

BioRID – Dummy Artefacts T2 Jacket Bolts / Shoulder Plates

**GTR 7 – Meeting
NHTSA-Office, Washington DC
June 10th, 2011**

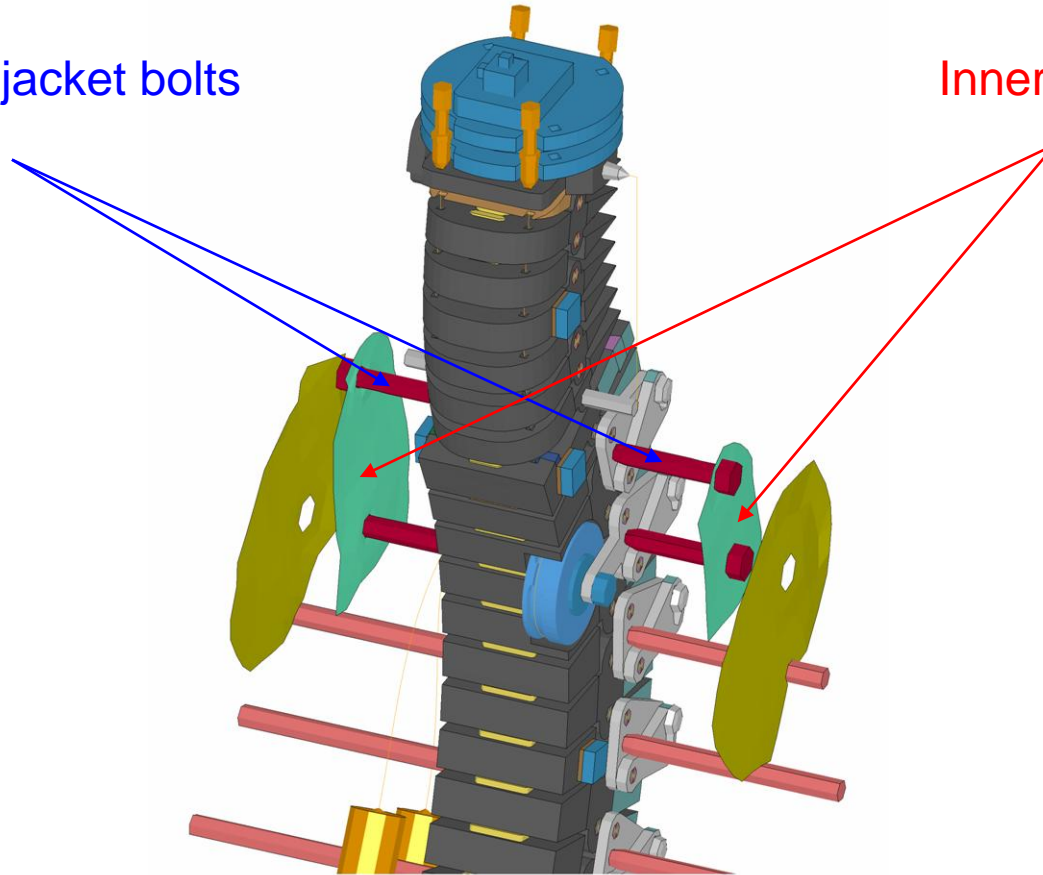
Hypothesis

- Depending on the shape of the backrest load can be applied through the shoulder to the spine
- Possible interaction between torso jacket bolts and inner shoulder plates
- Test set-up
 - Testing
 - Hard bucket seat
 - SRA 16 crash pulse
 - Simulation
 - Hard bucket seat
 - Standard vehicle seat
 - SRA 16 crash pulse

Design of the dummy

Upper torso jacket bolts

Inner plates

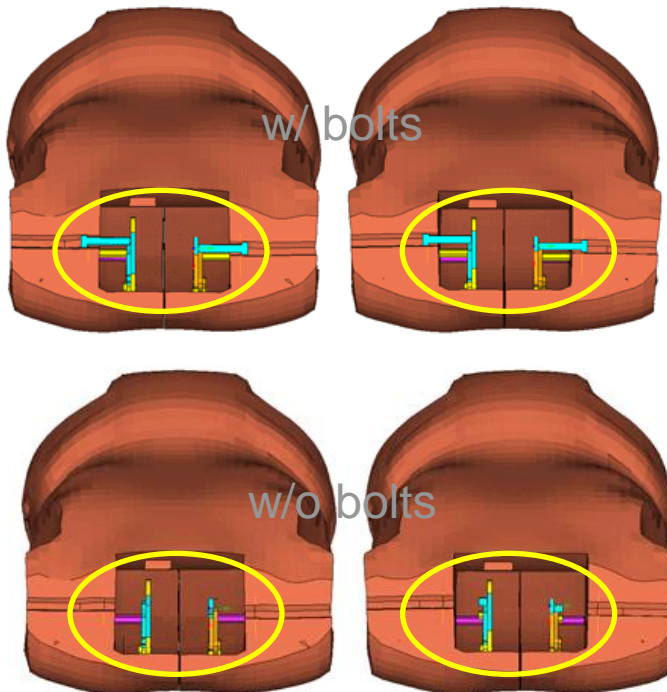


Kinematics

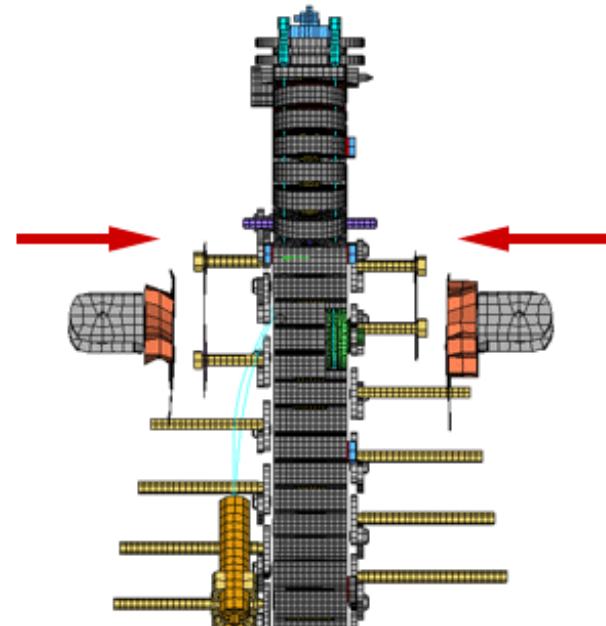
Load path shoulder to spine

Hard bucket
seat

Vehicle
seat

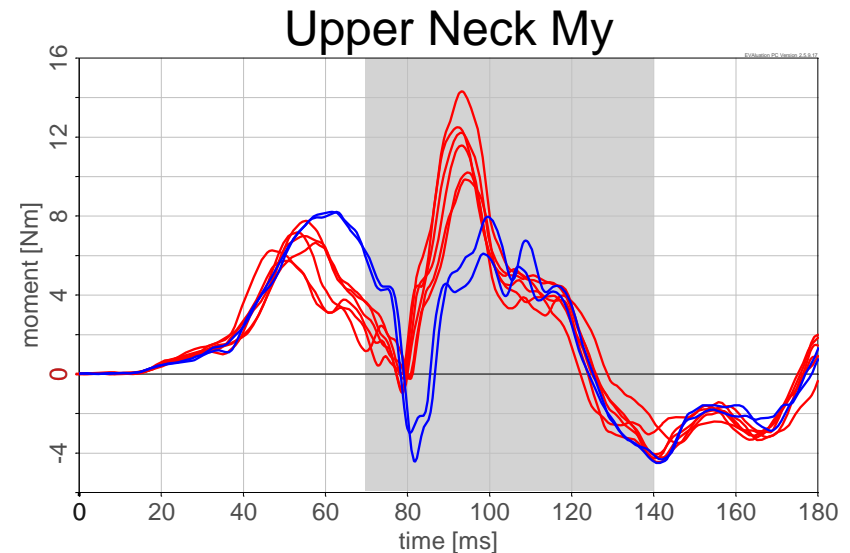
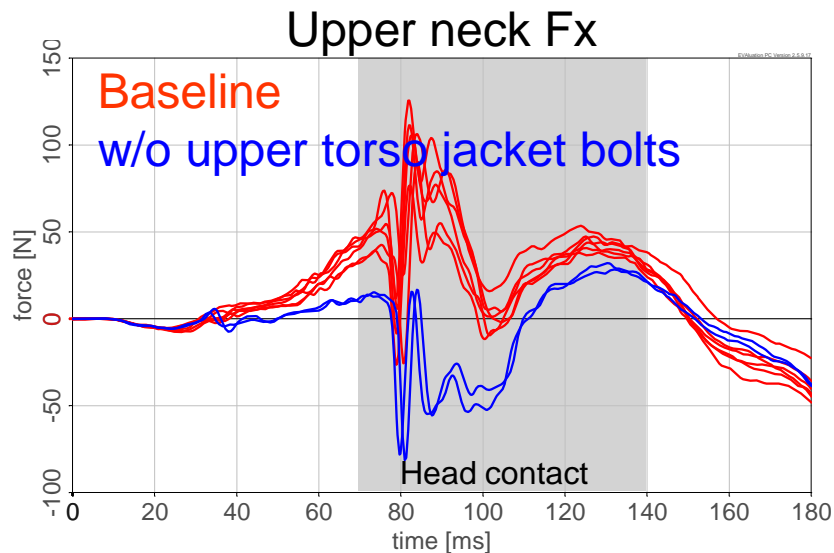


Interaction between bolts and
plates (hard bucket seat)



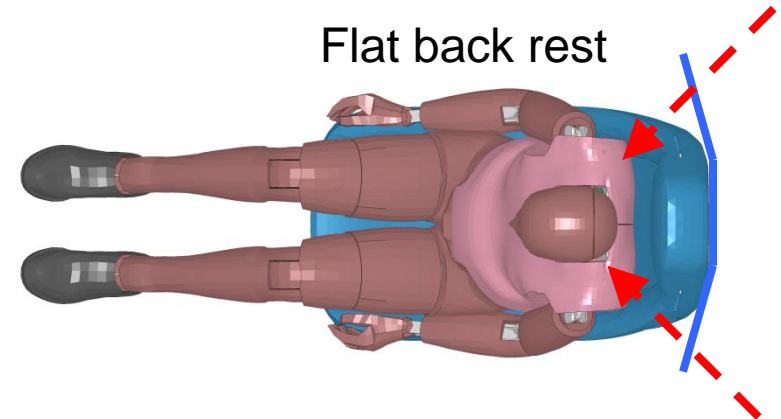
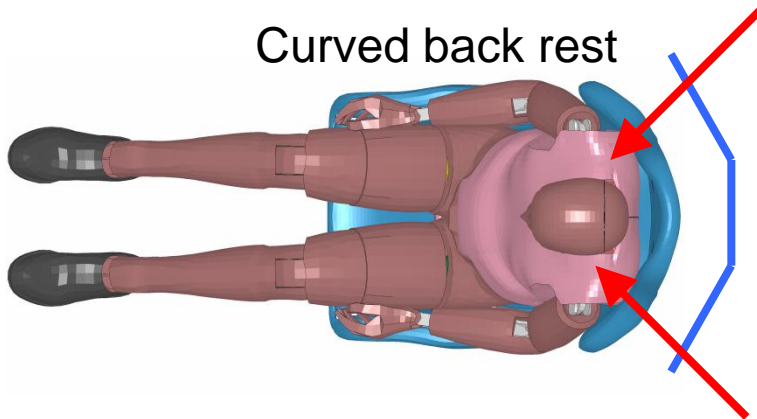
Test Results

Dummy D078



- Positive neck force is mainly caused by the load applied via the upper torso jacket bolts incl. the interaction with the inner shoulder plates
 - Change of Nkm by 11% and of NIC by 2%

Conclusion



- Shape of the back rest can enable a load path through the upper torso jacket bolts (T2) → significance influence on forces and moments
 - Curved → Load path through shoulder-bolts to the spine influences measurements
 - Flat → Minor influence to the measurements
- Clamping of shoulder plates at jacket bolts can introduce load to the spine

Remaining Questing

- Shoulder bolt load path:
 - Is this a biofidelic behavior of the BioRID?
 - Is the curvature of the back rest in the shoulder region responsible for WAD protection?