

Assembly: A0007 Accumulator container System: EN - Engine and drivetrain

Part Name	
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	A0007
DLS	A
PLS	A
Comment	

Car # 054

Ass. Cost	\$976,24
Net Cost	\$696,36
Qty	1

Total NC \$696,36

Ext. Cost \$976,24

Full P/N FSG - 15 - 054 - EN - A0007 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

ItemOrder	Part	Part Cost	Quantity	SubTotal
00031	Aluminum box part 1	\$5,05	4	\$20,20
00032	Aluminum box part 2	\$7,68	1	\$7,68
00033	Aluminium box part 3	\$12,04	1	\$12,04
00034	Aluminum nut support	\$4,79	1	\$4,79
00035	Aluminum stack support top	\$0,63	10	\$6,27
00036	Aluminum stack support bottom	\$1,42	10	\$14,17
00037	Aluminum support 1	\$1,48	12	\$17,75
00038	Aluminum tube	\$3,40	1	\$3,40
00039	Aluminum support 2	\$1,77	4	\$7,08
00040	Carbon fiber cover	\$116,18	1	\$116,18
00041	Firewall	\$44,71	1	\$44,71
00042	AIR's support	\$1,45	2	\$2,90
00043	Fuse support	\$1,39	2	\$2,79
00044	Precharge support	\$1,53	3	\$4,59
00045	Aluminum HV connections	\$1,34	1	\$1,34
00046	Copper HV connections	\$1,77	1	\$1,77
00047	Maintenance plugs support	\$0,78	14	\$10,94
00048	Maintenance plugs cover	\$0,09	14	\$1,30
SubTotal				\$279,89

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Quantity	Unit	Area	Unit	Density	SubTotal
1	Chassis Control Module, + HV Precharge	Precharge Circuit	\$/unit	50,00	unit			1					\$50,00
2	Chassis Control Module, + HV Insulation Relay	AIRs	\$/unit	120,00	unit			2					\$240,00
3	Chassis Control Module, + HC-HV Fuse incl. Box	HV Fuse	\$/unit	100,00	unit			1					\$100,00
4	Wire, Power	EM - HVD, HVD - AIR-	\$/m	3,00	m			2					\$6,00
5	Wire, Control		\$/m	1,00	m			3					\$3,00
6	Connector, HC-HV incl. Interlock	HV connector to controller	\$/unit	30,00	unit			1					\$30,00
7	Connector, Aerospace Quality	LV connector to LV battery, MicroAutobox	\$/pin	1,00	pin			23					\$23,00
8	Lamp, LED	Led indicator	\$/unit	0,50	unit			1					\$0,50
9	Belt	Cover belt	\$/mm	0,05	mm			1000					\$50,00
10	Adhesive		\$/unit	-									\$0,00
11	Tape		\$/unit	-									\$0,00
SubTotal													\$502,50

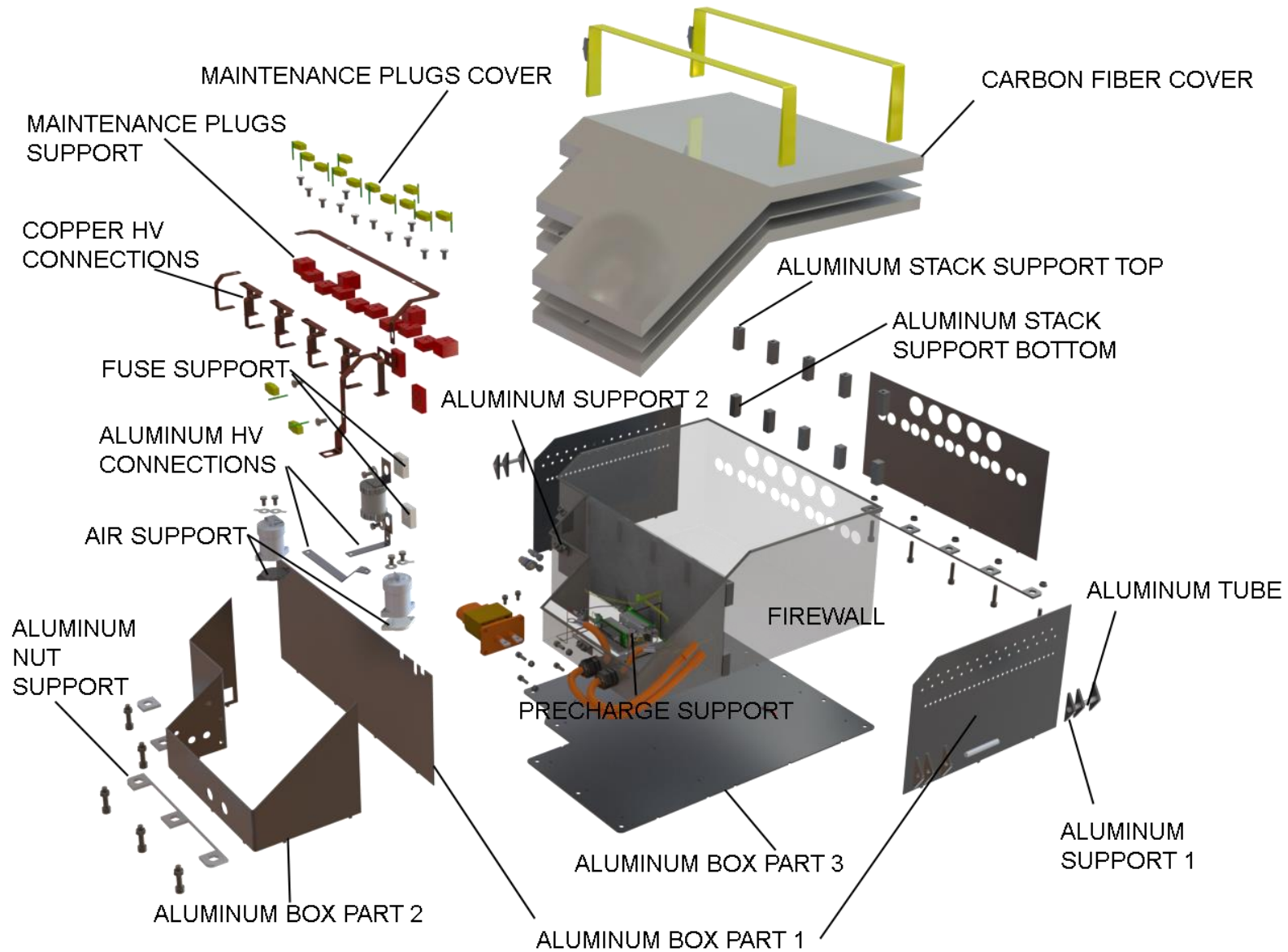
PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal
1	Assemble, 5kg, Loose	Accumulator container parts	\$/unit	0,31	unit	18,0			\$5,58
2	Weld	Accumulator container parts	\$/cm	0,15	cm	400,5			\$60,08
3	Brush apply	Firewall and component supports	\$/cm²	0,02	cm²	3325,0			\$66,50

Assembly: A0007 Accumulator container System: EN - Engine and drivetrain

4	Assemble, 1kg, Line-on-line	HV components, LV box (A0009)	\$/unit	0,13	unit	15,0	\$1,95
5	Screwdriver > 1 Turn	HV components	\$/unit	0,50	unit	14,0	\$7,00
6	Reaction Tool<=6.35 mm	HV components	\$/unit	0,25	unit	4,0	\$1,00
7	Assemble, 10kg, Loose	Stacks (A0008)	\$/unit	0,63	unit	5,0	\$3,15
8	Screwdriver > 1 Turn	Stacks (A0008)	\$/unit	0,50	unit	10,0	\$5,00
9	Assemble, 1kg, Loose	Cover and Battery cooling (A0013)	\$/unit	0,06	unit	2,0	\$0,12
10	Screwdriver > 1 Turn	Cover	\$/unit	0,50	unit	4,0	\$2,00
11	Reaction Tool<=6.35 mm	Cover	\$/unit	0,25	unit	4,0	\$1,00
12	Connector Install, Circular, Bayonet		\$/unit	0,11	unit	3,0	\$0,33
13	Connector Install, Square, Screw (x2)		\$/unit	0,50	unit	1,0	\$0,50
14	Adjustment - Misc.		\$/unit	5,00	unit	2,0	\$10,00
15	Assemble, >20kg, Line-on-line	Accumulator container - Frame	\$/unit	3,75	unit	1,0	\$3,75
16	Screwdriver > 1 Turn	Accumulator container - Frame	\$/unit	0,50	unit	10,0	\$5,00
17	Hand, Tight <= 6.35 mm	Maintenance Plugs	\$/unit	0,50	unit	14,0	\$7,00
18	Tape		\$/m	0,80	m	0,2	\$0,16
SubTotal							\$180,12

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal
1	Bolt, Grade 8.8 (SAE 5)	Accumulator - Frame	\$/unit	0,14	mm	8	mm	35	10	\$1,40
2	Nut, Grade 8.8 (SAE 5)	Accumulator - Frame	\$/unit	0,04	mm	8			10	\$0,40
3	Nut, Grade 8.8 (SAE 5)	EM	\$/unit	0,07	mm	10			2	\$0,14
4	Bolt, Grade 8.8 (SAE 5)	Maintenance Plugs	\$/unit	0,04	mm	6	mm	16	14	\$0,56
5	Pin, Cotter, Hairpin	Maintenance Plugs	\$/unit	0,08	mm				14	\$1,12
6	Thread Insert	Maintenance Plugs	\$/unit	0,60	mm	6	mm	9	14	\$8,40
7	Bolt, Grade 8.8 (SAE 5)	HV connector	\$/unit	0,02	mm	6	mm	12	6	\$0,12
8	Nut, Grade 8.8 (SAE 5)	HV connector	\$/unit	0,02	mm	6			6	\$0,12
9	Bolt, Grade 8.8 (SAE 5)	Cover	\$/unit	0,04	mm	6	mm	16	4	\$0,16
10	Nut, Grade 8.8 (SAE 5)	Cover	\$/unit	0,03	mm	6			4	\$0,12
11	Bolt, Grade 8.8 (SAE 5)	Fuse	\$/unit	0,03	mm	6	mm	10	2	\$0,06
12	Washer, Grade 8.8 (SAE 5)	Fuse	\$/unit	0,01	mm		mm		2	\$0,02
13	Bolt, Grade 8.8 (SAE 5)	AIR's	\$/unit	0,02	mm	5	mm	10	4	\$0,08
14	Washer, Grade 8.8 (SAE 5)	AIR's	\$/unit	0,01	mm	5	mm		4	\$0,04
SubTotal										\$12,74

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	FractionIncluded	SubTotal
1	Welds - Welding Fixture		\$/point	500	point	6	3000		\$1,00
SubTotal									\$1,00



Part: 00031 Aluminum box part 1

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Aluminum box part 1
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00031
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$5,05
Quantity 4

Ext. Cost \$20,20

Full P/N FSG - 15 - 054 - EN - 00031 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	393	221	2	mm²	86853	kg/mm³	2,70E-06	1	\$1,97
													SubTotal	\$1,97

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	178,0	Material - Aluminum	1,00	\$1,78	
									SubTotal	\$3,08

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminium box part 2
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00032
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$7,68
Quantity 1

Ext. Cost \$7,68

Full P/N FSG - 15 - 054 - EN - 00032 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	706	188	2	mm²	132728	kg/mm³	2,70E-06	1	\$3,01
													SubTotal	\$3,01

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	237,0	Material - Aluminum	1,00	\$2,37	
3	Sheet metal bends		\$/bend	0,25	bend	4,0			\$1,00	
									SubTotal	\$4,67

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminium box part 3
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00033
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$12,04
Quantity 1

Ext. Cost \$12,04

Full P/N FSG - 15 - 054 - EN - 00033 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	563	460	3	mm²	258980	kg/mm³	2,70E-06	1	\$8,81
													SubTotal	\$8,81

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	192,8	Material - Aluminum	1,00	\$1,93	
									SubTotal	\$3,23

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00034 Aluminium nut support

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Aluminium nut support
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00034
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$4,79
Quantity 1

Ext. Cost \$4,79

Full P/N FSG - 15 - 054 - EN - 00034 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	459	35	5	mm²	16065	kg/mm³	2,70E-06	1	\$0,91
													SubTotal	\$0,91

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	257,7	Material - Aluminum	1,00	\$2,58	
									SubTotal	\$3,88

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00035 Aluminum stack support top

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Aluminum stack support top
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00035
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$0,63
Quantity 10

Ext. Cost \$6,27

Full P/N FSG - 15 - 054 - EN - 00035 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	15	15	40	mm²	225	kg/mm³	2,70E-06	1	\$0,10
													SubTotal	\$0,10

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Drilled holes < 25.4 mm dia.		\$/unit	0,35	Unit	1	Machine - Hole Length >= 4f	1,50	\$ 0,53	
									SubTotal	\$0,53

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00036 Aluminum stack support bottom

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Aluminum stack support bottom
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00036
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,42
Quantity 10

Ext. Cost \$14,17

Full P/N FSG - 15 - 054 - EN - 00036 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	15	15	40	mm²	225	kg/mm³	2,70E-06	1	\$0,10
													SubTotal	\$0,10

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	1,5	Material - Aluminum	1,00	\$0,02	
									SubTotal	\$1,32

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminum support 1
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00037
DLS	A
PLS	A
Comment	Lateral cover support

Car # 054

Part Cost \$1,48
Quantity 12

Ext. Cost \$17,75

Full P/N FSG - 15 - 054 - EN - 00037 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	50	16	5	mm²	800	kg/mm³	2,70E-06	1	\$0,05
													SubTotal	\$0,05

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	13,4	Material - Aluminum	1,00	\$0,13	
									SubTotal	\$1,43

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminum tube
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00038
DLS	A
PLS	A
Comment	Lateral cover support

Car # 054

Part Cost \$3,40
Quantity 1

Ext. Cost \$3,40

Full P/N FSG - 15 - 054 - EN - 00038 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	-	-	256	mm²	50	kg/mm³	2,70E-06	1	\$0,15
													SubTotal	\$0,15

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Machining Setup, Change		\$/unit	0,65	Unit	3			\$ 1,95	
3	Waterjet cut		\$/cm	0,01	cm	0,8	Material - Aluminum	1,00	\$0,01	
									SubTotal	\$3,26

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminum support 2
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00039
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,77
Quantity 4

Ext. Cost \$7,08

Full P/N FSG - 15 - 054 - EN - 00039 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	54	35	2	mm²	1890	kg/mm³	2,70E-06	1	\$0,04
													SubTotal	\$0,04

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	17,8	Material - Aluminum	1,00	\$0,18	
3	Sheet metal bends		\$/bend	0,25	bend	1,0			\$0,25	
									SubTotal	\$1,73

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Carbon fiber cover
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00040
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$116,18
Quantity 1

Ext. Cost \$116,18

Full P/N FSG - 15 - 054 - EN - 00040 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Carbon Fiber, 1 ply		\$/kg	200,00	mm	450	480	0,2	mm²	216000	kg/mm³	1,80E-06	4	\$62,21
2	Honeycomb Nomex		\$/kg	125,00	mm	450	480	3	mm²	216000	kg/mm³	3,22E-08	1	\$2,61
3	Glass Fiber, 1 ply		\$/kg	100,00	mm	450	480	0	mm²	216000	kg/mm³	1,50E-06	1	\$3,24
													SubTotal	\$68,06

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal
1	Lamination, Manual		\$/m²	35,00	m²	0,216	Repeat 5	5,00	\$ 37,80
2	Resin application, Manual		\$/m²	5,00	m²	0,216	Repeat 5	5,00	\$5,40
3	Cure, Room Temperature		\$/m²	10,00	m²	0,216			\$2,16
									SubTotal \$45,36

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal
	None									\$0,00
										SubTotal \$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal
1	Lamination - Flat Panel Tool		\$/m²	1500	m²	0,221	120	\$2,76
								SubTotal \$2,76

Part: 00041 Firewall

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Firewall
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00041
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$44,71
Quantity 1

Ext. Cost \$44,71

Full P/N FSG - 15 - 054 - EN - 00041 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Glass Fiber, 1 ply		\$/kg	100,00	mm	840	385	0,1	mm²	323200	kg/mm³	1,50E-06	1	\$4,85
													SubTotal	\$4,85

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Lamination, Manual		\$/m²	35,00	m²	0,323			\$ 11,31	
2	Resin application, Manual		\$/m²	5,00	m²	0,323			\$1,62	
									SubTotal	\$12,93

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
1	Lamination - Composite Tool		\$/m²	10000	m²	0,323	120	\$26,93	
								SubTotal	\$26,93

Part Name	AIR's support
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00042
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,45
Quantity 2

Ext. Cost \$2,90

Full P/N FSG - 15 - 054 - EN - 00042 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	53	35	5	mm²	1866	kg/mm³	1,20E-06	1	\$0,04
													SubTotal	\$0,04

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	23,0	Material - Plastic	0,50	\$0,12	
									SubTotal	\$1,42

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Fuse support
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00043
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,39
Quantity 2

Ext. Cost \$2,79

Full P/N FSG - 15 - 054 - EN - 00043 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	31	25	10	mm²	775	kg/mm³	1,20E-06	1	\$0,03
													SubTotal	\$0,03

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	12,7	Material - Plastic	0,50	\$0,06	
									SubTotal	\$1,36

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00044 Precharge support

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Precharge support
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00044
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,53
Quantity 3

Ext. Cost \$4,59

Full P/N FSG - 15 - 054 - EN - 00044 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	60	68	5	mm²	4080	kg/mm³	1,20E-06	1	\$0,08
													SubTotal	\$0,08

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	29,6	Material - Plastic	0,50	\$0,15	
									SubTotal	\$1,45

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00045 Aluminum HV connections

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Aluminum HV connections
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00045
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,34
Quantity 1

Ext. Cost \$1,34

Full P/N FSG - 15 - 054 - EN - 00045 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	85	45	2	mm²	3825	kg/mm³	2,70E-06	1	\$0,09
													SubTotal	\$0,09

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	73,8	Material - Aluminum	1,00	\$0,74	
3	Sheet metal bends		\$/bend	0,25	bend	5,0			\$1,25	
									SubTotal	\$3,29

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00046 Copper HV connections

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Copper HV connections
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00046
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,77
Quantity 1

Ext. Cost \$1,77

Full P/N FSG - 15 - 054 - EN - 00046 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Copper		\$/kg	2,20	mm	350	124	2	mm²	43400	kg/mm³	2,70E-06	1	\$0,52
													SubTotal	\$0,52

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	284,8			\$2,85	
3	Sheet metal bends		\$/bend	0,25	bend	5,0			\$1,25	
									SubTotal	\$5,40

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00047 Maintenance plugs support

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Maintenance plugs support
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00047
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$0,78
Quantity 14

Ext. Cost \$10,94

Full P/N FSG - 15 - 054 - EN - 00047 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, ABS		\$/kg	3,30	mm	25	25	13	mm²	625	kg/mm³	1,05E-06	1	\$0,03
													SubTotal	\$0,03

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Rapid Prototype - Plastic		\$/kg	32,00	kg	0,01			\$ 0,27	
2	Drilled holes < 25.4 mm dia.		\$/hole	0,35	hole	1			\$ 0,35	
3	Threading, Internal (machining)		\$/cm	0,10	cm	1,3			\$0,13	
									SubTotal	\$0,75

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00048 Maintenance plugs cover

System: EN - Engine and drivetrain Assembly: A0007 Accumulator container

Part Name	Maintenance plugs cover
Assembly	Accumulator container
System	Engine & Drivetrain
P/N Base	00048
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$0,09
Quantity 14

Ext. Cost \$1,30

Full P/N FSG - 15 - 054 - EN - 00048 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, ABS		\$/kg	3,30	mm	26	12	8	mm²	312	kg/mm³	1,05E-06	1	\$0,01
													SubTotal	\$0,01

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Rapid Prototype - Plastic		\$/kg	32,00	kg	0,003			\$ 0,08	
									SubTotal	\$0,08

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Assembly: A0008 Stack

System: EN - Engine and drivetrain

Part Name	
Assembly	Stack
System	Engine & Drivetrain
P/N Base	A0008
DLS	A
PLS	A
Comment	

Car # 054

Ass. Cost	\$1.863,80
Net Cost	\$1.514,87
Qty	5

Total NC \$7.574,34

Ext. Cost \$9.318,98

Full P/N FSG - 15 - 054 - EN - A0008 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

ItemOrder	Part	Part Cost	Quantity	SubTotal
00049	Aluminum box part 1	\$9,09	1	\$9,09
00050	Aluminum box part 2	\$8,24	1	\$8,24
00051	Aluminum box part 3	\$3,03	1	\$3,03
00052	Firewall	\$279,90	1	\$279,90
00053	Stack cover	\$2,00	1	\$2,00
00054	Copper cell connection	\$15,41	1	\$15,41
00055	Cell connection support 1	\$3,02	1	\$3,02
00056	Cell connection support 2	\$3,15	1	\$3,15
00057	Cell connection support 3	\$3,04	1	\$3,04
00058	BMS board support	\$1,97	7	\$13,79
00059	Cover support	\$2,75	3	\$8,26
SubTotal				\$348,93

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Quantity	Unit	Area	Unit	Density	SubTotal
1	Tape	Cells attachment			mm	1750							\$0,00
2	Foam, Expanding, Non-Structural	Cells fitting	\$/kg	15,00	mm	30	45	2	mm ²	1350	kg/m ³	15,00	\$0,01
3	Adhesive	Plastic assembly											\$0,00
4	Cable, pull	Stack removal	\$/m	15,00	mm	700		1					\$10,50
5	Battery, Tractie Lithium	Energy	\$/kW-h	600,00				1,52					\$912,00
6	Chassis Control Module, Battery Management System	Cells control	\$/channel	20,00	channel			24					\$480,00
7	Connector, OEM Quality	BMS connectors	\$/pin	0,50	pin			72					\$36,00
8	Wire, Control	BMS wiring	\$/m	1,00				1					\$1,00
SubTotal													\$1.439,51

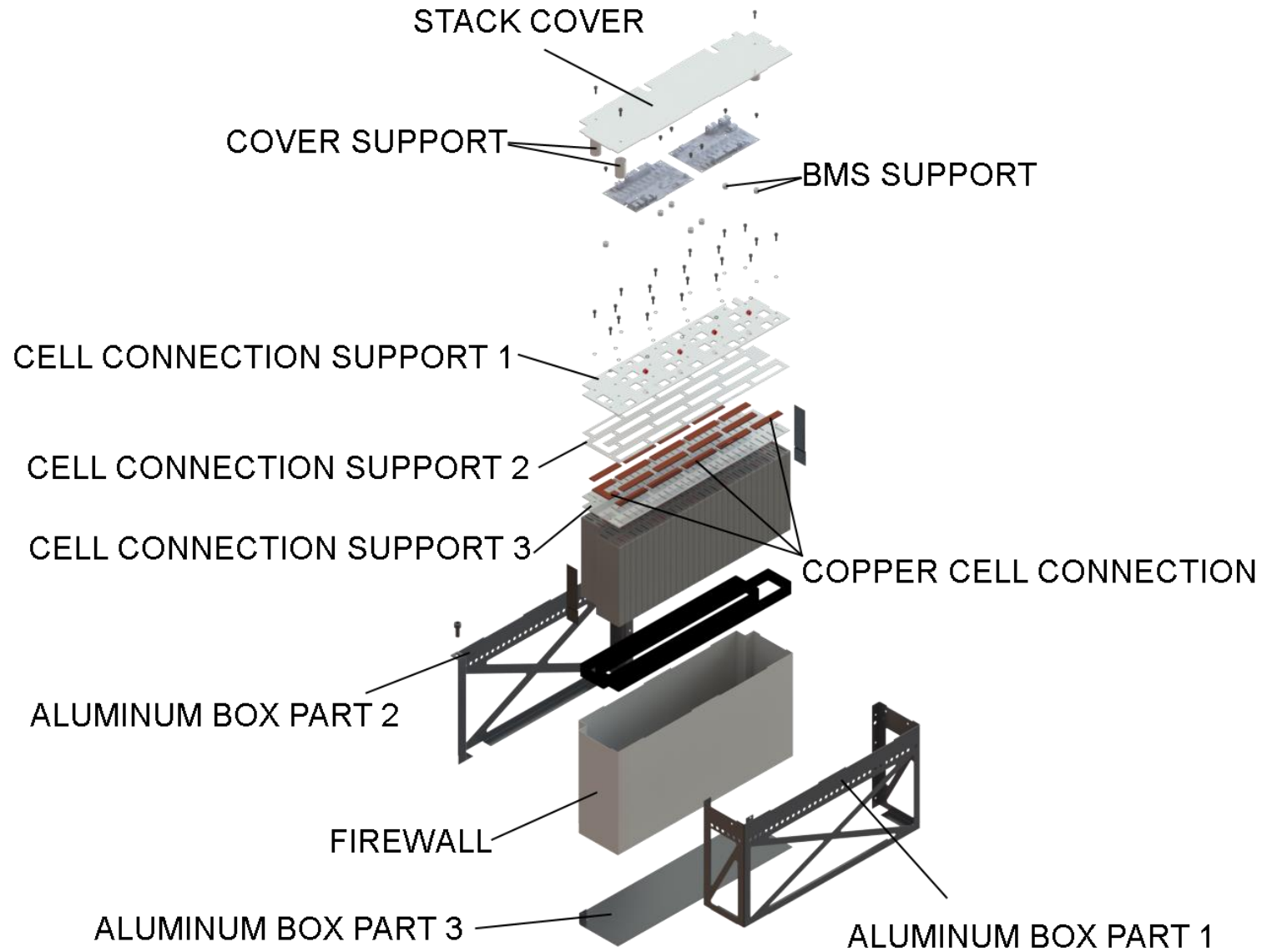
PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal
1	Assemble, 1 kg, Loose	Connections support	\$/unit	0,06	unit	42			\$2,52
2	Brush apply	Connections support	\$/cm ²	0,02	cm ²	500			\$10,00
3	Attach Wire, Solder wire, bent	BMS connections	\$/unit	0,35	unit	52			\$18,20
4	Assemble, 1 kg, Loose	Cell assembly	\$/unit	0,06	unit	57			\$3,42
5	Assemble, 1 kg, Line-on-line	Connectios	\$/unit	0,13	unit	1			\$0,13
6	Screwdriver	Connections fastening	\$/unit	0,50	unit	21			\$10,50
7	Connector Assembly, Crimp	BMS connections	\$/contacts	0,36	contacts	52			\$18,72
8	Assemble, 1 kg, Loose	BMS and cover support	\$/unit	0,06	unit	10			\$0,60
9	Brush apply	Glue to BMS and cover support	\$/cm ²	0,02	cm ²	8			\$0,17
10	Connector Install, Square, Friction	BMS connector	\$/unit	0,14	unit	2			\$0,28
11	Screwdriver	BMS and cover	\$/unit	0,50	unit	10			\$5,00
12	Assemble, 1 kg, Loose	Firewall	\$/unit	0,06	unit	8			\$0,48

Assembly: A0008 Stack System: EN - Engine and drivetrain

13	Assemble, 1 kg, Loose	Stack assembly	\$/unit	0,06	unit	3					\$0,18
14	Assemble, 1 kg, Line-on-line	Stack assembly	\$/unit	0,13	unit	2					\$0,26
15	Screwdriver	Stack assembly	\$/unit	0,50	unit	2					\$1,00
16	Riveting	Stack assembly	\$/unit	0,25	unit	8					\$2,00
17	Assemble, 1 kg, Loose	Cell and connections	\$/unit	0,06	unit	1					\$0,06
18	Tape	Cell assembly	\$/m	0,80	m	1,30					\$1,04
										SubTotal	\$74,56

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
1	Bolt, Grade 6.8 (SAE 3)	Cells connections	\$/unit	0,01	mm	3	mm	8	21	\$0,21	
2	Nut, Grade 6.8 (SAE 3)	Cells connections	\$/unit	0,01	mm	3	mm		21	\$0,21	
3	Bolt, Grade 6.8 (SAE 3)	BMS and cover bolts	\$/unit	0,01	mm	3	mm	4	10	\$0,10	
4	Rivet, Pop	Stack assembly	\$/unit	0,03					8	\$0,24	
5	Bolt, Grade 6.8 (SAE 3)	Stack assembly	\$/unit	0,02	mm	6	mm	12	2	0,04	
										SubTotal	\$0,80

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	FractionIncluded	SubTotal	
	None								\$0,00	
									SubTotal	\$0,00



Part: 00049 Aluminum box part 1

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Aluminum box part 1
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00049
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$9,09
Quantity 5

Ext. Cost \$45,47

Full P/N FSG - 15 - 054 - EN - 000049 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum, Normal		\$/kg	4,20	mm	500	200	1	mm ²	100000	kg/mm ³	2,70E-06	1	\$1,13
													SubTotal	\$1,13

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	491	Material - Aluminum	4,91	\$ 4,91	
3	Sheet metal bends		\$/bend	0,25	bend	7,0			\$1,75	
									SubTotal	\$7,96

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00050 Aluminum box part 2

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Aluminum box part 2
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00050
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$8,24
Quantity 5

Ext. Cost \$41,22

Full P/N FSG - 15 - 054 - EN - 000050 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum, Normal		\$/kg	4,20	mm ²	350	200	1	mm ²	70000	kg/mm ³	2,70E-06	1	\$0,79
													SubTotal	\$0,79

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	340,35	Material - Aluminum	3,40	\$ 3,40	
3	Sheet metal bends		\$/bend	0,25	bend	11,0			\$2,75	
									SubTotal	\$7,45

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00051 Aluminum box part 3

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Aluminum box part 3
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00051
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$3,03
Quantity 5

Ext. Cost \$15,13

Full P/N FSG - 15 - 054 - EN - 000051 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum, Normal		\$/kg	4,20	mm ²	320	90	1	mm ²	28800	kg/mm ³	2,70E-06	1	\$0,33
													SubTotal	\$0,33

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	90,36	Material - Aluminum	0,90	\$ 0,90	
3	Sheet metal bends		\$/bend	0,25	bend	2,0			\$0,50	
									SubTotal	\$2,70

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Firewall
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00052
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$279,90
Quantity 5

Ext. Cost \$1.399,50

Full P/N FSG - 15 - 054 - EN - 000052 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Glass Fiber, 1 Ply	Firewall	\$/kg	100,00	mm	900	200	0,10	mm ²	180000	kg/mm ³	1,50E-06	1	\$2,70
													SubTotal	\$2,70

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Lamination, Manual		\$/m ²	35,00	m ²	0,18			\$ 6,30	
2	Resin application, Manual		\$/m ²	5,00	m ²	0,18			\$ 0,90	
									SubTotal	\$7,20

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
1	Lamination - Flat Panel Tool		\$/m ²	1500	m ²	0,18		\$270,00	
								SubTotal	\$270,00

Part Name	Stack cover
Assembly	Stack cover
System	Engine & Drivetrain
P/N Base	00053
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$2,00
Quantity 5

Ext. Cost \$9,98

Full P/N FSG - 15 - 054 - EN - 000053 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm ²	95	330	2	mm ²	31350	kg/mm ³	1,2	1	\$0,22
													SubTotal	\$0,22

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	95,1	Material - Plastic	0,50	\$ 0,48	
									SubTotal	\$1,78

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00054 Copper cell connection

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Copper cell connection
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00054
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$15,41
Quantity 1

Ext. Cost \$15,41

Full P/N FSG - 15 - 054 - EN - 000054 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Copper	Connections	\$/kg	2,20	mm	500	500	2	mm ²	250000	kg/mm ³	2,70E-06	1	\$2,97
													SubTotal	\$2,97

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	1114			\$ 11,14	
									SubTotal	\$12,44

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00055 Cell connection support 1

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Cell connection support 1
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00055
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$3,02
Quantity 5

Ext. Cost \$15,09

Full P/N FSG - 15 - 054 - EN - 000055 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	315	85	2	mm ²	26775	Kg/mm ³	1,20E-06	1	\$0,21
													SubTotal	\$0,21

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	301	Material - Plastic	0,50	\$ 1,51	
									SubTotal	\$2,81

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00056 Cell connection support 2

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Cell connection support 2
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00056
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$3,15
Quantity 5

Ext. Cost \$15,73

Full P/N FSG - 15 - 054 - EN - 000056 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	315	85	1	mm ²	26775	kg/mm ³	1,20E-06	1	\$0,11
													SubTotal	\$0,11

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	348	Material - Plastic	0,50	\$ 1,74	
									SubTotal	\$3,04

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00057 Cell connection support 3

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	Cell connection support 3
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00057
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$3,04
Quantity 5

Ext. Cost \$15,18

Full P/N FSG - 15 - 054 - EN - 000057 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	315	85	5	mm ²	26775	kg/mm ³	1,20E-06	1	\$0,53
													SubTotal	\$0,53

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	501	Material - Plastic	0,50	\$ 2,51	
									SubTotal	\$2,51

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00058 BMS board support

System: EN - Engine and drivetrain Assembly: A0008 Stack

Part Name	BMS board support
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00058
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,97
Quantity 5

Ext. Cost \$9,85

Full P/N FSG - 15 - 054 - EN - 000058 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, ABS	Support	\$/kg	3,30	mm			5	mm ²	45	kg/mm ³	1,05E-06	7	\$0,01
													SubTotal	\$0,01

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining, Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Machining		\$/cm ³	0,04	cm ³	15,76	Material - Plastic	0,50	\$ 0,32	
3	Drilled holes < 25,4 mm dia.		\$/hole	0,35	hole	1,0			\$0,35	
									SubTotal	\$1,97

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Cover support
Assembly	Stack
System	Engine & Drivetrain
P/N Base	00059
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$2,75
Quantity 5

Ext. Cost \$13,77

Full P/N FSG - 15 - 054 - EN - 000059 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, ABS	Support	\$/kg	3,30	mm			25	mm ²	172	kg/mm ³	1,05E-06	3	\$0,04
													SubTotal	\$0,04

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining, Setup, Install and remove		\$/unit	1,30	Unit	1,0			\$ 1,30	
2	Machining		\$/cm ³	0,04	cm ³	53,01	Material - Plastic	0,50	\$ 1,06	
3	Drilled holes < 25,4 mm dia.		\$/hole	0,35	hole	1,0			\$0,35	
									SubTotal	\$2,71

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Assembly: A0009 LV accumulator box

System: EN - Engine and drivetrain

Part Name	
Assembly	LV accumulator box
System	Engine & Drivetrain
P/N Base	A0009
DLS	A
PLS	A
Comment	

Car # 054

Ass. Cost	\$363,08
Net Cost	\$355,78
Qty	1

Total NC \$355,78

Ext. Cost \$363,08

Full P/N FSG - 15 - 054 - EN - A0009 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

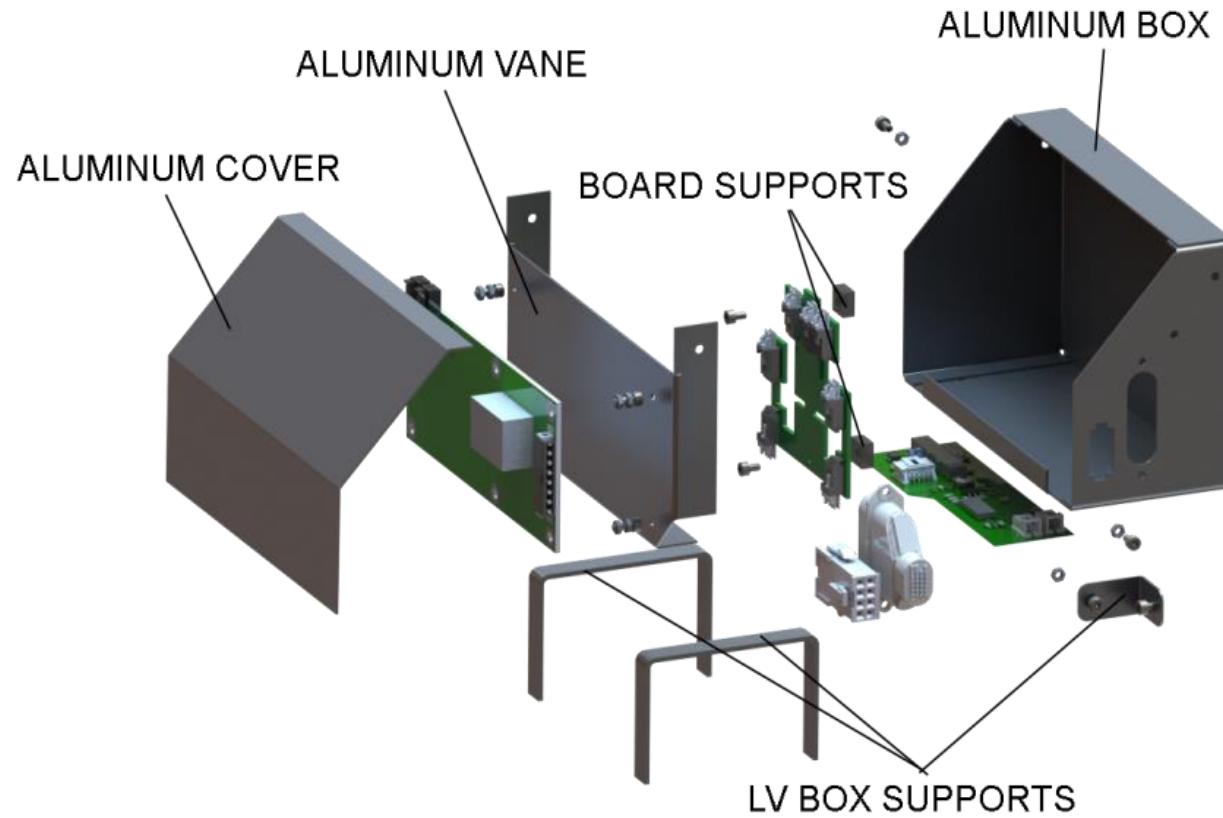
ItemOrder	Part	Part Cost	Quantity	SubTotal
00061	Aluminium box	\$2,90	1	\$2,90
00062	Aluminium cover	\$0,73	1	\$0,73
00063	Aluminium vane	\$0,99	1	\$0,99
00064	Board supports	\$1,39	1	\$1,39
00065	LV box supports	\$1,29	1	\$1,29
			SubTotal	\$7,30

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Quantity	Unit	Area	Unit	Density	SubTotal
1	Chassis Control Module, + Isolation Monitoring Device		\$/unit	300,00	unit			1					\$300,00
2	Chassis Control Module, + TSAL	LED indicator	\$/unit	10,00	unit			1					\$10,00
3	Piano Hinge, Aluminum	Cover support	\$/mm	1,96	mm	2	10	1					\$1,96
4	Connector, Aerospace Quality		\$/pin	1,00	pin			32					\$32,00
5	Wire, Control		\$/m	1,00	m			1					\$1,00
												SubTotal	\$344,96

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Riveting	Box structure	\$/unit	0,25	unit	6,0			\$1,50	
2	Brush apply		\$/cm²	0,02	cm²	9,8			\$0,20	
3	Connector Install, Square, Friction		\$/unit	0,14	unit	1,0			\$0,14	
4	Connector Install, Square, Screw (x2)		\$/unit	0,50	unit	1,0			\$0,50	
5	Assemble, 1kg, Line-on-line		\$/unit	0,13	unit	4,0			\$0,52	
6	Screwdriver > 1 Turn		\$/unit	0,50	unit	10,0			\$5,00	
7	Reaction Tool <= 6.35 mm		\$/unit	0,25	unit	11,0			\$2,75	
									SubTotal	\$10,61

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
1	Rivet, Pop	Box structure	\$/unit	0,03	unit	3			6	\$0,09	
4	Bolt, Grade 8.8 (SAE 5)		\$/unit	0,01	mm	3	mm	5	6	\$0,03	
5	Bolt, Grade 8.8 (SAE 5)		\$/unit	0,01	mm	3	mm	8	4	\$0,03	
6	Nut, Grade 8.8 (SAE 5)		\$/unit	0,02	mm	3			11	\$0,06	
										SubTotal	\$0,21

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	FractionIncluded	SubTotal	
	None								\$0,00	
									SubTotal	\$0,00



Part Name	Aluminium box
Assembly	LV accumulator box
System	Engine & Drivetrain
P/N Base	00060
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$2,90
Quantity 1

Ext. Cost \$2,90

Full P/N FSG - 15 - 054 - EN - 00060 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	291	197	1	mm²	57327	kg/mm³	2,70E-06	1	\$0,65
													SubTotal	\$0,65

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	97,4	Material - Aluminum	1,00	\$0,97	
3	Sheet metal bends		\$/bend	0,25	bend	9,0			\$2,25	
									SubTotal	\$4,52

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminium cover
Assembly	LV accumulator box
System	Engine & Drivetrain
P/N Base	00061
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$0,73
Quantity 1

Ext. Cost \$0,73

Full P/N FSG - 15 - 054 - EN - 00061 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	160	127	1	mm²	20320	kg/mm³	2,70E-06	1	\$0,23
													SubTotal	\$0,23

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	57,4	Material - Aluminum	1,00	\$0,57	
3	Sheet metal bends		\$/bend	0,25	bend	2,0			\$0,50	
									SubTotal	\$2,37

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	Aluminium vane
Assembly	LV accumulator box
System	Engine & Drivetrain
P/N Base	00062
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$0,99
Quantity 1

Ext. Cost \$0,99

Full P/N FSG - 15 - 054 - EN - 00062 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	110	191	1	mm²	21010	kg/mm³	2,70E-06	1	\$0,24
													SubTotal	\$0,24

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	60,0	Material - Aluminum	1,00	\$0,60	
3	Sheet metal bends		\$/bend	0,25	bend	3,0			\$0,75	
									SubTotal	\$2,65

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part: 00063 Board support

System: EN - Engine and drivetrain Assembly: A0009 LV accumulator box

Part Name	Board support
Assembly	LV accumulator box
System	Engine & Drivetrain
P/N Base	00063
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,39
Quantity 1

Ext. Cost \$1,39

Full P/N FSG - 15 - 054 - EN - 00063 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Plastic, Polycarbonate		\$/kg	3,30	mm	30	30	5	mm²	900	kg/mm³	1,20E-06	1	\$0,02
													SubTotal	\$0,02

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	15,0	Material - Plastic	0,50	\$0,08	
									SubTotal	\$1,38

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00

Part Name	LV box supports
Assembly	LV accumulator box
System	Engine & Drivetrain
P/N Base	00064
DLS	A
PLS	A
Comment	

Car # 054

Part Cost \$1,29
Quantity 1

Ext. Cost \$1,29

Full P/N FSG - 15 - 054 - EN - 00064 - AA
University Escola Tècnica Superior d'Enginyeria Industrial de Barcelona - UPC

MID	Material	Use	Unit	Cost	Unit	Size 1	Size 2	Length	Unit	Area	Unit	Density	Quantity	SubTotal
1	Aluminum Normal		\$/kg	4,20	mm	172	20	1	mm²	3440	kg/mm³	2,70E-06	1	\$0,04
													SubTotal	\$0,04

PID	Process	Use	Unit	Cost	Unit	Quantity	Multiplier	Mult. Val.	SubTotal	
1	Machining Setup, Install and remove		\$/unit	1,30	Unit	1			\$ 1,30	
2	Laser cut		\$/cm	0,01	cm	72,8	Material - Aluminum	1,00	\$0,73	
3	Sheet metal bends		\$/bend	0,25	bend	5,0			\$1,25	
									SubTotal	\$3,28

FID	Fastener	Use	Unit	Cost	Unit	Size 1	Unit	Size 2	Quantity	SubTotal	
	None									\$0,00	
										SubTotal	\$0,00

TID	Tooling	Use	Unit	Cost	Unit	Quantity	PVF	SubTotal	
	None							\$0,00	
								SubTotal	\$0,00