Joint Australian and Canadian Pole Side Impact Research

Thomas Belcher
Australian Government Department of Infrastructure and Transport

Suzanne Tylko
Transport Canada

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Program Overview

• Research jointly funded by Australian Government Department of Infrastructure and Transport, and Transport Canada.

• Paired comparisons of 29 km/h perpendicular and 32 km/h oblique pole side impact tests with WorldSID ATDs.

• Canadian market vehicles including Chevrolet Cruze, Suzuki Kizashi, Mitsubishi RVR (ASX), and Mazda 2.
• Struck (left/driver) side WS 50th instrumented with RibEye multipoint rib deflection measurement system.
• Non-struck (right/passenger) side WS 50th instrumented with 1D-IRTRACC rib deflection measurement system.

IRTRACC Deflection = Py - sqrt[(Py – |Ry|)^2 + Rx^2 + Rz^2]

Py = IRTRACC pivot-to-pivot dimension of an unloaded rib

Rx = RibEye middle LED position change in the X direction.

Ry = RibEye middle LED position change in the Y direction.

Rz = RibEye middle LED position change in the Z direction.

Chevrolet Cruze

29 km/h Perpendicular

32 km/h Oblique
Chevrolet Cruze

Resultant Head Acceleration Response (0-80ms)

HIC 36 (oblique - excluding dummy interactions after t = 80 ms): 577
HIC 36 (perpendicular - excluding dummy interactions after t = 80 ms): 288

Acceleration [g] vs. Time [s]

- 29 km/h Perpendicular
- 32 km/h Oblique
Chevrolet Cruze

X-Y Response (0-100ms): Thorax Rib 1

Rearward - Y  - Y  Forward

X - X  X +
Chevrolet Cruze

X-Y Response (0-100ms): Thorax Rib 2

Rearward

Forward
Chevrolet Cruze

X-Y Response (0-100ms): Abdomen Rib 1

Rearward - Y
Forward - X
Chevrolet Cruze

X-Y Response (0-100ms): Abdomen Rib 2

Rearward

- Y

- X

X +
Sample Comparison (Thorax Rib 1):
Theoretical IRTRACC Deflection vs Middle LED Y-axis Displacement

29 km/h Perpendicular

32 km/h Oblique
Suzuki Kizashi

29 km/h Perpendicular

32 km/h Oblique
Resultant Head Acceleration Response (0-80ms)

HIC 36 (oblique - excluding dummy interactions after t = 80 ms): 337
HIC 36 (perpendicular - excluding dummy interactions after t = 80 ms): 316
Suzuki Kizashi

Sample Comparison (Thorax Rib 2):
Theoretical IRTRACC Deflection vs Middle LED Y-axis Displacement

29 km/h Perpendicular  32 km/h Oblique
Thank you