Status of Advanced Frontal Crash Protection Research Program

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POTENTIAL TEST PROCEDURES FOR
FMVSS NO. 208

Prepared By The

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### NASS Analysis of Frontal Impacts

**Evaluation of Potential Frontal Tests**

**Target populations for Tests**

<table>
<thead>
<tr>
<th>Target Populations Addressed by Tests</th>
<th>Drivers with Serious and Greater Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Barrier</td>
<td>4,000</td>
</tr>
<tr>
<td>FFFDB</td>
<td>8,000</td>
</tr>
<tr>
<td>EU Off</td>
<td>12,000</td>
</tr>
<tr>
<td>MDB Full</td>
<td>16,000</td>
</tr>
<tr>
<td>MDB Off Stiff</td>
<td>16,000</td>
</tr>
<tr>
<td>MDB Off Soft</td>
<td>16,000</td>
</tr>
<tr>
<td>Sled</td>
<td>0</td>
</tr>
</tbody>
</table>
“…Additionally, it is recommended that research be continued in developing and evaluating the moving deformable barrier test for future agency consideration for upgrading FMVSS No. 208.”
Fatalities in Vehicle-to-Vehicle Collisions

![Chart showing fatalities in vehicle-to-vehicle collisions from 1980 to 1998 for different types of collisions: Car-Car, LTV-Car, and LTV-LTV.](chart)

- **Car-Car Collisions**
- **LTV-Car Collisions**
- **LTV-LTV Collisions**
Risk of Fatality: LTVs vs. Cars

(%Fatalities - %Exposure)

Cars
LTVs
Evaluation of Frontal Offset/Oblique Crash Test Conditions

Carl L. Ragland, Osvaldo Fessahaie, and Daniel Elliott

Seventeenth International Technical Conference on the Enhanced Safety of Vehicles

Paper No. 385

Amsterdam, The Netherlands, June 2001
NASS CDS 1995-1999

- Frontal crashes
- Vehicle-to-vehicle
- Two vehicle
- Both vehicles inspected
Case 1: Right Offset

Case 2: Left Offset

Case 3: Left Offset Oblique

Case 4: Center-to-Left Offset Oblique

Case 5: Full Frontal

Case 6: Right Offset Oblique

Case 7: Center-to-Right Offset Oblique

Case 8: Left Full Oblique

Case 9: Right Full Oblique
Percentage of NASS Two Vehicle Crashes

Vehicle Involvement by Case Type
Unweighted & Weighted Cases

Preliminary Data
Distribution of Moderate to Serious Injuries by Case

Preliminary Data
Distribution of Minor and Moderate Injuries by Case

Preliminary Data
Distribution of Leg Injuries

Distribution of AIS 1-3 Leg Injuries
95 - 99 NASS

Percent of Drivers with leg Injuries

0% 5% 10% 15% 20% 25%

CASE TYPE

1 2 3 4 5 6 7 8 9

unweighted weighted

Preliminary Data
Distribution of Overlap
Percent

Percentage Distribution of Overlap %
For Case 3 Vehicles

Preliminary Data
Distribution of Angle

Percentage Distribution of Angle
For Case 3 Vehicles

Cumulative Percent

0% 20% 40% 60% 80% 100%

-15+/-5 35+/-5 55+/-5 75+/-5

Angle Ranges

unweighted weighted

Preliminary Data
Summary of NASS Analysis

- **New methodology** to evaluate crash conditions

- **Preliminary data:**
  - Predominate crash is left offset oblique
  - More minor and moderate injuries in left oblique crashes
  - Most leg injuries in left-oblique, center-to-left corner, and left offset crashes
Recent Crash Testing
Recent Crash Testing
Post-impact Photograph
Post-impact Photograph
Summary