Table Of Content

BR (Brake System)		**Brake Fluid**				254-BR-A004
DOT 5.1		*Brake fluid for brake actuation*	Buy		1 x	254-BR-00017
Material	Bought Part	*Liqui Moly Brake Fluid*		1 x		

BR (Brake System)	**Brake System Front**					254-BR-A001
[Assembly Processes]			Make		2 x	254-BR-A001P
Process	Assemble	*To place pads inside the calipers x 4*		1 x		
Process	Assemble	*To place cotter pin to hold pads x 2*		1 x		
Process	Assemble	*To align the caliper on the upright x 2*		1 x		
Process	Assemble	*To align bolt and washer on caliper x 4*		1 x		
Process	Assemble	*To align nut on caliper x 2*		1 x		
Process	Fastener install (every)	*To tighten the nut x 2*		1 x		
Process	Assemble	*To place the disc on the hub*		1 x		
Process	Assemble	*To place bobbins b/w hub and disc x 5*		1 x		
Process	Assemble	*To fasten bobbins with retaining ring x5*		1 x		
Process	Safety Wire, Install	*To retain the bobbin in position x 5*		1 x		
Process	Brake Bleed - Per Bleeder Valve	*Bleed the brake*		1 x		
Fastener	Retaining Ring	*Groove dia 12mm , Od 23.4mm*		5 x		
Fastener	Bolt	*8mm Grade 12.9,bolt caliper to upright*		2 x		
Fastener	Nut	*8mm Grade 12.9 , To fasten the bolt*		2 x		
Fastener	Washer	*8mm Grade 12.9 , To redistribute stress*		4 x		
Fastener	Other: Pin, cotter, hairpin	*To hold brake pads*		2 x		
Fastener	Other: Safety Wire	*length 40mm , To retain the bobbin*		5 x		
Front bobbins	*To Mount brake disk on hub, OD - 18mm*		Make		10 x	254-BR-00001
Material	Aluminum	*Al 7075-T6 (dia 21mm , length 170mm)*		1 x		
Process	Machining setup	*To set up the billet for drilling*		1 x		
Process	Drilled hole	*To drill the central hole, dia 7mm*		1 x		
Process	Machining setup	*To set up the billet for turning*		1 x		
Process	Machining	*To perform turning and facing on lathe*		1 x		
Process	Machining	*Groove for circlip on lathe*		1 x		
Process	Machining setup	*To install parting tool*		1 x		
Process	Cutting (Manual)	*To cut the material using parting tool*		1 x		
Process	Machining setup	*To remove the finished part from machine*		1 x		
Front brake caliper	*Four Pistons , ISR 22-048 OC*		Buy		2 x	254-BR-00002
Material	Bought Part	*Al 6061-T6, Piston Diameter 25mm, Fixed*		1 x		
Front brake disc	*AISI 4140, Hub mounted*		Make		2 x	254-BR-00003
Material	Steel	*AISI 4140,13 HRC*		1 x		
Process	Machining setup	*To setup sheet for laser cutting*		1 x		
Process	Laser Cut	*To laser cut profile of rotors*		1 x		
Process	Machining setup	*To remove the job from machine*		1 x		

Process	Machining setup	*To Setup part for surface finish*		1 x		
Process	Grinding	*Surface finish , 1.425 microns*		1 x		
Process	Machining setup	*To remove the job from machine*		1 x		
Front brake pads		*ISR29-002NA, For braking action*	Buy		8 x	254-BR-00004
Material	Bought Part	*Organic brake pads*		1 x		

BR (Brake System)	**Brake System Rear**			254-BR-A002
[Assembly Processes]		Make	2 x	254-BR-A002P
Material	Other: Seal,O-ring, Elastomer	*To seal piston inside calliper*	2 x	
Material	Other: Seal, O-ring, Elastomer	*To seal caliper 2 halves*	1 x	
Material	Other: Bleedscrew, Hydraulic(Brake,clutch,etc.)	*for bleeding*	2 x	
Material	Other: Thread insert	*To increase the threaded strength*	2 x	
Material	Other: Cotter Pin	*To hold pads inside the calipers*	1 x	
Process	Assemble	*To place o-ring inside caliper halves x1*	1 x	
Process	Assemble	*To place o-ring for piston x2*	1 x	
Process	Assemble	*To place piston inside caliper halves x2*	1 x	
Process	Assemble	*To place helicoil inside caliper x2*	1 x	
Process	Assemble	*To align upper and lower caliper*	1 x	
Process	Assemble	*To align bolt with hole, 8mm x2*	1 x	
Process	Fastener install (every)	*To fasten the bolt x2*	1 x	
Process	Assemble	*To place the bleed screw in placex2*	1 x	
Process	Fastener install (every)	*To tighten the bleed screwx2*	1 x	
Process	Assemble	*To align bolt with hole , 4mm*	1 x	
Process	Fastener install (every)	*To tighten the bolt*	1 x	
Process	Assemble	*To place pads inside the calipers x 2*	1 x	
Process	Assemble	*To place cotter pins to hold the pads*	1 x	
Process	Assemble	*To align caliper on upright x2*	1 x	
Process	Assemble	*To align bolt and washer on caliper x 4*	1 x	
Process	Assemble	*To align nut on caliper x 2*	1 x	
Process	Fastener install (every)	*To tighten the nut x2*	1 x	
Process	Assemble	*To place disc on hub*	1 x	
Process	Assemble	*To place bobbins b/w hub and disc x4*	1 x	
Process	Assemble	*To fasten bobbins with retaining ring x5*	1 x	
Process	Safety Wire, Install	*To fasten bobbins with retaining ring x5*	1 x	
Process	Brake Bleed - Per Bleeder Valve	*Bleed the brake*	1 x	
Fastener	Retaining Ring	*Groove dia 12mm , Od 23.4mm*	4 x	
Fastener	Bolt	*8mm Grade 12.9,bolt two halves, caliper*	2 x	
Fastener	Bolt	*4mm Grade 12.9,to cover internal routing*	1 x	
Fastener	Washer	*4mm Grade 12.9 to cover internal routing*	1 x	
Fastener	Bolt	*8mm Grade 12.9,bolt caliper to upright*	2 x	
Fastener	Nut	*8mm Grade 12.9 , To fasten the bolt*	2 x	
Fastener	Washer	*8mm Grade 12.9 , To redistribute stress*	4 x	
Fastener	Other: Other: Pin, cotter , hairpin	*To hold brake pads*	1 x	
Fastener	Other: Safety Wire	*length 40mm , To retain the bobbin*	4 x	

Rear bobbins	*Bobbins for rear brake assembly*	Make		8 x	254-BR-00005
Material	Aluminum	*7075 T6, dia 21mm , length 170mm*	1 x		
Process	Machining setup	*To setup the billet for drilling*	1 x		
Process	Drilled hole	*To drill the central hole, dia 7mm*	1 x		
Process	Machining setup	*To set up the billet for turning*	1 x		
Process	Machining	*To perform turning and facing on lathe*	1 x		
Process	Machining	*Groove for circlip on lathe*	1 x		
Process	Machining setup	*To install parting tool*	1 x		
Process	Cutting (Manual)	*To cut the material using parting tool*	1 x		

Rear caliper upper	*Upper part of custom calliper*	Make		2 x	254-BR-00006
Material	Aluminum	*Al 7075 T6 ,45 mm X 85 mm X 65 mm*	1 x		
Process	Machining setup	*To set billet for milling*	1 x		
Process	Machining	*To remove material from side surface*	1 x		
Process	Machining setup	*To change orientation of billet*	1 x		
Process	Machining	*To remove material from top surface*	1 x		
Process	Machining setup	*To change orientation of billet*	1 x		
Process	Machining	*Removing material from back surface*	1 x		
Process	Machining setup	*To set up billet for drilling,*	1 x		
Process	Drilled hole	*To drill the hole , 8mm X5*	1 x		
Process	Machining setup	*To change position of drill,tool dia*	1 x		
Process	Drilled hole	*To drill the hole , 4.9mm*	1 x		
Process	Machining setup	*To change orientation of billet*	1 x		
Process	Drilled hole	*To drill the hole , 4mm*	1 x		
Process	Machining setup	*To change orientation of billet*	1 x		
Process	Drilled hole	*To drill the hole , 3mm*	1 x		
Process	Machining setup	*To setup for making groove*	1 x		
Process	Machining	*To make groove*	1 x		
Process	Machining setup	*change orientation, setup for threading*	1 x		
Process	Threading	*Internal threading , 10mm*	1 x		

Rear caliper lower	*Lower part of custom caliper*	Make		2 x	254-BR-00007
Material	Aluminum	*7075 T6 , 35mm X 65mm X 55mm*	1 x		
Process	Machining setup	*To set billet for milling , and remove*	1 x		
Process	Machining	*To remove material from side surface*	1 x		
Process	Machining setup	*To change orientation of billet*	1 x		
Process	Machining	*To remove material form top surface*	1 x		
Process	Machining setup	*To change orientation of billet*	1 x		
Process	Machining	*Removing material from back surface*	1 x		
Process	Machining setup	*To set up billet for drilling, remove*	1 x		

Process	Drilled hole	*To drill the hole , 8mm X2*	1 x	
Process	Machining setup	*To change position of drill,tool dia*	1 x	
Process	Drilled hole	*To drill the hole , 3mm*	1 x	
Process	Machining setup	*change position of drill,tool dia*	1 x	
Process	Drilled hole	*To drill the hole , 4.9mm*	1 x	
Process	Machining setup	*To change orientation of billet,tool dia*	1 x	
Process	Drilled hole	*To drill the hole , 8mm*	1 x	
Process	Machining setup	*To change orientation of billet*	1 x	
Process	Drilled hole	*To drill the hole , 8mm*	1 x	
Process	Machining setup	*To change tool diameter*	1 x	
Process	Machining	*To drill the hole , 2mm*	1 x	
Process	Machining setup	*To setup for making groove*	1 x	
Process	Machining	*To make groove*	1 x	
Process	Machining setup	*To setup for threading*	1 x	
Process	Threading	*Internal threading , 8mm*	1 x	
Process	Machining setup	*change orientation, setup for threading*	1 x	
Process	Threading	*Internal threading , 8mm*	1 x	
Process	Machining	*change orientation, setup for threading*	1 x	
Process	Threading	*Internal threading , 8mm*	1 x	
Process	Machining setup	*change orientation, setup for threading*	1 x	
Process	Threading	*Internal threading , 8mm*	1 x	

Rear caliper piston	*Willwood PS1*	Buy	2 x	254-BR-00008	
Material	Bought Part	*AISI 304,Piston Dia 28.4mm ,*	1 x		

Rear brake disc	*Brake rotors , AISI 4140*	Make	2 x	254-BR-00009	
Material	Steel	*AISI 4130 ,13 HRC*	1 x		
Process	Machining	*To setup sheet for laser cutting, remove*	1 x		
Process	Laser Cut	*To laser cut profile of rotors*	1 x		
Process	Machining setup	*Setup part for surface finish , remove*	1 x		
Process	Grinding	*Surface finish , 1.425 microns*	1 x		

Rear brake pads	*Willwood PS1, For braking action*	Buy	4 x	254-BR-00010	
Material	Bought Part	*semi metallic pads*	1 x		

BR (Brake System)	**Other: Brake Actuation Assembly**	*For actuation of brake assembly*				254-BR-A003
[Assembly Processes]			Make		2 x	254-BR-A003P
Process	Assemble	*Align inlet hose with reservoir*		1 x		
Process	Assemble	*Align hose clamp at inlet pipe*		1 x		
Process	Assemble	*Attach hose clamp at inlet pipe*		1 x		
Process	Other: Ratchet	*Torque hose clamp*		1 x		
Process	Assemble	*To align connector on inlet hose*		1 x		
Process	Assemble	*To align hose clamp on connector*		1 x		
Process	Assemble	*To attach hose clamp on connector*		1 x		
Process	Other: Ratchet	*Torque the hose clamp*		1 x		
Process	Assemble	*Align Cu washer in banjo bolt*		1 x		
Process	Assemble	*To align the connector in banjo bolt*		1 x		
Process	Assemble	*Align Cu washer in banjo bolt*		1 x		
Process	Assemble	*Align banjo bolt, master cylinder inlet*		1 x		
Process	Other: Ratchet	*Torque banjo bolt at 20Nm*		1 x		
Process	Assemble	*Align banjo with copper washer*		1 x		
Process	Assemble	*Align banjo with BPS connector*		1 x		
Process	Assemble	*Align banjo with copper washer*		1 x		
Process	Assemble	*Align brake line connector with banjo*		1 x		
Process	Assemble	*Align Cu washer with banjo X2*		1 x		
Process	Assemble	*Align banjo to master cyl outlet*		1 x		
Process	Other: Ratchet	*Torque banjo bolt at 20Nm*		1 x		
Process	Assemble	*Route the brake line*		1 x		
Process	Assemble	*Align Cu washer with banjo bolt x2*		1 x		
Process	Assemble	*To align the BL connector in banjo X2*		1 x		
Process	Assemble	*Align Cu washer with banjo bolt x2*		1 x		
Process	Assemble	*Align banjo bolt with caliper X2*		1 x		
Process	Assemble	*Tie wrap BL with chassis member X7*		1 x		
Process	Assemble	*Attach circle cable clip on BL X4*		1 x		
Fastener	Washer	*Copper washer*		16 x		
Fastener	Hose Clamp	*Attach brake lines, M cylinder,reservoir*		2 x		
Fastener	Other: Tie Wraps	*To attach brake lines with chassis*		7 x		
Fastener	Other: Circle cable clip	*To attach brake line base plate*		4 x		

Brake fluid reservoir	*Storage reservoir for brake fluid*		Buy		2 x	254-BR-00011
Material	Bought Part	*n/a*		1 x		

Brake lines Front	*Front steel braided brake lines*		Buy		1 x	254-BR-00012
Material	Bought Part	*n/a*		1 x		

Brake lines Rear		*Rear steel braided brake lines*	Buy		1 x	254-BR-00013
Material	Bought Part	*n/a*		1 x		

BPS connector		*To mount BPS on master cylinder*	Make		2 x	254-BR-00014
Material	Aluminum	*Aluminium 7075 T6*		1 x		
Process	Machining setup	*To set Billet for Milling, remove*		1 x		
Process	Machining	*Removing material from top*		1 x		
Process	Machining setup	*To set Billet for Milling, change*		1 x		
Process	Machining	*Removing material from Below*		1 x		
Process	Machining setup	*To set Billet for Drilling , remove*		1 x		
Process	Drilled hole	*To drill the hole,3mm*		1 x		
Process	Machining setup	*To change tool diameter*		1 x		
Process	Drilled hole	*To drill the hole,10mm*		1 x		
Process	Machining setup	*To remove the finished part from machine*		1 x		

Banjo Bolt		*Connect brake lines with calipers, m.cyl*	Buy		8 x	254-BR-00015
Material	Bought Part	*n/a*		1 x		

Master cylinder		*Tilton 600 series, Adjust brake bias*	Buy		2 x	254-BR-00016
Material	Bought Part	*n/a*		1 x		

EL (Electrical)	**Brake Light**			254-EL-A001
Linear (20cmX1.3cm)	*Illuminates when brakes are applied*	Buy	1 x	254-EL-00001

EL (Electrical)	**BSPD => Capacitor**			254-EL-A002
0.1u	*Capacitor_SMD 1.42X1.75mm*	Buy	4 x	254-EL-00002
10u	*Capacitor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00003
100u	*Capacitor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00004

EL (Electrical)	**BSPD => Connector**			254-EL-A003
Molex_01x02	*2 pin PC-5557 5559*	Buy	5 x	254-EL-00005

EL (Electrical)	**BSPD => Integrated Circuits**			254-EL-A004
OR Logic Gate	*SN74LS32N*	Buy	1 x	254-EL-00006
AND Logic Gates	*SN74S08N*	Buy	1 x	254-EL-00007
Comparator	*LM324NE3*	Buy	1 x	254-EL-00008
Voltage Regulator	*LM7805*	Buy	1 x	254-EL-00009
Delay IC	*LTC6994CS6-2-TRMPBF*	Buy	1 x	254-EL-00010

EL (Electrical)	**BSPD => Relay**			254-EL-A005
Double Pole Double Throw	*Works as a Switch*	Buy	1 x	254-EL-00011

EL (Electrical)	**BSPD => Resistor**			254-EL-A006
68k	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00012
1M	*Resistor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00013
680k	*Resistor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00014
18k	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00015
220k	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00016
820k	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00017
33k	*Resistor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00018
1k	*Resistor_SMD 1.42X1.75mm*	Buy	3 x	254-EL-00019
27k	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00020
Varistor	*3386F-1-101LF*	Buy	3 x	254-EL-00021

EL (Electrical)	**Dash Panel => Buttons**			254-EL-A007
Toggle Switch	*Traction*	Buy	1 x	254-EL-00022
Toggle Switch	*MAP Change*	Buy	1 x	254-EL-00023
Toggle Switch	*FAN/Waterpump*	Buy	1 x	254-EL-00024

EL (Electrical)	**Dash Panel => Capacitor**				254-EL-A008
100u	*Capacitor_SMD 1.42X1.75mm*	Buy		1 x	254-EL-00025
1000u	*Capacitor_SMD 1.42X1.75mm*	Buy		1 x	254-EL-00026

EL (Electrical)	**Dash Panel => Connector**			254-EL-A009
Molex_01x02	*2 pin PC-5557 5559*	Buy	6 x	254-EL-00027
Molex_01x03	*3 pin 105309-1103*	Buy	1 x	254-EL-00028
Molex_01x04	*4 pin PC-61-503x2*	Buy	1 x	254-EL-00029
Conn_01x26	*26 pin 9-6437287-8*	Buy	1 x	254-EL-00030
RJ45 Connector	*rj45: 216500-1*	Buy	1 x	254-EL-00031

EL (Electrical)	**Dash Panel => Diode**			254-EL-A010
D_Schottky	*IN407*	Buy	1 x	254-EL-00032

EL (Electrical)	**Dash Panel => Ferride Bead**			254-EL-A011
MH2029-300Y	*SMD: 1.15X1.40mm*	Buy	1 x	254-EL-00033

EL (Electrical)	**Dash Panel => Integrated Circuits**			254-EL-A012
Arduino Nano	*Microcontroller for Pneumatic Shifting*	Buy	1 x	254-EL-00034
L293DNE	*Motor Driver*	Buy	1 x	254-EL-00035
LM2576	*Voltage Regulator*	Buy	1 x	254-EL-00036

EL (Electrical)	**ECM/Engine Electronics**			254-EL-A013
Engine Control Unit	*PE3 ECU ,S/N D8803952DE59 M:8400A*	Buy	1 x	254-EL-00037

EL (Electrical)	**Fuses => 10Amps**			254-EL-A014
Blade Fuse	*For overcurrent protection*	Buy	4 x	254-EL-00038

EL (Electrical)	**Fuses => 20Amps**			254-EL-A015
Blade Fuse	*For overcurrent protection*	Buy	1 x	254-EL-00039

EL (Electrical)	**Fuses => 30Amps**			254-EL-A016
Blade Fuse	*For overcurrent protection*	Buy	1 x	254-EL-00040

EL (Electrical)	**Kill Switch => Brake Over Travel Switch**			254-EL-A017
Push/Pull type	*Shuts the power during brake fail*	Buy	1 x	254-EL-00041

EL (Electrical)	**Kill Switch => Inertial Switch**			254-EL-A018
Push/Pull type	*Shuts the power in times of accident*	Buy	1 x	254-EL-00042

EL (Electrical)	**Kill Switch => Primary Master Switch**			254-EL-A019
Rotary type	*Shuts the whole power source of car*	Buy	1 x	254-EL-00043

EL (Electrical)	**Kill Switch => Secondary Master Switch**			254-EL-A020
Push and Rotary type	*Shuts the Ignition And injection system*	Buy	3 x	254-EL-00044

EL (Electrical)	**LV-Battery**			254-EL-A021
Advanced Chemistry	*Power Source of the Car*	Buy	1 x	254-EL-00045

EL (Electrical)	**Other: Data Logger**	*Log data via CAN and transmit telemetry*		254-EL-A022
Race Capture PRO	*MK2*	Buy	1 x	254-EL-00046

EL (Electrical)	**Other: Power Control Module => Capacitor**	...		254-EL-A023
100u	*Capacitor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00047
0.1u	*Capacitor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00048
10u	*Capacitor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00049
1000u	*Capacitor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00050

EL (Electrical)	**Other: Power Control Module => Connector**	...		254-EL-A024
Screw Terminals	*01x02*	Buy	6 x	254-EL-00051
Conn_01x35	*TE 776164-1*	Buy	1 x	254-EL-00052
Screw terminal	*03x02*	Buy	2 x	254-EL-00053

EL (Electrical)	**Other: Power Control Module => Diode**	...		254-EL-A025
D_Schottky	*IN407*	Buy	4 x	254-EL-00054
Zener	*1N4728A*	Buy	1 x	254-EL-00055

EL (Electrical)	**Other: Power Control Module => Ferride Bead**	...		254-EL-A026
MH2029-300Y	*SMD: 1.15X1.40mm*	Buy	2 x	254-EL-00056

EL (Electrical)	**Other: Power Control Module => Inductor**	...		254-EL-A027
100u	*Inductor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00057

EL (Electrical)	**Other: Power Control Module => Integrated Circuits**	...		254-EL-A028
Comparator	*uA741*	Buy	1 x	254-EL-00058
Voltage Regulator	*LM2576*	Buy	2 x	254-EL-00059

EL (Electrical)	**Other: Power Control Module => Light Emitting Diode**	...		254-EL-A029
Red LED	*As Diagnosing*	Buy	2 x	254-EL-00060
Green LED	*As Diagnosing*	Buy	8 x	254-EL-00061

EL (Electrical)	**Other: Power Control Module => Mosfet**	...		254-EL-A030
IRF4905PBF	*For Fan, Waterpump and ECU*	Buy	3 x	254-EL-00062
PMV250EPEAR	*For over voltage protection*	Buy	2 x	254-EL-00063

EL (Electrical)	**Other: Power Control Module => Relay**	...		254-EL-A031
7-1414967-8	*Works as Switch*	Buy	2 x	254-EL-00064

EL (Electrical)	**Other: Power Control Module => Resistor**	...		254-EL-A032
1M	*Resistor_SMD 1.42X1.75mm*	Buy	5 x	254-EL-00065
1k	*Resistor_SMD 1.42X1.75mm*	Buy	10 x	254-EL-00066
10k	*Resistor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00067
2k	*Resistor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00068

EL (Electrical)	**Other: Sensors PCB => Front**	...		254-EL-A033
Conn_01x03	*3 pin 105309-1103*	Buy	6 x	254-EL-00069
Conn_01x08	*8 pin 1-770970-1*	Buy	1 x	254-EL-00070

EL (Electrical)	**Other: Sensors PCB => Rear**	...		254-EL-A034
Conn_01x03	*3 pin 105309-1103*	Buy	6 x	254-EL-00071
Conn_01x08	*8 pin 1-770970-1*	Buy	1 x	254-EL-00072

EL (Electrical)	**Other: Steering PCB => CAN System**	...		254-EL-A035
MCP2551-|-SN	*Package_SO: SOIC*	Buy	2 x	254-EL-00073

EL (Electrical)	**Other: Steering PCB => Capacitor**	...		254-EL-A036
0.1u	*Capacitor_SMD 1.42X1.75mm*	Buy	2 x	254-EL-00074

EL (Electrical)	**Other: Steering PCB => Connector**	...		254-EL-A037
Molex_01X03	*3 pin 105309-1103*	Buy	2 x	254-EL-00075
6 pin Header	*RI 188*	Buy	3 x	254-EL-00076
RJ45 Connector	*rj45: 216500-1*	Buy	1 x	254-EL-00077

EL (Electrical)	**Other: Steering PCB => Integrated Circuits**	...		254-EL-A038
LM7805	*Voltage Regulator*	Buy	1 x	254-EL-00078

EL (Electrical)	**Other: Steering PCB => Light Emitting Diode**	...		254-EL-A039
Red LED	*LED_THT: LED_D5.0mm*	Buy	4 x	254-EL-00079
Blue LED	*LED_THT: LED_D5.0mm*	Buy	4 x	254-EL-00080
Green LED	*LED_THT: LED_D5.0mm*	Buy	4 x	254-EL-00081

EL (Electrical)	**Other: Steering PCB => Resistor**	*Displays Data from CAN Bus*		254-EL-A040
1k	*Resistor_SMD 1.42X1.75mm*	Buy	12 x	254-EL-00082
10k	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00083
220	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00084

EL (Electrical)	**Sensors**			254-EL-A041
Brake Pressure Sensor	*Curtis 1238*	Buy	2 x	254-EL-00085
Linear Pot	*Texys Autosport RSL 75*	Buy	4 x	254-EL-00086
Wheel Speed	*Little Fuse 55075 M12*	Buy	4 x	254-EL-00087
Engine Oil Pressure	*Curtis 1238*	Buy	1 x	254-EL-00088
IMU	*IZZE Racing IRIMU-V2*	Buy	1 x	254-EL-00089
IR	*IZZE Racing IRTS-SP-PCB-V1*	Buy	1 x	254-EL-00090
Sync Sensor	*Stock*	Buy	1 x	254-EL-00091
Trigger Sensor	*Stock*	Buy	1 x	254-EL-00092
Coolant Temp Sensor	*Delphi 12146312*	Buy	2 x	254-EL-00093
Lambda Sensor	*Bosch LSU 4.2*	Buy	2 x	254-EL-00094
Lambda Signal Conditioner	*Power Electronics AN103*	Buy	1 x	254-EL-00095
Throttle Position Sensor	*Stock*	Buy	1 x	254-EL-00096

EL (Electrical)	**Starter Button**			254-EL-A042
Switch, Pushbutton	*Start Button*	Buy	1 x	254-EL-00097

EL (Electrical)	**Telemetry => Capacitor**			254-EL-A043
22p	*Capacitor_SMD 1.42X1.75mm*	Buy	7 x	254-EL-00098

EL (Electrical)	**Telemetry => Connector**			254-EL-A044
Conn_02x04	*For NRF Module*	Buy	1 x	254-EL-00099
Molex_01x02	*2 pin PC-5557 5559*	Buy	2 x	254-EL-00100

EL (Electrical)	**Telemetry => Crystal Oscillaor**			254-EL-A045
16M	*SKU: 5939706117*	Buy	2 x	254-EL-00101

EL (Electrical)	**Telemetry => Ferride Bead**			254-EL-A046
MH2029-300Y	*SMD: 1.15X1.40mm*	Buy	1 x	254-EL-00102

EL (Electrical)	**Telemetry => Integrated Circuits**			254-EL-A047
MCP-2551	*CAN System*	Buy	1 x	254-EL-00103
MCP-2515	*CAN System*	Buy	1 x	254-EL-00104
Atmege328P-PU	*Microcontroller IC*	Buy	1 x	254-EL-00105
LM1117	*Voltage Regulator*	Buy	1 x	254-EL-00106

EL (Electrical)	**Telemetry => Resistor**			254-EL-A048
10k	*Resistor_SMD 1.42X1.75mm*	Buy	3 x	254-EL-00107
120	*Resistor_SMD 1.42X1.75mm*	Buy	1 x	254-EL-00108

EL (Electrical)	**Wire Harness/Connectors => Connector**			254-EL-A049
Conn 2 pin	*Sync Sensor*	Buy	1 x	254-EL-00109
Conn 2 pin	*Trigger Sensor*	Buy	1 x	254-EL-00110
Conn 2 pin	*Waterpump*	Buy	1 x	254-EL-00111
Conn 2 pin	*Fan*	Buy	1 x	254-EL-00112
Conn 3 pin	*Throttle Position Sensor*	Buy	1 x	254-EL-00113
Conn 3 pin	*Coolant Temp Sensor 1*	Buy	1 x	254-EL-00114
Conn 3 pin	*Coolant Temp Sensor 2*	Buy	1 x	254-EL-00115
Conn 3 pin	*Brake Pressure Sensor L*	Buy	1 x	254-EL-00116
Conn 3 pin	*Brake Pressure Sensor R*	Buy	1 x	254-EL-00117
Conn 3 pin	*Engine Oil Pressure Sensor*	Buy	1 x	254-EL-00118
Conn 4 pin	*Lambda Sensor*	Buy	2 x	254-EL-00119
Conn 5 pin	*Signal Conditioner*	Buy	1 x	254-EL-00120

EL (Electrical)	**Wire Harness/Connectors => Primary Harness**			254-EL-A050
Battery to PMS	*0.48m*	Buy	1 x	254-EL-00121
Battery to Engine Gnd	*1.18m*	Buy	1 x	254-EL-00122
Starter Relay to PMS	*0.68m*	Buy	1 x	119-EL-00203
Starter Relay to Motor	*1.12m*	Buy	1 x	119-EL-00204
Starter Relay to Chassi G	*0.18m*	Buy	1 x	119-EL-00205
Starter Relay to Dash	*1.05m*	Buy	1 x	119-EL-00206
Starter Relay to Main PCB	*1.6m*	Buy	1 x	119-EL-00207
Rectifier to Alternator	*0.76m*	Buy	3 x	119-EL-00210
Rectifier Gnd to Engine G	*0.94m*	Buy	1 x	119-EL-00211
Rectifier Power to PMS	*0.65m*	Buy	1 x	119-EL-00212

EL (Electrical)	**Wire Harness/Connectors => Wire, Control**			254-EL-A051
ECU to Ignition Coil1	*1.98m*	Buy	1 x	119-EL-00095
ECU to Ignition Coil2	*2.11m*	Buy	1 x	119-EL-00096
ECU to Ignition Coil3	*2.17m*	Buy	1 x	119-EL-00097
ECU to Ignition Coil4	*2.31m*	Buy	1 x	119-EL-00098
ECU to Injector1	*2.14m*	Buy	1 x	119-EL-00099
ECU to Injector2	*2.23m*	Buy	1 x	119-EL-00100
ECU to Injector3	*2.33m*	Buy	1 x	119-EL-00101
ECU to Injector4	*2.43m*	Buy	1 x	119-EL-00102

EL (Electrical)	**Wire Harness/Connectors => Wire, Power**			254-EL-A052
PCM to E.C.U. Power	*0.73m*	Buy	1 x	119-EL-00067
PCM to E.C.U. Ground	*0.73m*	Buy	1 x	119-EL-00068
PCM to Dash Board Power	*0.72m*	Buy	1 x	119-EL-00069
PCM to Dash Board Ground	*0.72m*	Buy	1 x	119-EL-00070
Dash to Steering PCB Pwr	*0.22m*	Buy	1 x	119-EL-00183
Dash to Steering PCB Gnd	*0.22m*	Buy	1 x	119-EL-00184
PCM to BSPD PCB Power	*0.26m*	Buy	1 x	119-EL-00073
PCM to BSPD PCB Ground	*0.26m*	Buy	1 x	119-EL-00074
PCM to Sensor PCB Power R	*2.32m*	Buy	1 x	119-EL-00103
PCM to Sensor PCB Gnd R	*2.32m*	Buy	1 x	119-EL-00104
PCM to Sensor PCB Power F	*1.95m*	Buy	1 x	119-EL-00185
PCM to Sensor PCB Gnd F	*1.95m*	Buy	1 x	119-EL-00186
PCM to Telemetry PCB P	*2.45m*	Buy	1 x	119-EL-00272
PCM to Telemetry PCB G	*2.45m*	Buy	1 x	119-EL-00273
PCM to Datalogger Power	*2.32m*	Buy	1 x	119-EL-00075

PCM to Datalogger Ground	*2.32m*	Buy	1 x	119-EL-00076
PCM to Lambda Power	*1.82m*	Buy	1 x	119-EL-00077
PCM to Lambda Ground1	*1.82m*	Buy	1 x	119-EL-00078
PCM to Lambda Ground2	*1.82m*	Buy	1 x	119-EL-00187
PCM to Fuel Pump Power	*2.06m*	Buy	1 x	119-EL-00079
PCM to Fuel Pump Ground	*2.06m*	Buy	1 x	119-EL-00080
PCM to Water Pump Power	*2.71m*	Buy	1 x	119-EL-00081
PCM to Water Pump Ground	*2.71m*	Buy	1 x	119-EL-00082
PCM to Fan Power	*2.71m*	Buy	1 x	119-EL-00083
PCM to Fan Ground	*2.71m*	Buy	1 x	119-EL-00084
PCM to TPS Power	*2.52m*	Buy	1 x	119-EL-00188
PCM to BPS 1 Power	*1.18m*	Buy	1 x	119-EL-00189
PCM to BPS 2 Power	*1.66m*	Buy	1 x	119-EL-00190
PCM to SMS L Power	*2.63m*	Buy	1 x	119-EL-00237
Dash to Pneumatic Split1	*1.3m*	Buy	1 x	119-EL-00191
PneumaticSplit1 to valve1	*0.18m*	Buy	1 x	119-EL-00192

PneumaticSplit1 to valve2	*0.33m*	Buy	1 x	119-EL-00193
P.Split1 to P.Split2	*0.6m*	Buy	1 x	119-EL-00194
PneumaticSplit2 to valve3	*0.54m*	Buy	1 x	119-EL-00195
PneumaticSplit2 to valve4	*0.54m*	Buy	1 x	119-EL-00196
PCM to Ign Coils(Split)	*1.65m*	Buy	1 x	119-EL-00085
Ign Split to Ign Coil 1	*0.22m*	Buy	1 x	119-EL-00086
Ign Split to Ign Coil2	*0.35m*	Buy	1 x	119-EL-00087
Ign Split to Ign Coil3	*0.41m*	Buy	1 x	119-EL-00088
Ign Split to Ign Coil4	*0.55m*	Buy	1 x	119-EL-00089
PCM to Inj Power(Split)	*1.62m*	Buy	1 x	119-EL-00090
Inj Split to Injector1	*0.41m*	Buy	1 x	119-EL-00091
Inj Split to Injector2	*0.50m*	Buy	1 x	119-EL-00092
Inj Split to Injector3	*0.60m*	Buy	1 x	119-EL-00093
Inj Split to Injector4	*0.70m*	Buy	1 x	119-EL-00094
PCM Gnd to CTS Split	*0.6m*	Buy	1 x	119-EL-00213
CTS Split to CTS 1	*1.22m*	Buy	1 x	119-EL-00214

CTS Split to CTS 2	*1.66m*	Buy	1 x	119-EL-00215
Sensor R PCB to LWS P	*1.33m*	Buy	1 x	119-EL-00199
Sensor R PCB to LWS G	*1.33m*	Buy	1 x	119-EL-00200
Sensor R PCB to RWS P	*1.33m*	Buy	1 x	119-EL-00228
Sensor R PCB to RWS G	*1.33m*	Buy	1 x	119-EL-00229
SensorR PCB to LinearPotP	*0.88m*	Buy	2 x	119-EL-00216
SensorR PCB to LinearPotG	*0.88m*	Buy	2 x	119-EL-00219
SensorR PCB to IMU P	*1.96m*	Buy	1 x	119-EL-00217
SensorR PCB to IMU G	*1.96m*	Buy	1 x	119-EL-00220
SensorR PCB to EOP G	*1.28m*	Buy	1 x	119-EL-00218
SensorR PCB to EOP P	*1.28m*	Buy	1 x	119-EL-00221
Sensor F PCB to LWS P	*1.71m*	Buy	1 x	119-EL-00222
Sensor F PCB to LWS G	*1.71m*	Buy	1 x	119-EL-00223
Sensor F PCB to RWS P	*1.71m*	Buy	1 x	119-EL-00230
Sensor F PCB to RWS G	*1.71m*	Buy	1 x	119-EL-00231
Sensor F PCB to BPS1	*1.18m*	Buy	1 x	119-EL-00225

Sensor F PCB to BPS2	*1.66m*	Buy	1 x	119-EL-00224
SensorF PCB to LinearPotP	*0.93m*	Buy	2 x	119-EL-00226
SensorF PCB to LinearPotG	*0.93m*	Buy	2 x	119-EL-00227

EL (Electrical)	**Wire Harness/Connectors => Wire, Signal**			254-EL-A053
ECU to PCM:Fan/Water Pump	*0.73m*	Buy	1 x	119-EL-00105
Dash to PCM:Fan/WaterPump	*0.72m*	Buy	1 x	119-EL-00106
ECU to PCM: Fuel Pump	*0.73m*	Buy	1 x	119-EL-00107
ECU to PCM: 5V ECU Out	*0.73m*	Buy	1 x	119-EL-00108
ECU to PCM: 5V Sensor Gnd	*0.73m*	Buy	1 x	119-EL-00109
ECU to Trigger Signal	*1.77m*	Buy	1 x	119-EL-00110
PCM to Trigger Ground	*1.66m*	Buy	1 x	119-EL-00111
ECU to Sync Signal	*2.72m*	Buy	1 x	119-EL-00112
PCM to Sync Ground	*2.61m*	Buy	1 x	119-EL-00113
ECU to CTS1	*1.38m*	Buy	1 x	119-EL-00238
ECU to CTS2	*1.92m*	Buy	1 x	119-EL-00239
ECU to BSPD	*0.40m*	Buy	3 x	119-EL-00240
ECU to EOP	*2.25m*	Buy	1 x	119-EL-00241
ECU to Sensor PCB F	*2.32m*	Buy	1 x	119-EL-00242
ECU to Sensor PCB R	*2.63m*	Buy	2 x	119-EL-00243

ECU to Lambda	*2.01m*	Buy	2 x	119-EL-00244
ECU to Dash Button	*0.84m*	Buy	3 x	119-EL-00245
ECU to Dash: CAN	*0.78m*	Buy	2 x	119-EL-00246
ECU to Dash: Ethernet	*0.80m*	Buy	4 x	119-EL-00247
BSPD to TPS	*2.63m*	Buy	1 x	119-EL-00248
BSPD to BPS1	*1.18m*	Buy	1 x	119-EL-00249
BSPD to BPS2	*1.66m*	Buy	1 x	119-EL-00250
Dash to MAP Switch	*0.13m*	Buy	2 x	119-EL-00251
Dash to Traction Switch	*0.13m*	Buy	2 x	119-EL-00252
Dash to FAN/Waterpump	*0.13m*	Buy	2 x	119-EL-00253
Dash to Pneumatic valve1	*1.48m*	Buy	1 x	119-EL-00258
Dash to Pneumatic valve1	*1.63m*	Buy	1 x	119-EL-00259
Dash to Pneumatic valve3	*2.44m*	Buy	1 x	119-EL-00260
Dash to Pneumatic valve4	*2.50m*	Buy	1 x	119-EL-00261
Dash PCB to Steering PCB	*0.30m*	Buy	1 x	119-EL-00262
Steering PCB to P. Button	*0.15m*	Buy	4 x	119-EL-00263

Dash to SMS Front	*0.15m*	Buy	3 x	119-EL-00254
Dash to SMS Left	*1.98m*	Buy	2 x	119-EL-00255
Dash to SMS Right	*1.62m*	Buy	2 x	119-EL-00256
SMS Right to SMS Left	*1.06m*	Buy	1 x	119-EL-00257
Datalogger to LinearPotRL	*0.92m*	Buy	1 x	119-EL-00264
Datalogger to LinearPotRR	*0.92m*	Buy	1 x	119-EL-00265
Datalogger to LinearPotFL	*0.95m*	Buy	1 x	119-EL-00266
Datalogger to LinearPotFR	*0.95m*	Buy	1 x	119-EL-00267
Datalogger to Rear WS R	*1.38m*	Buy	1 x	119-EL-00268
Datalogger to Rear WS R	*1.38m*	Buy	1 x	119-EL-00269
Datalogger to EOP	*1.30m*	Buy	1 x	119-EL-00270
Datalogger to IMU	*2.03m*	Buy	2 x	119-EL-00271
Datalogger to Telemetry	*0.16m*	Buy	2 x	119-EL-00274

EN (Engine & Drivetrain)	**Air Filter**					0,08€	254-EN-A001
[Assembly Processes]			Make			1 x 0,06€ = 0,06€	254-EN-A001P
Process	Cut (scissors, knife)	*To cut mesh of required size.*		1 x 0,03€ = 0,03€	*120sec, Unskilled*		
Process	Assemble	*Align mesh to throttle body.*		1 x 0,01€ = 0,01€	*50sec, Unskilled*		
Process	Install Tie Wrap (Zip Tie, Cable Clamp)	*To attach mesh to throttle body.*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*		
Fastener	Adjustment - Misc.	*Black tie wrap.*		1 x 0,01€ = 0,01€	*novoflex nylon*		

Mesh	*Used as filter for air.*		Buy			1 x 0,02€ = 0,02€	254-EN-00001
Material	Bought Part	*Used to filter air*		1 x 0,02€ = 0,02€	*0.225 m sq.(1.023€; m sq.)*		

EN (Engine & Drivetrain)		**Axles**			91,51€	254-EN-A002
Halfshaft Left		*Transmit power btw diff. and wheel*	Make		1 x 46,54€ = 46,54€	254-EN-00002
Process	Machining	*Groove making for circlip x2*		1 x 0,28€ = 0,28€	*0.01 hours, Lathe*	
Material	Steel	*AISI4140; OD-27mm; L-441mm; 18 HRC*		1 x 2,71€ = 2,71€	*2.09kg(1.29€ per kg)*	
Process	Machining setup	*To setup billet for heat treatment*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Heat Treatment	*Heat treated to 25HRC*		1 x 12,04€ = 12,04€	*0.38 hours, Heat Treatment*	
Process	Machining setup	*To remove job from machine*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Machining setup	*To set up rod for turning and facing.*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining	*Turning halfshaft material*		1 x 0,67€ = 0,67€	*0.86 hours, Lathe*	
Process	Machining	*Facing halfshaft material*		1 x 0,02€ = 0,02€	*0.03 hours, Lathe*	
Process	Machining setup	*To remove job from machine*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining setup	*To set up rod for turning and facing*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining	*Turning halfshaft material*		1 x 0,67€ = 0,67€	*0.86 hours, Lathe*	
Process	Machining	*Facing halfshaft material*		1 x 0,02€ = 0,02€	*0.03 hours, Lathe*	
Process	Machining setup	*To remove job from machine*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining setup	*To set up rod for spline cutting*		1 x 0,17€ = 0,17€	*0.19 hours, Semi Skilled*	
Process	Machining	*Milling of spline on wheel end*		1 x 0,38€ = 0,38€	*0.24 hours, Gear Hobbing*	
Process	Machining setup	*To remove job from machine*		1 x 0,17€ = 0,17€	*0.19 hours, Semi Skilled*	
Process	Machining setup	*To set up rod for spline cutting.*		1 x 0,17€ = 0,17€	*0.19 hours, Semi Skilled*	
Process	Machining	*milling of spline on differential end*		1 x 0,38€ = 0,38€	*0.24 hours, Gear Hobbing*	
Process	Machining setup	*To remove job from machine*		1 x 0,17€ = 0,17€	*0.19 hours, Semi Skilled*	
Process	Machining setup	*To set up rod for groove making.*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining setup	*To remove job from machine*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining setup	*To setup rod for grooving making.*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining	*Groove making for circlip x2*		1 x 0,28€ = 0,28€	*0.01 hours, Lathe*	
Process	Machining setup	*To remove job from machine*		1 x 0,16€ = 0,16€	*0.18 hours, Semi Skilled*	
Process	Machining setup	*To setup rod for drilling.*		1 x 0,21€ = 0,21€	*0.24 hours, Semi Skilled*	
Process	Machining	*To drill M8 through hole.*		1 x 0,89€ = 0,89€	*0.13 hours, Lathe*	
Process	Machining setup	*To remove job from machine*		1 x 0,21€ = 0,21€	*0.24 hours, Semi Skilled*	
Process	Machining setup	*To setup billet for heat treatment.*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Heat Treatment	*Heat treated to 53HRC*		1 x 24,50€ = 24,50€	*0.86 hours, Heat Treatment*	
Process	Machining setup	*To remove finished part from machine*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	

Halfshaft Right		*Transmit power btw diff. and wheel*	Make		1 x 44,97€ = 44,97€	254-EN-00003
Material	Steel	*AISI 4140; OD-27mm; L-466mm; 18 HRC*		1 x 2,56€ = 2,56€	*1.98kg(1.29€ per kg)*	
Process	Machining setup	*To setup billet for heat treatment.*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Heat Treatment	*heat treated to 25HRC*		1 x 11,30€ = 11,30€	*0.38 hours, Heat Treatment*	
Process	Machining setup	*To remove job from machine*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Machining setup	*To set up rod for turning and facing.*		1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*	
Process	Machining	*Turning halfshaft*		1 x 0,46€ = 0,46€	*0.82 hours, Lathe*	

Process	Machining	*Facing halfshaft*	1 x 0,19€ = 0,19€	*0.03 hours, Lathe*
Process	Machining setup	*To remove job from machine.*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining setup	*To setup rod for turning and facing*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining	*Turning halfshaft*	1 x 0,46€ = 0,46€	*0.82 hours, Lathe*
Process	Machining	*Facing Halfshaft*	1 x 0,19€ = 0,19€	*0.03 hours, Lathe*
Process	Machining setup	*To remove job from machine*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining setup	*To set up rod for spline cutting*	1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*
Process	Machining	*spline cutting on wheel end*	1 x 0,29€ = 0,29€	*0.24 hours, Gear Hobbing*
Process	Machining setup	*To remove job from machine*	1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*
Process	Machining setup	*To set up rod for spline cutting.*	1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*
Process	Machining	*spline cutting on differential end*	1 x 0,29€ = 0,29€	*0.24 hours, Gear Hobbing*
Process	Machining setup	*To remove job from machine*	1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*
Process	Machining setup	*To set up rod for groove making.*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining	*Groove making for circlip x2*	1 x 0,11€ = 0,11€	*0.01 hours, Lathe*
Process	Machining setup	*To remove job from machine*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining setup	*To setup rod for groove making.*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining	*Groove making for circlip x2*	1 x 0,11€ = 0,11€	*0.01 hours, Lathe*
Process	Machining setup	*To remove job from machine*	1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*
Process	Machining setup	*To setup rod for drilling.*	1 x 0,21€ = 0,21€	*0.24 hours, Semi skilled*
Process	Machining	*To drill M10 through hole.*	1 x 0,81€ = 0,81€	*0.12 hours, Lathe*
Process	Machining setup	*To remove job from machine*	1 x 0,21€ = 0,21€	*0.24 hours, Semi skilled*
Process	Machining setup	*To setup billet for heat treatment.*	1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*
Process	Machining	*heat treated to 53HRC*	1 x 24,50€ = 24,50€	*0.86 hours, Heat Treatment*
Process	Machining setup	*To remove finished part from machine*	1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*

EN (Engine & Drivetrain)	**Chain** / **Belt**				60,65€	254-EN-A003
DID single Row	*Transmit power from engine to driveline*		Buy		1 x 60,65€ = 60,65€	254-EN-00004
Material Bought Part	*X ring 520 ERV3; 51 links*			1 x 60,65€ = 60,65€	*51 links(142€; for 120 links)*	

EN (Engine & Drivetrain)		**Coolant**				2,88€	254-EN-A004
Water		*Liquid used for cooling engine*	Buy			3 x 0,96€ = 2,88€	254-EN-00005
Material	Bought Part	*3Litres distilled water*		3 x 0,32€ = 0,96€	*0.323€ per litre*		

EN (Engine & Drivetrain)		**Coolant Lines**				52,36€	254-EN-A005
Radiator Inlet		*For connection of cooling hose.*	Make			1 x 27,74€ = 27,74€	254-EN-00006
Material	Aluminum	*Al Tube; OD-25 x 2.5 mm Length-1220mm*		1 x 1,71€ = 1,71€	*0.59kg (2.91€ per kg)*		
Process	Machining setup	*To setup the tube for drilling.*		1 x 0,04€ = 0,04€	*0.046 hours, Semi skilled*		
Process	Drilled hole	*M17,drilled hole*		1 x 0,18€ = 0,18€	*0.03 hours, Lathe*		
Process	Drilled hole	*M8 drilled holes in radiator inlet tube*		1 x 0,18€ = 0,18€	*0.03 hours, Lathe*		
Process	Machining setup	*To remove job from machine.*		1 x 0,04€ = 0,04€	*0.046 hours, Semi skilled*		
Process	Machining setup	*Setup for tube bending*		1 x 0,26€ = 0,26€	*0.29 hours, Semi skilled*		
Process	Tube process	*Tube bending as per profile*		1 x 0,02€ = 0,02€	*0.007 hours, Tube bending*		
Process	Tube process	*Tube bending as per profile.*		1 x 0,01€ = 0,01€	*0.003 hours, Tube bending*		
Process	Machining setup	*To remove job from machine.*		1 x 0,26€ = 0,26€	*0.29 hours, Semi skilled*		
Material	Aluminum	*Al Tube; OD 25 x 1.5mm Length- 25mm*		1 x 0,02€ = 0,02€	*0.01kg (2.91€ per kg)*		
Process	Weld	*Welding of tube to bend tube*		1 x 1,20€ = 1,20€	*0.09 hours, Welding Machine*		
Material	Aluminum	*Al tube; OD 15 x 1.5 Length- 97mm*		1 x 0,05€ = 0,05€	*0.02kg (2.91€ per kg)*		
Process	Weld	*Welding of tube to bend tube*		1 x 0,60€ = 0,60€	*0.05 hours, Welding Machine*		
Material	Aluminum	*Al tube OD 43 x 6.5mm Length-22mm*		1 x 0,13€ = 0,13€	*0.04kg (2.91€ per kg)*		
Process	Machining setup	*Setup for maching of pressure cap seat*		1 x 0,11€ = 0,11€	*0.12 hours, Semi skilled*		
Process	Machining	*Machining of flange for seat*		1 x 19,05€ = 19,05€	*0.48 hours, VMC*		
Process	Machining setup	*To remove job from machine.*		1 x 0,11€ = 0,11€	*0.12 hours, Semi skilled*		
Process	Weld	*Welding of pressure cap seat to tube*		1 x 1,21€ = 1,21€	*0.09 hours, Welding Machine*		
Tooling	Welding Fixure	*Fixture for welding of pressure cap seat*		1 x 2,56€ = 2,56€	*Double support strip holding tube*		
Radiator Outlet		*Direct flow from radiator to water pump*	Make			1 x 2,61€ = 2,61€	254-EN-00007
Material	Aluminum	*Al tube OD-25x1.5mm; length 320mm*		1 x 0,28€ = 0,28€	*0.10kg (2.90€ per kg)*		
Process	Machining setup	*To setup tube for cutting.*		1 x 0,01€ = 0,01€	*0.01 hours, Semi Skilled*		
Process	Cutting (Manual)	*To cut tubes of required dimension*		1 x 0,01€ = 0,01€	*0.01 hours, Miter Saw*		
Process	Machining setup	*To remove job from machine.*		1 x 0,01€ = 0,01€	*0.01 hours, Semi Skilled*		
Process	Weld	*To weld tubes and make beads.*		1 x 2,17€ = 2,17€	*0.17 hours, Welding Machine*		
Tooling	Welding Fixure	*Steel welding fixture.*		1 x 0,13€ = 0,13€	*Two semicircle end support*		
Water pump connector.		*To increase diameter of cooling line*	Make			1 x 2,64€ = 2,64€	254-EN-00008
Material	Aluminum	*Al tube OD 45x5mm; length 100mm*		1 x 0,49€ = 0,49€	*0.17kg (2.90€ per kg)*		
Material	Aluminum	*Al tube OD 35x1.5mm; length 40mm*		1 x 0,04€ = 0,04€	*0.01kg (2.90€ per kg)*		
Process	Machining setup	*To setup tube for cutting.*		1 x 0,01€ = 0,01€	*0.01 hours, Semi Skilled*		
Process	Cutting (Manual)	*To cut tube of required dimension.*		1 x 0,01€ = 0,01€	*0.01 hours, Miter Saw*		
Process	Machining setup	*To remove job from machine.*		1 x 0,01€ = 0,01€	*0.01 hours, Semi Skilled*		
Process	Weld	*To weld tube and make beads.*		1 x 2,08€ = 2,08€	*0.017 hours, Welding Machine*		

Water pump outlet		*To connect water pump to inlet T*	Make		1 x 3,30€ = 3,30€	254-EN-00009
Material	Aluminum	*Al tube OD 30x2mm; length 35mm*		1 x 0,02€ = 0,02€	*0.01kg (2.90€ per kg)*	
Material	Aluminum	*Al tube OD 35x2mm; length 35mm*		1 x 0,02€ = 0,02€	*0.01kg (2.90€ per kg)*	
Process	Weld	*To weld the tubes and make beads.*		1 x 3,26€ = 3,26€	*0.26 hours, Welding Machine*	

Inlet T connector		*To connect pump to oil cooler and CTS*	Make		1 x 4,00€ = 4,00€	254-EN-00010
Material	Aluminum	*Al tube OD 25x1.5mm; Length 115mm*		1 x 0,03€ = 0,03€	*0.01kg (2.90€ per kg)*	
Process	Machining setup	*To setup tube for cutting.*		1 x 0,01€ = 0,01€	*0.01 hours, Semi skilled*	
Process	Cutting (Manual)	*To cut tube of required dimension.*		1 x 0,41€ = 0,41€	*0.02 hours, Miter Saw*	
Process	Machining setup	*To remove job from machine.*		1 x 0,01€ = 0,01€	*0.01 hours, Semi skilled*	
Process	Machining setup	*To setup tube for drilling holes.*		1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	
Process	Drilled hole	*To drill hole of 25mm.*		1 x 1,17€ = 1,17€	*0.07 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*		1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	
Process	Weld	*To weld tubes and make beads*		1 x 0,97€ = 0,97€	*0.09 hours, Welding Machine*	
Tooling	Welding Fixure	*Steel welding fixture.*		1 x 1,20€ = 1,20€	*Fixture clamping T and tube*	

T connector CTS		*T connector for assembling CTS*	Make		1 x 4,76€ = 4,76€	254-EN-00011
Material	Aluminum	*Al tube for T connector OD 25x1.5mm*		1 x 0,02€ = 0,02€	*0.01kg(2.90 € per kg)*	
Material	Aluminum	*Al tube for CTS holder 18x1.5mm*		1 x 0,03€ = 0,03€	*0.01kg(2.90 € per kg)*	
Process	Machining setup	*To setup tube for drilling.*		1 x 0,20€ = 0,20€	*0.12 hours, Semi skilled*	
Process	Drilled hole	*To drill hole of 18mm in T connector.*		1 x 0,76€ = 0,76€	*0.07 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*		1 x 0,20€ = 0,20€	*0.12 hours, Semi skilled*	
Process	Machining setup	*To setup tube for internal threading.*		1 x 0,08€ = 0,08€	*0.046 hours, Semi skilled*	
Process	Tapping holes	*To make internal threads for CTS*		1 x 0,02€ = 0,02€	*0.01 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*		1 x 0,08€ = 0,08€	*0.046 hours, Semi skilled*	
Process	Weld	*To weld tubes together and make beads*		1 x 1,07€ = 1,07€	*0.09 hours, Welding machine*	
Tooling	Welding Fixure	*Steel welding fixture.*		1 x 2,30€ = 2,30€	*Support strip for lower tube*	

Coolant line connector		*Connect T connector CTS to engine*	Make		1 x 1,38€ = 1,38€	254-EN-00012
Material	Aluminum	*Al tube OD 25x1.5mm; length 300mm*		1 x 0,26€ = 0,26€	*0.09kg (2.90€ per kg)*	
Process	Machining setup	*Setup of tube for bending*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*	
Process	Tube process	*tube bending for properly directing the*		1 x 0,02€ = 0,02€	*0.01 hours, Tube bending*	
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*	
Process	Weld	*To weld bead to prevent leaks*		1 x 0,60€ = 0,60€	*0.05 hours, Welding Machine*	

Silicon Hose		*Radiator inlet, outlet and extension.*	Buy		1 x 1,32€ = 1,32€	254-EN-00013
Material	Bought Part	*OD-34.9 x 4.8 mm*		3 x 0,44€ = 1,32€	*170mm (2.58€ per m)*	

Silicon Hose	*Engine inlet, outlet & oil cooler inlet*	Buy		1 x 1,14€ = 1,14€	254-EN-00014
Material	Bought Part	*OD- 34.9 x 4.8 mm*	3 x 0,38€ = 1,14€	*150mm (2.58€ per m)*	
Silicon Hose	*Water pump inlet and outlet.*	Buy		1 x 0,60€ = 0,60€	254-EN-00015
Material	Bought Part	*OD-50.8 x 4.76 mm*	2 x 0,30€ = 0,60€	*110mm (2.73€ per m)*	
Rubber Hose	*Oil cooler outlet.*	Buy		1 x 0,29€ = 0,29€	254-EN-00016
Material	Bought Part	*OD-21 x 4 mm*	1 x 0,29€ = 0,29€	*210mm (1.422€ per m)*	
Polyurethane Hose	*Cooling assembly(for catch can).*	Buy		1 x 2,58€ = 2,58€	254-EN-00017
Material	Bought Part	*OD-15 x 2.5 mm*	1 x 2,58€ = 2,58€	*1m (2.58€; per m)*	

EN (Engine & Drivetrain)	**CV Joints/U Joints**				154,08€	254-EN-A006
Tripod Bearing(Diff side)	*To transmit power at variable angle*		Buy		1 x 6,46€ = 6,46€	254-EN-00018
Material	Bought Part	*Santro-OD-28 ID-21*		2 x 3,23€ = 6,46€	*Hyundai autoparts stock Bearing*	
Tripod Bearing (Hub side)	*To transmit power at variable angle*		Buy		1 x 5,16€ = 5,16€	254-EN-00019
Material	Bought Part	*Nano-OD-29 ID-19*		2 x 2,58€ = 5,16€	*Tata motors stock Bearing*	
Tripod Housing	*Housing case for tripod bearing*		Make		2 x 59,44€ = 118,88€	254-EN-00020
Material	Aluminum	*Al 7075-T6; OD 70mm Length 161mm*		1 x 13,50€ = 13,50€	*1.741Kg (Cost 7.75€ per kg)*	
Process	Machining setup	*To setup billet for heat treatment.*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Heat Treatment	*heat treated to 25HRC*		1 x 13,20€ = 13,20€	*0.38 hours, Heat Treatment*	
Process	Machining setup	*To remove job from machine.*		1 x 0,33€ = 0,33€	*0.38 hours, Semi skilled*	
Process	Machining setup	*To set up the billet for turning.*		1 x 0,12€ = 0,12€	*0.13 hours, Semi skilled*	
Process	Machining	*turning billet to obtain outer profile*		1 x 0,13€ = 0,13€	*0.08 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*		1 x 0,12€ = 0,12€	*0.13 hours, Semi skilled*	
Process	Machining setup	*To set up the billet for drilling.*		1 x 0,21€ = 0,21€	*0.24 hours, Semi skilled*	
Process	Drilled hole	*drilling of M6 hole*		1 x 1,22€ = 1,22€	*0.17 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*		1 x 0,21€ = 0,21€	*0.24 hours, Semi skilled*	
Process	Machining setup	*To set up the billet for machining.*		1 x 0,11€ = 0,11€	*0.12 hours, Semi skilled*	
Process	Machining	*To obtain inner profile*		1 x 24,60€ = 24,60€	*0.61 hours, VMC*	
Process	Machining setup	*To remove job from machine.*		1 x 0,11€ = 0,11€	*0.12 hours, Semi skilled*	
Process	Machining setup	*To set up billet for spline cutting.*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*	
Process	Machining	*Milling of splines.*		1 x 0,71€ = 0,71€	*0.24 hours, Gear Hobbing*	
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*	
Process	Machining setup	*To setup billet for anodizing.*		1 x 0,20€ = 0,20€	*0.23 hours, Semi skilled*	
Process	Annodize	*Anodizing to 0.25 microns*		1 x 3,64€ = 3,64€	*0.58 hours, Anodizing*	
Process	Machining setup	*To remove finished part from machine.*		1 x 0,20€ = 0,20€	*0.23 hours, Semi skilled*	
Graphite Grease	*To Lubricate the CV joints*		Buy		1 x 2,34€ = 2,34€	254-EN-00021
Material	Bought Part	*Tribocor TC 17*		1 x 2,34€ = 2,34€	*350 grams (6.68€; per kg)*	
Boot Cap	*Finger Guard against rotating bearings*		Buy		4 x 5,31€ = 21,24€	254-EN-00022
Material	Bought Part	*Spizvel CV joint boot*		1 x 5,31€ = 5,31€	*PN:TAPL084717*	

EN (Engine & Drivetrain)	**Differential**				1.653,89€	254-EN-A007
[Assembly Processes]			Make		1 x 23,25€ = 23,25€	254-EN-A007P
Process	Assemble	*Align bearing to eccentric x2*		1 x 0,04€ = 0,04€	*90sec, Unskilled each for 2*	
Process	Other: Press Fit	*Press fit bearing to eccentric x 2*		1 x 3,23€ = 3,23€	*25 pound pressure for bearing press fit*	
Process	Assemble	*Align bearing to differential x2*		1 x 0,04€ = 0,04€	*90sec, Unskilled each for 2*	
Process	Other: Press Fit	*Press fit eccentric to diff. mount x 2*		1 x 3,23€ = 3,23€	*25 pound pressure for bearing press fit*	
Process	Fastener install (every)	*M5 bolts,nuts,washers(2) on Eccentric x7*		1 x 1,40€ = 1,40€	*25 sec, Unskilled each for 7*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,15€ = 0,15€	*66 sec, Semi skilled for 7 bolt 1inch*	
Process	Assemble	*Adapter on differential*		1 x 0,01€ = 0,01€	*60 sec, Unskilled*	
Process	Assemble	*Sprocket on adapter*		1 x 0,04€ = 0,04€	*150sec, Unskilled*	
Process	Fastener install (every)	*M8 bolt, nuts washers(2) on sprocket x 8*		1 x 0,03€ = 0,03€	*20sec, Unskilled each for 8*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,15€ = 0,15€	*66 sec, Semi skilled for 8, 1 inch*	
Process	Assemble	*Circlip on Differential to hold sprocket*		1 x 0,08€ = 0,08€	*300sec, Semi skilled*	
Process	Assemble	*Housing on Differential x 2*		1 x 9,16€ = 9,16€	*420sec, Unskilled*	
Process	Fastener install (every)	*M8 bolts in Housing x 2*		1 x 0,01€ = 0,01€	*20sec, Unskilled each for 2*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,06€ = 0,06€	*66sec, Semi skilled 1inch for 2*	
Process	Assemble	*Bearing on halfshaft x 2*		1 x 0,01€ = 0,01€	*30sec, Unskilled*	
Process	Assemble	*Bearing of halfshaft x 2*		1 x 0,01€ = 0,01€	*30sec, Unskilled*	
Process	Assemble	*Circlip on halfshaft to hold bearing x 4*		1 x 0,07€ = 0,07€	*60sec, Semi skilled each for 4*	
Process	Assemble	*Grease on bearing and housing x 8*		1 x 0,04€ = 0,04€	*20sec, Unskilled each for 8*	
Process	Assemble	*Halfshaft assemble on housing and hub x2*		1 x 0,13€ = 0,13€	*240sec, Semi skilled each for 2*	
Process	Assemble	*Bootcap assembly x 4*		1 x 0,03€ = 0,03€	*30sec, Unskilled each for 4*	
Process	Install Tie Wrap (Zip Tie, Cable Clamp)	*Tie wrap on boot caps installed*		1 x 0,01€ = 0,01€	*60sec, Unskilled*	
Fastener	Bolt	*M8 1 inch full threaded*		10 x 0,16€ = 1,60€	*Grade 12.9*	
Fastener	Bolt	*M5 1 inch full threaded*		7 x 0,07€ = 0,49€	*Grade 12.9*	
Fastener	Nut	*M5 Nylon lock nut*		7 x 0,13€ = 0,91€	*Grade 12.9*	
Fastener	Nut	*M8 Nylon lock nut*		10 x 0,14€ = 1,40€	*Grade 12.9*	
Fastener	Washer	*M5 For stress distribution*		14 x 0,02€ = 0,28€	*Grade 12.9*	
Fastener	Washer	*M8 For stress distribution*		20 x 0,03€ = 0,60€	*Grade 12.9*	
Fastener	Other: Tie Wraps	*Black tie wrap*		4 x 0,01€ = 0,04€	*Novolfex thin*	
Limited Slip differential	*Rotate wheels at different speed*		Buy		1 x 1.605,64€ = 1.605,64€	254-EN-00023
Material	Bought Part	*FSAE Drexler differential*		1 x 1.605,64€ = 1.605,64€	*Drexler PN:DSD-240-600-0006-00*	
Differential Oil	*Lubrication for parts in differential.*		Buy		1 x 25,00€ = 25,00€	254-EN-00024
Material	Bought Part	*75w-140 Limited Slip Synthetic*		1 x 25,00€ = 25,00€	*To lubricate the Differential internals*	

EN (Engine & Drivetrain)	**Differential Bearings**				23,65€	254-EN-A008
Ball Bearing Right	*Installed between right shaft and mount*		Buy		1 x 13,96€ = 13,96€	254-EN-00025
Material Bought Part	*Rotate right shaft with stationary mount*			1 x 13,96€ = 13,96€	*Deep Groove OD-100 x 7.5 mm*	
Ball Bearing Left	*Installed between left shaft and mount*		Buy		1 x 9,69€ = 9,69€	254-EN-00026
Material Bought Part	*Rotate left shaft with stationary mount*			1 x 9,69€ = 9,69€	*Deep Groove OD-50 x 6 mm*	

EN (Engine & Drivetrain)		**Differential Mounts**				145,94€	254-EN-A009
Differential Mount Left		*Mount to hold differential*		Make		1 x 45,73€ = 45,73€	254-EN-00027
Material	Aluminum	*7075-T6 sheet; 7mm thickness*		1 x 19,96€ = 19,96€	*2.57kg (7.75€ per kg)*		
Process	Machining setup	*To set up sheet for laser cut.*		1 x 0,16€ = 0,16€	*0.19 hours, Semi skilled*		
Process	Laser Cut	*Lasercut to obtain profilewith slots*		1 x 25,45€ = 25,45€	*0.49 hours, Laser Cut*		
Process	Machining setup	*To remove job from machine.*		1 x 0,16€ = 0,16€	*0.19 hours, Semi skilled*		
Differential Mount Right		*Mount to hold differential*		Make		1 x 40,58€ = 40,58€	254-EN-00028
Material	Aluminum	*7075-T6 sheet; 7mm thick*		1 x 15,00€ = 15,00€	*1.93kg (7.75€ per kg)*		
Process	Machining setup	*To set up sheet for laser cut.*		1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*		
Process	Laser Cut	*Laser cut to obtain profile and slots*		1 x 19,09€ = 19,09€	*0.40 hours, Laser Cut*		
Process	Machining setup	*To remove job from machine.*		1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*		
Process	Machining setup	*To set up sheet for end milling.*		1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*		
Process	Machining	*end milling for step*		1 x 5,83€ = 5,83€	*0.29 hours, Conventional Milling*		
Process	Machining setup	*To remove finished part from machine.*		1 x 0,16€ = 0,16€	*0.18 hours, Semi skilled*		
Eccentric Left		*Coarse chain adjustment*		Make		1 x 31,97€ = 31,97€	254-EN-00029
Material	Aluminum	*7075-T6 round billet 29mm thick*		1 x 10,70€ = 10,70€	*1.38kg (7.75€ per kg)*		
Process	Machining setup	*To set up top surface for milling.*		1 x 0,24€ = 0,24€	*0.19 hours, Semi skilled*		
Process	Machining	*Milling from top surface(Face milling)*		1 x 17,25€ = 17,25€	*0.79 hours, Conventional Milling*		
Process	Machining setup	*To remove job from machine.*		1 x 0,24€ = 0,24€	*0.19 hours, Semi skilled*		
Process	Machining setup	*To set up bottom surface for milling.*		1 x 0,24€ = 0,24€	*0.19 hours, Semi skilled*		
Process	Machining	*bottom surface finishing(End Milling)*		1 x 3,06€ = 3,06€	*0.29 hours, Conventional Milling*		
Process	Machining setup	*To remove finished part from machine.*		1 x 0,24€ = 0,24€	*0.19 hours, Semi skilled*		
Eccentric Right		*Fine chain adjustment*		Make		1 x 27,66€ = 27,66€	254-EN-00030
Material	Aluminum	*7075-T6 round billet 19mm thick*		1 x 7,91€ = 7,91€	*1.02kg (7.75€ per kg)*		
Process	Machining setup	*To set up top surface for milling.*		1 x 0,25€ = 0,25€	*0.19 hours, Semi skilled*		
Process	Machining	*Milling from top surface(Face Milling)*		1 x 15,73€ = 15,73€	*0.72 hours, Conventional Milling*		
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.19 hours, Semi skilled*		
Process	Machining setup	*To set up bottom surface for milling.*		1 x 0,25€ = 0,25€	*0.19 hours, Semi skilled*		
Process	Machining	*bottom surface finishing(End Milling)*		1 x 3,02€ = 3,02€	*0.29 hours, Conventional Milling*		
Process	Machining setup	*To remove finished part from machine.*		1 x 0,25€ = 0,25€	*0.19 hours, Semi skilled*		

EN (Engine & Drivetrain)		**Engine**				1.851,52€	254-EN-A010
[Assembly Processes]				Make		1 x 6,75€ = 6,75€	254-EN-A010P
Process	Assemble		*Align Engine to Engine mount*		1 x 0,05€ = 0,05€	*300sec, Unskilled*	
Process	Assemble		*Align Engine Bolts to Mounts x4*		1 x 0,09€ = 0,09€	*120sec, Unskilled each for 4*	
Process	Assemble		*Align Engine sleeves x4*		1 x 1,33€ = 1,33€	*Time estimated 30sec for unskilled*	
Process	Fastener install (every)		*Engine Bolts, lock nuts x4,*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 4*	
Process	Other: Ratchet		*To tighten the fastener*		1 x 1,48€ = 1,48€	*66sec, Semi skilled per inch for 20 inch*	
Process	Other: Liquid Addition		*Addition of RON 98 fuel-7litres*		1 x 0,01€ = 0,01€	*Fuel nozzle flow time for 7 litre*	
Process	Other: Liquid Addition		*3 litres water*		1 x 0,11€ = 0,11€	*Water flow rate time for 3 litre*	
Process	Other: Liquid Addition		*EngineOil-1.5L crankcase; 2.5L reservoir*		1 x 0,07€ = 0,07€	*Oil f;ow rate time for 4 litre*	
Fastener	Bolt		*M12 Length-380mm*		1 x 0,65€ = 0,65€	*Grade 12.9*	
Fastener	Bolt		*M12 Length-180mm*		2 x 0,31€ = 0,62€	*Grade 12.9*	
Fastener	Bolt		*M12 Length-137mm*		1 x 0,25€ = 0,25€	*Grade 12.9*	
Fastener	Nut		*M12 metal lock*		4 x 0,52€ = 2,08€	*Grade 12.9*	
Engine		*Honda CBR 600RR*		Buy		1 x 1.329,37€ = 1.329,37€	254-EN-00031
Material	Bought Part		*Provide power to run the vehicle*		1 x 1.329,37€ = 1.329,37€	*CBR 600RR 2008 PN:PC40E-2047451*	
Ignition Coil		*Denso*		Buy		4 x 34,56€ = 138,24€	254-EN-00032
Material	Bought Part		*Transfer voltage to spark plug*		1 x 34,56€ = 34,56€	*PN:123700-4510J0451*	
Spark Plug		*NGK Iridium*		Buy		4 x 59,97€ = 239,88€	254-EN-00033
Material	Bought Part		*Provides spark to combust air fuel mix*		1 x 59,97€ = 59,97€	*PN:IMR9C9HES*	
Engine Spacers		*To dampen the engine vibrations*		Buy		4 x 34,32€ = 137,28€	254-EN-00034
Material	Bought Part		*To dampen the engine vibrations*		4 x 8,58€ = 34,32€	*high density polyurethane spacers*	

EN (Engine & Drivetrain)		**Engine Mounts**				2,74€	254-EN-A011
Engine Mounts		*Mounting engine on chassis*		Make		1 x 2,74€ = 2,74€	254-EN-00035
Material	Steel	*AISI 1020; OD 24.5mm Length 375mm*			1 x 1,79€ = 1,79€	*1.39kg (1.29€ per kg)*	
Process	Machining setup	*To set up rod for turning and facing.*			1 x 0,12€ = 0,12€	*0.14 hours, Semi skilled*	
Process	Machining	*To perform turning*			1 x 0,14€ = 0,14€	*0.09 hours, Lathe*	
Process	Machining	*To perform facing*			1 x 0,05€ = 0,05€	*0.03 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*			1 x 0,12€ = 0,12€	*0.14 hours, Semi skilled*	
Process	Machining setup	*To setup rod for drilling holes.*			1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	
Process	Drilled hole	*M12 x 1*			1 x 0,08€ = 0,08€	*0.01 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*			1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	
Process	Machining setup	*To install parting tool.*			1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	
Process	Machining	*Parting x 4*			1 x 0,04€ = 0,04€	*0.02 hours, Lathe*	
Process	Machining setup	*To remove finished part from machine.*			1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	

EN (Engine & Drivetrain)	**Engine/Diff Oil**					38,76€	254-EN-A012
Liqui Moly Engine Oil	*Lubrication Oil.*		Buy			4 x 9,69€ = 38,76€	254-EN-00036
Material Bought Part		*Used to lubricate parts of engine*		1 x 9,69€ = 9,69€	*10W-40 street 1L*		

EN (Engine & Drivetrain)	**Exhaust Manifold**				34,80€	254-EN-A013
[Assembly Processes]			Make		1 x 15,02€ = 15,02€	254-EN-A013P
Process	Assemble	*Assemble port and primary*		1 x 0,01€ = 0,01€	*60sec, for Unskilled*	
Process	Weld	*Full Weld port and primary x4*		1 x 1,49€ = 1,49€	*432 sec, welding machine*	
Process	Assemble	*Install flange to primary x4*		1 x 0,01€ = 0,01€	*60sec, for Unskilled*	
Process	Assemble	*Secondary tube to two primary x2*		1 x 0,01€ = 0,01€	*60sec, for Unskilled*	
Process	Weld	*Full Weld secondary to 2 primary x2*		1 x 0,74€ = 0,74€	*216 sec, Welding Machine*	
Process	Assemble	*Assemble Secondary and tertiary tube*		1 x 0,01€ = 0,01€	*60sec, for Unskilled*	
Process	Weld	*Full Weld of secondary and tertiary*		1 x 0,76€ = 0,76€	*220 sec, Welding Machine*	
Process	Assemble	*Assemble lambda ports on secondary x2*		1 x 0,01€ = 0,01€	*30sec, Unskilled each for 2*	
Process	Weld	*Full weld of lambda port to secondary x2*		1 x 0,33€ = 0,33€	*105sec, Welding Machine*	
Process	Assemble	*Assemble support strip on primary x3*		1 x 0,02€ = 0,02€	*30sec, Unskilled each for 3*	
Process	Weld	*Seam weld of strips to primary x6*		1 x 0,52€ = 0,52€	*150sec, Welding Machine*	
Process	Assemble	*Assemble exhaust port to Exhaust opening*		1 x 0,02€ = 0,02€	*30sec, Unskilled each for 4*	
Process	Assemble	*Assemble exhaust flange to 2 studs x4*		1 x 0,04€ = 0,04€	*60sec, Unskilled each for 4*	
Process	Fastener install (every)	*Attach exhaust nuts on studs x8*		1 x 0,06€ = 0,06€	*45sec, Unskilled each for 8*	
Process	Other: Ratchet	*To tighten the fastener.*		1 x 0,11€ = 0,11€	*66sec, Semiskilled each for 8*	
Process	Coating	*Rust oleum coating*		1 x 1,26€ = 1,26€	*2HR, Semiskilled*	
Fastener	Nut	*M8 exhuast nuts*		8 x 0,64€ = 5,12€	*Engine Nuts 12.9*	
Tooling	Welding Fixure	*Fixture for weld of port to primary*		1 x 3,12€ = 3,12€	*Fixture mount for primary and port*	
Tooling	Welding Fixure	*Fixture for weld of Exhaust tubes.*		1 x 0,91€ = 0,91€	*Fixture mount for secondary and primary*	
Tooling	Welding Fixure	*Fixture for weld of Lambda sensor sleeve*		1 x 0,47€ = 0,47€	*Fixture mount holding sleeve*	

Port tube		*connection between manifold and engine*	Make		1 x 0,41€ = 0,41€	254-EN-00037
Material	Steel	*AISI 1020, 45mmx7mm; Length 13mm*		1 x 0,11€ = 0,11€	*0.09kg (1.29€ per kg)*	
Process	Machining setup	*To set up tube for turning and facing.*		1 x 0,12€ = 0,12€	*0.14 hours, Semi skilled*	
Process	Machining	*To perform turning.*		1 x 0,02€ = 0,02€	*0.01 hours, Lathe*	
Process	Machining	*To perform facing.*		1 x 0,04€ = 0,04€	*0.02 hours, Lathe*	
Process	Machining setup	*To remove finished part from machine.*		1 x 0,12€ = 0,12€	*0.14 hours, Semi skilled*	

Exhaust tubes		*primary, secondary and tertiary pipes*	Make		1 x 4,42€ = 4,42€	254-EN-00038
Material	Steel	*AISI 1020: OD-31 x 1.5mm; Length-1120mm*		1 x 1,57€ = 1,57€	*1.22kg (1.29€ per kg)*	
Process	Machining setup	*To setup tube for cutting.*		1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*	
Process	Cutting (Manual)	*Primary tubes to 279.4mm length x 4*		1 x 0,01€ = 0,01€	*0.01 hours, Miter Saw*	
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*	
Process	Machining setup	*Setup for tube bending*		1 x 0,07€ = 0,07€	*0.02 hours, Semi skilled*	
Process	Tube process	*CNC bending to profile x 4*		1 x 0,65€ = 0,65€	*0.38 hours, Tube bending*	
Process	Machining setup	*To remove finished part from machine.*		1 x 0,07€ = 0,07€	*0.02 hours, Semi skilled*	
Material	Steel	*AISI 1020: OD-41 x 1.5mm; Length-575mm*		1 x 1,08€ = 1,08€	*0.84kg (1.29€ per kg)*	

Process	Machining setup	*To setup tube for cutting.*	1 x 0,18€ = 0,18€	*0.02 hours, Semi skilled*	
Process	Cutting (Manual)	*Secondary and tertiary to 190.5mm x 3*	1 x 0,01€ = 0,01€	*0.01 hours, Miter Saw*	
Process	Machining setup	*To remove job from machine.*	1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*	
Process	Machining setup	*Setup for tube bending*	1 x 0,07€ = 0,07€	*0.02 hours, Semi skilled*	
Process	Tube process	*CNC bending to profile x 2*	1 x 0,32€ = 0,32€	*0.38 hours, Tube bending*	
Process	Machining setup	*To remove job from machine.*	1 x 0,07€ = 0,07€	*0.02 hours, Semi skilled*	
Process	Machining setup	*To setup tube for drilling.*	1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	
Process	Drilled hole	*Hole in secondary for lambda x2*	1 x 0,06€ = 0,06€	*0.02 hours, Vertical Drilling*	
Process	Machining setup	*To remove finished part from machine.*	1 x 0,10€ = 0,10€	*0.12 hours, Semi skilled*	

Exhaust flanges	*tighten the manifold to engine*		Make	4 x 1,04€ = 4,16€	254-EN-00039
Material	Steel	*AISI 1020 sheet; 77 x 63 x 5.5mm*	1 x 0,15€ = 0,15€	*0.21kg (0.71€ per kg)*	
Process	Machining setup	*To set up sheet for laser cut.*	1 x 0,25€ = 0,25€	*0.29 hours, Semi Skilled*	
Process	Laser Cut	*Laser cut according to profile*	1 x 0,39€ = 0,39€	*0.01 hours, Laser Cut*	
Process	Machining setup	*To remove finished part from machine.*	1 x 0,25€ = 0,25€	*0.29 hours, Semi Skilled*	

Supporting strips	*structural strength to manifold*		Make	1 x 0,10€ = 0,10€	254-EN-00040
Material	Steel	*AISI 1020 sheet; 180 x 20 x 2mm*	1 x 0,04€ = 0,04€	*0.06kg (0.71€ per kg)*	
Process	Machining setup	*To install cutting tool.*	1 x 0,02€ = 0,02€	*0.02 hours, Semi Skilled*	
Process	Cutting (Manual)	*To cut required length of strips.*	1 x 0,02€ = 0,02€	*0.02 hours, Miter Saw*	
Process	Machining setup	*To remove finish part from machine.*	1 x 0,02€ = 0,02€	*0.02 hours, Semi Skilled*	

Lambda sensor sleeves	*sleeves to attach lambda sensor*		Make	2 x 0,76€ = 1,52€	254-EN-00041
Material	Steel	*AISI 1020; OD 30mm; length 20mm*	1 x 0,14€ = 0,14€	*0.11kg (1.29€ per kg)*	
Process	Machining setup	*To setup rod for turning and facing.*	1 x 0,12€ = 0,12€	*0.14 hours, Semi Skilled*	
Process	Machining	*To perform turning.*	1 x 0,04€ = 0,04€	*0.02 hours, Lathe*	
Process	Machining	*To perform facing.*	1 x 0,02€ = 0,02€	*0.01 hours, Lathe*	
Process	Machining setup	*To set up rod for drilling.*	1 x 0,08€ = 0,08€	*0.05 hours, Semi Skilled*	
Process	Drilled hole	*Hole ID 16mm*	1 x 0,16€ = 0,16€	*0.02 hours, Lathe*	
Process	Machining setup	*To remove job from machine.*	1 x 0,08€ = 0,08€	*0.05 hours, Semi Skilled*	
Process	Machining setup	*To install taping tool.*	1 x 0,04€ = 0,04€	*0.05 hours, Semi Skilled*	
Process	Threading	*Internal threading for sensor*	1 x 0,04€ = 0,04€	*0.02 hours, Lathe*	
Process	Machining setup	*To remove finish part from machine.*	1 x 0,04€ = 0,04€	*0.05 hours, Semi Skilled*	

Rust oleum	*to prevent rust*		Buy	1 x 9,17€ = 9,17€	254-EN-00042
Material	Bought Part	*Sprayed on Exhaust manifold*	1 x 9,17€ = 9,17€	*PN: B003CT499O*	

EN (Engine & Drivetrain)	**Fuel Filter**				11,74€	254-EN-A014
Holley Inline	*Filter out fuel going into the cylinder*	Buy			1 x 11,74€ = 11,74€	254-EN-00043
Material Bought Part	*Inline fuel system after pump*		1 x 11,74€ = 11,74€	*PN:HLY-162523*		

EN (Engine & Drivetrain)		**Fuel Injectors**				90,68€	254-EN-A015
Primary fuel injector		*fuel injector mounted on intake manifold*	Buy			4 x 22,16€ = 88,64€	254-EN-00044
Material	Bought Part	*Used to inject fuel in the cylinder*		1 x 22,16€ = 22,16€	*Denso PN: 16460-MJF-D01*		
O ring		*Placed between injector and rail*	Buy			4 x 0,19€ = 0,76€	254-EN-00045
Material	Bought Part	*Seals injector and rail*		1 x 0,19€ = 0,19€	*OD 7.8 x 1.9mm*		
O ring		*Placed between injector and manifold*	Buy			4 x 0,32€ = 1,28€	254-EN-00046
Material	Bought Part	*Seal to attach injector to manifold*		1 x 0,32€ = 0,32€	*OD7.47 x 3.6mm*		

EN (Engine & Drivetrain)	**Fuel Lines/Rails**					40,77€	254-EN-A016
[Assembly Processes]				Make		1 x 7,98€ = 7,98€	254-EN-A016P
Process	Assemble	*Align Injector on Fuel Rail x4*		1 x 0,03€ = 0,03€	*30sec, Semiskilled each for 4*		
Process	Assemble	*Align Fuel rail on Intake*		1 x 0,01€ = 0,01€	*60sec, Unskilled*		
Process	Assemble	*Align Spacers on rail x 4*		1 x 0,07€ = 0,07€	*60sec, Semiskilled each for 4*		
Process	Fastener install (every)	*M5 bolts,nuts on rail x4*		1 x 1,40€ = 1,40€	*25sec, Unskilled each for 4*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,07€ = 0,07€	*66sec, Semiskilled for 4 bolts 1 inch*		
Process	Fastener install (every)	*Hose clamp for fuel hoses x 12*		1 x 0,10€ = 0,10€	*30sec, Unskilled, for 12*		
Process	Other: Ratchet	*To tighten the fasteners*		1 x 0,18€ = 0,18€	*50sec,Unskilled,for 12 clamps*		
Fastener	Bolt	*M5 length 2 inch*		4 x 0,09€ = 0,36€	*Grade 12.9*		
Fastener	Nut	*M5 Metal lock nut*		4 x 0,24€ = 0,96€	*Grade 12.9*		
Fastener	Hose Clamp	*Bolt and nut type*		12 x 0,40€ = 4,80€	*chamfered edge 15mm*		
Fuel line	*to connect tank outlet and pump inlet*			Buy		1 x 1,55€ = 1,55€	254-EN-00047
Material	Bought Part	*Rubber 5/16" SAE 100 R6 OD-19 x 3.5mm*		1 x 1,55€ = 1,55€	*600mm (2.58€; per meter)*		
Fuel line	*line connecting other fuel components*			Buy		1 x 2,81€ = 2,81€	254-EN-00048
Material	Bought Part	*Rubber 5/16" SAE 100 R6 OD-14 x 3.5mm*		1 x 2,81€ = 2,81€	*1.2m (2.34€; per m)*		
T joint	*T junction between regulator and rail*			Buy		1 x 0,77€ = 0,77€	254-EN-00049
Material	Bought Part	*Routes fuel to regulator and rail*		1 x 0,77€ = 0,77€	*Brass T junction*		
Fuel Rail	*fuel flow and transfer*			Buy		1 x 27,14€ = 27,14€	254-EN-00050
Material	Bought Part	*Distributes fuel to the 4 injectors*		1 x 27,14€ = 27,14€	*OEM Honda CBR Fuel rail*		
Fuel rail Spacer	*Spacer for injectors*			Buy		4 x 0,13€ = 0,52€	254-EN-00051
Material	Bought Part	*n/a*		1 x 0,13€ = 0,13€	*Polyurethane high pressure plastic*		

EN (Engine & Drivetrain)	**Fuel Pressure Reg.**					75,53€	254-EN-A017
[Assembly Processes]			Make			1 x 0,88€ = 0,88€	254-EN-A017P
Process	Assemble	*Align Pres. reg. with sleeve x2*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 2*		
Process	Fastener install (every)	*M6 bolts, nuts, washer through sleeve*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 2*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,04€ = 0,04€	*66sec, Semi skilled each for 2*		
Fastener	Bolt	*M6 2 inch*		2 x 0,09€ = 0,18€	*Grade 12.9*		
Fastener	Nut	*M6 lock nut*		2 x 0,26€ = 0,52€	*Grade 12.9*		
Fastener	Washer	*M6 for weight distribution*		4 x 0,03€ = 0,12€	*Grade 12.9*		
Fuel pressure regulator	*maintain ambient pressure in lines*		Buy			1 x 74,65€ = 74,65€	254-EN-00052
Material	Bought Part	*Keeps a pressure of 3.5 bar in line*		1 x 74,65€ = 74,65€	*Malpassi High pressure*		

EN (Engine & Drivetrain)	**Fuel Pump**				25,60€	254-EN-A018
Fuel Pump	*Fuel flow along the line*		Buy		1 x 25,60€ = 25,60€	254-EN-00053
Material Bought Part		*Bosch 5 Bar*		1 x 25,60€ = 25,60€	*PN: 580 464 089*	

EN (Engine & Drivetrain)	**Fuel Tank – NOT THE HV-Battery**					77,28€	254-EN-A019
[Assembly Processes]			Make			1 x 4,63€ = 4,63€	254-EN-A019P
Process	Assemble	*Attach clamps on Fuel filler neck*		1 x 0,01€ = 0,01€	*30sec, Unskilled*		
Process	Assemble	*NRV, vent line on fuel filler cap*		1 x 0,01€ = 0,01€	*50sec, Unskilled*		
Process	Fastener install (every)	*Install NRV nut*		1 x 0,01€ = 0,01€	*45sec, Unskilled*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,01€ = 0,01€	*66sec, Semi skilled*		
Process	Assemble	*Filler cap on FFN & FFN on fuel tank*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*		
Process	Fastener install (every)	*Clamps installed on filler neck x 2*		1 x 0,01€ = 0,01€	*30sec, Unskilled each for 2*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,10€ = 0,10€	*50sec, Semi skilled*		
Process	Assemble	*Fuel tank with mounting bushing*		1 x 0,03€ = 0,03€	*60sec, Unskilled*		
Process	Fastener install (every)	*Bushing M6 studs*		1 x 0,01€ = 0,01€	*20sec, Unskilled each for 4*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,03€ = 0,03€	*50sec, Semi skilled*		
Fastener	Nut	*M6 lock nut*		4 x 0,13€ = 0,52€	*Grade 12.9*		
Fastener	Hose Clamp	*Hose Clamp ID 42*		2 x 1,94€ = 3,88€	*V- band type quick release*		
Fuel Tank	*storage for fuel*		Make			1 x 37,98€ = 37,98€	254-EN-00054
Material	Aluminum	*Al 6061 -T6; 1200x800x3 mm*		1 x 27,20€ = 27,20€	*8.09kg (3.36€ per kg)*		
Material	Aluminum	*6061 Tube for inlet, outlet and return*		1 x 0,81€ = 0,81€	*0.28kg (2.91€ per kg)*		
Process	Machining setup	*To set up sheet for laser cut.*		1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*		
Process	Laser Cut	*To laser cut the profile.*		1 x 3,48€ = 3,48€	*0.46 hours, Laser Cut*		
Process	Machining setup	*To remove job from machine.*		1 x 0,17€ = 0,17€	*0.19 hours, Semi skilled*		
Process	Machining setup	*To setup tube for cutting.*		1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*		
Process	Cutting (Manual)	*To obtain outlet tube.*		1 x 0,04€ = 0,04€	*0.10 hours, Miter saw*		
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*		
Process	Machining setup	*To setup tube for cutting.*		1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*		
Process	Cutting (Manual)	*To obtain inlet tube.*		1 x 0,04€ = 0,04€	*0.10 hours, Miter Saw*		
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.02 hours, Semi skilled*		
Process	Machining setup	*To setup tube for cutting.*		1 x 0,04€ = 0,04€	*0.02 hours, Semi skilled*		
Process	Cutting (Manual)	*Profiling the tube for welding.*		1 x 0,04€ = 0,04€	*0.10 hours, Miter saw*		
Process	Machining setup	*To remove job from machine.*		1 x 0,04€ = 0,04€	*0.02 hours, Semi skilled*		
Process	Weld	*To full weld the fuel tank.*		1 x 5,22€ = 5,22€	*0.46 hours, welding machine*		
Tooling	Welding Fixure	*Fixture for welding fuel tank.*		1 x 0,65€ = 0,65€	*L Fixture support*		
Filler Neck	*Path for filling the fuel to tank*		Buy			1 x 3,30€ = 3,30€	254-EN-00055
Material	Bought Part	*Flexible Polyurethane steel enforced*		1 x 3,30€ = 3,30€	*250mm (12.9€ per m)*		
Non return Valve	*placed over filler neck cap*		Buy			1 x 15,94€ = 15,94€	254-EN-00056
Material	Bought Part	*restrict back flow of fuel out of system*		1 x 15,94€ = 15,94€	*Part Number SUM G3114*		

Neck Attachment	*To attach filler cap to filler neck*		Make	1 x 0,50€ = 0,50€	254-EN-00057
Material	Aluminum	*Tube for neck attachment.*		1 x 0,20€ = 0,20€	*0.07kg (2.91€ per kg)*
Process	Machining setup	*To set up tube for external threading.*		1 x 0,12€ = 0,12€	*0.14 hours, Semi skilled*
Process	Threading	*To fasten filler cap on filler neck.*		1 x 0,06€ = 0,06€	*0.03 hours, Lathe*
Process	Machining setup	*To remove finish part from machine.*		1 x 0,12€ = 0,12€	*0.14 hours, Semi skilled*

Fuel Filler Cap	*Capping of Filler neck*		Make	1 x 14,05€ = 14,05€	254-EN-00058
Material	Aluminum	*6061 Billet*		1 x 0,50€ = 0,50€	*0.15kg (3.36€ per kg)*
Process	Machining setup	*To set up billet for milling upper half.*		1 x 0,09€ = 0,09€	*0.19 hours, Semi skilled*
Process	Machining	*To obtain upper half of cap shape.*		1 x 7,82€ = 7,82€	*0.21 hours, Conventional Milling*
Process	Machining setup	*To remove job from machine.*		1 x 0,09€ = 0,09€	*0.19 hours, Semi skilled*
Process	Machining setup	*To change setup for machining lower half*		1 x 0,09€ = 0,09€	*0.19 hours, Semi skilled*
Process	Machining	*To obtain lower half of cap shape.*		1 x 5,21€ = 5,21€	*0.14 hours, Conventional Milling*
Process	Machining setup	*To remove job from machine.*		1 x 0,09€ = 0,09€	*0.19 hours, Semi skilled*
Process	Machining setup	*To set up billet for internal threading.*		1 x 0,04€ = 0,04€	*0.05 hours, Semi skilled*
Process	Threading	*To fasten the filler cap on filler neck.*		1 x 0,08€ = 0,08€	*0.04 hours, Lathe*
Process	Machining setup	*To remove finished part from machine.*		1 x 0,04€ = 0,04€	*0.05 hours, Semi skilled*

Fueltank mounting bushing	*To support the fuel tank mounting*		Make	2 x 0,44€ = 0,88€	254-EN-00059
Material	Rubber	*Bushing for mounting.*		2 x 0,07€ = 0,14€	*0.02kg (4.91€ per kg)*
Process	Machining setup	*To set up rubber for drilling holes.*		1 x 0,04€ = 0,04€	*0.05 hours, Semi skilled*
Process	Drilled hole	*To drill hole(M6) in rubber for stud*		1 x 0,01€ = 0,01€	*0.01 hours, Vertical Drilling*
Process	Machining setup	*To remove job from machine.*		1 x 0,04€ = 0,04€	*0.05 hours, Semi skilled*
Process	Brush Apply	*To apply adhesive on stud.*		1 x 0,01€ = 0,01€	*0.02 hours, Unskilled*
Process	Assemble	*To assemble stud with hole.*		1 x 0,01€ = 0,01€	*40sec, Unskilled*
Fastener	Other: Stud	*M6 4 inch*		1 x 0,19€ = 0,19€	*4inch(0.0475€ per inch)*

EN (Engine & Drivetrain)	**Intake Manifold**					567,23€	254-EN-A020
[Assembly Processes]			Make			1 x 5,33€ = 5,33€	254-EN-A020P
Process	Other: Adhesive	*Gasket on throttle body and restrcitor*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*		
Process	Assemble	*Align throttle body on restrictor*		1 x 0,01€ = 0,01€	*45sec, Unskilled*		
Process	Fastener install (every)	*M4 bolt, lock nut and washers x4*		1 x 0,04€ = 0,04€	*25sec, Unskilled each for 4*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,07€ = 0,07€	*66sec, Semi skilled*		
Process	Other: Adhesive	*Sealant on restrictor and diffuser*		1 x 0,03€ = 0,03€	*120sec, Semi skilled*		
Process	Assemble	*Align Restrictor on diffuser*		1 x 0,04€ = 0,04€	*180sec, Unskilled*		
Process	Fastener install (every)	*M4 bolts, washers and nuts x4*		1 x 0,03€ = 0,03€	*25sec, Unskilled each for 4*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,07€ = 0,07€	*66sec, Semi skilled each for 4*		
Process	Other: Adhesive	*Sealant on diffuser and plenum*		1 x 0,03€ = 0,03€	*120sec, Semi skilled*		
Process	Assemble	*Assemble diffuser and plenum*		1 x 0,01€ = 0,01€	*50sec, Unskilled*		
Process	Fastener install (every)	*M4 bolts, washers and nuts x8*		1 x 0,06€ = 0,06€	*25sec, Unskilled each for 8*		
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,15€ = 0,15€	*66sec, Semi skilled*		
Process	Assemble	*Assemble manifold on Intake port*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*		
Process	Assemble	*Sleeve for manifold x2*		1 x 0,03€ = 0,03€	*60sec, Semi skilled each for 2*		
Process	Fastener install (every)	*M6 bolt, washer and metal lock nut x2*		1 x 0,01€ = 0,01€	*40sec, Semi skilled each for 2*		
Process	Other: Ratchet	*Tighten the intake hose clamp x4*		1 x 0,11€ = 0,11€	*66sec, Semi skilled 3 inch for 2*		
Fastener	Bolt	*M4 length 1nch*		16 x 0,08€ = 1,28€	*Grade 12.9*		
Fastener	Bolt	*M6 length 3 inch*		2 x 0,42€ = 0,84€	*Grade 12.9*		
Fastener	Washer	*M4 for weight distribution*		16 x 0,02€ = 0,32€	*Grade 12.9*		
Fastener	Washer	*M6 for weight distribution*		2 x 0,03€ = 0,06€	*Grade 12.9*		
Fastener	Nut	*M4 Lock Nut*		16 x 0,10€ = 1,60€	*Grade 12.9*		
Fastener	Nut	*M6 Metal lock nut*		2 x 0,26€ = 0,52€	*Grade 12.9*		
Diffuser		*connects restrictor to plenum*	Make			1 x 122,93€ = 122,93€	254-EN-00060
Material	Plastic	*Nylon PA 12*		1 x 20,40€ = 20,40€	*0.225kg (90.70€/kg)*		
Process	Machining setup	*To setup machine for 3D printing.*		1 x 0,17€ = 0,17€	*0.19 hours, skilled*		
Process	Rapid Prototype	*Multi jet fusion for 3D printing.*		1 x 102,36€ = 102,36€	*12.55 hours, MJF*		
Plenum & Runners		*storage and distribution of air*	Make			1 x 438,59€ = 438,59€	254-EN-00061
Material	Plastic	*Nylon PA 12*		1 x 74,01€ = 74,01€	*0.816kg (90.70€/kg)*		
Process	Machining setup	*To setup machine for 3D printing.*		1 x 0,17€ = 0,17€	*0.19 hours, skilled*		
Process	Rapid Prototype	*Multi jet fusion for 3D printing.*		1 x 364,41€ = 364,41€	*44.73 hours, MJF*		
Intake mounting sleeve		*to keep manifold intact with engine*	Make			1 x 0,38€ = 0,38€	254-EN-00062
Material	Aluminum	*6061-T6; OD 10 x 2mm*		1 x 0,01€ = 0,01€	*4.2*10^-5kg (3.341€/kg)*		
Process	Machining setup	*To set up rod for facing.*		1 x 0,12€ = 0,12€	*0.05 hours semi-skilled*		
Process	Machining	*To perform facing*		1 x 0,04€ = 0,04€	*0.03 hours Lathe*		

Process	Machining setup	*To setup tube for drilling.*	1 x 0,12€ = 0,12€	*0.05 hours semi skilled*
Process	Machining	*Drilling hole of 6mm.*	1 x 0,01€ = 0,01€	*0.02 hours Lathe*
Process	Machining setup	*To install parting tool.*	1 x 0,01€ = 0,01€	*0.02 hours semi skilled*
Process	Machining	*Parting x 2*	1 x 0,02€ = 0,02€	*0.03 hours lathe*
Process	Machining setup	*To remove finished part from machine.*	1 x 0,05€ = 0,05€	*0.02 hours semi skilled*

EN (Engine & Drivetrain)	**Muffler**					24,94€	254-EN-A021
[Assembly Processes]			Make			1 x 4,45€ = 4,45€	254-EN-A021P
Process	Assemble	*Perforated tube to Inlet housing cover*		1 x 0,01€ = 0,01€	*90sec, Unskilled*		
Process	Weld	*Perforated tube to inlet housing cover*		1 x 0,84€ = 0,84€	*250sec, Welding Machine*		
Process	Assemble	*Inlet housing cover to housing*		1 x 0,01€ = 0,01€	*90sec, Unskilled*		
Process	Weld	*Inlet housing cover to housing*		1 x 1,49€ = 1,49€	*432sec, Welding Machine*		
Process	Assemble	*Inlet pipe to inlet housing cover*		1 x 0,01€ = 0,01€	*90sec, Unskilled*		
Process	Weld	*Inlet pipe to inlet housing cover*		1 x 0,74€ = 0,74€	*216sec, Welding machine*		
Process	Assemble	*Outlet housing cover to housing*		1 x 0,01€ = 0,01€	*90sec, Unskilled*		
Process	Machining setup	*To setup machine for drilling.*		1 x 0,12€ = 0,12€	*0.05 hours semi skilled*		
Process	Drilled hole	*3mm through hole on cover and housing x3*		1 x 0,01€ = 0,01€	*0.01 hours lathe*		
Process	Machining setup	*To remove job from machine.*		1 x 0,12€ = 0,12€	*0.5 hours semi skilled*		
Process	Fastener install (every)	*To rivet the housing cover and housingx3*		1 x 0,07€ = 0,07€	*90sec, Semi skilled each for 3*		
Process	Assemble	*Tail pipe to Outlet cover*		1 x 0,01€ = 0,01€	*60sec, Unskilled*		
Process	Weld	*Tail pipe to Outlet cover*		1 x 0,33€ = 0,33€	*105sec, Welding Machine*		
Process	Assemble	*Spring attachments to inlet tube x3*		1 x 0,01€ = 0,01€	*20sec, Unskilled each for 3*		
Process	Weld	*Spring attachment to inlet tube x3*		1 x 0,20€ = 0,20€	*38sec, Welding Machine*		
Process	Assemble	*Springs to attachments x3*		1 x 0,03€ = 0,03€	*40sec, Unskilled each for 3*		
Process	Assemble	*Muffler clamp to muffler*		1 x 0,01€ = 0,01€	*60sec, Unskilled*		
Process	Fastener install (every)	*M6 bolt and lock nut for muffler clamp*		1 x 0,01€ = 0,01€	*45sec, Unskilled*		
Process	Other: Ratchet	*To tighten the fastener.*		1 x 0,01€ = 0,01€	*66sec, Semi skilled*		
Fastener	Bolt	*M6 1 inch*		1 x 0,07€ = 0,07€	*Grade 12.9*		
Fastener	Nut	*M6 Nylon lock nut*		1 x 0,13€ = 0,13€	*Grade 12.9*		
Fastener	Other: Rivet	*M4 4mm long*		3 x 0,07€ = 0,21€	*Flange 5mm*		
Outer housing	*outer muffler body*		Make			1 x 6,38€ = 6,38€	254-EN-00063
Material	Steel	*AISI 1020 sheet 380x380x2mm*		1 x 1,61€ = 1,61€	*2.27kg (0.71€/kg)*		
Process	Machining setup	*Setup for sheet rolling*		1 x 0,25€ = 0,25€	*0.58 hours, Semi skilled*		
Process	Sheet metal process	*Rolling sheet to cylinder*		1 x 2,01€ = 2,01€	*0.08 hours, CNC sheet bending*		
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.58 hours, Semi skilled*		
Process	Weld	*Seam Weld full length*		1 x 1,99€ = 1,99€	*0.19 hours, welding machine*		
Tooling	Welding Fixure	*Fixture for welding of outer shell*		1 x 0,27€ = 0,27€	*Semi circular fixture*		
Housing Cover inlet	*cover the open inlet of muffler*		Make			1 x 1,05€ = 1,05€	254-EN-00064
Material	Steel	*AISI 1020 130 x 130 x 2mm*		1 x 0,19€ = 0,19€	*0.26kg (0.71€/kg)*		
Process	Machining setup	*Setup to laser cut inlet housing cover*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*		
Process	Laser Cut	*Laser cut as per profile*		1 x 0,36€ = 0,36€	*0.01 hours, Laser Cut*		
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*		

Housing cover outlet	*cover open outlet of muffler*		Make	1 x 1,27€ = 1,27€	254-EN-00065
Material	Steel	*AISI 1020 130 x 130 x 2mm*		1 x 0,19€ = 0,19€	*0.265kg (0.71€/kg)*
Process	Machining setup	*Setup to laser cut outlet housing cover*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*
Process	Laser Cut	*Laser cut as per profile*		1 x 0,29€ = 0,29€	*0.01 hours, Laser cut*
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*
Material	Steel	*AISI 1020 2mm thick 380mm long 20mm wide*		1 x 0,08€ = 0,08€	*0.12kg (0.71€/kg)*
Tooling	Welding Fixure	*Fixture to weld cover and steel plate*		1 x 0,21€ = 0,21€	*Holding plate for clamping*

Perforated tube	*inner perforate profile to damp sound*		Make	1 x 5,47€ = 5,47€	254-EN-00066
Material	Steel	*4mm dia perforated steel sheet 2mm thick*		1 x 0,25€ = 0,25€	*0.35kg (0.71€/kg)*
Process	Machining setup	*To setup perforated sheet for laser cut*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*
Process	Laser Cut	*To cut sheet into 2 desired profiles*		1 x 0,50€ = 0,50€	*0.01 hours, Laser Cut*
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours, Semi skilled*
Process	Machining setup	*Setup to roll sheet into cone x2*		1 x 0,38€ = 0,38€	*0.86 hours, Semi skilled*
Process	Sheet metal process	*Rolling sheet to cone x2*		1 x 2,26€ = 2,26€	*0.15 hours, CNC sheet bending*
Process	Machining setup	*To remove job from machine.*		1 x 0,19€ = 0,19€	*0.86 hours, Semi skilled*
Process	Weld	*Seam welding both conics for venturi*		1 x 1,21€ = 1,21€	*0.09 hours, welding machine*
Tooling	Welding Fixure	*Fixture for welding of conics*		1 x 0,18€ = 0,18€	*Straight tube holding lower cone*

Muffler inlet	*tube to connect muffler to exhaust*		Make	1 x 0,31€ = 0,31€	254-EN-00067
Material	Steel	*Steel AISI 1020 Tube ID 44 OD 47*		1 x 0,26€ = 0,26€	*0.20kg (1.29€/kg)*
Process	Machining setup	*Setup for cutting tube*		1 x 0,02€ = 0,02€	*0.02 hours, semi-skilled*
Process	Cutting (Manual)	*Cutting tube at a length of 90mm*		1 x 0,01€ = 0,01€	*0.01 hours, mitter saw*
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.02 hours, semi-skilled*

Tail pipe	*direct exhaust gas coming out of muffler*		Make	1 x 0,74€ = 0,74€	254-EN-00068
Material	Steel	*Steel AISI 1020 Tube ID 30 OD 34 L 25*		1 x 0,05€ = 0,05€	*0.04kg (1.29€/kg)*
Process	Machining setup	*Setup to create 90 bend*		1 x 0,26€ = 0,26€	*0.29 hours, semi-skilled*
Process	Tube process	*CNC tube bending 40mm curvature*		1 x 0,03€ = 0,03€	*0.01 hours, Welding machine*
Process	Machining setup	*To remove job from machine.*		1 x 0,26€ = 0,26€	*0.29 hours, semi-skilled*
Process	Machining setup	*Setup for Cutting tube*		1 x 0,02€ = 0,02€	*0.02 hours, semi-skilled*
Process	Cutting (Manual)	*Cutting tube at 45 angle*		1 x 0,01€ = 0,01€	*0.01 hours, semi-skilled*
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.02 hours, semi-skilled*
Tooling	Welding Fixure	*Fixture to weld tail pipe housing cover*		1 x 0,09€ = 0,09€	*semicircular rest for tail pipe*

Muffler clamp	*to prevent vibration of muffler*		Make	1 x 2,39€ = 2,39€	254-EN-00070
Material	Aluminum	*Al 5052; Length-500mm; Width-20mm; T-1mm*		1 x 0,09€ = 0,09€	*0.03kg (3.23€/kg)*
Process	Machining setup	*Setup for sheet bending*		1 x 0,15€ = 0,15€	*0.06 hours, semi-skilled*
Process	Bending	*sheet bending as per profile*		1 x 1,75€ = 1,75€	*0.01 hours, sheet metal bending*

Process	Machining setup	*To remove job from machine.*		1 x 0,15€ = 0,15€	*0.06 hours, semi-skilled*	
Process	Machining setup	*To drill 6mm hole*		1 x 0,10€ = 0,10€	*0.05 hours semi skilled*	
Process	Drilled hole	*Drill 6mm hole on clamp x2*		1 x 0,05€ = 0,05€	*0.01 hours, drilling machine*	
Process	Machining setup	*To remove job from machine.*		1 x 0,10€ = 0,10€	*0.05 hours, semi skilled*	
Spring		*extra support for muffler*	Buy	3 x 0,44€ = 1,32€		254-EN-00071
Material	Bought Part	*Steel soft 15mm OD 50mm long*		1 x 0,44€ = 0,44€	*Rated 0.38 for 5cm and 0.12 cutting cost*	
Spring Attachments		*hooks to hold muffler springs*	Buy	3 x 0,52€ = 1,56€		254-EN-00069
Material	Bought Part	*Used to hold muffler intact*		1 x 0,52€ = 0,52€	*Steel hook 9mm dia*	

EN (Engine & Drivetrain)		**Other: Clutch Assembly**		*Pneumatic Clutch control*		281,71€	254-EN-A022
[Assembly Processes]				Make		1 x 4,69€ = 4,69€	254-EN-A022P
Process	Assemble		*Attach connector to valve x4*		1 x 0,07€ = 0,07€	*60sec, Semi skilled each for 4*	
Process	Assemble		*Align CO2 cylinder to chassis*		1 x 0,01€ = 0,01€	*60sec, Unskilled*	
Process	Assemble		*Align hose clamp to CO2 cylinder x2*		1 x 0,01€ = 0,01€	*30sec, Unskilled each for 2*	
Process	Fastener install (every)		*Tighten hose clamp to cylinder x2*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 2*	
Process	Other: Ratchet		*To tighten the fastener*		1 x 0,03€ = 0,03€	*50sec, Semi skilled each for 2*	
Process	Assemble		*Attach connector to stabilizer*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*	
Process	Assemble		*Attach 1 way flow control to valve*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*	
Process	Fastener install (every)		*Hex bolt 1/8 inch to valve x2*		1 x 0,01€ = 0,01€	*40sec, Semi skilled each for 2*	
Process	Assemble		*Attach pressure gauge to 1 way connector*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*	
Process	Assemble		*To connect lines to connectors x10*		1 x 0,06€ = 0,06€	*20sec, Unskilled each for 10*	
Process	Assemble		*To attach valve mount to valve x2*		1 x 0,01€ = 0,01€	*25sec, Semi skilled each for 2*	
Process	Fastener install (every)		*To fasten valve mount with M3 bolt x2*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 2*	
Process	Other: Ratchet		*To tighten the fastener*		1 x 0,03€ = 0,03€	*50sec, Semi skilled each for 2*	
Fastener	Hose Clamp		*65 open ID hose clamp*		2 x 1,00€ = 2,00€	*stainless steel*	
Process	Assemble		*Attach Stabiliser to CO2 cylinder*		1 x 0,01€ = 0,01€	*55sec, Semi skilled*	
Fastener	Bolt		*Hex bolt 1/4th inch*		2 x 1,00€ = 2,00€	*Brass material pneumatic port*	
Fastener	Bolt		*M3 1inch*		2 x 0,08€ = 0,16€	*Grade 12.9*	
Fastener	Nut		*M3 Lock nut*		2 x 0,10€ = 0,20€	*Grade 12.9*	
Fastener	Washer		*M3 For stress distribution*		4 x 0,01€ = 0,04€	*Grade 12.9*	
5/2 Solenoid Valve		*Directs gas flow.*		Buy		2 x 36,19€ = 72,38€	254-EN-00072
Material	Bought Part		*2 inlet 3 outlet pneumatic valve*		1 x 36,19€ = 36,19€	*Festo MFH-5-1/8*	
Pressure Gauge		*Mounted on pressure regulator*		Buy		1 x 7,51€ = 7,51€	254-EN-00073
Material	Bought Part		*display the pressure reading in lines*		1 x 7,51€ = 7,51€	*MA-40-10-1/8-EN*	
CO2 Gas Cylinder		*Aluminium Tank for gas storage*		Buy		1 x 28,44€ = 28,44€	254-EN-00074
Material	Bought Part		*Storage of CO2 upto 20oz*		1 x 28,44€ = 28,44€	*Tippmann 20z*	
Pressure Stabilizer		*Female type 0-250 psi output*		Buy		1 x 87,68€ = 87,68€	254-EN-00075
Material	Bought Part		*To regulate the pressure of gas flowing*		1 x 87,68€ = 87,68€	*Palmer Female pressure stabiliser*	
Valve Connectors		*Push type connectors*		Buy		4 x 7,24€ = 28,96€	254-EN-00076
Material	Bought Part		*Connect the pneumatic line to valve*		1 x 7,24€ = 7,24€	*Festo 1/8 connector*	

Pneumatic Lines	*PU pneumatic lines 10 bar*		Buy		1 x 0,45€ = 0,45€	254-EN-00077
Material	Bought Part	*Directs flow of CO2 in pneumatic system*		5 x 0,09€ = 0,45€	*350mm (0.26€; per m)*	
T connector	*Push type T connection*		Buy		1 x 7,65€ = 7,65€	254-EN-00078
Material	Bought Part	*for routing of gas to different Valve*		1 x 7,65€ = 7,65€	*Festo 3 way T connector*	
Pneumatic 2 way Piston	*Double actuating piston*		Buy		1 x 26,96€ = 26,96€	254-EN-00079
Material	Bought Part	*2 way piston for gear shift*		1 x 26,96€ = 26,96€	*Festo DSNU-32-320-P-A*	
Clutch Cable	*Cable connecting clutch lever and piston*		Make		1 x 0,26€ = 0,26€	254-EN-00080
Material	Other: Clutch Cable wire	*Bowden Cable 3.5mm dia*		1 x 0,17€ = 0,17€	*0.5m (0.35€ per m)*	
Process	Cutting (Manual)	*Cutting Clutch cable to a length of 2m*		1 x 0,09€ = 0,09€	*0.01 hours, miter saw*	
Stopper	*M5 nut bolt type*		Buy		1 x 0,19€ = 0,19€	254-EN-00081
Material	Bought Part	*Keeps the cable in tension*		1 x 0,19€ = 0,19€	*Stainless steel M5*	
Adjuster	*Adjuster bolt M6*		Buy		1 x 0,38€ = 0,38€	254-EN-00082
Material	Bought Part	*Directs clutch cable line*		1 x 0,38€ = 0,38€	*0.02 hours, semi-skilled*	
Pneumatic Silencer	*Pneumatic outlet silencer connector*		Buy		1 x 2,12€ = 2,12€	254-EN-00083
Material	Bought Part	*Reduce noise of gas coming out of valve*		1 x 2,12€ = 2,12€	*Festo 2307 silencer*	
1 way flow control valve	*directs flow in single channel*		Buy		1 x 14,04€ = 14,04€	254-EN-00084
Material	Bought Part	*Used to adjust slow release*		1 x 14,04€ = 14,04€	*Festo 1 way flow valve*	

EN (Engine & Drivetrain)	**Other: CO2 Gas.**	*Gas for pneumatic system*		0,22€	254-EN-A034
CO2 gas	*Used for push pull operations via piston*	Buy		1 x 0,22€ = 0,22€	254-EN-00131
Material Bought Part	*To be filled in cylinder*	1 x 0,22€ = 0,22€	*1.13kg (0.193€; per kg)*		

EN (Engine & Drivetrain)	**Other: Lubrication Assembly**		*Lubrication Assembly*		931,93€	254-EN-A023
[Assembly Processes]			Make		1 x 5,91€ = 5,91€	254-EN-A023P
Process	Other: Disassemble	*Removal of Water Pump from engine*		1 x 0,05€ = 0,05€	*165sec, Semi skilled*	
Process	Other: Disassemble	*Removal of Wet sump from engine*		1 x 0,13€ = 0,13€	*490 sec,Semi skilled*	
Process	Assemble	*OP seat, weld in ext., weld in fitting*		1 x 0,01€ = 0,01€	*55sec, Unskilled*	
Process	Weld	*Welding at different spots*		1 x 1,07€ = 1,07€	*0.09 hours, welding machine*	
Process	Other: Adhesive	*Gasket on pan*		1 x 0,06€ = 0,06€	*180sec, Semi skilled*	
Process	Assemble	*Sump pan with engine*		1 x 0,03€ = 0,03€	*120sec, Unskilled*	
Process	Fastener install (every)	*Engine Bolts with engine x12*		1 x 0,11€ = 0,11€	*40sec, Unskilled each for 12*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,18€ = 0,18€	*50sec, Semi skilled each for 12*	
Process	Assemble	*Socket fitting, olive on SSH x 8*		1 x 0,27€ = 0,27€	*120sec, Semi skilled each for 8*	
Process	Assemble	*Teflon tape on Weld-in fitting x 8*		1 x 0,14€ = 0,14€	*60sec, Semi skilled each for 8*	
Process	Assemble	*Socket fitting tighten on various parts*		1 x 0,20€ = 0,20€	*90sec, Semi skilled each for lettr*	
Process	Assemble	*Scavenge pump on engine*		1 x 0,08€ = 0,08€	*300sec, Semi skilled*	
Process	Fastener install (every)	*M6 bolts on scavenge pump x3*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 3*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,05€ = 0,05€	*50sec, Semi skilled*	
Process	Assemble	*Socket fitting on weld in fitting x 2*		1 x 0,06€ = 0,06€	*90sec, Semi skilled each for 2*	
Process	Assemble	*Weld in fitting on scavenge pump inlets*		1 x 0,01€ = 0,01€	*60sec, Unskilled*	
Process	Assemble	*Reservoir tank on chassis tab*		1 x 0,01€ = 0,01€	*60sec, Unskilled*	
Process	Fastener install (every)	*M6 bolt,nut, washer(2) on tab x2*		1 x 0,01€ = 0,01€	*25sec, Unskilled each for 2*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,03€ = 0,03€	*66sec, Semi skilled each for 2*	
Process	Assemble	*Vent line to catch can*		1 x 0,01€ = 0,01€	*60sec, Unskilled*	
Process	Assemble	*Hose on tube & catch can*		1 x 0,03€ = 0,03€	*60sec, Semi skilled each for 2*	
Process	Assemble	*Hose clamp worm gear on hose*		1 x 0,01€ = 0,01€	*60sec, Unskilled*	
Process	Fastener install (every)	*OD-35.6mm*		1 x 0,52€ = 0,52€	*Hose Clamp on hose*	
Fastener	Bolt	*M6 Engine Bolts*		12 x 0,14€ = 1,68€	*Grade 10.8*	
Fastener	Bolt	*M6 bolts*		5 x 0,05€ = 0,25€	*Grade 12.9*	
Fastener	Nut	*M6 Lock nut*		2 x 0,13€ = 0,26€	*Grade 12.9*	
Fastener	Washer	*M6 For stress distribution*		4 x 0,03€ = 0,12€	*Grade 12.9*	
Fastener	Hose Clamp	*OD 35.6mm*		1 x 0,52€ = 0,52€	*Worm gear type*	

Sump Pan	*Temporary Oil Collector*		Make		1 x 168,47€ = 168,47€	254-EN-00086
Material	Aluminum	*7075-T6; Billet*		1 x 42,90€ = 42,90€	*12.77kg (3.36€/kg)*	
Process	Machining setup	*To set up billet for end milling.*		1 x 0,25€ = 0,25€	*0.29 hours semi skilled*	
Process	Machining	*End milling of inner volume.*		1 x 48,16€ = 48,16€	*1.23 hours VMC*	
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours semi skilled*	
Process	Machining setup	*To setup billet for face and end milling*		1 x 0,25€ = 0,25€	*0.29 hours semi skilled*	
Process	Machining	*Face and end milling for outer profile.*		1 x 73,71€ = 73,71€	*1.23 hours VMC*	
Process	Machining setup	*To remove job from machine.*		1 x 0,25€ = 0,25€	*0.29 hours semi skilled*	
Tooling	Welding Fixure	*Steel welding fixture*		1 x 2,70€ = 2,70€	*Block Fixture holding sump*	

Reservoir Tank	*Oil storage unit.*		Make	1 x 21,75€ = 21,75€	254-EN-00087
Material	Aluminum	*6061 sheet; 520 x 445 x 2 mm*		1 x 4,19€ = 4,19€	*1.25kg (0.71€/kg)*
Material	Aluminum	*5052 Tube; OD 22 x 4;OD 32 x 4.5*		1 x 3,97€ = 3,97€	*1.23 kg(3.23 euro per kg)*
Process	Machining setup	*To set up sheet for laser cut.*		1 x 0,17€ = 0,17€	*0.19 hours semi skilled*
Process	Laser Cut	*Laser cut to obtain profile*		1 x 8,07€ = 8,07€	*0.19 hours laser cut*
Process	Machining setup	*To remove job from machine.*		1 x 0,17€ = 0,17€	*0.19 hours semi skilled*
Process	Machining setup	*To set up sheet for bending.*		1 x 0,02€ = 0,02€	*0.01 hours semi skilled*
Process	Sheet metal process	*Bending Cylindrical Profile*		1 x 0,64€ = 0,64€	*0.08 hours CNC bending machine*
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.01 hours semi skilled*
Process	Machining setup	*To setup machine for cutting tube.*		1 x 0,01€ = 0,01€	*0.01 hours semi skilled*
Process	Cutting (Manual)	*Cut tubes to required length*		1 x 0,02€ = 0,02€	*0.01 hours miter saw*
Process	Machining setup	*to remove job from machine*		1 x 0,01€ = 0,01€	*0.01 hours semi skilled*
Process	Machining setup	*To setup machine for cutting tubes.*		1 x 0,01€ = 0,01€	*0.01 hours semi skilled*
Process	Cutting (Manual)	*1 piece diagonal cut*		1 x 0,01€ = 0,01€	*0.01 hours miter saw*
Process	Machining setup	*To remove job from machine.*		1 x 0,01€ = 0,01€	*0.01 hours semi skilled*
Process	Weld	*Full weld*		1 x 1,98€ = 1,98€	*0.19 hours welding machine*
Tooling	Welding Fixure	*Steel Welding Fixture*		1 x 2,45€ = 2,45€	*Fixture holding Reservoir*

Mechanical Oil Pump Seat	*Leak Proof Seal.*		Make	1 x 0,11€ = 0,11€	254-EN-00088
Material	Aluminum	*6061 Tube; OD 25x 2mm*		1 x 0,05€ = 0,05€	*0.015kg (2.91€/kg)*
Process	Machining setup	*To setup machine for cutting.*		1 x 0,02€ = 0,02€	*0.01 hours unskilled*
Process	Cutting (Manual)	*To cut required length of tube.*		1 x 0,02€ = 0,02€	*0.01 semi skilled*
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.01 unskilled*

Scavenge Pump	*Directs oil in sump to reservoir.*		Buy	1 x 553,90€ = 553,90€	254-EN-00089
Material	Bought Part	*two way inlet single outlet*		1 x 553,90€ = 553,90€	*Dailey Engineering; SP 2 stage*

Weld In Extension	*Lubrication Assembly*		Make	1 x 1,95€ = 1,95€	254-EN-00090
Material	Aluminum	*6061 Tube; OD 19 x 2.5mm; Length-70mm*		1 x 0,07€ = 0,07€	*0.02kg (2.91€ per kg)*
Material	Aluminum	*6061 Tube; OD 21 x 2mm; Length-10mm*		1 x 0,01€ = 0,01€	*0.003kg (2.91€ per kg)*
Process	Machining setup	*To setup machine for cutting tube*		1 x 0,20€ = 0,20€	*0.01 hours semi skilled*
Process	Cutting (Manual)	*Cut tube(OD 19mm) into 12 parts*		1 x 0,60€ = 0,60€	*0.12 hours mitter saw*
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.01hours semi skilled*
Process	Machining setup	*To setup machine for cutting tube*		1 x 0,14€ = 0,14€	*0.02hours semi skilled*
Process	Cutting (Manual)	*Cut tube(OD 25mm) into 3 parts*		1 x 0,60€ = 0,60€	*0.15hours semi skilled*
Process	Machining	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.09 hours semi skilled*
Process	Weld	*To weld tubes together.*		1 x 0,07€ = 0,07€	*0.05 hours skilled*
Tooling	Welding Fixure	*Steel welding fixture*		1 x 0,22€ = 0,22€	*V block support for extension*

Metal Braided Hose	*To connect sump and scavenge pump.*		Buy		2 x 0,79€ = 1,58€	254-EN-00091
Material	Bought Part	*Oil flows from sump to scavenge pump*		1 x 0,79€ = 0,79€	*BMRS Low Pressure PN: AR-10-S for 25cm*	
Metal Braided Hose	*To connect scavenge pump and reservoir.*		Buy		1 x 1,85€ = 1,85€	254-EN-00092
Material	Bought Part	*Oil flow from scavenge pump to reservoir*		1 x 1,85€ = 1,85€	*BMRS Low Pressure PN:AR-12-S for 0.5m*	
Metal Braided Hose	*To connect reservoir and sump.*		Buy		1 x 2,14€ = 2,14€	254-EN-00093
Material	Bought Part	*Oil flow from reservoir to sump*		1 x 2,14€ = 2,14€	*BMRS Low Pressure PN:AR-16-S for 0.5m*	
Socket Fitting	*To connect oil hoses.*		Buy		4 x 10,07€ = 40,28€	254-EN-00094
Material	Bought Part	*provide a leak proof connection*		1 x 10,07€ = 10,07€	*BMRS socket Fitting PN: AR-10-F3*	
Socket Fitting	*To connect oil hoses.*		Buy		2 x 11,38€ = 22,76€	254-EN-00095
Material	Bought Part	*provide a leak proof connection*		1 x 11,38€ = 11,38€	*BMRS socket Fitting PN: AR-12-F3*	
Socket Fitting	*To connect oil hoses.*		Buy		2 x 16,74€ = 33,48€	254-EN-00096
Material	Bought Part	*provide a leak proof connection*		1 x 16,74€ = 16,74€	*BMRS socket Fitting PN: AR-16-F3*	
Olive	*Inline between hose and connector*		Buy		4 x 2,56€ = 10,24€	254-EN-00097
Material	Bought Part	*To seal the lines at connectors*		1 x 2,56€ = 2,56€	*BMRS Olive PN: AR-O-10*	
Olive	*Inline between hose and connector*		Buy		2 x 3,04€ = 6,08€	254-EN-00098
Material	Bought Part	*To seal the lines at connectors*		1 x 3,04€ = 3,04€	*BMRS Olive PN: AR-O-12*	
Olive	*Inline between hose and connector*		Buy		2 x 3,19€ = 6,38€	254-EN-00099
Material	Bought Part	*To seal the lines at connectors*		1 x 3,19€ = 3,19€	*BMRS Olive PN: AR-O-16*	
Weld Fitting	*To connect Socket fitting.*		Buy		5 x 6,15€ = 30,75€	254-EN-00100
Material	Bought Part	*leak proof socket connection*		1 x 6,15€ = 6,15€	*BMRS Weld In fitting PN:W0-16-JJ*	
Weld Fitting	*To connect Socket fitting.*		Buy		2 x 5,74€ = 11,48€	254-EN-00101
Material	Bought Part	*Leak proof socket connection*		1 x 5,74€ = 5,74€	*BMRS Weld In fitting PN:W0-12-JJ*	
Weld Fitting	*To connect Socket fitting.*		Buy		2 x 4,96€ = 9,92€	254-EN-00102
Material	Bought Part	*Leak proof socket connection*		1 x 4,96€ = 4,96€	*BMRS Weld In fitting PN:W0-10-JJ*	

Teflon Tape		*To prevent leak from threaded connectors*	Buy		1 x 0,06€ = 0,06€	254-EN-00103
Material	Bought Part	*12mm width*		6 x 0,01€ = 0,06€	*50mm (0.024€; per m)*	
Rubber Hose		*To connect reservoir and catch can.*	Buy		1 x 2,32€ = 2,32€	254-EN-00104
Material	Bought Part	*OD- 34 x 4.5 mm*		1 x 2,32€ = 2,32€	*Silicon based flexible hose*	
Vent Line		*To remove oil vapours from catch can.*	Buy		1 x 0,52€ = 0,52€	254-EN-00105
Material	Bought Part	*Transparent Polyurathene*		1 x 0,52€ = 0,52€	*800mm (0.64€; per m)*	

EN (Engine & Drivetrain)	**Other: Pressure Cap**		*Cooling line assembly.*		73,35€	254-EN-A024
Pressure Cap	*Installed at top most point*		Buy		1 x 73,35€ = 73,35€	254-EN-00106
Material Bought Part		*Prevents vapour buildup in line*		1 x 73,35€ = 73,35€	*OEM Honda 1.4 bar pressure cap*	

EN (Engine & Drivetrain)	**Other: Sealant**		*To seal parts.*		28,90€	254-EN-A025
Gasket maker	*To create a gas tight seal.*		Buy		1 x 2,70€ = 2,70€	254-EN-00107
Material Bought Part		*Applied to seal sump to engine*		1 x 2,70€ = 2,70€	*Anabond RED high Temp. RTV Silicone 85g*	
Gasket Paper	*To create a gas sight seal.*		Buy		1 x 5,93€ = 5,93€	254-EN-00108
Material Bought Part		*Installed between muffler and exhaust*		1 x 5,93€ = 5,93€	*Flexoid 0.5mm gasket paper*	
Silicon Sealant	*To create a gas tight seal.*		Buy		1 x 20,27€ = 20,27€	254-EN-00109
Material Bought Part		*To seal intake manifold parts*		1 x 20,27€ = 20,27€	*Liqui Moly Silicone sealant*	

EN (Engine & Drivetrain)	**Other: Shifter Assembly**		*For pneumatic gear shifting*		297,58€	254-EN-A026
[Assembly Processes]			Make		1 x 0,72€ = 0,72€	254-EN-A026P
Process	Assemble	*Attach connector to valve x 6*		1 x 0,01€ = 0,01€	*42sec, Semi skilled each for 6*	
Process	Assemble	*Attach stabilizer to CO2 cylinder.*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*	
Process	Assemble	*Attach gauge to stabilizer*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*	
Process	Assemble	*Attach piston connector to piston x 2*		1 x 0,03€ = 0,03€	*60sec, Semi skilled each for 2*	
Process	Assemble	*Attach connector to stabilizer*		1 x 0,01€ = 0,01€	*60sec, Semi skilled*	
Process	Assemble	*Align CO2 cylinder to chassis*		1 x 0,01€ = 0,01€	*50sec, Unskilled*	
Process	Assemble	*Align hose clamp to CO2 cylinder x 2*		1 x 0,01€ = 0,01€	*30sec, Unskilled each for 2*	
Process	Fastener install (every)	*To tighten hose clamps for cylinder*		1 x 0,03€ = 0,03€	*50sec, Semi skilled each for 2*	
Process	Assemble	*Connect pneumatic lines to connectors*		1 x 0,06€ = 0,06€	*20sec, Unskilled each for 10 years*	
Process	Assemble	*Hex bolt 1/4 inch on valve x4*		1 x 0,01€ = 0,01€	*12sec, Unskilled for 4*	
Process	Fastener install (every)	*To tighten hex bolts on valve*		1 x 0,01€ = 0,01€	*20sec, Unskilled each for 4*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,03€ = 0,03€	*50sec, semi skilled each for 2*	
Process	Assemble	*To attach valve mounts to valve x2*		1 x 0,01€ = 0,01€	*22sec, Semi skilled each for 2*	
Process	Fastener install (every)	*To fasten valve mounts with M3 bolt x2*		1 x 0,01€ = 0,01€	*30sec, Unskilled each for 2*	
Process	Other: Ratchet	*To tighten the fastener*		1 x 0,03€ = 0,03€	*50sec, Semi skilled each for 1*	
Fastener	Bolt	*Hex bolt 1/4 inch*		4 x 0,01€ = 0,04€	*Brass pneumatic*	
Fastener	Bolt	*M3 Length 1 inch*		2 x 0,08€ = 0,16€	*Grade 12.9*	
Fastener	Nut	*M3 Lock nut*		2 x 0,10€ = 0,20€	*Grade 12.9*	
Fastener	Washer	*M3 for stress distribution*		4 x 0,01€ = 0,04€	*Grade 12.9*	
CO2 Gas Cylinder	*Aluminium tank for gas storage*		Buy		1 x 28,44€ = 28,44€	254-EN-00110
Material	Bought Part	*Storage of CO2 upto 20oz*		1 x 28,44€ = 28,44€	*Tippmann 20z*	
Pressure Stabilizer	*Female type 0-250 psi output*		Buy		1 x 87,68€ = 87,68€	254-EN-00111
Material	Bought Part	*To regulate the pressure of gas flowing*		1 x 87,68€ = 87,68€	*Palmer Female pressure stabiliser*	
Pressure Gauge	*Mounted on pressure regulator*		Buy		1 x 7,51€ = 7,51€	254-EN-00112
Material	Bought Part	*display the pressure reading in lines*		1 x 7,51€ = 7,51€	*MA-40-10-1/8-EN*	
5/2 Solenoid Vavle	*Directs gas flow.*		Buy		2 x 36,19€ = 72,38€	254-EN-00113
Material	Bought Part	*2 inlet 3 outlet pneumatic valve*		1 x 36,19€ = 36,19€	*Festo MFH-5-1/8*	
Valve Connectors	*Push Type connectors*		Buy		7 x 7,24€ = 50,68€	254-EN-00114
Material	Bought Part	*Connect the pneumatic line to valve*		1 x 7,24€ = 7,24€	*Festo 1/8 connector*	

Piston connector		*To connect pneumatic lines to piston*		Buy	2 x 7,24€ = 14,48€	254-EN-00115
Material	Bought Part	*Attached to piston for lines*		1 x 7,24€ = 7,24€	*Festo connectors*	
Pneumatic Lines		*PU pneumatic lines 10 bar*		Buy	1 x 0,45€ = 0,45€	254-EN-00116
Material	Bought Part	*Directs flow of CO2 in pneumatic system*		5 x 0,09€ = 0,45€	*350mm (0.26€; per m)*	
Pneumatic 2 way Piston		*2 way acting piston to shift gear.*		Buy	1 x 26,96€ = 26,96€	254-EN-00117
Material	Bought Part	*2 way for clutch actuation*		1 x 26,96€ = 26,96€	*Festo DSNU-32-320-P-A*	
T connector		*Push type T connection*		Buy	1 x 7,65€ = 7,65€	254-EN-00118
Material	Bought Part	*for routing of fas to different Valve*		1 x 7,65€ = 7,65€	*Festo 3 way T connector*	
Shifter Lever		*To transmit piston motion to transmissio*		Make	1 x 0,63€ = 0,63€	254-EN-00119
Material	Steel	*AISI 1020 rod for shifter lever OD13mm*		1 x 0,04€ = 0,04€	*0.05 kg (1.29 euro per kg)*	
Material	Steel	*AISI 1020 for extension.*		1 x 0,04€ = 0,04€	*0.05 kg(1.29 euro per kg)*	
Process	Machining setup	*To setup machine for laser cut.*		1 x 0,03€ = 0,03€	*0.04 hours , semi skilled*	
Process	Laser Cut	*To laser cut the required profile.*		1 x 0,38€ = 0,38€	*0.01 hours , laser cut*	
Process	Machining setup	*To remove job from machine.*		1 x 0,03€ = 0,03€	*0.04 hours , semi skilled*	
Process	Weld	*To weld Shifter lever*		1 x 0,04€ = 0,04€	*0.01 hours , welding machine*	
Tooling	Welding Fixure	*Steel welding fixture*		1 x 0,07€ = 0,07€	*Fixture for L joint*	

EN (Engine & Drivetrain)	**Overflow Bottles**					7,50€	254-EN-A027
Catch Can	*Aluminium water bottle*		Buy			2 x 3,75€ = 7,50€	254-EN-00121
Material Bought Part		*Stores excess oil and coolant*		1 x 3,75€ = 3,75€	*RJM Aluminium bottle*		

EN (Engine & Drivetrain)		**Radiator**				176,45€	254-EN-A028
Radiator		*Responsible for cooling of coolant.*		Make		1 x 25,79€ = 25,79€	254-EN-00122
Material	Aluminum	*Core Al 6061; 28X28X3.2 cm*			1 x 10,68€ = 10,68€	*Radiator Core Mahle*	
Material	Aluminum	*6061 sheet 450mm x 600mm x 2mm*			1 x 4,90€ = 4,90€	*1.46kg (3.34€/kg)*	
Process	Machining setup	*To set up sheet for laser cut.*			1 x 0,16€ = 0,16€	*0.19 hours, semi-skilled*	
Process	Laser Cut	*To laser cut the required profile*			1 x 4,85€ = 4,85€	*0.15 hours, CO2 laser cut*	
Process	Machining setup	*To remove job from machine.*			1 x 0,16€ = 0,16€	*0.19 hours, semi-skilled*	
Process	Weld	*Seam weld*			1 x 4,79€ = 4,79€	*0.238 hours, TIG welding machine*	
Tooling	Welding Fixure	*Steel Fixture for radiator base and top*			1 x 0,25€ = 0,25€	*Single L fixture*	
Davis Craig Electric pump		*Responsible for Constant coolant flow.*		Buy		1 x 150,66€ = 150,66€	254-EN-00123
Material	Bought Part	*Maintains constant coolant flow rate*			1 x 150,66€ = 150,66€	*12V nylon EWP115*	

EN (Engine & Drivetrain)		**Radiator Fans**			92,43€	254-EN-A029
Spal Fan		*To achieve required flow rate of air*	Buy		1 x 81,04€ = 81,04€	254-EN-00124
Material	Bought Part	*maintain enough air flow for cooling*		1 x 81,04€ = 81,04€	*10" ; 800 cfm PN:VA11-AP7/C-57A*	
Shroud		*Used to attach fan to radiator.*	Make		1 x 11,39€ = 11,39€	254-EN-00125
Material	Aluminum	*6061 sheet; 2mm thick*		1 x 2,24€ = 2,24€	*0.665kg (3.36€/kg)*	
Process	Machining setup	*To set up sheet for laser cut.*		1 x 0,07€ = 0,07€	*0.20 hours, semi-skilled*	
Process	Laser Cut	*To laser cut the required profile*		1 x 7,70€ = 7,70€	*0.33 hours, CO2 laser cut*	
Process	Machining setup	*To remove job from machine.*		1 x 0,07€ = 0,07€	*0.20 hours, semi-skilled*	
Process	Weld	*Seam weld*		1 x 1,31€ = 1,31€	*0.10 Hours, TIG weld*	

EN (Engine & Drivetrain)		**Restrictor**			52,61€	254-EN-A030
Restrictor		*To restrict air flow as per rule.*	Make	1 x 52,61€ = 52,61€		254-EN-00126
Material	Plastic	*Nylon- PA12*		1 x 5,44€ = 5,44€	*0.060kg (90.70€/kg)*	
Process	Machining setup	*To setup machine for 3D printing.*		1 x 0,17€ = 0,17€	*0.19 hours skilled*	
Process	Rapid Prototype	*Multi jet fusion for 3D printing.*		1 x 47,00€ = 47,00€	*3.96 hours, MJF*	

EN (Engine & Drivetrain)	**Shields**				13,56€	254-EN-A031
[Assembly Processes]			Make	1 x 0,51€ = 0,51€		254-EN-A031P
Process	Assemble	*To align scatter shield to chassis*		1 x 0,01€ = 0,01€	*50sec, Unskilled*	
Process	Fastener install (every)	*To align bolt, nut and washers x 2*		1 x 0,01€ = 0,01€	*30sec, unskilled each for 2*	
Process	Other: Ratchet	*To tighten the faster x 2*		1 x 0,01€ = 0,01€	*66sec, Semi skilled each for 2*	
Fastener	Bolt	*M6 1 inch*		2 x 0,05€ = 0,10€	*Grade 12.9*	
Fastener	Nut	*M6 Lock nut*		2 x 0,13€ = 0,26€	*Grade 12.9*	
Fastener	Washer	*M6 for weight distribution*		4 x 0,03€ = 0,12€	*Grade 12.9*	

Scatter Shield	*Provide protection against rotating part*		Make	1 x 13,05€ = 13,05€		254-EN-00127
Material	Steel	*AISI 1020, L-530mm B-86mm T-2.4mm*		1 x 0,61€ = 0,61€	*0.86kg (0.71€ per kg)*	
Process	Machining setup	*To setup machine for laser cut*		1 x 0,17€ = 0,17€	*0.20 hours, semi-skilled*	
Process	Laser Cut	*To laser cut as per profile*		1 x 10,42€ = 10,42€	*0.33 hours, CO2 laser cut*	
Process	Machining setup	*To remove job from machine.*		1 x 0,17€ = 0,17€	*0.20 hours, semi-skilled*	
Process	Machining setup	*To setup machine for sheet bending*		1 x 0,02€ = 0,02€	*0.03 hours, semi-skilled*	
Process	Sheet metal process	*To bend sheet as per profile*		1 x 0,52€ = 0,52€	*0.10 hours, sheet metal bending*	
Process	Machining setup	*To remove job from machine.*		1 x 0,02€ = 0,02€	*0.03 hours, semi-skilled*	
Process	Weld	*To weld tabs to shield*		1 x 0,99€ = 0,99€	*0.09 hours, TIG welding*	
Tooling	Welding Fixure	*Steel welding fixture*		1 x 0,13€ = 0,13€	*Support strip for holding tab*	

EN (Engine & Drivetrain)		**Sprocket/Pulleys**				47,81€	254-EN-A032
Sprocket		*To maintain final drivetrain ratio.*		Make		1 x 12,24€ = 12,24€	254-EN-00128
Material	Aluminum	*Al 7075-T6 Sheet; 240 x 240 x 6.4mm*			1 x 2,84€ = 2,84€	*0.37kg (7.75€ per kg)*	
Process	Machining setup	*To set up sheet for laser cut.*			1 x 0,25€ = 0,25€	*0.29 hours, semi-skilled*	
Process	Laser Cut	*Teeth and Inner profile; 37 Teeth*			1 x 8,90€ = 8,90€	*0.18 hours, semi-skilled*	
Process	Machining setup	*To remove finished part from machine.*			1 x 0,25€ = 0,25€	*0.29 hours, semi-skilled*	
Sprocket Adaptor		*Connect sprocket to differential*		Make		1 x 35,57€ = 35,57€	254-EN-00129
Material	Aluminum	*Al 7075-T6; Dia 32mm Length 118mm*			1 x 2,07€ = 2,07€	*0.266kg (7.75€/kg)*	
Process	Machining setup	*To set up billet for machining.*			1 x 0,16€ = 0,16€	*0.18 hours, semi-skilled*	
Process	Machining	*Milling from Top*			1 x 16,66€ = 16,66€	*0.40 hours, semi-skilled*	
Process	Machining setup	*To remove job from machine.*			1 x 0,16€ = 0,16€	*0.18 hours, semi-skilled*	
Process	Machining setup	*To set up billet for machining.*			1 x 0,16€ = 0,16€	*0.18 hours , semi-skilled*	
Process	Machining	*Milling from bottom(Surface finish)*			1 x 8,33€ = 8,33€	*0.27 hours, semi-skilled*	
Process	Machining setup	*To remove job from machine.*			1 x 0,16€ = 0,16€	*0.18 hours, semi-skilled*	
Process	Machining setup	*To set up billet for spline cutting.*			1 x 0,08€ = 0,08€	*0.18 hours, semi-skilled*	
Process	Broach	*Internal splines; 4mm thick*			1 x 7,71€ = 7,71€	*0.33 hours, vertical broaching machine*	
Process	Machining setup	*To remove finished part from machine.*			1 x 0,08€ = 0,08€	*0.18 hours, semi-skilled*	

EN (Engine & Drivetrain)		**Throttle Body**				26,34€	254-EN-A033
Throttle body		*Mounted before restrictor*		Buy		1 x 26,34€ = 26,34€	254-EN-00130
Material	Bought Part		*Control amount of air entering cylinder*		1 x 26,34€ = 26,34€	*Maruti Stock PN:13421M8xxxx*	

FR (Chassis & Body)	**Aerodynamics Front Wing**			254-FR-A001
Intermediate End Plate	*CFRP-Balsa Core Sandwich laminate*	Make	2 x	254-FR-00001
Inner End Plate	*CFRP-Balsa Core Sandwich laminate*	Make	2 x	254-FR-00002
Mounts	*Al 6061-T6 Laser Cut plate*	Make	2 x	254-FR-00003
Mounting Brackets	*AL-6061-T6 Machined brackets*	Make	4 x	254-FR-00004
L Brackets	*CFRP L brackets, to support the Endplate*	Make	8 x	254-FR-00005

FR (Chassis & Body)	**Aerodynamics Front Wing => FW Main Element**			254-FR-A002
Foam Core Envelope	*CFRP laminate over machined PU-foam*	Make	1 x	254-FR-00006
Ribs	*3mm balsa cutouts in aero profile*	Make	2 x	254-FR-00007

FR (Chassis & Body)	**Aerodynamics Front Wing => FW Multi Element Flap (Large)**			254-FR-A003
Foam Core Envelope	*CFRP laminate over machined PU-foam*	Make	2 x	254-FR-00008
RIbs	*3mm balsa cutouts in aero profile*	Make	4 x	254-FR-00009
Gurney Flap	*CFRP laminate, to generate downforce*	Make	2 x	254-FR-00010

FR (Chassis & Body)	**Aerodynamics Front Wing => FW Multi Element Flap (Small)**			254-FR-A004
Foam Core Envelope	*CFRP laminate over machined PU-foam*	Make	2 x	254-FR-00011
Ribs	*3mm balsa cutouts in aero profile*	Make	4 x	254-FR-00012

FR (Chassis & Body)	**Aerodynamics Front Wing => FW Outer End Plate**			254-FR-A005
End plate	*CFRP-Balsa Core Sandwich laminate Panel*	Make	2 x	254-FR-00013
Foot plate	*CFRP laminate to generate vortex*	Make	2 x	254-FR-00014
End Plate Gurney Flap	*CFRP laminate, sustain foot plate vortex*	Make	2 x	254-FR-00015

FR (Chassis & Body)	**Aerodynamics Rear Wing**			254-FR-A006
End Plate	*CFRP-Balsa Sandwich Laminate Panel*	Make	2 x	254-FR-00016

FR (Chassis & Body)	**Aerodynamics Rear Wing => RW Main Element**			254-FR-A007
Upper Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00017
Lower Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00018
Spar (Large)	*CFRP Manufactured Laminate, for rigidity*	Make	2 x	254-FR-00019
Spar (Small)	*CFRP Manufactured Laminate, for rigidity*	Make	2 x	254-FR-00020
Ribs	*AL-6061-T6 Laser Cut plate*	Make	2 x	254-FR-00021

FR (Chassis & Body)	**Aerodynamics Rear Wing => RW Mounting**			254-FR-A008
Support Tubes	*CFRP Tubes, to suspend the Wing*	Make	5 x	254-FR-00022
Tube Inserts	*AL-7075-T6 Inserts, to fasten the tubes*	Make	10 x	254-FR-00023
Tube Mounting Brackets	*AL-6061-T6 Machined Brackets*	Make	4 x	254-FR-00024

FR (Chassis & Body)	**Aerodynamics Rear Wing => RW Multi Element Flap (Intermed**			254-FR-A009
Upper Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00025
Lower Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00026
Ribs	*AL-6061-T6 Laser Cut plate*	Make	2 x	254-FR-00027
Spar	*CFRP Structure, for rigidity*	Make	1 x	254-FR-00028

FR (Chassis & Body)	**Aerodynamics Rear Wing => RW Multi Element Flap (Large)**			254-FR-A010
Upper Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00029
Lower Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00030
Ribs	*AL-6061-T6 Laser Cut plate*	Make	2 x	254-FR-00031
Spar	*CFRP Structure, for rigidity*	Make	1 x	254-FR-00032

FR (Chassis & Body)	**Aerodynamics Rear Wing => RW Multi Element Flap (Small)**			254-FR-A011
Upper Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00033
Lower Half	*CFRP Manufactured Laminate*	Make	1 x	254-FR-00034
Ribs	*AL-6061-T6 Laser Cut plate*	Make	2 x	254-FR-00035
Spar	*CFRP structure, for rigidity*	Make	1 x	254-FR-00036

FR (Chassis & Body)	**Body Attachments => Nose**			254-FR-A012
Upper Half	*3 layered Monolithic CFRP laminate*	Make	1 x	254-FR-00037
Lower Half	*3 layered Monolithic CFRP laminate*	Make	1 x	254-FR-00038

FR (Chassis & Body)	**Body Attachments => Side Panel**			254-FR-A013
Side Panel (Left)	*CFRP-GFRP Honeycomb Sandwich Structure*	Make	1 x	254-FR-00039
Side Panel (Right)	*CFRP-GFRP Honeycomb Sandwich Structure*	Make	1 x	254-FR-00040

FR (Chassis & Body)	**Body Attachments => Sidepods**			254-FR-A014
Left Sidepod	*CFRP-GFRP Hybrid Laminate*	Make	1 x	254-FR-00041
Right Sidepod	*CFRP-GFRP Hybrid Laminate*	Make	1 x	254-FR-00042
L Mounts	*L-shaped CFRP Laminate*	Make	4 x	254-FR-00043

FR (Chassis & Body)	**Chassis Assembly => Assembly Mounting**			254-FR-A015
Front Wing Tabs	*Double Shear (3mm), to mount the wing*	Make	8 x	254-FR-00044
Rear Wing Brackets	*MS (3mm), to mount the CF tubes*	Make	3 x	254-FR-00045
Rear Wing tabs	*MS (3mm), to mount the CF tubes*	Make	4 x	254-FR-00046
Brake Reservoir Tabs	*Single Shear, to mount the Reservoir*	Make	2 x	254-FR-00047
BOTS tab	*Single Shear, to mount the BOTS*	Make	1 x	254-FR-00048
Pedal Rail tabs	*Double Shear, to mount the Pedal Rail*	Make	12 x	254-FR-00049
ARB clamp Tabs	*Single shear, to Mount the ARB*	Make	2 x	254-FR-00050
Electrical Box Tabs	*Single Shear, to mount the box*	Make	4 x	254-FR-00051
Dis-Hose Fastener Tabs	*Single Shear, to mount the Nose*	Make	4 x	254-FR-00052
Front Bell Crank Tabs	*Double Shear, to mount Bell Cranks*	Make	4 x	254-FR-00053
Rear Bell Crank Tabs	*Double Shear, to mount Bell Cranks*	Make	4 x	254-FR-00054
Damper Mount Tabs	*Double Shear, to mount the Dampers*	Make	2 x	254-FR-00055
Bevel Casing Tabs	*Single Shear MS (4mm), to mount casing*	Make	3 x	254-FR-00056
Steering O-clamp mount	*MS (3mm), tubes for shaft bearing*	Make	2 x	254-FR-00057
Steering Rack Tabs	*Single shear MS (3mm), for the Rack*	Make	4 x	254-FR-00058

Dashboard Tabs	*Single Shear, to mount the Dashboard*	Make	2 x	254-FR-00059
Front Control Arm Tabs	*Double Shear MS (3mm) for Control Arms*	Make	16 x	254-FR-00060
Rear Control Arm Tabs	*Double Shear MS (3mm) for Control Arms*	Make	20 x	254-FR-00061
Seat Mounts	*Single shear MS (3mm), to mount the seat*	Make	2 x	254-FR-00062
Lap Belt Mounts	*Single shear MS (3mm), for the Lap Belt*	Make	2 x	254-FR-00063
Shoulder Belt Tabs	*Single Shear MS (3mm), Shoulder belt*	Make	2 x	254-FR-00064
Anti-Sub Belt Tabs	*Single shear MS (3mm), for Anti-sub belt*	Make	2 x	254-FR-00065
Oil Reservoir Tabs	*Single Shear MS (3mm), mount Reservoir*	Make	2 x	254-FR-00066
Restrictor Tabs	*Single shear MS (3mm), mount Restrictor*	Make	1 x	254-FR-00067
Pneumatic Piston Tab	*Single shear MS (4mm), to mount Piston*	Make	1 x	254-FR-00068
Pneumatic cylinder Tabs	*Single shear Ms (3mm), for cylinders*	Make	2 x	254-FR-00069
Master Switch Tabs	*Double Shear MS (3mm), for Master Switch*	Make	2 x	254-FR-00070
Muffler Tab	*Single shear MS (3mm), for the Muffler*	Make	1 x	254-FR-00071
F-Pressure Regulator Tabs	*MS (3mm), for the Regulator*	Make	2 x	254-FR-00072
Radiator Tabs	*Double shear MS (3mm), for Radiator*	Make	4 x	254-FR-00073
Scatter Shield Tabs	*Single shear MS(3mm), for Scatter Shield*	Make	2 x	254-FR-00074

Head Restraint plate Tabs	*Single Shear MS (3mm), for backing plate*	Make	2 x	254-FR-00075
Firewall Tabs	*Single Shear MS (3mm) tabs, for mounting*	Make	6 x	254-FR-00076
Inertia Switch tabs	*MS single shear (3mm) tabs, switch mount*	Make	1 x	254-FR-00077
Base Plate Tabs	*Single shear MS (3mm), for Base Plate*	Make	23 x	254-FR-00078

FR (Chassis & Body)	**Floor Pan**			254-FR-A016
Base Plate (Foot Rest)	*CFRP-GFRP-PU-Foam Sandwich Laminate*	Make	1 x	254-FR-00079
Base Plate (Intermediate)	*CFRP-GFRP-PU-Foam Sandwich Laminate*	Make	1 x	254-FR-00080
Base Plate (Rack)	*CFRP-GFRP-PU-Foam Sandwich Laminate*	Make	1 x	254-FR-00081
Base Plate (Driver)	*CFRP-GFRP-PU-Foam Sandwich Laminate*	Make	2 x	254-FR-00082

FR (Chassis & Body)	**Frame / Frame Tubes**			254-FR-A017
Chassis	*AISI 4130 Spaceframe*	Make	1 x	254-FR-00083
Anti-Intrusion Plate	*AISI 1020 Steel Plate*	Make	1 x	254-FR-00084
Head restraint rod	*8mm MS rod for mounting*	Make	2 x	254-FR-00085
Head Restraint Plate	*3mm MS plate to attach the Restraint*	Make	1 x	254-FR-00086

FR (Chassis & Body)	**Impact Attenuator**			254-FR-A018
Impact Attenuator	*FSAE Standard Impact Attenuator*	Buy	1 x	254-FR-00087
Backing Plate	*Laser Cut Backing Plate for fastening*	Make	1 x	254-FR-00088

FR (Chassis & Body)	**Pedal (Accelerator)**			254-FR-A019
Throttle Pedal	*CNC milled AL-7075 T6 Pedal*	Make	1 x	254-FR-00089
Throttle Pedal Rail	*AL-7075 T6 CNC milled Rail*	Make	1 x	254-FR-00090
Throttle Pedal Stopper	*To restrict the travel of the pedal*	Make	1 x	254-FR-00091
Throttle Cable	*Car builder Aluminum cable*	Buy	1 x	254-FR-00092
Throttle Cable Adjuster	*To fine tune the tension in the cable*	Buy	2 x	254-FR-00093
Throttle Cable Stopper	*To maintain the tension in the cable*	Buy	1 x	254-FR-00094
Throttle Cable Sleeve	*To protect the cable from any damage*	Buy	1 x	254-FR-00095
Throttle Pedal Springs	*To help retract the throttle pedal*	Buy	2 x	254-FR-00096

FR (Chassis & Body)	**Pedal (Brake)**			254-FR-A020
Brake Pedal	*CNC milled AL-7075 T6 Pedal*	Make	1 x	254-FR-00097
Brake Pedal Rail	*AL-7075 T6 CNC milled Rail*	Make	1 x	254-FR-00098

MS (Misc., Fit & Finish & Assembly)	**Other: Driver Protection => Behind Driver Protection**	*Protection for driver*		254-MS-A001
Head Restraint	*SFI 45.2 thickness of 40mm*	Buy	1 x	254-MS-00007
Roll Bar Padding	*FIA 8857 2001*	Buy	2 x	254-MS-00008

MS (Misc., Fit & Finish & Assembly)	**Other: Driver Protection => Driver Restraint Harness**	*Protection for the Driver*		254-MS-A002
6-point Harness	*SPARCO 6-point harness FIA D-258 T/98*	Buy	1 x	254-MS-00009
Arm Restraint	*SFI 8856-2000*	Buy	1 x	254-MS-00010

MS (Misc., Fit & Finish & Assembly)	**Other: Driver Protection => Firewall**	*Protection for the driver*		254-MS-A003
Primary Firewall	*1.5mm Al-6061 sheet coated with 'Nomex'*	Make	1 x	254-MS-00011
Secondary Firewall	*1.5mm Al-6061 sheet coated with 'Nomex'*	Make	1 x	254-MS-00012
Tertiary Firewall	*1.5mm Al-6061 sheet coated with 'Nomex'*	Make	3 x	254-MS-00013

MS (Misc., Fit & Finish & Assembly)	**Other: Electrical Packaging => Electrical Box**	*To efficiently package the components*		254-MS-A004
PCB and ECB box	*3D print (FDM) PLA, to mount PCB and ECB*	Make	2 x	254-MS-00014
DAQ box	*3D print(FDM) PLA,to contain Data logger*	Make	1 x	254-MS-00015
Backing plate	*CFRP laminate to mount electrical box*	Make	1 x	254-MS-00016
Starter Relay Casing	*3D print (FDM) PLA, for Starter Relay*	Make	1 x	254-MS-00017
BSPD Casing	*3D print (FDM) PLA,casing for the Sensor*	Make	1 x	254-MS-00018
Dashboard	*Waterjet CFRP laminate for PCB housing*	Make	1 x	254-MS-00019

MS (Misc., Fit & Finish & Assembly)	**Other: Sharp edge Beadings**	*To cover sharp edges*		254-MS-A005
Sharp edges of Body Works	*5mm radius black rubber tube*	Buy	1 x	254-MS-00020
Sharp edges of End plate	*5mm radius black rubber tube*	Buy	1 x	254-MS-00021
Sharp edges of Seat	*Foam Duct taped to the edges*	Buy	1 x	254-MS-00022
Sharp bolt ends	*Foam application on the bolt ends*	Buy	1 x	254-MS-00023

MS (Misc., Fit & Finish & Assembly)	**Paint – Body**			254-MS-A006
3M Vinyl	*Red, Blue, White*	Buy	1 x	254-MS-00024
Matt Black paint	*Matte Black Aerosol Spray Paint*	Buy	1 x	254-MS-00025

MS (Misc., Fit & Finish & Assembly)	**Paint – Frame**			254-MS-A007
Powder Coat	*Rust free Black powder coat*	Buy	1 x	254-MS-00026
Aerosol paint	*Metallic Black paint*	Buy	1 x	254-MS-00027

MS (Misc., Fit & Finish & Assembly)	**Seats**			254-MS-A008
Driver's Seat	*CFRP-GFRP hybrid laminate*	Make	1 x	254-MS-00028

ST (Steering System)		**Steering Rack**				254-ST-A001
[Assembly Processes]			Make		1 x	254-ST-A001P
Process	Assemble	*To place rack stopper x 2*		1 x		
Process	Assemble	*To place clevis x 2*		1 x		
Process	Fastener install (every)	*To align clevis to rack x 2, M6*		1 x		
Process	Other: Ratchet	*To tighten clevis to rack x 2, M6*		1 x		
Process	Assemble	*To place rack clamps on the rack x4*		1 x		
Process	Assemble	*To place bolt in the rack clamps x4*		1 x		
Process	Fastener install (every)	*To align bolt, base plate and rack x4*		1 x		
Process	Other: Ratchet	*To tighten the bolt x4*		1 x		
Process	Assemble	*To mesh pinion adapter and coupler*		1 x		
Fastener	Bolt	*1/4" x 28 Grade 5 custom bolt, Clevis*		2 x		
Fastener	Bolt	*M6 Grade 8.8; Fasten rack and base plate*		4 x		
Fastener	Washer	*M6 Grade 8.8; For Stress Distribution*		8 x		
Fastener	Nut	*M6 Locknut; Fasten rack and base plate*		4 x		
Steering Rack		*Kaz Technology Steering Rack*	Buy		1 x	254-ST-00001
Material	Bought Part	*Rack and pinion type*		1 x		
Clevis		*Connects steering rack to tie rod*	Make		2 x	254-ST-00002
Material	Aluminum	*Al-7075 T6 billet (60mm x 60mm x 30mm)*		1 x		
Process	Machining setup	*To install billet on milling machine*		1 x		
Process	Machining	*Remove material from side to get profile*		1 x		
Process	Machining setup	*Setup change to install drill tool*		1 x		
Process	Machining	*Drill M6 hole of 30 mm for tie rod*		1 x		
Process	Machining setup	*Setup change for milling the U-shape*		1 x		
Process	Machining	*Remove material to get the reqd U-shape*		1 x		
Process	Machining setup	*Setup change to install drill tool*		1 x		
Process	Machining	*Drill M6 hole of 10 mm for steering rack*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		
Coupler		*Fastens pinion shaft with pinion adapter*	Make		1 x	254-ST-00003
Material	Aluminum	*Al-7075 T6 billet; 28mm dia, 70mm length*		1 x		
Process	Machining setup	*To install the billet on lathe*		1 x		
Process	Machining	*To turn the billet from one side*		1 x		
Process	Machining	*To face the billet from that side*		1 x		
Process	Machining setup	*Change setup to turn from other side*		1 x		
Process	Machining	*To turn from other side*		1 x		
Process	Machining	*To face the other side*		1 x		

Process	Machining setup	*Change setup and install drill tool*	1 x	
Process	Drilled hole	*To drill a hole (11mm dia, 42mm length)*	1 x	
Process	Machining setup	*Remove job from lathe machine*	1 x	
Process	Machining setup	*To install the job on slotter machine*	1 x	
Process	Machining	*To make internal keyway (6x3x15mm)*	1 x	
Process	Machining setup	*To remove job from machine*	1 x	
Process	Machining setup	*To install billet on broaching machine*	1 x	
Process	Machining	*To make internal splines on the coupler*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

Rack Stopper	*Prevents rack over travel*	Make	2 x	254-ST-00004
Material	Steel	*AISI 1020(OD-20mm, ID-18mm, length-40mm)*	1 x	
Process	Machining setup	*Setup the tube for cutting*	1 x	
Process	Cutting (Manual)	*Cut the tube using Miter Saw*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

Upper Rack Clamp	*Securely mounts the rack to chassis*	Make	2 x	254-ST-00005
Material	Aluminum	*Al-6061 T6 billet (40mm x 25mm x 30mm)*	1 x	
Process	Machining setup	*Install the job on the milling machine*	1 x	
Process	Machining	*Remove material to get external profile*	1 x	
Process	Machining setup	*Setup change for drilling from top*	1 x	
Process	Drilled hole	*Drill 2 M6 holes of 15mm, to fasten bolt*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

Lower Rack Clamp	*Securely mounts the rack to chassis*	Make	2 x	254-ST-00006
Material	Aluminum	*Al6061 T6 billet (40 x 25 x20 mm)*	1 x	
Process	Machining setup	*Install the job on milling machine*	1 x	
Process	Machining	*Remove material to get external profile*	1 x	
Process	Machining setup	*Setup change for drilling from top*	1 x	
Process	Drilled hole	*Drill 2 M6 holes of 15mm, to fasten bolt*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

ST (Steering System)	**Steering Shaft**			254-ST-A002
[Assembly Processes]		Make	1 x	254-ST-A002P
Process	Fastener install (every)	*To align pinion shaft and coupler*	1 x	
Process	Other: Ratchet	*To fasten pinion shaft and coupler*	1 x	
Process	Assemble	*To place bearing in bevel gear x2*	1 x	
Process	Other: Press Fit	*To press fit bearing into bevel gear x2*	1 x	
Process	Assemble	*To place bevel gear in bevel casing x2*	1 x	
Process	Other: Press Fit	*To press fit bevel gear into casing x2*	1 x	
Process	Other: Lubrication	*Apply lubricating oil to bevel assembly*	1 x	
Process	Other: Mesh	*To mesh the bevel gears*	1 x	
Process	Assemble	*To align the two bevel casings*	1 x	
Process	Assemble	*To align the casing mount to casing x2*	1 x	
Process	Fastener install (every)	*Align bolt to fasten casings & mount x2*	1 x	
Process	Other: Ratchet	*To tighten the bolt x2*	1 x	
Process	Fastener install (every)	*Align bolt, pinion shaft & bevel gear x2*	1 x	
Process	Other: Ratchet	*To tighten the bolt x2*	1 x	
Process	Fastener install (every)	*To align bolt, casing mount & its tab x2*	1 x	
Process	Other: Ratchet	*To tighten the bolt x2*	1 x	
Process	Fastener install (every)	*To align bolt, casing and tab*	1 x	
Process	Other: Ratchet	*To tighten the bolt*	1 x	
Process	Weld	*To weld O-clamp mount to chassis x2*	1 x	
Process	Assemble	*To place bearing in O-Clamp connector*	1 x	
Process	Other: Press Fit	*Press fit bearing into O-Clamp connector*	1 x	
Process	Assemble	*To place O-clamp connector in shaft*	1 x	
Process	Other: Press Fit	*Press fit bearing into steering shaft*	1 x	
Process	Fastener install (every)	*Align bolt, O-clamp & connector x3*	1 x	
Process	Other: Ratchet	*To tighten the bolt x3*	1 x	
Process	Fastener install (every)	*To align bolt,steering shaft & casing x2*	1 x	
Process	Other: Ratchet	*To tighten the bolt x2*	1 x	
Fastener	Bolt	*M4 Grade 8.8; Pinion shaft & casing*	1 x	
Fastener	Bolt	*M4 Grade 8.8; Steering shaft & casing*	2 x	
Fastener	Bolt	*M4 Grade 8.8; Bevel casing & mount*	3 x	
Fastener	Bolt	*M4 Grade 8.8; Casing mount to its tab*	2 x	
Fastener	Bolt	*M4 Grade8.8; O-clamp & O-clamp connector*	3 x	
Fastener	Bolt	*M4 Grade 8.8; bevel casing to tab*	1 x	
Fastener	Washer	*M4 Grade 8.8; For Stress Distribution*	18 x	
Fastener	Nut	*M4 locknut*	9 x	
Tooling	Welding Fixure	*Steel Welding Fixture*	1 x	

Pinion Shaft		*Connects the rack to the bevel assembly*	Make		1 x	254-ST-00007
Material	Aluminum	*Al-7075 T6 billet;350mm length; 30mm dia*		1 x		
Process	Machining setup	*Install the billet on lathe machine*		1 x		
Process	Machining	*To turn from one side*		1 x		
Process	Machining	*To face from same side*		1 x		
Process	Machining setup	*Setup change for facing from other side*		1 x		
Process	Machining	*To turn the job from other side*		1 x		
Process	Machining	*To face from same side*		1 x		
Process	Machining setup	*To remove job from machine*		1 x		
Process	Machining setup	*Install the job on a milling machine*		1 x		
Process	Machining	*Remove material; make rectangular insert*		1 x		
Process	Machining setup	*Setup change for milling other surface*		1 x		
Process	Machining	*Make keyway; locking of shaft with rack*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

Bevel Casing Mount		*Helps mount bevel casing to chassis*	Make		2 x	254-ST-00008
Material	Aluminum	*Al-6061 T6 billet (22mm x 13mm x 13mm)*		1 x		
Process	Machining setup	*Install billet on the machine*		1 x		
Process	Machining	*Start machining from the front*		1 x		
Process	Machining setup	*Setup change to install drill tool*		1 x		
Process	Drilled hole	*M4 hole of length 6mm for mounting x 2*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

Steering Shaft		*Helps transmit motion to bevel gears*	Make		1 x	254-ST-00009
Material	Steel	*AISI 1020 billet (22mm dia)*		1 x		
Process	Machining setup	*Install the billet on lathe machine*		1 x		
Process	Machining	*To turn the billet from the front*		1 x		
Process	Machining	*To face the billet from front*		1 x		
Process	Machining setup	*Setup change to turn from other side*		1 x		
Process	Machining	*To turn the billet from the other side*		1 x		
Process	Machining	*To face the billet from the other side*		1 x		
Process	Machining setup	*To remove the job from machine*		1 x		
Process	Machining setup	*Install the job on a milling machine*		1 x		
Process	Machining	*Rectangular slot for attaching bevel*		1 x		
Process	Machining setup	*Install broach tool and setup fixture*		1 x		
Process	Broach	*Make splines to lock with quick release*		1 x		
Process	Machining	*Setup change for making internal groove*		1 x		
Process	Machining	*Make grooves for quick release*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

O Clamp	*Helps mount steering shaft to chassis*		Make		1 x	254-ST-00010
Material	Steel	*AISI 1020 billet (22mm x 13mm x 13mm)*		1 x		
Process	Machining setup	*Install sheet on laser cut machine*		1 x		
Process	Laser Cut	*Get required profile of O clamp*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

O Clamp Mount	*Helps mount O Clamp to chassis*		Make		2 x	254-ST-00011
Material	Steel	*AISI 1020 billet (10 mm dia)*		1 x		
Process	Machining setup	*Set the billet for cutting*		1 x		
Process	Cutting (Manual)	*Cut the billet using Miter saw*		1 x		
Process	Machining setup	*To remove job from machine*		1 x		
Process	Machining setup	*To install job on lathe machine*		1 x		
Process	Machining	*Face the billet from one side*		1 x		
Process	Machining setup	*Setup change to face from other side*		1 x		
Process	Machining	*Face from the other side*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

Bevel Gear	*Motion transmission*		Make		2 x	254-ST-00012
Material	Steel	*EN 24 billet (48 mm dia)*		1 x		
Process	Machining setup	*Install the billet on lathe machine*		1 x		
Process	Machining	*To turn from one side*		1 x		
Process	Machining	*To face from same side*		1 x		
Process	Machining setup	*Setup change for making tapered profile*		1 x		
Process	Machining	*Turn surface to obtain tapered profile*		1 x		
Process	Machining setup	*Remove job from lathe machine*		1 x		
Process	Machining setup	*Install job on milling machine*		1 x		
Process	Machining	*Make slot to attach with pinion shaft*		1 x		
Process	Machining setup	*Setup change to install drill tool*		1 x		
Process	Drilled hole	*M6 hole (20mm) to fasten gear with shaft*		1 x		
Process	Machining setup	*Remove job from milling machine*		1 x		
Process	Machining setup	*Install the job on a hobbing machine*		1 x		
Process	Gear Shaping (hobbing)	*Make 31 teeth on the tapered part*		1 x		
Process	Machining setup	*To remove job from hobbing machine*		1 x		
Process	Machining	*To setup job for hardening*		1 x		
Process	Heat Treatment	*Hardened to 55 HRC*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

Bevel Casing	*To house the bevel gears*		Make		2 x	254-ST-00013
Material	Aluminum	*Al-7075 T6 billet;100mm length;120mm dia*		1 x		

Process	Machining setup	*Install billet on waterjet machine*	1 x	
Process	Waterjet Cut	*Cut the billet to req. dimensions*	1 x	
Process	Machining setup	*To remove job from machine*	1 x	
Process	Machining setup	*Install the job on CNC milling machine*	1 x	
Process	Machining	*Obtain the inner profile of the casing*	1 x	
Process	Machining	*Obtain profile of flange for mounting*	1 x	
Process	Machining setup	*Change setup to install drill tool*	1 x	
Process	Drilled hole	*M4 hole of length 3 mm into flange x 3*	1 x	
Process	Machining setup	*Change setup to machine from other end*	1 x	
Process	Machining	*Obtain outer profile of casing*	1 x	
Process	Machining setup	*Change setup to machine lower end*	1 x	
Process	Machining	*Obtain lower end profile of casing*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

Deep Groove Ball Bearing	*press fit on bevel casing seat*	Buy	2 x	254-ST-00014
Material	Bought Part	*OD- 28mm, ID- 15mm, 7mm thick*	2 x	

O-Clamp Connector	*Connects steering shaft to O Clamp*	Make	1 x	254-ST-00015
Material	Steel	*Al-7075 T6; 9mm length; 36mm dia*	1 x	
Process	Machining setup	*Install the billet on milling machine*	1 x	
Process	Laser Cut	*Get required profile same as the O-clamp*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

Deep Groove Ball Bearing	*Press fit on steering shaft*	Buy	1 x	254-ST-00016
Material	Bought Part	*OD- 24mm, ID- 12mm, 6mm thick*	1 x	

Square Key	*Locks pinion shaft with coupler*	Make	1 x	254-ST-00017
Material	Steel	*AISI 1020 square bar (width 6mm)*	1 x	
Process	Machining setup	*Setup the square bar for cutting*	1 x	
Process	Cutting (Manual)	*Cut the square bar using Miter saw*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

ST (Steering System)	**Steering Wheel**			254-ST-A003
[Assembly Processes]		Make	1 x	254-ST-A003P
Process	Assemble	*Place the upper grip on the base x2*	1 x	
Process	Assemble	*Place the lower grip on the base x2*	1 x	
Process	Fastener install (every)	*Align the hole on base and grips x4*	1 x	
Process	Assemble	*Place a bolt on each aligned hole x4*	1 x	
Process	Other: Ratchet	*To tighten the bolt x4*	1 x	
Process	Assemble	*Place display onto housing*	1 x	
Process	Other: Adhesive	*Apply adhesive to fix display to housing*	1 x	
Process	Other: Adhesive	*Fix steering PCB to electronic housing*	1 x	
Process	Assemble	*Place button on the housing x2*	1 x	
Process	Other: Ratchet	*To tighten the buttons x2*	1 x	
Process	Fastener install (every)	*Align bolt, electronic housing & base x3*	1 x	
Process	Other: Ratchet	*To tighten the bolt x3*	1 x	
Process	Fastener install (every)	*Align switch, bolt and paddle housing x2*	1 x	
Process	Fastener install (every)	*Fasten switch to the paddle housing x2*	1 x	
Process	Other: Adhesive	*Attach magnet to paddle housing x2*	1 x	
Process	Other: Adhesive	*Attach magnet to paddle x2*	1 x	
Process	Fastener install (every)	*To align bolt, paddle and paddle housing*	1 x	
Process	Other: Ratchet	*To tighten the bolt*	1 x	
Process	Fastener install (every)	*To align bolt, paddle housing & base x4*	1 x	
Process	Other: Ratchet	*To tighten the bolt x4*	1 x	
Fastener	Bolt	*M3 Grade 8.8; Fasten electronic housing*	3 x	
Fastener	Nut	*M3 hexagonal nut*	4 x	
Fastener	Nut	*M3 hexagonal nut*	1 x	
Fastener	Bolt	*Custom screw for mounting buttons*	3 x	
Fastener	Bolt	*M3 Grade 8.8 bolt; fastens grips & base*	4 x	
Fastener	Nut	*M3 hexagonal nut; Grade 8.8*	4 x	
Fastener	Bolt	*M3 Grade 8.8; Fastens switch*	2 x	
Fastener	Nut	*M3 hexagonal nut; Fastens switch*	2 x	
Fastener	Bolt	*M3 Grade 8.8; Fasten paddle to housing*	1 x	
Fastener	Bolt	*M3 Grade 8.8; Fasten paddle housing*	4 x	
Fastener	Nut	*M3 hexagonal nut*	3 x	
Fastener	Washer	*M3 Grade 8.8; For Stress Distribution*	28 x	

Steering Wheel Base	*Attach steering wheel components*	Make	1 x	254-ST-00018
Material	Aluminum	*Al-6061 T6 sheet (250mm x 170mm x 3mm)*	1 x	
Process	Machining setup	*Install sheet on laser cut machine*	1 x	
Process	Laser Cut	*Get reqd profile of steering wheel base*	1 x	
Process	Machining setup	*To remove finished part from machine*	1 x	

Electronic Housing	*Houses electrical components like PCB*		Make		1 x	254-ST-00019
Material	3D Print	*PLA (Polylactic acid)*		1 x		
Process	Machining setup	*To setup machine for 3D printing*		1 x		
Process	Rapid Prototype	*Fused Deposition Modeling*		1 x		
Process	Other: Sanding	*Remove support material after printing*		1 x		
Steering Wheel Lower Grip	*For firm grip of steering wheel*		Make		2 x	254-ST-00020
Material	3D Print	*TPU (Thermoplastic Polyurethane)*		1 x		
Process	Machining setup	*To setup machine for 3D printing*		1 x		
Process	Rapid Prototype	*Fused Deposition Modeling*		1 x		
Process	Other: Sanding	*Remove support material after printing*		1 x		
Steering Wheel Upper Grip	*For firm grip of steering wheel*		Make		2 x	254-ST-00021
Material	3D Print	*Thermoplastic Polyurethane*		1 x		
Process	Machining setup	*To setup machine for 3D printing*		1 x		
Process	Rapid Prototype	*Fused Deposition Modeling*		1 x		
Process	Other: Sanding	*Remove support material after printing*		1 x		
Buttons	*Slow/Quick Clutch Release*		Buy		2 x	254-ST-00022
Material	Bought Part	*n/a*		1 x		
Paddles	*Helps in actuating gear shifting switch*		Make		2 x	254-ST-00023
Material	3D Print	*PLA (Polylactic acid)*		1 x		
Process	Machining setup	*To setup machine for 3D printing*		1 x		
Process	Rapid Prototype	*Fused Deposition Modeling*		1 x		
Process	Other: Sanding	*Remove support material after printing*		1 x		
Paddle Housing	*Housing for gear shifting switch*		Make		2 x	254-ST-00024
Material	3D Print	*PLA (Polylactic acid)*		1 x		
Process	Machining setup	*To setup machine for 3D printing*		1 x		
Process	Rapid Prototype	*Fused Deposition Modeling*		1 x		
Process	Other: Sanding	*Remove support material after printing*		1 x		
Gear Shifting Switch	*Helps in gear shifting*		Buy		2 x	254-ST-00025
Material	Bought Part	*n/a*		1 x		
Display	*Displays RPM, CTS data and gear position*		Buy		1 x	254-ST-00026
Material	Bought Part	*Nextion Nx4827k043*		1 x		

Magnet		*Neodymium; Fixed to paddle & its housing*	Buy		4 x	254-ST-00027
Material	Bought Part	*n/a*		1 x		

ST (Steering System)		**Steering Wheel Quick Release**				254-ST-A004
[Assembly Processes]			Make		3 x	254-ST-A004P
Process	Fastener install (every)	*Align quick release & steering wheel x3*		1 x		
Process	Other: Ratchet	*To tighten the bolts x3*		1 x		
Fastener	Bolt	*M4 Grade 8.8*		3 x		
Fastener	Nut	*M4 hexagonal nut*		3 x		
Fastener	Washer	*M4 Grade 8.8; For stress distribution*		6 x		
Quick Release		*Helps in removing the steering wheel*	Buy		1 x	254-ST-00028
Material	Bought Part	*Spatechnique QR1-B, PCD 50.8 mm*		1 x		

ST (Steering System)	**Tie Rods**					254-ST-A005
[Assembly Processes]			Make		2 x	254-ST-A005P
Tooling	Other: Vertical Insert Fixture	*For bonding insert to tie rod*		1 x		
Material	2-component adhesive	*DP 490 - 15 ml*		1 x		
Process	Assemble	*Place the insert on insert fixture x2*		1 x		
Process	Aerosol Apply	*Apply DP-490 on the surface of insert*		1 x		
Process	Aerosol Apply	*Apply DP-490 on inner surface of tube*		1 x		
Process	Assemble	*CF tube is placed on the insert*		1 x		
Process	2-component adhesive	*One end of tube is bonded to insert*		1 x		
Process	Aerosol Apply	*Apply DP-490 on surface of second insert*		1 x		
Process	Aerosol Apply	*Apply DP-490 on inner surface(other end)*		1 x		
Process	Assemble	*Other end of tube is placed on insert*		1 x		
Process	2-component adhesive	*Other end of tube is bonded to insert*		1 x		
Process	Assemble	*Place jam nut on rod end x2*		1 x		
Process	Assemble	*Place rod end on insert x2*		1 x		
Process	Fastener install (every)	*Tighten the jam nut placed on rod end x2*		1 x		
Process	Assemble	*Insert sleeve b/w rod end and clevis x2*		1 x		
Process	Fastener install (every)	*Align bolt to fasten tie rod to clevis*		1 x		
Process	Other: Ratchet	*To tighten the bolt*		1 x		
Process	Other: Ratchet	*To tighten the bolt*		1 x		
Process	Assemble	*Insert sleeve b/w rod end and upright x2*		1 x		
Process	Fastener install (every)	*Align bolt to fasten tie rod to upright*		1 x		
Fastener	Nut	*M6 jam nut; Fasten rod end to insert*		2 x		
Fastener	Bolt	*M6; Grade 8.8; Fasten tie rod to clevis*		1 x		
Fastener	Bolt	*M6; Grade 8.8; Fasten tie rod to upright*		1 x		
Fastener	Nut	*M6 lock nut; Grade 8.8*		2 x		
Fastener	Washer	*M6 Grade 8.8; For stress distribution*		4 x		
Tie Rod Tube	*Helps in steering & adjusting static toe*		Buy		2 x	254-ST-00029
Material	Bought Part	*CF tube; 0.5" ID x 0.628" OD*		1 x		
Process	Machining setup	*Setup tube for cutting to reqd length*		1 x		
Process	Cutting (Manual)	*Cut tube using Tubing Cutter Tool*		1 x		
Rod End	*M6 Male Rod End, Right hand*		Buy		2 x	254-ST-00030
Material	Bought Part	*SA 6 E*		2 x		
Rod End	*M6 Male Rod End, Left hand*		Buy		2 x	254-ST-00031
Material	Bought Part	*SAL 8 E*		2 x		

Tie Rod Insert		*To help in attachment*	Make		4 x	254-ST-00032
Material	Aluminum	*Al-6061 T6 billet (20 mm dia)*		1 x		
Process	Machining setup	*Install the billet on lathe machine*		1 x		
Process	Machining	*Turn the job on the machine*		1 x		
Process	Machining setup	*Setup change to install drill tool*		1 x		
Process	Drilled hole	*Drill M5 holes of 34 mm length at centre*		1 x		
Process	Machining setup	*To remove job from machine*		1 x		
Process	Machining setup	*Install job on vice to create threads*		1 x		
Process	Tapping holes	*Create threads using tapping tool*		1 x		
Process	Machining setup	*To remove finished part from vice*		1 x		

Sleeve		*To allow free movement of the rod end*	Make		8 x	254-ST-00033
Material	Steel	*Al-6061 T6 rod; (10mm dia; 5cm length)*		1 x		
Process	Machining setup	*Install the rod on the lathe machine*		1 x		
Process	Machining setup	*Install drill tool on the lathe*		1 x		
Process	Drilled hole	*M6 hole of length 5 mm*		1 x		
Process	Machining setup	*To remove job from machine*		1 x		
Process	Machining setup	*Setup the workpiece for cutting*		1 x		
Process	Cutting (Manual)	*Cut job to reqd length using Miter Saw*		1 x		
Process	Machining setup	*To remove finished part from machine*		1 x		

SU (Suspension System)	**A-Arms front lower**			254-SU-A001
A- Arm plate right	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00001
A- Arm plate left	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00002
A-Arm fore CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00003
A-Arm aft CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00004
Inserts	*Turned , Al 7075 T6,Inserts for CF tubes*	Make	4 x	254-SU-00005
Sleeves	*Al 6061 T6,allow free movement of rodend*	Make	8 x	254-SU-00006
Spherical bearing	*OD 19mm ID 8 mm Width 9 mm*	Make	2 x	254-SU-00007

SU (Suspension System)	**A-Arms front upper**			254-SU-A002
A-Arm plate right	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00008
A-Arm plate left	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00009
A-Arm fore CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00010
A-Arms aft CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00011
Inserts	*Turned , Al 7075 T6,Inserts for CF tubes*	Make	4 x	254-SU-00012
Sleeves	*Al 6061 T6,allow free movement of rodend*	Make	8 x	254-SU-00013
Spherical bearing	*OD 19 mm ID 8 mm Width 9 mm*	Make	2 x	254-SU-00014

SU (Suspension System)	**A-Arms rear lower**			254-SU-A003
A-Arm plate right	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00015
A- Arm plate left	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00016
A-Arm for CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00017
A-Arm aft CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00018
Inserts	*Turned , Al 7075 T6,Inserts for CF tubes*	Make	4 x	254-SU-00019
Toe link tube	*CF tube*	Buy	2 x	254-SU-00020
Toe link tube inserts	*Turned , Al 7075 T6,Inserts for CF tubes*	Make	2 x	254-SU-00021
Sleeves	*Al 6061 T6,allow free movement of rodend*	Make	8 x	254-SU-00022
Spherical bearing	*OD 19 mm ID 8 mm Width 9 mm*	Make	2 x	254-SU-00023

SU (Suspension System)	**A-Arms rear upper**			254-SU-A004
A- Arm plate right	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00024
A-Arm plate left	*Machined ,Al 7075 T6, To fix A-Arm tubes*	Make	1 x	254-SU-00025
A-Arms fore CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00026
A-Arm aft CF tube	*CF tubes for control arms*	Buy	2 x	254-SU-00027
Inserts	*Turned , Al 7075 T6,Inserts for CF tubes*	Make	4 x	254-SU-00028
Sleeves	*Al 6061 T6,allow free movement of rodend*	Make	8 x	254-SU-00029
Spherical beaing	*OD 19 mm ID 8 mm Width 9 mm*	Make	2 x	254-SU-00030

SU (Suspension System)	**Anti Roll Bar Front**			254-SU-A005
ARB Shaft	*Turned , Aluminium 7075 T6*	Make	1 x	254-SU-00031
Front ARB flange	*Machined, Aluminium 7075 T6*	Make	2 x	254-SU-00032
Moment Arm	*Laser Cut, Al 7075-T6, to mount ARB*	Make	2 x	254-SU-00033
Inserts	*For mounting the ARB*	Make	4 x	254-SU-00034
Deep grooved ball bearing	*OD 26mm ID 17mm width 5mm*	Buy	2 x	254-SU-00035
Drop link female rod end	*M6 rod end, To attach bell crank to ARB*	Buy	2 x	254-SU-00036
Drop link male rod end	*M6 rod end, To attach bell crank to ARB*	Buy	2 x	254-SU-00037
Sleeves	*To eliminate play, Al-6061 T6*	Make	10 x	254-SU-00038

SU (Suspension System)	**Anti Roll Bar Rear**			254-SU-A006
ARB shaft	*Turned , Aluminium 6061 T6*	Make	1 x	254-SU-00039
Rear ARB flange	*To mount ARB to chassis*	Make	2 x	254-SU-00040
Moment arm	*Al 7075 T6,For mounting the ARB*	Make	2 x	254-SU-00041
Inserts	*For mounting the ARB*	Make	4 x	254-SU-00042
Mount	*For mounting the ARB to chassis*	Make	1 x	254-SU-00043
Deep grooved ball bearing	*OD 26mm ID 17mm width 5mm*	Buy	2 x	254-SU-00044
Sleeves	*To eliminate play, Al-6061 T6*	Make	8 x	254-SU-00045

SU (Suspension System)	**Bell Cranks Front**			254-SU-A007
Bell Crank Plates	*Lasercut , Aluminium 6061 T6*	Make	4 x	254-SU-00046
Sleeves	*To eliminate play, Al-6061T6*	Make	10 x	254-SU-00047

SU (Suspension System)	**Bell Cranks Rear**			254-SU-A008
Bell Crank Plates	*Lasercut , Aluminium 6061 T6*	Make	4 x	254-SU-00048
Sleeve	*To eliminate play, Al-6061 T6*	Make	10 x	254-SU-00049

SU (Suspension System)	**Damper System Front**			254-SU-A009
Damper , Ohlins TTX25	*To provide Damping*	Buy	2 x	254-SU-00050
Potentiometer	*To measure linear deflection of damper*	Buy	2 x	254-SU-00051
Spacer	*Turned, Al-6061 T6*	Make	8 x	254-SU-00052

SU (Suspension System)	**Damper System Rear**			254-SU-A010
Damper , Ohlins TTX25	*To provide Damping*	Buy	2 x	254-SU-00053
Damper mount rear	*Machined , Al-7075 T6*	Make	2 x	254-SU-00054
Potentiometer	*To measure linear deflection of damper*	Buy	2 x	254-SU-00055
Spacer	*Turned, Al-6061 T6*	Make	8 x	254-SU-00056

SU (Suspension System)	**Front Uprights**			254-SU-A011
Front upright right	*Machined , Aluminium 7075 T6*	Make	1 x	254-SU-00057
Front upright left	*Machined , Aluminium 7075 T6*	Make	1 x	254-SU-00058
Front upright bracket	*Machined , Aluminium 7075 T6*	Make	2 x	254-SU-00059
Steering Flange	*Lasercut , Aluminium 7075 T6*	Make	4 x	254-SU-00060
Roller tapered bearing	*OD 52 mm ID 28 mm Width 16 mm*	Buy	4 x	254-SU-00061
Spacer	*Turned, Al-6061 T6*	Make	8 x	254-SU-00062

SU (Suspension System)	**Push/Pullrod Front**			254-SU-A012
Inserts	*Turned , Al 7075-T6,Inserts for CF tubes*	Make	4 x	254-SU-00063
Push rod tube	*CF tube, Attached to upper A-Arm plate*	Make	2 x	254-SU-00064
Sleeves	*Al 6061 T6,allow free movement of rodend*	Make	4 x	254-SU-00065

SU (Suspension System)	**Push/Pullrod Rear**			254-SU-A013
Inserts	*Turned , Al 7075-T6,Inserts for CF tubes*	Make	4 x	254-SU-00066
Push rod tube	*CF tube, Attached to lower A-Arm plate*	Buy	2 x	254-SU-00067
Sleeves	*Al 6061 T6,allow free movement of rodend*	Make	4 x	254-SU-00068

SU (Suspension System)	**Rear Uprights**			254-SU-A014
Rear Upright right	*Machined , Aluminium 7075 T6*	Make	1 x	254-SU-00069
Rear upright left	*Machined , Aluminium 7075 T6*	Make	1 x	254-SU-00070
Rear upright bracket	*Machined , Aluminium 7075 T6*	Make	2 x	254-SU-00071
Toe link Flange	*Lasercut , Aluminium 7075 T6*	Make	4 x	254-SU-00072
Deep grooved ball bearing	*OD 85mm ID 60mm width 13mm*	Buy	4 x	254-SU-00073
Spacer	*Turned, Al-6061 T6*	Make	8 x	254-SU-00074

SU (Suspension System)	**Springs**			254-SU-A015
FSAE Hyperco front spring	*TTX25, ID-1.45" , Free length - 4.4"*	Buy	2 x	254-SU-00075
FSAE Hyperco rear spring	*TTX25, ID-1.45" , Free length - 4.4"*	Buy	2 x	254-SU-00076

WT (Wheels, Wheel Bearings & Tires)	**Front Hubs**			254-WT-A001
Front Hub	*Machined Al 6061-T6*	Make	2 x	254-WT-00001
Castle Nut	*Machined Al 6061-T6*	Make	2 x	254-WT-00002
Hub Washer	*Laser Cut Al 6061-T6*	Make	2 x	254-WT-00003
Wheel Speed Sprocket	*Laser Cut AISI 1020; 10 teeths*	Make	1 x	254-WT-00004
Wheel Speed Sensor Mount	*Al 6061-T6 welded laser cut profile*	Make	1 x	254-WT-00005
Split Pin	*Steel, 3 inch, Positive locking of hub*	Buy	2 x	254-WT-00006

WT (Wheels, Wheel Bearings & Tires)	**Lug Nuts**			254-WT-A002
Lug Nut	*M12 Steel Lug Nuts*	Buy	16 x	254-WT-00007

WT (Wheels, Wheel Bearings & Tires)	**Rear Hubs**			254-WT-A003
Rear Hub	*Machined Al 6061-T6*	Make	2 x	254-WT-00008
Hub Locker	*Machined Al 6061-T6*	Make	2 x	254-WT-00009
Hub Washer	*Laser Cut Al 6061-T6*	Make	2 x	254-WT-00010
Wheel Speed Sprocket	*Laser Cut , AISI 1020; 10 teeths*	Make	1 x	254-WT-00011
Wheel Speed Sensor Mount	*Al 6061-T6 welded laser cut profile*	Make	1 x	254-WT-00012
Safety Wire	*1.25 mm dia; 20 cm length steel wire*	Buy	2 x	254-WT-00013

WT (Wheels, Wheel Bearings & Tires)	**Tires**			254-WT-A004
Dry Tires	*Continental 205/470/R13 34M*	Buy	4 x	254-WT-00014

WT (Wheels, Wheel Bearings & Tires)	**Valve Stems**			254-WT-A005
Valve Stem	*To inflate the tire*	Buy	4 x	254-WT-00015
Valve Stem Cover	*To cover the valve stem*	Buy	4 x	254-WT-00016

WT (Wheels, Wheel Bearings & Tires)	**Wheel Bearings**				254-WT-A006
Front Wheel Bearing	*Roller Taper ,OD-58mm,ID-28mm,16mm thick*	Buy		4 x	254-WT-00017
Rear Wheel Bearing	*Deep Groove Ball Bearing,OD-85mm,ID-60mm*	Buy		4 x	254-WT-00018

WT (Wheels, Wheel Bearings & Tires)	**Wheel Studs**			254-WT-A007
Wheel Studs	*12 mm Steel; Press-fit on hubs*	Buy	16 x	254-WT-00019

WT (Wheels, Wheel Bearings & Tires)	**Wheels**			254-WT-A008
Wheel Centre	*CFRP manufactured monolithic laminate*	Make	4 x	254-WT-00020
Keizer Wheel Rims	*Aluminium 2-piece rim, Forged; 7x13 inch*	Buy	4 x	254-WT-00021

Overview Costed System: EN				
Engine & Drivetrain	**Air Filter**			254-EN-A001
Engine & Drivetrain	**Axles**		91,51 €	254-EN-A002
Engine & Drivetrain	**Chain / Belt**		60,65 €	254-EN-A003
Engine & Drivetrain	**Coolant**		2,88 €	254-EN-A004
Engine & Drivetrain	**Coolant Lines**		52,36 €	254-EN-A005
Engine & Drivetrain	**CV Joints/U Joints**		154,08 €	254-EN-A006
Engine & Drivetrain	**Differential**		1.653,89 €	254-EN-A007
Engine & Drivetrain	**Differential Bearings**		23,65 €	254-EN-A008
Engine & Drivetrain	**Differential Mounts**		145,94 €	254-EN-A009
Engine & Drivetrain	**Engine**		1.851,52 €	254-EN-A010
Engine & Drivetrain	**Engine Mounts**		2,74 €	254-EN-A011
Engine & Drivetrain	**Engine/Diff Oil**		38,76 €	254-EN-A012
Engine & Drivetrain	**Exhaust Manifold**		34,80 €	254-EN-A013
Engine & Drivetrain	**Fuel Filter**		11,74 €	254-EN-A014
Engine & Drivetrain	**Fuel Injectors**		90,68 €	254-EN-A015
Engine & Drivetrain	**Fuel Lines/Rails**		40,77 €	254-EN-A016
Engine & Drivetrain	**Fuel Pressure Reg.**		75,53 €	254-EN-A017
Engine & Drivetrain	**Fuel Pump**		25,60 €	254-EN-A018
Engine & Drivetrain	**Fuel Tank – NOT THE HV-Battery**		77,28 €	254-EN-A019
Engine & Drivetrain	**Intake Manifold**		567,23 €	254-EN-A020
Engine & Drivetrain	**Muffler**		24,94 €	254-EN-A021
Engine & Drivetrain	**Other: Clutch Assembly**	*Pneumatic Clutch control*	281,71 €	254-EN-A022
Engine & Drivetrain	**Other: CO2 Gas.**	*Gas for pneumatic system*		254-EN-A034
Engine & Drivetrain	**Other: Lubrication Assembly**	*Lubrication Assembly*	931,93 €	254-EN-A023
Engine & Drivetrain	**Other: Pressure Cap**	*Cooling line assembly.*	73,35 €	254-EN-A024
Engine & Drivetrain	**Other: Sealant**	*To seal parts.*	28,90 €	254-EN-A025
Engine & Drivetrain	**Other: Shifter Assembly**	*For pneumatic gear shifting*	297,58 €	254-EN-A026
Engine & Drivetrain	**Overflow Bottles**		7,50 €	254-EN-A027

Engine & Drivetrain	**Radiator**	176,45 €	254-EN-A028
Engine & Drivetrain	**Radiator Fans**	92,43 €	254-EN-A029
Engine & Drivetrain	**Restrictor**	52,61 €	254-EN-A030
Engine & Drivetrain	**Shields**	13,56 €	254-EN-A031
Engine & Drivetrain	**Sprocket/Pulleys**	47,81 €	254-EN-A032
Engine & Drivetrain	**Throttle Body**	26,34 €	254-EN-A033
SUM		**7.057,02 €**	