



BITS Pilani
Dubai Campus



BITS Pilani-Dubai

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March 31, 2014

Subject: Cost Data for car #91 participating in 2014 Formula SAE® Michigan

Respected Suzy Zukowski,

BITS Pilani- Dubai is competing in Formula SAE® Michigan under the team name Gear Shifters with the allotted car number being 91. We are required to submit a detailed Cost report of our car as a part of the Cost and Manufacturing event.

The Cost Report consists of detailed Bill of Material (BOM) of all the parts of the car based on the performance advantage of each part and assembly. While making the report the team carefully observed and understood the principles of Design for Manufacture and Assembly, lean manufacturing and Minimum Constraint Design.

The team has tried to provide the most accurate Materials and Processes according to the given tables. The team also kept in mind that unnecessary wastes are culminated and the report is easy to understand so that the judges don't waste their time during the evaluation process. The total cost after compilation of all the seven systems in which the car is divided sums up to **\$13762.29**. The event objectives for the Cost and Manufacturing event have been kept in mind at all times while the formulation of the report to provide a logical, simple and time efficient rule set enabling students to achieve the event's objectives.

Thanking you for giving us your valuable time.

Yours sincerely,

Anshul Singhal

(Team Leader)

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Cost Summary Basics

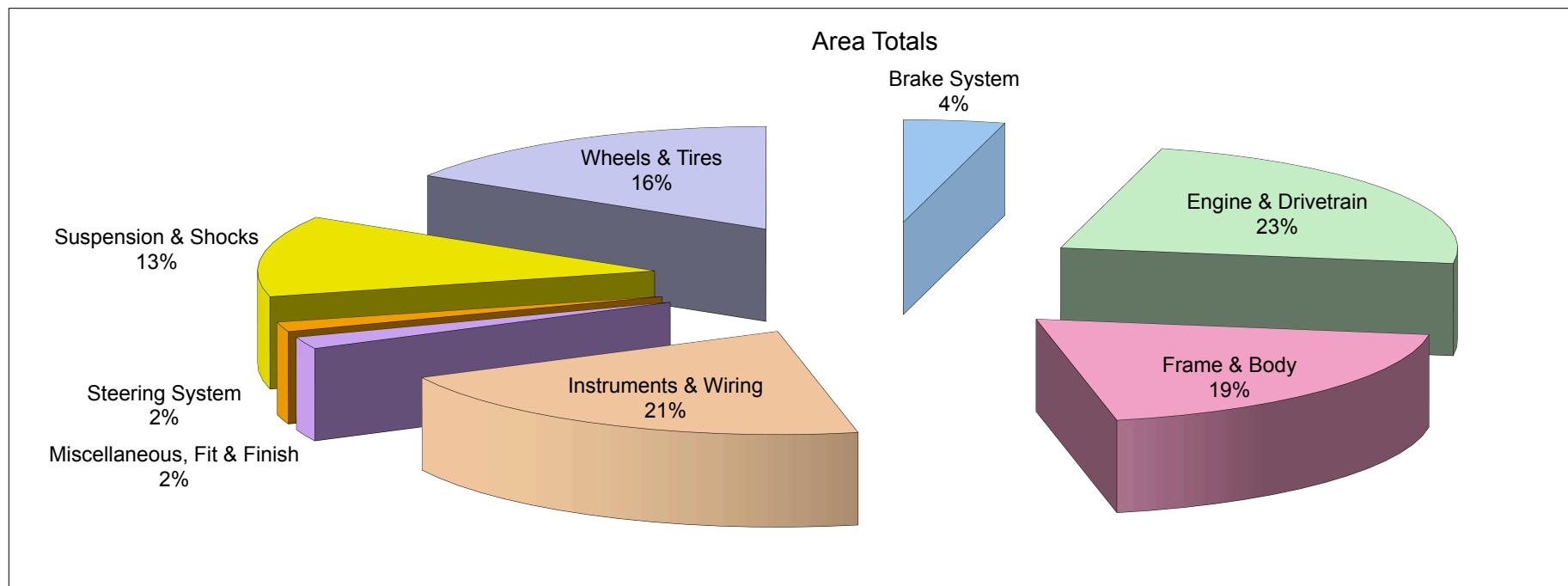
BITS Pilani-Dubai
Car # 091



BITS Pilani
Dubai Campus

Area Totals	Materials	Processes	Fasteners	Tooling	Total
Brake System	\$ 333.87	\$ 18.01	\$ 17.67	\$ -	\$ 567.70
Engine & Drivetrain	\$ 2,849.21	\$ 286.51	\$ 21.72	\$ -	\$ 3,206.37
Frame & Body	\$ 1,444.55	\$ 904.67	\$ 10.49	\$ -	\$ 2,660.49
Instruments & Wiring	\$ 2,428.38	\$ 420.02	\$ 19.26	\$ -	\$ 2,867.66
Miscellaneous, Fit & Finish	\$ 8.40	\$ 0.75	\$ -	\$ -	\$ 257.08
Steering System	\$ 151.29	\$ 46.68	\$ 0.26	\$ -	\$ 208.00
Suspension & Shocks	\$ 1,544.33	\$ 175.54	\$ 14.64	\$ 21.32	\$ 1,755.82
Wheels & Tires	\$ 419.80	\$ 300.80	\$ 0.43	\$ 2.66	\$ 2,239.18
Total Vehicle	\$ 9,179.82	\$ 2,152.98	\$ 84.47	\$ 23.98	\$ 13,762.29

Composition for total vehicle:



University University of BITS Pilani, Dubai Campus
 Competition Code FSAME
 Year 14
 Car # 091

Total Vehicle Cost \$ 13,762.29

Line Num.	Area of Commodity	System Designation	Asm #	Asm	Part #	Design Rev. Level	Component	Description	Unit Cost	Quantity	Material Cost	Process Cost	Fastener Cost	Tooling Cost	Total Cost
1	Brake System	BR	A1001	Front Rotor Assembly	P1001	AA	Front Rotor Assembly	Brake Pad Part	\$ 7.45	4.00	\$ 7.20	\$ 0.25	\$ -	\$ -	\$ 29.80
2					P1002	AA	Brake Discs	Brake Rotor	\$ 77.08	2.00	\$ 67.05	\$ 3.75	\$ 6.28	\$ -	\$ 154.16
3					P1003	AA	Brake Calipers	Brake Caliper, Wilwood, Billet Dynalite Single	\$ 53.25	2.00	\$ 50.00	\$ 1.50	\$ 1.75	\$ -	\$ 106.50
4			A1002	Rear Rotor Assembly	P1004	AA	Rear Rotor Assembly	Brake Discs	\$ 71.11	1.00	\$ 63.32	\$ 3.73	\$ 4.06	\$ -	\$ 71.11
5					P1005	AA	Brake Pads	Brake Pad Part	\$ 7.45	1.00	\$ 7.20	\$ 0.25	\$ -	\$ -	\$ 7.45
6					P1006	AA	Brake Calipers	Brake Caliper, Wilwood, Billet Dynalite Single	\$ 55.99	1.00	\$ 50.00	\$ 1.50	\$ 4.49	\$ -	\$ 55.99
7			A1003	Brake Line Assembly	P1007	AA	Brake Line Assembly	Brake Lines	\$ 5.00	1.00	\$ -	\$ 5.00	\$ -	\$ -	\$ 5.00
8					P1008	AA	Master Cylinder	Hose, Low Pressure, Stainless Steel Braided Outer	\$ 17.60	1.00	\$ 17.60	\$ -	\$ -	\$ -	\$ 17.60
9					P1009	AA	Fittings	Master Cylinder, Wilwood, 260-10371	\$ 45.47	2.00	\$ 43.00	\$ 1.63	\$ 0.84	\$ -	\$ 90.94
10								All Fittings	\$ 29.15	1.00	\$ 28.50	\$ 0.65	\$ 0.65	\$ -	\$ 29.15
11	Brake System	I		Area Total					\$ 369.55	1.00	\$ 333.87	\$ 18.01	\$ 17.67	\$ -	\$ 567.70
12	Engine & Drivetrain	EN	A2001	Engine Assembly	P2001	AA	Engine	Engine and its parts	\$ 3.75	1.00	\$ 3.75	\$ 0.25	\$ -	\$ -	\$ 3.75
13					P2002	AA	Coolant Pump	Honda CR600F2 Engine	\$ 1,522.33	1.00	\$ 1,499.75	\$ 13.43	\$ 9.15	\$ -	\$ 1,522.33
14			A2002	Exhaust Assmebly	P2003	AA	Exhaust Manifold	Inbuilt Coolant Pump	\$ 20.00	1.00	\$ 20.00	\$ -	\$ -	\$ -	\$ 20.00
15					P2004	AA	Collector	Complete Exhaust Assembly	\$ 0.13	1.00	\$ -	\$ 0.13	\$ -	\$ -	\$ 0.13
16					P2005	AA	Muffler	Headers, Runners and Flange Student Built	\$ 33.83	1.00	\$ 3.83	\$ 29.64	\$ 0.36	\$ -	\$ 33.83
17			A2003	Air Intake Assembly	P2006	AA	Intake Assembly	Student Built	\$ 17.37	1.00	\$ 0.31	\$ 17.06	\$ -	\$ -	\$ 17.37
18					P2007	AA	Lower Intake Manifold	Honda CR600F2 Stock Muffler	\$ 123.49	1.00	\$ 123.49	\$ 0.25	\$ -	\$ -	\$ 123.49
19					P2008	AA	Upper Intake Manifold	Complete Air Intake Assembly	\$ 4.00	1.00	\$ 0.25	\$ 3.75	\$ -	\$ -	\$ 4.00
20					P2009	AA	Air Filter Flange	Runnings Custom Made	\$ 16.91	1.00	\$ 1.58	\$ 15.33	\$ -	\$ -	\$ 16.91
21					P2010	AA	Air Filter	Restrictor, Plenum and Runners Custom Made	\$ 21.53	1.00	\$ 2.01	\$ 19.52	\$ -	\$ -	\$ 21.53
22			A2004	Fuel Assembly	P2011	AA	Fuel Injectors	Student Made	\$ 5.73	1.00	\$ 0.34	\$ 5.28	\$ 0.12	\$ -	\$ 5.73
23					P2012	AA	Fuel Tank	Purchased K&N Air Filter	\$ 59.55	1.00	\$ 58.18	\$ 0.63	\$ 0.74	\$ -	\$ 59.55
24					P2013	AA	Fuel Pump	Jenvey Throttle Body	\$ 132.78	1.00	\$ 132.56	\$ -	\$ 0.22	\$ -	\$ 132.78
25					P2014	AA	Fuel Pressure Regulator	Complete Fuel Assembly	\$ -	1.00	\$ -	\$ -	\$ -	\$ -	\$ -
26					P2015	AA	Fuel Filter	Walbro GS1 392 Fuel Pump	\$ 35.35	1.00	\$ 35.00	\$ 0.13	\$ 0.22	\$ -	\$ 35.35
27					P2016	AA	Fuel Lines	Honda Stock Regulator	\$ 15.33	1.00	\$ 15.00	\$ 0.13	\$ 0.20	\$ -	\$ 15.33
28					P2017	AA	Fuel Rail	Aeromotive Fuel Filter	\$ 8.25	1.00	\$ 8.00	\$ 0.13	\$ 0.12	\$ -	\$ 8.25
29					P2018	AA	Fuel Check Valve	Stock Honda Primary Fuel Rail	\$ 33.23	1.00	\$ 32.70	\$ 0.35	\$ 0.18	\$ -	\$ 33.23
30			A2005	Cooling Assembly	P2019	AA	Speedflow Breather Check Valve	Speedflow Breather Check Valve	\$ 15.13	1.00	\$ 15.00	\$ 0.13	\$ 0.13	\$ -	\$ 15.13
31					P2020	AA	Water Pump	Complete Cooling Assembly	\$ 13.52	1.00	\$ 13.00	\$ 0.25	\$ 0.52	\$ -	\$ 13.52
32					P2021	AA	Radiator	Student Built Complete Radiator	\$ 74.00	1.00	\$ 72.00	\$ 2.00	\$ 0.25	\$ -	\$ 74.00
33			A2006	Differential Assembly	P2022	AA	Coilovers	Hoses and Plumbing	\$ 6.67	1.00	\$ 2.65	\$ 0.42	\$ 0.40	\$ -	\$ 6.67
34					P2023	AA	Differential Internals	Catch Can	\$ 12.40	1.00	\$ 12.00	\$ -	\$ 0.40	\$ -	\$ 12.40
35					P2024	AA	Differential Bearings	Student Purchased	\$ 1.68	1.00	\$ -	\$ -	\$ 1.68	\$ -	\$ 1.68
36					P2025	AA	Differential Oil Container	Complete Differential Assembly	\$ 1.68	1.00	\$ -	\$ -	\$ -	\$ -	\$ 1.68
37					P2026	AA	Differential Oil Containment and Brake rotor Flange	Torsen T1 Student Purchased	\$ 165.00	1.00	\$ 165.00	\$ -	\$ -	\$ -	\$ 165.00
38					P2027	AA	Left Spacer	NSK Deep Groove Ball Bearings	\$ 57.10	1.00	\$ 56.34	\$ 0.76	\$ -	\$ -	\$ 57.10
39					P2028	AA	Right Spacer	Student Built	\$ 2.93	1.00	\$ 2.93	\$ -	\$ -	\$ -	\$ 2.93
40			A2007	Drivetrain Assembly	P2029	AA	Splines	Student Built	\$ 34.34	1.00	\$ 33.75	\$ 0.57	\$ 0.48	\$ -	\$ 34.34
41					P2030	AA	Left Spacers	Student Built	\$ 0.57	1.00	\$ 0.08	\$ 0.46	\$ 0.5	\$ -	\$ 0.57
42					P2031	AA	Drain Plug	Student Purchased	\$ 1.41	1.00	\$ 0.11	\$ 1.30	\$ -	\$ -	\$ 1.41
43					P2032	AA	Differential Oil	Red Line 75W90 Differential Oil	\$ 13.99	1.00	\$ 13.99	\$ -	\$ -	\$ -	\$ 13.99
44					P2033	AA	Differential Bearing Carriers	Student Made Carriers	\$ 0.71	1.00	\$ 0.71	\$ -	\$ -	\$ -	\$ 0.71
45					P2034	AA	Sprockets, Axle and Chain	Sprockets, Axle and Chain	\$ 73.13	1.00	\$ 23.65	\$ 49.49	\$ -	\$ -	\$ 73.13
46	Engine & Drivetrain	FR	A3001	Pedals & Control Assembly	P3001	AA	Chain	520 Series Chain	\$ 5.38	1.00	\$ 5.38	\$ 0.25	\$ -	\$ -	\$ 5.38
47					P3002	AA	Chain Guard	Throttle Pedal	\$ 67.47	1.00	\$ 67.07	\$ 0.25	\$ -	\$ -	\$ 67.47
48			A3002	Tube Space Frame Assembly	P3003	AA	Axle	Pedal, Wilwood	\$ 4.50	1.00	\$ 2.02	\$ 2.18	\$ 0.76	\$ -	\$ 4.50
49					P3004	AA	Rear Sprocket	Clutch Lever	\$ 16.65	2.00	\$ 16.43	\$ -	\$ 0.22	\$ -	\$ 16.65
50					P3005	AA	Front Sprocket	Clutch Lever	\$ 37.60	1.00	\$ 7.13	\$ 29.95	\$ 0.51	\$ -	\$ 37.60
51					P3006	AA	CV Joints	13 Tooth Sprocket Student Built	\$ 6.64	1.00	\$ 0.93	\$ 5.39	\$ 0.33	\$ -	\$ 6.64
52					P3007	AA	CV Joints	Purchased CV Joints	\$ 190.00	1.00	\$ 190.00	\$ -	\$ -	\$ -	\$ 190.00
53			A3003	Body Panel	P3008	AA	Tube Frame	Complete Tube Space Frame	\$ 819.67	1.00	\$ 82.58	\$ 737.09	\$ -	\$ -	\$ 819.67
54							Body Panel		\$ 1,517.44	1.00	\$ 2,849.21	\$ 286.51	\$ 21.72	\$ -	\$ 3,206.37
55							Bodyside Panels (Front)		\$ 923.62	1.00	\$ 649.70	\$ 28.23	\$ -	\$ -	\$ 923.62
56							Floor(Fiberglass)		\$ 66.90	1.00	\$ 61.00	\$ 5.99	\$ -	\$ -	\$ 66.90
57							Sidepod Wall(Fiberglass)		\$ 8.30	1.00	\$ 2.10	\$ 5.30	\$ 0.90	\$ -	\$ 33.30
58			A3004	Linkage Assembly	P3009	AA	Linkage Assembly	Clutch Linkage	\$ 31.40	1.00	\$ 30.00	\$ 1.40	\$ -	\$ -	\$ 31.40

Frame & Body				Area Total				\$ 2,359.71		1.00 \$		1,444.55 \$		904.87 \$		10.49 \$		-		\$ 2,060.49	
54	Instruments & Wiring	EL	A4001	Engine management assembly	P4001 AA	Engine Control Unit	Motec M4	\$ 1,063.55	1.00 \$	\$ 1,051.15 \$	\$ -	\$ 10.80 \$	\$ 1.60 \$	\$ -	\$ -	\$ 1,063.55	\$ -	\$ -	\$ -	\$ 1,063.55	
55					P4002 AA	Intake Air Temperature Sensor	Delco	\$ 4.12	1.00 \$	\$ 4.00 \$	\$ 0.12 \$	\$ -	\$ -	\$ -	\$ -	\$ 4.12	\$ -	\$ -	\$ -	\$ 4.12	
56					P4003 AA	Engine Coolant Temperature sensor	Bosch	\$ 8.12	1.00 \$	\$ 8.00 \$	\$ 0.12 \$	\$ -	\$ -	\$ -	\$ -	\$ 8.12	\$ -	\$ -	\$ -	\$ 8.12	
57					P4004 AA	Throttle Position Sensor	(Motec) Throttle pedal angle(0-90 degrees)	\$ 5.04	1.00 \$	\$ 4.00 \$	\$ 1.00 \$	\$ 0.04 \$	\$ 0.04 \$	\$ -	\$ -	\$ 5.04	\$ -	\$ -	\$ -	\$ 5.04	
58					P4005 AA	Lambda Sensor	Bosch 4-wire wideband	\$ 35.00	1.00 \$	\$ 35.00 \$	\$ 0.12 \$	\$ 0.01 \$	\$ 0.01 \$	\$ -	\$ -	\$ 35.13	\$ -	\$ -	\$ -	\$ 35.13	
59					P4006 AA	Manifold Absolute Pressure Sensor	Delco	\$ 7.69	1.00 \$	\$ 4.09 \$	\$ 2.22 \$	\$ 0.08 \$	\$ 0.08 \$	\$ -	\$ -	\$ 7.69	\$ -	\$ -	\$ -	\$ 7.69	
60					P4007 AA	OEM Magnetic Sensor (Crankshaft)	Honda hall effect	\$ 4.00	1.00 \$	\$ 4.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.00	\$ -	\$ -	\$ -	\$ 4.00	
61					P4008 AA	OEM Magnetic Sensor (Camshaft)	Honda hall effect	\$ 5.04	1.00 \$	\$ 4.00 \$	\$ 0.50 \$	\$ 0.54 \$	\$ 0.54 \$	\$ -	\$ -	\$ 5.04	\$ -	\$ -	\$ -	\$ 5.04	
62					P4009 AA	Fuel injector	Denso 60CF3	\$ 40.48	1.00 \$	\$ 40.00 \$	\$ 0.48 \$	\$ 0.48 \$	\$ 0.48 \$	\$ -	\$ -	\$ 40.48	\$ -	\$ -	\$ -	\$ 40.48	
63					P4010 AA	OEM Spark Plug	Honda NTK	\$ 0.48	1.00 \$	\$ -	\$ 0.48 \$	\$ -	\$ -	\$ -	\$ -	\$ 0.48	\$ -	\$ -	\$ -	\$ 0.48	
64					P4011 AA	OEM Inductive Ignition Coils	Honda	\$ 0.24	1.00 \$	\$ -	\$ 0.24 \$	\$ -	\$ -	\$ -	\$ -	\$ 0.24	\$ -	\$ -	\$ -	\$ 0.24	
65	A4002			Wiring and supply control assembly	P4012 AA	Wiring loom ECU	Motec M4	\$ 239.81	1.00 \$	\$ -	\$ 236.61 \$	\$ 3.20 \$	\$ -	\$ -	\$ -	\$ 239.81	\$ -	\$ -	\$ -	\$ 239.81	
66					P4013 AA	Primary/Master Kill switch with alternator protection	(Pegasus) 3 Ohm resistor lead for alternator protection	\$ 6.24	1.00 \$	\$ 5.00 \$	\$ -	\$ 1.24 \$	\$ -	\$ -	\$ -	\$ 6.24	\$ -	\$ -	\$ -	\$ 6.24	
67					P4014 AA	Security Key	Push Button type	\$ 3.00	1.00 \$	\$ 3.00 \$	\$ -	\$ 0.08 \$	\$ 0.08 \$	\$ -	\$ -	\$ 3.00	\$ -	\$ -	\$ -	\$ 3.00	
68					P4015 AA	3 button ignition key switch		\$ 5.28	1.00 \$	\$ 3.00 \$	\$ -	\$ 2.28 \$	\$ -	\$ -	\$ -	\$ 5.28	\$ -	\$ -	\$ -	\$ 5.28	
69					P4016 AA	Brake Over Travel switch		\$ 7.05	1.00 \$	\$ 7.05 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7.05	\$ -	\$ -	\$ -	\$ 7.05	
70					P4017 AA	Wires(red/black)	I.D = 2.5mm O.D = 4mm	\$ 6.00	1.00 \$	\$ 6.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6.00	\$ -	\$ -	\$ -	\$ 6.00	
71					P4018 AA	Fuse 20A	Protection	\$ 7.25	1.00 \$	\$ 1.00 \$	\$ 1.00 \$	\$ 1.10 \$	\$ 1.10 \$	\$ -	\$ -	\$ 7.25	\$ -	\$ -	\$ -	\$ 7.25	
72					P4019 AA	Fuse Box	Case	\$ 7.50	1.00 \$	\$ 7.50 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7.50	\$ -	\$ -	\$ -	\$ 7.50	
73					P4020 AA	Crimps	Push crimp	\$ 7.00	1.00 \$	\$ 7.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7.00	\$ -	\$ -	\$ -	\$ 7.00	
74					P4021 AA	Connectors 4 - Terminal	Connect wires	\$ 5.00	1.00 \$	\$ 5.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5.00	\$ -	\$ -	\$ -	\$ 5.00	
75					P4022 AA	Connector 5 - Terminal	Connect wires	\$ 2.00	1.00 \$	\$ 2.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2.00	\$ -	\$ -	\$ -	\$ 2.00	
76					P4023 AA	Bosch 12V/30A mini relay	Normally open	\$ 19.50	1.00 \$	\$ 14.00 \$	\$ -	\$ 5.50 \$	\$ 5.50 \$	\$ -	\$ -	\$ 19.50	\$ -	\$ -	\$ -	\$ 19.50	
77					P4024 AA	Battery (12V LIFEP04 175CCA 11Ah)	Power source	\$ 201.58	1.00 \$	\$ 195.80 \$	\$ 5.70 \$	\$ 0.08 \$	\$ 0.08 \$	\$ -	\$ -	\$ 201.58	\$ -	\$ -	\$ -	\$ 201.58	
78	A4003			Ignition control Module assembly	P4025 AA	Ignition control Module	Dual channel by Bosch	\$ 3.61	1.00 \$	\$ -	\$ 3.16 \$	\$ 0.45 \$	\$ -	\$ -	\$ -	\$ 3.61	\$ -	\$ -	\$ -	\$ 3.61	
79					P4026 AA	Connectors	7 terminals	\$ 4.00	1.00 \$	\$ 4.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.00	\$ -	\$ -	\$ -	\$ 4.00	
80					P4027 AA	Crimps	Crimp	\$ 0.25	1.00 \$	\$ 0.25 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.25	\$ -	\$ -	\$ -	\$ 0.25	
81	A4004			Dashboard display assembly	P4028 AA	Accewell RPM meter 1500	RPM display	\$ 99.73	1.00 \$	\$ -	\$ 99.73 \$	\$ -	\$ -	\$ -	\$ -	\$ 99.73	\$ -	\$ -	\$ -	\$ 99.73	
82					P4029 AA	OEM wheel speed sensor	Wheel speed	\$ 26.05	1.00 \$	\$ 26.00 \$	\$ -	\$ 0.05 \$	\$ 0.05 \$	\$ -	\$ -	\$ 26.05	\$ -	\$ -	\$ -	\$ 26.05	
83					P4030 AA	OEM RPM sensor	Engine RPM	\$ 7.56	1.00 \$	\$ 6.16 \$	\$ -	\$ 1.40 \$	\$ 1.40 \$	\$ -	\$ -	\$ 7.56	\$ -	\$ -	\$ -	\$ 7.56	
84					P4031 AA	OEM engine temperature sensor	Engine temperature	\$ 10.00	1.00 \$	\$ 10.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10.00	\$ -	\$ -	\$ -	\$ 10.00	
85					P4032 AA	Arduino Uno rev3 micro controller board		\$ 4.63	1.00 \$	\$ 4.00 \$	\$ 0.15 \$	\$ 0.15 \$	\$ 0.15 \$	\$ -	\$ -	\$ 4.63	\$ -	\$ -	\$ -	\$ 4.63	
86					P4033 AA	Hitch LCD HD44780		\$ 5.92	1.00 \$	\$ 2.30 \$	\$ 3.62 \$	\$ -	\$ -	\$ -	\$ -	\$ 5.92	\$ -	\$ -	\$ -	\$ 5.92	
87					P4034 AA	Push button switches		\$ 3.00	1.00 \$	\$ 2.00 \$	\$ 1.00 \$	\$ 1.00 \$	\$ 1.00 \$	\$ -	\$ -	\$ 3.00	\$ -	\$ -	\$ -	\$ 3.00	
88	A4005			Gear Shift Control Assembly	P4035 AA	Flat Shifter Max	Paddleshifter	\$ 28.64	1.00 \$	\$ -	\$ 28.64 \$	\$ -	\$ -	\$ -	\$ -	\$ 28.64	\$ -	\$ -	\$ -	\$ 28.64	
89					P4036 AA	Flat Shifter Expert	Throttle blip	\$ 379.40	1.00 \$	\$ 379.40 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 379.40	\$ -	\$ -	\$ -	\$ 379.40	
90	A4006			Brake Light Assembly	P4037 AA	Brake lights	Brake notification	\$ 23.56	1.00 \$	\$ -	\$ 23.50 \$	\$ 0.06 \$	\$ -	\$ -	\$ -	\$ 23.56	\$ -	\$ -	\$ -	\$ 23.56	
91					P4038 AA	Brake Light Switch	hydraulic switch	\$ 8.00	1.00 \$	\$ 8.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8.00	\$ -	\$ -	\$ -	\$ 8.00	
92					P4039 AA	Brake light wiring	Power supply	\$ 7.50	1.00 \$	\$ 7.50 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7.50	\$ -	\$ -	\$ -	\$ 7.50	
93	Instruments & Wiring	MS	A5001				Area Total	\$ 2,867.66	1.00 \$	\$ 2,428.38 \$	\$ 420.02 \$	\$ 19.26 \$	\$ -	\$ -	\$ -	\$ -	\$ 2,867.66	\$ -	\$ -	\$ -	\$ 2,867.66
94	Miscellaneous, Fit & Finish						Seats	\$ 140.79	1.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 140.79	\$ -	\$ -	\$ -	\$ 140.79
95							Safety Harness	\$ 45.00	1.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 45.00	\$ -	\$ -	\$ -	\$ 45.00
96							Paint - Frame	\$ 3.00	1.00 \$	\$ 3.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3.00	\$ -	\$ -	\$ -	\$ 3.00	
97							Paint - Body	\$ 44.72	1.00 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 44.72	\$ -	\$ -	\$ -	\$ 44.72
98							Fire Wall	\$ 4.95	1.00 \$	\$ 4.20 \$	\$ 0.75 \$	\$ -	\$ -	\$ -	\$ -	\$ 4.95	\$ -	\$ -	\$ -	\$ 4.95	
99							Safety Shield	\$ 4.20	1.00 \$	\$ 4.20 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.20	\$ -	\$ -	\$ -	\$ 4.20	
100							Area Total	\$ 257.08	1.00 \$	\$ 8.40 \$	\$ 0.75 \$	\$ -	\$ -	\$ -	\$ -	\$ 257.08	\$ -	\$ -	\$ -	\$ 257.08	
101	Steering System	ST	A6001	Steering Rack Assembly	P6001 AA	Steering Rack Assembly	Pinion Gear	\$ 12.50	1.00 \$	\$ 1.42 \$	\$ 11.68 \$	\$ -	\$ -	\$ -	\$ -	\$ 12.50	\$ -	\$ -	\$ -	\$ 12.50	
102					P6002 AA	Steering Rack	Heck gear	\$ 11.81	1.00 \$	\$ 2.00 \$	\$ 9.64 \$	\$ 0.12 \$	\$ 0.12 \$	\$ -	\$ -	\$ 11.81	\$ -	\$ -	\$ -	\$ 11.81	
103					P6003 AA	Steering Rack Housing	Aluminum housing	\$ 8.60	1.00 \$	\$ 4.32 \$	\$ 4.28 \$	\$ -	\$ -	\$ -	\$ -	\$ 8.60	\$ -	\$ -	\$ -	\$ 8.60	
104					P6004 AA	Pinion Gear Housing	Aluminum housing	\$ 9.27	1.00 \$	\$ 3.57 \$	\$ 5.70 \$	\$ -	\$ -	\$ -	\$ -	\$ 9.27	\$ -	\$ -	\$ -	\$ 9.27	
105					A6002	Steering Column Assembly	Steering Column Assembly	\$ 1.00	1.00 \$	\$ 0.00 \$	\$ 0.00 \$	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 1.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 1.00	
106					P6005 AA	Column Joints	U-Joint	\$ 74.27	1.00 \$	\$ 60.00 \$	\$ 13.60 \$	\$ -	\$ -	\$ 0.67	\$ 0.67	\$ 74.27	\$ -	\$ -	\$ -	\$ 74.27	
107					P6006 AA	Tube Column	Tube	\$ 0.37	1.00 \$	\$ 0.37 \$	\$ 0.37 \$	\$ -	\$ -	\$ 0.37	\$ 0.37	\$ 0.37	\$ -	\$ -	\$ -	\$ 0.37	
108	A6003			Steering Wheel Assembly	P6007 AA	Steering Wheel Assembly	Steering Wheel	\$ 27.25	1.00 \$	\$ 27.25 \$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 27.25	\$ -	\$ -	\$ -	\$ 27.25	
109					P6008 AA	Quick Release	Aluminum quick release	\$ 50.41	1.00 \$	\$ 49.03 \$	\$ 1.38 \$	\$ -	\$ -	\$ -	\$ -	\$ 50.41	\$ -	\$ -	\$ -	\$ 50.41	
110					A6004	Tie Rod Assembly	Tie Rod	\$ 0.37	1.00 \$	\$ 0.37 \$	\$ 0.37 \$	\$ -	\$ -	\$ -	\$ -	\$ 0.37	\$ -	\$ -	\$ -	\$ 0.37	
111					P6009 AA	Rod Ends	Rod Ends	\$ 14.22	1.00 \$	\$ 5.56 \$	\$ 1.04 \$	\$ 0.48 \$	\$ 0.48 \$	\$ -	\$ -	\$ 14.22	\$ -	\$ -	\$ -	\$ 14.22	
112					P6010 AA	Front A-Arm Assembly	Lower A-Arm	\$ 41.46	2.00 \$	\$ 67.69 \$	\$ 13.06 \$	\$ 2.16 \$	\$ 2.16 \$	\$ -	\$ -	\$ 82.81	\$ -	\$ -	\$ -	\$ 82.81	
113					P6011 AA	Upper A-Arm	Steel Upper A-Arm	\$ 41.01	2.00 \$	\$ 66.79 \$	\$ 13.06 \$	\$ 2.16 \$	\$ 2.16 \$	\$ -	\$ -	\$ 82.01	\$ -	\$ -	\$ -	\$ 82.01	
114					P6012 AA	Rear A-Arm Assembly	Complete Rear A-Arms	\$ 1.00	1.00 \$	\$ 0.00 \$	\$ 0.00 \$	\$ -	\$ -	\$ -	\$ -	\$ 1.00	\$ -	\$ -	\$ -	\$ 1.00	
115					P6013 AA	Lower A-Arm	Steel Lower A-Arm	\$ 39.75	2.00 \$	\$ 64.27 \$	\$ 13.06 \$	\$ 2.16 \$	\$ 2.16 \$	\$ -	\$ -	\$ 79.49	\$ -	\$ -	\$ -	\$ 79.49	
116					P6014 AA	Upper A-Arm	Steel Upper A-Arm	\$ 39.48	2.00 \$	\$ 63.73 \$	\$ 13.06 \$	\$ 2.16 \$	\$ 2.16 \$	\$ -	\$ -	\$ 78.95	\$ -	\$ -	\$ -	\$ 78.95	
117					A7005	Front Bell Crank Assembly	Front Aluminum Bell Crank	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
118					A7006	Rear Bell Crank Assembly	Rear Aluminum Bell Crank	\$ 104.16	2.00 \$	\$ 193.47 \$	\$ 14.12 \$	\$ 0.72 \$	\$ 0.72 \$	\$ -	\$ -	\$ 208.31	\$ -	\$ -	\$ -	\$ 208.31	
119					A7007	Upright Assembly	Aluminum Bell Crank	\$ 104.16	2.00 \$	\$ 193.47 \$	\$ 14.12 \$										

Introduction

The Cost report has been developed after keenly following the event objectives of the Cost and Manufacturing event. It hasn't only been made to report the area totals of each section of the car but also follows a hierarchy under which each part of the car is addressed to the minutest extent possible. The report itself explains each and every step in the manufacturing, production and assembling of the car and also depicts where wastes can be eliminated in the manufacturing process.

The Tables, which have been provided for our reference, were referred to and the formulas for fastener unit costs were used to calculate the costs. At some places in the report the need of using Exchange rate arises. We being a team participating from U.A.E. used AED↔DOLLAR conversions and the exchange rate used was 3.67AED=1\$.

Brake System – BR

1.1 Front Rotor Assembly

1.1.1 Complete Front Brake Assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 290.49								
System	Braking System	Qty	1										
Assembly	Front Rotor Assembly												
P/N Base	A1001												
Suffix	AA												
Details	Complete Front Brake Assembly												
ItemOrder	Part	Part Cost	Quantity	Sub Total									
10	Brake Pads	\$ 7.46	4.00E+00	\$ 29.841									
20	Brake Discs	\$ 77.08	2.00E+00	\$ 154.157									
30	Brake Calipers	\$ 53.25	2.00E+00	\$ 106.494									
		Sub Total		\$ 290.493									
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
													Sub Total \$ -
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
									\$-				
								Sub Total	0				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									\$-				
								Sub Total	\$-				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								Sub Total					

1.1.2 Brake Disc Part

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 77.08								
System	Braking System	Qty	2										
Assembly	Front Rotor Assembly												
Part	Brake Discs												
P/N Base	A1001/P1002												
Suffix	AA												
Details	Brake Disc Part												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Lengt	Density	Quantity	Sub Total
10	Brake Rotor (All Cost as Made)	Brake Disc	\$ 67.05									1.00E+00	\$ 67.05
													Sub Total \$ 67.050
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Ratchet <= 25.4 mm	Tighten Disc Bolts	\$ 0.75		5			\$ 3.75					
							Sub Total	\$ 3.75					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
	Bolt, Grade 12.9		\$1.15	9.525	mm		22	mm		5	\$ 5.77		
	Nut, Grade 12.9		\$0.10	9.525	mm					5	\$ 0.50		
											\$ -		
											\$ -		
									Sub Total	\$ 6.28			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total					
								Sub Total	0				

1.1.3 Brake Pad Part

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 7.46
System	Braking System			Qty	4
Assembly	Front Rotor Assembly				
Part	Brake Pads				
P/N Base	A1001/P1001			Extended Cost	\$ 29.84
Suffix	AA				
Details	Brake Pad Part				

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Brake Pad, Iron or Steel Rotor		\$ 0.0002	18025.78	mm^3							2.00E+00	\$ 7.21

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line		\$ 0.13	Labor	2			\$ 0.25

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total

1.1.4 Brake Caliper, Wilwood, Billet Dynalite Single

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 53.25								
System	Braking System	Qty	2										
Assembly	Front Rotor Assembly												
Part	Brake Calipers												
P/N Base	A1001/P1003												
Suffix	AA												
Details	Brake Caliper, Wilwood, Billet Dynalite Single												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Brake Caliper, Wilwood, Billet Dynalite Single		\$ 50.00									1.00E+00	\$ 50.00
													Sub Total \$ 50.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Ratchet <= 25.4 mm	Tighten Caliper Bolts	\$ 0.75		2			\$ 1.50					
								Sub Total \$ 1.50					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
			\$0.80	8 mm		35 mm		2	\$ 1.60				
			\$0.07	8 mm				2	\$ 0.15				
									\$ -				
									\$ -				
									Sub Total \$ 1.75				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total 0					

1.2 Rear Rotor Assembly

1.2.1 Brake Disc Part

University	BITS Pilani-Dubai
System	Braking System
Assembly	Rear Rotor Assembly
Part	Brake Discs
P/N Base	A1002/P1004
Suffix	AA
Details	Brake Disc Part

Car #	91	Part Cost	\$ 71.13
Qty	1		

Extended Cost \$ 71.13

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Brake Rotor (All Cost as Made)	Brake Disc	\$ 63.32									1.00E+00	\$ 63.32

Sub Total \$ 63.320

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Ratchet <= 25.4 mm	Tighten Disc Bolts	\$ 0.75		5		\$ 3.75	

Sub Total \$ 3.75

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9		\$0.74	8	mm	25	mm	5	\$ 3.68
20	Nut, Grade 12.9		\$0.07	8	mm			5	\$ 0.37

Sub Total \$ 4.06

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total

Sub Total 0

1.2.2 Brake Pad Part

University	BITS Pilani-Dubai
System	Braking System
Assembly	Rear Rotor Assembly
Part	Brake Pads
P/N Base	A1002/P1004
Suffix	AA
Details	Brake Pad Part

Car # 91 **Part Cost** \$ 7.46

Qty 1

Extended Cos \$ 7.46

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Brake Pad, Iron or Steel Rotor		\$ 0.0002	18025.78	mm^3							2.00E+00	\$ 7.21
													\$ -

Sub Total \$ 7.210

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line		\$ 0.13	Labor	2		\$ 0.25	
								Sub Total \$ 0.25

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total 0

1.2.3 Brake Caliper, Wilwood, Billet Dynalite Single

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 55.99
System	Braking System	Qty	1		
Assembly	Rear Rotor Assembly				
Part	Brake Calipers				
P/N Base	A1002/P1006				
Suffix	AA				
Details	Brake Caliper, Wilwood, Billet Dynalite Single				

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Brake Caliper, Wilwood, Billet Dynalite Single		\$ 50.00									1.00E+00	\$ 50.00
													Sub Total \$ 50.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Ratchet <= 25.4 mm	Tighten Caliper Bolts	\$ 0.75		2		\$ 1.50	
							Sub Total \$ 1.50	

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
	Bolt, Grade 12.9		\$1.24	9.525	mm	31.75	mm	2	\$ 2.47
	Nut, Grade 12.9		\$1.01	9.525	mm			2	\$ 2.02
									Sub Total \$ 4.49

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total 0

1.3 Brake Line Assembly

1.3.1 Complete Brake Line Assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	138.44								
System	Braking System			Qty	1								
Assembly	Brake Line Assembly												
P/N Base	A1003												
Suffix	AA												
Details	Complete Brake Line Assembly												
ItemOrder	Part	Part Cost	Quantity	Sub Total									
10	Brake lines	\$ 17.60	1.00E+00	\$ 17.600									
20	Master Cylinder	\$ 45.47	2.00E+00	\$ 90.940									
30	Fittings	\$ 29.15	1.00E+00	\$ 29.150									
			Sub Total	\$ 137.690									
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fluid,Oil	Fluid For Lines	\$ 0.75		1 litre							1.00	\$ 0.75
												Sub Total	\$ 0.750
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Brake Bleed-Bleeder Valve	Bleed Brake	\$ 2.50	unit	2	1	1	\$ 5.00					
								Sub Total	\$ 5.00				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
												\$-	
									Sub Total	\$-			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total					
								Sub Total					

1.3.2 Brake Lines

University	BITS Pilani-Dubai
System	Braking System
Assembly	Brake Line Assembly
Part	Brake Line
P/N Base	A1003/P107
Suffix	AA
Details	Brake Lines

Car #	91	Part Cost	\$ 17.60
Qty	1	Extended Cos	\$ 17.60

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Hose, Low Pressure, Stainless Steel Braided Outer		\$ 3.52	5	m							1.00E+00	\$ 17.60

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ -	Sub Total \$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ -	Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total 0

1.3.3 Master Cylinder, Wilwood, 260-10371

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 45.4								
System	Braking System	Qty											
Assembly	Brake Line Assembly												
Part	Master Cylinder												
P/N Base	A1003/P1008												
Suffix	AA												
Details	Master Cylinder, Wilwood, 260-10371												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Master Cylinder, Wilwood, 260-10371		\$ 43.00									1.00E+00	\$ 43.00
													Sub Total \$ 43.00
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Ratchet <= 25.4 mm	Tighten Bolts	\$ 0.75	unit	2			\$ 1.50					
20	Assemble, 1 kg, Line-on-Line	Brake Line Connection	\$ 0.13	unit	1			\$ 0.13					
							Sub Total	\$ 1.63					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
10	Bolt, Grade 12.9		\$0.77	8 mm		30 mm		1	\$ 0.77				
20	Nut, Grade 12.9		\$0.07	8 mm				1	\$ 0.07				
									Sub Total \$ 0.84				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
									Sub Total 0				

1.3.4 All Brake Fittings

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 29.15
System	Braking System	Qty	1		
Assembly	Brake Line Assembly				
Part	Fittings				
P/N Base	A1003/P1009				
Suffix	AA				
Details	All Brake Fittings				

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fitting/H.P./Elbow/ 90 deg./Steel/		\$ 9.50									3.00E+00	\$ 28.50
												Sub Total	\$ 28.500

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line		\$0.13	unit	5		\$ 0.65	
								Sub Total \$ 0.65

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ -	
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total 0

Engine and Drivetrain – EN

2.1 Engine Assembly

2.1.1 Engine And Its Parts

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Engine Assembly
P/N Base	A2001
Suffix	AA
Details	Engine and its parts

Car #	91

Asm Cost	\$ 1,546.08
Qty	1
Extended Cost	\$ 1,546.08

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Honda CBR600F2 Engine	\$ 1,522.33	1	\$ 1,522.330
20	Spark Plug Coil	\$ -	4	\$ -
30	Spark Plug Wire	\$ -	4	\$ -
40	Oil Filter	\$ -	1	\$ -
50	Water Pump	\$ 20.00	1	\$ 20.000
Sub Total				\$ 1,542.330

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
													Sub Total \$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Connector Install, Circular, Friction	Connect Spark Plug Coil	\$ 0.14	unit	4	1	1	\$ 0.56
20	Ratchet <= 25.4 mm	Spark Plug Tightening	\$ 0.75	unit	4	1	1	\$ 3.00
30	Assemble, 1 kg, Line-on-Line	Engine wire harness connection to Bulkhead	\$ 0.13	unit	1	1	1	\$ 0.13
40	Assemble, 1 kg, Loose	Chain routing over Sprocket	\$ 0.06	unit	1	1	1	\$ 0.06
Sub Total								3.75

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
								Sub Total 0

2.1.2 Honda CBR600F2 Engine

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	\$ 1,522.33									
System	Engine & Drivetrain	Qty	1											
Assembly	Engine Assembly													
Part	Engine													
P/N Base	A2001/P2001													
Suffix	AA													
Details	Honda CBR600F2 Engine													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
10	Engine and Transmission, Ultra High Performance (>10 HP/100 cc)	Engine	\$ 2.50	599	cc		hp					1	\$ 1,497.50	
20	Spark Plug Coil	Ignition System	\$ -		unit							4	\$ -	
30	Spark Plug Wire	Ignition System	\$ -		unit							4	\$ -	
40	Fluid, Oil	Cooling Engine Components	\$ 0.75	3	liter							1	\$ 2.25	
50	Oil Filter	Filter Engine Oil	\$ -		1 unit							1	\$ -	
60	Overflow Bottle, JAX, 1 Qt. Recirc. Catch Can	Oil Reservoir for Vent Hoses	\$ 12.00		1 unit							1	\$ 12.00	
													Sub Total \$ 1,499.750	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplied	Mult. Val.	Sub Total						
10	Assemble, >20 kg, Loose	Mount Engine	\$ 1.88	unit	1	1	1	\$ 1.88						
20	Drilled holes < 25.4 mm dia.	Mount Camshaft Sensor	\$ 0.35	unit	2	1	1	\$ 0.70						
30	Drilled holes < 25.4 mm dia.	Mount Engine Coolant Temperature Sensor	\$ 0.35	unit		1	1	\$ 0.35						
40	Ratchet <= 25.4 mm	Tighten Engine Bolts	\$ 0.75	unit	8	1	1	\$ 6.00						
50	Ratchet <= 25.4 mm	Tighten Spark Plugs	\$ 0.75	unit	4	1	1	\$ 3.00						
60	Ratchet <= 25.4 mm	Remove Oil Filter	\$ 0.75	unit	1	1	1	\$ 0.75						
70	Ratchet <= 25.4 mm	Install New Oil Filter	\$ 0.75	unit	1	1	1	\$ 0.75					Sub Total 13.43	
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
10	Bolt, Grade 12.9	Engine Mounts	\$ 0.67	10	mm	60	mm	4	\$ 2.68					
20	Bolt, Grade 12.9	Engine Mounts	\$ 2.99	10	mm	180	mm	1	\$ 2.99					
30	Bolt, Grade 12.9	Engine Mounts	\$ 3.48	10	mm	200	mm	1	\$ 3.48					Sub Total \$ 9.15
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIn	Sub Total						
								0						Sub Total 0

2.1.3 Inbuilt Coolant Pump

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Engine Assembly
Part	Coolant Pump
P/N Base	A2001/P2002
Suffix	AA
Details	Inbuilt Coolant Pump

Car #	91
Qty	1
Extended Cc	\$ 20.00

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Coolant Pump, External Electric	Coolant Circulation Pump	\$ 20.00		1 unit							1	\$ 20.00
												Sub Total	\$ 20.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ -	
							Sub Total	0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ -	
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
							Sub Total	0

2.2 Exhaust Assembly

2.2.1 Complete Exhaust Assembly

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Exhaust Assembly
P/N Base	A2002
Suffix	AA
Details	Complete Exhaust Assembly

Car # 91

Asm Cost	\$ 174.82
Qty	1
Extended C	\$ 174.82

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Exhaust Manifold	\$ 33.83	1	\$ 33.830
20	Collector	\$ 17.37	1	\$ 17.370
30	Muffler	\$ 123.49	1	\$ 123.490
Sub Total				\$ 174.690

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
													Sub Total \$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Assemble exhaust	\$ 0.13	unit	1	1	1	\$ 0.13
							Sub Total	0.13

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.2.2 Headers, Runners and Flange Student Built

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Exhaust Assembly
Part	Exhaust Manifold
P/N Base	A2002/P2003
Suffix	AA
Details	Header and Flange Student Built

Car #	91	Asm Cost	\$ 33.83
Qty	1	Extended Cc	\$ 33.83

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Stainless	Material Headers	\$ 2.25	1.56	kg							1	\$ 3.51
30	Steel, Stainless	Material for Flange	\$ 2.25	0.14	kg							1	\$ 0.32
												Sub Total	\$ 3.825

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Tube bends	Bend Runner tubes to shape	\$ 0.75	bend	9	1	1	\$ 6.75
20	Weld	Weld to Tri Y Configuration	\$ 0.15	cm	24.2	1	1	\$ 3.63
30	Weld	Weld to Tri Y Configuration	\$ 0.15	cm	23.5	1	1	\$ 3.53
40	Weld	Weld to Tri Y Configuration	\$ 0.15	cm	30.7	1	1	\$ 4.61
50	Tube end preparation for welding	Prepare for Tri Y Configuration	\$ 0.75	end	4	1	1	\$ 3.00
60	Weld - Round Tubing	Weld to Tri Y Configuration	\$ 0.38	cm	21.4	1	1	\$ 8.13
70	Tube end preparation for welding	Prepare for Flange Weld	\$ 0.75	end	8	1	1	\$ 6.00
80	Weld - Round Tubing	Weld Flange	\$ 0.38	cm	10.6	1	1	\$ 4.03
							Sub Total	\$ 29.642

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Fasten Flange to Engine	\$ 0.18	8	mm		28	mm	2 \$ 0.36
20	Bolt, Grade 12.9	Fasten Flange to Engine	\$ 0.27	8	mm		42	mm	2 \$ 0.54
								Sub Total	\$ 0.36

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total	
								\$ -	
								Sub Total	0

2.2.3 Student Built

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Exhaust Assembly
Part	Collector
P/N Base	A2002/P2004
Suffix	AA
Details	Student Built

Car #	91	Asm Cost	\$ 17.37
Qty	1		
FileLink1			
FileLink2			
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Stainless	Material for Collector	\$ 2.25	0.136	kg							1	\$ 0.31
												Sub Total	\$ 0.306

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Tube bends	Bending to shape	\$ 0.75	bend	1	1	1	\$ 0.75
20	Tube end preparation for welding	Prepare Tri Y into 1 collector	\$ 0.75	end	4	1	1	\$ 3.00
30	Weld - Round Tubing	Weld collector	\$ 0.38	cm	37	1	1	\$ 14.06
								Sub Total 17.06

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.2.4 Honda CBR600F2 Stock Muffler

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Exhaust Assembly
Part	Muffler
P/N Base	A2002/P2005
Suffix	AA
Details	Honda CBR600F2 Stock Muffler

Car #	91	Asm Cost	\$ 123.49
Qty	1	Extended C	\$ 123.49

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Muffler (All Cost as Made)	Reduce noise	\$ 123.49		1 unit							1	\$ 123.49
												Sub Total	\$ 123.490

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ -	0
							Sub Total	0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ -	
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
							Sub Total	0

2.3 Air Intake Assembly

2.3.1 Complete Air Intake Assembly

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Air Intake Assembly
P/N Base	A2003
Suffix	AA
Details	Complete Air Intake Assembly

Car #	91	Asm Cost	\$ 240.93
Qty	1		
FileLink1			
FileLink2			
FileLink3			
Extended Cc	\$ 240.93		

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Lower Intake Manifold	\$ 16.91	1	\$ 16.910
20	Upper Intake Manifold	\$ 21.53	1	\$ 21.530
30	Air Filter Flange	\$ 5.73	1	\$ 5.730
40	Air Filter	\$ 59.55	1	\$ 59.550
50	Throttle Body	\$ 132.78	1	\$ 132.780
Sub Total				\$ 236.500

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Seal, O-Ring, Elastomer	Seal	\$ 0.05	1	unit	2.01	inch					1	\$ 0.05
												Sub Total	\$ 0.050

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Align Intake Manifold	\$ 0.13	unit	1	1	1	\$ 0.13
20	Assemble, 1 kg, Line-on-Line	Align Rubber Clamps	\$ 0.13	unit	4	1	1	\$ 0.52
30	Ratchet <= 25.4 mm	Tighten Runners together	\$ 0.75	unit	4	1	1	\$ 3.00
40	Assemble, 1 kg, Line-on-Line	Attach Throttle Cable	\$ 0.13	unit	1	1	1	\$ 0.13
Sub Total								3.78

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Intake Manifold Assembly	\$ 0.07	6	mm	20	mm	5	\$ 0.35
20	Nut, Grade 12.9	Intake Manifold Assembly	\$ 0.05	6	mm			5	\$ 0.25
Sub Total								\$ 0.60	

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PFV	FractionIncluded	Sub Total
								\$ -
								0

2.3.2 Runners Custom Made

University	BITS Pilani Dubai Campus								Car #	91	Asm Cost	\$ 16.91
System	Engine & Drivetrain								Qty	1		
Assembly	Air Intake Assembly											
Part	Lower Intake Manifold											
P/N Base	A2003/P2006											
Suffix	AA											
Details	Runners Custom Made											
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity
10	Plastic, Fluoropolymers	Complete Lower Intake Assembly	\$ 3.30	0.479	kg							1 \$ 1.58
												Sub Total \$ 1.581
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total				
10	Rapid Prototype - Plastic	Printing Lower Intake Manifold	\$ 32.00	kg	0.479	1	1	\$ 15.33				
							Sub Total	15.328				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total			
									\$ -			
									Sub Total \$ -			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total				
									\$ -			
							Sub Total	0				

2.3.3 Restrictor, Plenum and Runners Custom Made

University	BITS Pilani Dubai Campus								Car #	91	Asm Cost	\$ 21.53
System	Engine & Drivetrain								Qty	1		
Assembly	Air Intake Assembly											
Part	Upper Intake Manifold											
P/N Base	A2003/P2007											
Suffix	AA											
Details	Restrictor, Plenum and Runners Custom Made											
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity
10	Plastic, ABS	Complete Upper Intake Manifold	\$ 3.30	0.61	kg							1 \$ 2.01
												Sub Total \$ 2.013
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total				
10	Rapid Prototype - Plastic	Print Upper Intake Manifold	\$ 32.00	kg	0.61	1	1	\$ 19.52				
							Sub Total	19.52				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total			
									\$ -			
							Sub Total	\$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total				
									\$ -			
							Sub Total	0				

2.3.4 Student Made

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Air Intake Assembly
Part	Air Filter Flange
P/N Base	A2003/P2008
Suffix	AA
Details	Student Made

Car #	91
Asm Cost	\$ 5.73
Qty	1

Extended Cq \$ 5.73

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Connects Throttle Body and Air Filter	\$ 2.25	0.149	kg							1	\$ 0.34
												Sub Total	\$ 0.335

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Manufacturing the flange	\$ 1.30	unit	1	1	1	\$ 1.30
20	Machining	Material Removal	\$ 0.04	cm^3	4.96	1	1	\$ 0.20
30	Drilled holes < 25.4 mm dia.	Nuts and Bolts	\$ 0.35	hole	4	1	1	\$ 1.40
40	Weld - Round Tubing	Welding	\$ 0.38	cm	1	1	1	\$ 0.38
50	Screwdriver > 1 Turn	Screw Nuts and Bolts	\$ 0.50	turn	4	1	1	\$ 2.00
						Sub Total	5.2784	

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 8.8 (SAE 5)	Assemble Flange to Throttle Body	\$ 0.03	5	mm		20	mm	4 \$ 0.12
20	Nut, Grade 8.8 (SAE 5)	Assemble Flange to Throttle Body	\$ 0.02	5	mm				5 \$ 0.10
								Sub Total	\$ 0.12

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
							Sub Total	0

2.3.5 Purchased K&N Air Filter

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Air Intake Assembly
Part	Air Filter
P/N Base	A2003/P2009
Suffix	AA
Details	Purchased K&N Air Filter

Car #	91	Asm Cost	\$ 59.55
Qty	1	Extended Cc	\$ 59.55
FileLink1			FileLink2
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Air Filter	Filter air from Debris	\$ 0.15	387.88	cm^2							1	\$ 58.18
												Sub Total	\$ 58.182

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Align Filter to Adapter	\$ 0.13	unit	1	1	1	\$ 0.13
20	Screwdriver > 1 Turn	Tightening clamp	\$ 0.50	unit	1	1	1	\$ 0.50
								Sub Total 0.63

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Hose Clamp, Worm Drive	Secure Air Filter	\$ 0.74	60.9	mm			1	\$ 0.74
								Sub Total	\$ 0.74

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
								Sub Total 0

2.4 Fuel Assembly

2.4.1 Complete Fuel Assembly

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
P/N Base	A2004
Suffix	AA
Details	Complete Fuel Assembly

Car #	91
Asm Cost	\$ 440.55
Qty	1
FileLink1	
FileLink2	
FileLink3	
Extended Co	\$ 440.55

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Fuel Injector, Gasoline	\$ 10.52	4	\$ 42.080
20	Fuel Tank	\$ 51.20	1	\$ 51.200
30	Fuel Pump	\$ 35.35	1	\$ 35.350
40	Fuel Pressure Regulator	\$ 15.33	1	\$ 15.330
50	Fuel Filter	\$ 8.25	1	\$ 8.250
60	Fuel Lines	\$ 239.98	1	\$ 239.979
70	Fuel Rail	\$ 33.23	1	\$ 33.230
80	Fuel Check Valve	\$ 15.13	1	\$ 15.130
Sub Total				\$ 440.549

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
													Sub Total \$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.4.2 Denso 6CF.3 Injectors

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
Part	Fuel Injectors
P/N Base	A2004/P2011
Suffix	AA
Details	Denso 6CF.3 Injectors

Car #	91	Asm Cost	\$ 10.76
Qty	4		
Extended Cc	\$ 43.04		

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fuel Injector, Gasoline	Inject Fuel	\$ 10.00	unit								1	\$ 10.00
													Sub Total \$ 10.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Interference	Install Injector	\$ 0.19	unit	4	1	\$ 0.76	
							Sub Total	0.76

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.4.3 Aluminum Tank

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
Part	Fuel Tank
P/N Base	A2004/P2012
Suffix	AA
Details	Aluminum Tank

Car #	91	Asm Cost	\$ 51.20
Qty	1		
FileLink1			
FileLink2			
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Aluminum, Normal	Material for Fuel tank	\$ 4.20	1.13	kg							1	\$ 4.75
20	Steel, Stainless	Fuel Line Return	\$ 2.25		kg							1	\$ 2.25
30	Fitting, Weld-in, Male, Aluminum	Magnetic Drain Plug	\$ 2.41	14	mm							1	\$ 2.41
													Sub Total \$ 9.406

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Sheet metal shearing	Cut sheet metal	\$ 0.25	cut	14	1	1	\$ 3.50
20	Sheet metal bends	Bending of sheets for shape	\$ 0.25	bend	6	1	1	\$ 1.50
30	Drilled holes < 25.4 mm dia.	Drain Plug, Return Line, Breather Check Valve, Fuel Pump Inlet	\$ 0.35	hole	4	1	1	\$ 1.40
40	Drilled hole < 50.8 mm dia.	Filler Neck	\$ 0.70	hole	1	1	1	\$ 0.70
50	Weld - Round Tubing	Welding Filler Neck	\$ 0.38	cm	41.86	1	1	\$ 15.91
60	Weld	Welding Fuel Tank for shape	\$ 0.15	cm	115.68	1	1	\$ 17.35
								Sub Total 40.3588

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Mount Fuel Tank	\$ 0.17	8	mm		26	mm	6 \$ 1.02
20	Nut, Grade 12.9	Mount Fuel Tank	\$ 0.07	8	mm				6 \$ 0.42
									Sub Total \$ 1.44

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
								Sub Total 0

2.4.4 Walbro GSL 392 Fuel Pump

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
Part	Fuel Pump
P/N Base	A2004/P2013
Suffix	AA
Details	Walbro GSL 392 Fuel Pump

Car #	91	Asm Cost	\$ 35.35
Qty	1		
FileLink1			Extended Cc
FileLink2			\$ 35.35
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fuel Pump, Fuel Injected, Gasoline	Fuel Pump	\$ 35.00	unit								1	\$ 35.00
													Sub Total \$ 35.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Fuel Pump Installation	\$ 0.13	unit	1	1	1	\$ 0.13
								Sub Total 0.13

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Mount Fuel Pump	0.06	6	mm	14	mm	2	\$ 0.12
20	Nut, Grade 12.9	Mount Fuel Pump	0.05	6	mm			2	\$ 0.10
								Sub Total	\$ 0.22

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
								Sub Total 0

2.4.5 Honda Stock Regulator

University	BITS Pilani Dubai Campus										Car #	91	Asm Cost	\$ 15.33	
System	Engine & Drivetrain										Qty	1			
Assembly	Fuel Assembly										Extended C	\$ 15.33			
Part	Fuel Pressure Regulator														
P/N Base	A2004/P2014														
Suffix	AA														
Details	Honda Stock Regulator														
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total		
10	Fuel Pressure Regulator, Gasoline	Pressure Regulation	\$ 15.00	unit								1	\$ 15.00		
												Sub Total	\$ 15.000		
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total							
10	Assemble, 1 kg, Line-on-Line	Installation of Pressure Regulator	\$ 0.13	unit	1	1	1	\$ 0.13					Sub Total	0.13	
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total						
10	Bolt, Grade 12.9	Mount Fuel Pressure Regulator	\$ 0.10	7 mm		20 mm		2	\$ 0.20						
20	Nut, Grade 12.9	Mount Fuel Pressure Regulator	\$ 0.06	7 mm				2	\$ 0.12				Sub Total	\$ 0.20	
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total							
								0					Sub Total	0	

2.4.6 Aeromotive Fuel Filter

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
Part	Fuel Filter
P/N Base	A2004/P2015
Suffix	AA
Details	Aeromotive Fuel Filter

Car #	91	Asm Cost	\$ 8.25
Qty	1	FileLink1	
FileLink2			Extended Cc \$ 8.25
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fuel Filter	Fuel Filtration	\$ 8.00	unit								1	\$ 8.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Installation of Fuel Filter	\$ 0.13	unit	1	1	1	\$ 0.13

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Mount Fuel Filter	\$ 0.06	6 mm		14 mm		2	\$ 0.12
20	Nut, Grade 12.9	Mount Fuel Filter	\$ 0.05	6 mm				2	\$ 0.10

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0

2.4.7 Complete Fuel Line Assembly

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	239.9785								
System	Engine & Drivetrain	Qty	1										
Assembly	Fuel Assembly												
Part	Fuel Lines												
P/N Base	A2004/P2016												
Suffix	AA												
Details	Complete Fuel Line assembly												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Hose, Low Pressure, Stainless Steel Braided Outer	Material for Fuel Hard Lines	\$ 21.99	10	mm							1	\$ 21.99
20	Adapter/L.P./Elbow/Female to Male Pipe/90 deg./Aluminum/Anodized	Fuel Outlet Fitting for Fuel Tank	\$ 22.35	9.525	mm		10	mm				1	\$ 22.35
30	Fitting/L.P./Straight/Steel/	Fuel Pump Fitting	\$ 34.92	9.525	mm							2	\$ 69.85
40	Fitting/L.P./Straight/Steel/	Fuel Filter Fitting	\$ 34.92	9.525	mm							2	\$ 69.84
50	Banjo Fitting, Steel	Fuel Rail Fitting	\$ 20.00	9.525	mm							1	\$ 20.00
60	Fitting/L.P./Elbow/90 deg./Steel/	Sight Tube Fitting	\$ 16.15	6	mm							2	\$ 32.30
													Sub Total \$ 236.329
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Tube cut	Cutting Tubes	\$ 0.14	cm	10	1	1	\$ 1.40					
20	Tube Flare/Bead	Flare Ends	\$ 0.45	end	5	1	1	\$ 2.25					
								Sub Total 3.65					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									Sub Total \$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
									Sub Total 0				

2.4.8 Stock Honda Primary Fuel Rail

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
Part	Fuel Rail
P/N Base	A2004/P2017
Suffix	AA
Details	Stock Honda Primary Fuel Rail

Car #	91	Asm Cost	\$ 33.23
Qty	1		
Extended C			\$ 33.23

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fuel Rail (All Cost as Made)	Installing Injectors	\$ 32.70	unit								1	\$ 32.70
												Sub Total	\$ 32.700

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Drilled holes < 25.4 mm dia.	Pressure Gauge Fitting	\$ 0.35	unit	1	1	1	\$ 0.35
							Sub Total	0.35

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Mount Fuel Rail	\$ 0.06	6 mm		16 mm		3	\$ 0.18
20	Nut, Grade 12.9	Mount Fuel Rail	\$ 0.05	6 mm				3	\$ 0.15
									Sub Total \$ 0.18

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
							Sub Total	0

2.4.9 Speedflow Breather Check Valve

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Fuel Assembly
Part	Fuel Check Valve
P/N Base	A2004/P2018
Suffix	AA
Details	Speedflow Breather Check Valve

Car #	91	Asm Cost	\$ 15.13
Qty	1		
Extended C			\$ 15.13

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fuel Check Valve, In-line, Aluminum Rollover	Breather Valve for Fuel Tank	\$ 15.00	unit								1	\$ 15.00
												Sub Total	\$ 15.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Installation of Check Valve	\$ 0.13	unit	1	1	1	\$ 0.13
							Sub Total	0.13

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
							Sub Total	\$ -	

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
							Sub Total	0

2.5 Cooling Assembly

2.5.1 Complete Cooling Assembly

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Cooling Assembly
P/N Base	A2005
Suffix	AA
Details	Complete Cooling Assembly

Car #	91	Asm Cost	\$ 94.58
Qty	1		
FileLink1		Extended Cn	\$ 94.58
FileLink2			
FileLink3			

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Radiator	\$ 74.39	1	\$ 74.390
20	Coolant Lines	\$ 6.67	1	\$ 6.670
30	Catch Can	\$ 12.40	1	\$ 12.400
Sub Total				\$ 81.060

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fluid, Coolant	Cooling	\$ 0.00	litre								1	\$ 0.00
20	Filler Cap	Cap to cooling system	\$ 3.00	unit								1	\$ 3.00
												Sub Total	\$ 3.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Assemble Radiator with Lines	\$ 0.13	labor	4	1	1	\$ 0.52
20	Wrench <= 25.4 mm	Assemble fan to radiator	\$ 1.50	unit	1	1	1	\$ 1.50
30	Screwdriver > 1 Turn	Tighten clamps	\$ 0.50	unit	17	1	1	\$ 8.50
Sub Total								10.52

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total	
								\$ -	
								Sub Total	0

2.5.2 OEM Honda CBR600RR Radiator

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	\$ 74.39								
System	Engine & Drivetrain	Qty	1										
Assembly	Cooling Assembly												
Part	Radiator												
P/N Base	A2005/P2019												
Suffix	AA												
Details	OEM Honda CBR600RR Radiator												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Heat Exchanger, Air to Liquid	Cooling Motor	\$ 0.0035	2026 cm^3								1	\$ 7.09
20	Heat Exchanger Fan	Sucks in Cool Air	\$ 30.00	1 unit								1	\$ 30.00
30	Heat Exchanger Fan Shroud (All Cost as Made)	Air funneling & Fan Support	\$ 36.78	1 unit								1	\$ 36.78
												Sub Total	\$ 73.871
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Assemble, 1 kg, Line-on-Line	Assembling Materials	\$ 0.13	unit	1	1	1	\$ 0.13					
							Sub Total	\$ 0.13					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
10	Bolt, Grade 12.9	Mount Radiator	\$ 0.13	6 mm		36 mm		3	\$ 0.39				
20	Nut, Grade 12.9	Mount Radiator	\$ 0.05	6 mm					\$ -				
								Sub Total	\$ 0.39				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
									\$ -				
							Sub Total	0					

2.5.3 Hoses and Plumbing

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	\$ 6.67									
System	Engine & Drivetrain	Qty	1											
Assembly	Cooling Assembly			Extended Cc	\$ 6.67									
Part	Coolant Lines													
P/N Base	A2005/P2020													
Suffix	AA													
Details	Hoses and Plumbing													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
10	Aluminum, Normal	Plumbing for Radiator	\$ 4.20	0.246	kg							1	\$ 1.03	
20	Hose, Rubber	Connects Catch Can to Filler Neck	\$ 1.62	9	mm							1	\$ 1.62	
30	Hose, Rubber	Connects Plumbing for Radiator	\$ 4.66	25.9	mm							1	\$ 4.66	
												Sub Total	\$ 2.653	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
20	Cut (scissors, knife)	Cut rubber tubing	\$ 0.06	cm	6.98	1	1	\$ 0.42					Sub Total	0.4188
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
10	Hose Clamp, Worm Drive	Hose Tightening	0.6	25.9	mm				6	\$ 3.60				
20	Hose Clamp, Worm Drive	Hose Tightening	0.54	9	mm				2	\$ 1.08				
									Sub Total	\$ 3.60				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total						
									0					
									Sub Total	0				

2.5.4 Student Purchased

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	\$ 12.40								
System	Engine & Drivetrain	Qty	1										
Assembly	Cooling Assembly			Extended Cc	\$ 12.40								
Part	Catch Can												
P/N Base	A2005/P2021												
Suffix	AA												
Details	Student Purchased												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Overflow Bottle, JAX, 1 Qt. Recirc. Catch Can	Stores Overflowing Coolant	\$ 12.00	1	unit							1	\$ 12.00
												Sub Total	\$ 12.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
									\$ -				
									Sub Total	0			
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
10	Bolt, Grade 12.9	Mounting Catch Can	\$ 0.13	8	mm	20	mm		2	\$ 0.26			
20	Nut, Grade 12.9	Mounting Catch Can	\$ 0.07	8	mm				2	\$ 0.14			
									Sub Total	\$ 0.40			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
									\$ -				
									Sub Total	0			

2.6 Differential Assembly

2.6.1 Complete Differential Assembly

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Differential Assembly
P/N Base	A2006
Suffix	AA
Details	Complete Differential Assembly

Car #	91
Asm Cost	\$ 261.46
Qty	1

Extended Cc \$ 261.46

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Differential Internals	\$ 165.00	1	\$ 165.000
20	Differential Bearings	\$ 57.10	1	\$ 57.100
30	Differential Oil Container	\$ 2.93	1	\$ 2.930
	Differential Oil Container Cap and Brake rotor			
40	Flange	\$ 34.18	1	\$ 34.180
50	Left Spacer	\$ 0.57	1	\$ 0.570
60	Right Spacer	\$ 1.41	1	\$ 1.410
70	Drain Plug	\$ 13.99	1	\$ 13.990
80	Differential Oil	\$ 0.71	1	\$ 0.710
90	Differential Bearing Carriers	\$ 73.13	1	\$ 73.130
		Sub Total	\$ 259.780	

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
													Sub Total \$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Mount the Part	\$ 0.42	10	mm		40	mm	4 \$ 1.68
20	Nut, Grade 12.9	Mount the Part	\$ 0.11	10	mm				4 \$ 0.44
									Sub Total \$ 1.68

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.6.2 Torsen T1 Student Purchased

University	BITS Pilani Dubai Campus										Car #	91	Asm Cost	\$ 165.00
System	Engine & Drivetrain										Qty	1		
Assembly	Differential Assembly										Extended Cc	\$ 165.00		
Part	Differential Internals													
P/N Base	A2006/P2022													
Suffix	AA													
Details	Torsen T1 Student Purchased													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
10	Differential Internals, Limited Slip, Torsen T1	Differential Internals	\$ 165.00	1	unit							1	\$ 165.00	
													Sub Total	\$ 165.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
								\$ -						
								Sub Total	0					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
								\$ -						
								Sub Total	\$ -					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total						
								0						
								Sub Total	0					

2.6.3 NSK Deep Groove Ball Bearings

University	BITS Pilani Dubai Campus										Car #	91	Asm Cost	\$ 57.10
System	Engine & Drivetrain										Qty	1		
Assembly	Differential Assembly										Extended Cc	\$ 57.10		
Part	Differential Bearings													
P/N Base	A2006/P2023													
Suffix	AA													
Details	NSK Deep Groove Ball Bearings													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
10	Bearing, Ball, Deep Groove	Bearings for Differential	\$ 26.34	68	mm	15	mm					1	\$ 26.34	
20	Bearing, Ball, Deep Groove	Bearings for Differential	\$ 30.00	75	mm	16	mm					1	\$ 30.00	
								Sub Total	56.340					
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
10	Assemble, 1 kg, Interference	Assemble Bearings	\$ 0.19	unit	4	1	1	\$ 0.76						
								Sub Total	0.76					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
								\$ -						
								Sub Total	\$ -					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total						
								0						
								Sub Total	0					

2.6.4 Student Built

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Differential Assembly
	Differential Oil Container Cap and Brake rotor
Part	Flange
P/N Base	A2006/P2025
Suffix	AA
Details	Student Built

Car #	91	Asm Cost	\$ 34.18
Qty	1	Extended C	\$ 34.18
Sub Total			\$ 7.380

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material for part	\$ 2.25	3.28	kg							1	\$ 7.38

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup	\$ 1.30	unit	1	1	1	\$ 1.30
20	Machining	Material Removal	\$ 0.04	cm^3	265.44	1	1	\$ 10.62
30	Drilled holes < 25.4 mm dia.	Holes for Bolts	\$ 1.35	hole	9	1	1	\$ 12.15
40	Ratchet <= 25.4 mm	Tighten Bolts	\$ 0.75	unit	3	1	1	\$ 2.25
						Sub Total	\$ 26.32	

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Mount the Part	\$ 0.16	8	mm		25	mm	3 \$ 0.48
20	Nut, Grade 12.9	Mount the Part	\$ 0.07	8	mm				3 \$ 0.21
								Sub Total	\$ 0.48

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								Sub Total 0

2.6.5 Student Built

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	\$ 2.93								
System	Engine & Drivetrain	Qty	1										
Assembly	Differential Assembly												
Part	Differential Oil Container												
P/N Base	A2006/P2024												
Suffix	AA												
Details	Student Built												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Tubing Material for Container	\$ 2.25	1.3	kg							1	\$ 2.93
20	Steel, Mild	Boss for Drain Plug	\$ 2.25	0.024	kg							1	\$ 0.05
													Sub Total \$ 2.925
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Tube cut	Cutting the tube	\$ 0.10	cm	13	1	1	\$ 1.30					
20	Tube cut	Cutting the tube	\$ 0.10	cm	2.3	1	1	\$ 0.23					
30	Weld - Round Tubing	Join Boss and Container	\$ 0.38	cm	2.3	1	1	\$ 0.87					
40	Drilled holes < 25.4 mm dia.	Opening for drain plug	\$ 0.35	hole	1	1	1	\$ 0.35					
50	Threading, Internal (machining)	For attaching drain plug	\$ 0.10	cm	1	1	1	\$ 0.10					
							Sub Total	\$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
													Sub Total \$ -
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								0					Sub Total 0

2.6.6 Student Built

University	BITS Pilani Dubai Campus							Car #	91		Asm Cost	\$ 1.41	
System	Engine & Drivetrain							Qty	1		Extended Cc	\$ 1.41	
Assembly	Differential Assembly												
Part	Right Spacer												
P/N Base	A2006/P2027												
Suffix	AA												
Details	Student Built												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Right Spacer Material	\$ 2.25	0.049	kg							1	\$ 0.11
												Sub Total	\$ 0.110
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Machining Setup, Install and remove	Machine Setup	\$ 1.30	unit	1	1	1	\$ 1.30					
20	Machining	Material Removal	\$ 0.04	cm ³	0.99	1	1	\$ 0.04					
30	Assemble, 1 kg, Loose	Asemble spacer on housing boss	\$ 0.06	unit	1	1	1	\$ 0.06					
							Sub Total	\$ 1.30					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
												\$ -	
									Sub Total	\$ -			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
												0	
							Sub Total	0					

2.6.7 Student Built

University	BITS Pilani Dubai Campus							Car #	91		Asm Cost	\$ 0.57	
System	Engine & Drivetrain							Qty	1		Extended Cc	\$ 0.57	
Assembly	Differential Assembly												
Part	Left Spacer												
P/N Base	A2006/P2026												
Suffix	AA												
Details	Student Built												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Right Spacer Material	\$ 2.25	0.0344	kg							1	\$ 0.08
									Sub Total	\$ 0.077			
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Tube cut	Cutting the tube	\$ 0.10	cm	4.9	1	1	\$ 0.49					
20	Assemble, 1 kg, Loose	Asemble spacer on housing boss	\$ 0.06	unit	1	1	1	\$ 0.06					
							Sub Total	\$ 0.49					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
												\$ -	
								Sub Total	\$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
												0	
							Sub Total	0					

2.6.8 Student Purchased

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Differential Assembly
Part	Drain Plug
P/N Base	A2006/P2028
Suffix	AA
Details	Student Purchased

Car #	91	Asm Cost	\$ 13.99
Qty	1	Extended Cq	\$ 13.99

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Drain Plug, Hex Head, Magnetic	Drain out Oil	\$ 1.17	12	mm							1	\$ 13.99

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								Sub Total \$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								Sub Total \$ -	

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								Sub Total 0

2.6.9 Red Line 75W90 Differential Oil

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Differential Assembly
Part	Differential Oil
P/N Base	A2006/P2029
Suffix	AA
Details	Red Line 75W90 Differential Oil

Car # 91 Asm Cost \$ 0.71

Qty 1 Extended Cq \$ 0.71

FileLink1

FileLink2

FileLink3

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Fluid, Oil	Lubrication	\$ 0.75	0.95	litre							1	\$ 0.71

Sub Total \$ 0.713

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								Sub Total \$ - 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								Sub Total \$ -	

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								Sub Total \$ - 0

2.6.10 Student Made Carriers

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Differential Assembly
Part	Differential Bearing Carriers
P/N Base	A2006/P2030
Suffix	AA
Details	Student Made Carriers

Car #	91	Asm Cost	\$ 73.13
Qty	1	Extended Cc	\$ 73.13
Sub Total	\$ 23.648		

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Alloy	Left Bearing Carrier	\$ 2.25	6.49	kg							1	\$ 14.60
20	Steel, Alloy	Right Bearing Carrier	\$ 2.25	4.02	kg							1	\$ 9.05

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup	\$ 1.30	unit	2	1	1	\$ 2.60
20	Machining	Material Removal Left Bearing Carrier	\$ 0.04	cm^3	638.18	1	1	\$ 25.53
30	Machining	Material Removal Right Bearing Carrier	\$ 0.04	cm^3	362.69	1	1	\$ 14.51
40	Drilled holes < 25.4 mm dia.	Material Removal Left Bearing Carrier	\$ 0.35	hole	6	1	1	\$ 2.10
50	Drilled holes < 25.4 mm dia.	Material Removal Right Bearing Carrier	\$ 0.35	hole	5	1	1	\$ 1.75
60	Ratchet <= 25.4 mm	Both Bearing Carriers	\$ 0.75	unit	4	1	1	\$ 3.00

Sub Total **49.4848**

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -

Sub Total **\$ -**

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -

Sub Total **0**

2.7 Drivetrain Assembly

2.7.1 Sprockets, Axle and Chain

University	BITS Pilani Dubai Campus	Car #	91	Asm Cost	\$ 345.35									
System	Engine & Drivetrain	Qty	1											
Assembly	Drivetrain Assembly													
P/N Base	A2007													
Suffix	AA													
Details	Sprockets, Axle and Chain													
ItemOrder	Part	Part Cost	Quantity	Sub Total										
10	Chain	\$ 67.47	1	\$ 67.470										
20	Chain Guard	\$ 4.96	1	\$ 4.958										
30	Axle	\$ 16.65	2	\$ 33.300										
40	Rear Sprocket	\$ 37.60	1	\$ 37.600										
50	Front Sprocket	\$ 6.64	1	\$ 6.640										
60	CV Joints	\$ 190.00	1	\$ 190.000										
			Sub Total	\$ 339.968										
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
													\$ -	
													Sub Total \$ -	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.		Sub Total					
10	Assemble, 3 kg, Line-on-Line	Assemble Drivetrain	\$ 0.38	unit	1	1	1	\$ 0.38						
20	Adjustment - Misc.	Tension Chain	\$ 5.00	unit	1	1	1	\$ 5.00						
							Sub Total	5.38						
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
													\$ -	
													Sub Total \$ -	
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded		Sub Total					
													\$ -	
													Sub Total 0	

2.7.2 520 Series Chain

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Drivetrain Assembly
Part	Chain
P/N Base	A2007/P2031
Suffix	AA
Details	520 Series Chain

Car #	91	Asm Cost	\$ 67.47
Qty	1	Extended C	\$ 67.47

Extended C \$ 67.47

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Chain		\$ 0.05	1349.375	mm							1	\$ 67.47
												Sub Total	\$ 67.469

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
							Sub Total	0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
							Sub Total	\$ -	

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
							Sub Total	0

2.7.3 Student Built

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Drivetrain Assembly
Part	Chain Guard
P/N Base	A2007/P2032
Suffix	AA
Details	Student Built

Car #	91	Asm Cost	4.95825
Qty	1		
FileLink1			
FileLink2			
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Chain Guard Material	\$ 2.25	0.897	kg							1.00	\$ 2.02
												Sub Total	\$ 2.018

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup	\$ 1.30	unit	1	1	1	\$ 1.30
20	Sheet metal shearing	Cutting sheet metal	\$ 0.25	cut	1	1	1	\$ 0.25
30	Sheet metal bends	Bending chain guard to shape	\$ 0.25	bend	2	1	1	\$ 0.50
40	Assemble, 1 kg, Line-on-Line	Chain Assembly	\$ 0.13	unit	1	1	1	\$ 0.13
							Sub Total	2.18

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Fasten Chain Guard	0.1	8	mm		12	mm	
20	Nut, Grade 12.9	Fasten Chain Guard	0.07	8	mm				
30	Washer, Grade 12.9	Fasten Chain Guard	0.02	1	unit				
									Sub Total \$ 0.76

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.7.4 Student Purchased

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Drivetrain Assembly
Part	Axle
P/N Base	A2007/P2033
Suffix	AA
Details	Student Purchased

Car #	91	Asm Cost	\$ 16.65
Qty	2		
Extended Cc			\$ 33.30

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Axle (All Cost as Made)	Student Purchased Axle	\$ 16.43	1	unit							1	\$ 16.43
												Sub Total	\$ 16.430

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
			\$ -			1	1 \$ -	
								Sub Total 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Retaining Ring, Internal	Retain Axle Position	0.11	23.34	mm			2	\$ 0.22
								Sub Total	\$ 0.22

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
								Sub Total 0

2.7.5 Student Built

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Drivetrain Assembly
Part	Rear Sprocket
P/N Base	A2007/P2034
Suffix	AA
Details	Student Built

Car #	91	Asm Cost	\$ 37.60
Qty	1		
FileLink1			
FileLink2			
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Alloy	Sprocket Material	\$ 2.25	3.17	kg							1	\$ 7.13
												Sub Total	\$ 7.13

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup	\$ 1.30	unit	2	1	1	\$ 2.60
20	Drilled holes < 25.4 mm dia.	Holes for weight reduction	\$ 0.35	hole	32	1	1	\$ 11.20
30	Drilled holes < 25.4 mm dia.	Holes for Bolts	\$ 1.35	hole	3	1	1	\$ 4.05
40	Drilled hole < 50.8 mm dia.	Holes for weight reduction	\$ 0.70	hole	9	1	1	\$ 6.30
50	Machining	Material Removal	\$ 0.04	cm^3	80.08	1	1	\$ 3.20
60	Gear Shaping (hobbing)	Gear forming	\$ 0.50	cm	0.7	1	1	\$ 0.35
70	Ratchet <= 25.4 mm	Tighten Bolts	\$ 0.75	unit	3	1	1	\$ 2.25
							Sub Total	29.9532

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Fastening Rear Sprocket to Differential Housing	0.17	8	mm	26	mm	3	\$ 0.51
								Sub Total	\$ 0.51

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total	
								\$ -	
								Sub Total	0

2.7.6 13 Tooth Sprocket Student Built

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Drivetrain Assembly
Part	Front Sprocket
P/N Base	A2007/P2035
Suffix	AA
Details	13 Tooth Sprocket Student Built

Car #	91	Asm Cost	\$ 6.64
Qty	1		
Extended Cost			\$ 6.64

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Sprocket (All Cost as Made)	Machined Part	\$ -		unit							1	\$ -
20	Steel, Alloy	Sprocket Material	\$ 2.25	0.411	kg							1	\$ 0.92
												Sub Total	\$ 0.925

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup	\$ 1.30	unit	2	1	1	\$ 2.60
20	Machining	Material Removal	\$ 0.04	cm^3	30.53	1	1	\$ 1.22
30	Drilled hole < 50.8 mm dia.	Holes for weight reduction	\$ 0.70	hole	1	1	1	\$ 0.70
40	Gear Shaping (hobbing)	Gear forming	\$ 0.50	cm	0.73	1	1	\$ 0.37
50	Broach, Internal	Spline Forming	\$ 0.50	unit	1	1	1	\$ 0.50
							Sub Total	5.3862

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Fasten Front Sprocket	0.33	8	mm		50	mm	1 \$ 0.33
								Sub Total	\$ 0.33

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -
							Sub Total	0

2.7.7 Purchased CV Joints

University	BITS Pilani Dubai Campus
System	Engine & Drivetrain
Assembly	Drivetrain Assembly
Part	CV Joints
P/N Base	A2007/P2036
Suffix	AA
Details	Purchased CV Joints

Car #	91	Asm Cost	\$ 190.00
Qty	1		
Extended Cc	\$ 190.00		

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Constant Velocity Joint, Boot	Cover Joint	\$ 5.00		1 unit							2	\$ 10.00
20	Constant Velocity Joint, Tripod	Tripod	\$ 45.00		1 unit							4.00	\$ 180.00
												Sub Total	\$ 190.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ -	
							Sub Total	0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								0
							Sub Total	0

Frame and Body - FR

3.1 Pedals & Control Assembly

3.1.1 Throttle Pedal

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Pedals&Control Assembly
Part	Gas Pedal
P/N Base	A3001/P3001
Suffix	AA
Details	Throttle Pedal

Car #	91
Part Cost	\$ 53.57
Qty	1

Extended Cost \$ 53.57

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Gas Pedal		\$ 49.97									1.00	\$ 49.97
												Sub Total	\$ 49.970

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								Sub Total

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9		\$0.40	\$6.00	mm	\$28.00	mm	4	\$ 1.61
	Nut, Grade 12.9		\$0.50	\$6.00	mm			4	\$ 1.99
								Sub Total	\$ 3.60

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total

3.1.2 Pedal,Wilwood

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Pedals & Control Assembly
P/N Base	A3001
Suffix	AA
Details	All pedals

Car # 91

Asm Cost \$ 128.86

Qty 1

Extended Cost \$ 128.86

ItemOrder	Part	Part Cost	Quantity	Sub Total
\$10.00	Gas Pedal	\$ 53.57	1.00E+00	\$ 53.570
\$20.00	Brake Pedal	\$ 66.99	1.00E+00	\$ 66.990
\$30.00	Clutch Lever	\$ 8.30	1.00E+00	\$ 8.300
Sub Total				\$ 128.860

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
\$10.00													\$ -
												Sub Total	\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total 0.00

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total
								Sub Total

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Pedals&Control Assembly
Part	Brake Pedal
P/N Base	A3001/P3002
Suffix	AA
Details	Pedal, Wilwood, 340-1285

Car # 91

Part Cost	\$ 66.99
Qty	1
Extended Cost	\$ 66.99

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Pedal, Wilwood, 340-1285	Brake Pedal	\$ 61.00	1.00	unit								\$ 61.00
												Sub Total	\$ 61.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$-
								Sub Total \$-

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
	10 Bolt, Grade 12.9		\$0.75	\$8.00	mm			4	\$ 3.02
	Nut, Grade 12.9		\$0.74	8.00	mm			4	\$ 2.97
								Sub Total	\$ 5.99

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total

3.1.3 Clutch Lever

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Pedals&Control Assembly
Part	Clutch Lever
P/N Base	A3001/P3003
Suffix	AA
Details	Clutch Handle

Car # 91

Part Cost \$ 8.30

Qty 1

Extended Cost \$ 8.30

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10.00	Aluminium,Premium(per Kg)	Clutch Material	\$ 4.20	0.50	kg							1.00	\$ 2.10

Sub Total \$ 2.100

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and Remove		\$ 1.30	unit	1.00			\$ 1.30
20	Mill-Form Cutter	Material Removal	\$ 0.04	cm^3	100.00			\$ 4.00
								Sub Total \$ 5.30

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade AN		0.22	6.35	mm	\$19.05	mm	2	\$ 0.44
20	Nut, Grade AN		0.21	6.35	mm			2	\$ 0.42
30	Washer, Grade AN		0.02	6.35	mm			2	\$ 0.04
								Sub Total	\$ 0.90

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total 0.00

3.2 Tube Space Frame Assembly

3.2.1 Complete Tube Space Frame

University	BITS Pilani-Dubai	Car #	91.00	Part Cost	\$ 819.67									
System	Frame&Body	Qty	1	Extended Cos	\$ 819.67									
Assembly	Tube Space Frame Assembl													
Part	Complete Tube Frame													
P/N Base	A3002/P3004													
Suffix	AA													
Details	Steel Alloy Tube Frame													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
10.00	Round 1.00" x 0.049"	Frame Material	\$ 2.25	16.00	kg								\$ 36.00	
20.00	Round 1.00"x0.065"	Frame Material	\$ 2.25	13.10	kg								\$ 29.48	
30.00	Round 1.00"x0.095"	Frame Material	\$ 2.25	6.60	kg								\$ 14.85	
40.00	Square 0.98" x 2"	Frame Material	\$ 2.25	1.00	kg								\$ 2.25	
													Sub Total \$ 82.575	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
10.00	Tube Bend		\$ 0.75	bend	7.00			\$ 5.25						
20.00	Tube Cut		\$ 0.15	cm	1,078.00			\$ 161.70						
30.00	Tube end weld preparation		\$ 0.75	end	214.00			\$ 160.50						
40.00	Weld-Round Tubing		\$ 0.38	cm	1,078.00			\$ 409.64						
								Sub Total \$ 737.09						
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
									\$ -					
									Sub Total \$ -					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncid	Sub Total						
									Sub Total \$ 0.00					

3.3 Body Panel

3.3.1 Student built

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Body Panel
Part	Body Panel(Fiberglass)
P/N Base	A3003/P3005
Suffix	AA
Details	Body Panel

Car #	91	Part Cost	\$ 882.82
Qty	1		

Extended Cost \$ 882.82

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10.00	Glass Fiber,1Ply	Panel material	\$ 100.00	8.00	kg								\$ 800.00
												Sub Total	\$ 800.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10.00	Resin application, Manual		\$ 5.00	m^2	3.17			\$ 15.87
20.00	Cut (scissors, knife)		\$ 0.06	cm	587.08			\$ 35.22
30.00	Cure, Room Temperature		\$ 10.00	m^2	3.17			\$ 31.73
								Sub Total \$ 82.82

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total 0.00

3.3.2 Student built

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Body Panel
P/N Base	A3003
Suffix	AA
Details	Body Panels

Car # 91.00

Asm Cost 1,535.26

Qty 1

Extended Cost \$ 1,535.26

ItemOrder	Part	Part Cost	Quantity	Sub Total
10.00	Body Panel(Fiberglass)	\$ 923.52	1.00E+00	\$ 923.520
20.00	Floor(Fiberglass)	\$ 300.78	1.00E+00	\$ 300.780
30.00	Sidepot Wall(Fiberglass)	\$ 155.48	2.00E+00	\$ 310.960
				\$ -
				Sub Total \$ 1,535.260

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10.00													\$ -
												Sub Total	\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total 0.00

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PFV	FractionInclud	Sub Total
								#DIV/0!
								Sub Total #DIV/0!

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Body Panel
Part	Sidepot Wall(fiberglass)
P/N Base	A3003/P3006
Suffix	AA
Details	Sidepot

Car # 91

Part Cost \$ 155.48

Qty

Extended Cost \$ 155.48

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10.00	Glass Fiber,1Ply	Panel material	\$ 100.00	1.21	kg								\$ 120.50
													Sub Total \$ 120.500

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10.00	Resin application, Manual		\$ 5.00	m^2	0.31			\$ 1.54
20.00	Cut (scissors, knife)		\$ 0.06	cm	505.81			\$ 30.39
30.00	Cure, Room Temperature		\$ 10.00	m^2	0.31			\$ 3.09
							Sub Total	\$ 34.98

3.3.3 Student built

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Body Panel
Part	Floor(Fiberglass)
P/N Base	A3003/P3007
Suffix	AA
Details	Floor

Car #	91	Part Cost	\$ 300.78
Qty	1	Extended Cost	\$ 300.78
Sub Total			\$ 257.70
Sub Total			\$ 257.70

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10.00	Glass Fiber,1Ply	Panel material	\$ 100.00	2.58	kg								\$ 257.70

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10.00	Resin application, Manual		\$ 5.00	m^2	0.99			\$ 4.96
20.00	Cut (scissors, knife)		\$ 0.06	cm	470.18			\$ 28.21
30.00	Cure, Room Temperature		\$ 10.00	m^2	0.99			\$ 9.91
								\$ -
								Sub Total \$ 43.08

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total	Sub Total
								\$ -	
								\$ -	
								Sub Total 0.00	

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Linkage Assembly
Part	Clutch Linkage
P/N Base	A3003/P3008
Suffix	AA
Details	Clutch Lever Linkage

Car # 91.00 Part Cost \$ 31.40
Qty 1

Extended Cost \$ 31.40

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Cable,Push/Pull	Clutch Control	\$ 30.00	m								1.00E+00	\$ 30.00

Sub Total \$ 30.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove		\$ 1.30	unit	\$ 1.00			\$ 1.30
20	Mill-Form Cutter	Material Removal	\$ 0.10	cm	\$ 1.00			\$ 0.10
								Sub Total \$ 1.40

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total

3.4 Linkage Assembly

University	BITS Pilani-Dubai
System	Frame&Body
Assembly	Linkage Assembly
P/N Base	A3004
Suffix	AA
Details	All Linkages

Car # 91 **Asm Cost** \$ 31.40
Qty 1

Extended Cost \$ 31.40

ItemOrder	Part	Part Cost	Quantity	Sub Total
10.00	Clutch Linkage	\$ 31.40	1.00E+00	\$ 31.400
Sub Total				\$ 31.400

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
												Sub Total	\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total 0.00

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total
								Sub Total

Instruments and Wiring – EL

4.1 Engine management assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 1,173.89								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Engine management assembly												
P/N Base	A4001												
Suffix	AA												
Details	Engine Electronics assembly with ECU												
ItemOrder	Part	Part Cost	Quantity	Sub Total									
1	Engine Control Unit	\$ 1,063.550	1.00	\$ 1,063.550									
2	Intake Air temperature Sensor	\$ 4.120	1.00	\$ 4.120									
3	Engine Coolant Temperature sensor	\$ 8.120	1.00	\$ 8.120									
4	Throttle Position Sensor	\$ 5.040	1.00	\$ 5.040									
5	Lambda Sensor	\$ 35.130	1.00	\$ 35.130									
6	Manifold Air Pressure Sensor	\$ 7.690	1.00	\$ 7.690									
7	OEM Magnetic Sensor (Crankshaft)	\$ 4.000	1.00	\$ 4.000									
8	OEM Magnetic Sensor (Camshaft)	\$ 5.040	1.00	\$ 5.040									
9	Fuel injector	\$ 40.480	1.00	\$ 40.480									
10	OEM Spark Plugs	\$ 0.480	1.00	\$ 0.480									
11	OEM Inductive Ignition Coils	\$ 0.240	1.00	\$ 0.240									
		Sub Total		\$ 1,173.890									
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
													\$ -
													\$ -
													Sub Total 0
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
													\$ -
													\$ -
													Sub Total \$ -
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PFV	FractionIncluded	Sub Total					
													Sub Total \$ -

4.2 Engine Control Unit

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 1,063.55								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Engine management assembly												
Part	Engine Control Unit												
P/N Base	A4001/P4001												
Suffix	AA												
Details	MoTec M4 ECU Kit												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	ECU, MoTeC, M4	Control System for fuel injection and ignition.	\$ 1,050.00									1.00	\$ 1,050.00
2	Iron	Sheet for Mounting and container designing.	\$ 1.00	1	kg							1.00	\$ 1.00
3	Galvanized Iron sheet	For clamping to iron sheet board	\$ 1.00	1	kg							0.15	\$ 0.15
													Sub Total \$ 1,051.150
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Sheet Metal Saw Cut		\$ 0.20	cm	20			\$ 4.00					
2	Sheet metal bends		\$ 0.25	bend	8			\$ 2.00					
3	Drilled holes < 25.4 mm dia.		\$ 0.35	hole	8			\$ 2.80					
4	Screwdriver > 1 Turn		\$ 0.50		4			\$ 2.00					
													Sub Total \$ 10.80
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8 (SAE 5)	For fastening the ECU to the Acrylic sheet through G.I. Clamps	\$ 0.19	4	mm		16	mm	4	\$ 0.76			
2	Nut, Grade 8.8 (SAE 5)	For fastening the ECU to the Acrylic sheet through G.I. Clamps	0.2	4	mm				4	\$ 0.80			
3	Washer, Grade 8.8 (SAE 5)	For fastening the ECU to the Acrylic sheet through G.I. Clamps	0.01	4	mm				4	\$ 0.04			
													Sub Total \$ 1.60
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0

4.3 Intake Air Temperature Sensor

University	BITS Pilani-Dubai							Car #	91	Part Cost	\$ 4.12		
System	Instruments and Wiring							Qty	1				
Assembly	Engine management assembly												
Part	Intake Air temperature Sensor												
P/N Base	A4001/P4002							Extended Cost	\$ 4.12				
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Temperature Sensor	Air temperature	\$ 4.00									1.00 \$ 4.00	
												Sub Total \$ 4.000	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Hand - Start Only		\$ 0.12		1.00			\$ 0.12					
							Sub Total	\$ 0.12					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								Sub Total	\$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total	0				

4.4 Engine Coolant Temperature Sensor

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 8.12								
System	Instruments and Wiring	Qty	1										
Assembly	Engine management assembly												
Part	Engine Coolant Temperature sensor												
P/N Base	A4001/P4003												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Sensor, Temperature	Engine Coolant Temperature sensor	\$ 8.00									1.00	\$ 8.00
													Sub Total \$ 8.00
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Hand - Start Only	Threading based	\$ 0.12		1.00			\$ 0.12					
								Sub Total \$ 0.12					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
													Sub Total \$ -
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total 0					



4.5 Throttle Position Sensor

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 5.04								
System	Instruments and Wiring	Qty	1										
Assembly	Engine management assembly												
Part	Throttle Position Sensor												
P/N Base	A4001/P4004												
Suffix	AA												
Details	[motec]Throttle pedal angle(0-90 degrees)												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Sensor, Angular Position	Throttle Position	\$ 4.00									1.00	\$ 4.00
													Sub Total \$ 4.00
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Wrench <= 6.35 mm	To fasten the nuts used to mount the sensor to the throttle body	\$ 1.00		1			\$ 1.00					
													Sub Total \$ 1.00
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8 (SAE 5)	For fastening the ECU to the Acrylic sheet through G.I. Clamps	\$ 0.02	4	mm			2	\$ 0.04				
													Sub Total \$ 0.04
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0



4.6 Lambda Sensor

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$								
System	Instruments and Wiring	Qty											
Assembly	Engine management assembly												
Part	Lambda Sensor												
P/N Base	A4001/P4005												
Suffix	AA												
Details	Bosch 4-wire wideband												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Sensor, Wide Band Air Fuel Raito	Air Fuel Ratio control	\$ 35.00										1.00 \$
													Sub Total \$
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Hand - Start Only	Threading based	\$ 0.12		1.00			\$ 0.12					
								Sub Total	\$ 0.12				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Washer, Grade 12.9		0.01						1 \$ 0.01				
								Sub Total	\$ 0.01				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total					
								Sub Total	0				



4.7 Manifold Air Pressure Sensor

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 7.69								
System	Instruments and Wiring	Qty	1										
Assembly	Engine management assembly												
Part	Manifold Air Pressure Sensor												
P/N Base	A4001/P4006												
Suffix	AA												
Details	Delco 1 Bar												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Sensor, Manifold Absolute Pressure (MAP)	Air pressure in Plenum	\$ 4.00									1.00	\$ 4.00
2	Hose, Rubber	Carries the air to the sensor	\$ 0.18	1 m								0.50	\$ 0.09
													Sub Total \$ 4.090
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Screwdriver > 1 Turn	For the Fasteners.	\$ 0.50		2			\$ 1.00					
2	Cut (scissors, knife)	To cut the rubber hose of required length.	\$ 0.06		2			\$ 0.12					
3	Hand, Tight <= 6.35 mm	To fasten the rubber hose.	\$ 0.50		2			\$ 1.00					
													Sub Total \$ 2.12
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8 (SAE 5)	For fastening the ECU to the Acrylic sheet through G.I. Clamps	\$ 0.50	5 mm		4 mm		2	\$ 1.00				
2	Nut, Grade 8.8 (SAE 5)	For fastening the ECU to the Acrylic sheet through G.I. Clamps	0.24	5 mm				2	\$ 0.48				
													Sub Total \$ 1.48
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0



4.8 EM Magnetic Sensor (Crankshaft)



4.9 OEM Magnetic Sensor (Camshaft)

University	BITS Pilani-Dubai										Car #	91	Part Cost	\$ 5.04
System	Instruments and Wiring										Qty	1		
Assembly	Engine management assembly													
Part	OEM Magnetic Sensor (Camshaft)													
P/N Base	A4001/P4008										Extended Cost	\$ 5.04		
Suffix	AA													
Details														
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Sensor, Hall Effect	Camshaft position	\$ 4.00										1.00	\$ 4.00
														Sub Total \$ 4.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
1	Screwdriver > 1 Turn		\$ 0.50		1			\$ 0.50						
								Sub Total \$ 0.50						
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
1	Bolt, Grade 12.9		\$ 0.50	5 mm		18 mm		1	\$ 0.50					
2	Nut, Grade 12.9		0.04	5 mm				1	\$ 0.04					
									Sub Total \$ 0.54					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncl	Sub Total						
								Sub Total 0						



Fig. : SYNC sensor mounting a.) Front view b.) Top view

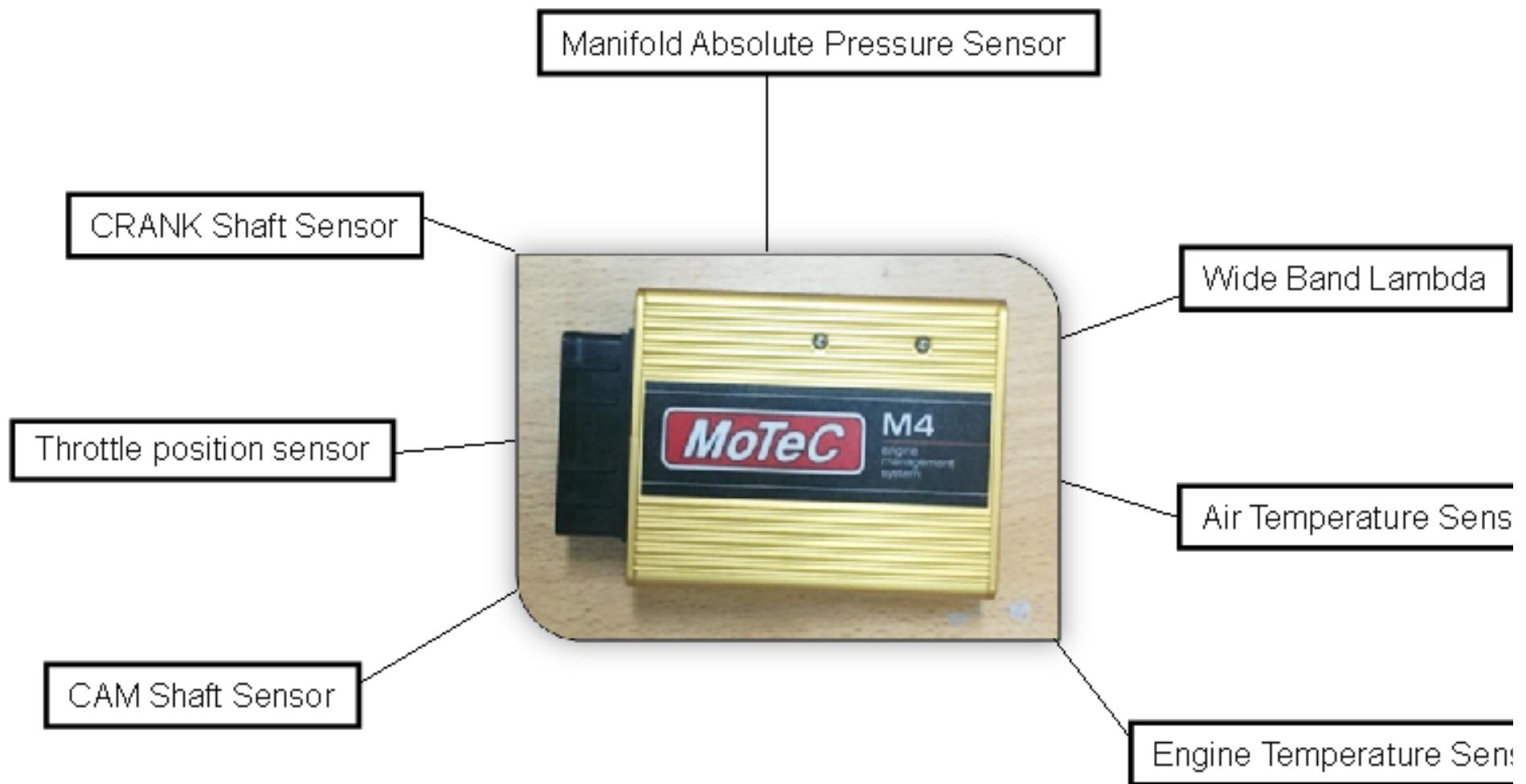
4.10 Fuel Injectors

University	BITS Pilani-Dubai										Car #	91	Part Cost	\$ 40.48
System	Instruments and Wiring										Qty	1		
Assembly	Engine management assembly													
Part	Fuel injector													
P/N Base	A4001/P4009										Extended Cost	\$ 40.48		
Suffix	AA													
Details														
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Fuel Injector, Gasoline		\$ 10.00									4.00	\$ 40.00	
													Sub Total	\$ 40.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
1	Hand - Start Only		\$ 0.12		4			\$ 0.48						
							Sub Total	\$ 0.48						
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
								Sub Total	\$ -					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total						
								Sub Total	0					

4.11 OEM Spark Plugs

4.12 OEM Inductive Ignition Coils

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 0.24								
System	Instruments and Wiring	Qty	1										
Assembly	Engine management assembly												
Part	OEM Inductive Ignition Coils												
P/N Base	A4001/P4010												
Suffix	AA												
Details	Included with Engine Cost												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Spark Plug Coil	Ignition	\$ -									2.00	\$ -
													Sub Total \$ -
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Hand - Start Only		\$ 0.12		2			\$ 0.24					
								Sub Total \$ 0.24					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
													Sub Total
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total 0					



4.13 Wiring and supply control assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 613.97								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
P/N Base	A4002												
Suffix	AA												
Details													
ItemOrder	Part	Part Cost	Quantity	Sub Total									
12	Wiring loom ECU	\$ 37.13	1.00	\$ 37.130									
13	Master Kill switch	\$ 6.24	1.00	\$ 6.240									
14	Secondary Kill switch	\$ 3.08	1.00	\$ 3.080									
15	3 Postion ignition key switch	\$ 3.00	1.00	\$ 3.000									
16	Brake Over Travel switch	\$ 5.28	1.00	\$ 5.280									
17	Wires (red/black)	\$ 70.50	1.00	\$ 70.500									
18	Fuse 20A	\$ 6.00	1.00	\$ 6.000									
19	Fuse Box	\$ 2.35	1.00	\$ 2.350									
20	Crimps	\$ 7.50	1.00	\$ 7.500									
21	Connectors 4 - Terminal	\$ 10.00	1.00	\$ 10.000									
22	Connector5 - Terminal	\$ 2.00	1.00	\$ 2.000									
23	Bosch 12V/30A mini relay	\$ 19.50	1.00	\$ 19.500									
24	Battery	\$ 201.58	1.00	\$ 201.580									
				Sub Total	\$ 374.160								
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Lay Wire - Signal		\$ 0.02	m	11.35			\$ 0.23					
2	Lay Wire - Power		\$ 0.03	m	23.5			\$ 0.71					
3	Lay Wire - Control		\$ 0.02	m	9.65			\$ 0.19					
4	Strip Wire		\$ 0.08	unit	250			\$ 20.00					
5	Cut wire		\$ 0.08	unit	250			\$ 20.00					
6	Tape		\$ 0.80	m	100			\$ 80.00					
7	Crimp Wire		\$ 0.17	unit	200			\$ 34.00					
8	Connector Assembly, Crimp		\$ 0.36	contact	18			\$ 6.48					
9	Shrink tube		\$ 0.15	cm	500			\$ 75.00					
								Sub Total	\$ 236.61				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Tie Wrap	To fasten shrink tube and wires	0.04							80	\$ 3.20		
												Sub Total	\$ 3.20
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								Sub Total					

4.14 Wiring Loom ECU

University	BITS Pilani-Dubai	
System	Instruments and Wiring	
Assembly	Wiring and supply control assembly	
Part	Wiring loom ECU	
P/N Base	A4002/P4012	
Suffix	AA	
Details	sensors/auxiliary input/auxiliary output/power supply/PC cable connector	
ItemOrder	Material	Use
1	Wire, Signal	Sensor inputs, digital paddle input
2	Wire, Control	Injectors, Spark plug and relay control
3	Connector, Aerospace Quality	Sensor connectors
4	Heat Shrink Tubing	Protection ECU wiring loom
5	Connector, Computer Type	Tuning purpose
6	Connector, Single Wire	Crimps
ItemOrder	Process	Use
ItemOrder	Fastener	Use
ItemOrder	Tooling	Use

Car #	91	Part Cost	\$ 37.13
Qty	1		
Extended Cost	\$ 37.13		

UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
\$ 1.00	1	m							11.35	\$ 11.35
\$ 1.00	1	m							9.65	\$ 9.65
\$ 1.00	1	unit							12.00	\$ 12.00
\$ 0.50	1	m							2.25	\$ 1.13
\$ 1.00	1	unit							1.00	\$ 1.00
\$ 0.05	1	unit							40.00	\$ 2.00
										Sub Total \$ 37.125

UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
					Sub Total \$ -

UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
						\$ -
						\$ -
						Sub Total \$ -

UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
					Sub Total 0

4.15 Primary/Master Kill switch with alternator protection

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 6.24								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Master Kill switch												
P/N Base	A4002/P4013												
Suffix	AA												
Details	Primary/Master Kill switch with alternator protection												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Switch, Kill	Master kill switch with alternator protection	\$ 3.00									1.00	\$ 3.00
2	Connector, High Power, > 2 Amps	For high current flow	\$ 2.00									1.00	\$ 2.00
													Sub Total \$ 5.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
													Sub Total \$ -
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 12.9	Mounting	\$ 0.12	5 mm				2	\$ 0.24				
2	Nut, Grade 12.9	Mounting	\$ 0.50	5 mm				2	\$ 1.00				
													Sub Total \$ 1.24
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0

4.16 Secondary Kill switch

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 3.08								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Secondary Kill switch												
P/N Base	A4002/P4014	Extended Cost	\$ 3.08										
Suffix	AA												
Details	Push button type												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Switch, Pushbutton	Cockpit Kill Switch	\$ 1.00										1.00 \$ 1.00
2	Connector, High Power, > 2 Amps	For high current flow	\$ 2.00										1.00 \$ 2.00
													Sub Total \$ 3.00
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
													Sub Total \$ -
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8(SAE 5)	Mounting	\$ 0.02	4 mm		16 mm		2	\$ 0.04				
2	Nut, Grade 8.8(SAE 5)	Mounting	\$ 0.02	4 mm				2	\$ 0.04				
													Sub Total \$ 0.08
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncl	Sub Total					
													Sub Total 0

4.17 3 Postion ignition key switch

4.18 Brake Over Travel switch

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 5.28								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Brake Over Travel switch												
P/N Base	A4002/P4016												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Switch, Pushbutton		\$ 1.00									1.00	\$ 1.00
2	Connector, High Power, > 2 Amps	For high current flow	\$ 2.00									1.00	\$ 2.00
													Sub Total \$ 3.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
													Sub Total \$ -
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 12.9	Mounting	\$ 0.84	6 mm		24 mm		2	\$ 1.68				
2	Nut, Grade 12.9	Mounting	\$ 0.30	6 mm				2	\$ 0.60				
													Sub Total \$ 2.28
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total					
													Sub Total 0

4.19 Wires(red/black)

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 70.50								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Wires (red/black)												
P/N Base	A4002/P4017												
Suffix	AA												
Details	2.5 meter wires (red/black) I.D = 2.5mm O.D = 4mm												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Wire, Power	Power supply	\$ 3.00	1 m								23.50	\$ 70.50
													Sub Total \$ 70.50
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								Sub Total					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									\$ -				
									\$ -				
									Sub Total \$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total	0				

4.20 Fuse 20A

University	BITS Pilani-Dubai										Car #	91	Part Cost	\$ 6.00
System	Instruments and Wiring(EL)										Qty	1		
Assembly	Wiring and supply control assembly													
Part	Fuse 20A													
P/N Base	A4002/P4018										Extended Cost	\$ 6.00		
Suffix	AA													
Details														
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Fuse, Power	Protection	\$ 1.00										6.00 \$ 6.00	
													Sub Total \$ 6.00	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
													\$ -	
													\$ -	
													Sub Total \$ -	
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
													\$ -	
													\$ -	
													Sub Total \$ -	
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total						
													Sub Total 0	

4.21 Fuse Box

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 2.35								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Fuse Box												
P/N Base	A4002/P4019												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Fuse Box	Mount for fuse	\$ 0.25		pin								5.00 \$ 1.25
													Sub Total \$ 1.250
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								\$ -					
								\$ -					
								Sub Total \$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8	Mounting	\$ 0.31	5 mm		20 mm		2	\$ 0.62				
2	Nut, Grade 8.8	Mounting	\$ 0.24	5 mm				2	\$ 0.48				
									\$ -				
									Sub Total \$ 1.10				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
									Sub Total 0				

4.22 Crimps - 9.5mm push button

University	BITS Pilani-Dubai										Car #	91	Part Cost	\$ 7.50
System	Instruments and Wiring(EL)										Qty	1		
Assembly	Wiring and supply control assembly													
Part	Crimp													
P/N Base	A4002/P4020										Extended Cost	\$ 7.50		
Suffix	AA													
Details	Connecting wires													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Connector, Single Wire	Connecting wires	\$ 0.05									150.00	\$ 7.50	
													Sub Total	\$ 7.500
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total				\$ -		
												\$ -		
								Sub Total	\$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total			\$ -		
												\$ -		
									Sub Total	\$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total						
								Sub Total	0					

4.23 Connectors 4 – Terminal

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 10.00								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Connectors 4 - Terminal												
P/N Base	A4002/P4021												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Connector, High Power, > 2 Amps	For high current	\$ 2.00									5.00	\$ 10.00
													Sub Total \$ 10.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								\$ -					
								\$ -					
								Sub Total \$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									\$ -				
									\$ -				
									Sub Total \$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
									Sub Total 0				

4.24 Connector 5 – Terminal

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 2.00								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Connector 5 - Terminal												
P/N Base	A4002/P4022												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Connector, High Power, > 2 Amps	For high current	\$ 2.00									1.00	\$ 2.00
													Sub Total \$ 2.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								\$ -					
								\$ -					
								Sub Total \$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									\$ -				
									\$ -				
									Sub Total \$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total					
									Sub Total 0				

4.25 Bosch 12V/30A mini relay

System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Mini relay												
P/N Base	A4002/P4023												
Suffix	AA												
Details	Bosch 12V/30A												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Relay, Control	Automated control	\$ 2.00										3.00 \$ 6.00
2	Relay, Power	Automated control	\$ 4.00										2.00 \$ 8.00
													Sub Total \$ 14.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.						
													Sub Total
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8	Mounting	\$ 0.31	5 mm		20 mm		10	\$ 3.10				
2	Nut, Grade 8.8	Mounting	\$ 0.24	5 mm				10	\$ 2.40				
													Sub Total \$ 5.50
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0

4.26 Battery (12V LIFEPO4 175CCA 11Ah)

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 201.58								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Wiring and supply control assembly												
Part	Battery												
P/N Base	A4002/P4024												
Suffix	AA												
Details	12V LIFEPO4 175CCA 11Ah												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Battery, Advanced Chemistry (NiMH, Li-Ion, etc.)	Power supply	\$ 65.00	1	kg							3.00	\$ 195.00
2	Iron (per kg)	Casing	\$ 1.00	1	kg							0.80	\$ 0.80
													Sub Total \$ 195.800
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Sheet Metal Saw Cut		\$ 0.20	cm	6			\$ 1.20					
2	Sheet metal bends		\$ 0.25	cm	6			\$ 1.50					
3	Weld		\$ 0.15	cm	20			\$ 3.00					
								Sub Total \$ 5.70					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Tie Wrap		0.04					2	\$ 0.08				
									Sub Total \$ 0.08				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total 0					

4.27 Ignition control Module assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 15.86								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Ignition control Module assembly												
P/N Base	A4003												
Suffix	AA												
Details													
ItemOrder	Part	Part Cost	Quantity	Sub Total									
25	Ignition control Module	\$ 7.00	1.00	\$ 7.000									
26	Connectors	\$ 5.00	1.00	\$ 5.000									
27	Crimps	\$ 0.25	1.00	\$ 0.250									
			Sub Total	\$ 12.250									
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Hand - Start Only		\$ 0.12		3			\$ 0.36					
2	Screwdriver > 1 Turn		\$ 0.50		2			\$ 1.00					
3	Connector Assembly, Crimp		\$ 0.36		5			\$ 1.80					
								Sub Total	\$ 3.16				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8(SAE 5)	Mounting	\$ 0.02	4 mm		22 mm		2	\$ 0.05				
2	Nut, Grade 8.8(SAE 5)	Mounting	\$ 0.20	4 mm		4 mm		2	\$ 0.40				
									Sub Total	\$ 0.45			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								Sub Total					

4.28 Ignition control Module

University	BITS Pilani-Dubai		Car #	91	Asm Cost	\$ 15.86							
System	Instruments and Wiring(EL)		Qty	1									
Assembly	Ignition control Module assembly												
P/N Base	A4003												
Suffix	AA		Extended Cost	\$ 15.86									
Details													
ItemOrder	Part	Part Cost	Quantity	Sub Total									
25	Ignition control Module	\$ 7.00	1.00	\$ 7.000									
26	Connectors	\$ 5.00	1.00	\$ 5.000									
27	Crimps	\$ 0.25	1.00	\$ 0.250									
			Sub Total	\$ 12.250									
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Hand - Start Only		\$ 0.12		3			\$ 0.36					
2	Screwdriver > 1 Turn		\$ 0.50		2			\$ 1.00					
3	Connector Assembly, Crimp		\$ 0.36		5			\$ 1.80					
								Sub Total	\$ 3.16				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8(SAE 5)	Mounting	\$ 0.02	4	mm	22	mm	2	\$ 0.05				
2	Nut, Grade 8.8(SAE 5)	Mounting	\$ 0.20	4	mm	4	mm	2	\$ 0.40				
									Sub Total	\$ 0.45			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								Sub Total					



4.29 Connectors

4.30 Crimp

4.31 Dashboard display assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 161.04								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Dashboard display assembly												
P/N Base	A4004												
Suffix	AA												
Details													
ItemOrder	Part	Part Cost	Quantity	Sub Total									
28	Acewell RPM meter 1500	\$ 26.05	1.00	\$ 26.050									
29	OEM wheel speed sensors	\$ 7.56	1.00	\$ 7.560									
30	OEM RPM sensor	\$ 1.00	1.00	\$ 1.000									
31	OEM engine temperature sensor	\$ 10.00	1.00	\$ 10.000									
32	Arduino Uno rev.3 micro controller board	\$ 6.15	1.00	\$ 6.150									
33	Hitachi LCD HD44780	\$ 4.63	1.00	\$ 4.630									
34	Push button switches	\$ 5.92	1.00	\$ 5.920									
				Sub Total	\$ 61.310								
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Lay Wire - Power		\$ 0.03		2.1			\$ 0.06					
2	Screwdriver > 1 Turn		\$ 0.50		6			\$ 3.00					
3	Lay Wire - Signal		\$ 0.02		3.25			\$ 0.07					
4	Sheet Metal Saw Cut		\$ 0.20	cm	50			\$ 10.00					
4	Strip Wire		\$ 0.08	unit	20			\$ 1.60					
5	Cut wire		\$ 0.08	unit	20			\$ 1.60					
6	Tape		\$ 0.80	m	4			\$ 3.20					
7	Crimp Wire		\$ 0.17	unit	20			\$ 3.40					
8	Connector Assembly, Crimp		\$ 0.36	contact	5			\$ 1.80					
9	Shrink tube		\$ 0.15	cm	500			\$ 75.00					
								Sub Total	\$ 99.73				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
										\$ -			
										\$ -			
										Sub Total	\$ -		
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
										Sub Total	0		

4.32 Acewell RPM meter 1500

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 26.05								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Dashboard display assembly												
Part	Acewell RPM meter 1500												
P/N Base	A4004/P4028												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Chassis Control Module, +Dashboard	RPM and Speed display	\$ 20.00										1.00 \$ 20.00
2	Wire, Power	Power supply	\$ 3.00	1 m									2.00 \$ 6.00
													Sub Total \$ 26.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
													Sub Total
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Nut, Grade 8.8 (SAE 5)		0.024	5 mm				2	\$ 0.05				
													Sub Total \$ 0.05
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total					
													Sub Total 0



4.33 OEM Wheel Speed Sensor

System	Instruments and Wiring(EL)												
Assembly	Dashboard display assembly												
Part	OEM wheel speed sensor												
P/N Base	A4004/P4029												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Sensor, Hall Effect	Wheel Speed	\$ 4.00									1.00 \$ 4.00	
2	Galvanized Iron sheet	For clamping to iron sheet board	\$ 1.00	0.15	kg							1.00 \$ 0.15	
3	Iron	Magnetic material for sensing	\$ 1.00		kg							0.01 \$ 0.01	
4	Wire, Signal	Sense	\$ 1.00									2.00 \$ 2.00	
												Sub Total \$ 6.160	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								Sub Total					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8		\$ 0.15	4	mm		10	mm		4	\$ 0.60		
2	Nut, Grade 8.8		0.2	4	mm					4	\$ 0.80		
									Sub Total	\$ 1.40			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total		0			

4.34 OEM RPM Sensor

4.35 OEM Engine Temperature Sensor

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 10.00								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Dashboard display assembly												
Part	OEM engine temperature sensor												
P/N Base	A4004/P4031												
Suffix	AA												
Details	Text describing the assembly, especially unique content												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Sensor, Temperature	Temperature measurement	\$ 8.00										1.00 \$ 8.00
2	Wire, Signal	Sense	\$ 1.00	1	m								2.00 \$ 2.00
													Sub Total \$ 10.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.						
													Sub Total
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity					
													Sub Total
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclId	Sub Total					
													Sub Total 0

4.36 Arduino Uno Rev.3 Micro Controller Board

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 6.15								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Dashboard display assembly												
Part	Arduino Uno rev.3 micro controller board												
P/N Base	A4004/P4032												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Chassis Control Module, +Automatic Shifter	Gearshift display unit	\$ 5.00										1.00 \$ 5.00
2	Wire, Signal	Sense	\$ 1.00										1.00 \$ 1.00
													Sub Total \$ 6.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Drilled holes < 25.4 mm dia.												
2	Screwdriver > 1 Turn												
								Sub Total					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8(SAE 5)	Mounting	\$ 0.02	4 mm		16 mm		4	\$ 0.07				
2	Nut, Grade 8.8(SAE 5)	Mounting	\$ 0.02	4 mm				4	\$ 0.08				
								4	\$ -				
								Sub Total	\$ 0.15				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total	0				

4.37 Hitachi LCD HD44780

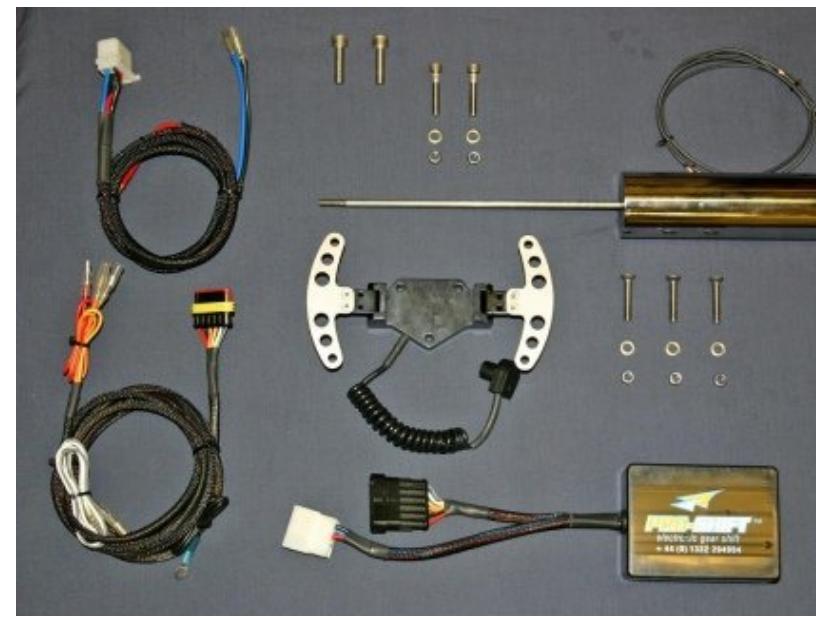
University	BITS Pilani-Dubai										Car #	91	Part Cost	\$ 4.63
System	Instruments and Wiring(EL)										Qty	1		
Assembly	Dashboard display assembly													
Part	LCD													
P/N Base	A4004/P4033										Extended Cost	\$ 4.63		
Suffix	AA													
Details	Hitachi LCD HD44780													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Display, 7 Segment	LCD	\$ 1.00										1.00 \$ 1.00	
2	Wire, Power	Power supply	\$ 3.00	1 m									0.10 \$ 0.30	
3	Wire, Signal	Sense	\$ 1.00	1 m									0.25 \$ 0.25	
													Sub Total \$ 1.550	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
1	Attach Wire, Solder wire, not bent		\$ 0.52	unit	4			\$ 2.08						
2	Hand, Loose <= 6.35 mm		\$ 0.25	unit	4			\$ 1.00						
								Sub Total \$ 3.08						
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
									Sub Total					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total						
									Sub Total					

4.38 Push button switches

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 5.92									
System	Instruments and Wiring(EL)	Qty	1											
Assembly	Dashboard display assembly													
Part	Push button switches													
P/N Base	A4004/P4034													
Suffix	AA													
Details														
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Switch, Pushbutton	Paddleshift	\$ 1.00	unit									2.00	\$ 2.00
2	Wire, Signal	Sense	\$ 1.00		1 m								0.30	\$ 0.30
														Sub Total \$ 2.300
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
1	Attach Wire, Solder wire, not bent		\$ 0.52	unit	6			\$ 3.12						
2	Hand, Loose <= 6.35 mm		\$ 0.25	unit	2			\$ 0.50						
														Sub Total \$ 3.62
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
														Sub Total
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total						
														Sub Total

4.39 Gear Shift Control Assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 859.84								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Gear Shift Control Assembly												
P/N Base	A4005												
Suffix	AA												
Details													
ItemOrder	Part	Part Cost	Quantity	Sub Total									
35	Shifter, Automatic, Flat Shifter Max	\$ 379.40	1.00	\$ 379.400									
36	Shifter, Automatic, Flat Shifter Expert	\$ 451.80	1.00	\$ 451.800									
		Sub Total	\$ 831.200										
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Lay Wire - Power		\$ 0.03		4.60			\$ 0.14					
2	Screwdriver > 1 Turn		\$ 0.50		10.00			\$ 5.00					
3	Lay Wire - Signal		\$ 0.02		1.30			\$ 0.03					
4	Strip Wire		\$ 0.08	unit	20.00			\$ 1.60					
5	Cut wire		\$ 0.08	unit	20.00			\$ 1.60					
6	Tape		\$ 0.80	m	4.00			\$ 3.20					
7	Crimp Wire		\$ 0.17	unit	8.00			\$ 1.36					
8	Connector Assembly, Crimp		\$ 0.36	contact	2.00			\$ 0.72					
9	Shrink tube		\$ 0.15	cm	100.00			\$ 15.00					
							Sub Total	\$ 28.64					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									Sub Total	\$ -			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								Sub Total	\$ -				



4.40 Flat Shifter Max

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 379.40								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Gear Shift Control Assembly												
Part	Flat Shifter Max												
P/N Base	A4005/P4035												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Shifter, Automatic, Flat Shifter Max	Paddleshifter	\$ 370.00									1.00	\$ 370.00
2	Wire, Power	Power supply	\$ 3.00									3.10	\$ 9.30
3	Connector, Single Wire	Crimps	\$ 0.05									2.00	\$ 0.10
													Sub Total \$ 379.400
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
													Sub Total \$ -
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
													Sub Total \$ -
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0

4.41 Flat Shifter Expert

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 451.80								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Gear Shift Control Assembly												
Part	Flat Shifter Expert												
P/N Base	A4005/P4036												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Shifter, Automatic, Flat Shifter Expert	Throttle blip	\$ 446.00										1.00 \$ 446.00
2	Wire, Signal	Sense	\$ 1.00										1.30 \$ 1.30
3	Wire, Power	Power supply	\$ 3.00										1.50 \$ 4.50
													Sub Total \$ 451.800
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.						
													Sub Total \$ -
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity					
													Sub Total \$ -
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
													Sub Total 0

4.42 Brake Light Assembly

University	BITS Pilani-Dubai	Car #	91	Asm Cost	\$ 43.06								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Brake Light Assembly												
P/N Base	A4007												
Suffix	AA												
Details													
ItemOrder	Part	Part Cost	Quantity	Sub Total									
37	Brake lights	\$ 4.00	1.00	\$ 4.000									
38	Brake Light Switch	\$ 8.00	1.00	\$ 8.000									
39	Brake Light Wiring	\$ 7.50	1.00	\$ 7.500									
		Sub Total		\$ 19.500									
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
1	Lay Wire - Power		\$ 0.03		2.50			\$ 0.08					
2	Screwdriver > 1 Turn		\$ 0.50		5.00			\$ 2.50					
4	Strip Wire		\$ 0.08	unit	8.00			\$ 0.64					
5	Cut wire		\$ 0.08	unit	8.00			\$ 0.64					
6	Tape		\$ 0.80	m	0.50			\$ 0.40					
7	Crimp Wire		\$ 0.17	unit	8.00			\$ 1.36					
8	Connector Assembly, Crimp		\$ 0.36	contact	8.00			\$ 2.88					
9	Shrink tube		\$ 0.15	cm	100.00			\$ 15.00					
								Sub Total	\$ 23.50				
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
1	Bolt, Grade 8.8	Mounting	\$ 0.01	3	mm	10	mm	2	\$ 0.02				
2	Nut, Grade 8.8	Mounting	\$ 0.02	3	mm			2	\$ 0.04				
									Sub Total	\$ 0.06			
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
									Sub Total				

4.43 Brake lights

4.44 Brake Light Switch

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 8.00								
System	Instruments and Wiring(EL)	Qty	1										
Assembly	Brake Light Assembly												
Part	Brake Light Switch												
P/N Base	A4006/P4038												
Suffix	AA												
Details													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
1	Brake Light Pressure Switch Banjo Bolt	Light control	\$ 8.00									1.00	\$ 8.00
													Sub Total \$ 8.000
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								\$ -					
								\$ -					
								Sub Total \$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									\$ -				
									\$ -				
								Sub Total \$ -					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total					
								Sub Total 0					

4.45 Brake light wiring

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 7.50									
System	Instruments and Wiring(EL)	Qty			1									
Assembly	Brake Light Assembly													
Part	Brake Light Wirings													
P/N Base	A4006/P4039													
Suffix	AA													
Details														
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
1	Wire, Power	Power supply	\$ 3.00										2.50	\$ 7.50
														Sub Total \$ 7.500
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
									\$ -					
									\$ -					
								Sub Total	\$ -					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
									\$ -					
									\$ -					
									Sub Total	\$ -				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncid	Sub Total						
								Sub Total	0					

Miscellaneous -MS

5.1 Seats

University	BITS Pilani-Dubai
System	Misc Fit&Finish
Assembly	Cocpit & Safety Assembly
Part	Seat
P/N Base	A5001/PS001
Suffix	AA
Details	Fiber Glass Seat

Car #	91
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Part Cost	\$ 24.50
Qty	1
Extended Cost	\$ 24.50

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Foam, Expanding, Non-Structural	Foam For Seat	\$ 15.00	1.5	kg								\$ 22.50

Sub Total \$ 22.50

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Liquid Apply - Pour Expanding Foam	Poor resin/gel coat onto beads	\$ 2.00	m^3			\$ 2.00	Sub Total \$ 2.00

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -

Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total \$ -

5.2 Safety Harness

University	BITS Pilani-Dubai
System	Misc Fit&Finish
Assembly	Cockpit & Safety Assembly
Part	Safety Harness
P/N Base	A5001/P5002
Prefix	AA
Details	Drivers Safety

Car #	91
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Part Cost	\$ 45.00
Qty	1
Extended Cost	\$ 45.00

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Harness, Driver	Drivers Safety	\$ 45.00										\$ 45.00
												Sub Total	\$ 45.000

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total \$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total 0

5.3 Paint – Frame

University	BITS Pilani-Dubai
System	Misc Fit&Finish
Assembly	Cockpit & Safety Assembly
Part	Paint-Frame
P/N Base	A5001/P5003
Suffix	AA
Details	Paint Chasis and A arms

Car #	91
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Part Cost	\$ 17.42
Qty	1
Extended Cost	\$ 17.42

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Paint		\$ 10.00		1.71 m		1.02 m		1.7442				\$ 17.42
													\$ -

Sub Total \$ 17.420

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								\$ -
								\$ -
Sub Total								\$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
Sub Total								\$ -	

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
Sub Total								0

5.4 Paint – Body

University	BITS Pilani-Dubai
System	Misc Fit&Finish
Assembly	Cockpit&Safety Assembly
Part	Paint-Body
P/N Base	A5001/P5004
Suffix	AA
Details	Body And Floor Paint

Car #	91
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Part Cost	\$ 44.72
Qty	1
Extended Cost	\$ 44.72

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Body Panel	Body Enhancement	\$ 10.00	3.173	m^2								\$ 31.73
20	Sidepot Wall	Body Enhancement	\$ 10.00	0.3089	m^2								\$ 3.09
30	Floor	Body Enhancement	\$ 10.00	0.9912	m^2								\$ 9.90
													Sub Total \$ 44.719

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								\$ -
								Sub Total \$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total 0

5.5 Fire Wall

University	BITS Pilani-Dubai
System	Misc Fit&Finish
Assembly	Cockpit & Safety Assembly
Part	Firewall
P/N Base	A5001/P5005
Suffix	AA
Details	Aluminum Firewall

Car #	91
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Part Cost	\$ 4.95
Qty	1
Extended Cost	\$ 4.95

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Aluminium,Normal(per Kg)	Firewall Material	\$ 4.20	2.85	kg							1.00E+00	\$ 4.20
													\$ -

Sub Total \$ 4.200

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Sheet Metal Bend		\$ 0.25	bend	3			\$ 0.75
								\$ -

Sub Total \$ 0.75

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -

Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total 0

Sub Total 0

5.6 Safety Shield

University	BITS Pilani-Dubai
System	Misc Fit& Finish
Assembly	Cockpit & Safety Assembly
Part	Safety Shield
P/N Base	A5001/P5006
Suffix	AA
Details	Safety Shield

Car #	91
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Part Cost	\$ 4.20
Qty	1
Extended Cost	\$ 4.20

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Aluminium,Normal(per Kg)		\$ 4.20	1	kg							\$ 1.00	\$ 4.20
												Sub Total	\$ 4.200

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ -	
							\$ -	
							\$ -	
								Sub Total \$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ -	
								\$ -	
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								Sub Total 0

Steering System – ST

6.1 Steering Rack Assembly

University	BITS Pilani-Dubai
System	Steering System
Assembly	Steering Rack Assembly
P/N Base	A6001
Suffix	AA
Details	Complete Steering Rack

Car #	91	Asm Cost	\$24.31
Qty	1		
Extended Cost			\$24.31

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Pinion Gear	\$12.50	1	\$12.50
20	Steering Rack	\$11.81	1	\$11.81
30	Steering Rack Housing	\$8.80	1	\$8.80
40	Pinion Gear Housing	\$9.27	1	\$9.27
		Sub Total		\$24.31

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$0.00

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$0.00

6.2 Pinion Gear

University	BITS Pilani - Dubai
System	Steering System
Assembly	complete steering rack
Part	Pinion Gear
P/N Base	A6001/P6001
Suffix	AA
Details	Helix gear

Car #	91	Part Cost	12.4935
Qty	1		
Extended Cost			12.4935

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material for pinion gear	\$2.25	0.63	kg								\$1.42
												Sub Total	1.4175

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	setup machine	\$1.30	Labour	1		1	\$1.30
20	Machining	Remove material	\$0.04	cm^3	49.8	3	1	\$5.98
30	Machining Setup, Change	Change tool	\$0.65	Labour	1	1	1	\$0.65
40	Drilled holes < 25.4 mm dia.	Drill holes	\$0.35	hole	1	9	1	\$3.15
								Sub Total
								11.076

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ 0
									Sub Total
									\$0

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
								\$ 0
								Sub Total
								\$0

6.3 Steering Rack

University BITS Pilani - Dubai
System Steering System
Assembly complete steering rack
Part Steering Rack
P/N Base A6001/P6002
Suffix AA
Details Helix gear

Car #	91	Part Cost	11.8104
Qty	1		

Extended Cost 11.8104

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material for rack gear	\$2.25	0.63	kg								\$1.42
20	Steel, Mild	Material for tie rod mount	\$2.25	0.282	kg								\$0.63

Sub Total 2.052

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove setup machine		\$1.30	Labour	1	1	1	\$1.30
20	Machining	Remove material	\$0.04	cm^3	21.97	3	1	\$2.64
30	Machining Setup, Change	Change tool	\$0.65	Labour	4	1	1	\$2.60
40	Drilled holes < 25.4 mm dia.	Drill holes	\$0.35	hole	8	3	1	\$8.40
40	Drilled holes < 25.4 mm dia.	Drill holes	\$0.35	hole	2	3	1.5	\$2.10
40	Ratchet <= 6.35 mm	Tighten bolt	\$0.50	unit	2	1	1	\$1.00

Sub Total 9.6364

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Attach tie rod mount	0.061	6	mm	16	mm	2	0.122

Sub Total 0.122

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
								\$ 0

Sub Total \$0

6.4 Steering Rack Housing

University	BITS Pilani - Dubai	Car #	91	Part Cost	8.595396								
System	Steering System	Qty	1										
Assembly	complete steering rack												
Part	Steering Rack Housing												
P/N Base	A6001/P6003												
Suffix	AA												
Details	Aluminium housing												
				Extended Cost	8.595396								
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Aluminum, Normal	Material for rack housing	\$4.20	0.759	kg								\$3.19
20	Bronze (per kg)	Material for Bushing	\$2.20	0.515	kg								\$1.13
													Sub Total 4.3208
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Machining Setup, Install and remove	setup machine	\$1.30	Labour	1	1	1	\$1.30					
20	Machining	Remove material for housing	\$0.04	cm^3	69.67	1	1	\$2.79					
30	Machining	Remove material for bushing	\$0.04	cm^3	3.53	1.33	1	\$0.19					Sub Total 4.274596
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
													Sub Total \$0.00
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
													Sub Total \$0

6.5 Pinion Gear Housing

University	BITS Pilani - Dubai
System	Steering System
Assembly	complete steering rack
Part	Pinion Gear Housing
P/N Base	A6001/P6004
Suffix	AA
Details	Aluminium housing

Car #	91	Part Cost	9.266
Qty	1		
Extended Cost	9.266		

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Aluminum, Normal	Material for Pinion Gear housing	\$4.20	0.85	kg								\$3.57

Sub Total 3.57

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	setup machine	\$1.30	Labour	1	1	1	\$1.30
20	Machining Setup, Change	Change tool	\$0.65	Labour	4	1	1	\$2.60
30	Machining	Remove material for bushing	\$0.04	cm^3	36.15	1	1	\$1.45
40	Drilled holes < 25.4 mm dia.	Drill holes	\$0.35	hole	1	1	1	\$0.35
50	Drilled hole < 50.8 mm dia.	Drill holes	\$0.70	hole	1	1	1	0.7
							Sub Total	5.696

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$0.00
								Sub Total	\$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
								\$0.00
								Sub Total \$0.00

6.6 Steering Column Assembly

University	BITS Pilani-Dubai
System	Steering System
Assembly	Steering Column Assembly
P/N Base	A6002
Suffix	AA
Details	Steering Column and shaft

Car #	91	Asm Cost	\$75.78
Qty	1		
Extended Cost			\$75.78

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Column Joints	\$74.27	1	\$74.27
20	Column	0.37	1	0.37
Sub Total			\$74.64	

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total \$0.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Ratchet <= 6.35 mm	Tightening	0.5 per bolt		2	1	1	\$1.00
								Sub Total 1

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9		0.034	6 mm		34 mm		2	\$0.07
20	Nut, Grade 12.9		0.034	6 mm		34 mm		2	\$0.07
								Sub Total	\$0.14

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$0.00
								Sub Total \$0.00

6.7 Column Joints

University	BITS Pilani - Dubai
System	Steering System
Assembly	Steering Column Assembly
Part	Column joint
P/N Base	A6002/P6005
Suffix	AA
Details	U Joint

Car #	91	Part Cost	\$74.27
Qty	1	Extended Cost	74.26686667

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	U Joint	U- Joint for Column	\$20.00									3	\$60.00
ItemOrder													
Process													
10	weld	Welding tube	\$0.38	cm	11.93	3	1						Sub Total
													\$13.60
ItemOrder													
Fastener													
													Sub Total
													\$0.00
ItemOrder													
Tooling													
10	Welds - Welding Fixture	Fix point	\$500.00	point	4	3000							Sub Total
													\$0.67
Sub Total													
													0.6666666667

6.8 Column

University	BITS Pilani - Dubai
System	Steering System
Assembly	Steering Column Assembly
Part	Column
P/N Base	A6002/P6006
Suffix	AA
Details	Tube column

Car #	91	Part Cost	0.3735
Qty	1		
Extended Cost			0.3735

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Stainless	Material used	\$2.25	0.166	kg								0.3735
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total		Sub Total	0		
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								\$ 0					
								\$ 0					
								Sub Total	\$0				
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								\$ 0					
								\$ 0					
								Sub Total	\$0				

6.9 Steering Wheel Assembly

University	BITS Pilani-Dubai
System	Steering System
Assembly	Steering Wheel Assembly
P/N Base	A6003
Suffix	AA
Details	Steering Wheel

Car # 91

Asm Cost	\$77.66
Qty	1
Extended Cost	\$77.66

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Steering Wheel	\$27.25	1	\$27.25
20	Quick Release	\$50.41	1	\$50.41
Sub Total				\$77.66

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
												Sub Total		\$0.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total	
								\$0.00	
							Sub Total		\$0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total	
									\$0.00	
								Sub Total		\$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total	
								\$0.00	
							Sub Total		\$0.00

6.10 Steering Wheel

University	BITS Pilani - Dubai
System	Steering System
Assembly	Steering Wheel Assembly
Part	Steering Wheel
P/N Base	A6003/P6007
Suffix	AA
Details	Steering Wheel

Car #	91	Part Cost	27.247
Qty	1	Extended Cost	27.247

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steering Wheel	Steering	\$27.25										27.247
Sub Total													

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ 0	
							\$ 0	
								Sub Total \$0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ 0	
								\$ 0	
									Sub Total \$0

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ 0
								\$ 0
								Sub Total \$0

6.11 Quick Release

University System	BITS Pilani - Dubai
Assembly	Steering System
Part	Steering Wheel Assembly
P/N Base	Quick Release
Suffix	A6003/P6008
Details	AA
	Aluminium quick release

Car #	91	Part Cost	50.4136
Qty	1		
Extended Cost			50.4136

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Quick Release	Quick detachment of steering wheel	\$49.03										49.03
Sub Total													
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Machining Setup, Install and resetup machine		\$1.30	Labour	1	1	1	\$1.30					
30	Machining	Remove material for bushing	\$0.04	cm^3	2.09	1	1	\$0.08					
								Sub Total					1.3836
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								\$ 0					
								\$ 0					
								Sub Total					\$0
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								\$ 0					
								\$ 0					
								Sub Total					\$0

6.12 Tie Rod Assembly

University	BITS Pilani-Dubai
System	Steering System
Assembly	Tie Rod Assembly
P/N Base	A6004
Suffix	AA
Details	Tie Rod Assembly

Car #	91	Asm Cost	\$12.38
Qty	1		
Extended Cost \$12.38			

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Rod Tube	\$0.37	2	\$0.74
20	Rod Ends	\$2.91	4	\$11.64
Sub Total			\$12.38	

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total \$0.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$0.00
								\$0.00
								\$0.00
								Sub Total \$0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$0.00
									\$0.00
									\$0.00
									Sub Total \$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$0.00
								\$0.00
								Sub Total \$0.00

6.13 Rod Tube

University BITS Pilani - Dubai
System Steering System
Assembly Steering Column Assembly
Part Rod Tube
P/N Base A6004/P6009
Suffix AA
Details Tie rod

Car #	91	Part Cost	0.37125
Qty	2		

Extended Cost 0.7425

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Alloy	Material for tie rod	\$2.25	0.165	kg							1	\$0.37
													Sub Total 0.37125
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								\$ 0					
								\$ 0					Sub Total \$0
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								\$ 0					
								\$ 0					Sub Total \$0
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								\$ 0					
								\$ 0					Sub Total \$0

6.14 Rod Ends

University BITS Pilani - Dubai
System Steering System
Assembly Tie Rod Assembly
Part Rod Ends
P/N Base A6004/P6010
Suffix AA
Details Aurora Rod Ends

Car #	91	Part Cost	2.91
Qty	4	Extended Cost	11.64

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Tie Rod, Industrial	Rod ends	\$2.91	9.525	mm							1	2.91
Sub Total													
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
								\$ 0					
								\$ 0					
										Sub Total			\$0
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								\$ 0					
								\$ 0					
										Sub Total			\$0
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total					
								\$ 0					
								\$ 0					
										Sub Total			\$0

Suspension - SU

7.1 Damper Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Dampers
P/N Base	A7001
Suffix	AA
Details	Damper Setup

Car #	91
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Asm Cost	\$ 807.36
Qty	1
Extended Cost	\$ 807.36

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Damper, Risse Jupiter 5R	\$ 201.84	4	\$ 807.36
Sub Total				\$ 807.360

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
												\$ -	
												Sub Total	\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								Sub Total 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total
								Sub Total \$ -

7.2 Shock Absorbers

University	BITS Pilani-Dubai
System	Suspension
Assembly	Dampers
Part	Shock Absorbers
P/N Base	A7001/P7001
Suffix	AA
Details	Aluminum Shocks

Car # 91

Part Cost	\$ 201.84
Qty	4
Extended Cost	\$ 807.36

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Damper, Risse Jupiter 5R	Balance and stability maintenance	\$ 200.00									1.00	\$ 200.00

Sub Total \$ 200.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Ratchet <= 25.4 mm	Tighten Damper Bolts	\$ 0.75	unit	1		2 \$ 1.50	Sub Total \$ 1.50

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 12.9	Fasten Damper To Frame	0.1	6 mm		28 mm		1	\$ 0.10
20	Nut, Grade 12.9	Fasten Damper To Frame	0.05	6 mm				1	\$ 0.05
30	Bolt, Grade 12.9	Fasten Damper To Frame	0.14	6 mm		40 mm		1	\$ 0.14
40	Nut, Grade 12.9	Fasten Damper To Frame	0.05	6 mm				1	\$ 0.05

Sub Total \$ 0.34

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								\$ -

Sub Total \$ -

7.3 Push Rod Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Pushrod Assembly
P/N Base	A7002
Suffix	AA
Details	Alloy Steel Push Rods

Car #	91
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Asm Cost	107.12
Qty	1
Extended Cost	\$ 107.12

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	All Rod Tubes	\$ 12.76	1	\$ 12.760
20	All Tube Adapters	\$ 35.92	1	\$ 35.918
30	All Rod Ends	\$ 56.88	1	\$ 56.880
Sub Total				\$ 105.558

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Ratchet <= 25.4 mm	Pushrod-Mounts on lower A arm	\$ 0.75		1			\$ 0.75
20	Ratchet <= 25.4 mm	Pushrod-Bell Crank	\$ 0.75		1			\$ 0.75
30	Assemble, 1 kg, Loose	Assemble Complete Push Rod Setup	\$ 0.06		1			\$ 0.06
Sub Total								\$ 1.56

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
									\$ -
									Sub Total
									\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total
								\$ -
								Sub Total
								\$ -

7.4 Rod Tubes

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 3.19									
System	Suspension	Qty	4											
Assembly	Pushrod Assembly													
Part	Rod Tube													
P/N Base	A7002/P7002													
Suffix	AA													
Details	Steel Rod Tubes													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total	
10	Steel, Alloy	Push Rod	\$ 2.25	0.65	kg		mm			240mm	7.8g/mm^3	1	\$ 2.25	
												Sub Total	\$ 2.250	
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total						
10	Ratchet <= 25.4 mm		\$ 0.75		1		2	\$ 0.26					Sub Total	\$ 0.26
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total					
10	Bolt, Grade 10.9 (SAE 8)	Fasten Pushrod to Bell Crank And A-Arms	\$ 0.24	8	mm		45	mm		2	\$ 0.48			
20	Nut, Grade 10.9 (SAE 8)	Fasten Pushrod to Bell Crank And A-Arms	\$ 0.06	8	mm					2	\$ 0.12			
30	Washer, Grade 10.9 (SAE 8)	Safety Washer	\$ 0.02	8	mm					4	\$ 0.08		Sub Total	\$ 0.68
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total						
													Sub Total	\$ -

7.5 Rod Inserts

University	BITS Pilani-Dubai
System	Suspension
Assembly	Pushrod Assembly
Part	Tube Adapters
P/N Base	A7002/P7003
Suffix	AA
Details	Steel Alloy Tube Adapters

Car # 91

Part Cost	\$ 8.98
Qty	4
Extended Cost	\$ 35.92

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Alloy	Rod End Adapter	\$ 2.25	0.054	kg							2	\$ 0.24

Sub Total \$ 0.243

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Setup For Material Removal	\$ 1.30	unit	1		1	\$ 1.30
20	Machining	Machine Drill And Tap Holes	\$ 0.04	cm^3	1.99		2	\$ 0.16
30	Weld	Weld Tube Adapters Into Tube Ends	\$ 0.15	cm	6.48		2	\$ 1.94

Sub Total \$ 3.40

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -

Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
10	Welds		\$ 500.00	point	8	3000	4	\$ 5.33

Sub Total 5.333333333

7.6 Rod Ends

University	BITS Pilani-Dubai
System	Suspension
Assembly	Pushrod Assembly
Part	Rod Ends
P/N Base	A7002/P7004
Suffix	AA
Details	Steel Alloy Rod Ends

Car # 91

Part Cost	\$ 14.22
Qty	4
Extended Cost	\$ 56.88

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Rod End, Industrial	Connection Apparatus	\$ 2.50	8 mm								2	\$ 5.00
20	Bearing, Spherical	Lower Spherical	\$ 6.92	8 mm								2	\$ 13.84
													Sub Total \$ 13.840

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Assemble, 1 kg, Line-on-Line	Assemble rod end setup	\$ 0.13		1		2	\$ 0.26
20	Ratchet <= 25.4 mm		\$ 0.75		1		2	\$ 0.26
								Sub Total \$ 0.26

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Nut, Grade 10.9 (SAE 8)	Lock Rod End To Adapter	\$ 0.06	8				2	\$ 0.12
									\$ -
									\$ -
								Sub Total	\$ 0.12

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								\$ -
								Sub Total \$ -

7.7 Front A-Arm Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Front A-Arm Assembly
P/N Base	A7003
Suffix	AA
Details	Complete Front A-Arms

Car # 91

Asm Cost	\$ 164.93
Qty	1
Extended Cost	\$ 164.93

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Front lower A-Arm	\$ 82.92	1.00	\$ 82.915
20	Front Upper A-Arm	\$ 82.02	1.00	\$ 82.015
Sub Total			\$ 164.931	

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -

Sub Total 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
									\$ -

Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								\$ -

Sub Total \$ -

7.8 Front Lower A-Arm

University	BITS Pilan-Dubai
System	Suspension
Assembly	Front A-Arm Assembly
Part	Lower A-Arm
P/N Base	A7003/P7005
Suffix	AA
Details	Alloy Steel Lower A-Arm

Car # 91

Part Cost	\$ 41.46
Qty	2
Extended Cost	\$ 82.92

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel,Alloy	Steel Tubing	\$ 2.25	1.16	kg							2	\$ 5.22
20	Steel,Alloy	Material for tube adapters	\$ 2.25	0.054	kg							3	\$ 0.36
30	Rod End, Industrial	Connection Apparatus	\$ 2.50	8	mm							3	\$ 7.50
40	Bearing, Spherical	Lower Spherical	\$ 6.92	8	mm							3	\$ 20.76
													Sub Total \$ 33.845

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Tube Cut	Cutting Tubes For Tube Adapters And Connecting A-Arms At An Angle	\$ 0.15		1			6 \$ 0.90
20	Weld	Weld A-Arms	\$ 0.15		1			1 \$ 0.15
30	Machining Setup, Install and remove	Machining Tube Adapters	\$ 1.30		1			1 \$ 1.30
40	Machining	Machine,Drill and Tap Holes	\$ 0.06		1.99			3 \$ 0.36
50	Weld	Weld Tube Adapters Into Tube Ends	\$ 0.15		1			3 \$ 0.45
60	Assemble, 1 kg, Line-on-Line	Align all Rod Ends And Nuts	\$ 0.13		1			3 \$ 0.38
70	Ratchet <= 6.35 mm	Tighten all bolts/nuts	\$ 0.50		1			6 \$ 3.00
								Sub Total \$ 6.53

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And Chasis Mount	0.24	8	mm	45	mm	3	\$ 0.72
20	Nut, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And Chasis Mount	0.06	8	mm			3	\$ 0.18
30	Nut, Grade 10.9 (SAE 8)	Lock Rod End To Adapter	0.06	8	mm			3	\$ 0.18
									Sub Total \$ 1.08

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								\$ -
								\$ -
								Sub Total \$ -

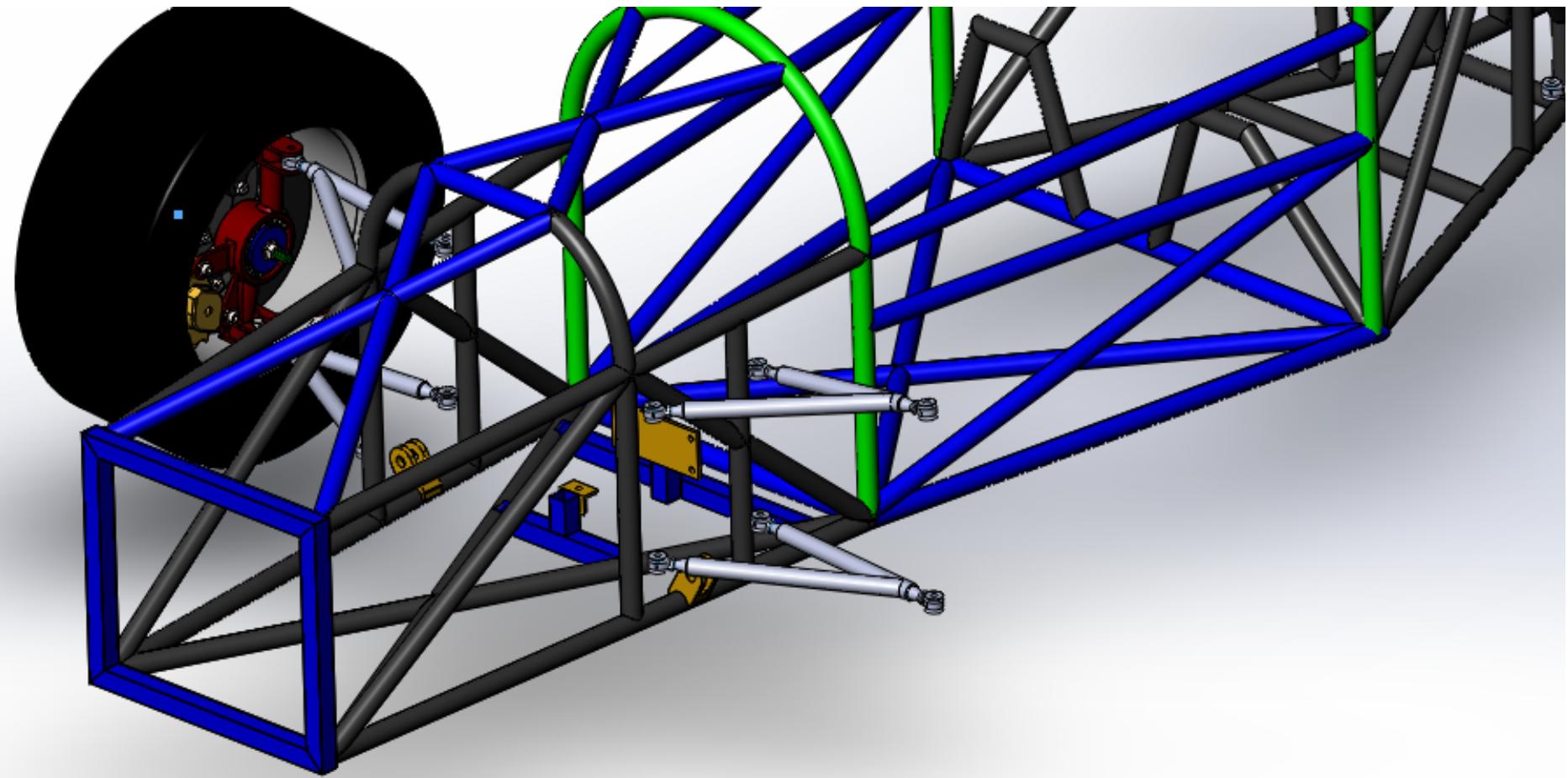
7.9 Front Upper A-Arm

University	BITS Pilani-Dubai								Car #
System	Suspension								
Assembly	Front A-Arm Assembly								
Part	Upper A-Arm								
P/N Base	A7003/P7006								
Suffix	AA								
Details	Alloy Steel Upper A-Arm								
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area
10	Steel,Alloy	Steel Tubing	\$ 2.25	1.06	kg				
20	Steel,Alloy	Material for tube adapters	\$ 2.25	0.054	kg				
30	Rod End, Industrial	Connection Apparatus	\$ 2.50	8	mm				
40	Bearing, Spherical	Lower Spherical	\$ 6.92	8	mm				

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Tube Cut	Cutting Tubes For Tube Adapters And Connecting A-Arms At An Angle	\$ 0.15		1		6	\$ 0.90
20	Weld	Weld A-Arms	\$ 0.15		1		1	\$ 0.15
30	Machining Setup, Install and remove	Machining Tube Adapters	\$ 1.30		1		1	\$ 1.30
40	Machining	Machine,Drill and Tap Holes	\$ 0.06		1.99		3	\$ 0.36
50	Weld	Weld Tube Adapters Into Tube Ends	\$ 0.15		1		3	\$ 0.45
60	Assemble, 1 kg, Line-on-Line	Allign all Rod Ends And Nuts	\$ 0.13		1		3	\$ 0.38
70	Ratchet <= 6.35 mm	Tighten all bolts/nuts	\$ 0.50		1		6	\$ 3.00
							Sub Total	\$ 6.53

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And Chasis Mount	0.24	8	mm	45	mm	3	\$ 0.72
20	Nut, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And Chasis Mount	0.06	8	mm			3	\$ 0.18
30	Nut, Grade 10.9 (SAE 8)	Lock Rod End To Adapter	0.06	8	mm			3	\$ 0.18
								Sub Total	\$ 1.08

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PFV	FracInclD	Sub Total
								\$ -
								\$ -
								Sub Total \$ -



7.10 Rear A-Arm Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Rear A-Arm Assembly
P/N Base	A7004
Suffix	AA
Details	Complete Rear A-Arms

Car #	91
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Asm Cost	\$ 158.45
Qty	1
Extended Cost	\$ 158.45

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Rear Lower A-Arm	\$ 79.50	1.00	\$ 79.495
20	Rear Upper A-Arm	\$ 78.96	1.00	\$ 78.955
Sub Total				\$ 158.451

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total

Sub Total **0**

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total

Sub Total **\$ -**

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total

Sub Total **\$ -**

7.11 Lower A-Arm

University	BITS Pilani-Dubai	Car #							
System	Suspension								
Assembly	Rear A-Arm Assembly								
Part	Lower A-Arm								
P/N Base	A7004/P7007								
Suffix	AA								
Details	Alloy Steel A-Arm								
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area
10	Steel, Alloy	Steel Tubing	\$ 2.25	0.78	kg				
20	Steel, Alloy	Material for tube adapters	\$ 2.25	0.054	kg				
30	Rod End, Industrial	Connection Apparatus	\$ 2.50	8	mm				
40	Bearing, Spherical	Lower Spherical	\$ 6.92	8	mm				

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Tube Cut	Cutting Tubes For Tube Adapters And Connecting A-Arms At An Angle	\$ 0.15		1		6	\$ 0.90
20	Weld	Weld A-Arms	\$ 0.15		1		1	\$ 0.15
30	Machining Setup, Install and remove	Machining Tube Adapters	\$ 1.30		1		1	\$ 1.30
40	Machining	Machine, Drill and Tap Holes	\$ 0.06		1.99		3	\$ 0.36
50	Weld	Weld Tube Adapters Into Tube Ends	\$ 0.15		1		3	\$ 0.45
60	Assemble, 1 kg, Line-on-Line	Allign all Rod Ends And Nuts	\$ 0.13		1		3	\$ 0.38
70	Ratchet <= 6.35 mm	Tighten all bolts/nuts	\$ 0.50		1		6	\$ 3.00
							Sub Total	\$ 6.53

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And Chasis Mou	0.24	8	mm	45	mm	3	\$ 0.72
20	Nut, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And Chasis Mou	0.06	8	mm			3	\$ 0.18
30	Nut, Grade 10.9 (SAE 8)	Lock Rod End To Adapter	0.06	8	mm			3	\$ 0.18
									Sub Total \$ 1.08

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								\$ -
								\$ -
								Sub Total \$ -

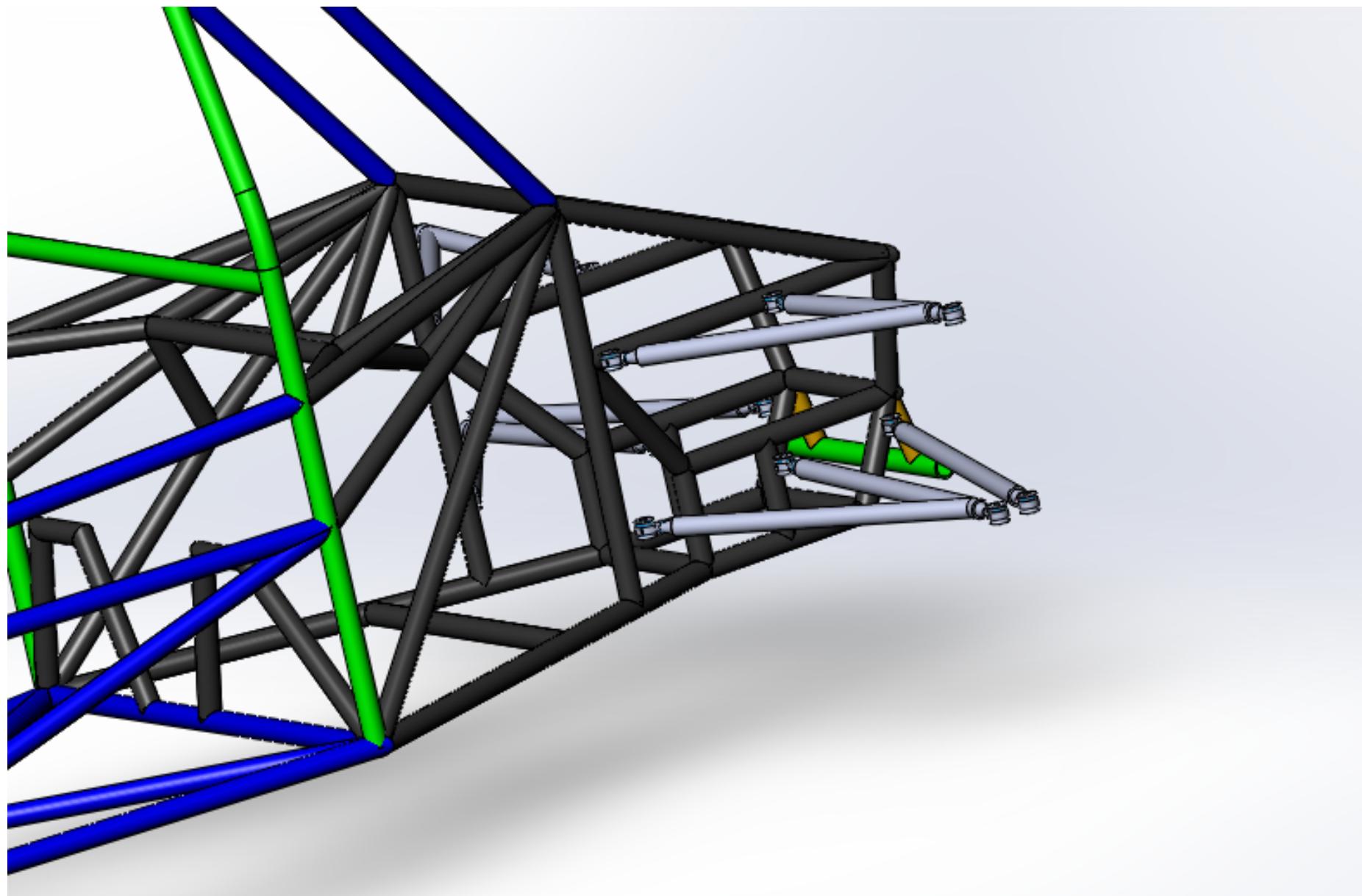
7.12 Upper A-Arm

University	BITS Pilani-Dubai	Car #	91	Part Cost	\$ 39.48								
System	Suspension	Qty	2										
Assembly	Rear A-Arm Assembly												
Part	Upper A-Arm												
P/N Base	A7004/P7008												
Suffix	AA												
Details	Alloy Steel A-Arm												
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel,Alloy	Steel Tubing	\$ 2.25	0.72	kg							2	\$ 3.24
20	Steel,Alloy	Material for tube adapters	\$ 2.25	0.054	kg							3	\$ 0.36
30	Rod End, Industrial	Connection Apparatus	\$ 2.50	8	mm							3	\$ 7.50
40	Bearing, Spherical	Lower Spherical	\$ 6.92	8	mm							3	\$ 20.76
													Sub Total \$ 31.865

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Tube Cut	Cutting Tubes For Tube Adapters And Connecting A-Arms At An Angle	\$ 0.15		1		6	\$ 0.90
20	Weld	Weld A-Arms	\$ 0.15		1		1	\$ 0.15
30	Machining Setup, Install and remove	Machining Tube Adapters	\$ 1.30		1		1	\$ 1.30
40	Machining	Machine, Drill and Tap Holes	\$ 0.06		1.99		3	\$ 0.36
50	Weld	Weld Tube Adapters Into Tub	\$ 0.15		1		3	\$ 0.45
60	Assemble, 1 kg, Line-on-Line	Allign all Rod Ends And Nuts	\$ 0.13		1		3	\$ 0.38
70	Ratchet <= 6.35 mm	Tighten all bolts/nuts	\$ 0.50		1		6	\$ 3.00
							Sub Total	\$ 6.53

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And C	0.24	8	mm	45	mm	3	\$ 0.72
20	Nut, Grade 10.9 (SAE 8)	Fasten A-Arms To Spindle And C	0.06	8	mm			3	\$ 0.18
30	Nut, Grade 10.9 (SAE 8)	Lock Rod End To Adapter	0.06	8	mm			3	\$ 0.18
								Sub Total	\$ 1.08

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								\$ -
								\$ -
								Sub Total \$ -



7.13 Front Bell Crank Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Front Bell Crank Assembly
P/N Base	A7005
Suffix	AA
Details	Alloy Steel Bell Crank

Car #	91
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Asm Cost	\$ 208.31
Qty	1
Extended Cost	\$ 208.31

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Front Bell Crank	\$ 208.31	1.00	\$ 208.315
Sub Total				\$ 208.315

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
												Sub Total	\$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								Sub Total 0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total
								\$ -
								Sub Total \$ -

7.14 Front Aluminum Bell Crank

University	BITS Pilani-Dubai
System	Suspension
Assembly	Front Bell Crank Assembly
Part	Front Alluminium Bell Crank
P/N Base	A7005/P7009
Suffix	AA
Details	Carbon Steel Bell Crank

Car # 91

Part Cost	\$ 104.
Qty	
Extended Cost	\$ 208.

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Bell Crank Material	\$ 2.25	2.355	kg							1	\$ 5.
20	Bearing, Needle	Bearings	\$ 3.60	25.4	mm	19.05	mm					1	\$ 91.
												Sub Total	\$ 96.7

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup For Material Removal	\$ 1.30	unit	1	1	1	\$ 1.30
20	Machining	Remove Material	\$ 0.04	cm^3	125.215	1	1	\$ 5.01
30	Ratchet <= 25.4 mm	Bell Crank To Chasis Mount	\$ 0.75	unit	1	1	1	\$ 0.75
							Sub Total	\$ 7.06

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 10.9 (SAE 8)	Fasten Pushrod to Bell Crank And A-Arms	\$ 0.30	8	mm	55	mm	1	\$ 0.30
20	Nut, Grade 10.9 (SAE 8)	Fasten Pushrod to Bell Crank And A-Arms	\$ 0.06	8	mm			1	\$ 0.06
								Sub Total	\$ 0.36

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total \$ -

7.15 Rear Bell Crank Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Rear Bell Crank Assembly
P/N Base	A7006
Suffix	AA
Details	Alloy Steel Bell Crank

Car #	91
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Asm Cost	\$ 208.31
Qty	1
Extended Cost	\$ 208.31

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Rear Bell Crank	\$ 208.31	1.00	\$ 208.315
Sub Total				\$ 208.315

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total \$ -

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
							\$ -	
Sub Total								0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
									\$ -
Sub Total									\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclud	Sub Total
								\$ -
Sub Total								\$ -

7.16 Rear Aluminum Bell Crank

University	BITS Pilani-Dubai
System	Suspension
Assembly	Rear Bell Crank Assembly
Part	Rear Alluminium Bell Crank
P/N Base	A7006/P7010
Suffix	AA
Details	Carbon Steel Bell Crank

Car #	91
Part Cost	\$ 104.16
Qty	2
Extended Cost	\$ 208.31

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Bell Crank Material	\$ 2.25	2.355	kg							1	\$ 5.30
20	Bearing, Needle	Bearings	\$ 3.60	25.4	mm	19.05	mm					1	\$ 91.44
												Sub Total	\$ 96.739

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup For Material Remv	\$ 1.30	unit	1	1	1	\$ 1.30
20	Machining	Remove Material	\$ 0.04	cm^3	125.215	1	1	\$ 5.01
30	Ratchet <= 25.4 mm	Bell Crank To Chasis Mount	\$ 0.75	unit	1	1	1	\$ 0.75
	Sub Total							
	\$ 7.06							

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10	Bolt, Grade 10.9 (SAE 8)	Fasten Pushrod to Bell Crank And A-A	\$ 0.30	8	mm	55	mm	1	\$ 0.30
20	Nut, Grade 10.9 (SAE 8)	Fasten Pushrod to Bell Crank And A-A	\$ 0.06	8	mm			1	\$ 0.06
	Sub Total								\$ 0.36

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracIncld	Sub Total
								\$ -
	Sub Total							

7.17 Upright Assembly

University	BITS Pilani-Dubai
System	Suspension
Assembly	Upright Assembly
P/N Base	A7007
Suffix	AA
Details	Front Steel Alloy Upright

Car #	91
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Asm Cost	\$ 101.390
Qty	1
Extended Cost	\$ 101.39

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Front Upright And Tie Rod Mount	\$ 55.16	1.00	\$ 55.160
20	Rear Upright And Toe Link Mount	\$ 46.23	1.00	\$ 46.230
Sub Total				\$ 101.390

ItemOrder	Material	Use	UnitCost	Size1

ItemOrder	Process	Use	UnitCost	Unit	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													\$ -
													\$ -
													\$ -
Sub Total													\$ -

ItemOrder	Fastener	Use	UnitCost	Size1	Quantity	Multiplier	Mult. Val.	Sub Total
								\$ -
								\$ -
								\$ -
Sub Total								0

ItemOrder	Tooling	Use	UnitCost	Unit	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -

7.18 Front Upright And Tie Rod Mount

University	BITS Pilani-Dubai
System	Suspension
Assembly	Upright Assembly
Part	Front Upright
P/N Base	A7007/P7011
Suffix	AA
Details	Alloy Steel Upright

Car # 91

Part Cost	27.58
Qty	2
Extended Cost	55.16

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material For Upright And Tie Rod Mount	\$ 2.25	3.3	kg								\$ 7.43

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	Machine Setup For Upright	\$ 1.30	Labor	1			\$ 1.30
20	Machining	Machine Upright	\$ 0.04	cm^3	278.79			\$ 11.15
30	Drilled holes < 25.4 mm dia.	Material Removal	\$ 0.35	hole	7			\$ 2.45
40	Ratchet <= 25.4 mm	Tighten Bolts On Upright	\$ 0.75	unit	7			\$ 5.25
						Sub Total	\$ 20.15	

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
									\$ -
								Sub Total	\$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								Sub Total \$ -

7.19 Rear Upright And Toe Link Mount

University	BITS Pilani-Dubai
System	Suspension
Assembly	Rear Upright Assembly
Part	Rear Upright
P/N Base	A7007/P7012
Suffix	AA
Details	Rear Alloy Steel Upright

Car # 91

Part Cost	\$ 23.12
Qty	2
Extended Cost	\$ 46.23

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Alloy	Material For Upright	\$ 2.25	3.27	kg								\$ 7.36
													Sub Total \$ 7.360

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup,Install and remove	Machine Setup For Upright	\$ 1.30	Labor	1			\$ 1.30
20	Machining	Machine Upright	\$ 0.04	cm^3	256.41			\$ 10.26
30	Drilled holes < 25.4 mm dia.	Material Removal	\$ 0.35	hole	6			\$ 2.10
30	Ratchet <= 25.4 mm	Tighten Bolts On Upright	\$ 0.75	unit	3			\$ 2.10
						Sub Total	\$ 15.76	

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$ -
									\$ -
									\$ -
									Sub Total \$ -

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FracInclD	Sub Total
								\$ -
								\$ -
								Sub Total \$ -

Wheels, Wheel Bearing and Tyres – WT

8.1 Wheel Assembly

University	BITS Pilani-Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Assembly
P/N Base	A8001
Suffix	AA
Details	Front and rear wheel bearings

Car #	91
FileLink1	
FileLink2	
FileLink3	

Asm Cost	20.52
Qty	1
Extended Cost	20.52

ItemOrder	Part	Part Cost	Quantity	Sub Total
	10 Hoosier Racing Tire R25B C2500	\$85.00	4	\$340.00
	20 Keizer Magnesium wheels, 13"	\$140.00	4	\$560.00
	30 Centerlock	\$9.51	4	\$38.04
Sub Total				\$900.00

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
												Sub Total	\$0.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
	10 Assemble, 10 kg, Loose	Place wheels on hub	\$0.63	unit	4	1	2.52	
	20 Ratchet > 25.4 mm	tighten centerlock	\$1.50	labour	4	3	18	
								Sub Total 20.52

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									Sub Total \$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
								Sub Total \$0.00

8.2 Wheels

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Assembly
Part	Wheels
P/N Base	A8001/P8001
Suffix	AA
Details	Keizer Magnesium wheels, 13"

Car #	91	Part Cost	\$ 140.00
Qty	4	FileLink1	
		FileLink2	

Extended Cost \$ 560.00

FileLink3

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
	10 Keizer Magnesium wheels, 13"	wheels	\$ 140.00										4 \$ 560.00
<hr/>													
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					Sub Total
								\$ 0					\$0
	<hr/>							Sub Total					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								\$ 0					\$0
	<hr/>							Sub Total					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total					
								\$ 0					\$0
	<hr/>							Sub Total					

8.3 Tires

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Assembly
Part	Tires
P/N Base	A8001/P8002
Suffix	AA
Details	Hoosier Racing Tire R25B C2500

Car #	91	Part Cost	\$ 85
Qty	4	Extended Cost	\$ 340
FileLink1			
FileLink2			
FileLink3			

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total					
10	Tire, Hoosier, R25B, 13"-20.5 x 7.0	Tires	\$85.00									4	\$340.00					
Sub Total \$ 340.00																		
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total										
\$ 0																		
Sub Total \$0																		
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total									
\$ 0																		
Sub Total \$0																		
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total										
\$ 0																		
Sub Total \$0																		

8.4 Center Lock

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Assembly
Part	Centerlock
P/N Base	A8001/P8003
Suffix	AA
Details	Centerlock for wheels

Car #	91	Part Cost	9.5086
Qty	4		
FileLink1		Extended Cost	38.0344

FileLink2

FileLink3

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material for centerlock	\$2.25		0.78 kg								1.755
<hr/>													
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Machining Setup, Install and remove	setup machine	\$1.30 Labour		1		1	\$1.30					
20	Drilled hole < 50.8 mm dia.	Drill holes	\$0.70 hole		1	3	1	\$2.10					
30	Machining	Remove material	\$0.04 cm ³		36.28	3	1	\$4.35					
							Sub Total	7.7536					
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
									\$ 0				
									\$ 0				
							Sub Total	\$0					
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total					
								\$ 0					
								\$ 0					
							Sub Total	\$0					

8.5 Front & Rear Hub Assembly

University	BITS Pilani-Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Front and Rear Assembly
P/N Base	A8002
Suffix	AA
Details	Front and rear wheel bearings

Car # 91

Asm Cost	582.78
Qty	1
Extended Cost	582.78

FileLink1
FileLink2
FileLink3

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Front hub	\$115.64	2	\$231.28
20	Rear hub	\$175.75	2	\$351.50
Sub Total				\$582.78

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total

Sub Total \$0.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$0.00

Sub Total \$0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$0.00

Sub Total \$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
								\$0.00

Sub Total \$0.00

8.6 Front Hub

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Front & Rear Hub Assembly
Part	Front Hub
P/N Base	A8002/P8004
Suffix	AA
Details	Front Hub

Car #	91
FileLink1	
FileLink2	
FileLink3	

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density
10 Steel, Mild		Material for hub	\$2.25		4.82 kg						

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10 Machining Setup, Install and remove	setup machine for hub		\$1.30 Labour		1		1	\$1.30
20 Machining	Remove material		\$0.04 cm^3		251.8	3	1	\$30.22
30 Machining Setup, Change	Change tool		\$0.65 Labour		6	1	1	\$3.90
40 Drilled holes < 25.4 mm dia.	Drill holes		\$0.35 hole		39	3	1	\$40.95
50 Drilled hole < 50.8 mm dia.	Drill holes		\$0.70 hole		2	3	1	\$4.20
60 Weld	Welding		\$0.15 cm		55.42	3	1	\$24.94
							Sub Total	\$105.51

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ 0	
								\$ 0	
								Sub Total	\$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total	
10 Welds - Welding Fixture		Fix point	\$500.00	point	8	3000		\$1.33	
								Sub Total	\$1.33

8.7 Rear Hub

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Front & Rear Hub Assembly
Part	Rear hub
P/N Base	A8002/P8005
Suffix	AA
Details	Rear Hub

Car #	91	Part Cost	\$175.75
Qty	2		
FileLink1			Extended Cost
FileLink2			FileLink3

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10 Steel, Mild		Material for hub	\$2.25	5.69 kg								1	\$12.80

Sub Total **\$12.80**

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10 Machining Setup, Install and remove		setup machine for hub	\$1.30 Labour		1		1	\$1.30
20 Machining		Remove material	\$0.04 cm^3		250.21	3	1	\$30.03
30 Machining Setup, Change		Change tool	\$0.65 Labour		7	1	1	\$4.55
40 Drilled holes < 25.4 mm dia.		Drill holes	\$0.35 hole		67	3	1	\$70.35
50 Drilled hole < 50.8 mm dia.		Drill holes	\$0.70 hole		3	3	1	\$6.30
60 Weld		Welding	\$0.15 cm		94.79	3	1	\$42.66
70 Wrench <= 6.35 mm		Tighten bolt	\$1.00 unit		6	1	1	\$6.00
								Sub Total \$161.18

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
10 Bolt, Grade 12.9			0.0516	6 mm		12 mm		6	\$0.31
20 Washer, Grade 12.9			\$0.02					6	\$0.12
								Sub Total	\$0.43

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionIncluded	Sub Total
10 Welds - Welding Fixture		Fix point	\$500.00	point	8	3000		\$1.33

Sub Total **\$1.33**

Wheel Bearing Assembly

University	BITS Pilani-Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Bearing Assembly
P/N Base	A8003
Suffix	AA
Details	Front and rear wheel bearings

Car #	91	Asm Cost	689.72
Qty	1	Qty	1
FileLink1			Extended Cost 689.72
FileLink2			
FileLink3			

ItemOrder	Part	Part Cost	Quantity	Sub Total
10	Wheel Bearing	\$171.00	4	\$684.00
20	Wheel Bearing Spacer front	\$2.86	2	\$5.72
30	Wheel Bearing Spacer rear	\$2.78	2	\$5.56
				Sub Total \$689.72

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
													Sub Total \$0.00

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
								\$0.00
							Sub Total	\$0

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
									\$0.00
								Sub Total	\$0.00

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
								\$0.00
							Sub Total	\$0.00

8.8 Wheel Bearing

University	BITS Pilani - Dubai	Car #	91	Part Cost	\$171.64								
System	Wheels, Wheel Bearings and Tires	Qty	4										
Assembly	Wheel Bearing Assembly												
Part	Wheel Bearing												
P/N Base	A8003/P8006												
Suffix	AA												
Details	Wheel Bearing												
		FileLink1		Extended Cost	\$686.56								
		FileLink2											
		FileLink3											
<hr/>													
ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Wheel Bearing, Tapered Roller	Front Upright Bearing	\$35.12		80 mm		19.75 mm					1	\$35.12
20	Wheel Bearing, Ball, Angular Contact	Rear Upright Bearing	\$135.76		80 mm		18 mm					1	\$135.76
													Sub Total
													\$170.88
ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total					
10	Assemble, 1 kg. Interference	Bearings into upright	\$0.19	unit	4			\$0.76					
									Sub Total				\$0.76
ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total				
								\$ 0					
								\$ 0					
									Sub Total				\$0
ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total					
								\$ 0					
								\$ 0					
									Sub Total				\$0

8.9 Wheel Bearing Spacer Front

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Bearing Assembly
Part	Wheel Bearing Spacer front
P/N Base	A8003/P8007
Suffix	AA
Details	Wheel Bearing

Car #	91	Part Cost	\$2.86
Qty	2	Extended Cost	\$5.72
FileLink1		FileLink2	

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material for spacer	\$2.25	0.13 kg									\$0.29

Sub Total \$0.29

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total
10	Machining Setup, Install and remove	setup machine	\$1.30	Labour	1		1	\$1.30
20	Machining	Remove material	\$0.04	cm^3	10.6	3	1	\$1.27

Sub Total \$2.57

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ 0	

Sub Total \$0

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
								\$ 0

Sub Total \$0

8.10 Wheel Bearing Spacer Rear

University	BITS Pilani - Dubai
System	Wheels, Wheel Bearings and Tires
Assembly	Wheel Bearing Assembly
Part	Wheel Bearing Spacer rear
P/N Base	A8003/P8008
Prefix	AA
Details	Wheel Bearing

Car #	91	Part Cost	\$2.78
Qty	2		
FileLink1			
FileLink2			
FileLink3			
Extended Cost			\$5.56

ItemOrder	Material	Use	UnitCost	Size1	Unit1	Size2	Unit2	Area Name	Area	Length	Density	Quantity	Sub Total
10	Steel, Mild	Material for spacer	\$2.25		0.122 kg								\$0.27

ItemOrder	Process	Use	UnitCost	Unit	Quantity	Multiplier	Mult. Val.	Sub Total	Sub Total	\$0.27
10	Machining Setup, Install and remove	setup machine	\$1.30 Labour		1		1	\$1.30		
20	Machining	Remove material	\$0.04 cm^3		10.048	3	1	\$1.21	Sub Total	\$2.51

ItemOrder	Fastener	Use	UnitCost	Size1	Unit1	Size2	Unit2	Quantity	Sub Total
								\$ 0	
								\$ 0	Sub Total \$0

ItemOrder	Tooling	Use	UnitCost	Unit	Quantity	PVF	FractionInclude	Sub Total
						\$ 0		
						\$ 0		Sub Total \$0



