VEHICLE SAFETY TESTING FOR
FMVSS 208, OCCUPANT CRASH PROTECTION
FMVSS 212, WINDSHIELD MOUNTING
FMVSS 219, WINSHIELD INTRUSION (PARTIAL)
FMVSS 301, FUEL SYSTEM INTEGRITY

Daimler Chrysler Corporation
2005 Dodge Grand Caravan
NHTSA No.: C50311

PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Dates: September 13, 2006
Final Report Date: October 19, 2006

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NVS-220
400 SEVENTH STREET, SW, ROOM 6115
WASHINGTON, D.C. 20590
This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-11002.

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: _____________________________ 
Jeff Lewandowski, Project Engineer 
Date: October 19, 2006

Reviewed by: _____________________________ 
David Winkelbauer, Facility Director 
Date: October 19, 2006

FINAL REPORT ACCEPTED BY OVSC:

Accepted By: _____________________________ 
Date: October 19, 2006

Acceptance Date: _____________________________
Compliance tests were conducted on the subject 2005 Dodge Grand Caravan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP208-13 for the determination of FMVSS 208 compliance. Test failures identified were as follows:

The left front crash sensor was disconnected for the crash test.

FMVSS 208 S16.1 The 5th% female driver dummy had a neck tension (Fz) measure of 3349N at 111.0 ms after offset deformable barrier impact during the 40 kmph unbelted frontal test. The maximum allowed is 2620N.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Purpose of Test</td>
<td>1</td>
</tr>
<tr>
<td>2 Tests Performed</td>
<td>2</td>
</tr>
<tr>
<td>3 Injury Result Summary</td>
<td>4</td>
</tr>
<tr>
<td>4 Discussion of Test (if applicable)</td>
<td>5</td>
</tr>
<tr>
<td>5 Test Data Sheets</td>
<td>6</td>
</tr>
</tbody>
</table>

## Data Sheet

<table>
<thead>
<tr>
<th>Data Sheet</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 COTR Vehicle Work Order</td>
<td>7</td>
</tr>
<tr>
<td>2 Report of Vehicle Condition</td>
<td>11</td>
</tr>
<tr>
<td>3 Certification Label and Tire Placard Information</td>
<td>13</td>
</tr>
<tr>
<td>14 Marking of Reference Points for Various Test Positions &amp; Points</td>
<td>14</td>
</tr>
<tr>
<td>32 Vehicle Weight, Fuel Tank, and Attitude Data</td>
<td>21</td>
</tr>
<tr>
<td>33 Vehicle Accelerometer Locations and Measurements</td>
<td>25</td>
</tr>
<tr>
<td>34 Photographic Targets</td>
<td>28</td>
</tr>
<tr>
<td>35 Camera Locations</td>
<td>34</td>
</tr>
<tr>
<td>36 Dummy Positioning</td>
<td>36</td>
</tr>
<tr>
<td>37 Dummy Measurements</td>
<td>48</td>
</tr>
<tr>
<td>38 Crash Test</td>
<td>51</td>
</tr>
<tr>
<td>39 Offset Deformable Barrier Test Using Belted 5th Percentile Female Dummies</td>
<td>53</td>
</tr>
<tr>
<td>40 Accident Investigation Measurements</td>
<td>63</td>
</tr>
<tr>
<td>41 Windshield Mounting (FMVSS 212)</td>
<td>65</td>
</tr>
<tr>
<td>42 Windshield Zone Intrusion (FMVSS 219)</td>
<td>67</td>
</tr>
<tr>
<td>43 Fuel System Integrity (FMVSS 301)</td>
<td>69</td>
</tr>
</tbody>
</table>

## Appendix

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Crash Test Data</td>
<td>A-1</td>
</tr>
<tr>
<td>B Crash Test Photographs</td>
<td>B-1</td>
</tr>
<tr>
<td>C Instrumentation Calibration</td>
<td>C-1</td>
</tr>
<tr>
<td>D Notice of Test Failure (If Applicable)</td>
<td>D-1</td>
</tr>
</tbody>
</table>
SECTION 1
PURPOSE OF TEST

The test performed are part of a program conducted for the National Highway Traffic Safety Administration (NHTSA) by MGA Research Corporation (MGA) under Contract No. DTNH22-03-D-11002. The purpose of this test was to determine whether the subject vehicle, a 2005 Dodge Grand Caravan, NHTSA No. C50311, meets certain performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity" with the left front crash sensor disconnected. The test was conducted in accordance with OVSC Laboratory Test Procedure No. TP208-13 dated July 27, 2005.
## SECTION 2
### TESTS PERFORMED

**Test Vehicle:** 2005 Dodge Grand Caravan  
**NHTSA No.:** C50311  
**Test Program:** FMVSS 208  
**Test Dates:** 9/13/06

The following checked items indicate the tests that were performed:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rear outboard seating position seat belts (S4.1.1.2(b) &amp; (S4.2.4)</td>
</tr>
<tr>
<td>2</td>
<td>Air bag labels (S4.5.1)</td>
</tr>
<tr>
<td>3</td>
<td>Readiness indicator (S4.5.2)</td>
</tr>
<tr>
<td>4</td>
<td>Passenger air bag manual cut-off device (S4.5.4)</td>
</tr>
<tr>
<td>5</td>
<td>Lap belt lockability (S7.1.1.5)</td>
</tr>
<tr>
<td>6</td>
<td>Seat belt warning system (S7.3)</td>
</tr>
<tr>
<td>7</td>
<td>Seat belt contact force (S7.4.4)</td>
</tr>
<tr>
<td>8</td>
<td>Seat belt latch plate access (S7.4.4)</td>
</tr>
<tr>
<td>9</td>
<td>Seat belt retraction (S7.4.5)</td>
</tr>
<tr>
<td>10</td>
<td>Seat belt guides and hardware (S7.4.6)</td>
</tr>
<tr>
<td>11</td>
<td>Suppression tests with 12-month-old CRABI dummy (Part 572, Subpart R)</td>
</tr>
<tr>
<td>12</td>
<td>Suppression tests with newborn infant (Part 572, Subpart K)</td>
</tr>
<tr>
<td>13</td>
<td>Suppression tests with 3-year-old dummy (Part 572, Subpart P)</td>
</tr>
<tr>
<td>14</td>
<td>Suppression tests with 6-year-old child</td>
</tr>
<tr>
<td>15</td>
<td>Test of reactivation of the passenger air bag system with an unbelted 5th percentile female human</td>
</tr>
<tr>
<td>16</td>
<td>Low risk deployment test with 12-month-old dummy (Part 572, Subpart R)</td>
</tr>
<tr>
<td>17</td>
<td>Low risk deployment test with 3-year-old dummy (Part 572, Subpart P)</td>
</tr>
<tr>
<td>18</td>
<td>Low risk deployment test with 6-year-old dummy (Part 572, Subpart N)</td>
</tr>
<tr>
<td>19</td>
<td>Low risk deployment test with 5th female dummy (Part 572, Subpart O)</td>
</tr>
<tr>
<td>20</td>
<td>Impact Tests</td>
</tr>
<tr>
<td></td>
<td>Frontal Oblique</td>
</tr>
<tr>
<td></td>
<td>Belted 50th male dummy driver and passenger (0 to 48 kmph) (S5.1.1(a))</td>
</tr>
<tr>
<td></td>
<td>Unbelted 50th male dummy driver and passenger (0 to 48 kmph) (S5.1.2(a)(1))</td>
</tr>
<tr>
<td></td>
<td>Unbelted 50th male dummy driver and passenger (32 to 40 kmph) (S5.1.2(a) (1) or S5.1.2(b))</td>
</tr>
<tr>
<td></td>
<td>Frontal 0°</td>
</tr>
<tr>
<td></td>
<td>Belted 50th male dummy driver (0 to 48 kmph) (S5.1.1.(b)(1) or S5.1.1(a))</td>
</tr>
<tr>
<td></td>
<td>Belted 50th male dummy passenger (0 to 48 kmph) (S5.1.1.(b)(1) or S5.1.1(a))</td>
</tr>
<tr>
<td></td>
<td>Belted 5th female dummy driver (0 to 48 kmph) (S16.1(a))</td>
</tr>
<tr>
<td></td>
<td>Belted 5th female dummy passenger (0 to 48 kmph) (S16.1(a))</td>
</tr>
<tr>
<td></td>
<td>Belted 50th male dummy driver and passenger (0 to 56 kmph) (S5.1.1.(b)(2))</td>
</tr>
<tr>
<td></td>
<td>Unbelted 50th male dummy driver and passenger (0 to 48 kmph) (S5.1.2(a) (1))</td>
</tr>
<tr>
<td></td>
<td>Unbelted 50th male dummy driver (32 to 40 kmph) (S5.1.2.(a)(2) or S5.1.2(b))</td>
</tr>
<tr>
<td></td>
<td>Unbelted 50th male dummy passenger (32 to 40 kmph) (S5.1.2.(a)(2) or S5.1.2(b))</td>
</tr>
</tbody>
</table>
For the crash tests, the vehicle was instrumented with 8 accelerometers. The accelerometer data from the vehicle and dummies were sampled at 10,000 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 high-speed digital video.

The left front crash sensor was disconnected. In this condition, the vehicle does not appear to meet all of the performance requirements to which it was tested: FMVSS 208 S16.1 The 5th% female driver dummy had a neck tension (Fz) measure of 3349N at 111.0 ms after offset deformable barrier impact during the 40 kmph unbelted frontal test. The maximum allowed is 2620N.
SECTION 3
INJURY RESULT SUMMARY FOR FMVSS 208 TESTS

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
NHTSA No.: C50311  
Test Date: 9/13/06

40 kmph Frontal Crash

Impact Angle: Zero Degrees LH 40% ODB

Belted Dummies: ___Yes   _X_ No
Speed Range: ___ 0 to 40 kmph  _X_ 32 to 40 kmph
___ 0 to 48 kmph  ___ 0 to 56 kmph

Test Speed: 39.9 kmph  
Test Weight: 2112.9 kg

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

5th Percentile Female Frontal Crash Test
Vehicles certified to S16.1(a), S16.1(b), or S18.1

<table>
<thead>
<tr>
<th>Injury Criteria</th>
<th>Max. Allowable Injury Assessment Values</th>
<th>Driver</th>
<th>Passenger</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIC15</td>
<td>700</td>
<td>225</td>
<td>142</td>
</tr>
<tr>
<td>(N_{se})</td>
<td>1.0</td>
<td>1.0 (.959)</td>
<td>0.2</td>
</tr>
<tr>
<td>(N_{sd})</td>
<td>1.0</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>(N_{se})</td>
<td>1.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>(N_{cf})</td>
<td>1.0</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Neck Tension</td>
<td>2620 N</td>
<td>3349</td>
<td>633</td>
</tr>
<tr>
<td>Neck Compression</td>
<td>2520 N</td>
<td>41</td>
<td>1025</td>
</tr>
<tr>
<td>Chest g</td>
<td>60 g</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td>Chest Displacement</td>
<td>52 mm</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Left Femur</td>
<td>6805 N</td>
<td>2112</td>
<td>218</td>
</tr>
<tr>
<td>Right Femur</td>
<td>6805 N</td>
<td>2354</td>
<td>233</td>
</tr>
</tbody>
</table>
SECTION 4
DISCUSSION OF TESTS

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
NHTSA No.: C50311  
Test Dates: 9/13/06

The vehicle did not meet all performance requirements of FMVSS 208 S16.1. The 5th% female driver dummy had a neck tension (Fz) measure of 3349N at 111.0 ms after the vehicle contacted the offset deformable barrier during the 40 kmph belted frontal test. The maximum neck tension allowed is 2620N.

The vehicle was confirmed to have no air bag faults prior to preparation for testing. Just prior to towing the vehicle down the test track, the air bag left front crash sensor was disconnected causing the readiness indicator light to illuminate.

The vehicle did not have a tire placard. Information from another 2005 Dodge Grand Caravan was used to calculate the vehicle loading information. The placard is shown below.
### SECTION 5
#### TEST DATA SHEETS

<table>
<thead>
<tr>
<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50311</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Program:</td>
<td>FMVSS 208</td>
<td>Test Dates:</td>
<td>9/13/06</td>
</tr>
</tbody>
</table>
DATA SHEET 1
COTR VEHICLE WORK ORDER

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
COTR Signature: Charles R. Case

Test to be performed for this vehicle are checked below:

1. Rear Outboard Seating Position Seat Belts (S4.1.2(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 (S7.4.4)
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 R) using the following indicated child restraints.
   Section B
   - Britax Handle with Care 191
   - Century Assura 4553
   - Century Avanta SE 41530
   - Century Smart Fit 4543
   - Cosco Arriva 02727
   - 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 Touriva 02519
   - Evenflo Horizon V 425
   - Evenflo Medallion 254

12. Suppression tests with newborn infant (Part 572, Subpart K) using the following indicated child restraints.
   Section A
   - Cosco Dream Ride 02-719

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

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Full Rearward</th>
<th>Mid Position</th>
<th>Full Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britax Roundabout 161</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Century Encore 4612</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Century STE 1000 4416</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cosco Olympian 02803</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cosco Touriva 02519</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evenflo Horizon V 425</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evenflo Medallion 254</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Section D

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Full Rearward</th>
<th>Mid Position</th>
<th>Full Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britax Roadster 9004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Century Next Step 4920</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cosco High Back Booster 02-442</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evenflo Right Fit 245</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 14. Suppression tests with representative 3-year-old child using the following indicated child restraints where a child restraint is required. (Appendix H, Data Sheet 16H and 17H)

#### 15. Suppression tests with 3-year-old dummy (Part 572, Subpart P) in the following Forward, Middle, and Rearward seat track 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**

| Britax Roadster 9004 | Full Rearward | Mid Position | Full Forward |
| Century Next Step 4920 | Full Rearward | Mid Position | Full Forward |
| Cosco High Back Booster 02-442 | Full Rearward | Mid Position | Full Forward |
| Evenflo Right Fit 245 | Full Rearward | Mid Position | Full Forward |

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

**Section D**

| Britax Roadster 9004 | Full Rearward | Mid Position | Full Forward |
| Century Next Step 4920 | Full Rearward | Mid Position | Full Forward |
| Cosco High Back Booster 02-442 | Full Rearward | Mid Position | Full Forward |
| Evenflo Right Fit 245 | Full Rearward | Mid Position | Full Forward |

19. Suppression tests with 6-year-old dummy (Part 572, Subpart N) in the following Forward, Middle, and Rearward seat track 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 child’s side (S22.2.2.4)
- Sitting back in the seat and leaning on the right front passenger door (S24.2.3)

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 child’s side (S22.2.2.4)
- Sitting back in the seat and leaning on the right front passenger door (S24.2.3)

21. Test of Reactivation of the Passenger Air Bag System with an Unbelted 5th percentile female dummy (S20.3, 22.3, S24.3). Perform this test after the following suppression tests: After each restraint.

22. Test of Reactivation of the passenger air bag system with a representative 5th percentile female (S20.3, 22.3, S24.3). Perform this test after the following suppression tests:

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 | Full Rearward | Mid Position | Full Forward |
| Century Assura 4553 | Full Rearward | Mid Position | Full Forward |
| Century Avanta SE 41530 | Full Rearward | Mid Position | Full Forward |
| Century Smart Fit 4543 | Full Rearward | Mid Position | Full Forward |
| Cosco Arriva 02727 | Full Rearward | Mid Position | Full Forward |
| Cosco Opus 35 02603 | Full Rearward | Mid Position | Full Forward |
| Evenflo Discovery Adjust Right 212 | Full Rearward | Mid Position | Full Forward |
| Evenflo First Choice 204 | Full Rearward | Mid Position | Full Forward |
| Evenflo On My Way Position Right V 282 | Full Rearward | Mid Position | Full Forward |
| Graco Infant 8457 | Full Rearward | Mid Position | Full Forward |
### Section C

<table>
<thead>
<tr>
<th>Britax Roundabout 161</th>
<th>Full Rearward</th>
<th>Mid Position</th>
<th>Full Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Century Encore 4612</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century STE 1000 4416</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco Olympian 02803</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco Touriva 02519</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Horizon V 425</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Medallion 254</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Position 1</th>
<th>Position 2</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Position 1</th>
<th>Position 2</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Position 1</th>
<th>Position 2</th>
</tr>
</thead>
</table>

27. Impact Tests

- **Frontal Oblique – Test Speed:**
  - Belted 50th male dummy driver and passenger (0 to 48 kmph) (S5.1.1(a))
  - Unbelted 50th male dummy driver and passenger (0 to 48 kmph) (S5.1.2(a)(1))
  - Unbelted 50th male dummy driver and passenger (32 to 40 kmph) (S5.1.2(a)(1) or S5.1.2(b))

- **Frontal 0° - Test Speed: 39.9 kmph**
  - Belted 50th male dummy driver (0 to 48 kmph) (S5.1.1(b)(1) or S5.1.1(a))
  - Belted 50th male dummy passenger (0 to 48 kmph) (S5.1.1(b)(1) or S5.1.1(a))
  - Belted 5th female dummy driver (0 to 48 kmph) (S16.1(a))
  - Belted 5th female dummy passenger (0 to 48 kmph) (S16.1(a))
  - Belted 50th male dummy driver and passenger (0 to 56 kmph) (S5.1.2(a)(2) or S5.1.2(b))
  - Unbelted 50th male dummy driver and passenger (0 to 48 kmph) (S5.1.2(a)(1))
  - Unbelted 50th male dummy driver (32 to 40 kmph) (S5.1.2(a)(2) or S5.1.2(b))
  - Unbelted 50th male dummy passenger (32 to 40 kmph) (S5.1.2(a)(2) or S5.1.2(b))
  - Unbelted 5th female dummy driver (32 to 40 kmph) (S16.1(b))
  - Unbelted 5th female dummy passenger (32 to 40 kmph) (S16.1(b))

- **40% Offset 0° Belted 5th male dummy driver and passenger (0 to 40 kmph) (S18.1)**
  - Test Speed: 40 kmph

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

29. FMVSS 204 Indicant Test

30. FMVSS 212 Indicant Test

31. FMVSS 219 Indicant Test

32. FMVSS 301 Frontal Indicant Test
DATA SHEET 2
REPORT OF VEHICLE CONDITION

Test Vehicle: 2005 Dodge Grand Caravan  NHTSA No.: C50311
Test Program: FMVSS 208  Test Dates: 9/13/06

CONTRACT NO.  DTNH22-03-D-11002  Date: 9/20/06
FROM (Lab and rep name): MGA Research Corporation
TO: NHTSA, OVSC (NVS-220)

PURPOSE: (X) Initial Receipt  ( ) Received via Transfer  (X) Present vehicle condition

MODEL YEAR/MAKE/MODEL/BODY STYLE: 2005 Dodge Grand Caravan
MANUFACTURE DATE: 02/04
NHTSA NO. C50311  GVWR: 2586 kg (5700 lbs)
BODY COLOR: Silver  GAWR (Fr): 1293 kg (2850 lbs)
VIN: 2D4GP44L65R103557  GAWR (Rr): 1339kg (2950 lbs)

ODOMETER READINGS: ARRIVAL (miles): 31453  DATE: 8/25/06
COMPLETION (miles): 31454  DATE: 9/13/06

PURCHASE PRICE: ($) 16,350
DEALER’S NAME: Galeana's Van Dyke Dodge; 28400 Van Dyke Ave.; Warren, MI 48093

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:  ___Yes  _X_ No
F. The glove box contains an owner’s manual, warranty document, consumer information, and extra set of keys:  
   _X_ Yes  ___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

Test Vehicle: 2005 Dodge Grand Caravan  NHTSA No.: C50311
Test Program: FMVSS 208  Test Dates: 9/13/06
REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

LIST OF FMVSS TESTS PERFORMED BY THIS LAB: FMVSS 208, 212, 219, 301

VEHICLE: 2005 Dodge Grand Caravan  NHTSA NO. C50311

REMARKS:

Equipment that is no longer on the test vehicle as noted on previous page:
Storage lid and carpet behind right front passenger seat, and carpet behind third row seats

Explanation for equipment removal:
Components removed for instrumentation installation and to meet target weight.

Test Vehicle Condition:
25 mph frontal impact damage- front suspension & structure damaged, hood & front quarter panels damaged, radiator damaged, air bags & pretensioners deployed, Stoddard in fuel system

RECORDED BY: Jeff Lewandowski  DATE: 9/20/2006
APPROVED BY: David Winkelbauer  DATE: 9/20/2006

# # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #

RELEASE OF TEST VEHICLE

The vehicle described above is released from MGA to be delivered to:

Date:  Time:  Odometer:
Lab Rep’s Signature:
Title:
Carrier/Customer Rep:
Date:


DATA SHEET 3
CERTIFICATION LABEL AND TIRE PLACARD INFORMATION

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
Test Technician: Nick Kosinski

### Certification Label

<table>
<thead>
<tr>
<th>Manufacturer:</th>
<th>DaimlerChrysler Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Manufacture:</td>
<td>02/04</td>
</tr>
<tr>
<td>VIN:</td>
<td>2D4GP44L65R103557</td>
</tr>
<tr>
<td>Vehicle Certified As (Pass. Car/MPV/Truck/Bus):</td>
<td>MPV</td>
</tr>
<tr>
<td>Front Axle GVWR:</td>
<td>1293 kg (2850 lbs)</td>
</tr>
<tr>
<td>Rear Axle GVWR:</td>
<td>1339 kg (2950 lbs)</td>
</tr>
<tr>
<td>Total GVWR:</td>
<td>2586 kg (5700 lbs)</td>
</tr>
</tbody>
</table>

### Tire Placard

| Not applicable, vehicle is not a passenger car and does not have a tire placard. | YES (MPV) |
| This is not a passenger car, but all or part of this information is still contained on a vehicle label and is reported here. | YES (MPV) - The information was taken from the tire placard of a similar vehicle. |
| Vehicle Capacity Weight: | 521 kg (1150 lbs) |
| Designated Seating Capacity Front: | 2 |
| Designated Seating Capacity Rear: | 5 |
| Total Designated Seating Capacity: | 7 |
| Recommended Cold Tire Inflation Pressure Front: | 215 kpa (36 psi) |
| Recommended Cold Tire Inflation Pressure Rear: | 215 kpa (36 psi) |
| Recommended Tire Size: | P215/65R16 |

The vehicle did not have a tire placard. Information from another 2005 Dodge Grand Caravan was used.

Signature: Nick Kosinski  
Date: 9/13/06
DATA SHEET 14
MARKING OF REFERENCE POINTS FOR VARIOUS TEST POSITIONS AND POINTS

Test Vehicle: 2005 Dodge Grand Caravan  
NHTSA No.: C50311
Test Program: FMVSS 208  
Test Date: 9/13/06
Test Technician: Brian Roach

DATA SHEET 14.1
MARKING OF REFERENCE POINTS FOR 5th FEMALE

X Driver Seat ___ Passenger Seat

1. Seat Position

X 1.1 Position the seat’s adjustable lumbar supports so that the lumbar supports are in the lowest, retracted or deflated adjustment positions. (S16.2.10.1, S20.1.9.1, S20.4.1, S22.1.7.1)
N/A – No lumbar adjustment

X 1.2 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, S20.1.9.2, S20.4.1, S22.1.7.1, S22.4.2.1, S22.4.3.1, S24.4.2.1, S26.2.3, S26.3.1)
N/A – No additional support adjustment

X 1.3 Position an adjustable leg support system in its rearmost position. (8/27/04 interpretation to Toyota)
N/A – No adjustable leg support system

X 1.4 Mark a point (seat cushion reference point) on the side of the seat cushion that is between 150 mm and 250 mm from the front edge of the seat cushion. (S16.3.1.12)

X 1.5 Draw a line (seat cushion reference line) through the seat cushion reference point. (S16.3.1.13)

X 1.6 Use only the controls that primarily move the seat in the fore-aft direction to move the seat cushion reference point to the rearmost position. (S16.2.10.3.1, S22.1.7.3)

X 1.7 If the seat cushion adjusts fore-aft, independent of the seat back, use only the controls that primarily move the seat cushion in the fore-aft direction to move the seat cushion reference point to the rearmost position. (S16.2.10.3.1, S20..1.9.3)
N/A – No independent fore-aft seat cushion adjustment

X 1.8 Use any part of any control, other than the parts just used for fore-aft positioning, to determine the range of angles of the seat cushion reference line and to set the seat cushion reference line at the mid-angle. (S16.2.10.3.1)
Maximum angle 15.9 Nose down
Minimum angle 3.8 Nose down
Mid-angle 9.9 Nose down

X 1.9 If the seat and/or seat cushion height is adjustable, use any part of any control other than the parts which primarily move the seat or seat cushion fore-aft, to put the seat cushion reference point in its lowest position with the seat cushion reference line angle at the mid-angle found in 1.8. (S16.2.10.3.1)
N/A – No seat height adjustment

X 1.10 Use only the controls that primarily move the seat in the fore-aft direction to verify the seat is in the rearmost position.
1.11 Use only the controls that primarily move the seat in the fore-aft direction to mark for future reference the fore-aft seat positions. Mark each position so that there is a visual indication when the seat is at a particular position. For manual seats, move the seat forward one detent at a time and mark each detent. For power seats, mark only the rearmost, middle, and foremost positions. Label three of the positions with the following: F for foremost, 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 rearmost.

1.12 Use only the controls that primarily move the seat in the fore-aft direction to place the seat in the rearmost position.

1.13 Use any part of any control, other than the parts which primarily move the seat or seat cushion fore-aft, to find and visually mark for future reference the maximum, minimum, and middle height of the seat cushion reference point with the seat cushion reference line at the mid-angle determined in 1.8. (S20.1.9.4, S22.1.2, S22.1.7.4, S22.3.1, S22.4.3.1, S24.1.2, S24.3.1, S24.4.3.1, S26.2.3, S26.3.1)

__ N/A – No seat height adjustment. Go to 1.18

1.14 Use only the controls that primarily move the seat and/or seat cushion in the fore-aft direction to place the seat in the mid-fore-aft position.

1.15 Use any part of any control, other than the parts which primarily move the seat or seat cushion fore-aft, to find and visually mark for future reference the maximum, minimum, and middle height of the seat cushion reference point with the seat cushion reference line at the mid-angle determined in 1.8. (S20.1.9.4, S22.1.2, S22.1.7.4, S22.3.1, S24.1.2, S24.3.1)

1.16 Use only the control that change the seat in the fore-aft direction to place the seat in the foremost position. (S16.2.10.3.2)

1.17 Use any part of any control, other than the parts which primarily move the seat or seat cushion fore-aft, to find and visually mark for future reference the maximum, minimum, and middle height of the seat cushion reference point with the seat cushion reference line at the mid-angle determined in 1.8. (S16.2.10.3.3, S20.1.9.4, S22.1.2, S22.1.7.4, S22.3.1, S24.1.2, S24.3.1)

1.18 Visually mark for future reference the seat back angle at the manufacturer's nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer for the rearmost, mid, and foremost seat positions. (S20.1.9.5, S22.1.7.5, S22.4.2.1, S22.4.3.1, S24.1.2, S24.4.2.1, S26.2.3, S26.3.1)

__ N/A – No seat back angle adjustment

Manufacturer's design seat back angle 22° on seat back or 8° from upright position

1.19 Is the seat a bucket seat?

X Yes, go to 1.20 and skip 1.21

__ No, go to 1.21 and skip 1.20

1.20 Bucket seats:
Locate and mark for future reference the longitudinal centerline of the seat cushion. The intersection of the vertical longitudinal plane that passes through the SgRP and the seat cushion upper surface determines the longitudinal centerline of a bucket seat cushion. (S16.3.1.10 & S20.1.10)

__ 1.21 Bench seats (complete ONLY the one that is applicable to the seat being marked):

__ 1.21.1 Driver Seat
Locate and mark for future reference the longitudinal line on the seat cushion that marks the intersection of the vertical longitudinal plane through the centerline of the steering wheel and the seat cushion upper surface.
1.21.2 Passenger Seat
Locate and mark for future reference the longitudinal centerline of the passenger seat cushion. The longitudinal centerline is the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel. (S20.2.1.3, S22.2.1.3, S24.2.3, S20.4.4, S22.2.2.1(b), S22.2.2.3(b), S22.2.2.4(a), S22.2.2.5(a), S22.2.2.6(a), S22.2.2.7(a), S24.2.3(a))
Record the distance from the longitudinal centerline of the vehicle to the center of the steering wheel. _______
Record the distance from the longitudinal centerline of the vehicle to the longitudinal centerline of the seat cushion. (The vertical plane through this longitudinal centerline is Plane B for suppression.) _______

2. Head Restraint Position
N/A Vehicle contains automatic head restraints.
N/A, there is no head restraint adjustment
X 2.1 Adjust the head restraint to its lowest position. (S16.2.10.2, S20.1.9.6 S20.4.1, S22.1.7.6, S22.4.2.1, S22.4.3.1, S24.4.3.1, S26.2.3, S26.3.1)
X 2.2 All adjustments 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. Mark the foremost position. (S16.2.10.2 & S16.3.4.4 & S20.1.9.6, S20.4.1, S22.4.2.1, S22.4.3.1, S24.4.3.1, S26.2.3, S26.3.1)
X 2.3 Measure the vertical distance from the top most point of the head restraint to the bottom most point. Locate and mark a horizontal plane through the midpoint of this distance. (S16.3.4.3)
Vertical height of head restraint 200 mm
Mid-point height 100 mm

I certify that I have read and performed each instruction.

___________________________  _____9/13/06_____
I certify that I have read and performed each instruction. Date
DATA SHEET 14.1
MARKING OF REFERENCE POINTS FOR 5th FEMALE

__Driver Seat X Passenger Seat

1. Seat Position
X 1.1 Position the seat’s adjustable lumbar supports so that the lumbar supports are in the lowest, retracted or deflated adjustment positions. (S16.2.10.1, S20.1.9.1, S20.4.1, S22.1.7.1)
   X N/A – No lumbar adjustment
X 1.2 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, S20.1.9.2, S20.4.1, S22.1.7.1, S22.4.2.1, S22.4.3.1, S24.4.2.1, S26.2.3, S26.3.1)
   X N/A – No additional support adjustment
X 1.3 Position an adjustable leg support system in its rearmost position. (8/27/04 interpretation to Toyota)
   X N/A – No adjustable leg support system
X 1.4 Mark a point (seat cushion reference point) on the side of the seat cushion that is between 150 mm and 250 mm from the front edge of the seat cushion. (S16.3.1.12)
X 1.5 Draw a line (seat cushion reference line) through the seat cushion reference point. (S16.3.1.13)
X 1.6 Use only the controls that primarily move the seat in the fore-aft direction to move the seat cushion reference point to the rearmost position. (S16.2.10.3.1, S22.1.7.3)
X 1.7 If the seat cushion adjusts fore-aft, independent of the seat back, use only the controls that primarily move the seat cushion in the fore-aft direction to move the seat cushion reference point to the rearmost position. (S16.2.10.3.1, S20.1.9.3)
   X N/A – No independent fore-aft seat cushion adjustment
X 1.8 Use any part of any control, other than the parts just used for fore-aft positioning, to determine the range of angles of the seat cushion reference line and to set the seat cushion reference line at the mid-angle. (S16.2.10.3.1) NO ADJUSTMENT
   Maximum angle Zero
   Minimum angle Zero
   Mid-angle Zero
X 1.9 If the seat and/or seat cushion height is adjustable, use any part of any control other than the parts which primarily move the seat or seat cushion fore-aft, to put the seat cushion reference point in its lowest position with the seat cushion reference line angle at the mid-angle found in 1.8. (S16.2.10.3.1)
   X N/A – No seat height adjustment
X 1.10 Use only the controls that primarily move the seat in the fore-aft direction to verify the seat is in the rearmost position.
X 1.11 Use only the controls that primarily move the seat in the fore-aft direction to mark for future reference the fore-aft seat positions. Mark each position so that there is a visual indication when the seat is at a particular position. For manual seats, move the seat forward one detent at a time and mark each detent. For power seats, mark only the rearmost, middle, and foremost positions. Label three of the positions with the following: F for foremost, 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 rearmost.
X 1.12 Use only the controls that primarily move the seat in the fore-aft direction to place the seat in the rearmost position.
1.13 Use any part of any control, other than the parts which primarily move the seat or seat cushion fore-aft, to find and visually mark for future reference the maximum, minimum, and middle height of the seat cushion reference point with the seat cushion reference line at the mid-angle determined in 1.8. (S20.1.9.4, S22.1.2, S22.1.7.4, S22.3.1, S22.4.3.1, S24.1.2, S24.3.1, S24.4.3.1, S26.2.3, S26.3.1)

X N/A – No seat height adjustment. Go to 1.18

1.14 Use only the controls that primarily move the seat and/or seat cushion in the fore-aft direction to place the seat in the mid-fore-aft position.

1.15 Use any part of any control, other than the parts which primarily move the seat or seat cushion fore-aft, to find and visually mark for future reference the maximum, minimum, and middle height of the seat cushion reference point with the seat cushion reference line at the mid-angle determined in 1.8. (S20.1.9.4, S22.1.2, S22.1.7.4, S22.3.1, S24.1.2, S24.3.1)

1.16 Use only the control that change the seat in the fore-aft direction to place the seat in the foremost position. (S16.2.10.3.2)

1.17 Use any part of any control, other than the parts which primarily move the seat or seat cushion fore-aft, to find and visually mark for future reference the maximum, minimum, and middle height of the seat cushion reference point with the seat cushion reference line at the mid-angle determined in 1.8. (S16.2.10.3.3, S20.1.9.4, S22.1.2, S22.1.7.4, S22.3.1, S24.1.2, S24.3.1)

X 1.18 Visually mark for future reference the seat back angle at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer for the rearmost, mid, and foremost seat positions. (S20.1.9.5, S22.1.7.5, S22.4.2.1, S22.4.3.1, S24.1.2, S24.4.2.1, S26.2.3, S26.3.1)

__ N/A – No seat back angle adjustment

1.19 Is the seat a bucket seat?

X Yes, go to 1.20 and skip 1.21

__ No, go to 1.21 and skip 1.20

1.20 Bucket seats:

Locate and mark for future reference the longitudinal centerline of the seat cushion. The intersection of the vertical longitudinal plane that passes through the SgRP and the seat cushion upper surface determines the longitudinal centerline of a bucket seat cushion. (S16.3.1.10 & S20.1.10)

1.21 Bench seats (complete ONLY the one that is applicable to the seat being marked):

1.21.1 Driver Seat

Locate and mark for future reference the longitudinal line on the seat cushion that marks the intersection of the vertical longitudinal plane through the centerline of the steering wheel and the seat cushion upper surface.

1.21.2 Passenger Seat

Locate and mark for future reference the longitudinal centerline of the passenger seat cushion. The longitudinal centerline is the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel. (S20.2.1.3, S22.2.1.3, S24.2.3, S20.4.4, S22.2.2.1(b), S22.2.2.3(b), S22.2.2.4(a), S22.2.2.5(a), S22.2.2.6(a), S22.2.2.7(a), S24.2.3(a))

Record the distance from the longitudinal centerline of the vehicle to the center of the steering wheel. ________

Record the distance from the longitudinal centerline of the vehicle to the longitudinal centerline of the seat cushion. (The vertical plane through this longitudinal centerline is Plane B for suppression.) ________
2. Head Restraint Position
   
   N/A Vehicle contains automatic head restraints.
   N/A, there is no head restraint adjustment

X 2.1 Adjust the head restraint to its lowest position. (S16.2.10.2, S20.1.9.6 S20.4.1, S22.1.7.6, S22.4.2.1, S22.4.3.1, S24.4.3.1, S26.2.3, S26.3.1)

X 2.2 All adjustments 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. **Mark** the foremost position. (S16.2.10.2 & S16.3.4.4 & S20.1.9.6, S20.4.1, S22.4.2.1, S22.4.3.1, S24.4.3.1, S26.2.3, S26.3.1)

X 2.3 Measure the vertical distance from the top most point of the head restraint to the bottom most point. Locate and **mark** a horizontal plane through the midpoint of this distance. (S16.3.4.3)
   Vertical height of head restraint **200** mm
   Mid-point height **100** mm

I certify that I have read and performed each instruction.

__________________________________________  9/13/06
I certify that I have read and performed each instruction.   Date
DATA SHEET 14.3
MARKING OF REFERENCE POINTS FOR STEERING WHEEL

X 1. Is the steering wheel adjustable up and down and/or in and out?
   X Yes – go to 2
   _No – this form is complete

X 2. Find and **mark** for future reference each up and down position. Label three of the positions with the following: H for highest, M for mid-position (if there is no mid-position, label the next lowest adjustment position), and L for lowest.
   _N/A – steering wheel is not adjustable up and down

X 3. Find and **mark** for future references each in and out position. Label three of the positions with the following: F for foremost, M for mid-position (if there is no mid-position, label the next rearmost adjustment position), and R for rearmost.
   _N/A – steering wheel is not adjustable in and out.

I certify that I have read and performed each instruction.

___________________________  _____9/13/06_____
I certify that I have read and performed each instruction.   Date
21

DATA SHEET 32
VEHICLE WEIGHT, FUEL TANK, AND ATTITUDE DATA

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Nick Kosinski
NHTSA No.: C50311
Test Date: 9/13/06

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees LH 40% ODB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>Yes</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>X 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>X 5th female</td>
</tr>
</tbody>
</table>

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 useable fuel tank capacity supplied by the COTR
   Useable Fuel Tank Capacity supplied by COTR: 75.7 liters (20.0 gallons)
5. Record the fuel tank capacity supplied in the owner's manual.
   Useable Fuel Tank Capacity in owner's manual: 75.7 liters (20.0 gallons)
6. 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,” or gasoline, fill the fuel tank.
   Amount Added: 75.7 liters (20.0 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: 36 psi | LF: 36 psi | RR: 36 psi | LR: 36 psi |
   Owner's manual pressure:
   | RF: 36 psi | LF: 36 psi | RR: 36 psi | LR: 36 psi |
   Actual inflated pressure:
   | RF: 36 psi | LF: 36 psi | RR: 36 psi | LR: 36 psi |
12. Record the vehicle weight at each wheel to determine the unloaded vehicle weight (UVW), i.e. "as delivered" weight.
   Right Front (kg): 544.8 Right Rear (kg): 422.3
   Left Front (kg): 549.3 Left Rear (kg): 460.4
   Total Front (kg): 1094.1 Total Rear (kg): 882.7
   % Total Weight: 55.4 % Total Weight: 44.6
   UVW = TOTAL FRONT PLUS TOTAL REAR (KG): 1976.8
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

<table>
<thead>
<tr>
<th>RF:</th>
<th>LF:</th>
<th>RR:</th>
<th>LR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>770</td>
<td>770</td>
<td>785</td>
<td>769</td>
</tr>
</tbody>
</table>

14. Calculate the Rated Cargo and Luggage Weight (RCLW): 45 kg

14.1 Does the vehicle have the vehicle capacity weight (VCW) on the certification label or tire placard?

- Yes, go to 14.3 The vehicle did not have a tire placard. Information from another 2005 Dodge Grand Caravan was used.
- No, go to 14.2

14.2 VCW = Gross Vehicle Weight – UVW

\[ VCW = \text{UVW} - \text{Gross Vehicle Weight} \]

14.3 VCW = 521 kg (1150 lbs)

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 = _7_

14.7 RCLW = VCW – (68 kg x DSC) = 521 kg - (68 kg x 7) = 45 kg

14.8 Is the vehicle certified as a truck, MPV or bus (see the certification label on the door jamb)?

- 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): 2120.1 kg

15.1 Place the appropriate test dummy in both front outboard seating positions.

- Driver: X 5th female __ 50th male
- Passenger: X 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.

<table>
<thead>
<tr>
<th>Right Front (kg):</th>
<th>576.8</th>
<th>Right Rear (kg):</th>
<th>460.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Front (kg):</td>
<td>584.9</td>
<td>Left Rear (kg):</td>
<td>498.0</td>
</tr>
<tr>
<td>Total Front (kg):</td>
<td>1161.7</td>
<td>Total Rear (kg):</td>
<td>958.4</td>
</tr>
<tr>
<td>% Total Weight:</td>
<td>54.7</td>
<td>% Total Weight:</td>
<td>45.3</td>
</tr>
<tr>
<td>% GVW</td>
<td>50.0</td>
<td>% GVW</td>
<td>51.7</td>
</tr>
</tbody>
</table>

(\% \text{GVW} = \text{Axle GVW} \div \text{Vehicle GVW})

\[ \text{Fully Loaded Weight} = \text{Total Front Plus Total Rear (kg)} \]

\[ \text{Fully Loaded Weight} = 2120.1 \]

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

<table>
<thead>
<tr>
<th>RF:</th>
<th>LF:</th>
<th>RR:</th>
<th>LR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>756</td>
<td>753</td>
<td>753</td>
<td>736</td>
</tr>
</tbody>
</table>

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 92 - 94 percent of useable capacity.

Fuel tank capacity x .94 = 75.7 liters (20.0 gallons) x .94 = 71.2 liters (18.8 gallons)

Amount added 71.0 liters (18.77 gallons) 93.8%

19. Crank the engine to fill the fuel delivery system with Stoddard solvent

20. Calculate the test weight range.

20.1 Calculated Weight = UVW (see 12 above) + RCLW (see 14 above) + 2x(dummy weight)

\[ \text{Calculated Weight} = 2119.8 \text{ kg} = 1976.8 \text{ kg} + 45.0 \text{ kg} + 98.0 \text{ kg} \]

20.2 Test Weight Range = Calculated Weight (- 4.5 kg, - 9 kg.)

\[ \text{Max. Test Weight} = \text{Calculated Test Weight} – 4.5 \text{ kg} = 2115.3 \text{ kg} \]

\[ \text{Min. Test Weight} = \text{Calculated Test Weight} – 9 \text{ kg} = 2110.8 \text{ kg} \]

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

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.

<table>
<thead>
<tr>
<th>Right Front (kg):</th>
<th>579.7</th>
<th>Right Rear (kg):</th>
<th>455.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Front (kg):</td>
<td>585.6</td>
<td>Left Rear (kg):</td>
<td>492.2</td>
</tr>
<tr>
<td>Total Front (kg):</td>
<td>1165.3</td>
<td>Total Rear (kg):</td>
<td>947.6</td>
</tr>
<tr>
<td>% Total Weight:</td>
<td>55.1</td>
<td>% Total Weight:</td>
<td>44.9</td>
</tr>
<tr>
<td>% GVW</td>
<td>50.0</td>
<td>% GVW</td>
<td>51.7</td>
</tr>
</tbody>
</table>

(\% \text{GVW} = \text{Axle GVW divided by Vehicle GVW})

TOTAL FRONT PLUS TOTAL REAR (kg): 2112.9
28. Is the test weight between the Max. Weight and the Min. Weight (See 20.2)?
   X Yes
   X No, explain why not.

29. Test Weight Vehicle Attitude: (all dimensions in millimeters)
   29.1 Place the vehicle on a level surface
   29.2 Measure perpendicular to the level surface to the 4 points marked on the body (see 13 above) and record the measurements
   RF: 757 | LF: 755 | RR: 758 | LR: 737

30. Summary of test attitude
   30.1 AS DELIVERED:
   RF: 770 | LF: 770 | RR: 785 | LR: 769
   AS TESTED:
   RF: 757 | LF: 755 | RR: 758 | LR: 737
   FULLY LOADED:
   RF: 756 | LF: 753 | RR: 753 | LR: 736

30.2 Is the “as tested” test attitude equal to or between the “fully loaded” and “as delivered” attitude?
   X Yes
   X No, explain why not.

REMARKS:
I certify that I have read and performed each instruction.

Signature: [signature]
Date: 9/13/06
### DATA SHEET 33

**VEHICLE ACCELEROMETER LOCATION AND MEASUREMENT**

<table>
<thead>
<tr>
<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50311</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Program:</td>
<td>FMVSS 208</td>
<td>Test Date:</td>
<td>9/13/06</td>
</tr>
<tr>
<td>Test Technician:</td>
<td>Nick Kosinski</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees LH 40% ODB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>Yes</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>X 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>X 5th female</td>
</tr>
</tbody>
</table>

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.

**REMARKS:**

I certify that I have read and performed each instruction.

Signature: Nick Kosinski

Date: 9/13/06
Dimensions Corresponding To The Letters “A” Through “K” (Excluding “I”) 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 33
### VEHICLE ACCELEROMETER LOCATION AND MEASUREMENTS

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>LENGTH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRETEST VALUES</strong></td>
<td></td>
</tr>
<tr>
<td>A (LH Rear Seat Xmbr)</td>
<td>112</td>
</tr>
<tr>
<td>B (RH Rear Seat Xmbr)</td>
<td>112</td>
</tr>
<tr>
<td>C (Engine Top)</td>
<td>4446</td>
</tr>
<tr>
<td>D (Engine Bottom)</td>
<td>4314</td>
</tr>
<tr>
<td>E (Caliper)</td>
<td>Right Side 4241</td>
</tr>
<tr>
<td>F (Left Caliper)</td>
<td>686</td>
</tr>
<tr>
<td>G (IP)</td>
<td>3527</td>
</tr>
<tr>
<td>H (Seat)</td>
<td>1923</td>
</tr>
<tr>
<td>J (Right Caliper)</td>
<td>686</td>
</tr>
<tr>
<td>K (Trunk)</td>
<td>826</td>
</tr>
<tr>
<td><strong>POST TEST VALUES</strong></td>
<td></td>
</tr>
<tr>
<td>A (LH Rear Seat Xmbr)</td>
<td>112</td>
</tr>
<tr>
<td>B (RH Rear Seat Xmbr)</td>
<td>112</td>
</tr>
<tr>
<td>C (Engine Top)</td>
<td>4431</td>
</tr>
<tr>
<td>D (Engine Bottom)</td>
<td>4236</td>
</tr>
<tr>
<td>E (Caliper)</td>
<td>Right Side 4239</td>
</tr>
<tr>
<td>F (Left Caliper)</td>
<td>691</td>
</tr>
<tr>
<td>G (IP)</td>
<td>3501</td>
</tr>
<tr>
<td>H (Seat)</td>
<td>1923</td>
</tr>
<tr>
<td>J (Right Caliper)</td>
<td>660</td>
</tr>
<tr>
<td>K (Trunk)</td>
<td>826</td>
</tr>
</tbody>
</table>
1. FMVSS 208 vehicle targeting requirements (See Figures 28A and 28B)
   1.1 Targets A1 and A2 are on flat rectangular panels.
   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 (mm): 100 mm
   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 (mm): 100 mm
   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 (mm): 915 mm
   1.5 Firmly fix target A1 on the vehicle roof in the vertical longitudinal plane that is coincident with the midsagittal plane of the driver dummy.
   1.6 Firmly fix target A2 on the vehicle roof in the vertical longitudinal plane that is coincident with the midsagittal plane of the passenger dummy.
   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 (mm): 611 mm
   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 (mm): 613 mm
   1.9 Place tape with squares having alternating colors on the top portion of the steering wheel.
   1.10 Chalk the bottom portion of the steering wheel
   1.11 Is this an offset test?
     Yes, continue with this section
     No, go to 2.
   1.12 Measure the width of the vehicle.
     Vehicle width (mm):
1.13 Find the centerline of the vehicle. (½ of the vehicle width)

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

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 28D)

2. Barrier Targeting

2.1 Fix two stationary targets D1 and D2 to the barrier as shown in the Figure 28A. 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 centerline of the vehicle. The center of each circular target is 100 mm from the one next to it.

Distance between circular targets on D1 (mm): 100 mm
Distance between circular targets on D2 (mm): 100 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?”

Yes, continue with this form.

4.2 Resection panel (Figure 28C)

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.

REMARKS:

I certify that I have read and performed each instruction.

Signature: [Signature]

Date: 9/13/06
REFERENCE PHOTO TARGETS

CONCRETE BARRIER

MONORAIL

COVERED PHOTO PIT

LEFT SIDE VIEW
RESECTION PANEL TARGETING ALIGNMENT

Car top targets A1 & A2

Resection control points panel

Steering wheel

Steering column target B

Rear view

Test run steering column camera view of typical time zero vehicle position

Left side view
PRE-RUN STEERING COLUMN HIGH SPEED CAMERA VIEW

LEFT SIDE VIEW

914 mm
## DATA SHEET 35
### CAMERA LOCATIONS

**Test Vehicle:** 2005 Dodge Grand Caravan  
**NHTSA No.:** C50311  
**Test Program:** FMVSS 208  
**Test Date:** 9/13/06  
**Time:** 11:00 am

<table>
<thead>
<tr>
<th>CAMERA NO.</th>
<th>VIEW</th>
<th>CAMERA POSITIONS (mm) *</th>
<th>LENS (mm)</th>
<th>SPEED (fps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Real Time Left Side View</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Left Side View (Barrier face to front seat backs)</td>
<td>430 -5875 1080</td>
<td>24 1500</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Left Side View (Driver)</td>
<td>950 -6895 1410</td>
<td>35 400</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Left Side View (B-post aimed toward center of steering wheel)</td>
<td>5435 -5610 2055</td>
<td>50 400</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Left Side View (Steering Column)</td>
<td>765 -5490 1350</td>
<td>25 400</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Left Side View (Steering Column)</td>
<td>785 -5480 900</td>
<td>25 400</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Right Side View (Overall)</td>
<td>1485 7005 1275</td>
<td>19 1500</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Right Side View (Passenger)</td>
<td>975 6935 1500</td>
<td>35 400</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Right Side View (Angle)</td>
<td>5015 5600 2705</td>
<td>50 400</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Right Side View (Front door)</td>
<td>665 5730 1125</td>
<td>25 1500</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Front View Windshield</td>
<td>-2035 200 2995</td>
<td>12.5 400</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Front View Driver</td>
<td>-1775 -565 2250</td>
<td>19 1500</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Front View Passenger</td>
<td>-1780 695 2240</td>
<td>19 1500</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Overhead Barrier Impact View</td>
<td>470 200 5050</td>
<td>19 1500</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Pit Camera Engine View</td>
<td>185 200 -3150</td>
<td>24 1500</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Pit Camera Fuel Tank View</td>
<td>2105 200 -3150</td>
<td>24 1500</td>
<td></td>
</tr>
</tbody>
</table>

*COORDINATES:
+X - forward of impact plane  
+Y - right of monorail centerline  
+Z - above ground level
DATA SHEET 36
APPENDIX G
DUMMY POSITIONING PROCEDURES
FOR 5th% DRIVER TEST DUMMY CONFORMING TO SUBPART O OF PART 572

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Eric Peschman
IMPACT ANGLE: Zero Degrees LH 40% ODB
BELTED DUMMIES (YES/NO): Yes
TEST SPEED: _X_ 32 to 40 kmph | ___ 0 to 48 kmph | ___ 0 to 56 kmph
DRIVER DUMMY: _X_ 5th female | ___ 50th male
PASSENGER DUMMY: _X_ 5th female | ___ 50th male

X 1. Using the markings made from data sheet 14.3 (If not done previously or steering repairs have been made, complete data sheet 14.3 at this time.) to position the steering controls in the mid-position or if applicable next lowest detent position. (S16.2.9)

X 2. Place the SCRP in the full rearward, mid-height position, and mid-seat cushion angle, determined during the completion of Data Sheet 14.1. (S16.3.2.1.1)

X 3. If the vehicle has an adjustable accelerator pedal, place it in the full forward position. (S16.3.2.2.1)
_X_ N/A accelerator pedal not adjustable

X 4. Fully recline the seat back. (S16.3.2.1.2)
___ N/A seat back not adjustable.

X 5. Place the dummy in the seat with the legs at an angle of 120 degrees to the thighs. The calves should not be touching the seat cushion. (S16.3.2.1.2)

X 6. Position the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in Data Sheet 14.1. (S16.3.2.1.3 and S16.3.2.1.4)

X 7. Hold down the dummy’s thighs and push rearward on the upper torso to maximize the pelvic angle. (S16.3.2.1.5)

X 8. Set the angle between the legs and the thighs to 120 degrees. (S16.3.2.1.6)

X 9. Set the transverse distance between the centers of the front of the knees at 160 to 170 mm. (6.3 to 6.7 inches) Center the knee separation with respect to the longitudinal seat cushion marking as determined Data Sheet 14.1. (S16.3.2.1.6)
Record Knee Separation ___170___

X 10. Push rearward on the dummy’s knees until the pelvis contacts the seat back, or the backs of the calves contact the seat cushion, whichever occurs first. (S16.3.2.1.6)
___Pelvis contacted seat back.
_X_Calves contacted seat cushion.
X 11. Gently rock the upper torso ± 5 degrees (approximately 51 mm (2 inches)) side-to-side three time. (S16.3.2.1.7)

X 12. If needed, extend the legs until the feet do not contact the floor pan. The thighs should be resting on the seat cushion. (S16.3.2.1.8)

X 13. Position the right foot until the foot is in line with a longitudinal vertical plane passing through the center of the accelerator pedal. Maintain the leg and thigh in a vertical plane. (S16.3.2.1.8)

X 14. Rotate the left leg and thigh laterally to equalize the distance between each knee and the longitudinal seat cushion marking as determined in Data Sheet 14.1. (S16.3.2.1.8)

X 15. Attempt to return the seat to the foremost fore-aft position, mid-height, and seat cushion mid-angle as determined in Data Sheet 14.2. The foot may contact and depress the accelerator and/or change the angle of the foot with respect to the leg. (S16.3.2.1.8)

X Foremost position achieved. Proceed to step 20.

___ Foremost not achieved because of foot interference. Proceed to step 17.

___ Foremost not achieved because of steering wheel contact.

___ 16. If either of the dummy’s legs contact the steering wheel, move the steering wheel up the minimum amount required to avoid contact. If the steering wheel is not adjustable separate the knees the minimum required to avoid contact. (S16.3.2.1.8)

___ N/A- there was no leg contact

___ Steering wheel repositioned

___ Knees separated

___ 17. If the left foot interferes with the clutch or brake pedals, rotate the left foot about the leg to provide clearance. If this is not sufficient, rotate the thigh outboard at the hip the minimum amount required for clearance. (S16.3.2.1.8)

___ N/A, No foot interference with pedals.

___ Foot adjusted to provide clearance.

___ Foot and Thigh adjusted to provide clearance.

___ 18. Continue to move the seat. Use seat controls to line up the seat markings determined during the completion of Data Sheet 14.1 to set the foremost fore-aft position, mid-height position and the seat cushion mid-angle. If the dummy contacts the interior move the seat rearward until a maximum clearance of 5 mm (0.2 inches) is achieved or the seat is in the closest detent position that does not cause dummy contact. (S16.3.2.1.8)

___ Foremost, mid-height position and the seat cushion mid-angle reached

___ Dummy contact. Clearance set at maximum of 5mm

    Measured Clearance______________

___ Dummy Contact. Seat set at nearest detent position.

    Seat position ___ detent positions rearward of foremost
    (foremost is position zero)
19. If the steering wheel was repositioned in step 16, return the steering wheel to the original position. If the steering wheel contacts the dummy before reaching the original position, position the wheel until a maximum clearance of 5mm (0.2 inches) is achieved, or the steering wheel is in the closest detent position that does not cause dummy contact. (S16.3.2.1.8)
   __N/A Steering wheel was not repositioned.
   __Original position achieved.
   __Dummy contact. Clearance set at maximum of 5mm
     Measured Clearance ________________
   __Dummy Contact. Steering wheel set at nearest detent position.
     Steering wheel position ___ detent positions upward of original position.
     (Original position is position zero)

20. If the seat back is adjustable, rotate the seat back forward while holding the thighs in place. Continue rotating the seat back forward until the transverse instrument platform of the dummy head is level ± 0.5 degrees. If the head cannot be leveled using the seat back adjustment, or the seat back is not adjustable, use the lower neck bracket adjustment to level the head. If a level position cannot be achieved, minimize the angle. (S16.3.2.1.9)
   X_ Head Level Achieved. (Check all that apply)
     ___ Head leveled using the adjustable seat back
     ___ Head leveled using the neck bracket.
       Head Angle ___ 0.2 ___ degrees
   __ Head Level NOT Achieved. (Check all that apply)
     ___ Head adjusted using the adjustable seat back
     ___ Head adjusted using the neck bracket.
       Head Angle _____________ degrees

21. Verify the pelvis is not interfering with the seat bight. (S16.3.2.1.9)
   X_ No interference
     ___ Pelvis moved forward the minimum amount so that it is not caught in the seat bight.

22. Verify the dummy abdomen is properly installed. (S16.3.2.1.9)

   X_ Abdomen still seated properly into dummy
     ___ Abdomen was adjusted because it was not seated properly into dummy

23. Head Angle
   X_ N/A, neither the pelvis nor the abdomen were adjusted.

23.1 Head still level (Go to 24)
   __ 23.2 Head level adjusted
     ___ Head Level Achieved. (Check all that apply)
       ___ Head leveled using the adjustable seat back
       ___ Head leveled using the neck bracket.
         Head Angle _____________ degrees
     ___ Head Level NOT Achieved. (Check all that apply)
       ___ Head level adjusted using the adjustable seat back
       ___ Head level adjusted using the neck bracket.
         Head Angle _____________ degrees
24. If the dummy torso contacts the steering wheel while performing step 20, reposition the steering wheel in the following order to eliminate contact. (S16.3.2.1.9)
X N/A, No dummy torso contact with the steering wheel.

24.1 Adjust telescoping mechanism.
X N/A No telescoping adjustment.
Adjustment performed (fill in appropriate change)
Steering wheel moved ____ detent positions in the forward direction.
Steering wheel moved ____ mm in the forward direction.

24.2 Adjust tilt mechanism.
X N/A No tilt adjustment.
No adjustment performed.
Adjustment performed.
Steering wheel moved ____ detent positions Upward/Downward.
(circle one)
Steering wheel moved ____ degrees Upward/Downward

24.3 Adjust Seat in the aft direction.
X No Adjustment performed.
Seat moved aft ____ mm from original position.
Seat moved aft ____ detent positions from the original position.

25. Measure and set the pelvic angle using the pelvic angle gage TE-2504. The pelvic angle should be 20.0 degrees ± 2.5 degrees. If the pelvic angle cannot be set to the specified range because the head will not be level or because the dummy will have need major repositioning, adjust the pelvis as closely as possible to the angle range, but keep the head level. (S16.3.2.1.11)
X Pelvic angle set to 20.0 degrees ± 2.5 degrees.
Pelvic angle of 20.0 degrees not achieved, the angular difference was minimized.
Record the pelvic angle. ____ degrees

26. Check the dummy for contact with the interior after completing adjustments. (S16.3.2.1.12)
X No contact.
Dummy in contact with interior.
Seat moved aft ____ mm from the previous position.
Seat moved aft ____ detent positions from the previous position.

27. Check the dummy to see if additional interior clearance is obtained, allowing the seat to be moved forward. (S16.3.2.1.12)
X N/A, Seat already at foremost position.
Clearance unchanged. No adjustments required.
Additional clearance available
Seat moved Forward ____ mm from the previous position.
Seat moved Forward ____ detent positions from the previous position.

28. Driver’s foot positioning, right foot. Place the foot perpendicular to the leg and determine if the heel contacts the floor pan at any leg position. If the heel contacts the floor pan proceed to step 29 otherwise, proceed to step 30. (S16.3.2.2.1)
29. Perform the following steps until either all steps are completed, or the foot contacts the accelerator pedal. Step 29.6 shall be completed in all cases. (S16.3.2.2.1(a))

29.1 With the rear of the heel contacting the floor pan, move the foot forward until pedal contact occurs or the foot is at the full forward position.

29.2 If the vehicle has an adjustable accelerator pedal, move the pedals rearward until pedal contact occurs or the pedals reach the full rearward position.

29.3 Extend the leg, allowing the heel to lose contact with the floor until the foot contacts the pedal. Do not raise the toe of the foot higher than the top of the accelerator pedal. If the foot does not contact the pedal, proceed to the next step. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.3)

29.4 Angle the foot to achieve contact between the foot and the pedal. If the foot does not contact the pedal, return the foot to the perpendicular orientation. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.3)

29.5 Align the centerline of the foot with the vertical-longitudinal plane passing through the center of the accelerator pedal. Place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.3)

29.6 Record foot position
   __ Pedal Contact achieved. Contact occurred at step _____.
      X Heel contacts floor pan
      __ Heel set _____ mm from floor pan.
   __ Pedal Contact not achieved. Heel set _____ mm from the floor pan.
X 30. Perform the following steps until either all steps are completed, or the foot contacts the accelerator pedal. Step 30.5 shall be completed in all cases.

X 30.1 Extend the leg until the foot contacts the pedal. Do not raise the toe of the foot higher than the top of the accelerator pedal. If the foot does not contact the pedal, proceed to the next step. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.1(b) & S16.3.2.2.3)

A tapered foam block was used to position the dummy.

__30.2 If the vehicle has an adjustable accelerator pedal, move the pedals rearward until pedal contact occurs or the pedals reach the full rearward position. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.1(b) & S16.3.2.2.3)

__X N/A No pedal adjustment

__30.3 Angle the foot to achieve contact between the foot and the pedal. If the foot does not contact the pedal, return the foot to the perpendicular orientation. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.2 & S16.3.2.2.3)
30.4 Align the centerline of the foot in the same horizontal plane as the centerline of the accelerator pedal. Place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward. (S16.3.2.2.3)

X 30.5 Record foot position
   __ Pedal Contact achieved. Contact occurred at step __30.1__.
   __ Heel set _____ mm from floor pan.
   __ Pedal Contact not achieved. Heel set _____ mm from the floor pan.

X 31. Driver’s foot positioning, left foot.

X 31.1 Place the foot perpendicular to the leg and determine if the heel contacts the floor pan at any leg position. If the heel contacts the floor pan proceed to step 31.2, otherwise position the leg as perpendicular to the thigh as possible with the foot parallel to the floor pan. (S16.2.2.6)

X 31.2 Place the foot on the toe board with the heel resting on the floor pan as close to the intersection of the floor pan and the toe board as possible. Adjust the angle of the foot if necessary to contact the toe board. If the foot will not contact the toe board, set the foot perpendicular to the leg, and set the heel on the floor pan as far forward as possible. Avoid contact with the brake pedal, clutch pedal, wheel well projection, and footrest. To avoid this contact use the following three manipulations in the order listed, with each subsequent option incorporating the previous, until contact is avoided: rotate the foot about the lower leg (abduction/adduction), plantar flex the foot, rotate the leg outboard about the hip. Movement should be the minimum amount necessary. If it is not possible to avoid all foot contact, give priority to avoiding brake or clutch pedal contact. (S16.2.2.4 & S16.2.2.5 & S16.2.2.7)
   X  No contact
   __ Foot rotated about the leg (abduction/adduction)
   __ Foot rotated about the leg, and foot plantar flexed
   __ Foot rotated about the leg, foot plantar flexed, and the leg rotated about the hip.

X 31.3 Record foot position.
   X  Heel does not contact floor pan.
   __ Heel on floor pan and foot on toe board.
   __ Heel on floor pan and foot not on toe board.

X 32. Driver arm/hand positioning.

X 32.1 Place the dummy’s upper arms adjacent to the torso with the arm centerlines as close to a vertical longitudinal plane as possible. (S16.3.2.3.1)

X 32.2 Place the palms of the dummy in contact with the outer part of the steering wheel rim at its horizontal centerline with the thumbs over the steering wheel rim. (S16.3.2.3.2)

X 32.3 If it is not possible to position the thumbs inside the steering wheel rim at its horizontal centerline, then position them above and as close to the horizontal centerline of the steering wheel rim as possible. (S16.3.2.3.3)
32.4 Lightly tape the hands to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 9 N (2 lb) and not more than 22 N (5 lb), the tape releases the hand from the steering wheel rim. S16.3.2.3.4

33. Adjustable head restraints
   N/A, there is no head restraint adjustment

   33.1 If the head restraint has an automatic adjustment, leave it where the system positions the restraint after the dummy is placed in the seat. (S16.3.4.1) Go to 34.

   33.2 Adjust each head restraint vertically so that the mid-horizontal plane determined in Data Sheet 14.1 is aligned with the center of gravity (CG) of the dummy head. (S16.3.4.3)

   33.3 If the above position is not attainable, move the vertical center of the head restraint to the closest detent below the center of the head CG. (S16.3.4.3)

      N/A midpoint position attained in previous step
      Headrest set at nearest detent below the head CG

   33.4 If the head restraint has a fore and aft adjustment, place the restraint in the foremost position or until contact with the head is made, whichever occurs first. (S16.3.4.4)

34. Driver and passenger manual belt adjustment (for tests conducted with a belted dummy). (S16.3.5)

   34.1 If an adjustable seat belt D-ring anchorage exists, place it in the manufacturer’s design position for a 5th percentile adult female. (S16.3.5.1) This information will be supplied by the COTR.

      Manufacturer’s specified position Full Down
      Actual Position Full Down 4 Of 4

   34.2 Place the Type 2 manual belt around the test dummy and fasten the latch. (S16.3.5.2)

   34.3 Ensure that the dummy’s head remains as level as possible. (S16.3.5.3)

   34.4 Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 9 N (2 lbf) to 18 N (4 lbf) tension load to the lap belt. If the belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor. (S16.3.5.4)

REMARKS:

I certify that I have read and performed each instruction.

Signature: [Signature]                Date: 9/13/06
APPENDIX G
DUMMY POSITIONING PROCEDURES
FOR 5th% PASSENGER TEST DUMMY CONFORMING TO SUBPART O OF PART 572

Test Vehicle: 2005 Dodge Grand Caravan  NHTSA No.: C50311
Test Program: FMVSS 208  Test Date: 9/13/06
Test Technician: Joe Fleck

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees LH 40% ODB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>Yes</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td></td>
<td>__ 0 to 48 kmph</td>
</tr>
<tr>
<td></td>
<td>__ 0 to 56 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>X 5th female</td>
</tr>
<tr>
<td></td>
<td>__ 50th male</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>X 5th female</td>
</tr>
<tr>
<td></td>
<td>__ 50th male</td>
</tr>
</tbody>
</table>

(Check this item ONLY if it applies to this vehicle.)

X The passenger seat adjustments are controlled by the adjustments made to the driver’s seat. Therefore, positioning of the passenger dummy is made simultaneously with the driver dummy. Adjustments made to the seat to position the driver will over ride any adjustments that would normally be made to position the passenger. (S16.2.10.3)

X 1. Place the SCRP in the full rearward, mid-height position, and mid-seat cushion angle, determined during the completion of Data Sheet 14.1. (S16.3.3.1.1)

X 2. Fully recline the seat back. (S16.3.3.1.2)
   __ N/A seat back not adjustable.

X 3. Place the dummy in the seat with the legs at an angle of 120 degrees to the thighs. The calves should not be touching the seat cushion. (S16.3.3.1.2)

X 4. Position the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion marking that was determined in Data Sheet 14.1. (S16.3.3.1.3 and S16.3.3.1.4)

X 5. Hold down the dummy’s thighs and push rearward on the upper torso to maximize the pelvic angle. (S16.3.3.1.5)

X 6. Set the angle between the legs and the thighs to 120 degrees. (S16.3.3.1.6)

X 7. Set the transverse distance between the centers of the front of the knees at 160 to 170 mm. (6.3 to 6.7 inches). Center the knee separation with respect to the longitudinal seat cushion marking that was determined Data Sheet 14.1. (S16.3.3.1.6)
   Record Knee Separation  165

X 8. Push rearward on the dummy’s knees until the pelvis contacts the seat back, or the backs of the calves contact the seat cushion, whichever occurs first. (S16.3.3.1.6)
   X Pelvis contacted seat back.
   __Calves contacted seat cushion.
9. Gently rock the upper torso ± 5 degrees (approximately 51 mm (2 inches)) side-to-side three times. (S16.3.3.1.7)

10. If needed, extend the legs until the feet do not contact the floor pan. The thighs should be resting on the seat cushion. (S16.3.3.1.8)

11. Use seat controls to line up the seat markings determined during the completion of Data Sheet 14.1 to set the foremost fore-aft position, mid-height position and the seat cushion mid-angle. If the dummy contacts the interior move the seat rearward until a maximum clearance of 5 mm (0.2 inches) is achieved or the seat is in the closest detent position that does not cause dummy contact. (S16.3.3.1.8)
   Foremost, mid-height position and the seat cushion mid-angle reached
   __Dummy contact. Clearance set at maximum of 5mm
   Measured Clearance ____________
   __Dummy Contact. Seat set at nearest detent position.
   Seat position ___ detent positions rearward of foremost
   (foremost is position zero)

12. If the seat back is adjustable, rotate the seat back forward while holding the thighs in place. Continue rotating the seat back forward until the transverse instrument platform of the dummy head is level ± 0.5 degrees. If head cannot be leveled using the seat back adjustment, or the seat back is not adjustable, use the lower neck bracket adjustment to level the head. If a level position cannot be achieved, adjust the head as closely as possible to the ± 0.5 degree range. (S16.3.3.1.9 and S16.3.3.1.10)
   (Check All That Apply)
   __Seat back not adjustable
   __Seat back not independent of driver side seat back
   X Head Level Achieved. (Check all that apply)
   X Head leveled using the adjustable seat back
   __Head leveled using the neck bracket.
   Head Angle _______0.2_____ degrees
   __Head Level NOT Achieved. (Check all that apply)
   __ Head adjusted using the adjustable seat back
   __ Head adjusted using the neck bracket.
   Head Angle _____________ degrees

13. Verify the pelvis is not interfering with the seat bight. (S16.3.3.1.9)
   X No interference
   __Pelvis moved forward the minimum amount so that it is not caught in the seat bight.

14. Verify the dummy abdomen is properly installed. (S16.3.3.1.9)
   X Abdomen still seated properly into dummy
   __Abdomen was adjusted because it was not seated properly into dummy

15. Head Angle
   X N/A, neither the pelvis nor the abdomen were adjusted.

15.1 Head still level (Go to 16)
15.2 Head level adjusted
   (Check all that apply)
   __Head Level Achieved
   __Head leveled using the adjustable seat back
   __Head leveled using the neck bracket.
   Head Angle ____________ degrees
   __Head Level NOT Achieved
   __Head adjusted using the adjustable seat back
   __Head adjusted using the neck bracket.
   Head Angle ____________ degrees

X 16. Measure and set the pelvic angle using the pelvic angle gage TE-2504. The pelvic angle should be 20.0 degrees ± 2.5 degrees. If the pelvic angle cannot be set to the specified range because the head will not be level or because the dummy will have need major repositioning, adjust the pelvis as closely as possible to the angle range, but keep the head level.
   Pelvic angle set to 20.0 degrees ± 2.5 degrees.
   __Pelvic angle of 20.0 degrees not achieved, the angular difference was minimized.
   X Record the pelvic angle. ____21.0 _____ degrees

X 17. Check the dummy for contact with the interior after completing adjustments.
   X No contact.
   __Dummy in contact with interior.
   __Seat moved aft ___ mm from the previous position.
   __Seat moved aft ___ detent positions from the previous position.

X 18. Verify the transverse instrument platform of the dummy head is level +/- 0.5 degrees.
   Use the lower neck bracket adjustment to level the head. If a level position cannot be achieved, minimize the angle. (S16.3.3.1.9, S16.3.3.1.10, and S16.3.3.1.11)
   X Head Level Achieved
   __Head Level NOT Achieved.
   __Head Angle ____________ degrees

X 19. Check the dummy to see if additional interior clearance is obtained, allowing the seat to be moved forward. (S16.3.3.1.12)
   N/A Bench Seat
   X N/A Seat already at full forward position.
   __Clearance unchanged. No adjustments required.
   __Additional clearance available
   __Seat moved Forward ___ mm from the previous position.
   __Seat moved Forward ___ detent positions from the previous position.
   __Seat moved Forward, Full Forward position reached.

X 20. Passenger foot positioning. (Indicate final position achieved) (S16.3.3.2)

   __20.1 Place feet flat on the toe board; OR (S16.3.3.2.1)

   __20.2 If the feet cannot be placed flat on the toe board, set the feet perpendicular to the lower leg, and rest the heel as far forward on the floor pan as possible; OR (S16.3.3.2.2)

   __20.3 If the heels do not touch the floor pan, set the legs as perpendicular to the thighs as possible and set the feet parallel to the floor pan. (S16.3.3.2.2)
X 21. Passenger arm/hand positioning. (S16.3.3.3)

X 21.1 Place the dummy’s upper arms adjacent to the torso with the arm centerlines as close to a vertical longitudinal plane as possible. (S16.3.3.3.1)

X 21.2 Place the palms of the dummy in contact with the outer part of the thighs (S16.3.3.3.2)

X 21.3 Place the little fingers in contact with the seat cushion. (S16.3.3.3.3)

X 22. Adjustable head restraints (S16.3.4)

__N/A, there is no head restraint adjustment

__22.1 If the head restraint has an automatic adjustment, leave it where the system positions the restraint after the dummy is placed in the seat. (S16.3.4.1) Go to 23.

__22.2 Adjust each head restraint vertically so that the horizontal plane determined in Data Sheet 14.1 is aligned with the center of gravity (CG) of the dummy head. (S16.3.4.3)

X 22.3 If the above position is not attainable, move the vertical center of the head restraint to the closest detent below the center of the head CG. (S16.3.4.3)

__N/A midpoint position attained in previous step

X Headrest set at nearest detent below the head CG

X 22.4 If the head restraint has a fore and aft adjustment, place the restraint in the foremost position or until contact with the head is made, whichever occurs first. (S16.3.4.4)

X 23. Manual belt adjustment (for tests conducted with a belted dummy) S16.3.5

__N/A, Unbelted test

X 23.1 If an adjustable seat belt D-ring anchorage exists, place it in the manufacturer’s design position for a 5th percentile adult female. This information will be supplied by the COTR. (S16.3.5.1)

<table>
<thead>
<tr>
<th>Manufacturer’s specified position</th>
<th>Full Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Position</td>
<td>Full Down 4 Of 4</td>
</tr>
</tbody>
</table>

X 23.2 Place the Type 2 manual belt around the test dummy and fasten the latch. (S16.3.5.2)

X 23.3 Ensure that the dummy’s head remains as level as possible. (S16.3.5.3)

X 23.4 Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 9 N (2 lbf) to 18 N (4 lbf) tension load to the lap belt. If the belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor. (S16.3.5.4)

REMARKS:
I certify that I have read and performed each instruction.

Signature: [Signature]
Date: 9/13/06
DATA SHEET 37

DUMMY MEASUREMENTS

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
Test Technician: Eric Peschman

NHTSA No.: C50311  
Test Date: 9/13/06

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD</td>
<td>Chest to Dash</td>
</tr>
<tr>
<td>CS</td>
<td>Chest to Steering Wheel Hub</td>
</tr>
<tr>
<td>HH</td>
<td>Head to Header</td>
</tr>
<tr>
<td>HW</td>
<td>Head to Windshield</td>
</tr>
<tr>
<td>HZ</td>
<td>Head to Roof</td>
</tr>
<tr>
<td>KDA</td>
<td>Knee to Dash Angle</td>
</tr>
<tr>
<td>KDL</td>
<td>Left Knee to Dash</td>
</tr>
<tr>
<td>KDR</td>
<td>Right Knee to Dash</td>
</tr>
<tr>
<td>NA</td>
<td>Nose to Rim</td>
</tr>
<tr>
<td>NR</td>
<td>Nose to Rim Angle</td>
</tr>
<tr>
<td>PA</td>
<td>Pelvic Angle</td>
</tr>
<tr>
<td>RA</td>
<td>Rim to Abdomen</td>
</tr>
<tr>
<td>SA</td>
<td>Seat Back Angle</td>
</tr>
<tr>
<td>SCA</td>
<td>Steering Column Angle</td>
</tr>
<tr>
<td>SH</td>
<td>Striker to H-Point</td>
</tr>
<tr>
<td>SK</td>
<td>Striker to Knee</td>
</tr>
<tr>
<td>ST</td>
<td>Striker to Head</td>
</tr>
<tr>
<td>SWA</td>
<td>Steering Wheel Angle</td>
</tr>
<tr>
<td>TA</td>
<td>Tibial Angle</td>
</tr>
<tr>
<td>WA</td>
<td>Windshield Angle</td>
</tr>
</tbody>
</table>

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 Axis)

CD  °  HH  °  HW  °  HZ  °  KDA  °  KDL  °  KDR  °  NA  °  NR  °  PA  °  RA  °  SA  °  SCA  °  SH  °  SK  °  ST  °  SWA  °  TA  °  WA  °  TA  °  PA  °  RA  °  SA  °  SCA  °  SH  °  SK  °  ST  °  SWA  °  TA  °  WA

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Eric Peschman
NHTSA No.: C50311
Test Date: 9/13/06

Vertical Transverse Plane
Vertical Longitudinal Planes
<table>
<thead>
<tr>
<th>Code</th>
<th>Measurement Description</th>
<th>Driver SN 510</th>
<th>Passenger SN 511</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Length (mm)</td>
<td>Angle (°)</td>
</tr>
<tr>
<td>WA</td>
<td>Windshield Angle</td>
<td>27.9</td>
<td></td>
</tr>
<tr>
<td>SWA</td>
<td>Steering Wheel Angle</td>
<td>64.9</td>
<td></td>
</tr>
<tr>
<td>SCA</td>
<td>Steering Column Angle</td>
<td>25.7</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>Seat Back Angle (On Headrest)</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>HZ</td>
<td>Head to Roof (Z)</td>
<td>223</td>
<td>206</td>
</tr>
<tr>
<td>HH</td>
<td>Head to Header</td>
<td>319</td>
<td>44.4</td>
</tr>
<tr>
<td>HW</td>
<td>Head to Windshield</td>
<td>632</td>
<td>0.0</td>
</tr>
<tr>
<td>HR</td>
<td>Head to Side Header (Y)</td>
<td>248</td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td>Nose to Rim</td>
<td>276</td>
<td>5.4</td>
</tr>
<tr>
<td>CD</td>
<td>Chest to Dash</td>
<td>483</td>
<td>474</td>
</tr>
<tr>
<td>CS</td>
<td>Chest to Steering Hub</td>
<td>203</td>
<td>1.1</td>
</tr>
<tr>
<td>RA</td>
<td>Rim to Abdomen</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>KDL</td>
<td>Left Knee to Dash</td>
<td>102</td>
<td>43.0</td>
</tr>
<tr>
<td>KDR</td>
<td>Right Knee to Dash</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>Pelvic Angle</td>
<td>22.3</td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>Tibia Angle</td>
<td>67.6</td>
<td></td>
</tr>
<tr>
<td>KK</td>
<td>Knee to Knee (Y)</td>
<td>283</td>
<td>225</td>
</tr>
<tr>
<td>SK</td>
<td>Striker to Knee</td>
<td>694</td>
<td>86.6</td>
</tr>
<tr>
<td>ST</td>
<td>Striker to Head</td>
<td>615</td>
<td>19.6</td>
</tr>
<tr>
<td>SH</td>
<td>Striker to H-Point</td>
<td>357</td>
<td>83.9</td>
</tr>
<tr>
<td>SHY</td>
<td>Striker to H-Point (Y)</td>
<td>303</td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td>Head to Side Window</td>
<td>396</td>
<td></td>
</tr>
<tr>
<td>HD</td>
<td>H-Point to Door (Y)</td>
<td>198</td>
<td></td>
</tr>
<tr>
<td>AD</td>
<td>Arm to Door (Y)</td>
<td>182</td>
<td></td>
</tr>
<tr>
<td>AA</td>
<td>Ankle to Ankle</td>
<td>307</td>
<td></td>
</tr>
</tbody>
</table>
### SEAT BELT POSITIONING DATA

**Dummy’s Centerline**

**SHOULDER BELT PORTION**

**TBI**

**‘D’ Ring**

**SHOULDER BELT PORTION**

**LAP BELT PORTION**

**1/8” Thick Aluminum Plate**

**Emergency Locking Retractor**

**Buckle Assembly**

**Male Blade**

**Outboard Anchorage**

**Inboard Anchorage**

**Floorpan**

**Front View of Dummy**

### SEAT BELT POSITIONING MEASUREMENTS

<table>
<thead>
<tr>
<th>Measurement Description</th>
<th>Units</th>
<th>Driver</th>
<th>Passenger</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBU - Top surface of reference to belt upper edge</td>
<td>mm</td>
<td>262</td>
<td>260</td>
</tr>
<tr>
<td>PBL - Top surface of reference to belt lower edge</td>
<td>mm</td>
<td>170</td>
<td>180</td>
</tr>
</tbody>
</table>
## DATA SHEET 38
### CRASH TEST

<table>
<thead>
<tr>
<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50311</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Program:</td>
<td>FMVSS 208</td>
<td>Test Date:</td>
<td>9/13/06</td>
</tr>
<tr>
<td>Test Technician:</td>
<td>Eric Peschman</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees LH 40% ODB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>Yes</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>X 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>X 5th female</td>
</tr>
</tbody>
</table>

1. Vehicle underbody painted
2. The speed measuring devices are in place and functioning.
3. The speed measuring devices are _1.0_ m from the barrier (spec. 1.5m) and _30_ cm from the barrier (spec. is 30 cm)
4. Convertible top is in the closed position.
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.
   - 250 kpa front left tire
   - 250 kpa front right tire
   - 250 kpa rear left tire
   - 250 kpa rear right tire
   - 250 kpa specified on tire placard or in owner information
7. Time zero contacts on barrier 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. Posttest zero and shunt calibration checks performed and recorded
16. Actual test speed 39.9 kmph
17. Vehicle rebound from the barrier 302 cm
18. Describe whether the doors open after the test and what method is used to open the doors.
   - Left Front Door: Door remained closed and latched; Door opened without tools
   - Right Front Door: Door remained closed and latched; Door opened without tools
   - Left Rear Door: Door remained closed and latched; Door opened without tools
   - Right Rear Door: Door remained closed and latched; Door opened without tools
19. Describe the contact points of the dummy with the interior of the vehicle.
   X Driver Dummy: Head to Steering Wheel, Air Bag, and Head Rest; Chest to Air Bag; Knees to Knee Bolster
   X Passenger Dummy: Head to Air Bag; Chest to Air Bag; Knees to Glove Box

REMARKS:
I certify that I have read and performed each instruction.

Signature: ___________________________ Date: 9/13/06
## DATA SHEET NO. 39
OFFSET DEFORMABLE BARRIER TEST USING BELTED 5th PERCENTILE FEMALE DUMMIES
(Part 572, Subpart O) (S18)

<table>
<thead>
<tr>
<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50311</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Program:</td>
<td>FMVSS 208</td>
<td>Test Date:</td>
<td>9/13/06</td>
</tr>
<tr>
<td>Test Technician:</td>
<td>Nick Kosinski</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IMPACT ANGLE:
Zero Degrees LH 40% ODB

### BELTED DUMMIES (YES/NO):
Yes

### TEST SPEED:
- X 32 to 40 kmph
- __ 0 to 48 kmph
- __ 0 to 56 kmph

### DRIVER DUMMY:
- X 5th female
- __ 50th male

### PASSENGER DUMMY:
- X 5th female
- __ 50th male

Barrier Serial Number: FL002

Driver dummy Serial Number: 510  Passenger Dummy Serial Number: 511

Vehicle Speed  (39.9) 40 km/hr  Offset 40 Percent

### 1.0 Pre-Test Activities

- X 1.1 Complete the following data sheets
  - X 1.1.1 Vehicle Receiving and Inspection
  - X 1.1.2 Vehicle Weight, Fuel Tank, and Attitude
  - X 1.1.3 Vehicle Accelerometer Location
  - X 1.1.4 General Test Vehicle Data
  - X 1.1.5 Photographic Targets
  - X 1.1.6 Camera Locations
  - X 1.1.7 5th Percentile Female Dummy Calibration
  - X 1.1.8 Appendix G 5th Percentile Female Dummy Seating and Positioning Procedure
X 1.2 Barrier Certification
X 1.2.1 Verify the offset deformable barrier materials and construction are certified to Subpart C of 49 CFR 587. (Attach vendor certification sheets to this data sheet.)

**CERTIFICATE OF CONFORMITY**

Certificate No. 25859  
Serial No. FL002

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Frontal ODB painted grey</th>
<th>Cellbond Part No.</th>
<th>70EEVCFI US</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Test Results</th>
<th>GR No.</th>
<th>Bk No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3658-8</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>4141-8</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Declaration

The above moving deformable barrier has been manufactured in accordance with the provisions of the European Parliament and Council No 96/79/EC Directive (Regulation ECE R94)

Additional Information...
EEVC DEFORMABLE FRONTAL BARRIER
ALUMINIUM HONEYCOMB CERTIFICATION
STATIC TEST RESULTS

MAIN BLOCK
Core: 1.8 3/4 3003

Required Crush Strength
0.308 MPa to 0.342 MPa

Test No: 3658-8

GR No: CHC0303065FK
Block No: N/A

<table>
<thead>
<tr>
<th>Crush Strength (MPa)</th>
<th>6.4 to 9.7 mm</th>
<th>9.7 to 13.2 mm</th>
<th>13.2 to 16.5 mm</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample* 1</td>
<td>0.3287</td>
<td>0.3287</td>
<td>0.3249</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 2</td>
<td>0.3224</td>
<td>0.3054</td>
<td>0.3190</td>
<td>FAIL</td>
</tr>
<tr>
<td>Sample 3</td>
<td>0.3286</td>
<td>0.3266</td>
<td>0.3309</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 4</td>
<td>0.3389</td>
<td>0.3409</td>
<td>0.3256</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 5</td>
<td>0.3316</td>
<td>0.3400</td>
<td>0.3400</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 6</td>
<td>0.3295</td>
<td>0.3280</td>
<td>0.3245</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 7</td>
<td>0.3281</td>
<td>0.3321</td>
<td>0.3374</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 8</td>
<td>0.3337</td>
<td>0.3366</td>
<td>0.3299</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Seven out of the eight samples must fulfill the crush strength requirement in order to pass the block certification

*Sample size and location as per R94.

RESULT: PASSED
EEVC DEFORMABLE FRONTAL BARRIER
MAIN BLOCK

Honeycomb Type: 1.8/3/4 3003
Higher Acceptable Crush Strength Limit: 0.342 MPa
Lower Acceptable Crush Strength Limit: 0.308 MPa

Test No: 3658-8
GR No: CHC0003065FK

SAMPLE 1
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 2
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 3
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 4
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 5
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 6
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 7
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

SAMPLE 8
Zone 1 Zone 2 Zone 3
0 5 10 15 20 25
Deflection (mm)

Section 1: 6.4 - 9.7 mm
Section 2: 9.7 - 13.2 mm
Section 3: 13.2 - 16.5 mm
Speed: 6.35 mm/min
Block No: N/A
EEVC DEFORMABLE FRONTAL BARRIER
ALUMINIUM HONEYCOMB CERTIFICATION
STATIC TEST RESULTS

BUMPER
Core: 5.2 1/4 3003

Required Crush Strength
1.540 MPa to 1.711 MPa

Test No: 4141-8

GR No: CHC0511008FL
Block No: N/A

<table>
<thead>
<tr>
<th>Crush Strength (MPa)</th>
<th>6.4 to 9.7 mm</th>
<th>9.7 to 13.2 mm</th>
<th>13.2 to 16.5 mm</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1</td>
<td>1.638</td>
<td>1.642</td>
<td>1.633</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 2</td>
<td>1.628</td>
<td>1.638</td>
<td>1.628</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 3</td>
<td>1.634</td>
<td>1.636</td>
<td>1.622</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 4</td>
<td>1.680</td>
<td>1.667</td>
<td>1.667</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 5</td>
<td>1.654</td>
<td>1.638</td>
<td>1.631</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 6</td>
<td>1.627</td>
<td>1.624</td>
<td>1.618</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 7</td>
<td>1.643</td>
<td>1.630</td>
<td>1.636</td>
<td>PASS</td>
</tr>
<tr>
<td>Sample 8</td>
<td>1.650</td>
<td>1.656</td>
<td>1.638</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Seven out of the eight samples must fulfil the crush strength requirement in order to pass the block certification.

*Sample size and location as per R94.

RESULT: PASSED
Honeycomb Type: 5.2 1/4 3003
Higher Acceptable Crush Strength Limit: 1.711 MPa
Lower Acceptable Crush Strength Limit: 1.540 MPa

Test No: 4141-8  Gate No: CHC3511005FL

SAMPLE 1
Zone 1 Zone 2 Zone 3

SAMPLE 2
Zone 1 Zone 2 Zone 3

SAMPLE 3
Zone 1 Zone 2 Zone 3

SAMPLE 4
Zone 1 Zone 2 Zone 3

SAMPLE 5
Zone 1 Zone 2 Zone 3

SAMPLE 6
Zone 1 Zone 2 Zone 3

SAMPLE 7
Zone 1 Zone 2 Zone 3

SAMPLE 8
Zone 1 Zone 2 Zone 3

Section 1: 6.4 - 9.7 mm
Section 2: 9.7 - 13.2 mm
Section 3: 13.2 - 16.5 mm
Speed: 6.35 mm/min
Block No: N/A
1.3 Verify barrier measurements and complete the table below. (See Figure 1)

<table>
<thead>
<tr>
<th>Specified Dimension in mm +/- 2.5 unless specified</th>
<th>Measured Dimension in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Body Height RH Side</td>
<td>650</td>
</tr>
<tr>
<td>Main Body Height LH Side</td>
<td>650</td>
</tr>
<tr>
<td>Floor to Lower Barrier LH</td>
<td>200 +/- 15</td>
</tr>
<tr>
<td>Floor to Lower Barrier RH</td>
<td>200 +/- 15</td>
</tr>
<tr>
<td>Main Body Width</td>
<td>1000</td>
</tr>
<tr>
<td>Bumper Element Width</td>
<td>1000</td>
</tr>
<tr>
<td>Bumper Element Height LH</td>
<td>330</td>
</tr>
<tr>
<td>Bumper Element Height RH</td>
<td>330</td>
</tr>
<tr>
<td>Main Body Depth LH</td>
<td>450</td>
</tr>
<tr>
<td>Main Body Depth RH</td>
<td>450</td>
</tr>
<tr>
<td>Bumper Element Depth LH</td>
<td>90</td>
</tr>
<tr>
<td>Bumper Element Depth RH</td>
<td>90</td>
</tr>
<tr>
<td>Upper Slot Location</td>
<td>220</td>
</tr>
<tr>
<td>Lower Slot Location</td>
<td>110</td>
</tr>
<tr>
<td>Upper Slot Width</td>
<td>4mm Max</td>
</tr>
<tr>
<td>Lower Slot width</td>
<td>4mm Max</td>
</tr>
</tbody>
</table>

1.3.1 All Dimensions within specified Tolerance

Yes

1.4 Verify deformable barrier mounted using 10 bolts (8mm diameter minimum) and the steel strips specified.

1.5 Verify height of Fixed Rigid Barrier relative to vehicle being tested.

1.6 Photograph pre-test condition. Include photograph shown below.

- Pre-test frontal view of test vehicle
- Pre-test left side view of test vehicle
- Pre-test right side view of test vehicle
- Pre-test left front three-quarter view of test vehicle
- Pre-test right rear three-quarter view of test vehicle
- Pre-test windshield view
- Pre-test engine compartment view
- Pre-test fuel filler cap view
- Pre-test front underbody view
- Pre-test rear underbody view
- Pre-test driver dummy position with the door open and with the camera perpendicular to the longitudinal centerline of the vehicle and in line with the markings showing the fore-aft position of the seat.
- Frontal Pre-test driver dummy position with the camera in the same plane as the longitudinal centerline of the dummy.
- Pre-test passenger dummy position with the door open and with the camera perpendicular to the longitudinal centerline of the vehicle and in line with the markings showing the fore-aft position of the seat.
Frontal Pre-test passenger dummy position view with the camera in the same plane as the longitudinal centerline of the dummy.

Dummy contact point(s) (vehicle and dummy)

Pre-test view of the knee bolsters.

Pre-test view of the steering column shear capsule if any part of it is visible. Do NOT disassemble any parts to take these photographs.

Pre-test under hood view of the steering column intersecting the firewall. Take the best photograph possible without removing any parts.

Pre-test view of the steering column intersecting the firewall from inside the vehicle. Take the best photograph possible without removing any parts.

2.0 Test Execution

2.1 Impact vehicle into offset deformable barrier at a speed of 25 km/hr +0/-2 km/hr

Record Impact speed

<table>
<thead>
<tr>
<th>Trap Location (from barrier)</th>
<th>1000 and 300 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed at impact 25 km/hr +0 / -2 km/hr</td>
<td>Yes / No</td>
</tr>
</tbody>
</table>

2.2 Strike barrier at offset of 10% of vehicle width +/- 50mm from the vehicle centerline.

Vehicle Width 2039 mm as measured (1996 mm per manufacturer)

<table>
<thead>
<tr>
<th>Required Offset</th>
<th>799 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Measured Offset</td>
<td>799 mm</td>
</tr>
</tbody>
</table>

The offset is based on manufacturer data of 1996 mm.

Offset within +/- 50mm | Yes / No |

2.3 Vehicle attitude at impact 0.0 degrees +/- 5 degrees

Impact angle 0.0 degrees

Impact angle 0.0 +/- 5 degrees | Yes / No |
3.0 Post Test Activities

X 3.1 Photograph post-test condition. Include photograph shown below.

X Post test frontal view of test vehicle
X Post test left side view of test vehicle
X Post test right side view of test vehicle
X Post test left front three-quarter view of test vehicle
X Post test right rear three-quarter view of test vehicle
X Post test windshield view
X Post test engine compartment view
X Post test fuel filler cap view
X Post test front underbody view
X Post test rear underbody view
X Post test driver dummy position with the door open and with the camera perpendicular to the longitudinal centerline of the vehicle and in line with the markings showing the fore-aft position of the seat.
X Frontal post test driver dummy position with the camera in the same plane as the longitudinal centerline of the dummy.
X Post test passenger dummy position with the door open and with the camera perpendicular to the longitudinal centerline of the vehicle and in line with the markings showing the fore-aft position of the seat
X Frontal post test passenger dummy position view with the camera in the same plane as the longitudinal centerline of the dummy.
X Dummy contact point(s)( vehicle and dummy)
X Post test view of the knee bolsters.
X Post test view of the steering column shear capsule if any part of it is visible. Do NOT disassemble any parts to take these photographs.
X Post test under hood view of the steering column intersecting the fire wall. Take the best photograph possible without removing any parts.
X Post test view of the steering column intersecting the fire wall from inside the vehicle. Take the best photograph possible without removing any parts.
X Post test Stoddard solvent spillage location view, if required.
X Post test electrolyte spillage location view, if required.
X Post test top view of test vehicle while vehicle is on static rollover machine. (If applicable)

X 3.2 Process data channels per section 11.14 and record injury values in the Table.
### 5th Percentile Female Frontal Crash Test

Vehicles certified to S16.1(a), S16.1(b), or S18.1

<table>
<thead>
<tr>
<th>Injury Criteria</th>
<th>Max. Allowable Injury Assessment Values</th>
<th>Driver</th>
<th>Passenger</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIC15</td>
<td>700</td>
<td>225</td>
<td>142</td>
</tr>
<tr>
<td>N_{te}</td>
<td>1.0</td>
<td>1.0 (.959)</td>
<td>0.2</td>
</tr>
<tr>
<td>N_{de}</td>
<td>1.0</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>N_{cf}</td>
<td>1.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Neck Tension</td>
<td>2620 N</td>
<td>3349</td>
<td>633</td>
</tr>
<tr>
<td>Neck Compression</td>
<td>2520 N</td>
<td>41</td>
<td>1025</td>
</tr>
<tr>
<td>Chest g</td>
<td>60 g</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td>Chest Displacement</td>
<td>52 mm</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Left Femur</td>
<td>6805 N</td>
<td>2112</td>
<td>218</td>
</tr>
<tr>
<td>Right Femur</td>
<td>6805 N</td>
<td>2354</td>
<td>233</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All injury Criteria within limits</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

3.3 Perform post-test calibration check.

### FIGURE 1

OFFSET BARRIER

I certify that I have read and performed each instruction.

Signature: ___________________________ Date: 9/13/06
### Impact Angle:
Zero Degrees LH 40% ODB

### Belted Dummies (Yes/No):
Yes

### Test Speed:
- X 32 to 40 kmph
- 0 to 48 kmph
- 0 to 56 kmph

### Driver Dummy:
- X 5th female
- 50th male

### Passenger Dummy:
- X 5th female
- 50th male

### Vehicle Year/Make/Model/Body Style:
2005 Dodge Grand Caravan

### VIN:
2D4GP44L65R103557

### Wheelbase:
3034 mm

### Build Date:
02/04

### Vehicle Size Category:
5

### Test Weight:
2203.1 kg

### Front Overhang:
963 mm

### Overall Width:
2039 mm

### Overall Length Center:
5063 mm

#### Accelerometer Data

<table>
<thead>
<tr>
<th>Location</th>
<th>As per measurements on Data Sheet 33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linearity</td>
<td>&gt;99.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integration Algorithm</th>
<th>Trapezoidal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Impact Speed</td>
<td>39.9 kmph</td>
</tr>
<tr>
<td>Time of Separation</td>
<td>182.1 ms</td>
</tr>
<tr>
<td>Velocity Change</td>
<td>47.1 kmph</td>
</tr>
</tbody>
</table>
CRUSH PROFILE

Collision Deformation Classification: 12FDEW6
Midpoint of Damage: Vehicle Longitudinal Centerline
Damage Region Length (mm): 1367
Impact Mode: Frontal Barrier

<table>
<thead>
<tr>
<th>No.</th>
<th>Measurement Description</th>
<th>Units</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Crush zone 1 at left side</td>
<td>mm</td>
<td>4911</td>
<td>4637</td>
<td>274</td>
</tr>
<tr>
<td>C2</td>
<td>Crush zone 2 at left side</td>
<td>mm</td>
<td>4995</td>
<td>4624</td>
<td>371</td>
</tr>
<tr>
<td>C3</td>
<td>Crush zone 3 at left side</td>
<td>mm</td>
<td>5047</td>
<td>4782</td>
<td>265</td>
</tr>
<tr>
<td>C4</td>
<td>Crush zone 4 at right side</td>
<td>mm</td>
<td>5046</td>
<td>4968</td>
<td>78</td>
</tr>
<tr>
<td>C5</td>
<td>Crush zone 5 at right side</td>
<td>mm</td>
<td>4996</td>
<td>4992</td>
<td>4</td>
</tr>
<tr>
<td>C6</td>
<td>Crush zone 6 at right side</td>
<td>mm</td>
<td>4913</td>
<td>4934</td>
<td>-21</td>
</tr>
</tbody>
</table>

REMARKS:

I certify that I have read and performed each instruction.

Signature: [Signature]

Date: 9/13/06
DATA SHEET 41
WINDSHIELD MOUNTING (FMVSS 212)

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
Test Technician: Nick Kosinski  
NHTSA No.: C50311  
Test Date: 9/13/06

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees LH 40% ODB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>Yes</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>X 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>X 5th female</td>
</tr>
</tbody>
</table>

1. Pre-Crash
   1.1 Describe from visual inspection how the windshield is mounted and describe any trim material.

   Retained with glue
   Rubber trim

   1.2 Mark the longitudinal centerline of the windshield
   1.3 Measure pre-crash A, B, and C for the left side and record in the chart below.
   1.4 Measure pre-crash C, D, and E for the right side and record in the chart below.
   1.5 Measure from the edge of the retainer or molding to the edge of the windshield.
   Dimension G (mm): 11 mm

2. Post Crash
   2.1 Can a single thickness of copier type paper (as small a piece as necessary) slide between the windshield and the vehicle body?

   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

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
Test Technician: Nick Kosinski  
NHTSA No.: C50311  
Test Date: 9/13/06
# WINDSHIELD RETENTION MEASUREMENTS

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Pre-Crash (mm)</th>
<th>Post-Crash (mm)</th>
<th>Percent Retention (Post-Test ÷ Pre-Crash)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>612</td>
<td>612</td>
<td>100%</td>
</tr>
<tr>
<td>B</td>
<td>896</td>
<td>896</td>
<td>100%</td>
</tr>
<tr>
<td>C</td>
<td>823</td>
<td>823</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>2321</td>
<td>2321</td>
<td>100%</td>
</tr>
</tbody>
</table>

Left Side

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Pre-Crash (mm)</th>
<th>Post-Crash (mm)</th>
<th>Percent Retention (Post-Test ÷ Pre-Crash)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>612</td>
<td>612</td>
<td>100%</td>
</tr>
<tr>
<td>E</td>
<td>896</td>
<td>896</td>
<td>100%</td>
</tr>
<tr>
<td>F</td>
<td>823</td>
<td>823</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>2321</td>
<td>2321</td>
<td>100%</td>
</tr>
</tbody>
</table>

Right Side

Indicate area of mounting failure. NONE

**FRONT VIEW OF WINDSHIELD**

**INDICATE WIDTH OF MOLDING**

**ZERO POINT (0,0)**

**REMARKS:**

I certify that I have read and performed each instruction.

Signature: [Signature]

Date: 9/13/06
DATA SHEET 42
WINDSHIELD ZONE INTRUSION (FMVSS 219)

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Nick Kosinski

NHTSA No.: C50311
Test Date: 9/13/06

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees LH 40% ODB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>Yes</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph, 0 to 48 kmph, 0 to 56 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>X 5th female, 50th male</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>X 5th female, 50th male</td>
</tr>
</tbody>
</table>

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.

Provide all dimensions necessary to reproduce the protected area.
WINDSHIELD DIMENSIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>mm</td>
<td>1204</td>
</tr>
<tr>
<td>B</td>
<td>mm</td>
<td>530</td>
</tr>
<tr>
<td>C</td>
<td>mm</td>
<td>1644</td>
</tr>
<tr>
<td>D</td>
<td>mm</td>
<td>896</td>
</tr>
<tr>
<td>E</td>
<td>mm</td>
<td>615</td>
</tr>
<tr>
<td>F</td>
<td>mm</td>
<td>685</td>
</tr>
</tbody>
</table>

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>NONE</td>
<td></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>NONE</td>
<td></td>
</tr>
</tbody>
</table>

REMARKS:

I certify that I have read and performed each instruction.

Signature:  
Date: 9/13/06
DATA SHEET 43
FUEL SYSTEM INTEGRITY (FMVSS 301)

Test Vehicle: 2005 Dodge Grand Caravan  NHTSA No.: C50311
Test Program: FMVSS 208  Test Date: 9/13/06
Test Technician: Eric Peschman

TYPE OF IMPACT: 25 mph Belted ODB Frontal

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0.0 grams
   (Maximum Allowable = 28 grams)
B. For the 5 minute period after motion ceases: 0.0 grams
   (Maximum Allowable = 142 grams)
C. For the following 25 minutes: 0.0 grams
   (Maximum Allowable = 28 grams/minute)
D. Spillage: NONE

REMARKS: NO SPILLAGE
DATA SHEET NO. 43
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
NHTSA No.: C50311
Test Date: 9/13/06

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage locations: **The post test FMVSS 301 rollover was not conducted at the direction of the COTR.**

<table>
<thead>
<tr>
<th>Test Phase</th>
<th>Rotation Time (sec.)</th>
<th>Hold Time (sec.)</th>
<th>Spillage (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0° to 90°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90° to 180°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>180° to 270°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>270° to 360°</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test Vehicle:
2005 Dodge Grand Caravan

Test Program:
FMVSS 208

NHTSA No.:
C50311

Test Date:
9/13/06

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage locations: **The post test FMVSS 301 rollover was no conducted at the direction of the COTR.**
APPENDIX A

CRASH TEST DATA
## TABLE OF DATA PLOTS

<table>
<thead>
<tr>
<th>Figure No.</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Driver Head X Acceleration vs. Time</td>
<td>A-1</td>
</tr>
<tr>
<td>2</td>
<td>Driver Head Y Acceleration vs. Time</td>
<td>A-1</td>
</tr>
<tr>
<td>3</td>
<td>Driver Head Z Acceleration vs. Time</td>
<td>A-1</td>
</tr>
<tr>
<td>4</td>
<td>Driver Head Resultant Acceleration vs. Time</td>
<td>A-1</td>
</tr>
<tr>
<td>5</td>
<td>Driver Head X Velocity vs. Time</td>
<td>A-2</td>
</tr>
<tr>
<td>6</td>
<td>Driver Head Y Velocity vs. Time</td>
<td>A-2</td>
</tr>
<tr>
<td>7</td>
<td>Driver Head Z Velocity vs. Time</td>
<td>A-2</td>
</tr>
<tr>
<td>8</td>
<td>Driver Neck Force X vs. Time</td>
<td>A-3</td>
</tr>
<tr>
<td>9</td>
<td>Driver Neck Force Y vs. Time</td>
<td>A-3</td>
</tr>
<tr>
<td>10</td>
<td>Driver Neck Force Z vs. Time</td>
<td>A-3</td>
</tr>
<tr>
<td>11</td>
<td>Driver Neck Force Resultant vs. Time</td>
<td>A-3</td>
</tr>
<tr>
<td>12</td>
<td>Driver Neck Moment X vs. Time</td>
<td>A-4</td>
</tr>
<tr>
<td>13</td>
<td>Driver Neck Moment Y vs. Time</td>
<td>A-4</td>
</tr>
<tr>
<td>14</td>
<td>Driver Neck Moment Z vs. Time</td>
<td>A-4</td>
</tr>
<tr>
<td>15</td>
<td>Driver Neck Moment Resultant vs. Time</td>
<td>A-4</td>
</tr>
<tr>
<td>16</td>
<td>Driver Chest X Acceleration vs. Time</td>
<td>A-5</td>
</tr>
<tr>
<td>17</td>
<td>Driver Chest Y Acceleration vs. Time</td>
<td>A-5</td>
</tr>
<tr>
<td>18</td>
<td>Driver Chest Z Acceleration vs. Time</td>
<td>A-5</td>
</tr>
<tr>
<td>19</td>
<td>Driver Chest Resultant Acceleration vs. Time</td>
<td>A-5</td>
</tr>
<tr>
<td>20</td>
<td>Driver Chest X Velocity vs. Time</td>
<td>A-6</td>
</tr>
<tr>
<td>21</td>
<td>Driver Chest Y Velocity vs. Time</td>
<td>A-6</td>
</tr>
<tr>
<td>22</td>
<td>Driver Chest Z Velocity vs. Time</td>
<td>A-6</td>
</tr>
<tr>
<td>23</td>
<td>Driver Chest Displacement vs. Time</td>
<td>A-6</td>
</tr>
<tr>
<td>24</td>
<td>Driver Left Femur Force vs. Time</td>
<td>A-7</td>
</tr>
<tr>
<td>25</td>
<td>Driver Right Femur Force vs. Time</td>
<td>A-7</td>
</tr>
<tr>
<td>26</td>
<td>Passenger Head X Acceleration vs. Time</td>
<td>A-8</td>
</tr>
<tr>
<td>27</td>
<td>Passenger Head Y Acceleration vs. Time</td>
<td>A-8</td>
</tr>
<tr>
<td>28</td>
<td>Passenger Head Z Acceleration vs. Time</td>
<td>A-8</td>
</tr>
<tr>
<td>29</td>
<td>Passenger Head Resultant Acceleration vs. Time</td>
<td>A-8</td>
</tr>
<tr>
<td>Figure No.</td>
<td>Description</td>
<td>Page No.</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>30</td>
<td>Passenger Head X Velocity vs. Time</td>
<td>A-9</td>
</tr>
<tr>
<td>31</td>
<td>Passenger Head Y Velocity vs. Time</td>
<td>A-9</td>
</tr>
<tr>
<td>32</td>
<td>Passenger Head Z Velocity vs. Time</td>
<td>A-9</td>
</tr>
<tr>
<td>33</td>
<td>Passenger Neck Force X vs. Time</td>
<td>A-10</td>
</tr>
<tr>
<td>34</td>
<td>Passenger Neck Force Y vs. Time</td>
<td>A-10</td>
</tr>
<tr>
<td>35</td>
<td>Passenger Neck Force Z vs. Time</td>
<td>A-10</td>
</tr>
<tr>
<td>36</td>
<td>Passenger Neck Force Resultant vs. Time</td>
<td>A-10</td>
</tr>
<tr>
<td>37</td>
<td>Passenger Neck Moment X vs. Time</td>
<td>A-11</td>
</tr>
<tr>
<td>38</td>
<td>Passenger Neck Moment Y vs. Time</td>
<td>A-11</td>
</tr>
<tr>
<td>39</td>
<td>Passenger Neck Moment Z vs. Time</td>
<td>A-11</td>
</tr>
<tr>
<td>40</td>
<td>Passenger Neck Moment Resultant vs. Time</td>
<td>A-11</td>
</tr>
<tr>
<td>41</td>
<td>Passenger Chest X Acceleration vs. Time</td>
<td>A-12</td>
</tr>
<tr>
<td>42</td>
<td>Passenger Chest Y Acceleration vs. Time</td>
<td>A-12</td>
</tr>
<tr>
<td>43</td>
<td>Passenger Chest Z Acceleration vs. Time</td>
<td>A-12</td>
</tr>
<tr>
<td>44</td>
<td>Passenger Chest Resultant Acceleration vs. Time</td>
<td>A-12</td>
</tr>
<tr>
<td>45</td>
<td>Passenger Chest X Velocity vs. Time</td>
<td>A-13</td>
</tr>
<tr>
<td>46</td>
<td>Passenger Chest Y Velocity vs. Time</td>
<td>A-13</td>
</tr>
<tr>
<td>47</td>
<td>Passenger Chest Z Velocity vs. Time</td>
<td>A-13</td>
</tr>
<tr>
<td>48</td>
<td>Passenger Chest Displacement vs. Time</td>
<td>A-13</td>
</tr>
<tr>
<td>49</td>
<td>Passenger Left Femur Force vs. Time</td>
<td>A-14</td>
</tr>
<tr>
<td>50</td>
<td>Passenger Right Femur Force vs. Time</td>
<td>A-14</td>
</tr>
<tr>
<td>51</td>
<td>Driver Nij (N_{TF}) vs. Time</td>
<td>A-15</td>
</tr>
<tr>
<td>52</td>
<td>Driver Nij (N_{TE}) vs. Time</td>
<td>A-15</td>
</tr>
<tr>
<td>53</td>
<td>Driver Nij (N_{CF}) vs. Time</td>
<td>A-15</td>
</tr>
<tr>
<td>54</td>
<td>Driver Nij (N_{CE}) vs. Time</td>
<td>A-15</td>
</tr>
<tr>
<td>55</td>
<td>Passenger Nij (N_{TF}) vs. Time</td>
<td>A-16</td>
</tr>
<tr>
<td>56</td>
<td>Passenger Nij (N_{TE}) vs. Time</td>
<td>A-16</td>
</tr>
<tr>
<td>57</td>
<td>Passenger Nij (N_{CF}) vs. Time</td>
<td>A-16</td>
</tr>
<tr>
<td>58</td>
<td>Passenger Nij (N_{CE}) vs. Time</td>
<td>A-16</td>
</tr>
<tr>
<td>59</td>
<td>Driver Occipital Condyle Moment vs. Time</td>
<td>A-17</td>
</tr>
</tbody>
</table>
Figure No. 60. Passenger Occipital Condyle Moment vs. Time A-17
Figure No. 61. Left Rear Seat Crossmember X Acceleration vs. Time A-18
Figure No. 62. Left Rear Seat Crossmember X Velocity vs. Time A-18
Figure No. 63. Right Rear Seat Crossmember X Acceleration vs. Time A-18
Figure No. 64. Right Rear Seat Crossmember X Velocity vs. Time A-18
Figure No. 65. Top of Engine X Acceleration vs. Time A-19
Figure No. 66. Top of Engine X Velocity vs. Time A-19
Figure No. 67. Bottom of Engine X Acceleration vs. Time A-19
Figure No. 68. Bottom of Engine X Velocity vs. Time A-19
Figure No. 69. Left Brake Caliper X Acceleration vs. Time A-20
Figure No. 70. Left Brake Caliper X Velocity vs. Time A-20
Figure No. 71. Right Brake Caliper X Acceleration vs. Time A-20
Figure No. 72. Right Brake Caliper X Velocity vs. Time A-20
Figure No. 73. Instrument Panel X Acceleration vs. Time A-21
Figure No. 74. Instrument Panel X Velocity vs. Time A-21
Figure No. 75. Trunk Z Acceleration vs. Time A-21
Figure No. 76. Trunk Z Velocity vs. Time A-21
Figure No. 77. Driver Airbag Timing (Stage 1) Volts vs. Time A-22
Figure No. 78. Driver Airbag Timing (Stage 2) Volts vs. Time A-22
Figure No. 79. Passenger Airbag Timing (Stage 1) Volts vs. Time A-22
Figure No. 80. Passenger Airbag Timing (Stage 2) Volts vs. Time A-22
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

Max: 40.1 kph
Tmax: 65.1 ms
Min: -10.6 kph
Tmin: 173.5 ms
CFC 180

Max: 7.9 kph
Tmax: 300.0 ms
Min: -1.9 kph
Tmin: 140.5 ms
CFC 180

Max: 37.6 kph
Tmax: 300.0 ms
Min: -0.8 kph
Tmin: 63.5 ms
CFC 180
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

**DRIVER NECK FX (N) vs TIME (ms)**
- Max: 48.9 N
- Tmax: 296.2 ms
- Min: -1115.0 N
- Tmin: 117.2 ms
- CFC 1000

**DRIVER NECK FY (N) vs TIME (ms)**
- Max: 159.8 N
- Tmax: 142.1 ms
- Min: -107.6 N
- Tmin: 111.5 ms
- CFC 1000

**DRIVER NECK FZ (N) vs TIME (ms)**
- Max: 3348.8 N
- Tmax: 111.0 ms
- Min: -40.8 N
- Tmin: 51.5 ms
- CFC 1000

**DRIVER NECK FResultant (N) vs TIME (ms)**
- Max: 3433.5 N
- Tmax: 111.0 ms
- Min: 0.4 N
- Tmin: 0.0 ms
- CFC 1000
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

Max: 1.5 G's
Tmax: 241.7 ms
Min: -43.0 G's
Tmin: 113.1 ms
CFC 180

Max: 6.1 G's
Tmax: 115.9 ms
Min: -7.6 G's
Tmin: 110.2 ms
CFC 180

Max: 11.7 G's
Tmax: 112.5 ms
Min: -5.1 G's
Tmin: 110.8 ms
CFC 180

Max: 44.2 G's
Tmax: 113.0 ms
Min: 0.1 G's
Tmin: 0.0 ms
CFC 180
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

DRIVER CHEST X Velocity (kph) vs TIME (ms)
Max: 39.9 kph
Tmax: 0.0 ms
Min: -9.9 kph
Tmin: 196.4 ms
CFC 180

DRIVER CHEST Y Velocity (kph) vs TIME (ms)
Max: 9.8 kph
Tmax: 300.0 ms
Min: -0.4 kph
Tmin: 83.6 ms
CFC 180

DRIVER CHEST Z Velocity (kph) vs TIME (ms)
Max: 6.9 kph
Tmax: 300.0 ms
Min: -4.4 kph
Tmin: 97.3 ms
CFC 180

DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)
Max: 0.3 mm
Tmax: 48.0 ms
Min: -25.4 mm
Tmin: 113.8 ms
CFC 600
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)
Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

Max: 465.4 N
Tmax: 99.3 ms
Min: -2112.3 N
Tmin: 113.7 ms
CFC 600

Max: 245.3 N
Tmax: 100.0 ms
Min: -2354.5 N
Tmin: 106.8 ms
CFC 600
PASSENGER HEAD X (G's) vs TIME (ms)
Max: 20.9 G's
Tmax: 133.4 ms
Min: -40.8 G's
Tmin: 158.1 ms
CFC 1000

PASSENGER HEAD Y (G's) vs TIME (ms)
Max: 18.4 G's
Tmax: 152.1 ms
Min: -9.2 G's
Tmin: 126.1 ms
CFC 1000

PASSENGER HEAD Z (G's) vs TIME (ms)
Max: 47.8 G's
Tmax: 133.2 ms
Min: -0.8 G's
Tmin: 47.3 ms
CFC 1000

PASSENGER HEAD Resultant (G's) vs TIME (ms)
Max: 51.9 G's
Tmax: 133.3 ms
Min: 0.0 G's
Tmin: 0.0 ms
CFC 1000
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER HEAD X Velocity (kph) vs TIME (ms)
Max: 40.0 kph
Tmax: 53.2 ms
Min: -7.9 kph
Tmin: 266.2 ms
CFC 180

PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
Max: 14.7 kph
Tmax: 300.0 ms
Min: -0.2 kph
Tmin: 62.4 ms
CFC 180

PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
Max: 78.6 kph
Tmax: 300.0 ms
Min: -0.7 kph
Tmin: 63.3 ms
CFC 180
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER NECK FX (N) vs TIME (ms)
Max: 103.7 N
Tmax: 295.5 ms
Min: -1974.0 N
Tmin: 154.4 ms
CFC 1000

PASSENGER NECK FY (N) vs TIME (ms)
Max: 466.0 N
Tmax: 147.8 ms
Min: -56.8 N
Tmin: 185.1 ms
CFC 1000

PASSENGER NECK FZ (N) vs TIME (ms)
Max: 633.2 N
Tmax: 158.7 ms
Min: -1025.2 N
Tmin: 126.8 ms
CFC 1000

PASSENGER NECK FResultant (N) vs TIME (ms)
Max: 2047.3 N
Tmax: 155.0 ms
Min: 0.2 N
Tmin: 0.0 ms
CFC 1000
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER NECK MX (Nm) vs TIME (ms)
Max: 14.0 Nm
Tmax: 139.9 ms
Min: -6.3 Nm
Tmin: 172.3 ms
CFC 600

PASSENGER NECK MY (Nm) vs TIME (ms)
Max: 57.8 Nm
Tmax: 139.5 ms
Min: -10.4 Nm
Tmin: 283.5 ms
CFC 600

PASSENGER NECK MZ (Nm) vs TIME (ms)
Max: 8.2 Nm
Tmax: 156.9 ms
Min: -3.2 Nm
Tmin: 220.4 ms
CFC 600

PASSENGER NECK MResultant (Nm) vs TIME (ms)
Max: 59.4 Nm
Tmax: 139.6 ms
Min: 0.0 Nm
Tmin: 0.0 ms
CFC 600
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)
Speed: 24.8 mph (39.9 km/h)

Test Date: 09/13/2006

PASSENGER CHEST X Velocity (kph) vs TIME (ms)
Max: 39.9 kph
Tmax: 0.0 ms
Min: -7.0 kph
Tmin: 217.2 ms
CFC 180

PASSENGER CHEST Y Velocity (kph) vs TIME (ms)
Max: 13.6 kph
Tmax: 227.5 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

PASSENGER CHEST Z Velocity (kph) vs TIME (ms)
Max: 4.5 kph
Tmax: 159.3 ms
Min: -3.1 kph
Tmin: 88.6 ms
CFC 180

PASSENGER CHEST DISPLACEMENT (mm) vs TIME (ms)
Max: 0.4 mm
Tmax: 47.7 ms
Min: -13.0 mm
Tmin: 125.4 ms
CFC 600
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER LEFT FEMUR (N) vs TIME (ms)
- Max: 477.3 N
- Tmax: 143.1 ms
- Min: -218.3 N
- Tmin: 281.3 ms
- CFC 600

PASSENGER RIGHT FEMUR (N) vs TIME (ms)
- Max: 514.1 N
- Tmax: 107.9 ms
- Min: -233.2 N
- Tmin: 216.7 ms
- CFC 600
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

Pass. nij (NTF) () vs TIME (ms)

Max: 0.6
Tmax: 155.6 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

Pass. nij (NTE) () vs TIME (ms)

Max: 0.2
Tmax: 283.6 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

Pass. nij (NCF) () vs TIME (ms)

Max: 0.6
Tmax: 140.5 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

Pass. nij (NCE) () vs TIME (ms)

Max: 0.1
Tmax: 121.2 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

Driv. Occipital Condyle Moment (Nm) vs TIME (ms)

Max: 4.5 Nm
Tmax: 109.5 ms
Min: -41.4 Nm
Tmin: 116.1 ms
CFC 600

Pass. Occipital Condyle Moment (Nm) vs TIME (ms)

Max: 72.4 Nm
Tmax: 149.5 ms
Min: -10.8 Nm
Tmin: 283.4 ms
CFC 600
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

Left Rear Seat Crossmember X (G's) vs Time (ms)
- Max: 1.1 G's
- Tmax: 195.8 ms
- Min: -13.4 G's
- Tmin: 131.6 ms
- CFC 60

Left Rear Seat Crossmember X Velocity (kph) vs Time (ms)
- Max: 39.9 kph
- Tmax: 3.5 ms
- Min: -3.9 kph
- Tmin: 181.7 ms
- CFC 180

Right Rear Seat Crossmember X (G's) vs Time (ms)
- Max: 1.0 G's
- Tmax: 197.1 ms
- Min: -13.1 G's
- Tmin: 131.4 ms
- CFC 60

Right Rear Seat Crossmember X Velocity (kph) vs Time (ms)
- Max: 39.9 kph
- Tmax: 0.0 ms
- Min: -3.3 kph
- Tmin: 184.3 ms
- CFC 180
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

LEFT BRAKE CALIPER X (G's) vs TIME (ms)
Max: 15.2 G's
Tmax: 105.2 ms
Min: -32.9 G's
Tmin: 67.6 ms
CFC 60

LEFT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
Max: 40.0 kph
Tmax: 0.0 ms
Min: -10.5 kph
Tmin: 231.1 ms
CFC 180

RIGHT BRAKE CALIPER X (G's) vs TIME (ms)
Max: 3.6 G's
Tmax: 177.9 ms
Min: -16.5 G's
Tmin: 121.2 ms
CFC 60

RIGHT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
Max: 40.1 kph
Tmax: 5.8 ms
Min: -0.3 kph
Tmin: 169.7 ms
CFC 180
25 MPH LH 40% ODB BELTED
2005 DODGE CARAVAN (C50311)

Test Date: 09/13/2006
Speed: 24.8 mph (39.9 km/h)

**Driver Airbag Timing (Stage 1) (Volts) vs Time (ms)**
- Max: 3.9 Volts
- Tmax: 101.1 ms
- Min: -0.2 Volts
- Tmin: 132.1 ms

**Driver Airbag Timing (Stage 2) (Volts) vs Time (ms)**
- Max: 14.4 Volts
- Tmax: 199.7 ms
- Min: -0.2 Volts
- Tmin: 220.6 ms

**Passenger Airbag Timing (Stage 1) (Volts) vs Time (ms)**
- Max: 4.2 Volts
- Tmax: 100.8 ms
- Min: -0.2 Volts
- Tmin: 138.8 ms

**Passenger Airbag Timing (Stage 2) (Volts) vs Time (ms)**
- Max: 3.9 Volts
- Tmax: 108.8 ms
- Min: -0.1 Volts
- Tmin: 108.3 ms
APPENDIX B

CRASH TEST PHOTOGRAPHS
# TABLE OF PHOTOGRAPHS

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Vehicle Certification Label</td>
<td>B-1</td>
</tr>
<tr>
<td>2.</td>
<td>Pre-Test Front View of Test Vehicle</td>
<td>B-2</td>
</tr>
<tr>
<td>3.</td>
<td>Post-Test Front View of Test Vehicle</td>
<td>B-3</td>
</tr>
<tr>
<td>4.</td>
<td>Pre-Test Left Side View of Test Vehicle</td>
<td>B-4</td>
</tr>
<tr>
<td>5.</td>
<td>Post-Test Left Side View of Test Vehicle</td>
<td>B-5</td>
</tr>
<tr>
<td>6.</td>
<td>Pre-Test Right Side View of Test Vehicle</td>
<td>B-6</td>
</tr>
<tr>
<td>7.</td>
<td>Post-Test Right Side View of Test Vehicle</td>
<td>B-7</td>
</tr>
<tr>
<td>8.</td>
<td>Pre-Test Right Front Three-Quarter View of Test Vehicle</td>
<td>B-8</td>
</tr>
<tr>
<td>9.</td>
<td>Post-Test Right Front Three-Quarter View of Test Vehicle</td>
<td>B-9</td>
</tr>
<tr>
<td>10.</td>
<td>Pre-Test Left Front Three-Quarter View of Test Vehicle</td>
<td>B-10</td>
</tr>
<tr>
<td>11.</td>
<td>Post-Test Left Front Three-Quarter View of Test Vehicle</td>
<td>B-11</td>
</tr>
<tr>
<td>12.</td>
<td>Pre-Test Right Rear Three-Quarter View of Test Vehicle</td>
<td>B-12</td>
</tr>
<tr>
<td>13.</td>
<td>Post-Test Right Rear Three-Quarter View of Test Vehicle</td>
<td>B-13</td>
</tr>
<tr>
<td>14.</td>
<td>Pre-Test Left Rear Three-Quarter View of Test Vehicle</td>
<td>B-14</td>
</tr>
<tr>
<td>15.</td>
<td>Post-Test Left Rear Three-Quarter View of Test Vehicle</td>
<td>B-15</td>
</tr>
<tr>
<td>16.</td>
<td>Pre-Test Rear View of Test Vehicle</td>
<td>B-16</td>
</tr>
<tr>
<td>17.</td>
<td>Post-Test Rear View of Test Vehicle</td>
<td>B-17</td>
</tr>
<tr>
<td>18.</td>
<td>Pre-Test Windshield View</td>
<td>B-18</td>
</tr>
<tr>
<td>19.</td>
<td>Post-Test Windshield View</td>
<td>B-19</td>
</tr>
<tr>
<td>20.</td>
<td>Pre-Test Engine Compartment View</td>
<td>B-20</td>
</tr>
<tr>
<td>21.</td>
<td>Post-Test Engine Compartment View</td>
<td>B-21</td>
</tr>
<tr>
<td>22.</td>
<td>Pre-Test Fuel Filler Cap View</td>
<td>B-22</td>
</tr>
<tr>
<td>23.</td>
<td>Post-Test Fuel Filler Cap View</td>
<td>B-23</td>
</tr>
<tr>
<td>24.</td>
<td>Pre-Test Front Underbody View</td>
<td>B-24</td>
</tr>
<tr>
<td>25.</td>
<td>Post-Test Front Underbody View</td>
<td>B-25</td>
</tr>
<tr>
<td>26.</td>
<td>Pre-Test Mid Underbody View</td>
<td>B-26</td>
</tr>
</tbody>
</table>
Photo No. 27. Post-Test Mid Underbody View B-27
Photo No. 28. Pre-Test Fuel Tank View B-28
Photo No. 29. Post-Test Fuel Tank View B-29
Photo No. 30. Pre-Test Rear Underbody View B-30
Photo No. 31. Post-Test Rear Underbody View B-31
Photo No. 32. Pre-Test Driver Dummy Front View (head position) B-32
Photo No. 33. Post-Test Driver Dummy Front View (head position) B-33
Photo No. 34. Pre-Test Driver Dummy Position Left Side View B-34
Photo No. 35. Post-Test Driver Dummy Position Left Side View B-35
Photo No. 36. Pre-Test Driver Dummy Position Left Side View (Door Open) B-36
Photo No. 37. Post-Test Driver Dummy Position Left Side View (Door Open) B-37
Photo No. 38. Pre-Test Driver Dummy Seat Position B-38
Photo No. 39. Post-Test Driver Dummy Seat Position B-39
Photo No. 40. Pre-Test Driver Dummy Feet Position B-40
Photo No. 41. Post-Test Driver Dummy Feet Position B-41
Photo No. 42. Pre-Test Driver Side Knee Bolster View B-42
Photo No. 43. Post-Test Driver Side Knee Bolster View B-43
Photo No. 44. Post-Test Driver Dummy Head Contact (headrest) B-44
Photo No. 45. Post-Test Driver Dummy Head Contact (steering wheel) B-45
Photo No. 46. Post-Test Driver Dummy Knee Contact (left side) B-46
Photo No. 47. Post-Test Driver Dummy Knee Contact (right side) B-47
Photo No. 48. Post-Test Driver Dummy Airbag Contact B-48
Photo No. 49. Pre-Test Passenger Dummy Front View (head position) B-49
Photo No. 50. Post-Test Passenger Dummy Front View (head position) B-50
Photo No. 51. Pre-Test Passenger Dummy Position Right Side View B-51
Photo No. 52. Post-Test Passenger Dummy Position Right Side View B-52
Photo No. 53. Pre-Test Passenger Dummy Position Right Side View (Door Open) B-53
Photo No. 54. Post-Test Passenger Dummy Position Right Side View (Door Open) B-54
<table>
<thead>
<tr>
<th>Photo No.</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>Pre-Test Passenger Dummy Seat Position</td>
<td>B-55</td>
</tr>
<tr>
<td>56</td>
<td>Post-Test Passenger Dummy Seat Position</td>
<td>B-56</td>
</tr>
<tr>
<td>57</td>
<td>Pre-Test Passenger Dummy Feet Position</td>
<td>B-57</td>
</tr>
<tr>
<td>58</td>
<td>Post-Test Passenger Dummy Feet Position</td>
<td>B-58</td>
</tr>
<tr>
<td>59</td>
<td>Pre-Test Passenger Side Knee Bolster View</td>
<td>B-59</td>
</tr>
<tr>
<td>60</td>
<td>Post-Test Passenger Side Knee Bolster View</td>
<td>B-60</td>
</tr>
<tr>
<td>61</td>
<td>Post-Test Passenger Dummy Head Contact View (headrest)</td>
<td>B-61</td>
</tr>
<tr>
<td>62</td>
<td>Post-Test Passenger Dummy Knee Contact</td>
<td>B-62</td>
</tr>
<tr>
<td>63</td>
<td>Post-Test Passenger Dummy Airbag Contact</td>
<td>B-63</td>
</tr>
<tr>
<td>64</td>
<td>Pre-Test Offset Deformable Barrier Left Side View</td>
<td>B-64</td>
</tr>
<tr>
<td>65</td>
<td>Post-Test Offset Deformable Barrier Left Side View</td>
<td>B-65</td>
</tr>
<tr>
<td>66</td>
<td>Pre-Test Offset Deformable Barrier Right Side View</td>
<td>B-66</td>
</tr>
<tr>
<td>67</td>
<td>Post-Test Offset Deformable Barrier Right Side View</td>
<td>B-67</td>
</tr>
<tr>
<td>68</td>
<td>Pre-Test Offset Deformable Barrier Front View</td>
<td>B-68</td>
</tr>
<tr>
<td>69</td>
<td>Post-Test Offset Deformable Barrier Front View</td>
<td>B-69</td>
</tr>
<tr>
<td>70</td>
<td>Pre-Test Offset Deformable Barrier Top View</td>
<td>B-70</td>
</tr>
<tr>
<td>71</td>
<td>Post-Test Offset Deformable Barrier Top View</td>
<td>B-71</td>
</tr>
<tr>
<td>72</td>
<td>Temperature Plot</td>
<td>B-72</td>
</tr>
</tbody>
</table>
Vehicle Certification Label

MFD BY DAIMLERCHRYSLER CORPORATION

GUWR
2586 KG (5700 LB)

GAWR FRONT
1293 KG (2850 LB) 215/65R16 WITH TIRES

GAWR REAR
1339 KG (2950 LB) 215/65R16 WITH TIRES

RIMS AT 16X6.5 COLD
248 KPA (36 PSI)

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 2D4GP44L65R103557 TYPE: MPV SINGLE DUAL X

MDM: 028312 006AA PNT:PS2 VEHICLE MADE IN CANADA TRM:B705 4648505
Pre-Test Left Side View of Test Vehicle
Pre-Test Right Side View of Test Vehicle
Pre-Test Right Front Three-Quarter View of Test Vehicle
Pre-Test Left Front Three-Quarter View of Test Vehicle
Pre-Test Right Rear Three-Quarter View of Test Vehicle
Post-Test Right Rear Three-Quarter View of Test Vehicle
Post-Test Left Rear Three-Quarter View of Test Vehicle
Pre-Test Rear View of Test Vehicle
Post-Test Rear View of Test Vehicle
Pre-Test Engine Compartment View
Post-Test Engine Compartment View
Pre-Test Front Underbody View
Post-Test Mid Underbody View
Pre-Test Fuel Tank View
Post-Test Fuel Tank View
Pre-Test Rear Underbody View
Pre-Test Driver Dummy Front View (head position)
Post-Test Driver Dummy Front View (head position)
Post-Test Driver Dummy Position Left Side View
Pre-Test Driver Dummy Position Left Side View (Door Open)
Post-Test Driver Dummy Position Left Side View (Door Open)
Pre-Test Driver Dummy Seat Position
Post-Test Driver Dummy Seat Position
Pre-Test Driver Dummy Feet Position
Pre-Test Driver Side Knee Bolster View
Post-Test Driver Side Knee Bolster View
Post-Test Driver Dummy Head Contact (headrest)
Post-Test Driver Dummy Head Contact (steering wheel)
Post-Test Driver Dummy Knee Contact (left side)
Post-Test Driver Dummy Knee Contact (right side)
Post-Test Driver Dummy Airbag Contact
Pre-Test Passenger Dummy Front View (head position)
Post-Test Passenger Dummy Front View (head position)
Pre-Test Passenger Dummy Position Right Side View (Door Open)
Post-Test Passenger Dummy Position Right Side View (Door Open)
Pre-Test Passenger Dummy Feet Position
Post-Test Passenger Dummy Feet Position
Pre-Test Passenger Side Knee Bolster View
Post-Test Passenger Side Knee Bolster View
Post-Test Passenger Dummy Head Contact View (headrest)
Post-Test Passenger Dummy Knee Contact
Post-Test Passenger Dummy Airbag Contact
Pre-Test Offset Deformable Barrier Left Side View
Pre-Test Offset Deformable Barrier Front View
Temperature Plot
APPENDIX C

INSTRUMENTATION CALIBRATION
### INSTRUMENTS FOR DRIVER DUMMY NO. 510

<table>
<thead>
<tr>
<th>SERIAL NO.</th>
<th>MANUFACTURER</th>
<th>CALIBRATION DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head X</td>
<td>P49471</td>
<td>Endevco</td>
</tr>
<tr>
<td>Head Y</td>
<td>P49480</td>
<td>Endevco</td>
</tr>
<tr>
<td>Head Z</td>
<td>P49468</td>
<td>Endevco</td>
</tr>
<tr>
<td>Neck Load Cell</td>
<td>1562</td>
<td>Denton</td>
</tr>
<tr>
<td>Chest X</td>
<td>J23-M06</td>
<td>Entran</td>
</tr>
<tr>
<td>Chest Y</td>
<td>J23-M07</td>
<td>Entran</td>
</tr>
<tr>
<td>Chest Z</td>
<td>J23-M03</td>
<td>Entran</td>
</tr>
<tr>
<td>Chest Displacement</td>
<td>510</td>
<td>Servo</td>
</tr>
<tr>
<td>Left Femur Load Cell</td>
<td>9426</td>
<td>GSE</td>
</tr>
<tr>
<td>Right Femur Load Cell</td>
<td>9425</td>
<td>GSE</td>
</tr>
</tbody>
</table>

### INSTRUMENTS FOR PASSENGER DUMMY NO. 511

<table>
<thead>
<tr>
<th>SERIAL NO.</th>
<th>MANUFACTURER</th>
<th>CALIBRATION DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head X</td>
<td>P49475</td>
<td>Endevco</td>
</tr>
<tr>
<td>Head Y</td>
<td>P49477</td>
<td>Endevco</td>
</tr>
<tr>
<td>Head Z</td>
<td>P49476</td>
<td>Endevco</td>
</tr>
<tr>
<td>Neck Load Cell</td>
<td>1703</td>
<td>Endevco</td>
</tr>
<tr>
<td>Chest X</td>
<td>P49478</td>
<td>Endevco</td>
</tr>
<tr>
<td>Chest Y</td>
<td>P49470</td>
<td>Endevco</td>
</tr>
<tr>
<td>Chest Z</td>
<td>P49506</td>
<td>Endevco</td>
</tr>
<tr>
<td>Chest Displacement</td>
<td>511</td>
<td>Servo</td>
</tr>
<tr>
<td>Left Femur Load Cell</td>
<td>1362</td>
<td>Denton</td>
</tr>
<tr>
<td>Right Femur Load Cell</td>
<td>1361</td>
<td>Denton</td>
</tr>
<tr>
<td>VEHICLE INSTRUMENTS</td>
<td>SERIAL NO.</td>
<td>MANUFACTURER</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Left Rear Seat Crossmember X</td>
<td>E05-Z57</td>
<td>Entran</td>
</tr>
<tr>
<td>Right Rear Seat Crossmember X</td>
<td>H10-L03</td>
<td>Entran</td>
</tr>
<tr>
<td>Top of Engine X</td>
<td>J10420</td>
<td>Endevco</td>
</tr>
<tr>
<td>Bottom of Engine X</td>
<td>J20965</td>
<td>Endevco</td>
</tr>
<tr>
<td>Left Brake Caliper X</td>
<td>K03-J17</td>
<td>Entran</td>
</tr>
<tr>
<td>Right Brake Caliper X</td>
<td>G29-X10</td>
<td>Entran</td>
</tr>
<tr>
<td>Instrument Panel X</td>
<td>L02-Z44</td>
<td>Entran</td>
</tr>
<tr>
<td>Trunk Z</td>
<td>A07-R11</td>
<td>Entran</td>
</tr>
</tbody>
</table>
APPENDIX D

NOTICE OF TEST FAILURE
LABORATORY NOTICE OF APPARENT TEST FAILURE TO OVSC

FMVSS NO. 208 TEST DATE: September 13, 2006

LABORATORY: MGA Research Corporation

CONTRACT NO.: DTNH22-03-D-11002 DELV. ORDER NO.: #15

LABORATORY PROJECT ENGINEER'S NAME: Jeff Lewandowski

TEST SPECIMEN DESCRIPTION: 2005 Dodge Grand Caravan MPV

VEHICLE NHTSA NO.: C50311 VIN: 2D4GP44L65R103557

MFR: DaimlerChrysler Corporation

APPARENT TEST FAILURE DESCRIPTION: The 5th% Driver Dummy SN510 had a Neck Tension of 3349N at a 111.0 ms time during the 40 kph (25mph) belted frontal impact test with the left front crash sensor disconnected.

FMVSS REQUIREMENT, PARAGRAPH S:
S18.1 The maximum Neck Tension allowed is 2620N.

NOTIFICATION TO NHTSA (COTR): Charles Case

DATE: 9-13-2006 BY: Jeff Lewandowski

REMARKS: