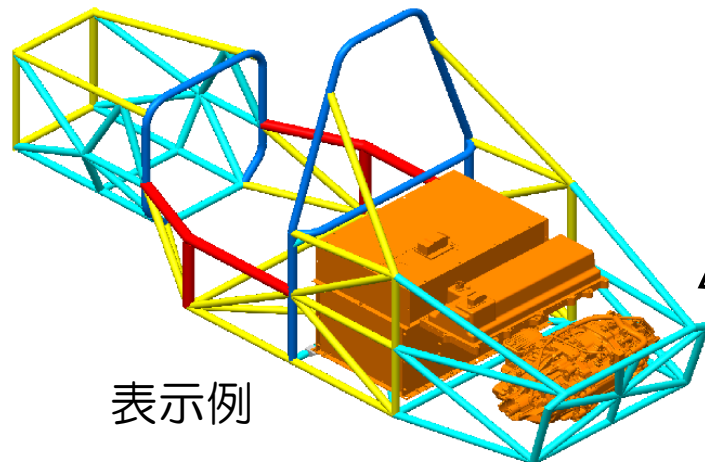
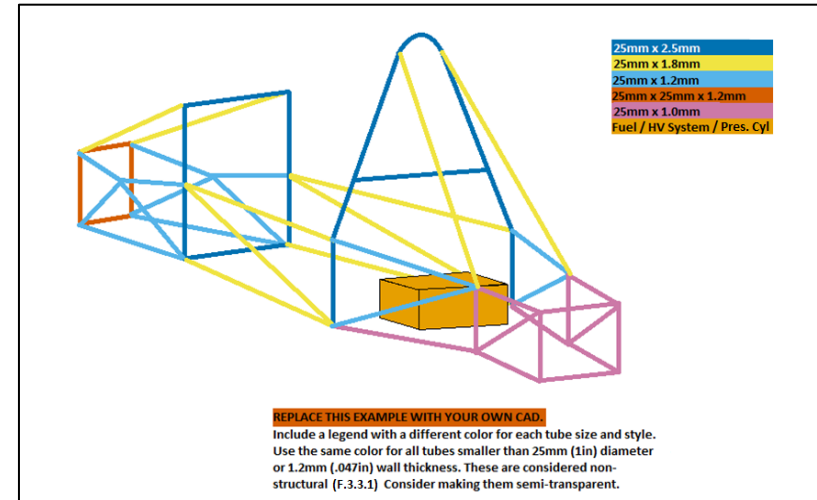
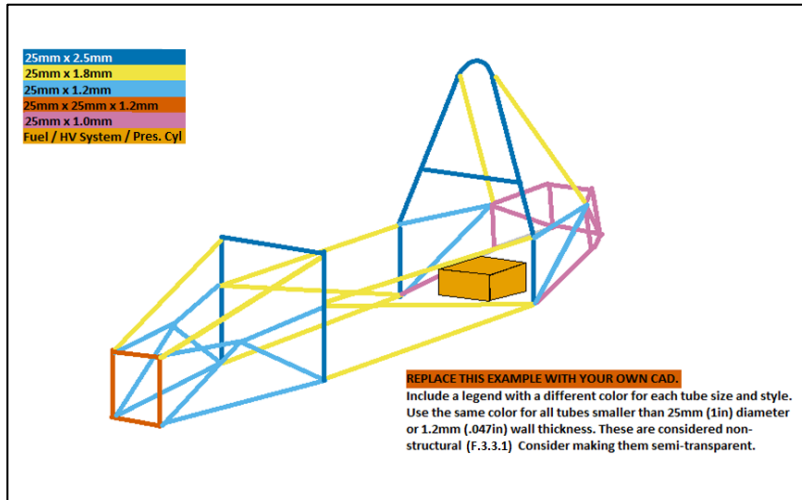


SES(等価構造計算書)

EVの場合の注意点

HV Systems の表示

Show accumulator installation/removal.
Use different colors for square and round.
Include a legend that shows each color and size.
Fuel tank, HV systems, pressurized tanks shown in orange.



表示例

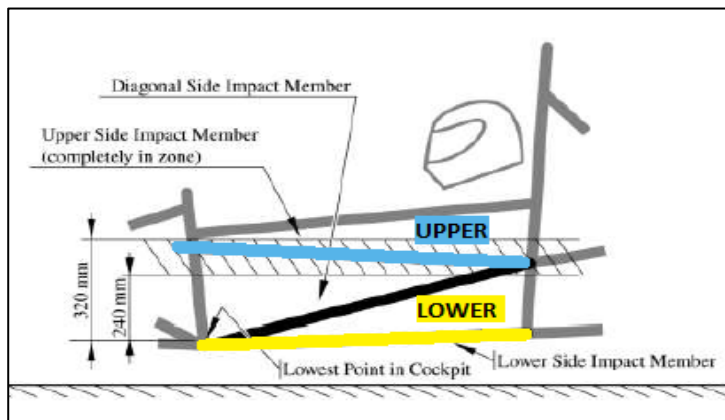
HV systems として必要な表示

- Accumulator Container
- Inverter System
- Tractive System

これらを全て表示すること

Accumulator Side Protection

Protectionの要否は、Upper Side Impact Memberの高さを基準にする



F.11.2.1

All Accumulator Containers must be protected from side impact or rear impact by Side Impact Structure (F.6.4, F.7.6, or Equivalent)

- The Accumulator Container must not form part of the equivalent structure.

Accumulator Container は Major Structureの高さ以内であること。



Fig. 1 はルール通り。

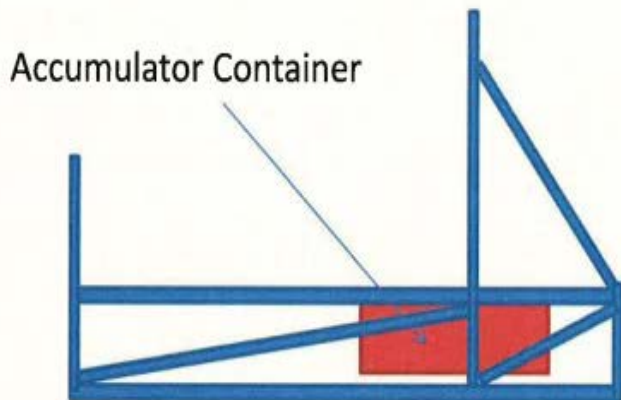


Fig. 1



Accumulator Container が Major Structure より高くなる場合、Fig. 2の様に、飛び出した部分を三角構造によって保護すること。

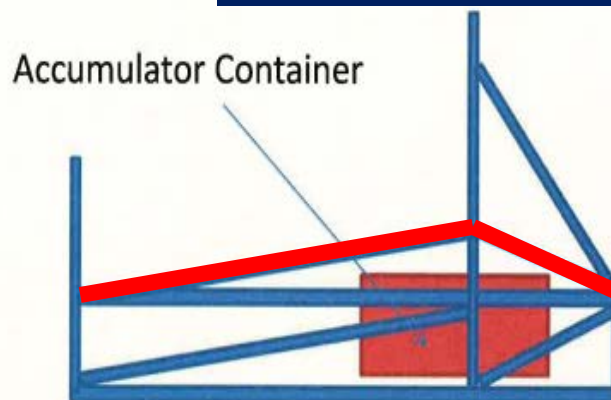


Fig. 2

Tractive Side Protection

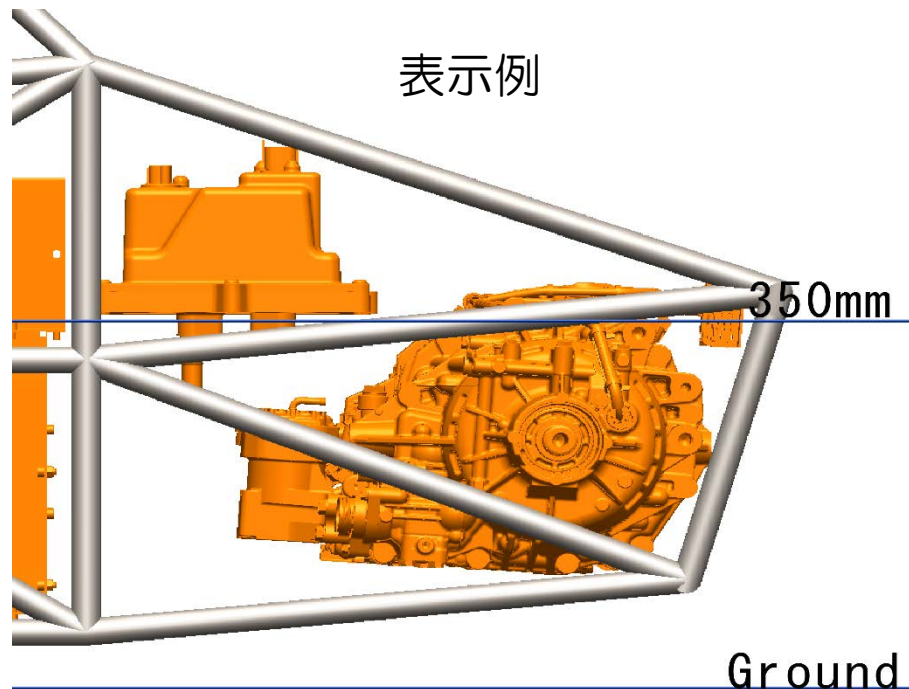
Protectionの要否は、地上から350mmの高さを基準にする

F.11.2.3 Tractive System parts in a position below 350 mm from the ground must be:

a. Protected from:

- Side impact
- Rear impact
- Intrusion by non-crushable objects (such as a differential)

b. Protected by structure meeting F.5.13 Component Protection



Rear Impact Protection

Tractive Rear Impact Protection か Accumulator Rear Impact Protection で選択が分かれる

F.11.2.3 Your motor or diff could fit between the acc.and rear impact? ☒ Yes

Tractive Rear Impact Protection

Minimum Tube Used

F.3.2.1 Example: 25.4mm x 1.2mm round

Size C ☒ Round

F.11.2.3 Rear Impact Diagonal:
Tractive Rear Impact Protection Minimum Tube Used

F.11.2.3 Rear Impact Diagonal:
Tractive Rear Impact Protection Minimum Tube Used

F.11.2.1 Your motor or diff could fit between the acc.and rear impact? ☒ No

Accumulator Rear Impact Protection

Minimum Tube Used

F.3.2.1 Example: 25.4mm x 1.6mm round

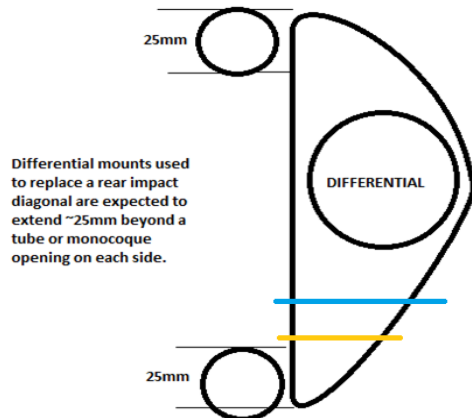
Size B ☒ Round

F.11.2.1 Rear Impact Diagonal:
Accumulator Rear Impact Protection Minimum Tube Used

F.11.2.1 Rear Impact Diagonal:
Accumulator Rear Impact Protection Minimum Tube Used

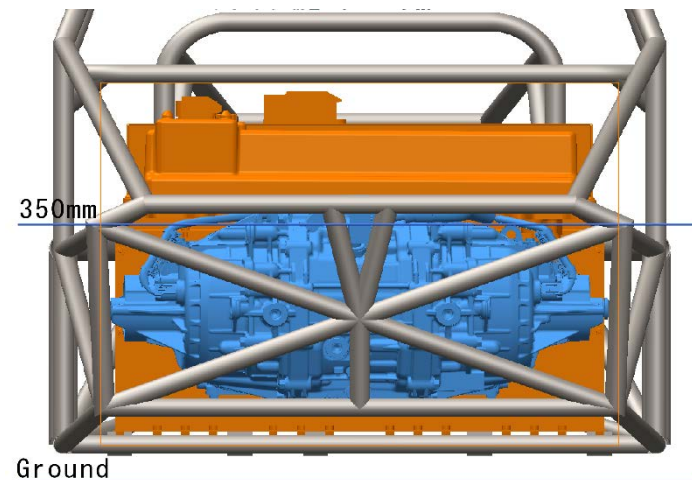
F.3.2.1 Example: 25.4mm x 1.6mm round Size C ☐ Round

REPLACE THIS EXAMPLE WITH YOUR OWN CAD.
Include all required dimensions.



Differential mounts used to replace a rear impact diagonal are expected to extend ~25mm beyond a tube or monocoque opening on each side.

Minimum horizontal Moment of Inertia (I) may not be same place as minimum horizontal Cross Sectional Area (A)



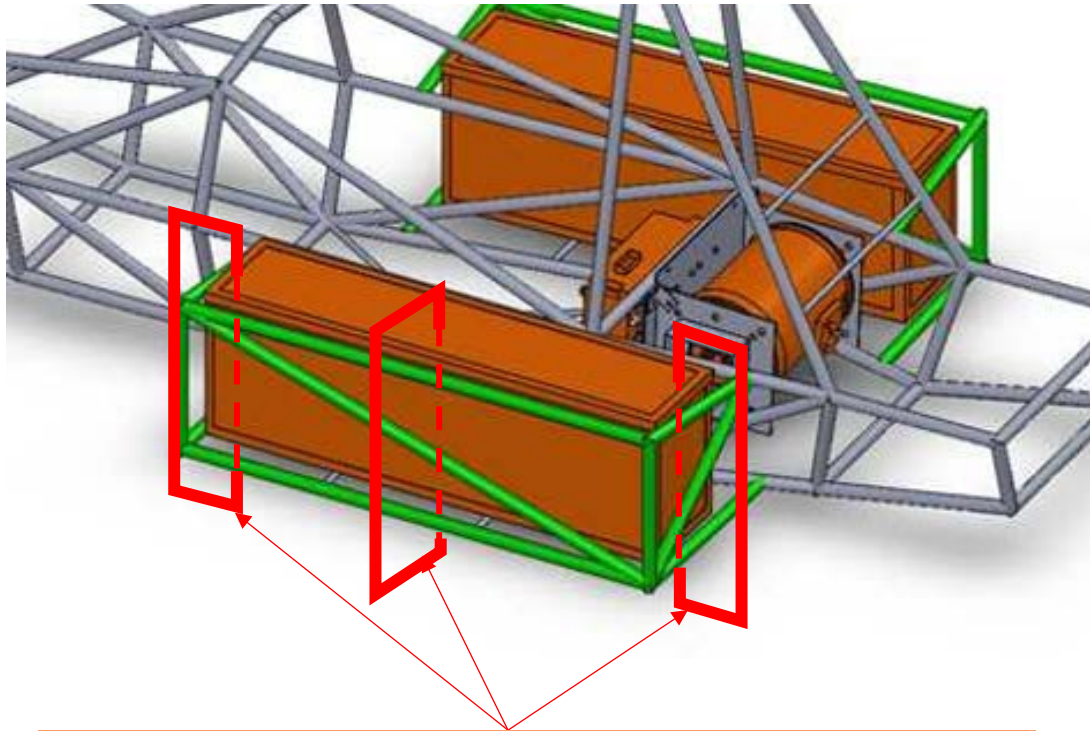
表示例

EV Protectionの強度計算

EVのAccumulator 及びTractive System Protectionについて

基本的な考え方はSide Impact Structureと同じ

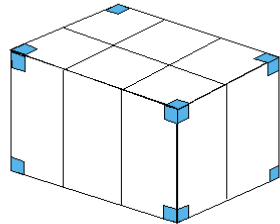
最も弱い1面の最も弱い垂直断面の構成パイプで計算すること



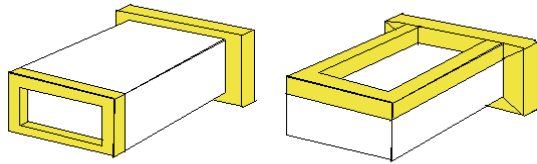
最も弱い断面の構成パイプで計算すること

EV Accumulator の記載

EVのAccumulator については、図解を参考に正しく記載すること。

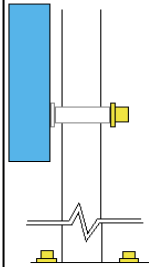


REPLACE THIS EXAMPLE WITH YOUR OWN CAD.

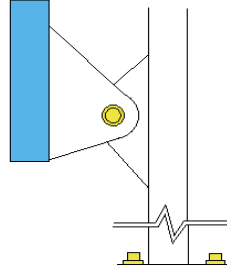


Guidance images vary by section. **REPLACE THIS EXAMPLE WITH YOUR OWN CAD.**
Equivalence calculations and required dimensions are the same for every attachment.

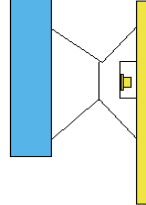
Direct
mount
to Acc. &
Tube



Mount on Acc. &
Mount on Tube



Mount on Acc. & Mount
on Structural Panel



Copy this tab for equivalence if a subframe is used.

Guidance images vary by section. **REPLACE THIS EXAMPLE WITH YOUR OWN CAD.**
Equivalence calculations and required dimensions are the same for every attachment.

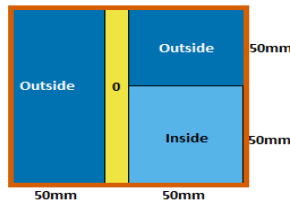
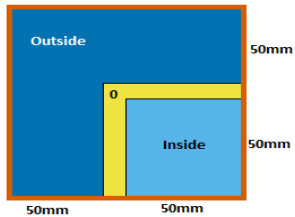
Outside the surfaces of the segment structures.

Outside the surfaces of the segment structures.

Inside the surfaces of the segment structures.

Outside the surfaces of the segment structures.

Guidance images vary by section. **REPLACE THIS EXAMPLE WITH YOUR OWN CAD.**
Equivalence calculations and required dimensions are the same for every attachment.

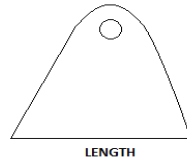


For corner attachment, in all three planar views, the shear area or axis of the fastener must be within 50mm of the corner of the segment structure. The entire skin thickness counts as 0mm.

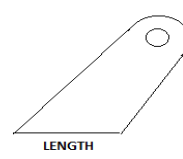
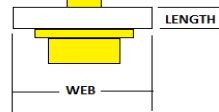
Mounts that are inside the segment edges (on the surface) in one view with less than 12.7mm to the fastener centerline in the others do not require braces.

REPLACE THIS EXAMPLE WITH YOUR OWN CAD.
Include all required dimensions.

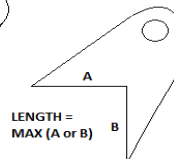
LENGTH IN THE FASTENER SHEAR PLANE
FOR A FLAT TAB, WEB IS THICKNESS



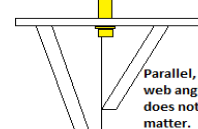
Without gussets,
length and web are
reversed parallel
to the axis.



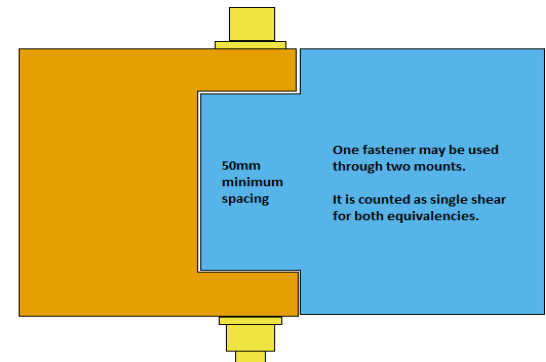
Parallel to fastener
axis, add web
thicknesses.



Parallel to fastener axis,
length is minimum of web
included.



Guidance images vary by section. **REPLACE THIS EXAMPLE WITH YOUR OWN CAD.**
Equivalence calculations and required dimensions are the same for every attachment.



Accumulator Segment について

Accumulator Segment については、以下ルールが基準である。
別途登録のESFとの整合を確認すること。

①	EV.3.1.2	Maximum segment voltage:
②	EV.3.1.2	Nominal segment capacity:
③	EV.1.3.2	Maximum accumulator voltage:

BLANK				
	Cell type:	Cylindrical		EQ
	Maximum Voltage:		V	BLANK
	Nominal Voltage:		V	BLANK
	Nominal Capacity:		mAh	BLANK
	Maximum segment cells in series:			BLANK
	Maximum segment cells in parallel:			BLANK
	Maximum segment voltage:	0	V	EQ
EV.4.1.2	Nominal segment capacity:	0	MJ	EQ
	Total accumulator cells in series:			BLANK
	Total accumulator cells in parallel:			BLANK
	Maximum accumulator voltage:	0	V	EQ
EV.1.3.2	Nominal accumulator capacity:	0	kWh	EQ
BLANK				
F.10.2.3	Cell mounting and bracing material:	E:	Pa	BLANK
		UTS:	Pa	BLANK
		Shear:	Pa	BLANK
	Assembled Segment moment of inertia, Lateral cross section:		mm^4	BLANK
	Assembled Segment moment, Longitudinal cross section:		mm^4	BLANK
	Maximum segment length:		mm	BLANK
	Maximum segment width:		mm	BLANK
	Maximum segment height:		mm	BLANK
BLANK				
F.10.2.3	Restraint Method:	Examples: Bolted, Friction, Adhesive		BLANK