

FORMULA SAE®

Rules 2026

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REVISION SUMMARY

*Provided as a courtesy. Not a complete list. See **GR.3.3** and **GR.6.6***

AD.2, AD.6, F.4.2, F.6, F.7, F.8, F.10, F.11, T.8.2, T.8.3, EV.1, EV.3.2, IN.3,
IN.5, IN.6, IN.10, IN.14

GR.4.2.3, GR.4.3, AD.3.6, F.5.2.4, T.4.2.3, T.9.2.1, IC.4.3.2, IC.4.8.3,
EV.4.1.3, EV.5.2.3, EV.5.11.4, EV.6.7.1, EV.7.4.3

GR - GENERAL REGULATIONS

GR.1 FORMULA SAE COMPETITION OBJECTIVE

GR.1.1 Collegiate Design Series

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GR.1.2 Formula SAE Concept

GR.1.3 Engineering Competition

GR.1.4 Vehicle Design Objectives

GR.1.5 Good Engineering Practices



GR.2 ORGANIZER AUTHORITY

GR.2.1 General Authority

GR.2.2 Right to Impound

GR.2.3 Problem Resolution

GR.2.4 Restriction on Vehicle Use

GR.3 TEAM RESPONSIBILITY

GR.3.1 Rules Compliance

GR.3.2 Student Project

GR.3.3 Understanding the Rules

GR.3.4 Participating in the Competition

GR.3.5 Forfeit for Non Appearance

GR.4 RULES AUTHORITY AND ISSUE

GR.4.1 Rules Authority

GR.4.2 Rules Validity

Incorporated by Reference.

GR.4.3 Rules Hierarchy

GR.4.2.3

GR.4.2.3

GR.4.4 Rules Alterations

GR.4.5 Rules Compliance

Refer to the Event Website to verify the current version

GR.4.6 Violations on Intent

GR.5 RULES OF CONDUCT

GR.5.1 Unsportsmanlike Conduct

GR.5.2 Official Instructions

GR.5.3 Arguments with Officials

GR.5.4 Alcohol and Illegal Material

GR.5.5 Smoking – Prohibited

GR.6 RULES FORMAT AND USE

GR.6.1 Definition of Terms

- **Must**
- **Must NOT**
- **Should**
- **May**

GR.6.2 Capitalized Terms

For example, “Rules Questions” or “Primary Structure”

GR.6.3 Headings

GR.6.4 Applicability

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GR.6.5 Figures and Illustrations

GR.6.6 Change Identification

GR.7 RULES QUESTIONS

GR.7.1 Question Types

GR.7.2 Question Format

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GR.7.3 Question Publication

GR.8 PROTESTS

GR.8.1 Cause for Protest

GR.8.2 Preliminary Review – Required

GR.8.3 Protest Format

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GR.8.4 Protest Point Bond

GR.8.5 Protest Period

GR.8.6 Decision

GR.9 VEHICLE ELIGIBILITY

GR.9.1 Student Developed Vehicle

GR.9.2 Definitions
Competition Year

First Year Vehicle

Second Year Vehicle

Third Year Vehicle



GR.9.3 Formula SAE Competition Eligibility

The Formula SAE and Formula SAE Electric events do not allow Second Year Vehicles

AD - ADMINISTRATIVE REGULATIONS

AD.1 THE FORMULA SAE SERIES

AD.1.1 Rule Variations

AD.1.2 Official Announcements and Competition Information

AD.1.3 Official Languages

AD.2 OFFICIAL INFORMATION SOURCES

AD.2.1 Event Website

AD.2.2 Contact the Organizer

AD.3 INDIVIDUAL PARTICIPATION REQUIREMENTS

AD.3.1 Eligibility

AD.3.2 Age



AD.3.3 Driver's License

AD.3.4 Society Membership

AD.3.5 Medical Insurance

AD.3.6 Disabled Accessibility

the Organizer

Contact

AD.4 INDIVIDUAL REGISTRATION REQUIREMENTS

AD.4.1 Preliminary Registration

Contact the Organizer

AD.4.2 Onsite Registration

AD.5 TEAM ADVISORS AND OFFICERS

AD.5.1 Faculty Advisor

AD.5.2 Electrical System Officer (EV Only)

a.

AD.3 Individual Participation Requirements

EV.11.1.1

AD.5.3 Electric System Advisor (EV Only)

AD.6 COMPETITION REGISTRATION

AD.6.1 Registration Details

AD.6.2 Registration Fees

AD.6.3 Waitlist

AD.6.4 Withdrawals

[Contact the Organizer](#)

AD.7 COMPETITION SITE

AD.7.1 Personal Vehicles

AD.7.2 Motorcycles, Bicycles, Rollerblades, etc. - Prohibited

AD.7.3 Self-propelled Pit Carts, Tool Boxes, etc. - Prohibited

AD.7.4 Trash Cleanup

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PS - PRE-COMPETITION SUBMISSIONS

PS.1 DOCUMENTATION

PS.1.1 Requirements

PS.1.2 Definitions

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Examples: submitting a few minutes late would be one day penalty; submitting 25 hours late would be two days penalty

PS.2 SUBMISSION DETAILS

PS.2.1 Submission Location

PS.2.2 Submission Format Requirements

PS.3 SUBMISSION PENALTIES

PS.3.1 Submissions

PS.3.2 Penalty Detail

Not Submitted

PS.3.3 Removal of Team Entry

Grounds for Removal

Not Submitted

PS.3.4 Specific Penalties

- **Not Submitted**
- **Not Submitted**

IC.5.1

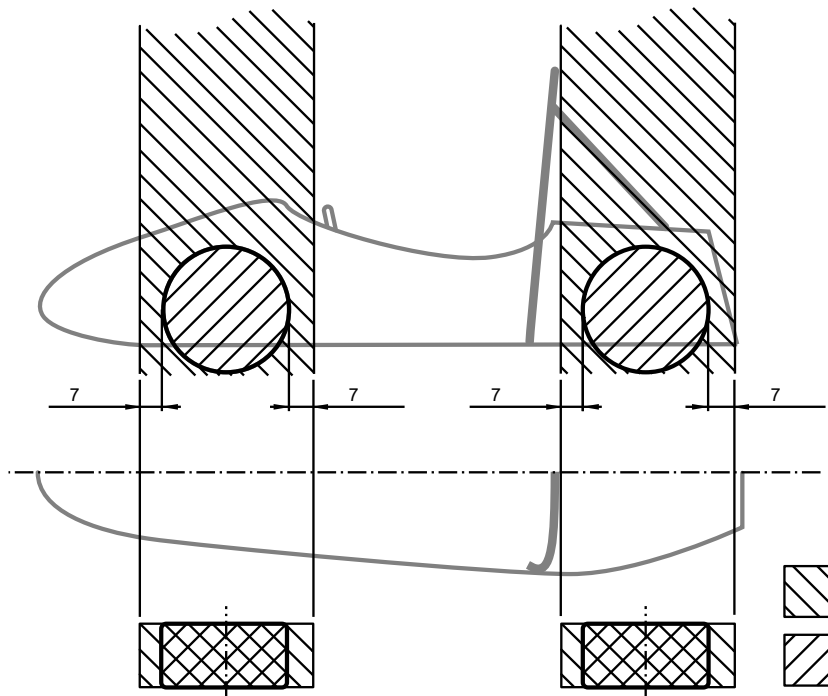
Table PS-1 Submission Information

	F.2.1			
	IC.4.2			

V - VEHICLE REQUIREMENTS

V.1 CONFIGURATION

V.1.1 Open Wheel



V.1.2 Wheelbase

V.1.3 Vehicle Track

IN.11.2

V.1.4 Ground Clearance

F.6.4.5, F.7.5.1

The intent is that sliding skirts or other devices that by design, fabrication or as a consequence of moving, contact the track surface are prohibited and any unintended contact with the ground which causes damage, or in the opinion of the Dynamic Event Officials could result in damage to the track, will result in forfeit of a run or an entire dynamic event

V.2 DRIVER

V.2.1 Accommodation

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V.2.2 Visibility

V.3 SUSPENSION AND STEERING

V.3.1 Suspension

Critical Fasteners T.8.2

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V.3.2 Steering

F.5.14

Critical Fasteners T.8.2

V.3.1.5 above

V.3.3 Steering Wheel

T.1.4.4

V.4 WHEELS AND TIRES

V.4.1 Wheel Size

V.4.2 Wheel Attachment

A second nut (jam nut) does not meet this requirement

V.4.3 Tires

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F - CHASSIS AND STRUCTURAL

F.1 DEFINITIONS

F.1.1 Chassis

F.1.2 Frame Member

F.1.3 Monocoque

F.1.4 Main Hoop

F.1.5 Front Hoop

F.1.6 Roll Hoop(s)

F.1.7 Roll Hoop Bracing Supports

F.1.8 Front Bulkhead

F.1.9 Impact Attenuator

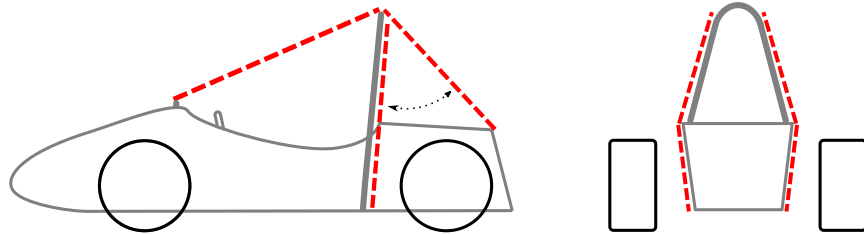
F.1.10 Primary Structure

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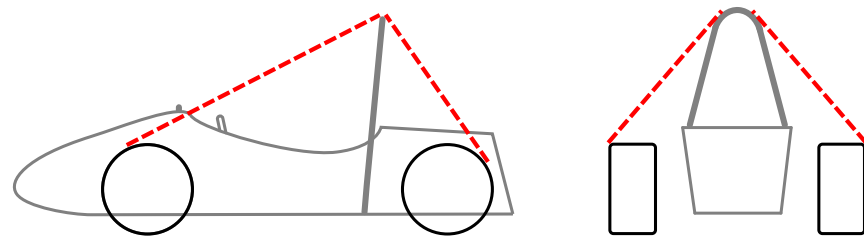
F.1.11 Primary Structure Envelope

F.1.12 Major Structure

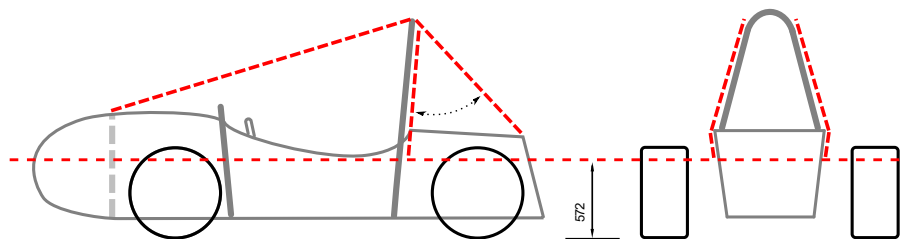
F.1.13 Rollover Protection Envelope



F.1.14 Tire Surface Envelope

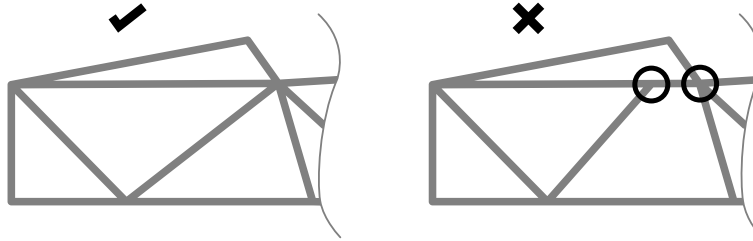


F.1.15 Component Envelope



F.1.16 Buckling Modulus (EI)

F.1.17 Triangulation



F.1.18 Nonflammable Material

F.2 DOCUMENTATION

F.2.1 Structural Equivalency Spreadsheet - SES

F.2.2 Structural Documentation

PS - Pre-

Competition Submissions

F.2.3 Equivalence

For example, in a Side Impact Structure consisting of one tube per [F.3.2.1.e](#) and a laminate panel, the panel only needs to be Equivalent to two Side Impact Tubes.

F.2.4 Tolerance

F.2.5 Fabrication

F.3 TUBING AND MATERIAL

F.3.1 Dimensions

	1.0" x 0.095"
	25 x 2.5 mm
	1.0" x 0.065"
	25.4 x 1.6 mm
	1.0" x 0.049"
	25.4 x 1.2 mm
	1.375" x 0.049"
	35 x 1.2 mm

F.3.5 Aluminum Tubing

F.3.2.1

F.3.4.1
F.3.4.2.a above

F.4 COMPOSITE AND OTHER MATERIALS

F.4.1 Requirements

F.3.2

F.4.2 Laminate and Material Testing

F.4.2.3

F.4.2.2

The intent is for the test panel to use the same material batch, material age, material storage, and student layup quality as the monocoque, and to make sure the calibration of the test machine is accurate

F.4.2.4

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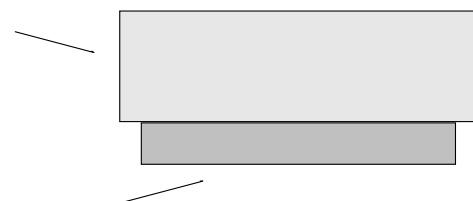
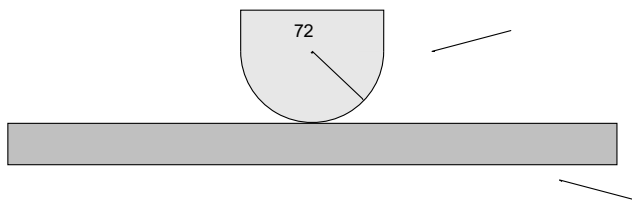
F.3.2.1.e

F.4.2.2

F.4.2.3

F.4.2

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F.7.3.3 F.7.5.5
F.7.3.3 F.7.5.5

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The intent is to perform a test of the actual bond overlap, and fail the skin before the bond

F.4.3 Use of Laminates

F.4.4 Equivalent Flat Panel Calculation

F.4.3

F.5 CHASSIS REQUIREMENTS

F.5.1 Primary Structure

- **F.3.2 F.3.4**
- **F.3.2 F.3.5**
- **F.4**

F.5.1.1

F.2.3

F.5.4, F.5.5, F.7.8

F.5.2 Bent Tubes or Multiple Tubes

F.5.6.3

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F.5.3 Holes and Openings in Regulated Tubing

F.5.4 Fasteners in Primary Structure

Bonded fasteners and blind nuts and bolts do not meet this requirement

Critical Fasteners T.8.2

“D” equals the hole diameter. “e” equals the distance from the edge of the hole to the nearest free edge

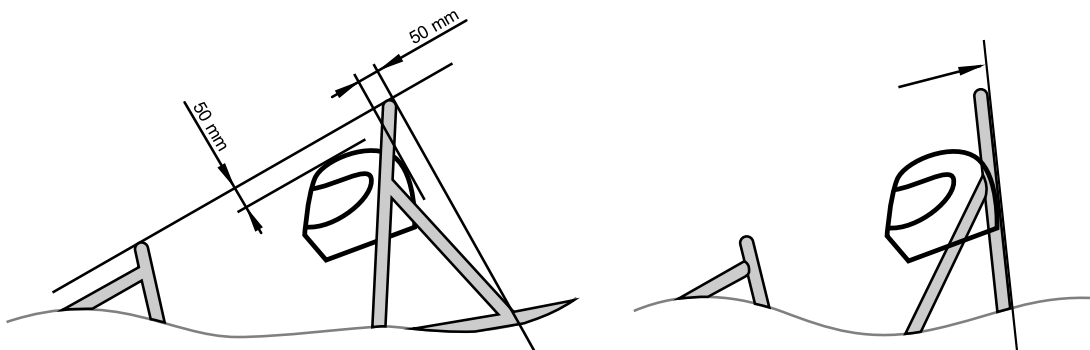
Tabs attaching the Suspension to the Primary Structure are NOT “in the Primary Structure”

F.5.5 Bonding in Regulated Structure

F.5.6 Roll Hoops

F.7.8

V.2.1.1



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F.5.7 Front Hoop

F.3.2.1.c

F.5.9.6 below

F.5.8 Main Hoop

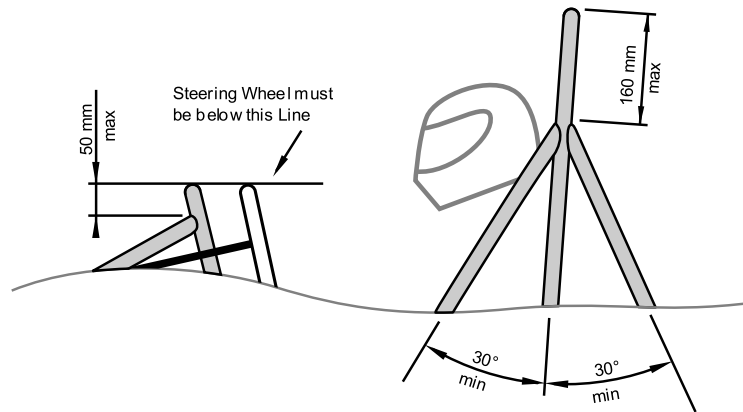
F.3.2.1.g

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F.5.9 Main Hoop Braces

F.3.2.1.h

The Main Hoop Braces should be attached as near as possible to the top of the Main Hoop



F.5.10 Head Restraint Protection

T.2.8.3.b

F.5.9.2

F.3.2.1.h

F.5.2.1

F.5.2.2

F.5.2.3

T.2.8

F.5.11 External Items

F.1.11

F.3.2.1.o

F.5.11.2 above

F.5.12 Mechanically Attached Roll Hoop Bracing

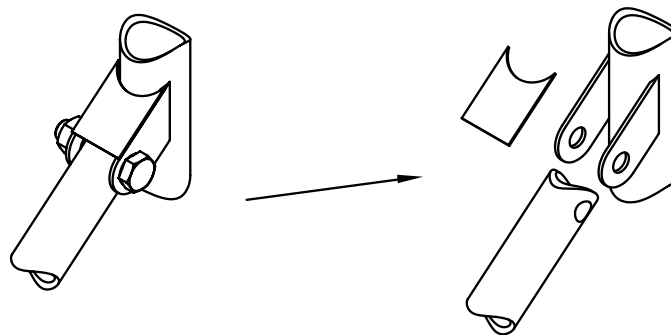
T.8.2

F.5.12.5

F.5.12.7

Critical Fasteners

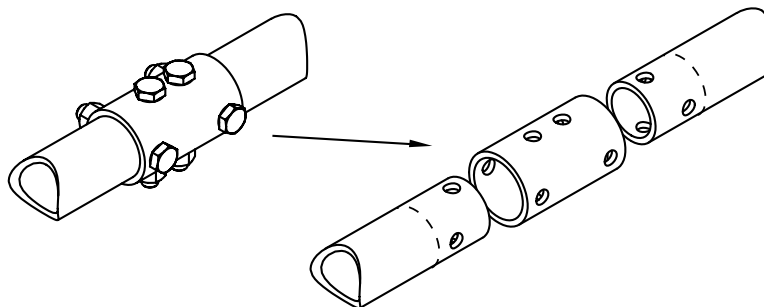
Figure – Double Lug Joint



10 mm Metric Grade 9.8 or 3/8 in SAE Grade 8

[F.5.12.1 above](#)

Figure – Sleeved Butt Joint



6 mm Metric Grade 9.8 or 1/4 in SAE Grade 8
F.5.12.1 above

F.5.13 Other Bracing Requirements

Critical Fasteners T.8.2

F.5.14 Steering Protection

F.3.2.1.n

F.7.8

F.5.15 Other Side Tube Requirements

This is intended to prevent the drivers' shoulders from passing under the Roll Hoop Brace or frame tube, and the driver's neck contacting this brace or tube.

F.5.16 Component Protection

F.3.2.1.n

F.4.1.3

F.6 TUBE FRAMES

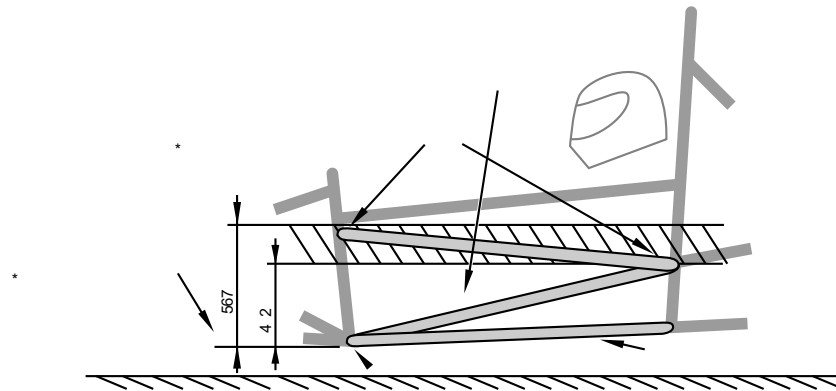
F.6.1 Front Bulkhead

F.3.2.1.a

F.6.2 Front Bulkhead Support

F.3.2.1.b

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F.6.5 Shoulder Harness Mounting

F.3.2.1.k

F.5.2.1 F.5.2.2

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F.3.2.1.l

F.6.6 Main Hoop Bracing Supports

F.3.2.1.i

F.5.2

F.7 MONOCOQUE

F.7.1 General Requirements

F.7.5.3.b

F.4 Composite and Other Materials

F.7.2 Front Bulkhead

F.6.1

F.7.3 Front Bulkhead Support

F.3.2.1.b

F.4.3

F.4.2.5

F.7.4 Front Hoop Attachment

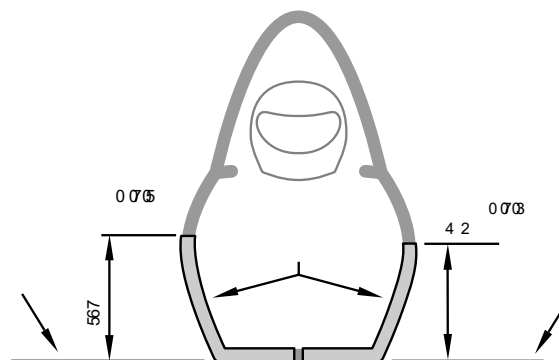
F.3.2.1.c

F.5.7.2 F.7.8

F.7.8

F.5.7.7

F.7.5 Side Impact Structure Side Impact Zone



F.3.2.1.e

F.3.2.1.e F.4.3

F.4.3

F.4.2.5

F.7.6 Main Hoop Attachment

F.7.8

F.7.7 Roll Hoop Bracing Attachment

F.7.8

F.7.8 Attachments

F.6 F.11.2

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F.7.8.1

F.4.2.5

Fasteners

T.8.2

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Critical

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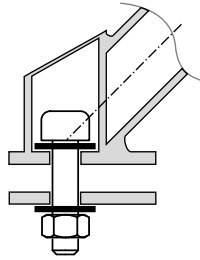
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Critical Fasteners

T.8.2

F.7.8.4

above



F.4.3

F.7.5

F.7.9 Driver Harness Attachment

The angles are measured from the plane of the Test Sample (90° is normal to the Test Sample and 0° is parallel to the Test Sample)

The intent is that the test specimen, to the best extent possible, represents the vehicle as driven at competition. Teams are expected to test a panel that is manufactured in as close a configuration to what is built in the vehicle as possible

F.8 FRONT CHASSIS PROTECTION

F.8.1 Requirements

F.8.2 Anti Intrusion Plate - AIP

F.8.3

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Critical Fasteners T.8.2

F.8.5.3.b

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F.8.3 Composite Anti Intrusion Plate

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F.4.2.2 F.4.2.5

F.8.4 Impact Attenuator - IA

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F.8.8

F.3.2.1.b

F.2.3.1

-
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F.8.8.6 F.8.8.7

F.8.5 Impact Attenuator Attachment

F.5.5

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Critical Fasteners, T.8.2

F.8.6 Front Impact Objects

Fasteners should be oriented with the nuts rearwards

F.6.1, F.7.2, F.8.4.3

Non Crushable Items include, but are not limited to batteries, master cylinders, hydraulic reservoirs

F.8.7 Front Impact Verification

F.8.8.2

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F.8.7.4

F.8.7.5

F.8.7.2

F.8.7.2

F.8.8 Impact Attenuator Data - IAD

These are not test requirements

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F.8.8.2

The 25 mm spacing represents the front bulkhead support and insures that the plate does not intrude excessively into the cockpit.

F.9 FUEL SYSTEM (IC ONLY)

F.9.1 Location

F.1.10

IC.1.2

F.9.2 Protection

F.10 TRACTIVE BATTERY CONTAINER (EV ONLY)

F.10.1 General Requirements

F.1.18

F.10.2 Structure

F.4.1 F.4.2

F.4.1 F.4.2

EV.5.1.1

The Internal Walls should extend to the lid above any Module

The intent is to have each Module fully enclosed in its own six sided box

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F.10.2.5.a above

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F.5.5

F.10.2.5.a above

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Folding or bending plate material to create flanges or to eliminate joints between walls is recommended.

Positive Locking Mechanisms

F.10.3 Cells and Modules

F.10.3.1 above

F.10.2.5.a

Modules should meet F.10.3.2.a. Use of cover/lid F.10.3.2.b may not be allowed past 2026

Positive Locking Mechanisms

F.10.3.1

F.10.4 Holes and Openings

EV.4.3.2

F.10.5 Attachment

Critical Fasteners T.8.2

- F.10.5.6 F.10.5.8
- F.10.5.7 F.10.5.8
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Examples: If not filled in with additional structure, an extruded L shape would require attachments at 10 convex corners (the corners at the inside of the L are not convex); an extruded hexagon would require 12 attachments

F.7.8.7

F.11 TRACTIVE SYSTEM (EV ONLY)

F.11.1 Location

F.1.10

EV.4.1.3

EV.1.1

F.11.1.2 above

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F.1.13

F.5.16 Component Protection

F.11.2 Side Impact Protection

F.6.4, F.7.5

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F.6.4.4 F.7.5.1

F.5.16

Component Protection

F.11.3 Rear Impact Protection

F.6.4, F.7.5

F.5.16 Component Protection

F.6.4.4 F.7.5.1

F.6.4, F.7.5

F.6.4, F.7.5

F.11.3.1 above

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F.11.3.3 above

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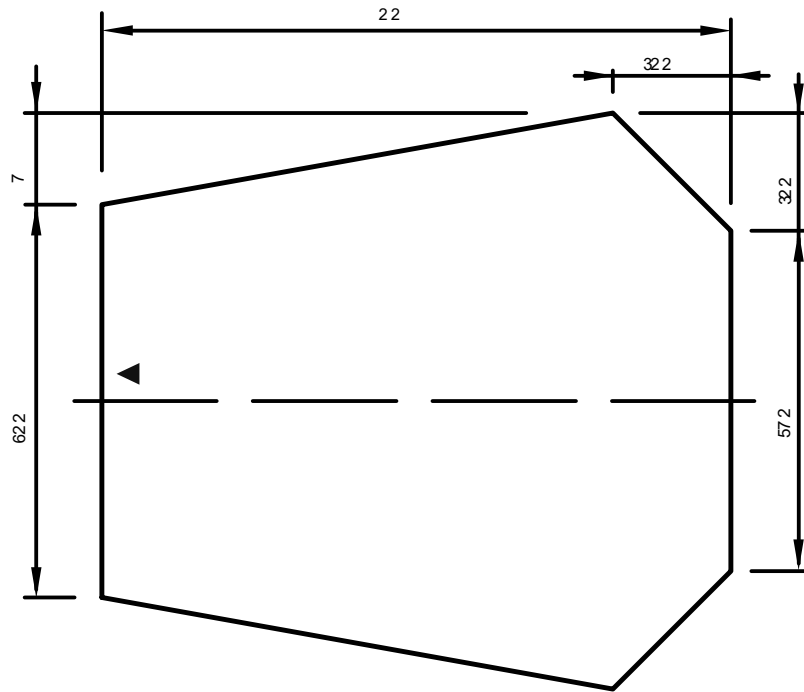
F.11.4 Clearance and Non Crushable Items

Tractive Battery Pack mounts do not require clearance

T - TECHNICAL ASPECTS

T.1 COCKPIT

T.1.1 Cockpit Opening

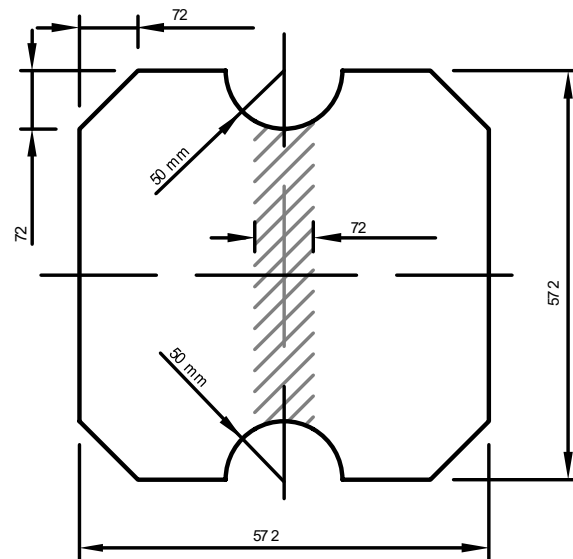


F.6.4 F.7.5.1

During inspection, the steering column, for practical purposes, will not be removed. The template may be maneuvered around the steering column, but not any fixed supports.

For ease of use, the template may contain a slot at the front center that the steering column may pass through.

T.1.2 Internal Cross Section



For ease of use, the template may contain a full or partial slot in the shaded area shown on the figure

T.1.3 Driver Protection

Moving components include, but are not limited to springs, shock absorbers, rocker arms, anti-roll/sway bars, steering racks and steering column CV joints.

T.1.4 Vehicle Controls

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This is to prevent debris or interference and includes but is not limited to a gear mechanism

F.6.4 F.7.5

T.1.5 Driver's Seat

F.3.2.1.e

T.1.6 Thermal Protection

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T.1.7 Floor Closeout

T.1.8 Firewall

EV.4.1.3

T.1.8.1 above

EV.6.7 Grounding

T.2 DRIVER ACCOMMODATION

T.2.1 Harness Definitions

F.5.6.5

F.5.6.6

F.5.6.5

F.5.6.6

T.2.2 Harness Specification

T.2.3 Harness Requirements

Lap Belts with “pull-up” adjusters are recommended over “pull-down” adjusters.

T.2.4 Belt, Strap and Harness Installation - General

F.3.2.1.j

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Bolt tabs are checked in double tearout

Critical Fasteners T.8.2

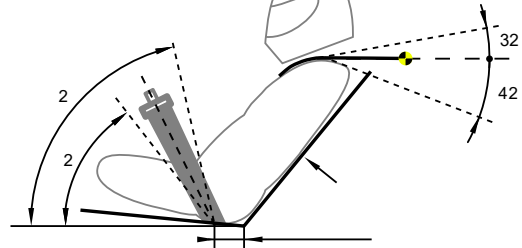
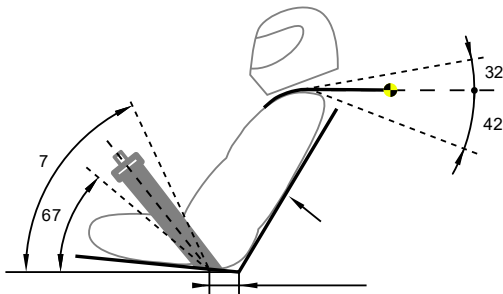
Double shear attachments are preferred. Tabs and brackets for double shear mounts should be welded on the two sides.

Threads should be 7/16-20 or greater

F.3.4.3

T.1.8.1

T.2.5 Lap Belt Mounting



F.7.8.8

T.2.4.3

Critical Fasteners T.8.2,

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T.2.6 Shoulder Harness

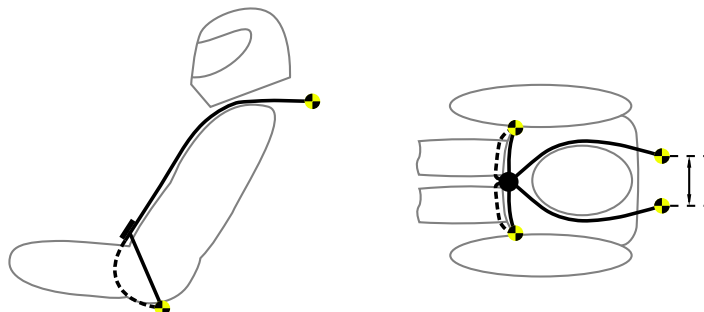
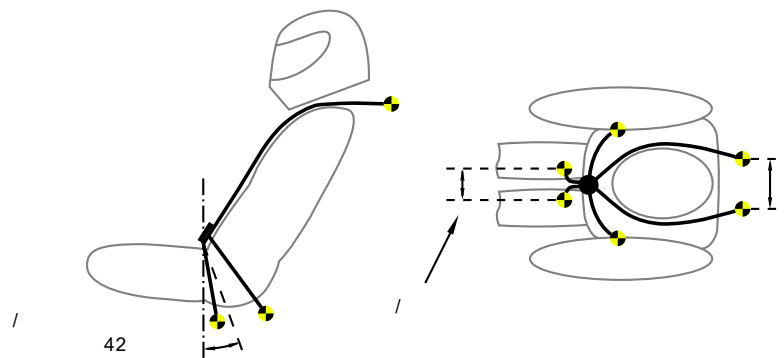
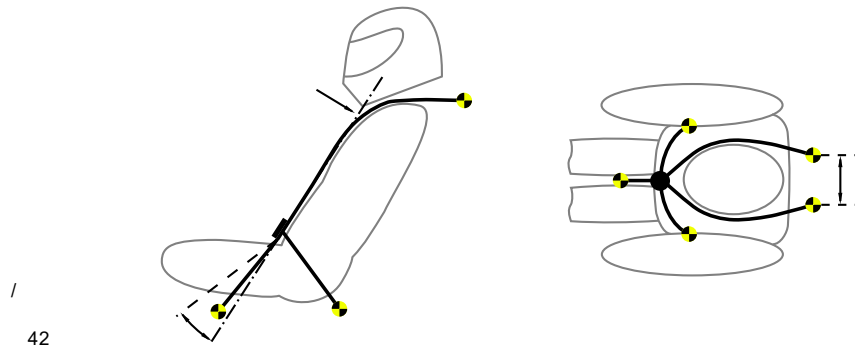
F.7.8.8

T.2.4.3

Critical Fasteners T.8.2,

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T.2.7 Anti-Submarine Belt Mounting



T.2.7.1

T.2.7.2

F.7.8.8

T.2.4.3

F.3.2.1.j

F.6.4.5

Critical Fasteners

T.8.2,

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T.2.8 Head Restraint

F.1.13

F.5.10

Approximately 100 mm of longitudinal adjustment should accommodate range of specified drivers. Several Head Restraints with different thicknesses may be used

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T.2.9 Roll Bar Padding

T.3 BRAKES

T.3.1 Brake System

T.5.2

Critical Fasteners T.8.2

T.3.2 Brake Pedal, Pedal Box and Mounting

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This is not a design criteria. The Brake Pedal and Brake System may be tested by pressing the pedal with the maximum force that can be exerted by any official when seated normally

T.3.3 Brake Over Travel Switch - BOTS

IC.9.2.2 EV.7.2.2

T.3.4 Brake Light

T.4 ELECTRONIC THROTTLE COMPONENTS

T.4.1 Applicability

T.4

-
-

IC.4

T.4.2 Accelerator Pedal Position Sensor - APPS

T.1.4.1

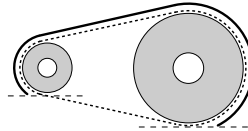
T.4.3 Brake System Encoder - BSE

-
-

T.5 POWERTRAIN

T.5.1 Transmission and Drive

T.5.2 Drivetrain Shields and Guards



T.3.1.8

T.5.2.7 T.5.2.8

Critical Fasteners T.8.2

T.5.3 Motor Protection (EV Only)

EV.4.1

-
-
-

-

-

-

T.5.4 Coolant Fluid

-

-

T.5.5 System Sealing

T.5.6 Catch Cans

T.6 PRESSURIZED SYSTEMS

T.6.1 Compressed Gas Cylinders and Lines

-
-

T.1.6.3

T.2.6

T.6.2 High Pressure Hydraulic Pumps and Lines

This section T.6.2 does not apply to Brake lines or hydraulic clutch lines

T.7 BODYWORK AND AERODYNAMIC DEVICES

T.7.1 Aerodynamic Devices

IN.6.2

T.7.2 Bodywork

T.7.3 Measurement

The intent is to standardize the measurement, see [GR.6.4.1](#)

- **Head Restraint Plane**
-

T.7.4 Location

V.1.1 V.1.4.1

T.7.5 Length

T.7.6 Width

T.8.2 Critical Fastener Requirements

-
-

Mechanisms T.8.3

Positive Locking

T.8.3 Positive Locking Mechanisms

Meaning If the fastener begins to loosen, the locking device still prevents the fastener coming completely loose

Lock washers, bolts with nylon patches and thread locking compounds (Loctite®), DO NOT meet the positive locking requirement. A latch requires an additional Positive Locking Mechanism

T.8.4 Requirements for All Fasteners

T.9 ELECTRICAL EQUIPMENT

T.9.1 Definitions

High Voltage – HV

Low Voltage - LV

Normally Open

T.9.2 Low Voltage Batteries

T.2.6

This chassis structure must be sufficient for suspension mounting

Nonflammable Material

T.9.3 Master Switches

IC.9.3 EV.7.9

T.9.4 Inertia Switch

-
-

IC.9.2.2 EV.7.2.2

VE - VEHICLE AND DRIVER EQUIPMENT

VE.1 VEHICLE IDENTIFICATION

VE.1.1 Vehicle Number

VE.1.2 School Name

VE.1.3 SAE Logo

VE.1.4 Inspection Sticker

IN.15.2

-
-

VE.1.5 Transponder / RFID Tag

VE.2 VEHICLE EQUIPMENT

VE.2.1 Jacking Point

VE.2.2 Push Bar

VE.2.3 Fire Extinguisher

-
-
-

VE.2.4 Electrical Equipment (EV Only)

-

•

VE.2.5 Camera Mounts

VE.3 DRIVER EQUIPMENT

VE.3.1 General

VE.3.2 Helmet

VE.3.3 Driver Gear

Flame Resistant Material

- _____
- _____
- _____
- _____
- _____

Flame

Resistant Material

Flame Resistant Material

Flame Resistant Material

- _____
- _____
- _____

Flame Resistant Material

Flame Resistant Material

IC - INTERNAL COMBUSTION ENGINE VEHICLES

IC.1 GENERAL REQUIREMENTS

IC.1.1 Engine Limitations

710 cc

IC.1.2 Air Intake and Fuel System Location

Tire Surface Envelope F.1.14

IC.2 AIR INTAKE SYSTEM

IC.2.1 General

IC.2.2 Intake System Location

IC.1.2

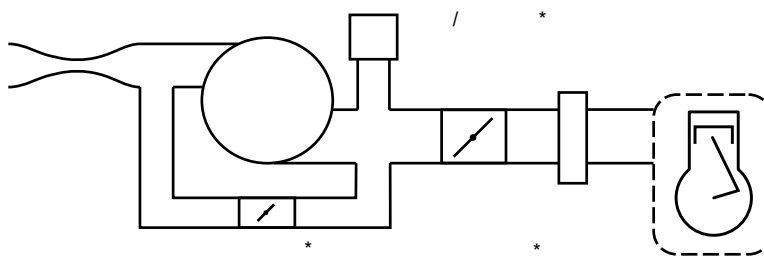
F.6.4 F.7.5

IC.2.3 Intake System Mounting

-
-

T.8.3

IC.2.4 Intake System Restrictor



IC.2.5 Turbochargers & Superchargers

T.5.4.1

IC.2.4.2.b

For the purpose of definition, a plenum is any tank or volume that is a significant enlargement of the normal intake runner system. Teams may submit their designs via a Rules Question for review prior to competition if the legality of their proposed system is in doubt.

IC.2.6 Connections to Intake

IC.3 THROTTLE

IC.3.1 General

IC.3.2 Throttle Actuation Method

IC.3.3

IC.4

IC.3.3 Throttle Actuation – Mechanical

IC.4 ELECTRONIC THROTTLE CONTROL

This section IC.4 applies only when Electronic Throttle Control is used

IC.4.1 General Design

IC.4.2 Documentation

-
-

Competition Submissions

PS - Pre-

PS.3.4.1

IC.4.3 Commercial ETC System

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-
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IC.4.4 Throttle Position Sensor - TPS

IC.4

IC.4.5 Accelerator Pedal Position Sensor - APPS

T.4.2

IC.4.6 Brake System Encoder - BSE

T.4.3

IC.4.7 Throttle Plausibility Checks

IC.4.7.2.b above

IC.4.8 Brake System Plausibility Device - BSPD

Throttle Plausibility Checks IC.4.7

IC.9.2.2

IC.9.3

IC.9.4

IC.9.2.2

IC.4.8.6

IC.5 FUEL AND FUEL SYSTEM

IC.5.1 Fuel

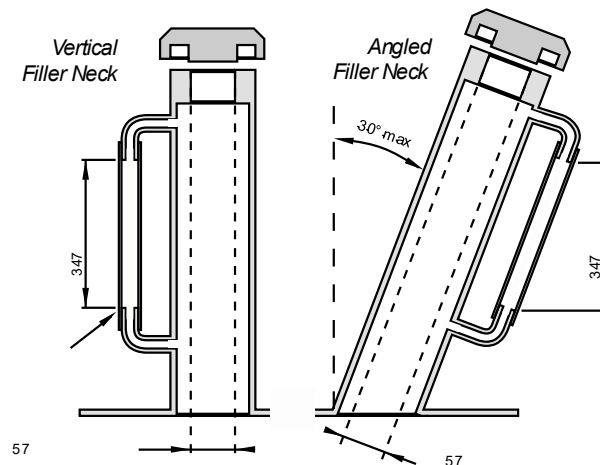
IC.5.2 Fuel System

IC.1.2 F.9

T.1.8

IC.5.3 Fuel Tank

IC.5.4 Fuel Filler Neck & Sight Tube



Fuel Level Line

This line will be used as the fill line for the Tilt Test, and before and after Endurance to measure the amount of fuel used during the Endurance Event.

The gas can is minimum 25 cm wide x 25 cm deep x 35 cm high, with a 25 cm spout at the top

IC.5.5 Fuel Tank Filling

D.13.2.5

IC.5.6 Venting Systems

IC.5.7 Fuel Lines

IC.6 FUEL INJECTION

IC.6.1 Low Pressure Injection (LPI)

-
-

Critical Fasteners T.8.2

IC.6.2 High Pressure Injection (HPI) / Direct Injection (DI)

Direct Injection systems often utilize a low pressure electric fuel pump and high pressure mechanical “boost” pump driven off the engine.

-
-

Critical Fasteners T.8.2

IC.7 EXHAUST AND NOISE CONTROL

IC.7.1 Exhaust Protection

T.1.6.3

IC.7.2 Exhaust Outlet

IC.7.3 Variable Exhaust

IN.12.2

IC.7.4 Connections to Exhaust

IC.7.5 Noise Level and Testing

IN.12.5

IN.12

IC.8 ELECTRICAL

IC.8.1 Starter

IC.8.2 Batteries

T.9.2

IC.8.3 Voltage Limit

T.9.1.2

-
-
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IC.9 SHUTDOWN SYSTEM

IC.9.1 Shutdown Circuit

IC.9.3

IC.9.4

IC.4.8

T.3.3

T.9.4



IC.9.2 Shutdown Circuit Operation

IC.9.1.1

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-
-

IC.4.1.1

IC.9.3 Primary Master Switch

T.9.3

IC.9.4 Cockpit Main Switch

EV - ELECTRIC VEHICLES

EV.1 DEFINITIONS

EV.1.1 Cell

EV.1.2 Module

EV.1.3 Tractive Battery

EV.1.4 Tractive Battery Container

EV.1.5 Tractive Battery Pack

EV.1.6 Tractive System – TS

EV.1.7 Grounded Low Voltage - GLV

EV.2 DOCUMENTATION

EV.2.1 Electrical System Form - ESF

Submission and approval of the ESF does not mean that the vehicle will automatically pass Electrical Technical Inspection with the described items / parts

PS - Pre-Competition

Submissions

EV.2.2 Submission Penalties

PS - Pre-Competition Submissions

EV.3 ELECTRICAL LIMITATIONS

EV.3.1 Operation

EV.3.2 Energy Meter

GR.4.2.3

EV.3.3 Power and Voltage

80 kW

600 V DC

EV.3.4 Violations

EV.3.3.1

EV.3.3.2

-
-

EV.3.5 Penalties

-

D.14.2.1

EV.4 COMPONENTS

EV.4.1 Motors

T.5.3

EV.7.8

EV.7.2.2

F.1.11

F.11.1.3

(no dangling cables, loops, coils, etc)

EV.4.2 Motor Controller

EV.4.3 Tractive Battery Container

F.10

F.10.4

EV.6.1



-
-

T.9.1.1

EV.4.4 Grounded Low Voltage System

EV.7.9.1

EV.5.8

T.9.2

EV.4.5 Accelerator Pedal Position Sensor - APPS

T.4.2

EV.4.6 Brake System Encoder - BSE

T.4.3

EV.4.7 APPS / Brake Pedal Plausibility Check

- **EV.4.6 T.3.2.4**
- **EV.4.5**

EV.4.8 Tractive System Part Positioning

F.11

EV.4.9 Housings and Enclosures



T.9.1.1

EV.6.7

EV.4.10 Hand Cart

EV.11.4.2 EV.11.5.1

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EV.5 ENERGY STORAGE

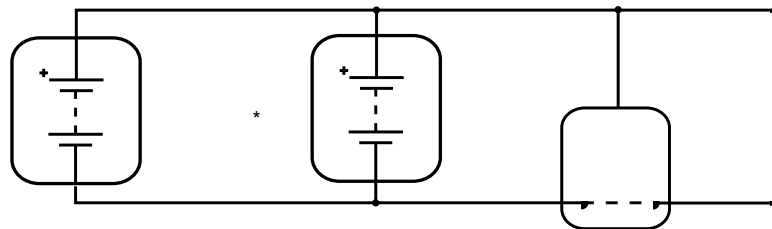
EV.5.1 Tractive Battery

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-

-

EV.3.1



EV.5.2 Electrical Configuration

EV.6.7

F.1.18

The intent is to prevent arc flashes caused by inter Module or intra Module contact or by parts/tools accidentally falling into the Container during maintenance for example

Soldering wires to cells for the voltage monitoring input of the BMS is permitted, these wires are not part of the high current path

EV.5.3 Maintenance Plugs

EV.5.1.1

EV.11.4.1

EV.5.4 Isolation Relays - IR

EV.6.6

T.9.1.1

F.1.18

EV.7.2.2

EV.5.5 Manual Service Disconnect - MSD

EV.11.3.2

EV.7.8

EV.7.2.2

EV.6.1.2

EV.5.6 Precharge and Discharge Circuits

EV.7.1

EV.5.7 Voltage Indicator

T.9.1.1

EV.5.8 Tractive System Measuring Points - TSMP

EV.7.9

EV.8.2

EV.5.9 Connectors

EV.7.8

EV.5.10 Ready to Move Light

Refer to the Rules FAQ on the Event Website for additional information

Rollover Protection Envelope F.1.13

Visibility is checked with Bodywork and Aerodynamic Devices in place

EV.6.5.4

T.9.1.1

EV.5.11 Tractive System Status Indicator

Refer to the Rules FAQ on the Event Website for additional information

Rollover Protection Envelope F.1.13

Condition	Green Light	Red Light
EV.7.3.5	EV.7.6.5	

EV.6 ELECTRICAL SYSTEM

EV.6.1 Covers

Removable Bodywork is not suitable to enclose Tractive System connections

A rating of IP65 is recommended

EV.6.2 Insulation

EV.6.3 Wiring

EV.6.4 Connections

EV.6.7

*Lock washers or thread locking compounds (Loctite®) or adhesives are not acceptable
Bolts with nylon patches are permitted for blind connections into OEM components*

EV.6.5 Voltage Separation

IN.10.2.2

Some components, such as the Motor Controller, may be part of both systems.

EV.7.8.4

EV.5.4

EV.7.3

EV.5.6

EV.7.6

EV.5.10

EV.3.1

EV.6.6 Overcurrent Protection

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-

EV.6.6.2.b above

EV.7.2.2

*Most cell internal Overcurrent Protection devices are Low Voltage or non voltage rated and conditions of **EV.6.6.5 above** will apply.*

EV.6.7 Grounding

T.1.8.4

T.1.8.4

The part itself must meet the grounding requirement if conductive tape is applied

Examples: parts made of steel, (anodized) aluminum, any other metal parts

Example: carbon fiber parts

Carbon fiber parts may need special measures such as using copper mesh or similar to keep the ground resistance below 5 Ohms.

EV.7 SHUTDOWN SYSTEM

EV.7.1 Shutdown Circuit

EV.7.3

EV.7.6

EV.7.7

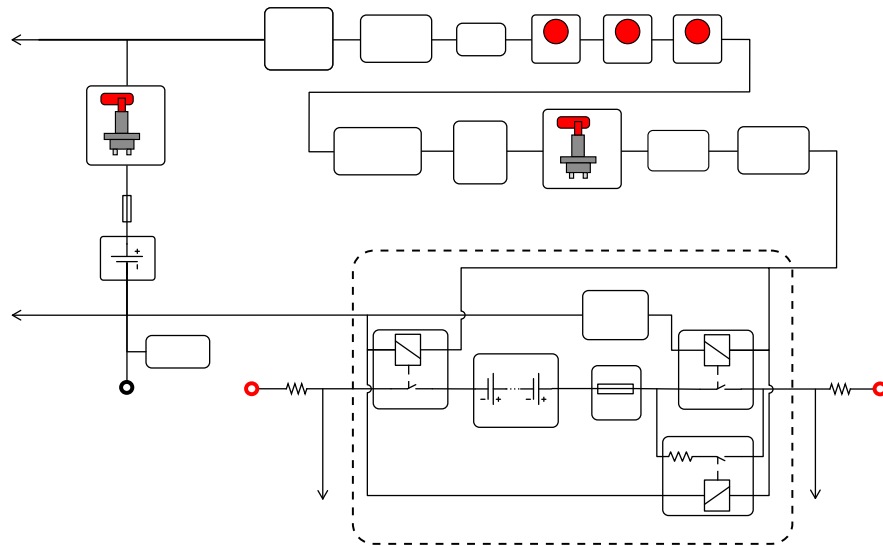
EV.7.8

EV.7.9

EV.7.10

T.3.3

T.9.4



EV.7.2 Shutdown Circuit Operation

EV.7.1.1

EV.5.4.3

T.9.1.2

EV.7.3 Battery Management System - BMS

EV.7.5

EV.11.5

EV.8.3

EV.7.4

EV.7.2, EV.8.4

EV.7.4.2

EV.7.5.2

EV.7.3.4 above

EV.7.2.2

EV.5.11.5

EV.7.2.3

EV.7.4 Tractive Battery Voltage

When single Cells are directly connected in parallel, only one voltage measurement is needed

EV.7.5 Tractive Battery Temperature

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The temperature of each cell should be monitored

EV.7.5

-
-

EV.7.6 Insulation Monitoring Device - IMD

EV.7.6.4 above

EV.7.2.2

EV.5.11.5

EV.7.2.3

EV.7.7 Brake System Plausibility Device - BSPD

APPS / Brake Pedal Plausibility Check EV.4.7
EV.7.2.2

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-

EV.4.6

EV.7.2.2

The suggested test would introduce a current by a separate wire from an external power supply simulating the Tractive System current while pressing the brake pedal

EV.7.8 Interlocks

EV.4.1.3 EV.5.5.2 EV.5.9

EV.7.2.2

EV.6.5

EV.5.9

EV.7.9 Master Switches

T.9.3

EV.4.4

EV.7.2.2



EV.11.3.1

EV.7.10 Shutdown Buttons

EV.7.2.2

F.5.9



EV.8 CHARGER REQUIREMENTS

EV.8.1 Charger Requirements

IN.5.1

IN.5.2.2

EV.8.2 Charger Features

EV.5.8.2

EV.8.4.2



EV.8.3 Charging Shutdown Circuit

EV.8.2.7

EV.7.3

EV.7.6

EV.8.4 Charging Shutdown Circuit Operation

T.9.1.2

EV.9 VEHICLE OPERATIONS

EV.9.1 Activation Requirement

EV.7.9

EV.9.2 Activation Sequence

EV.9.3

EV.9.4

EV.9.5

EV.9.3 Low Voltage (GLV) System

EV.9.4 Tractive System Active

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-

EV.9.5 OK to Energize

D.2.3

D.1.2.1

EV.9.6 Ready to Drive

- **EV.9.4**
-
-

T.3.2

Such as pressing a specific button in the cockpit

EV.9.7 Ready to Drive Sound

IN.10.3

EV.10 EVENT SITE ACTIVITIES

EV.10.1 Onsite Registration

EV.10.2 Tractive Battery Pack Removal

EV.11 WORK PRACTICES

EV.11.1 Personnel

AD.5.2

EV.11.2 Maintenance

EV.11.3 Lockout

EV.7.9.3

EV.5.5

EV.11.4 Tractive System

IN.5

EV.5.3.3

EV.4.3

EV.4.10.2

EV.11.4.3

EV.5.1.1

EV.11.5 Charging

EV.4.10

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-

EV.12 RED CAR CONDITION

EV.12.1 Definition

EV.5.11

EV.12.2 Actions

IN - TECHNICAL INSPECTION

IN.1 INSPECTION REQUIREMENTS

IN.1.1 Inspection Required

IN.15.1

IN.15.2

IN.1.2 Technical Inspection Authority

IN.1.3 Team Responsibility

IN.1.4 Reinspection

IN.17

IN.2 INSPECTION CONDUCT

IN.2.1 Vehicle Condition

IN.2.2 Measurement

IN.2.3 Visible Access

Methods to provide visible access include but are not limited to removable body panels, access panels, and other components

IN.2.4 Inspection Items

IN.2.5 Correction

-
-

IN.2.6 Marked Items

IN.17

IN.3 INSPECTION PARTS

IN.3.1 Inspection Steps

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-
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-
-
-

IN.3.2 Step Details

IN.4 INITIAL INSPECTION / GEAR CHECK

-
-
-
-

VE.3

VE.2.3

V.4.3.2

IN.5 TRACTIVE BATTERY PACK AND CHARGER INSPECTION (EV ONLY)

IN.5.1 Inspection Items

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-
-

EV.4.10

EV.5.1.3

EV.8.1

F.10.2.1.c F.10.2.2.c

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-
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EV.2

GR.7

IN.5.2 Inspection Conduct

IN.2.6

IN.5.3 Inspection Completion

IN.6 MECHANICAL / ELECTRICAL INSPECTION

IN.6.1 Inspection Items

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-
-
-
-
-
-

V.4.3.1

VE.2.2

F.2.1

F.4.2

F.8.8.7

GR.7

IN.6.2 Aerodynamic Devices Stability and Strength

This is guidance, but actual conformance will be up to technical inspectors at the respective competitions. The intent is to reduce the likelihood of wings detaching

IN.17 Reinspection

IN.6.3 Monocoque Inspections

F.7.1.4

F.7.4.3

IN.6.4 Engine Inspection (IC Only)

IN.6.5 Mechanical / Electrical Inspection Completion

EV.11.3.2

IN.7 DRIVER TEMPLATE INSPECTIONS

IN.7.1 Conduct

F.5.6.5

F.5.6.6

IN.7.2 Driver Template Clearance Criteria

F.5.6.4

IN.8 COCKPIT TEMPLATE INSPECTIONS

IN.8.1 Conduct

T.1.1

T.1.2

IN.8.2 Cockpit Template Criteria

IN.9 DRIVER COCKPIT CHECKS

IN.9.1 Driver Clearance

- **F.5.6.4**
- **T.2.8.6**
- **T.2.5, T.2.6, T.2.7**

IN.9.2 Egress Test

VE.3.2 VE.3.3

IC.9.4

EV.7.10.4

IN.9.3 Driver Clearance and Egress Test Completion

IN.9.1

IN.9.2

IN.10 ACTIVE INSPECTION / EV ACTIVE (EV ONLY)

IN.10.1 Insulation Monitoring Device Test

EV.5.8

IN.10.2 Insulation Measurement Test

IN.10.3 Ready to Drive Sound

EV.9.7

IN.10.4 Active Inspection / EV Active Completion

IN.15.2

EV.9.5

IN.11 TILT TEST

IN.11.1 Tilt Test Requirements

IC.6.2

IN.11.2 Tilt Test Criteria

IN.11.3 Tilt Test Completion

IN.12 NOISE AND SWITCH TEST (IC ONLY)

IN.12.1 Sound Level Measurement

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-
-
-

IC.7.2.2

IC.7.2.2

IN.12.2.2 below

IN.12.2 Special Configurations

IN.12.3 Industrial Engine

IN.12.4 Test Speeds

Test Speeds for typical engines are published on the Event Website

IN.12.5 Maximum Permitted Sound Level

IN.12.6 Noise Level Retesting

IN.12.7 Switch Function

IC.9.3

IC.9.4

T.3.3

IN.12.8 Noise Test Completion

IN.13 RAIN TEST (EV ONLY)

IN.13.1 Rain Test Requirements

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EV.7

IN.15.2 Inspection Sticker

VE.1.4

IN.15.3 Inspection Validity

IN.16 MODIFICATIONS AND REPAIRS

IN.16.1 Prior to Inspection Approval

IN.16.2 After Inspection Approval

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-
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-
-

V.4.3.4

T.7.1

-

-

D.6

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IN.16.3 Repairs or Changes After Inspection Approval

IN.15.1.3

IN.16.2 above

IN.17 REINSPECTION

IN.17.1 Requirement

IN.17.2 Conduct

IN.17.3 Result

IN.15.1

S - STATIC EVENTS

S.1 GENERAL STATIC

Total 325 points

S.2 PRESENTATION EVENT

S.2.1 Presentation Event Objective

S.2.2 Presentation Concept

S.2.3 Presentation Schedule

S.2.4 Presentation Submissions

PS - Pre-Competition

Submissions

S.2.5 Presentation Format

-
-

S.2.5.2

S.2.6 Presentation Equipment

S.2.7 Evaluation Criteria

S.2.8 Judging Sequence

S.2.9 Presentation Event Scoring

S.3 COST AND MANUFACTURING EVENT

S.3.1 Cost Event Objective

Making tradeoff decisions between content and cost based on the performance of each part and assembly and accounting for each part and process to meet a budget is part of Project Management

S.3.2 Cost Event Supplement

S.3.3 Cost Event Areas

S.3.4 Cost Report

Cast parts on the prototype must be cost as cast, and fabricated parts as fabricated, etc.

Submissions

PS - Pre-Competition

S.3.5 Bill of Materials - BOM

S.3.6 Late Submission

PS - Pre-

Competition Submissions

S.3.7 Cost Addendum

PS - Pre-Competition

Submissions

S.3.8 Cost Tables

S.3.10

S.3.9 Make versus Buy

Formula SAE Cost Event Supplement

S.3.10 Add Item Request

S.3.11 Public Cost Reports

S.3.12 Cost Report Penalties Process

a.

Penalty Method A - Fixed Point Deductions

Penalty Method B – Adjusted Cost

Additions

-
-

-
-
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Example - if a point deduction is given for a missing Assembly, the missing Parts are ignored.

The table costs of all items in error are included in the calculation. A missing Assembly would include the price of all Parts, Materials, Processes and Fasteners making up the Assembly.

S.3.13 Event Day and Discussion

IN.5.3

V.4.3.1

S.3.14 Cost Audit

S.3.15 Cost Scenario

S.3.16 Cost Event Scoring

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-
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S.4 DESIGN EVENT

S.4.1 Design Event Objective

S.4.2 Design Documents

-
-

PS - Pre-Competition Submissions

S.4.3 Design Briefing

PS - Pre-Competition Submissions

S.4.4 Vehicle Drawings

PS - Pre-Competition Submissions

S.4.5 Design Spec Sheet

PS - Pre-

Competition Submissions

The Design Judges realize that final design refinements and vehicle development may cause the submitted values to differ from those of the completed vehicle. For specifications that are subject to tuning, an anticipated range of values may be appropriate.

S.4.6 Vehicle Condition

IN.15.1.1

IN.5.3

S.4.7 Support Material

S.4.8 Judging Sequence

Typical Design judging includes a first round review of all teams, then additional review of selected teams.

S.4.9 Judging Criteria

S.4.10 Design Event Scoring

D - DYNAMIC EVENTS

D.1 GENERAL DYNAMIC

D.1.1 Dynamic Events and Maximum Scores

	Total	675 points
D.1.2	Definitions	
	Dynamic Area	
	Staging Area	

D.2 PIT AND PADDOCK

D.2.1 Vehicle Movement

VE.2.2

D.2.2 Fueling and Charging

EV.11.5

D.2.3 Powertrain Operation

IN.10.4

D.3 DRIVING

D.3.1 Drivers Meetings – Attendance Required

D.3.2 Dynamic Area Limitations

Refer to the Event Website for specific information

D.3.3 Driving Under Power

D.3.4 Driving Offsite - Prohibited

D.3.5 Driver Equipment

D.3.6 Starting

IC.8.1

D.3.7 Practice Area

D.3.8 Instructions from Officials

D.3.9 Vehicle Integrity

D.3.10 Stalled & Disabled Vehicles

D.4 FLAGS

Any specific variations will be addressed at the drivers meeting.

D.4.1 Command Flags

Black Flag

Black Flag with Orange Dot

Blue Flag

Checkered Flag

Green Flag

Red Flag

Yellow Flag (Stationary)

Yellow Flag (Waved)

D.4.2 Informational Flags

Red and Yellow Striped Flag

White Flag

D.5 WEATHER CONDITIONS

D.5.1 Operating Adjustments

D.5.2 Operating Conditions

- Dry
- Damp
- Wet

D.6 TIRES AND TIRE CHANGES

D.6.1 Tire Requirements

	V.4.3.1
	V.4.3.2

D.6.2 Tire Changes during Endurance

D.7 DRIVER LIMITATIONS

D.7.1 Three Event Limit

A minimum of four drivers are required to participate in all of the dynamic events.

D.8 DEFINITIONS

DOO

DNF

DQ

Gate

Entry Gate

Exit Gate

OC

Where more than one boundary indicator is used on the same course, the narrowest track will be used when determining Off Course penalties.

D.9 ACCELERATION EVENT

D.9.1 Acceleration Layout

D.9.2 Acceleration Procedure

D.9.3 Acceleration Penalties

D.9.4 Acceleration Scoring

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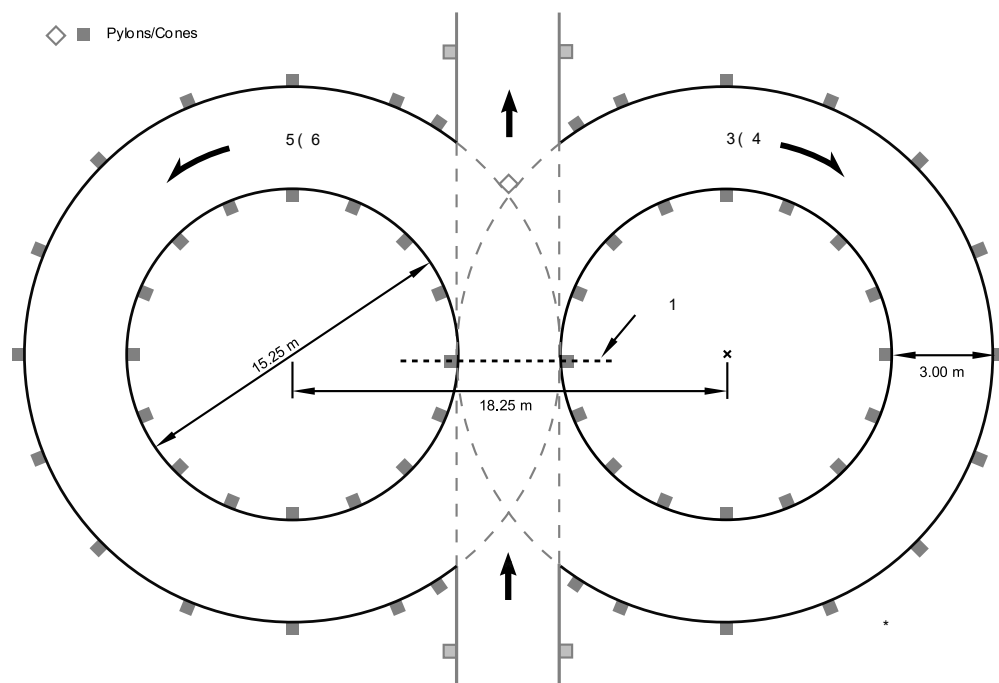
D.10 SKIDPAD EVENT

D.10.1 Skidpad Layout

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The Skidpad layout diagram shows the circles for cone placement, not for course marking. Chalk lines are marked on the opposite side of the cones, outside the driving path



D.10.2 Skidpad Procedure

D.10.3 Skidpad Penalties

D.10.4 Skidpad Scoring

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D.11 AUTOCROSS EVENT

D.11.1 Autocross Layout

D.11.2 Autocross Procedure

D.11.3 Autocross Penalties

D.11.4 Autocross Scoring

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D.12 ENDURANCE EVENT

D.12.1 Endurance General Information

D.12.2 Endurance Layout

D.12.3 Endurance Run Order

D.12.4 Endurance Vehicle Starting / Restarting

D.12.12.5

EV.9.5

D.12.5 Endurance Event Procedure

D.12.6 below

D.12.8 below

D.12.6 below

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D.12.6 Endurance Run Procedure

D.12.7 Driver Change Limitations

EV.11.1.1

EV.7.10

IC.9.3 EV.7.9

IC.9.4

IN.16.2.2

D.6.2

D.12.8 Driver Change Procedure

IN.16.2.2

D.12.4

D.12.9 Breakdowns & Stalls

D.12.1.4

D.12.4

D.12.10 Endurance Event – Black Flags

D.14.2

D.12.11 Endurance Event – Passing

D.12.12 Endurance Penalties

D.12.10

D.14.2

D.12.4.1

D.12.13 Endurance Scoring

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D.14.2

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D.13 EFFICIENCY EVENT

D.13.1 Efficiency General Information

D.13.2 Efficiency Procedure

IC.5.4.5

D.12.5

IC.5.4.5

IC.5.5.1

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D.13.3.4

EV.3.3

EV.3.5

D.13.3.4

D.13.3 Efficiency Eligibility

D.13.4.5

D.13.4 Efficiency Scoring

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D.12.13.1

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