

FSAE Design Spec Sheet – Note: SI units

2011

Competitors please replace the sample specification values in the table below with those appropriate for your vehicle and submit this to with your design report. This information will be reviewed by the design judges and may be referred to during the design event.

~Please do not modify format of this sheet. Consistent formatting will help keep the judges happy!

~The sample values are realistic and should not be used as the baseline for your design.

Car No.	247
School	Jetison Academy of Applied Engineering

Dimensions	Front	Rear
Overall Length, Width, Height	2338mm long, 1476mm wide, 1404mm high	
Wheelbase	1676mm	
Track Width	1410 mm	1475 mm
Weight with 68kg driver	121 kg	138 kg

Suspension Parameters	Front	Rear
Suspension Type	Double unequal length A-Arms. Push rod actuated horizontally oriented spring and damper	Double unequal length A-Arms. Direct acting spring and damper
Tire Size and Compound Type	20x6.5-13 R25A Hoosier	20x8-13 R25A Hoosier
Wheels (width, construction)	8 inch wide, 3 pc Al Rim, 20mm neg. offset	9 inch wide, 1 pc carbon, 34mm neg. offset
Center of Gravity Design Height	214 mm above ground (confirmed with testing)	
Suspension design travel	32mm jounce/ 29 mm rebound	48mm jounce/ 36 mm rebound
Wheel rate (chassis to wheel center)	38 N/mm	48 N/mm
Roll rate (chassis to wheel center)	3.14 degrees per g	
Spring mass natural frequency	1.53 Hz	1.62 Hz
Jounce Damping	42% of critical damping at X mm/sec	38 % of critical damping at X mm/sec
Rebound Damping	72% of critical damping at X mm/sec	68 % of critical damping at X mm/sec
Motion ratio / type	0.91 / linear	0.82 / progressive rate
Camber coefficient in bump (deg / in)	19.3 deg / in	32.5 deg / in
Camber coefficient in roll (deg / deg)	2.62 deg / deg	2.62 deg / deg
Static Toe	-0.2 deg toe flex out	0.3 deg toe in
Static camber and adjustment method	-1.5 deg. adj. via shim plates on A-arm	-0.5 deg. adj. via inboard rod ends.
Front Caster and adjustment method	13 degrees non-adjustable	
Front Kingpin Axis	2 degrees non-adjustable	
Kingpin offset and trail	6mm offset, 3mm trail	
Static Ackermann and adjustment method	110% non-adjustable	
Anti dive / Anti Squat	0	-30%
Roll center position static	34mm above ground	12mm above ground
Roll center position at 1g lateral acc	30mm above ground, 154mm toward loaded side	5mm above ground, 260 mm toward laden side
Steer location, Gear ratio, Steer Arm Length	Front steer, . 25mm c-factor, 62mm steer arm	

Brake System / Hub & Axle	Front	Rear
Rotors	Floating, Cast Iron, hub mounted, 205mm dia. vented	Outboard, 260 mm dia x 10mm Carbon ceramic
Master Cylinder	Student Built 22mm bore front / 19mm bore rear with driver adjustable bias bar	
Calipers	48mm dia., Opposing piston, fixed mtg	Dual piston 25mm dia., floating
Hub Bearings	Tapered roller bearings. Separate spring loaded rubber lip seal	Single 5205 dbl row ang contact bearing with integral seal
Upright Assembly	CNC 7075-Al, integral caliper mount	Weldment, 4130 sheet, heat treated, shot peened
Axle type, size, and material	Fixed spindles, 28mm dia., 4130 steel normalized	Rotating axle, 52mm ODx 2.5mm wall, 4340 steel, RC 40

Ergonomics	
Driver Size Adjustments	Fixed seat and steering wheel. Pedals adjust fore and aft 75mm from center position
Seat (materials, padding)	Wet lay-up carbon, padded lumbar and knee protection, 80mm foam head support
Driver Visibility (angle of side view, mirrors?)	210 degree side visibility, 60 x 100mm side mirrors rigidly mounted to nose
Shift Actuator (type, location)	Manually actuated lever/ linkage, right side cockpit mount
Clutch Actuator (type, location)	Foot pedal, cable actuated
Instrumentation	Dash mounted temp/oil gauge, 5 LED tach/shift light

System Design Specification Document

Kathleen Armour



System Design Specification Document:

System Design Specification Document Book Review: Unveiling the Power of Words

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