

# 2024 FSAE-B: EV 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. Rain Test
3. Tilt Table
4. Braking Performance Inspection

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

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

## Check from the Technical Inspection Secretariat

<b>Date:</b>	<b>Hour:</b>	Garage Inspection	<b>Date:</b>	<b>Hour:</b>	Chassis	<b>Date:</b>	<b>Hour:</b>	Body	<b>Date:</b>	<b>Hour:</b>	EV Car Devices
		Judge Name			Judge Name			Judge Name			Judge Name
<b>Date:</b>	<b>Hour:</b>	"5" Seconds	<b>Date:</b>	<b>Hour:</b>	Electrical Inspection	<b>Date:</b>	<b>Hour:</b>	Rain Test	<b>Date:</b>	<b>Hour:</b>	Weighing
		Judge Name			Judge Name			Judge Name			Judge Name
<b>Date:</b>	<b>Hour:</b>	Tilt Table	<b>Date:</b>	<b>Hour:</b>	Brake Test						
		Judge Name			Judge Name						

**Technical Inspection Committee Final Approval Name:**

May be can Senior Judge approval

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Finished Date:

Finished Hour

**Comments**



## 2 - Body Inspection

Check date

### Driver In, Bodywork On

		Name	Judge	Judge	EV Vehicle Number	2A
Item	Description	Team	Check	Recheck		
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.					
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 cm <sup>2</sup> 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					
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					

2 - Body Inspection		Name	Judge	Judge	EV Vehicle Number	2B
Check date						
<b>Driver In, Bodywork On</b>						
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)	
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>Driver Fit</b>						
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.					

## 2 - Body Inspection

Check date		Name	Judge	Judge	EV Vehicle Number	2C
<b>Driver Out</b>						
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)	
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.					
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 3/4" 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					

## 2 - Body Inspection

Check date

Name	Judge	Judge	EV Vehicle Number	2D

### Aero

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)
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							
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)		
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.						

### 3 - Chassis Inspection

Check date	
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Name	Judge	Judge	EV Vehicle Number	3B

#### Roll Hoops

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)
S9	<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				
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.				

### 3 - Chassis Inspection

Check date	
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Name	Judge	Judge	EV Vehicle Number	3C

#### Front Impact

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)
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.				
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				
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.				

### 3 - Chassis Inspection

Check date	<input type="text"/>
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Name	Judge	Judge	EV Vehicle Number	3D
<input type="text"/>	<input type="text"/>	<input type="text"/>		

#### Tube Primary Structure

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)																																				
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)																																								
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#### 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.				



4 - Car Devices		Name	Judge	Judge	Start time	CAR #	4A
		Check date					
Overall Specs							
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)		
46	<b>BRAKE PEDAL OVER TRAVEL SWITCH - T.3.3</b> •Must cut propulsion system •No re-start if brake released or actuated a second time. •Must NOT rely on software to work. •Not resettable by driver - Open Shutdown circuit						
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.						
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.)						
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.						
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.						
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>MOTOR PROTECTION - 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.						
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.						

4 - EV Car Devices		Name	Judge	Judge	EV Vehicle Number	4B
Check date						
<b>Overall Specs</b>						
Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)	
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.					
68	<b>COOLANT - T.5.4</b> •100% water, or oil.					
74EV	<b>TRACTIVE SYSTEM MEASUREMENT POINTS - EV.6.8</b> •Right side of vehicle at drivers shoulder height •Can be accessed without tools •TSMP red and labeled HV+/HV-•Ground measurement point black and labeled GND•No excessive lash in joints and pivots.					
75EV	<b>SAFETY EQUIPMENT - IN.4.1</b> •HV insulating gloves which are within 12mo of test date.					
76EV	<b>HIGH VOLTAGE DISCONNECT - EV.6.5</b> •Must be a removable/disconnectable element•Labeled HVD•Accessible without tools•Above 350mm from the ground					
77EV	<b>OUTBOARD WHEEL MOTORS - EV.5.1.3</b> •Require interlock to open shutdown circuit if wheel assembly is damaged or knocked off car.					
78 B EV	<b>HV WIRING</b> •All TS wiring must be orange•GLV wiring must not be orange•TS wiring outside enclosures must have shielding or in protective conduit•Conduit or shielded cable must be strain relieved at each end•TS and GLV wiring in separate conduit and connectors (except interlock)					
79EV	<b>HIGH VOLTAGE DISCONNECT - EV.6.5</b> •Must be a removable/disconnectable element•Labeled HVD•Accessible without tools•Above 350mm from the ground					
79B EV	<b>HV CONNECTIONS</b> •Bolted connections must have positive locking•Soldering not allowed in high current path					
80EV	<b>TS PROTECTION</b> •Must not be possible to touch with 100mm x 6mm probe•Only tape for insulation is prohibited•TS wiring protected from damage•TS wiring not below chassis					
97EV	<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. •No excessive lash in joints and pivots.					
97B EV	<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.					

4 - EV Car Devices		Name	Judge	Judge	EV Vehicle Number	4C
		Check date				
Overall Specs		Team	Check	Recheck	Recheck (Write on the back if necessary)	
98EV	<b>VISIBLE ACCESS - IN.2.3</b> To all items on Tech Sheet without the use of mirrors, borescopes, etc					
101EV	<b>SEAT INTERFERENCE - T.2.5</b> • Seat does not redirect harness belts • Seat edges protected to prevent belt abrasion					
134EV	<b>TRACTIVE SYSTEM FIREWALL T.1.9</b> •Two layers; grounded aluminum between 0.5-0.7mm facing tractive system, •Electrically insulating•Strong enough to prevent puncture by 4mm screwdriver with 250N force facing driver. •Carbon Fiber not allowed to be layer facing driver					
135EV	<b>GLV FUSING</b> •All wiring protected by overcurrent protection with current rating <= ampacity of wire.					
136EV	<b>HV WARNING STICKERS</b> •Each housing/enclosure containing HV parts (except motor housings) must be labeled with "High Voltage" stickers					
138 EV	<b>CRITICAL FASTENERS F.10.3.3</b> •Any fastener used to mount the Accumulator Container.					
138 B EV	<b>MASTER SWITCHES</b> TS and GLVS master switch on the right side of the vehicle at the height of the drivers shoulders near roll bar. •GLVMS labeled "LV" and in center of red circle •TSMS labeled "HV", in the center of orange circle, and Minimum diameter = 40mm. •On and Off position of each switch is labeled. Both switches must be a rotary type with a removable handle. •The ON position must be in horizontal position. •Access from outside of car. •No relay. •Must kill ALL electrical systems. •Marked with international symbol. •Three switches labeled with Lightening Bolt symbol •TSMS has lockout for off position					
140 EV	<b>FOOT PEDAL ACCELERATOR</b> •The foot pedal must have a positive stop to prevent sensors from being mechanically overstressed. •Two springs must be used to return the accelerator pedal to the off position and each spring must work with the other disconnected. The springs in the APPS are not acceptable return springs.					
141EV	<b>FIREWALL</b> Rigid, nonflammable material. •Must separate the driver compartment from all components of high voltage system (including HV wiring). •Must be coated with an electrically insulating material on the driver side •Insulating material must be puncture and scratch resistant.					
S41 EV	<b>CHASSIS ACCUMULATOR ATTACHMENTS - F.10.5</b> • No more than 2 mounts per chassis tube • Mounts match SES documentation • Critical Fasteners match SES • Fastener shoulder length matches SES • Locking nuts must be replaced per mfg. schedule or measured to meet mfg. torque spec.					
S42 EV	<b>ACCUMULATOR ATTACHMENTS - F.10.5</b> • Points match SES documentation • All points exceed test load • >50mm separation to other points • Should avoid mounting to compartments without cell segments. • If corner mounted, one point <=50mm from each convex corner of the assembled segments.					

# 4 - EV Car Devices

Check date	
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Name	Judge	Judge	EV Vehicle Number	4D

## Overall Specs

Item	Description	Team	Check	Recheck	Recheck (Write on the back if necessary)
S43 EV	<b>SIDE IMPACT - ACCUMULATOR AND TRACTIVE SYSTEM - F.11.2.1</b> • An upper, lower, and full triangulating diagonals (or SES equiv.) are required. • Up to Upper SIS height or the top of the accumulator, whichever is lower. • Material size B beside Accumulator, Size C elsewhere. • 25mm gap around the accumulator should be present except at mount locations.				
S44 EV	<b>REAR IMPACT - ACCUMULATOR AND TRACTIVE SYSTEM - F.11.2.2</b> • An upper, lower, and fully triangulating diagonal (or SES equiv.) are required. • A fully structural path (triangulated if tube) back to the Upper and Lower SIS is required. • Reaching at least 240mm above the lower SIS. • Material Size B if Acc is <100mm away, Size C if Acc is >=100mm away. • Differential Mounts or Plates used as SES equiv. must fully overlap the upper and lower tubes. • Non-crushable objects should have 25mm gap to the accumulator.				
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

