FORMULA STUDENT CZECH REPUBLIC INSPECTION SHEET 2023
CV Class

INFORMATIONS

University:
Vehicle number:
Engine:
Bore/Stroke:
Fuel Type:
ETC:
ABS:

USED SYMBOLS:

- • Information
- ▶ Action
- △ Check in responsibility of the team
- ○ Check

Present the vehicle for inspection in following order:
Pre-Inspection
1.Mechanical Inspection
2.Tilt Test
3.ETC Inspection
4. Noise Test
5. Brake Test

NOTES:

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

PART I: PRE-INSPECTION

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

☐ 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 & SAFETY

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

9 ○ **UNDERWEAR** - Must be made from acceptable fire-resistant material as listed in T 13.3.11 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 allowed only over fire resistant material.

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

13 ○ **HELMETS** - Snell K2010, K2015, K2020, M2010, M2015, M2020, SA2010, SAH2010, SA2015, SA2020, EA2016, SFI 31.1/2010, 31.1/2015, 31.1/2020, 41.1/2010, 41.1/2015, 41.1/2020 FIA 8860-2010, FIA 8860-2018, FIA 8859-2015 (with SA 2015), FIA 8858-2010 (with SA(H) 2010). Closed Face, no Open Face, must have integrated shield (no dirt bike helmets). No camera mounts.

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

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

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

NON-COMPLIANCE / COMMENTS

PART II: EGRESS TEST

☐DRIVER POSITION

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

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

19 ◯ **MAIN HOOP & FRONT HOOP HEIGHTS** - Helmet of 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.

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

21 ◯ **SHOULDER HARNESS MOUNTING** - Angle from shoulder between 10 deg. up and 20 deg. down to horizontal.

☐ DRIVER EGRESS TEST

- All drivers must be able to exit the vehicle in less than 5s.
- 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.

☐ DRIVER APPROVAL & RUN DOCUMENTATION

	Driver Name	Driver ID	Signature when passed	Acc	SkidPad	AutoX	Endurance
1.	_____	_____	_____	☐☐	☐☐	☐☐	☐☐
2.	_____	_____	_____	☐☐	☐☐	☐☐	☐☐
3.	_____	_____	_____	☐☐	☐☐	☐☐	☐☐
4.	_____	_____	_____	☐☐	☐☐	☐☐	☐☐
5.	_____	_____	_____	☐☐	☐☐	☐☐	☐☐
6.	_____	_____	_____	☐☐	☐☐	☐☐	☐☐

PART III: MECHANICAL INSPECTION

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

- The time limit for this part of the inspection is 75 minutes. 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 status ▶ Add timer to the car ▶ Start timer

☐ VEHICLE WITH TALLEST DRIVER READY TO RACE

22 ◯ **FIRE EXTINGUISHERS** - Two (2) hand-held, 0.9 kg (2 lb.) minimum, dry chemical (10BC, 1A10BC, 34B, 5A 34B, 20BE or 1A 10BE), with pressure/charge gauge, Aqueous Film Forming Foam (AFFF) fire extinguishers are prohibited, 1 WITH VEHICLE securely installed on push-bar, 1 in paddock. (Must see BOTH at Tech.). On-board fire system possible.

23 ◯ **PUSH BAR (red color)** - With vehicle, securely attached to vehicle, detachable, push & pull function for 2 people. University name on it.

24 △ **CAMERAS** - Must be secured by two points on different sides of the camera body, see T11.10.5. No cameras mounted to helmet.

25 ◯ **VISIBILITY** - Minimum of 100 deg. field either side. Head rotation allowed or mirrors. If mirrors, must be firmly installed and adjusted

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

27 ◯ **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 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.

28 ◯ **ROLL BAR PADDING** - Roll bar or bracing that could be hit by driver's helmet must be covered with 12mm thick, SFI spec 45.1 or FIA 8857-2001 padding.

29 △ **OTHER SIDE TUBES** - Design prevents driver's neck hitting bracing or other side tubes

30 ◯ **HEAD RESTRAINT**- Near vertical. Must take 890N load. 40mm thick, SFI 45.2 standard or FIA technical list n°17 type B. Max. 25mm from helmet. Helmet contact point 50mm min. from any edge. May be changed for different drivers. Minimum 150x150mm.

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 50mm), two shoulder straps (min. width 75mm) and two leg or anti-submarine straps (min. width 50mm). (7-point system must have three anti-submarine straps). Must be securely attached to prim. structure (25.4 x 2.4mm or equal.)

32 ◯ **LAP BELT MOUNTING** - Pivoting mounting with eye bolts or shoulder bolts attached securely to Primary Structure. Min. tab thickness 1.6mm. Attachment brackets to the monocoque must be steel, see T5.3.2.

33 ◯ **SHOULDER HARNESS MOUNTING** - Mounting points 180 - 230mm apart (measured center to center). Angle from shoulder between 10 deg. up and 20 deg. down to horizontal. Attach to Primary Structure - 25.4 x 2.4mm or 25.0 x 2.5mm steel tube min. NOT to put bending loads into Main Hoop Bracing without extra bracing. Additional braces if not straight to main hoop. Cannot pass through a firewall. Attachment brackets to the monocoque must be steel.

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

☐ VEHICLE WITHOUT DRIVER

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

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

37 △ **VEHICLE NUMBERS** - On front & both sides of vehicle, minimum 150mm tall, 20mm stroke & spacing, 25mm min. between number and background edge, Black on White, White on Black only, specified background shapes. Must be clearly visible, font: Roman Sans-Serif characters.

38 △ **BODYWORK EDGES** - edges that could contact a pedestrian must have a minimum radius of 1.0mm (safety requirement)

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

40 ◯ **BODYWORK** - Min. 38mm radius on nose. No large openings in bodywork into driver compartment in front of or alongside driver, (except cockpit opening).

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

42 △ **AERODYNAMICS** - ALL aerodynamic devices maximum 250mm rearward of rear tires, maximum 700mm forward of front tires. Devices lower than 500mm 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 500mm 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 500mm from the ground. Rear device max 1.2 m above ground (incl. end plates); Front device max 250mm above ground outside of the inside plane of the front tires inside this plane max 500mm.

44 ◯ **EDGES/RADII** - Edges that could contact a pedestrian must have a minimum radius of: horizontal leading edges min 5mm; vertical forward facing edges min 3mm. All other edges must have a minimum radius of 1.0mm

45 ◯ **AIR INTAKE SYSTEM ROLL OVER PROTECTION** - All parts of air intake system (including throttle body or carb, air intake ducting,

air cleaner & air box) must be within a surface defined by the top of the main hoop and the outside top edge of the tires.

46 ◯ **AIR INTAKE SYSTEM** - Must be supported if cantilevered (isolated to frame, rigid to engine). Any portion < 350mm above ground must have side and rear impact protection to rule CV 1.3.2. Intercooler after throttle body.

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

48 ◯ **COCKPIT OPENING** - Fig. 11 (left) template passes down from above cockpit to below the upper side impact member. Steering wheel, seat & padding can be removed. No removing of firewall.

49 ◯ **COCKPIT INTERNAL CROSS SECTION** - Fig. 11 (right) template passes from the cockpit opening to 100mm rear of rearmost pedal contact area (in most forward position). Steering wheel and paddings can be removed (without tools).

50 △ **STEERING WHEEL** - Continuous perimeter, near round (no concave sections) with driver operable quick disconnect. 250mm max from front hoop.

51 ◯ **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

52 ◯ **FUEL FILLER NECK** - Min. 35mm dia., within 30_ of vertical. Fuel resistant, transparent sight tube or transparent filler neck (material must be rated for at least 120_C). min 125mm vert. height visible to fueler with vehicle fully assembled, with non-moveable fuel level line 12-25mm below top of sight tube. Sight tube must NOT run below top of tank. Must prevent fuel spillage contacting driver, exhaust or ignition. Fueled w/o manipulating vehicle in any way. Cap secure and capable of withstanding pressurization (ie: threads or latch.)

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

54 ◯ **FUEL VENTS** - Must exit outside of the bodywork and have a check valve to prevent leakage if vehicle inverted.

☐ REMOVE BODY PANELS

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

56 ◯ **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 (25x1.2 or equivalent) in side or front views when touching the pedals.

57 ◯ **PERCY** - Helmet of 95th percentile male (PERCY) to be 50mm 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 915mm from pedals.

58 ◯ **BRAKES** - Dual hydraulic system & 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. No parts below chassis in side view. Brake pedal capable of 2000N, no failures if official exerts max force (seated normally in vehicle).

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 △ **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 => 50mm diameter. Marked with LV and international symbol. Level horizontal when in ON position.

61 ◯ **TUBING & MATERIALS** - Team must show an APPROVED SES. No Magnesium tubes in primary structure.

62 ◯ **MONOCOQUE** - Must see laminate test specimen. All samples must be marked with the following non-removable (e.g.: permanent marker or engraving, but no sticker) information: laminated structure acronym and date of testing. Steel backing plates (=>2mm thick) used at attachment points (must be fully supported).

63 ◯ **BOLTED JOINTS** in primary structure - Distance hole centerline to the nearest free edge > 1.5 x hole diameter.

64 ◯ **MAIN HOOP** - MUST BE STEEL. Check dimension as shown in approved SES. Must be made of one piece and extend to lowest frame member. Above Major Structure, must be within 10 deg. of vertical plane. Smooth bends without wrinkles.

65 ◯ **MAIN HOOP BRACING** - MUST BE STEEL. One straight brace on each side. Dimension as shown in the approved SES. Attached within 160mm from the top. Min. 30 deg. Included angle with hoop. If main hoop is not vertical, bracing must not be on same side of the vertical plane as the main hoop. No bends. No rod-ends. Proper design for removable braces (capping etc.) on BOTH ENDS. Must take load back to bottom of main hoop and node of upper side impact tube through proper triangulated structure. (25.4 x 1.2mm or equivalent)

66 ◯ **FRONT HOOP** - Must be closed section metal tube. Can be multi-piece with gussets or additional attachments to the monocoque. Must extend down to lowest frame member. No lower than top of steering wheel. Max. 20 deg. to vertical. Check dimension as shown in approved SES. Requires 6 attachment points – 2 on each side connecting to front bulkhead support structures and two connecting to front hoop bracing.

67 ◯ **FRONT HOOP BRACING** - Two straight 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 50mm of top and must have a minimum distance of 100mm between each other at the front hoop. Extra rearward bracing required if Front Hoop leans backwards more than 10 deg.

68 ◯ **SIDE IMPACT PROTECTION** - Min. of 2 tubes + diagonal must connect the main and front hoops in straight line. Upper tube between 240 - 320mm above lowest inside chassis point between FH and MH. Dimension as shown in approved SES.

69 ◯ **FRONT IMPACT PROTECTION** - No non-crushable objects forward of bulkhead. IMPACT ATTENUATOR forward of bulkhead, 200mm long x 200mm wide x 100mm high. No portion of the required 100x200x200mm^3 volume of the IA can be positioned more than 350 mm above the ground. 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 vehicle. Standard IA: Requires diagonal brace if bulkhead >25.4mm from IA on any side.

70 ◯ **ANTI INTRUSION PLATE** - A 1.5mm solid steel or 4.0mm solid aluminum sheet. Must be welded (size: min. to centerlines) or min. 8 screws M8 Grade 8.8 critical fasteners T10) (size: min. outside dimensions). CFRP plate is accepted if SES approved.

71 ◯ **FRONT BULKHEAD SUPPORT** - Support back to front roll hoop; 3 tubes per side, all 25mm x 1.5mm wall steel tube or equiv. 1 bottom; 1 top within 50mm of top of bulkhead and connecting within 100mm above and 50mm below upper SIS tube; 1 or more node-to-node diagonal to completely triangulate connections to upper and lower SIS tubes.

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

61 ◯ **JACKS** - One or two devices that must be available to safely lift up and hold all driven wheels min. 100mm 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 driver to enter and exit the vehicle. The device must not extend out of the area defined by the footprint of the four tires. Device pick-up points must be indicated by orange triangles on both sides. University name on it.

73 ◯ **WHEELS** - 203.2mm (8") min. diam. No Aluminum or hollow wheel bolts. Single retaining nut must incorporate a device to retain the nut. Aluminum wheel nuts must be hard anodized.

74 ◯ **FIREWALL** - Fire resistant material; must separate driver compartment from cooling, oil system & LV battery. Passthroughs OK with grommets. Multiple panels OK if gaps sealed. No gaps at sides or bottom. Must be rigidly mounted to the chassis. Material must meet UL94-V0, FAR 25.853(a)(1)(i) or equivalent (THICKNESS NEEDED IN DATA SHEET).

☐ VEHICLE LIFTED AND WHEELS REMOVED

75 ◯ **SUSPENSION PICK-UP POINTS** - Inspected thoroughly for integrity.

76 ◯ **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.

77 ◯ **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 degrees max. free play at the steering wheel. NO STEER-BY-WIRE on front wheels. Rear wheel steering, max. 6 deg. and mechanical stops installed. No bonded joints in steering column.

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

80 ◯ **ENGINE** - Four cycle piston engine. No hybrids. Waste heat recovery allowed.

81 ◯ **ON-BOARD STARTER** - Required.

82 ◯ **COMPRESSORS** - Turbo or super chargers allowed if not OEM to engine; must be between restrictor and throttle. Carburetors are not allowed, if compressors are used. Compressor recirculation valves are ok if located downstream of restrictor.

83 ◯ **INTAKE MANIFOLD** - Securely attached to block or head with mech. Fasteners (positive locking!). OEM type rubber bushings not sufficient. If less than 350 mm, muse be shielded (CV 1.3.2)

84 ◯ **RESTRICTOR** - Must be circular; max. diam. 20mm for gasoline fueled vehicles and 19mm for E85 fueled vehicles. Cannot be movable. Placed before compressor.

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

86 ◯ **THROTTLE PEDAL** - Must have positive stop to prevent overstressing cable

87 ◯ **ENGINE LUBRICATION SYSTEM** - Lowest point of the engine lubrication system is not lower than the lowest frame part. Otherwise, protection structure mounted to chassis necessary.

88 ◯ **GAS CYLINDERS** - Proprietary manufacture & labeled, Nonflammable gas, regulator on tank, securely mounted, axis not pointed at driver, within the rollover protection envelope, or in structural side pod, insulated from exhaust, appropriate lines & fittings. Positively retained, i.e., no tie-wraps. Gas cylinders/tanks and their pressure regulators must be shielded from the driver. The shields must be steel or aluminum with a minimum thickness of 1 mm.

89 ◯ **SCATTERSHIELDS INCL. MOUNTING** - Required for clutches, chains, belts, etc. No holes. 6mm diam. Grade 8.8 minimum. End parallel to lowest part of the sprocket/pulley in front and rear.

90 △ **SCATTERSHIELD MATERIALS** - For chains, 2mm min. thick solid STEEL, 3 x chain width. For belts, 3mm min. thick Al 6061-T6, 3 x belt width. Finger guards: cover all drivetrain parts that spin while vehicle is stationary. No holes >12mm dia.

91 ◯ **LV BATTERY** - Rigid and sturdy casing and attached securely to frame or chassis. Battery behind firewall; wet cells in IPX7 rated and acid resistant casing if inside cockpit. Must be contained within the rollover protection envelope, see T1.1.14. Grounded to chassis; hot terminal insulated; protected for short circuits (fused). No circuits >60VDC. Completely closed LV battery cases must have an overpressure relief. Venting gases must be separated from the driver by a firewall.

92 ◯ ↺ **STUDENT BUILD LV BATTERY** Proper Insulation of internal connections; proper mounting of cells

93 ◯ ↺ **LI-ION LV BATTERY** (only applicable if other than $LiFePO_4$)- Has a fire-retardant casing according to UL94-V0. Battery pack includes: an overcurrent protection that trips below maximum discharge current; overtemperature protection of _30% of the cells; voltage protection of all cells; it must be possible to display all cell voltages and measured temperatures on a team laptop.

94 ◯ **HIGH PRESS HYDRAULICS** - Pumps and lines must have 1mm steel or aluminum shields protecting driver and workers. 95

95 △ **COOLANT** - 100% water. NO ADDITIVES WHATSOEVER.

96 ◯ **CATCH TANKS** - Any coolant overflow or combustion engine lubrication system vents must have separate catch tanks. 0.9 l or 10% of the fluid being contained minimum volume each, whichever is greater. 100 deg. C material, behind firewall, below shoulder level. 3mm min. dia. vent away from driver down to the bottom level of frame. Trans or diff., cooling systems using plain water, unless sealed, require 100 ml catch tanks.

97 △ **FLUID LEAKS** - Oil, grease, coolant, fuel, Brake fluid -> none permitted

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

99 ◯ **FUEL TANKS** - Must lie within rollover protection envelope (T 1.1.15), except the filler neck if its 350mm above the ground, with full side impact protection & firewall between fuel supply & driver, min. 50mm away from exhaust components. Rigid tanks cannot carry structural load & must be flexibly mounted and must not touch anything else than its mounting.

100 ◯ **BELLYPANS** - In total minimum of two venting holes of at least 25mm 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.

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 metal braided hose with threaded fittings or reinforced beaded rubber hose with approved clamps. Must be securely attached and protected from possible rotating equipment or collision failure. No plastic connectors in 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

102 ◯ **BRAKE LIGHT** - Only one RED brake light, clearly visible from the rear; on vehicle centerline; height between wheel centerline & driver's shoulders. Round, triangle, or rectangular on black background. 15 cm2 minimum illuminated area. LED strips OK if elements closer than 20mm apart and total length > 150 mm.

☐ HYBRID

103 ◯ **HSD –** Hybrid system definition accepted?

104 ◯ **LOW VOLATAGE** – Voltage <60 V are allowed. The hybrid system will be incorporated into the CV shutdown circuit. The HSC AIR must be part of the Shutdown circuit.

105 ◯ **BATTERY –** Maximum weight 3 kg without cooling liquid, but with electronic safety relay and casing. Fuel cells, flywheels and pressure containers are prohibited. Must have UL-94-v0 compatible casing. Must be removable.

106 ◯ **BMS –** Battery management system is required. And must be able to switch off safety relay.

107 ◯ **FIREWALL –** A firewall must be present between the low voltage battery and the fuel tank.

108 ◯ **MOTORS (EV 2) –** 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.

109 ◯ **DEPLOYMENT –** The Hybrid System may only be deployed if the Combustion Engine is running or when the Starter Button is pushed.

110 ◯ **HSC –** Must comply to T11.7. and to T11.7.8 regardless of chemistry type. If multiple HSCs are used, their total weight is limited to 3 kg.

111 ◯ **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.

112 ◯ **FUSE –** A fuse rated for the maximum specified discharge current of the cells must be implemented as required in T11.7.8.

☐ TIS STATUS UPDATE

▶ Set online TIS status

NON-COMPLIANCE / COMMENTS

PART IV: TILT TEST

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

☐ TILT TEST

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

114 ◯ **VEHICLE STABILITY** - All wheels in contact with tilt table when tilted to 60 degrees to the horizontal.

115 ◯ **FUEL TYPE:** 98 or ethanol

116 △ **GROUND CLEARANCE** - At least 30mm min. with driver.

NON-COMPLIANCE / COMMENTS

PART V: ETC INSPECTION

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

☐ ACCELERATOR PEDAL POSITION SENSOR (APPS)

117 ◯ Accelerator Pedal returns to original position if not actuated.
118 ◯ At least two sensors with different transfer function are installed. (For digital sensors, a checksum is necessary)
119 ◯ Sensors do not share supply or signal lines.
120 ◯ Sensors are protected from being mechanically overstressed (Positive stop of pedal).
121 ◯ Minimum two springs installed to return pedal.
▶ Disassemble one spring.
122 ◯ Each spring still returns pedal with the second one disconnected (Springs in the APPSs not counted.)
▶ Open throttle and disconnect APPS(s).
123 ◯ 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)

124 ◯ 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 throttle is open.
125 ◯ Throttle must return to idle position in one second.
126 ◯ At least two Throttle Position Sensors (TPS) installed
▶ Open throttle and disconnect TPS(s).
127 ◯ 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.
128 ◯ 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 idle position for at least one second.

NON-COMPLIANCE / COMMENTS

PART VI: AUTONOMUS SYSTEM

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

☐ AUTONOMUS SYSTEM TEST

Info: Before the start of Autonomous System Test read the complete instructions.

►Switch on the LVMS and select the ~~i~~nspection mission (AMI).
129 ◯ The ASSIs remains off.
►Check for neutral gear and Switch on the ASMS ~~and the TSMS~~.
130 ◯ Activating the engine~~TS~~ using the cockpit engine start ~~activation~~ button is not possible
►Activate the engine ~~TS~~ via the external engine start ~~activation~~ button. Be ready to press RES "Go" button.
131 ◯ The ASSIs light up in yellow continuously after a self check ("AS Ready").
►Press RES "Go" button within 5 s after "AS Ready".
132 ◯ "AS Driving" (ASSIs flashing yellow) has not been entered.
133 ◯ Vehicle is still not in R2D.
134 ◯ Check functionality and visibility of AMI - correct mission is indicated.
135 ◯ All 3 ASSIs are yellow and clearly visible in very bright sunlight. At least one ASSI is visible from any angle of the vehicle.
136 ◯ Brakes are closed.
►Press the RES "Go" button.
!! CAUTION WHEELS AND STEERING SYSTEM ARE MOVING !!
137 ◯ The ASSIs start flashing yellow ("AS Driving").
138 ◯ Drivetrain is slowly spinning and steering system is moving.
►Wait for the transition from "AS Driving" to "AS Finished".
139 ◯ The ASSIs light up in blue continuously within 25 s to 30 s and brakes are engaged ("AS Finishes"). ASSIs must not start flashing.
140 ◯ All 3 ASSIs are blue and clearly visible in very bright sunlight.
141 ◯ Engine ~~TS~~ is deactivated.
►Turn off the ASMS and release the Brakes via the deactivation points.
142 ◯ Brakes are disengaged, manual steering is possible, ASSI is off.
~~EBS indicator l~~
►Try to start the engine ~~activate TS~~ again and enter "AS Ready" state.
143 ◯ Engine ~~TS~~ stays disabled and system does not enter state "AS Ready".
► Power cycle LV system or do any other necessary actions ~~press the reset button~~ and re-enter "AS Ready" state.
►Press one shutdown button while autonomous state is "AS Ready". Be ready to check properties of "AS Emergency" sound (ie. duration).
144 ◯ ASSIs start flashing blue ("AS Emergency").
145 ◯ Brakes are closed.
146 ◯ Intermittent sound for 8 s to 10 s (1 Hz to 5 Hz, 50 % duty cycle).
147 ◯ EBS error indicator inside the cockpit is off.
148 ◯ Engine ~~TS~~ is deactivated.
►Turn of ASMS and reset the EBS (manual actions may be required).
►Reset the EBS and re-enter "AS Driving" state with inspection mission selected, before each of the following tests.
►1. Press RES 2. Press any shutdown button 3. Switch off the ASMS
149 ◯ Engine ~~TS~~ is deactivated.
150 ◯ Transition to "AS Emergency", ASSI is blue flashing, EBS is activated, EBS activation sound.
151 ◯ EBS error indicator is off.
►Test all operating errors (e. g. manual valves) and some (choose randomly 1 to 3) EBS failure modes (e.g. disconnect sensors/energy supply/pneumatics/hydraulics. . .).
152 ◯ System has detected a failure.
153 ◯When ASSI is "AS Ready" or "AS Driving" state, the system has to enter "AS Emergency".
154 ◯ When ASSI is "AS OFF" state no transition to "AS Ready" is possible when switching on ASMS and activating the TS (without LVMS power cycle).

☐ TIS STATUS UPDATE

► Inform scrut management about attempt result
► update attempt info table on the beginning of the section

NON-COMPLIANCE / COMMENTS

PART VI: NOISE INSPECTION

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

☐ NOISE TEST

▶ **TEST RPM** - Test at 7500 rpm.

155 ◯ **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 degrees to the outlet. If multiple outlets, all to be checked. If movable tuning or throttling device, see IN 10.1.6.

156 ◯ **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 degrees to the outlet. If multiple outlets, all to be checked. Movable tuning or throttling device must be in "worst condition"

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

158 ◯ **SHUTDOWN BUTTONS 1** - Push-pull or push-rotate. Unobstructed by steering wheel, easily reached by belted-in driver. Must kill ignition & fuel pump(s). Marked with international symbol. Must cause engine to top when actuated (Perform at around 5000 rpm).

159 ◯ **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 easy reachable from outside the vehicle. Must kill ignition & fuel pump(s). Marked with international symbol. Must cause engine to stop when actuated (Perform at around 5000 rpm).

160 ◯ **INERTIA SWITCH** - Rigidly attached to the vehicle, demountable for functionality check. Must open the shutdown circuit and kill ignition & fuel pump(s) when accelerated between 6g and 11g (T10.5). Must cause engine to stop when actuated (Perform at around 5000 rpm).

161 ◯ **BRAKE PEDAL OVER-TRAVEL SWITCH** - Must constantly open the shutdown circuit if one brake circuit fails for brake balance bar in all possible positions. 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 (Perform at around 5000 rpm).

162 ◯ **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

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

164 ◯ **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.

☐ BRAKE SYSTEM PLAUSIBILITY DEVICE (BSPD)

165 △ Must directly supplied from the LVMS & no additional functionality implemented on all required Printed Circuit Boards (PCBs) & the interfaces must be reduced to the minimum necessary signals.

▶ Disconnect brake system encoder from BSPD while throttle is open.

166 ◯ Power to ignition & fuel pump(s) must shut down.

▶ Disconnect throttle position sensor from BSPD and press brake pedal while throttle is open.

167 ◯ Power to ignition & fuel pump(s) must shut down.

▶ Team simulates a throttle of >25%, press brake representing hard braking (>500 ms).

168 ◯ Must open the shutdown circuit and kill ignition & fuel pump(s).

169 ◯ Reactivation by the driver is not possible. May reset itself if the opening condition is no longer present

☐ NON-COMPLIANCE / COMMENTS

PART VII: BRAKE TEST

APPROVAL

	Inspector Names	Date and Time	Signatures when passed
1.	_____ / _____		
2.	_____ / _____		

☐ BRAKE TEST

170 ◯ **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.

171 ◯ **BRAKE LIGHT** - must be clearly visible even in bright sunlight

NON-COMPLIANCE / COMMENTS