Safety Compliance Testing for FMVSS 208
Occupant Crash Protection

Saturn Corporation
2004 Saturn Ion
NHTSA Number: C40113
TRC Inc. Test Number: 040318-1

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

Test Date: March 18, 2004
Final Report: March 31, 2004

Prepared For:
U.S. Department of Transportation
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance (NVS-220)
400 Seventh Street, S.W., Room No. 6115
Washington, DC 20590
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Test Performed By: John Shultz, Supervisor

Report Approved By:

[Signature] Date: 3/31/04

Walter Dudek, Project Manager
Transportation Research Center Inc.

Final Report Acceptance By OVSC:

[Signature] Date: 8/3/04

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Walter Dudek, Project Manager
Transportation Research Center Inc.

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## 16. Abstract

Compliance tests were conducted on a 2004 Saturn Ion, NHTSA No. C40113, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP208-12 for the determination of FMVSS 208 compliance. Possible test failures identified were as follows:

None

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- Safety Engineering
- FMVSS 208

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Section 1

Purpose of Compliance Test
PURPOSE

This Federal Motor Vehicle Safety Standard 208 compliance test is part of a program conducted for the National Highway Traffic Safety Administration by Transportation Research Center (TRC Inc.) under contract DTH22-03-D-01002. The purpose of the test was to determine whether the subject vehicle, a 2004 Saturn Ion, NHTSA No. C40113, meets certain performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; indicant FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity". The compliance test was conducted in accordance with OVSC Laboratory Test Procedure No. TP-208-12 dated January 14, 2003.
Section 2

Tests Performed
TESTS PERFORMED

The following checked items indicate the tests that were performed:

- 1. Rear outboard seating position seat belts (S4.1.4.2(b) & (S4.2.4)
- 2. Air bag labels (S4.5.1)
- 3. Readiness indicator (S4.5.2)
- 4. Passenger Air Bag Manual Cut-Off Device (S4.5.4)
- 5. Lap belt lockability (S7.1.1.5)
- 6. Seat belt warning system (S7.3)
- 7. Seat belt contact force (S7.4.3)
- 8. Seat belt latch plate access (S7.4.4)
- 9. Seat belt retraction (S7.4.5)
- 10. Seat belt guides and hardware (S7.4.6)
- 11. Suppression tests with 12-month-old CRABI dummy (Part 572, Subpart N)
- 12. Suppression tests with Newborn infant Subpart K dummy (Part 572, Subpart N)
- 13. Suppression tests with 3-year-old dummy (Part 572, Subpart P)
- 14. Suppression tests with 6-year-old dummy (Part 572, Subpart R)
- 15. Test of Reactivation of the passenger Air Bag system with an Unbelted 5th Percentile female dummy
- 16. Low risk deployment test with 12-month-old dummy (Part 572, Subpart N)
- 17. Low risk deployment test with 3-year-old dummy (Part 572, Subpart P)
- 18. Low risk deployment test with 6-year-old dummy (Part 572, Subpart R)
- 19. Low risk deployment test with 5th female dummy (Part 572, Subpart O)
- 20. Impact tests
   - Frontal Oblique
     - Belted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.1.(a))
     - Unbelted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.2(a)(1))
     - Unbelted 50th male dummy driver and passenger (32 to 40 km/h) (S5.1.2(a)(1) or S5.1.2(b))
   - Frontal 0°
     - Belted 50th male dummy driver (0 to 48 km/h) (S5.1.1(b)(1) or S5.1.1(a))
     - Belted 50th male dummy passenger (0 to 48 km/h) (S5.1.1(b)(1) or S5.1.1(a))
     - Belted 5th female dummy driver (0 to 48 km/h) (S16.1(a))
     - Belted 5th female dummy passenger (0 to 48 km/h) (S16.1(a))
     - Belted 50th male dummy driver and passenger (0 to 56 km/h) (S5.1.1(b)(2))
     - Unbelted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.2(a)(1))
     - Unbelted 50th male dummy driver (32 to 40 km/h) (S5.1.2(a)(2) or S5.1.2(b))
     - Unbelted 50th male dummy passenger (32 to 40 km/h) (S5.1.2(a)(2) or S5.1.2(b))
     - Unbelted 5th female dummy driver (32 to 40 km/h) (S16.1(b))
Unbelted 5th female dummy passenger (32 to 40 km/h) (S16.1(b))

40% Offset 0° Belted 5th female dummy driver and passenger (0 to 40 km/h) (S18.1)

21. Sled test: Unbelted 50th male dummy driver and passenger (S1.3)

22. FMVSS 204 indicant test

23. FMVSS 212 indicant test

24. FMVSS 219 indicant test

25. FMVSS 301 frontal test

For the crash tests, the vehicle was instrumented with 8 accelerometers. The accelerometer data from the vehicle and dummies were sampled at 12,500 samples per second and processed as specified in SAE J211/1 MAR95 and FMVSS 208, S4.13.

The dynamic tests were recorded using high speed film and digital motion picture cameras.

The vehicle appears to meet the performance requirements to which it was tested.
Section 3

Injury Result Summary
INJURY RESULT SUMMARY FOR CRASH TESTS AND/OR
LOW RISK DEPLOYMENT TESTS

NHTSA No.: C40113 Test Date: 03/18/04

VIN: 1G8AF52F54Z

Frontal Crash X Offset Crash Low Risk Deployment ___

Impact Angle: ___ 0 ___

Belted Dummies: Yes X No

Speed Range: X 32 to 40 km/h ___ 0 to 48 km/h ___ 0 to 56 km/h

Test Speed: ___ 40.0 km/h ___

Driver Dummy: ___ 5th female X 50th male

Passenger Dummy: ___ 5th female X 50th male

Test weight: ___ 1426.0 kg ___

50th Percentile Male Frontal Crash Test
Vehicles certified to S5.1.1(b)(1), S5.1.1(b)(2), S5.1.2(a)(2), or S5.1.2(b)

<table>
<thead>
<tr>
<th>Injury Criteria</th>
<th>Max. Allowable Injury Assessment Values</th>
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<th>Passenger</th>
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<tr>
<td>HIC15</td>
<td>700</td>
<td>96</td>
<td>154</td>
</tr>
<tr>
<td>N₁₆</td>
<td>1.0</td>
<td>0.09</td>
<td>0.31</td>
</tr>
<tr>
<td>N₂₀</td>
<td>1.0</td>
<td>0.28</td>
<td>0.19</td>
</tr>
<tr>
<td>N₅₀</td>
<td>1.0</td>
<td>0.22</td>
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<td>N₄₀</td>
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<td>0.09</td>
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<tr>
<td>Neck tension</td>
<td>4170 N</td>
<td>1202</td>
<td>1469</td>
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<tr>
<td>Neck compression</td>
<td>4000 N</td>
<td>1309</td>
<td>390</td>
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<tr>
<td>Chest g</td>
<td>60 g</td>
<td>39.3</td>
<td>34.6</td>
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<tr>
<td>Chest displacement</td>
<td>63 mm</td>
<td>20</td>
<td>9</td>
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<tr>
<td>Left femur</td>
<td>10,000 N</td>
<td>4157</td>
<td>6390</td>
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<tr>
<td>Right femur</td>
<td>10,000 N</td>
<td>5248</td>
<td>3789</td>
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</tbody>
</table>
Section 4

Discussion of Test
DISCUSSION OF TEST

The following data channels recorded an anomalous data spike at approximately 41 milliseconds:

Driver's Y-axis neck force channel, NEKYF1
Driver's Z-axis neck moment channel, NEKZM1
Driver's Z-axis right femur force channel, RFMZF1
Right front passenger's X-axis neck force channel, NEKXF2
Right front passenger's Y-axis neck force channel, NEKYF2
Right front passenger's Z-axis neck moment channel, NEKZM2
Right front passenger's Z-axis left femur force channel, LFMZF2

The right front passenger's neck moment occipital condyle about the Y-axis was also affected.
Section 5

Test Data Sheets
Vehicle model year, make, and model: **2004 Saturn Ion**

**NHTSA No.: C40113**

**COTR signature: Charles R. Case**

**Test Date: 03/18/04**

Tests to be performed for this vehicle are checked below.

1. **X** Rear outward seating position seat belts (S4.1.4.2(b) & (S4.2.4))
2. **X** Air bag labels (S4.5.1)
3. **X** Readiness indicator (S4.5.2)
4. **X** Passenger air bag manual cut-off device (S4.5.4)
5. **X** Lap belt lockability (S7.1.1.5)
6. **X** Seat belt warning system (S7.3)
7. **X** Seat belt contact force (S7.4.3)
8. **X** Seat belt latch plate access (S7.4.4)
9. **X** Seat belt retraction (S7.4.5)
10. **X** Seat belt guides and hardware (S7.4.6)
11. **X** Suppression tests with 12-month-old CRAB1 dummy (Part 572, Subpart R) using the following indicated child restraints.

**Section B**

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<th>Midposition</th>
<th>Full forward</th>
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<td>Century Assura 4553</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
</tr>
<tr>
<td>Century Avanta SE 41530</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
</tr>
<tr>
<td>Century Smart Fit 4543</td>
<td>Full rearward</td>
<td>Midposition</td>
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</tr>
<tr>
<td>Cosco Ariva 02727</td>
<td>Full rearward</td>
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<tr>
<td>Cosco Opus 35 02603</td>
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<td>Midposition</td>
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<tr>
<td>Eventflo Discovery Adjust Right 212</td>
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<td>Midposition</td>
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<tr>
<td>Eventflo First Choice 204</td>
<td>Full rearward</td>
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</tr>
<tr>
<td>Eventflo On My Way Position Right V 282</td>
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<tr>
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<td>Full rearward</td>
<td>Midposition</td>
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<td>Cosco Olympian 02803</td>
<td>Full rearward</td>
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<tr>
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12. Suppression tests with Newborn infant (Part 572, Subpart K) using the following indicated child restraints.

**Section A**

| Cosco Dream Ride 02-719     | Full rearward | Midposition  | Full forward |

13. Suppression tests with 3-year-old dummy (Part 572, Subpart P) using the following indicated child restraints where a child restraint is required.

**Section C**

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<td>Century STE 1000 4416</td>
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</tr>
<tr>
<td>Cosco Olympian 02803</td>
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<td>Midposition</td>
<td>Full forward</td>
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<td>Cosco Touiva 02519</td>
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<td>Eventflo Horizon V 425</td>
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<td>Eventflo Medallion 254</td>
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<th>Position 4</th>
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<td>Full rearward</td>
<td>Midposition</td>
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<tr>
<td>Century Next Step 4920</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
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</tr>
<tr>
<td>Cosco High Back Booster 02-442</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
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<tr>
<td>Evenflo Right Fit 245</td>
<td>Full rearward</td>
<td>Midposition</td>
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14. Suppression tests with representative 3-year-old child using the following indicated child restraints where a child restraint is required. (TP-208-12 Appendix R, Data Sheet 16H and 17H)

Section C

<table>
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<td>Cosco Olympian 02303</td>
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<tr>
<td>Cosco Touriva 02519</td>
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<td>Evenflo Horizon V 425</td>
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<td>Evenflo Medallion 254</td>
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Section D

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<th>Position 3</th>
<th>Position 4</th>
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<td>Evenflo Right Fit 245</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
<td></td>
</tr>
</tbody>
</table>

15. Suppression tests with 3-year-old dummy (Part 572, Subpart P) in the following positions

- Sitting on seat with back against seat back (S22.2.2.1)
- Sitting on seat with back against reclined seat back (S22.2.2.2)
- Sitting on seat with back not against seat back (S22.2.2.3)
- Sitting on seat edge, spine vertical, hands by the child’s side (S22.2.2.4)
- Standing on seat, facing forward (S22.2.2.5)
- Kneeling on seat facing forward (S22.2.2.6)
- Kneeling on seat facing rearward (S22.2.2.7)
- Lying on seat (S22.2.2.8)

16. Suppression tests with representative 3-year-old child in the following positions

- Sitting on seat with back against seat back (S22.2.2.1)
- Sitting on seat with back against reclined seat back (S22.2.2.2)
- Sitting on seat with back not against seat back (S22.2.2.3)
- Sitting on seat edge, spine vertical, hands by the child’s side (S22.2.2.4)
- Standing on seat, facing forward (S22.2.2.5)
- Kneeling on seat facing forward (S22.2.2.6)
- Kneeling on seat facing rearward (S22.2.2.7)
- Lying on seat (S22.2.2.8)

17. Suppression tests with 6-year-old dummy (Part 572, Subpart N) using the following indicated child restraints where a child restraint is required.

Section D

<table>
<thead>
<tr>
<th>Item</th>
<th>Position 1</th>
<th>Position 2</th>
<th>Position 3</th>
<th>Position 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britax Roadster 9004</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
<td></td>
</tr>
<tr>
<td>Century Next Step 4920</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
<td></td>
</tr>
<tr>
<td>Cosco High Back Booster 02-442</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
<td></td>
</tr>
<tr>
<td>Evenflo Right Fit 245</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
<td></td>
</tr>
</tbody>
</table>

18. Suppression tests with representative 6-year-old child using the following indicated child restraints where a child restraint is required.

Section D

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</tr>
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<td>Midposition</td>
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</tr>
<tr>
<td>Evenflo Right Fit 245</td>
<td>Full rearward</td>
<td>Midposition</td>
<td>Full forward</td>
<td></td>
</tr>
</tbody>
</table>

19. Suppression tests with 6-year-old dummy (Part 572, Subpart N) in the following positions

- Sitting on seat with back against seat back (S22.2.2.1)
- Sitting on seat with back against reclined seat back (S22.2.2.2)
- Sitting on seat edge, spine vertical, hands by the dummy’s side (S22.2.2.4)
- Sitting back in the seat and leaning on the right front passenger door (S24.3.3)
20. Suppression tests with representative 6-year-old child in the following positions
   - Sitting on seat with back against seat back (S22.2.2.1)
   - Sitting on seat with back against reclined seat back (S22.2.2.2)
   - Sitting on seat edge, spine vertical, hands by the dummy's side (S22.2.2.4)
   - Sitting back in the seat and leaning on the right front passenger door (S22.2.3)

21. Test of Reactivation of the Passenger Air Bag System with an Unbelted 5th Percentile Female Dummy (S20.3, 22.3, 24.3) Perform this test after the following suppression test(s): 

22. Test of Reactivation of the Passenger Air Bag System with a representative 5th Percentile Female (S20.3, 22.3, 24.3) Perform this test after the following suppression test(s): 

23. Low risk deployment test with 12-month-old dummy (Part 572, Subpart R) using the following indicated child restraints.

Section B
   - Britax Handle with Care 191
   - Century Assure 4533
   - Century Avanza SE 41530
   - Century Smart Fit 4543
   - Cosco Aelite 02772
   - Cosco Opus 35 02603
   - Evenflo Discovery Adjust Right 212
   - Evenflo First Choice 204
   - Evenflo On My Way Position Right V 282
   - Graco Infant 8457

Section C
   - Britax Roundabout 161
   - Century Encore 4612
   - Century STE 1000 4416
   - Cosco Olympian 02803
   - Cosco Tandem 02519
   - Evenflo Horizon V 425
   - Evenflo Medallion 254

24. Low risk deployment test with 3-year-old dummy (Part 572, Subpart P) in the following positions
   - Position 1
   - Position 2

25. Low risk deployment test with 6-year-old dummy (Part 572, Subpart N) in the following positions
   - Position 1
   - Position 2

26. Low risk deployment test with 5th female dummy (Part 572, Subpart O) in the following positions
   - Position 1
   - Position 2

27. Impact tests
   - Frontal Oblique Test Speed
     - Belted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.1.(a))
     - Unbelted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.2(a1))
     - Unbelted 50th male dummy driver and passenger (32 to 40 km/h) (S5.1.2(a1) or S5.1.2(b))
   - Frontal 0° Test Speed 40 km/h
     - Belted 50th male dummy driver (0 to 48 km/h) (S5.1.1(b1) or S5.1.1(a))
     - Belted 50th male dummy passenger (0 to 48 km/h) (S5.1.1(b1) or S5.1.1(a))
     - Belted 5th female dummy driver (0 to 48 km/h) (S16.1(a))
     - Belted 5th female dummy passenger (0 to 48 km/h) (S16.1(a))
     - Belted 50th male dummy driver and passenger (0 to 56 km/h) (S5.1.1(b2))
Unbelted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.2(a)(1))

X Unbelted 50th male dummy driver (32 to 40 km/h) (S5.1.2(a)(2) or S5.1.2(b))

X Unbelted 50th male dummy passenger (32 to 40 km/h) (S5.1.2(a)(2) or S5.1.2(b))

____ Unbelted 5th female dummy driver (32 to 40 km/h) (S16.1(b))

____ Unbelted 5th female dummy passenger (32 to 40 km/h) (S16.1(b))

____ 40% Offset 0° Belted 5th female dummy driver and passenger (0 to 40 km/h) (S18.1)

Test Speed

28. Sled test: Unbelted 50th male dummy driver and passenger (S13)

29. FMVSS 204 indiand test

X 30. FMVSS 212 test

X 31. FMVSS 219 indiand test

X 32. FMVSS 301 frontal test
DATA SHEET 2
REPORT OF VEHICLE CONDITION

CONTRACT NO. DYNH22-03-D-01002 Date: 03/18/04
FROM: Transportation Research Center Inc., Walter Dudek
      Lab & rep name
TO: Charles R. Case .................................................. OVSC, NSA-31
COTR Name
PURPOSE: ( ) Initial Receipt (X) Present vehicle condition
MODEL YEAR/MAKE/MODEL/BODY STYLE: 2004/Saturn Ion/4-door
MANUFACTURE DATE: 11/03 NHTSA NO.: C40113 BODY COLOR: Red
VIN: 1G8AF52F54Z661661 GAWR (Fr) 850 GAWR (Rr) 811
ODOMETER READINGS: ARRIVAL 81 miles DATE 2/24/2004
      COMPLETION 81 miles DATE 03/18/04
PURCHASE PRICE: $ 10,650 DEALER'S NAME: Saturn of Dayton North

A. All options listed on "window sticker" are present on the test vehicle.
   X Yes ___ No

B. Tires and wheel rims are new and the same as listed.
   X Yes ___ No

C. There are no dents or other interior or exterior flaws.
   X Yes ___ No

D. The vehicle has been properly prepared and is in running condition.
   X Yes ___ No

E. Keyless remote is available and working.
   X Yes ___ No

F. The glove box contains an owner's manual, warranty document, consumer
   information, and extra set of keys.
   ___ Yes ___ X No

G. Proper fuel filler cap is supplied on the test vehicle.
   X Yes ___ No

H. Using permanent marker, identify vehicle with NHTSA number and FMVSS test
   type(s) on roof line above driver door or for school buses, place a placard with
   NHTSA number inside the windshield and to the exterior front and rear side of bus.
   X Yes ___ No

I. Place vehicle in storage area.
   X Yes ___ No

J. Inspect the vehicle's interior and exterior, including all windows, seats, doors, etc.,
   To confirm that each system is complete and functional per the manufacturer's
   specifications. Any damage, misadjustment, or other unusual condition that could
   influence the test program or test results shall be recorded. Report any abnormal
   condition to the NHTSA COTR before beginning any test.
   X Vehicle OK ___ Conditions reported below in comment section

Identify the letter above to which any of the following comments apply.
Comments: F: Vehicle did not include an extra set of keys.
LIST OF FMVSS TESTS PERFORMED BY THIS LAB:
208, 212, 219 Indicant, 301

MODEL YEAR/MAKE/MODEL/BODY STYLE: 2004/Saturn/Ion/4-door

NHTSA NO. C40113

REMARKS: None

Equipment that is no longer on the test vehicle as noted on previous page: None

Explanation for equipment removal:

Test Vehicle Condition: Test vehicle crashed in front as part of FMVSS 208 test.

RECORDED BY: Robert Benavides
DATE: 03/19/04

APPROVED BY: Walter Dudek
DATE: 03/25/04

RELEASE OF TEST VEHICLE

The vehicle described above is released from TRC Inc. to be delivered to (Laboratory) (Laboratory)

Date: ___________ Time: ___________ Odometer: ___________

Lab Representative: ____________________________ Signature ____________________________ Title

Carrier/Customer Representative: ____________________________ Signature ____________________________ Date
DATA SHEET 3
Certification Label and Tire Placard Information

NHTSA No.: C40113 Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

1. Certification Label
   Manufacturer: Saturn Corporation
   Date of Manufacture: 11/03
   VIN: 1G8AF52F54Z
   Vehicle certified as: X Passenger car MPV Truck Bus
   Front axle GAWR: 850 kg/1874 lbs.
   Rear axle GAWR: 811 kg/1787 lbs.
   Total GVWR: 1661 kg/3661 lbs.

2. Tire Placard
   N/A – Vehicle is not a passenger car and does not have a tire placard.
   This is not a passenger car (see the item 1 above), but all or part of this
   information is still contained on a vehicle label and is reported here.

   Vehicle Capacity Weight: 408 kg/899 lbs.
   Designated seating capacity front: 2
   Designated seating capacity rear: 3
   Total designated seating capacity: 5
   Recommended cold tire inflation pressure front: 210 kPa/30 psi
   Recommended cold tire inflation pressure rear: 210 kPa/30 psi
   Recommended tire size: P185/70R14
DATA SHEET 4
REAR OUTBOARD SEATING POSITION SEAT BELTS

NHTSA No.: C49113 ____________________________  Test Date: 03/17/04

Laboratory: TRC Inc. ______ Test Technician(s): Michael S. Postle ____________________________

Do all rear outboard seating positions have type 2 seat belts? Yes X; No ______

If NO, describe the seat belt installed, the seat location, and any other information about the seat that would explain why a type 2 seat belt was not installed.

REMARKS:

5-9  040318-1
DATA SHEET 5
AIR BAG LABELS (S4.5.1)

NHTSA No.: C40113
Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

1. Air Bag Maintenance Label and Owner’s Manual Instructions: (S4.5.1(a))
   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 label specifying air bag maintenance or replacement?
      ___ Yes-Pass; ___ No-FAIL
   1.3 Does the label contain one of the following?
      ___ Yes-Pass; ___ No-FAIL
      Check applicable schedule
      ___ Schedule on label specifies month and year (Record date ________)
      ___ Schedule on label specifies vehicle mileage (Record mileage ________)
      ___ Schedule on label specifies interval measured from date on certification label
      (Record interval ________)
   1.4 Is the label permanently affixed within the passenger compartment such that it cannot be
      removed without destroying or defacing the label or the surrvisor?
      ___ 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 inches 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?
      ___ X Yes-Pass; ___ 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?
      ___ X Yes-Pass; ___ No-FAIL
   2.3 Include a statement that the air bag is a supplemental restraint at the front outboard seating
      positions?
      ___ X Yes-Pass; ___ 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?
      ___ X Yes-Pass; ___ 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?
      ___ X Yes-Pass; ___ 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?
      ___ X Yes-Pass; ___ No-FAIL

5-10 040318-1
2.7 Is the vehicle certified to meet the requirements of S14.5, S15, S17, S19, S21, S23, and S25? (Obtain the answer to this question from the COTR.) (§4.5.1(f)(2))

Yes (go to 2.7.1); No (go to 3)

2.7.1 Explain the proper functioning of the advanced air bag system? (§4.5.1(f)(2))

Yes-Pass; No-FAIL

2.7.2 Provide a summary of the actions that may affect the proper functioning of the system? (§4.5.1(f)(2)(i))

Yes-Pass; No-FAIL

2.7.3 Present and explain the main components of the advanced passenger air bag system? (§4.5.1(f)(2)(i))

Yes-Pass; No-FAIL

2.7.4 Explain how the components function together as part of the advanced passenger air bag system? (§4.5.1(f)(2)(ii))

Yes-Pass; No-FAIL

2.7.5 Contain the basic requirements for proper operation, including an explanation of the actions that may affect the proper functioning of the system? (§4.5.1(f)(2)(iii))

Yes-Pass; No-FAIL

2.7.6 Is the vehicle certified to the requirements of S19.2, S21.2 or S23.2 (automatic suppression)?

Yes, continue with 2.7.6

No, go to 2.7.7

2.7.6.1 Contain a complete description of the passenger air bag suppression system installed in the vehicle, including a discussion of any suppression zone? (§4.5.1(f)(2)(iv))

Yes-Pass; No-FAIL

2.7.6.2 Discuss the telltale light, specifying its location in the vehicle and explaining when the light is illuminated?

Yes-Pass; No-FAIL

2.7.7 Explain the interaction of the advanced passenger air bag system with other vehicle components, such as seat belts, seats or other components? (§4.5.1(f)(2)(v))

Yes-Pass; No-FAIL

2.7.8 Summarize the expected outcomes when child restraint systems, children and small teenagers or adults are both properly and improperly positioned in the passenger seat, including cautionary advice against improper placement of child restraint systems? (§4.5.1(f)(2)(vi))

Yes-Pass; No-FAIL

2.7.9 Provide information on how to contact the vehicle manufacturer concerning modifications for persons with disabilities that may affect the advanced air bag system? (§4.5.1(f)(2)(vii))

Yes-Pass; No-FAIL

3. Sun Visor Air Bag Warning Label (§4.5.1 (b)) Check only one of the following:

X The vehicle is not certified to meet the requirements of S19, S21 and S23. (Obtain the answer to this question from the COTR.) (§4.5.1(b)(1))

Go to 3.1 and skip 3.2 and 3.3

The vehicle is certified to meet the requirements of S19, S21 and S23 before 9/1/03. (Obtain the answer to this question from the COTR.) (§4.5.1(b)(2))

Go to 3.2 and skip 3.1 and 3.3

The vehicle is certified to meet the requirements of S19, S21 and S23 on 9/1/03 or later. (Obtain the answer to this question from the COTR.) (§4.5.1(b)(3))

Go to 3.3 and skip 3.1 and 3.2

3.1 Vehicles not certified to meet the requirements of S19, S21 and S23

3.1.1 Is the label permanently affixed (including permanent marking on the visor material or molding into the visor material) to either side of the sun visor at each front outboard seating position such that it cannot be removed without destroying or defacing the label or the sun visor? (§4.5.1(b)(1))

Driver side Yes-Pass

Passenger side Yes-Pass

No-FAIL

No-FAIL
3.1.2 Does the label conform in content to the label shown in either Figure 6a or 6b (Figure 6b is for vehicles with passenger air bag on-off switches), as appropriate, at each front outboard seating position? (S4.5.1(b)(1)) (Vehicles without back seats may omit the statement: "The BACK SEAT is the SAFEST place for children." (S4.5.1(b)(1)(iv)))

Driver side X Yes-Pass ___ No-FAIL
Passenger side X Yes-Pass ___ No-FAIL

3.1.3 Is the label heading area yellow with the word “WARNING” and the alert symbol in black? (S4.5.1(b)(1)(i))

Driver side X Yes-Pass ___ No-FAIL
Passenger side X Yes-Pass ___ No-FAIL

3.1.4 Is the message area white with black text? (S4.5.1(b)(1)(ii))

Driver side X Yes-Pass ___ No-FAIL
Passenger side X Yes-Pass ___ No-FAIL

3.1.5 Is the message area at least 30 cm²? (S4.5.1(b)(1)(ii))

Driver side: Length 10.0 cm, Width 3.0 cm
Passenger side: Length 10.0 cm, Width 3.0 cm
Driver actual message area 30 cm²
Passenger actual message area 30 cm²
Driver side X Yes-Pass ___ No-FAIL
Passenger side X Yes-Pass ___ No-FAIL

3.1.6 Is the pictogram black on a white background? (S4.5.1(b)(2)(iii))

Driver side X Yes-Pass ___ No-FAIL
Passenger side X Yes-Pass ___ No-FAIL

3.1.7 Is the pictogram at least 30 mm in diameter? (S4.5.1(b)(2)(iii))

Actual diameter 30 mm
Driver side X Yes-Pass ___ No-FAIL
Passenger side X Yes-Pass ___ No-FAIL

3.2 Vehciles certified to meet the requirements of S19, S21, and S23 before 9/1/03. (S4.5.1(b)(2))

3.2.1 Is the label permanently affixed (including permanent marking on the visor material or molding into the visor material) to either side of the sun visor at each front outboard seating position such that it cannot be removed without destroying or defacing the label or the sun visor? (S4.5.1(b)(2))

Driver side ___ Yes-Pass ___ No-FAIL
Passenger side ___ Yes-Pass ___ No-FAIL

3.2.2 Does the label conform in content to the label shown in Figure 8 or Figure 11 at each front outboard seating position? (S4.5.1(b)(2)) (Vehicles without back seats may omit the statement: "The BACK SEAT is the SAFEST place for children." (S4.5.1(b)(2)(1)(v)) Vehicles without back seats or the back seat is too small to accommodate a rear-facing child restraint may omit the statement "Never put a rear-facing child seat in the front." (S4.5.1(b)(2)(v)))

Driver side ___ Yes-Pass ___ No-FAIL
Passenger side ___ Yes-Pass ___ No-FAIL

3.2.3 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 ___ No-FAIL
Passenger side ___ Yes-Pass ___ No-FAIL

3.2.4 Is the message area white with black text? (S4.5.1(b)(2)(ii))

Driver side ___ Yes-Pass ___ No-FAIL
Passenger side ___ Yes-Pass ___ No-FAIL
3.2.5 Is the message area at least 30 cm²? (§4.5.1(b)(2)(ii))

Driver side: Length Width
Passenger side: Length Width

Driver actual message area cm²
Passenger actual message area cm²

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.2.6 Is the pictogram black with a red circle and slash on a white background? (§4.5.1(b)(2)(iii))

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.2.7 Is the pictogram at least 30 mm (1.2 in.) in length? (§4.5.1(b)(2)(iii))

Driver side: Length
Passenger side: Length

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3 Vehicles certified to meet the requirements of S19, S21, and S23 on 9/1/03 and later (§4.5.1(b)(3)).

3.3.1 Is the label permanently affixed (including permanent marking on the visor material or molding into the visor material) to either side of the sun visor at each front outboard seating position such that it cannot be removed without destroying or defacing the label or the sun visor? (§4.5.1(b)(3))

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3.2 Does the label conform in content to the label shown in Figure 11 at each front outboard seating position? (§4.5.1(b)(2)) (Vehicles without back seats may omit the statement: "The BACK SEAT IS THE SAFEST place for children." (§4.5.1(b)(3)(iv)) Vehicles without back seats or the back seat is too small to accommodate a rear-facing child restraint may omit the statement "Never put a rear-facing child seat in the front." (§4.5.1(b)(3)(v)))

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3.3 Is the label heading area yellow with the word "WARNING" and the alert symbol in black? (§4.5.1(b)(3)(i))

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3.4 Is the message area white with black text? (§4.5.1(b)(3)(ii))

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3.5 Is the message area at least 30 cm²? (§4.5.1(b)(3)(ii))

Driver side: Length Width
Passenger side: Length Width

Driver actual message area cm²
Passenger actual message area cm²

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3.6 Is the pictogram black with a red circle and slash on a white background? (§4.5.1(b)(3)(iii))

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL

3.3.7 Is the pictogram at least 30 mm in length? (§4.5.1(b)(3)(iii))

Driver side: Length
Passenger side: Length

Driver side Yes-Pass No-FAIL
Passenger side Yes-Pass No-FAIL
3.4 Is the same side of the sun visor that contains the air bag warning label free of other information with the exception of the air bag maintenance label and/or the rollover-warning label? (S4.5.1 (b)(5)(i))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>X Yes-Pass</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>X Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

3.5 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 and/or the rollover-warning label? (S4.5.1 (b)(5)(i))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>X Yes-Pass</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>X Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

3.6 Does the driver side visor contain a rollover-warning label on the same side of the visor as the air bag warning label?

Yes (go to 3.6.1)  No (go to 4., skipping 3.6.1 through 3.6.3)

3.6.1 Are both the rollover-warning label and the air bag warning label surrounded by a continuous solid-lined border?

Yes (go to 3.6.2 and skip 3.6.3)  No (go to 3.6.3 and skip 3.6.2.)

3.6.2 Is the shortest distance from the border of the rollover label to the border of the air bag warning label at least 1 cm? (S75.105 (d)(1)(iv)(B))

| actual distance | Yes-Pass;  No-FAIL |

3.6.3 Is the shortest distance from any of the lettering or graphics on the rollover-warning label to any of the lettering or graphics of the air bag warning label at least 3 cm? (S75.105 (d)(1)(iv)(A))

| actual distance | Yes-Pass;  No-FAIL |

4. Air Bag Alert Label (S4.5.1(e)) (A "Rollover Warning Label" or "Rollover Alert Label" may be on the same side of the driver's sun visor as the "Air Bag Alert Label." S75.105(d))

4.1 Is the Sun Visor Warning Label visible when the sun visor is in the stowed position?

<table>
<thead>
<tr>
<th>Driver side</th>
<th>X Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>X Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

If yes for driver and passenger go to 5.

4.2 Is the air bag alert label permanently affixed (including permanent marking on the visor material or molding into the visor material) to the sun visor at each front outboard seating position such that it cannot be removed without destroying or defacing the label or the sun visor? (S4.5.1 (c))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>Yes-Pass</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

4.3 Is the air bag alert label visible when the visor is in the stowed position? (S4.5.1(c))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>Yes-Pass</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

4.4 Does the label conform in content to the label shown in Figure 6c? (S4.5.1(c))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>Yes-Pass</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

4.5 Is the message area blank with yellow text? (S4.5.1(c)(1))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>Yes-Pass</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

4.6 Is the message area at least 20 cm²? (S4.5.1(e)(1))

<table>
<thead>
<tr>
<th>Driver side</th>
<th>Length</th>
<th>Width</th>
<th>Driver actual message area</th>
<th>cm²</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>Length</td>
<td>Width</td>
<td>Passenger actual message area</td>
<td>cm²</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>

Driver side | Yes-Pass | No-FAIL |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger side</td>
<td>Yes-Pass</td>
<td>No-FAIL</td>
</tr>
</tbody>
</table>
4.7 Is the pictogram black with a red circle and slash on a white background? (S4.5.1(e)(2))
Driver side  Yes-Pass  No-FAIL
Passenger side Yes-Pass  No-FAIL

4.8 Is the pictogram at least 20 mm in diameter? (S4.5.1(c)(2))
Driver side: diameter mm
Passenger side: diameter mm
Driver side  Yes-Pass  No-FAIL
Passenger side  Yes-Pass  No-FAIL

5. Label On the Dashboard
5.1 Is the vehicle certified to meet the requirements of S19, S21, and S23? (Obtain the answer to this question from the COTR.) (S4.5.1(e)(2))
--- Yes (go to 5.1.1 and skip 5.2)
X Yes (go to 5.2, skipping 5.1.1 through 5.1.6)

5.1.1 Does the vehicle have a label on the dash or steering wheel hub? (S4.5.1(e)(2))
--- Yes-Pass;  No-FAIL

5.1.2 Is the label clearly visible from all front seating positions? (S4.5.1(e)(2))
--- Yes-Pass;  No-FAIL

5.1.3 Does the label conform in content to the label shown in Figure 97 (S4.5.1(e)(2)) (Vehicles without back seats may omit the statement: “The back seat is the safest place for children.” (S4.5.1(e)(2)(iii)))
--- Yes-Pass;  No-FAIL

5.1.4 Is the heading area yellow with black text? (S4.5.1(e)(2)(i))
--- Yes-Pass;  No-FAIL

5.1.5 Is the message white with black text? (S4.5.1(e)(2)(ii))
--- Yes-Pass;  No-FAIL

5.1.6 Is the message area at least 30 cm²? (S4.5.1(e)(2)(ii))
Length mm, Width mm
Actual message area cm²
--- Yes-Pass;  No-FAIL

5.2 Does the vehicle have a label on the dash or steering wheel hub? (S4.5.1(e)(1))
--- Yes-Pass;  No-FAIL

5.2.1 Is the label clearly visible from all front seating positions? (S4.5.1(e)(1))
--- Yes-Pass;  No-FAIL

5.2.2 Does the label conform in content to the label shown in Figure 77? (S4.5.1 (e)(1)(iiii)) (Vehicles without back seats may omit the statement: “The back seat is the safest place for children 12 and under.” (S4.5.1(e)(2)(iii))))
--- Yes-Pass;  No-FAIL

5.2.3 Is the heading area yellow with the word “WARNING” and the alert symbol in black? (S4.5.1 (e)(1)(i))
--- Yes-Pass;  No-FAIL

5.2.4 Is the message white with black text? (S4.5.1(e)(1)(ii))
--- Yes-Pass;  No-FAIL

5.2.5 Is the message area at least 30 cm²? (S4.5.1(e)(1)(ii))
Length cm, Width cm
Actual message area cm²
--- Yes-Pass;  No-FAIL
WARNING

DEATH or SERIOUS INJURY can occur

Children 12 and under can be killed by the airbag
The BUCK SEAT in the SAFEST place for children
NEVER put a non-boosting child seat in the front
Seat as far back as possible from the airbag
ALWAYS use SEAT BELTS and CHILD RESTRAINTS

Figure 6a. Sun Visor Label Visible When Visor is in Down Position.

Figure 6b. Sun Visor Label Visible When Visor is in Down Position.
Figure 6c. Sun Visor Label Visible When Visor is in Up Position.

Figure 7. Removable Label on Dash.
Figure 8. Sun Visor Label Visible when Visor is in Down Position.
This Vehicle is Equipped with Advanced Air Bags

Even with Advanced Air Bags
Children can be killed or seriously injured by the air bag.
The back seat is the safest place for children.
Always use seat belts and child restraints.
See owner’s manual for more information about air bags.

Figure 9. Removable Label on Dash.
WARNING

EVEN WITH ADVANCED AIR BAGS

- Children can be killed or seriously injured by the air bag
- The back seat is the safest place for children
- Never put a rear-facing child seat in the front
- Always use seat belts and child restraints
- See owner’s manual for more information about air bags

Figure 11. Sun Visor Label Visible when Visor is in Down Position.
DATA SHEET 6
FMVSS 208 READINESS INDICATOR (§4.5.2)

NHTSA No.: C40113 Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

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 to Lawrence F. Herneberger on behalf of Breed)

X 1. Is the system totally mechanical? Yes ___; No X
   (If YES this Data Sheet is complete.)

X 2. Describe the location of the readiness indicator: Upper right of instrument panel module

X 3. Is the readiness indicator clearly visible to the driver?
   X Yes-Pass; ___ No-FAIL

X 4. Is a list of the elements of the occupant restraint system, being monitored by the readiness indicator, provided on a label or in the owner's manual?
   X Yes-Pass; ___ No-FAIL

X 5. Does the vehicle have an on-off switch for the passenger air bag?
   ____ Yes (go to 6) X No (this form is complete)

____ 6. Is the air bag readiness indicator off when the passenger air bag switch is in the off position?
   ___ Yes-Pass; ____ No-FAIL

REMARKS:
DATA SHEET 7
Passenger Air Bag Manual Cut-Off Device (S4.5.4)

NHTSA No.: C40113
Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

X 1. Is the vehicle equipped with an on-off switch that deactivates the air bag installed at the right front outboard seating position?
   ___ Yes, go to 2
   X No, this sheet is complete

2. Does the vehicle have any forward-facing rear designated seating positions? (S4.5.4(a))
   ___ Yes, go to 3
   ___ No, go to 4

3. Verification of the lack of room for a child restraint in the rear seat behind the driver's seat. (S4.5.4(b))
   ___ 3.1 Position the seat's adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
       ___ N/A - No lumbar adjustment
   ___ 3.2. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
       ___ N/A - No additional support adjustment
   ___ 3.3 If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
       ___ N/A - No independent fore-aft seat cushion adjustment
   ___ 3.4. If the seat cushion height adjusts independent of the seat back, set this adjustment to the full down position. (S16.2.10.3.1)
       ___ N/A - No independent seat cushion height adjustment
   ___ 3.5. Put the seat in its full rearward position. (S16.2.10.3.1)
       ___ N/A - the seat does not have a fore-aft adjustment
   ___ 3.6. If the seat height is adjustable, put it in the full down position. (S16.2.10.3.1)
       ___ N/A - No seat height adjustment
   ___ 3.7 Draw a horizontal reference line on the side of the seat cushion.
   ___ 3.8. Using only the controls that change the seat in the fore-aft direction, mark the fore-aft seat positions. Mark the side of the seat and a reference position directly below on a part of the vehicle that does not adjust. For manual seats, move the seat forward one detent at a time and mark each detent as was done for the full rearward position. For power seats, mark only the full rearward, middle, and full forward positions. Label three of the positions with the following: F for full forward, M for mid-position (if there is no mid position, label the closest adjustment position to the rear of the mid-point), and R for full rearward.
       ___ N/A - The seat does not have a fore-aft adjustment.
   ___ 3.9. Using only the controls that change the seat in the fore-aft direction, place the seat in the full rearward position and then place the seat in the middle fore-aft position. (S8.1.2)
       ___ N/A - The seat does not have fore-aft adjustment.
   ___ Mid position
   If there is no mid position, put the seat in the closest adjustment position to the rear of the midpoint. Describe the location of the seat:

   ___ 3.10. If seat adjustments, other than fore-aft, are present and the horizontal reference line is no longer horizontal, use those adjustments to maintain the reference line as closely as possible to the horizontal.
       ___ N/A - No adjustments

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040318-1
3.11. The seat back angle, if adjustable, is set at the manufacturer's nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)

N/A – No seat back angle adjustment

Manufacturer's design seat back angle

Tested seat back angle

3.12 Is the driver seat a bucket seat?

Yes, go to 3.12.1 and skip 3.12.2.

No, go to 3.12.2 and skip 3.12.1.

3.12.1 Bucket seats:

3.12.1.1 Locate and mark a vertical Plane B through the longitudinal centerline of the seat driver's seat cushion. (S22.2.1.3) The longitudinal centerline of a bucket seat cushion is determined at the widest part of the seat cushion. Measure perpendicular to the longitudinal centerline of the vehicle.

Record the width of the seat.

3.12.1.2 Locate the longitudinal horizontal line in plane B that is tangent to the highest point of the rear seat cushion behind the driver's seat. Measure along this line from the front of the seat back of the rear seat to the rear of the seat back of the driver's seat.

mm distance

less than 720 mm – Pass

more than 720 mm – FAIL

Go to 4

3.12.2 Bench seats (including split bench seats):

3.12.2.1 Locate and mark a vertical Plane B through the center of the steering wheel parallel to the vehicle longitudinal centerline.

3.12.2.2 Locate the longitudinal horizontal line in plane B that is tangent to the highest point of the rear seat cushion. Measure along this line from the front of the seat back of the rear seat to the rear of the seat back of the front seat.

mm distance

less than 720 mm – Pass

more than 720 mm – FAIL

Go to 4

4. Does the device turn the air bag on and off using the vehicle's ignition key? (S4.5.4.2)

Yes-Pass; No-FAIL

5. Is the on-off device separate from the ignition switch? (S4.5.4.2)

Yes-Pass; No-FAIL

6. Is there a telltale light that comes on when the passenger air bag is turned off? (S4.5.4.2)

Yes-Pass; No-FAIL

7. Telltale light (S4.5.4.3)

7.1 Is the light yellow? S4.5.4.3(a)

Yes-Pass; No-FAIL

7.2 Are the words "PASSENGER AIR BAG OFF" (S4.5.4.3(b)) located:

7.2.1 on the telltale?

Yes – Pass, go to 7.3

No – go to 7.2.2

7.2.2 within 25 mm of the telltale? mm from the edge of the telltale light

Yes-Pass; No-FAIL
7.3 Does the telltale remain illuminated while the air bag is turned off? (S4.5.4.3(c)) (Leave the air bag off for 5 minutes.)
   Yes-Pass; No-FAIL

7.4 Is the telltale illuminated while the air bag is turned on? (S4.5.4.3(d))
   Yes-Pass; No-FAIL

7.5 Is the telltale combined with the air bag readiness indicator? (S4.5.3(e))
   Yes-FAIL; No-Pass

8. Owner's manual
   8.1 Does the owner's manual contain complete instructions on the operation of the on-off switch? (S4.5.4.4(a))
      Yes-Pass; No-FAIL

   8.2 Does the owner's manual contain a statement that the on-off switch should only be used when a member of one of the following risk groups is occupying the right front passenger seating position? (S4.5.4.4(b))
      Infants:
      the rear seat is too small to accommodate a child restraint
      there is a medical condition that must be monitored constantly
      Children aged 1 to 12:
      space is not always available in the rear seat
      there is a medical condition that must be monitored constantly
      Medical condition:
      medical risk causes special risk for passenger
      greater risk for harm than with the air bag on
      Yes-Pass; No-FAIL

   8.3 Does the owner's manual contain a warning about the safety consequences of using the on-off switch at other times?
      Yes-Pass; No-FAIL
DATA SHEET 8
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 that can be adjusted to forward-facing or that is a forward-facing seat, other than the driver's seat (S7.1.1.5(a), and that has seat belt retractors that are not solely automatic locking retractors. (S7.1.1.5(c))

NHTSA No.: C40113 ____________________________ Test Date: 03/17/04

Laboratory: TRC Inc. ____________________________ Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Front Row Right

N/A - No retractor is at this position
N/A - The retractor is an automatic locking retractor ONLY

X 1. Record test fore-aft seat position. Full Rear (S7.1.1.5 (c)(1)) (Any position is acceptable.)

X 2. 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 of the vehicle. (S7.1.1.5 (a))
   X Yes-Pass; __ No-FAIL

X 3. 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))
   X Yes-Pass; __ No-FAIL

X 4. Buckle the seat belt. (S7.1.1.5(c)(1))

X 5. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

X 6. 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))

X 7. 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?
   X Yes; __ No (If yes, go to 7.1. If no, go to 8.)

X 7.1 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))
   X Yes-Pass; __ No-FAIL

X 8. 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) & S7.1.1.5(c)(1))

X 9. 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 44.5 inches

X 10. 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))
X_11. 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)

X_12. 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 32.0 inches

X_13. 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 25 lb/sec (spec. 10 to 50 lb/sec) (S7.1.1.5(c)(5))

Measured distance between A and B 32.2 inches (S7.1.1.5(c)(6))

X_14. Subtract the measurement in 13 from the measurement in 12. Is the difference 2 inches or less? (S7.1.1.5(c)(7)) 13-12 = -0.2 inches;

X Yes-Pass; No-FAIL

X_15. Subtract the measurement in 9 from the measurement in 13. Is the difference 3 inches or more? (S7.1.1.5(c)(8)) 9-13 = 12.3 inches;

X Yes-Pass; No-FAIL

REMARKS:
Figure 5. - Webbing Tension Pull Device
DATA SHEET 8
LAP BELT LOCKABILITY
Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (87.1.1.5)

Complete one of these forms for each designated seating position that can be adjusted to forward-facing or that is a forward-facing seat, other than the driver’s seat (87.1.1.5(a), and that has seat belt retractors that are not solely automatic locking retractors. (87.1.1.5(c))

NHTSA No.: C40113
Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Right

N/A – No retractor is at this position
N/A – The retractor is an automatic locking retractor ONLY

1. Record test fore-aft seat position. Fixed (87.1.1.5 (c)(1))
   (Any position is acceptable.)

2. 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 of the vehicle. (87.1.1.5 (a))
   X Yes-Pass; No-FAIL

3. 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. (87.1.1.5 (a))
   X Yes-Pass; No-FAIL

4. Buckle the seat belt. (87.1.1.5(c)(1))

5. Locate a reference point A on the seat belt buckle. (87.1.1.5(c)(2))

6. 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. (87.1.1.5(c)(2))

7. Does the vehicle user need to take any 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?
   X Yes; No (If yes, go to 7.1. If no, go to 8.)

7.1 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. (87.1.1.5(b))
   X Yes-Pass; No-FAIL

8. 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. (87.1.1.5(c)(2) & 87.1.1.5(c)(1))

9. 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. (87.1.1.5(c)(2))
   Measured distance between A and B 50.5 inches

10. 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. (87.1.1.5(a)(3))

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X 11. 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° (spec. 5 - 15 degrees)

X 12. 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 40.5 inches

X 13. 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 2.5 lb/sec (spec. 10 to 50 lb/sec) (S7.1.1.5(c)(5))

Measured distance between A and B 40.5 inches

X 14. Subtract the measurement in 13 from the measurement in 12. Is the difference 2 inches or less? (S7.1.1.5(c)(7)) 13-12= 0 inches;

__ Yes-Pass; __ No-FAIL

X 15. Subtract the measurement in 9 from the measurement in 13. Is the difference 3 inches or more? (S7.1.1.5(c)(8)) 9-13= 10 inches;

__ Yes-Pass; __ No-FAIL

REMARKS:
Direction of Pull

Dimension A - Width of Webbing Plus 1/2 Inch
Dimension B - 1/2 of Dimension A

Figure 5. - Webbing Tension Pull Device
DATA SHEET 8
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 that can be adjusted to forward-facing or that is a forward-facing seat, other than the driver's seat (S7.1.1.5(a), and that has seat belt retractors that are not solely automatic locking retractors. (S7.1.1.5(c))

NHTSA No.: C40113 ___________________________ Test Date: 03/17/04

Laboratory: TRC Inc. ___________________________ Test Technician(s): Michael S. Postle ___________________________

DESIGNATED SEATING POSITION: Second Row Center ___________________________

___ N/A – No retractor is at this position
___ N/A – The retractor is an automatic locking retractor ONLY

X 1. Record test fore-aft seat position. Fixed ___________________________ (S7.1.1.5(c)(1))
   (Any position is acceptable.)

X 2. 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 of the vehicle. (S7.1.1.5 (a))
   X Yes-Pass; ___ No-FAIL

X 3. 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))
   X Yes-Pass; ___ No-FAIL

X 4. Buckle the seat belt. (S7.1.1.5(c)(1))

X 5. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

X 6. 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))

X 7. 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?
   X Yes; ___ No (If yes, go to 7.1. If no, go to 8.)

X 7.1 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))
   X Yes-Pass; ___ No-FAIL

X 8. 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) & S7.1.1.5(c)(1))

X 9. 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 56.5 _______ inches

X 10. 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))

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X 11. 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___________ (spec. 5 - 15 degrees)

X 12. 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 41.5___________ inches

X 13. 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 25__________ lb/sec (spec. 10 to 50 lb/sec) (S7.1.1.5(c)(5))

Measured distance between A and B 42.0___________ inches (S7.1.1.5(c)(6))

X 14. Subtract the measurement in 13 from the measurement in 12. Is the difference 2 inches or less? (S7.1.1.5(c)(7)) 13-12 = -0.5 __________ inches;

X Yes-Pass; No-FAIL

X 15. Subtract the measurement in 9 from the measurement in 13. Is the difference 3 inches or more? (S7.1.1.5(c)(8)) 9-13 = 14.5 __________ inches;

X Yes-Pass; No-FAIL

REMARKS:
Figure 5. - Webbing Tension Pull Device

Dimension A - Width of Webbing Plus 1/2 Inch
Dimension B - 1/2 of Dimension A
DATA SHEET 8
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 that can be adjusted to forward-facing or that is a forward-facing seat, other than the driver's seat (S7.1.1.5(a)), and that has seat belt reductors that are not solely automatic locking reductors. (S7.1.1.5(c))

NHTSA No.: C40113 Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: __ Second Row Left

___ N/A – No reductor is at this position
___ N/A – The reductor is an automatic locking reductor ONLY

X 1. Record test fore-aft seat position. Fixed (S7.1.1.5 (c)(1))
   (Any position is acceptable.)

X 2. 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, reductor, or any other part of the vehicle. (S7.1.1.5 (a))
   X Yes-Pass; ___ No-FAIL

X 3. 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))
   X Yes-Pass; ___ No-FAIL

X 4. Buckle the seat belt. (S7.1.1.5(c)(1))

X 5. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

X 6. Locate a reference point B on the attachment hardware or reductor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

X 7. 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?
   X Yes;
   ___ No (If yes, go to 7.1. If no, go to 8.)

X 7.1 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 tighten secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1.5(b))
   X Yes-Pass; ___ No-FAIL

X 8. 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) & S7.1.1.5(c)(1))

X 9. 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: 50.3 inches

X 10. 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))
X 11. 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)

X 12. 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: 38.2 inches

X 13. 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: 25 lb/sec (spec. 10 to 50 lb/sec) (S7.1.1.5(c)(5))

Measured distance between A and B: 38.6 inches (S7.1.1.5(c)(6))

X 14. Subtract the measurement in 13 from the measurement in 12. Is the difference 2 inches or less? (S7.1.1.5(c)(7)) 13-12= 0.4 inches;

X Yes-Pass;  No-FAIL

X 15. Subtract the measurement in 9 from the measurement in 13. Is the difference 3 inches or more? (S7.1.1.5(c)(8)) 9-13= 11.7 inches;

X Yes-Pass;  No-FAIL

REMARKS:
Figure 5. - Webbing Tension Pull Device

Dimension A - Width of Webbing Plus 1/2 Inch
Dimension B - 1/2 of Dimension A
DATA SHEET 9
FMVSS 208 SEAT BELT WARNING SYSTEM CHECK (S7.3)

NHTSA No.: C40113 Test Date: 03/17/04
Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

X 1. The occupant is in the driver’s seat.
X 2. The seat belt is in the stowed position.
X 3. The key is in the “on” or “start” position.
X 4. The time duration of the audible signal beginning with key “on” or “start” is 7.0 seconds.
X 5. The occupant is in the driver’s seat.
X 6. The seat belt is in the stowed position.
X 7. The key is in the “on” or “start” position.
X 8. The time duration of the warning light beginning with key “on” or “start” is 72 seconds.
X 9. The occupant is in the driver’s seat.
X 10. The seat belt is in the latched position and with at least 4 inches of belt webbing extended.
X 11. The key is in the “on” or “start” position.
X 12. The time duration of the audible signal beginning with key “on” or “start” is 0 seconds.
X 13. The occupant is in the driver’s seat.
X 14. The seat belt is in the latched position and with at least 4 inches of belt webbing extended.
X 15. The key is in the “on” or “start” position.
X 16. The time duration of the warning light beginning with key “on” or “start” is 0 seconds.
X 17. Complete the following table with the data from 4, 8, 12 and 16 to determine which option is used

<table>
<thead>
<tr>
<th>S7.3 (a)(1)</th>
<th>Warning light</th>
<th>Audible signal</th>
<th>Audible signal specification*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belt latched &amp; Key on or start</td>
<td>Item 16   0</td>
<td>Item 12   0</td>
<td>0 seconds**</td>
</tr>
<tr>
<td>Belt stowed &amp; Key on or start</td>
<td>Item 8   72</td>
<td>Item 4   7.0</td>
<td>4 to 8 seconds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S7.3 (a)(2)</th>
<th>Warning light</th>
<th>Audible signal</th>
<th>Audible signal specification*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belt latched &amp; Key on or start</td>
<td>Item 16   0</td>
<td>Item 12   0</td>
<td>0 seconds**</td>
</tr>
<tr>
<td>Belt stowed &amp; Key on or start</td>
<td>Item 8   72</td>
<td>Item 4   7.0</td>
<td>4 to 8 seconds</td>
</tr>
</tbody>
</table>

* 49 USCS @ 30124 does NOT allow an audible signal to operate for more than 8 seconds.
** 0 seconds means the light or audible signal are NOT permitted to operate under these conditions. See 7/12/00 interpretation to Patrick Raher of Hogan and Hartson
18. The seat belt warning system meets the requirements of (manufacturers may comply with either section)
   - X S7.3 (a)(1)
   - S7.3 (a)(2)
   - FAIL - Does NOT meet the requirements of either option

19. Note wording of visual warning: (S7.3(a)(1) and S7.3(a)(2))
   - X Fasten Seat Belts
   - Fasten Belts
   - Symbol 101
   - FAIL - Does not use any of the above wording or symbol
DATA SHEET 10
BELT CONTACT FORCE (S7.4.3)

NHTSA No.: C40113  Test Date: 03/17/04
Laboratory: TRC Inc.  Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Right

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.

X 1. Does the vehicle incorporate a webbing tension-relieving device?
   ___ Yes (this form is complete)
   X  No (continue with this check sheet)

X 2. Position the seat's adjustable lumbar support so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
   X  N/A - No lumbar adjustment

X 3. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
   X  N/A - No additional support adjustment

X 4. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
   X  N/A - No independent fore-aft seat cushion adjustment

X 5. If the seat cushion height adjusts independent of the seat back, set this adjustment to the full down position. (S16.2.10.3.1)
   X  N/A - No independent seat cushion height adjustment

X 6. Put the seat in its full rearward position. (S16.2.10.3.1)
   X  N/A - the seat does not have a fore-aft adjustment

X 7. If the seat height is adjustable, put it in the full down position. (S16.2.10.3.1)
   X  N/A - No seat height adjustment

X 8. Draw a horizontal reference line on the side of the seat cushion.

X 9. Using only the controls that change the seat in the fore-aft direction, mark the fore-aft seat positions. Mark the side of the seat and a reference position directly below on a part of the vehicle that does not adjust. For manual seats, move the seat forward one detent at a time and mark each detent as was done for the full rearward position. For power seats, mark only the full rearward, middle, and full forward positions. Label three of the positions with the following: F for full forward, M for mid position (if there is no mid position, label the closest adjustment position to the rear of the mid-point), and R for full rearward.
   X  N/A - The seat does not have a fore-aft adjustment.

X 10. Using only the controls that change the seat in the fore-aft direction, place the seat in the full rearward position and then place the seat in the middle fore-aft position for this test. (S8.1.2)
      ___ Mid position. If there is no mid position, put the seat in the closest adjustment position to the rear of the midpoint. Describe the location of the seat:
      X  N/A - The seat does not have a fore-aft adjustment.

X 11. If seat adjustments other than fore-aft are present and the horizontal reference line is no longer horizontal, use those adjustments to maintain the reference line as closely as possible to the horizontal. (S16.2.10.3.2.1)
   X  N/A - No adjustments
   Reference line angle as tested

5-39  040318-1
12. The seat back angle, if adjustable, is set at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)

13. Position the test dummies according to dummy position placement instructions in Appendix B and include the positioning check sheets.

14. Fasten the seat belt latch.

15. 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.

16. 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. (S10.8) Using a force measuring gage with a full scale range of no more than 1.5 pounds, measure the contact force perpendicular to the dummy’s chest exerted by the belt webbing.

- Contact force: 0.46 lb.
- 0.0 to 0.7 pounds - Pass
- Greater than 0.7 pounds - FAIL
DATA SHEET 10
BELT CONTACT FORCE (S7.4.3)

NHTSA No.: C40113  Test Date: 03/17/04

Laboratory: TRC Inc.  Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Center

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?
   [X] Yes (this form is complete)
   [ ] No (continue with this check sheet)

2. Position the seat's adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
   [X] N/A - No lumbar adjustment

3. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
   [X] N/A - No additional support adjustment

4. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
   [X] N/A - No independent fore-aft seat cushion adjustment

5. If the seat cushion height adjusts independent of the seat back, set this adjustment to the full down position. (S16.2.10.3.1)
   [X] N/A - No independent seat cushion height adjustment.

6. Put the seat in its full rearward position. (S16.2.10.3.1)
   [X] N/A - the seat does not have a fore-aft adjustment

7. If the seat height is adjustable, put it in the full down position. (S16.2.10.3.1)
   [X] N/A - No seat height adjustment

8. Draw a horizontal reference line on the side of the seat cushion.

9. Using only the controls that change the seat in the fore-aft direction, mark the fore-aft seat positions. Mark the side of the seat and a reference position directly below on a part of the vehicle that does not adjust. For manual seats, move the seat forward one dent at a time and mark each dent as was done for the full rearward position. For power seats, mark only the full rearward, middle, and full forward positions. Label three of the positions with the following: F for full forward, M for mid position (if there is no mid position, label the closest adjustment position to the rear of the mid-point), and R for full rearward.
   [X] N/A - The seat does not have a fore-aft adjustment.

10. Using only the controls that change the seat in the fore-aft direction, place the seat in the full rearward position and then place the seat in the middle fore-aft position for this test. (S8.1.2)
    [ ] Mid position. If there is no mid position, put the seat in the closest adjustment position to the rear of the midpoint. Describe the location of the seat: ____________________________
    [X] N/A - The seat does not have a fore-aft adjustment.

11. If seat adjustments other than fore-aft are present and the horizontal reference line is no longer horizontal, use those adjustments to maintain the reference line as closely as possible to the horizontal. (S16.2.10.5.2.1)
    [X] N/A - No adjustments

Reference line angle as tested ____________________
12. The seat back angle, if adjustable, is set at the manufacturer's nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (§4.5.4.1 (b) and 88.13)

X N/A - No adjustments

Manufacturer's design seat back angle

Tested seat back angle

13. Position the test dummies according to dummy position placement instructions in Appendix B and include the positioning check sheets.

X 14. Fasten the seat belt latch.

X 15. 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.

X 16. 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) Using a force measuring gage with a full scale range of no more than 5.0 pounds, measure the contact force perpendicular to the dummy's chest exerted by the belt webbing.

Contact force _0.44_ lb.

X 0.0 to 0.7 pounds - Pass

___ greater than 0.7 pounds - FAIL
DATA SHEET 10
BELT CONTACT FORCE (S7.4.3)

NHTSA No.: C40113
Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Left

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.

X 1. Does the vehicle incorporate a webbing tension-relieving device?
   ___ Yes (this form is complete)
   ___ No (continue with this check sheet)

X 2. Position the seat's adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
   ___ N/A - No lumbar adjustment

X 3. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
   ___ N/A - No additional support adjustment

X 4. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
   ___ N/A - No independent fore-aft seat cushion adjustment

X 5. If the seat cushion height adjusts independent of the seat back, set this adjustment to the full down position. (S16.2.10.3.1)
   ___ N/A - No independent seat cushion height adjustment

X 6. Put the seat in its full rearward position. (S16.2.10.3.1)
   ___ N/A - the seat does not have a fore-aft adjustment

X 7. If the seat height is adjustable, put it in the full down position. (S16.2.10.3.1)
   ___ N/A - No seat height adjustment

X 8. Draw a horizontal reference line on the side of the seat cushion.

X 9. Using only the controls that change the seat in the fore-aft direction, mark the fore-aft seat positions. Mark the side of the seat and a reference position directly below on a part of the vehicle that does not adjust. For manual seats, move the seat forward one detent at a time and mark each detent as was done for the full rearward position. For power seats, mark only the full rearward, middle, and full forward positions. Label three of the positions with the following: F for full forward, M for mid position (if there is no mid position, label the closest adjustment position to the rear of the mid-point), and R for full rearward.
   ___ N/A - The seat does not have a fore-aft adjustment.

X 10. Using only the controls that change the seat in the fore-aft direction, place the seat in the full rearward position and then place the seat in the middle fore-aft position for this test. (S8.1.2)
   ___ Mid position. If there is no mid position, put the seat in the closest adjustment position to the rear of the midpoint. Describe the location of the seat:
   ___ N/A - The seat does not have a fore-aft adjustment.

X 11. If seat adjustments other than fore-aft are present and the horizontal reference line is no longer horizontal, use those adjustments to maintain the reference line as closely as possible to the horizontal. (S16.2.10.3.2.1)
   ___ N/A - No adjustments

Reference line angle as tested
12. The seat back angle, if adjustable, is set at the manufacturer's nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)
   X N/A = No adjustments
   Manufacturer's design seat back angle
   Tested seat back angle

13. Position the test dummies according to dummy position placement instructions in Appendix B and include the positioning check sheets.

14. Fasten the seat belt intah.

15. 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.

16. 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. (S10.8) Using a force measuring gauge with a full scale range of no more than 1.5 pounds, measure the contact force perpendicular to the dummy's chest exerted by the belt webbing.
   Contact force 0.46 _______ lb.
   X 0.6 to 0.7 pounds - Pass
   _____ greater than 0.7 pounds - FAIL
DATA SHEET 11
LATCHPLATE ACCESS (S7.4.4)

NHTSA No.: C40113 Test Date: 

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: N/A - Passenger car

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's adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S16.2.10.3)
   ___ N/A - No lumbar adjustment

2. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
   ___ N/A - No additional support adjustment

3. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
   ___ N/A - No independent fore-aft seat cushion adjustment

4. If the seat cushion height adjusts independent of the seat back, set this adjustment to the full down position. (S16.2.10.3.1)
   ___ N/A - No independent seat cushion height adjustment.

5. Put the seat in its full rearward position. (S16.2.10.3.1)
   ___ N/A - the seat does not have a fore-aft adjustment

6. If the seat height is adjustable, put it in the full down position. (S16.2.10.3.1)
   ___ N/A - No seat height adjustment

7. Draw a horizontal reference line on the side of the seat cushion

8. Using only the controls that change the seat in the fore-aft direction, mark the fore-aft seat positions. Mark the side of the seat and a reference position directly below on a part of the vehicle that does not adjust. For manual seats, move the seat forward one detent at a time and mark each detent as was done for the full rearward position. For power seats, mark only the full rearward, middle, and full forward positions. Label three of the positions with the following: F for full forward, M for mid-position (if there is no mid position, label the closest adjustment position to the rear of the mid-point), and R for full rearward.
   ___ N/A - The seat does not have a fore-aft adjustment.

9. Using only the controls that change the seat in the fore-aft direction, place the seat in the full rearward position and then place the seat in the forwardmost fore-aft position for this test. (S10.7)

10. If seat adjustments, other than fore-aft, are present and the horizontal reference line is no longer horizontal, use those adjustments to maintain the reference line as closely as possible to the horizontal.
   ___ N/A - No adjustments

Reference line angle as tested 

5-45 040318-1
11. The seat back angle, if adjustable, is set at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)

N/A – No seat back angle adjustment
Manufacturer’s design seat back angle
Tested seat back angle

12. Position the test dummy using the procedures in Appendix A. (Some modifications to the positioning procedure may need to be made because the seat is in its forward most position. Note on the Appendix A positioning check sheet any deviations necessary to position the Part 572, Subpart E dummy.) Include the positioning check sheet with this form.

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

14. Attach the inboard reach string to the base of the head following the instructions on Figure 3.

15. Attach the outboard reach string to the torso sheath following the instructions on Figure 3.

16. Place the latch plate in the stowed position.

17. Extend inboard reach string in front of the dummy and then backward and outboard to the latch plate to generate an arc of the reach envelope of the test dummy’s arms. Is the latch plate within the reach envelope?
   ___ Yes-Pass;  ___ No

18. Extend outboard reach string in front of the dummy and then backward and outboard to the latch plate to generate an arc of the reach envelope of the test dummy’s arms. Is the latch plate within the reach envelope?
   ___ Yes-Pass;  ___ No

19. Is the latch plate within the inboard (item 17) or outboard (item 18) reach envelope?
   ___ Yes-Pass;  ___ No-FAIL

20. Using the clearance test block, specified in Figure 4, is there sufficient clearance between the vehicle seat and the side of vehicle interior to allow the test block to move unhindered to the latch plate or buckle?
   ___ Yes-Pass;  ___ No-FAIL
Attach the inboard Reach String (19 1/4" long) at the base of the head on centerline.

Rear view
50th %ile dummy seated in normal seat adjustment position.

Attach the outboard Reach String (21 1/2" long) at this point on the torso sheath.

--- Using flexible tape measure 9" from back centerline 10 1/2" from front centerline to find anchor point below arm pit on torso sheath.

Seat Plane is 80” to the Torso Line

Figure 3. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility Using Subject T Test Device
Figure 4—USE OF CLEARANCE TEST BLOCK TO DETERMINE HAND/ARM ACCESS

[Diagram showing the use of a clearance test block to determine hand/arm access, with a note about corners being rounded off to reduce snags.]
DATA SHEET 12
SEAT BELT RETRACTION (S7.4.5)

NHTSA No.: C40113 Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: N/A - Passenger car

GVWR: 1661 kg/3661 lbs.

Test all front outboard 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.

_ X 1. Is the vehicle a passenger car or walk-in van-type vehicle?
   _ X Yes, this form is complete
   _ No

_ 2. Position the seat's adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
   _ N/A - No lumbar adjustment

_ 3. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
   _ N/A - No additional support adjustment

_ 4. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
   _ N/A - No independent fore-aft seat cushion adjustment

_ 5. If the seat cushion height adjusts independent of the seat back, set this adjustment to the full down position. (S16.2.10.3.1)
   _ N/A - No independent seat cushion height adjustment.

_ 6. Put the seat in its full rearward position.
   _ N/A - The seat does not have a fore-aft adjustment

_ 7. If the seat height is adjustable, put it in the full down position. (S8.1.2)
   _ N/A - No seat height adjustment

_ 8. Draw a horizontal line on the side of the seat cushion.

_ 9. Using only the controls that change the seat in the fore-aft direction, mark the fore-aft seat positions. Mark the side of the seat and a reference position directly below on a part of the vehicle that does not adjust. For manual seats, move the seat forward one detent at a time and mark each detent as was done for the full rearward position. For power seats, mark only the full rearward, middle, and full forward positions. Label three of the positions with the following: F for full forward, M for mid-position (if there is no mid position, label the closest adjustment position to the rear of the mid-point), and R for full rearward.
   _ N/A - The seat does not have a fore-aft adjustment.

_ 10. If seat adjustments, other than fore-aft, are present and the reference line is no longer horizontal, use those adjustments to maintain the reference line as closely as possible to the horizontal. (S16.2.103.2)
   _ N/A - No seat adjustments

Reference angle as tested
11. The seat back angle, if adjustable, is set at the manufacturer's nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S8.1.3)
   __ N/A – No seat back angle adjustment
   Manufacturer’s design seat back angle
   ______________
   Tested seat back angle
   ______________

12. If adjustable, set the head restraint at the full up and full forward position. (S8.1.3) Any adjustment of the head restraint shall be used to position it full forward. For example, if it rotates, rotate it such that the head restraint extends as far forward as possible.
   __ N/A – No head restraint adjustment

13. Place any adjustable seat belt anchorages at the vehicle manufacturer’s nominal design position for a 50th percentile adult male occupant (S8.1.3)
   __ N/A – No adjustable upper seat belt anchorage
   Manufacturer’s specified anchorage position
   ______________
   Tested anchorage position
   ______________

14. Is the driver seat a bucket seat?
   __ Yes, go to 14.1 and skip 14.2.
   __ No, go to 14.2 and skip 14.1.

14.1 Bucket seats:
   Locate and mark a vertical Plane B through the longitudinal centerline of the seat. The longitudinal centerline of a bucket seat cushion is determined at the widest part of the seat cushion. Measure perpendicular to the longitudinal centerline of the vehicle.
   Record the width of the seat.
   mm ______________
   Record the distance from the edge of the seat to Plane B.
   mm ______________

14.2 Bench seats (including split bench seats):
   __ Driver seat: Locate and mark a vertical Plane B through the center of the steering wheel parallel to the vehicle longitudinal centerline.
   __ Passenger seat: Locate and mark a vertical longitudinal Plane B on the seat that is the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel.
   Distance from the vehicle centerline to the center of the steering wheel
   ______________
   Distance from the vehicle centerline to Plane B
   ______________

15. Stow outboard arrears that are capable of being stowed. (S7.4.5)

16. Remove the arms of a Subpart E dummy and place it in the seat such that the midsagittal plane is coincident with Plane B and the upper torso rests against the seat back. (S10.4.1.1 & S10.4.1.2)

17. Rest the thighs on the seat cushion.

18. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined by using the equipment and procedures specified in SAE J826 (APR 1980). (S10.4.2.1) Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications. (S10.4.2.1) and S10.4.2.2)

   __ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.)
   (S10.4.2.1)
   __ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.)
   (S10.4.2.1)
   __ pelvic angle (20° to 25°) (S10.4.2.2)

19. Set the distance between the outboard knee elevis flange surfaces at 10.6 inches.
   __ measured distance (10.6 inches) (S10.5)
20. To the extent practicable keep the thighs and the legs in a vertical plane (§10.5) and rest the thighs on the seat cushion while resting the feet on the floorpan or toe board.

21. Fasten the seat belt around the dummy.

22. Remove all slack from the lap belt portion. (§10.9)

23. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times. (§10.9)

24. Apply a 2 to 4 pound tension load to the lap belt. (§10.9)

___ pound load applied

25. Is the belt system equipped with a tension relieving device?

___ Yes, continue

___ No, go to 26

25.1 Introduce the maximum amount of slack into the upper torso belt that is recommended by the vehicle manufacturer in the vehicle owner's manual. (§10.9). Go to 26.

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

26.1 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 latch plate is released. ___ Pass

26.2 The torso and lap belt webbing of the seat belt system automatically retracts when the seat belt latch plate is released. ___ Pass

26.3 Neither A or B apply. ___ FAIL

27. 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

28. If this test vehicle has an open body (without doors) and has a seat system with a tension-relieving device, does the seat system fully retract when the tension-relieving device is deactivated?

___ N/A

___ Yes-Pass; ___ No-FAIL
DATA SHEET 13
SEAT BELT GUIDES AND HARDWARE (S7.4.6)

NHTSA No.: C40113  Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Right

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.

X 1. Is the seat cushion movable so that the seat back serves a function other than seating? (S7.4.6.1(b))
   Yes; this form is complete
   No; go to 2

X 2. Is the seat removable? (S7.4.6.1(b))
   Yes; this form is complete
   No; go to 3

X 3. Is the seat movable so that the space formerly occupied by the seat can be used for a secondary function? (S7.4.6.1(b))
   Yes; this form is complete
   No; go to 4

X 4. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back? (S7.4.6.1(a))
   Yes: go to 5.
   No: this form is complete.

X 5. Does one of the following three parts, the seat belt latch plate, 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)? (S7.4.6.1(a))
   Yes-Pass; No-FAIL
   Identify the part(s) on top or above the seat.

X seat belt latch plate; X buckle; X seat belt webbing

X 6. Are the remaining two seat belt parts accessible under normal conditions?
   Yes-Pass;
   No-FAIL

X 7. The buckle and latch plate do not pass through the guides or conduits provided and fail behind the seat when the belt is completely retracted or, if the belt is nonretractable, the belt is unlatched. (S7.4.6.2)
   Yes-Pass;
   No-FAIL

X 8. The buckle and latch plate do not pass through the guides or conduits provided and fail behind the seat when the seat is moved to any position to which it is designed to be adjusted. (S7.4.6.2)
   Yes-Pass;
   No-FAIL

X 9. The buckle and latch plate do not pass through the guides or conduits provided and fail behind the seat when the seat back, if foldable, is folded forward as far as possible and then moved backward into position. (S7.4.6.2)
   Yes-Pass;
   No-FAIL

X 10. Is the inboard receptacle end of the seat belt assembly, installed in the front outboard designated seating position, accessible with the center armrest in any position to which it can be adjusted (without moving the armrest)? (S7.4.6.2)
   Yes-Pass;
   No-FAIL

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DATA SHEET 13
SEAT BELT GUIDES AND HARDWARE (S7.4.6)

NHTSA No.: C40113 Test Date: 03/17/04

Laboratory: TRC Inc. Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Center

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.

1. Is the seat cushion movable so that the seat back serves a function other than seating?
   (S7.4.6.1(b))
   ___ Yes; this form is complete
   X No; go to 2

2. Is the seat removable? (S7.4.6.1(b))
   ___ Yes; this form is complete
   X No; go to 3

3. Is the seat movable so that the space formerly occupied by the seat can be used for a
   secondary function? (S7.4.6.1(b))
   ___ Yes; this form is complete
   X No; go to 4

4. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat
   back? (S7.4.6.1(a))
   X Yes; go to 5.
   ___ No: this form is complete.

5. Does one of the following three parts, the seat belt latch plate, 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)?
   (S7.4.6.1(a))
   X Yes-Pass; ___ No-FAIL
   Identify the part(s) on top or above the seat.
   ___ seat belt latch plate; X buckle; X seat belt webbing

6. Are the remaining two seat belt parts accessible under normal conditions?
   X Yes-Pass; ___ No-FAIL

7. The buckle and latch plate do not pass through the guides or conduits provided and fail
   behind the seat when the belt is completely retracted or, if the belt is nonretractable, the belt
   is unlatched. (S7.4.6.2)
   X Yes-Pass; ___ No-FAIL

8. The buckle and latch plate do not pass through the guides or conduits provided and fail
   behind the seat when the seat is moved to any position to which it is designed to be adjusted.
   (S7.4.6.2)
   X Yes-Pass; ___ No-FAIL

9. The buckle and latch plate do not pass through the guides or conduits provided and fail
   behind the seat when the seat back, if foldable, is folded forward as far as possible and then
   moved backward into position. (S7.4.5.2)
   X Yes-Pass; ___ No-FAIL

10. Is the inboard receptacle end of the seat belt assembly, installed in the front outboard
    designated seating position, accessible with the center armrest in any position to which it can
    be adjusted (without moving the armrest)? (S7.4.6.2)
    X Yes-Pass; ___ No-FAIL
DATA SHEET 13
SEAT BELT GUIDES AND HARDWARE (S7.4.6)

NHTSA No.: C40113 ____________________________ Test Date: 03/17/04

Laboratory: TRC Inc. ___________ Test Technician(s): Michael S. Postle

DESIGNATED SEATING POSITION: Second Row Left

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.

X 1. Is the seat cushion movable so that the seat back serves a function other than seating? (S7.4.6.1(b))
   __ Yes; this form is complete
   X  No; go to 2

X 2. Is the seat removable? (S7.4.6.1(b))
   __ Yes; this form is complete
   X  No; go to 3

X 3. Is the seat movable so that the space formerly occupied by the seat can be used for a secondary function? (S7.4.6.1(b))
   Yes; this form is complete
   X  No; go to 4

X 4. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back? (S7.4.6.1(a))
   X  Yes; go to 5.
   __ No; this form is complete.

X 5. Does one of the following three parts, the seat belt latch plate, 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)? (S7.4.6.1(a))
   X  Yes-Pass;  __ No-FAIL
   Identify the part(s) on top or above the seat.
   X  seat belt latch plate; X  buckle; X  seat belt webbing

X 6. Are the remaining two seat belt parts accessible under normal conditions?
   X  Yes-Pass;  __ No-FAIL

X 7. The buckle and latch plate do not pass through the guides or conduits provided and fail behind the seat when the belt is completely retracted or, if the belt is nonretractable, the belt is unlatched. (S7.4.6.2)
   X  Yes-Pass;  __ No-FAIL

X 8. The buckle and latch plate do not pass through the guides or conduits provided and fail behind the seat when the seat is moved to any position to which it is designed to be adjusted. (S7.4.6.2)
   X  Yes-Pass;  __ No-FAIL

X 9. The buckle and latch plate do not pass through the guides or conduits provided and fail behind the seat when the seat back, if foldable, is folded forward as far as possible and then moved backward into position. (S7.4.6.2)
   X  Yes-Pass;  __ No-FAIL

X 10. Is the inboard receptacle end of the seat belt assembly, installed in the front outboard designated seating position, accessible with the center armrest in any position to which it can be adjusted (without moving the armrest)? (S7.4.6.2)
    X  Yes-Pass;  __ No-FAIL

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DATA SHEET 30

VEHICLE WEIGHT, FUEL TANK, AND ATTITUDE DATA

NHTSA No.: C40113 Test Date: 03/16-17/04

Laboratory: TRC Inc. Test Technician(s): R. Benavides, D. Schmitt, B. Miller

Impact Angle: 0° Belted Dummies: Yes No

Test Speed: X 32 to 40 km/h 0 to 48 km/h 0 to 56 km/h

Driver Dummy: 5th female 50th male Passenger Dummy: 5th female 50th male

1. Fill the transmission with transmission fluid to the satisfactory range.
2. Drain fuel from vehicle.
3. Run the engine until fuel remaining in the fuel delivery system is used and the engine stops.
4. Record the usable fuel tank capacity supplied by the COTR. 13.6 gallons (51.5 l)
5. Record the fuel tank capacity supplied in the owner's manual. 12.5 gallons
6. Using purple dyed Stoddard solvent having the physical and chemical properties of Type I solvent or cleaning fluid, Table 1, ASTM Standard D484-71, "Standard Specifications for Hydrocarbon Dry-cleaning Solvents", or gasoline, fill the fuel tank.
   Amount added 12.6 gallons
7. Fill the coolant system to capacity.
8. Fill the engine with motor oil to the max. mark on the dip stick.
9. Fill the brake reservoir with brake fluid to its normal level.
10. Fill the windshield washer reservoir to capacity.
11. Inflate the tires to the tire pressure on the tire placard. If no tire placard is available, inflate the tires to the recommended pressure in the owner's manual.
   Tire placard pressure RF 30; LF 30; RR 30; LR 30
   Owner's manual pressure RF 30; LF 30; RR 30; LR 30
   Actual inflated pressure RF 30; LF 30; RR 30; LR 30
12. Record the vehicle weight at each wheel to determine the unloaded vehicle weight (UVW), i.e. "as delivered" weight.

Right Front = 374.5 kg Right Rear = 249.0 kg
Left Front = 361.0 kg Left Rear = 248.0 kg
TOTAL FRONT = 735.5 kg TOTAL REAR = 497.0 kg
% Total Weight = 59.7 % % Total Weight = 40.3 %

UVW = TOTAL FRONT PLUS TOTAL REAR = 1232.5 kg

13. UVW Test Vehicle Attitude: (all dimensions in millimeters)
   13.1 Mark a point on the vehicle above the center of each wheel.
   13.2 Place the vehicle on a level surface.
   13.3 Measure perpendicular to the level surface to the 4 points marked on the body and record the measurements
   RF 709; LF 705; RR 760; LR 698

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14. Calculate the Rated Cargo and Luggage Weight (RCLW).

14.1 Does the vehicle have the vehicle capacity weight (VCW) on the certification label or tire placard?
   ___ Yes, go to 14.2.
   ___ No, go to 14.3.

14.2 VCW = Gross Vehicle Weight - UVW
   VCW = __________ - __________ = __________ kg

14.3 VCW = __________ kg

14.4 Does the certification or tire placard contain the Designated Seating Capacity (DSC)?
   ___ Yes, go to 14.6.
   ___ No, go to 14.5 and skip 14.6.

14.5 DSC = Total number of seat belt assemblies = __________

14.6 DSC = __________

14.7 RCLW = VCW - (68 kg x DSC) = __________ - (68 kg x __________) = __________ kg

14.8 Is the vehicle certified as a truck, MPV or bus (see the certification label on the door jambs)?
   ___ Yes, if the calculated RCLW is greater than 136 kg, use 136 kg as the RCLW (S8.1.1).
   ___ No, use the RCLW calculated in 14.7.

15. Fully Loaded Weight (100% fuel fill)

15.1 Place the appropriate test dummy in both front outboard seating positions.
   Driver: ___ 5th female  ___ 50th male
   Passenger: ___ 5th female  ___ 50th male

15.2 Load the vehicle with the RCLW from 14.7 or 14.8 whichever is applicable.

15.3 Place the RCLW in the cargo area. Center the load over the longitudinal centerline of the vehicle. (S8.1.1 (d))

15.4 Record the vehicle weight at each wheel to determine the Fully Loaded Weight.

   Right Front = __________ kg  Right Rear = __________ kg
   Left Front = __________ kg  Left Rear = __________ kg

   TOTAL FRONT = __________ kg  TOTAL REAR = __________ kg

   % Total Weight = __________ %  % Total Weight = __________ %

   % GVW = __________ %  % GVW = __________ %

   FULLY LOADED WEIGHT = TOTAL FRONT + TOTAL REAR = __________ kg

16. Fully Loaded Test Vehicle Attitude: (all dimensions in millimeters)

16.1 Place the vehicle on a level surface.

16.2 Measure perpendicular to the level surface to the 4 points marked on the body (see 13.1 above) and record the measurements
   RF 689; LF 685; RR 660; LR 663

17. Drain the fuel system.

18. Using purple dyed Stoddard solvent having the physical and chemical properties of Type 1 solvent or cleaning fluid, Table 1, ASTM Standard D484-71, "Standard Specifications for Hydrocarbon Dry-cleaning Solvents", fill the fuel tank to 94% of useable capacity.
   Fuel tank capacity x .94 = __________ gallons
   Amount added __________ gallons
19. Crank the engine to fill the fuel delivery system with Stoddard solvent.

20. Calculate the test weight range.
   X 20.1 Calculated Test Weight = UVW (see 12 above) + RCLW (see 14 above) + 2 x (dummy weight)
   \[ \frac{1452.5}{1232.5} + \frac{68.0}{152.0} \]
   X 20.2 Test Weight Range = Calculated Weight (-4.5 kg, - 9 kg.)
   Max. Test Weight = Calculated Test Weight - 4.5 kg = 1448.0
   Min. Test Weight = Calculated Test Weight - 9 kg = 1443.5

21. Remove the RCLW from the cargo area.

22. Drain transmission fluid, engine coolant, motor oil, and windshield washer fluid from the test vehicle so that Stoddard solvent leakage from the fuel system will be evident.

23. Vehicle Components Removed For Weight Reduction:
   None

24. Secure the equipment and ballast in the load carrying area and distribute it, as nearly as possible, to obtain the proportion of axle weight indicated by the gross axle weight ratings and center it over the longitudinal centerline of the vehicle.

25. If necessary, add ballast to achieve the actual test weight.
   N/A
   Weight of ballast = 4 kg

26. Ballast, including test equipment, must be contained so that it will not shift during the impact event or interfere with data collection or interfere with high-speed film recordings or affect the structural integrity of the vehicle or do anything else to affect test results. Care must be taken to assure that any attachment hardware added to the vehicle is not in the vicinity of the fuel tank or lines.

27. Record the vehicle weight at each wheel to determine the actual test weight.
   Right Front = 397.4 kg
   Left Front  = 401.2 kg
   TOTAL FRONT = 798.6 kg
   % Total Weight = 55.3%
   % GVW = 94.0%
   Right Rear  = 321.2 kg
   Left Rear   = 324.2 kg
   TOTAL REAR = 645.4 kg
   % Total Weight = 44.7%
   % GVW = 80.0%
   (%GVW = Axle GVW ÷ Vehicle GVW)

28. Is the test weight between the Max. Weight and the Min. Weight (See 20.2)?
   X Yes
   ___ No, explain why not.

29. Test Weight Vehicle Attitude; (all dimensions in millimeters)
   X 29.1 Place the vehicle on a level surface.
   X 29.2 Measure perpendicular to the level surface to the 4 points marked on the body (see 13.1 above) and record the measurements
   RF 694; LF 692; RR 660; LR 664
30. Summary of test attitude

30.1

AS DELIVERED: RF 709; LF 705; RR 700; LR 698

AS TESTED: RF 694; LF 692; RR 660; LR 664

FULLY LOADED: RF 689; LF 685; RR 660; LR 663

30.2 Is the "as tested" test attitude equal to or between the "fully loaded" and "as delivered" attitude?

X Yes

No, explain why not. ____________________________________________
DATA SHEET 31
Vehicle Accelerometer Location

NHTSA No.: C40113 Test Date: 03/17/94

Laboratory: TRC Inc. Test Technician(s): D. Thomas

Impact Angle: 0° Belted Dummies: Yes No

Test Speed: X 32 to 40 km/h 0 to 48 km/h 0 to 56 km/h

Driver Dummy: 50th female 50th male Passenger Dummy: 5th female 50th male

1. Find the location where the vertical plane parallel to the longitudinal centerline of the vehicle and through the center of the left front outboard seating position intersects the left rear seat cross member. Install an accelerometer at this intersection on the rear seat cross member to record x-direction accelerations. Record the location on the following chart.

2. Find the location where the vertical plane parallel to the longitudinal centerline of the vehicle and through the center of the right front outboard seating position intersects the right rear seat cross member. Install an accelerometer at this intersection on the rear seat cross member to record x-direction accelerations. Record the location on the following chart.

3. Find the location where a vertical plane through the longitudinal centerline of the vehicle and a vertical transverse plane through the center of the two wheels on opposite sides of the engine intersect at the top of the engine. Install an accelerometer at this intersection to record x-direction accelerations. Record the location on the following chart.

4. Find the location where a vertical plane through the longitudinal centerline of the vehicle and a vertical transverse plane through the center of the two wheels on opposite sides of the engine intersect the bottom of the engine. Install an accelerometer at this intersection to record x-direction accelerations. Record the location on the following chart.

5. Install an accelerometer on the right front brake caliper to record x-direction accelerations. Record the location on the following chart.

6. Find the location where a vertical plane through the longitudinal centerline of the vehicle intersects the top of the instrument panel. Install an accelerometer at this intersection to record x-direction accelerations. Record the location on the following chart.

7. Install an accelerometer on the left front brake caliper to record x-direction accelerations. Record the location on the following chart.

8. Find the location where a vertical plane through the longitudinal centerline of the vehicle intersects the floor of the trunk. Install an accelerometer on the trunk floor at this intersection to record z-direction accelerations. Record the location on the following chart.
VEHICLE ACCELEROMETER LOCATION
AND DATA SUMMARY

CENTERLINE OF FRONT WHEELS

ENGINE

TOP VIEW

ACCELEROMETER COORDINATE SYSTEM (POSITIVE DIRECTION SHOWN)

REAR SEAT CUSHION ASSY. FRONT ATTACHMENT BRACKET SUPPORT

BOTTOM OF OIL PAN

DISC BRAKE CALIPER

LEFT SIDE VIEW

DIMENSION CORRESPONDING TO THE LETTERS "A" THROUGH "K" ARE
RECORDED IN THE TABLE ON THE FOLLOWING PAGE.
ACCELEROMETERS CORRESPONDING TO THE NUMBERS 1 THROUGH 8 ARE
SPECIFIED ON THE PRECEDING PAGE.

Dimensions corresponding to the letters “A” through “K” are recorded in the table on the following page.
Accelerometers corresponding to the numbers 1 through 8 are specified on the preceding page.
## DATA SHEET 31
### VEHICLE ACCELEROMETER LOCATION MEASUREMENTS

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<th>DIMENSION</th>
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<th>PRE-TEST VALUES</th>
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<td></td>
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<tr>
<td>B</td>
<td>330</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>3938</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3798</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>3288 Right Side</td>
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<td>640 Right Side</td>
<td>640 Left Side</td>
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<td>G</td>
<td>2990</td>
<td></td>
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<tr>
<td>H</td>
<td>1858 Right Side</td>
<td>1858 Left Side</td>
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<tr>
<td>K</td>
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<table>
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**REMARKS:**
DATA SHEET 32
Photographic Targets

NHTSA No.: C40113  Test Date: 03/18/04

Laboratory: TRC Inc.  Test Technician(s): D. Thomas, R. Benavides, B. Miller

Impact Angle: 0° Offset percentage: 0  Belted Dummies: Yes  X No

Test Speed:  X 32 to 40 km/h  ___ 0 to 48 km/h  ___ 0 to 56 km/h

Driver Dummy: ___ 5th female  X 50th male  Passenger Dummy: ___ 5th female  X 50th male

1. FMVSS 208 vehicle targeting requirements (See Figures 32A and 32B)
   X 1.1 Targets A1 and A2 are on flat rectangular panels.
   X 1.2 Three circular targets at least 90 mm in diameter and with black and yellow quadrants are mounted at the front on the outboard sides of A1 and A2. The center of each circular target is 100 mm from the one next to it.  Distance between targets 127 mm
   X 1.3 Three circular targets at least 90 mm in diameter and with black and yellow quadrants are mounted at the back on the outboard sides of on A1 and A2. The center of each circular target is 100 mm from the one next to it.  Distance between targets 127 mm
   X 1.4 The distance between the first circular target at the front of A1 and A2 and the last circular target at the back of A1 and A2 is at least 915 mm.  Distance between the first and last circular targets 864 mm
   X 1.5 Firmly fix target A1 on the vehicle roof in the vertical longitudinal plane that is coincident with the mid sagittal plane of the driver dummy.
   X 1.6 Firmly fix target A2 on the vehicle roof in the vertical longitudinal plane that is coincident with the mid sagittal plane of the passenger dummy.
   X 1.7 Two circular targets (C1 and C2) at least 90 mm in diameter and with black and yellow quadrants are mounted on the outside of the driver door. The centers of each circular target are at least 610 mm apart.  Distance between targets 610 mm
   X 1.8 Two circular targets (C1 and C2) at least 90 mm in diameter and with black and yellow quadrants are mounted on the outside of the passenger door. The centers of each circular target are at least 610 mm apart.  Distance between targets 610 mm
   X 1.9 Place tape with squares having alternating colors on the top portion of the steering wheel.
   X 1.10 Chalk the bottom portion of the steering wheel.

X 1.11 Is this an offset test?
   ___ Yes, continue with this section
   X No, go to 2.

X 1.12 Measure the width of the vehicle.  Vehicle width __________ mm

X 1.13 Find the centerline of the vehicle. (% of the vehicle width)

X 1.14 Find the line parallel to the centerline of the vehicle and 0.1 x vehicle width from the centerline of the vehicle.

X 1.15 Apply 25 mm wide tape with alternating black and yellow squares parallel to and on each side of the line found in 1.14. The edge of each tape shall be 50 mm from the line found in 1.14. The tape shall extend from the bottom of the bumper to the front edge of the windshield. (Figure 32D)
2. Barrier targeting
   2.1 Fix two stationary targets D1 and D2 to the barrier as shown in the Figure 32A. One target is in the vertical longitudinal plane that is coincident with the midsagittal plane of the driver dummy. The other is in the vertical longitudinal plane that is coincident with the midsagittal plane of the passenger dummy.
   2.2 Targets D1 and D2 are on a rectangular panel.
   2.3 Three circular targets at least 90 mm in diameter and with black and yellow quadrants are mounted on the sides of the rectangular panel away from the longitudinal cemterline of the vehicle. The center of each circular target is 100 mm from the one next to it.
   Distance between circular targets on D1 \[ \text{127} \pm \text{mm} \]
   Distance between circular targets on D2 \[ \text{N/A} \pm \text{mm} \]

3. FMVSS 208 dummy targeting requirements
   3.1 Place a circular target with black and yellow quadrants on both sides of the driver dummy head as close as possible to the center of gravity of the head in the x and z direction (relative to the measuring directions of the accelerometers).
   3.2 Place a circular target with black and yellow quadrants on both sides of the passenger dummy head as close as possible to the center of gravity of the head in the x and z direction (relative to the measuring directions of the accelerometers).
   3.3 Place a circular target with black and yellow quadrants on the outboard shoulder of the driver dummy. Place the target as high up on the arm as possible at the intersection of the arm and shoulder. The sleeve of the shirt on the dummy may be cut to make the target visible, but do not remove any material.
   3.4 Place a circular target with black and yellow quadrants on the outboard shoulder of the passenger dummy. Place the target as high up on the arm as possible at the intersection of the arm and shoulder. The sleeve of the shirt on the dummy may be cut to make the target visible, but do not remove any material.

4. FMVSS 204 targeting requirements
   4.1 Is an FMVSS 204 indicant test ordered on the “COTR Vehicle Work Order?”
   \[ \text{X} \] No, this form is complete
   \[ \_ \_ \_ \] Yes, continue with this form.
   4.2 Resection panel (Figure 32C)
       \[ \_ \_ \_ \] 4.2.1 The panel deviates no more than 6 mm from perfect flatness when suspended vertically.
       \[ \_ \_ \_ \] 4.2.2 The 8 targets on the panel are circular targets at least 90 mm in diameter and with black and yellow quadrants.
       \[ \_ \_ \_ \] 4.2.3 The center of each of the 4 outer targets are placed within 1 mm of the corners of a square measuring 914 mm on each side.
       \[ \_ \_ \_ \] 4.2.4 Locate another square with 228 mm sides and with the center of this square coincident with the center of the 914 mm square.
       \[ \_ \_ \_ \] 4.2.5 The center of the 4 inner targets are placed at the midpoints of each of the 228 mm sides.
       \[ \_ \_ \_ \] 4.3 Place a circular target at least 90 mm in diameter and with black and yellow quadrants on a material (cardboard, metal, etc.) that can be taped to the top of the steering column.
       \[ \_ \_ \_ \] 4.4 Tape the target from 4.3 to the top of the steering column in a manner that does not interfere with the movement of the steering column in a crash.

\[ ^{1} \] Fixed stationary target D2 was omitted from this test in error.
REFERENCE PHOTO TARGETS

CONCRETE BARRIER

MONORAIL

COVERED PHOTO PIT

LEFT SIDE VIEW

FIGURE 32A
RESECTION PANEL TARGETING ALIGNMENT

Car Top Targets A1 & A2

Resection Control Points Panel

Steering Column Target B

Rear View

Test Run Steering Column Camera View of Typical Time Zero Vehicle Position

Left Side View

Figure 32B
PRE-RUN STEERING COLUMN HIGH SPEED CAMERA VIEW

LEFT SIDE VIEW

FIGURE 32C
OFFSET DEFORMABLE BARRIER
ADDITIONAL VEHICLE TARGETING

FIGURE 32D
# DATA SHEET 33
## CAMER A LOCATIONS

**VEH. NHTSA No.: C4011**3 ; **TEST DATE: 03/18/04** ; **TIME: 10:29**

**VEH. YEAR/MAKE/MODEL/BODY STYLE: 2004/Saturn Ion/4-door**

<table>
<thead>
<tr>
<th>CAMERA NO.</th>
<th>VIEW</th>
<th>CAMERA POSITIONS (mm)</th>
<th>ANGLE (deg)</th>
<th>FILM PLANE TO HEAD TARGET</th>
<th>LENS (mm)</th>
<th>SPEED (fps)</th>
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<tbody>
<tr>
<td>1</td>
<td>Left Side View</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
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<tr>
<td>2</td>
<td>Left Side View (barrier face to front seat backs)</td>
<td>1810 -7350 -950</td>
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<td>3</td>
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<tr>
<td>12</td>
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<td>13</td>
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<td>14</td>
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<tr>
<td>15</td>
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<tr>
<td>16</td>
<td>Pit Camera Fuel Tank View</td>
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<td>89</td>
<td>NA1</td>
<td>17</td>
<td>1010</td>
</tr>
</tbody>
</table>

*+X* - film plane forward (downstream) from barrier impact surface  
*+Y* - film plane to right of monorail centerline from driver's perspective  
*+Z* - film plane below ground level

1. Not recorded  
2. Digital camera
CAMERA POSITIONS FOR FRONTAL IMPACTS

TOP VIEW

REAL TIME CAMERA

CONECTE PAD

CONCRETE BARRIER

COVER PHOTO PIT

TEST VEHICLE

MONORAIL

TOW ROAD

CENAER FRAME RATES:

#1 = 24 fps
ALL OTHERS = 1,000 fps

CONCRETE BARRIER

COVER PHOTO PIT

LEFT SIDE VIEW
DATA SHEET 34
DUMMY POSITIONING PROCEDURES
FOR DRIVER TEST DUMMY CONFORMING TO SUBPART E OF PART 572

NHTSA No.: C40113  Test Date: 03/18/04

Laboratory: TRC Inc.  Test Technician(s): John Shultz

Impact Angle: 0°  Belted Dummies: Yes  X No

Test Speed:  X 32 to 40 km/h  0 to 48 km/h  0 to 56 km/h

X 1. Position the seat’s adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
   X N/A – No lumbar adjustment

X 2. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S20.1.8.2)
   X N/A – No additional support adjustment

X 3. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S20.1.9.3)
   X N/A – No independent fore-aft seat cushion adjustment

X 4. Use the seat markings determined during completion of Data Sheet 14 to set the mid fore-aft position, full down height position and the seat cushion angle. (S8.1.2)

X 5. The seat back angle, if adjustable, is set at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)
   ___ N/A – No seat back angle adjustment

Manufacturer’s design seat back angle 9° to 9.5° measured at the head restraint
Tested seat back angle 9.4° measured at the head restraint

X 6. If adjustable, set the head restraint at the full up and full forward position. Any adjustment of the head restraint shall be used to position it full forward. For example, if it rotates, rotate it such that the head restraint extends as far forward as possible. (S8.1.3)
   X N/A – No head restraint adjustment

X 7. Place any adjustable seat belt anchorages at the vehicle manufacturer’s nominal design position for a 50th percentile adult male occupant (S8.1.3)
   X N/A – No adjustable upper seat belt anchorage

Manufacturer’s specified anchorage position.

Tested anchorage position

X 8. Place the adjustable accelerator pedal in the full forward position.
   X N/A – the accelerator pedal is not adjustable.

X 9. Set the steering wheel hub at the geometric center of the full range of driving positions including any telescopin positions as determined in Data Sheet 14.

X 10. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in item 1.18 of Data Sheet 14 and the upper torso rests against the seat back. (S10.4.1.1 & S10.4.1.2)

X 11. Rest the thighs on the seat cushion. (S10.5)

X 12. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined by using the equipment and procedures specified in SAE J826 (APR 1980). (S10.4.2.1) Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications. (S10.4.2.1 and S10.4.2.2)

5-70  040318-1
X horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1) measurement not recorded

X vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1) measurement not recorded

X pelvic angle (20° to 25°) 22.5°

13. Is the head level within ± 0.5°? (S10.1)
  X Yes, go to 14
  ____ No, go to 13.1
  ____ 13.1 Adjust the position of the H-point. (S10.1)
  ____ 13.2 Is the head level within ± 0.5°? (S10.1)
  ____ Yes, record the following, then go to 15. ____ No, go to 13.3
  ____ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
  ____ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
  ____ pelvic angle (20° to 25°) (S10.4.2.2)
  ____ 13.3 Adjust the pelvic angle. (S10.1)
  ____ 13.4 Is the head level within ± 0.5°? (S10.1)
  ____ Yes, record the following, then go to 14. ____ No, go to 13.5
  ____ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
  ____ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
  ____ pelvic angle (20° to 25°) (S10.4.2.2)
  ____ 13.5 Adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted “0” setting until the head is level within ± 0.5°. (S10.1)
  Record the following, then go to 14
  ____ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
  ____ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
  ____ pelvic angle (20° to 25°) (S10.4.2.2)

X 14. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.
  10.6 measured distance (10.6 inches) (S10.5)

X 15. Can the right foot be placed on the accelerator?
  X Yes, go to 15.1 and skip 15.2
  ____ No, go to 15.2
  15.1 To the extent practicable keep the right thigh and the leg in a vertical plane (S10.5) while resting the foot on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. (S10.6.1.1)
  15.2 Initially set the foot perpendicular to the leg and then place it as far forward as possible in the direction of the pedal centerline with the rearmost point of the heel resting on the floor pan. (S10.6.1.1)
  15.2.1 Move the adjustable pedal to its most rearward position or until the right foot is flat on the pedal, whichever occurs first. (S10.6.1.1)
  N/A – the accelerator pedal is not adjustable

X 16. Does the vehicle have a foot rest?
  ____ Yes, go to 16.1
  X No, go to 16.1.2
  16.1 With the left thigh and leg in a vertical plane, place the foot on the foot rest. (S10.6.1.2)
  16.1.1 Is the left foot elevated above the right foot?

5-71 040318-1
16.1.2 Check the ONLY one of the following that applies

X The foot reaches the toeboard without adjusting the foot or leg. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (S10.5) and place the foot on the toeboard, skip 16.1.3 (S10.6.1.2)

X The foot reaches the toeboard but contacts the brake or clutch pedal and must be rotated to avoid pedal contact. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (S10.5) and place the foot on the toeboard. The foot was rotated about the leg to avoid pedal contact, skip 16.1.3 (S10.6.1.2)

X The foot reaches the toeboard but contacts the brake or clutch pedal and the foot and leg must be rotated to avoid pedal contact. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (S10.5) and place the foot on the toeboard. The foot was rotated about the leg and the leg was rotated outboard about the hip the minimum distance necessary to avoid pedal contact, skip 16.1.3 (S10.6.1.2)

N/A - the foot does not reach the toeboard, go to 16.1.3

16.1.3 Check the ONLY one of the following that applies

X The foot did not contact the brake or clutch pedal. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (S10.5). Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan. (S10.6.1.2)

X The foot did contact the brake or clutch pedal and the foot was rotated to avoid contact. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (S10.5). Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan and rotate the foot the minimum amount to avoid pedal contact. (S10.6.1.2)

X The foot did contact the brake or clutch pedal and the foot was rotated about the leg and the leg was rotated outboard about the hip the minimum distance necessary to avoid pedal contact. Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan and rotate the foot about the leg and the thigh and leg outboard about the hip the minimum distance necessary to avoid pedal contact. (S10.6.1.2)

17. Place the right upper arm adjacent to the torso with the centerline as close to a vertical plane as possible. (S10.2.1)

18. Is the driver seat belt used for this test?

X Yes, continue

X No, go to 19

X Fasten the seat belt around the dummy.

X Remove all slack from the lap belt portion. (S10.9)

X Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times. (S10.9)

X Apply a 2 to 4 pound tension load to the lap belt. (S10.9)

X pound load applied

X Is the belt system equipped with a tension relieving device?

X Yes, continue

X No, go to 19

X Introduce the maximum amount of slack into the upper torso belt that is recommended by the vehicle manufacturer in the vehicle owner's manual. (S10.9).

19. Place the left upper arm adjacent to the torso with the centerline as close to a vertical plane as possible. (S10.2.1)
20. Place the right hand with the palm in contact with the steering wheel at the rim's horizontal centerline and with the thumb over the steering wheel. (S10.3.1)

21. Place the left hand with the palm in contact with the steering wheel at the rim's horizontal centerline and with the thumb over the steering wheel. (S10.3.1)

22. Tape the thumb of each hand to the steering wheel by using masking tape with a width of 0.25 inch. The length of the tape shall only be enough to go around the thumb and steering wheel one time.
1. The seat is a bench seat for which the adjustments have already been made for the driver and there are no independent adjustments that can be made for the passenger. Go to 7
X 2. Position the seat’s adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)
X 3. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S20.1.8.2)
X 4. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S20.1.9.3)
X 5. Use the seat markings determined during completion of Data Sheet 14 to set the mid fore-aft position, full down height position and the seat cushion angle. (S8.1.2).
X 6. The seat back angle, if adjustable, is set at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1(b) and S8.1.3)
X 7. If adjustable, set the head restraint at the full up and full forward position. Any adjustment of the head restraint shall be used to position it full forward. For example, if it rotates, rotate it such that the head restraint extends as far forward as possible. (S8.1.3)
X 8. Place any adjustable seat belt anchorages at the vehicle manufacturer’s nominal design position for a 50th percentile adult male occupant (S8.1.3)
X 9. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in Item 2.19 of Data Sheet 14 and the upper torso rests against the seat back. (S10.4.1.1 & S10.4.1.2)
X 10. Rest the thighs on the seat cushion. (S10.5)
X 11. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined by using the equipment and procedures specified in SAE J826 (APR 1980). (S10.4.2.1) Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications. (S10.4.2.1 and S10.4.2.2)
12. Is the head level within ± 0.5°? (S10.1)
   X Yes, go to 13
   ___ No, go to 12.1

12.1 Adjust the position of the H-point. (S10.1 and S10.4.2.1)

12.2 Is the head level within ± 0.5°? (S10.1)
   ___ Yes, record the following, then go to 13.
   ____ No, go to 12.3
   ________ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   ________ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   ________ pelvic angle (20° to 25°) (S10.4.2.2)

12.3 Adjust the pelvic angle. (S10.1)

12.4 Is the head level within ± 0.5°? (S10.1)
   ___ Yes, record the following, then go to 13.
   ____ No, go to 12.5
   ________ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   ________ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   ________ pelvic angle (20° to 25°) (S10.4.2.2)

12.5 Adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted "0" setting until the head is level within ± 0.5°. (S10.1)
Record the following, then go to 13
   ________ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   ________ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   ________ pelvic angle (20° to 25°) (S10.4.2.2)

13. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.
   10.6 ___ measured distance (10.6 inches) (S10.5)

14. Check the only one of the following that applies:
   X To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, place the feet on the toeboard with the heels resting on the floor pan as close as possible to the intersection of the floor pan and toeboard.
   ___ The feet cannot be placed flat on the toeboard. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heels resting on the floor pan.
   ___ The vehicle has a wheelhouse projection. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heels resting on the floor pan. Do not set the feet on the wheelhouse projection.
   ___ The vehicle has a wheelhouse projection and the feet cannot be placed on the toeboard. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heel resting on the floor pan. Do not set the feet on the wheelhouse projection.
15. Place the left upper arm in contact with the seat back and side of the torso. (S10.2.2)
16. Is the passenger seat belt used for this test?
   ___ Yes, continue
   ___ No, go to 17
   16.1 Fasten the seat belt around the dummy.
   16.2 Remove all slack from the lap belt portion. (S10.9)
   16.3 Pull the upper torso webbing out of the retractor and allow it to retract; repeat this
        four times. (S10.9)
   16.4 Apply a 2 to 4 pound tension load to the lap belt. (S10.9)
        pound load applied
   16.5 Is the belt system equipped with a tension relieving device?
        ___ Yes, continue
        ___ No, go to 17
   16.6 Introduce the maximum amount of slack into the upper torso belt that is
        recommended by the vehicle manufacturer in the vehicle owner’s manual. (S10.9).
        Go to 17.
17. Place the right upper arm in contact with the seat back and side of the torso. (S10.2.2)
18. Place the left hand palm in contact with the outside of the left thigh and the little finger in
    contact with the seat cushion. (S10.3.2)
19. Place the right hand palm in contact with the outside of the right thigh and the little finger
    in contact with the seat cushion. (S10.3.2)
## DATA SHEET 35
### DUMMY POSITIONING MEASUREMENTS

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<td>CS</td>
<td>239</td>
</tr>
<tr>
<td>RA</td>
<td>312</td>
</tr>
<tr>
<td>KDL</td>
<td>195</td>
</tr>
<tr>
<td>KDR</td>
<td>200</td>
</tr>
<tr>
<td>PA°</td>
<td>396 ANGLE 12.1°</td>
</tr>
<tr>
<td>TA°</td>
<td>NA</td>
</tr>
<tr>
<td>KK</td>
<td>222</td>
</tr>
<tr>
<td>ST</td>
<td>143 ANGLE 39.6°</td>
</tr>
<tr>
<td>SK</td>
<td>531</td>
</tr>
<tr>
<td>SH</td>
<td>227 ANGLE 34.1°</td>
</tr>
<tr>
<td>SHY</td>
<td>222 ANGLE 30.3°</td>
</tr>
<tr>
<td>HS</td>
<td>222 ANGLE 30.3°</td>
</tr>
<tr>
<td>HD</td>
<td>227 ANGLE 34.1°</td>
</tr>
<tr>
<td>AD</td>
<td>227 ANGLE 34.1°</td>
</tr>
</tbody>
</table>

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DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

AD - Arm to Door
HD - H-Point to Door
HR - Head to Side Header
HS - Head to Side Window
KK - Knee to Knee
SHY - Striker to H-Point (Y Direction)

CD - Chest to Dash
CS - Steering Wheel to Chest
HH - Head to Header
HW - Head to Windshield
Hz - Head to Roof
KDA - Knee to Dash Angle
KDL - Left Knee to Dash
KDF - Right Knee to Dash
NA - Nose to Rim Angle
NR - Nose to Rim
PA - Pelvic Angle
RA - Rim to Abdomen
SA - Seat Back Angle
SCA - Steering Column Angle
SH - Striker to H-Point
SK - Striker to Knee
ST - Striker to Head
SWA - Steering Wheel Angle
TA - Tibial Angle
WA - Windshield Angle

VERTICAL LONGITUDINAL PLANES

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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. 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 photograph.

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).

* 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 photograph.

SH, SK, ST  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

* Measurement used in Data Tape Reference Guide

1 Only outboard measurement is referenced in Data Tape Reference Guide

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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 photograph.

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 that allows a level measurement. Use a level. See photograph.

** 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 bicep. 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.

** 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 photograph.

** 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 cievis 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 ** Pelvic or Femur Angle, taken by inserting the pelvic angle gage 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.

* Measurement used in Data Tape Reference Guide

† Only outboard measurement is referenced in Data Tape Reference Guide
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCA</td>
<td>Steering Column Angle, measured with respect to the horizontal by placing an inclinometer on the center of the underside of the steering column.</td>
</tr>
<tr>
<td>NA</td>
<td>Measure the angle made when taking the measurement NR with respect to the horizontal.</td>
</tr>
<tr>
<td>KDA</td>
<td>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 photograph.</td>
</tr>
<tr>
<td>WA</td>
<td>Windshield Angle, place an inclinometer along the transverse center of the windshield exterior (measurement is made with respect to horizontal).</td>
</tr>
<tr>
<td>TA</td>
<td>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.</td>
</tr>
</tbody>
</table>
DATA SHEET 36
CRASH TEST

NHTSA No.: C40113
Test Date: 03/18/04

Laboratory: TRC Inc.  Test Technician(s): John Shultz

Impact Angle: 0°  Belted Dummies: Yes  No
Test Speed:  X 32 to 40 km/h  0 to 48 km/h  0 to 56 km/h
Driver Dummy:  5th female  X  50th male  Passenger Dummy:  5th female  X  50th male

1. Vehicle underbody painted
2. The speed measuring devices are in place and functioning.
3. The speed measuring devices are 1.5 m from the barrier (spec. 1.5 m) and 30 cm from the barrier (spec. is 30 cm)
4. Convertible top is in the closed position.
   N/A — Not a convertible
5. Instrumentation and wires are placed so the motion of the dummies during impact is not affected.
6. Tires inflated to pressure on tire placard or if it does not have a tire placard because it is not a passenger car, then inflated to the tire pressure specified in the owner information.
   210 kPa front left tire  210 kPa specified on tire placard or in owner information
   210 kPa front right tire  210 kPa specified on tire placard or in owner information
   210 kPa rear left tire  210 kPa specified on tire placard or in owner information
   210 kPa rear right tire  210 kPa specified on tire placard or in owner information
7. Time zero markers and switches in-place.
8. Pre-test zero and shunt calibration adjustments performed and recorded
9. Dummy temperature meets requirements of section 12.2 of the test procedure.
10. Vehicle hood closed and latched
11. Transmission placed in neutral
12. Parking brake off
13. Ignition in the ON position
14. Doors closed and latched but not locked.
15. Post-test zero and shunt calibration checks performed and recorded
16. Actual test speed 40.0 km/h
17. Vehicle rebound from the barrier N/A 17 mm
18. Describe whether the doors open after the test and what method is used to open the doors.
   Left front door  Easy
   Right front door  Easy
   Left rear door  Easy
   Right rear door  Easy
19. Describe the contact points of the dummy with the interior of the vehicle.
   Driver dummy  Head contacted header and airbag. Chest contacted airbag.
   both knees contacted the knee bolster.
   Passenger dummy  Head contacted sun visor, header, A-pillar and airbag. Chest
   contacted airbag. Both knees contacted the glove box.

1 Measurement not recorded.
DATA SHEET 38

ACCIDENT INVESTIGATION MEASUREMENTS

NHTSA No.: C40113 Test Date: 03/18/04

Laboratory: TRC Inc. Test Technician(s): John Shultz

Impact Angle: 0° Belted Dummies: Yes No

Test Speed: X 32 to 40 km/h 0 to 48 km/h 0 to 56 km/h

Driver Dummy: 50th female 50th male Passenger Dummy: 5th female 50th male

Vehicle Year/Make/Model/Body Style: 2004/Saturn/Ion/4-door

VIN: 1G8AF52F54Z

Wheelbase: 2615 mm Build Date: 11/03

Veh. Size Category: 3 Test Weight: 1426 kg

Front Overhang: 975 mm Overall Width: 1695 mm

Veh. Impact Speed: 40.0 km/h Vel. Change: 46.0 km/h

Collision Deformation Classification (CDC) Code: 12FDEW2
Impact Mode: 0° Front

Crush Depth Dimensions:\n\n$C_1 = 253$ mm
$C_2 = 323$ mm
$C_3 = 371$ mm
$C_4 = 358$ mm
$C_5 = 314$ mm
$C_6 = 235$ mm

Midpoint of Damage: D = 0 mm
(Left of Vehicle Longitudinal Centerline)

Length of Damage Region:
$L = 1505$ mm

REMARKS:

\(^1\) Numbered from left to right of vehicle.
DATA SHEET 39
WINDSHIELD MOUNTING (FMVSS 212)

NHTSA No.: C40113 ________________  Test Date: 03/18/04

Laboratory: TRC Inc.  Test Technician(s): D. Thomas, R. Benavides

Impact Angle: 0°  Belted Dummies: Yes  X No
Test Speed: X 32 to 40 km/h  0 to 48 km/h  0 to 56 km/h
Driver Dummy: 5th female  X 50th male  Passenger Dummy: 5th female  X 50th male

Most vehicle windshields are either bonded in place and covered with chrome or plastic strips or they are held to the body by a rubber retainer. It is difficult to determine the exact periphery of the windshield because the glazing edge is hidden from view. The test engineer will measure the perimeter inside the retainer or molding at several locations. After the impact test the covering over the glazing edge may be removed for exact measurement of the windshield periphery. Do not disturb the molding or retainer in the event of a noncompliance.

1. Pre crash
   X 1.1 Describe from visual inspection how the windshield is mounted and describe any trim material:
      Adhesive, plastic trim

2. Post Crash
   X 2.1 Can a single thickness of copier type paper (as small a piece as necessary) slide between the windshield and the vehicle body?
     X No, pass. Skip to the table of measurements, complete it by repeating the pre-crash measurements in the post crash column, and calculate the retention percentage, which will be 100%.
     ___ Yes, go to 2.2.

   2.2 Visibly mark the beginning and end of the portions of the periphery where the paper slides between the windshield and the vehicle body.

   2.3 Measure and record post-crash A, B, C, D, E, and F such that the measurements do not include any of the parts of the windshield where the paper slides between the windshield and the vehicle body.

   2.4 Calculate and record the percent retention for the right and left side of the windshield.

   2.5 Is total right side percent retention less than 75%?
      ___ Yes, FAIL
      ___ No, Pass

   2.6 Is total left side percent retention less than 75%?
      ___ Yes, FAIL
      ___ No, Pass

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### WINDSHIELD PERIPHERY MEASUREMENT

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Pre-crash mm</th>
<th>Post-crash mm</th>
<th>Percent Retention (Post-crash ÷ Pre-crash)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left side</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>594</td>
<td>594</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>851</td>
<td>851</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>742</td>
<td>742</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2187</td>
<td>2187</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Right side</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>594</td>
<td>594</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>851</td>
<td>851</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>742</td>
<td>742</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2187</td>
<td>2187</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Width of Molding</strong></td>
<td>G</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

Indicate area of mounting failure.

### FRONT VIEW OF WINDSHIELD

**INDICATE WIDTH OF MOLDING**

ZERO POINT (0,0)
DATA SHEET 40
WINDSHIELD ZONE INTRUSION (FMVSS 219)

NHTSA No.: C40113
Test Date: 03/18/04

Laboratory: TRC Inc.  Test Technician(s): D. Thomas, R. Benavides

Impact Angle: 0°  Belted Dummies: Yes  No

Test Speed: X 32 to 40 km/h  0 to 48 km/h  0 to 56 km/h

Driver Dummy: X 50th male  X 50th male  Passenger Dummy: X 50th female  X 50th male

1. Place a 165 mm diameter rigid sphere, with a mass of 6.8 kg on the instrument panel so that it is simultaneously touching the instrument panel and the windshield. (571.219 S6.1(a))

2. Roll the sphere from one side of the windshield to the other while marking on the windshield where the sphere contacts the windshield. (571.219 S6.1(b))

3. From the outermost contactable points on the windshield draw a horizontal line to the edges of the windshield. (571.219 S6.1(b))

4. Draw a line on the inner surface of the windshield that is 13 mm below the line determined in items 2 and 3.

5. After the crash test, record any points where a part of the exterior of the vehicle has marked, penetrated, or broken the windshield.

SKETCH OF FRONT VIEW OF WINDSHIELD:

Provide all dimensions necessary to reproduce the protected area.

FRONT VIEW OF WINDSHIELD

A

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1188</td>
<td>585</td>
<td>1485</td>
<td>851</td>
<td>578</td>
<td>418</td>
</tr>
</tbody>
</table>

ZERO POINT (0,0)
LOWER EDGE OF PROTECTED ZONE
AREA OF PROTECTED ZONE FAILURES:

B. Provide coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one which is normally in contact with the windshield.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>No penetration</td>
<td>No penetration</td>
</tr>
</tbody>
</table>

C. Provide coordinates of the area beneath the protected zone template that the inner surface of the windshield was penetrated by a vehicle component.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>No penetration</td>
<td>No penetration</td>
</tr>
</tbody>
</table>

REMARKS:

No penetration into or beneath the protected zone.
DATA SHEET 41
FUEL SYSTEM INTEGRITY (FMVSS 301)

TEST VEHICLE NHTSA NO.: C40113 ; TEST DATE: 03/18/04

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 2004/Saturn/Ion/4-door

TYPE OF IMPACT: 0º Flat Frontal

STOCCARD SOLVENT SPILLAGE MEASUREMENT:

A. From impact until vehicle motion ceases —
   Actual = 0.0 grams. (Maximum Allowable = 28 grams)

B. For 5 minute period after vehicle motion ceases —
   Actual = 0.0 grams. (Maximum Allowable = 142 grams)

C. For next 25 minutes —
   Actual = 0.0 grams. (Maximum Allowable = 28 grams/minute)

D. Provide Spillage Details: None

REMARKS:

No spillage occurred during the interval between test time and the start of the rollover.
A. TEST PHASE = 0° TO 90°

Determination of Stoddard
Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 30 seconds
   (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold
   Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 30 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

   Actual Test Vehicle Stoddard Solvent Spillage:

   1. First 5 minutes from onset of rotation = 0.0 grams
      (142 grams allowed)

   2. 6th minute = 0.0 grams
      (28 grams allowed)

   3. 7th minute = 0.0 grams
      (28 grams allowed)

   4. 8th minute (if required) = NA grams
      (28 grams allowed)

Provide Details of Stoddard Solvent Spillage Locations - None
B. **TEST PHASE = 90° TO 180°**

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = \( \frac{1}{6} \) minutes, 30 seconds

   (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold
   Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 30 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

   Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 minutes from onset of rotation = 0.0 grams
   (142 grams allowed)

2. 6th minute = 0.0 grams
   (28 grams allowed)

3. 7th minute = 0.0 grams
   (28 grams allowed)

4. 8th minute (if required) = NA grams
   (28 grams allowed)

Provide Details of Stoddard Solvent Spillage Locations - None
C. TEST PHASE = 180° TO 270°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minute, 30 seconds
   (Specified Range is 1 to 3 minutes)

2. PMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 30 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 minutes from onset of rotation = 0.0 grams
   (142 grams allowed)

2. 6th minute = 0.0 grams
   (28 grams allowed)

3. 7th minute = 0.0 grams
   (28 grams allowed)

4. 8th minute (if required) = NA grams
   (28 grams allowed)

Provide Details of Stoddard Solvent Spillage Locations - None
D. TEST PHASE = 270° TO 360°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minute, 30 seconds

(Specified range is 1 to 3 minutes)

2. FMVSS 301 Position Hold
   Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 30 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 minutes from onset of rotation = 0.0 grams
   (142 grams allowed)

2. 6th minute = 0.0 grams
   (28 grams allowed)

3. 7th minute = 0.0 grams
   (28 grams allowed)

4. 8th minute (if required) = NA grams
   (28 grams allowed)

Provide Details of Stoddard Solvent Spillage Locations - None
Section 6

Test Data
40 KM/H FRONTAL 2004 SATURN ION C40113

DRIVER HEAD RESULTANT ACCELERATION

TRC INC.

TEST NUMBER: 010318-1

ACCELERATION (G X 10^-1)

TIME (MS)

CHANNEL: HE3RG1 FILTER: CH. CLASS 1000

PEAK DATA: 39.94 G @ 114.00 MS; 0.07 G @ -2.16 MS
40 KM/H FRONTAL 2004 SATURN ION C48113
DRIVER NECK Y-AXIS SHEAR FORCE
40 KMPH FRONTAL
TEST NUMBER: 040318-1

Data Acquisition Explanations

channel: nekyf3  filter: ch. class 1000
peak data: 125.60 n @ 41.36 ms, -158.81 n @ 41.92 ms
40 KM/H FRONTAL 2004 SATURN ION C40113
DRIVER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 040318-1

ACCELERATION (G x 10^-1)

TIME (MS)

CHANNEL: GSTZC1   FILTER: CH. CLASS 180

PEAK DATA: 10.04 G @ 87.60 MS, -7.98 G @ 56.24 MS
40 KMPH FRONTAL 2004 SATURN ION C40113
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 840318-1

ACCELERATION (G)

CHANNEL: HEDXG2 FILTER: CH. CLASS 1000
PEAK DATA: 9.96 G @ 310.00 MS; -63.55 G @ 139.52 MS
RIGHT FRONT PASSENGER NIJ TENSION/EXTENSION

40 KPH FRONTAL 2004 SATURN ION C10113

TEST NUMBER: 040318-1

CHANNEL: NTE2
FILTER: CH. CLASS 600
PEAK DATA: 0.31 NIJ @ 93.52 MS; 0.00 NIJ @ -1.36 MS
40 KPH FRONTAL 2004 SATURN ION C40113
RIGHT FRONT PASSENGER NIJ COMPRESSION-FLEXION

CHANNEL: NCF2  FILTER: CH. CLASS 500
PEAK DATA: 0.06 NIJ @ 140.88 MS; 0.00 NIJ @ -20.00 MS
40 KMPH FRONTAL 2004 SATURN ION C48113
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

TRC INC.

48 KPH FRONTAL

TEST NUMBER: 048318-1

ACCELERATION (G x 10^-1)

-54
-38
-15
0
15
38
61
84

TIME (MS)

-20
-10
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: CSTYG2
FILTER: CH. CLASS 180

PEAK DATA: 7.91 G @ 110.88 MS; -4.92 G @ 95.68 MS
40 KM PH FRONTAL 2004 SATURN ION C40113
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 040318-1

ACCELERATION

CHANNEL: CSTZC2 FILTER: CH. CLASS 100
PEAK DATA: 16.41 G @ 98.56 MS, -4.90 G @ 67.04 MS