

## 2022 Formula SAE Japan Local Rules Number 2

Issued: June 13, 2022 (Second 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

### J2022-2-01 Schedule for Online Static Events (refer to 2022 FSAEJ Participation Rules Article 18, 19, 20)

**-Mid-July, 2022:** Guideline for Online Static Events.

**-End of July, 2022:** Static Document Results with penalties

**-August 29 and 30, 2022:** Presentation Event.

**-August 23, 24, 25, and 26, 2022:** Design Event. – TBD: Design FINAL Event.

**-August 31 and September 1 2022:** Cost and Manufacturing Event.

**Online platform will be Cisco Webex Meetings or Microsoft Teams.**

### J2022-2-02 Submission Documents for Static Events (refer to 2022 FSAEJ Participation Rules Article 13)

Category	Items to be submitted	Submission format at (file format/maximum size)	Submit to	Refer to	Deadline	Delay Deadline
Cost and Manufacturing Event	Cost Report : Electronic data		Team page	Local Rules J2022-2-10	14:00, June 1	14:00, June 3
	Entry sheet for Cost Report	dedicated format for FSAEJ, Excel/3M				
	Bill of Materials (BOM) *	dedicated format for FSAEJ, Excel and PDF				
	Cost calculation data (FCA) for each part*					
	*Total 300MB	Supporting documentation for cost calculation*	PDF			
	Cost Event Addendum (When there is a design change.)	PDF/20MB	Team page	Local Rules J2022-2-11	14:00, Aug. 24	-
Real case scenario	PDF/3MB	Team page	Local Rules J2022-2-17	14:00, Aug. 29	-	
Design Event	Design Documents		Team page	Local Rules J2022-2-22	14:00, June 14	14:00, June 16
	Design Briefing	PDF/25MB				
	Design Specification Sheet	Excel/3MB				
	Vehicle Drawings (3 View Drawing)	PDF/3MB		Local Rules J2022-2-22	14:00, July 14	14:00, Aug. 22
Presentation Event	Sales Presentation Document (SPD)	dedicated format for FSAEJ, PDF/10MB		Local Rules J2022-2-05	14:00, June 21	14:00, June 23
Static Photo	Photos of the assembly parts	PDF(zip)/30MB	Team page	Local Rules J2022-2-25	14:00, Aug. 1	-
	Photos of the vehicle	PDF(zip)/30MB			14:00, Aug. 22	-

The following penalty will be counted on the Overall Score

Category	Submission past deadline	Re-submission	Required level not achieved	Non-submission
Cost and Manufacturing Event	Uniform 20-point penalty	40-point penalty	Regarded as “not submitted”	Disqualified from FSAEJ or Penalized
Design Event		/		
Presentation Event				

**J2022-2-03 Document Screening for Static Events (refer to Formula SAE® Rules 2022 DR.3.4, 2022 FSAEJ Participation Rules Article 13)**

Judges chooses case A or case B if the following Documents of the Static Event is not submitted or equivalent to not submitted.

**In case of no-show on the day, penalty of 20 points will be counted.**

Events	Documents/Items	Case A	Case B
Cost and Manufacturing	Cost Report	Disqualified from FSAEJ	Removed from Cost and Manufacturing Event and score -100 points in Total Score
Design	Design Documents	Disqualified from FSAEJ	Removed from Design Event and score -20 points in Total Score
Presentation	Sales Presentation Document	Disqualified from FSAEJ	Removed from Presentation Event and score -20 points in Total Score

**J2022-2-04 Presentation Concept (refer to Formula SAE® Rules 2022 S.2.2 and 2021 FSAEJ Participation Rules Article 18)**

The concept for the Presentation Event in this year’s Formula SAE Japan (FSAEJ) is as follows.

Your company (use your school’s name as the name of your company) is currently working to design and sell an FSAE car.

The world of FSAE has shared the recent dramatic changes in the global environment and it is clear that sales will fall if companies carry on with the same strategy as before. Therefore, your company should create a plan to design and sell your FSAE car based on a new strategy that aims to boost sales.

In addition, continuing on from last year (or newly from this year, whichever is relevant), your company intends to outsource production to us (= a vehicle manufacturer).

For this reason, we have high expectations that your presentation will outline design and sales plans that fit the current social circumstances. Please note that since other companies will be making the same presentation today, the presentation time is limited to a maximum of ten minutes for each company.

**Assumptions**

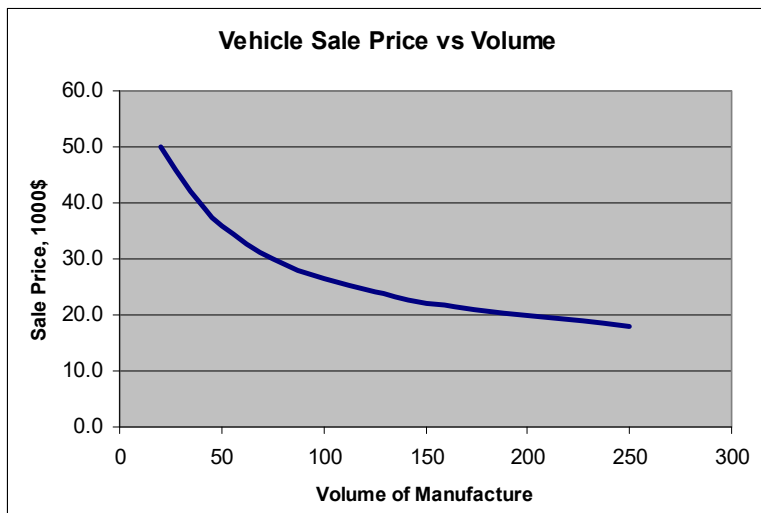
- Teams that participated in FSAEJ in a previous year are regarded as pre-existing companies and should refer to the presentation that they made that year as “the initial plan,” assuming that they are currently producing their car. Teams that did not participate in FSAEJ in a previous year are regarded as new companies entering the market and should present a new business plan.
- You cannot outsource only part production to us (except for parts for repair of vehicles that have already been sold).
- We (the manufacturer) include people with various different backgrounds (engineering, manufacturing, sales, marketing, materials, and the like) and different amounts of experience in each field.
- You should make your presentation assuming that we have read the Sales Presentation Document (SPD) thoroughly in advance.

These conditions apply to both teams participating for the first time and teams that have participated before.

**J2022-2-05 Submission of Sales Presentation Document (SPD) (refer to Formula SAE® Rules 2022 S.2.2 and S.2.4, and 2021 FSAEJ Participation Rules Article 13)**

The Sales Presentation Document (SPD) must be written using the following details as a basic concept.

- The philosophy of your company
- An outline of your company (its sector of industry, capital, number of employees, locations, sales, income, etc.)
  - \* The available capital and company scale should be defined in reference to the sales volume/price chart below. This chart should be linked with your business plan.



Volume of cars sold per year	Sale Price, \$
20	50,000
35	42,000
50	36,000
75	30,000
100	26,500
125	24,000
150	22,000
250	17,900
500	14,600
750	13,400
1,000	12,600

- Information about your company’s awareness of the business environment in and after 2022, and how your business or design reflects these trends (for example, how carbon neutrality or the post-COVID-19 situation relates to your business or design).
- Market analysis
- Sales strategy
- The link between sales and the strategy and performance of your car (including basic specifications and performance)
- An effective design concept aimed at us as a manufacturer
- Business targets: profitability by year X after founding the business, accumulated losses eliminated by year Y, etc.
- Basic specifications (consistency with the Design Briefing)
- Main performance targets (consistency with the Design Briefing)

Descriptions in this document related to the car to be sold are required to be consistent with the Design Briefing (i.e., the content of the Design Briefing must be referenced, the car must be the same car, and the like). However, teams are permitted to make changes related to cost in accordance with the business plan.

The minimum font size in the Sales Presentation Document must be 10-point for both Japanese and English descriptions (10-point as defined in desktop publishing (DTP) software applications), and uniform font sizes must be used.

The number of pages and format may not be changed. Entry must be made into the specified yellow fields. The gray explanations in the yellow fields should be deleted.

The purpose of this document is to describe details. This means that the form should be completely filled in without omissions using logical and convincing language.

If the content of this document could be mistaken for the same as a previously submitted document or the descriptions are judged to be flimsy or lacking proper study, then this document will be regarded as “not submitted.”

(We expect at least two-thirds of the document to be completed and it will be compared with previous years’ SPDs.)

**J2022-2-06 Procedure for Presentation Event (refer to Formula SAE® Rules 2022 S.2.3, S.2.5, and S.2.6, and 2021 FSAEJ Participation Rules Article 18)**

The following times are allotted to each team in the Presentation Event: no more than 15 minutes to set up the

necessary equipment, no more than 10 minutes for the actual presentation, and a question and answer session lasting approximately 5 minutes.

Teams that fail to set up their equipment or prepare to speak within the allotted time and cannot begin their presentation at the scheduled time shall be disqualified and receive 0 points.

Details about access to the Presentation Event venue (including the online venue), the methods of setting up equipment before the event starts, and the like will be described in a handbook to be published at a later date.

Teams that fail to finish their presentation within the allotted time shall be cut off and points awarded based on the material presented within the allotted time.

Presentations shall be carried out by a maximum of three team members, including those participating in the question and answer session and those operating the equipment.

A maximum of six people are permitted to be present in the online presentation venue during the presentation, including members of the audience. The audience is not permitted to assist the presentation team in any way, including the setting up and removal of equipment, participation in the question and answer session, and time keeping. If such assistance is discovered, the presentation shall be suspended immediately and the team shall be awarded 0 points.

### **J2022-2-07 Evaluation Criteria (refer to Formula SAE® Rules 2022 S.2.7, 2022 FSAEJ Participation Rules Article 18)**

If an inconsistency exists between the presentation and Sales Presentation Document, the details must be announced at the beginning of the presentation.

### **J2022-2-08 Cost and Manufacturing Event (refer to 2022 FSAEJ Participation Rules Article 19)**

#### **1. Cost Report**

In accordance with Local Rules **J2022-2-10**, each team must submit as electronic data a Cost Report containing (1) Bill of Materials (BOM), (2) Cost estimate data for each assembly or part (FCA), and (3) Supplement documentation for cost estimation.

The Cost Report must be submitted using a storage service as instructed in the Cost Report Entry Sheet (issued separately).

In addition, teams must fill in the necessary items and submit the Cost Report Entry Sheet via the team page by the Cost Report submission deadline. Teams may not update the electronic Cost Report data in the storage service after submission of the Cost Report Entry Sheet.

The configuration of the electronic Cost Report data to be submitted must be in accordance with the Local Rules **J2022-2-10**.

#### **2. Re-Submission of the Cost Report**

In the event that a serious insufficiency is found with the electronic data of the Cost Report submitted by the team, the judges may request the team to resubmit the electronic data of the Cost Report. The method of resubmission must be instructed when the resubmission request is issued. Re-submission requests are scheduled to be issued in around the middle of June 2022.

Teams that are requested to resubmit the Cost Report must resubmit the electronic data within 48 hours of the request. A request to resubmit the Cost Report will generate a 40-point penalty. Teams that fail to resubmit when requested to do so will be regarded as “not submitted”.

#### **3. Non-Submission of the Cost Report**

In addition to rule DR.1.2.5 of the Formula SAE® Rules 2022, the Cost Report must be regarded as “not submitted” in the following cases.

- a. If resubmission of the Cost Report is requested but the Cost Report is not resubmitted by the deadline.
- b. If the BOM is incomplete.
- c. If the cost estimate data for each assembly or part (FCA) is incomplete.

## **J2022-2-09 Preconditions for Preparation of Cost Report (refer to Formula SAE® Rules 2022 S.3.4, S.3.8)**

The costs estimated in the Cost Report do not include R&D cost, Overhead cost, profits, and the like.

Production of the formula car is defined as 1,000 units per year, and 3,000 units per life.

In addition, in creating the cost report, the team must use the FSAEJ cost table posted separately on the team page.

## **J2022-2-10 Submission Items for Cost and Manufacturing Event (refer to Formula SAE® Rules 2022 DR.1 - DR.3, S.3.4, S.3.5)**

For FSAEJ, the FSAE Online website must not be used to prepare the Bill of Materials (BOM) and cost estimate data (FCA).

The Cost Report must submit the following electronic data.

The structure of the electronic data to be submitted must conform to the Local Rules Appendix J-4 or J-5.

### **1. Bill of Materials (BOM)**

This is a sheet for estimating the cost of one whole vehicle unit. This sheet must be submitted using the official FSAEJ format (to be posted on the team page in early February 2022). If submitted in a different format, the Cost Report will be judged as “not submitted.”

In addition, teams must submit both the Excel file and their converted PDF file using the software in Excel.

\* File name and file format:

**Carnumber\_abbreviatedschoolname\_FSAEJ\_CR\_BOM.xlsx**

**Carnumber\_abbreviatedschoolname\_FSAEJ\_CR\_BOM.pdf**

(The abbreviated school name must consist of no more than 30 letters.)

### **2. Cost estimate data for each assembly or part (FCA)**

These are sheets for estimating the cost of each assembly or part. These sheets must be submitted using the official FSAEJ format (to be posted on the team page in early February 2022). If submitted in a different format, the Cost Report will be judged as “not submitted.”

FCA must be divided into each system shown in the Local Rule Appendix J-2 and J-3.

In addition, teams must submit both the Excel files and their converted PDF files using the software in Excel.

\* File name and file format:

**Carnumber\_abbreviatedschoolname\_FSAEJ\_CR\_FCA\_system designation.xlsx**

**Carnumber\_abbreviatedschoolname\_FSAEJ\_CR\_FCA\_system designation.pdf**

(The abbreviated school name must consist of no more than 30 letters.)

NOTE: Photographs or drawing data must NOT be included in the BOM and the FCA.

### **3. Supplement documentation for cost estimation**

These are materials that provide evidence to support the accuracy of the figures required to calculate the costs of each part. Any format is acceptable.

The supplement must be divided into each system shown in the Local Rule Appendix J-2 and J-3.

\* File name and file format:

**Carnumber\_abbreviatedschoolname\_FSAEJ\_CR\_Suppl\_system designation.pdf**

(The abbreviated school name must consist of no more than 30 letters.)

The supplement must include the following materials as a minimum requirement.

- a. Parts production drawings (three-view drawings) or materials equivalent to parts production drawings (three-view drawings) for parts defined as “Made” in Formula SAE® Rules 2022 S.3.9 (see the Cost

Tables and Formula SAE® Cost Event Supplement CR.2).

- b. In the case of composite parts, the material compositions, structures, and processes of each component part in addition to parts production drawings (three-view drawings) or materials equivalent to parts production drawings (three-view drawings).
- c. In the case of wire harnesses, wiring diagrams in addition to parts production drawings or materials equivalent to parts production drawings.

In addition, for EVs, separate parts production drawings (or materials equivalent to parts production drawings) and wiring diagrams must be prepared for the EV high-voltage wire harnesses (HV Wiring: System Engine and Drivetrain – EN-EV) and other wire harnesses (Wire Harness: System Electrical – EL-WH), and these must be saved in each system.

NOTE: The Excel file and the converted PDF file must have the same numerical value.

#### **J2022-2-11 Cost Event Addendum (refer to Formula SAE® Rules 2022 S.3.7)**

The Cost Event Addendum reflecting design changes implemented after the submission of the original Cost Report must use the official FSAEJ format (to be posted on the team page in the middle of July 2022). Addendum submitted in any other format will not be accepted.

In addition, revisions of calculation errors in the Cost Report and the like must not be included in the addendum.

Photos before and after the design change must be added to the addendum for online event.

Addendum must be submitted to the Judges in electronic data (PDF) by August 24 (before to the Cost and Manufacturing Event).

#### **J2022-2-12 Add Item Requests for Cost Tables (refer to Formula SAE® Rules 2022 S.3.8, S.3.10)**

The first version of the official Cost Tables for FSAEJ will be released at the end of March 2022 on the team page. If “Bought” parts, Processes, etc. used in the vehicle are not included in these Cost Tables, the team must submit an “Add Item Request” via the “Cost Table Add Item Request” page of the Q&A system. The completed “Add Item Request” Excel file (to be specified separately) and supporting documentation must be compressed using the zip format and submitted by 14:00 on April 25 (Mon.), 2022 (JST), Japan time. The final version of the Cost Tables incorporating this information will be issued in the middle of May, and their details will be frozen at this time.

If cost information shown in the final FSAEJ Cost Tables differs from that in the Formula SAE® Cost Tables, the FSAEJ version has the priority, even if the Formula SAE® Cost Tables feature an additional part.

If the Add Item Request could not be completed when creating the Cost Report and parts not listed in the Cost Tables need to be entered in the report, the team must appraise the costs of these items and identify them clearly in the Cost Report (e.g., through the use of colored cells). The Cost Judges may re-evaluate the costs and deduct points appropriately.

#### **J2022-2-13 Scoring of the Cost Report (refer to Formula SAE® Rules 2022 S.3.12)**

If the Adjusted Cost (including penalties) is found to exceed \$ 45,000 in the pre-screening procedure of the Cost Report, the Adjusted Cost will be defined as exactly \$ 45,000.

#### **J2022-2-14 EV incentives in the Cost Report (refer to Formula SAE® Rules 2022 S.3.12)**

Give incentive of \$ 8,000 to EV. In this way, as for the Adjusted Cost of EV, it will be reduced \$ 8,000.

#### **J2022-2-15 Scoring of the Cost and Manufacturing Event (refer to Formula SAE® Rules 2022 S.3.12, S.3.16)**

The points scoring in the Cost and Manufacturing Event will be as follows.

- |                     |                   |
|---------------------|-------------------|
| • Price Score:      | • Scenario Score: |
| • Discussion Score: | • Total Score:    |

0 to 40 points  
0 to 40 points

0 to 20 points  
0 to 100 points

FSAEJ does not use Penalty Points. Penalty A will be deducted from the Discussion Score. If the Discussion Score becomes zero, all remaining penalties will be calculated as Penalty B and added to the Adjusted Cost.

**J2022-2-16 Submitted Items for EV Cost Report Review (refer to Formula SAE® Rules 2022 S.3.13)**

On the day of the Cost and Manufacturing Event, if requested by a Cost Judge, photographs of dedicated EV parts that are not visible due to enclosure within a sealed structure or the like must be submitted as evidence of the cost estimation for those parts.

Teams unable to submit photographs on request will be penalized a maximum of 20 points.

**J2022-2-17 Procedure for the Cost and Manufacturing Event (refer to Formula SAE® Rules 2022 S.3.13, S.3.15)**

The Cost and Manufacturing Event will be held online on specified dates. For details on how to set up the Online Event, please refer to the Guideline for Online Static Events to be published.

A maximum of six team members may be present in the online system to explain the necessary items. During the judging, these team members may be interchanged freely.

(1) Confirmation of consistency between the Cost Report and the Cost Photos, and feedback of document screening results (15 minutes)

The Judges will confirm the consistency between pre-submitted the Cost Photos, Cost Report and Cost Addendum. If any inconsistencies are discovered, penalties will be awarded in accordance with FSAE® Rules 2022 S.3.14.

The Judges will also provide feedback on the Cost Report judging results and discuss the Cost Report with the team.

If necessary, the judge will request additional photos. The team must have photos ready that may be required during the online review.

(2) Real case scenario (Cost Scenario) (15 minutes)

The issues for the real case scenario that affect cost and manufacturing will be disclosed in early August. (These issues will be posted on the team page.)

Teams must report the results, which they have considered in advance based on these issues, to the Judges (5 minutes).

Teams must submit electronic data (PDF) of the materials to be reported by August 29.

The Judges will question the team about this report and ask for additional explanations as necessary (10 minutes).

(3) Delays in starting time

The scheduled finishing time of judging will not be adjusted if the start of judging is delayed by the team.

If the start of judging is delayed by 10 minutes or more, the real case scenario will be omitted. In this case, the team will be scored 0 points in the Scenario Score.

**J2022-2-18 Cost Audit (refer to Formula SAE® Rules 2022 S.3.14)**

FSAEJ does not perform a Cost Audit since the Cost Reports are subject to document screening.

**J2022-2-19 Excluded Items for Cost Report (refer to Formula SAE® Cost Event Supplement\_V2.0 CS.5, Local Rule J2022-1-28)**

The Ready-To-Drive-Sound (Tractive System Active Sound (TTAS)) does not have to be included in the Cost Report.

### **J2022-2-20 Part Numbering on Drawings (refer to Formula SAE® Cost Event Supplement\_V2.0 CL.2)**

Parts production drawings (three-view drawings) or materials equivalent to parts production drawings (three-view drawings) attached as supporting documentation for the Cost Report must include part numbers and the abbreviated name of the school.

### **J2022-2-21 Design Event (refer to 2022 FSAEJ Participation Rules Article 20)**

In order to ensure fair and accurate judging, **the Static Photos** will be required in addition to the Design Documents (Design Briefing, Design Spec Sheet **and Vehicle Drawings**).

### **J2022-2-22 Design Documents (refer to Formula SAE® Rules 2022 DR.2, S.4.2)**

**The Design Documents must consist of the Design Briefing, Design Spec Sheet and Vehicle Drawings.**

The requirements on Design Briefing are on the 2022 Design Review Briefing PPT Template published on FSAE Online. The language in Design Briefing is English only.

The following dimensions must be included in **Vehicle Drawings** as a minimum requirement: overall length, overall width, overall height, wheelbase, front and rear track, and minimum ground clearance.

NOTE: The design review process begins when the Design Documents are submitted. Teams should understand the significance of the Design Event and submit a highly complete documentation.

### **J2022-2-23 Procedure for Design Event**

The Design Event will be held online on specified dates. For details on how to set up the Online Event, please refer to the Guideline for Online Static Events **to be published**.

The Online Design Event will be conducted by connecting the team's location to the judges via Web Conference. Be ready to connect at least 5 minutes before the instructed time with the vehicle and support materials in front of the team members. A maximum of six team members may be present in the online Design Event. To avoid crowding, the vehicle should be located in a well-ventilated area, and the team members are sure to practice social distancing. The web conference can be accessed 3 minutes before the event.

At the designated time, the judges will have 2 minutes to introduce their expert area and the teams will have **15** minutes to describe their vehicles. At this point, the vehicle should have cowls and ready to drive. Next, we remove the cowl and move to the breakout room, which is divided into three areas: suspension, powertrain, and body. Therefore, the team needs at least three devices to connect to the web conference. (It is the best for all six members to have their own individual devices).

The Q&A session in each breakout room is limited to **45** minutes. In Q&A session team members do not have to stick to show Design Briefing but may show additional information such as video of each part of the vehicle or prepared verification data, etc. Then return from each breakout room for a brief 3-minute review.

There are two stages for Design Event: the first online Design judging for all teams, and the Design Finals for a few teams selected from the online Design judging. **The Design Finals may be held on-site.**

The Online Design Event may be recorded. Also, depending on the status of COVID-19 infection, online judging with the actual vehicle will not be conducted. In this case, the online judging will be conducted using only the Static Photos and materials prepared by teams.

Design Free Talk schedule and procedure will be defined in the Guideline for Online Static Events.

### **J2022-2-24 Insufficient Redesign**

Copying of content from a previous Design Report, or expressions that closely resemble previous content must result in the corresponding components being defined as insufficiently redesigned, and points must not be scored. If more than one-third of the Design Briefing (including drawings) are judged as a copy from a previous, all Design Documents will be regarded as “not submitted”.



### **J2022-2-25 Static Photo: Submit vehicle and assembly parts photos for online review of the Static Events**

The team must submit photos of the vehicle and assembly parts for online review of the Cost and Manufacturing Event and Design Event.

- Photos submission deadline
  - Photos of the vehicle. : August 22
  - Photos of the assembly parts. : August 1 (Only a sub system will be admit to be submitted on August 23 if there are any unfinished assembly parts.)
- State of the photos
  - Photos of the vehicle. : must follow the Appendix J-6.
  - Photos of the assembly parts. : must be photos that can identify the specifications of the assembly parts.
- Photos submission format : PDF
- PDF file name
  - Photos of the vehicle is “Vehicle” only
  - Photos of the assembly parts is 22 PDF files. (EV is 21 PDF files)
  - Must follow Local Rule “Appendix J2” and “Appendix J7”.
  - In the photos of assembly parts, write the assembly parts number for each photos.
  - The assembly parts number must be the same as the one listed on the BOM of Cost Event.

### **J2022-2-26 Understanding of Flags Used in Dynamic Events (refer to Formula SAE® Rules 2022 D. 4)**

Only team members that pass the Flag Test\* in the Technical Inspection will be permitted to drive in the Dynamic Events. Team members that have passed the Flag Test will be awarded a driver’s wristband. Drivers without a wristband must not be permitted to participate in the Dynamic Events. The maximum penalty for any irregularity will be disqualification from the relevant events. \* Flag test: Team members must be shown several types of flags and asked to promptly describe in words the actions that must be taken in reaction to the flag (e.g., red flag = come to an immediate safe controlled stop, etc.).

### **J2022-2-27 Participation in the Acceleration, Skid-Pad, and Autocross Events (refer to Formula SAE® Rules 2022 D9. - D.12)**

1. Cars in the ICV and EV classes will participate together in these events under mixed running conditions (these cars will not participate in these events at separate times).
2. In the heats of each event, one driver may perform two runs. After completing the first run, the driver may join the line of cars waiting in the start lane. Therefore, if a car pulls out due to mechanical problems or the like during the first run, the car will not be permitted to make the second run.
3. If a car pulls out before receiving the instruction to begin the first run (i.e., the official start instruction), the car may be permitted to start by re-joining the waiting line for the start lane.

### **J2022-2-28 Participation in the Endurance and Efficiency Events (refer to Formula SAE® Rules 2022 D.12, D.13)**

1. Cars that fail to record a lap time in the Autocross event within 133% (in the case of ICVs) or 145% (in the case of EVs) of the fastest lap time (all times in this section include penalties) recorded by all ICVs and EVs will not be permitted to participate in the Endurance and Efficiency events.
2. ICVs and EVs will be divided respectively into Groups A, B, and C in order of the fastest lap times recorded in the Autocross event. The Endurance Event will be held on the first day for Groups B and C, and on the second day for Group A.
3. The running order for Groups B and C will start from the cars with the fastest laps recorded in the Autocross event. The running order for Group A will start from the car with the slowest lap recorded in the Autocross event.
4. The Run order of EV Class takes into consideration the battery charging time.
5. Only 2 or 3 cars will be permitted to be on the course at the same time. \* However, it may be necessary

to change rule J2022-2-31 because of the weather or other circumstances. In this case, any changes in the rule will be announced in advance. (Refer to Formula SAE® Rules 2022 D.5)

**J2022-2-29 Limitation on Number of People in Driver Change Area for EV Class Endurance Event (refer to Formula SAE® Rules 2022 D.12.7.1.b)**

For the EV class, the three team members that are permitted to be in the Driver Change Area may consist of (1) an ESO and two drivers, or (2) an ESO, a driver, and another team member.

**J2022-2-30 Cone Penalties in Endurance Event (refer to rule Formula SAE® Rules 2022 D.12.12.1)**

In the Endurance Event, if a car incurs more than nine cone penalties, the number of penalties will be rounded up to the nearest ten, and the car will be penalized by 30 seconds for each multiple of ten penalties.

However, any car that incurs more than 30 cone penalties will be classified as DNF.

\* 1 to 9 cone penalties = number of penalties × 2 seconds

\* 10 cone penalties = 30 seconds

\* 11 to 20 cone penalties = 60 seconds

\* 21 to 30 cone penalties = 90 seconds

**APPENDIX J-2 Systems in Cost Report (refer to Formula SAE® Cost Event Supplement\_V2.0 CL.1)**

The Cost Report must follow the organized list of Systems in the following sequence:

Area	System name	System Designation	Sub System name	Sub System Designation
1	Brake System	BR	Master Cylinder and Balance Bar	BR-MB
			Calipers and Discs	BR-CD
			Brake Lines and Other	BR-LO
2	Engine and Drivetrain --- ICV case ---	EN	Engine	EN-EN
			Intake and Exhaust	EN-IE
			Fuel	EN-FU
			Cooling	EN-CO
			Drivetrain	EN-DT
	Engine and Drivetrain --- EV case ---	EN	EV System	EN-EV
			Auxiliary Parts	EN-AU
			Cooling	EN-CO
Drivetrain			EN-DT	
3	Frame & Body	FR	Frame	FR-FR
			Cowl and Aerodynamic Parts	FR-CA
			Pedals and Shifter	FR-PS
			Final Assembly	FR-FA
4	Electrical --- ICV case ---	EL	Wire Harness	EL-WH
			Dash Panel and ECU	EL-DP
			Battery and Others	EL-BO
	Electrical --- EV case ---	EL	Wire Harness	EL-WH
			Dash Panel	EL-DP
			Others	EL-BO
5	Miscellaneous, Finish and Assembly	MS	-----	-----
6	Steering System	ST	Steering Rack	ST-RA
			Steering Wheel and Shaft	ST-WS
7	Suspension System	SU	Springs and Dampers	SU-SD
			Arms and Links	SU-AL
			Stabilizer	SU-ST
8	Wheels, Wheel Bearings and Tires	WT	-----	-----
---	Fasteners (regardless of where used)	FS	-----	-----

Assignment of Assemblies to each System is provided in the Local Rules Appendix J-3.

**APPENDIX J-3 System and Assembly List in Cost Report (refer to Formula SAE® Cost Event Supplement\_V2.0 CL.4, CL.5 and CL.6)**

**A) SYSTEM AND ASSEMBLY LIST – ALL VEHICLES**

**1. Brake System - BR**

**1-1. Master Cylinder and Balance Bar - BR-MB**

Brake Master Cylinder  
Balance Bar  
Clevis  
Hydraulic Fluid Reservoir  
Proportioning Valve

**1-2. Calipers and Discs - BR-CD**

Brake Rotor Floating Pins  
Front Brake Discs / Rotors  
Front Brake Pads  
Front Calipers  
Rear Brake Discs / Rotors  
Rear Brake Pads  
Rear Calipers

**1-3. Brake Lines and Other - BR-LO**

ABS Kit  
Banjo Bolts  
Brake Cooling Ducts  
Brake Fluid  
Brake Lines

**3. Frame & Body - FR**

**3-1. Frame - FR-FR**

Composite Monocoque Chassis  
Frame / Frame Tubes  
Mounts Integral to Frame

**3-2. Cowl and Aerodynamic Parts - FR-CA**

Cowl / Body  
Floor Pan  
Front Wing  
Rear Wing

**3-3. Pedals and Shifter - FR-PS**

Accelerator Pedal / Throttle Controls  
Brake Pedal  
Clutch Pedal / Lever  
Shifter  
Shifter Cable / Linkage

**3-4. Final Assembly - FR-FA**

Final Assembly

**5. Miscellaneous, Finish and Assembly - MS**

Driver's Harness  
Firewall  
Headrest / Restraints  
Impact Attenuator  
Mirrors  
Paint - Body

Paint - Frame

Seats  
Shields

**6. Steering System - ST**

**6-1. Steering Rack - ST-RA**

Rod Ends / Clevis  
Steering Rack  
Tie Rods

**6-2. Steering Wheel and Shaft - ST-WS**

Steering Shaft  
Steering Wheel  
Steering Wheel Quick Release

**7. Suspension System - SU**

**7-1. Springs and Dampers - SU-SD**

Front Bell Cranks  
Front Pushrods / Pullrods  
Front Shocks / Dampers  
Front Springs  
Rear Bell Cranks  
Rear Pushrods / Pullrods  
Rear Shocks / Dampers  
Rear Springs  
Rod Ends

**7-2. Arms and Links - SU-AL**

Front Lower A-Arms  
Front Upper A-Arms  
Front Uprights  
Rear Links  
Rear Lower A-Arms  
Rear Upper A-Arms  
Rear Uprights  
Rod Ends

**7-3. Stabilizer - SU-ST**

Front Suspension Stabilizer  
Rear Suspension Stabilizer

**8. Wheels, Wheel Bearings and Tires - WT**

Front Hubs  
Front Wheel Bearings  
Lug Nuts Rear Hubs  
Rear Wheel Bearings  
Tires  
Valve Stems  
Wheel Studs  
Wheel Weights  
Wheels

## **B) SYSTEM AND ASSEMBLY LIST – INTERNAL COMBUSTION VEHICLES**

### **2. Engine and Drivetrain - EN**

#### **2-1. Engine - EN-EN**

Engine  
Engine Mounts  
Engine Oil

#### **2-2. Intake and Exhaust - EN-IE**

Air Filter  
Carburetor  
Exhaust Manifold  
Intake Manifold  
Muffler  
Restrictor  
Throttle Body  
Turbocharger / Supercharger

#### **2-3. Fuel - EN-FU**

Fuel Filter  
Fuel Injectors  
Fuel Lines/Rails  
Fuel Pressure Regulator  
Fuel Pump  
Fuel Tank  
Fuel Vent / Check Valve

#### **2-4. Cooling - EN-CO**

Coolant  
Coolant Lines  
Hose Clamps  
Oil Cooler  
Overflow Bottles  
Radiator  
Radiator Fans

#### **2-5. Drivetrain - EN-DT**

Axles  
Chain / Belt  
CV Joints / U Joints  
Differential  
Differential Bearings  
Differential Mounts  
Differential Oil  
Shields  
Sprockets / Pulleys

### **4. Electrical - EL**

#### **4-1. Wire Harness - EL-WH**

Connectors  
Wire Harness

#### **4-2. Dash Panel and ECU - EL-DP**

CCM  
Dash Panel  
Data Logger  
Displays  
ECU / Engine Electronics  
Indicator Lights  
Switches / Buttons / Controls

#### **4-3. Battery and Others - EL-BO**

Battery  
Brake Light  
Bulbs  
Fuses  
Gages (any)  
Relays  
Solenoid

## C) SYSTEM AND ASSEMBLY LIST – ELECTRIC VEHICLES

### **2. Engine and Drivetrain - EN**

#### **2-1. EV System - EN-EV**

Accumulator Container  
Accumulator Isolation Relays (AIR)  
Accumulators / Batteries  
Battery Management System (BMS/AMS)  
CCM  
Cell Module  
Converter (AC-DC / DC-DC)  
ECU  
HV Wiring  
Inertia Switch  
Motor Controller  
Motor Mounts  
Motors

#### **2-2. Auxiliary Parts - EN-AU**

Isolation Monitoring Device (IMD)  
Tractive System Active Light  
TSMP

#### **2-3. Cooling - EN-CO**

Coolant  
Coolant Lines  
Hose Clamps  
Overflow Bottles  
Radiator  
Radiator Fans

#### **2-4. Drivetrain - EN-DT**

Axles  
Chain / Belt  
CV Joints / U Joints Differential  
Differential Bearings  
Differential Mounts  
Differential Oil  
Shields  
Sprockets / Pulleys

### **4. Electrical - EL**

#### **4-1. Wire Harness - EL-WH**

Connectors  
Wire Harness (LV)

#### **4-2. Dash Panel - EL-DP**

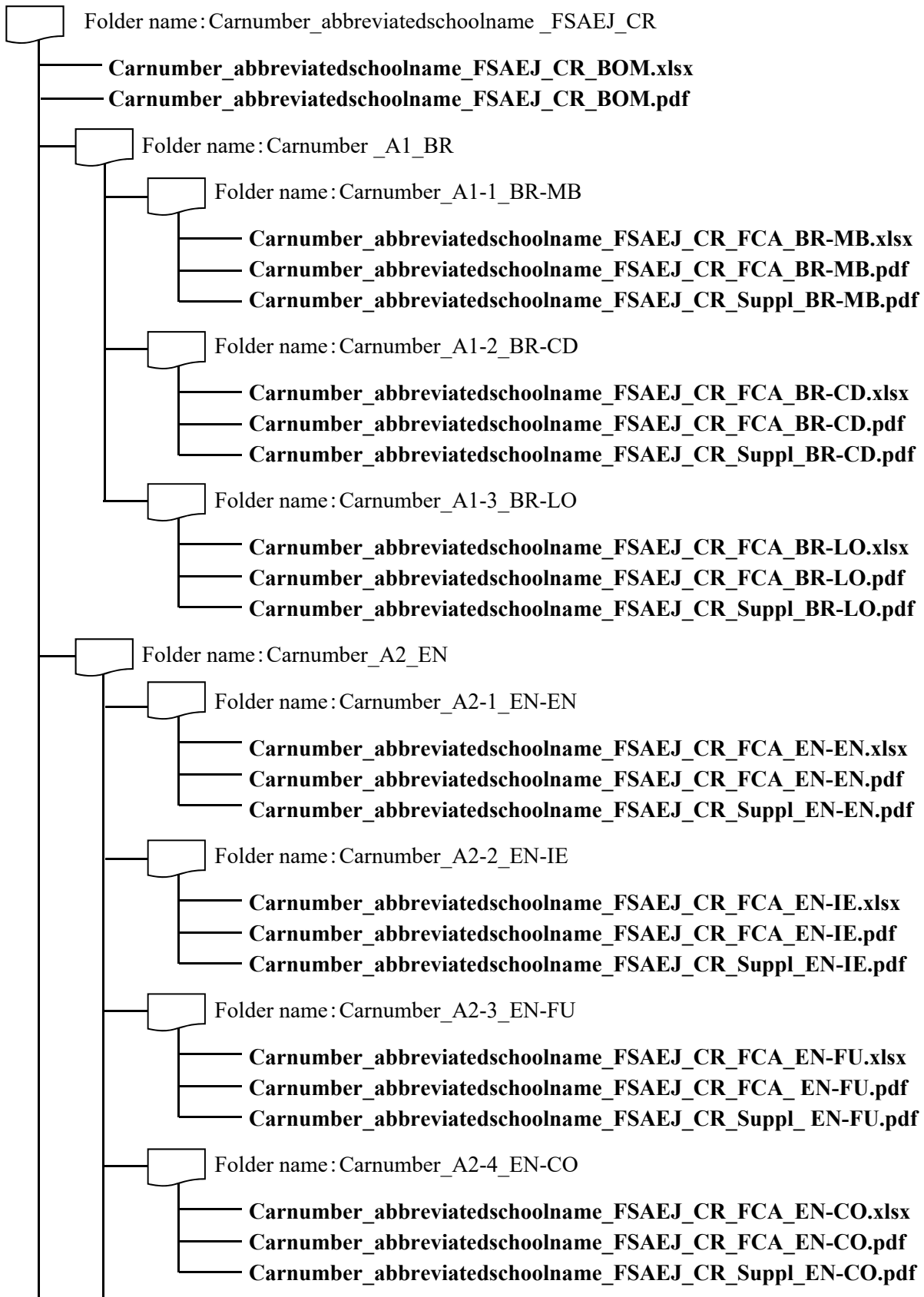
Dash Panel\_  
Data Logger  
Displays  
Indicator Lights  
Switches / Buttons / Controls

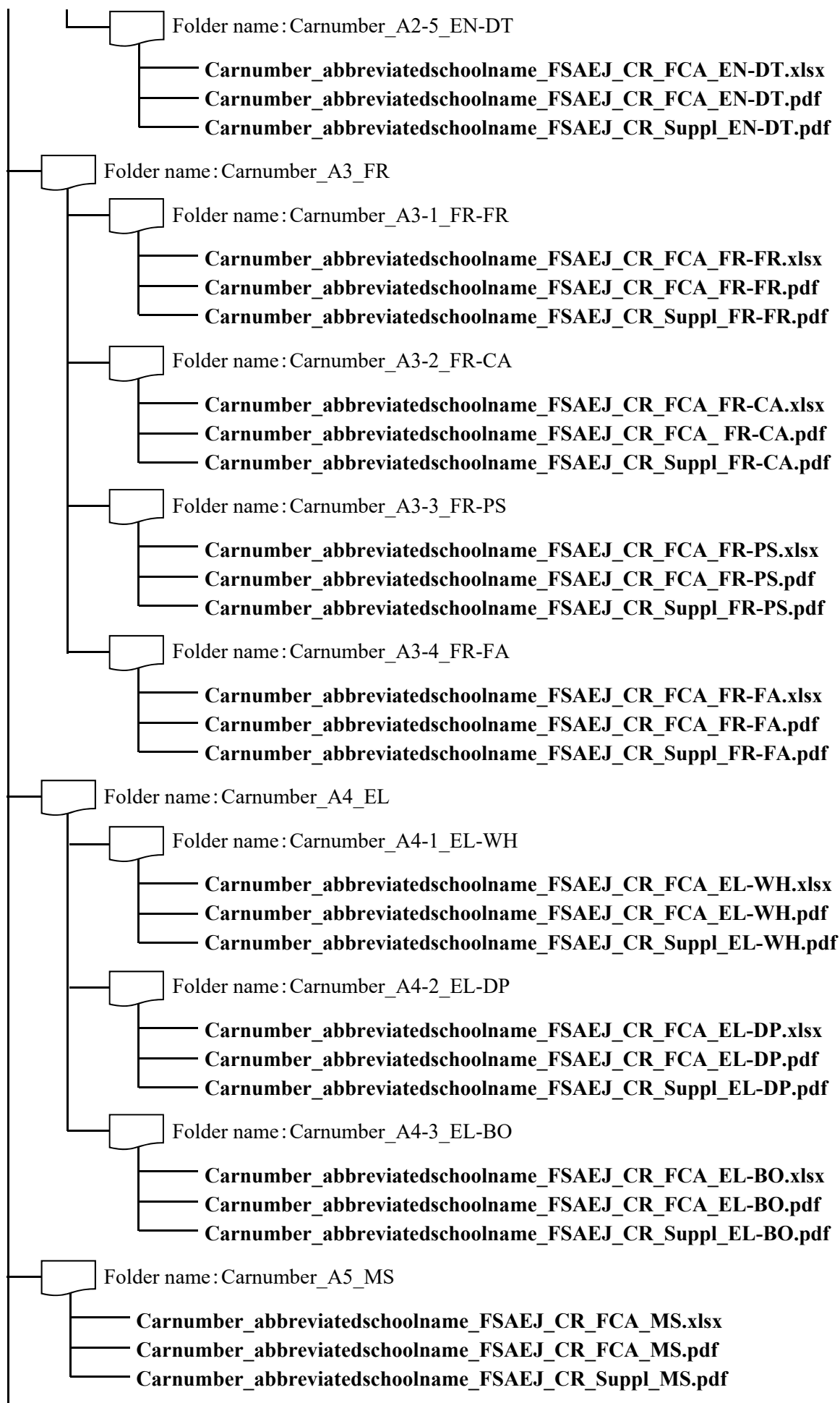
#### **4-3. Others - EL-BO**

Brake Light  
Bulbs  
Fuses  
Gages (any)  
Relays  
Solenoids

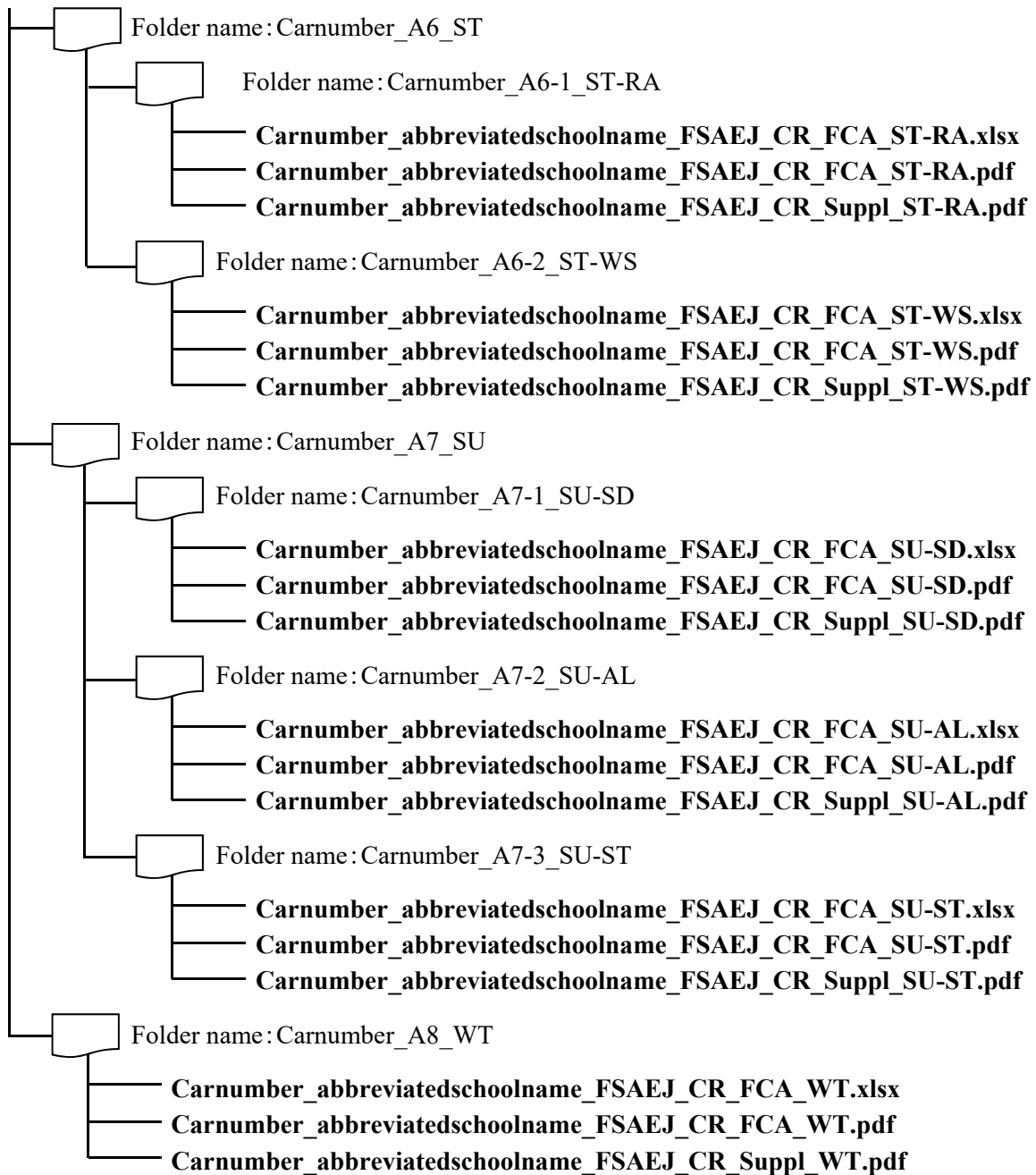
**APPENDIX J-4 Structure of Cost Report electric data – ICV case**

The folder hierarchy of cost report electronic data must be created in the hierarchy shown below. The abbreviated school name must consist of no more than 30 letters.



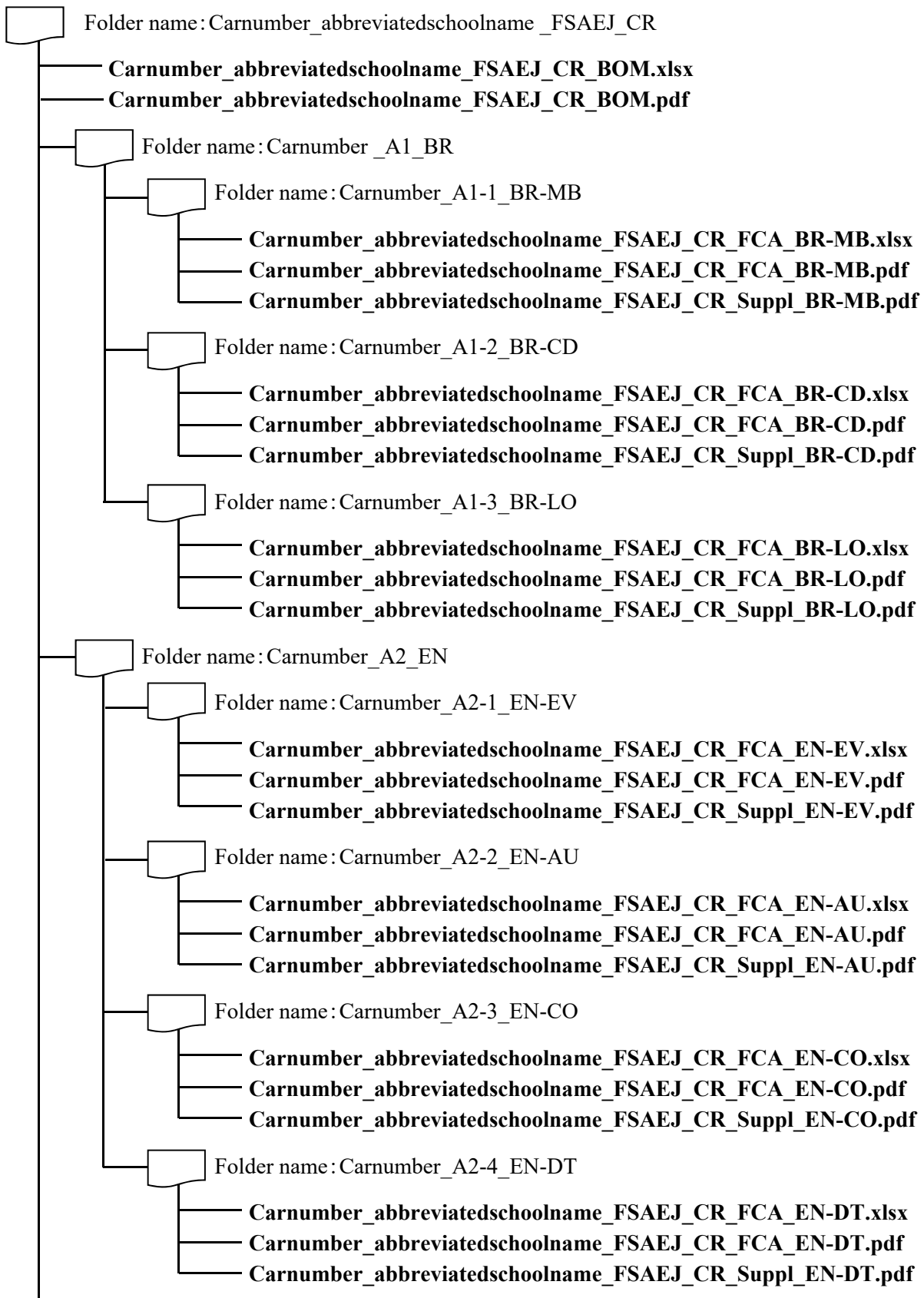


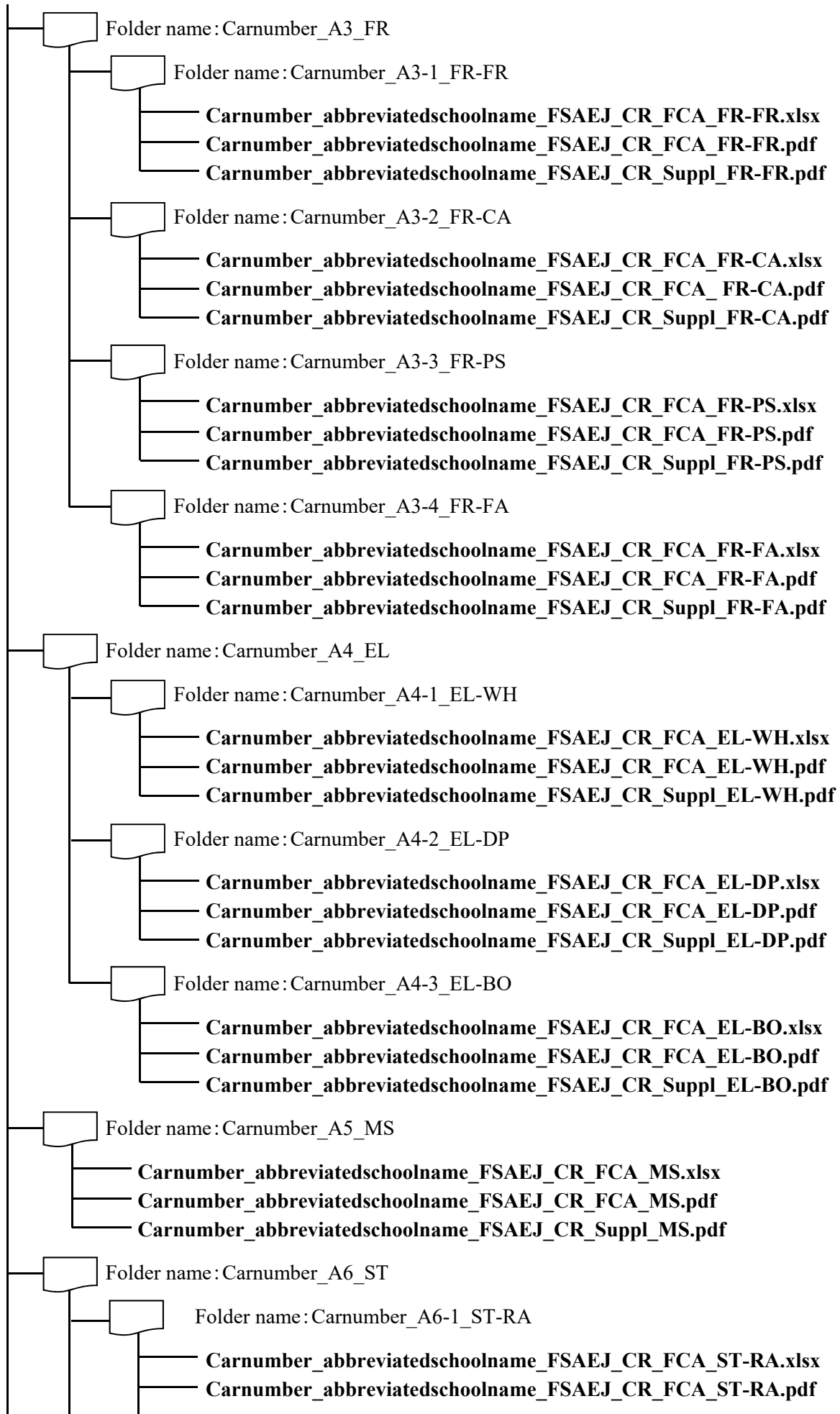


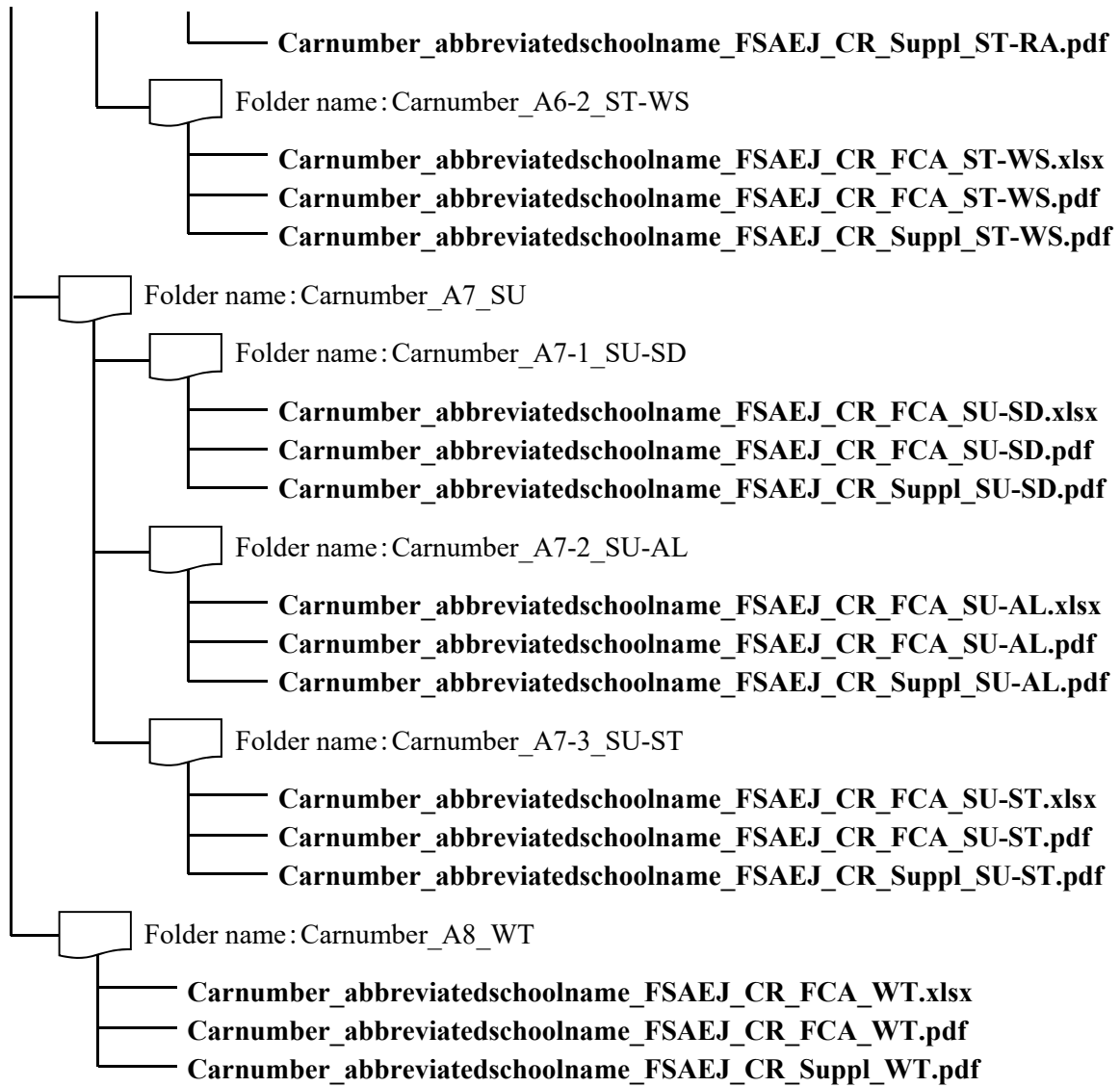


**APPENDIX J-5 Structure of Cost Report electric data – EV case**

The folder hierarchy of cost report electronic data must be created in the hierarchy shown below. The abbreviated school name must consist of no more than 30 letters.







**APPENDIX J-6 Photos of the vehicle**

Photos of the completed vehicle taken from the directions shown Figure A and B must be submitted.

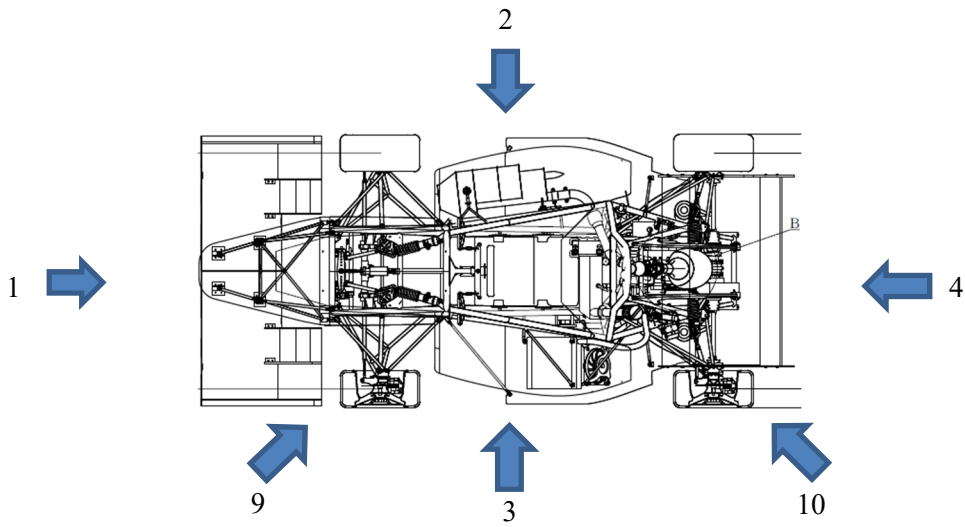


Figure A

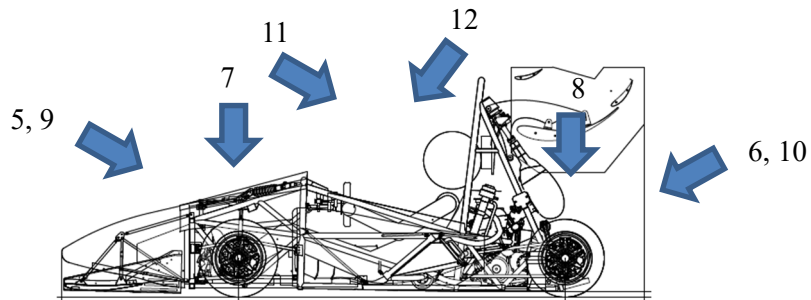


Figure B

No.	View	Cowl Condition	
		With Cowl	Without Cowl
1	Front View	With Cowl	Without Cowl
2	RH Side View	With Cowl	Without Cowl
3	LH Side View	With Cowl	Without Cowl
4	Rear View	With Cowl	Without Cowl
5	Front Upper View	With Cowl	Without Cowl
6	Rear Upper View	With Cowl	Without Cowl
7	Front Suspension Top View	-	Without Cowl
8	Rear Suspension Top View	-	Without Cowl
9	Front Suspension Iso View	-	Without Cowl
10	Rear Suspension Iso View	-	Without Cowl
11	Cockpit Front View	With Cowl	Without Cowl
12	Cockpit Rear View	With Cowl	Without Cowl

## **APPENDIX J-7 PDF file name of the vehicle and the assembly parts**

The name of the PDF file of the vehicle and the assembly parts should be as follows.

### **【ICV case】**

- Carnumber\_P0\_vehicle.pdf
- Carnumber\_P1-1\_BR-MB.pdf
- Carnumber\_P1-2\_BR-CD.pdf
- Carnumber\_P1-3\_BR-LO.pdf
- Carnumber\_P2-1\_EN-EN.pdf
- Carnumber\_P2-2\_EN-IE.pdf
- Carnumber\_P2-3\_EN-FU.pdf
- Carnumber\_P2-4\_EN-CO.pdf
- Carnumber\_P2-5\_EN-DT.pdf
- Carnumber\_P3-1\_FR-FR.pdf
- Carnumber\_P3-2\_FR-CA.pdf
- Carnumber\_P3-3\_FR-PS.pdf
- Carnumber\_P3-4\_FR-FA.pdf
- Carnumber\_P4-1\_EL-WH.pdf
- Carnumber\_P4-2\_EL-DP.pdf
- Carnumber\_P4-3\_EL-BO.pdf
- Carnumber\_P5\_MS.pdf
- Carnumber\_P6-1\_ST-RA.pdf
- Carnumber\_P6-2\_ST-WS.pdf
- Carnumber\_P7-1\_SU-SD.pdf
- Carnumber\_P7-2\_SU-AL.pdf
- Carnumber\_P7-3\_SU-ST.pdf
- Carnumber\_P8\_WT.pdf

### **【EV case】**

- Carnumber\_P0\_vehicle.pdf
- Carnumber\_P1-1\_BR-MB.pdf
- Carnumber\_P1-2\_BR-CD.pdf
- Carnumber\_P1-3\_BR-LO.pdf
- Carnumber\_P2-1\_EN-EV.pdf
- Carnumber\_P2-2\_EN-AU.pdf
- Carnumber\_P2-3\_EN-CO.pdf
- Carnumber\_P2-4\_EN-DT.pdf
- Carnumber\_P3-1\_FR-FR.pdf
- Carnumber\_P3-2\_FR-CA.pdf
- Carnumber\_P3-3\_FR-PS.pdf
- Carnumber\_P3-4\_FR-FA.pdf
- Carnumber\_P4-1\_EL-WH.pdf
- Carnumber\_P4-2\_EL-DP.pdf
- Carnumber\_P4-3\_EL-BO.pdf
- Carnumber\_P5\_MS.pdf
- Carnumber\_P6-1\_ST-RA.pdf
- Carnumber\_P6-2\_ST-WS.pdf
- Carnumber\_P7-1\_SU-SD.pdf
- Carnumber\_P7-2\_SU-AL.pdf
- Carnumber\_P7-3\_SU-ST.pdf
- Carnumber\_P8\_WT.pdf

**Revision Record:**

**[Second Edition]**

**- J2022-2-01 Schedule for Online Static Events**

The Guideline for Online Static Events to be published at the Mid-July.

Online platform will be Cisco Webex Meetings or Microsoft Teams.

**- J2022-2-17 Procedure for the Cost and Manufacturing Event**

**- J2022-2-23 Procedure for Design Event**

The Guideline for Online Static Events to be published at the end of June.

**- J2022-2-02 Submission Documents for Static Events**

**J2022-2-21 Design Event**

**J2022-2-22 Design Documents**

Additional Item: Vehicle Drawings (3 View Drawing)