



C L E P A

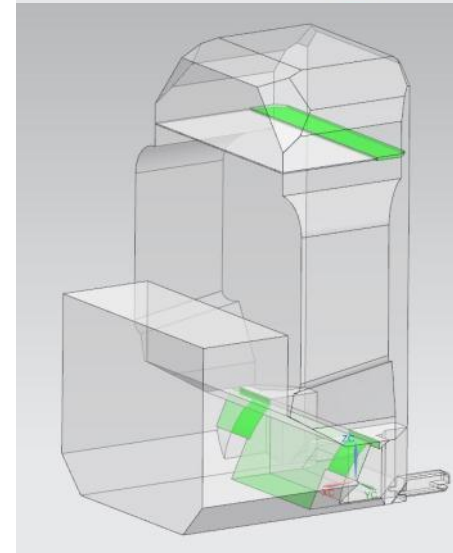
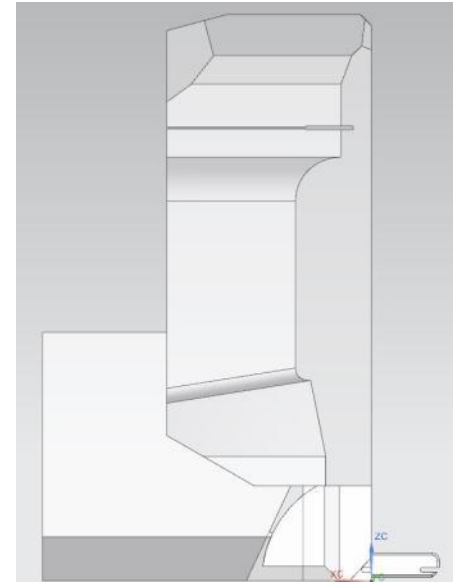
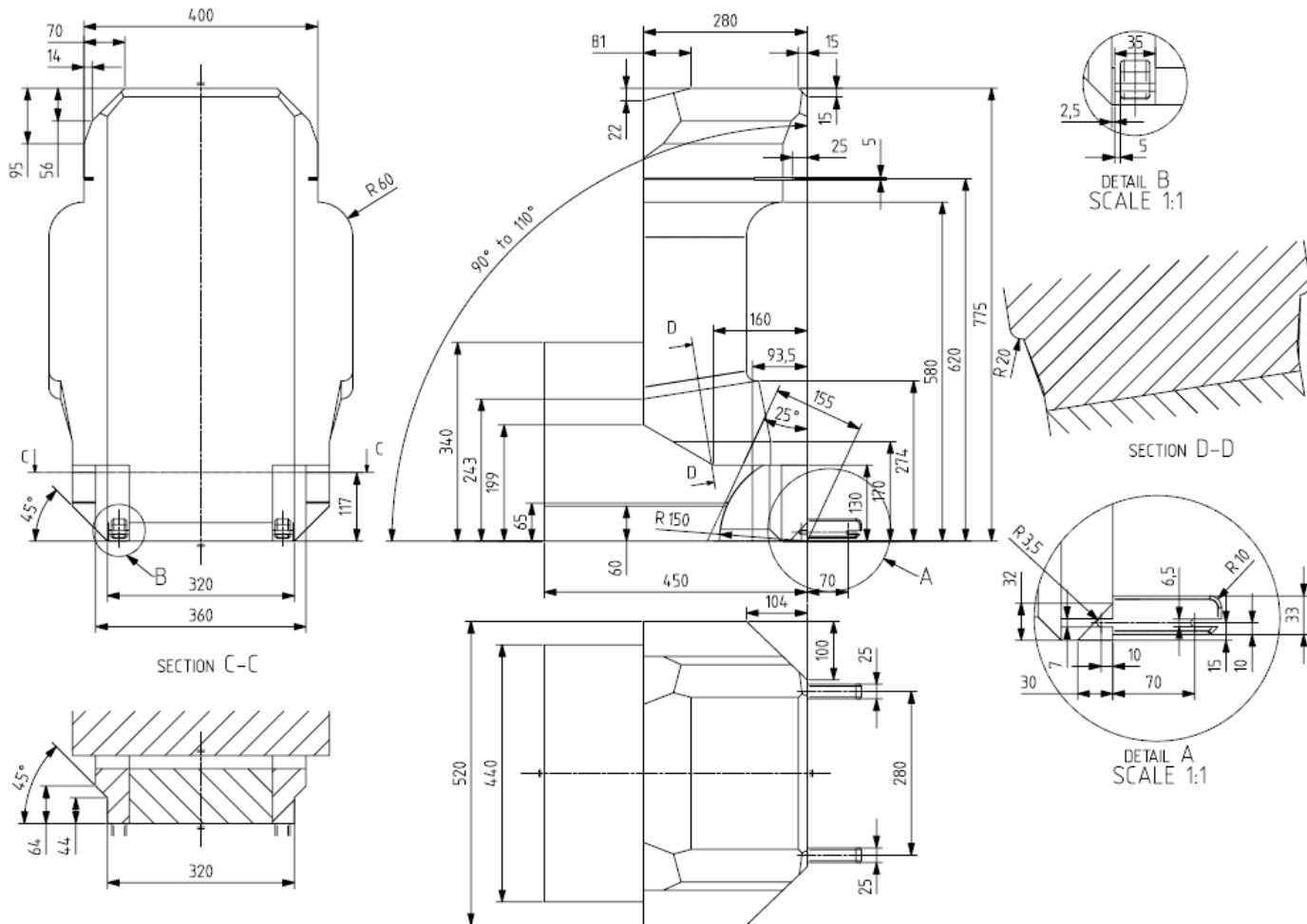
*European Association of
Automotive Suppliers*

47th Meeting Informal Group on Child Restraint Systems

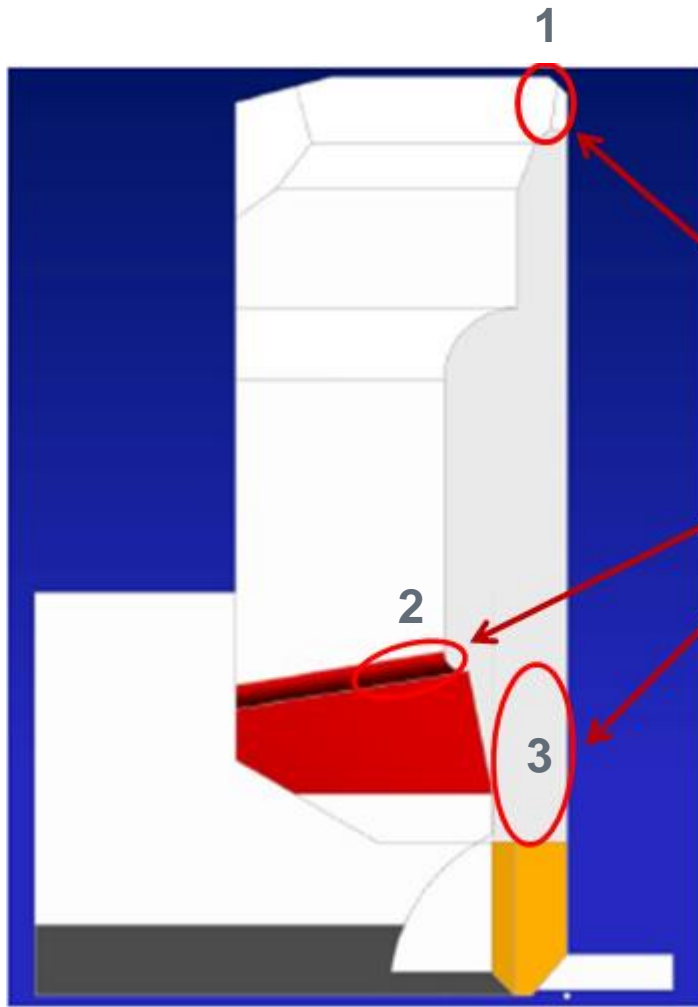
Booster Vehicle Seat Fixture Development

14th October 2014
Farid Bendjellal

Current Booster Fixture – N1083



Findings from BASt Workshop



1 - C-Pillar interaction with top of CRF

- Mitsubishi Space star (ISOFIX only)
- Opel Adam (ISOFIX only)
- Audi A1

Areas of
interaction
identified during
workshop

2 - Door interaction with side wing of CRF

- Opel Zafira

3 – Vehicle seat interaction with rear of CRF

- Audi A1
- Porsche Panamera

Areas of Interaction

1 - C-Pillar-roof interaction



Is this critical?

2 - Door-side wing interaction



Is this critical?

3 – Seat-rear interaction

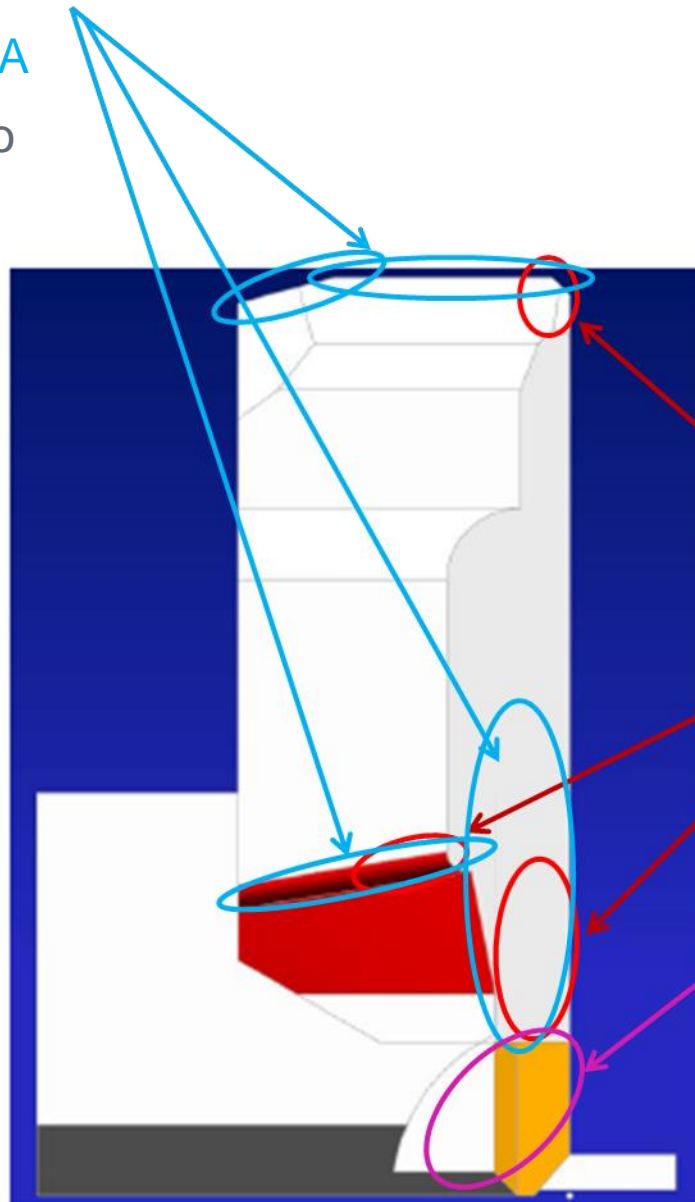


May prevent ISOFIX latching

Additional Changes Requested by OICA

Additional areas
requested by OICA

Evidence yet to
be provided



C-Pillar-roof interaction - 3 examples

Door-side-wing interaction - 1 example

Seat-rear interaction – 2 examples

Areas of
interaction
identified during
workshop

Additional area
requested by
OICA to allow
buckling

2 Examples of
difficulties

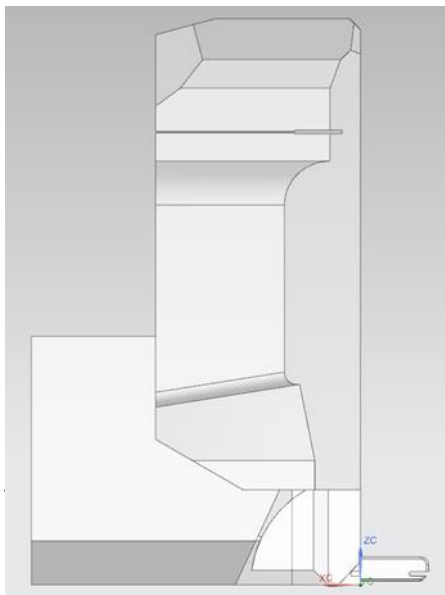
Investigation of Interactions

1. Verify Fixture in selection of problematic vehicles

- C-pillar-roof interaction
- Door-side wing interaction
- Seat-rear interaction
- Buckle difficulties



2. Quantify/measure contact – mm/cm



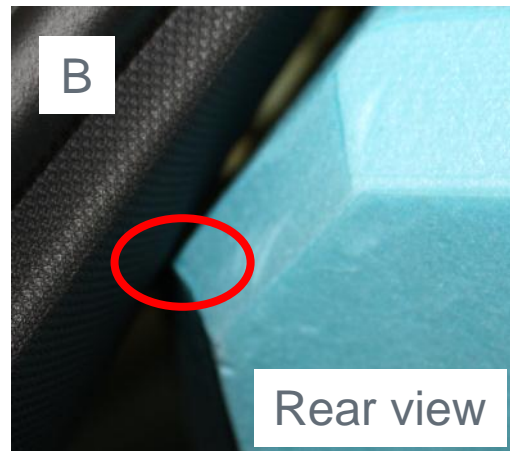
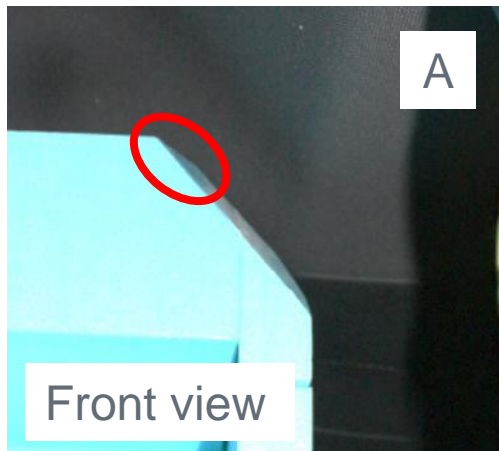
List of Interactions

10 **worst-case** vehicles selected by OICA (assessed during BASt workshop)
3 vehicles no interaction issues found

Vehicle	Attachment	Position	Issue	Comment
Audi A1	ISO Belt	Outer Outer	No Latch C-Pillar	
Ford Fiesta	Belt	Middle	Buckling	
Mitsubishi Space Star	ISO	Outer	C-Pillar	1 of 2 Fixtures
Suzuki SX4	Belt	Middle	Buckling	Waiting on vehicle availability (rare car)
Vauxhall Adam	ISO	Outer	C-Pillar	1 of 2 Fixtures
Vauxhall Zafira	Belt/ISO	Outer	Door	
Porsche Panamera	ISO	Front Outer	No Latch	Waiting on vehicle availability (rare car)

Investigation of Interactions

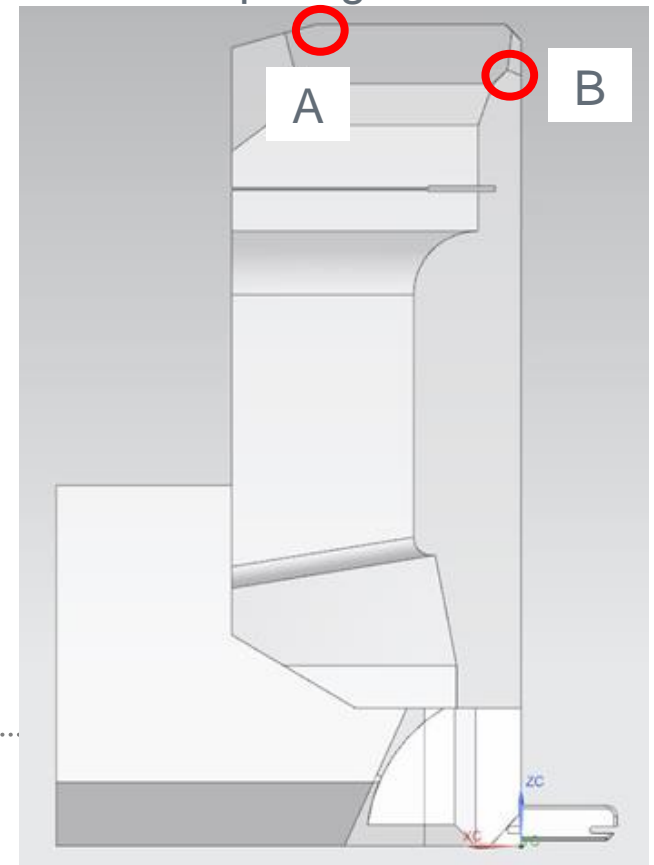
Vehicle	Attachment	Position	Issue	Comment
Audi A1	Belt	Outer	C-Pillar	Significance – Minor No angle change (1.5°) Amount to remove $\approx 5\text{mm}$



2 interactions with C-pillar / roof



Areas requiring modification



Investigation of Interactions

Vehicle	Attachment	Position	Issue	Comment
Ford Fiesta	Belt	Middle	Buckling	Significance – Critical for centre seat only

- Fixture does not fit in rear centre position
- Not possible to buckle
- Width between buckles less than 280mm (ISOFIX centre width)
- Therefore impossible to fit if fixture has ISOFIX connectors



Investigation of Interactions

Vehicle	Attachment	Position	Issue	Comment
Mitsubishi Space Star / Mirage	ISO	Outer	C-Pillar	Significance – Minor No angle change (1°) Amount to remove \approx 5mm

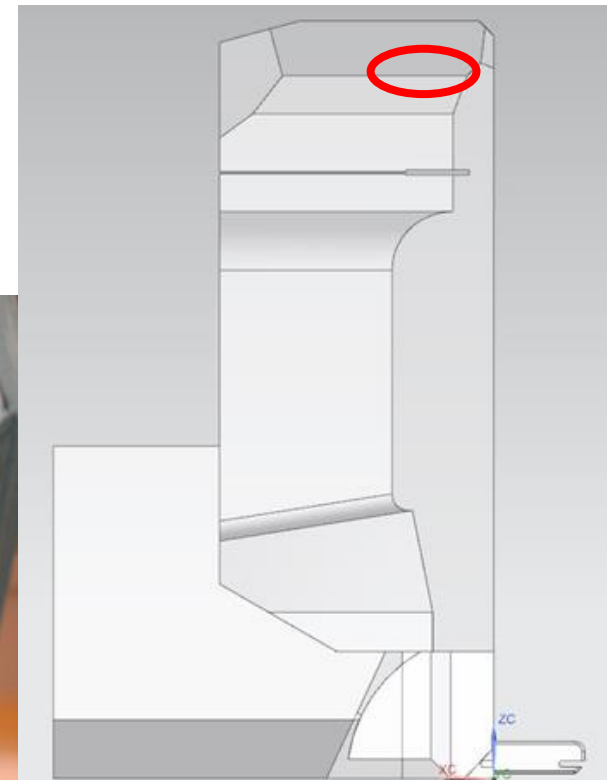


Straighten edge would
remove contact

Contact with C-Pillar
(ISOFIX only)



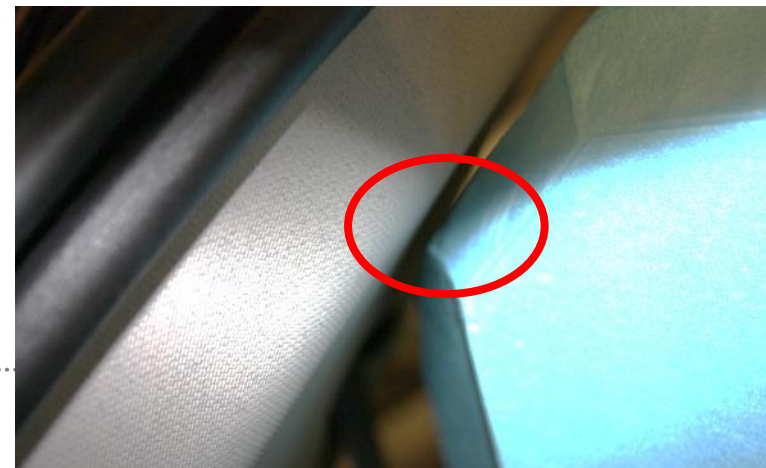
Area requiring modification



Investigation of Interactions

Vehicle	Attachment	Position	Issue	Comment
Vauxhall Adam	ISO	Outer	C-Pillar	No interaction Action – None

- No interaction found
- Gap between C-Pillar and fixture using ISOFIX
- Conclusion: Fixture fits



Investigation of Interactions

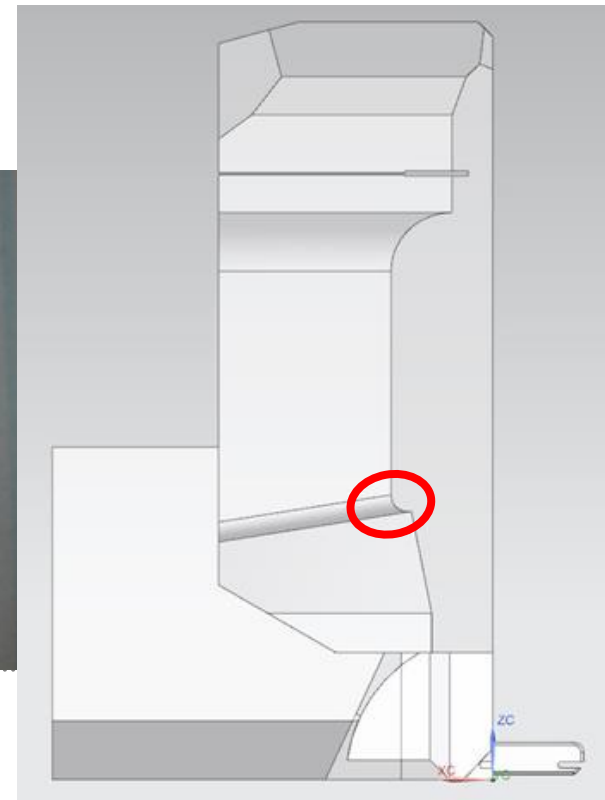
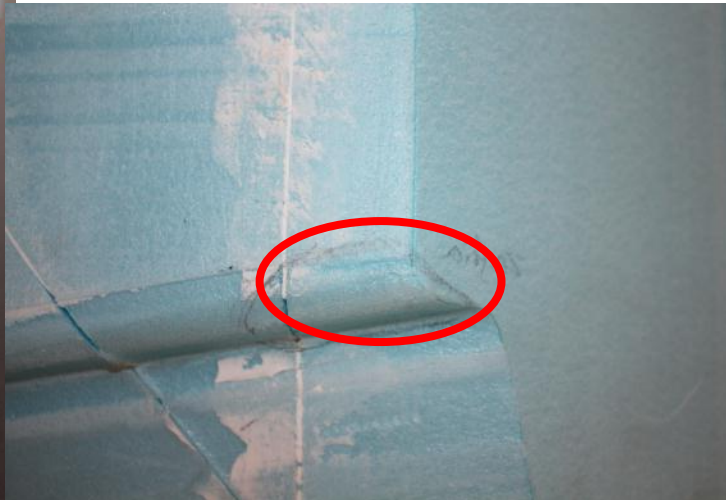
Vehicle	Attachment	Position	Issue	Comment
Vauxhall Zafira Tourer	Belt/ISO	Outer	Door	Significance – Minor No angle change (1°) Amount to remove $\approx 5\text{mm}$

Very small contact with door

Area requiring modification



Remove material $\approx 5\text{mm}$



Summary of Interaction Investigation

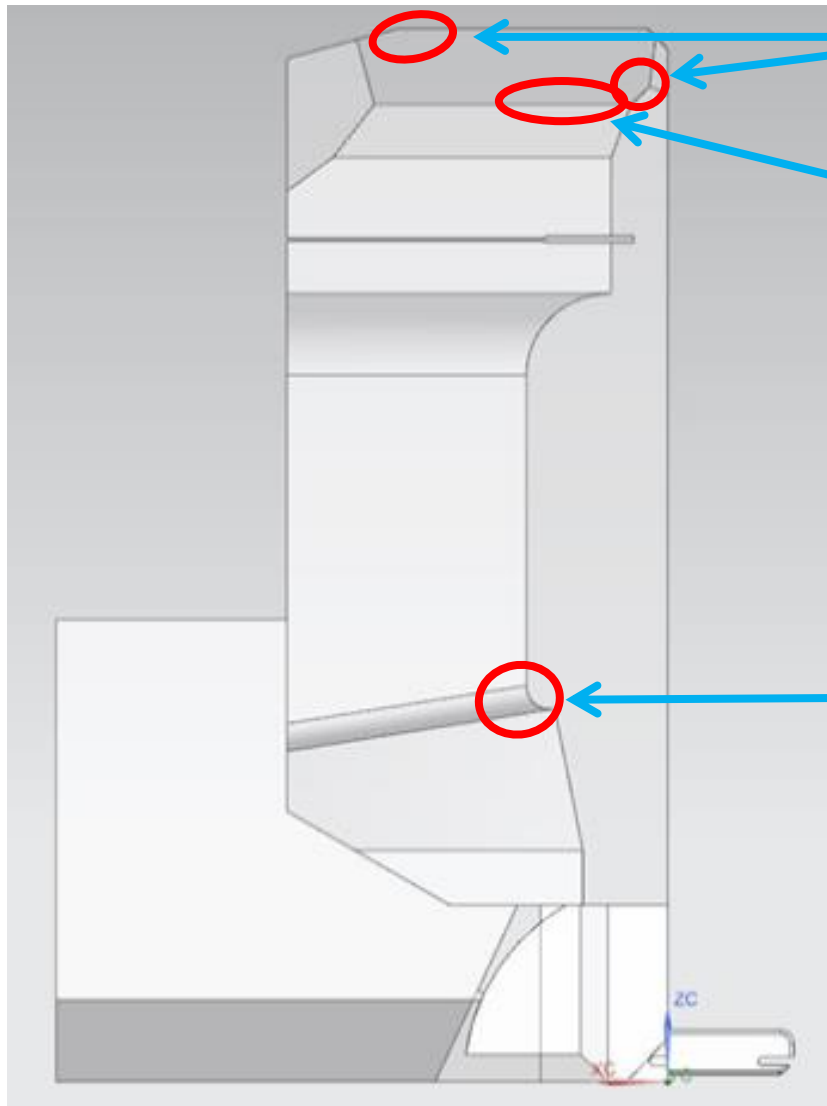
5 vehicles assessed further

- 1 vehicle: the fixture fitted with no interactions – no action required
- 1 vehicle: the fixture did not fit in middle position – position not suitable
- 3 vehicles: had minor interaction – modifications proposed

Vehicle	Attachment	Position	Issue	Comment
Audi A1	ISO Belt	Outer Outer	No Latch C-Pillar	Propose modification
Ford Fiesta	Belt	Middle	Buckling	Position not suitable
Mitsubishi Space Star	ISO	Outer	C-Pillar	Propose modification
Vauxhall Adam	ISO	Outer	C-Pillar	Fixture fits
Vauxhall Zafira	Belt/ISO	Outer	Door	Propose modification

Summary of Modification Areas

Proposed modification areas

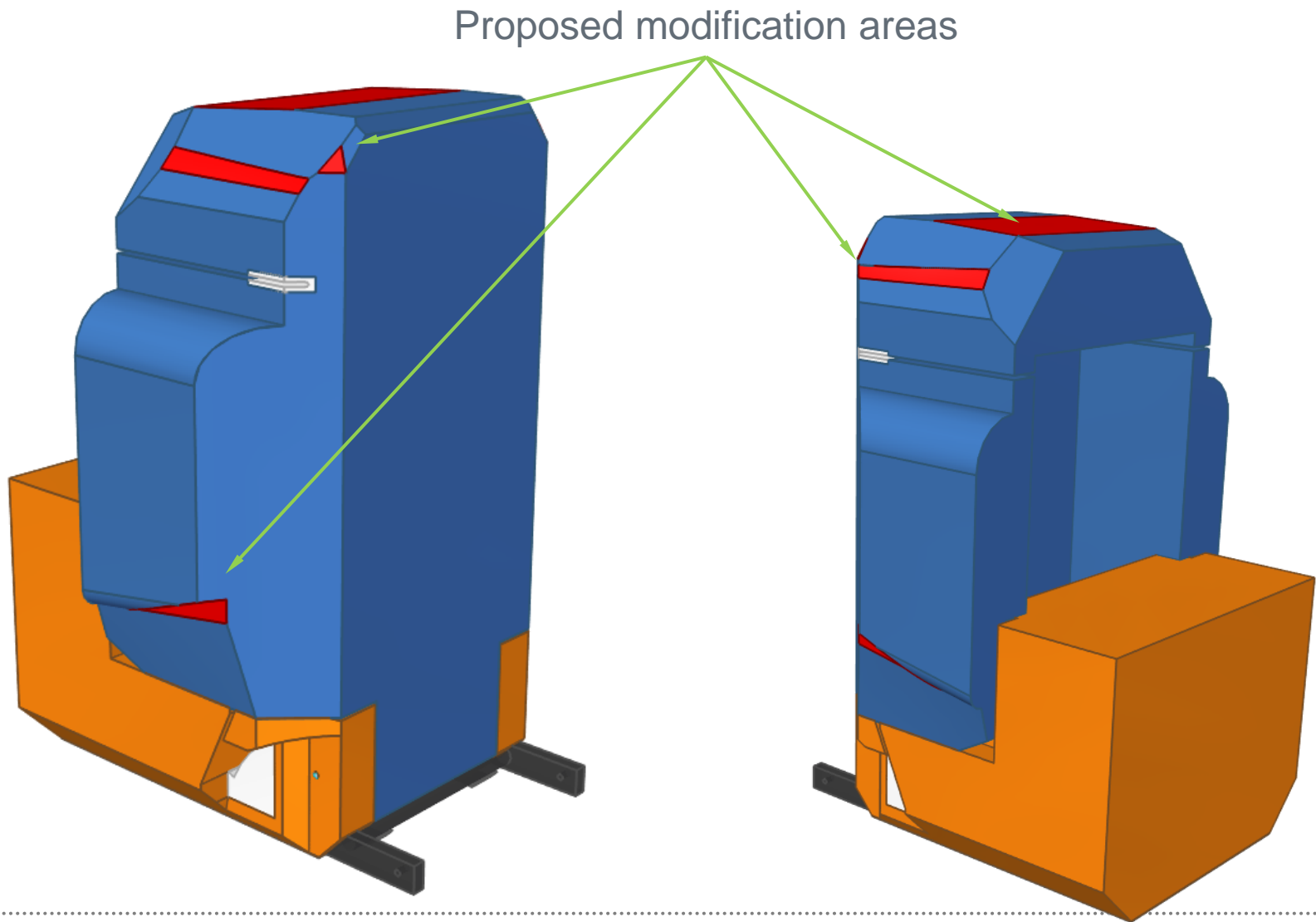


A1 C-Pillar interaction

Space Star C-Pillar interaction

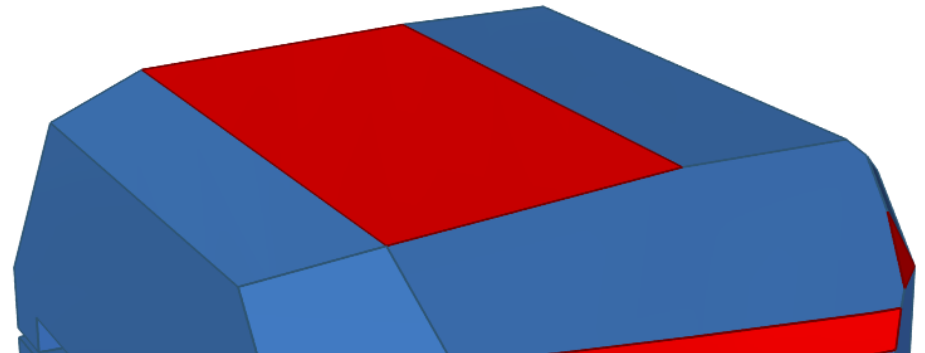
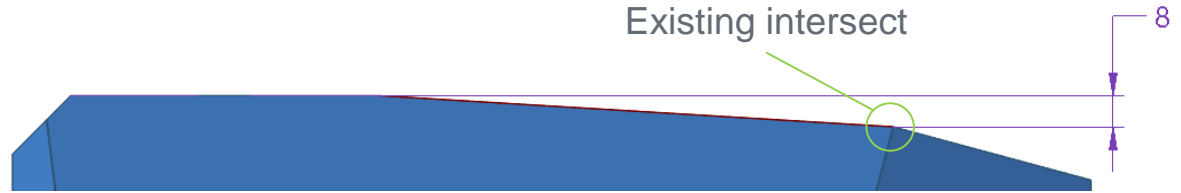
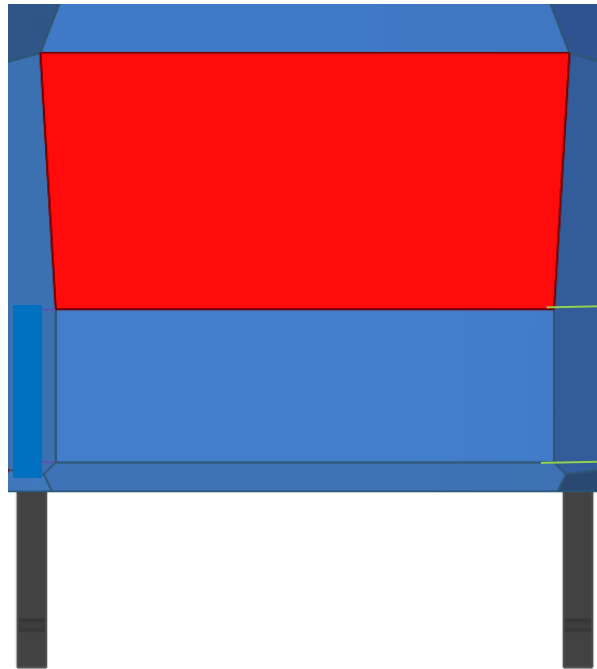
Zafira door interaction

1st Draft Proposition for CAD modifications



1st Draft Proposition for CAD modifications

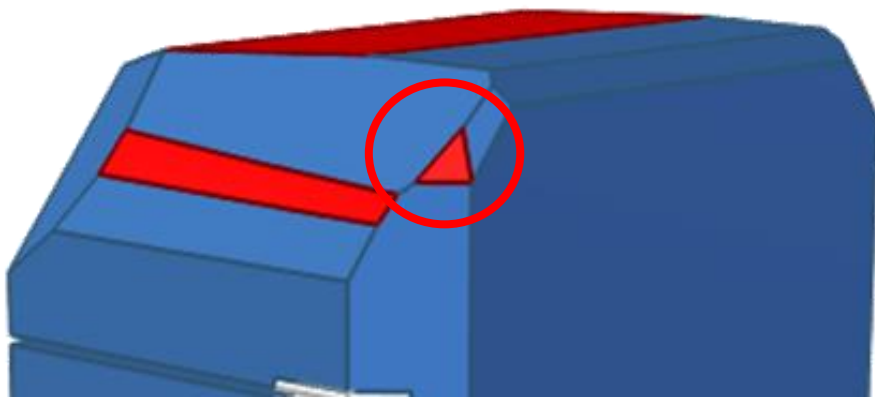
A1 C-Pillar/roof interaction



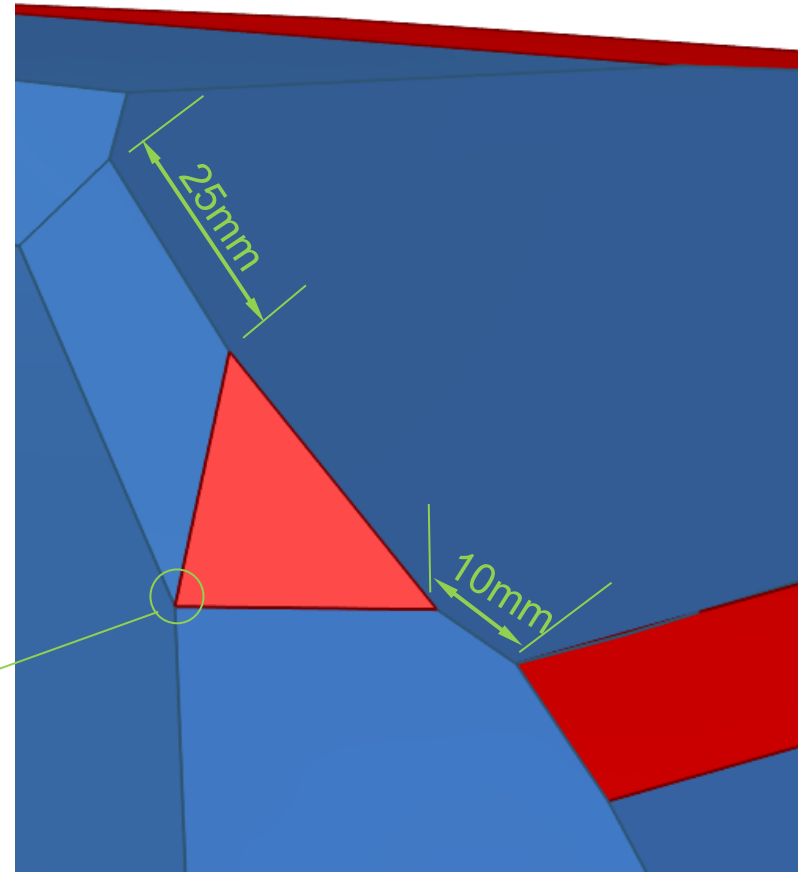
Overhead view

1st Draft Proposition for CAD modifications

A1 C-Pillar/roof interaction

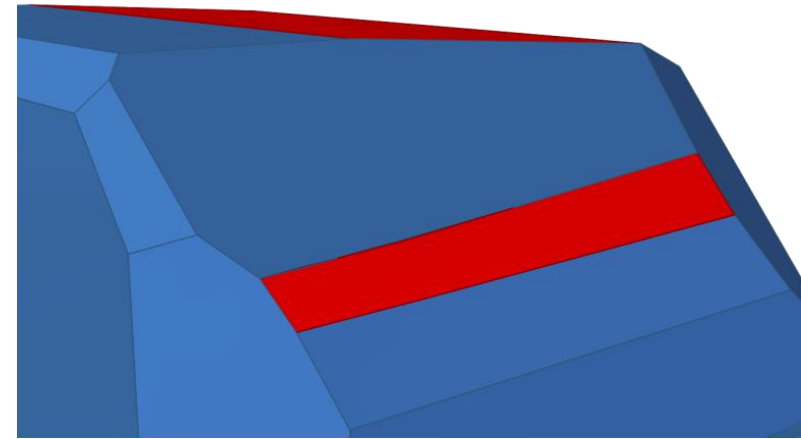
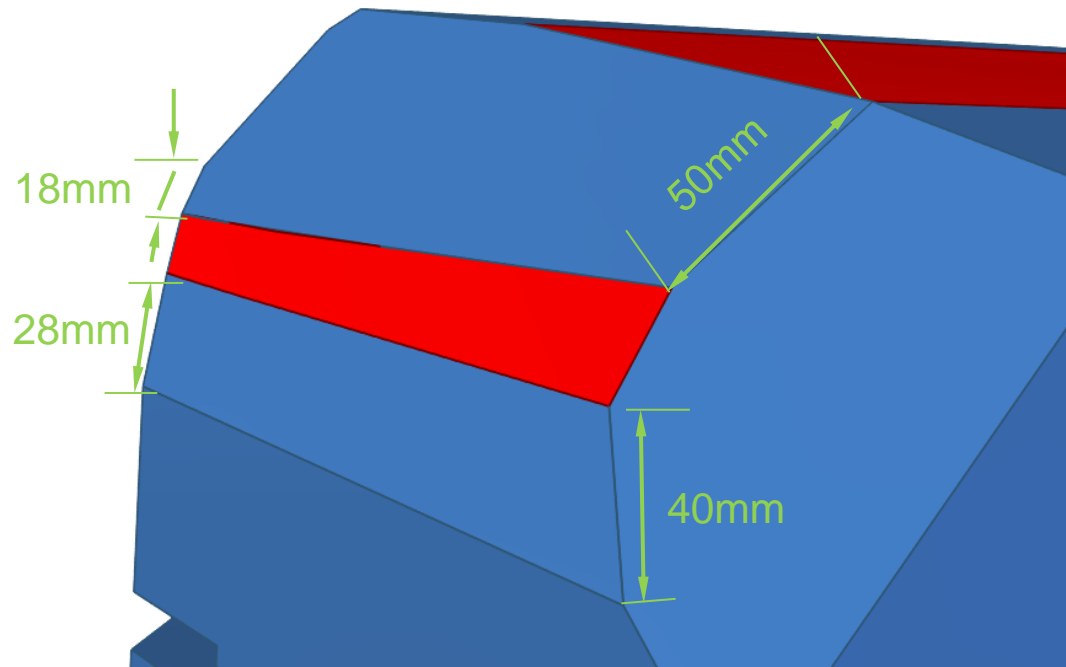


Existing intersect



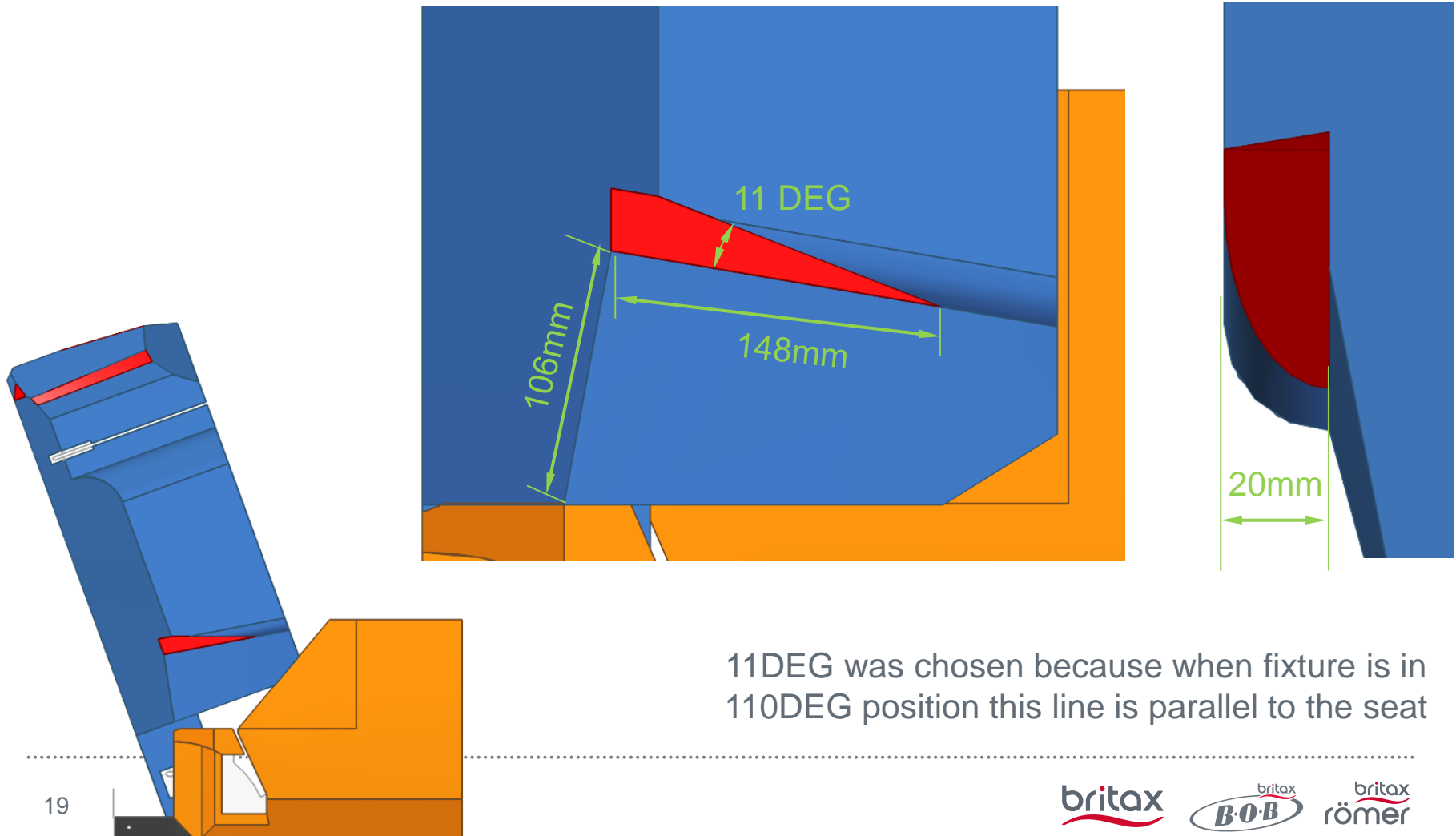
1st Draft Proposition for CAD modifications

Space Star C-Pillar interaction

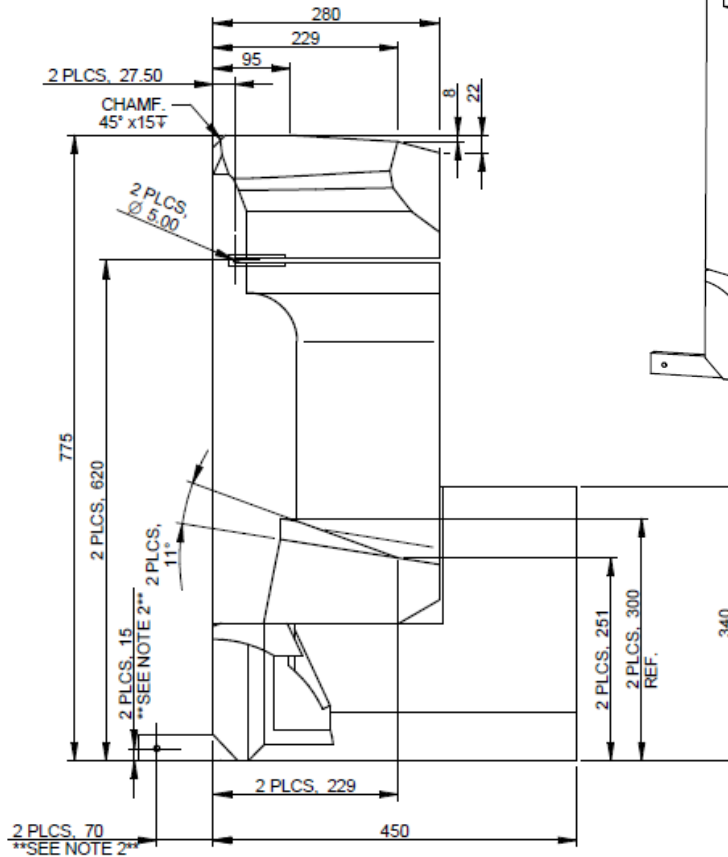
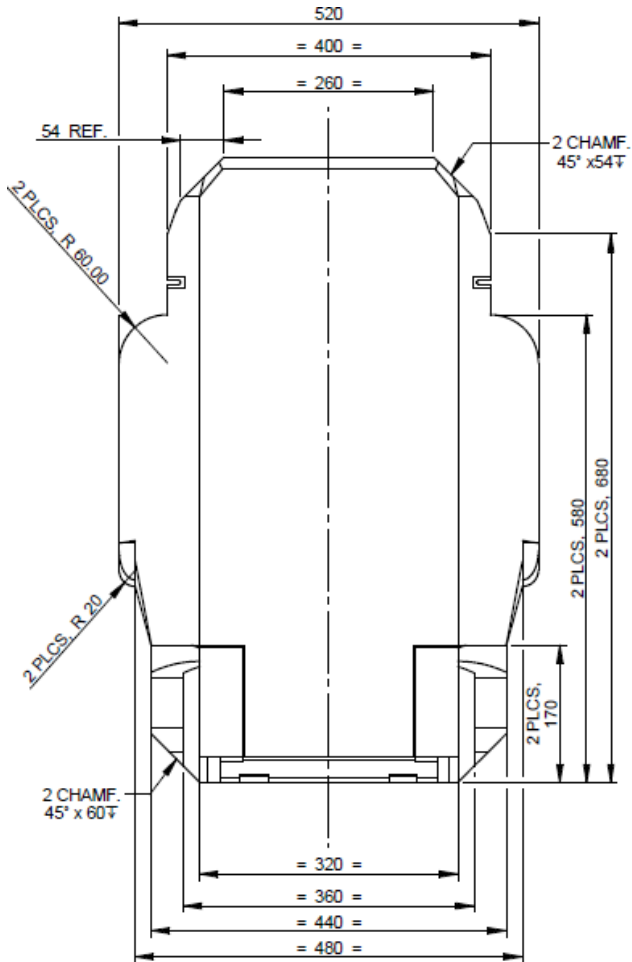


1st Draft Proposition for CAD modifications

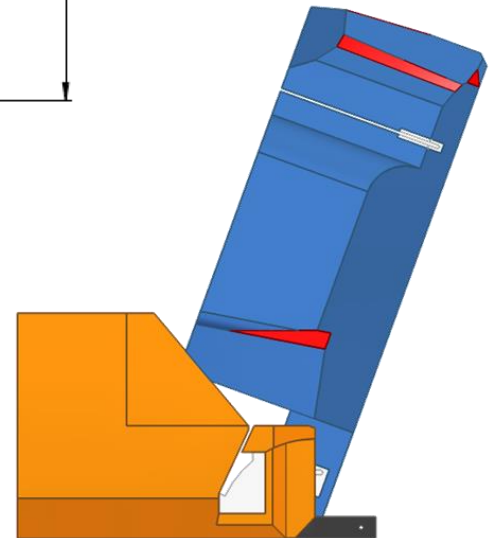
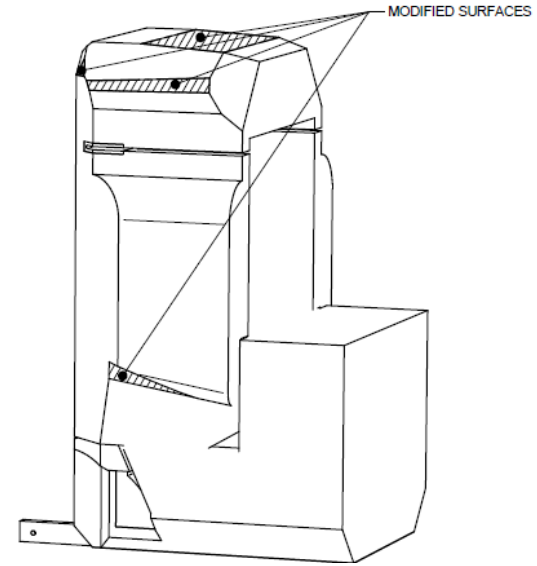
Zafira door interaction



1st Draft Proposition for Modified Booster Fixture



Note 2: MAX. ISOFIX ENVELOPE DESIGN
DEFINED IN REGULATION 129,
PARAGRAPH 6.3.3.2. FIGURE 0(b).



CRF - NEXT STEPS

- Confirm proposed changes to CRF with in-car installation trials
- Finalise discussion with OICA and agree on final modifications of the CRF
- Final CRF definition to be submitted to ISO SC12 WG1 for confirmation