

FSAEJ2025

Design Event Onsite Review

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2025 Sep. 13

First of all,

1. What's FSAE/Design Event?
2. Summary of FSAEJ2025 Design Event
3. Good examples
4. Toward FSAEJ2026
5. Q&A

日本語 or English?

1. What's FSAE/Design Event?
2. Summary of FSAEJ2025 Design Event
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5. Q&A

Q: What is “Formula SAE”?

1. What's FSAE/Design Event?

GR.1.2 Formula SAE Concept

The Formula SAE® competitions challenge teams of university undergraduate and graduate students to conceive, design, fabricate, develop and compete with small, formula style vehicles.

GR.1.3 Engineering Competition

Formula SAE® is an engineering education competition that requires performance demonstration of vehicles in a series of events, off track and on track against the clock.

Each competition gives teams the chance to demonstrate their creativity and engineering skills in comparison to teams from other universities around the world.

GR.1.4 Vehicle Design Objectives

GR.1.4.1 Teams will act as an engineering firm that will conceive, design, fabricate, test, develop and demonstrate a prototype vehicle

GR.1.4.2 The vehicle should have high performance and be sufficiently durable to successfully complete all the events at the Formula SAE competitions.

GR.1.4.3 Additional design factors include: aesthetics, cost, ergonomics, maintainability, and manufacturability.

GR.1.4.4 Each design will be judged and evaluated against other competing designs in a series of Static and Dynamic events to determine the vehicle that best meets the design goals and may be profitably built and marketed.

GR.1.5 Good Engineering Practices

Vehicles entered into Formula SAE competitions should be designed and fabricated in accordance with good engineering practices.

It is written in the FSAE Rule.

Q: How can I get a high score on Design Event?

1. What's FSAE/Design Event?



S.4 DESIGN EVENT

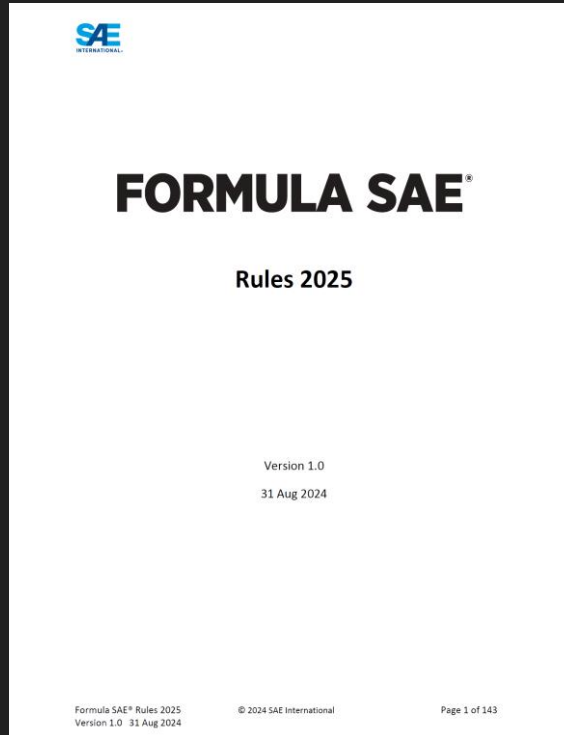
S.4.1 Design Event Objective

- S.4.1.1 The Design Event evaluates the engineering effort that went into the vehicle and how the engineering meets the intent of the market both in terms of vehicle performance and overall value.
- S.4.1.2 The team and vehicle that illustrate the best use of engineering to meet the design goals, a cost effective high performance vehicle, and the best understanding of the design by the team members will win the Design Event.
- S.4.1.3 Components and systems that are incorporated into the design as finished items are not evaluated as a student designed unit, but are assessed on the team's selection and application of that unit.

It is written in the FSAE Rule.

Theory → Design → Build → Test&Validation → Refine↻

1. What's FSAE/Design Event?



Everything starts from understanding the Rules.

1. What's FSAE/Design Event?

Rules

Rules for vehicle production, vehicle inspection, examination (static and dynamic), etc. comply with Formula SAE® rules.

[Formula SAE <Official website>](#)

Local rules for the Japanese tournament have been established for some rules.[Please check here for English rule books from before 24.](#)

23rd Formula SAE Japan 2025

[23rd Tournament Rules \(2nd edition\) ※Japanese version 2025.2.12](#)

[2025 Participation Rules 2nd Edition <PDF> *English version 2025.2.12](#)

[Local Rules \(2nd Edition\) <PDF> *English version only 2025.2.12](#)

You must know all the Rule sets related to your activity.

Q: Did you read the Static Events' rule?

For your reference

APPENDIX J-S-5 Design Judging coverage of each judge

In the Q&A session, the judges will discuss with the team members in accordance with the coverages below.

JUDGE CATEGORY	JUDGING COVERAGE		
	ORGANIZATION, FEASIBILITY STUDY AND VALIDATIONS	HARDWARE	SOFTWARE AND CONTROLLING
BODY	Team management/Overall layout/Ergonomics	Frame/Monocoque/Cowls/Aero devices/Driver interfaces, meter, indicator/Cockpit control, pedals, switches, and levers	Body control, display control
SUSPENSION	Vehicle dynamics simulation and validation /Suspension kinematics and mechanics/Tire data	Suspension system/Brake system/Steering system/Wheels and tires	Brake Control (ex. ABS)/Steering control (ex. 4WS)/Vehicle dynamics control (over multiple tires, ex. Yaw control)
POWER-TRAIN (ICV and EV respectively)	Power dyno/Drivetrain simulation and testing/HV testing/EMC test/Noise testing/Cooling simulation and testing	Engine/Intake and Exhaust system/Motor/Fuel system/Energy storage system/High Voltage systems/Inverters and converters/Transmission and clutch/Final Drive and differential gear/Cooling system/Low voltage systems	Throttle control/Fuel control/Battery management/Energy management (power output and re-generation)/Vehicle communication/Functional safety/Traction control (longitudinal only)

※Topics such as data logging, infotainment, simulations, material studies and application/tuning are judged in the category of its intended usages.

It is written in the FSAE Rule.

1. What's Design Event?

Design Event does not evaluate if a designed vehicle is fast/quick or not.

Design even evaluates “things between 2 ears”, not “things among 4 tires”.

On the subject of developing and producing small formula style vehicles, whether

- ✓ What is considered/investigated
- ✓ Why/what is an aim
- ✓ What is done, how
- ✓ What is clarified/understood
- ✓ What is an achievement

are understood by each team member or not is evaluated.

Not only your vehicle as your output, but your processes, investigation data are very important.

1. What's Design Event?

- ✓ There are no correct answer in Formula SAE/Formula Student!

Actually, judges enjoys the diversity of Formula SAE/Formula Student all over the world.

- ✓ Judges seek to understand how you define the vehicle performance target and how you solve your own formula/problem.
- ✓ Often, your targets and ideas surprise judges.
- ✓ Judges try to trace your processes/considerations with their knowledges, and dig deeper and deeper.

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2. Summary of FSAEJ2025 Design Event

- ✓ Participants:
First Round Review judging: ICV 51 teams, EV 23 teams, Followup 2 teams
Design Final: ICV 2 teams, EV 2 teams
- ✓ Face to face judging with vehicles
- ✓ Design Event in the same location as Cost & Manufacturing event
- ✓ Design Final was open to audience in a larger space

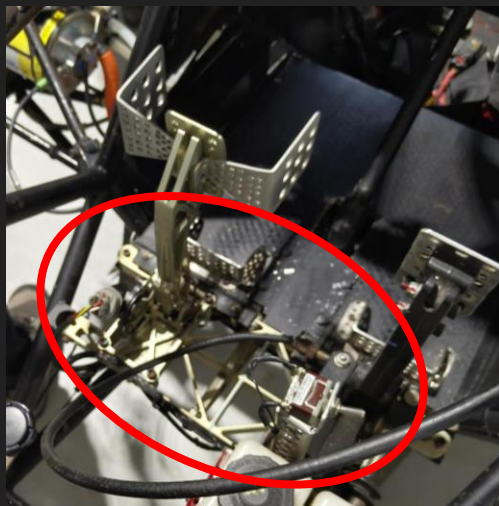
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3. Good examples

- Design Finalists – To be uploaded on Youtube
- Similarities of the top teams
Team management, steady improvement, a running vehicle, validation
⇒ Competition result is not only because your vehicle performance, but your strength of your teams.
- Some good examples from 2025 vehicles in the following slides, as results of mechanics understanding, critical thinking, validation achievements

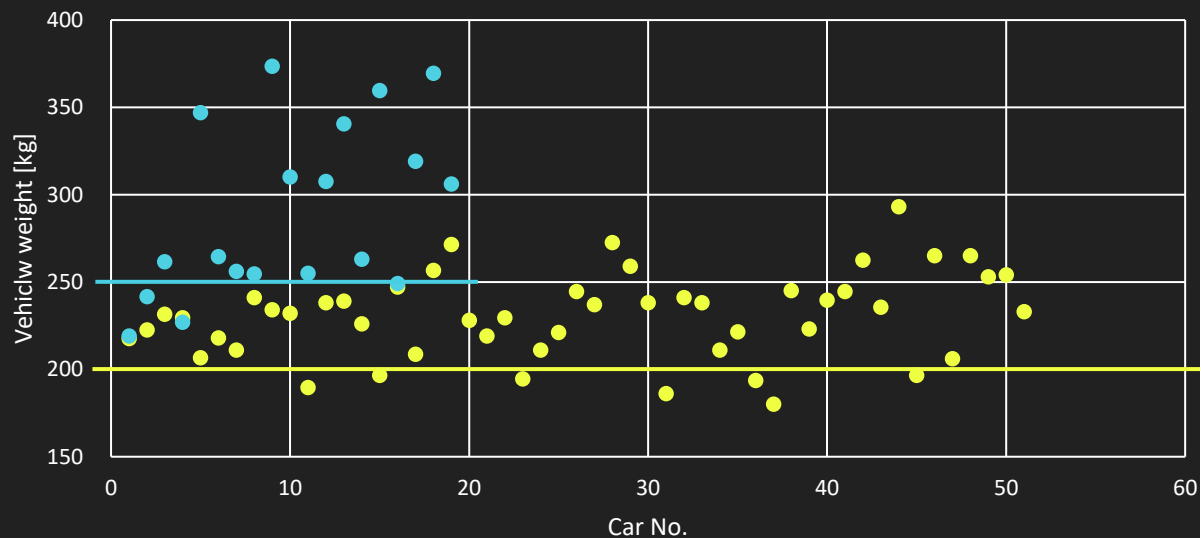
3. Good examples

- “Lighter weight”, “Lower CoG”, “Lower moment of inertia”
Basically unnecessary “heavy”, “high”, “large”, “long” are not good on racing cars.



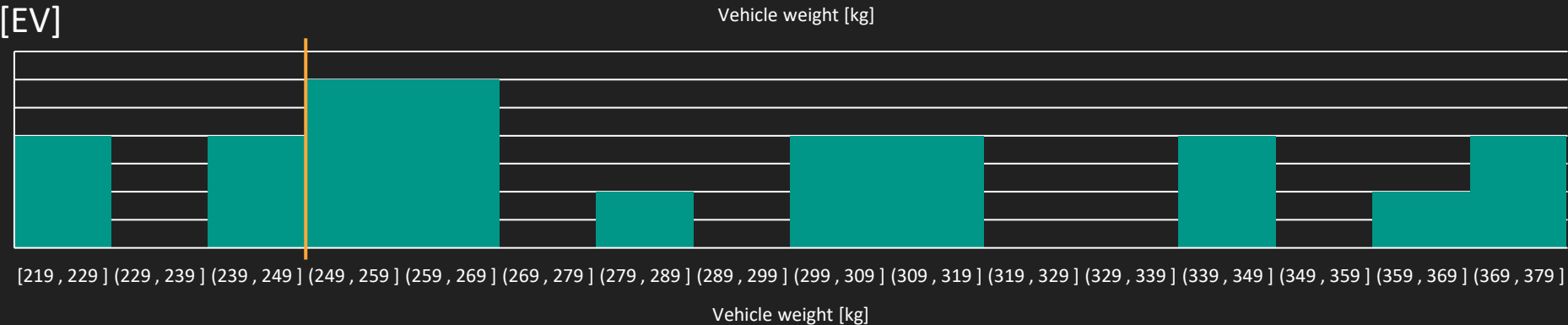
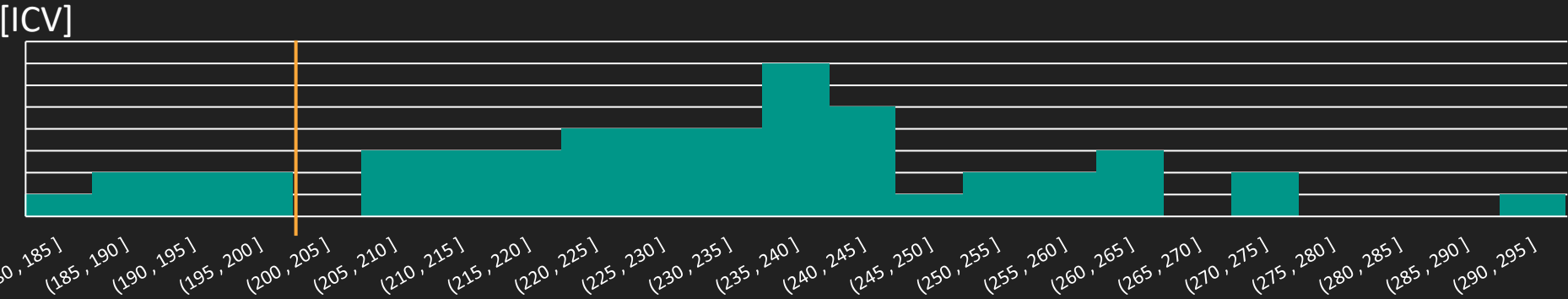
3. Good examples

- Data from 2025: Vehicle weight/Car No.



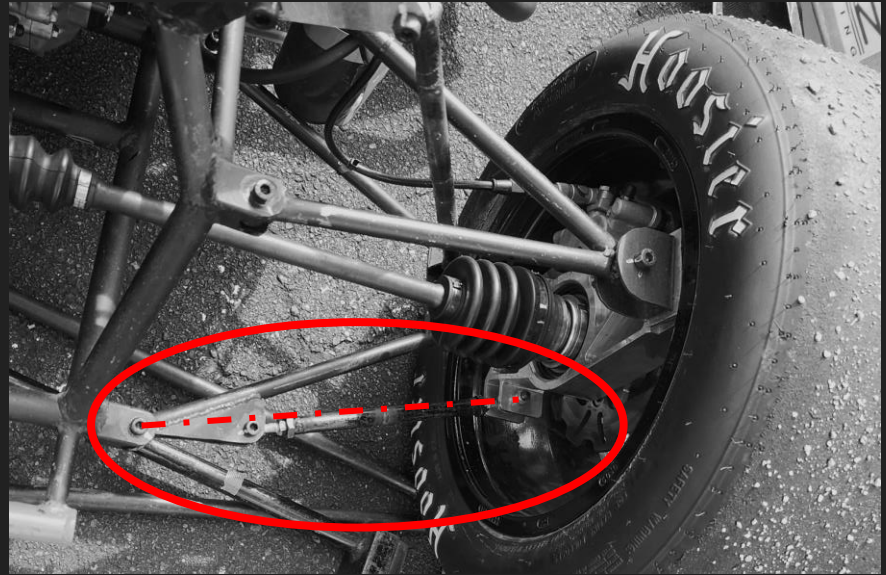
3. Good examples

- Data from 2025: Team distribution of Vehicle weight



3. Good examples

- Effective material usage: avoid stress concentrations, translate loads to structures



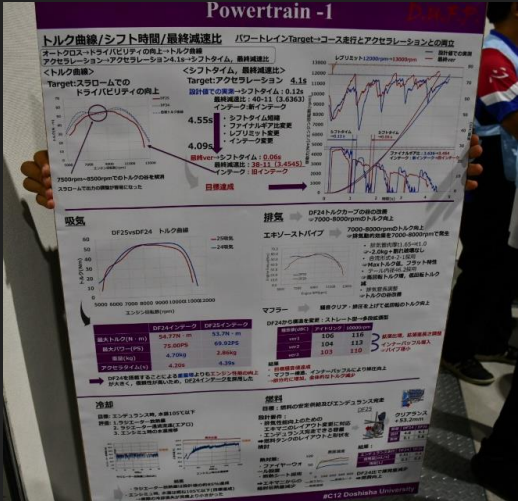
3. Good examples

- Arrange air flow well → a smaller radiator → Lighter
Not only a weight of a radiator, but coolant and hoses etc.
Overheated, then needs a larger radiator: REALLY???
- A radiator larger than that of original motorcycle needs to be doubted.



3. Good examples

- Preparation to convince



3. Good examples

- Vehicle to protect drivers

The Rule defines the *minimum*.

Is it enough to comply with the Rule?

Aren't you anxious to drive it at 100km/h?

Do you want your dearests to drive it?

Ask yourselves, discuss within your team.

Not only about your car, but your team operation.

No safety, no FSAE event!



3. Good examples

- Clean, beautiful, organized vehicle:
Quality as a selling product
Rusty components vs Painted
Easy to maintain, easy to find a defect or something



3. Good examples

- Clean, beautiful, organized pit and team:
Team management, team work
Be tidy!





Love lives in details.

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4. Toward FSAEJ2026

Please watch the Review of 2024 on Youtube.



Not only FSAEJ, many Design Reviews available.

Q: Anyone wants penalties?

4. Toward FSAEJ2026

- Document penalty total 1020 pts for 36 ICV teams, 440 pts for 15 EV teams!

Ex. 2026/06/05 is 266days = 38weeks = 8months 24days

The following penalty will be counted on the Overall Score			
Category	Submission past deadline	Non-submission and Required level not achieved	Response to failure
Technical Inspection (SES)	10-point penalty	Disqualified from FSAEJ	
ETC Notice of Intent /ETC-ESF		Use of ETC prohibited	
ESO/ESA form		Disqualified from FSAEJ	
EV-ESF		Disqualified from FSAEJ	Descending order of EV Inspection, etc.
Presentation Event		(A) Disqualified from FSAEJ or (B) Disqualified for Presentation Event, and -20 points from total score	
Cost and Manufacturing		(A) Disqualified from FSAEJ or (B) Disqualified for Cost and Manufacturing Event, and -100 points from total score	
Design Event		(A) Disqualified from FSAEJ or (B) Disqualified for Design Event, and -20 points from total score	
Shakedown Certificate		Cannot participate in vehicle inspection (technical / EV) Not disqualified from FSAEJ	

J2025-S-01 No show at Static Events

(refer to Formula SAE® Rules 2025 S.3.16.4, S.4.10.3 and 2025 FSAEJ Participation Rules Article 13)

No show at Static Events is recognized as “Document Non-submission” and will receive penalties shown in 2025 FSAEJ Participation Rules Article 13.

4. Toward FSAEJ2026

- Design Briefing format violation: 6 teams (2024 format, in Japanese, Design Report)
- Design Spec Sheet penalty: 307 cells, 40 teams

J2025-S-17 Design Documents

(refer to Formula SAE® Rules 2025 DR.2, S.4.2/3/4/5)

The Design Documents must consist of Design Briefing, Design Spec Sheet, and Vehicle Drawings. The language in Design Documents is **English only**. The words in the other languages will be recognized as not submitted.

The requirements on Design Briefing are on the 2025 Design Review Briefing PPT Template published on FSAE Online.

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

Teams must fill all the figures on Design Spec Sheet unless figures are not applicable to the vehicle. For example, Aerodynamics Coefficients & Reference Area must be filled even if the car does not have any aerodynamics devices.

Lack of information and avoidable blanks/"N.A." on the Design Documents may receive penalty points.

J2025-S-18 Insufficient Redesign

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

4. Toward FSAEJ2026

Spec sheet: a list of figures you **MUST** be aware of about your vehicle!

Dimensions	Units				
Overall Dimensions	mm	Length	Width	Height	
Chassis & Truck	mm	Wheelbase	Front Track	Rear Track	
Center of Gravity Design Height	mm	CG Height	Compliant Via		
Mass without driver	kg	Front	Rear	Total	
Weight Distribution with 50kg driver	% Front	% Rear			
Responsive Parameters	Units	Front		Rear	
Tire Size, Compound and Make					
Wheels (width, construction)					
Suspension Type					
Suspension design travel	mm	Inverted (coil D) Rebound (coil D)		Inverted (coil D) Rebound (coil D)	
Wheel rate (springs to wheel center)	N/mm				
Roll axis (springs to wheel center)	N/m deg				
Sprung mass natural frequency	Hz				
Inverse Damping	% critical	@ ____ mm/sec		@ ____ mm/sec	
Rebound Damping	% critical	@ ____ mm/sec		@ ____ mm/sec	
Roll rate	deg/m	Type			
Roll Center (axis of Center Change)	deg/m				
Roll Center	deg/deg				
Static Tie (rot. + in)	deg				
Static center	deg				
Static center adjustment method	deg				
Anti dive / Anti Squat	%				
Roll center height above ground, static	mm				
Roll center position at 1 lateral acc	mm	Height (coil D) Lateral (coil D)		Height (coil D) Lateral (coil D)	
Front Caster, Trail, and Scrub Radius	Caster (deg) Inclination (deg) Offset (mm)		King Trail (mm)		Scrub Rad (mm)
Front Kingpin axis					
Static Ackermann	%	adjustable?			
Convergence adjustment Methods					
Steer Ratio (C-Factor, Steer Arm Length)	Steer Ratio (C-Factor)		C-Factor (mm)		Steer Arm Length
Brake System / Hub & Axle	Units	Front		Rear	
Caliper					
Master Cylinder					
Calipers					
Brake Pad/Lining Material					
Drive and Reverse @ 2 Deceleration	Short Press (bar)		Rear Press (bar)		Pedal Force (N)
Spring Assembly					
Hub Bearings					
Axis type, size and material					
Ergonomics	Units				
Driver Size adjustments					
Seat materials, padding, damping					
Chassis Wheel (dia, construction)	Diameter (mm)		Construction		
Steering Wheel (dia, construction)					
Steering Actuator type, location					
Clutch Actuator type, location					
Instrumentation					
Options					
API & Driver Safety Systems, etc.)					
Electrical (non-drive systems)	Units				
Power Management / Control					
Wiring / Loom / ECM mounting					
Battery / Charging System					
Control					
Other assist Systems					
Logging / Telemetry					
Special Sensing Technology					

Frame	Units				
Frame Construction					
Material					
Joining method and material					
Base frame mass with brackets & paint	kg	Target	Physical Test		
Torsional stiffness	N-m/deg	Target	Simulated	Physical Test	
Torsional stiffness validation method					
Impact alternative configuration					
Impact alternative dimensions	mm	Width	Height	Depth	
Impact alternative energy capacity	kJ	Energy	Endure		
Active Drive Power System	Units	Front		Rear	
Motor Manufacture / Model / Type					
Motor Technology utilized					
Motor Count and Location(s)					
Driver Wheel Count & Location(s)					
Nominal Motor Voltage phase and volts	V	Phase (coil D) Voltage (coil D)		Phase (coil D) Voltage (coil D)	
Maximum Design Motor RPM (1/min)	rpm				
Base Speed (Motor torque with 0 RPM)	rpm				
Maximum Motor Torque (peak)	Nm/hr				
Maximum Motor Torque (continuous)	Nm				
Maximum Motor Power (peak)	kw at RPM				
Maximum Motor Power (continuous)	kw at RPM				
Motor Speed Sensitivity 1 to 50, what type					
Significant Motor Modifications					
Motor Controller(s) Type / Model	Motor Controller				
Motor Controller Discharge Power (peak)	kw/hr				
Controller Continuous Discharge Power	kw				
Accumulator Cell Manufacture / Type					
Accumulator Cell Voltage / Capacity	Volt, mAh				
Accumulator Voltage (fully charged)	V				
Accumulator Cell Technology/Chemistry					
Accumulator Cell Configuration	kw/hr				
Accumulator Discharge Power (peak)	kw				
Accumulator Discharge Power (continuous)	kw				
Accumulator Full Charge Time	hrs/min				
Accumulator Charging Efficiency	%				
Accumulator Charging Power	kw				
Torque Control Modes (locking, etc.)					
Other Special Components					
Drivetrains	Units				
Drive Type					
Drivetrain Type (if used)					
Final Drive Reduction Ratio	<1				
Vehicle Speed @ max power (design) gm	1st gear	2nd gear	3rd gear		
Vehicle Speed @ max power (design) gm	4th gear	5th gear	6th gear		
Final shaft size and material					
Link joint type					
Aerodynamics (if applicable)	Units				
Type / Configuration					
Force (at 30 mph, pw 1.162 kg/m ²)	Downforce (N)	% Front	Drag (N)		
Coefficients & Reference Area	C _d	Ref. Area (m ²)	C _d		
Variable Features (active, etc)					
Other Information	Units				
Body Work (material, process)					
Optional Information					

All the items listed in the Design Spec Sheet are targeted and/or clarified in engineering design point of views. You must understand and fill in all the boxes minimally.

→ Figures not written and “N.A.” get penalties except a few figures; “if applicable”.

4. Toward FSAEJ2026

Design Judging Score Sheet

→ Check what's are the expectations from judges!

Low Voltage/DA

- Battery Chemistry
- Sizing and Overall co
- Vehicle Mounting

- Layout methodology
- Wire selection: Mat
- Connector selection
- LAN / Ethernet / Hi
- Harness overwrap: s

- Power Control State
- Grounding Strategy
- Fusing and Circuit Br
- Charging Circuit: Cc
- Master Switches: Co

- Acquisition type and
- Channel selection, lo
- Sensor selection and
- Telemetry and Comm
- Data analysis: Tools
- Use of data for mode

Driver Interface

- Ease of step-in
- Driver adjustment and
- Adequate room (elbow
- Adequate shielding (e.i
- Lack of snag points (sh

- Seat and headrest sup
- Materials and Manufac
- Adjustability: Method
- Driver visibility: Track,
- Seat / Cockpit pressure
- Belts: Configuration, n

- Pedals: Travel/effort, a
- Steering: Effort/feedback
- Clutch: Accessibility, el
- Overall slip, stiffness a
- Switches: Visibility, lab
- Instrumentation: Visib
- Active Controls (launch

- System level requirem
- Master cylinders: Conf
- Brake lines: Type, rout
- Rotors: Materials, siz
- Calipers: Materials, siz
- Brake Pads: Materials,
- Heat management: M
- Active systems: ABS, ti
- parameters/selection,

- Ease of driver egress a
- Intuitiveness
- Robustness of cockpit: i
- Robustness of surround

Chassis

- Global loads targets an
- Structural margin targ
- Vehicle level mass and

- Input loads and struct
- Stiffness targets and vi
- Primary structure: Ma
- Attachment Points: Ma
- Bodywork: Material st
- Impact Attenuator: M
- Paint and surface treat

- Suspension links: Mat
- Joints and Flexible mer
- Tuning: Adjustment m
- Hub/Upright: Material
- Wheel bearings: Confi
- Springs: Configuratio
- Dampers: Configurati
- Steering Rack: Material
- Steering Column: Joint

- Bolted joint analysis m
- Bolted and bonded joi
- Installation process / ti

Powertrain – EV

- Power and torque goals: M
- Driven wheel strategy (RWI
- Regenerative braking, char
- Student engineered vs. pur

- Cell selection: Cylindrical, i
- Chemistry, C-rate, DCR (Dir
- Cell arrangement: pack vol
- Accumulator Integration: I
- Cooling Strategy: Passive/s
- Safety: Thermal Runaway s
- Battery Management Syste

- Synthesizing the desired ou
- Lap times, power/torque co
- Drivetrain gearing, diff
- CAE: FEA, CFD, electrical, ti
- Design trade-off studies

- Component testing, hardw
- Data acquisition vs. calculat
- Dynamometer testing
- Software Calibration
- Failure analysis and recover

- Cell fundamentals: wire bo
- Motor fundamentals: Type
- Power Electronics & busin
- Cooling System: Sizing, int
- Lubrication / Tribology: Sp
- Materials, coatings, or othe
- Structure: Accumulator an
- stressed accumulator

- Drivetrain: Differential det
- Electronic powertrain contr
- Safety and technical inspec

- Track Testing
- Agreement/Disagreement t
- Driver feedback and driv
- Lessons Learned

Aerodynamics

- Downforce, Drag and Center of Pres
- Selection and sizing of aerodynamic
- Downforce vs. drag vs. mass tradeoff
- Aerodynamic coefficients (C_d, C_x, etc)
- Design elements: Front/rear/side w
- wings, etc.

- Component interaction: e.g. front v
- angle, steering
- Center of Pressure location, migrati
- understeer/oversteer, relationship v
- Flow separation/stall, energized flo
- Ground effect, aeroelasticity, flutter

- Heat transfer vs. velocity, mass airfl
- Size and placement of radiators, fan
- Impact on aerodynamics, drag, and

- Modeling / simulation tools used
- Solution Methods: Direct/DNS, Rey
- Turbulence models
- Accuracy/convergence
- Design case selection: Ride height,

- Wind Tunnel Testing: Reynolds scal
- moment measurements, boundary
- Track testing, agreement/disagree
- Sensors: Pitot tubes, pressure taps,
- stations, ground speed (GPS, wheel
- Practical tools: Yarn tufts, flowvis

- Manufacturing techniques, surface
- Structural loads, chassis adjustm
- Packaging, clearance, and accessibl
- Tolerances: Do the parts match the
- Repeatable manufacturing and adj

Vehicle Dynamics

- Vehicle dynamics concepts: F=ma, mas
- Synthesis of CG location, tire selection,
- Wheelbase, track width, chassis stiffnes
- Effect of brakes, drivetrain, torque-vec
- Performance/handling/balance metrics
- Use/analysis of collected data (stopwat
- Full-vehicle calculations/modeling & co

- Selection: Size, manufacturer, compou
- Static settings: Toe, inclination, pressur
- Dynamic operating conditions: Loads, i
- In-plane forces & moments including st
- Vertical rates & damping
- Tire dynamic responses: Load sensiti
- Wheel selection: Width, offset, materi
- Tire data, calculations/modeling & com
- Suspensi

- Vehicle modes: Heave, pitch, roll & wa
- Tire control: Load, inclination, toe
- Kinematics (camber gain, etc.)
- Anti-geometry
- Compliances
- Springs and dampers: Rates, frequen
- Front/rear lateral load transd
- Use of integrated sim to res

- Schedule & Schedule Rigor
- Team Organization: Struct
- Systems Engineering
- Resource Management: B
- Knowledge Management: T
- Top level vehicle level design cri

- Consistent application of enj
- Build quality: Welds, body
- Refinement and overall tidi
- Aesthetics

- Clarity, depth, and utility of i
- of correlations to competit
- Demonstration that Overall i

Overall Vehicle

- Drives, engine and other big
- Suspension points and linkag
- Straight line load paths that
- Aero (if equipped) is design
- Integration and functional co

- Competition/design strategy
- competition rules and comp
- Vehicle architecture selectio
- Synthesis of subsystems: Do
- Team constraints: Impacts o
- Correlate competition point
- Correlate vehicle performan
- Were multiple competition s
- Overall vehicle goals: Consis
- characteristics, and stated te

- System specifications (perf
- Demonstration that concept
- Vehicle Definition: Mass, ce
- Tire selection & performan
- Powertrain sizing: Targets, F
- Aerodynamics: Center of pr
- Front/rear lateral load transd
- Use of integrated sim to res

- Schedule & Schedule Rigor
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- Demonstration that Overall i

More on the Design Process...

Design Judges are interested in your implementation every aspect of your car. The process begins culminating in your understanding. Reflective per the following breakdown:

- **Design (~25%):** Were different design op decisions? How much is a new design, at the underlying science/engineering? Wh design, or a series of independent sub-sy
- **Build (~25%):** Does the car reflect the de not? What special manufacturing consid processes appropriate and well-executed
- **Refinement/Validation (~25%):** How the developed and executed? Were discrepa acted upon to improve final build? How i
- **Understanding (~25%):** Do the students the design and the engineering fundame testing their car? How would the team ir

More on Sub-System Categories...

This scoresheet divides the vehicle into seven individual Design Judges and the focus areas Judges and students alike work together to e Design Judges will be evaluating your team ir

The Overall Vehicle category necessarily spar discuss top level design and management to; no sub-system exists in a vacuum. Design Ju subsystems while focusing on each specific co

Final thoughts...

Be sure to read the Design Event section of ti found on the [Series Resources page of faeset](#)

Keep in mind that Design Judges are not pick elements are the best way to win the comp goals. They will then evaluate your subreq The knowledge/understanding demonstrate

The next few pages provide a survey of topic and should not be treated as a checklist.

Formula SAE Design Judging Score Sheet – EV

School Name: _____ Car #: _____

Paddock #: _____ Contact Name/Cell #: _____

Summary of Design Judge Scoring Areas

Overall Vehicle	/25
Vehicle Dynamics	/25
Aerodynamics	/15
Powertrain	/30
Chassis	/30
Driver Interface	/15
Low Voltage/Data Acquisition	/10
Total	/150

About your score...

This Design Judging Score Sheet totals 150pts. Your official Design Event score will differ from the score on this page. Do not panic! This scoresheet is a tool.

The score listed on this sheet reflects your assigned judges' assessments relative to other teams in your queue. Despite attempts to ensure consistency, judge scores always vary somewhat from queue to queue. Hence, the chief judges compare notes across queues, working to normalize scores and minimize bias via multi-tier rankings of teams. The official Design Event score is the result of this process.

Design Judging Score Sheets with written judges' comments shall be distributed to the teams but are not shared with other teams. Teams should expect to receive written comments along with verbal feedback from their First Round Design Judges.

About this scoresheet...

This scoresheet divides the vehicle into numerous subsystems. For each subsystem, the topics listed on the following pages will be of interest to the Design Judges. NOTE: The topics listed are not all-inclusive and should not be treated as a checklist by students or judges.

As always, Design, Build, Validation/Refinement and Understanding are essential aspects of the Design Event. For any topic, students should be ready to discuss their decision-making process, goals, the underlying theory, modeling choices, options considered, constraints, assumptions, component/material selection, manufacturing, testing, validation/correlation and any successes/failures encountered.

Remember, judges are evaluating your knowledge and understanding, along with your vehicle.

Theory → Design → Build → Test&Validation → Refine

4. Toward FSAEJ2026

PDCA Cycle



→ Not just “Did it, made it!”, review it and improvement to be in place.

→ C : Check how it was
A : Improvement for next

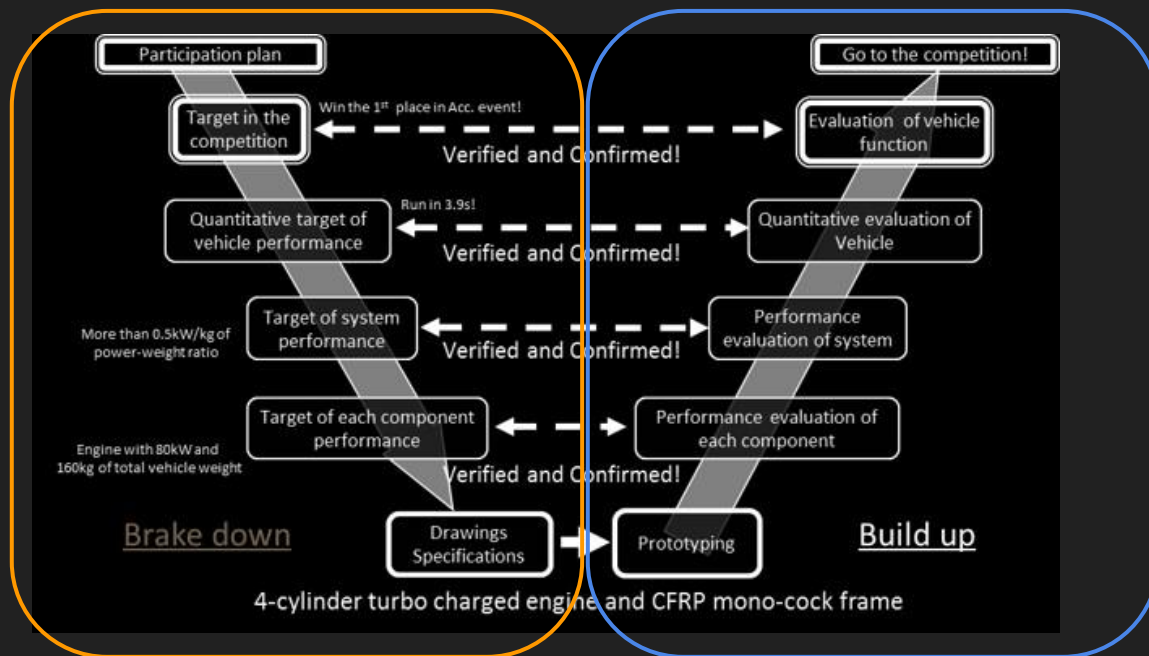
→ Multiple scales loops are existing.
1 loop a year ~ many loops in a day

→ Collect “actuals” and update your plan and actions!

4. Toward FSAEJ2026

V-Process

Break down vehicle target into each part to clarify design problems



Break down of target

Build up validation (Simulation + physical measurement)

Check target and achievement on each level.

4. Toward FSAEJ2026

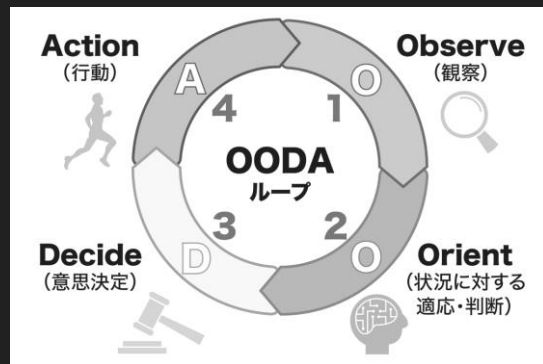
Example of build up validation



Time spent testing is invaluable; reliability, data, driver training

Introducing PDCA cycle and V-process as
examples.

Not saying those are the correct way to develop.
There are other useful methods as well.

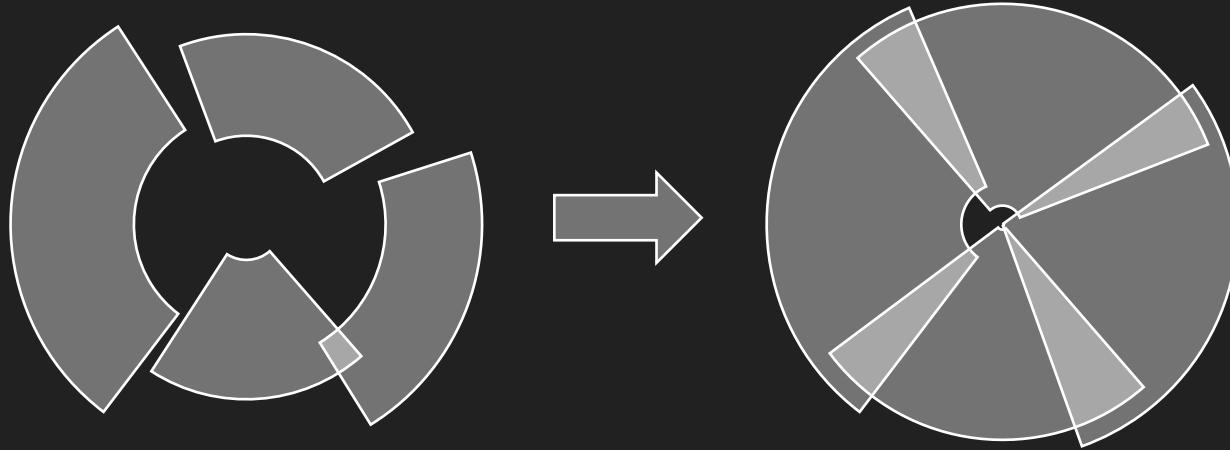


4. Toward FSAEJ2026

- Maintain your vehicle.
Rusty/oily/free play/deformation/wear/tear/loose/unfinished
- How do you carry a force?
Mounting point in the mid of a pipe vs on a Node
Single shear vs Double shear
Bending/Rotating vs Push/Pull
Narrow vs Wide
- Engineers speak with numbers and data.
Qualitative vs quantitative
Data before data and after data
- Don't forget, just because your software can do it, that does not mean you know what you are doing.

Engineering Design Knowledge Visualization

Baumkuchen Model



- Center: Fundamental knowledge, Radial direction: Advanced/Application knowledge
- Central angle: Range of knowledge
- Overwraps: Cross Functional Knowledge

4. Toward FSAEJ2026

Importance of handing over

- No handing over
“I do by my own!”



- Build on handing over
“Lesson learnt from the past experiences”



Handing over failures may avoid unnecessarily failures, and results in better achievement and/or effective resource usage.

Better to use lesson learnt! Don't waste your time.

Once you watch this review, it is not over.

Learn from anything and make your actions.

Re-check, re-view, repeat.

1. What's FSAE/Design Event?
2. Review of FSAEJ2025 Design Event
3. Good examples
4. Toward FSAEJ2026
5. Q&A

Q&A

Before ending,

“We want you to become engineers who can play an active role not only in Japan but also all over the world”

世界の共通言語は英語。技術者の世界でも同じです。

FSAEJデザイン審査は英語を使う機会です。

同じDBで海外大会に参戦出来ます。

→ 英語が使えることによってより多くの機会がある！

海外大会には多くの経験豊富な審査員がいる！

海外のエキスパートと話せる！

英語を話す人は日本語を話す人の約12倍います！



FSAEJ2026

海外大会のHP、セミナー、Youtube等、より多くの情報やグループがあります。

Thus, if you cannot communicate
in English, information and
opportunities would be less
than 1/12.

Expand your
potential!



GUIDE TO 2026 FSAE FRAME RULE CHANGES

David Project Management | Friday Anthony

- Planning out side view tubes
- Reference point change
- Modular calculation view turns
- Comments requested one feedback to tube

[Read More](#)



THREADED FASTENERS

David Project Management | Friday Anthony

- Clamp load, both when to use fasteners
- Prevent self loosening
- Tightening methods
- Fastener types

[Read More](#)



A RECIPE FOR SUCCESS IN THE COST AND MANUFACTURING EVENT AT FSAE MICHIGAN

David Project Management | Friday Anthony

The Cost Report is a 50% of the total, detailing the costs to produce the team's prototype vehicle using standardized cost references. The Cost Scenario asks for each team's strategic response to an event outside their control.

[Read More](#)



CONCEPTUAL AND OBJECTIVE DESIGN IN FSAE

David Project Management | Friday Anthony

- How to find the optimum concept for your overall racecar
- How to roll down the concept before putting effort into perfecting its execution
- How to get more design points for overall racecar design
- How to create a design process that can be handed down to succeeding teams

[Read More](#)



FMEA (FAILURE MODES AND EFFECTS ANALYSIS) AND ITS USAGE IN FSAE

David Project Management | Friday Anthony

FMEA can capture the design team's risks, can help the team verify they meet and exceed safety regulations and requirements.

[Read More](#)



GUIDE TO 2025 FSAE FRAME RULE CHANGES

David Project Management | Friday Anthony

- Side Ingress Impact Attenuator Impact Structure Ingress
- Use Function for Turnover Claps
- EV Door Latching Requirement
- Get External Items off the Main Ingress and Main Ingress Drives

[Read More](#)



WHY DO ENGINEERS NEED SOCIAL SKILLS?

David Project Management | Dr. Vaughan Roberts

- Think about what other people are thinking
- Give honest feedback without being a jerk
- Take your own and your team's feelings seriously

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GUIDE TO THE 2024 FSAE COST MODULE CHANGES

David Project Management | Friday Anthony

- Materials catalog updates
- Process changes in turning, casting, machining
- Tuning changes: Dr metal, 2x plastic hubbers, 1x PCB
- New materials for fasteners and standoffs

[Read More](#)



A FACULTY ADVISOR'S PERSPECTIVE ON FORMULA DESIGN JUDGING

David Project Management | Friday James

Notes for students from the Design Judges

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A RECIPE FOR SUCCESS IN THE COST AND MANUFACTURING EVENT AT FSAE MICHIGAN

David Project Management | Friday Anthony

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Your experience in FSAE/FS is your treasure.

#FSAEJ2025

**Good luck and do your best
toward FSAEJ2026!**

And have FUN!!!!!!

Wishing all the best for your next season.

卒業後はスタ ッ フに!!!!!!