Agenda

• Current tests – data analysis
  o R&R of certification
  o Correlation to car seat sled tests

• New tests under development
  o Design
  o FE study
  o Manufacture equipment
  o 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
  o Using latest Biorid model

• Several load cases
  o Vary bumper stiffnesses
  o Vary jacket stiffness
  o Vary head to restraint friction

• Varying test conditions and sled parameters

• Conclusions so far
Vary bumper stiffness –
Y-rotation_thorax and lumber spine

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2/20/2013
Vary bumper stiffness – Y-rotation_thorax and lumber spine

No significant difference observed

@ 670 ms

Δ = 1.9 Nm

1.53 Nm

Base run
Run+40%
Run-40%
Vary Head to restraint friction -
Results - Neck upper load cell

Friction_0.15
Friction_0.3
Friction_0.7

@ 660 ms
Conclusions so far

- Possibly detect bumper variations
- Possibly detect jacket
- Head to restraint friction is critical
  o 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
  o Hopefully some conclusions in late May