

# CERTIFICATION TEST UPDATE TO GTR7

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# Agenda

- Current tests – data analysis
  - R&R of certification
  - Correlation to car seat sled tests
- New tests under development
  - Design
  - FE study
  - Manufacture equipment
  - Testing
- Timeline



# Current Certification Test Trials

- Jacket Impact test
- Pelvis impact tests
  - Back, bottom
- Spine quasi-static bending
  - Flexion, extension, with & without damper & torsion pins
- Mini-sled
- Mini-sled with head restraint

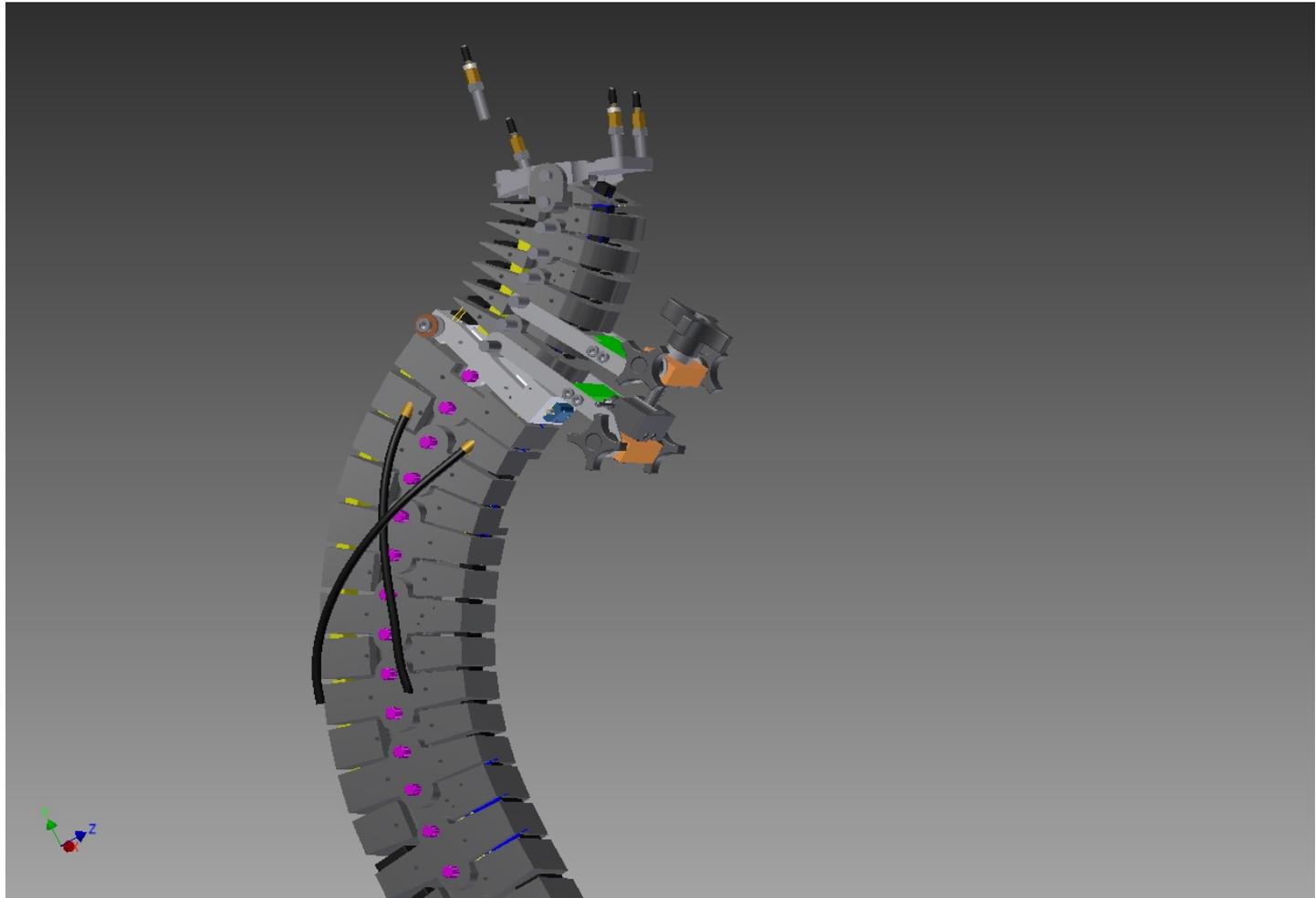


# New Tests under development

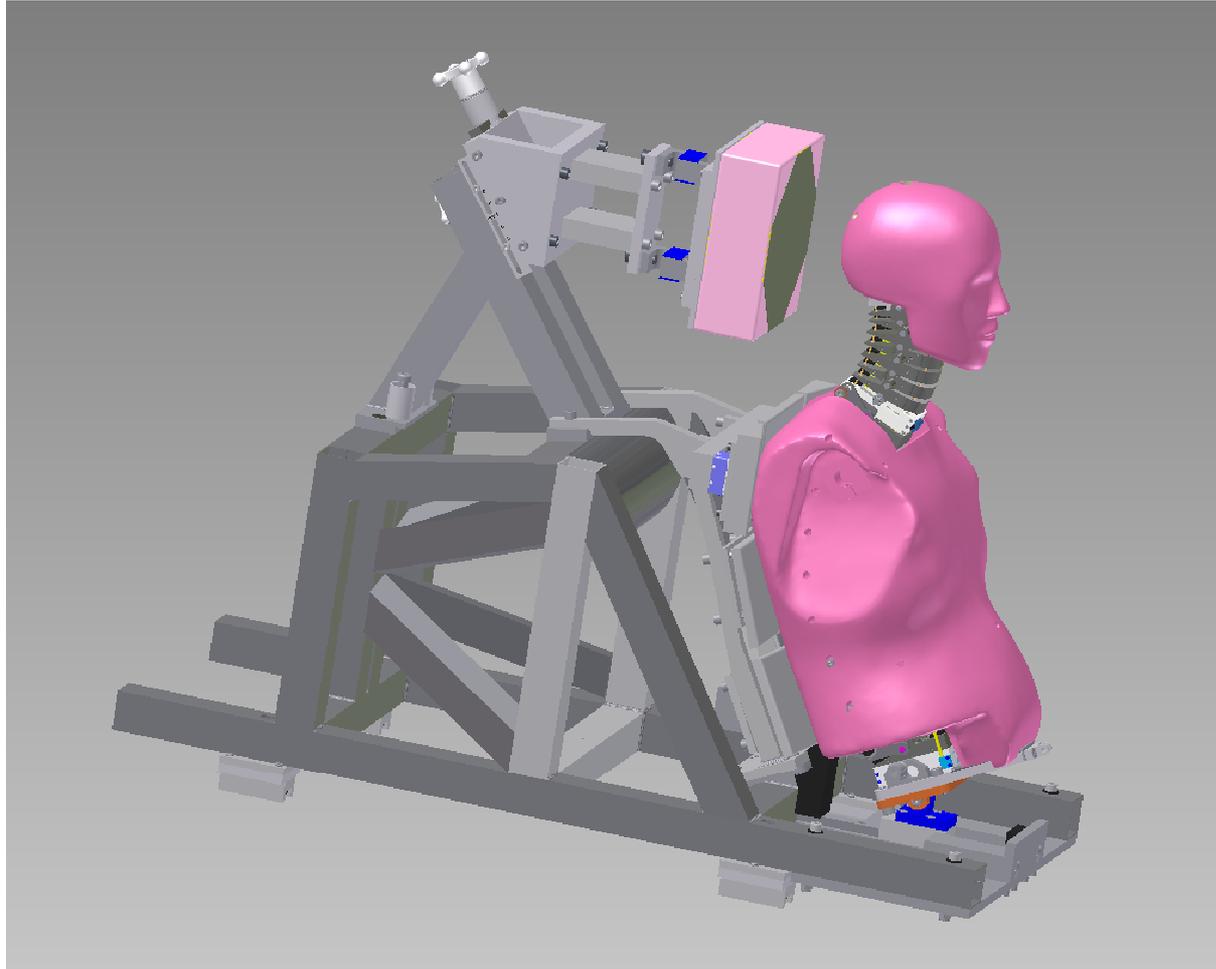
- Bumper compression on spine
- Full back support mini-sled
- Quasi-static jacket compression
- Quasi-static pelvis compression



# Bumper Compression on Spine



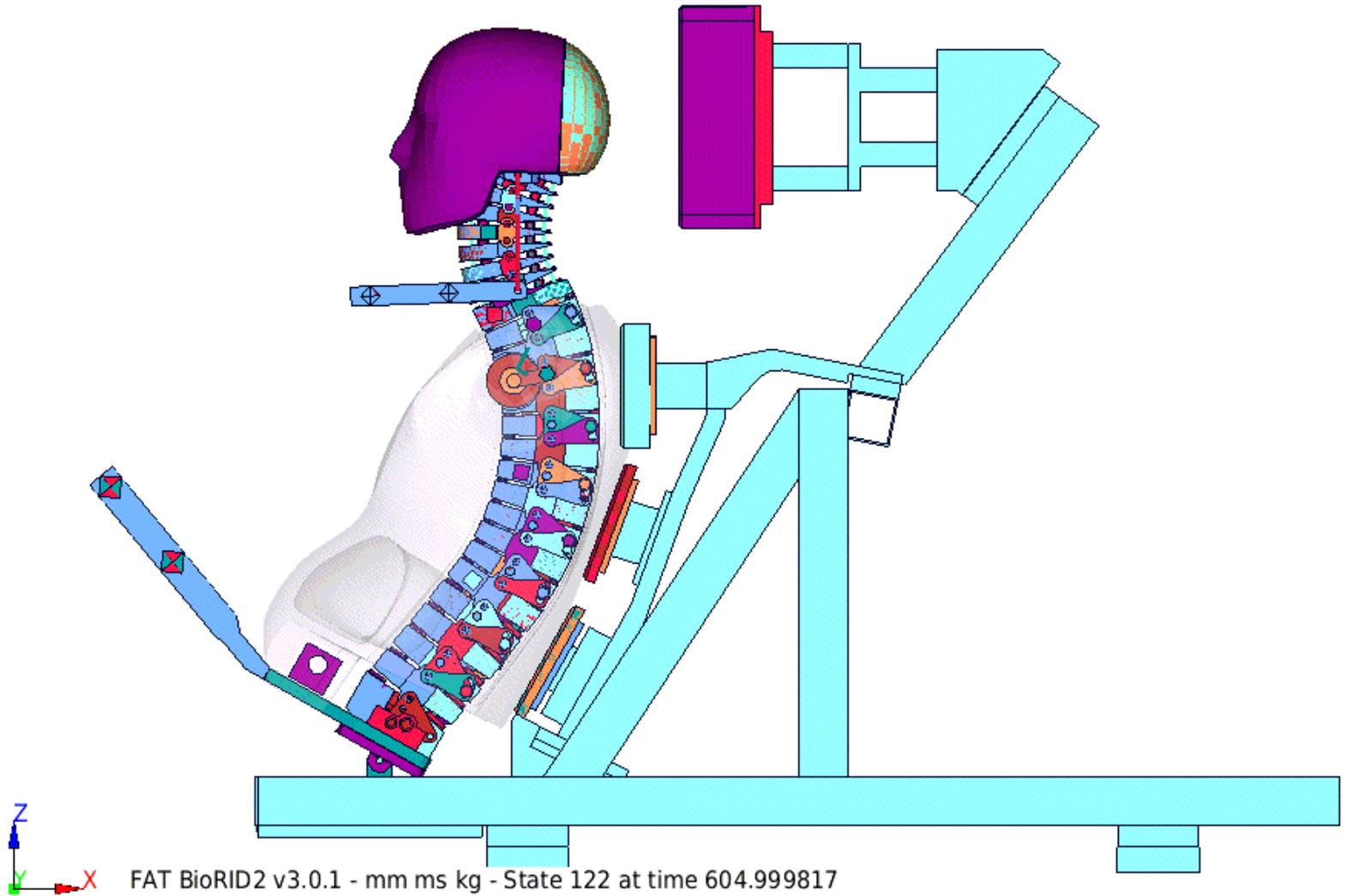
# Full Back Support mini-sled



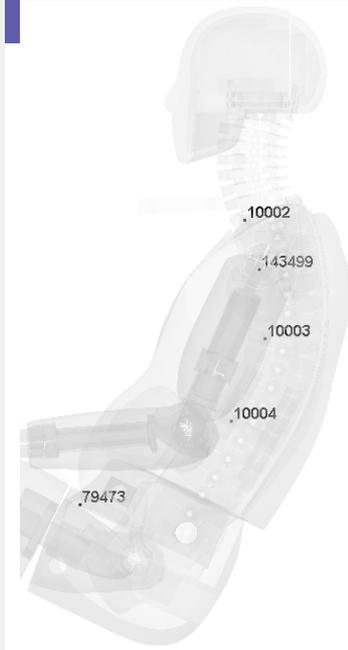
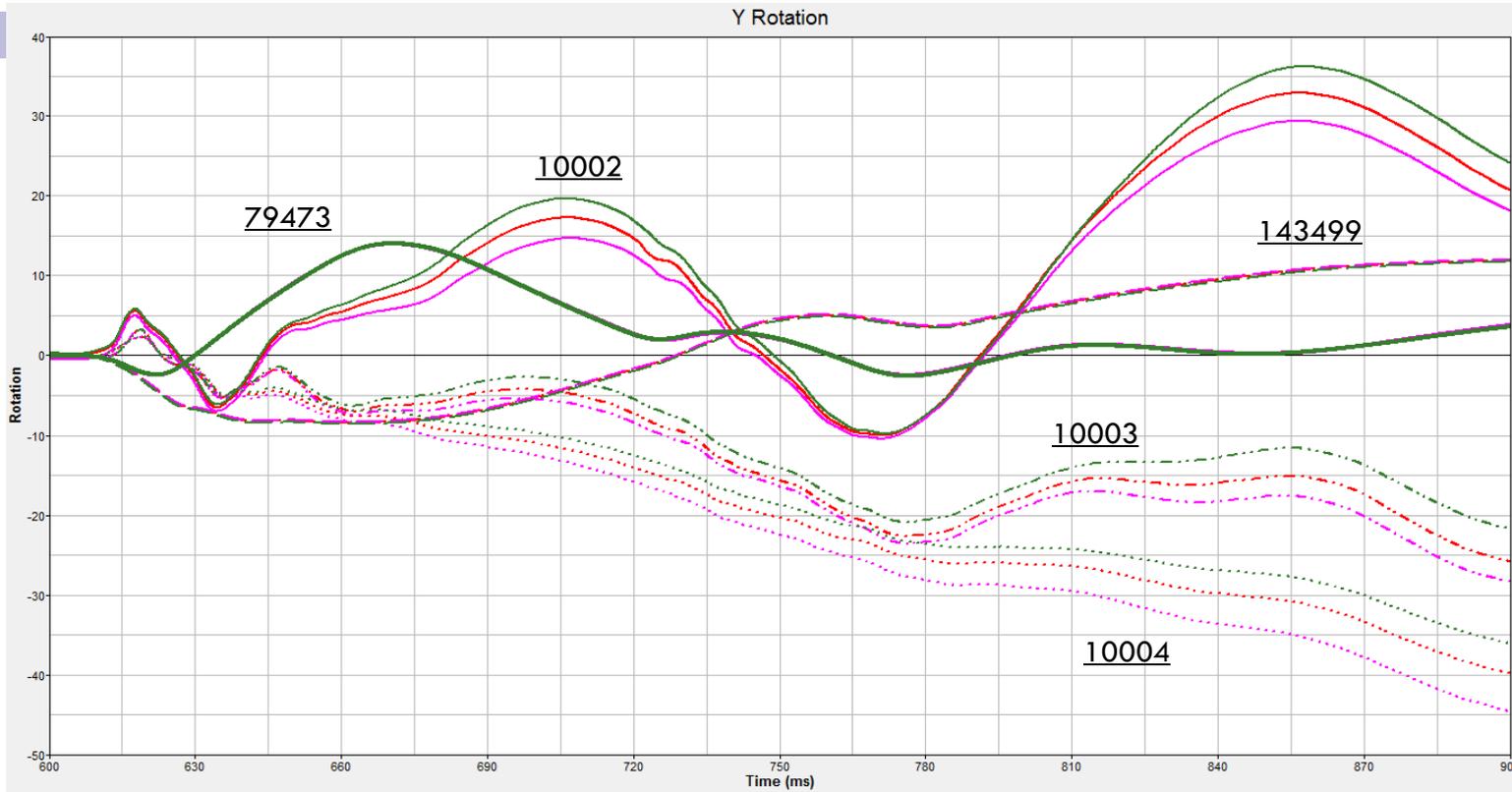
# FE Study on Full Back Support Test

- CAE group in Europe
  - Using latest Biorid model
- Several load cases
  - Vary bumper stiffnesses
  - Vary jacket stiffness
  - Vary head to restraint friction
- Varying test conditions and sled parameters
- Conclusions so far





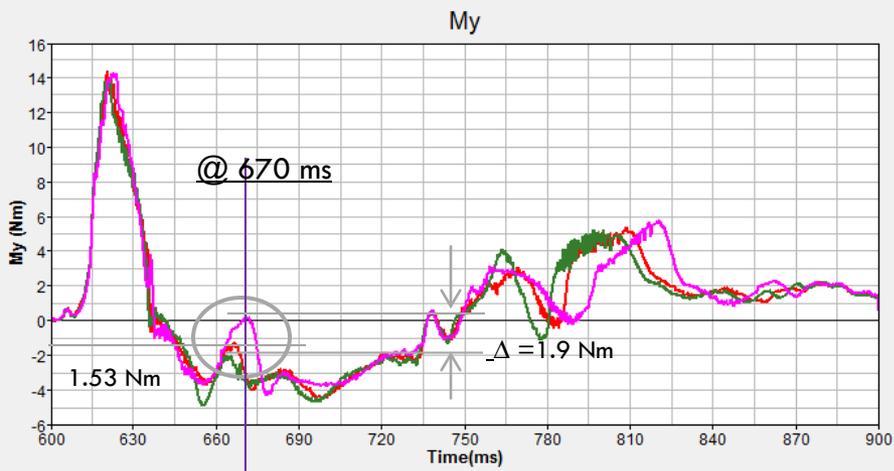
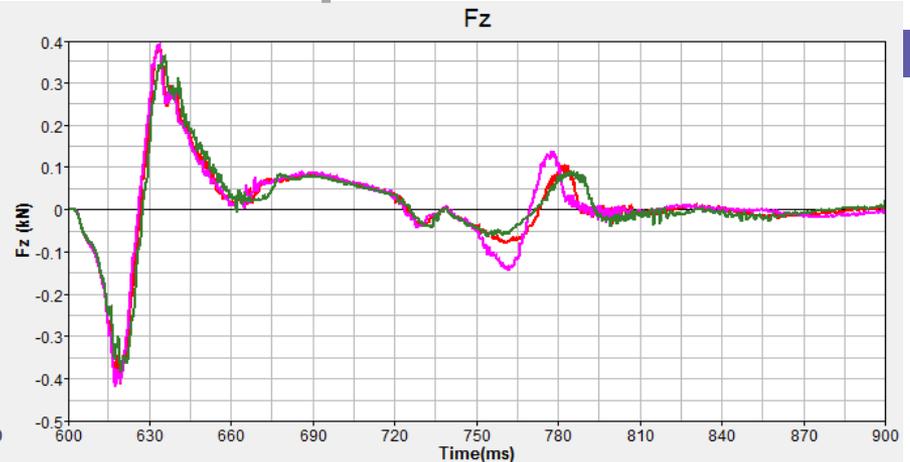
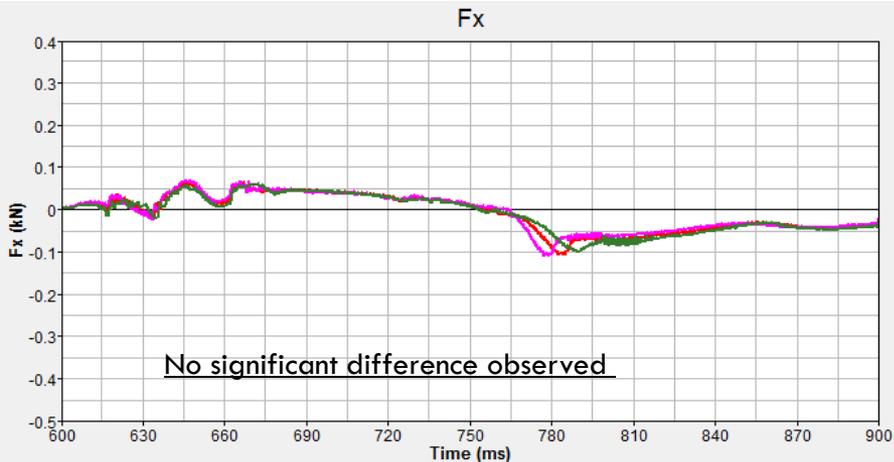
# Vary bumper stiffness – Y-rotation\_thorax and lumber spine



- **Base run**
- **Run+40%**
- **Run-40%**



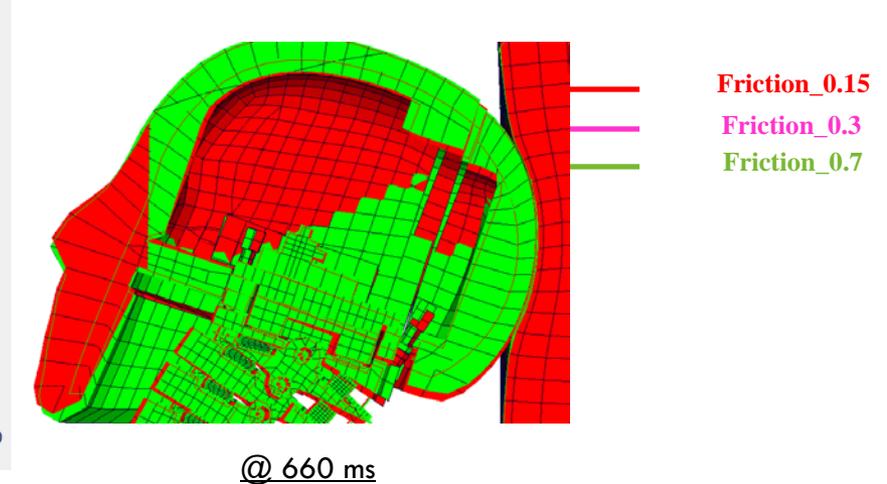
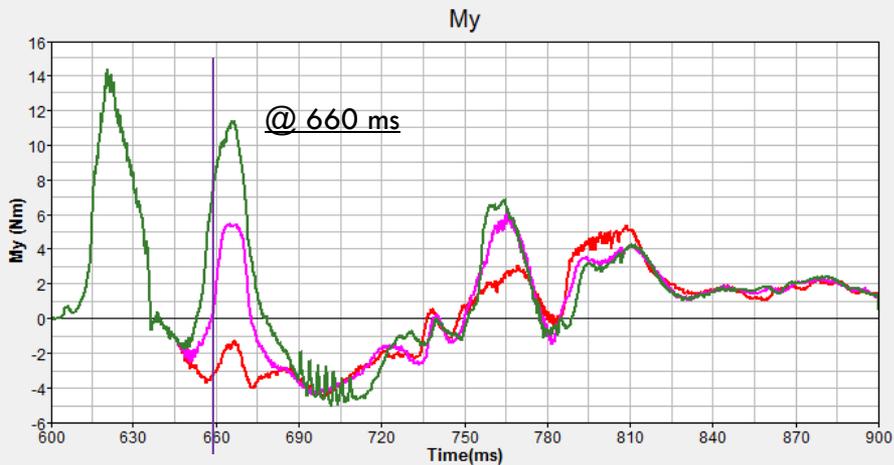
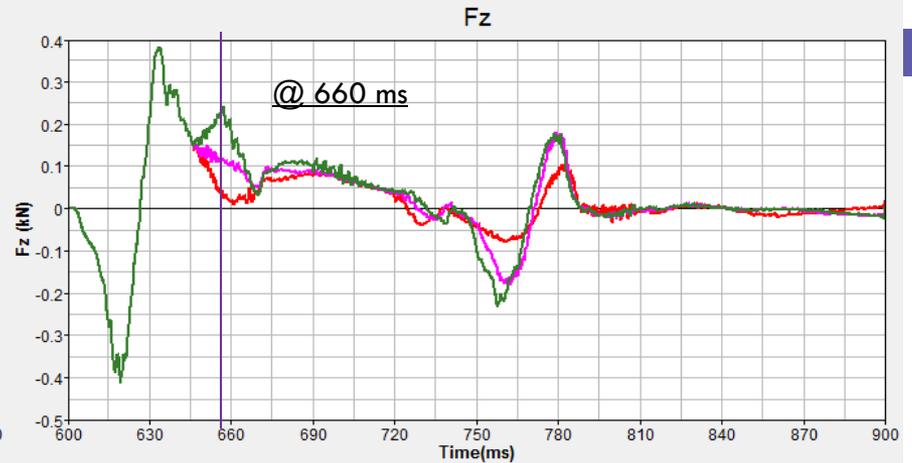
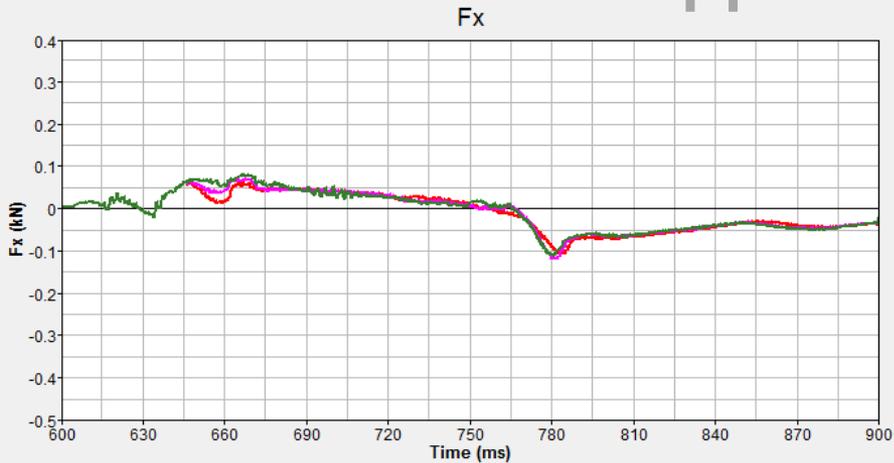
# Vary bumper stiffness – Y-rotation\_thorax and lumbar spine



— Base run  
— Run+40%  
— Run-40%



# Vary Head to restraint friction- Results - Neck upper load cell



# Conclusions so far

- Possibly detect bumper variations
- Possibly detect jacket
- Head to restraint friction is critical
  - Is this a problem with car seat testing as well?



# Timeline for Work

- Work plan was developed in March
- Program management if following/tracking/pushing
- Currently on track for early August completion certification work
  - Hopefully some conclusions in late May

