

BMW i3 Cost Analysis Zone 2: Exterior



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Technical Disclaimer: The goal of this analysis is to establish a should cost value for manufacturing the vehicle and its sub-systems. These cost totals do not include tooling, Engineering Research and Development (ER&D), testing and calibration, logistics, or profit. Manufacturing process assumptions, such as manual assembly vs. automation or mold cavity numbers, were selected based on an annual volume of 20,000.

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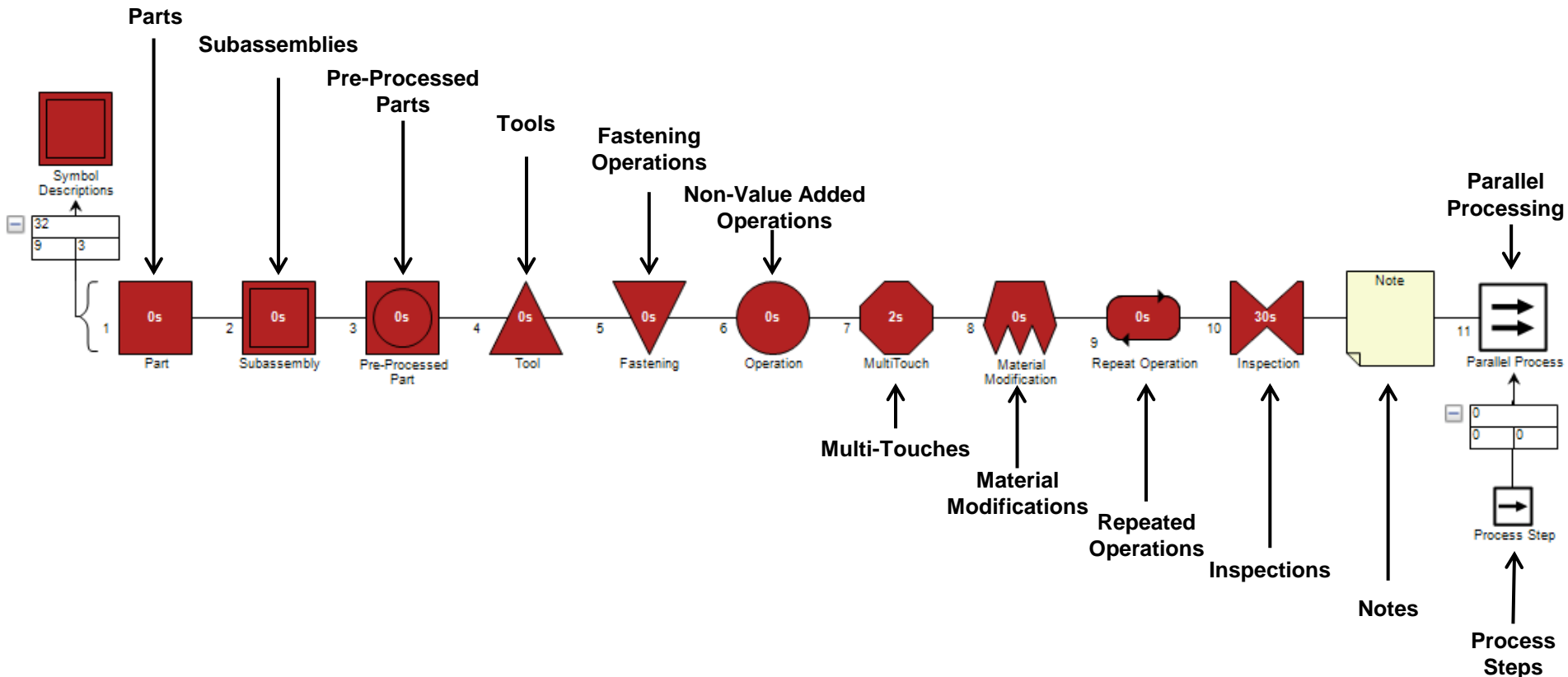
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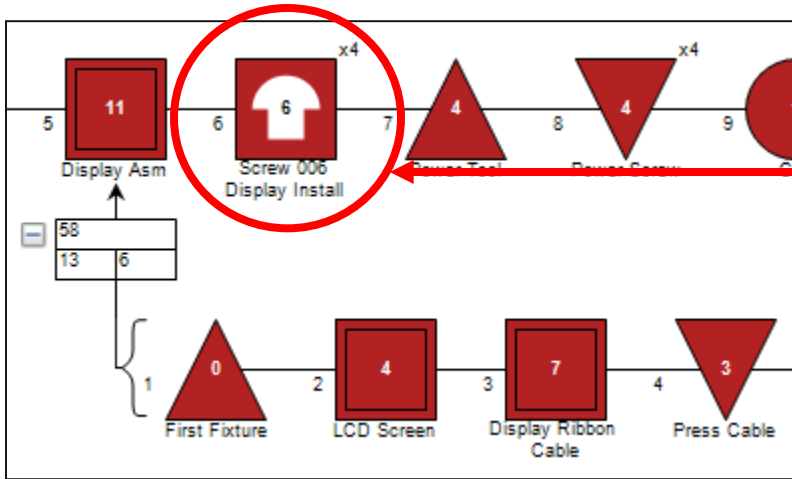
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- The Design Profit® Software is used to provide a detailed cost map analyzing every subassembly, part, operation, & tool in the manufacturing process.
- The various symbols shown below are used in a hierarchical diagram to quantify & compare design and manufacturing efficiencies & costs.





Part Properties

This Symbol is Contained in: **Default Assembly**

Number: *Library* Screw 006 Display Install Quantity: 4 Repeat

Name: *Symbol* Screw 006 Display Install Repeat Rate: 100%

Description: *Library* Screw 006 Display Install Amount: 1 Unit of Measure: Each Fluid

Actual Time: 6.0000 sec Dwell: 0.0000 sec Engineered Service

Eye Catching

Material: (None) Weight: 0.0000 lb Supplier:

Investment Cost: \$0.00 Piece Cost: \$0.06

Does It Have To Move? Fastener

Does It Have To Be A Different Material? Key/Critical Component

Scoring Fastener Quality Multimedia Categories Notes Instructions Attachments Custom Fields

Munro Score: 6 Part / Operator Part / Part

Eng Hours Score: 5 Unstable Part Fight Gravity

No Gets Score: 3 Pull Apart Complex Motions

Handle Carefully Vision Restricted

Small Part Access Limited

Filthy Part Operator Dependent

Wear Gloves Hold Down

Unwrap Parts Ergo Danger

Hazardous Material Poka Yoke Issue

Pick Up Part

One Hand

Two Hands

Crane

No Handling

Label... Library Item... OK Cancel

Each symbol is created by filling out a properties window. Penalty conditions and other information related to the symbol are assigned, in order to calculate the effect of handling difficulties on assembly time.

The following assumptions were made for the cost analysis:

- All processing was documented in the Design Profit software.
- All raw material prices are based on quotes and published information.
- All manufacturing processes include the man and machine to establish an hourly cost for the manufacturing work cell for each process and country utilized in creating the vehicle. These work cell rates are used along with calculation of cycle time to generate the process costs of components. Machine rates are developed through an internal model, accounting for all aspects of the primary and secondary equipment for the process. Operator rates are based on the specific country, and related industry labor rates. Adjustments are made for the number of operators in the workcell.
- Common/basic components were costed as commodity items. These included: bearings, seals, fasteners, and electronic components.
- Bearings/Seals/Fasteners are compared to numerous costed bills of materials to establish a purchased price.
- Electronic component costs are based on the costed bill of materials on hand, quote requests, and published information. Component pricing is run through trend lines to establish a cost for the appropriate targeted volumes.
- Machining cycle times are calculated using operations based on speeds and feeds from the standard machinist handbook.

Sales, General, and Administration:

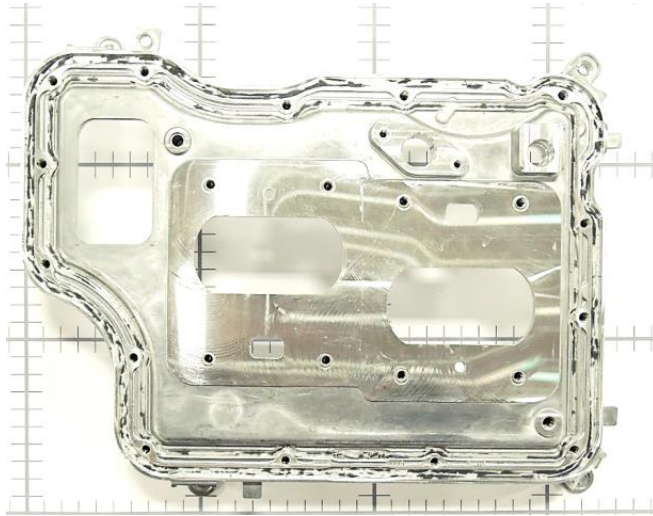
- The SG&A mark-up used for commodity parts is a flat 3.0% typically used as a standard industry value. This mark-up accounts for the purchasing and handling of commodity parts.
- The SG&A mark-up used for fabricated parts raw material and processing costs is a variable rate based on the technology level associated with the system. A table of the standard percentage mark-ups is shown to the right. Low technology is typical of a system mostly consisting of simple parts, such as basic stampings and injection molded parts. High technology is typically a system with complex automated assembly, high tolerance machined parts, and complex electronic systems, or more standard processes applied to new applications. Cutting edge is typically a system that uses first to market application of an advanced technology.

	Technology Level	SG&A Mark-Ups
Low	1	6.0%
	2	7.0%
	3	8.0%
	4	9.0%
	5	10.0%
Medium	6	11.0%
	7	12.0%
	8	13.0%
	9	14.0%
	10	15.0%
High	11	16.0%
	12	17.0%
	13	18.0%
	14	19.0%
	15	20.0%
Cutting Edge	16	21.0%
	17	22.0%
	18	23.0%
	19	24.0%
	20	25.0%

Quality Burden (Q Burden) is the additional cost carried by each good product unit, to account for the actions and materials used to correct defects in parts (as received or produced) or in production processes. Q Burden is a key component of the Cost of Quality and may be considered equivalent to failure costs. Q Burden reflects the variable cost of poor quality. The probability of a defect can be estimated from industry averages or can be based on company statistics. Q Burden is calculated by adding the incident and disposition costs for each defect and multiplying the sum by the probability of a defect occurrence. The incident is the set of actions that are taken immediately upon the discovery of a real or suspected defect. The disposition is the actions to deal with the defective production after the incident.

Q Burden does not include:

- Base overhead associated with the quality organization (the amount required to assure compliance with industry and customer standards)
- Process documentation generally needed in order to communicate requirements and standards for production, inspection, and testing
- Inspection and test equipment depreciation and consumables (unless needed for troubleshooting defective product)
- Defect prevention activity (investment in new equipment, process improvement, mistake-proofing activities, redesign, lean/six sigma activities, etc.)



The die casting material costs and cycle times are calculated in an internal parametric based cost estimating sheet, and outputs are fed into Design Profit to develop final fabrication costs. Since die casting is a more material driven primary fabrication process, the cells to the right include general dimensional values and material selections.

Die Casting Material Costs & Cycle Times

Part Name: Top Plate, Top Plate w/Silicone Bead

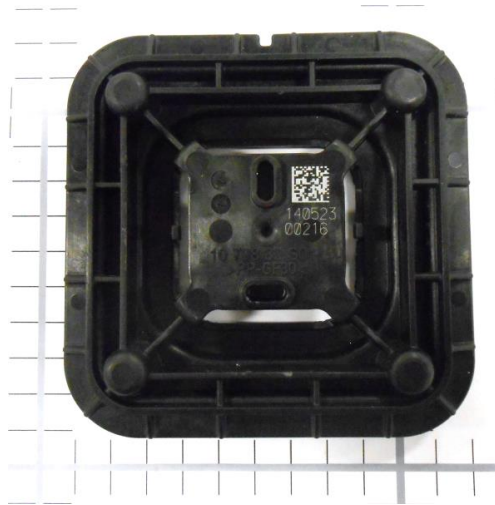
Inputs:

Die Casting Inputs:			
1	Height - Tool Draw	82	mm
2	Length - Longest	314	mm
3	Width - Shortest	250	mm
4	Max. Wall Thickness	5.5	mm
5	Weight of Part - Finished	0.738	kg
6	Percent Loss from Machining	7.00	%
7	Number of Cavities in Tool	2	
8	Number of Die Lock Features	0	
9	Material Number	7	

Material Name	Abbreviation	Cost (\$/kg)
Al-9Si-3Cu(Fe)	A380	\$2.27

Outputs to DP:

Die Casting Outputs:			
1	Min. Die Casting Machine	1927	tons
2	Die Casting Time	28.13	sec
3	Raw Material Weight	0.790	kg
4	Material Cost	\$1.79	



The injection molding material costs and cycle times are calculated in an internal parametric based cost estimating sheet, and outputs are fed into Design Profit to develop final fabrication costs. Since injection molding is a more complex material driven primary fabrication process, the cells to the right include detailed dimensional values and material selections.

Injection Molding Material Costs & Cycle Times

Part Name: Vent Body

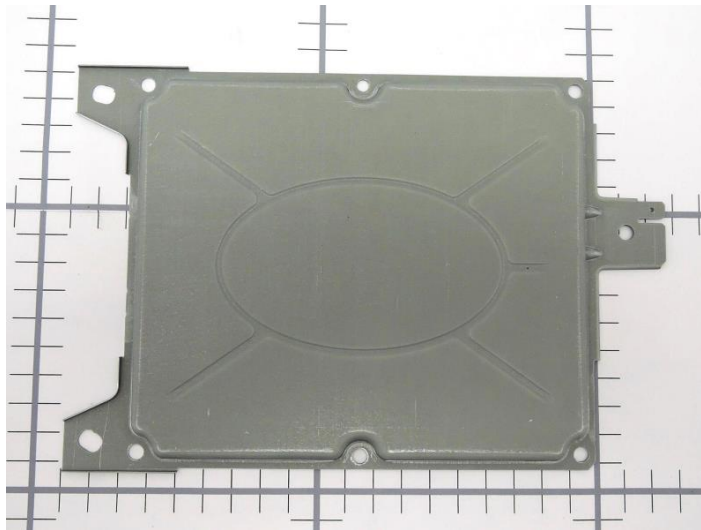
Inputs:

Injection Molding Inputs:			
1	Number of Injection Shots: (1, 2, & 3)	1	
2	Weight of Part	0.050	kg
3	Number of Cavities in Tool	2	
4	Number of Die Lock Features	0	
5	Recycle Offal (1=Yes, 0=No)	0	
6	Height - Tool Draw	19.52	mm
Inputs for Each Injection Shot:			
7	Injection Process: (Standard=1, MuCell=2, & Foaming Agent=3)	1	
8	Length - Longest (mm)	105.4	
9	Width - Shortest (mm)	105.3	
10	Percentage of Part Area Used Based on Square Area of Length x Width	90.00	
11	Nominal Wall Thickness (mm)	2	
12	Material Number	59	

	Material Name	Abbreviation	Cost (\$/kg)	Offal Value (\$/kg)
-	Polypropylene (30% glass)	PP + GF30	\$2.71	\$0.00
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Outputs to DP:

Injection Molding Outputs:			
1	Min. Injection Molding Press	103	tons
Outputs for Each Injection Shot:		PP + GF30	-
2	Injection Molding Time (sec)	7.29	-
3	Net Weight (kg)	0.050	-
4	Raw Material Weight (kg)	0.053	-
5	Raw Material Cost	\$0.14	-



The stamping material costs and cycle times are calculated in an internal parametric based cost estimating sheet, and outputs are fed into Design Profit to develop final fabrication costs. Since stamping is a more machine driven primary fabrication process, the cells to the right include dimensional values related to stations operating in the press, along with material selections.

Stamping Material Costs & Cycle Times

Part Name: Bottom Cover, Cell Control

Inputs:

Stamping Inputs:			
General Inputs:			
1	Stamping Quality: (Standard=1, Fine Blanking=2)	1	
2	Parts per Hit (Side by Side Across Press Width)	1	
3	Material Number	6	
Blanking Inputs:			
4	Shape Type: (Formed Sheet=1, Drawn Box=2, Drawn Cylinder=3)	1	
5	Part Height - Tool Draw	6.73	mm
6	Wrap Length - Longest	225	mm
7	Wrap Width - Shortest	150	mm
8	Sheet Thickness	0.65	mm
9	Number of Blanking Hits (If Unknown = 0)	0	
Piercing Inputs:			
10	Number of Circular Holes	8	
11	Average Diameter of Circular Holes	5	mm
12	Number of Non-Circular Holes	2	
13	Total Perimeter of Non-Circular Holes	64	mm
14	Number of Piercing Hits (If Unknown = 0)	0	
Bending Inputs:			
15	Number of Bends	0	
16	Total Length of Bend Lines	0	mm
17	Number of Bending Hits (If Unknown = 0)	0	
Flanging Holes Inputs:			
18	Number of Flanged Holes	0	
19	Total Perimeter of Flanged Holes	0	mm
20	Number of Flanging Holes Hits (If Unknown = 0)	0	
Forming Depression Inputs:			
21	Number of Depressions	1	
22	Total Perimeter of Depressions	560	mm
23	Number of Forming Depression Hits (If Unknown = 0)	0	
Deep Drawing Inputs:			
24	Drawn Area Depth	0	mm
25	Drawn Area Length - Longest	0	mm
26	Drawn Area Width - Shortest	0	mm
27	Number of Deep Drawing Hits (If Unknown = 0)	0	

Material Name	Abbreviation	Cost (\$/kg)
Medium Carbon Steel 1040 - Galvanized	AISI 1040 - Galvs	\$1.50

Outputs to DP:

Stamping Outputs: (Progressive Die)			
1	Stamping Press	60	tons
2	Stamping Cycle Time	0.67	sec
3	Blank Weight	0.197	kg
4	Material Cost	\$0.30	

Zone Report Outline:

- Zone Information
 - Zone Overview
 - Zone Executive Summary
- Chapter Information
 - Chapter Overview
 - Eye Catching Features
 - Executive Summary
 - Repeating Series of Sets of Costing Detail Pages
 - Assembly Details (Set of 3 Pages)
 - Part Details (Set of 2 Pages)
 - Assembly Process (Set of 2 Pages)
- Appendix Information
 - TechInsights Reports
 - Electronic Component Costing Details
 - Munro & Associates Wire Harness Reports
 - Wire Harness Costing Details
- Zones and Chapters are meant to be similar in structure to a system and sub-system breakdown, however, they may or may not represent specific Original Equipment Manufacturer (OEM) organizations. For example, the Zone 7: Driveline contains the chapters for Motor, Gear Box and Half Shafts.



Battery Pack	
Summary	
Parts	11,254
Fasteners	246
Part Numbers	196
Steps	5,009
Fastenings	5,009
Right First Time	0.29
OEM Process Time (Hr.)	0.88
Supplier Process Time (Hr.)	29.30
Total Weight (kg)	233.71
Material Cost**	Values Available in Report
OEM Process Cost	
Supplier Process Cost	
Overhead Burden	
SG&A	
Manufacturing Cost*	

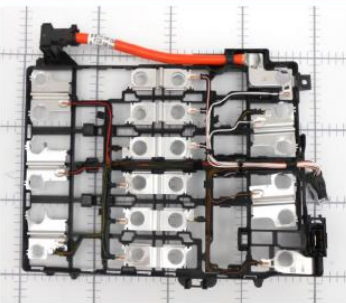

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

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At the beginning of each Zone report and beginning of each Chapter, there will be a Executive Summary page. This page provides the high level totals of the Zone or Chapter, based on the following detailed data. The upper part of the summary table shows typical metrics totaled from the assembly and fabrication processes, including part counts, operation counts, timing, and weights. The lower part of the table shows the total costs incurred from these processes.

Executive Summary: Page 1 of 1

Buss and Sense Asm

Battery Pack Asm
 HV Battery Module, Asm
 Buss and Sense Asm

Assembly Summary

Parts	38
Fasteners	0
Part Numbers	17
Steps	319
Fastenings	54
Light Time	96.82 %
OEM Process Time (Min)	4.71
Supplier Process Time (Min)	5.47
Total Weight (kg)	0.46

Material Cost**	Values Available in Report
OEM Process Cost	
Supplier Process Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts

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Assembly Details: Page 1 of 3

As the report progresses through the breakdown hierarchy of the Chapter, when an assembly is analyzed, three detail pages will be provided. The first page, shown to the left, is a high level overview. The top left photo is the independent assembly, placed on a grid for a reference perspective. The bottom left photo is the assembly in location, once it is assembled to its parent assembly. The top right is a list of the parent assemblies of this assembly. The bottom right is a table summarizing total metrics and costs related to the completed assembly.

Buss and Sense Asm											
Name	Qty	Fasteners	Parts	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Buss Frame Asm	1	19	4	37	19	99.61%	0.80	0.00	22.00	17.74	0.15
Assemble Module Harness	1	10	1	33	10	99.47%	1.67	0.00	0.00	0.00	0.00
Buss Connector 1	3	0	1	7	0	99.94%	0.00	0.00	0.00	7.60	0.01
Buss Connector 2	2	0	1	7	0	99.94%	0.00	0.00	0.00	7.60	0.01
Buss Connector 3	4	0	1	10	0	99.90%	0.00	0.00	5.60	7.60	0.01
Buss Connector 4	2	0	1	10	0	99.90%	0.00	0.00	5.60	7.67	0.01
Assemble Buss Connector	1	11	0	37	11	99.62%	1.18	0.00	38.00	0.00	0.00
Module Bus Terminal Asm	1	2	3	30	2	99.70%	0.00	0.00	27.00	20.70	0.06
Connection Cable Asm	1	1	1	17	1	99.63%	0.00	0.00	14.00	12.10	0.10
Assemble Buss Connectors	1	2	0	9	2	99.61%	0.28	0.00	10.00	0.00	0.00
Assemble Thermistor Leads	1	9	17	48	9	99.61%	0.78	0.00	50.00	0.00	0.00

Buss and Sense Asm											
Name	Part	Series	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost		
Buss Frame Asm											
Assemble Module Harness											
Buss Connector 1											
Buss Connector 2											
Buss Connector 3											
Buss Connector 4											
Assemble Buss Connector											
Module Bus Terminal Asm											
Connection Cable Asm											
Assemble Buss Connectors											
Assemble Thermistor Leads											

Values Available in Report

The second assembly detail page, shown to the left, is the detailed breakdown of the totals for each line item within the current assembly. The line items within the breakdown will include assemblies, parts, and assembly processes. This makes these tables effectively a combined Bill of Materials (BOM) and Bill of Process (BOP) for that assembly. The top table provides the typical metrics totaled from the assembly and fabrication process of each line item. The bottom table provides the total costs incurred from these processes.

Assembly Details: Page 2 of 3

- Note for large assemblies with many line items this page could become multiple pages.

Buss and Sense Asm

Detailed Summary

Parts	38
Fasteners	0
Part Numbers	17
Steps	319
Fastenings	54
Right First Time	96.82
OEM Asm. Time (Min)	4.71
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	2.24
Supplier Fab. Time (Min)	0.46
Total Weight (kg)	0.46
Processed Part	Values Available in Report
Material Cost	
OEM Asm. Cost	
OEM Fab. Cost	
Supplier Asm. Cost	
Supplier Fab. Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

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The third assembly detail page, shown to the left, is a detailed summary of the totals shown on the previous page. The upper part of the summary table shows typical metrics totaled from the assembly and fabrication process, including part counts, operation counts, timing, and weights. The lower part of the table shows the total costs incurred from these processes.

Assembly Details: Page 3 of 3

Buss Connector 2

- ...Buss and Sense Asm
- Buss Connector 2
- Buss Connector 2, Process

Process Summary

Right First Time	99.94 %
Process Time (Sec)	7.60
Total Weight (kg)	0.01

Material Cost**	Values Available in Report
OEM Process Cost	
Supplier Process Cost	
Q Burden	
SG&A	
Manufacturing Cost*	


* Excluding tooling, ER&D, logistics, and profit margin
** Includes material cost and purchased parts cost

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Part Details: Page 1 of 2

As the report progresses through the breakdown hierarchy of the Chapter, when a part is analyzed, two detail pages will be provided. The first page, shown to the left, is a high level overview. The top left photo is the independent part, placed on a grid for a reference perspective. The bottom left photo is the part in location, once it is assembled to its parent assembly. The top right is a list of the parent assemblies of this part. The bottom right is a table summarizing total metrics and costs related to the completed part.

Buss Connector 2



Buss Connector 2, Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	3.50	1						
Debur	3.50	1						
Stamp, 25 Ton Press	0.60	1						

Buss Connector 2, Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Buss Connector 2, Material	1	Aluminum 1350 - Coil Stock					

SAMPLE


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The second part detail page, shown to the left, is the detailed breakdown of the totals for the raw materials and each process step to fabricate the part. The top table provides the typical fabrication process metrics and costs totaled for each step. The bottom table provides the total costs for raw material or purchased parts used in the fabrication process.

Part Details: Page 2 of 2

- Note for complex parts with many steps this page could become multiple pages.

Assemble Thermistor Leads






\HV Battery Module, Asm
 \Buss and Sense Asm
 \Assemble Thermistor Leads

Process Summary

Right First Time	99.67 %
Process Time (sec)	97.00
Total Weight (kg)	0.01

Material Cost**	Values Available in Report
OEM Process Cost	
Supplier Process Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost



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Assembly Process Details: Page 1 of 2

As the report progresses through the breakdown hierarchy of the Chapter, when an assembly process is analyzed, two detail pages will be provided. The first page, shown to the left, is a high level overview. The top left are photos of the purchased parts utilized in the process, placed on a grid for a reference perspective. The bottom left photo is a view of the location, once the process is complete. The top right is a list of the parent assemblies of this process. The bottom right is a table summarizing total metrics and costs related to the process.

Assemble Thermistor Leads

Overall Cycle Time (Sec) Parts / Cycle Number of Operators Workcell Rate (\$/hr) Country Process Cost Right First Time Q Burden

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	47.00	1	1.00					
Apply Epoxy	50.00	1	0.25					

Values Available in Report

Assemble Thermistor Leads

Qty Material Material Cost / kg (\$/kg) Net Weight (kg) Gross Material Weight (kg) Purchased Part Cost Material Cost

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Small Wire Tie	1	Commodity Item					
Thermistor Hot Met	1	Commodity Item					
Termination Epoxy	15	Commodity Item					

Values Available in Report

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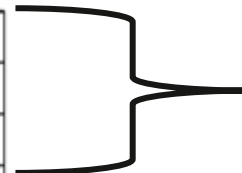
The second assembly process detail page, shown to the left, is the detailed breakdown of the totals for the purchased parts and each assembly process step. The top table provides the typical assembly process metrics and costs totaled for each step. The bottom table provides the total costs for purchased parts used in the assembly process. If a electronic component or wire harness are in the list of purchased parts, then this page will also have a link to the accompanying report in the Appendix.

Assembly Process Details: Page 2 of 2

- Note for complex processes with many steps this page could become multiple pages.

Detailed Summary

Parts	38
Fasteners	0
Part Numbers	17
Steps	319
Fastenings	54
Right First Time	96.82%
OEM Asm. Time (Min)	4.71
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.23
Supplier Fab. Time (Min)	2.24
Total Weight (kg)	0.46
Purchased Part Cost	Values Available in Report
Material Cost	
OEM Asm. Cost	
OEM Fab. Cost	
Supplier Asm. Cost	
Supplier Fab. Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

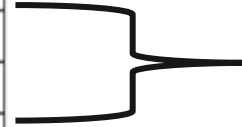


Summary tables, include three metrics related to part count. The first metric, “Parts” is the total quantity of parts. The second metric, “Fasteners” is the total quantity of fasteners, within that total part count, meaning that the fasteners count is a sub-total of the parts count. The third metric, “Part Numbers” is the total unique part instances in the total part count (this includes numbers for both main parts and fasteners).

Detailed Summary

Parts	38
Fasteners	0
Part Numbers	17
Steps	319
Fastenings	54
Right First Time	96.82%
OEM Asm. Time (Min)	4.71
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.23
Supplier Fab. Time (Min)	2.24
Total Weight (kg)	0.46

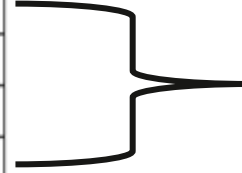
Purchased Part Cost	Values Available in Report
Material Cost	
OEM Asm. Cost	
OEM Fab. Cost	
Supplier Asm. Cost	
Supplier Fab. Cost	
Q Burden	
SG&A	
Manufacturing Cost*	



Summary tables, also include two metrics related to operation counts. The first “Steps”, is the total count of the operations required to complete an assembly, part, or assembly process. Operations counted in this total include handling of parts, movement of equipment or operators, handling of tools, fastenings of parts and assemblies, operations to add and remove material during the fabrication process, etc. The second “Fastenings” is the total count of the operations specifically related to fastenings components together, meaning that the fastening count is a sub-total of the steps count.

Detailed Summary

Parts	38
Fasteners	0
Part Numbers	17
Steps	319
Fastenings	54
Right First Time	96.82%
OEM Asm. Time (Min)	4.71
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.23
Supplier Fab. Time (Min)	2.24
Total Weight (kg)	0.46



Often it would be expected that the analysis would have the same number of fasteners to fastenings, however, that is not always the case. One scenario is shown to the right, where there are less fasteners, than fastenings. This is typical of welding operations or the application of sealant or adhesive, as there is not a standard bolt, nut, or clip to be counted as a fastener. A second scenario is where there are more fasteners, than fastenings. This is typical of a process that engages multiple fasteners at the same time, like a multi-head nut runner.

Purchased Part Cost	Values Available in Report
Material Cost	
OEM Asm. Cost	
OEM Fab. Cost	
Supplier Asm. Cost	
Supplier Fab. Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

Detailed Summary


Parts	38
Fasteners	0
Part Numbers	17
Steps	319
Fastenings	54
Right First Time	96.82%
OEM Asm. Time (Min)	4.71
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.23
Supplier Fab. Time (Min)	2.24
Total Weight (kg)	0.46

Purchased Part Cost	Values Available in Report
Material Cost	
OEM Asm. Cost	
OEM Fab. Cost	
Supplier Asm. Cost	
Supplier Fab. Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

Summary tables include “Right First Time” (RFT). This value states the probability that all the steps that total to this point in the process will be completed without an error. Naturally, as the number and complexity of steps required to complete the assembly, part, or assembly process increase, the RFT percentage will decrease. RFT is calculated using typical best-in-class PPM values for incident rates. However, even with high Sigma level processes, as the steps count increases greatly, the RFT percentage will decrease greatly.



Driver Side Half Shaft Installation




No Commodity Items
Required for This
Process

Zone 7 Driveline
Half Shafts
Driver Side Half Shaft Installation

Process Summary

Right First Time	99.96 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	Values Available in Report
Supplier Process Cost	
Q Burden	
SG&A	
Manufacturing Cost*	

* Excluding tooling, ER&D, logistics, and profit margin
** Includes material cost and purchased parts




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Some assembly processes will not require the use of commodity items in the process to fasten parts and assemblies. For example, the installation of the half shafts to the vehicle utilizes a press fit, and therefore does not require commodities, like bolts, nuts, or clips to fasten in place. When no commodities are required, the top left photos will be replaced with the standard statement shown on the left. Additionally there will be no weight or material cost / purchased parts cost present in the process summary.

Interpreting Data – Low Q Burden

Buss Connector 2, Process								
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	3.60	1						\$0.00
Debur	3.60	1						\$0.00
Stamp, 25 Ton Press	0.60	1						\$0.00

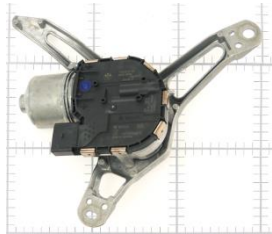
Values Available in Report



Some assembly and fabrication process steps that have few operations or operations with low PPMs of defects, will often display \$0.00 in Q Burden. This is simply because the Q Burden value for that step in the process is less than one cent. However, this fraction of a cent of cost will be rolled-up to any parent part or assembly for these processes and added to its totals.

Cost Analysis

Zone 2: Exterior Overview



Zone 2 consists of the front and rear fascia's, front head lights (adaptive), rear tail lamps, front windshield wipers, lift gate wiper and exterior trim components.

The fascia's were both injection molded plastic designs with class A painted surfaces. All of lamps in the lighting system were LED designs except for the fog and front turn signals which use typical incandescent bulbs. All lamp assemblies consisted primarily of multi-piece injection molded components. The front wipers were unique as each blade is driven by a separate motor (no linkage) while the rear wiper appears to be typical of current automotive designs. The exterior trim section includes the front fenders sill plates, mirror flags front trunk trim and various cladding and badging.

All major components were costed in detail, while prices were applied to commodity items (i.e. seals, fasteners, latches, and seat belts).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.



Summary

Parts	1,328
Fasteners	555
Part Numbers	602
Steps	5,264
Fastenings	1,388
Right First Time	27.49%
OEM Process Time (Hrs)	5.46
Supplier Process Time (Hrs)	3.30
Total Weight (kg)	82.93
Material Cost**	\$1,191.76
OEM Process Cost	\$341.46
Supplier Process Cost	\$152.17
Q Burden	\$19.36
SG&A	\$197.50
Manufacturing Cost*	\$1,902.25

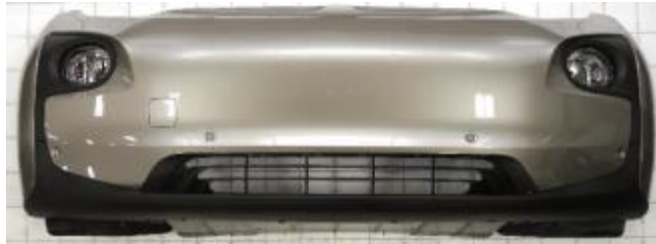
* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fascia's' Overview



The fascia's for the i3 consist of thermoplastic panels. Assembly and manufacturing details for the components will be covered throughout the report.

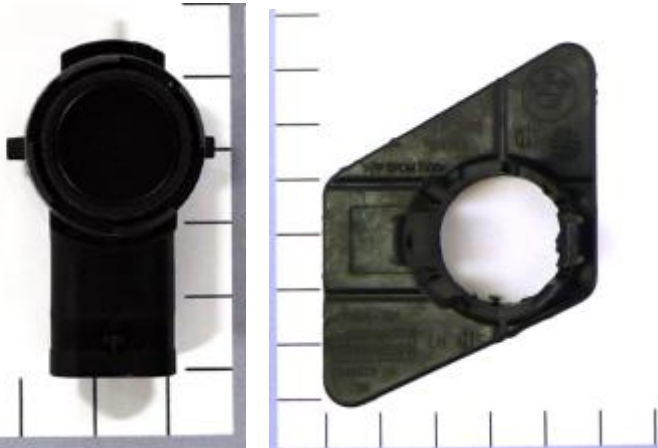


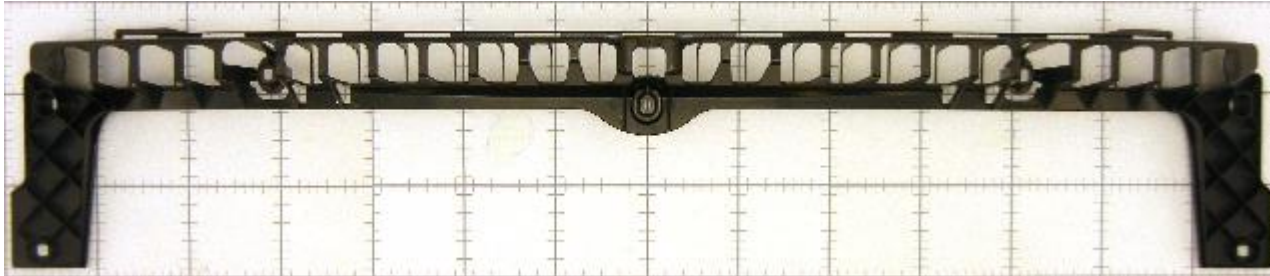
The fascia consists of the thermoplastic multi-piece panels that snap together. The fascia are painted in a two tone design much like the rest of the exterior of the vehicle to give the i3 a futuristic appeal. The parking assist sensors are mounted in plastic brackets that are attached to the fascia using double sided adhesive tape.

All major components were costed in detail, while prices were applied to commodity items (i.e. seals, rivets, snap rings).

Estimates are based on actual parts.

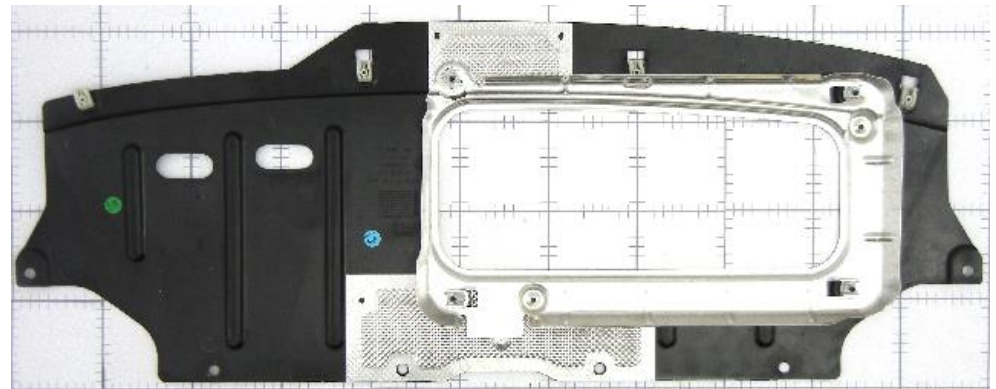
Photos: Background on 100mm grid paper.





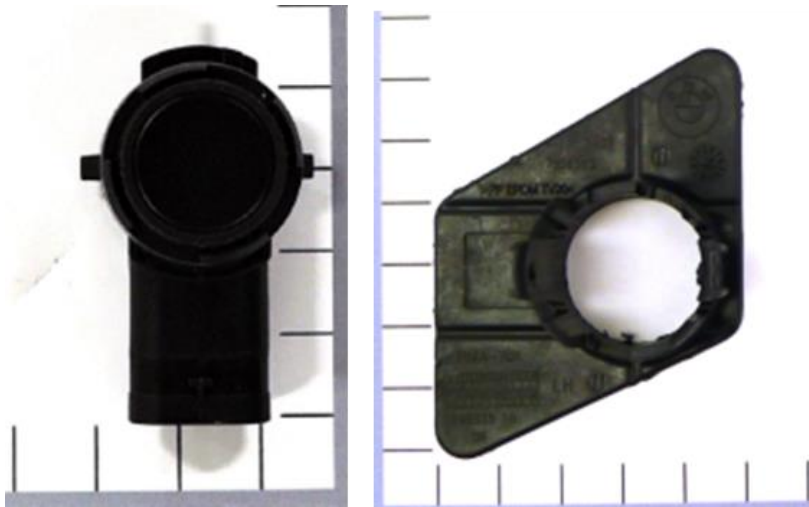
Observations:

The BMW i3 utilizes a >ABS< Rear Fascia Support that spans the full width of the vehicle to add strength to the Rear Fascia.



Observations:

There is a plastic aero shield attached to the rear fascia. The aero shield has a stamp aluminum heat shield fastened to it that extends to the packaging dimensions of the exhaust system.



Description:

- The Park Assist Sensors and Brackets are Mounted to the Thermoplastic Fascia Panels using Double Sided Tape

Advantages:

- Reduced Manufacturing Complexity due to reduced number of fasteners



Description:

- All of the Fascia Trim Pieces are Snapped Together. The only Fasteners used for the Fascia are to mount the lamps and mount the Fascia to the vehicle.

Advantages:

- Reduced Manufacturing Complexity due to reduced number of assembly steps and fasteners
- Reduced Assembly Cost resulting from reduced manufacturing complexity

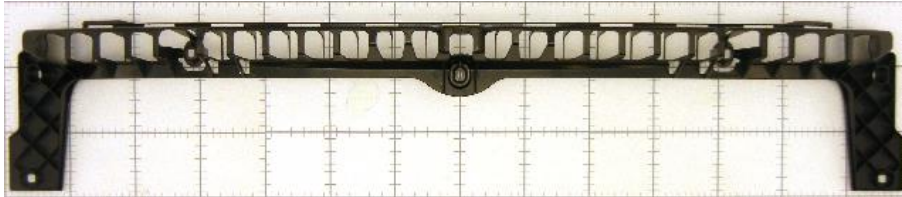
Summary

Parts	201
Fasteners	80
Part Numbers	74
Steps	701
Fastenings	203
Right First Time	85.44%
OEM Process Time (Hrs)	0.94
Supplier Process Time (Hrs)	0.17
Total Weight (kg)	14.47
Material Cost**	\$387.27
OEM Process Cost	\$74.54
Supplier Process Cost	\$9.08
Q Burden	\$2.36
SG&A	\$37.36
Manufacturing Cost*	\$510.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Support



\...
\Fascias
\Rear Fascia Support
\Rear Fascia Support Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	29.85
Total Weight (kg)	0.82

Material Cost**	\$2.28
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.57
Q Burden	\$0.00
SG&A	\$0.28
Manufacturing Cost*	\$3.13



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Support

Rear Fascia Support Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
610 Ton Injection Molding Press	29.85	1	0.25	68.23	GER	\$0.57	99.99%	\$0.00

Rear Fascia Support Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Rear Fascia Support	1	ABS	\$2.60	0.8200	0.8200	\$0.00	\$2.28

Rear Fascia Support Installation



\...
\Zone 2 Exterior
\Fascias
\Rear Fascia Support Installation

Process Summary

Right First Time	98.96 %
Process Time (Sec)	66.00
Total Weight (kg)	0.03

Material Cost**	\$0.15
OEM Process Cost	\$1.68
Supplier Process Cost	\$0.00
Q Burden	\$0.16
SG&A	\$0.17
Manufacturing Cost*	\$2.15



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Support Installation



Rear Fascia Support Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	66.00	1	1.00	91.41	GER	\$1.68	98.96%	\$0.16

Rear Fascia Support Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	5	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

\...
 \Zone 2 Exterior
 \Fascias
 \Rear Fascia Asm

Assembly Summary



Parts	61
Fasteners	12
Part Numbers	37
Steps	212
Fastenings	57
Right First Time	96.05 %
OEM Process Time (Min)	20.78
Supplier Process Time (Min)	2.93
Total Weight (kg)	4.42

Material Cost**	\$134.87
OEM Process Cost	\$26.39
Supplier Process Cost	\$2.13
Q Burden	\$0.60
SG&A	\$12.20
Manufacturing Cost*	\$176.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Asm

Rear Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Rear Fascia Outer Asm, Rear Fascia Asm	1	33	35	110	35	98.29 %	4.69	9.00	0.00	0.46	3.3074
Rear Fascia Inner Asm, Rear Fascia Asm	1	28	21	97	21	97.77 %	1.98	4.89	1.80	0.67	1.1149
Assemble Rear Fascia	1	0	1	3	1	99.95 %	0.22	0.00	0.00	0.00	0.0000

Rear Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Rear Fascia Outer Asm, Rear Fascia Asm	\$58.40	\$69.63	\$7.15	\$11.00	\$0.00	\$0.20	\$0.26	\$10.55	\$157.18
Rear Fascia Inner Asm, Rear Fascia Asm	\$0.76	\$6.08	\$3.02	\$4.90	\$1.63	\$0.31	\$0.34	\$1.62	\$18.64
Assemble Rear Fascia	\$0.00	\$0.00	\$0.33	\$0.00	\$0.00	\$0.00	\$0.01	\$0.03	\$0.37

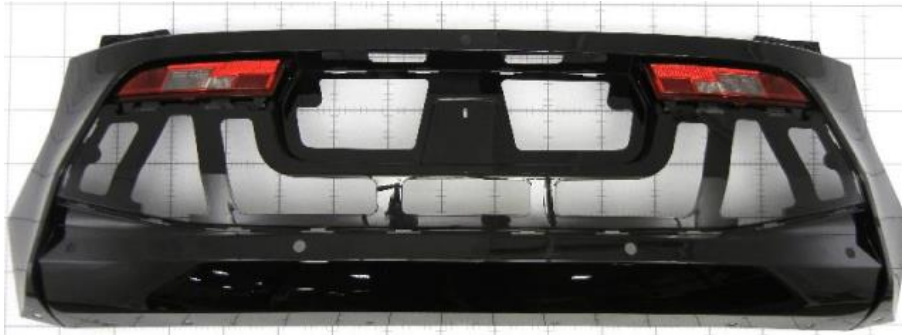
Detailed Summary

Parts	61
Fasteners	12
Part Numbers	37
Steps	212
Fastenings	57
Right First Time	96.05%
OEM Asm. Time (Min)	6.89
OEM Fab. Time (Min)	13.89
Supplier Asm. Time (Min)	1.80
Supplier Fab. Time (Min)	1.14
Total Weight (kg)	4.42
Purchased Part Cost	\$59.16
Material Cost	\$75.71
OEM Asm. Cost	\$10.49
OEM Fab. Cost	\$15.90
Supplier Asm. Cost	\$1.63
Supplier Fab. Cost	\$0.50
Q Burden	\$0.60
SG&A	\$12.20
Manufacturing Cost*	\$176.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Outer Asm, Rear Fascia Asm



\...
 \Fascias
 \Rear Fascia Asm
 \Rear Fascia Outer Asm, Rear Fascia Asm

Assembly Summary

Parts	33
Fasteners	2
Part Numbers	20
Steps	110
Fastenings	35
Right First Time	98.29 %
OEM Process Time (Min)	13.69
Supplier Process Time (Min)	0.46
Total Weight (kg)	3.31

Material Cost**	\$128.03
OEM Process Cost	\$18.14
Supplier Process Cost	\$0.20
Q Burden	\$0.26
SG&A	\$10.55
Manufacturing Cost*	\$157.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Outer Asm, Rear Fascia Asm



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Rear Fascia Outer Asm, Rear Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Rear Fascia Outer, Rear Fascia Outer Asm	1	4	0	22	0	99.78 %	0.00	9.00	0.00	0.00	3.0000
Assemble Back Up Lamp	1	3	3	7	3	99.93 %	0.39	0.00	0.00	0.00	0.0053
Park Assist Sensor Bracket, Rear Fascia Outer Asm	4	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0038
Assemble Bracket Parking Assist	1	10	18	37	18	99.22 %	2.44	0.00	0.00	0.00	0.1112
Backup Camera Bracket, Rear Fascia Outer Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0128
Assemble Backup Camera	1	3	5	9	5	99.83 %	0.54	0.00	0.00	0.00	0.0374
LH Mounting Bracket, Rear Fascia Outer Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.10	0.0223
Assemble Left Bracket Rear Fascia Side Bracket	1	1	2	4	2	99.88 %	0.31	0.00	0.00	0.00	0.0029
RH Mounting Bracket, Rear Fascia Outer Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.10	0.0227
Assemble Right Bracket Rear Fascia Side Bracket	1	2	3	6	3	99.85 %	0.44	0.00	0.00	0.00	0.0030
RF Signal Mounting Bracket, Rear Fascia Outer Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.10	0.0190
Assemble RF Signal Receiver	1	2	4	8	4	99.88 %	0.56	0.00	0.00	0.00	0.0556

Rear Fascia Outer Asm, Rear Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Rear Fascia Outer, Rear Fascia Outer Asm	\$0.00	\$18.00	\$0.00	\$11.00	\$0.00	\$0.00	\$0.03	\$2.90	\$31.93
Assemble Back Up Lamp	\$0.21	\$0.00	\$0.60	\$0.00	\$0.00	\$0.00	\$0.01	\$0.07	\$0.88
Park Assist Sensor Bracket, Rear Fascia Outer Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Bracket Parking Assist	\$64.54	\$0.00	\$3.72	\$0.00	\$0.00	\$0.00	\$0.12	\$2.01	\$60.39
Backup Camera Bracket, Rear Fascia Outer Asm	\$0.00	\$0.05	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.07
Assemble Backup Camera	\$0.02	\$51.31	\$0.82	\$0.00	\$0.00	\$0.00	\$0.03	\$5.21	\$57.39
LH Mounting Bracket, Rear Fascia Outer Asm	\$0.00	\$0.08	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.14
Assemble Left Bracket Rear Fascia Side Bracket	\$0.01	\$0.00	\$0.48	\$0.00	\$0.00	\$0.00	\$0.02	\$0.05	\$0.56
RH Mounting Bracket, Rear Fascia Outer Asm	\$0.00	\$0.08	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.14
Assemble Right Bracket Rear Fascia Side Bracket	\$0.11	\$0.00	\$0.67	\$0.00	\$0.00	\$0.00	\$0.02	\$0.07	\$0.87
RF Signal Mounting Bracket, Rear Fascia Outer Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.12
Assemble RF Signal Receiver	\$3.51	\$0.00	\$0.86	\$0.00	\$0.00	\$0.00	\$0.02	\$0.19	\$4.58

Detailed Summary

Parts	33
Fasteners	2
Part Numbers	20
Steps	110
Fastenings	35
Right First Time	98.29%
OEM Asm. Time (Min)	4.69
OEM Fab. Time (Min)	9.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.46
Total Weight (kg)	3.31
Purchased Part Cost	\$58.40
Material Cost	\$69.63
OEM Asm. Cost	\$7.15
OEM Fab. Cost	\$11.00
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.20
Q Burden	\$0.26
SG&A	\$10.55
Manufacturing Cost*	\$157.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Rear Fascia Outer Asm, Rear Fascia Asm
- \Rear Fascia Outer, Rear Fascia Outer Asm
- \Rear Fascia Outer Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	539.80
Total Weight (kg)	3.00

Material Cost**	\$18.00
OEM Process Cost	\$11.00
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$2.90
Manufacturing Cost*	\$31.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Outer, Rear Fascia Outer Asm



Rear Fascia Outer Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Primer	164.82	1	0.25	50.17	GER	\$2.30	99.97 %	\$0.01
Apply Clearcoat	19.60	1	0.25	117.09	GER	\$0.64	99.97 %	\$0.01
Cure Basecoat	147.18	1	0.25	50.17	GER	\$2.05	99.97 %	\$0.01
Apply Basecoat	19.60	1	0.25	117.09	GER	\$0.64	99.97 %	\$0.01
Cure Primer	111.88	1	0.25	50.17	GER	\$1.56	99.97 %	\$0.01
Apply Primer	19.60	1	0.25	117.09	GER	\$0.64	99.97 %	\$0.01
3000 Ton Injection Molding Press	57.12	1	0.25	200.35	GER	\$3.18	99.99 %	\$0.00

Rear Fascia Outer Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$3.47
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$2.97
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$1.69
Material, Rear Fascia Outer	1	PP/EPDM TD20	\$3.29	3.0000	3.0000	\$0.00	\$9.87

Assemble Back Up Lamp



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- \Rear Fascia Asm
- \Rear Fascia Outer Asm, Rear Fascia Asm
- \Assemble Back Up Lamp

Process Summary

Right First Time	99.93 %
Process Time (Sec)	23.50
Total Weight (kg)	0.01
Material Cost**	\$0.21
OEM Process Cost	\$0.60
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.07
Manufacturing Cost*	\$0.88

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Back Up Lamp

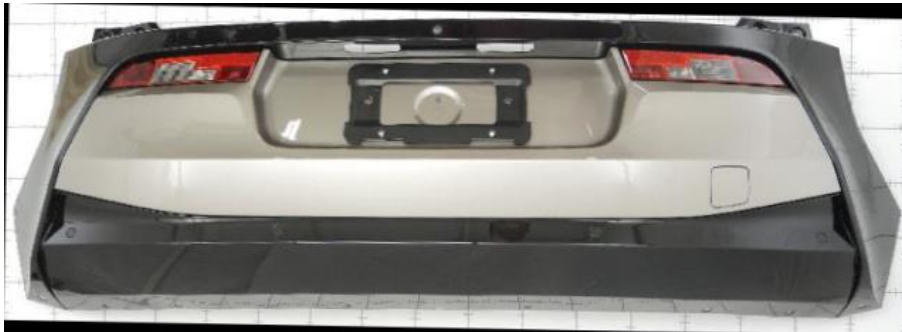
Assemble Back Up Lamp

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	23.50	1	1.00	91.41	GER	\$0.60	99.93%	\$0.01

Assemble Back Up Lamp

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plastic J-Nut	2	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Park Assist Sensor Bracket, Rear Fascia Outer Asm



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- \Rear Fascia Outer Asm, Rear Fascia Asm
- \Park Assist Sensor Bracket, Rear Fascia Outer Asm
- \Park Assist Sensor Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.12
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Park Assist Sensor Bracket, Rear Fascia Outer Asm

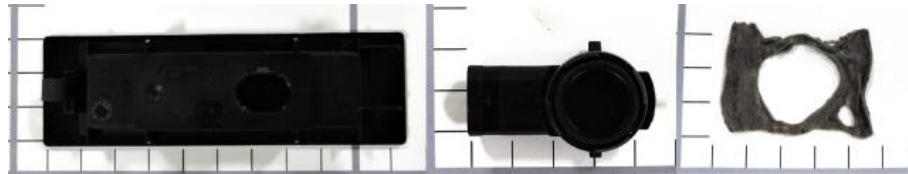


Park Assist Sensor Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.96	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Park Assist Sensor Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Park Sensor Assist Bracket	1	PP/EPDM TD20	\$3.29	0.0038	0.0041	\$0.00	\$0.01



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- \Rear Fascia Asm
- \Rear Fascia Outer Asm, Rear Fascia Asm
- \Assemble Bracket Parking Assist

Process Summary

Right First Time	99.22 %
Process Time (Sec)	146.60
Total Weight (kg)	0.11

Material Cost**	\$54.54
OEM Process Cost	\$3.72
Supplier Process Cost	\$0.00
Q Burden	\$0.12
SG&A	\$2.01
Manufacturing Cost*	\$60.39



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Bracket Parking Assist



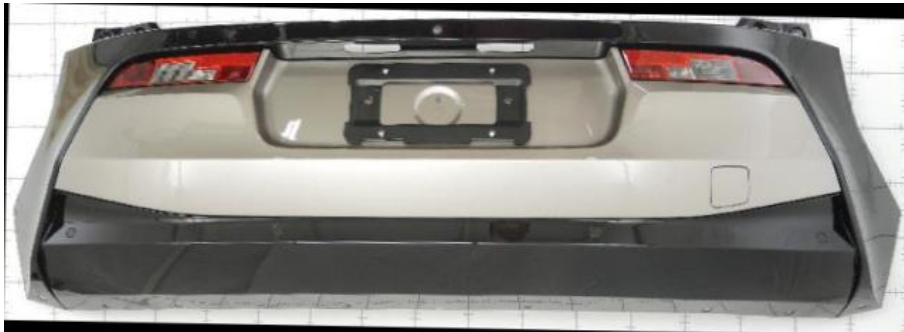
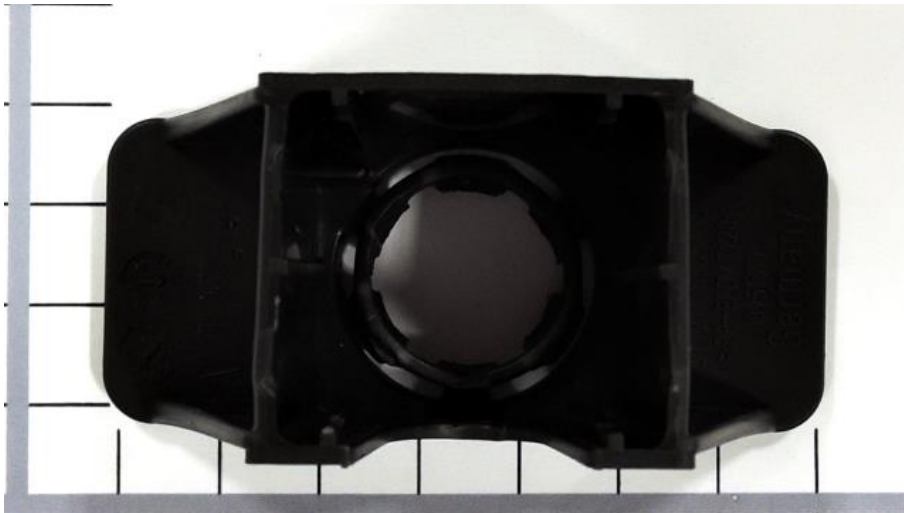
Assemble Bracket Parking Assist

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	146.60	1	1.00	91.41	GER	\$3.72	99.22 %	\$0.12

Assemble Bracket Parking Assist

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, Parking Sensor Bracket	4	Commodity Item	Purchased	0.0009	-	\$0.01	\$0.00
Sensor, Parking Assist	4	Commodity Item	Purchased	0.0161	-	\$12.50	\$0.00
Light, License Plate	2	Commodity Item	Purchased	0.0216	-	\$2.25	\$0.00

Backup Camera Bracket, Rear Fascia Outer Asm



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- \Rear Fascia Outer Asm, Rear Fascia Asm
- \Backup Camera Bracket, Rear Fascia Outer Asm
- \Backup Camera Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.19
Total Weight (kg)	0.01

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Backup Camera Bracket, Rear Fascia Outer Asm

Backup Camera Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	17.52	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Backup Camera Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Backup Camera Bracket	1	PP/EPDM TD20	\$3.29	0.0128	0.0138	\$0.00	\$0.05

Assemble Backup Camera



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- \Rear Fascia Asm
- \Rear Fascia Outer Asm, Rear Fascia Asm
- \Assemble Backup Camera

Process Summary

Right First Time	99.83 %
Process Time (Sec)	32.30
Total Weight (kg)	0.04

Material Cost**	\$51.33
OEM Process Cost	\$0.82
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$5.21
Manufacturing Cost*	\$57.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Backup Camera

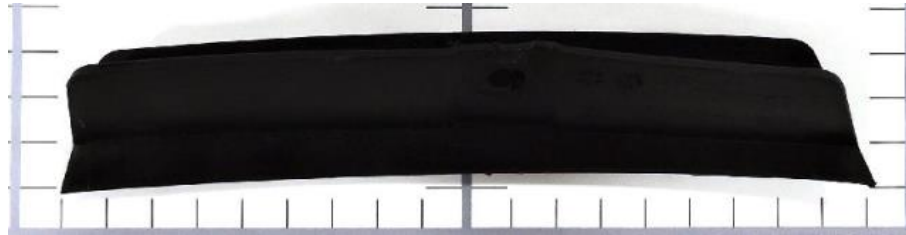


Assemble Backup Camera									
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden	
OEM Manual Asm	32.30	1	1.00	91.41	GER	\$0.82	99.83%	\$0.03	

Assemble Backup Camera								
Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost	
Double Sided Tape, Back Up Camera Bracket	2	Commodity Item	Purchased	0.0008	-	\$0.01	\$0.00	
Camera, Rear Fascia	1	See Appendix	-	0.0358	-	\$0.00	\$51.31	

[Click Here for TechInsights Electronics Report on Rear Camera](#)

LH Mounting Bracket, Rear Fascia Outer Asm



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- \Rear Fascia Outer Asm, Rear Fascia Asm
- \LH Mounting Bracket, Rear Fascia Outer Asm
- \LH Mounting Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.72
Total Weight (kg)	0.02

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LH Mounting Bracket, Rear Fascia Outer Asm



LH Mounting Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	22.88	4	0.25	26.65	GER	\$0.04	99.99%	\$0.00

LH Mounting Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, LH Mounting Bracket	1	PP/EPDM TD20	\$3.29	0.0223	0.0240	\$0.00	\$0.08

Assemble Left Bracket Rear Fascia Side Bracket



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\Rear Fascia Asm

\Rear Fascia Outer Asm, Rear Fascia Asm

\ Assemble Left Bracket Rear Fascia Side Bracket

Process Summary

Right First Time	99.88 %
Process Time (Sec)	18.88
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.48
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.05
Manufacturing Cost*	\$0.56

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Left Bracket Rear Fascia Side Bracket



Assemble Left Bracket Rear Fascia Side Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	18.88	1	1.00	91.41	GER	\$0.48	99.88 %	\$0.02

Assemble Left Bracket Rear Fascia Side Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, Rear Fascia Side Bracket	1	Commodity Item	Purchased	0.0029	-	\$0.01	\$0.00

RH Mounting Bracket, Rear Fascia Outer Asm



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- \Rear Fascia Outer Asm, Rear Fascia Asm
- \RH Mounting Bracket, Rear Fascia Outer Asm
- \RH Mounting Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.72
Total Weight (kg)	0.02

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

RH Mounting Bracket, Rear Fascia Outer Asm



RH Mounting Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	22.88	4	0.25	26.65	GER	\$0.04	99.99%	\$0.00

RH Mounting Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, RH Mounting Bracket	1	PP/EPDM TD20	\$3.29	0.0227	0.0244	\$0.00	\$0.08

Assemble Right Bracket Rear Fascia Side Bracket



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\Rear Fascia Asm

\Rear Fascia Outer Asm, Rear Fascia Asm

\Assemble Right Bracket Rear Fascia Side Bracket

Process Summary

Right First Time	99.85 %
Process Time (Sec)	26.38
Total Weight (kg)	0.00

Material Cost**	\$0.11
OEM Process Cost	\$0.67
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.07
Manufacturing Cost*	\$0.87

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Right Bracket Rear Fascia Side Bracket



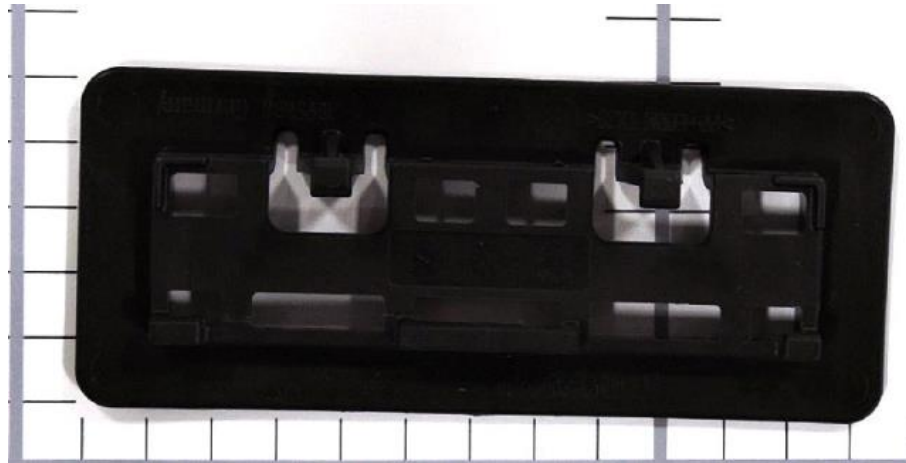
Assemble Right Bracket Rear Fascia Side Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	26.38	1	1.00	91.41	GER	\$0.67	99.85%	\$0.02

Assemble Right Bracket Rear Fascia Side Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, Rear Fascia Side Bracket	1	Commodity Item	Purchased	0.0029	-	\$0.01	\$0.00
Label, BMW P/N	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00

RF Signal Mounting Bracket, Rear Fascia Outer Asm



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- \Rear Fascia Outer Asm, Rear Fascia Asm
- \RF Signal Mounting Bracket, Rear Fascia Outer Asm
- \RF Signal Mounting Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.70
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

RF Signal Mounting Bracket, Rear Fascia Outer Asm



RF Signal Mounting Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	22.80	4	0.25	26.65	GER	\$0.04	99.99%	\$0.00

RF Signal Mounting Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, RF Signal Mounting Bracket	1	PP/EPDM TD20	\$3.29	0.0190	0.0204	\$0.00	\$0.07

Assemble RF Signal Receiver



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\Rear Fascia Asm

\Rear Fascia Outer Asm, Rear Fascia Asm

\Assemble RF Signal Receiver

Process Summary

Right First Time	99.88 %
Process Time (Sec)	33.75
Total Weight (kg)	0.06

Material Cost**	\$3.51
OEM Process Cost	\$0.86
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.19
Manufacturing Cost*	\$4.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble RF Signal Receiver

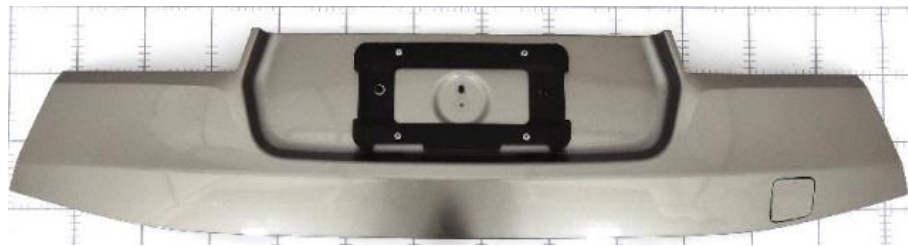


Assemble RF Signal Receiver

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	33.75	1	1.00	91.41	GER	\$0.86	99.88 %	\$0.02

Assemble RF Signal Receiver

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, RF Signal Bracket	1	Commodity Item	Purchased	0.0045	-	\$0.01	\$0.00
Sensor, RF Signal Receiver	1	Commodity Item	Purchased	0.0511	-	\$3.50	\$0.00



\...
 \Fascias
 \Rear Fascia Asm
 \Rear Fascia Inner Asm, Rear Fascia Asm

Assembly Summary

Parts	28
Fasteners	10
Part Numbers	18
Steps	97
Fastenings	21
Right First Time	97.77 %
OEM Process Time (Min)	6.87
Supplier Process Time (Min)	2.47
Total Weight (kg)	1.11

Material Cost**	\$6.84
OEM Process Cost	\$7.91
Supplier Process Cost	\$1.93
Q Burden	\$0.34
SG&A	\$1.62
Manufacturing Cost*	\$18.64

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Rear Fascia Inner Asm, Rear Fascia Asm



Rear Fascia Inner Asm, Rear Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Inner Fascia, Rear Fascia Inner Asm	1	4	0	22	0	99.78 %	0.00	4.89	0.00	0.00	0.9860
Assemble Rear Fascia	1	2	2	6	2	99.92 %	0.45	0.00	0.00	0.00	0.0002
License Plate Cover Asm, Rear Fascia Inner Asm	1	12	11	26	11	99.57 %	0.00	0.00	1.80	0.23	0.0960
Assemble License Plate Cover	1	6	6	15	6	98.76 %	1.37	0.00	0.00	0.00	0.0176
Tow Ring Cover, Rear Fascia Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.44	0.0151
Assemble Tow Ring Cover	1	0	2	3	2	99.95 %	0.17	0.00	0.00	0.00	0.0000

Rear Fascia Inner Asm, Rear Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Inner Fascia, Rear Fascia Inner Asm	\$0.00	\$5.70	\$0.00	\$4.90	\$0.00	\$0.00	\$0.03	\$1.06	\$11.69
Assemble Rear Fascia	\$0.20	\$0.00	\$0.68	\$0.00	\$0.00	\$0.00	\$0.01	\$0.07	\$0.97
License Plate Cover Asm, Rear Fascia Inner Asm	\$0.28	\$0.29	\$0.00	\$0.00	\$1.63	\$0.12	\$0.07	\$0.21	\$2.59
Assemble License Plate Cover	\$0.28	\$0.00	\$2.08	\$0.00	\$0.00	\$0.00	\$0.19	\$0.22	\$2.77
Tow Ring Cover, Rear Fascia Asm	\$0.00	\$0.09	\$0.00	\$0.00	\$0.00	\$0.19	\$0.03	\$0.03	\$0.34
Assemble Tow Ring Cover	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.01	\$0.03	\$0.29

Detailed Summary

Parts	28
Fasteners	10
Part Numbers	18
Steps	97
Fastenings	21
Right First Time	97.77%
OEM Asm. Time (Min)	1.98
OEM Fab. Time (Min)	4.89
Supplier Asm. Time (Min)	1.80
Supplier Fab. Time (Min)	0.67
Total Weight (kg)	1.11
Purchased Part Cost	\$0.76
Material Cost	\$6.08
OEM Asm. Cost	\$3.02
OEM Fab. Cost	\$4.90
Supplier Asm. Cost	\$1.63
Supplier Fab. Cost	\$0.31
Q Burden	\$0.34
SG&A	\$1.62
Manufacturing Cost*	\$18.64

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Fascia, Rear Fascia Inner Asm



\...

- \Rear Fascia Inner Asm, Rear Fascia Asm
- \Inner Fascia, Rear Fascia Inner Asm
- \Inner Fascia Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	293.63
Total Weight (kg)	0.99

Material Cost**	\$5.70
OEM Process Cost	\$4.90
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$1.06
Manufacturing Cost*	\$11.69

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Fascia, Rear Fascia Inner Asm

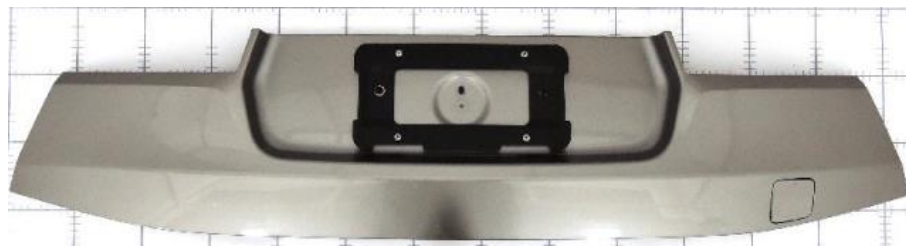
Inner Fascia Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	81.00	1	0.25	50.17	GER	\$1.13	99.97 %	\$0.01
Apply Clearcoat	16.48	1	0.25	62.44	GER	\$0.29	99.97 %	\$0.01
Cure Basecoat	72.67	1	0.25	50.17	GER	\$1.01	99.97 %	\$0.01
Apply Basecoat	16.48	1	0.25	62.44	GER	\$0.29	99.97 %	\$0.01
Cure Primer	56.00	1	0.25	50.17	GER	\$0.78	99.97 %	\$0.01
Apply Primer	16.48	1	0.25	62.44	GER	\$0.29	99.97 %	\$0.01
1200 Ton Injection Molding Press	34.52	1	0.25	116.67	GER	\$1.12	99.99 %	\$0.00

Inner Fascia Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$1.05
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.90
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.51
Material, Inner Fascia	1	PP/EPDM TD20	\$3.29	0.9860	0.9860	\$0.00	\$3.24

Assemble Rear Fascia



\...

- \Rear Fascia Asm
- \Rear Fascia Inner Asm, Rear Fascia Asm
- \Assemble Rear Fascia

Process Summary

Right First Time	99.92 %
Process Time (Sec)	26.75
Total Weight (kg)	0.00

Material Cost**	\$0.20
OEM Process Cost	\$0.68
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.07
Manufacturing Cost*	\$0.97

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Rear Fascia

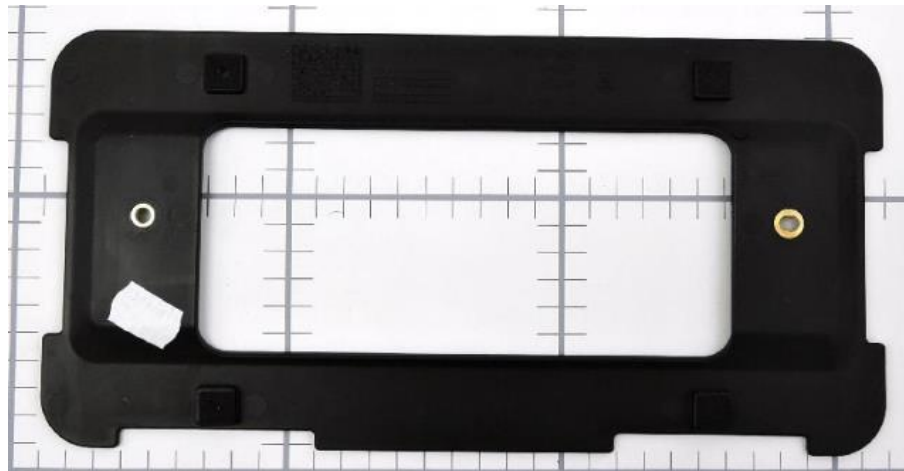
Assemble Rear Fascia

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	26.75	1	1.00	91.41	GER	\$0.68	99.92%	\$0.01

Assemble Rear Fascia

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Label, BMW Vin Number	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00

License Plate Cover Asm, Rear Fascia Inner Asm



\...

\Rear Fascia Asm

\Rear Fascia Inner Asm, Rear Fascia Asm

\License Plate Cover Asm, Rear Fascia Inner Asm

Assembly Summary

Parts	12
Fasteners	4
Part Numbers	6
Steps	26
Fastenings	11
Right First Time	99.57 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.03
Total Weight (kg)	0.10

Material Cost**	\$0.57
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.75
Q Burden	\$0.07
SG&A	\$0.21
Manufacturing Cost*	\$2.59

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

License Plate Cover Asm, Rear Fascia Inner Asm



License Plate Cover Asm, Rear Fascia Inner Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cover, License Plate Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.23	0.0800
Assemble License Plate Cover	1	11	11	24	11	99.58 %	0.00	0.00	1.80	0.00	0.0160

License Plate Cover Asm, Rear Fascia Inner Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cover, License Plate Cover Asm	\$0.00	\$0.29	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.04	\$0.45
Assemble License Plate Cover	\$0.28	\$0.00	\$0.00	\$0.00	\$1.63	\$0.00	\$0.06	\$0.17	\$2.14

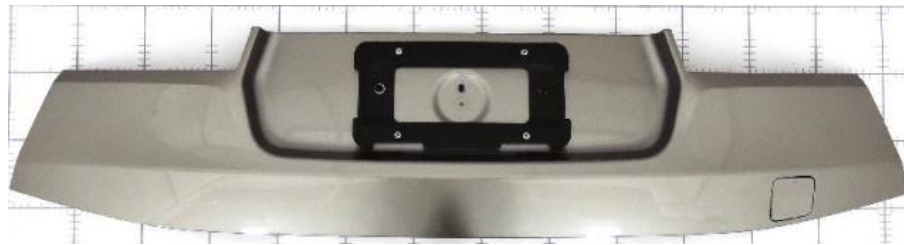
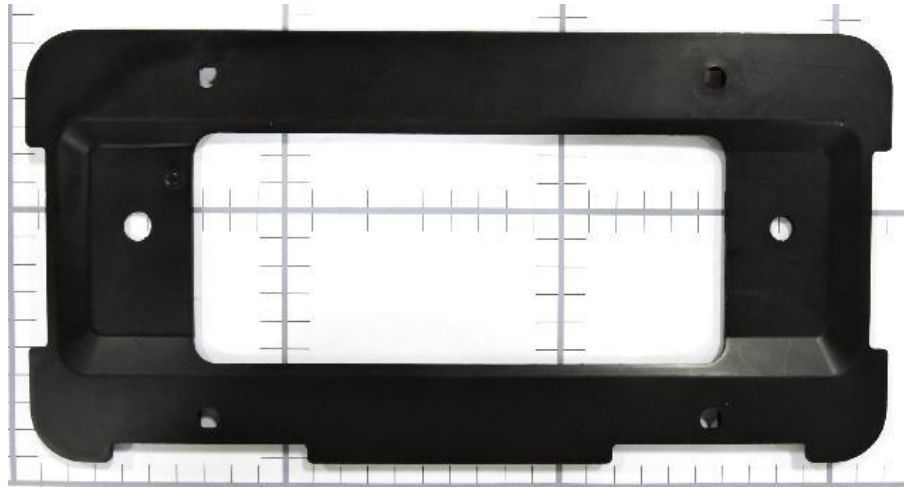
Detailed Summary

Parts	12
Fasteners	4
Part Numbers	6
Steps	26
Fastenings	11
Right First Time	99.57%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.80
Supplier Fab. Time (Min)	0.23
Total Weight (kg)	0.10
Purchased Part Cost	\$0.28
Material Cost	\$0.29
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$1.63
Supplier Fab. Cost	\$0.12
Q Burden	\$0.07
SG&A	\$0.21
Manufacturing Cost*	\$2.59

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover, License Plate Cover Asm



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- \License Plate Cover Asm, Rear Fascia Inner Asm
- \Cover, License Plate Cover Asm
- \License Plate Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.97
Total Weight (kg)	0.08

Material Cost**	\$0.29
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover, License Plate Cover Asm



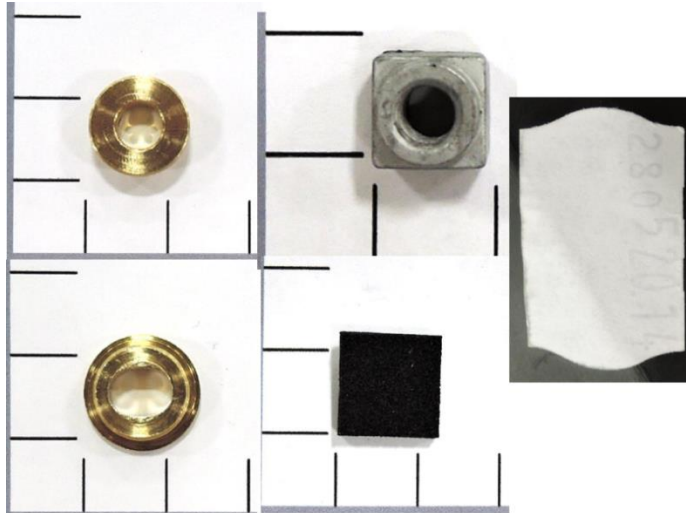
License Plate Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	27.94	2	0.25	30.85	GER	\$0.12	99.99%	\$0.00

License Plate Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, License Plate Cover	1	PP/EPDM	\$3.32	0.0800	0.0860	\$0.00	\$0.29

Assemble License Plate Cover



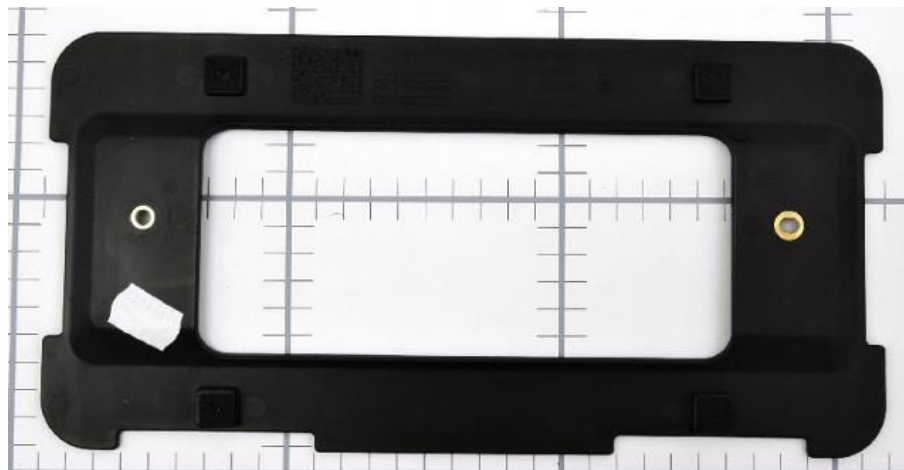
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- \Rear Fascia Inner Asm, Rear Fascia Asm
- \License Plate Cover Asm, Rear Fascia Inner Asm
- \Assemble License Plate Cover

Process Summary

Right First Time	99.58 %
Process Time (Sec)	107.83
Total Weight (kg)	0.02

Material Cost**	\$0.28
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.63
Q Burden	\$0.06
SG&A	\$0.17
Manufacturing Cost*	\$2.14



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble License Plate Cover



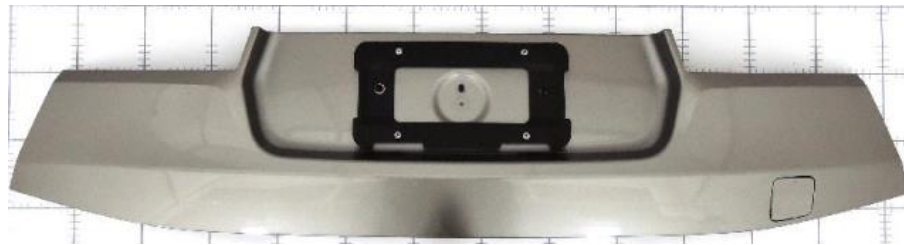
Assemble License Plate Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	107.83	1	1.00	54.32	GER	\$1.63	99.58 %	\$0.06

Assemble License Plate Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Knurled & Flanged Insert	1	Commodity Item	Purchased	0.0017	-	\$0.05	\$0.00
M5 Slotted Insert	1	Commodity Item	Purchased	0.0024	-	\$0.05	\$0.00
M5 Square Nut, License Plate Cover	4	Commodity Item	Purchased	0.0029	-	\$0.03	\$0.00
Square Nut Foam Cover, License Plate Cover	4	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
Label, Date Code, License Plate Cover	1	Commodity Item	Purchased	0.0001	-	\$0.02	\$0.00

Assemble License Plate Cover



- \...
- \Rear Fascia Asm
- \Rear Fascia Inner Asm, Rear Fascia Asm
- \Assemble License Plate Cover

Process Summary

Right First Time	98.76 %
Process Time (Sec)	82.00
Total Weight (kg)	0.02

Material Cost**	\$0.28
OEM Process Cost	\$2.08
Supplier Process Cost	\$0.00
Q Burden	\$0.19
SG&A	\$0.22
Manufacturing Cost*	\$2.77

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble License Plate Cover



Assemble License Plate Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	82.00	1	1.00	91.41	GER	\$2.08	98.76%	\$0.19

Assemble License Plate Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Pan Head Phillips	2	Commodity Item	Purchased	0.0024	-	\$0.12	\$0.00
M5x12mm-Pan Head Phillips	4	Commodity Item	Purchased	0.0032	-	\$0.01	\$0.00

Tow Ring Cover, Rear Fascia Asm



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- \Rear Fascia Inner Asm, Rear Fascia Asm
- \Tow Ring Cover, Rear Fascia Asm
- \Tow Ring Cover Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	26.37
Total Weight (kg)	0.02

Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.19
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tow Ring Cover, Rear Fascia Asm



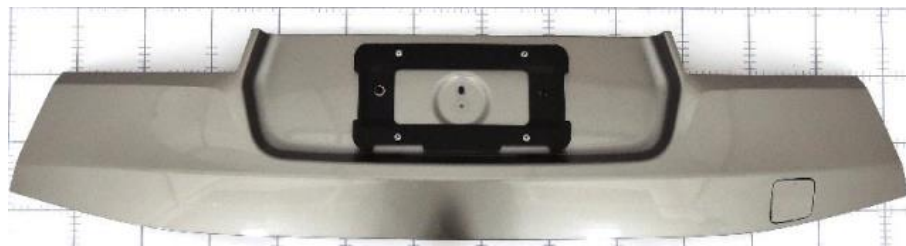
Tow Ring Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	5.78	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Apply Clearcoat	2.48	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	5.36	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Apply Basecoat	2.48	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	4.52	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Primer	2.48	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
150 Ton Injection Molding Press	26.16	8	0.25	27.82	GER	\$0.03	99.99 %	\$0.00

Tow Ring Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Tow Ring Cover	1	PBT+PC	\$3.63	0.0151	0.0162	\$0.00	\$0.06

No Commodity Items
Required for This
Process



\...

\Rear Fascia Asm

\Rear Fascia Inner Asm, Rear Fascia Asm

\Assemble Tow Ring Cover

Process Summary

Right First Time	99.95 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.25
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tow Ring Cover



Assemble Tow Ring Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	10.00	1	1.00	91.41	GER	\$0.25	99.95%	\$0.01

Assemble Tow Ring Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...
\Fascias
\Rear Fascia Asm
\Assemble Rear Fascia

Process Summary

Right First Time	99.95 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.33
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Rear Fascia



Assemble Rear Fascia

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.00	1	1.00	91.41	GER	\$0.33	99.95%	\$0.01

Assemble Rear Fascia

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Rear Fascia Installation



\...
\Zone 2 Exterior
\Fascias
\Rear Fascia Installation

Process Summary

Right First Time	97.78 %
Process Time (Sec)	169.00
Total Weight (kg)	0.06

Material Cost**	\$0.24
OEM Process Cost	\$4.29
Supplier Process Cost	\$0.00
Q Burden	\$0.34
SG&A	\$0.44
Manufacturing Cost*	\$5.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Installation



Rear Fascia Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	169.00	1	1.00	91.41	GER	\$4.29	97.78 %	\$0.34

Rear Fascia Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	6	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00
M5x23mm-Hex SEMS Screw	1	Commodity Item	Purchased	0.0058	-	\$0.02	\$0.00
M5x18mm-SEMS Torx Screw	2	Commodity Item	Purchased	0.0051	-	\$0.02	\$0.00

Front Fascia Asm



\...
 \Zone 2 Exterior
 \Fascias
 \Front Fascia Asm

Assembly Summary

Parts	97
Fasteners	32
Part Numbers	36
Steps	317
Fastenings	90
Right First Time	95.43 %
OEM Process Time (Min)	29.16
Supplier Process Time (Min)	2.71
Total Weight (kg)	7.84

Material Cost**	\$244.36
OEM Process Cost	\$37.89
Supplier Process Cost	\$2.56
Q Burden	\$0.70
SG&A	\$23.07
Manufacturing Cost*	\$308.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Fascia Asm



Front Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Upper Fascia Asm, Front Fascia Asm	1	34	30	111	30	98.86 %	5.04	13.52	0.00	0.16	3.1726
Support, Front Fascia	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0294
Assemble Support	1	8	12	28	12	99.68 %	1.53	0.00	0.00	0.00	0.0120
Front Grille, FrontFascia Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.51	0.6460
Assemble Front Grille	1	14	15	43	15	99.61 %	2.73	0.00	0.00	0.00	1.8760
Lower Trim, FrontFascia Asm	1	1	0	1	0	99.99 %	0.00	0.84	0.00	0.00	0.9940
Assemble Lower Trim	1	0	3	4	3	99.92 %	0.22	0.00	0.00	0.00	0.0000
Trim Fog Lamp, Front Fascia Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.13	0.1100
Assemble Trim Fog Lamp	1	0	2	5	2	99.92 %	0.30	0.00	0.00	0.00	0.0000
Tow Ring Cover, Front Fascia Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.44	0.0151
Assemble Tow Ring Cover	1	0	2	3	2	99.95 %	0.17	0.00	0.00	0.00	0.0000
Driver Aeroshield Asm, Front Fascia Asm	1	8	6	20	6	99.81 %	0.86	0.00	0.00	0.47	0.1100

Front Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Upper Fascia Asm, Front Fascia Asm	\$75.80	\$16.02	\$7.68	\$14.21	\$0.00	\$0.07	\$0.17	\$6.07	\$120.02
Support, Front Fascia	\$0.00	\$0.08	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.13
Assemble Support	\$0.12	\$0.00	\$2.33	\$0.00	\$0.00	\$0.00	\$0.05	\$0.24	\$2.74
Front Grille, FrontFascia Asm	\$0.00	\$2.13	\$0.00	\$0.00	\$0.00	\$0.63	\$0.00	\$0.28	\$3.04
Assemble Front Grille	\$0.00	\$142.66	\$4.16	\$0.00	\$0.00	\$0.00	\$0.06	\$14.68	\$161.57
Lower Trim, FrontFascia Asm	\$0.00	\$3.27	\$0.00	\$1.14	\$0.00	\$0.00	\$0.00	\$0.44	\$4.85
Assemble Lower Trim	\$0.00	\$0.00	\$0.33	\$0.00	\$0.00	\$0.00	\$0.01	\$0.03	\$0.38
Trim Fog Lamp, Front Fascia Asm	\$0.00	\$0.39	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.05	\$0.56
Assemble Trim Fog Lamp	\$0.00	\$0.00	\$0.46	\$0.00	\$0.00	\$0.00	\$0.01	\$0.05	\$0.51
Tow Ring Cover, Front Fascia Asm	\$0.00	\$0.09	\$0.00	\$0.00	\$0.00	\$0.19	\$0.03	\$0.03	\$0.34
Assemble Tow Ring Cover	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.01	\$0.03	\$0.29
Driver Aeroshield Asm, Front Fascia Asm	\$0.41	\$0.25	\$1.31	\$0.00	\$0.00	\$0.48	\$0.03	\$0.22	\$2.69

Front Fascia Asm



Front Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Driver Aeroshield	1	2	2	6	2	99.57 %	0.53	0.00	0.00	0.00	0.0138
Passenger Aeroshield Asm, Front Fascia Asm	1	9	7	22	7	99.72 %	1.02	0.00	0.00	0.47	0.0969
Assemble Passenger Aeroshield	1	2	2	6	2	99.57 %	0.53	0.00	0.00	0.00	0.0138
Central Aeroshield Asm, Front Fascia Asm	1	6	5	17	5	99.84 %	0.87	0.00	0.00	0.28	0.5845
Assemble Central Aeroshield	1	4	4	13	4	99.16 %	0.98	0.00	0.00	0.00	0.0276

Front Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Driver Aeroshield	\$0.06	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00	\$0.06	\$0.08	\$1.02
Passenger Aeroshield Asm, Front Fascia Asm	\$0.43	\$0.21	\$1.56	\$0.00	\$0.00	\$0.47	\$0.04	\$0.24	\$2.95
Assemble Passenger Aeroshield	\$0.06	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00	\$0.06	\$0.08	\$1.02
Central Aeroshield Asm, Front Fascia Asm	\$0.33	\$1.46	\$1.33	\$0.00	\$0.00	\$0.42	\$0.02	\$0.33	\$3.89
Assemble Central Aeroshield	\$0.12	\$0.00	\$1.50	\$0.00	\$0.00	\$0.00	\$0.13	\$0.15	\$1.90

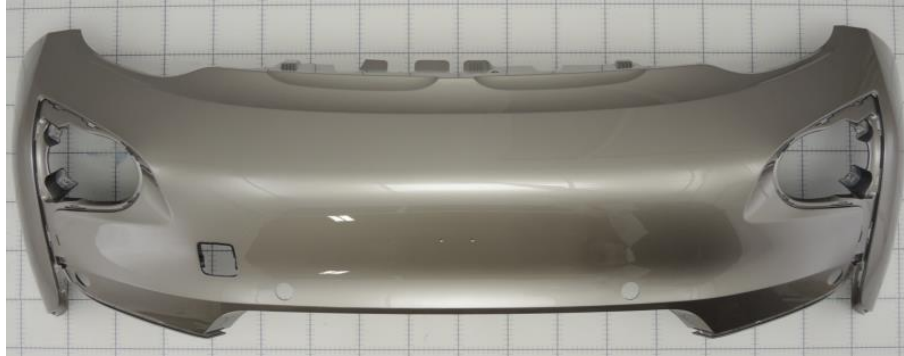
Detailed Summary

Parts	97
Fasteners	32
Part Numbers	36
Steps	317
Fastenings	90
Right First Time	95.43%
OEM Asm. Time (Min)	14.80
OEM Fab. Time (Min)	14.36
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	2.71
Total Weight (kg)	7.84
Purchased Part Cost	\$77.33
Material Cost	\$167.03
OEM Asm. Cost	\$22.54
OEM Fab. Cost	\$15.35
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$2.56
Q Burden	\$0.70
SG&A	\$23.07
Manufacturing Cost*	\$308.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Fascia Asm, Front Fascia Asm



\...
 \Fascias
 \Front Fascia Asm
 \Upper Fascia Asm, Front Fascia Asm

Assembly Summary

Parts	34
Fasteners	6
Part Numbers	16
Steps	111
Fastenings	30
Right First Time	98.86 %
OEM Process Time (Min)	18.56
Supplier Process Time (Min)	0.16
Total Weight (kg)	3.17

Material Cost**	\$91.82
OEM Process Cost	\$21.89
Supplier Process Cost	\$0.07
Q Burden	\$0.17
SG&A	\$6.07
Manufacturing Cost*	\$120.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Fascia Asm, Front Fascia Asm



Upper Fascia Asm, Front Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Upper Fascia, Upper Fascia Asm	1	1	0	1	0	99.99 %	0.00	0.71	0.00	0.00	2.9500
Front Fascia Upper Installation	1	8	8	23	8	99.78 %	1.33	0.00	0.00	0.00	0.0146
Side Panel Park Assist Bracket, Upper Fascia Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0060
Assemble Side Panel Park Assist Bracket	1	2	4	9	4	99.87 %	0.78	0.00	0.00	0.00	0.0028
Side Park Assist Bracket, Upper Fascia Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0088
Assemble Front Panel Side Parking Assist Bracket	1	2	4	9	4	99.87 %	0.65	0.00	0.00	0.00	0.0020
Middle Park Assist Bracket, Upper Fascia Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0082
Assemble Middle Parking Sensor Bracket	1	15	14	56	14	99.41 %	2.28	12.80	0.00	0.00	0.1572

Upper Fascia Asm, Front Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Upper Fascia, Upper Fascia Asm	\$0.00	\$9.71	\$0.00	\$2.39	\$0.00	\$0.00	\$0.00	\$1.21	\$13.31
Front Fascia Upper Installation	\$0.26	\$0.00	\$2.03	\$0.00	\$0.00	\$0.00	\$0.03	\$0.21	\$2.53
Side Panel Park Assist Bracket, Upper Fascia Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.04
Assemble Side Panel Park Assist Bracket	\$0.02	\$0.00	\$1.18	\$0.00	\$0.00	\$0.00	\$0.02	\$0.12	\$1.34
Side Park Assist Bracket, Upper Fascia Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.05
Assemble Front Panel Side Parking Assist Bracket	\$0.02	\$0.00	\$0.99	\$0.00	\$0.00	\$0.00	\$0.02	\$0.10	\$1.13
Middle Park Assist Bracket, Upper Fascia Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.05
Assemble Middle Parking Sensor Bracket	\$75.50	\$6.15	\$3.48	\$11.83	\$0.00	\$0.00	\$0.09	\$4.41	\$101.45

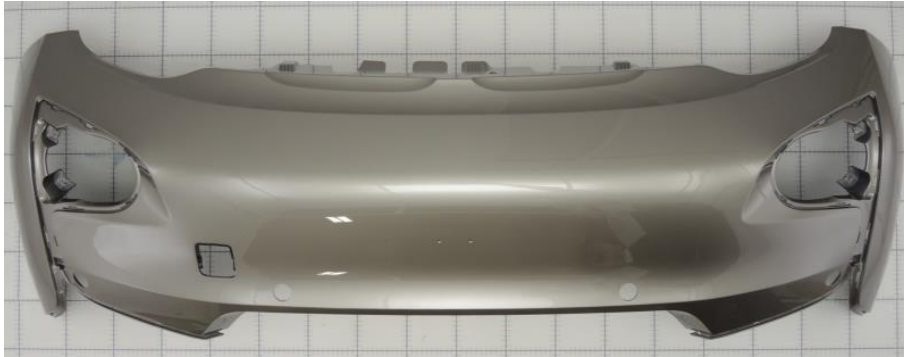
Detailed Summary

Parts	34
Fasteners	6
Part Numbers	16
Steps	111
Fastenings	30
Right First Time	98.86%
OEM Asm. Time (Min)	5.04
OEM Fab. Time (Min)	13.52
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.16
Total Weight (kg)	3.17
Purchased Part Cost	
	\$75.80
Material Cost	
	\$16.02
OEM Asm. Cost	
	\$7.68
OEM Fab. Cost	
	\$14.21
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.07
Q Burden	
	\$0.17
SG&A	
	\$6.07
Manufacturing Cost*	
	\$120.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Fascia, Upper Fascia Asm



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- \Upper Fascia Asm, Front Fascia Asm
- \Upper Fascia, Upper Fascia Asm
- \Upper Fascia Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	42.86
Total Weight (kg)	2.95

Material Cost**	\$9.71
OEM Process Cost	\$2.39
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$1.21
Manufacturing Cost*	\$13.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Fascia, Upper Fascia Asm

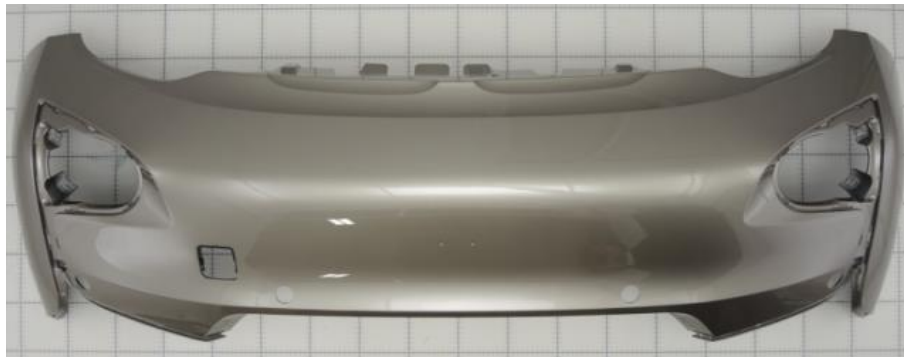
Upper Fascia Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
3000 Ton Injection Molding Press	42.86	1	0.25	200.35	GER	\$2.39	99.99%	\$0.00

Upper Fascia Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Upper Fascia	1	PP/EPDM TD20	\$3.29	2.9500	2.9500	\$0.00	\$9.71

Front Fascia Upper Installation



- \...
- \Front Fascia Asm
- \Upper Fascia Asm, Front Fascia Asm
- \Front Fascia Upper Installation

Process Summary

Right First Time	99.78 %
Process Time (Sec)	79.98
Total Weight (kg)	0.01
Material Cost**	\$0.26
OEM Process Cost	\$2.03
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.21
Manufacturing Cost*	\$2.53

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Fascia Upper Installation



Front Fascia Upper Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	79.98	1	1.00	91.41	GER	\$2.03	99.78 %	\$0.03

Front Fascia Upper Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	6	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
Label, BMW Vin Number Small	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Side Panel Park Assist Bracket, Upper Fascia Asm



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- \Upper Fascia Asm, Front Fascia Asm
- \Side Panel Park Assist Bracket, Upper Fascia Asm
- \Side Panel Park Assist Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.87
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Panel Park Assist Bracket, Upper Fascia Asm



Side Panel Park Assist Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.96	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Side Panel Park Assist Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Side Panel Park Assist Bracket	1	PP/EPDM TD20	\$3.29	0.0060	0.0065	\$0.00	\$0.02

Assemble Side Panel Park Assist Bracket



\...

- \Front Fascia Asm
- \Upper Fascia Asm, Front Fascia Asm
- \Assemble Side Panel Park Assist Bracket

Process Summary

Right First Time	99.87 %
Process Time (Sec)	46.65
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$1.18
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.12
Manufacturing Cost*	\$1.34



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Side Panel Park Assist Bracket



Assemble Side Panel Park Assist Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	46.65	1	1.00	91.41	GER	\$1.18	99.87%	\$0.02

Assemble Side Panel Park Assist Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, 53 x42	2	Commodity Item	Purchased	0.0014	-	\$0.01	\$0.00

Side Park Assist Bracket, Upper Fascia Asm



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- \Upper Fascia Asm, Front Fascia Asm
- \Side Park Assist Bracket, Upper Fascia Asm
- \Side Park Assist Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.47
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.05



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Park Assist Bracket, Upper Fascia Asm



Side Park Assist Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	11.76	8	0.25	26.65	GER	\$0.01	99.99%	\$0.00

Side Park Assist Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Side Park Assist Bracket	1	PBT+PC	\$3.63	0.0088	0.0095	\$0.00	\$0.03

Assemble Front Panel Side Parking Assist Bracket



\...

- \Front Fascia Asm
 - \Upper Fascia Asm, Front Fascia Asm
 - \Assemble Front Panel Side Parking Assist Bracket

Process Summary

Right First Time	99.87 %
Process Time (Sec)	38.85
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.99
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.10
Manufacturing Cost*	\$1.13



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Front Panel Side Parking Assist Bracket



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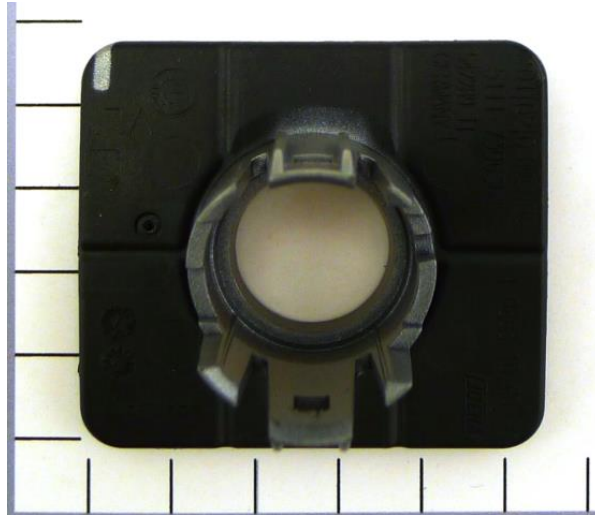
Assemble Front Panel Side Parking Assist Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	38.85	1	1.00	91.41	GER	\$0.99	99.87%	\$0.02

Assemble Front Panel Side Parking Assist Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, 57 x 52	2	Commodity Item	Purchased	0.0010	-	\$0.01	\$0.00

Middle Park Assist Bracket, Upper Fascia Asm



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- \Upper Fascia Asm, Front Fascia Asm
- \Middle Park Assist Bracket, Upper Fascia Asm
- \Middle Park Assist Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.46
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Middle Park Assist Bracket, Upper Fascia Asm



Middle Park Assist Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	11.68	8	0.25	26.65	GER	\$0.01	99.99%	\$0.00

Middle Park Assist Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Middle Park Assist Bracket	1	PBT+PC	\$3.63	0.0082	0.0088	\$0.00	\$0.03

Assemble Middle Parking Sensor Bracket



\...

- \Front Fascia Asm
- \Upper Fascia Asm, Front Fascia Asm
- \Assemble Middle Parking Sensor Bracket

Process Summary

Right First Time	99.41 %
Process Time (Sec)	905.14
Total Weight (kg)	0.16
Material Cost**	\$81.65
OEM Process Cost	\$15.30
Supplier Process Cost	\$0.00
Q Burden	\$0.09
SG&A	\$4.41
Manufacturing Cost*	\$101.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Middle Parking Sensor Bracket



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Assemble Middle Parking Sensor Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	276.00	1	0.25	50.17	GER	\$3.85	99.97 %	\$0.01
Apply Clearcoat	20.08	1	0.25	117.09	GER	\$0.65	99.97 %	\$0.01
Cure Basecoat	246.00	1	0.25	50.17	GER	\$3.43	99.97 %	\$0.01
Apply Basecoat	20.08	1	0.25	117.09	GER	\$0.65	99.97 %	\$0.01
Cure Primer	186.00	1	0.25	50.17	GER	\$2.59	99.97 %	\$0.01
Apply Primer	20.08	1	0.25	117.09	GER	\$0.65	99.97 %	\$0.01
OEM Manual Asm	136.90	1	1.00	91.41	GER	\$3.48	99.62 %	\$0.06

Assemble Middle Parking Sensor Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$2.63
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$2.24
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$1.28
Double Sided Tape, 54x47	2	Commodity Item	Purchased	0.0012	-	\$0.02	\$0.00
Sensor, Parking Assist	6	Commodity Item	Purchased	0.0161	-	\$12.50	\$0.00
Reflector, Front Fascia	2	Commodity Item	Purchased	0.0283	-	\$0.21	\$0.00
Double Sided Tape, 384x8	2	Commodity Item	Purchased	0.0008	-	\$0.02	\$0.00

Support, Front Fascia



\...
\Front Fascia Asm
\Support, Front Fascia
\Support Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.12
Total Weight (kg)	0.03

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

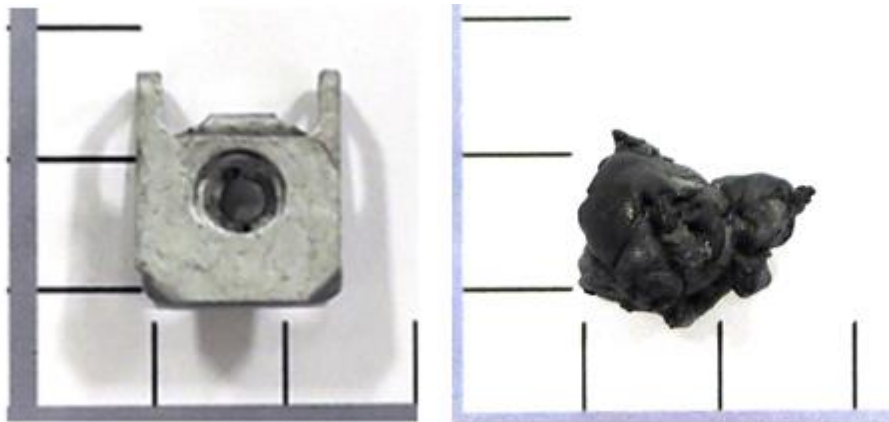
Support, Front Fascia

Support Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	24.72	6	0.25	30.85	GER	\$0.04	99.99%	\$0.00

Support Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Support	1	ABS	\$2.60	0.0294	0.0294	\$0.00	\$0.08



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 \Fascias
 \Front Fascia Asm
 \Assemble Support

Process Summary

Right First Time	99.68 %
Process Time (Sec)	91.90
Total Weight (kg)	0.01

Material Cost**	\$0.12
OEM Process Cost	\$2.33
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$0.24
Manufacturing Cost*	\$2.74



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Support



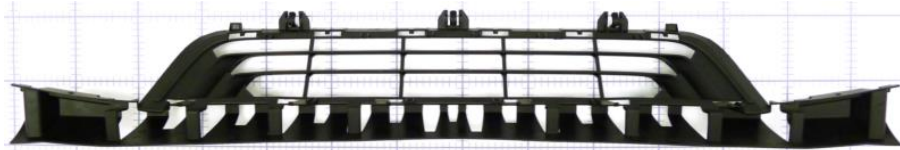
Assemble Support

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	91.90	1	1.00	91.41	GER	\$2.33	99.68 %	\$0.05

Assemble Support

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	4	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
Double Sided Tape, 39x10	4	Commodity Item	Purchased	0.0006	-	\$0.02	\$0.00

Front Grille, Front Fascia Asm



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- \Front Fascia Asm
- \Front Grille, Front Fascia Asm
- \Front Grille Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	30.52
Total Weight (kg)	0.65

Material Cost**	\$2.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.63
Q Burden	\$0.00
SG&A	\$0.28
Manufacturing Cost*	\$3.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Grille, Front Fascia Asm

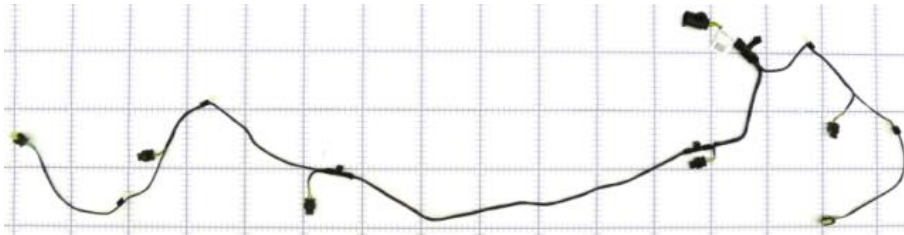


Front Grille Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
720 Ton Injection Molding Press	30.52	1	0.25	74.40	GER	\$0.63	99.99%	\$0.00

Front Grille Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Front Grille	1	PP/EPDM TD20	\$3.29	0.6460	0.6460	\$0.00	\$2.13



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 \Fascias
 \Front Fascia Asm
 \Assemble Front Grille

Process Summary

Right First Time	99.61 %
Process Time (Sec)	164.00
Total Weight (kg)	1.88

Material Cost**	\$142.66
OEM Process Cost	\$4.16
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$14.68
Manufacturing Cost*	\$161.57

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Front Grille



Assemble Front Grille									
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden	
OEM Manual Asm	164.00	1	1.00	91.41	GER	\$4.16	99.61 %	\$0.06	

Assemble Front Grille								
Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost	
Wire Harness, Parking Assist Sensor, Front Fascia	14	See Appendix	-	0.1340	-	\$0.00	\$10.19	

[Click Here for Munro & Associates Wire Harness Report on Harness, Park Assist Sensor, Front Wire Harness](#)

Lower Trim, Front Fascia Asm



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- \Front Fascia Asm
- \Lower Trim, Front Fascia Asm
- \Lower Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	50.58
Total Weight (kg)	0.99

Material Cost**	\$3.27
OEM Process Cost	\$1.14
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.44
Manufacturing Cost*	\$4.85

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lower Trim, Front Fascia Asm



Lower Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
720 Ton Injection Molding Press	50.58	1	0.25	81.14	GER	\$1.14	99.99%	\$0.00

Lower Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lower Trim	1	PP/EPDM TD20	\$3.29	0.9940	0.9940	\$0.00	\$3.27

No Commodity Items Required for This Process



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\Fascias
\Front Fascia Asm
\Assemble Lower Trim

Process Summary

Right First Time	99.92 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.33
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.38

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lower Trim



Assemble Lower Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.00	1	1.00	91.41	GER	\$0.33	99.92 %	\$0.01

Assemble Lower Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Trim Fog Lamp, Front Fascia Asm



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- \Front Fascia Asm
- \Trim Fog Lamp, Front Fascia Asm
- \Trim Fog Lamp Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.72
Total Weight (kg)	0.11

Material Cost**	\$0.39
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.00
SG&A	\$0.05
Manufacturing Cost*	\$0.56



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Fog Lamp, Front Fascia Asm



Trim Fog Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	30.88	4	0.25	56.33	GER	\$0.12	99.99%	\$0.00

Trim Fog Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Trim Fog Lamp	1	PP/EPDM TD20	\$3.29	0.1100	0.1180	\$0.00	\$0.39

No Commodity Items Required for This Process



\...
\Fascias
\Front Fascia Asm
\Assemble Trim Fog Lamp

Process Summary

Right First Time	99.92 %
Process Time (Sec)	18.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.46
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Trim Fog Lamp



Assemble Trim Fog Lamp

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	18.00	1	1.00	91.41	GER	\$0.46	99.92 %	\$0.01

Assemble Trim Fog Lamp

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Tow Ring Cover, Front Fascia Asm



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- \Front Fascia Asm
- \Tow Ring Cover, Front Fascia Asm
- \Tow Ring Cover Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	26.37
Total Weight (kg)	0.02

Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.19
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tow Ring Cover, Front Fascia Asm



Tow Ring Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	5.78	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Apply Clearcoat	2.48	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	5.36	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Apply Basecoat	2.48	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	4.52	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Primer	2.48	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
150 Ton Injection Molding Press	26.16	8	0.25	27.82	GER	\$0.03	99.99 %	\$0.00

Tow Ring Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Tow Ring Cover	1	PBT+PC	\$3.63	0.0151	0.0162	\$0.00	\$0.06

No Commodity Items Required for This Process



\...
\Fascias
\Front Fascia Asm
\Assemble Tow Ring Cover

Process Summary

Right First Time	99.95 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.25
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tow Ring Cover



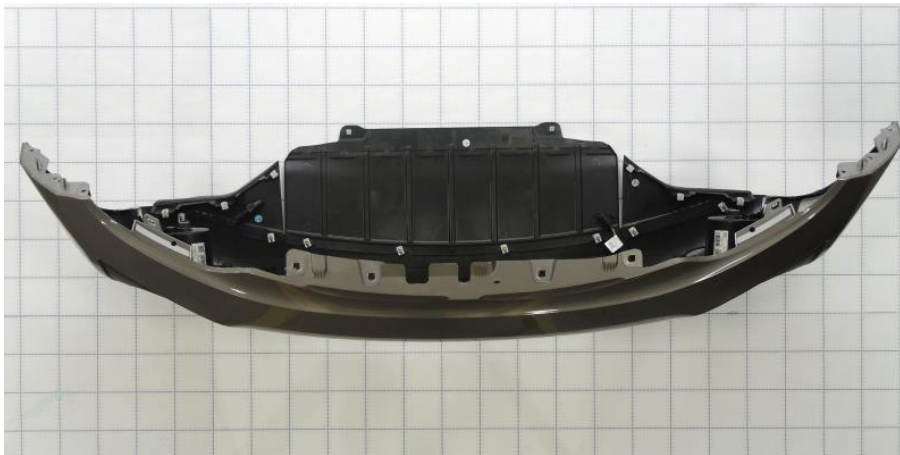
Assemble Tow Ring Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	10.00	1	1.00	91.41	GER	\$0.25	99.95%	\$0.01

Assemble Tow Ring Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Aeroshield Asm, Front Fascia Asm



\...
 \Fascias
 \Front Fascia Asm
 \Driver Aeroshield Asm, Front Fascia Asm
Assembly Summary

Parts	8
Fasteners	5
Part Numbers	4
Steps	20
Fastenings	6
Right First Time	99.81 %
OEM Process Time (Min)	0.86
Supplier Process Time (Min)	0.47
Total Weight (kg)	0.11

Material Cost**	\$0.66
OEM Process Cost	\$1.31
Supplier Process Cost	\$0.48
Q Burden	\$0.03
SG&A	\$0.22
Manufacturing Cost*	\$2.69

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Aeroshield Asm, Front Fascia Asm



Driver Aeroshield Asm, Front Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Driver Aeroshield, Driver Aeroshield Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.47	0.0969
Assemble Driver Aeroshield	1	6	6	17	6	99.83 %	0.86	0.00	0.00	0.00	0.0131

Driver Aeroshield Asm, Front Fascia Asm

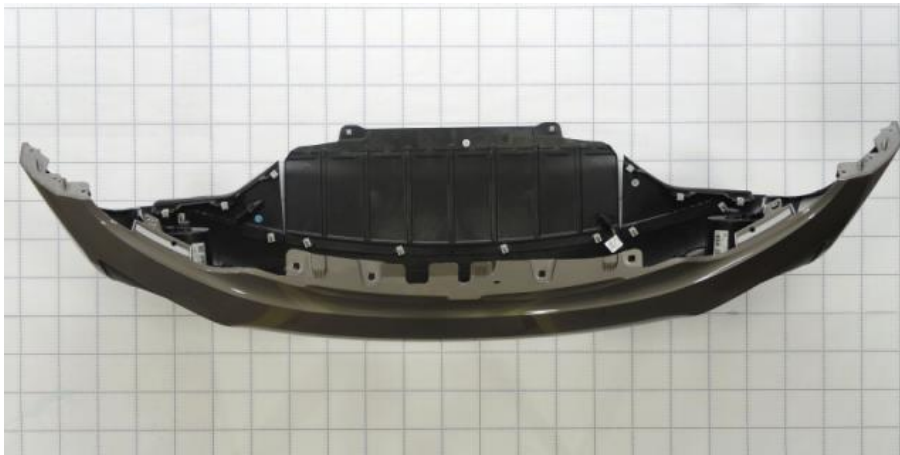
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Driver Aeroshield, Driver Aeroshield Asm	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.48	\$0.00	\$0.07	\$0.80
Assemble Driver Aeroshield	\$0.41	\$0.00	\$1.31	\$0.00	\$0.00	\$0.00	\$0.03	\$0.14	\$1.89

Detailed Summary

Parts	8
Fasteners	5
Part Numbers	4
Steps	20
Fastenings	6
Right First Time	99.81%
OEM Asm. Time (Min)	0.86
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.47
Total Weight (kg)	0.11
Purchased Part Cost	
Purchased Part Cost	\$0.41
Material Cost	\$0.25
OEM Asm. Cost	\$1.31
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.48
Q Burden	\$0.03
SG&A	\$0.22
Manufacturing Cost*	\$2.69

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Driver Aeroshield Asm, Front Fascia Asm
- \Driver Aeroshield, Driver Aeroshield Asm
- \Driver Aeroshield Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	28.04
Total Weight (kg)	0.10

Material Cost**	\$0.25
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.48
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.80

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Aeroshield, Driver Aeroshield Asm



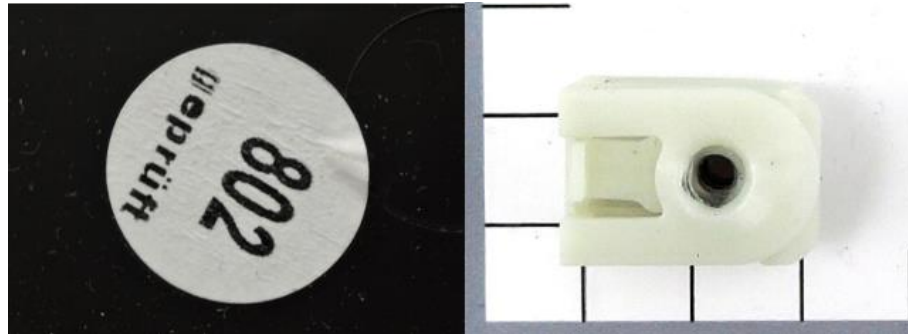
Driver Aeroshield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	56.08	2	0.25	61.01	GER	\$0.48	99.98 %	\$0.00

Driver Aeroshield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Driver Aeroshield	1	PP	\$2.38	0.0804	0.0862	\$0.00	\$0.21
Material 2, Driver Aeroshield	1	TPE	\$2.54	0.0165	0.0177	\$0.00	\$0.04

Assemble Driver Aeroshield



- \...
- \Front Fascia Asm
- \Driver Aeroshield Asm, Front Fascia Asm
- \Assemble Driver Aeroshield

Process Summary

Right First Time	99.83 %
Process Time (Sec)	51.48
Total Weight (kg)	0.01

Material Cost**	\$0.41
OEM Process Cost	\$1.31
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.14
Manufacturing Cost*	\$1.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Aeroshield



Assemble Driver Aeroshield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	51.48	1	1.00	91.41	GER	\$1.31	99.83%	\$0.03

Assemble Driver Aeroshield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plastic J-Nut	5	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Label, Inspector Number	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Driver Aeroshield



\...
\Fascias
\Front Fascia Asm
\Assemble Driver Aeroshield

Process Summary

Right First Time	99.57 %
Process Time (Sec)	32.00
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$0.81
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$0.08
Manufacturing Cost*	\$1.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Aeroshield



Assemble Driver Aeroshield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	32.00	1	1.00	91.41	GER	\$0.81	99.57%	\$0.06

Assemble Driver Aeroshield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	2	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Passenger Aeroshield Asm, Front Fascia Asm



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 \Fascias
 \Front Fascia Asm
 \Passenger Aeroshield Asm, Front Fascia Asm
Assembly Summary

Parts	9
Fasteners	5
Part Numbers	5
Steps	22
Fastenings	7
Right First Time	99.72 %
OEM Process Time (Min)	1.02
Supplier Process Time (Min)	0.47
Total Weight (kg)	0.10

Material Cost**	\$0.64
OEM Process Cost	\$1.56
Supplier Process Cost	\$0.47
Q Burden	\$0.04
SG&A	\$0.24
Manufacturing Cost*	\$2.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Aeroshield Asm, Front Fascia Asm



Passenger Aeroshield Asm, Front Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Passenger Aeroshield, Passenger Aeroshield A	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.47	0.0795
Assemble Passenger SideAero Shield	1	7	7	19	7	99.74 %	1.02	0.00	0.00	0.00	0.0174

Passenger Aeroshield Asm, Front Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Passenger Aeroshield, PassengerAeroshield A	\$0.00	\$0.21	\$0.00	\$0.00	\$0.00	\$0.47	\$0.00	\$0.07	\$0.76
Assemble Passenger SideAero Shield	\$0.43	\$0.00	\$1.56	\$0.00	\$0.00	\$0.00	\$0.04	\$0.17	\$2.20

Detailed Summary

Parts	9
Fasteners	5
Part Numbers	5
Steps	22
Fastenings	7
Right First Time	99.72%
OEM Asm. Time (Min)	1.02
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.47
Total Weight (kg)	0.10
Purchased Part Cost	\$0.43
Material Cost	\$0.21
OEM Asm. Cost	\$1.56
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.47
Q Burden	\$0.04
SG&A	\$0.24
Manufacturing Cost*	\$2.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Aeroshield, Passenger Aeroshield Asm



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- \Passenger Aeroshield Asm, Front Fascia Asm
- \Passenger Aeroshield, Passenger Aeroshield A
- \Passenger Aeroshield Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	27.99
Total Weight (kg)	0.08

Material Cost**	\$0.21
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.47
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Aeroshield, Passenger Aeroshield Asm



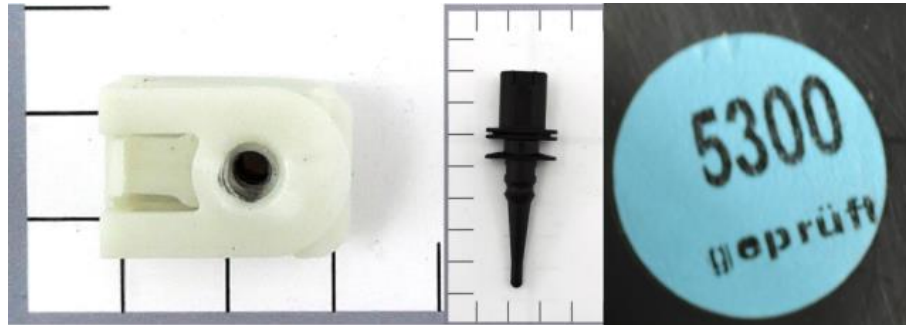
Passenger Aeroshield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	55.98	2	0.25	61.01	GER	\$0.47	99.98 %	\$0.00

Passenger Aeroshield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Passenger Aeroshield	1	PP	\$2.38	0.0660	0.0707	\$0.00	\$0.17
Material 2, Passenger Aeroshield	1	TPE	\$2.54	0.0135	0.0145	\$0.00	\$0.04

Assemble Passenger Side Aero Shield



\...

\Front Fascia Asm

\Passenger Aeroshield Asm, Front Fascia Asm

\Assemble Passenger Side Aero Shield

Process Summary

Right First Time	99.74 %
Process Time (Sec)	61.48
Total Weight (kg)	0.02

Material Cost**	\$0.43
OEM Process Cost	\$1.56
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.17
Manufacturing Cost*	\$2.20



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Side Aero Shield



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Assemble Passenger Side Aero Shield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	61.48	1	1.00	91.41	GER	\$1.56	99.74 %	\$0.04

Assemble Passenger Side Aero Shield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plastic J-Nut	5	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Aeroshield Connector	1	Commodity Item	Purchased	0.0043	-	\$0.02	\$0.00
Label, Inspector Number	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Passenger Aeroshield



\...
\Fascias
\Front Fascia Asm
\Assemble Passenger Aeroshield

Process Summary

Right First Time	99.57 %
Process Time (Sec)	32.00
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$0.81
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$0.08
Manufacturing Cost*	\$1.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Aeroshield



Assemble Passenger Aeroshield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	32.00	1	1.00	91.41	GER	\$0.81	99.57%	\$0.06

Assemble Passenger Aeroshield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	2	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00



\...
 \Fascias
 \Front Fascia Asm
 \Central Aeroshield Asm, Front Fascia Asm

Assembly Summary

Parts	6
Fasteners	4
Part Numbers	3
Steps	17
Fastenings	5
Right First Time	99.84 %
OEM Process Time (Min)	0.87
Supplier Process Time (Min)	0.28
Total Weight (kg)	0.58

Material Cost**	\$1.79
OEM Process Cost	\$1.33
Supplier Process Cost	\$0.42
Q Burden	\$0.02
SG&A	\$0.33
Manufacturing Cost*	\$3.89

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Central Aeroshield Asm, Front Fascia Asm



Central Aeroshield Asm, Front Fascia Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Central Aeroshield, Central Aeroshield Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.28	0.5740
Assemble Central Aeroshield	1	5	5	15	5	99.85 %	0.87	0.00	0.00	0.00	0.0105

Central Aeroshield Asm, Front Fascia Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Central Aeroshield, Central Aeroshield Asm	\$0.00	\$1.46	\$0.00	\$0.00	\$0.00	\$0.42	\$0.00	\$0.19	\$2.06
Assemble Central Aeroshield	\$0.33	\$0.00	\$1.33	\$0.00	\$0.00	\$0.00	\$0.02	\$0.14	\$1.83

Detailed Summary

Parts	6
Fasteners	4
Part Numbers	3
Steps	17
Fastenings	5
Right First Time	99.84%
OEM Asm. Time (Min)	0.87
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.28
Total Weight (kg)	0.58
Purchased Part Cost	
	\$0.33
Material Cost	\$1.46
OEM Asm. Cost	\$1.33
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.42
Q Burden	\$0.02
SG&A	\$0.33
Manufacturing Cost*	\$3.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Central Aeroshield, Central Aeroshield Asm



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- \Central Aeroshield Asm, Front Fascia Asm
- \Central Aeroshield, Central Aeroshield Asm
- \Central Aeroshield Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	16.65
Total Weight (kg)	0.57

Material Cost**	\$1.46
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.42
Q Burden	\$0.00
SG&A	\$0.19
Manufacturing Cost*	\$2.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

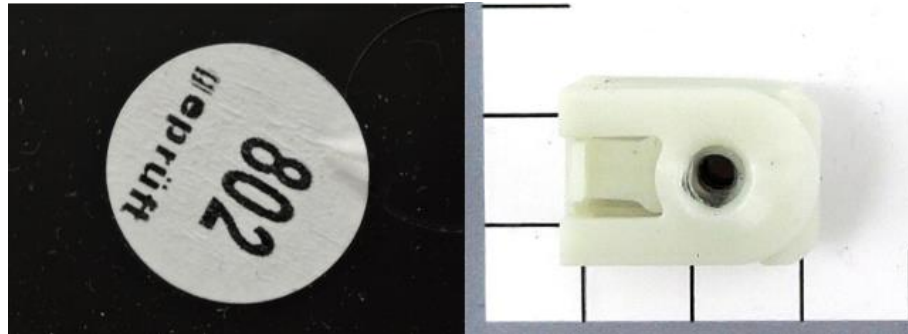
Central Aeroshield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	16.65	1	0.25	89.76	GER	\$0.42	99.99%	\$0.00

Central Aeroshield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Central Aeroshield	1	PPTD20	\$2.54	0.5740	0.5740	\$0.00	\$1.46

Assemble Central Aeroshield



- \...
- \Front Fascia Asm
- \Central Aeroshield Asm, Front Fascia Asm
- \Assemble Central Aeroshield

Process Summary

Right First Time	99.85 %
Process Time (Sec)	52.48
Total Weight (kg)	0.01

Material Cost**	\$0.33
OEM Process Cost	\$1.33
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.14
Manufacturing Cost*	\$1.83

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Central Aeroshield



Assemble Central Aeroshield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	52.48	1	1.00	91.41	GER	\$1.33	99.85%	\$0.02

Assemble Central Aeroshield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plastic J-Nut	4	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Label, Inspector Number	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Central Aeroshield To Fascia



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\...
\Fascias
\Front Fascia Asm
\Assemble Central Aeroshield

Process Summary

Right First Time	99.16 %
Process Time (Sec)	59.00
Total Weight (kg)	0.03

Material Cost**	\$0.12
OEM Process Cost	\$1.50
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.15
Manufacturing Cost*	\$1.90



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Central Aeroshield To Fascia



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& ASSOCIATES, INC.

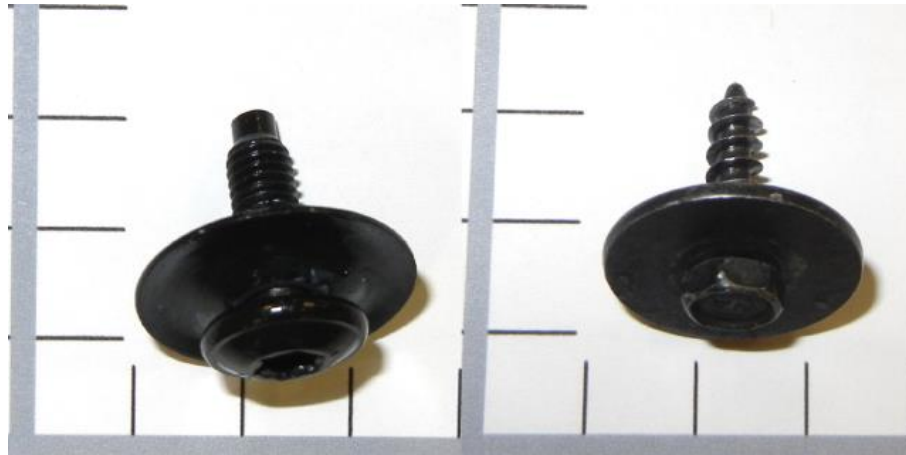
Assemble Central Aeroshield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	59.00	1	1.00	91.41	GER	\$1.50	99.16%	\$0.13

Assemble Central Aeroshield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	4	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Front Fascia Installation



\...
\Zone 2 Exterior
\Fascias
\Front Fascia Installation

Process Summary

Right First Time	98.54 %
Process Time (Sec)	113.00
Total Weight (kg)	0.38

Material Cost**	\$1.46
OEM Process Cost	\$2.87
Supplier Process Cost	\$0.00
Q Burden	\$0.22
SG&A	\$0.33
Manufacturing Cost*	\$4.88



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Fascia Installation



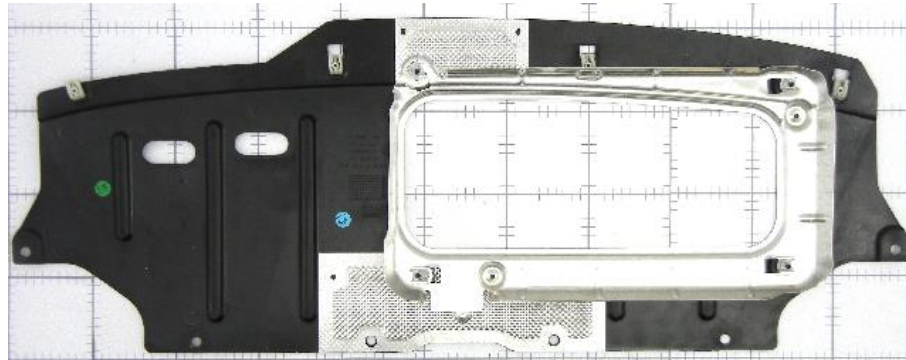
Front Fascia Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	113.00	1	1.00	91.41	GER	\$2.87	98.54%	\$0.22

Front Fascia Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x17mm-Torx SEMS Bolt	4	Commodity Item	Purchased	0.0920	-	\$0.35	\$0.00
M5x19mm-Hex SEMS Screw	2	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Rear Fascia Aeroshield Asm



\...
 \Zone 2 Exterior
 \Fascias
 \Rear Fascia Aeroshield Asm

Assembly Summary

Parts	18
Fasteners	12
Part Numbers	8
Steps	73
Fastenings	16
Right First Time	98.59 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	4.02
Total Weight (kg)	0.89

Material Cost**	\$3.79
OEM Process Cost	\$0.00
Supplier Process Cost	\$3.82
Q Burden	\$0.21
SG&A	\$0.73
Manufacturing Cost*	\$8.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Aeroshield Asm



Rear Fascia Aeroshield Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Exhaust Shield Asm, Rear Fascia Aeroshield Asm	1	5	4	20	4	99.84 %	0.00	0.00	0.62	0.33	0.2306
Aeroshield Asm, Rear Fascia Aeroshield Asm	1	3	2	20	2	99.75 %	0.00	0.00	0.30	0.64	0.6200
Assemble Aeroshield	1	10	10	31	10	98.99 %	0.00	0.00	2.13	0.00	0.0382

Rear Fascia Aeroshield Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Exhaust Shield Asm, Rear Fascia Aeroshield Asm	\$0.04	\$1.75	\$0.00	\$0.00	\$0.56	\$0.16	\$0.02	\$0.25	\$2.76
Aeroshield Asm, Rear Fascia Aeroshield Asm	\$0.00	\$1.54	\$0.00	\$0.00	\$0.15	\$1.02	\$0.04	\$0.27	\$3.02
Assemble Aeroshield	\$0.46	\$0.00	\$0.00	\$0.00	\$1.93	\$0.00	\$0.15	\$0.21	\$2.75

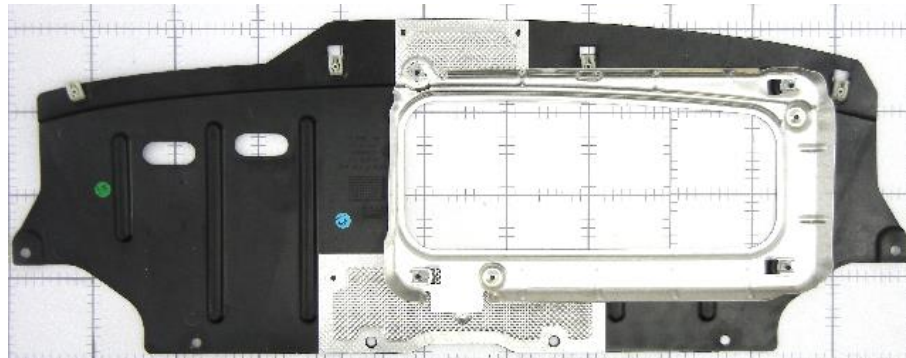
Detailed Summary

Parts	18
Fasteners	12
Part Numbers	8
Steps	73
Fastenings	16
Right First Time	98.59%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.05
Supplier Fab. Time (Min)	0.97
Total Weight (kg)	0.89
Purchased Part Cost	\$0.50
Material Cost	\$3.29
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$2.64
Supplier Fab. Cost	\$1.18
Q Burden	\$0.21
SG&A	\$0.73
Manufacturing Cost*	\$8.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exhaust Shield Asm, Rear Fascia Aeroshield Asm



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 \Fascias
 \Rear Fascia Aeroshield Asm
 \Exhaust Shield Asm, Rear Fascia Aeroshield Asm
Assembly Summary

Parts	5
Fasteners	4
Part Numbers	2
Steps	20
Fastenings	4
Right First Time	99.84 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.95
Total Weight (kg)	0.23

Material Cost**	\$1.79
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.72
Q Burden	\$0.02
SG&A	\$0.25
Manufacturing Cost*	\$2.78

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exhaust Shield Asm, Rear Fascia Aeroshield Asm



Exhaust Shield Asm, Rear Fascia Aeroshield Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Shield, Exhaust Shield Asm	1	1	0	7	0	99.97 %	0.00	0.00	0.00	0.33	0.2210
Assemble Shield	1	4	4	12	4	99.88 %	0.00	0.00	0.62	0.00	0.0096

Exhaust Shield Asm, Rear Fascia Aeroshield Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Shield, Exhaust Shield Asm	\$0.00	\$1.75	\$0.00	\$0.00	\$0.00	\$0.16	\$0.01	\$0.19	\$2.11
Assemble Shield	\$0.04	\$0.00	\$0.00	\$0.00	\$0.56	\$0.00	\$0.02	\$0.06	\$0.67

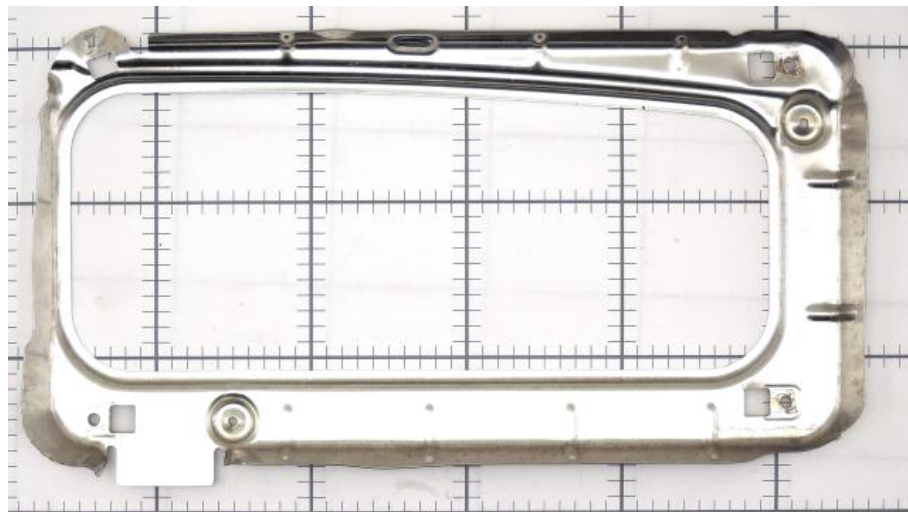
Detailed Summary

Parts	5
Fasteners	4
Part Numbers	2
Steps	20
Fastenings	4
Right First Time	99.84%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.62
Supplier Fab. Time (Min)	0.33
Total Weight (kg)	0.23
Purchased Part Cost	\$0.04
Material Cost	\$1.75
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.56
Supplier Fab. Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.25
Manufacturing Cost*	\$2.78

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Shield, Exhaust Shield Asm



- \...
- \Exhaust Shield Asm, Rear Fascia Aeroshield Asm
- \Shield, Exhaust Shield Asm
- \Shield Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	19.82
Total Weight (kg)	0.22

Material Cost**	\$1.75
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.01
SG&A	\$0.19
Manufacturing Cost*	\$2.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Shield, Exhaust Shield Asm

Shield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	9.00	1	0.25	20.00	GER	\$0.05	99.99%	\$0.00
Deburr	9.00	1	0.25	35.68	GER	\$0.09	99.99%	\$0.00
300 Ton Stamping Press	1.82	1	0.25	49.57	GER	\$0.03	99.99%	\$0.00

Shield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Shield	1	Aluminum 3003-O - Coil Stock	\$4.08	0.2210	0.2210	\$0.00	\$1.75

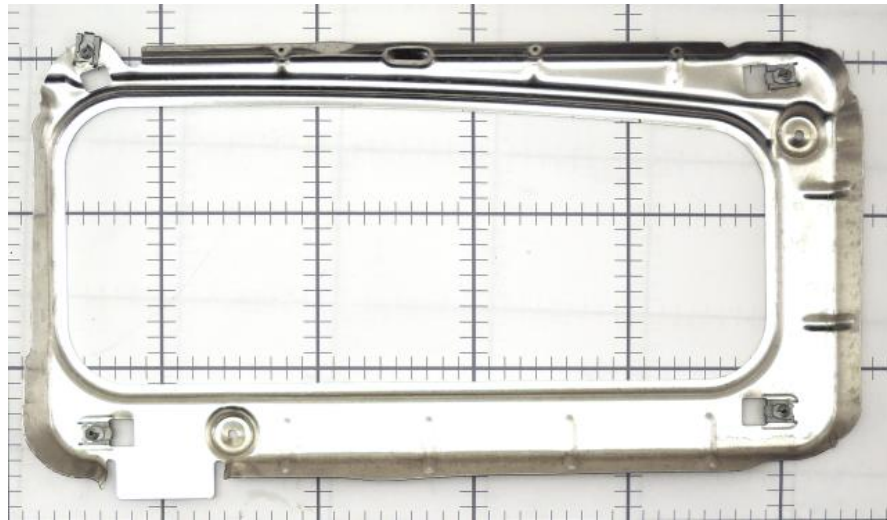


- \...
- \Rear Fascia Aeroshield Asm
- \Exhaust Shield Asm, Rear Fascia Aeroshield Asm
- \Assemble Shield

Process Summary

Right First Time	99.88 %
Process Time (Sec)	37.00
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.56
Q Burden	\$0.02
SG&A	\$0.06
Manufacturing Cost*	\$0.67



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

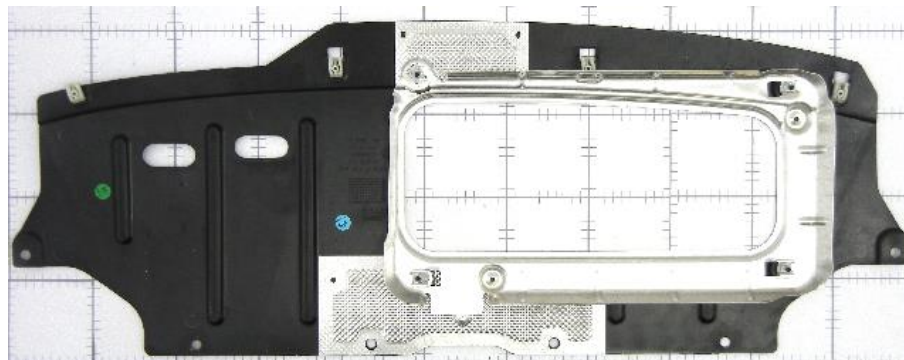
Assemble Shield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	37.00	1	1.00	54.32	GER	\$0.56	99.88 %	\$0.02

Assemble Shield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	4	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00

Aeroshield Asm, Rear Fascia Aeroshield Asm



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\Fascias

\Rear Fascia Aeroshield Asm

\Aeroshield Asm, Rear Fascia Aeroshield Asm

Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	20
Fastenings	2
Right First Time	99.75 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.94
Total Weight (kg)	0.62

Material Cost**	\$1.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.17
Q Burden	\$0.04
SG&A	\$0.27
Manufacturing Cost*	\$3.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Aeroshield Asm, Rear Fascia Aeroshield Asm



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Aeroshield Asm, Rear Fascia Aeroshield Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Aeroshield, Aeroshield Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.54	0.5768
Small Aluminum Shield, Aeroshield Asm	1	1	0	4	0	99.97 %	0.00	0.00	0.00	0.05	0.0118
Large Aluminum Shield, Aeroshield Asm	1	1	0	4	0	99.97 %	0.00	0.00	0.00	0.05	0.0314
Assemble Aluminum Shields	1	0	2	8	2	99.83 %	0.00	0.00	0.30	0.00	0.0000

Aeroshield Asm, Rear Fascia Aeroshield Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Aeroshield, Aeroshield Asm	\$0.00	\$1.47	\$0.00	\$0.00	\$0.00	\$0.98	\$0.00	\$0.25	\$2.70
Small Aluminum Shield, Aeroshield Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.02	\$0.01	\$0.00	\$0.05
Large Aluminum Shield, Aeroshield Asm	\$0.00	\$0.05	\$0.00	\$0.00	\$0.00	\$0.02	\$0.01	\$0.01	\$0.08
Assemble Aluminum Shields	\$0.00	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.03	\$0.02	\$0.19

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	20
Fastenings	2
Right First Time	99.75%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.64
Total Weight (kg)	0.62
Purchased Part Cost	
	\$0.00
Material Cost	\$1.54
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.15
Supplier Fab. Cost	\$1.02
Q Burden	\$0.04
SG&A	\$0.27
Manufacturing Cost*	\$3.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...

- \Aeroshield Asm, Rear Fascia Aeroshield Asm
- \Aeroshield, Aeroshield Asm
- \Aeroshield Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	32.24
Total Weight (kg)	0.58

Material Cost**	\$1.47
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.98
Q Burden	\$0.00
SG&A	\$0.25
Manufacturing Cost*	\$2.70

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

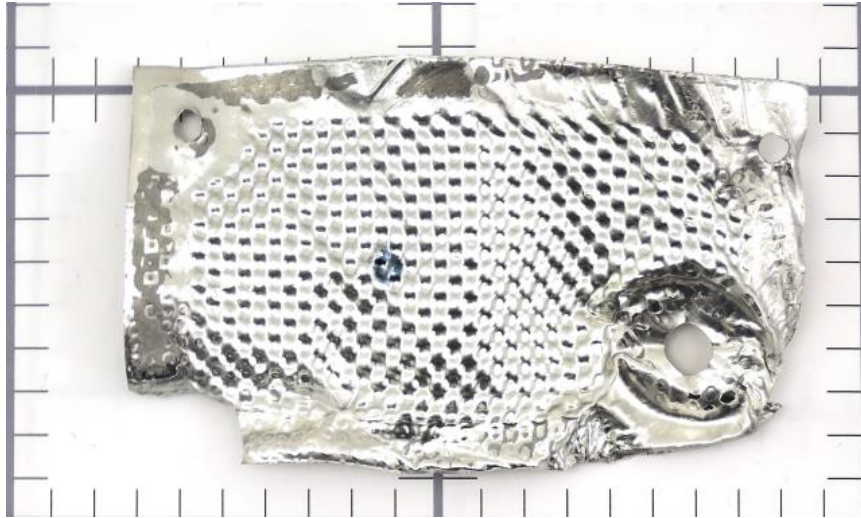
Aeroshield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	32.24	1	0.25	109.93	GER	\$0.98	99.99%	\$0.00

Aeroshield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Aeroshield	1	PPTD20	\$2.54	0.5768	0.5768	\$0.00	\$1.47

Small Aluminum Shield, Aeroshield Asm



\...

- \Aeroshield Asm, Rear Fascia Aeroshield Asm
- \Small Aluminum Shield, Aeroshield Asm
- \Small Aluminum Shield Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	3.20
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.01
SG&A	\$0.00
Manufacturing Cost*	\$0.05



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Small Aluminum Shield, Aeroshield Asm

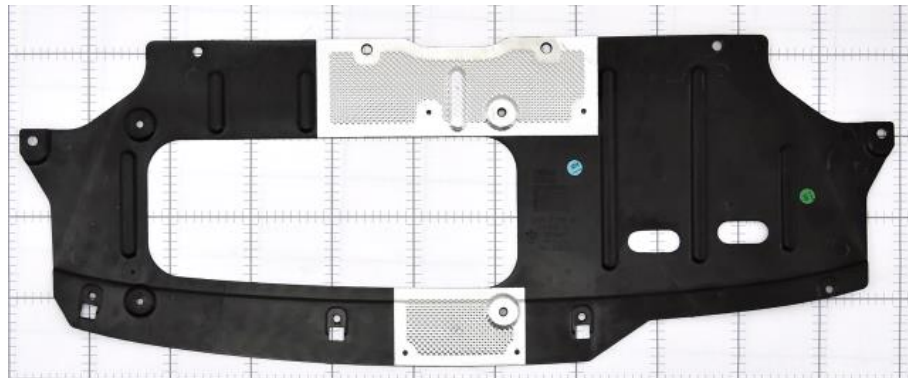
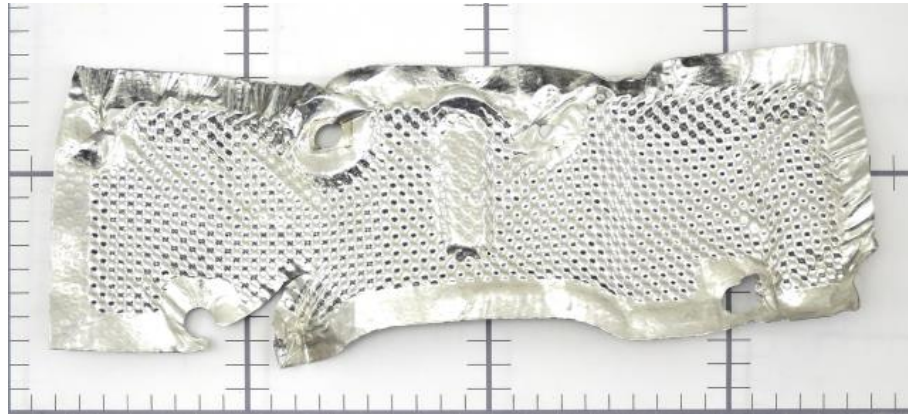


Small Aluminum Shield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
25Ton Trim Press	3.20	1	0.25	19.09	GER	\$0.02	99.97%	\$0.01

Small Aluminum Shield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Small Aluminum Shield	1	Dimpled Aluminum Sheet Stock		By Area 0.0118	-	\$0.00	\$0.02



\...

- \Aeroshield Asm, Rear Fascia Aeroshield Asm
- \Large Aluminum Shield, Aeroshield Asm
- \Small Aluminum Shield Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	3.20
Total Weight (kg)	0.03

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Large Aluminum Shield, Aeroshield Asm



Small Aluminum Shield Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
25Ton Trim Press	3.20	1	0.25	19.09	GER	\$0.02	99.97%	\$0.01

Small Aluminum Shield Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Large Aluminum Shield	1	Dimpled Aluminum Sheet Stock	By Area	0.0314	-	\$0.00	\$0.05

No Commodity Items
Required for This
Process



\...

- \Rear Fascia Aeroshield Asm
- \Aeroshield Asm, Rear Fascia Aeroshield Asm
- \Assemble Aluminum Shields

Process Summary

Right First Time	99.83 %
Process Time (Sec)	18.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.03
SG&A	\$0.02
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Aluminum Shields

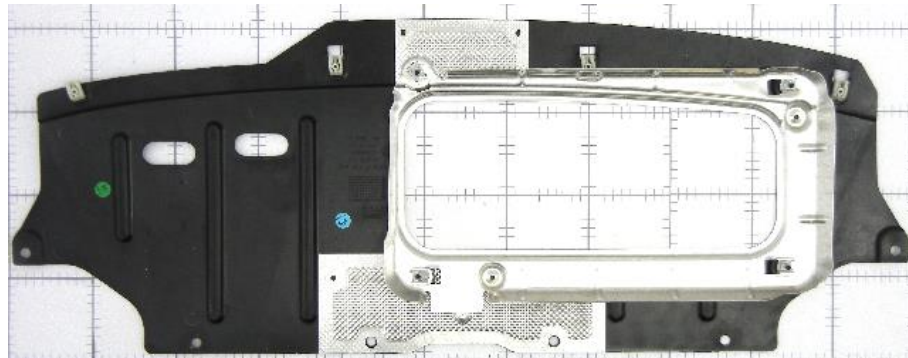
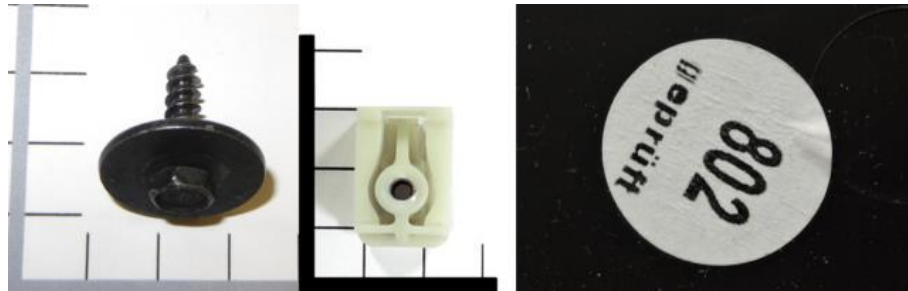


Assemble Aluminum Shields

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	18.00	1	0.25	30.27	GER	\$0.15	99.83%	\$0.03

Assemble Aluminum Shields

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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\...
 \Fascias
 \Rear Fascia Aeroshield Asm
 \Assemble Aeroshield

Process Summary

Right First Time	98.99 %
Process Time (Sec)	127.95
Total Weight (kg)	0.04

Material Cost**	\$0.46
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.93
Q Burden	\$0.15
SG&A	\$0.21
Manufacturing Cost*	\$2.75

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Aeroshield



Assemble Aeroshield

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	127.95	1	1.00	54.32	GER	\$1.93	98.99%	\$0.15

Assemble Aeroshield

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	4	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00
Plastic J-Nut White	4	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Label, Inspector Number	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
Label, Inspector Number	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

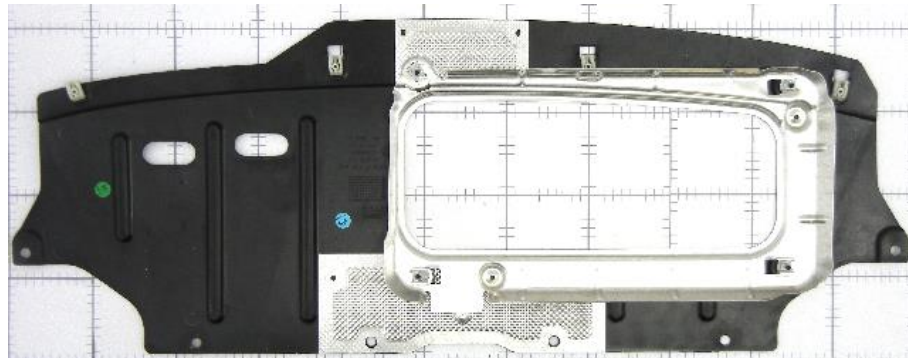


\...
 \Zone 2 Exterior
 \Fascias
 \Rear Fascia Aero Shield Asm Installation

Process Summary

Right First Time	99.16 %
Process Time (Sec)	56.00
Total Weight (kg)	0.03

Material Cost**	\$0.12
OEM Process Cost	\$1.42
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.15
Manufacturing Cost*	\$1.81



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Fascia Aero Shield Asm Installation



Rear Fascia Aero Shield Asm Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	56.00	1	1.00	91.41	GER	\$1.42	99.16%	\$0.13

Rear Fascia Aero Shield Asm Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x19mm-Hex SEMS Screw	4	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Exterior Trim Overview



The Exterior Trim consists of all of the Thermoplastic Trim panels, Wheel Well Liners, Badging/Cladding, the lift gate glass, spoiler, and all supporting structural pieces for support the trim parts.



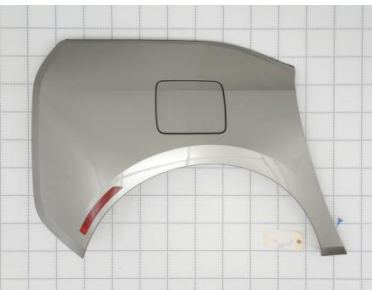
The Thermoplastic Trim Panels are glued together using a structural adhesive. The BMW badges are an aluminum stamped part over-molded onto a plastic backing. All supporting structural pieces are injection molded.



All major components were costed in detail, while prices were applied to commodity items (i.e. seals, fasteners, latches, and seat belts).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.





Description:

- Lift Gate Glass: The middle section of the lift gate is a glass panel. The tail lamp is mounted to the glass panel using plastic brackets and epoxy.

Advantages:

- Unique Application: Utilizing a glass panel for a futuristic appeal on the lift gate. Then removing the need for large, complex brackets and replacing them with smaller, cheaper brackets.



Description:

- Lift Gate Glass: The middle section of the lift gate is a glass panel. The tail lamp is mounted to the glass panel using plastic brackets and epoxy.

Disadvantages:

- Increased Manufacturing Investment due to machinery required to handle epoxy



Observations:

The front under hood compartment contains a storage bin. The storage bin contains the tow ring, tire inflator, tire patching, and car charger.



Observations:

All the badges have an aluminum stamped upper that is over-molded with a plastic backing. The aluminum/plastic sub-assembly is then painted.

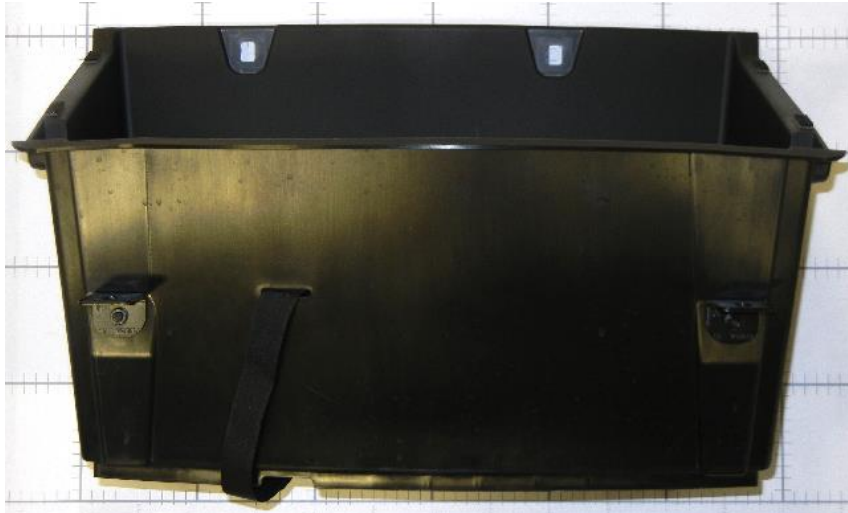
Summary

Parts	664
Fasteners	305
Part Numbers	296
Steps	2,785
Fastenings	653
Right First Time	53.65%
OEM Process Time (Hrs)	4.27
Supplier Process Time (Hrs)	1.11
Total Weight (kg)	50.59
Material Cost**	\$421.69
OEM Process Cost	\$244.33
Supplier Process Cost	\$49.88
Q Burden	\$9.33
SG&A	\$81.31
Manufacturing Cost*	\$806.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Storage Bin Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Storage Bin Asm

Assembly Summary

Parts	11
Fasteners	3
Part Numbers	7
Steps	37
Fastenings	6
Right First Time	99.28 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.91
Total Weight (kg)	2.15

Material Cost**	\$8.93
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.91
Q Burden	\$0.11
SG&A	\$1.61
Manufacturing Cost*	\$12.56

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Storage Bin Asm

Storage Bin Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Mounting Bracket, Storage Bin Asm	1	3	1	19	1	99.83 %	0.00	0.00	0.13	0.40	0.0210
Storage Bin, StorageBin Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.49	2.1030
Assemble Storage Bin	1	7	5	15	5	99.47 %	0.00	0.00	0.88	0.00	0.0226

Storage Bin Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Mounting Bracket, Storage Bin Asm	\$0.03	\$0.16	\$0.00	\$0.00	\$0.06	\$0.17	\$0.03	\$0.06	\$0.50
Storage Bin, StorageBin Asm	\$0.00	\$8.62	\$0.00	\$0.00	\$0.00	\$0.89	\$0.00	\$1.43	\$10.94
Assemble Storage Bin	\$0.12	\$0.00	\$0.00	\$0.00	\$0.80	\$0.00	\$0.08	\$0.12	\$1.12

Detailed Summary

Parts	11
Fasteners	3
Part Numbers	7
Steps	37
Fastenings	6
Right First Time	99.28%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.02
Supplier Fab. Time (Min)	0.89
Total Weight (kg)	2.15
Purchased Part Cost	\$0.15
Material Cost	\$8.78
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.86
Supplier Fab. Cost	\$1.06
Q Burden	\$0.11
SG&A	\$1.61
Manufacturing Cost*	\$12.56

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Bracket, Storage Bin Asm



\...
 \Exterior Trim
 \Storage Bin Asm
 \Mounting Bracket, Storage Bin Asm
Assembly Summary

Parts	3
Fasteners	1
Part Numbers	3
Steps	19
Fastenings	1
Right First Time	99.83 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.54
Total Weight (kg)	0.02

Material Cost**	\$0.19
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.03
SG&A	\$0.06
Manufacturing Cost*	\$0.50

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Mounting Bracket, Storage Bin Asm



Mounting Bracket, Storage Bin Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Mouting Bracket, Mounting Bracket Asm	1	1	0	7	0	99.97 %	0.00	0.00	0.00	0.23	0.0200
Assemble Mounting Bracket	1	2	1	11	1	99.86 %	0.00	0.00	0.13	0.17	0.0010

Mounting Bracket, Storage Bin Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Mouting Bracket, Mounting Bracket Asm	\$0.00	\$0.15	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.04	\$0.29
Assemble Mounting Bracket	\$0.03	\$0.01	\$0.00	\$0.00	\$0.06	\$0.07	\$0.02	\$0.02	\$0.22

Detailed Summary

Parts	3
Fasteners	1
Part Numbers	3
Steps	19
Fastenings	1
Right First Time	99.83%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.13
Supplier Fab. Time (Min)	0.40
Total Weight (kg)	0.02
<hr/>	
Purchased Part Cost	\$0.03
Material Cost	\$0.16
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.06
Supplier Fab. Cost	\$0.17
Q Burden	\$0.03
SG&A	\$0.06
Manufacturing Cost*	\$0.50

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



- \...
- \Mounting Bracket, Storage Bin Asm
- \Mounting Bracket, Mounting Bracket Asm
- \Mounting Bracket Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	14.08
Total Weight (kg)	0.02
Material Cost**	\$0.15
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Bracket, Mounting Bracket Asm



Mounting Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	9.00	1	0.25	20.00	GER	\$0.05	99.99%	\$0.00
Debur	5.00	1	0.25	31.36	GER	\$0.04	99.99%	\$0.00
60 Ton Stamping Press	0.64	8	0.25	25.22	GER	\$0.00	99.99%	\$0.00

Mounting Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Mouting Bracket	1	Aluminum 3003-O - Coil Stock	\$4.08	0.0200	0.0200	\$0.00	\$0.15

Assemble Mounting Bracket



\...

- \Storage Bin Asm
- \Mounting Bracket, Storage Bin Asm
- \Assemble Mounting Bracket

Process Summary

Right First Time	99.86 %
Process Time (Sec)	18.14
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Mounting Bracket

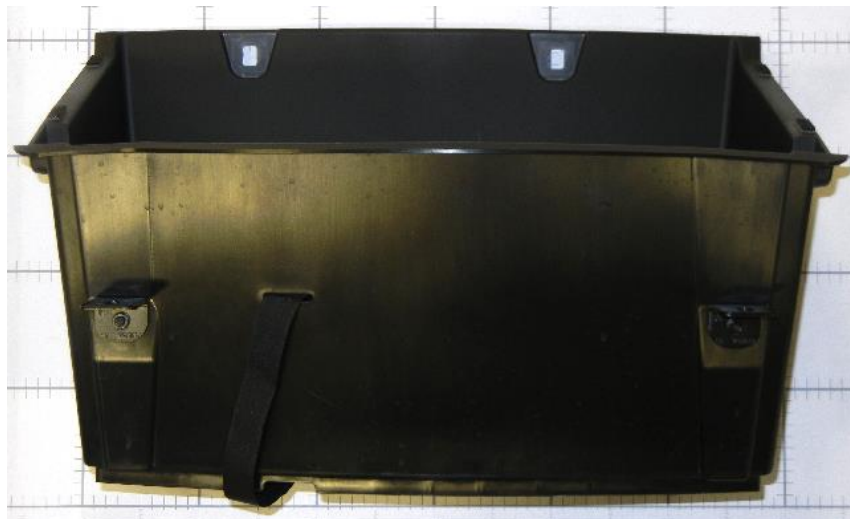
Assemble Mounting Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Basecoat	6.14	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Dip Painting Line	4.00	1	0.25	40.99	GER	\$0.05	99.99 %	\$0.00
Supplier Automated Asm	8.00	1	0.25	25.62	GER	\$0.06	99.91 %	\$0.01

Assemble Mounting Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat		By Area 0.0000	-	\$0.00	\$0.01
M5x6mm-Nut	1	Commodity Item		Purchased 0.0010	-	\$0.03	\$0.00

Storage Bin, Storage Bin Asm



- \...
- \Storage Bin Asm
- \Storage Bin, Storage Bin Asm
- \Storage Bin Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	29.13
Total Weight (kg)	2.10

Material Cost**	\$8.62
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.89
Q Burden	\$0.00
SG&A	\$1.43
Manufacturing Cost*	\$10.94

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Storage Bin, Storage Bin Asm



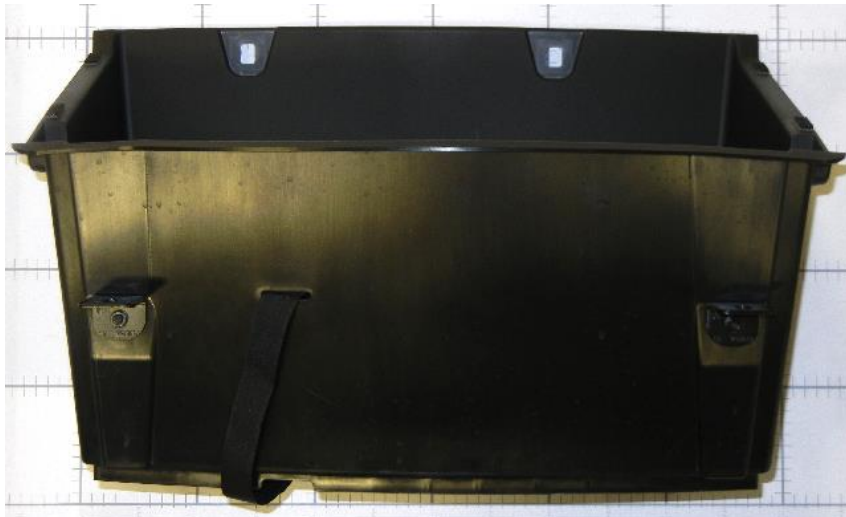
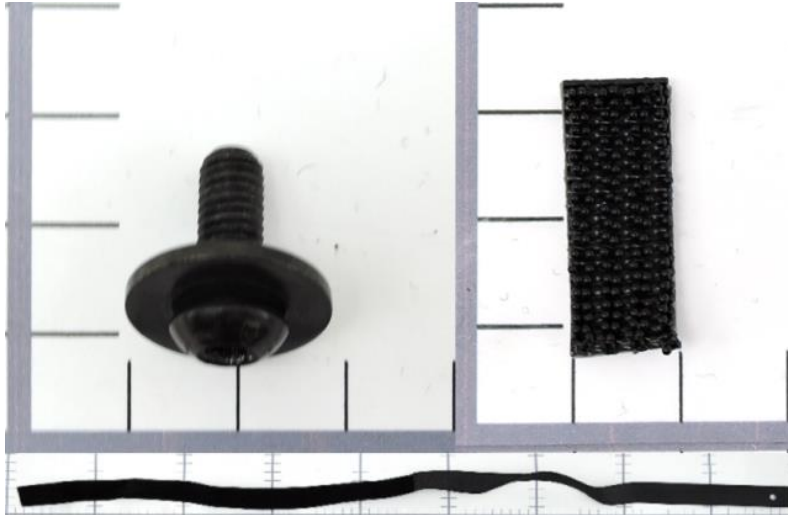
Storage Bin Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	29.13	1	0.25	109.93	GER	\$0.89	99.99%	\$0.00

Storage Bin Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Storage Bin	1	PA6 GF30	\$4.10	2.1030	2.1030	\$0.00	\$8.62

Assemble Storage Bin



\...
\Exterior Trim
\Storage Bin Asm
\Assemble Storage Bin

Process Summary

Right First Time	99.47 %
Process Time (Sec)	53.00
Total Weight (kg)	0.02

Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.80
Q Burden	\$0.08
SG&A	\$0.12
Manufacturing Cost*	\$1.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Storage Bin

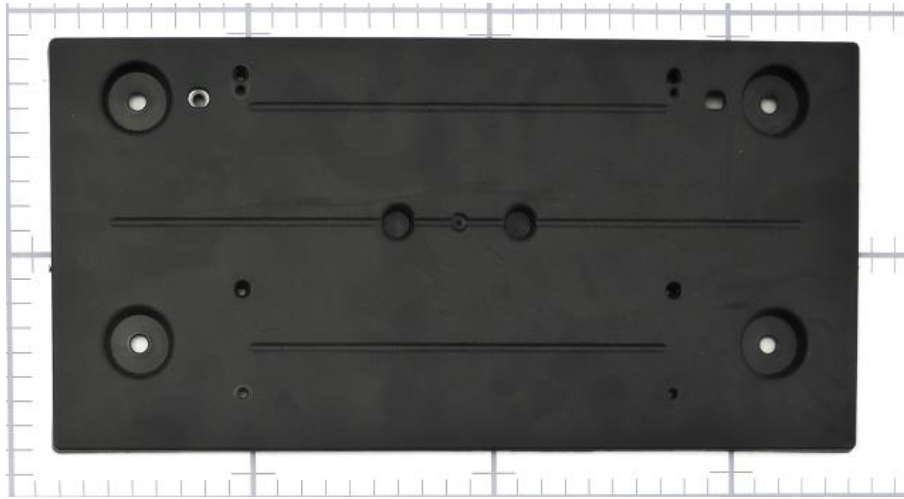
Assemble Storage Bin

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	53.00	1	1.00	54.32	GER	\$0.80	99.47%	\$0.08

Assemble Storage Bin

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x20mm-Round Head Bolt with Captured Washer	2	Commodity Item	Purchased	0.0067	-	\$0.03	\$0.00
Velcro Strip with Tape	4	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00
Velcro Retention Strip	1	Commodity Item	Purchased	0.0076	-	\$0.02	\$0.00

Front License Plate Mounting Cover Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Front License Plate Mounting Cover Asm
Assembly Summary

Parts	3
Fasteners	2
Part Numbers	2
Steps	8
Fastenings	2
Right First Time	99.94 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.55
Total Weight (kg)	0.20

Material Cost**	\$0.65
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.51
Q Burden	\$0.01
SG&A	\$0.17
Manufacturing Cost*	\$1.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Front License Plate Mounting Cover Asm



Front License Plate Mounting Cover Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
License Cover, Front License Mounting Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.25	0.1915
Assemble Cover	1	2	2	6	2	99.95 %	0.00	0.00	0.30	0.00	0.0050

Front License Plate Mounting Cover Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
License Cover, Front License Mounting Cover Asm	\$0.00	\$0.63	\$0.00	\$0.00	\$0.00	\$0.24	\$0.00	\$0.13	\$1.00
Assemble Cover	\$0.02	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.01	\$0.04	\$0.34

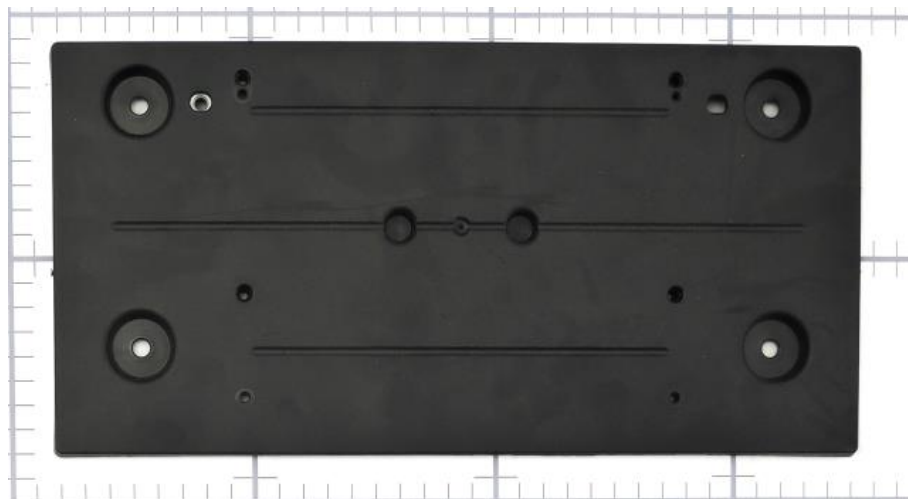
Detailed Summary

Parts	3
Fasteners	2
Part Numbers	2
Steps	8
Fastenings	2
Right First Time	99.94%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.25
Total Weight (kg)	0.20
Purchased Part Cost	\$0.02
Material Cost	\$0.63
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.27
Supplier Fab. Cost	\$0.24
Q Burden	\$0.01
SG&A	\$0.17
Manufacturing Cost*	\$1.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

License Cover, Front License Mounting Cover Asm



\...

- \Front License Plate Mounting Cover Asm
- \License Cover, Front License Mounting Cover Asm
- \License Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	15.18
Total Weight (kg)	0.19

Material Cost**	\$0.63
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.24
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$1.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

License Cover, Front License Mounting Cover Asm

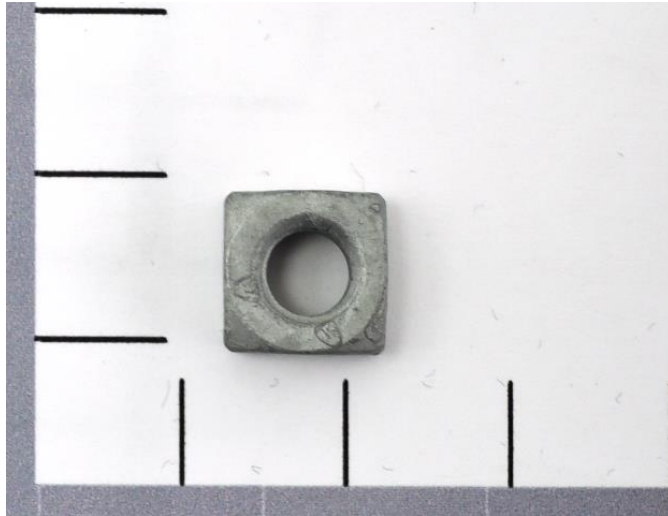


License Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	30.36	2	0.25	56.33	GER	\$0.24	99.99%	\$0.00

License Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, License Cover	1	PP/EPDM TD20	\$3.29	0.1915	0.1915	\$0.00	\$0.63

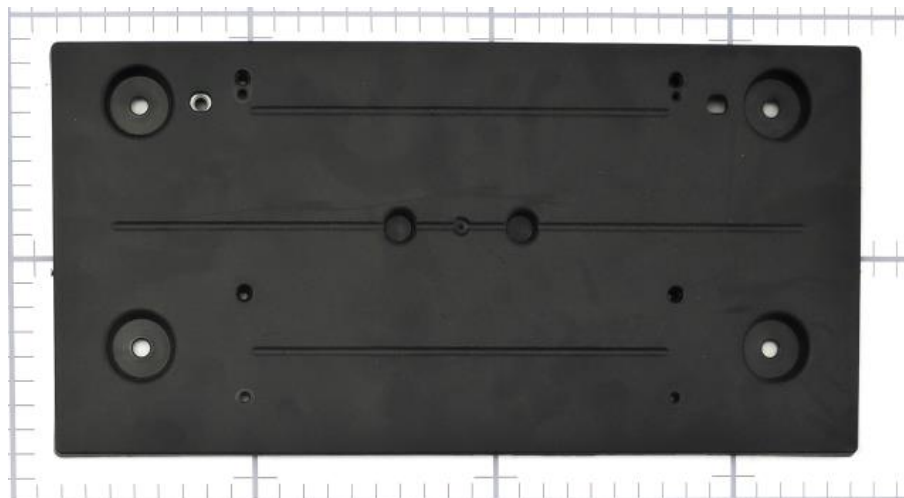


\...
 \Exterior Trim
 \Front License Plate Mounting Cover Asm
 \Assemble Cover

Process Summary

Right First Time	99.95 %
Process Time (Sec)	18.00
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.34



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cover

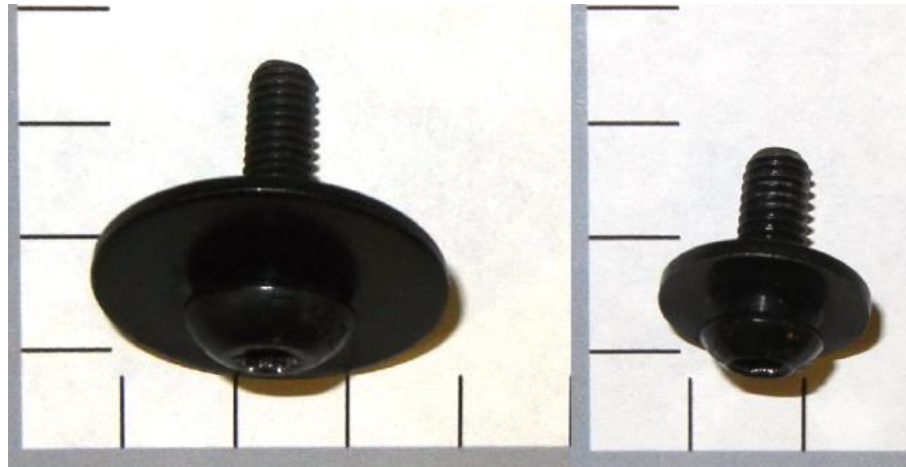
Assemble Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	18.00	1	1.00	54.32	GER	\$0.27	99.95%	\$0.01

Assemble Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x5mm-Square Nut	2	Commodity Item	Purchased	0.0025	-	\$0.01	\$0.00

Storage Bin Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Storage Bin Installation

Process Summary

Right First Time	98.73 %
Process Time (Sec)	90.00
Total Weight (kg)	0.06

Material Cost**	\$0.24
OEM Process Cost	\$2.29
Supplier Process Cost	\$0.00
Q Burden	\$0.19
SG&A	\$0.35
Manufacturing Cost*	\$3.07



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Storage Bin Installation

Storage Bin Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	90.00	1	1.00	91.41	GER	\$2.29	98.73%	\$0.19

Storage Bin Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x21mm-SEMS Torx Bolt	2	Commodity Item	Purchased	0.0160	-	\$0.06	\$0.00
M6x15mm-SEMS Bolt	4	Commodity Item	Purchased	0.0067	-	\$0.03	\$0.00

Driver Side Beauty Cover Asm



\...

\Zone 2 Exterior

\Exterior Trim

\Driver Side Beauty Cover Asm

Assembly Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	23
Fastenings	7
Right First Time	99.73 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.53
Total Weight (kg)	0.22

Material Cost**	\$1.50
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.37
Q Burden	\$0.04
SG&A	\$0.27
Manufacturing Cost*	\$2.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Side Beauty Cover Asm



Driver Side Beauty Cover Asm											
Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Outer Housing, Driver Side Beauty Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.1520
Inner Housing, Driver Side Beauty Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.06	0.0560
Assemble Driver Side Beauty Cover	1	6	7	19	7	99.75 %	0.00	0.00	0.40	0.00	0.0083

Driver Side Beauty Cover Asm										
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*	
Outer Housing, Driver Side Beauty Cover Asm	\$0.00	\$0.67	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.12	\$0.89	
Inner Housing, Driver Side Beauty Cover Asm	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.05	\$0.37	
Assemble Driver Side Beauty Cover	\$0.09	\$0.49	\$0.00	\$0.00	\$0.20	\$0.00	\$0.04	\$0.11	\$0.93	

Detailed Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	23
Fastenings	7
Right First Time	99.73%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.40
Supplier Fab. Time (Min)	0.13
Total Weight (kg)	0.22
Purchased Part Cost	\$0.09
Material Cost	\$1.41
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.20
Supplier Fab. Cost	\$0.17
Q Burden	\$0.04
SG&A	\$0.27
Manufacturing Cost*	\$2.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Housing, Driver Side Beauty Cover Asm



\...

\Driver Side Beauty Cover Asm

\Outer Housing, Driver Side Beauty Cover Asm

\Outer Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.07
Total Weight (kg)	0.15
Material Cost**	\$0.67
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.00
SG&A	\$0.12
Manufacturing Cost*	\$0.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Housing, Driver Side Beauty Cover Asm



Outer Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	16.28	4	0.25	89.76	GER	\$0.10	99.99%	\$0.00

Outer Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Housing	1	PA6	\$4.39	0.1520	0.1520	\$0.00	\$0.67

Inner Housing, Driver Side Beauty Cover Asm



\...

- \Driver Side Beauty Cover Asm
- \Inner Housing, Driver Side Beauty Cover Asm
- \Inner Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	3.71
Total Weight (kg)	0.06

Material Cost**	\$0.25
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.00
SG&A	\$0.05
Manufacturing Cost*	\$0.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Housing, Driver Side Beauty Cover Asm



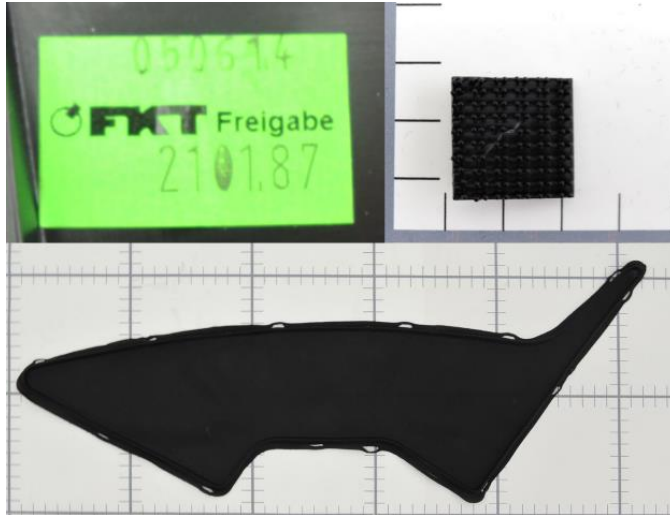
Inner Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
610 Ton Injection Molding Press	14.84	4	0.25	68.23	GER	\$0.07	99.99%	\$0.00

Inner Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Housing	1	PA6	\$4.39	0.0560	0.0560	\$0.00	\$0.25

Assemble Driver Side Beauty Cover



\...
\Exterior Trim
\Driver Side Beauty Cover Asm
\Assemble Driver Side Beauty Cover

Process Summary

Right First Time	99.75 %
Process Time (Sec)	24.00
Total Weight (kg)	0.01

Material Cost**	\$0.58
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.20
Q Burden	\$0.04
SG&A	\$0.11
Manufacturing Cost*	\$0.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Side Beauty Cover



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& ASSOCIATES, INC.

Assemble Driver Side Beauty Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	24.00	1	0.25	30.27	GER	\$0.20	99.75%	\$0.04

Assemble Driver Side Beauty Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Driver Side Beauty Cover Cloth	1	Cloth Surfacing -Low Quality	By Area	0.0062	-	\$0.00	\$0.49
Velcro Square	4	Commodity Item	Purchased	0.0005	-	\$0.01	\$0.00
Label, FKT Supplier	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...
\Zone 2 Exterior
\Exterior Trim
\Driver Beauty Cover Installation

Process Summary

Right First Time	99.93 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.33

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Beauty Cover Installation



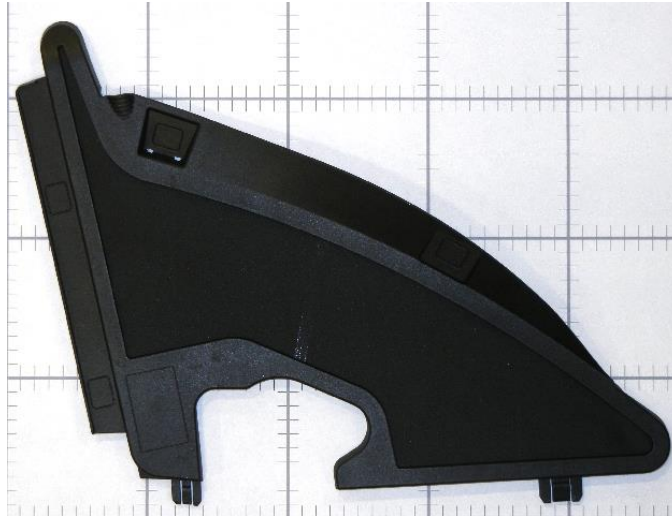
Driver Beauty Cover Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	11.00	1	1.00	91.41	GER	\$0.28	99.93%	\$0.01

Driver Beauty Cover Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Passenger Side Beauty Cover Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Side Beauty Cover Asm
Assembly Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	23
Fastenings	7
Right First Time	99.74 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.64
Total Weight (kg)	0.25

Material Cost**	\$1.88
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.64
Q Burden	\$0.04
SG&A	\$0.37
Manufacturing Cost*	\$2.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Side Beauty Cover Asm



Passenger Side Beauty Cover Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Outer Housing, Passenger Side Beauty Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.13	0.1640
Inner Housing, Passenger Side Beauty Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.11	0.0760
Assemble Passenger Side Beauty Cover	1	6	7	19	7	99.76 %	0.00	0.00	0.40	0.00	0.0148

Passenger Side Beauty Cover Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Outer Housing, Passenger Side Beauty Cover Asm	\$0.00	\$0.72	\$0.00	\$0.00	\$0.00	\$0.23	\$0.00	\$0.14	\$1.09
Inner Housing, Passenger Side Beauty Cover Asm	\$0.00	\$0.33	\$0.00	\$0.00	\$0.00	\$0.21	\$0.00	\$0.08	\$0.62
Assemble Passenger Side Beauty Cover	\$0.09	\$0.74	\$0.00	\$0.00	\$0.20	\$0.00	\$0.04	\$0.14	\$1.21

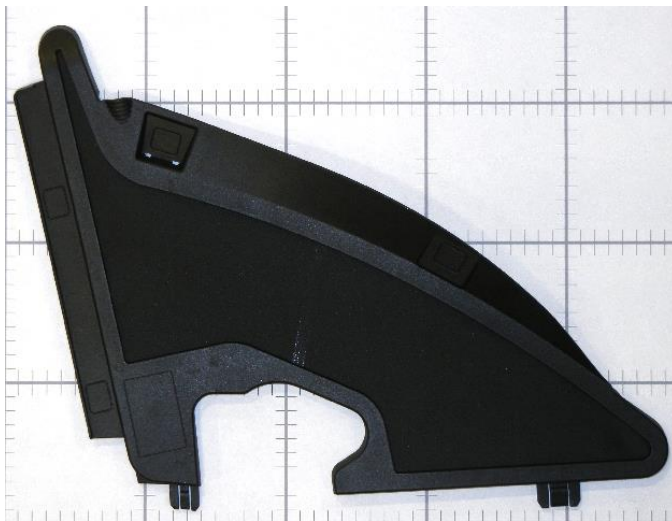
Detailed Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	23
Fastenings	7
Right First Time	99.74%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.40
Supplier Fab. Time (Min)	0.24
Total Weight (kg)	0.25
Purchased Part Cost	
	\$0.09
Material Cost	
	\$1.79
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.20
Supplier Fab. Cost	
	\$0.44
Q Burden	
	\$0.04
SG&A	
	\$0.37
Manufacturing Cost*	
	\$2.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Housing, Passenger Side Beauty Cover Asm



\...

- \Passenger Side Beauty Cover Asm
- \Outer Housing, Passenger Side Beauty Cover Asm
- \Outer Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.55
Total Weight (kg)	0.16
Material Cost**	\$0.72
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.00
SG&A	\$0.14
Manufacturing Cost*	\$1.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Housing, Passenger Side Beauty Cover Asm



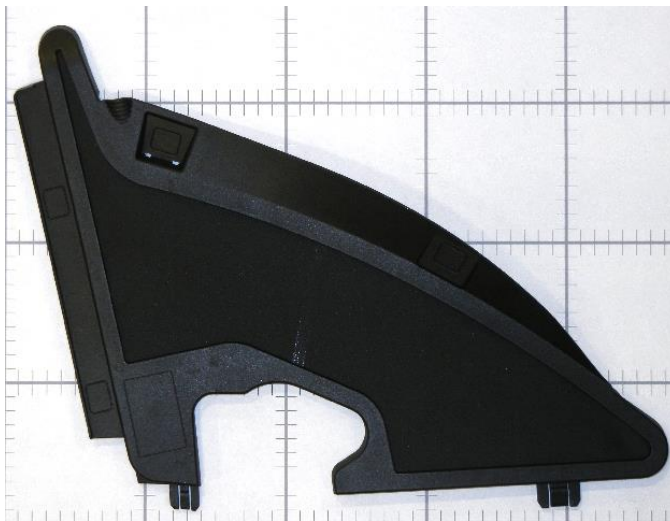
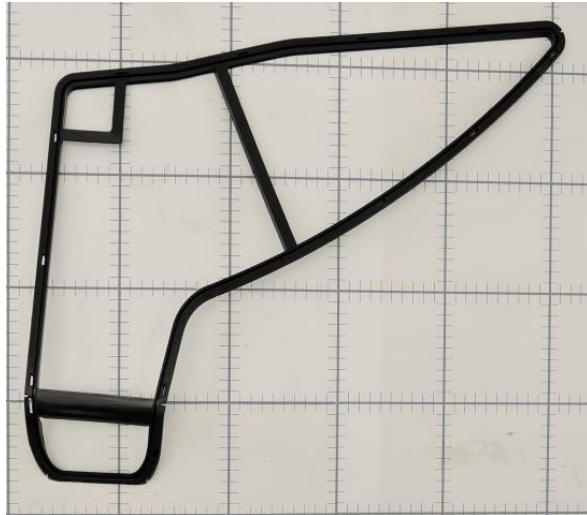
Outer Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	30.20	4	0.25	109.93	GER	\$0.23	99.99%	\$0.00

Outer Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Housing	1	PA6	\$4.39	0.1640	0.1640	\$0.00	\$0.72

Inner Housing, Passenger Side Beauty Cover Asm



\...

- \Passenger Side Beauty Cover Asm
 - \Inner Housing, Passenger Side Beauty Cover Asm
 - \Inner Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	6.86
Total Weight (kg)	0.08
Material Cost**	\$0.33
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.21
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.62

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Housing, Passenger Side Beauty Cover Asm



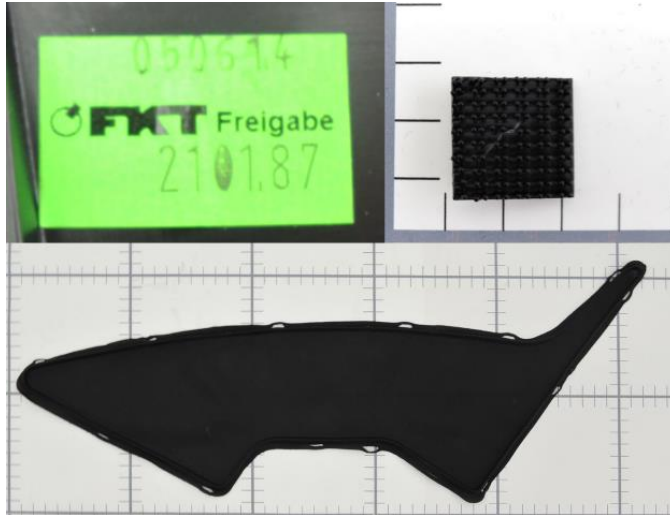
Inner Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	27.44	4	0.25	109.93	GER	\$0.21	99.99%	\$0.00

Inner Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Housing	1	PA6	\$4.39	0.0760	0.0760	\$0.00	\$0.33

Assemble Passenger Side Beauty Cover



- \...
- \Exterior Trim
- \Passenger Side Beauty Cover Asm
- \Assemble Passenger Side Beauty Cover

Process Summary

Right First Time	99.76 %
Process Time (Sec)	24.00
Total Weight (kg)	0.01

Material Cost**	\$0.83
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.20
Q Burden	\$0.04
SG&A	\$0.14
Manufacturing Cost*	\$1.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Side Beauty Cover



Assemble Passenger Side Beauty Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	24.00	1	0.25	30.27	GER	\$0.20	99.76%	\$0.04

Assemble Passenger Side Beauty Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Passenger Side Beauty Cover Cloth	1	Cloth Surfacing -Low Quality	By Area	0.0127	-	\$0.00	\$0.74
Velcro Square	4	Commodity Item	Purchased	0.0005	-	\$0.01	\$0.00
Label, FKT Supplier	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...
\Zone 2 Exterior
\Exterior Trim
\Passenger Beauty Cover Installation

Process Summary

Right First Time	99.93 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.33

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Beauty Cover Installation



Passenger Beauty Cover Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	11.00	1	1.00	91.41	GER	\$0.28	99.93%	\$0.01

Passenger Beauty Cover Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Fender Front Wheel Well Liner



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Fender Front Wheel Well Liner
Assembly Summary

Parts	4
Fasteners	1
Part Numbers	4
Steps	14
Fastenings	2
Right First Time	99.74 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.88
Total Weight (kg)	0.53

Material Cost**	\$2.47
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.97
Q Burden	\$0.04
SG&A	\$0.51
Manufacturing Cost*	\$3.99

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Driver Fender Front Wheel Well Liner



MUNRO
& ASSOCIATES, INC.

Driver Fender Front Wheel Well Liner

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Access Cap, Driver Fender Front Wheel Well Liner A	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0472
Liner, Driver Fender Front Wheel Well Liner Asm	1	2	0	6	0	99.95 %	0.00	0.00	0.00	0.47	0.4800
Assemble Driver Fender Front Wheel Well Liner	1	1	2	5	2	99.80 %	0.00	0.00	0.33	0.00	0.0026

Driver Fender Front Wheel Well Liner

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Access Cap, Driver Fender Front Wheel Well Liner A	\$0.00	\$0.17	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.03	\$0.27
Liner, Driver Fender Front Wheel Well Liner Asm	\$0.00	\$2.22	\$0.00	\$0.00	\$0.00	\$0.61	\$0.01	\$0.42	\$3.26
Assemble Driver Fender Front Wheel Well Liner	\$0.08	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.03	\$0.05	\$0.46

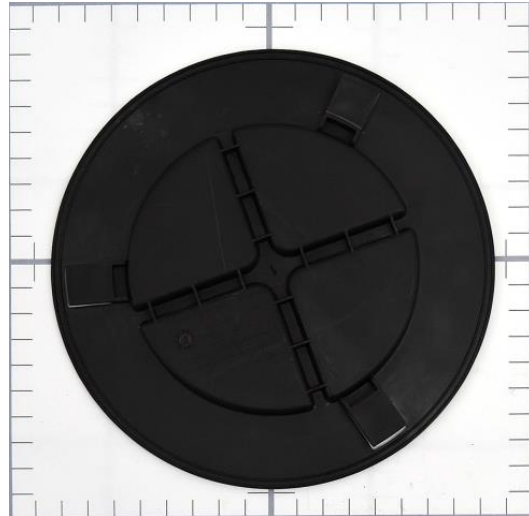
Detailed Summary

Parts	4
Fasteners	1
Part Numbers	4
Steps	14
Fastenings	2
Right First Time	99.74%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.33
Supplier Fab. Time (Min)	0.54
Total Weight (kg)	0.53
Purchased Part Cost	\$0.08
Material Cost	\$2.39
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.30
Supplier Fab. Cost	\$0.67
Q Burden	\$0.04
SG&A	\$0.51
Manufacturing Cost*	\$3.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Access Cap, Driver Fender Front Wheel Well Liner Asm



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- \Driver Fender Front Wheel Well Liner
- \Access Cap, Driver Fender Front Wheel Well Liner A
- \Access Cap Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.23
Total Weight (kg)	0.05

Material Cost**	\$0.17
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.27

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Access Cap, Driver Fender Front Wheel Well Liner Asm



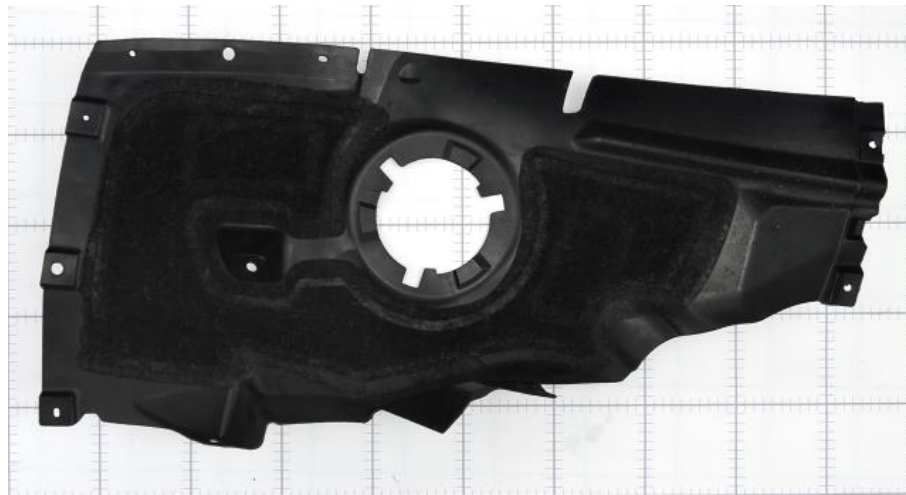
Access Cap Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	16.92	4	0.25	52.65	GER	\$0.06	99.99%	\$0.00

Access Cap Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Access Cap	1	PP/EPDM	\$3.32	0.0472	0.0507	\$0.00	\$0.17

Liner, Driver Fender Front Wheel Well Liner Asm



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- \Driver Fender Front Wheel Well Liner
- \Liner, Driver Fender Front Wheel Well Liner Asm
- \Liner Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	28.44
Total Weight (kg)	0.48
Material Cost**	\$2.22
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.61
Q Burden	\$0.01
SG&A	\$0.42
Manufacturing Cost*	\$3.26

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Liner, Driver Fender Front Wheel Well Liner Asm



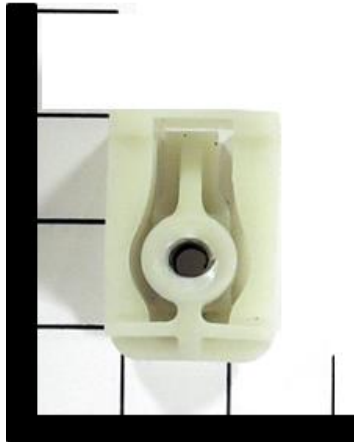
Liner Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	23.24	1	0.25	89.76	GER	\$0.58	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Liner Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Liner	1	PP/EPDM MD10	\$3.57	0.4600	0.4600	\$0.00	\$1.64
Material 1, Liner	1	Felt (Low Quality)	By Area	0.0200	-	\$0.00	\$0.58

Assemble Driver Fender Front Wheel Well Liner



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\Exterior Trim

\Driver Fender Front Wheel Well Liner

\Assemble Driver Fender Front Wheel Well Liner

Process Summary

Right First Time	99.80 %
Process Time (Sec)	20.00
Total Weight (kg)	0.00

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.03
SG&A	\$0.05
Manufacturing Cost*	\$0.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Fender Front Wheel Well Liner



Assemble Driver Fender Front Wheel Well Liner

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	20.00	1	1.00	54.32	GER	\$0.30	99.80%	\$0.03

Assemble Driver Fender Front Wheel Well Liner

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plastic J-Nut White	1	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00

Driver Fender Rear Wheel Well Liner



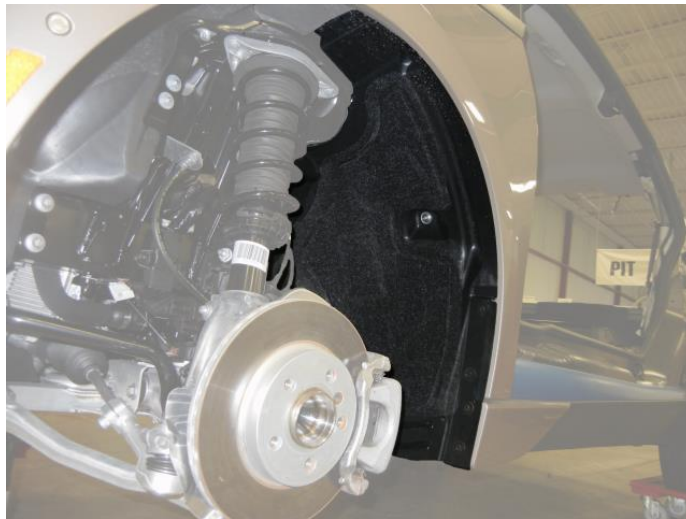
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- \Exterior Trim
 - \Driver Fender Rear Wheel Well Liner
 - \Driver Fender Rear Wheel Well Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	44.34
Total Weight (kg)	0.62

Material Cost**	\$2.64
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.22
Q Burden	\$0.01
SG&A	\$0.58
Manufacturing Cost*	\$4.45



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Fender Rear Wheel Well Liner



Driver Fender Rear Wheel Well Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	39.14	1	0.25	109.93	GER	\$1.20	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Driver Fender Rear Wheel Well Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Driver Fender Rear Wheel Well Liner	1	PP/EPDM MD10	\$3.57	0.6040	0.6040	\$0.00	\$2.16
Material 2, Driver Fender Rear Wheel Well Liner	1	Felt (Low Quality)	By Area	0.0200	-	\$0.00	\$0.48

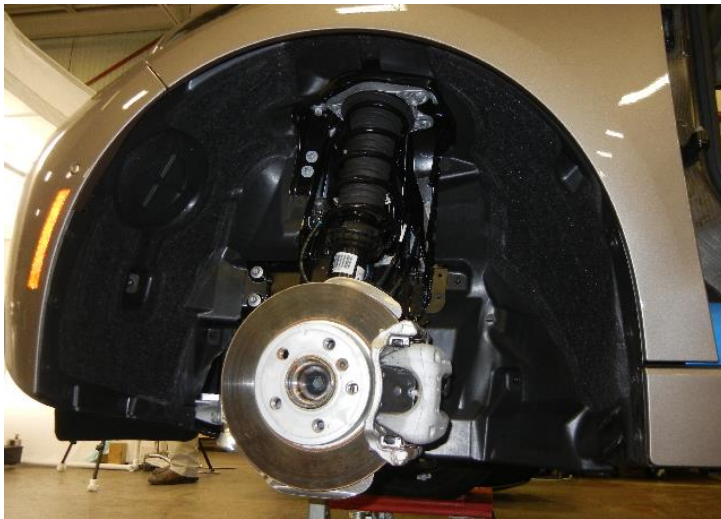


- \...
- \Zone 2 Exterior
- \Exterior Trim
- \Driver Fender Wheel Well Liner Installation

Process Summary

Right First Time	95.35 %
Process Time (Sec)	280.00
Total Weight (kg)	0.14

Material Cost**	\$0.68
OEM Process Cost	\$7.11
Supplier Process Cost	\$0.00
Q Burden	\$0.71
SG&A	\$1.09
Manufacturing Cost*	\$9.59



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Fender Wheel Well Liner Installation



Driver Fender Wheel Well Liner Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	280.00	1	1.00	91.41	GER	\$7.11	95.35%	\$0.71

Driver Fender Wheel Well Liner Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x11 Plastic Hex Flange Nut	4	Commodity Item	Purchased	0.0014	-	\$0.03	\$0.00
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00
M5x19mm-Hex SEMS Screw	18	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00



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\Zone 2 Exterior

\Exterior Trim

\Passenger Fender Front Wheel Well Liner

Assembly Summary

Parts	4
Fasteners	1
Part Numbers	4
Steps	14
Fastenings	2
Right First Time	99.74 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.88
Total Weight (kg)	0.53

Material Cost**	\$2.47
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.97
Q Burden	\$0.04
SG&A	\$0.51
Manufacturing Cost*	\$3.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Front Wheel Well Liner



MUNRO
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Passenger Fender Front Wheel Well Liner

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Access Cap, Psgr Fender Frt Wheel Well Liner Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0472
Liner, Passenger Fender Front Wheel Well Liner Asm	1	2	0	6	0	99.95 %	0.00	0.00	0.00	0.47	0.4800
Assemble Passenger Fender Front Wheel Well Liner	1	1	2	5	2	99.80 %	0.00	0.00	0.33	0.00	0.0026

Passenger Fender Front Wheel Well Liner

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Access Cap, Psgr Fender Frt Wheel Well Liner Asm	\$0.00	\$0.17	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.03	\$0.27
Liner, Passenger Fender Front Wheel Well Liner Asm	\$0.00	\$2.22	\$0.00	\$0.00	\$0.00	\$0.61	\$0.01	\$0.42	\$3.26
Assemble Passenger Fender Front Wheel Well Liner	\$0.08	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.03	\$0.05	\$0.46

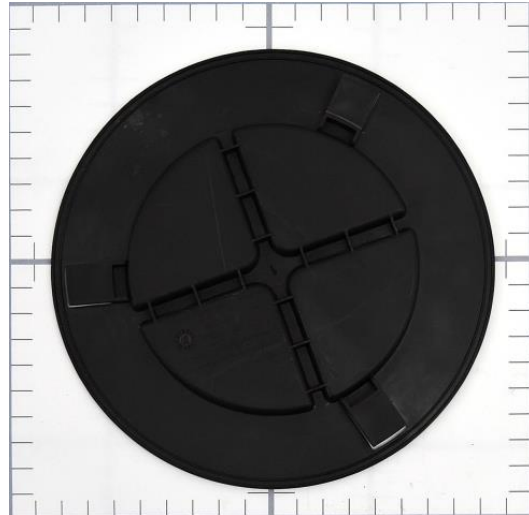
Detailed Summary

Parts	4
Fasteners	1
Part Numbers	4
Steps	14
Fastenings	2
Right First Time	99.74%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.33
Supplier Fab. Time (Min)	0.54
Total Weight (kg)	0.53
Purchased Part Cost	\$0.08
Material Cost	\$2.39
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.30
Supplier Fab. Cost	\$0.67
Q Burden	\$0.04
SG&A	\$0.51
Manufacturing Cost*	\$3.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Access Cap, Passenger Fender Front Wheel Well Liner Asm



\...
 \Passenger Fender Front Wheel Well Liner
 \Access Cap, Passenger Fender Front Wheel Well Liner
 Asm \Access Cap Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.23
Total Weight (kg)	0.05
Material Cost**	\$0.17
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.27

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Access Cap, Passenger Fender Front Wheel Well Liner Asm



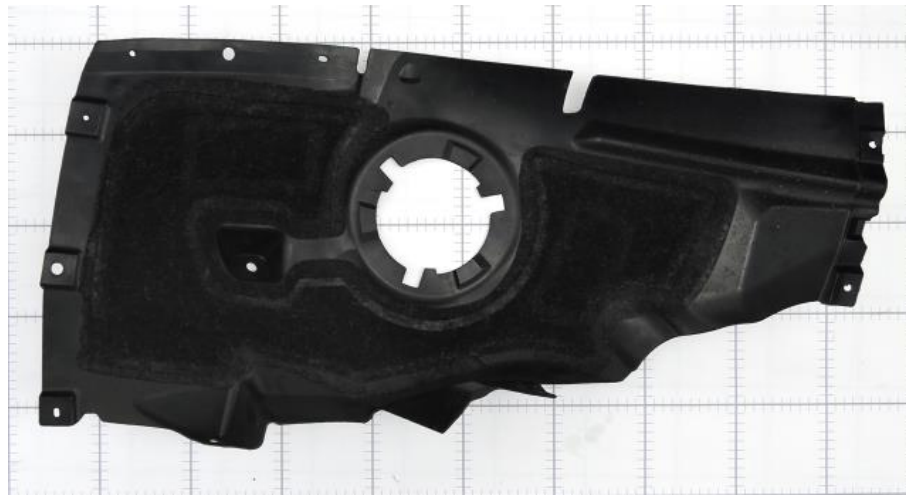
Access Cap Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	16.92	4	0.25	52.65	GER	\$0.06	99.99%	\$0.00

Access Cap Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Access Cap	1	PP/EPDM	\$3.32	0.0472	0.0507	\$0.00	\$0.17

Liner, Passenger Fender Front Wheel Well Liner Asm



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- \Passenger Fender Front Wheel Well Liner
- \Liner, Passenger Fender Front Wheel Well Liner Asm
- \Liner Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	28.44
Total Weight (kg)	0.48
Material Cost**	\$2.22
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.61
Q Burden	\$0.01
SG&A	\$0.42
Manufacturing Cost*	\$3.26

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Liner, Passenger Fender Front Wheel Well Liner Asm



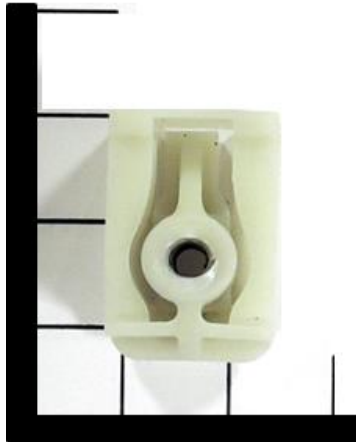
Liner Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	23.24	1	0.25	89.76	GER	\$0.58	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Liner Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Liner	1	PP/EPDM MD10	\$3.57	0.4600	0.4600	\$0.00	\$1.64
Material 1, Liner	1	Felt (Low Quality)	By Area	0.0200	-	\$0.00	\$0.58

Assemble Passenger Fender Front Wheel Well Liner



\...

\Exterior Trim

\Passenger Fender Front Wheel Well Liner

\Assemble Passenger Fender Front Wheel Well Liner

Process Summary

Right First Time	99.80 %
Process Time (Sec)	20.00
Total Weight (kg)	0.00

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.03
SG&A	\$0.05
Manufacturing Cost*	\$0.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Fender Front Wheel Well Liner



MUNRO
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Assemble Passenger Fender Front Wheel Well Liner

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	20.00	1	1.00	54.32	GER	\$0.30	99.80%	\$0.03

Assemble Passenger Fender Front Wheel Well Liner

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plastic J-Nut White	1	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00



\...

\Exterior Trim

\Passenger Fender Rear Wheel Well Liner

\Passenger Fender Rear Wheel Well Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	44.44
Total Weight (kg)	0.68

Material Cost**	\$2.84
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.23
Q Burden	\$0.01
SG&A	\$0.61
Manufacturing Cost*	\$4.68



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Rear Wheel Well Liner



MUNRO
& ASSOCIATES, INC.

Passenger Fender Rear Wheel Well Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	39.24	1	0.25	109.93	GER	\$1.20	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Passenger Fender Rear Wheel Well Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Passenger Fender Rear Wheel Well Liner	1	PP/EPDM MD10	\$3.57	0.6600	0.6600	\$0.00	\$2.36
Material 1, Passenger Fender Rear Wheel Well Liner	1	Felt (Low Quality)	By Area	0.0200	-	\$0.00	\$0.48

Passenger Fender Wheel Well Liner Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Fender Wheel Well Liner Installation

Process Summary

Right First Time	95.55 %
Process Time (Sec)	269.00
Total Weight (kg)	0.13

Material Cost**	\$0.65
OEM Process Cost	\$6.83
Supplier Process Cost	\$0.00
Q Burden	\$0.68
SG&A	\$1.04
Manufacturing Cost*	\$9.21



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Wheel Well Liner Installation

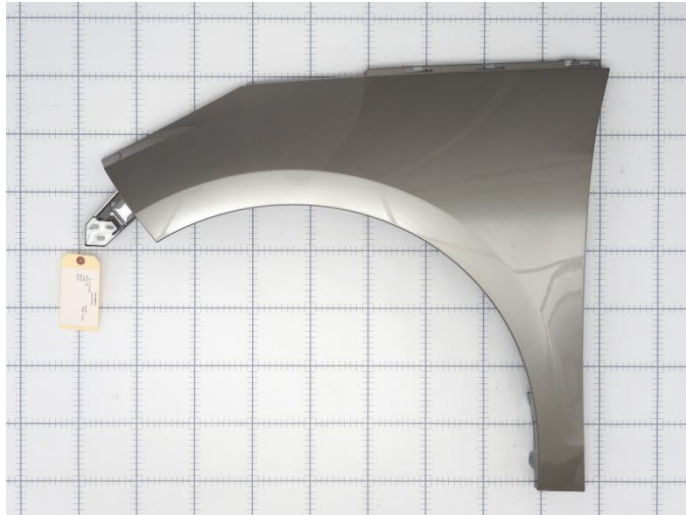
Passenger Fender Wheel Well Liner Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	269.00	1	1.00	91.41	GER	\$6.83	95.55%	\$0.68

Passenger Fender Wheel Well Liner Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x11 Plastic Hex Flange Nut	3	Commodity Item	Purchased	0.0014	-	\$0.03	\$0.00
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00
M5x19mm-Hex SEMS Screw	18	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Driver Fender Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Fender Asm

Assembly Summary

Parts	13
Fasteners	3
Part Numbers	9
Steps	70
Fastenings	11
Right First Time	99.29 %
OEM Process Time (Min)	20.93
Supplier Process Time (Min)	0.07
Total Weight (kg)	1.33

Material Cost**	\$8.30
OEM Process Cost	\$13.74
Supplier Process Cost	\$0.03
Q Burden	\$0.11
SG&A	\$3.28
Manufacturing Cost*	\$25.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Driver Fender Asm



Driver Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Fender Asm, Driver Fender Asm	1	5	3	47	3	99.55 %	1.19	18.65	0.00	0.00	1.2999
Support Asm, Passenger Fender Asm	1	4	3	10	3	99.89 %	0.45	0.00	0.00	0.07	0.0264
Assemble Driver Fender Bracket	1	4	5	11	5	99.84 %	0.63	0.00	0.00	0.00	0.0050

Driver Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Fender Asm, Driver Fender Asm	\$0.00	\$7.98	\$1.42	\$10.67	\$0.00	\$0.00	\$0.07	\$3.01	\$23.14
Support Asm, Passenger Fender Asm	\$0.03	\$0.07	\$0.69	\$0.00	\$0.00	\$0.03	\$0.02	\$0.12	\$0.95
Assemble Driver Fender Bracket	\$0.22	\$0.00	\$0.96	\$0.00	\$0.00	\$0.00	\$0.02	\$0.15	\$1.36

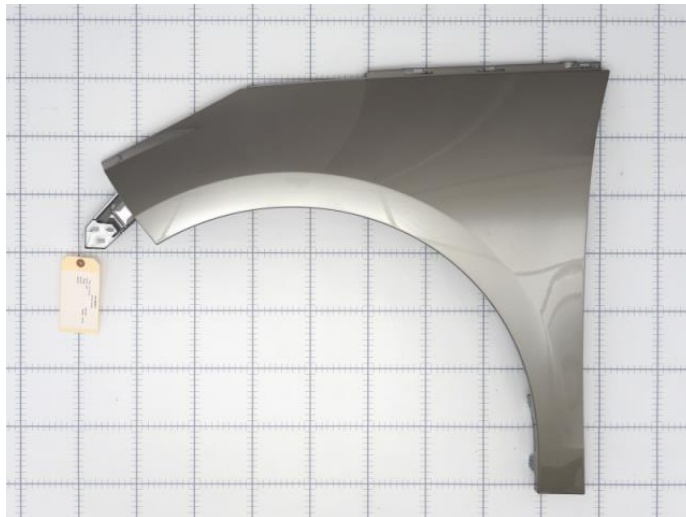
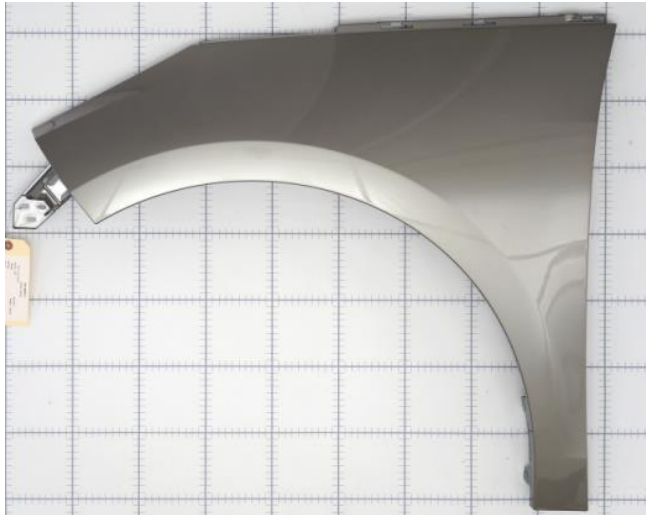
Detailed Summary

Parts	13
Fasteners	3
Part Numbers	9
Steps	70
Fastenings	11
Right First Time	99.29%
OEM Asm. Time (Min)	2.28
OEM Fab. Time (Min)	18.65
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.07
Total Weight (kg)	1.33
Purchased Part Cost	\$0.25
Material Cost	\$8.05
OEM Asm. Cost	\$3.07
OEM Fab. Cost	\$10.67
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.03
Q Burden	\$0.11
SG&A	\$3.28
Manufacturing Cost*	\$25.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fender Asm, Driver Fender Asm



\...
 \Exterior Trim
 \Driver Fender Asm
 \Fender Asm, Driver Fender Asm
Assembly Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	47
Fastenings	3
Right First Time	99.55 %
OEM Process Time (Min)	19.85
Supplier Process Time (Min)	0.00
Total Weight (kg)	1.30

Material Cost**	\$7.98
OEM Process Cost	\$12.09
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$3.01
Manufacturing Cost*	\$23.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fender Asm, Driver Fender Asm



Fender Asm, Driver Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Inner Fender, Fender Asm	1	1	0	1	0	99.99 %	0.00	0.41	0.00	0.00	0.0941
Outer Fender, Fender Asm	1	1	0	1	0	99.99 %	0.00	0.87	0.00	0.00	1.1340
Assemble Driver Inner & Outer Fender	1	3	3	43	3	99.57 %	1.19	17.38	0.00	0.00	0.0718

Fender Asm, Driver Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Inner Fender, Fender Asm	\$0.00	\$0.33	\$0.00	\$0.43	\$0.00	\$0.00	\$0.00	\$0.11	\$0.87
Outer Fender, Fender Asm	\$0.00	\$3.40	\$0.00	\$1.39	\$0.00	\$0.00	\$0.00	\$0.72	\$5.52
Assemble Driver Inner & Outer Fender	\$0.00	\$4.25	\$1.42	\$8.85	\$0.00	\$0.00	\$0.06	\$2.18	\$16.76

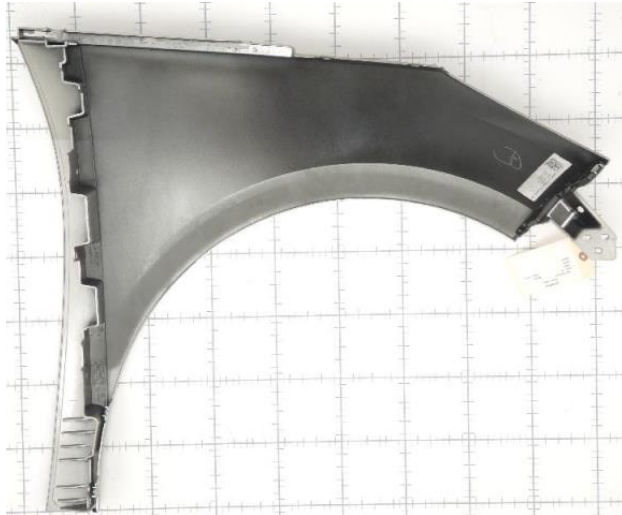
Detailed Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	47
Fastenings	3
Right First Time	99.55%
OEM Asm. Time (Min)	1.19
OEM Fab. Time (Min)	18.65
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	1.30
Purchased Part Cost	
	\$0.00
Material Cost	
	\$7.98
OEM Asm. Cost	
	\$1.42
OEM Fab. Cost	
	\$10.67
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.07
SG&A	
	\$3.01
Manufacturing Cost*	
	\$23.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Fender, Fender Asm



\...

- \Fender Asm, Driver Fender Asm
- \Inner Fender, Fender Asm
- \Inner Fender Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	24.30
Total Weight (kg)	0.09
Material Cost**	\$0.33
OEM Process Cost	\$0.43
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.87

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Fender, Fender Asm

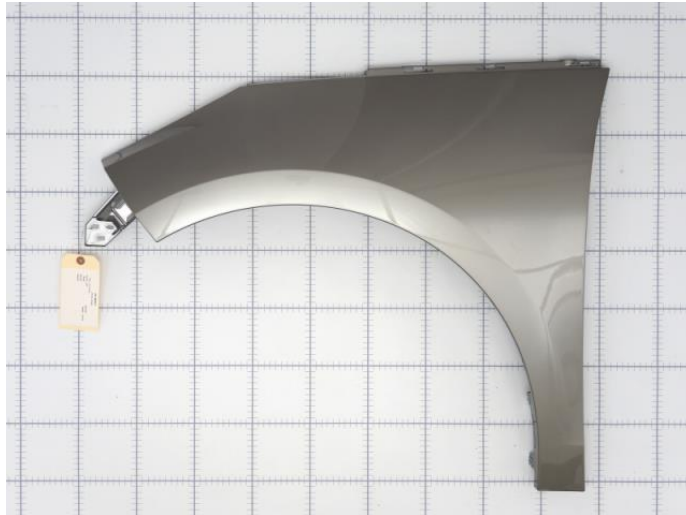
Inner Fender Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	48.60	2	0.25	63.07	GER	\$0.43	99.99%	\$0.00

Inner Fender Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Fender	1	PP/EPDM TD30	\$3.00	0.0941	0.1010	\$0.00	\$0.33

Outer Fender, Fender Asm



\...

- \Fender Asm, Driver Fender Asm
- \Outer Fender, Fender Asm
- \Outer Fender Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	52.03
Total Weight (kg)	1.13

Material Cost**	\$3.40
OEM Process Cost	\$1.39
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.72
Manufacturing Cost*	\$5.52



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Fender, Fender Asm



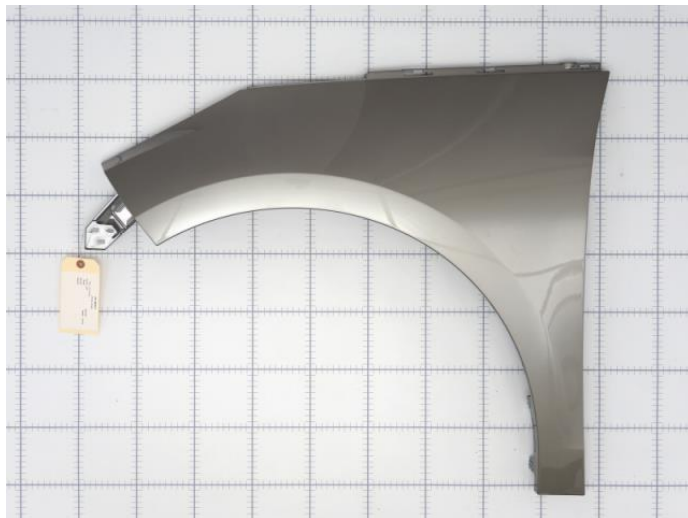
Outer Fender Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	52.03	1	0.25	96.50	GER	\$1.39	99.99%	\$0.00

Outer Fender Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Fender	1	PP/EPDM TD30	\$3.00	1.1340	1.1340	\$0.00	\$3.40

No Commodity Items Required for This Process



\...

\Driver Fender Asm

\Fender Asm, Driver Fender Asm

\Assemble Driver Inner & Outer Fender

Process Summary

Right First Time	99.57 %
Process Time (Sec)	1114.45
Total Weight (kg)	0.07

Material Cost**	\$4.25
OEM Process Cost	\$10.27
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$2.18
Manufacturing Cost*	\$16.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Inner & Outer Fender



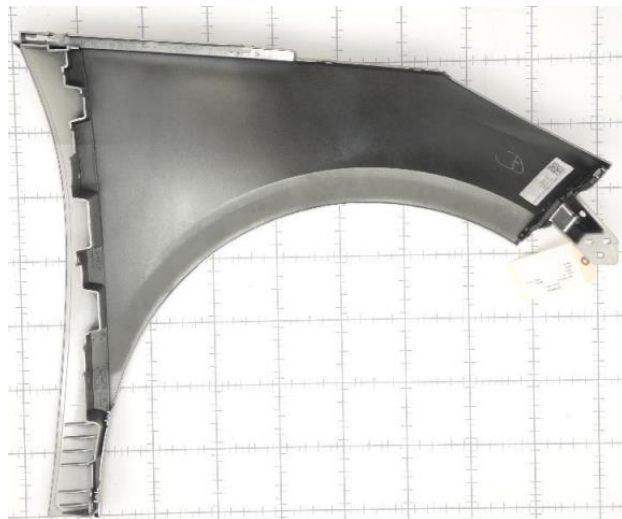
MUNRO
& ASSOCIATES, INC.

Assemble Driver Inner & Outer Fender

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	486.00	1	0.25	27.19	GER	\$3.67	99.97 %	\$0.01
Apply Base Coat	20.92	1	0.25	103.43	GER	\$0.60	99.94 %	\$0.01
OEM CO2 Cleaning Line	12.96	1	0.25	51.85	GER	\$0.19	99.99 %	\$0.00
Hand Sanding	19.05	1	1.00	91.41	GER	\$0.48	99.96 %	\$0.01
Cure Paint	486.00	1	0.25	27.19	GER	\$3.67	99.97 %	\$0.01
Apply Base Coat	20.92	1	0.25	103.43	GER	\$0.60	99.94 %	\$0.01
OEM Plasma Surface Treatment Line	12.96	1	0.25	49.58	GER	\$0.18	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
IR Cure	21.00	1	0.25	67.69	GER	\$0.39	99.96 %	\$0.01
OEM Adhesive Bead Station Auto	18.64	1	0.25	69.43	GER	\$0.36	99.91 %	\$0.01

Assemble Driver Inner & Outer Fender

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.48
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.48
Adhesive, Driver Fender	1	Structural Adhesive - Polymer	\$17.94	0.0718	0.0718	\$0.00	\$1.29



\...
 \Exterior Trim
 \Driver Fender Asm
 \Support Asm, Passenger Fender Asm

Assembly Summary

Parts	4
Fasteners	1
Part Numbers	3
Steps	10
Fastenings	3
Right First Time	99.89 %
OEM Process Time (Min)	0.45
Supplier Process Time (Min)	0.07
Total Weight (kg)	0.03

Material Cost**	\$0.10
OEM Process Cost	\$0.69
Supplier Process Cost	\$0.03
Q Burden	\$0.02
SG&A	\$0.12
Manufacturing Cost*	\$0.95

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Support Asm, Driver Fender Asm



Support Asm, Passenger Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Support, Support Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0234
Assemble Support Driver Fender	1	3	3	8	3	99.90 %	0.45	0.00	0.00	0.00	0.0030

Support Asm, Passenger Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Support, Support Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.02	\$0.12
Assemble Support Driver Fender	\$0.03	\$0.00	\$0.69	\$0.00	\$0.00	\$0.00	\$0.01	\$0.10	\$0.83

Detailed Summary

Parts	4
Fasteners	1
Part Numbers	3
Steps	10
Fastenings	3
Right First Time	99.89%
OEM Asm. Time (Min)	0.45
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.07
Total Weight (kg)	0.03
Purchased Part Cost	
	\$0.03
Material Cost	
	\$0.07
OEM Asm. Cost	
	\$0.69
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.03
Q Burden	
	\$0.02
SG&A	
	\$0.12
Manufacturing Cost*	
	\$0.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support, Support Asm



\...
\Support Asm, Passenger Fender Asm
\Support, Support Asm
\Support Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.36
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support, Support Asm

Support Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	17.44	4	0.25	26.65	GER	\$0.03	99.99%	\$0.00

Support Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Support	1	ABS	\$2.60	0.0234	0.0234	\$0.00	\$0.07

Assemble Support Driver Fender



\...

- \Driver Fender Asm
- \Support Asm, Passenger Fender Asm
- \Assemble Support Driver Fender

Process Summary

Right First Time	99.90 %
Process Time (Sec)	27.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.69
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.10
Manufacturing Cost*	\$0.83

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Support Driver Fender



Assemble Support Driver Fender

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	27.00	1	1.00	91.41	GER	\$0.69	99.90%	\$0.01

Assemble Support Driver Fender

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	1	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
40mmx10mm Double Sided Tape	2	Commodity Item	Purchased	0.0003	-	\$0.01	\$0.00

Assemble Driver Fender Bracket

- \...
- \Exterior Trim
- \Driver Fender Asm
- \Assemble Driver Fender Bracket



Process Summary

Right First Time	99.84 %
Process Time (Sec)	37.98
Total Weight (kg)	0.01

Material Cost**	\$0.22
OEM Process Cost	\$0.96
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.15
Manufacturing Cost*	\$1.36



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Fender Bracket



Assemble Driver Fender Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	37.98	1	1.00	91.41	GER	\$0.96	99.84%	\$0.02

Assemble Driver Fender Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	2	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Label, BMW Vin Number Small	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Fender Installation

Process Summary

Right First Time	98.15 %
Process Time (Sec)	110.00
Total Weight (kg)	0.05

Material Cost**	\$0.18
OEM Process Cost	\$2.79
Supplier Process Cost	\$0.00
Q Burden	\$0.28
SG&A	\$0.42
Manufacturing Cost*	\$3.68



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Fender Installation



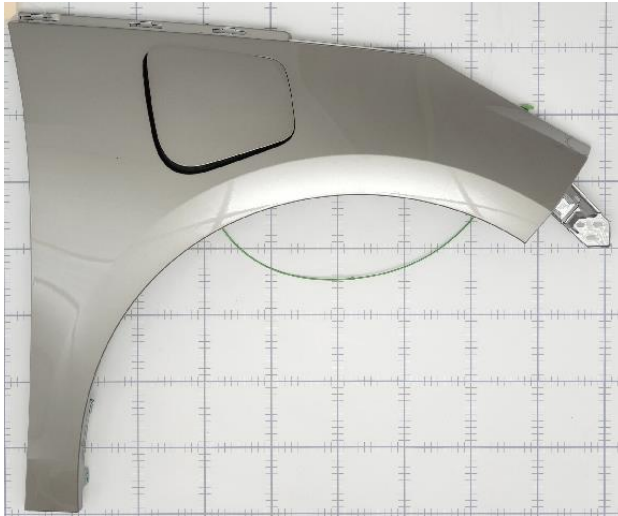
Driver Fender Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	110.00	1	1.00	91.41	GER	\$2.79	98.15%	\$0.28

Driver Fender Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x14mm-Hex SEMS Screw	9	Commodity Item	Purchased	0.0051	-	\$0.02	\$0.00

Passenger Fender Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Fender Asm

Assembly Summary

Parts	37
Fasteners	3
Part Numbers	30
Steps	181
Fastenings	34
Right First Time	98.11 %
OEM Process Time (Min)	21.65
Supplier Process Time (Min)	4.62
Total Weight (kg)	1.86

Material Cost**	\$18.80
OEM Process Cost	\$15.46
Supplier Process Cost	\$2.99
Q Burden	\$0.29
SG&A	\$4.58
Manufacturing Cost*	\$42.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Asm



MUNRO
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Passenger Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Fender Asm, Passenger Fender Asm	1	5	3	44	3	99.60 %	0.89	18.41	0.00	0.00	1.3000
Fuel Filler Door Asm, Passenger Fender Asm	1	24	22	112	22	98.79 %	1.13	0.00	1.91	2.64	0.5271
Assemble Fuel Filler Door To Fender	1	0	1	3	1	99.95 %	0.17	0.00	0.00	0.00	0.0000
Support Asm, Passenger Fender Asm	1	4	3	9	3	99.90 %	0.47	0.00	0.00	0.07	0.0264
Assemble Support Fender	1	4	5	10	5	99.86 %	0.58	0.00	0.00	0.00	0.0050

Passenger Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Fender Asm, Passenger Fender Asm	\$0.00	\$8.62	\$1.08	\$10.80	\$0.00	\$0.00	\$0.06	\$3.08	\$23.64
Fuel Filler Door Asm, Passenger Fender Asm	\$8.13	\$1.73	\$1.73	\$0.00	\$1.46	\$1.50	\$0.18	\$1.21	\$15.93
Assemble Fuel Filler Door To Fender	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.01	\$0.04	\$0.30
Support Asm, Passenger Fender Asm	\$0.03	\$0.07	\$0.71	\$0.00	\$0.00	\$0.03	\$0.02	\$0.12	\$0.98
Assemble Support Fender	\$0.22	\$0.00	\$0.89	\$0.00	\$0.00	\$0.00	\$0.02	\$0.14	\$1.27

Detailed Summary

Parts	37
Fasteners	3
Part Numbers	30
Steps	181
Fastenings	34
Right First Time	98.11%
OEM Asm. Time (Min)	3.24
OEM Fab. Time (Min)	18.41
Supplier Asm. Time (Min)	1.91
Supplier Fab. Time (Min)	2.71
Total Weight (kg)	1.86
Purchased Part Cost	
	\$8.38
Material Cost	
	\$10.42
OEM Asm. Cost	
	\$4.66
OEM Fab. Cost	
	\$10.80
Supplier Asm. Cost	
	\$1.46
Supplier Fab. Cost	
	\$1.53
Q Burden	
	\$0.29
SG&A	
	\$4.58
Manufacturing Cost*	
	\$42.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fender Asm, Passenger Fender Asm



- \...
 - \Exterior Trim
 - \Passenger Fender Asm
 - \Fender Asm, Passenger Fender Asm
- ## Assembly Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	44
Fastenings	3
Right First Time	99.60 %
OEM Process Time (Min)	19.30
Supplier Process Time (Min)	0.00
Total Weight (kg)	1.30

Material Cost**	\$8.62
OEM Process Cost	\$11.88
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.08
Manufacturing Cost*	\$23.64

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fender Asm, Passenger Fender Asm



Fender Asm, Passenger Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Outer Fender, Fender Asm	1	1	0	1	0	99.99 %	0.00	0.55	0.00	0.00	1.0980
Inner Fender, Fender Asm	1	1	0	1	0	99.99 %	0.00	0.41	0.00	0.00	0.1302
Assemble Pass Inner & Outer Fender	1	3	3	40	3	99.62 %	0.89	17.46	0.00	0.00	0.0718

Fender Asm, Passenger Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Outer Fender, Fender Asm	\$0.00	\$3.29	\$0.00	\$1.42	\$0.00	\$0.00	\$0.00	\$0.71	\$5.42
Inner Fender, Fender Asm	\$0.00	\$0.46	\$0.00	\$0.40	\$0.00	\$0.00	\$0.00	\$0.13	\$0.99
Assemble Pass Inner & Outer Fender	\$0.00	\$4.87	\$1.08	\$8.97	\$0.00	\$0.00	\$0.06	\$2.24	\$17.22

Detailed Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	44
Fastenings	3
Right First Time	99.6%
OEM Asm. Time (Min)	0.89
OEM Fab. Time (Min)	18.41
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	1.30
Purchased Part Cost	\$0.00
Material Cost	\$8.62
OEM Asm. Cost	\$1.08
OEM Fab. Cost	\$10.80
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.08
Manufacturing Cost*	\$23.64

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Fender, Fender Asm



\...

- \Fender Asm, Passenger Fender Asm
- \Outer Fender, Fender Asm
- \Outer Fender Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	32.80
Total Weight (kg)	1.10

Material Cost**	\$3.29
OEM Process Cost	\$1.42
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.71
Manufacturing Cost*	\$5.42



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Fender, Fender Asm



Outer Fender Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	32.80	1	0.25	156.30	GER	\$1.42	99.99%	\$0.00

Outer Fender Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Fender	1	PP/EPDM TD30	\$3.00	1.0980	1.0980	\$0.00	\$3.29

Inner Fender, Fender Asm



\...

- \Fender Asm, Passenger Fender Asm
- \Inner Fender, Fender Asm
- \Inner Fender Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	24.40
Total Weight (kg)	0.13

Material Cost**	\$0.46
OEM Process Cost	\$0.40
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.99



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Fender, Fender Asm



Inner Fender Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	48.80	2	0.25	59.39	GER	\$0.40	99.99%	\$0.00

Inner Fender Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Fender	1	PP/EPDM TD30	\$3.00	0.1302	0.1396	\$0.00	\$0.46

No Commodity Items Required for This Process



\...

- \Passenger Fender Asm
- \Fender Asm, Passenger Fender Asm
- \Assemble Passenger Inner & Outer Fender

Process Summary

Right First Time	99.62 %
Process Time (Sec)	1101.01
Total Weight (kg)	0.07
Material Cost**	\$4.87
OEM Process Cost	\$10.06
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$2.24
Manufacturing Cost*	\$17.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Inner & Outer Fender



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& ASSOCIATES, INC.

Assemble Pass Inner & Outer Fender

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	486.00	1	0.25	27.19	GER	\$3.67	99.97 %	\$0.01
Apply Base Coat	22.84	1	0.25	103.43	GER	\$0.66	99.94 %	\$0.01
OEM CO2 Cleaning Line	13.92	1	0.25	51.85	GER	\$0.20	99.99 %	\$0.00
Hand Sanding	20.85	1	1.00	91.41	GER	\$0.53	99.96 %	\$0.01
Cure Paint	486.00	1	0.25	27.19	GER	\$3.67	99.97 %	\$0.01
Apply Base Coat	22.84	1	0.25	103.43	GER	\$0.66	99.94 %	\$0.01
OEM Plasma Surface Treatment Line	13.92	1	0.25	49.58	GER	\$0.19	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Adhesive Bead Station Auto	18.64	1	0.25	69.43	GER	\$0.36	99.91 %	\$0.01

Assemble Pass Inner & Outer Fender

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.79
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.79
Adhesive, Passenger Fender	1	Structural Adhesive - Polymer	\$17.94	0.0718	0.0718	\$0.00	\$1.29

Fuel Filler Door Asm, Passenger Fender Asm



- \...
 - \Exterior Trim
 - \Passenger Fender Asm
 - \Fuel Filler Door Asm, Passenger Fender Asm
- ## Assembly Summary

Parts	24
Fasteners	0
Part Numbers	22
Steps	112
Fastenings	22
Right First Time	98.79 %
OEM Process Time (Min)	1.13
Supplier Process Time (Min)	4.55
Total Weight (kg)	0.53

Material Cost**	\$9.86
OEM Process Cost	\$1.73
Supplier Process Cost	\$2.96
Q Burden	\$0.18
SG&A	\$1.21
Manufacturing Cost*	\$15.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fuel Filler Door Asm, Passenger Fender Asm



Fuel Filler Door Asm, Passenger Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Filler Door Asm, Fuel Filler Door Asm	1	11	5	60	5	99.43 %	0.27	0.00	1.01	2.41	0.4086
Assemble Spring Fuel Filler Door	1	1	2	4	2	99.95 %	0.00	0.00	0.20	0.00	0.0026
Solenoid Asm, Fuel Filler Door Asm	1	7	5	18	5	99.76 %	0.00	0.00	0.52	0.14	0.0893
Cap, Fuel Filler Door	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0011
Assemble Solenoid	1	2	8	14	8	99.80 %	0.67	0.00	0.00	0.00	0.0196
Emergency Tether Asm, Fuel Filler Door Asm	1	2	1	7	1	99.93 %	0.00	0.00	0.18	0.07	0.0059
Assemble Emergency Tether to Fuel Filler Door Asm	1	0	1	4	1	99.94 %	0.20	0.00	0.00	0.00	0.0000

Fuel Filler Door Asm, Passenger Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Filler Door Asm, Fuel Filler Door Asm	\$0.20	\$1.64	\$0.41	\$0.00	\$0.86	\$1.39	\$0.09	\$0.65	\$5.24
Assemble Spring Fuel Filler Door	\$0.04	\$0.00	\$0.00	\$0.00	\$0.18	\$0.00	\$0.01	\$0.03	\$0.26
Solenoid Asm, Fuel Filler Door Asm	\$5.64	\$0.05	\$0.00	\$0.00	\$0.28	\$0.07	\$0.04	\$0.23	\$6.30
Cap, Fuel Filler Door	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Solenoid	\$2.25	\$0.00	\$1.02	\$0.00	\$0.00	\$0.00	\$0.03	\$0.22	\$3.52
Emergency Tether Asm, Fuel Filler Door Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.14	\$0.03	\$0.01	\$0.03	\$0.23
Assemble Emergency Tether to Fuel Filler Door Asm	\$0.00	\$0.00	\$0.30	\$0.00	\$0.00	\$0.00	\$0.01	\$0.05	\$0.36

Detailed Summary

Parts	24
Fasteners	0
Part Numbers	22
Steps	112
Fastenings	22
Right First Time	98.79%
OEM Asm. Time (Min)	1.13
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.91
Supplier Fab. Time (Min)	2.64
Total Weight (kg)	0.53
Purchased Part Cost	\$8.13
Material Cost	\$1.73
OEM Asm. Cost	\$1.73
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$1.46
Supplier Fab. Cost	\$1.50
Q Burden	\$0.18
SG&A	\$1.21
Manufacturing Cost*	\$15.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Filler Door Asm, Fuel Filler Door Asm



- \...
 - \Passenger Fender Asm
 - \Fuel Filler Door Asm, Passenger Fender Asm
 - \Filler Door Asm, Fuel Filler Door Asm
- ## Assembly Summary

Parts	11
Fasteners	0
Part Numbers	10
Steps	60
Fastenings	5
Right First Time	99.43 %
OEM Process Time (Min)	0.27
Supplier Process Time (Min)	3.41
Total Weight (kg)	0.41

Material Cost**	\$1.84
OEM Process Cost	\$0.41
Supplier Process Cost	\$2.25
Q Burden	\$0.09
SG&A	\$0.65
Manufacturing Cost*	\$5.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Filler Door Asm, Fuel Filler Door Asm



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Filler Door Asm, Fuel Filler Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Fuel Filler Door Asm	1	3	0	3	0	99.97 %	0.00	0.00	0.00	0.44	0.1440
Filler Door Asm, Fuel Filler Door Asm	1	7	4	49	4	99.55 %	0.00	0.00	1.01	1.93	0.2602
Fuel Filler DoorHinge Pin, Fuel Filler Door Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0044
Assemble Fuel Filler Door Asm	1	0	1	4	1	99.92 %	0.27	0.00	0.00	0.00	0.0000

Filler Door Asm, Fuel Filler Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Fuel Filler Door Asm	\$0.00	\$0.43	\$0.00	\$0.00	\$0.00	\$0.42	\$0.00	\$0.13	\$0.98
Filler Door Asm, Fuel Filler Door Asm	\$0.20	\$1.19	\$0.00	\$0.00	\$0.86	\$0.96	\$0.07	\$0.46	\$3.74
Fuel Filler DoorHinge Pin, Fuel Filler Door Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Fuel Filler Door Asm	\$0.00	\$0.00	\$0.41	\$0.00	\$0.00	\$0.00	\$0.01	\$0.06	\$0.48

Detailed Summary

Parts	11
Fasteners	0
Part Numbers	10
Steps	60
Fastenings	5
Right First Time	99.43%
OEM Asm. Time (Min)	0.27
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.01
Supplier Fab. Time (Min)	2.41
Total Weight (kg)	0.41
Purchased Part Cost	\$0.20
Material Cost	\$1.64
OEM Asm. Cost	\$0.41
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.86
Supplier Fab. Cost	\$1.39
Q Burden	\$0.09
SG&A	\$0.65
Manufacturing Cost*	\$5.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Fuel Filler Door Asm



- \...
- \Filler Door Asm, Fuel Filler Door Asm
- \Housing, Fuel Filler Door Asm
- \Housing Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	26.65
Total Weight (kg)	0.14

Material Cost**	\$0.43
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.42
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.98

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Fuel Filler Door Asm



Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	53.30	2	0.25	56.23	GER	\$0.42	99.97%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Housing	1	PP GF20	\$2.78	0.1108	0.1191	\$0.00	\$0.33
Material 2, Housing	1	NBR	\$2.80	0.0204	0.0204	\$0.00	\$0.06
Material 3, Housing	1	NBR	\$2.80	0.0128	0.0128	\$0.00	\$0.04

Filler Door Asm, Fuel Filler Door Asm



- \...
 - \Fuel Filler Door Asm, Passenger Fender Asm
 - \Filler Door Asm, Fuel Filler Door Asm
 - \Filler Door Asm, Fuel Filler Door Asm
- ## Assembly Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	49
Fastenings	4
Right First Time	99.55 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.93
Total Weight (kg)	0.26

Material Cost**	\$1.39
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.82
Q Burden	\$0.07
SG&A	\$0.46
Manufacturing Cost*	\$3.74

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Filler Door Asm, Fuel Filler Door Asm



Filler Door Asm, Fuel Filler Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Outer Substrate, Filler Door Asm	1	4	1	31	1	99.70 %	0.00	0.00	0.36	1.78	0.1401
Inner Substrate Asm, Filler Door Asm	1	2	1	10	1	99.95 %	0.00	0.00	0.35	0.14	0.1200
Assemble Fuel Filler Door Asm	1	1	2	6	2	99.91 %	0.00	0.00	0.30	0.00	0.0001

Filler Door Asm, Fuel Filler Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Outer Substrate, Filler Door Asm	\$0.05	\$0.70	\$0.00	\$0.00	\$0.32	\$0.89	\$0.05	\$0.29	\$2.29
Inner Substrate Asm, Filler Door Asm	\$0.05	\$0.49	\$0.00	\$0.00	\$0.27	\$0.07	\$0.01	\$0.13	\$1.02
Assemble Fuel Filler Door Asm	\$0.10	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.01	\$0.04	\$0.43

Detailed Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	49
Fastenings	4
Right First Time	99.55%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.01
Supplier Fab. Time (Min)	1.93
Total Weight (kg)	0.26
Purchased Part Cost	\$0.20
Material Cost	\$1.19
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.86
Supplier Fab. Cost	\$0.96
Q Burden	\$0.07
SG&A	\$0.46
Manufacturing Cost*	\$3.74

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Substrate, Filler Door Asm



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- \Filler Door Asm, Fuel Filler Door Asm
- \Outer Substrate, Filler Door Asm
- \Outer Substrate Process

Process Summary

Right First Time	99.70 %
Process Time (Sec)	128.42
Total Weight (kg)	0.14

Material Cost**	\$0.75
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.21
Q Burden	\$0.05
SG&A	\$0.29
Manufacturing Cost*	\$2.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Substrate, Filler Door Asm



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Outer Substrate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	33.63	1	0.25	17.08	GER	\$0.16	99.97 %	\$0.01
Apply Base Coat	5.56	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Supplier Manual Asm	13.50	1	1.00	54.32	GER	\$0.20	99.96 %	\$0.01
Supplier CO2 Cleaning Station	5.56	1	0.25	44.69	GER	\$0.07	99.99 %	\$0.00
Supplier Hand Sanding Station	7.93	1	1.00	54.32	GER	\$0.12	99.94 %	\$0.01
Cure Paint	33.63	1	0.25	17.08	GER	\$0.16	99.97 %	\$0.01
Apply Base Coat	5.56	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Supplier Plasma Treating Station	5.56	1	0.25	146.20	GER	\$0.23	99.98 %	\$0.00
Wash	9.00	1	0.25	20.00	GER	\$0.05	99.99 %	\$0.00
300 Ton Injection Molding Press	33.96	4	0.25	39.50	GER	\$0.09	99.99 %	\$0.00

Outer Substrate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.11
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.11
Material, Outer Substrate	1	PC+PET	\$3.45	0.1400	0.1400	\$0.00	\$0.48

Inner Substrate Asm, Filler Door Asm



- \...
- \Filler Door Asm, Fuel Filler Door Asm
- \Filler Door Asm, Fuel Filler Door Asm
- \Inner Substrate Asm, Filler Door Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	10
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.49
Total Weight (kg)	0.12

Material Cost**	\$0.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.34
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$1.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Substrate Asm, Filler Door Asm



Inner Substrate Asm, Filler Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Inner Substrate, Inner Substrate Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.14	0.1184
Assemble Inner Substrate	1	1	1	8	1	99.96 %	0.00	0.00	0.35	0.00	0.0016

Inner Substrate Asm, Filler Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Inner Substrate, Inner Substrate Asm	\$0.00	\$0.49	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.08	\$0.65
Assemble Inner Substrate	\$0.05	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.01	\$0.04	\$0.37

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	10
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.35
Supplier Fab. Time (Min)	0.14
Total Weight (kg)	0.12
<hr/>	
Purchased Part Cost	\$0.05
Material Cost	\$0.49
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.27
Supplier Fab. Cost	\$0.07
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$1.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Inner Substrate Asm, Filler Door Asm
- \Inner Substrate, Inner Substrate Asm
- \Inner Substrate Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.65
Total Weight (kg)	0.12

Material Cost**	\$0.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Substrate, Inner Substrate Asm



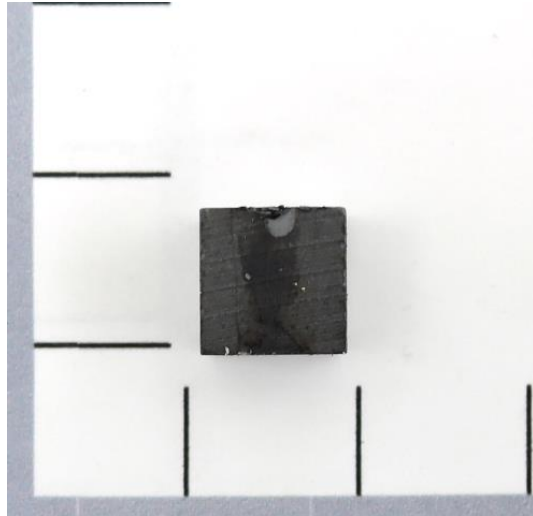
Inner Substrate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	17.30	2	0.25	30.85	GER	\$0.07	99.99%	\$0.00

Inner Substrate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Substrate	1	PA6 GF30	\$4.10	0.1184	0.1184	\$0.00	\$0.49

Assemble Inner Substrate



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- \Filler Door Asm, Fuel Filler Door Asm
- \Inner Substrate Asm, Filler Door Asm
- \Assemble Inner Substrate

Process Summary

Right First Time	99.96 %
Process Time (Sec)	21.00
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Inner Substrate



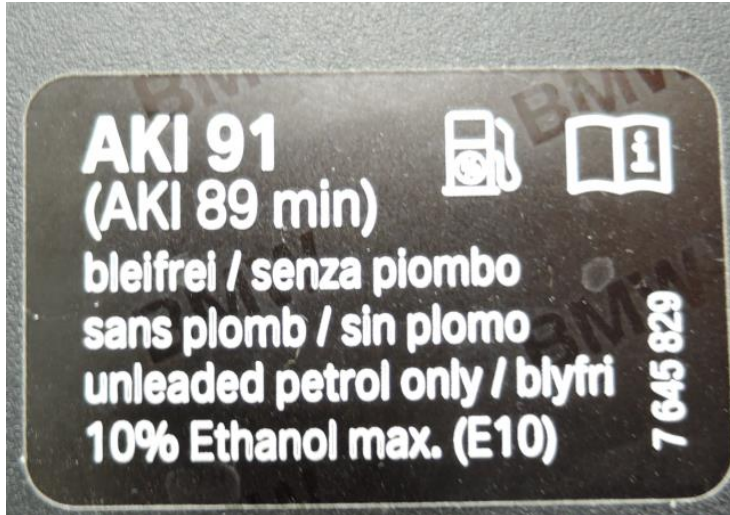
Assemble Inner Substrate

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	15.00	1	1.00	54.32	GER	\$0.23	99.98 %	\$0.00
Supplier Automated Asm	6.00	1	0.25	25.62	GER	\$0.04	99.98 %	\$0.00

Assemble Inner Substrate

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Magnet	1	Commodity Item	Purchased	0.0016	-	\$0.05	\$0.00

Assemble Fuel Filler Door Asm



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- \Filler Door Asm, Fuel Filler Door Asm
- \Filler Door Asm, Fuel Filler Door Asm
- \Assemble Fuel Filler Door Asm

Process Summary

Right First Time	99.91 %
Process Time (Sec)	18.00
Total Weight (kg)	0.00

Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.43

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fuel Filler Door Asm



Assemble Fuel Filler Door Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	18.00	1	1.00	54.32	GER	\$0.27	99.91 %	\$0.01

Assemble Fuel Filler Door Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Fuel Warning	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00

Fuel Filler Door Hinge Pin, Fuel Filler Door Asm



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- \Filler Door Asm, Fuel Filler Door Asm
- \Fuel Filler Door Hinge Pin, Fuel Filler Door Asm
- \Fuel Filler Door Hinge Pin Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.05
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fuel Filler Door Hinge Pin, Fuel Filler Door Asm



Fuel Filler Door Hinge Pin Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.40	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Fuel Filler Door Hinge Pin Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Fuel Filler Door Hinge Pin	1	PA6 GF30	\$4.10	0.0044	0.0044	\$0.00	\$0.02

Assemble Fuel Filler Door Asm



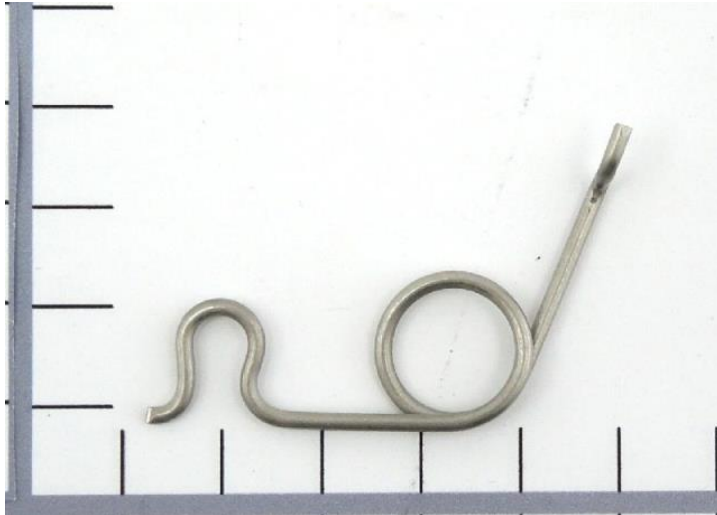
Assemble Fuel Filler Door Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	16.00	1	1.00	91.41	GER	\$0.41	99.92 %	\$0.01

Assemble Fuel Filler Door Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Spring Fuel Filler Door



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- \Passenger Fender Asm
- \Fuel Filler Door Asm, Passenger Fender Asm
- \Assemble Spring Fuel Filler Door

Process Summary

Right First Time	99.95 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.18
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.26

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Spring Fuel Filler Door



Assemble Spring Fuel Filler Door

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	12.00	1	1.00	54.32	GER	\$0.18	99.95%	\$0.01

Assemble Spring Fuel Filler Door

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Spring, Fuel Filler Door	1	Commodity Item	Purchased	0.0026	-	\$0.04	\$0.00

Solenoid Asm, Fuel Filler Door Asm



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- \Passenger Fender Asm
- \Fuel Filler Door Asm, Passenger Fender Asm
- \Solenoid Asm, Fuel Filler Door Asm

Assembly Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	18
Fastenings	5
Right First Time	99.76 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.65
Total Weight (kg)	0.09

Material Cost**	\$5.69
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.04
SG&A	\$0.23
Manufacturing Cost*	\$6.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Solenoid Asm, Fuel Filler Door Asm



Solenoid Asm, Fuel Filler Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Connector, Solenoid Asm	1	3	0	5	0	99.98 %	0.00	0.00	0.00	0.07	0.0031
Assemble Connector Fuel Filler Door Solenoid	1	2	2	5	2	99.87 %	0.00	0.00	0.30	0.00	0.0759
Arm, Solenoid Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0087
Assemble Arm Solenoid	1	1	3	5	3	99.93 %	0.00	0.00	0.22	0.00	0.0016

Solenoid Asm, Fuel Filler Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Connector, Solenoid Asm	\$0.10	\$0.01	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.16
Assemble Connector Fuel Filler Door Solenoid	\$5.52	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.02	\$0.18	\$5.84
Arm, Solenoid Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.08
Assemble Arm Solenoid	\$0.02	\$0.00	\$0.00	\$0.00	\$0.16	\$0.00	\$0.01	\$0.02	\$0.22

Detailed Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	18
Fastenings	5
Right First Time	99.76%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.52
Supplier Fab. Time (Min)	0.14
Total Weight (kg)	0.09
Purchased Part Cost	
	\$5.64
Material Cost	
	\$0.05
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.28
Supplier Fab. Cost	
	\$0.07
Q Burden	
	\$0.04
SG&A	
	\$0.23
Manufacturing Cost*	
	\$6.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...
 \Solenoid Asm, Fuel Filler Door Asm
 \Connector, Solenoid Asm
 \Connector Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	4.09
Total Weight (kg)	0.00

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Connector, Solenoid Asm



Connector Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	32.72	8	0.25	32.44	GER	\$0.04	99.98 %	\$0.00

Connector Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Connector Pins	2	Commodity Item	Purchased	0.0002	-	\$0.05	\$0.00
Material, Connector	1	PP	\$2.38	0.0027	0.0029	\$0.00	\$0.01

Assemble Connector Fuel Filler Door Solenoid



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- \Fuel Filler Door Asm, Passenger Fender Asm
- \Solenoid Asm, Fuel Filler Door Asm
- \Assemble Connector Fuel Filler Door Solenoid

Process Summary

Right First Time	99.87 %
Process Time (Sec)	18.00
Total Weight (kg)	0.08

Material Cost**	\$5.52
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.02
SG&A	\$0.18
Manufacturing Cost*	\$5.84

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Connector Fuel Filler Door Solenoid



Assemble Connector Fuel Filler Door Solenoid

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	18.00	1	0.25	23.36	ESP	\$0.12	99.87%	\$0.02

Assemble Connector Fuel Filler Door Solenoid

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Solenoid, Fuel Filler Arm	1	Commodity Item	Purchased	0.0748	-	\$5.50	\$0.00
Dust Cover, Solenoid	1	Commodity Item	Purchased	0.0011	-	\$0.02	\$0.00

Arm, Solenoid Asm



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\Solenoid Asm, Fuel Filler Door Asm

\Arm, Solenoid Asm

\Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.04
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Arm, Solenoid Asm

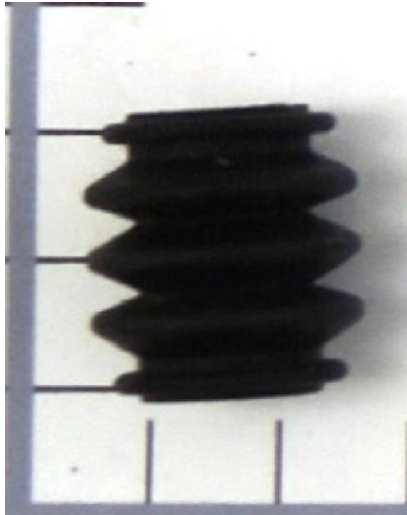
Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	16.16	4	0.25	27.82	GER	\$0.03	99.99%	\$0.00

Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Arm	1	PA6	\$4.39	0.0087	0.0087	\$0.00	\$0.04

Assemble Arm Solenoid



\...

- \Fuel Filler Door Asm, Passenger Fender Asm
- \Solenoid Asm, Fuel Filler Door Asm
- \Assemble Arm Solenoid

Process Summary

Right First Time	99.93 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Arm Solenoid



Assemble Arm Solenoid

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	13.00	1	1.00	45.01	ESP	\$0.16	99.93%	\$0.01

Assemble Arm Solenoid

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Dust Cover, Solenoid Arm Pin	1	Commodity Item	Purchased	0.0016	-	\$0.02	\$0.00

Cap, Fuel Filler Door



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\Fuel Filler Door Asm, Passenger Fender Asm

\Cap, Fuel Filler Door

\Cap Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.78
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Fuel Filler Door



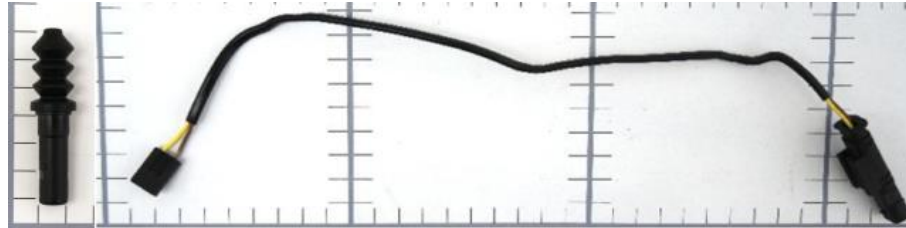
Cap Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.24	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Cap Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Cap	1	NBR	\$2.80	0.0011	0.0011	\$0.00	\$0.01

Assemble Solenoid



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\Passenger Fender Asm

\Fuel Filler Door Asm, Passenger Fender Asm

\Assemble Solenoid

Process Summary

Right First Time	99.80 %
Process Time (Sec)	40.00
Total Weight (kg)	0.02

Material Cost**	\$2.25
OEM Process Cost	\$1.02
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.22
Manufacturing Cost*	\$3.52

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Solenoid

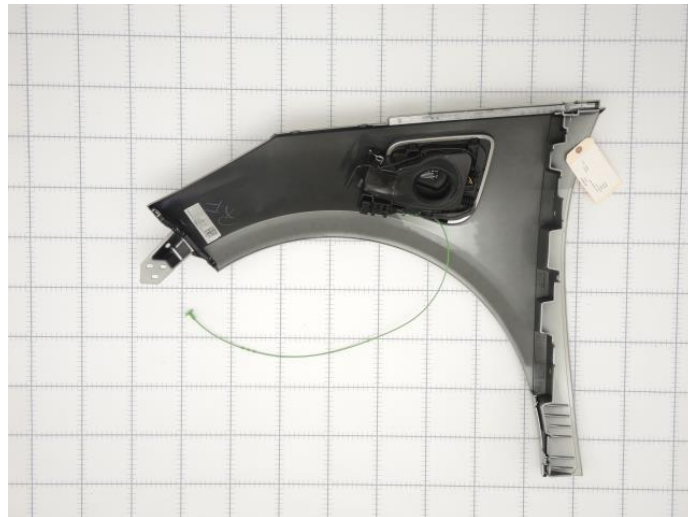
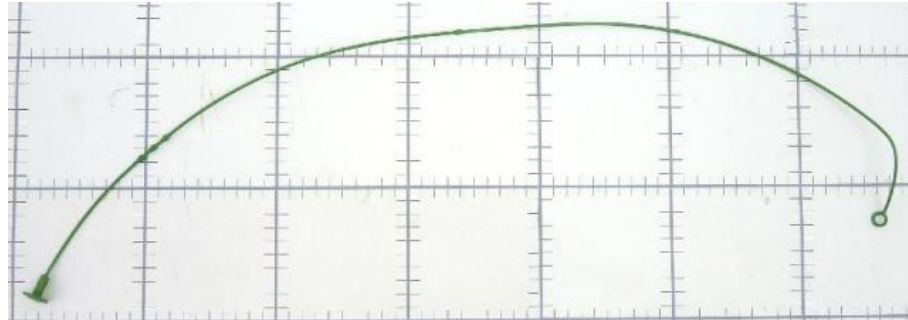
Assemble Solenoid

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	40.00	1	1.00	91.41	GER	\$1.02	99.80%	\$0.03

Assemble Solenoid

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
2-Stage Plunger, Fuel Filler Door	1	Commodity Item	Purchased	0.0060	-	\$0.05	\$0.00
Sensor, Fuel Filler Door	1	Commodity Item	Purchased	0.0136	-	\$2.20	\$0.00

Emergency Tether Asm, Fuel Filler Door Asm



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\Passenger Fender Asm

\Fuel Filler Door Asm, Passenger Fender Asm

\Emergency Tether Asm, Fuel Filler Door Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	7
Fastenings	1
Right First Time	99.93 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.25
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.17
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Emergency Tether Asm, Fuel Filler Door Asm



Emergency Tether Asm, Fuel Filler Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Handle, Emergency Tether Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0013
Tether, Emergency Tether Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0046
Assemble Fuel Door Emergency Tether	1	0	1	3	1	99.95 %	0.00	0.00	0.18	0.00	0.0000

Emergency Tether Asm, Fuel Filler Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Handle, Emergency Tether Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Tether, Emergency Tether Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Fuel Door Emergency Tether	\$0.00	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.01	\$0.02	\$0.17

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	7
Fastenings	1
Right First Time	99.93%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.18
Supplier Fab. Time (Min)	0.07
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.00
Material Cost	
	\$0.03
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.14
Supplier Fab. Cost	
	\$0.03
Q Burden	
	\$0.01
SG&A	
	\$0.03
Manufacturing Cost*	
	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Handle, Emergency Tether Asm



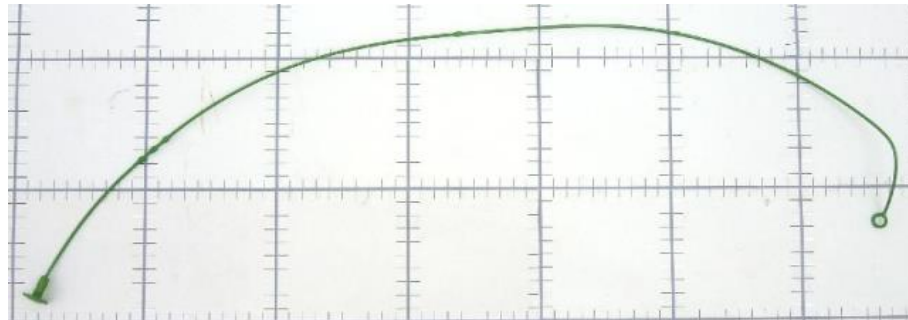
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- \Emergency Tether Asm, Fuel Filler Door Asm
- \Handle, Emergency Tether Asm
- \Handle Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.08
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Handle, Emergency Tether Asm

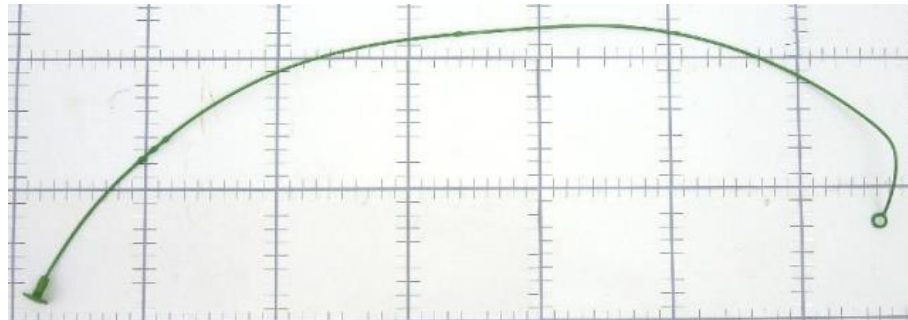
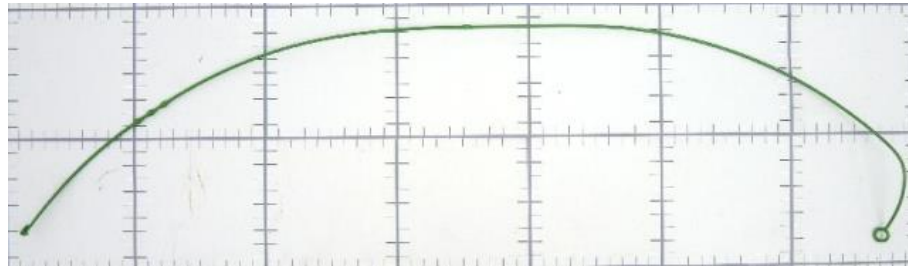
Handle Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.64	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Handle Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Handle	1	PA66+PE	\$3.30	0.0013	0.0014	\$0.00	\$0.01

Tether, Emergency Tether Asm



\...

- \Emergency Tether Asm, Fuel Filler Door Asm
- \Tether, Emergency Tether Asm
- \Tether Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.10
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tether, Emergency Tether Asm

Tether Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.80	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tether Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tether	1	PA66+PE	\$3.30	0.0046	0.0049	\$0.00	\$0.02

No Commodity Items Required for This Process



\...

- \Fuel Filler Door Asm, Passenger Fender Asm
- \Emergency Tether Asm, Fuel Filler Door Asm
- \Assemble Fuel Door Emergency Tether

Process Summary

Right First Time	99.95 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fuel Door Emergency Tether



Assemble Fuel Door Emergency Tether

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	11.00	1	1.00	45.01	ESP	\$0.14	99.95%	\$0.01

Assemble Fuel Door Emergency Tether

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...

\Passenger Fender Asm

\Fuel Filler Door Asm, Passenger Fender Asm

\Assemble Emergency Tether to Fuel Filler Door Asm

Process Summary

Right First Time	99.94 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.30
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.36

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Emergency Tether to Fuel Filler Door Asm



Assemble Emergency Tether to Fuel Filler Door Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	12.00	1	1.00	91.41	GER	\$0.30	99.94 %	\$0.01

Assemble Emergency Tether to Fuel Filler Door Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...
\Exterior Trim
\Passenger Fender Asm
\Assemble Fuel Filler Door To Fender

Process Summary

Right First Time	99.95 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.25
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fuel Filler Door To Fender



Assemble Fuel Filler Door To Fender

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	10.00	1	1.00	91.41	GER	\$0.25	99.95%	\$0.01

Assemble Fuel Filler Door To Fender

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Support Asm, Passenger Fender Asm



\...
 \Exterior Trim
 \Passenger Fender Asm
 \Support Asm, Passenger Fender Asm
Assembly Summary

Parts	4
Fasteners	1
Part Numbers	3
Steps	9
Fastenings	3
Right First Time	99.90 %
OEM Process Time (Min)	0.47
Supplier Process Time (Min)	0.07
Total Weight (kg)	0.03

Material Cost**	\$0.10
OEM Process Cost	\$0.71
Supplier Process Cost	\$0.03
Q Burden	\$0.02
SG&A	\$0.12
Manufacturing Cost*	\$0.98

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support Asm, Passenger Fender Asm



Support Asm, Passenger Fender Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Support, Support Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0234
Assemble Support	1	3	3	7	3	99.91 %	0.47	0.00	0.00	0.00	0.0030

Support Asm, Passenger Fender Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Support, Support Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.02	\$0.12
Assemble Support	\$0.03	\$0.00	\$0.71	\$0.00	\$0.00	\$0.00	\$0.01	\$0.11	\$0.86

Detailed Summary

Parts	4
Fasteners	1
Part Numbers	3
Steps	9
Fastenings	3
Right First Time	99.9%
OEM Asm. Time (Min)	0.47
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.07
Total Weight (kg)	0.03
Purchased Part Cost	
	\$0.03
Material Cost	
	\$0.07
OEM Asm. Cost	
	\$0.71
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.03
Q Burden	
	\$0.02
SG&A	
	\$0.12
Manufacturing Cost*	
	\$0.98

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support, Support Asm



\...
\Support Asm, Passenger Fender Asm
\Support, Support Asm
\Support Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.36
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support, Support Asm

Support Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	17.44	4	0.25	26.65	GER	\$0.03	99.99%	\$0.00

Support Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Support	1	ABS	\$2.60	0.0234	0.0234	\$0.00	\$0.07



- \...
- \Passenger Fender Asm
- \Support Asm, Passenger Fender Asm
- \Assemble Support

Process Summary

Right First Time	99.91 %
Process Time (Sec)	28.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.71
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.11
Manufacturing Cost*	\$0.86

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Support



Assemble Support

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	28.00	1	1.00	91.41	GER	\$0.71	99.91 %	\$0.01

Assemble Support

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	1	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
Double Sided Tape, 40 x 10	2	Commodity Item	Purchased	0.0003	-	\$0.01	\$0.00

Assemble Support Fender

- \...
- \Exterior Trim
- \Passenger Fender Asm
- \Assemble Support Fender



Process Summary

Right First Time	99.86 %
Process Time (Sec)	34.98
Total Weight (kg)	0.01

Material Cost**	\$0.22
OEM Process Cost	\$0.89
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.14
Manufacturing Cost*	\$1.27



* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Assemble Support Fender



Assemble Support Fender

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	34.98	1	1.00	91.41	GER	\$0.89	99.86%	\$0.02

Assemble Support Fender

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	2	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Label, BMW Vin Number Small	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00

Passenger Fender Installation



\...

- \Zone 2 Exterior
- \Exterior Trim
- \Passenger Fender Installation

Process Summary

Right First Time	97.96 %
Process Time (Sec)	148.50
Total Weight (kg)	0.05

Material Cost**	\$0.18
OEM Process Cost	\$3.77
Supplier Process Cost	\$0.00
Q Burden	\$0.31
SG&A	\$0.57
Manufacturing Cost*	\$4.83



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Installation



Passenger Fender Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	148.50	1	1.00	91.41	GER	\$3.77	97.96%	\$0.31

Passenger Fender Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x14mm-Hex SEMS Screw	9	Commodity Item	Purchased	0.0051	-	\$0.02	\$0.00



\...

- \Exterior Trim
- \Driver Fender Rear Reinforcement
- \Driver Fender Rear Reinforcement Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.71
Total Weight (kg)	0.31
Material Cost**	\$1.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.00
SG&A	\$0.19
Manufacturing Cost*	\$1.47

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Fender Rear Reinforcement



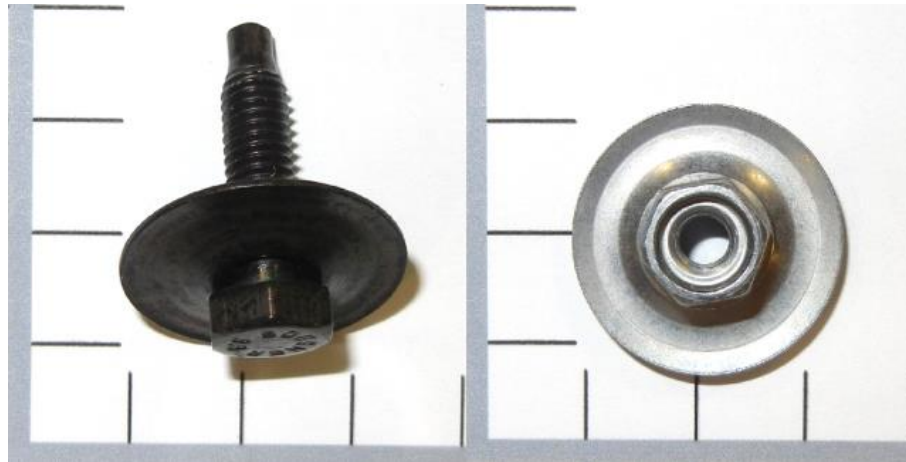
Driver Fender Rear Reinforcement Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	27.42	2	0.25	39.50	GER	\$0.15	99.99%	\$0.00

Driver Fender Rear Reinforcement Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Driver Fender Rear Reinforcement	1	ABS + PC	\$3.40	0.3100	0.3100	\$0.00	\$1.13

Driver Fender Rear Reinforcement Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Driver Fender Rear Reinforcement Installation

Process Summary

Right First Time	99.16 %
Process Time (Sec)	44.00
Total Weight (kg)	0.03

Material Cost**	\$0.11
OEM Process Cost	\$1.12
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.17
Manufacturing Cost*	\$1.52



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Fender Rear Reinforcement Installation



Driver Fender Rear Reinforcement Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	44.00	1	1.00	91.41	GER	\$1.12	99.16%	\$0.13

Driver Fender Rear Reinforcement Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x22mm-Hex SEMS Bolt	3	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00



- \...
- \Exterior Trim
- \Passenger Fender Rear Reinforcement
- \Passenger Fender Rear Reinforcement Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.71
Total Weight (kg)	0.31
Material Cost**	\$1.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.00
SG&A	\$0.19
Manufacturing Cost*	\$1.47

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Rear Reinforcement



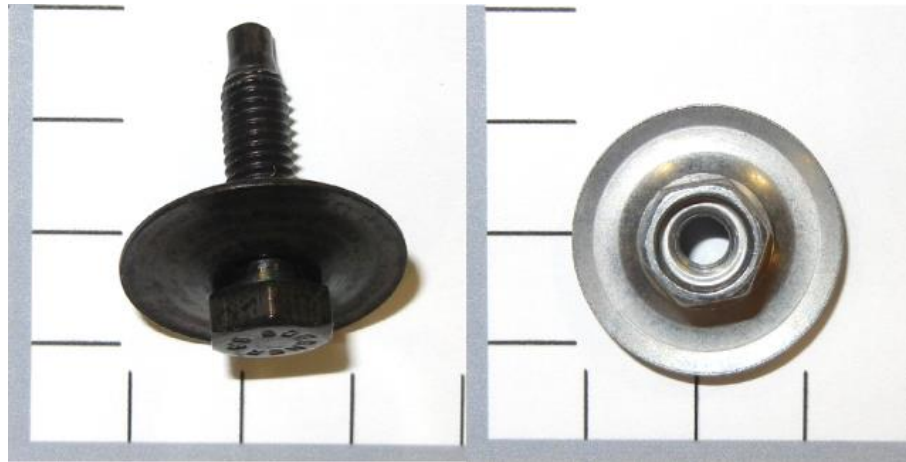
Passenger Fender Rear Reinforcement Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	27.42	2	0.25	39.50	GER	\$0.15	99.99%	\$0.00

Passenger Fender Rear Reinforcement Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Passenger Fender Rear Reinforcement	1	ABS + PC	\$3.40	0.3100	0.3100	\$0.00	\$1.13

Passenger Fender Rear Reinforcement Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Fender Rear Reinforcement Installation

Process Summary

Right First Time	99.16 %
Process Time (Sec)	44.00
Total Weight (kg)	0.03

Material Cost**	\$0.11
OEM Process Cost	\$1.12
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.17
Manufacturing Cost*	\$1.52



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Fender Rear Reinforcement Installation



Passenger Fender Rear Reinforcement Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	44.00	1	1.00	91.41	GER	\$1.12	99.16%	\$0.13

Passenger Fender Rear Reinforcement Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x22mm-Hex SEMS Bolt	3	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00

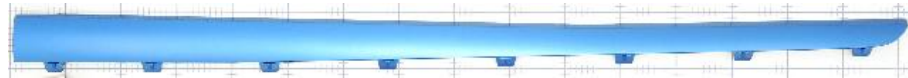
Driver Door Sill Accent Trim

\...

\Exterior Trim

\Driver Door Sill Accent Trim

\Driver Door Sill Accent Trim Process



Process Summary

Right First Time	99.68 %
Process Time (Sec)	270.59
Total Weight (kg)	0.38

Material Cost**	\$1.92
OEM Process Cost	\$4.16
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$0.90
Manufacturing Cost*	\$7.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Door Sill Accent Trim



MUNRO
& ASSOCIATES, INC.

Driver Door Sill Accent Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	37.13	1	1.00	91.41	GER	\$0.94	99.96 %	\$0.01
Cure Paint	39.33	1	0.25	23.29	GER	\$0.25	99.97 %	\$0.01
Apply Base Coat	18.72	1	0.25	48.78	GER	\$0.25	99.97 %	\$0.01
OEM CO2 Cleaning Line	18.72	1	0.25	51.85	GER	\$0.27	99.99 %	\$0.00
Hand Sanding	29.85	1	1.00	91.41	GER	\$0.76	99.96 %	\$0.01
Cure Paint	39.33	1	0.25	23.29	GER	\$0.25	99.97 %	\$0.01
Apply Base Coat	18.72	1	0.25	48.78	GER	\$0.25	99.97 %	\$0.01
OEM Plasma Surface Treatment Line	18.72	1	0.25	49.58	GER	\$0.26	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Manual Asm	19.00	1	1.00	91.41	GER	\$0.48	99.98 %	\$0.00
610 Ton Injection Molding Press	30.14	2	0.25	74.97	GER	\$0.31	99.99 %	\$0.00

Driver Door Sill Accent Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost	
Label, BMW Internal	1	Commodity Item		Purchased	0.0001	-	\$0.10	\$0.00
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00	\$0.34
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00	\$0.34
Material, Driver Door Sill Trim	1	PP/EPDM TD30	\$3.00	0.3800	0.3800	\$0.00	\$1.14	

No Commodity Items
Required for This
Process



\...
\Zone 2 Exterior
\Exterior Trim
\Driver Door Sill Accent Trim Installation

Process Summary

Right First Time	99.90 %
Process Time (Sec)	17.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.43
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.06
Manufacturing Cost*	\$0.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Door Sill Accent Trim Installation



MUNRO
& ASSOCIATES, INC.

Driver Door Sill Accent Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	17.00	1	1.00	91.41	GER	\$0.43	99.90%	\$0.02

Driver Door Sill Accent Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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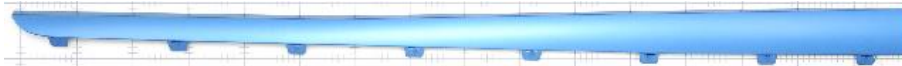
Passenger Door Sill Accent Trim

\...

\Exterior Trim

\Passenger Door Sill Accent Trim

\Passenger Door Sill Accent Trim Process



Process Summary

Right First Time	99.68 %
Process Time (Sec)	270.59
Total Weight (kg)	0.38

Material Cost**	\$1.92
OEM Process Cost	\$4.16
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$0.90
Manufacturing Cost*	\$7.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Door Sill Accent Trim



MUNRO
& ASSOCIATES, INC.

Passenger Door Sill Accent Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	37.13	1	1.00	91.41	GER	\$0.94	99.96 %	\$0.01
Cure Paint	39.33	1	0.25	23.29	GER	\$0.25	99.97 %	\$0.01
Apply Base Coat	18.72	1	0.25	48.78	GER	\$0.25	99.97 %	\$0.01
OEM CO2 Cleaning Line	18.72	1	0.25	51.85	GER	\$0.27	99.99 %	\$0.00
Hand Sanding	29.85	1	1.00	91.41	GER	\$0.76	99.96 %	\$0.01
Cure Paint	39.33	1	0.25	23.29	GER	\$0.25	99.97 %	\$0.01
Apply Base Coat	18.72	1	0.25	48.78	GER	\$0.25	99.97 %	\$0.01
OEM Plasma Surface Treatment Line	18.72	1	0.25	49.58	GER	\$0.26	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Manual Asm	19.00	1	1.00	91.41	GER	\$0.48	99.98 %	\$0.00
610 Ton Injection Molding Press	30.14	2	0.25	74.97	GER	\$0.31	99.99 %	\$0.00

Passenger Door Sill Accent Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, BMW Internal	1	Commodity Item		Purchased	0.0001	-	\$0.10
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Material, Passenger Door Sill Trim	1	PP/EPDM TD30	\$3.00	0.3800	0.3800	\$0.00	\$1.14

No Commodity Items
Required for This
Process

\...

\Zone 2 Exterior

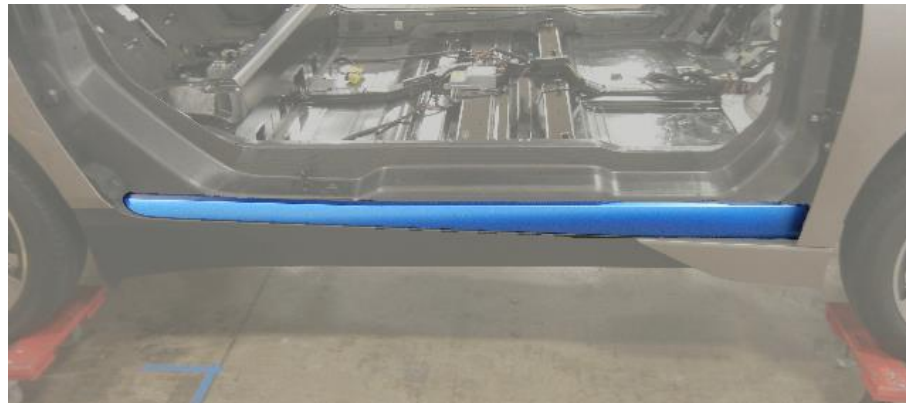
\Exterior Trim

\Passenger Door Sill Accent Trim Installation

Process Summary

Right First Time	99.90 %
Process Time (Sec)	17.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.43
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.06
Manufacturing Cost*	\$0.51



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Door Sill Accent Trim Installation



Passenger Door Sill Accent Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	17.00	1	1.00	91.41	GER	\$0.43	99.90%	\$0.02

Passenger Door Sill Accent Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Rocker Panel Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Rocker Panel Asm

Assembly Summary

Parts	18
Fasteners	8
Part Numbers	8
Steps	67
Fastenings	16
Right First Time	99.31 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	9.92
Total Weight (kg)	2.38

Material Cost**	\$9.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$13.13
Q Burden	\$0.10
SG&A	\$3.22
Manufacturing Cost*	\$25.54

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rocker Panel Asm



Driver Rocker Panel Asm											
Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Driver Rocker Panel, Driver Rocker Panel Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	2.90	2.2030
Driver Rocker Panel Trim, Driver Rocker Panel Asm	1	4	1	31	1	99.71 %	0.00	0.00	0.66	4.59	0.1521
Assemble Driver Rocker Panel Asm	1	13	15	33	15	99.61 %	0.00	0.00	1.76	0.00	0.0214

Driver Rocker Panel Asm										
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*	
Driver Rocker Panel, Driver Rocker Panel Asm	\$0.00	\$7.42	\$0.00	\$0.00	\$0.00	\$9.37	\$0.00	\$2.52	\$19.31	
Driver Rocker Panel Trim, Driver Rocker Panel Asm	\$0.05	\$0.76	\$0.00	\$0.00	\$0.67	\$1.59	\$0.04	\$0.44	\$3.46	
Assemble Driver Rocker Panel Asm	\$0.86	\$0.00	\$0.00	\$0.00	\$1.59	\$0.00	\$0.06	\$0.26	\$2.77	

Detailed Summary

Parts	18
Fasteners	8
Part Numbers	8
Steps	67
Fastenings	16
Right First Time	99.31%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	2.42
Supplier Fab. Time (Min)	7.50
Total Weight (kg)	2.38
Purchased Part Cost	\$0.91
Material Cost	\$8.18
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$2.16
Supplier Fab. Cost	\$10.96
Q Burden	\$0.10
SG&A	\$3.22
Manufacturing Cost*	\$25.54

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rocker Panel, Driver Rocker Panel Asm



\...

\Driver Rocker Panel Asm

\Driver Rocker Panel, Driver Rocker Panel Asm

\Driver Rocker Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	174.20
Total Weight (kg)	2.20

Material Cost**	\$7.42
OEM Process Cost	\$0.00
Supplier Process Cost	\$9.37
Q Burden	\$0.00
SG&A	\$2.52
Manufacturing Cost*	\$19.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rocker Panel, Driver Rocker Panel Asm



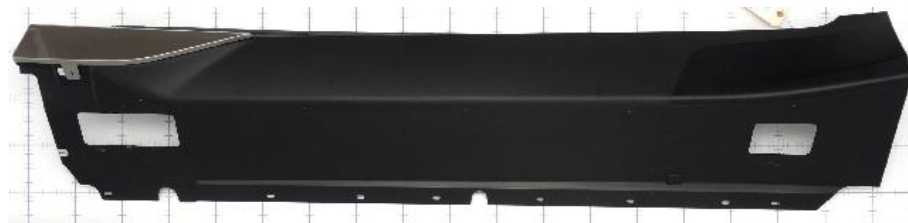
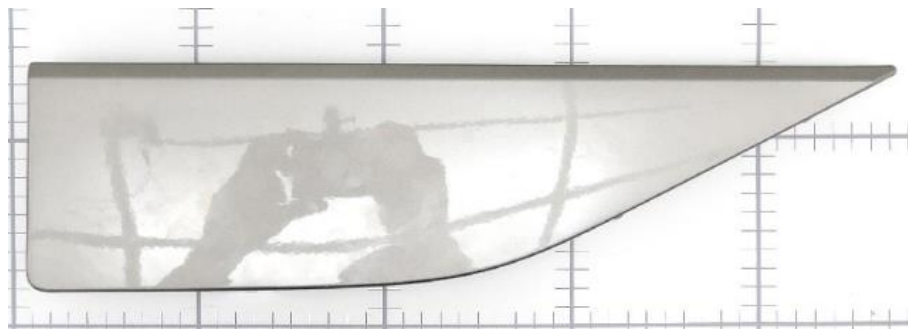
Driver Rocker Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
3000 Ton Injection Molding Press	174.20	1	0.25	193.61	GER	\$9.37	99.99%	\$0.00

Driver Rocker Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Driver Rocker Panel	1	PP/EPR TD20	\$3.37	2.2030	2.2030	\$0.00	\$7.42

Driver Rocker Panel Trim, Driver Rocker Panel Asm



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\Driver Rocker Panel Asm

\Driver Rocker Panel Trim, Driver Rocker Panel Asm

\Driver Rocker Panel Trim Process

Process Summary

Right First Time	99.71 %
Process Time (Sec)	315.26
Total Weight (kg)	0.15

Material Cost**	\$0.81
OEM Process Cost	\$0.00
Supplier Process Cost	\$2.17
Q Burden	\$0.04
SG&A	\$0.44
Manufacturing Cost*	\$3.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rocker Panel Trim, Driver Rocker Panel Asm



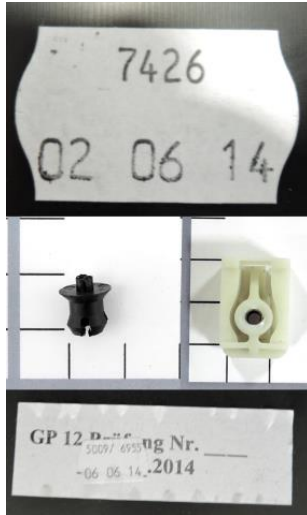
Driver Rocker Panel Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	20.50	1	1.00	54.32	GER	\$0.31	99.97 %	\$0.01
Cure Paint	118.29	1	0.25	17.08	GER	\$0.56	99.97 %	\$0.01
Apply Base Coat	7.52	1	0.25	41.62	GER	\$0.09	99.97 %	\$0.01
Supplier CO2 Cleaning Station	7.52	1	0.25	44.69	GER	\$0.09	99.99 %	\$0.00
Hand Sanding	11.60	1	1.00	54.32	GER	\$0.18	99.94 %	\$0.01
Cure Paint	118.29	1	0.25	17.08	GER	\$0.56	99.97 %	\$0.01
Apply Base Coat	7.52	1	0.25	41.62	GER	\$0.09	99.97 %	\$0.01
Supplier Plasma Surface Treatment Line	7.52	1	0.25	42.42	GER	\$0.09	99.98 %	\$0.00
Wash	9.00	1	0.25	20.00	GER	\$0.05	99.99 %	\$0.00
720 Ton Injection Molding Press	30.00	4	0.25	74.40	GER	\$0.15	99.99 %	\$0.00

Driver Rocker Panel Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item		Purchased	0.0001	-	\$0.05
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Material, Driver Rocker Panel	1	PP/EPDM TD30	\$3.00	0.1520	0.1520	\$0.00	\$0.46

Assemble Driver Rocker Panel Asm



- \...
- \Exterior Trim
- \Driver Rocker Panel Asm
- \Assemble Driver Rocker Panel Asm

Process Summary

Right First Time	99.61 %
Process Time (Sec)	105.45
Total Weight (kg)	0.02
Material Cost**	\$0.86
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.59
Q Burden	\$0.06
SG&A	\$0.26
Manufacturing Cost*	\$2.77



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Rocker Panel Asm



Assemble Driver Rocker Panel Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	105.45	1	1.00	54.32	GER	\$1.59	99.61 %	\$0.06

Assemble Driver Rocker Panel Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Two Stage Push Pin	1	Commodity Item	Purchased	0.0002	-	\$0.02	\$0.00
Plastic J-Nut White	4	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Plastic J-Nut White	4	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Label, Supplier DateCode	3	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Label, RMA-TSK Supplier	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Driver Rocker Panel Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Driver Rocker Panel Installation

Process Summary

Right First Time	98.36 %
Process Time (Sec)	133.00
Total Weight (kg)	0.07

Material Cost**	\$0.44
OEM Process Cost	\$3.38
Supplier Process Cost	\$0.00
Q Burden	\$0.25
SG&A	\$0.52
Manufacturing Cost*	\$4.59



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rocker Panel Installation



Driver Rocker Panel Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	133.00	1	1.00	91.41	GER	\$3.38	98.36%	\$0.25

Driver Rocker Panel Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00
M6x22mm-Hex SEMS Bolt	6	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
Short Two Stage Push Pin	8	Commodity Item	Purchased	0.0012	-	\$0.03	\$0.00

Passenger Rocker Panel Asm



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Rocker Panel Asm

Assembly Summary

Parts	18
Fasteners	8
Part Numbers	8
Steps	67
Fastenings	16
Right First Time	99.31 %
OEM Process Time (Min)	2.90
Supplier Process Time (Min)	6.88
Total Weight (kg)	2.38

Material Cost**	\$9.23
OEM Process Cost	\$9.69
Supplier Process Cost	\$3.64
Q Burden	\$0.10
SG&A	\$3.28
Manufacturing Cost*	\$25.94

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rocker Panel Asm



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Passenger Rocker Panel Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Passenger Rocker Panel, Passenger Rocker Panel Asm	1	1	0	1	0	99.99 %	0.00	2.90	0.00	0.00	2.2030
Passenger Rocker Panel Trim, Passenger Rocker Pane	1	4	1	31	1	99.71 %	0.00	0.00	0.66	4.59	0.1521
Assemble Driver Rocker Panel Asm	1	13	15	33	15	99.61 %	0.00	0.00	1.62	0.00	0.0214

Passenger Rocker Panel Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Passenger Rocker Panel, Passenger Rocker Panel Asm	\$0.00	\$7.56	\$0.00	\$9.69	\$0.00	\$0.00	\$0.00	\$2.59	\$19.84
Passenger Rocker Panel Trim, Passenger Rocker Pane	\$0.05	\$0.76	\$0.00	\$0.00	\$0.67	\$1.59	\$0.04	\$0.44	\$3.46
Assemble Driver Rocker Panel Asm	\$0.86	\$0.00	\$0.00	\$0.00	\$1.47	\$0.00	\$0.06	\$0.25	\$2.63

Detailed Summary

Parts	18
Fasteners	8
Part Numbers	8
Steps	67
Fastenings	16
Right First Time	99.31%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	2.90
Supplier Asm. Time (Min)	2.28
Supplier Fab. Time (Min)	4.59
Total Weight (kg)	2.38
<hr/>	
Purchased Part Cost	\$0.91
Material Cost	\$8.32
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$9.69
Supplier Asm. Cost	\$2.04
Supplier Fab. Cost	\$1.59
Q Burden	\$0.10
SG&A	\$3.28
Manufacturing Cost*	\$25.94

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rocker Panel, Passenger Rocker Panel Asm



\...
 \Passenger Rocker Panel Asm
 \Passenger Rocker Panel, Passenger Rocker Panel
 Asm \Passenger Rocker Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	174.20
Total Weight (kg)	2.20

Material Cost**	\$7.56
OEM Process Cost	\$9.69
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$2.59
Manufacturing Cost*	\$19.84

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rocker Panel, Passenger Rocker Panel Asm



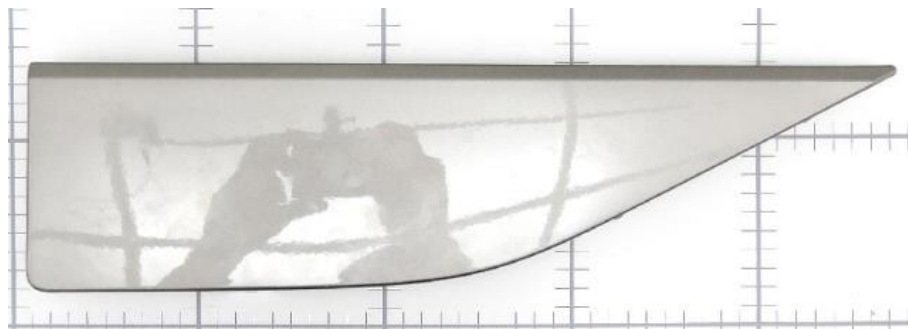
Passenger Rocker Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
3000 Ton Injection Molding Press	174.20	1	0.25	200.35	GER	\$9.69	99.99%	\$0.00

Passenger Rocker Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Passenger Rocker Panel	1	PP/EPR TD20	\$3.37	2.2030	2.2030	\$0.00	\$7.56

Passenger Rocker Panel Trim, Passenger Rocker Panel Asm



\...
\Passenger Rocker Panel Asm
\Passenger Rocker Panel Trim, Passenger Rocker
Pane \Driver Rocker Panel Trim Process

Process Summary

Right First Time	99.71 %
Process Time (Sec)	315.26
Total Weight (kg)	0.15
Material Cost**	\$0.81
OEM Process Cost	\$0.00
Supplier Process Cost	\$2.17
Q Burden	\$0.04
SG&A	\$0.44
Manufacturing Cost*	\$3.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rocker Panel Trim, Passenger Rocker Panel Asm



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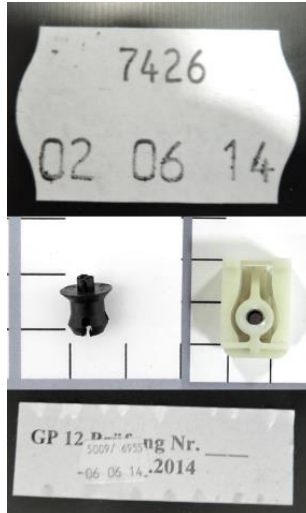
Driver Rocker Panel Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	20.50	1	1.00	54.32	GER	\$0.31	99.97 %	\$0.01
Cure Paint	118.29	1	0.25	17.08	GER	\$0.56	99.97 %	\$0.01
Apply Base Coat	7.52	1	0.25	41.62	GER	\$0.09	99.97 %	\$0.01
Supplier CO2 Cleaning Station	7.52	1	0.25	44.69	GER	\$0.09	99.99 %	\$0.00
Hand Sanding	11.60	1	1.00	54.32	GER	\$0.18	99.94 %	\$0.01
Cure Paint	118.29	1	0.25	17.08	GER	\$0.56	99.97 %	\$0.01
Apply Base Coat	7.52	1	0.25	41.62	GER	\$0.09	99.97 %	\$0.01
Supplier Plasma Surface Treatment Line	7.52	1	0.25	42.42	GER	\$0.09	99.98 %	\$0.00
Wash	9.00	1	0.25	20.00	GER	\$0.05	99.99 %	\$0.00
720 Ton Injection Molding Press	30.00	4	0.25	74.40	GER	\$0.15	99.99 %	\$0.00

Driver Rocker Panel Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item		Purchased	0.0001	-	\$0.05
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Material, Passenger Rocker Panel	1	PP/EPDM TD30	\$3.00	0.1520	0.1520	\$0.00	\$0.46

Assemble Driver Rocker Panel Asm



- \...
- \Exterior Trim
- \Passenger Rocker Panel Asm
- \Assemble Driver Rocker Panel Asm

Process Summary

Right First Time	99.61 %
Process Time (Sec)	97.45
Total Weight (kg)	0.02
Material Cost**	\$0.86
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.47
Q Burden	\$0.06
SG&A	\$0.25
Manufacturing Cost*	\$2.63



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Rocker Panel Asm



Assemble Driver Rocker Panel Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	97.45	1	1.00	54.32	GER	\$1.47	99.61 %	\$0.06

Assemble Driver Rocker Panel Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Two Stage Push Pin	1	Commodity Item	Purchased	0.0002	-	\$0.02	\$0.00
Plastic J-Nut White	4	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Plastic J-Nut White	4	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00
Label, Supplier DateCode	3	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Label, RMA-TSK Supplier	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Passenger Rocker Panel Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Passenger Rocker Panel Installation

Process Summary

Right First Time	98.36 %
Process Time (Sec)	133.00
Total Weight (kg)	0.07

Material Cost**	\$0.44
OEM Process Cost	\$3.38
Supplier Process Cost	\$0.00
Q Burden	\$0.25
SG&A	\$0.52
Manufacturing Cost*	\$4.59



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rocker Panel Installation



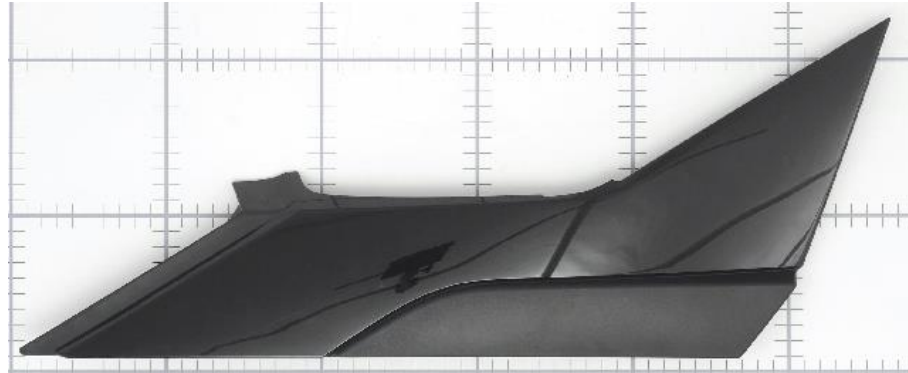
Passenger Rocker Panel Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	133.00	1	1.00	91.41	GER	\$3.38	98.36%	\$0.25

Passenger Rocker Panel Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00
M6x22mm-Hex SEMS Bolt	6	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
Short Two Stage Push Pin	8	Commodity Item	Purchased	0.0012	-	\$0.03	\$0.00

Driver Mirror Flag Trim Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Mirror Flag Trim Asm

Assembly Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	2
Right First Time	99.88 %
OEM Process Time (Min)	0.73
Supplier Process Time (Min)	0.61
Total Weight (kg)	0.29

Material Cost**	\$1.27
OEM Process Cost	\$0.93
Supplier Process Cost	\$0.35
Q Burden	\$0.02
SG&A	\$0.38
Manufacturing Cost*	\$2.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Mirror Flag Trim Asm



Driver Mirror Flag Trim Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Trim, Driver Mirror Flag Trim Asm	1	1	0	1	0	99.99 %	0.00	0.23	0.00	0.00	0.1404
Mounting Trim, Driver Mirror Flag Trim Asm	1	2	0	2	0	99.98 %	0.00	0.50	0.00	0.00	0.1456
Assemble Mirror Flag Trim	1	1	2	8	2	99.91 %	0.00	0.00	0.61	0.00	0.0001

Driver Mirror Flag Trim Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Trim, Driver Mirror Flag Trim Asm	\$0.00	\$0.50	\$0.00	\$0.24	\$0.00	\$0.00	\$0.00	\$0.11	\$0.85
Mounting Trim, Driver Mirror Flag Trim Asm	\$0.00	\$0.75	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$0.22	\$1.67
Assemble Mirror Flag Trim	\$0.02	\$0.00	\$0.00	\$0.00	\$0.35	\$0.00	\$0.01	\$0.05	\$0.44

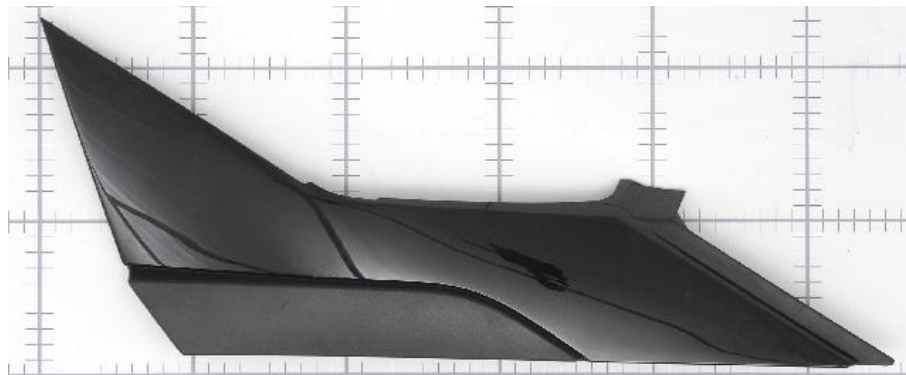
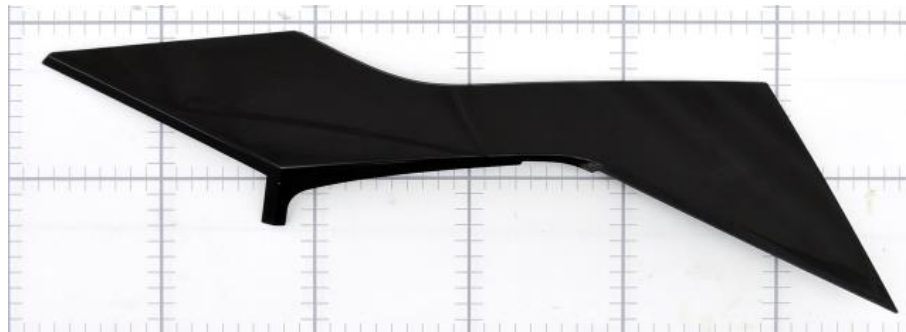
Detailed Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	2
Right First Time	99.88%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.73
Supplier Asm. Time (Min)	0.61
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.29
Purchased Part Cost	
	\$0.02
Material Cost	
	\$1.25
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.93
Supplier Asm. Cost	
	\$0.35
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.02
SG&A	
	\$0.38
Manufacturing Cost*	
	\$2.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim, Driver Mirror Flag Trim Asm



\...

\Driver Mirror Flag Trim Asm

\Trim, Driver Mirror Flag Trim Asm

\Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.59
Total Weight (kg)	0.14

Material Cost**	\$0.50
OEM Process Cost	\$0.24
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.85

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim, Driver Mirror Flag Trim Asm



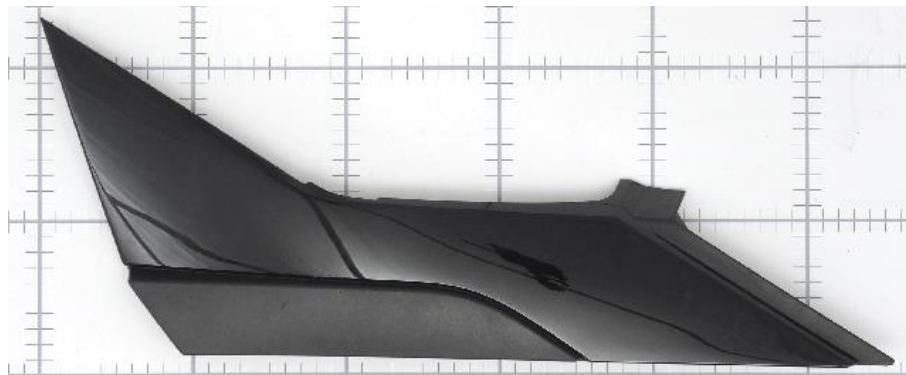
Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	27.18	2	0.25	63.07	GER	\$0.24	99.99%	\$0.00

Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Trim	1	PMMA - Colored	\$3.57	0.1404	0.1404	\$0.00	\$0.50

Mounting Trim, Driver Mirror Flag Trim Asm



\...

- \Driver Mirror Flag Trim Asm
- \Mounting Trim, Driver Mirror Flag Trim Asm
- \Mounting Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	30.05
Total Weight (kg)	0.15
Material Cost**	\$0.75
OEM Process Cost	\$0.70
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.22
Manufacturing Cost*	\$1.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Trim, Driver Mirror Flag Trim Asm



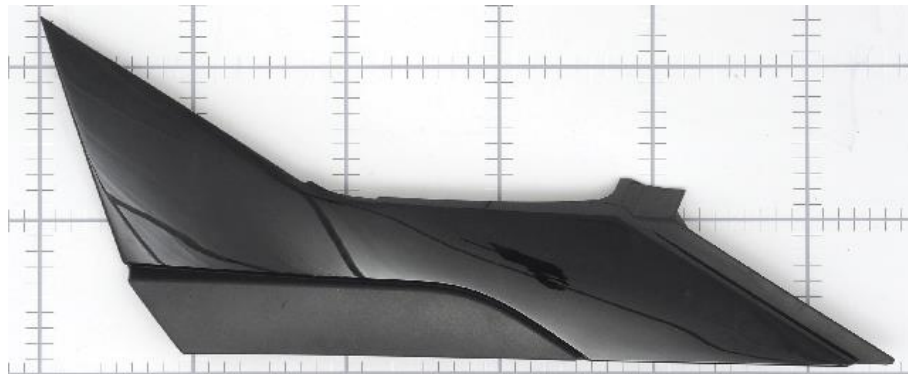
Mounting Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
610 Ton Injection Molding Press	60.10	2	0.25	83.33	GER	\$0.70	99.98 %	\$0.00

Mounting Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Mounting Trim	1	ASA	\$4.94	0.1418	0.1418	\$0.00	\$0.70
Material 2, Mounting Trim	1	SEBS	\$11.55	0.0038	0.0040	\$0.00	\$0.05

No Commodity Items
Required for This
Process



\...
\Exterior Trim
\Driver Mirror Flag Trim Asm
\Assemble Mirror Flag Trim

Process Summary

Right First Time	99.91 %
Process Time (Sec)	36.63
Total Weight (kg)	0.00
Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Mirror Flag Trim



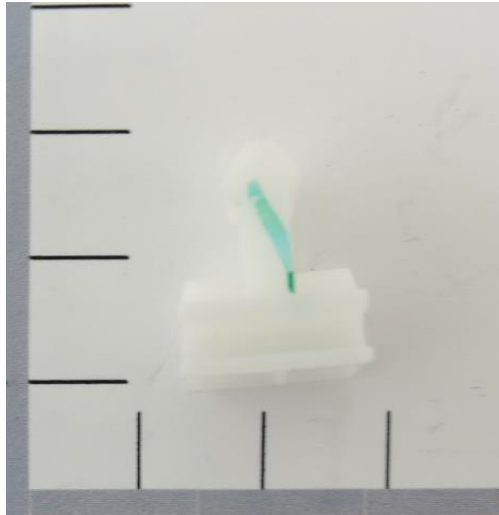
Assemble Mirror Flag Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.63	1	1.00	54.32	GER	\$0.16	99.96%	\$0.01
Supplier Infrared Welder	26.00	1	0.25	26.35	GER	\$0.19	99.95%	\$0.01

Assemble Mirror Flag Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Date/Time Stamp	1	Commodity Item	Purchased	0.0001	-	\$0.02	\$0.00

Driver Mirror Flag Trim Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Driver Mirror Flag Trim Installation

Process Summary

Right First Time	99.93 %
Process Time (Sec)	17.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.43
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.07
Manufacturing Cost*	\$0.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Mirror Flag Trim Installation



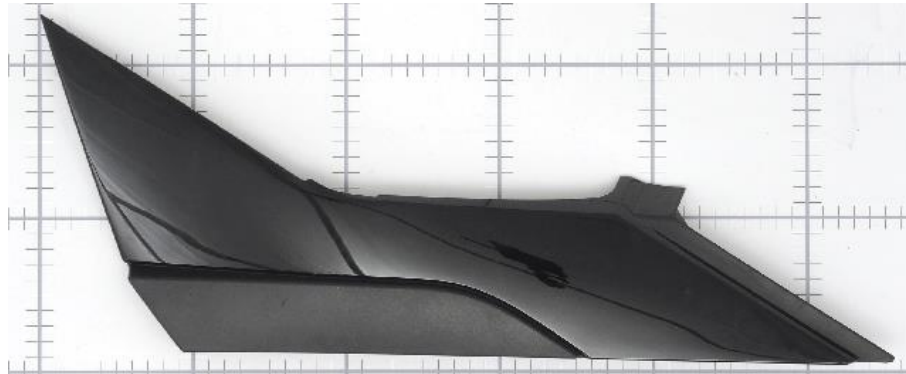
Driver Mirror Flag Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	17.00	1	1.00	91.41	GER	\$0.43	99.93%	\$0.01

Driver Mirror Flag Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
■ Push-In Clip	1	Commodity Item	Purchased	0.0013	-	\$0.04	\$0.00

Passenger Mirror Flag Trim Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Mirror Flag Trim Asm
Assembly Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	2
Right First Time	99.88 %
OEM Process Time (Min)	0.73
Supplier Process Time (Min)	0.61
Total Weight (kg)	0.29

Material Cost**	\$1.27
OEM Process Cost	\$0.93
Supplier Process Cost	\$0.35
Q Burden	\$0.02
SG&A	\$0.38
Manufacturing Cost*	\$2.95

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Passenger Mirror Flag Trim Asm



Passenger Mirror Flag Trim Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Trim, Passenger Mirror Flag Trim Asm	1	1	0	1	0	99.99 %	0.00	0.23	0.00	0.00	0.1404
Mounting Trim, Passenger Mirror Flag Trim Asm	1	2	0	2	0	99.98 %	0.00	0.50	0.00	0.00	0.1456
Assemble Mirror Flag Trim	1	1	2	8	2	99.91 %	0.00	0.00	0.61	0.00	0.0001

Passenger Mirror Flag Trim Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Trim, Passenger Mirror Flag Trim Asm	\$0.00	\$0.50	\$0.00	\$0.24	\$0.00	\$0.00	\$0.00	\$0.11	\$0.85
Mounting Trim, Passenger Mirror Flag Trim Asm	\$0.00	\$0.75	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$0.22	\$1.67
Assemble Mirror Flag Trim	\$0.02	\$0.00	\$0.00	\$0.00	\$0.35	\$0.00	\$0.01	\$0.05	\$0.44

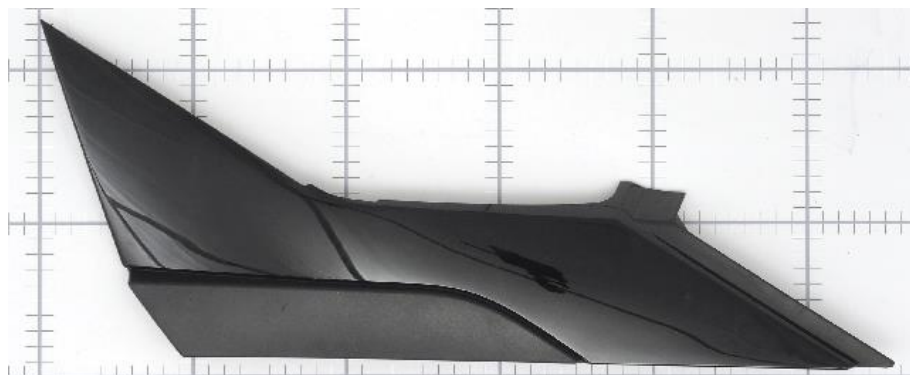
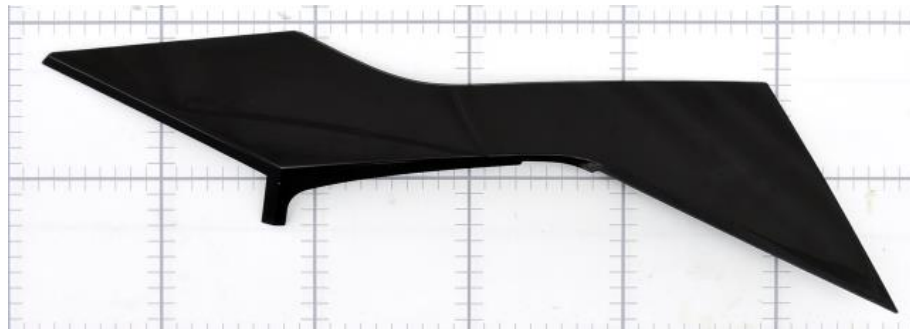
Detailed Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	2
Right First Time	99.88%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.73
Supplier Asm. Time (Min)	0.61
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.29
Purchased Part Cost	
	\$0.02
Material Cost	
	\$1.25
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.93
Supplier Asm. Cost	
	\$0.35
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.02
SG&A	
	\$0.38
Manufacturing Cost*	
	\$2.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim, Passenger Mirror Flag Trim Asm



\...

- \Passenger Mirror Flag Trim Asm
- \Trim, Passenger Mirror Flag Trim Asm
- \Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.59
Total Weight (kg)	0.14

Material Cost**	\$0.50
OEM Process Cost	\$0.24
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.85

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim, Passenger Mirror Flag Trim Asm



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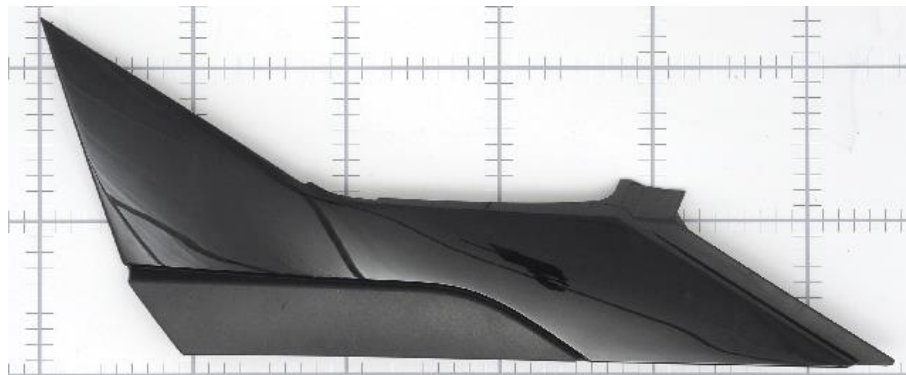
Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	27.18	2	0.25	63.07	GER	\$0.24	99.99%	\$0.00

Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Trim	1	PMMA - Colored	\$3.57	0.1404	0.1404	\$0.00	\$0.50

Mounting Trim, Passenger Mirror Flag Trim Asm



\...

- \Passenger Mirror Flag Trim Asm
- \Mounting Trim, Passenger Mirror Flag Trim Asm
- \Mounting Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	30.05
Total Weight (kg)	0.15

Material Cost**	\$0.75
OEM Process Cost	\$0.70
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.22
Manufacturing Cost*	\$1.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Trim, Passenger Mirror Flag Trim Asm



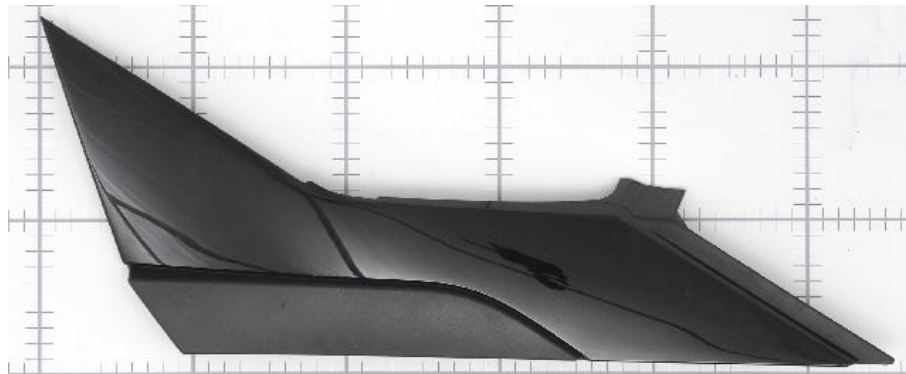
Mounting Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
610 Ton Injection Molding Press	60.10	2	0.25	83.33	GER	\$0.70	99.98 %	\$0.00

Mounting Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Mounting Trim	1	ASA	\$4.94	0.1418	0.1418	\$0.00	\$0.70
Material 2, Mounting Trim	1	SEBS	\$11.55	0.0038	0.0040	\$0.00	\$0.05

No Commodity Items Required for This Process



\...
\Exterior Trim
\Passenger Mirror Flag Trim Asm
\Assemble Mirror Flag Trim

Process Summary

Right First Time	99.91 %
Process Time (Sec)	36.63
Total Weight (kg)	0.00
Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Mirror Flag Trim



Assemble Mirror Flag Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.63	1	1.00	54.32	GER	\$0.16	99.96%	\$0.01
Supplier Infrared Welder	26.00	1	0.25	26.35	GER	\$0.19	99.95%	\$0.01

Assemble Mirror Flag Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Date/Time Stamp	1	Commodity Item	Purchased	0.0001	-	\$0.02	\$0.00

Passenger Mirror Flag Trim Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Passenger Mirror Flag Trim Installation

Process Summary

Right First Time	99.93 %
Process Time (Sec)	17.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.43
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.07
Manufacturing Cost*	\$0.55



* Excluding tooling, ER&D, logistics, and profit margin
** Includes material cost and purchased parts cost

Passenger Mirror Flag Trim Installation



Passenger Mirror Flag Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	17.00	1	1.00	91.41	GER	\$0.43	99.93%	\$0.01

Passenger Mirror Flag Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push-In Clip	1	Commodity Item	Purchased	0.0013	-	\$0.04	\$0.00

Passenger A-Pillar Exterior Trim



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger A-Pillar Exterior Trim

Assembly Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	46
Fastenings	3
Right First Time	99.57 %
OEM Process Time (Min)	5.36
Supplier Process Time (Min)	0.00
Total Weight (kg)	0.54

Material Cost**	\$3.31
OEM Process Cost	\$4.04
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.10
Manufacturing Cost*	\$8.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger A-Pillar Exterior Trim



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Passenger A-Pillar Exterior Trim

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Mounting Trim, Passenger A-Pillar Exterior Trim As	1	2	0	2	0	99.98 %	0.00	0.11	0.00	0.00	0.1971
Exterior Trim, Passenger A-Pillar Exterior Trim As	1	1	0	1	0	99.99 %	0.00	0.33	0.00	0.00	0.2957
Assemble Driver A-Pillar Exterior Trim	1	4	3	41	3	99.60 %	1.24	3.68	0.00	0.00	0.0453

Passenger A-Pillar Exterior Trim

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Mounting Trim, Passenger A-Pillar Exterior Trim As	\$0.00	\$0.71	\$0.00	\$0.08	\$0.00	\$0.00	\$0.00	\$0.12	\$0.92
Exterior Trim, Passenger A-Pillar Exterior Trim As	\$0.00	\$1.14	\$0.00	\$0.53	\$0.00	\$0.00	\$0.00	\$0.25	\$1.92
Assemble Driver A-Pillar Exterior Trim	\$0.05	\$1.41	\$1.56	\$1.87	\$0.00	\$0.00	\$0.06	\$0.73	\$5.67

Detailed Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	46
Fastenings	3
Right First Time	99.57%
OEM Asm. Time (Min)	1.24
OEM Fab. Time (Min)	4.12
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.54
Purchased Part Cost	
	\$0.05
Material Cost	
	\$3.26
OEM Asm. Cost	
	\$1.56
OEM Fab. Cost	
	\$2.48
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.06
SG&A	
	\$1.10
Manufacturing Cost*	
	\$8.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Trim, Passenger A-Pillar Exterior Trim Asm



\...

- \Passenger A-Pillar Exterior Trim
 - \Mounting Trim, Passenger A-Pillar Exterior Trim As
 - \Mounting Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	6.57
Total Weight (kg)	0.20

Material Cost**	\$0.71
OEM Process Cost	\$0.08
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.12
Manufacturing Cost*	\$0.92

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Trim, Passenger A-Pillar Exterior Trim Asm



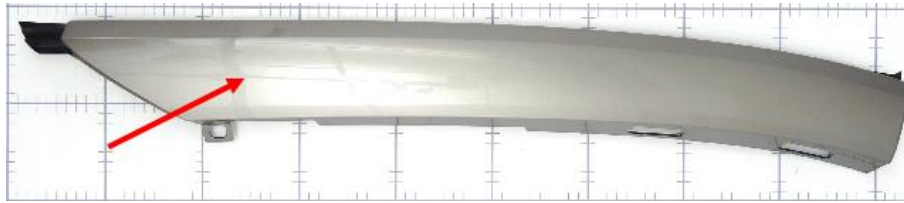
Mounting Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	26.28	4	0.25	46.24	GER	\$0.08	99.98 %	\$0.00

Mounting Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Mounting Trim	1	ABS + PC GF20	\$3.59	0.1474	0.1474	\$0.00	\$0.57
Material 2, Mounting Trim	1	TPE	\$2.54	0.0497	0.0534	\$0.00	\$0.14

Exterior Trim, Passenger A-Pillar Exterior Trim Asm



\...

- \Passenger A-Pillar Exterior Trim
- \Exterior Trim, Passenger A-Pillar Exterior Trim As
- \Exterior Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	19.73
Total Weight (kg)	0.30
Material Cost**	\$1.14
OEM Process Cost	\$0.53
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.25
Manufacturing Cost*	\$1.92

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exterior Trim, Passenger A-Pillar Exterior Trim Asm



Exterior Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	39.46	2	0.25	96.50	GER	\$0.53	99.99%	\$0.00

Exterior Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Exterior Trim	1	ABS + PC GF20	\$3.59	0.2957	0.2957	\$0.00	\$1.14



- \...
- \Exterior Trim
- \Passenger A-Pillar Exterior Trim
- \Assemble Driver A-Pillar Exterior Trim

Process Summary

Right First Time	99.60 %
Process Time (Sec)	295.48
Total Weight (kg)	0.05

Material Cost**	\$1.46
OEM Process Cost	\$3.43
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$0.73
Manufacturing Cost*	\$5.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger A-Pillar Exterior Trim



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Assemble Driver A-Pillar Exterior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.50	1	1.00	91.41	GER	\$0.34	99.96 %	\$0.01
Cure Paint	89.71	1	0.25	27.19	GER	\$0.68	99.97 %	\$0.01
Apply Base Coat	10.80	1	0.25	48.78	GER	\$0.15	99.97 %	\$0.01
OEM CO2 Cleaning Line	10.80	1	0.25	51.85	GER	\$0.16	99.99 %	\$0.00
Hand Sanding	16.75	1	1.00	91.41	GER	\$0.43	99.96 %	\$0.01
Cure Paint	89.71	1	0.25	27.19	GER	\$0.68	99.97 %	\$0.01
Apply Base Coat	10.80	1	0.25	48.78	GER	\$0.15	99.97 %	\$0.01
OEM Plasma Surface Treatment Line	10.80	1	0.25	49.58	GER	\$0.15	99.98 %	\$0.00
Wash	9.00	1	0.25	27.16	GER	\$0.07	99.98 %	\$0.00
IR Cure	19.00	1	0.25	67.69	GER	\$0.36	99.96 %	\$0.01
OEM Adhesive Bead Station Auto	14.61	1	0.25	69.43	GER	\$0.28	99.93 %	\$0.01

Assemble Driver A-Pillar Exterior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.30
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.30
Adhesive, Passenger A-Pillar Exterior Trim	1	Structural Adhesive - Polymer	\$17.94	0.0452	0.0452	\$0.00	\$0.81

Passenger A-Pillar Exterior Trim Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger A-Pillar Exterior Trim Installation

Process Summary

Right First Time	99.75 %
Process Time (Sec)	26.00
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.66
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.10
Manufacturing Cost*	\$0.82



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger A-Pillar Exterior Trim Installation

Passenger A-Pillar Exterior Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	26.00	1	1.00	91.41	GER	\$0.66	99.75%	\$0.04

Passenger A-Pillar Exterior Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x16mm-Pan Head Torx Bolt	1	Commodity Item	Purchased	0.0059	-	\$0.02	\$0.00

Passenger Header Exterior Trim Asm



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\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Header Exterior Trim Asm

Assembly Summary



Parts	14
Fasteners	0
Part Numbers	13
Steps	60
Fastenings	7
Right First Time	99.41 %
OEM Process Time (Min)	6.56
Supplier Process Time (Min)	0.05
Total Weight (kg)	1.24

Material Cost**	\$8.10
OEM Process Cost	\$6.98
Supplier Process Cost	\$0.03
Q Burden	\$0.09
SG&A	\$2.25
Manufacturing Cost*	\$17.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Header Exterior Trim Asm



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Passenger Header Exterior Trim Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Trim Asm, PassengerHeader Exterior Trim Asm	1	6	2	42	2	99.61 %	1.65	3.40	0.00	0.00	1.2240
End Seal, PassengerHeader Exterior Trim Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.05	0.0024
Assemble End Seal	1	2	2	5	2	99.93 %	0.26	0.00	0.00	0.00	0.0002
Trim Seal, PassengerHeader Exterior Trim Asm	1	2	0	2	0	99.98 %	0.00	0.72	0.00	0.00	0.0058
Assemble Trim Seal	1	2	3	6	3	99.91 %	0.53	0.00	0.00	0.00	0.0051

Passenger Header Exterior Trim Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Trim Asm, Passenger Header Exterior Trim Asm	\$0.00	\$7.96	\$2.00	\$3.28	\$0.00	\$0.00	\$0.06	\$1.98	\$15.28
End Seal, PassengerHeader Exterior Trim Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.06
Assemble End Seal	\$0.02	\$0.00	\$0.40	\$0.00	\$0.00	\$0.00	\$0.01	\$0.06	\$0.49
Trim Seal, PassengerHeader Exterior Trim Asm	\$0.00	\$0.02	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.08	\$0.60
Assemble Trim Seal	\$0.08	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00	\$0.01	\$0.12	\$1.02

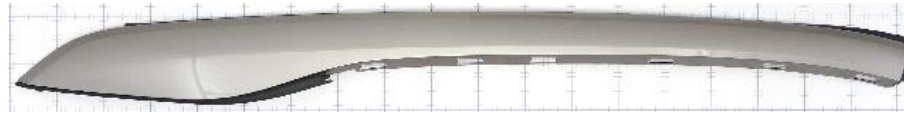
Detailed Summary

Parts	14
Fasteners	0
Part Numbers	13
Steps	60
Fastenings	7
Right First Time	99.41%
OEM Asm. Time (Min)	2.44
OEM Fab. Time (Min)	4.12
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.05
Total Weight (kg)	1.24
Purchased Part Cost	
	\$0.10
Material Cost	
	\$8.00
OEM Asm. Cost	
	\$3.20
OEM Fab. Cost	
	\$3.77
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.03
Q Burden	
	\$0.09
SG&A	
	\$2.25
Manufacturing Cost*	
	\$17.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Asm, Passenger Header Exterior Trim Asm



\...
 \Exterior Trim
 \Passenger Header Exterior Trim Asm
 \Trim Asm, Passenger Header Exterior Trim Asm

Assembly Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	42
Fastenings	2
Right First Time	99.61 %
OEM Process Time (Min)	5.05
Supplier Process Time (Min)	0.00
Total Weight (kg)	1.22

Material Cost**	\$7.96
OEM Process Cost	\$5.27
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.98
Manufacturing Cost*	\$15.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Asm, Passenger Header Exterior Trim Asm



Trim Asm, Passenger Header Exterior Trim Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Mounting Trim, Trim Asm	1	2	0	2	0	99.98 %	0.00	0.55	0.00	0.00	0.0626
Exterior Trim, Trim Asm	1	1	0	1	0	99.99 %	0.00	0.71	0.00	0.00	1.0418
Assemble Passenger A-Pillar Exterior Trim	1	3	2	37	2	99.64 %	1.65	2.15	0.00	0.00	0.1196

Trim Asm, Passenger Header Exterior Trim Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Mounting Trim, Trim Asm	\$0.00	\$0.26	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.11	\$0.87
Exterior Trim, Trim Asm	\$0.00	\$3.99	\$0.00	\$1.14	\$0.00	\$0.00	\$0.00	\$0.77	\$5.90
Assemble Passenger A-Pillar Exterior Trim	\$0.00	\$3.71	\$2.00	\$1.64	\$0.00	\$0.00	\$0.05	\$1.10	\$8.50

Detailed Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	42
Fastenings	2
Right First Time	99.61%
OEM Asm. Time (Min)	1.65
OEM Fab. Time (Min)	3.40
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	1.22
Purchased Part Cost	
	\$0.00
Material Cost	\$7.96
OEM Asm. Cost	\$2.00
OEM Fab. Cost	\$3.28
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.98
Manufacturing Cost*	\$15.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Trim Asm, Passenger Header Exterior Trim Asm
- \Mounting Trim, Trim Asm
- \Mounting Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	32.80
Total Weight (kg)	0.06

Material Cost**	\$0.26
OEM Process Cost	\$0.50
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.87

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

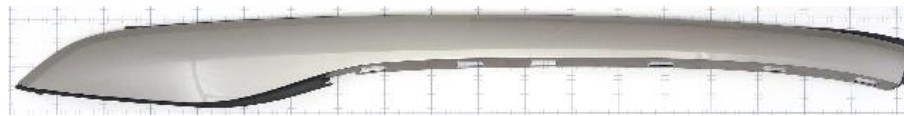
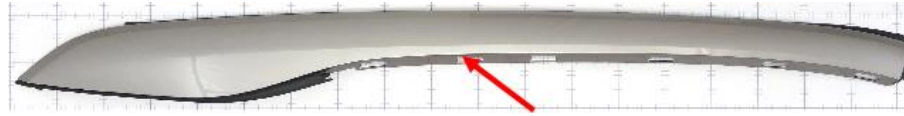
Mounting Trim, Trim Asm

Mounting Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	65.60	2	0.25	54.61	GER	\$0.50	99.98 %	\$0.00

Mounting Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Mounting Trim	1	ABS + PC GF20	\$3.59	0.0448	0.0448	\$0.00	\$0.17
Material 2, Mounting Trim	1	TPE	\$2.54	0.0178	0.0191	\$0.00	\$0.09



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- \Trim Asm, Passenger Header Exterior Trim Asm
- \Exterior Trim, Trim Asm
- \Exterior Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	42.63
Total Weight (kg)	1.04

Material Cost**	\$3.99
OEM Process Cost	\$1.14
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.77
Manufacturing Cost*	\$5.90

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exterior Trim, Trim Asm

Exterior Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	42.63	1	0.25	96.50	GER	\$1.14	99.99%	\$0.00

Exterior Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Exterior Trim	1	ABS + PC GF20	\$3.59	1.0418	1.0418	\$0.00	\$3.99

Assemble Passenger A-Pillar Exterior Trim



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- \Passenger Header Exterior Trim Asm
- \Trim Asm, Passenger Header Exterior Trim Asm
- \Assemble Passenger A-Pillar Exterior Trim

Process Summary

Right First Time	99.64 %
Process Time (Sec)	227.55
Total Weight (kg)	0.12

Material Cost**	\$3.71
OEM Process Cost	\$3.63
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$1.10
Manufacturing Cost*	\$8.50



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger A-Pillar Exterior Trim



MUNRO
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Assemble Passenger A-Pillar Exterior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	22.46	1	0.25	27.19	GER	\$0.17	99.97 %	\$0.01
Apply Base Coat	24.96	1	0.25	62.44	GER	\$0.43	99.97 %	\$0.01
OEM CO2 Cleaning Line	18.96	1	0.25	51.85	GER	\$0.27	99.99 %	\$0.00
Hand Sanding	32.05	1	1.00	91.41	GER	\$0.81	99.96 %	\$0.01
Cure Paint	22.46	1	0.25	27.19	GER	\$0.17	99.97 %	\$0.01
Apply Base Coat	24.96	1	0.25	62.44	GER	\$0.43	99.97 %	\$0.01
OEM Plasma Surface Treatment Line	16.80	1	0.25	49.58	GER	\$0.23	99.98 %	\$0.00
Wash	15.00	1	0.25	37.85	GER	\$0.16	99.98 %	\$0.00
IR Cure	25.00	1	0.25	67.69	GER	\$0.47	99.96 %	\$0.01
OEM Adhesive Bead Station Auto	24.90	1	0.25	69.43	GER	\$0.48	99.93 %	\$0.01

Assemble Passenger A-Pillar Exterior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.78
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.78
Adhesive, Passenger Header Exterior Trim	1	Structural Adhesive - Polymer	\$17.94	0.1196	0.1196	\$0.00	\$2.15

End Seal, Passenger Header Exterior Trim Asm



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- \Passenger Header Exterior Trim Asm
- \End Seal, Passenger Header Exterior Trim Asm
- \End Seal Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	3.26
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

End Seal, Passenger Header Exterior Trim Asm



End Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	26.08	8	0.25	32.08	GER	\$0.03	99.98 %	\$0.00

End Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, End Seal	1	PP GF30	\$2.71	0.0021	0.0022	\$0.00	\$0.01
Material 2, End Seal	1	TPE	\$2.54	0.0003	0.0003	\$0.00	\$0.01

Assemble End Seal



\...
 \Exterior Trim
 \Passenger Header Exterior Trim Asm
 \Assemble End Seal

Process Summary

Right First Time	99.93 %
Process Time (Sec)	15.75
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.40
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.06
Manufacturing Cost*	\$0.49

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble End Seal



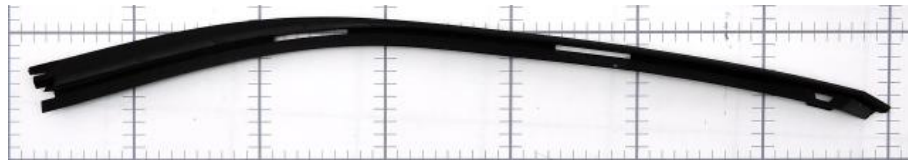
Assemble End Seal

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	15.75	1	1.00	91.41	GER	\$0.40	99.93%	\$0.01

Assemble End Seal

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
10mm x 10mm Double Side Tape	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
20mmx10mm Double Side Tape	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Trim Seal, Passenger Header Exterior Trim Asm



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- \Passenger Header Exterior Trim Asm
- \Trim Seal, Passenger Header Exterior Trim Asm
- \Trim Seal Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	42.96
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.50
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Seal, Passenger Header Exterior Trim Asm



Trim Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	171.84	4	0.25	41.75	GER	\$0.50	99.98 %	\$0.00

Trim Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Trim Seal	1	PP GF30	\$2.71	0.0025	0.0027	\$0.00	\$0.01
Material 2, Trim Seal	1	PP/EPDM TD20	\$3.29	0.0033	0.0035	\$0.00	\$0.01

Assemble Trim Seal



\...
\Exterior Trim
\Passenger Header Exterior Trim Asm
\Assemble Trim Seal

Process Summary

Right First Time	99.91 %
Process Time (Sec)	31.75
Total Weight (kg)	0.01
Material Cost**	\$0.08
OEM Process Cost	\$0.81
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.12
Manufacturing Cost*	\$1.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Trim Seal



Assemble Trim Seal

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	31.75	1	1.00	91.41	GER	\$0.81	99.91 %	\$0.01

Assemble Trim Seal

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
570mmx10mm Double Sided Tape	1	Commodity Item	Purchased	0.0050	-	\$0.03	\$0.00
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...
\Zone 2 Exterior
\Exterior Trim
\Passenger Header Exterior Trim Installation

Process Summary

Right First Time	99.93 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.33
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Header Exterior Trim Installation



Passenger Header Exterior Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.00	1	1.00	91.41	GER	\$0.33	99.93%	\$0.01

Passenger Header Exterior Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver A-Pillar Exterior Trim Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver A-Pillar Exterior Trim Asm
Assembly Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	46
Fastenings	3
Right First Time	99.57 %
OEM Process Time (Min)	4.24
Supplier Process Time (Min)	0.00
Total Weight (kg)	0.54

Material Cost**	\$3.31
OEM Process Cost	\$3.53
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.02
Manufacturing Cost*	\$7.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver A-Pillar Exterior Trim Asm



Driver A-Pillar Exterior Trim Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Mounting Trim, DriverA-Pillar Exterior Trim Asm	1	2	0	2	0	99.98 %	0.00	0.11	0.00	0.00	0.1971
Exterior Trim, DriverA-Pillar Exterior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.33	0.00	0.00	0.2957
Assemble Driver A-Pillar Exterior Trim	1	4	3	41	3	99.60 %	1.24	2.56	0.00	0.00	0.0453

Driver A-Pillar Exterior Trim Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Mounting Trim, Driver A-Pillar Exterior Trim Asm	\$0.00	\$0.71	\$0.00	\$0.08	\$0.00	\$0.00	\$0.00	\$0.12	\$0.92
Exterior Trim, DriverA-Pillar Exterior Trim Asm	\$0.00	\$1.14	\$0.00	\$0.53	\$0.00	\$0.00	\$0.00	\$0.25	\$1.92
Assemble Driver A-Pillar Exterior Trim	\$0.05	\$1.41	\$1.56	\$1.36	\$0.00	\$0.00	\$0.06	\$0.65	\$5.09

Detailed Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	46
Fastenings	3
Right First Time	99.57%
OEM Asm. Time (Min)	1.24
OEM Fab. Time (Min)	3.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.54
Purchased Part Cost	\$0.05
Material Cost	\$3.26
OEM Asm. Cost	\$1.56
OEM Fab. Cost	\$1.98
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.02
Manufacturing Cost*	\$7.93

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Trim, Driver A-Pillar Exterior Trim Asm



\...

- \Driver A-Pillar Exterior Trim Asm
- \Mounting Trim, Driver A-Pillar Exterior Trim Asm
- \Mounting Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	6.57
Total Weight (kg)	0.20
Material Cost**	\$0.71
OEM Process Cost	\$0.08
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.12
Manufacturing Cost*	\$0.92



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Trim, Driver A-Pillar Exterior Trim Asm



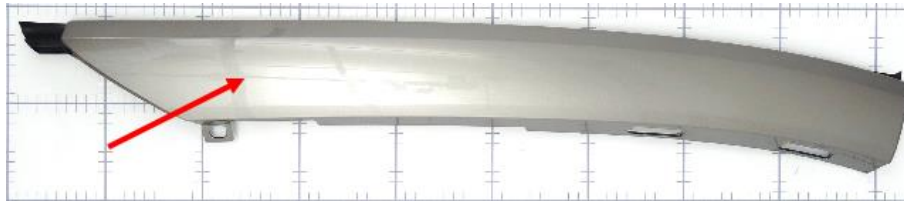
Mounting Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	26.28	4	0.25	46.24	GER	\$0.08	99.98 %	\$0.00

Mounting Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Mounting Trim	1	ABS + PC GF20	\$3.59	0.1474	0.1474	\$0.00	\$0.57
Material 2, Mounting Trim	1	TPE	\$2.54	0.0497	0.0534	\$0.00	\$0.14

Exterior Trim, Driver A-Pillar Exterior Trim Asm



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- \Driver A-Pillar Exterior Trim Asm
- \Exterior Trim, Driver A-Pillar Exterior Trim Asm
- \Exterior Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	19.73
Total Weight (kg)	0.30
Material Cost**	\$1.14
OEM Process Cost	\$0.53
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.25
Manufacturing Cost*	\$1.92



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exterior Trim, Driver A-Pillar Exterior Trim Asm



Exterior Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	39.46	2	0.25	96.50	GER	\$0.53	99.99%	\$0.00

Exterior Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Exterior Trim	1	ABS + PC GF20	\$3.59	0.2957	0.2957	\$0.00	\$1.14

Assemble Driver A-Pillar Exterior Trim



\...
 \Exterior Trim
 \Driver A-Pillar Exterior Trim Asm
 \Assemble Driver A-Pillar Exterior Trim

Process Summary

Right First Time	99.60 %
Process Time (Sec)	228.23
Total Weight (kg)	0.05

Material Cost**	\$1.46
OEM Process Cost	\$2.92
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$0.65
Manufacturing Cost*	\$5.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver A-Pillar Exterior Trim



MUNRO
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Assemble Driver A-Pillar Exterior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.50	1	1.00	91.41	GER	\$0.34	99.96 %	\$0.01
Cure Paint	89.71	1	0.25	27.19	GER	\$0.68	99.97 %	\$0.01
Apply Base Coat	10.80	1	0.25	48.78	GER	\$0.15	99.97 %	\$0.01
OEM CO2 Cleaning Line	10.80	1	0.25	51.85	GER	\$0.16	99.99 %	\$0.00
Hand Sanding	16.75	1	1.00	91.41	GER	\$0.43	99.96 %	\$0.01
Cure Paint	22.46	1	0.25	27.19	GER	\$0.17	99.97 %	\$0.01
Apply Base Coat	10.80	1	0.25	48.78	GER	\$0.15	99.97 %	\$0.01
OEM Plasma Surface Treatment Line	10.80	1	0.25	49.58	GER	\$0.15	99.98 %	\$0.00
Wash	9.00	1	0.25	27.16	GER	\$0.07	99.98 %	\$0.00
IR Cure	19.00	1	0.25	67.69	GER	\$0.36	99.96 %	\$0.01
OEM Adhesive Bead Station Auto	14.61	1	0.25	69.43	GER	\$0.28	99.93 %	\$0.01

Assemble Driver A-Pillar Exterior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.30
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.30
Adhesive, Driver A-Pillar Exterior Trim	1	Structural Adhesive - Polymer	\$17.94	0.0452	0.0452	\$0.00	\$0.81



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver A-Pillar Exterior Trim Installation

Process Summary

Right First Time	99.75 %
Process Time (Sec)	26.00
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.66
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.10
Manufacturing Cost*	\$0.82



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver A-Pillar Exterior Trim Installation



Driver A-Pillar Exterior Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	26.00	1	1.00	91.41	GER	\$0.66	99.75%	\$0.04

Driver A-Pillar Exterior Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x16mm-Pan Head Torx Bolt	1	Commodity Item	Purchased	0.0059	-	\$0.02	\$0.00

Driver Header Exterior Trim

\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Header Exterior Trim

Assembly Summary



Parts	14
Fasteners	0
Part Numbers	13
Steps	60
Fastenings	7
Right First Time	99.41 %
OEM Process Time (Min)	6.56
Supplier Process Time (Min)	0.05
Total Weight (kg)	1.24

Material Cost**	\$8.06
OEM Process Cost	\$6.93
Supplier Process Cost	\$0.03
Q Burden	\$0.09
SG&A	\$2.24
Manufacturing Cost*	\$17.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Header Exterior Trim



MUNRO
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Driver Header Exterior Trim

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Trim Asm, DriverHeader Exterior Trim Asm	1	6	2	42	2	99.61 %	1.65	3.40	0.00	0.00	1.2240
End Seal, DriverHeader Exterior Trim Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.05	0.0024
Assemble End Seal	1	2	2	5	2	99.93 %	0.26	0.00	0.00	0.00	0.0002
Trim Seal, DriverHeader Exterior Trim Asm	1	2	0	2	0	99.98 %	0.00	0.72	0.00	0.00	0.0058
Assemble Trim Seal	1	2	3	6	3	99.91 %	0.53	0.00	0.00	0.00	0.0051

Driver Header Exterior Trim

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Trim Asm, Driver Header Exterior Trim Asm	\$0.00	\$7.92	\$2.00	\$3.23	\$0.00	\$0.00	\$0.06	\$1.97	\$15.18
End Seal, DriverHeader Exterior Trim Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.06
Assemble End Seal	\$0.02	\$0.00	\$0.40	\$0.00	\$0.00	\$0.00	\$0.01	\$0.06	\$0.49
Trim Seal, DriverHeader Exterior Trim Asm	\$0.00	\$0.02	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.08	\$0.60
Assemble Trim Seal	\$0.08	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00	\$0.01	\$0.12	\$1.02

Detailed Summary

Parts	14
Fasteners	0
Part Numbers	13
Steps	60
Fastenings	7
Right First Time	99.41%
OEM Asm. Time (Min)	2.44
OEM Fab. Time (Min)	4.12
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.05
Total Weight (kg)	1.24
Purchased Part Cost	
	\$0.10
Material Cost	
	\$7.96
OEM Asm. Cost	
	\$3.20
OEM Fab. Cost	
	\$3.73
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.03
Q Burden	
	\$0.09
SG&A	
	\$2.24
Manufacturing Cost*	
	\$17.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...
 \Exterior Trim
 \Driver Header Exterior Trim
 \Trim Asm, Driver Header Exterior Trim Asm

Assembly Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	42
Fastenings	2
Right First Time	99.61 %
OEM Process Time (Min)	5.05
Supplier Process Time (Min)	0.00
Total Weight (kg)	1.22

Material Cost**	\$7.92
OEM Process Cost	\$5.23
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.97
Manufacturing Cost*	\$15.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Asm, Driver Header Exterior Trim Asm



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Trim Asm, Driver Header Exterior Trim Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Mounting Trim, Trim Asm	1	2	0	2	0	99.98 %	0.00	0.55	0.00	0.00	0.0626
Exterior Trim, Trim Asm	1	1	0	1	0	99.99 %	0.00	0.71	0.00	0.00	1.0418
Assemble Driver Header Exterior Trim	1	3	2	37	2	99.64 %	1.65	2.15	0.00	0.00	0.1196

Trim Asm, Driver Header Exterior Trim Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Mounting Trim, Trim Asm	\$0.00	\$0.22	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.11	\$0.83
Exterior Trim, Trim Asm	\$0.00	\$3.99	\$0.00	\$1.14	\$0.00	\$0.00	\$0.00	\$0.77	\$5.90
Assemble Driver Header Exterior Trim	\$0.00	\$3.71	\$2.00	\$1.59	\$0.00	\$0.00	\$0.05	\$1.09	\$8.45

Detailed Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	42
Fastenings	2
Right First Time	99.61%
OEM Asm. Time (Min)	1.65
OEM Fab. Time (Min)	3.40
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	1.22
Purchased Part Cost	
	\$0.00
Material Cost	\$7.92
OEM Asm. Cost	\$2.00
OEM Fab. Cost	\$3.23
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.97
Manufacturing Cost*	\$15.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...

- \Trim Asm, Driver Header Exterior Trim Asm
- \Mounting Trim, Trim Asm
- \Mounting Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	32.80
Total Weight (kg)	0.06

Material Cost**	\$0.22
OEM Process Cost	\$0.50
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.83

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

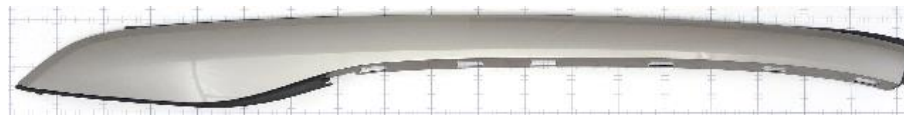
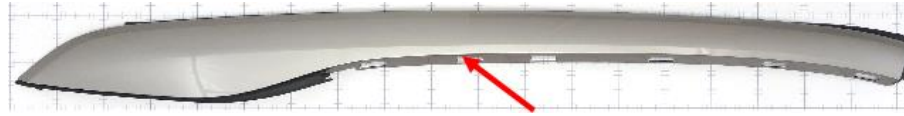
Mounting Trim, Trim Asm

Mounting Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	65.60	2	0.25	54.61	GER	\$0.50	99.98 %	\$0.00

Mounting Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Mounting Trim	1	ABS + PC GF20	\$3.59	0.0448	0.0448	\$0.00	\$0.17
Material 2, Mounting Trim	1	TPE	\$2.54	0.0178	0.0191	\$0.00	\$0.05



\...
 \Trim Asm, Driver Header Exterior Trim Asm
 \Exterior Trim, Trim Asm
 \Exterior Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	42.63
Total Weight (kg)	1.04

Material Cost**	\$3.99
OEM Process Cost	\$1.14
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.77
Manufacturing Cost*	\$5.90

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exterior Trim, Trim Asm

Exterior Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	42.63	1	0.25	96.50	GER	\$1.14	99.99%	\$0.00

Exterior Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Exterior Trim	1	ABS + PC GF20	\$3.59	1.0418	1.0418	\$0.00	\$3.99

Assemble Driver Header Exterior Trim



\...

\Driver Header Exterior Trim

\Trim Asm, Driver Header Exterior Trim Asm

\Assemble Driver Header Exterior Trim

Process Summary

Right First Time	99.64 %
Process Time (Sec)	227.55
Total Weight (kg)	0.12

Material Cost**	\$3.71
OEM Process Cost	\$3.59
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$1.09
Manufacturing Cost*	\$8.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Header Exterior Trim



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Assemble Driver Header Exterior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	22.46	1	0.25	27.19	GER	\$0.17	99.97 %	\$0.01
Apply Base Coat	24.96	1	0.25	62.44	GER	\$0.43	99.97 %	\$0.01
OEM CO2 Cleaning Line	18.96	1	0.25	51.85	GER	\$0.27	99.99 %	\$0.00
Hand Sanding	32.05	1	1.00	91.41	GER	\$0.81	99.96 %	\$0.01
Cure Paint	22.46	1	0.25	27.19	GER	\$0.17	99.97 %	\$0.01
Apply Base Coat	24.96	1	0.25	62.44	GER	\$0.43	99.97 %	\$0.01
OEM Plasma Surface Treatment Line	16.80	1	0.25	49.58	GER	\$0.23	99.98 %	\$0.00
Wash	15.00	1	0.25	27.16	GER	\$0.11	99.98 %	\$0.00
IR Cure	25.00	1	0.25	67.69	GER	\$0.47	99.96 %	\$0.01
OEM Adhesive Bead Station Auto	24.90	1	0.25	69.43	GER	\$0.48	99.93 %	\$0.01

Assemble Driver Header Exterior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.78
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.78
Adhesive, Driver Header Exterior Trim	1	Structural Adhesive - Polymer	\$17.94	0.1196	0.1196	\$0.00	\$2.15



\...

- \Driver Header Exterior Trim
- \End Seal, Driver Header Exterior Trim Asm
- \End Seal Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	3.26
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

End Seal, Driver Header Exterior Trim Asm



End Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	26.08	8	0.25	32.08	GER	\$0.03	99.98%	\$0.00

End Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, End Seal	1	PP GF30	\$2.71	0.0021	0.0022	\$0.00	\$0.01
Material 2, End Seal	1	TPE	\$2.54	0.0003	0.0003	\$0.00	\$0.01

Assemble End Seal



\...
\Exterior Trim
\Driver Header Exterior Trim
\Assemble End Seal

Process Summary

Right First Time	99.93 %
Process Time (Sec)	15.75
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.40
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.06
Manufacturing Cost*	\$0.49

* Excluding tooling, ER&D, logistics, and profit margin

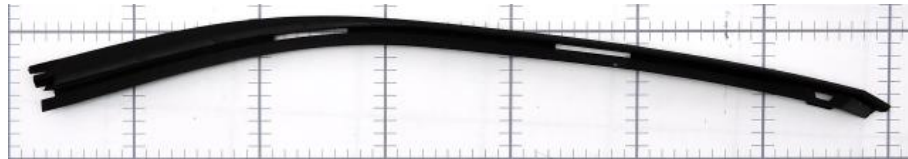
** Includes material cost and purchased parts cost

Assemble End Seal



Assemble End Seal									
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden	
OEM Manual Asm	15.75	1	1.00	91.41	GER	\$0.40	99.93%	\$0.01	

Assemble End Seal								
Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost	
10mmx10mm Double Side Tape	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00	
20mm x10mm Double Side Tape	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00	



\...

\Driver Header Exterior Trim
 \Trim Seal, Driver Header Exterior Trim Asm
 \Trim Seal Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	42.96
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.50
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Seal, Driver Header Exterior Trim Asm



MUNRO
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Trim Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	171.84	4	0.25	41.75	GER	\$0.50	99.98 %	\$0.00

Trim Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Trim Seal	1	PP GF30	\$2.71	0.0025	0.0027	\$0.00	\$0.01
Material 2, Trim Seal	1	PP/EPDM TD20	\$3.29	0.0033	0.0035	\$0.00	\$0.01

Assemble Trim Seal



\...
 \Exterior Trim
 \Driver Header Exterior Trim
 \Assemble Trim Seal

Process Summary

Right First Time	99.91 %
Process Time (Sec)	31.75
Total Weight (kg)	0.01
Material Cost**	\$0.08
OEM Process Cost	\$0.81
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.12
Manufacturing Cost*	\$1.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Trim Seal



Assemble Trim Seal

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	31.75	1	1.00	91.41	GER	\$0.81	99.91 %	\$0.01

Assemble Trim Seal

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
570mm x10mm Double Sided Tape	1	Commodity Item	Purchased	0.0050	-	\$0.03	\$0.00
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

No Commodity Items
Required for This
Process



\...
\Zone 2 Exterior
\Exterior Trim
\Driver Header Exterior Trim Installation

Process Summary

Right First Time	99.93 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.33
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Header Exterior Trim Installation



Driver Header Exterior Trim Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.00	1	1.00	91.41	GER	\$0.33	99.93%	\$0.01

Driver Header Exterior Trim Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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BMW Hood Badge Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \BMW Hood Badge Asm

Assembly Summary

Parts	13
Fasteners	0
Part Numbers	11
Steps	83
Fastenings	3
Right First Time	99.27 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.98
Total Weight (kg)	0.05

Material Cost**	\$0.90
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.31
Q Burden	\$0.11
SG&A	\$0.33
Manufacturing Cost*	\$2.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Hood Badge Asm



BMW Hood Badge Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
BMW Badge, BMW Hood Badge Asm	1	7	0	50	0	99.58 %	0.00	0.00	0.00	1.75	0.0207
BMW Badge Background, BMW Hood Badge Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.99	0.0270
Assemble Badge & Background	1	2	3	9	3	99.91 %	0.00	0.00	0.25	0.00	0.0033

BMW Hood Badge Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
BMW Badge, BMW Hood Badge Asm	\$0.00	\$0.13	\$0.00	\$0.00	\$0.00	\$0.81	\$0.06	\$0.14	\$1.14
BMW Badge Background, BMW Hood Badge Asm	\$0.00	\$0.69	\$0.00	\$0.00	\$0.00	\$0.40	\$0.03	\$0.16	\$1.28
Assemble Badge & Background	\$0.01	\$0.07	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$0.03	\$0.23

Detailed Summary

Parts	13
Fasteners	0
Part Numbers	11
Steps	83
Fastenings	3
Right First Time	99.27%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.25
Supplier Fab. Time (Min)	2.73
Total Weight (kg)	0.05
Purchased Part Cost	
	\$0.01
Material Cost	
	\$0.89
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.11
Supplier Fab. Cost	
	\$1.21
Q Burden	
	\$0.11
SG&A	
	\$0.33
Manufacturing Cost*	
	\$2.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Badge, BMW Hood Badge Asm



\...

- \BMW Hood Badge Asm
- \BMW Badge, BMW Hood Badge Asm
- \BMW Badge Process

Process Summary

Right First Time	99.58 %
Process Time (Sec)	104.77
Total Weight (kg)	0.02

Material Cost**	\$0.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.81
Q Burden	\$0.06
SG&A	\$0.14
Manufacturing Cost*	\$1.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Badge, BMW Hood Badge Asm



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BMW Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	9.01	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Clearcoat	4.64	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Basecoat, Black	8.45	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Basecoat, Black	4.64	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Basecoat, Blue	8.45	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Basecoat, Blue	4.40	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Basecoat, White	8.45	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Basecoat, White	4.40	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Primer	7.34	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Apply Primer	4.64	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Wash	9.00	1	0.25	30.69	GER	\$0.08	99.99 %	\$0.00
110 Ton Injection Molding Press	18.90	6	0.25	35.38	GER	\$0.03	99.99 %	\$0.00

BMW Badge Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Clearcoat, BMW Badge	1	Paint - Clearcoat		By Area	0.0000	-	\$0.00
Basecoat, Black, BMW Badge	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Basecoat, Blue, BMW Badge	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Basecoat, White, BMW Badge	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Primer, BMW Badge	1	Paint - Primer		By Area	0.0000	-	\$0.00
Material, Substrate, BMW Badge	1	PA6 GF15	\$4.52	0.0134	0.0134	\$0.00	\$0.06
Material, Front Plate, BMW Badge	1	Aluminum 6061 - Coil Stock	\$2.80	0.0073	0.0073	\$0.00	\$0.02

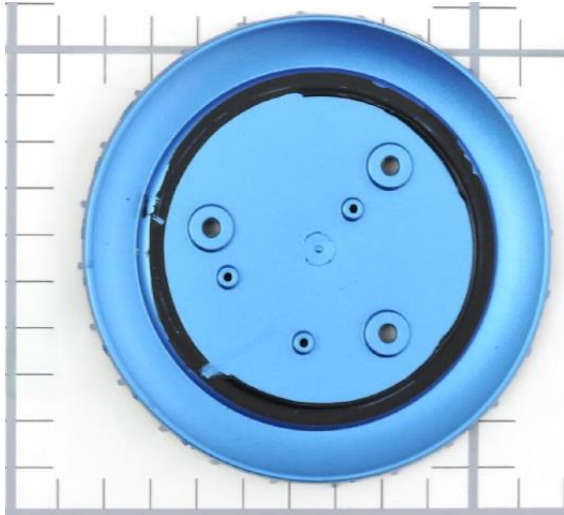
BMW Badge, BMW Hood Badge Asm



BMW Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	9.00	1	0.25	30.69	GER	\$0.08	99.99%	\$0.00
Polish	9.00	1	0.25	31.36	GER	\$0.08	99.99%	\$0.00
Debur	9.00	1	0.25	31.36	GER	\$0.08	99.99%	\$0.00
25 Ton Stamping Press	1.20	1	0.25	21.63	GER	\$0.01	99.99%	\$0.00

BMW Badge Background, BMW Hood Badge Asm



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\BMW Hood Badge Asm

\BMW Badge Background, BMW Hood Badge Asm

\BMW Badge Background Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	59.11
Total Weight (kg)	0.03

Material Cost**	\$0.69
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.40
Q Burden	\$0.03
SG&A	\$0.16
Manufacturing Cost*	\$1.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Badge Background, BMW Hood Badge Asm



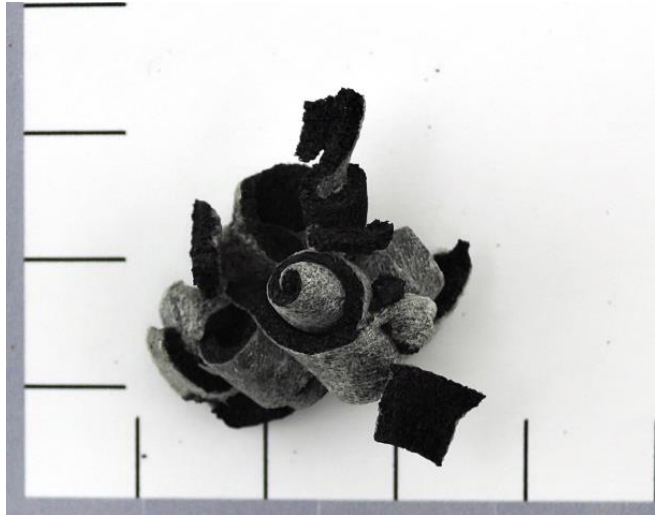
BMW Badge Background Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	14.80	1	0.25	17.08	GER	\$0.07	99.97 %	\$0.01
Apply Clearcoat	4.84	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Cure Basecoat	13.60	1	0.25	17.08	GER	\$0.06	99.97 %	\$0.01
Apply Basecoat	4.84	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Cure Primer	11.20	1	0.25	17.08	GER	\$0.05	99.97 %	\$0.01
Apply Primer	4.84	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
200 Ton Injection Molding Press	19.96	4	0.25	30.85	GER	\$0.04	99.99 %	\$0.00

BMW Badge Background Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.24
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.21
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.12
Material, BMW BadgeBackground	1	PA6 GF15	\$4.52	0.0270	0.0270	\$0.00	\$0.12

Assemble Badge & Background



\...

\Exterior Trim

\BMW Hood Badge Asm

\Assemble Badge & Background

Process Summary

Right First Time	99.91 %
Process Time (Sec)	14.88
Total Weight (kg)	0.00

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.23



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Badge & Background



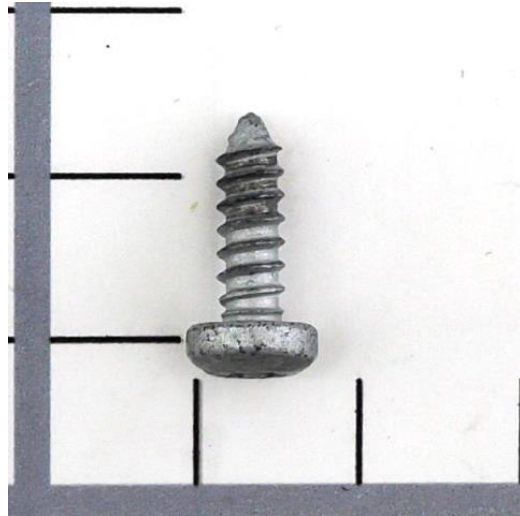
Assemble Badge & Background

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	14.88	1	0.25	25.62	GER	\$0.11	99.91 %	\$0.01

Assemble Badge & Background

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Adhesive, BMW BadgeAsm	1	Structural Adhesive - Mixed Materials	\$24.22	0.0028	0.0028	\$0.00	\$0.07
Foam Isolator Strip	1	Commodity Item	Purchased	0.0005	-	\$0.01	\$0.00

Assemble Hood Badge



\...
\Zone 2 Exterior
\Exterior Trim
\Assemble Hood Badge

Process Summary

Right First Time	99.78 %
Process Time (Sec)	16.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.41
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.06
Manufacturing Cost*	\$0.53



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Hood Badge



Assemble Hood Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	16.00	1	1.00	91.41	GER	\$0.41	99.78 %	\$0.03

Assemble Hood Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x13mm-Pan Head Torx	1	Commodity Item	Purchased	0.0014	-	\$0.03	\$0.00

BMW Liftgate Badge



\...
 \Zone 2 Exterior
 \Exterior Trim
 \BMW Liftgate Badge

Assembly Summary

Parts	18
Fasteners	0
Part Numbers	16
Steps	111
Fastenings	5
Right First Time	99.01 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	3.90
Total Weight (kg)	0.07

Material Cost**	\$1.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.71
Q Burden	\$0.15
SG&A	\$0.42
Manufacturing Cost*	\$3.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Liftgate Badge



MUNRO
& ASSOCIATES, INC.

BMW Liftgate Badge

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
BMW Badge, BMW Liftgate Badge Asm	1	7	0	50	0	99.58 %	0.00	0.00	0.00	1.75	0.0207
BMW Badge Background, BMW Liftgate Badge Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.93	0.0259
Assemble Badge & Background	1	1	2	5	2	99.96 %	0.00	0.00	0.06	0.00	0.0028
Mounting Plate, BMW Liftgate Badge Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0153
Assemble BMW Mounting Plate	1	1	2	4	2	99.95 %	0.00	0.00	0.17	0.00	0.0010
Outer Trim, BMW Liftgate Badge Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.89	0.0076
Assemble BMW Badge Outer Trim	1	0	1	3	1	99.98 %	0.00	0.00	0.07	0.00	0.0000

BMW Liftgate Badge

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
BMW Badge, BMW Liftgate Badge Asm	\$0.00	\$0.13	\$0.00	\$0.00	\$0.00	\$0.81	\$0.06	\$0.14	\$1.14
BMW Badge Background, BMW Liftgate Badge Asm	\$0.00	\$0.16	\$0.00	\$0.00	\$0.00	\$0.39	\$0.03	\$0.08	\$0.67
Assemble Badge & Background	\$0.00	\$0.07	\$0.00	\$0.00	\$0.02	\$0.00	\$0.01	\$0.01	\$0.11
Mounting Plate, BMW Liftgate Badge Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.11
Assemble BMW Mounting Plate	\$0.01	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.01	\$0.01	\$0.10
Outer Trim, BMW Liftgate Badge Asm	\$0.00	\$0.66	\$0.00	\$0.00	\$0.00	\$0.36	\$0.03	\$0.15	\$1.20
Assemble BMW Badge Outer Trim	\$0.00	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.04

Detailed Summary

Parts	18
Fasteners	0
Part Numbers	16
Steps	111
Fastenings	5
Right First Time	99.01%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.29
Supplier Fab. Time (Min)	3.61
Total Weight (kg)	0.07
Purchased Part Cost	
	\$0.01
Material Cost	\$1.09
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.12
Supplier Fab. Cost	\$1.58
Q Burden	\$0.15
SG&A	\$0.42
Manufacturing Cost*	\$3.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \BMW Liftgate Badge
- \BMW Badge, BMW Liftgate Badge Asm
- \BMW Badge Process

Process Summary

Right First Time	99.58 %
Process Time (Sec)	104.77
Total Weight (kg)	0.02

Material Cost**	\$0.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.81
Q Burden	\$0.06
SG&A	\$0.14
Manufacturing Cost*	\$1.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Badge, BMW Liftgate Badge Asm



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BMW Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	9.01	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Clearcoat	4.64	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Basecoat, Black	8.45	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Basecoat, Black	4.64	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Basecoat, Blue	8.45	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Basecoat, Blue	4.40	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Basecoat, White	8.45	1	0.25	17.08	GER	\$0.04	99.97 %	\$0.01
Apply Basecoat, White	4.40	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Cure Primer	7.34	1	0.25	17.08	GER	\$0.03	99.97 %	\$0.01
Apply Primer	4.64	1	0.25	41.62	GER	\$0.05	99.97 %	\$0.01
Wash	9.00	1	0.25	30.69	GER	\$0.08	99.99 %	\$0.00
110 Ton Injection Molding Press	18.90	6	0.25	35.38	GER	\$0.03	99.99 %	\$0.00

BMW Badge Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Clearcoat, BMW Badge	1	Paint - Clearcoat		By Area	0.0000	-	\$0.00
Basecoat, Black, BMW Badge	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Basecoat, Blue, BMW Badge	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Basecoat, White, BMW Badge	1	Paint - Basecoat		By Area	0.0000	-	\$0.00
Primer, BMW Badge	1	Paint - Primer		By Area	0.0000	-	\$0.00
Material, Substrate, BMW Badge	1	PA6 GF15	\$4.52	0.0134	0.0134	\$0.00	\$0.06
Material, Front Plate, BMW Badge	1	Aluminum 6061 - Coil Stock	\$2.80	0.0073	0.0073	\$0.00	\$0.02

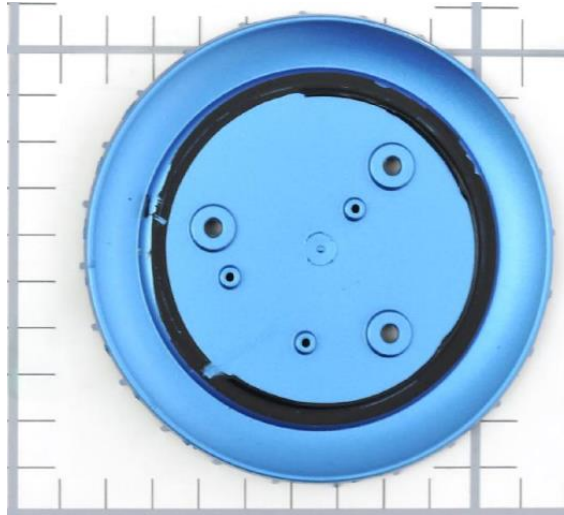
BMW Badge, BMW Liftgate Badge Asm



BMW Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	9.00	1	0.25	30.69	GER	\$0.08	99.99%	\$0.00
Polish	9.00	1	0.25	31.36	GER	\$0.08	99.99%	\$0.00
Debur	9.00	1	0.25	31.36	GER	\$0.08	99.99%	\$0.00
25 Ton Stamping Press	1.20	1	0.25	21.63	GER	\$0.01	99.99%	\$0.00

BMW Badge Background, BMW Liftgate Badge Asm



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- \BMW Liftgate Badge
- \BMW Badge Background, BMW Liftgate Badge Asm
- \BMW Badge Background Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	55.84
Total Weight (kg)	0.03

Material Cost**	\$0.16
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.39
Q Burden	\$0.03
SG&A	\$0.08
Manufacturing Cost*	\$0.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Badge Background, BMW Liftgate Badge Asm



BMW Badge Background Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	13.82	1	0.25	17.08	GER	\$0.07	99.97 %	\$0.01
Apply Clearcoat	4.76	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Cure Basecoat	12.73	1	0.25	17.08	GER	\$0.06	99.97 %	\$0.01
Apply Basecoat	4.76	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Cure Primer	10.55	1	0.25	17.08	GER	\$0.05	99.97 %	\$0.01
Apply Primer	4.76	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
300 Ton Injection Molding Press	26.76	6	0.25	39.50	GER	\$0.05	99.99 %	\$0.00

BMW Badge Background Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Clearcoat	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.02
Material, Basecoat	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.02
Primer, BMW BadgeBackground	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, BMW BadgeBackground	1	PA6 GF30	\$4.10	0.0259	0.0259	\$0.00	\$0.11

No Commodity Items
Required for This
Process



\...

\Exterior Trim

\BMW Liftgate Badge

\Assemble Badge & Background

Process Summary

Right First Time	99.96 %
Process Time (Sec)	3.38
Total Weight (kg)	0.00

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Badge & Background



Assemble Badge & Background

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	3.38	1	0.25	25.62	GER	\$0.02	99.96%	\$0.01

Assemble Badge & Background

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Adhesive, BMW BadgeAsm	1	Structural Adhesive - Mixed Materials	\$24.22	0.0028	0.0028	\$0.00	\$0.07

Mounting Plate, BMW Liftgate Badge Asm



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- \BMW Liftgate Badge
- \Mounting Plate, BMW Liftgate Badge Asm
- \Mounting Plate Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.37
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Mounting Plate, BMW Liftgate Badge Asm



Mounting Plate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	14.22	6	0.25	39.50	GER	\$0.03	99.99%	\$0.00

Mounting Plate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Mounting Plate	1	PA6	\$4.39	0.0153	0.0153	\$0.00	\$0.07

Assemble BMW Mounting Plate



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\Exterior Trim

\BMW Liftgate Badge

\Assemble BMW Mounting Plate

Process Summary

Right First Time	99.95 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble BMW Mounting Plate



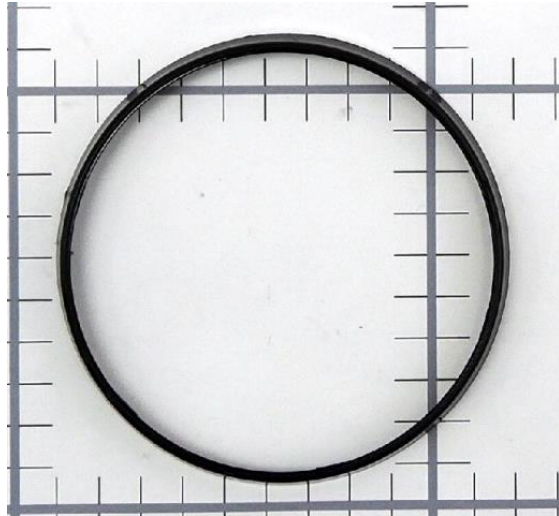
Assemble BMW Mounting Plate

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	10.00	1	0.25	25.62	GER	\$0.07	99.95%	\$0.01

Assemble BMW Mounting Plate

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Side Tape, BMW Badge Mounting Plate	1	Commodity Item	Purchased	0.0010	-	\$0.01	\$0.00

Outer Trim, BMW Liftgate Badge Asm



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- \BMW Liftgate Badge
- \Outer Trim, BMW Liftgate Badge Asm
- \Outer Trim Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	53.40
Total Weight (kg)	0.01

Material Cost**	\$0.66
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.36
Q Burden	\$0.03
SG&A	\$0.15
Manufacturing Cost*	\$1.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Trim, BMW Liftgate Badge Asm



Outer Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	13.82	1	0.25	17.08	GER	\$0.07	99.97 %	\$0.01
Apply Clearcoat	4.88	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Cure Basecoat	12.73	1	0.25	17.08	GER	\$0.06	99.97 %	\$0.01
Apply Basecoat	4.88	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
Cure Primer	10.55	1	0.25	17.08	GER	\$0.05	99.97 %	\$0.01
Apply Primer	4.88	1	0.25	41.62	GER	\$0.06	99.97 %	\$0.01
110 Ton Injection Molding Press	9.96	6	0.25	26.65	GER	\$0.01	99.99 %	\$0.00

Outer Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.27
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.23
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.13
Material, Outer Trim	1	PA6	\$4.39	0.0076	0.0076	\$0.00	\$0.03

No Commodity Items
Required for This
Process



\...

- \Exterior Trim
 - \BMW Liftgate Badge
 - \Assemble BMW Badge Outer Trim

Process Summary

Right First Time	99.98 %
Process Time (Sec)	4.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble BMW Badge Outer Trim



Assemble BMW Badge Outer Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	4.00	1	0.25	25.62	GER	\$0.03	99.98 %	\$0.00

Assemble BMW Badge Outer Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process

\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble Liftgate Badge

Process Summary

Right First Time	99.95 %
Process Time (Sec)	18.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.46
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.07
Manufacturing Cost*	\$0.53



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Liftgate Badge



Assemble Liftgate Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	18.00	1	1.00	91.41	GER	\$0.46	99.95%	\$0.01

Assemble Liftgate Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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E-Drive Badge Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \E-Drive Badge Asm

Assembly Summary

Parts	11
Fasteners	0
Part Numbers	11
Steps	56
Fastenings	2
Right First Time	99.39 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.92
Total Weight (kg)	0.00

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.57
Q Burden	\$0.09
SG&A	\$0.10
Manufacturing Cost*	\$0.87

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

E-Drive Badge Asm



E-Drive Badge Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
E Badge, E-Drive Badge Asm	1	5	0	24	0	99.77 %	0.00	0.00	0.00	0.26	0.0012
Drive Badge, E-DriveBadge Asm	1	5	0	24	0	99.77 %	0.00	0.00	0.00	0.36	0.0024
Assemble E-Drive Badge	1	1	2	6	2	99.85 %	0.00	0.00	0.30	0.00	0.0002

E-Drive Badge Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
E Badge, E-Drive Badge Asm	\$0.00	\$0.05	\$0.00	\$0.00	\$0.00	\$0.13	\$0.03	\$0.03	\$0.24
Drive Badge, E-DriveBadge Asm	\$0.00	\$0.05	\$0.00	\$0.00	\$0.00	\$0.17	\$0.03	\$0.03	\$0.29
Assemble E-Drive Badge	\$0.01	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.02	\$0.04	\$0.35

Detailed Summary

Parts	11
Fasteners	0
Part Numbers	11
Steps	56
Fastenings	2
Right First Time	99.39%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.62
Total Weight (kg)	0.00
Purchased Part Cost	\$0.01
Material Cost	\$0.10
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.27
Supplier Fab. Cost	\$0.30
Q Burden	\$0.09
SG&A	\$0.10
Manufacturing Cost*	\$0.87

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

E Badge, E-Drive Badge Asm



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- \E-Drive Badge Asm
- \E Badge, E-Drive Badge Asm
- \E Badge Process

Process Summary

Right First Time	99.77 %
Process Time (Sec)	15.77
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



E Badge, E-Drive Badge Asm



MUNRO
& ASSOCIATES, INC.

E Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	2.29	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Clearcoat	2.22	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	2.26	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Basecoat	2.22	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	2.19	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Primer	2.22	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
55 Ton Injection Molding Press	14.08	8	0.25	32.44	GER	\$0.02	99.99 %	\$0.00
25 Ton Stamping Press	0.60	1	0.25	21.63	GER	\$0.00	99.99 %	\$0.00

E Badge Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, E Badge	1	ABS + PC	\$3.40	0.0002	0.0002	\$0.00	\$0.01
Material, E Badge	1	Aluminum 6061 - Coil Stock	\$2.80	0.0010	0.0010	\$0.00	\$0.01

Drive Badge, E-Drive Badge Asm



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\E-Drive Badge Asm

\Drive Badge, E-Drive Badge Asm

\Drive Badge Process

Process Summary

Right First Time	99.77 %
Process Time (Sec)	21.43
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.17
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Drive Badge, E-Drive Badge Asm



Drive Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	3.73	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Clearcoat	2.88	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	3.54	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Basecoat	2.88	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	3.15	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Primer	2.88	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
55 Ton Injection Molding Press	14.16	8	0.25	32.44	GER	\$0.02	99.99 %	\$0.00
25 Ton Stamping Press	0.60	1	0.25	21.63	GER	\$0.00	99.99 %	\$0.00

Drive Badge Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Drive Badge	1	ABS + PC	\$3.40	0.0004	0.0004	\$0.00	\$0.01
Material, Drive Badge	1	Aluminum 6061 - Coil Stock	\$2.80	0.0020	0.0020	\$0.00	\$0.01

Assemble E-Drive Badge



\...
\Exterior Trim
\E-Drive Badge Asm
\Assemble E-Drive Badge

Process Summary

Right First Time	99.85 %
Process Time (Sec)	18.10
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.35



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble E-Drive Badge



Assemble E-Drive Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	18.10	1	1.00	54.32	GER	\$0.27	99.85%	\$0.02

Assemble E-Drive Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, E-Drive Badge	1	Commodity Item	Purchased	0.0002	-	\$0.01	\$0.00

No Commodity Items
Required for This
Process

- \...
- \Zone 2 Exterior
- \Exterior Trim
- \Assemble E-Drive Badge

Process Summary

Right First Time	99.96 %
Process Time (Sec)	8.10
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.21
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.24



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble E-Drive Badge To Liftgate



Assemble E-Drive Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	8.10	1	1.00	91.41	GER	\$0.21	99.96%	\$0.01

Assemble E-Drive Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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3 Badge, 3 Badge Asm



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- \3 Badge Asm
- \3 Badge, 3 Badge Asm
- \3 Badge Process

Process Summary

Right First Time	99.77 %
Process Time (Sec)	16.19
Total Weight (kg)	0.00
Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

3 Badge, 3 Badge Asm



3 Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	2.43	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Clearcoat	2.24	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	2.38	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Basecoat	2.24	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	2.29	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Primer	2.24	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
55 Ton Injection Molding Press	14.16	8	0.25	23.71	GER	\$0.01	99.99 %	\$0.00
25 Ton Stamping Press	0.60	1	0.25	21.63	GER	\$0.00	99.99 %	\$0.00

3 Badge Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, 3 Badge	1	ABS + PC	\$3.40	0.0007	0.0007	\$0.00	\$0.01
Material, 3 Badge	1	Aluminum 6061 - Coil Stock	\$2.80	0.0010	0.0010	\$0.00	\$0.02

3 Badge Asm



\...
\Exterior Trim
\3 Badge Asm
\Assemble 3 Badge

Process Summary

Right First Time	99.97 %
Process Time (Sec)	3.65
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.04
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

3 Badge Asm

Assemble 3 Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Automated Asm	3.65	1	0.25	41.01	GER	\$0.04	99.97%	\$0.00

Assemble 3 Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, 3 Badge	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

No Commodity Items Required for This Process



\...
\Zone 2 Exterior
\Exterior Trim
\Assemble 3 Badge

Process Summary

Right First Time	99.96 %
Process Time (Sec)	6.65
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.17
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble 3 Badge



Assemble 3 Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	6.65	1	1.00	91.41	GER	\$0.17	99.96%	\$0.01

Assemble 3 Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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\...
 \Zone 2 Exterior
 \Exterior Trim
 \i Badge Asm

Assembly Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	28
Fastenings	1
Right First Time	99.75 %
OEM Process Time (Min)	0.07
Supplier Process Time (Min)	0.30
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.05
Supplier Process Cost	\$0.14
Q Burden	\$0.04
SG&A	\$0.03
Manufacturing Cost*	\$0.31

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

i Badge Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
i Badge, i Badge Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.30	0.0030
Assemble i Badge	1	1	1	5	1	99.97 %	0.07	0.00	0.00	0.00	0.0002

i Badge Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
i Badge, i Badge Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.14	\$0.03	\$0.03	\$0.24
Assemble i Badge	\$0.01	\$0.00	\$0.05	\$0.00	\$0.00	\$0.00	\$0.00	\$0.01	\$0.07

Detailed Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	28
Fastenings	1
Right First Time	99.75%
OEM Asm. Time (Min)	0.07
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.30
Total Weight (kg)	0.00
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Purchased Part Cost	\$0.01
Material Cost	\$0.04
OEM Asm. Cost	\$0.05
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.14
Q Burden	\$0.04
SG&A	\$0.03
Manufacturing Cost*	\$0.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

i Badge, i Badge Asm



\...

- \i Badge Asm
- \i Badge, i Badge Asm
- \i Badge Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	18.08
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

i Badge, i Badge Asm

i Badge Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	2.69	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Clearcoat	2.34	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	2.62	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Basecoat	2.34	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	2.46	1	0.25	17.08	GER	\$0.01	99.97 %	\$0.01
Apply Primer	2.34	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
55 Ton Injection Molding Press	26.40	8	0.25	23.71	GER	\$0.02	99.99 %	\$0.00

i Badge Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, i Badge	1	PA6 GF15	\$4.52	0.0030	0.0030	\$0.00	\$0.01



- \...
- \Exterior Trim
- \i Badge Asm
- \Assemble i Badge

Process Summary

Right First Time	99.97 %
Process Time (Sec)	4.05
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.05
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble i Badge



Assemble i Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Automated Asm	4.05	1	0.25	41.01	GER	\$0.05	99.97%	\$0.00

Assemble i Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, i Badge	1	Commodity Item	Purchased	0.0002	-	\$0.01	\$0.00

No Commodity Items Required for This Process



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble i Badge

Process Summary

Right First Time	99.96 %
Process Time (Sec)	7.05
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.18
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble i Badge To Liftgate



Assemble i Badge

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	7.05	1	1.00	91.41	GER	\$0.18	99.96%	\$0.01

Assemble i Badge

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Rear Wheel Well Liner



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Rear Wheel Well Liner

Assembly Summary

Parts	9
Fasteners	5
Part Numbers	6
Steps	25
Fastenings	4
Right First Time	99.70 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.71
Total Weight (kg)	1.01

Material Cost**	\$4.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.93
Q Burden	\$0.05
SG&A	\$0.93
Manufacturing Cost*	\$7.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Wheel Well Liner



MUNRO
& ASSOCIATES, INC.

Driver Rear Wheel Well Liner

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Front Liner, DriverRear Wheel Well Liner Asm	1	2	0	6	0	99.95 %	0.00	0.00	0.00	0.48	0.4840
Rear Liner, DriverRear Wheel Well Liner Asm	1	2	0	6	0	99.95 %	0.00	0.00	0.00	0.50	0.6200
Assemble Driver RearWheel Well Liner	1	5	4	11	4	99.80 %	0.00	0.00	0.73	0.00	0.0079

Driver Rear Wheel Well Liner

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Front Liner, Driver Rear Wheel Well Liner Asm	\$0.00	\$2.07	\$0.00	\$0.00	\$0.00	\$0.62	\$0.01	\$0.40	\$3.10
Rear Liner, DriverRear Wheel Well Liner Asm	\$0.00	\$2.13	\$0.00	\$0.00	\$0.00	\$0.64	\$0.01	\$0.42	\$3.20
Assemble Driver RearWheel Well Liner	\$0.34	\$0.00	\$0.00	\$0.00	\$0.66	\$0.00	\$0.03	\$0.11	\$1.14

Detailed Summary

Parts	9
Fasteners	5
Part Numbers	6
Steps	25
Fastenings	4
Right First Time	99.7%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.73
Supplier Fab. Time (Min)	0.98
Total Weight (kg)	1.01
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Purchased Part Cost	\$0.34
Material Cost	\$4.20
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.66
Supplier Fab. Cost	\$1.26
Q Burden	\$0.05
SG&A	\$0.93
Manufacturing Cost*	\$7.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Liner, Driver Rear Wheel Well Liner Asm



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- \Driver Rear Wheel Well Liner
- \Front Liner, Driver Rear Wheel Well Liner Asm
- \Front Liner Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	28.90
Total Weight (kg)	0.48

Material Cost**	\$2.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.62
Q Burden	\$0.01
SG&A	\$0.40
Manufacturing Cost*	\$3.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Front Liner, Driver Rear Wheel Well Liner Asm



Front Liner Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	23.70	1	0.25	89.76	GER	\$0.59	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Front Liner Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, FrontLiner	1	PP/EPDM MD10	\$3.57	0.4700	0.4700	\$0.00	\$1.68
Material 1, FrontLiner	1	Felt (Low Quality)	By Area	0.0140	-	\$0.00	\$0.39

Rear Liner, Driver Rear Wheel Well Liner Asm



\...

- \Driver Rear Wheel Well Liner
- \Rear Liner, Driver Rear Wheel Well Liner Asm
- \Rear Liner Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	29.95
Total Weight (kg)	0.52

Material Cost**	\$2.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.64
Q Burden	\$0.01
SG&A	\$0.42
Manufacturing Cost*	\$3.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Rear Liner, Driver Rear Wheel Well Liner Asm



Rear Liner Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	24.75	1	0.25	89.76	GER	\$0.62	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Rear Liner Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Rear Liner	1	PP/EPDM MD10	\$3.57	0.5100	0.5100	\$0.00	\$1.82
Material 1, RearLiner	1	Felt (Low Quality)	By Area	0.0100	-	\$0.00	\$0.31

Assemble Driver Rear Wheel Well Liner



- \...
- \Exterior Trim
 - \Driver Rear Wheel Well Liner
 - \Assemble Driver Rear Wheel Well Liner

Process Summary

Right First Time	99.80 %
Process Time (Sec)	44.00
Total Weight (kg)	0.01

Material Cost**	\$0.34
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.66
Q Burden	\$0.03
SG&A	\$0.11
Manufacturing Cost*	\$1.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Driver Rear Wheel Well Liner



MUNRO
& ASSOCIATES, INC.

Assemble Driver Rear Wheel Well Liner

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	44.00	1	1.00	54.32	GER	\$0.66	99.80%	\$0.03

Assemble Driver Rear Wheel Well Liner

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
2-Stage Push Pin	3	Commodity Item	Purchased	0.0009	-	\$0.06	\$0.00
Plastic J-Nut White	2	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00



\...

\Zone 2 Exterior

\Exterior Trim

\Driver Rear Wheel Well Liner Installation

Process Summary

Right First Time	96.75 %
Process Time (Sec)	193.00
Total Weight (kg)	0.10

Material Cost**	\$0.48
OEM Process Cost	\$4.90
Supplier Process Cost	\$0.00
Q Burden	\$0.50
SG&A	\$0.75
Manufacturing Cost*	\$6.63

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Wheel Well Liner Installation



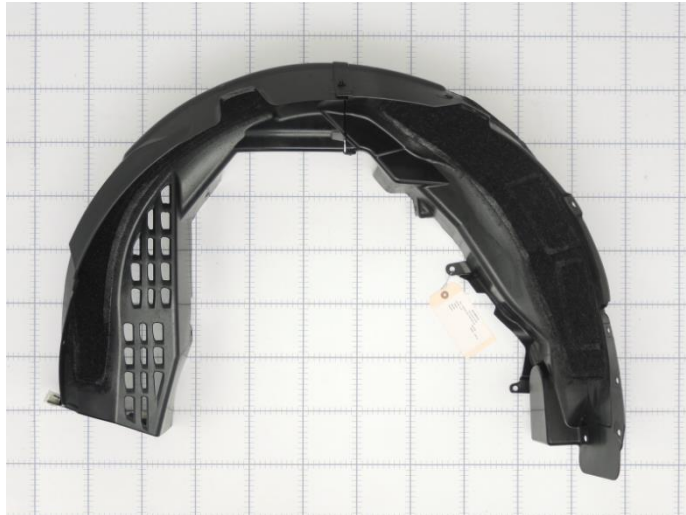
Driver Rear Wheel Well Liner Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	193.00	1	1.00	91.41	GER	\$4.90	96.75%	\$0.50

Driver Rear Wheel Well Liner Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x11 Plastic Hex Flange Nut	2	Commodity Item	Purchased	0.0014	-	\$0.03	\$0.00
M5x19mm-Hex SEMS Screw	14	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Passenger Rear Wheel Well Liner



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Rear Wheel Well Liner
Assembly Summary

Parts	9
Fasteners	5
Part Numbers	6
Steps	25
Fastenings	4
Right First Time	99.70 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.71
Total Weight (kg)	1.01

Material Cost**	\$4.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.93
Q Burden	\$0.05
SG&A	\$0.93
Manufacturing Cost*	\$7.44

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost



Passenger Rear Wheel Well Liner



MUNRO
& ASSOCIATES, INC.

Passenger Rear Wheel Well Liner

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Front Liner, Passenger Rear Wheel Well Liner Asm	1	2	0	6	0	99.95 %	0.00	0.00	0.00	0.48	0.4840
Rear Liner, Passenger Rear Wheel Well Liner Asm	1	2	0	6	0	99.95 %	0.00	0.00	0.00	0.50	0.5200
Assemble Passenger Rear Wheel Well Liner	1	5	4	11	4	99.80 %	0.00	0.00	0.73	0.00	0.0079

Passenger Rear Wheel Well Liner

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Front Liner, Passenger Rear Wheel Well Liner Asm	\$0.00	\$2.07	\$0.00	\$0.00	\$0.00	\$0.62	\$0.01	\$0.40	\$3.10
Rear Liner, Passenger Rear Wheel Well Liner Asm	\$0.00	\$2.13	\$0.00	\$0.00	\$0.00	\$0.64	\$0.01	\$0.42	\$3.20
Assemble Passenger Rear Wheel Well Liner	\$0.34	\$0.00	\$0.00	\$0.00	\$0.66	\$0.00	\$0.03	\$0.11	\$1.14

Detailed Summary

Parts	9
Fasteners	5
Part Numbers	6
Steps	25
Fastenings	4
Right First Time	99.7%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.73
Supplier Fab. Time (Min)	0.98
Total Weight (kg)	1.01
Purchased Part Cost	
	\$0.34
Material Cost	
	\$4.20
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.66
Supplier Fab. Cost	
	\$1.26
Q Burden	
	\$0.05
SG&A	
	\$0.93
Manufacturing Cost*	
	\$7.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Liner, Passenger Rear Wheel Well Liner Asm



\...

- \Passenger Rear Wheel Well Liner
- \Front Liner, Passenger Rear Wheel Well Liner Asm
- \Front Liner Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	28.90
Total Weight (kg)	0.48

Material Cost**	\$2.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.62
Q Burden	\$0.01
SG&A	\$0.40
Manufacturing Cost*	\$3.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Front Liner, Passenger Rear Wheel Well Liner Asm



Front Liner Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	23.70	1	0.25	89.76	GER	\$0.59	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Front Liner Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, FrontLiner	1	PP/EPDM MD10	\$3.57	0.4700	0.4700	\$0.00	\$1.68
Material 1, FrontLiner	1	Felt (Low Quality)	By Area	0.0140	-	\$0.00	\$0.39

Rear Liner, Passenger Rear Wheel Well Liner Asm



\...

- \Passenger Rear Wheel Well Liner
 - \Rear Liner, Passenger Rear Wheel Well Liner Asm
 - \Rear Liner Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	29.95
Total Weight (kg)	0.52

Material Cost**	\$2.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.64
Q Burden	\$0.01
SG&A	\$0.42
Manufacturing Cost*	\$3.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Rear Liner, Passenger Rear Wheel Well Liner Asm



Rear Liner Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	24.75	1	0.25	89.76	GER	\$0.62	99.99%	\$0.00
Die Cut Machine	5.20	1	0.25	19.09	GER	\$0.03	99.97%	\$0.01

Rear Liner Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Rear Liner	1	PP/EPDM MD10	\$3.57	0.5100	0.5100	\$0.00	\$1.82
Material 1, RearLiner	1	Felt (Low Quality)	By Area	0.0100	-	\$0.00	\$0.31

Assemble Passenger Rear Wheel Well Liner



- \...
- \Exterior Trim
- \Passenger Rear Wheel Well Liner
- \Assemble Passenger Rear Wheel Well Liner

Process Summary

Right First Time	99.80 %
Process Time (Sec)	44.00
Total Weight (kg)	0.01

Material Cost**	\$0.34
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.66
Q Burden	\$0.03
SG&A	\$0.11
Manufacturing Cost*	\$1.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Passenger Rear Wheel Well Liner



Assemble Passenger Rear Wheel Well Liner

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	44.00	1	1.00	54.32	GER	\$0.66	99.80%	\$0.03

Assemble Passenger Rear Wheel Well Liner

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
2-Stage Push Pin	3	Commodity Item	Purchased	0.0009	-	\$0.06	\$0.00
Plastic J-Nut White	2	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00

Passenger Rear Wheel Well Liner Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Rear Wheel Well Liner Installation

Process Summary

Right First Time	97.15 %
Process Time (Sec)	171.00
Total Weight (kg)	0.09

Material Cost**	\$0.42
OEM Process Cost	\$4.34
Supplier Process Cost	\$0.00
Q Burden	\$0.43
SG&A	\$0.66
Manufacturing Cost*	\$5.86



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Wheel Well Liner Installation

Passenger Rear Wheel Well Liner Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	171.00	1	1.00	91.41	GER	\$4.34	97.15%	\$0.43

Passenger Rear Wheel Well Liner Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x11 Plastic Hex Flange Nut	2	Commodity Item	Purchased	0.0014	-	\$0.03	\$0.00
M5x19mm-Hex SEMS Screw	12	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Driver Rear Quarter Panel Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Rear Quarter Panel Asm

Assembly Summary

Parts	16
Fasteners	8
Part Numbers	10
Steps	74
Fastenings	13
Right First Time	99.22 %
OEM Process Time (Min)	21.33
Supplier Process Time (Min)	1.00
Total Weight (kg)	2.64

Material Cost**	\$11.22
OEM Process Cost	\$15.46
Supplier Process Cost	\$0.60
Q Burden	\$0.12
SG&A	\$4.05
Manufacturing Cost*	\$31.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Driver Rear Quarter Panel Asm



Driver Rear Quarter Panel Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Rear Quarter Asm, Driver Rear Quarter Panel Asm	1	5	2	45	2	99.57 %	1.26	18.88	0.00	0.00	2.5000
Seal, Driver Rear Quarter Panel Asm	1	3	0	5	0	99.97 %	0.00	0.00	0.00	1.00	0.1250
Assemble Seal	1	8	11	22	11	99.68 %	1.20	0.00	0.00	0.00	0.0199

Driver Rear Quarter Panel Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Rear Quarter Asm, Driver Rear Quarter Panel Asm	\$0.00	\$10.37	\$1.49	\$12.14	\$0.00	\$0.00	\$0.06	\$3.60	\$27.66
Seal, Driver Rear Quarter Panel Asm	\$0.00	\$0.55	\$0.00	\$0.00	\$0.00	\$0.60	\$0.01	\$0.17	\$1.32
Assemble Seal	\$0.30	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$0.05	\$0.28	\$2.46

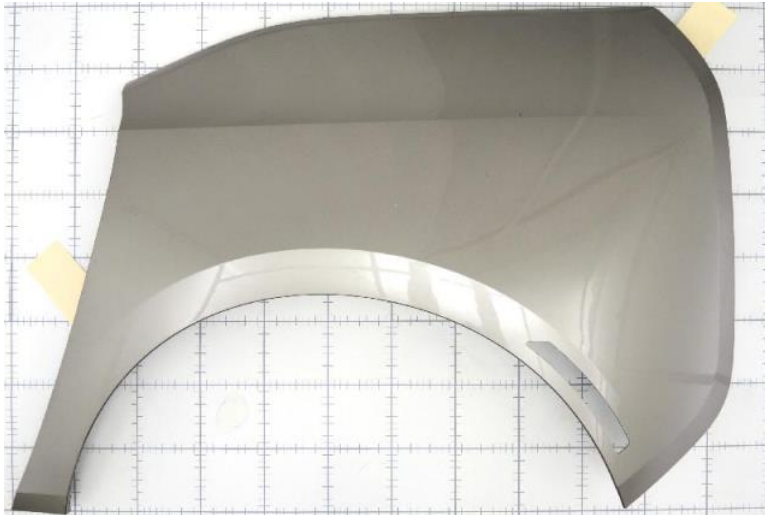
Detailed Summary

Parts	16
Fasteners	8
Part Numbers	10
Steps	74
Fastenings	13
Right First Time	99.22%
OEM Asm. Time (Min)	2.46
OEM Fab. Time (Min)	18.88
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	1.00
Total Weight (kg)	2.64
Purchased Part Cost	\$0.30
Material Cost	\$10.92
OEM Asm. Cost	\$3.32
OEM Fab. Cost	\$12.14
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.60
Q Burden	\$0.12
SG&A	\$4.05
Manufacturing Cost*	\$31.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Quarter Asm, Driver Rear Quarter Panel Asm



\...

\Exterior Trim

\Driver Rear Quarter Panel Asm

\Rear Quarter Asm, Driver Rear Quarter Panel Asm

Assembly Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	45
Fastenings	2
Right First Time	99.57 %
OEM Process Time (Min)	20.13
Supplier Process Time (Min)	0.00
Total Weight (kg)	2.50

Material Cost**	\$10.37
OEM Process Cost	\$13.63
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.60
Manufacturing Cost*	\$27.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Rear Quarter Asm, Driver Rear Quarter Panel Asm



Rear Quarter Asm, Driver Rear Quarter Panel Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Inner Quarter, Rear Quarter Asm	1	1	0	1	0	99.99 %	0.00	0.55	0.00	0.00	0.3082
Outer Quarter, Rear Quarter Asm	1	1	0	1	0	99.99 %	0.00	0.93	0.00	0.00	2.0582
Assemble Driver Rear Quarter Inner & Outer	1	3	2	41	2	99.59 %	1.26	17.40	0.00	0.00	0.1336

Rear Quarter Asm, Driver Rear Quarter Panel Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Inner Quarter, Rear Quarter Asm	\$0.00	\$0.92	\$0.00	\$1.20	\$0.00	\$0.00	\$0.00	\$0.32	\$2.44
Outer Quarter, Rear Quarter Asm	\$0.00	\$6.17	\$0.00	\$2.42	\$0.00	\$0.00	\$0.00	\$1.29	\$9.88
Assemble Driver Rear Quarter Inner & Outer	\$0.00	\$3.28	\$1.49	\$8.52	\$0.00	\$0.00	\$0.06	\$1.99	\$15.34

Detailed Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	45
Fastenings	2
Right First Time	99.57%
OEM Asm. Time (Min)	1.26
OEM Fab. Time (Min)	18.88
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	2.50
Purchased Part Cost	\$0.00
Material Cost	\$10.37
OEM Asm. Cost	\$1.49
OEM Fab. Cost	\$12.14
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.60
Manufacturing Cost*	\$27.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Quarter, Rear Quarter Asm



\...

- \Rear Quarter Asm, Driver Rear Quarter Panel Asm
- \Inner Quarter, Rear Quarter Asm
- \Inner Quarter Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	32.87
Total Weight (kg)	0.31
Material Cost**	\$0.92
OEM Process Cost	\$1.20
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.32
Manufacturing Cost*	\$2.44



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Quarter, Rear Quarter Asm



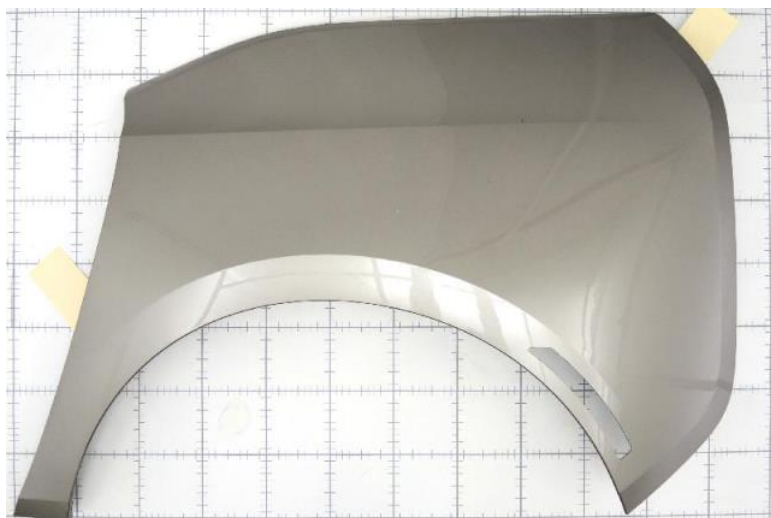
Inner Quarter Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1500 Ton Injection Molding Press	32.87	1	0.25	131.11	GER	\$1.20	99.99%	\$0.00

Inner Quarter Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Quarter	1	PP/EPDM TD30	\$3.00	0.3082	0.3082	\$0.00	\$0.92

Outer Quarter, Rear Quarter Asm



\...

- \Rear Quarter Asm, Driver Rear Quarter Panel Asm
- \Outer Quarter, Rear Quarter Asm
- \Outer Quarter Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	55.79
Total Weight (kg)	2.06
Material Cost**	\$6.17
OEM Process Cost	\$2.42
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$1.29
Manufacturing Cost*	\$9.88



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Quarter, Rear Quarter Asm

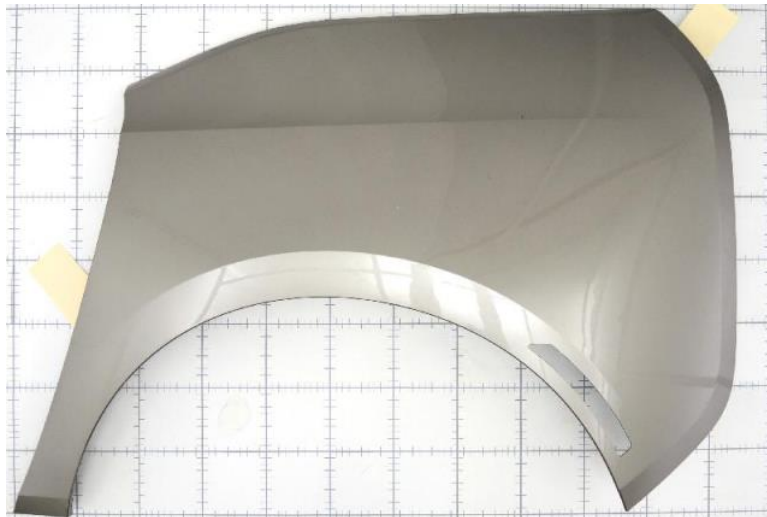
Outer Quarter Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	55.79	1	0.25	156.30	GER	\$2.42	99.99%	\$0.00

Outer Quarter Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Quarter	1	PP/EPDM TD30	\$3.00	2.0582	2.0582	\$0.00	\$6.17

Assemble Driver Rear Quarter Inner & Outer



\...

\Driver Rear Quarter Panel Asm

\Rear Quarter Asm, Driver Rear Quarter Panel Asm

\Assemble Driver Rear Quarter Inner & Outer

Process Summary

Right First Time	99.59 %
Process Time (Sec)	1119.41
Total Weight (kg)	0.13

Material Cost**	\$3.28
OEM Process Cost	\$10.01
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$1.99
Manufacturing Cost*	\$15.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Rear Quarter Inner & Outer



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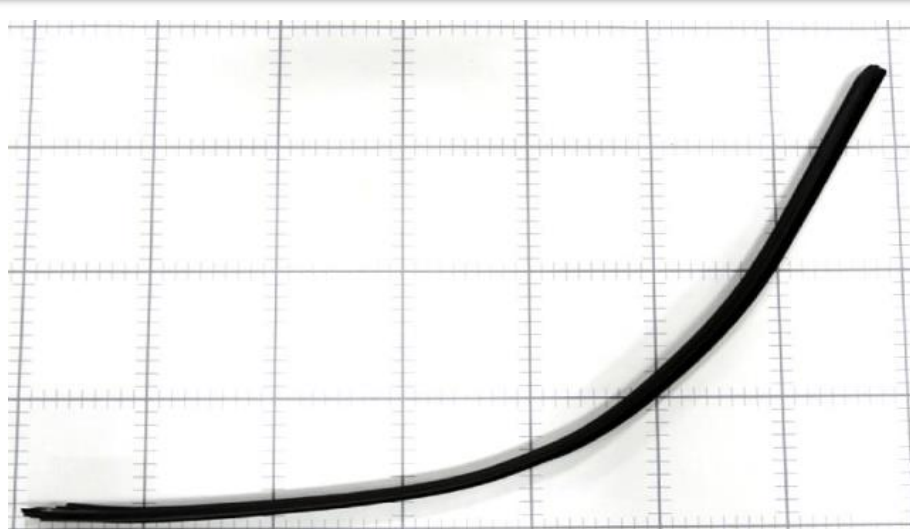
Assemble Driver Rear Quarter Inner & Outer

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	486.00	1	0.25	27.19	GER	\$3.67	99.97 %	\$0.01
Apply Base Coat	21.40	1	0.25	117.09	GER	\$0.70	99.94 %	\$0.01
OEM CO2 Cleaning Line	13.20	1	0.25	51.85	GER	\$0.19	99.99 %	\$0.00
Hand Sanding	19.50	1	1.00	91.41	GER	\$0.50	99.96 %	\$0.01
Cure Paint	486.00	1	0.25	23.29	GER	\$3.14	99.97 %	\$0.01
Apply Base Coat	21.40	1	0.25	117.09	GER	\$0.70	99.94 %	\$0.01
OEM Plasma Surface Treatment Line	13.20	1	0.25	49.58	GER	\$0.18	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
IR Cure	21.00	1	0.25	67.69	GER	\$0.39	99.96 %	\$0.01
OEM Adhesive Bead Station Auto	21.71	1	0.25	69.43	GER	\$0.42	99.93 %	\$0.01

Assemble Driver Rear Quarter Inner & Outer

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.63
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.63
Adhesive, Driver Rear Quarter	1	Structural Adhesive - Polymer	\$17.94	0.1336	0.1336	\$0.00	\$0.02

Seal, Driver Rear Quarter Panel Asm



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- \Driver Rear Quarter Panel Asm
- \Seal, Driver Rear Quarter Panel Asm
- \Seal Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	60.17
Total Weight (kg)	0.13

Material Cost**	\$0.55
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.60
Q Burden	\$0.01
SG&A	\$0.17
Manufacturing Cost*	\$1.32

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Seal, Driver Rear Quarter Panel Asm



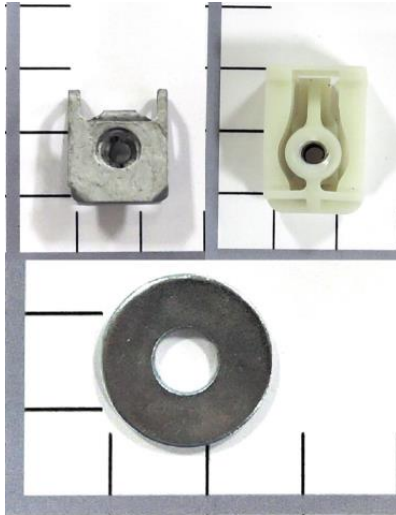
Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55 Ton Injection Molding Press	90.96	2	0.25	32.44	GER	\$0.41	99.98 %	\$0.00
Extrude: 32mm, 1 Layer	14.69	1	0.50	45.66	GER	\$0.19	99.99 %	\$0.00

Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Seal	1	EPDM	\$4.04	0.0032	0.0032	\$0.00	\$0.01
Material 3, Seal	1	EPDM	\$4.04	0.0038	0.0038	\$0.00	\$0.02
Material 1, Seal	1	EPDM (Extrusion Grade)	\$4.43	0.1180	0.1180	\$0.00	\$0.52

Assemble Seal



\...
\Exterior Trim
\Driver Rear Quarter Panel Asm
\Assemble Seal

Process Summary

Right First Time	99.68 %
Process Time (Sec)	72.00
Total Weight (kg)	0.02

Material Cost**	\$0.30
OEM Process Cost	\$1.83
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$0.28
Manufacturing Cost*	\$2.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Seal

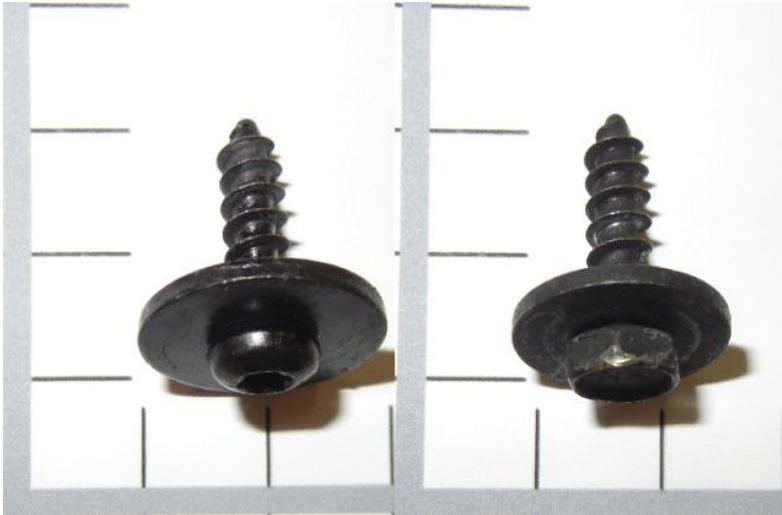
Assemble Seal

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	72.00	1	1.00	91.41	GER	\$1.83	99.68 %	\$0.05

Assemble Seal

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	4	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
M6 Washer	1	Commodity Item	Purchased	0.0025	-	\$0.02	\$0.00
Plastic J-Nut	3	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00

Driver Rear Quarter Panel Installation



\...

\Zone 2 Exterior

\Exterior Trim

\Driver Rear Quarter Panel Installation

Process Summary

Right First Time	98.48 %
Process Time (Sec)	90.50
Total Weight (kg)	0.03

Material Cost**	\$0.14
OEM Process Cost	\$2.30
Supplier Process Cost	\$0.00
Q Burden	\$0.23
SG&A	\$0.35
Manufacturing Cost*	\$3.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Quarter Panel Installation



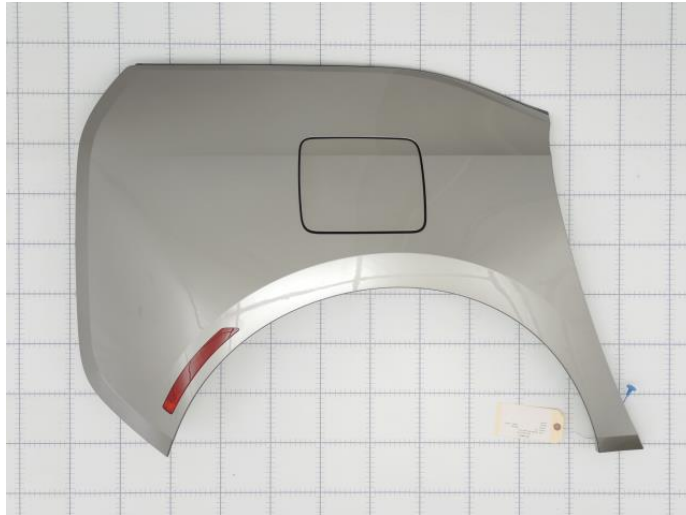
Driver Rear Quarter Panel Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	90.50	1	1.00	91.41	GER	\$2.30	98.48 %	\$0.23

Driver Rear Quarter Panel Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x18mm-SEMS Torx Screw	3	Commodity Item	Purchased	0.0051	-	\$0.02	\$0.00
M5x18mm-Hex SEMS Screw	4	Commodity Item	Purchased	0.0046	-	\$0.02	\$0.00

Passenger Rear Quarter Panel Asm



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Rear Quarter Panel Asm
Assembly Summary

Parts	44
Fasteners	8
Part Numbers	36
Steps	215
Fastenings	42
Right First Time	97.31 %
OEM Process Time (Min)	27.85
Supplier Process Time (Min)	6.58
Total Weight (kg)	3.02

Material Cost**	\$22.55
OEM Process Cost	\$21.43
Supplier Process Cost	\$3.74
Q Burden	\$0.41
SG&A	\$6.16
Manufacturing Cost*	\$54.29

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Asm



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Passenger Rear Quarter Panel Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Rear Quarter Asm, Passenger Rear Quarter Panel Asm	1	7	4	48	4	99.54 %	1.39	22.59	0.00	0.00	2.1830
Charging Outlet Cover Asm, Passenger Rear Quarter	1	23	22	115	22	98.46 %	1.87	0.00	1.89	3.44	0.6880
Assemble Charging Outletto Rear Quarter	1	0	1	3	1	99.88 %	0.17	0.00	0.00	0.00	0.0000
Seal, Passenger Rear Quarter Asm	1	3	0	5	0	99.97 %	0.00	0.00	0.00	1.00	0.1250
Assemble Seal to Passenger Rear Quarter	1	8	11	22	11	99.68 %	1.20	0.00	0.00	0.00	0.0199
Emergency Tether Asm, Passenger Rear Quarter Asm	1	3	2	11	2	99.89 %	0.18	0.00	0.12	0.13	0.0065
Assemble Charging DoorEmergency Tether	1	0	2	7	2	99.88 %	0.45	0.00	0.00	0.00	0.0000

Passenger Rear Quarter Panel Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Rear Quarter Asm, Passenger Rear Quarter Panel Asm	\$0.20	\$11.32	\$1.83	\$13.71	\$0.00	\$0.00	\$0.07	\$4.04	\$31.17
Charging Outlet Cover Asm, Passenger Rear Quarter	\$7.80	\$2.35	\$2.84	\$0.00	\$1.21	\$1.77	\$0.23	\$1.46	\$17.67
Assemble Charging Outletto Rear Quarter	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.02	\$0.04	\$0.31
Seal, Passenger Rear Quarter Asm	\$0.00	\$0.55	\$0.00	\$0.00	\$0.00	\$0.60	\$0.01	\$0.17	\$1.32
Assemble Seal to Passenger Rear Quarter	\$0.30	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$0.05	\$0.28	\$2.46
Emergency Tether Asm, Passenger Rear Quarter Asm	\$0.00	\$0.03	\$0.28	\$0.00	\$0.11	\$0.05	\$0.02	\$0.07	\$0.55
Assemble Charging DoorEmergency Tether	\$0.00	\$0.00	\$0.69	\$0.00	\$0.00	\$0.00	\$0.02	\$0.10	\$0.81

Detailed Summary

Parts	44
Fasteners	8
Part Numbers	36
Steps	215
Fastenings	42
Right First Time	97.31%
OEM Asm. Time (Min)	5.26
OEM Fab. Time (Min)	22.59
Supplier Asm. Time (Min)	2.01
Supplier Fab. Time (Min)	4.57
Total Weight (kg)	3.02
Purchased Part Cost	
	\$8.30
Material Cost	
	\$14.25
OEM Asm. Cost	
	\$7.72
OEM Fab. Cost	
	\$13.71
Supplier Asm. Cost	
	\$1.32
Supplier Fab. Cost	
	\$2.42
Q Burden	
	\$0.41
SG&A	
	\$6.16
Manufacturing Cost*	
	\$54.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Quarter Asm, Passenger Rear Quarter Panel Asm



\...
 \Exterior Trim
 \Passenger Rear Quarter Panel Asm
 \Rear Quarter Asm, Passenger Rear Quarter Panel Asm

Assembly Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	48
Fastenings	4
Right First Time	99.54 %
OEM Process Time (Min)	23.99
Supplier Process Time (Min)	0.00
Total Weight (kg)	2.18

Material Cost**	\$11.52
OEM Process Cost	\$15.54
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$4.04
Manufacturing Cost*	\$31.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Quarter Asm, Passenger Rear Quarter Panel Asm



Rear Quarter Asm, Passenger Rear Quarter Panel Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Inner Quarter, Rear Quarter Asm	1	1	0	1	0	99.99 %	0.00	0.55	0.00	0.00	0.3082
Outer Quarter, Rear Quarter Asm	1	1	0	1	0	99.99 %	0.00	0.61	0.00	0.00	1.7410
Assemble Passenger Rear Quarter Inner & Outer	1	5	4	44	4	99.56 %	1.39	21.43	0.00	0.00	0.1338

Rear Quarter Asm, Passenger Rear Quarter Panel Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Inner Quarter, Rear Quarter Asm	\$0.00	\$0.92	\$0.00	\$1.20	\$0.00	\$0.00	\$0.00	\$0.32	\$2.43
Outer Quarter, Rear Quarter Asm	\$0.00	\$5.22	\$0.00	\$1.60	\$0.00	\$0.00	\$0.00	\$1.02	\$7.84
Assemble Passenger Rear Quarter Inner & Outer	\$0.20	\$5.18	\$1.83	\$10.91	\$0.00	\$0.00	\$0.07	\$2.69	\$20.89

Detailed Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	48
Fastenings	4
Right First Time	99.54%
OEM Asm. Time (Min)	1.39
OEM Fab. Time (Min)	22.59
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	2.18
Purchased Part Cost	
	\$0.20
Material Cost	
	\$11.32
OEM Asm. Cost	
	\$1.83
OEM Fab. Cost	
	\$13.71
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.07
SG&A	
	\$4.04
Manufacturing Cost*	
	\$31.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Rear Quarter Asm, Passenger Rear Quarter Panel Asm
- \Inner Quarter, Rear Quarter Asm
- \Inner Quarter Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	32.83
Total Weight (kg)	0.31

Material Cost**	\$0.92
OEM Process Cost	\$1.20
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.32
Manufacturing Cost*	\$2.43



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Quarter, Rear Quarter Asm



Inner Quarter Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1500 Ton Injection Molding Press	32.83	1	0.25	131.11	GER	\$1.20	99.99%	\$0.00

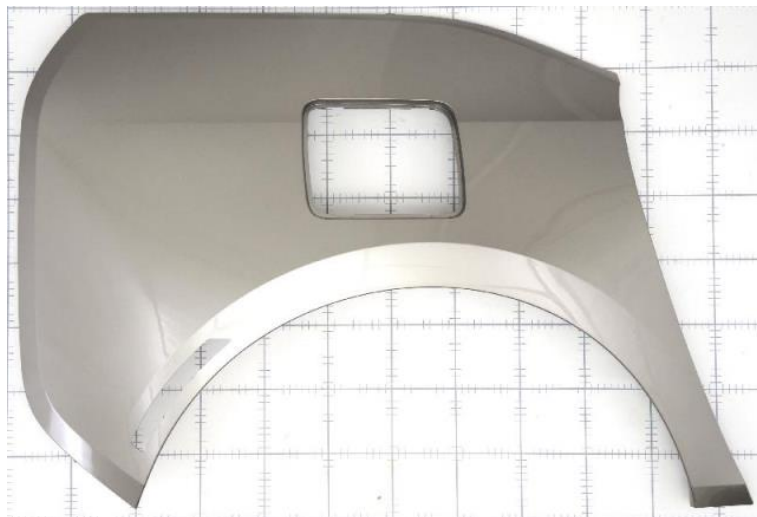
Inner Quarter Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Quarter	1	PP/EPDM TD30	\$3.00	0.3082	0.3082	\$0.00	\$0.92

Outer Quarter, Rear Quarter Asm



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\...

- \Rear Quarter Asm, Passenger Rear Quarter Panel Asm
- \Outer Quarter, Rear Quarter Asm
- \Outer Quarter Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	36.84
Total Weight (kg)	1.74

Material Cost**	\$5.22
OEM Process Cost	\$1.60
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$1.02
Manufacturing Cost*	\$7.84



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Quarter, Rear Quarter Asm



Outer Quarter Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	36.84	1	0.25	156.30	GER	\$1.60	99.99%	\$0.00

Outer Quarter Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Quarter	1	PP/EPDM TD30	\$3.00	1.7410	1.7410	\$0.00	\$5.22

Assemble Passenger Rear Quarter Inner & Outer



\...

- \Passenger Rear Quarter Panel Asm
- \Rear Quarter Asm, Passenger Rear Quarter Panel Asm
- \Assemble Passenger Rear Quarter Inner & Outer

Process Summary

Right First Time	99.56 %
Process Time (Sec)	1369.54
Total Weight (kg)	0.13
Material Cost**	\$5.38
OEM Process Cost	\$12.75
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$2.69
Manufacturing Cost*	\$20.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Rear Quarter Inner & Outer



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Assemble Passenger Rear Quarter Inner & Outer

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	24.98	1	1.00	91.41	GER	\$0.63	99.93 %	\$0.01
Cure Paint	606.00	1	0.25	27.19	GER	\$4.58	99.97 %	\$0.01
Apply Base Coat	22.20	1	0.25	117.09	GER	\$0.72	99.94 %	\$0.01
OEM CO2 Cleaning Line	13.60	1	0.25	51.85	GER	\$0.20	99.99 %	\$0.00
OEM Hand Sanding Station	23.25	1	1.00	91.41	GER	\$0.59	99.94 %	\$0.01
Cure Paint	606.00	1	0.25	27.19	GER	\$4.58	99.97 %	\$0.01
Apply Base Coat	22.20	1	0.25	117.09	GER	\$0.72	99.94 %	\$0.01
OEM Plasma Surface Treatment Line	13.60	1	0.25	49.58	GER	\$0.19	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Adhesive Bead Station Auto	21.71	1	0.25	69.43	GER	\$0.42	99.93 %	\$0.01

Assemble Passenger Rear Quarter Inner & Outer

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Label, BMW Vin Number Small	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.39
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.39
Adhesive, Passenger Rear Quarter	1	Structural Adhesive - Polymer	\$17.94	0.1336	0.1336	\$0.00	\$2.40

Charging Outlet Cover Asm, Passenger Rear Quarter



- \...
 - \Exterior Trim
 - \Passenger Rear Quarter Panel Asm
 - \Charging Outlet Cover Asm, Passenger Rear Quarter
- ## Assembly Summary

Parts	23
Fasteners	0
Part Numbers	22
Steps	115
Fastenings	22
Right First Time	98.46 %
OEM Process Time (Min)	1.87
Supplier Process Time (Min)	5.33
Total Weight (kg)	0.69

Material Cost**	\$10.15
OEM Process Cost	\$2.84
Supplier Process Cost	\$2.99
Q Burden	\$0.23
SG&A	\$1.46
Manufacturing Cost*	\$17.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Cover Asm, Passenger Rear Quarter



Charging Outlet Cover Asm, Passenger Rear Quarter

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Charging Outlet Asm, Charging Outlet Cover Asm	1	20	17	103	17	98.66 %	1.37	0.00	1.89	3.38	0.6092
Assemble Charging Outlet Solenoid	1	2	3	6	3	99.86 %	0.37	0.00	0.00	0.00	0.0674
Solenoid Cover, Charging Outlet Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.06	0.0114
Assemble Cover Solenoid	1	0	2	3	2	99.95 %	0.13	0.00	0.00	0.00	0.0000

Charging Outlet Cover Asm, Passenger Rear Quarter

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Charging Outlet Asm, Charging Outlet Cover Asm	\$3.28	\$2.32	\$2.08	\$0.00	\$1.21	\$1.75	\$0.20	\$1.20	\$12.05
Assemble Charging Outlet Solenoid	\$4.52	\$0.00	\$0.56	\$0.00	\$0.00	\$0.00	\$0.02	\$0.22	\$5.32
Solenoid Cover, Charging Outlet Cover Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.07
Assemble Cover Solenoid	\$0.00	\$0.00	\$0.20	\$0.00	\$0.00	\$0.00	\$0.01	\$0.03	\$0.24

Charging Outlet Cover Asm, Passenger Rear Quarter

Detailed Summary

Parts	23
Fasteners	0
Part Numbers	22
Steps	115
Fastenings	22
Right First Time	98.46%
OEM Asm. Time (Min)	1.87
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.89
Supplier Fab. Time (Min)	3.44
Total Weight (kg)	0.69
Purchased Part Cost	
	\$7.80
Material Cost	
	\$2.35
OEM Asm. Cost	
	\$2.84
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$1.21
Supplier Fab. Cost	
	\$1.77
Q Burden	
	\$0.23
SG&A	
	\$1.46
Manufacturing Cost*	
	\$17.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Asm, Charging Outlet Cover Asm



\...

- \Passenger Rear Quarter Panel Asm
- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Charging Outlet Asm, Charging Outlet Cover Asm

Assembly Summary

Parts	20
Fasteners	0
Part Numbers	19
Steps	103
Fastenings	17
Right First Time	98.66 %
OEM Process Time (Min)	1.37
Supplier Process Time (Min)	5.27
Total Weight (kg)	0.61

Material Cost**	\$5.60
OEM Process Cost	\$2.08
Supplier Process Cost	\$2.96
Q Burden	\$0.20
SG&A	\$1.20
Manufacturing Cost*	\$12.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Asm, Charging Outlet Cover Asm



Charging Outlet Asm, Charging Outlet Cover Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Charging Outlet Door Asm, Charging Outlet Asm	1	7	3	42	3	99.58 %	0.00	0.00	0.90	2.64	0.3662
Charging Outlet Housing Asm, Charging Outlet Asm	1	10	11	47	11	99.41 %	0.82	0.00	0.99	0.62	0.2312
Door Hinge Pin, Charging Outlet Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0052
Assemble Outlet Door to Housing	1	1	2	6	2	99.78 %	0.42	0.00	0.00	0.00	0.0055
Cap, Charging Outlet Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.09	0.0011
Assemble Outlet Door to Housing	1	0	1	2	1	99.90 %	0.13	0.00	0.00	0.00	0.0000

Charging Outlet Asm, Charging Outlet Cover Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Charging Outlet Door Asm, Charging Outlet Asm	\$0.20	\$1.50	\$0.00	\$0.00	\$0.81	\$1.35	\$0.06	\$0.56	\$4.48
Charging Outlet Housing Asm, Charging Outlet Asm	\$2.96	\$0.79	\$1.24	\$0.00	\$0.40	\$0.35	\$0.09	\$0.51	\$6.34
Door Hinge Pin, Charging Outlet Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Outlet Door to Housing	\$0.12	\$0.00	\$0.63	\$0.00	\$0.00	\$0.00	\$0.03	\$0.10	\$0.89
Cap, Charging Outlet Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.05
Assemble Outlet Door to Housing	\$0.00	\$0.00	\$0.20	\$0.00	\$0.00	\$0.00	\$0.02	\$0.03	\$0.25

Detailed Summary

Parts	20
Fasteners	0
Part Numbers	19
Steps	103
Fastenings	17
Right First Time	98.66%
OEM Asm. Time (Min)	1.37
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.89
Supplier Fab. Time (Min)	3.38
Total Weight (kg)	0.61
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Purchased Part Cost	\$3.28
Material Cost	\$2.32
OEM Asm. Cost	\$2.08
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$1.21
Supplier Fab. Cost	\$1.75
Q Burden	\$0.20
SG&A	\$1.20
Manufacturing Cost*	\$12.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Door Asm, Charging Outlet Asm



- \...
- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Charging Outlet Door Asm, Charging Outlet Asm

Assembly Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	42
Fastenings	3
Right First Time	99.58 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	3.54
Total Weight (kg)	0.37

Material Cost**	\$1.70
OEM Process Cost	\$0.00
Supplier Process Cost	\$2.16
Q Burden	\$0.06
SG&A	\$0.56
Manufacturing Cost*	\$4.48

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Door Asm, Charging Outlet Asm



Charging Outlet Door Asm, Charging Outlet Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Outer Substrate, Charging Outlet Door Asm	1	4	1	31	1	99.70 %	0.00	0.00	0.36	2.29	0.1881
Inner Substrate, Charging Outlet Door Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.35	0.1780
Assemble Charging Door Substrate	1	1	2	7	2	99.91 %	0.00	0.00	0.54	0.00	0.0001

Charging Outlet Door Asm, Charging Outlet Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Outer Substrate, Charging Outlet Door Asm	\$0.05	\$0.89	\$0.00	\$0.00	\$0.33	\$1.12	\$0.05	\$0.35	\$2.79
Inner Substrate, Charging Outlet Door Asm	\$0.00	\$0.61	\$0.00	\$0.00	\$0.00	\$0.23	\$0.00	\$0.13	\$0.97
Assemble Charging Door Substrate	\$0.15	\$0.00	\$0.00	\$0.00	\$0.48	\$0.00	\$0.01	\$0.08	\$0.73

Detailed Summary

Parts	7
Fasteners	0
Part Numbers	6
Steps	42
Fastenings	3
Right First Time	99.58%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.90
Supplier Fab. Time (Min)	2.64
Total Weight (kg)	0.37
Purchased Part Cost	\$0.20
Material Cost	\$1.50
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.81
Supplier Fab. Cost	\$1.35
Q Burden	\$0.06
SG&A	\$0.56
Manufacturing Cost*	\$4.48

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Substrate, Charging Outlet Door Asm



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\Charging Outlet Door Asm, Charging Outlet Asm
\Outer Substrate, Charging Outlet Door Asm
\Outer Substrate Process

Process Summary

Right First Time	99.70 %
Process Time (Sec)	159.23
Total Weight (kg)	0.19

Material Cost**	\$0.94
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.45
Q Burden	\$0.05
SG&A	\$0.35
Manufacturing Cost*	\$2.79

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Substrate, Charging Outlet Door Asm



MUNRO
& ASSOCIATES, INC.

Outer Substrate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Paint	48.44	1	0.25	17.08	GER	\$0.23	99.97 %	\$0.01
Apply Base Coat	5.76	1	0.25	41.62	GER	\$0.07	99.97 %	\$0.01
Supplier Manual Asm	13.50	1	1.00	54.32	GER	\$0.20	99.96 %	\$0.01
Supplier CO2 Cleaning Station	5.76	1	0.25	44.69	GER	\$0.07	99.99 %	\$0.00
Supplier Hand Sanding Station	8.30	1	1.00	54.32	GER	\$0.13	99.94 %	\$0.01
Cure Paint	48.44	1	0.25	17.08	GER	\$0.23	99.97 %	\$0.01
Apply Base Coat	5.76	1	0.25	41.62	GER	\$0.07	99.97 %	\$0.01
Supplier Plasma Treating Station	5.76	1	0.25	146.20	GER	\$0.23	99.98 %	\$0.00
Wash	9.00	1	0.25	17.69	GER	\$0.04	99.99 %	\$0.00
720 Ton Injection Molding Press	34.04	4	0.25	74.40	GER	\$0.18	99.99 %	\$0.00

Outer Substrate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.12
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.12
Material, Outer Substrate	1	PC+PET	\$3.45	0.1880	0.1880	\$0.00	\$0.65



\...

- \Charging Outlet Door Asm, Charging Outlet Asm
- \Inner Substrate, Charging Outlet Door Asm
- \Inner Substrate Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	20.78
Total Weight (kg)	0.18

Material Cost**	\$0.61
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.97

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Substrate, Charging Outlet Door Asm



MUNRO
& ASSOCIATES, INC.

Inner Substrate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	41.56	2	0.25	39.50	GER	\$0.23	99.98 %	\$0.00

Inner Substrate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Cover	1	PA6 GF50	\$3.55	0.1586	0.1586	\$0.00	\$0.56
Material 2, Cover	1	TPE	\$2.54	0.0194	0.0208	\$0.00	\$0.05

Assemble Charging Door Substrate



- \...
- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Charging Outlet Door Asm, Charging Outlet Asm
- \Assemble Charging Door Substrate

Process Summary

Right First Time	99.91 %
Process Time (Sec)	32.13
Total Weight (kg)	0.00

Material Cost**	\$0.15
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.48
Q Burden	\$0.01
SG&A	\$0.08
Manufacturing Cost*	\$0.73

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Charging Door Substrate



Assemble Charging Door Substrate

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	32.13	1	1.00	54.32	GER	\$0.48	99.91 %	\$0.01

Assemble Charging Door Substrate

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Battery LED Information	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00

Charging Outlet Housing Asm, Charging Outlet Asm



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- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Charging Outlet Housing Asm, Charging Outlet Asm

Assembly Summary

Parts	10
Fasteners	0
Part Numbers	10
Steps	47
Fastenings	11
Right First Time	99.41 %
OEM Process Time (Min)	0.82
Supplier Process Time (Min)	1.61
Total Weight (kg)	0.23

Material Cost**	\$3.75
OEM Process Cost	\$1.24
Supplier Process Cost	\$0.75
Q Burden	\$0.09
SG&A	\$0.51
Manufacturing Cost*	\$6.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Housing Asm, Charging Outlet Asm



MUNRO
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Charging Outlet Housing Asm, Charging Outlet Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Charging Outlet Housing Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.25	0.1380
Trim Light Asm, Charging Outlet Housing Asm	1	6	5	27	5	99.66 %	0.00	0.00	0.99	0.34	0.0920
Charging Outlet Cover Dampener Asm	1	2	1	5	1	99.95 %	0.22	0.00	0.00	0.03	0.0012
Assemble Charging Outlet Housing	1	0	5	10	5	99.83 %	0.60	0.00	0.00	0.00	0.0000

Charging Outlet Housing Asm, Charging Outlet Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Charging Outlet Housing Asm	\$0.00	\$0.42	\$0.00	\$0.00	\$0.00	\$0.25	\$0.00	\$0.10	\$0.77
Trim Light Asm, Charging Outlet Housing Asm	\$2.91	\$0.36	\$0.00	\$0.00	\$0.40	\$0.09	\$0.05	\$0.21	\$4.02
Charging Outlet Cover Dampener Asm	\$0.05	\$0.01	\$0.33	\$0.00	\$0.00	\$0.01	\$0.01	\$0.05	\$0.46
Assemble Charging Outlet Housing	\$0.00	\$0.00	\$0.91	\$0.00	\$0.00	\$0.00	\$0.03	\$0.14	\$1.08

Detailed Summary

Parts	10
Fasteners	0
Part Numbers	10
Steps	47
Fastenings	11
Right First Time	99.41%
OEM Asm. Time (Min)	0.82
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.99
Supplier Fab. Time (Min)	0.62
Total Weight (kg)	0.23
Purchased Part Cost	\$2.96
Material Cost	\$0.79
OEM Asm. Cost	\$1.24
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.40
Supplier Fab. Cost	\$0.35
Q Burden	\$0.09
SG&A	\$0.51
Manufacturing Cost*	\$6.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Charging Outlet Housing Asm



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- \Charging Outlet Housing Asm, Charging Outlet Asm
- \Housing, Charging Outlet Housing Asm
- \Housing Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	14.75
Total Weight (kg)	0.14

Material Cost**	\$0.42
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.25
Q Burden	\$0.00
SG&A	\$0.10
Manufacturing Cost*	\$0.77

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Charging Outlet Housing Asm



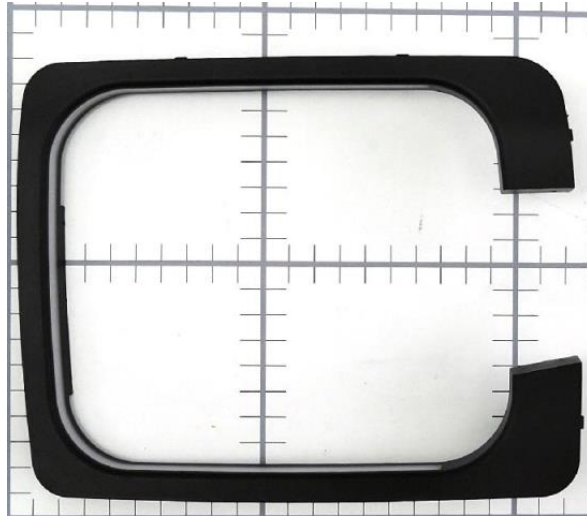
Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Dual Shot Injection Molding	29.50	2	0.25	61.01	GER	\$0.25	99.98 %	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Housing	1	PP GF20	\$2.78	0.1376	0.1476	\$0.00	\$0.41
Material 2, Housing	1	TPE	\$2.54	0.0004	0.0004	\$0.00	\$0.01

Trim Light Asm, Charging Outlet Housing Asm



- \...
- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Charging Outlet Housing Asm, Charging Outlet Asm
- \Trim Light Asm, Charging Outlet Housing Asm

Assembly Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	27
Fastenings	5
Right First Time	99.66 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.34
Total Weight (kg)	0.09

Material Cost**	\$3.27
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.49
Q Burden	\$0.05
SG&A	\$0.21
Manufacturing Cost*	\$4.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Trim Light Asm, Charging Outlet Housing Asm



Trim Light Asm, Charging Outlet Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Light Asm, Trim Light Asm	1	4	3	17	3	99.74 %	0.00	0.00	0.68	0.21	0.0781
Cover Asm, Trim Light Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.13	0.0138
Assemble Trim Light	1	1	2	7	2	99.93 %	0.00	0.00	0.31	0.00	0.0001

Trim Light Asm, Charging Outlet Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Light Asm, Trim Light Asm	\$2.90	\$0.29	\$0.00	\$0.00	\$0.28	\$0.06	\$0.04	\$0.18	\$3.75
Cover Asm, Trim Light Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.02	\$0.12
Assemble Trim Light	\$0.01	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$0.02	\$0.15

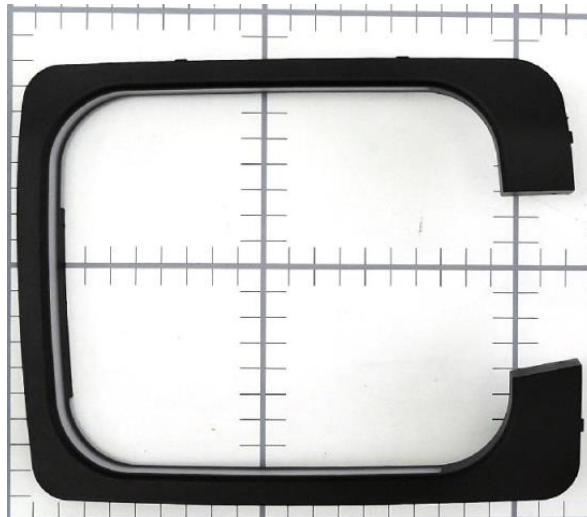
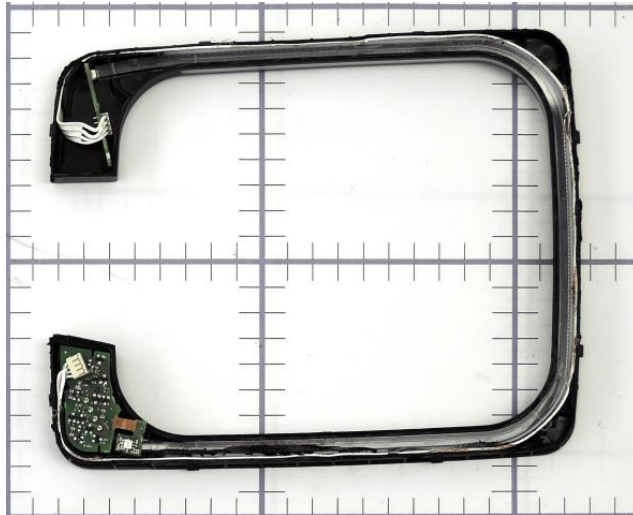
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	27
Fastenings	5
Right First Time	99.66%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.99
Supplier Fab. Time (Min)	0.34
Total Weight (kg)	0.09
<hr/>	
Purchased Part Cost	\$2.91
Material Cost	\$0.36
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.40
Supplier Fab. Cost	\$0.09
Q Burden	\$0.05
SG&A	\$0.21
Manufacturing Cost*	\$4.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Asm, Trim Light Asm



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\Charging Outlet Housing Asm, Charging Outlet Asm

\Trim Light Asm, Charging Outlet Housing Asm

\Light Asm, Trim Light Asm

Assembly Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	17
Fastenings	3
Right First Time	99.74 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.89
Total Weight (kg)	0.08

Material Cost**	\$3.19
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.34
Q Burden	\$0.04
SG&A	\$0.18
Manufacturing Cost*	\$3.75

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Asm, Trim Light Asm



Light Asm, Trim Light Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Light Pipe, Light Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.11	0.0158
Housing, Light Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.10	0.0497
Assemble Housing	1	1	3	12	3	99.77 %	0.00	0.00	0.68	0.00	0.0126

Light Asm, Trim Light Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Light Pipe, Light Asm	\$0.00	\$0.05	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.10
Housing, Light Asm	\$0.00	\$0.24	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.04	\$0.31
Assemble Housing	\$2.90	\$0.00	\$0.00	\$0.00	\$0.28	\$0.00	\$0.03	\$0.13	\$3.35

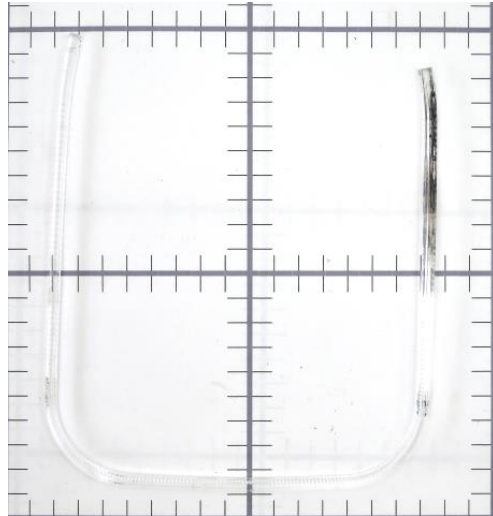
Detailed Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	17
Fastenings	3
Right First Time	99.74%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.68
Supplier Fab. Time (Min)	0.21
Total Weight (kg)	0.08
Purchased Part Cost	
	\$2.90
Material Cost	
	\$0.29
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.28
Supplier Fab. Cost	
	\$0.06
Q Burden	
	\$0.04
SG&A	
	\$0.18
Manufacturing Cost*	
	\$3.75

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe, Light Asm



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\Light Asm, Trim Light Asm

\Light Pipe, Light Asm

\Light Pipe Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	6.61
Total Weight (kg)	0.02

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

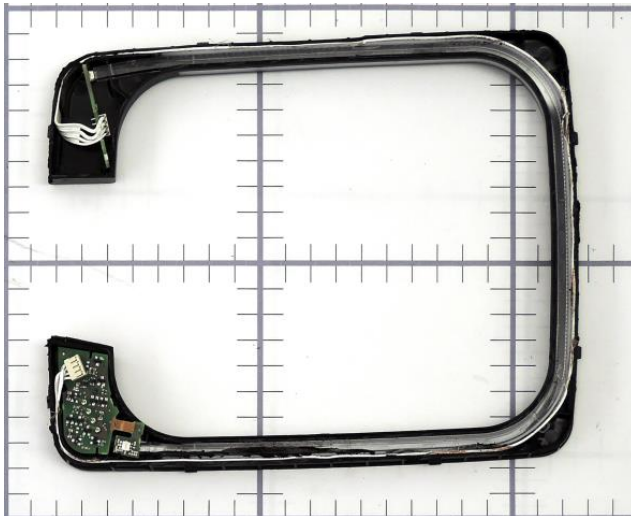
Light Pipe, Light Asm

Light Pipe Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	26.44	4	0.25	17.57	HUN	\$0.03	99.99%	\$0.00

Light Pipe Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe	1	PMMA - Clear	\$3.09	0.0158	0.0170	\$0.00	\$0.05



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\Light Asm, Trim Light Asm
\Housing, Light Asm
\Housing Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	6.00
Total Weight (kg)	0.05

Material Cost**	\$0.24
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

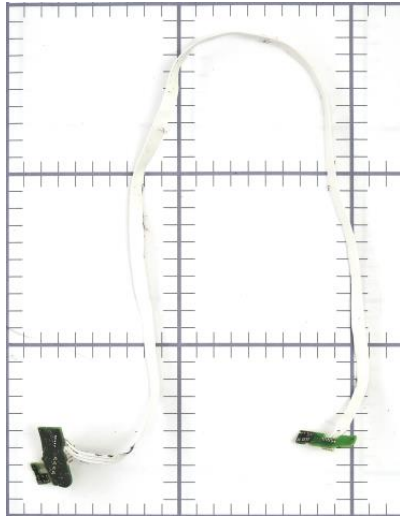
Housing, Light Asm

Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.00	2	0.25	14.89	HUN	\$0.02	99.98 %	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Housing	1	ASA	\$4.94	0.0316	0.0339	\$0.00	\$0.17
Material 2, Housing	1	PMMA - Colored	\$3.57	0.0181	0.0195	\$0.00	\$0.07



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- \Trim Light Asm, Charging Outlet Housing Asm
- \Light Asm, Trim Light Asm
- \Assemble Housing

Process Summary

Right First Time	99.77 %
Process Time (Sec)	41.00
Total Weight (kg)	0.01

Material Cost**	\$2.90
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.28
Q Burden	\$0.03
SG&A	\$0.13
Manufacturing Cost*	\$3.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housing



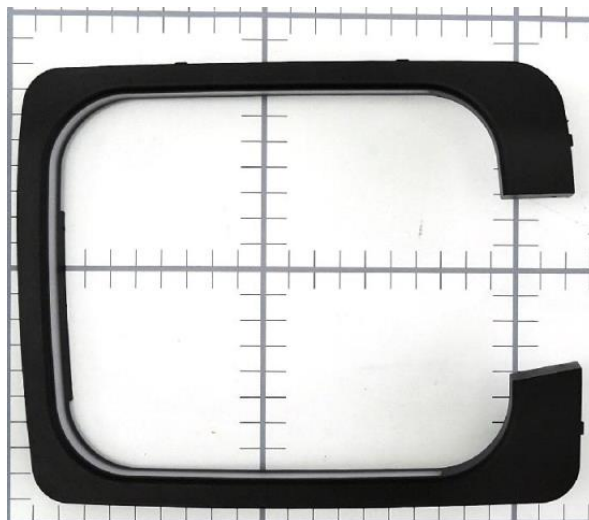
Assemble Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	41.00	1	1.00	24.91	HUN	\$0.28	99.77%	\$0.03

Assemble Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Trim Light Harness	1	Commodity Item	Purchased	0.0126	-	\$2.90	\$0.00

Cover Asm, Trim Light Asm



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\Trim Light Asm, Charging Outlet Housing Asm

\Cover Asm, Trim Light Asm

\Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.99
Total Weight (kg)	0.01

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover Asm, Trim Light Asm



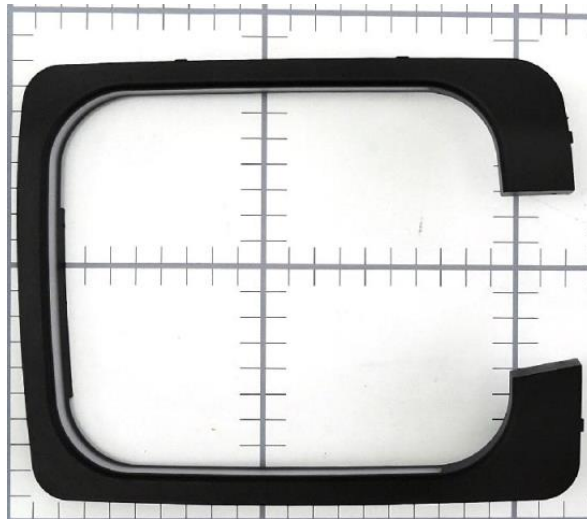
Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	15.98	2	0.25	14.89	HUN	\$0.03	99.99%	\$0.00

Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Cover	1	ASA	\$4.94	0.0138	0.0138	\$0.00	\$0.07

Assemble Trim Light



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- \Charging Outlet Housing Asm, Charging Outlet Asm
- \Trim Light Asm, Charging Outlet Housing Asm
- \Assemble Trim Light

Process Summary

Right First Time	99.93 %
Process Time (Sec)	18.50
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Trim Light



Assemble Trim Light

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.50	1	1.00	24.91	HUN	\$0.07	99.96 %	\$0.01
Supplier Vibration Welding Station	9.00	1	0.25	19.40	HUN	\$0.05	99.97 %	\$0.00

Assemble Trim Light

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Supplier QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Charging Outlet Cover Dampener Asm



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- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Charging Outlet Housing Asm, Charging Outlet Asm
- \Charging Outlet Cover Dampener Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.22
Supplier Process Time (Min)	0.03
Total Weight (kg)	0.00

Material Cost**	\$0.06
OEM Process Cost	\$0.33
Supplier Process Cost	\$0.01
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Charging Outlet Cover Dampener Asm



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Charging Outlet Cover Dampener Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
11 Tooth Sprocket	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0002
Assemble Charging Outlet Cover Dampener	1	1	1	3	1	99.96 %	0.22	0.00	0.00	0.00	0.0010

Charging Outlet Cover Dampener Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
11 Tooth Sprocket	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Charging Outlet Cover Dampener	\$0.05	\$0.00	\$0.33	\$0.00	\$0.00	\$0.00	\$0.01	\$0.05	\$0.44

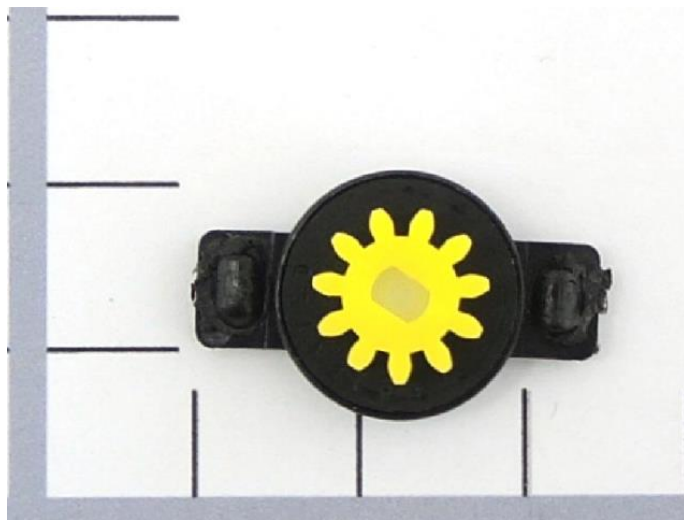
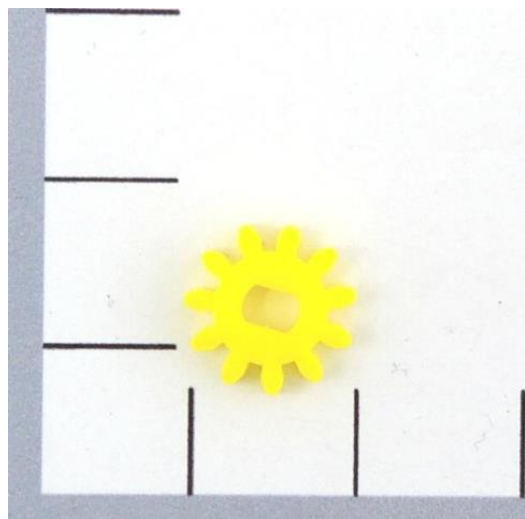
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.22
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.00
<hr/>	
Purchased Part Cost	\$0.05
Material Cost	\$0.01
OEM Asm. Cost	\$0.33
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.01
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

11 Tooth Sprocket



\...

\Charging Outlet Cover Dampener Asm

\11 Tooth Sprocket

\11 Tooth Sprocket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.79
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

11 Tooth Sprocket



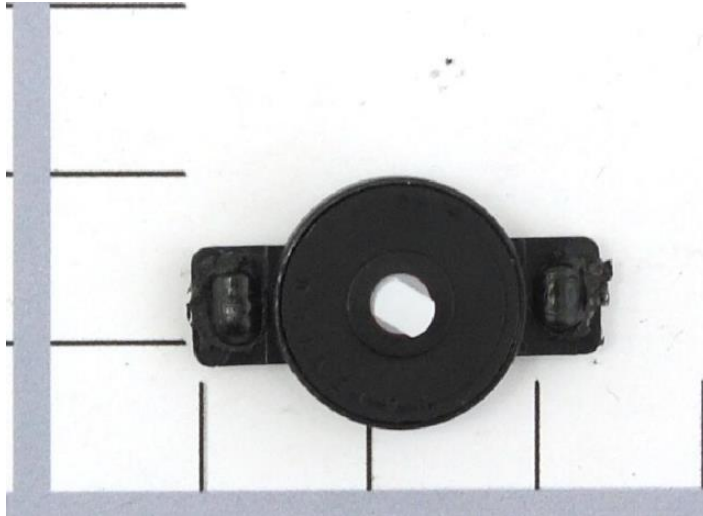
11 Tooth Sprocket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.32	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

11 Tooth Sprocket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, 11 Tooth Sprocket	1	PP	\$2.38	0.0002	0.0002	\$0.00	\$0.01

Assemble Charging Outlet Cover Dampener



\...

- \Charging Outlet Housing Asm, Charging Outlet Asm
- \Charging Outlet Cover Dampener Asm
- \Assemble Charging Outlet Cover Dampener

Process Summary

Right First Time	99.96 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.33
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Charging Outlet Cover Dampener



Assemble Charging Outlet Cover Dampener

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	13.00	1	1.00	91.41	GER	\$0.33	99.96%	\$0.01

Assemble Charging Outlet Cover Dampener

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Charging Outlet Cover Dampener	1	Commodity Item	Purchased	0.0010	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...

- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Charging Outlet Housing Asm, Charging Outlet Asm
- \Assemble Charging Outlet Housing

Process Summary

Right First Time	99.83 %
Process Time (Sec)	36.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.91
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.14
Manufacturing Cost*	\$1.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Charging Outlet Housing



Assemble Charging Outlet Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	36.00	1	1.00	91.41	GER	\$0.91	99.83%	\$0.03

Assemble Charging Outlet Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Door Hinge Pin, Charging Outlet Asm



\...

- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Door Hinge Pin, Charging Outlet Asm
- \Door Hinge Pin Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.04
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Door Hinge Pin, Charging Outlet Asm



Door Hinge Pin Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.32	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Door Hinge Pin Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Door Hinge Pin	1	PA6 GF30	\$4.10	0.0052	0.0052	\$0.00	\$0.02

Assemble Outlet Door to Housing



\...

- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Assemble Outlet Door to Housing

Process Summary

Right First Time	99.78 %
Process Time (Sec)	25.00
Total Weight (kg)	0.01

Material Cost**	\$0.12
OEM Process Cost	\$0.63
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.10
Manufacturing Cost*	\$0.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost




Assemble Outlet Door to Housing



Assemble Outlet Door to Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	25.00	1	1.00	91.41	GER	\$0.63	99.78 %	\$0.03

Assemble Outlet Door to Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Spiral Torsion Spring	1	Commodity Item	Purchased	0.0055	-	\$0.12	\$0.00

Cap, Charging Outlet Asm



\...

\Charging Outlet Asm, Charging Outlet Cover Asm

\Cap, Charging Outlet Asm

\Cap Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.31
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Cap, Charging Outlet Asm

Cap Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	42.48	8	0.25	23.71	GER	\$0.03	99.99%	\$0.00

Cap Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Cap	1	NBR	\$2.80	0.0011	0.0011	\$0.00	\$0.01

No Commodity Items Required for This Process



\...

- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Charging Outlet Asm, Charging Outlet Cover Asm
- \Assemble Outlet Door to Housing

Process Summary

Right First Time	99.90 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.20
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Outlet Door to Housing



Assemble Outlet Door to Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	8.00	1	1.00	91.41	GER	\$0.20	99.90%	\$0.02

Assemble Outlet Door to Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Charging Outlet Solenoid



\...

- \Passenger Rear Quarter Panel Asm
- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Assemble Charging Outlet Solenoid

Process Summary

Right First Time	99.86 %
Process Time (Sec)	22.00
Total Weight (kg)	0.07

Material Cost**	\$4.52
OEM Process Cost	\$0.56
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.22
Manufacturing Cost*	\$5.32

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Charging Outlet Solenoid



Assemble Charging Outlet Solenoid

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	22.00	1	1.00	91.41	GER	\$0.56	99.86%	\$0.02

Assemble Charging Outlet Solenoid

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Charging Outlet Solenoid	1	Commodity Item	Purchased	0.0656	-	\$4.50	\$0.00
Charging Outlet Door Lever	1	Commodity Item	Purchased	0.0018	-	\$0.02	\$0.00

Solenoid Cover, Charging Outlet Cover Asm



\...

- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Solenoid Cover, Charging Outlet Cover Asm
- \Solenoid Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	3.68
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Solenoid Cover, Charging Outlet Cover Asm



Solenoid Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	14.72	4	0.25	26.65	GER	\$0.03	99.99%	\$0.00

Solenoid Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Solenoid Cover	1	PPGF20	\$2.78	0.0114	0.0123	\$0.00	\$0.03

No Commodity Items Required for This Process

- \...
- \Passenger Rear Quarter Panel Asm
- \Charging Outlet Cover Asm, Passenger Rear Quarter
- \Assemble Cover Solenoid

Process Summary

Right First Time	99.95 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.20
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Cover Solenoid



Assemble Cover Solenoid

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	8.00	1	1.00	91.41	GER	\$0.20	99.95%	\$0.01

Assemble Cover Solenoid

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items
Required for This
Process



\...
 \Exterior Trim
 \Passenger Rear Quarter Panel Asm
 \Assemble Charging Outlet to Rear Quarter

Process Summary

Right First Time	99.88 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.25
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Charging Outlet to Rear Quarter



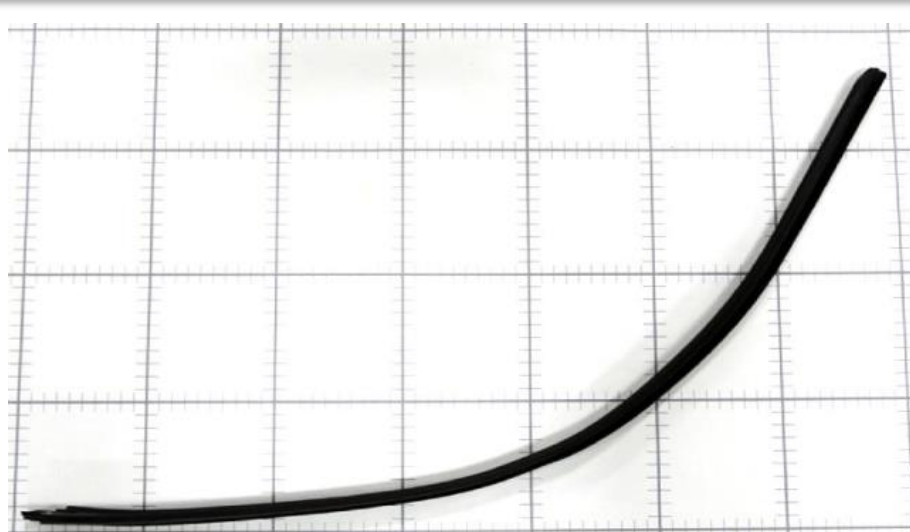
Assemble Charging Outlet to Rear Quarter

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	10.00	1	1.00	91.41	GER	\$0.25	99.88 %	\$0.02

Assemble Charging Outlet to Rear Quarter

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Seal, Passenger Rear Quarter Asm



\...
\Passenger Rear Quarter Panel Asm
\Seal, Passenger Rear Quarter Asm
\Seal Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	60.17
Total Weight (kg)	0.13

Material Cost**	\$0.55
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.60
Q Burden	\$0.01
SG&A	\$0.17
Manufacturing Cost*	\$1.32

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Seal, Passenger Rear Quarter Asm



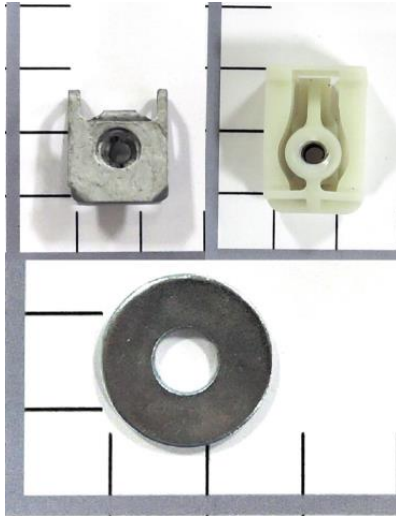
Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55 Ton Injection Molding Press	90.96	2	0.25	32.44	GER	\$0.41	99.98 %	\$0.00
Extrude: 32mm, 1 Layer	14.69	1	0.50	45.66	GER	\$0.19	99.99 %	\$0.00

Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 2, Seal	1	EPDM	\$4.04	0.0032	0.0032	\$0.00	\$0.01
Material 3, Seal	1	EPDM	\$4.04	0.0038	0.0038	\$0.00	\$0.02
Material 1, Seal	1	EPDM (Extrusion Grade)	\$4.43	0.1180	0.1180	\$0.00	\$0.52

Assemble Seal to Passenger Rear Quarter



- \...
- \Exterior Trim
- \Passenger Rear Quarter Panel Asm
- \Assemble Seal to Passenger Rear Quarter

Process Summary

Right First Time	99.68 %
Process Time (Sec)	72.00
Total Weight (kg)	0.02

Material Cost**	\$0.30
OEM Process Cost	\$1.83
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$0.28
Manufacturing Cost*	\$2.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Seal to Passenger Rear Quarter



Assemble Seal to Passenger Rear Quarter

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	72.00	1	1.00	91.41	GER	\$1.83	99.68 %	\$0.05

Assemble Seal to Passenger Rear Quarter

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	4	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
M6 Washer	1	Commodity Item	Purchased	0.0025	-	\$0.02	\$0.00
Plastic J-Nut	3	Commodity Item	Purchased	0.0026	-	\$0.08	\$0.00

Emergency Tether Asm, Passenger Rear Quarter Asm

\...
 \Exterior Trim
 \Passenger Rear Quarter Panel Asm
 \Emergency Tether Asm, Passenger Rear Quarter Asm

Assembly Summary



Parts	3
Fasteners	0
Part Numbers	3
Steps	11
Fastenings	2
Right First Time	99.89 %
OEM Process Time (Min)	0.18
Supplier Process Time (Min)	0.24
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.07
Manufacturing Cost*	\$0.55

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost



Emergency Tether Asm, Passenger Rear Quarter Asm



Emergency Tether Asm, Passenger Rear Quarter Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Upper Tether, Emergency Tether Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.05	0.0026
Lower Tether, Emergency Tether Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.05	0.0026
Assemble Charging Door Cover Emergency Tether	1	0	1	3	1	99.95 %	0.18	0.00	0.00	0.00	0.0000
Tether Handle, Emergency Tether Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0013
Assemble Tether Handle	1	0	1	2	1	99.97 %	0.00	0.00	0.12	0.00	0.0000

Emergency Tether Asm, Passenger Rear Quarter Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Upper Tether, Emergency Tether Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.00	\$0.03
Lower Tether, Emergency Tether Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.00	\$0.03
Assemble Charging Door Cover Emergency Tether	\$0.00	\$0.00	\$0.28	\$0.00	\$0.00	\$0.00	\$0.01	\$0.04	\$0.33
Tether Handle, Emergency Tether Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Tether Handle	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.00	\$0.02	\$0.13

Emergency Tether Asm, Passenger Rear Quarter Asm



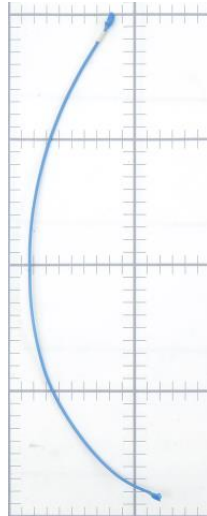
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& ASSOCIATES, INC.

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	11
Fastenings	2
Right First Time	99.89%
OEM Asm. Time (Min)	0.18
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.12
Supplier Fab. Time (Min)	0.13
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.00
Material Cost	
	\$0.03
OEM Asm. Cost	
	\$0.28
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.11
Supplier Fab. Cost	
	\$0.05
Q Burden	
	\$0.02
SG&A	
	\$0.07
Manufacturing Cost*	
	\$0.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



- \...
- \Emergency Tether Asm, Passenger Rear Quarter Asm
- \Upper Tether, Emergency Tether Asm
- \Upper Tether Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.75
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Tether, Emergency Tether Asm



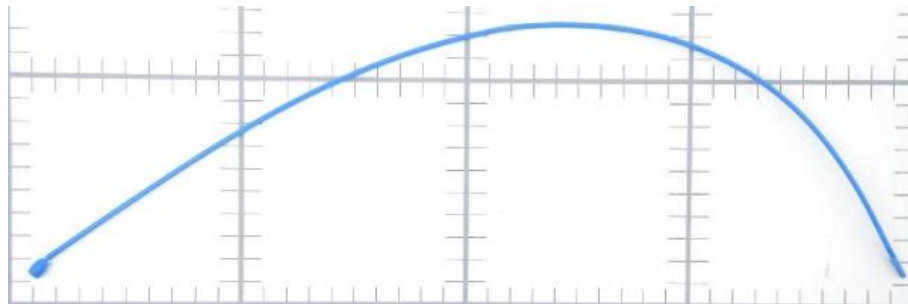
Upper Tether Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	22.00	8	0.25	23.71	GER	\$0.02	99.99%	\$0.00

Upper Tether Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Upper Tether	1	PP	\$2.38	0.0026	0.0028	\$0.00	\$0.01

Lower Tether, Emergency Tether Asm



\...

- \Emergency Tether Asm, Passenger Rear Quarter Asm
- \Lower Tether, Emergency Tether Asm
- \Lower Tether Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.75
Total Weight (kg)	0.00
Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lower Tether, Emergency Tether Asm



Lower Tether Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	22.00	8	0.25	23.71	GER	\$0.02	99.99%	\$0.00

Lower Tether Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lower Tether	1	PP	\$2.38	0.0026	0.0028	\$0.00	\$0.01

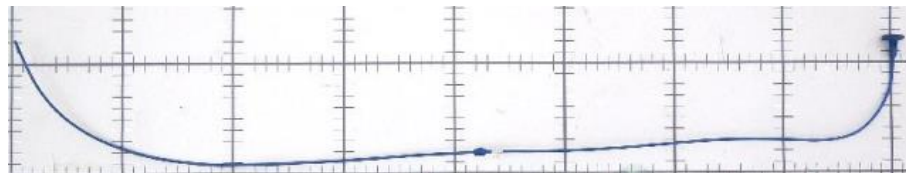
No Commodity Items
Required for This
Process

- \...
- \Passenger Rear Quarter Panel Asm
- \Emergency Tether Asm, Passenger Rear Quarter Asm
- \Assemble Charging Door Cover Emergency Tether

Process Summary

Right First Time	99.95 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.33



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Charging Door Cover Emergency Tether



Assemble Charging Door Cover Emergency Tether

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	11.00	1	1.00	91.41	GER	\$0.28	99.95%	\$0.01

Assemble Charging Door Cover Emergency Tether

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Tether Handle, Emergency Tether Asm



\...

- \Emergency Tether Asm, Passenger Rear Quarter Asm
- \Tether Handle, Emergency Tether Asm
- \Tether Handle Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.07
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tether Handle, Emergency Tether Asm



Tether Handle Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.56	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tether Handle Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tether Handle	1	PP	\$2.38	0.0013	0.0014	\$0.00	\$0.01

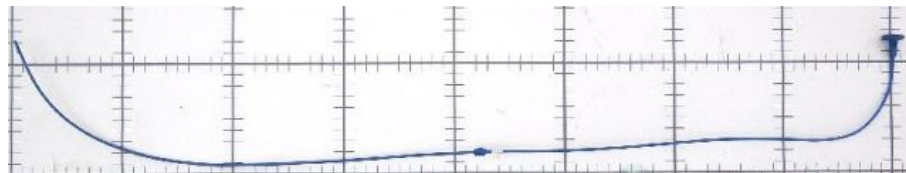
No Commodity Items
Required for This
Process

- \...
- \Passenger Rear Quarter Panel Asm
- \Emergency Tether Asm, Passenger Rear Quarter Asm
- \Assemble Tether Handle

Process Summary

Right First Time	99.97 %
Process Time (Sec)	7.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.13



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tether Handle



Assemble Tether Handle

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.00	1	1.00	54.32	GER	\$0.11	99.97%	\$0.00

Assemble Tether Handle

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...
\Exterior Trim
\Passenger Rear Quarter Panel Asm
\Assemble Charging Door Emergency Tether

Process Summary

Right First Time	99.88 %
Process Time (Sec)	27.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.69
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.10
Manufacturing Cost*	\$0.81

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Charging Door Emergency Tether

Assemble Charging Door Emergency Tether

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	27.00	1	1.00	91.41	GER	\$0.69	99.88 %	\$0.02

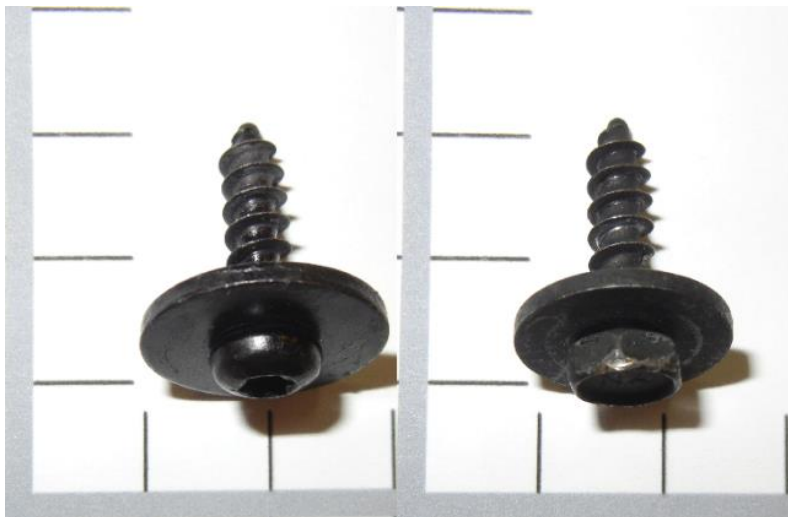
Assemble Charging Door Emergency Tether

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Passenger Rear Quarter Panel Process



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\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Rear Quarter Panel Process

Process Summary

Right First Time	98.37 %
Process Time (Sec)	114.50
Total Weight (kg)	0.03

Material Cost**	\$0.14
OEM Process Cost	\$2.91
Supplier Process Cost	\$0.00
Q Burden	\$0.25
SG&A	\$0.44
Manufacturing Cost*	\$3.73



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Process



Passenger Rear Quarter Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	114.50	1	1.00	91.41	GER	\$2.91	98.37%	\$0.25

Passenger Rear Quarter Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x18mm-SEMS Torx Screw	3	Commodity Item	Purchased	0.0051	-	\$0.02	\$0.00
M5x18mm-Hex SEMS Screw	4	Commodity Item	Purchased	0.0046	-	\$0.02	\$0.00



- \...
- \Exterior Trim
- \Driver Rear NVH Foam
- \Driver Rear NVH Foam Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	1.61
Total Weight (kg)	0.01
Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear NVH Foam



Driver Rear NVH Foam Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Foam Molding Press	1.61	1	1.00	115.32	GER	\$0.05	99.98 %	\$0.00

Driver Rear NVH Foam Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push Pin	1	Commodity Item	Purchased	0.0012	-	\$0.04	\$0.00
Material, Driver Rear NVH Foam	1	EPE	\$5.29	0.0072	0.0072	\$0.00	\$0.05

No Commodity Items Required for This Process



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Rear Quarter Panel Installation

Process Summary

Right First Time	99.97 %
Process Time (Sec)	5.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.13
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Quarter Panel Installation



Driver Rear Quarter Panel Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	5.00	1	1.00	91.41	GER	\$0.13	99.97%	\$0.00

Driver Rear Quarter Panel Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Passenger Rear NVH Foam



- \...
- \Exterior Trim
- \Passenger Rear NVH Foam
- \Passenger Rear NVH Foam Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	1.61
Total Weight (kg)	0.01

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.15



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear NVH Foam



Passenger Rear NVH Foam Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Foam Molding Press	1.61	1	1.00	115.32	GER	\$0.05	99.98 %	\$0.00

Passenger Rear NVH Foam Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push Pin	1	Commodity Item	Purchased	0.0012	-	\$0.04	\$0.00
Material, Passenger Rear NVH Foam	1	EPE	\$5.29	0.0072	0.0072	\$0.00	\$0.04

No Commodity Items Required for This Process



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Rear Quarter Panel Installation

Process Summary

Right First Time	99.97 %
Process Time (Sec)	5.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.13
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Installation



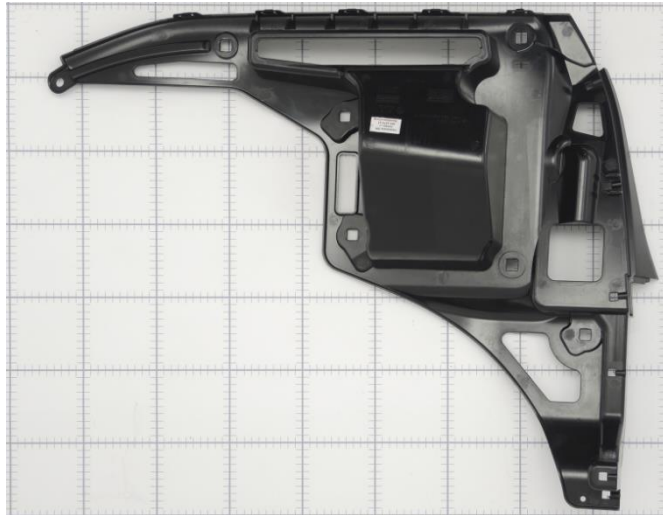
Passenger Rear Quarter Panel Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	5.00	1	1.00	91.41	GER	\$0.13	99.97%	\$0.00

Passenger Rear Quarter Panel Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Rear Quarter Panel Upper Reinforcement



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Rear Quarter Panel Upper Reinforcement
Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	6
Fastenings	1
Right First Time	99.94 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.82
Total Weight (kg)	1.16

Material Cost**	\$4.24
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.05
Q Burden	\$0.01
SG&A	\$0.79
Manufacturing Cost*	\$6.08

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Driver Rear Quarter Panel Upper Reinforcement



Driver Rear Quarter Panel Upper Reinforcement

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Upper Reinf, Dvr Rear Qtr Panel Upr Reinforcement	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.52	1.1601
Assemble Dvr Rear Qtr Panel Upr Reinforcement	1	2	1	4	1	99.95 %	0.00	0.00	0.30	0.00	0.0039

Driver Rear Quarter Panel Upper Reinforcement

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Upper Reinf, Dvr Rear Qtr Panel Upr Reinforcement	\$0.00	\$4.18	\$0.00	\$0.00	\$0.00	\$0.77	\$0.00	\$0.74	\$5.69
Assemble Dvr Rear Qtr Panel Upr Reinforcement	\$0.06	\$0.00	\$0.00	\$0.00	\$0.28	\$0.00	\$0.01	\$0.04	\$0.39

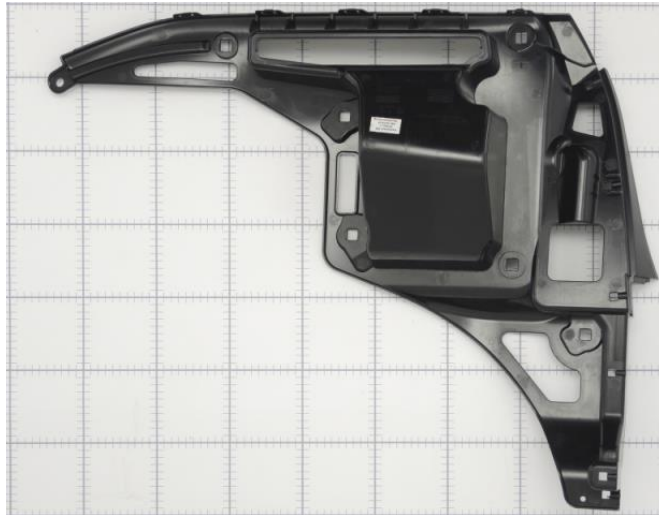
Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	6
Fastenings	1
Right First Time	99.94%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.52
Total Weight (kg)	1.16
Purchased Part Cost	
	\$0.06
Material Cost	
	\$4.18
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.28
Supplier Fab. Cost	
	\$0.77
Q Burden	
	\$0.01
SG&A	
	\$0.79
Manufacturing Cost*	
	\$6.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Reinforcement, Driver Rear Quarter Panel Upper Reinforcement



\...
 \Driver Rear Quarter Panel Upper Reinforcement
 \Upper Reinforcement, Driver Rear Quarter Panel
 Upper Reinforcement Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	30.91
Total Weight (kg)	1.16

Material Cost**	\$4.18
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.77
Q Burden	\$0.00
SG&A	\$0.74
Manufacturing Cost*	\$5.69

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Reinforcement, Driver Rear Quarter Panel Upper Reinforcement



Upper Reinf Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	30.91	1	0.25	89.76	GER	\$0.77	99.99%	\$0.00

Upper Reinf Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Upper Reinforcement	1	ABS + PC	\$3.40	1.1601	1.1601	\$0.00	\$4.18

Assemble Driver Rear Quarter Panel Upper Reinforcement



\...
 \Exterior Trim
 \Driver Rear Quarter Panel Upper Reinforcement
 \Assemble Driver Rear Quarter Panel Upper Reinforcement

Process Summary

Right First Time	99.95 %
Process Time (Sec)	18.25
Total Weight (kg)	0.00
Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.28
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Rear Quarter Panel Upper Reinforcement



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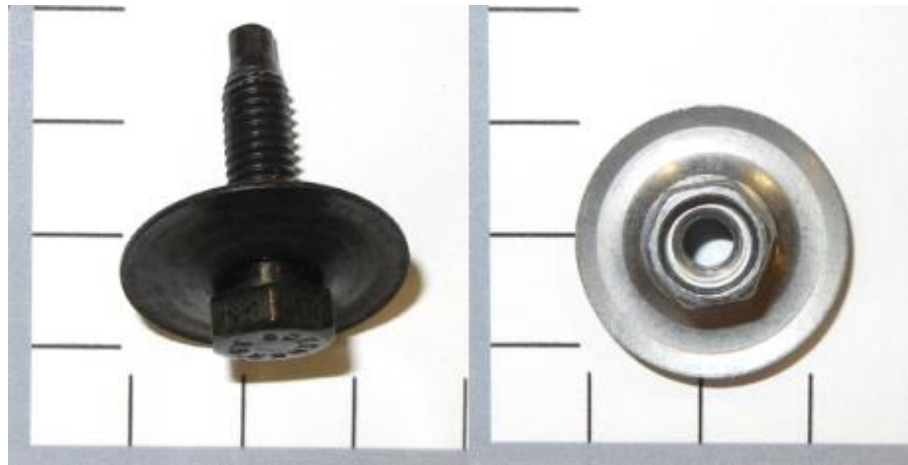
Assemble Dvr Rear Qtr Panel Upr Reinforcement

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	18.25	1	1.00	54.32	GER	\$0.28	99.95%	\$0.01

Assemble Dvr Rear Qtr Panel Upr Reinforcement

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Foam Strip	1	Commodity Item	Purchased	0.0038	-	\$0.01	\$0.00
Label, RMA-TSK Supplier Label	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Driver Rear Quarter Panel Upper Reinforcement Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Driver Rear Quarter Panel Upper Reinforcement
Installation

Process Summary

Right First Time	98.35 %
Process Time (Sec)	90.00
Total Weight (kg)	0.06

Material Cost**	\$0.19
OEM Process Cost	\$2.29
Supplier Process Cost	\$0.00
Q Burden	\$0.25
SG&A	\$0.35
Manufacturing Cost*	\$3.07



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Quarter Panel Upper Reinforcement Installation



Driver Rear Quarter Panel Upper Rein Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	90.00	1	1.00	91.41	GER	\$2.29	98.35%	\$0.25

Driver Rear Quarter Panel Upper Rein Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x22mm-Hex SEMS Bolt	3	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
M5x10 KEPS Nut	3	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00
M5x23mm-Hex SEMS Screw	2	Commodity Item	Purchased	0.0058	-	\$0.02	\$0.00

Passenger Rear Quarter Panel Upper Reinforcement



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Passenger Rear Quarter Panel Upper Reinforcement
Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	6
Fastenings	1
Right First Time	99.94 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.83
Total Weight (kg)	1.40

Material Cost**	\$5.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.06
Q Burden	\$0.01
SG&A	\$0.91
Manufacturing Cost*	\$7.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Upper Reinforcement



Pssgr Rear Qtr Panel Upr Reinforcement

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Upper Reinf, Pssgr Rear Qtr Panel Upr Reinforceme	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.52	1.3981
Assemble Pssgr Rear Qtr Panel Upr Reinforcement	1	2	1	4	1	99.95 %	0.00	0.00	0.30	0.00	0.0039

Pssgr Rear Qtr Panel Upr Reinforcement

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Upper Reinf, Pssgr Rear Qtr Panel Upr Reinforceme	\$0.00	\$5.03	\$0.00	\$0.00	\$0.00	\$0.78	\$0.00	\$0.87	\$6.68
Assemble Pssgr Rear Qtr Panel Upr Reinforcement	\$0.06	\$0.00	\$0.00	\$0.00	\$0.28	\$0.00	\$0.01	\$0.04	\$0.39

Passenger Rear Quarter Panel Upper Reinforcement

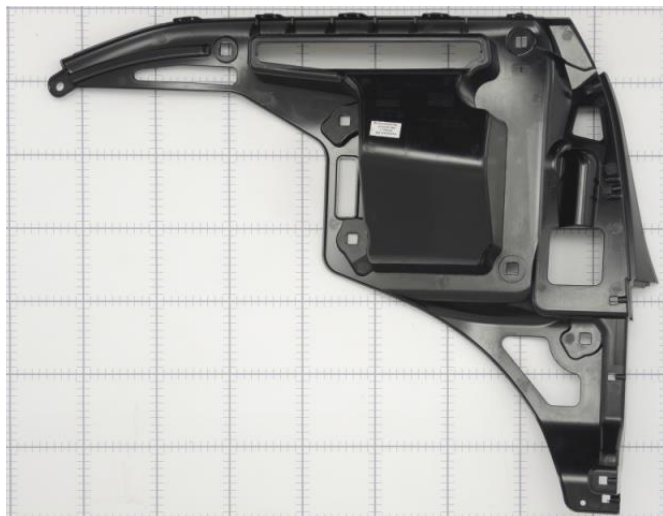
Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	6
Fastenings	1
Right First Time	99.94%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.52
Total Weight (kg)	1.40
<hr/>	
Purchased Part Cost	\$0.06
Material Cost	\$5.03
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.28
Supplier Fab. Cost	\$0.78
Q Burden	\$0.01
SG&A	\$0.91
Manufacturing Cost*	\$7.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Reinforcement, Passenger Rear Quarter Panel Upper Reinforcement



\...
 \Passenger Rear Quarter Panel Upper Reinforcement
 \Upper Reinforcement, Passenger Rear Quarter Panel
 Upper Reinforcement Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	31.28
Total Weight (kg)	1.40
Material Cost**	\$5.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.78
Q Burden	\$0.00
SG&A	\$0.87
Manufacturing Cost*	\$6.68

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Reinforcement, Passenger Rear Quarter Panel Upper Reinforcement



Upper Reinf Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	31.28	1	0.25	89.76	GER	\$0.78	99.99%	\$0.00

Upper Reinf Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Upper Reinforcement	1	ABS + PC	\$3.40	1.3981	1.3981	\$0.00	\$5.03

Assemble Passenger Rear Quarter Panel Upper Reinforcement



\...
 \Exterior Trim
 \Passenger Rear Quarter Panel Upper Reinforcement
 \Assemble Passenger Rear Quarter Panel Upper Reinforcement

Process Summary

Right First Time	99.95 %
Process Time (Sec)	18.25
Total Weight (kg)	0.00

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.28
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Rear Quarter Panel Upper Reinforcement



Assemble Psgr Rear Qtr Panel Upr Reinforcement

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	18.25	1	1.00	54.32	GER	\$0.28	99.95%	\$0.01

Assemble Psgr Rear Qtr Panel Upr Reinforcement

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Foam Strip	1	Commodity Item	Purchased	0.0038	-	\$0.01	\$0.00
Label, RMA-TSK Supplier Label	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Passenger Rear Quarter Panel Upper Reinforcement Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Passenger Rear Quarter Panel Upper Reinforcement
Installation

Process Summary

Right First Time	97.92 %
Process Time (Sec)	113.00
Total Weight (kg)	0.07

Material Cost**	\$0.24
OEM Process Cost	\$2.87
Supplier Process Cost	\$0.00
Q Burden	\$0.31
SG&A	\$0.44
Manufacturing Cost*	\$3.86



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Upper Reinforcement Installation



Pssgr Rear Quarter Panel Upper Rein Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	113.00	1	1.00	91.41	GER	\$2.87	97.92 %	\$0.31

Pssgr Rear Quarter Panel Upper Rein Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Foam Isolator Pad	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
M6x22mm-Hex SEMS Bolt	3	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
M5x10 KEPS Nut	5	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00
M5x23mm-Hex SEMS Screw	2	Commodity Item	Purchased	0.0058	-	\$0.02	\$0.00

Driver Rear Quarter Panel Lower Reinforcement



\...
\Exterior Trim
\Driver Rear Quarter Panel Lower Reinforcement
\Driver Rear Quarter Panel Lwr Reinforcement
Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.62
Total Weight (kg)	0.29

Material Cost**	\$1.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.20
Q Burden	\$0.00
SG&A	\$0.19
Manufacturing Cost*	\$1.43



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Quarter Panel Lower Reinforcement



Driver Rear Qtr Panel Lwr Reinforcement Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	27.24	2	0.25	52.65	GER	\$0.20	99.99%	\$0.00

Driver Rear Qtr Panel Lwr Reinforcement Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Driver Rear Qtr Panel Lwr Reinforcement	1	ABS + PC	\$3.40	0.2860	0.2860	\$0.00	\$1.04

Driver Rear Quarter Panel Lower Reinforcement Installation



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Rear Quarter Panel Lower Reinforcement
 Installation

Process Summary

Right First Time	99.34 %
Process Time (Sec)	46.00
Total Weight (kg)	0.03

Material Cost**	\$0.09
OEM Process Cost	\$1.17
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$0.18
Manufacturing Cost*	\$1.53



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Rear Quarter Panel Lower Reinforcement Installation



Driver Rear Quarter Panel Lower Rein Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	46.00	1	1.00	91.41	GER	\$1.17	99.34%	\$0.10

Driver Rear Quarter Panel Lower Rein Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Foam Isolator Pad	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
M6x22mm-Hex SEMS Bolt	2	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00

Passenger Rear Quarter Panel Lower Reinforcement



\...
\Exterior Trim
\Passenger Rear Quarter Panel Lower Reinforcement
\Driver Rear Quarter Panel Lwr Reinforcement
Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	13.62
Total Weight (kg)	0.29

Material Cost**	\$1.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.20
Q Burden	\$0.00
SG&A	\$0.19
Manufacturing Cost*	\$1.43



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Lower Reinforcement



Driver Rear Qtr Panel Lwr Reinforcement Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	27.24	2	0.25	52.65	GER	\$0.20	99.99%	\$0.00

Driver Rear Qtr Panel Lwr Reinforcement Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Passenger Rear Qtr Panel Lwr Reinforceme	1	ABS + PC	\$3.40	0.2889	0.2889	\$0.00	\$1.04

Passenger Rear Quarter Panel Lower Reinforcement Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Passenger Rear Quarter Panel Lower Reinforcement
Installation

Process Summary

Right First Time	99.37 %
Process Time (Sec)	41.00
Total Weight (kg)	0.03

Material Cost**	\$0.08
OEM Process Cost	\$1.04
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$0.16
Manufacturing Cost*	\$1.37



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Rear Quarter Panel Lower Reinforcement Installation



Pass Rear Quarter Panel Lower Rein Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	41.00	1	1.00	91.41	GER	\$1.04	99.37%	\$0.10

Pass Rear Quarter Panel Lower Rein Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x22mm-Hex SEMS Bolt	2	Commodity Item	Purchased	0.0094	-	\$0.03	\$0.00
M5x10 KEPS Nut	1	Commodity Item	Purchased	0.0062	-	\$0.02	\$0.00

Exterior Trim Panel, Driver Side Front Door Asm



\...

\Zone 2 Exterior

\Exterior Trim

\Exterior Trim Panel, Driver Side Front Door Asm

Assembly Summary

Parts	9
Fasteners	3
Part Numbers	6
Steps	56
Fastenings	6
Right First Time	99.49 %
OEM Process Time (Min)	17.99
Supplier Process Time (Min)	0.00
Total Weight (kg)	3.75

Material Cost**	\$17.62
OEM Process Cost	\$13.79
Supplier Process Cost	\$0.00
Q Burden	\$0.08
SG&A	\$4.70
Manufacturing Cost*	\$36.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exterior Trim Panel, Driver Side Front Door Asm



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Exterior Trim Panel, Driver Side Front Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Panel, Driver FrntDoor Exterior Trim Panel Asm	1	1	0	1	0	99.99 %	0.00	0.61	0.00	0.00	2.1506
Inr Panel, DriverFrntDoor Exterior Trim Panel As	1	1	0	1	0	99.99 %	0.00	0.58	0.00	0.00	1.4337
Assemble Driver FrtDoor Exterior Trim	1	7	6	52	6	99.51 %	1.93	14.88	0.00	0.00	0.1656

Exterior Trim Panel, Driver Side Front Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Panel, Driver Frnt Door Exterior Trim Panel Asm	\$0.00	\$6.45	\$0.00	\$1.58	\$0.00	\$0.00	\$0.00	\$1.20	\$9.23
Inr Panel, DriverFrntDoor Exterior Trim Panel As	\$0.00	\$4.30	\$0.00	\$1.50	\$0.00	\$0.00	\$0.00	\$0.87	\$6.67
Assemble Driver FrtDoor Exterior Trim	\$0.08	\$6.79	\$2.62	\$8.09	\$0.00	\$0.00	\$0.07	\$2.63	\$20.28

Exterior Trim Panel, Driver Side Front Door Asm



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Detailed Summary

Parts	9
Fasteners	3
Part Numbers	6
Steps	56
Fastenings	6
Right First Time	99.49%
OEM Asm. Time (Min)	1.93
OEM Fab. Time (Min)	16.06
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	3.75
Purchased Part Cost	
	\$0.08
Material Cost	
	\$17.54
OEM Asm. Cost	
	\$2.62
OEM Fab. Cost	
	\$11.17
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.08
SG&A	
	\$4.70
Manufacturing Cost*	
	\$36.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Driver Front Door Exterior Trim Panel Asm



\...

- \Exterior Trim Panel, Driver Side Front Door Asm
- \Panel, Driver Front Door Exterior Trim Panel Asm
- \Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	36.31
Total Weight (kg)	2.15
Material Cost**	\$6.45
OEM Process Cost	\$1.58
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$1.20
Manufacturing Cost*	\$9.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Driver Front Door Exterior Trim Panel Asm



Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	36.31	1	0.25	156.30	GER	\$1.58	99.99%	\$0.00

Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Panel	1	PP/EPDM TD30	\$3.00	2.1506	2.1506	\$0.00	\$6.45

Inner Panel, Driver Front Door Exterior Trim Panel As



\...

- \Exterior Trim Panel, Driver Side Front Door Asm
- \Inner Panel, Driver Front Door Exterior Trim Panel As
- \Inner Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	34.55
Total Weight (kg)	1.43
Material Cost**	\$4.30
OEM Process Cost	\$1.50
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.87
Manufacturing Cost*	\$6.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Panel, Driver Front Door Exterior Trim Panel As



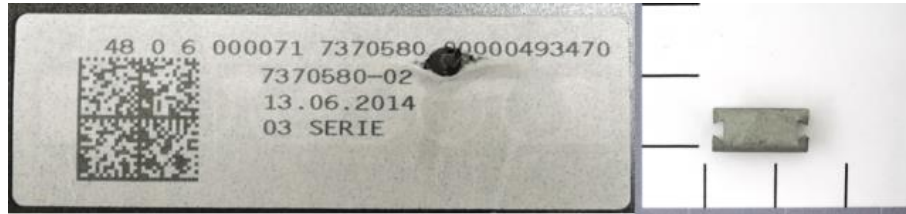
Inner Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	34.55	1	0.25	156.30	GER	\$1.50	99.99%	\$0.00

Inner Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Panel	1	PP/EPDM TD30	\$3.00	1.4337	1.4337	\$0.00	\$4.30

Assemble Driver Front Door Exterior Trim



\...

\Exterior Trim

\Exterior Trim Panel, Driver Side Front Door Asm

\Assemble Driver Front Door Exterior Trim

Process Summary

Right First Time	99.51 %
Process Time (Sec)	1008.54
Total Weight (kg)	0.17

Material Cost**	\$6.87
OEM Process Cost	\$10.71
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$2.63
Manufacturing Cost*	\$20.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Front Door Exterior Trim



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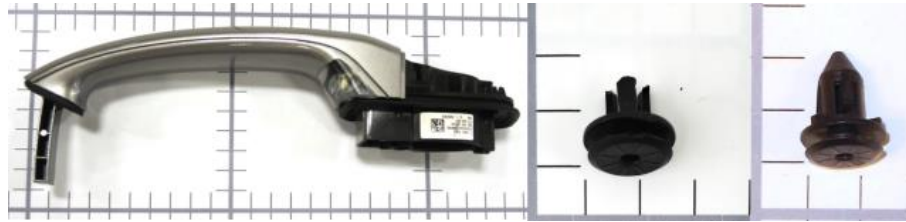
Assemble Driver Frt Door Exterior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	27.50	1	1.00	91.41	GER	\$0.70	99.96 %	\$0.01
Cure Paint	406.00	1	0.25	27.19	GER	\$3.07	99.97 %	\$0.01
Apply Base Coat	24.92	1	0.25	117.09	GER	\$0.81	99.94 %	\$0.01
OEM CO2 Cleaning Line	14.96	1	0.25	51.85	GER	\$0.22	99.99 %	\$0.00
OEM Hand Sanding Station	25.80	1	1.00	91.41	GER	\$0.66	99.94 %	\$0.01
Cure Paint	406.00	1	0.25	27.19	GER	\$3.07	99.97 %	\$0.01
Apply Base Coat	24.92	1	0.25	117.09	GER	\$0.81	99.94 %	\$0.01
OEM Plasma Surface Treatment Line	14.96	1	0.25	49.58	GER	\$0.21	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Adhesive Bead Station Auto	23.48	1	0.25	69.43	GER	\$0.45	99.93 %	\$0.01
OEM Manual Asm	24.00	1	1.00	91.41	GER	\$0.61	99.93 %	\$0.01

Assemble Driver Frt Door Exterior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.92
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.92
Adhesive, Driver FrntDoor Exterior Trim Panel Asm	1	Structural Adhesive - Polymer	\$17.94	0.1643	0.1643	\$0.00	\$2.95
Channel Retention Clip	3	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00

Assemble Exterior Trim Panel



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble Exterior Trim Panel

Process Summary

Right First Time	99.53 %
Process Time (Sec)	107.00
Total Weight (kg)	0.15

Material Cost**	\$8.47
OEM Process Cost	\$2.72
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$0.66
Manufacturing Cost*	\$11.92



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Exterior Trim Panel



Assemble Exterior Trim Panel

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	107.00	1	1.00	91.41	GER	\$2.72	99.53%	\$0.07

Assemble Exterior Trim Panel

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push Pin	7	Commodity Item	Purchased	0.0012	-	\$0.06	\$0.00
Push Pin	1	Commodity Item	Purchased	0.0008	-	\$0.05	\$0.00
Exterior Door HandleAsm, DS Front DoorAsm	1	Commodity Item	Purchased	0.1441	-	\$8.00	\$0.00

Cover Asm, Driver Side Front Door Asm



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\...

\Zone 2 Exterior

\Exterior Trim

\Cover Asm, Driver Side Front Door Asm

Assembly Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	26
Fastenings	1
Right First Time	99.74 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.58
Total Weight (kg)	0.01

Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.36
Q Burden	\$0.04
SG&A	\$0.07
Manufacturing Cost*	\$0.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover Asm, Driver Side Front Door Asm



Cover Asm, Driver Side Front Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cover, Cover Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.36	0.0100
Assemble Cover	1	1	1	3	1	99.96 %	0.00	0.00	0.22	0.00	0.0001

Cover Asm, Driver Side Front Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cover, Cover Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.16	\$0.03	\$0.03	\$0.30
Assemble Cover	\$0.05	\$0.00	\$0.00	\$0.00	\$0.20	\$0.00	\$0.01	\$0.03	\$0.29

Detailed Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	26
Fastenings	1
Right First Time	99.74%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.22
Supplier Fab. Time (Min)	0.36
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.05
Material Cost	
	\$0.07
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.20
Supplier Fab. Cost	
	\$0.16
Q Burden	
	\$0.04
SG&A	
	\$0.07
Manufacturing Cost*	
	\$0.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover, Cover Asm



\...

\Cover Asm, Driver Side Front Door Asm

\Cover, Cover Asm

\Cover Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	21.65
Total Weight (kg)	0.01

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover, Cover Asm

Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	4.27	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Clearcoat	2.58	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	4.02	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Basecoat	2.58	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	3.52	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Primer	2.58	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
110 Ton Injection Molding Press	16.72	8	0.25	26.65	GER	\$0.02	99.99 %	\$0.00

Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Cover	1	ABS + PC	\$3.40	0.0100	0.0100	\$0.00	\$0.04



\...
 \Exterior Trim
 \Cover Asm, Driver Side Front Door Asm
 \Assemble Cover

Process Summary

Right First Time	99.96 %
Process Time (Sec)	13.10
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.20
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cover



Assemble Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	13.10	1	1.00	54.32	GER	\$0.20	99.96%	\$0.01

Assemble Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...
\Zone 2 Exterior
\Exterior Trim
\Assemble Cover Asm

Process Summary

Right First Time	99.90 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cover Asm



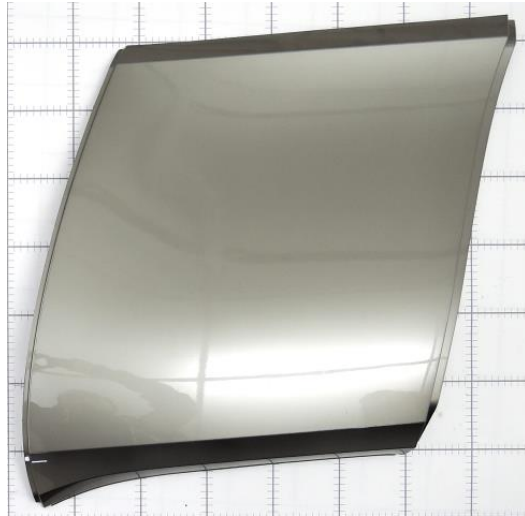
Assemble Cover Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	11.00	1	1.00	91.41	GER	\$0.28	99.90%	\$0.02

Assemble Cover Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Side Rear Door Exterior Trim Panel



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Driver Side Rear Door Exterior Trim Panel
Assembly Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	45
Fastenings	3
Right First Time	99.60 %
OEM Process Time (Min)	17.94
Supplier Process Time (Min)	0.00
Total Weight (kg)	1.53

Material Cost**	\$9.20
OEM Process Cost	\$11.93
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.16
Manufacturing Cost*	\$24.36

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Side Rear Door Exterior Trim Panel



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Driver Side Rear Door Exterior Trim Panel

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Panel, Drvr Side Rr Door Exterior Trim Panel Asm	1	1	0	1	0	99.99 %	0.00	0.86	0.00	0.00	0.8553
Inner Panel, Drvr Sd Rr Dr Exterior Trim Panel Asm	1	1	0	1	0	99.99 %	0.00	0.54	0.00	0.00	0.5501
Assemble Driver Rear Door Trim Panel	1	4	3	41	3	99.62 %	1.31	15.23	0.00	0.00	0.1207

Driver Side Rear Door Exterior Trim Panel

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Panel, Drvr Side Rr Door Exterior Trim Panel Asm	\$0.00	\$2.57	\$0.00	\$1.88	\$0.00	\$0.00	\$0.00	\$0.67	\$5.12
Inner Panel, Drvr Sd Rr Dr Exterior Trim Panel Asm	\$0.00	\$1.65	\$0.00	\$0.73	\$0.00	\$0.00	\$0.00	\$0.36	\$2.74
Assemble Driver Rear Door Trim Panel	\$0.05	\$4.93	\$1.73	\$7.59	\$0.00	\$0.00	\$0.06	\$2.14	\$16.49

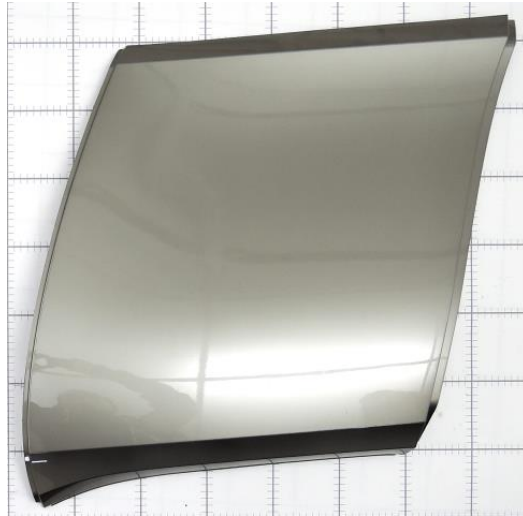
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	45
Fastenings	3
Right First Time	99.6%
OEM Asm. Time (Min)	1.31
OEM Fab. Time (Min)	16.63
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	1.53
Purchased Part Cost	\$0.05
Material Cost	\$9.15
OEM Asm. Cost	\$1.73
OEM Fab. Cost	\$10.20
Supplier Asm. Cost	\$0.00
Supplier Fab. Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.16
Manufacturing Cost*	\$24.36

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Driver Side Rear Door Exterior Trim Panel Asm



\...

\Driver Side Rear Door Exterior Trim Panel

\Panel, Driver Side Rear Door Exterior Trim Panel Asm

\Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	51.70
Total Weight (kg)	0.86

Material Cost**	\$2.57
OEM Process Cost	\$1.88
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.67
Manufacturing Cost*	\$5.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Driver Side Rear Door Exterior Trim Panel Asm



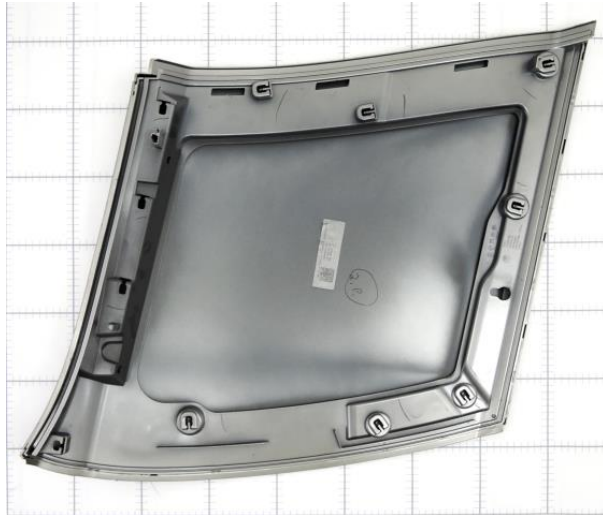
Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1500 Ton Injection Molding Press	51.70	1	0.25	131.11	GER	\$1.88	99.99%	\$0.00

Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Panel	1	PP/EPDM TD30	\$3.00	0.8553	0.8553	\$0.00	\$2.57

Inner Panel, DS Rear Door Exterior Trim Panel Asm



\...

- \Driver Side Rear Door Exterior Trim Panel
- \Inner Panel, Driver Sd Rear Dr Exterior Trim Panel Asm
- \Inner Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	32.41
Total Weight (kg)	0.55
Material Cost**	\$1.65
OEM Process Cost	\$0.73
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.36
Manufacturing Cost*	\$2.74

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Panel, DS Rear Door Exterior Trim Panel Asm



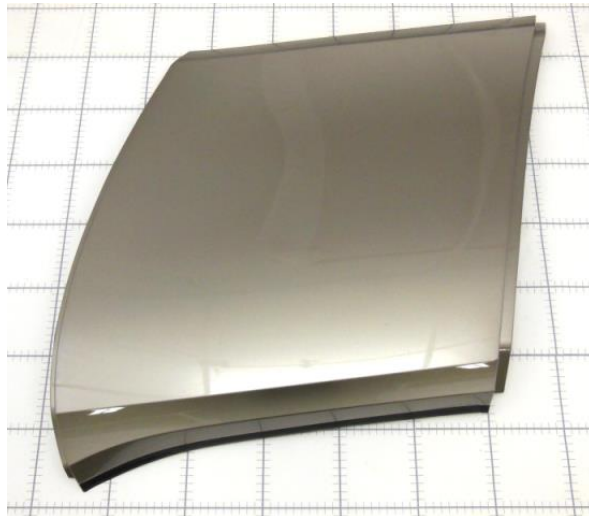
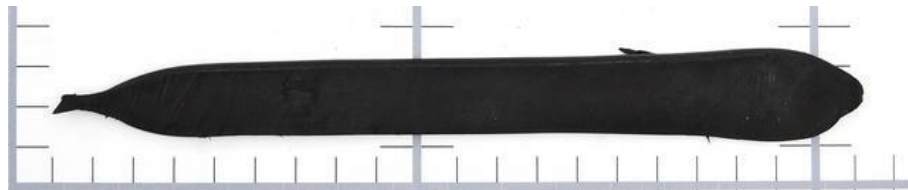
Inner Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
720 Ton Injection Molding Press	32.41	1	0.25	81.14	GER	\$0.73	99.99%	\$0.00

Inner Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Panel	1	PP/EPDM TD30	\$3.00	0.5501	0.5501	\$0.00	\$1.65

Assemble Driver Rear Door Trim Panel



\...

\Exterior Trim

\Driver Side Rear Door Exterior Trim Panel

\Assemble Driver Rear Door Trim Panel

Process Summary

Right First Time	99.62 %
Process Time (Sec)	992.01
Total Weight (kg)	0.12

Material Cost**	\$4.98
OEM Process Cost	\$9.32
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$2.14
Manufacturing Cost*	\$16.49

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Rear Door Trim Panel



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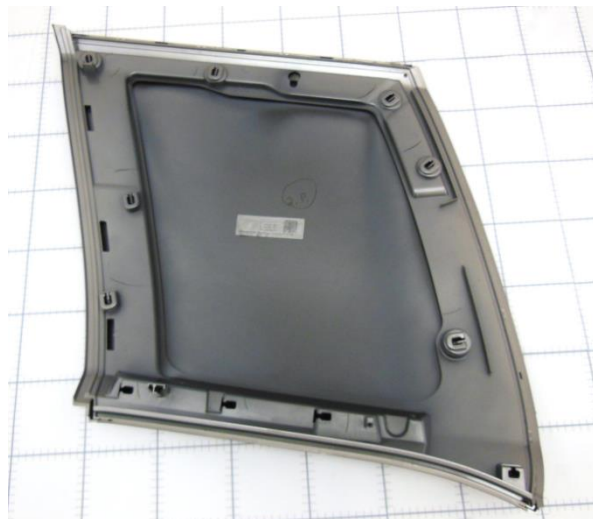
Assemble Driver Rear Door Trim Panel

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	27.50	1	1.00	91.41	GER	\$0.70	99.96 %	\$0.01
Cure Paint	456.00	1	0.25	27.19	GER	\$3.44	99.97 %	\$0.01
Apply Clear Coat	12.20	1	0.25	117.09	GER	\$0.40	99.96 %	\$0.01
OEM CO2 Cleaning Line	11.20	1	0.25	51.85	GER	\$0.16	99.99 %	\$0.00
OEM Hand Sanding Station	18.75	1	1.00	91.41	GER	\$0.48	99.94 %	\$0.01
Cure Paint	406.00	1	0.25	27.19	GER	\$3.07	99.97 %	\$0.01
Apply Base Coat	12.20	1	0.25	117.09	GER	\$0.40	99.96 %	\$0.01
OEM Plasma Surface Treatment Line	11.20	1	0.25	49.58	GER	\$0.15	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Adhesive Bead Station Auto	20.96	1	0.25	69.43	GER	\$0.40	99.93 %	\$0.01

Assemble Driver Rear Door Trim Panel

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$1.49
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.28
Adhesive, Driver Rear Exterior Trim	1	Structural Adhesive - Polymer	\$17.94	0.1206	0.1206	\$0.00	\$2.16

Assemble Exterior Trim Panel



\...
\Zone 2 Exterior
\Exterior Trim
\Assemble Exterior Trim Panel

Process Summary

Right First Time	99.71 %
Process Time (Sec)	92.00
Total Weight (kg)	0.01

Material Cost**	\$0.60
OEM Process Cost	\$2.34
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.37
Manufacturing Cost*	\$3.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Exterior Trim Panel



Assemble Exterior Trim Panel

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	92.00	1	1.00	91.41	GER	\$2.34	99.71 %	\$0.04

Assemble Exterior Trim Panel

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push Pin	10	Commodity Item	Purchased	0.0012	-	\$0.06	\$0.00

Passenger Front Door Exterior Trim Panel Asm



\...

\Zone 2 Exterior

\Exterior Trim

\Passenger Front Door Exterior Trim Panel Asm

Assembly Summary

Parts	9
Fasteners	3
Part Numbers	6
Steps	56
Fastenings	6
Right First Time	99.49 %
OEM Process Time (Min)	17.99
Supplier Process Time (Min)	0.00
Total Weight (kg)	3.75

Material Cost**	\$17.62
OEM Process Cost	\$13.79
Supplier Process Cost	\$0.00
Q Burden	\$0.08
SG&A	\$4.70
Manufacturing Cost*	\$36.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Front Door Exterior Trim Panel Asm



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Psgr Front Door Exterior Trim Panel Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Panel, Psgr FrntDoor Exterior Trim Panel Asm	1	1	0	1	0	99.99 %	0.00	0.61	0.00	0.00	2.1506
Inr Panel, Psgr FrntDoor Exterior Trim Panel Asm	1	1	0	1	0	99.99 %	0.00	0.58	0.00	0.00	1.4337
Assemble Pass FrtDoor Exterior Trim	1	7	6	52	6	99.51 %	1.93	14.88	0.00	0.00	0.1656

Psgr Front Door Exterior Trim Panel Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Panel, Psgr FrntDoor Exterior Trim Panel Asm	\$0.00	\$6.45	\$0.00	\$1.58	\$0.00	\$0.00	\$0.00	\$1.20	\$9.23
Inr Panel, Psgr FrntDoor Exterior Trim Panel Asm	\$0.00	\$4.30	\$0.00	\$1.50	\$0.00	\$0.00	\$0.00	\$0.87	\$6.67
Assemble Pass FrtDoor Exterior Trim	\$0.08	\$6.79	\$2.62	\$8.09	\$0.00	\$0.00	\$0.07	\$2.63	\$20.28

Passenger Front Door Exterior Trim Panel Asm



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Detailed Summary

Parts	9
Fasteners	3
Part Numbers	6
Steps	56
Fastenings	6
Right First Time	99.49%
OEM Asm. Time (Min)	1.93
OEM Fab. Time (Min)	16.06
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	3.75
Purchased Part Cost	
	\$0.08
Material Cost	
	\$17.54
OEM Asm. Cost	
	\$2.62
OEM Fab. Cost	
	\$11.17
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.08
SG&A	
	\$4.70
Manufacturing Cost*	
	\$36.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Passenger Front Door Exterior Trim Panel Asm



\...

- \Passenger Front Door Exterior Trim Panel Asm
- \Panel, Passenger Front Door Exterior Trim Panel Asm
- \Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	36.31
Total Weight (kg)	2.15

Material Cost**	\$6.45
OEM Process Cost	\$1.58
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$1.20
Manufacturing Cost*	\$9.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Passenger Front Door Exterior Trim Panel Asm



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Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	36.31	1	0.25	156.30	GER	\$1.58	99.99%	\$0.00

Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Panel	1	PP/EPDM TD30	\$3.00	2.1506	2.1506	\$0.00	\$6.45

Inner Panel, Passenger Front Door Exterior Trim Panel Asm



\...
\Passenger Front Door Exterior Trim Panel Asm
\Inner Panel, Passenger Front Door Exterior Trim Panel Asm
\Inner Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	34.55
Total Weight (kg)	1.43

Material Cost**	\$4.30
OEM Process Cost	\$1.50
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.87
Manufacturing Cost*	\$6.67

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Panel, Passenger Front Door Exterior Trim Panel Asm



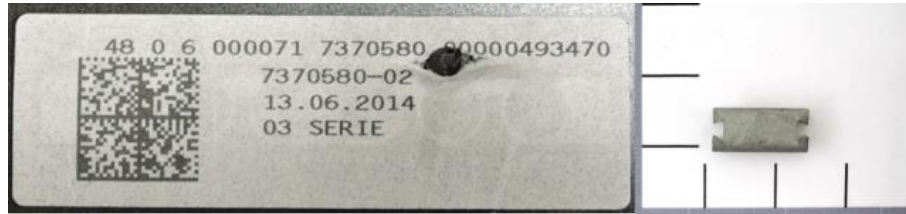
Inner Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
2000 Ton Injection Molding Press	34.55	1	0.25	156.30	GER	\$1.50	99.99%	\$0.00

Inner Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Panel	1	PP/EPDM TD30	\$3.00	1.4337	1.4337	\$0.00	\$4.30

Assemble Passenger Front Door Exterior Trim



\...

\Exterior Trim

\Passenger Front Door Exterior Trim Panel Asm

\Assemble Passenger Front Door Exterior Trim

Process Summary

Right First Time	99.51 %
Process Time (Sec)	1008.54
Total Weight (kg)	0.17

Material Cost**	\$6.87
OEM Process Cost	\$10.71
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$2.63
Manufacturing Cost*	\$20.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Front Door Exterior Trim



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Assemble Pass Frt Door Exterior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	27.50	1	1.00	91.41	GER	\$0.70	99.96 %	\$0.01
Cure Paint	406.00	1	0.25	27.19	GER	\$3.07	99.97 %	\$0.01
Apply Base Coat	24.92	1	0.25	117.09	GER	\$0.81	99.94 %	\$0.01
OEM CO2 Cleaning Line	14.96	1	0.25	51.85	GER	\$0.22	99.99 %	\$0.00
OEM Hand Sanding Station	25.80	1	1.00	91.41	GER	\$0.66	99.94 %	\$0.01
Cure Paint	406.00	1	0.25	27.19	GER	\$3.07	99.97 %	\$0.01
Apply Base Coat	24.92	1	0.25	117.09	GER	\$0.81	99.94 %	\$0.01
OEM Plasma Surface Treatment Line	14.96	1	0.25	49.58	GER	\$0.21	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Adhesive Bead Station Auto	23.48	1	0.25	69.43	GER	\$0.45	99.93 %	\$0.01
OEM Manual Asm	24.00	1	1.00	91.41	GER	\$0.61	99.93 %	\$0.01

Assemble Pass Frt Door Exterior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.92
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.92
Adhesive, Psgr FrntDoor Exterior Trim Panel Asm	1	Structural Adhesive - Polymer	\$17.94	0.1643	0.1643	\$0.00	\$2.95
Channel Retention Clip	3	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00

Assemble Exterior Trim Panel

\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble Exterior Trim Panel



Process Summary

Right First Time	99.53 %
Process Time (Sec)	107.00
Total Weight (kg)	0.15

Material Cost**	\$8.47
OEM Process Cost	\$2.72
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$0.66
Manufacturing Cost*	\$11.92



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Exterior Trim Panel



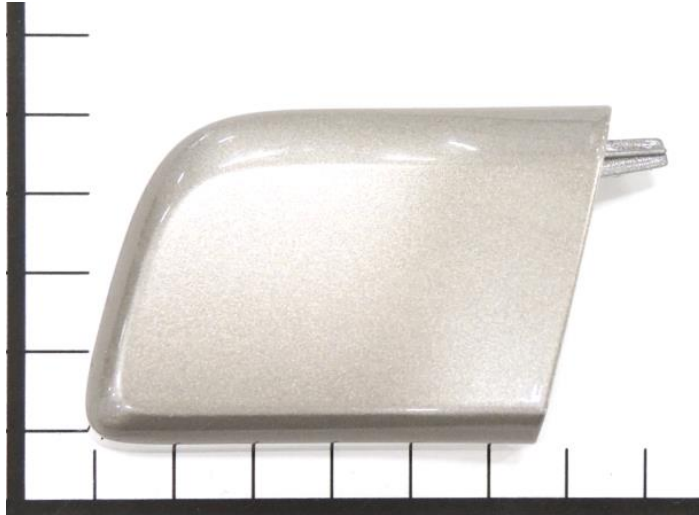
Assemble Exterior Trim Panel

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	107.00	1	1.00	91.41	GER	\$2.72	99.53%	\$0.07

Assemble Exterior Trim Panel

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push Pin	7	Commodity Item	Purchased	0.0012	-	\$0.06	\$0.00
Push Pin	1	Commodity Item	Purchased	0.0008	-	\$0.05	\$0.00
Exterior Door HandleAsm, PS Front DoorAsm	1	Commodity Item	Purchased	0.1441	-	\$8.00	\$0.00

Cover Asm, Passenger Side Front Door Asm



\...

\Zone 2 Exterior

\Exterior Trim

\Cover Asm, Passenger Side Front Door Asm

Assembly Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	26
Fastenings	1
Right First Time	99.74 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.60
Total Weight (kg)	0.01

Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.37
Q Burden	\$0.04
SG&A	\$0.07
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cover Asm, Passenger Side Front Door Asm



Cover Asm, Passenger Side Front Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cover, Cover Asm	1	4	0	22	0	99.78 %	0.00	0.00	0.00	0.36	0.0100
Assemble Cover	1	1	1	3	1	99.96 %	0.00	0.00	0.23	0.00	0.0001

Cover Asm, Passenger Side Front Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cover, Cover Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.16	\$0.03	\$0.03	\$0.30
Assemble Cover	\$0.05	\$0.00	\$0.00	\$0.00	\$0.21	\$0.00	\$0.01	\$0.03	\$0.30

Detailed Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	26
Fastenings	1
Right First Time	99.74%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.23
Supplier Fab. Time (Min)	0.36
Total Weight (kg)	0.01
Purchased Part Cost	\$0.05
Material Cost	\$0.07
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.21
Supplier Fab. Cost	\$0.16
Q Burden	\$0.04
SG&A	\$0.07
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...
 \Cover Asm, Passenger Side Front Door Asm
 \Cover, Cover Asm
 \Cover Process

Process Summary

Right First Time	99.78 %
Process Time (Sec)	21.65
Total Weight (kg)	0.01

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.03
SG&A	\$0.03
Manufacturing Cost*	\$0.30

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Cover, Cover Asm

Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure Clearcoat	4.27	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Clearcoat	2.58	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Basecoat	4.02	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Basecoat	2.58	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
Cure Primer	3.52	1	0.25	17.08	GER	\$0.02	99.97 %	\$0.01
Apply Primer	2.58	1	0.25	41.62	GER	\$0.03	99.97 %	\$0.01
110 Ton Injection Molding Press	16.72	8	0.25	26.65	GER	\$0.02	99.99 %	\$0.00

Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$0.01
Material, Paint	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$0.01
Material, Cover	1	ABS + PC	\$3.40	0.0100	0.0100	\$0.00	\$0.04



- \...
- \Exterior Trim
- \Cover Asm, Passenger Side Front Door Asm
- \Assemble Cover

Process Summary

Right First Time	99.96 %
Process Time (Sec)	14.10
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.21
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cover



Assemble Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	14.10	1	1.00	54.32	GER	\$0.21	99.96%	\$0.01

Assemble Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble Cover Asm

Process Summary

Right First Time	99.90 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cover Asm



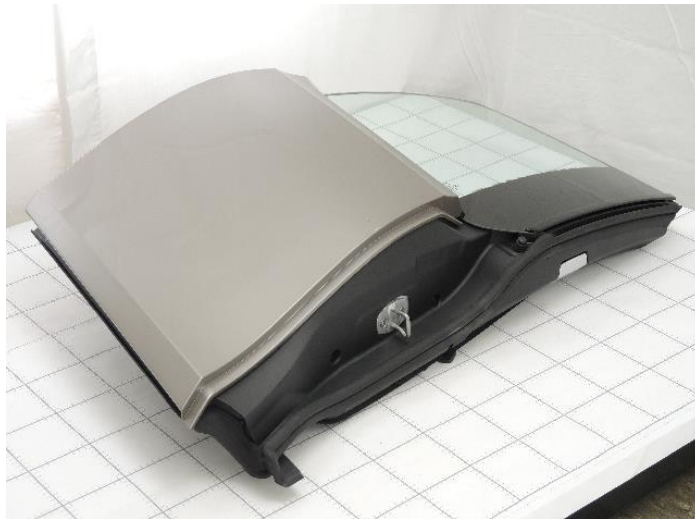
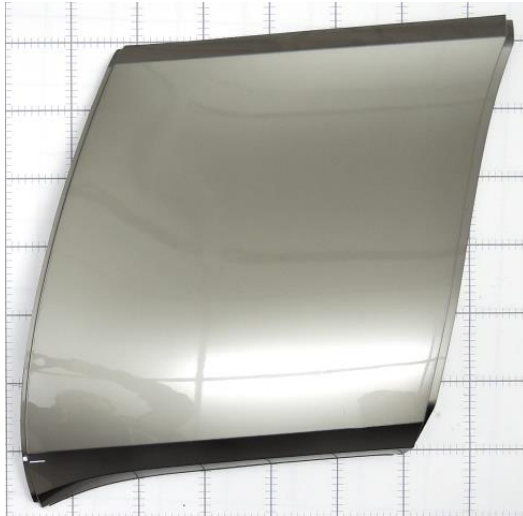
Assemble Cover Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	11.00	1	1.00	91.41	GER	\$0.28	99.90%	\$0.02

Assemble Cover Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Exterior Trim Panel, Passenger Side Rear Door Asm



\...

\Zone 2 Exterior

\Exterior Trim

\Exterior Trim Panel, Passenger Side Rear Door Asm

Assembly Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	45
Fastenings	3
Right First Time	99.60 %
OEM Process Time (Min)	17.94
Supplier Process Time (Min)	0.00
Total Weight (kg)	1.53

Material Cost**	\$9.20
OEM Process Cost	\$11.93
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$3.16
Manufacturing Cost*	\$24.36

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Exterior Trim Panel, Passenger Side Rear Door Asm



Exterior Trim Panel, Passenger Side Rear Door Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Panel, Psgr SideRear Door Exterior Trim Panel	1	1	0	1	0	99.99 %	0.00	0.86	0.00	0.00	0.8553
Inner Panel, PsgrSd Rr Dr Exterior Trim Panel Asm	1	1	0	1	0	99.99 %	0.00	0.54	0.00	0.00	0.5501
Assemble Passenger RearDoor Trim Panel	1	4	3	41	3	99.62 %	1.31	15.23	0.00	0.00	0.1207

Exterior Trim Panel, Passenger Side Rear Door Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Panel, Psgr Side Rear Door Exterior Trim Panel	\$0.00	\$2.57	\$0.00	\$1.88	\$0.00	\$0.00	\$0.00	\$0.67	\$5.12
Inner Panel, PsgrSd Rr Dr Exterior Trim Panel Asm	\$0.00	\$1.65	\$0.00	\$0.73	\$0.00	\$0.00	\$0.00	\$0.36	\$2.74
Assemble Passenger RearDoor Trim Panel	\$0.05	\$4.93	\$1.73	\$7.59	\$0.00	\$0.00	\$0.06	\$2.14	\$16.49

Exterior Trim Panel, Passenger Side Rear Door Asm



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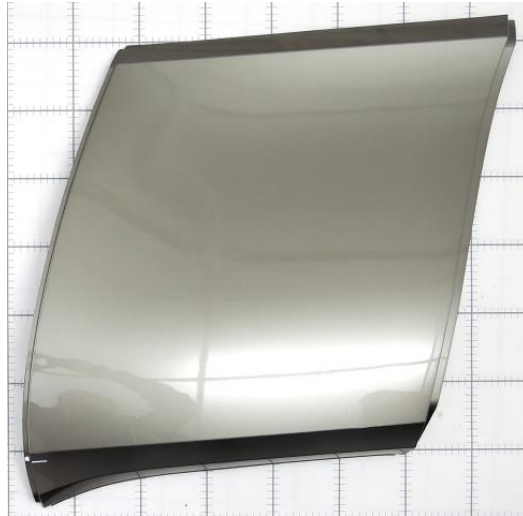
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	45
Fastenings	3
Right First Time	99.6%
OEM Asm. Time (Min)	1.31
OEM Fab. Time (Min)	16.63
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	1.53
Purchased Part Cost	
	\$0.05
Material Cost	
	\$9.15
OEM Asm. Cost	
	\$1.73
OEM Fab. Cost	
	\$10.20
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.06
SG&A	
	\$3.16
Manufacturing Cost*	
	\$24.36

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Passenger Side Rear Door Exterior Trim Panel



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- \Exterior Trim Panel, Passenger Side Rear Door Asm
- \Panel, Passenger Side Rear Door Exterior Trim Panel
- \Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	51.70
Total Weight (kg)	0.86

Material Cost**	\$2.57
OEM Process Cost	\$1.88
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.67
Manufacturing Cost*	\$5.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Panel, Passenger Side Rear Door Exterior Trim Panel



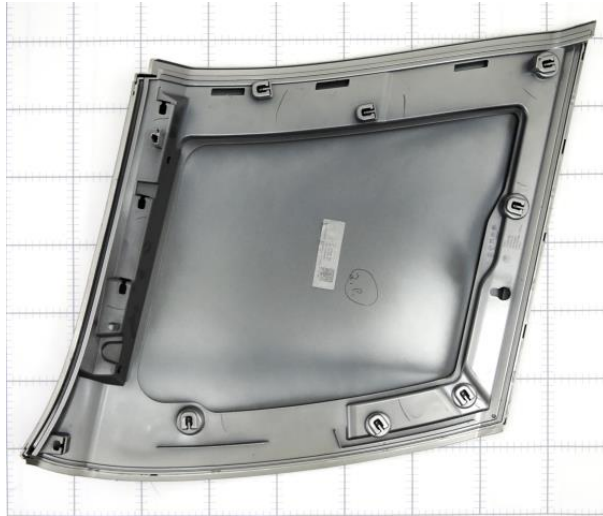
Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1500 Ton Injection Molding Press	51.70	1	0.25	131.11	GER	\$1.88	99.99%	\$0.00

Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Panel	1	PP/EPDM TD30	\$3.00	0.8553	0.8553	\$0.00	\$2.57

Inner Panel, PS Rear Dr Exterior Trim Panel Asm



\...
 \Exterior Trim Panel, Passenger Side Rear Door Asm
 \Inner Panel, Passenger Sd Rear Dr Exterior Trim Panel
 Asm \Inner Panel Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	32.41
Total Weight (kg)	0.55
Material Cost**	\$1.65
OEM Process Cost	\$0.73
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.36
Manufacturing Cost*	\$2.74

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Panel, PS Rear Dr Exterior Trim Panel Asm



Inner Panel Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
720 Ton Injection Molding Press	32.41	1	0.25	81.14	GER	\$0.73	99.99%	\$0.00

Inner Panel Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Panel	1	PP/EPDM TD30	\$3.00	0.5501	0.5501	\$0.00	\$1.65

Assemble Passenger Rear Door Trim Panel



\...

\Exterior Trim

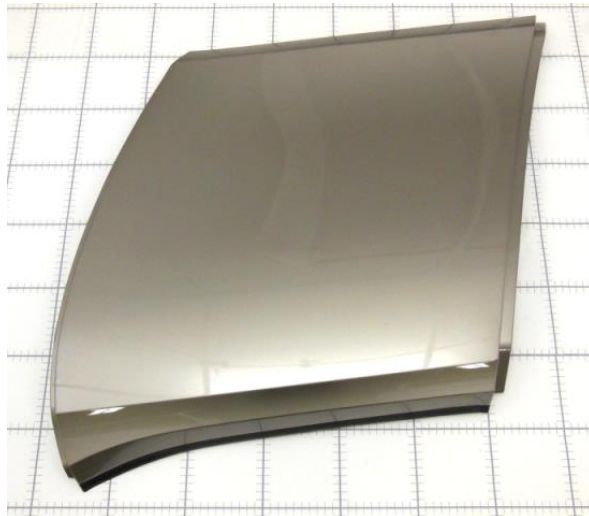
\Exterior Trim Panel, Passenger Side Rear Door Asm

\Assemble Passenger Rear Door Trim Panel

Process Summary

Right First Time	99.62 %
Process Time (Sec)	992.01
Total Weight (kg)	0.12

Material Cost**	\$4.98
OEM Process Cost	\$9.32
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$2.14
Manufacturing Cost*	\$16.49



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Rear Door Trim Panel



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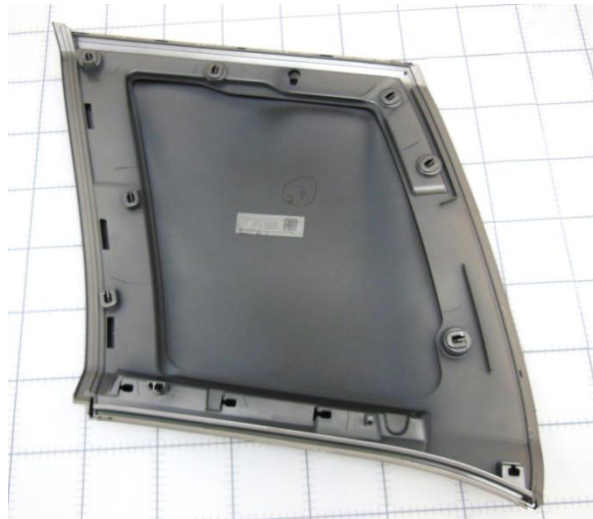
Assemble Passenger Rear Door Trim Panel

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	27.50	1	1.00	91.41	GER	\$0.70	99.96 %	\$0.01
Cure Paint	456.00	1	0.25	27.19	GER	\$3.44	99.97 %	\$0.01
Apply Clearcoat	12.20	1	0.25	117.09	GER	\$0.40	99.96 %	\$0.01
OEM CO2 Cleaning Line	11.20	1	0.25	51.85	GER	\$0.16	99.99 %	\$0.00
OEM Hand Sanding Station	18.75	1	1.00	91.41	GER	\$0.48	99.94 %	\$0.01
Cure Paint	406.00	1	0.25	27.19	GER	\$3.07	99.97 %	\$0.01
Apply Base Coat	12.20	1	0.25	117.09	GER	\$0.40	99.96 %	\$0.01
OEM Plasma Surface Treatment Line	11.20	1	0.25	49.58	GER	\$0.15	99.98 %	\$0.00
Wash	16.00	1	0.25	27.16	GER	\$0.12	99.98 %	\$0.00
OEM Adhesive Bead Station Auto	20.96	1	0.25	69.43	GER	\$0.40	99.93 %	\$0.01

Assemble Passenger Rear Door Trim Panel

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Clearcoat	1	Paint - Primer	By Area	0.0000	-	\$0.00	\$1.49
Material, Paint	1	Paint - Basecoat	By Area	0.0000	-	\$0.00	\$1.28
Adhesive, Psgr Rear Exterior Trim	1	Structural Adhesive - Polymer	\$17.94	0.1206	0.1206	\$0.00	\$2.16

Assemble Exterior Trim Panel



\...

\Zone 2 Exterior

\Exterior Trim

\Assemble Exterior Trim Panel

Process Summary

Right First Time	99.71 %
Process Time (Sec)	95.00
Total Weight (kg)	0.01

Material Cost**	\$0.60
OEM Process Cost	\$2.41
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.38
Manufacturing Cost*	\$3.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Exterior Trim Panel



Assemble Exterior Trim Panel

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	95.00	1	1.00	91.41	GER	\$2.41	99.71 %	\$0.04

Assemble Exterior Trim Panel

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Push Pin	10	Commodity Item	Purchased	0.0012	-	\$0.06	\$0.00



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Spoiler Asm

Assembly Summary

Parts	35
Fasteners	13
Part Numbers	22
Steps	115
Fastenings	32
Right First Time	97.69 %
OEM Process Time (Min)	4.09
Supplier Process Time (Min)	12.54
Total Weight (kg)	2.16

Material Cost**	\$16.42
OEM Process Cost	\$6.38
Supplier Process Cost	\$5.17
Q Burden	\$0.35
SG&A	\$3.67
Manufacturing Cost*	\$32.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Spoiler Asm



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Spoiler Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Spoiler Substrate Asm, Spoiler Asm	1	8	4	41	4	99.63 %	0.00	1.10	0.60	10.66	1.6500
Rear Wiper LineAsm, Spoiler Asm	1	8	7	23	7	99.60 %	0.00	0.00	0.83	0.30	0.0456
Assemble Third Brake Light	1	1	2	5	2	99.92 %	0.28	0.00	0.00	0.00	0.0135
Third Brake Light Cover Asm, Spoiler	1	5	4	13	4	99.84 %	0.83	0.00	0.00	0.15	0.3500
Assemble Third Brake Light Cover	1	13	15	30	15	98.68 %	1.88	0.00	0.00	0.00	0.1025

Spoiler Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Spoiler Substrate Asm, Spoiler Asm	\$0.05	\$9.10	\$0.00	\$1.82	\$0.37	\$4.17	\$0.06	\$2.32	\$17.89
Rear Wiper LineAsm, Spoiler Asm	\$0.25	\$0.18	\$0.00	\$0.00	\$0.32	\$0.17	\$0.06	\$0.11	\$1.09
Assemble Third Brake Light	\$0.00	\$1.10	\$0.43	\$0.00	\$0.00	\$0.00	\$0.01	\$0.23	\$1.77
Third Brake Light Cover Asm, Spoiler	\$2.79	\$1.67	\$1.26	\$0.00	\$0.00	\$0.13	\$0.02	\$0.54	\$6.42
Assemble Third Brake Light Cover	\$1.28	\$0.00	\$2.87	\$0.00	\$0.00	\$0.00	\$0.20	\$0.47	\$4.82

Detailed Summary

Parts	35
Fasteners	13
Part Numbers	22
Steps	115
Fastenings	32
Right First Time	97.69%
OEM Asm. Time (Min)	2.99
OEM Fab. Time (Min)	1.10
Supplier Asm. Time (Min)	1.42
Supplier Fab. Time (Min)	11.12
Total Weight (kg)	2.16
Purchased Part Cost	
	\$4.37
Material Cost	\$12.05
OEM Asm. Cost	\$4.56
OEM Fab. Cost	\$1.82
Supplier Asm. Cost	\$0.70
Supplier Fab. Cost	\$4.48
Q Burden	\$0.35
SG&A	\$3.67
Manufacturing Cost*	\$32.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Spoiler Substrate Asm, Spoiler Asm



\...
 \Exterior Trim
 \Spoiler Asm
 \Spoiler Substrate Asm, Spoiler Asm

Assembly Summary

Parts	8
Fasteners	0
Part Numbers	7
Steps	41
Fastenings	4
Right First Time	99.63 %
OEM Process Time (Min)	1.10
Supplier Process Time (Min)	11.26
Total Weight (kg)	1.65

Material Cost**	\$9.15
OEM Process Cost	\$1.82
Supplier Process Cost	\$4.55
Q Burden	\$0.06
SG&A	\$2.32
Manufacturing Cost*	\$17.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Spoiler Substrate Asm, Spoiler Asm



Spoiler Substrate Asm, Spoiler Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Outer Substrate, Spoiler Substrate Asm	1	1	0	1	0	99.99 %	0.00	0.57	0.00	0.00	0.9276
Inner Substrate, Spoiler Substrate Asm	1	1	0	1	0	99.99 %	0.00	0.53	0.00	0.00	0.5975
Assemble Spoiler Substrate	1	6	4	37	4	99.65 %	0.00	0.00	0.60	10.66	0.1249

Spoiler Substrate Asm, Spoiler Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Outer Substrate, Spoiler Substrate Asm	\$0.00	\$2.78	\$0.00	\$1.11	\$0.00	\$0.00	\$0.00	\$0.58	\$4.47
Inner Substrate, Spoiler Substrate Asm	\$0.00	\$1.79	\$0.00	\$0.71	\$0.00	\$0.00	\$0.00	\$0.38	\$2.88
Assemble Spoiler Substrate	\$0.05	\$4.53	\$0.00	\$0.00	\$0.37	\$4.17	\$0.05	\$1.36	\$10.55

Detailed Summary

Parts	8
Fasteners	0
Part Numbers	7
Steps	41
Fastenings	4
Right First Time	99.63%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	1.10
Supplier Asm. Time (Min)	0.60
Supplier Fab. Time (Min)	10.66
Total Weight (kg)	1.65
Purchased Part Cost	
	\$0.05
Material Cost	
	\$9.10
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$1.82
Supplier Asm. Cost	
	\$0.37
Supplier Fab. Cost	
	\$4.17
Q Burden	
	\$0.06
SG&A	
	\$2.32
Manufacturing Cost*	
	\$17.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Substrate, Spoiler Substrate Asm



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- \Spoiler Substrate Asm, Spoiler Asm
- \Outer Substrate, Spoiler Substrate Asm
- \Outer Substrate Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	34.12
Total Weight (kg)	0.93
Material Cost**	\$2.78
OEM Process Cost	\$1.11
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.58
Manufacturing Cost*	\$4.47

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Outer Substrate, Spoiler Substrate Asm



Outer Substrate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
1200 Ton Injection Molding Press	34.12	1	0.25	116.67	GER	\$1.11	99.99%	\$0.00

Outer Substrate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Outer Substrate	1	PP/EPDM TD30	\$3.00	0.9276	0.9276	\$0.00	\$2.78



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- \Spoiler Substrate Asm, Spoiler Asm
- \Inner Substrate, Spoiler Substrate Asm
- \Inner Substrate Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	31.61
Total Weight (kg)	0.60

Material Cost**	\$1.79
OEM Process Cost	\$0.71
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.38
Manufacturing Cost*	\$2.88

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Inner Substrate, Spoiler Substrate Asm



Inner Substrate Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
720 Ton Injection Molding Press	31.61	1	0.25	81.14	GER	\$0.71	99.99%	\$0.00

Inner Substrate Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Inner Substrate	1	PP/EPDM TD30	\$3.00	0.5975	0.5975	\$0.00	\$1.79

Assemble Spoiler Substrate



\...
 \Spoiler Asm
 \Spoiler Substrate Asm, Spoiler Asm
 \Assemble Spoiler Substrate

Process Summary

Right First Time	99.65 %
Process Time (Sec)	675.50
Total Weight (kg)	0.12

Material Cost**	\$4.58
OEM Process Cost	\$0.00
Supplier Process Cost	\$4.55
Q Burden	\$0.05
SG&A	\$1.36
Manufacturing Cost*	\$10.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Spoiler Substrate



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Assemble Spoiler Substrate

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Automated Asm	13.50	1	0.25	25.62	GER	\$0.10	99.97 %	\$0.00
Cure Clearcoat	231.00	1	0.25	20.98	GER	\$1.35	99.97 %	\$0.01
Apply Clearcoat	15.60	1	0.25	55.28	GER	\$0.24	99.97 %	\$0.01
Cure Basecoat	206.00	1	0.25	20.98	GER	\$1.20	99.97 %	\$0.01
Apply Basecoat	15.60	1	0.25	55.28	GER	\$0.24	99.97 %	\$0.01
Cure Primer	156.00	1	0.25	20.98	GER	\$0.91	99.97 %	\$0.01
Apply Basecoat	15.60	1	0.25	55.28	GER	\$0.24	99.97 %	\$0.01
OEM Adhesive Bead Station Auto	22.20	1	0.25	45.16	GER	\$0.28	99.89 %	\$0.02

Assemble Spoiler Substrate

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, QR Code	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$1.51
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$1.29
Material, Paint	1	Paint - Clearcoat	By Area	0.0000	-	\$0.00	\$0.73
Adhesive, Spoiler Asm	2	Structural Adhesive - Polymer	\$17.94	0.0624	0.0624	\$0.00	\$0.50

Rear Wiper Line Asm, Spoiler Asm



- \...
- \Exterior Trim
- \Spoiler Asm
- \Rear Wiper Line Asm, Spoiler Asm

Assembly Summary

Parts	8
Fasteners	0
Part Numbers	7
Steps	23
Fastenings	7
Right First Time	99.60 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.13
Total Weight (kg)	0.05

Material Cost**	\$0.43
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.49
Q Burden	\$0.06
SG&A	\$0.11
Manufacturing Cost*	\$1.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Rear Wiper Line Asm, Spoiler Asm



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Rear Wiper Line Asm, Spoiler Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Line, Rear Wiper Line Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.19	0.0343
Grommet, Rear WiperLine Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.09	0.0050
Assemble Grommet	1	0	1	4	1	99.91 %	0.00	0.00	0.15	0.00	0.0000
Double Ended Connector, Rear Wiper Line Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0008
Assemble Wiper Line	1	5	6	13	6	99.72 %	0.00	0.00	0.68	0.00	0.0055

Rear Wiper Line Asm, Spoiler Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Line, Rear Wiper Line Asm	\$0.00	\$0.15	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.04	\$0.34
Grommet, Rear WiperLine Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.01	\$0.05
Assemble Grommet	\$0.00	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.01	\$0.06
Double Ended Connector, Rear Wiper Line Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.02
Assemble Wiper Line	\$0.25	\$0.00	\$0.00	\$0.00	\$0.28	\$0.00	\$0.04	\$0.05	\$0.62

Detailed Summary

Parts	8
Fasteners	0
Part Numbers	7
Steps	23
Fastenings	7
Right First Time	99.6%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.83
Supplier Fab. Time (Min)	0.30
Total Weight (kg)	0.05
Purchased Part Cost	\$0.25
Material Cost	\$0.18
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.32
Supplier Fab. Cost	\$0.17
Q Burden	\$0.06
SG&A	\$0.11
Manufacturing Cost*	\$1.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Line, Rear Wiper Line Asm



\...
\Rear Wiper Line Asm, Spoiler Asm
\Line, Rear Wiper Line Asm
\Line Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	11.23
Total Weight (kg)	0.03
Material Cost**	\$0.15
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Line, Rear Wiper Line Asm



Line Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Extrude: 32mm, 1 Layer	11.23	1	0.50	45.66	GER	\$0.14	99.99%	\$0.00

Line Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Line	1	EPDM (Extrusion Grade)	\$4.43	0.0343	0.0343	\$0.00	\$0.15

Grommet, Rear Wiper Line Asm



\...

- \Rear Wiper Line Asm, Spoiler Asm
- \Grommet, Rear Wiper Line Asm
- \Grommet Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.38
Total Weight (kg)	0.01
Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Grommet, Rear Wiper Line Asm



Grommet Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	43.04	8	0.25	14.88	CZE	\$0.02	99.99%	\$0.00

Grommet Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Grommet	1	EPDM	\$4.04	0.0050	0.0050	\$0.00	\$0.02

No Commodity Items
Required for This
Process

\...

\Spoiler Asm

\Rear Wiper Line Asm, Spoiler Asm

\Assemble Grommet

Process Summary

Right First Time	99.91 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.06



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Grommet



Assemble Grommet

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	9.00	1	0.25	17.86	CZE	\$0.04	99.91 %	\$0.01

Assemble Grommet

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Double Ended Connector, Rear Wiper Line Asm



\...

- \Rear Wiper Line Asm, Spoiler Asm
- \Double Ended Connector, Rear Wiper Line Asm
- \Double Ended Connector Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.59
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Double Ended Connector, Rear Wiper Line Asm



Double Ended Connector Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.72	8	0.25	14.88	CZE	\$0.01	99.99%	\$0.00

Double Ended Connector Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Double Ended Connector	1	POM	\$3.18	0.0008	0.0009	\$0.00	\$0.01



\...
 \Spoiler Asm
 \Rear Wiper Line Asm, Spoiler Asm
 \Assemble Wiper Line

Process Summary

Right First Time	99.72 %
Process Time (Sec)	40.75
Total Weight (kg)	0.01

Material Cost**	\$0.25
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.28
Q Burden	\$0.04
SG&A	\$0.05
Manufacturing Cost*	\$0.62

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Wiper Line



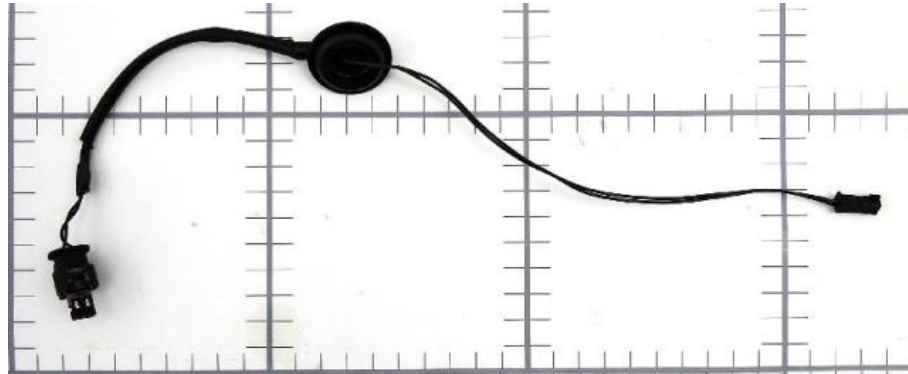
Assemble Wiper Line

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	40.75	1	1.00	24.59	CZE	\$0.28	99.72 %	\$0.04

Assemble Wiper Line

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiper Line Connector	1	Commodity Item	Purchased	0.0042	-	\$0.15	\$0.00
Push Pin with Attachment Feature	1	Commodity Item	Purchased	0.0010	-	\$0.05	\$0.00
Tape	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
Label, Supplier ID	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00

Assemble Third Brake Light



\...
\Exterior Trim
\Spoiler Asm
\Assemble Third Brake Light

Process Summary

Right First Time	99.92 %
Process Time (Sec)	17.00
Total Weight (kg)	0.01

Material Cost**	\$1.10
OEM Process Cost	\$0.43
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.23
Manufacturing Cost*	\$1.77



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Third Brake Light



Assemble Third Brake Light

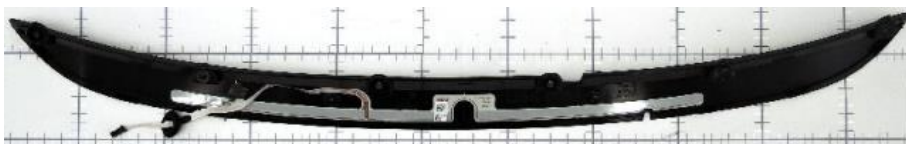
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	17.00	1	1.00	91.41	GER	\$0.43	99.92 %	\$0.01

Assemble Third Brake Light

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wire Harness Third Brake Light	1	See Appendix	-	0.0135	-	\$0.00	\$1.10

[Click Here for Munro & Associates Wire Harness Report on Wire Harness, Third Brake Light Wire Harness](#)

Third Brake Light Cover Asm, Spoiler



\...
 \Exterior Trim
 \Spoiler Asm
 \Third Brake Light Cover Asm, Spoiler

Assembly Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	4
Right First Time	99.84 %
OEM Process Time (Min)	0.83
Supplier Process Time (Min)	0.15
Total Weight (kg)	0.35

Material Cost**	\$4.46
OEM Process Cost	\$1.26
Supplier Process Cost	\$0.13
Q Burden	\$0.02
SG&A	\$0.54
Manufacturing Cost*	\$6.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Cover Asm, Spoiler



Third Brake Light Cover Asm, Spoiler

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Third Brake Light Cover, Third Brake Light Cover A	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.15	0.3386
Assemble Third Brake Light Cover	1	4	4	11	4	99.85 %	0.83	0.00	0.00	0.00	0.0114

Third Brake Light Cover Asm, Spoiler

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Third Brake Light Cover, Third Brake Light Cover A	\$0.00	\$1.67	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.27	\$2.07
Assemble Third Brake Light Cover	\$2.79	\$0.00	\$1.26	\$0.00	\$0.00	\$0.00	\$0.02	\$0.27	\$4.34

Third Brake Light Cover Asm, Spoiler



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Detailed Summary

Parts	5
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	4
Right First Time	99.84%
OEM Asm. Time (Min)	0.83
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.00
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.35
Purchased Part Cost	
	\$2.79
Material Cost	
	\$1.67
OEM Asm. Cost	
	\$1.26
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.00
Supplier Fab. Cost	
	\$0.13
Q Burden	
	\$0.02
SG&A	
	\$0.54
Manufacturing Cost*	
	\$6.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Cover, Third Brake Light Cover Asm



\...

- \Third Brake Light Cover Asm, Spoiler
- \Third Brake Light Cover, Third Brake Light Cover A
- \Third Brake Light Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.97
Total Weight (kg)	0.34

Material Cost**	\$1.67
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.27
Manufacturing Cost*	\$2.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Cover, Third Brake Light Cover Asm



Third Brake Light Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	17.94	2	0.25	52.65	GER	\$0.13	99.99%	\$0.00

Third Brake Light Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Third Brake Light Cover	1	ASA	\$4.94	0.3386	0.3386	\$0.00	\$1.67

Assemble Third Brake Light Cover



\...

\Spoiler Asm

\Third Brake Light Cover Asm, Spoiler

\Assemble Third Brake Light Cover

Process Summary

Right First Time	99.85 %
Process Time (Sec)	49.63
Total Weight (kg)	0.01
Material Cost**	\$2.79
OEM Process Cost	\$1.26
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.27
Manufacturing Cost*	\$4.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Third Brake Light Cover

Assemble Third Brake Light Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	49.63	1	1.00	91.41	GER	\$1.26	99.85%	\$0.02

Assemble Third Brake Light Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Flat Wire Spoiler, Third Brake Light Cover Asm	1	Commodity Item	Purchased	0.0107	-	\$2.68	\$0.00
Label, BMW QR Code Small	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00
Rubber Bumper	2	Commodity Item	Purchased	0.0003	-	\$0.03	\$0.00

Assemble Third Brake Light Cover



\...
\Exterior Trim
\Spoiler Asm
\Assemble Third Brake Light Cover

Process Summary

Right First Time	98.68 %
Process Time (Sec)	113.00
Total Weight (kg)	0.10

Material Cost**	\$1.28
OEM Process Cost	\$2.87
Supplier Process Cost	\$0.00
Q Burden	\$0.20
SG&A	\$0.47
Manufacturing Cost*	\$4.82

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Third Brake Light Cover



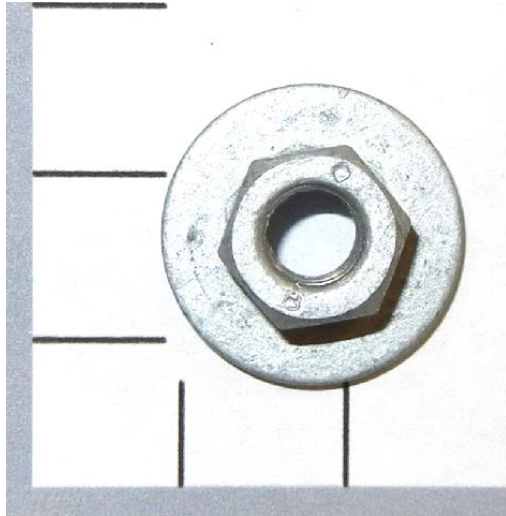
Assemble Third Brake Light Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	113.00	1	1.00	91.41	GER	\$2.87	98.68 %	\$0.20

Assemble Third Brake Light Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x16mm-Torx Screw	4	Commodity Item	Purchased	0.0018	-	\$0.03	\$0.00
Two-Stage Push Pin	4	Commodity Item	Purchased	0.0007	-	\$0.04	\$0.00
Stud, Spoiler	5	Commodity Item	Purchased	0.0185	-	\$0.20	\$0.00

Spoiler Asm Installation



\...
\Zone 2 Exterior
\Exterior Trim
\Spoiler Asm Installation

Process Summary

Right First Time	98.84 %
Process Time (Sec)	100.50
Total Weight (kg)	0.02

Material Cost**	\$0.10
OEM Process Cost	\$2.55
Supplier Process Cost	\$0.00
Q Burden	\$0.18
SG&A	\$0.39
Manufacturing Cost*	\$3.21



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Spoiler Asm Installation

Spoiler Asm Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	100.50	1	1.00	91.41	GER	\$2.55	98.84%	\$0.18

Spoiler Asm Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x6mm-Hex KEPS Nut	5	Commodity Item	Purchased	0.0049	-	\$0.02	\$0.00

\...
 \Zone 2 Exterior
 \Exterior Trim
 \Liftgate Glass Asm

Assembly Summary



Parts	19
Fasteners	0
Part Numbers	12
Steps	78
Fastenings	18
Right First Time	98.86 %
OEM Process Time (Min)	1.19
Supplier Process Time (Min)	1.27
Total Weight (kg)	3.66

Material Cost**	\$17.01
OEM Process Cost	\$1.30
Supplier Process Cost	\$0.65
Q Burden	\$0.17
SG&A	\$0.86
Manufacturing Cost*	\$19.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Liftgate Glass Asm



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Liftgate Glass Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Seal Asm, Liftgate Glass	1	2	1	7	1	99.96 %	0.00	0.00	0.62	0.42	0.0732
Assemble Seal to Liftgate	1	1	1	5	1	99.97 %	0.17	0.00	0.00	0.00	3.5220
Tail Lamp Mounting Bracket R4, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0067
Tail Lamp Mounting Bracket L4, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0067
Tail Lamp Mounting Bracket R3, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0065
Tail Lamp Mounting Bracket L3, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0065
Tail Lamp Mounting Bracket L2, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0063
Tail Lamp Mounting Bracket R2, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0063
Tail Lamp Mounting Bracket R1, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0067
Tail Lamp Mounting Bracket L1, Liftgate Glass Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0067
Assemble Tail Lamp Mounting Brackets	1	8	16	49	16	99.02 %	1.02	0.00	0.00	0.00	0.0180

Liftgate Glass Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Seal Asm, Liftgate Glass	\$0.01	\$0.20	\$0.00	\$0.00	\$0.23	\$0.32	\$0.01	\$0.11	\$0.88
Assemble Seal to Liftgate	\$16.48	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.51	\$17.11
Tail Lamp Mounting Bracket R4, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket L4, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket R3, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket L3, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket L2, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket R2, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket R1, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Tail Lamp Mounting Bracket L1, Liftgate Glass Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Assemble Tail Lamp Mounting Brackets	\$0.00	\$0.08	\$1.19	\$0.00	\$0.00	\$0.00	\$0.15	\$0.19	\$1.60

Detailed Summary

Parts	19
Fasteners	0
Part Numbers	12
Steps	78
Fastenings	18
Right First Time	98.86%
OEM Asm. Time (Min)	1.19
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.62
Supplier Fab. Time (Min)	0.66
Total Weight (kg)	3.66
Purchased Part Cost	\$16.49
Material Cost	\$0.52
OEM Asm. Cost	\$1.30
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.23
Supplier Fab. Cost	\$0.41
Q Burden	\$0.17
SG&A	\$0.86
Manufacturing Cost*	\$19.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Seal Asm, Liftgate Glass

\...
 \Exterior Trim
 \Liftgate Glass Asm
 \Seal Asm, Liftgate Glass

Assembly Summary



Parts	2
Fasteners	0
Part Numbers	2
Steps	7
Fastenings	1
Right First Time	99.96 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.03
Total Weight (kg)	0.07

Material Cost**	\$0.21
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.55
Q Burden	\$0.01
SG&A	\$0.11
Manufacturing Cost*	\$0.88

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Seal Asm, Liftgate Glass



Seal Asm, Liftgate Glass

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Seal, Seal Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.42	0.0707
Assemble Seal	1	1	1	5	1	99.97 %	0.00	0.00	0.62	0.00	0.0025

Seal Asm, Liftgate Glass

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Seal, Seal Asm	\$0.00	\$0.20	\$0.00	\$0.00	\$0.00	\$0.32	\$0.00	\$0.08	\$0.60
Assemble Seal	\$0.01	\$0.00	\$0.00	\$0.00	\$0.23	\$0.00	\$0.00	\$0.04	\$0.28

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	7
Fastenings	1
Right First Time	99.96%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.62
Supplier Fab. Time (Min)	0.42
Total Weight (kg)	0.07
Purchased Part Cost	\$0.01
Material Cost	\$0.20
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.23
Supplier Fab. Cost	\$0.32
Q Burden	\$0.01
SG&A	\$0.11
Manufacturing Cost*	\$0.88

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

\...
 \Seal Asm, Liftgate Glass
 \Seal, Seal Asm
 \Seal Process



Process Summary

Right First Time	99.99 %
Process Time (Sec)	24.97
Total Weight (kg)	0.07

Material Cost**	\$0.20
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.32
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.60



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Seal, Seal Asm

Seal Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Extrude: 32mm, 1 Layer	24.97	1	0.50	45.66	GER	\$0.32	99.99%	\$0.00

Seal Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Seal	1	TPE	\$2.54	0.0707	0.0707	\$0.00	\$0.20



\...
 \Liftgate Glass Asm
 \Seal Asm, Liftgate Glass
 \Assemble Seal

Process Summary

Right First Time	99.97 %
Process Time (Sec)	37.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.28



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Seal

Assemble Seal

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	37.00	1	0.25	22.78	SVK	\$0.23	99.97%	\$0.00

Assemble Seal

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, Seal	1	Commodity Item	Purchased	0.0025	-	\$0.01	\$0.00

No Commodity Items
Required for This
Process

- \...
- \Exterior Trim
- \Liftgate Glass Asm
- \Assemble Seal to Liftgate

Process Summary

Right First Time	99.97 %
Process Time (Sec)	10.00
Total Weight (kg)	3.52

Material Cost**	\$16.48
OEM Process Cost	\$0.11
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.51
Manufacturing Cost*	\$17.11



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Seal to Liftgate



Assemble Seal to Liftgate

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Automated Asm	10.00	1	0.25	41.01	GER	\$0.11	99.97%	\$0.00

Assemble Seal to Liftgate

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Liftgate Glass	1	Commodity Item	Purchased	3.5220	-	\$16.48	\$0.00

Tail Lamp Mounting Bracket R4, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket R4, Liftgate Glass Asm

\Tail Lamp Mounting Bracket R4 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket R4, Liftgate Glass Asm

Tail Lamp Mounting Bracket R4 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket R4 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket R4	1	PA66 GF30	\$3.95	0.0067	0.0067	\$0.00	\$0.03

Tail Lamp Mounting Bracket L4, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket L4, Liftgate Glass Asm

\Tail Lamp Mounting Bracket L4 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket L4, Liftgate Glass Asm



Tail Lamp Mounting Bracket L4 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket L4 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket L4	1	PA66 GF30	\$3.95	0.0067	0.0067	\$0.00	\$0.03

Tail Lamp Mounting Bracket R3, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket R3, Liftgate Glass Asm

\Tail Lamp Mounting Bracket R3 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket R3, Liftgate Glass Asm

Tail Lamp Mounting Bracket R3 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket R3 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket R3	1	PA66 GF30	\$3.95	0.0065	0.0070	\$0.00	\$0.03

Tail Lamp Mounting Bracket L3, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket L3, Liftgate Glass Asm

\Tail Lamp Mounting Bracket L3 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket L3, Liftgate Glass Asm

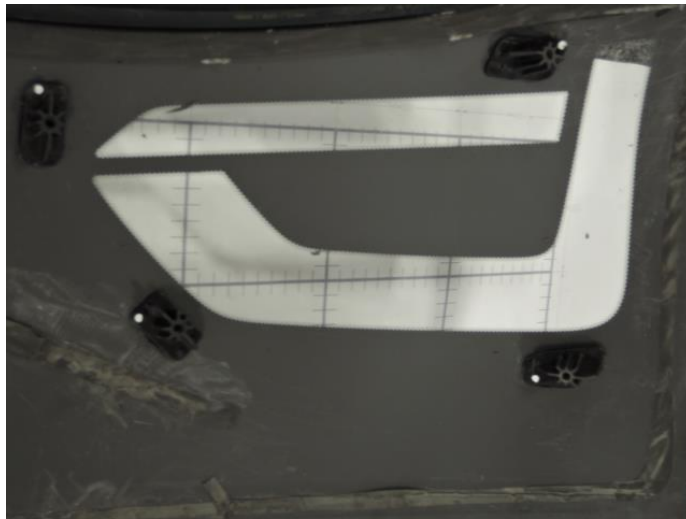
Tail Lamp Mounting Bracket L3 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket L3 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket L3	1	PA66 GF30	\$3.95	0.0065	0.0070	\$0.00	\$0.03

Tail Lamp Mounting Bracket L2, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket L2, Liftgate Glass Asm

\Tail Lamp Mounting Bracket L2 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket L2, Liftgate Glass Asm

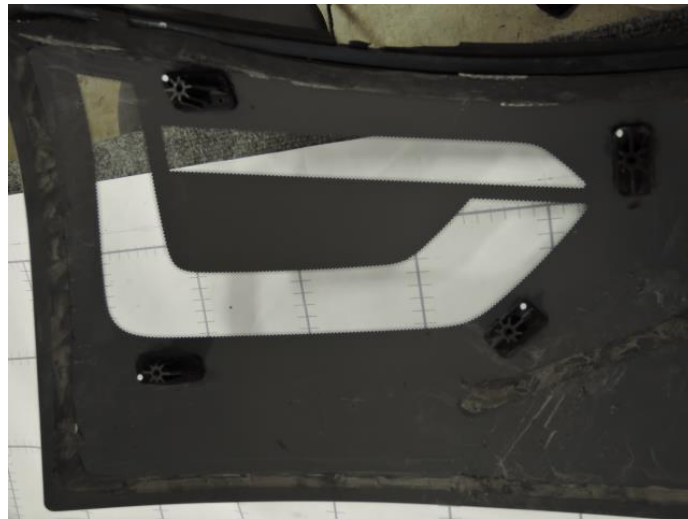
Tail Lamp Mounting Bracket L2 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket L2 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket L2	1	PA66 GF30	\$3.95	0.0063	0.0068	\$0.00	\$0.03

Tail Lamp Mounting Bracket R2, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket R2, Liftgate Glass Asm

\Tail Lamp Mounting Bracket L2 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket R2, Liftgate Glass Asm

Tail Lamp Mounting Bracket L2 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket L2 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket R2	1	PA66 GF30	\$3.95	0.0063	0.0068	\$0.00	\$0.03

Tail Lamp Mounting Bracket R1, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket R1, Liftgate Glass Asm

\Tail Lamp Mounting Bracket R1 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket R1, Liftgate Glass Asm

Tail Lamp Mounting Bracket R1 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket R1 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket R1	1	PA66 GF30	\$3.95	0.0067	0.0067	\$0.00	\$0.03

Tail Lamp Mounting Bracket L1, Liftgate Glass Asm



\...

\Liftgate Glass Asm

\Tail Lamp Mounting Bracket L1, Liftgate Glass Asm

\Tail Lamp Mounting Bracket R1 Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.81
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Mounting Bracket L1, Liftgate Glass Asm



Tail Lamp Mounting Bracket R1 Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.48	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Tail Lamp Mounting Bracket R1 Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Mounting Bracket L1	1	PA66 GF30	\$3.95	0.0067	0.0067	\$0.00	\$0.03

No Commodity Items
Required for This
Process



\...
\Exterior Trim
\Liftgate Glass Asm
\Assemble Tail Lamp Mounting Brackets

Process Summary

Right First Time	99.02 %
Process Time (Sec)	61.48
Total Weight (kg)	0.02
Material Cost**	\$0.08
OEM Process Cost	\$1.19
Supplier Process Cost	\$0.00
Q Burden	\$0.15
SG&A	\$0.19
Manufacturing Cost*	\$1.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tail Lamp Mounting Brackets



Assemble Tail Lamp Mounting Brackets

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Adhesive Bead Station Auto	61.48	1	0.25	69.43	GER	\$1.19	99.02 %	\$0.15

Assemble Tail Lamp Mounting Brackets

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Adhesive, Liftgate Glass Mounting Brackets	8	Structural Adhesive - Polymer	\$17.94	0.0020	0.0020	\$0.00	\$0.01

Assemble Liftgate Glass



\...
\Zone 2 Exterior
\Exterior Trim
\Assemble Liftgate Glass

Process Summary

Right First Time	99.84 %
Process Time (Sec)	25.01
Total Weight (kg)	0.14

Material Cost**	\$2.48
OEM Process Cost	\$0.28
Supplier Process Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.41
Manufacturing Cost*	\$3.20



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Liftgate Glass



Assemble Liftgate Glass

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Automated Asm	25.01	1	0.25	41.01	GER	\$0.28	99.84%	\$0.02

Assemble Liftgate Glass

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Adhesive, Liftgate Glass	1	Structural Adhesive - Polymer	\$17.94	0.1380	0.1380	\$0.00	\$2.48

Assemble Liftgate Release Handle



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble Liftgate Release Handle

Process Summary

Right First Time	99.54 %
Process Time (Sec)	60.00
Total Weight (kg)	0.04

Material Cost**	\$1.58
OEM Process Cost	\$1.52
Supplier Process Cost	\$0.00
Q Burden	\$0.07
SG&A	\$0.28
Manufacturing Cost*	\$3.45



* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Assemble Liftgate Release Handle



Assemble Liftgate Release Handle

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	60.00	1	1.00	91.41	GER	\$1.52	99.54%	\$0.07

Assemble Liftgate Release Handle

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Liftgate Release Handle Asm	1	Commodity Item	Purchased	0.0309	-	\$1.50	\$0.00
M6 U Nut	2	Commodity Item	Purchased	0.0012	-	\$0.02	\$0.00
M4x13mm-Pan Head Torx	2	Commodity Item	Purchased	0.0016	-	\$0.02	\$0.00

Assemble Driver Side Exterior Mirror



\...
 \Zone 2 Exterior
 \Exterior Trim
 \Assemble Driver Side Exterior Mirror

Process Summary

Right First Time	99.33 %
Process Time (Sec)	55.00
Total Weight (kg)	1.49

Material Cost**	\$75.12
OEM Process Cost	\$1.52
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$2.48
Manufacturing Cost*	\$79.23



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Side Exterior Mirror



Assemble Driver Side Exterior Mirror

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	55.00	1	1.00	99.79	GER	\$1.52	99.33%	\$0.10

Assemble Driver Side Exterior Mirror

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Exterior Mirror Asm, Driver Side Front Door Asm	1	Commodity Item	Purchased	1.4639	-	\$75.00	\$0.00
M6x16mm, SEMS Torx Bolt	3	Commodity Item	Purchased	0.0084	-	\$0.04	\$0.00

Assemble Passenger Exterior Mirror



\...

\Zone 2 Exterior

\Exterior Trim

\Assemble Passenger Exterior Mirror

Process Summary

Right First Time	99.33 %
Process Time (Sec)	55.00
Total Weight (kg)	1.49

Material Cost**	\$75.12
OEM Process Cost	\$1.52
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$2.48
Manufacturing Cost*	\$79.23



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Exterior Mirror



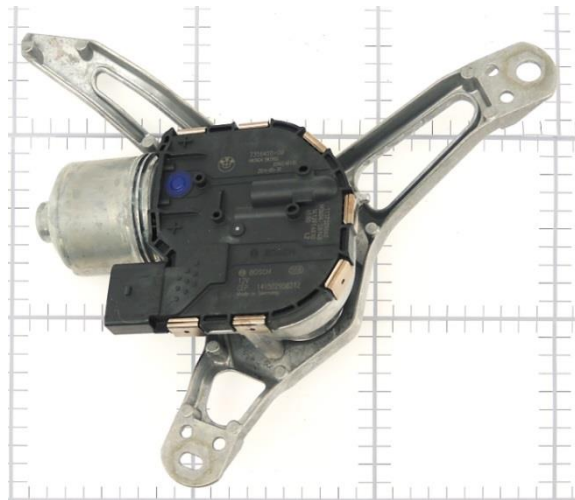
Assemble Passenger Exterior Mirror

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	55.00	1	1.00	99.79	GER	\$1.52	99.33%	\$0.10

Assemble Passenger Exterior Mirror

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Exterior Mirror Asm, Passenger Side Front Door Asm	1	Commodity Item	Purchased	1.4639	-	\$75.00	\$0.00
M6x16mm, SEMS Torx Bolt	3	Commodity Item	Purchased	0.0084	-	\$0.04	\$0.00

Wipers Overview



The Wipers system consists of the front and rear wiper assemblies, the Wiper Motors, the wiper fluid fill bottle, and the Cowl.

The Front Wipers utilize two individual motors eliminating any linkage between passenger and driver. The Wiper Motors are mounted to die cast >A380< aluminum brackets. The Cowl is a large dual shot >PP TD20< and >TPE< injection molded part. The wiper fluid fill bottle is a two piece >PP< Housing that is vibration welded together.

All major components were costed in detail, while prices were applied to commodity items (i.e. seals, fasteners, latches, and seat belts).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.





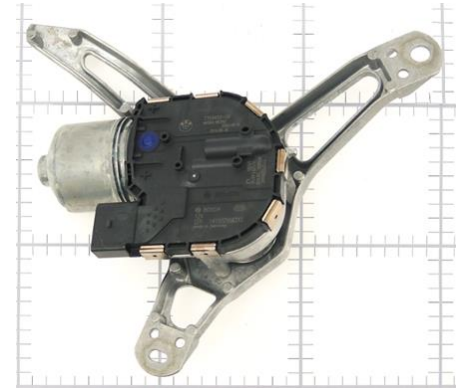
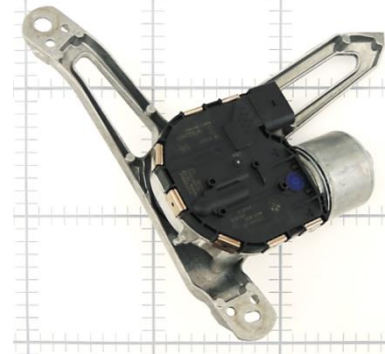
Observations:

The Rear Wiper is an all plastic design. The Rear Wiper Motor utilizes a plastic mounting bracket that is fastened to the lift gate.

Eye Catching Features

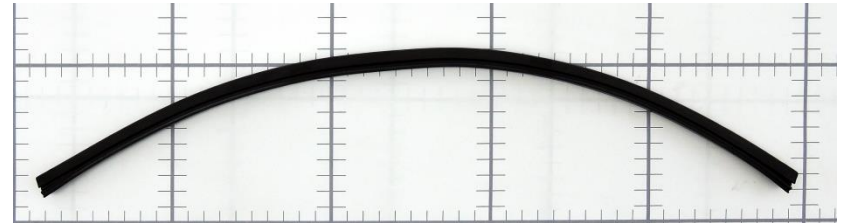


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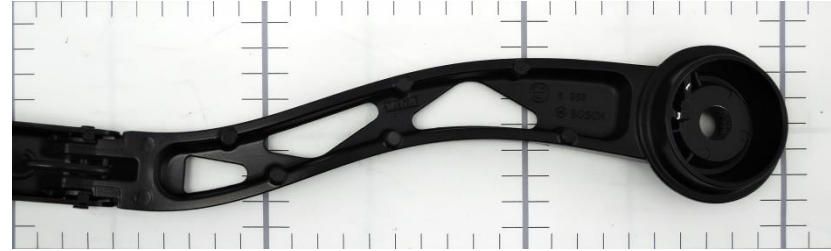
Observations:

- The Front Wiper System has individual motors for the passenger and driver wipers. This eliminates the linkage between the wipers.



Observations:

- The front wipers utilize the spring force in the wiper to keep the wiper pressed against the front glass.



Observations:

- The Wiper Assemblies utilizes a die cast aluminum mounting piece to reduce the weight of the wiper assembly.



Observations:

- The Washer Fluid Tank and Tube Assembly utilizes an intricate extrusion that incorporates the hose and wire routing features into one extrusion.

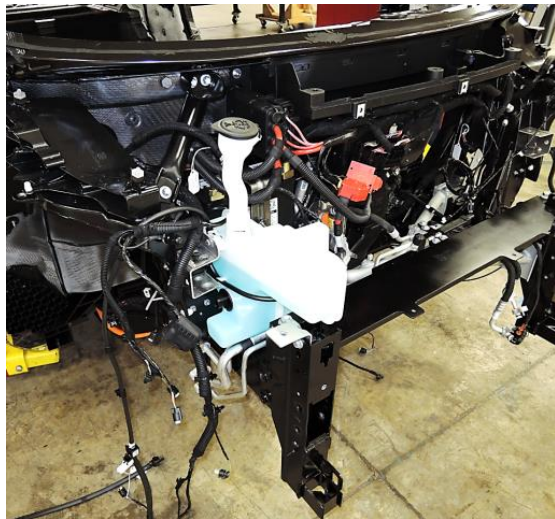
Summary

Parts	73
Fasteners	39
Part Numbers	41
Steps	278
Fastenings	109
Right First Time	92.56%
OEM Process Time (Hrs)	0.11
Supplier Process Time (Hrs)	0.21
Total Weight (kg)	6.65
Material Cost**	\$102.98
OEM Process Cost	\$9.74
Supplier Process Cost	\$13.35
Q Burden	\$1.16
SG&A	\$6.23
Manufacturing Cost*	\$133.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Washer Fluid Tank and Tube Asm



\...
 \Zone 2 Exterior
 \Wipers
 \Washer Fluid Tank and Tube Asm
Assembly Summary

Parts	32
Fasteners	14
Part Numbers	21
Steps	129
Fastenings	45
Right First Time	97.98 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	7.33
Total Weight (kg)	0.76

Material Cost**	\$13.33
OEM Process Cost	\$0.00
Supplier Process Cost	\$6.30
Q Burden	\$0.31
SG&A	\$1.31
Manufacturing Cost*	\$21.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Washer Fluid Tank and Tube Asm



Washer Fluid Tank and Tube Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm	1	11	10	36	10	99.21 %	0.00	0.00	1.40	0.54	0.4908
Tube Asm, Washer Fluid Tank and Tube Asm	1	21	30	81	30	98.92 %	0.00	0.00	3.99	0.91	0.2665
Assemble Tube to Washer Fluid Tank	1	0	5	10	5	99.85 %	0.00	0.00	0.48	0.00	0.0000

Washer Fluid Tank and Tube Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm	\$7.00	\$0.89	\$0.00	\$0.00	\$1.20	\$0.37	\$0.12	\$0.51	\$10.09
Tube Asm, Washer Fluid Tank and Tube Asm	\$4.60	\$0.84	\$0.00	\$0.00	\$3.61	\$0.68	\$0.16	\$0.75	\$10.65
Assemble Tube to Washer Fluid Tank	\$0.00	\$0.00	\$0.00	\$0.00	\$0.44	\$0.00	\$0.02	\$0.05	\$0.51

Detailed Summary

Parts	32
Fasteners	14
Part Numbers	21
Steps	129
Fastenings	45
Right First Time	97.98%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	5.87
Supplier Fab. Time (Min)	1.46
Total Weight (kg)	0.76
Purchased Part Cost	
	\$11.60
Material Cost	\$1.73
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$5.25
Supplier Fab. Cost	\$1.06
Q Burden	\$0.31
SG&A	\$1.31
Manufacturing Cost*	\$21.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Washer Fluid Tank Asm, Washer Fluid Tank and Tube Asm



\...
 \Wipers
 \Washer Fluid Tank and Tube Asm
 \Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm

Assembly Summary

Parts	11
Fasteners	2
Part Numbers	11
Steps	36
Fastenings	10
Right First Time	99.21 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.94
Total Weight (kg)	0.49

Material Cost**	\$7.89
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.57
Q Burden	\$0.12
SG&A	\$0.51
Manufacturing Cost*	\$10.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Washer Fluid Tank Asm, Washer Fluid Tank and Tube Asm



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Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Tank Asm, Washer Fluid Tank Asm	1	2	1	8	1	99.95 %	0.00	0.00	0.15	0.27	0.3192
Filler Neck Asm, Washer Fluid Tank Asm	1	2	1	7	1	99.93 %	0.00	0.00	0.17	0.19	0.0449
Assemble Washer Fluid Tank	1	1	2	5	2	99.86 %	0.00	0.00	0.33	0.00	0.0002
Low Level Sensor Isolator, Washer Fluid Tank Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.09	0.0043
Assemble Low Level Sensor	1	5	6	12	6	99.48 %	0.00	0.00	0.75	0.00	0.1222

Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Tank Asm, Washer Fluid Tank Asm	\$0.00	\$0.76	\$0.00	\$0.00	\$0.07	\$0.25	\$0.01	\$0.13	\$1.22
Filler Neck Asm, Washer Fluid Tank Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.15	\$0.08	\$0.01	\$0.04	\$0.40
Assemble Washer Fluid Tank	\$0.05	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.02	\$0.04	\$0.41
Low Level Sensor Isolator, Washer Fluid Tank Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.06
Assemble Low Level Sensor	\$6.95	\$0.00	\$0.00	\$0.00	\$0.68	\$0.00	\$0.08	\$0.29	\$8.00

Washer Fluid Tank Asm, Washer Fluid Tank and Tube Asm

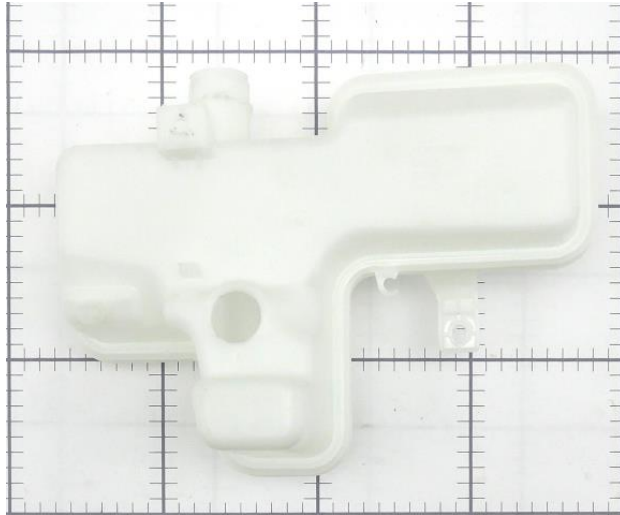
Detailed Summary

Parts	11
Fasteners	2
Part Numbers	11
Steps	36
Fastenings	10
Right First Time	99.21%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.40
Supplier Fab. Time (Min)	0.54
Total Weight (kg)	0.49
Purchased Part Cost	\$7.00
Material Cost	\$0.89
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$1.20
Supplier Fab. Cost	\$0.37
Q Burden	\$0.12
SG&A	\$0.51
Manufacturing Cost*	\$10.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tank Asm, Washer Fluid Tank Asm



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- \Washer Fluid Tank and Tube Asm
- \Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm
- \Tank Asm, Washer Fluid Tank Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	8
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.42
Total Weight (kg)	0.32

Material Cost**	\$0.76
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.32
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$1.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tank Asm, Washer Fluid Tank Asm



Tank Asm, Washer Fluid Tank Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
LH Housing, Tank Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.14	0.1596
RH Housing, Tank Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.13	0.1596
Assemble Tank	1	0	1	4	1	99.97 %	0.00	0.00	0.15	0.00	0.0000

Tank Asm, Washer Fluid Tank Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
LH Housing, Tank Asm	\$0.00	\$0.38	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.06	\$0.57
RH Housing, Tank Asm	\$0.00	\$0.38	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.06	\$0.57
Assemble Tank	\$0.00	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.00	\$0.01	\$0.08

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	8
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.15
Supplier Fab. Time (Min)	0.27
Total Weight (kg)	0.32
Purchased Part Cost	\$0.00
Material Cost	\$0.76
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.07
Supplier Fab. Cost	\$0.25
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$1.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LH Housing, Tank Asm



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- \Tank Asm, Washer Fluid Tank Asm
- \LH Housing, Tank Asm
- \LH Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.19
Total Weight (kg)	0.16
Material Cost**	\$0.38
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.06
Manufacturing Cost*	\$0.57

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LH Housing, Tank Asm



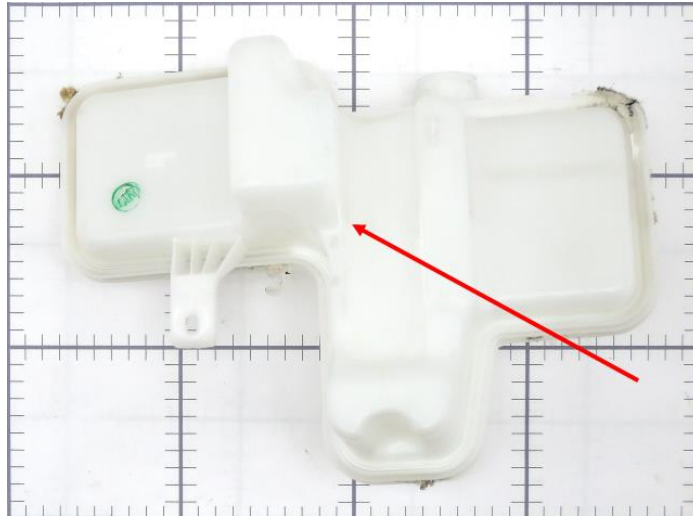
LH Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	16.38	2	0.25	56.33	GER	\$0.13	99.99%	\$0.00

LH Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, LH Housing	1	PP	\$2.38	0.1596	0.1596	\$0.00	\$0.38

RH Housing, Tank Asm



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- \Tank Asm, Washer Fluid Tank Asm
- \RH Housing, Tank Asm
- \RH Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.01
Total Weight (kg)	0.16

Material Cost**	\$0.38
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.06
Manufacturing Cost*	\$0.57

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

RH Housing, Tank Asm

RH Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
500 Ton Injection Molding Press	16.02	2	0.25	56.33	GER	\$0.13	99.99%	\$0.00

RH Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, RH Housing	1	PP	\$2.38	0.1596	0.1596	\$0.00	\$0.38

No Commodity Items Required for This Process



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\Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm
\Tank Asm, Washer Fluid Tank Asm
\Assemble Tank

Process Summary

Right First Time	99.97 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tank

Assemble Tank

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Vibration Welding Station	9.00	1	0.25	27.26	GER	\$0.07	99.97%	\$0.00

Assemble Tank

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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\Washer Fluid Tank and Tube Asm

\Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm

\Filler Neck Asm, Washer Fluid Tank Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	7
Fastenings	1
Right First Time	99.93 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.35
Total Weight (kg)	0.04

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.24
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.40

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Filler Neck Asm, Washer Fluid Tank Asm



Filler Neck Asm, Washer Fluid Tank Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Neck, Filler Neck Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.0363
Lid, Filler Neck Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.0086
Assemble Filler Neck	1	0	1	3	1	99.95 %	0.00	0.00	0.17	0.00	0.0000

Filler Neck Asm, Washer Fluid Tank Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Neck, Filler Neck Asm	\$0.00	\$0.09	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.14
Lid, Filler Neck Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.01	\$0.09
Assemble Filler Neck	\$0.00	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.01	\$0.02	\$0.18

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	7
Fastenings	1
Right First Time	99.93%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.19
Total Weight (kg)	0.04
Purchased Part Cost	\$0.00
Material Cost	\$0.11
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.15
Supplier Fab. Cost	\$0.08
Q Burden	\$0.01
SG&A	\$0.04
Manufacturing Cost*	\$0.40

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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\Filler Neck Asm, Washer Fluid Tank Asm

\Neck, Filler Neck Asm

\Neck Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	3.97
Total Weight (kg)	0.04

Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Neck, Filler Neck Asm

Neck Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	15.88	4	0.25	26.65	GER	\$0.03	99.99%	\$0.00

Neck Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Neck	1	PP	\$2.38	0.0363	0.0390	\$0.00	\$0.09

Lid, Filler Neck Asm



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\Filler Neck Asm, Washer Fluid Tank Asm

\Lid, Filler Neck Asm

\Lid Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.13
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lid, Filler Neck Asm

Lid Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	42.78	6	0.25	27.82	GER	\$0.06	99.99%	\$0.00

Lid Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lid	1	TPE	\$2.54	0.0086	0.0092	\$0.00	\$0.02

No Commodity Items Required for This Process



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Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm
Filler Neck Asm, Washer Fluid Tank Asm
Assemble Filler Neck

Process Summary

Right First Time	99.95 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Filler Neck



Assemble Filler Neck

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	54.32	GER	\$0.15	99.95%	\$0.01

Assemble Filler Neck

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Washer Fluid Tank



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Washer Fluid Tank and Tube Asm

Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm

Assemble Washer Fluid Tank

Process Summary

Right First Time	99.86 %
Process Time (Sec)	20.00
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.41

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Washer Fluid Tank



Assemble Washer Fluid Tank

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	20.00	1	1.00	54.32	GER	\$0.30	99.86%	\$0.02

Assemble Washer Fluid Tank

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 O-Ring Filler Neck	1	Commodity Item	Purchased	0.0002	-	\$0.05	\$0.00

Low Level Sensor Isolator, Washer Fluid Tank Asm



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- \Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm
- \Low Level Sensor Isolator, Washer Fluid Tank Asm
- \Low Level Sensor Isolator Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.38
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Low Level Sensor Isolator, Washer Fluid Tank Asm



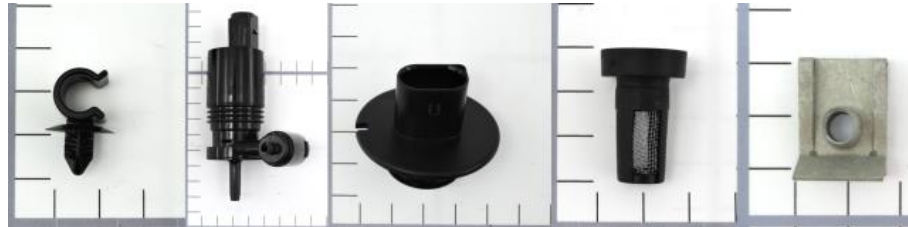
Low Level Sensor Isolator Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	43.04	8	0.25	23.71	GER	\$0.04	99.99%	\$0.00

Low Level Sensor Isolator Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Low Level Sensor Isolator	1	EPDM	\$4.04	0.0043	0.0043	\$0.00	\$0.02

Assemble Low Level Sensor



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- \Washer Fluid Tank and Tube Asm
- \Washer Fluid Tank Asm, Wshr Fluid Tnk and Tube Asm
- \Assemble Low Level Sensor

Process Summary

Right First Time	99.48 %
Process Time (Sec)	45.00
Total Weight (kg)	0.12
Material Cost**	\$6.95
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.68
Q Burden	\$0.08
SG&A	\$0.29
Manufacturing Cost*	\$8.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Low Level Sensor



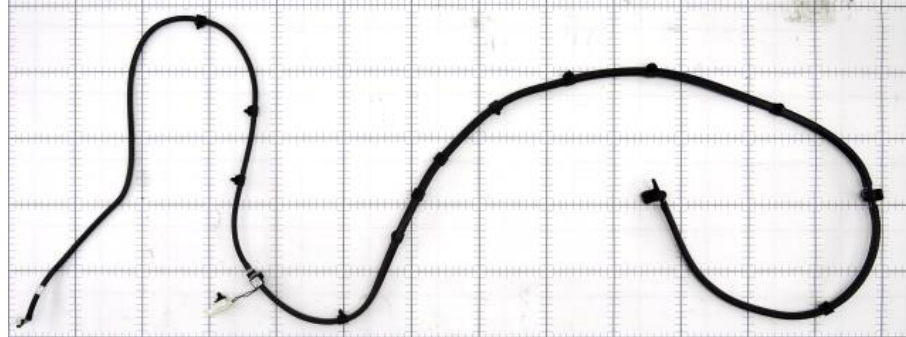
Assemble Low Level Sensor

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	45.00	1	1.00	54.32	GER	\$0.68	99.48 %	\$0.08

Assemble Low Level Sensor

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Low Level Sensor	1	Commodity Item	Purchased	0.0103	-	\$2.50	\$0.00
Pump Isolator and Filter	1	Commodity Item	Purchased	0.0022	-	\$0.40	\$0.00
Washer Fluid 12VPump	1	Commodity Item	Purchased	0.1036	-	\$4.00	\$0.00
M6 U-Nut	1	Commodity Item	Purchased	0.0048	-	\$0.01	\$0.00
C-Clip Push Pin	1	Commodity Item	Purchased	0.0013	-	\$0.04	\$0.00

Tube Asm, Washer Fluid Tank and Tube Asm



\...

\Wipers

\Washer Fluid Tank and Tube Asm

\Tube Asm, Washer Fluid Tank and Tube Asm

Assembly Summary

Parts	21
Fasteners	12
Part Numbers	11
Steps	81
Fastenings	30
Right First Time	98.92 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	4.90
Total Weight (kg)	0.27

Material Cost**	\$5.44
OEM Process Cost	\$0.00
Supplier Process Cost	\$4.29
Q Burden	\$0.16
SG&A	\$0.75
Manufacturing Cost*	\$10.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tube Asm, Washer Fluid Tank and Tube Asm



Tube Asm, Washer Fluid Tank and Tube Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Connection Tube Asm, Tube Asm	1	7	6	18	6	99.70 %	0.00	0.00	0.88	0.31	0.0572
Nozzle Tube Asm, Tube Asm	1	14	22	57	22	99.29 %	0.00	0.00	2.89	0.60	0.2093
Assemble Tube	1	0	2	4	2	99.94 %	0.00	0.00	0.22	0.00	0.0000

Tube Asm, Washer Fluid Tank and Tube Asm

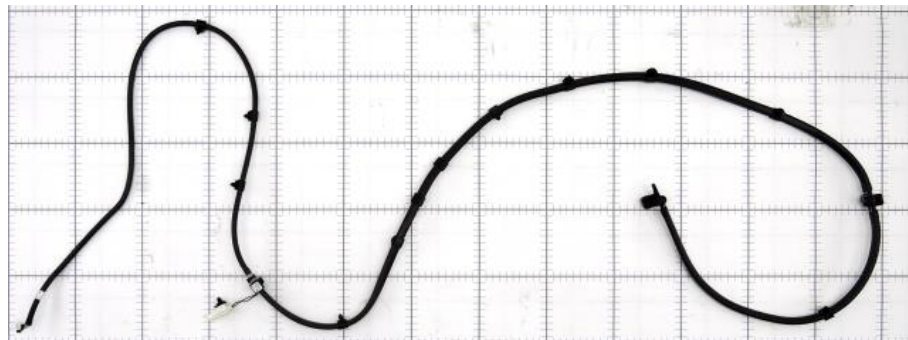
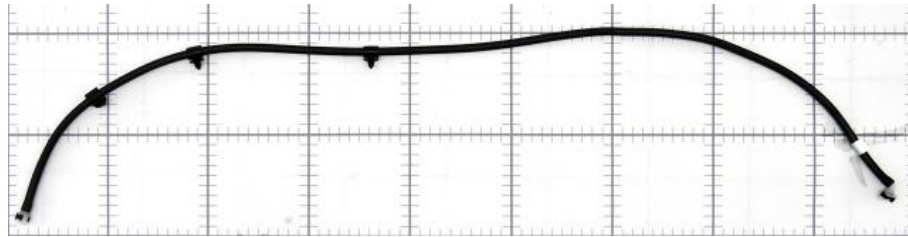
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Connection Tube Asm, Tube Asm	\$0.35	\$0.21	\$0.00	\$0.00	\$0.80	\$0.24	\$0.05	\$0.16	\$1.80
Nozzle Tube Asm, Tube Asm	\$4.25	\$0.63	\$0.00	\$0.00	\$2.62	\$0.44	\$0.11	\$0.57	\$8.62
Assemble Tube	\$0.00	\$0.00	\$0.00	\$0.00	\$0.20	\$0.00	\$0.01	\$0.02	\$0.23

Detailed Summary

Parts	21
Fasteners	12
Part Numbers	11
Steps	81
Fastenings	30
Right First Time	98.92%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.99
Supplier Fab. Time (Min)	0.91
Total Weight (kg)	0.27
Purchased Part Cost	
	\$4.60
Material Cost	
	\$0.84
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$3.61
Supplier Fab. Cost	
	\$0.68
Q Burden	
	\$0.16
SG&A	
	\$0.75
Manufacturing Cost*	
	\$10.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Washer Fluid Tank and Tube Asm
- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Connection Tube Asm, Tube Asm

Assembly Summary

Parts	7
Fasteners	3
Part Numbers	5
Steps	18
Fastenings	6
Right First Time	99.70 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.19
Total Weight (kg)	0.06

Material Cost**	\$0.56
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.03
Q Burden	\$0.05
SG&A	\$0.16
Manufacturing Cost*	\$1.80

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Connection Tube Asm, Tube Asm



Connection Tube Asm, Tube Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Tube, Connection Tube Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.31	0.0509
Assemble Connection Tube	1	6	6	16	6	99.71 %	0.00	0.00	0.88	0.00	0.0063

Connection Tube Asm, Tube Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Tube, Connection Tube Asm	\$0.00	\$0.21	\$0.00	\$0.00	\$0.00	\$0.24	\$0.00	\$0.05	\$0.50
Assemble Connection Tube	\$0.35	\$0.00	\$0.00	\$0.00	\$0.80	\$0.00	\$0.04	\$0.11	\$1.30

Detailed Summary

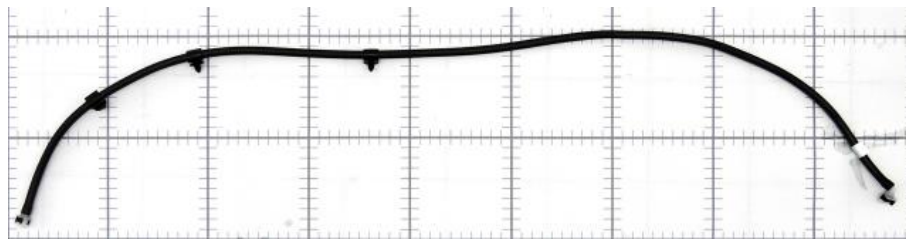
Parts	7
Fasteners	3
Part Numbers	5
Steps	18
Fastenings	6
Right First Time	99.7%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.88
Supplier Fab. Time (Min)	0.31
Total Weight (kg)	0.06
Purchased Part Cost	\$0.35
Material Cost	\$0.21
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.80
Supplier Fab. Cost	\$0.24
Q Burden	\$0.05
SG&A	\$0.16
Manufacturing Cost*	\$1.80

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tube, Connection Tube Asm

\...
 \Connection Tube Asm, Tube Asm
 \Tube, Connection Tube Asm
 \Tube Process



Process Summary

Right First Time	99.99 %
Process Time (Sec)	18.82
Total Weight (kg)	0.05

Material Cost**	\$0.21
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.24
Q Burden	\$0.00
SG&A	\$0.05
Manufacturing Cost*	\$0.50

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tube, Connection Tube Asm



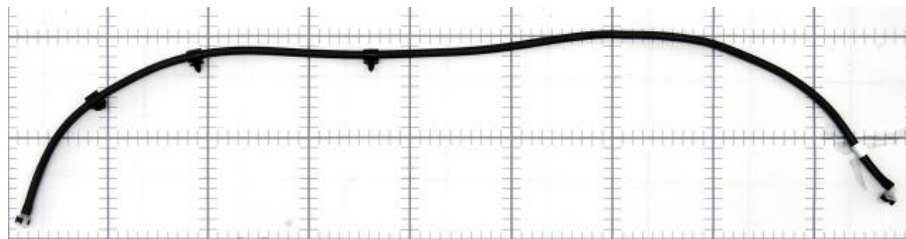
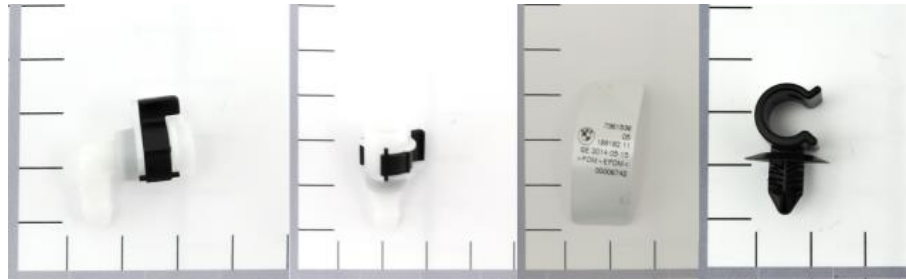
Tube Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Extrude: 32mm, 1 Layer	18.82	1	0.50	45.66	GER	\$0.24	99.99%	\$0.00

Tube Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tube	1	POM+EPDM	\$4.08	0.0509	0.0509	\$0.00	\$0.21

Assemble Connection Tube



- \...
- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Connection Tube Asm, Tube Asm
- \Assemble Connection Tube

Process Summary

Right First Time	99.71 %
Process Time (Sec)	52.75
Total Weight (kg)	0.01

Material Cost**	\$0.35
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.80
Q Burden	\$0.04
SG&A	\$0.11
Manufacturing Cost*	\$1.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Connection Tube



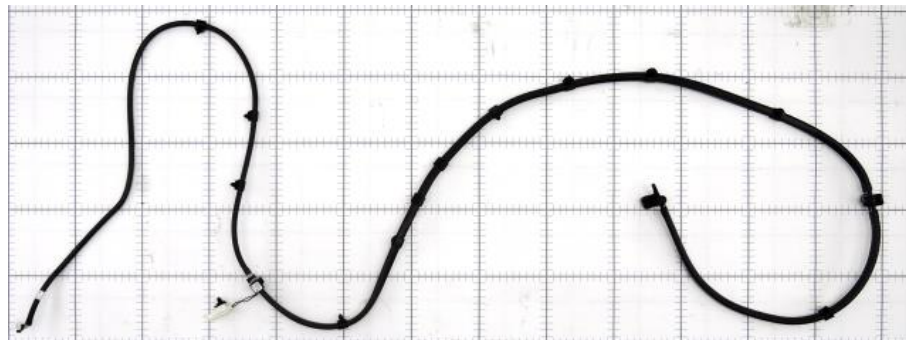
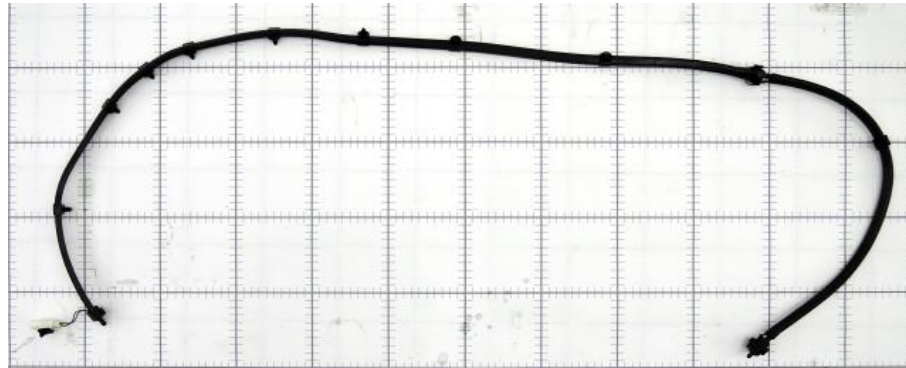
Assemble Connection Tube

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	52.75	1	1.00	54.32	GER	\$0.80	99.71 %	\$0.04

Assemble Connection Tube

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
90 Degree Connector with CPA	1	Commodity Item	Purchased	0.0012	-	\$0.10	\$0.00
Connector with CPA	1	Commodity Item	Purchased	0.0011	-	\$0.10	\$0.00
C-Clip Push Pin	3	Commodity Item	Purchased	0.0013	-	\$0.04	\$0.00
Label, Hose Mfg Info	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00

Nozzle Tube Asm, Tube Asm



\...

- \Washer Fluid Tank and Tube Asm
- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Nozzle Tube Asm, Tube Asm

Assembly Summary

Parts	14
Fasteners	9
Part Numbers	6
Steps	57
Fastenings	22
Right First Time	99.29 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	3.49
Total Weight (kg)	0.21

Material Cost**	\$4.88
OEM Process Cost	\$0.00
Supplier Process Cost	\$3.06
Q Burden	\$0.11
SG&A	\$0.57
Manufacturing Cost*	\$8.62

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Nozzle Tube Asm, Tube Asm



Nozzle Tube Asm, Tube Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Short Nozzle Tube, Nozzle Tube Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.17	0.0464
Assemble Short Nozzle Tube	1	1	5	9	5	99.84 %	0.00	0.00	0.57	0.00	0.0398
Long Nozzle Tube, Nozzle Tube Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.39	0.1050
Assemble Long Nozzle Tube	1	0	5	9	5	99.82 %	0.00	0.00	0.57	0.00	0.0000
End Connector, Nozzle Tube Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0027
Assemble Nozzle Tube	1	10	12	33	12	99.66 %	0.00	0.00	1.76	0.00	0.0154

Nozzle Tube Asm, Tube Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Short Nozzle Tube, Nozzle Tube Asm	\$0.00	\$0.19	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.04	\$0.36
Assemble Short Nozzle Tube	\$3.77	\$0.00	\$0.00	\$0.00	\$0.51	\$0.00	\$0.02	\$0.17	\$4.48
Long Nozzle Tube, Nozzle Tube Asm	\$0.00	\$0.43	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.09	\$0.82
Assemble Long Nozzle Tube	\$0.00	\$0.00	\$0.00	\$0.00	\$0.51	\$0.00	\$0.03	\$0.06	\$0.60
End Connector, Nozzle Tube Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Nozzle Tube	\$0.48	\$0.00	\$0.00	\$0.00	\$1.59	\$0.00	\$0.05	\$0.21	\$2.33

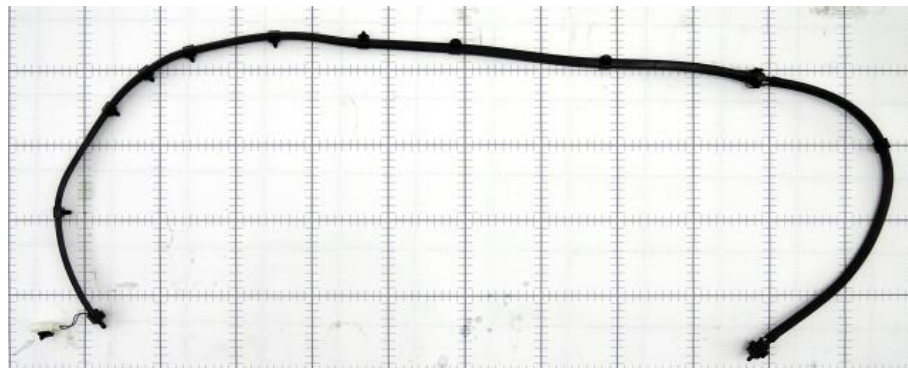
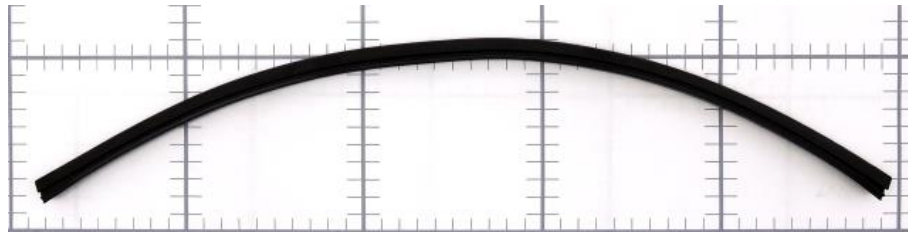
Detailed Summary

Parts	14
Fasteners	9
Part Numbers	6
Steps	57
Fastenings	22
Right First Time	99.29%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	2.89
Supplier Fab. Time (Min)	0.60
Total Weight (kg)	0.21
Purchased Part Cost	
	\$4.25
Material Cost	
	\$0.63
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$2.62
Supplier Fab. Cost	
	\$0.44
Q Burden	
	\$0.11
SG&A	
	\$0.57
Manufacturing Cost*	
	\$8.62

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Short Nozzle Tube, Nozzle Tube Asm



\...

- \Nozzle Tube Asm, Tube Asm
- \Short Nozzle Tube, Nozzle Tube Asm
- \Short Nozzle Tube Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	10.36
Total Weight (kg)	0.05

Material Cost**	\$0.19
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.36

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Short Nozzle Tube, Nozzle Tube Asm



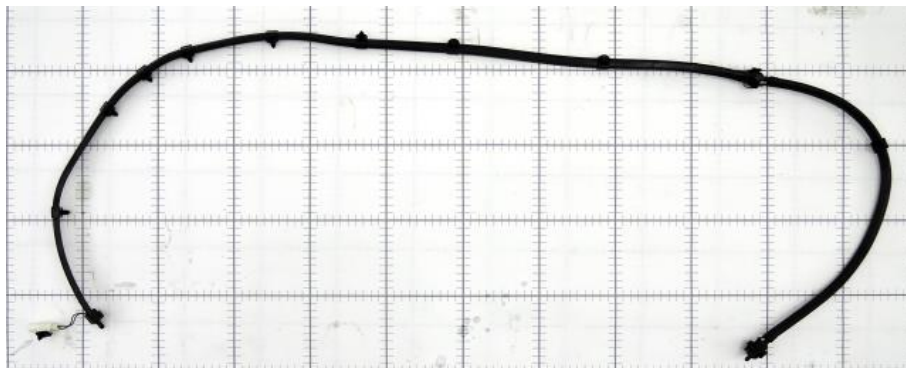
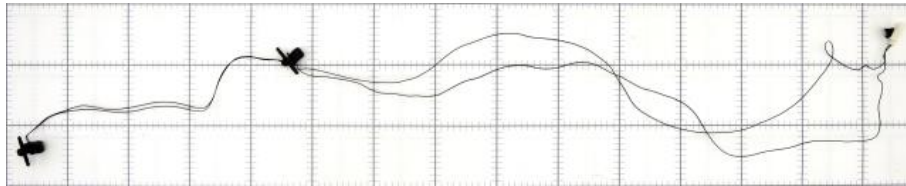
Short Nozzle Tube Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Extrude: 32mm, 1 Layer	10.36	1	0.50	45.66	GER	\$0.13	99.99%	\$0.00

Short Nozzle Tube Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Short Nozzle Tube	1	POM+EPDM	\$4.08	0.0464	0.0464	\$0.00	\$0.19

Assemble Short Nozzle Tube



\...

- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Nozzle Tube Asm, Tube Asm
- \Assemble Short Nozzle Tube

Process Summary

Right First Time	99.84 %
Process Time (Sec)	34.00
Total Weight (kg)	0.04

Material Cost**	\$3.77
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.51
Q Burden	\$0.02
SG&A	\$0.17
Manufacturing Cost*	\$4.48

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Short Nozzle Tube



Assemble Short Nozzle Tube

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	34.00	1	1.00	54.32	GER	\$0.51	99.84%	\$0.02

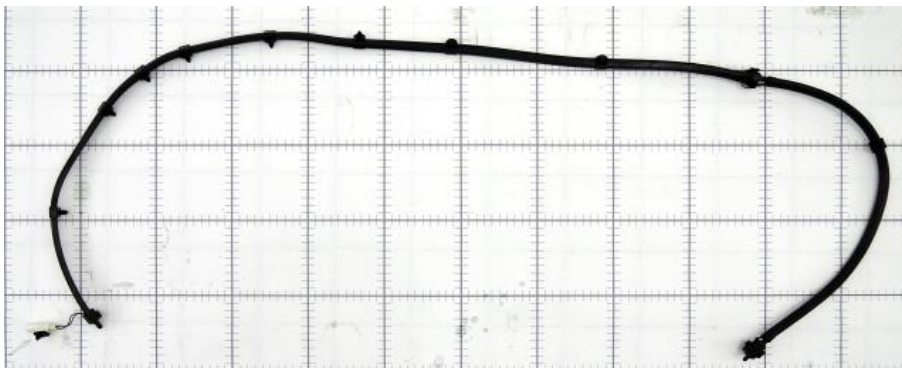
Assemble Short Nozzle Tube

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Spray Nozzle Wire Harness Asm	1	Commodity Item	Purchased	0.0398	-	\$3.77	\$0.00

Long Nozzle Tube, Nozzle Tube Asm

\...

- \Nozzle Tube Asm, Tube Asm
- \Long Nozzle Tube, Nozzle Tube Asm
- \Long Nozzle Tube Process



Process Summary

Right First Time	99.99 %
Process Time (Sec)	23.62
Total Weight (kg)	0.11

Material Cost**	\$0.43
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.00
SG&A	\$0.09
Manufacturing Cost*	\$0.82

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Long Nozzle Tube, Nozzle Tube Asm



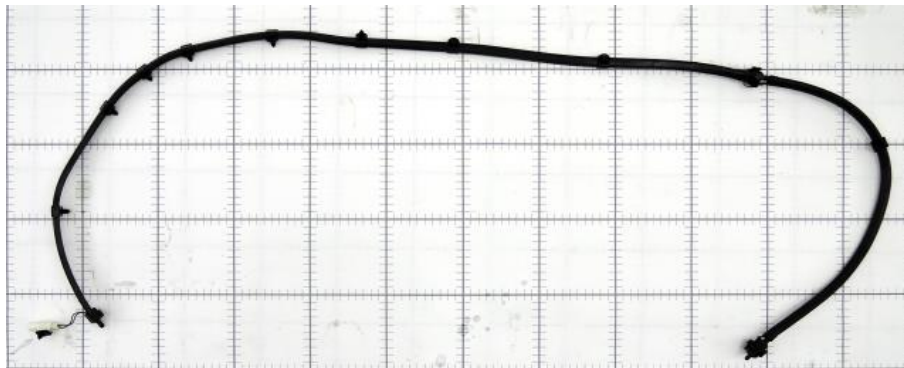
Long Nozzle Tube Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Extrude: 32mm, 1 Layer	23.62	1	0.50	45.66	GER	\$0.30	99.99%	\$0.00

Long Nozzle Tube Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Long Nozzle Tube	1	POM+EPDM	\$4.08	0.1050	0.1050	\$0.00	\$0.43

No Commodity Items Required for This Process



\...

- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Nozzle Tube Asm, Tube Asm
- \Assemble Long Nozzle Tube

Process Summary

Right First Time	99.82 %
Process Time (Sec)	34.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.51
Q Burden	\$0.03
SG&A	\$0.06
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Long Nozzle Tube



Assemble Long Nozzle Tube

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	34.00	1	1.00	54.32	GER	\$0.51	99.82%	\$0.03

Assemble Long Nozzle Tube

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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End Connector, Nozzle Tube Asm



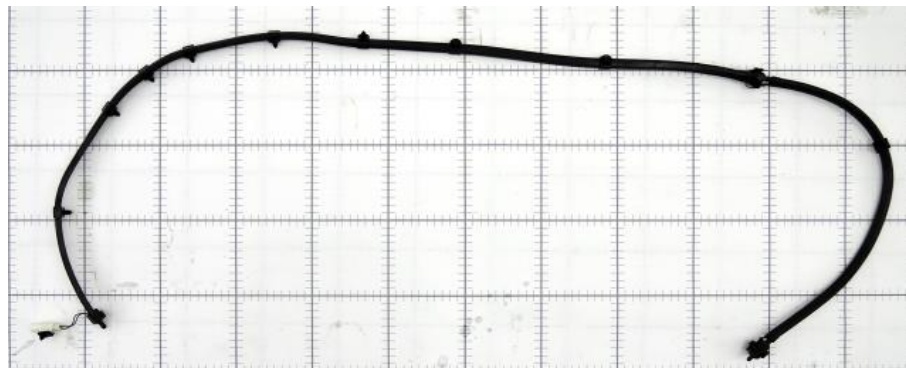
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- \Nozzle Tube Asm, Tube Asm
- \End Connector, Nozzle Tube Asm
- \End Connector Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.03
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

End Connector, Nozzle Tube Asm



End Connector Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.24	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

End Connector Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, End Connector	1	PA6	\$4.39	0.0027	0.0027	\$0.00	\$0.01

Assemble Nozzle Tube

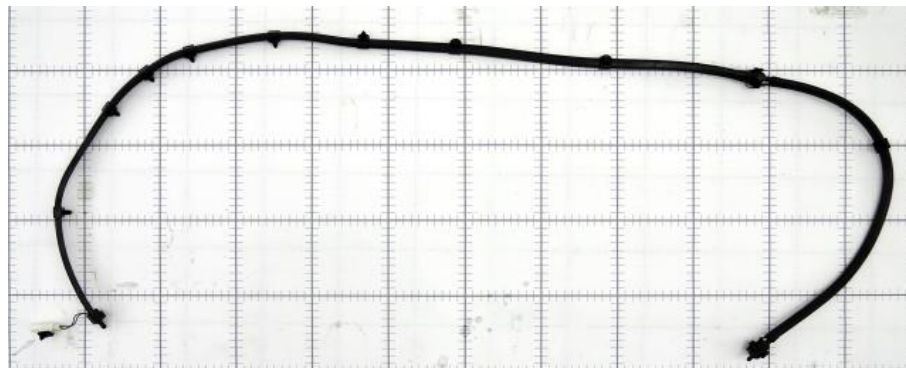


- \...
- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Nozzle Tube Asm, Tube Asm
- \Assemble Nozzle Tube

Process Summary

Right First Time	99.66 %
Process Time (Sec)	105.38
Total Weight (kg)	0.02

Material Cost**	\$0.48
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.59
Q Burden	\$0.05
SG&A	\$0.21
Manufacturing Cost*	\$2.33



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Nozzle Tube



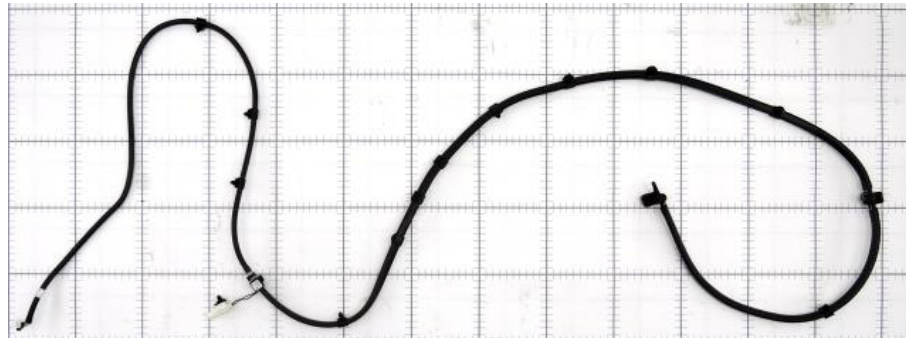
Assemble Nozzle Tube

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	105.38	1	1.00	54.32	GER	\$1.59	99.66%	\$0.05

Assemble Nozzle Tube

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Hose Mfg Info	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00
Hose Retention Push Pin	9	Commodity Item	Purchased	0.0017	-	\$0.05	\$0.00

No Commodity Items Required for This Process



\...

- \Washer Fluid Tank and Tube Asm
- \Tube Asm, Washer Fluid Tank and Tube Asm
- \Assemble Tube

Process Summary

Right First Time	99.94 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.20
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tube



Assemble Tube

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	13.00	1	1.00	54.32	GER	\$0.20	99.94%	\$0.01

Assemble Tube

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...

\Wipers

\Washer Fluid Tank and Tube Asm

\Assemble Tube to Washer Fluid Tank

Process Summary

Right First Time	99.85 %
Process Time (Sec)	29.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.44
Q Burden	\$0.02
SG&A	\$0.05
Manufacturing Cost*	\$0.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Tube to Washer Fluid Tank

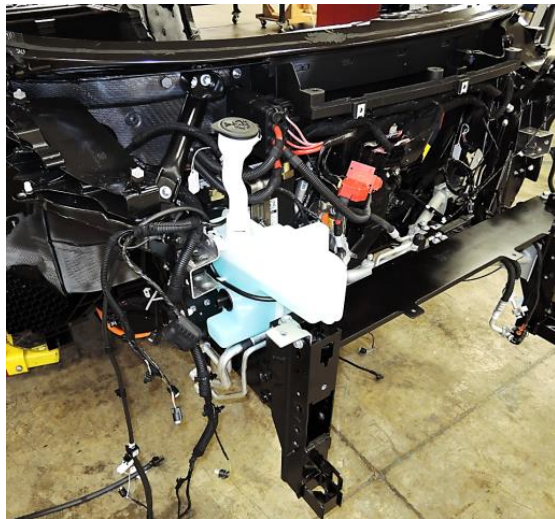
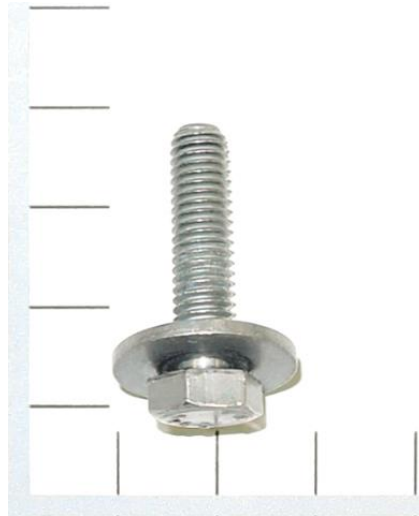


Assemble Tube to Washer Fluid Tank

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	29.00	1	1.00	54.32	GER	\$0.44	99.85%	\$0.02

Assemble Tube to Washer Fluid Tank

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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\...
 \Zone 2 Exterior
 \Wipers
 \Washer Fluid Tank and Tube Installation

Process Summary

Right First Time	99.16 %
Process Time (Sec)	119.50
Total Weight (kg)	0.02

Material Cost**	\$0.08
OEM Process Cost	\$3.03
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.37
Manufacturing Cost*	\$3.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Washer Fluid Tank and Tube Installation



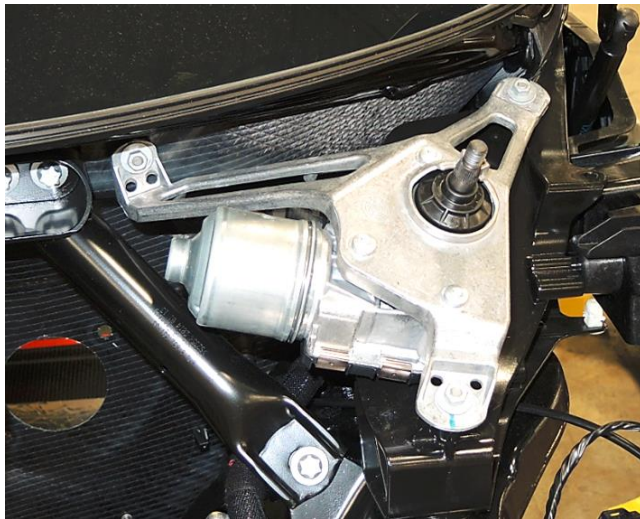
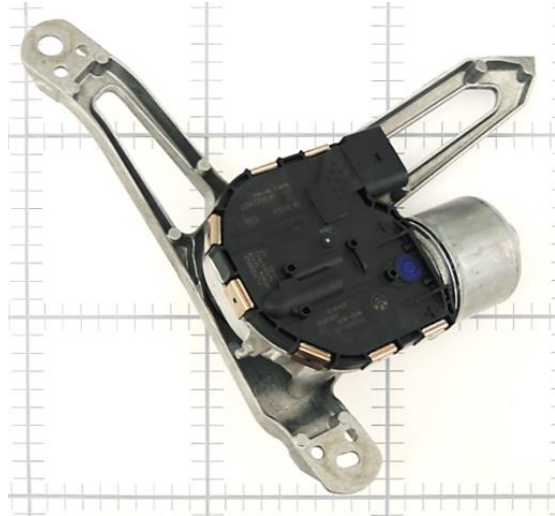
Washer Fluid Tank and Tube Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	119.50	1	1.00	91.41	GER	\$3.03	99.16%	\$0.13

Washer Fluid Tank and Tube Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x24mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0095	-	\$0.04	\$0.00
M6x24mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0095	-	\$0.04	\$0.00

Driver Wiper Motor Asm



\...
 \Zone 2 Exterior
 \Wipers
 \Driver Wiper Motor Asm

Assembly Summary

Parts	5
Fasteners	3
Part Numbers	3
Steps	15
Fastenings	4
Right First Time	99.31 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.15
Total Weight (kg)	1.48

Material Cost**	\$25.46
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.45
Q Burden	\$0.10
SG&A	\$0.97
Manufacturing Cost*	\$27.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Wiper Motor Asm



Driver Wiper Motor Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Wiper Motor Bracket, Driver Wiper Motor Asm	1	1	0	4	0	99.97 %	0.00	0.00	0.00	0.31	0.1771
Assemble Driver Wiper Motor	1	4	4	10	4	99.34 %	0.00	0.00	0.83	0.00	1.3038

Driver Wiper Motor Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Wiper Motor Bracket, Driver Wiper Motor Asm	\$0.00	\$0.40	\$0.00	\$0.00	\$0.00	\$0.70	\$0.01	\$0.13	\$1.24
Assemble Driver Wiper Motor	\$25.06	\$0.00	\$0.00	\$0.00	\$0.75	\$0.00	\$0.10	\$0.84	\$26.76

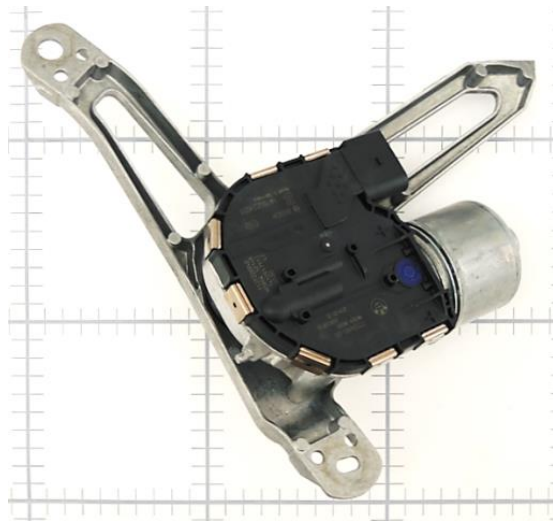
Detailed Summary

Parts	5
Fasteners	3
Part Numbers	3
Steps	15
Fastenings	4
Right First Time	99.31%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.83
Supplier Fab. Time (Min)	0.31
Total Weight (kg)	1.48
Purchased Part Cost	
	\$25.06
Material Cost	\$0.40
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.75
Supplier Fab. Cost	\$0.70
Q Burden	\$0.10
SG&A	\$0.97
Manufacturing Cost*	\$27.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Wiper Motor Bracket, Driver Wiper Motor Asm



\...

\Driver Wiper Motor Asm

\Wiper Motor Bracket, Driver Wiper Motor Asm

\Wiper Motor Bracket Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	18.84
Total Weight (kg)	0.18

Material Cost**	\$0.40
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.70
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$1.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Wiper Motor Bracket, Driver Wiper Motor Asm



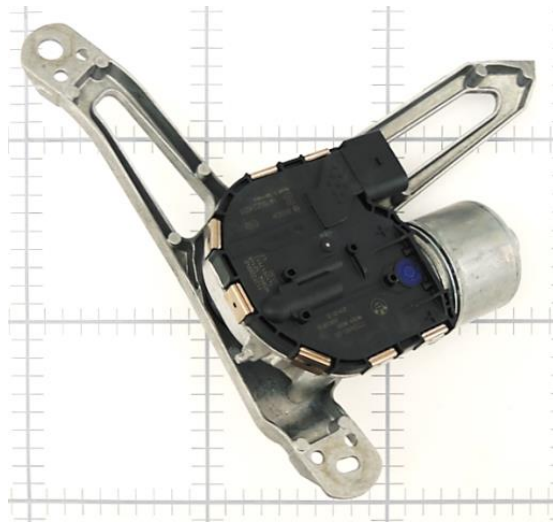
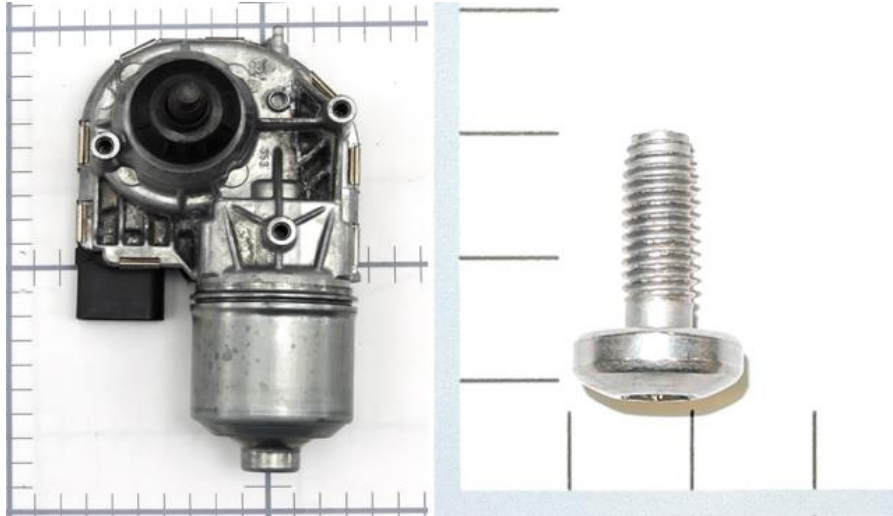
Wiper Motor Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
60 Ton Trim Press	4.67	1	0.25	22.68	GER	\$0.03	99.98 %	\$0.00
840 Ton DieCasting Machine	28.34	2	1.00	170.22	GER	\$0.67	99.99 %	\$0.00

Wiper Motor Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Wiper Motor Bracket	1	A380	\$2.27	0.1771	0.1771	\$0.00	\$0.40

Assemble Driver Wiper Motor



\...
\Wipers
\Driver Wiper Motor Asm
\Assemble Driver Wiper Motor

Process Summary

Right First Time	99.34 %
Process Time (Sec)	50.00
Total Weight (kg)	1.30
Material Cost**	\$25.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.75
Q Burden	\$0.10
SG&A	\$0.84
Manufacturing Cost*	\$26.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Wiper Motor

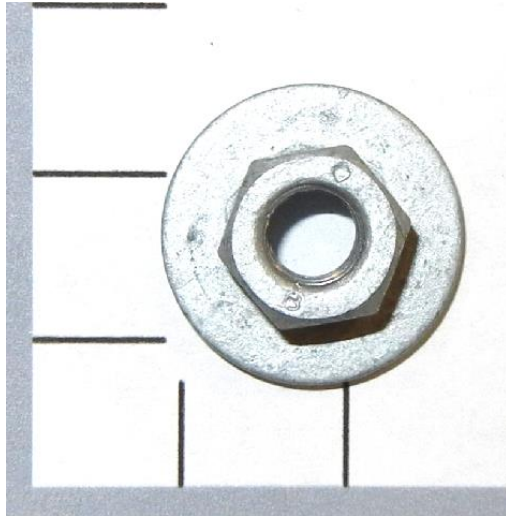


Assemble Driver Wiper Motor

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	50.00	1	1.00	54.32	GER	\$0.75	99.34%	\$0.10

Assemble Driver Wiper Motor

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiper Motor	1	Commodity Item	Purchased	1.2840	-	\$25.00	\$0.00
M6x16mm-Torx Bolt	3	Commodity Item	Purchased	0.0066	-	\$0.02	\$0.00

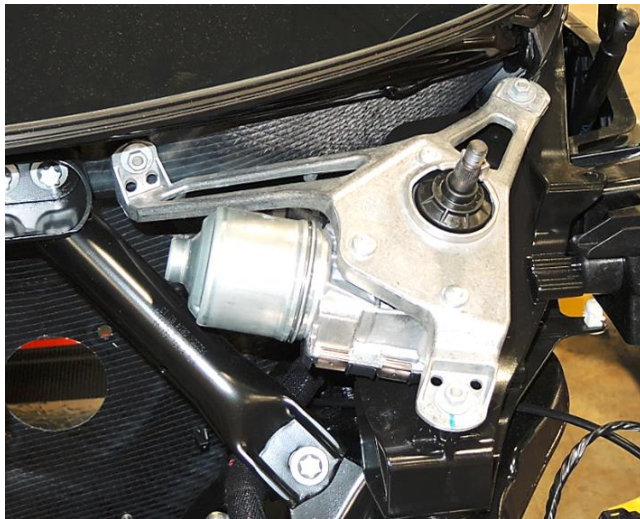


\...
 \Zone 2 Exterior
 \Wipers
 \Driver Wiper Motor Installation

Process Summary

Right First Time	99.33 %
Process Time (Sec)	59.50
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$1.51
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$0.18
Manufacturing Cost*	\$1.86



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Wiper Motor Installation



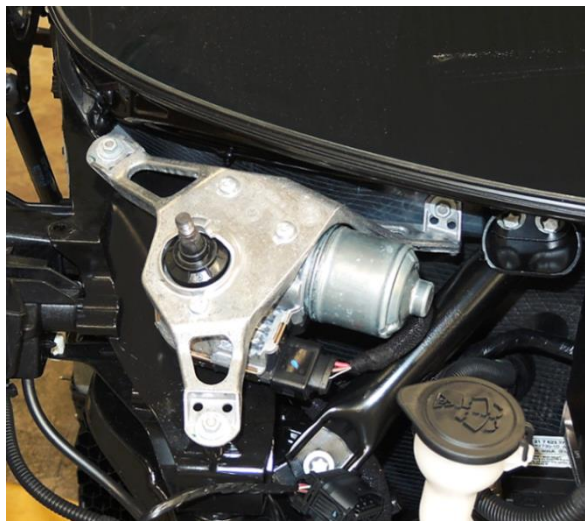
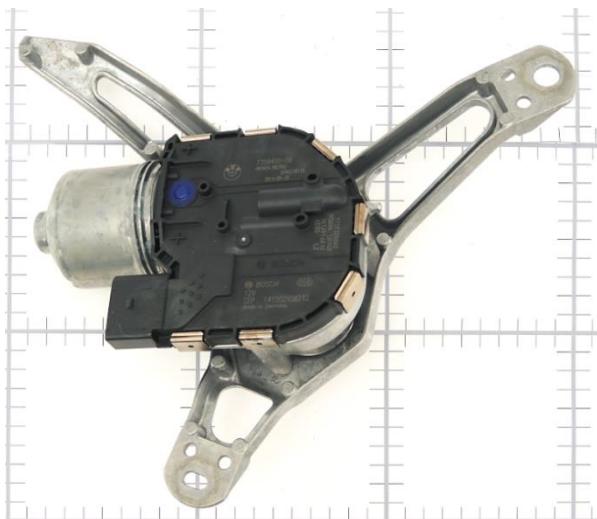
Driver Wiper Motor Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	59.50	1	1.00	91.41	GER	\$1.51	99.33%	\$0.10

Driver Wiper Motor Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x6mm-Hex KEPS Nut	3	Commodity Item	Purchased	0.0049	-	\$0.02	\$0.00

Passenger Wiper Motor Asm



\...
 \Zone 2 Exterior
 \Wipers
 \Passenger Wiper Motor Asm

Assembly Summary

Parts	5
Fasteners	3
Part Numbers	3
Steps	15
Fastenings	4
Right First Time	99.31 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.15
Total Weight (kg)	1.48

Material Cost**	\$25.46
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.45
Q Burden	\$0.10
SG&A	\$0.97
Manufacturing Cost*	\$27.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Wiper Motor Asm



Passenger Wiper Motor Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Wiper Motor Bracket, Passenger Wiper Motor Asm	1	1	0	4	0	99.97 %	0.00	0.00	0.00	0.31	0.1771
Assemble Passenger Wiper Motor	1	4	4	10	4	99.34 %	0.00	0.00	0.83	0.00	1.3038

Passenger Wiper Motor Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Wiper Motor Bracket, Passenger Wiper Motor Asm	\$0.00	\$0.40	\$0.00	\$0.00	\$0.00	\$0.70	\$0.01	\$0.13	\$1.24
Assemble Passenger Wiper Motor	\$25.06	\$0.00	\$0.00	\$0.00	\$0.75	\$0.00	\$0.10	\$0.84	\$26.76

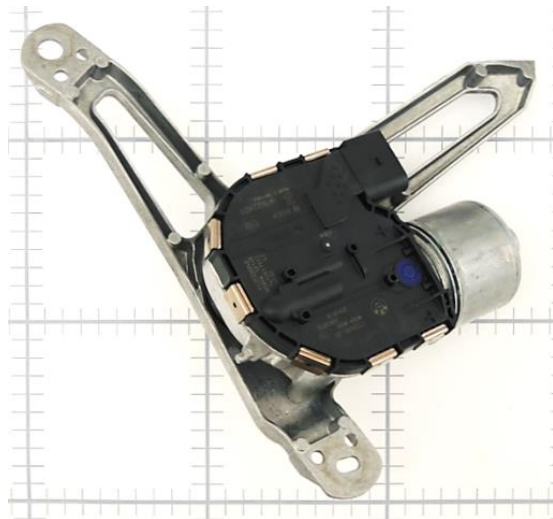
Detailed Summary

Parts	5
Fasteners	3
Part Numbers	3
Steps	15
Fastenings	4
Right First Time	99.31%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.83
Supplier Fab. Time (Min)	0.31
Total Weight (kg)	1.48
Purchased Part Cost	
	\$25.06
Material Cost	\$0.40
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.75
Supplier Fab. Cost	\$0.70
Q Burden	\$0.10
SG&A	\$0.97
Manufacturing Cost*	\$27.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Wiper Motor Bracket, Passenger Wiper Motor Asm



\...

\Passenger Wiper Motor Asm

\Wiper Motor Bracket, Passenger Wiper Motor Asm

\Wiper Motor Bracket Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	18.84
Total Weight (kg)	0.18

Material Cost**	\$0.40
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.70
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$1.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Wiper Motor Bracket, Passenger Wiper Motor Asm



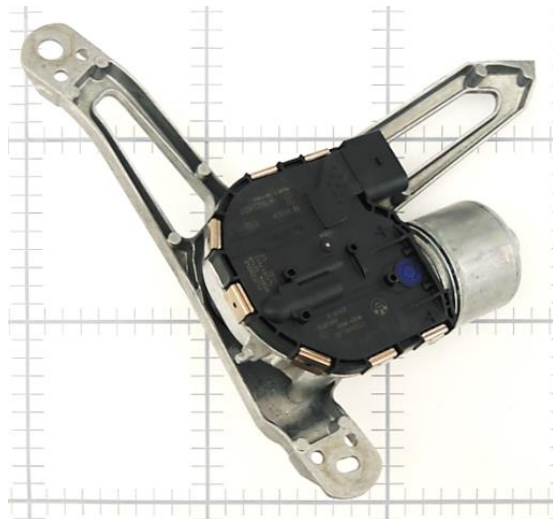
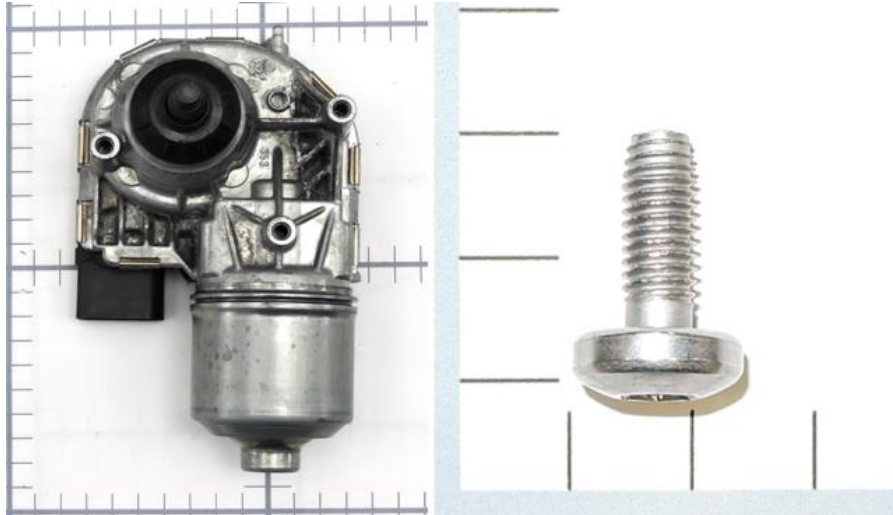
Wiper Motor Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
60 Ton Trim Press	4.67	1	0.25	22.68	GER	\$0.03	99.98 %	\$0.00
840 Ton DieCasting Machine	28.34	2	1.00	170.22	GER	\$0.67	99.99 %	\$0.00

Wiper Motor Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Wiper Motor Bracket	1	A380	\$2.27	0.1771	0.1771	\$0.00	\$0.40

Assemble Passenger Wiper Motor



\...

\Wipers

\Passenger Wiper Motor Asm

\Assemble Passenger Wiper Motor

Process Summary

Right First Time	99.34 %
Process Time (Sec)	50.00
Total Weight (kg)	1.30

Material Cost**	\$25.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.75
Q Burden	\$0.10
SG&A	\$0.84
Manufacturing Cost*	\$26.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Passenger Wiper Motor



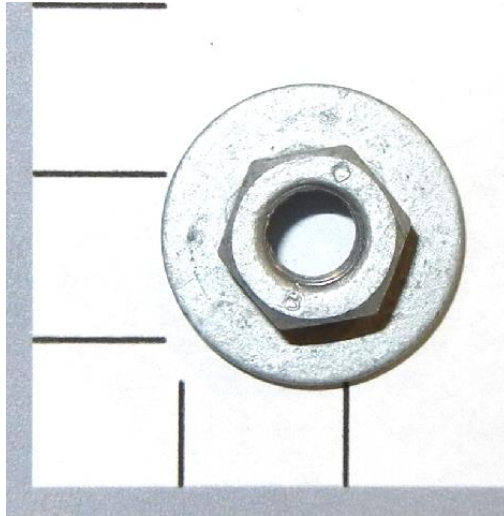
Assemble Passenger Wiper Motor

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	50.00	1	1.00	54.32	GER	\$0.75	99.34 %	\$0.10

Assemble Passenger Wiper Motor

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiper Motor	1	Commodity Item	Purchased	1.2840	-	\$25.00	\$0.00
M6x16mm-Torx Bolt	3	Commodity Item	Purchased	0.0066	-	\$0.02	\$0.00

Passenger Wiper Motor Installation

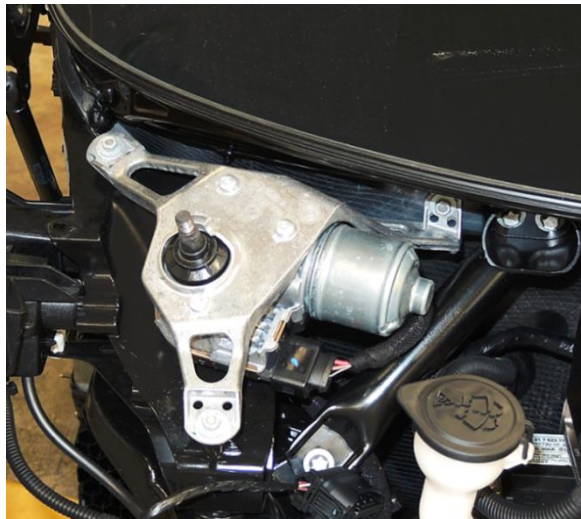


\...
\Zone 2 Exterior
\Wipers
\Passenger Wiper Motor Installation

Process Summary

Right First Time	99.33 %
Process Time (Sec)	53.50
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$1.36
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$0.16
Manufacturing Cost*	\$1.68



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Wiper Motor Installation

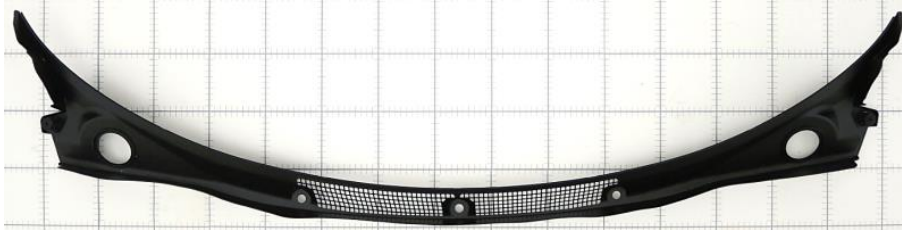


Passenger Wiper Motor Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	53.50	1	1.00	91.41	GER	\$1.36	99.33%	\$0.10

Passenger Wiper Motor Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x6mm-Hex KEPS Nut	3	Commodity Item	Purchased	0.0049	-	\$0.02	\$0.00



\...
 \Zone 2 Exterior
 \Wipers
 \Cowl Asm

Assembly Summary

Parts	6
Fasteners	0
Part Numbers	4
Steps	11
Fastenings	2
Right First Time	99.61 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.19
Total Weight (kg)	0.62

Material Cost**	\$1.60
OEM Process Cost	\$0.00
Supplier Process Cost	\$3.53
Q Burden	\$0.06
SG&A	\$0.61
Manufacturing Cost*	\$5.80

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cowl Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cowl, Cowl Asm	1	4	0	4	0	99.96 %	0.00	0.00	0.00	1.69	0.5985
Assemble Cowl	1	2	2	6	2	99.65 %	0.00	0.00	0.50	0.00	0.0196

Cowl Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cowl, Cowl Asm	\$0.00	\$1.54	\$0.00	\$0.00	\$0.00	\$3.08	\$0.01	\$0.55	\$5.18
Assemble Cowl	\$0.06	\$0.00	\$0.00	\$0.00	\$0.45	\$0.00	\$0.05	\$0.06	\$0.62

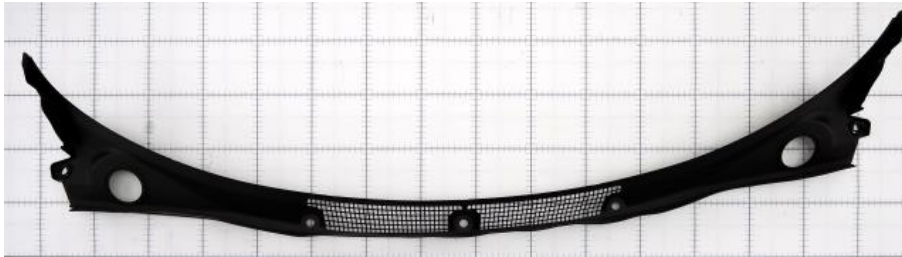
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	4
Steps	11
Fastenings	2
Right First Time	99.61%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.50
Supplier Fab. Time (Min)	1.69
Total Weight (kg)	0.62
Purchased Part Cost	\$0.06
Material Cost	\$1.54
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.45
Supplier Fab. Cost	\$3.08
Q Burden	\$0.06
SG&A	\$0.61
Manufacturing Cost*	\$5.80

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cowl, Cowl Asm



\...
\Cowl Asm
\Cowl, Cowl Asm
\Cowl Process

Process Summary

Right First Time	99.96 %
Process Time (Sec)	101.36
Total Weight (kg)	0.60

Material Cost**	\$1.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$3.08
Q Burden	\$0.01
SG&A	\$0.55
Manufacturing Cost*	\$5.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cowl, Cowl Asm

Cowl Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
950 Ton Injection Molding Press	101.36	1	0.25	109.42	GER	\$3.08	99.96%	\$0.01

Cowl Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Cowl	1	PPTD20	\$2.54	0.5941	0.5941	\$0.00	\$1.51
Material 2, Cowl	1	TPE	\$2.54	0.0036	0.0038	\$0.00	\$0.01
Material 3, Cowl	2	TPE	\$2.54	0.0004	0.0008	\$0.00	\$0.01

Assemble Cowl



\...
\Wipers
\Cowl Asm
\Assemble Cowl

Process Summary

Right First Time	99.65 %
Process Time (Sec)	30.00
Total Weight (kg)	0.02

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.45
Q Burden	\$0.05
SG&A	\$0.06
Manufacturing Cost*	\$0.62



* Excluding tooling, ER&D, logistics, and profit margin


** Includes material cost and purchased parts cost

Assemble Cowl

Assemble Cowl

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	30.00	1	1.00	54.32	GER	\$0.45	99.65%	\$0.05

Assemble Cowl

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Rubber Bumper	2	Commodity Item	Purchased	0.0098	-	\$0.03	\$0.00

Cowl Installation



\...
 \Zone 2 Exterior
 \Wipers
 \Cowl Installation

Process Summary

Right First Time	99.66 %
Process Time (Sec)	56.00
Total Weight (kg)	0.01

Material Cost**	\$0.18
OEM Process Cost	\$1.42
Supplier Process Cost	\$0.00
Q Burden	\$0.05
SG&A	\$0.18
Manufacturing Cost*	\$1.83



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cowl Installation

Cowl Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	56.00	1	1.00	91.41	GER	\$1.42	99.66%	\$0.05

Cowl Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Short Two Stage Push Pin	2	Commodity Item	Purchased	0.0012	-	\$0.03	\$0.00
Two Stage Push Pin w/Foam Isolator	3	Commodity Item	Purchased	0.0014	-	\$0.04	\$0.00



\...
 \Zone 2 Exterior
 \Wipers
 \Driver Wiper Installation

Process Summary

Right First Time	99.73 %
Process Time (Sec)	36.00
Total Weight (kg)	0.73

Material Cost**	\$7.05
OEM Process Cost	\$0.91
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.32
Manufacturing Cost*	\$8.33

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Wiper Installation

Driver Wiper Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	36.00	1	1.00	91.41	GER	\$0.91	99.73%	\$0.04

Driver Wiper Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Driver Wiper Asm	1	Commodity Item	Purchased	0.7140	-	\$7.00	\$0.00
M10x9mm-Keps Bolt	1	Commodity Item	Purchased	0.0113	-	\$0.04	\$0.00
Wiper Nut Cap	1	Commodity Item	Purchased	0.0006	-	\$0.01	\$0.00



\...
 \Zone 2 Exterior
 \Wipers
 \Passenger Wiper Installation

Process Summary

Right First Time	99.73 %
Process Time (Sec)	36.00
Total Weight (kg)	0.56

Material Cost**	\$6.05
OEM Process Cost	\$0.91
Supplier Process Cost	\$0.00
Q Burden	\$0.04
SG&A	\$0.29
Manufacturing Cost*	\$7.30

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Wiper Installation



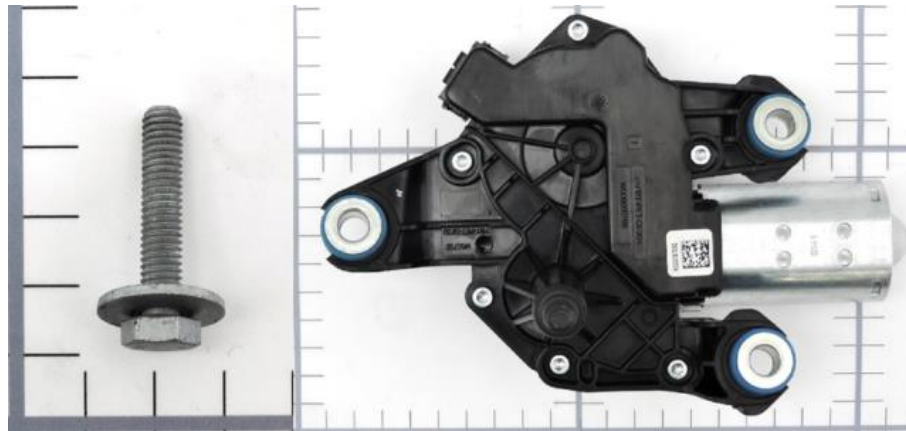
Passenger Wiper Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	36.00	1	1.00	91.41	GER	\$0.91	99.73%	\$0.04

Passenger Wiper Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Passenger Wiper Asm	1	Commodity Item	Purchased	0.5520	-	\$6.00	\$0.00
M10x9mm-Keps Bolt	1	Commodity Item	Purchased	0.0113	-	\$0.04	\$0.00
Wiper Nut Cap	1	Commodity Item	Purchased	0.0006	-	\$0.01	\$0.00

Assemble Wiper Motor



\...
 \Zone 2 Exterior
 \Wipers
 \Assemble Wiper Motor

Process Summary

Right First Time	99.38 %
Process Time (Sec)	40.00
Total Weight (kg)	0.79

Material Cost**	\$20.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.60
Q Burden	\$0.09
SG&A	\$0.68
Manufacturing Cost*	\$21.49



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Wiper Motor



Assemble Wiper Motor

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	40.00	1	1.00	54.32	GER	\$0.60	99.38 %	\$0.09

Assemble Wiper Motor

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiper Motor Asm	1	Commodity Item	Purchased	0.7640	-	\$20.00	\$0.00
M6x28mm-Hex SEMS	3	Commodity Item	Purchased	0.0102	-	\$0.04	\$0.00

Liftgate Wiper Arm Installation



\...
\Zone 2 Exterior
\Wipers
\Liftgate Wiper Arm Installation

Process Summary

Right First Time	99.79 %
Process Time (Sec)	23.00
Total Weight (kg)	0.18

Material Cost**	\$3.53
OEM Process Cost	\$0.58
Supplier Process Cost	\$0.00
Q Burden	\$0.03
SG&A	\$0.18
Manufacturing Cost*	\$4.32



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Liftgate Wiper Arm Installation



Liftgate Wiper Arm Installation

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	23.00	1	1.00	91.41	GER	\$0.58	99.79%	\$0.03

Liftgate Wiper Arm Installation

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Liftgate Wiper Arm Asm	1	Commodity Item	Purchased	0.1714	-	\$3.50	\$0.00
M8x8mm-Flanged Hex Nut	1	Commodity Item	Purchased	0.0069	-	\$0.03	\$0.00

Lamps Overview



The lamps for the i3 are mostly LED lights with the exception of the fog lamp. Assembly and manufacturing details for the gear box will be covered through out the report.

The lamps consists of the BMW Adaptive Lens headlights, multi-housing plastic tail lamps, back up lamps, fog lamps, side lamps, and third brake lights. The tail lamps are mounted to the glass portion of the lift gate utilizing epoxy and plastic brackets. The BMW Adaptive Lens headlights employs sensors to measure speed, steering angle and yaw; based on this information an electric motor actuates the lens in the direction of the curve to provide greater visibility to the driver.

All major components were costed in detail, while prices were applied to commodity items (i.e. seals, rivets, snap rings).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.



Description:

- BMW Adaptive Lens Head Lights: headlights employs sensors to measure speed, steering angle and yaw; based on this information an electric motor actuates the lens in the direction of the curve to provide greater visibility to the driver.

Advantages:

- Eye Catching Customer Feature
- Increased Safety Ratings

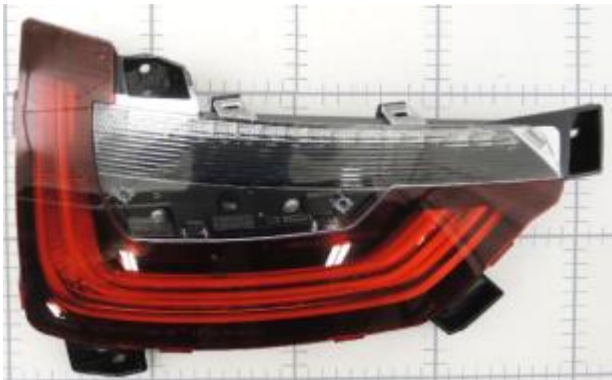


Description:

- BMW Adaptive Lens Head Lights: headlights employs sensors to measure speed, steering angle and yaw; based on this information an electric motor actuates the lens in the direction of the curve to provide greater visibility to the driver.

Disadvantages:

- Increased Cost due to number of components and complexity of system



Description:

- Tail Lamp: The middle section of the lift gate is a glass panel. The tail lamp is mounted to the glass panel using plastic brackets and epoxy.

Advantages:

- Unique Application: Utilizing a glass panel for a futuristic appeal on the lift gate. Then removing the need for large, complex brackets and replacing them with smaller, cheaper brackets.



Description:

- Tail Lamp: The middle section of the lift gate is a glass panel. The tail lamp is mounted to the glass panel using plastic brackets and epoxy.

Disadvantages:

- Increased Manufacturing Investment due to machinery required to handle epoxy

Summary

Parts	390
Fasteners	131
Part Numbers	203
Steps	1,500
Fastenings	423
Right First Time	64.8%
OEM Process Time (Hrs)	0.14
Supplier Process Time (Hrs)	1.81
Total Weight (kg)	11.21
Material Cost**	\$279.82
OEM Process Cost	\$12.85
Supplier Process Cost	\$79.87
Q Burden	\$6.50
SG&A	\$72.60
Manufacturing Cost*	\$451.64

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Asm



\...

\Zone 2 Exterior

\Lamps

\Driver Head Lamp Asm

Assembly Summary

Parts	100
Fasteners	29
Part Numbers	64
Steps	429
Fastenings	116
Right First Time	88.75 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	38.82
Total Weight (kg)	3.26

Material Cost**	\$87.55
OEM Process Cost	\$0.00
Supplier Process Cost	\$19.62
Q Burden	\$1.79
SG&A	\$20.13
Manufacturing Cost*	\$129.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Asm



MUNRO
& ASSOCIATES, INC.

Driver Head Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Driver Head Lamp Housing Asm, Driver Head Lamp	1	92	110	407	110	88.97 %	0.00	0.00	13.75	23.61	3.2044
Head Lamp Seal Small, Driver Head Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.16	0.0196
Assemble Head Lamp Seal Small	1	0	1	3	1	99.95 %	0.00	0.00	0.15	0.00	0.0000
Head Lamp Seal Large, Driver Head Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.47	0.0346
Assemble Head Lamp Seal Large	1	4	5	12	5	99.84 %	0.00	0.00	0.67	0.00	0.0004

Driver Head Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Driver Head Lamp Housing Asm, Driver Head Lamp	\$17.87	\$69.23	\$0.00	\$0.00	\$10.14	\$8.50	\$1.75	\$19.87	\$127.35
Head Lamp Seal Small, Driver Head Lamp Asm	\$0.00	\$0.06	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.03	\$0.16
Assemble Head Lamp Seal Small	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$0.02	\$0.14
Head Lamp Seal Large, Driver Head Lamp Asm	\$0.00	\$0.10	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.09	\$0.49
Assemble Head Lamp Seal Large	\$0.29	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.02	\$0.12	\$0.94

Detailed Summary

Parts	100
Fasteners	29
Part Numbers	64
Steps	429
Fastenings	116
Right First Time	88.75%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	14.58
Supplier Fab. Time (Min)	24.24
Total Weight (kg)	3.26
Purchased Part Cost	
	\$18.16
Material Cost	
	\$69.39
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$10.76
Supplier Fab. Cost	
	\$8.86
Q Burden	
	\$1.79
SG&A	
	\$20.13
Manufacturing Cost*	
	\$129.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Housing Asm, Driver Head Lamp



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\Lamps

\Driver Head Lamp Asm

\Driver Head Lamp Housing Asm, Driver Head Lamp

Assembly Summary

Parts	92
Fasteners	29
Part Numbers	58
Steps	407
Fastenings	110
Right First Time	88.97 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	37.36
Total Weight (kg)	3.20

Material Cost**	\$87.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$18.64
Q Burden	\$1.75
SG&A	\$19.87
Manufacturing Cost*	\$127.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Housing Asm, Driver Head Lamp



Driver Head Lamp Housing Asm, Driver Head Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing Asm, DriverHead Lamp Housing Asm	1	86	107	361	107	89.42 %	0.00	0.00	13.55	5.70	2.5984
Lens, Driver Head Lamp Housing Asm	1	6	0	39	0	99.62 %	0.00	0.00	0.00	17.91	0.6060
Assemble Lens	1	0	3	5	3	99.89 %	0.00	0.00	0.21	0.00	0.0000

Driver Head Lamp Housing Asm, Driver Head Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing Asm, Driver Head Lamp Housing Asm	\$17.87	\$65.42	\$0.00	\$0.00	\$10.06	\$3.38	\$1.68	\$17.89	\$116.29
Lens, Driver Head Lamp Housing Asm	\$0.00	\$3.81	\$0.00	\$0.00	\$0.00	\$5.12	\$0.06	\$1.96	\$10.95
Assemble Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.02	\$0.02	\$0.12

Driver Head Lamp Housing Asm, Driver Head Lamp

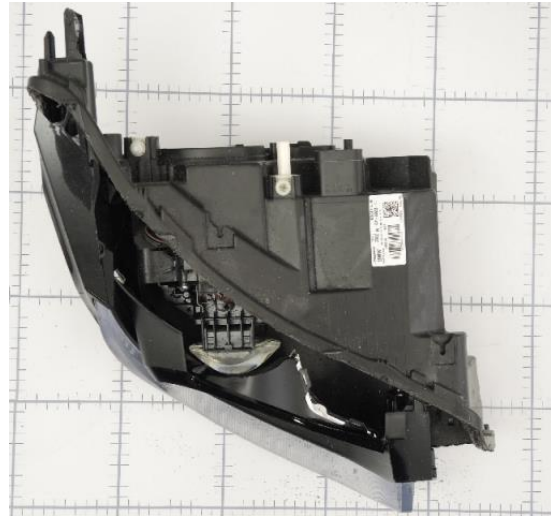
Detailed Summary

Parts	92
Fasteners	29
Part Numbers	58
Steps	407
Fastenings	110
Right First Time	88.97%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	13.75
Supplier Fab. Time (Min)	23.61
Total Weight (kg)	3.20
Purchased Part Cost	
	\$17.87
Material Cost	
	\$69.23
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$10.14
Supplier Fab. Cost	
	\$8.50
Q Burden	
	\$1.75
SG&A	
	\$19.87
Manufacturing Cost*	
	\$127.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Driver Head Lamp Housing Asm



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\Driver Head Lamp Asm

\Driver Head Lamp Housing Asm, Driver Head Lamp

\Housing Asm, Driver Head Lamp Housing Asm

Assembly Summary

Parts	86
Fasteners	29
Part Numbers	52
Steps	361
Fastenings	107
Right First Time	89.42 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	19.25
Total Weight (kg)	2.60

Material Cost**	\$83.29
OEM Process Cost	\$0.00
Supplier Process Cost	\$13.44
Q Burden	\$1.68
SG&A	\$17.89
Manufacturing Cost*	\$116.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Driver Head Lamp Housing Asm



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Housing Asm, Driver Head Lamp Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.37	0.7720
Assemble Wiring to Housing	1	1	9	20	9	99.15 %	0.00	0.00	1.32	0.00	0.1075
Bevel Gear, Housing Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0014
Snap In Bevel Gear Short Asm, Housing Asm	1	2	1	5	1	99.95 %	0.00	0.00	0.13	0.03	0.0068
Snap In Bevel Gear Large Asm, Housing Asm	1	2	1	5	1	99.95 %	0.00	0.00	0.13	0.03	0.0076
Assemble Actuator Gear Arm	1	1	5	10	5	99.52 %	0.00	0.00	0.53	0.00	0.0003
Head Lamp Moisture Vent Asm, Housing Asm	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0012
Cap Asm, Housing Asm	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0005
Twist Cap Asm, Housing Asm	1	2	3	13	3	99.87 %	0.00	0.00	0.20	0.09	0.0275
Assemble Cap and Moisture Valve	1	2	5	10	5	99.84 %	0.00	0.00	0.45	0.00	0.0030
LED Circuit Board Asm, Housing Asm	1	2	3	5	3	99.89 %	0.00	0.00	0.22	0.00	0.1394
Assemble LED Circuit Board Asm	1	6	7	15	7	99.15 %	0.00	0.00	0.88	0.00	0.0116

Housing Asm, Driver Head Lamp Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Housing Asm	\$0.00	\$1.77	\$0.00	\$0.00	\$0.00	\$0.23	\$0.00	\$0.44	\$2.44
Assemble Wiring to Housing	\$0.00	\$8.26	\$0.00	\$0.00	\$0.99	\$0.00	\$0.13	\$2.03	\$11.41
Bevel Gear, Housing Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.02
Snap In Bevel Gear Short Asm, Housing Asm	\$0.04	\$0.02	\$0.00	\$0.00	\$0.10	\$0.01	\$0.01	\$0.03	\$0.21
Snap In Bevel Gear Large Asm, Housing Asm	\$0.04	\$0.03	\$0.00	\$0.00	\$0.10	\$0.01	\$0.01	\$0.03	\$0.22
Assemble Actuator Gear Arm	\$0.01	\$0.00	\$0.00	\$0.00	\$0.40	\$0.00	\$0.07	\$0.09	\$0.57
Head Lamp Moisture Vent Asm, Housing Asm	\$0.09	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.25
Cap Asm, Housing Asm	\$0.02	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.18
Twist Cap Asm, Housing Asm	\$0.00	\$0.12	\$0.00	\$0.00	\$0.13	\$0.03	\$0.02	\$0.06	\$0.35
Assemble Cap and Moisture Valve	\$0.02	\$0.00	\$0.00	\$0.00	\$0.34	\$0.00	\$0.02	\$0.07	\$0.46
LED Circuit Board Asm, Housing Asm	\$0.05	\$3.44	\$0.00	\$0.00	\$0.16	\$0.00	\$0.02	\$0.79	\$4.46
Assemble LED Circuit Board Asm	\$0.42	\$0.00	\$0.00	\$0.00	\$0.66	\$0.00	\$0.13	\$0.16	\$1.37

Housing Asm, Driver Head Lamp Housing Asm



Housing Asm, Driver Head Lamp Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Frontal Light Electronics Asm, Housing Asm	1	2	2	4	2	99.91 %	0.00	0.00	0.17	0.00	0.3218
Assemble Actuator Motor Housed Circuit	1	6	7	18	7	98.90 %	0.00	0.00	1.10	0.00	0.1064
Actuator Arm Long, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0042
Actuator Arm Short, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0035
Assemble Actuator Arms	1	0	4	7	4	99.52 %	0.00	0.00	0.38	0.00	0.0000
Actuator Bracket, Housing Asm	1	8	9	37	9	99.15 %	0.00	0.00	1.42	0.15	0.1200
Assemble Actuator Bracket	1	0	3	4	3	99.74 %	0.00	0.00	0.20	0.00	0.0000
Adaptive Lens Asm, Housing	1	28	22	119	22	96.77 %	0.00	0.00	3.33	3.71	0.4664
Assemble Adaptive Lens Asm	1	4	8	18	8	99.00 %	0.00	0.00	1.17	0.00	0.0064
Interior Trim Asm, Housing	1	7	11	31	11	99.28 %	0.00	0.00	1.02	1.17	0.4803
Assemble Interior Trim	1	2	3	6	3	99.55 %	0.00	0.00	0.35	0.00	0.0040
LED Cover Asm, Housing	1	2	1	5	1	99.91 %	0.00	0.00	0.15	0.05	0.0052

Housing Asm, Driver Head Lamp Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Frontal Light Electronics Asm, Housing Asm	\$0.05	\$33.77	\$0.00	\$0.00	\$0.13	\$0.00	\$0.01	\$7.46	\$41.42
Assemble Actuator Motor Housed Circuit	\$10.05	\$0.00	\$0.00	\$0.00	\$0.83	\$0.00	\$0.17	\$0.48	\$11.52
Actuator Arm Long, Housing Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Actuator Arm Short, Housing Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Actuator Arms	\$0.00	\$0.00	\$0.00	\$0.00	\$0.29	\$0.00	\$0.07	\$0.06	\$0.42
Actuator Bracket, Housing Asm	\$0.03	\$2.91	\$0.00	\$0.00	\$1.06	\$0.06	\$0.13	\$0.89	\$5.08
Assemble Actuator Bracket	\$0.00	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.04	\$0.03	\$0.22
Adaptive Lens Asm, Housing	\$6.97	\$5.33	\$0.00	\$0.00	\$2.42	\$2.50	\$0.49	\$2.46	\$20.17
Assemble Adaptive Lens Asm	\$0.04	\$0.00	\$0.00	\$0.00	\$0.88	\$0.00	\$0.15	\$0.19	\$1.26
Interior Trim Asm, Housing	\$0.02	\$1.81	\$0.00	\$0.00	\$0.76	\$0.48	\$0.11	\$0.67	\$3.86
Assemble Interior Trim	\$0.02	\$0.00	\$0.00	\$0.00	\$0.26	\$0.00	\$0.07	\$0.06	\$0.41
LED Cover Asm, Housing	\$0.00	\$7.90	\$0.00	\$0.00	\$0.11	\$0.03	\$0.01	\$1.77	\$9.82

Housing Asm, Driver Head Lamp Housing Asm



Housing Asm, Driver Head Lamp Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble LED Cover	1	0	1	2	1	99.97 %	0.00	0.00	0.07	0.00	0.0000

Housing Asm, Driver Head Lamp Housing Asm

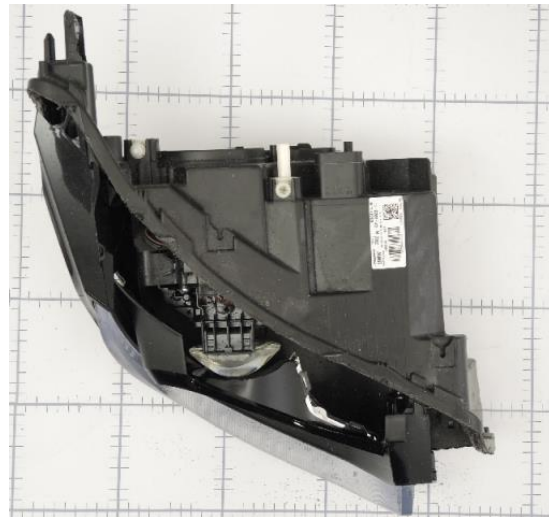
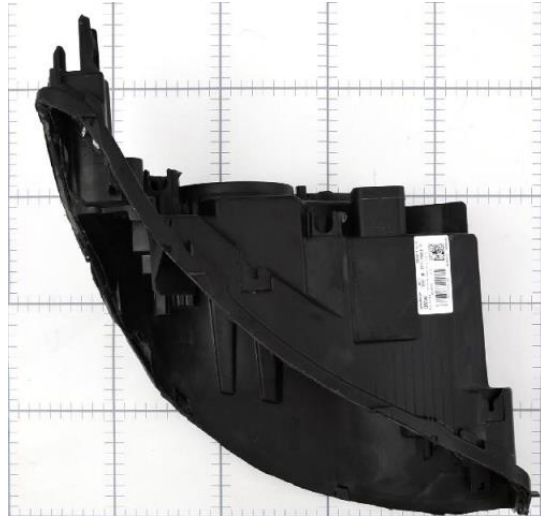
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble LED Cover	\$0.00	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$0.01	\$0.07

Detailed Summary

Parts	86
Fasteners	29
Part Numbers	52
Steps	361
Fastenings	107
Right First Time	89.42%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	13.55
Supplier Fab. Time (Min)	5.70
Total Weight (kg)	2.60
Purchased Part Cost	
	\$17.87
Material Cost	
	\$65.42
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$10.06
Supplier Fab. Cost	
	\$3.38
Q Burden	
	\$1.68
SG&A	
	\$17.89
Manufacturing Cost*	
	\$116.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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\Housing Asm, Driver Head Lamp Housing Asm
 \Housing, Housing Asm
 \Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	22.02
Total Weight (kg)	0.77

Material Cost**	\$1.77
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.00
SG&A	\$0.44
Manufacturing Cost*	\$2.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Housing Asm

Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	22.02	1	0.25	37.36	ESP	\$0.23	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Head Lamp Housing	1	PPTD40	\$2.14	0.7720	0.8280	\$0.00	\$1.77

Assemble Wiring to Housing



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- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Assemble Wiring to Housing

Process Summary

Right First Time	99.15 %
Process Time (Sec)	79.00
Total Weight (kg)	0.11

Material Cost**	\$8.26
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.99
Q Burden	\$0.13
SG&A	\$2.03
Manufacturing Cost*	\$11.41

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Wiring to Housing



Assemble Wiring to Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	79.00	1	1.00	45.01	ESP	\$0.99	99.15%	\$0.13

Assemble Wiring to Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiring, Housing Asm	1	See Appendix	-	0.1075	-	\$0.00	\$8.26

[Click Here for Munro & Associates Wire Harness Report on Housing Asm, Head Lamp Wire Harness](#)

Bevel Gear, Housing Asm



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- \Housing Asm, Driver Head Lamp Housing Asm
- \Bevel Gear, Housing Asm
- \Bevel Gear Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.30
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bevel Gear, Housing Asm



Bevel Gear Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	10.40	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Bevel Gear Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Bevel Gear	1	PBT	\$3.06	0.0014	0.0016	\$0.00	\$0.01

Snap In Bevel Gear Short Asm, Housing Asm



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- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Snap In Bevel Gear Short Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.16
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Snap In Bevel Gear Short Asm, Housing Asm



Snap In Bevel Gear Short Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Short Gear, Snap In Bevel Gear Short Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0066
Assemble Snap In Bevel Gear Short	1	1	1	3	1	99.96 %	0.00	0.00	0.13	0.00	0.0002

Snap In Bevel Gear Short Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Short Gear, Snap In Bevel Gear Short Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Snap In Bevel Gear Short	\$0.04	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.17

Snap In Bevel Gear Short Asm, Housing Asm

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.13
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.01
<hr/>	
Purchased Part Cost	\$0.04
Material Cost	\$0.02
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.10
Supplier Fab. Cost	\$0.01
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Short Gear, Snap In Bevel Gear Short Asm



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- \Snap In Bevel Gear Short Asm, Housing Asm
- \Short Gear, Snap In Bevel Gear Short Asm
- \Snap In Bevel Gear Short Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.61
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Short Gear, Snap In Bevel Gear Short Asm



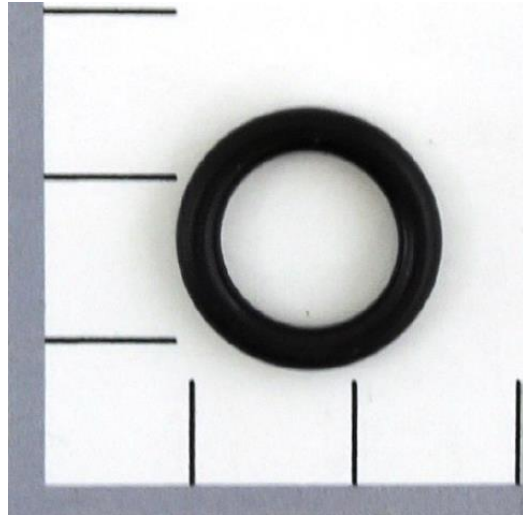
Snap In Bevel Gear Short Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.88	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Snap In Bevel Gear Short Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Snap In Bevel Gear Short	1	PBT GF10	\$3.46	0.0066	0.0071	\$0.00	\$0.02

Assemble Snap In Bevel Gear Short



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- \Housing Asm, Driver Head Lamp Housing Asm
- \Snap In Bevel Gear Short Asm, Housing Asm
- \Assemble Snap In Bevel Gear Short

Process Summary

Right First Time	99.96 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00
Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Snap In Bevel Gear Short



Assemble Snap In Bevel Gear Short

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	45.01	ESP	\$0.10	99.96%	\$0.01

Assemble Snap In Bevel Gear Short

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Snap In Bevel Gear O-ring	1	Commodity Item	Purchased	0.0002	-	\$0.04	\$0.00

Snap In Bevel Gear Large Asm, Housing Asm



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- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Snap In Bevel Gear Large Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.16
Total Weight (kg)	0.01

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Snap In Bevel Gear Large Asm, Housing Asm



Snap In Bevel Gear Large Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Long Gear, Snap In Bevel Gear Long Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0074
Assemble Snap In Bevel Gear Long	1	1	1	3	1	99.96 %	0.00	0.00	0.13	0.00	0.0002

Snap In Bevel Gear Large Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Long Gear, Snap In Bevel Gear Long Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Assemble Snap In Bevel Gear Long	\$0.04	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.17

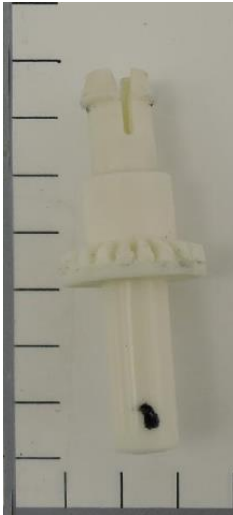
Snap In Bevel Gear Large Asm, Housing Asm

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.13
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.04
Material Cost	
	\$0.03
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.10
Supplier Fab. Cost	
	\$0.01
Q Burden	
	\$0.01
SG&A	
	\$0.03
Manufacturing Cost*	
	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...

- \Snap In Bevel Gear Large Asm, Housing Asm
- \Long Gear, Snap In Bevel Gear Long Asm
- \Snap In Bevel Gear Long Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.62
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Long Gear, Snap In Bevel Gear Long Asm



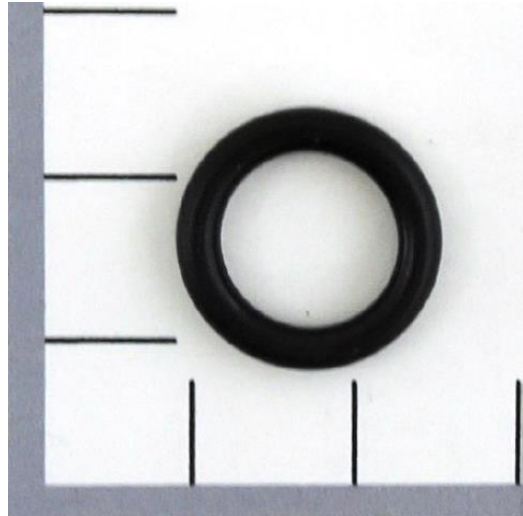
Snap In Bevel Gear Long Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	12.96	8	0.25	24.56	ESP	\$0.01	99.99%	\$0.00

Snap In Bevel Gear Long Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Long Gear	1	PBT GF30	\$3.18	0.0074	0.0080	\$0.00	\$0.03

Assemble Snap In Bevel Gear Long



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Snap In Bevel Gear Large Asm, Housing Asm
- \Assemble Snap In Bevel Gear Long

Process Summary

Right First Time	99.96 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Snap In Bevel Gear Long



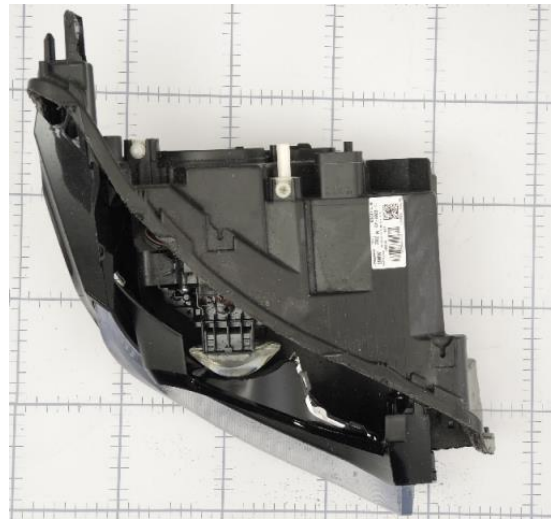
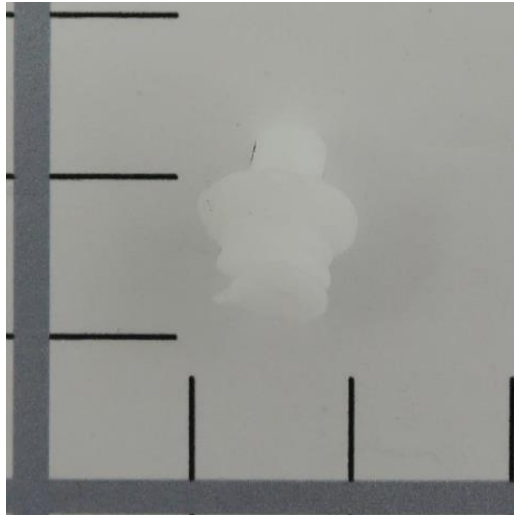
Assemble Snap In Bevel Gear Long

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	45.01	ESP	\$0.10	99.96%	\$0.01

Assemble Snap In Bevel Gear Long

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Snap In Bevel Gear O-ring	1	Commodity Item	Purchased	0.0002	-	\$0.04	\$0.00

Assemble Actuator Gear Arm



\...

\Driver Head Lamp Housing Asm, Driver Head Lamp
 \Housing Asm, Driver Head Lamp Housing Asm
 \Assemble Actuator Gear Arm

Process Summary

Right First Time	99.52 %
Process Time (Sec)	32.00
Total Weight (kg)	0.00
Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.40
Q Burden	\$0.07
SG&A	\$0.09
Manufacturing Cost*	\$0.57

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

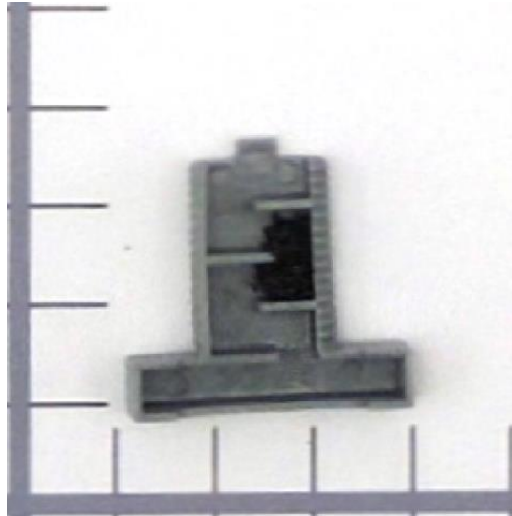
Assemble Actuator Gear Arm



Assemble Actuator Gear Arm									
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden	
Supplier Manual Asm	32.00	1	1.00	45.01	ESP	\$0.40	99.52 %	\$0.07	

Assemble Actuator Gear Arm									
Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost		
Bevel Gear Cap, Housing Asm	1	Commodity Item	Purchased	0.0003	-	\$0.01	\$0.00		

Head Lamp Moisture Vent Asm, Housing Asm



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\Driver Head Lamp Housing Asm, Driver Head Lamp Housing Asm, Driver Head Lamp Housing Asm
 \Head Lamp Moisture Vent Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.17
Total Weight (kg)	0.00

Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Head Lamp Moisture Vent Asm, Housing Asm



Head Lamp Moisture Vent Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Moisture Vent	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0012

Head Lamp Moisture Vent Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Moisture Vent	\$0.09	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.25

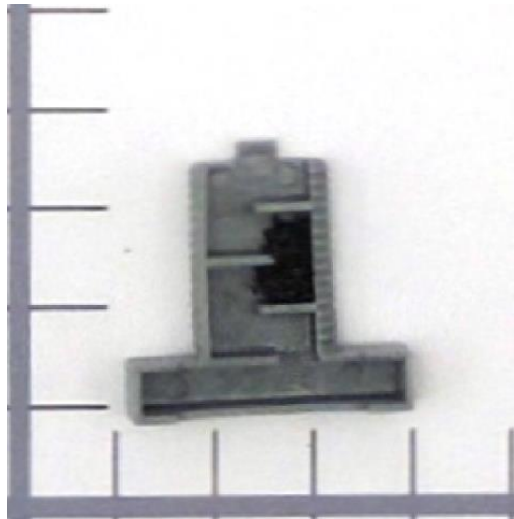
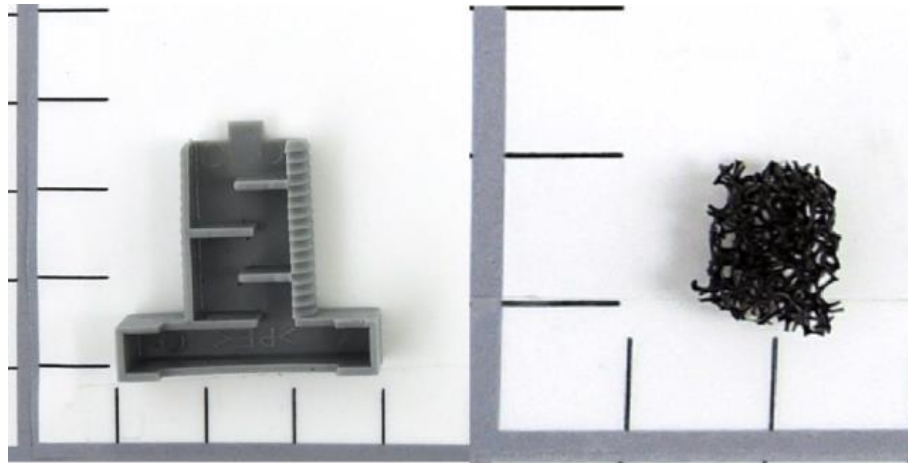
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.00
Purchased Part Cost	\$0.09
Material Cost	\$0.00
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.13
Supplier Fab. Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Moisture Vent



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Head Lamp Moisture Vent Asm, Housing Asm
- \Assemble Moisture Vent

Process Summary

Right First Time	99.97 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Moisture Vent



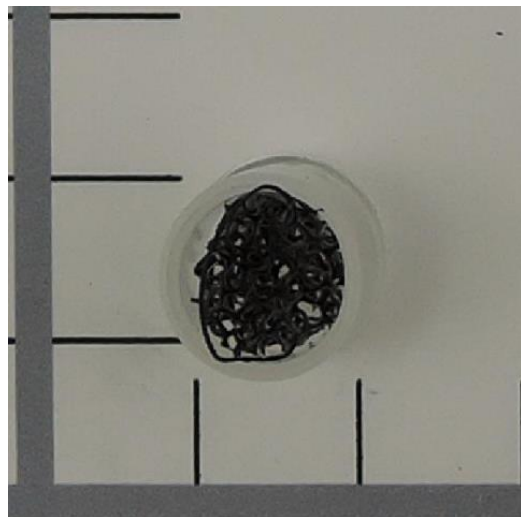
Assemble Moisture Vent

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.97%	\$0.00

Assemble Moisture Vent

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Moisture Vent Head Lamp, Moisture Vent Head Lamp	1	Commodity Item	Purchased	0.0011	-	\$0.08	\$0.00
Low Density Foam	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Cap Asm, Housing Asm



\...

- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Cap Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.17
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap Asm, Housing Asm



Cap Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Cap Head Lamp	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0005

Cap Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Cap Head Lamp	\$0.02	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.18

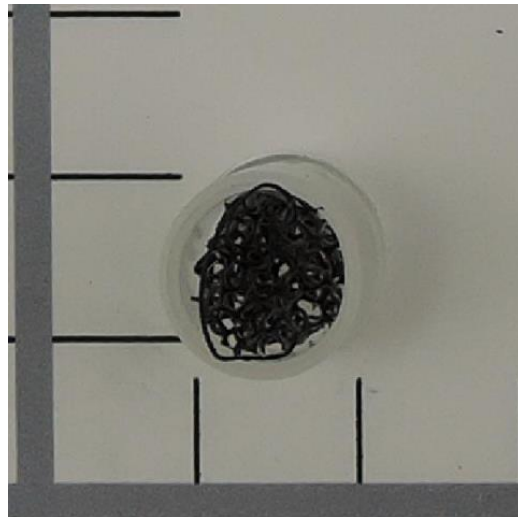
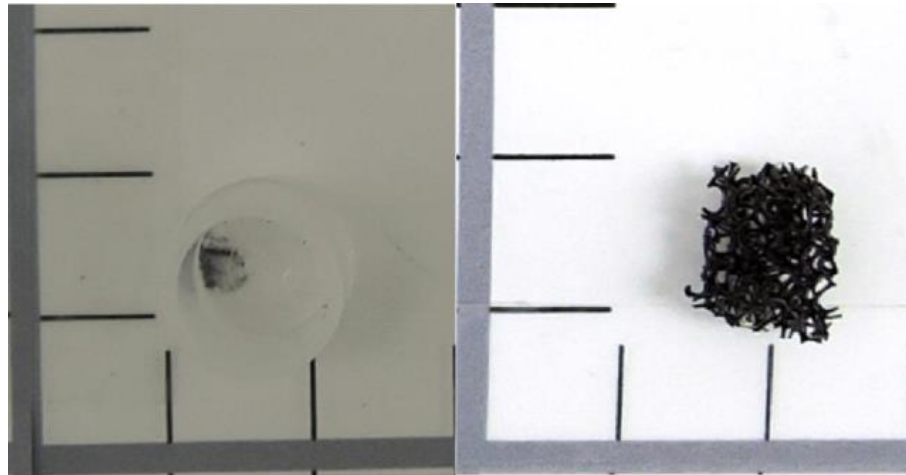
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.00
Purchased Part Cost	
	\$0.02
Material Cost	
	\$0.00
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.13
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.00
SG&A	
	\$0.03
Manufacturing Cost*	
	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cap Head Lamp



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Cap Asm, Housing Asm
- \Assemble Cap Head Lamp

Process Summary

Right First Time	99.97 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cap Head Lamp



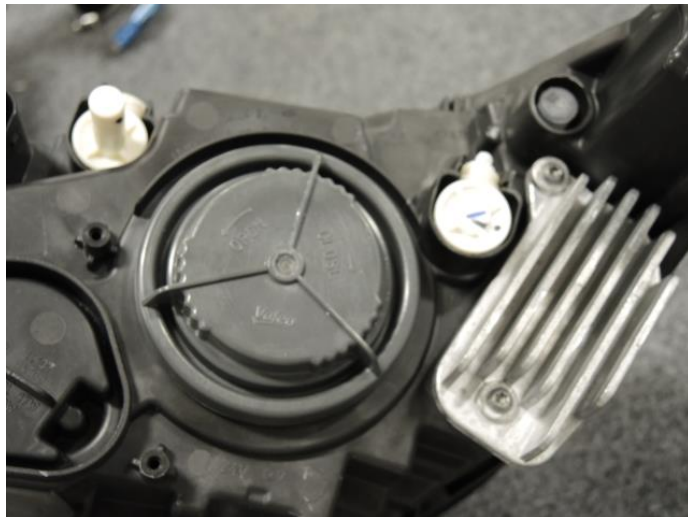
Assemble Cap Head Lamp

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.97%	\$0.00

Assemble Cap Head Lamp

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Cap, Cap Asm	1	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00
Low Density Foam	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Twist Cap Asm, Housing Asm



\...
 \Driver Head Lamp Housing Asm, Driver Head Lamp
 \Housing Asm, Driver Head Lamp Housing Asm
 \Twist Cap Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	13
Fastenings	3
Right First Time	99.87 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.29
Total Weight (kg)	0.03

Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.06
Manufacturing Cost*	\$0.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Twist Cap Asm, Housing Asm



Twist Cap Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Twist Cap, Twist Cap Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0241
Foam Insert, TwistCap Asm	1	1	2	7	2	99.94 %	0.00	0.00	0.07	0.04	0.0034
Assemble Twist Cap	1	0	1	3	1	99.94 %	0.00	0.00	0.13	0.00	0.0000

Twist Cap Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Twist Cap, Twist Cap Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.03	\$0.16
Foam Insert, TwistCap Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03	\$0.01	\$0.01	\$0.01	\$0.07
Assemble Twist Cap	\$0.00	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.13

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	13
Fastenings	3
Right First Time	99.87%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.20
Supplier Fab. Time (Min)	0.09
Total Weight (kg)	0.03
Purchased Part Cost	\$0.00
Material Cost	\$0.12
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.13
Supplier Fab. Cost	\$0.03
Q Burden	\$0.02
SG&A	\$0.06
Manufacturing Cost*	\$0.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Twist Cap, Twist Cap Asm



\...

- \Twist Cap Asm, Housing Asm
- \Twist Cap, Twist Cap Asm
- \Twist Cap Head Lamp Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.69
Total Weight (kg)	0.02

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.16



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Twist Cap, Twist Cap Asm



Twist Cap Head Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	10.76	4	0.25	21.64	ESP	\$0.02	99.99%	\$0.00

Twist Cap Head Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Twist Cap	1	PBT+ASA GF20	\$4.17	0.0241	0.0259	\$0.00	\$0.11

Foam Insert, Twist Cap Asm



\...

- \Twist Cap Asm, Housing Asm
- \Foam Insert, Twist Cap Asm
- \Foam Insert Process

Process Summary

Right First Time	99.94 %
Process Time (Sec)	6.62
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.07



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Foam Insert, Twist Cap Asm



Foam Insert Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	4.02	1	0.25	23.36	ESP	\$0.03	99.96%	\$0.01
25 Ton Trim Press	2.60	1	0.25	16.83	ESP	\$0.01	99.99%	\$0.00

Foam Insert Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Medium Density Foam, Foam Insert Twist Cap	1	Medium Density Foam	By Area	0.0034	-	\$0.00	\$0.01

No Commodity Items Required for This Process



\...

\Housing Asm, Driver Head Lamp Housing Asm
\Twist Cap Asm, Housing Asm
\Assemble Twist Cap

Process Summary

Right First Time	99.94 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Twist Cap



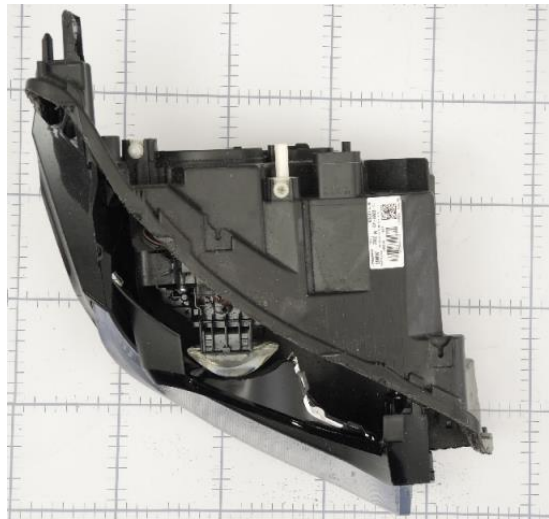
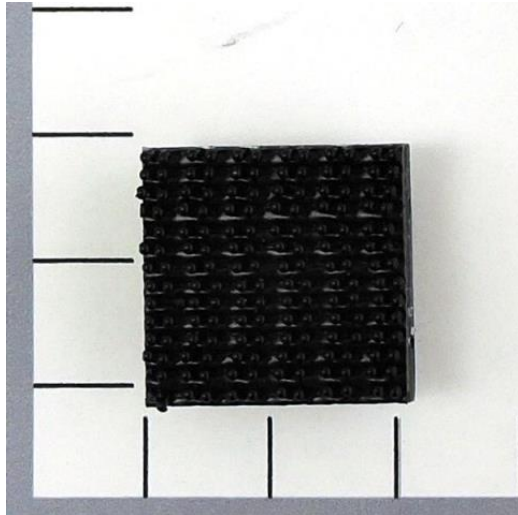
Assemble Twist Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	45.01	ESP	\$0.10	99.94%	\$0.01

Assemble Twist Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Cap and Moisture Valve



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\Driver Head Lamp Housing Asm, Driver Head Lamp
Housing Asm, Driver Head Lamp Housing Asm
Assemble Cap and Moisture Valve

Process Summary

Right First Time	99.84 %
Process Time (Sec)	27.00
Total Weight (kg)	0.00
Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.34
Q Burden	\$0.02
SG&A	\$0.07
Manufacturing Cost*	\$0.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cap and Moisture Valve



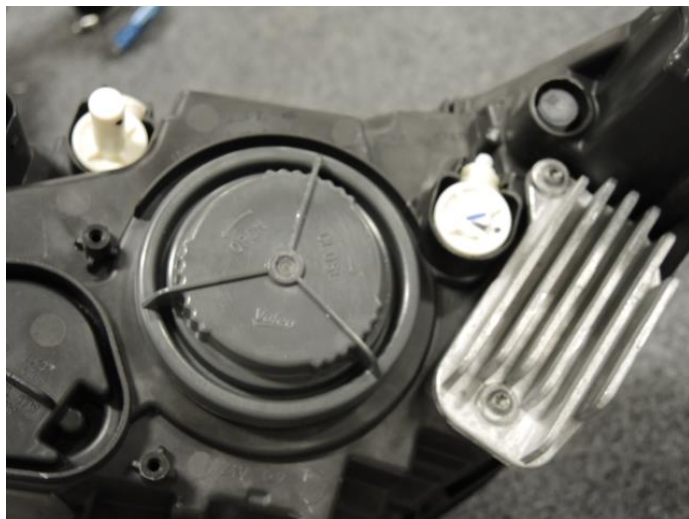
Assemble Cap and Moisture Valve

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	27.00	1	1.00	45.01	ESP	\$0.34	99.84 %	\$0.02

Assemble Cap and Moisture Valve

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Beauty Cover Velcro	2	Commodity Item	Purchased	0.0015	-	\$0.01	\$0.00

LED Circuit Board Asm, Housing Asm



\...

- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \LED Circuit Board Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	3
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.22
Total Weight (kg)	0.14

Material Cost**	\$3.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.79
Manufacturing Cost*	\$4.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Circuit Board Asm, Housing Asm



LED Circuit Board Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble LED CircuitBoard	1	2	3	5	3	99.89%	0.00	0.00	0.22	0.00	0.1394

LED Circuit Board Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble LED CircuitBoard	\$0.05	\$3.44	\$0.00	\$0.00	\$0.16	\$0.00	\$0.02	\$0.79	\$4.46

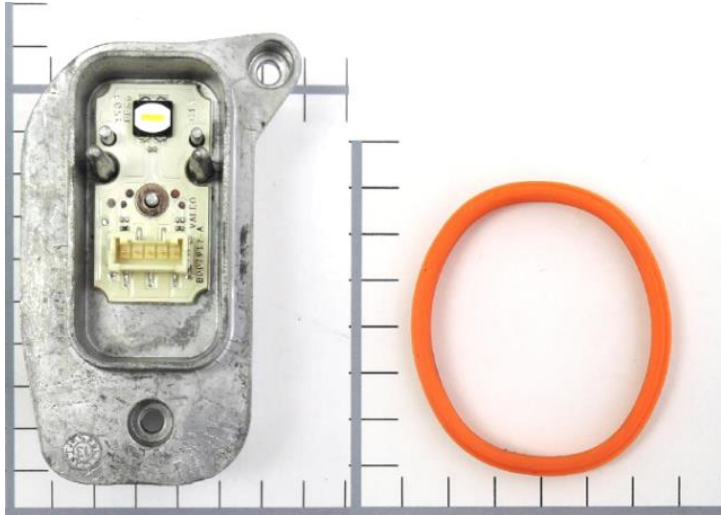
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	3
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.22
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.14
<hr/>	
Purchased Part Cost	\$0.05
Material Cost	\$3.44
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.16
Supplier Fab. Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.79
Manufacturing Cost*	\$4.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit Board



- \...
- \Housing Asm, Driver Head Lamp Housing Asm
- \LED Circuit Board Asm, Housing Asm
- \Assemble LED Circuit Board

Process Summary

Right First Time	99.89 %
Process Time (Sec)	13.00
Total Weight (kg)	0.14

Material Cost**	\$3.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.79
Manufacturing Cost*	\$4.46



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit Board



Assemble LED Circuit Board

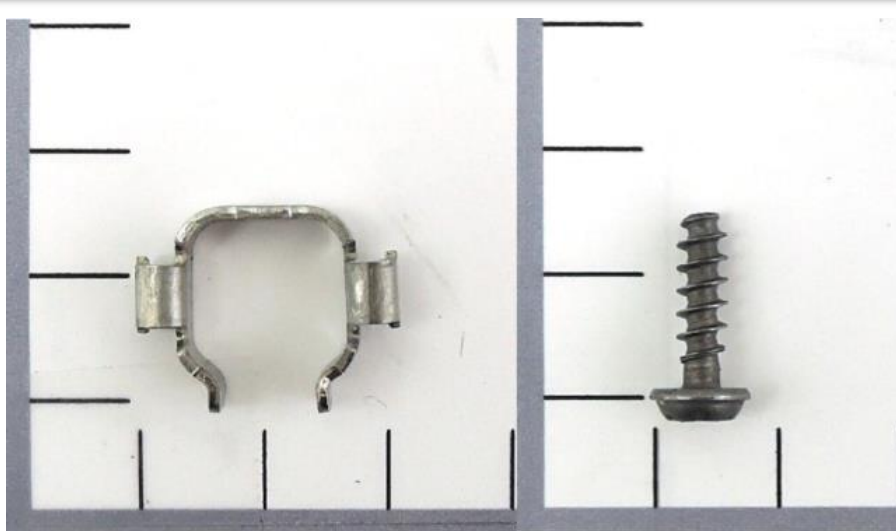
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	13.00	1	1.00	45.01	ESP	\$0.16	99.89%	\$0.02

Assemble LED Circuit Board

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Daytime Running Lamp ASM, Driver Side	1	See Appendix	-	0.1360	-	\$0.00	\$3.44
LED Circuit Board Seal, LED Circuit Board Asm	1	Commodity Item	Purchased	0.0034	-	\$0.05	\$0.00

[Click Here for TechInsights Electronics Report on Daytime Running Lamp Asm](#)

Assemble LED Circuit Board Asm



\...

- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Assemble LED Circuit Board Asm

Process Summary

Right First Time	99.15 %
Process Time (Sec)	53.00
Total Weight (kg)	0.01

Material Cost**	\$0.42
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.66
Q Burden	\$0.13
SG&A	\$0.16
Manufacturing Cost*	\$1.37



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit Board Asm



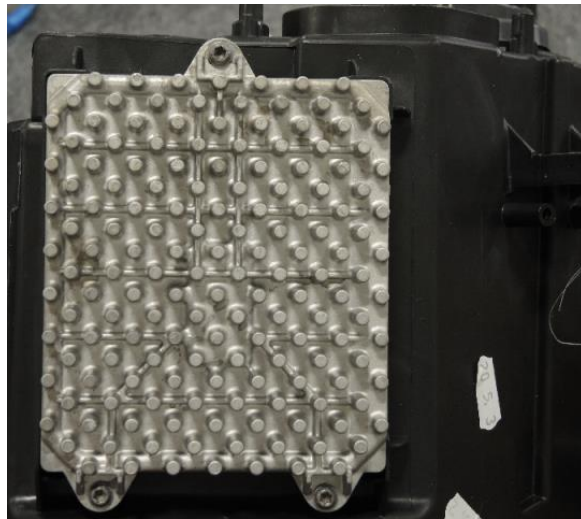
Assemble LED Circuit Board Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	53.00	1	1.00	45.01	ESP	\$0.66	99.15%	\$0.13

Assemble LED Circuit Board Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x12mm-Pan Head Torx	2	Commodity Item	Purchased	0.0012	-	\$0.01	\$0.00
Compression Sleeve, Housing Asm	4	Commodity Item	Purchased	0.0023	-	\$0.10	\$0.00

Frontal Light Electronics Asm, Housing Asm



\...
 \Driver Head Lamp Housing Asm, Driver Head Lamp
 \Housing Asm, Driver Head Lamp Housing Asm
 \Frontal Light Electronics Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	4
Fastenings	2
Right First Time	99.91 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.17
Total Weight (kg)	0.32

Material Cost**	\$33.82
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.01
SG&A	\$7.46
Manufacturing Cost*	\$41.42

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Frontal Light Electronics Asm, Housing Asm



Frontal Light Electronics Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Housed Circuit	1	2	2	4	2	99.91 %	0.00	0.00	0.17	0.00	0.3218

Frontal Light Electronics Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Housed Circuit	\$0.05	\$33.77	\$0.00	\$0.00	\$0.13	\$0.00	\$0.01	\$7.46	\$41.42

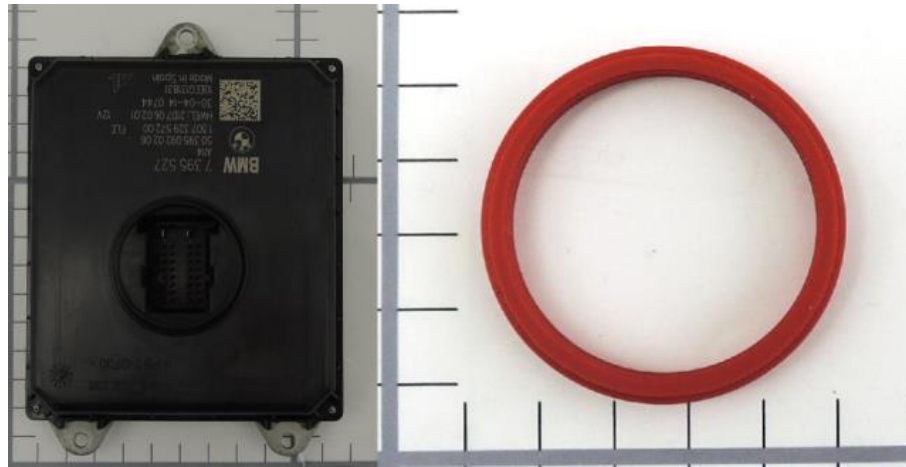
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	4
Fastenings	2
Right First Time	99.91%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.32
Purchased Part Cost	\$0.05
Material Cost	\$33.77
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.13
Supplier Fab. Cost	\$0.00
Q Burden	\$0.01
SG&A	\$7.46
Manufacturing Cost*	\$41.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housed Circuit



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Frontal Light Electronics Asm, Housing Asm
- \Assemble Housed Circuit

Process Summary

Right First Time	99.91 %
Process Time (Sec)	10.00
Total Weight (kg)	0.32

Material Cost**	\$33.82
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.01
SG&A	\$7.46
Manufacturing Cost*	\$41.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housed Circuit



Assemble Housed Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.91 %	\$0.01

Assemble Housed Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Headlamp Actuator Motor, Driver Side	1	See Appendix	-	0.3188	-	\$0.00	\$33.77
Actuator Motor Housed Circuit Seal	1	Commodity Item	Purchased	0.0030	-	\$0.05	\$0.00

[Click Here for TechInsights Electronics Report on Headlamp Actuator Motor Controller](#)

Assemble Actuator Motor Housed Circuit

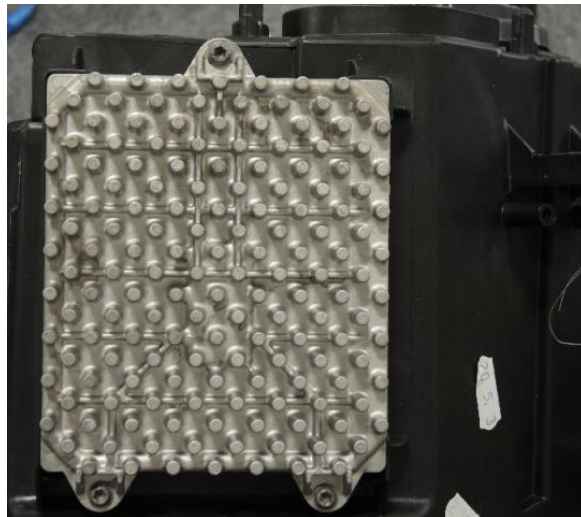


\...
 \Driver Head Lamp Housing Asm, Driver Head Lamp
 \Housing Asm, Driver Head Lamp Housing Asm
 \Assemble Actuator Motor Housed Circuit

Process Summary

Right First Time	98.90 %
Process Time (Sec)	66.00
Total Weight (kg)	0.11

Material Cost**	\$10.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.83
Q Burden	\$0.17
SG&A	\$0.48
Manufacturing Cost*	\$11.52



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Motor Housed Circuit



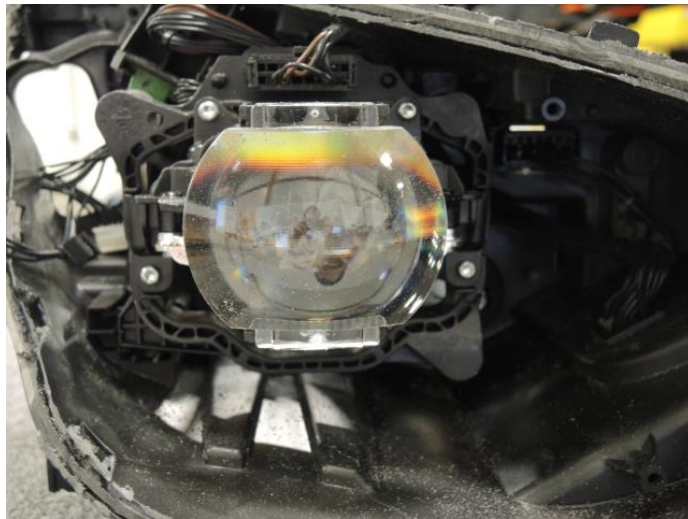
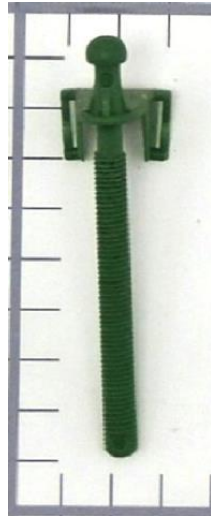
Assemble Actuator Motor Housed Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	66.00	1	1.00	45.01	ESP	\$0.83	98.90%	\$0.17

Assemble Actuator Motor Housed Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x12mm-Pan Head Torx	3	Commodity Item	Purchased	0.0012	-	\$0.01	\$0.00
Actuator Motor, Housing Asm	1	Commodity Item	Purchased	0.0988	-	\$10.00	\$0.00
M4x20mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00

Actuator Arm Long, Housing Asm



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Actuator Arm Long, Housing Asm
- \Actuator Arm Long Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.04
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Long, Housing Asm



Actuator Arm Long Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.32	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Arm Long Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm Long	1	PA66 GF30	\$3.95	0.0042	0.0045	\$0.00	\$0.02

Actuator Arm Short, Housing Asm



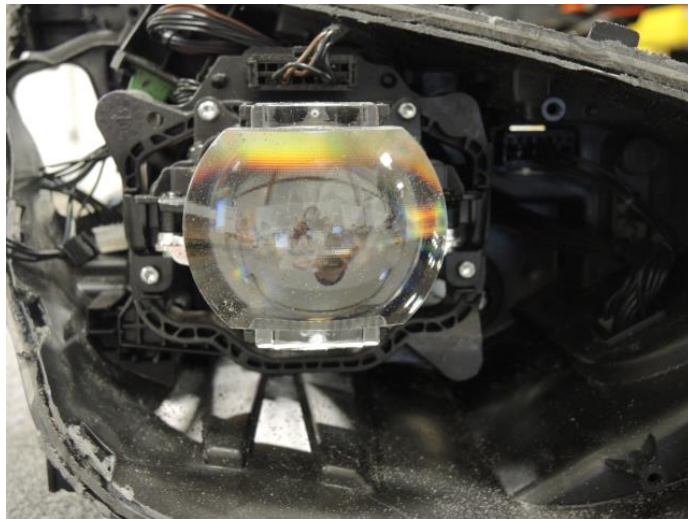
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- \Housing Asm, Driver Head Lamp Housing Asm
- \Actuator Arm Short, Housing Asm
- \Actuator Arm Short Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.04
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Short, Housing Asm



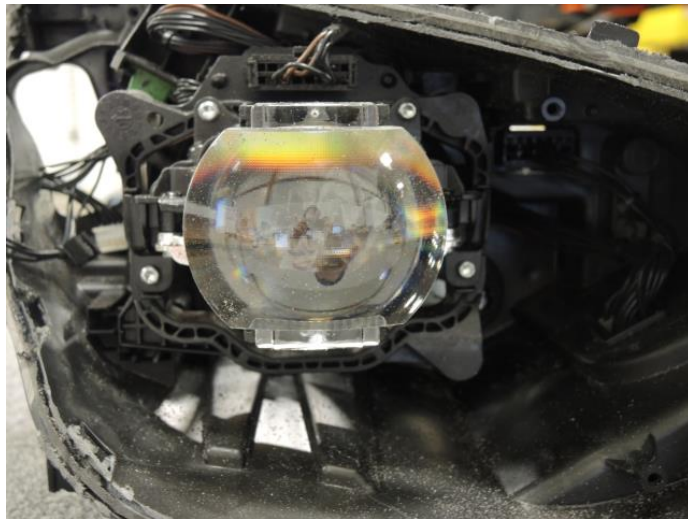
Actuator Arm Short Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.32	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Arm Short Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm Short	1	PA66 GF30	\$3.95	0.0035	0.0038	\$0.00	\$0.02

No Commodity Items Required for This Process



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\Driver Head Lamp Housing Asm, Driver Head Lamp
Housing Asm, Driver Head Lamp Housing Asm
Assemble Actuator Arms

Process Summary

Right First Time	99.52 %
Process Time (Sec)	23.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.29
Q Burden	\$0.07
SG&A	\$0.06
Manufacturing Cost*	\$0.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Arms



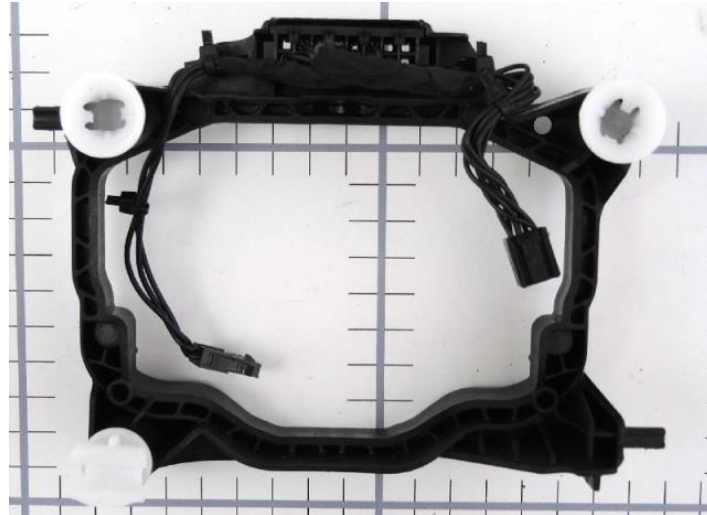
Assemble Actuator Arms

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	23.00	1	1.00	45.01	ESP	\$0.29	99.52 %	\$0.07

Assemble Actuator Arms

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Actuator Bracket, Housing Asm



\...

- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Actuator Bracket, Housing Asm

Assembly Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	37
Fastenings	9
Right First Time	99.15 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.56
Total Weight (kg)	0.12

Material Cost**	\$2.94
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.12
Q Burden	\$0.13
SG&A	\$0.89
Manufacturing Cost*	\$5.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Bracket, Housing Asm



Actuator Bracket, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Bracket Asm, Actuator Bracket	1	7	6	29	6	99.32 %	0.00	0.00	0.98	0.15	0.1021
Assemble Bracket Wiring	1	1	3	7	3	99.83 %	0.00	0.00	0.43	0.00	0.0179

Actuator Bracket, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Bracket Asm, Actuator Bracket	\$0.03	\$0.35	\$0.00	\$0.00	\$0.74	\$0.06	\$0.10	\$0.25	\$1.53
Assemble Bracket Wiring	\$0.00	\$2.56	\$0.00	\$0.00	\$0.33	\$0.00	\$0.03	\$0.63	\$3.55

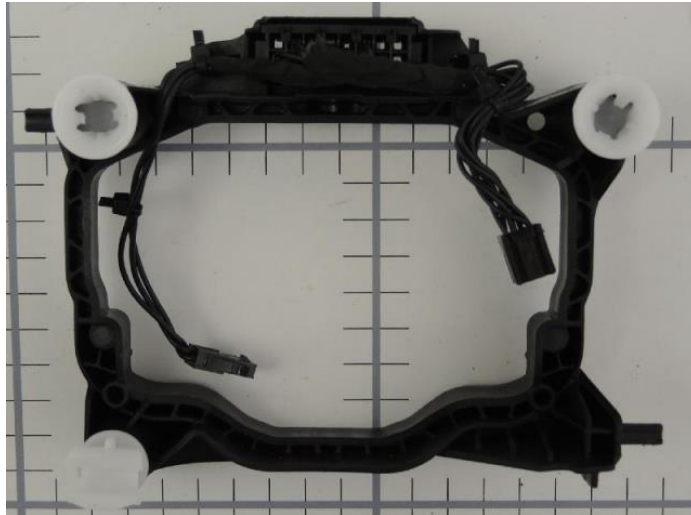
Detailed Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	37
Fastenings	9
Right First Time	99.15%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.42
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.12
<hr/>	
Purchased Part Cost	\$0.03
Material Cost	\$2.91
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$1.06
Supplier Fab. Cost	\$0.06
Q Burden	\$0.13
SG&A	\$0.89
Manufacturing Cost*	\$5.08

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket Asm, Actuator Bracket



\...

\Housing Asm, Driver Head Lamp Housing Asm

\Actuator Bracket, Housing Asm

\Bracket Asm, Actuator Bracket

Assembly Summary

Parts	7
Fasteners	0
Part Numbers	4
Steps	29
Fastenings	6
Right First Time	99.32 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.13
Total Weight (kg)	0.10

Material Cost**	\$0.38
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.80
Q Burden	\$0.10
SG&A	\$0.25
Manufacturing Cost*	\$1.53

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket Asm, Actuator Bracket



Bracket Asm, Actuator Bracket

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Bracket, Bracket Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.10	0.0945
Ball Stud UBracket, Bracket Asm	1	2	1	5	1	99.89 %	0.00	0.00	0.15	0.03	0.0032
Cap, Bracket Asm	2	2	1	6	1	99.88 %	0.00	0.00	0.22	0.01	0.0022
Assemble U Bracket and Actuator Arm Cap	1	0	3	7	3	99.68 %	0.00	0.00	0.40	0.00	0.0000

Bracket Asm, Actuator Bracket

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Bracket, Bracket Asm	\$0.00	\$0.32	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.08	\$0.44
Ball Stud UBracket, Bracket Asm	\$0.01	\$0.01	\$0.00	\$0.00	\$0.11	\$0.01	\$0.02	\$0.03	\$0.19
Cap, Bracket Asm	\$0.01	\$0.01	\$0.00	\$0.00	\$0.16	\$0.00	\$0.02	\$0.04	\$0.24
Assemble U Bracket and Actuator Arm Cap	\$0.00	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.05	\$0.07	\$0.41

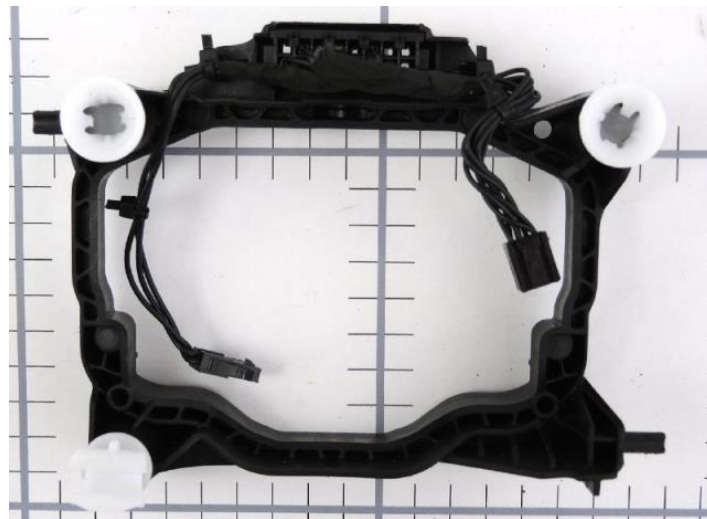
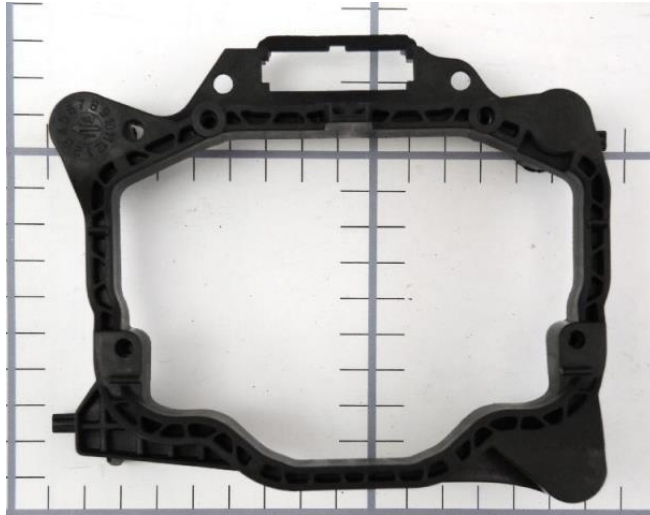
Detailed Summary

Parts	7
Fasteners	0
Part Numbers	4
Steps	29
Fastenings	6
Right First Time	99.32%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.98
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.10
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Purchased Part Cost	\$0.03
Material Cost	\$0.35
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.74
Supplier Fab. Cost	\$0.06
Q Burden	\$0.10
SG&A	\$0.25
Manufacturing Cost*	\$1.53

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket, Bracket Asm



\...

\Bracket Asm, Actuator Bracket

\Bracket, Bracket Asm

\Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.86
Total Weight (kg)	0.09

Material Cost**	\$0.32
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket, Bracket Asm

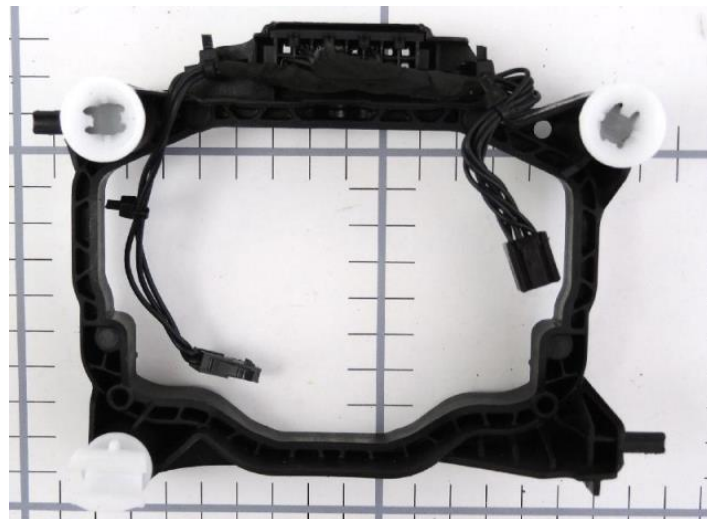
Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	11.72	2	0.25	24.56	ESP	\$0.04	99.99%	\$0.00

Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Bracket	1	PBT GF30	\$3.18	0.0945	0.1016	\$0.00	\$0.32

Ball Stud U Bracket, Bracket Asm



- \...
- \Actuator Bracket, Housing Asm
- \Bracket Asm, Actuator Bracket
- \Ball Stud U Bracket, Bracket Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.18
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Ball Stud U Bracket, Bracket Asm



Ball Stud U Bracket, Bracket Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
U Bracket, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0031
Assemble Ball Stud U Bracket	1	1	1	3	1	99.90 %	0.00	0.00	0.15	0.00	0.0001

Ball Stud U Bracket, Bracket Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
U Bracket, Housing Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Ball Stud U Bracket	\$0.01	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.02	\$0.03	\$0.16

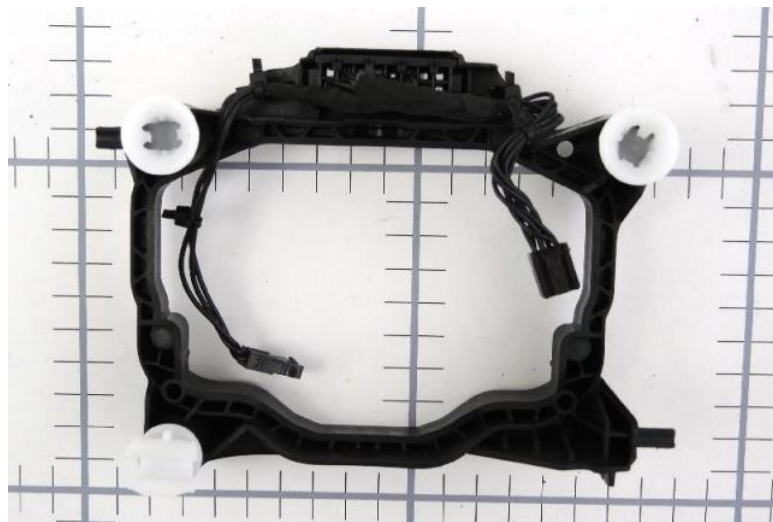
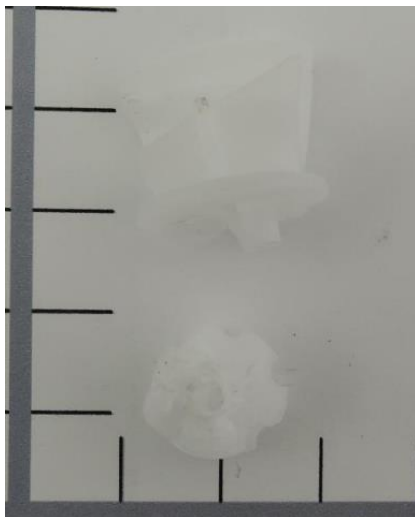
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.15
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.00
Purchased Part Cost	\$0.01
Material Cost	\$0.01
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.11
Supplier Fab. Cost	\$0.01
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

U Bracket, Housing Asm



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- \Ball Stud U Bracket, Bracket Asm
- \U Bracket, Housing Asm
- \U Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.57
Total Weight (kg)	0.00
Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

U Bracket, Housing Asm



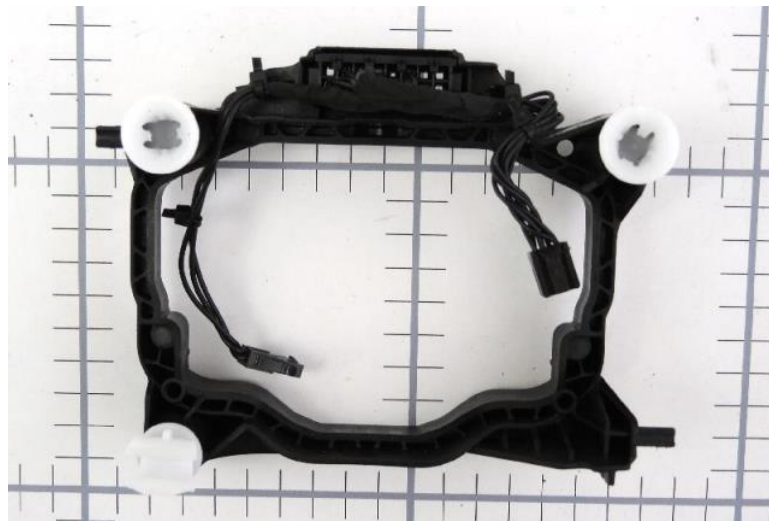
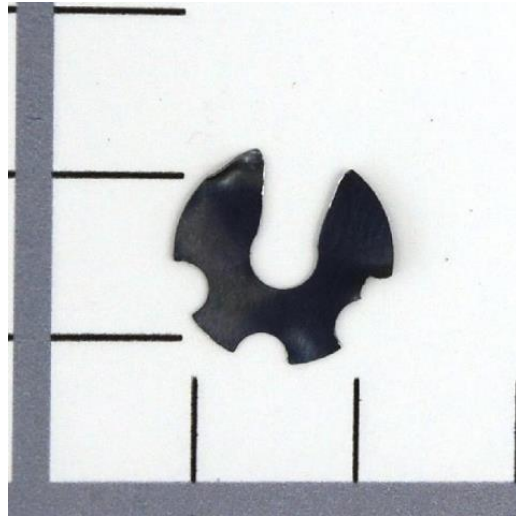
U Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.56	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

U Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, U Bracket	1	PBT	\$3.06	0.0031	0.0033	\$0.00	\$0.01

Assemble Ball Stud U Bracket



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- \Bracket Asm, Actuator Bracket
- \Ball Stud U Bracket, Bracket Asm
- \Assemble Ball Stud U Bracket

Process Summary

Right First Time	99.90 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Ball Stud U Bracket



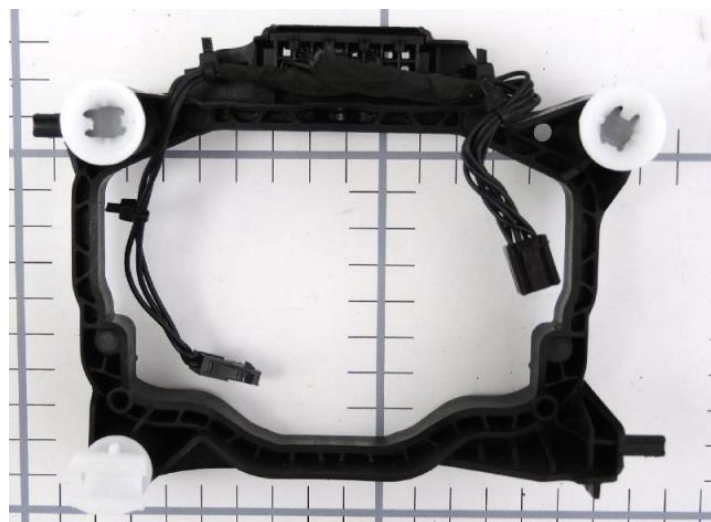
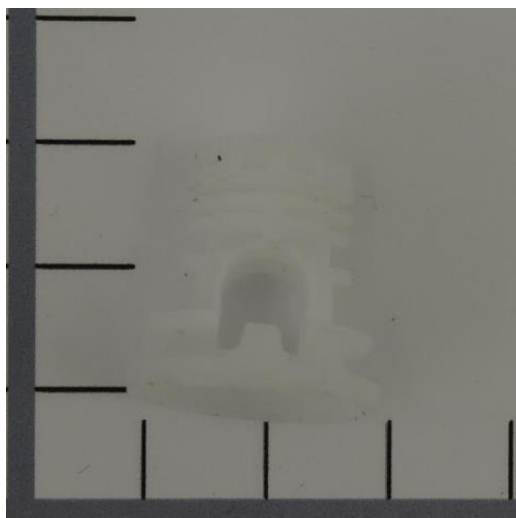
Assemble Ball Stud U Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.90%	\$0.02

Assemble Ball Stud U Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Fog Lamp, Actuator Cap, Snap Ring	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Cap, Bracket Asm



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\Actuator Bracket, Housing Asm

\Bracket Asm, Actuator Bracket

\Cap, Bracket Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	6
Fastenings	1
Right First Time	99.88 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.23
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.17
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Bracket Asm



Cap, Bracket Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cap, Bracket Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0021
Assemble Fog Lamp Actuator Arm Cap Asm	1	1	1	4	1	99.89 %	0.00	0.00	0.22	0.00	0.0001

Cap, Bracket Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cap, Bracket Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Fog Lamp Actuator Arm Cap Asm	\$0.01	\$0.00	\$0.00	\$0.00	\$0.16	\$0.00	\$0.02	\$0.04	\$0.22

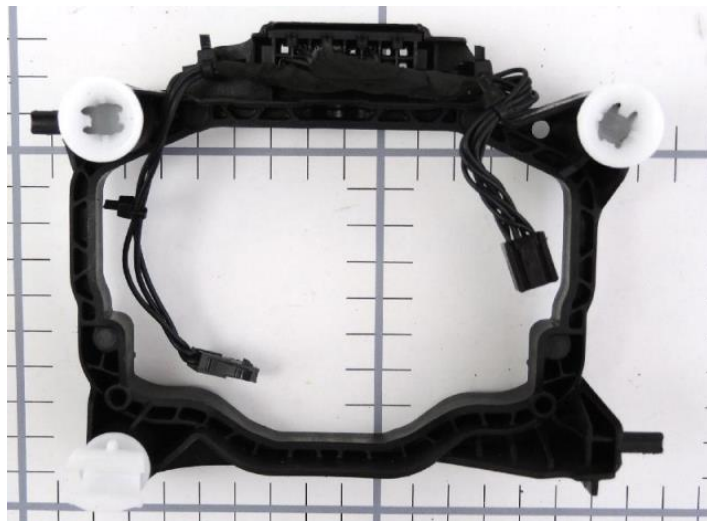
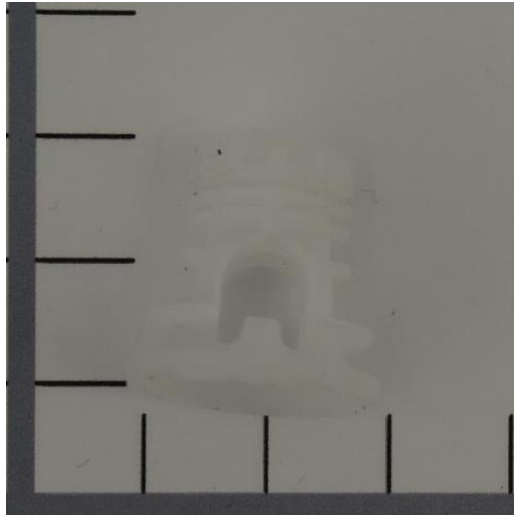
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	6
Fastenings	1
Right First Time	99.88%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.22
Supplier Fab. Time (Min)	0.01
Total Weight (kg)	0.00
Purchased Part Cost	\$0.01
Material Cost	\$0.01
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.16
Supplier Fab. Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Bracket Asm



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- \Cap, Bracket Asm
- \Cap, Bracket Asm
- \Cap, Actuator Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.73
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Bracket Asm

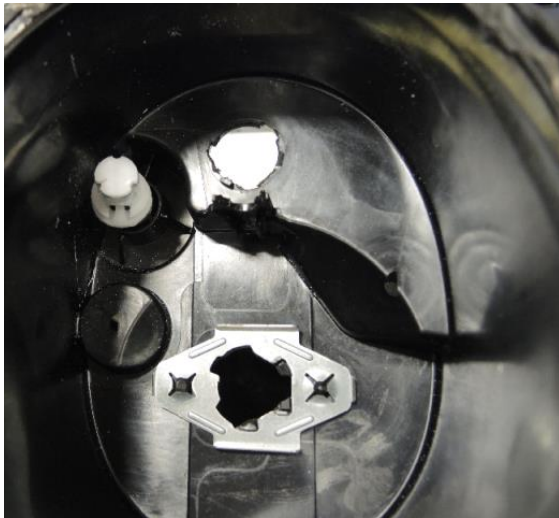
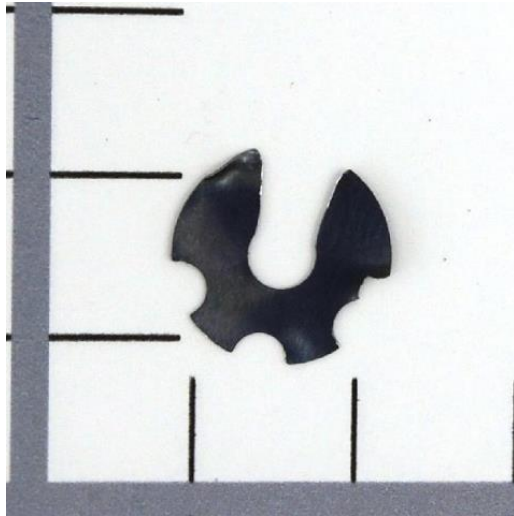
Cap, Actuator Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	5.84	8	0.25	21.64	ESP	\$0.00	99.99%	\$0.00

Cap, Actuator Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Cap Actuator Arm	1	PBT	\$3.06	0.0021	0.0023	\$0.00	\$0.01

Assemble Fog Lamp Actuator Arm Cap Asm



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\Bracket Asm, Actuator Bracket

\Cap, Bracket Asm

\Assemble Fog Lamp Actuator Arm Cap Asm

Process Summary

Right First Time	99.89 %
Process Time (Sec)	13.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm Cap Asm



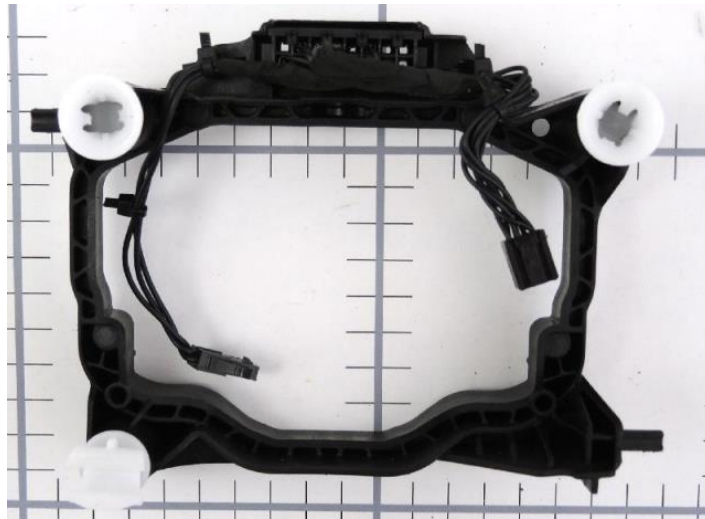
Assemble Fog Lamp Actuator Arm Cap Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	13.00	1	1.00	45.01	ESP	\$0.16	99.89%	\$0.02

Assemble Fog Lamp Actuator Arm Cap Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
■ Snap Ring, Actuator Arm Cap	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

No Commodity Items Required for This Process



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- \Actuator Bracket, Housing Asm
- \Bracket Asm, Actuator Bracket
- \Assemble U Bracket and Actuator Arm Cap

Process Summary

Right First Time	99.68 %
Process Time (Sec)	24.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.05
SG&A	\$0.07
Manufacturing Cost*	\$0.41

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble U Bracket and Actuator Arm Cap



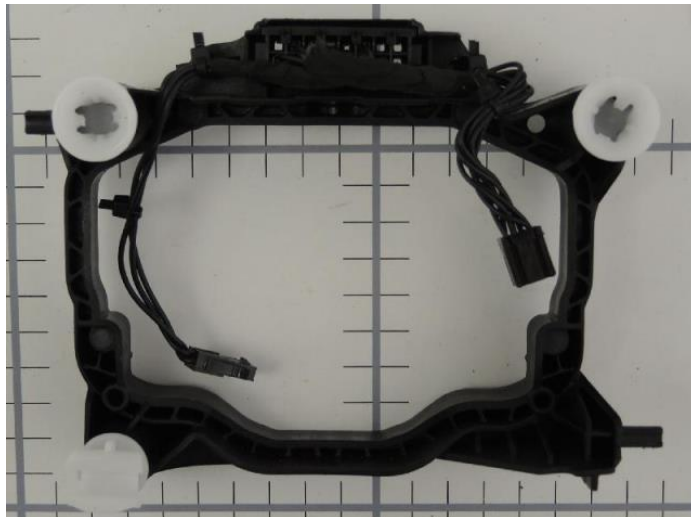
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Assemble U Bracket and Actuator Arm Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	24.00	1	1.00	45.01	ESP	\$0.30	99.68 %	\$0.05

Assemble U Bracket and Actuator Arm Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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- \Housing Asm, Driver Head Lamp Housing Asm
- \Actuator Bracket, Housing Asm
- \Assemble Bracket Wiring

Process Summary

Right First Time	99.83 %
Process Time (Sec)	26.00
Total Weight (kg)	0.02
Material Cost**	\$2.56
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.33
Q Burden	\$0.03
SG&A	\$0.63
Manufacturing Cost*	\$3.55

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Bracket Wiring



Assemble Bracket Wiring									
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden	
Supplier Manual Asm	26.00	1	1.00	45.01	ESP	\$0.33	99.83%	\$0.03	

Assemble Bracket Wiring								
Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost	
Wiring, Actuator Bracket Asm	1	See Appendix	-	0.0179	-	\$0.00	\$2.56	

[Click Here for Munro & Associates Wire Harness Report on Wiring, Actuator Bracket Asm](#)

No Commodity Items Required for This Process



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\Driver Head Lamp Housing Asm, Driver Head Lamp
Housing Asm, Driver Head Lamp Housing Asm
Assemble Actuator Bracket

Process Summary

Right First Time	99.74 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.04
SG&A	\$0.03
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Bracket



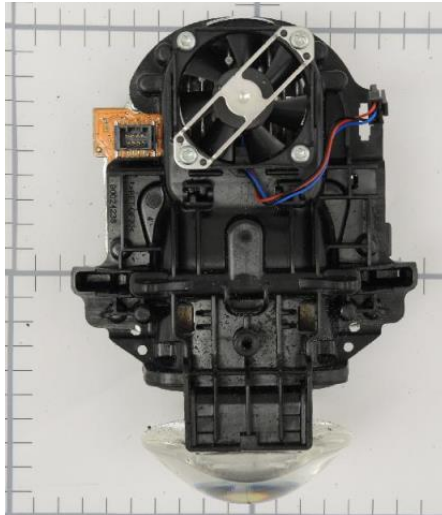
Assemble Actuator Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	12.00	1	1.00	45.01	ESP	\$0.15	99.74 %	\$0.04

Assemble Actuator Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Adaptive Lens Asm, Housing



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- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Adaptive Lens Asm, Housing

Assembly Summary

Parts	28
Fasteners	14
Part Numbers	17
Steps	119
Fastenings	22
Right First Time	96.77 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	7.05
Total Weight (kg)	0.47

Material Cost**	\$12.30
OEM Process Cost	\$0.00
Supplier Process Cost	\$4.91
Q Burden	\$0.49
SG&A	\$2.46
Manufacturing Cost*	\$20.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Adaptive Lens Asm, Housing



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Adaptive Lens Asm, Housing

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Adaptive Lens Housing Asm, Adaptive Lens	1	3	2	10	2	99.93 %	0.00	0.00	0.24	1.48	0.2131
Support, Adaptive Lens Asm	1	1	0	37	0	99.85 %	0.00	0.00	0.00	1.04	0.0112
Reflector Trim, Adaptive Lens Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.25	0.0123
Fan Circuit Asm, Adaptive Lens	1	9	7	27	7	99.22 %	0.00	0.00	1.07	0.31	0.1514
Assemble Fan Circuit	1	6	8	19	8	98.66 %	0.00	0.00	1.12	0.00	0.0096
Reflector Lower Trim, Adaptive Lens Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.63	0.0351
Assemble Fan	1	5	5	13	5	99.13 %	0.00	0.00	0.90	0.00	0.0337

Adaptive Lens Asm, Housing

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Adaptive Lens Housing Asm, Adaptive Lens	\$0.10	\$0.78	\$0.00	\$0.00	\$0.10	\$0.55	\$0.01	\$0.32	\$1.86
Support, Adaptive Lens Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.73	\$0.02	\$0.17	\$0.96
Reflector Trim, Adaptive Lens Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.08	\$0.47
Fan Circuit Asm, Adaptive Lens	\$0.27	\$4.12	\$0.00	\$0.00	\$0.80	\$0.32	\$0.12	\$1.16	\$6.79
Assemble Fan Circuit	\$0.06	\$0.00	\$0.00	\$0.00	\$0.84	\$0.00	\$0.20	\$0.19	\$1.29
Reflector Lower Trim, Adaptive Lens Asm	\$0.00	\$0.28	\$0.00	\$0.00	\$0.00	\$0.63	\$0.00	\$0.20	\$1.12
Assemble Fan	\$6.54	\$0.00	\$0.00	\$0.00	\$0.68	\$0.00	\$0.13	\$0.34	\$7.69

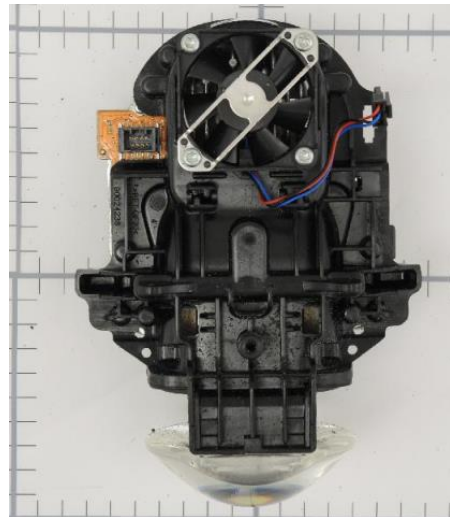
Detailed Summary

Parts	28
Fasteners	14
Part Numbers	17
Steps	119
Fastenings	22
Right First Time	96.77%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.33
Supplier Fab. Time (Min)	3.71
Total Weight (kg)	0.47
Purchased Part Cost	
	\$6.97
Material Cost	
	\$5.33
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$2.42
Supplier Fab. Cost	
	\$2.50
Q Burden	
	\$0.49
SG&A	
	\$2.46
Manufacturing Cost*	
	\$20.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Adaptive Lens Housing Asm, Adaptive Lens



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\Housing Asm, Driver Head Lamp Housing Asm

\Adaptive Lens Asm, Housing

\Adaptive Lens Housing Asm, Adaptive Lens

Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	10
Fastenings	2
Right First Time	99.93 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.73
Total Weight (kg)	0.21

Material Cost**	\$0.88
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.65
Q Burden	\$0.01
SG&A	\$0.32
Manufacturing Cost*	\$1.86

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Adaptive Lens Housing Asm, Adaptive Lens



Adaptive Lens Housing Asm, Adaptive Lens

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Adaptive Lens Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.11	0.1170
Lens, Adaptive Lens Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	1.38	0.0960
Assemble Housing Asm	1	1	2	6	2	99.95 %	0.00	0.00	0.24	0.00	0.0001

Adaptive Lens Housing Asm, Adaptive Lens

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Adaptive Lens Asm	\$0.00	\$0.37	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.09	\$0.51
Lens, Adaptive Lens Asm	\$0.00	\$0.41	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.20	\$1.11
Assemble Housing Asm	\$0.10	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.03	\$0.23

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	10
Fastenings	2
Right First Time	99.93%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.24
Supplier Fab. Time (Min)	1.48
Total Weight (kg)	0.21
Purchased Part Cost	
	\$0.10
Material Cost	
	\$0.78
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.10
Supplier Fab. Cost	
	\$0.55
Q Burden	
	\$0.01
SG&A	
	\$0.32
Manufacturing Cost*	
	\$1.86

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Adaptive Lens Housing Asm, Adaptive Lens
- \Housing, Adaptive Lens Asm
- \Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	6.35
Total Weight (kg)	0.12
Material Cost**	\$0.37
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.09
Manufacturing Cost*	\$0.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Adaptive Lens Asm



Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	12.70	2	0.25	28.76	ESP	\$0.05	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Housing Adaptive Lens	1	PET GF30	\$2.93	0.1170	0.1258	\$0.00	\$0.37



\...

- \Adaptive Lens Housing Asm, Adaptive Lens
- \Lens, Adaptive Lens Asm
- \Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	82.69
Total Weight (kg)	0.10
Material Cost**	\$0.41
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.50
Q Burden	\$0.00
SG&A	\$0.20
Manufacturing Cost*	\$1.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lens, Adaptive Lens Asm



Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	165.38	2	0.25	21.64	ESP	\$0.50	99.99%	\$0.00

Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lens	1	PC	\$3.97	0.0960	0.1032	\$0.00	\$0.41



\...

- \Adaptive Lens Asm, Housing
- \Adaptive Lens Housing Asm, Adaptive Lens
- \Assemble Housing Asm

Process Summary

Right First Time	99.95 %
Process Time (Sec)	14.63
Total Weight (kg)	0.00
Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housing Asm

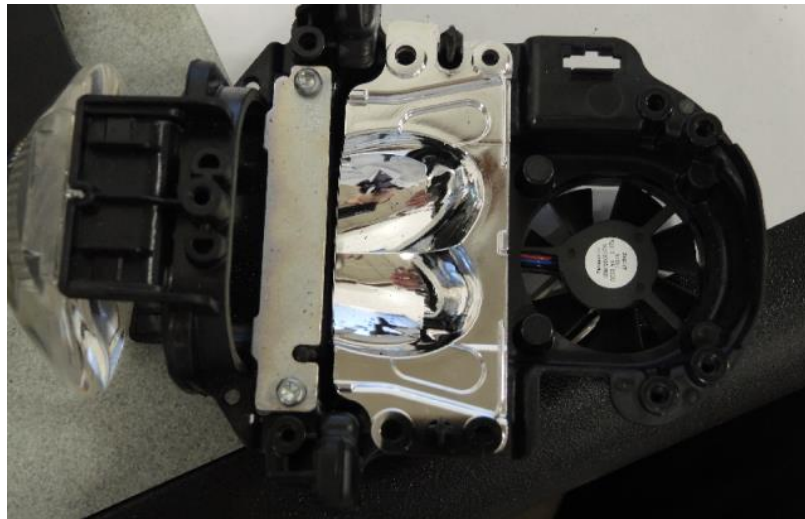


Assemble Housing Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Vibration Welding Station	14.63	1	0.25	25.02	ESP	\$0.10	99.95%	\$0.01

Assemble Housing Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00



- \...
- \Adaptive Lens Asm, Housing
- \Support, Adaptive Lens Asm
- \Support Adaptive Lens Process

Process Summary

Right First Time	99.85 %
Process Time (Sec)	62.68
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.73
Q Burden	\$0.02
SG&A	\$0.17
Manufacturing Cost*	\$0.96

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support, Adaptive Lens Asm



Support Adaptive Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	5.00	1	0.25	28.36	ESP	\$0.04	99.99 %	\$0.00
Deburr	4.00	1	0.25	29.03	ESP	\$0.03	99.99 %	\$0.00
CNC Machining	44.08	1	0.25	47.46	ESP	\$0.58	99.90 %	\$0.02
Wash	5.00	1	0.25	28.36	ESP	\$0.04	99.99 %	\$0.00
Deburr	4.00	1	0.25	29.03	ESP	\$0.03	99.99 %	\$0.00
25 Ton Stamping Press	0.60	1	0.25	19.41	ESP	\$0.00	99.99 %	\$0.00

Support Adaptive Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Support Adaptive Lens	1	Aluminum 5052-H32 - Coil Stock	\$3.35	0.0112	0.0112	\$0.00	\$0.04

Reflector Trim, Adaptive Lens Asm



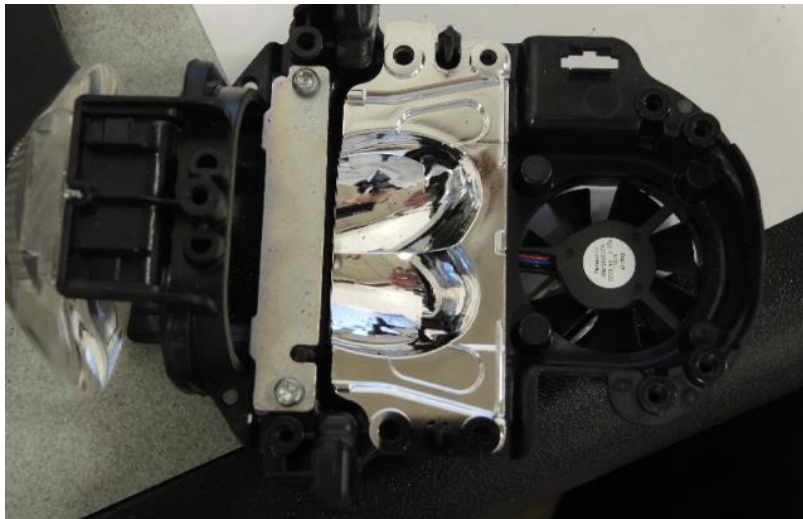
\...

- \Adaptive Lens Asm, Housing
- \Reflector Trim, Adaptive Lens Asm
- \Reflector Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	15.19
Total Weight (kg)	0.01

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.47



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Trim, Adaptive Lens Asm



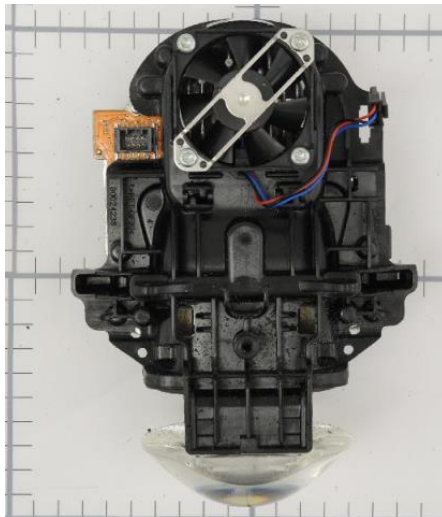
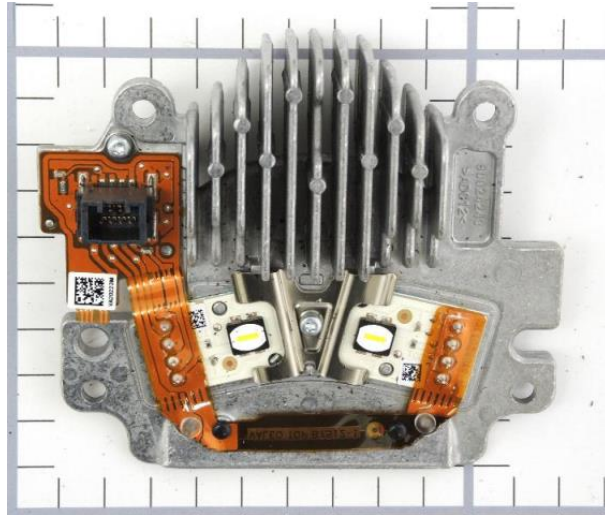
Reflector Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	13.38	1	0.25	69.10	ESP	\$0.26	99.99%	\$0.00
200 Ton Injection Molding Press	14.48	8	0.25	28.76	ESP	\$0.01	99.99%	\$0.00

Reflector Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Reflector Trim	1	Plating - Chrome		By Area	0.0000	\$0.00	\$0.06
Material, Reflector Trim	1	PC	\$3.97	0.0123	0.0132	\$0.00	\$0.05

Fan Circuit Asm, Adaptive Lens



\...

\Housing Asm, Driver Head Lamp Housing Asm

\Adaptive Lens Asm, Housing

\Fan Circuit Asm, Adaptive Lens

Assembly Summary

Parts	9
Fasteners	4
Part Numbers	7
Steps	27
Fastenings	7
Right First Time	99.22 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.38
Total Weight (kg)	0.15

Material Cost**	\$4.39
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.12
Q Burden	\$0.12
SG&A	\$1.16
Manufacturing Cost*	\$6.79

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fan Circuit Asm, Adaptive Lens



MUNRO
& ASSOCIATES, INC.

Fan Circuit Asm, Adaptive Lens

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Platform, Fan Circuit Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.16	0.1340
Assemble Fan Circuit Tape	1	3	3	7	3	99.86 %	0.00	0.00	0.40	0.00	0.0140
Bracket, Fan Circuit Asm	1	1	0	7	0	99.97 %	0.00	0.00	0.00	0.14	0.0024
Assemble Bracket	1	4	4	10	4	99.40 %	0.00	0.00	0.67	0.00	0.0010

Fan Circuit Asm, Adaptive Lens

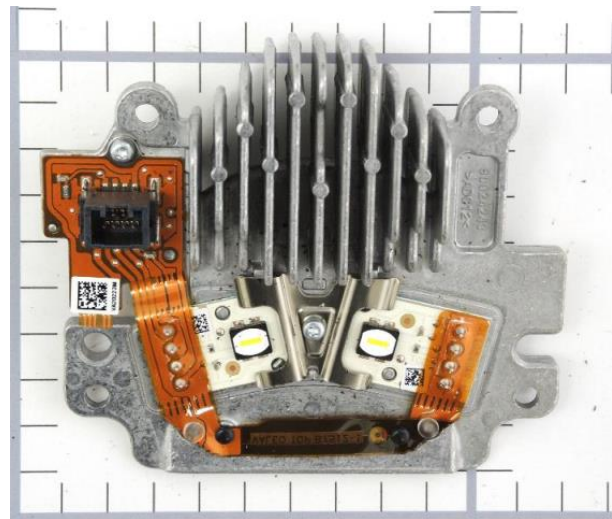
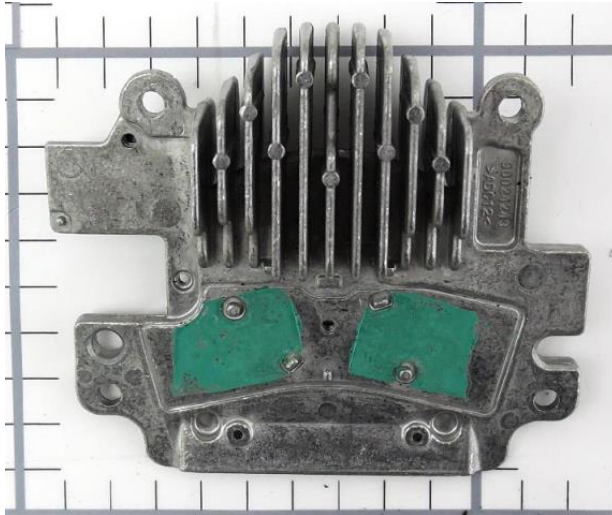
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Platform, Fan Circuit Asm	\$0.00	\$0.31	\$0.00	\$0.00	\$0.00	\$0.28	\$0.00	\$0.13	\$0.72
Assemble Fan Circuit Tape	\$0.23	\$3.77	\$0.00	\$0.00	\$0.30	\$0.00	\$0.02	\$0.90	\$5.23
Bracket, Fan Circuit Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.02	\$0.10
Assemble Bracket	\$0.04	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.09	\$0.11	\$0.74

Detailed Summary

Parts	9
Fasteners	4
Part Numbers	7
Steps	27
Fastenings	7
Right First Time	99.22%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.07
Supplier Fab. Time (Min)	0.31
Total Weight (kg)	0.15
Purchased Part Cost	
	\$0.27
Material Cost	\$4.12
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.80
Supplier Fab. Cost	\$0.32
Q Burden	\$0.12
SG&A	\$1.16
Manufacturing Cost*	\$6.79

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



- \...
- \Fan Circuit Asm, Adaptive Lens
- \Platform, Fan Circuit Asm
- \Platform Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	9.72
Total Weight (kg)	0.13
Material Cost**	\$0.31
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.28
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.72

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Platform, Fan Circuit Asm



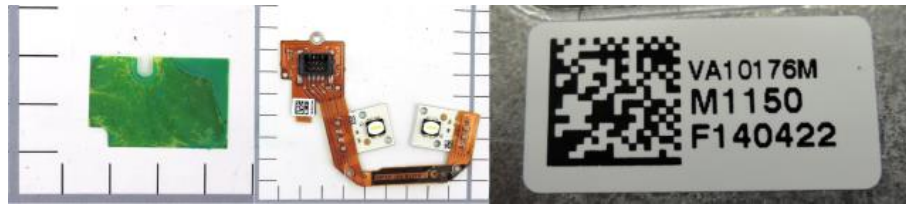
Platform Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
260 Ton Die Cast Machine	19.44	2	1.00	103.98	ESP	\$0.28	99.99%	\$0.00

Platform Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Platform	1	A380	\$2.27	0.1340	0.1353	\$0.00	\$0.31

Assemble Fan Circuit Tape

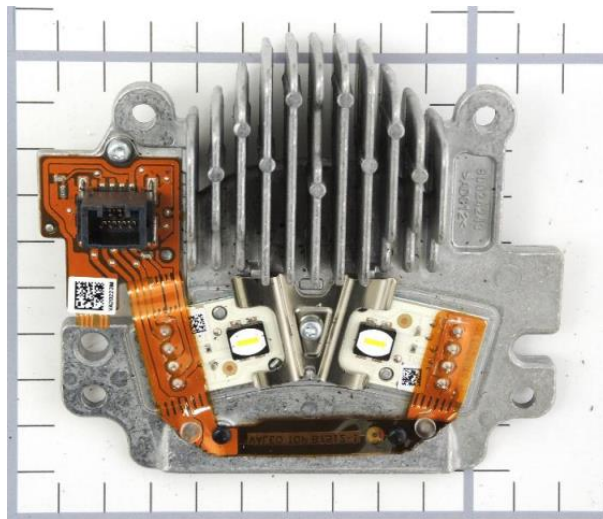


- \...
- \Adaptive Lens Asm, Housing
- \Fan Circuit Asm, Adaptive Lens
- \Assemble Fan Circuit Tape

Process Summary

Right First Time	99.86 %
Process Time (Sec)	24.25
Total Weight (kg)	0.01

Material Cost**	\$4.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.02
SG&A	\$0.90
Manufacturing Cost*	\$5.23



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fan Circuit Tape



Assemble Fan Circuit Tape

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	24.25	1	1.00	45.01	ESP	\$0.30	99.86%	\$0.02

Assemble Fan Circuit Tape

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00
Fan Circuit, Printed Circuit Board	1	See Appendix	-	0.0138	-	\$0.00	\$3.77
Printed Circuit Board, Insulator Pad	1	Commodity Item	Purchased	0.0001	-	\$0.20	\$0.00

[Click Here for TechInsights Electronics Report on Fan Circuit, Printed Circuit Board](#)

Bracket, Fan Circuit Asm



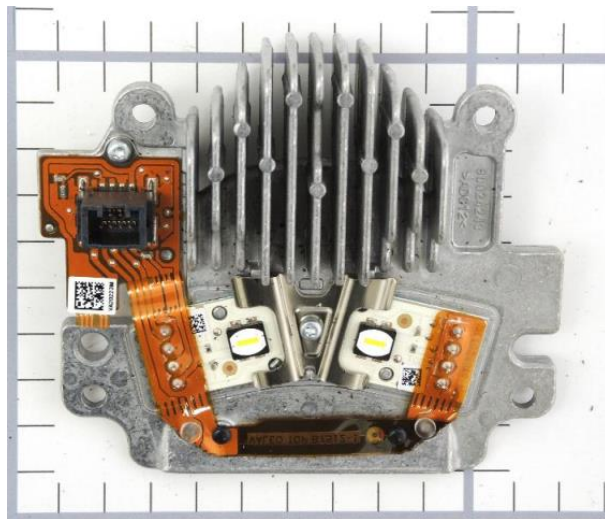
\...

- \Fan Circuit Asm, Adaptive Lens
- \Bracket, Fan Circuit Asm
- \Bracket Fan Circuit Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	8.60
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.10



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket, Fan Circuit Asm

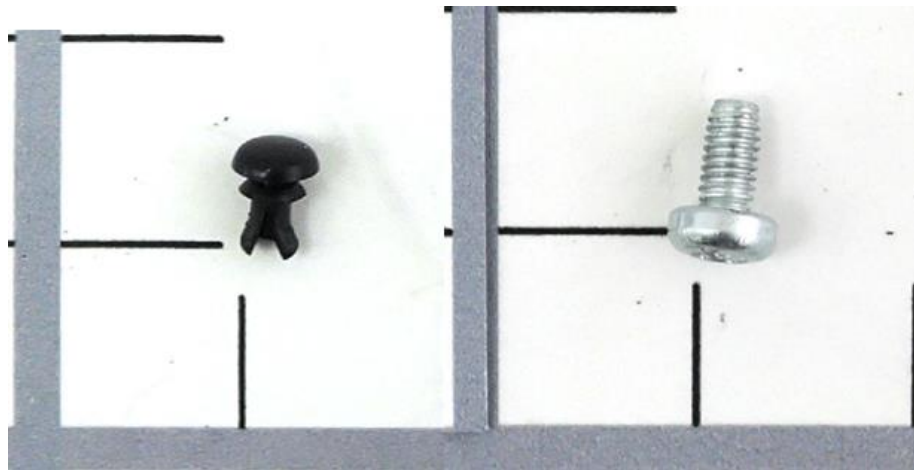
Bracket Fan Circuit Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	5.00	1	0.25	17.68	ESP	\$0.02	99.99%	\$0.00
Deburr	3.00	1	0.25	10.03	ESP	\$0.01	99.99%	\$0.00
25 Ton Stamping Press	0.60	1	0.25	19.41	ESP	\$0.00	99.99%	\$0.00

Bracket Fan Circuit Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Bracket	1	Stainless Steel 304- Coil Stock	\$2.58	0.0024	0.0140	\$0.00	\$0.04

Assemble Bracket

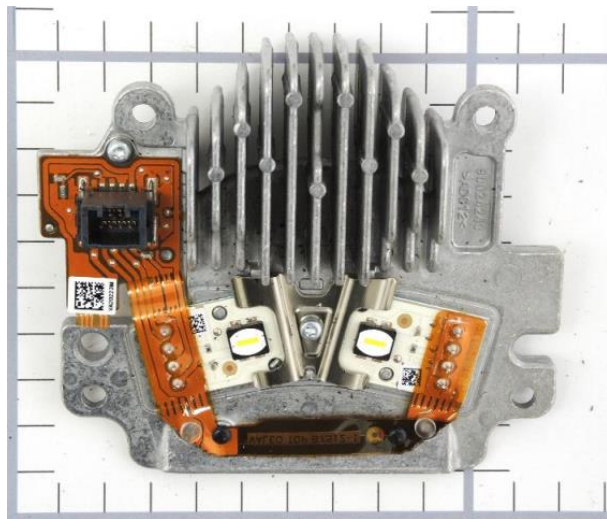


- \...
- \Adaptive Lens Asm, Housing
- \Fan Circuit Asm, Adaptive Lens
- \Assemble Bracket

Process Summary

Right First Time	99.40 %
Process Time (Sec)	40.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.50
Q Burden	\$0.09
SG&A	\$0.11
Manufacturing Cost*	\$0.74



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Bracket



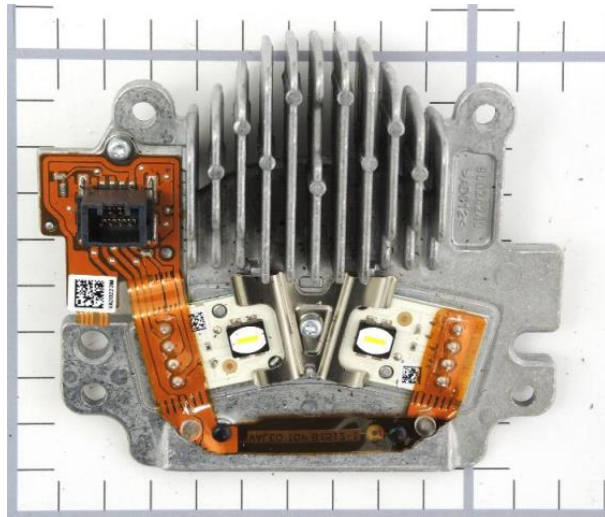
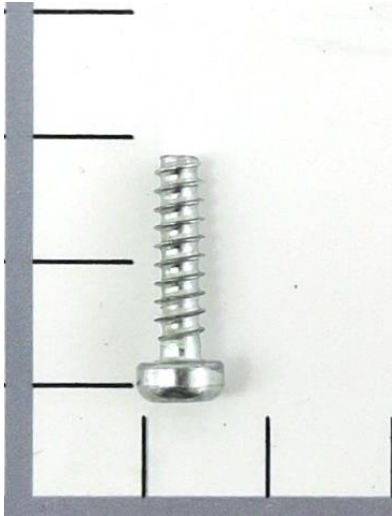
Assemble Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	40.00	1	1.00	45.01	ESP	\$0.50	99.40%	\$0.09

Assemble Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M3x5mm-Pan Head Torx	2	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00
Push Pin Electronic Circuit	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Fan Circuit



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Adaptive Lens Asm, Housing
- \Assemble Fan Circuit

Process Summary

Right First Time	98.66 %
Process Time (Sec)	67.00
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.84
Q Burden	\$0.20
SG&A	\$0.19
Manufacturing Cost*	\$1.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fan Circuit

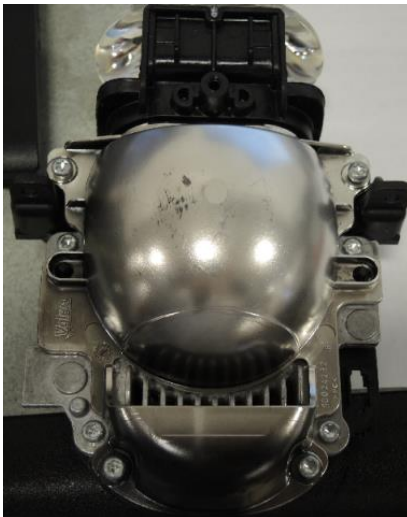
Assemble Fan Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	67.00	1	1.00	45.01	ESP	\$0.84	98.66%	\$0.20

Assemble Fan Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	6	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

Reflector Lower Trim, Adaptive Lens Asm



\...

- \Adaptive Lens Asm, Housing
- \Reflector Lower Trim, Adaptive Lens Asm
- \Reflector Lower Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	37.63
Total Weight (kg)	0.04
Material Cost**	\$0.28
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.63
Q Burden	\$0.00
SG&A	\$0.20
Manufacturing Cost*	\$1.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Lower Trim, Adaptive Lens Asm

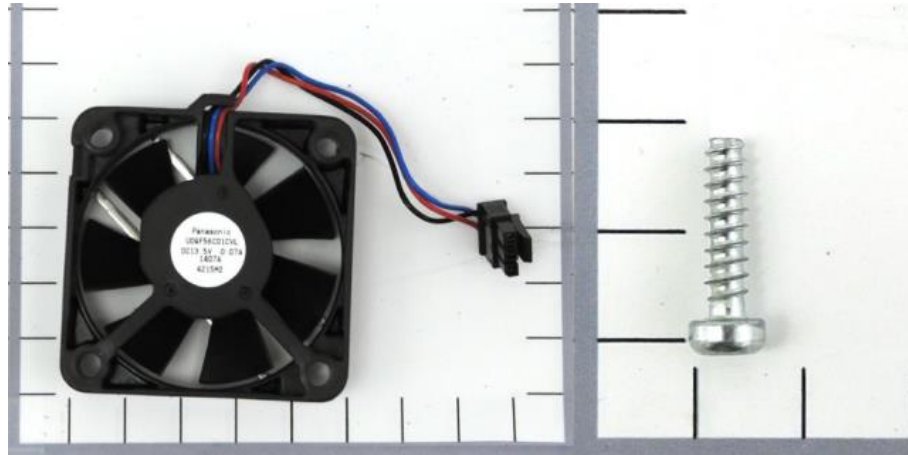


Reflector Lower Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	30.35	1	0.25	69.10	ESP	\$0.58	99.99%	\$0.00
110 Ton Injection Molding Press	14.56	2	0.25	24.56	ESP	\$0.05	99.99%	\$0.00

Reflector Lower Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Reflector Lower Trim	1	Plating - Chrome		By Area	0.0000	\$0.00	\$0.13
Material, Lower Reflector Trim	1	PC	\$3.97	0.0351	0.0377	\$0.00	\$0.15



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Adaptive Lens Asm, Housing
- \Assemble Fan

Process Summary

Right First Time	99.13 %
Process Time (Sec)	54.00
Total Weight (kg)	0.03

Material Cost**	\$6.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.68
Q Burden	\$0.13
SG&A	\$0.34
Manufacturing Cost*	\$7.69



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fan



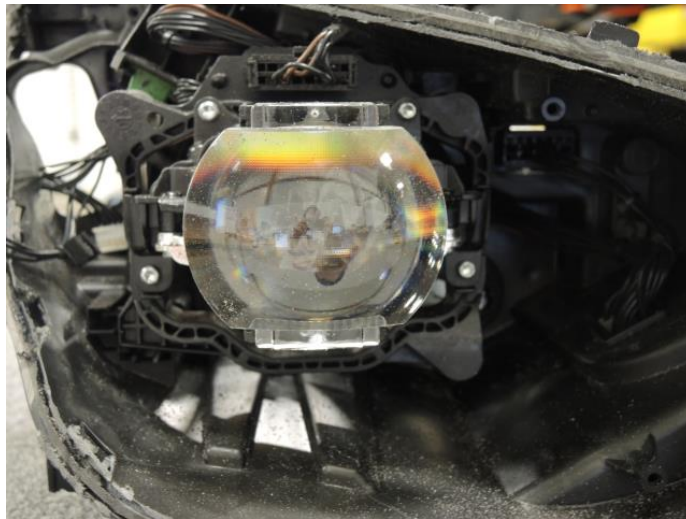
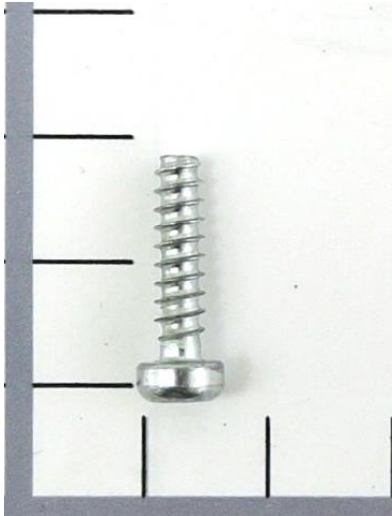
Assemble Fan

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	54.00	1	1.00	45.01	ESP	\$0.68	99.13%	\$0.13

Assemble Fan

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Fan, Adaptive Lens Asm	1	Commodity Item	Purchased	0.0273	-	\$6.50	\$0.00
M4x14mm-Pan Head Torx	4	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

Assemble Adaptive Lens Asm



\...

\Driver Head Lamp Housing Asm, Driver Head Lamp
Housing Asm, Driver Head Lamp Housing Asm
Assemble Adaptive Lens Asm

Process Summary

Right First Time	99.00 %
Process Time (Sec)	70.00
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.88
Q Burden	\$0.15
SG&A	\$0.19
Manufacturing Cost*	\$1.26

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Adaptive Lens Asm



Assemble Adaptive Lens Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	70.00	1	1.00	45.01	ESP	\$0.88	99.00%	\$0.15

Assemble Adaptive Lens Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	4	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

Interior Trim Asm, Housing



\...

- \Driver Head Lamp Housing Asm, Driver Head Lamp
- \Housing Asm, Driver Head Lamp Housing Asm
- \Interior Trim Asm, Housing

Assembly Summary

Parts	7
Fasteners	2
Part Numbers	6
Steps	31
Fastenings	11
Right First Time	99.28 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.18
Total Weight (kg)	0.48

Material Cost**	\$1.83
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.25
Q Burden	\$0.11
SG&A	\$0.67
Manufacturing Cost*	\$3.86

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Interior Trim Asm, Housing



Interior Trim Asm, Housing

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Light Pipe Trim Asm, Interior Trim	1	2	4	10	4	99.86 %	0.00	0.00	0.25	0.15	0.1440
Light Trim, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.1060
Assemble Light Trim	1	0	3	5	3	99.93 %	0.00	0.00	0.15	0.00	0.0000
Light Pipe Lens, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.86	0.2120
Assemble Light Pipe Lens	1	2	3	7	3	99.55 %	0.00	0.00	0.52	0.00	0.0032
BMW Adaptive LED Chrome Trim, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0151
Assemble BMW Adaptive LED Chrome Trim	1	0	1	2	1	99.97 %	0.00	0.00	0.10	0.00	0.0000

Interior Trim Asm, Housing

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Light Pipe Trim Asm, Interior Trim	\$0.00	\$0.60	\$0.00	\$0.00	\$0.19	\$0.06	\$0.02	\$0.19	\$1.05
Light Trim, Interior Trim Asm	\$0.00	\$0.45	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.11	\$0.62
Assemble Light Trim	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$0.02	\$0.15
Light Pipe Lens, Interior Trim Asm	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$0.35	\$0.00	\$0.23	\$1.29
Assemble Light Pipe Lens	\$0.02	\$0.00	\$0.00	\$0.00	\$0.39	\$0.00	\$0.07	\$0.09	\$0.56
BMW Adaptive LED Chrome Trim, Interior Trim Asm	\$0.00	\$0.06	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.02	\$0.09
Assemble BMW Adaptive LED Chrome Trim	\$0.00	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.00	\$0.02	\$0.10

Detailed Summary

Parts	7
Fasteners	2
Part Numbers	6
Steps	31
Fastenings	11
Right First Time	99.28%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.02
Supplier Fab. Time (Min)	1.17
Total Weight (kg)	0.48
Purchased Part Cost	
	\$0.02
Material Cost	
	\$1.81
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.76
Supplier Fab. Cost	
	\$0.48
Q Burden	
	\$0.11
SG&A	
	\$0.67
Manufacturing Cost*	
	\$3.86

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim Asm, Interior Trim



\...

\Housing Asm, Driver Head Lamp Housing Asm

\Interior Trim Asm, Housing

\Light Pipe Trim Asm, Interior Trim

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	10
Fastenings	4
Right First Time	99.86 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.40
Total Weight (kg)	0.14

Material Cost**	\$0.60
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.25
Q Burden	\$0.02
SG&A	\$0.19
Manufacturing Cost*	\$1.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim Asm, Interior Trim



Light Pipe Trim Asm, Interior Trim

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Light Pipe Trim, Light Pipe Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.1100
Light Pipe, LightPipe Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0340
Assemble Light Pipe	1	0	4	6	4	99.88 %	0.00	0.00	0.25	0.00	0.0000

Light Pipe Trim Asm, Interior Trim

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Light Pipe Trim, Light Pipe Trim Asm	\$0.00	\$0.49	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.12	\$0.66
Light Pipe, LightPipe Trim Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.03	\$0.15
Assemble Light Pipe	\$0.00	\$0.00	\$0.00	\$0.00	\$0.19	\$0.00	\$0.02	\$0.04	\$0.25

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	10
Fastenings	4
Right First Time	99.86%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.25
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.14
Purchased Part Cost	\$0.00
Material Cost	\$0.60
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.19
Supplier Fab. Cost	\$0.06
Q Burden	\$0.02
SG&A	\$0.19
Manufacturing Cost*	\$1.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim, Light Pipe Trim Asm



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- \Light Pipe Trim Asm, Interior Trim
- \Light Pipe Trim, Light Pipe Trim Asm
- \Light Pipe Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.12
Total Weight (kg)	0.11
Material Cost**	\$0.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.12
Manufacturing Cost*	\$0.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim, Light Pipe Trim Asm



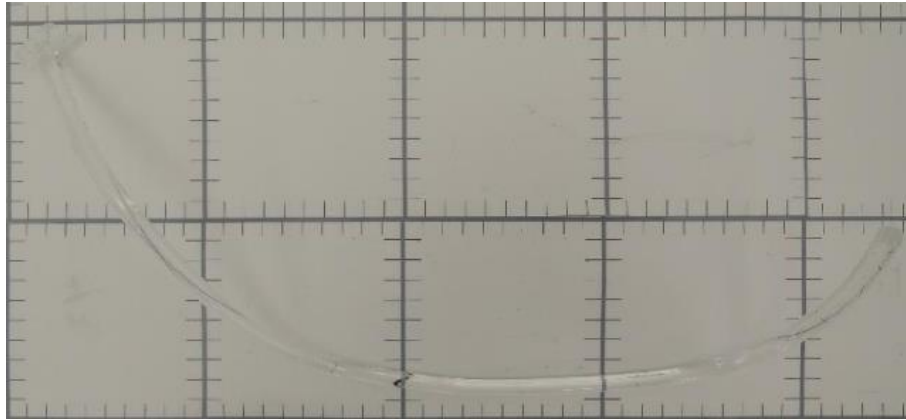
Light Pipe Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	14.24	2	0.25	24.56	ESP	\$0.05	99.99%	\$0.00

Light Pipe Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe Trim	1	PBT+ASA GF20	\$4.17	0.1100	0.1183	\$0.00	\$0.49

Light Pipe, Light Pipe Trim Asm



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\Light Pipe Trim Asm, Interior Trim

\Light Pipe, Light Pipe Trim Asm

\Light Pipe Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.80
Total Weight (kg)	0.03

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe, Light Pipe Trim Asm



Light Pipe Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	10.80	6	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Light Pipe Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe	1	PMMA - Clear	\$3.09	0.0340	0.0366	\$0.00	\$0.11

No Commodity Items Required for This Process



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\Interior Trim Asm, Housing

\Light Pipe Trim Asm, Interior Trim

\Assemble Light Pipe

Process Summary

Right First Time	99.88 %
Process Time (Sec)	15.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.19
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Pipe



Assemble Light Pipe

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	15.00	1	1.00	45.01	ESP	\$0.19	99.88 %	\$0.02

Assemble Light Pipe

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Light Trim, Interior Trim Asm



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\Interior Trim Asm, Housing
\Light Trim, Interior Trim Asm
\Light Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.43
Total Weight (kg)	0.11
Material Cost**	\$0.45
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.62

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Trim, Interior Trim Asm



Light Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	14.86	2	0.25	28.76	ESP	\$0.06	99.99%	\$0.00

Light Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Trim	1	PC	\$3.97	0.1060	0.1140	\$0.00	\$0.45

No Commodity Items Required for This Process



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\Housing Asm, Driver Head Lamp Housing Asm
 \Interior Trim Asm, Housing
 \Assemble Light Trim

Process Summary

Right First Time	99.93 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Trim



Assemble Light Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.93%	\$0.01

Assemble Light Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Light Pipe Lens, Interior Trim Asm



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- \Interior Trim Asm, Housing
- \Light Pipe Lens, Interior Trim Asm
- \Light Pipe Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	51.79
Total Weight (kg)	0.21
Material Cost**	\$0.70
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.00
SG&A	\$0.23
Manufacturing Cost*	\$1.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Lens, Interior Trim Asm



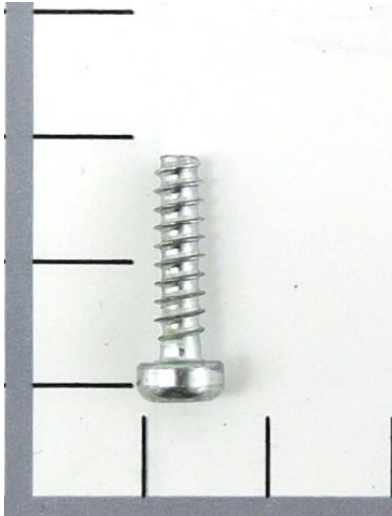
Light Pipe Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	207.16	4	0.25	24.56	ESP	\$0.35	99.99%	\$0.00

Light Pipe Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe Lens	1	PMMA - Clear	\$3.09	0.2120	0.2279	\$0.00	\$0.70

Assemble Light Pipe Lens



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Interior Trim Asm, Housing
- \Assemble Light Pipe Lens

Process Summary

Right First Time	99.55 %
Process Time (Sec)	31.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.39
Q Burden	\$0.07
SG&A	\$0.09
Manufacturing Cost*	\$0.56

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Pipe Lens



Assemble Light Pipe Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	31.00	1	1.00	45.01	ESP	\$0.39	99.55%	\$0.07

Assemble Light Pipe Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	2	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

BMW Adaptive LED Chrome Trim, Interior Trim Asm



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\Interior Trim Asm, Housing

\BMW Adaptive LED Chrome Trim, Interior Trim Asm

\BMW Adaptive LED Chrome Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.86
Total Weight (kg)	0.02

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Adaptive LED Chrome Trim, Interior Trim Asm



BMW Adaptive LED Chrome Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	14.88	8	0.25	24.56	ESP	\$0.01	99.99%	\$0.00

BMW Adaptive LED Chrome Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, BMW Adaptive LED Chrome Trim	1	PC	\$3.97	0.0151	0.0162	\$0.00	\$0.06

No Commodity Items Required for This Process



\...

- \Housing Asm, Driver Head Lamp Housing Asm
- \Interior Trim Asm, Housing
- \Assemble BMW Adaptive LED Chrome Trim

Process Summary

Right First Time	99.97 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble BMW Adaptive LED Chrome Trim



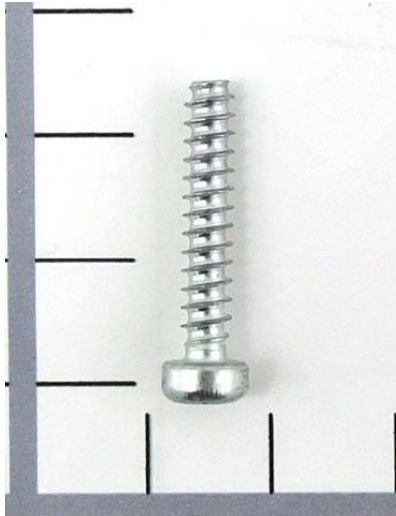
Assemble BMW Adaptive LED Chrome Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	6.00	1	1.00	45.01	ESP	\$0.08	99.97%	\$0.00

Assemble BMW Adaptive LED Chrome Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Interior Trim



\...

\Driver Head Lamp Housing Asm, Driver Head Lamp
\Housing Asm, Driver Head Lamp Housing Asm
\Assemble Interior Trim

Process Summary

Right First Time	99.55 %
Process Time (Sec)	21.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.26
Q Burden	\$0.07
SG&A	\$0.06
Manufacturing Cost*	\$0.41



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Interior Trim



Assemble Interior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	21.00	1	1.00	45.01	ESP	\$0.26	99.55%	\$0.07

Assemble Interior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x20mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00

LED Cover Asm, Housing



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\Driver Head Lamp Housing Asm, Driver Head Lamp
 \Housing Asm, Driver Head Lamp Housing Asm
 \LED Cover Asm, Housing

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.91 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.20
Total Weight (kg)	0.01

Material Cost**	\$7.90
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.01
SG&A	\$1.77
Manufacturing Cost*	\$9.82

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Cover Asm, Housing



LED Cover Asm, Housing

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
LED Cover, LED Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.05	0.0044
Assemble LED Cover	1	1	1	3	1	99.92 %	0.00	0.00	0.15	0.00	0.0008

LED Cover Asm, Housing

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
LED Cover, LED Cover Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.01	\$0.06
Assemble LED Cover	\$0.00	\$7.88	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$1.76	\$9.76

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.91%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.15
Supplier Fab. Time (Min)	0.05
Total Weight (kg)	0.01
Purchased Part Cost	\$0.00
Material Cost	\$7.90
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.11
Supplier Fab. Cost	\$0.03
Q Burden	\$0.01
SG&A	\$1.77
Manufacturing Cost*	\$9.82

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Cover, LED Cover Asm



\...

- \LED Cover Asm, Housing
- \LED Cover, LED Cover Asm
- \LED Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	3.15
Total Weight (kg)	0.00
Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Cover, LED Cover Asm



LED Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	12.60	4	0.25	28.76	ESP	\$0.03	99.99%	\$0.00

LED Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, LED Cover	1	PC	\$3.97	0.0044	0.0047	\$0.00	\$0.02

Assemble LED Cover



- \...
- \Housing Asm, Driver Head Lamp Housing Asm
- \LED Cover Asm, Housing
- \Assemble LED Cover

Process Summary

Right First Time	99.92 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$7.88
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$1.76
Manufacturing Cost*	\$9.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Cover



Assemble LED Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.92 %	\$0.01

Assemble LED Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Head Lamp, Housing Asm Driver Side	1	See Appendix	-	0.0008	-	\$0.00	\$7.88

[Click Here for TechInsights Electronics Report on LED Board, Head Lamp](#)

No Commodity Items Required for This Process



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\Driver Head Lamp Housing Asm, Driver Head Lamp
Housing Asm, Driver Head Lamp Housing Asm
Assemble LED Cover

Process Summary

Right First Time	99.97 %
Process Time (Sec)	4.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Cover



Assemble LED Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	4.00	1	1.00	45.01	ESP	\$0.05	99.97%	\$0.00

Assemble LED Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Lens, Driver Head Lamp Housing Asm



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\Driver Head Lamp Housing Asm, Driver Head Lamp
\Lens, Driver Head Lamp Housing Asm
\Lens Process

Process Summary

Right First Time	99.62 %
Process Time (Sec)	1074.30
Total Weight (kg)	0.61
Material Cost**	\$3.81
OEM Process Cost	\$0.00
Supplier Process Cost	\$5.12
Q Burden	\$0.06
SG&A	\$1.96
Manufacturing Cost*	\$10.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lens, Driver Head Lamp Housing Asm



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Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure PC Glazing	54.75	1	0.25	14.30	ESP	\$0.22	99.97 %	\$0.01
Spray PC Glazing (Abrasion Resistance)	10.00	1	0.25	52.79	ESP	\$0.15	99.97 %	\$0.01
Cure PC Glazing	43.50	1	0.25	14.30	ESP	\$0.17	99.97 %	\$0.01
Spray PC Glazing (Defogging)	10.00	1	0.25	52.79	ESP	\$0.15	99.97 %	\$0.01
Wash	16.00	1	0.25	17.68	ESP	\$0.08	99.98 %	\$0.00
Cure Clearcoat	343.50	1	0.25	14.30	ESP	\$1.36	99.97 %	\$0.01
Apply Clearcoat	11.28	1	0.25	52.79	ESP	\$0.17	99.97 %	\$0.01
Cure Basecoat	306.00	1	0.25	14.30	ESP	\$1.22	99.97 %	\$0.01
Apply Basecoat	11.28	1	0.25	52.79	ESP	\$0.17	99.97 %	\$0.01
Cure Primer	231.00	1	0.25	14.30	ESP	\$0.92	99.97 %	\$0.01
Apply Primer	11.28	1	0.25	52.79	ESP	\$0.17	99.97 %	\$0.01
390 Ton Injection Molding Press	25.71	1	0.25	50.37	ESP	\$0.36	99.99 %	\$0.00

Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, PC Coating	1	PC Glazing - Abrasion Resistance		By Area	0.0000	-	\$0.08
Material, PC Coating	1	PC Glazing - Defogging		By Area	0.0000	-	\$0.02
Material, Paint	1	Paint - Clearcoat		By Area	0.0000	-	\$0.48
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.41
Material, Paint	1	Paint - Primer		By Area	0.0000	-	\$0.23
Material, Lens	1	PC	\$3.97	0.6060	0.6536	\$0.00	\$2.59

No Commodity Items Required for This Process



\...

\Driver Head Lamp Asm

\Driver Head Lamp Housing Asm, Driver Head Lamp

\Assemble Lens

Process Summary

Right First Time	99.89 %
Process Time (Sec)	12.38
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.12

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lens



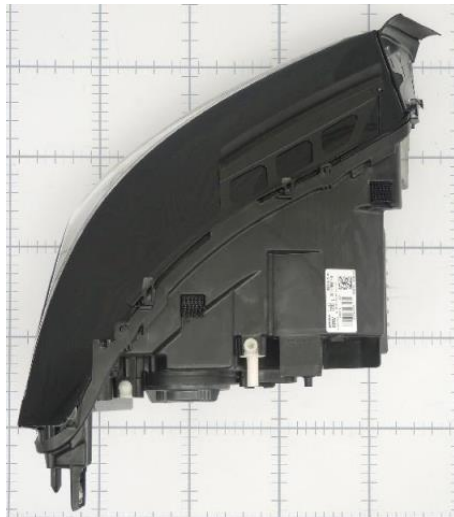
Assemble Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	12.38	1	0.25	23.36	ESP	\$0.08	99.89%	\$0.02

Assemble Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Head Lamp Seal Small, Driver Head Lamp Asm



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\Driver Head Lamp Asm

\Head Lamp Seal Small, Driver Head Lamp Asm

\Head Lamp Seal Small Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	9.51
Total Weight (kg)	0.02
Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Head Lamp Seal Small, Driver Head Lamp Asm



Head Lamp Seal Small Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	57.06	6	0.25	25.74	ESP	\$0.07	99.98 %	\$0.00

Head Lamp Seal Small Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Head Lamp Seal Small	1	PP GF30	\$2.71	0.0136	0.0146	\$0.00	\$0.04
Material 2, Head Lamp Seal Small	1	TPE	\$2.54	0.0060	0.0065	\$0.00	\$0.02

No Commodity Items Required for This Process



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\Lamps

\Driver Head Lamp Asm

\Assemble Head Lamp Seal Small

Process Summary

Right First Time	99.95 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Head Lamp Seal Small



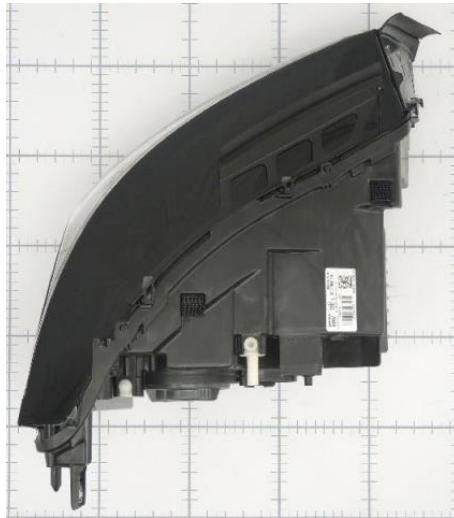
Assemble Head Lamp Seal Small

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.95%	\$0.01

Assemble Head Lamp Seal Small

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Head Lamp Seal Large, Driver Head Lamp Asm



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\Driver Head Lamp Asm

\Head Lamp Seal Large, Driver Head Lamp Asm

\Head Lamp Seal Large Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	28.49
Total Weight (kg)	0.03

Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.00
SG&A	\$0.09
Manufacturing Cost*	\$0.49

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Head Lamp Seal Large, Driver Head Lamp Asm



Head Lamp Seal Large Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	56.98	2	0.25	37.36	ESP	\$0.30	99.98 %	\$0.00

Head Lamp Seal Large Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Head Lamp Seal Large	1	PP GF30	\$2.71	0.0271	0.0291	\$0.00	\$0.08
Material 2, Head Lamp Seal Large	1	TPE	\$2.54	0.0075	0.0081	\$0.00	\$0.02

Assemble Head Lamp Seal Large



- \...
- \Lamps
- \Driver Head Lamp Asm
- \Assemble Head Lamp Seal Large

Process Summary

Right First Time	99.84 %
Process Time (Sec)	40.38
Total Weight (kg)	0.00
Material Cost**	\$0.29
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.50
Q Burden	\$0.02
SG&A	\$0.12
Manufacturing Cost*	\$0.94

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Head Lamp Seal Large



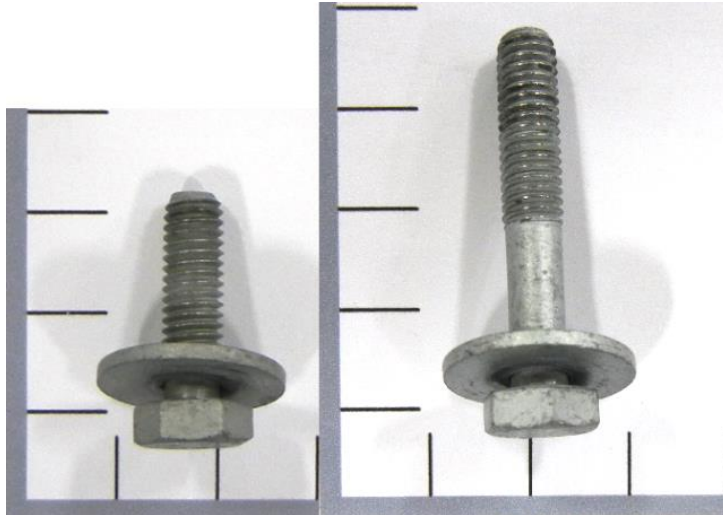
Assemble Head Lamp Seal Large

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	40.38	1	1.00	45.01	ESP	\$0.50	99.84 %	\$0.02

Assemble Head Lamp Seal Large

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00
Label, Date Code, Head Lamp	2	Commodity Item	Purchased	0.0001	-	\$0.02	\$0.00
Label, Valeo Supplier Large	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00

Driver Head Lamp Installation

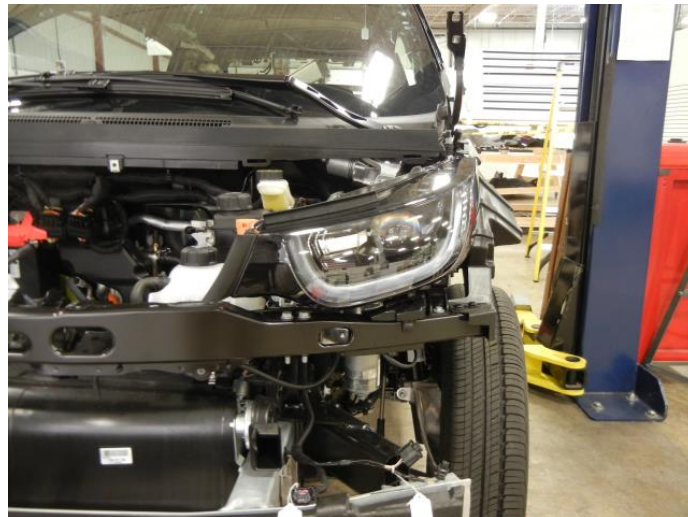


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\Zone 2 Exterior
\Lamps
\Driver Head Lamp Process

Process Summary

Right First Time	99.12 %
Process Time (Sec)	71.50
Total Weight (kg)	0.04

Material Cost**	\$0.15
OEM Process Cost	\$1.82
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.40
Manufacturing Cost*	\$2.50



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Installation



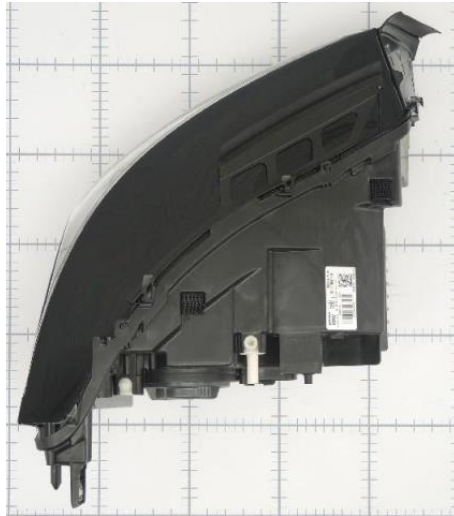
Driver Head Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	71.50	1	1.00	91.41	GER	\$1.82	99.12 %	\$0.13

Driver Head Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x18mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0087	-	\$0.03	\$0.00
M6x33mm-Hex SEMS Bolt	3	Commodity Item	Purchased	0.0111	-	\$0.04	\$0.00

Passenger Head Lamp Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Passenger Head Lamp Asm

Assembly Summary

Parts	100
Fasteners	29
Part Numbers	64
Steps	425
Fastenings	115
Right First Time	88.76 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	38.72
Total Weight (kg)	3.26

Material Cost**	\$87.26
OEM Process Cost	\$0.00
Supplier Process Cost	\$20.49
Q Burden	\$1.79
SG&A	\$20.25
Manufacturing Cost*	\$129.79

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Asm



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Passenger Head Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Passenger Head Lamp Housing Asm, Passenger Head La	1	92	109	403	109	88.98 %	0.00	0.00	13.69	23.57	3.2044
Head Lamp Seal Small, Passenger Head Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.16	0.0196
Assemble Head Lamp Seal Small	1	0	1	3	1	99.95 %	0.00	0.00	0.15	0.00	0.0000
Head Lamp Seal Large, Passenger Head Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.47	0.0346
Assemble Head Lamp Seal Large	1	4	5	12	5	99.84 %	0.00	0.00	0.67	0.00	0.0004

Passenger Head Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Passenger Head Lamp Housing Asm, Passenger Head La	\$17.87	\$68.94	\$0.00	\$0.00	\$10.42	\$9.21	\$1.75	\$20.02	\$128.21
Head Lamp Seal Small, Passenger Head Lamp Asm	\$0.00	\$0.06	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.03	\$0.16
Assemble Head Lamp Seal Small	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$0.02	\$0.14
Head Lamp Seal Large, Passenger Head Lamp Asm	\$0.00	\$0.10	\$0.00	\$0.00	\$0.00	\$0.17	\$0.00	\$0.06	\$0.33
Assemble Head Lamp Seal Large	\$0.29	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.02	\$0.12	\$0.94

Detailed Summary

Parts	100
Fasteners	29
Part Numbers	64
Steps	425
Fastenings	115
Right First Time	88.76%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	14.51
Supplier Fab. Time (Min)	24.21
Total Weight (kg)	3.26
Purchased Part Cost	
	\$18.16
Material Cost	
	\$69.10
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$11.04
Supplier Fab. Cost	
	\$9.45
Q Burden	
	\$1.79
SG&A	
	\$20.25
Manufacturing Cost*	
	\$129.79

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Housing Asm, Passenger Head Lamp



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 \Lamps
 \Passenger Head Lamp Asm
 \Passenger Head Lamp Housing Asm, Passenger
 Head La

Assembly Summary

Parts	92
Fasteners	29
Part Numbers	58
Steps	403
Fastenings	109
Right First Time	88.98 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	37.26
Total Weight (kg)	3.20

Material Cost**	\$86.81
OEM Process Cost	\$0.00
Supplier Process Cost	\$19.63
Q Burden	\$1.75
SG&A	\$20.02
Manufacturing Cost*	\$128.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Housing Asm, Passenger Head Lamp



Passenger Head Lamp Housing Asm, Passenger Head La

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing Asm, Passenger Head Lamp	1	86	106	357	106	89.46 %	0.00	0.00	13.48	5.67	2.5984
Lens, Passenger Head Lamp	1	6	0	39	0	99.62 %	0.00	0.00	0.00	17.91	0.6060
Assemble Lens	1	0	3	5	3	99.85 %	0.00	0.00	0.21	0.00	0.0000

Passenger Head Lamp Housing Asm, Passenger Head La

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing Asm, Passenger Head Lamp	\$17.87	\$65.31	\$0.00	\$0.00	\$10.27	\$4.10	\$1.67	\$18.06	\$117.26
Lens, Passenger Head Lamp	\$0.00	\$3.63	\$0.00	\$0.00	\$0.00	\$5.12	\$0.06	\$1.92	\$10.73
Assemble Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.02	\$0.03	\$0.21

Passenger Head Lamp Housing Asm, Passenger Head Lamp



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Detailed Summary

Parts	92
Fasteners	29
Part Numbers	58
Steps	403
Fastenings	109
Right First Time	88.98%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	13.69
Supplier Fab. Time (Min)	23.57
Total Weight (kg)	3.20
Purchased Part Cost	
	\$17.87
Material Cost	
	\$68.94
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$10.42
Supplier Fab. Cost	
	\$9.21
Q Burden	
	\$1.75
SG&A	
	\$20.02
Manufacturing Cost*	
	\$128.21

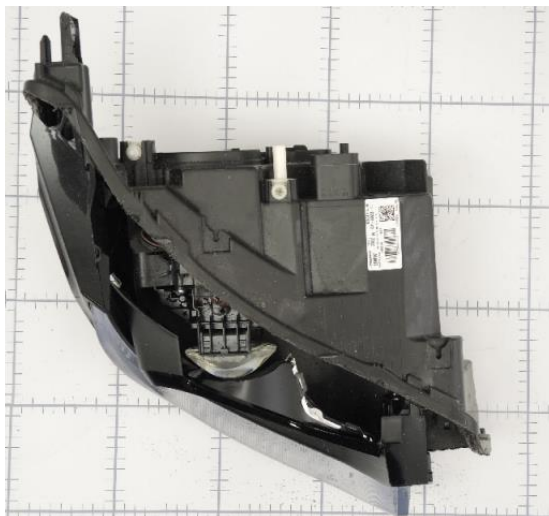
* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Passenger Head Lamp



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 \Passenger Head Lamp Asm
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp

Assembly Summary

Parts	86
Fasteners	29
Part Numbers	52
Steps	357
Fastenings	106
Right First Time	89.46 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	19.15
Total Weight (kg)	2.60

Material Cost**	\$83.18
OEM Process Cost	\$0.00
Supplier Process Cost	\$14.36
Q Burden	\$1.67
SG&A	\$18.06
Manufacturing Cost*	\$117.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Passenger Head Lamp



Housing Asm, Passenger Head Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Passenger Head Lamp Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.37	0.7720
Assemble Wiring to Housing	1	1	9	20	9	99.15 %	0.00	0.00	1.32	0.00	0.1075
Bevel Gear, Housing Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0014
Snap In Bevel Gear Short Asm, Housing Asm	1	2	1	5	1	99.95 %	0.00	0.00	0.13	0.03	0.0068
Snap In Bevel Gear Large Asm, Housing Asm	1	2	1	5	1	99.95 %	0.00	0.00	0.13	0.03	0.0076
Assemble Actuator Gear Arm	1	1	5	10	5	99.52 %	0.00	0.00	0.53	0.00	0.0003
Head Lamp Moisture Valve Asm, Housing Asm	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0012
Cap Asm, Housing Asm	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0005
Twist Cap Asm, Housing Asm	1	2	3	11	3	99.88 %	0.00	0.00	0.18	0.06	0.0275
Assemble Cap and Moisture Valve	1	2	5	10	5	99.84 %	0.00	0.00	0.45	0.00	0.0030
LED Circuit Board Asm, Housing Asm	1	2	3	5	3	99.89 %	0.00	0.00	0.22	0.00	0.1394
Assemble LED Circuit Board Asm	1	6	7	15	7	99.21 %	0.00	0.00	0.87	0.00	0.0116

Housing Asm, Passenger Head Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Passenger Head Lamp Housing Asm	\$0.00	\$1.65	\$0.00	\$0.00	\$0.00	\$0.23	\$0.00	\$0.41	\$2.29
Assemble Wiring to Housing	\$0.00	\$8.26	\$0.00	\$0.00	\$0.99	\$0.00	\$0.13	\$2.03	\$11.41
Bevel Gear, Housing Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.02
Snap In Bevel Gear Short Asm, Housing Asm	\$0.04	\$0.02	\$0.00	\$0.00	\$0.10	\$0.01	\$0.01	\$0.03	\$0.21
Snap In Bevel Gear Large Asm, Housing Asm	\$0.04	\$0.03	\$0.00	\$0.00	\$0.10	\$0.01	\$0.01	\$0.03	\$0.22
Assemble Actuator Gear Arm	\$0.01	\$0.00	\$0.00	\$0.00	\$0.40	\$0.00	\$0.07	\$0.09	\$0.57
Head Lamp Moisture Valve Asm, Housing Asm	\$0.09	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.25
Cap Asm, Housing Asm	\$0.02	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.18
Twist Cap Asm, Housing Asm	\$0.00	\$0.12	\$0.00	\$0.00	\$0.12	\$0.02	\$0.02	\$0.06	\$0.34
Assemble Cap and Moisture Valve	\$0.02	\$0.00	\$0.00	\$0.00	\$0.34	\$0.00	\$0.02	\$0.07	\$0.46
LED Circuit Board Asm, Housing Asm	\$0.05	\$3.44	\$0.00	\$0.00	\$0.16	\$0.00	\$0.02	\$0.79	\$4.46
Assemble LED Circuit Board Asm	\$0.42	\$0.00	\$0.00	\$0.00	\$0.65	\$0.00	\$0.12	\$0.16	\$1.34

Housing Asm, Passenger Head Lamp



Housing Asm, Passenger Head Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Frontal Light Electronics Asm, Housing Asm	1	2	2	4	2	99.91 %	0.00	0.00	0.17	0.00	0.3218
Assemble Actuator Motor Housed Circuit	1	6	7	18	7	98.90 %	0.00	0.00	1.10	0.00	0.1064
Actuator Arm Short, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0035
Actuator Arm Long, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0042
Assemble Actuator Arms	1	0	4	7	4	99.52 %	0.00	0.00	0.38	0.00	0.0000
Actuator Bracket, Housing Asm	1	8	9	36	9	99.16 %	0.00	0.00	1.47	0.15	0.1200
Assemble Actuator Bracket	1	0	3	4	3	99.74 %	0.00	0.00	0.20	0.00	0.0000
Adaptive Lens Asm, Housing Asm	1	28	23	120	23	96.75 %	0.00	0.00	3.26	3.73	0.4664
Assemble Adaptive Lens Asm	1	4	8	17	8	99.00 %	0.00	0.00	1.12	0.00	0.0064
Interior Trim Asm, Housing Asm	1	7	9	29	9	99.28 %	0.00	0.00	1.02	1.17	0.4803
Assemble Interior Trim	1	2	3	7	3	99.55 %	0.00	0.00	0.40	0.00	0.0040
LED Cover Asm, Housing Asm	1	2	1	5	1	99.91 %	0.00	0.00	0.13	0.03	0.0052

Housing Asm, Passenger Head Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Frontal Light Electronics Asm, Housing Asm	\$0.05	\$33.77	\$0.00	\$0.00	\$0.15	\$0.00	\$0.01	\$7.46	\$41.45
Assemble Actuator Motor Housed Circuit	\$10.05	\$0.00	\$0.00	\$0.00	\$0.83	\$0.00	\$0.17	\$0.48	\$11.52
Actuator Arm Short, Housing Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Actuator Arm Long, Housing Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Actuator Arms	\$0.00	\$0.00	\$0.00	\$0.00	\$0.29	\$0.00	\$0.07	\$0.06	\$0.42
Actuator Bracket, Housing Asm	\$0.03	\$2.91	\$0.00	\$0.00	\$1.17	\$0.06	\$0.13	\$0.91	\$5.20
Assemble Actuator Bracket	\$0.00	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.04	\$0.03	\$0.22
Adaptive Lens Asm, Housing Asm	\$6.97	\$5.35	\$0.00	\$0.00	\$2.39	\$3.23	\$0.50	\$2.62	\$21.06
Assemble Adaptive Lens Asm	\$0.04	\$0.00	\$0.00	\$0.00	\$0.84	\$0.00	\$0.15	\$0.19	\$1.21
Interior Trim Asm, Housing Asm	\$0.02	\$1.81	\$0.00	\$0.00	\$0.88	\$0.48	\$0.11	\$0.70	\$4.00
Assemble Interior Trim	\$0.02	\$0.00	\$0.00	\$0.00	\$0.30	\$0.00	\$0.07	\$0.07	\$0.45
LED Cover Asm, Housing Asm	\$0.00	\$7.90	\$0.00	\$0.00	\$0.12	\$0.01	\$0.01	\$1.77	\$9.82

Housing Asm, Passenger Head Lamp



Housing Asm, Passenger Head Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble LED Cover	1	0	1	2	1	99.97 %	0.00	0.00	0.07	0.00	0.0000

Housing Asm, Passenger Head Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble LED Cover	\$0.00	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$0.01	\$0.07

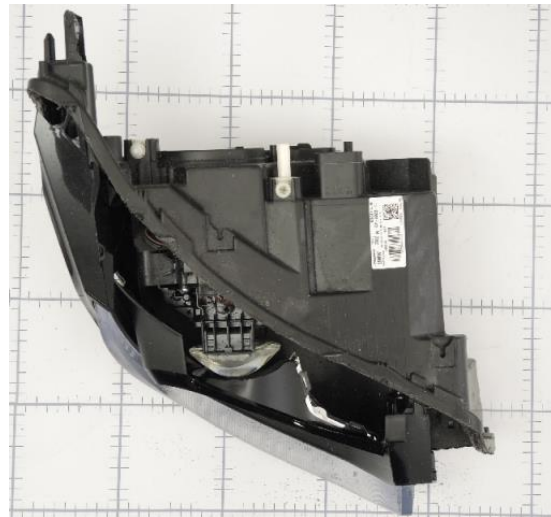
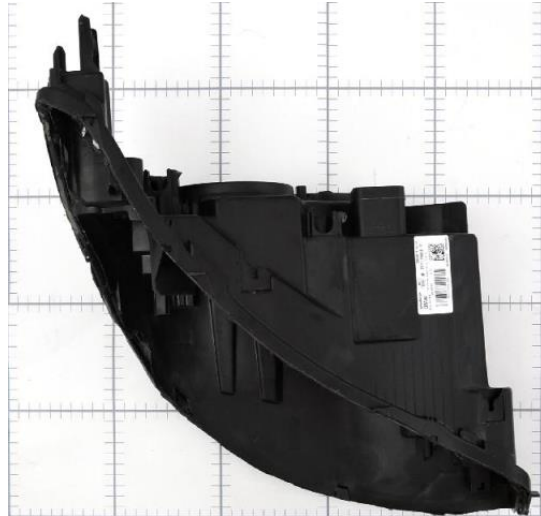
Detailed Summary

Parts	86
Fasteners	29
Part Numbers	52
Steps	357
Fastenings	106
Right First Time	89.46%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	13.48
Supplier Fab. Time (Min)	5.67
Total Weight (kg)	2.60
Purchased Part Cost	
	\$17.87
Material Cost	
	\$65.31
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$10.27
Supplier Fab. Cost	
	\$4.10
Q Burden	
	\$1.67
SG&A	
	\$18.06
Manufacturing Cost*	
	\$117.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Passenger Head Lamp Housing Asm



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\Housing Asm, Passenger Head Lamp

\Housing, Passenger Head Lamp Housing Asm

\Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	22.02
Total Weight (kg)	0.77

Material Cost**	\$1.65
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.00
SG&A	\$0.41
Manufacturing Cost*	\$2.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Passenger Head Lamp Housing Asm



Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	22.02	1	0.25	37.36	ESP	\$0.23	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Head Lamp Housing	1	PPTD40	\$2.14	0.7720	0.7720	\$0.00	\$1.65

Assemble Wiring to Housing



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Wiring to Housing

Process Summary

Right First Time	99.15 %
Process Time (Sec)	79.00
Total Weight (kg)	0.11

Material Cost**	\$8.26
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.99
Q Burden	\$0.13
SG&A	\$2.03
Manufacturing Cost*	\$11.41



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Wiring to Housing



Assemble Wiring to Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	79.00	1	1.00	45.01	ESP	\$0.99	99.15%	\$0.13

Assemble Wiring to Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiring, Housing Asm	1	See Appendix	-	0.1075	-	\$0.00	\$8.26

[Click Here for Munro & Associates Wire Harness Report on Housing Asm, Head Lamp Wire Harness](#)

Bevel Gear, Housing Asm



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\Housing Asm, Passenger Head Lamp

\Bevel Gear, Housing Asm

\Bevel Gear Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.30
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bevel Gear, Housing Asm



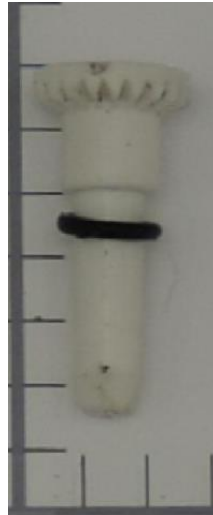
Bevel Gear Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	10.40	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Bevel Gear Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Bevel Gear	1	PBT	\$3.06	0.0014	0.0016	\$0.00	\$0.01

Snap In Bevel Gear Short Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Snap In Bevel Gear Short Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.16
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Snap In Bevel Gear Short Asm, Housing Asm



Snap In Bevel Gear Short Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Short Gear, Snap In Bevel Gear Short Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0066
Assemble Snap In Bevel Gear Short	1	1	1	3	1	99.96 %	0.00	0.00	0.13	0.00	0.0002

Snap In Bevel Gear Short Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Short Gear, Snap In Bevel Gear Short Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble Snap In Bevel Gear Short	\$0.04	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.17

Snap In Bevel Gear Short Asm, Housing Asm

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.13
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.01
<hr/>	
Purchased Part Cost	\$0.04
Material Cost	\$0.02
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.10
Supplier Fab. Cost	\$0.01
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Short Gear, Snap In Bevel Gear Short Asm



\...

- \Snap In Bevel Gear Short Asm, Housing Asm
- \Short Gear, Snap In Bevel Gear Short Asm
- \Snap In Bevel Gear Short

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.61
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Short Gear, Snap In Bevel Gear Short Asm



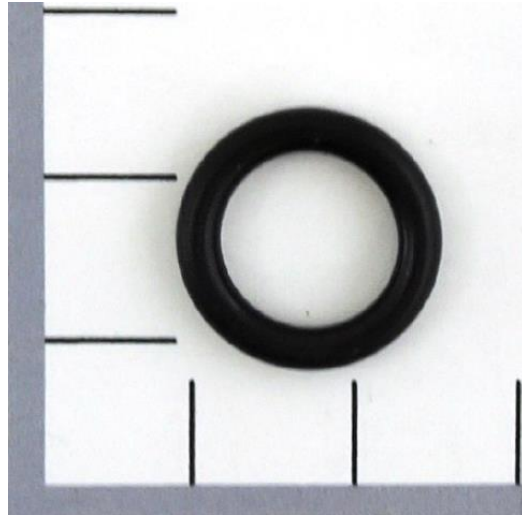
Snap In Bevel Gear Short

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.88	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Snap In Bevel Gear Short

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Snap In Bevel Gear Short	1	PBT GF10	\$3.46	0.0066	0.0071	\$0.00	\$0.02

Assemble Snap In Bevel Gear Short



\...

- \Housing Asm, Passenger Head Lamp
- \Snap In Bevel Gear Short Asm, Housing Asm
- \Assemble Snap In Bevel Gear Short

Process Summary

Right First Time	99.96 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00
Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Snap In Bevel Gear Short



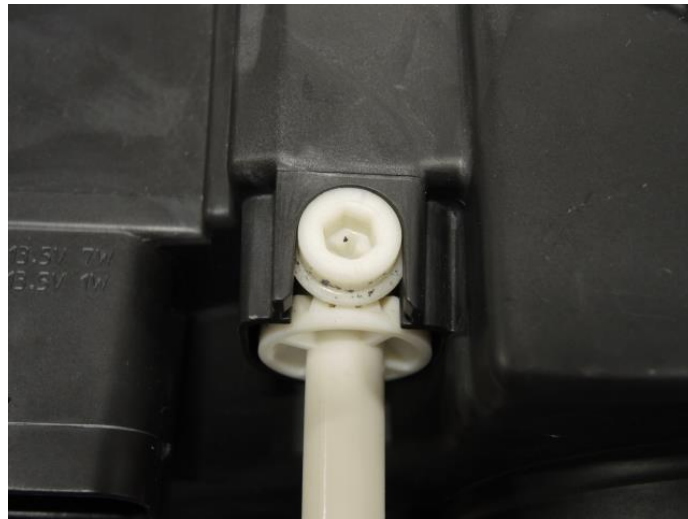
Assemble Snap In Bevel Gear Short

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	45.01	ESP	\$0.10	99.96%	\$0.01

Assemble Snap In Bevel Gear Short

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
■ Snap In Bevel Gear O-ring	1	Commodity Item	Purchased	0.0002	-	\$0.04	\$0.00

Snap In Bevel Gear Large Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Snap In Bevel Gear Large Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.16
Total Weight (kg)	0.01

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Snap In Bevel Gear Large Asm, Housing Asm



Snap In Bevel Gear Large Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Long Gear, Snap In Bevel Gear Long Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0074
Assemble Snap In Bevel Gear Long	1	1	1	3	1	99.96 %	0.00	0.00	0.13	0.00	0.0002

Snap In Bevel Gear Large Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Long Gear, Snap In Bevel Gear Long Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Assemble Snap In Bevel Gear Long	\$0.04	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.17

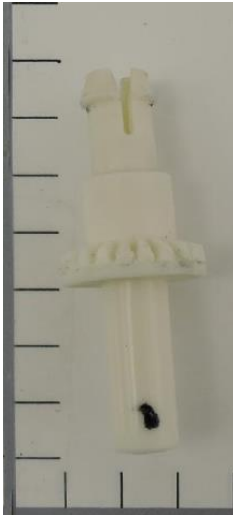
Snap In Bevel Gear Large Asm, Housing Asm

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.95%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.13
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.01
Purchased Part Cost	\$0.04
Material Cost	\$0.03
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.10
Supplier Fab. Cost	\$0.01
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Snap In Bevel Gear Large Asm, Housing Asm
- \Long Gear, Snap In Bevel Gear Long Asm
- \Snap In Bevel Gear Long Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.62
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Long Gear, Snap In Bevel Gear Long Asm



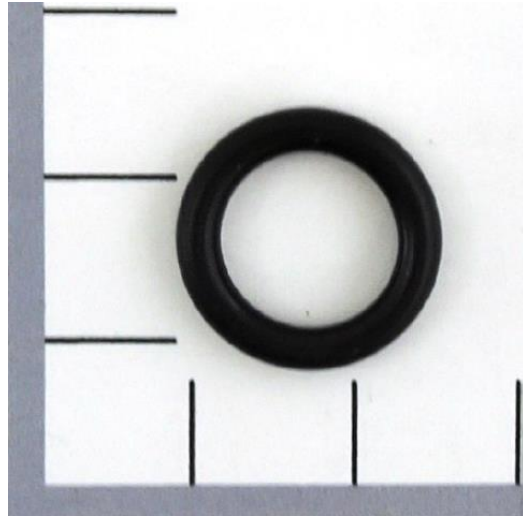
Snap In Bevel Gear Long Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.96	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Snap In Bevel Gear Long Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Long Gear	1	PBT GF10	\$3.46	0.0074	0.0082	\$0.00	\$0.03

Assemble Snap In Bevel Gear Long



\...

- \Housing Asm, Passenger Head Lamp
- \Snap In Bevel Gear Large Asm, Housing Asm
- \Assemble Snap In Bevel Gear Long

Process Summary

Right First Time	99.96 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Snap In Bevel Gear Long



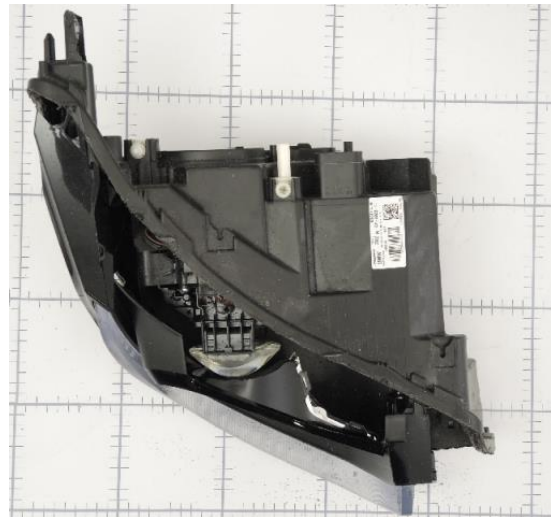
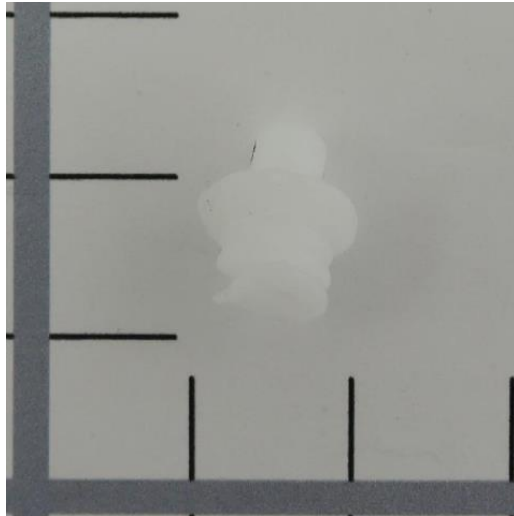
Assemble Snap In Bevel Gear Long

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	45.01	ESP	\$0.10	99.96%	\$0.01

Assemble Snap In Bevel Gear Long

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Snap In Bevel Gear O-ring	1	Commodity Item	Purchased	0.0002	-	\$0.04	\$0.00

Assemble Actuator Gear Arm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Actuator Gear Arm

Process Summary

Right First Time	99.52 %
Process Time (Sec)	32.00
Total Weight (kg)	0.00
Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.40
Q Burden	\$0.07
SG&A	\$0.09
Manufacturing Cost*	\$0.57

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Gear Arm



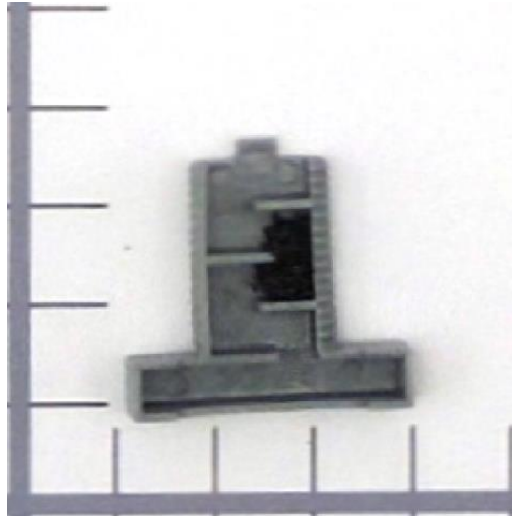
Assemble Actuator Gear Arm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	32.00	1	1.00	45.01	ESP	\$0.40	99.52 %	\$0.07

Assemble Actuator Gear Arm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Bevel Gear Cap, Housing Asm	1	Commodity Item	Purchased	0.0003	-	\$0.01	\$0.00

Head Lamp Moisture Valve Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Head Lamp Moisture Valve Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.17
Total Weight (kg)	0.00

Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Head Lamp Moisture Valve Asm, Housing Asm



Head Lamp Moisture Valve Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Moisture Vent	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0012

Head Lamp Moisture Valve Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Moisture Vent	\$0.09	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.25

Head Lamp Moisture Valve Asm, Housing Asm

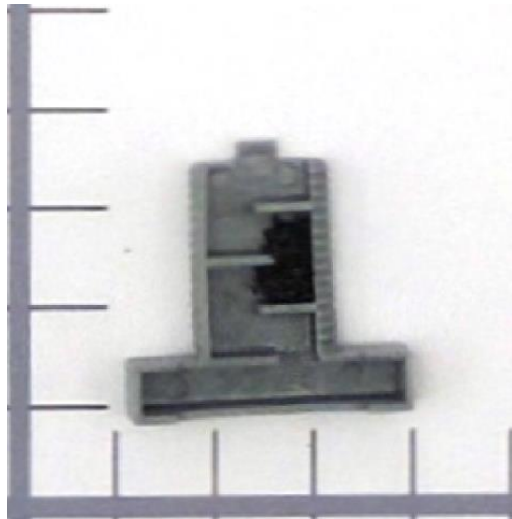
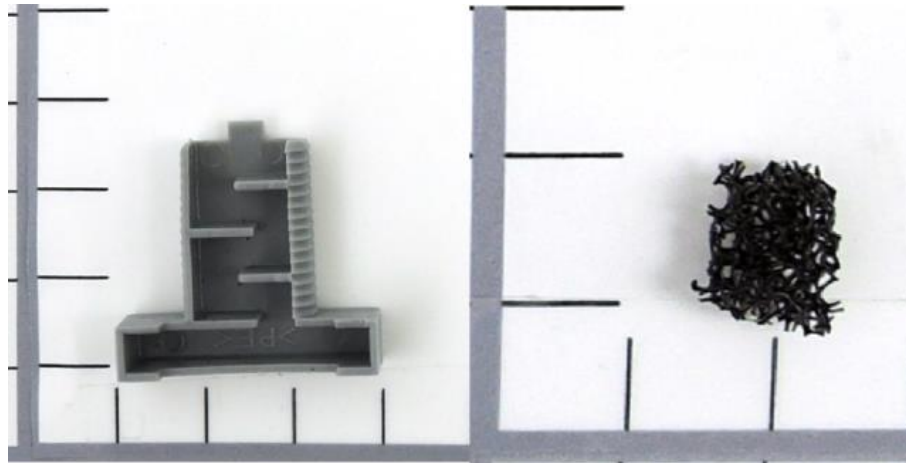
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.00
Purchased Part Cost	\$0.09
Material Cost	\$0.00
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.13
Supplier Fab. Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Moisture Vent



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- \Housing Asm, Passenger Head Lamp
- \Head Lamp Moisture Valve Asm, Housing Asm
- \Assemble Moisture Vent

Process Summary

Right First Time	99.97 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00
Material Cost**	\$0.09
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Moisture Vent



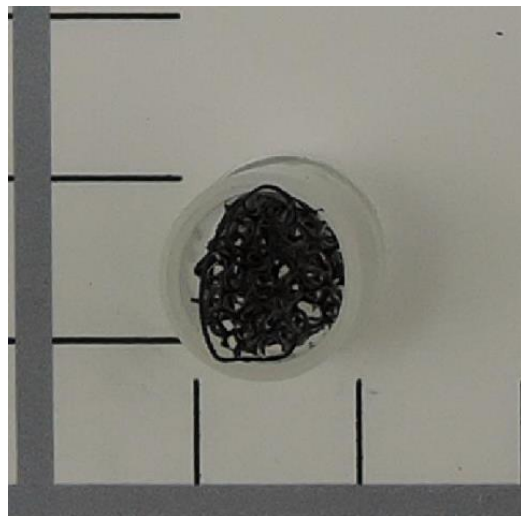
Assemble Moisture Vent

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.97%	\$0.00

Assemble Moisture Vent

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Moisture Vent Head Lamp, Moisture Vent Head Lamp	1	Commodity Item	Purchased	0.0011	-	\$0.08	\$0.00
Low Density Foam	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Cap Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Cap Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.17
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap Asm, Housing Asm



Cap Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Cap Head Lamp	1	2	1	3	1	99.97 %	0.00	0.00	0.17	0.00	0.0005

Cap Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Cap Head Lamp	\$0.02	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.00	\$0.03	\$0.18

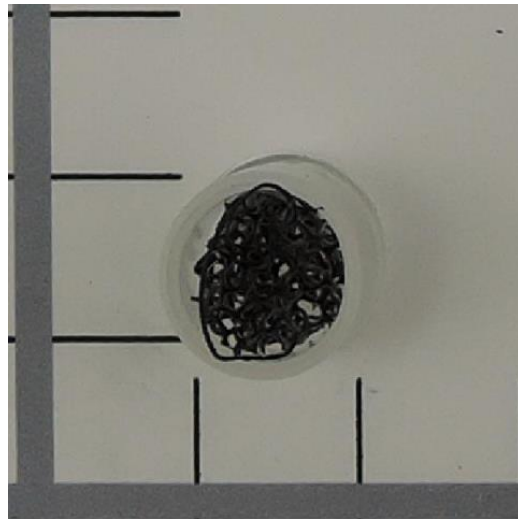
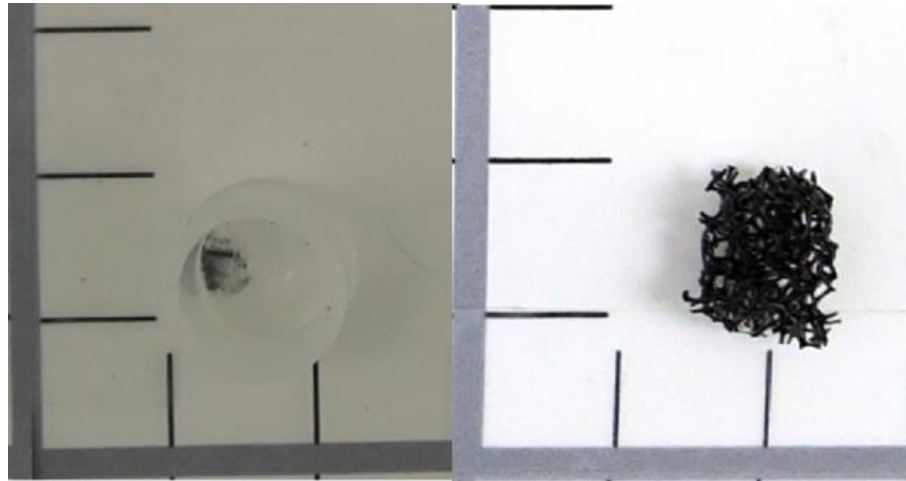
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	3
Fastenings	1
Right First Time	99.97%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.00
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Purchased Part Cost	\$0.02
Material Cost	\$0.00
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.13
Supplier Fab. Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cap Head Lamp



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\Housing Asm, Passenger Head Lamp

\Cap Asm, Housing Asm

\Assemble Cap Head Lamp

Process Summary

Right First Time	99.97 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cap Head Lamp



Assemble Cap Head Lamp

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.97%	\$0.00

Assemble Cap Head Lamp

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Cap, Cap Asm	1	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00
Low Density Foam	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Twist Cap Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Twist Cap Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	11
Fastenings	3
Right First Time	99.88 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.25
Total Weight (kg)	0.03

Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.02
SG&A	\$0.06
Manufacturing Cost*	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Twist Cap Asm, Housing Asm



Twist Cap Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Twist Cap, Twist Cap Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0241
Foam Insert, TwistCap Asm	1	1	2	5	2	99.95 %	0.00	0.00	0.05	0.02	0.0034
Assemble Twist Cap	1	0	1	3	1	99.94 %	0.00	0.00	0.13	0.00	0.0000

Twist Cap Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Twist Cap, Twist Cap Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.03	\$0.16
Foam Insert, TwistCap Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.02	\$0.00	\$0.01	\$0.01	\$0.05
Assemble Twist Cap	\$0.00	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.13

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	11
Fastenings	3
Right First Time	99.88%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.18
Supplier Fab. Time (Min)	0.06
Total Weight (kg)	0.03
Purchased Part Cost	
	\$0.00
Material Cost	
	\$0.12
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.12
Supplier Fab. Cost	
	\$0.02
Q Burden	
	\$0.02
SG&A	
	\$0.06
Manufacturing Cost*	
	\$0.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Twist Cap, Twist Cap Asm



\...

- \Twist Cap Asm, Housing Asm
- \Twist Cap, Twist Cap Asm
- \Twist Cap Head Lamp Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.69
Total Weight (kg)	0.02

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.16



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Twist Cap, Twist Cap Asm



Twist Cap Head Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	10.76	4	0.25	21.64	ESP	\$0.02	99.99%	\$0.00

Twist Cap Head Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Twist Cap	1	PBT+ASA GF20	\$4.17	0.0241	0.0259	\$0.00	\$0.11

Foam Insert, Twist Cap Asm



\...

- \Twist Cap Asm, Housing Asm
- \Foam Insert, Twist Cap Asm
- \Foam Insert Process

Process Summary

Right First Time	99.95 %
Process Time (Sec)	4.02
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.05



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Foam Insert, Twist Cap Asm



Foam Insert Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Automated Asm	3.02	1	0.25	23.36	ESP	\$0.02	99.96%	\$0.01
25 Ton Trim Press	1.00	1	0.25	16.83	ESP	\$0.00	99.99%	\$0.00

Foam Insert Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Medium Density Foam, Foam Insert Twist Cap	1	Medium Density Foam	By Area	0.0034	-	\$0.00	\$0.01

No Commodity Items Required for This Process



\...

- \Housing Asm, Passenger Head Lamp
- \Twist Cap Asm, Housing Asm
- \Assemble Twist Cap

Process Summary

Right First Time	99.94 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Twist Cap



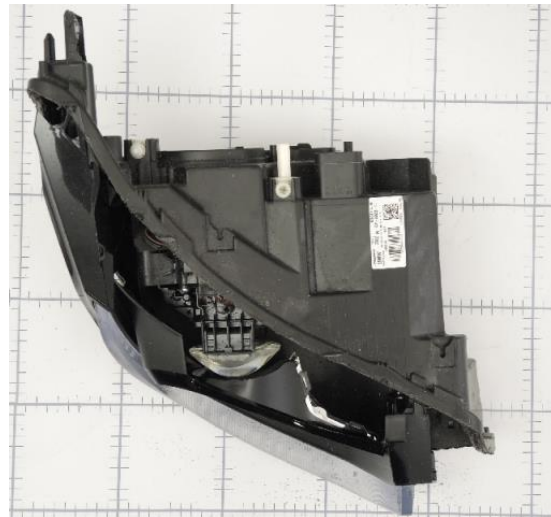
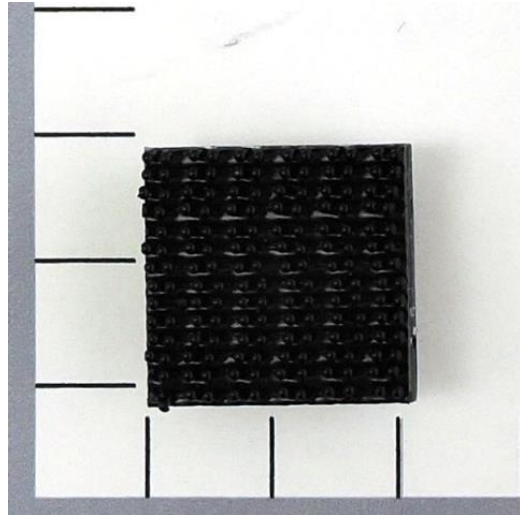
Assemble Twist Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	45.01	ESP	\$0.10	99.94%	\$0.01

Assemble Twist Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Cap and Moisture Valve



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Cap and Moisture Valve

Process Summary

Right First Time	99.84 %
Process Time (Sec)	27.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.34
Q Burden	\$0.02
SG&A	\$0.07
Manufacturing Cost*	\$0.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Cap and Moisture Valve



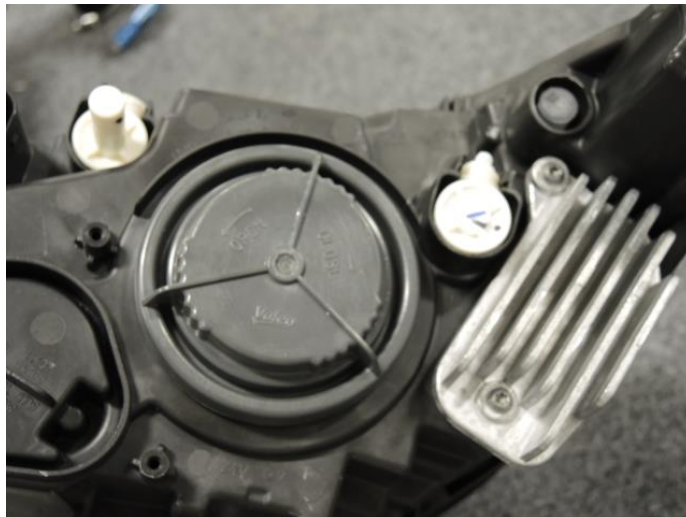
Assemble Cap and Moisture Valve

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	27.00	1	1.00	45.01	ESP	\$0.34	99.84 %	\$0.02

Assemble Cap and Moisture Valve

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Beauty Cover Velcro	2	Commodity Item	Purchased	0.0015	-	\$0.01	\$0.00

LED Circuit Board Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \LED Circuit Board Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	3
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.22
Total Weight (kg)	0.14

Material Cost**	\$3.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.79
Manufacturing Cost*	\$4.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Circuit Board Asm, Housing Asm



LED Circuit Board Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble LED CircuitBoard	1	2	3	5	3	99.89%	0.00	0.00	0.22	0.00	0.1394

LED Circuit Board Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble LED CircuitBoard	\$0.05	\$3.44	\$0.00	\$0.00	\$0.16	\$0.00	\$0.02	\$0.79	\$4.46

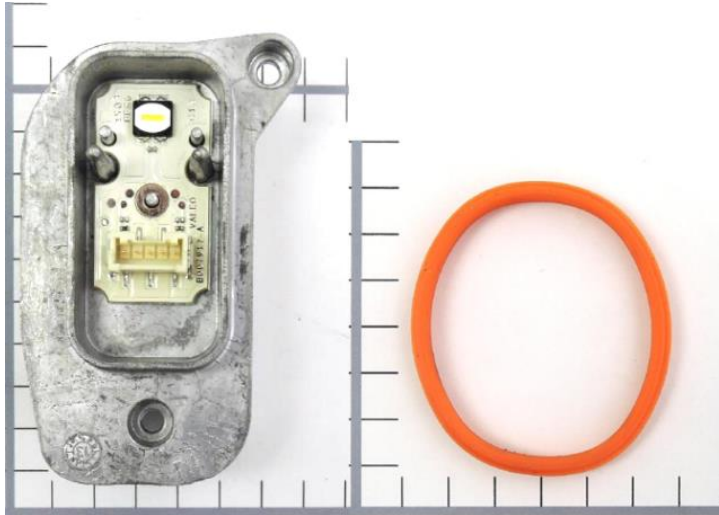
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	3
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.22
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.14
<hr/>	
Purchased Part Cost	\$0.05
Material Cost	\$3.44
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.16
Supplier Fab. Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.79
Manufacturing Cost*	\$4.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit Board



- \...
- \Housing Asm, Passenger Head Lamp
- \LED Circuit Board Asm, Housing Asm
- \Assemble LED Circuit Board

Process Summary

Right First Time	99.89 %
Process Time (Sec)	13.00
Total Weight (kg)	0.14

Material Cost**	\$3.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.16
Q Burden	\$0.02
SG&A	\$0.79
Manufacturing Cost*	\$4.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit Board



Assemble LED Circuit Board

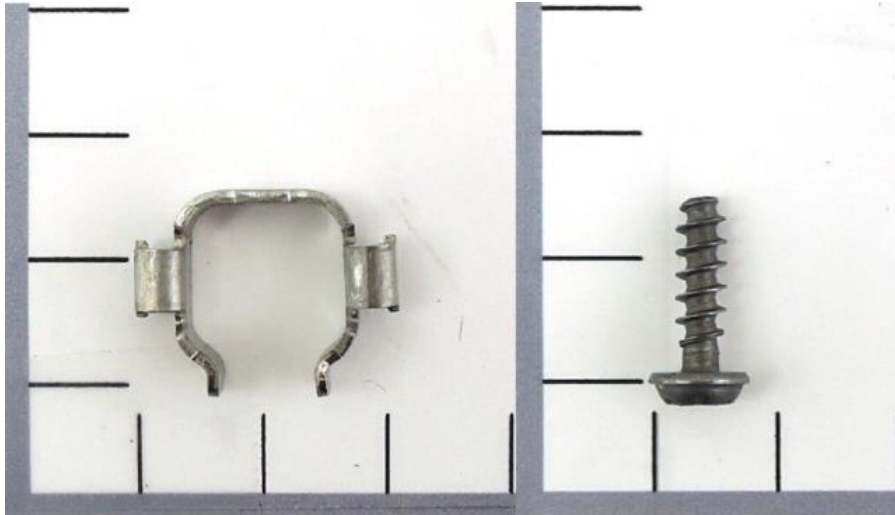
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	13.00	1	1.00	45.01	ESP	\$0.16	99.89%	\$0.02

Assemble LED Circuit Board

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Daytime Running Lamp ASM, Passenger Side	1	See Appendix	-	0.1360	-	\$0.00	\$3.44
LED Circuit Board Seal, LED Circuit Board Asm	1	Commodity Item	Purchased	0.0034	-	\$0.05	\$0.00

[Click Here for TechInsights Electronics Report on Daytime Running Lamp Asm](#)

Assemble LED Circuit Board Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble LED Circuit Board Asm

Process Summary

Right First Time	99.21 %
Process Time (Sec)	52.00
Total Weight (kg)	0.01

Material Cost**	\$0.42
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.65
Q Burden	\$0.12
SG&A	\$0.16
Manufacturing Cost*	\$1.34



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit Board Asm



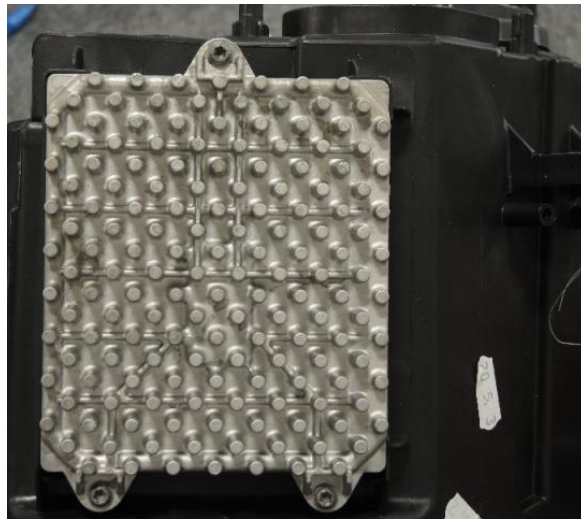
Assemble LED Circuit Board Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	52.00	1	1.00	45.01	ESP	\$0.65	99.21 %	\$0.12

Assemble LED Circuit Board Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x12mm-Pan Head Torx	2	Commodity Item	Purchased	0.0012	-	\$0.01	\$0.00
Compression Sleeve, Head Lamps	4	Commodity Item	Purchased	0.0023	-	\$0.10	\$0.00

Frontal Light Electronics Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Frontal Light Electronics Asm, Housing Asm
Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	4
Fastenings	2
Right First Time	99.91 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.17
Total Weight (kg)	0.32

Material Cost**	\$33.82
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.01
SG&A	\$7.46
Manufacturing Cost*	\$41.45

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Frontal Light Electronics Asm, Housing Asm



Frontal Light Electronics Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Assemble Housed Circuit	1	2	2	4	2	99.91 %	0.00	0.00	0.17	0.00	0.3218

Frontal Light Electronics Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Assemble Housed Circuit	\$0.05	\$33.77	\$0.00	\$0.00	\$0.15	\$0.00	\$0.01	\$7.46	\$41.45

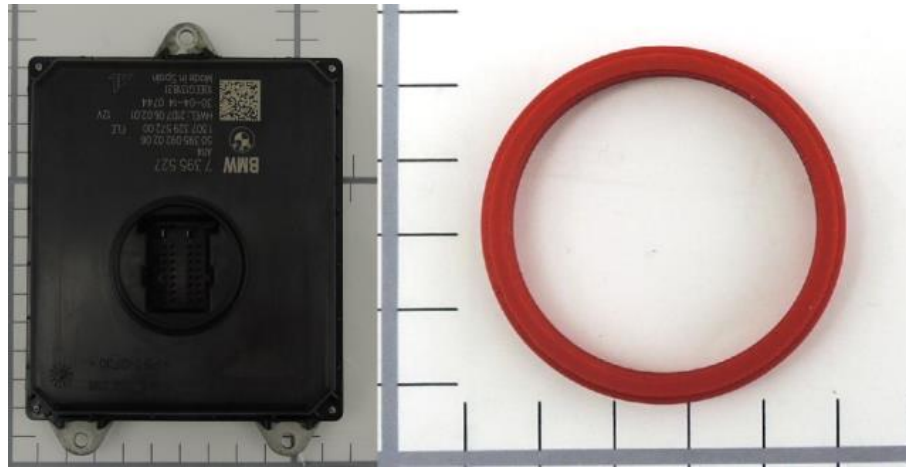
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	4
Fastenings	2
Right First Time	99.91%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.00
Total Weight (kg)	0.32
Purchased Part Cost	
	\$0.05
Material Cost	
	\$33.77
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.15
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.01
SG&A	
	\$7.46
Manufacturing Cost*	
	\$41.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housed Circuit



- \...
- \Housing Asm, Passenger Head Lamp
- \Frontal Light Electronics Asm, Housing Asm
- \Assemble Housed Circuit

Process Summary

Right First Time	99.91 %
Process Time (Sec)	10.00
Total Weight (kg)	0.32

Material Cost**	\$33.82
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.01
SG&A	\$7.46
Manufacturing Cost*	\$41.45

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housed Circuit



Assemble Housed Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	54.32	GER	\$0.15	99.91 %	\$0.01

Assemble Housed Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Headlamp Actuator Motor, Passenger Side	1	See Appendix	-	0.3188	-	\$0.00	\$33.77
Actuator Motor Housed Circuit Seal, Head Lamp	1	Commodity Item	Purchased	0.0030	-	\$0.05	\$0.00

[Click Here for TechInsights Electronics Report on Headlamp Actuator Motor Controller](#)

Assemble Actuator Motor Housing Circuit

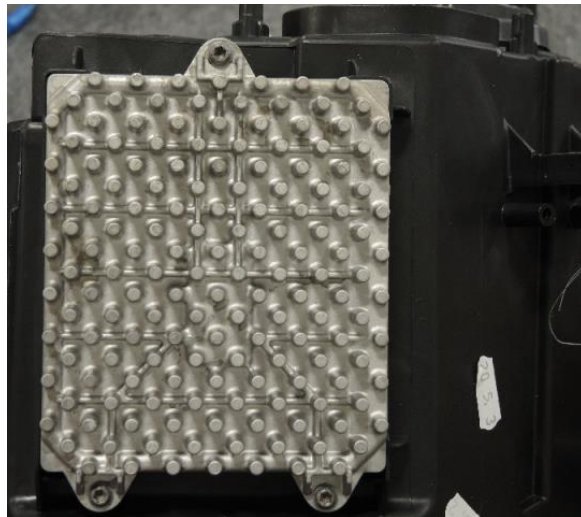


\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Actuator Motor Housing Circuit

Process Summary

Right First Time	98.90 %
Process Time (Sec)	66.00
Total Weight (kg)	0.11

Material Cost**	\$10.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.83
Q Burden	\$0.17
SG&A	\$0.48
Manufacturing Cost*	\$11.52



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Motor Housed Circuit



Assemble Actuator Motor Housed Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	66.00	1	1.00	45.01	ESP	\$0.83	98.90%	\$0.17

Assemble Actuator Motor Housed Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x12mm-Pan Head Torx	3	Commodity Item	Purchased	0.0012	-	\$0.01	\$0.00
Actuator Motor, Head Lamps	1	Commodity Item	Purchased	0.0988	-	\$10.00	\$0.00
M4x20mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00

Actuator Arm Short, Housing Asm



\...

\Housing Asm, Passenger Head Lamp

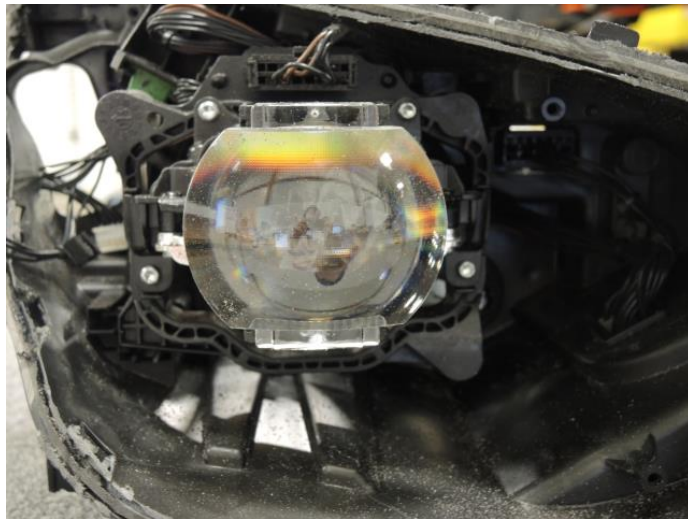
\Actuator Arm Short, Housing Asm

\Actuator Arm Short Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.04
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Short, Housing Asm



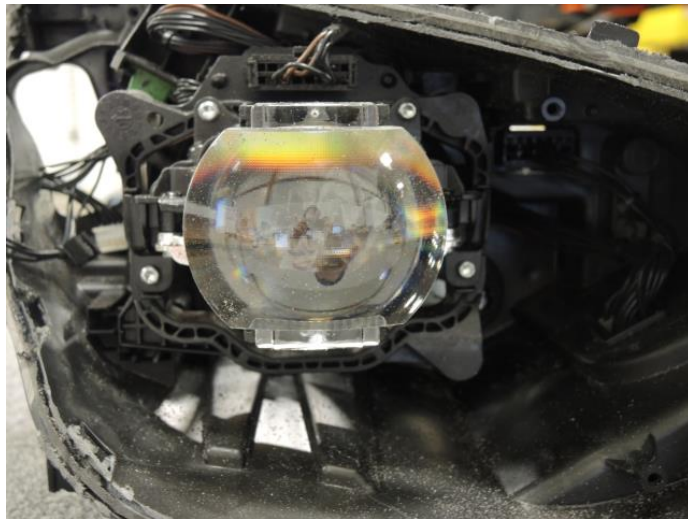
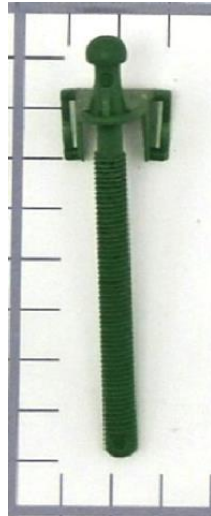
Actuator Arm Short Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.32	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Arm Short Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm Short	1	PA66 GF30	\$3.95	0.0035	0.0038	\$0.00	\$0.01

Actuator Arm Long, Housing Asm



\...

\Housing Asm, Passenger Head Lamp

\Actuator Arm Long, Housing Asm

\Actuator Arm Long Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.04
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Long, Housing Asm



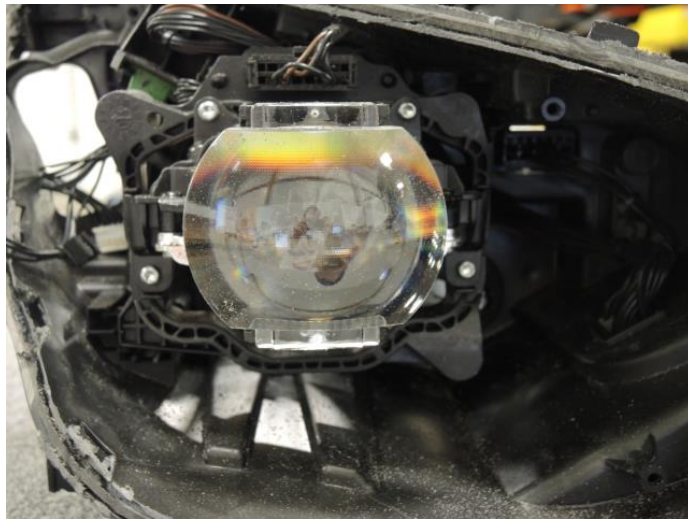
Actuator Arm Long Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	16.32	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Arm Long Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm Long	1	PA66 GF30	\$3.95	0.0042	0.0045	\$0.00	\$0.02

No Commodity Items Required for This Process



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Actuator Arms

Process Summary

Right First Time	99.52 %
Process Time (Sec)	23.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.29
Q Burden	\$0.07
SG&A	\$0.06
Manufacturing Cost*	\$0.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Arms



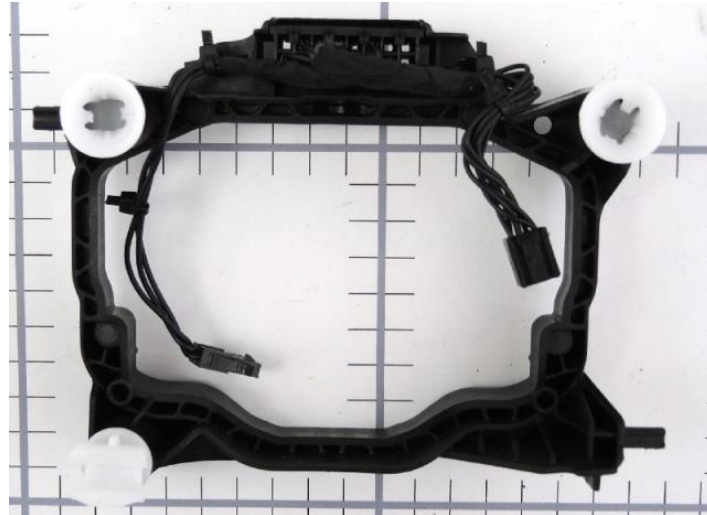
Assemble Actuator Arms

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	23.00	1	1.00	45.01	ESP	\$0.29	99.52 %	\$0.07

Assemble Actuator Arms

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Actuator Bracket, Housing Asm



- \...
- \Passenger Head Lamp Housing Asm, Passenger Head
- La \Housing Asm, Passenger Head Lamp
- \Actuator Bracket, Housing Asm

Assembly Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	36
Fastenings	9
Right First Time	99.16 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.61
Total Weight (kg)	0.12

Material Cost**	\$2.94
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.23
Q Burden	\$0.13
SG&A	\$0.91
Manufacturing Cost*	\$5.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Bracket, Housing Asm



Actuator Bracket, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Bracket Asm, Actuator Bracket	1	7	6	28	6	99.32 %	0.00	0.00	1.03	0.15	0.1021
Assemble Bracket Wiring	1	1	3	7	3	99.83 %	0.00	0.00	0.43	0.00	0.0179

Actuator Bracket, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Bracket Asm, Actuator Bracket	\$0.03	\$0.35	\$0.00	\$0.00	\$0.78	\$0.06	\$0.10	\$0.26	\$1.58
Assemble Bracket Wiring	\$0.00	\$2.56	\$0.00	\$0.00	\$0.39	\$0.00	\$0.03	\$0.65	\$3.63

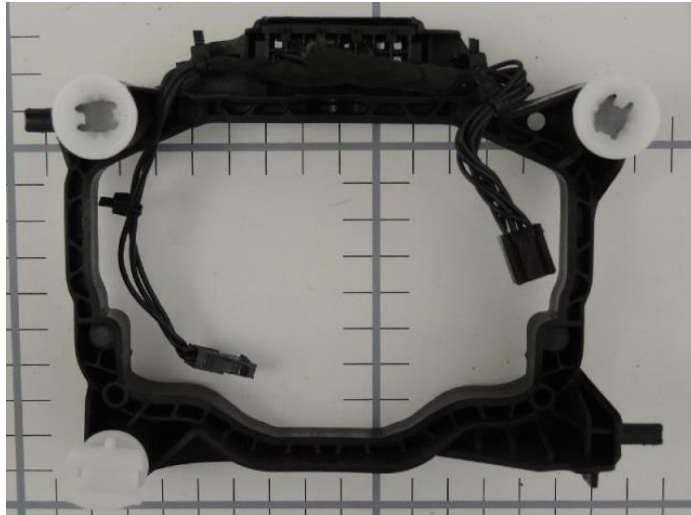
Detailed Summary

Parts	8
Fasteners	0
Part Numbers	5
Steps	36
Fastenings	9
Right First Time	99.16%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.47
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.12
Purchased Part Cost	
	\$0.03
Material Cost	
	\$2.91
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$1.17
Supplier Fab. Cost	
	\$0.06
Q Burden	
	\$0.13
SG&A	
	\$0.91
Manufacturing Cost*	
	\$5.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket Asm, Actuator Bracket



\...

\Housing Asm, Passenger Head Lamp

\Actuator Bracket, Housing Asm

\Bracket Asm, Actuator Bracket

Assembly Summary

Parts	7
Fasteners	0
Part Numbers	4
Steps	28
Fastenings	6
Right First Time	99.32 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.18
Total Weight (kg)	0.10

Material Cost**	\$0.38
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.83
Q Burden	\$0.10
SG&A	\$0.26
Manufacturing Cost*	\$1.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket Asm, Actuator Bracket



Bracket Asm, Actuator Bracket

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Bracket, Bracket Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.10	0.0945
Ball Stud UBracket, Housing Asm	1	2	1	5	1	99.89 %	0.00	0.00	0.15	0.03	0.0032
Actuator Arm, Cap	2	2	1	5	1	99.89 %	0.00	0.00	0.20	0.01	0.0022
Assemble U Bracket and Actuator Arm Cap	1	0	3	8	3	99.68 %	0.00	0.00	0.48	0.00	0.0000

Bracket Asm, Actuator Bracket

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Bracket, Bracket Asm	\$0.00	\$0.32	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.08	\$0.44
Ball Stud UBracket, Housing Asm	\$0.01	\$0.01	\$0.00	\$0.00	\$0.11	\$0.01	\$0.02	\$0.03	\$0.19
Actuator Arm, Cap	\$0.01	\$0.01	\$0.00	\$0.00	\$0.15	\$0.00	\$0.02	\$0.04	\$0.23
Assemble U Bracket and Actuator Arm Cap	\$0.00	\$0.00	\$0.00	\$0.00	\$0.36	\$0.00	\$0.05	\$0.08	\$0.49

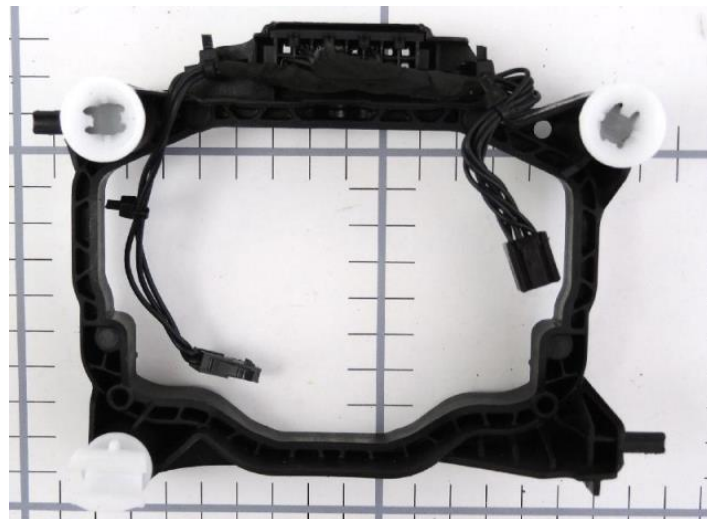
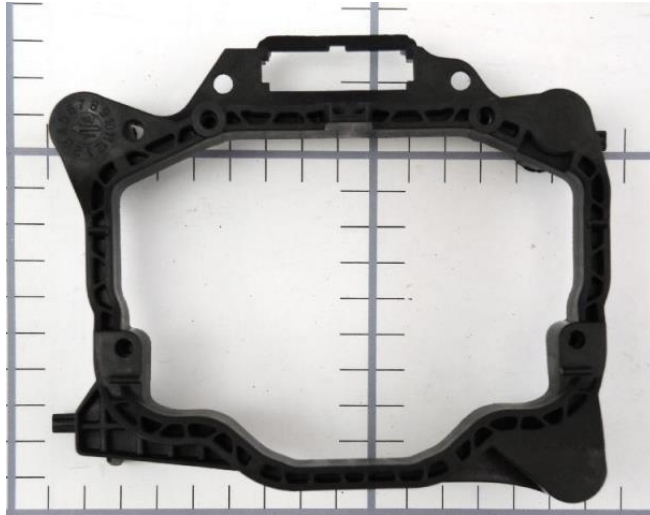
Detailed Summary

Parts	7
Fasteners	0
Part Numbers	4
Steps	28
Fastenings	6
Right First Time	99.32%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.03
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.10
Purchased Part Cost	\$0.03
Material Cost	\$0.35
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.78
Supplier Fab. Cost	\$0.06
Q Burden	\$0.10
SG&A	\$0.26
Manufacturing Cost*	\$1.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket, Bracket Asm



\...

\Bracket Asm, Actuator Bracket

\Bracket, Bracket Asm

\Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.86
Total Weight (kg)	0.09

Material Cost**	\$0.32
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.44

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket, Bracket Asm

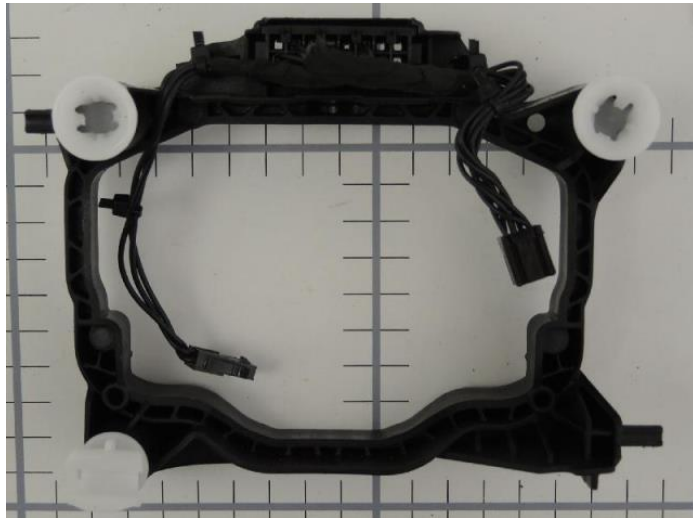
Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	11.72	2	0.25	24.56	ESP	\$0.04	99.99%	\$0.00

Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Bracket	1	PBT GF30	\$3.18	0.0945	0.1016	\$0.00	\$0.32

Ball Stud U Bracket, Housing Asm



- \...
- \Actuator Bracket, Housing Asm
- \Bracket Asm, Actuator Bracket
- \Ball Stud U Bracket, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.18
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Ball Stud U Bracket, Housing Asm



Ball Stud U Bracket, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
U Bracket, Ball Stud U-Bracket.Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0031
Assemble Ball Stud U Bracket	1	1	1	3	1	99.90 %	0.00	0.00	0.15	0.00	0.0001

Ball Stud U Bracket, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
U Bracket, Ball Stud U-Bracket.Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
Assemble Ball Stud U Bracket	\$0.01	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.02	\$0.03	\$0.16

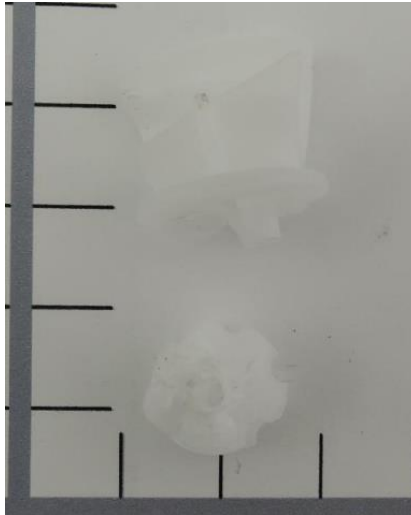
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.15
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.00
<hr/>	
Purchased Part Cost	\$0.01
Material Cost	\$0.01
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.11
Supplier Fab. Cost	\$0.01
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

U Bracket, Ball Stud U-Bracket Asm



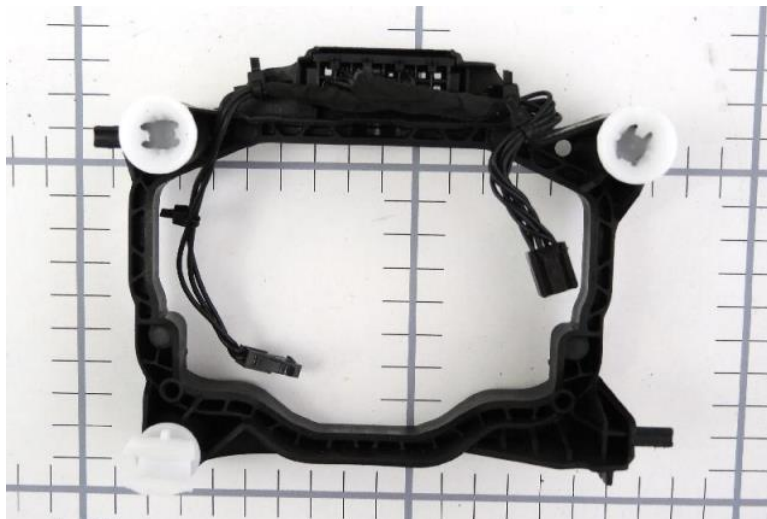
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- \Ball Stud U Bracket, Housing Asm
- \U Bracket, Ball Stud U-Bracket Asm
- \U Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.57
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.03



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

U Bracket, Ball Stud U-Bracket Asm



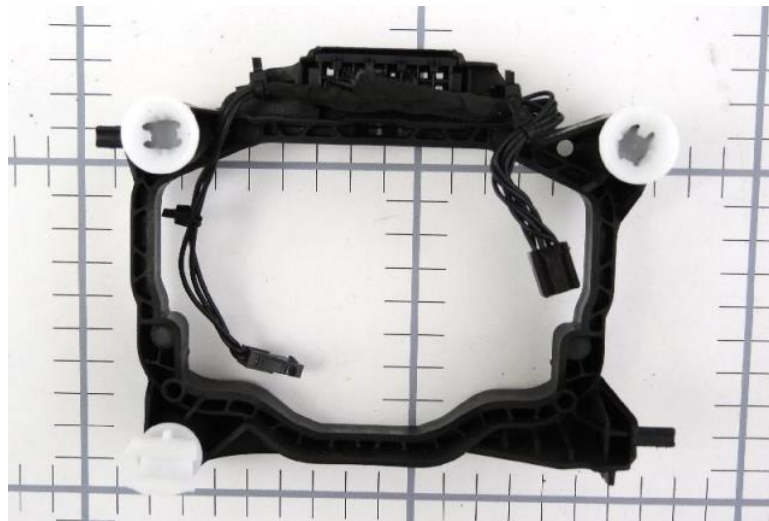
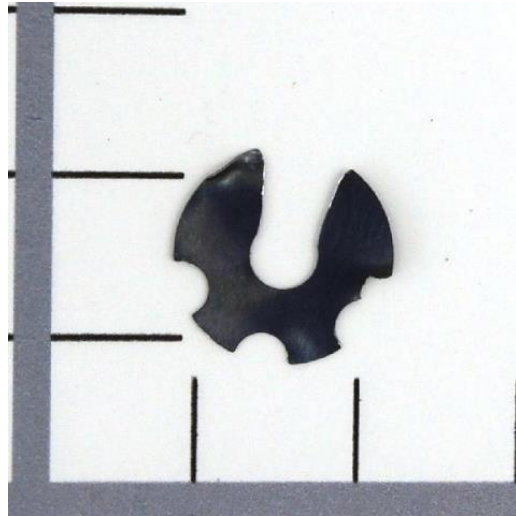
U Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	12.56	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

U Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, U Bracket	1	PBT	\$3.06	0.0031	0.0033	\$0.00	\$0.01

Assemble Ball Stud U Bracket



\...

- \Bracket Asm, Actuator Bracket
- \Ball Stud U Bracket, Housing Asm
- \Assemble Ball Stud U Bracket

Process Summary

Right First Time	99.90 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Ball Stud U Bracket



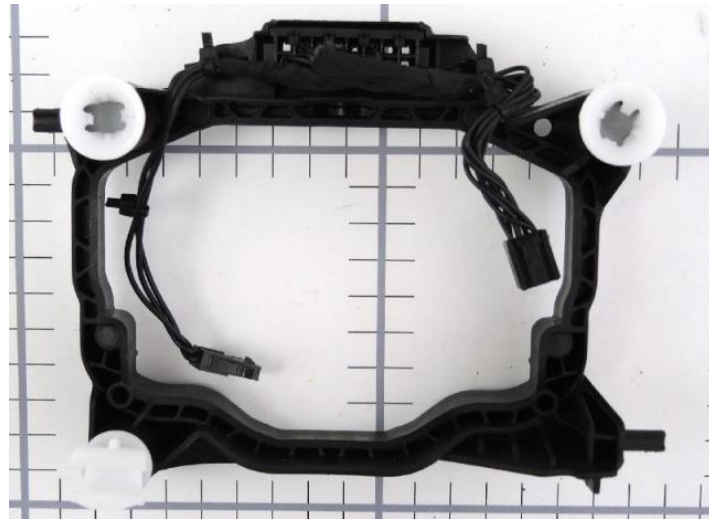
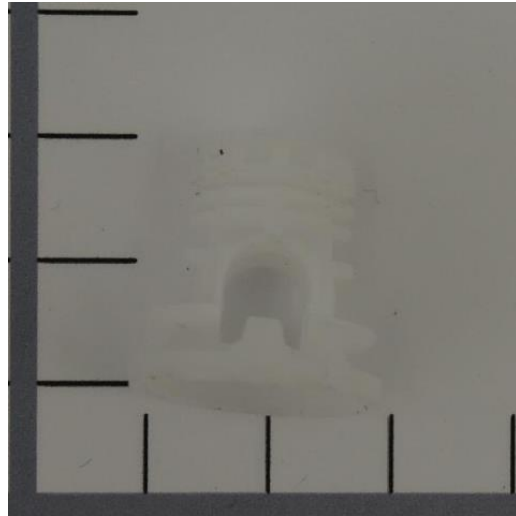
Assemble Ball Stud U Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.90%	\$0.02

Assemble Ball Stud U Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Fog Lamp, Actuator Cap, Snap Ring	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Actuator Arm, Cap



\...

\Actuator Bracket, Housing Asm

\Bracket Asm, Actuator Bracket

\Actuator Arm, Cap

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.21
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Cap



Actuator Arm, Cap

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cap, Actuator Arm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0021
Assemble Actuator Arm Cap	1	1	1	3	1	99.90 %	0.00	0.00	0.20	0.00	0.0001

Actuator Arm, Cap

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cap, Actuator Arm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Actuator Arm Cap	\$0.01	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.02	\$0.03	\$0.21

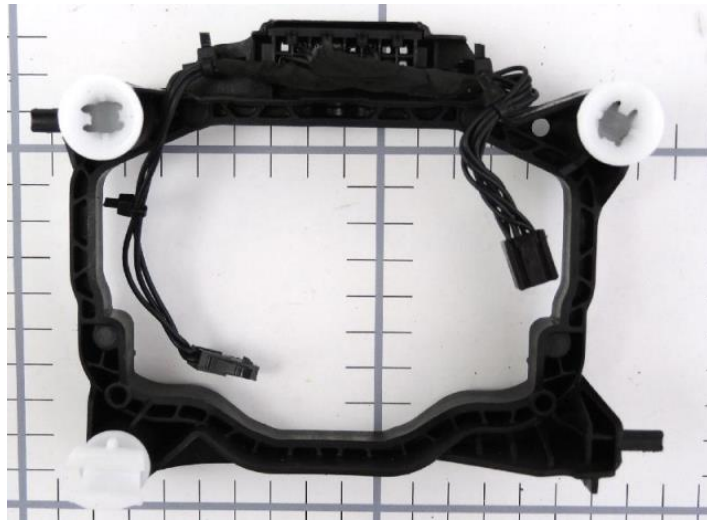
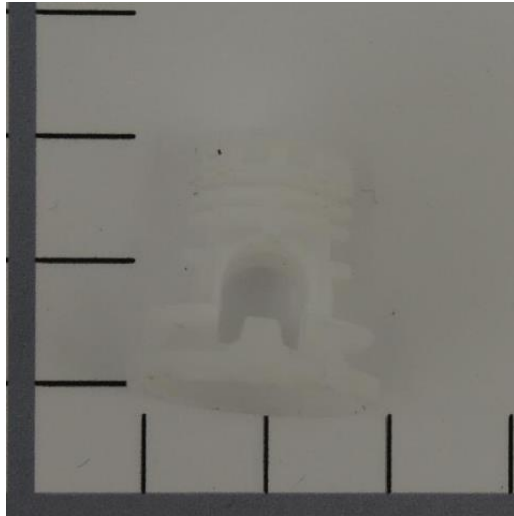
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.20
Supplier Fab. Time (Min)	0.01
Total Weight (kg)	0.00
Purchased Part Cost	\$0.01
Material Cost	\$0.01
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.15
Supplier Fab. Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Actuator Arm



\...

- \Actuator Arm, Cap
- \Cap, Actuator Arm
- \Cap, Actuator Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.73
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Actuator Arm

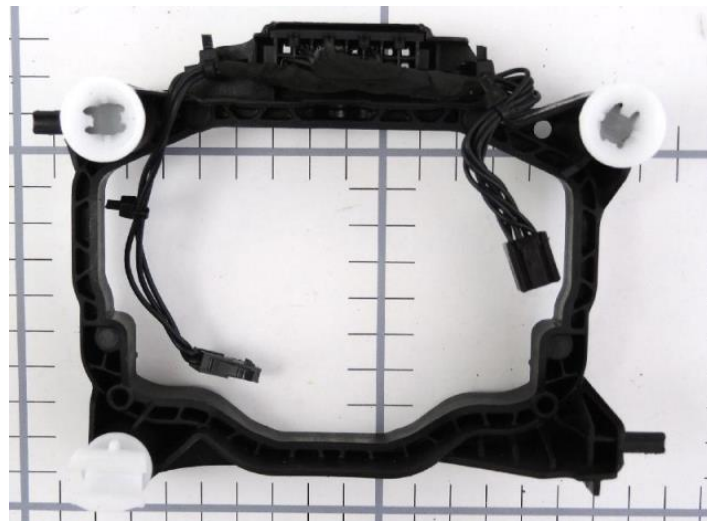
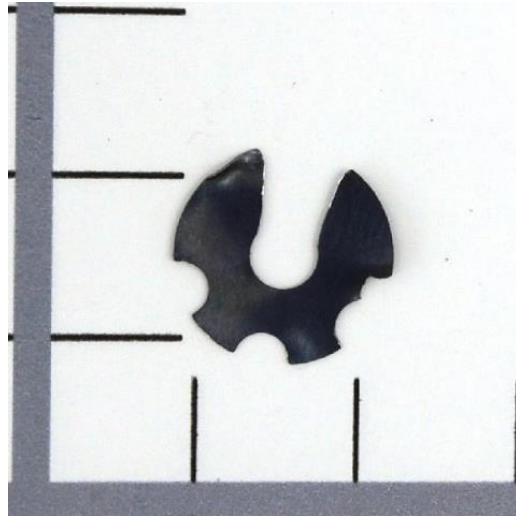
Cap, Actuator Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	5.84	8	0.25	21.64	ESP	\$0.00	99.99%	\$0.00

Cap, Actuator Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material Cap Actuator Arm	1	PBT	\$3.06	0.0021	0.0023	\$0.00	\$0.01

Assemble Actuator Arm Cap



\...

- \Bracket Asm, Actuator Bracket
- \Actuator Arm, Cap
- \Assemble Actuator Arm Cap

Process Summary

Right First Time	99.90 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Actuator Arm Cap



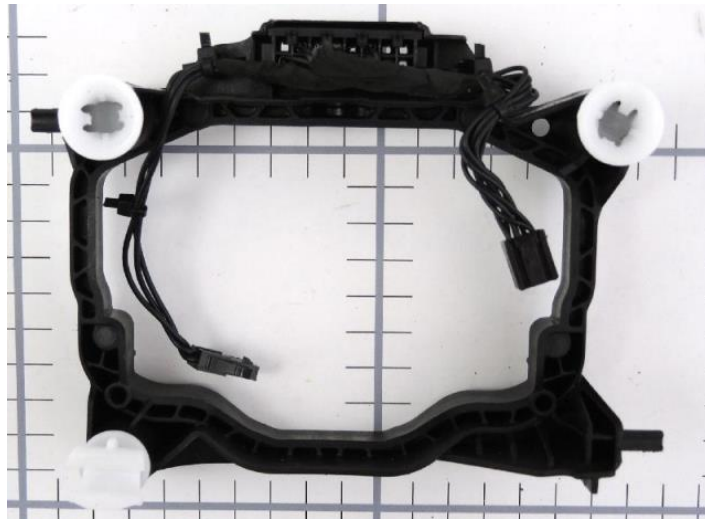
Assemble Actuator Arm Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	12.00	1	1.00	45.01	ESP	\$0.15	99.90%	\$0.02

Assemble Actuator Arm Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Snap Ring, Actuator Arm Cap	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

No Commodity Items Required for This Process



\...

- \Actuator Bracket, Housing Asm
- \Bracket Asm, Actuator Bracket
- \Assemble U Bracket and Actuator Arm Cap

Process Summary

Right First Time	99.68 %
Process Time (Sec)	29.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.36
Q Burden	\$0.05
SG&A	\$0.08
Manufacturing Cost*	\$0.49

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble U Bracket and Actuator Arm Cap



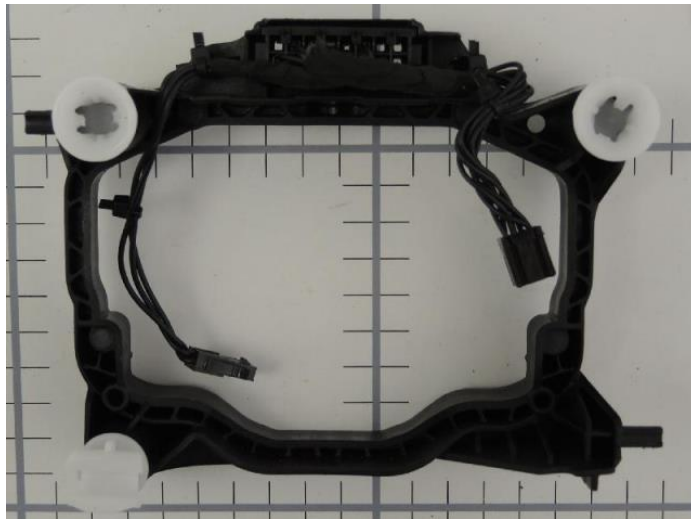
Assemble U Bracket and Actuator Arm Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	29.00	1	1.00	45.01	ESP	\$0.36	99.68 %	\$0.05

Assemble U Bracket and Actuator Arm Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Bracket Wiring



\...

- \Housing Asm, Passenger Head Lamp
- \Actuator Bracket, Housing Asm
- \Assemble Bracket Wiring

Process Summary

Right First Time	99.83 %
Process Time (Sec)	26.00
Total Weight (kg)	0.02

Material Cost**	\$2.56
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.39
Q Burden	\$0.03
SG&A	\$0.65
Manufacturing Cost*	\$3.63

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Bracket Wiring



Assemble Bracket Wiring

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	26.00	1	1.00	54.32	GER	\$0.39	99.83%	\$0.03

Assemble Bracket Wiring

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Wiring, Actuator Bracket Asm	1	See Appendix	-	0.0179	-	\$0.00	\$2.56

[Click Here for Munro & Associates Wire Harness Report on Wiring, Actuator Bracket Asm](#)

No Commodity Items
Required for This
Process



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Actuator Bracket

Process Summary

Right First Time	99.74 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.04
SG&A	\$0.03
Manufacturing Cost*	\$0.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Actuator Bracket



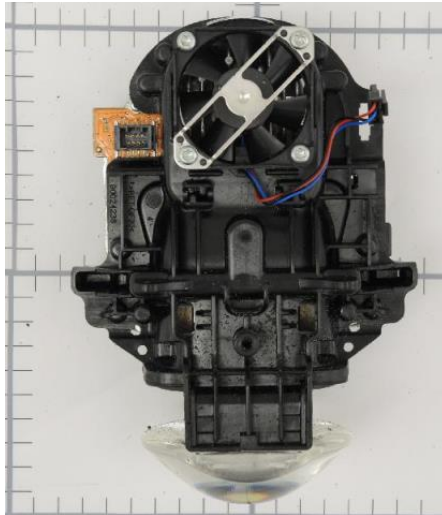
Assemble Actuator Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	12.00	1	1.00	45.01	ESP	\$0.15	99.74 %	\$0.04

Assemble Actuator Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Adaptive Lens Asm, Housing Asm



- \...
- \Passenger Head Lamp Housing Asm, Passenger Head
- La \Housing Asm, Passenger Head Lamp
- \Adaptive Lens Asm, Housing Asm

Assembly Summary

Parts	28
Fasteners	14
Part Numbers	17
Steps	120
Fastenings	23
Right First Time	96.75 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	7.00
Total Weight (kg)	0.47

Material Cost**	\$12.32
OEM Process Cost	\$0.00
Supplier Process Cost	\$5.62
Q Burden	\$0.50
SG&A	\$2.62
Manufacturing Cost*	\$21.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Adaptive Lens Asm, Housing Asm



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& ASSOCIATES, INC.

Adaptive Lens Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Adaptive Lens Housing Asm, Adaptive Lens	1	3	2	10	2	99.93 %	0.00	0.00	0.21	1.48	0.2131
Support, Adaptive Lens Asm	1	1	0	37	0	99.85 %	0.00	0.00	0.00	1.04	0.0112
Reflector Trim, Adaptive Lens Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.25	0.0123
Fan Circuit Asm, Adaptive Lens	1	9	8	28	8	99.20 %	0.00	0.00	1.19	0.32	0.1514
Assemble Fan Circuit	1	6	8	19	8	98.66 %	0.00	0.00	1.12	0.00	0.0096
Reflector Lower Trim, Adaptive Lens Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.63	0.0351
Assemble Fan	1	5	5	13	5	99.13 %	0.00	0.00	0.75	0.00	0.0337

Adaptive Lens Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Adaptive Lens Housing Asm, Adaptive Lens	\$0.10	\$0.78	\$0.00	\$0.00	\$0.10	\$0.64	\$0.01	\$0.34	\$1.97
Support, Adaptive Lens Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.76	\$0.02	\$0.18	\$1.00
Reflector Trim, Adaptive Lens Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.08	\$0.47
Fan Circuit Asm, Adaptive Lens	\$0.27	\$4.14	\$0.00	\$0.00	\$0.89	\$0.34	\$0.12	\$1.19	\$6.95
Assemble Fan Circuit	\$0.06	\$0.00	\$0.00	\$0.00	\$0.84	\$0.00	\$0.20	\$0.19	\$1.29
Reflector Lower Trim, Adaptive Lens Asm	\$0.00	\$0.28	\$0.00	\$0.00	\$0.00	\$1.22	\$0.00	\$0.33	\$1.83
Assemble Fan	\$6.54	\$0.00	\$0.00	\$0.00	\$0.56	\$0.00	\$0.13	\$0.32	\$7.55

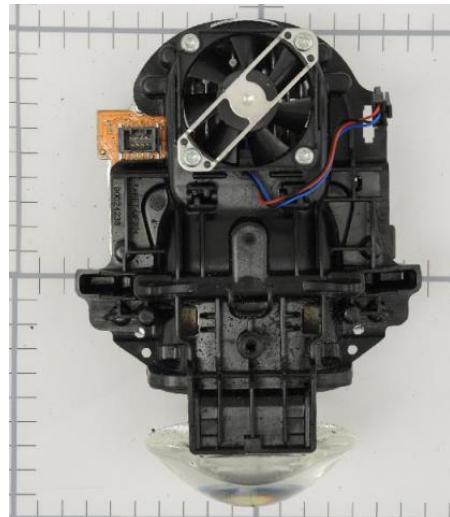
Detailed Summary

Parts	28
Fasteners	14
Part Numbers	17
Steps	120
Fastenings	23
Right First Time	96.75%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.26
Supplier Fab. Time (Min)	3.73
Total Weight (kg)	0.47
Purchased Part Cost	
	\$6.97
Material Cost	
	\$5.35
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$2.39
Supplier Fab. Cost	
	\$3.23
Q Burden	
	\$0.50
SG&A	
	\$2.62
Manufacturing Cost*	
	\$21.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Adaptive Lens Housing Asm, Adaptive Lens



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\Housing Asm, Passenger Head Lamp

\Adaptive Lens Asm, Housing Asm

\Adaptive Lens Housing Asm, Adaptive Lens

Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	10
Fastenings	2
Right First Time	99.93 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.69
Total Weight (kg)	0.21

Material Cost**	\$0.88
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.74
Q Burden	\$0.01
SG&A	\$0.34
Manufacturing Cost*	\$1.97

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Adaptive Lens Housing Asm, Adaptive Lens



Adaptive Lens Housing Asm, Adaptive Lens

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Adaptive Lens Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.11	0.1170
Lens, Adaptive Lens Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	1.38	0.0960
Assemble Housing Asm	1	1	2	6	2	99.95 %	0.00	0.00	0.21	0.00	0.0001

Adaptive Lens Housing Asm, Adaptive Lens

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Adaptive Lens Asm	\$0.00	\$0.37	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.09	\$0.51
Lens, Adaptive Lens Asm	\$0.00	\$0.41	\$0.00	\$0.00	\$0.00	\$0.69	\$0.00	\$0.22	\$1.22
Assemble Housing Asm	\$0.10	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$0.01	\$0.02	\$0.23

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	10
Fastenings	2
Right First Time	99.93%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.21
Supplier Fab. Time (Min)	1.48
Total Weight (kg)	0.21
Purchased Part Cost	
	\$0.10
Material Cost	
	\$0.78
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.10
Supplier Fab. Cost	
	\$0.64
Q Burden	
	\$0.01
SG&A	
	\$0.34
Manufacturing Cost*	
	\$1.97

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



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- \Adaptive Lens Housing Asm, Adaptive Lens
- \Housing, Adaptive Lens Asm
- \Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	6.35
Total Weight (kg)	0.12
Material Cost**	\$0.37
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.09
Manufacturing Cost*	\$0.51

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Adaptive Lens Asm



Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	12.70	2	0.25	28.76	ESP	\$0.05	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Housing	1	PET GF30	\$2.93	0.1170	0.1258	\$0.00	\$0.37



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- \Adaptive Lens Housing Asm, Adaptive Lens
- \Lens, Adaptive Lens Asm
- \Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	82.69
Total Weight (kg)	0.10

Material Cost**	\$0.41
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.59
Q Burden	\$0.00
SG&A	\$0.22
Manufacturing Cost*	\$1.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lens, Adaptive Lens Asm



Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	330.76	4	0.25	25.74	ESP	\$0.59	99.99%	\$0.00

Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lens	1	PC	\$3.97	0.0960	0.1032	\$0.00	\$0.41



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- \Adaptive Lens Asm, Housing Asm
- \Adaptive Lens Housing Asm, Adaptive Lens
- \Assemble Housing Asm

Process Summary

Right First Time	99.95 %
Process Time (Sec)	12.63
Total Weight (kg)	0.00
Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.10
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Housing Asm

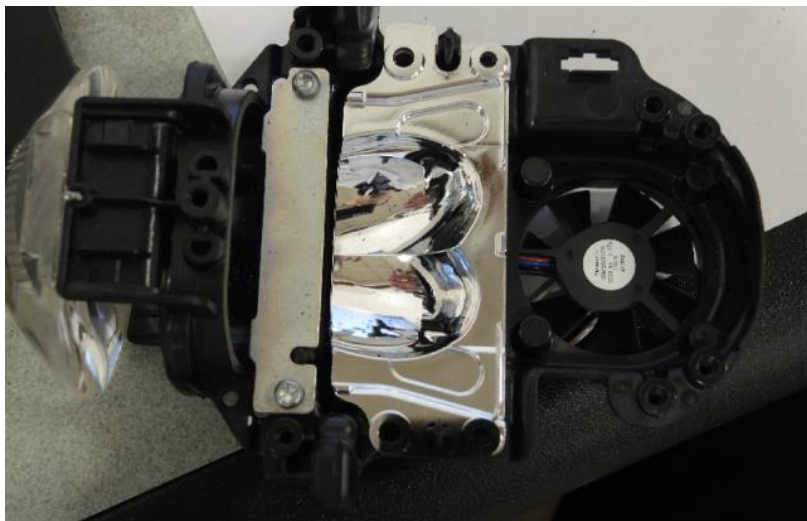
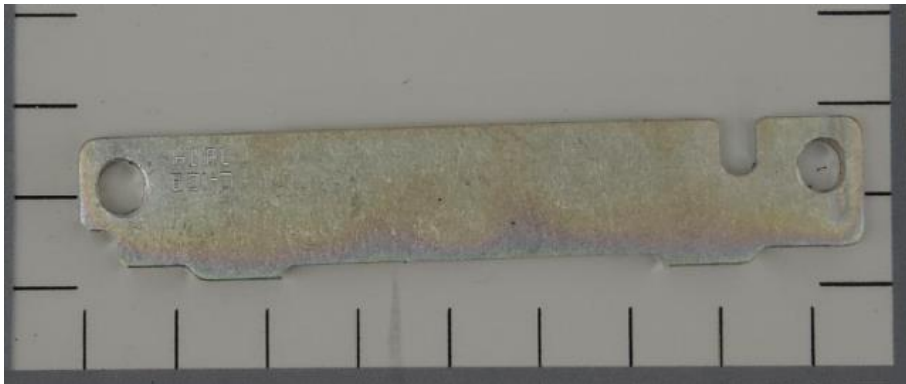


Assemble Housing Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Vibration Welding Station	12.63	1	0.25	27.26	GER	\$0.10	99.95%	\$0.01

Assemble Housing Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00



\...

- \Adaptive Lens Asm, Housing Asm
- \Support, Adaptive Lens Asm
- \Support Adaptive Lens Process

Process Summary

Right First Time	99.85 %
Process Time (Sec)	62.68
Total Weight (kg)	0.01
Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.76
Q Burden	\$0.02
SG&A	\$0.18
Manufacturing Cost*	\$1.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Support, Adaptive Lens Asm

Support Adaptive Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	5.00	1	0.25	28.36	ESP	\$0.04	99.99 %	\$0.00
Debur	4.00	1	0.25	29.03	ESP	\$0.03	99.99 %	\$0.00
CNC Machining	44.08	1	0.25	49.86	GER	\$0.61	99.90 %	\$0.02
Wash	5.00	1	0.25	28.36	ESP	\$0.04	99.99 %	\$0.00
Debur	4.00	1	0.25	29.03	ESP	\$0.03	99.99 %	\$0.00
25 Ton Stamping Press	0.60	1	0.25	19.41	ESP	\$0.00	99.99 %	\$0.00

Support Adaptive Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Support Adaptive Lens	1	Aluminum 5052-H32 - Coil Stock	\$3.35	0.0112	0.0112	\$0.00	\$0.04

Reflector Trim, Adaptive Lens Asm



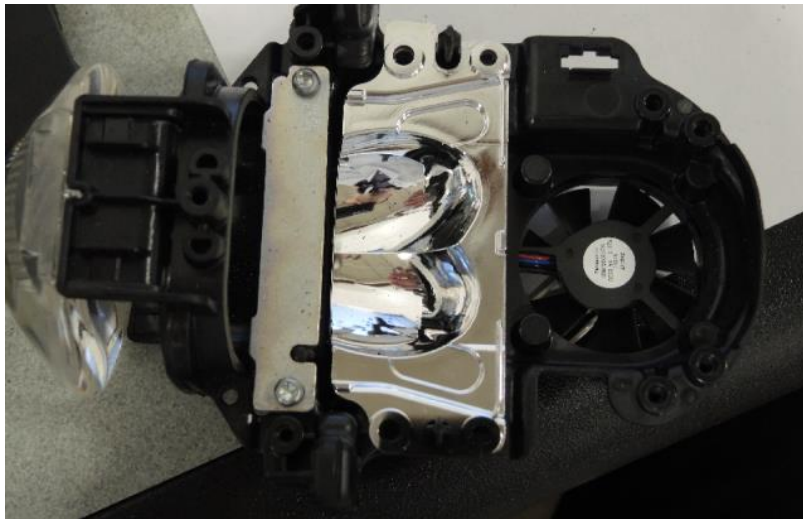
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- \Adaptive Lens Asm, Housing Asm
- \Reflector Trim, Adaptive Lens Asm
- \Reflector Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	15.19
Total Weight (kg)	0.01

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.00
SG&A	\$0.08
Manufacturing Cost*	\$0.47



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Trim, Adaptive Lens Asm



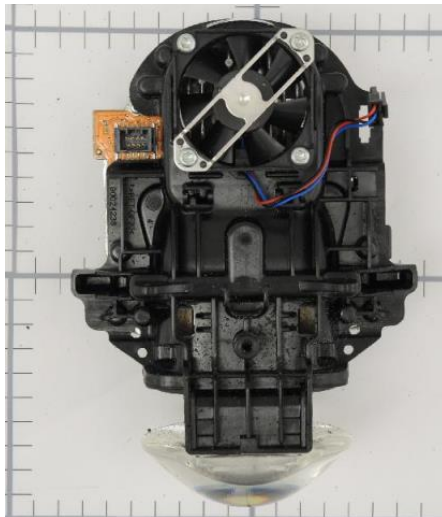
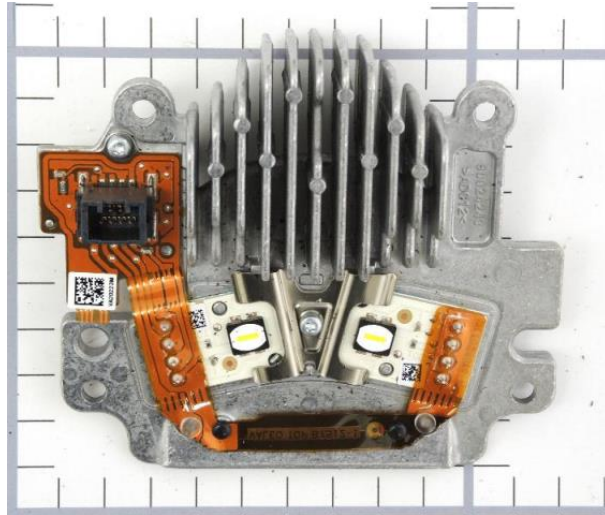
Reflector Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	13.38	1	0.25	69.10	ESP	\$0.26	99.99%	\$0.00
200 Ton Injection Molding Press	14.48	8	0.25	28.76	ESP	\$0.01	99.99%	\$0.00

Reflector Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Reflector Trim	1	Plating - Chrome		By Area	0.0000	\$0.00	\$0.06
Material, Reflector Trim	1	PC	\$3.97	0.0123	0.0132	\$0.00	\$0.05

Fan Circuit Asm, Adaptive Lens



- \...
- \Housing Asm, Passenger Head Lamp
- \Adaptive Lens Asm, Housing Asm
- \Fan Circuit Asm, Adaptive Lens

Assembly Summary

Parts	9
Fasteners	4
Part Numbers	7
Steps	28
Fastenings	8
Right First Time	99.20 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.51
Total Weight (kg)	0.15

Material Cost**	\$4.41
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.23
Q Burden	\$0.12
SG&A	\$1.19
Manufacturing Cost*	\$6.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fan Circuit Asm, Adaptive Lens



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Fan Circuit Asm, Adaptive Lens

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Platform, Fan Circuit Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.16	0.1340
Assemble Fan Circuit Tape	1	3	3	7	3	99.86 %	0.00	0.00	0.40	0.00	0.0140
Bracket, Fan Circuit Asm	1	1	0	7	0	99.97 %	0.00	0.00	0.00	0.16	0.0024
Assemble Bracket	1	4	5	11	5	99.38 %	0.00	0.00	0.78	0.00	0.0010

Fan Circuit Asm, Adaptive Lens

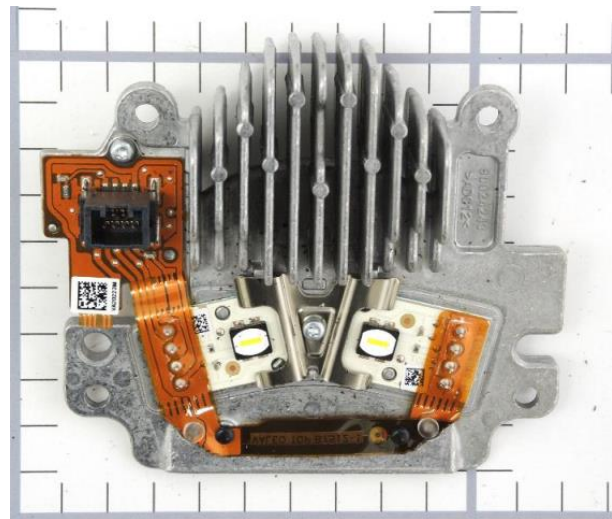
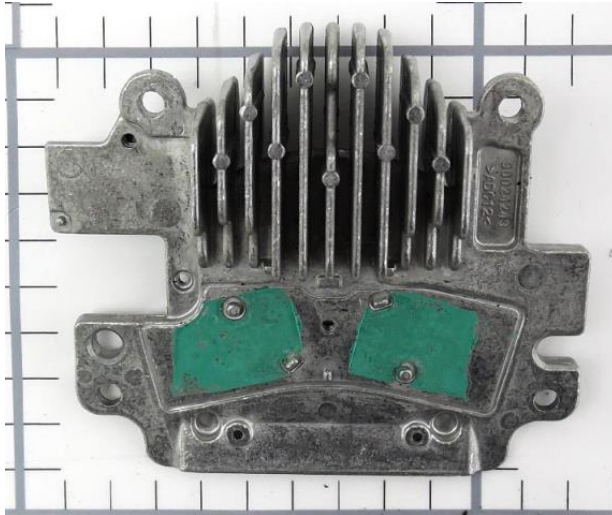
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Platform, Fan Circuit Asm	\$0.00	\$0.33	\$0.00	\$0.00	\$0.00	\$0.28	\$0.00	\$0.13	\$0.75
Assemble Fan Circuit Tape	\$0.23	\$3.77	\$0.00	\$0.00	\$0.30	\$0.00	\$0.02	\$0.90	\$5.23
Bracket, Fan Circuit Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.02	\$0.13
Assemble Bracket	\$0.04	\$0.00	\$0.00	\$0.00	\$0.59	\$0.00	\$0.09	\$0.13	\$0.85

Detailed Summary

Parts	9
Fasteners	4
Part Numbers	7
Steps	28
Fastenings	8
Right First Time	99.2%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.19
Supplier Fab. Time (Min)	0.32
Total Weight (kg)	0.15
Purchased Part Cost	
	\$0.27
Material Cost	\$4.14
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.89
Supplier Fab. Cost	\$0.34
Q Burden	\$0.12
SG&A	\$1.19
Manufacturing Cost*	\$6.95

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



- \...
- \Fan Circuit Asm, Adaptive Lens
- \Platform, Fan Circuit Asm
- \Platform Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	9.72
Total Weight (kg)	0.13
Material Cost**	\$0.33
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.28
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.75

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Platform, Fan Circuit Asm



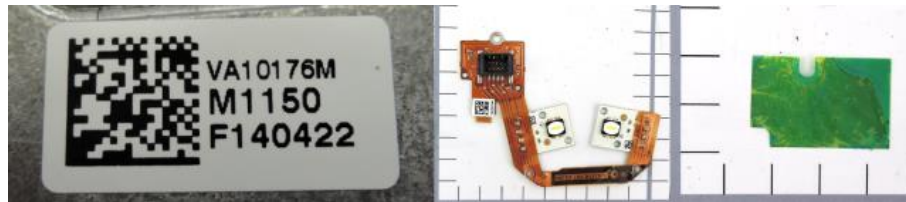
Platform Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
260 Ton Die Cast Machine	19.44	2	1.00	103.98	ESP	\$0.28	99.99%	\$0.00

Platform Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Platform	1	A380	\$2.27	0.1340	0.1340	\$0.00	\$0.33

Assemble Fan Circuit Tape

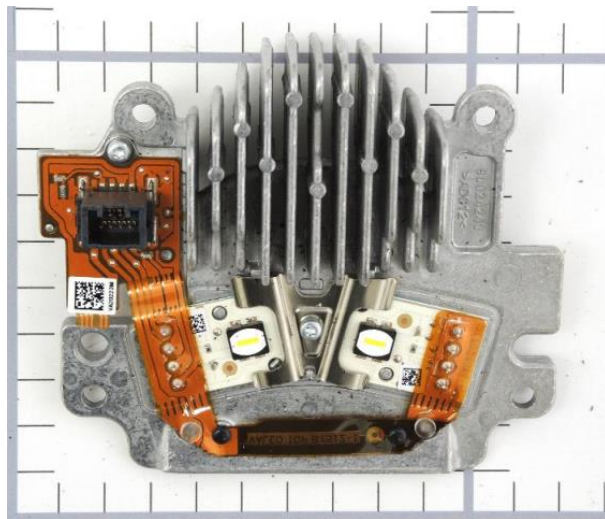


- \...
- \Adaptive Lens Asm, Housing Asm
- \Fan Circuit Asm, Adaptive Lens
- \Assemble Fan Circuit Tape

Process Summary

Right First Time	99.86 %
Process Time (Sec)	24.25
Total Weight (kg)	0.01

Material Cost**	\$4.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.02
SG&A	\$0.90
Manufacturing Cost*	\$5.23



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fan Circuit Tape



Assemble Fan Circuit Tape

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	24.25	1	1.00	45.01	ESP	\$0.30	99.86%	\$0.02

Assemble Fan Circuit Tape

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00
Fan Circuit, Printed Circuit Board	1	See Appendix	-	0.0138	-	\$0.00	\$3.77
Printed Circuit Board, Insulator Pad	1	Commodity Item	Purchased	0.0001	-	\$0.20	\$0.00

[Click Here for TechInsights Electronics Report on Fan Circuit, Printed Circuit Board](#)

Bracket, Fan Circuit Asm



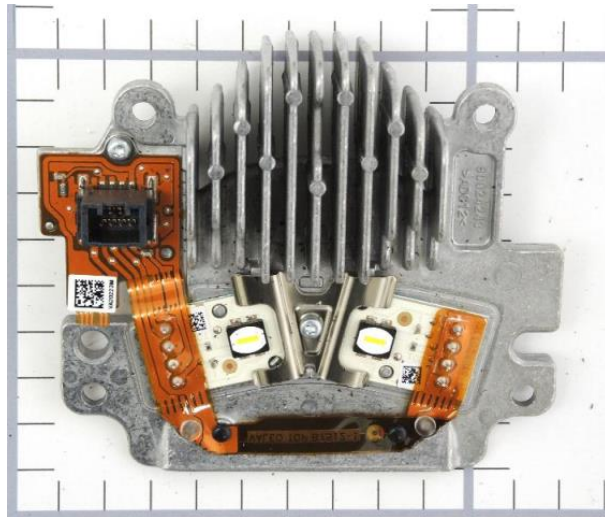
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- \Fan Circuit Asm, Adaptive Lens
- \Bracket, Fan Circuit Asm
- \Bracket Fan Circuit Process

Process Summary

Right First Time	99.97 %
Process Time (Sec)	9.60
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.13



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Bracket, Fan Circuit Asm



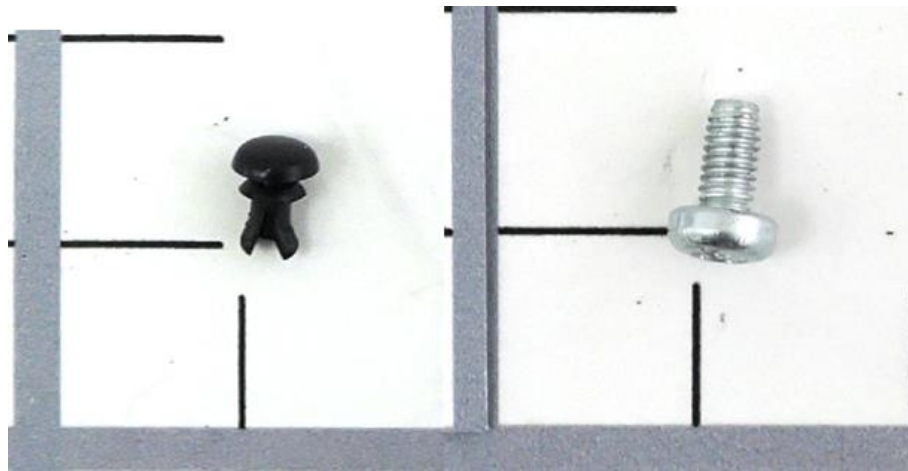
Bracket Fan Circuit Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Wash	5.00	1	0.25	17.68	ESP	\$0.02	99.99%	\$0.00
Debur	4.00	1	0.25	29.03	ESP	\$0.03	99.99%	\$0.00
25 Ton Stamping Press	2.40	4	0.25	19.41	ESP	\$0.00	99.99%	\$0.00

Bracket Fan Circuit Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Fan Circuit Bracket	1	Stainless Steel 304- Coil Stock	\$2.58	0.0024	0.0024	\$0.00	\$0.04

Assemble Bracket

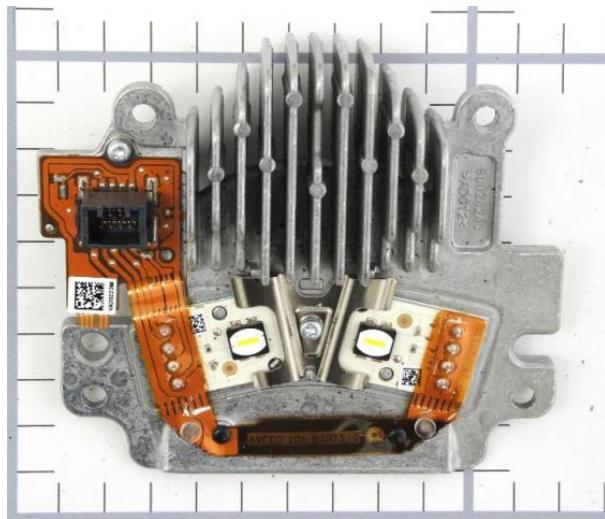


- \...
- \Adaptive Lens Asm, Housing Asm
- \Fan Circuit Asm, Adaptive Lens
- \Assemble Bracket

Process Summary

Right First Time	99.38 %
Process Time (Sec)	47.00
Total Weight (kg)	0.00

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.59
Q Burden	\$0.09
SG&A	\$0.13
Manufacturing Cost*	\$0.85



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Bracket



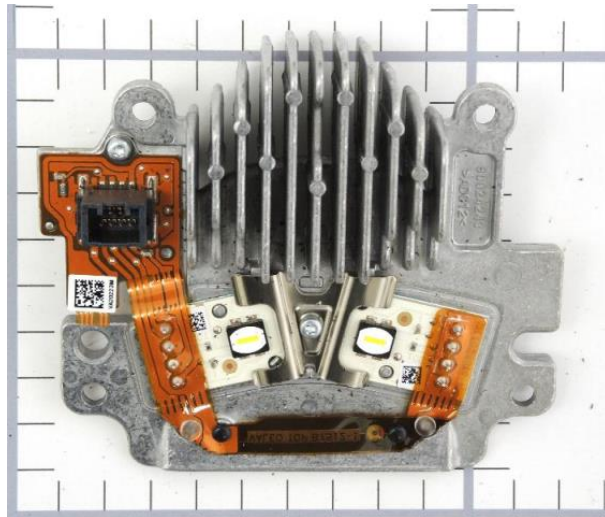
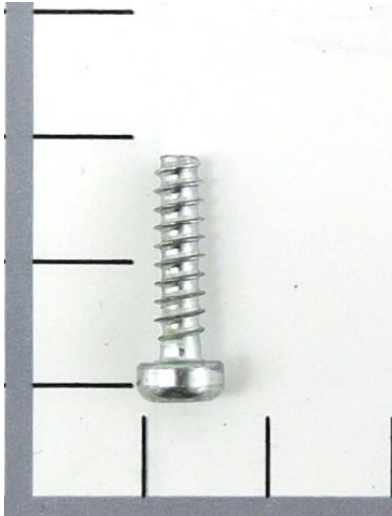
Assemble Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	47.00	1	1.00	45.01	ESP	\$0.59	99.38 %	\$0.09

Assemble Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M3x5mm-Pan Head Torx	2	Commodity Item	Purchased	0.0004	-	\$0.01	\$0.00
Push Pin Electronic Circuit	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Fan Circuit



\...

- \Housing Asm, Passenger Head Lamp
- \Adaptive Lens Asm, Housing Asm
- \Assemble Fan Circuit

Process Summary

Right First Time	98.66 %
Process Time (Sec)	67.00
Total Weight (kg)	0.01

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.84
Q Burden	\$0.20
SG&A	\$0.19
Manufacturing Cost*	\$1.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fan Circuit



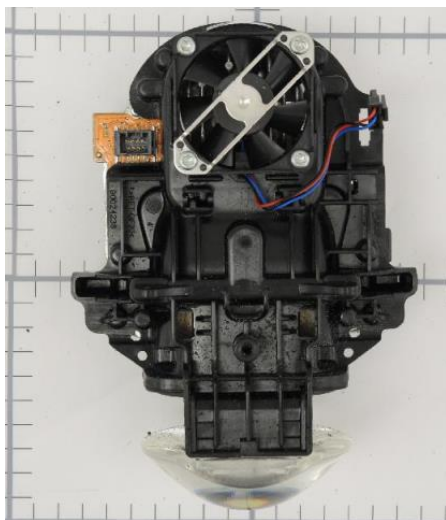
Assemble Fan Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	67.00	1	1.00	45.01	ESP	\$0.84	98.66%	\$0.20

Assemble Fan Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	6	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

Reflector Lower Trim, Adaptive Lens Asm



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- \Adaptive Lens Asm, Housing Asm
- \Reflector Lower Trim, Adaptive Lens Asm
- \Reflector Lower Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	37.63
Total Weight (kg)	0.04
Material Cost**	\$0.28
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.22
Q Burden	\$0.00
SG&A	\$0.33
Manufacturing Cost*	\$1.83

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Lower Trim, Adaptive Lens Asm

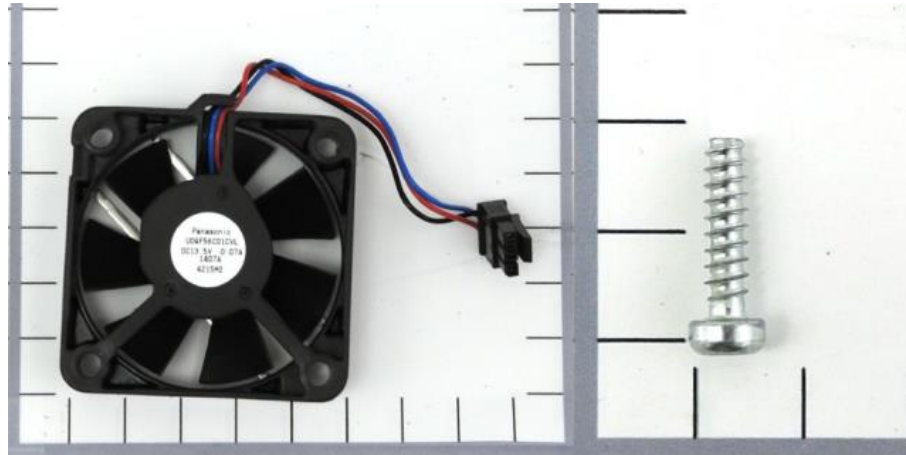


Reflector Lower Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	30.35	1	0.25	138.83	ESP	\$1.17	99.99%	\$0.00
110 Ton Injection Molding Press	14.56	2	0.25	24.56	ESP	\$0.05	99.99%	\$0.00

Reflector Lower Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Reflector Lower Trim	1	Plating - Chrome	By Area	0.0000	-	\$0.00	\$0.13
Material, Reflector Lower Trim	1	PC	\$3.97	0.0351	0.0377	\$0.00	\$0.15



- \...
- \Housing Asm, Passenger Head Lamp
- \Adaptive Lens Asm, Housing Asm
- \Assemble Fan

Process Summary

Right First Time	99.13 %
Process Time (Sec)	45.00
Total Weight (kg)	0.03

Material Cost**	\$6.54
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.56
Q Burden	\$0.13
SG&A	\$0.32
Manufacturing Cost*	\$7.55



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fan



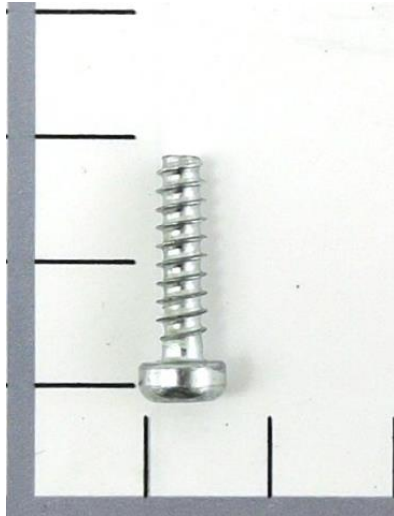
Assemble Fan

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	45.00	1	1.00	45.01	ESP	\$0.56	99.13%	\$0.13

Assemble Fan

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Fan, Adaptive Lens Asm	1	Commodity Item	Purchased	0.0273	-	\$6.50	\$0.00
M4x14mm-Pan Head Torx	4	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

Assemble Adaptive Lens Asm

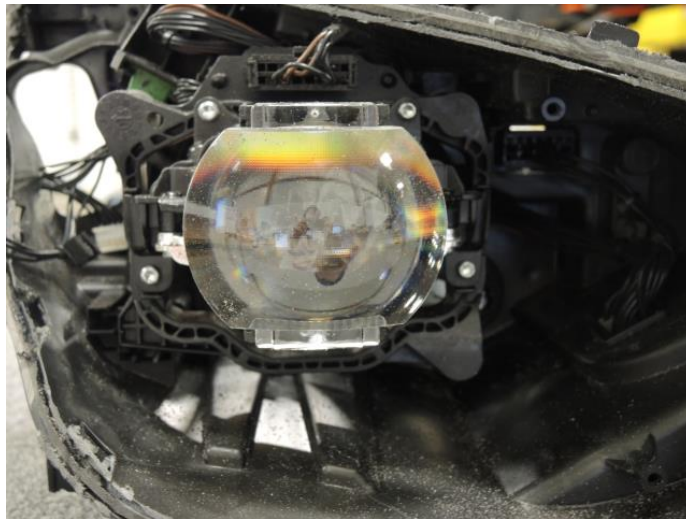


\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Adaptive Lens Asm

Process Summary

Right First Time	99.00 %
Process Time (Sec)	67.00
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.84
Q Burden	\$0.15
SG&A	\$0.19
Manufacturing Cost*	\$1.21



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Adaptive Lens Asm



Assemble Adaptive Lens Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	67.00	1	1.00	45.01	ESP	\$0.84	99.00%	\$0.15

Assemble Adaptive Lens Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	4	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

Interior Trim Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Interior Trim Asm, Housing Asm

Assembly Summary

Parts	7
Fasteners	2
Part Numbers	6
Steps	29
Fastenings	9
Right First Time	99.28 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.18
Total Weight (kg)	0.48

Material Cost**	\$1.83
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.37
Q Burden	\$0.11
SG&A	\$0.70
Manufacturing Cost*	\$4.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Interior Trim Asm, Housing Asm



MUNRO
& ASSOCIATES, INC.

Interior Trim Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Light Pipe Trim Asm, Interior Trim	1	2	4	10	4	99.86 %	0.00	0.00	0.25	0.15	0.1440
Light Trim, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.1060
Assemble Light Trim	1	0	1	3	1	99.94 %	0.00	0.00	0.13	0.00	0.0000
Light Pipe Lens, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.86	0.2120
Assemble Light Pipe Lens	1	2	3	7	3	99.55 %	0.00	0.00	0.52	0.00	0.0032
BMW Adaptive LED Chrome Trim, Interior Housing Tri	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0151
Assemble BMW Adaptive LED Chrome Trim	1	0	1	2	1	99.96 %	0.00	0.00	0.12	0.00	0.0000

Interior Trim Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Light Pipe Trim Asm, Interior Trim	\$0.00	\$0.60	\$0.00	\$0.00	\$0.19	\$0.06	\$0.02	\$0.19	\$1.05
Light Trim, Interior Trim Asm	\$0.00	\$0.45	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.11	\$0.62
Assemble Light Trim	\$0.00	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.01	\$0.03	\$0.16
Light Pipe Lens, Interior Trim Asm	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$0.35	\$0.00	\$0.23	\$1.29
Assemble Light Pipe Lens	\$0.02	\$0.00	\$0.00	\$0.00	\$0.47	\$0.00	\$0.07	\$0.10	\$0.66
BMW Adaptive LED Chrome Trim, Interior Housing Tri	\$0.00	\$0.06	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.02	\$0.09
Assemble BMW Adaptive LED Chrome Trim	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.01	\$0.02	\$0.13

Detailed Summary

Parts	7
Fasteners	2
Part Numbers	6
Steps	29
Fastenings	9
Right First Time	99.28%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.02
Supplier Fab. Time (Min)	1.17
Total Weight (kg)	0.48
Purchased Part Cost	
	\$0.02
Material Cost	
	\$1.81
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.88
Supplier Fab. Cost	
	\$0.48
Q Burden	
	\$0.11
SG&A	
	\$0.70
Manufacturing Cost*	
	\$4.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim Asm, Interior Trim



\...

\Housing Asm, Passenger Head Lamp

\Interior Trim Asm, Housing Asm

\Light Pipe Trim Asm, Interior Trim

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	10
Fastenings	4
Right First Time	99.86 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.40
Total Weight (kg)	0.14

Material Cost**	\$0.60
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.25
Q Burden	\$0.02
SG&A	\$0.19
Manufacturing Cost*	\$1.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim Asm, Interior Trim



Light Pipe Trim Asm, Interior Trim

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Light Pipe Trim, Light Pipe Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.1100
Light Pipe, LightPipe Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0340
Assemble Light Pipe	1	0	4	6	4	99.88 %	0.00	0.00	0.25	0.00	0.0000

Light Pipe Trim Asm, Interior Trim

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Light Pipe Trim, Light Pipe Trim Asm	\$0.00	\$0.49	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.12	\$0.66
Light Pipe, LightPipe Trim Asm	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.03	\$0.15
Assemble Light Pipe	\$0.00	\$0.00	\$0.00	\$0.00	\$0.19	\$0.00	\$0.02	\$0.04	\$0.25

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	10
Fastenings	4
Right First Time	99.86%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.25
Supplier Fab. Time (Min)	0.15
Total Weight (kg)	0.14
Purchased Part Cost	
	\$0.00
Material Cost	
	\$0.60
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.19
Supplier Fab. Cost	
	\$0.06
Q Burden	
	\$0.02
SG&A	
	\$0.19
Manufacturing Cost*	
	\$1.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim, Light Pipe Trim Asm



\...

- \Light Pipe Trim Asm, Interior Trim
- \Light Pipe Trim, Light Pipe Trim Asm
- \Light Pipe Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.12
Total Weight (kg)	0.11
Material Cost**	\$0.49
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.12
Manufacturing Cost*	\$0.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Trim, Light Pipe Trim Asm



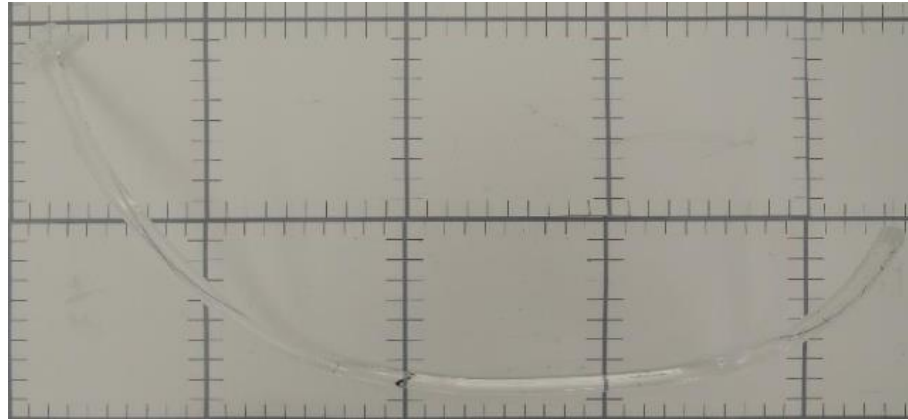
Light Pipe Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	14.24	2	0.25	24.56	ESP	\$0.05	99.99%	\$0.00

Light Pipe Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe Trim	1	PBT+ASA GF20	\$4.17	0.1100	0.1183	\$0.00	\$0.49

Light Pipe, Light Pipe Trim Asm



\...

\Light Pipe Trim Asm, Interior Trim

\Light Pipe, Light Pipe Trim Asm

\Light Pipe Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.80
Total Weight (kg)	0.03

Material Cost**	\$0.11
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe, Light Pipe Trim Asm



Light Pipe Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	10.80	6	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Light Pipe Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe	1	PMMA - Clear	\$3.09	0.0340	0.0366	\$0.00	\$0.11

No Commodity Items Required for This Process



\...

\Interior Trim Asm, Housing Asm
\Light Pipe Trim Asm, Interior Trim
\Assemble Light Pipe

Process Summary

Right First Time	99.88 %
Process Time (Sec)	15.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.19
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.25

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Pipe



Assemble Light Pipe

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	15.00	1	1.00	45.01	ESP	\$0.19	99.88 %	\$0.02

Assemble Light Pipe

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Light Trim, Interior Trim Asm



\...
\Interior Trim Asm, Housing Asm
\Light Trim, Interior Trim Asm
\Light Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.43
Total Weight (kg)	0.11
Material Cost**	\$0.45
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.62

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Trim, Interior Trim Asm



Light Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	14.86	2	0.25	28.76	ESP	\$0.06	99.99%	\$0.00

Light Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Trim	1	PC	\$3.97	0.1060	0.1140	\$0.00	\$0.45

No Commodity Items Required for This Process



\...

\Housing Asm, Passenger Head Lamp
 \Interior Trim Asm, Housing Asm
 \Assemble Light Trim

Process Summary

Right First Time	99.94 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Trim



Assemble Light Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	54.32	GER	\$0.12	99.94 %	\$0.01

Assemble Light Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Light Pipe Lens, Interior Trim Asm



\...

- \Interior Trim Asm, Housing Asm
- \Light Pipe Lens, Interior Trim Asm
- \Light Pipe Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	51.79
Total Weight (kg)	0.21
Material Cost**	\$0.70
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.00
SG&A	\$0.23
Manufacturing Cost*	\$1.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Lens, Interior Trim Asm



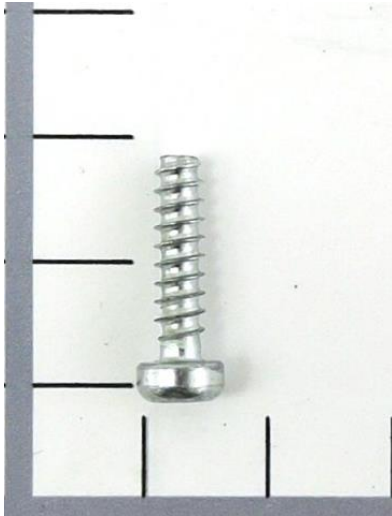
Light Pipe Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	207.16	4	0.25	24.56	ESP	\$0.35	99.99%	\$0.00

Light Pipe Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe Lens	1	PMMA - Clear	\$3.09	0.2120	0.2120	\$0.00	\$0.70

Assemble Light Pipe Lens



\...

- \Housing Asm, Passenger Head Lamp
- \Interior Trim Asm, Housing Asm
- \Assemble Light Pipe Lens

Process Summary

Right First Time	99.55 %
Process Time (Sec)	31.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.47
Q Burden	\$0.07
SG&A	\$0.10
Manufacturing Cost*	\$0.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Pipe Lens



Assemble Light Pipe Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	31.00	1	1.00	54.32	GER	\$0.47	99.55%	\$0.07

Assemble Light Pipe Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	2	Commodity Item	Purchased	0.0016	-	\$0.01	\$0.00

BMW Adaptive LED Chrome Trim, Interior Housing Trim



\...

\Interior Trim Asm, Housing Asm

\BMW Adaptive LED Chrome Trim, Interior Housing Tri

\BMW Adaptive LED Chrome Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.86
Total Weight (kg)	0.02
Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.09

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

BMW Adaptive LED Chrome Trim, Interior Housing Trim



BMW Adaptive LED Chrome Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	14.88	8	0.25	24.56	ESP	\$0.01	99.99%	\$0.00

BMW Adaptive LED Chrome Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, BMW Adaptive LED Chrome Trim	1	PC	\$3.97	0.0151	0.0162	\$0.00	\$0.06

No Commodity Items Required for This Process



\...

- \Housing Asm, Passenger Head Lamp
- \Interior Trim Asm, Housing Asm
- \Assemble BMW Adaptive LED Chrome Trim

Process Summary

Right First Time	99.96 %
Process Time (Sec)	7.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble BMW Adaptive LED Chrome Trim



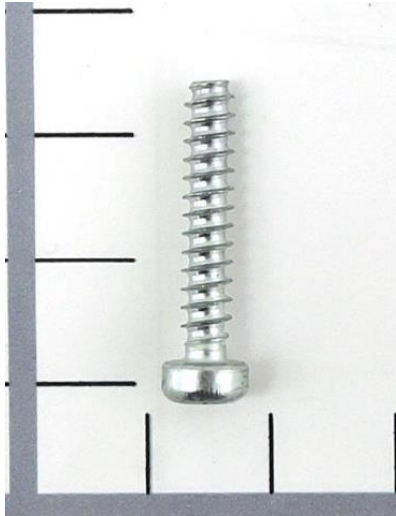
Assemble BMW Adaptive LED Chrome Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.00	1	1.00	54.32	GER	\$0.11	99.96%	\$0.01

Assemble BMW Adaptive LED Chrome Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Interior Trim



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble Interior Trim

Process Summary

Right First Time	99.55 %
Process Time (Sec)	24.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.30
Q Burden	\$0.07
SG&A	\$0.07
Manufacturing Cost*	\$0.45



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Interior Trim



Assemble Interior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	24.00	1	1.00	45.01	ESP	\$0.30	99.55%	\$0.07

Assemble Interior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x20mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00

LED Cover Asm, Housing Asm



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \LED Cover Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.91 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.16
Total Weight (kg)	0.01

Material Cost**	\$7.90
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.01
SG&A	\$1.77
Manufacturing Cost*	\$9.82

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Cover Asm, Housing Asm



LED Cover Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
LED Cover, LED Cover Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0044
Assemble LED Cover	1	1	1	3	1	99.92 %	0.00	0.00	0.13	0.00	0.0008

LED Cover Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
LED Cover, LED Cover Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.04
Assemble LED Cover	\$0.00	\$7.88	\$0.00	\$0.00	\$0.12	\$0.00	\$0.01	\$1.76	\$9.77

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.91%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.13
Supplier Fab. Time (Min)	0.03
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.00
Material Cost	
	\$7.90
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.12
Supplier Fab. Cost	
	\$0.01
Q Burden	
	\$0.01
SG&A	
	\$1.77
Manufacturing Cost*	
	\$9.82

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Cover, LED Cover Asm



- \...
- \LED Cover Asm, Housing Asm
- \LED Cover, LED Cover Asm
- \LED Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.68
Total Weight (kg)	0.00
Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.04

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

LED Cover, LED Cover Asm



LED Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	6.72	4	0.25	28.76	ESP	\$0.01	99.99%	\$0.00

LED Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, LED Cover	1	PC	\$3.97	0.0044	0.0047	\$0.00	\$0.02

Assemble LED Cover



\...
 \Housing Asm, Passenger Head Lamp
 \LED Cover Asm, Housing Asm
 \Assemble LED Cover

Process Summary

Right First Time	99.92 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00

Material Cost**	\$7.88
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.01
SG&A	\$1.76
Manufacturing Cost*	\$9.77

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Cover



Assemble LED Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	54.32	GER	\$0.12	99.92 %	\$0.01

Assemble LED Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Head Lamp, Housing Asm Passenger Side	1	See Appendix	-	0.0008	-	\$0.00	\$7.88

[Click Here for TechInsights Electronics Report on LED Board, Head Lamp](#)

No Commodity Items Required for This Process



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Housing Asm, Passenger Head Lamp
 \Assemble LED Cover

Process Summary

Right First Time	99.97 %
Process Time (Sec)	4.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Cover



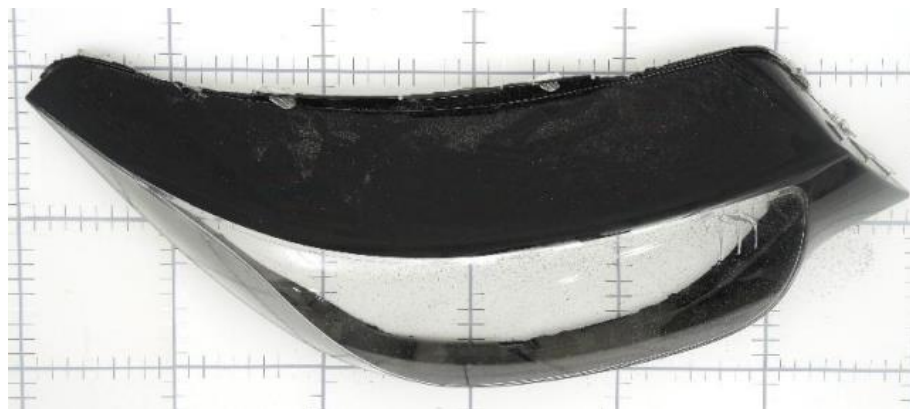
Assemble LED Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	4.00	1	1.00	45.01	ESP	\$0.05	99.97%	\$0.00

Assemble LED Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Lens, Passenger Head Lamp



\...
 \Passenger Head Lamp Housing Asm, Passenger Head
 La \Lens, Passenger Head Lamp
 \Lens Process

Process Summary

Right First Time	99.62 %
Process Time (Sec)	1074.30
Total Weight (kg)	0.61
Material Cost**	\$3.63
OEM Process Cost	\$0.00
Supplier Process Cost	\$5.12
Q Burden	\$0.06
SG&A	\$1.92
Manufacturing Cost*	\$10.73

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lens, Passenger Head Lamp



MUNRO
& ASSOCIATES, INC.

Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure PC Glazing	54.75	1	0.25	14.30	ESP	\$0.22	99.97 %	\$0.01
Spray PC Glazing (Abrasion Resistance)	10.00	1	0.25	52.79	ESP	\$0.15	99.97 %	\$0.01
Cure PC Glazing	43.50	1	0.25	14.30	ESP	\$0.17	99.97 %	\$0.01
Spray PC Glazing (Defogging)	10.00	1	0.25	52.79	ESP	\$0.15	99.97 %	\$0.01
Wash	16.00	1	0.25	17.68	ESP	\$0.08	99.98 %	\$0.00
Cure Clearcoat	343.50	1	0.25	14.30	ESP	\$1.36	99.97 %	\$0.01
Apply Clearcoat	11.28	1	0.25	52.79	ESP	\$0.17	99.97 %	\$0.01
Cure Basecoat	306.00	1	0.25	14.30	ESP	\$1.22	99.97 %	\$0.01
Apply Basecoat	11.28	1	0.25	52.79	ESP	\$0.17	99.97 %	\$0.01
Cure Primer	231.00	1	0.25	14.30	ESP	\$0.92	99.97 %	\$0.01
Apply Primer	11.28	1	0.25	52.79	ESP	\$0.17	99.97 %	\$0.01
390 Ton Injection Molding Press	25.71	1	0.25	50.37	ESP	\$0.36	99.99 %	\$0.00

Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, PC Coating	1	PC Glazing - Abrasion Resistance		By Area	0.0000	-	\$0.08
Material, PC Coating	1	PC Glazing - Defogging		By Area	0.0000	-	\$0.02
Material, Paint	1	Paint - Clearcoat		By Area	0.0000	-	\$0.48
Material, Paint	1	Paint - Basecoat		By Area	0.0000	-	\$0.41
Material, Paint	1	Paint - Primer		By Area	0.0000	-	\$0.23
Material, Lens	1	PC	\$3.97	0.6060	0.6060	\$0.00	\$2.41

No Commodity Items Required for This Process



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\...
  \Passenger Head Lamp Asm
    \Passenger Head Lamp Housing Asm, Passenger Head
La   \Assemble Lens
    
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Process Summary

Right First Time	99.85 %
Process Time (Sec)	12.38
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lens



Assemble Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	12.38	1	1.00	45.01	ESP	\$0.15	99.85%	\$0.02

Assemble Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Head Lamp Seal Small, Passenger Head Lamp Asm



\...

\Passenger Head Lamp Asm

\Head Lamp Seal Small, Passenger Head Lamp Asm

\Head Lamp Seal Small Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	9.51
Total Weight (kg)	0.02

Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.16

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Head Lamp Seal Small, Passenger Head Lamp Asm



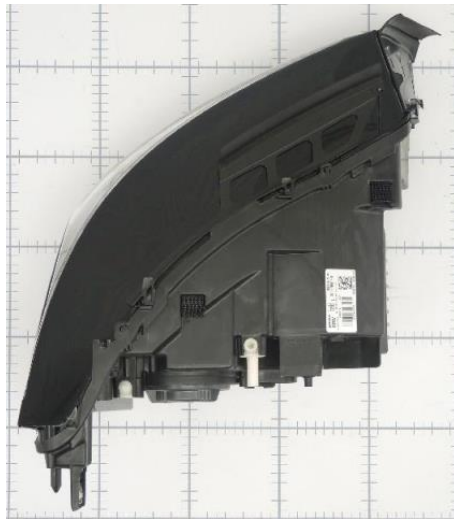
Head Lamp Seal Small Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	19.02	2	0.25	25.74	ESP	\$0.07	99.98 %	\$0.00

Head Lamp Seal Small Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Head Lamp Seal Small	1	PP GF30	\$2.71	0.0136	0.0146	\$0.00	\$0.04
Material 2, Head Lamp Seal Small	1	TPE	\$2.54	0.0060	0.0060	\$0.00	\$0.02

No Commodity Items Required for This Process



\...
\Lamps
\Passenger Head Lamp Asm
\Assemble Head Lamp Seal Small

Process Summary

Right First Time	99.95 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.14

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Head Lamp Seal Small



Assemble Head Lamp Seal Small

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.95%	\$0.01

Assemble Head Lamp Seal Small

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Head Lamp Seal Large, Passenger Head Lamp Asm



\...

\Passenger Head Lamp Asm

\Head Lamp Seal Large, Passenger Head Lamp Asm

\Head Lamp Seal Large Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	28.49
Total Weight (kg)	0.03

Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.17
Q Burden	\$0.00
SG&A	\$0.06
Manufacturing Cost*	\$0.33

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Head Lamp Seal Large, Passenger Head Lamp Asm



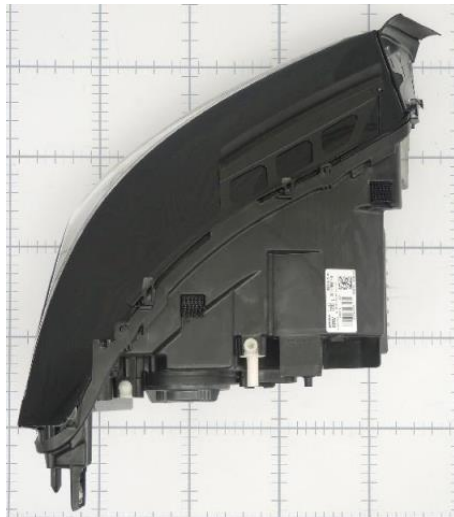
Head Lamp Seal Large Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	56.98	2	0.25	21.64	ESP	\$0.17	99.98 %	\$0.00

Head Lamp Seal Large Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material 1, Head Lamp Seal Large	1	PP GF30	\$2.71	0.0271	0.0291	\$0.00	\$0.08
Material 2, Head Lamp Seal Large	1	TPE	\$2.54	0.0075	0.0081	\$0.00	\$0.02

Assemble Head Lamp Seal Large



- \...
- \Lamps
 - \Passenger Head Lamp Asm
 - \Assemble Head Lamp Seal Large

Process Summary

Right First Time	99.84 %
Process Time (Sec)	40.38
Total Weight (kg)	0.00
Material Cost**	\$0.29
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.50
Q Burden	\$0.02
SG&A	\$0.12
Manufacturing Cost*	\$0.94

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Head Lamp Seal Large



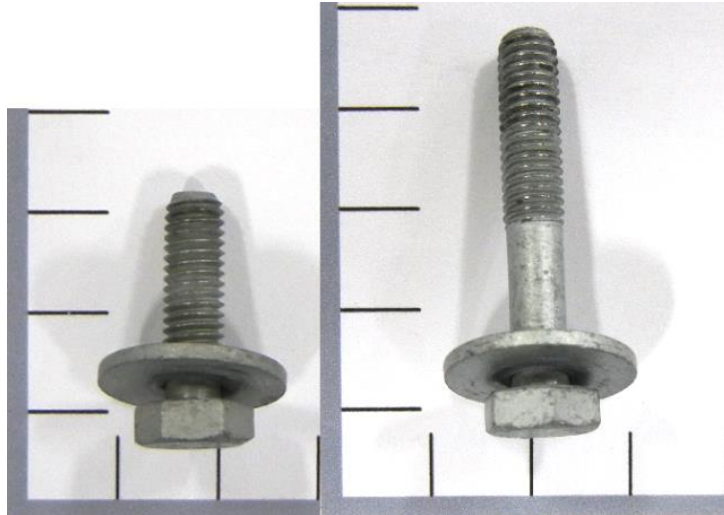
Assemble Head Lamp Seal Large

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	40.38	1	1.00	45.01	ESP	\$0.50	99.84 %	\$0.02

Assemble Head Lamp Seal Large

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00
Label, Date Code, Head Lamp	2	Commodity Item	Purchased	0.0001	-	\$0.02	\$0.00
Label, Valeo Supplier Large	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00

Passenger Head Lamp Installation



\...
 \Zone 2 Exterior
 \Lamps
 \Passenger Head Lamp Process

Process Summary

Right First Time	99.12 %
Process Time (Sec)	71.50
Total Weight (kg)	0.04

Material Cost**	\$0.15
OEM Process Cost	\$1.82
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.40
Manufacturing Cost*	\$2.50



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Installation



Passenger Head Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	71.50	1	1.00	91.41	GER	\$1.82	99.12 %	\$0.13

Passenger Head Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x18mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0087	-	\$0.03	\$0.00
M6x33mm-Hex SEMS Bolt	3	Commodity Item	Purchased	0.0111	-	\$0.04	\$0.00

Driver Head Lamp Bracket Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Driver Head Lamp Bracket Asm
Assembly Summary

Parts	10
Fasteners	7
Part Numbers	6
Steps	29
Fastenings	9
Right First Time	99.38 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.54
Total Weight (kg)	0.22

Material Cost**	\$0.85
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.27
Q Burden	\$0.09
SG&A	\$0.44
Manufacturing Cost*	\$2.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Bracket Asm



Driver Head Lamp Bracket Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Driver Head Lamp Bracket, Driver Head Lamp Bracket	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.26	0.1760
Caged J-Nut, Driver's Head Lamp Bracket Asm	2	4	3	9	3	99.76 %	0.00	0.00	0.45	0.01	0.0216
Assemble Driver Head Lamp Bracket	1	1	3	7	3	99.88 %	0.00	0.00	0.37	0.00	0.0048

Driver Head Lamp Bracket Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Driver Head Lamp Bracket, Driver Head Lamp Bracket	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.18	\$1.00
Caged J-Nut, Driver's Head Lamp Bracket Asm	\$0.06	\$0.01	\$0.00	\$0.00	\$0.41	\$0.00	\$0.04	\$0.09	\$0.61
Assemble Driver Head Lamp Bracket	\$0.01	\$0.00	\$0.00	\$0.00	\$0.33	\$0.00	\$0.02	\$0.07	\$0.43

Detailed Summary

Parts	10
Fasteners	7
Part Numbers	6
Steps	29
Fastenings	9
Right First Time	99.38%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.27
Supplier Fab. Time (Min)	0.28
Total Weight (kg)	0.22
Purchased Part Cost	
	\$0.13
Material Cost	
	\$0.72
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$1.15
Supplier Fab. Cost	
	\$0.13
Q Burden	
	\$0.09
SG&A	
	\$0.44
Manufacturing Cost*	
	\$2.66

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Bracket, Driver Head Lamp Bracket



\...

\Driver Head Lamp Bracket Asm

\Driver Head Lamp Bracket, Driver Head Lamp Bracket

\Driver Head Lamp Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	15.32
Total Weight (kg)	0.18

Material Cost**	\$0.70
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.00
SG&A	\$0.18
Manufacturing Cost*	\$1.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Bracket, Driver Head Lamp Bracket



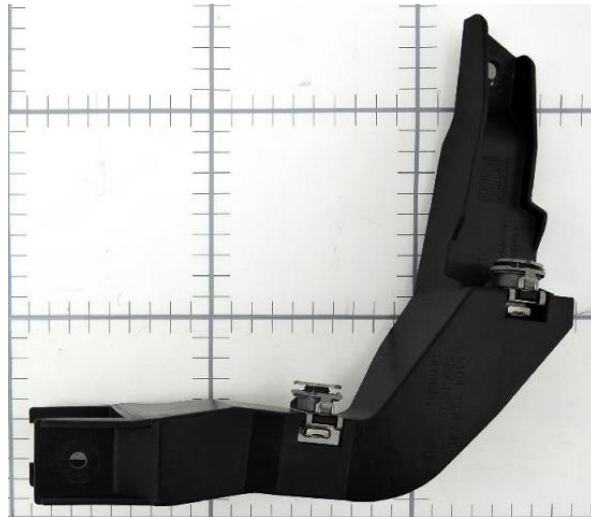
Driver Head Lamp Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	30.64	2	0.25	27.82	GER	\$0.12	99.99%	\$0.00

Driver Head Lamp Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Driver Head Lamp Bracket	1	PA66 GF30	\$3.95	0.1760	0.1760	\$0.00	\$0.70

Caged J-Nut, Driver's Head Lamp Bracket Asm



\...

\Lamps

\Driver Head Lamp Bracket Asm

\Caged J-Nut, Driver's Head Lamp Bracket Asm

Assembly Summary

Parts	4
Fasteners	3
Part Numbers	4
Steps	9
Fastenings	3
Right First Time	99.76 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.46
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.41
Q Burden	\$0.04
SG&A	\$0.09
Manufacturing Cost*	\$0.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Caged J-Nut, Driver's Head Lamp Bracket Asm



Caged J-Nut, Driver's Head Lamp Bracket Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Nut Retention Feature	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0006
Assemble Caged J-Nut	1	3	3	7	3	99.77 %	0.00	0.00	0.45	0.00	0.0210

Caged J-Nut, Driver's Head Lamp Bracket Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Nut Retention Feature	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Caged J-Nut	\$0.06	\$0.00	\$0.00	\$0.00	\$0.41	\$0.00	\$0.04	\$0.09	\$0.59

Caged J-Nut, Driver's Head Lamp Bracket Asm

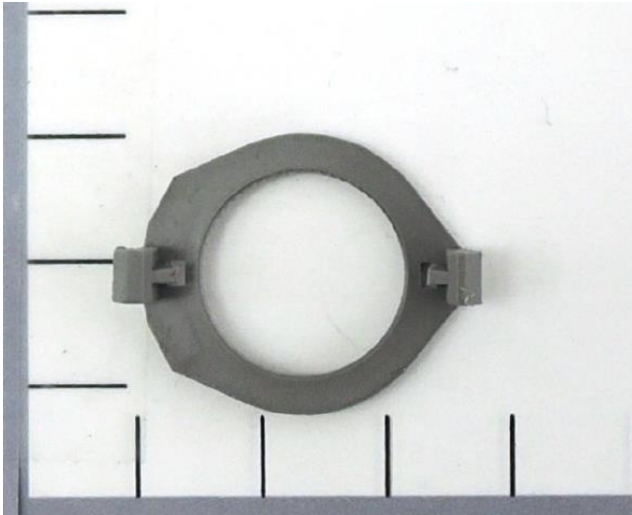
Detailed Summary

Parts	4
Fasteners	3
Part Numbers	4
Steps	9
Fastenings	3
Right First Time	99.76%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.45
Supplier Fab. Time (Min)	0.01
Total Weight (kg)	0.02
Purchased Part Cost	
	\$0.06
Material Cost	
	\$0.01
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.41
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.04
SG&A	
	\$0.09
Manufacturing Cost*	
	\$0.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Nut Retention Feature



\...

\Caged J-Nut, Driver's Head Lamp Bracket Asm

\Nut Retention Feature

\Nut Retention Feature Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.59
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Nut Retention Feature



Nut Retention Feature Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.16	24	0.25	23.71	GER	\$0.00	99.99%	\$0.00

Nut Retention Feature Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Nut Retention Feature	1	PA66	\$4.15	0.0006	0.0006	\$0.00	\$0.01

Assemble Caged J-Nut



\...

\Driver Head Lamp Bracket Asm

\Caged J-Nut, Driver's Head Lamp Bracket Asm

\Assemble Caged J-Nut

Process Summary

Right First Time	99.77 %
Process Time (Sec)	27.00
Total Weight (kg)	0.02
Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.41
Q Burden	\$0.04
SG&A	\$0.09
Manufacturing Cost*	\$0.59

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Caged J-Nut

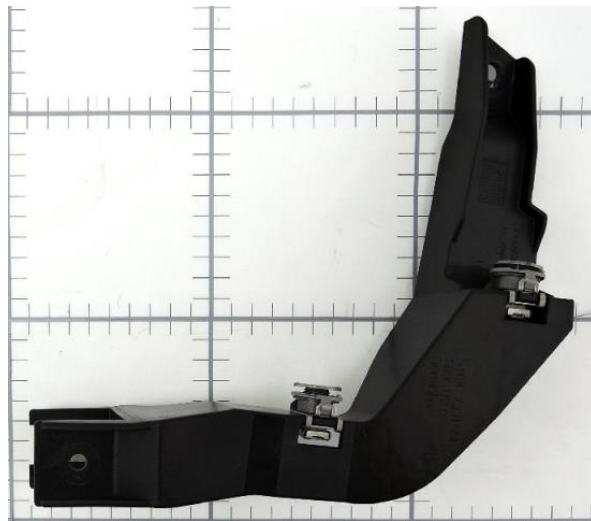
Assemble Caged J-Nut

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	27.00	1	1.00	54.32	GER	\$0.41	99.77%	\$0.04

Assemble Caged J-Nut

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Flanged Nut	1	Commodity Item	Purchased	0.0060	-	\$0.02	\$0.00
U-Nut with Captured Nut	1	Commodity Item	Purchased	0.0084	-	\$0.02	\$0.00
Threaded Flanged Nut	1	Commodity Item	Purchased	0.0066	-	\$0.02	\$0.00

Assemble Driver Head Lamp Bracket



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\Lamps

\Driver Head Lamp Bracket Asm

\Assemble Driver Head Lamp Bracket

Process Summary

Right First Time	99.88 %
Process Time (Sec)	22.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.33
Q Burden	\$0.02
SG&A	\$0.07
Manufacturing Cost*	\$0.43

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Driver Head Lamp Bracket

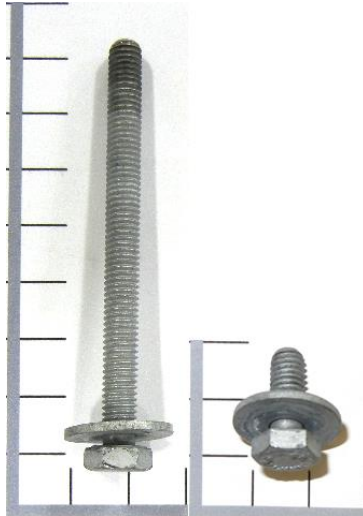


Assemble Driver Head Lamp Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	22.00	1	1.00	54.32	GER	\$0.33	99.88 %	\$0.02

Assemble Driver Head Lamp Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 M6 U-Nut	1	Commodity Item	Purchased	0.0048	-	\$0.01	\$0.00



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 \Zone 2 Exterior
 \Lamps
 \Driver Head Lamp Bracket Process

Process Summary

Right First Time	99.57 %
Process Time (Sec)	25.00
Total Weight (kg)	0.03

Material Cost**	\$0.08
OEM Process Cost	\$0.63
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$0.14
Manufacturing Cost*	\$0.92



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Head Lamp Bracket Installation



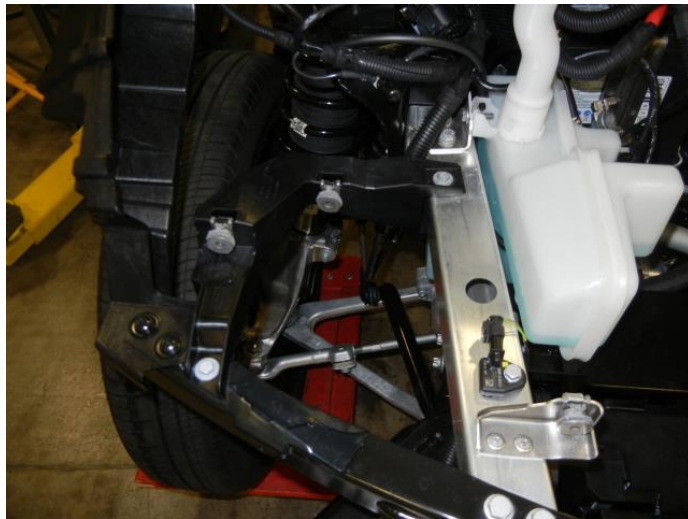
Driver Head Lamp Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	25.00	1	1.00	91.41	GER	\$0.63	99.57%	\$0.06

Driver Head Lamp Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x68mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0171	-	\$0.05	\$0.00
M6x14mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0080	-	\$0.03	\$0.00

Passenger Head Lamp Bracket Asm



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 \Zone 2 Exterior
 \Lamps
 \Passenger Head Lamp Bracket Asm
Assembly Summary

Parts	10
Fasteners	7
Part Numbers	6
Steps	29
Fastenings	9
Right First Time	99.38 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.53
Total Weight (kg)	0.22

Material Cost**	\$0.85
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.26
Q Burden	\$0.09
SG&A	\$0.44
Manufacturing Cost*	\$2.64

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Bracket Asm



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Passenger Head Lamp Bracket Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Passenger Head Lamp Bracket, Passenger Head Lamp B	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.26	0.1760
Caged J-Nut, Passenger Head Lamp Bracket Asm	2	4	3	9	3	99.76 %	0.00	0.00	0.45	0.01	0.0216
Assemble Driver Head Lamp Bracket	1	1	3	7	3	99.88 %	0.00	0.00	0.35	0.00	0.0048

Passenger Head Lamp Bracket Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Passenger Head Lamp Bracket, Passenger Head Lamp B	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.18	\$1.00
Caged J-Nut, Passenger Head Lamp Bracket Asm	\$0.06	\$0.01	\$0.00	\$0.00	\$0.41	\$0.00	\$0.04	\$0.09	\$0.61
Assemble Driver Head Lamp Bracket	\$0.01	\$0.00	\$0.00	\$0.00	\$0.32	\$0.00	\$0.02	\$0.07	\$0.42

Detailed Summary

Parts	10
Fasteners	7
Part Numbers	6
Steps	29
Fastenings	9
Right First Time	99.38%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.25
Supplier Fab. Time (Min)	0.28
Total Weight (kg)	0.22
Purchased Part Cost	
	\$0.13
Material Cost	
	\$0.72
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$1.13
Supplier Fab. Cost	
	\$0.13
Q Burden	
	\$0.09
SG&A	
	\$0.44
Manufacturing Cost*	
	\$2.64

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Bracket, Passenger Head Lamp Bracket



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\Passenger Head Lamp Bracket Asm
\Passenger Head Lamp Bracket, Passenger Head
Lamp Bracket
Passenger Head Lamp Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	15.32
Total Weight (kg)	0.18
Material Cost**	\$0.70
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.00
SG&A	\$0.18
Manufacturing Cost*	\$1.00

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Bracket, Passenger Head Lamp Bracket



Passenger Head Lamp Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	30.64	2	0.25	27.82	GER	\$0.12	99.99%	\$0.00

Passenger Head Lamp Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Passenger Head Lamp Bracket	1	PA66 GF30	\$3.95	0.1760	0.1760	\$0.00	\$0.70

Caged J-Nut, Passenger Head Lamp Bracket Asm



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 \Lamps
 \Passenger Head Lamp Bracket Asm
 \Caged J-Nut, Passenger Head Lamp Bracket Asm
Assembly Summary

Parts	4
Fasteners	3
Part Numbers	4
Steps	9
Fastenings	3
Right First Time	99.76 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.46
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.41
Q Burden	\$0.04
SG&A	\$0.09
Manufacturing Cost*	\$0.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Caged J-Nut, Passenger Head Lamp Bracket Asm



Caged J-Nut, Passenger Head Lamp Bracket Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Nut Retention Feature	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0006
Assemble Caged J-Nut	1	3	3	7	3	99.77 %	0.00	0.00	0.45	0.00	0.0210

Caged J-Nut, Passenger Head Lamp Bracket Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Nut Retention Feature	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Caged J-Nut	\$0.06	\$0.00	\$0.00	\$0.00	\$0.41	\$0.00	\$0.04	\$0.09	\$0.59

Caged J-Nut, Passenger Head Lamp Bracket Asm

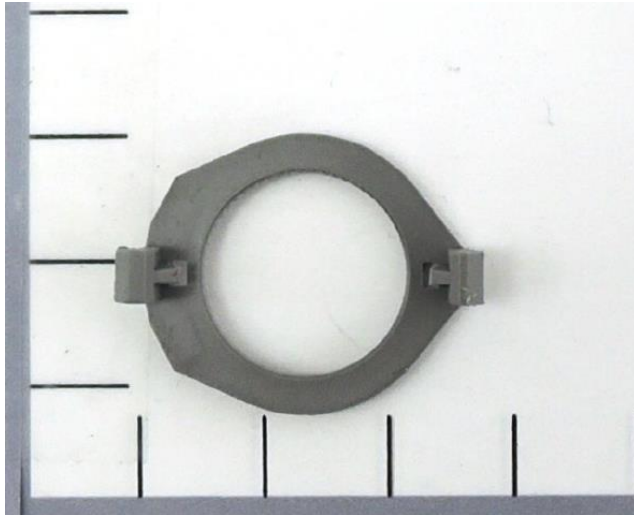
Detailed Summary

Parts	4
Fasteners	3
Part Numbers	4
Steps	9
Fastenings	3
Right First Time	99.76%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.45
Supplier Fab. Time (Min)	0.01
Total Weight (kg)	0.02
Purchased Part Cost	
	\$0.06
Material Cost	
	\$0.01
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.41
Supplier Fab. Cost	
	\$0.00
Q Burden	
	\$0.04
SG&A	
	\$0.09
Manufacturing Cost*	
	\$0.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Nut Retention Feature



\...

\Caged J-Nut, Passenger Head Lamp Bracket Asm

\Nut Retention Feature

\Nut Retention Feature Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.59
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Nut Retention Feature



Nut Retention Feature Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	14.16	24	0.25	23.71	GER	\$0.00	99.99%	\$0.00

Nut Retention Feature Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Nut Retention Feature	1	PA66	\$4.15	0.0006	0.0006	\$0.00	\$0.01

Assemble Caged J-Nut



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- \Passenger Head Lamp Bracket Asm
- \Caged J-Nut, Passenger Head Lamp Bracket Asm
- \Assemble Caged J-Nut

Process Summary

Right First Time	99.77 %
Process Time (Sec)	27.00
Total Weight (kg)	0.02
Material Cost**	\$0.06
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.41
Q Burden	\$0.04
SG&A	\$0.09
Manufacturing Cost*	\$0.59

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Caged J-Nut



Assemble Caged J-Nut

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	27.00	1	1.00	54.32	GER	\$0.41	99.77%	\$0.04

Assemble Caged J-Nut

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Flanged Nut	1	Commodity Item	Purchased	0.0060	-	\$0.02	\$0.00
U-Nut with Captured Nut	1	Commodity Item	Purchased	0.0084	-	\$0.02	\$0.00
Threaded Flanged Nut	1	Commodity Item	Purchased	0.0066	-	\$0.02	\$0.00

Assemble Driver Head Lamp Bracket



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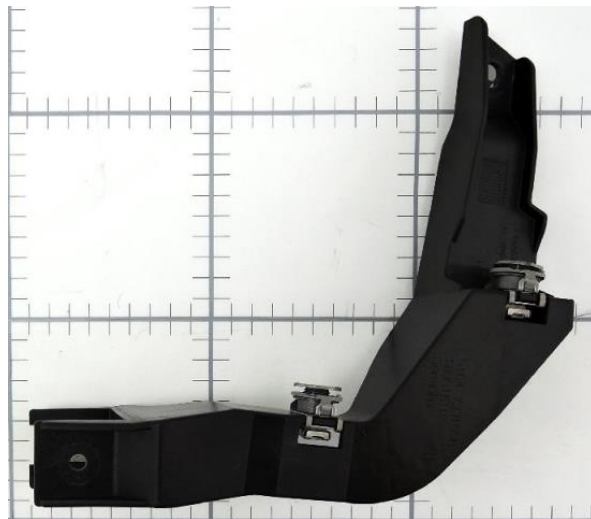
\Passenger Head Lamp Bracket Asm

\Assemble Driver Head Lamp Bracket

Process Summary

Right First Time	99.88 %
Process Time (Sec)	21.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.32
Q Burden	\$0.02
SG&A	\$0.07
Manufacturing Cost*	\$0.42



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Driver Head Lamp Bracket



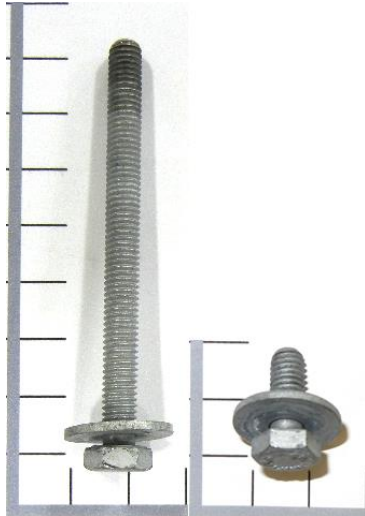
Assemble Driver Head Lamp Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	21.00	1	1.00	54.32	GER	\$0.32	99.88 %	\$0.02

Assemble Driver Head Lamp Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6 U-Nut	1	Commodity Item	Purchased	0.0048	-	\$0.01	\$0.00

Passenger Head Lamp Bracket Installation



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\Zone 2 Exterior
\Lamps
\Passenger Head Lamp Bracket Process

Process Summary

Right First Time	99.57 %
Process Time (Sec)	25.00
Total Weight (kg)	0.03

Material Cost**	\$0.08
OEM Process Cost	\$0.63
Supplier Process Cost	\$0.00
Q Burden	\$0.06
SG&A	\$0.14
Manufacturing Cost*	\$0.92



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Head Lamp Bracket Installation



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Passenger Head Lamp Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	25.00	1	1.00	91.41	GER	\$0.63	99.57%	\$0.06

Passenger Head Lamp Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M6x68mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0171	-	\$0.05	\$0.00
M6x14mm-Hex SEMS Bolt	1	Commodity Item	Purchased	0.0080	-	\$0.03	\$0.00

Driver Back Up Lamp Asm



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 \Zone 2 Exterior
 \Lamps
 \Driver Back Up Lamp Asm

Assembly Summary

Parts	10
Fasteners	2
Part Numbers	9
Steps	32
Fastenings	8
Right First Time	99.27 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.98
Total Weight (kg)	0.43
Material Cost**	\$7.92
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.55
Q Burden	\$0.11
SG&A	\$2.06
Manufacturing Cost*	\$11.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Driver Back Up Lamp Asm



Driver Back Up Lamp Asm											
Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Back Up LightHousing Asm, Driver's Back Up Lamp	1	8	6	25	6	99.33 %	0.00	0.00	0.97	0.66	0.3765
Back Up Lamp Lens, Driver Back Up Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.26	0.0576
Assemble Back Up Lamp Lens	1	0	2	3	2	99.96 %	0.00	0.00	0.08	0.00	0.0000

Driver Back Up Lamp Asm										
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*	
Back Up LightHousing Asm, Driver's Back Up Lamp	\$0.12	\$7.59	\$0.00	\$0.00	\$0.88	\$0.49	\$0.10	\$1.97	\$11.15	
Back Up Lamp Lens, Driver Back Up Lamp Asm	\$0.00	\$0.21	\$0.00	\$0.00	\$0.00	\$0.12	\$0.00	\$0.07	\$0.40	
Assemble Back Up Lamp Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.01	\$0.02	\$0.10	

Detailed Summary

Parts	10
Fasteners	2
Part Numbers	9
Steps	32
Fastenings	8
Right First Time	99.27%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.05
Supplier Fab. Time (Min)	0.92
Total Weight (kg)	0.43
Purchased Part Cost	
	\$0.12
Material Cost	
	\$7.80
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.95
Supplier Fab. Cost	
	\$0.60
Q Burden	
	\$0.11
SG&A	
	\$2.06
Manufacturing Cost*	
	\$11.65

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Light Housing Asm, Driver's Back Up Lamp



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\Lamps

\Driver Back Up Lamp Asm

\Back Up Light Housing Asm, Driver's Back Up Lamp

Assembly Summary

Parts	8
Fasteners	2
Part Numbers	7
Steps	25
Fastenings	6
Right First Time	99.33 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.63
Total Weight (kg)	0.38

Material Cost**	\$7.71
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.36
Q Burden	\$0.10
SG&A	\$1.97
Manufacturing Cost*	\$11.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Light Housing Asm, Driver's Back Up Lamp



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Back Up Light Housing Asm, Driver's Back Up Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Back Up Lamp Reflector Asm, Back Up Lamp Housing	1	4	2	12	2	99.84 %	0.00	0.00	0.25	0.53	0.2324
Back Up Lamp Housing, Back Up Lamp Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.14	0.1400
Assemble Back Up Lamp Housing	1	3	4	10	4	99.51 %	0.00	0.00	0.72	0.00	0.0041

Back Up Light Housing Asm, Driver's Back Up Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Back Up Lamp Reflector Asm, Back Up Lamp Housing	\$0.00	\$7.08	\$0.00	\$0.00	\$0.23	\$0.40	\$0.02	\$1.69	\$9.42
Back Up Lamp Housing, Back Up Lamp Housing Asm	\$0.00	\$0.51	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.13	\$0.73
Assemble Back Up Lamp Housing	\$0.12	\$0.00	\$0.00	\$0.00	\$0.65	\$0.00	\$0.07	\$0.15	\$0.99

Detailed Summary

Parts	8
Fasteners	2
Part Numbers	7
Steps	25
Fastenings	6
Right First Time	99.33%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.97
Supplier Fab. Time (Min)	0.66
Total Weight (kg)	0.38
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Purchased Part Cost	\$0.12
Material Cost	\$7.59
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.88
Supplier Fab. Cost	\$0.49
Q Burden	\$0.10
SG&A	\$1.97
Manufacturing Cost*	\$11.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Reflector Asm, Back Up Lamp Housing



\...
 \Driver Back Up Lamp Asm
 \Back Up Light Housing Asm, Driver's Back Up Lamp
 \Back Up Lamp Reflector Asm, Back Up Lamp
 Housing

Assembly Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	12
Fastenings	2
Right First Time	99.84 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.78
Total Weight (kg)	0.23

Material Cost**	\$7.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.62
Q Burden	\$0.02
SG&A	\$1.69
Manufacturing Cost*	\$9.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Reflector Asm, Back Up Lamp Housing



Back Up Lamp Reflector Asm, Back Up Lamp Housing

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Reflector Lower Trim, Back Up Lamp Reflector Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.34	0.0571
Reflector Upper Trim, Back Up Lamp Reflector Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.19	0.0333
Assemble Reflector Upper & Lower	1	1	2	5	2	99.87 %	0.00	0.00	0.25	0.00	0.1420

Back Up Lamp Reflector Asm, Back Up Lamp Housing

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Reflector Lower Trim, Back Up Lamp Reflector Asm	\$0.00	\$0.32	\$0.00	\$0.00	\$0.00	\$0.31	\$0.00	\$0.14	\$0.77
Reflector Upper Trim, Back Up Lamp Reflector Asm	\$0.00	\$0.14	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.05	\$0.28
Assemble Reflector Upper & Lower	\$0.00	\$6.62	\$0.00	\$0.00	\$0.23	\$0.00	\$0.02	\$1.51	\$8.37

Back Up Lamp Reflector Asm, Back Up Lamp Housing



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Detailed Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	12
Fastenings	2
Right First Time	99.84%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.25
Supplier Fab. Time (Min)	0.53
Total Weight (kg)	0.23
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Purchased Part Cost	\$0.00
Material Cost	\$7.08
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.23
Supplier Fab. Cost	\$0.40
Q Burden	\$0.02
SG&A	\$1.69
Manufacturing Cost*	\$9.42

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Lower Trim, Back Up Lamp Reflector Asm



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- \Back Up Lamp Reflector Asm, Back Up Lamp Housing
- \Reflector Lower Trim, Back Up Lamp Reflector Asm
- \Reflector Lower Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	20.56
Total Weight (kg)	0.06

Material Cost**	\$0.32
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.31
Q Burden	\$0.00
SG&A	\$0.14
Manufacturing Cost*	\$0.77

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Lower Trim, Back Up Lamp Reflector Asm



Reflector Lower Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	12.97	1	0.25	70.87	GER	\$0.26	99.99%	\$0.00
110 Ton Injection Molding Press	15.18	2	0.25	26.65	GER	\$0.06	99.99%	\$0.00

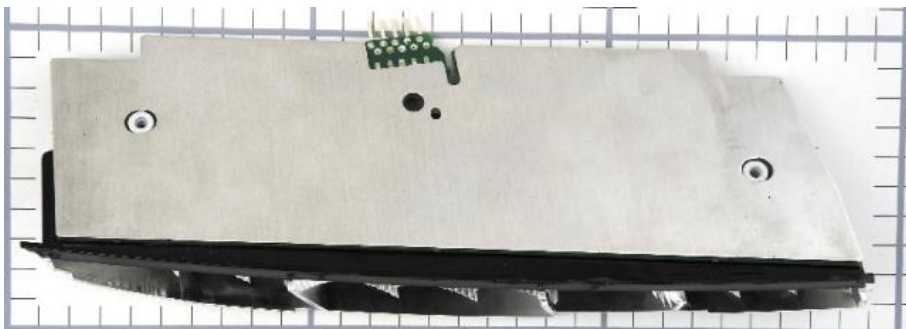
Reflector Lower Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Tail Lamp Reflector Lower Trim	1	Plating - Chrome	By Area	0.0000	-	\$0.00	\$0.08
Material, Reflector Lower Trim	1	PC	\$3.97	0.0571	0.0614	\$0.00	\$0.24

Reflector Upper Trim, Back Up Lamp Reflector Asm



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\...

- \Back Up Lamp Reflector Asm, Back Up Lamp Housing
- \Reflector Upper Trim, Back Up Lamp Reflector Asm
- \Reflector Upper Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	11.16
Total Weight (kg)	0.03
Material Cost**	\$0.14
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.00
SG&A	\$0.05
Manufacturing Cost*	\$0.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Upper Trim, Back Up Lamp Reflector Asm



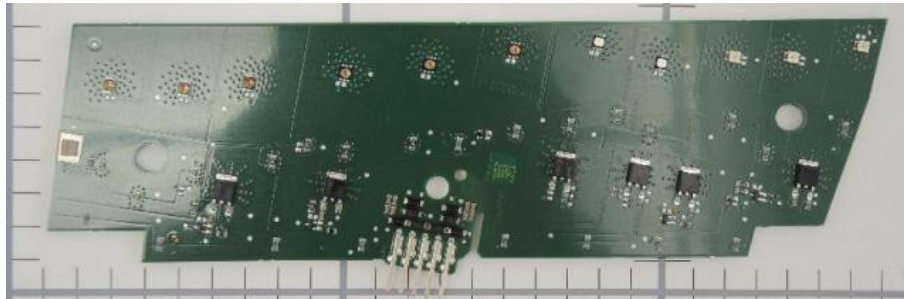
Reflector Upper Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	22.32	2	0.25	27.82	GER	\$0.09	99.99%	\$0.00

Reflector Upper Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Reflector Upper Trim	1	PC	\$3.97	0.0333	0.0358	\$0.00	\$0.14

Assemble Reflector Upper & Lower



\...

- \Back Up Light Housing Asm, Driver's Back Up Lamp
- \Back Up Lamp Reflector Asm, Back Up Lamp Housing
- \Assemble Reflector Upper & Lower

Process Summary

Right First Time	99.87 %
Process Time (Sec)	15.00
Total Weight (kg)	0.14

Material Cost**	\$6.62
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.23
Q Burden	\$0.02
SG&A	\$1.51
Manufacturing Cost*	\$8.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Reflector Upper & Lower



Assemble Reflector Upper & Lower

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	15.00	1	1.00	54.32	GER	\$0.23	99.87%	\$0.02

Assemble Reflector Upper & Lower

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Tail Lamp, Driver Side	1	See Appendix	-	0.1420	-	\$0.00	\$6.62

[Click Here for TechInsights Electronics Report on Tail Lamp PCB](#)

Back Up Lamp Housing, Back Up Lamp Housing Asm



\...

- \Back Up Light Housing Asm, Driver's Back Up Lamp
- \Back Up Lamp Housing, Back Up Lamp Housing Asm
- \Back Up Light Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.15
Total Weight (kg)	0.14

Material Cost**	\$0.51
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.73

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Housing, Back Up Lamp Housing Asm



Back Up Light Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	16.30	2	0.25	39.50	GER	\$0.09	99.99%	\$0.00

Back Up Light Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Back Up Lamp Housing	1	ABS + PC	\$3.40	0.1400	0.1400	\$0.00	\$0.51

Assemble Back Up Lamp Housing



\...

- \Driver Back Up Lamp Asm
- \Back Up Light Housing Asm, Driver's Back Up Lamp
- \Assemble Back Up Lamp Housing

Process Summary

Right First Time	99.51 %
Process Time (Sec)	43.00
Total Weight (kg)	0.00

Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.65
Q Burden	\$0.07
SG&A	\$0.15
Manufacturing Cost*	\$0.99

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Back Up Lamp Housing



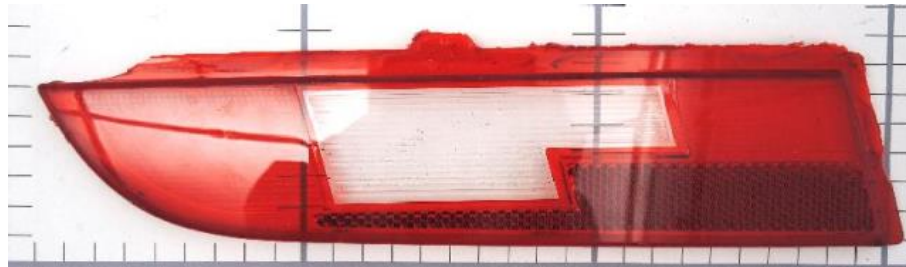
Assemble Back Up Lamp Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	43.00	1	1.00	54.32	GER	\$0.65	99.51 %	\$0.07

Assemble Back Up Lamp Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00
Label, Supplier Label, Tail Lamp	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00

Back Up Lamp Lens, Driver Back Up Lamp Asm



\...

- \Driver Back Up Lamp Asm
- \Back Up Lamp Lens, Driver Back Up Lamp Asm
- \Tail Lamp Lens Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	15.62
Total Weight (kg)	0.06

Material Cost**	\$0.21
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.40

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Lens, Driver Back Up Lamp Asm



Tail Lamp Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	31.24	2	0.25	26.65	GER	\$0.12	99.98 %	\$0.00

Tail Lamp Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Back Up Lamp Lens	1	PMMA - Colored	\$3.57	0.0506	0.0544	\$0.00	\$0.19
Material, Back Up Lamp Lens	1	PMMA - Clear	\$3.09	0.0070	0.0080	\$0.00	\$0.02

No Commodity Items Required for This Process



\...
\Lamps
\Driver Back Up Lamp Asm
\Assemble Back Up Lamp Lens

Process Summary

Right First Time	99.96 %
Process Time (Sec)	5.06
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Back Up Lamp Lens



Assemble Back Up Lamp Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	5.06	1	1.00	54.32	GER	\$0.08	99.96%	\$0.01

Assemble Back Up Lamp Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Passenger Back Up Lamp Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Passenger Back Up Lamp Asm

Assembly Summary

Parts	10
Fasteners	2
Part Numbers	9
Steps	34
Fastenings	8
Right First Time	99.21 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	2.13
Total Weight (kg)	0.43
Material Cost**	\$7.92
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.82
Q Burden	\$0.12
SG&A	\$2.12
Manufacturing Cost*	\$11.98

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Passenger Back Up Lamp Asm



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Passenger Back Up Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Back Up Lamp Housing Asm, Passenger Back Up Lamp A	1	8	6	26	6	99.31 %	0.00	0.00	1.05	0.66	0.3765
Back Up Lamp Lens, Passenger Back Up Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.26	0.0576
Assemble Back Up Lamp Lens	1	0	2	4	2	99.92 %	0.00	0.00	0.15	0.00	0.0000

Passenger Back Up Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Back Up Lamp Housing Asm, Passenger Back Up Lamp A	\$0.12	\$7.59	\$0.00	\$0.00	\$0.95	\$0.47	\$0.10	\$1.99	\$11.22
Back Up Lamp Lens, Passenger Back Up Lamp Asm	\$0.00	\$0.21	\$0.00	\$0.00	\$0.00	\$0.26	\$0.00	\$0.10	\$0.58
Assemble Back Up Lamp Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.01	\$0.03	\$0.18

Detailed Summary

Parts	10
Fasteners	2
Part Numbers	9
Steps	34
Fastenings	8
Right First Time	99.21%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.20
Supplier Fab. Time (Min)	0.92
Total Weight (kg)	0.43
Purchased Part Cost	
	\$0.12
Material Cost	\$7.80
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$1.09
Supplier Fab. Cost	\$0.73
Q Burden	\$0.12
SG&A	\$2.12
Manufacturing Cost*	\$11.98

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Housing Asm, Passenger Back Up Lamp Asm



\...
 \Lamps
 \Passenger Back Up Lamp Asm
 \Back Up Lamp Housing Asm, Passenger Back Up
 Lamp A

Assembly Summary

Parts	8
Fasteners	2
Part Numbers	7
Steps	26
Fastenings	6
Right First Time	99.31 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.71
Total Weight (kg)	0.38
Material Cost**	\$7.71
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.42
Q Burden	\$0.10
SG&A	\$1.99
Manufacturing Cost*	\$11.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Housing Asm, Passenger Back Up Lamp Asm



Back Up Lamp Housing Asm, Passenger Back Up Lamp A

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Back Up Lamp Reflector Asm, Back Up Lamp Housing A	1	4	2	13	2	99.82 %	0.00	0.00	0.35	0.53	0.2324
Back Up Lamp Housing, Back Up Lamp Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.14	0.1400
Assemble Back Up Lamp Housing	1	3	4	10	4	99.51 %	0.00	0.00	0.70	0.00	0.0041

Back Up Lamp Housing Asm, Passenger Back Up Lamp A

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Back Up Lamp Reflector Asm, Back Up Lamp Housing A	\$0.00	\$7.08	\$0.00	\$0.00	\$0.32	\$0.40	\$0.03	\$1.71	\$9.54
Back Up Lamp Housing, Back Up Lamp Housing Asm	\$0.00	\$0.51	\$0.00	\$0.00	\$0.00	\$0.07	\$0.00	\$0.13	\$0.71
Assemble Back Up Lamp Housing	\$0.12	\$0.00	\$0.00	\$0.00	\$0.63	\$0.00	\$0.07	\$0.14	\$0.97

Back Up Lamp Housing Asm, Passenger Back Up Lamp Asm



Detailed Summary

Parts	8
Fasteners	2
Part Numbers	7
Steps	26
Fastenings	6
Right First Time	99.31%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	1.05
Supplier Fab. Time (Min)	0.66
Total Weight (kg)	0.38
Purchased Part Cost	
	\$0.12
Material Cost	
	\$7.59
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.95
Supplier Fab. Cost	
	\$0.47
Q Burden	
	\$0.10
SG&A	
	\$1.99
Manufacturing Cost*	
	\$11.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Reflector Asm, Back Up Lamp Housing Asm



\...
 \Passenger Back Up Lamp Asm
 \Back Up Lamp Housing Asm, Passenger Back Up Lamp
 \Back Up Lamp Reflector Asm, Back Up Lamp Housing A

Assembly Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	2
Right First Time	99.82 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.88
Total Weight (kg)	0.23

Material Cost**	\$7.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.71
Q Burden	\$0.03
SG&A	\$1.71
Manufacturing Cost*	\$9.54

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Reflector Asm, Back Up Lamp Housing Asm



Back Up Lamp Reflector Asm, Back Up Lamp Housing A

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Reflector Lower Trim, Back Up Lamp Reflector Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.34	0.0571
Reflector Upper Trim, Back Up Lamp Reflector Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.19	0.0333
Assemble Reflector Upper & Lower	1	1	2	6	2	99.85 %	0.00	0.00	0.35	0.00	0.1420

Back Up Lamp Reflector Asm, Back Up Lamp Housing A

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Reflector Lower Trim, Back Up Lamp Reflector Asm	\$0.00	\$0.32	\$0.00	\$0.00	\$0.00	\$0.31	\$0.00	\$0.14	\$0.77
Reflector Upper Trim, Back Up Lamp Reflector Asm	\$0.00	\$0.14	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.05	\$0.28
Assemble Reflector Upper & Lower	\$0.00	\$6.62	\$0.00	\$0.00	\$0.32	\$0.00	\$0.02	\$1.53	\$8.49

Back Up Lamp Reflector Asm, Back Up Lamp Housing Asm

Detailed Summary

Parts	4
Fasteners	0
Part Numbers	4
Steps	13
Fastenings	2
Right First Time	99.82%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.35
Supplier Fab. Time (Min)	0.53
Total Weight (kg)	0.23
Purchased Part Cost	
	\$0.00
Material Cost	
	\$7.08
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.32
Supplier Fab. Cost	
	\$0.40
Q Burden	
	\$0.03
SG&A	
	\$1.71
Manufacturing Cost*	
	\$9.54

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Lower Trim, Back Up Lamp Reflector Asm



\...

- \Back Up Lamp Reflector Asm, Back Up Lamp Housing A
- \Reflector Lower Trim, Back Up Lamp Reflector Asm
- \Tail Lamp Reflector Lower Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	20.56
Total Weight (kg)	0.06

Material Cost**	\$0.32
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.31
Q Burden	\$0.00
SG&A	\$0.14
Manufacturing Cost*	\$0.77

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Lower Trim, Back Up Lamp Reflector Asm



Tail Lamp Reflector Lower Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	12.97	1	0.25	70.87	GER	\$0.26	99.99%	\$0.00
110 Ton Injection Molding Press	15.18	2	0.25	26.65	GER	\$0.06	99.99%	\$0.00

Tail Lamp Reflector Lower Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Tail Lamp Reflector Lower Trim	1	Plating - Chrome		By Area	0.0000	-	\$0.08
Material, Tail Lamp Reflector Lower Trim	1	PC	\$3.97	0.0571	0.0614	\$0.00	\$0.24

Reflector Upper Trim, Back Up Lamp Reflector Asm



\...

- \Back Up Lamp Reflector Asm, Back Up Lamp Housing A
- \Reflector Upper Trim, Back Up Lamp Reflector Asm
- \Tail Lamp Reflector Upper Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	11.16
Total Weight (kg)	0.03

Material Cost**	\$0.14
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.00
SG&A	\$0.05
Manufacturing Cost*	\$0.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Upper Trim, Back Up Lamp Reflector Asm



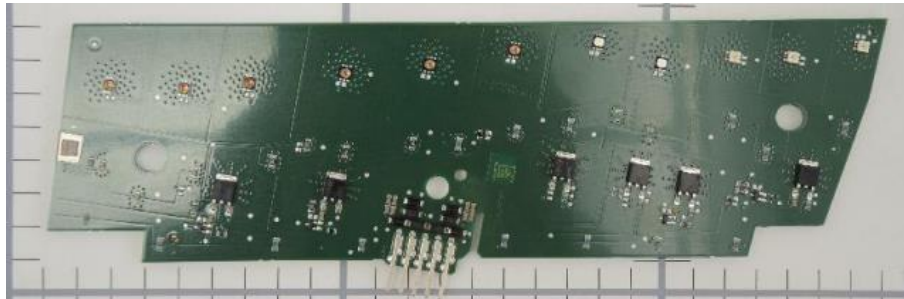
Tail Lamp Reflector Upper Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	22.32	2	0.25	27.82	GER	\$0.09	99.99%	\$0.00

Tail Lamp Reflector Upper Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Reflector Upper Trim	1	PC	\$3.97	0.0333	0.0358	\$0.00	\$0.14

Assemble Reflector Upper & Lower



- \...
- \Back Up Lamp Housing Asm, Passenger Back Up Lamp
- A \Back Up Lamp Reflector Asm, Back Up Lamp Housing
- A \Assemble Reflector Upper & Lower

Process Summary

Right First Time	99.85 %
Process Time (Sec)	21.00
Total Weight (kg)	0.14

Material Cost**	\$6.62
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.32
Q Burden	\$0.02
SG&A	\$1.53
Manufacturing Cost*	\$8.49

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Reflector Upper & Lower



Assemble Reflector Upper & Lower

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	21.00	1	1.00	54.32	GER	\$0.32	99.85%	\$0.02

Assemble Reflector Upper & Lower

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Tail Lamp, Passenger Side	1	See Appendix	-	0.1420	-	\$0.00	\$6.62

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Back Up Lamp Housing, Back Up Lamp Housing Asm



- \...
- \Back Up Lamp Housing Asm, Passenger Back Up Lamp
- A \Back Up Lamp Housing, Back Up Lamp Housing Asm
- \Back Up Light Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.15
Total Weight (kg)	0.14

Material Cost**	\$0.51
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.71

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Housing, Back Up Lamp Housing Asm



Back Up Light Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	16.30	2	0.25	30.85	GER	\$0.07	99.99%	\$0.00

Back Up Light Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Back Up Lamp Housing	1	ABS + PC	\$3.40	0.1400	0.1400	\$0.00	\$0.51

Assemble Back Up Lamp Housing



\...
 \Passenger Back Up Lamp Asm
 \Back Up Lamp Housing Asm, Passenger Back Up
 Lamp Assemble Back Up Lamp Housing

Process Summary

Right First Time	99.51 %
Process Time (Sec)	42.00
Total Weight (kg)	0.00
Material Cost**	\$0.12
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.63
Q Burden	\$0.07
SG&A	\$0.14
Manufacturing Cost*	\$0.97

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Back Up Lamp Housing



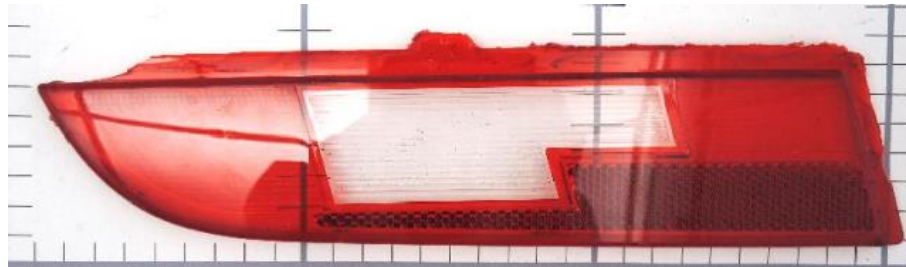
Assemble Back Up Lamp Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	42.00	1	1.00	54.32	GER	\$0.63	99.51 %	\$0.07

Assemble Back Up Lamp Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x14mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00
Label, Supplier Label	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00

Back Up Lamp Lens, Passenger Back Up Lamp Asm



\...

- \Passenger Back Up Lamp Asm
- \Back Up Lamp Lens, Passenger Back Up Lamp Asm
- \Tail Lamp Lens Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	15.62
Total Weight (kg)	0.06

Material Cost**	\$0.21
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.26
Q Burden	\$0.00
SG&A	\$0.10
Manufacturing Cost*	\$0.58

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Back Up Lamp Lens, Passenger Back Up Lamp Asm



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Tail Lamp Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	31.24	2	0.25	61.01	GER	\$0.26	99.98 %	\$0.00

Tail Lamp Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Back Up Lamp Lens	1	PMMA - Colored	\$3.57	0.0506	0.0544	\$0.00	\$0.19
Material, Back Up Lamp Lens	1	PMMA - Clear	\$3.09	0.0070	0.0080	\$0.00	\$0.02

No Commodity Items Required for This Process

- \...
- \Lamps
 - \Passenger Back Up Lamp Asm
 - \Assemble Back Up Lamp Lens

Process Summary

Right First Time	99.92 %
Process Time (Sec)	9.06
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.18



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Back Up Lamp Lens



Assemble Back Up Lamp Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.06	1	1.00	54.32	GER	\$0.14	99.92 %	\$0.01

Assemble Back Up Lamp Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Back Up Lamps



\...
\Zone 2 Exterior
\Lamps
\Assemble Back Up Lamps

Process Summary

Right First Time	99.11 %
Process Time (Sec)	63.00
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$1.60
Supplier Process Cost	\$0.00
Q Burden	\$0.13
SG&A	\$0.35
Manufacturing Cost*	\$2.13



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Back Up Lamps



Assemble Back Up Lamps

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	63.00	1	1.00	91.41	GER	\$1.60	99.11 %	\$0.13

Assemble Back Up Lamps

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x16mm-Pan Head Torx	4	Commodity Item	Purchased	0.0023	-	\$0.01	\$0.00

Driver Fog Lamp Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Driver Fog Lamp Asm

Assembly Summary

Parts	29
Fasteners	5
Part Numbers	24
Steps	105
Fastenings	25
Right First Time	97.43 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	5.43
Total Weight (kg)	0.57

Material Cost**	\$10.76
OEM Process Cost	\$0.00
Supplier Process Cost	\$4.81
Q Burden	\$0.39
SG&A	\$2.36
Manufacturing Cost*	\$18.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Driver Fog Lamp Asm



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Driver Fog Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Reflector Asm, Driver Fog Lamp	1	6	3	17	3	99.30%	0.00	0.00	0.83	0.94	0.1576
Housing Asm, Driver Fog Lamp	1	6	5	25	5	99.32%	0.00	0.00	0.77	0.16	0.2605
Assemble Fog Lamp Housing and Reflector	1	0	1	3	1	99.95%	0.00	0.00	0.12	0.00	0.0000
Lens, Driver Fog Lamp Asm	1	3	0	15	0	99.85%	0.00	0.00	0.00	0.66	0.0900
Assemble Fog Lamp Lens	1	0	2	3	2	99.88%	0.00	0.00	0.12	0.00	0.0000
Actuator Gear, Driver Fog Lamp	1	1	0	1	0	99.99%	0.00	0.00	0.00	0.05	0.0057
Assemble Fog Lamp Actuator Gear	1	0	1	2	1	99.90%	0.00	0.00	0.10	0.00	0.0000
Actuator Arm, Driver Fog Lamp Asm	1	1	0	1	0	99.99%	0.00	0.00	0.00	0.03	0.0092
Actuator Arm Cover, Driver Fog Lamp	1	1	0	1	0	99.99%	0.00	0.00	0.00	0.02	0.0107
Assemble Fog Lamp Actuator Arm & Cover	1	2	4	9	4	99.51%	0.00	0.00	0.55	0.00	0.0024
Plug, Driver Fog Lamp Asm	2	1	0	1	0	99.99%	0.00	0.00	0.00	0.01	0.0007
Assemble Fog Lamp Plugs	1	7	9	18	9	99.75%	0.00	0.00	1.05	0.00	0.0345

Driver Fog Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Reflector Asm, Driver Fog Lamp	\$0.03	\$3.53	\$0.00	\$0.00	\$0.63	\$1.76	\$0.11	\$1.30	\$7.35
Housing Asm, Driver Fog Lamp	\$0.04	\$1.09	\$0.00	\$0.00	\$0.58	\$0.09	\$0.10	\$0.39	\$2.28
Assemble Fog Lamp Housing and Reflector	\$0.00	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.01	\$0.02	\$0.11
Lens, Driver Fog Lamp Asm	\$0.00	\$0.41	\$0.00	\$0.00	\$0.00	\$0.26	\$0.02	\$0.15	\$0.84
Assemble Fog Lamp Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.02	\$0.02	\$0.13
Actuator Gear, Driver Fog Lamp	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.01	\$0.05
Assemble Fog Lamp Actuator Gear	\$0.00	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.02	\$0.02	\$0.11
Actuator Arm, Driver Fog Lamp Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Actuator Arm Cover, Driver Fog Lamp	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.06
Assemble Fog Lamp Actuator Arm & Cover	\$0.02	\$0.00	\$0.00	\$0.00	\$0.41	\$0.00	\$0.07	\$0.09	\$0.60
Plug, Driver Fog Lamp Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.02
Assemble Fog Lamp Plugs	\$5.53	\$0.00	\$0.00	\$0.00	\$0.78	\$0.00	\$0.04	\$0.34	\$6.69

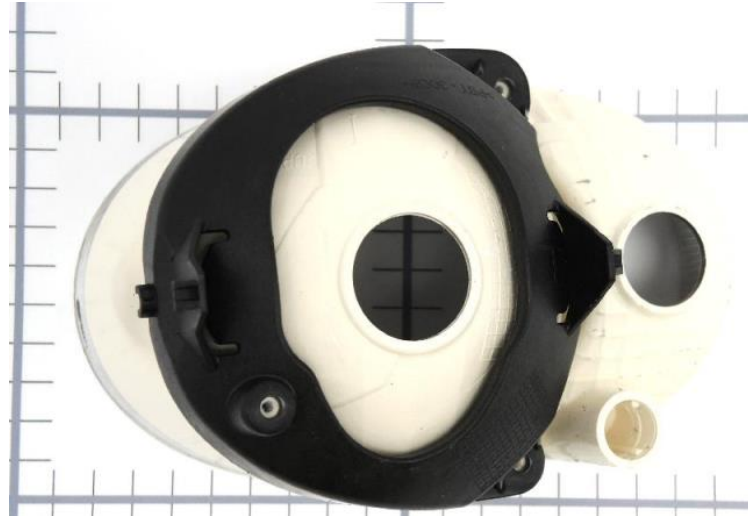
Detailed Summary

Parts	29
Fasteners	5
Part Numbers	24
Steps	105
Fastenings	25
Right First Time	97.43%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.53
Supplier Fab. Time (Min)	1.89
Total Weight (kg)	0.57
Purchased Part Cost	
	\$5.62
Material Cost	
	\$5.14
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$2.65
Supplier Fab. Cost	
	\$2.16
Q Burden	
	\$0.39
SG&A	
	\$2.36
Manufacturing Cost*	
	\$18.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Asm, Driver Fog Lamp



\...

\Lamps

\Driver Fog Lamp Asm

\Reflector Asm, Driver Fog Lamp

Assembly Summary

Parts	6
Fasteners	3
Part Numbers	4
Steps	17
Fastenings	3
Right First Time	99.30 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.77
Total Weight (kg)	0.16

Material Cost**	\$3.56
OEM Process Cost	\$0.00
Supplier Process Cost	\$2.39
Q Burden	\$0.11
SG&A	\$1.30
Manufacturing Cost*	\$7.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Asm, Driver Fog Lamp



Reflector Asm, Driver Fog Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Reflector Fog Lamp, Reflector Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.84	0.1525
Reflector Support Fog Lamp, Reflector Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.10	0.0036
Assemble Fog Lamp Refelctor Asm	1	3	3	10	3	99.34 %	0.00	0.00	0.83	0.00	0.0015

Reflector Asm, Driver Fog Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Reflector Fog Lamp, Reflector Asm	\$0.00	\$3.52	\$0.00	\$0.00	\$0.00	\$1.72	\$0.00	\$1.15	\$6.39
Reflector Support Fog Lamp, Reflector Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.07
Assemble Fog Lamp Refelctor Asm	\$0.03	\$0.00	\$0.00	\$0.00	\$0.63	\$0.00	\$0.10	\$0.14	\$0.89

Detailed Summary

Parts	6
Fasteners	3
Part Numbers	4
Steps	17
Fastenings	3
Right First Time	99.3%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.83
Supplier Fab. Time (Min)	0.94
Total Weight (kg)	0.16
Purchased Part Cost	
	\$0.03
Material Cost	
	\$3.53
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.63
Supplier Fab. Cost	
	\$1.76
Q Burden	
	\$0.11
SG&A	
	\$1.30
Manufacturing Cost*	
	\$7.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Fog Lamp, Reflector Asm



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- \Reflector Asm, Driver Fog Lamp
- \Reflector Fog Lamp, Reflector Asm
- \Reflector Process

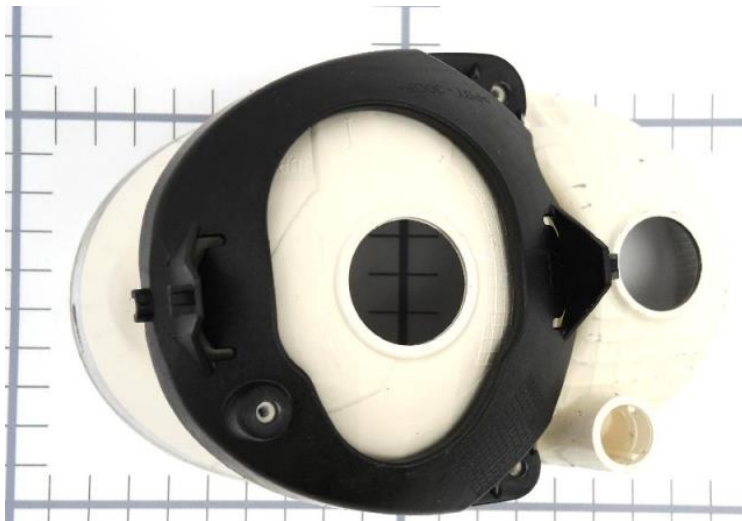
Process Summary

Right First Time	99.98 %
Process Time (Sec)	50.14
Total Weight (kg)	0.15

Material Cost**	\$3.52
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.72
Q Burden	\$0.00
SG&A	\$1.15
Manufacturing Cost*	\$6.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Reflector Fog Lamp, Reflector Asm



Reflector Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	43.10	1	0.25	138.83	ESP	\$1.66	99.99%	\$0.00
200 Ton Injection Molding Press	14.08	2	0.25	28.76	ESP	\$0.06	99.99%	\$0.00

Reflector Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Reflector	1	Plating - Chrome		By Area	0.0000	\$0.00	\$0.16
Material, Reflector	1	UP GF	\$22.05	0.1525	0.1525	\$0.00	\$3.36

Reflector Support Fog Lamp, Reflector Asm



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- \Reflector Asm, Driver Fog Lamp
- \Reflector Support Fog Lamp, Reflector Asm
- \Reflector Support Process

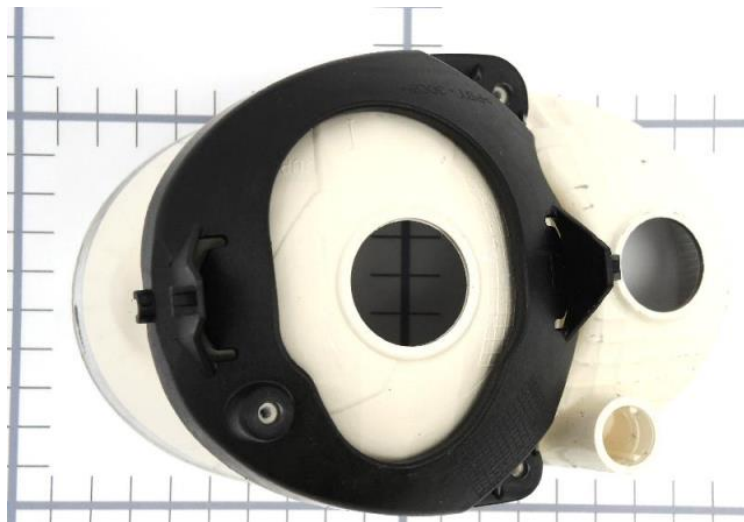
Process Summary

Right First Time	99.99 %
Process Time (Sec)	6.28
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Reflector Support Fog Lamp, Reflector Asm



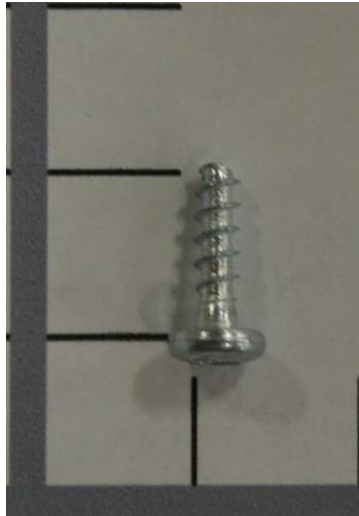
Reflector Support Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	12.56	2	0.25	24.56	ESP	\$0.04	99.99%	\$0.00

Reflector Support Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Reflector Support	1	PBT GF30	\$3.18	0.0036	0.0039	\$0.00	\$0.01

Assemble Fog Lamp Reflector Asm



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- \Driver Fog Lamp Asm
- \Reflector Asm, Driver Fog Lamp
- \Assemble Fog Lamp Reflector Asm

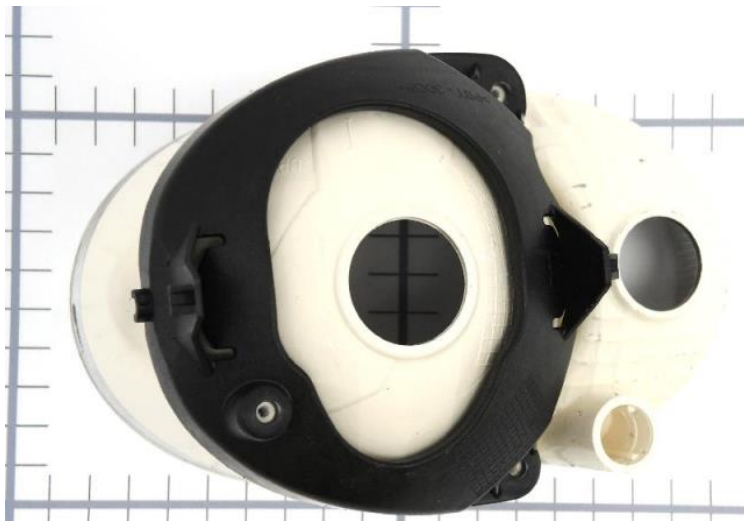
Process Summary

Right First Time	99.34 %
Process Time (Sec)	50.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.63
Q Burden	\$0.10
SG&A	\$0.14
Manufacturing Cost*	\$0.89

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Fog Lamp Reflector Asm



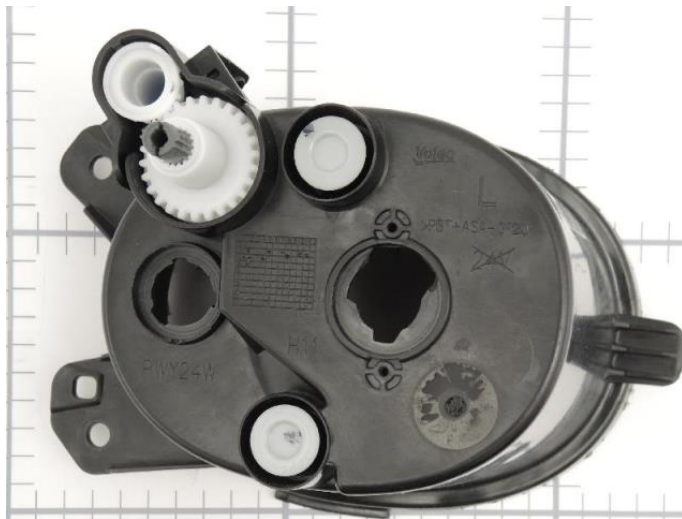
Assemble Fog Lamp Refelctor Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	50.00	1	1.00	45.01	ESP	\$0.63	99.34%	\$0.10

Assemble Fog Lamp Refelctor Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M3x8mm-Pan Head Torx	3	Commodity Item	Purchased	0.0005	-	\$0.01	\$0.00

Housing Asm, Driver Fog Lamp



\...
 \Lamps
 \Driver Fog Lamp Asm
 \Housing Asm, Driver Fog Lamp
Assembly Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	25
Fastenings	5
Right First Time	99.32 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.93
Total Weight (kg)	0.26

Material Cost**	\$1.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.66
Q Burden	\$0.10
SG&A	\$0.39
Manufacturing Cost*	\$2.28

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Housing Asm, Driver Fog Lamp



MUNRO
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Housing Asm, Driver Fog Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.2450
Actuator Arm Asm, Housing Asm	1	2	1	5	1	99.89 %	0.00	0.00	0.17	0.02	0.0055
Assemble Fog Lamp Actuator Arm	1	0	1	3	1	99.76 %	0.00	0.00	0.17	0.00	0.0000
Cap Asm, Housing Asm	1	2	1	6	1	99.90 %	0.00	0.00	0.18	0.01	0.0022
Assemble Fog Lamp Acuator Arm Cap	1	0	1	3	1	99.89 %	0.00	0.00	0.15	0.00	0.0000
Reflector Bracket, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0078
Assemble Fog Lamp Bracket	1	0	1	2	1	99.90 %	0.00	0.00	0.10	0.00	0.0000

Housing Asm, Driver Fog Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Housing Asm	\$0.00	\$1.02	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.24	\$1.34
Actuator Arm Asm, Housing Asm	\$0.03	\$0.02	\$0.00	\$0.00	\$0.13	\$0.01	\$0.02	\$0.03	\$0.23
Assemble Fog Lamp Actuator Arm	\$0.00	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.04	\$0.03	\$0.19
Cap Asm, Housing Asm	\$0.01	\$0.01	\$0.00	\$0.00	\$0.14	\$0.00	\$0.02	\$0.03	\$0.21
Assemble Fog Lamp Acuator Arm Cap	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.02	\$0.02	\$0.15
Reflector Bracket, Housing Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.01	\$0.05
Assemble Fog Lamp Bracket	\$0.00	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.02	\$0.02	\$0.11

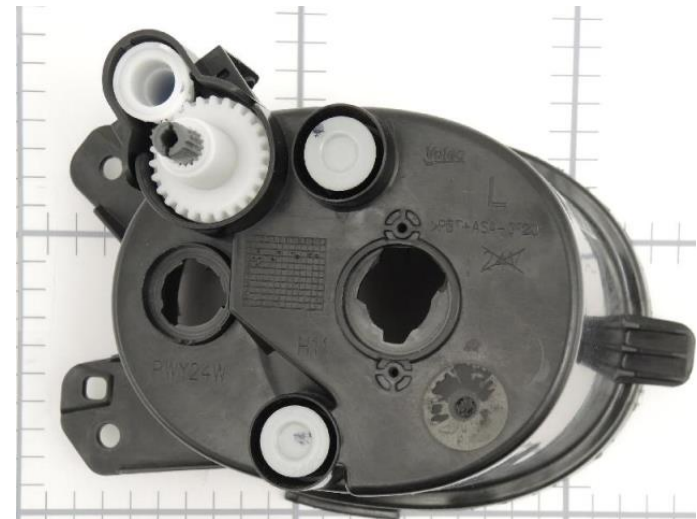
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	25
Fastenings	5
Right First Time	99.32%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.77
Supplier Fab. Time (Min)	0.16
Total Weight (kg)	0.26
Purchased Part Cost	
	\$0.04
Material Cost	
	\$1.09
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.58
Supplier Fab. Cost	
	\$0.09
Q Burden	
	\$0.10
SG&A	
	\$0.39
Manufacturing Cost*	
	\$2.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Housing Asm



- \...
- \Housing Asm, Driver Fog Lamp
- \Housing, Housing Asm
- \Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.31
Total Weight (kg)	0.25
Material Cost**	\$1.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.00
SG&A	\$0.24
Manufacturing Cost*	\$1.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Housing Asm

Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	14.62	2	0.25	37.36	ESP	\$0.08	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Housing	1	PBT+ASA GF20	\$4.17	0.2450	0.2450	\$0.00	\$1.02

Actuator Arm Asm, Housing Asm



\...

- \Driver Fog Lamp Asm
- \Housing Asm, Driver Fog Lamp
- \Actuator Arm Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.19
Total Weight (kg)	0.01

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Asm, Housing Asm



Actuator Arm Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Actuator Arm, Actuator Arm Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0054
Assemble Fog Lamp Actuator Arm Asm	1	1	1	3	1	99.90 %	0.00	0.00	0.17	0.00	0.0001

Actuator Arm Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Actuator Arm, Actuator Arm Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.03
Assemble Fog Lamp Actuator Arm Asm	\$0.03	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.02	\$0.03	\$0.20

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.02
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.03
Material Cost	
	\$0.02
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.13
Supplier Fab. Cost	
	\$0.01
Q Burden	
	\$0.02
SG&A	
	\$0.03
Manufacturing Cost*	
	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Actuator Arm Asm



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- \Actuator Arm Asm, Housing Asm
- \Actuator Arm, Actuator Arm Asm
- \Actuator Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.24
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Actuator Arm Asm



Actuator Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	9.92	8	0.25	14.56	ROU	\$0.01	99.99%	\$0.00

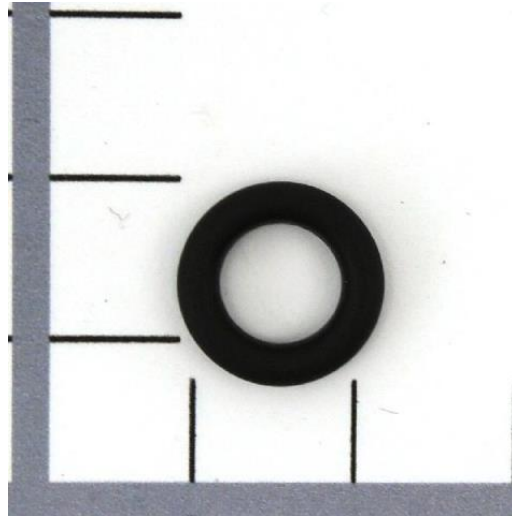
Actuator Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm	1	PA66 GF30	\$3.95	0.0054	0.0058	\$0.00	\$0.02

Assemble Fog Lamp Actuator Arm Asm



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& ASSOCIATES, INC.



\...

- \Housing Asm, Driver Fog Lamp
- \Actuator Arm Asm, Housing Asm
- \Assemble Fog Lamp Actuator Arm Asm

Process Summary

Right First Time	99.90 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm Asm



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& ASSOCIATES, INC.

Assemble Fog Lamp Actuator Arm Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.90%	\$0.02

Assemble Fog Lamp Actuator Arm Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
O-Ring, Actuator Arm Asm	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00

No Commodity Items Required for This Process



\...

- \Driver Fog Lamp Asm
- \Housing Asm, Driver Fog Lamp
- \Assemble Fog Lamp Actuator Arm

Process Summary

Right First Time	99.76 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.04
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm

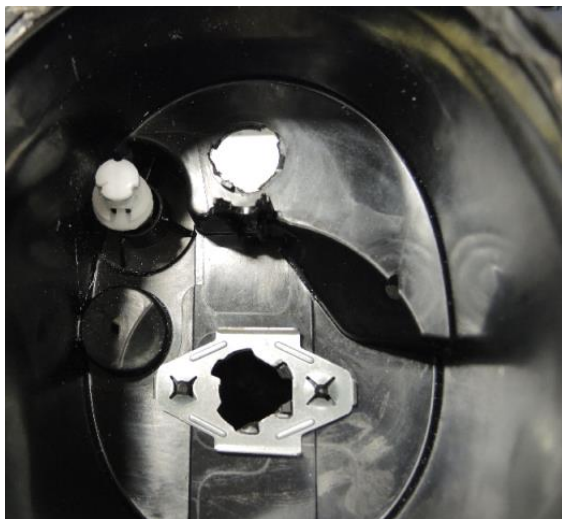
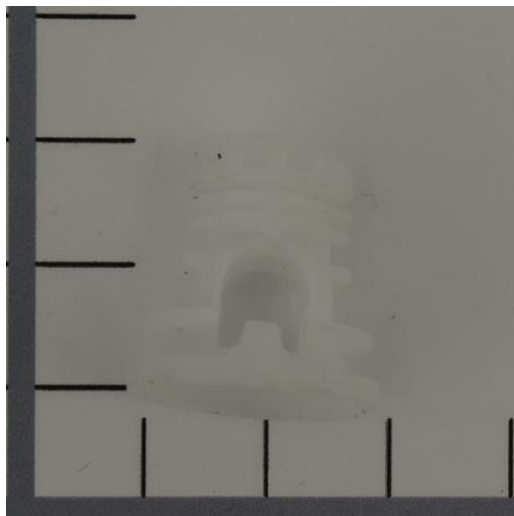


Assemble Fog Lamp Actuator Arm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.76%	\$0.04

Assemble Fog Lamp Actuator Arm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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\Driver Fog Lamp Asm

\Housing Asm, Driver Fog Lamp

\Cap Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	6
Fastenings	1
Right First Time	99.90 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.20
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap Asm, Housing Asm

Cap Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Cap, Cap Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0021
Assemble Fog Lamp Actuator Arm Cap Asm	1	1	1	4	1	99.91 %	0.00	0.00	0.18	0.00	0.0001

Cap Asm, Housing Asm

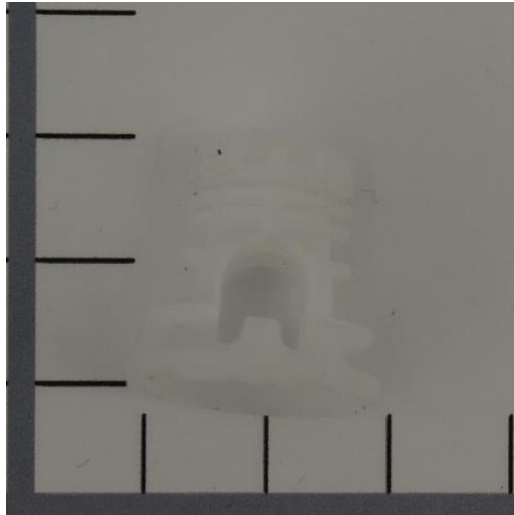
Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Cap, Cap Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Fog Lamp Actuator Arm Cap Asm	\$0.01	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.01	\$0.03	\$0.19

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	6
Fastenings	1
Right First Time	99.9%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.18
Supplier Fab. Time (Min)	0.01
Total Weight (kg)	0.00
<hr/>	
Purchased Part Cost	\$0.01
Material Cost	\$0.01
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.14
Supplier Fab. Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

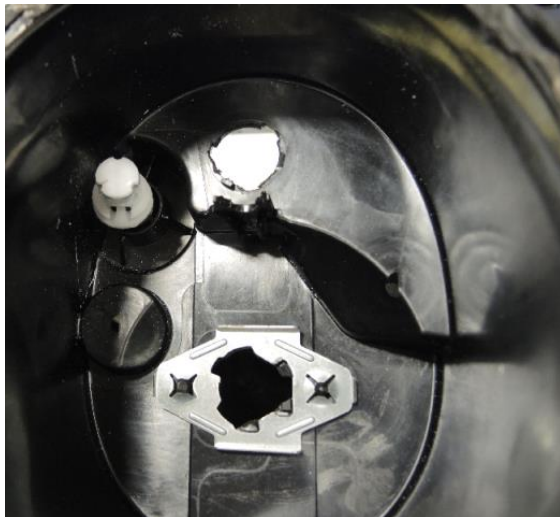


\...
 \Cap Asm, Housing Asm
 \Cap, Cap Asm
 \Actuator Cap Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.73
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Cap Asm

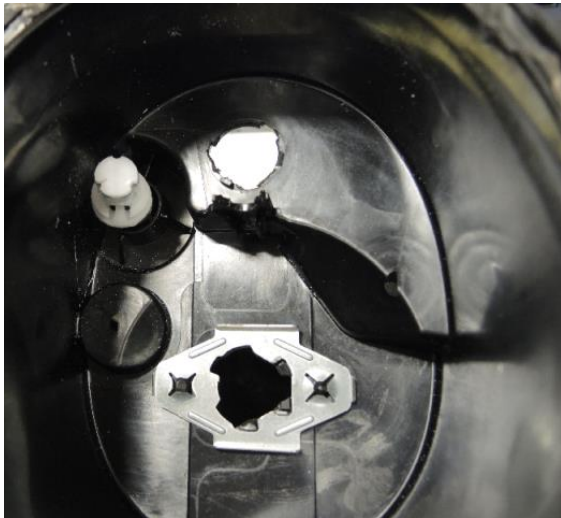
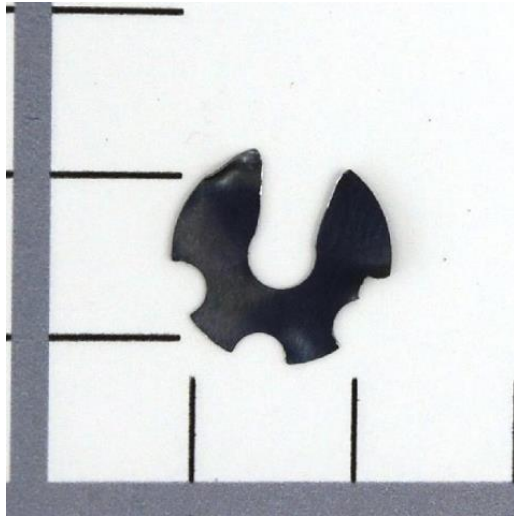
Actuator Cap Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	5.84	8	0.25	21.64	ESP	\$0.00	99.99%	\$0.00

Actuator Cap Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Cap	1	PA66 GF30	\$3.95	0.0021	0.0023	\$0.00	\$0.01

Assemble Fog Lamp Actuator Arm Cap Asm



\...

\Housing Asm, Driver Fog Lamp

\Cap Asm, Housing Asm

\Assemble Fog Lamp Actuator Arm Cap Asm

Process Summary

Right First Time	99.91 %
Process Time (Sec)	11.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm Cap Asm



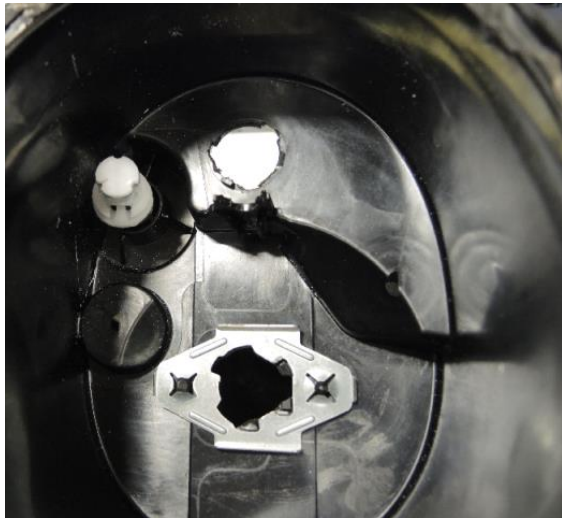
Assemble Fog Lamp Actuator Arm Cap Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	11.00	1	1.00	45.01	ESP	\$0.14	99.91 %	\$0.01

Assemble Fog Lamp Actuator Arm Cap Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
■ Snap Ring	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

No Commodity Items Required for This Process



\...

- \Driver Fog Lamp Asm
- \Housing Asm, Driver Fog Lamp
- \Assemble Fog Lamp Actuator Arm Cap

Process Summary

Right First Time	99.89 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm Cap



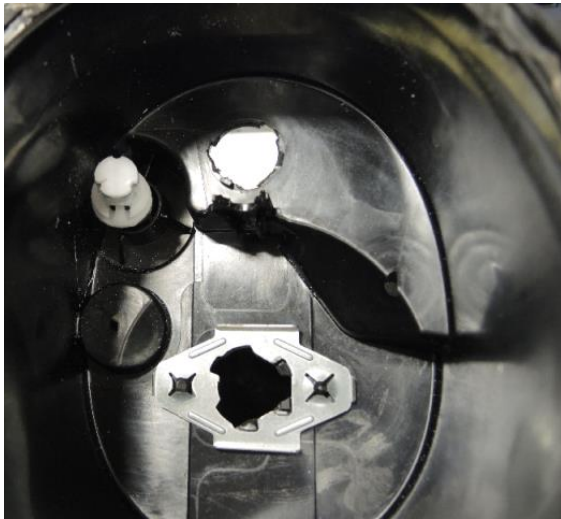
Assemble Fog Lamp Acutator Arm Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.89%	\$0.02

Assemble Fog Lamp Acutator Arm Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Reflector Bracket, Housing Asm



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- \Housing Asm, Driver Fog Lamp
- \Reflector Bracket, Housing Asm
- \Reflector Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.60
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Bracket, Housing Asm



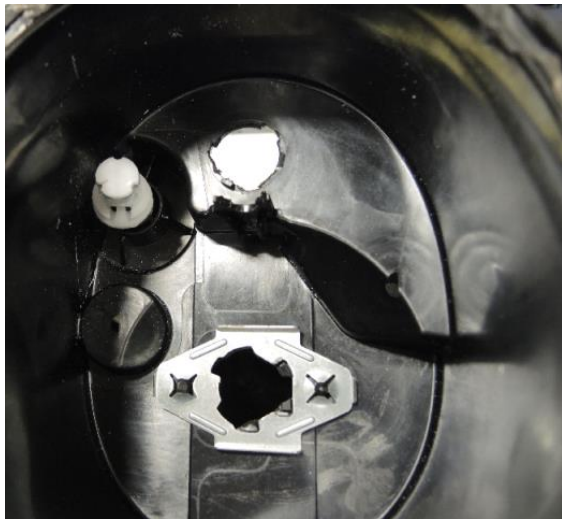
Reflector Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
25Ton Stamping Press	0.60	1	0.25	19.41	ESP	\$0.00	99.99%	\$0.00

Reflector Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Reflector Bracket	1	Steel 1018 - Coil Stock	\$1.21	0.0078	0.0078	\$0.00	\$0.04

No Commodity Items Required for This Process



\...

\Driver Fog Lamp Asm

\Housing Asm, Driver Fog Lamp

\Assemble Fog Lamp Bracket

Process Summary

Right First Time	99.90 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Bracket



Assemble Fog Lamp Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	6.00	1	1.00	45.01	ESP	\$0.08	99.90%	\$0.02

Assemble Fog Lamp Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...
\Lamps
\Driver Fog Lamp Asm
\Assemble Fog Lamp Housing and Reflector

Process Summary

Right First Time	99.95 %
Process Time (Sec)	7.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Housing and Reflector



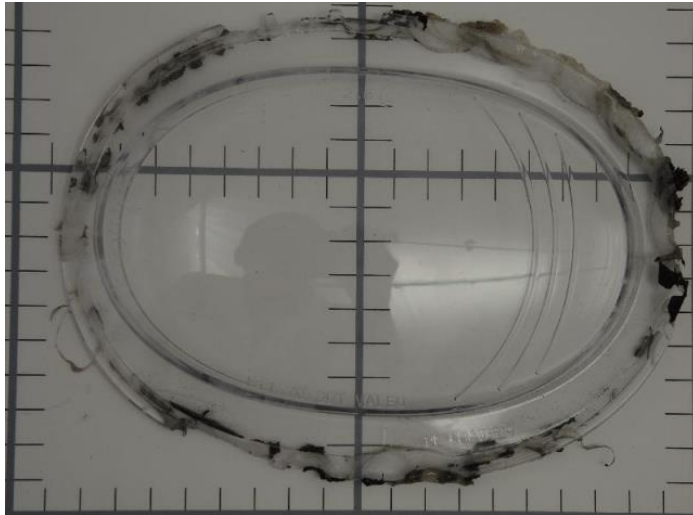
Assemble Fog Lamp Housing and Reflector

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.00	1	1.00	45.01	ESP	\$0.09	99.95%	\$0.01

Assemble Fog Lamp Housing and Reflector

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Lens, Driver Fog Lamp Asm



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\Driver Fog Lamp Asm

\Lens, Driver Fog Lamp Asm

\Lens Fog Lamp Process

Process Summary

Right First Time	99.85 %
Process Time (Sec)	39.32
Total Weight (kg)	0.09

Material Cost**	\$0.41
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.26
Q Burden	\$0.02
SG&A	\$0.15
Manufacturing Cost*	\$0.84

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lens, Driver Fog Lamp Asm

Lens Fog Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure PC Coating(Abrasion Resistance)	9.42	1	0.25	14.30	ESP	\$0.04	99.97 %	\$0.01
Apply PC Coating (Abrasion Resistance)	5.20	1	0.25	39.25	ESP	\$0.06	99.97 %	\$0.01
Cure PC Coating(Defogging)	8.17	1	0.25	14.30	ESP	\$0.03	99.97 %	\$0.01
Apply PC Coating(Defogging)	5.20	1	0.25	39.25	ESP	\$0.06	99.97 %	\$0.01
110 Ton Injection Molding Press	22.66	2	0.25	24.56	ESP	\$0.08	99.99 %	\$0.00

Lens Fog Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, PC Coating	1	PC Glazing - Abrasion Resistance	By Area	0.0000	-	\$0.00	\$0.02
Material, PC Coating	1	PC Glazing - Defogging	By Area	0.0000	-	\$0.00	\$0.01
Material, Lens Fog Lamp	1	PC	\$3.97	0.0900	0.0968	\$0.00	\$0.38

No Commodity Items Required for This Process



\...
\Lamps
\Driver Fog Lamp Asm
\Assemble Fog Lamp Lens

Process Summary

Right First Time	99.88 %
Process Time (Sec)	7.10
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Lens



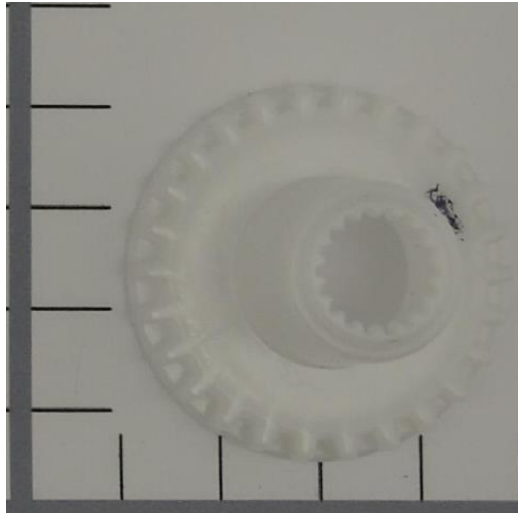
Assemble Fog Lamp Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.10	1	1.00	45.01	ESP	\$0.09	99.88 %	\$0.02

Assemble Fog Lamp Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Actuator Gear, Driver Fog Lamp



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- \Driver Fog Lamp Asm
- \Actuator Gear, Driver Fog Lamp
- \Actuator Gear Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.99
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Gear, Driver Fog Lamp



Actuator Gear Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	23.92	8	0.25	21.64	ESP	\$0.02	99.99%	\$0.00

Actuator Gear Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Gear	1	POM	\$3.18	0.0057	0.0061	\$0.00	\$0.02

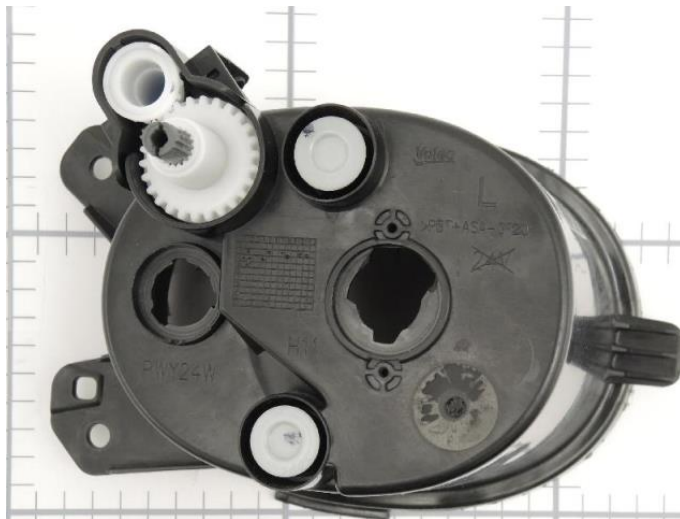
No Commodity Items
Required for This
Process

- \...
- \Lamps
- \Driver Fog Lamp Asm
- \Assemble Fog Lamp Actuator Gear

Process Summary

Right First Time	99.90 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.11



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Gear



Assemble Fog Lamp Actuator Gear

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	6.00	1	1.00	45.01	ESP	\$0.08	99.90%	\$0.02

Assemble Fog Lamp Actuator Gear

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Actuator Arm, Driver Fog Lamp Asm



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- \Driver Fog Lamp Asm
- \Actuator Arm, Driver Fog Lamp Asm
- \Actuator Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.94
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Driver Fog Lamp Asm



Actuator Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	15.52	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm	1	POM	\$3.18	0.0092	0.0099	\$0.00	\$0.03

Actuator Arm Cover, Driver Fog Lamp



\...

- \Driver Fog Lamp Asm
- \Actuator Arm Cover, Driver Fog Lamp
- \Actuator Gear Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.41
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Cover, Driver Fog Lamp



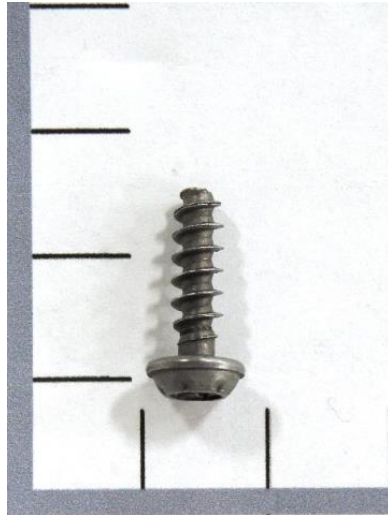
Actuator Gear Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	11.28	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Gear Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Gear Cover	1	PBT GF20	\$3.33	0.0107	0.0115	\$0.00	\$0.04

Assemble Fog Lamp Actuator Arm & Cover



\...

\Lamps

\Driver Fog Lamp Asm

\Assemble Fog Lamp Actuator Arm & Cover

Process Summary

Right First Time	99.51 %
Process Time (Sec)	33.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.41
Q Burden	\$0.07
SG&A	\$0.09
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Fog Lamp Actuator Arm & Cover



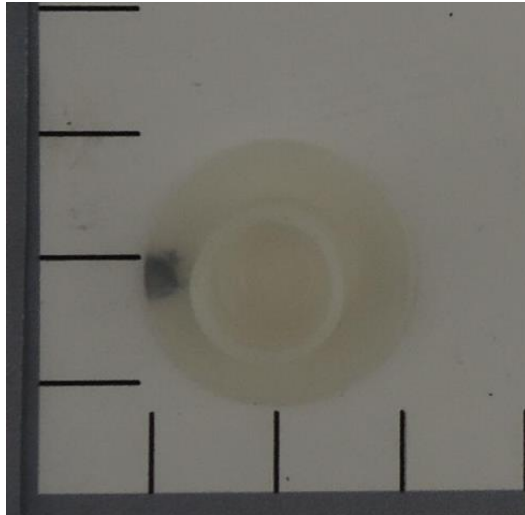
Assemble Fog Lamp Actuator Arm & Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	33.00	1	1.00	45.01	ESP	\$0.41	99.51 %	\$0.07

Assemble Fog Lamp Actuator Arm & Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 M4x13mm-Pan Torx Screw	2	Commodity Item	Purchased	0.0012	-	\$0.01	\$0.00

Plug, Driver Fog Lamp Asm



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- \Driver Fog Lamp Asm
- \Plug, Driver Fog Lamp Asm
- \Plug Fog Lamp Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.84
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Plug, Driver Fog Lamp Asm



Plug Fog Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Process	6.72	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Plug Fog Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Plug Fog Lamp	1	PP	\$2.38	0.0007	0.0008	\$0.00	\$0.01

Assemble Fog Lamp Plugs

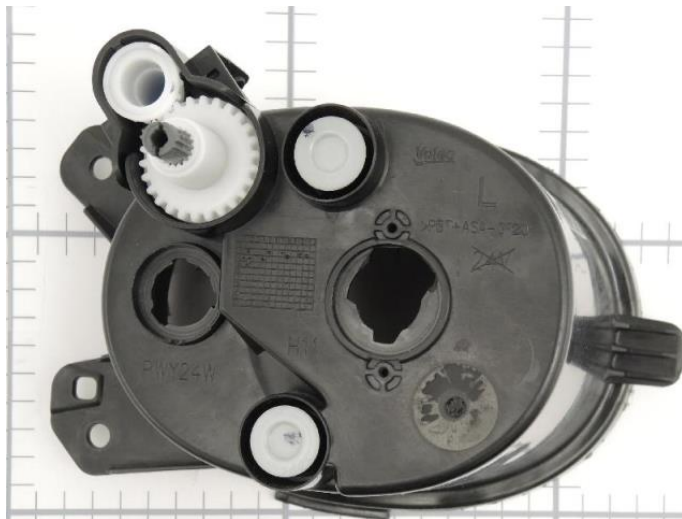
- \...
- \Lamps
- \Driver Fog Lamp Asm
- \Assemble Fog Lamp Plugs



Process Summary

Right First Time	99.75 %
Process Time (Sec)	62.78
Total Weight (kg)	0.03

Material Cost**	\$5.53
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.78
Q Burden	\$0.04
SG&A	\$0.34
Manufacturing Cost*	\$6.69



* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Assemble Fog Lamp Plugs



Assemble Fog Lamp Plugs

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	62.78	1	1.00	45.01	ESP	\$0.78	99.75%	\$0.04

Assemble Fog Lamp Plugs

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Low Density Foam	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
Turn Signal Bulb, Driver's Fog Lamp	1	Commodity Item	Purchased	0.0109	-	\$1.75	\$0.00
Light Bulb, Driver's Fog Lamp	1	Commodity Item	Purchased	0.0231	-	\$3.50	\$0.00
Label, Valeo Supplier Large	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00
Label, Date Code, Fog Lamp	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Passenger Fog Lamp Asm



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 \Zone 2 Exterior
 \Lamps
 \Passenger Fog Lamp Asm

Assembly Summary

Parts	29
Fasteners	5
Part Numbers	24
Steps	104
Fastenings	25
Right First Time	97.42 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	5.41
Total Weight (kg)	0.57

Material Cost**	\$10.73
OEM Process Cost	\$0.00
Supplier Process Cost	\$4.82
Q Burden	\$0.39
SG&A	\$2.35
Manufacturing Cost*	\$18.29

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost



Passenger Fog Lamp Asm



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Passenger Fog Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Reflector Asm, Passenger Fog Lamp	1	6	3	16	3	99.31 %	0.00	0.00	0.82	0.94	0.1576
Housing Asm, Passenger Fog Lamp Asm	1	6	5	25	5	99.30 %	0.00	0.00	0.78	0.16	0.2605
Assemble Fog Lamp Housing and Reflector	1	0	1	3	1	99.95 %	0.00	0.00	0.12	0.00	0.0000
Lens, Passenger Fog Lamp Asm	1	3	0	15	0	99.85 %	0.00	0.00	0.00	0.66	0.0900
Assemble Fog Lamp Lens	1	0	2	3	2	99.88 %	0.00	0.00	0.12	0.00	0.0000
Actuator Gear, Passenger Fog Lamp Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.05	0.0057
Assemble Fog Lamp Actuator Gear	1	0	1	2	1	99.90 %	0.00	0.00	0.10	0.00	0.0000
Actuator Arm, Passenger Fog Lamp Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0092
Actuator Arm Cover, Passenger Fog Lamp Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0107
Assemble Fog Lamp Actuator Arm & Cover	1	2	4	9	4	99.51 %	0.00	0.00	0.55	0.00	0.0024
Plug, Passenger Fog Lamp Asm	2	1	0	1	0	99.99 %	0.00	0.00	0.00	0.00	0.0007
Assemble Fog Lamp Plugs	1	7	9	18	9	99.75 %	0.00	0.00	1.05	0.00	0.0345

Passenger Fog Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Reflector Asm, Passenger Fog Lamp	\$0.03	\$3.53	\$0.00	\$0.00	\$0.61	\$1.76	\$0.10	\$1.30	\$7.34
Housing Asm, Passenger Fog Lamp Asm	\$0.04	\$1.06	\$0.00	\$0.00	\$0.60	\$0.09	\$0.11	\$0.39	\$2.28
Assemble Fog Lamp Housing and Reflector	\$0.00	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.01	\$0.02	\$0.11
Lens, Passenger Fog Lamp Asm	\$0.00	\$0.41	\$0.00	\$0.00	\$0.00	\$0.26	\$0.02	\$0.15	\$0.84
Assemble Fog Lamp Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.02	\$0.02	\$0.13
Actuator Gear, Passenger Fog Lamp Asm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.01	\$0.05
Assemble Fog Lamp Actuator Gear	\$0.00	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.02	\$0.02	\$0.11
Actuator Arm, Passenger Fog Lamp Asm	\$0.00	\$0.03	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.05
Actuator Arm Cover, Passenger Fog Lamp Asm	\$0.00	\$0.04	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.06
Assemble Fog Lamp Actuator Arm & Cover	\$0.02	\$0.00	\$0.00	\$0.00	\$0.41	\$0.00	\$0.07	\$0.09	\$0.60
Plug, Passenger Fog Lamp Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Fog Lamp Plugs	\$5.53	\$0.00	\$0.00	\$0.00	\$0.78	\$0.00	\$0.04	\$0.34	\$6.69

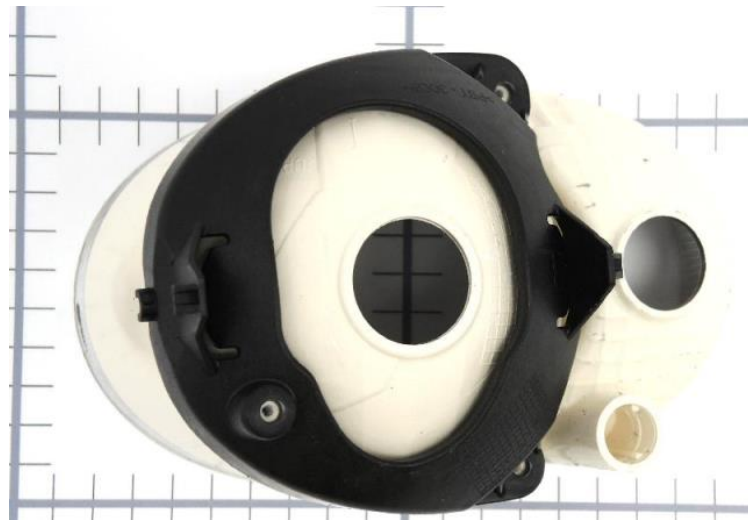
Detailed Summary

Parts	29
Fasteners	5
Part Numbers	24
Steps	104
Fastenings	25
Right First Time	97.42%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	3.53
Supplier Fab. Time (Min)	1.88
Total Weight (kg)	0.57
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Purchased Part Cost	\$5.62
Material Cost	\$5.11
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$2.66
Supplier Fab. Cost	\$2.15
Q Burden	\$0.39
SG&A	\$2.35
Manufacturing Cost*	\$18.29

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Asm, Passenger Fog Lamp



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\Lamps

\Passenger Fog Lamp Asm

\Reflector Asm, Passenger Fog Lamp

Assembly Summary

Parts	6
Fasteners	3
Part Numbers	4
Steps	16
Fastenings	3
Right First Time	99.31 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	1.76
Total Weight (kg)	0.16

Material Cost**	\$3.56
OEM Process Cost	\$0.00
Supplier Process Cost	\$2.38
Q Burden	\$0.10
SG&A	\$1.30
Manufacturing Cost*	\$7.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Asm, Passenger Fog Lamp



Reflector Asm, Passenger Fog Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Reflector Fog Lamp, Reflector Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	0.84	0.1525
Reflector Support, Reflector Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.11	0.0036
Assemble Fog Lamp Refelctor Asm	1	3	3	9	3	99.35 %	0.00	0.00	0.82	0.00	0.0015

Reflector Asm, Passenger Fog Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Reflector Fog Lamp, Reflector Asm	\$0.00	\$3.52	\$0.00	\$0.00	\$0.00	\$1.72	\$0.00	\$1.15	\$6.39
Reflector Support, Reflector Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.07
Assemble Fog Lamp Refelctor Asm	\$0.03	\$0.00	\$0.00	\$0.00	\$0.61	\$0.00	\$0.10	\$0.14	\$0.88

Detailed Summary

Parts	6
Fasteners	3
Part Numbers	4
Steps	16
Fastenings	3
Right First Time	99.31%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.82
Supplier Fab. Time (Min)	0.94
Total Weight (kg)	0.16
Purchased Part Cost	
	\$0.03
Material Cost	
	\$3.53
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.61
Supplier Fab. Cost	
	\$1.76
Q Burden	
	\$0.10
SG&A	
	\$1.30
Manufacturing Cost*	
	\$7.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Fog Lamp, Reflector Asm



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- \Reflector Asm, Passenger Fog Lamp
- \Reflector Fog Lamp, Reflector Asm
- \Reflector Process

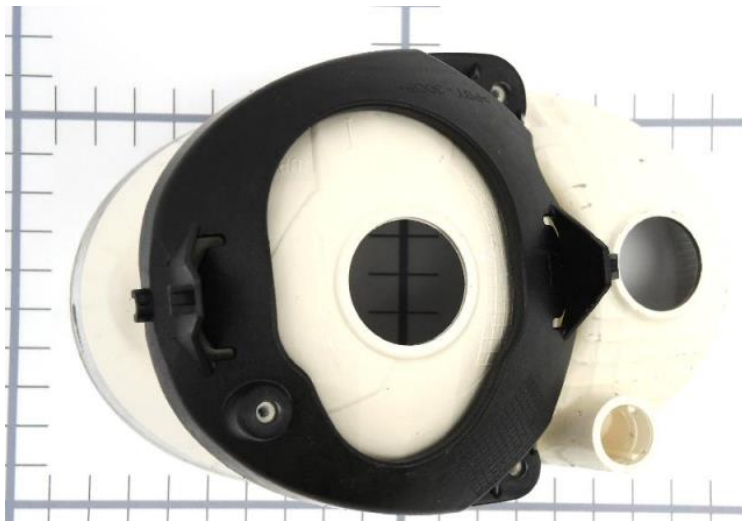
Process Summary

Right First Time	99.98 %
Process Time (Sec)	50.14
Total Weight (kg)	0.15

Material Cost**	\$3.52
OEM Process Cost	\$0.00
Supplier Process Cost	\$1.72
Q Burden	\$0.00
SG&A	\$1.15
Manufacturing Cost*	\$6.39

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Reflector Fog Lamp, Reflector Asm



Reflector Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	43.10	1	0.25	138.83	ESP	\$1.66	99.99%	\$0.00
200 Ton Injection Molding Press	14.08	2	0.25	28.76	ESP	\$0.06	99.99%	\$0.00

Reflector Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Reflector	1	Plating - Chrome		By Area	0.0000	-	\$0.16
Material, Reflector	1	UP GF	\$22.05	0.1525	0.1525	\$0.00	\$3.36

Reflector Support, Reflector Asm



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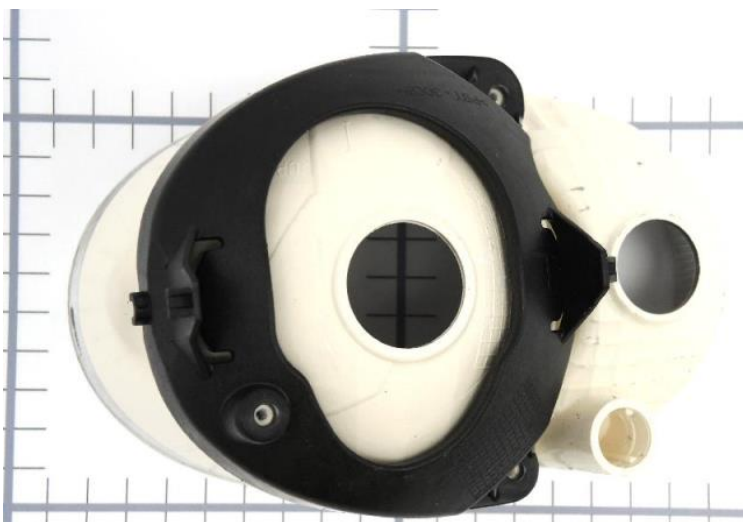
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- \Reflector Asm, Passenger Fog Lamp
- \Reflector Support, Reflector Asm
- \Reflector Support Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	6.49
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.07



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Support, Reflector Asm



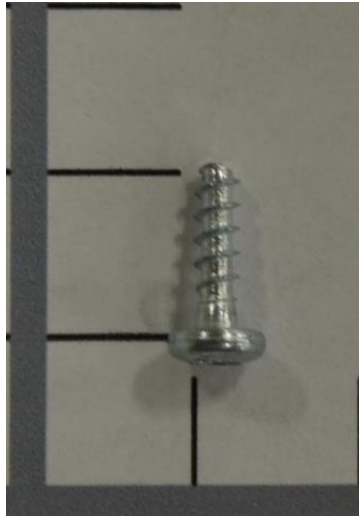
Reflector Support Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	12.98	2	0.25	24.56	ESP	\$0.04	99.99%	\$0.00

Reflector Support Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Reflector Support	1	PBT GF30	\$3.18	0.0036	0.0039	\$0.00	\$0.01

Assemble Fog Lamp Reflector Asm



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- \Passenger Fog Lamp Asm
- \Reflector Asm, Passenger Fog Lamp
- \Assemble Fog Lamp Reflector Asm

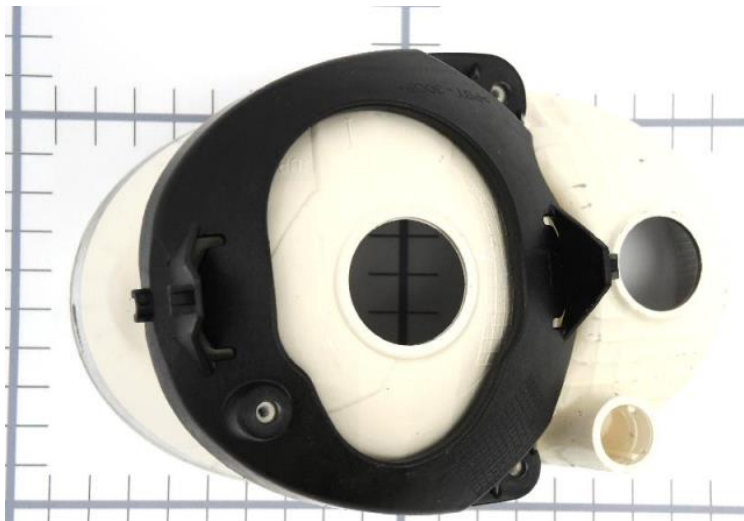
Process Summary

Right First Time	99.35 %
Process Time (Sec)	49.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.61
Q Burden	\$0.10
SG&A	\$0.14
Manufacturing Cost*	\$0.88

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Assemble Fog Lamp Reflector Asm



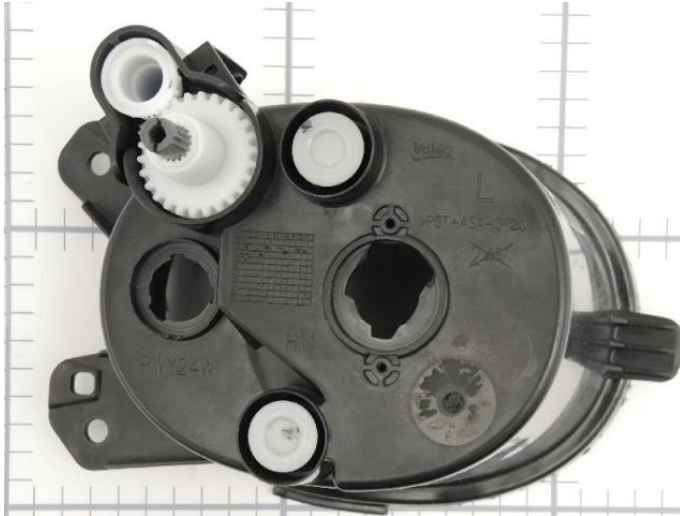
Assemble Fog Lamp Refelctor Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	49.00	1	1.00	45.01	ESP	\$0.61	99.35%	\$0.10

Assemble Fog Lamp Refelctor Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M3x8mm-Pan Head Torx	3	Commodity Item	Purchased	0.0005	-	\$0.01	\$0.00

Housing Asm, Passenger Fog Lamp Asm



- \...
 - \Lamps
 - \Passenger Fog Lamp Asm
 - \Housing Asm, Passenger Fog Lamp Asm
- ## Assembly Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	25
Fastenings	5
Right First Time	99.30 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.95
Total Weight (kg)	0.26

Material Cost**	\$1.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.69
Q Burden	\$0.11
SG&A	\$0.39
Manufacturing Cost*	\$2.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Passenger Fog Lamp Asm



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Housing Asm, Passenger Fog Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.2450
Actuator Arm Asm, Housing Asm	1	2	1	6	1	99.88 %	0.00	0.00	0.17	0.02	0.0055
Assemble Fog Lamp Actuator Arm	1	0	1	3	1	99.76 %	0.00	0.00	0.17	0.00	0.0000
Cap, Housing Asm	1	2	1	5	1	99.89 %	0.00	0.00	0.20	0.01	0.0022
Assemble Fog Lamp Acuator Arm Cap	1	0	1	3	1	99.89 %	0.00	0.00	0.15	0.00	0.0000
Reflector Bracket, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0078
Assemble Fog Lamp Bracket	1	0	1	2	1	99.90 %	0.00	0.00	0.10	0.00	0.0000

Housing Asm, Passenger Fog Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing, Housing Asm	\$0.00	\$1.02	\$0.00	\$0.00	\$0.00	\$0.08	\$0.00	\$0.24	\$1.34
Actuator Arm Asm, Housing Asm	\$0.03	\$0.02	\$0.00	\$0.00	\$0.13	\$0.01	\$0.02	\$0.03	\$0.23
Assemble Fog Lamp Actuator Arm	\$0.00	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.04	\$0.03	\$0.19
Cap, Housing Asm	\$0.01	\$0.01	\$0.00	\$0.00	\$0.15	\$0.00	\$0.02	\$0.04	\$0.23
Assemble Fog Lamp Acuator Arm Cap	\$0.00	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.02	\$0.02	\$0.15
Reflector Bracket, Housing Asm	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Fog Lamp Bracket	\$0.00	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.02	\$0.02	\$0.13

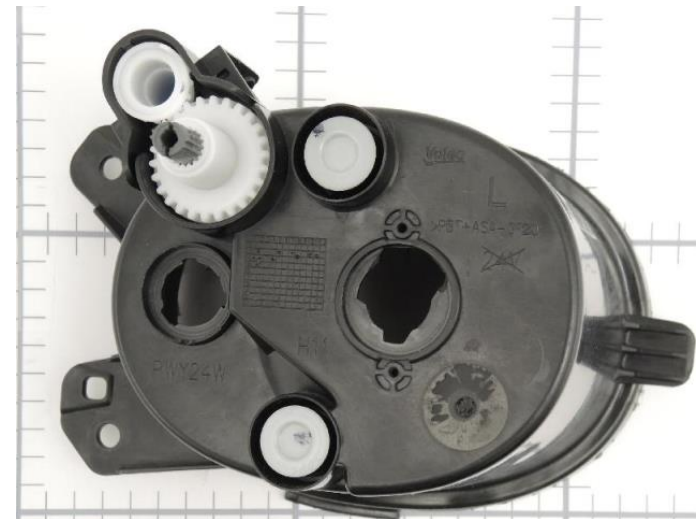
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	6
Steps	25
Fastenings	5
Right First Time	99.3%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.78
Supplier Fab. Time (Min)	0.16
Total Weight (kg)	0.26
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Purchased Part Cost	\$0.04
Material Cost	\$1.06
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.60
Supplier Fab. Cost	\$0.09
Q Burden	\$0.11
SG&A	\$0.39
Manufacturing Cost*	\$2.28

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Housing Asm



\...
 \Housing Asm, Passenger Fog Lamp Asm
 \Housing, Housing Asm
 \Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.31
Total Weight (kg)	0.25

Material Cost**	\$1.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.00
SG&A	\$0.24
Manufacturing Cost*	\$1.34

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing, Housing Asm



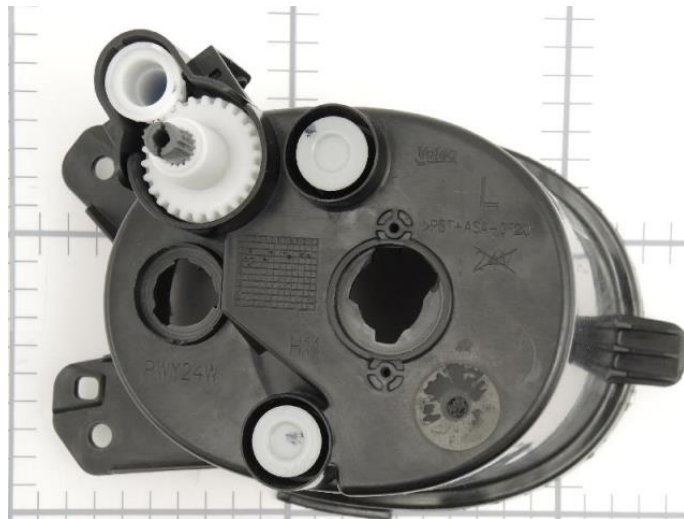
Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	14.62	2	0.25	37.36	ESP	\$0.08	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Housing	1	PBT+ASA GF20	\$4.17	0.2450	0.2450	\$0.00	\$1.02

Actuator Arm Asm, Housing Asm



- \...
- \Passenger Fog Lamp Asm
- \Housing Asm, Passenger Fog Lamp Asm
- \Actuator Arm Asm, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	6
Fastenings	1
Right First Time	99.88 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.19
Total Weight (kg)	0.01

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Asm, Housing Asm



Actuator Arm Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Fog Lamp, Actuator Arm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.02	0.0054
Assemble Fog Lamp Actuator Arm Asm	1	1	1	4	1	99.89 %	0.00	0.00	0.17	0.00	0.0001

Actuator Arm Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Fog Lamp, Actuator Arm	\$0.00	\$0.02	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01	\$0.03
Assemble Fog Lamp Actuator Arm Asm	\$0.03	\$0.00	\$0.00	\$0.00	\$0.13	\$0.00	\$0.02	\$0.03	\$0.20

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	6
Fastenings	1
Right First Time	99.88%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.17
Supplier Fab. Time (Min)	0.02
Total Weight (kg)	0.01
Purchased Part Cost	
	\$0.03
Material Cost	
	\$0.02
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.13
Supplier Fab. Cost	
	\$0.01
Q Burden	
	\$0.02
SG&A	
	\$0.03
Manufacturing Cost*	
	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...
 \Actuator Arm Asm, Housing Asm
 \Fog Lamp, Actuator Arm
 \Actuator Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.24
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.03

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Fog Lamp, Actuator Arm



Actuator Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	9.92	8	0.25	14.56	ROU	\$0.01	99.99%	\$0.00

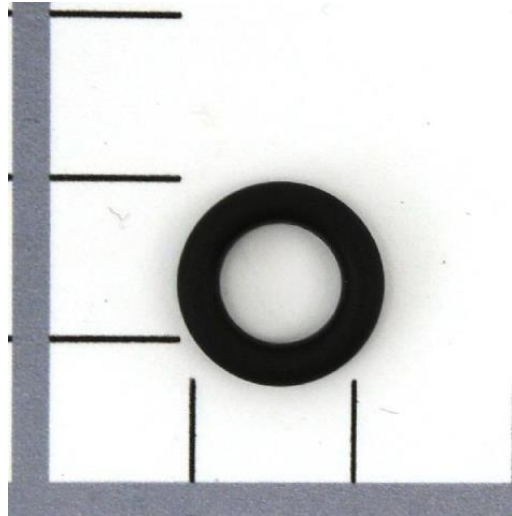
Actuator Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm	1	PA66 GF30	\$3.95	0.0054	0.0058	\$0.00	\$0.02

Assemble Fog Lamp Actuator Arm Asm



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\...

- \Housing Asm, Passenger Fog Lamp Asm
- \Actuator Arm Asm, Housing Asm
- \Assemble Fog Lamp Actuator Arm Asm

Process Summary

Right First Time	99.89 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm Asm



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Assemble Fog Lamp Actuator Arm Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.89%	\$0.02

Assemble Fog Lamp Actuator Arm Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
O-Ring, Actuator Arm Asm	1	Commodity Item	Purchased	0.0001	-	\$0.03	\$0.00

No Commodity Items Required for This Process



\...

- \Passenger Fog Lamp Asm
- \Housing Asm, Passenger Fog Lamp Asm
- \Assemble Fog Lamp Actuator Arm

Process Summary

Right First Time	99.76 %
Process Time (Sec)	10.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.13
Q Burden	\$0.04
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm



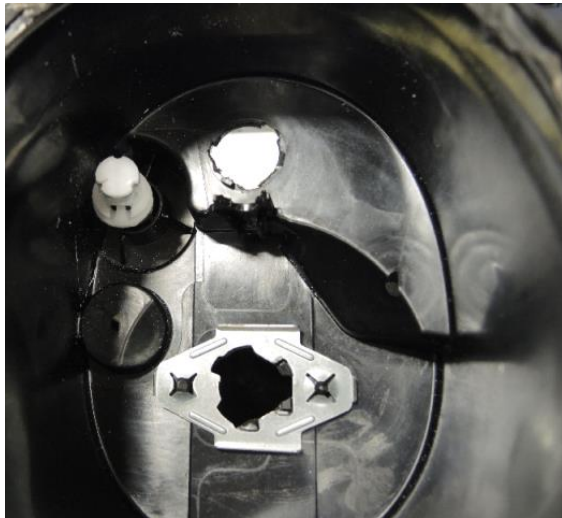
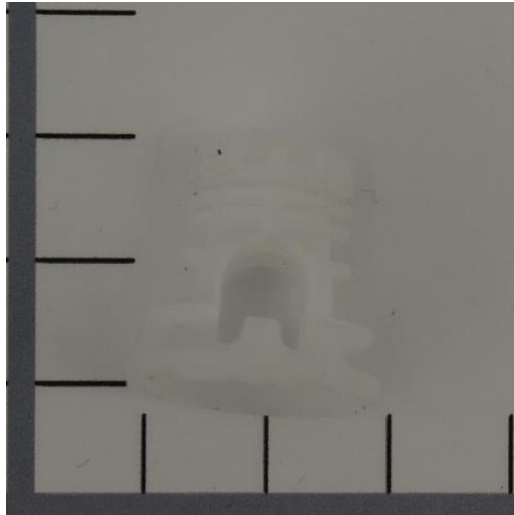
Assemble Fog Lamp Actuator Arm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	10.00	1	1.00	45.01	ESP	\$0.13	99.76%	\$0.04

Assemble Fog Lamp Actuator Arm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Cap, Housing Asm



- \...
- \Passenger Fog Lamp Asm
- \Housing Asm, Passenger Fog Lamp Asm
- \Cap, Housing Asm

Assembly Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.21
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Cap, Housing Asm

Cap, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Actuator Arm, Cap	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.01	0.0021
Assemble Fog Lamp Actuator Arm Cap Asm	1	1	1	3	1	99.90 %	0.00	0.00	0.20	0.00	0.0001

Cap, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Actuator Arm, Cap	\$0.00	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Assemble Fog Lamp Actuator Arm Cap Asm	\$0.01	\$0.00	\$0.00	\$0.00	\$0.15	\$0.00	\$0.02	\$0.03	\$0.21

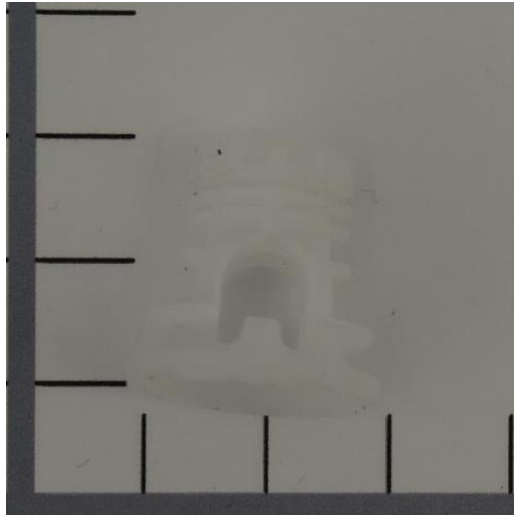
Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.89%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.20
Supplier Fab. Time (Min)	0.01
Total Weight (kg)	0.00
Purchased Part Cost	\$0.01
Material Cost	\$0.01
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.15
Supplier Fab. Cost	\$0.00
Q Burden	\$0.02
SG&A	\$0.04
Manufacturing Cost*	\$0.23

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Cap



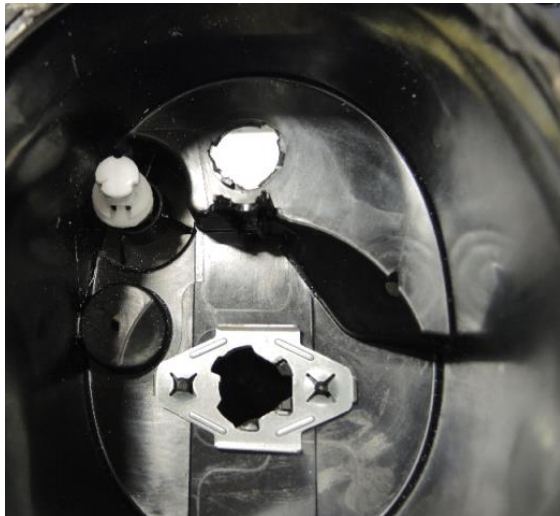
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- \Cap, Housing Asm
- \Actuator Arm, Cap
- \Actuator Cap Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.73
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Cap



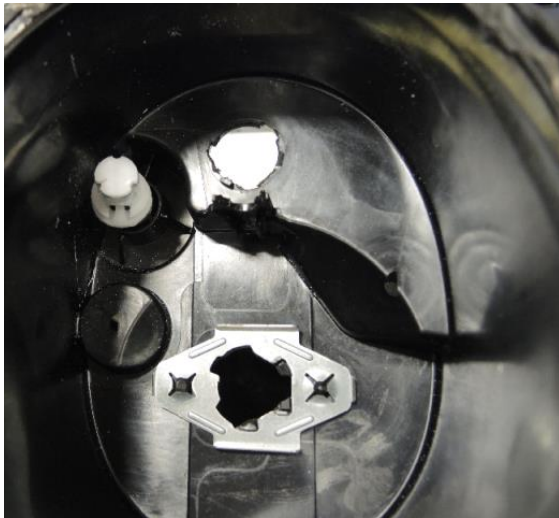
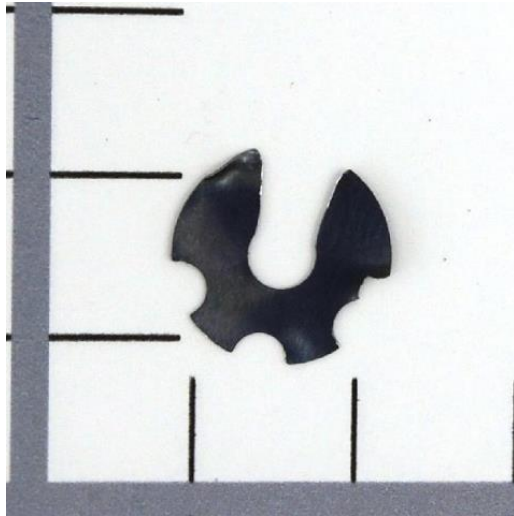
Actuator Cap Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	5.84	8	0.25	21.64	ESP	\$0.00	99.99%	\$0.00

Actuator Cap Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Cap	1	PA66 GF30	\$3.95	0.0021	0.0023	\$0.00	\$0.01

Assemble Fog Lamp Actuator Arm Cap Asm



\...

\Housing Asm, Passenger Fog Lamp Asm

\Cap, Housing Asm

\Assemble Fog Lamp Actuator Arm Cap Asm

Process Summary

Right First Time	99.90 %
Process Time (Sec)	12.00
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.03
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Fog Lamp Actuator Arm Cap Asm



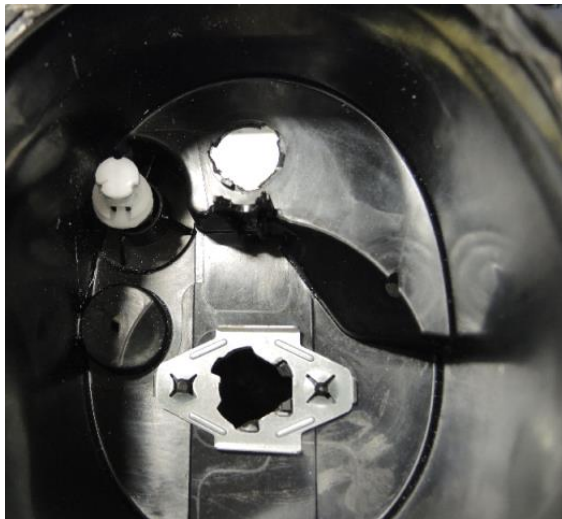
Assemble Fog Lamp Actuator Arm Cap Asm

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	12.00	1	1.00	45.01	ESP	\$0.15	99.90%	\$0.02

Assemble Fog Lamp Actuator Arm Cap Asm

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Snap Ring	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

No Commodity Items Required for This Process



\...

- \Passenger Fog Lamp Asm
- \Housing Asm, Passenger Fog Lamp Asm
- \Assemble Fog Lamp Actuator Arm Cap

Process Summary

Right First Time	99.89 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.15

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm Cap



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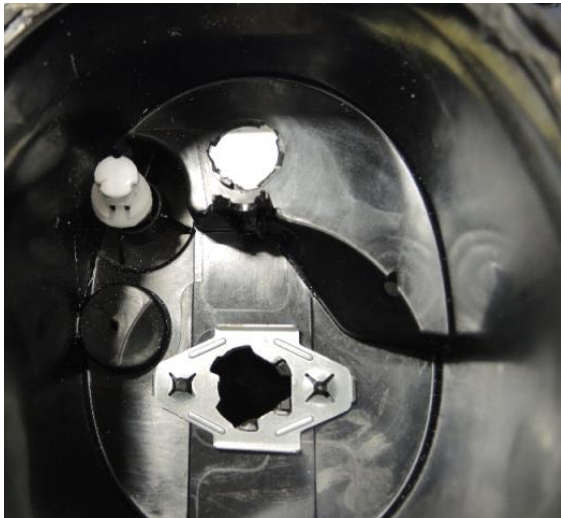
Assemble Fog Lamp Acutator Arm Cap

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	45.01	ESP	\$0.11	99.89%	\$0.02

Assemble Fog Lamp Acutator Arm Cap

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Reflector Bracket, Housing Asm



\...
\Housing Asm, Passenger Fog Lamp Asm
\Reflector Bracket, Housing Asm
\Reflector Bracket Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.60
Total Weight (kg)	0.01

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Reflector Bracket, Housing Asm



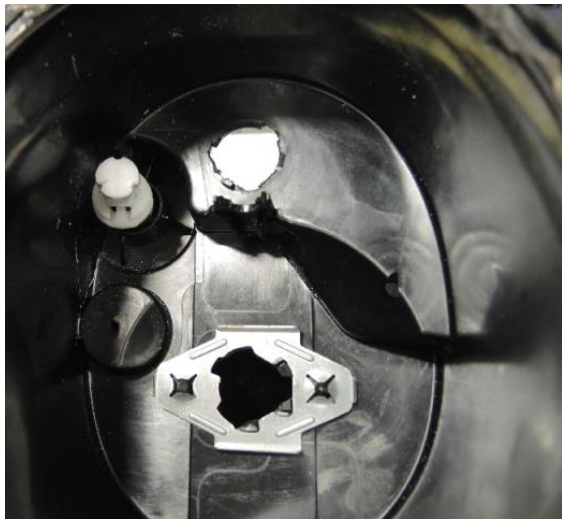
Reflector Bracket Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
25Ton Stamping Press	0.60	1	0.25	19.41	ESP	\$0.00	99.99%	\$0.00

Reflector Bracket Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Reflector Bracket	1	Steel 1018 - Coil Stock	\$1.21	0.0078	0.0078	\$0.00	\$0.01

No Commodity Items Required for This Process



\...

- \Passenger Fog Lamp Asm
- \Housing Asm, Passenger Fog Lamp Asm
- \Assemble Fog Lamp Bracket

Process Summary

Right First Time	99.90 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Bracket



Assemble Fog Lamp Bracket

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	6.00	1	1.00	54.32	GER	\$0.09	99.90%	\$0.02

Assemble Fog Lamp Bracket

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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No Commodity Items Required for This Process



\...
\Lamps
\Passenger Fog Lamp Asm
\Assemble Fog Lamp Housing and Reflector

Process Summary

Right First Time	99.95 %
Process Time (Sec)	7.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.01
SG&A	\$0.02
Manufacturing Cost*	\$0.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Housing and Reflector



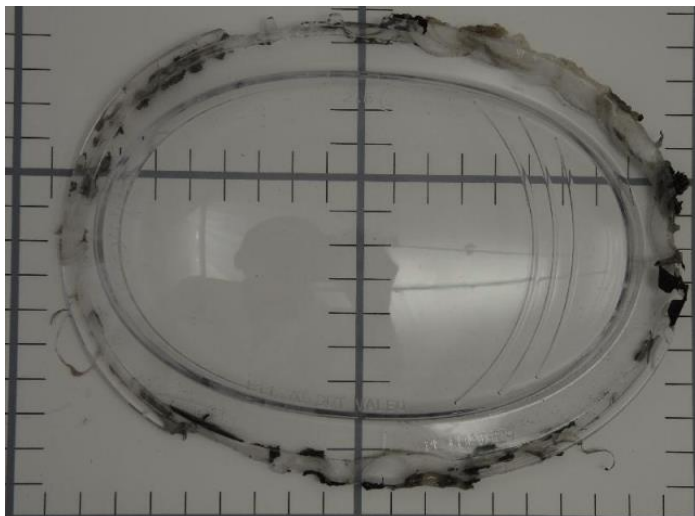
Assemble Fog Lamp Housing and Reflector

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.00	1	1.00	45.01	ESP	\$0.09	99.95%	\$0.01

Assemble Fog Lamp Housing and Reflector

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Lens, Passenger Fog Lamp Asm



\...

- \Passenger Fog Lamp Asm
- \Lens, Passenger Fog Lamp Asm
- \Lens Fog Lamp Process

Process Summary

Right First Time	99.85 %
Process Time (Sec)	39.32
Total Weight (kg)	0.09
Material Cost**	\$0.41
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.26
Q Burden	\$0.02
SG&A	\$0.15
Manufacturing Cost*	\$0.84

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lens, Passenger Fog Lamp Asm



Lens Fog Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Cure PC Coating(Abrasion Resistance)	9.42	1	0.25	14.30	ESP	\$0.04	99.97 %	\$0.01
Apply PC Coating (Abrasion Resistance)	5.20	1	0.25	39.25	ESP	\$0.06	99.97 %	\$0.01
Cure PC Coating(Defogging)	8.17	1	0.25	14.30	ESP	\$0.03	99.97 %	\$0.01
Apply PC Coating(Defogging)	5.20	1	0.25	39.25	ESP	\$0.06	99.97 %	\$0.01
110 Ton Injection Molding Press	22.66	2	0.25	24.56	ESP	\$0.08	99.99 %	\$0.00

Lens Fog Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, PC Coating	1	PC Glazing -Abrasion Resistance	By Area	0.0000	-	\$0.00	\$0.02
Material, PC Coating	1	PC Glazing -Defogging	By Area	0.0000	-	\$0.00	\$0.01
Material, Lens Fog Lamp	1	PC	\$3.97	0.0900	0.0968	\$0.00	\$0.38

No Commodity Items Required for This Process



\...
\Lamps
\Passenger Fog Lamp Asm
\Assemble Fog Lamp Lens

Process Summary

Right First Time	99.88 %
Process Time (Sec)	7.10
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Lens



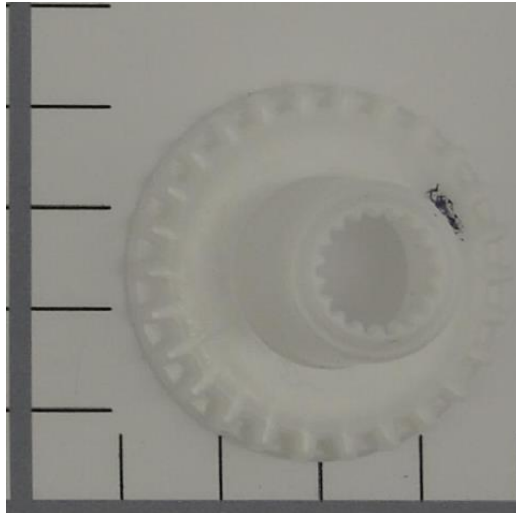
Assemble Fog Lamp Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.10	1	1.00	45.01	ESP	\$0.09	99.88 %	\$0.02

Assemble Fog Lamp Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Actuator Gear, Passenger Fog Lamp Asm



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- \Passenger Fog Lamp Asm
- \Actuator Gear, Passenger Fog Lamp Asm
- \Actuator Gear Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.99
Total Weight (kg)	0.01

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Gear, Passenger Fog Lamp Asm



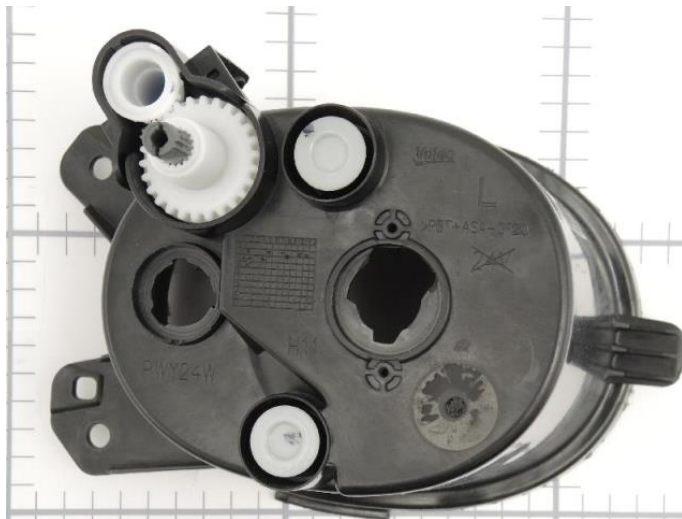
Actuator Gear Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	23.92	8	0.25	21.64	ESP	\$0.02	99.99%	\$0.00

Actuator Gear Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Gear	1	POM	\$3.18	0.0057	0.0061	\$0.00	\$0.02

No Commodity Items Required for This Process



\...
\Lamps
\Passenger Fog Lamp Asm
\Assemble Fog Lamp Actuator Gear

Process Summary

Right First Time	99.90 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.08
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.11

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Gear



Assemble Fog Lamp Actuator Gear

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	6.00	1	1.00	45.01	ESP	\$0.08	99.90%	\$0.02

Assemble Fog Lamp Actuator Gear

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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\...

- \Passenger Fog Lamp Asm
- \Actuator Arm, Passenger Fog Lamp Asm
- \Actuator Arm Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.94
Total Weight (kg)	0.01

Material Cost**	\$0.03
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.05

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm, Passenger Fog Lamp Asm



Actuator Arm Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	15.52	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

Actuator Arm Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Arm	1	POM	\$3.18	0.0092	0.0099	\$0.00	\$0.03

Actuator Arm Cover, Passenger Fog Lamp Asm



\...

\Passenger Fog Lamp Asm

\Actuator Arm Cover, Passenger Fog Lamp Asm

\Actuator Gear Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.41
Total Weight (kg)	0.01

Material Cost**	\$0.04
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Actuator Arm Cover, Passenger Fog Lamp Asm



Actuator Gear Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	11.28	8	0.25	21.64	ESP	\$0.01	99.99%	\$0.00

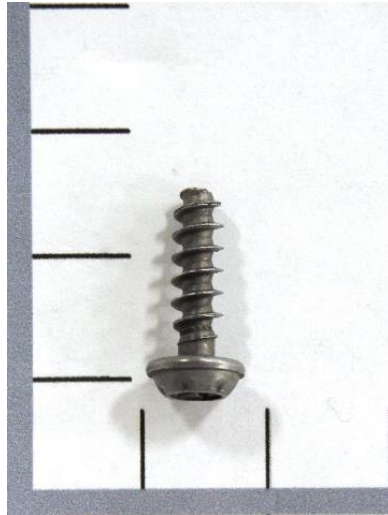
Actuator Gear Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Actuator Gear Cover	1	PBT GF20	\$3.33	0.0107	0.0115	\$0.00	\$0.04

Assemble Fog Lamp Actuator Arm & Cover



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\Lamps

\Passenger Fog Lamp Asm

\Assemble Fog Lamp Actuator Arm & Cover

Process Summary

Right First Time	99.51 %
Process Time (Sec)	33.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.41
Q Burden	\$0.07
SG&A	\$0.09
Manufacturing Cost*	\$0.60

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp Actuator Arm & Cover



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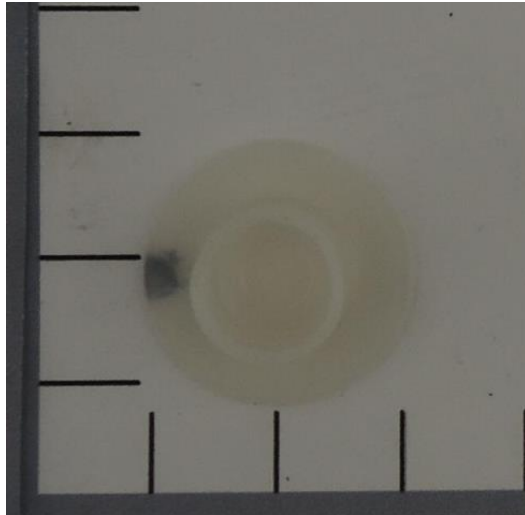
Assemble Fog Lamp Actuator Arm & Cover

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	33.00	1	1.00	45.01	ESP	\$0.41	99.51 %	\$0.07

Assemble Fog Lamp Actuator Arm & Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x13mm-Pan Torx Screw	2	Commodity Item	Purchased	0.0012	-	\$0.01	\$0.00

Plug, Passenger Fog Lamp Asm



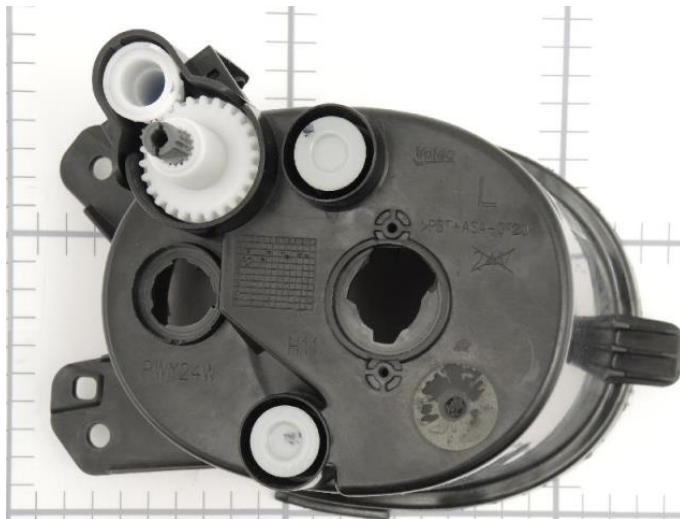
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- \Passenger Fog Lamp Asm
- \Plug, Passenger Fog Lamp Asm
- \Plug Fog Lamp Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	0.29
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.00
Q Burden	\$0.00
SG&A	\$0.00
Manufacturing Cost*	\$0.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Plug, Passenger Fog Lamp Asm



Plug Fog Lamp Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Process	2.32	8	0.25	21.64	ESP	\$0.00	99.99%	\$0.00

Plug Fog Lamp Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Plug	1	PP	\$2.38	0.0007	0.0008	\$0.00	\$0.01

Assemble Fog Lamp Plugs

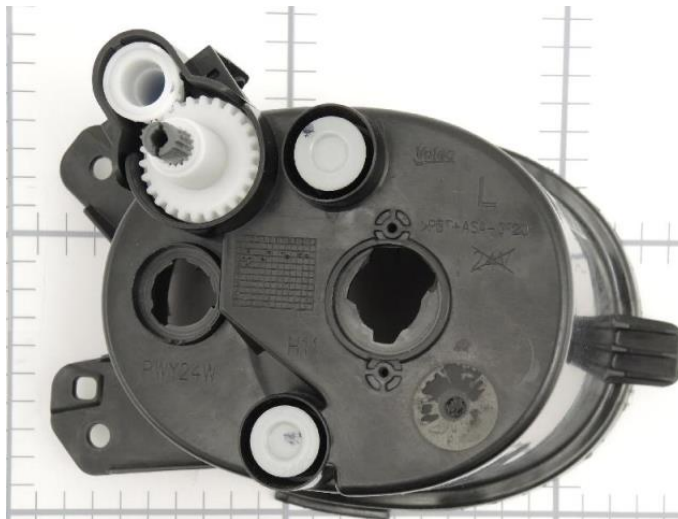


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- \Lamps
 - \Passenger Fog Lamp Asm
 - \Assemble Fog Lamp Plugs

Process Summary

Right First Time	99.75 %
Process Time (Sec)	62.78
Total Weight (kg)	0.03

Material Cost**	\$5.53
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.78
Q Burden	\$0.04
SG&A	\$0.34
Manufacturing Cost*	\$6.69



* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Assemble Fog Lamp Plugs



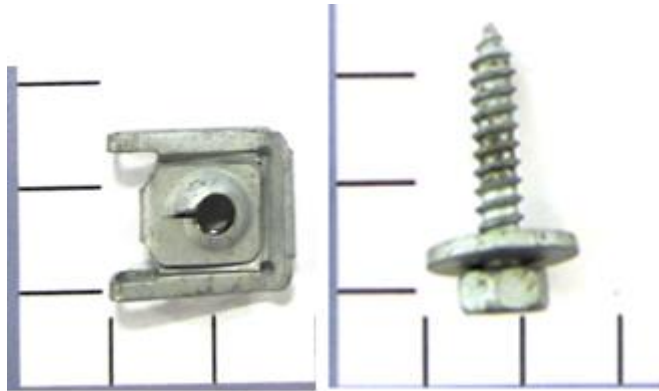
Assemble Fog Lamp Plugs

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	62.78	1	1.00	45.01	ESP	\$0.78	99.75%	\$0.04

Assemble Fog Lamp Plugs

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Fog Lamp, Low Density Foam	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00
Turn Signal Bulb, Driver's Fog Lamp	1	Commodity Item	Purchased	0.0109	-	\$1.75	\$0.00
Light Bulb, Driver's Fog Lamp	1	Commodity Item	Purchased	0.0231	-	\$3.50	\$0.00
Label, Valeo Supplier Large	1	Commodity Item	Purchased	0.0001	-	\$0.15	\$0.00
Label, Valeo Supplier Small	1	Commodity Item	Purchased	0.0001	-	\$0.10	\$0.00
Label, Date Code, Fog Lamp	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Fog Lamp



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\Zone 2 Exterior
\Lamps
\Assemble Fog Lamp

Process Summary

Right First Time	99.00 %
Process Time (Sec)	94.00
Total Weight (kg)	0.03

Material Cost**	\$0.08
OEM Process Cost	\$2.39
Supplier Process Cost	\$0.00
Q Burden	\$0.15
SG&A	\$0.53
Manufacturing Cost*	\$3.14



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Fog Lamp



Assemble Fog Lamp

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	94.00	1	1.00	91.41	GER	\$2.39	99.00%	\$0.15

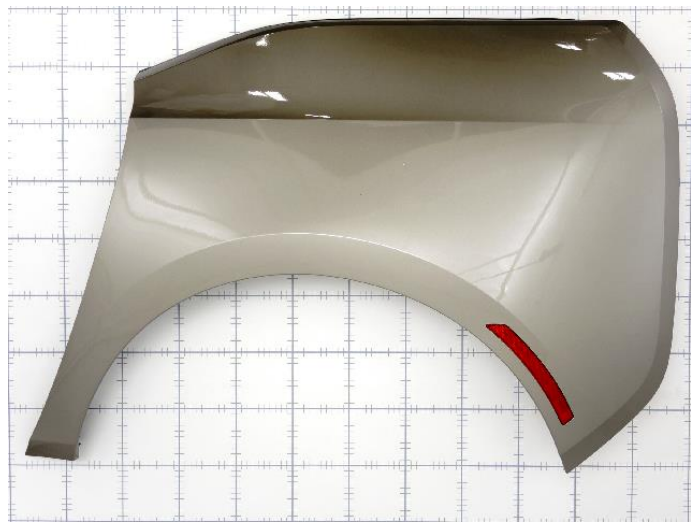
Assemble Fog Lamp

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5 Metal Clip Nut	4	Commodity Item	Purchased	0.0024	-	\$0.01	\$0.00
M5x20mm-Hex SEMS Screw	4	Commodity Item	Purchased	0.0050	-	\$0.01	\$0.00

Side Lamp Asm, Driver Rear Quarter



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\...
 \Zone 2 Exterior
 \Lamps
 \Side Lamp Asm, Driver Rear Quarter

Assembly Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	16
Fastenings	4
Right First Time	99.73 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.62
Total Weight (kg)	0.04

Material Cost**	\$0.64
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.53
Q Burden	\$0.04
SG&A	\$0.25
Manufacturing Cost*	\$1.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Asm, Driver Rear Quarter



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Side Lamp Asm, Driver Rear Quarter

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Side Lamp Housing, Side Lamp Asm	1	3	0	5	0	99.98 %	0.00	0.00	0.00	0.07	0.0230
Assemble Side Lamp LED	1	1	1	3	1	99.91 %	0.00	0.00	0.13	0.00	0.0017
Side Lamp Lens, Side Lamp Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0174
Assemble Side Lamp Lens	1	1	3	5	3	99.86 %	0.00	0.00	0.39	0.00	0.0011

Side Lamp Asm, Driver Rear Quarter

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Side Lamp Housing, Side Lamp Asm	\$0.02	\$0.08	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.03	\$0.18
Assemble Side Lamp LED	\$0.00	\$0.45	\$0.00	\$0.00	\$0.12	\$0.00	\$0.01	\$0.13	\$0.71
Side Lamp Lens, Side Lamp Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.02	\$0.10
Assemble Side Lamp Lens	\$0.02	\$0.00	\$0.00	\$0.00	\$0.35	\$0.00	\$0.02	\$0.08	\$0.47

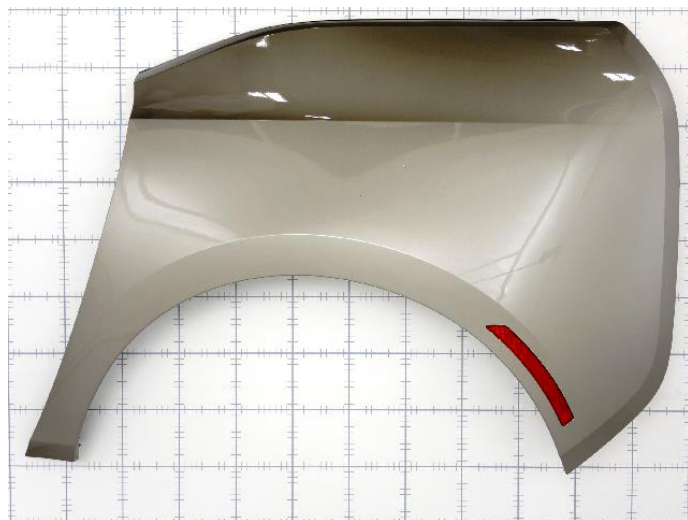
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	16
Fastenings	4
Right First Time	99.73%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.52
Supplier Fab. Time (Min)	0.10
Total Weight (kg)	0.04
Purchased Part Cost	
	\$0.04
Material Cost	
	\$0.60
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.47
Supplier Fab. Cost	
	\$0.06
Q Burden	
	\$0.04
SG&A	
	\$0.25
Manufacturing Cost*	
	\$1.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Housing, Side Lamp Asm



- \...
- \Side Lamp Asm, Driver Rear Quarter
- \Side Lamp Housing, Side Lamp Asm
- \Side Lamp Housing Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	4.31
Total Weight (kg)	0.02

Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Housing, Side Lamp Asm



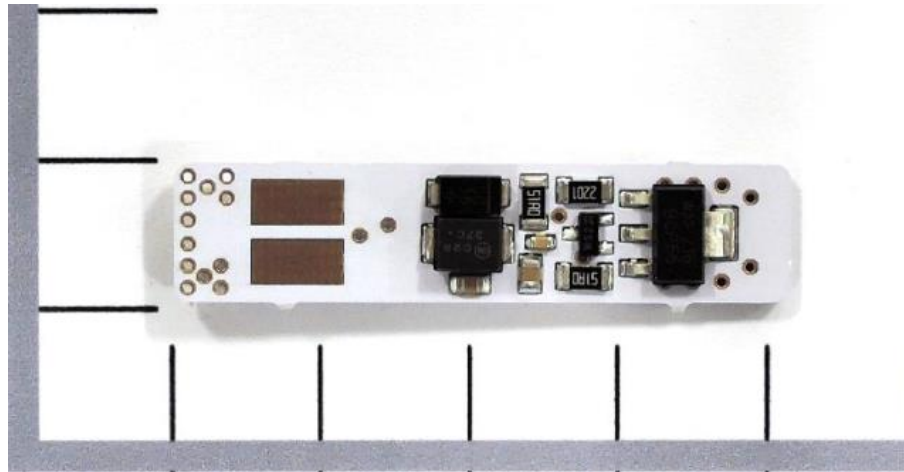
Side Lamp Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	17.24	4	0.25	39.57	GER	\$0.05	99.98 %	\$0.00

Side Lamp Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Side Lamp Housing	1	ABS +PC	\$3.40	0.0228	0.0228	\$0.00	\$0.08
LED Contact, SideLamp Housing	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Side Lamp LED



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\Lamps

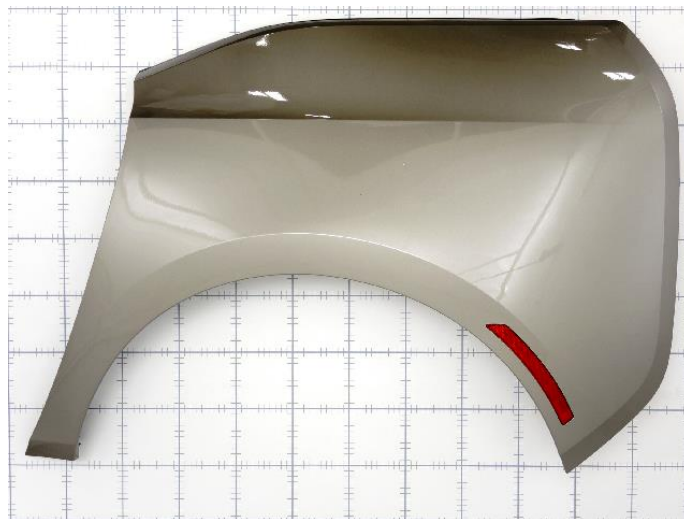
\Side Lamp Asm, Driver Rear Quarter

\Assemble Side Lamp LED

Process Summary

Right First Time	99.91 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00

Material Cost**	\$0.45
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$0.71




* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Side Lamp LED

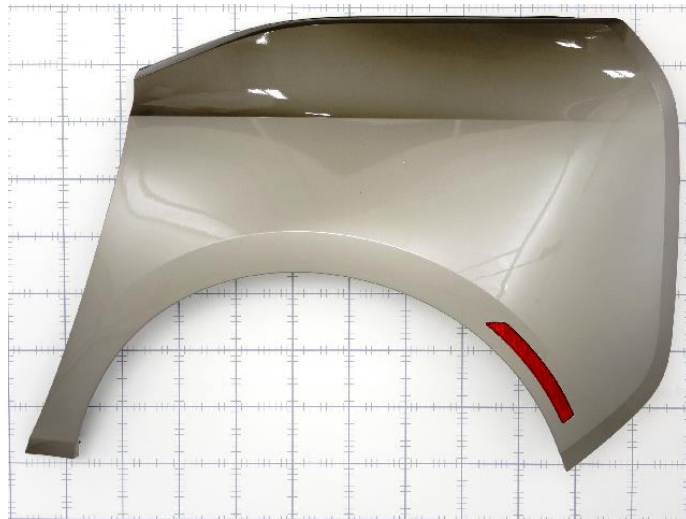
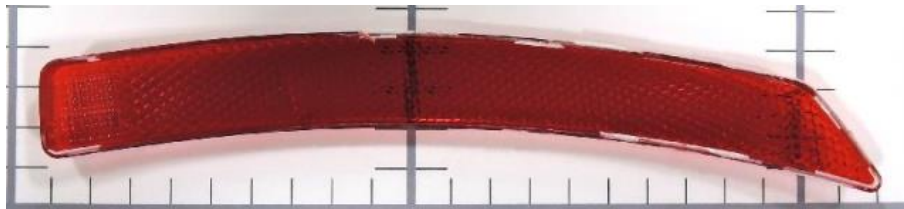


Assemble Side Lamp LED									
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden	
Supplier Manual Asm	8.00	1	1.00	54.32	GER	\$0.12	99.91 %	\$0.01	

Assemble Side Lamp LED								
Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost	
 Side Lamp LED, Side Lamp Asm	1	See Appendix	-	0.0017	-	\$0.00	\$0.45	

[Click Here for TechInsights Electronics Report on Side Lamp LED](#)

Side Lamp Lens, Side Lamp Asm



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- \Side Lamp Asm, Driver Rear Quarter
- \Side Lamp Lens, Side Lamp Asm
- \Side Lamp Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.73
Total Weight (kg)	0.02
Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Lens, Side Lamp Asm



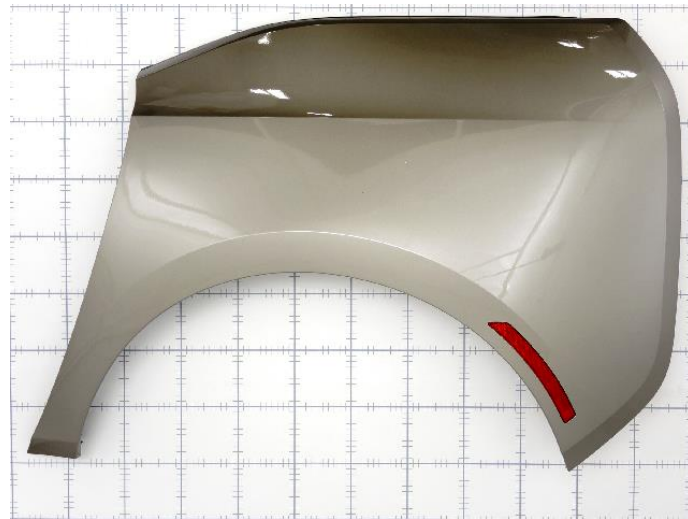
Side Lamp Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	13.84	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Side Lamp Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Side Lamp Lens	1	PMMA - Colored	\$3.57	0.0174	0.0187	\$0.00	\$0.07

Assemble Side Lamp Lens



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\Lamps
\Side Lamp Asm, Driver Rear Quarter
\Assemble Side Lamp Lens

Process Summary

Right First Time	99.86 %
Process Time (Sec)	23.35
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.02
SG&A	\$0.08
Manufacturing Cost*	\$0.47

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Side Lamp Lens

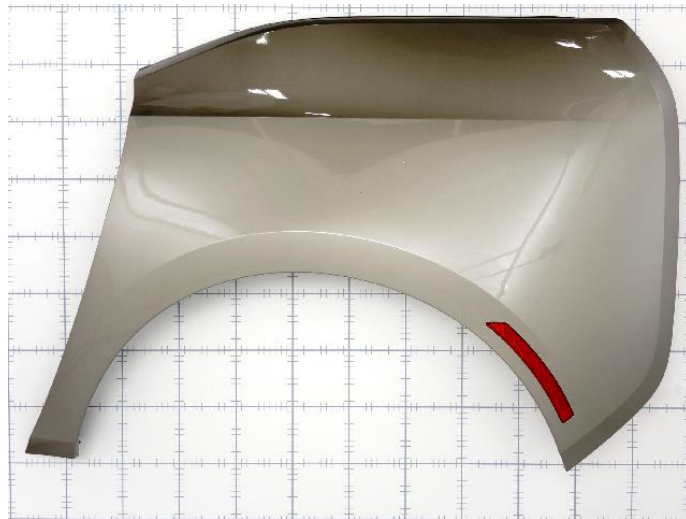
Assemble Side Lamp Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	23.35	1	1.00	54.32	GER	\$0.35	99.86%	\$0.02

Assemble Side Lamp Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, Side Lamp	1	Commodity Item	Purchased	0.0011	-	\$0.02	\$0.00

No Commodity Items Required for This Process



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\Zone 2 Exterior
\Lamps
\Assemble Light Driver Rear Quarter

Process Summary

Right First Time	99.96 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.15
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.19

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Driver Rear Quarter



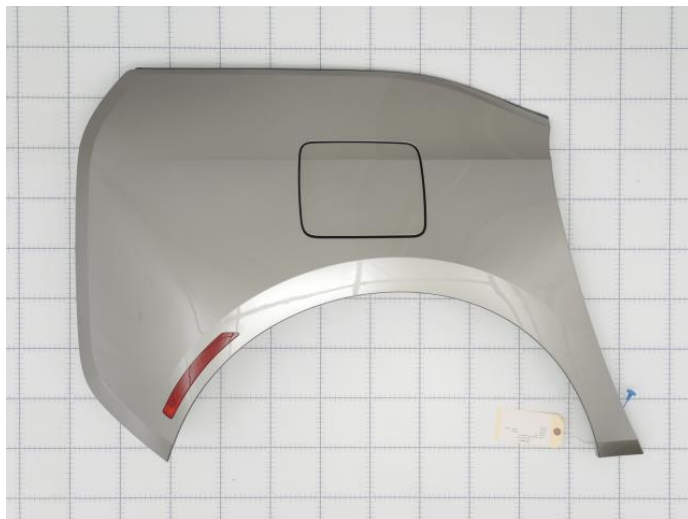
Assemble Light Driver Rear Quarter

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	6.00	1	1.00	91.41	GER	\$0.15	99.96%	\$0.01

Assemble Light Driver Rear Quarter

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Side Lamp Asm, Passenger Rear Quarter



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 \Zone 2 Exterior
 \Lamps
 \Side Lamp Asm, Passenger Rear Quarter
Assembly Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	16
Fastenings	4
Right First Time	99.73 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.62
Total Weight (kg)	0.04

Material Cost**	\$0.64
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.53
Q Burden	\$0.04
SG&A	\$0.25
Manufacturing Cost*	\$1.46

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Side Lamp Asm, Passenger Rear Quarter



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Side Lamp Asm, Passenger Rear Quarter

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Side Lamp Housing, Side Lamp Asm	1	3	0	5	0	99.98 %	0.00	0.00	0.00	0.07	0.0230
Assemble Side Lamp LED	1	1	1	3	1	99.91 %	0.00	0.00	0.13	0.00	0.0017
Side Lamp Lens, Side Lamp Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.03	0.0174
Assemble Side Lamp Lens	1	1	3	5	3	99.86 %	0.00	0.00	0.39	0.00	0.0011

Side Lamp Asm, Passenger Rear Quarter

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Side Lamp Housing, Side Lamp Asm	\$0.02	\$0.08	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.03	\$0.18
Assemble Side Lamp LED	\$0.00	\$0.45	\$0.00	\$0.00	\$0.12	\$0.00	\$0.01	\$0.13	\$0.71
Side Lamp Lens, Side Lamp Asm	\$0.00	\$0.07	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.02	\$0.10
Assemble Side Lamp Lens	\$0.02	\$0.00	\$0.00	\$0.00	\$0.35	\$0.00	\$0.02	\$0.08	\$0.47

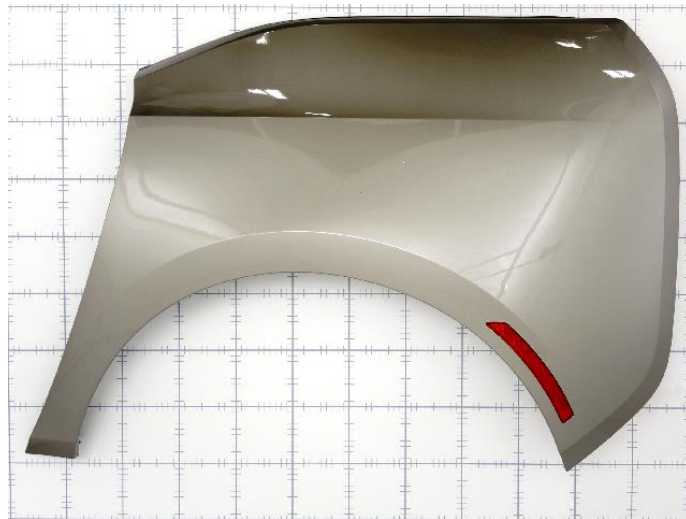
Detailed Summary

Parts	6
Fasteners	0
Part Numbers	5
Steps	16
Fastenings	4
Right First Time	99.73%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.52
Supplier Fab. Time (Min)	0.10
Total Weight (kg)	0.04
Purchased Part Cost	
	\$0.04
Material Cost	
	\$0.60
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.47
Supplier Fab. Cost	
	\$0.06
Q Burden	
	\$0.04
SG&A	
	\$0.25
Manufacturing Cost*	
	\$1.46

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Housing, Side Lamp Asm



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- \Side Lamp Asm, Passenger Rear Quarter
- \Side Lamp Housing, Side Lamp Asm
- \Side Lamp Housing Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	4.31
Total Weight (kg)	0.02

Material Cost**	\$0.10
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.18

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Housing, Side Lamp Asm



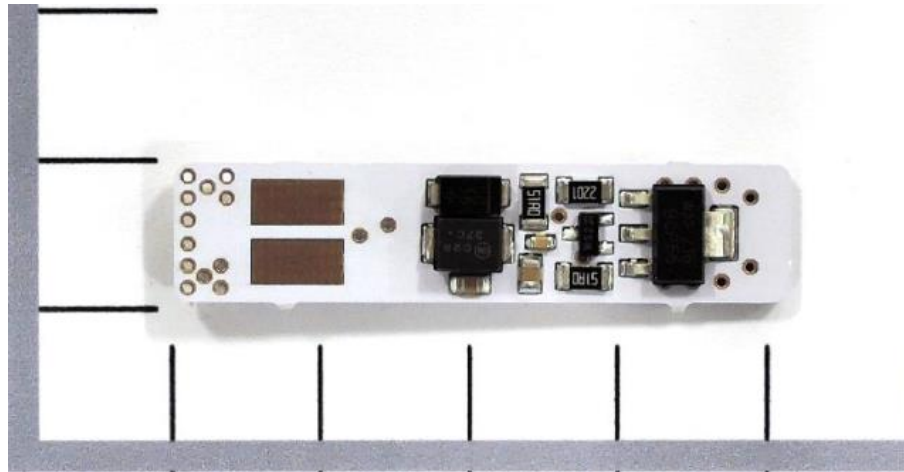
Side Lamp Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
200 Ton Injection Molding Press	17.24	4	0.25	39.57	GER	\$0.05	99.98 %	\$0.00

Side Lamp Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Side Lamp Housing	1	ABS +PC	\$3.40	0.0228	0.0228	\$0.00	\$0.08
LED Contact, SideLamp Housing	2	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Side Lamp LED



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\Lamps

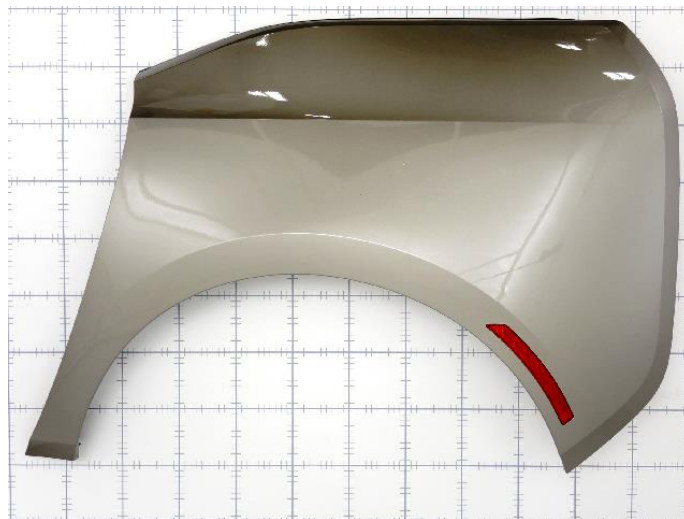
\Side Lamp Asm, Passenger Rear Quarter

\Assemble Side Lamp LED

Process Summary

Right First Time	99.91 %
Process Time (Sec)	8.00
Total Weight (kg)	0.00

Material Cost**	\$0.45
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.12
Q Burden	\$0.01
SG&A	\$0.13
Manufacturing Cost*	\$0.71



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble Side Lamp LED



Assemble Side Lamp LED

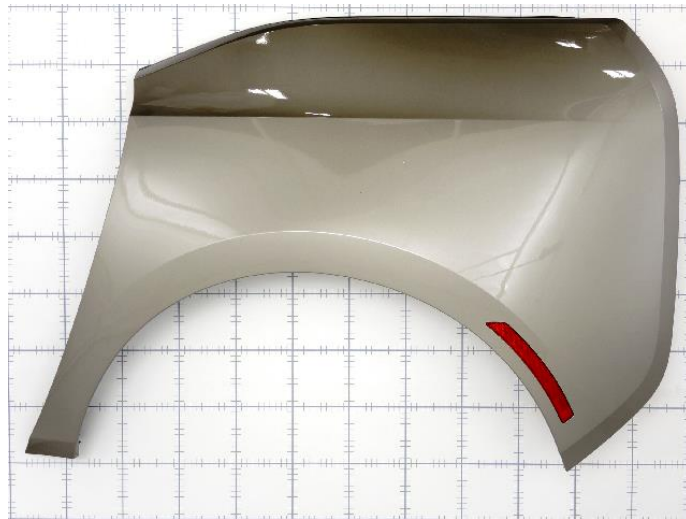
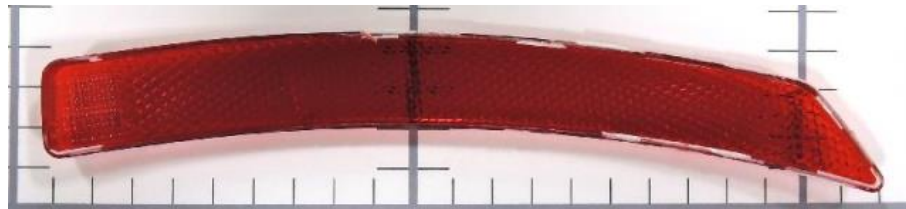
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	8.00	1	1.00	54.32	GER	\$0.12	99.91 %	\$0.01

Assemble Side Lamp LED

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 Side Lamp LED, Side Lamp Asm	1	See Appendix	-	0.0017	-	\$0.00	\$0.45

[Click Here for TechInsights Electronics Report on Side Lamp LED](#)

Side Lamp Lens, Side Lamp Asm



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\Side Lamp Asm, Passenger Rear Quarter

\Side Lamp Lens, Side Lamp Asm

\Side Lamp Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	1.73
Total Weight (kg)	0.02

Material Cost**	\$0.07
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.01
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.10

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Side Lamp Lens, Side Lamp Asm



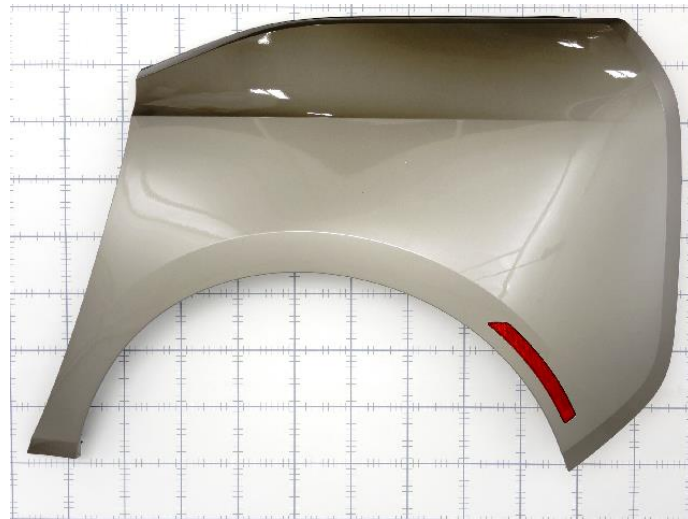
Side Lamp Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	13.84	8	0.25	23.71	GER	\$0.01	99.99%	\$0.00

Side Lamp Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Side Lamp Lens	1	PMMA - Colored	\$3.57	0.0174	0.0187	\$0.00	\$0.07

Assemble Side Lamp Lens



\...

\Lamps

\Side Lamp Asm, Passenger Rear Quarter

\Assemble Side Lamp Lens

Process Summary

Right First Time	99.86 %
Process Time (Sec)	23.35
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.35
Q Burden	\$0.02
SG&A	\$0.08
Manufacturing Cost*	\$0.47

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Side Lamp Lens

Assemble Side Lamp Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	23.35	1	1.00	54.32	GER	\$0.35	99.86%	\$0.02

Assemble Side Lamp Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, Side Lamp	1	Commodity Item	Purchased	0.0011	-	\$0.02	\$0.00

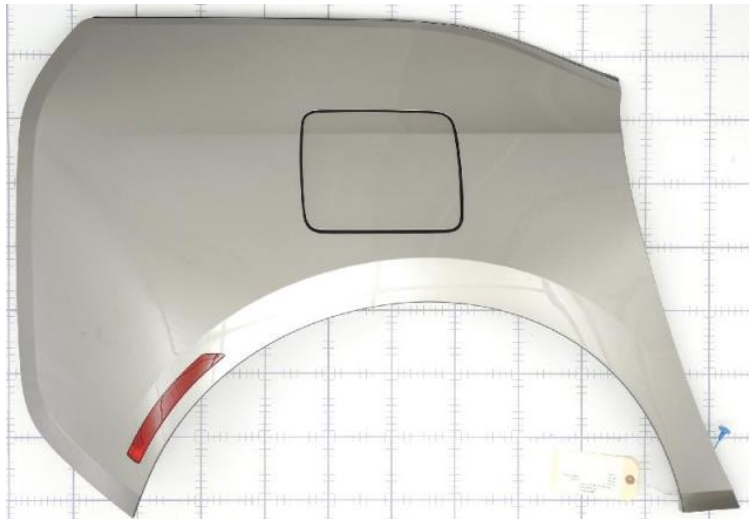
No Commodity Items
Required for This
Process

\...
\Zone 2 Exterior
\Lamps
\Assemble Light Passenger Rear Quarter

Process Summary

Right First Time	99.96 %
Process Time (Sec)	6.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.15
Supplier Process Cost	\$0.00
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.19



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Light Passenger Rear Quarter



Assemble Light Passenger Rear Quarter

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	6.00	1	1.00	91.41	GER	\$0.15	99.96%	\$0.01

Assemble Light Passenger Rear Quarter

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Passenger Tail Lamp Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Passenger Tail Lamp Asm

Assembly Summary

Parts	20
Fasteners	5
Part Numbers	16
Steps	69
Fastenings	26
Right First Time	98.16 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	5.41
Total Weight (kg)	0.90

Material Cost**	\$30.56
OEM Process Cost	\$0.00
Supplier Process Cost	\$15.75
Q Burden	\$0.28
SG&A	\$10.17
Manufacturing Cost*	\$56.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Passenger Tail Lamp Asm



Passenger Tail Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Tail Lamp Housing, Passenger Tail Lamp Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	1.82	0.2920
Assemble Small LED Circuit Board	1	3	7	13	7	99.67 %	0.00	0.00	0.58	0.00	0.0316
Circuit Board Cover, Passenger Tail Lamp	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.19	0.0452
Assemble LED Circuit Board and Cover	1	5	6	13	6	99.25 %	0.00	0.00	0.87	0.00	0.0721
Lower Light Pipe Trim, Passenger Tail Lamp Asm	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.11	0.0660
Assemble Lower Light Pipe Trim	1	0	1	3	1	99.95 %	0.00	0.00	0.15	0.00	0.0000
Interior Trim Asm, Passenger Tail Lamp	1	3	2	9	2	99.90 %	0.00	0.00	0.30	0.20	0.2261
Assemble Interior Trim	1	2	6	10	6	99.53 %	0.00	0.00	0.55	0.00	0.0040
Upper Lens, Passenger Tail Lamp	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.21	0.0560
Lower Lens, Passenger Tail Lamp	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.21	0.1080
Assemble Lens	1	0	4	6	4	99.92 %	0.00	0.00	0.23	0.00	0.0000

Passenger Tail Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Tail Lamp Housing, Passenger Tail Lamp Asm	\$0.00	\$1.19	\$0.00	\$0.00	\$0.00	\$12.76	\$0.00	\$3.07	\$17.02
Assemble Small LED Circuit Board	\$0.00	\$18.86	\$0.00	\$0.00	\$0.53	\$0.00	\$0.05	\$4.27	\$23.70
Circuit Board Cover, Passenger Tail Lamp	\$0.00	\$0.16	\$0.00	\$0.00	\$0.00	\$0.17	\$0.00	\$0.07	\$0.40
Assemble LED Circuit Board and Cover	\$0.08	\$8.49	\$0.00	\$0.00	\$0.78	\$0.00	\$0.11	\$2.04	\$11.51
Lower Light Pipe Trim, Passenger Tail Lamp Asm	\$0.00	\$0.22	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.06	\$0.35
Assemble Lower Light Pipe Trim	\$0.00	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.01	\$0.03	\$0.17
Interior Trim Asm, Passenger Tail Lamp	\$0.01	\$0.83	\$0.00	\$0.00	\$0.27	\$0.11	\$0.02	\$0.27	\$1.50
Assemble Interior Trim	\$0.02	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.07	\$0.11	\$0.70
Upper Lens, Passenger Tail Lamp	\$0.00	\$0.24	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.07	\$0.41
Lower Lens, Passenger Tail Lamp	\$0.00	\$0.46	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.13	\$0.73
Assemble Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.21	\$0.00	\$0.01	\$0.05	\$0.27

Detailed Summary

Parts	20
Fasteners	5
Part Numbers	16
Steps	69
Fastenings	26
Right First Time	98.16%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	2.68
Supplier Fab. Time (Min)	2.73
Total Weight (kg)	0.90
Purchased Part Cost	
	\$0.11
Material Cost	\$30.45
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$2.43
Supplier Fab. Cost	\$13.32
Q Burden	\$0.28
SG&A	\$10.17
Manufacturing Cost*	\$56.76

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Housing, Passenger Tail Lamp Asm



\...

- \Passenger Tail Lamp Asm
- \Tail Lamp Housing, Passenger Tail Lamp Asm
- \Tail Lamp Housing Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	108.93
Total Weight (kg)	0.29

Material Cost**	\$1.19
OEM Process Cost	\$0.00
Supplier Process Cost	\$12.76
Q Burden	\$0.00
SG&A	\$3.07
Manufacturing Cost*	\$17.02



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Housing, Passenger Tail Lamp Asm



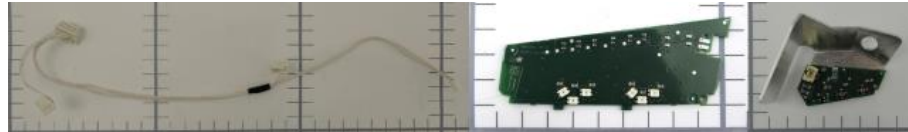
Tail Lamp Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	95.53	1	0.25	473.42	GER	\$12.56	99.99%	\$0.00
390 Ton Injection Molding Press	26.80	2	0.25	52.65	GER	\$0.20	99.99%	\$0.00

Tail Lamp Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Tail Lamp Housing	1	Plating - Chrome		By Area	0.0000	\$0.00	\$0.13
Material, Tail Lamp Housing	1	ABS + PC	\$3.40	0.2920	0.2920	\$0.00	\$1.06

Assemble Small LED Circuit Board



\...
\Lamps
\Passenger Tail Lamp Asm
\Assemble Small LED Circuit Board

Process Summary

Right First Time	99.67 %
Process Time (Sec)	35.00
Total Weight (kg)	0.03

Material Cost**	\$18.86
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.53
Q Burden	\$0.05
SG&A	\$4.27
Manufacturing Cost*	\$23.70



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Small LED Circuit Board



Assemble Small LED Circuit Board

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	35.00	1	1.00	54.32	GER	\$0.53	99.67%	\$0.05

Assemble Small LED Circuit Board

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Tail Lamp Wiring Harness Asm, Passenger Tail Lamp	1	See Appendix	-	0.0059	-	\$0.00	\$1.38
Board, Tail Lamp, Passenger Side	1	See Appendix	-	0.0095	-	\$0.00	\$14.91
Small Upper Printed Circuit Board, Passenger Tail	1	See Appendix	-	0.0162	-	\$0.00	\$2.57

[Click Here for TechInsights Electronics Report on LED Board, Tail Lamp](#)

[Click Here for TechInsights Electronics Report on Small Upper Board](#)

[Click Here for Munro & Associates Wire Harness Report on Tail Lamp](#)

[Wire Harness](#)

Circuit Board Cover, Passenger Tail Lamp



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- \Passenger Tail Lamp Asm
- \Circuit Board Cover, Passenger Tail Lamp
- \Circuit Board Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	11.61
Total Weight (kg)	0.05

Material Cost**	\$0.16
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.17
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.40



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Circuit Board Cover, Passenger Tail Lamp



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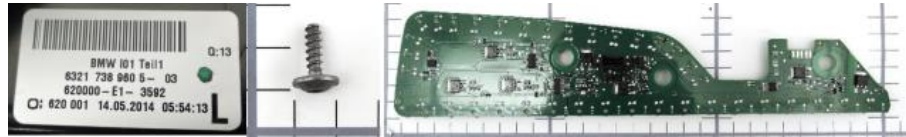
Circuit Board Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	23.22	2	0.25	52.65	GER	\$0.17	99.99%	\$0.00

Circuit Board Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Circuit Board Cover	1	ABS + PC	\$3.40	0.0452	0.0452	\$0.00	\$0.16

Assemble LED Circuit Board and Cover



- \...
- \Lamps
 - \Passenger Tail Lamp Asm
 - \Assemble LED Circuit Board and Cover

Process Summary

Right First Time	99.25 %
Process Time (Sec)	52.00
Total Weight (kg)	0.07

Material Cost**	\$8.57
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.78
Q Burden	\$0.11
SG&A	\$2.04
Manufacturing Cost*	\$11.51



* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Assemble LED Circuit Board and Cover



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Assemble LED Circuit Board and Cover

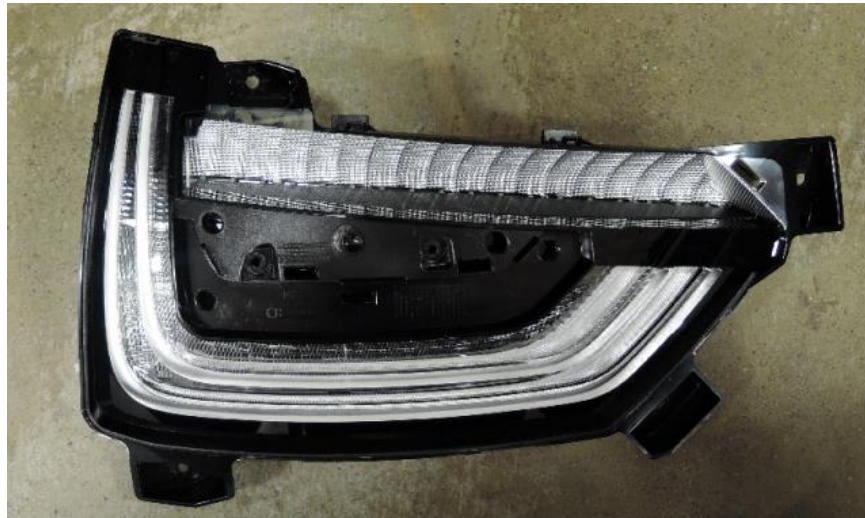
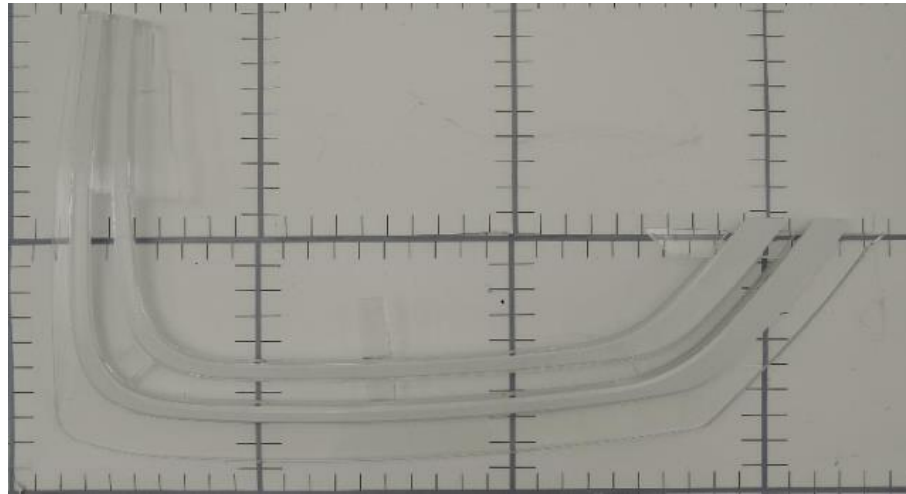
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	52.00	1	1.00	54.32	GER	\$0.78	99.25%	\$0.11

Assemble LED Circuit Board and Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Tail Lamp Main Board, Passenger Side	1	See Appendix	-	0.0660	-	\$0.00	\$8.49
M4x13mm-Pan Head Torx	3	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00
Label, Supplier Tail Lamp	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

[Click Here for TechInsights Electronics Report on Tail Lamp, Main Board](#)

Lower Light Pipe Trim, Passenger Tail Lamp Asm



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- \Passenger Tail Lamp Asm
- \Lower Light Pipe Trim, Passenger Tail Lamp Asm
- \Lower Light Pipe Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	6.55
Total Weight (kg)	0.07

Material Cost**	\$0.22
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.06
Manufacturing Cost*	\$0.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lower Light Pipe Trim, Passenger Tail Lamp Asm



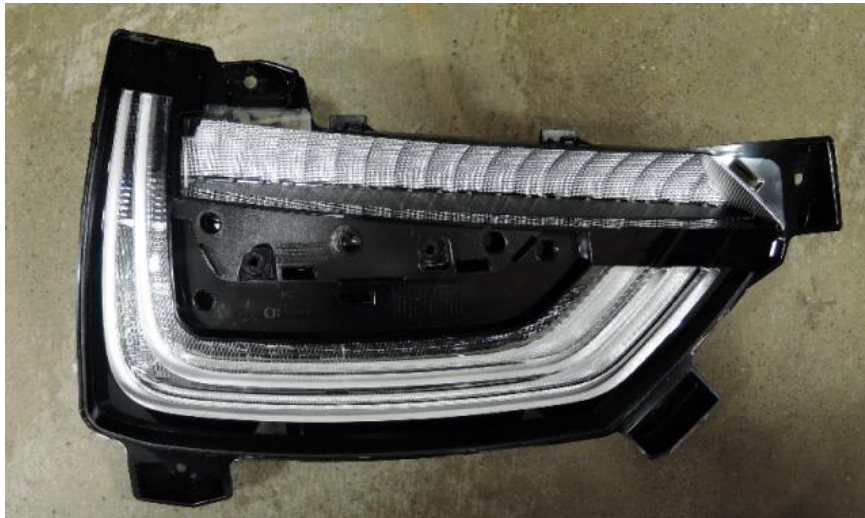
Lower Light Pipe Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	26.20	4	0.25	35.01	GER	\$0.06	99.98 %	\$0.00

Lower Light Pipe Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lower Light Pipe Trim	1	PMMA - Clear	\$3.09	0.0634	0.0682	\$0.00	\$0.21
Material, Lower Light Pipe Trim	1	ABS	\$2.60	0.0026	0.0026	\$0.00	\$0.01

No Commodity Items Required for This Process



\...
\Lamps
\Passenger Tail Lamp Asm
\Assemble Lower Light Pipe Trim

Process Summary

Right First Time	99.95 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00

Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lower Light Pipe Trim



Assemble Lower Light Pipe Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	54.32	GER	\$0.14	99.95%	\$0.01

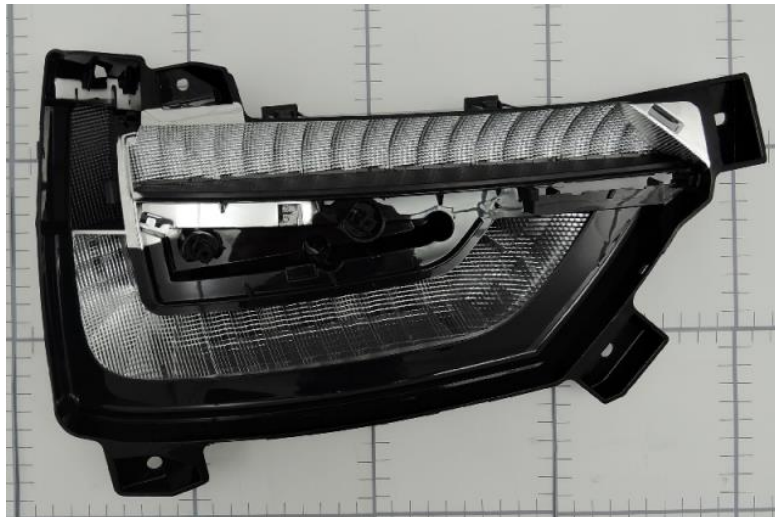
Assemble Lower Light Pipe Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Interior Trim Asm, Passenger Tail Lamp



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\Lamps

\Passenger Tail Lamp Asm

\Interior Trim Asm, Passenger Tail Lamp

Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	9
Fastenings	2
Right First Time	99.90 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.49
Total Weight (kg)	0.23

Material Cost**	\$0.84
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.37
Q Burden	\$0.02
SG&A	\$0.27
Manufacturing Cost*	\$1.50

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Interior Trim Asm, Passenger Tail Lamp



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Interior Trim Asm, Passenger Tail Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Tail Lamp Interior Trim, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.0900
Light Pipe Lens, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.1360
Assemble Interior Trim	1	1	2	5	2	99.92 %	0.00	0.00	0.30	0.00	0.0001

Interior Trim Asm, Passenger Tail Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Tail Lamp Interior Trim, Interior Trim Asm	\$0.00	\$0.38	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.10	\$0.54
Light Pipe Lens, Interior Trim Asm	\$0.00	\$0.45	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.11	\$0.61
Assemble Interior Trim	\$0.01	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.01	\$0.06	\$0.35

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	9
Fastenings	2
Right First Time	99.9%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.20
Total Weight (kg)	0.23
Purchased Part Cost	
	\$0.01
Material Cost	
	\$0.83
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.27
Supplier Fab. Cost	
	\$0.11
Q Burden	
	\$0.02
SG&A	
	\$0.27
Manufacturing Cost*	
	\$1.50

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...

- \Interior Trim Asm, Passenger Tail Lamp
- \Tail Lamp Interior Trim, Interior Trim Asm
- \Tail Lamp Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.42
Total Weight (kg)	0.09
Material Cost**	\$0.38
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.10
Manufacturing Cost*	\$0.54

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Interior Trim, Interior Trim Asm



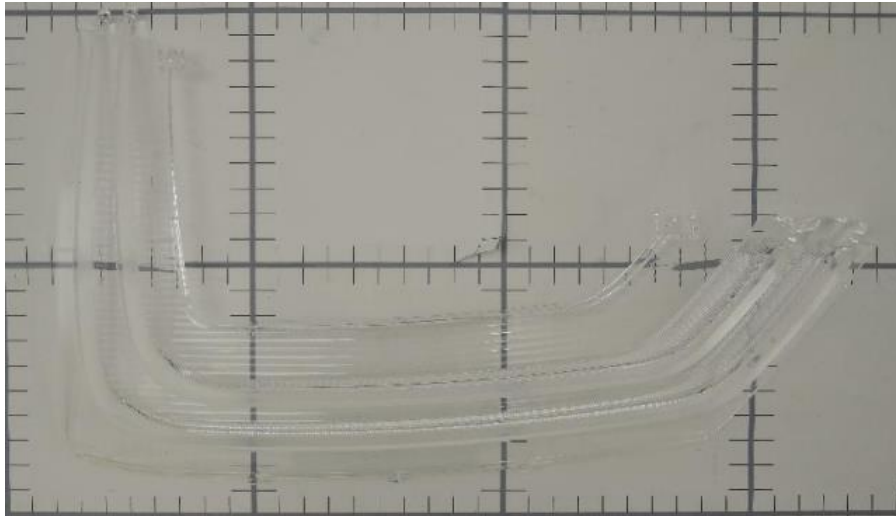
Tail Lamp Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	14.84	2	0.25	27.82	GER	\$0.06	99.99%	\$0.00

Tail Lamp Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Interior Trim	1	PC	\$3.97	0.0900	0.0968	\$0.00	\$0.38

Light Pipe Lens, Interior Trim Asm



\...

- \Interior Trim Asm, Passenger Tail Lamp
- \Light Pipe Lens, Interior Trim Asm
- \Light Pipe Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.39
Total Weight (kg)	0.14
Material Cost**	\$0.45
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.05
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.61

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Lens, Interior Trim Asm

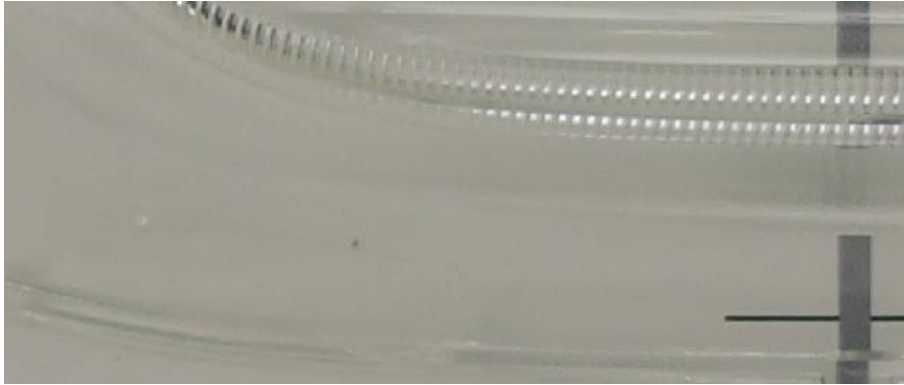


Light Pipe Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	17.56	4	0.25	39.50	GER	\$0.05	99.99%	\$0.00

Light Pipe Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe Lens	1	PMMA - Clear	\$3.09	0.1360	0.1462	\$0.00	\$0.45



\...
 \Passenger Tail Lamp Asm
 \Interior Trim Asm, Passenger Tail Lamp
 \Assemble Interior Trim

Process Summary

Right First Time	99.92 %
Process Time (Sec)	17.83
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.01
SG&A	\$0.06
Manufacturing Cost*	\$0.35



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Interior Trim

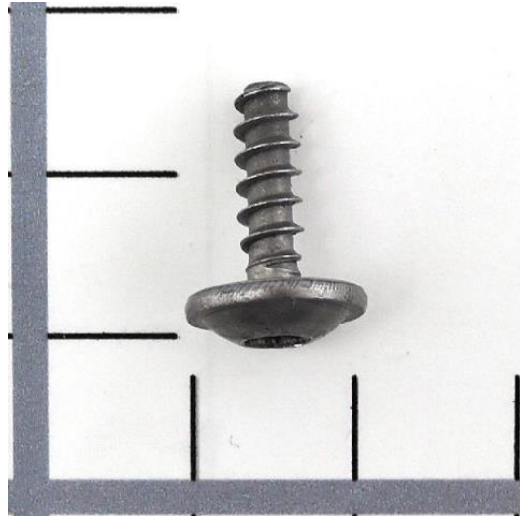


Assemble Interior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	17.83	1	1.00	54.32	GER	\$0.27	99.92 %	\$0.01

Assemble Interior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, 31mmx8mm	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00



\...
 \Lamps
 \Passenger Tail Lamp Asm
 \Assemble Interior Trim

Process Summary

Right First Time	99.53 %
Process Time (Sec)	33.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.50
Q Burden	\$0.07
SG&A	\$0.11
Manufacturing Cost*	\$0.70



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Interior Trim



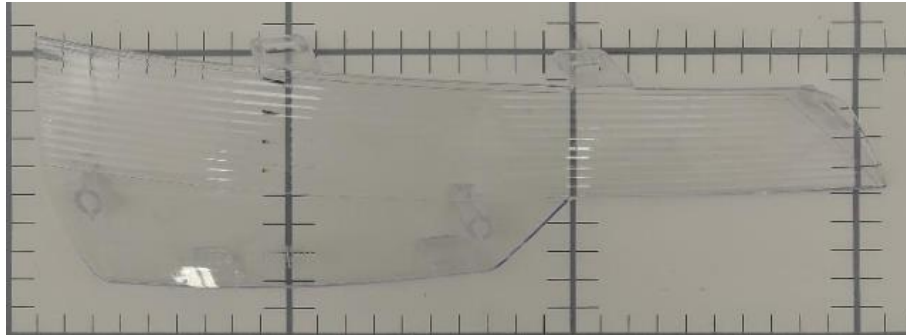
Assemble Interior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	33.00	1	1.00	54.32	GER	\$0.50	99.53%	\$0.07

Assemble Interior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x13mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00

Upper Lens, Passenger Tail Lamp



\...

- \Passenger Tail Lamp Asm
- \Upper Lens, Passenger Tail Lamp
- \Upper Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	12.36
Total Weight (kg)	0.06
Material Cost**	\$0.24
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.41

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Lens, Passenger Tail Lamp



Upper Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	24.72	2	0.25	26.65	GER	\$0.09	99.99%	\$0.00

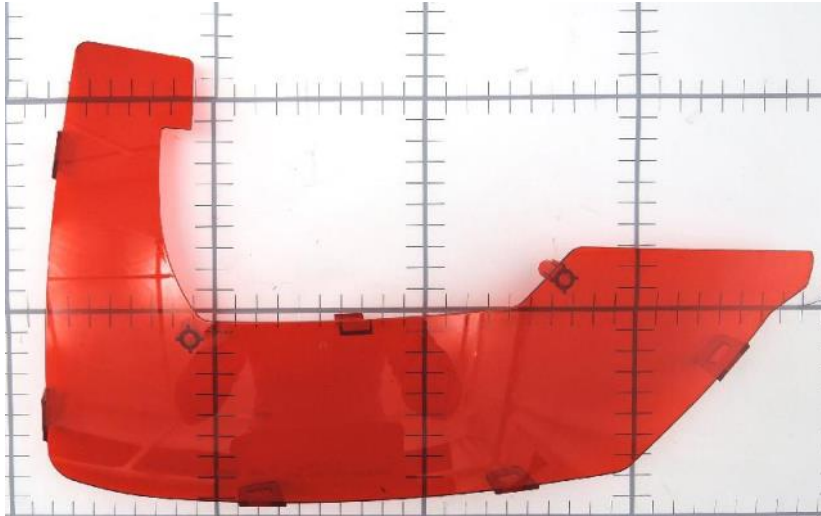
Upper Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Upper Lens	1	PC	\$3.97	0.0560	0.0602	\$0.00	\$0.24

Lower Lens, Passenger Tail Lamp



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\...

- \Passenger Tail Lamp Asm
- \Lower Lens, Passenger Tail Lamp
- \Lower Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	12.31
Total Weight (kg)	0.11
Material Cost**	\$0.46
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.73

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lower Lens, Passenger Tail Lamp



Lower Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	24.62	2	0.25	39.50	GER	\$0.14	99.99%	\$0.00

Lower Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lower Lens	1	PC	\$3.97	0.1080	0.1161	\$0.00	\$0.46

No Commodity Items Required for This Process



\...
\Lamps
\Passenger Tail Lamp Asm
\Assemble Lens

Process Summary

Right First Time	99.92 %
Process Time (Sec)	14.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.21
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.27

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lens



Assemble Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	14.00	1	1.00	54.32	GER	\$0.21	99.92 %	\$0.01

Assemble Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Driver Tail Lamp Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Driver Tail Lamp Asm

Assembly Summary

Parts	20
Fasteners	5
Part Numbers	16
Steps	70
Fastenings	26
Right First Time	98.15 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	5.67
Total Weight (kg)	0.90

Material Cost**	\$30.53
OEM Process Cost	\$0.00
Supplier Process Cost	\$7.14
Q Burden	\$0.28
SG&A	\$8.27
Manufacturing Cost*	\$46.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Driver Tail Lamp Asm



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Driver Tail Lamp Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Tail Lamp Housing, Driver Tail Lamp Asm	1	2	0	4	0	99.98 %	0.00	0.00	0.00	2.03	0.2920
Assemble Small LED Circuit Board	1	3	7	13	7	99.67 %	0.00	0.00	0.60	0.00	0.0316
Circuit Board Cover, Driver Tail Lamp	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.19	0.0452
Assemble LED Circuit Board and Cover	1	5	6	13	6	99.25 %	0.00	0.00	0.87	0.00	0.0721
Lower Light Pipe Trim, Driver Tail Lamp	1	2	0	2	0	99.98 %	0.00	0.00	0.00	0.11	0.0660
Assemble Lower Light Pipe	1	0	1	3	1	99.95 %	0.00	0.00	0.15	0.00	0.0000
Interior Trim, Driver Tail Lamp	1	3	2	9	2	99.90 %	0.00	0.00	0.30	0.20	0.2261
Assemble Interior Trim	1	2	6	10	6	99.53 %	0.00	0.00	0.55	0.00	0.0040
Upper Lens, Driver Tail Lamp	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.21	0.0560
Lower Lens, Driver Tail Lamp	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.21	0.1080
Assemble Lens	1	0	4	7	4	99.91 %	0.00	0.00	0.27	0.00	0.0000

Driver Tail Lamp Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Tail Lamp Housing, Driver Tail Lamp Asm	\$0.00	\$1.19	\$0.00	\$0.00	\$0.00	\$4.12	\$0.00	\$1.17	\$6.48
Assemble Small LED Circuit Board	\$0.00	\$18.86	\$0.00	\$0.00	\$0.54	\$0.00	\$0.05	\$4.27	\$23.72
Circuit Board Cover, Driver Tail Lamp	\$0.00	\$0.13	\$0.00	\$0.00	\$0.00	\$0.17	\$0.00	\$0.07	\$0.37
Assemble LED Circuit Board and Cover	\$0.08	\$8.49	\$0.00	\$0.00	\$0.78	\$0.00	\$0.11	\$2.04	\$11.51
Lower Light Pipe Trim, Driver Tail Lamp	\$0.00	\$0.22	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.06	\$0.35
Assemble Lower Light Pipe	\$0.00	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.01	\$0.03	\$0.17
Interior Trim, Driver Tail Lamp	\$0.01	\$0.83	\$0.00	\$0.00	\$0.27	\$0.09	\$0.02	\$0.26	\$1.48
Assemble Interior Trim	\$0.02	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.07	\$0.11	\$0.70
Upper Lens, Driver Tail Lamp	\$0.00	\$0.24	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.07	\$0.41
Lower Lens, Driver Tail Lamp	\$0.00	\$0.46	\$0.00	\$0.00	\$0.00	\$0.14	\$0.00	\$0.13	\$0.73
Assemble Lens	\$0.00	\$0.00	\$0.00	\$0.00	\$0.24	\$0.00	\$0.01	\$0.05	\$0.31

Detailed Summary

Parts	20
Fasteners	5
Part Numbers	16
Steps	70
Fastenings	26
Right First Time	98.15%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	2.73
Supplier Fab. Time (Min)	2.94
Total Weight (kg)	0.90
Purchased Part Cost	
	\$0.11
Material Cost	
	\$30.42
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$2.47
Supplier Fab. Cost	
	\$4.67
Q Burden	
	\$0.28
SG&A	
	\$8.27
Manufacturing Cost*	
	\$46.22

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Housing, Driver Tail Lamp Asm



\...

- \Driver Tail Lamp Asm
- \Tail Lamp Housing, Driver Tail Lamp Asm
- \Tail Lamp Housing Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	121.98
Total Weight (kg)	0.29

Material Cost**	\$1.19
OEM Process Cost	\$0.00
Supplier Process Cost	\$4.12
Q Burden	\$0.00
SG&A	\$1.17
Manufacturing Cost*	\$6.48

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Housing, Driver Tail Lamp Asm



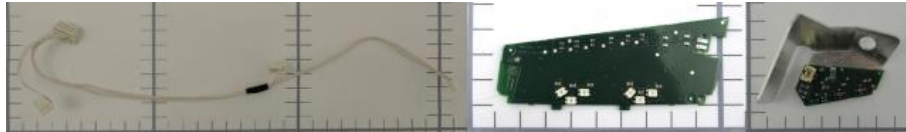
Tail Lamp Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Electroplating	95.53	1	0.25	140.69	GER	\$3.73	99.99%	\$0.00
390 Ton Injection Molding Press	26.45	1	0.25	52.65	GER	\$0.39	99.99%	\$0.00

Tail Lamp Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Plating, Tail Lamp Housing	1	Plating - Chrome		By Area	0.0000	\$0.00	\$0.13
Material, Tail Lamp Housing	1	ABS + PC	\$3.40	0.2920	0.2920	\$0.00	\$1.06

\...
 \Lamps
 \Driver Tail Lamp Asm
 \Assemble Small LED Circuit Board



Process Summary

Right First Time	99.67 %
Process Time (Sec)	36.00
Total Weight (kg)	0.03

Material Cost**	\$18.86
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.54
Q Burden	\$0.05
SG&A	\$4.27
Manufacturing Cost*	\$23.72



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Small LED Circuit Board



Assemble Small LED Circuit Board

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	36.00	1	1.00	54.32	GER	\$0.54	99.67%	\$0.05

Assemble Small LED Circuit Board

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Tail Lamp Wiring Harness, Driver Tail Lamp Asm	1	See Appendix	-	0.0059	-	\$0.00	\$1.38
Board, Tail Lamp, Driver Side	1	See Appendix	-	0.0095	-	\$0.00	\$14.91
Small Upper Printed Circuit Board, Driver Tail Lam	1	See Appendix	-	0.0162	-	\$0.00	\$2.57

[Click Here for TechInsights Electronics Report on LED Board, Tail Lamp](#)

[Click Here for TechInsights Electronics Report on Small Upper Board](#)

[Click Here for Munro & Associates Wire Harness Report on Tail Lamp](#)

[Wire Harness](#)

Circuit Board Cover, Driver Tail Lamp



\...

- \Driver Tail Lamp Asm
- \Circuit Board Cover, Driver Tail Lamp
- \Circuit Board Cover Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	11.61
Total Weight (kg)	0.05

Material Cost**	\$0.13
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.17
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.37



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Circuit Board Cover, Driver Tail Lamp



Circuit Board Cover Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
390 Ton Injection Molding Press	23.22	2	0.25	52.65	GER	\$0.17	99.99%	\$0.00

Circuit Board Cover Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Circuit Board Cover	1	ABS + PC	\$3.40	0.0452	0.0452	\$0.00	\$0.13

- \...
- \Lamps
 - \Driver Tail Lamp Asm
 - \Assemble LED Circuit Board and Cover



Process Summary

Right First Time	99.25 %
Process Time (Sec)	52.00
Total Weight (kg)	0.07

Material Cost**	\$8.57
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.78
Q Burden	\$0.11
SG&A	\$2.04
Manufacturing Cost*	\$11.51



* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Assemble LED Circuit Board and Cover



Assemble LED Circuit Board and Cover

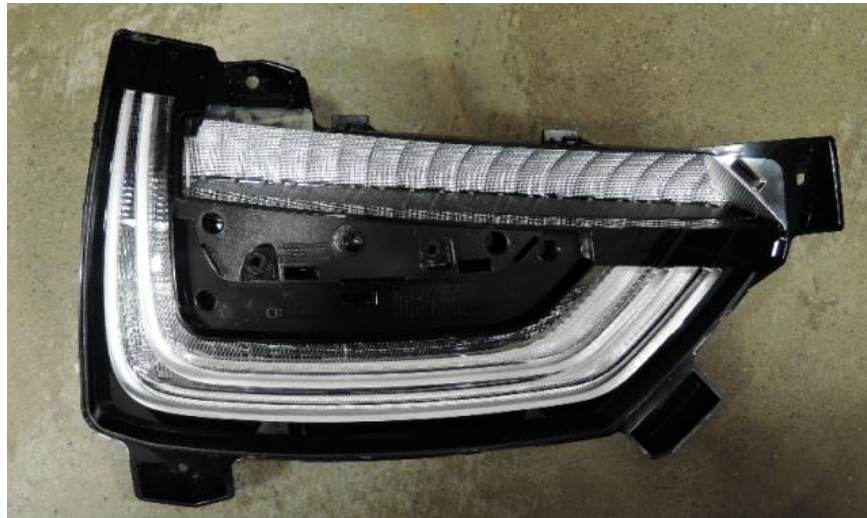
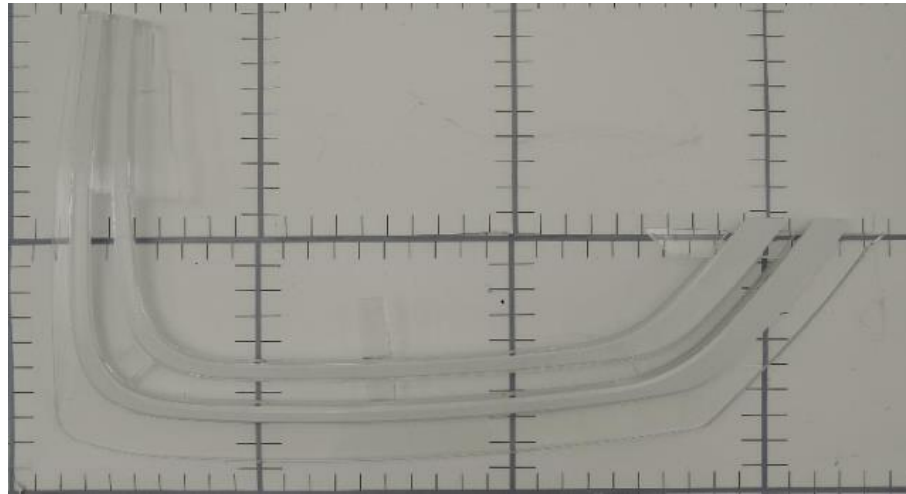
Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	52.00	1	1.00	54.32	GER	\$0.78	99.25%	\$0.11

Assemble LED Circuit Board and Cover

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Tail Lamp Main Board, Driver Side	1	See Appendix	-	0.0660	-	\$0.00	\$8.49
M4x13mm-Pan Head Torx	3	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00
Label, Supplier Tail Lamp	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

[Click Here for TechInsights Electronics Report on Tail Lamp, Main Board](#)

Lower Light Pipe Trim, Driver Tail Lamp



\...

- \Driver Tail Lamp Asm
- \Lower Light Pipe Trim, Driver Tail Lamp
- \Lower Light Pipe Trim Process

Process Summary

Right First Time	99.98 %
Process Time (Sec)	6.55
Total Weight (kg)	0.07
Material Cost**	\$0.22
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.06
Manufacturing Cost*	\$0.35

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lower Light Pipe Trim, Driver Tail Lamp



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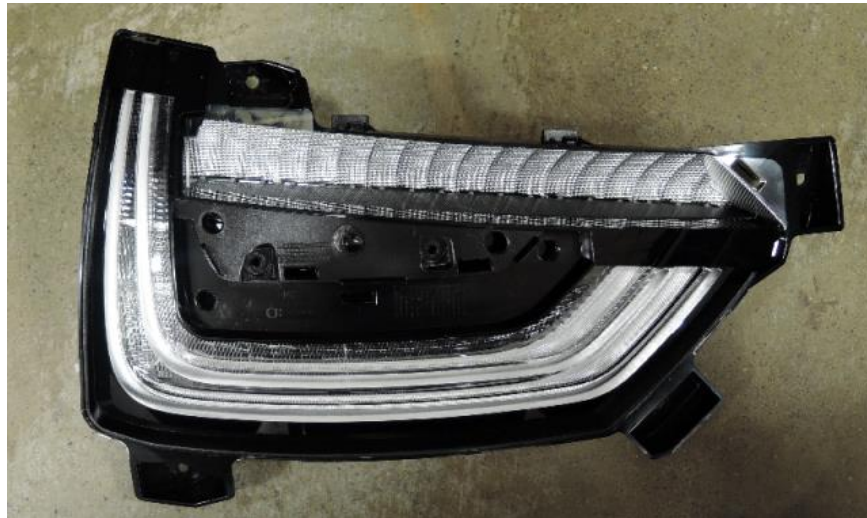
Lower Light Pipe Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	26.20	4	0.25	35.01	GER	\$0.06	99.98 %	\$0.00

Lower Light Pipe Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lower Light Pipe Trim	1	PMMA - Clear	\$3.09	0.0634	0.0682	\$0.00	\$0.21
Material, Lower Light Pipe Trim	1	ABS	\$2.60	0.0026	0.0026	\$0.00	\$0.01

No Commodity Items Required for This Process



\...
 \Lamps
 \Driver Tail Lamp Asm
 \Assemble Lower Light Pipe

Process Summary

Right First Time	99.95 %
Process Time (Sec)	9.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.01
SG&A	\$0.03
Manufacturing Cost*	\$0.17

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lower Light Pipe



Assemble Lower Light Pipe

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	9.00	1	1.00	54.32	GER	\$0.14	99.95%	\$0.01

Assemble Lower Light Pipe

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Interior Trim, Driver Tail Lamp



\...
 \Lamps
 \Driver Tail Lamp Asm
 \Interior Trim, Driver Tail Lamp

Assembly Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	9
Fastenings	2
Right First Time	99.90 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.49
Total Weight (kg)	0.23

Material Cost**	\$0.84
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.36
Q Burden	\$0.02
SG&A	\$0.26
Manufacturing Cost*	\$1.48

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Interior Trim, Driver Tail Lamp



Interior Trim, Driver Tail Lamp

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Tail Lamp Interior Trim, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.12	0.0900
Light Pipe Lens, Interior Trim Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.07	0.1360
Assemble Interior Trim	1	1	2	5	2	99.92 %	0.00	0.00	0.30	0.00	0.0001

Interior Trim, Driver Tail Lamp

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Tail Lamp Interior Trim, Interior Trim Asm	\$0.00	\$0.38	\$0.00	\$0.00	\$0.00	\$0.06	\$0.00	\$0.10	\$0.54
Light Pipe Lens, Interior Trim Asm	\$0.00	\$0.45	\$0.00	\$0.00	\$0.00	\$0.03	\$0.00	\$0.11	\$0.59
Assemble Interior Trim	\$0.01	\$0.00	\$0.00	\$0.00	\$0.27	\$0.00	\$0.01	\$0.06	\$0.35

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	9
Fastenings	2
Right First Time	99.9%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.30
Supplier Fab. Time (Min)	0.20
Total Weight (kg)	0.23
Purchased Part Cost	
	\$0.01
Material Cost	
	\$0.83
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.27
Supplier Fab. Cost	
	\$0.09
Q Burden	
	\$0.02
SG&A	
	\$0.26
Manufacturing Cost*	
	\$1.48

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



\...

- \Interior Trim, Driver Tail Lamp
- \Tail Lamp Interior Trim, Interior Trim Asm
- \Tail Lamp Trim Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	7.42
Total Weight (kg)	0.09

Material Cost**	\$0.38
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.06
Q Burden	\$0.00
SG&A	\$0.10
Manufacturing Cost*	\$0.54

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Tail Lamp Interior Trim, Interior Trim Asm



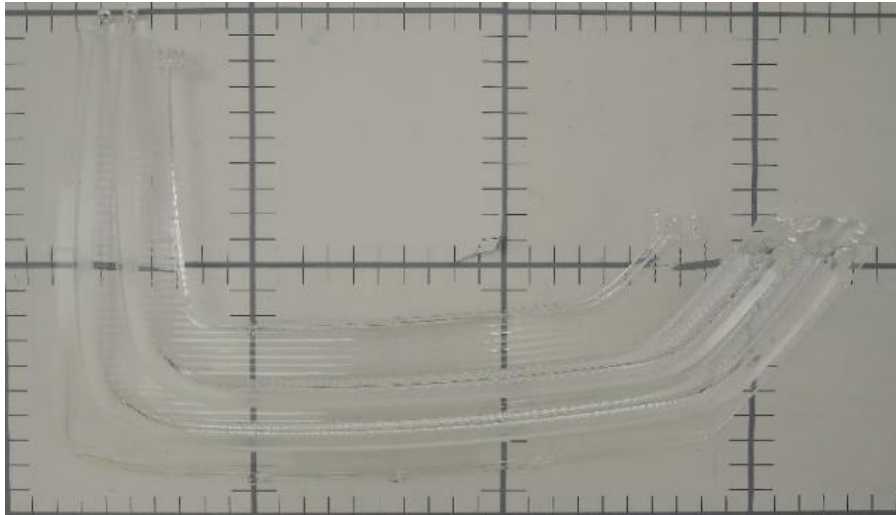
Tail Lamp Trim Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
150 Ton Injection Molding Press	14.84	2	0.25	27.82	GER	\$0.06	99.99%	\$0.00

Tail Lamp Trim Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Tail Lamp Interior Trim	1	PC	\$3.97	0.0900	0.0968	\$0.00	\$0.38

Light Pipe Lens, Interior Trim Asm



\...

- \Interior Trim, Driver Tail Lamp
- \Light Pipe Lens, Interior Trim Asm
- \Light Pipe Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	4.39
Total Weight (kg)	0.14
Material Cost**	\$0.45
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.03
Q Burden	\$0.00
SG&A	\$0.11
Manufacturing Cost*	\$0.59

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Light Pipe Lens, Interior Trim Asm

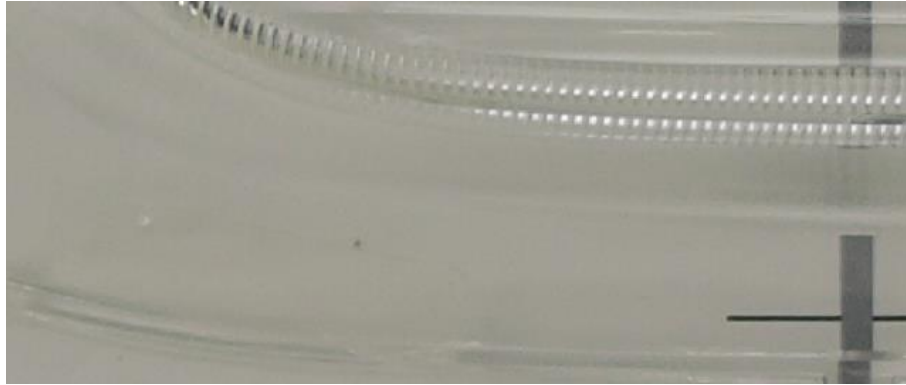


Light Pipe Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	17.56	4	0.25	26.65	GER	\$0.03	99.99%	\$0.00

Light Pipe Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Light Pipe Lens	1	PMMA - Clear	\$3.09	0.1360	0.1462	\$0.00	\$0.45



\...
 \Driver Tail Lamp Asm
 \Interior Trim, Driver Tail Lamp
 \Assemble Interior Trim

Process Summary

Right First Time	99.92 %
Process Time (Sec)	17.83
Total Weight (kg)	0.00

Material Cost**	\$0.01
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.01
SG&A	\$0.06
Manufacturing Cost*	\$0.35



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Interior Trim



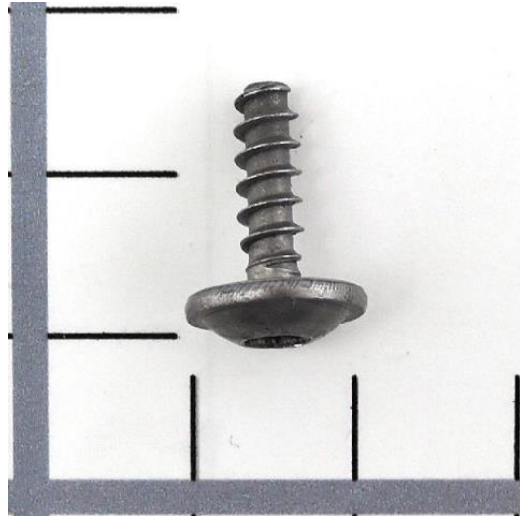
Assemble Interior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	17.83	1	1.00	54.32	GER	\$0.27	99.92 %	\$0.01

Assemble Interior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Double Sided Tape, 31mmx8mm	1	Commodity Item	Purchased	0.0001	-	\$0.01	\$0.00

Assemble Interior Trim



\...
\Lamps
\Driver Tail Lamp Asm
\Assemble Interior Trim

Process Summary

Right First Time	99.53 %
Process Time (Sec)	33.00
Total Weight (kg)	0.00

Material Cost**	\$0.02
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.50
Q Burden	\$0.07
SG&A	\$0.11
Manufacturing Cost*	\$0.70



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Interior Trim



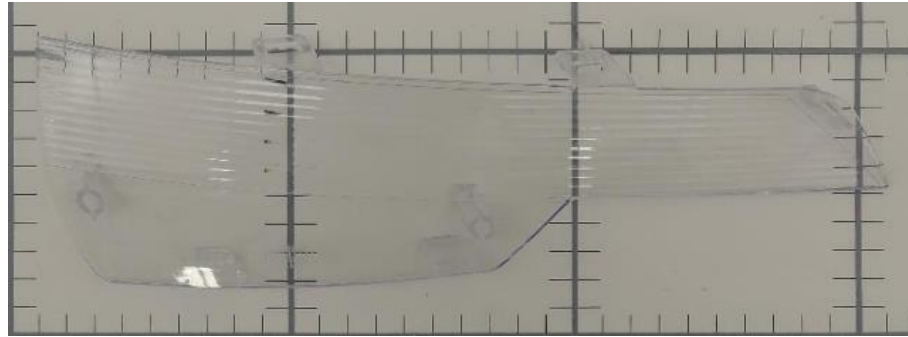
Assemble Interior Trim

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	33.00	1	1.00	54.32	GER	\$0.50	99.53%	\$0.07

Assemble Interior Trim

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x13mm-Pan Head Torx	2	Commodity Item	Purchased	0.0020	-	\$0.01	\$0.00

Upper Lens, Driver Tail Lamp



\...

- \Driver Tail Lamp Asm
- \Upper Lens, Driver Tail Lamp
- \Upper Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	12.36
Total Weight (kg)	0.06

Material Cost**	\$0.24
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.09
Q Burden	\$0.00
SG&A	\$0.07
Manufacturing Cost*	\$0.41

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Upper Lens, Driver Tail Lamp



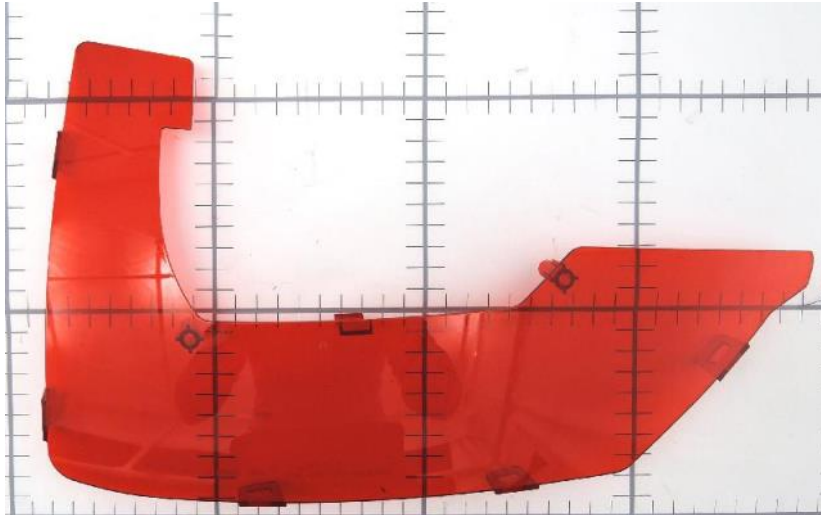
Upper Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	24.72	2	0.25	26.65	GER	\$0.09	99.99%	\$0.00

Upper Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Upper Lens	1	PC	\$3.97	0.0560	0.0602	\$0.00	\$0.24

Lower Lens, Driver Tail Lamp



\...

- \Driver Tail Lamp Asm
- \Lower Lens, Driver Tail Lamp
- \Lower Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	12.31
Total Weight (kg)	0.11

Material Cost**	\$0.46
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.14
Q Burden	\$0.00
SG&A	\$0.13
Manufacturing Cost*	\$0.73

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Lower Lens, Driver Tail Lamp



Lower Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	24.62	2	0.25	39.50	GER	\$0.14	99.99%	\$0.00

Lower Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Lower Lens	1	PC	\$3.97	0.1080	0.1161	\$0.00	\$0.46

No Commodity Items Required for This Process



\...
\Lamps
\Driver Tail Lamp Asm
\Assemble Lens

Process Summary

Right First Time	99.91 %
Process Time (Sec)	16.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.24
Q Burden	\$0.01
SG&A	\$0.05
Manufacturing Cost*	\$0.31

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lens



Assemble Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	16.00	1	1.00	54.32	GER	\$0.24	99.91 %	\$0.01

Assemble Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Assemble Lamp Tail Lamp



\...
\Zone 2 Exterior
\Lamps
\Assemble Lamp Tail Lamp

Process Summary

Right First Time	98.33 %
Process Time (Sec)	101.00
Total Weight (kg)	0.03

Material Cost**	\$0.16
OEM Process Cost	\$2.56
Supplier Process Cost	\$0.00
Q Burden	\$0.25
SG&A	\$0.57
Manufacturing Cost*	\$3.55



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lamp Tail Lamp



Assemble Lamp Tail Lamp

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	101.00	1	1.00	91.41	GER	\$2.56	98.33%	\$0.25

Assemble Lamp Tail Lamp

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M5x15mm-Torx SEMS Screw	8	Commodity Item	Purchased	0.0039	-	\$0.02	\$0.00

Third Brake Light Asm



\...
 \Zone 2 Exterior
 \Lamps
 \Third Brake Light Asm

Assembly Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	20
Fastenings	5
Right First Time	99.67 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.78
Total Weight (kg)	0.13

Material Cost**	\$2.78
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.27
Q Burden	\$0.05
SG&A	\$0.66
Manufacturing Cost*	\$3.77

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

Third Brake Light Asm



Third Brake Light Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Housing Asm, Third Brake Light	1	3	2	11	2	99.84 %	0.00	0.00	0.23	0.23	0.0940
Third Brake LightLens, Third Brake Light Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.04	0.0360
Assemble Lens	1	1	3	6	3	99.84 %	0.00	0.00	0.28	0.00	0.0001

Third Brake Light Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Housing Asm, Third Brake Light	\$0.00	\$2.59	\$0.00	\$0.00	\$0.09	\$0.06	\$0.02	\$0.60	\$3.37
Third Brake LightLens, Third Brake LightAsm	\$0.00	\$0.14	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.03	\$0.20
Assemble Lens	\$0.05	\$0.00	\$0.00	\$0.00	\$0.11	\$0.00	\$0.02	\$0.02	\$0.21

Detailed Summary

Parts	5
Fasteners	0
Part Numbers	5
Steps	20
Fastenings	5
Right First Time	99.67%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.51
Supplier Fab. Time (Min)	0.27
Total Weight (kg)	0.13
Purchased Part Cost	
	\$0.05
Material Cost	
	\$2.73
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.20
Supplier Fab. Cost	
	\$0.08
Q Burden	
	\$0.05
SG&A	
	\$0.66
Manufacturing Cost*	
	\$3.77

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Third Brake Light

\...

\Lamps

\Third Brake Light Asm

\Housing Asm, Third Brake Light

Assembly Summary



Parts	3
Fasteners	0
Part Numbers	3
Steps	11
Fastenings	2
Right First Time	99.84 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.46
Total Weight (kg)	0.09

Material Cost**	\$2.59
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.15
Q Burden	\$0.02
SG&A	\$0.60
Manufacturing Cost*	\$3.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Housing Asm, Third Brake Light



Housing Asm, Third Brake Light

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Third Brake Light Housing, Housing Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.13	0.0580
LED Circuit Asm, Housing Asm	1	2	1	5	1	99.91 %	0.00	0.00	0.12	0.09	0.0360
Assemble LED Circuitto Housing	1	0	1	3	1	99.94 %	0.00	0.00	0.12	0.00	0.0000

Housing Asm, Third Brake Light

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Third Brake Light Housing, Housing Asm	\$0.00	\$0.16	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.04	\$0.24
LED Circuit Asm, Housing Asm	\$0.00	\$2.43	\$0.00	\$0.00	\$0.04	\$0.02	\$0.01	\$0.55	\$3.06
Assemble LED Circuitto Housing	\$0.00	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.01	\$0.06

Detailed Summary

Parts	3
Fasteners	0
Part Numbers	3
Steps	11
Fastenings	2
Right First Time	99.84%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.23
Supplier Fab. Time (Min)	0.23
Total Weight (kg)	0.09
Purchased Part Cost	\$0.00
Material Cost	\$2.59
OEM Asm. Cost	\$0.00
OEM Fab. Cost	\$0.00
Supplier Asm. Cost	\$0.09
Supplier Fab. Cost	\$0.06
Q Burden	\$0.02
SG&A	\$0.60
Manufacturing Cost*	\$3.37

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Housing, Housing Asm



\...

- \Housing Asm, Third Brake Light
- \Third Brake Light Housing, Housing Asm
- \Housing Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	8.02
Total Weight (kg)	0.06
Material Cost**	\$0.16
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.00
SG&A	\$0.04
Manufacturing Cost*	\$0.24

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Housing, Housing Asm



Housing Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
110 Ton Injection Molding Press	16.04	2	0.25	17.08	ROU	\$0.04	99.99%	\$0.00

Housing Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Third Brake Light Housing	1	ABS	\$2.60	0.0580	0.0580	\$0.00	\$0.16

- \...
- \Third Brake Light Asm
- \Housing Asm, Third Brake Light
- \LED Circuit Asm, Housing Asm

Assembly Summary



Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.91 %
OEM Process Time (Min)	0.00
Supplier Process Time (Min)	0.21
Total Weight (kg)	0.04

Material Cost**	\$2.43
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.07
Q Burden	\$0.01
SG&A	\$0.55
Manufacturing Cost*	\$3.06

* Excluding tooling, ER&D, logistics, and profit margin
 ** Includes material cost and purchased parts cost

LED Circuit Asm, Housing Asm



LED Circuit Asm, Housing Asm

Name	Qty	Parts	Fasteners	Steps	Fastenings	Right First Time	OEM Asm. Time (Min)	OEM Fab. Time (Min)	Supplier Asm. Time (Min)	Supplier Fab. Time (Min)	Total Weight (kg)
Third Brake Light Light Pipe, LED Circuit Asm	1	1	0	1	0	99.99 %	0.00	0.00	0.00	0.09	0.0233
Assemble LED Printed Circuit	1	1	1	3	1	99.92 %	0.00	0.00	0.12	0.00	0.0127

LED Circuit Asm, Housing Asm

Name	Purchased Part Cost	Material Cost	OEM Asm. Cost	OEM Fab. Cost	Supplier Asm. Cost	Supplier Fab. Cost	Q Burden	SG&A	Manufacturing Cost*
Third Brake Light Light Pipe, LED Circuit Asm	\$0.00	\$0.08	\$0.00	\$0.00	\$0.00	\$0.02	\$0.00	\$0.02	\$0.13
Assemble LED Printed Circuit	\$0.00	\$2.35	\$0.00	\$0.00	\$0.04	\$0.00	\$0.01	\$0.53	\$2.93

Detailed Summary

Parts	2
Fasteners	0
Part Numbers	2
Steps	5
Fastenings	1
Right First Time	99.91%
OEM Asm. Time (Min)	0.00
OEM Fab. Time (Min)	0.00
Supplier Asm. Time (Min)	0.12
Supplier Fab. Time (Min)	0.09
Total Weight (kg)	0.04
Purchased Part Cost	
	\$0.00
Material Cost	
	\$2.43
OEM Asm. Cost	
	\$0.00
OEM Fab. Cost	
	\$0.00
Supplier Asm. Cost	
	\$0.04
Supplier Fab. Cost	
	\$0.02
Q Burden	
	\$0.01
SG&A	
	\$0.55
Manufacturing Cost*	
	\$3.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Light Pipe, LED Circuit Asm

\...

\LED Circuit Asm, Housing Asm

\Third Brake Light Light Pipe, LED Circuit Asm

\Light Pipe Process



Process Summary

Right First Time	99.99 %
Process Time (Sec)	5.60
Total Weight (kg)	0.02

Material Cost**	\$0.08
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.02
Manufacturing Cost*	\$0.13

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost



Third Brake Light Light Pipe, LED Circuit Asm



Light Pipe Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
55Ton Injection Molding Press	22.40	4	0.25	14.56	ROU	\$0.02	99.99%	\$0.00

Light Pipe Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Third Brake Light Light Pipe Housing	1	PMMA - Clear	\$3.09	0.0233	0.0250	\$0.00	\$0.08

\...

\Housing Asm, Third Brake Light
 \LED Circuit Asm, Housing Asm
 \Assemble LED Printed Circuit



Process Summary

Right First Time	99.92 %
Process Time (Sec)	7.00
Total Weight (kg)	0.01

Material Cost**	\$2.35
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.01
SG&A	\$0.53
Manufacturing Cost*	\$2.93



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost


Assemble LED Printed Circuit



Assemble LED Printed Circuit

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.00	1	1.00	22.94	ROU	\$0.04	99.92 %	\$0.01

Assemble LED Printed Circuit

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
 LED Board, Third Brake Light	1	See Appendix	-	0.0127	-	\$0.00	\$2.35

[Click Here for TechInsights Electronics Report on LED Board, Third Brake Light](#)

No Commodity Items
Required for This
Process



\...

- \Third Brake Light Asm
- \Housing Asm, Third Brake Light
- \Assemble LED Circuit to Housing

Process Summary

Right First Time	99.94 %
Process Time (Sec)	7.00
Total Weight (kg)	0.00
Material Cost**	\$0.00
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.04
Q Burden	\$0.01
SG&A	\$0.01
Manufacturing Cost*	\$0.06

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble LED Circuit to Housing



Assemble LED Circuit to Housing

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	7.00	1	1.00	22.94	ROU	\$0.04	99.94%	\$0.01

Assemble LED Circuit to Housing

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
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Third Brake Light Lens, Third Brake Light Asm



\...

\Third Brake Light Asm

\Third Brake Light Lens, Third Brake Light Asm

\Third Brake Light Lens Process

Process Summary

Right First Time	99.99 %
Process Time (Sec)	2.44
Total Weight (kg)	0.04

Material Cost**	\$0.14
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.02
Q Burden	\$0.00
SG&A	\$0.03
Manufacturing Cost*	\$0.20

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Third Brake Light Lens, Third Brake Light Asm



Third Brake Light Lens Process

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
300 Ton Injection Molding Press	14.64	6	0.25	27.68	ROU	\$0.02	99.99%	\$0.00

Third Brake Light Lens Process

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Material, Third Brake Light Lens	1	PMMA - Colored	\$3.57	0.0360	0.0387	\$0.00	\$0.14



\...
\Lamps
\Third Brake Light Asm
\Assemble Lens

Process Summary

Right First Time	99.84 %
Process Time (Sec)	16.61
Total Weight (kg)	0.00

Material Cost**	\$0.05
OEM Process Cost	\$0.00
Supplier Process Cost	\$0.11
Q Burden	\$0.02
SG&A	\$0.02
Manufacturing Cost*	\$0.21

* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Lens



Assemble Lens

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
Supplier Manual Asm	16.61	1	1.00	22.94	ROU	\$0.11	99.84%	\$0.02

Assemble Lens

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
Label, Valeo Supplier Third Brake Light	1	Commodity Item	Purchased	0.0001	-	\$0.05	\$0.00

Assemble Third Brake Light



\...
\Zone 2 Exterior
\Lamps
\Assemble Third Brake Light

Process Summary

Right First Time	99.35 %
Process Time (Sec)	43.00
Total Weight (kg)	0.01

Material Cost**	\$0.09
OEM Process Cost	\$1.09
Supplier Process Cost	\$0.00
Q Burden	\$0.10
SG&A	\$0.24
Manufacturing Cost*	\$1.52



* Excluding tooling, ER&D, logistics, and profit margin

** Includes material cost and purchased parts cost

Assemble Third Brake Light



Assemble Third Brake Light

Symbol Name	Overall Cycle Time (Sec)	Parts / Cycle	Number of Operators	Workcell Rate (\$/Hr)	Country	Process Cost	Right First Time	Q Burden
OEM Manual Asm	43.00	1	1.00	91.41	GER	\$1.09	99.35%	\$0.10

Assemble Third Brake Light

Symbol Name	Qty	Material	Material Cost / kg (\$/kg)	Net Weight (kg)	Gross Material Weight (kg)	Purchased Part Cost	Material Cost
M4x16mm-Torx Screw	3	Commodity Item	Purchased	0.0018	-	\$0.03	\$0.00

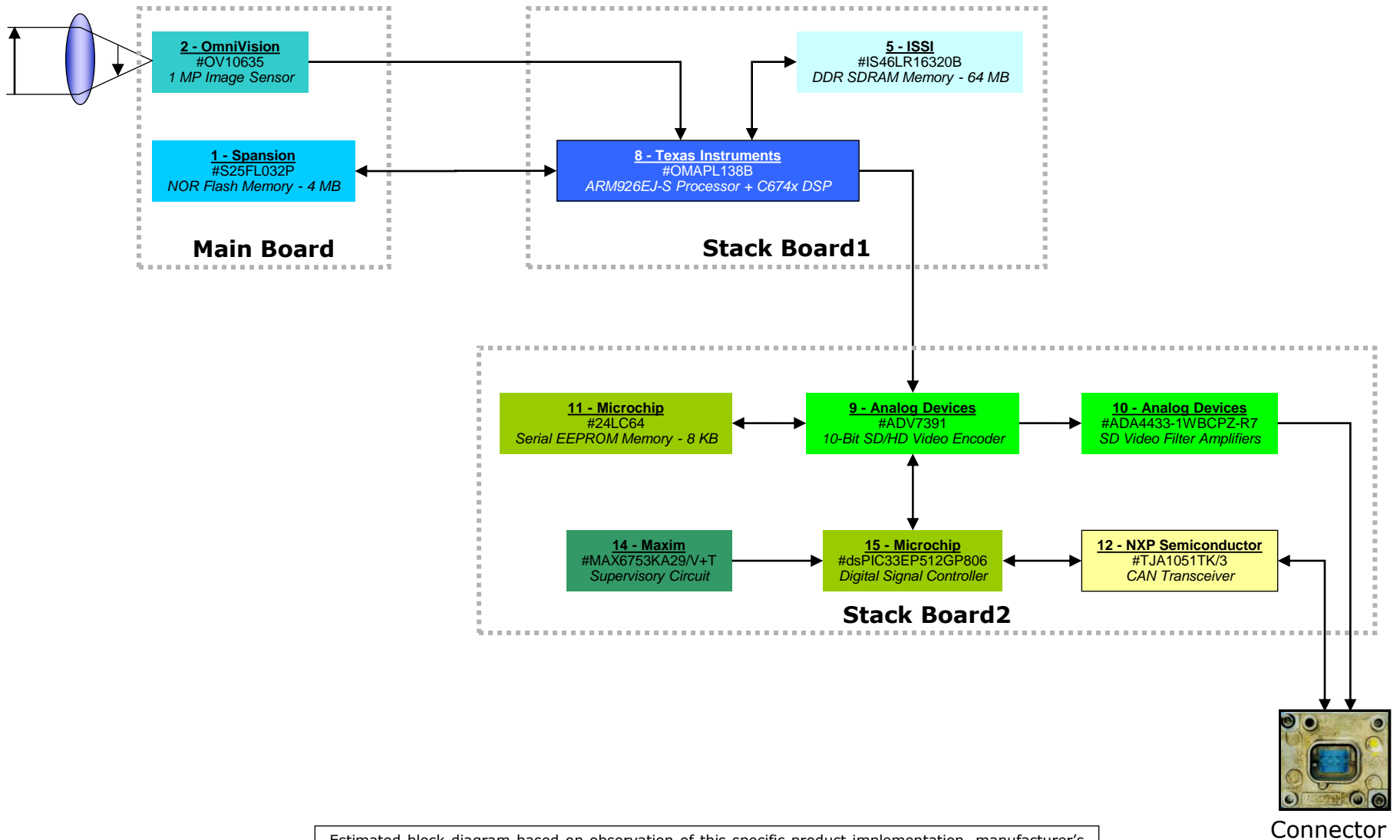


Appendix Reports

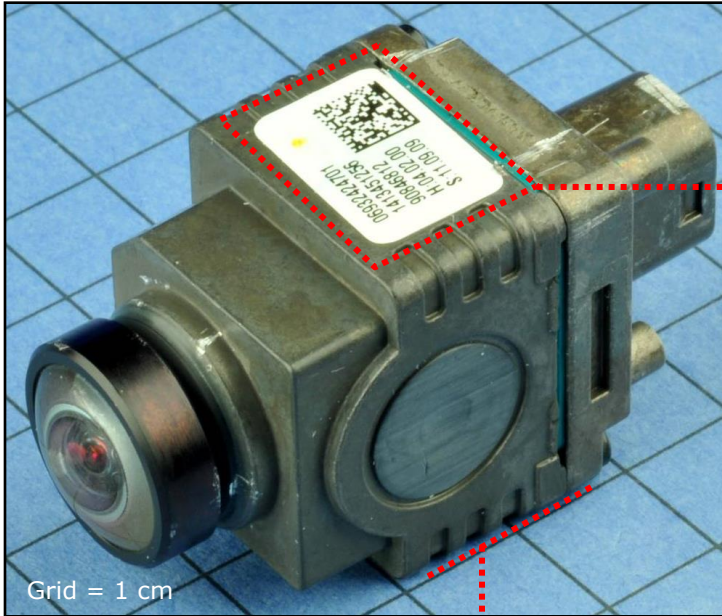
TechInsights Electronics Reports

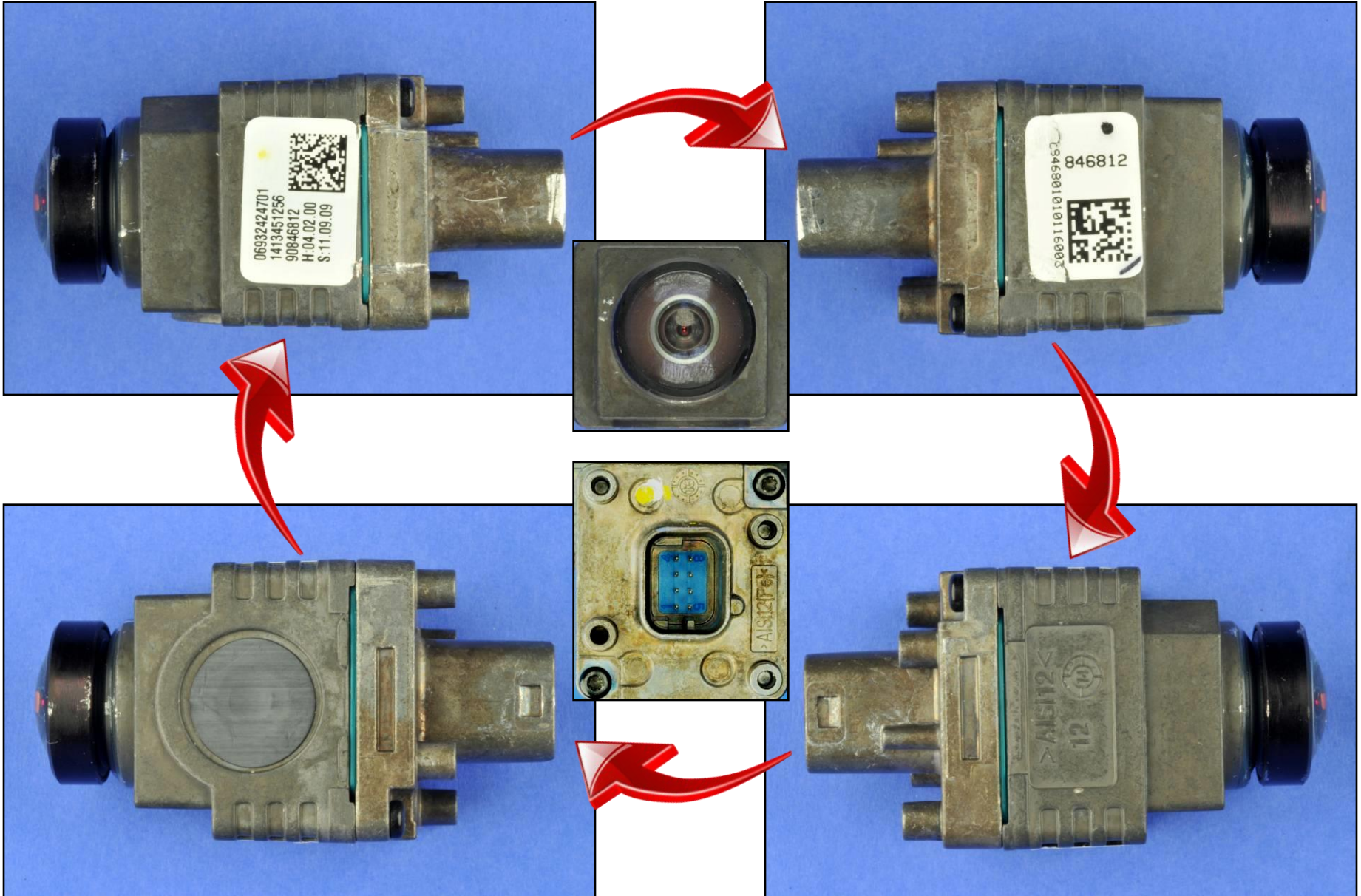
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	15	
Brand	BMW	IC Package Count	15	
Product Name & Model #	i3 Rear Camera, 5003, 90846812	Cost Metrics		
Official Release Date	Unknown			
Weight (grams)	35.7 (Measured)	Retail Price		
Product Dimensions (mm)	53.3 x 28.1 x 25.1 (Measured)	Total Manufacturing Cost	\$51.31	
Product Features		Electronics Cost	\$42.84	
		Manufacturing Cost Breakdown		
Resolution	1 MP	Integrated Circuits	\$35.76	69.7%
Image Sensor	OmniVision OV10635	Modules, Discretes & Connectors	\$3.46	6.7%
Lens Quantity & Composition	(5) Glass, (2) Plastic	Substrates	\$1.20	2.3%
Material	Housing, Upper & Lower = AISi12	Component Insertion	\$1.84	3.6%
Processors	Texas Instruments OMAPL138B ARM926EJ-S Processor + C674x DSP Microchip dsPIC33EP512GP806 Digital Signal Controller Analog Devices ADV7391 10-Bit SD/HD Video Encoder	Card Test	\$0.59	1.1%
Storage	ISSI IS46LR16320B DDR SDRAM Memory - 64 MB Spansion S25FL032P NOR Flash Memory - 4 MB Microchip 24LC64 Serial EEPROM Memory - 8 KB	Non-Electronic Parts	\$7.97	15.5%
Communications	NXP Semiconductor TJA1051TK/3 CAN Transceiver	Final Assembly & Test	\$0.49	1.0%
		Total	\$51.31	100.0%

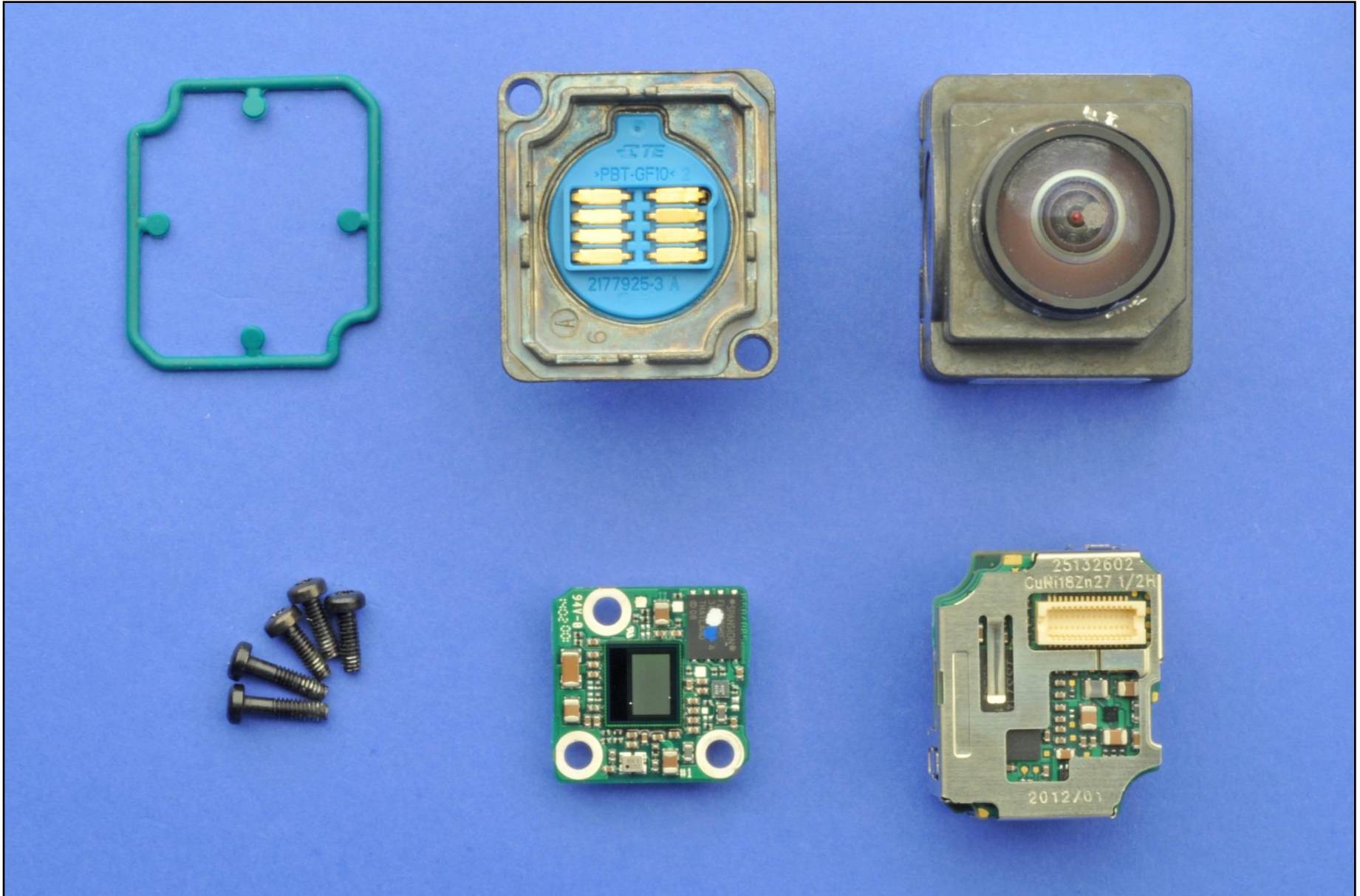
Block Diagram

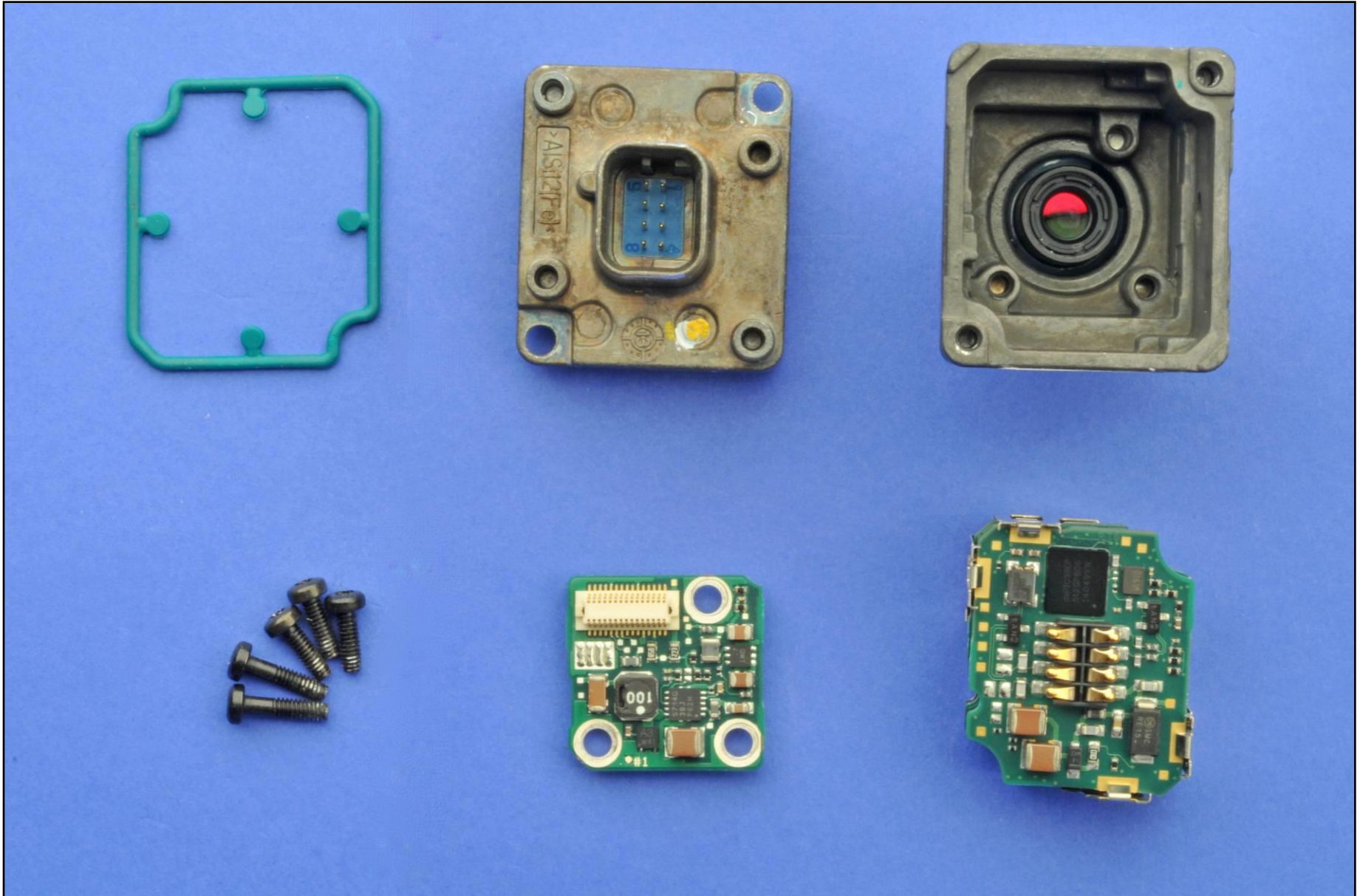


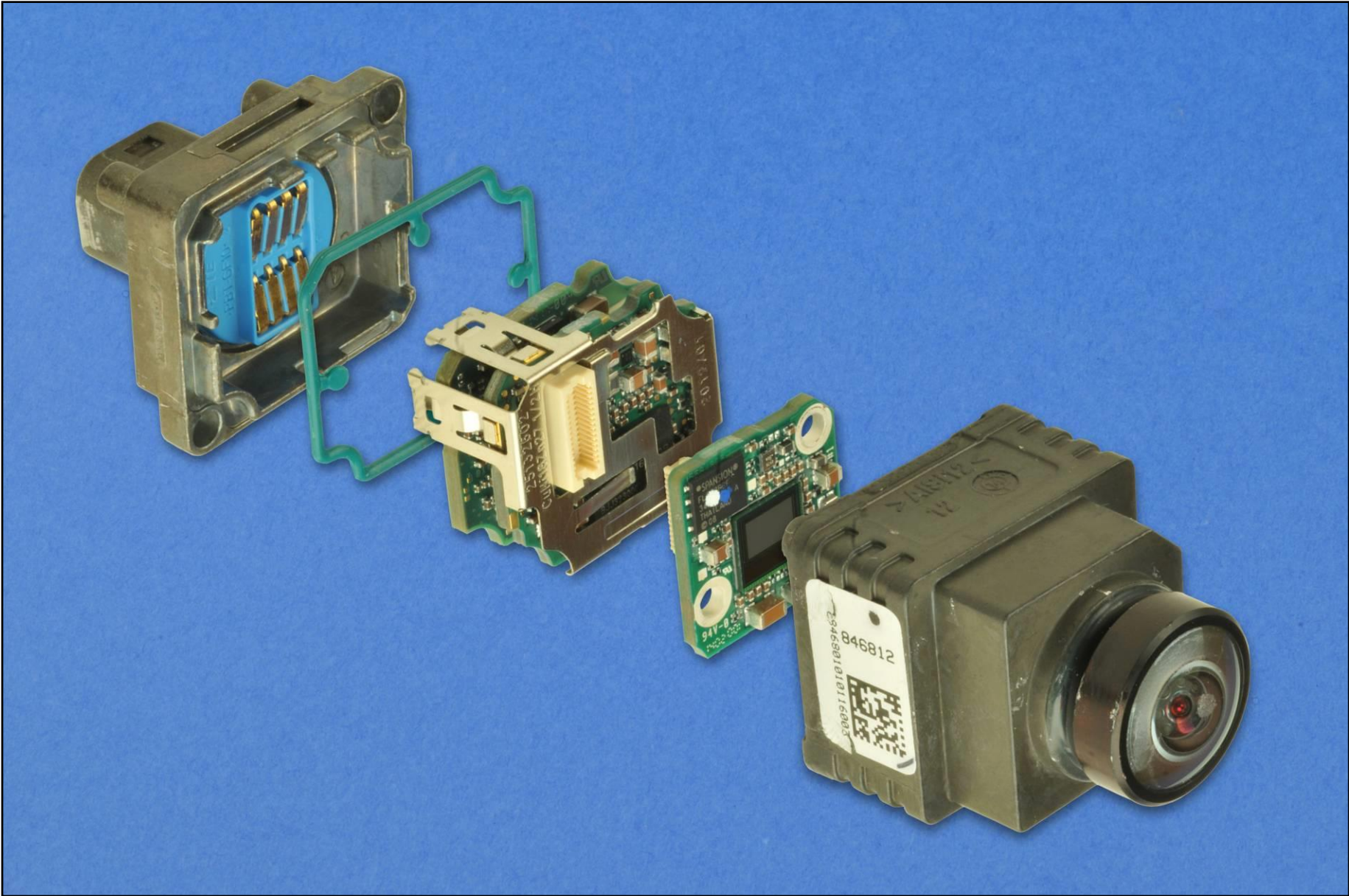
Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.

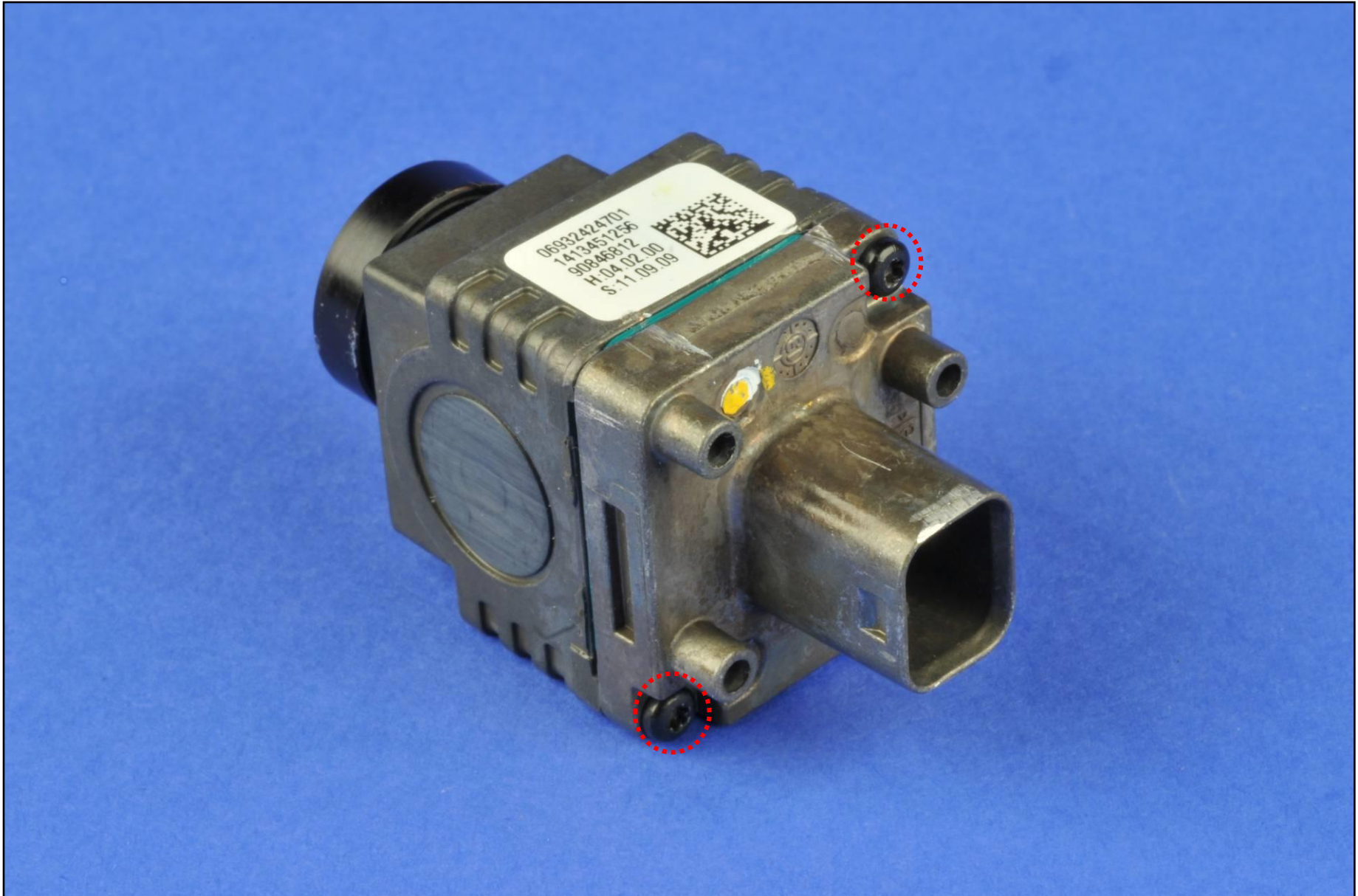




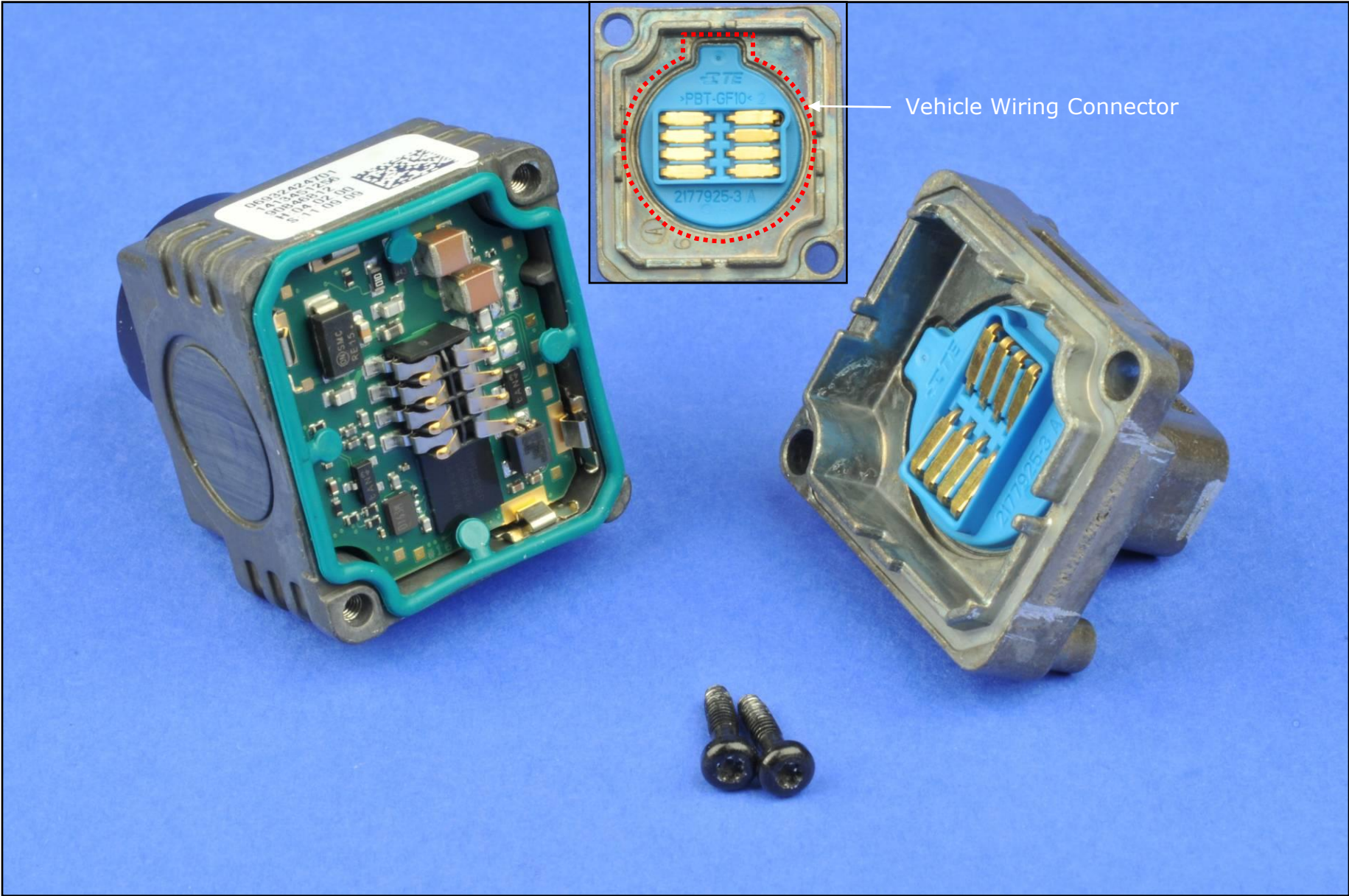


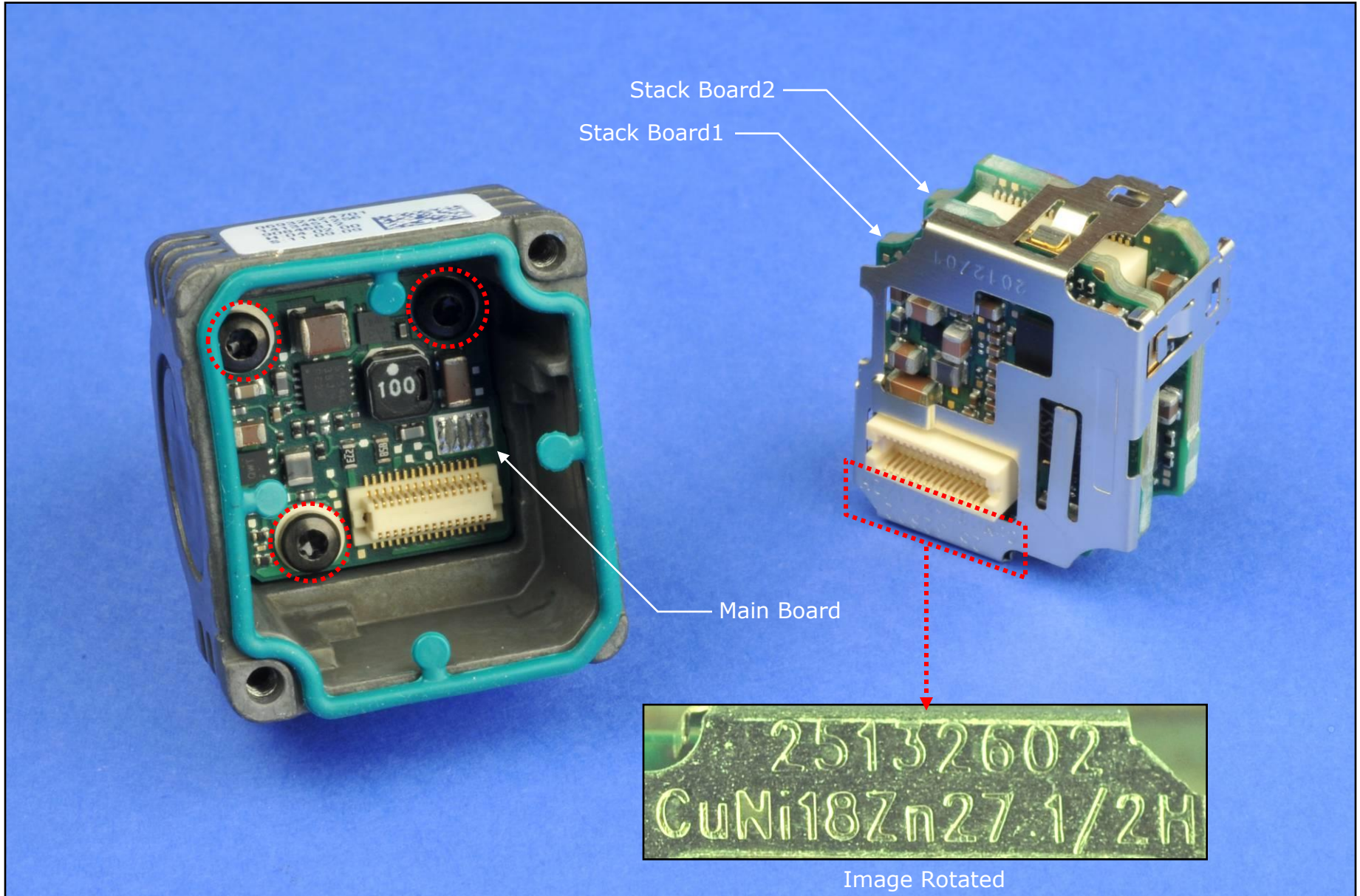


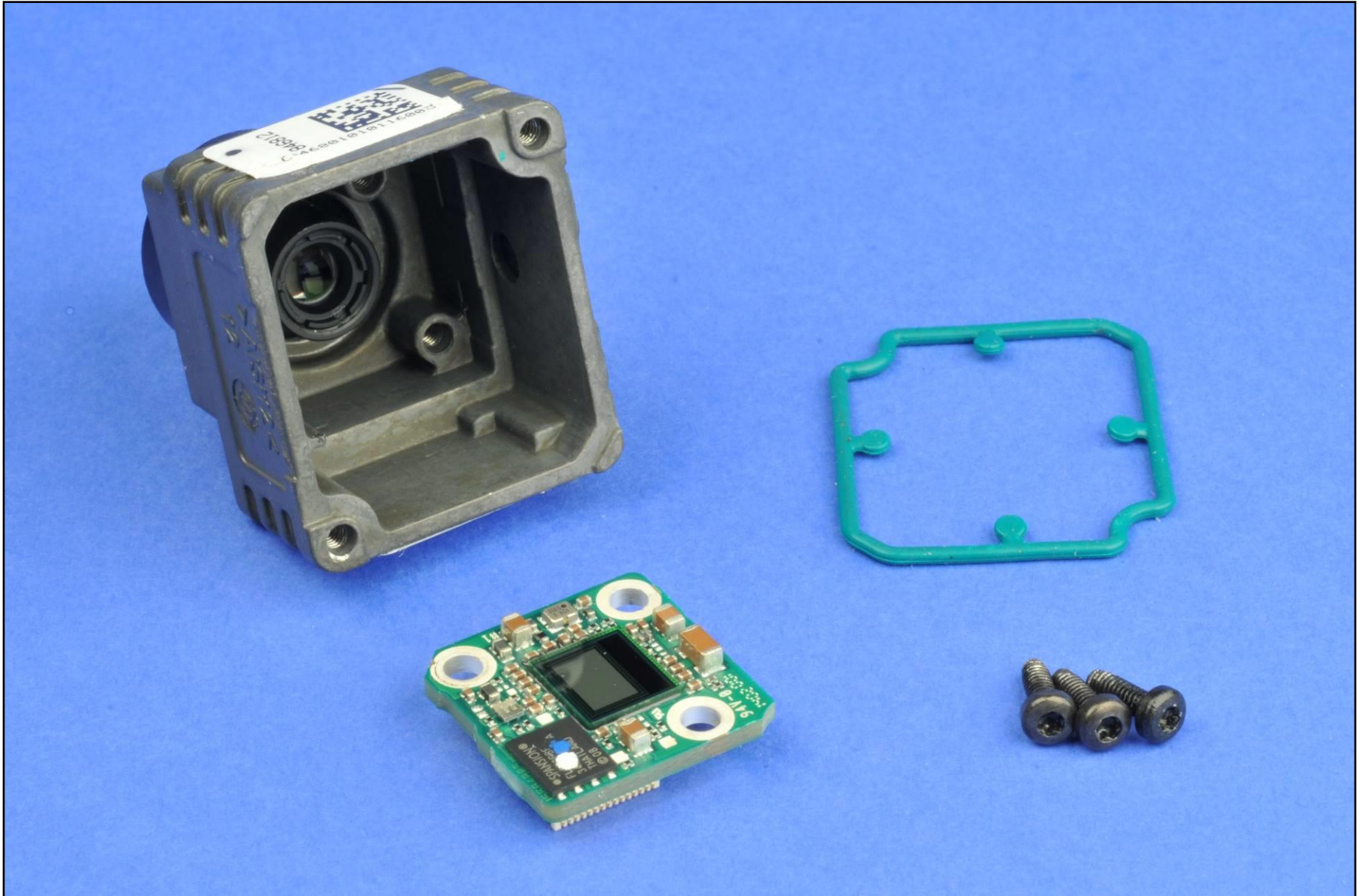


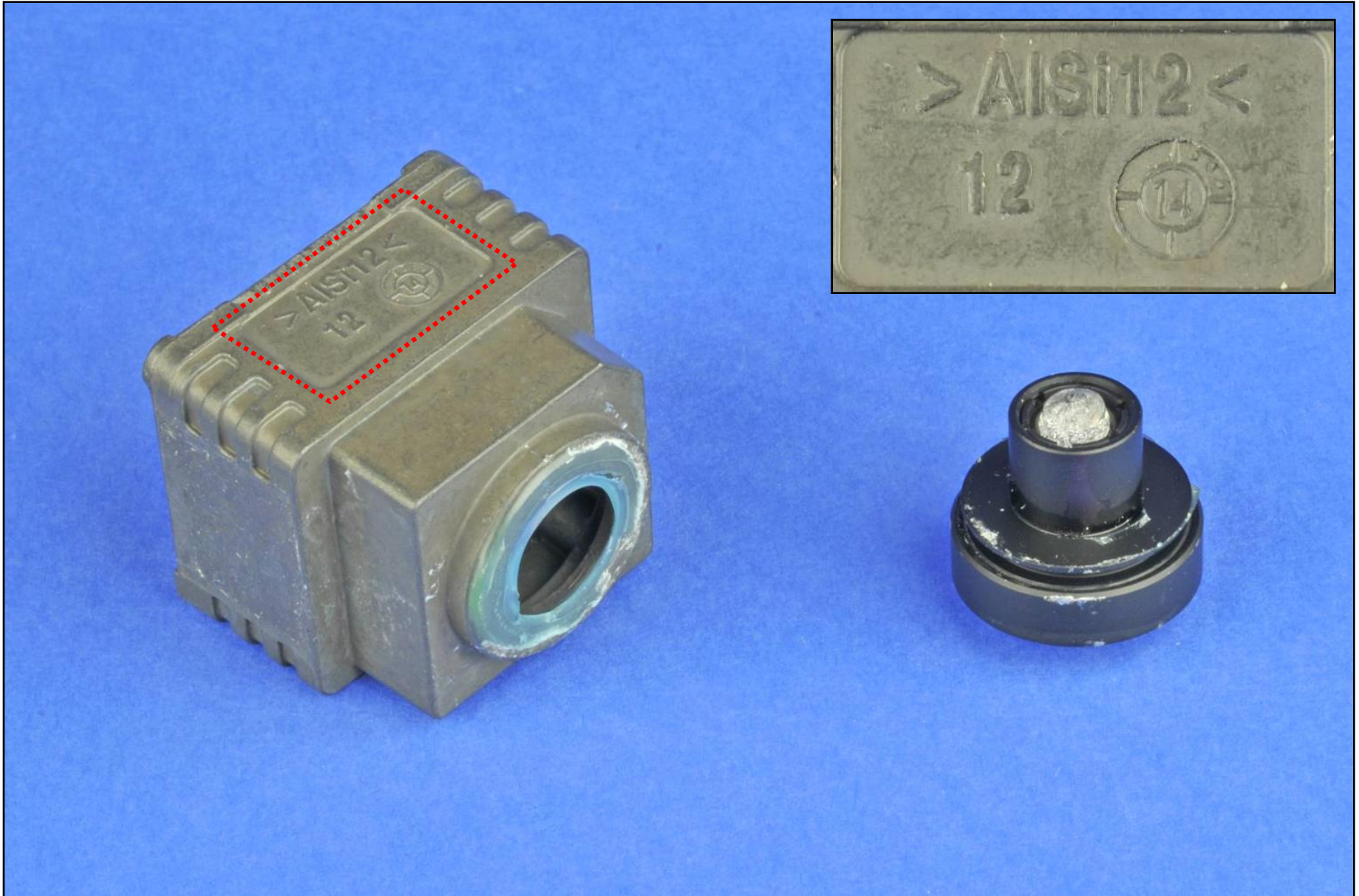


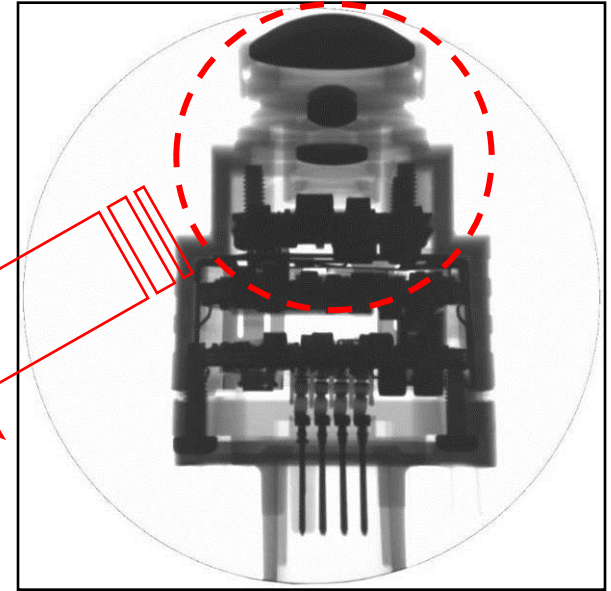
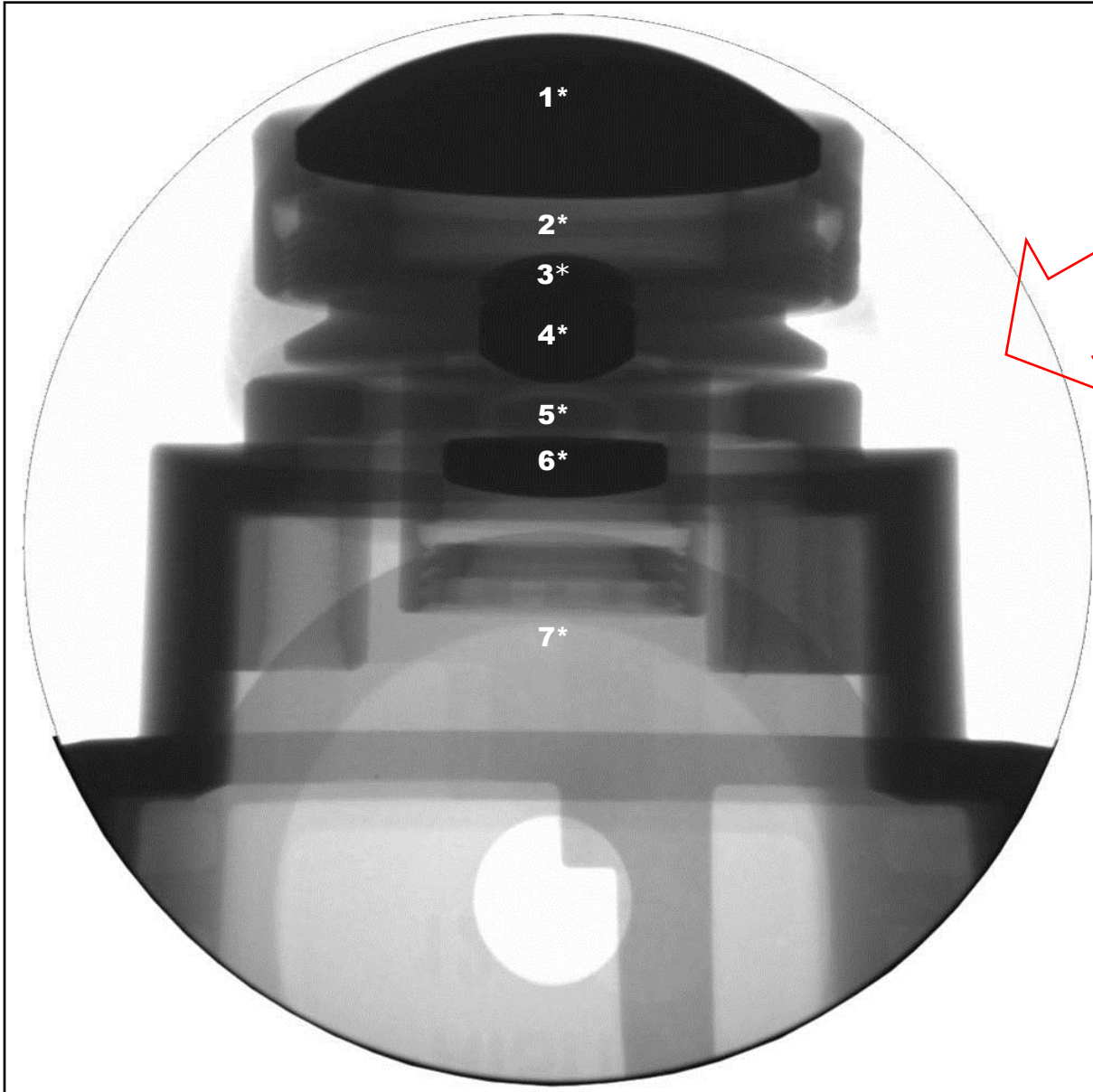
Teardown Sequence



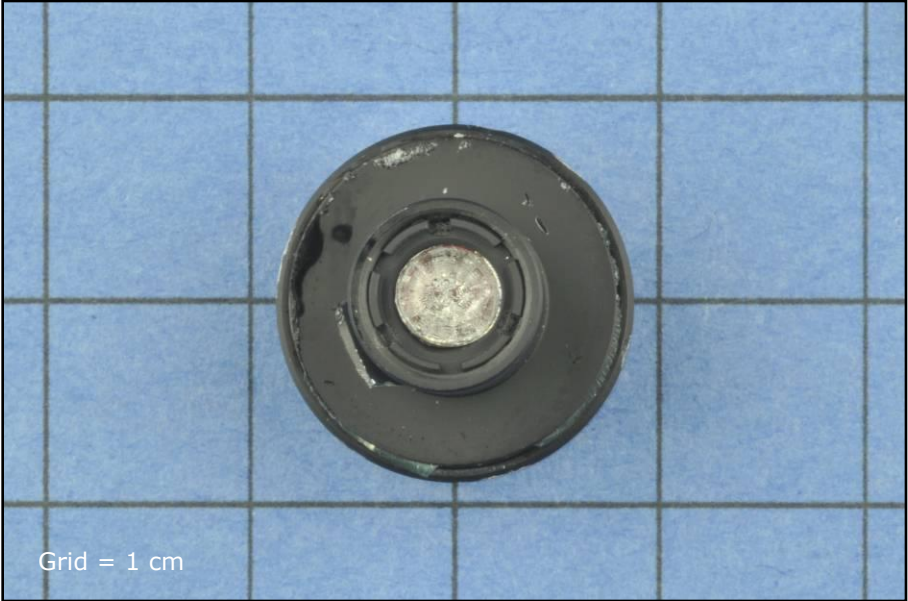
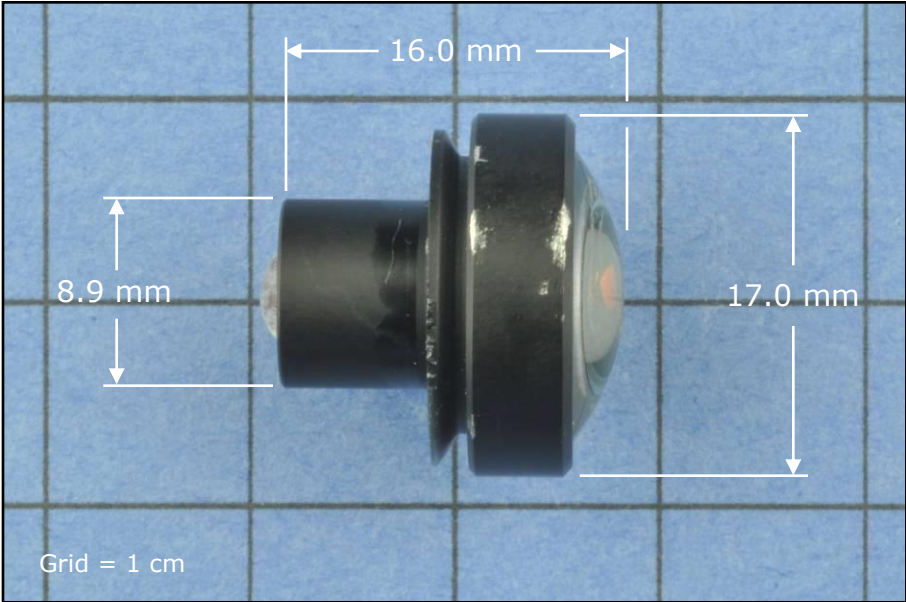




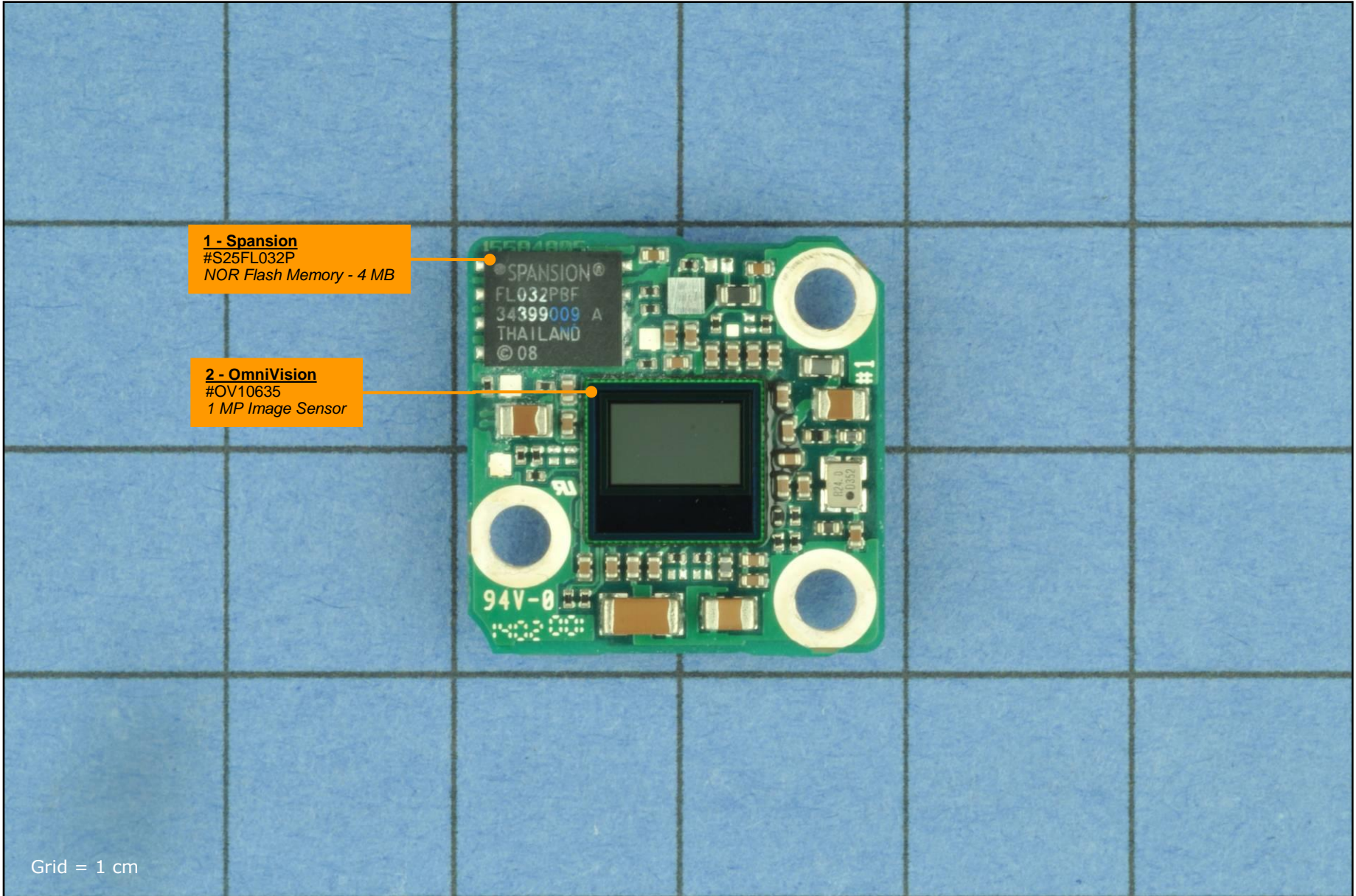




*** See Lens slides on pages 15 & 16 for more detail.**





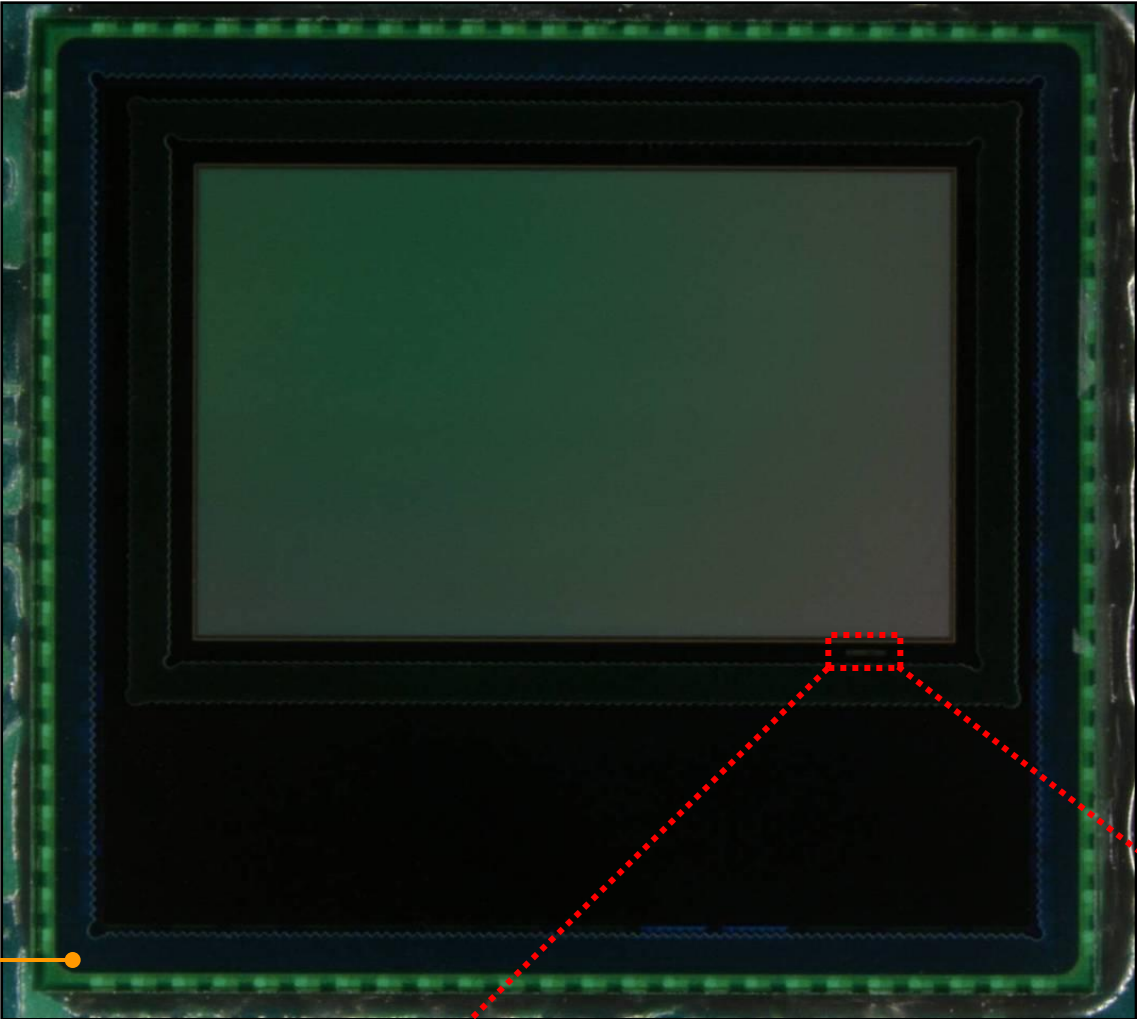


1 - Spansion
#S25FL032P
NOR Flash Memory - 4 MB

2 - OmniVision
#OV10635
1 MP Image Sensor

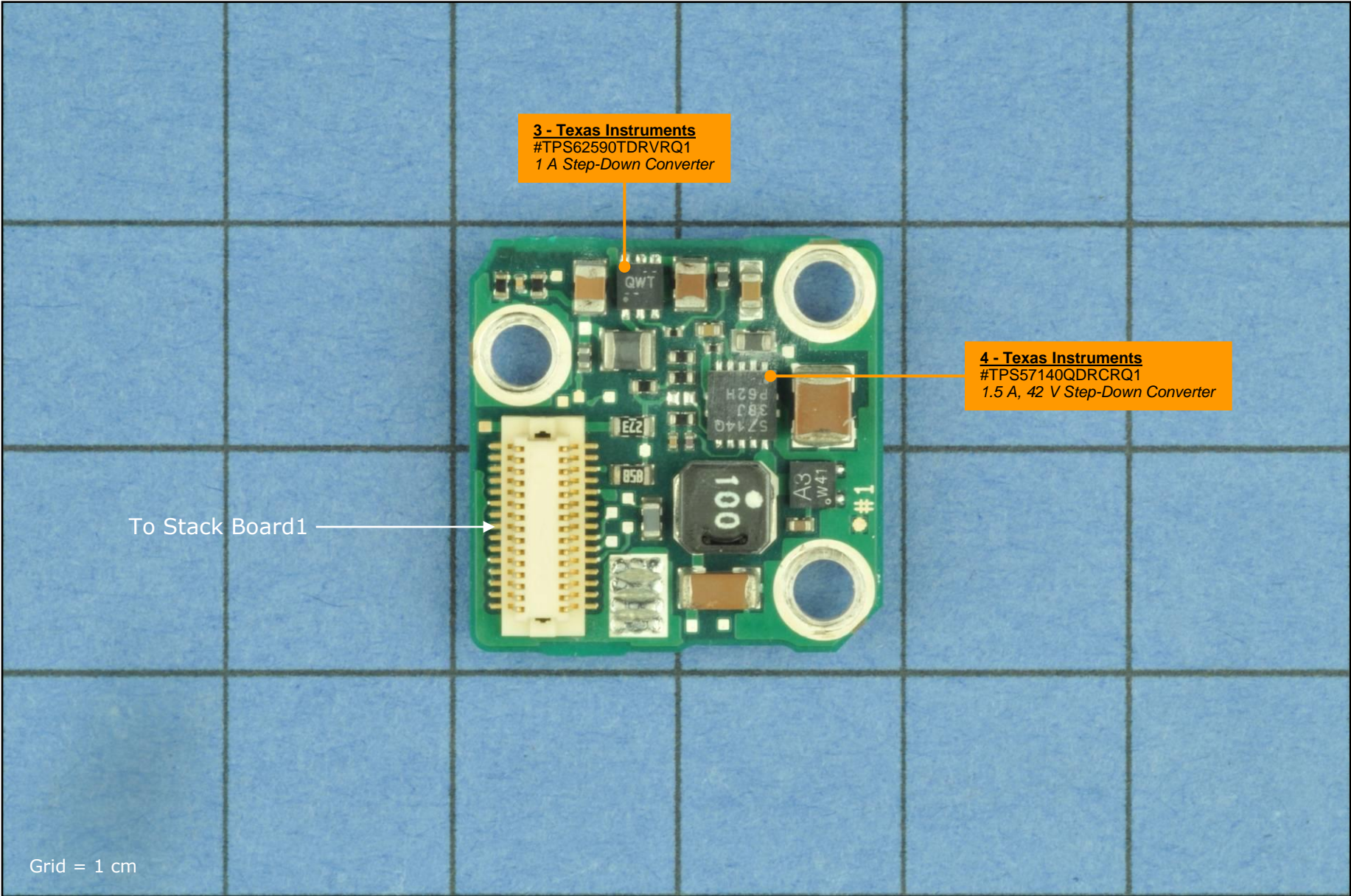
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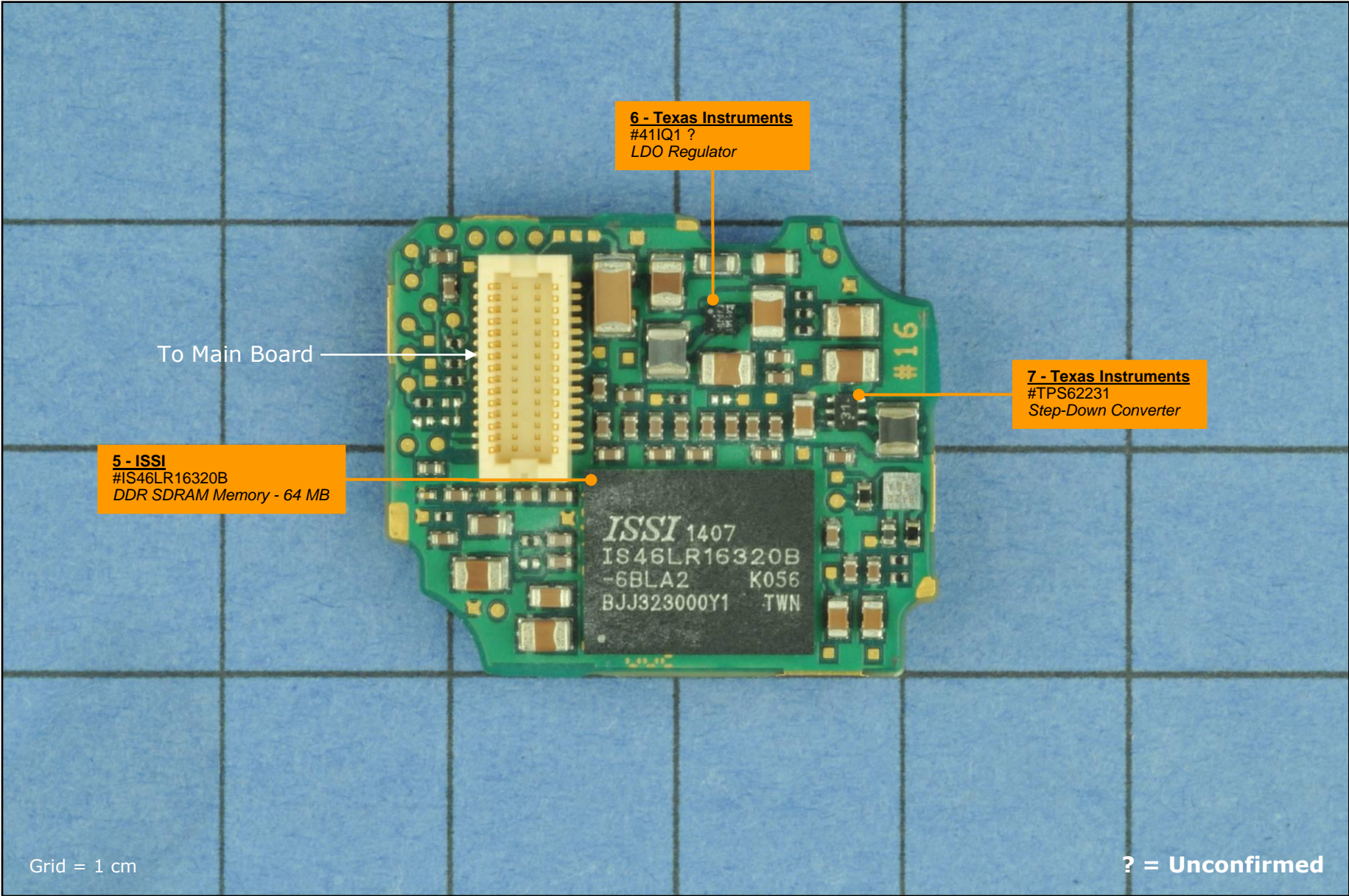
2 - OmniVision
#OV10635
1 MP Image Sensor
Pkg Size: 7.8 x 7.1 mm



2.1 - OmniVision
#OV2D1AB
1 MP Image Sensor
Die Size: 7.8 x 7.1 mm







6 - Texas Instruments
 #411Q1 ?
 LDO Regulator

7 - Texas Instruments
 #TPS62231
 Step-Down Converter

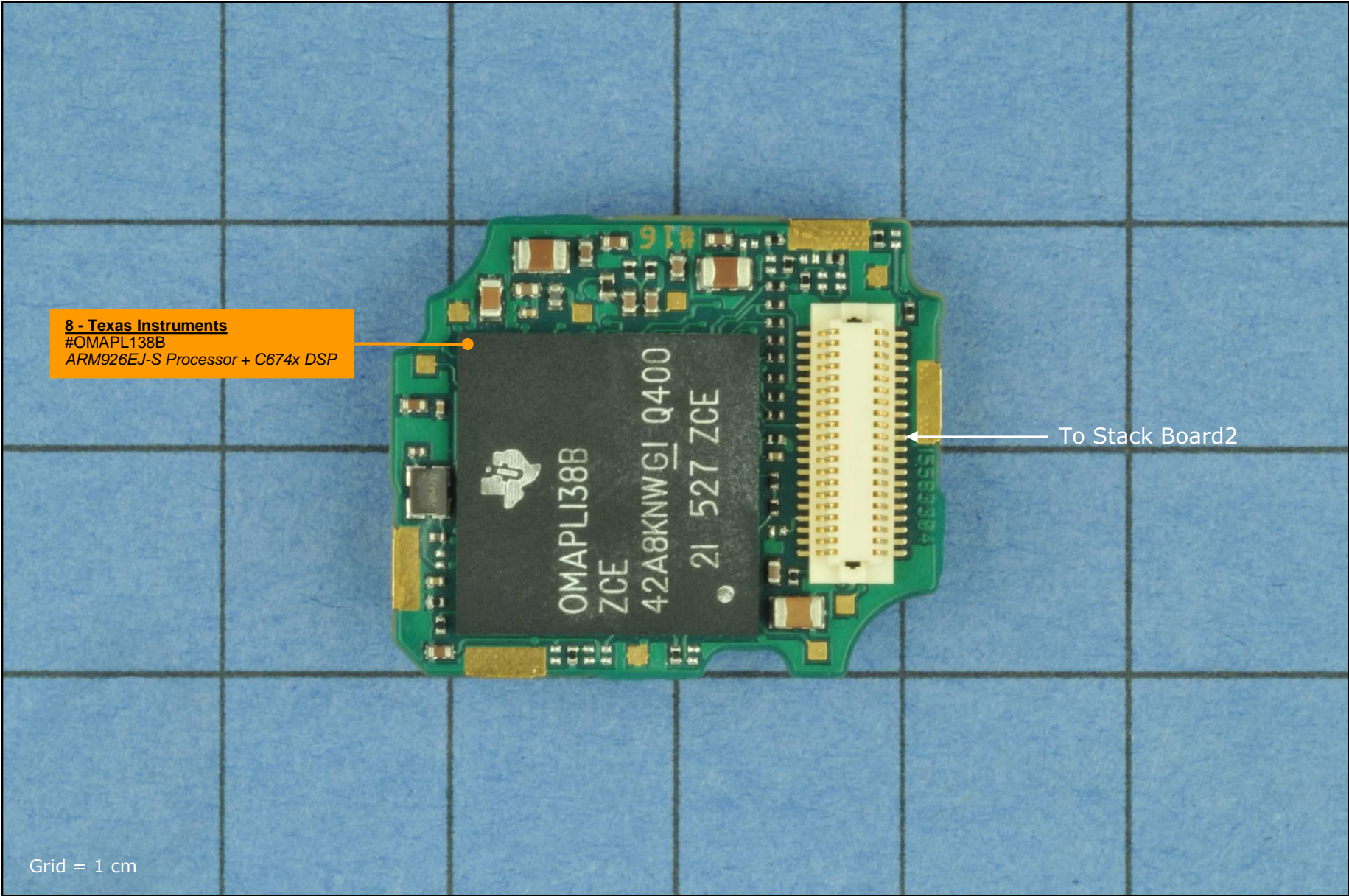
5 - ISSI
 #IS46LR16320B
 DDR SDRAM Memory - 64 MB

To Main Board →

ISSI 1407
 IS46LR16320B
 -6BLA2 K056
 BJJ323000Y1 TWN

Grid = 1 cm

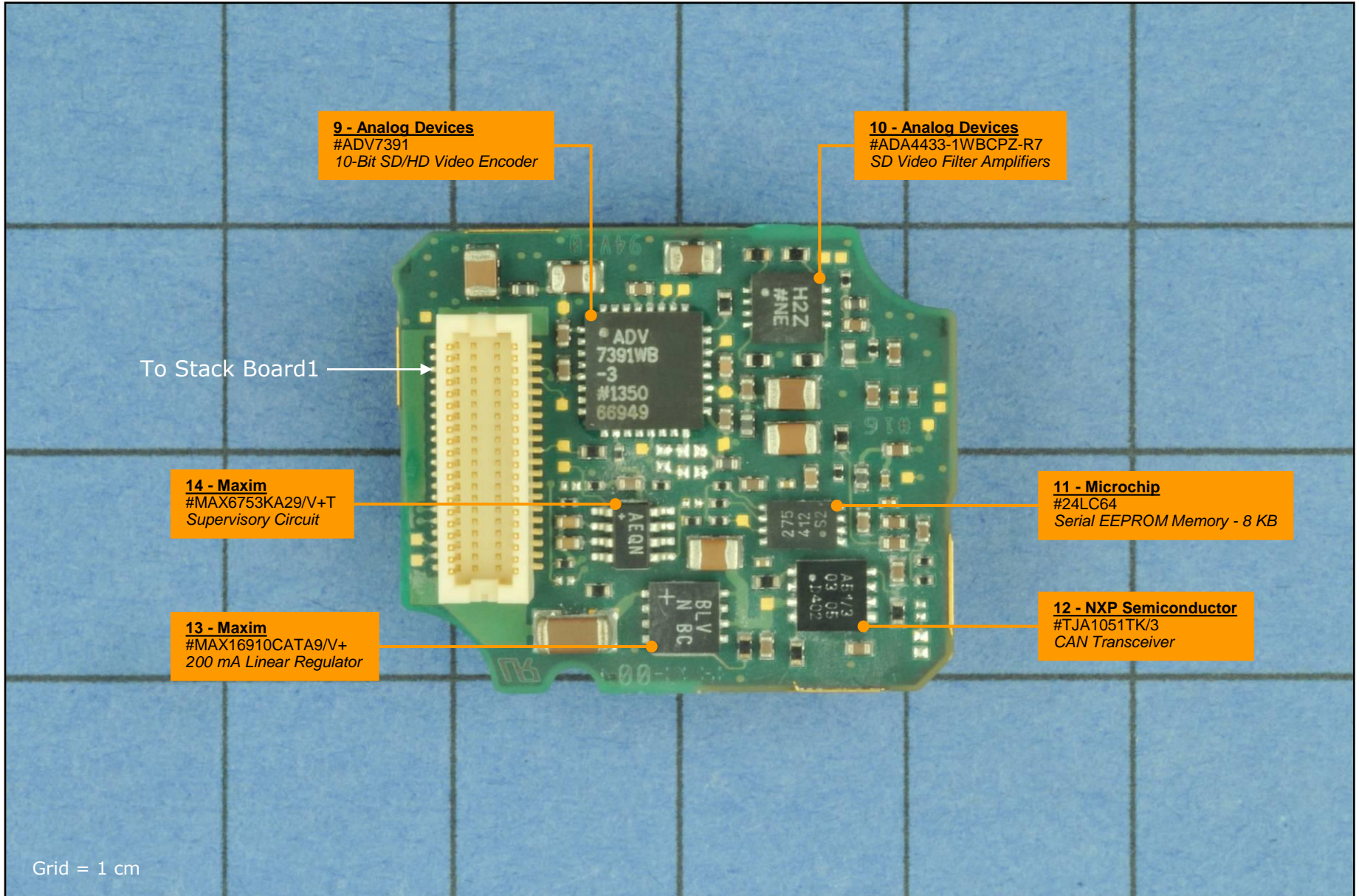
? = Unconfirmed

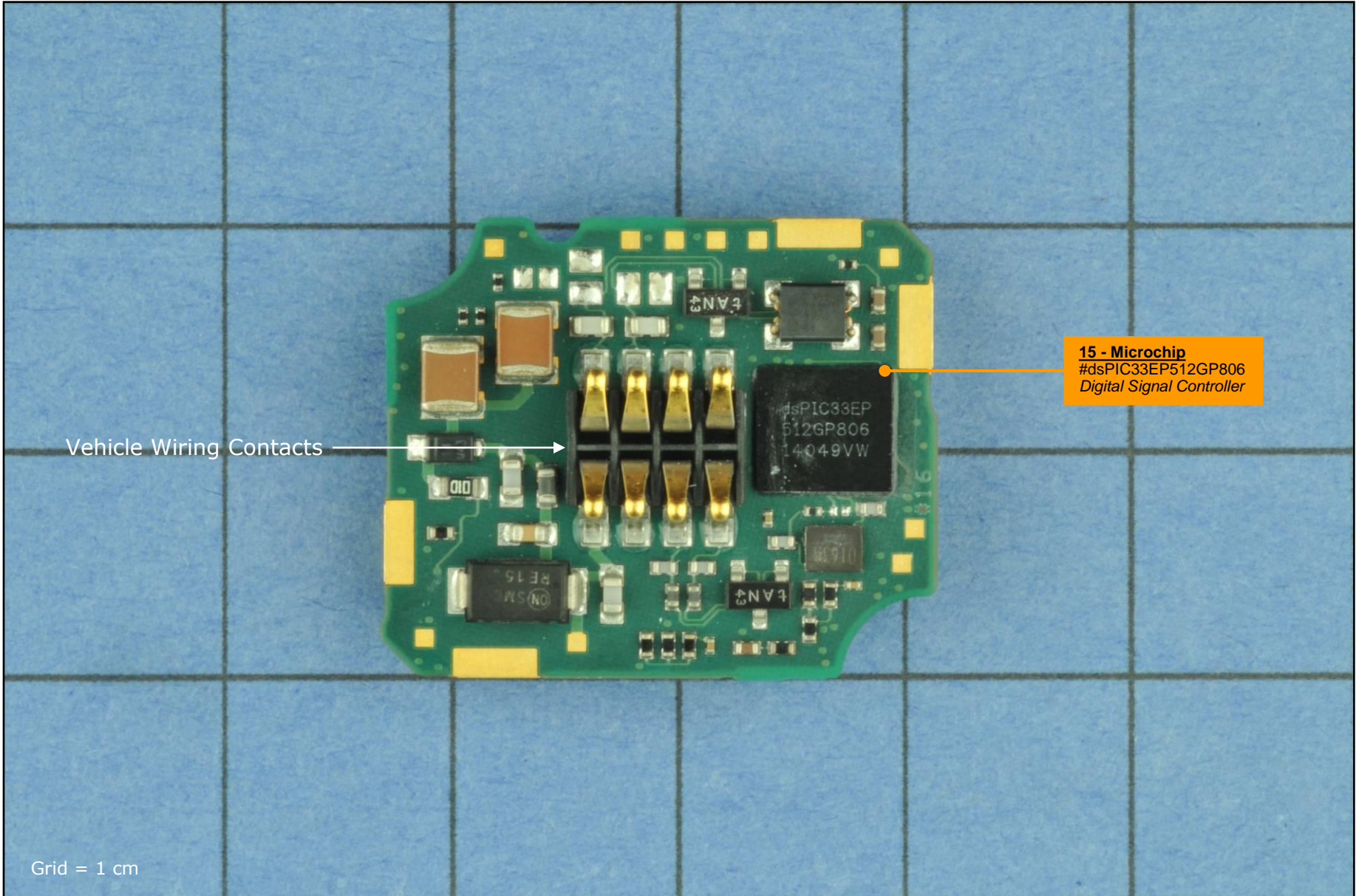


8 - Texas Instruments
 #OMAPL138B
 ARM926EJ-S Processor + C674x DSP

To Stack Board2

Grid = 1 cm



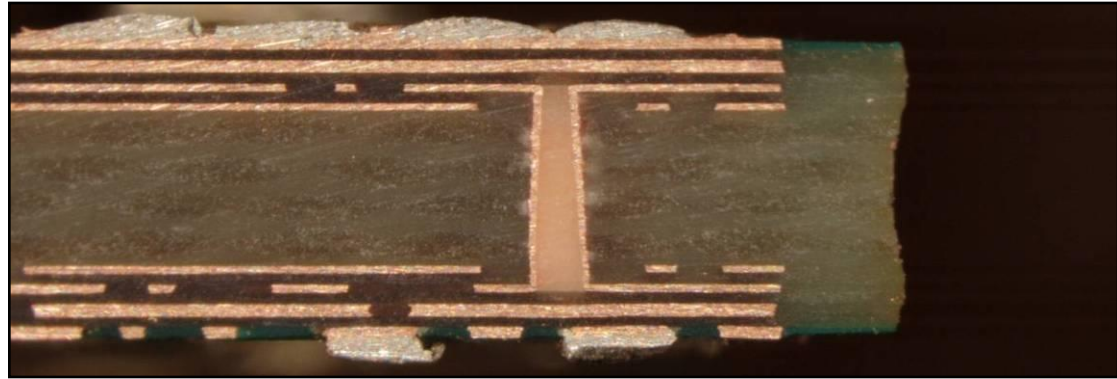


Vehicle Wiring Contacts →

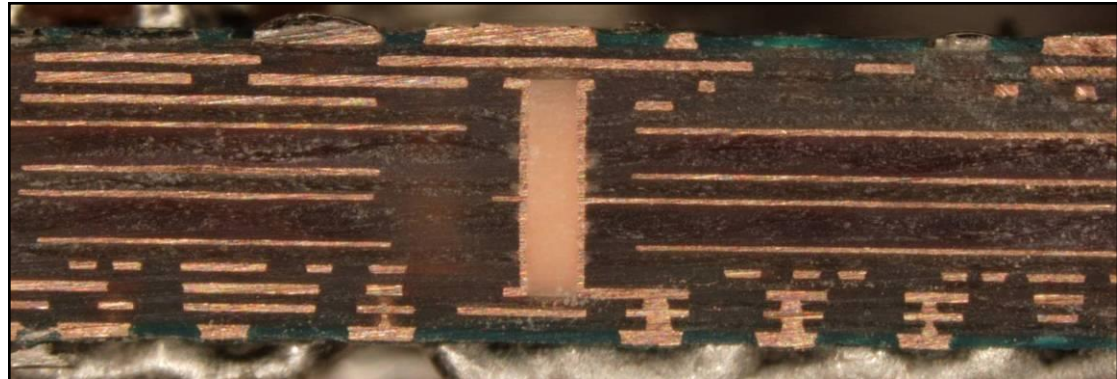
15 - Microchip
#dsPIC33EP512GP806
Digital Signal Controller

Grid = 1 cm

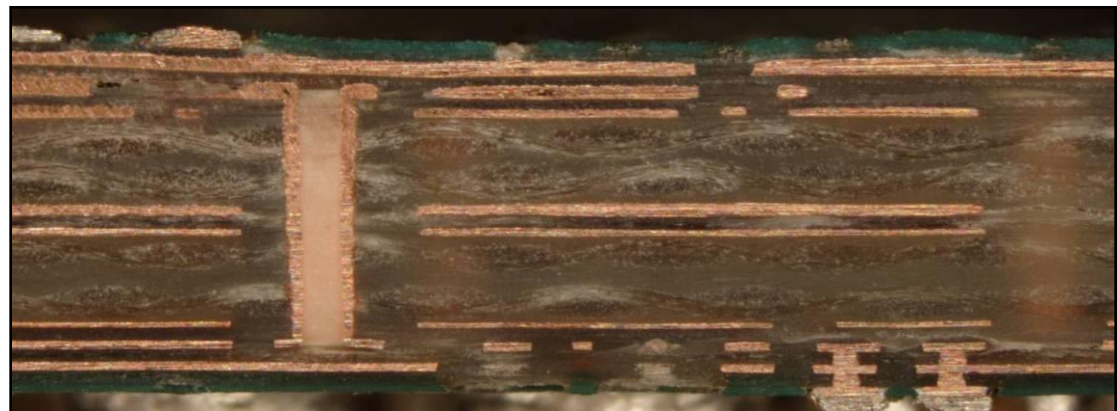
Main Board



Stack Board 1



Stack Board 2



Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Unknown	FR4	8 Layer Buildup FR4 / HF	8	3.3	0.50	0.15			0.30	0.00	1.6	62.3	\$ 0.23
Stack Board1	Unknown	FR4	12 Layer Buildup FR4 / HF	12	4.4	0.20	0.10			0.30	0.00	1.5	96.8	\$ 0.56
Stack Board2	Unknown	FR4	10 Layer Buildup FR4 / HF	10	4.4	0.20	0.10			0.30	0.00	1.9	56.9	\$ 0.41

Location	Package Info										Die Info						Estimated Costs		
	Pkg Ref. #	Pkg Qty	Brand Name	Part Number	Pkg Description	Form	Pin Count	Length (mm)	Width (mm)	Height (mm)	Die Ref #	Die Qty	Brand Name	Part Number	Description	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	1	Spansion	S25FL032P	NOR Flash Memory - 4 MB	DFN	8	6.00	5.00	0.60	1.1	1	Spansion	98L22A	NOR Flash Memory - 4 MB	3.90	2.90	\$ 0.301	\$ 0.301
	2	1	OmniVision	OV10635	1 MP Image Sensor	Flip Chip, Solder (UF)	129	7.80	7.10	1.00	2.1	1	OmniVision	OV2D1AB	1 MP Image Sensor	7.80	7.10	\$ 10.670	\$ 10.670
Main Board, Side 2	3	1	Texas Instruments	TPS62590TDRV/RQ1	1 A Step-Down Converter	DFN	6	2.00	2.00	0.90	3.1	1	Texas Instruments	TPS6226XB1	1 A Step-Down Converter	1.50	0.90	\$ 0.100	\$ 0.100
	4	1	Texas Instruments	TPS57140QDRRCRQ1	1.5 A, 42 V Step-Down Converter	DFN	10	3.00	3.00	0.90	4.1	1	Texas Instruments	TPS54160	1.5 A, 42 V Step-Down Converter	1.60	1.50	\$ 0.190	\$ 0.190
Stack Board1, Side 1	5	1	ISSI	IS46LR16320B	DDR SDRAM Memory - 64 MB	BGA	60	10.00	8.00	0.60	5.1	1	ISSI	K056121F 012811	DDR SDRAM Memory - 64 MB	8.30	6.60	\$ 3.780	\$ 3.780
	6	1	Texas Instruments	411Q1 ?	LDO Regulator	Flip Chip, Solder	9	1.30	1.30	0.50	6.1	1	Texas Instruments	TPS????0B0	LDO Regulator	1.30	1.30	\$ 0.130	\$ 0.130
	7	1	Texas Instruments	TPS62231	Step-Down Converter	SOP	6	1.50	1.00	0.70	7.1	1	Texas Instruments	TPS62231A0	Step-Down Converter	1.10	0.50	\$ 0.060	\$ 0.060
Stack Board1, Side 2	8	1	Texas Instruments	OMAPL138B	ARM926EJ-S Processor + C674x DS	BGA	361	13.00	13.00	0.90	8.1	1	Texas Instruments	F771527B	ARM926EJ-S Processor + C674x DS	7.40	4.70	\$ 11.250	\$ 11.250
Stack Board2, Side 1	9	1	Analog Devices	ADV7391	10-Bit SD/HD Video Encoder	QFN	32	5.00	5.00	0.80	9.6	1	Analog Devices	TV750B	10-Bit SD/HD Video Encoder	3.00	2.60	\$ 1.710	\$ 1.710
	10	1	Analog Devices	ADA4433-1WBCPZ-R7	SD Video Filter Amplifiers	DFN	8	3.00	3.00	0.80	10.1	1	Analog Devices	ADA4433-1	SD Video Filter Amplifiers	2.40	1.30	\$ 0.220	\$ 0.220
	11	1	Microchip	24LC64	Serial EEPROM Memory - 8 KB	DFN	8	3.00	2.00	0.90	11.1	1	Microchip	DE DUJ	Serial EEPROM Memory - 8 KB	1.30	1.10	\$ 0.120	\$ 0.120
	12	1	NXP Semiconductor	TJA1051TK/3	CAN Transceiver	DFN	8	3.00	3.00	0.90	12.1	1	NXP Semiconductor	cp1371C	CAN Transceiver	1.90	1.50	\$ 0.210	\$ 0.210
	13	1	Maxim	MAX16910CAT9/V+	200 mA Linear Regulator	DFN	8	3.00	3.00	0.90	13.1	1	Maxim	AP13Z	200 mA Linear Regulator	1.10	1.00	\$ 0.100	\$ 0.100
Stack Board2, Side 2	14	1	Maxim	MAX753KA29/V+T	Supervisory Circuit	SOP	8	3.00	1.50	1.20	14.1	1	Maxim	M562Y -7	Supervisory Circuit	2.00	0.60	\$ 0.100	\$ 0.100
Stack Board2, Side 2	15	1	Microchip	dsPIC33EP512GP806	Digital Signal Controller	Flip Chip, Solder (UF)	81	5.90	5.40	0.90	15.1	1	Microchip	TB AA1	Digital Signal Controller	5.90	5.40	\$ 6.820	\$ 6.820
Totals		15					742					15							\$35.76

(UF) = Underfilled

Note: Supplemental information, such as IC package & die markings, is included in the Excel Bill of Materials (BOM) spreadsheet.

Location	Qty	Brand Name	Part Number	Description	Package			Estimated Costs	
					Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Unknown	R24.0 D352	Crystal: Ceramic	4	2.00	1.60	\$ 0.200	\$ 0.200
Stack Board1, Side 2	1	Unknown	D27402	Crystal: Ceramic	4	2.00	1.60	\$ 0.200	\$ 0.200
Stack Board2, Side 2	1	Unknown	D163M	Crystal: Ceramic	4	2.50	2.00	\$ 0.200	\$ 0.200
TOTALS	3				12				\$0.60

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Small Active	MOSFET - Si8429DB	8429 3AV	4	1.60	1.60	\$0.290	\$0.290
Main Board, Side 2	1	Small Active	Transistor, Small	A3 W41	3	2.00	2.00	\$0.030	\$0.030
Stack Board1, Side 1	1	Small Active	MOSFET - Si8429DB	8429 4GA	4	1.60	1.60	\$0.290	\$0.290
Stack Board2, Side 2	2	Small Active	Transistor, Small	t AN 43	3	2.90	1.20	\$0.030	\$0.060
	1	Small Active	Diode, SMT	ON SEMI logo SMC RE15	2	4.50	2.80	\$0.015	\$0.015
	1	Small Active	Diode, SMT	14 M43	2	2.10	1.30	\$0.015	\$0.015
TOTALS	7				21				\$0.70

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 1	52	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.208
Main Board, Side 2	1	Coil	SMT, Small	2	\$0.050	\$0.050
	25	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.100
Stack Board1, Side 1	63	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.252
Stack Board1, Side 2	46	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.184
Stack Board2, Side 1	67	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.268
Stack Board2, Side 2	1	Coil	SMT, Small	4	\$0.050	\$0.050
	34	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.136
TOTALS	289			580		\$1.25

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 2	1	Bd to Bd: Male - Stack Board1	30	9.60	3.60	\$0.170	\$0.170
Stack Board1, Side 1	1	Bd to Bd: Female - Main Board	30	9.70	3.80	\$0.170	\$0.170
Stack Board1, Side 2	1	Bd to Bd: Male - Stack Board2	40	12.10	3.60	\$0.220	\$0.220
Stack Board2, Side 1	1	Bd to Bd: Female - Stack Board1	40	12.10	3.80	\$0.220	\$0.220
Stack Board2, Side 2	1	Bd to Bd: Male - Vehicle Wiring	9	19.00	16.50	\$0.065	\$0.065
	1	Bd to Bd: Female - Vehicle Wiring Contacts	8	7.60	5.90	\$0.060	\$0.060
TOTALS	6		157				\$0.90

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	3.3	8	26.4	62.3	86	350	26.1	106.1	4.1	2.40
Main Electronics	Stack Board1	4.4	12	52.8	96.8	117	732	26.6	166.4	6.3	3.30
Main Electronics	Stack Board2	4.4	8	35.2	56.9	117	430	26.6	97.7	3.7	3.40
	System Totals	12.1	28	114.4		320	1512	26.4	125.0	4.7	9.10

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 13.15	\$ 11.26	\$ 0.20	\$ 0.32	\$ 0.36	\$ 0.17	\$ 0.23	\$ 0.50	\$ 0.11
Main Electronics	Stack Board1	\$ 18.02	\$ 15.22	\$ 0.20	\$ 0.29	\$ 0.44	\$ 0.39	\$ 0.56	\$ 0.65	\$ 0.28
Main Electronics	Stack Board2	\$ 11.67	\$ 9.28	\$ 0.20	\$ 0.09	\$ 0.45	\$ 0.34	\$ 0.41	\$ 0.69	\$ 0.15
	System Totals	\$ 42.84	\$ 35.76	\$ 0.60	\$ 0.70	\$ 1.25	\$ 0.90	\$ 1.20	\$ 1.84	\$ 0.54

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	4	153	1	4	2	7	78	156	1	30	436
Main Electronics	Stack Board1	4	436	1	4	1	4	109	218	2	70	849
Main Electronics	Stack Board2	7	153	1	4	4	10	102	206	3	57	547
	System Totals	15	742	3	12	7	21	289	580	6	157	1832

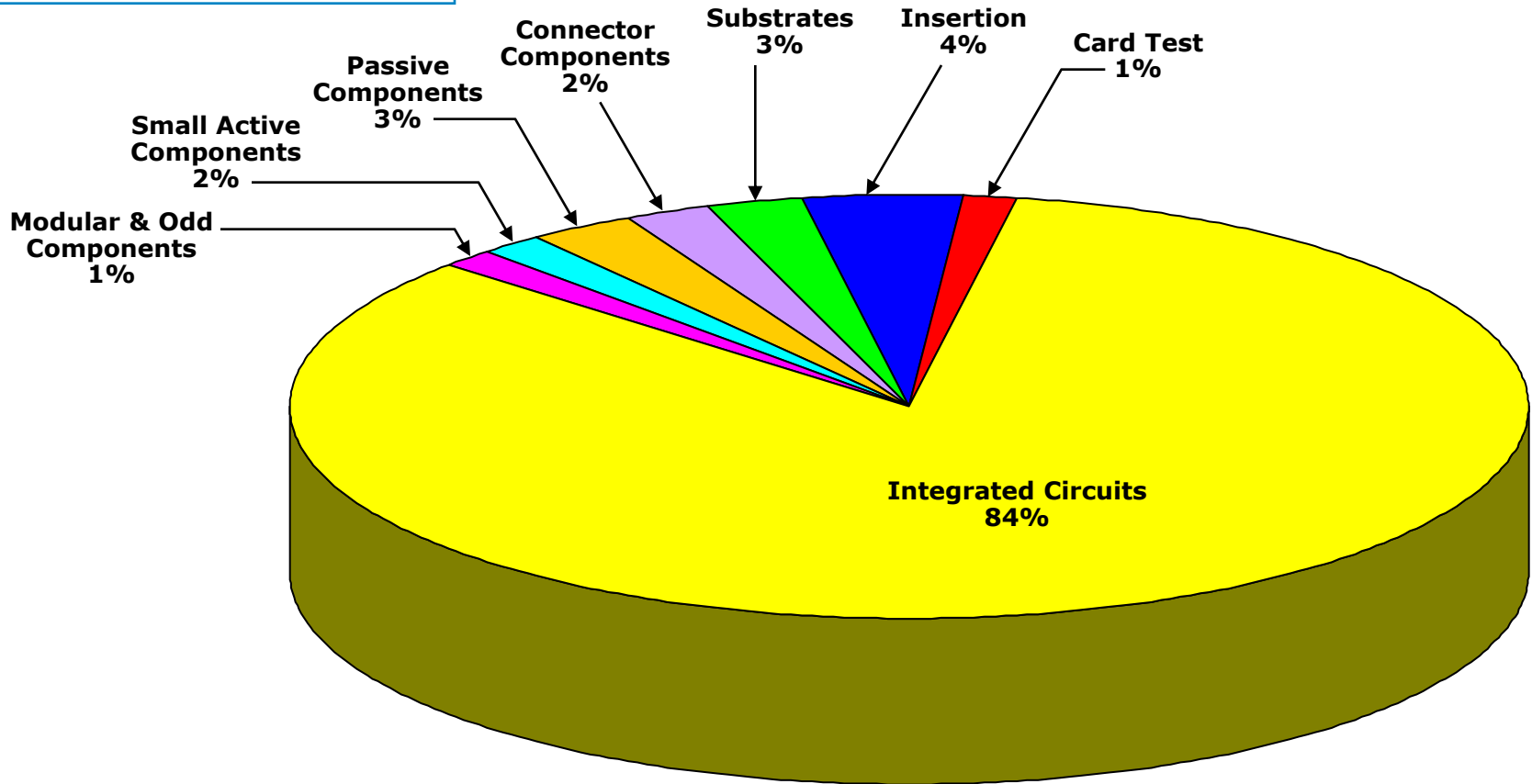
NOTE: Occasional inconsistencies in totals may be present due to rounding error.

IC Metrics												
General Area	Assembly Name	IC Die Count	IC Package Count	Number of Package Connections	Die Area (sq.mm)	Substrate Tiling Density (die area / substrate area)	Package Area (sq.mm)	Die Area/Package Area Ratio	Package Connections per sq.cm of Package Area	Volatile Memory (KBytes)	Non-Volatile Memory (KBytes)	
Main Electronics	Main Board	4	4	153	70.4	0.21	98.4	0.72	155.5	0	4096	
Main Electronics	Stack Board1	4	4	436	91.8	0.21	252.2	0.36	172.9	65536	0	
Main Electronics	Stack Board2	7	7	153	49.4	0.11	94.4	0.52	162.1	0	8	
	System Totals	15	15	742	211.6		444.9	0.48	166.8	65536	4104	

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

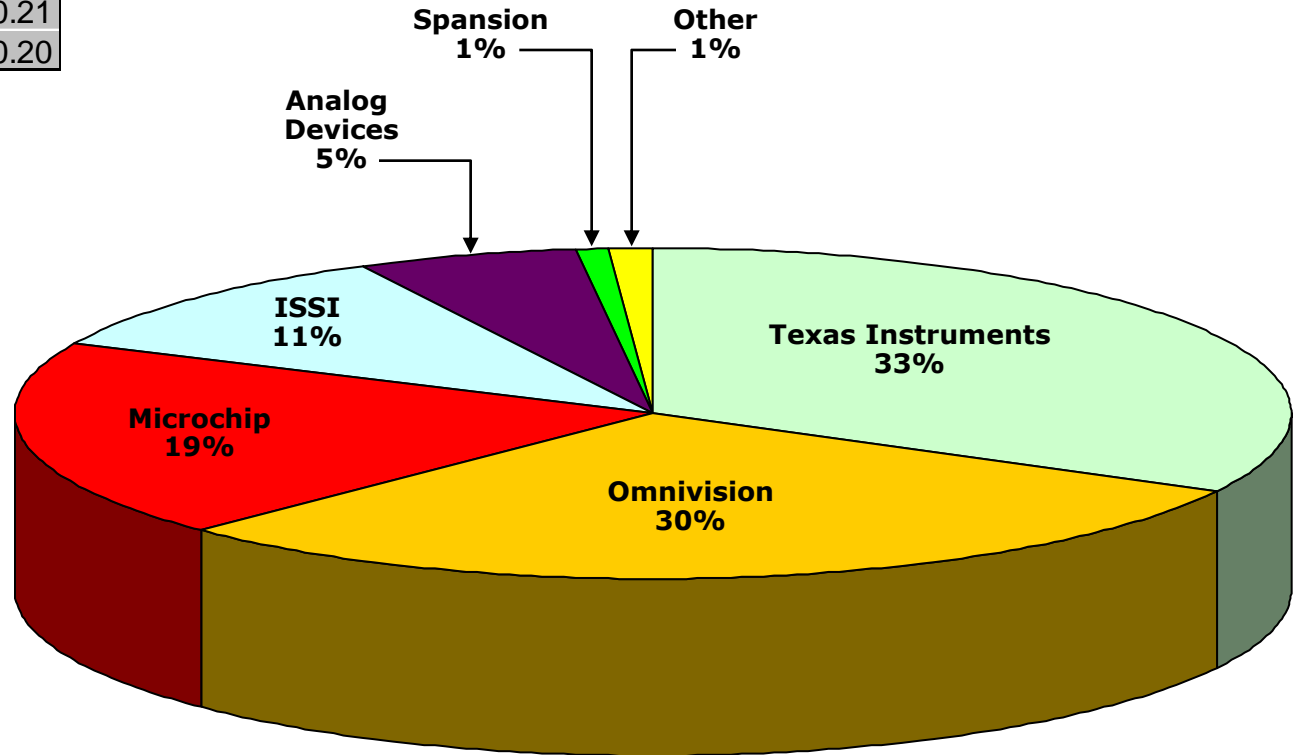
**Estimated Cost
of Electronics**

\$42.84



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Pkg. Brand	Cost
Texas Instruments	\$11.73
OmniVision	\$10.67
Microchip	\$6.94
ISSI	\$3.78
Analog Devices	\$1.93
Spansion	\$0.30
Other	
NXP Semiconductor	\$0.21
Maxim	\$0.20



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

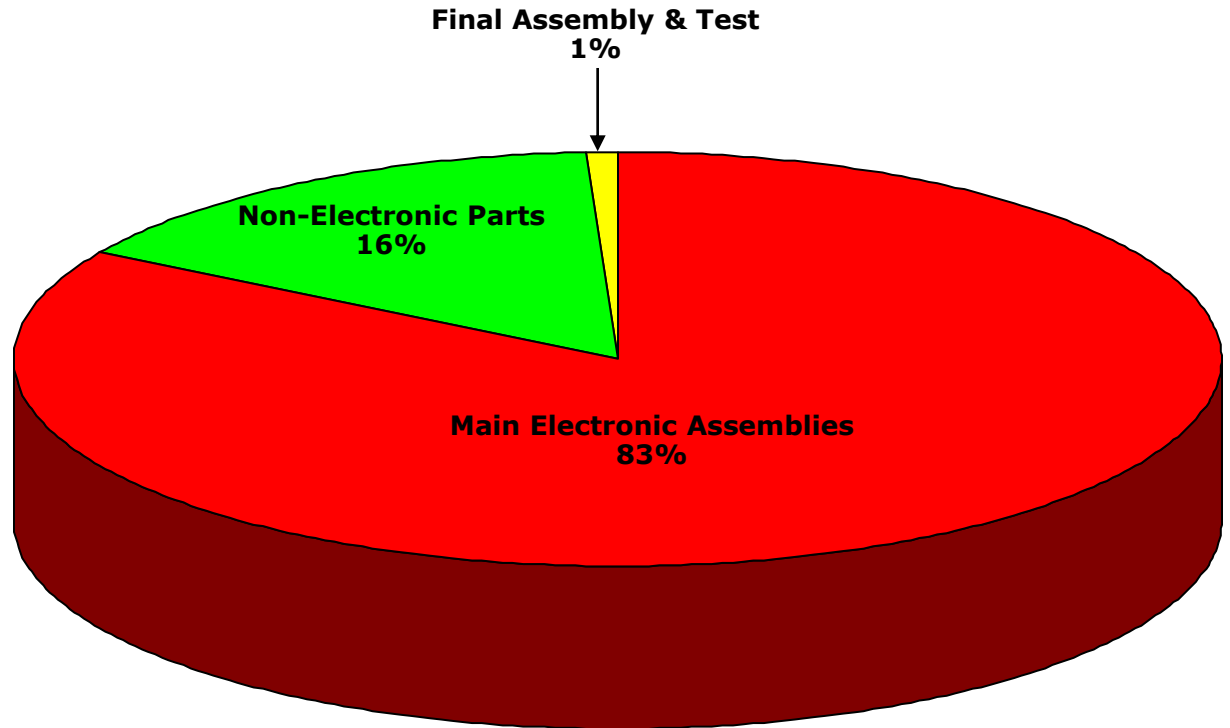
Subsystem	Part ID No.	Qty	Description	Fabrication Process	Material	Dimensions (mm)	Weight (grams)	Est'd Cost Each	Est'd Extended Cost	
Housing	1	1	Housing, Upper	Cast + Finished + Anodized + Tapped	AlSi12	28.1 x 24.9 x 24.2	10.90	0.970	0.970	
	2	1	Housing, Lower	Cast + Finished + Anodized	AlSi12 (Fe)	28 x 25.1 x 21.8	7.60	0.400	0.400	
	3	1	Bracket, PCB Stacking	Stamped + Formed	CuNi18Zn27	24.3 x 20.7 x 11.7	0.90	0.160	0.160	
Misc	18	1	O-Ring, Housing	Molded	Rubber	27.7 x 23.6 x 1.2	0.05	0.030	0.030	
	19	2	Labels	Die-Cut + Printed	Plastic + Adhesive	16.2 x 11 x 0.06	0.02	0.050	0.100	
	20	5	Screws	Extruded + Threaded	Steel	x	0.05	0.020	0.100	
	21	1	Hole Cover	Die-Cut	Plastic	14 x 14 x 0.3	0.01	0.010	0.010	
Optics	4	1	Housing, Optics	Cast + Finished + Anodized + Tapped	Aluminum	14.5 x 12.5 x 8.9	2.40	0.300	0.300	
	5	1	Trim Ring	Cast + Formed + Anodized + Tapped	Aluminum	17 x 17 x 4.9	0.50	0.120	0.120	
	6	1	Glass Lens1	Molded + Polished + Painted	Glass	14.6 x 14.6 x 3.5	1.40	2.390	2.390	
	7	1	O-Ring	Molded	Rubber	13.1 x 13.1 x 0.8	0.05	0.020	0.020	
	8	1	Plastic Lens 2	Molded + Polished	Plastic	9.5 x 9.5 x 2.1	0.10	0.510	0.510	
	9	1	Glass Lens 3 + IR Filter	Molded + Polished + Coated	Glass	4.5 x 4.5 x 1.6	0.05	0.630	0.630	
	10	1	Glass Lens 4	Molded + Polished	Glass	4.5 x 4.5 x 2.2	0.05	0.570	0.570	
	11	1	Aluminum Spacer 1	Stamped + Formed	Aluminum	6.5 x 6.5 x 2.2	0.05	0.030	0.030	
	12	1	Glass Lens 5	Molded + Polished	Glass	3.8 x 3.8 x 2.2	0.05	0.480	0.480	
	13	1	Plastic Spacer 2	Die-Cut	Plastic	5 x 5 x 0.3	0.05	0.010	0.010	
	14	1	Glass Lens 6	Molded + Polished	Glass	6.3 x 6.3 x 1.6	0.05	0.790	0.790	
	15	1	Retaining Ring	Cast + Finished + Painted + Threaded	Aluminum	7.5 x 7.5 x 1.8	0.05	0.100	0.100	
	16	1	Plastic Spacer 3	Die-Cut	Plastic	4.6 x 4.6 x 0.5	0.05	0.010	0.010	
17	1	Plastic Lens 7	Molded + Polished	Plastic	4.5 x 4.5 x 2.8	0.05	0.240	0.240		
Total		26						Estimated Cost		\$7.97

Final Ass'y Labor & Test Cost Estimate

Final Assembly & Test	
Made in	China
Number of parts	31
Est'd number of steps	99
Est'd time (seconds)	337
Est'd final assembly cost	\$ 0.29
Est'd final test cost	\$ 0.20

Estimated Cost Totals	
Main Electronic Assemblies	\$ 42.84
Non-Electronic Parts	\$ 7.97
Final Assembly & Test	\$ 0.49
Total	\$ 51.31

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.



Cost Estimation Process

(Overview & Discussion)

Cost modeling is tricky business. Multiple variables affect the actual production costs a manufacturer will experience, including development expenses, unit volumes, supply-and-demand in component markets, die yield-curve maturity, OEM purchasing power, and even variations in accounting practices. Different cost modeling methods employ different assumptions about how to handle these and other variables, but we can identify two basic approaches: that which seeks to track short-term variations in the inputs to the production process, and that which strives to maintain comparability of the output of the model across product families and over time.

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Silicon Tiling Density : Ratio of Total Silicon Area to total printed circuit board “projected” area (i.e. the simple board area and not the cumulative surface area of both sides of the board). This metric directly reflects the level of efficiency and aggressiveness in integrated circuit packing and placement. Single digit Silicon Tiling Density is typical but silicon coverage of 10% - 20% has been seen in some of the most advanced products we have examined. Higher Tiling Densities often correspond with the use of chip scale packaging (CSPs) or other small form-factor IC packaging technologies. High density circuit boards are also often a supporting technology.

Number of Parts : Total component count including ICs, passives, modules, connectors, etc., each separated out in our reporting.

Number of Connections : The total number of connections corresponds to the total number of interconnects introduced by the aggregate component set and reflects any electrical connection observed (solder joints, adhesive interconnect, or connector terminal interfaces).

Opportunity Count : Opportunity Count is the total number of parts plus the total number of connections; the name reflects that each of these constituent elements represents an opportunity for failure. A high opportunity count means more complex and riskier electronics assembly.

Average Pin Count (APC) : Ratio of total number of component terminals to total number of parts, at the system level. This metric reflects the ‘average’ terminal complexity of the components and often provide a signature of integration level and/or “digital-ness” of the overall product. Low APCs reflect a high number of discrettes or other low-pincount devices often characteristic of analog circuitry. Conversely, high APCs are characteristic of highly integrated, high-pincount assemblies, often those composed largely of digital integrated circuits.

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Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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Deep Dive Report

BMW i3 Daytime Running Lamp ASM

5205

Report #15900-150218-RRb



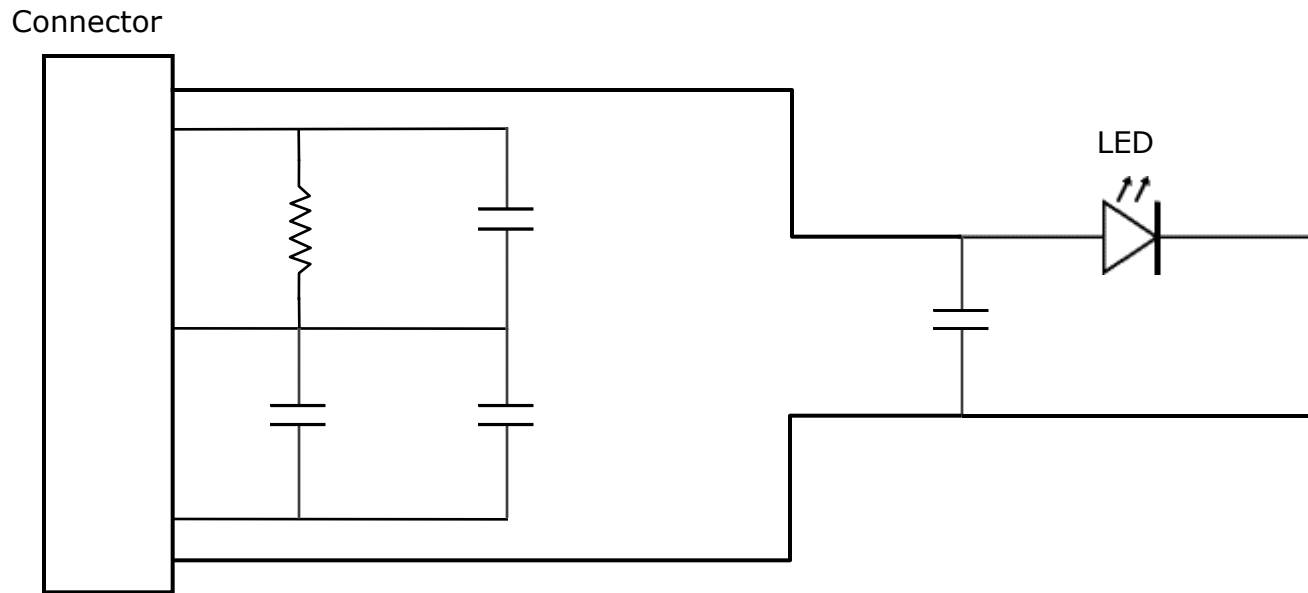
Product Description

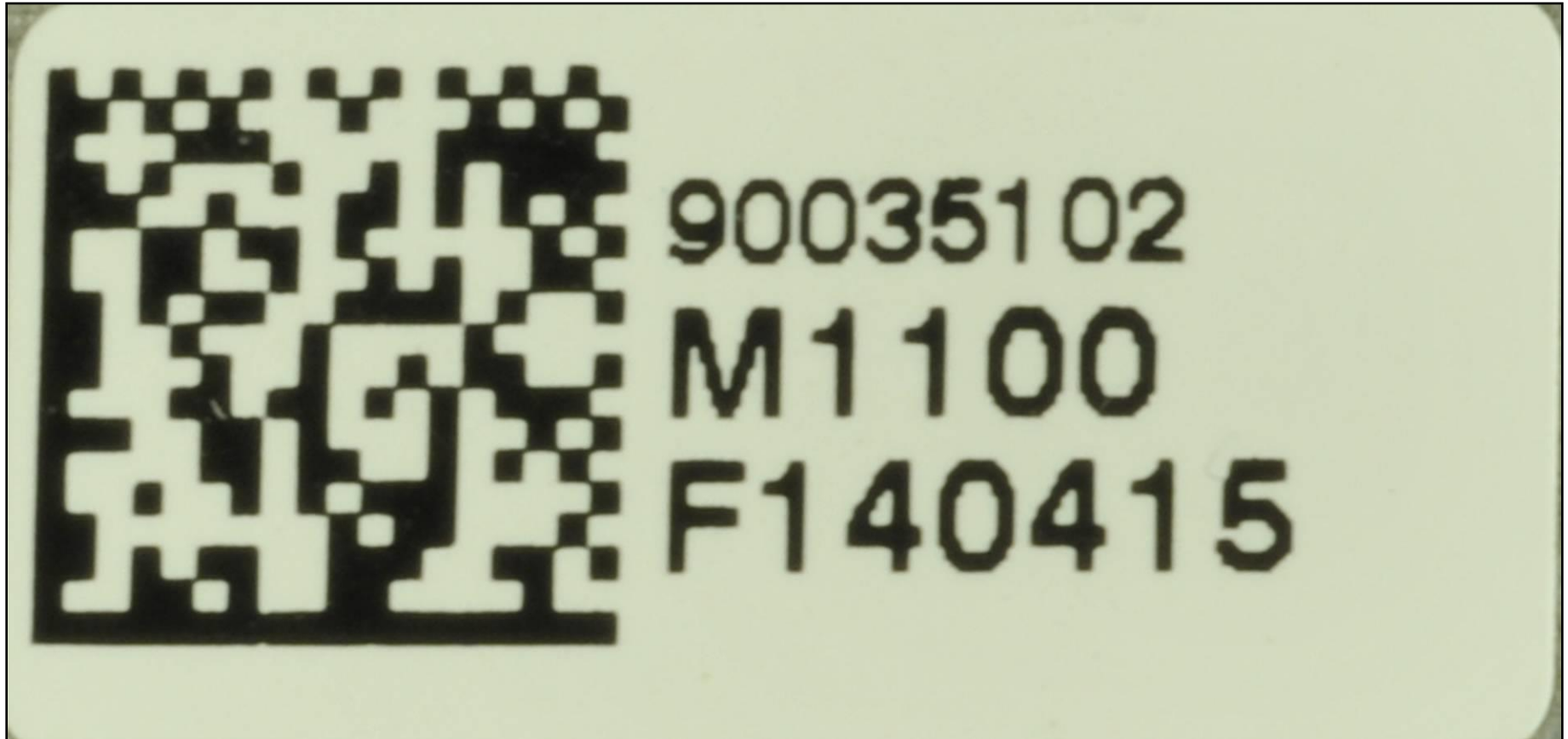
The BMW i3 Daytime Running Lamp ASM is the DRL LED illumination portion of the headlamp assembly in the BMW i3.

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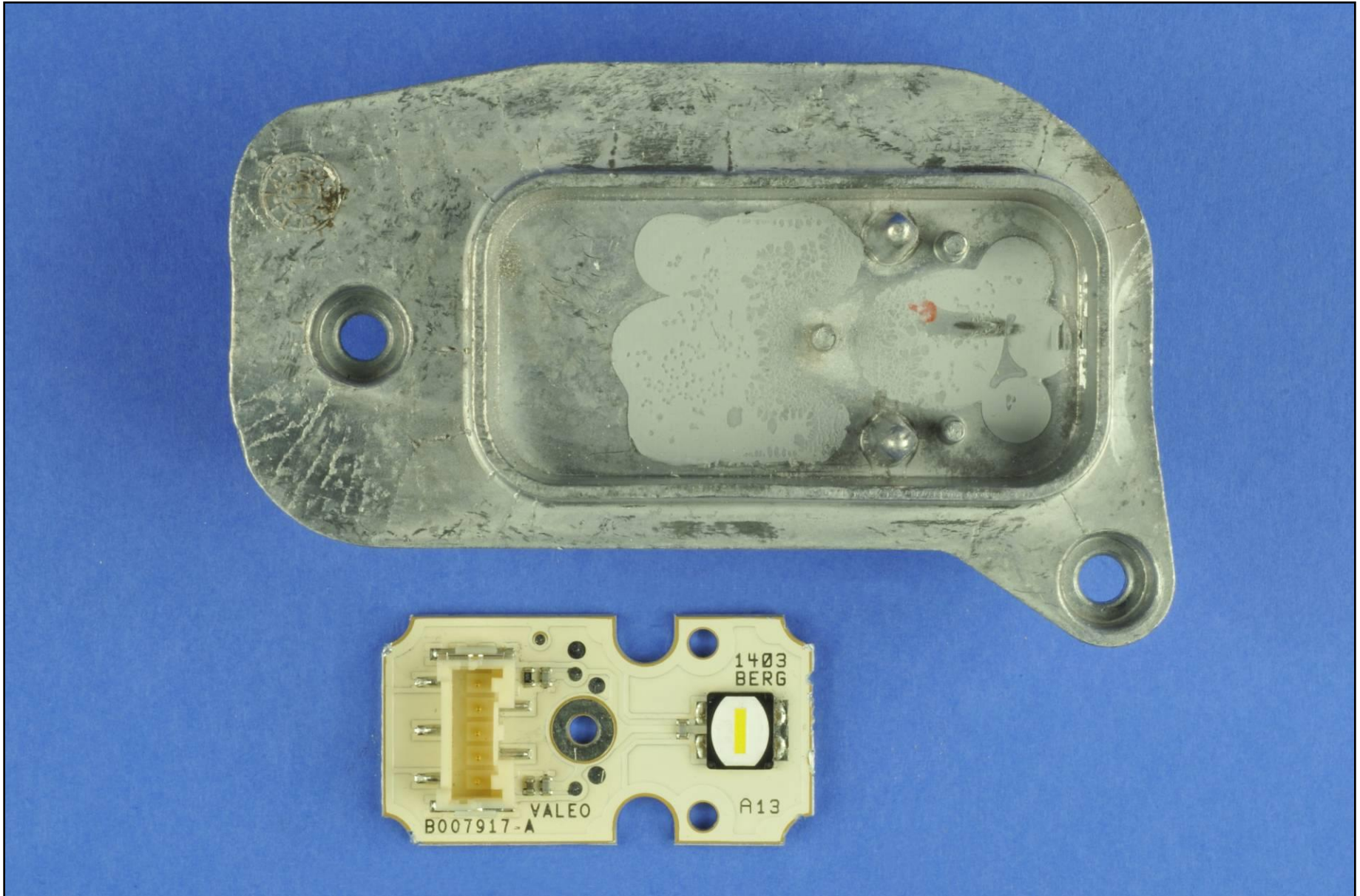
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 Daytime Running Lamp ASM	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	135.8 (Measured)	Retail Price		
Product Dimensions (mm)	93.2 x 48.0 x 42.95 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$3.44	
Product Features		Electronics Cost	\$0.54	
		Manufacturing Cost Breakdown		
Operating System	n/a	Small Active Components	\$0.20	5.8%
Communications	n/a	Passive Components	\$0.02	0.6%
		Connectors	\$0.20	5.8%
Connectivity	n/a	Substrate	\$0.05	1.5%
		Insertion	\$0.05	1.5%
Battery Life	n/a	Card Test	\$0.02	0.6%
		Non-Electronic Parts	\$2.67	77.6%
Processor	n/a	Final Assembly & Test	\$0.23	6.7%
		Total	\$3.44	100.0%

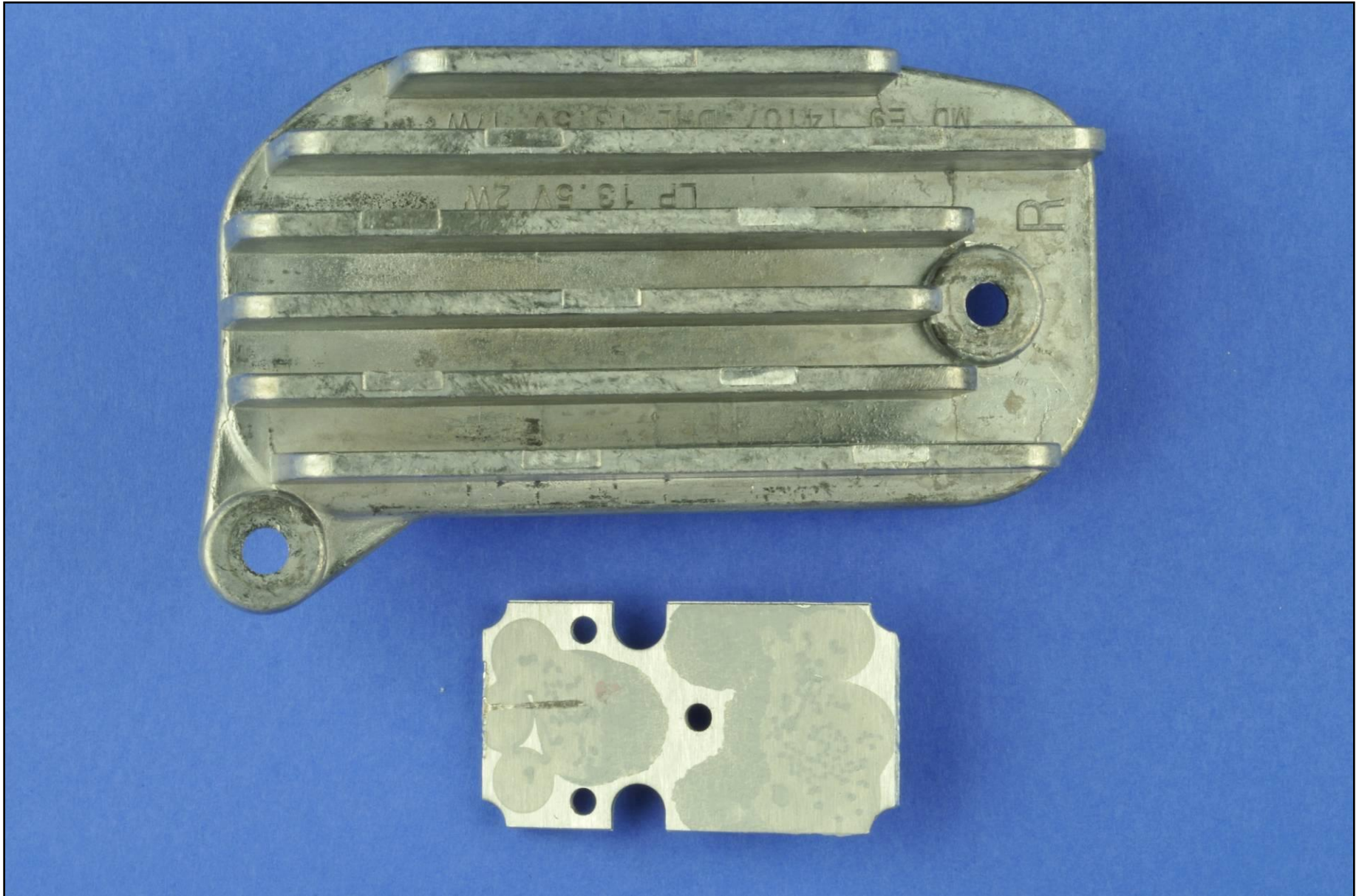


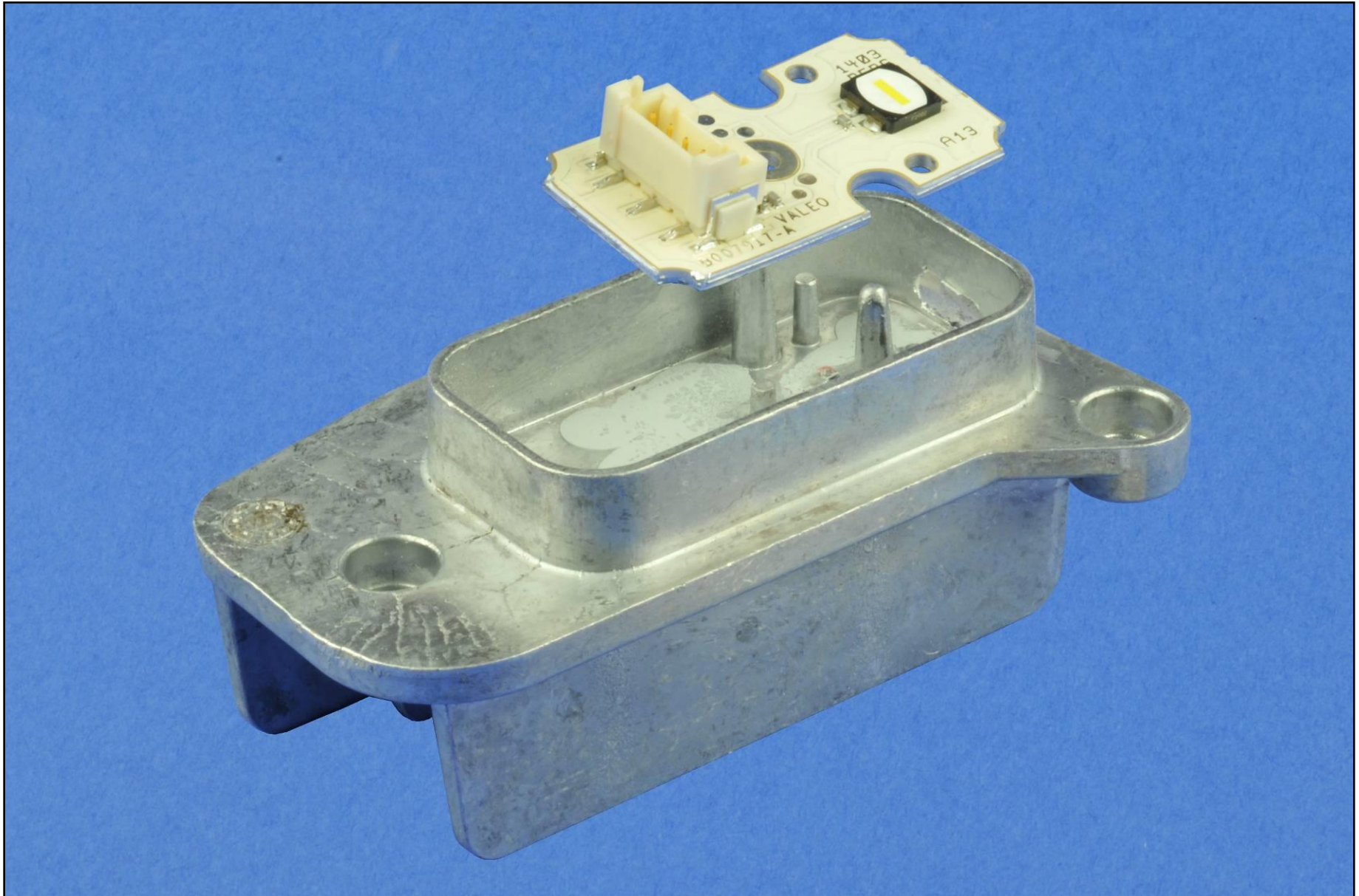




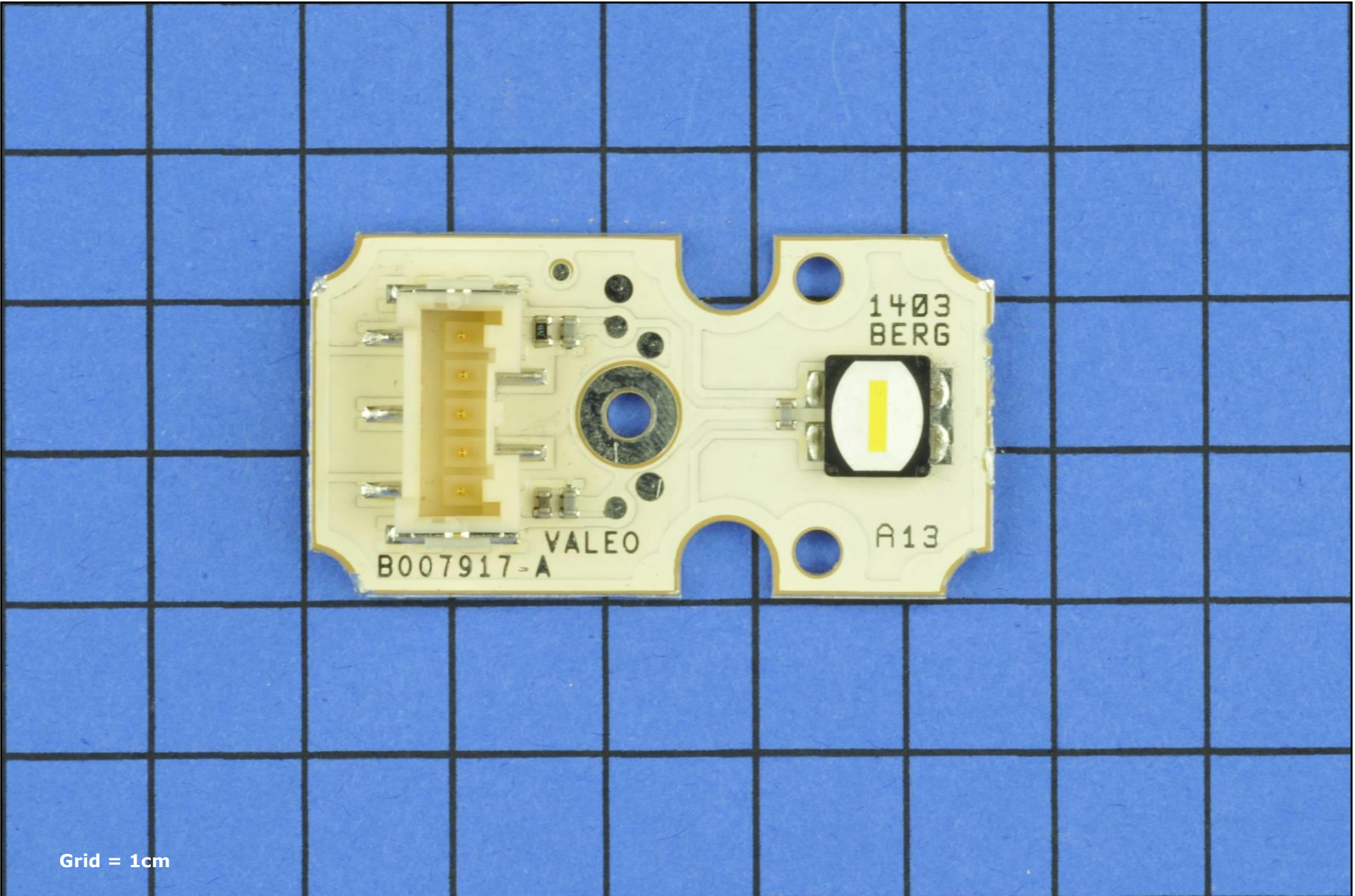


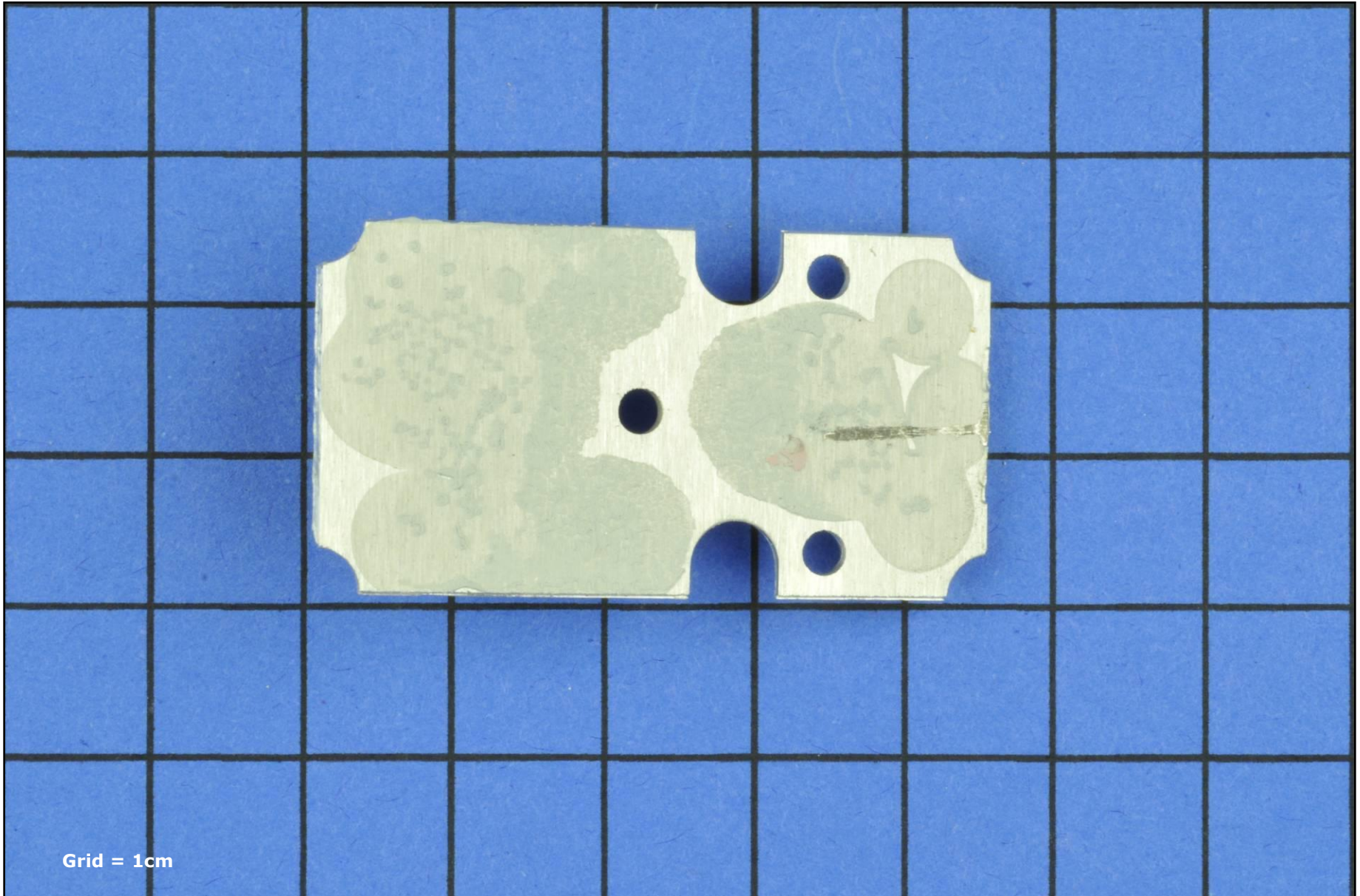




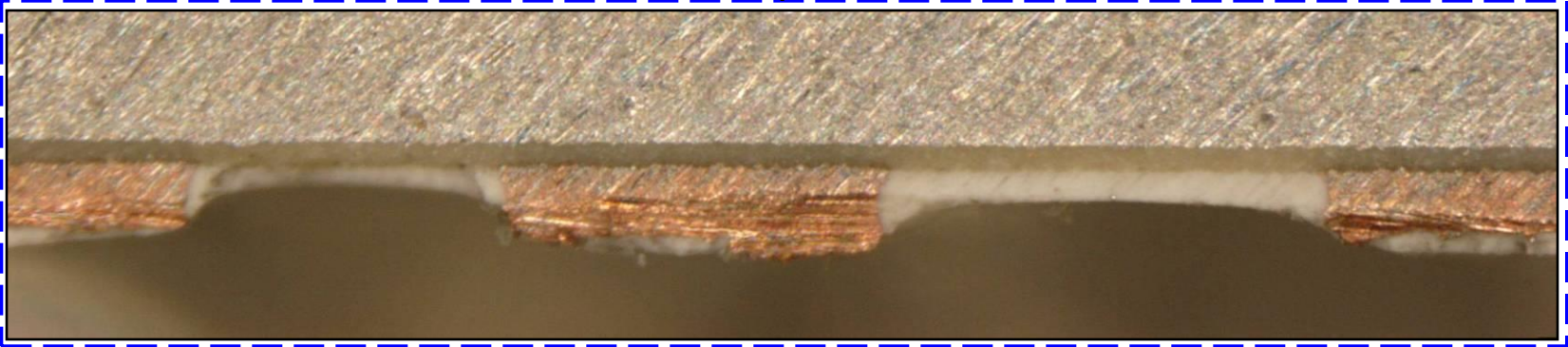
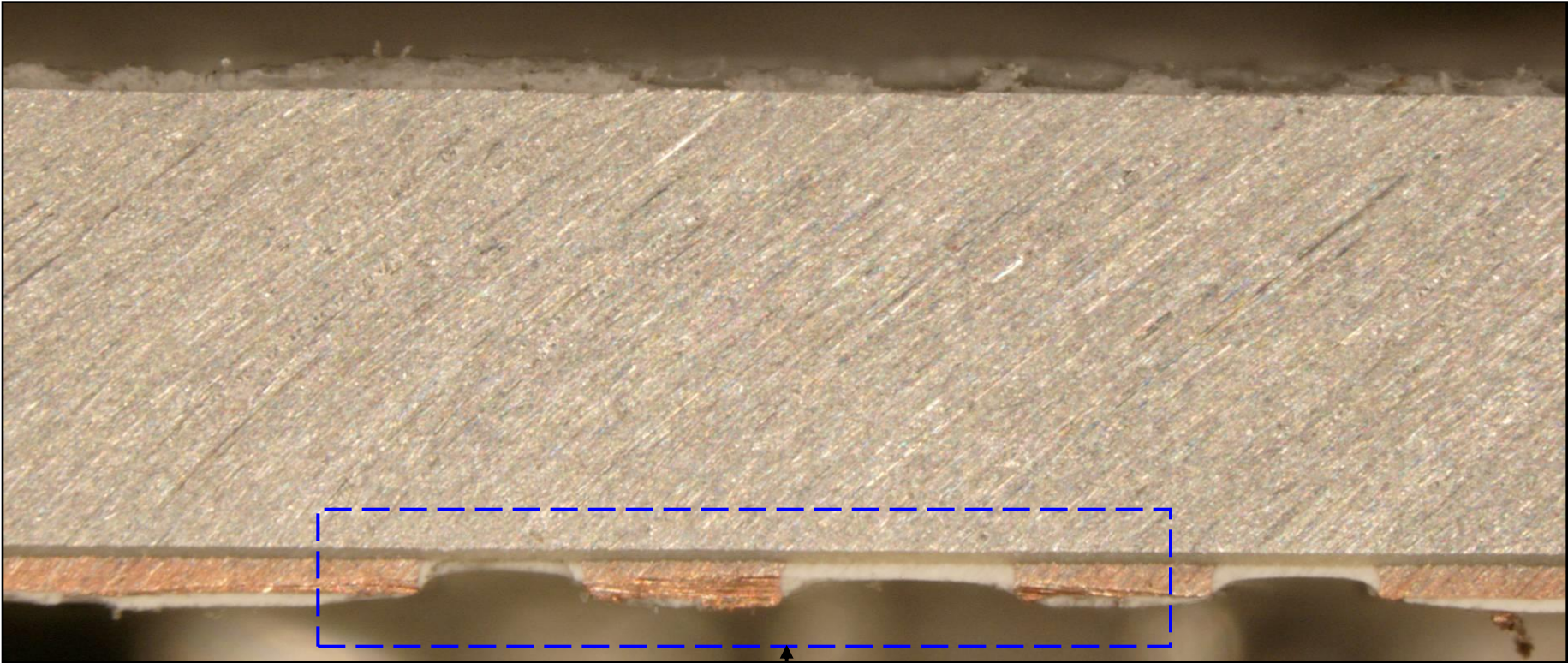








Grid = 1cm



Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Valeo	Aluminum	1 Layer Aluminum	1	10.8	1.64	0.63					1.6	6.6	\$ 0.05

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Small Active	LED, Single	F2902	4	7.98	6.95	\$0.200	\$0.200
TOTALS	1				4				\$0.20

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 1	1	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.004
	4	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.016
TOTALS	5			10		\$0.02

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Connector: LIF	5	17.40	7.99	\$0.200	\$0.200
TOTALS	1		5				\$0.20

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	10.8	1	10.8	6.6	7	19	0.7	1.8	2.7	6.10
	System Totals	10.8	1	10.8		7	19	0.6	1.8	2.7	6.10

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

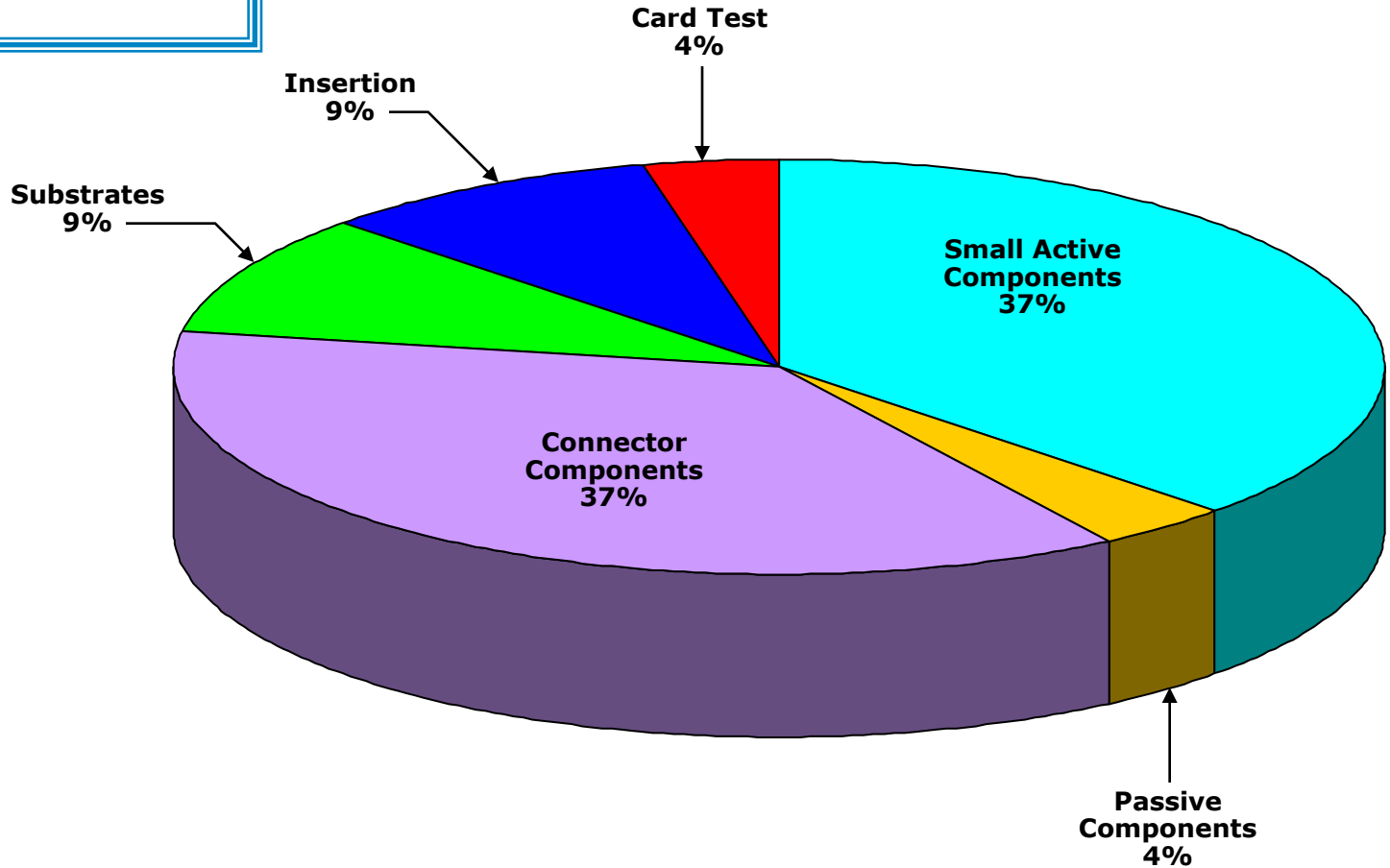
Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 0.54	\$ -	\$ -	\$ 0.20	\$ 0.02	\$ 0.20	\$ 0.05	\$ 0.05	\$ 0.02
	System Totals	\$ 0.54	\$ -	\$ -	\$ 0.20	\$ 0.02	\$ 0.20	\$ 0.05	\$ 0.05	\$ 0.02

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Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	0	0	0	0	1	4	5	10	1	5	26
	System Totals	0	0	0	0	1	4	5	10	1	5	26

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Estimated Cost of Electronics
(Includes Subsystem Electronics)
\$.54



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

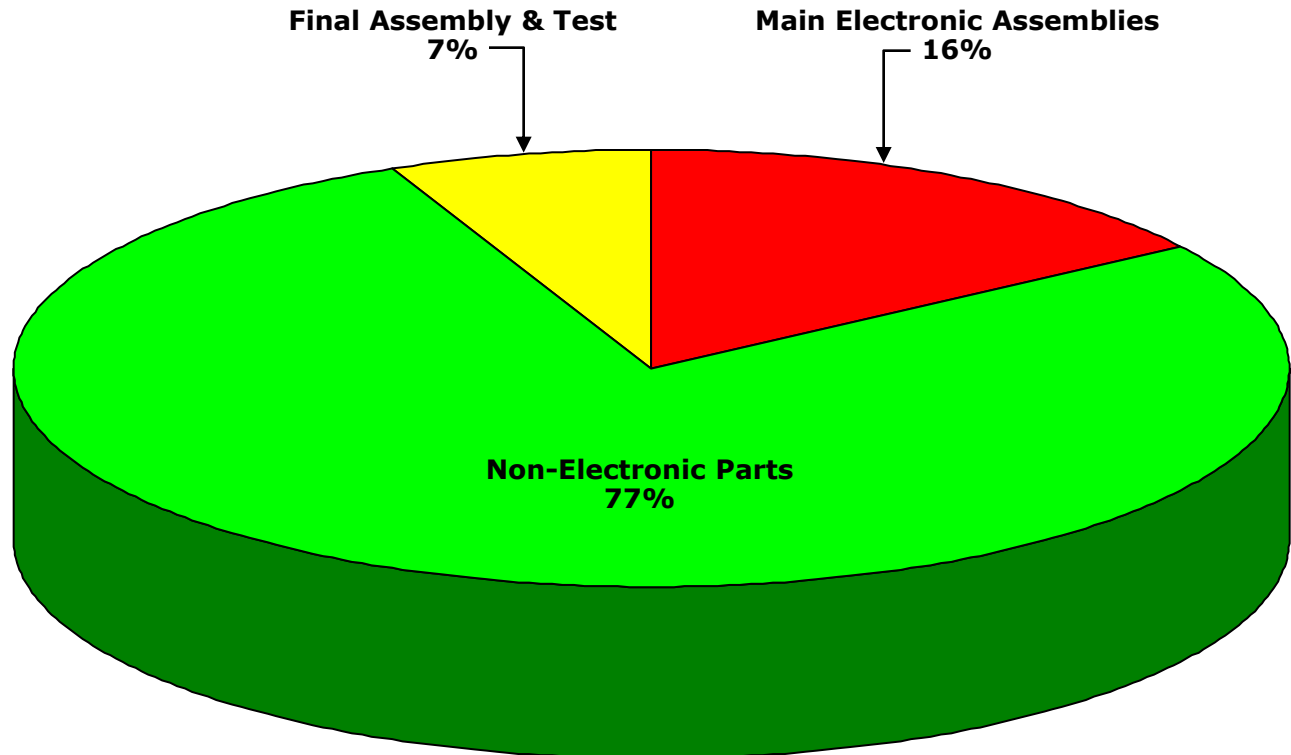
Subsystem	Part ID No.	Qty	Description	Fabrication Process	Material	Dimensions (mm)	Weight (grams)	Est'd Cost Each	Est'd Extended Cost	
Assembly	1	1	Heat Sink	Cast	Aluminum	93.2 x 48 x 42.95	129.40	2.620	2.620	
	2	1	Label	Die-Cut + Printed	Plastic	19.94 x 9.95 x 0.03	0.05	0.050	0.050	
Total		2						Estimated Cost		\$2.67

Final Ass'y Labor & Test Cost Estimate

Final Assembly & Test	
Made in	China
Number of parts	4
Est'd number of steps	12
Est'd time (seconds)	36
Est'd final assembly cost	\$ 0.03
Est'd final test cost	\$ 0.20

Estimated Cost Totals	
Main Electronic Assemblies	\$ 0.54
Non-Electronic Parts	\$ 2.67
Final Assembly & Test	\$ 0.23
Total	\$ 3.44

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.



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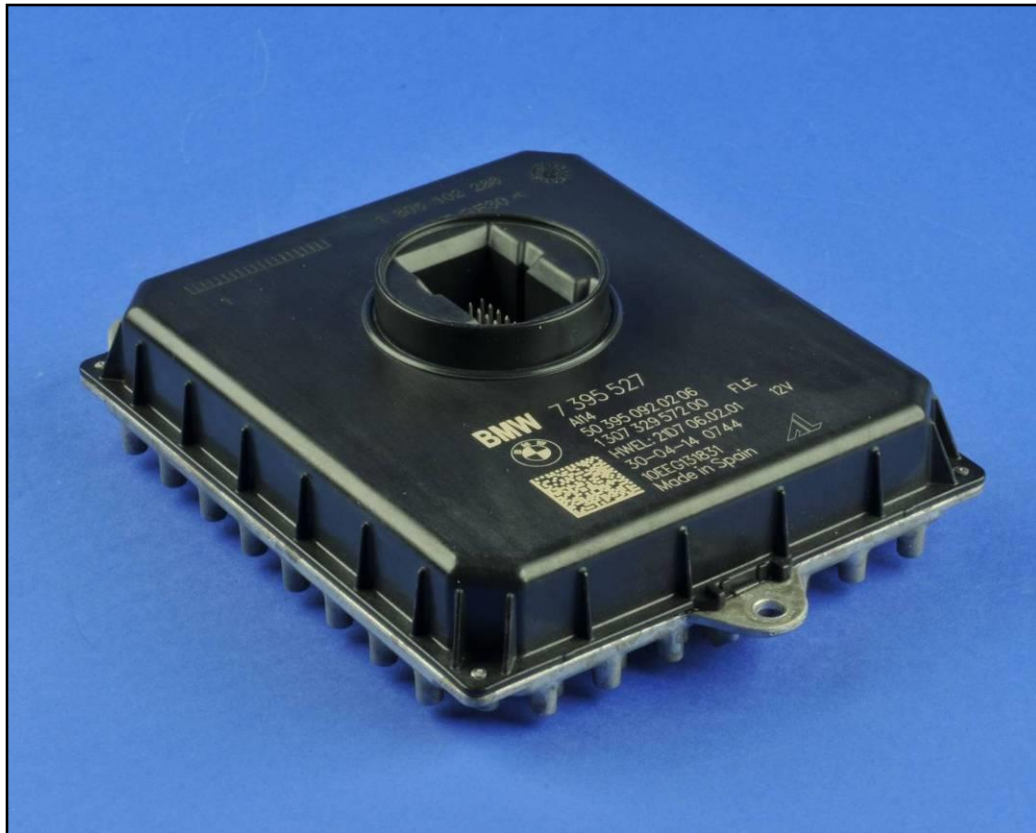
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Deep Dive Report

BMW i3 Headlamp Actuator Motor Controller

5210

Report #15900-021615-DHb



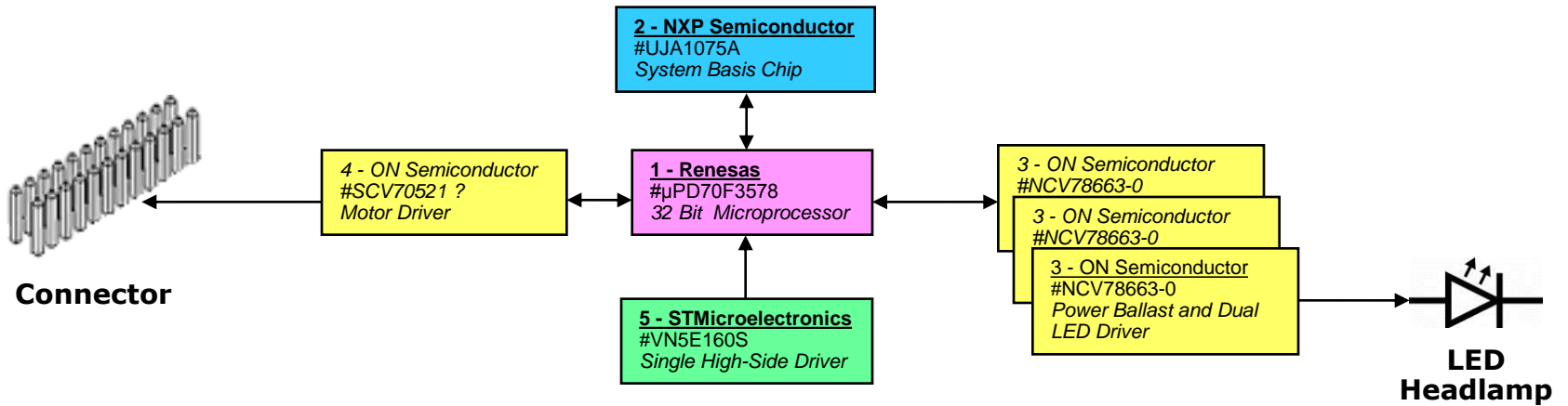
Product Description

This report concerns the Headlamp Actuator Motor Controller (model #7 395 527) for the 2014 BMW i3. This device controls the motor that allows the vehicle's headlights to move in order to improve the focus of the headlight beams on curving roads or rising and falling surfaces. It consists of a single printed circuit board (PCB) with a glass-filled plastic resin top enclosure and an aluminum alloy heat sink on the bottom. Key components include a Renesas # μ PD70F3578 32-bit microprocessor and an NXP Semiconductor #UJA1075A system basis chip. It also has a single 24-pin connector.

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Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	7	
Brand	BMW	IC Package Count	7	
Product Name & Model #	i3 Headlamp Actuator Motor Controller, 7 395 527	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	318.4 (Measured)	Retail Price		
Product Dimensions (mm)	148.64 x 107.15 x 39.15 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$33.77	
Product Features		Electronics Cost	\$27.50	
		Manufacturing Cost Breakdown		
Communications	CAN, LIN, SPI	Integrated Circuits	\$17.20	50.9%
Connector	(1) 24-Pin	Modules, Discretes & Connectors	\$6.28	18.6%
Processors	Renesas μ PD70F3578 32-Bit Microprocessor	Substrates	\$1.59	4.7%
		Component Insertion	\$1.64	4.9%
		Card Test	\$0.79	2.3%
		Non-Electronic Parts	\$5.78	17.1%
		Final Assembly & Test	\$0.49	1.5%
		Total	\$33.77	100.0%



? = Unconfirmed

Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.



BMW



7 395 527

A114

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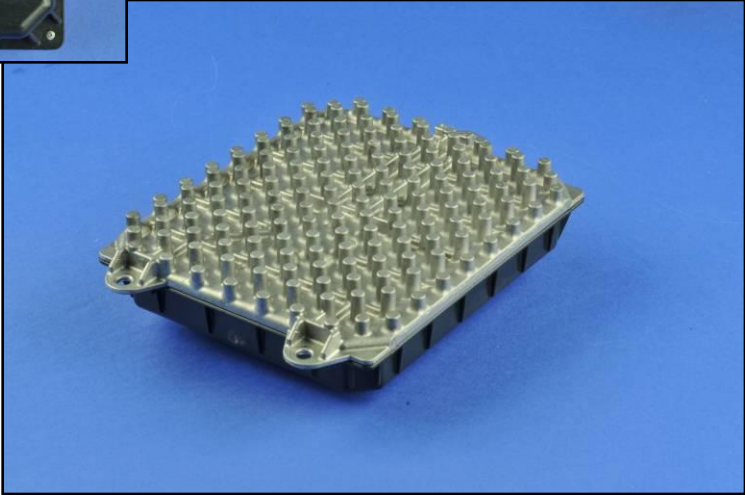
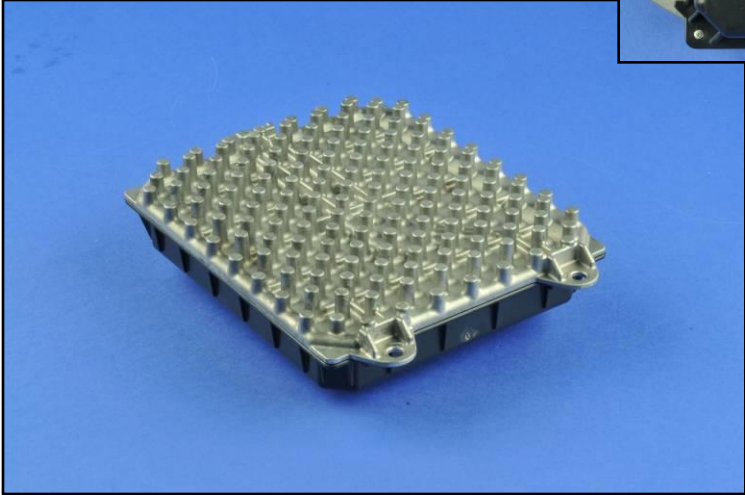
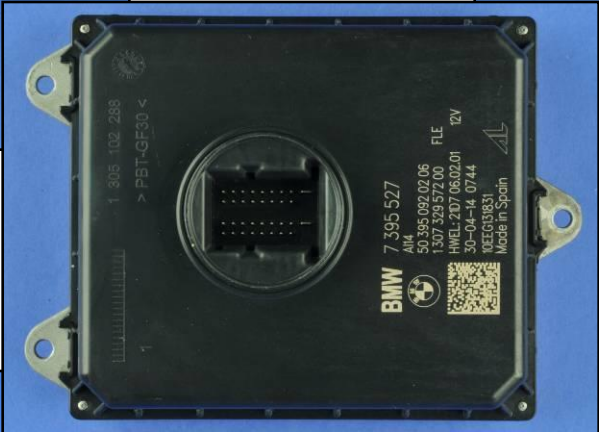
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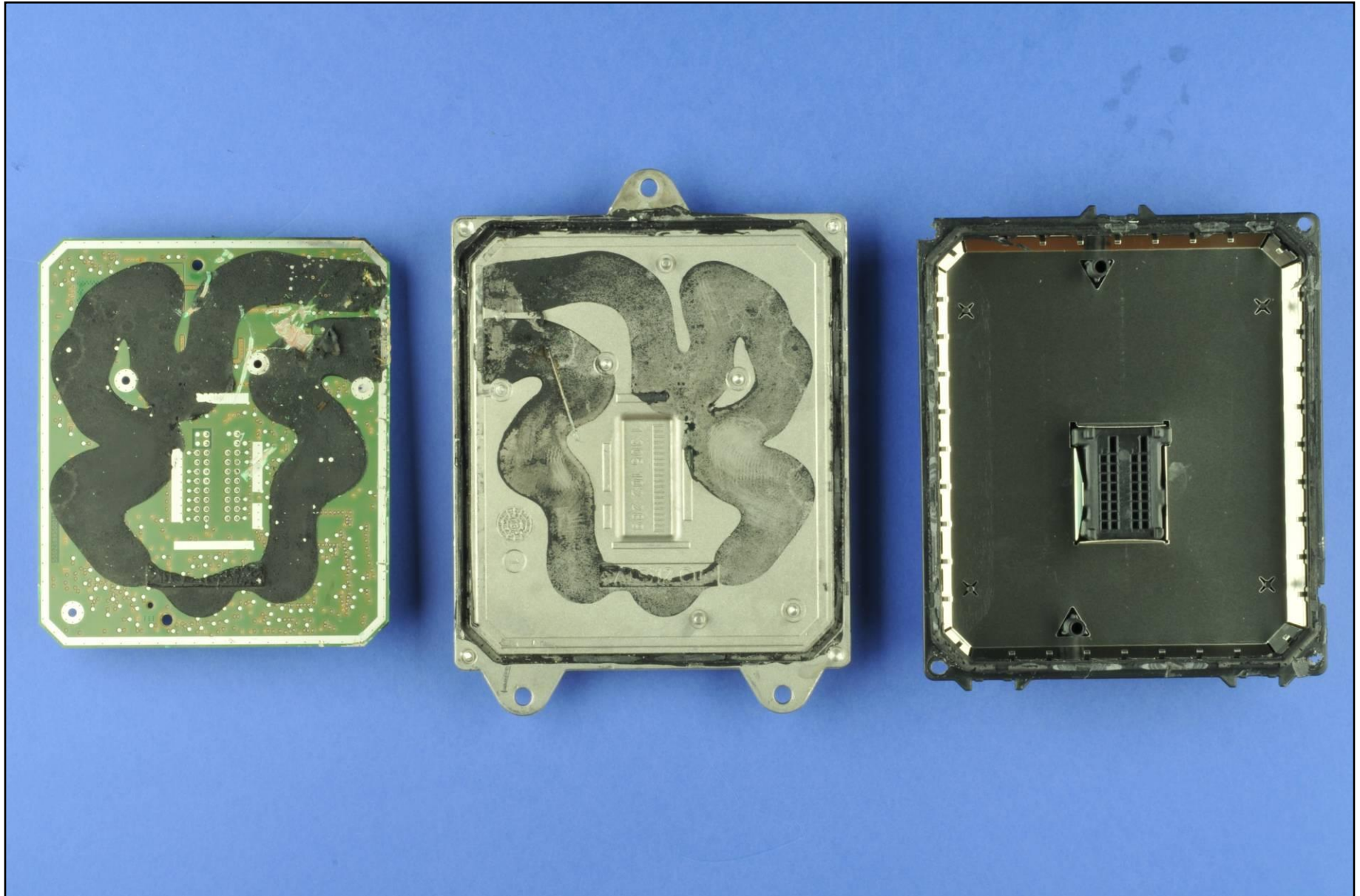
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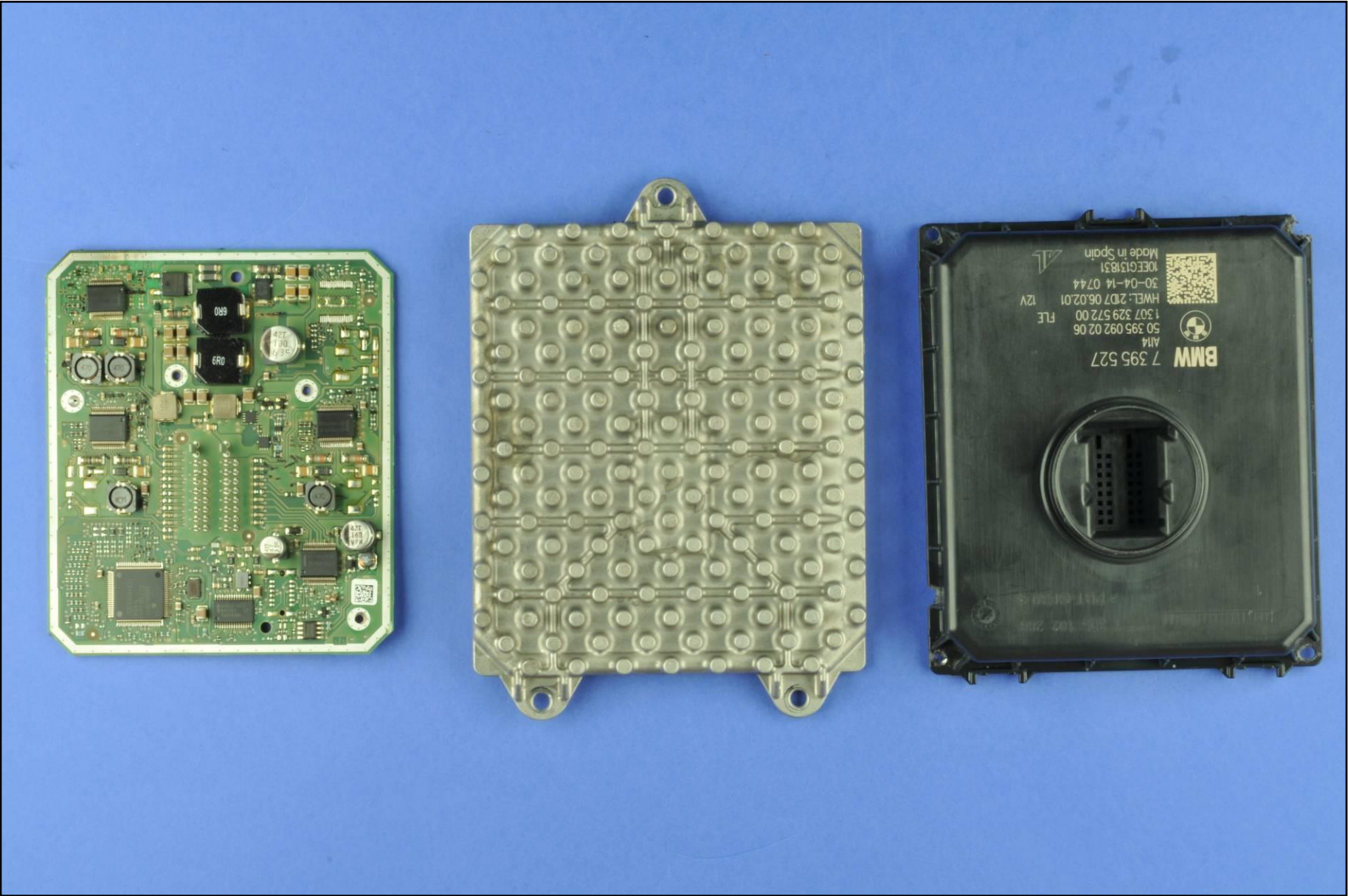
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Made in Spain

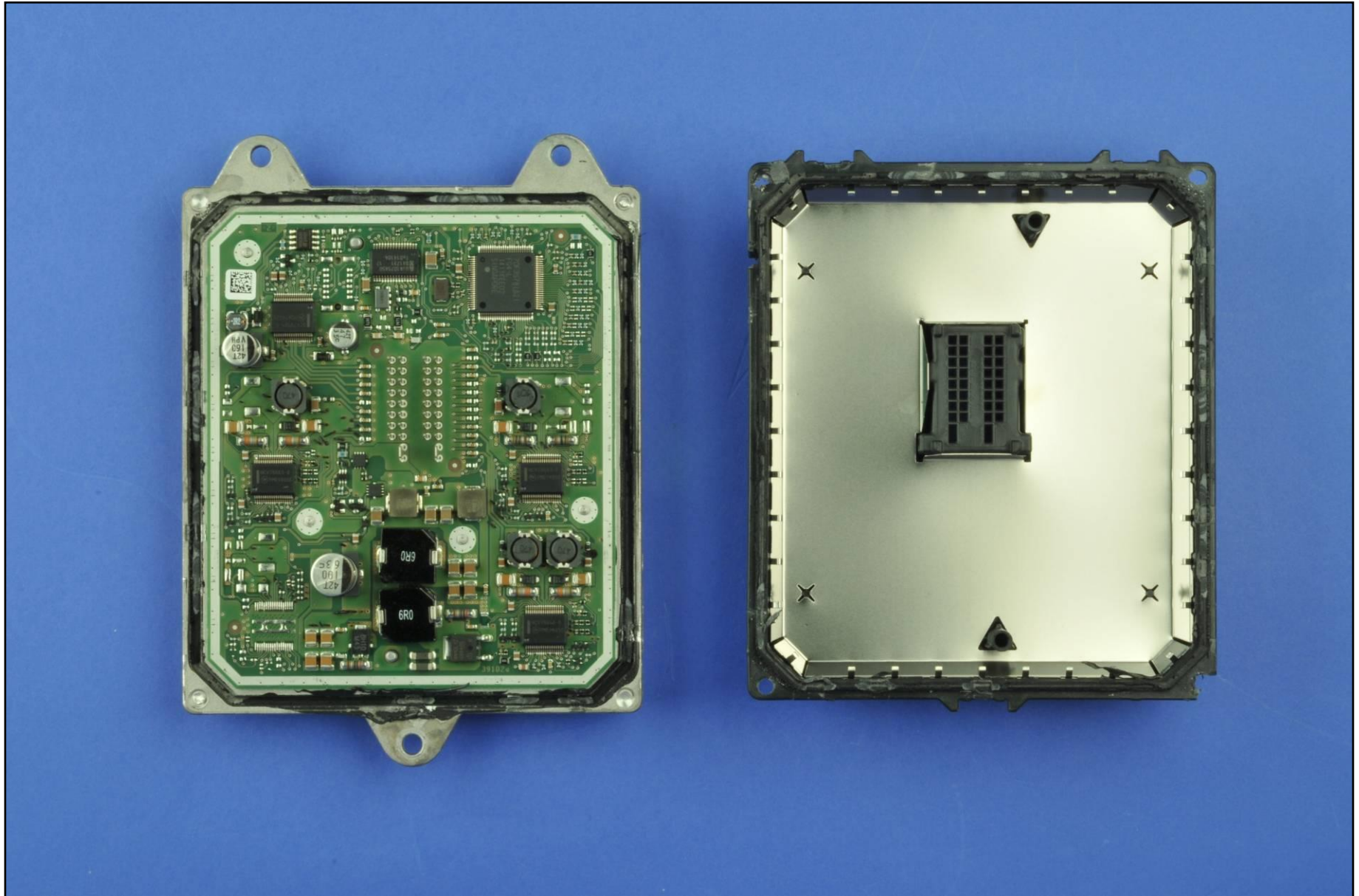


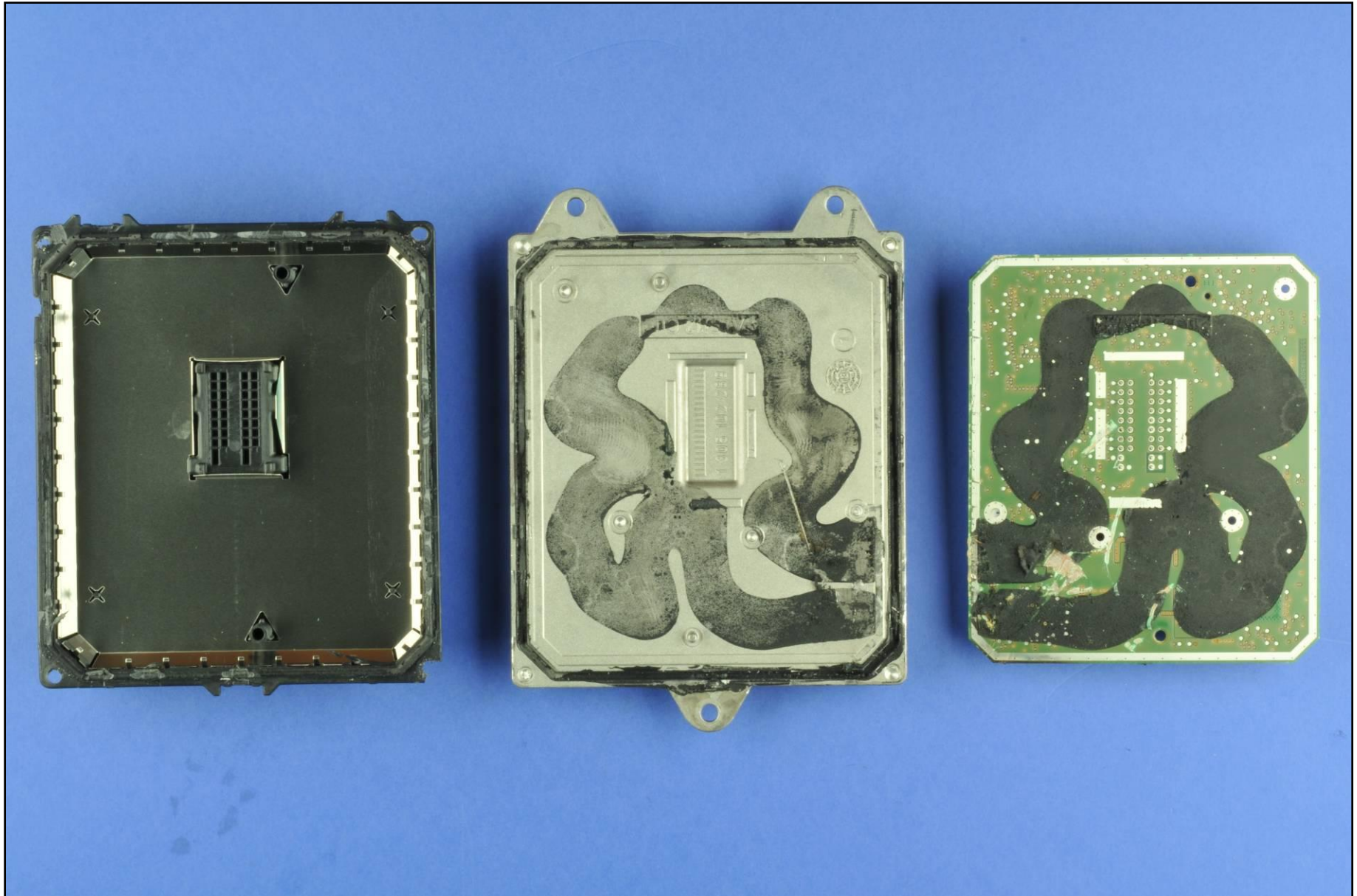




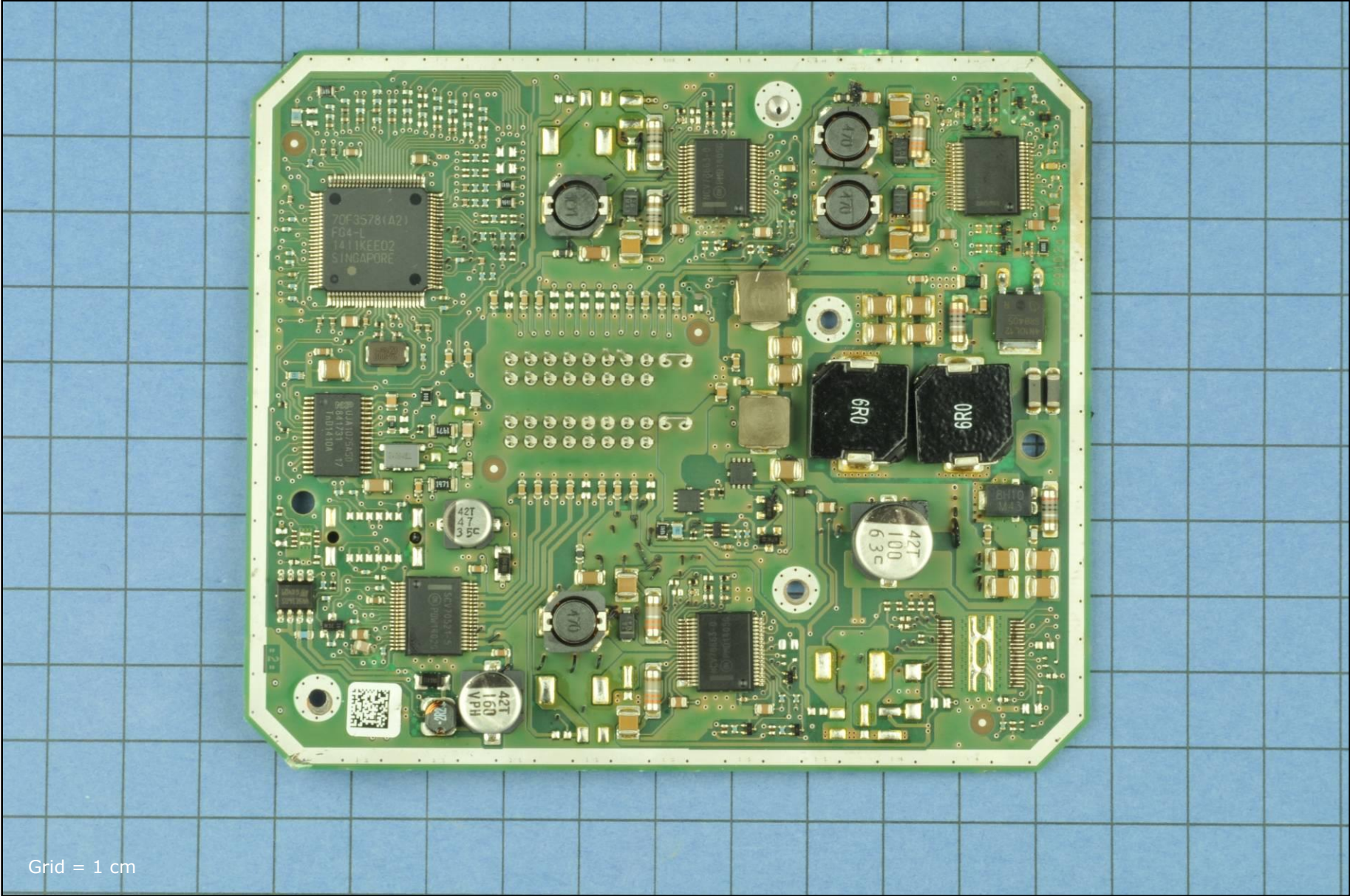




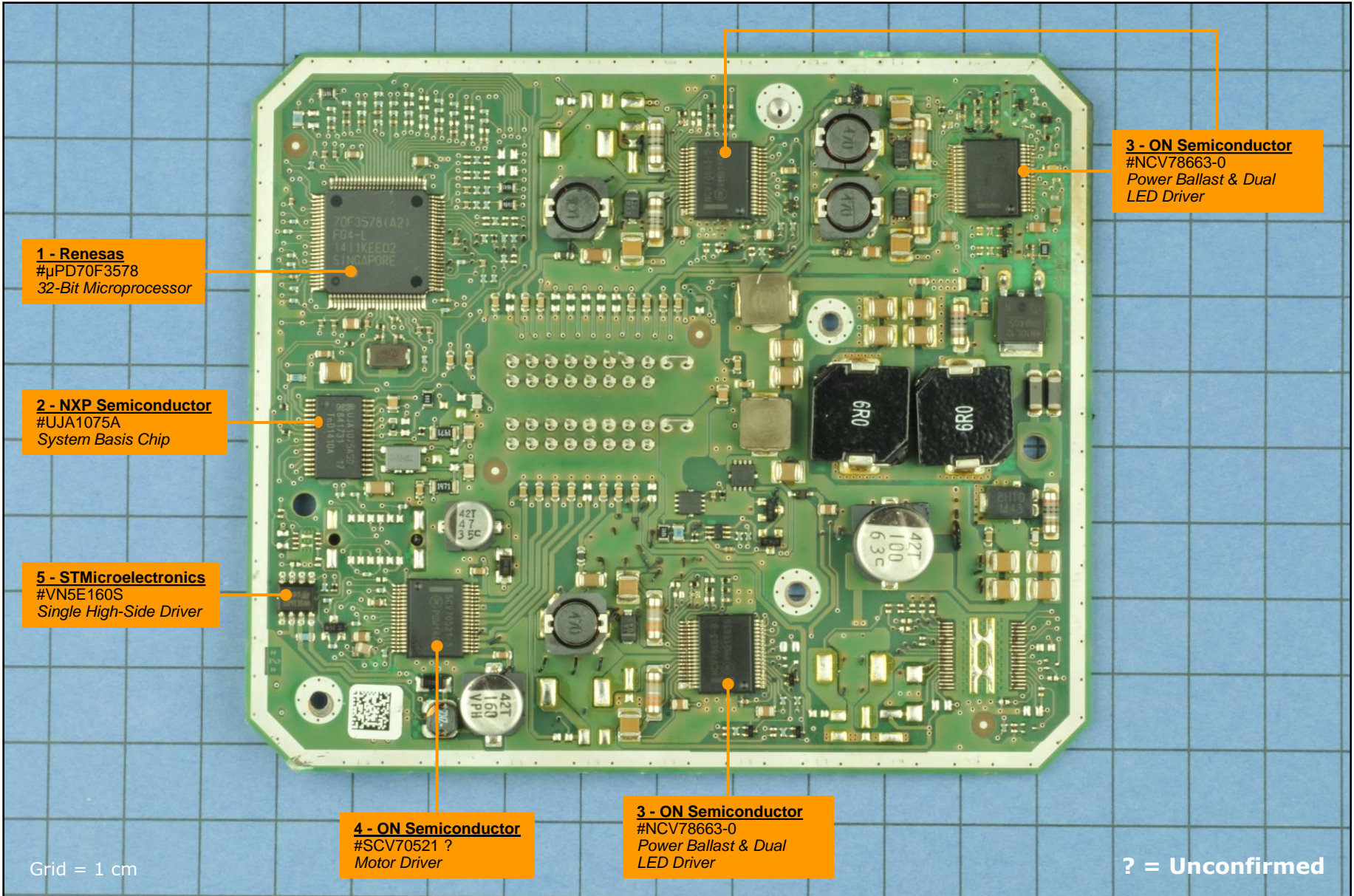




Main Board (Side 1)



Grid = 1 cm



1 - Renesas
#uPD70F3578
32-Bit Microprocessor

2 - NXP Semiconductor
#UJA1075A
System Basis Chip

5 - STMicroelectronics
#VN5E160S
Single High-Side Driver

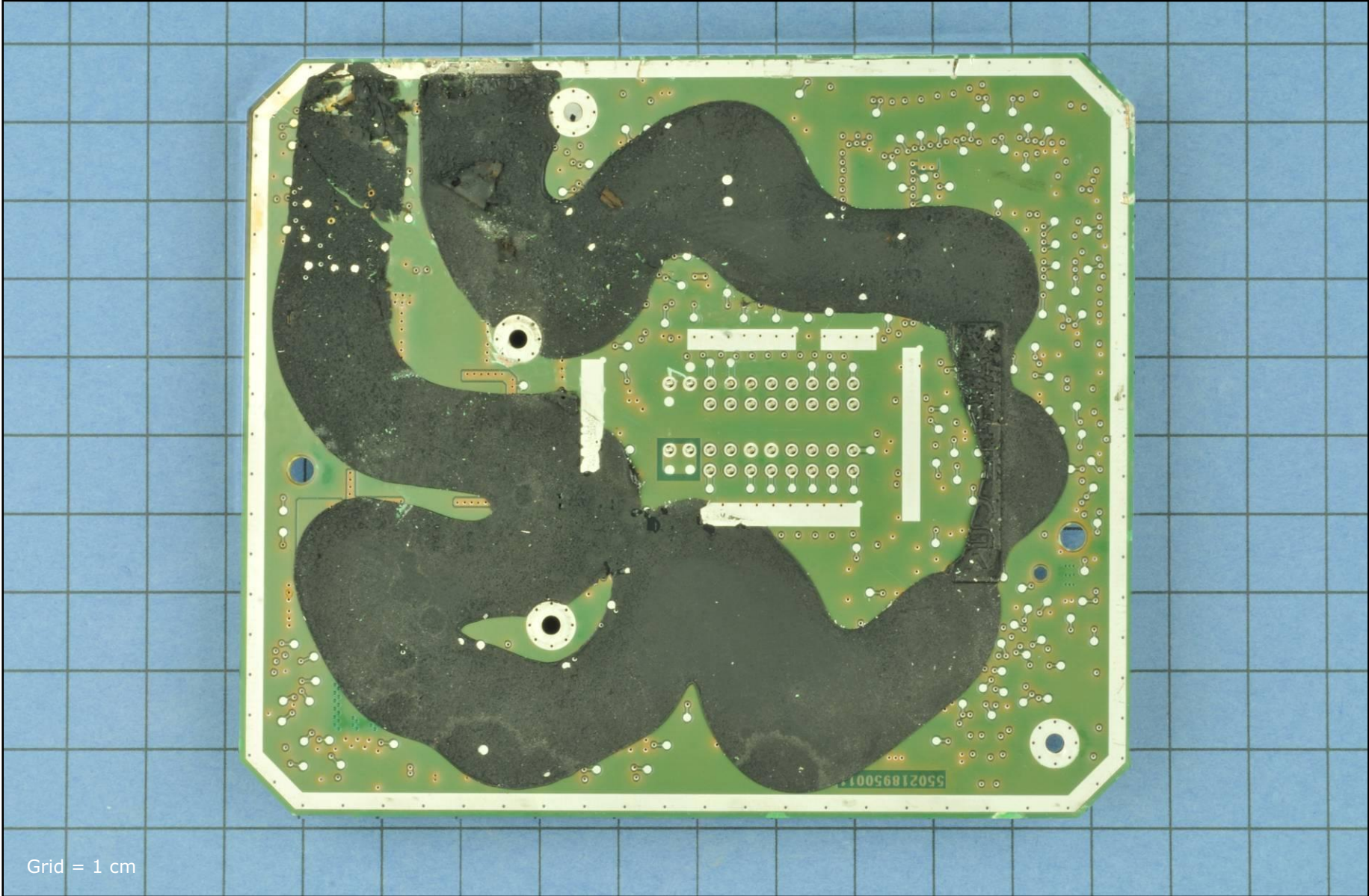
4 - ON Semiconductor
#SCV70521 ?
Motor Driver

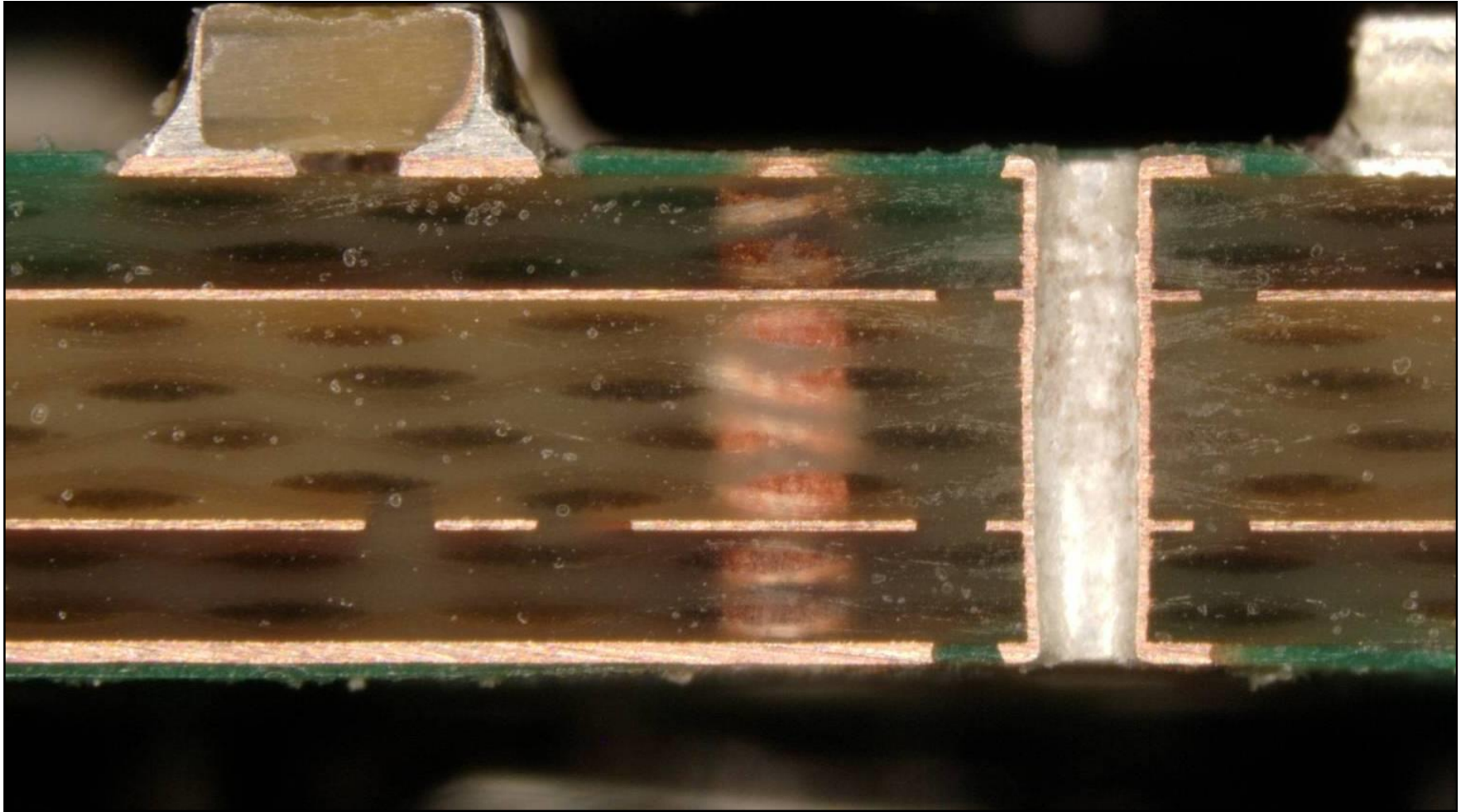
3 - ON Semiconductor
#NCV78663-0
Power Ballast & Dual LED Driver

3 - ON Semiconductor
#NCV78663-0
Power Ballast & Dual LED Driver

Grid = 1 cm

? = Unconfirmed





Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Unknown	FR4	4 Layer Conventional FR4 / HF	4	105.3	0.40	0.18	0.60	0.30			1.7	14.6	\$ 1.59

Location	Package Info									Die Info						Estimated Costs				
	Pkg Ref. #	Pkg Qty	Brand Name	Part Number	Pkg Description	Form	Pin Count	Length (mm)	Width (mm)	Height (mm)	Die Ref #	Die Qty	Brand Name	Part Number	Description	Length (mm)	Width (mm)	Each	Total	
Main Board, Side 1	1	1	Renesas	µPD70F3578	32-Bit Microprocessor	QFN	100	16.11	16.04	1.57	1.1	1	Renesas	D70F3578	32-Bit Microprocessor	3.65	3.62	\$ 5.250	\$ 5.250	
	2	1	NXP Semiconductor	UJA1075A	System Basis Chip	TSOP	32	10.96	8.02	1.10	2.1	1	NXP Semiconductor	cF1501A	System Basis Chip	4.07	3.09	\$ 2.564	\$ 2.564	
	3	3	ON Semiconductor	NCV78663-0	Power Ballast & Dual LED Driver	TSOP	36	10.72	10.48	2.32	3.1	1	ON Semiconductor	C383_0	Power Ballast & Dual LED Driver	3.43	3.12	\$ 2.264	\$ 6.793	
	4	1	ON Semiconductor	SCV70521 ?	Motor Driver	TSOP	36	10.61	10.38	2.31	4.1	1	ON Semiconductor	C521_0	Motor Driver	3.67	3.20	\$ 2.399	\$ 2.399	
	5	1	STMicroelectronics	VN5E160S	Single High-Side Driver	TSOP	8	4.98	4.84	1.63	5.1	1	STMicroelectronics	V1093.8098	Single High-Side Driver	2.30	1.31	\$ 0.196	\$ 0.196	
Totals		7					284					7								\$17.20

Note: Supplemental information, such as IC package & die markings, is included in the Excel Bill of Materials (BOM) spreadsheet.

Location	Qty	Brand Name	Part Number	Description	Package			Estimated Costs	
					Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Unknown	Unknown	Shielding: Shielding	1	114.28	98.38	\$ 0.720	\$ 0.720
	1	NDK	NX5032GA	Crystal: Ceramic	2	5.00	3.22	\$ 0.200	\$ 0.200
	1	Unknown	P008 J D4502	Fuse: SMT	2	3.08	1.53	\$ 0.040	\$ 0.040
TOTALS	3				5				\$0.96

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	2	Small Active	MOSFET	4824 RE03	3	3.28	3.18	\$0.090	\$0.180
	1	Small Active	MOSFET	8H10 M43	3	5.90	4.20	\$0.160	\$0.160
	1	Small Active	Diode, SMT	43 1Ps	6	2.30	2.06	\$0.015	\$0.015
	1	Small Active	MOSFET	Infineon logo 4N10L12 GRB405 R	3	9.92	6.46	\$0.350	\$0.350
	3	Small Active	Transistor, Small	Y2W 43, A7W 41, W3E 41	3	2.88	1.23	\$0.030	\$0.090
	11	Small Active	Transistor, Small	41, 3N	3	1.63	1.10	\$0.030	\$0.329
	1	Small Active	Diode, SMT	A7	2	1.94	1.22	\$0.015	\$0.015
	4	Small Active	Diode, SMT	26 M43	2	3.38	2.03	\$0.015	\$0.060
	2	Small Active	Diode, SMT	EDL51D	2	2.78	1.81	\$0.015	\$0.030
TOTALS	26				74				\$1.23

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 1	1	Capacitor	Electrolytic, Small	2	\$0.040	\$0.040
	8	Resistor	SMT, MELF	2	\$0.180	\$1.440
	222	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.888
	1	Coil	SMT, Small	2	\$0.020	\$0.020
	1	Coil	SMT, Small	2	\$0.040	\$0.040
	2	Coil	SMT, Small	2	\$0.050	\$0.100
	2	Coil	SMT, Small	2	\$0.270	\$0.540
	1	Coil	SMT	2	\$0.140	\$0.140
	3	Coil	SMT	2	\$0.140	\$0.420
	1	Capacitor	Electrolytic, Small	2	\$0.060	\$0.060
	1	Capacitor	Electrolytic, Small	2	\$0.040	\$0.040
	TOTALS	243			486	

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	2	Connector: Press Fit Tab	1	14.94	2.78	\$0.020	\$0.040
	32	Connector: Press Fit Pin	1	14.53	0.61	\$0.010	\$0.320
TOTALS	34		34				\$0.36

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	105.3	4	421.2	14.6	313	883	3.0	8.4	2.8	74.00
	System Totals	105.3	4	421.2		313	883	3.0	8.4	2.8	74.00

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 27.50	\$ 17.20	\$ 0.96	\$ 1.23	\$ 3.73	\$ 0.36	\$ 1.59	\$ 1.64	\$ 0.79
	System Totals	\$ 27.50	\$ 17.20	\$ 0.96	\$ 1.23	\$ 3.73	\$ 0.36	\$ 1.59	\$ 1.64	\$ 0.79

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	7	284	3	5	26	74	243	486	34	34	1196
	System Totals	7	284	3	5	26	74	243	486	34	34	1196

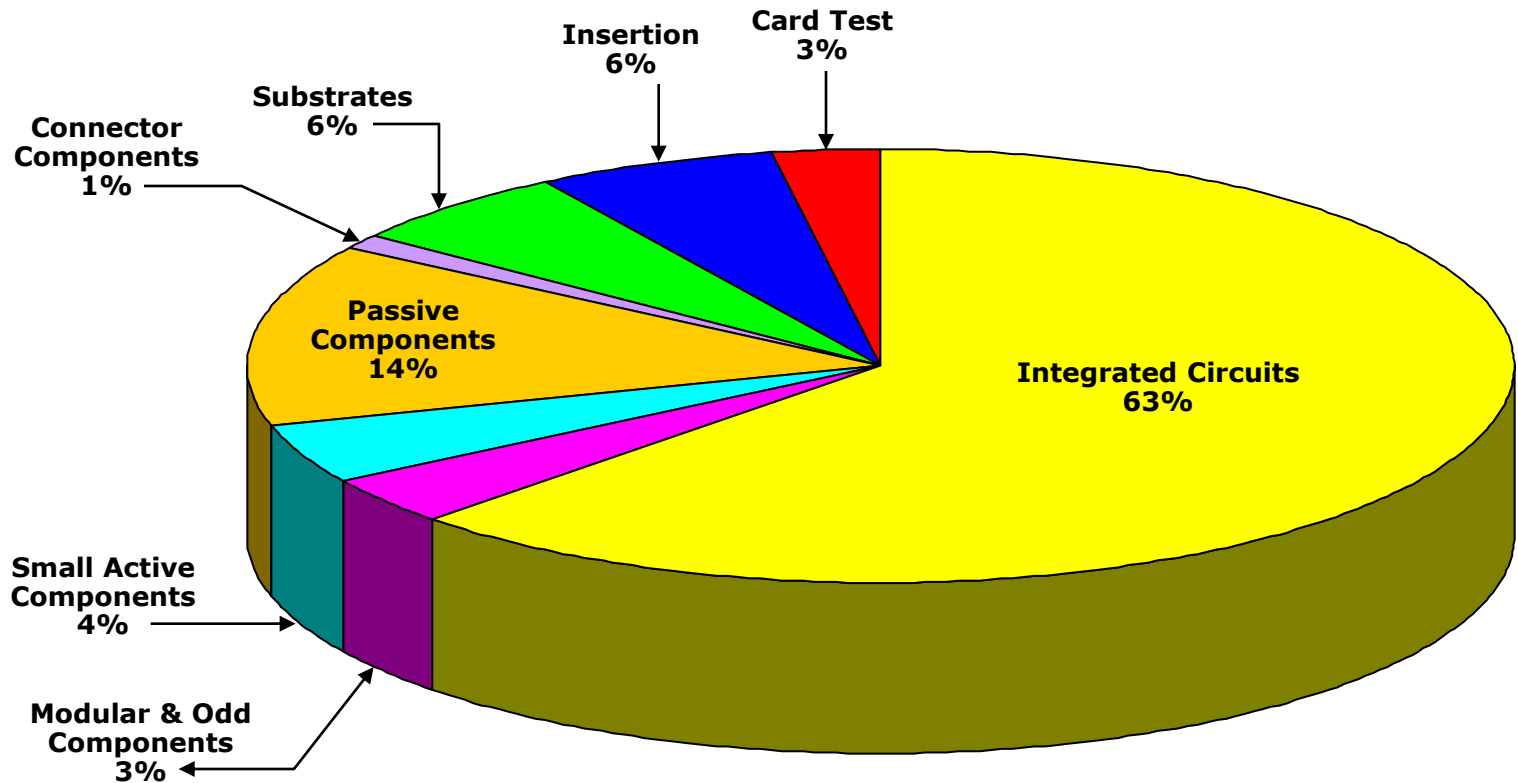
NOTE: Occasional inconsistencies in totals may be present due to rounding error.

IC Metrics											
General Area	Assembly Name	IC Die Count	IC Package Count	Number of Package Connections	Die Area (sq.mm)	Substrate Tiling Density (die area / substrate area)	Package Area (sq.mm)	Die Area/Package Area Ratio	Package Connections per sq.cm of Package Area	Volatile Memory (KBytes)	Non-Volatile Memory (KBytes)
Main Electronics	Main Board	7	7	284	72.7	0.01	817.6	0.09	34.7	0	0
	System Totals	7	7	284	72.7		817.6	0.09	34.7	0	0

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

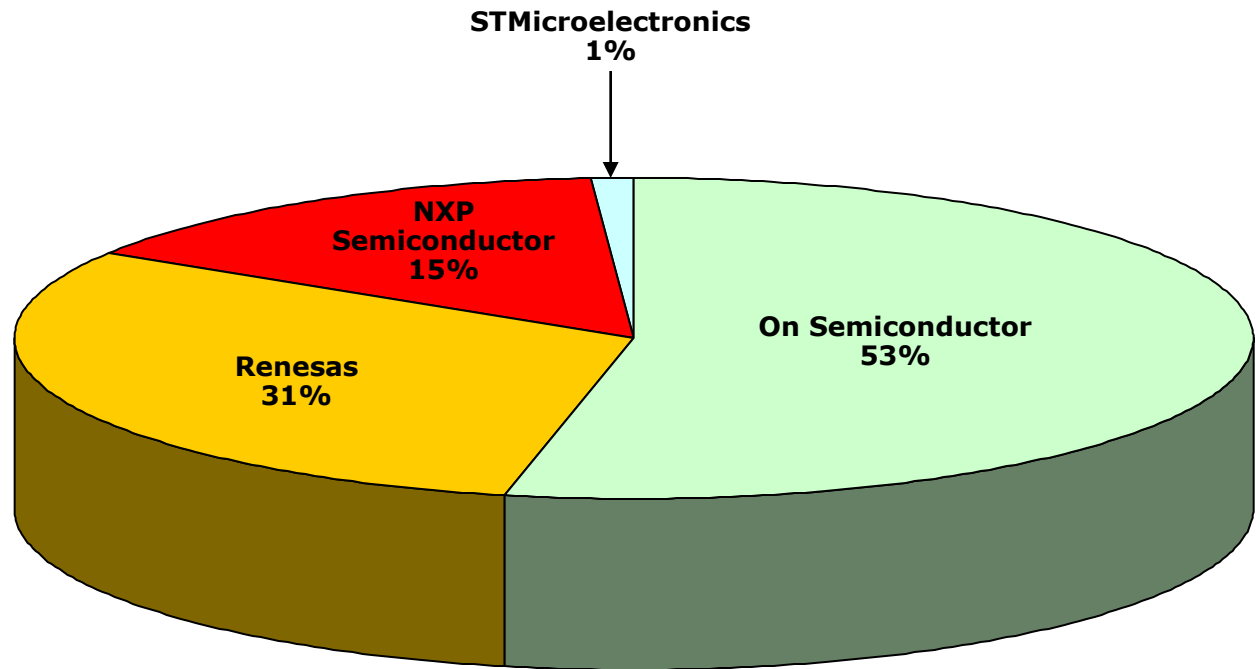
**Estimated Cost
of Electronics**

\$27.50



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Pkg. Brand	Cost
ON Semiconductor	\$9.19
Renesas	\$5.25
NXP Semiconductor	\$2.56
STMicroelectronics	\$0.20



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

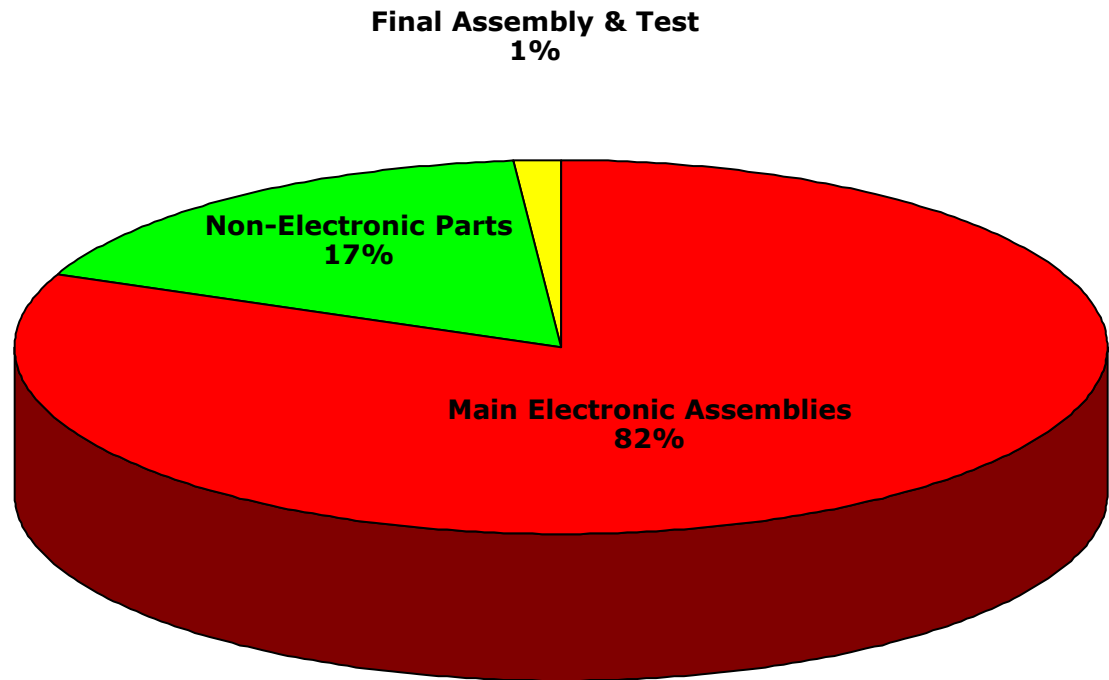
Subsystem	Part ID No.	Qty	Description	Fabrication Process	Material	Dimensions (mm)	Weight (grams)	Est'd Cost Each	Est'd Extended Cost
Enclosures	1	1	Top	Molded + Printed	PBT + GF30	129.12 x 106.86 x 29.19	53.50	2.610	2.610
	2	1	Heat Sink	Cast	ALSi12Cu	148.64 x 107.4 x 17.11	167.60	3.160	3.160
Miscellaneous	3	1	Label, Barcode	Die-Cut + Printed	Plastic + Adhesive	7.56 x 7.44 x 0.05	0.05	0.010	0.010
Total	3							Estimated Cost	\$5.78

Final Ass'y Labor & Test Cost Estimate

Final Assembly & Test	
Made in	Spain
Number of parts	4
Est'd number of steps	13
Est'd time (seconds)	39
Est'd final assembly cost	\$ 0.29
Est'd final test cost	\$ 0.20

Estimated Cost Totals	
Main Electronic Assemblies	\$ 27.50
Non-Electronic Parts	\$ 5.78
Final Assembly & Test	\$ 0.49
Total	\$ 33.77

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.



Cost Estimation Process

(Overview & Discussion)

Cost modeling is tricky business. Multiple variables affect the actual production costs a manufacturer will experience, including development expenses, unit volumes, supply-and-demand in component markets, die yield-curve maturity, OEM purchasing power, and even variations in accounting practices. Different cost modeling methods employ different assumptions about how to handle these and other variables, but we can identify two basic approaches: that which seeks to track short-term variations in the inputs to the production process, and that which strives to maintain comparability of the output of the model across product families and over time.

TechInsights' philosophy in cost modeling is to emphasize consistency across products and comparability over time, rather than to track short-term fluctuations. During the past eight years, we have developed an estimation process that, while necessarily lacking an insider's knowledge of the cost factors that impact any one manufacturer, is reasonably accurate in its prediction of unit costs in high-volume production environments. We do not claim that the model will produce the "right" answer for your firm's environment. However, TechInsights does give customers a key analytical tool with a complete set of data in our Bill of Materials (BOM). The BOM allows readers to 1) scrutinize the assumptions behind our cost model and 2) modify the results based on substitution of their own component cost estimates where they have better information based on inside knowledge.

Our estimation process decomposes overall system cost into three major categories: Electronics, Mechanical, and Final Assembly. We begin by creating a complete electronics bill-of-materials (BOM). Each component from the largest ASIC to the smallest discrete resistor is entered into a BOM table with identifying attributes such as size, pitch, I/O count, package type, manufacturer, part number, estimated placement cost, and die size (if the component is an IC). Integrated circuit costs are calculated from measured die area. Using assumptions for wafer size, process type, number of die per wafer, defect density, and profit margin in combination with die area, an estimate of semiconductor cost is derived. Costs for discrete components and interconnect are derived from assumption tables which relate BOM line items to specific cost estimates by component type and estimates for part placement costs are included. For LCD display costs, we employ a model which tabulates expected cost from measurements of glass area, LCD type, and total pixel resolution. When market costs are available from alternative sources, LCD panel costs are taken from and referenced to these sources.

Costs of non-electronic components such as molded plastic enclosures and metallic components are measured in terms of weight, size, thickness, type of material, and complexity to arrive at their estimated cost. Other system items such as optics, antennae, batteries and displays are costed from a set of assumption tables derived from a combination of industry data, average high volume costs, and external sources. For final assembly, we re-build the torn-down product, tabulating stepwise assembly times as the reconstruction proceeds, to reach a total assembly time. Using a labor rate assumption for the country of origin, we then calculate final assembly cost.

The three major categories for system cost contributors can be broken down into the subcategories of ICs, other electronics parts, displays, batteries (as appropriate), camera modules, electronics assembly, non-electronic elements, and final assembly. By adding the cost estimates for each of these subcategories, an overall estimated cost is derived for the system under evaluation. Product packaging and accessories (CDs, cables, etc.) are also documented and estimated for their contribution to total cost as appropriate.

We believe our cost estimates generally fall within 15 percent of the "right answer," which itself can vary depending on the market and OEM-specific factors mentioned earlier. While the TechInsights cost model is imperfect, it yields important insights into technology and business dynamics along with good first-order contributions to system cost by component type. Additionally, the consistency of approach and gradual modification to assumptions (smoothing out frequently-shifting pricing factors) hopefully yields a credible, but user-modifiable, view of OEM high volume cost-to-produce.

Please feel free to contact us at support@techinsights.com with any comments, questions, or proposed corrections with respect to our cost estimates. We welcome your input.

In our product teardowns, we gather a series of metrics for product profiling and comparison. Some metrics focus on system characteristics such as total silicon area, total system semiconductor storage capacity, and total connection count. Other metrics reflect more subtle aspects of electronics assembly such as connection density, average component I/O count, and silicon tiling density. Taken as a whole, the metrics allow deeper comparison and benchmarking across multiple disciplines and multiple products. Key metrics we gather on products are described below along with their definitions and what they tend to say about the system under study. Most metrics can be used both in comparing similar products for benchmarking purposes or for quantifying differences in levels of complexity between dissimilar product types. Data fall into two categories; either “raw” measured data or ratios of these measured data sets.

Total Silicon Area : This metric describes the total area of silicon as measured from X-ray or direct measurement of ICs. The area is an expression of the enclosed bare die area and excludes packaging area. The aggregate silicon area is a good benchmark to show how integrated a design might be when making comparisons to similar systems. Total silicon area also reflects the major cost driver for most systems we examine.

Silicon Tiling Density : Ratio of Total Silicon Area to total printed circuit board “projected” area (i.e. the simple board area and not the cumulative surface area of both sides of the board). This metric directly reflects the level of efficiency and aggressiveness in integrated circuit packing and placement. Single digit Silicon Tiling Density is typical but silicon coverage of 10% - 20% has been seen in some of the most advanced products we have examined. Higher Tiling Densities often correspond with the use of chip scale packaging (CSPs) or other small form-factor IC packaging technologies. High density circuit boards are also often a supporting technology.

Number of Parts : Total component count including ICs, passives, modules, connectors, etc., each separated out in our reporting.

Number of Connections : The total number of connections corresponds to the total number of interconnects introduced by the aggregate component set and reflects any electrical connection observed (solder joints, adhesive interconnect, or connector terminal interfaces).

Opportunity Count : Opportunity Count is the total number of parts plus the total number of connections; the name reflects that each of these constituent elements represents an opportunity for failure. A high opportunity count means more complex and riskier electronics assembly.

Average Pin Count (APC) : Ratio of total number of component terminals to total number of parts, at the system level. This metric reflects the ‘average’ terminal complexity of the components and often provide a signature of integration level and/or “digital-ness” of the overall product. Low APCs reflect a high number of discrettes or other low-pincount devices often characteristic of analog circuitry. Conversely, high APCs are characteristic of highly integrated, high-pincount assemblies, often those composed largely of digital integrated circuits.

Connection Density : This metric is a ratio of the total Number of Connections to total printed circuit board assembly area, in units of connections per sq. inch. The metric provides data related to the Silicon Tiling Density above, but with an emphasis on complexity of I/O interconnect. For example, with a fixed Connection Density, high tiling density of low-pincount memory chips is more readily achieved than comparable silicon tiling of high pincount logic.

Part Density : This metric is a ratio of the total Number of Parts to total printed circuit board assembly area, in units of components per sq. inch. The metric provides data related to the Silicon Tiling Density and Connection Density as described above, but with an emphasis on density and complexity of component packing efficiency. For example, low Part Density of high-pincount devices can pose an equal challenge in Connection Density to high Part Density of low-pincount devices. High Part Density does reflect challenges in surface mount assembly in terms of (typically) precision of placement, number of placements, and engineering of part clearances.

Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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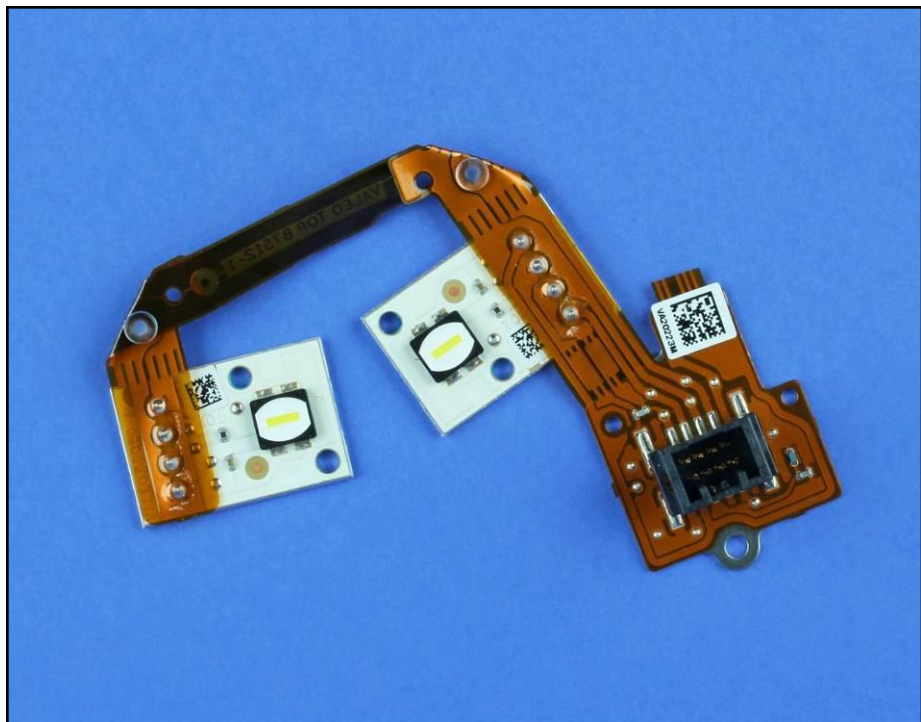
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Deep Dive Report

BMW i3 Fan Circuit, Printed Circuit Board

5171

Report #15900-150225-PKb



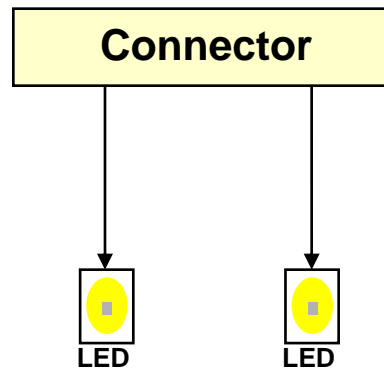
Product Description:

This report pertains to the Board Assembly from the fan assembly for the 2014 BMW i3. It contains a connector, flex cable, and two aluminum boards, and two LEDs.

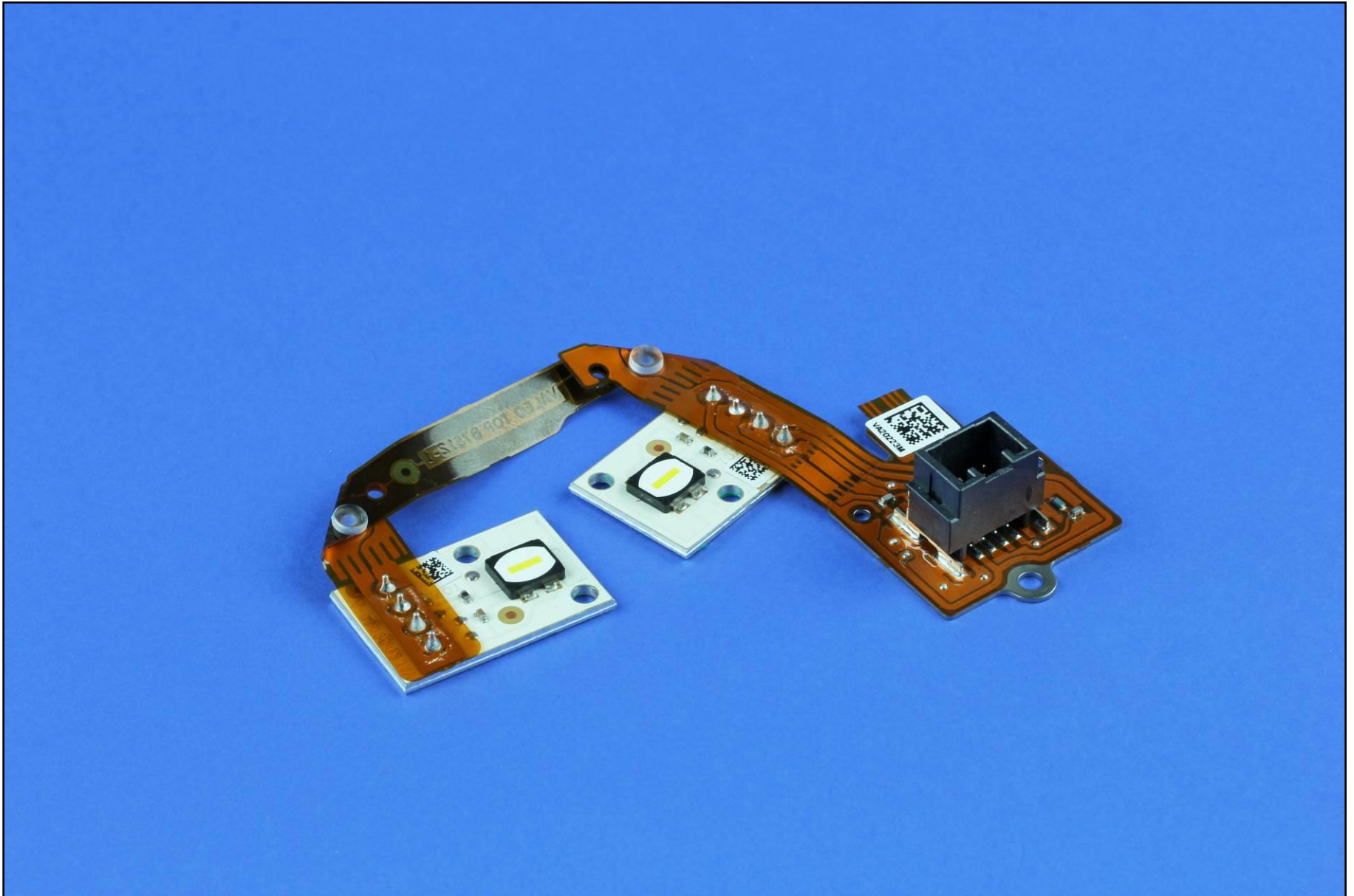
DISCLAIMER: All company names, product names, and service names mentioned are used for identification purposes only and may be registered trademarks, trademarks, or service marks of their respective owners. All analyses are done without participation, authorization, or endorsement of the manufacturer. Any cost analyses presented in this material are estimates prepared by TechInsights from generally available data. While TechInsights believes that these estimates reflect the probable costs, the actual producer did not supply the data, and therefore the actual costs may be different from these estimates. Furthermore, TechInsights extends no warranties with respect to any information in this document, and shall bear no liability whatsoever for the use of the information.

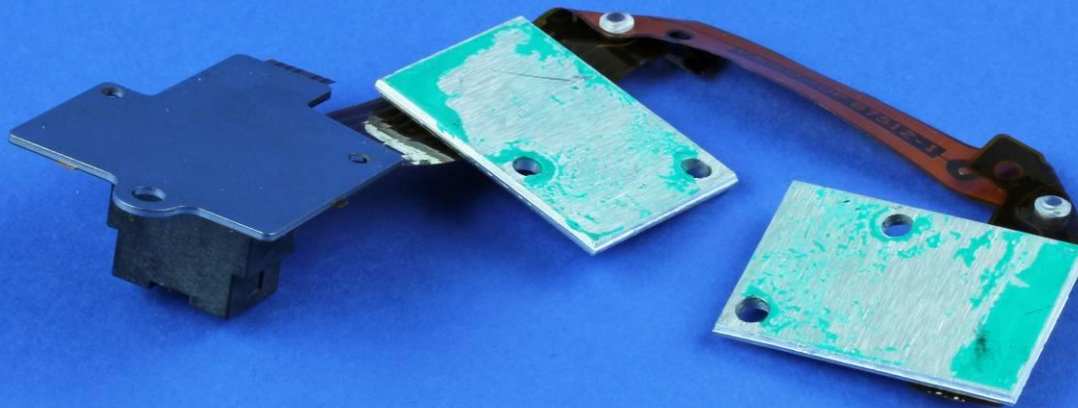
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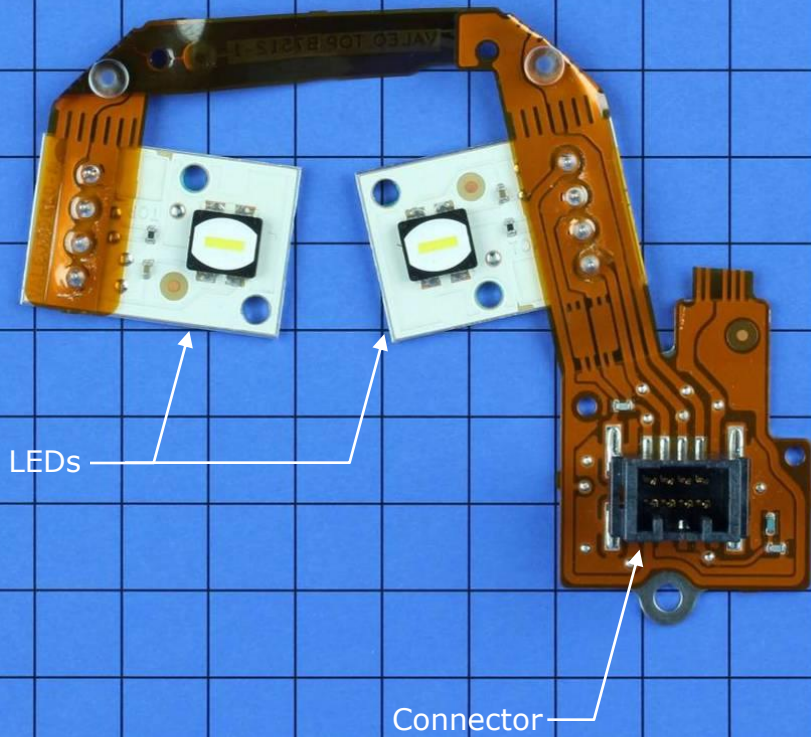
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 Board Asm, Fan Asm	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	13.8 (Measured)	Retail Price		
Product Dimensions	92.1 x 71.5 x 13.6 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$3.77	
Product Features		Electronics Cost	\$3.39	
		Manufacturing Cost Breakdown		
Lighting	2 LEDs	Modules, Discretes & Connectors	\$1.20	31.8%
		Substrates	\$1.97	52.3%
		Component Insertion	\$0.06	1.6%
		Card Test	\$0.17	4.5%
		Non-Electronic Parts	\$0.12	3.2%
		Final Assembly & Test	\$0.25	6.6%
		Total	\$3.77	100.0%



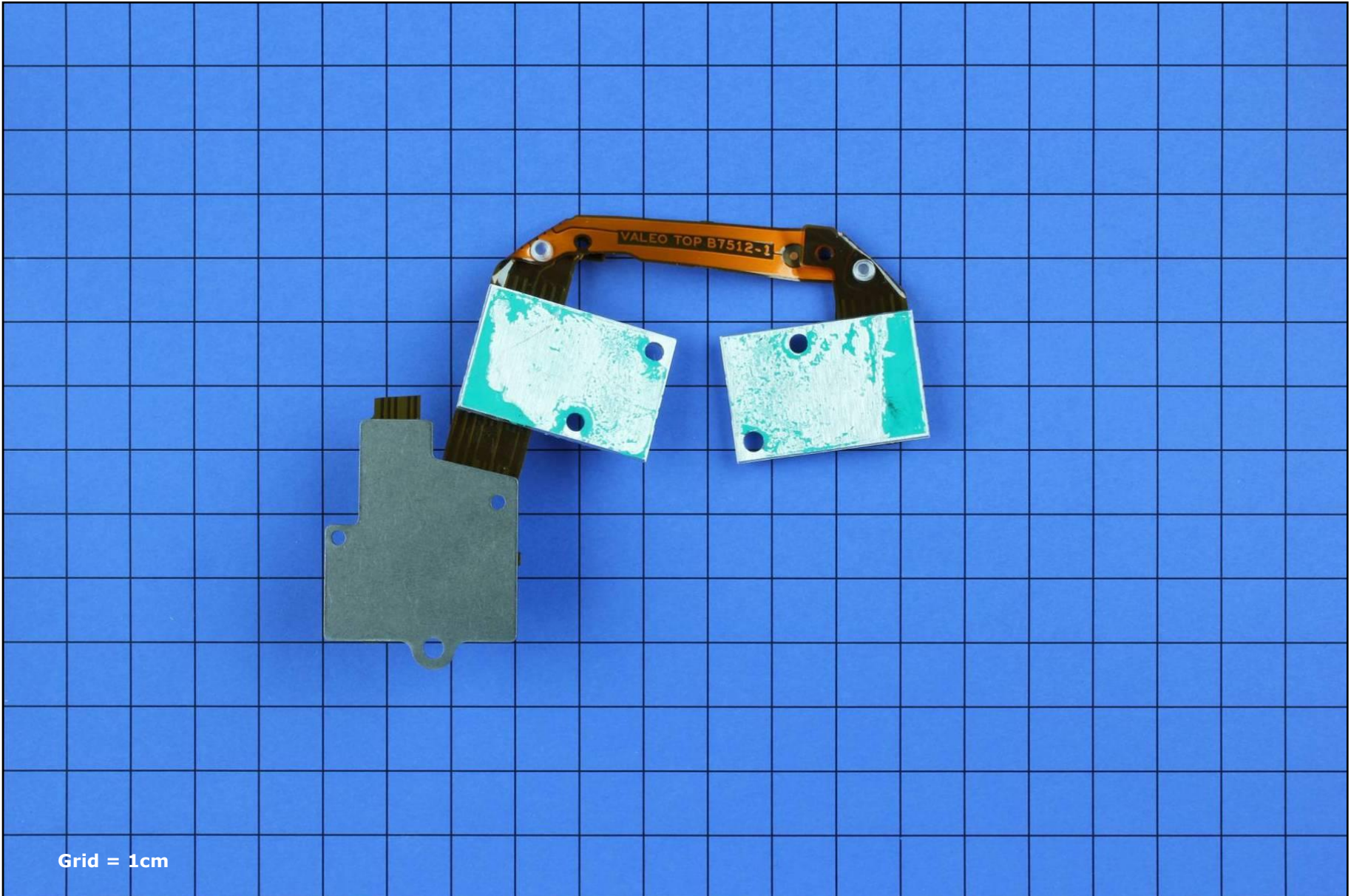
Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.



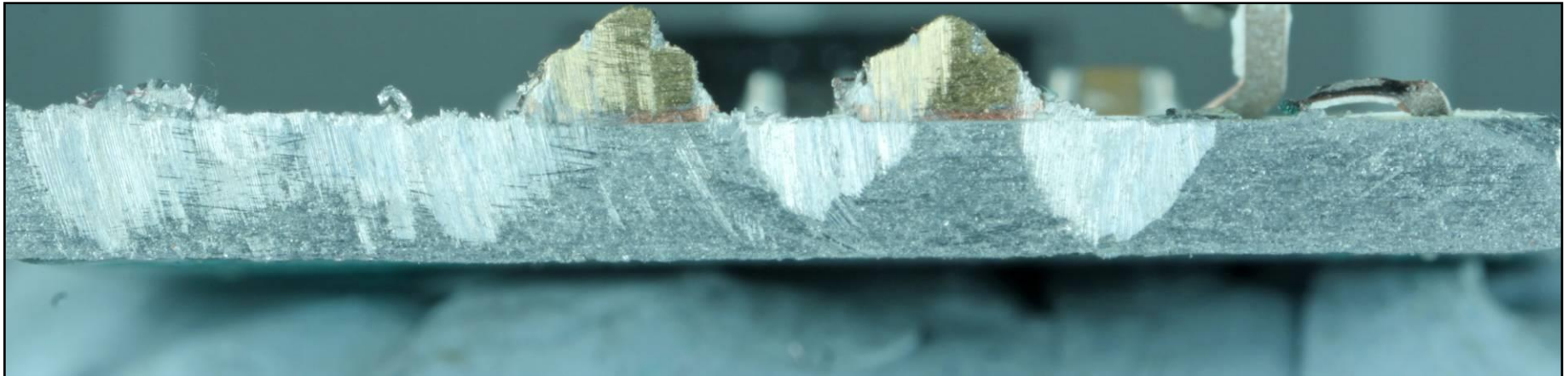




Grid = 1cm



Grid = 1cm



Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Flex Board	Valeo	Polyimide	1 Layer flex	1	21.2	1.00	0.50					0.1	4.6	\$ 1.91
LED board 1	Valeo	Aluminum	Other	1	6.1	1.40	0.50					1.6	5.6	\$ 0.03
LED board 2	Valeo	Aluminum	Other	1	6.1	1.40	0.50					1.6	5.6	\$ 0.03

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
LED board 1, Side 1	1	Small Active	LED, Single	None	4	8.50	8.00	\$0.100	\$0.100
LED board 2, Side 1	1	Small Active	LED, Single	None	4	8.50	8.00	\$0.100	\$0.100
TOTALS	2				8				\$0.20

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Flex Board, Side 1	3	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.012
LED board 1, Side 1	2	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.008
LED board 2, Side 1	2	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.008
TOTALS	7			14		\$0.03

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Flex Board, Side 1	1	Bd to Bd: Male	8	15.50	12.80	\$0.960	\$0.960
TOTALS	1		8				\$0.96

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq. cm)	Metal Layers	Circuit Area (sq. cm)	Routing Density (cm of routing per sq. cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq. cm)	Connection Density (Connections/sq. cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Flex Board	21.2	1	21.2	4.6	4	14	0.2	0.7	3.5	7.50
Main Electronics	LED board 1	6.1	1	6.1	5.6	3	8	0.5	1.3	2.7	3.00
Main Electronics	LED board 2	6.1	1	6.1	5.6	3	8	0.5	1.3	2.7	3.00
	System Totals	33.4	3	33.4		10	30	0.3	0.9	3.0	13.50

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Flex Board	\$ 3.07	\$ -	\$ -	\$ -	\$ 0.01	\$ 0.96	\$ 1.91	\$ 0.03	\$ 0.15
Main Electronics	LED board 1	\$ 0.16	\$ -	\$ -	\$ 0.10	\$ 0.01	\$ -	\$ 0.03	\$ 0.01	\$ 0.01
Main Electronics	LED board 2	\$ 0.16	\$ -	\$ -	\$ 0.10	\$ 0.01	\$ -	\$ 0.03	\$ 0.01	\$ 0.01
	System Totals	\$ 3.39	\$ -	\$ -	\$ 0.20	\$ 0.03	\$ 0.96	\$ 1.97	\$ 0.06	\$ 0.17

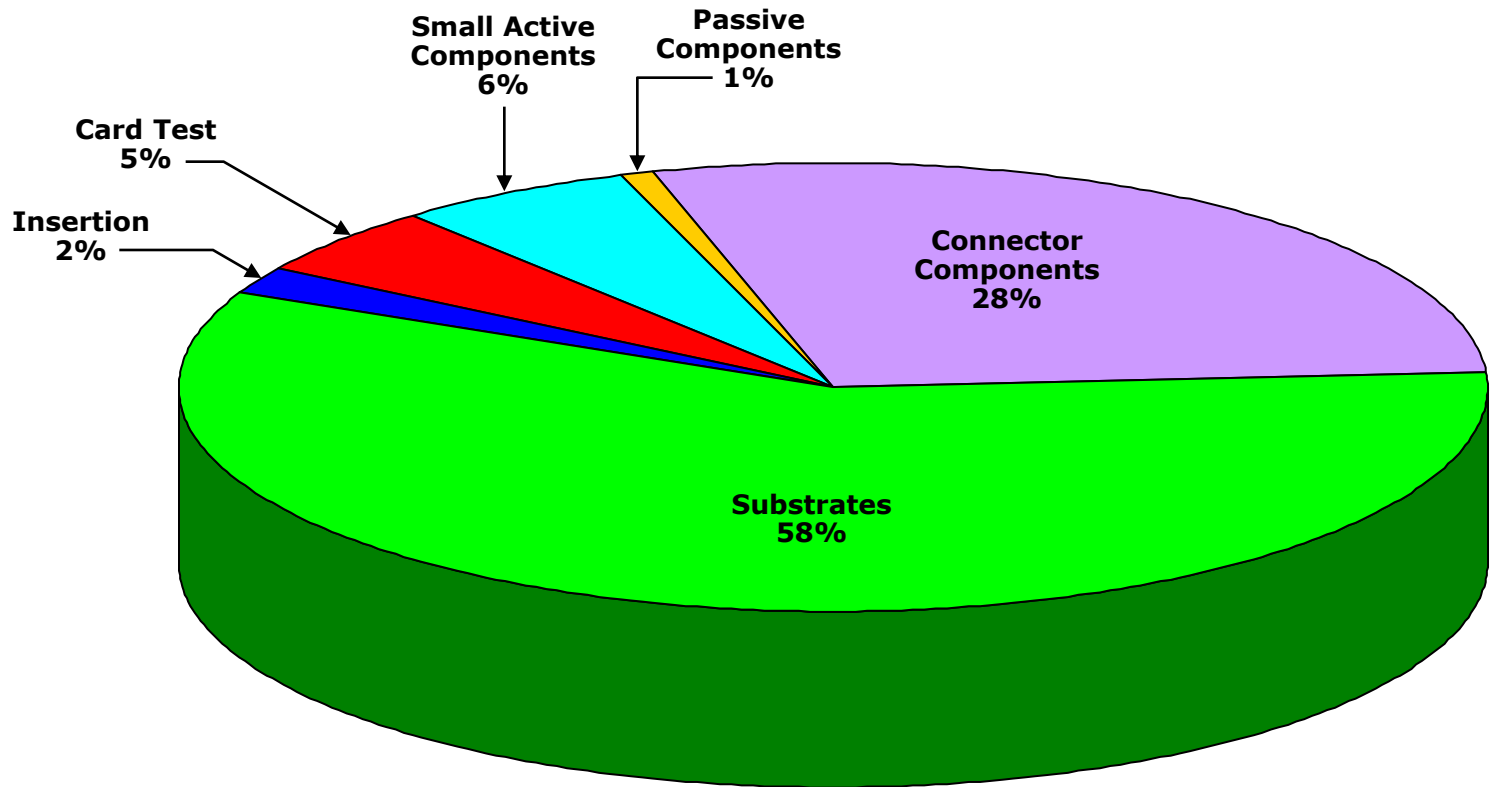
NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Flex Board	0	0	0	0	0	0	3	6	1	8	18
Main Electronics	LED board 1	0	0	0	0	1	4	2	4	0	0	11
Main Electronics	LED board 2	0	0	0	0	1	4	2	4	0	0	11
	System Totals	0	0	0	0	2	8	7	14	1	8	40

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**Estimated Cost
of Electronics**

\$3.39



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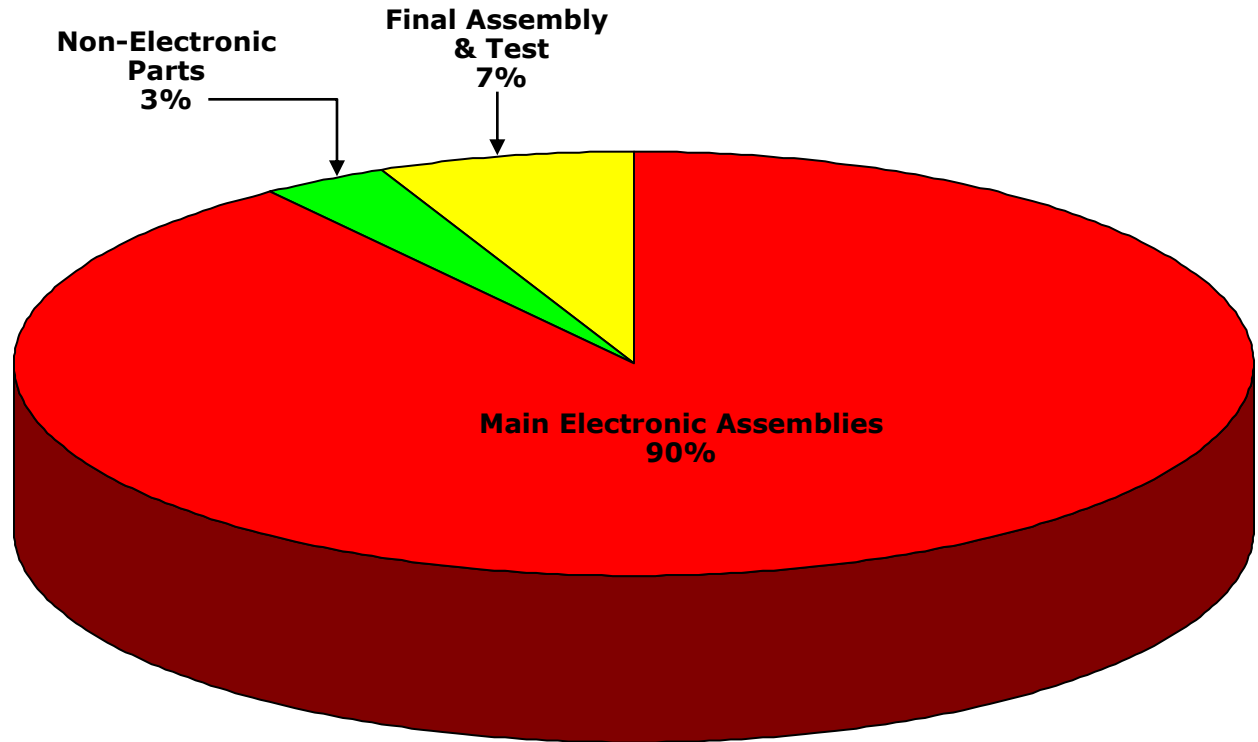
Subsystem	Part ID No.	Qty	Description	Fabrication Process	Material	Dimensions (mm)	Weight (grams)	Est'd Cost Each	Est'd Extended Cost	
Miscellaneous	1	1	Metal Support, Flex stiffener	Stamped	Metal	37.6 x 29	4.90	0.050	0.050	
	2	2	Alignment Pins	Molded	Plastic	4.4 x 3	0.08	0.020	0.040	
	3	1	Small Label	Die-Cut + Printed	Plastic + Adhesive	6 x 5.9	0.05	0.030	0.030	
Total		4						Estimated Cost		\$0.12

Final Ass'y Labor & Test Cost Estimate

Final Assembly & Test	
Made in	China
Number of parts	7
Est'd number of steps	21
Est'd time (seconds)	63
Est'd final assembly cost	\$ 0.05
Est'd final test cost	\$ 0.20

Estimated Cost Totals	
Main Electronic Assemblies	\$ 3.39
Non-Electronic Parts	\$ 0.12
Final Assembly & Test	\$ 0.25
Total	\$ 3.77

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.



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We believe our cost estimates generally fall within 15 percent of the "right answer," which itself can vary depending on the market and OEM-specific factors mentioned earlier. While the TechInsights cost model is imperfect, it yields important insights into technology and business dynamics along with good first-order contributions to system cost by component type. Additionally, the consistency of approach and gradual modification to assumptions (smoothing out frequently-shifting pricing factors) hopefully yields a credible, but user-modifiable, view of OEM high volume cost-to-produce.

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Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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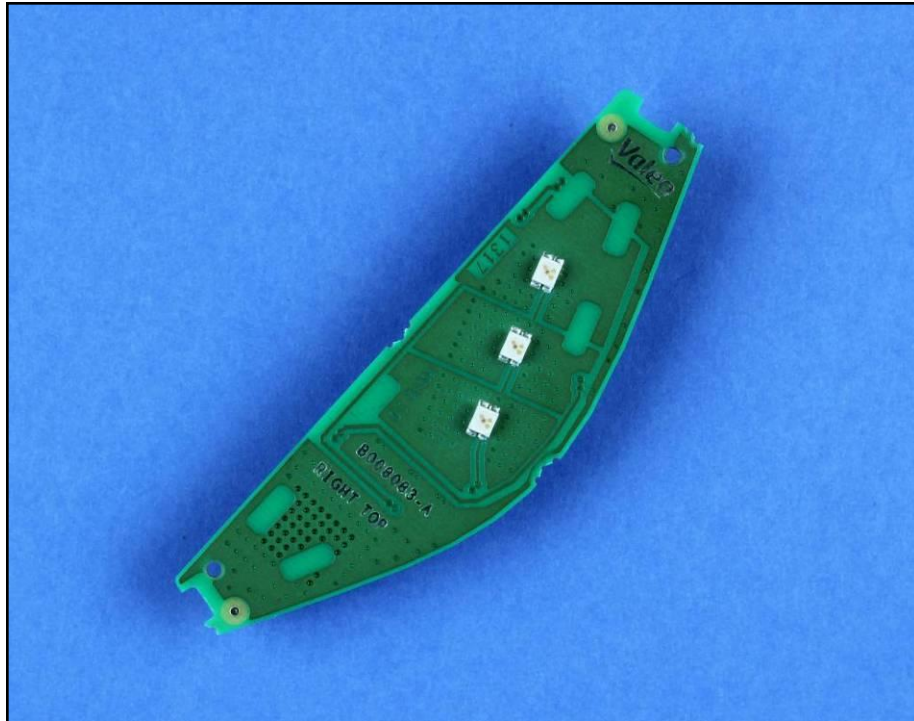
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1296***

Deep Dive Report

BMW i3 LED Board, Head Lamp

5162

Report #15900-150211-PKb



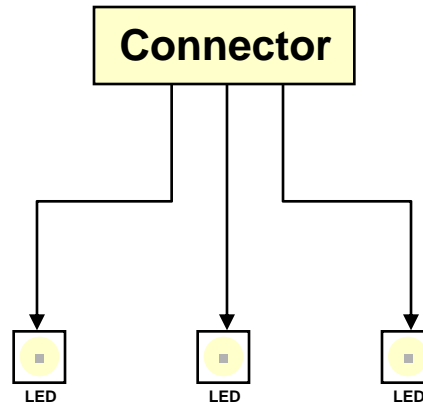
Product Description

This report concerns the Head Lamp, Housing Assembly, LED Printed Circuit for the 2014 BMW i3. This lighting board has (3) yellow LEDs on Side 1 and a connector on Side 2.

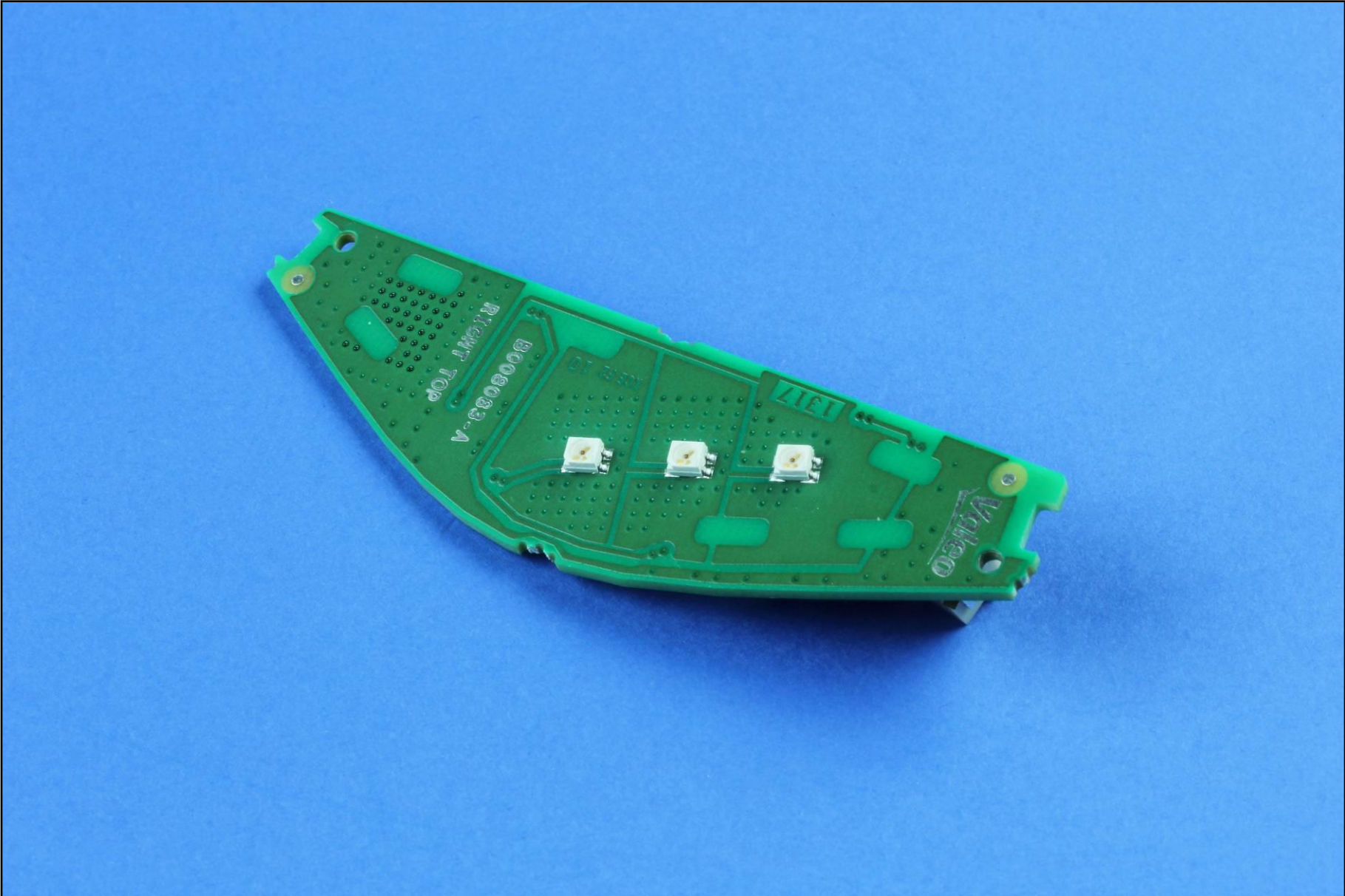
DISCLAIMER: All company names, product names, and service names mentioned are used for identification purposes only and may be registered trademarks, trademarks, or service marks of their respective owners. All analyses are done without participation, authorization, or endorsement of the manufacturer. Any cost analyses presented in this material are estimates prepared by TechInsights from generally available data. While TechInsights believes that these estimates reflect the probable costs, the actual producer did not supply the data, and therefore the actual costs may be different from these estimates. Furthermore, TechInsights extends no warranties with respect to any information in this document, and shall bear no liability whatsoever for the use of the information.

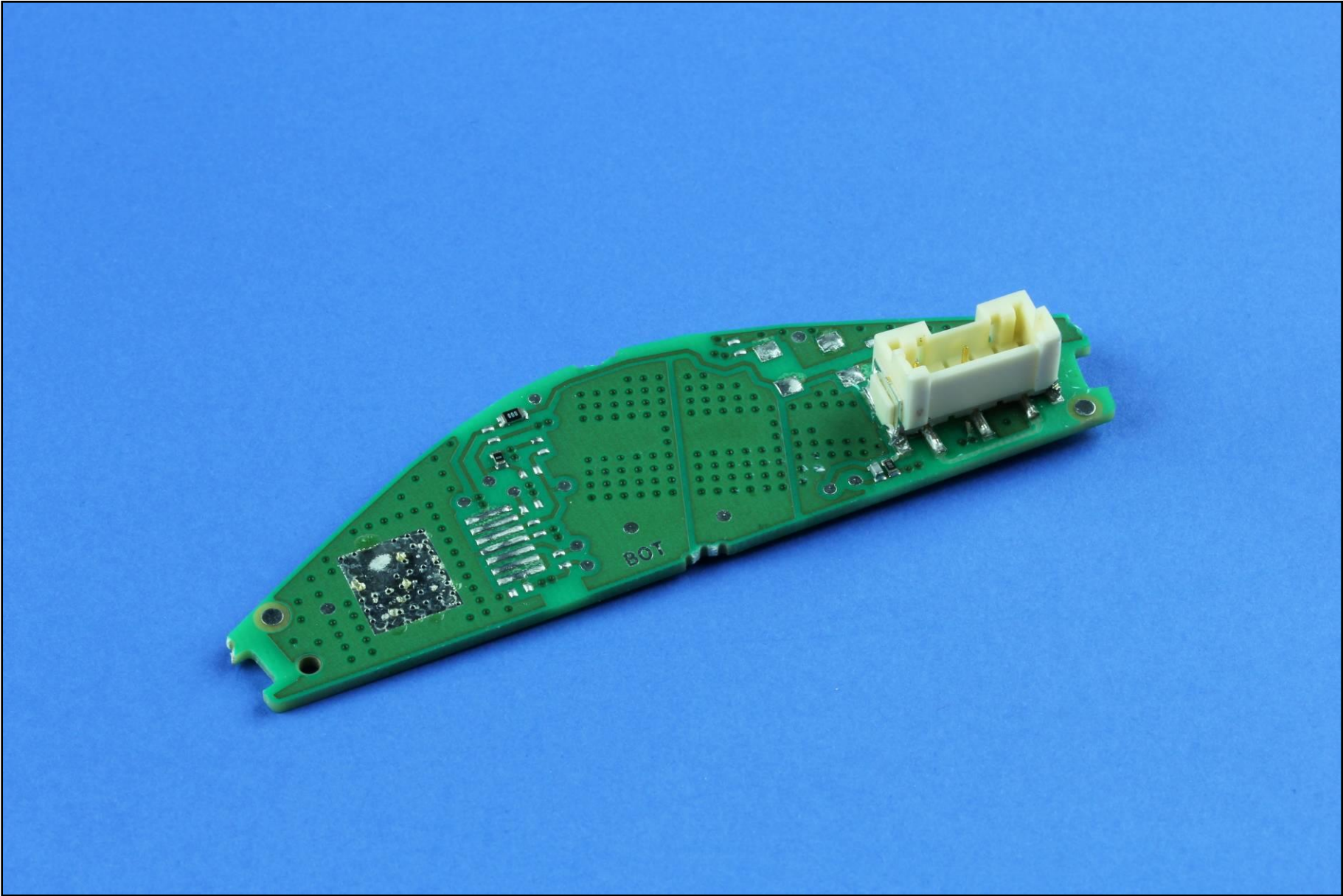
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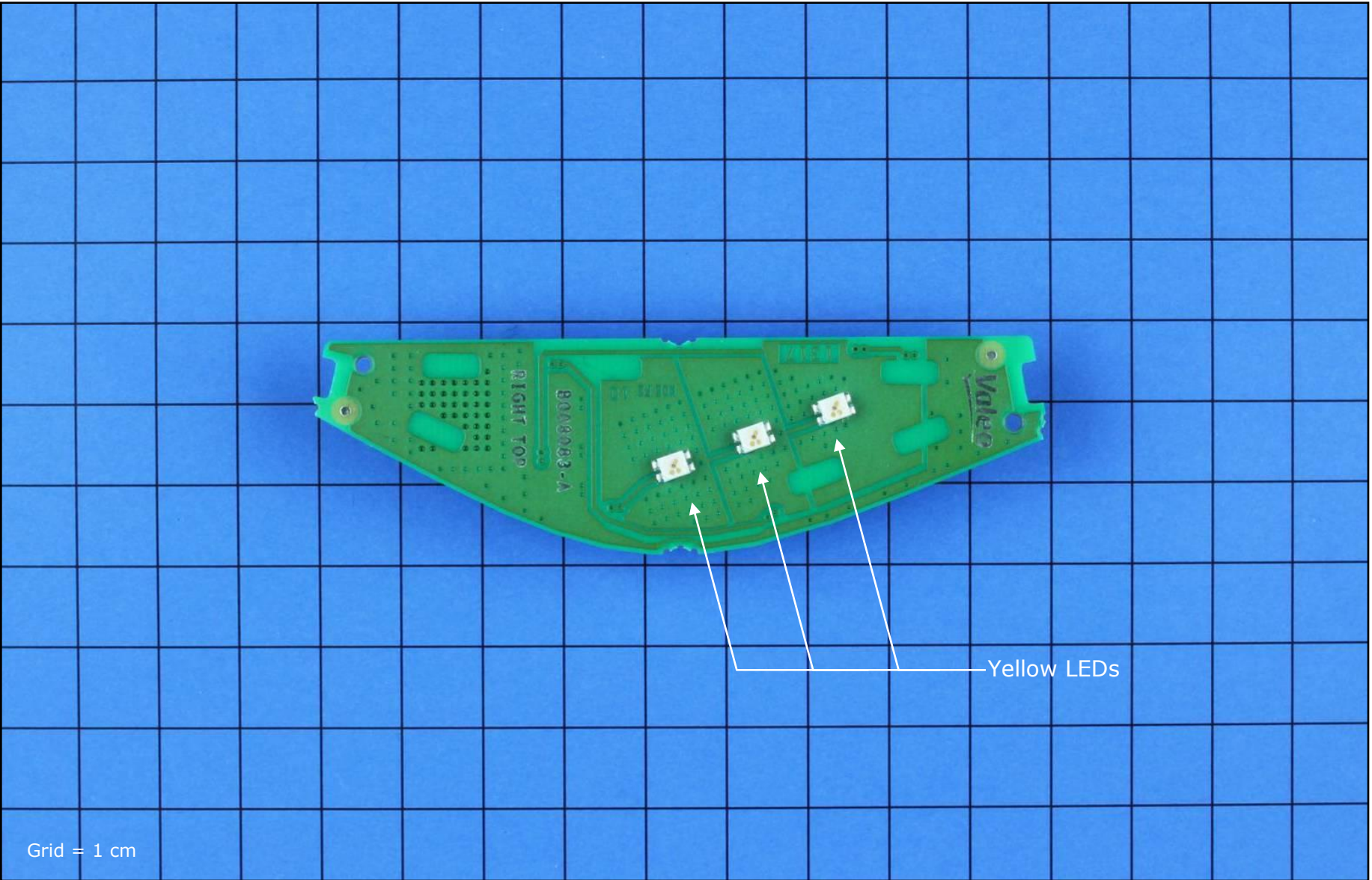
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 Head Lamp, Housing Assembly, LED Board	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	7.6 (Measured)	Retail Price		
Product Dimensions	87.2 x 25.8 x 11.5 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$7.88	
Product Features		Electronics Cost	\$7.88	
		Manufacturing Cost Breakdown		
Lighting	(3) Yellow LEDs	Small Active Discretes	\$7.11	90.2%
Connector	(1) Connector	Passive Discretes	\$0.02	0.3%
		Connectors	\$0.23	2.9%
		Substrate	\$0.31	3.9%
		Insertion	\$0.06	0.8%
		Card Test	\$0.15	1.9%
		Total	\$7.88	100.0%

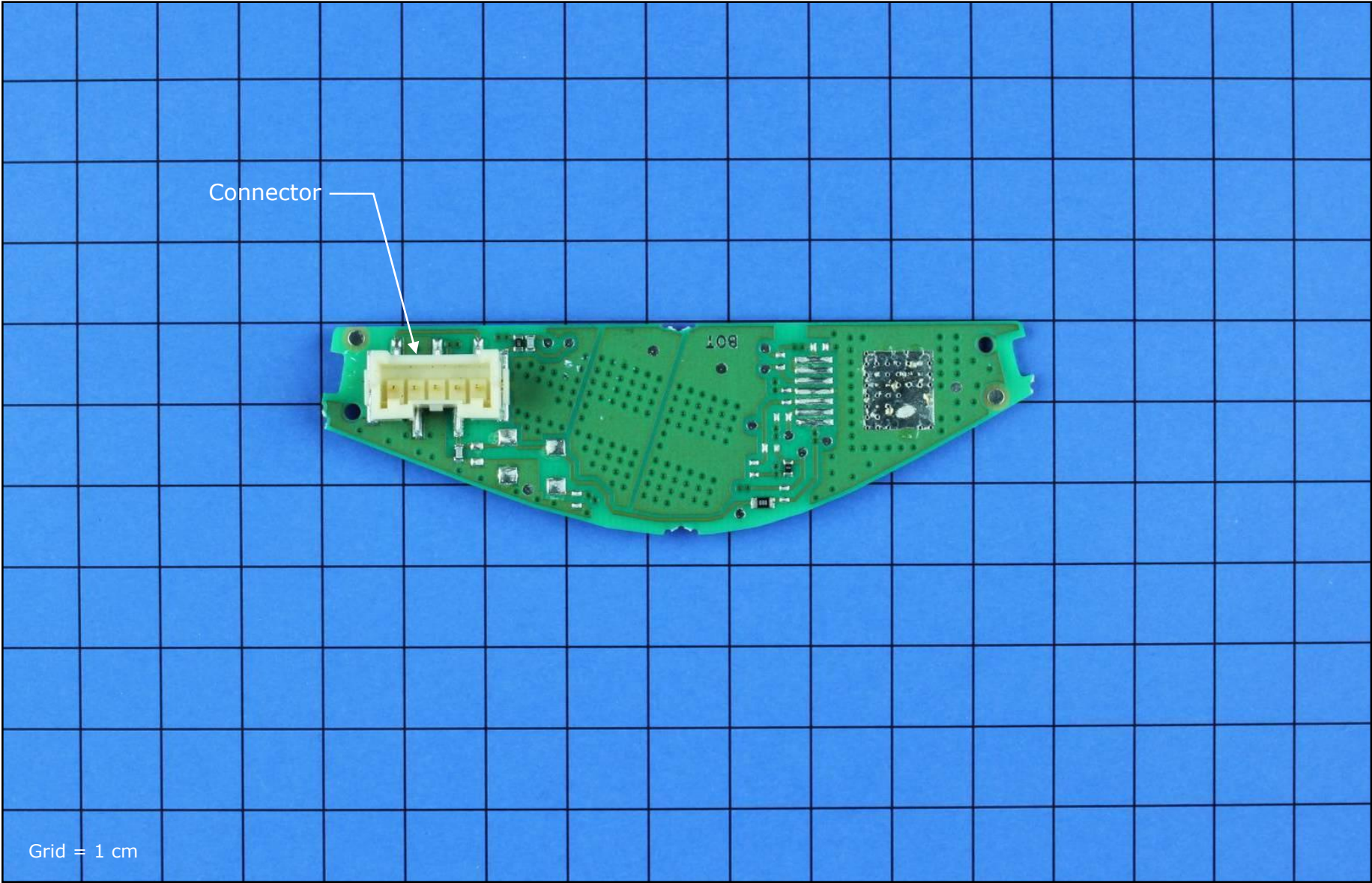


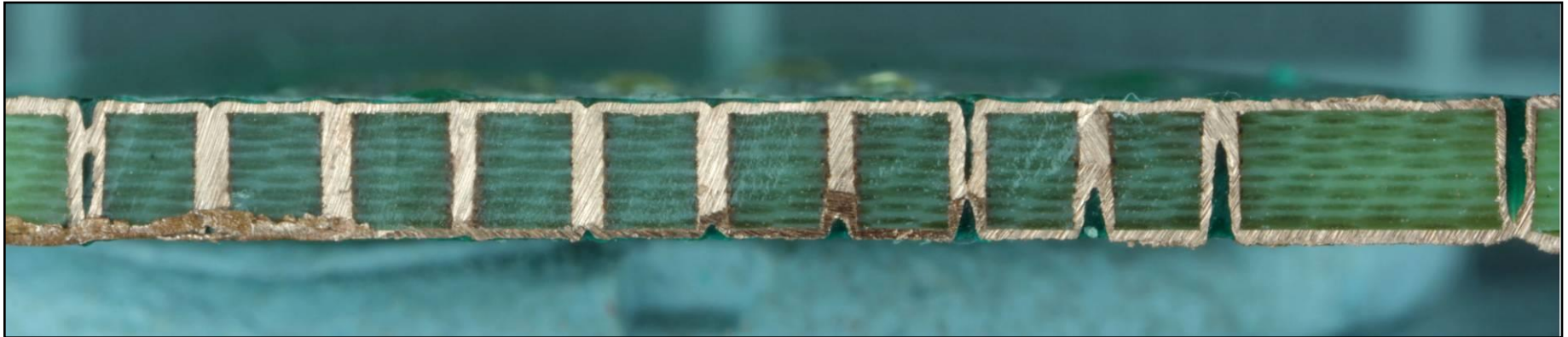
Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.











Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Head Lamp Board	Valeo	FR4	2 Layer conventional FR4 / HF	2	16.7	1.03	0.37	0.72	0.30			1.6	7.1	\$ 0.31

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Head Lamp Board, Side 1	3	Small Active	LED, Single	None	4	3.50	2.78	\$2.370	\$7.110
TOTALS	3				12				\$7.11

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Head Lamp Board, Side 2	5	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.020
TOTALS	5			10		\$0.02

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Head Lamp Board, Side 2	1	Connector: LIF	7	17.46	9.76	\$0.230	\$0.230
TOTALS	1		7				\$0.23

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Head Lamp Board	16.7	2	33.4	7.1	9	29	0.5	1.7	3.2	7.60
	System Totals	16.7	2	33.4		9	29	0.5	1.7	3.2	7.60

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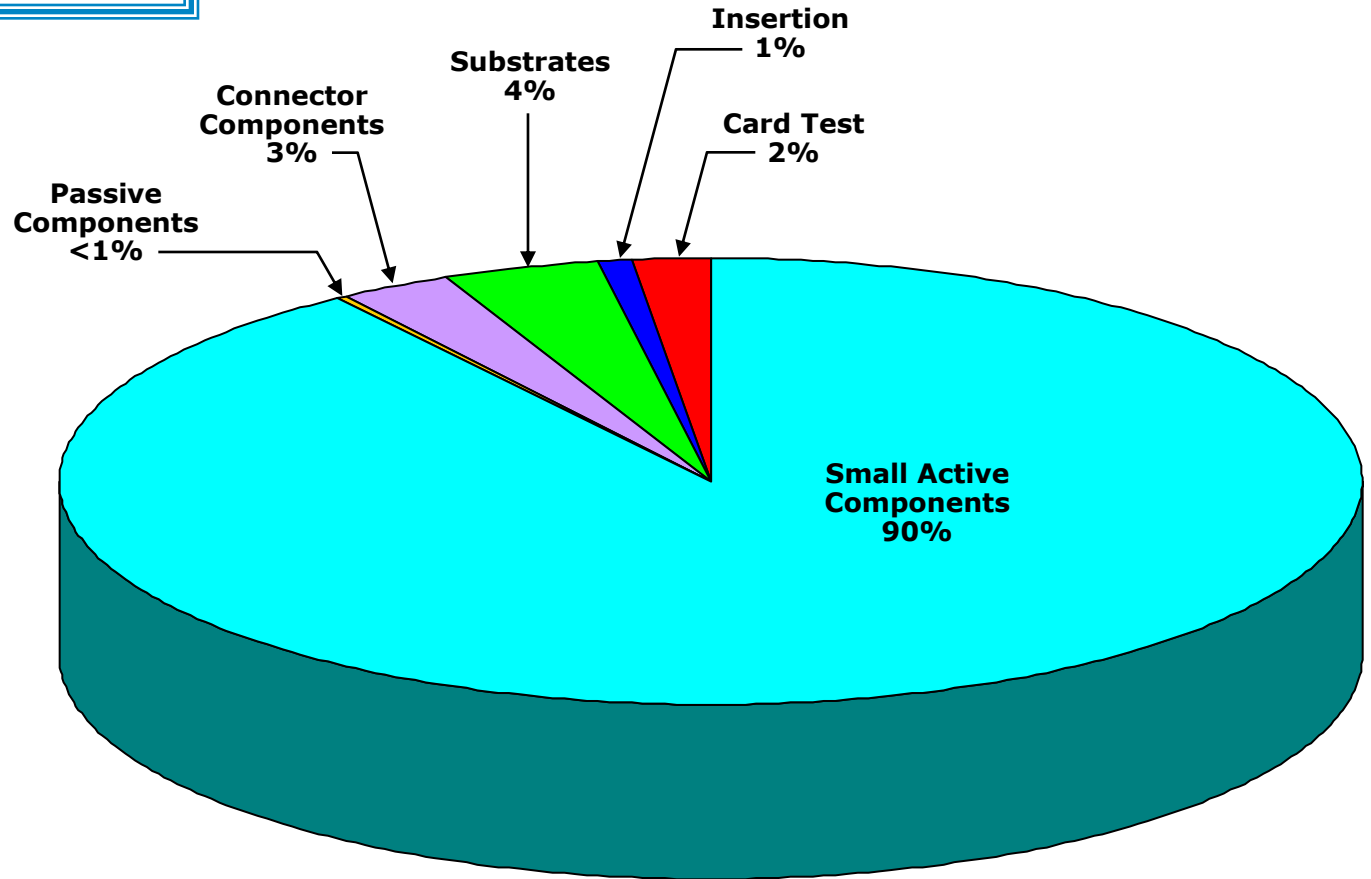
Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Head Lamp Board	\$ 7.88	\$ -	\$ -	\$ 7.11	\$ 0.02	\$ 0.23	\$ 0.31	\$ 0.06	\$ 0.15
	System Totals	\$ 7.88	\$ -	\$ -	\$ 7.11	\$ 0.02	\$ 0.23	\$ 0.31	\$ 0.06	\$ 0.15

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Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Head Lamp Board	0	0	0	0	3	12	5	10	1	7	38
	System Totals	0	0	0	0	3	12	5	10	1	7	38

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

**Estimated Cost
of Electronics**
(Includes Subsystem Electronics)
\$7.88



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Cost Summary

Estimated Cost Totals	
Main Electronic Assemblies	\$ 7.88
Total	\$ 7.88

Cost Total Notes:
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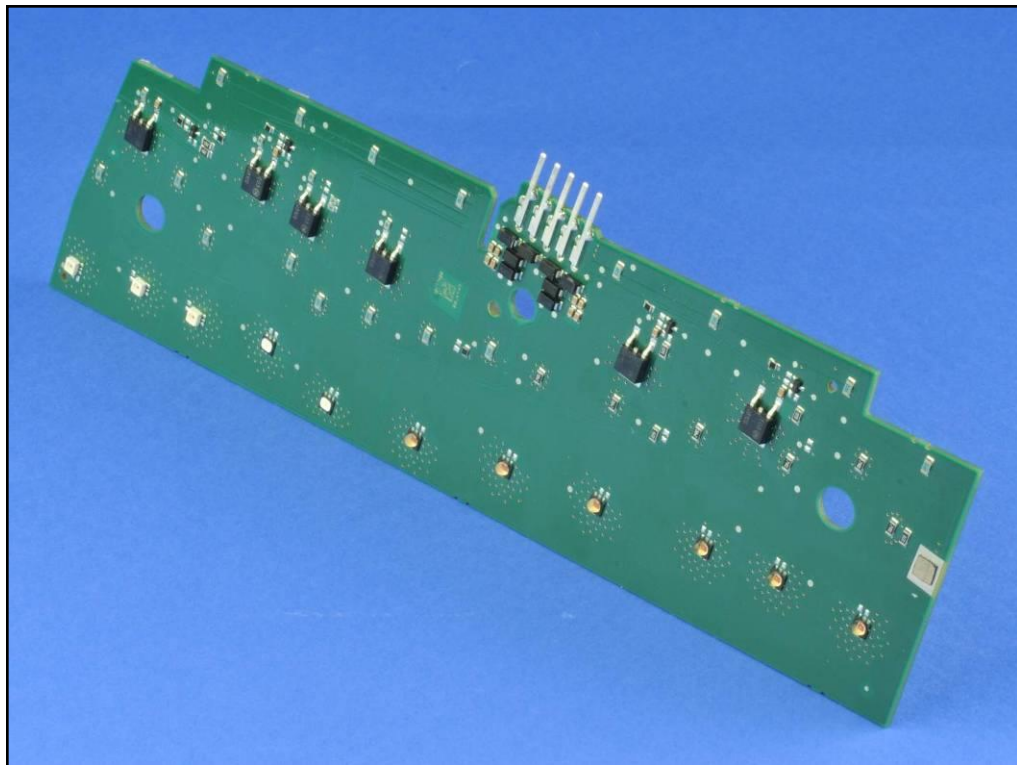
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Deep Dive Report

BMW i3 Tail Lamp PCB

Munro Part No. 5151
Report #15900-141029-KTb



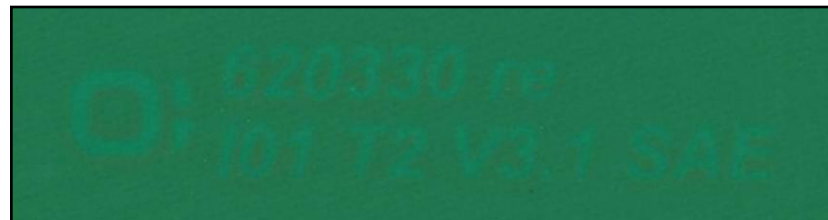
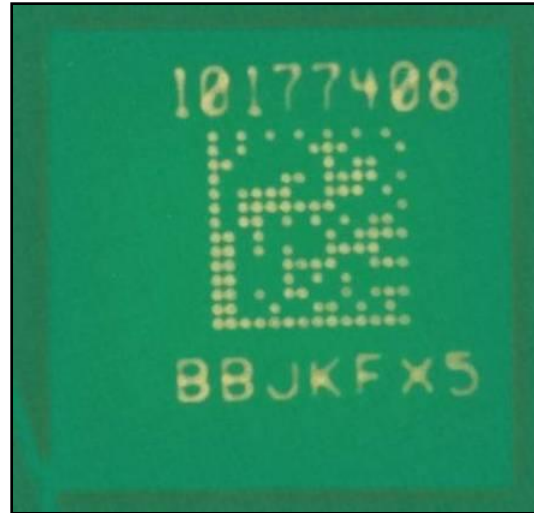
Product Description

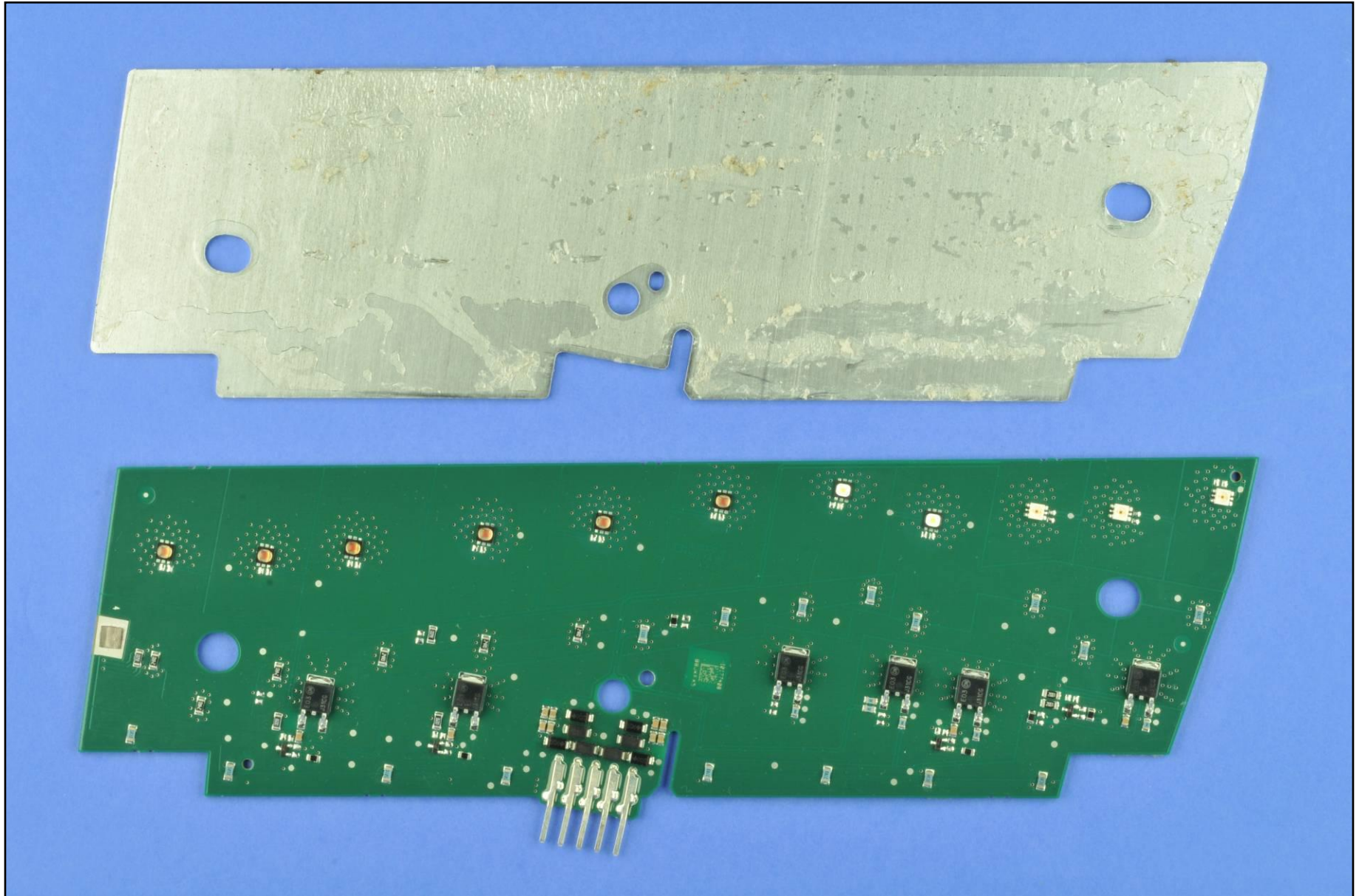
The PCB for the BMW i3 tail lamp (model 620330) incorporates 11 LEDs, which are switched by 6 ON Semiconductor NJVMJD31CG BJT transistors.

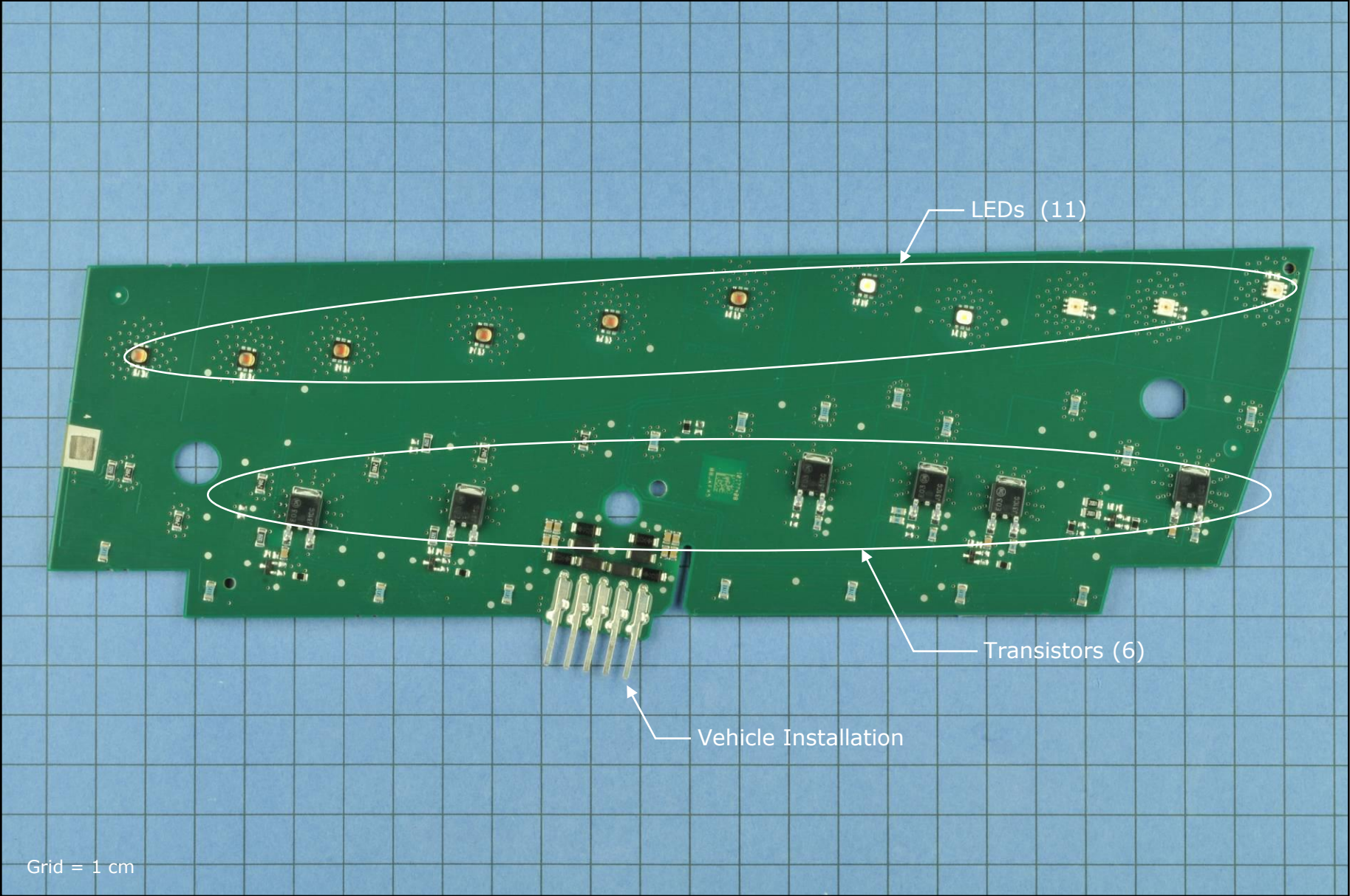
DISCLAIMER: All company names, product names, and service names mentioned are used for identification purposes only and may be registered trademarks, trademarks, or service marks of their respective owners. All analyses are done without participation, authorization, or endorsement of the manufacturer. Any cost analyses presented in this material are estimates prepared by TechInsights from generally available data. While TechInsights believes that these estimates reflect the probable costs, the actual producer did not supply the data, and therefore the actual costs may be different from these estimates. Furthermore, TechInsights extends no warranties with respect to any information in this document, and shall bear no liability whatsoever for the use of the information.

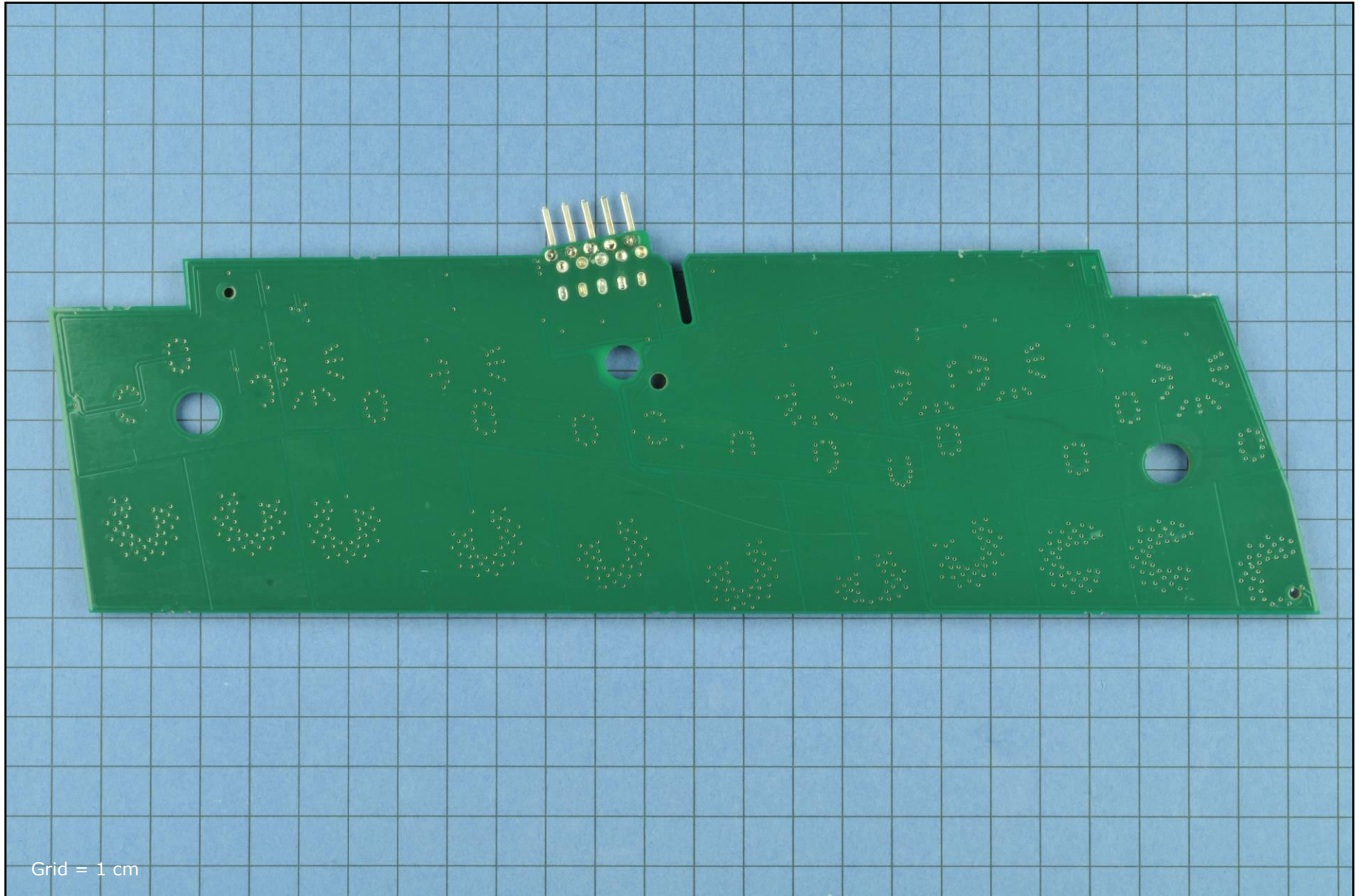
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Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count**	0	
Brand	BMW	IC Package Count**	0	
Product Name & Model #	Tail Lamp Printed Circuit Board 620330	Cost Metrics		
Official Release Date	4/1/2014 ?			
Weight (grams)	71.2	Retail Price		
Product Dimensions (mm)	245 x 73.6 x 1.67	Total Manufacturing Cost*	\$6.62	
Product Features		Electronics Cost**	\$4.93	
		Manufacturing Cost Breakdown		
Operating System	N/A	Integrated Circuits	\$0.00	0.0%
Communications	N/A	Modules, Discretes & Connectors	\$2.45	37.0%
		Substrates	\$1.88	28.4%
Connectivity	N/A	Component Insertion	\$0.46	6.9%
		Card Test	\$0.15	2.3%
Battery Life	N/A	Battery Subsystem	\$0.00	0.0%
		Display Subsystem	\$0.00	0.0%
Processor	N/A	Camera Subsystem	\$0.00	0.0%
		Non-Electronic Parts	\$1.35	20.4%
Interface	N/A	Final Assembly & Test	\$0.33	5.0%
		Total	\$6.62	100.0%
Storage	N/A	*Excluding Supporting Materials' Cost		
Sensors	N/A	**Including Subsystems		

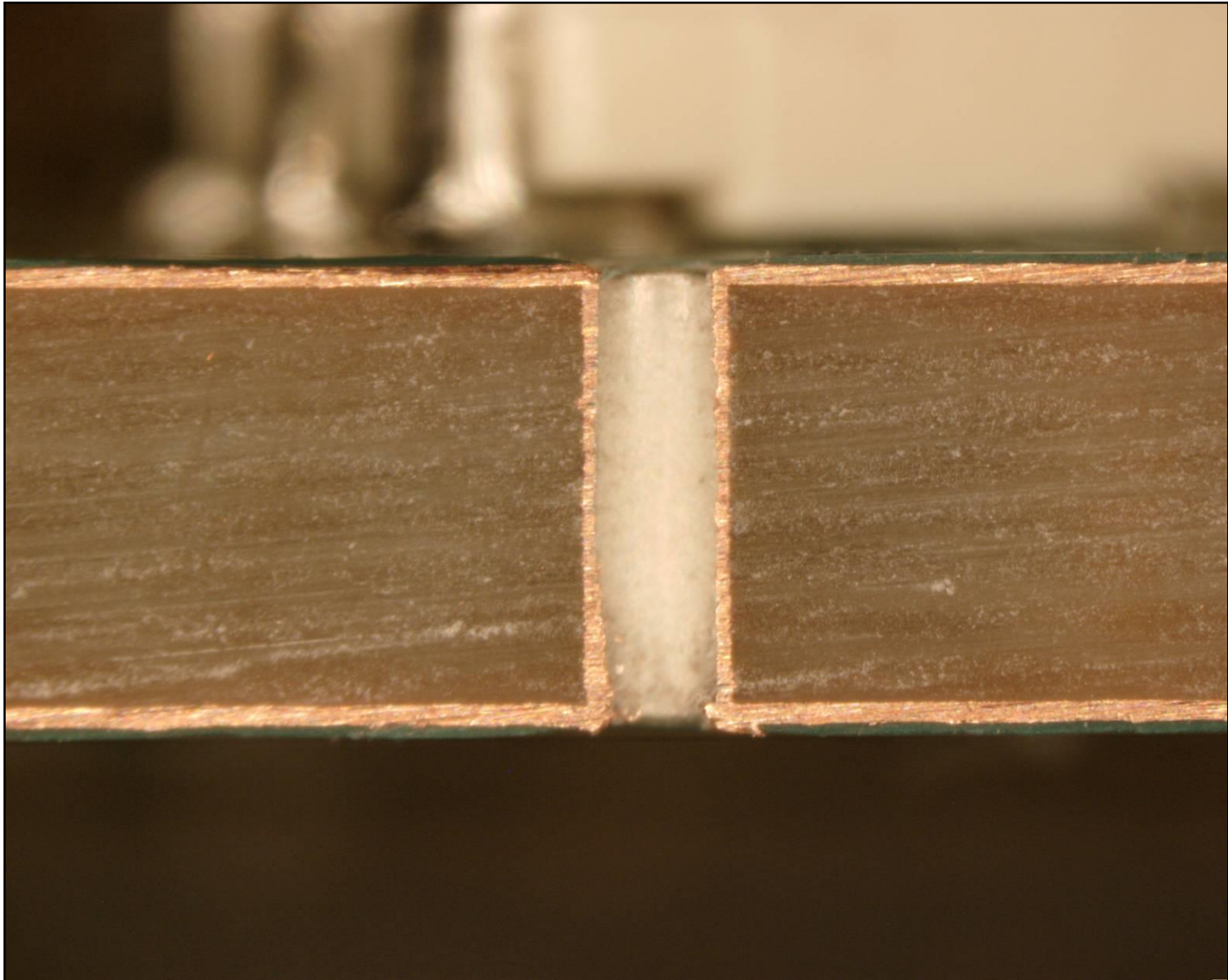








Grid = 1 cm



Substrates

Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Unknown	FR4	2 Layer conventional FR4 / HF	2	180.0	0.82	0.47	0.75	0.40			1.7	5.1	\$ 1.88

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	6	Small Active	LED, Single	None	6	3.75	3.75	\$0.100	\$0.600
	4	Small Active	Diode, SMT	SG 3C SG Logo	2	4.10	2.55	\$0.020	\$0.080
	4	Small Active	Diode, SMT	ON Logo SEC RE07	2	4.25	2.74	\$0.020	\$0.080
	4	Small Active	Transistor, Small	1B E	3	2.93	1.25	\$0.030	\$0.120
	6	Small Active	Transistor, Large	E03 ON Logo J31CG	3	6.46	6.00	\$0.150	\$0.900
	3	Small Active	LED, Single	EXX2	6	3.32	3.00	\$0.070	\$0.210
	2	Small Active	LED, Single	None	2	3.75	3.75	\$0.070	\$0.140
TOTALS	29				104				\$2.13

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 1	52	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.208
TOTALS	52			104		\$0.21

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Contact: Pad Mesh	1	4.72	4.72	\$0.010	\$0.010
	5	Connector: Pin	1	19.00	2.05	\$0.020	\$0.100
TOTALS	6		6				\$0.11

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	180.0	2	360.0	5.1	87	214	0.5	1.2	2.5	71.20
	System Totals	180.0	2	360		87	214	0.5	1.2	2.5	71.20

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

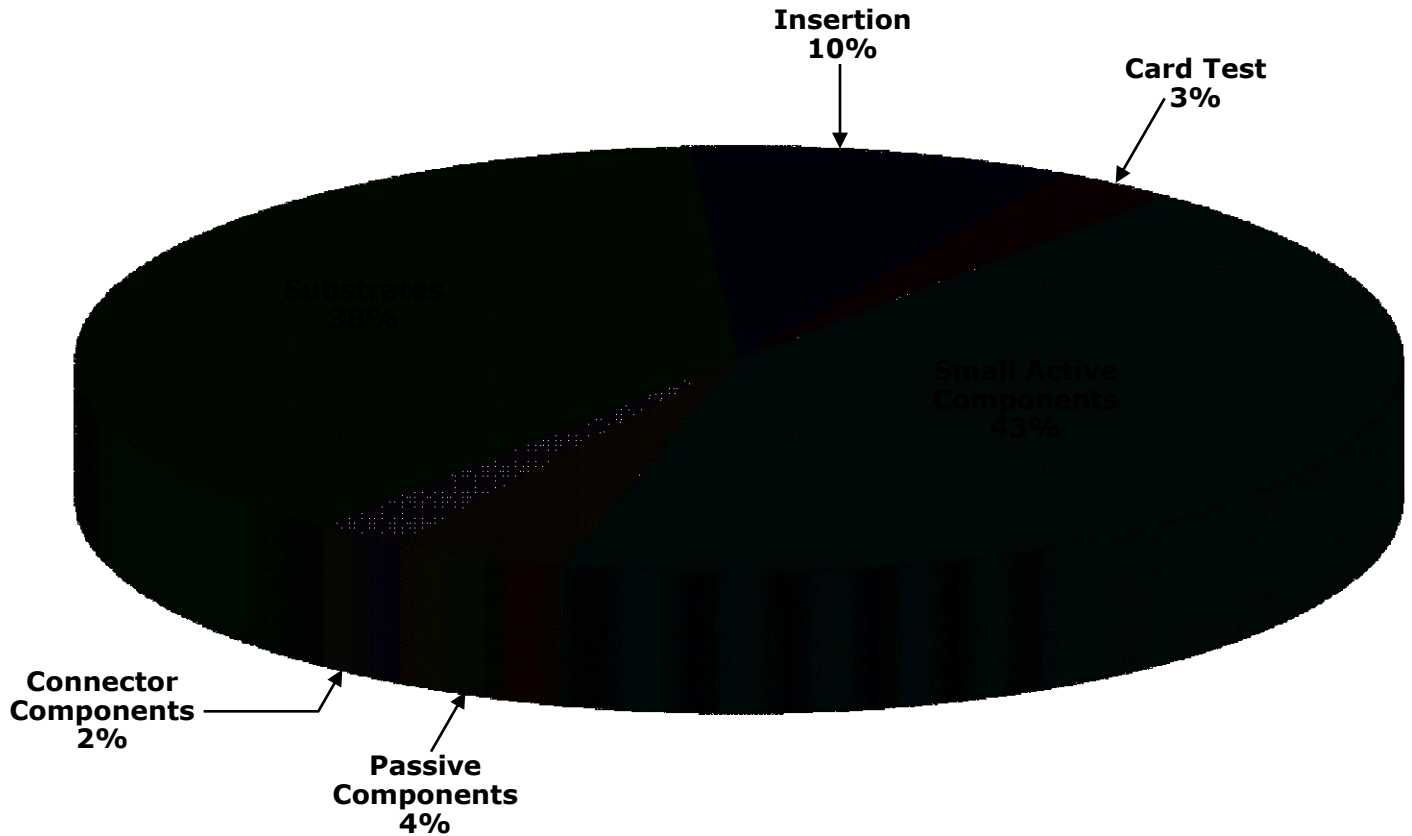
Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 4.93	\$ -	\$ -	\$ 2.13	\$ 0.21	\$ 0.11	\$ 1.88	\$ 0.46	\$ 0.15
	System Totals	\$ 4.93	\$ -	\$ -	\$ 2.13	\$ 0.21	\$ 0.11	\$ 1.88	\$ 0.46	\$ 0.15

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Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Old Form Components	Modular/Old Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	0	0	0	0	29	104	52	104	6	6	301
	System Totals	0	0	0	0	29	104	52	104	6	6	301

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**Estimated Cost
of Electronics**
(Includes Subsystem Electronics)
\$4.93



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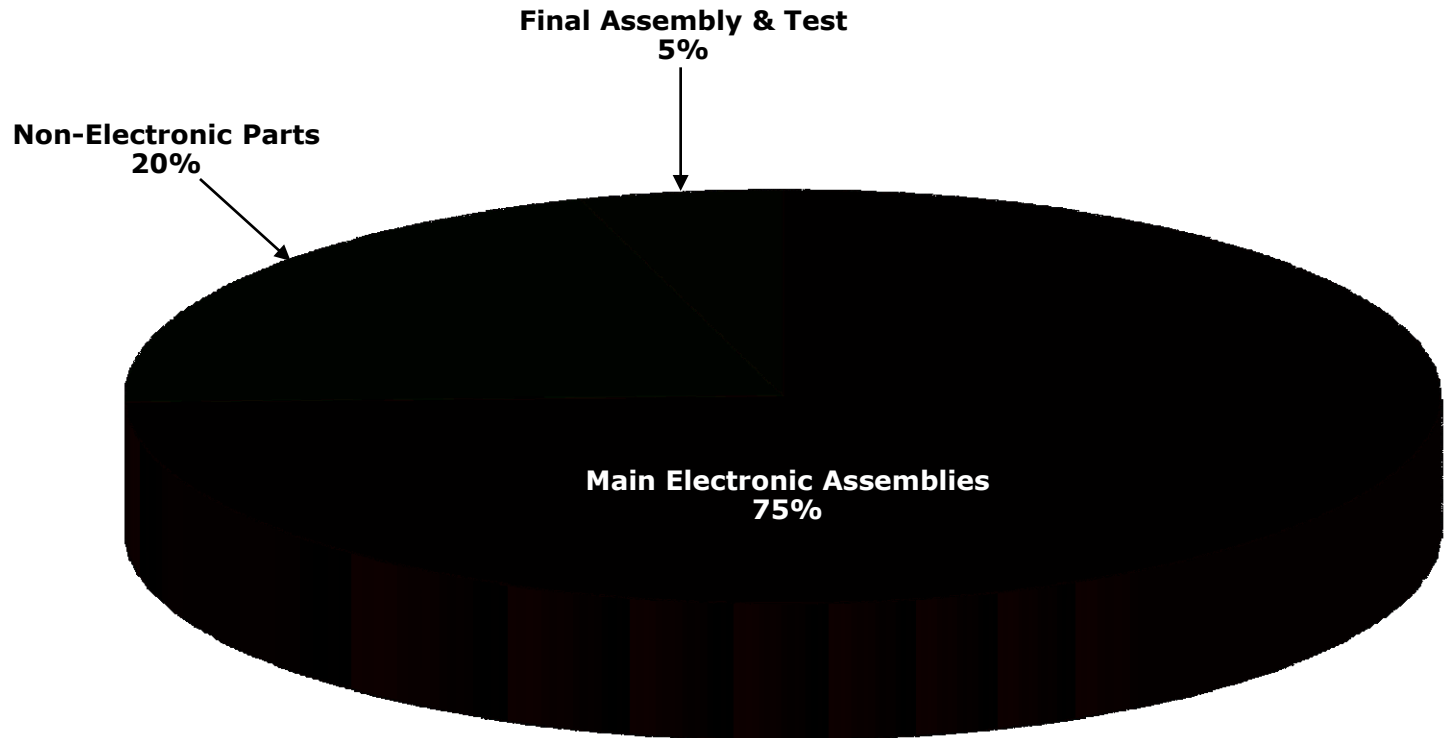
Subsystem	Part ID No.	Qty	Description	Fabrication Process	Material	Dimensions (mm)	Weight (grams)	Est'd Cost Each	Est'd Extended Cost	
Miscellaneous	1	1	Back Plate	Stamped	Aluminum	245 x 73.6 x 1.48	70.00	1.300	1.300	
	2	1	Tape, Double-Sided	Die-Cut	Adhesive	245 x 73 x 0.3	0.03	0.050	0.050	
Total		2						Estimated Cost		\$1.35

Final Ass'y Labor & Test Cost Estimate

Final Assembly & Test	
Made in	China
Number of parts	8
Est'd number of steps	29
Est'd time (seconds)	109
Est'd final assembly cost	\$ 0.08
Est'd final test cost	\$ 0.25

Estimated Cost Totals	
Main Electronic Assemblies	\$ 4.93
Non-Electronic Parts	\$ 1.35
Final Assembly & Test	\$ 0.33
Total	\$ 6.62

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
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Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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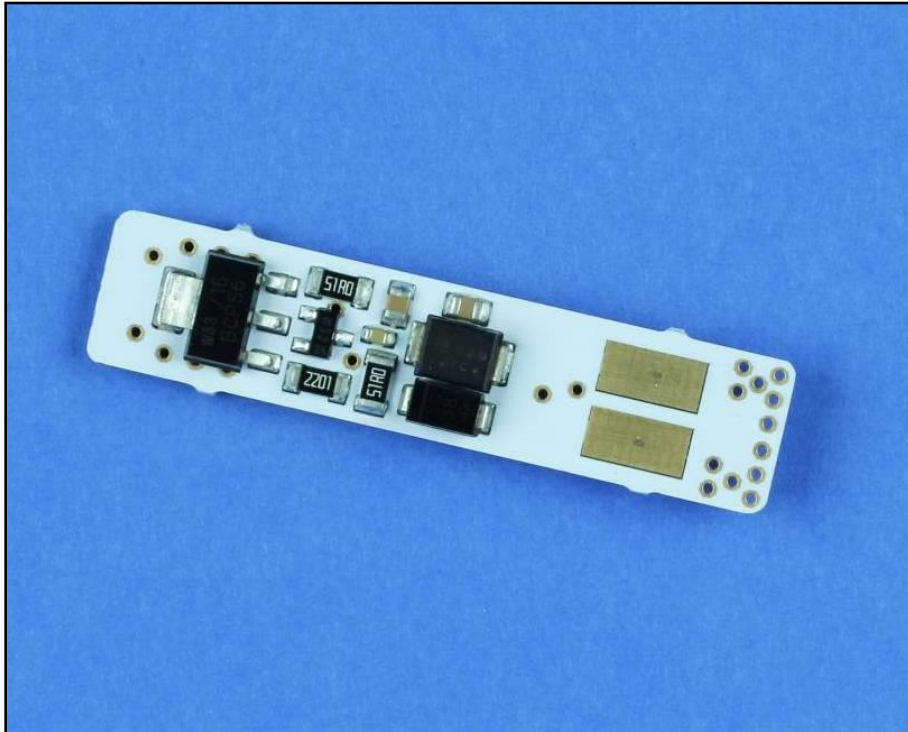
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Deep Dive Report

BMW i3 Side Lamp LED

5019

Report #15900-150225-PKb



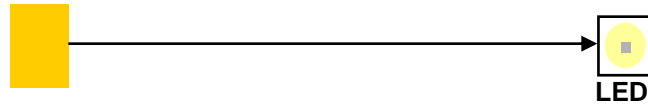
Product Description:

This report concerns the Side Lamp LED Board with 1 single red LED used in the 2014 BMW i3.

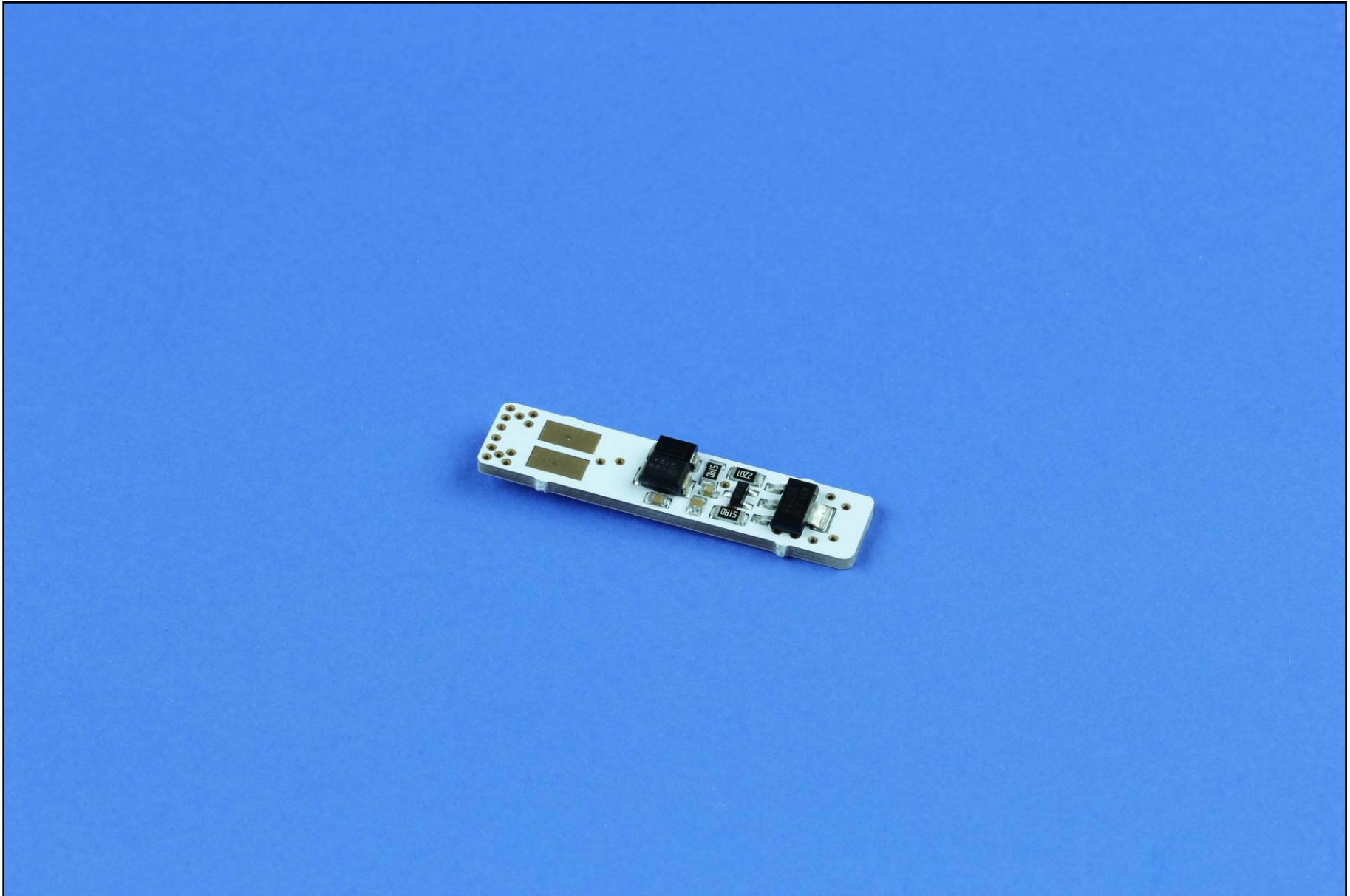
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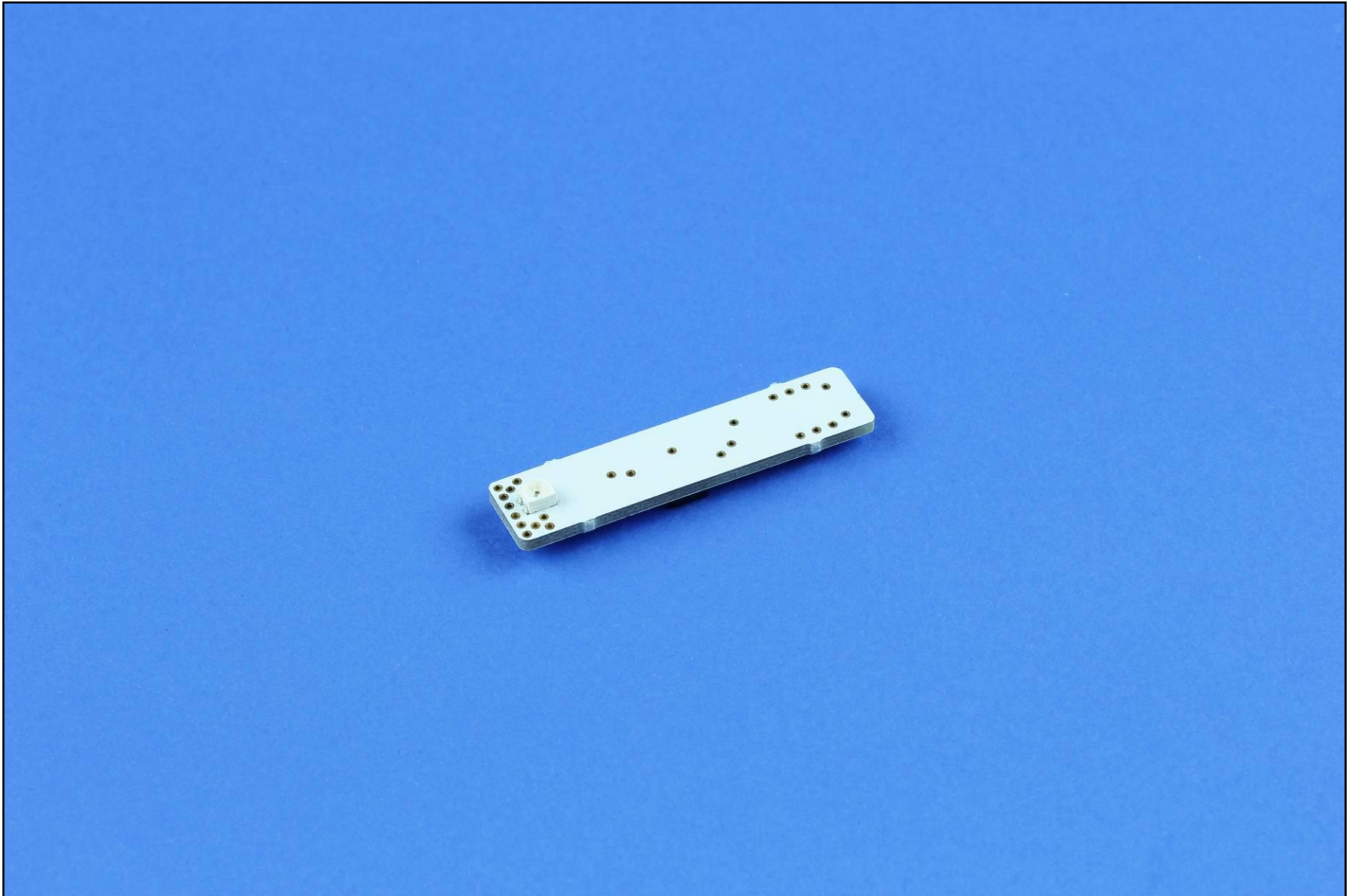
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Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 Side Lamp LED	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	1.7 (Measured)	Retail Price		
Product Dimensions	49.0 x 9.8 x 5.9 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$0.45	
Product Features		Electronics Cost	\$0.45	
		Manufacturing Cost Breakdown		
Lighting	Single red LED	Modules, Discretes & Connectors	\$0.31	68.9%
		Substrates	\$0.06	13.3%
		Component Insertion	\$0.05	11.1%
		Card Test	\$0.03	6.7%
		Total	\$0.45	100.0%

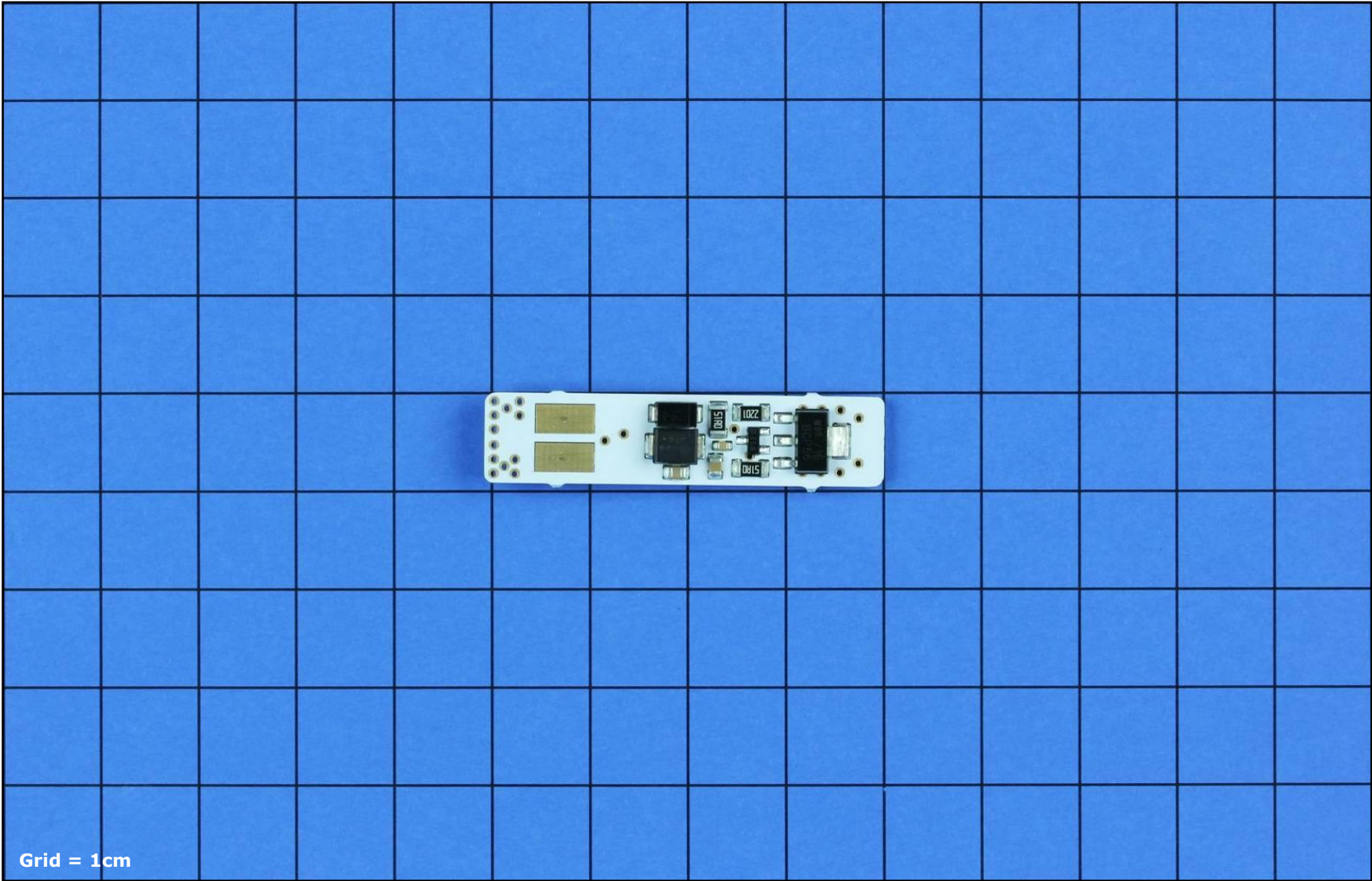


Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.

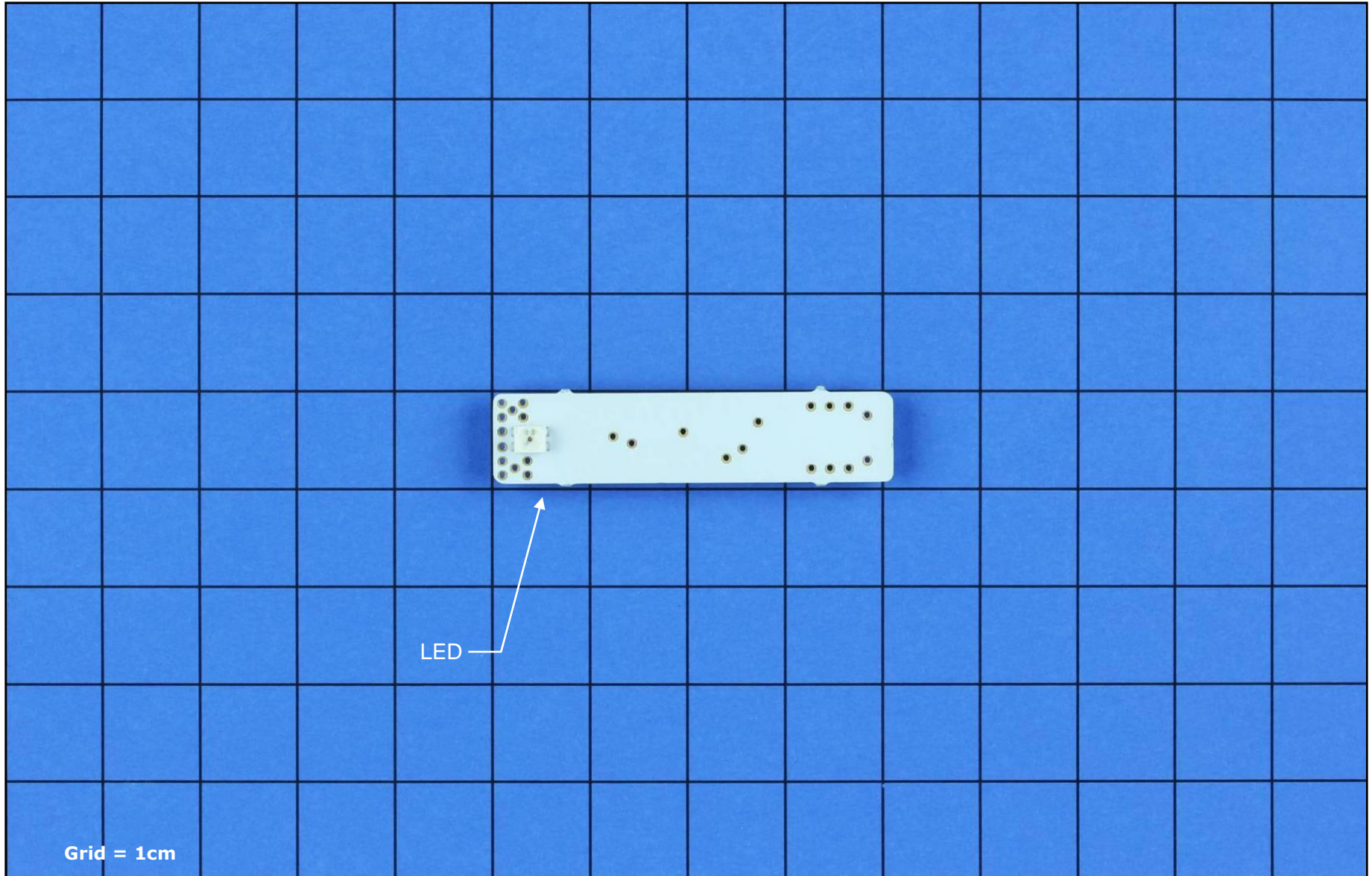


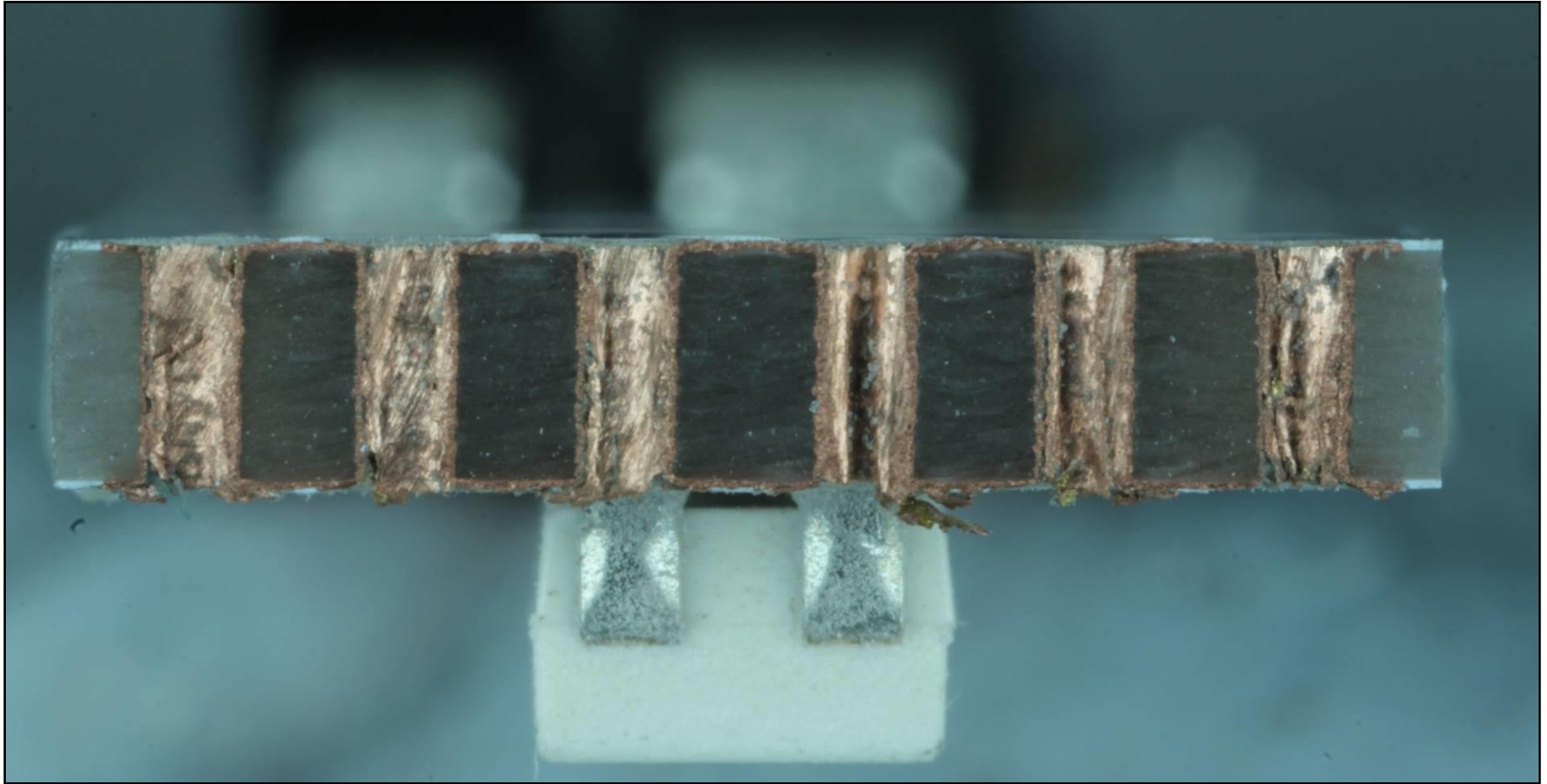


Main Board (Side 1)



Grid = 1cm





Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Valeo?	FR4	2 Layer conventional FR4 / HF	2	3.7	1.46	1.08	0.97	0.43			1.6	12.7	\$ 0.06

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Small Active	Diode, SMT	ON Semiconductor logo C29 27C	2	5.30	2.20	\$0.060	\$0.060
	1	Small Active	Diode, SMT	SG 38 Vishay logo	2	5.10	2.40	\$0.060	\$0.060
	1	Small Active	Transistor, Small	WS2 35	3	3.10	2.80	\$0.030	\$0.030
	1	Small Active	Transistor, Small	W33 716 BCP56	4	7.10	6.60	\$0.080	\$0.080
Main Board, Side 2	1	Small Active	LED, Single	None	4	3.60	2.70	\$0.050	\$0.050
TOTALS	5				15				\$0.28

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
	6	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.024
TOTALS	6			12		\$0.02

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	3.7	2	7.4	12.7	11	27	3.0	7.3	2.5	1.70
	System Totals	3.7	2	7.4		11	27	3.0	7.3	2.5	1.70

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 0.45	\$ -	\$ -	\$ 0.28	\$ 0.02	\$ -	\$ 0.06	\$ 0.05	\$ 0.03
	System Totals	\$ 0.45	\$ -	\$ -	\$ 0.28	\$ 0.02	\$ -	\$ 0.06	\$ 0.05	\$ 0.03

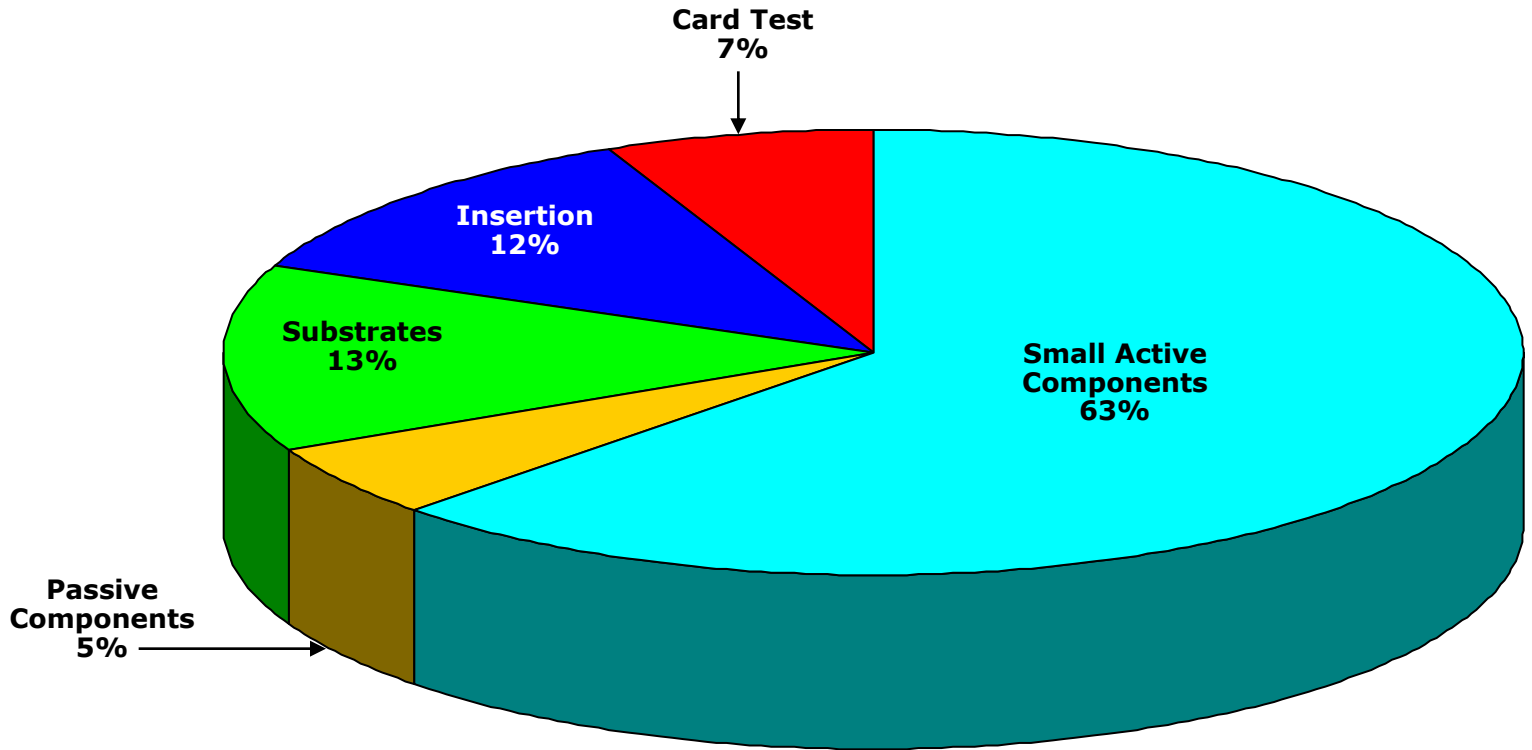
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Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Ocid Form Components	Modular/Ocid Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	0	0	0	0	5	15	6	12	0	0	38
	System Totals	0	0	0	0	5	15	6	12	0	0	38

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

**Estimated Cost
of Electronics**

\$0.45



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Cost Summary

Estimated Cost Totals	
Main Electronic Assemblies	\$ 0.45
Total	\$ 0.45

Cost Total Notes:
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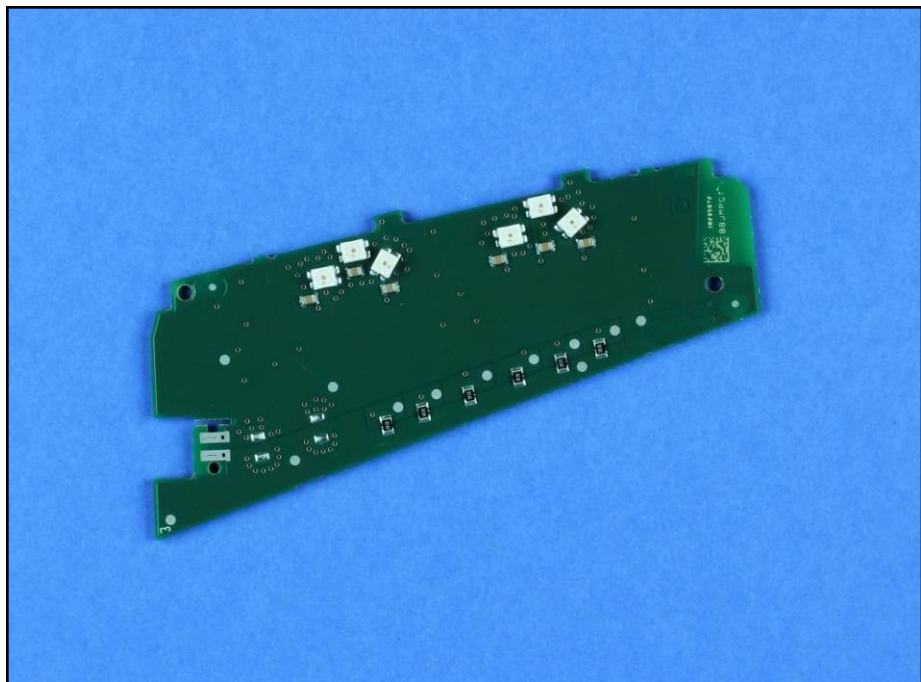
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Deep Dive Report

BMW i3 LED Board, Tail Lamp

5277

Report #15900-150211-PKb



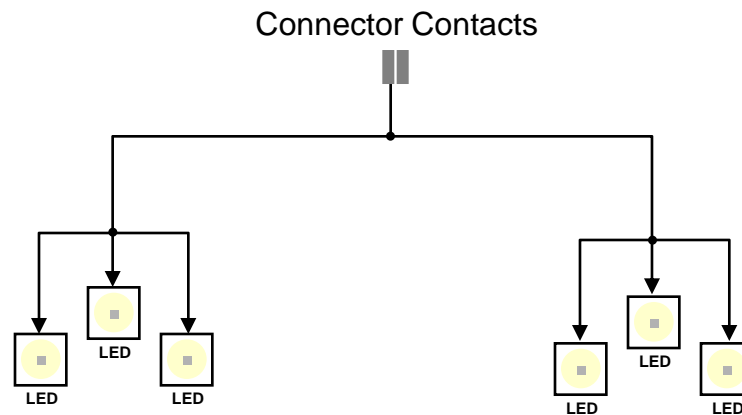
Product Description

This report concerns the LED Board for the 2014 BMW i3 Tail Lamp Assembly, which has (6) red LEDs and (1) connector.

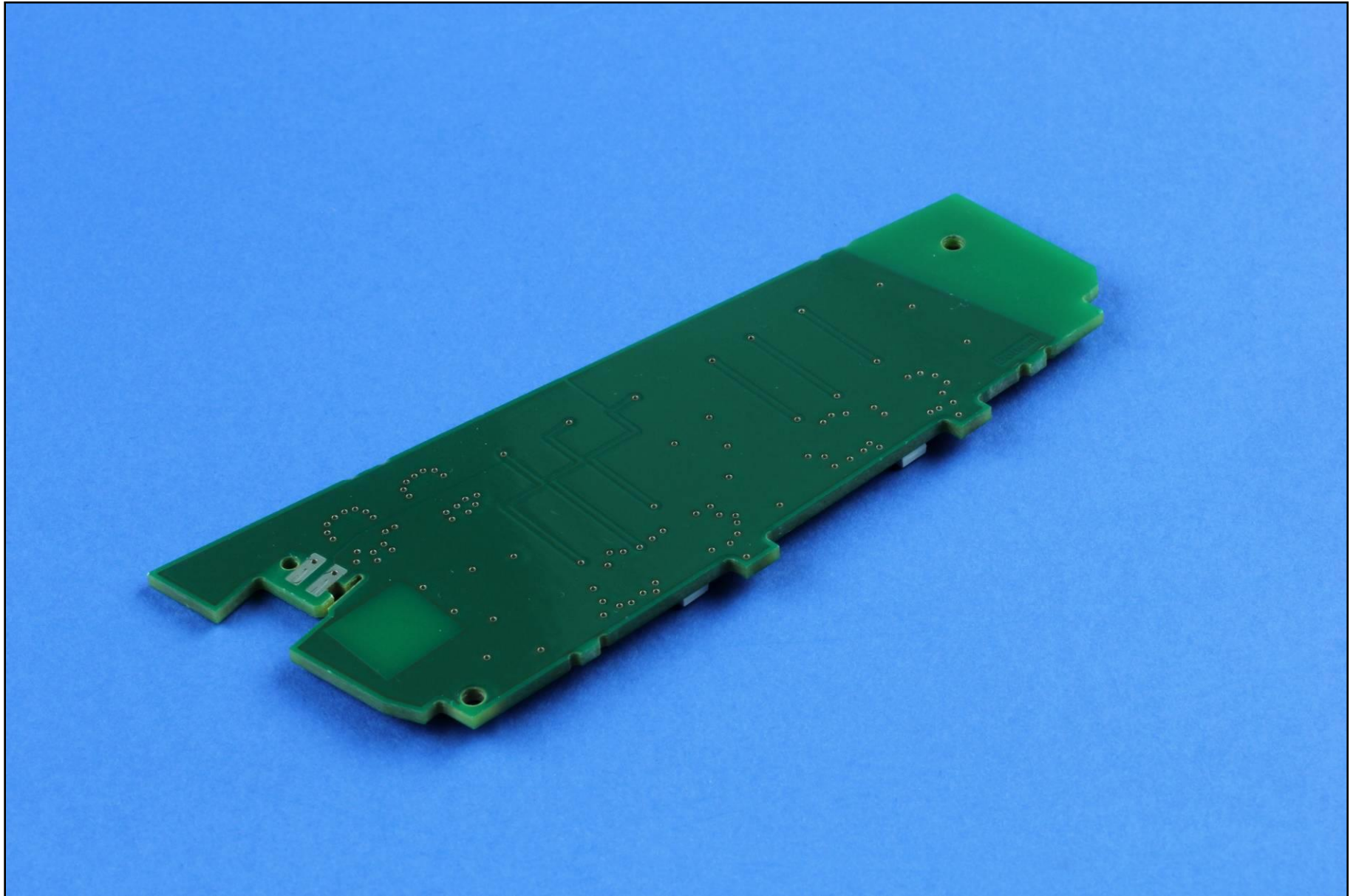
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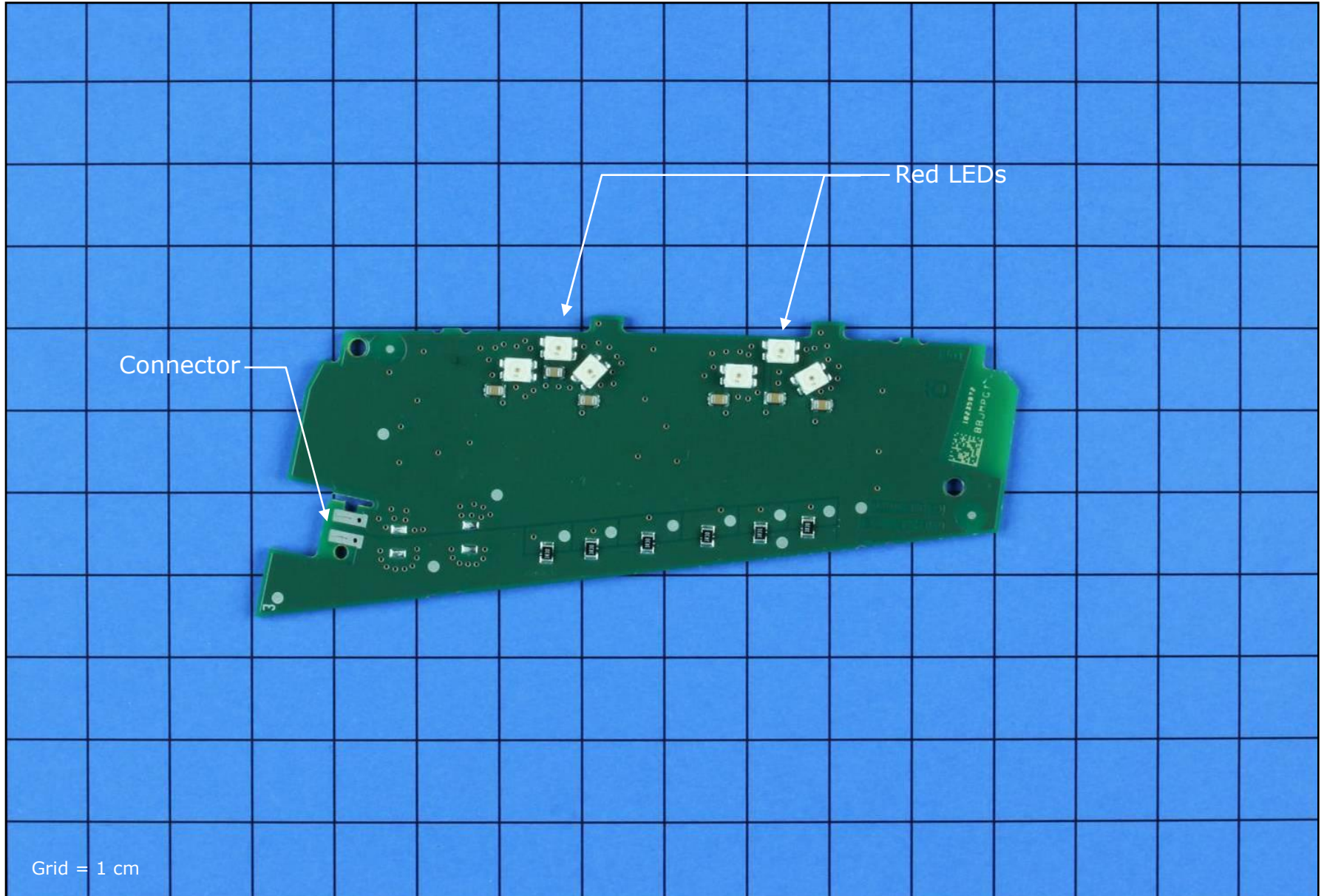
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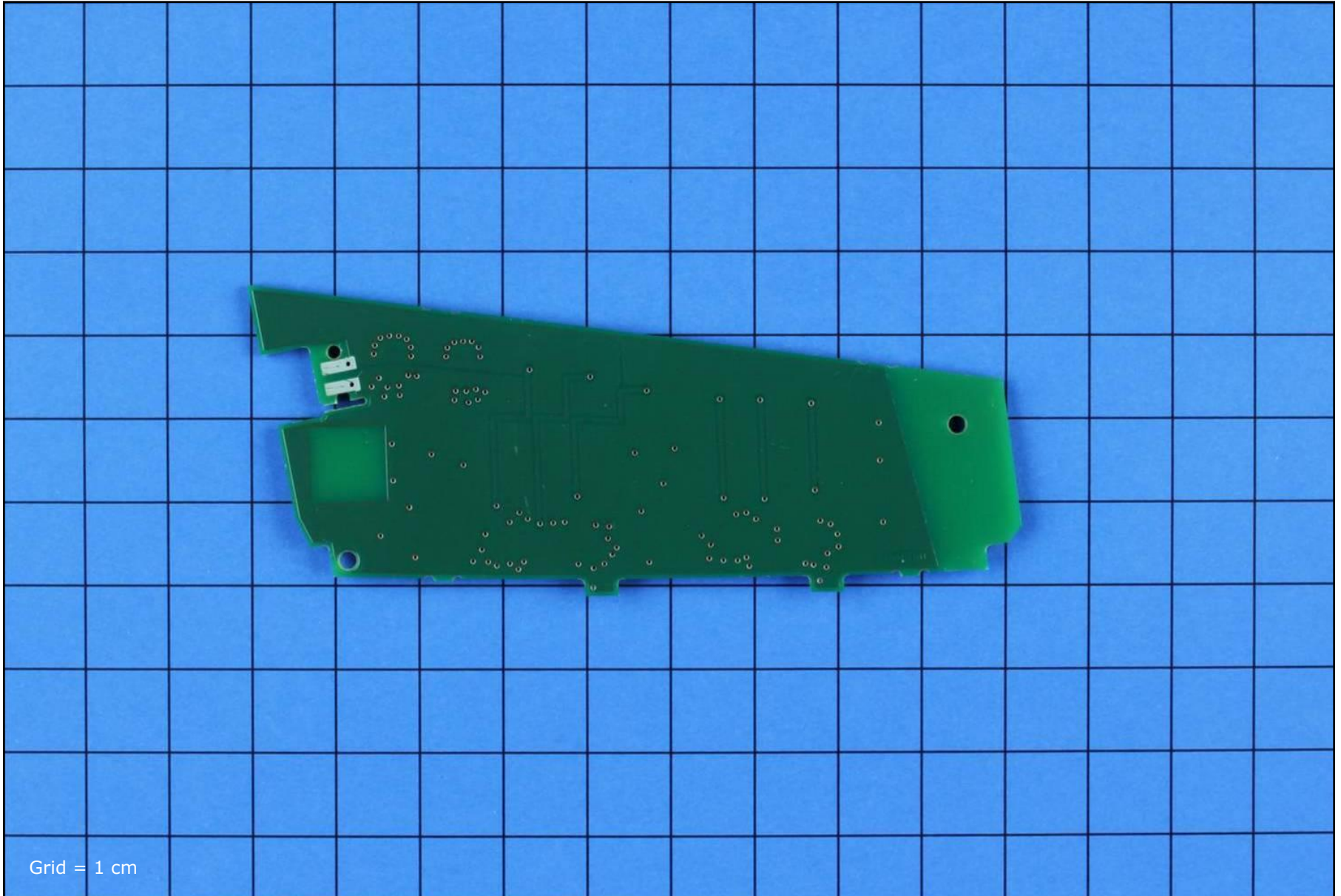
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 LED Board, Tail Lamp	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	9.5 (Measured)	Retail Price		
Product Dimensions	85.5 x 38.5 x 3.54 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$14.91	
Product Features		Electronics Cost	\$14.91	
		Manufacturing Cost Breakdown		
Lighting	(6) Red LEDs	Small Actives	\$14.22	95.4%
Connectivity	(1) Connector	Passives	\$0.05	0.3%
		Substrate	\$0.37	2.5%
		Insertion	\$0.09	0.6%
		Card Test	\$0.18	1.2%
		Total	\$14.91	100.0%



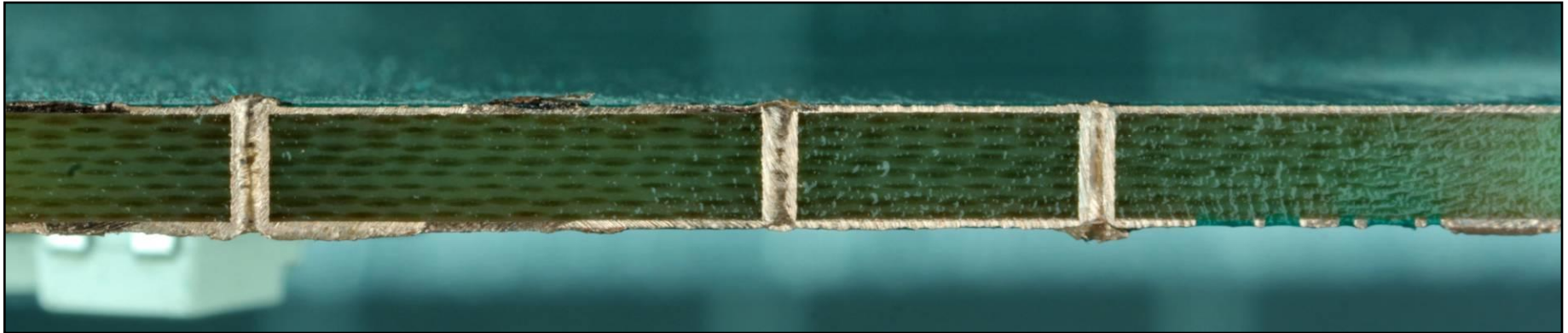
Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.







Grid = 1 cm



Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Unknown	FR4	2 Layer conventional FR4 / HF	2	24.5	0.66	0.46	0.70	0.40			1.7	5.1	\$ 0.37

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	6	Small Active	LED, Single	None	2	3.50	2.80	\$2.370	\$14.220
TOTALS	6				12				\$14.22

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 1	12	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.048
TOTALS	12			24		\$0.05

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq. cm)	Metal Layers	Circuit Area (sq. cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq. cm)	Connection Density (Connections/sq. cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	24.5	2	49.0	5.1	18	36	0.7	1.5	2.0	9.50
	System Totals	24.5	2	49		18	36	0.7	1.5	2.0	9.50

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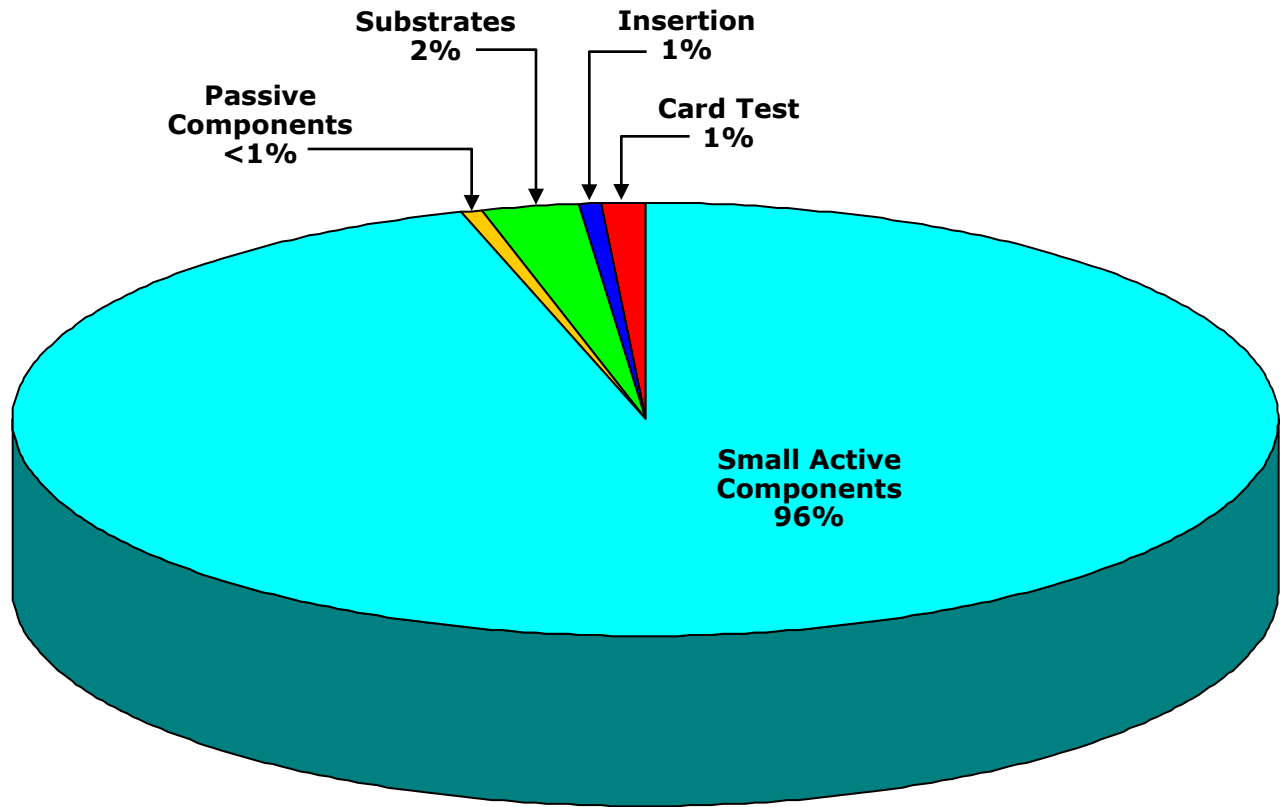
Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 14.91	\$ -	\$ -	\$ 14.22	\$ 0.05	\$ -	\$ 0.37	\$ 0.09	\$ 0.18
	System Totals	\$ 14.91	\$ -	\$ -	\$ 14.22	\$ 0.05	\$ -	\$ 0.37	\$ 0.09	\$ 0.18

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	0	0	0	0	6	12	12	24	0	0	54
	System Totals	0	0	0	0	6	12	12	24	0	0	54

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

**Estimated Cost
of Electronics**
(Includes Subsystem Electronics)
\$14.91



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Cost Summary

Estimated Cost Totals	
Main Electronic Assemblies	\$ 14.91
Total	\$ 14.91

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.

Cost modeling is tricky business. Multiple variables affect the actual production costs a manufacturer will experience, including development expenses, unit volumes, supply-and-demand in component markets, die yield-curve maturity, OEM purchasing power, and even variations in accounting practices. Different cost modeling methods employ different assumptions about how to handle these and other variables, but we can identify two basic approaches: that which seeks to track short-term variations in the inputs to the production process, and that which strives to maintain comparability of the output of the model across product families and over time.

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We believe our cost estimates generally fall within 15 percent of the "right answer," which itself can vary depending on the market and OEM-specific factors mentioned earlier. While the TechInsights cost model is imperfect, it yields important insights into technology and business dynamics along with good first-order contributions to system cost by component type. Additionally, the consistency of approach and gradual modification to assumptions (smoothing out frequently-shifting pricing factors) hopefully yields a credible, but user-modifiable, view of OEM high volume cost-to-produce.

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Total Silicon Area : This metric describes the total area of silicon as measured from X-ray or direct measurement of ICs. The area is an expression of the enclosed bare die area and excludes packaging area. The aggregate silicon area is a good benchmark to show how integrated a design might be when making comparisons to similar systems. Total silicon area also reflects the major cost driver for most systems we examine.

Silicon Tiling Density : Ratio of Total Silicon Area to total printed circuit board “projected” area (i.e. the simple board area and not the cumulative surface area of both sides of the board). This metric directly reflects the level of efficiency and aggressiveness in integrated circuit packing and placement. Single digit Silicon Tiling Density is typical but silicon coverage of 10% - 20% has been seen in some of the most advanced products we have examined. Higher Tiling Densities often correspond with the use of chip scale packaging (CSPs) or other small form-factor IC packaging technologies. High density circuit boards are also often a supporting technology.

Number of Parts : Total component count including ICs, passives, modules, connectors, etc., each separated out in our reporting.

Number of Connections : The total number of connections corresponds to the total number of interconnects introduced by the aggregate component set and reflects any electrical connection observed (solder joints, adhesive interconnect, or connector terminal interfaces).

Opportunity Count : Opportunity Count is the total number of parts plus the total number of connections; the name reflects that each of these constituent elements represents an opportunity for failure. A high opportunity count means more complex and riskier electronics assembly.

Average Pin Count (APC) : Ratio of total number of component terminals to total number of parts, at the system level. This metric reflects the ‘average’ terminal complexity of the components and often provide a signature of integration level and/or “digital-ness” of the overall product. Low APCs reflect a high number of discretely or other low-pincount devices often characteristic of analog circuitry. Conversely, high APCs are characteristic of highly integrated, high-pincount assemblies, often those composed largely of digital integrated circuits.

Connection Density : This metric is a ratio of the total Number of Connections to total printed circuit board assembly area, in units of connections per sq. inch. The metric provides data related to the Silicon Tiling Density above, but with an emphasis on complexity of I/O interconnect. For example, with a fixed Connection Density, high tiling density of low-pincount memory chips is more readily achieved than comparable silicon tiling of high pincount logic.

Part Density : This metric is a ratio of the total Number of Parts to total printed circuit board assembly area, in units of components per sq. inch. The metric provides data related to the Silicon Tiling Density and Connection Density as described above, but with an emphasis on density and complexity of component packing efficiency. For example, low Part Density of high-pincount devices can pose an equal challenge in Connection Density to high Part Density of low-pincount devices. High Part Density does reflect challenges in surface mount assembly in terms of (typically) precision of placement, number of placements, and engineering of part clearances.

Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

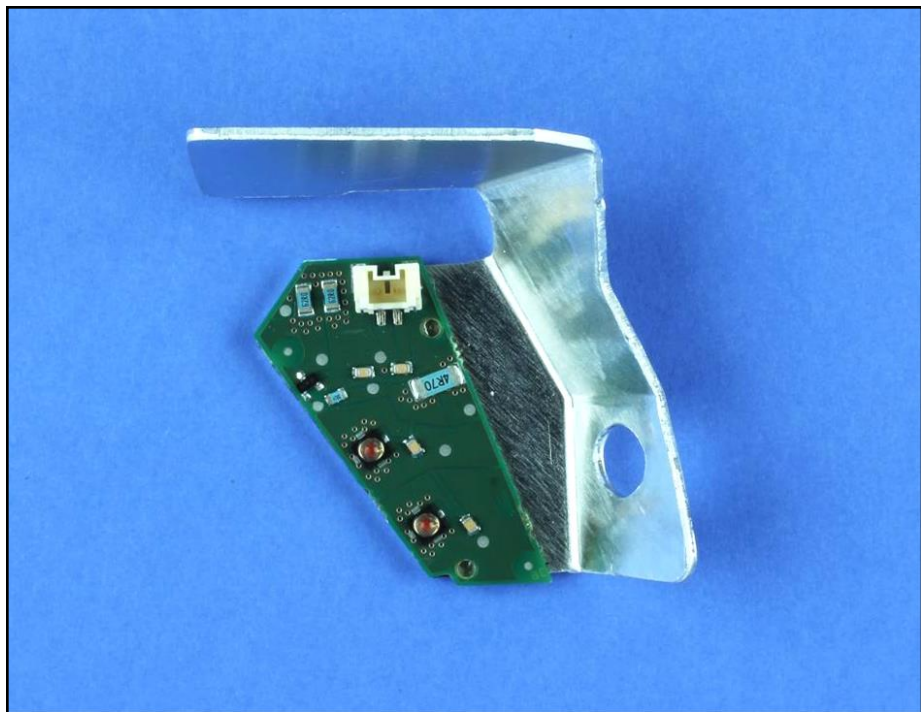
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Deep Dive Report

BMW i3 Small Upper Board, Tail Lamp Asm

5276
Report #15900-150211-PKb



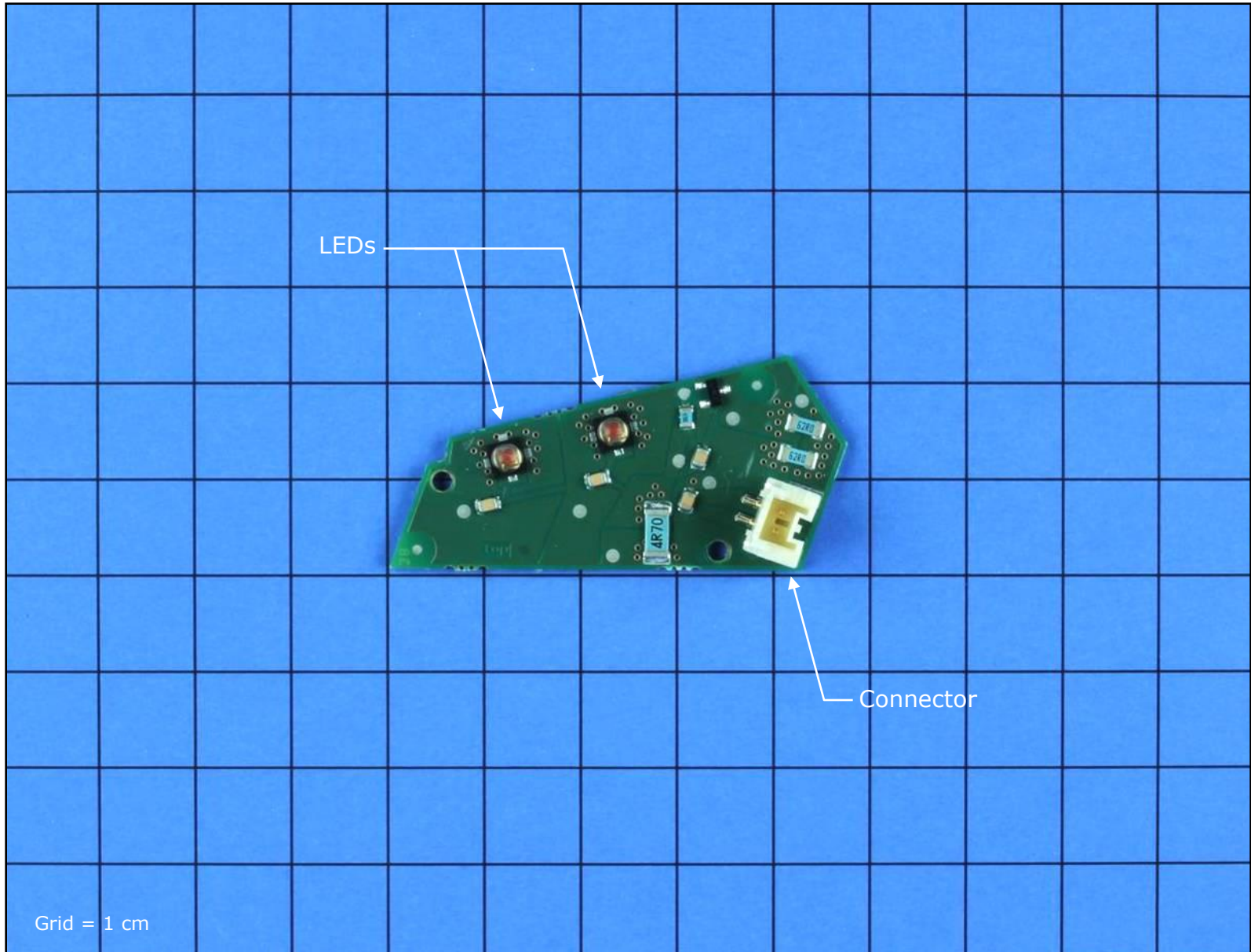
Product Description

This report concerns a small upper printed circuit board (PCB) for the tail lamp of the 2014 BMW i3. This PCB has (2) red notification LEDs and an attached aluminum support.

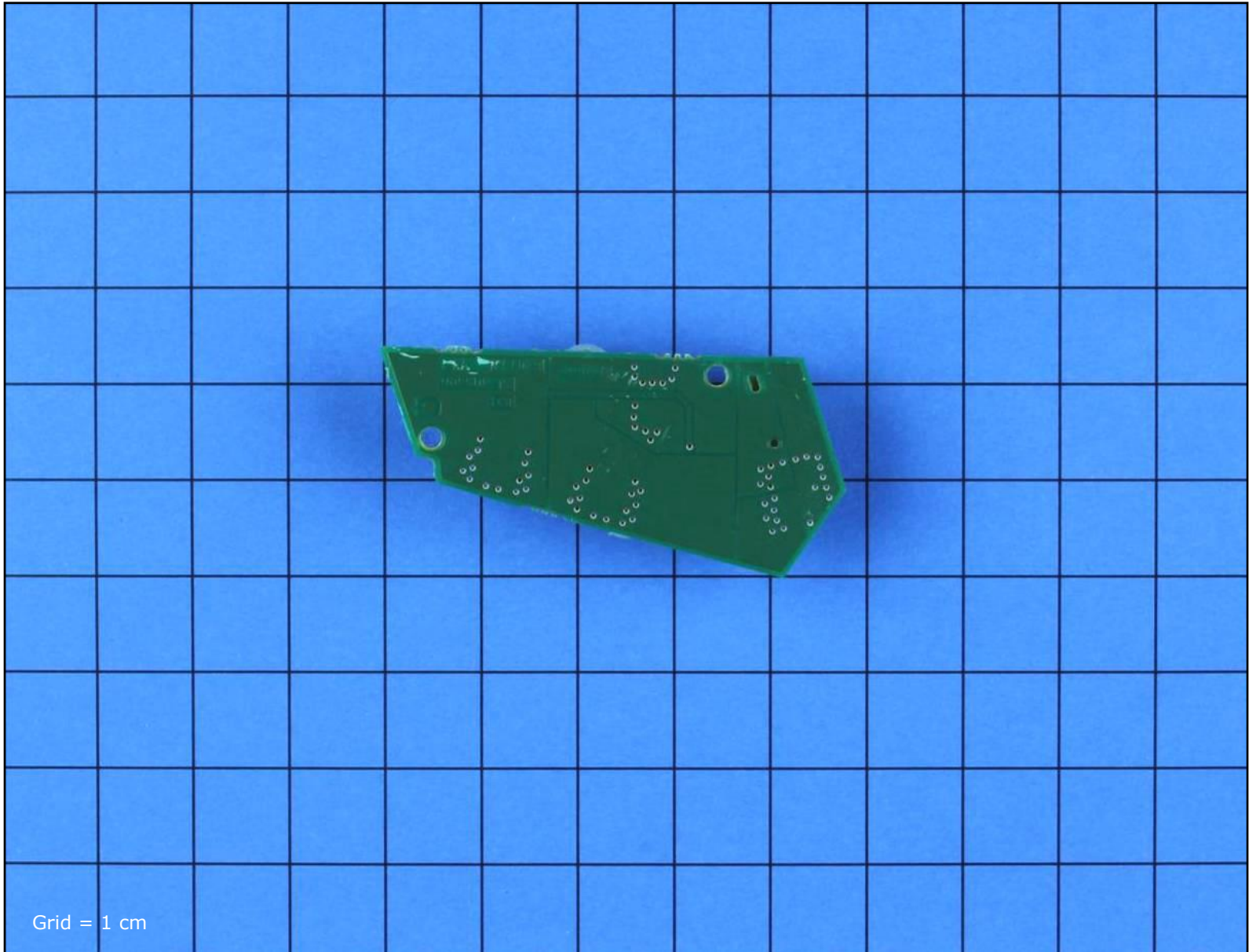
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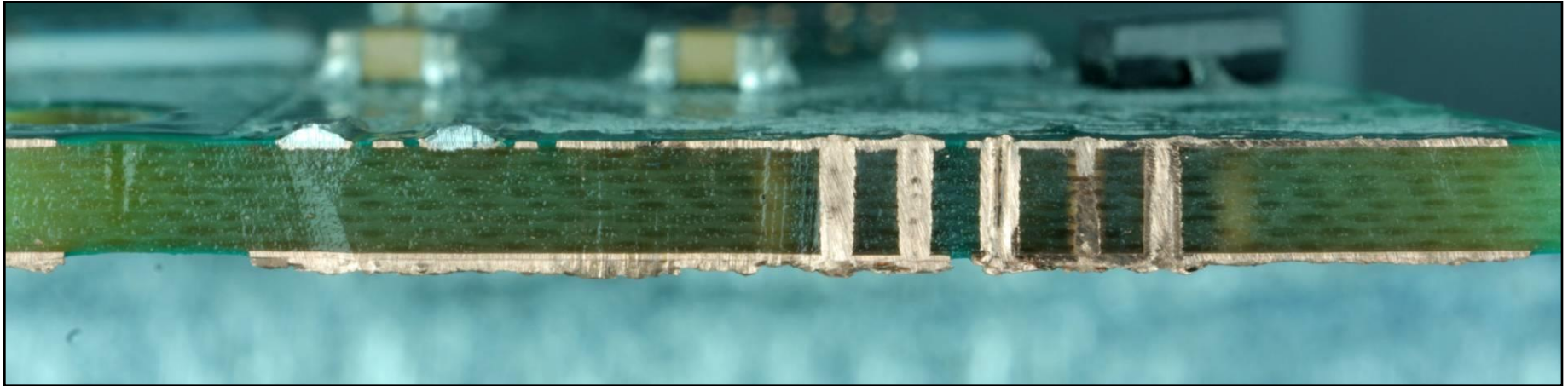
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 Small Upper Board, Tail Lamp Assy	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	16.2 (Measured)	Retail Price		
Product Dimensions	76 x 47.5 x 30.1 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$2.57	
Product Features		Electronics Cost	\$1.86	
		Manufacturing Cost Breakdown		
Notification	(2) Red LEDs	Discretes & Connectors	\$1.61	62.6%
Support	(1) Aluminum Support (attached)	Substrates	\$0.11	4.3%
		Component Insertion	\$0.07	2.7%
		Card Test	\$0.06	2.3%
		Non-Electronic Parts	\$0.48	18.7%
		Final Assembly & Test	\$0.24	9.3%
		Total	\$2.57	100.0%



Grid = 1 cm



Grid = 1 cm



Substrates

Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Unknown	FR4	2 Layer conventional FR4 / HF	2	7.5	0.73	0.48	0.70	0.40			1.6	9.8	\$ 0.11

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	2	Small Active	LED, Single	None	4	3.70	3.70	\$0.700	\$1.400
	1	Small Active	Transistor, Small	6CW 35	3	2.80	2.70	\$0.030	\$0.030
TOTALS	3				11				\$1.43

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
	8	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.032
TOTALS	8			16		\$0.03

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Connector: LIF	4	8.90	7.90	\$0.150	\$0.150
TOTALS	1		4				\$0.15

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	7.5	2	15.0	9.8	12	31	1.6	4.1	2.6	3.40
	System Totals	7.5	2	15		12	31	1.6	4.1	2.6	3.40

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

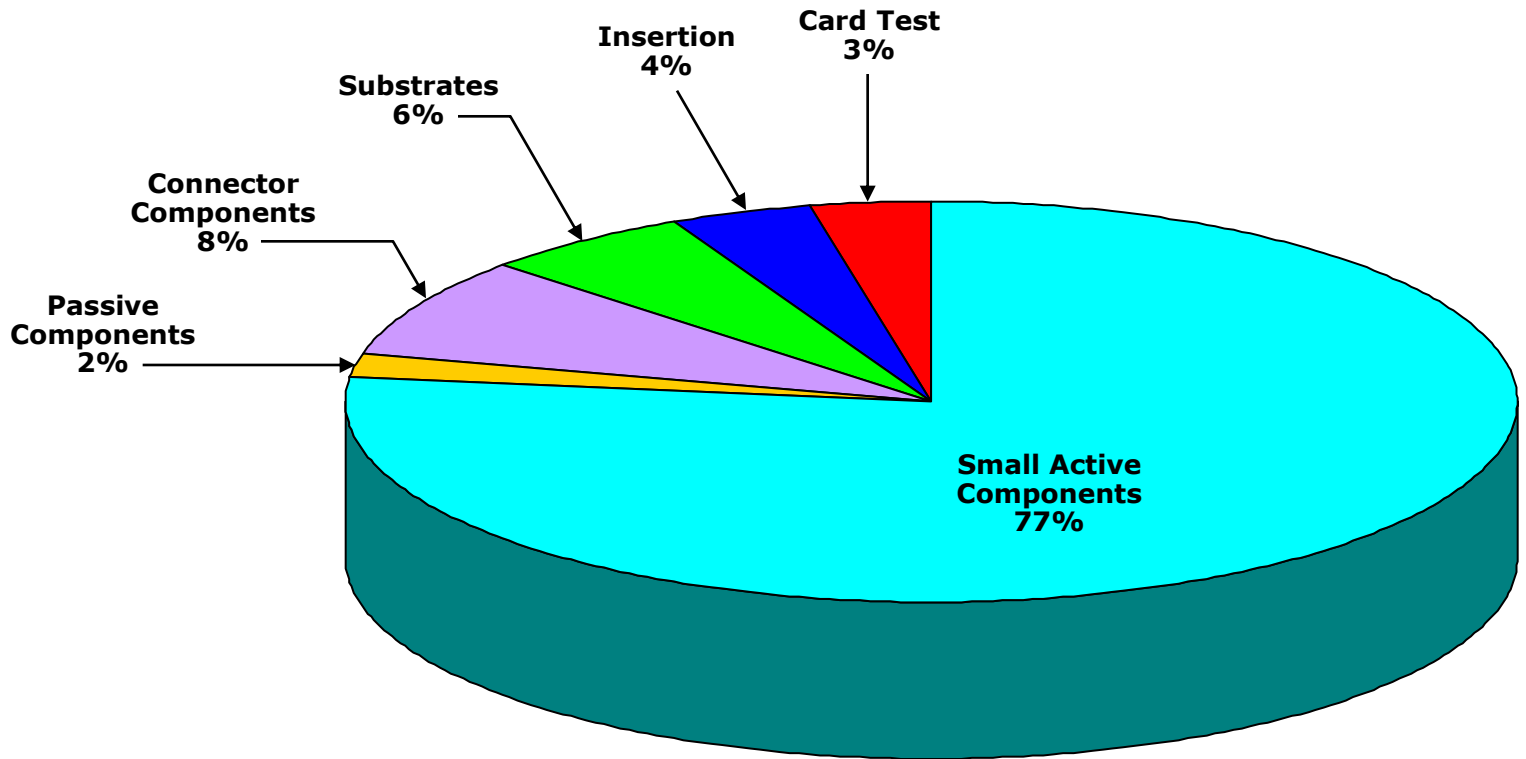
Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 1.86	\$ -	\$ -	\$ 1.43	\$ 0.03	\$ 0.15	\$ 0.11	\$ 0.07	\$ 0.06
	System Totals	\$ 1.86	\$ -	\$ -	\$ 1.43	\$ 0.03	\$ 0.15	\$ 0.11	\$ 0.07	\$ 0.06

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Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	0	0	0	0	3	11	8	16	1	4	43
	System Totals	0	0	0	0	3	11	8	16	1	4	43

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**Estimated Cost
of Electronics**
(Includes Subsystem Electronics)
\$1.86



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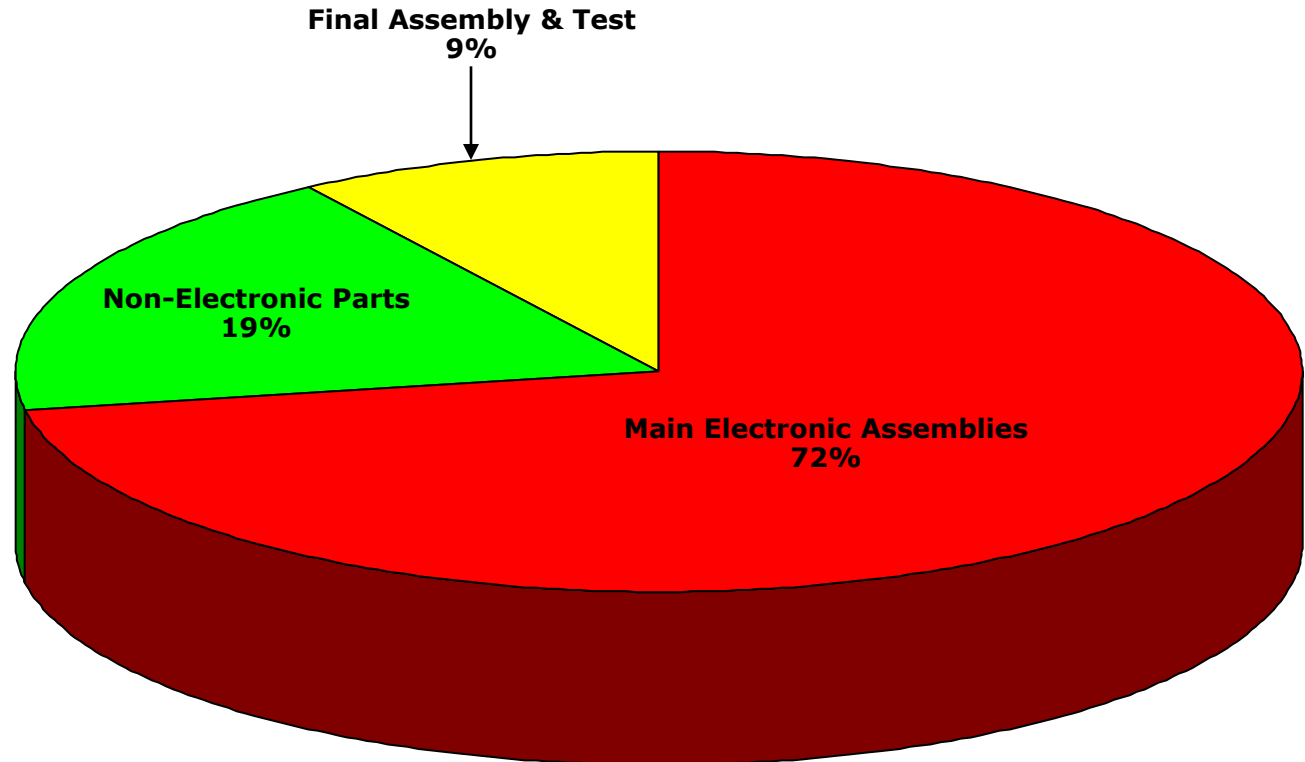
Subsystem	Part ID No.	Qty	Description	Fabrication Process	Material	Dimensions (mm)	Weight (grams)	Est'd Cost Each	Est'd Extended Cost	
Miscellaneous	1	1	Aluminum Support	Stamped + Formed	Aluminum	76 x 47.5 x 30.1	12.60	0.480	0.480	
Total		1						Estimated Cost		\$0.48

Final Ass'y Labor & Test Cost Estimate

Final Assembly & Test	
Made in	China
Number of parts	3
Est'd number of steps	11
Est'd time (seconds)	42
Est'd final assembly cost	\$ 0.04
Est'd final test cost	\$ 0.20

Estimated Cost Totals	
Main Electronic Assemblies	\$ 1.86
Non-Electronic Parts	\$ 0.48
Final Assembly & Test	\$ 0.24
Total	\$ 2.57

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
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Average Pin Count (APC) : Ratio of total number of component terminals to total number of parts, at the system level. This metric reflects the ‘average’ terminal complexity of the components and often provide a signature of integration level and/or “digital-ness” of the overall product. Low APCs reflect a high number of discrettes or other low-pincount devices often characteristic of analog circuitry. Conversely, high APCs are characteristic of highly integrated, high-pincount assemblies, often those composed largely of digital integrated circuits.

Connection Density : This metric is a ratio of the total Number of Connections to total printed circuit board assembly area, in units of connections per sq. inch. The metric provides data related to the Silicon Tiling Density above, but with an emphasis on complexity of I/O interconnect. For example, with a fixed Connection Density, high tiling density of low-pincount memory chips is more readily achieved than comparable silicon tiling of high pincount logic.

Part Density : This metric is a ratio of the total Number of Parts to total printed circuit board assembly area, in units of components per sq. inch. The metric provides data related to the Silicon Tiling Density and Connection Density as described above, but with an emphasis on density and complexity of component packing efficiency. For example, low Part Density of high-pincount devices can pose an equal challenge in Connection Density to high Part Density of low-pincount devices. High Part Density does reflect challenges in surface mount assembly in terms of (typically) precision of placement, number of placements, and engineering of part clearances.

Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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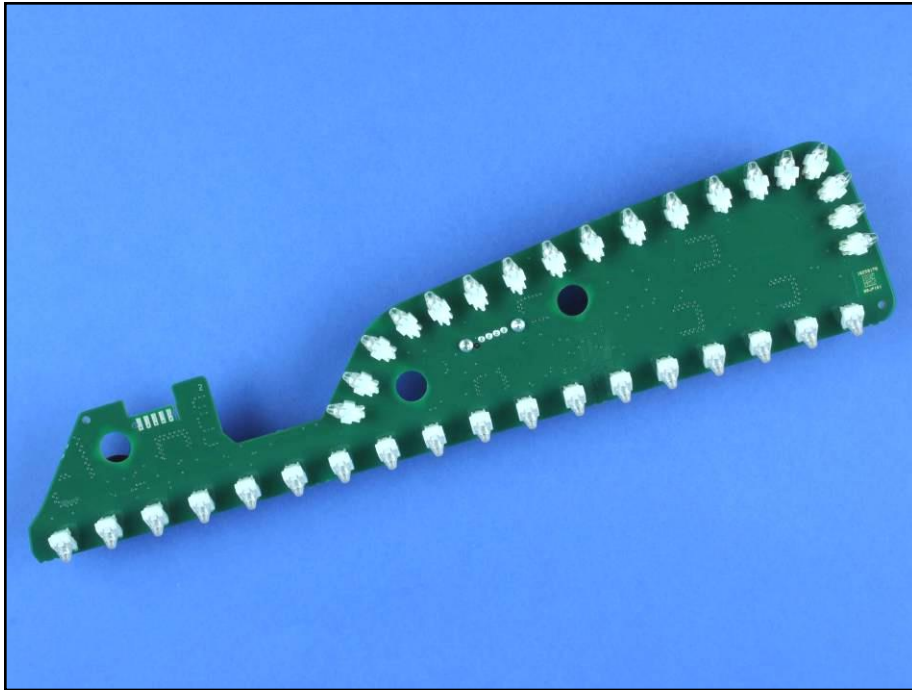
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Deep Dive Report

BMW i3 Tail Lamp Main Board

5275

Report #15900-150130-RRPKb



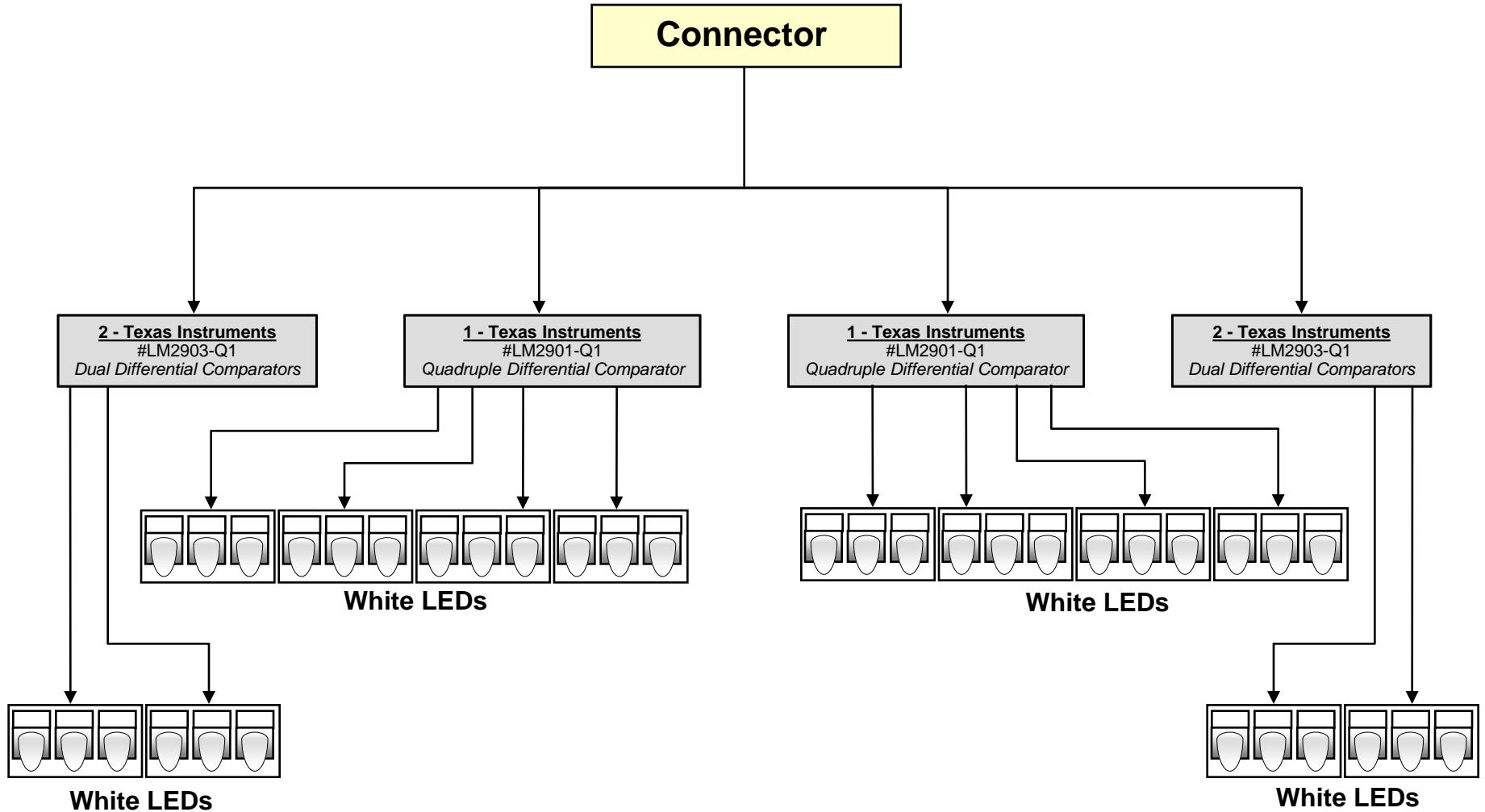
Product Description

This report concerns the main printed circuit board (PCB) for the tail light of the 2014 BMW i3. This PCB features (36) White LEDs and (4) comparators from Texas Instruments: (2) #LM2901-Q1 quadruple differential comparators and (2) LM2903-Q1 dual differential comparators.

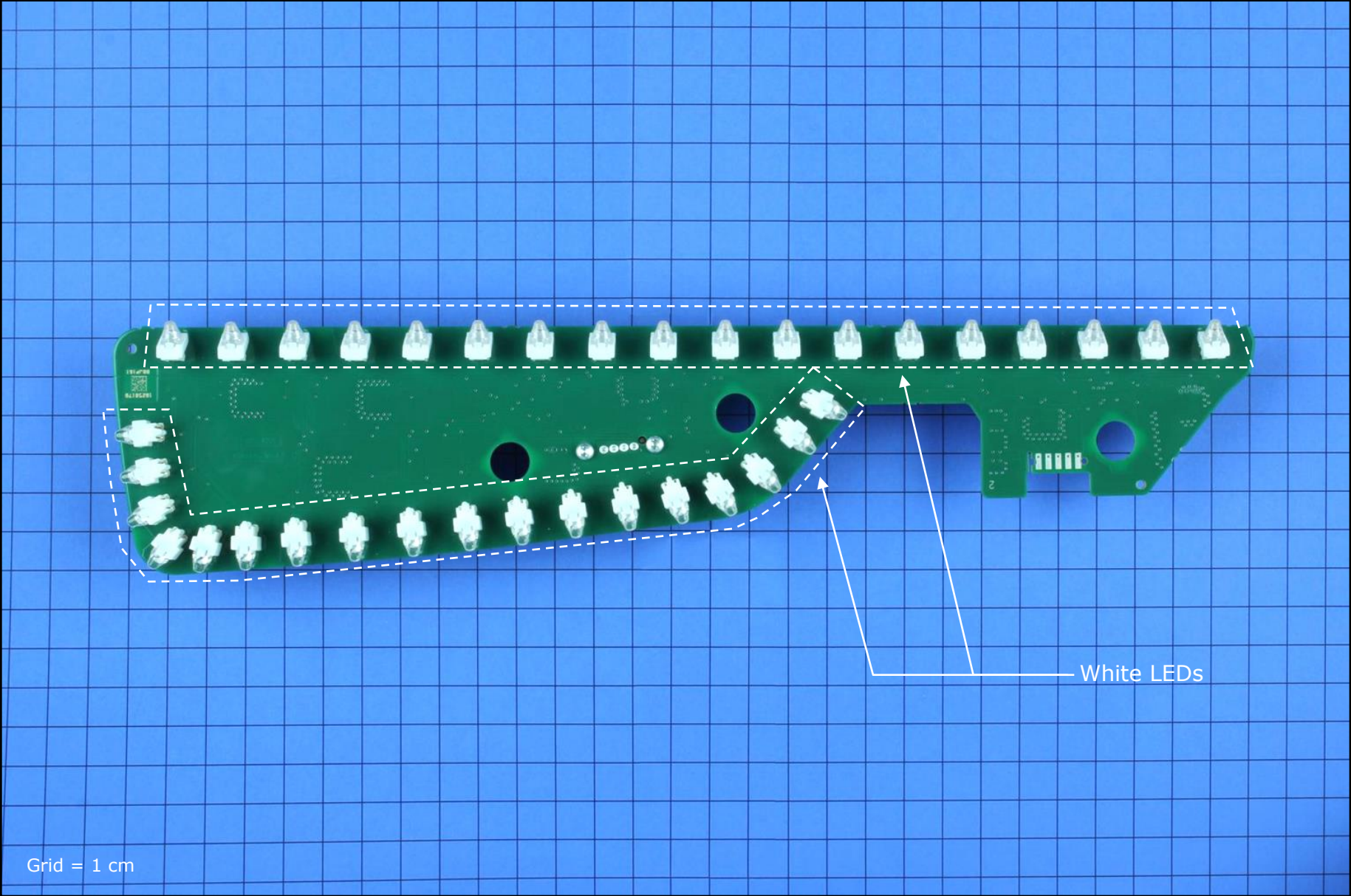
DISCLAIMER: All company names, product names, and service names mentioned are used for identification purposes only and may be registered trademarks, trademarks, or service marks of their respective owners. All analyses are done without participation, authorization, or endorsement of the manufacturer. Any cost analyses presented in this material are estimates prepared by TechInsights from generally available data. While TechInsights believes that these estimates reflect the probable costs, the actual producer did not supply the data, and therefore the actual costs may be different from these estimates. Furthermore, TechInsights extends no warranties with respect to any information in this document, and shall bear no liability whatsoever for the use of the information.

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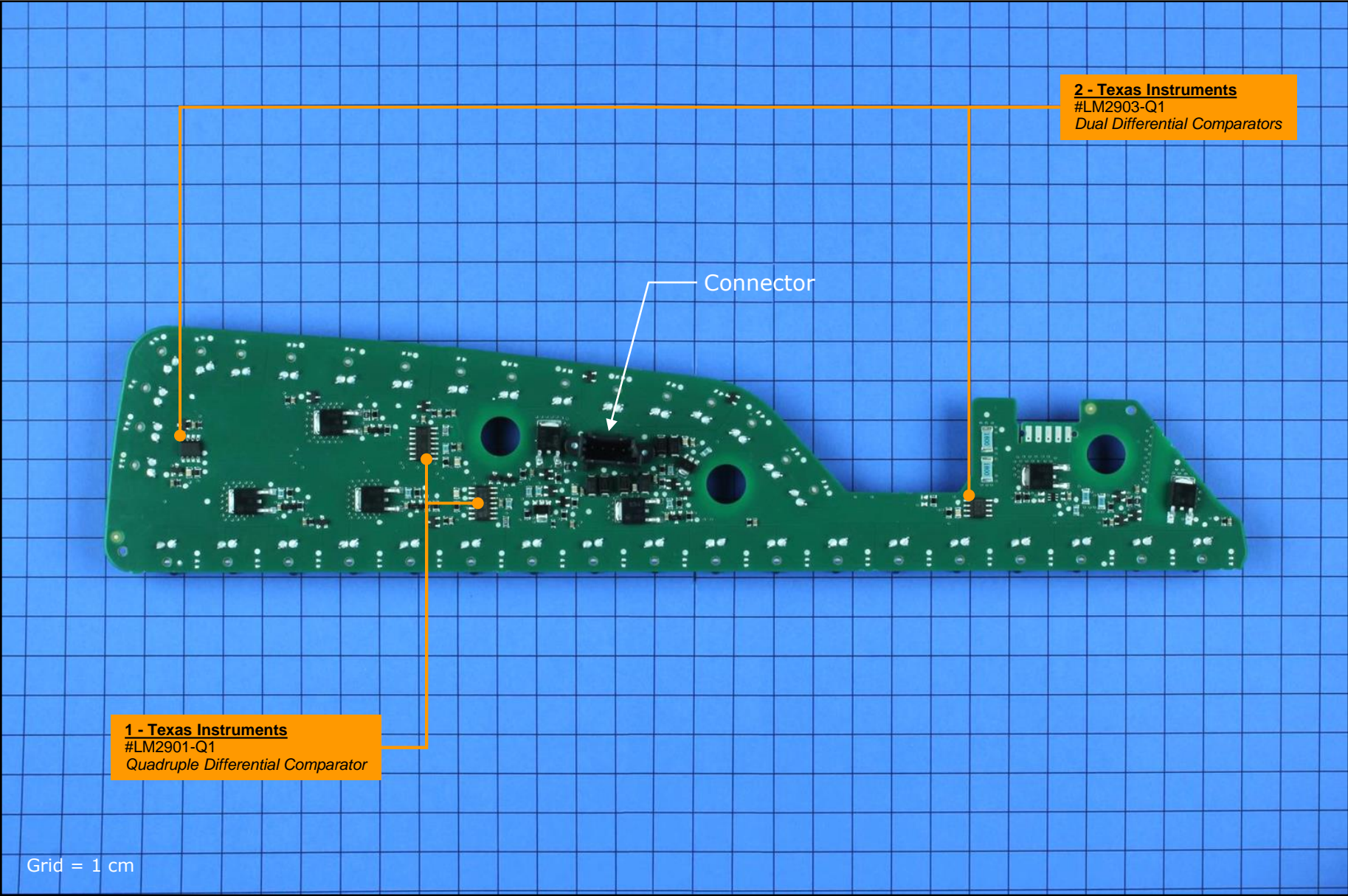
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	4	
Brand	BMW	IC Package Count	4	
Product Name & Model #	i3 Tail Lamp Main Board	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	66 (Measured)	Retail Price		
Product Dimensions	287.6 x 62.3 x 27.1 (Measured at Longest/Widest/Thickest)	Total Manufacturing Cost	\$8.49	
Product Features		Electronics Cost	\$8.49	
		Manufacturing Cost Breakdown		
Comparators	(2) Texas Instruments #LM2901-Q1 Quadruple Differential Comparators, (2) Texas Instruments LM2903-Q1 Dual Differential Comparators	Integrated Circuits	\$0.54	6.4%
White LEDs	36 pcs.	Discretes	\$4.77	56.2%
		Connectors	\$0.14	1.6%
		Substrates	\$1.47	17.3%
		Component Insertion	\$0.84	9.9%
		Card Test	\$0.73	8.6%
		Total	\$8.49	100.0%



Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.



Grid = 1 cm

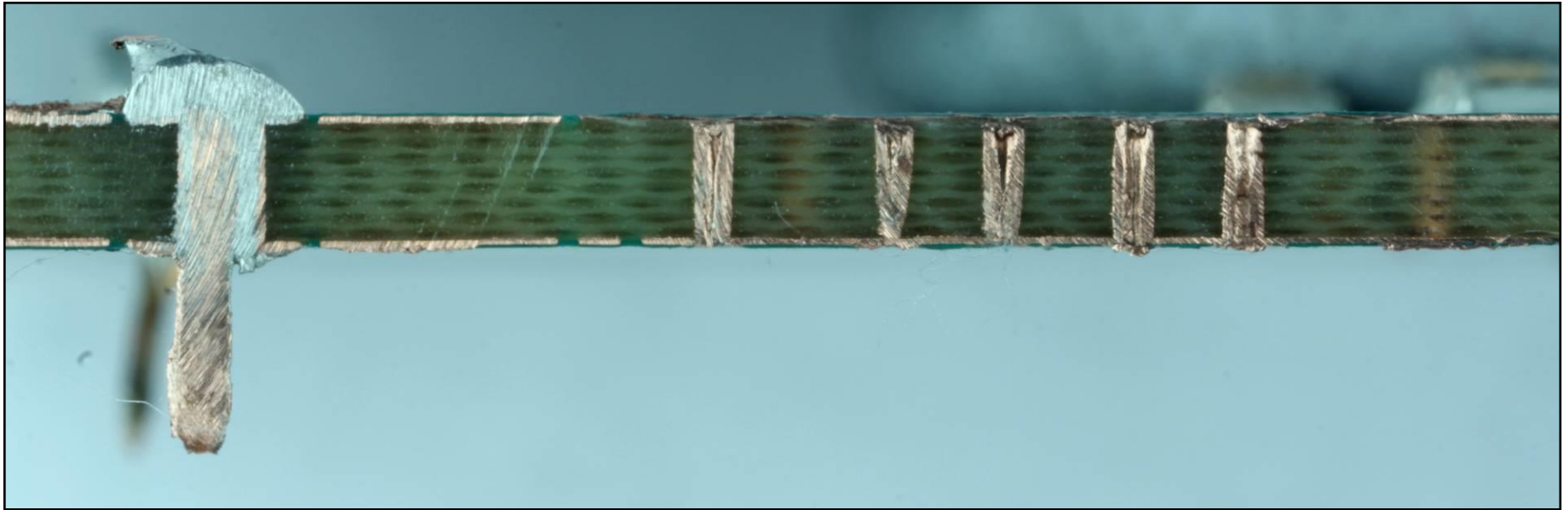


2 - Texas Instruments
#LM2903-Q1
Dual Differential Comparators

Connector

1 - Texas Instruments
#LM2901-Q1
Quadruple Differential Comparator

Grid = 1 cm



Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Unknown	FR4	2 Layer Conventional FR4 / HF	2	124.3	0.62	0.45	0.69	0.35			1.6	8.5	\$ 1.47

Location	Package Info									Die Info						Estimated Costs			
	Pkg Ref. #	Pkg Qty	Brand Name	Part Number	Pkg Description	Form	Pin Count	Length (mm)	Width (mm)	Height (mm)	Die Ref #	Die Qty	Brand Name	Part Number	Description	Length (mm)	Width (mm)	Each	Total
Main Board, Side 2	1	2	Texas Instruments	LM2901-Q1	Quadruple Differential Comparator	SOP	14	8.68	5.95	1.78	1.1	1	Texas Instruments	339	Quadruple Differential Comparator	1.22	1.20	\$ 0.170	\$ 0.340
	2	2	Texas Instruments	LM2903-Q1	Dual Differential Comparators	SOP	8	5.83	4.95	1.68	2.1	1	Texas Instruments	393TLM	Dual Differential Comparators	1.07	0.85	\$ 0.100	\$ 0.200
Totals		4					44					4							\$0.54

Note: Supplemental information, such as IC package & die markings, is included in the Excel Bill of Materials (BOM) spreadsheet.

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	36	Small Active	LED, Single	None	2	9.88	6.54	\$0.080	\$2.880
Main Board, Side 2	3	Small Active	Diode, SMT	ON Logo SEC RE13.	2	5.40	2.82	\$0.050	\$0.150
	3	Small Active	Diode, SMT	SG 42 General Semiconductor Logo	2	5.10	2.60	\$0.050	\$0.150
	2	Small Active	Diode, SMT	D4 =	6	2.95	2.21	\$0.015	\$0.030
	12	Small Active	Diode, SMT	CA2 A6	3	2.94	1.84	\$0.015	\$0.179
	2	Small Active	Transistor, Small	3DW 42	3	2.88	1.66	\$0.030	\$0.060
	6	Small Active	Transistor, Small	1BW	3	2.92	1.70	\$0.030	\$0.179
	2	Small Active	Transistor, Small	AA	4	4.47	4.15	\$0.030	\$0.060
	7	Small Active	Transistor	E02 ON Logo J31CG	3	10.00	6.50	\$0.100	\$0.700
	1	Small Active	Transistor, Small	1Ds 3N	2	2.10	2.00	\$0.030	\$0.030
TOTALS	74				187				\$4.42

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 2	86	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.344
TOTALS	86			172		\$0.34

Location	Qty	Form	Package			Estimated Costs	
			Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 2	1	Connector: LIF	4	15.40	7.00	\$0.140	\$0.140
TOTALS	1		4				\$0.14

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	124.3	2	248.7	8.5	165	407	1.3	3.3	2.5	66.00
	System Totals	124.3	2	248.66		165	407	1.3	3.3	2.5	66.00

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 8.49	\$ 0.54	\$ -	\$ 4.42	\$ 0.34	\$ 0.14	\$ 1.47	\$ 0.84	\$ 0.73
	System Totals	\$ 8.49	\$ 0.54	\$ -	\$ 4.42	\$ 0.34	\$ 0.14	\$ 1.47	\$ 0.84	\$ 0.73

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

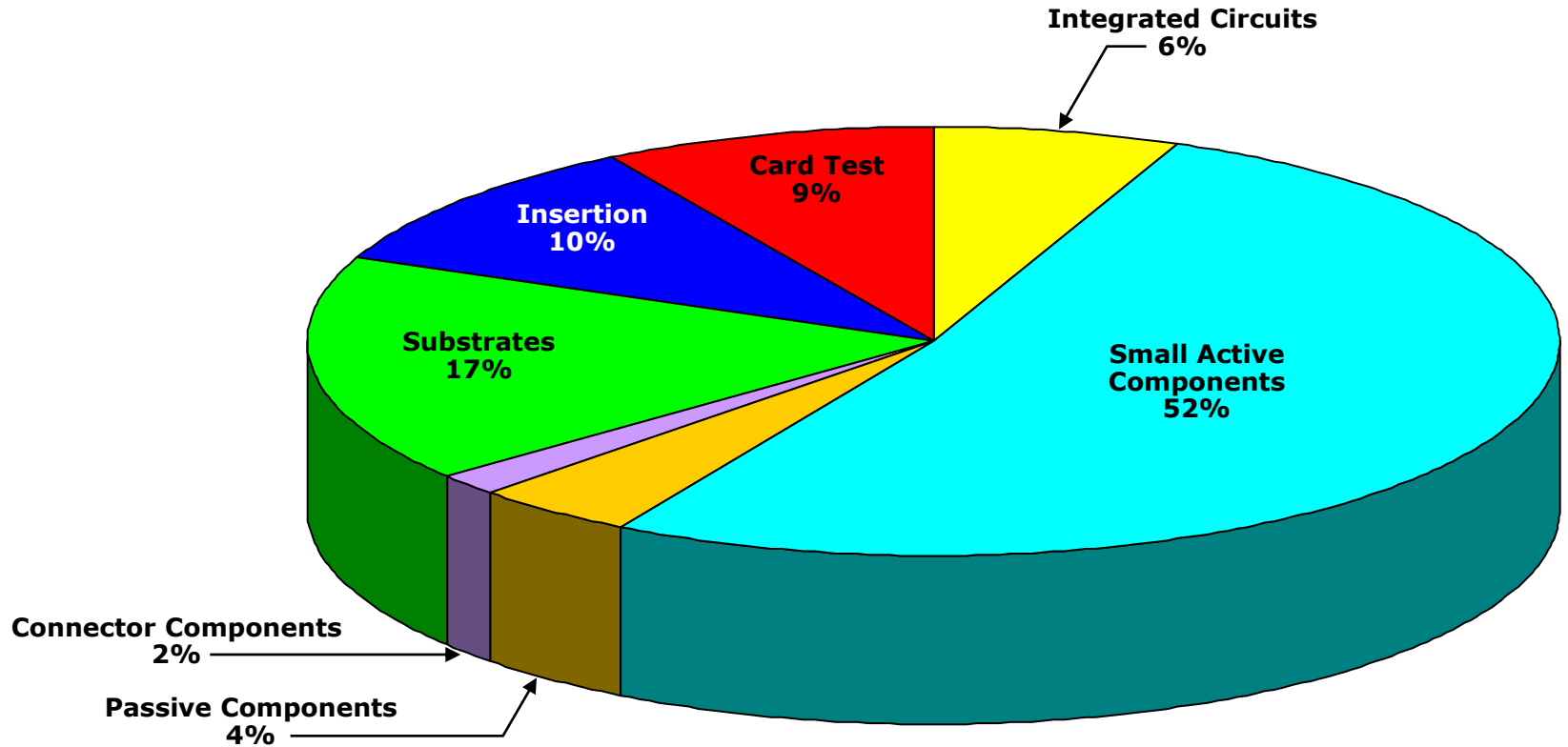
Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Odd Form Components	Modular/Odd Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	4	44	0	0	74	187	86	172	1	4	572
	System Totals	4	44	0	0	74	187	86	172	1	4	572

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

IC Metrics											
General Area	Assembly Name	IC Die Count	IC Package Count	Number of Package Connections	Die Area (sq.mm)	Substrate Tiling Density (die area / substrate area)	Package Area (sq.mm)	Die Area/Package Area Ratio	Package Connections per sq.cm of Package Area	Volatile Memory (KBytes)	Non-Volatile Memory (KBytes)
Main Electronics	Main Board	4	4	44	4.8	0	161.0	0.03	27.3	0	0
	System Totals	4	4	44	4.8		161.0	0.03	27.3	0	0

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

**Estimated Cost
of Electronics**
(Includes Subsystem Electronics)
\$8.49



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Estimated Cost Totals	
Main Electronic Assemblies	\$ 8.49
Total	\$ 8.49

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.

Cost modeling is tricky business. Multiple variables affect the actual production costs a manufacturer will experience, including development expenses, unit volumes, supply-and-demand in component markets, die yield-curve maturity, OEM purchasing power, and even variations in accounting practices. Different cost modeling methods employ different assumptions about how to handle these and other variables, but we can identify two basic approaches: that which seeks to track short-term variations in the inputs to the production process, and that which strives to maintain comparability of the output of the model across product families and over time.

TechInsights' philosophy in cost modeling is to emphasize consistency across products and comparability over time, rather than to track short-term fluctuations. During the past eight years, we have developed an estimation process that, while necessarily lacking an insider's knowledge of the cost factors that impact any one manufacturer, is reasonably accurate in its prediction of unit costs in high-volume production environments. We do not claim that the model will produce the "right" answer for your firm's environment. However, TechInsights does give customers a key analytical tool with a complete set of data in our Bill of Materials (BOM). The BOM allows readers to 1) scrutinize the assumptions behind our cost model and 2) modify the results based on substitution of their own component cost estimates where they have better information based on inside knowledge.

Our estimation process decomposes overall system cost into three major categories: Electronics, Mechanical, and Final Assembly. We begin by creating a complete electronics bill-of-materials (BOM). Each component from the largest ASIC to the smallest discrete resistor is entered into a BOM table with identifying attributes such as size, pitch, I/O count, package type, manufacturer, part number, estimated placement cost, and die size (if the component is an IC). Integrated circuit costs are calculated from measured die area. Using assumptions for wafer size, process type, number of die per wafer, defect density, and profit margin in combination with die area, an estimate of semiconductor cost is derived. Costs for discrete components and interconnect are derived from assumption tables which relate BOM line items to specific cost estimates by component type and estimates for part placement costs are included. For LCD display costs, we employ a model which tabulates expected cost from measurements of glass area, LCD type, and total pixel resolution. When market costs are available from alternative sources, LCD panel costs are taken from and referenced to these sources.

Costs of non-electronic components such as molded plastic enclosures and metallic components are measured in terms of weight, size, thickness, type of material, and complexity to arrive at their estimated cost. Other system items such as optics, antennae, batteries and displays are costed from a set of assumption tables derived from a combination of industry data, average high volume costs, and external sources. For final assembly, we re-build the torn-down product, tabulating stepwise assembly times as the reconstruction proceeds, to reach a total assembly time. Using a labor rate assumption for the country of origin, we then calculate final assembly cost.

The three major categories for system cost contributors can be broken down into the subcategories of ICs, other electronics parts, displays, batteries (as appropriate), camera modules, electronics assembly, non-electronic elements, and final assembly. By adding the cost estimates for each of these subcategories, an overall estimated cost is derived for the system under evaluation. Product packaging and accessories (CDs, cables, etc.) are also documented and estimated for their contribution to total cost as appropriate.

We believe our cost estimates generally fall within 15 percent of the "right answer," which itself can vary depending on the market and OEM-specific factors mentioned earlier. While the TechInsights cost model is imperfect, it yields important insights into technology and business dynamics along with good first-order contributions to system cost by component type. Additionally, the consistency of approach and gradual modification to assumptions (smoothing out frequently-shifting pricing factors) hopefully yields a credible, but user-modifiable, view of OEM high volume cost-to-produce.

Please feel free to contact us at support@techinsights.com with any comments, questions, or proposed corrections with respect to our cost estimates. We welcome your input.

In our product teardowns, we gather a series of metrics for product profiling and comparison. Some metrics focus on system characteristics such as total silicon area, total system semiconductor storage capacity, and total connection count. Other metrics reflect more subtle aspects of electronics assembly such as connection density, average component I/O count, and silicon tiling density. Taken as a whole, the metrics allow deeper comparison and benchmarking across multiple disciplines and multiple products. Key metrics we gather on products are described below along with their definitions and what they tend to say about the system under study. Most metrics can be used both in comparing similar products for benchmarking purposes or for quantifying differences in levels of complexity between dissimilar product types. Data fall into two categories; either “raw” measured data or ratios of these measured data sets.

Total Silicon Area : This metric describes the total area of silicon as measured from X-ray or direct measurement of ICs. The area is an expression of the enclosed bare die area and excludes packaging area. The aggregate silicon area is a good benchmark to show how integrated a design might be when making comparisons to similar systems. Total silicon area also reflects the major cost driver for most systems we examine.

Silicon Tiling Density : Ratio of Total Silicon Area to total printed circuit board “projected” area (i.e. the simple board area and not the cumulative surface area of both sides of the board). This metric directly reflects the level of efficiency and aggressiveness in integrated circuit packing and placement. Single digit Silicon Tiling Density is typical but silicon coverage of 10% - 20% has been seen in some of the most advanced products we have examined. Higher Tiling Densities often correspond with the use of chip scale packaging (CSPs) or other small form-factor IC packaging technologies. High density circuit boards are also often a supporting technology.

Number of Parts : Total component count including ICs, passives, modules, connectors, etc., each separated out in our reporting.

Number of Connections : The total number of connections corresponds to the total number of interconnects introduced by the aggregate component set and reflects any electrical connection observed (solder joints, adhesive interconnect, or connector terminal interfaces).

Opportunity Count : Opportunity Count is the total number of parts plus the total number of connections; the name reflects that each of these constituent elements represents an opportunity for failure. A high opportunity count means more complex and riskier electronics assembly.

Average Pin Count (APC) : Ratio of total number of component terminals to total number of parts, at the system level. This metric reflects the ‘average’ terminal complexity of the components and often provide a signature of integration level and/or “digital-ness” of the overall product. Low APCs reflect a high number of discretely or other low-pincount devices often characteristic of analog circuitry. Conversely, high APCs are characteristic of highly integrated, high-pincount assemblies, often those composed largely of digital integrated circuits.

Connection Density : This metric is a ratio of the total Number of Connections to total printed circuit board assembly area, in units of connections per sq. inch. The metric provides data related to the Silicon Tiling Density above, but with an emphasis on complexity of I/O interconnect. For example, with a fixed Connection Density, high tiling density of low-pincount memory chips is more readily achieved than comparable silicon tiling of high pincount logic.

Part Density : This metric is a ratio of the total Number of Parts to total printed circuit board assembly area, in units of components per sq. inch. The metric provides data related to the Silicon Tiling Density and Connection Density as described above, but with an emphasis on density and complexity of component packing efficiency. For example, low Part Density of high-pincount devices can pose an equal challenge in Connection Density to high Part Density of low-pincount devices. High Part Density does reflect challenges in surface mount assembly in terms of (typically) precision of placement, number of placements, and engineering of part clearances.

Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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Deep Dive Report

BMW i3 LED Board, Third Brake Light

5302

Report #15900-150225-PKa



Product Description:

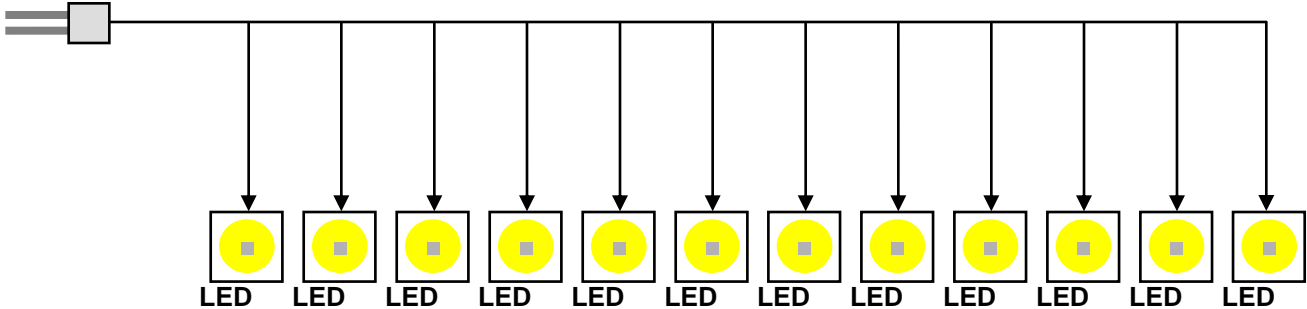
This report concerns the LED Board for the third brake light in the 2014 BMW i3. It consists of 12 Red LEDs.

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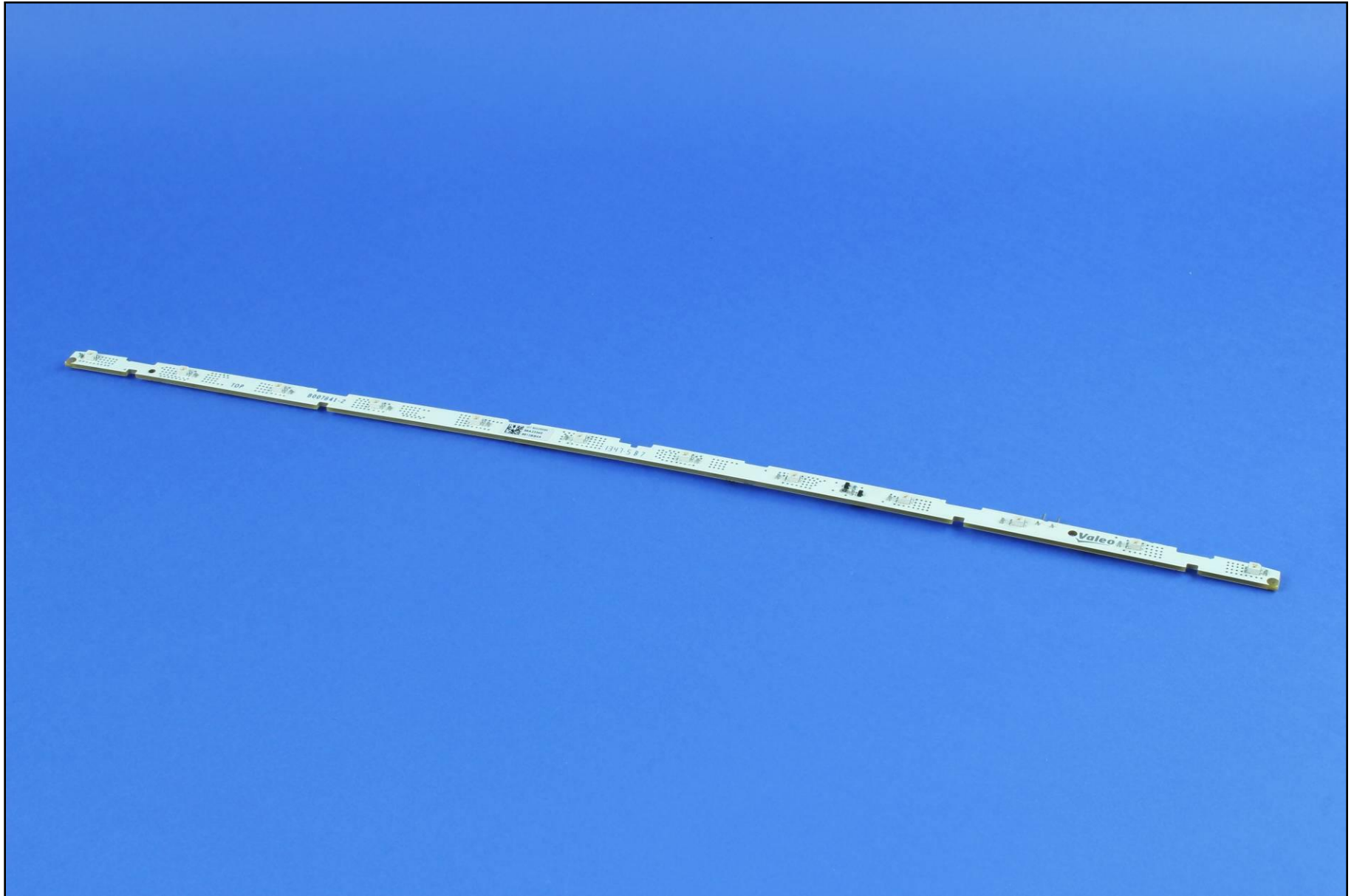
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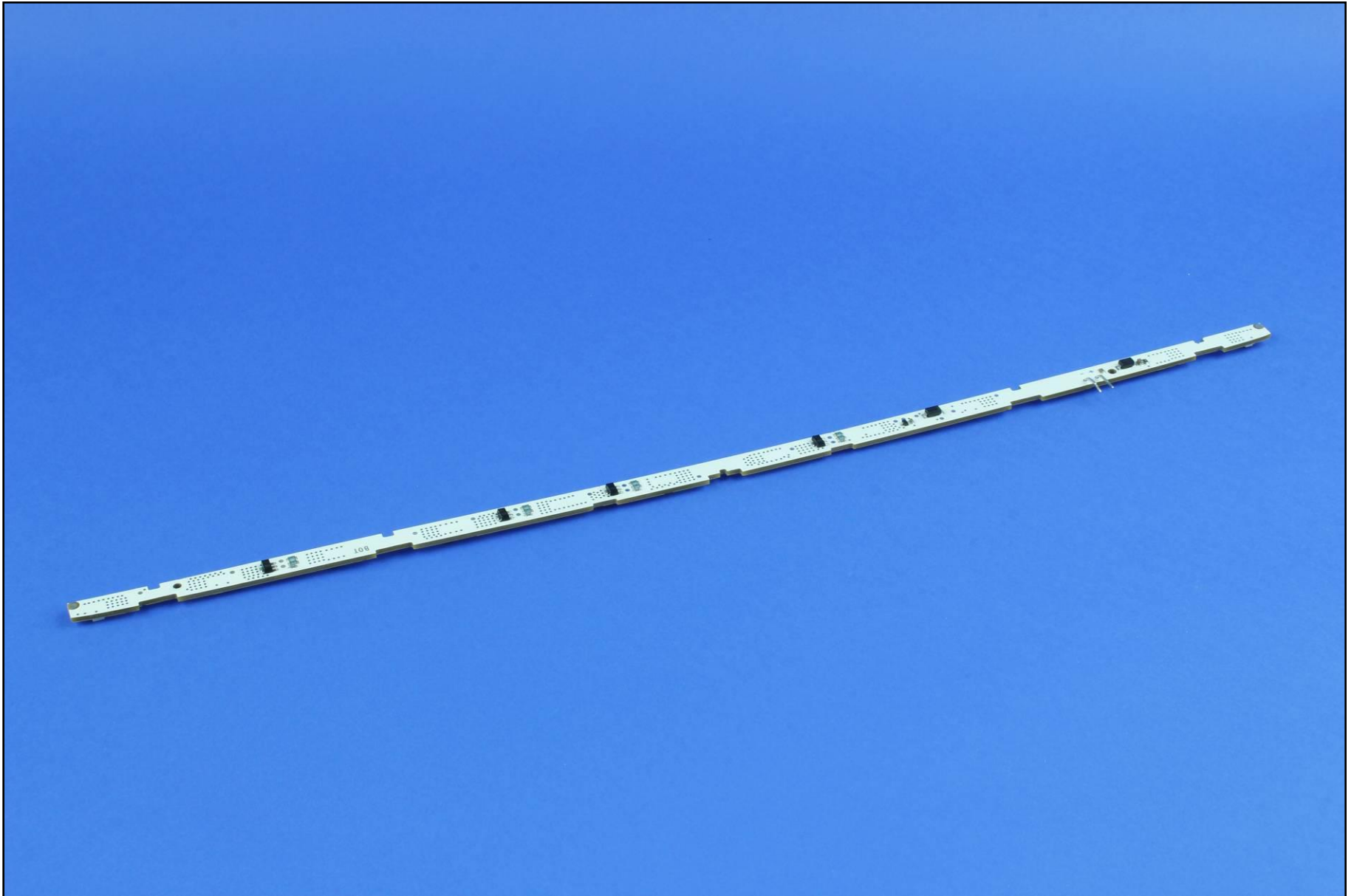
Product Description		Integrated Circuit Metrics		
Product Type	Automotive	IC Die Count	0	
Brand	BMW	IC Package Count	0	
Product Name & Model #	i3 LED Board, Third Brake Light	Cost Metrics		
Official Release Date	5/2/2014			
Weight (grams)	12.7 (Measured)	Retail Price		
Product Dimensions	367.0 x 11.0 x 5.0 (Measured at Longest/Widest/Thickest Points)	Total Manufacturing Cost	\$2.35	
Product Features		Electronics Cost	\$2.35	
		Manufacturing Cost Breakdown		
Lighting	12 red LEDs	Active Components	\$1.35	57.4%
		Passive Components	\$0.12	5.1%
		Substrates	\$0.41	17.4%
		Component Insertion	\$0.26	11.1%
		Card Test	\$0.21	8.9%
		Total	\$2.35	100.0%

Block Diagram

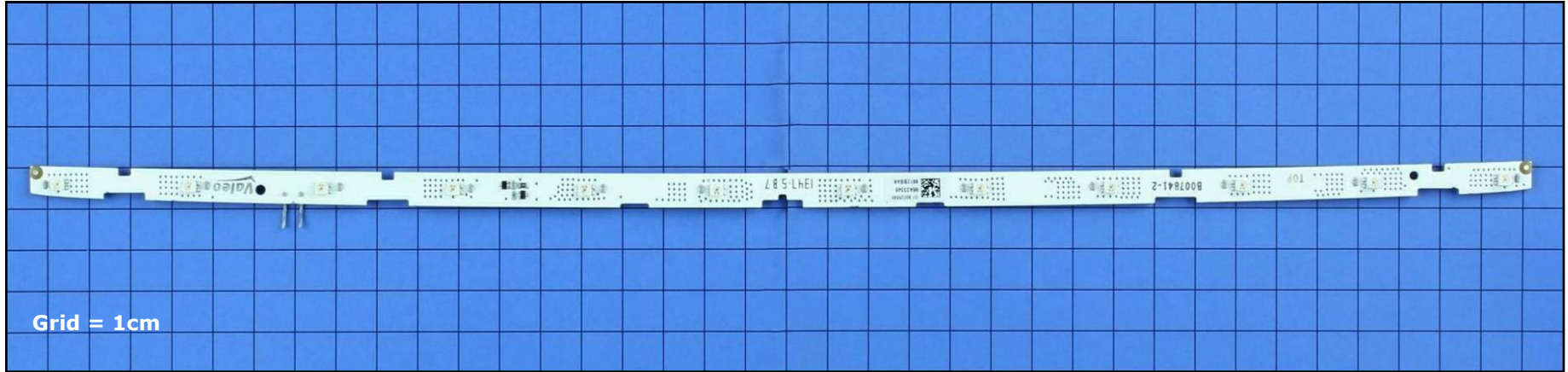


Estimated block diagram based on observation of this specific product implementation, manufacturer's data sheets where available, and best engineering judgment. Certain details of the interface circuitry are not reflected in this block diagram. Partitioning and connectivity are speculative.

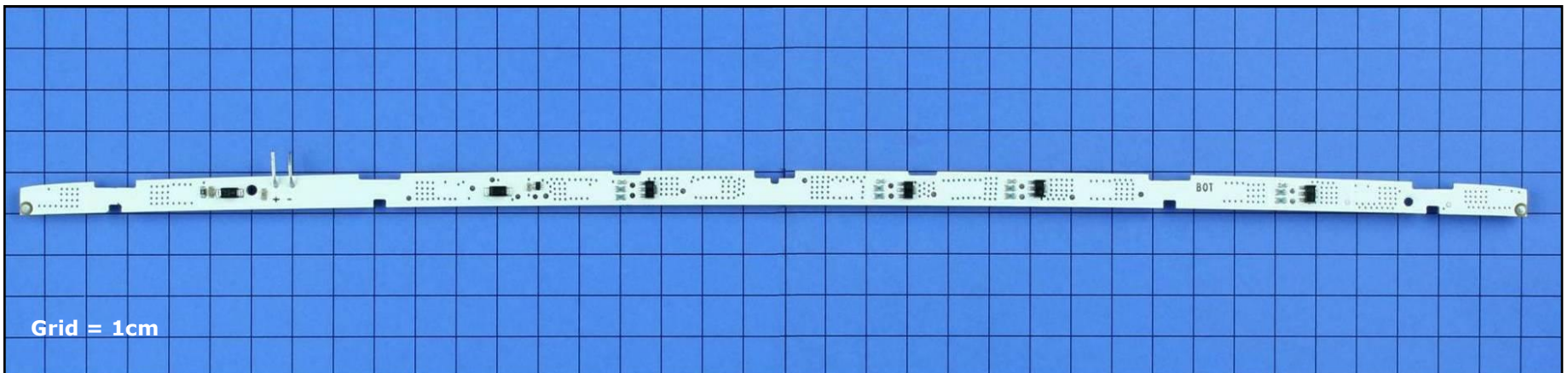


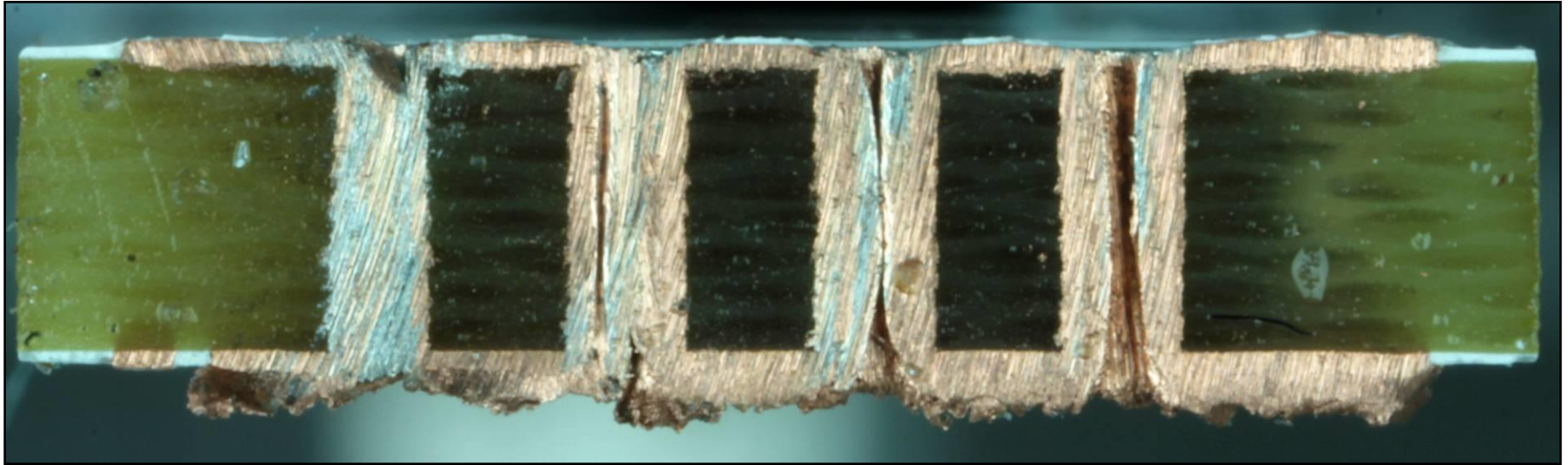


Side 1



Side 2





Substrates														
Assembly Name	Manufacturer	Core Material	Mfg. Technology	Layers	Area (cm ²)	Min. Trace Pitch (mm)	Min. Trace Width (mm)	ThruVia Land Dia (mm)	ThruVia Hole Dia (mm)	BlindVia Land Dia (mm)	BlindVia Hole Dia (mm)	Thickness (mm)	Routing Density	Estimated Costs
Main Board	Valeo	FR4	2 Layer conventional FR4 / HF	2	27.6	0.50	0.30	0.90	0.55			1.6	11.1	\$ 0.41

Location	Qty	Functional Description	Package					Estimated Costs	
			Form	Top Marking	Pin Count	Length (mm)	Width (mm)	Each	Total
Main Board, Side 1	1	Small Active	Diode, SMT	A7t	3	2.20	2.00	\$0.015	\$0.015
	1	Small Active	Transistor, Small	5Ct	3	2.20	2.00	\$0.030	\$0.030
	12	Small Active	LED, Single	None	4	3.40	2.70	\$0.080	\$0.960
Main Board, Side 2	2	Small Active	Diode, SMT	SC 3H Vishay logo	2	5.20	2.70	\$0.100	\$0.200
	2	Small Active	Diode, SMT	A7t	3	2.20	2.00	\$0.015	\$0.030
	4	Small Active	Transistor, Small	BL W39	4	4.40	4.30	\$0.030	\$0.120
TOTALS	22				80				\$1.35

Location	Qty	Functional Description	Package		Estimated Costs	
			Form	Pin Count	Each	Total
Main Board, Side 1	15	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.060
Main Board, Side 2	16	Small Passive	Cap, Res, Ferrite	2	\$0.004	\$0.064
TOTALS	31			62		\$0.12

Electronic Assembly Metrics by Assembly											
General Area	Assembly Name	Substrate Area (sq.cm)	Metal Layers	Circuit Area (sq.cm)	Routing Density (cm of routing per sq.cm of substrate)	Number of Components	Number of Connections	Component Density (Components/sq.cm)	Connection Density (Connections/sq.cm)	Avg. Pin Count	Assembly Weight (grams)
Main Electronics	Main Board	27.6	2	55.2	11.1	53	142	1.9	5.1	2.7	12.70
	System Totals	27.6	2	55.2		53	142	1.9	5.1	2.7	12.70

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Electronics Costs by Assembly										
General Area	Assembly Name	Total	Integrated Circuits	Modular & Odd Form Components	Small Active Components	Passive Components	Connector Components	Substrates	Insertion	Card Test
Main Electronics	Main Board	\$ 2.36	\$ -	\$ -	\$ 1.35	\$ 0.12	\$ -	\$ 0.41	\$ 0.26	\$ 0.21
	System Totals	\$ 2.36	\$ -	\$ -	\$ 1.35	\$ 0.12	\$ -	\$ 0.41	\$ 0.26	\$ 0.21

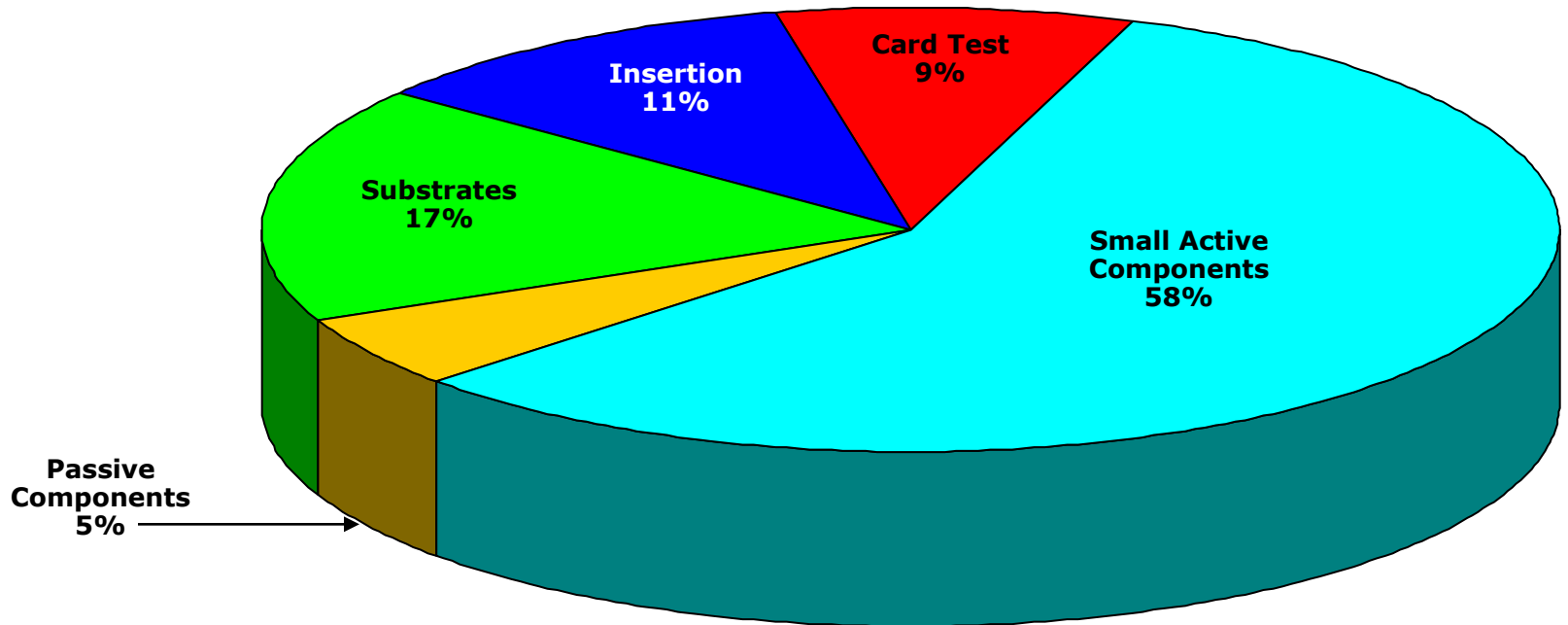
NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Counts by Assembly												
General Area	Assembly Name	IC Package Count	IC Connections	Modular/Ocid Form Components	Modular/Ocid Form Component Connections	Small Active Components	Small Active Component Connections	Passive Components	Passive Component Connections	Connectors	Connector Connections	Opportunities
Main Electronics	Main Board	0	0	0	0	22	80	31	62	0	0	195
	System Totals	0	0	0	0	22	80	31	62	0	0	195

NOTE: Occasional inconsistencies in totals may be present due to rounding error.

**Estimated Cost
of Electronics**

\$2.35



NOTE: Occasional inconsistencies in totals may be present due to rounding error.

Cost Summary

Estimated Cost Totals	
Main Electronic Assemblies	\$ 2.35
Total	\$ 2.35

Cost Total Notes:
Estimated final assembly cost includes labor only.
Total cost does not include Non-recurring, R&D, G&A, IP licensing fees/royalties, software, sales & marketing, distribution.
Assumes fully scaled production.

Cost modeling is tricky business. Multiple variables affect the actual production costs a manufacturer will experience, including development expenses, unit volumes, supply-and-demand in component markets, die yield-curve maturity, OEM purchasing power, and even variations in accounting practices. Different cost modeling methods employ different assumptions about how to handle these and other variables, but we can identify two basic approaches: that which seeks to track short-term variations in the inputs to the production process, and that which strives to maintain comparability of the output of the model across product families and over time.

TechInsights' philosophy in cost modeling is to emphasize consistency across products and comparability over time, rather than to track short-term fluctuations. During the past eight years, we have developed an estimation process that, while necessarily lacking an insider's knowledge of the cost factors that impact any one manufacturer, is reasonably accurate in its prediction of unit costs in high-volume production environments. We do not claim that the model will produce the "right" answer for your firm's environment. However, TechInsights does give customers a key analytical tool with a complete set of data in our Bill of Materials (BOM). The BOM allows readers to 1) scrutinize the assumptions behind our cost model and 2) modify the results based on substitution of their own component cost estimates where they have better information based on inside knowledge.

Our estimation process decomposes overall system cost into three major categories: Electronics, Mechanical, and Final Assembly. We begin by creating a complete electronics bill-of-materials (BOM). Each component from the largest ASIC to the smallest discrete resistor is entered into a BOM table with identifying attributes such as size, pitch, I/O count, package type, manufacturer, part number, estimated placement cost, and die size (if the component is an IC). Integrated circuit costs are calculated from measured die area. Using assumptions for wafer size, process type, number of die per wafer, defect density, and profit margin in combination with die area, an estimate of semiconductor cost is derived. Costs for discrete components and interconnect are derived from assumption tables which relate BOM line items to specific cost estimates by component type and estimates for part placement costs are included. For LCD display costs, we employ a model which tabulates expected cost from measurements of glass area, LCD type, and total pixel resolution. When market costs are available from alternative sources, LCD panel costs are taken from and referenced to these sources.

Costs of non-electronic components such as molded plastic enclosures and metallic components are measured in terms of weight, size, thickness, type of material, and complexity to arrive at their estimated cost. Other system items such as optics, antennae, batteries and displays are costed from a set of assumption tables derived from a combination of industry data, average high volume costs, and external sources. For final assembly, we re-build the torn-down product, tabulating stepwise assembly times as the reconstruction proceeds, to reach a total assembly time. Using a labor rate assumption for the country of origin, we then calculate final assembly cost.

The three major categories for system cost contributors can be broken down into the subcategories of ICs, other electronics parts, displays, batteries (as appropriate), camera modules, electronics assembly, non-electronic elements, and final assembly. By adding the cost estimates for each of these subcategories, an overall estimated cost is derived for the system under evaluation. Product packaging and accessories (CDs, cables, etc.) are also documented and estimated for their contribution to total cost as appropriate.

We believe our cost estimates generally fall within 15 percent of the "right answer," which itself can vary depending on the market and OEM-specific factors mentioned earlier. While the TechInsights cost model is imperfect, it yields important insights into technology and business dynamics along with good first-order contributions to system cost by component type. Additionally, the consistency of approach and gradual modification to assumptions (smoothing out frequently-shifting pricing factors) hopefully yields a credible, but user-modifiable, view of OEM high volume cost-to-produce.

Please feel free to contact us at support@techinsights.com with any comments, questions, or proposed corrections with respect to our cost estimates. We welcome your input.

In our product teardowns, we gather a series of metrics for product profiling and comparison. Some metrics focus on system characteristics such as total silicon area, total system semiconductor storage capacity, and total connection count. Other metrics reflect more subtle aspects of electronics assembly such as connection density, average component I/O count, and silicon tiling density. Taken as a whole, the metrics allow deeper comparison and benchmarking across multiple disciplines and multiple products. Key metrics we gather on products are described below along with their definitions and what they tend to say about the system under study. Most metrics can be used both in comparing similar products for benchmarking purposes or for quantifying differences in levels of complexity between dissimilar product types. Data fall into two categories; either “raw” measured data or ratios of these measured data sets.

Total Silicon Area : This metric describes the total area of silicon as measured from X-ray or direct measurement of ICs. The area is an expression of the enclosed bare die area and excludes packaging area. The aggregate silicon area is a good benchmark to show how integrated a design might be when making comparisons to similar systems. Total silicon area also reflects the major cost driver for most systems we examine.

Silicon Tiling Density : Ratio of Total Silicon Area to total printed circuit board “projected” area (i.e. the simple board area and not the cumulative surface area of both sides of the board). This metric directly reflects the level of efficiency and aggressiveness in integrated circuit packing and placement. Single digit Silicon Tiling Density is typical but silicon coverage of 10% - 20% has been seen in some of the most advanced products we have examined. Higher Tiling Densities often correspond with the use of chip scale packaging (CSPs) or other small form-factor IC packaging technologies. High density circuit boards are also often a supporting technology.

Number of Parts : Total component count including ICs, passives, modules, connectors, etc., each separated out in our reporting.

Number of Connections : The total number of connections corresponds to the total number of interconnects introduced by the aggregate component set and reflects any electrical connection observed (solder joints, adhesive interconnect, or connector terminal interfaces).

Opportunity Count : Opportunity Count is the total number of parts plus the total number of connections; the name reflects that each of these constituent elements represents an opportunity for failure. A high opportunity count means more complex and riskier electronics assembly.

Average Pin Count (APC) : Ratio of total number of component terminals to total number of parts, at the system level. This metric reflects the ‘average’ terminal complexity of the components and often provide a signature of integration level and/or “digital-ness” of the overall product. Low APCs reflect a high number of discretely or other low-pincount devices often characteristic of analog circuitry. Conversely, high APCs are characteristic of highly integrated, high-pincount assemblies, often those composed largely of digital integrated circuits.

Connection Density : This metric is a ratio of the total Number of Connections to total printed circuit board assembly area, in units of connections per sq. inch. The metric provides data related to the Silicon Tiling Density above, but with an emphasis on complexity of I/O interconnect. For example, with a fixed Connection Density, high tiling density of low-pincount memory chips is more readily achieved than comparable silicon tiling of high pincount logic.

Part Density : This metric is a ratio of the total Number of Parts to total printed circuit board assembly area, in units of components per sq. inch. The metric provides data related to the Silicon Tiling Density and Connection Density as described above, but with an emphasis on density and complexity of component packing efficiency. For example, low Part Density of high-pincount devices can pose an equal challenge in Connection Density to high Part Density of low-pincount devices. High Part Density does reflect challenges in surface mount assembly in terms of (typically) precision of placement, number of placements, and engineering of part clearances.

Routing Density (heuristic estimate) = $3 * (\text{Average Pin Count}) * \sqrt{\text{Part Density}}$. The Routing Density metric is an empirically derived relationship that characterizes the wiring density of the interconnect used to support the interconnection of components in a planar electronic assembly (i.e. the circuit board). Architectural issues such as bussing or other factors affecting the regularity of wiring impact the actual Routing Density needed to support a given application, but the metric provides a ready measure of wiring complexity.

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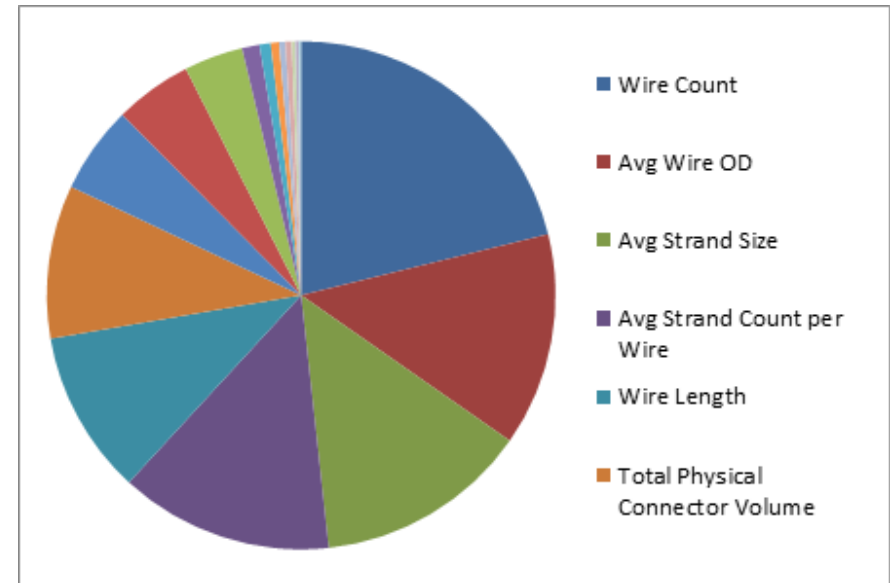
Munro & Associates Wire Harness Reports

Wire Harness Cost Analysis Harness, Park Assist Sensor, Front Wire Harness

- The Design Profit[®] based Wire Harness Coster generates cost estimates of various components and assembly processes for the majority of wire harnesses found in today's manufactured products. The Wire Harness Coster rolls up these costs to deliver an estimate of the total manufactured cost.
- Costs are based on several factors including: commodity items, components, burdened machine rates, processing speeds, burdened labor rates, and cost of poor quality drivers.
- The Wire Harness Coster consistently generates a cost estimate for a given wire harness without the need to completely disassemble or destroy the wire harness. Minimal disassembly may be required to capture various attributes and identify overall circuit routing. Inputs to the coster include: connector data (size, cavity count, locking mechanisms and sealing attributes), wire data (sizes quantities and lengths), coverings (type, size and length), fasteners, brackets, troughs, etc.
- The Wire Harness Coster separates the parts and processes to more easily delineate Bill of Material (BOM) costs and build processing costs.

Factors Influencing Cost:

1. Wire count is the primary factor driving cost as it affects the amount of wire, the size of connectors, and the number of assembly processes.
2. Wire selection (wire OD, strand size, strand count / wire) is significant as it directly relates to conductor cross section, and therefore the amount of copper or aluminum used in the harness.
3. Wire length is another major cost factor as it both relates to material cost and to assembly time, as longer lengths require more handling.
4. The total physical connector size is a major cost factor as connectors are a large portion of harness part costs. Total physical connector size also tends to drive assembly costs.

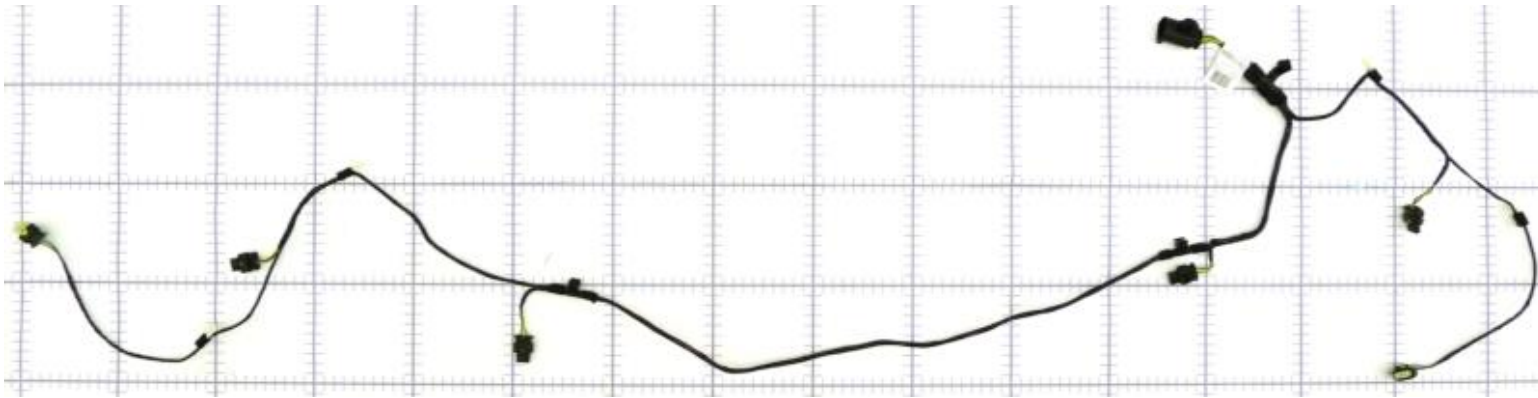


Relative influence of factors on harness costs
(Data based on L32 two-level Taguchi analysis
of the Wire Harness Coster)

Wire Harness, Park Assist Sensor, Front Fascia Overview



MUNRO
& ASSOCIATES, INC.



The Park Assist Sensor, Front Fascia Harness assembly consists of 20 wires, joining 7 connectors. There are two splices, joining seven wires each for common power and ground.

All wires are 1.2 mm in diameter. All wire conductors are twisted copper strands. The overall weight of the harness is 0.1340 kg.

All of the connectors are sealed connectors with multiple terminal cavities.

The largest connector has 8 cavities populated with 8 terminals.

The harness covering consists of primarily vinyl tape. There are two edge biter clips, and four X-tree clips tape tacked to the harness.

All major components are analyzed in detail, while prices are applied to commodity items (i.e. clips, terminals).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.

Design Profit[®]

EXECUTIVE SUMMARY Harness Overview

	5060 - Harn, Park Assist Sensor, Frt
Parts	59
Steps	294
Assembly Time (min)	25.39
Total Weight (kg)	0.1340
Purchased Part Cost	\$2.49
Supplier Asm. Cost	\$7.33
Q Burden	\$0.37
Total Cost	\$10.19

Design Profit[®]

EXECUTIVE SUMMARY Wire, Cable & Splices

	5060 - Harn, Park Assist Sensor, Frt
Wire & Cable Count	24
Splice Count	2
Wire Length Total (cm)	1682.0
Harness Total Weight	0.1340 kg
Cu Conductor Mass	0.0295 kg
Cu to Harness Mass (%)	22.05 %
Al Conductor Mass	0.0000 kg
Al to Harness Mass (%)	0.00 %
Wire Cost	\$0.51

Design Profit[®]

EXECUTIVE SUMMARY Connectors & Terminals

	5060 - Harn, Park Assist Sensor, Frt
Connector Assemblies	7
Sealed Connectors	7
Terminal Cavities	26
Unpopulated Cavities	0
Connector Body Cost	\$1.11
Coax Connectors	0
Coax Connector Cost	\$0.00
Pin & Blade Terminals	26
Ring Terminals	0
Battery Terminals	0
Terminal Strips	0
Total Terminal Count	26
Terminal Cost	\$0.30

Design Profit[®]

EXECUTIVE SUMMARY Labels, Clips, Tape & Coverings

	5060 - Harn, Park Assist Sensor, Frt
Label Count	1
Label Area cm2	32.0
Label Cost	\$0.08
Clip Count	7
Clip Cost	\$0.22
Tape Tacks	10
Taped Length cm	244.5
Tape Actual Length cm	630.4
Tape Cost	\$0.21
Tube & Wrap Count	0
Heat Shrink Count	2
Covering Count Total	2
Covering Length cm	9.0
Covering Cost	\$0.03

Design Profit[®]

EXECUTIVE SUMMARY Miscellaneous Parts

	5060 - Harn, Park Assist Sensor, Frt
Bracket Count	0
Bracket Cost	\$0.00
Trough Count	0
Trough Cost	\$0.00
Fuse Count	0
Fuse Cost	\$0.00
Grommet Count	0
Grommet Cost	\$0.00
Misc Part Count	0
Misc Part Cost	\$0.00

Wire Harness Costed Bill of Materials

Harness CBOM

5060 - Harn, Park Assist Sensor, Frt

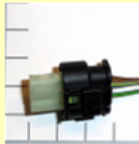
	Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■	Main Harness	\$2.4928	1	1	Each	\$2.4928

Media:



■	C01	\$0.1800	1	1	Each	\$0.1800
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Media:



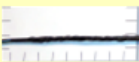
■	C02	\$0.1800	1	1	Each	\$0.1800
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Media:



■	Tape, Std - C01	\$0.0193	1	58.7	cm	\$0.0193
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Media:



■	Tape, Std - C02	\$0.0025	1	7.7	cm	\$0.0025
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Media:








Wire Harness Costed Bill of Materials

5060 - Harn, Park Assist Sensor, Frt

	Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■	Tape, Std B01 - B02	\$0.0177	1	54.0	cm	\$0.0177
Media:						
■	Clip, Tape-on Rosebud or X-Tree Std	\$0.0200	2	1	Each	\$0.0400
Media:						
■	Tape, Tack	\$0.0037	2	11.3	cm	\$0.0074
Media:						
■	C03	\$0.1800	1	1	Each	\$0.1800
Media:						
■	Tape, Std - C03	\$0.0013	1	3.9	cm	\$0.0013
Media:						

Wire Harness Costed Bill of Materials

5060 - Harn, Park Assist Sensor, Frt

	Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■	Tape, Std B01-03	\$0.0535	1	163.1	cm	\$0.0535
Media:						
■	Clip, Tape-on, Edge Biter, Two Tabs	\$0.0500	2	1	Each	\$0.1000
Media:						
■	Tape, Tack	\$0.0041	4	12.6	cm	\$0.0165
Media:						
■	C04	\$0.1800	1	1	Each	\$0.1800
Media:						
■	Tape, Std - C04	\$0.0015	1	4.6	cm	\$0.0015
Media:						






Wire Harness Costed Bill of Materials

5060 - Harn, Park Assist Sensor, Frt

	Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■	Tape, Std B01 - B04	\$0.0164	1	50.0	cm	\$0.0164
Media:						
■	C05	\$0.1800	1	1	Each	\$0.1800
Media:						
■	C06	\$0.1800	1	1	Each	\$0.1800
Media:						
■	Tape, Std - C05	\$0.0167	1	51.0	cm	\$0.0167
Media:						
■	Tape, Std - C06	\$0.0020	1	6.2	cm	\$0.0020
Media:						

Wire Harness Costed Bill of Materials

5060 - Harn, Park Assist Sensor, Frt

	Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■	Tape, Std B06 - B06	\$0.0134	1	41.0	cm	\$0.0134
Media:						
■	Clip, Tape-on Rosebud or X-Tree Std	\$0.0200	2	1	Each	\$0.0400
Media:						
■	Tape, Tack	\$0.0037	2	11.3	cm	\$0.0074
Media:						
■	Clip, Tape-on Rosebud or X-Tree Std	\$0.0400	1	1	Each	\$0.0400
Media:						
■	Tape, Tack	\$0.0049	2	15.1	cm	\$0.0099
Media:						

Wire Harness Costed Bill of Materials

5060 - Harn, Park Assist Sensor, Frt

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
 Tape, Std B01-06A Media: 	\$0.0126	1	38.5	cm	\$0.0126
 Heat Shrink Media: 	\$0.0155	2	4.5	cm	\$0.0310
 Tape, Std B01-06B Media: 	\$0.0085	1	26.0	cm	\$0.0085
 Label Media: 	\$0.0800	1	1	Each	\$0.0800
 C07 Media: 	\$0.3400	1	1	Each	\$0.3400
 Wire 1.2 OD/7-0.17 OD Strands	\$0.0256	20	84	cm	\$0.5119

Wire Harness Costed Bill of Process



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Assembly Process

5060 - Harn, Park Assist Sensor, Frt

Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Wire Operation	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire Cut & Strip Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire	4.0000 sec	\$0.00	\$0.02	20	\$0.03	\$0.38
Cut & Strip Wire	1.0000 sec	\$0.00	\$0.00	20	\$0.03	\$0.10
Wire Crimp Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Insert Wire Ends	2.0000 sec	\$0.00	\$0.01	26	\$0.04	\$0.25
Terminal, Contact	2.0000 sec	\$0.00	\$0.01	26	\$0.04	\$0.25
Crimp Terminal	1.0000 sec	\$0.00	\$0.00	26	\$0.04	\$0.13
Splice Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Place Wire Ends	3.0000 sec	\$0.00	\$0.01	14	\$0.02	\$0.20
Ultrasonic Splice	3.0000 sec	\$0.00	\$0.01	2	\$0.01	\$0.03
Heat Shrink	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05
Heat Gun	4.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.04
Shrink Tube	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05
Wiring Board	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grab Wire	4.0000 sec	\$0.00	\$0.02	20	\$0.03	\$0.38
Route Wire (avg length)	5.0400 sec	\$0.00	\$0.02	20	\$0.03	\$0.48
Connector	4.0000 sec	\$0.00	\$0.02	7	\$0.01	\$0.13
Insert Wire Contact (qty/connector)	4.0000 sec	\$0.00	\$0.02	26	\$0.04	\$0.50
Snap (qty/connector)	1.0000 sec	\$0.00	\$0.00	8	\$0.00	\$0.04
Test, Wire Harness	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Electrical Test Equipment	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grasp & Position Connector	3.0000 sec	\$0.00	\$0.01	7	\$0.01	\$0.10
Mate Connectors to test equip	2.0000 sec	\$0.00	\$0.01	7	\$0.00	\$0.07
Test Harness	2.0000 sec	\$0.00	\$0.01	20	\$0.01	\$0.19
Coverings & Tape Winding	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Label	8.0000 sec	\$0.00	\$0.04	1	\$0.00	\$0.04
Apply Label	8.0000 sec	\$0.01	\$0.04	1	\$0.01	\$0.04
Clip, Tape on X-Tree 2 Tabs	6.0000 sec	\$0.00	\$0.03	3	\$0.00	\$0.09
Tape Tack	5.0000 sec	\$0.00	\$0.02	6	\$0.01	\$0.14
Manip Harness to Avoid X-Tree	9.0000 sec	\$0.00	\$0.04	3	\$0.00	\$0.13
Clip, Tape on X-Tree 1 Tab	4.0000 sec	\$0.00	\$0.02	4	\$0.01	\$0.08
Tape Tack	5.0000 sec	\$0.00	\$0.02	4	\$0.01	\$0.10
Manip Harness to Avoid X-Tree	9.0000 sec	\$0.00	\$0.04	4	\$0.01	\$0.17
Tape Wind Branches & Pigtails	630.4000 sec	\$0.00	\$3.03	1	\$0.00	\$3.03

Wire Harness Costed Bill of Process



5060 - Harn, Park Assist Sensor, Frt

Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Route Branch Thru Wind Head	4.0000 sec	\$0.00	\$0.02	7	\$0.01	\$0.13

Report Totals

Count: 36

297

\$0.37

\$7.33

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Wire Harness Cost Analysis

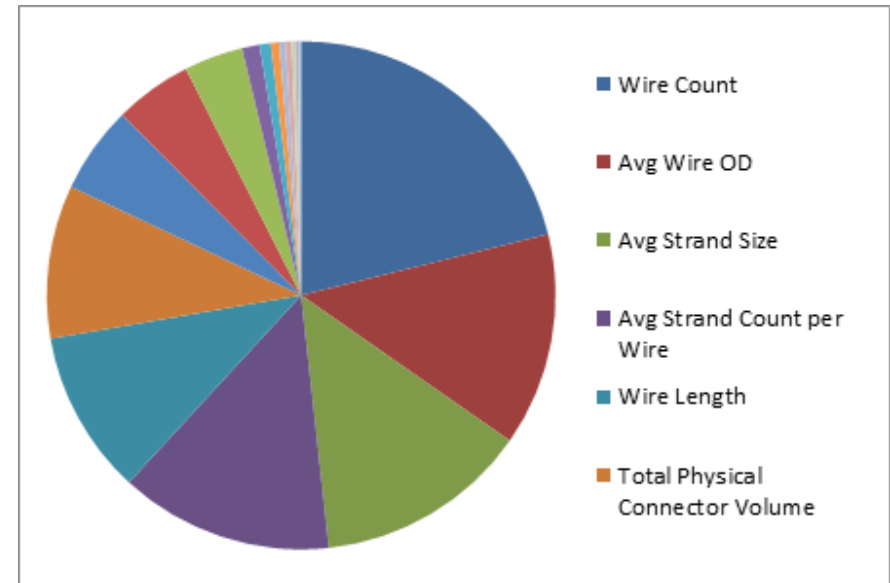
Wire Harness, Third Brake Light

Wire Harness

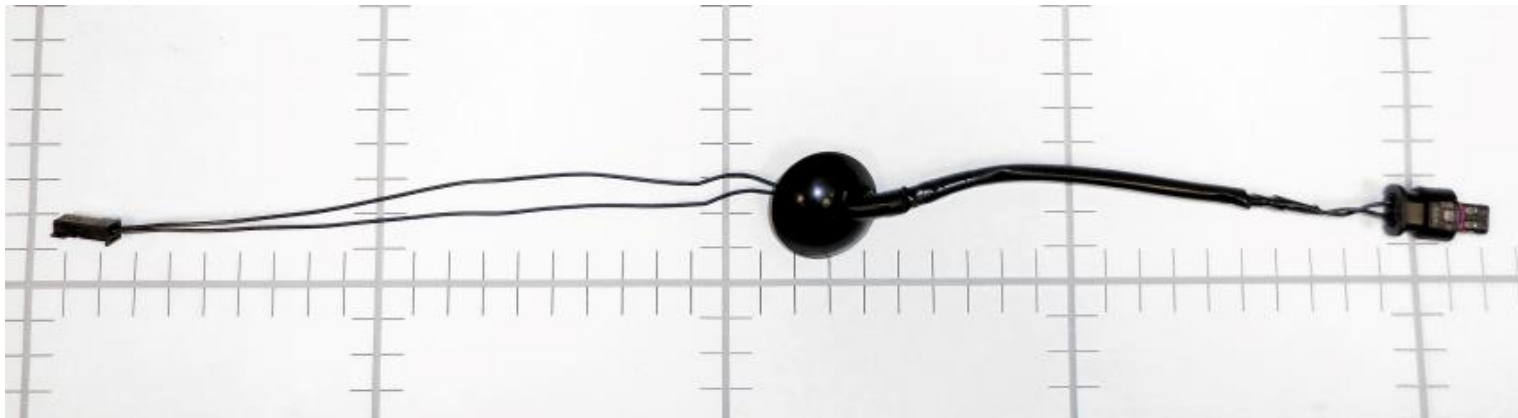
- The Design Profit[®] based Wire Harness Coster generates cost estimates of various components and assembly processes for the majority of wire harnesses found in today's manufactured products. The Wire Harness Coster rolls up these costs to deliver an estimate of the total manufactured cost.
- Costs are based on several factors including: commodity items, components, burdened machine rates, processing speeds, burdened labor rates, and cost of poor quality drivers.
- The Wire Harness Coster consistently generates a cost estimate for a given wire harness without the need to completely disassemble or destroy the wire harness. Minimal disassembly may be required to capture various attributes and identify overall circuit routing. Inputs to the coster include: connector data (size, cavity count, locking mechanisms and sealing attributes), wire data (sizes quantities and lengths), coverings (type, size and length), fasteners, brackets, troughs, etc.
- The Wire Harness Coster separates the parts and processes to more easily delineate Bill of Material (BOM) costs and build processing costs.

Factors Influencing Cost:

1. Wire count is the primary factor driving cost as it affects the amount of wire, the size of connectors, and the number of assembly processes.
2. Wire selection (wire OD, strand size, strand count / wire) is significant as it directly relates to conductor cross section, and therefore the amount of copper or aluminum used in the harness.
3. Wire length is another major cost factor as it both relates to material cost and to assembly time, as longer lengths require more handling.
4. The total physical connector size is a major cost factor as connectors are a large portion of harness part costs. Total physical connector size also tends to drive assembly costs.



Relative influence of factors on harness costs
(Data based on L32 two-level Taguchi analysis
of the Wire Harness Coster)



The Wire Harness, Third Brake Light harness consists of two connectors joined by 2 Wires. All wire conductors are twisted copper strands.

One of the two, 2 cavity connectors is sealed.

The overall weight of the harness assembly is 0.0135 kg.

Half the harness was covered by vinyl tubing and two tape tacks. A 31mm diameter rubber grommet is positioned in the middle of the harness.

All major components are analyzed in detail, while prices are applied to commodity items (i.e. clips, terminals).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.

Design Profit[®]

EXECUTIVE SUMMARY Harness Overview

	5307 - Wire Harness, Third Brake Light
Parts	8
Steps	44
Assembly Time (min)	1.91
Total Weight (kg)	0.0135
Purchased Part Cost	\$0.50
Supplier Asm. Cost	\$0.55
Q Burden	\$0.05
Total Cost	\$1.10

Design Profit[®]

EXECUTIVE SUMMARY Wire, Cable & Splices

	5307 - Wire Harness, Third Brake Light
Wire & Cable Count	2
Splice Count	0
Wire Length Total (cm)	78.0
Harness Total Weight	0.0135 kg
Cu Conductor Mass	0.0014 kg
Cu to Harness Mass (%)	10.16 %
Al Conductor Mass	0.0000 kg
Al to Harness Mass (%)	0.00 %
Wire Cost	\$0.02

Design Profit®

EXECUTIVE SUMMARY Connectors & Terminals

5307 - Wire Harness, Third Brake Light	
Connector Assemblies	2
Sealed Connectors	0
Terminal Cavities	4
Unpopulated Cavities	0
Connector Body Cost	\$0.10
Coax Connectors	0
Coax Connector Cost	\$0.00
Pin & Blade Terminals	4
Ring Terminals	0
Battery Terminals	0
Terminal Strips	0
Total Terminal Count	4
Terminal Cost	\$0.04

Design Profit[®]

EXECUTIVE SUMMARY Labels, Clips, Tape & Coverings

	5307 - Wire Harness, Third Brake Light
Label Count	0
Label Area cm2	0.0
Label Cost	\$0.00
Clip Count	0
Clip Cost	\$0.00
Tape Tacks	2
Taped Length cm	0.0
Tape Actual Length cm	12.6
Tape Cost	\$0.00
Tube & Wrap Count	1
Heat Shrink Count	0
Covering Count Total	1
Covering Length cm	9.5
Covering Cost	\$0.02

Design Profit[®]

EXECUTIVE SUMMARY Miscellaneous Parts

	5307 - Wire Harness, Third Brake Light
Bracket Count	0
Bracket Cost	\$0.00
Trough Count	0
Trough Cost	\$0.00
Fuse Count	0
Fuse Cost	\$0.00
Grommet Count	1
Grommet Cost	\$0.31
Misc Part Count	0
Misc Part Cost	\$0.00

Wire Harness Costed Bill of Materials

Harness CBOM

5307 - Wire Harness, Third Brake Light

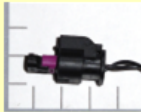
Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■ Main Harness	\$0.5048	1	1	Each	\$0.5048

Media:



■ C02	\$0.0900	1	1	Each	\$0.0900
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Media:



■ C01	\$0.0500	1	1	Each	\$0.0500
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Media:



■ Grommet, Rubber	\$0.3100	1	1	Each	\$0.3100
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Media:




■ Tube, Vinyl	\$0.0234	1	9.5	cm	\$0.0234
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Media:



Wire Harness Costed Bill of Materials

5307 - Wire Harness, Third Brake Light

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
<div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Tape, Tack</p> <p>Media:</p>  </div> </div>	\$0.0021	2	6.3	cm	\$0.0041
<div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Wire 1.2 OD/7-0.17 OD Strands</p> </div> </div>	\$0.0119	2	39	cm	\$0.0238

Wire Harness Costed Bill of Process



Assembly Process

5307 - Wire Harness, Third Brake Light

Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Wire Operations	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire Cut & Strip Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire	4.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.04
Cut & Strip Wire	1.0000 sec	\$0.00	\$0.00	2	\$0.00	\$0.01
Wire Crimp Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Insert Wire Ends	2.0000 sec	\$0.00	\$0.01	4	\$0.01	\$0.04
Terminal, Contact	2.0000 sec	\$0.00	\$0.01	4	\$0.01	\$0.04
Crimp Terminal	1.0000 sec	\$0.00	\$0.00	4	\$0.01	\$0.02
Wiring Board	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grab Wire	4.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.04
Route Wire (avg length)	2.3400 sec	\$0.00	\$0.01	2	\$0.00	\$0.02
Connector	4.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.04
Insert Wire Contact (qty/connector)	4.0000 sec	\$0.00	\$0.02	4	\$0.01	\$0.08
Snap (qty/connector)	1.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Test, Wire Harness	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Electrical Test Equipment	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grasp & Position Connector	3.0000 sec	\$0.00	\$0.01	2	\$0.00	\$0.03
Mate Connectors to test equip	2.0000 sec	\$0.00	\$0.01	2	\$0.00	\$0.02
Test Harness	2.0000 sec	\$0.00	\$0.01	2	\$0.00	\$0.02
Coverings & Tape Winding	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grommet, Rubber	7.0000 sec	\$0.00	\$0.03	1	\$0.00	\$0.03
Lube Grommet	3.0000 sec	\$0.00	\$0.01	1	\$0.00	\$0.01
Part Manipulation	3.0000 sec	\$0.00	\$0.01	1	\$0.00	\$0.01
Coverings	7.0000 sec	\$0.00	\$0.03	1	\$0.00	\$0.03
Part Manipulation	3.0000 sec	\$0.00	\$0.01	1	\$0.00	\$0.01
Tape Tack	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05

Report Totals

Count: 26

47 \$0.05 \$0.55

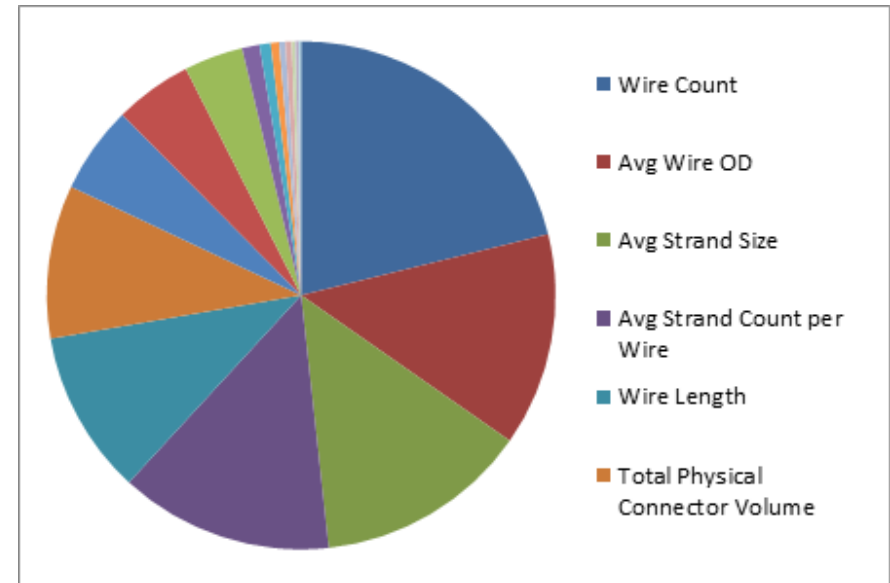
***[Click Here to Return to
Cost Analysis Page 827](#)***

Wire Harness Cost Analysis Housing Asm, Head Lamp Wire Harness

- The Design Profit[®] based Wire Harness Coster generates cost estimates of various components and assembly processes for the majority of wire harnesses found in today's manufactured products. The Wire Harness Coster rolls up these costs to deliver an estimate of the total manufactured cost.
- Costs are based on several factors including: commodity items, components, burdened machine rates, processing speeds, burdened labor rates, and cost of poor quality drivers.
- The Wire Harness Coster consistently generates a cost estimate for a given wire harness without the need to completely disassemble or destroy the wire harness. Minimal disassembly may be required to capture various attributes and identify overall circuit routing. Inputs to the coster include: connector data (size, cavity count, locking mechanisms and sealing attributes), wire data (sizes quantities and lengths), coverings (type, size and length), fasteners, brackets, troughs, etc.
- The Wire Harness Coster separates the parts and processes to more easily delineate Bill of Material (BOM) costs and build processing costs.

Factors Influencing Cost:

1. Wire count is the primary factor driving cost as it affects the amount of wire, the size of connectors, and the number of assembly processes.
2. Wire selection (wire OD, strand size, strand count / wire) is significant as it directly relates to conductor cross section, and therefore the amount of copper or aluminum used in the harness.
3. Wire length is another major cost factor as it both relates to material cost and to assembly time, as longer lengths require more handling.
4. The total physical connector size is a major cost factor as connectors are a large portion of harness part costs. Total physical connector size also tends to drive assembly costs.



Relative influence of factors on harness costs
(Data based on L32 two-level Taguchi analysis
of the Wire Harness Coster)

Head Lamp Housing, Wire Harness Overview



The Head Lamp Wire Harness consists of 29 wires joining 6 connectors. Five of the wires are 1.3 mm OD, 20 are 1.5 mm OD, 2 are 1.8 mm OD, 2 is 2.2 mm OD. All wires are copper stranded. There are two crimp splices shielded by heat shrink tubing.

The overall weight of the harness is 0.1076 kg.

The largest connector has 34 cavities populated with 23 terminals and has a slide lock to keep in in place.

The harness covering consists of three sections of cloth tape

There are 7 edge biter clips, and 5 zip ties.

All major components are analyzed in detail, while prices are applied to commodity items (i.e. clips, terminals).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.

Design Profit[®]

EXECUTIVE SUMMARY Harness Overview

	5248 - Housing Asm, Driver Head Lamp
Parts	54
Steps	433
Assembly Time (min)	18.99
Total Weight (kg)	0.1076
Purchased Part Cost	\$2.25
Supplier Asm. Cost	\$5.48
Q Burden	\$0.53
Total Cost	\$8.26

Design Profit[®]

EXECUTIVE SUMMARY Wire, Cable & Splices

	5248 - Housing Asm, Driver Head Lamp
Wire & Cable Count	29
Splice Count	2
Wire Length Total (cm)	1048.0
Harness Total Weight	0.1076 kg
Cu Conductor Mass	0.0437 kg
Cu to Harness Mass (%)	40.61 %
Al Conductor Mass	0.0000 kg
Al to Harness Mass (%)	0.00 %
Wire Cost	\$0.63

Design Profit[®]

EXECUTIVE SUMMARY Connectors & Terminals

5248 - Housing Asm, Driver Head Lamp	
Connector Assemblies	6
Sealed Connectors	0
Terminal Cavities	77
Unpopulated Cavities	26
Connector Body Cost	\$0.35
Coax Connectors	0
Coax Connector Cost	\$0.00
Pin & Blade Terminals	51
Ring Terminals	0
Battery Terminals	0
Terminal Strips	0
Total Terminal Count	51
Terminal Cost	\$0.66

Design Profit[®]

EXECUTIVE SUMMARY Labels, Clips, Tape & Coverings

	5248 - Housing Asm, Driver Head Lamp
Label Count	0
Label Area cm2	0.0
Label Cost	\$0.00
Clip Count	7
Clip Cost	\$0.49
Tape Tacks	0
Taped Length cm	19.0
Tape Actual Length cm	20.1
Tape Cost	\$0.01
Tube & Wrap Count	0
Heat Shrink Count	2
Covering Count Total	2
Covering Length cm	4.5
Covering Cost	\$0.01

Design Profit[®]


EXECUTIVE SUMMARY Miscellaneous Parts

	5248 - Housing Asm, Driver Head Lamp
Bracket Count	0
Bracket Cost	\$0.00
Trough Count	0
Trough Cost	\$0.00
Fuse Count	0
Fuse Cost	\$0.00
Grommet Count	0
Grommet Cost	\$0.00
Misc Part Count	7
Misc Part Cost	\$0.07

Wire Harness Costed Bill of Materials


Harness CBOM

5248 - Housing Asm, Driver Head Lamp

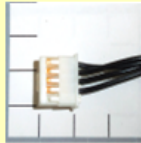
Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
 Main Harness	\$2.2462	1	1	Each	\$2.2462


Media:



 C01	\$0.1000	1	1	Each	\$0.1000
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Media:



 C02	\$0.1100	1	1	Each	\$0.1100
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Media:



 Zip Tie	\$0.0100	1	1	Each	\$0.0100
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Media:








 Clip, zip Tie	\$0.0700	1	1	Each	\$0.0700
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Media:













Wire Harness Costed Bill of Materials

5248 - Housing Asm, Driver Head Lamp

	Name	Purchased Part		Measure	Unit of Measure	Purchased Part Cost (Total)
		Cost	Item Qty			
■	Splice Crimp Ring	\$0.0100	1	1	Each	\$0.0100
■	Heat Shrink	\$0.0057	1	2.5	cm	\$0.0057
	Media:					
						
■	Tape, Fabric	\$0.0037	1	7.5	cm	\$0.0037
	Media:					
						
■	Clip, zip Tie	\$0.0700	2	1	Each	\$0.1400
	Media:					
						
■	C04	\$0.0800	1	1	Each	\$0.0800
	Media:					
						
■	Tape, Fabric	\$0.0025	1	5.0	cm	\$0.0025
	Media:					
						
■	Splice Crimp Ring	\$0.0100	1	1	Each	\$0.0100













Wire Harness Costed Bill of Materials

5248 - Housing Asm, Driver Head Lamp

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
 Heat Shrink Media: 	\$0.0046	1	2.0	cm	\$0.0046
 C03 Media: 	\$0.1900	1	1	Each	\$0.1900
 Tape, Fabric Media: 	\$0.0037	1	7.5	cm	\$0.0037
 Zip Tie Media: 	\$0.0100	2	1	Each	\$0.0200
 Clip, zip Tie Media: 	\$0.0700	2	1	Each	\$0.1400

Wire Harness Costed Bill of Materials

5248 - Housing Asm, Driver Head Lamp

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
 C05 Media: 	\$0.1500	1	1	Each	\$0.1500
 C06 Media: 	\$0.3800	1	1	Each	\$0.3800
 Zip Tie Media: 	\$0.0100	2	1	Each	\$0.0200
 Clip, zip Tie Media: 	\$0.0700	2	1	Each	\$0.1400
 Wire 1.3 OD/7- 0.22 OD Strands	\$0.0207	5	46	cm	\$0.1035
 Wire 1.5 OD/7- 0.25 OD Strands	\$0.0210	20	37.7	cm	\$0.4194
 Wire 1.8 OD/ 19- 0.20 OD Strands	\$0.0300	2	33	cm	\$0.0599
 Wire 2.2 OD/ 19- 0.29 OD Strands	\$0.0261	2	14	cm	\$0.0521

Wire Harness Costed Bill of Process



Assembly Process

5248 - Housing Asm, Driver Head Lamp

Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Wire Operations	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire Cut & Strip Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire	4.0000 sec	\$0.00	\$0.02	29	\$0.04	\$0.56
Cut & Strip Wire	1.0000 sec	\$0.00	\$0.00	29	\$0.04	\$0.14
Wire Crimp Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Insert Wire Ends	2.0000 sec	\$0.00	\$0.01	52	\$0.07	\$0.50
Terminal, Contact	2.0000 sec	\$0.00	\$0.01	51	\$0.07	\$0.49
Crimp Terminal	1.0000 sec	\$0.00	\$0.00	51	\$0.07	\$0.25
Splice Machine	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Place wire ends	3.0000 sec	\$0.00	\$0.01	6	\$0.01	\$0.09
Splice Crimp Ring	6.0000 sec	\$0.00	\$0.03	2	\$0.00	\$0.06
Crimp Splice	1.0000 sec	\$0.00	\$0.00	2	\$0.00	\$0.01
Heat Shrink	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05
Heat Gun	4.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.04
Shrink Tube	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05
Wiring Board	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grab Wire	4.0000 sec	\$0.00	\$0.02	29	\$0.04	\$0.56
Route Wire (avg length)	2.2320 sec	\$0.00	\$0.01	29	\$0.04	\$0.31
Connector	4.0000 sec	\$0.00	\$0.02	6	\$0.01	\$0.12
Insert Wire Contact (qty/connector)	4.0000 sec	\$0.00	\$0.02	51	\$0.07	\$0.98
Snap (qty/connector)	1.0000 sec	\$0.00	\$0.00	6	\$0.00	\$0.03
Test, Wire Harness	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Electrical Test Equipment	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grasp & Position Connector	3.0000 sec	\$0.00	\$0.01	6	\$0.01	\$0.09
Mate Connectors to test equip	2.0000 sec	\$0.00	\$0.01	6	\$0.00	\$0.06
Test Harness	2.0000 sec	\$0.00	\$0.01	29	\$0.01	\$0.28
Coverings & Tape Winding	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Heat Shrink	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05
Heat Gun	4.0000 sec	\$0.00	\$0.02	1	\$0.00	\$0.02
Shrink Tube	5.0000 sec	\$0.00	\$0.02	2	\$0.00	\$0.05
Clip, Zip Tie	7.0000 sec	\$0.00	\$0.03	13	\$0.02	\$0.44
Zip Tool	3.0000 sec	\$0.00	\$0.01	1	\$0.00	\$0.01
Zip Tie, Pull Tight & Trim	2.0000 sec	\$0.00	\$0.01	13	\$0.00	\$0.13
Tape Wind branches & pigtails	6.2000 sec	\$0.00	\$0.03	3	\$0.00	\$0.09
Route Branch thru wind head	4.0000 sec	\$0.00	\$0.02	3	\$0.00	\$0.06

Wire Harness Costed Bill of Process



Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Report Totals	Count: 35			436	\$0.53	\$5.48

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Cost Analysis Page
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1186***

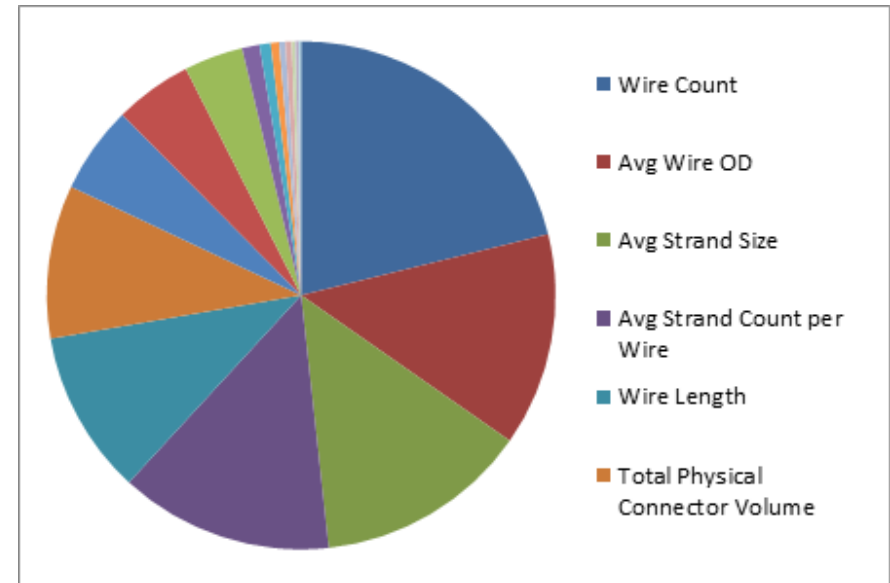
Wire Harness Cost Analysis

Wiring, Bracket Wire Harness

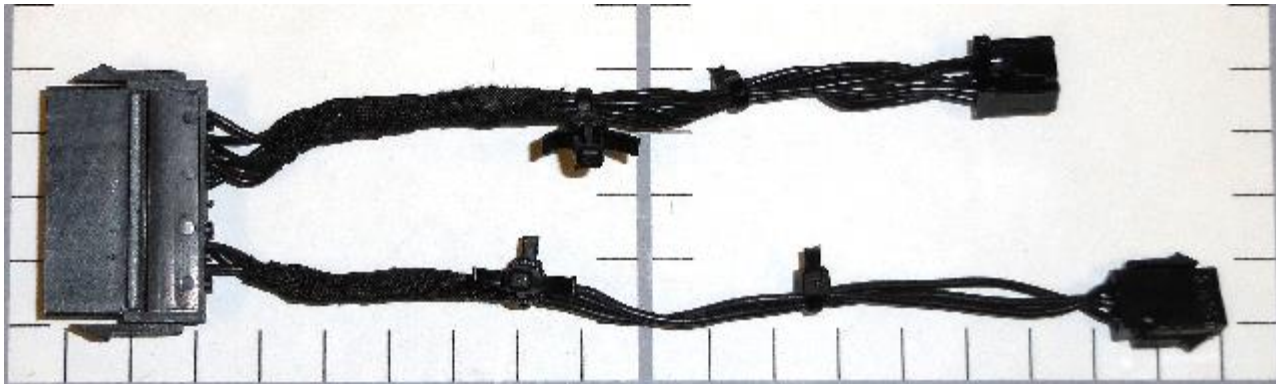
- The Design Profit[®] based Wire Harness Coster generates cost estimates of various components and assembly processes for the majority of wire harnesses found in today's manufactured products. The Wire Harness Coster rolls up these costs to deliver an estimate of the total manufactured cost.
- Costs are based on several factors including: commodity items, components, burdened machine rates, processing speeds, burdened labor rates, and cost of poor quality drivers.
- The Wire Harness Coster consistently generates a cost estimate for a given wire harness without the need to completely disassemble or destroy the wire harness. Minimal disassembly may be required to capture various attributes and identify overall circuit routing. Inputs to the coster include: connector data (size, cavity count, locking mechanisms and sealing attributes), wire data (sizes quantities and lengths), coverings (type, size and length), fasteners, brackets, troughs, etc.
- The Wire Harness Coster separates the parts and processes to more easily delineate Bill of Material (BOM) costs and build processing costs.

Factors Influencing Cost:

1. Wire count is the primary factor driving cost as it affects the amount of wire, the size of connectors, and the number of assembly processes.
2. Wire selection (wire OD, strand size, strand count / wire) is significant as it directly relates to conductor cross section, and therefore the amount of copper or aluminum used in the harness.
3. Wire length is another major cost factor as it both relates to material cost and to assembly time, as longer lengths require more handling.
4. The total physical connector size is a major cost factor as connectors are a large portion of harness part costs. Total physical connector size also tends to drive assembly costs.



Relative influence of factors on harness costs
(Data based on L32 two-level Taguchi analysis
of the Wire Harness Coster)



The Wiring, Bracket Harness consists of 10 wires joining 3 connectors.

All wires are 1.5 mm in diameter and are twisted copper strands. The overall weight of the harness is 0.0179 kg.

All of the connectors are unsealed connectors with multiple terminal cavities.

The harness is partly covered with cloth tape, and has two zip tie clips along with two standard zip ties.

All major components are analyzed in detail, while prices are applied to commodity items (i.e. clips, terminals).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.

Design Profit[®]

EXECUTIVE SUMMARY Harness Overview

	5165 - Wiring, Bracket
Parts	19
Steps	154
Assembly Time (min)	6.29
Total Weight (kg)	0.0179
Purchased Part Cost	\$0.55
Supplier Asm. Cost	\$1.82
Q Burden	\$0.19
Total Cost	\$2.56

Design Profit[®]

EXECUTIVE SUMMARY Wire, Cable & Splices

	5165 - Wiring, Bracket
Wire & Cable Count	10
Splice Count	0
Wire Length Total (cm)	140.5
Harness Total Weight	0.0179 kg
Cu Conductor Mass	0.0067 kg
Cu to Harness Mass (%)	37.33 %
Al Conductor Mass	0.0000 kg
Al to Harness Mass (%)	0.00 %
Wire Cost	\$0.09

Design Profit[®]

EXECUTIVE SUMMARY Connectors & Terminals

	5165 - Wiring, Bracket
Connector Assemblies	3
Sealed Connectors	0
Terminal Cavities	27
Unpopulated Cavities	8
Connector Body Cost	\$0.14
Coax Connectors	0
Coax Connector Cost	\$0.00
Pin & Blade Terminals	19
Ring Terminals	0
Battery Terminals	0
Terminal Strips	0
Total Terminal Count	19
Terminal Cost	\$0.21

Design Profit®

EXECUTIVE SUMMARY Labels, Clips, Tape & Coverings

	5165 - Wiring, Bracket
Label Count	0
Label Area cm2	0.0
Label Cost	\$0.00
Clip Count	2
Clip Cost	\$0.08
Tape Tacks	0
Taped Length cm	8.5
Tape Actual Length cm	20.1
Tape Cost	\$0.01
Tube & Wrap Count	0
Heat Shrink Count	0
Covering Count Total	0
Covering Length cm	0.0
Covering Cost	\$0.00



Design Profit[®]


EXECUTIVE SUMMARY Miscellaneous Parts

	5165 - Wiring, Bracket
Bracket Count	0
Bracket Cost	\$0.00
Trough Count	0
Trough Cost	\$0.00
Fuse Count	0
Fuse Cost	\$0.00
Grommet Count	0
Grommet Cost	\$0.00
Misc Part Count	2
Misc Part Cost	\$0.02

Wire Harness Costed Bill of Materials

Harness CBOM

5165 - Wiring, Bracket

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
 Main Harness	\$0.5524	1	1	Each	\$0.5524


Media:



 C01	\$0.0600	1	1	Each	\$0.0600
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Media:



 C02	\$0.1300	1	1	Each	\$0.1300
---	----------	---	---	------	----------

Media:



 C03	\$0.1500	1	1	Each	\$0.1500
---	----------	---	---	------	----------

Media:






 Tape, Fabric C01	\$0.0055	1	11.2	cm	\$0.0055
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Media:



Wire Harness Costed Bill of Materials

5165 - Wiring, Bracket

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
■ Tape, Fabric C02 Media: 	\$0.0044	1	8.8	cm	\$0.0044
■ Clip, Zip Tie Small Media: 	\$0.0400	2	1	Each	\$0.0800
■ Zip Tie, Small Media: 	\$0.0100	2	1	Each	\$0.0200
■ Wire 1.5 OD/ 19- 0.17 OD Strands	\$0.0095	10	14	cm	\$0.0948

Wire Harness Costed Bill of Process



MUNRO
& ASSOCIATES, INC.

Assembly Process

5165 - Wiring, Bracket

Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Wire Operations	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire Cut & Strip Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire	4.0000 sec	\$0.00	\$0.02	10	\$0.01	\$0.19
Cut & Strip Wire	1.0000 sec	\$0.00	\$0.00	10	\$0.01	\$0.05
Wire Crimp Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Insert Wire Ends	2.0000 sec	\$0.00	\$0.01	20	\$0.03	\$0.19
Terminal, Contact	2.0000 sec	\$0.00	\$0.01	19	\$0.03	\$0.18
Crimp Terminal	1.0000 sec	\$0.00	\$0.00	19	\$0.03	\$0.09
Wiring Board	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grab Wire	4.0000 sec	\$0.00	\$0.02	10	\$0.01	\$0.19
Route Wire (avg length)	0.8400 sec	\$0.00	\$0.00	10	\$0.01	\$0.04
Connector	4.0000 sec	\$0.00	\$0.02	3	\$0.00	\$0.06
Insert Wire Contact (qty/connector)	4.0000 sec	\$0.00	\$0.02	19	\$0.03	\$0.37
Snap (qty/connector)	1.0000 sec	\$0.00	\$0.00	3	\$0.00	\$0.01
Test, Wire Harness	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Electrical Test Equipment	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grasp & Position Connector	3.0000 sec	\$0.00	\$0.01	3	\$0.00	\$0.04
Mate Connectors to test equip	2.0000 sec	\$0.00	\$0.01	3	\$0.00	\$0.03
Test Harness	2.0000 sec	\$0.00	\$0.01	10	\$0.00	\$0.10
Coverings & Tape Winding	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Clip, Zip Tie	7.0000 sec	\$0.00	\$0.03	4	\$0.01	\$0.13
Zip tool	3.0000 sec	\$0.00	\$0.01	1	\$0.00	\$0.01
Zip Tie, Pull Tight & Trim	2.0000 sec	\$0.00	\$0.01	4	\$0.00	\$0.04
Tape Wind branches&igtails	8.6000 sec	\$0.00	\$0.04	2	\$0.00	\$0.08

Report Totals

Count: 24

157

\$0.19

\$1.82

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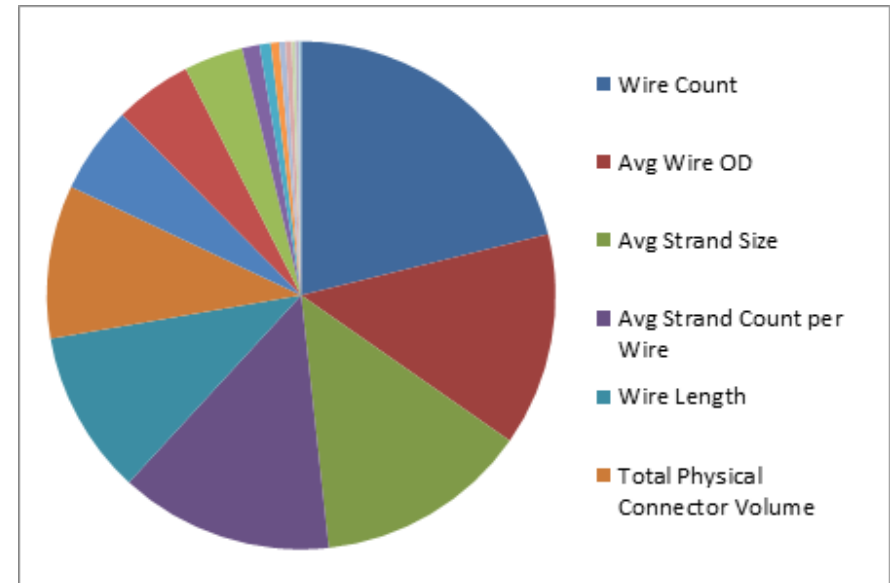
Wire Harness Cost Analysis

Tail Lamp Wiring Harness

- The Design Profit[®] based Wire Harness Coster generates cost estimates of various components and assembly processes for the majority of wire harnesses found in today's manufactured products. The Wire Harness Coster rolls up these costs to deliver an estimate of the total manufactured cost.
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- The Wire Harness Coster consistently generates a cost estimate for a given wire harness without the need to completely disassemble or destroy the wire harness. Minimal disassembly may be required to capture various attributes and identify overall circuit routing. Inputs to the coster include: connector data (size, cavity count, locking mechanisms and sealing attributes), wire data (sizes quantities and lengths), coverings (type, size and length), fasteners, brackets, troughs, etc.
- The Wire Harness Coster separates the parts and processes to more easily delineate Bill of Material (BOM) costs and build processing costs.

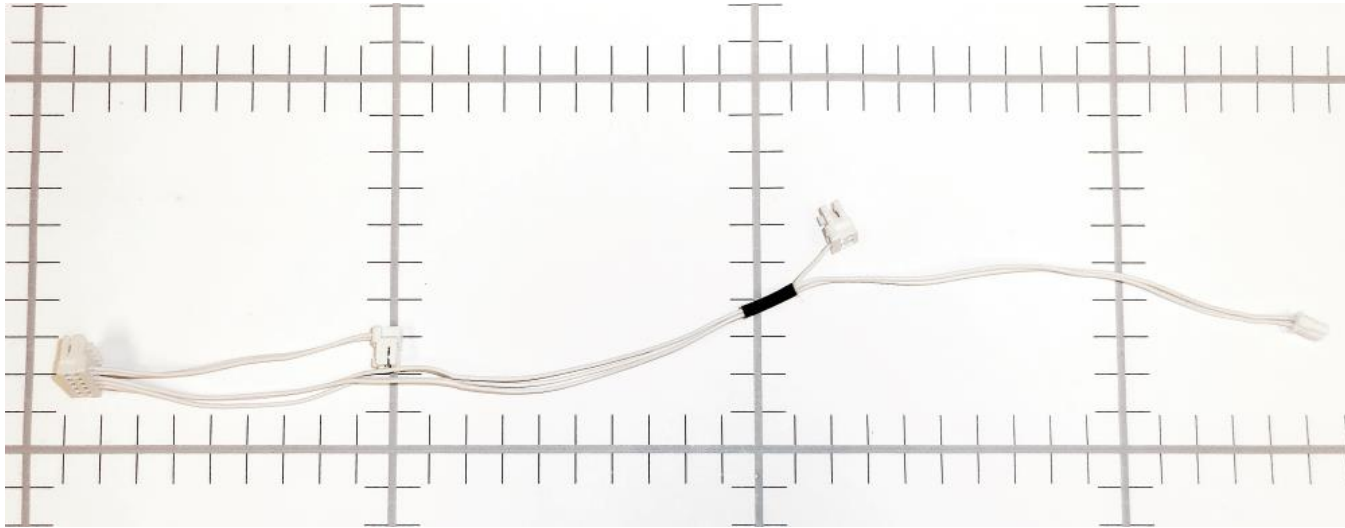
Factors Influencing Cost:

1. Wire count is the primary factor driving cost as it affects the amount of wire, the size of connectors, and the number of assembly processes.
2. Wire selection (wire OD, strand size, strand count / wire) is significant as it directly relates to conductor cross section, and therefore the amount of copper or aluminum used in the harness.
3. Wire length is another major cost factor as it both relates to material cost and to assembly time, as longer lengths require more handling.
4. The total physical connector size is a major cost factor as connectors are a large portion of harness part costs. Total physical connector size also tends to drive assembly costs.



Relative influence of factors on harness costs
(Data based on L32 two-level Taguchi analysis
of the Wire Harness Coster)

Tail Lamp Wiring Harness Asm Overview



The Tail Lamp Wiring Harness Assembly, consists of 5 wires joining 4 connectors.

All wires are 1.0 mm in diameter and are twisted copper strands. The overall weight of the harness is 0.0059 kg.

All of the connectors are unsealed connectors with multiple terminal cavities.

The harness is uncovered with 1 tape tack.

All major components are analyzed in detail, while prices are applied to commodity items (i.e. clips, terminals).

Estimates are based on actual parts.

Photos: Background on 100mm grid paper.

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EXECUTIVE SUMMARY Harness Overview

	5278 - Tail Lamp Wiring Harness
Parts	10
Steps	82
Assembly Time (min)	3.21
Total Weight (kg)	0.0059
Purchased Part Cost	\$0.36
Supplier Asm. Cost	\$0.93
Q Burden	\$0.10
Total Cost	\$1.38

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EXECUTIVE SUMMARY Wire, Cable & Splices

	5278 - Tail Lamp Wiring Harness
Wire & Cable Count	5
Splice Count	0
Wire Length Total (cm)	106.0
Harness Total Weight	0.0059 kg
Cu Conductor Mass	0.0020 kg
Cu to Harness Mass (%)	33.51 %
Al Conductor Mass	0.0000 kg
Al to Harness Mass (%)	0.00 %
Wire Cost	\$0.03

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EXECUTIVE SUMMARY Connectors & Terminals

	5278 - Tail Lamp Wiring Harness
Connector Assemblies	4
Sealed Connectors	0
Terminal Cavities	11
Unpopulated Cavities	0
Connector Body Cost	\$0.14
Coax Connectors	0
Coax Connector Cost	\$0.00
Pin & Blade Terminals	11
Ring Terminals	0
Battery Terminals	0
Terminal Strips	0
Total Terminal Count	11
Terminal Cost	\$0.20

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EXECUTIVE SUMMARY Labels, Clips, Tape & Coverings

	5278 - Tail Lamp Wiring Harness
Label Count	0
Label Area cm2	0.0
Label Cost	\$0.00
Clip Count	0
Clip Cost	\$0.00
Tape Tacks	1
Taped Length cm	0.0
Tape Actual Length cm	4.1
Tape Cost	\$0.00
Tube & Wrap Count	0
Heat Shrink Count	0
Covering Count Total	0
Covering Length cm	0.0
Covering Cost	\$0.00

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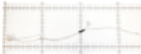





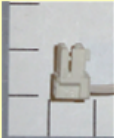


EXECUTIVE SUMMARY Miscellaneous Parts

	5278 - Tail Lamp Wiring Harness
Bracket Count	0
Bracket Cost	\$0.00
Trough Count	0
Trough Cost	\$0.00
Fuse Count	0
Fuse Cost	\$0.00
Grommet Count	0
Grommet Cost	\$0.00
Misc Part Count	0
Misc Part Cost	\$0.00

Wire Harness Costed Bill of Materials

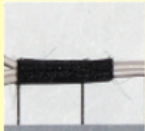
Harness CBOM

5278 - Tail Lamp Wiring Harness

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
 Main Harness	\$0.3598	1	1	Each	\$0.3598
Media:					
					
 C01	\$0.0500	1	1	Each	\$0.0500
Media:					
					
 C02	\$0.0700	1	1	Each	\$0.0700
Media:					
					
 C03	\$0.0700	1	1	Each	\$0.0700
Media:					
					
 C04	\$0.1300	1	1	Each	\$0.1300
Media:					
					

Wire Harness Costed Bill of Materials

5278 - Tail Lamp Wiring Harness

Name	Purchased Part Cost	Item Qty	Measure	Unit of Measure	Purchased Part Cost (Total)
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Tape, Tack</p> <p>Media:</p>  </div> </div>	\$0.0014	1	4.1	cm	\$0.0014
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Wire 1.0 OD/6-0.19 OD Strands</p> </div> </div>	\$0.0067	5	21	cm	\$0.0336

Wire Harness Costed Bill of Process



Assembly Process

5278 - Tail Lamp Wiring Harness

Symbol Name	Assembly Time	Q Burden	Assembly Cost	Qty	Q Burden (Total)	Assembly Cost (Total)
Wire Operations	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire Cut & Strip Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Wire	4.0000 sec	\$0.00	\$0.02	5	\$0.01	\$0.10
Cut & Strip Wire	1.0000 sec	\$0.00	\$0.00	5	\$0.01	\$0.02
Wire Crimp Machine, Automatic	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Insert Wire Ends	2.0000 sec	\$0.00	\$0.01	10	\$0.01	\$0.10
Terminal, Contact	2.0000 sec	\$0.00	\$0.01	10	\$0.01	\$0.10
Crimp Terminal	1.0000 sec	\$0.00	\$0.00	10	\$0.01	\$0.05
Wiring Board	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grab Wire	4.0000 sec	\$0.00	\$0.02	5	\$0.01	\$0.10
Route Wire (avg length)	1.2600 sec	\$0.00	\$0.01	5	\$0.01	\$0.03
Connector	4.0000 sec	\$0.00	\$0.02	4	\$0.01	\$0.08
Insert Wire Contact (qty/connector)	4.0000 sec	\$0.00	\$0.02	10	\$0.01	\$0.19
Test, Wire Harness	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Electrical Test Equipment	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Grasp & Position Connector	3.0000 sec	\$0.00	\$0.01	4	\$0.01	\$0.06
Mate Connectors to test equip	2.0000 sec	\$0.00	\$0.01	4	\$0.00	\$0.04
Test Harness	2.0000 sec	\$0.00	\$0.01	5	\$0.00	\$0.05
Coverings & Tape Winding	0.0000 sec	\$0.00	\$0.00	1	\$0.00	\$0.00
Tape Tack	5.0000 sec	\$0.00	\$0.02	1	\$0.00	\$0.02

Report Totals

Count: 20

85 \$0.10 \$0.93

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Cost Analysis Page
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Cost Analysis Page
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BMW i3 Plant Assembly Line Videos:

- <https://www.youtube.com/watch?v=gt1k3BLN7pw>
- <https://www.youtube.com/watch?v=1u7XiBnwPCw>
- <https://www.youtube.com/watch?v=htuVoxuMQFQ>
- <https://www.youtube.com/watch?v=kfISmVGCjxg>
- <https://www.youtube.com/watch?v=29VHdcOvnK8>
- https://www.youtube.com/watch?v=x3brfAEs_RY
- <https://www.youtube.com/watch?v=Zyf9JhfXu5k>

BMW i3 LED Lights

- <http://www.fancygens.com/bmw-i3-led-lights/>

BASF With Materials and Construction Know-How in the BMW i3

- http://www.plasticsportal.net/wa/plasticsEU/portal/show/common/plasticsportal_news/2014/14_176