University:	Dolor University
Vehicle number:	421
Engine:	
Bore/Stroke:	
Fuel Type:	
ETC:	
ABS:	
HSD Passed:	-

Present the vehicle for inspection in the following order
1. Pre-Inspection
2. Egress Test
3. Mechanical Inspection
4. Vehicle Weighing
5. Tilt Test
6. Noise Test
7. Brake Test

INFORMATION

USED SYMBOLS
- ● Information
- ▲ Action
- △ Check is the responsibility of the team
- ○ Check

NOTES
- This sheet must always stay with the push bar.
- Technical inspection approval voids if the inspection sheet is lost.
- If there is a conflict between this sheet and the rules, the rules prevail.

INSPECTION STATUS

Inspection	Pass	Inspector name	Inspector signature	Note
Pre-Inspection	☐			
Egress Test	☐			
Mechanical Inspection	☐			
Tilt Test	☐			
Noise Test	☐			
Brake Test	☐			

COMMENTS FROM DOCUMENT REVIEW

All comments from the document review must be checked and resolved during the relevant inspection. The team is responsible for notifying the inspectors about the comments. Inspectors shall place their initials and signatures next to the comments they have checked and resolved.

No comments from the review.

IMPORTANT NOTES

PART I: PRE-INSPECTION

APPROVAL

Inspector Names	Date and Time	Signatures when passed

○ TIRES

1 ○ **DRY TIRES** - Make

2 ○ **DRY TIRES** - Size

3 ○ **DRY TIRES** - Compound

4 ○ **WET TIRES** - Make

5 ○ **WET TIRES** - Size

6 ○ **WET TIRES** - Compound

7 ○ **WET TIRES** - 2.4 mm min. tread depth molded by tire manufacturer

○ DRIVER GEAR AND SAFETY

● Fire-resistant clothing must not be older than 10 years, recognizable since no FIA hologram label present.

8 ○ **FACE SHIELDS** - Made of impact resistant material.

9 ○ **UNDERWEAR** - Must be made from acceptable fire-resistant material as listed in T 13.3.13 and must cover the driver's body completely from neck down to ankles and wrists.

10 ○ **SOCKS** - Nomex or equivalent, fire-resistant socks (no cotton, no polyester, no bare skin).

11 ○ **GLOVES** - Fire resistant material. No holes. Leather is allowed only over fire-resistant material.

12 ○ **ARM RESTRAINTS** - SFI Standard 3.3 or equivalent.

13 ○ **HELMETS** - Snell SA2020, EA2016, SA2025 or newer, SFI 31.1/2015, 31.1/2020 or newer, FIA 8860-2010, FIA 8860-2018, FIA 8859-2015, 8859-2024 or newer. Closed Face, no Open Face, must have integrated shield (no dirt bike helmets). No camera mounts.

14 ○ **FRONTAL HEAD RESTRAINT** - If FHR/HANS is used, it must be certified to one of the following standards and be labelled as such - FIA 8858-2010, FIA 8860-2004, SFI 38.1.

15 ○ **DRIVER SUITS** - SFI 3.2A/5 (or higher), SFI 3.4/5 (or higher), FIA Standard 8856-2000 or FIA Standard 8856-2018.

16 ○ **HAIR COVER** - Fire resistant (Nomex or equiv.) balaclava of full helmet skirt REQUIRED FOR ALL DRIVERS.

17 ○ **SHOES** - SFI 3.3 or FIA 8856-2000/2018.

NON-COMPLIANCE/COMMENTS

PART II: EGRESS TEST

APPROVAL

Inspector Names	Date and Time	Signatures when passed

○ DRIVER POSITION

18 ○ **ARM RESTRAINTS** - Must be installed, so the driver can release them and exit unassisted regardless of the vehicle's position.

19 ○ **HEAD RESTRAINT** - Near vertical. Max. 25 mm from helmet. Helmet contact point 50 mm min. from any edge.

20 ○ **MAIN HOOP AND FRONT HOOP HEIGHTS** - Helmet of driver to be 50 mm below the line between the top of the front and main roll hoop AND between the top of the main hoop to rear attachment point of main hoop bracing.

21 ○ **LAP BELT MOUNTING** - Must pass over pelvic area between 45° and 65° to horizontal for upright driver, 60° to 80° for reclined. The lap belts must not be routed over the sides of the seat.

22 ○ **SHOULDER HARNESS MOUNTING** - Angle from shoulder between 10° up and 20° down to horizontal.

○ DRIVER EGRESS TEST

- ● All drivers must be able to exit the vehicle in less than 5 s.
- ● Driver must be seated in ready-to-race condition.

○ EGRESS PROCEDURE

- ▲ Both hands on the steering wheel - in all possible steering positions.
- ▲ Pressing cockpit-mounted shutdown button.
- ▲ The egress time will stop when the driver has both feet on the ground.

NON-COMPLIANCE/COMMENTS

PART III: MECHANICAL INSPECTION

APPROVAL

Inspector Names	Date and Time	Signatures when passed

INSPECTION RULES

- The time limit for each attempt at this technical inspection is 75 min. Continuation of the inspection is possible after requeuing.
- During technical inspection all work carried out on the vehicle must be approved by a technical inspector.
- Only tools needed for the (dis)assembly of parts for mechanical inspection.

○ TIS STATUS UPDATE/TIMER

▲ Set online TIS to Present ▲ Atach/place the timer ▲ Start the timer

○ VEHICLE WITH TALLEST DRIVER SEATED

23 ○ **FIRE EXTINGUISHERS** - Two foam type (of at least 34B or 5A 34B rating), with valid inspection tag, one with vehicle securely installed on the push bar, one in the team's paddock area (except for the inspection).

24 ○ **PUSH BAR** - Red color with university name. Securely attached to the vehicle, push and pull function. Operable by 2 people.

25 ○ **CAMERAS AND SENSORS** - Must be securely mounted. Must not come into contact with the driver's helmet under any circumstances. No cameras mounted to helmet.

26 ○ **VISIBILITY** - Minimum of 100° field either side. Head rotation allowed or mirrors. If mirrors, must be firmly installed and adjusted.

27 ○ **VEHICLE CONTROLS** - All controls, including the shifter, must be inside the cockpit. No arms or elbows outside the SIS plane.

28 ○ **DRIVER FLUID PROTECTION** - A firewall (rigidly mounted cover plate for cooling systems using plain water) must extend sufficiently far upwards and/or rearwards such that any point, less than 100 mm above the bottom of the helmet of the tallest driver, is not in a straight line of sight with any of the following parts: fuel supply system, hydraulic fluid (except brake system and dampers), flammable liquids and low voltage battery.

29 ○ **ROLL BAR PADDING** - Roll bar or bracing that could be hit by the driver's helmet must be covered with 12 mm thick, SFI spec 45.1 or FIA 8857-2001 padding. Design prevents driver's neck hitting bracing or other side tubes.

30 ○ **HEAD RESTRAINT** - Near vertical. Must withstand 890 N load. 40 mm thick, SFI 45.2 standard or FIA technical list n°17 type B. Max. 25 mm from helmet. Helmet contact point 50 mm min. from any edge. May be changed for different drivers. Minimum 150 × 150 mm.

31 ○ **DRIVER RESTRAINT HARNESS** - SFI 16.1, SFI 16.5, SFI 16.6, or FIA 8853/2016. 6 or 7-point system – Two-piece lap belt (min. width 50 mm), two shoulder straps (min. width 75 mm) and two leg or anti-submarine straps (min. width 50 mm). (7-point system must have three anti-submarine straps). Shoulder harness straps must have angle from shoulder between 10° up and 20° down to horizontal in side view. Belts must not pass through a firewall.

32 ○ **SUSPENSION** - Fully operational with dampers front and rear; 50 mm minimum wheel travel (minimum jounce of 25 mm) with driver in vehicle.

○ VEHICLE WITHOUT DRIVER

33 △ **TECH STICKER SPACE** - 45 × 175 mm on the centerline of front of the vehicle in front of the cockpit opening

34 △ **SCHOOL NAME AND OTHER DECALS** - School Name, or recognized initials - min. 50 mm tall (all letters). on both sides in Roman letters. Must be clearly visible.

35 △ **VEHICLE NUMBERS** - On front and both sides of vehicle, minimum 150 mm tall, 20 mm stroke and spacing, 25 mm min. between number and background edge, Black on White, White on Black only, and specified background shapes. Must be clearly visible, font: Roman Sans-Serif characters, horizontally aligned. Combustion hybrid vehicles have to be identified by an additional marking next to all three vehicle numbers with the capital letters "HY", Roman Sans-Serif, 75 mm high, white on red background.

36 △ **LOW VOLTAGE MASTER SWITCH** - Must be located on the right side of the vehicle, in proximity to the main hoop, at the 95th percentile male driver's shoulder height, in the middle of a completely red circular area of ≥ 50 mm diameter. Marked with LV and international symbol. Level horizontal when in ON position.

37 △ **BODYWORK/AERODYNAMIC DEVICES EDGES** - Edges that could contact with any standing pedestrian without reaching to the vehicle must have a minimum radius of 3.0 mm for all forward-facing edges and 1.0 mm for all other edges (safety requirement).

38 △ **BODY AND STYLING** - Open wheeled, open cockpit, formula style body. Vertical keep-out zones 75 mm in front and behind tires (no aero exceptions), tires unobstructed from sides.

39 ○ **BODYWORK** - Min. 38 mm radius on nose. No large openings in bodywork into the driver compartment in front of or alongside the driver, (except cockpit opening). Any gaps between bodywork and other parts must be reduced to a minimum. No external concave radii of curvatures in front of the cockpit opening and T 8.2 (in side view).

40 △ **ROTATING PARTS** - Finger guards are requiered to cover any parts (e.g. fans) that spin while the vehicle is stationary. No holes > 12 mm dia.

41 ○ **AERODYNAMIC DEVICES** - Securely mounted. The deflection may not exceed 10 mm when a force of 200 N is applied over a surface of 225 cm^2 and not more than 25 mm when a point force of 50 N is applied.

42 △ **AERODYNAMICS** - ALL aerodynamic devices maximum 250 mm rearward of rear tires, maximum 700 mm forward of front tires. Devices lower than 500 mm from the ground rearward of the front axle must be no wider than vertical plane from the outside of the front and rear tires. Devices higher than 500 mm behind the front axle must not be wider than the inside of the rear tires.

43 △ **AERO VERTICAL HEIGHT** - Devices forward of a vertical plane through the rearmost portion of the front face of the driver head restraint support, excluding any padding, set to its most rearward position, must be lower than 500 mm from the ground. Rear device max 1.2 m above ground (incl. end plates); Front device max 250 mm above ground outside of the inside plane of the front tires inside this plane max 500 mm.

44 △ **SEAT** - Insulated against heat conduction, convection and radiation. The lowest point no lower than the top of the upper surface of the lowest SIS member OR must have a longitudinal, 25.4 × 1.65 mm steel tube underneath.

45 ○ **COCKPIT OPENING** - Cockpit opening template (T 4.1) passes down from above the cockpit to below the upper side impact member. The steering wheel, seat and padding can be removed. No removing of firewall.

46 ○ **COCKPIT INTERNAL CROSS SECTION** - Cross section template (T 4.1) template passes from the cockpit opening to 100 mm rear of the rearmost pedal contact area (in most forward position). The steering wheel and paddings can be removed (without tools).

47 ○ **STEERING WHEEL** - Continuous perimeter with no concave sections. Driver operable quick disconnect. Max. 250 mm from the front hoop. In any steering angle, steering wheel must be below top most point of front hoop.

48 ○ **AIR SYSTEM ROLL OVER PROTECTION** - All parts of the air intake system (including throttle body or carb, air intake ducting, air cleaner and air box) must be within a surface defined by the top of the main hoop and the outside top edge of the tires.

49 ○ **AIR INTAKE SYSTEM** - Must be supported if cantilevered. Any portion < 350 mm above ground must be protected by the impact protection structure, see T 3.14. Intercooler after throttle body.

50 ○ **FUEL SYSTEM ROLL OVER PROTECTION** - All parts of the fuel storage, supply and fuel control system systems (including fuel rail, throttle body or carburetor), must lie within a surface defined by the top of the main hoop and the outside top edge of the tires.

51 ○ **FUEL FILLER NECK** - ≥ 35 mm diameter. Above the lowest point of the sight tube within 30°

of vertical. Fuel-resistant, transparent sight tube or transparent filler neck (material must be rated for at least 120 °C). min 125 mm vert. height visible to the fueler with the vehicle fully assembled, with a non-moveable fuel level line 12-25 mm below the top of the sight tube. The sight tube must NOT run below the top of the tank. Must prevent fuel spillage from contacting the driver, exhaust or ignition. Fueled w/o manipulating the vehicle in any way. Cap secure and capable of withstanding pressurization (ie: threads or latch).

52 △ **REFUELING** - Must be able to be accomplished without the removal of any body parts of the vehicle.

53 ○ **FUEL VENTS** - Must exit outside the bodywork and have a check valve to prevent leakage if the vehicle is inverted.

○ REMOVE BODY PANELS

54 ○ **DRIVER'S LEG PROTECTION** - Covers inside of cockpit over any sharp edges or moving suspension / steering components.

55 ○ **DRIVER'S FOOT PROTECTION** - Feet must be rearward of the Front Bulkhead and no part of shoes or legs above or outside the primary structure in side or front views when touching the pedals.

56 △ **FLOOR CLOSEOUT PANEL** - Required from foot area to firewall; solid, non-brittle material; multiple panels are OK if gaps less than 3 mm.

57 ○ **PERCY** - Helmet of 95th percentile male (PERCY) to be 50 mm below the lines between the top of the front and main roll hoops and between the top of the main hoop to rear attachment point of main hoop bracing. Center of bottom circle placed minimum 915 mm from pedals.

58 ○ **BRAKES** - Dual hydraulic system and reservoirs, operating on all four wheels, (one brake on limited slip differential is OK). System must be protected by structure or shields from drivetrain failure or minor collisions. No plastic brake lines. No brake-by-wire. Any part of the brake system must be within the surface envelope. Brake pedal capable of 2000 N, no failures if official exerts max force (seated normally in the vehicle). Check attachment of brake pedal to chassis, critical fasteners - min. 4 mm metric grade 8.8, positive locking.

59 △ **BRAKE OVER TRAVEL SWITCH** - In the event of a failure in one or both brake circuits the brake pedal over travel will result in the shutdown circuit being opened.

60 ○ **CHASSIS AND MATERIALS** - Team must show an APPROVED SES. Monocoque: Team must present laminate test specimens. All samples must be marked with information about laminated structure and date of testing.

61 ○ **BOLTED JOINTS** - Bolted joints in Primary Structure are consider as critical fasteners (T 10). Must be positively locked, distance hole centerline to the nearest free edge $>$ 1.5 x hole diameter. Manufactured according to SES. Monocoque: All attachments between monocoque and other primary structures (e.g. hoops, removable TSAC imapact protection) must use $\geq$ 2 mm thick steel backing plates (T 3.15.6). Backing plates must not have concave section.

62 ○ **INSPECTION HOLES** - 4.5 mm inspection holes required in non-critical areas of front and main hoops. Inspectors may ask for holes in other tube(s).

63 ○ **MAIN HOOP** - Must be made of one piece steel tube. Check tube dimensions and geometry in the approved SES. Monocoque: Each attachment point requires a minimum of two 8 mm metric grade 8.8 bolts and steel backing plates with a minimum thickness of 2 mm. Tabs or brackets must have an edge distance ratio "e/D" of 1.5 or greater. Design in accordance with SES.

64 ○ **MAIN HOOP BRACING** - Must be steel. One straight brace on each side. Tube dimension as specified in the approved SES. Attached within 160 mm from the top of MH. Min. 30° included angle with hoop. Proper design for removable braces (capping,...). Monocoque: Each brace attached with min. one 10 mm metric grade 8.8 bolt and min. 2 mm steel backing plate. Design in accordance with SES.

65 ○ **FRONT HOOP** - Must be closed section metal tube with dimension and geometry as specified in SES. Check dimension of tube through inspection hole. Monocoque: Laminated front hoop must have sufficient layer overlap and be manufactured according to good engineering practices.

66 ○ **FRONT HOOP BRACING** - Two straight forward-facing braces, attached within 50 mm of top and must have a minimum distance of 100 mm between each other at the front hoop. Tube dimensions and geometry same as specified in SES. Monocoque: See material specimens and test result in SES. Any holes or cutouts dimensions (eg. service windows) must not be larger than specified in SES.

67 ○ **SIDE IMPACT PROTECTION** - Three tubes must connect the main and front hoops, 2 horizontal and 1 diagonal bracing. The upper tube must be between 240 mm to 320 mm above the lowest inside chassis point between FH and MH. Check tube dimensions and geometry as shown in the ap-

proved SES. Monocoque: See material specimens and test results in SES. Check that dimensions match specification in SES.

68 ○ **FRONT BULKHEAD SUPPORT** - Support front bulkhead to front hoop. Min. 3 tubes on each side, tube dimensions and design according to SES specification. Monocoque: See material specimens and test result in SES. Any holes or cutouts (eg. for suspension) must not be larger than specified in SES.

69 ○ **FRONT BULKHEAD** - No non-crushable objects forward of bulkhead. No non-crushable object 25 mm behind the AIP. Front bulkhead manufactured according to SES specification. Requires diagonal bracing if larger than 400×350 mm. Monocoque: cutout dimension and material thickness match SES specification. See material sample and test resuls in SES.

70 ○ **IMPACT ATTENUATOR** - No portion of the required $100 \times 200 \times 200$ mm volume of the IA can be positioned more than 350 mm above the ground. No wing supports through the IA. Must be securely fastened directly to AIP. Adhesive used to mount standard IA to AIP must have a shear strength of at least 24 MPa. Manufactured in accordance with IAD form. Test piece presented and same as IA on vehicle.

71 ○ **ANTI INTRUSION PLATE** - A 1.5 mm solid steel or 4.0 mm solid aluminium sheet. Must be welded (size: min. to centerlines) or min. 8 bolts M8 Grade 8.8 critical fasteners with 2 mm thick steel backing plates (size: min. outside dimensions). Alternative materials allowed if tested and approved in SES and IAD.

72 ○ **LAP BELT MOUNTING** - Pivoting mounting with eye bolts or shoulder bolts attached securely to Primary Structure. Min. tab thickness 1.6 mm. Attachments to the monocoque must use one M10 8.8 or two M8 8.8 bolts and ≥ 2 mm thick steel backing plates (T 4.5.1). See test specimen and compare with actual design and SES.

73 ○ **SHOULDER HARNESS MOUNTING** - Mounting points 180 mm to 230 mm apart (measured center to center). Must not exert bending loads into the Main Hoop Bracing without extra bracing. Additional braces if not straight to the main hoop. Monocoque: Attached to Primary Structure as specified in SES using one M10 8.8 or two M8 8.8 bolts and ≥ 2 mm thick steel backing plates. See test specimen and compare with actual design.

74 ○ **FIREWALL** - Fire resistant material; must separate driver compartment from cooling, oil system and LV battery. Passthroughs are OK with grommets. Multiple panels are OK if gaps are sealed. No gaps at the sides or bottom. Must be rigidly mounted to the chassis. Material must meet UL94-V0 (or UL94 HF-1 / UL94 VTM-0 for foams), FAR 25.853(a)(1)(i) or equivalent (check if a minimum thickness is required in the datasheet).

75 ○ **JACKS** - One or two devices that must be available to safely lift and hold all driven wheels min. 100 mm above the ground. In lifted position the jack (s) must be locked/secured and function without the support of a person or additional weights. It must be safe for the driver to enter and exit the vehicle without additional devices. The device must not extend out of the vehicle's projected surface area. Device pick-up points must be indicated by orange triangles on both sides. University name on it.

76 ○ **RIM CLEARANCE** - The radial clearance between any non-rotating part and the inside of the rim must be at least 5 mm in static condition at any steering angle and any ride height.

○ VEHICLE LIFTED AND WHEELS REMOVED

77 ○ **WHEELS** - 203.2 mm (8") min. diameter. No Aluminium or hollow wheel bolts. Single retaining nut must incorporate a device to retain the nut. Aluminium wheel nuts must be hard anodized.

78 ○ **SUSPENSION PICK-UP POINTS** - Inspected thoroughly for integrity.

79 ○ **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 with locking nuts. 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. Primary structure e/D > 1.5. Alternative fasteners allowed for steering and suspension if equivalency can be shown. Snap rings allowed for brake floaters, groove must be manufacture according to standart and in pristine condition.

80 ○ **STEERING** - All steerable wheels must have positive stops placed on the rack to prevent linkage lock up or tires from contacting any part of the vehicle. 7° max. free play at the steering wheel. NO STEER-BY-WIRE on front wheels. Rear wheel steering, max. 6° and mechanical stops installed.

81 ○ **GAS CYLINDERS** - Nonflammable gas, max. pressure 10 bar, may exceed 10 bar if directly mounted regulator limits output to 10 bar. All

parts designed for max. pressure. Proprietary manufacturer, certified and labeled. All parts inside rollover protection envelope. Must be shielded from driver by min. 1 mm aluminium. Insulated from heat sources. Mounting must withstand 40g in lateral and longitudinal direction and 20g in vertical direction.

82 ○ **SCATTERSHIELDS INCL. MOUNTING** - Required for clutches, chains, belts, etc. No holes. Attached by M6 grade 8.8 bolts minimum. Must start and end parallel to the lowest point of the driven sprocket / chain wheel / belt or pulley.

83 ○ **SCATTERSHIELD MATERIALS** - $\geq$ 2 mm thick solid steel $\geq$ 3 mm thick Al 6061-T6. Min. 3 times chain/belt width. Finger guards: cover all drivetrain parts that spin while the vehicle is stationary. No holes $>$ 12 mm dia.

84 △ **FANS AND TURBINES** - Combined rated power of all active devices designed to move air is $\leq$500 W. This includes cooling fans but does not apply to turbochargers and superchargers according to CV 1.8.

85 ○ **LV BATTERY** - Rigid and sturdy casing and attached securely to frame or chassis. Behind a firewall, within the rollover protection envelope.

86 ○ **HIGH PRESS HYDRAULICS** - Pumps and lines must have 1 mm steel or aluminium shields protecting driver and workers. Including all autonomous system high pressure hydraulics like the ASB.

87 △ **COOLANT** - 100 percent water. NO ADDITIVES WHATSOEVER.

88 ○ **CATCH TANKS** - Rigidly mounted to chassis, rearward of firewall below shoulder level. Vents for water cooling system must have catch-can min. 100 mL or 10 % of fluid volume. All parts rated above 120 °C. Separate catch-can for fluids other than water, each 0.9 L or 10 percent of the fluid volume each, whichever is greater. Any catch can must vent through 3 mm hose down to the bottom of the chassis outside the bodywork.

89 ○ **BELLYPANS** - In a total minimum of two venting holes of at least 25 mm diameter in the lowest part of the structure to prevent accumulation of liquids. One in each enclosed chassis structure. Additional holes are required when multiple local lowest parts exist in the structure.

90 △ **FLUID LEAKS** - Oil, grease, coolant, fuel, Brake fluid $\rightarrow$ none permitted

91 ○ **ENGINE** - Four cycle piston engine. Waste heat recovery allowed. Hybrid powertrains must use purely electrical energy storage.

92 ○ **ON-BOARD STARTER** - Required.

93 ○ **COMPRESSORS** - Turbo or super chargers allowed, must be between the restrictor and throttle. Carburetors are not allowed if compressors are used. Compressor recirculation valves are ok if located downstream of restrictor.

94 ○ **INTAKE MANIFOLD** - Securely attached to block or head with mech. Fasteners (positive locking!). OEM-type rubber bushings are not sufficient.

95 ○ **RESTRICTOR** - Must be circular; maximum diameter 20 mm for gasoline fueled vehicles and 19 mm for E85 fueled vehicles. Cannot be movable. Placed before the compressor.

96 ○ **THROTTLE** - Must have a minimum of 2 springs (1 spring when ETC installed) at the TB, each capable of closing the throttle independently. TPS is not acceptable as a return spring. The cable must have a smooth operation with no binding or sticking; min. 50 mm from any exhaust component.

97 ○ **THROTTLE PEDAL** - Must have a positive stop to prevent overstressing cable

98 ○ **ENGINE LUBRICATION SYSTEM** - The lowest point of the engine lubrication system is not lower than the lowest frame part. Otherwise, a protection structure mounted to the chassis is necessary.

99 ○ **FUEL RAIL** - Securely attached to block (no nylon nuts), head or int. manifold with brackets and mech. fasteners (grade min. 8.8). Plastic, carbon fiber or rapid prototyping flammable materials are prohibited.

100 ○ **FUEL TANKS** - Must lie within rollover protection envelope (T 1.1.16), except the filler neck if its 350 mm above the ground, with full side impact protection and firewall between fuel supply and driver, min. 50 mm away from exhaust components. Rigid tanks cannot carry structural load and must be flexibly mounted and must not touch anything else than its mounting.

101 ○ **FUEL LINES** - All parts of the fuel system which can come in contact with the fuel must be rated for permanent contact with fuel. Fuel injection systems must use a metal braided hose with threaded fittings or reinforced beaded rubber hose with approved clamps (beaded or barbed hose fitting must be used if hose and clamp style connection used). Must be securely attached and protected from possible rotating equipment or collision failure. No plastic connectors in the fuel line. High-pressure injection systems see CV 2.5.2. All fuel lines must be fitted in such a way that any leakage cannot result in the accumulation of fuel in the cockpit. Must be rated for temperatures of at least 120 °C. Use of unmodified OEM fuel lines and connectors (including plastic) is acceptable.

102 ○ **BRAKE LIGHT** - Only one RED brake light, clearly visible from the rear, illuminated if and

only if a brake system is actuated; on vehicle centerline; height between wheel centerline and driver's shoulders. Round, triangle, or rectangular on black background. At least 15 cm^2 illuminated area. LED strips OK if elemets closer than 20 mm apart and total length $\geq$ 150 mm.

○ LV BATTERY

103 ○ Voltage $\leq 60\,V_{DC}$.
104 ○ Rigid and sturdy casing.
105 ○ Only for wet-cell batteries: IPX7 rated and acid resistant casing if inside the cockpit.
106 ○ Behind Firewall.
107 ○ Short circuit protection (e.g., fused).
108 ○ Proper insulation of internal electrical connections.
109 ○ Proper mounting of cells.
110 ○ Complete battery pack inside rollover protection envelope.
111 ○ Has overpressure relief, gas vent behind a firewall (only applies to fully enclosed battery case).
▲ Following checks only for Li-Ion batteries other than LiFePO4:
112 ○ UL94-V0 for min. used thickness or equivalent casing.
113 ○ Overcurrent protection that trips below maximum discharge current.
114 ○ Overtemperature protection of at least 30 % of the cells (max. 60 °C or datasheet, whichever is lower).
115 ○ Voltage protection of all cells.
116 ○ Signal failures electrically disconnect the LV battery (SCS) (check the schematics of LV battery AMS).
▲ Ask the team to connect their laptop to the AMS.
117 ○ Cell voltages can be displayed.
118 ○ Cell temperatures can be displayed.

○ BRAKE SYSTEM PLAUSIBILITY DEVICE (BSPD)

119 △ Must be directly supplied from the LVMS and no additional functionality implemented on all required Printed Circuit Boards (PCBs) and the interfaces must be reduced to the minimum necessary signals.
▲ Disconnect brake system encoder from BSPD while the throttle is open.
120 ○ Power to ignition and fuel pump(s) must shut down.
▲ Disconnect throttle position sensor from BSPD and press brake pedal while throttle is open.
121 ○ Power to ignition and fuel pump(s) must shut down.
▲ Team simulates a throttle of >25 percent, press brake representing hard braking (>500 ms).
122 ○ Must open the shutdown circuit and kill ignition and fuel pump(s).
123 ○ Reactivation by the driver is not possible. May reset itself if the opening condition is no longer present.
▲ Power cycle vehicle (reset BSPD).

○ ACCELERATION PEDAL POSITION (APPS)

124 ○ Accelerator Pedal returns to the original position if not actuated.
125 ○ At least two sensors with different transfer functions are installed. For digital sensors, a checksum is necessary.
126 ○ Sensors do not share supply or signal lines.
127 ○ Sensors are protected from being mechanically overstressed - positive stop of the pedal.
128 ○ Minimum two springs installed to return pedal.
▲ Disassemble one spring.
129 ○ Each spring still returns the pedal with the second one disconnected - springs in the APPSs not counted.
▲ Open throttle and disconnect APPS(s).
130 ○ Power to ETC system shuts down after 100 ms and throttle goes to idle position if less than two APPS are connected.

○ THROTTLE AND THROTTLE POSITION SENSOR (TPS)

131 ○ Two sources of energy to return the throttle to idle position. One must be a return spring (springs in the TPSs not counted.).
▲ Disconnect electronic throttle connector while the throttle is open.
132 ○ Throttle must return to idle position in one second.
133 ○ At least two Throttle Position Sensors (TPS) installed.
▲ Open throttle and disconnect TPS(s).
134 ○ Power to ETC system shuts down after 100 ms and throttle goes to idle position if less than two TPS are connected.

○ PLAUSIBILITY CHECKS

▲ Activate fuel pump (verify, that it is running), open throttle, insert a blocking device, command throttle to fully close.

135 ○ After 1 s, power to ignition, injection and fuel pump shuts down and throttle goes to idle position. This action must remain active until the TPS signals indicate the throttle returned to the idle position for at least one second.

○ HYBRID

136 ○ **HSD** - Hybrid system definition accepted?

137 ○ **LOW VOLTAGE** - Voltage is $< 60\,V$. The hybrid system is incorporated into the CV shutdown circuit. The HSC AIR must be a part of the Shutdown circuit.

138 ○ **HSC** - Maximum total weight of 3 kg (without cooling liquid). Fuel cells, flywheels and pressure containers are prohibited. Must have fire-retardant casing (T1.2.1). Must be removable. Must comply with T11.7.7.

139 ○ **BMS** - Battery management system is required and must be able to switch off the AIR.

140 ○ **SAFETY MECHANISMS** - The HSC must include overcurrent protection that trips at or below the maximum specified charge current of the cells. The disconnection mechanism must be designed as an AIR internal to the HSC, disconnecting the positive pole of the HSC. All electrical parts of the hybrid system must be IPxxB compliant when energized.

141 ○ **FIREWALL** - A firewall must be present between the low-voltage battery and the fuel tank.

142 ○ **POSITION** - All components must be inside surface envelope, battery must be inside rollover envelope.

143 ○ **MOTORS (EV 2.1)** - Only electric motors are allowed. Motor attachments must follow T 10 (critical fasteners). Motor casings must follow T 7.3. The motor(s) must be connected to the accumulator through a motor controller.

144 ○ **COOLING** - May only use air, water or oil as a coolant.

145 ○ **APPS** - At least two separate sensors must be used as APPS. They may share housing.

146 ○ **DEPLOYMENT** - The Hybrid System may only be deployed if the Combustion Engine is running or when the Starter Button is pushed.

147 ○ **FUSE** - A fuse rated for the maximum specified discharge current of the cells must be implemented as required in T 11.7.7.

○ TIS STATUS UPDATE/TIMER

▲ Set online TIS to Passed or Failed

▲ Stop the timer

▲ Collect the timer

NON-COMPLIANCE/COMMENTS

PART IV: TILT TEST

APPROVAL

Inspector Names	Date and Time	Signatures when passed

○ TILT TEST

148 ○ **FLUID LEAKAGE** - No fluid spill permitted when the vehicle is tilted to 60° in the direction most likely to create spillage. Tanks must be filled to the scribe line with non-moveable fuel level line 12-25 mm below the top of the sight tube.

149 ○ **VEHICLE STABILITY** - All wheels in contact with tilt table when tilted to 60° to the horizontal.

150 △ **FUEL TYPE** - 98 or ethanol.

151 △ **GROUND CLEARANCE** - At least 30 mm with driver. If an active suspension is installed, the static ground clearance is measured in the lowest adjustable position

NON-COMPLIANCE/COMMENTS

PART V: NOISE TEST

APPROVAL

Inspector Names	Date and Time	Signatures when passed

○ NOISE TEST

152 ▲ **TEST RPM** - Test at 7500 rpm.

153 ○ **NOISE LEVEL 1** - 110 dB(C) (fast weighting) maximum during a static test, gearbox in neutral, UP TO a specified rpm (see Rule CV 3.2). Microphone level with the exhaust outlet(s), 0.5 m from the outlet(s), at 45° to the outlet. If multiple outlets, all to be checked. If movable tuning or throttling device, see IN 10.1.6.

154 ○ **NOISE LEVEL 2** - 103 dB(C) (fast weighting) maximum during a static test, gearbox in neutral at idle. Microphone level with the exhaust outlet(s), 0.5 m from the outlet(s), at 45° to the outlet. If multiple outlets, all to be checked. Movable tuning or throttling device must be in "worst condition"

155 ○ **LOW VOLTAGE MASTER SWITCH** - Access from outside of vehicle, rotary type, no relay, must kill ALL electrical systems. Must cause the engine to stop when actuated. Perform at around 5000 rpm.

156 ○ **SHUTDOWN BUTTONS 1** - Push-pull or push-rotate. Unobstructed by the steering wheel, easily reached by belted-in driver. Must kill ignition and fuel pump(s). Must be red and marked with the international symbol. Must cause the engine to stop when actuated. Perform at around 5000 rpm.

157 ○ **SHUTDOWN BUTTONS 2** - Push-pull or push-rotate. One button must be located on each side of the vehicle behind the driver's compartment at approximately the level of the driver's head. Must be easily reachable from outside the vehicle. Must kill ignition and fuel pump(s). Must be red and marked with the international symbol. Must cause the engine to stop when actuated (Perform at around 5000 rpm).

158 ○ **INERTIA SWITCH** - Rigidly attached to the vehicle according to manufacturer specification, demountable for functionality check. Must open the shutdown circuit and kill ignition and fuel pump(s) when accelerated between 6g and 11g (T 11.5). Must cause the engine to stop when actuated. Perform at around 5000 rpm.

159 ○ **BRAKE PEDAL OVER-TRAVEL SWITCH** - Must constantly open the shutdown circuit if one brake circuit fails for the brake balance bar in all possible positions. No restart if released or actuated a second time. Push-pull or flip type Must NOT rely on programming to work. Not resettable by the driver. Perform at around 5000 rpm.

160 ○ **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.

161 ○ **EXHAUST OUTLET** - Outlet no more than 45 cm behind rear axle centerline or more than 60 cm above the ground.

162 ○ **EXHAUST SHIELDING** - components that protrude from the side of the chassis in front of the rear axle must be to prevent contact by persons approaching the vehicle or a driver exiting the vehicle. No fibrous/cloth wraps around exhaust tubes.

NON-COMPLIANCE/COMMENTS

PART VI: BRAKE TEST

APPROVAL

Inspector Names	Date and Time	Signatures when passed

○ BRAKE TEST

163 ○ **BRAKING PERFORMANCE** - Must lock all four wheels and stop the vehicle in a straight line at the end of an acceleration run specified by the officials without stalling the engine.

164 ○ **BRAKE LIGHT** - Must be clearly visible even in bright sunlight.

165 ○ After the brake test, the vehicle must be able to continue driving under its own power without external assistance.

NON-COMPLIANCE/COMMENTS