Preliminary Results of NHTSA's Comparison of the Current Offset Deformable Barrier Specified in FMVSS No. 208 and the Progressive Deformable Barrier

GRSP – 43rd Session
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Objective

Direct evaluation of the Progressive Deformable Barrier (PDB) and the ECE R94 Offset Deformable Barrier (R94)
Performance Measures

★ THOR LX legs to evaluate lower leg injuries

★ Barrier performance evaluated by
  – Bottoming out
    • Vehicle weight
  – Deformation pattern due to vehicle construction
    • Unibody vs. body on frame
Barrier Definition

 Barrier drawings are not on the same scale

[Diagram showing barrier specifications and dimensions]

- Constant Rear Deformable Core: 1.7 Mpa (New)
- Constant Front Deformable Core: 0.34 Mpa

Dimensions:
- 450 mm
- 540 mm
- 790 mm
- 250 mm

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Test Conditions

★ R94
  – 56 kph at 40 percent overlap
★ PDB
  – 60 kph at 50 percent overlap
★ Dummy based seating procedure
  – Place foot on accelerator pedal
Test Matrix

★ Chevy Aveo – small car (1433 kg)
★ Ford 500 – midsize car
★ Ford Escape – unibody SUV
★ Saturn Outlook – unibody SUV
★ Ford F-250 – large PU (3291 kg)
★ Ford 500 – midsize car
  – 3 repeat tests for both barriers
Aveo Left Side View
The Aveo (compact car) bottomed out the R94 barrier.
F-250 Left Side View

R94

PDB
F-250 Barrier Crush
Front View of PDB for F-250

Frame punctured the PDB
F-250 Force vs. Displacement
Summary

★ The PDB barrier did not bottom out when impacted with the F-250
★ Both barriers applied the same global force to the Aveo
★ The PDB absorbed more energy than the R94 barrier for the F-250
  – Peak Force was later in the event
★ The Aveo saw similar intrusion results and similar leg injury results
★ The F-250 had significantly lower intrusion results with the PDB and lower leg injury results.