



UNIVERSITY:	CAR NUMBER:
SEF PASSED: <input type="checkbox"/> YES <input type="checkbox"/> NO IADR PASSED: <input type="checkbox"/> YES <input type="checkbox"/> NO	ABS: <input type="checkbox"/> YES <input type="checkbox"/> NO
ENGINE:	NUMBER OF DRIVERS:
BORE / STROKE:	TALLEST DRIVER: HEIGHT:

IMPORTANT

PRESENT THE VEHICLE FOR INSPECTION IN THE FOLLOWING ORDER

1. TECHNICAL INSPECTION
2. FUELING & TILT TABLE INSPECTION
3. NOISE LEVEL & BRAKING PERFORMANCE INSPECTION

THIS FORM MUST STAY WITH THE CAR AT ALL TIMES

NOTE - IF THERE IS A CONFLICT BETWEEN THIS FORM AND THE RULES, THE RULES PREVAIL

PART 1 TECHNICAL INSPECTION

Scrutineer name:	Start time:	End time:
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TYRES, WHEELS & DRIVER'S EQUIPMENT

DRY TIRES - Make: DRY TIRES - Size: DRY TIRES - Compound:	RAIN TIRES - Make: RAIN TIRES - Size: RAIN TIRES - Compound:
WHEELS - 20,32 cm min. diam. Wheels with single wheel nut must have positive retainer. No Aluminium or hollow wheel bolts	RAIN TIRES - 2,4 mm (3/32 in.) min. tread depth molded by tire manufacturer.
1 UNDERWEAR – certified to SFI 3.3 or FIA 8856-2000	7 GOGGLES / FACE SHIELDS - made of impact resistant material.
2 SOCKS – Nomex or equivalent, fire resistant socks. No cotton. No polyester. No bare skin.	8 ARM RESTRAINTS - Must be installed so the driver can release them and exit unassisted regardless of vehicle's position.
3 SHOES – SFI 3.3 or FIA 8856-2000	9 GLOVES – Fire resistant material. No holes. Leather allowed only over fire resistant material.
4 HELMETS - Snell SA2000, SA2005, SA2010, M2000, M2005, M2010, K2000, K2005, K2010, BS 6658-85 Type A/FR (not Type A and B). SFI 31.2A, SFI 31.1/2005, FIA 8860-2004. Closed Face, no Open Face	10 FIRE EXTINGUISHERS - Two (2) hand-held, 0.9 kg (2 lb.) minimum, dry chemical (10BC, 1A10BC, 34B, 5A 34B, 20BE or 1A 10BE), Aqueous Film Forming Foam (AFFF) fire extinguishers are prohibited, 1 WITH CAR installed on push-bar, 1 in paddock. (Must see BOTH at Tech.). On-board fire system possible.
5 DRIVER SUITS - FIA 1986 or 2000, or SFI 3-2A/5, FIA 8856-2000 minimum rating, and LABELED AS SUCH	11 PUSH BAR - With car, detachable, push & pull function for 2 people standing erect. The push bar must be located behind the rear axle when the car is moved. FIRE EXTINGUISHERS must be installed
6 HAIR COVER - Fire resistant (Nomex or equiv.) balaclava of full helmet skirt REQUIRED FOR ALL DRIVERS.	

EXTERIOR, GENERAL

12 DRIVER RESTRAINT HARNESS - SFI 16.1, SFI 16.5 or FIA spec 5, 6 or 7 point and be labeled . 50 mm wide shoulder belts OK with HANS. 50 mm lap belts OK for FIA & SFI 16.5, not OK for SFI 16.1. All lap belts must have Quick Adjusters. Reclined drivers must have a 6 or 7 point, and Quick Adjuster sub-belts or 2 sets of sub belts.	16 VISIBILITY - Minimum of 100 deg. field either side. Head rotation allowed or mirrors. If mirrors, must be firmly installed and adjusted
13 LAP BELT MOUNTING - Must pass over pelvic area between 45 - 65 deg. to horizontal for upright driver, 60-80 deg. for reclined. Pivoting mounting with eye bolts or shoulder bolts attached securely to Primary Structure.	17 VEHICLE CONTROLS - All controls, including shifter, must be inside cockpit. No arms or elbows outside side impact system to actuate.
14 SHOULDER HARNESS MOUNTING - Mounting points 178 - 229 mm apart. Angle from shoulder between 10 deg. up and 20 deg. down to horizontal. Attach to Primary Structure - 25,4 x 2.4 mm or 25.0 mm x 2.5 mm steel tube min. NOT to put bending loads into Main Hoop Bracing without extra bracing. Braces if not straight to main hoop.	18 MAIN HOOP & FRONT HOOP HEIGHTS - Helmet of tallest driver to be 50 mm below line between top of front and main roll hoop AND between top of main hoop to rear attachment point of main hoop bracing.
15 HEAD RESTRAINT - Near vertical. Must take 890 N load. 38 mm thick, energy absorbing padding. Max. 25.4 mm from helmet. Helmet contact point 50mm min. from any edge. May be changed for different drivers. Minimum 150x150mm AND height adjustment of 175 mm; OR minimum 150 x 280mm	19 PERCY - Helmet of 95th percentile male (PERCY) to be 50 mm below the lines between top of front and main roll hoops and between top of main hoop to rear attachment point of main hoop bracing. Center of bottom circle placed minimum 915 mm from pedals.
21 BODY & STYLING - Open wheeled, open cockpit, formula style body. 69mm keep out zone around tires, tires unobstructed from above and from sides.	20 EGRESS - 5 seconds max. to actuate cockpit master switch and exit to side of vehicle, from fully seated position with all safety equipment; wings must remain fixed in position. ALL DRIVERS.
22 BODYWORK - Min. 38 mm radius on nose. No large openings in bodywork into driver compartment in front of or alongside driver, (except cockpit opening).	25 AERODYNAMICS - ALL aero devices, wings, u/trays, splitters, maximum 76 cm. In front of front tires, maximum 305mm rearward of rear tires, no wider than outside of widest track. No power ground effects.
	26 WING EDGES - - wing edges including wings, end plates, Gurney flaps, wicker bills and undertrays that could contact a pedestrian must have a minimum radius of 1.5 mm

FORMULA STUDENT GERMANY

COMBUSTION - INSPECTION SHEET 2013



23	SCHOOL NAME & OTHER DECALS - School Name, or recognised initials - 5.1 cm tall min. on both sides in Roman letters. Must be clearly visible.	27	JACKING POINT - an exposed tube at the rear perpendicular to the longitudinal axis 30 cm long by 2,5-2,9 cm O.D. Painted orange. Visible to person standing 1 metre behind car. Rear tires must come off the ground least 10.2 cm
24	CAR NUMBERS - On front & both sides of car, minimum 15.24 cm tall, 20 mm stroke & spacing, Black on White, White on Black only, specified background shapes. Must be clearly visible.	28	WHEELBASE - Minimum 1524 mm
		29	TECH STICKER SPACE - 7.5cm x 15 cm on centerline of front of car in front of the cockpit opening
PRIMARY STRUCTURE			
30	COCKPIT OPENING – Fig. 8 template passes down from above cockpit centre line of top SIS tube or to 350 mm above ground for monocoque. Steering wheel& column, seat & padding can be removed. No removing firewall. No fore/aft translation of template.	39	COCKPIT INTERNAL CROSS SECTION - Fig. 9 template passes forward from cockpit to 100 mm rear of pedals. Steering wheel, and padding removable with no tools & driver-in can be removed.
31	ALTERNATIVE TUBING & MATERIALS - If used, team must show an APPROVED SES. If using Alternative Frame Rules, SRCF req'd. No Magnesium tubes in primary structure.		SIDE IMPACT PROTECTION - Min. of two (2) tubes + diagonal must connect the main and front hoops in straight line. Upper tube must be between 300 mm and 350 mm above the ground with driver in car. Lower tube can be lower frame member. At least one diagonal per side must connect the upper and lower members between the main and front hoops. All tubes to be 25.4 x 1.65mm or 25.0 x 1.75mm or 25.4 x 1.6 mm wall steel or equivalent. Monocoques require signed SES.
32	MAIN HOOP - MUST BE STEEL. 25.4 x 2.4mm or 25.0 x 2.5mm. Must be 1 piece & extend to lowest frame member. 380 mm apart (inside dim.) where attaches to the Major Structure. Above Major Structure, must be within 10 deg. of vertical. Smooth bends without wrinkles.	40	
33	MAIN HOOP BRACING - MUST BE STEEL. One brace each side, 25.4mm x 1.65mm or 25.0 mm x 1.75mm or 25.4 mm x 1.60mm min., attached within 160 mm of top. Min. 30 deg. included angle with hoop. If main hoop is not vertical, bracing must not be on same side of vertical as main hoop. No bends. No rod-ends. Proper construction for removable braces (capping etc.) on BOTH ENDS. Must take load back to bottom of main hoop and node of upper side-impact tube thru proper triangulated structure.	41	FRONT IMPACT PROTECTION - Feet must be completely within Major Structure & rearward of the Front Bulkhead (25.4 x 1,65mm or 25.0 x 1.75 mm or 25.4 x 1.60 mm steel tube or equiv.) No non-crushable objects forward of bulkhead. IMPACT ATTENUATOR forward of bulkhead, 200 mm long x 200mm wide x 100mm high. No wing supports through the IA. IA must be securely fastened directly to AIP capable of taking transverse & vertical loads. No tape, etc. Test piece presented and same as IA on car. Standard IAD: requires diagonal brace if bulkhead >1" from IAD on any side.
34	FRONT HOOP – Must be closed section metal tube. Can be multi-piece. Must extend down to lowest frame member. No lower than top of steering wheel. Max. 20 deg. to vertical. 25.4 x 2.4mm or 25.0 x 2.5 mm wall steel or equiv. Longitudinal distance to steering wheel max. 250 mm.		ANTI INTRUSION PLATE - A 1.5mm solid steel metal or 4.0mm solid aluminium metal sheet (same size as outside dims.) must be welded or min. four screws M8 Grade 8.8
35	FRONT HOOP BRACING – Two forward facing braces, 25.4 x 1.65mm or 25.0 x 1.75mm or 25.4 x 1,6mm wall steel or equivalent, attached within 50 mm of top. Extra rearward bracing required if Front Hoop leans backwards more than 10 deg.	42	FRONT BULKHEAD SUPPORT - Support back to front roll hoop; 3 tubes per side;1 bottom, 1 top within 50 mm of top of bulkhead, with node to node diagonal ((must form a triangle with Front BulkH'd and either top or bottom tube); all 25.4 x 1,25mm wall steel tube or equiv. (25.0 mm x 1.5 mm and 26.0 mm x 1.2 mm tubes OK)
36	ROLL BAR PADDING – Roll bar or bracing that could be hit by driver's helmet must be covered with 12 mm thick, SFI or FIA (hard) padding. Pipe insulation and foam not acceptable.	43	INSPECTION HOLES - 4.5 mm inspection holes req'd in non-critical areas of front & main hoops. Inspectors may ask for holes in other tube(s).
37	SEAT - Insulated against heat conduction, convection and radiation. Lowest point no lower than bottom of side rails OR must have longitudinal, 25.4 x 1.65mm steel tube underneath.	44	OTHER SIDE TUBES - Design prevents driver's neck hitting bracing or other side tubes
38	MONOCOQUE – Must see laminate test specimen. Steel backing plates (>2mm thick) used at attachment points.		
STEERING, SUSPENSION, BRAKES			
45	VISIBLE ACCESS - To ALL components on Tech form.		
46	SUSPENSION - Fully operational with dampers front and rear; 50mm minimum wheel travel with driver in vehicle.	51	STEERING - All steerable wheels must have positive stops to prevent linkage lock up or tires from contacting any part of the car. 7 degrees max. free play at the steering wheel. NO STEER-BY-WIRE on front wheels.
47	SUSPENSION PICK-UP POINTS - Inspected thoroughly for integrity.		FASTENERS - Steering, braking, harness and suspension systems must use SAE Grade 5 or Metric Grade M8.8 or higher specs (AN/MS) with visible positive locking mechanisms, no Loctite or lock washers. Minimum of 2 exposed threads. Rod ends in single shear are captured by a washer larger than the ball diameter. Adjustable tie-rod ends must have jam nuts to prevent loosening. No Nylon lock nuts for Brake calipers or Brake discs. No button head cap, pan head or round head screws in critical locations, e.g cage structure or harness mount.
48	BRAKES - Dual hydraulic system & reservoirs, operating on all four wheels, (one brake on limited slip is OK). System must be protected by structure or shields from drivetrain failure or minor collisions. No plastic brake lines. No brake-by-wire. No parts below chassis/tub in side view. Brake pedal capable of 2000N, no failures if official exerts max force (seated normally in vehicle).	52	
49	CABLE STEERING - If steering is cable actuated, require approved FMEA (part of SES approval); confirm FMEA is representative of system, and reasonable.		
50	STEERING WHEEL - Continuous perimeter, near round (no concave sections) with driver operable quick disconnect. 25cm max from front hoop.	53	GROUND CLEARANCE - Sufficient clearance so that no part of the car other than the tires will contact the track surface.
INTERIOR			
54	FIREWALL - Fire resistant material; must separate driver compartment from fuel supply, cooling & oil systems. Pass-throughs OK with grommets. Multiple panels OK if gaps sealed. No gaps at sides or bottom. Must protect (line-of-sight up to mid-height of driver's helmet) from cooling, oil and fuel systems. If used a non metal material for the firewall (i.e. carbonfibre, fibreglass etc) a fire resistant heat protection shield with a metal surface must be fitted.	56	FLOOR CLOSEOUT PANEL - Required from foot area to firewall; solid, non-brittle material; multiple panels are OK if gaps less than 3.18 mm.
		57	DRIVER'S FOOT PROTECTION - Feet must be rearward of the Front Bulkhead and no part of shoes or legs above or outside the Major Structure in side or front views when touching pedals.
55	DRIVER'S LEG PROTECTION - Covers inside cockpit over sharp and moving suspension & steering components.		



ENGINE COMPARTMENT

58	ENGINE - Four cycle piston engine 610 cc maximum swept displacement. No hybrids. Waste heat recovery allowed.	69	EXHAUST OUTLET - Outlet no more than 45 cm behind rear axle centreline or more than 60 cm above the ground.
59	COMPRESSORS - Turbo or super chargers allowed if not OEM to engine; must be between restrictor and engine.	70	EXHAUST SHIELDING - components outside the body forward of main hoop must be shielded from people approaching the car.
60	AIR INTAKE SYSTEM ROLL OVER PROTECTION - All parts of the air and fuel systems, (including throttle body or carb., air intake ducting, air cleaner & air box), must lie within a surface defined by the top of the roll bar and the outside top edge of the tires.	71	SCATTERSHIELDS GENERAL - SCATTERSHIELDS GENERAL - Required for clutches, chains, belts, etc. No holes. 6mm diam. M8.8 diam. or Grade 5 fasteners minimum. End parallel to lowest part of the sprocket/pulley
61	AIR INTAKE SYSTEM - Any portion less than 350 mm above ground must have Side Impact protection to rule IC 1.4.2 / Supported if cantilevered (isolated to frame, rigid to engine)	72	SCATTERSHIELD MATERIALS - For chains, 2.7mm min. thick solid STEEL, 3 x chain width. For belts, 3mm min. thick Al 6061-T6, 1.7 x belt width.
62	INTAKE MANIFOLD - Securely attached to block or head with mech. Fasteners. OEM type rubber bushings not sufficient	73	HIGH PRESS HYDRAULICS - Pumps and lines must have 1 mm thick steel or aluminium shields to protect driver and workers.
63	RESTRICTOR - Must be circular; max. diam. 20.0 mm for gasoline fuelled cars and 19.0 mm for E85 fuelled cars.	74	ON-BOARD STARTER - Required.
64	THROTTLE - Cable must be at least 50.8 mm from any exhaust component and out of exhaust stream; must have smooth operation with no possibility of binding or sticking; must have minimum of 2 springs at the TB, each capable of closing the throttle independently; Throttle Potentiometer spring not acceptable as a return spring.	75	COOLANT - Only 100% water. NO ADDITIVES WHATSOEVER
65	ELECTRONIC THROTTLE CONTROLS - ETC or "drive-by-wire" NOT permitted.	76	CATCH TANKS - Any coolant overflow, crankcase breather or lube system vents must have separate catch tanks. One quart (0.9 l) minimum each, 100 deg. C material, behind firewall, below shoulder level. 3 mm min. dia. vent away from driver. PCV allowed if routed to the intake system upstream of the restrictor. Cannot attach breather to exhaust.
66	FUEL RAIL - Securely attached to block, head or int. manifold with brackets & mech. Fasteners. Made from plastic, carbon fibre or rapid prototyping flammable materials is prohibited.	77	GAS CYLINDERS - Proprietary manufacture & labeled, Non-flammable gas, regulator on tank, securely mounted, axis not pointed at driver, to rear of Main Hoop within the frame envelope, or in structural side pod, but not in cockpit , insulated from exhaust, appropriate lines & fittings.
67	THROTTLE PEDAL - Must have positive stop to prevent oversteering cable	78	FLUID LEAKS - Oil, grease, coolant, fuel, Brake fluid -> none permitted
68	ENGINE LUBRICATION SYSTEM - The lowest point of the engine lubrication system must be no lower than the lowest frame rail.	79	VISIBLE ACCESS - To ALL components on Tech sheet.

FUEL SYSTEM

80	FUEL SYSTEM ROLL OVER PROTECTION - All parts of the fuel storage, supply and fuel control system systems (including fuel rail, throttle body or carburettor), must lie within a surface defined by the top of the roll bar and the outside top edge of the tires	84	FUEL FILLER NECK - Min. 38 mm diam. & 125 mm vert. height above top of tank. Needs fuel resistant, transparent sight tube, 6 mm ID, 75mm min. vert. height, visible to fueller , with a non-moveable fuel level line 13 mm -25 mm below top of sight tube. A fuel resistant clear filler tube is acceptable. Sight tube must NOT run below top of tank. Must prevent fuel spillage contacting driver, exhaust or ignition parts. Fueled without manipulating car in any way.
81	FUEL TANKS - Must lie within major structure of the chassis with full side impact protection & firewall between fuel supply & driver. Rigid tanks CANNOT CARRY STRUCTURAL LOAD & must be flexibly mounted. Bladders or bags in rigid container.	85	REFUELING - must be able to be accomplished without the removal of any body parts of the car.
82	BELLYPANS - Must be vented to prevent accumulation of fuel. Must have at least one hole (minimum of 50 mm in diameter). This hole must be positioned in the lowest part of the structure	86	FUEL VENTS - Must exit outside of the bodywork, and have a check valve to prevent leakage if car inverted.
83	FUEL LINES - No plastic lines between fuel tank & engine. Fuel injection systems must use metal braided hose with threaded fittings, or reinforced rubber hose & approved clamps. Must be securely attached and protected from possible rotating equipment or collision failure. No plastic connectors in fuel line.	87	FUEL STICKER - Appropriate sticker applied adjacent to fuel filler. Is in responsibility of the teams
		88	FUEL TYPE - 98 RON gasoline, 95 RON gasoline, E-85 WRITE down type ->

ELECTRICAL

89	PRIMARY MASTER SWITCH - On driver's right near roll bar, access from outside of car, <u>rotary type</u> , must be a 6-pole switch, no relay, must kill ALL electrical systems. Marked with international symbol.	92	BRAKE PEDAL O/TRAVEL SWITCH - Must cut ignition & fuel pump; no re-start if released or actuated a second time. Push pull or flip type Must NOT rely on programming to work. Not resettable by driver.
90	COCKPIT MASTER SWITCH - Pull-ON, Push-OFF, alongside & unobstructed by steering wheel, easily reached by belted-in driver. Must kill ignition & fuel pump(s). Marked with international symbol.	93	BRAKE LIGHT - ONE Working RED brake light, clearly visible from the rear; on vehicles centerline; height between wheel centerline & driver's shoulders. Round, triangle, or rectangular on black background. 15cm² minimum illuminated area. Sufficient brightness for visible activation in bright sunlight.
91	BATTERY - Attached securely to frame or chassis; hot terminal insulated; wet-cells in marine box if inside cockpit; must be identifiable as Pb or LiFePO4, otherwise show mfr datasheet and mfr protection circuit info.		

NON-COMPLIANCE / COMMENTS

APPROVED BY:		DATE / TIME:	



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PART 2 FUEL SYSTEM & TILT TABLE INSPECTION

94	FUEL SPILLAGE - No fuel spill permitted when car is tilted to 45 degrees in the direction most likely to create spillage; Tanks must be filled to scribe line	96	VEHICLE STABILITY - All wheels in contact with tilt table when tilted to 60 degrees to the horizontal.
95	FUEL STICKER - Fuel sticker in place adjacent to F/T filler. MARK TYPE OF FUEL USED (98, 95 or E-85) ON THIS FORM Sticker is in responsibility of the teams	97	FUEL TYPE

NON-COMPLIANCE / COMMENTS

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PART 3 NOISE LEVEL & BRAKING PERFORMANCE INSPECTION

98	NOISE LEVEL - Maximum of 110 dB (A) ("A" scale; "fast" measurement time) maximum during a static test, gearbox in neutral, UP TO a specific rpm (see Rule IC 3.2.4). Microphone level with the exhaust outlet(s), 0.5 m from the outlet(s), at 45 degrees to the outlet. If multiple outlets, all should be measured individually. If movable tuning or throttling device, see IC 3.2.3	100	INTAKE SYSTEM LEAKAGE/BYPASS - There is no air leakage or bypass of the intake system permitted. When the intake is closed completely, the engine should almost immediately stall.
99	MASTER SWITCH - Master switch on right hand side of main roll hoop must cause engine to stop when actuated. (Perform at end of noise test at 5000 rpm)	101	BRAKING PERFORMANCE - Must lock-up all four wheels on dry asphalt at any speed. If adjustments are made to the vehicle after three failed attempts before retest, the car may run on the Practice Track without the final Brake Performance Tech Sticker.

NOISE LEVEL:	ATTEMPTS:
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NON-COMPLIANCE / COMMENTS

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