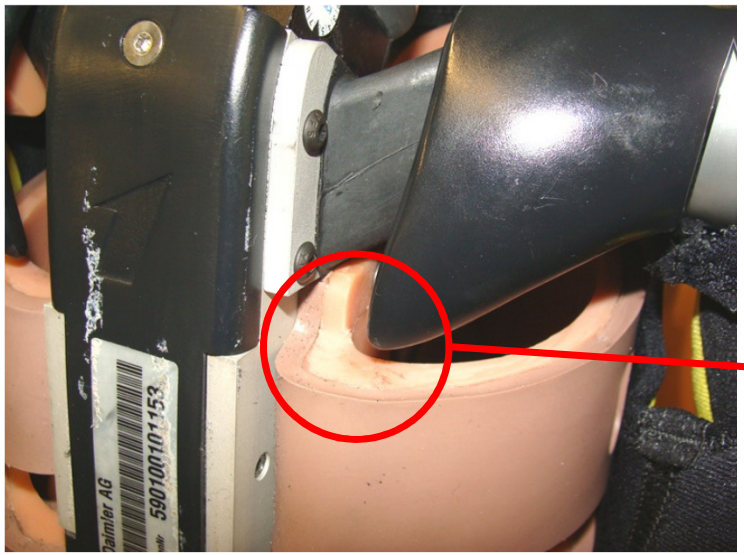
DAIMLER

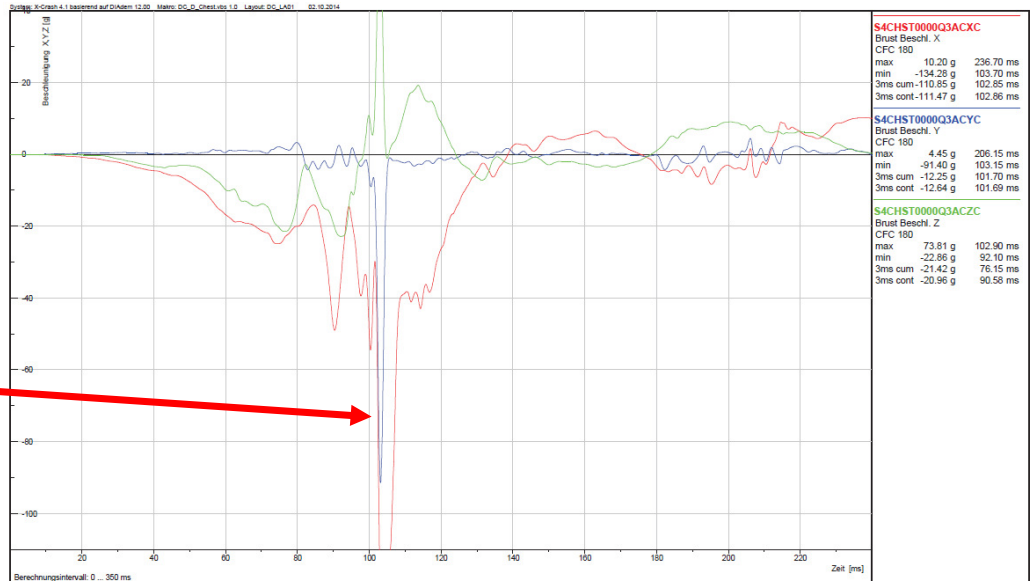
Q3 Scapula – Proposed Modification

2016-03-04

Q3 scapula to rib cage contact

- Daimler is using the Q3 dummy in full scale crash tests
- In tests with the Q3 dummy contact interactions between the scapula and the rib cage are observed
- This results in noise on the rib accelerations
- Issue was reported to German AK5 group in April 2015 and discussed with Humanetics over the past period

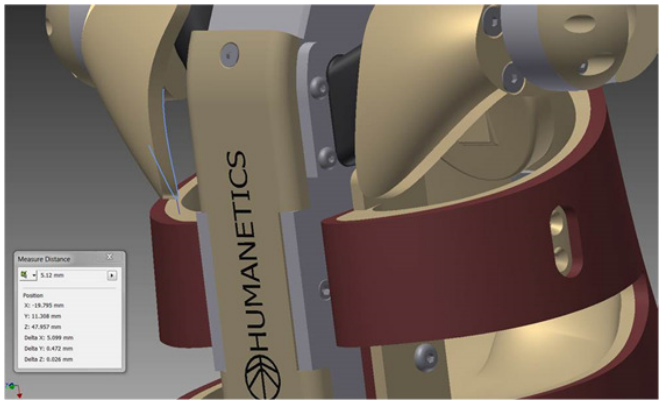




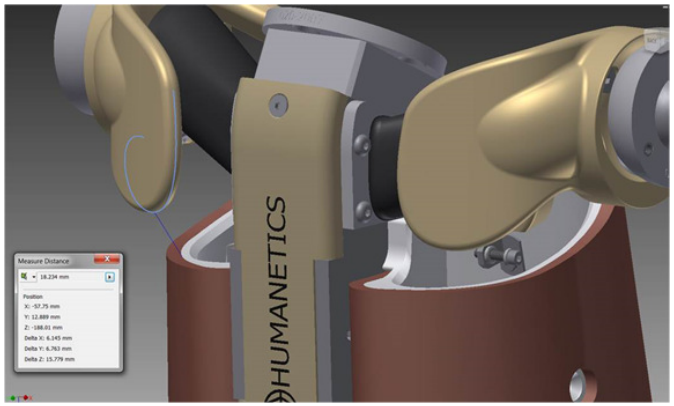
Q3 versus Q6 scapula

- As recommended by Daimler Humanetics compared the Q3 design against the Q6 design
- The Q6 has 13 mm more clearance between scapula and rib cage.
- The Q3 seems to have a more natural shape of the scapula while in the Q6 it is reduced in size.
- No documentation was found on the reasoning for this but when checking with the design engineers this was related to risk for contact in the Q6

Q3

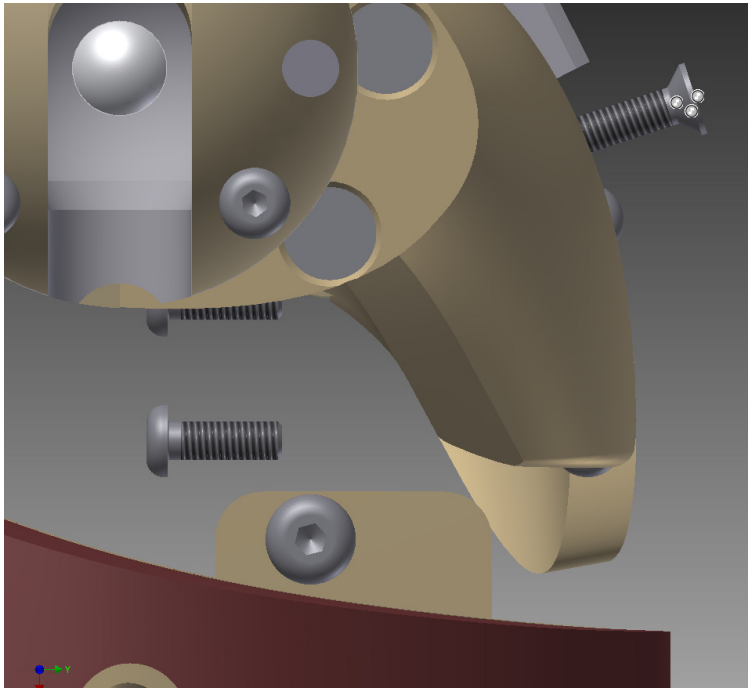


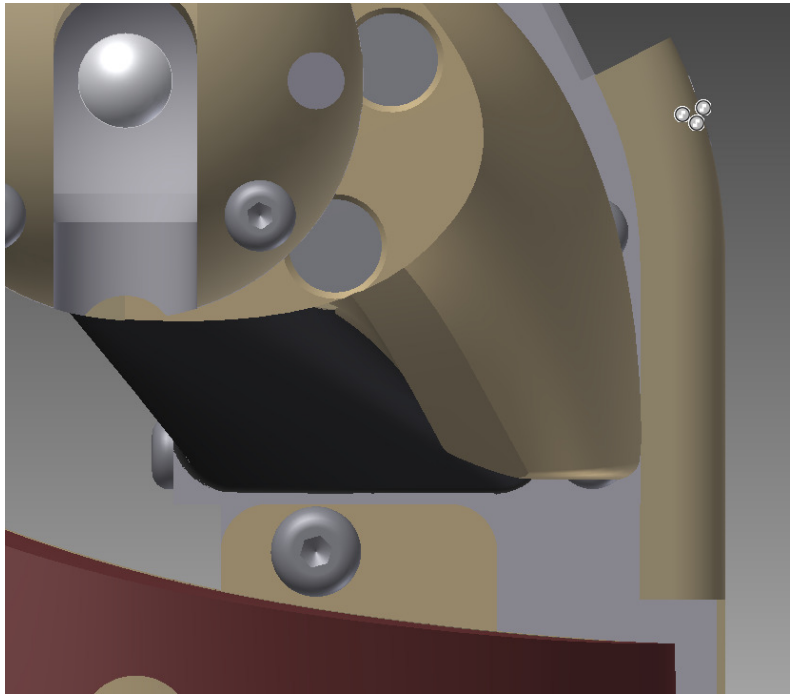
Q6



Comparison for Affect on Seating

- Below on the left shows a CAD picture looking directly from the side with the current scapular behind. Spine, shoulder rubbers and cable cover hidden. On the right these parts are shown.





Recommendation

- It is recommended to take off 11.5 mm from the lower end of the Q3 scapula
- This will maintain the same seating position of the dummy while generating a clearance with the rib cage of 16.5 mm which is more in line with Q6
- Minor mass change of about 1 gram on each side
- Changes to be included in Q3 dummy drawing package to be updated by Mid 2016 related to items like APTS sensor and hip-liner