

Informal Dummy Working Group
WorldSID

26 October 2011, Seoul, Korea

**FMVSS 214 Pole Crash Tests with
WorldSID 50th dummy:
Comparison of 2D IRTRACC to
Chestband Displacements**

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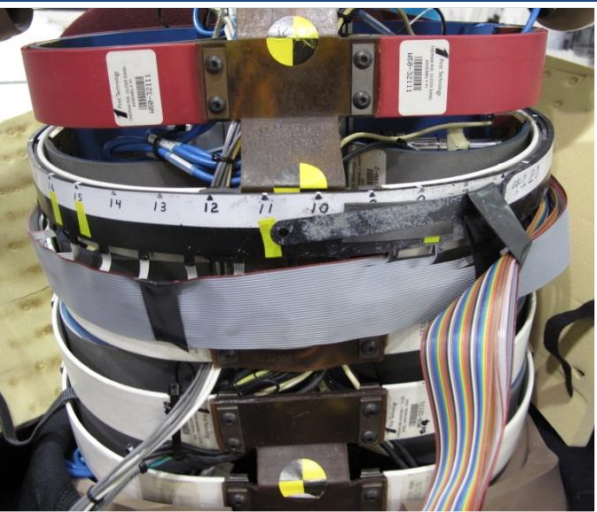
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TRC of Ohio

Crash Tests

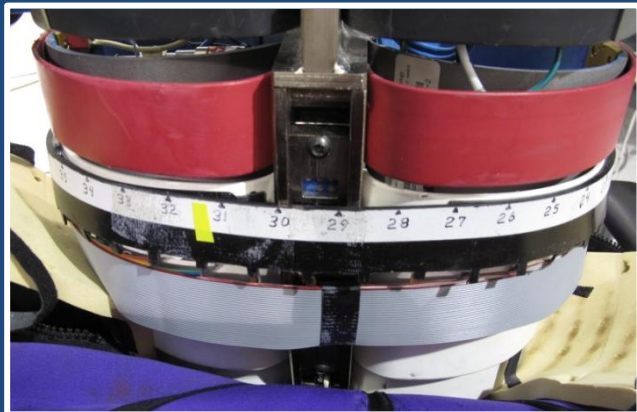
- FMVSS 214 Pole test
- 3 Vehicles
 - 2010 Acura MDX
 - 2010 Kia Forte
 - 2010 Suzuki SX4
- WorldSID 50th Driver
- 1 Chest band installed on rib
 - To determine rib contour throughout event
- 5 2D IR-TRACCS
 - To measure displacement and angle of rib end motion



Acura MDX – Thorax rib 2



Front of dummy



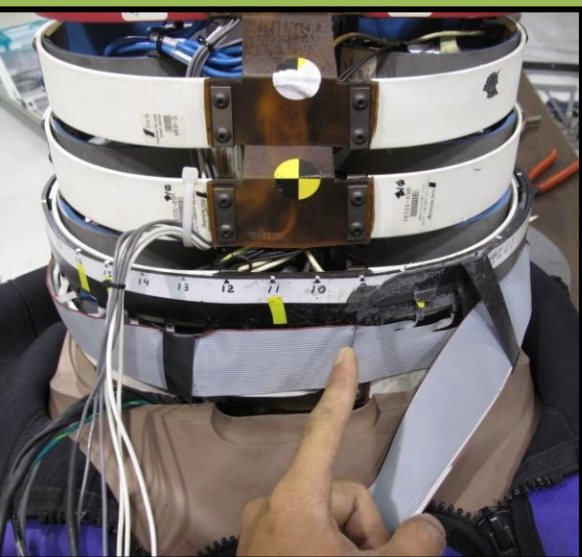
Rear of dummy

Kia Forte – Abdomen rib 1

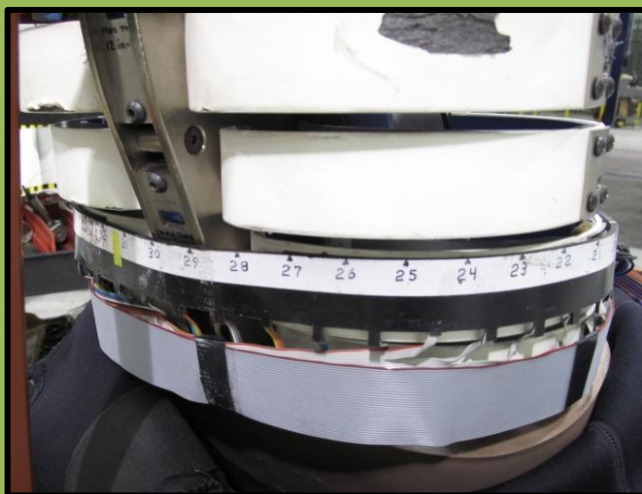


Front of dummy

Suzuki SX4 – Abdomen rib 1



Front of dummy

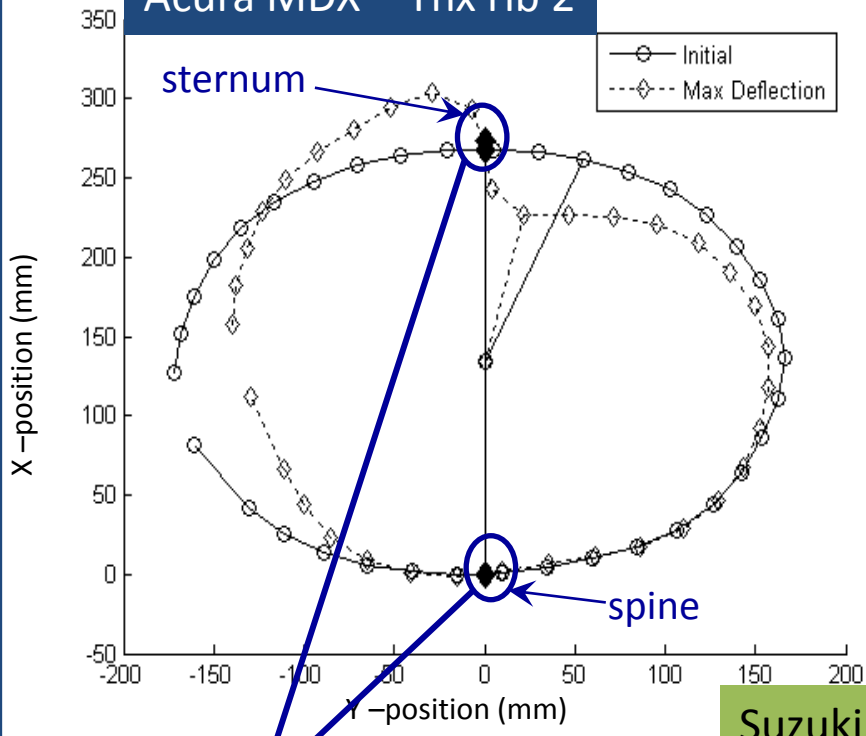


Rear of dummy

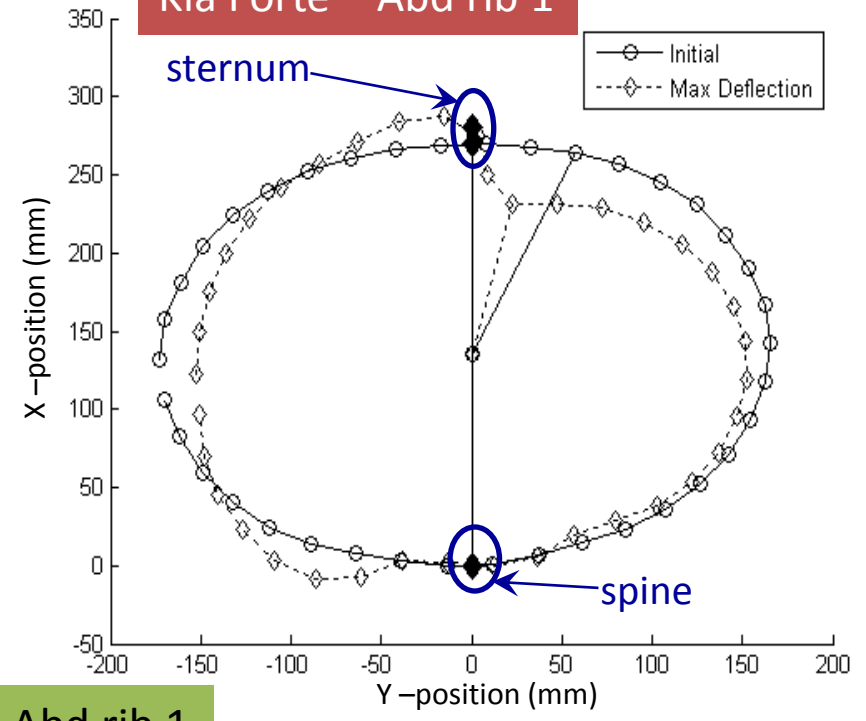


Rear of dummy

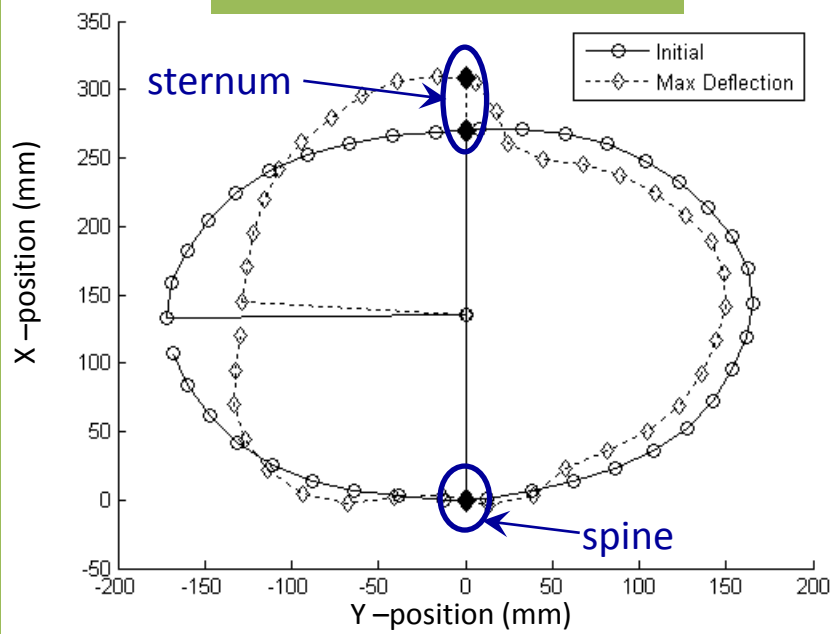
Acura MDX – Thx rib 2



Kia Forte – Abd rib 1

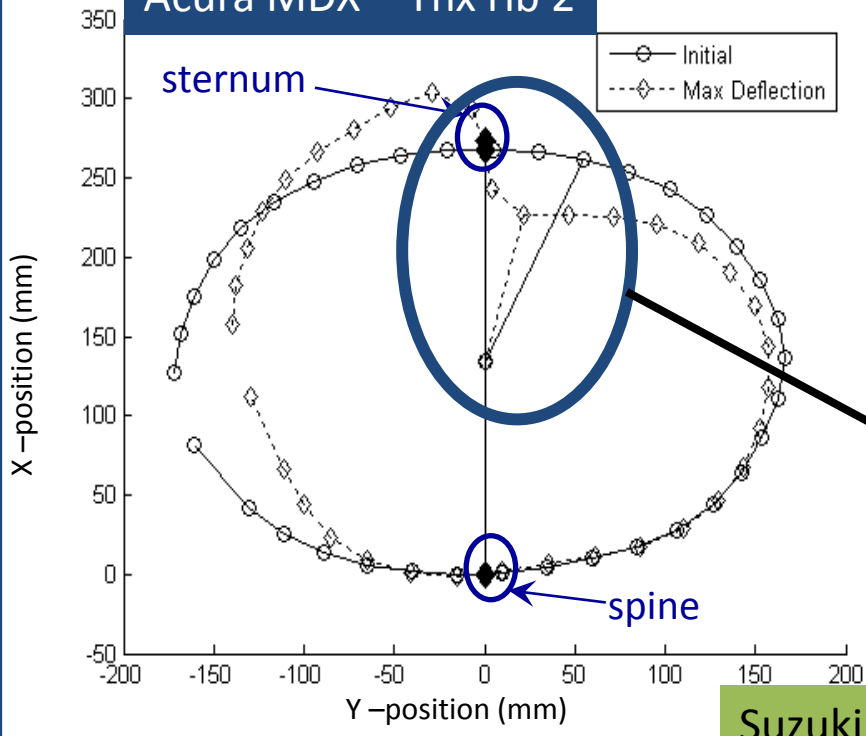


Suzuki SX4 – Abd rib 1

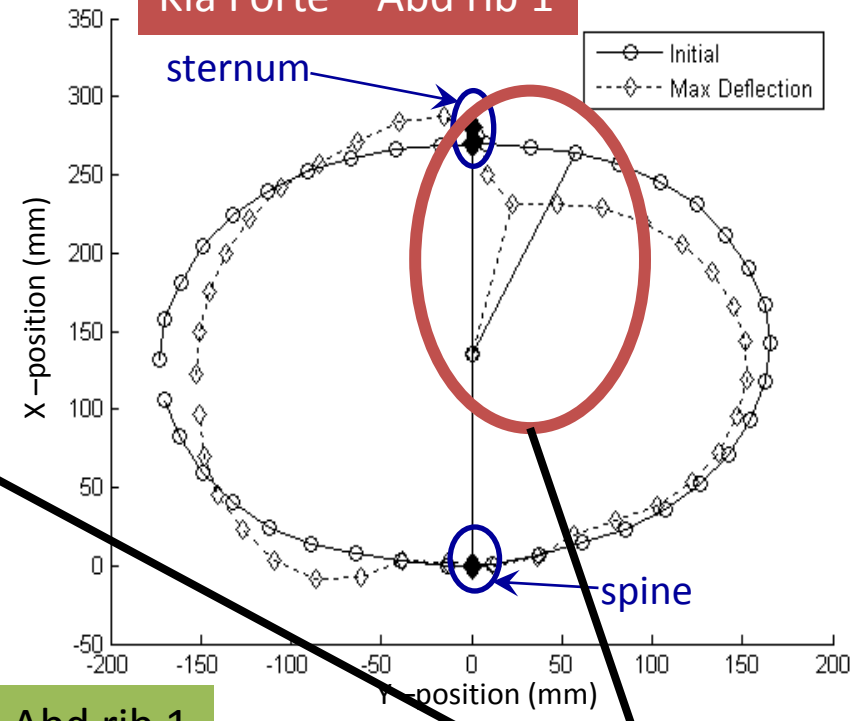


Contours aligned such that spine-sternum lines coincide

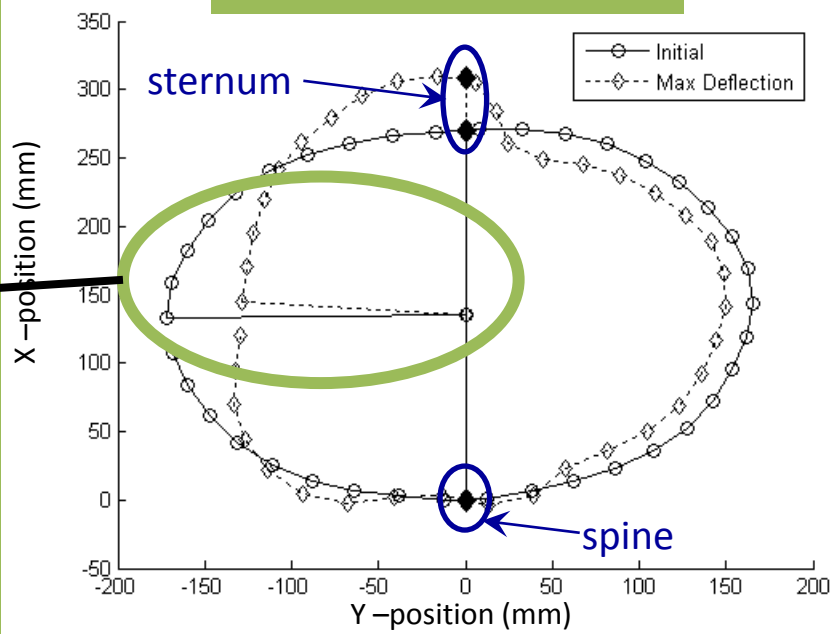
Acura MDX – Thx rib 2



Kia Forte – Abd rib 1



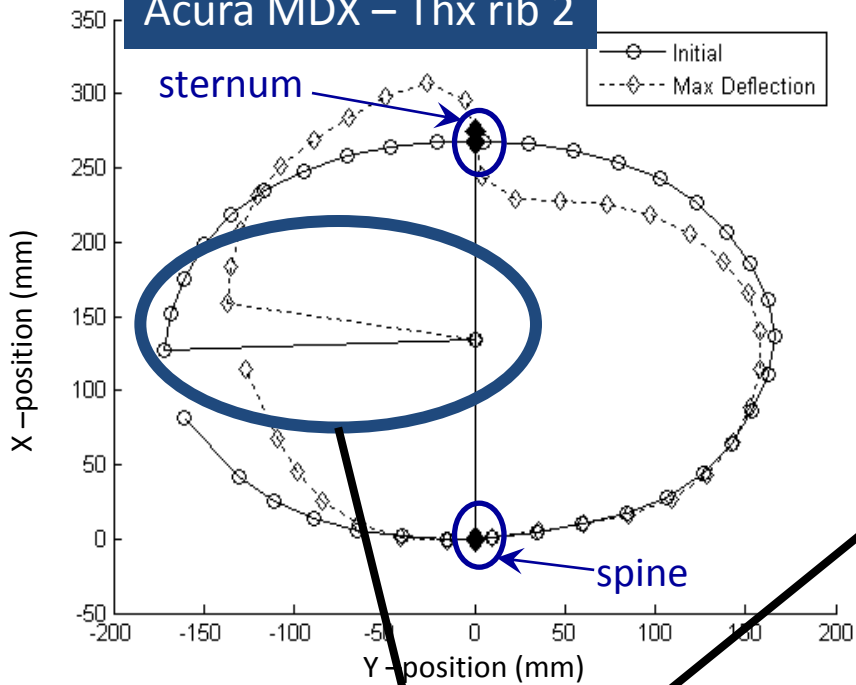
Suzuki SX4 – Abd rib 1



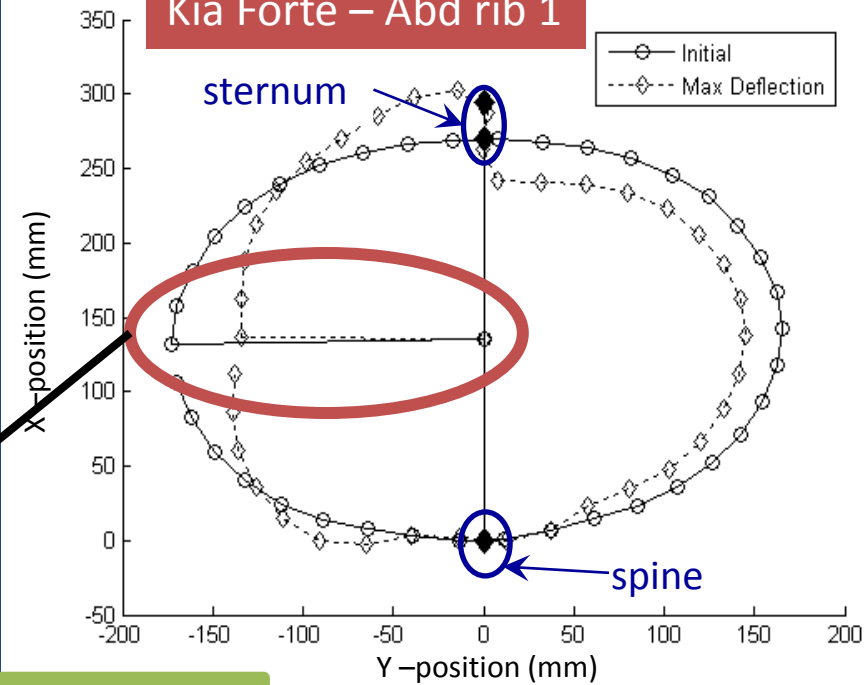
Max deflection occurred at **left lateral side** for Suzuki

Max deflection occurred at **sternum** for Acura & Kia

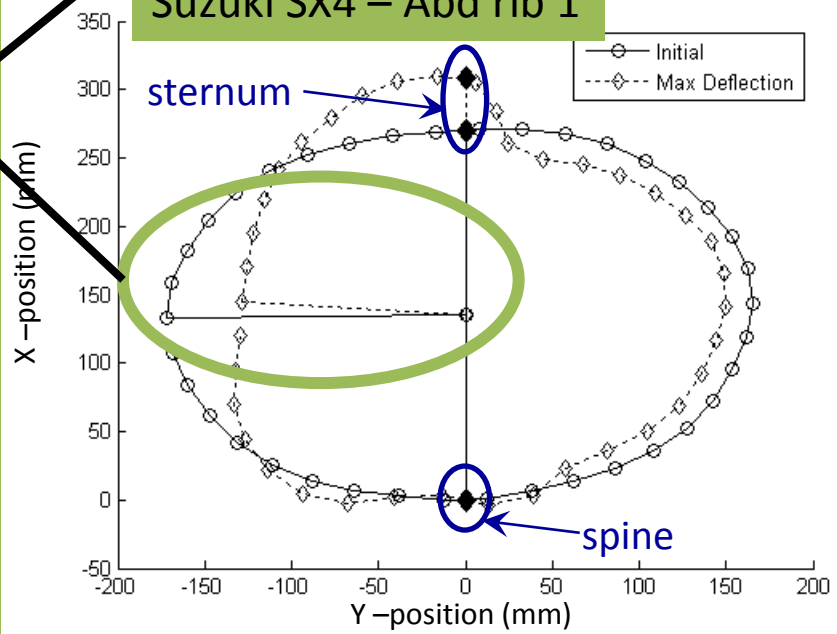
Acura MDX – Thx rib 2



Kia Forte – Abd rib 1

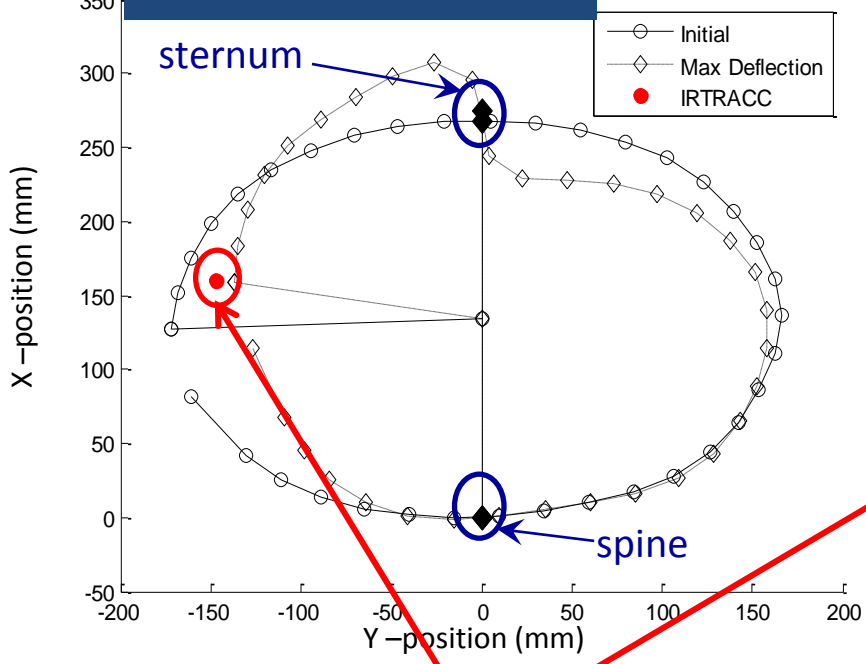


Suzuki SX4 – Abd rib 1

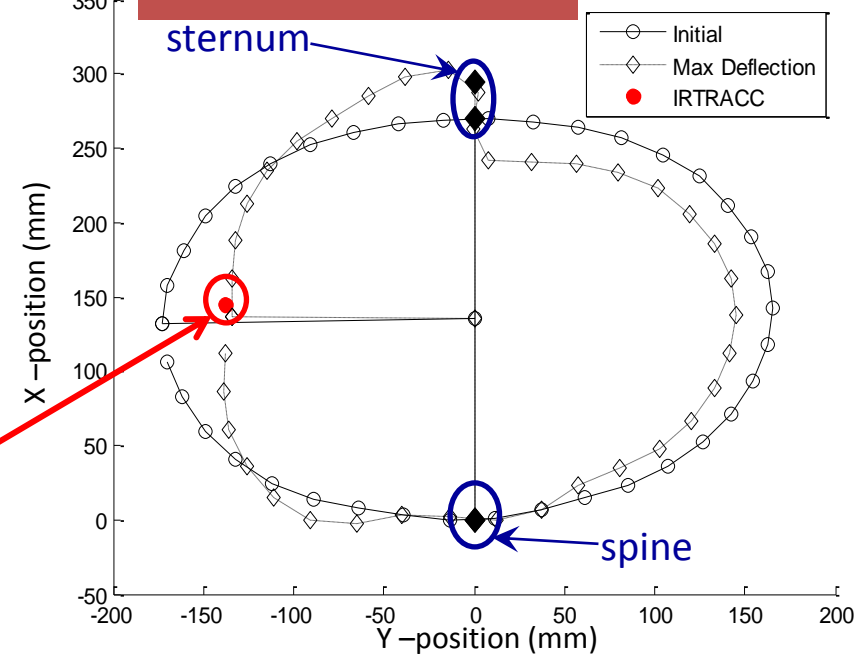


When limited to left of sternum, max deflection occurred at **left lateral side**

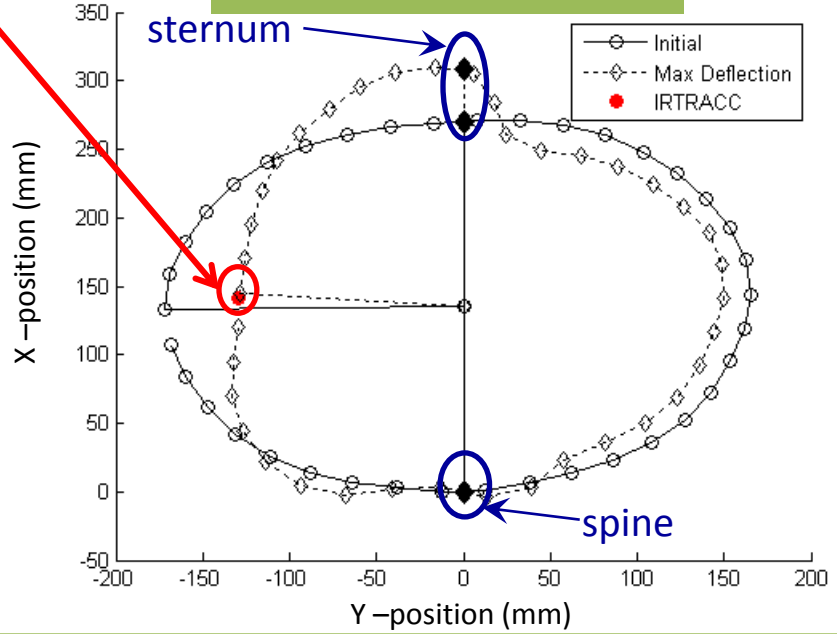
Acura MDX – Thx rib 2



Kia Forte – Abd rib 1

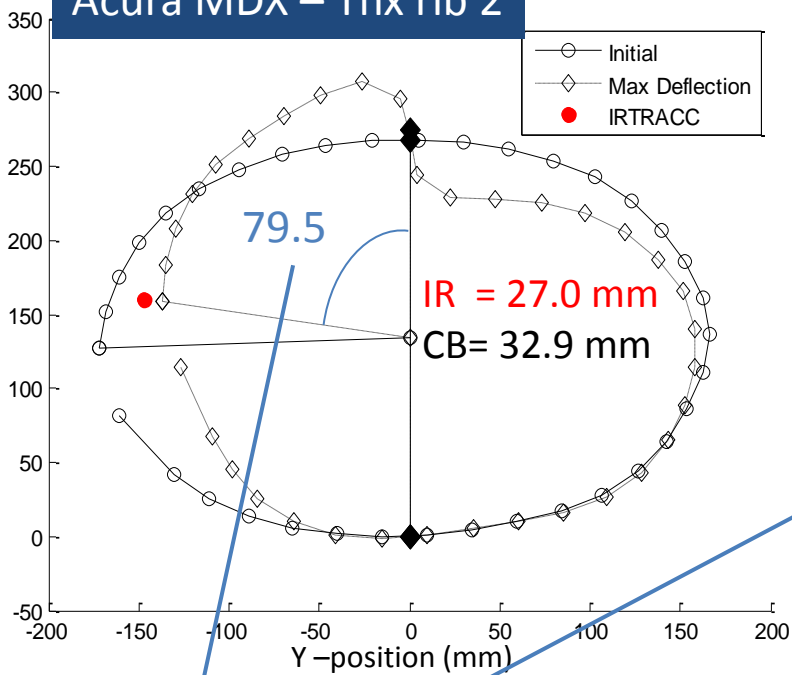


Suzuki SX4 – Abd rib 1

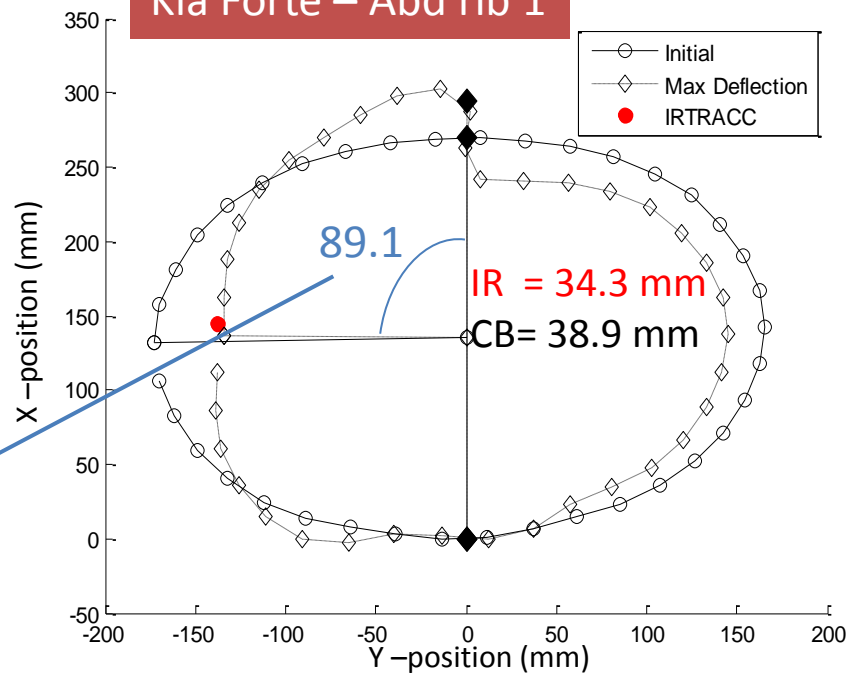


Position of IR-TRACC at rib end determined from IR-TRACC displacement and angle – **matches chest band max deflection gage well when limited to left of sternum**

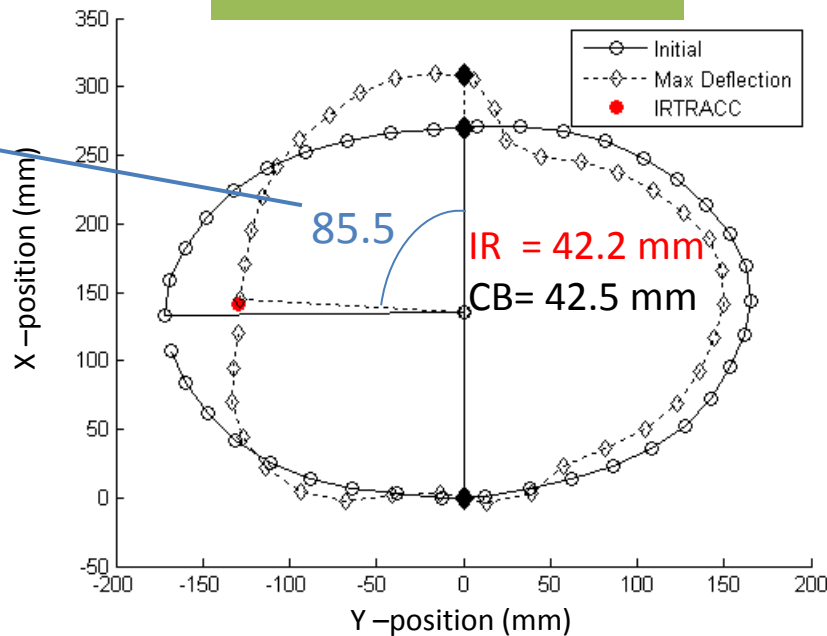
Acura MDX – Thx rib 2



Kia Forte – Abd rib 1



Suzuki SX4 – Abd rib 1



Angle at max deflection –
not very oblique

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

Summary

- WorldSID 50th 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 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 50th
 - May be able to predict displacement in direction of loading from 2D IR-TRACC (5th – yes; 50th - ?)