Informal Dummy Working Group
WorldSID
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FMVSS 214 Pole Crash Tests with WorldSID 50th dummy:
Comparison of 2D IRTRACC to Chestband Displacements

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Crash Tests

• FMVSS 214 Pole test

• 3 Vehicles
  – 2010 Acura MDX
  – 2010 Kia Forte
  – 2010 Suzuki SX4

• WorldSID 50\textsuperscript{th} Driver

• 1 Chest band installed on rib
  – To determine rib contour throughout event

• 5 2D IR-TRACCS
  – To measure displacement and angle of rib end motion
Contours aligned such that spine-sternum lines coincide.
Max deflection occurred at **left lateral side** for Suzuki.

Max deflection occurred at **sternum** for Acura & Kia.
When limited to left of sternum, max deflection occurred at left lateral side.
Position of IR-TRACC at rib end determined from IR-TRACC displacement and angle – matches chest band max deflection gage well when limited to left of sternum.
Acura MDX – Thx rib 2

Angle at max deflection – not very oblique

Kia Forte – Abd rib 1

Suzuki SX4 – Abd rib 1

Max deflection
-IR: IR-TRACC
-CB: chest band
-match quite well
Summary

• WorldSID 50\textsuperscript{th} flexible sternum results in “S-shape” during FMVSS 214 pole tests
  – Max deflection occurs at sternum in 2/3 tests
• Because chest loading is < 10 \textdegree from lateral, IR-TRACC displacement matches quite well with that of chest band (when limited to left of sternum)
• Further examination of IR-TRACC reliability in oblique loading conditions warranted for WSID 50\textsuperscript{th}
  – May be able to predict displacement in direction of loading from 2D IR-TRACC (5\textsuperscript{th} – yes; 50\textsuperscript{th} - ?)