Report Numbers: 208-TRC-03-004
212-TRC-03-001
219-TRC-03-001
301-TRC-03-001

Vehicle Safety Compliance Testing
for Occupant Crash Protection,
Windshield Retention, Windshield Zone Intrusion, and
Fuel System Integrity

General Motors Corporation
2003 Cadillac DeVille 4-door
NHTSA Number: C30108
TRC Inc. Test Number: 030121-1

Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319

Final Report
February 10, 2003

Prepared For:
U. S. Department of Transportation
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance (Mail Code: NVS-220)
400 Seventh Street, S.W., Room 6115
Washington, DC 20590
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Test Performed By: Ronald D. Stoner, Engineering Technician

Report Approved By:

[Signature] Date 2/10/03

Virginia L. Watters, Project Manager
Transportation Research Center Inc.

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Section 1.0

Purpose and Test Procedure
Purpose

This 30 mph flat frontal barrier impact test is part of the Federal Motor Vehicle Safety Standards (FMVSS) 208, 212, 219 (partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center Inc. (TRC Inc.) under Contract No. DTNH22-98-D-01055. The purpose of this test was to determine if the subject vehicle, a 2003 Cadillac DeVille 4-door, NHTSA No. C30108, meets the performance requirements of FMVSS 208, “Occupant Crash Protection”; FMVSS 212, “Windshield Retention”; FMVSS 219 (partial), “Windshield Zone Intrusion”; and FMVSS 301, “Fuel System Integrity” in the flat frontal barrier impact mode.
Test Procedure

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-10 dated January 15, 1998 and OVSC instructions for the addition of a load cell barrier face. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity" performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations and one (1) accelerometer to measure vertical axis acceleration. The vehicle's specified impact velocity range was 28.9 to 29.9 mph. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendix B of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations; chest deflection potentiometers; left and right femur load cells to measure axial forces; and 6-axis upper neck load cells to measure forces and moments.

The seventy-four (74) data channels were digitally sampled at 12,500 samples per second and processed per Sections 11.13 through 11.15 of the Laboratory Test Procedure.

The crash event was set up to be recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 208, 212, 219 (partial), and 301 data are presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the manufacturer's vehicle information. Appendix D contains miscellaneous test information including transducer information.
Section 2.0

Frontal Barrier Impact Test Summary
Test Results Summary

This flat frontal barrier test was conducted by TRC Inc. on January 21, 2003.

The test vehicle, a 2003 Cadillac DeVille 4-door, NHTSA No. C30108, was equipped with a 4.6 liter engine, 4-speed automatic transmission with overdrive, power steering and power brakes. The total test weight of the vehicle with dummies and cargo ballast weight was 4564.4 lbs. The test vehicle was equipped with airbags at the driver and right front passenger’s seating positions. The vehicle's impact speed was 29.3 mph.

The vehicle does appear to comply with the performance requirements of FMVSS 208 as measured by Hybrid III 50th percentile male dummies.

<table>
<thead>
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<th></th>
<th>FMVSS 208 Max. Allowable Injury Assessment Values</th>
<th>Driver</th>
<th>Passenger</th>
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<tr>
<td>HIC-36</td>
<td>1000</td>
<td>445</td>
<td>343</td>
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<tr>
<td>Chest g</td>
<td>60 g</td>
<td>46.6(^1)</td>
<td>47.4</td>
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<tr>
<td>Chest Displacement</td>
<td>3.0 inches</td>
<td>0.9</td>
<td>0.9</td>
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<tr>
<td>Left Femur</td>
<td>2250 lbs</td>
<td>850</td>
<td>758</td>
</tr>
<tr>
<td>Right Femur</td>
<td>2250 lbs</td>
<td>1267</td>
<td>915(^1)</td>
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The subject vehicle, a 2003 Cadillac DeVille, NHTSA No. C30108, appears to meet the other FMVSS 208 requirements for which it was tested. These results are shown in the data sheets that are included in this report.

The subject vehicle does appear to comply with FMVSS 212, 219 (partial) and 301 in the flat frontal barrier impact mode. The windshield periphery retention was 100 percent. There was no penetration into any portion of the windshield. No fluid spilled from the vehicle's fuel system following the impact.

\(^1\) See Data Acquisition Explanations
Data Acquisition Explanations

The driver dummy's chest Y-axis acceleration data channel, CSTYG1, had a questionable data spike at approximately 16 milliseconds. This affected the calculated chest resultant acceleration data channel, CSTRG1, but did not affect the 3-millisecond chest deflection injury value due to the time at which it occurred.

The right front passenger dummy's right femur force data channel, RFMZP2, had multiple questionable data spikes at approximately 29 to 31, 117, 132, 162, 174, and 188 milliseconds.

The vehicle's engine bottom X-axis acceleration data channel, ENGXG2, had a questionable data spike that exceeded the data acquisition system full-scale at approximately 46 milliseconds.

The instrument panel center X-axis acceleration data channel, DPCXG1, exceeded the data acquisition system full-scale at approximately 30 milliseconds and recorded no valid data after that time.

The two (2) photographic pit cameras for front and rear underbody views, cameras 14 and 15, did not run.
### Table 1: Crash Test Summary

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<tr>
<td>Test date:</td>
<td>01/21/03</td>
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<tr>
<td>Test time:</td>
<td>1339</td>
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<tr>
<td>Ambient temperature at impact area:</td>
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</tr>
<tr>
<td>Vehicle year/make/model/body style:</td>
<td>2003/Cadillac/DeVille/4-door</td>
</tr>
<tr>
<td>Vehicle test weight:</td>
<td>4564.4 lbs.</td>
</tr>
<tr>
<td>Vehicle/barrier impact angle¹:</td>
<td>0°</td>
</tr>
<tr>
<td>Impact velocity²:</td>
<td></td>
</tr>
<tr>
<td>Primary:</td>
<td>29.3 mph</td>
</tr>
<tr>
<td>Secondary:</td>
<td>29.3 mph</td>
</tr>
<tr>
<td>Maximum static crush:</td>
<td>18.3 in.</td>
</tr>
<tr>
<td>Average vehicle rebound:</td>
<td>69.7 in.</td>
</tr>
<tr>
<td>Dummies:</td>
<td></td>
</tr>
<tr>
<td>Dummy type: Part 572 E</td>
<td></td>
</tr>
<tr>
<td>Serial number:</td>
<td>229</td>
</tr>
<tr>
<td>Restraint: Seat belt, supplemental dual stage airbag</td>
<td></td>
</tr>
<tr>
<td>Number of data channels:</td>
<td>15</td>
</tr>
<tr>
<td>Number of cameras:</td>
<td></td>
</tr>
<tr>
<td>Real-time:</td>
<td>1</td>
</tr>
<tr>
<td>High-speed:</td>
<td>14</td>
</tr>
<tr>
<td>Door opening data:</td>
<td></td>
</tr>
<tr>
<td>Left front:</td>
<td>Easy</td>
</tr>
<tr>
<td>Right front:</td>
<td>Easy</td>
</tr>
<tr>
<td>Front seat data:</td>
<td></td>
</tr>
<tr>
<td>Seat track failure:</td>
<td>None</td>
</tr>
<tr>
<td>Seat back failure:</td>
<td>None</td>
</tr>
<tr>
<td>Visible dummy contact points:</td>
<td></td>
</tr>
<tr>
<td>Driver</td>
<td></td>
</tr>
<tr>
<td>Head: Airbag, head restraint</td>
<td></td>
</tr>
<tr>
<td>Chest: Airbag</td>
<td></td>
</tr>
<tr>
<td>Abdomen: Airbag</td>
<td></td>
</tr>
<tr>
<td>Left knee: Knee bolster</td>
<td></td>
</tr>
<tr>
<td>Right knee: Knee bolster</td>
<td></td>
</tr>
<tr>
<td>Passenger</td>
<td></td>
</tr>
<tr>
<td>Head: Airbag, head restraint</td>
<td></td>
</tr>
<tr>
<td>Chest: Airbag</td>
<td></td>
</tr>
<tr>
<td>Abdomen: Airbag</td>
<td></td>
</tr>
<tr>
<td>Left knee: Glove box</td>
<td></td>
</tr>
<tr>
<td>Right knee: Glove box</td>
<td></td>
</tr>
</tbody>
</table>

¹ With respect to tow track centerline.
² Speed trap measurement (±0.05 mph accuracy)
### Table 2 General Test and Vehicle Parameter Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle year/make/model/body style:</td>
<td>2003/Cadillac/DeVille/4-door</td>
</tr>
<tr>
<td>NHTSA number:</td>
<td>C30108</td>
</tr>
<tr>
<td>VIN:</td>
<td>1G6KD54Y93U113729</td>
</tr>
<tr>
<td>Color:</td>
<td>Sterling</td>
</tr>
<tr>
<td>Engine data:</td>
<td></td>
</tr>
<tr>
<td>Cylinders:</td>
<td>8</td>
</tr>
<tr>
<td>Displacement:</td>
<td>4.6 liters</td>
</tr>
<tr>
<td>Placement:</td>
<td>transverse</td>
</tr>
<tr>
<td>Transmission data:</td>
<td>4-speed, ___manual, ___automatic, ___overdrive</td>
</tr>
<tr>
<td>Final drive:</td>
<td>___fwd, ___rwd, ___4wd</td>
</tr>
<tr>
<td>Date vehicle received:</td>
<td>12/17/2002</td>
</tr>
<tr>
<td>Odometer reading:</td>
<td>317</td>
</tr>
<tr>
<td>Dealer's name and address:</td>
<td>Pierson Automotive, Inc. 2424 N. Verity Parkway Middletown, Ohio 45042</td>
</tr>
</tbody>
</table>

**Accessories:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Presence/Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power steering</td>
<td>Yes/Automatic transmission</td>
</tr>
<tr>
<td>Power brakes</td>
<td>Yes/Automatic speed control</td>
</tr>
<tr>
<td>Power seats</td>
<td>Yes/Tilting steering wheel</td>
</tr>
<tr>
<td>Power windows</td>
<td>Yes/Telescoping steering wheel</td>
</tr>
<tr>
<td>Air conditioning</td>
<td>Yes/Anti-skid brake</td>
</tr>
<tr>
<td>Rear window defroster</td>
<td>Yes/Power door locks</td>
</tr>
</tbody>
</table>

Other: Driver and right front passenger side impact airbags, 10-way power seats with power lumbar, OnStar® system, sim-top and pillar posts.

**Certification data from vehicle's label:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle manufactured by:</td>
<td>General Motors Corporation</td>
</tr>
<tr>
<td>Date of manufacture:</td>
<td>07/02</td>
</tr>
<tr>
<td>VIN:</td>
<td>1G6KD54Y93U113729</td>
</tr>
<tr>
<td>GVWR:</td>
<td>5139 lbs. (2231 kg)</td>
</tr>
<tr>
<td>GAWR:</td>
<td>Front: 2751 lbs. (1248 kg) Rear: 2388 lbs. (1083 kg)</td>
</tr>
</tbody>
</table>
Table 2 General Test and Vehicle Parameter Data, Cont'd.

Size of tires on vehicle: P255/60R16

Tire capacity with max. capacity vehicle load:
- Front: 35 psi
- Rear: 35 psi

Spare tire: T125/70R16

Tire & capacity data from vehicle's label:

Recommended tire size: P255/60R16

Recommended cold tire pressure:
- Front: 30 psi
- Rear: 30 psi

Designated Seating Capacity:
- Front: 3
- 2nd Row: 3
- Total: 6

Vehicle Capacity Weight: 1093 lbs. (496 kg)

Test vehicle attitudes:


Fully loaded attitude: LF: 27.6 in. RF: 27.8 in. LR: 27.1 in. RR: 27.3 in.

Pre-test attitude: LF: 27.4 in. RF: 27.5 in. LR: 27.2 in. RR: 27.0 in.

Post-test attitude: LF: 34.4 in. RF: 33.6 in. LR: 27.8 in. RR: 26.5 in.
Table 2 General Test and Vehicle Parameter Data, Cont'd.

Weight of test vehicle as received (with maximum fluids):

<table>
<thead>
<tr>
<th></th>
<th>Right front</th>
<th></th>
<th>Left front</th>
<th></th>
<th>Right rear</th>
<th></th>
<th>Left rear</th>
<th></th>
<th>Total front weight</th>
<th>2450.4 lbs.</th>
<th>(60.5 % of total vehicle weight)</th>
<th>Total rear weight</th>
<th>1602.7 lbs.</th>
<th>(39.5 % of total vehicle weight)</th>
<th>Total delivered weight</th>
<th>4053.1 lbs.</th>
</tr>
</thead>
</table>

Calculation of test vehicle's target test weight:

\[ \text{RCLW} = \text{Rated Cargo and Luggage Weight} \]
\[ \text{UDW} = \text{Unloaded Delivered Weight (4053.1 lbs.)} \]
\[ \text{VCW} = \text{Vehicle Capacity Weight = (1093 lbs.)} \]
\[ \text{DSC} = \text{Designated Seating Capacity (6)} \]
\[ \text{RCLW} = \text{VCW} - 150 \times \text{DSC} = 1093 - 6 \times 150 = 193 \text{ lbs.} \]

Calculated test weight = \text{UDW} + \text{RCLW} + (\text{No. of Hybrid III dummies} \times 157 \text{ lbs. per dummy})

Calculated test weight = 4053.1 + 193 + 334 = 4580.1 lbs.

Target test weight range = 4560.1 lbs. - 4570.1 lbs.

Weight of test vehicle with required dummies and 177.3 lbs. of cargo weight:

<table>
<thead>
<tr>
<th></th>
<th>Right front</th>
<th></th>
<th>Left front</th>
<th></th>
<th>Right rear</th>
<th></th>
<th>Left rear</th>
<th></th>
<th>Total front weight</th>
<th>2656.5 lbs.</th>
<th>(58.2 % of total vehicle weight)</th>
<th>Total rear weight</th>
<th>1907.9 lbs.</th>
<th>(41.8 % of total vehicle weight)</th>
<th>Total test weight</th>
<th>4564.4 lbs.</th>
</tr>
</thead>
</table>

Weight of ballast secured in vehicle cargo area: 4.4 lbs.; 60 lbs. of shot added to engine

Components removed to meet target test weight: None

Vehicle Wheelbase: 115.3 in.\(^1\)

CG rearward of front wheel centerline: 45.9 in.

\(^1\) Wheelbase provided by manufacturer.
Table 3 Post-Impact Data

Test type: FMVSS 208 frontal barrier impact
Impact angle: 0°
Test date: 01/21/03
Test time: 1339
Ambient temperature at impact area: 70° F
Temperature in occupant compartment: 69° F
NHTSA number: C30108
VIN: 1G6KD54Y93U113729
Required impact velocity: 28.9 mph to 29.9 mph
Barrier impact velocity:
  Primary: 29.3 mph
  Secondary: 29.3 mph
Distance from vehicle to barrier:
  Entering velocity trap: 14.0 in.
  Exiting velocity trap: 2.0 in.
Test vehicle static crush:
Overall length of test vehicle:
  Pre-test: L: 199.3 in.  C: 206.7 in.  R: 199.0 in.
  Post-test: L: 188.0 in.  C: 188.4 in.  R: 185.6 in.
  Total crush: L: 11.3 in.  C: 18.3 in.  R: 13.4 in.
  Average crush: 14.3 in.
Test vehicle rebound from flat barrier:
Distance from test vehicle to barrier:
  Post-test: L: 69.7 in.  C: 69.4 in.  R: 70.1 in.
  Average rebound: 69.7 in.
The final vane clears the final emitter/receiver pair two inches before impact.

The vanes have a one-foot spacing.
Vehicle year/make/model/body style: 2003/Cadillac/DeVille/4-door
Vehicle NHTSA number: C30108
VIN: 1G6KD54Y93U113729
Wheelbase: 1 115.3 in.
Build date: 07/02
Test date: 01/21/03
Vehicle size category: Large passenger car
Test weight: 4564.4 lbs.
Front overhang: 2 N/A
Maximum width: 1 74.5 in.
Impact speed: 29.3 mph
Collision Deformation Classification (CDC) code: 12FDFW2
Crush depth measurements:
   C1: 11.3 in.
   C2: 14.3 in.
   C3: 18.0 in.
   C4: 17.8 in.
   C5: 15.6 in.
   C6: 13.4 in.
Midpoint of damage: Vehicle Longitudinal Centerline
Length of damaged region:
   L: 60.0 in.

1 Measurement provided by manufacturer; test vehicle not measured.
2 Measurement not taken.
Figure 3. Vehicle Accelerometer Placement

Side View

Bottom View
<table>
<thead>
<tr>
<th>No.</th>
<th>LOCATION</th>
<th>X</th>
<th>Y</th>
<th>POSITIVE DIRECTION</th>
<th>NEGATIVE DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LEFT REAR SEAT CROSSMEMBER</td>
<td>PRE 82.2 in</td>
<td>-27.2 in</td>
<td>9.3 g @ 22.2 ms</td>
<td>27.5 g @ 51.1 ms</td>
</tr>
<tr>
<td></td>
<td>POST 82.8 in</td>
<td>-27.2 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>RIGHT REAR SEAT CROSSMEMBER</td>
<td>PRE 81.7 in</td>
<td>27.2 in</td>
<td>6.0 g @ 22.2 ms</td>
<td>27.0 g @ 59.9 ms</td>
</tr>
<tr>
<td></td>
<td>POST 82.8 in</td>
<td>27.2 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ENGINE TOP</td>
<td>PRE 182.9 in</td>
<td>0.6 in</td>
<td>19.1 g @ 48.6 ms</td>
<td>66.6 g @ 38.1 ms</td>
</tr>
<tr>
<td></td>
<td>POST 173.8 in</td>
<td>0.6 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ENGINE BOTTOM</td>
<td>PRE 174.6 in</td>
<td>2.6 in</td>
<td>35.5 g @ 52.4 ms</td>
<td>91.3 g @ 38.0 ms</td>
</tr>
<tr>
<td></td>
<td>POST 169.2 in</td>
<td>1.6 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>RIGHT FRONT BRAKE CALIPER</td>
<td>PRE 166.8 in</td>
<td>26.4 in</td>
<td>4.8 g @ 43.8 ms</td>
<td>94.9 g @ 52.0 ms</td>
</tr>
<tr>
<td></td>
<td>POST 165.0 in</td>
<td>26.8 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEST NUMBER: 030121-1</td>
<td>X</td>
<td>Y</td>
<td>POSITIVE DIRECTION</td>
<td>NEGATIVE DIRECTION</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>-------</td>
<td>-------</td>
<td>--------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>No. LOCATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 INSTRUMENT PANEL</td>
<td>PRE 138.7 in</td>
<td>0.0 in</td>
<td>---- g @ ---- ms</td>
<td>---- g @ ---- ms</td>
<td></td>
</tr>
<tr>
<td>CENTER</td>
<td>POST 137.9 in</td>
<td>0.0 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LONSDTUDINAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 LEFT FRONT BRAKE</td>
<td>PRE 166.7 in</td>
<td>-26.4 in</td>
<td>9.0 g @ 61.2 ms</td>
<td>94.5 g @ 51.7 ms</td>
<td></td>
</tr>
<tr>
<td>CALIPER</td>
<td>POST 165.5 in</td>
<td>-27.4 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LONSDTUDINAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 REAR TRUNK CENTERLINE</td>
<td>PRE 9.8 in</td>
<td>1.5 in</td>
<td>22.3 g @ 143.8 ms</td>
<td>17.8 g @ 72.5 ms</td>
<td></td>
</tr>
<tr>
<td>VERTICAL</td>
<td>POST 9.7 in</td>
<td>1.1 in</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

REFERENCE:  
X: + FORWARD FROM VEHICLE REAR BUMPER  
Y: + RIGHTWARD FROM VEHICLE CENTERLINE

1 Sign convention per SAEJ211 March 1995.  
2 See Data Acquisition Explanations.
Table 5 Seat and Steering Column Positioning Data

Vehicle: 2003/Cadillac/DeVille/4-door

NHTSA No.: C30108

Nominal Design Riding Position:

Driver Seat:  Seat Back Angle = 18.5° Power
The seat back was adjusted, so that the seat back angle would equal
18.5° when measured by an inclinometer on the outboard seatback
frame (foam cut away).

Passenger Seat:  Seat Back Angle = 18.5° Power
The seat back was adjusted, so that the seat back angle would equal
18.5° when measured by an inclinometer on the outboard seatback
frame (foam cut away).

Seat Fore and Aft Positions:

Driver Seat:  Mid position
The power seat was moved full forward and full rearward with the seat
in full down to mark the full travel; the seat was set in the measured
center of travel.

Passenger:  Mid position
The power seat was moved full forward and full rearward with the seat
in full down to mark the full travel; the seat was set in the measured
center of travel.

Steering Column Adjustments:

The steering column was set in the 4th of 6 total positions, counting the top detent
positions as number 1. The steering wheel angle measured 23.3 degrees.
Figure 4: Load Cell Locations on Fixed Barrier

36 LOAD CELLS
4 ROWS
9 COLUMNS
FRONT VIEW

FIXED BARRIER

GROUP 1: A1 through B3
GROUP 2: A4 through B6
GROUP 3: A7 through B9
GROUP 4: C1 through D3
GROUP 5: C4 through D6
GROUP 6: C7 through D9

The following data is presented as data plots at the end of Appendix B:

1) Data from 36 individual load cells
2) Total of 36 individual load cells
3) Data from 6 groupings shown above (6 cells/groups)
Section 3.0

FMVSS 208, 212, 219 (Partial), and 301 Data
Figure 5. Dummy Measurement Locations for Front Seat Occupants
<table>
<thead>
<tr>
<th>Designation</th>
<th>Type of Measurement</th>
<th>Driver (Serial #229)</th>
<th>Passenger (Serial #230)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>Windshield angle</td>
<td>28.8°</td>
<td>28.8°</td>
</tr>
<tr>
<td>SWA</td>
<td>Steering wheel angle</td>
<td>23.3°</td>
<td>N/A</td>
</tr>
<tr>
<td>SCA</td>
<td>Steering column angle</td>
<td>24.2°</td>
<td>N/A</td>
</tr>
<tr>
<td>SA</td>
<td>Seat back angle</td>
<td>18.5°</td>
<td>18.5°</td>
</tr>
<tr>
<td>HZ</td>
<td>Head to roof</td>
<td>8.1 in.</td>
<td>8.3 in.</td>
</tr>
<tr>
<td>HH</td>
<td>Head to header</td>
<td>14.2 in.</td>
<td>13.8 in.</td>
</tr>
<tr>
<td>HW</td>
<td>Head to windshield</td>
<td>25.6 in.</td>
<td>24.8 in.</td>
</tr>
<tr>
<td>HR</td>
<td>Head to side header</td>
<td>10.2 in.</td>
<td>10.4 in.</td>
</tr>
<tr>
<td>NR</td>
<td>Nose to rim</td>
<td>15.1 in.</td>
<td>N/A</td>
</tr>
<tr>
<td>NA</td>
<td>Nose to rim angle</td>
<td>7.6°</td>
<td>N/A</td>
</tr>
<tr>
<td>CD</td>
<td>Chest to dash</td>
<td>20.8 in.</td>
<td>23.0 in.</td>
</tr>
<tr>
<td>CS</td>
<td>Steering wheel to chest</td>
<td>11.6 in.</td>
<td>N/A</td>
</tr>
<tr>
<td>RA</td>
<td>Rim to abdomen</td>
<td>7.7 in.</td>
<td>N/A</td>
</tr>
<tr>
<td>KDL</td>
<td>Left knee to dash</td>
<td>5.5 in.</td>
<td>5.1 in.</td>
</tr>
<tr>
<td>KDR</td>
<td>Right knee to dash</td>
<td>4.9 in.</td>
<td>5.5 in.</td>
</tr>
<tr>
<td>XDA</td>
<td>Outboard knee to dash angle</td>
<td>47.1°</td>
<td>63.0°</td>
</tr>
<tr>
<td>PA</td>
<td>Pelvis angle</td>
<td>24.3°</td>
<td>24.6°</td>
</tr>
<tr>
<td>TA</td>
<td>Tibia angle</td>
<td>41.2°</td>
<td>44.5°</td>
</tr>
<tr>
<td>KK</td>
<td>Knee to knee</td>
<td>11.4 in.</td>
<td>10.6 in.</td>
</tr>
<tr>
<td>ST1</td>
<td>Striker to head</td>
<td>19.8 in.</td>
<td>18.9 in.</td>
</tr>
<tr>
<td></td>
<td>Striker to head angle¹</td>
<td>-76.8°</td>
<td>-77.0°</td>
</tr>
<tr>
<td>SK¹</td>
<td>Striker to knee</td>
<td>23.5 in.</td>
<td>23.1 in.</td>
</tr>
<tr>
<td></td>
<td>Striker to knee angle¹</td>
<td>-3.3°</td>
<td>-1.6°</td>
</tr>
<tr>
<td>STH¹</td>
<td>Striker to H-point</td>
<td>10.9 in.</td>
<td>11.0 in.</td>
</tr>
<tr>
<td></td>
<td>Striker to H-point angle¹</td>
<td>40.1°</td>
<td>39.8°</td>
</tr>
<tr>
<td>SHY</td>
<td>Striker to H-point (Y dir.)</td>
<td>11.6 in.</td>
<td>11.6 in.</td>
</tr>
<tr>
<td>HS</td>
<td>Head to side window</td>
<td>12.0 in.</td>
<td>12.7 in.</td>
</tr>
<tr>
<td>HD</td>
<td>H-point to door</td>
<td>6.7 in.</td>
<td>6.6 in.</td>
</tr>
<tr>
<td>AD</td>
<td>Arm to door</td>
<td>6.2 in.</td>
<td>6.4 in.</td>
</tr>
</tbody>
</table>

The seat back angle (SA°) is measured relative to vertical, all other angles are measured relative to horizontal.

¹ A negative angle indicates the measurement point was located above the striker.
Descriptions of Dummy Measurements

When a level is to be used, it is to ensure that the line containing the two points described is either parallel or perpendicular to the ground. If a measurement to be made is less than 10 inches ignore the directions to use a level and approximate a level measurement. Also, when a measurement is to be taken to or from the center of a bolt on the dummy, take the measurement from the center of the bolt hole if the bolt is recessed.

The following measurements are to be made within a vertical longitudinal plane.

* **HH**  Head to Header, taken from the point where the dummy’s nose meets his forehead (between his eyes) to the furthest point forward on the header.

* **HW**  Head to Windshield, taken from the point where the dummy’s nose meets his forehead (between his eyes) to a point on the windshield. Use a level.

* **HZ**  Head to Roof, taken from the point where the dummy’s nose meets his forehead (between his eyes) to the point on the roof directly above it. Use a level.

* **CS**  Steering Wheel to Chest, taken from the center of the steering wheel hub to the dummy’s chest. Use a level.

* **CD**  Chest to Dash, place a tape measure on the tip of the dummy’s chin and rotate five inches of it downward toward the dummy to the point of contact on the transverse center of the dummy’s chest. Then measure from this point to the closest point on the dashboard either between the upper part of the steering wheel between the hub and the rim, or measure to the dashboard placing the tape measure above the rim, whichever is a shorter measurement. See diagram.

* **RA**  Steering Wheel Rim to Abdomen, taken from the bottommost point of the steering wheel rim horizontally rearward to the dummy. Use a level.

* **NR**  Nose to Rim, taken from the tip of the dummy’s nose to the closest point on the top of the steering wheel rim. Also indicate the angle this line makes with respect to the horizontal (NA).

* Measurement used in Data Tape Reference Guide
Descriptions of Dummy Measurements, Cont'd.

*1 KDL
KDR  Left and Right Knees to Dashboard, taken from the center of the knee pivot bolt's outer surface to the closest point forward acquired by swinging the tape measure in continually larger arcs until it contacts the dashboard. Also reference the angle of this measurement with respect to the horizontal for the outboard knee (KDA). See diagram.

SHi
SKi
STi  Striker to Hip, Knee, and Head, these measurements are to be taken in the X-Z plane measured from the forward most center point on the striker to the center of the H-point, outer knee bolt, and head target. When taking this measurement a firm device that can be rigidly connected to the striker should be used. Use a level. The angles of these measurements with respect to the horizontal should also be recorded. The measurement in the Y (transverse) direction from the striker to the H-point should also be taken (SHY). See diagram.

The following measurements are to be made within a vertical transverse plane.

HS  Head to Side Window, taken from the point where the dummy's nose meets his forehead (between his eyes) to the outside of the side window. In order to make this measurement, roll the window down to the exact height which allows a level measurement. Use a level. See diagram.

* AD  Arm to Door, taken from the outer surface of the elbow pivot bolt on a Hybrid II dummy to the first point it hits on the door. In the case of a Hybrid III dummy, measure from the bolt on the outer biceps. When a SiD is used make the measurement from the center of the bottom of the arm segment where it meets the dummy's torso.

* HD  H-point to Door, taken from the H-point on the dummy to the closest point on the door. Use a level.

* HR  Head to Side Header, measure the shortest distance from the point where the dummy's nose meets his forehead (between his eyes) to the side edge of the header just above the window frame, directly adjacent to the dummy.

* Measurement used in Data Tape Reference Guide
* Only outboard measurement is referenced in Data Tape Reference Guide
Descriptions of Dummy Measurements, Cont’d.

SHY Striker to H-point, taken from a rod rigidly connected to the forward most center point on the striker to the H-point. Use a level. See diagram.

KK Knee to Knee, for Hybrid II dummies measure the distance between knee pivot bolt head outer surfaces. For Hybrid III dummies measure the distance between the outboard knee clevis flange surfaces. (This measurement may not be exactly transverse.)

Angles

SA Seat Back Angle, find this angle using the instructions provided by the manufacturer. If the manufacturer doesn’t provide clear instructions contact the COTR.

PA Pelvis or Femur Angle, taken by inserting the pelvic angle gauge into the H-point gauging hole on the SID or the Hybrid III dummies and taking this angle with respect to the horizontal. Measure the angle of the line connecting the H-point hole and the outer knee pivot bolt hole on a Hybrid II dummy with respect to the horizontal, to find the femur angle.

SWA Steering Wheel Angle, find this by placing a straight edge against the steering wheel rim along the longitudinal plane. Then measure the acute angle of the straight edge with respect to the horizontal.

SCA Steering Column Angle, measured with respect to the horizontal by placing an inclinometer on the center of the underside of the steering column.

NA Measure the angle made when taking the measurement NR with respect to the horizontal.

KDA Knee to Dash Angle, the angle that the measurement KD is taken at with respect to the horizontal. Only get this angle for the outboard knee. See diagram.

WA Windshield Angle, place an inclinometer along the transverse center of the windshield exterior (measurement is made with respect to horizontal).

TA Tibia Angle, use a straight edge to connect the dummy’s knee and ankle bolts. Then place an inclinometer on the straight edge and measure the angle with respect to the horizontal.

* Measurement used in Data Tape Reference Guide
Figure 6. Seat Belt Positioning Data

<table>
<thead>
<tr>
<th></th>
<th>Driver Dummy</th>
<th>Passenger Dummy</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBU - Top surface of aluminum plate to belt upper edge</td>
<td>13.8 in</td>
<td>13.8 in</td>
</tr>
<tr>
<td>PBL - Top surface of aluminum plate to belt lower edge</td>
<td>11.0 in</td>
<td>10.6 in</td>
</tr>
<tr>
<td>TBI - Dummy centerline to intersection of upper torso belt and lap belt</td>
<td>7.9 in</td>
<td>7.5 in</td>
</tr>
</tbody>
</table>
Figure 7  Vehicle Target Locations

Lateral distance from steering column target (A) to target line on door (B) = 25.2 in.
Figure 8 Camera Positions
### Table 7. Motion Picture Camera Locations

**Vehicle year/make/model/body style:** 2003/Cadillac/De Ville/4-door  
**Test number:** 030121-1

<table>
<thead>
<tr>
<th>Camera Number</th>
<th>View</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Camera Angle</th>
<th>Film Plane to Head Target</th>
<th>Camera Lens</th>
<th>Film Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Real-time documentation and panning</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Zoom</td>
<td>24 frames/s</td>
</tr>
<tr>
<td>2</td>
<td>Left vehicle crush</td>
<td>-45.1 in.</td>
<td>295.3 in.</td>
<td>57.7 in.</td>
<td>-5°</td>
<td>282.1 in.</td>
<td>25 mm</td>
<td>955 frames/s</td>
</tr>
<tr>
<td>3</td>
<td>Left windshield intrusion</td>
<td>-31.1 in.</td>
<td>255.9 in.</td>
<td>44.8 in.</td>
<td>0°</td>
<td>246.8 in.</td>
<td>25 mm</td>
<td>955 frames/s</td>
</tr>
<tr>
<td>4</td>
<td>Driver over shoulder</td>
<td>-194.5 in.</td>
<td>124.0 in.</td>
<td>73.6 in.</td>
<td>-11°</td>
<td>50.2 in.</td>
<td>25 mm</td>
<td>1007 frames/s</td>
</tr>
<tr>
<td>5</td>
<td>Steering column motion-upper</td>
<td>-65.4 in.</td>
<td>313.0 in.</td>
<td>96.7 in.</td>
<td>-10°</td>
<td>296.7 in.</td>
<td>35 mm</td>
<td>1000 frames/s</td>
</tr>
<tr>
<td>6</td>
<td>Steering column motion-lower</td>
<td>-65.4 in.</td>
<td>313.0 in.</td>
<td>64.4 in.</td>
<td>-5°</td>
<td>296.5 in.</td>
<td>25 mm</td>
<td>975 frames/s</td>
</tr>
<tr>
<td>7</td>
<td>Right overall</td>
<td>-94.1 in.</td>
<td>-330.3 in.</td>
<td>43.0 in.</td>
<td>-4°</td>
<td>312.6 in.</td>
<td>13 mm</td>
<td>1007 frames/s</td>
</tr>
<tr>
<td>8</td>
<td>Right windshield intrusion</td>
<td>-33.1 in.</td>
<td>-251.2 in.</td>
<td>44.5 in.</td>
<td>1°</td>
<td>242.9 in.</td>
<td>25 mm</td>
<td>1010 frames/s</td>
</tr>
<tr>
<td>9</td>
<td>Passenger over shoulder</td>
<td>-226.6 in.</td>
<td>-128.7 in.</td>
<td>72.2 in.</td>
<td>-9°</td>
<td>156.7 in.</td>
<td>25 mm</td>
<td>1032 frames/s</td>
</tr>
<tr>
<td>10</td>
<td>Passenger kinematics</td>
<td>-50.4 in.</td>
<td>-341.5 in.</td>
<td>59.8 in.</td>
<td>-6°</td>
<td>327.4 in.</td>
<td>25 mm</td>
<td>1000 frames/s</td>
</tr>
<tr>
<td>11</td>
<td>Windshield front view</td>
<td>-0.0 in.</td>
<td>0.0 in.</td>
<td>98.4 in.</td>
<td>-50°</td>
<td>105.1 in.</td>
<td>8.5 mm</td>
<td>965 frames/s</td>
</tr>
<tr>
<td>12</td>
<td>Driver - front view</td>
<td>-0.0 in.</td>
<td>14.6 in.</td>
<td>100.0 in.</td>
<td>-50°</td>
<td>105.1 in.</td>
<td>17 mm</td>
<td>997 frames/s</td>
</tr>
<tr>
<td>13</td>
<td>Passenger - front view</td>
<td>-0.0 in.</td>
<td>-13.6 in.</td>
<td>97.5 in.</td>
<td>-56°</td>
<td>105.1 in.</td>
<td>17 mm</td>
<td>1007 frames/s</td>
</tr>
<tr>
<td>14</td>
<td>Pit - front view of crush</td>
<td>-31.5 in.</td>
<td>0.0 in.</td>
<td>N/A</td>
<td>95°</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A³ frames/s</td>
</tr>
<tr>
<td>15</td>
<td>Pit - rear view of crush</td>
<td>-126.0 in.</td>
<td>0.0 in.</td>
<td>N/A</td>
<td>95°</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A³ frames/s</td>
</tr>
<tr>
<td>16</td>
<td>Real-time documentation of crush</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Zoom</td>
</tr>
</tbody>
</table>

1. +X: Film plane forward of barrier face  
2. +Y: Film plane to left of monorail centerline  
3. +Z: Film plane above ground level  
4. +Angle: Film plane angled upward from horizontal plane  
5. Camera did not run.
Table 8 FMVSS 208 Occupant Injury Data

Vehicle: 2003/Cadillac/DeVille/4-door  NHTSA No.: C30108  Date: 01/21/03

<table>
<thead>
<tr>
<th>Maximum Acceleration Values: (g's)</th>
<th>Driver Dummy #229</th>
<th>Passenger Dummy #230</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Channel X</td>
<td>-58.1</td>
<td>-43.2</td>
</tr>
<tr>
<td>Head Channel Y</td>
<td>-5.9</td>
<td>6.2</td>
</tr>
<tr>
<td>Head Channel Z</td>
<td>16.9</td>
<td>23.7</td>
</tr>
<tr>
<td>HEAD RESULTANT</td>
<td>59.8</td>
<td>48.2</td>
</tr>
<tr>
<td>Chest Channel X</td>
<td>-46.9</td>
<td>-46.0</td>
</tr>
<tr>
<td>Chest Channel Y</td>
<td>-6.2</td>
<td>-7.6</td>
</tr>
<tr>
<td>Chest Channel Z</td>
<td>7.2</td>
<td>11.4</td>
</tr>
<tr>
<td>CHEST RESULTANT</td>
<td>47.3</td>
<td>47.9</td>
</tr>
</tbody>
</table>

36 ms Head Injury Criteria (HIC) Values:

<table>
<thead>
<tr>
<th>HIC</th>
<th>445</th>
<th>343</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t_1 ) = (ms)</td>
<td>67.52</td>
<td>97.52</td>
</tr>
<tr>
<td>( t_2 ) = (ms)</td>
<td>71.68</td>
<td>107.68</td>
</tr>
</tbody>
</table>

[The maximum time interval from \( t_1 \) to \( t_2 \) is 36 milliseconds.]

Chest Injury Criteria (Clip) Values: (g's)

<table>
<thead>
<tr>
<th>CLIP</th>
<th>46.5</th>
<th>47.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t^1 ) = (ms)</td>
<td>83.95</td>
<td>86.91</td>
</tr>
<tr>
<td>( t^2 ) = (ms)</td>
<td>81.13</td>
<td>84.09</td>
</tr>
<tr>
<td>Chest Deflection (in)</td>
<td>0.9</td>
<td>0.9</td>
</tr>
</tbody>
</table>

1 Sign Convention per SAEJ211, March 1995.
2 See Data Acquisition Explanations
Table 8 FMVSS 208 Occupant Injury Data, Cont'd.

Vehicle: 2003/Cadillac/DeVille/4-door
NIITSA No.: C30108 Date: 01/21/03

<table>
<thead>
<tr>
<th>Max. Compressive Femur Forces (lbs.):</th>
<th>Driver Dummy #229</th>
<th>Passenger Dummy #230</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Side (lbs)</td>
<td>850</td>
<td>758</td>
</tr>
<tr>
<td>Right Side (lbs)</td>
<td>1267</td>
<td>915</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neck Injury Criteria (axial force and NIJ's):</th>
<th>Driver Dummy #229</th>
<th>Passenger Dummy #230</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Axial Tension (N)</td>
<td>1541</td>
<td>384</td>
</tr>
<tr>
<td>Peak Axial Compression (N)</td>
<td>185</td>
<td>778</td>
</tr>
<tr>
<td>NTE (tension-extension)</td>
<td>0.21</td>
<td>0.27</td>
</tr>
<tr>
<td>NTF (tension-flexion)</td>
<td>0.24</td>
<td>0.21</td>
</tr>
<tr>
<td>NCF (compression-extension)</td>
<td>0.02</td>
<td>0.16</td>
</tr>
<tr>
<td>NCF (compression-flexion)</td>
<td>0.15</td>
<td>0.22</td>
</tr>
</tbody>
</table>

1 See Data Acquisition Explanations
Figure 9. FMVSS 212 Test Data

Details of windshield mounting such as retention method, trim type, etc.: plastic trim

Clips or brackets used to retain windshield: N/A

FMVSS 212 requirements: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles not equipped with occupant passive restraints, and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Windshield periphery measurements:

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Percent Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right side</td>
<td>90.7 in.</td>
<td>90.7 in.</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Left side</td>
<td>90.7 in.</td>
<td>90.7 in.</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Total</td>
<td>181.4 in.</td>
<td>181.4 in.</td>
<td>100.0 %</td>
</tr>
</tbody>
</table>

Pre-test windshield mounting material temperature: N/A

A = 50.0 in.
B = 62.4 in.
C = 34.3 in.
D = 0.4 in.

Indicate Width of Molding

Front view of windshield

Loss of windshield retention lengths: None

1 Indicate areas of loss of retention, if any, on windshield diagram.
Protected zone lower edge requirement:
The lower edge of the protected zone is determined by placing a 6.5-inch diameter rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 0.5 inch from the locus line. The lower edge of the protected zone is the longitudinal projection onto the outer surface of the windshield of this line.

Windshield measurements:

A = 50.0 in.
B = 18.7 in.
C = 62.4 in.
D = 34.3 in.
E = 19.8 in.
F = 21.5 in.

Method of adhering protected zone template to windshield: N/A

Areas of windshield template penetration greater than 0.25 in: N/A

Areas of windshield penetration below the protected zone, through the inner surface of the windshield: None
Table 9  Fuel System Data

Vehicle year/make/model/body style:  2003/Cadillac/DeVille/4-door
NHTSA number:  C30108
Fuel system capacity:  18.5 gallons (from owner's manual)
Usable capacity:  18.5 gallons (furnished by COTR)
Test volume range:  17.0 gallons to 17.4 gallons (92-94% of usable)
Actual test volume:  17.2 gallons (with entire fuel system filled)
Test fluid type:  Stoddard solvent
Specific gravity:  0.764
Kinematic viscosity:  0.99 centistokes
Test fluid color:  purple
Type of fuel pump:  Yes
Did the electric fuel pump operate with ignition switch "on" and the engine not operating?  No
Details of fuel system:  The fuel tank is located under the rear seat. The filler neck runs out through the left rear wheel well. The filler cap is located in the left rear quarter panel. The fuel lines run forward inside the left frame rail.
Table 10  FMVSS 301 Post-Impact Test Data

Vehicle NHTSA number: C30108
Test date: 01/21/03
Vehicle year/make/model/body style: 2003/Cadillac/DeVille/4-door

Test requirements:
Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

Type of impact:

- X Frontal (30 mph)
- __ Oblique (30 mph) with ___ barrier face first contacting (driver's/passenger's) side
- __ Rear moving barrier (30 mph)
- ___ Lateral moving barrier (20 mph)

Fuel system fluid spillage measurements:

<table>
<thead>
<tr>
<th></th>
<th>Test Results</th>
<th>Maximum Allowable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>From impact until vehicle motion ceases</td>
<td>0 gram</td>
</tr>
<tr>
<td>2.</td>
<td>5-minute period after vehicle motion ceases</td>
<td>0 gram</td>
</tr>
<tr>
<td>3.</td>
<td>Next 25 minutes after 5-minute period</td>
<td>0 gram</td>
</tr>
</tbody>
</table>

Fuel system fluid spillage location(s): None
Figure 11: FMVSS 301 Static Rollover Test Data

NHTSA number: C30108

Test phase

Static rollover machine rotation time information: (specified range is 1-3 minutes)

- Time required for machine to rotate 90° = 2 minutes, 0 seconds
- FMVSS 301 position hold time = 5 minutes, 0 seconds
- Total = 7 minutes, 0 seconds
- Next whole minute interval = 7 minutes

Fuel system fluid spillage measurements:

<table>
<thead>
<tr>
<th>0° to 90° rotation (fuel filler cap down)</th>
<th>Test Results</th>
<th>Maximum Allowable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. First five minutes from onset of rotation</td>
<td>0 gram</td>
<td>142 grams</td>
</tr>
<tr>
<td>2. Sixth minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
<tr>
<td>3. Seventh minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
</tbody>
</table>

Fuel system fluid spillage location(s): None
Test phase

**Static rollover machine rotation time information:** (specified range is 1-3 minutes)
- Time required for machine to rotate 90° = 2 minutes, 0 seconds
- FMVSS 301 position hold time = 5 minutes, 0 seconds
- Total = 7 minutes, 0 seconds
- Next whole minute interval = 14 minutes

**Fuel system fluid spillage measurements:**

<table>
<thead>
<tr>
<th>90° to 180° rotation</th>
<th>Test Results</th>
<th>Maximum Allowable</th>
</tr>
</thead>
<tbody>
<tr>
<td>First five minutes from onset of rotation</td>
<td>0 gram</td>
<td>142 grams</td>
</tr>
<tr>
<td>Sixth minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
<tr>
<td>Seventh minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
</tbody>
</table>

**Fuel system fluid spillage location(s):** None
Test phase

Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds

PMVSS 301 position hold time = 5 minutes, 0 seconds

Total = 7 minutes, 0 seconds

Next whole minute interval = 21 minutes

Fuel system fluid spillage measurements:

<table>
<thead>
<tr>
<th>180 to 270° rotation</th>
<th>Test Results</th>
<th>Maximum Allowable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. First five minutes from onset of rotation</td>
<td>0 gram</td>
<td>142 grams</td>
</tr>
<tr>
<td>2. Sixth minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
<tr>
<td>3. Seventh minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
</tbody>
</table>

Fuel system fluid spillage location(s): None
Test phase

Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
FMVSS 301 position hold time = 5 minutes, 0 seconds
Total = 7 minutes, 0 seconds
Next whole minute interval = 28 minutes

Fuel system fluid spillage measurements:

<table>
<thead>
<tr>
<th>270° to 360° rotation</th>
<th>Test Results</th>
<th>Maximum Allowable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. First five minutes from onset of rotation</td>
<td>0 gram</td>
<td>142 grams</td>
</tr>
<tr>
<td>2. Sixth minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
<tr>
<td>3. Seventh minute from onset of rotation</td>
<td>0 gram</td>
<td>28 grams</td>
</tr>
</tbody>
</table>

Fuel system fluid spillage location(s): None
Table 11. FMVSS 208 Seat Belt Warning System Check

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Complete the following to determine which seat belt warning system option (S7.3(a)(1) or S7.3(a)(2)) is used. (Manufacturers may use either option.)

A. With occupant in driver's position and lap belt in stowed position and ignition switch placed in "Start/On" position:

A.1 S7.3(a)(1)
Time duration of audible warning signal = 5 seconds
(4 to 8 seconds)

Time duration of reminder light operation = 70 seconds
(no less than 60 seconds)

A.2 S7.3(a)(2)
Time duration of audible warning signal = seconds
(4 to 8 seconds) (see 49 USCS @ 30124)

Time duration of reminder light operation = seconds
(4 to 8 seconds)

B. With occupant in driver's position and lap belt in use and the ignition switch placed in "Start/On" position:

B.1 S7.3(a)(1)
Time duration of audible warning signal = seconds
(audible warning should not operate)

Time duration of reminder light operation = seconds
(reminder light does not operate)

B.2 S7.3(a)(2)
Time duration of audible warning signal = 0 seconds
(audible warning should not operate)

Time duration of reminder light operation = 5 seconds
(4 to 8 seconds)

C. Note wording of visual warning:
   Fasten Seat Belt
   Fasten Belt
   Symbol 101

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An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement (11/8/94 legal interpretation).

Is the system totally mechanical?  
☐ Yes;  ☒ No

Describe the location of the readiness indicator: Lower right side on instrument panel.

Is the readiness indicator clearly visible to the driver?  ☒ Yes;  ☐ No

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?  ☒ Yes;  ☐ No
Table 13  FMVSS 208 Air Bag Labels

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

1. Air Bag Maintenance Label and Owner’s Manual Instructions:

1.1 Does the manufacturer recommend periodic maintenance or replacement of the air bag?  
☐ Yes (Go to 1.2)  
☒ No (Go to 2)

1.2 Does the Vehicle have a maintenance or replacement label?  
☐ Yes-Pass  ☐ No-Fail

1.3 Does the label contain one of the following?  
☐ Yes-Pass  ☐ No-Fail
☐ Schedule on label specifies month and year  
☐ Schedule on label specifies vehicle mileage  
☐ Schedule on label specifies interval measured from date on certification label

1.4 Is the label permanently affixed within the passenger compartment?  
☐ Yes-Pass  ☐ No-Fail

1.5 Is the label lettered in English?  
☐ Yes-Pass  ☐ No-Fail

1.6 Is the label in block capitals and numerals?  
☐ Yes-Pass  ☐ No-Fail

1.7 Are the letters and numerals at least 3/32 inch high?  
☐ Yes-Pass  ☐ No-Fail

1.8 Does the owner’s manual set forth the recommended schedule for maintenance or replacement?  
☐ Yes-Pass  ☐ No-Fail

2. Does the owner’s manual: (S4.5.1 (f))

2.1 Include a description of the vehicle’s air bag system in an easily understandable format?  
☒ Yes  ☐ No-Fail

2.2 Include a statement that the vehicle is equipped with an air bag and a lap/shoulder belt at the front outboard seating positions?  
☒ Yes  ☐ No-Fail
Table 13  FMVSS 208 Air Bag Labels, Cont’d.

2.3 Include a statement that the air bag is a supplemental restraint at the front outboard seating positions?  
☐ Yes  ☐ No-Fail

2.4 Emphasize that all occupants, including the driver, should always wear their seat belts whether or not an air bag is also provided at their seating positions to minimize the risk of severe injury or death in the event of a crash?  
☐ Yes  ☐ No-Fail

2.5 Provide any necessary precautions regarding the proper positioning of occupants, including children, at seating positions equipped with air bags to ensure maximum safety protection for those occupants?  
☐ Yes  ☐ No-Fail

2.6 Explain that no objects should be placed over or near the air bag on the steering wheel or on the instrument panel, because any such objects could cause harm if the vehicle is in a crash severe enough to cause the air bag to inflate?  
☐ Yes  ☐ No-Fail

3. Does the Vehicle:

3.1 Provide an automatic means to ensure that the air bag does not deploy when a child seat or child with a total mass of 30 kg or less is present on the front outboard seat?  
☐ Yes  ☐ No

3.2 Incorporate sensors, other than or in addition to weight sensors, which automatically prevent the passenger air bag from deploying in situations in which it might have an adverse effect on infants in rear-facing child seat, and unbelted or improperly belted children?  
☐ Yes  ☐ No

3.3 Have a passenger air bag designed to deploy in a manner that does not create a risk of serious injury to infants in rear-facing child seats, and unbelted or improperly belted children?  
☐ Yes  ☐ No

If yes to 3.1, or 3.2, or 3.3, the vehicle is not required to have a Sun Visor Warning Label (§4.5.1(b)), an air bag alert label (§4.5.1(c)) or a label on the dash (§4.5.1(e)) and this check sheet is complete. (§4.5.1) If no to 3.1, 3.2, and 3.3, go to 4.
Table 13. FMVSS 208 Air Bag Labels, Cont'd.

4. **Sun Visor Warning Label**

4.1 Is the label permanently affixed (may be permanent marking or molding) to either side of the sun visor at each front outboard seating position with an air bag?

- Driver side: Yes-Pass
- Passenger side: Yes-Pass

4.2 Does the label conform in content (vehicles without back seats may omit the statement: “The BACK SEAT is the SAFEST place for children.”) (S4.5.1(b)(2)(v)) to the label shown in either Figure 6a or 6b as appropriate at each front outboard seating position with an air bag? (S4.5.1(b)(2))

4.2.1 Dual air bags

- Driver side: Yes-Pass
- Passenger side: Yes-Pass

4.2.2 Vehicles with driver air bag ONLY - either 4.2.1 or 4.2.2 is applicable, not both. (S4.5.1(b)(2)(iv))

4.2.2.1 Does the label conform on content to the label shown in either Figure 6a or 6b as appropriate?

- Yes-Pass: N/A

4.2.2.2 Does the label conform in content to the label shown in Figure 6a where the label can be modified to omit the pictogram and the message may read:

DEATH or SERIOUS INJURY can occur.

- Sit as far back as possible from the air bag.
- ALWAYS use SEAT BELTS and CHILD RESTRAINTS.
- The BACK SEAT is the SAFEST place for children.

- Yes-Pass: N/A
SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION  
LABEL OUTLINE, VERTICAL AND HORIZONTAL LINE BLACK

ARTWORK BLACK WITH WHITE BACKGROUND

BOTTOM TEXT BLACK WITH RED BULLETS ON WHITE BACKGROUND

CIRCLE AND LINE RED WITH WHITE BACKGROUND

TOP TEXT AND SYMBOL BLACK WITH YELLOW BACKGROUND

WARNING

DEATH or SERIOUS INJURY can occur

- Children 12 and under can be killed by the air bag
- The BACK SEAT is the SAFEST place for children
- NEVER put a rear-facing child seat in the front
- Sit as far back as possible from the air bag
- ALWAYS use SEAT BELTS and CHILD RESTRAINTS

Figure 6a
(S4.5.1(b)(2))
Table 13: FMVSS 208 Air Bag Labels, Cont'd.

**SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION**

- LABEL OUTLINE, VERTICAL AND HORIZONTAL LINE BLACK
- ARTWORK BLACK WITH WHITE BACKGROUND
- BOTTOM TEXT BLACK WITH RED BULLETS ON WHITE BACKGROUND
- CIRCLE AND LINE RED WITH WHITE BACKGROUND
- TOP TEXT AND SYMBOL BLACK WITH YELLOW BACKGROUND

![WARNING](image)

**DEATH or SERIOUS INJURY** can occur:
- Children 12 and under can be killed by the air bag
- The BACK SEAT is the SAFEST place for children
- NEVER put a rear-facing child seat in the front unless air bag is off
- Sit as far back as possible from the air bag
- ALWAYS use SEAT BELTS and CHILD RERAINTS

4.3 Is the label heading area yellow with the word “warning” and the alert symbol in black? (S4.5.1(b)(2)(i))
- Driver side: Yes-Pass
- Passenger side: Yes-Pass

4.4 Is the message white with black text? (S4.5.1(b)(2)(ii))
- Driver side: Yes-Pass
- Passenger side: Yes-Pass

4.5 Is the message area at least 30 cm²? (S4.5.1(b)(2)(ii))
- Actual message area, driver side: 40.5 cm²
- Actual message area, passenger side: 40.5 cm²
- Driver side: Yes-Pass
- Passenger side: Yes-Pass

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Table 13. FMVSS 208 Air Bag Labels, Cont'd.

4.6 Is the pictogram black with a red circle and slash on a white background? (S4.5.1(b)(2)(iii)) & (S4.5.1(b)(2)(iv))
   For vehicles with driver side air bag ONLY □ N/A
   Driver side □ Yes-Pass □ No-Fail
   Passenger side □ No air bag □ Yes-Pass □ No-Fail

4.7 Is the pictogram at least 30 mm in diameter? (S4.5.1(b)(2)(ii))
   Actual diameter, driver side 30 mm
   Actual diameter, passenger side 30 mm
   For vehicles with driver side air bag ONLY □ N/A
   Driver side □ Yes-Pass □ No-Fail
   Passenger side □ No air bag □ Yes-Pass □ No-Fail

4.8 Is the same side of the sun visor to which the sun visor label is affixed free of other information with the exception of an air bag maintenance label? (S4.5.1(b)(3)) and/or a rollover warning label specified in 49CFR Part 575 (S575.105)?
   Driver side □ Yes-Pass □ No-Fail
   Passenger side □ No air bag □ Yes-Pass □ No-Fail

4.9 Is the sun visor free of other information about air bags or the need to wear seat belts with the exception of the air bag alert label or the utility vehicle label?
   Driver side □ Yes-Pass □ No-Fail
   Passenger side □ No air bag □ Yes-Pass □ No-Fail

5. Air Bag Alert Label

5.1 Is the Sun Visor Warning Label visible when the sun visor is in the stowed position?
   Driver □ Yes □ No
   Passenger □ Yes □ No
   If yes, go to 6

5.2 Does the label conform in content to the label shown in Figure 6c? (S4.5.1(c)(2)) □ Yes-Pass □ No-Fail
   SUN VISOR LABEL VISIBLE WHEN VISOR IS IN UP POSITION
   Artwork Black with White Background
   Text Yellow with Black Background
   Circle and Line Red with White Background

Figure 6c (S4.5.1(c)(2))
Table 13  FMVSS 208 Air Bag Labels, Cont'd.

5.3 Is the message area black with yellow text? (S4.5.1(c)(2)(i))

☐ Yes-Pass  ☐ No-Fail

5.4 Is the message area at least 20 cm\(^2\)? (S4.5.1(c)(2)(ii))

Actual message area ___ cm\(^2\)  ☐ Yes-Pass  ☐ No-Fail

5.5 Is the pictogram black with a red circle and slash on a white background? (S4.5.1(c)(2)(ii))

For vehicles with driver side air bag ONLY  ☐ N/A

☐ Yes-Pass  ☐ No-Fail

5.6 Is the pictogram at least 20 mm in diameter? (S4.5.1(c)(2)(ii))

Actual diameter is ___ mm

For vehicles with driver side air bag ONLY  ☐ N/A

☐ Yes-Pass  ☐ No-Fail

6. Label On the Dash

6.1 Does the vehicle have a passenger air bag?  ☒ Yes  ☐ No

If no, this checklist is complete.

6.2 Does the vehicle have a label on the dash or steering wheel hub? (S4.5.1(e))

☒ Yes-Pass  ☐ No-Fail

6.3 Does the label conform in content (vehicles without back seats may omit the statement: “The back seat is the safest place for children 12 and under.”) (S4.5.1(e)(iii)) to the label shown in Figure 7? (S4.5.1(e))

☒ Yes-Pass  ☐ No-Fail

BOTTOM TEXT BLACK WITH WHITE BACKGROUND

Figure 7
(S4.5.1(e))

TOP OF TEXT AND SYMBOL BLACK WITH YELLOW BACKGROUND

WARNING
Children Can Be KILLED or INJURED by Passenger Air Bag
The back seat is the safest place for children 12 and under.
Make sure all children use seat belts or child seats.
<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes-Pass</th>
<th>No-Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4</td>
<td>Is the heading area yellow with the word “warning” and the alert symbol in black? (S4.5.1(e)(i))</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Table 14  FMVSS 208 Rear Outboard Seating Position Seat Belts

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108  Technician: Ronald D. Stoner  Date: 01/21/03

Do all rear outboard seating positions have type 2 seat belts?

[X] Yes;  [ ] No;  [ ] N/A (No Back Seat)

If No, describe the seat belt installed, the seat location, and any other information about the seat that would explain why a type 2 belt was not installed.
Table 15  FMVSS 208 Lap Belt Lockability

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for each designated seating position with forward-facing seats, other than the driver’s seat, or seats that can be adjusted to forward-facing and that has seat belt retractors that are not automatic retractors. (S7.1.1.5(e))

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door

NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Right Front

☒1. Record test seat position: Mid
   (S7.1.1.5(c)(1)) (Any position is acceptable.)

☒2. Buckle the seat belt. (S7.1.1.5(c)(1))

☒3. Complete any procedures recommended in the vehicle owner’s manual to activate any locking feature. (S7.1.1.5(c)(1))

☒4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7.1.1.5(a))
   ☒ Yes-Pass  ☐ No-Fail

☒5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7.1.1.5(a))
   ☒ Yes-Pass  ☐ No-Fail

☒6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?
   If yes, go to 6.1. If no, go to 7.
   ☒ Yes  ☐ No

6.1 Does the vehicle owner’s manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system? (S7.1.1.5(b))
   ☒ Yes-Pass  ☐ No-Fail
Table 15  FMVSS 208 Lap Belt Lockability, Cont’d.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108                Technician: Steven Bell                Date: 01/15/2003

Designated Seating Position: Right Front

1. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

2. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

3. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))

4. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2)) Measured distance between A and B 34.4 inches.

5. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))

6. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pulley device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4)) Measured force application angle 10 degrees. (Spec. 5°-15°)

7. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4)) Measured distance between A and B 23.0 inches.
Table 15: FMVSS 208 Lap Belt Lockability, Cont’d.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108     Technician: Steven Bell     Date: 01/15/2003

Designated Seating Position: Right Front

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate 10 lbs/sec (spec. 10 ~ 50 lb/sec)

The measured distance between A and B is 23.2 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14–13= 0.2 inches     Yes-Pass  No-Fail

16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more? (S7.1.1.5(c)(8))

10–14= 11.2 inches     Yes-Pass  No-Fail
Table 15  FMVSS 208 Lap Belt Lockability, Cont’d.

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for each designated seating position with forward-facing seats, other than the driver’s seat, or seats that can be adjusted to forward-facing and that has seat belt retractors that are not automatic retractors. (S7.1.1.5(c))

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door

NHTSA No.: C30108    Technician: Steven Bell    Date: 01/15/2003

Designated Seating Position: Right Rear

☒ 1. Record test seat position: Fixed
(S7.1.1.5(c)(1)) (Any position is acceptable.)

☒ 2. Buckle the seat belt. (S7.1.1.5(c)(1))

☒ 3. Complete any procedures recommended in the vehicle owner’s manual to activate any locking feature. (S7.1.1.5(c)(1))

☒ 4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7.1.1.5(a))    ☒ Yes-Pass    ☐ No-Fail

☒ 5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7.1.1.5(a))    ☒ Yes-Pass    ☐ No-Fail

☒ 6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?

If yes, go to 6.1. If no, go to 7.    ☐ Yes    ☒ No

6.1 Does the vehicle owner’s manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1.5(b))    ☐ Yes-Pass    ☐ No-Fail
Table 15: FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door

NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

**Designated Seating Position: Right Rear**

7. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))

10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2)) Measured distance between A and B 63.0 inches.

11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))

12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4)) Measured force application angle 10 degrees. (Spec. 5~15 degrees)

13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4)) Measured distance between A and B 30.5 inches.
Table 15  FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Right Rear

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate 10 lbs/sec (spec. 10 - 50 lb/sec)

The measured distance between A and B is 30.7 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14-13 = 0.2 inches

Yes-Pass  No-Fail

16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more? (S7.1.1.5(c)(8))

10-14 = 32.3 inches.

Yes-Pass  No-Fail
Table 15  FMVSS 208 Lap Belt Lockability, Cont'd.

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for each designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing and that has seat belt retractors that are not automatic retractors. (S7.1.1.5(c))

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door

NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Center Rear

☑1. Record test seat position: Fixed
   (S7.1.1.5(c)(1)) (Any position is acceptable.)

☑2. Buckle the seat belt. (S7.1.1.5(c)(1))

☑3. Complete any procedures recommended in the vehicle owner’s manual to activate any locking feature. (S7.1.1.5(c)(1))

☑4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7.1.1.5(a))
   ☑ Yes-Pass  ☐ No-Fail

☑5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7.1.1.5(a))
   ☑ Yes-Pass  ☐ No-Fail

☑6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?
   If yes, go to 6.1. If no, go to 7.
   ☐ Yes  ☑ No

6.1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system? (S7.1.1.5(b))
   ☐ Yes-Pass  ☐ No-Fail

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Table 15. FMVSS 208 Lap Belt Lockability, Cont’d.

Vehicle Model Year/Make/Model/Bodystyle: 2003/Cadillac/DeVille/4-door

NHTSA No.: C39108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Center Rear

7. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner’s manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))

10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2)) Measured distance between A and B 53.3 inches.

11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))

12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4)) Measured force application angle 10 degrees. (Spec. 5~15 degrees)

13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4)) Measured distance between A and B 22.0 inches.
Table 15: FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Center Rear

☑ 14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractor(s) are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate 10 lbs/sec (spec. 10-50 lb/sec)
The measured distance between A and B is 22.2 inches (S7.1.1.5(c)(6))

☑ 15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5(c)(7))

14-13 = 0.2 inches  ☑ Yes-Pass □ No-Fail

☑ 16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more? (S7.1.1.5(c)(8))

10-14 = 31.1 inches  ☑ Yes-Pass □ No-Fail

![Diagram](image)
Table 15  FMVSS 208 Lap Belt Lockability, Cont’d.

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for each designated seating position with forward-facing seats, other than the driver’s seat, or seats that can be adjusted to forward-facing and that has seat belt retractors that are not automatic retractors. (S7.1.1.5(c))

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door

NHTSA No.: C50108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Left Rear

1. Record test seat position: Fixed  (S7.1.1.5(c)(1)) (Any position is acceptable.)

2. Buckle the seat belt.  (S7.1.1.5(c)(1))

3. Complete any procedures recommended in the vehicle owner’s manual to activate any locking feature.  (S7.1.1.5(c)(1))

4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle?  (S7.1.1.5(a))

   Yes-Pass  No-Fail

5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing?  (S7.1.1.5(a))

   Yes-Pass  No-Fail

6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?

   Yes  No

6.1 Does the vehicle owner’s manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system.  (S7.1.1.5(b))

   Yes-Pass  No-Fail
Table 15  FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door

NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Left Rear

☐ 7. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

☐ 8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

☐ 9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7.1.1.5(c)(2))

☐ 10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2)) Measured distance between A and B 63.0 inches.

☐ 11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing. (S7.1.1.5(c)(3))

☐ 12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1.1.5(c)(4)) Measured force application angle 10 degrees. (Spec. 5–15 degrees)

☐ 13. Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4)) Measured distance between A and B 27.2 inches.
Table 15  FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
NHTSA No.: C30108  Technician: Steven Bell  Date: 01/15/2003

Designated Seating Position: Left Rear

14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractor is installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate \( \boxed{10} \) lbs/sec (spec. 10 ~50 lb/sec)

The measured distance between A and B is 27.4 inches (S7.1.1.5(c)(6))

15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5 (c)(7))

14-13 = 0.2 inches  \( \boxed{Yes-Pass} \)  \( \boxed{No-Fail} \)

16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more? (S7.1.1.5(c)(8))

10-14 = 35.6 inches.  \( \boxed{Yes-Pass} \)  \( \boxed{No-Fail} \)
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test
Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Right Rear
Date of Comfort and Convenience Check: 01/15/2003
Technician Performing Check: Steven Bell
GVWR: 5139 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

1. Does the vehicle incorporate a webbing tension-relieving device?
   [ ] Yes — go to latchplate access
   X [ ] No — continue with this check sheet

2. Adjustable seats are in the adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used. (S8.1.2)
   [ ] Check
   X [ ] N/A

3. If separately adjustable in a vertical direction, the seats are at the lowest position.
   [ ] Check
   X [ ] N/A

4. Place adjustable seat backs in the manufacturer’s nominal design riding position in the manner specified by the manufacturer.
   [ ] Check
   X [ ] N/A

5. Place any adjustable anchorages at the manufacturer’s nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.
   [ ] Check
   X [ ] N/A
6. Place each adjustable head restraint in its highest adjustment position.

☐ Check
☒ N/A

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (§3.1.3)

☐ Check
☒ N/A

8. Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure.

☒ Check

9. Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. (§10.8) Measure the contact force exerted by the belt webbing on the dummy's chest. Contact the COTR if the contact force exceeds 0.7 pounds. Contact force is 0.4 pounds.

☒ 0.0 to 0.7 pounds - Pass
☐ greater than 0.7 pounds - FAIL*

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.
Table 16 FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No.: C30138
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Center Rear
Date of Comfort and Convenience Check: 01/15/2003
Technician Performing Check: Steven Bell
GVWR: 5139 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

1. Does the vehicle incorporate a webbing tension-relieving device?
   [ ] Yes—go to latchplate access
   [X] No—continue with this check sheet

2. Adjustable seats are in the adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used. (S8.1.2)
   [ ] Check
   [X] N/A

3. If separately adjustable in a vertical direction, the seats are at the lowest position.
   [ ] Check
   [X] N/A

4. Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.
   [ ] Check
   [X] N/A

5. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.
   [ ] Check
   [X] N/A
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Belt Contact Force (§7.4.3)

6. Place each adjustable head restraint in its highest adjustment position.

☐ Check
☒ N/A

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (§8.1.3)

☐ Check
☒ N/A

8. Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure.

☒ Check

9. Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. (§10.8) Measure the contact force exerted by the belt webbing on the dummy's chest. Contact the COTR if the contact force exceeds 0.7 pounds. Contact force is 0.4 pounds.

☒ 0.0 to 0.7 pounds - Pass
☐ greater than 0.7 pounds - FAIL*

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.
Table 16: FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Left Rear
Date of Comfort and Convenience Check: 01/15/2003
Technician Performing Check: Steven Bell
GVWR: 5139 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

1. Does the vehicle incorporate a webbing tension-relieving device?
   - [ ] Yes-go to latchplate access
   - [x] No-continue with this check sheet

2. Adjustable seats are in the adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used. (S8.1.2)
   - [ ] Check
   - [x] N/A

3. If separately adjustable in a vertical direction, the seats are at the lowest position.
   - [ ] Check
   - [x] N/A

4. Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.
   - [ ] Check
   - [x] N/A

5. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.
   - [ ] Check
   - [x] N/A
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Belt Contact Force (§7.4.3)

6. Place each adjustable head restraint in its highest adjustment position.
   □ Check
   ✗ N/A

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (§8.1.3)
   □ Check
   ✗ N/A

8. Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure.
   ✗ Check

9. Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. (§10.8) Measure the contact force exerted by the belt webbing on the dummy's chest. Contact the COTR if the contact force exceeds 0.7 pounds. Contact force is 0.4 pounds.
   ✗ 0.0 to 0.7 pounds - Pass
   □ greater than 0.7 pounds - FAIL*

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.
Table 16 FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont’d.
Latchplate Access (S7.4.4)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Not applicable to passenger car
Date of Comfort and Convenience Check:
Technician Performing Check:
GVWR: 5139 pounds

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

1. Position the seat in its forward most adjustment position. □ Check

2. Position the test dummy using the procedures in Appendix B of the Laboratory Test Procedure. (Some modifications to the positioning procedure may need to be made because the seat is in its forward most position.) □ Check

3. Position the adjustable seat belt anchorage in the manufacturer’s nominal design position for a 50th percentile adult male occupant. □ Check

4. Attach the inboard and outboard reach string following the instructions on Figure 1C of the Laboratory Test Procedure. □ Check

5. Place the latch plate in the stowed position. □ Check

6. Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy’s arms. Is the latchplate within the reach envelope?
   □ Yes-Pass; □ No-Fail

7. Using the clearance test block, specified in Figure 2C of the Laboratory Test Procedure, determine if there is sufficient clearance between the vehicle seat and the side of vehicle to allow the test block to move unhindered to the latchplate or buckle.
   □ Yes-Pass; □ No-Fail
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Retraction (S7.4.5)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Not applicable to passenger car
Date of Comfort and Convenience Check:
Technician Performing Check:
GVWR: 5139 pounds

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

1. Is the vehicle a passenger car or walk-in van-type vehicle?
   □ Yes
   □ No
   If yes, go to seat belt guides and hardware.

2. Adjustable seats are in the adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used. (S8.1.2)
   □ Check

3. If separately adjustable in a vertical direction, the seats are at the lowest position.
   □ Check

4. Place any adjustable seat backs in the manufacturer’s nominal design riding position in the manner specified by the manufacturer.
   □ Check

5. Place any adjustable anchorages at the manufacturer’s nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.
   □ Check

6. Place each adjustable head restraint in its highest adjustment position.
   □ Check
Table 16: FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Retraction (S7.4.5)

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (§8.1.3) □ Check

8. Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B of the Laboratory Test Procedure. □ Check

9. Restrain the dummies using the belt systems for the position being tested. □ Check

10. Stow outboard armrests that are capable of being stowed. □ Check

11. Check the statement that applies to this test vehicle:

   (A) The torso and lap belt webbing of the seat belt system automatically retracts to a stowed position when the adjacent vehicle door is in an open position and the seat belt latchplate is released. □ Pass

   (B) The torso and lap belt webbing of the seat belt system automatically retracts when the seat belt latchplate is released. □ Pass

   (C) Neither A or B apply. □ Fail

12. With the webbing and hardware in the stowed position are the webbing and hardware prevented from being pinched when the door is closed? □ Yes-Pass; □ No-Fail

13. If this test vehicle has an open body (without doors) and has a belt system with a tension-relieving device, does the belt system fully retract when the tension-relieving device is deactivated? □ N/A

□ Yes-Pass; □ No-Fail

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Table 16 FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Center Front
Date of Comfort and Convenience Check: 01/15/2003
Technician Performing Check: Steven Bell
GVWR: 5139 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

The requirements for accessibility DO NOT APPLY to:

A. Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7.4.6.1(b)).

B. Seats which are removable.

C. Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, determine the following:

1. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back? □ Yes: go to 2.
   □ No: this form is complete.

2. Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)? □ Yes-Pass; □ No-Fail

3. Are the remaining two seat belt parts accessible under normal conditions? □ Yes-Pass; □ No-Fail

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<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Check</th>
<th>Yes-Pass</th>
<th>No-Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>The buckle and latchplate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched.</td>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(B) The seat is moved to any position to which it is designed to be adjusted.</td>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position.</td>
<td>☐</td>
<td>☐ Yes-Pass</td>
<td>☐ No-Fail</td>
</tr>
<tr>
<td>5.</td>
<td>Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)?</td>
<td>☐</td>
<td>☐ Yes-Pass</td>
<td>☐ No-Fail</td>
</tr>
</tbody>
</table>
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Seat Belt Guides And Hardware (S7.4.6)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Right Rear
Date of Comfort and Convenience Check: 01/15/2003
Technician Performing Check: Steven Bell
GVWR: 5139 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

The requirements for accessibility **DO NOT APPLY** to:

A. Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7.4.6.1(b)).

B. Seats which are removable.

C. Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, determine the following:

1. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?  
   □ Yes: go to 2.  
   □ No: this form is complete.

2. Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)?  
   □ Yes-Pass;  □ No-Fail

3. Are the remaining two seat belt parts accessible under normal conditions?  
   □ Yes-Pass;  □ No-Fail
4. The buckle and latchplate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:

   (A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched.
       ✅ Check

   (B) The seat is moved to any position to which it is designed to be adjusted.
       ✅ Check

   (C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position.
       ✅ Check

       ✅ Yes-Pass;  ❌ No-Fail

5. Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)?

       ✅ Yes-Pass;  ❌ No-Fail
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont’d.
Seat Belt Guides And Hardware (§7.4.6)

Test Vehicle NHTSA No.: C30108
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door
Designated Seating Position Tested: Center Rear
Date of Comfort and Convenience Check: 01/15/2003
Technician Performing Check: Steven Bell
GVWR: 5139 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

The requirements for accessibility DO NOT APPLY to:

A. Seats whose seat cushions are movable so that the seat back serves a function other than seating (§7.4.6.1(b)).

B. Seats which are removable.

C. Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, determine the following:

1. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?
   ☑ Yes: go to 2.
   ☐ No: this form is complete.

2. Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)?
   ☑ Yes-Pass; ☐ No-Fail

3. Are the remaining two seat belt parts accessible under normal conditions?
   ☑ Yes-Pass; ☐ No-Fail
Table 16. FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont’d.
Seat Belt Guides And Hardware (S7.4.6)

4. The buckle and latchplate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:

(A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched. ☑ Check

(B) The seat is moved to any position to which it is designed to be adjusted. ☑ Check

(C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position. ☑ Yes-Pass; ☐ No-Fail

5. Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)? ☐ Yes-Pass; ☑ No-Fail

N/A, no armrest for center seat
Table 16  FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

Test Vehicle NHTSA No.: C30108  
Vehicle Model Year/Make/Model/Body Style: 2003/Cadillac/DeVille/4-door  
Designated Seating Position Tested: Left Rear  
Date of Comfort and Convenience Check: 01/15/2003  
Technician Performing Check: Steven Bell  
GVWR: 5139 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

The requirements for accessibility **DO NOT APPLY** to:

A. Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7.4.6.1(b)).

B. Seats which are removable.

C. Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, determine the following:

1. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?  
   - Yes: go to 2.  
   - No: this form is complete.

2. Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)?  
   - Yes-Pass;  
   - No-Fail

3. Are the remaining two seat belt parts accessible under normal conditions?  
   - Yes-Pass;  
   - No-Fail
4. The buckle and latchplate do not pass through the guides or conduits provided and fall behind
the seat when the following events occur in order:

(A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched.  
   □ Check

(B) The seat is moved to any position to which it is designed to be adjusted.  
   □ Check

(C) The seat back, if foldable, is folded forward as far as possible and then moved
   backward into position.  
   □ Yes-Pass;   □ No-Fail

5. Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated
   seating position, accessible with the center arm rest in any position to which it can be
   adjusted (without moving the armrest)?  
   □ Yes-Pass;   □ No-Fail
LOCATION OF ANCHORING POINTS FOR LATCHPLATE REACH LIMITING CHAINS OR STRINGS TO TEST FOR LATCHPLATE ACCESSIBILITY

PART 572E DUMMY

50TH PERCENTILE DUMMY SEATED IN FOREMOST SEAT ADJUSTMENT POSITION

ATTACH THE OUTBOARD REACH STRING (19.125" LONG) AT THE BASE OF THE HEAD ON CENTERLINE

ATTACH THE OUTBOARD REACH STRING (29" LONG) AT THIS POINT ON THE TORSO SHEATH

A - USING FLEXIBLE TAPE, MEASURE 8" FROM BACK CENTERLINE 11.5" FROM FRONT CENTERLINE TO FIND ANCHOR POINT BELOW ARM PIT ON TORSO SHEATH

SEAT PLANE IS 90 DEGREES TO THE TORSO LINE

REAR VIEW

Figure 12 Laboratory Test Procedure Figure 1C
USE OF CLEARANCE TEST BLOCK
TO DETERMINE HAND/ARM ACCESS

CLEARANCE TEST BLOCK

2.5"

4"

8"

0.5 R.
typ.

NOTE: CORNERS ARE ROUNDED
OFF TO REDUCE SNAGGING

TYPICAL ARM REST

FRONT VIEW OF VEHICLE

Figure 13  Laboratory Test Procedure Figure 2C
Appendix A

Photographs
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Figure A-8. Post-Test Right Front Three-Quarter View
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Appendix B

Data Plots
C30108 2005 CADILLAC SEVILLE INTO LOAD CELL BARRIER AT 30 MPH
DRIVER HEAD X-AXIS ACCELERATION
FMVSS 208 CRASH TEST
TEST NUMBER 030121-1

ACCELERATION (g)

TIME (mS)

CHANNEL: HEDXG
FILTER: CH. CLASS 100B
PLAK DATA LC.03 C @ 221.04 MS, -58.11 C @ 62.48 MS
TRC INC

CHANNEL: MEK2F1  FILTER: CH  CLASS 1006  PEAK DATA: 500.60 N @ 81.24 ms, -134.33 N @ 182.34 ms
C32108 2005 CADILLAC DEVILLE INTO LOAD CELL BARREL AT 50 MPH

DRIVER NECK MOMENT ABOUT X AXIS

FMVSS 208 CRASH TEST

TEST NUMBER: 031812

TOFUSE (N x 1 x 10^3)

TIME (MS)

CHANNEL: MXMM2 FILTER: CH CLASS E00

PEAK DATA: 11.63 N-M AT 85.28 MS; -15 AT 185.808 32 MS
2003 CADILLAC DEVILLE INTO Fixed CELL BARRIER AT 30 MPH
DRIVER NII TENSION-FLEXION

PHYS 260 CRASH TEST

TEST NUMBER: 030121-1

N. (IN) G(N)

CHANNEL: NII FILTER: CH. CLASS 6113

PEAK DATA: 0.24 NII @ 75.2 NS; 0.00 NII @ 20.00 NS

TIME (MS)

-20 10 40 70 100 130 160 190 220 250 280 310
030108 2003 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 30 MPH
DRIVER SEAT COMPRESSION/FLEXIONS
FMVSS 208 CRASH TEST

TEST NUMBER 030121-2

CHANNEL HCF: FILTER CH CLASS 5000
PEAK DATA 0.15 kN @ 126.08 MS, 0.00 kN @ 20.00 MS
CSC108 2083 CADILLAC DEVILLE INTO GUARD RAIL BARRIER AT 30 MPH
DRIVER CHEST X AXIS ACCELERATION

CHANNEL: CSTXC1 FILTER: CLASE 196
PEAK DATA: 646.68 194.05 MS, 46.15 G 0.83 MS

ACCELERATION (G X 10^-1)

TIME (MS)

70
-70
-26
-26
-23
-23
-220
-220
-317
-317
-314
-314
-511
-511
-10
42
70
100
130
160
190
220
250
287
310

TEST NUMBER 250121-1
C33128 2003 CASTILLAN DEVILLE INTO LOAD CELL BARRIER AT 30 MPH
DRIVER CHEST Y AXIS ACCELERATION
FNYSS 208 CRASH TEST
TEST NUMBER: #33121-1

See Data Acquisition Explanations

CHANNEL: CSTY61
FILTER: CH. CLASS 13A

PEAK DATA: 2.93 g at 115.48 MS; -6.18 g at 16.00 MS
C30108 2003 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 38 MPH
DRIVER CHEST RESULTANT ACCELERATION
FMVSS 238 CRASH IFS
TEST NUMBER 03A171-

See Data Acquisition Explanations

CHANNEL: CSTRG1 FILTER: CH. CLASS 190
PEAK DATA 47.27 G @ 55.08 MS; 0.81 G @ 20.00 MS
C30103 2033 CADILLAC DEVILLE INTO LOAD CELL CARRIER AT 30 MPH
DRIVER RIGHT HEMISPHERE FORCE

TEST NUMBER: 030121

CHANNEL NHZ+1 FILTER 5% CLAMP 8000
PEAK DATA: 30.61 LBF @ 148.98 MS, 1207.93 LBF @ 55.40 NS
2003 CADILLAC DEVILLE INTO LOW CELL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

ACCELERATION (G)

TIME (MS)

CHANNEL: \text{HENVX2} \quad \text{FILTER: CH CLASS 100G}

PEAK DATA: 15.43 G @ 214.56 MS, -44.7 G @ 89.69 MS
030188 2003 CADILLAC DEVILLE HIC : DSS CELL DARIER AT 35 MPH
RIGHT FRONT PASSENGER NECK MOMENT OCCUPANT COMFORT ABOUT Z AXIS

PMHS 205 CRASH TEST

TEST NUMBER: 030188-1-1

TORQUE (N.m)

-21 -10  0  10  20  30  40  50  60  70  80  90  100  110  120  130

CHANNEL: NEXONZ2  FILTER CH: CLASS 600

PEAK DATA: 26.81 N.m @ 140.16 ms; -19.80 N.m @ 277.64 ms
030108 2005 CADILLAC DEVILLE INTO FOAD CELL BARRIER AT 33 MPH
RIGHT FRONT PASSENGER NIJ TENSION/FLEXION

CHANNEL: NTF2 FILTER: CH CLASS 600 PEAK DATA: 0.21 NIJ 0.136.34 MS, 0.00 NIJ 0 -20 30 TS
C30108 2003 CADILLAC DEVILLE INTO LANE CHAIN BARRIER AT 40 MPH
RIGHT FRONT PASSENGER NIJ COMPRESSION EXTENSION

TEST NUMBER: C30108

CHANNEL N522
FILTER: CH. CL2S 222
NIJ DATA: 0.18 NIJ @ 27.9 MS; 0.08 NIJ @ -18.8o MS

TIME (MS)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
TRC (V)
0 50 100 150 200 250 300
NIJ (NIJ x 10^-3)
G30108 2003 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER G-TEST Y-AXIS ACCELERATION
FMVSS 208 CRASH TEST

ACCELERATION (g x 10^-1)

CHANNEL CSTGC2  FILTER: CH. CLASS 180

PEAK DATA: 2.33 g @ 52.40 ms; -7.64 g @ 84.16 ms
See Data Acquisition Explanations

CHANNEL: REM12
FILTER: CH CLASS ERP
PEAK DATA: 673.81 lbf @ 152.96 ms, -915.26 lbf @ 81.38 ms
CH 11: 1993 CADILLAC DEVILLE INTO LOW-FILL BARRIER AT 30 MPH
RIGHT FRONT HANDEL CALIPER X AXIS ACCELERATION

CHANNEL: EORXG1 FILTER: CH CLASS 60 PEAK DATA: 4.80 6.43 8.41 NS 3.2 5.2 6.0 5.2 9.2 NS
C30108 2003 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 30 MPH
ENGINE 1/4 X AXIS ACCELERATION
FHV55200 CRASH TEST
TEST NUMBER 0301211

P-58

ACCELERATION (g)


TIME (ms)

-20 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310

CHANNEL ENC/CH FILTER: CH CLASS 60
PEAK DATA 19.05 0 19.64 0 -66 62 0 38.06 0

0301211
330:00 2303 CADILLAC DEVILLE IIII LOAD CELL BARRIER AT 30 MPH
INSTRUMENT PANEL CENTERLINE X AXES ACCELERATION

See Data Acquisition Explanations

CHANNEL: OPCX31 FILTER CN. CLS 00
PEAK DATA 1655 10 38 40 155: -1345.65 53 387.52 18
CHANNEL 8A2F FILTER: OP. CLASS 8R PEAK DATA 505.4# N @ 26 32 MS; -7288 13 X 0 33 36 MS
C30128 2002 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 30 MPH
LOAD CELL BARRIER POSITION VS FORCE

TEST NUMBER: C30128-

FORCE (N x 10^3)

-245
-203
-161
-113
-77
35

TIME (NS)

0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310

CHANNEL BB00 FILTER: CH. CLASS F0

PEAK DATA: 0.1588 N @ 9.36 NS; -22629 78 N @ 31.68 NS
C30188 2003 CADILLAC DEVILLE IN TO LOAD CELL BARRIER AT 30 MPH
LOAD CELL BARRIER POSITION VS FORCE
FMSS 208 CRASH TEST
TEST NUMBER 030124-1

CHANNEL: BC9F
FILTER: CH. CLASS 60

FORCE (N x 10^3)

TIME (INCR)

PEAK DATA: 310.61 N @ 33.92 MS; 285.14 N @ 46.64 MS
03:33:20 24/7 | LAD: 1 ACC LEVEL INTO LOAD CELL BARRIER AT 50 MPH
LOAD CELL BARRIER POSITION AT FORCE
FEMSS 208 CRASH TEST
TEST NUMBER: 030121-3

FORCE (kN x 10^3)

CHANNEL AD7F | FILTER CH CLASS 89

PEAK VALUES: 317 71 N @ 16.88 MS, 4781 45 N @ 31.93 MS
FORCE (N x 10^3)

TIME (MS)

-294 -244 -194 -144 -94 -44 0 94 144 194 244 294

10 40 70 100 130 160 190 220 250 280 310

CHANNEL: LOADF FILTER: CH. CLASS 50

PEAK DATA: 1648.11 N 6 -144 MS, -2375.40.03 N @ 37.28 MS
OC30108 2003 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 36 MPH
LOAD CELL BARRIER GROUP # 3 FORCE OUTAL
FMVSS 238 CRASH TEST

TEST NUMBER OC30121-1

-141
-117
-93
-69
-46
-22
1

FORCE (N x 10^3)

TIME (MS)

CHANNEL LIEG3F FILTER CH. CLASS CC
PEAK DATA 1419.18 N @ 4.16 MS; -128515 52 N @ 32.20 MS
CS8108 2003 CADILLAC DEVILLE INTO LOAD CELL BARRIER AT 30 MPH
TOTAL LOAD CELL BARRIER FORCE
FMVSS 208 CRASH TEST

CHANNEL: LM301 FILTER: CH CLASS 03
PEAK DATA: 1349.05 N @ 28 MS, 56667.13 N @ 52.72 MS
Appendix C

Manufacturer's Vehicle Information
Safety Belts

Safety Belts: They Are for Everyone

This part of the manual tells you how to use safety belts properly. It also tells you some things you should not do with safety belts.

⚠️ CAUTION:

Don't let anyone ride where he or she can't wear a safety belt properly. If you are in a crash and you're not wearing a safety belt, your injuries can be much worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be. If you are buckled up. Always fasten your safety belt, and check that your passengers' belts are fastened properly too.

Your vehicle has a light that comes on as a reminder to buckle up. See Safety Belt Reminder Light on page 3-45.

Why Safety Belts Work

When you ride in or on anything, you go as fast as it goes.

Take the simplest vehicle. Suppose it's just a seat on wheels.

In most states and in all Canadian provinces, the law says to wear safety belts. Here's why: They work.

You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

A few crashes are mild, and some crashes can be so serious that even buckled up, a person wouldn't survive. But most crashes are in between. In many of them, people who buckle up can survive and sometimes walk away. Without belts they could have been badly hurt or killed.

After more than 30 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter... a lot!
Put someone on it.

Get it up to speed. Then stop the vehicle. The rider doesn't stop.

The person keeps going until stopped by something. In a real vehicle, it could be the windshield...

or the instrument panel...
Questions and Answers About Safety Belts

Q: Won't I be trapped in the vehicle after an accident if I'm wearing a safety belt?
A: You could be - whether you're wearing a safety belt or not. But you can unbuckle a safety belt, even if you're upside down. And your chance of being conscious during and after an accident, so you can unbuckle and get out, is much greater if you are belted.

Q: If my vehicle has air bags, why should I have to wear safety belts?
A: Air bags are in many vehicles today and will be in most of them in the future. But they are supplemental systems only; so they work with safety belts - not instead of them. Every air bag system ever offered for sale has required the use of safety belts. Even if you're in a vehicle that has air bags, you still have to buckle up to get the most protection. That's true not only in frontal collisions, but especially in side and other collisions.

Q: If I'm a good driver, and I never drive far from home, why should I wear safety belts?
A: You may be an excellent driver, but if you're in an accident - even one that isn't your fault - you and your passengers can be hurt. Being a good driver doesn't protect you from things beyond your control, such as bad drivers.
Most accidents occur within 25 miles (40 km) of home. And the greatest number of serious injuries and deaths occur at speeds of less than 40 mph (65 km/h).
Safety belts are for everyone.

Driver Position

This part describes the driver's restraint system.

Lap-Shoulder Belt

The driver has a lap-shoulder belt. Here's how to wear it properly.
1. Close and lock the door.
2. Adjust the seat so you can sit up straight. To see how, see Power Seats on page 1-2.

How to Wear Safety Belts Properly

This part is only for people of adult size.

Be aware that there are special things to know about safety belts and children. And there are different rules for smaller children and babies. If a child will be riding in your vehicle, see Older Children on page 1-29 or Infants and Young Children on page 1-32. Follow those rules for everyone's protection.

First, you'll want to know which restraint systems your vehicle has.

We'll start with the driver position.
3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
   The lap-shoulder belt may lock if you pull the belt across you very quickly. If this happens, let the belt go back slightly to unlock it. Then pull the belt across you more slowly.

4. Push the latch plate into the buckle until it clicks.
   Be sure to use the correct buckle when buckling your lap-shoulder belt. If you find that the latch plate will not go fully into the buckle, see if you are using the buckle for the center passenger position.
   Pull up on the latch plate to make sure it is secure. If the belt isn't long enough, see Safety Belt Extender on page 1-28.
   Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks if there's a sudden stop or crash, or if you pull the safety belt very quickly out of the retractor.

Q: What's wrong with this?

A: The shoulder belt is too loose. It won't give nearly as much protection this way.

⚠️ CAUTION:

You can be seriously hurt if your shoulder belt is too loose. In a crash, you would move forward too much, which could increase injury. The shoulder belt should fit against your body.
Q: What's wrong with this?

A: The belt is buckled in the wrong place.

Q: What's wrong with this?

A: The shoulder belt is worn under the arm. It should be worn over the shoulder at all times.

CAUTION:

You can be seriously injured if your belt is buckled in the wrong place like this. In a crash, the belt would go up over your abdomen. The belt would be there, not at the pelvic bones. This could cause serious internal injuries. Always buckle your belt into the buckle nearest you.

CAUTION:

You can be seriously injured if you wear the shoulder belt under your arm. In a crash, your body would move too far forward, which would increase the chance of head and neck injury. Also, the belt would apply too much force to the ribs, which aren't as strong as shoulder bones. You could also severely injure internal organs like your liver or spleen.
Q: What's wrong with this?

⚠️ CAUTION:

You can be seriously injured by a twisted belt. In a crash, you wouldn't have the full width of the belt to spread impact forces. If a belt is twisted, make it straight so it can work properly, or ask your dealer to fix it.

A: The belt is twisted across the body.

Safety Belt Use During Pregnancy

Safety belts work for everyone, including pregnant women. Like all occupants, they are more likely to be seriously injured if they don't wear safety belts.

To un latch the belt, just push the button on the buckle. The belt should go back out of the way.

Before you close the door, be sure the belt is out of the way. If you slam the door on it, you can damage both the belt and your vehicle.

A pregnant woman should wear a lap-shoulder belt, and the lap portion should be worn as low as possible, below the rounding, throughout the pregnancy.
The best way to protect the fetus is to protect the mother. When a safety belt is worn properly, it's more likely that the fetus won't be hurt in a crash. For pregnant women, as for anyone, the key to making safety belts effective is wearing them properly.

**Right Front Passenger Position**

To learn how to wear the right front passenger’s safety belt properly, see Driver Position on page 1-14. The right front passenger’s safety belt works the same way as the driver’s safety belt — except for one thing. If you ever pull the lap portion of the belt out all the way, you will engage the child restraint locking feature. If this happens, just let the belt go back all the way and start again.

**Center Front Passenger Position**

When you sit in the center front seating position, you have a lap safety belt, which has no retractor. To make the belt longer, tilt the latch plate and pull it along the belt.

**Rear Seat Passengers**

It's very important for rear seat passengers to buckle up! Accident statistics show that unbelted people in the rear seat are hurt more often in crashes than those who are wearing safety belts. Rear passengers who aren't safety belted can be thrown out of the vehicle in a crash. And they can strike others in the vehicle who are wearing safety belts.

**Rear Seat Passenger Positions**

To make the belt shorter, pull its free end and as shown until the belt is snug.

Buckle, position and release it the same way as the lap part of a lap-shoulder belt. If the belt isn't long enough, see Safety Belt Extender on page 1-23.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.
Lap-Shoulder Belt

All rear seating positions have lap-shoulder belts. Here's how to wear one properly.

1. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
   The shoulder belt may lock if you pull the belt across you very quickly. If this happens, let the belt go back slightly to unlock it. Then pull the belt across you more slowly.

2. Push the latch plate into the buckle until it clicks.
   The latch plates for the safety belts in each rear seating position vary in size. If the center rear or the left rear latch plate is inserted into the incorrect buckle, the plate will not latch properly. Be sure you are using the correct buckle and that the latch plate clicks when inserted into the buckle.

3. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder part.

   If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle it.
   Pull up on the latch plate to make sure it is secure.
   If the belt is not long enough, see Safety Belt Extender on page 1-28.
   Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.
The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks if there's a sudden stop or a crash, or if you pull the belt very quickly out of the retractor.

To unlatch the belt, just push the button on the buckle.

---

Rear Safety Belt Comfort Guides for Children and Small Adults

Your vehicle may have this feature already. If it doesn't, you can get it from any GM dealer.

Rear shoulder belt comfort guides will provide added safety belt comfort for older children who have outgrown booster seats and for small adults. When installed on a shoulder belt, the comfort guide better protects the belt away from the neck and head.

There is one guide available for each outside passenger position in the rear seat. To provide added safety belt comfort for children who have outgrown child restraints and booster seats and for smaller adults, the comfort guides may be installed on the shoulder belts. Here's how to install a comfort guide and use the safety belt:

1. Remove the guide from its storage pocket on the top of the seatback.
2. Slide the guide under and past the belt. The elastic cord must be under the belt. Then, place the guide over the belt, and insert the two edges of the belt into the slots of the guide.

3. Be sure that the belt is not twisted and it lies flat. The elastic cord must be under the belt and the guide on top.

4. Buckle, position and release the safety belt as described in Rear Seat Passengers on page 1-22. Make sure that the shoulder belt crosses the shoulder.

To remove and store the comfort guides, squeeze the belt edges together so that you can take them out of the guides. Slide the guide into its storage pocket on the top of the seatback.

Safety Belt Pretensioners

Your vehicle has safety belt pretensioners. You’ll find them on the buckle end of the safety belts for the driver and right front passenger. They help the safety belts reduce a person’s forward movement in a moderate to severe crash in which the front of the vehicle hits something.

Pretensioners work only once. If they activate in a crash, you’ll need to get new ones, and probably other new parts for your safety belt system. See Replacing Restraint System Parts After a Crash on page 1-60.

Safety Belt Extender

If the vehicle’s safety belt will fasten around you, you should use it.

But if a safety belt isn’t long enough to fasten, your dealer will order you an extender. It’s free. When you go in to order it, take the heaviest coat you will wear, so the extender will be long enough for you. The extender will be just for you, and just for the seat in your vehicle that you choose. Don’t let someone else use it, and use it only for the seat it is made to fit. To wear it, just attach it to the regular safety belt.
Child Restraints

Older Children

Q: What is the proper way to wear safety belts?
A: If possible, an older child should wear a lap-shoulder belt and get the additional restraint a shoulder belt can provide. The shoulder belt should not cross the face or neck. The lap belt should fit snugly below the hips, just touching the top of the thighs. It should never be worn over the abdomen, which could cause severe or even fatal internal injuries in a crash.

Accident statistics show that children are safer if they are restrained in the rear seat.

In a crash, children who are not buckled up can strike other people who are buckled up, or can be thrown out of the vehicle. Older children need to use safety belts properly.

Older children who have outgrown booster seats should wear the vehicle’s safety belts.

If you have the choice, a child should sit next to a window so the child can wear a lap-shoulder belt and get the additional restraint a shoulder belt can provide.

Q: What if a child is wearing a lap-shoulder belt, but the child is so small that the shoulder belt is very close to the child’s face or neck?
A: If the child is sitting in a seat next to a window, move the child toward the center of the vehicle. If the child is sitting in the center rear seat passenger position, move the child toward the safety belt buckle. In either case, be sure that the shoulder belt still is on the child’s shoulder, so that in a crash the child’s upper body would have the restraint that belts provide.

If the child is sitting in a rear seat outside position, see Rear Safety Belt Comfort Guides for Children and Small Adults on page 1-26.

If the child is so small that the shoulder belt is still very close to the child’s face or neck, you might want to place the child in a seat that has a lap belt, if your vehicle has one.

⚠️ CAUTION:

Never do this. Here two children are wearing the same belt. The belt can’t properly spread the impact forces. In a crash, the two children can be crushed together and seriously injured. A belt must be used by only one person at a time.
CAUTION:

Never do this.

Here a child is sitting in a seat that has a lap-shoulder belt, but the shoulder part is behind the child. If the child wears the belt in this way, in a crash the child might slide under the belt. The belt's force would then be applied right on the child's abdomen. That could cause serious or fatal injuries.

The lap portion of the belt should be worn low and snug on the hips, just touching the child's thighs. This applies belt force to the child's pelvic bones in a crash.

Infants and Young Children

Everyone in a vehicle needs protection! This includes infants and all other children. Neither the distance traveled nor the age and size of the traveler changes the need, for everyone, to use safety restraints. In fact, the law in every state in the United States and in every Canadian province says children up to some age must be restrained while in a vehicle.

Every time infants and young children ride in vehicles, they should have the protection provided by appropriate restraints. Young children should not use the vehicle's adult safety belts alone, unless there is no other choice. Instead, they need to use a child restraint.

CAUTION:

People should never hold a baby in their arms while riding in a vehicle. A baby doesn't weigh much until a crash. During a crash a baby will become so heavy it is not possible to hold.
CAUTION: (Continued)

For example, in a crash at only 25 mph (40 km/h), a 12-lb. (5.5 kg) baby will suddenly become a 240-lb. (110 kg) force on a person’s arms. A baby should be secured in an appropriate restraint.

CAUTION:

Children who are up against, or very close to, any air bag when it inflates can be seriously injured or killed. Air bags plus lap-shoulder belts offer outstanding protection for adults and older children, but not for young children and infants. Neither the vehicle’s safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide.

Q: What are the different types of add-on child restraints?

A: Add-on child restraints, which are purchased by the vehicle’s owner, are available in four basic types. Selection of a particular restraint should take into consideration not only the child’s weight, height and age but also whether or not the restraint will be compatible with the motor vehicle in which it will be used.

For most basic types of child restraints, there are many different models available. When purchasing a child restraint, be sure it is designed to be used in a motor vehicle. If it is, the restraint will have a label saying that it meets federal motor vehicle safety standards.

The restraint manufacturer’s instructions that come with the restraint state the weight and height limitations for a particular child restraint. In addition, there are many kinds of restraints available for children with special needs.

CAUTION:

Newborn infants need complete support, including support for the head and neck. This is necessary because a newborn infant's neck is weak and its head weighs so much compared with the rest of its body. In a crash, an infant in a rear-facing seat settles into the restraint, so the crash forces can be distributed across the strongest part of an infant's body, the back and shoulders. Infants always should be secured in appropriate infant restraints.
CAUTION:

The body structure of a young child is quite unlike that of an adult or older child, for whom the safety belts are designed. A young child's hip bones are still so small that the vehicle's regular safety belt may not remain low on the hip bones, as it should. Instead, it may settle up around the child's abdomen. In a crash, the belt would apply force on a body area that's unprotected by any bony structure. This alone could cause serious or fatal injuries. Young children always should be secured in appropriate child restraints.

An infant car bed (A) is a special bed made for use in a motor vehicle, it is a restraint system designed to restrain or position a child on a continuous flat surface. Make sure the infant's head rests toward the center of the vehicle.

A rear-facing infant seat (B) provides restraint with the seating surface against the back of the infant. The harness system holds the infant in place and, in a crash, acts to keep the infant positioned in the restraint.

A forward-facing child seat (C-E) provides restraint for the child's body with the harness and also sometimes with surfaces such as T-shaped or shelf-like shields.
A booster seat (F-G) is a child restraint designed to improve the fit of the vehicle's safety belt system. Some booster seats have a shoulder belt positioner, and some high-back booster seats have a five-point harness. A booster seat can also help a child to see out the window.

**Q:** How do child restraints work?

**A:** A child restraint system is any device designed for use in a motor vehicle to restrain, seat, or position children. A built-in child restraint system is a permanent part of the motor vehicle. An add-on child restraint system is a portable one, which is purchased by the vehicle's owner.

For many years, add-on child restraints have used the adult belt system in the vehicle. To help reduce the chance of injury, the child also has to be secured within the restraint. The vehicle's belt system secures the add-on child restraint in the vehicle, and the add-on child restraint's harness system holds the child in place within the restraint.

One system, the three-point harness, has straps that come down over each of the infant's shoulders and buckle together at the crotch. The five-point harness system has two shoulder straps, two hip straps, and a crotch strap. A shield may take the place of hip straps. A T-shaped shield has shoulder straps that are attached to a flat pad which rests low against the child's body. A shell or armrest-type shield has straps that are attached to a wide, shelf-like shield that swings up or to the side.

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When choosing a child restraint, be sure the child restraint is designed to be used in a vehicle. If it is, it will have a label saying that it meets federal motor vehicle safety standards.

Then follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both. These restraints use the belt system in your vehicle, but the child also has to be secured within the restraint to help reduce the chance of personal injury. When securing an add-on child restraint, refer to the instructions that come with the restraint which may be on the restraint itself or in a booklet, or both, and to this manual. The child restraint instructions are important, so if they are not available, obtain a replacement copy from the manufacturer.

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**Where to Put the Restraint**

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. General Motors, therefore, recommends that child restraints be secured in a rear seat, including an infant riding in a rear-facing infant seat, a child riding in a forward-facing child seat and an older child riding in a booster seat. Never put a rear-facing child restraint in the front passenger seat. Here's why:

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**CAUTION:**

A child in a rear-facing child restraint can be seriously injured or killed if the right front passenger's air bag inflates. This is because the back of the rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in a rear seat.

You may secure a forward-facing child restraint in the right front seat, but before you do, always move the front passenger seat as far back as it will go. It's better to secure the child restraint in a rear seat.
CAUTION:

A child in a child restraint in the center front seat can be badly injured or killed by the right front passenger’s air bag if it inflates. Never secure a child restraint in the center front seat. It’s always better to secure a child restraint in the rear seat. You may secure a forward-facing child restraint in the right front passenger seat, but before you do, always move the front passenger seat as far back as it will go. It’s better to secure the child restraint in a rear seat.

Wherever you install it, be sure to secure the child restraint properly.

Keep in mind that an unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle. Be sure to properly secure any child restraint in your vehicle - even when no child is in it.

Top Strap

Some child restraints have a top strap, or “top tether”. It can help restrain the child restraint during a collision. For it to work, the top strap must be properly anchored to the vehicle. Some top strap-equipped child restraints are designed for use with or without the top strap being anchored. Others require the top strap always to be anchored. Be sure to read and follow the instructions for your child restraint. If yours require that the top strap be anchored, don’t use the restraint unless it is anchored properly.

If the child restraint does not have a top strap, one can be obtained, in kit form, for many child restraints. Ask the child restraint manufacturer whether or not a kit is available.

Anchor the top strap to one of the following anchor points. Be sure to use an anchor point located on the same side of the vehicle as the seating position where the child restraint will be placed.

If you have an adjustable head restraint, route the top strap under it.

Once you have the top strap anchored, you'll be ready to secure the child restraint itself. Tighten the top strap when and as the child restraint manufacturer's instructions say.

In Canada, the law requires that forward-facing child restraints have a top strap, and that the strap be anchored. In the United States, some child restraints also have a top strap. If your child restraint has a top strap, it should be anchored.
Top Strap Anchor Location

Your vehicle has top strap anchors already installed for the rear seating positions. You'll find them behind the rear seat on the filler panel.

In order to get to a bracket, you'll have to open the trim cover.

Lower Anchorages and Top Tethers for Children (LATCH System)

Your vehicle has the LATCH system. You'll find anchors (A) in all three rear seating positions.

To assist you in locating the lower anchors for this child restraint system, each seating position with the LATCH system will have the LATCH system symbol on the seatback directly above the anchors.

In order to use the system, you need either a forward-facing child restraint that has attaching points (B) at its base and a top tether anchor (C), or a rear-facing child restraint that has attaching points (B), as shown here.

A. Vehicle anchor
B. LATCH system attachment points
C. Top strap

A. Vehicle anchor
B. LATCH system attachment points
Use the LATCH system instead of the vehicle's safety belts to secure a child restraint.
Securing a Child Restraint Designed for the LATCH System

1. Find the anchors for the seating position you want to use, where the bottom of the seatback meets the back of the seat cushion.
2. Put the child restraint on the seat.
3. Attach the anchor points on the child restraint to the anchors in the vehicle. The child restraint instructions will show you how.
4. If the child restraint is forward-facing, attach the top strap to the top strap anchor. See Top Strap on page 1-30. Tighten the top strap according to the child restraint instructions.
5. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, simply unhook the top strap from the top tether anchor and then disconnect the anchor points.

CAUTION:
If a LATCH-type child restraint isn’t attached to its anchorage points, the restraint won’t be able to protect a child sitting there. In a crash, the child could be seriously injured or killed. Make sure that a LATCH-type child restraint is properly installed using the anchorage points, or use the vehicle’s safety belts to secure the restraint. See “Securing a Child Restraint Designed for the LATCH System” or “Securing a Child Restraint in a Rear Seat Position” in the index for information on how to secure a child restraint in your vehicle.

Securing a Child Restraint in a Rear Seat Position

If your child restraint is equipped with the LATCH system, see Lower Anchorage and Top Tethers for Children (LATCH System) on page 1-41.

CAUTION:
A child in a child restraint in the center front seat can be badly injured or killed by the right front passenger’s air bag if it inflates. Never secure a child restraint in the center front seat. It’s always better to secure a child restraint in the rear seat. You may secure a forward-facing child restraint in the right front passenger seat, but before you do, always move the front passenger seat as far back as it will go. It’s better to secure the child restraint in a rear seat.

You’ll be using the lap-shoulder belt. See Top Strap on page 1-30 if the child restraint has one. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.
1. Put the restraint on the seat.
2. Pick up the latch plate, and run the lap and shoulder portions of the vehicle’s safety belt through or around the restraint. The child restraint instructions will show you how.
Securing a Child Restraint in the Right Front Seat Position

If your child restraint is equipped with the LATCH system, see Lower Anchorage and Top Tethers for Children (LATCH System) on page 1-41.

4. To tighten the belt, pull up on the shoulder belt while you push down on the child restraint. If you're using a forward-facing child restraint, you may find it helpful to use your knee to push down on the child restraint as you tighten the belt.

5. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.
Your vehicle has a right front passenger air bag. Never put a rear facing child restraint in this seat. Here's why:

**CAUTION:**

A child in a rear-facing child restraint can be seriously injured or killed if the right front passenger's air bag inflates. This is because the back of the rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in a rear seat.

Although a rear seat is a safer place, you can secure a forward-facing child restraint in the right front seat.

You'll be using the lap-shoulder belt. See the earlier part about the Top Strap on page 1-38, if the child restraint has one. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

1. Because your vehicle has a right front passenger air bag, always move the seat as far back as it will go before securing a forward-facing child restraint. See Power Seats on page 1-2.

2. Put the restraint on the seat.

3. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.

4. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

5. Pull the rest of the lap belt all the way out of the retractor to set the lock.

6. To tighten the belt, feed the lap belt back into the retractor while you push down on the child restraint. You may find it helpful to use your knee to push down on the child restraint as you tighten the belt.

7. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.
Air Bag Systems

This part explains the frontal and side impact air bag systems.

Your vehicle has air bags — a frontal air bag for the driver and another frontal air bag for the right front passenger. Your vehicle also has a side impact air bag for the driver and another side impact air bag for the right front passenger. Your vehicle may also have a side impact air bag for each of the two rear seat outboard passenger positions.

If your vehicle has side impact air bags for each of the two rear seat outboard passenger positions, it will say AIR BAG on each side of the rear seatback closest to the door.

Frontal air bags are designed to help reduce the risk of injury from the force of an inflating frontal air bag. But these air bags must inflate very quickly to do their job and comply with federal regulations.

⚠️ CAUTION: ⚠️

You can be severely injured or killed in a crash if you aren’t wearing your safety belt, even if you have air bags. Wearing your safety belt during a crash helps reduce your chance of hitting things inside the vehicle or being ejected from it. Air bags are designed to work with safety belts but don’t replace them.

Frontal air bags for the driver and right front passenger are designed to deploy only in moderate to severe frontal crashes.

⚠️ CAUTION: (Continued)

Crashes. They aren’t designed to inflate at all in rollover, rear or low-speed frontal crashes, or in many side crashes. And, for some unrestrained occupants, frontal air bags may provide less protection in frontal crashes than more forceful air bags have provided in the past.

Side impact air bags are designed to inflate only in moderate to severe crashes where something hits the side of your vehicle. They aren’t designed to inflate in frontal, in rollover or in rear crashes.

Everyone in your vehicle should wear a safety belt properly, whether or not there’s an air bag for that person.
**CAUTION:**

Both frontal and side impact air bags inflate with great force, faster than the blink of an eye. If you’re too close to an inflating air bag, as you would be if you were leaning forward, it could seriously injure you. Safety belts help keep you in position for air bag inflation before and during a crash. Always wear your safety belt even with frontal air bags. The driver should sit as far back as possible while still maintaining control of the vehicle. Occupants should not lean on or sleep against the door.

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**CAUTION:**

Anyone who is up against, or very close to, any air bag when it inflates can be seriously injured or killed. Air bags plus lap-shoulder belts offer the best protection for adults, but not for young children and infants. Neither the vehicle’s safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide. Always secure children properly in your vehicle. To read how, see the part of this manual called "Older Children" or "Infants and Young Children".

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**AIR BAG**

United States  Canada

There is an air bag readiness light on the instrument panel, which shows the words AIR BAG or an air bag symbol.

The system checks the air bag electrical system for malfunctions. The light tells you if there is an electrical problem. See Air Bag Readiness Light on page 3-45 for more information.

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**Where Are the Air Bags?**

The driver's frontal air bag is in the middle of the steering wheel.
The right front passenger's frontal air bag is in the instrument panel on the passenger's side.

The driver's side impact air bag is in the side of the driver's seatback closest to the door.

The right front passenger's side impact air bag is in the side of the passenger's seatback closest to the door.

The side impact air bags for the rear seat outboard passenger positions are in the sides of the rear seatback closest to the doors.
CAUTION:

If something is between an occupant and an air bag, the bag might not inflate properly or it might force the object into that person causing severe injury or even death. The path of an inflating air bag must be kept clear. Don’t put anything between an occupant and an air bag, and don’t attach or put anything on the steering wheel hub or on or near any other air bag covering. Don’t let seat covers block the inflation path of a side impact air bag.

When Should an Air Bag Inflate?

The driver’s and right front passenger’s frontal air bags are designed to inflate in moderate to severe frontal or near-frontal crashes. But they are designed to inflate only if the impact speed is above the system’s designed “threshold level.”

In addition, your vehicle has “dual stage” frontal air bags, which adjust the amount of restraint according to crash severity. For moderate frontal impacts, these air bags inflate at a level less than full deployment. For more severe frontal impacts, full deployment occurs. If the front of your vehicle goes straight into a wall that doesn’t move or deform, the threshold level for the reduced deployment is about 10 to 16 mph (16 to 26 km/h), and the threshold level for a full deployment is about 18 to 24 mph (29 to 38.5 km/h). The threshold level can vary, however, with specific vehicle design, so that it can be somewhat above or below this range.

If your vehicle strikes something that will move or deform, such as a parked car, the threshold level will be higher. The driver’s and right front passenger’s frontal air bags are not designed to inflate in rollovers, rear impacts, or in many side impacts because inflation would not help the occupant.

The side impact air bags are designed to inflate in moderate to severe side crashes. A side impact air bag will inflate if the crash severity is above the system’s designed “threshold level.” The threshold level can vary with specific vehicle design. Side impact air bags are not designed to inflate in frontal or near-frontal impacts, rollovers or rear impacts, because inflation would not help the occupant. A side impact air bag will only deploy on the side of the vehicle that is struck.

In any particular crash, no one can say whether an air bag should have inflated simply because of the damage to a vehicle or because of what the repair costs were. For frontal air bags, inflation is determined by the angle of the impact and how quickly the vehicle slows down in frontal and near-frontal impacts. For side impact air bags, inflation is determined by the location and severity of the impact.

What Makes an Air Bag Inflated?

In an impact of sufficient severity, the air bag sensing system detects that the vehicle is in a crash. For both the frontal and side impact air bags, the sensing system triggers a release of gas from the inflator, which inflates the air bag. The inflator, air bag and related hardware are all part of the air bag modules inside the steering wheel, instrument panel and the side of the front seatbacks and behind the rear seatbacks closest to the door.

How Does an Air Bag Restrain?

In moderate to severe frontal or near frontal collisions, even belted occupants can contact the steering wheel or the instrument panel. In moderate to severe side collisions, even belted occupants can contact the inside of the vehicle. The air bag supplements the protection provided by safety belts. Air bags distribute the force of the impact more evenly over the occupant’s upper body, stopping the occupant more gradually. But the frontal air bags would not help you in many types of collisions, including rollovers, rear impacts, and many side impacts, primarily because an occupant’s motion is not toward the air bag.

Side impact air bags would not help you in many types of collisions, including frontal or near frontal collisions, rollovers, and rear impacts, primarily because an occupant’s motion is not toward these air bags. Air bags should never be regarded as anything more than a supplement to safety belts, and then only in moderate to severe frontal or near-frontal collisions for the driver’s and right front passenger’s frontal air bags, and only in moderate to severe side collisions for the side impact air bags.
What Will You See After an Air Bag Inflates?

After the air bag inflates, it quickly deflates, so quickly that some people may not even realize the air bag inflated. Some components of the air bag module — the steering wheel hub for the driver’s air bag, the instrument panel for the right front passenger’s bag, the side of the seat back closest to the door for the side impact air bags — will be hot for a short time. The parts of the bag that come into contact with you may be warm, but not too hot to touch. There will be some smoke and dust coming from the vents in the deflated air bags. Air bag inflation doesn’t prevent the driver from seeing or being able to steer the vehicle, nor does it stop people from leaving the vehicle.

⚠️ CAUTION: ⚠️

When an air bag inflates, there is dust in the air. This dust could cause breathing problems for people with a history of asthma or other breathing trouble. To avoid this, everyone in the vehicle should get out as soon as it is safe to do so. If you have breathing problems but can’t get out of the vehicle after an air bag inflates, then get fresh air by opening a window or a door. If you experience breathing problems following an air bag deployment, you should seek medical attention.

Your vehicle has a feature that will automatically unlock the doors and turn the interior lamps on when the air bags inflate (if battery power is available). You can lock the doors again and turn the interior lamps off by using the door lock and interior lamp controls.

In many crashes severe enough to inflate an air bag, windshield are broken by vehicle deformation. Additional windshield breakage may also occur from the right front passenger air bag.

- Air bags are designed to inflate only once. After an air bag inflates, you’ll need some new parts for your air bag system. If you don’t get them, the air bag system won’t be there to help protect you in another crash. A new system will include air bag modules and possibly other parts. The service manual for your vehicle covers the need to replace other parts.

- Your vehicle is equipped with an electronic frontal sensor, which helps the sensing system distinguish between a moderate frontal impact and a more severe frontal impact. Your vehicle is also equipped with a crash sensing and diagnostic module, which records information about the frontal air bag system. The module system records information about the readiness of the system, when the system commands air bag inflation and driver’s safety belt usage at deployment or rear-deployment crash. The module also records speed, engine RPM, brake and throttle data.

- Let only qualified technicians work on your air bag systems. Improper service can mean that an air bag system won’t work properly. See your dealer for service.

Notice: If you damage the covering for the driver’s or the right front passenger’s air bag, or the air bag covering on the driver’s, right front passenger’s or rear seatback, the bag may not work properly. You may have to replace the air bag module in the steering wheel, both the air bag module and the instrument panel for the right front passenger’s air bag, or both the air bag module and seatback for the side impact air bag. Do not open or break the air bag coverings.
Servicing Your Air Bag-Equipped Vehicle

Air bags affect how your vehicle should be serviced. There are parts of the air bag systems in several places around your vehicle. Your dealer and the service manual have information about servicing your vehicle and the air bag systems. To purchase a service manual, see Service Publications Ordering Information on page 7-10.

⚠️ CAUTION: ⚠️

For up to 10 seconds after the ignition key is turned off and the battery is disconnected, an air bag can still inflate during improper service. You can be injured if you are close to an air bag when it inflates. Avoid yellow connectors. They are probably part of the air bag systems. Be sure to follow proper service procedures, and make sure the person performing work for you is qualified to do so.

The air bag systems do not need regular maintenance.

Safety Belt Reminder Light

When the key is turned to ON or START, a chime will come on for several seconds to remind people to fasten their safety belts.

The safety belt light will also come on and stay on for several seconds. If the driver's belt is already buckled, the light will come on briefly, but the chime will not sound.

Air Bag Readiness Light

There is an air bag readiness light on the instrument panel, which shows AIR BAG or the air bag symbol. The system checks the air bag's electrical system for malfunctions. The light tells you if there is an electrical problem. The system check includes the air bag sensors, the air bag modules, the wiring and the crash sensing and diagnostic module. For more information on the air bag system, see Air Bag Systems on page 1-49.

This light will come on when you start your vehicle, and it will flash for a few seconds. Then the light should go out. This means the system is ready.
Appendix D

Miscellaneous Test Information
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TIME and DATE

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- Driver Head
- Driver Neck
- Driver Knee
- Pass. Chest
- Pass. Head
- Pass. Neck
- Pass. Knee