2019 Formula SAE Japan Local Rules Number 1

Issued: May 13, 2019（Fourth Edition）

The purpose of this document is to inform of the local rules that must apply to 2019 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 2019 Formula SAE Japan only.

Formula SAE Japan Rules Committee

J2019-01 Relaxation of Rules for First Year Vehicle (refer to Formula SAE® Rules 2019 GR.7.3.2, FSAEJ2019 Participation Rules Article 9)

As for EV Class, teams may use their frame constructed for the 2018 Student Formula Japan event if the frame meets or is modified to meet the applicable Formula SAE® Rules 2019.

However as for ICV Class, the car still must have a completely new chassis (frame and/or monocoque) at least.

J2019-02 Baseline Steel Material (refer to Formula SAE® Rules 2019 T.2.3.1, T.2.4.3, T.2.5.3)

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^2 as guaranteed by a mechanical strength standard. The “STKM11A” is one of them.

J2019-03 Re-submission of Structural Equivalency Sheet (refer to Formula SAE® Rules 2019 T.2.4)

Re-submission of the Structural Equivalency Sheet must not be permitted unless specifically instructed. In the case that the calculations are not submitted before the due date or before the re-submission due date instructed by the Inspection judge, the team must be disqualified from participating in the technical inspection.

J2019-04 Baseline Steel Tubing (refer to rule T.2.5.1 of the Formula SAE® Rules 2019)

The minimum permitted outside diameter for steel tubing used for the Side Impact Structure and the like is as follows: Round 25.4 × 1.6 mm (wall thickness).

J2019-05 Attachment Height of Impact Attenuator (refer to Formula SAE® Rules 2019 T.2.23)

The center of the impact attenuator must be within 350 mm from the ground.

J2019-06 Method of Inspection for Cockpit Opening and Internal Cross Section (refer to Formula SAE® Rules 2019 T.3.1.1, T.3.2.1)

(1) Vertical movement within 50 mm must be permitted for template **T.3.2.1** only in order to avoid interference with the rack and pinion unit.

(2) Template **T.3.2.1** 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.3.2.1** may be extended to the top and bottom sides.

(3) Template **T.3.2.1** 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.3.2.1** may be rotated within ±45 degrees around the back and forth axis.

(4) The splined part of the steering shaft is excluded from the inspection range of template **T.3.1.1.**

J2019-07　Driver Harness Installation (refer to Formula SAE® Rules 2019 T.4.3～4.6)

M10 eye bolts used to install shoulder harness belts and lap belts must satisfy
Japanese Industrial Standard (JIS) B1168: 1994.
The diameter of eye bolt hooks must satisfy the 8 mm.

J2019-08　Relaxation of Requirement for Use of Sensors with Different Transfer Functions as Accelerator Pedal Position Sensors (APPS) (refer to Formula SAE® Rules 2019 T.6.2.2)

There is no requirement for APPS with two different transfer functions.

J2019-09　JSAE Logo (refer to Formula SAE® Rules 2019 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, the 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) × 115 mm (height).

J2019-10　Size of Technical Inspection Stickers (refer to Formula SAE® Rules 2019 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) × 100 mm (height).

J2019-11　Transponder (refer to Formula SAE® Rules 2019 VE.1.5)

Any transponder is NOT used in 2019 Formula SAE Japan.

J2019-12　Quick Jack (refer to Formula SAE® Rules 2019 VE.2.1.2)

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

J2019-13　Fire Extinguishers (refer to Formula SAE® Rules 2019 VE.2.3)

It is allowed to use a fire extinguisher without a pressure gauge. 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, less than five years must have passed since the date of manufacture. For example, 3-ABC type fire extinguishers and CO_2 fire extinguishers are recommended.

J2019-14　Driver's Equipment (refer to Formula SAE® Rules 2019 VE.3)

The equipment in accordance with the latest standards which is safer than Formula SAE® Rules 2019 is accepted.

J2019-15　Fuel Allowed at SFJ (refer to Formula SAE® Rules 2019 IC.5.2)

The only fuel that must be permitted is unleaded gasoline with a Research Octane Number (RON) of 100.

J2019-16　Fuel Supply (refer to Formula SAE® Rules 2019 IC.5.2)

It must be permitted to obtain a full tank of fuel at the fueling station before undergoing the Technical Inspections.

The fuel that must be permitted is supplied by the Competition Organizer only.

J2019-17　Fuel Tank and Exhaust Pipe distance (refer to Formula SAE® Rules 2019 IC.5.3.4)

Teams must secure the clearance of fuel tank and an exhaust pipe to be not less than 50 mm.

Otherwise (if teams cannot secure a clearance of 50mm), teams must add 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, and also submit the document to show the evidence of that.

J2019-18　Coloring of Master Switches (refer to Formula SAE® Rules 2019 IC.8.4)

In ICV Class, the master switches must be red.

The cockpit-mounted switches except the master switch are must be any colors excluding red.

J2019-19　Scatter Shield (refer to Formula SAE® Rules 2019 EV.2.1.4)

The gap between the hole of the motor casing and the scatter shield is allowed. As for the hole on a vertical surface to the rotation axis, the scatter shield is unnecessary.

J2019-20　Thickness of the floor or bottom for Accumulator Container (refer to Formula SAE® Rules 2019 EV.4.2.2 a)

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

J2019-21　Accumulator Attachment – Interpretation of Corner Attachments (refer to Formula SAE® Rules 2019 EV.4.3.6 b.)

The phrase “the corner of the segment” in the Formula SAE® Rules 2019 may also be interpreted as “the corner of the container”.

J2019-22　Relaxation of Rule Relating to Placement of Temperature Sensor at Cell Negative Terminal (refer to Formula SAE® Rules 2019 EV.5.1.4)

If the team uses a ready-made accumulator consisting of assembled cells (segments) that cannot be disassembled, the temperatures of the positive and negative terminals of the segments, and actual measured data from the measurement points of the temperature sensor installed inside the segment (time series data when charged at maximum current) must be clearly stated on the Electrical Systems Form (ESF). If rule EV.5.1.3 is satisfied by control using these temperature sensor values in its ESF, the team must not be required to satisfy rule EV.5.1.4.

J2019-23　Ready-To-Drive-Sound (refer to Formula SAE® Rules 2019 EV.6.11.4～EV.6.11.6)

The car doesn’t have to make a Ready-To-Drive-Sound.

J2019-24　Relaxation of Requirement for Electrical Connections to Use Positive Locking Mechanisms (refer to Formula SAE® Rules 2019 EV.6.5.12～EV.6.5.14)

The requirement to use positive locking mechanisms described in EV.6.5.12～EV.6.5.14 must be regarded as

satisfied if the following conditions are all met.

Conditions: - The team can clearly demonstrate that the reasonable axial force or 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.

J2019-25 Method of Driving the Tractive Systems Active Light (TSAL) via High-Voltage (refer to Formula SAE® Rules 2019 EV.6.10.1)

To ensure that the TSAL flashes during Accumulator Isolation Relay (AIR) welding even when the Grounded Low Voltage Master Switch (GLVMS) is OFF, the power supply of the TSAL (red) must be taken from the tractive systems (TS) (e.g., via the DC/DC converter or the like) to drive the TSAL. The power supply of the TSAL (red) must NOT be taken from the Grounded Low Voltage (GLV).

J2019-26 Flashing Requirements of TSAL (Green) (refer to Formula SAE® Rules 2019 EV.6.10.4)

Rule EV.6.10.4 must NOT apply to the lighting green light.

J2019-27 Relaxation of Prohibition of Cell Balancing when Accumulator Isolation Relays (AIR) Are Open (refer to Formula SAE® Rules 2019 EV.7.2.5)

This rule may be regarded as not applicable providing that the high voltage (HV) portions of the accumulator management system (AMS) are inside the accumulator container.

J2019-28 Coloring of Shutdown Buttons (refer to Formula SAE® Rules 2019 EV.7.4)

EV shutdown buttons must be colored red. Other than the cockpit mounted shutdown button, switches installed at the driver's seat must not be colored red or orange.

J2019-29 Relaxation of Rules for EV Chargers (refer to Formula SAE® Rules 2019 ~~EV.7.8,~~ EV.9.3)

Teams may be exempted from complying with the three rules described below if all of the following conditions are satisfied: The documents of 'Standard Charging Procedure' and 'Charging Abnormality Procedure' must be submitted at the same time as the Electrical System Form, team members must be fully trained in the application of these two documents to charging operations, these team members must constantly monitor the state of charging while in possession of these documents, and these team members must be capable of taking the appropriate measures if an abnormality occurs during charging.

(1) The interlock function related to the connection state of connectors described in EV.9.3.4
(However, the method used to confirm the connection state of the charger and accumulator must be clearly stated in the Standard Charging Procedure document.)

(2) The function to turn off the charger using the AMS described in EV.9.3.6
(However, it must be possible to visually confirm the detection state of the AMS at all times. In addition, the abnormality types of AMS, judgment methods, and charging stop methods must be listed in the Charging Abnormality Procedure document.)

(3) The function to turn off the charger using the IMD described in EV.9.3.7

(However, it must be possible to visually confirm the detection state of the IMD at all times. In addition, the abnormality types of IMD, judgment methods, and charging stop methods must be listed in the Charging Abnormality Procedure document.)

When this rule is applied, the Standard Charging Procedure and Charging Abnormality Procedure documents must be handled as component elements of the Electrical Systems Form (ESF).

In addition, the following items must be entered on the procedure documents.

-Standard Charging Procedure:

Protective equipment, method and procedure for attaching and detaching the accumulator container from the vehicle (including flowchart), chain of command, names of devices, charging completion criteria, items listed in (1) above

-Charging Abnormality Procedure:

Protective equipment, types of abnormal states, actions for handling each abnormality (including flowcharts), chain of command, names of devices, procedure for disconnecting wiring between accumulator container and charger, criteria for restarting or stopping charging after each abnormality, items listed in (2) to (4) above

J2019-30 Failure Modes and Effects Analysis (FMEA) (refer to Formula SAE® Rules 2019 EV.10.2)

Only From No.55 to 69 except No. 61 described on "FMEA" sheet of 2019 Failure Modes and Effects Analysis Template (File name: 2019-FMEA-Template.xls) are applicable.

J2019-31 Submission of the ESF or FMEA (refer to Formula SAE® Rules 2019 EV.10.3, FSAEJ2019 Participation Rules Article 12)

Re-submission of the Electrical System Form (ESF) or Failure Modes and Effects Analysis (FMEA) may be requested multiple times to ensure that these materials achieve a sufficient degree of completion. In the event that re-submission is required, a maximum of fifty (50) negative points will be penalized depending on the degree of completion of these materials at the final deadline. However, the combined penalty due to the degree of completion and due to the late submission defined in rule EV.10.3 must not exceed fifty (50) negative points in total. In addition, the order of the Electrical Technical Inspection must be determined based on the degree of completion of the ESF and FMEA, as well as the order in which the documentation is received.

J2019-32 Driver Egress Test (refer to Formula SAE® Rules 2019 IN.5.3)

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.

J2019-33 Sound Measuring Procedure for CVT-Equipped Vehicles (refer to Formula SAE® Rules 2019 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.

J2019-34　Sound Measuring Procedure (refer to Formula SAE® Rules 2019 IN.10.1.2)

There is no change to the measurement speed for engines used in 2018 Student Formula 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.

J2019-35　Re-measurement of Noise（refer to Formula SAE® Rules 2019 IN10.4.3, IN10.6）

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 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 ten points.
   - ・Over +2dB of RV is a penalty of 20 points.

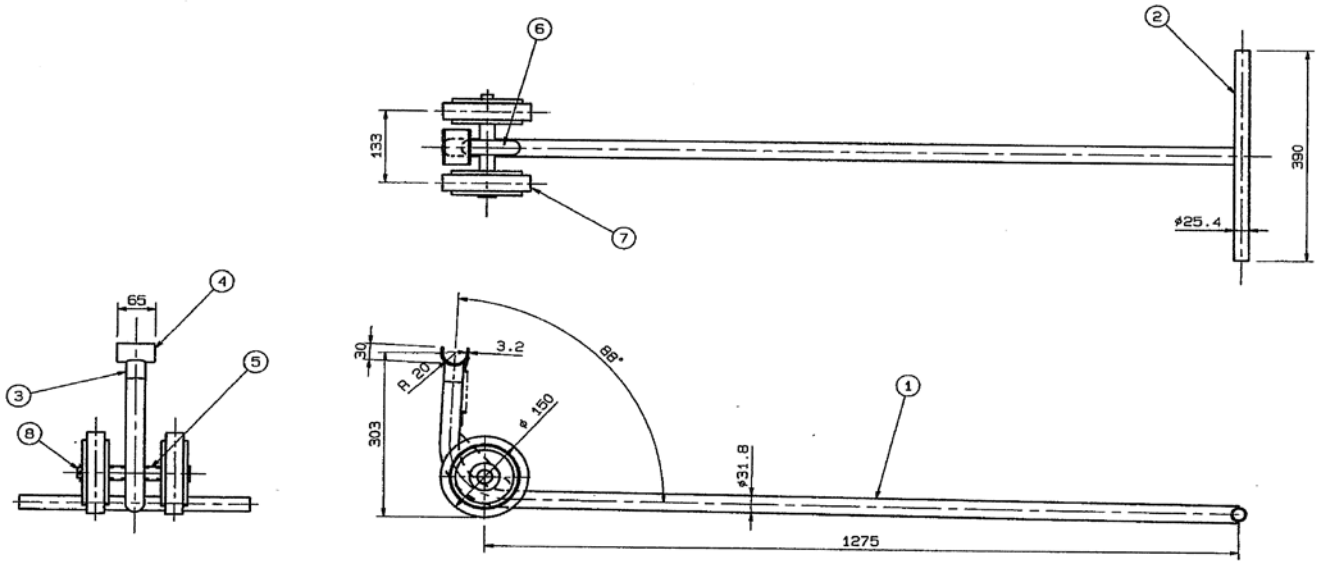
J2019-36　Seals after Rain Test (refer to Formula SAE® Rules 2019 IN.11.3)

After the rain test, seals must be applied to items attached to the vehicle for waterproofing (tape or the like). Teams must re-take the rain test if any of these seals are peeled off.

J2019-37　Permitted Changes after Inspection Approval (refer to Formula SAE® Rules 2019 IN.14.2.2)

Although the worn brake pads may be replaced, the car must be re-inspection if the positive locks such as wiring are removed.

APPENDIX　J-1 (J2019-12) Quick Jack



NO	PART NO	NAME	QTY	MATERIAL
8		SHAFT	1	S45C
7		TYRE	2	
6		GUSSET	1	SPCC t1.6
5		HOUSING	1	SPCC ϕ25.4xt2.3
4		SUPPORT	1	SPCC t3.2
3		NECK	1	SS400
2		HANDLE	1	STKM ϕ25.4xt1.6
1		MAIN TUBE	1	STKM ϕ31.8xt1.6
		QUICK LIFT JACK	1	

Revision Record

[Second Edition]

2018/12/26 J2019-21 Accumulator Attachment – Interpretation of Corner Attachments

2018/12/26 J2019-26 Lighting Requirements of TSAL (Green)

2018/12/26 J2019-29 Relaxation of Rules for EV Chargers

[Second Edition+]

2019/1/30 Correcting the defined terms: Refer to Formula SAE® Rules 2019 GR.4.1

Must - designates a requirement

Must NOT - designates a prohibition or restriction

Should - gives an expectation

May - gives permission, not a requirement and not a recommendation

[Third Edition]

2019/2/13 J2019-06 Method of Inspection for Cockpit Opening and Internal Cross Section

[Fourth Edition]

2019/5/13 J2019-10 Size of Technical Inspection Stickers (divided into the parts)