

## 2022 Formula SAE Japan Local Rules Number 1

Issued: August 17, 2022 (Third Edition)

The purpose of this document is to inform of the local rules that must apply to 2022 Formula SAE Japan. Any additional local rules that become necessary must be posted on the FSAEJ official website as they become available. These local rules are valid for 2022 Formula SAE Japan only.

Formula SAE Japan Rules Committee

### **J2022-1-01 Relaxation of Rules for Year Vehicle (refer to Formula SAE® Rules 2022 GR.7.2.2, 2022GR.10)**

A vehicle is considered as First Year Vehicle when the team checked in at the reception of the FSAEJ event with the vehicle, not when the team registered.

### **J2022-1-02 Eligibility for Second Year Vehicle (refer to Formula SAE® Rules 2022 GR.7.3.2, 2022GR.10)**

As for EV Class, teams may use their chassis (frame and/or monocoque) built for the 2019 Formula SAE Japan event if the chassis meets or is modified to meet the applicable Formula SAE® Rules 2022.

### **J2022-1-03 Baseline Steel Material (refer to Formula SAE® Rules 2022 F.3.4.2)**

The baseline steel material must be a material that satisfies the following condition.

Mild or alloy steel with a minimum tensile strength of 290 N/mm<sup>2</sup> as guaranteed by a mechanical strength standard. The “STKM11A” is one of them.

### **J2022-1-04 Standard Impact Attenuator (refer to Formula SAE® Rules 2022 F.8.7.3.d)**

DuPont Styro Corporation's DX-45 is considered to be equivalent material to IMPAXX™ 700 for Standard Foam Impact Attenuator.

### **J2022-1-05 Thickness of the floor or bottom for Accumulator Container (refer to Formula SAE® Rules 2022 F.10.2.1.b)**

An aluminum sheet thickness of 3.2 mm (0.125 inches) must be accepted up to a negative tolerance of 10%.

### **J2022-1-06 Accumulator Attachment – Interpretation of Corner Attachments (refer to Formula SAE® Rules 2022 F.10.5.6.b)**

The phrase “the corner of the segment” in the Formula SAE® Rules 2022 may also be interpreted as “the corner of the container”.

### **J2022-1-07 Method of Inspection for Cockpit Opening and Internal Cross Section (refer to Formula SAE® Rules 2022 T.1.1.1, T.1.2.1)**

- (1) Template **T.1.2.1** may be moved vertically within 50 mm only in order to avoid interference with the rack and pinion unit.
- (2) Template **T.1.2.1** may be split into left and right sections to enable inspection even when the rack and pinion unit is positioned on the lower frame. In other words, the slit in template **T.1.2.1** may be extended to the top and bottom sides.

- (3) Template **T.1.2.1** must be placed perpendicular to an axis formed assuming a straight line from the cockpit to the pedals and moved parallel to that axis. During this movement, template **T.1.2.1** may be rotated within  $\pm 45$  degrees around the back and forth axis.
- (4) The splined part of the steering shaft may be excluded from the inspection range of Template **T.1.1.1**.

**J2022-1-08 Driver Harness Installation (refer to Formula SAE® Rules 2022 T.2.5 - T.2.7)**

The eyebolts used to attach the driver harness must meet JIS standard B1168-1994.

The diameter of the hook part of the M10 and M8 eyebolt must satisfy 8 mm (6.3 mm).

**J2022-1-09 Relaxation of Requirement for Use of Sensors with Different Transfer Functions as Accelerator Pedal Position Sensors (APPS) (refer to Formula SAE® Rules 2022 T.4.2.2, T.4.2.3)**

APPS does not need to satisfy the rule T.4.2.3.

**J2022-1-10 JSAE Logo (refer to Formula SAE® Rules 2022 VE.1.3)**

The Society of Automotive Engineers (SAE) logo as specified in the Formula SAE® Rules must be replaced by the logo of the Society of Automotive Engineers of Japan (JSAE). In other words, teams must display the JSAE logo in a prominent location on the front and/or both sides of the vehicle. The JSAE logo stickers to be supplied to the teams at the competition site have approximate dimensions of 210 mm (width)  $\times$  115 mm (height).

**J2022-1-11 Size of Technical Inspection Stickers (refer to Formula SAE® Rules 2022 VE.1.4)**

The stickers indicating that the technical inspection has been passed are divided into the parts, with total dimensions of 150 mm (width)  $\times$  100 mm (height).

**J2022-1-12 Transponder (refer to Formula SAE® Rules 2022 VE.1.5)**

Any transponder is NOT used.

**J2022-1-13 Quick Jack (refer to Formula SAE® Rules 2022 VE.2.1)**

It must be possible to move the vehicle at all times using the quick jack shown in the APPENDIX J-1 without any additional manual effort. It must also be possible to utilize the quick jack without interfering with the vehicle body (i.e., the cowling, undercover, and so on).

**J2022-1-14 Fire Extinguishers (refer to Formula SAE® Rules 2022 VE.2.3)**

- (1) Fire extinguishers with NO pressure gauges may be used. However, each fire extinguisher must be within its expiration date, and the operation lever seal must be in place. For fire extinguishers without a displayed expiration date, it must be within 5 years from the date of manufacture.
- (2) ABC fire extinguishers with a capacity of 1 kg are recommended.
- (3) CO2 fire extinguishers are adequate for outdoor use, but there is a risk of death in indoor use. Some measures, such as preparing ABC type for indoor use in addition to CO2 type for outdoor use, are needed.

Refer to <https://www.epa.gov/snap/carbon-dioxide-fire-suppressant-examining-risks>

**J2022-1-15 Driver's Equipment (refer to Formula SAE® Rules 2022 VE.3)**

The equipment in accordance with the latest standards which is equivalent or safer than Formula SAE® Rules 2022 is accepted.

**J2022-1-16 Fuel Allowed at FSAEJ (refer to Formula SAE® Rules 2022 IC.5.1.1)**

The fuel provided is only unleaded gasoline with Research Octane Number (RON) of 100.

**J2022-1-17 Fuel Supply (refer to Formula SAE® Rules 2022 IC.5.2)**

Teams may fully refuel the tank of the vehicle at the fueling station before undergoing the Technical Inspections.

**J2022-1-18 Fuel Tank and Exhaust Pipe distance (refer to Formula SAE® Rules 2022 IC.5.2.3)**

Teams must secure the clearance of the fuel tank and exhaust pipes to be no less than 50 mm. Otherwise (if teams cannot secure a clearance of 50mm), teams must add the heat shields with fireproof equal to that of a fire wall, which prevents the temperature of the fuel from being above 50% distillate temperature of JIS standard K2202-2012 during the vehicle is running, OR the evidence of its performance are required.

**J2022-1-19 Extracting fuel from the Fuel Tank (refer to Formula SAE® Rules 2022 IC.5.3.5)**

The Fuel System must have a provision for emptying the Fuel Tank without any electric motor pump.

**J2022-1-20 Coloring of Master Switches (refer to Formula SAE® Rules 2022 IC.9.4)**

In ICV Class, the Master Switches must be red.

The cockpit-mounted switches except the Master Switch must NOT be red.

**J2022-1-21 Energy Meter Specification (refer to Formula SAE® Rules 2022 EV.4.2.1 , AD.2.2.1)**

EV teams must use the Energy Meter distributed by the Competition Organizer for the Dynamic Event. The Specification of that, Formula Student Germany FSE2016 Energy Meter, will be on the team page. The following texts in the FSE2016 Energy Meter Specification must be read as specified.

「FSAE2016 Rule EV4.8」

⇒ 「Formula SAE® Rules 2022 EV.4.2」 ,

「If there are any questions, please do not hesitate to submit a rules question at the FSG website」

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**J2022-1-22 Scatter Shield (refer to Formula SAE® Rules 2022 T.5.3.2)**

The small gap between the Scatter Shields neighboring the hole of the motor casing is allowed. As for the hole on a vertical surface to the rotation axis, the Scatter Shield is unnecessary.

**J2022-1-23 Relaxation of Prohibition of Cell Balancing when Accumulator Isolation Relays (AIR) Are Open (refer to Formula SAE® Rules 2022 EV.6.4.3, EV.8.3.3)**

AMS excludes the application of EV.8.3.3 for cell balance function.

**J2022-1-24 Relaxation of Rule Relating to Placement of Temperature Sensor at Cell Negative Terminal (refer to Formula SAE® Rules 2022 EV.8.5.3, EV.8.5.4)**

If the team uses a ready-made Accumulator consisting of assembled cells (segments) and built-in temperature sensor without modification, Accumulator temperature sensors exclude the application of EV.8.5.3 and EV.8.5.4. If so, the team must state this to the Electrical Systems Form (ESF) and obtain the approval by the judges.

**J2022-1-25 Relaxation of Requirement for Electrical Connections to Use Positive Locking Mechanisms (refer to Formula SAE® Rules 2022 EV.7.4.3)**

The requirement to use Positive Locking Mechanisms described in EV.7.4.3 must be regarded as satisfied if the following conditions are all met.

Conditions: - The team can clearly demonstrate that the reasonable axial force or the contact pressure has been applied to the connections during the Electrical Technical inspection. (A record of the fastening torque or riveting bonding force is acceptable.)  
- Furthermore, the structure must allow no application of external force (tension, torsional, or flexural) from the wiring to the connection.

**J2022-1-26 Coloring of Shutdown Buttons (refer to Formula SAE® Rules 2022 EV.8.10)**

EV Shutdown Buttons must be red. Other than the cockpit mounted Shutdown Button, switches installed in the cockpit must not be red nor orange.

**J2022-1-27 Relaxation of Requirement for the Overcurrent Protection in the multiple parallel battery cells (refer to Formula SAE® Rules 2022 EV.7.6.3)**

When using parallel connected cells / strings, each parallel cell / string If the overcurrent protection element is designed to protect when all current flows through only one cell / string,

The overcurrent protection element excludes the application of EV.7.6.3.

If so, that must be stated on the Electrical Systems Form (ESF) and approved by judges.

**J2022-1-28 Relaxation of Rules for EV Chargers (refer to Formula SAE® Rules 2022 EV.9.2.4, EV.9.4.1)**

If the team understands and can execute all of the following (1) to (3), do not apply ① to ③ to the vehicle.

(1) The team describes the "charging procedure" and "charging abnormality procedure" in the Electrical System Form (ESF) and obtains the approval by the judges.

(2) When the team charges, carry the Electrical System Form (ESF) with the necessary points in (1).

(3) When the team charges, it must be possible to handle the abnormality according to the "charging abnormality procedure".

① Interlock function related to the connection status of the connector specified in EV.9.2.4.

② Function to turn off the charger by AMS specified in EV.9.4.1

③ Function to turn off the charger by IMD specified in EV.9.4.1

**J2022-1-29 Driver Egress Test (refer to Formula SAE® Rules 2022 IN.5.2)**

In the Driver Egress Test, the direction of egress (i.e., to the left or right of the vehicle) must be instructed by the judges at that time.

**J2022-1-30 Sound Measuring Procedure for CVT-Equipped Vehicles (refer to Formula SAE® Rules 2022 IN.10.1.1)**

Teams using a vehicle equipped with a CVT without a neutral position must prepare an apparatus that can safely hold the driving wheels in a completely floating state during sound measurement.

**J2022-1-31 Sound Measuring Procedure (refer to Formula SAE® Rules 2022 IN.10.1.2)**

There is no change to the measurement speed for engines used in 2019 Formula SAE Japan. The measurement speeds for other engines must be released on the team page later. The location of the microphone at an angle of 45° with the outlet in the horizontal plane must be instructed by the judges at that time.

Measuring time will be within 5 minutes from the microphone set up.

**J2022-1-32 Remeasurement of Noise (refer to Formula SAE® Rules 2022 IN10.4.3, IN10.5)**

- (1) The vehicle that completed the Endurance Event is subject to the noise test.
- (2) The method of the noise testing applies IN.10.1.2 and local rule J2022-1-34 correspondingly.
- (3) It calls a penalty as follows according to measurements.
  - Up to +1dB of Reference Value (RV) is NO penalty.
  - Over +1dB up to +2dB of RV is a penalty of 10 points.
  - Over +2dB of RV is a penalty of 20 points.

**J2022-1-33 Seals for the Rain Test (refer to Formula SAE® Rules 2022 IN.4.7.1, IN.11)**

The judges seal the vehicle in two stages.

Items 1 will be sealed before the rain test.

Items 2 will be sealed after the rain test passed.

Items 1: The items checked at the Electrical Technical Inspection (Accumulator Container(s), Motor, etc.).

Items 2: The items attached to the vehicle for waterproofing (tapes or the like).

Teams must retake the following inspection if these seals are peeled off.

Items 1: Simplified Electrical Technical Inspection for the related parts. The Rain test again in some cases.

Items 2: The Rain test again.

**J2022-1-34 Technical Inspection After the Endurance (refer to Formula SAE® Rules 2022 IN.15, D.14.1)**

The vehicles may be re-inspected after the Endurance and refueling are completed.

**J2022-1-35 Relaxation of BSPD inspection methods(refer to Formula SAE® Rules 2022 EV.8.7.5)**

The BSPD test excludes the application of EV.8.7.5.b.

If so, that must be stated on the Electrical Systems Form (ESF) and approved by judges.

**J2022-1-36 Relaxation of insulation distance when integrated circuits are used such as opto-couplers (refer to Formula SAE® Rules 2022 EV.7.5.7)**

Even if integrated circuits such as opto-couplers are used, the prescribed insulation distance described in

EV.7.5.7 does not apply within the integrated circuit package.

**J2022-1-37 Spare Accumulators (refer to Formula SAE® Rules 2022 EV.6.1.4)**

If spare Accumulators are to be used, they all must be of the same size, weight and type as those that are replaced.

**J2022-1-38 Relaxation of galvanic insulation per boundary between AMS segments (refer to Formula SAE® Rules 2022 EV.8.3.2)**

When using a commercial AMS with a data sheet without modification, the AMS excludes EV.8.3.2.

If so, that must be stated on the Electrical Systems Form (ESF) and approved by judges.

**J2022-1-39 Relaxation of Rules the shape holes and Openings for airflow (refer to Formula SAE® Rules 2022 F.10.4.4)**

The shape holes and openings for airflows excludes the application of F.10.4.4.a

**J2022-1-40 Proving Upper Side Impact Member and IA height (refer to Formula SAE® Rules 2022 F.6.4.4, F.8.5.6)**

The followings are accepted at the Technical Inspection:

(1) Photo evidence

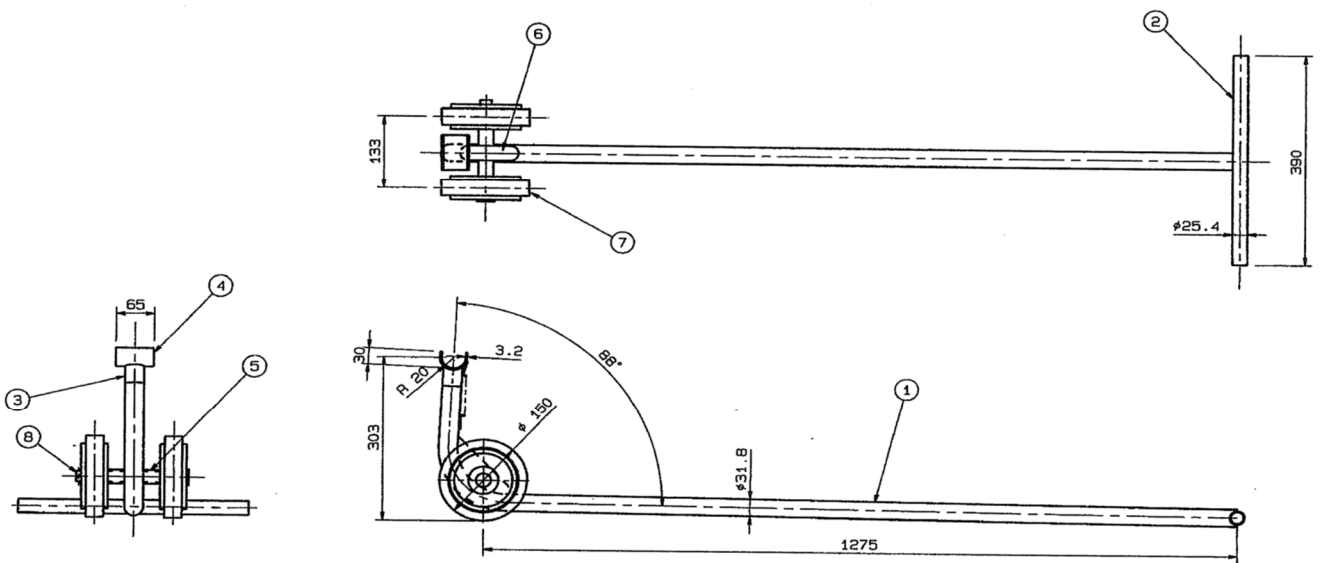
Teams may bring photo evidence shown in APPENDIX J-2 and skip the measurement.

(2) Team proposed measurement methods

Teams may propose measurement methods if they are appropriate.

If none of the above is presented, the Technical Inspectors indicate the measurement methods, and teams must follow them.

**APPENDIX J-1 (J2022-1-13) Quick Jack**



8	SHAFT	1	S45C	
7	TYRE	2		
6	GUSSET	1	SPCC t1.6	
5	HOUSING	1	SPCC t2.5, t12.3	
4	SUPPORT	1	SPCC t3.2	
3	NECK	1	SS400	
2	HANDLE	1	SINW25.4t1.6	
1	MAIN TUBE	1	SINW31.8t1.6	
	QUICK LIFT JACK	1		
NO	PART NO	NAME	QTY	MATERIAL



## APPENDIX J-2 (J2022-1-40) Proving Upper Side Impact Member and IA height

### Photo evidence

The photo evidence must provide the dimensions that can prove compliance to each rules.

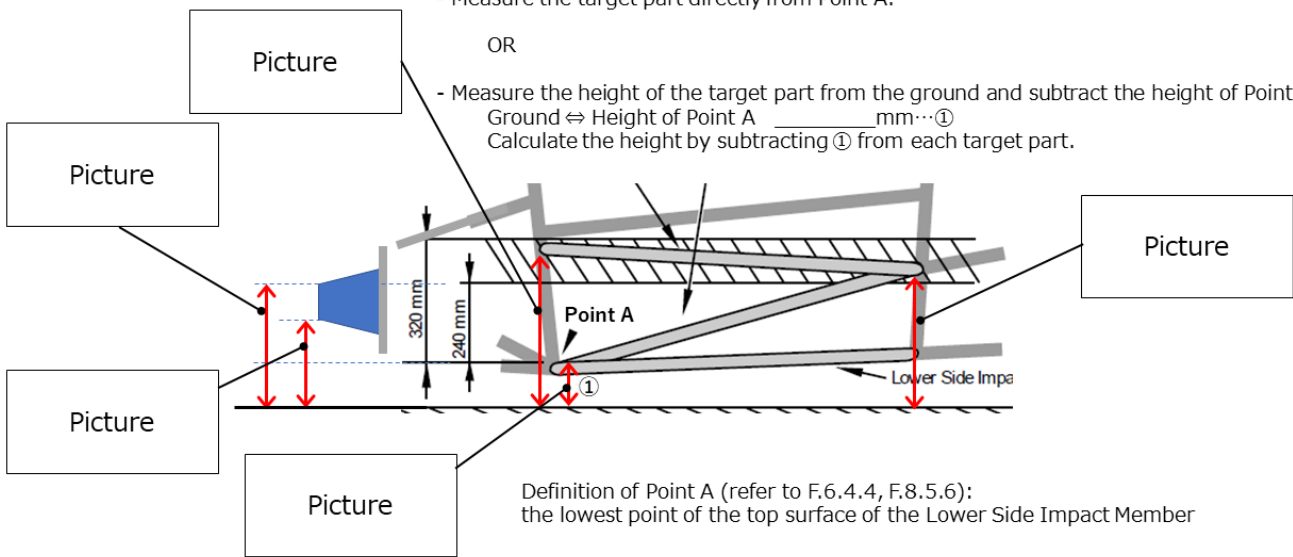
- Measure the target part directly from Point A.

OR

- Measure the height of the target part from the ground and subtract the height of Point A.

Ground  $\Leftrightarrow$  Height of Point A \_\_\_\_\_ mm...①

Calculate the height by subtracting ① from each target part.





**Revision Record:**

**[Second Edition]**

- J2022-1-27 Removed the words "Ready-Made segments of ".
- J2022-1-21 Error correction.

**[Third Edition]**

- J2022-1-40 Methods for proving of side impact structure height and IA height.
- APPENDIX J-2