

# 2024 FSAE-B: IC TECHNICAL INSPECTION

**IMPORTANT:** Each page must stay with the car until that specific part of inspection has been completed.

Present the vehicle for inspection in the following order:

- 1a. Supporting Equipment Inspection
- 1b. Mechanical Technical Inspection
2. Fuel Station
3. Weighing
3. Tilt Table
5. Noise
4. Braking Performance Inspection

<b>CAR NUMBER</b>		<b>Team Name</b>
<b>SCHOOL NAME</b>		
<b>Captain name</b>		
<b>Cell number (Whatsapp)</b>		

**NOTE: If there is a conflict between this form and the rules, the rules prevail**

## Check from the Technical Inspection Secretariat

<b>Garage Inspection</b>	<b>Chassis</b>	<b>Body</b>	<b>Power Train</b>
Date: Hour: Judge Name	Date: Hour: Judge Name	Date: Hour: Judge Name	Date: Hour: Judge Name

<b>"5" Seconds</b>	<b>Weighing</b>	<b>Tilt Table</b>	<b>Noise Test</b>
Date: Hour: Judge Name	Date: Hour: Judge Name	Date: Hour: Judge Name	Date: Hour: Judge Name

<b>Brake Test</b>
Date: Hour: Judge Name

**Technical Inspection Committee Final Approval Name:**

--

May be can Senior Judge approval

--	--

Finished Date:

Finished Hour

**Comments**

--

<b>1 - Garage Inspection</b>		Name	Judge	Judge	Start time	CAR #	1A								
Supporting Equipment Inspection: IN.3															
Check date					End time										
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)										
1	<b>HELMETS - VE.3.2</b> - Closed-face with integral chin guard (no dirtbike helmets). - Face shield integral with helmet, impact resistant material. - Specification: Snell: K2010, K2015, K2020, M2010, M2015, M2020, SA2010, SAH2010, SA2015, SA2020; or SFI: 31.1/2010 thru /2015; 41.1/2010 thru /2015; or FIA: 8860-2004, 8860-2010, 8860-2018, 8859-2015. - No camera mounts: VE.2.5.3 - (Place sticker on left side)														
2	<b>BALACLAVA - VE.3.3.3</b> - Required for all drivers. Flame Resistant material. Covers head, neck and hair. (No label required.)														
3	<b>ARM RESTRAINTS - VE.3.3.7</b> - Required for all drivers. Must be commercially manufactured. (No label required.)														
4	<b>DRIVERS' SUITS - VE.3.3.1</b> - Single piece suit, no holes. Must be labeled. Specification: SFI 3.2A/5; SFI 3.4/5; FIA 1986; FIA 8856-2000 or 8856-2018														
5	<b>GLOVES - VE.3.3.6</b> - Flame Resistant material (not all-leather). No holes. Leather palms allowed only over flame resistant material. (No label required.)														
6	<b>SHOES - VE.3.3.5</b> No holes. Must be labeled. Specification: SFI 3.3; or FIA 8856-2000 or 8856-2018														
7	<b>SOCKS - VE.3.3.4</b> Flame resistant material (no cotton; no polyester). Must cover all bare skin. (No label required.)														
8	<b>FIRE EXTINGUISHERS - VE.2.3</b> •Hand-held, dry chemical (no AFFF or halon), min specification: 10BC; 1A10BC; 34B; 5A 34B; 20BE; or 1A 10BE. •Min 0.9 kg (2 lb). •Two required: must present both at Tech.														
10	<b>WET TIRES - V.4.3.2</b> 2.4mm min tread depth. Molded or cut by tire manufacturer.  <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Front</td> <td style="width: 50%;">Rear</td> </tr> <tr> <td>Brand:</td> <td>Brand:</td> </tr> <tr> <td>Compound:</td> <td>Compound:</td> </tr> <tr> <td>Size</td> <td>Size</td> </tr> </table>	Front	Rear	Brand:	Brand:	Compound:	Compound:	Size	Size						
Front	Rear														
Brand:	Brand:														
Compound:	Compound:														
Size	Size														
12	<b>PUSH BAR - VE.2.2</b> Always with car (detachable), push & pull, usable by 2 people standing behind the car. EVs: HV disconnect tool, if used.														
<b>Comments</b>															

## 2 - Body Inspection

Check date	
------------	--

### Driver In, Bodywork On

		Name	Judge	Judge	Start time	CAR #	2A
					End time		
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)		
Reminder to teams: bring the following items: •Car on "Dry Tires" •Monocoque Laminate Test Specimens (if applicable) •The Impact Attenuator that was tested (if applicable) •Accumulator container and Tractive System firewall samples (if applicable) •Electronic, or printed, copies of any submitted Rules Questions including responses For egress (1 driver): •Helmet •Gloves •Arm Restraints •Long pants •Closed-toe shoes							
11	<b>First Year Vehicle - GR.9.3</b> New Chassis and is within its initial Competition Year.						
16	<b>CAR NUMBERS - VE.1.1</b> On •front & both sides of car, •minimum 150 mm tall, •18 mm stroke & spacing. •White-on-black or B-on-W only. •Background shape: round, oval, rectangular or square. •Visibility must not be obstructed.						
17	<b>SAE DECALS - VE.1.3</b> SAE logo on front OR both sides, in prominent location						
18	<b>SCHOOL NAME - VE.1.2</b> School name or recognized initials. •Both sides of car, •easily visible location, •50 mm tall min, •Roman letters, •high contrast background.						
19	<b>TECH STICKER SPACE - VE.1.4</b> 25 cm wide x 20 cm high available space, located on centerline of upper front bodywork (nose) of car.						
20	<b>CAMERA MOUNTS - VE.2.5</b> •If >0.25 kg, must be secured by two points (typical GoPro-brand camera is <0.25 kg). •No cameras mounted to helmet.						
21	<b>GROUND CLEARANCE - V.1.4</b> Sufficient clearance so that no part of the car other than the tires will contact the track surface.						
23	<b>VISIBILITY - V.2.2</b> 100° min field of view to each side. Head rotation OK, or mirrors. If mirrors, must be firmly installed and adjusted						
24	<b>ROLL BAR PADDING - T.2.9</b> Installed on any bar that could be hit by the driver's helmet. •12 mm thick. •Specification: SFI 45.1 or FIA 8857/2001 (pipe insulation or other foams not OK).						
25	<b>OTHER SIDE TUBES - F.5.12</b> Cockpit design must prevent driver's neck from hitting bracing or other side tubes						
26	<b>VEHICLE CONTROLS - T.1.4</b> No hands, arms, or elbows outside side impact system when actuating controls. All controls, including shifter, must be inside cockpit and below topmost point of Front Hoop.						
27	<b>LAP BELT FIT - T.2.5</b> •Must pass over pelvis, not waist. •45-65° to horizon for upright driver, 60-80° for reclined						
28	<b>SHOULDER HARNESS FIT - T.2.6</b> Angle from shoulder between 10° up and 20° down (vs horiz).						
29	<b>SUB BELT FIT - T.2.7</b> •Snug, holding latch in place. •Position in side-view: 5 Point: aligned with or forward of shoulder belt line; 6 Point: vertical or rearward of latch.						
<b>Attention</b>	<b>Critical Fasteners Reference: T.8</b> For all locations marked "CRITICAL FASTENERS" in this form, the following requirements apply: •Material rating: SAE Gr 5, Metric 8.8, or AN/MS. •Hex-head or socket-head; no pan head, button head, flat head, or low-profile screws. •Positive locking: safety wire, lock pins, or locking nuts with 2 threads visible beyond nut. Threadlock compounds not sufficient; no nylock nuts if >80 °C						

2 - Body Inspection		Name	Judge	Judge	IC Vehicle Number	2B
Check date						
<b>Driver Fit</b>						
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)	
30	<b>ARM RESTRAINTS FIT - VE.3.3.7</b> Installed so the driver can release them and exit unassisted regardless of vehicle's position.					
31	<b>HEAD RESTRAINT FIT - T.2.8</b> •Max 25 mm (1") forward gap to helmet. •Helmet contact point min 50 mm (2") from any edge. <b>APPLIES TO ALL DRIVERS (may be adjusted for each driver)</b>					
32	<b>MAIN HOOP &amp; FRONT HOOP HEIGHTS - F.5.6.3</b> Helmet 50 mm (2.0") below lines between •top of front and main roll hoops, and •top of main hoop to rear attachment point of main hoop bracing. <b>(Applies for every driver.)</b>					
33	<b>DRIVER'S FOOT PROTECTION - T.1.3.2</b> 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. Remove nose bodywork if necessary for visual access					
34	<b>EGRESS - IN.5.2</b> 5 seconds max to actuate cockpit master switch and exit to side of vehicle, from driving position, wearing safety equipment. Wings must remain fixed in position. (See egress worksheet.)	<i>Não é necessario analisar no local de inspeção técnica</i>				
<b>Driver Out</b>						
35	<b>BODY &amp; STYLING - V.1</b> Open cockpit, formula style body. Four wheels, not in a line.					
36	<b>OPEN WHEEL - V.1.1</b> •Top 180° of wheel/tire unobstructed from above. •Tires unobstructed from sides. •Vertical keepout zones 75mm in front & behind tires.					
37	<b>BODYWORK - T.7.2</b> •No large openings (> ~6mm) in bodywork into driver compartment in front of or alongside driver. •Body/nose min 38 mm radius, +/-45° all directions.					
38	<b>WHEELBASE - V.1.2</b> Minimum 1525 mm.					
40	<b>SEAT - T.1.5, T.1.6</b> •Insulated against heat conduction, convection and radiation. •Lowest point no lower than top of lower structure OR must have longitudinal 1.00" OD x 0.065" steel tube underneath.					
41	<b>FIREWALL - T.1.8</b> Rigid, nonflammable material. •Separates driver (line-of-sight to mid-height of driver's helmet) from fuel, cooling, oil, lithium battery, heat sources, and all tractive system components other than outboard wheel motors. Wire/cable pass-throughs OK with grommets. Multiple panels OK w/ gaps sealed. •No gaps at sides or bottom. •Leaks cannot contact driver					
42	<b>FLOOR CLOSEOUT PANEL - T.1.7</b> Non-perforated, non-brittle material from foot area to firewall. Multiple panels OK if gaps less than 3 mm (1/8").					
<b>Driver Out</b>						
43	<b>DRIVER'S LEG PROTECTION - T.1.3</b> Covers inside cockpit over sharp parts or moving suspension and steering components.					
48	<b>WHEELS - V.4</b> •203 mm (8.0") min diameter. •Wheels with single wheel nut must have positive retainer. •Aluminum lug nuts hard-anodized and pristine condition.					

## 2 - Body Inspection

Check date	
------------	--

### Driver Restraints

		Name	Judge	Judge	IC Vehicle Number	2C
Item	Description	Team	Check	Recheck		
49	<b>DRIVER RESTRAINT HARNESS - T.2.2</b> 5, 6 or 7 point and be •labeled: SFI 16.1, 16.5, or FIA 8853/98, 8853/2016 (or lookup FIA D-number) •All lap belts must have Quick Adjusters. •Reclined drivers must have 6 or 7 point, and Quick Adjuster sub-belts OR 2 sets of sub belts. •Belts expire after expiration year (not month) marked on label (SFI & FIA).					
50	<b>HARNESS HARDWARE AND INSTALLATION - T.2.2</b> •Belts threaded through hardware per mfr instructions. •Hardware must be unmodified (no drilling, welding, etc).					
51	<b>HARNESS MOUNTS - T.2.4</b> •Belts must be protected by firewalls. •All belts attached securely to Primary Structure. •Tabs 1.6 mm (0.063") thick min, 60 mm <sup>2</sup> shear area; tabs combining lap & sub belts 90 mm <sup>2</sup> . Double-shear preferred. •Tabs welded on both sides; bolt-on tabs use minimum of two ¼" dia Grade 5 bolts. •Tabs aligned with load direction of belt, may be pre-bent.					
52	<b>LAP BELT POSITION - T.2.5</b> •Pivoting mounting using eye bolt or shoulder bolt (no tube wrap). •Not re-directed by seat. •Belt centerline max 3" forward of seatback-seatbottom junction in side view					
53	<b>SHOULDER HARNESS POSITION - T.2.6</b> Mounting points 175-235 mm (~7" - 9") apart. Tube wrap OK					
54	<b>SUB BELT POSITION - T.2.7</b> Sub belts cannot be re-directed by anything other than the driver's body.					
55	<b>BELT ATTACHMENT FASTENERS - T.2.5.8, T.2.6.3, T.2.7.4</b> •Lap & Shoulder 10 mm Grade 8.8 (3/8" SAE Grade 5), •Sub 8 mm (5/16") or as specified by harness manufacturer. •Pins required in clip-brackets •CRITICAL (positive locking) - T.8					
56	<b>HEAD RESTRAINT - T.2.8</b> •Min 150x150 mm (6"x6") AND height adjustment of 175 mm (7"); OR 150x280 mm (6"x11"). •38 mm (1.5") thick. •Near vertical. •Pad and mount must take 900 N rearward and 300 N lateral forces. •Energy absorbing material: SFI Standard 45.2 or FIA Tech List 17 (CONFOR blue CF45 or CF45M). •Mount must be within Main Hoop Bracing envelope, or add extra tube per F.5.10					
<b>Aero</b>						
S32	<b>AERODYNAMIC DEVICES - T.7.1</b> •No powered ground effects. •Securely mounted - no oscillation or excessive movement. (Wings, undertray, splitter, endplates, vanes, etc.)					
S33	<b>EDGE RADII - T.7.1</b> •Horizontal leading edges min 5 mm radius. •Vertical forward-facing edges min 3 mm radius. •Other edges: not sharp - GR.1.5					
S34	<b>FRONT MOUNTED AERO - T.7.4</b> •Max forward: 700 mm ahead of the front tires. •Max width: OUTSIDE of the front tires (at hub height). •Max height: 250 mm if in front of tires (w/out driver).					
S35	<b>REAR MOUNTED AERO - T.7.5</b> •Max rearward: 250 mm behind the rear tires. •Max forward: Headrest support (undertrays exempt). •Max width: INSIDE of the rear tires (at hub height). •Max height: 1.2 m above ground (w/out driver).					
S36	<b>AERO BETWEEN WHEEL CENTERLINES - T.7.6</b> •Max width: Line between front & rear tires (at hub height). •Max height: 500 mm (exempt if w/in 400 mm of car centerline).					
<b>Attention</b>	<b>Critical Fasteners Reference: T.8</b> For all locations marked "CRITICAL FASTENERS" in this form, the following requirements apply: •Material rating: SAE Gr 5, Metric 8.8, or AN/MS. •Hex-head or socket-head; no pan head, button head, flat head, or low-profile screws. •Positive locking: safety wire, lock pins, or locking nuts with 2 threads visible beyond nut. Threadlock compounds not sufficient; no nylock nuts if >80 °C					

3 - Chassis Inspection		Name	Judge	Judge	Start time	CAR #	3A
		Check date					
Bodywork Off							
44	<b>NON-CRUSHABLE OBJECTS - F.8.6.3</b> 25 mm clearance aft of AI Plate, <i>Front Bulkhead including diagonals, and to pedals @ full travel and adjustment.</i>						
46	<b>BRAKE PEDAL - T.3.2</b> Steel, aluminum, or machined titanium (no welded Ti). Alt matl. <b>NOK</b> for pad face. Entire pedal-to-frame system capable of 2kN (tested only by organizers).						
<b>General Inspection - Chassis / Check Chassis with the SES Chassis FSAE-B 2024 document</b>							
57	<b>STEERING - V.3.2</b> •All steerable wheels must have positive stops to prevent linkage lock-up or contact with other parts. •7° max freeplay at the steering wheel. •NO STEER-BY-WIRE on front wheels. •No cables or belts. •No bonded joints in column without metal backup. •Rear steer limited to 6° total, with mechanical stops.						
58	<b>CRITICAL FASTENERS, Steering - V.3.2.8</b> Steering wheel, column, rack mounting, tie rods						
59	<b>SUSPENSION PICK-UP POINTS - GR.1.5</b> Inspected thoroughly for integrity: binding, over-articulation.						
60	<b>STEERING WHEEL - V.3.3</b> •Continuous perimeter, near round (no concave sections). •Driver operable quick disconnect. •Not higher than top of Front Hoop, in any ang						
61	<b>SUSPENSION - V.3.1</b> •Full suspension including front and rear damping. •Spherical rod ends and bearings: double-shear or safety washers.						
62	<b>MODIFIED LUG BOLTS/STUDS - V.4.2.2</b> Verify good engineering practices are followed e.g. no drill holes for mass reduction.						
63	<b>CRITICAL FASTENERS: SUSPENSION - V.3.1.4</b> Control arms, knuckle, spring load path, single wheel nuts. Exempt: lug nuts, multi-piece wheels, anti-roll bars, dampers.All fasteners must be tight (esp: jam nuts).						
64	<b>BRAKES - T.3.1</b> •Single pedal actuates all 4 wheels (one brake on limited slip OK) •Two separate hydraulic circuits w/ reservoirs; no brake-by-wire. •Protected by structure/shields from drivetrain & collisions. •No plastic brake lines. •No parts below chassis/tub in side-view.						
65	<b>CRITICAL FASTENERS: BRAKES - T.3.1</b> •Pedal Assembly: including adjustment mechanism, caliper to knuckle mounts, rotor to hat. •Exempt: COTS caliper body assembly						
66	<b>BRAKE CONTROL SYSTEMS - GR.1.5</b> ABS, Traction, Yaw Control, etc: must have an approved FMEA.						
39	<b>JACKING POINT - VE.2.1</b> •Horizontal, lateral tube at the rear. •Orange color. •300 mm wide by 25-30 mm O.D. •Visible to person standing 1 meter behind car. •75 mm min ground clearance •Rear tires must come off the ground using Quick-Jack (lifts to 200 mm). Exposed around the lower 180° of its circumference						
<b>Attention</b>	<b>Critical Fasteners Reference: T.8</b> For all locations marked "CRITICAL FASTENERS" in this form, the following requirements apply: •Material rating: SAE Gr 5, Metric 8.8, or AN/MS. •Hex-head or socket-head; no pan head, button head, flat head, or low-profile screws. •Positive locking: safety wire, lock pins, or locking nuts with 2 threads visible beyond nut. Threadlock compounds not sufficient; no nylock nuts if >80 °C						

# 3 - Chassis Inspection

Check date

Name	Judge	Judge	IC Vehicle Number	3B

## Roll Hoops

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)
S1	<b>MAIN HOOP - F.5.8</b> •Must be steel with smooth bends with no wrinkles. •Must be 1 piece & extend to lowest frame member. •Tube endpoints 380 mm apart (inside dim) at bottom attachment. •Above Major Structure, max 10° to vertical. •No part angled rearwards more than 10° from vertical. •Bends in side view, and front view below the SIS must be braced to a frame node.				
S2	<b>MAIN HOOP BRACING - F.5.9, F.6.6</b> Must be steel w/ no bends. •One brace each side, attached within 160 mm of top of hoop. •Min 30° included angle with hoop. •Bracing must not be on same side of vertical as Main Hoop.				
S3	<b>HEAD RESTRAINT - T.2.8.3</b> •Inside Rollover Envelope or F.5.10 Head Restraint protection.				
S4	<b>EXTERNAL ITEMS - F.5.11</b> (e.g. wings, suspension mounts, radiator) Single fastener connection at MH-MHB node preferred. If any item outside the Rollover Protection envelope creates a moment on or is attached to the Main Hoop or Braces not at a node, additional bracing must be added to prevent bending loads in the braces. Failure calculations in SES for non-preferred connections, matching components.				
S5	<b>FRONT HOOP - F.5.7</b> •Closed-section metal tube (may be multi-piece). •Non-ferrous tubes must have inspection holes. •Must extend to lowest frame member. •Above Upper SIS, max 20° to vertical, F.6.3.5 max 10° towards cockpit if no rearward bracing. •Bends in side view, and front view below the SIS, braced to a frame node. (F.5.6.2)				

## Chassis Features

S6	<b>STEERING COMPONENTS OUTSIDE FRAME - F.5.14</b> •Rack inside primary structure. •F.5.14 Steering rack outside primary structure protected to top, bottom, and local chassis width. •Welded to chassis, or 30kN per end (60kN total) shown in SES.				
S8	<b>HOLES AND OPENINGS IN REGULATED TUBES - F.5.3</b> •Holes in regulated tubes addressed in SES. •Tube ends must be closed using welded caps or welded inserts, except bottom of roll hoops.				
S9	<b>BOLTED JOINTS CONNECTING PRIMARY STRUCTURES F.5.4, F.5.13</b> •Double-shear (capped) or Sleeved butt joints only. •No bends. •No rod-end bearings. •Edge of any bolt hole located > 1.5 x hole diameter from nearest edge of the material. •No blind or welded threaded fasteners. •Bolts 8 mm (5/16"), plates 2.0 mm (0.08").				
S10	<b>HARNESS ATTACHMENTS •T.2.4.3</b> Tube: 15kN, single shear per SES. •F.7.9 Composite: Test specimens, representative of vehicle. •Test loading direction: prefer normal, min 45 up from panel or harness installation per rules.				

## Front Impact

S11	<b>IA LEADING EDGE VERTICAL POSITION - F.8.5.6</b> •Relative to lowest point of top surface of lower SIS tube, IA top edge must be higher than 240 mm (except std foam), and bottom edge lower than 220mm				
S12	<b>STANDARD IMPACT ATTENUATOR - F.8.4.3</b> •Must be fully bonded to AIP. •IA must not be degraded or damaged.				
S13	<b>NON-STANDARD IMPACT ATTENUATOR - F.8.4</b> •200 mm long x 200 mm wide x 100 mm high. •Adhesive attachment required for foam or honeycomb. •Attached to AIP w/ welds - 1:1 weld ratio, beads 25 mm min, or eight 8 mm (5/16") bolts. •Must be capable of taking vertical and transverse loads. •Must be identical to test specimen, engraved dates of test. <small>(Swivel to failure mode (cushion element not collapsed mount))</small>				
S14	<b>ANTI-INTRUSION PLATE - F.8.2</b> •1.5 mm steel or 4 mm aluminum. •120KN physical test, or 3-point composite per SES. •Attached to bulkhead w/ eight 8 mm (5/16") bolts, or bonded or laminated (AIP extending to outer edge of bulkhead), or >50% welded (AIP extending to centerline of bulkhead tubes). •Quick release and shear pin per SES if present. •CRITICAL FASTENERS: F.8.5.5				

### 3 - Chassis Inspection

Check date	
------------	--

Name	Judge	Judge	IC Vehicle Number	3C

#### Front Impact (Continued)

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)
S15	<b>FRONT WING DETACHMENT - F.8.6</b> •No portion of front wing or mountings block the front view of bulkhead. •F.8.6.2 Detaches below peak load. •Fasteners match SES documentation.				
S16	<b>FRONT BULKHEAD DIAGONAL - F.8.4.3</b> •Unless tested for <25mm AIP deflection, diagonal structure is required for the standard foam IA when FBH > 400mm x 350mm; diagonal required for all standard honeycomb IAs. •Diagonal may be attached to AIP.				

#### Tube Primary Structure

S17	<b>LOAD PATHS AND TRIANGULATION - F.1.17</b> •Upper and lower load paths, with sufficient diagonal tubing to fully triangulate in between, are required continuously through the FBHS, SIS, MHBS, (EV) ACC Side Protection, (EV) HV Side Protection, back to the (EV) Rear Impact F.6.6. •Minimum tube size requirements apply to Upper, Lower, and Diagonal structural tubes.																																														
S18	<b>BENT OR MULTIPLE TUBES - F.5.2</b> •Min bend radius at centerline: 3x tube OD. •A brace must connect from on the bend to a frame node, •Within 30° of plane of bend (Upper SIS, Shoulder Harness Bar exempt from 30°). •Brace tube matches min, except Roll Hoop bends Size C, Upper SIS diag Size B, Shoulder Harness Brace Size C.																																														
S19	<b>FRONT BULKHEAD SUPPORT - F.6.2</b> •Connect bottoms of Front Bulkhead and Front Hoop; •Connect within 50mm of top of bulkhead, 100 mm above and 50 mm below upper SIS tube •Brace to Main Hoop if top tube does not connect near upper SIS.																																														
S20	<b>FRONT HOOP BRACING - F.6.3</b> •Two forward facing braces, attached within 50 mm of top of hoop, attached to Front Bulkhead or triangulated structure. •Rearward bracing if FH more than 10° rear above Upper SIS.																																														
S21	<b>SIDE IMPACT STRUCTURE - F.6.4</b> •Upper tube must be between 240 mm and 320 mm above highest surface of lower SIS tube (F.6.4.3). •Lower tube must connect endpoints of Main and Front hoops.																																														
S22	<b>SHOULDER HARNESS MOUNTING BAR - F.6.5</b> •Uncut, closed-section tube. •Attached to Main Hoop. •Braced to Main Hoop if bent: minimum 30° between brace and bar. •Nothing attached except for Shoulder Harnesses, driver equipment, headrest, and light bodywork including the firewall and or seat.																																														
S23	<b>TUBE MINIMUMS - F.3.2</b> Tech may use ultrasound to measure wall thickness and/or ask that 4 mm dia holes be drilled ( See table F.3.2.1 Requirements by Application)  <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SIZE D</td> <td></td> <td>Bent Upper SIS</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SIZE A</td> <td></td> <td>MH</td> <td></td> <td>FH</td> <td></td> <td>SH</td> </tr> <tr> <td>SIZE B</td> <td></td> <td>MHBrace</td> <td></td> <td>Lap/Anti</td> <td></td> <td>FB</td> </tr> <tr> <td></td> <td>FHBrace</td> <td></td> <td>FHBrace &gt; 10 Rear</td> <td></td> <td></td> <td>SIS</td> </tr> <tr> <td>SIZE C</td> <td></td> <td>IADiag</td> <td></td> <td>FBHS</td> <td></td> <td>MHBS</td> </tr> <tr> <td></td> <td></td> <td>SHBrace</td> <td></td> <td>External Steering</td> <td></td> <td></td> </tr> </table>	SIZE D		Bent Upper SIS					SIZE A		MH		FH		SH	SIZE B		MHBrace		Lap/Anti		FB		FHBrace		FHBrace > 10 Rear			SIS	SIZE C		IADiag		FBHS		MHBS			SHBrace		External Steering						
SIZE D		Bent Upper SIS																																													
SIZE A		MH		FH		SH																																									
SIZE B		MHBrace		Lap/Anti		FB																																									
	FHBrace		FHBrace > 10 Rear			SIS																																									
SIZE C		IADiag		FBHS		MHBS																																									
		SHBrace		External Steering																																											

#### Cockpit Templates ( Applicable to Tube and Monocoque Chassis)

S29	<b>MAIN HOOP &amp; FRONT HOOP HEIGHTS - F.5.6.5</b> 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.				
S30	<b>COCKPIT OPENING - T.1.1</b> Template to pass from above cockpit to bottom of top SIS tube and less than 320mm from lowest point inside cockpit. Steering wheel & column, seat and padding can be removed; no removing firewall. Fore/aft translation of template OK.				
S31	<b>COCKPIT INTERNAL CROSS SECTION</b> T.1.2 Template to pass from rearwards of the steering column to 100 mm rearwards of the pedals. Steering wheel may be removed; padding may be removed if removable with no tools & with driver in seat.				

### 3 - Chassis Inspection

Check date	
------------	--

#### Monocoque Chassis

		Name	Judge	Judge	IC Vehicle Number	3D
Item	Description	Team	Check	Recheck		
	Visually compare key measurements as presented in the SES Exclusive document for Chassis Judges "SES Book Approval"					
S24	<b>LAMINATE TEST SPECIMENS - F.4.3</b> •Three-point bending: 275 x 500 mm or 138 x 500 mm •Perimeter shear: 100 x 100 mm or 3-point •Lap joint •Engraved with date, specimen name.					
S25	<b>BOLTED ROLL HOOP ATTACHMENTS - F.7.4, F.7.6</b> •Three points per side x 30 kN each, or two x 45 kN. •Within 25mm of bends below top of monocoque. •Boxed tube to plates and gussets ••Mounting plates on hoop min 2mm thick. •Backing plates per SES, receipts for non-steel. •Two 8 mm bolts per joint. •One 10mm bolt on centerline allowed for hoop braces. •No blind or threaded inserts. •Requires inserts or no gap between inner and outer skins.					
S27	<b>LAMINATED FRONT HOOP - F.7.4</b> •Front Hoop may be fully laminated instead of bolting. •Must not be attached only by adhesive, cores must fit tightly.					
S26	<b>SIDE IMPACT PROTECTION - F.7.5</b> •Min 240 height above Lowest SIS point. •No side view openings between Front Hoop and Main Hoop.					
S27	<b>LAMINATE THICKNESS VS SAMPLES AND SES - 4mm hole or external calipers.</b>  PANELS •FB •FBDiag •FBHS •FHBrace •SIS •Lap/Anti •SH •MHBS ATTACHMENTS •SteeringProtection •AIP •FH •Lap/Anti •SH •MH •MHB					
Attention	<b>Critical Fasteners Reference: T.8</b> For all locations marked "CRITICAL FASTENERS" in this form, the following requirements apply: •Material rating: SAE Gr 5, Metric 8.8, or AN/MS. •Hex-head or socket-head; no pan head, button head, flat head, or low-profile screws. •Positive locking: safety wire, lock pins, or locking nuts with 2 threads visible beyond nut. Threadlock compounds not sufficient; no nylock nuts if >80 °C					

Comments regarding Monocoque Chassis

4 - Powertrain		Name	Judge	Judge	Start time	CAR #	4A
		Check date					
Item	Description						
57	<b>LV BATTERIES, PRESSURIZED CYLINDERS - T.9.2.1, T.6.1.7</b> •Inside F.1.1 chassis •Below Shoulder Harness. •Below top of chassis ahead & behind & to the left & to the right •F.1.13-15 envelopes outside chassis not legal.						
67	<b>ENGINE - IC.1.1</b> Four-stroke piston engine, 710 cc maximum swept displacement. No hybrids. Waste heat recovery allowed.						
68	<b>COOLANT - T.5.4</b> (IC) Only 100% water. NO ADDITIVES WHATSOEVER. (EV) 100% water						
69	<b>INTAKE and FUEL SYSTEM LOCATION - IC.1.2</b> •All parts of air intake system (including throttle body or carb, air intake ducting, air cleaner & air box), AND •all parts of the fuel storage, supply and fuel control systems (including fuel rail, throttle body or carburetor), must be within a surface defined by the top of the roll bar and the outside top edge of the tires.						
70	<b>AIR INTAKE SYSTEM - IC.2.2 &amp; .3</b> •Side and Rear Impact protection if <350 mm above ground. •Supported if cantilevered (isolated to frame, rigid to engine).•CRITICAL FASTENERS: securely attached to block or head with brackets & mechanical fasteners w/ positive locking mechanisms. OEM-type rubber bushings not sufficient						
71	<b>THROTTLE - IC.3</b> •Min qty of 2 springs 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. •Cable position min 50 mm from any exhaust component. •Idle air bypass control and throttle blippers are ETC and not allowed without ETC process						
72	<b>RESTRICTOR - IC.2.4</b> •Must be circular: max dia 20.0 mm for gasoline and 19.0 mm for E85. •Cannot be movable or flexible. •Installed per below: NA: THROTTLE -> RESTRICTOR -> ENGINE FI: RESTRICTOR -> COMPRESSOR -> THROTTLE -> ENGINE						
73	<b>HIGH PRESSURE HYDRAULICS - T.6.2</b> Pumps and lines must have 1 mm thick steel or aluminum shields to protect driver and workers. (Brakes & clutch exempt.)						
74	<b>COMPRESSORS - IC.2.5</b> •Turbo or super chargers allowed if not OEM to engine. •Must be between restrictor and throttle. •Intercoolers downstream of throttle. •Carbs not allowed if compressors are used. •Compressor recirculation valves ok if downstream of restrictor. •No enlarged air chambers (section > 28 cm <sup>2</sup> ) before throttle						
75	<b>CATCH CANS - T.5.6</b> •Engine coolant (unless aircooled) and engine crankcase must have separate catch cans of 0.9 L min vol. •Oil(s) and water(s) must be separate. •100 °C-capable material. •Behind firewall, below shoulder level. •3 mm min diameter vent, directed away from driver. •PCV OK if routed to intake sys upstream of restrictor. •Cannot connect breathers to exhaust. •Trans, diff, other systems (unless sealed): 10% or 0.5 L catch can.						
76	<b>FLUID ACCUMULATION - T.5.5.5</b> Absorbent materials and open collection devices (regardless of material) are prohibited below the highest point of the exhaust system in compartments containing the engine, drivetrain, exhaust and fuel systems.						

4 - Powertrain		Name	Judge	Judge	IC Vehicle Number	4B
Check date						
IC Powertrain (Continued)		Team	Check	Recheck	Recheck (Write on the back if necessary)	
77	<b>BELLYPANS - T.5.5.4</b> Must be vented to prevent accumulation of fuel: 2 holes each min of 25mm dia. •Specific locations: <b>Lowest point in chassis; Aft of driver &amp; front of fuel tank.</b>					
78	<b>FLUID LEAKS - T.5.5.1</b> Not permitted. Firewalls must prevent contact w/ driver.					
79	<b>EXHAUST OUTLET - IC.7.2</b> •Outlet 45 cm (17.7") max behind rear axle centerline and 60 cm (23.6") max above the ground. •Located such that exhaust gases should not reach driver					
80	<b>EXHAUST SYSTEM - IC.7.2</b> •Exhaust components outside bodywork forward of main hoop must be shielded from people approaching the car. •No fibrous wraps around exhaust tubes.					
81	<b>SCATTERSHIELDS GENERAL - T.5.2</b> •Required for clutches, chains, belts, CVT rotating parts, etc. •Not perforated. •End parallel to lowest part of front and rear sprockets. •Min 6mm fasteners •CRITICAL FASTENERS					
82	<b>SCATTERSHIELD MATERIALS - T.5.2</b> •Size: for chains: 2.7 mm (0.105") min thick steel, 3x chain width; for belts: 3 mm (0.12") min thick aluminum 6061-T6, 1.7x belt width. •OEM engine drive sprocket cover OK.					
83	<b>D'TRAIN FINGER GUARDS - T.5.2.10</b> Required to cover all drivetrain parts that spin while car is at rest. No holes >12 mm dia.					
84	<b>COMPRESSED GAS CYLINDERS - T.6</b> •Unmodified COTS cylinder (labeled). •Nonflammable gas. •Regulator on tank. •Securely mounted, axis not pointed at driver. •Rearward of Main Hoop within the frame envelope, or in structural sidepod; not in cockpit. •Appropriate lines & fittings. • <=150mm from exhaust: metal, or protected per T.1.6.3.					
<b>Fuel System</b>						
85	<b>FUEL TANKS - IC.5.2 &amp; .3, F.9</b> •Must lie within major structure of the chassis, with side impact protection. •Rigid tanks cannot carry structural load & must be flexibly mounted. •Bladders or bags in rigid container. •No portion of fuel system below lower surface of frame. •Firewall between all parts of fuel system & driver.					
86	<b>FUEL LINES - IC.5.7</b> •No plastic lines between tank & engine (reinforced rubber hoses OK). •Bulbs/barbs on hose connections. •No worm-gear clamps. •Must be securely attached, •protected from rotating equipment & collision damage. •Systems >10 bar see IC.6.2					
87	<b>GOOD PRACTICES, fuel lines - GR.1.5</b> •Hoses and fittings must be type-matched (no clamps on braided metal hoses, etc). •Fuel lines restrained and protected from stress, heat, and abrasion.					
88	<b>FUEL FILLER NECK - IC.5.4</b> •Fuel-resistant materials, •min 35 mm inner dia, •within 30° of vertical. •Must prevent fuel spillage contacting driver, exhaust or ignition (add shields as needed). •Fueled w/o manipulating car in any way. •Cap secure and capable of withstanding pressurization (ie: threads or latch). •Easy access for common 2-gal jugs.					
89	<b>SIGHT TUBE - IC.5.4</b> •Fuel resistant materials, •transparent, •min 6mm inner dia. •Min 125 mm vertical height in area visible to fueller with vehicle fully assembled. •Sight tube must NOT run below top of tank. •Non-moveable fuel level line 12-25 mm below top of sight tube. (Clear filler neck OK as sight tube.)					
90	<b>FUEL RAIL - IC.6.1</b> •Securely attached to block, head or intake manifold with brackets & mechanical fasteners. •No plastic or composite fuel rails, except if unmodified OEM part. •CRITICAL FASTENERS					

4 - Powertrain		Name	Judge	Judge	IC Vehicle Number	4C
Check date						
<b>Electrical System</b>						
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)	
91	<b>FUEL TYPE - IC.5.1</b> 93 octane gasoline   100 octane gasoline   E-85 No agents other than the provided fuel and air may be induced into the combustion chamber. •Place appropriate fuel sticker adjacent to fuel filler (dot on cap)					
92	<b>FUEL VENTS - IC.5.6</b> •Must exit outside of the bodywork. •Must include a check valve to prevent leakage if car inverted					
45	<b>THROTTLE PEDAL - IC.3.3.1</b> Must have positive stop to prevent overstressing cable. Must return when not actuated.					
47	<b>BRAKE PEDAL OVER TRAVEL SWITCH - T.3.3</b> •Must cut ignition & fuel pump. •No re-start if brake released or actuated a second time. •Must NOT rely on software to work. •Not resettable by driver					
93	<b>ON-BOARD STARTER - IC.8.1</b> Required (remote starters and push-starts prohibited).					
94	<b>PRIMARY MASTER SWITCH - IC.9.3</b> •On driver's right, near roll bar. •Access from outside of car. •Rotary type. •No relay. •Must kill ALL electrical systems. •Marked with international symbol. •Lever horizontal when ON.					
95	<b>COCKPIT MASTER SWITCH - IC.9.4</b> •Pull-ON, Push-OFF type. •Alongside & unobstructed by steering wheel, easily reached by driver. •Must kill ignition & fuel pump(s). •Min dia 24 mm. •Marked with international symbol.					
96	<b>BATTERY - T.9.2</b> •Attached securely to frame or chassis. •Hot terminal insulated. •Wet-cells in marine box if inside cockpit. •Type must be identifiable. •Overcurrent protection • Lithium: firewall per T.1.8 between driver; OEM battery or with rigid nonflammable case. •No circuits > 60 VDC					
22	<b>BRAKE LIGHT - T.3.3</b> •RED color, •clearly visible from the rear, located 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 20 mm apart and total length > 150 mm (5.9"). •Sufficient brightness for visible activation in bright sunlight					
<b>Overall</b>						
97	<b>GOOD ENGINEERING PRACTICES - GR.1.5</b> •Proper use of fasteners. •Proper use of fluid lines and fittings. •Appropriate selection of materials regarding fluids, heat. •Protection from sharp edges - wiring, hoses, people. •Protection from heat - wiring, hoses, people. •Linkages not bound up or prone to over-articulation.					
98	<b>VISIBLE ACCESS - IN.2.3</b> To all items on Tech Sheet without the use of mirrors, borescopes, etc					
<b>Attention</b>	<b>Critical Fasteners Reference: T.8</b> For all locations marked "CRITICAL FASTENERS" in this form, the following requirements apply: •Material rating: SAE Gr 5, Metric 8.8, or AN/MS. •Hex-head or socket-head; no pan head, button head, flat head, or low-profile screws. •Positive locking: safety wire, lock pins, or locking nuts with 2 threads visible beyond nut. Threadlock compounds not sufficient; no nylock nuts if >80 °C					

<b>4 - Powertrain</b>		<b>Applicable ?</b>	<b>YES</b>	Name	Judge	Judge	<b>IC Vehicle Number</b>	<b>4D</b>
<b>Check date</b>								
<b>ELECTRONIC THROTTLE CONTROL</b>			<b>NO</b>					
<b>Item</b>	<b>Description</b>			<b>Team</b>	<b>Check</b>	<b>Recheck</b>	<b>Recheck (Write on the back if necessary)</b>	
<b>S37</b>	<b>ELECTRONIC THROTTLE CONTROL (ETC) - IC.4</b> •Only for cars using ETC: Do NOT signoff this tech form until separate ETC inspection is approved. •Requires prior submission and approval. Inspected by special team. •Idle air bypass control and throttle blippers are ETC, and are not allowed without completing the ETC process							

- To facilitate the inspection, request that the front inspection nozzle/cover be removed.
- To facilitate the inspection, request that the air filter/pressurization be removed in order to be able to visualize the TBI open/closed.
- The sealing stickers added in the ETC inspection will be checked before each dynamic event.
- Systems that use Blip Strategy will be analyzed in the technical inspection.

SECTION	ITEM	PRE ACTION	ACTION	EXPECTED RESULT	POST ACTION	CHECK
IC.4.1 General Design	IC.4.1.1	-	Check that the TBI is in good working order and that the connector locks are not broken or damaged.			
IC.4.1 General Design	IC.4.1.2	Check if the TBI has an idle return spring.	With the Primary Master Switch turned off, force the TBI to open.	As soon as you stop forcing the TBI open, it should return to idle state.		
IC.4.1 General Design	IC.4.1.1	Press the accelerator pedal in order to open the TBI (check if it opened).	Unplug the connector directly from the TBI.	TBI enters safe mode (returns to idle state).		
IC.4.4 Throttle Position Sensor - TPS	IC.4.4.2 IC.4.4.6	-	Check if there are two or more TPS, each with its individual connector.			
T.4.2 Accelerator Pedal Position Sensor - APPS	T.4.2.1	-	Check that pedal movement is free and smooth.			
T.4.2 Accelerator Pedal Position Sensor - APPS	T.4.2.1	Press the accelerator pedal to 100%.	Check that the pedal returns to the rest position (0%).			
T.4.2 Accelerator Pedal Position Sensor - APPS	T.4.2.1		Check that the pedal has a positive stop to prevent damage to the APPSs.			
T.4.2 Accelerator Pedal Position Sensor - APPS	T.4.2.1		Check if the pedal has 2 return springs for the rest position (0%).	Testing the springs individually returns the pedal to the rest position (0%).		
T.4.2 Accelerator Pedal Position Sensor - APPS	T.4.2.2 T.4.2.7		Check if there are two or more APPS, each with its individual connector.			
T.4.3 Brake System Encoder - BSE	T.4.3.1 T.4.3.2		Vehicle must have a sensor/switch to measure brake pedal position or brake system pressure.	Check if there is BSE with a pluggable connector.		
IC.4.8 Brake System Plausibility Device - BSPD	IC.4.8.3	Press the accelerator pedal in order to open the TBI (check if it opened).	Unplug +12v or 0v power from the BSPD.	TBI enters safe mode (returns to idle state).	Press the Cockpit Main Switch , the ETC system cannot be reactivated, you can only restart the system using the Primary Master Switch.	
IC.4.8 Brake System Plausibility Device - BSPD	IC.4.8.3	Press the accelerator pedal in order to open the TBI (check if it opened).	Unplug the TPS signal from the BSPD.	TBI enters safe mode (returns to idle state).	Press the Cockpit Main Switch , the ETC system cannot be reactivated, you can only restart the system using the Primary Master Switch.	

4 - Powertrain				Name	Judge	Judge	IC Vehicle Number	4E
Check date								
<b>ELECTRONIC THROTTLE CONTROL (Continued)</b>								
Item	Description			Team	Check	Recheck	Recheck (Write on the back if necessary)	
S37	<b>ELECTRONIC THROTTLE CONTROL (ETC) - IC.4</b> •Only for cars using ETC: Do NOT signoff this tech form until separate ETC inspection is approved. •Requires prior submission and approval. Inspected by special team. •Idle air bypass control and throttle blippers are ETC, and are not allowed without completing the ETC process							
SECTION	ITEM	PRE ACTION	ACTION	EXPECTED RESULT	POST ACTION	CHECK		
IC.4.8 Brake System Plausibility Device - BSPD	IC.4.8.4	Press the accelerator pedal in order to open the TBI (check if it opened).	Pressing the brake pedal to simulate hardbraking (getting in the car and stepping on the brake pedal) for more than 1s	TBI enters safe mode (returns to idle state).	Lock the BSPD box so the BSPD setpoints are not changed after inspection.			
IC.4.7 Throttle Plausibility Checks	IC.4.7.2		Lock TBI movement and press the accelerator pedal to simulate a Throttle Position vs Target difference					
IC.4.8 Brake System Plausibility Device - BSPD	IC.4.8.2		BSPD sensors signals must be connected directly to the BSPD.					
IC.4.8 Brake System Plausibility Device - BSPD	IC.4.8.1		A standalone nonprogrammable circuit must be used to monitor the electronic throttle control.					
IC.9 Shutdown System	IC.9.2.2		When the Shutdown Circuit Opens, it must deactivate ETC system					
<b>General Non-Compliance Comments</b>								

