

Side impact anchorage interaction with the door

The current proposal for the new regulation belt anchorages are shown in Table 1.

Table 1: Proposed new regulation anchorage positions

Direction	Upper Anchorage (C)			Buckle			Lower outer		
	X	Y	Z	X	Y	Z	X	Y	Z
Distance (mm)	-240	-220	-630	-29	200	59	10	-200	14.5

These locations are based on the NPACS project, with a modification to the Y position (30mm) of the upper anchorage. This was to correct the belt path across the 5th percentile, to match the belt path in vehicles. These positions are perfectly acceptable for the front impact test rig.

However for side impact a compatibility issue arises with the door. The lower outer position can interfere with the door when an anchorage is attached (Figure 1). A solution to this has been raised to simply cut a section of the door away.

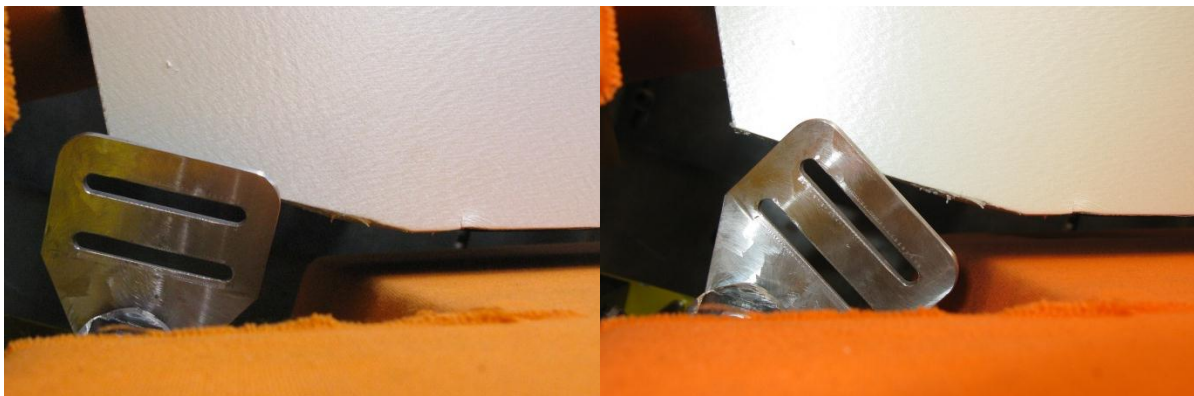


Figure 1: Anchorage interaction with the door

However the presence of the load cell also needs to be considered Figure 2. Contact of the load cell with the door could damage the load cell.

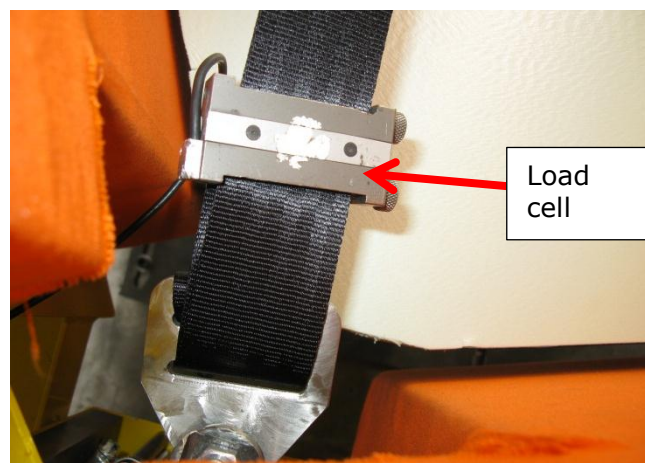
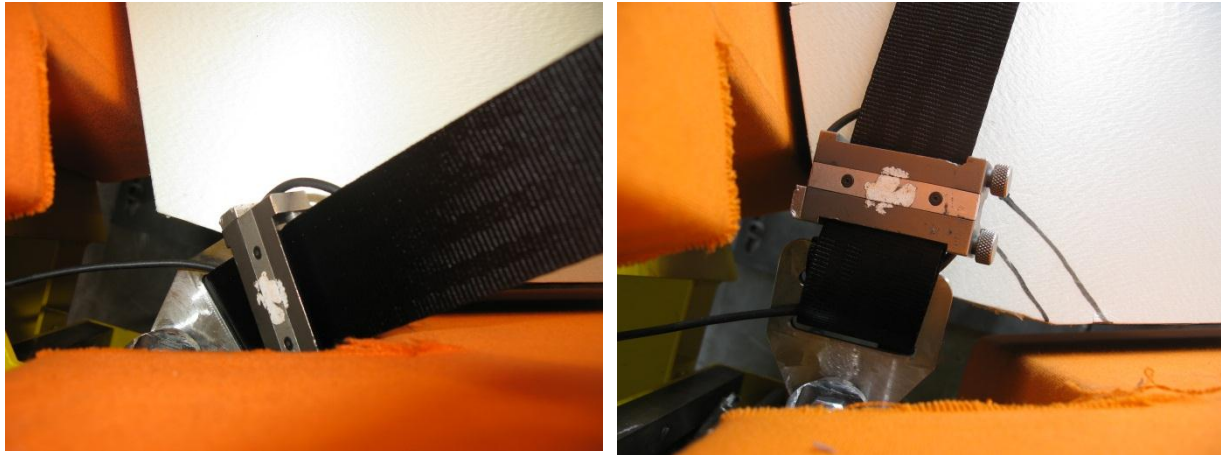


Figure 2: Anchorage interaction with the door

We have installed a range of child restraints to identify the variation in angle range for the lap section of the seat belt (Figure 3).



Minimum angle

Maximum angle

Figure 3: Angle range

Drawing around the load cell reveals the amount of door that needs to be removed to prevent contact between the load cell and the door (Figure 4). However it would be advised that more is removed to give sufficient clearance.

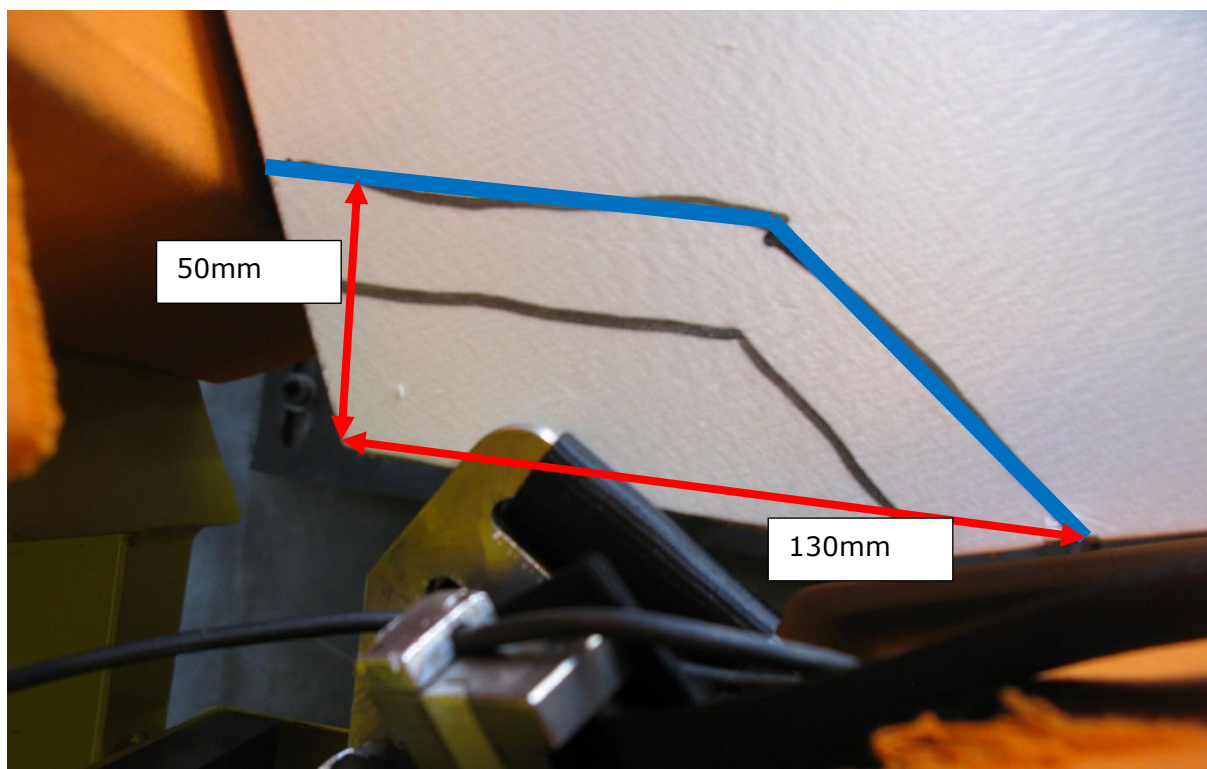


Figure 4: Minimum door cut-out area

We think that this is a large section of door to remove. This section will no longer interact with the child restraint. This could also lead to the child restraint get stuck under the door.

The alternative solution is to lower the height of the anchorage (Table 2). Lowering the positioning of the anchorage on that side would stop interaction between the door and the anchorage and the load cell and the door (Figure 5).

Table 2: Suggested lowered anchorage

Direction	Upper Anchorage (C)			Buckle			Lower outer		
	X	Y	Z	X	Y	Z	X	Y	Z
Distance (mm)	-240	-220	-630	-29	200	59	10	-200	14.5 59
Reg.44	-200	-300	-625	-20	200	60	60	-200	80



Figure 5: Alternative anchorage height