REPORT NUMBER: 208-MGA-2006-001-ODI

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

Daimler Chrysler Corporation
2005 Dodge Grand Caravan
NHTSA No.: C50313

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

Test Dates: September 12, 2006
Final Report Date: October 24, 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.

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Prepared by: _____________________________

Jeff Lewandowski, Project Engineer

Date:  October 24, 2006

Reviewed by: _____________________________

David Winkelbauer, Facility Director

Date:  October 24, 2006

FINAL REPORT ACCEPTED BY OVSC:

Accepted By: _____________________________

Date:  October 24, 2006
Tests were conducted on the subject 2005 Dodge Grand Caravan in accordance with the specifications of the Office of Vehicle Safety Test Procedure No. TP208-13 for the determination of FMVSS 208 performance. The left front crash sensor was disconnected for the test. Test failures identified were as follows:

None

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

Frontal Impact
40 kmph Vehicle Safety Testing
FMVSS 208, “Occupant Crash Protection”
FMVSS 212, “Windshield Mounting”
FMVSS 219, (partial), “Windshield Zone Intrusion”
FMVSS 301, “Fuel System Integrity”
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<td>Windshield Mounting (FMVSS 212)</td>
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<td>Windshield Zone Intrusion (FMVSS 219)</td>
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<td>Fuel System Integrity (FMVSS 301)</td>
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## Appendix

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<th>Section</th>
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<td>Crash Test Data</td>
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<tr>
<td>D</td>
<td>Notice of Test Failure (If Applicable)</td>
</tr>
</tbody>
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SECTION 1
PURPOSE OF TEST

The tests 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. C50313, 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  
Test Program: FMVSS 208  
NHTSA No.: C50313  
Test Dates: 9/12/2006

The following checked items indicate the tests that were performed:

1. Rear outboard seating position seat belts (S4.1.1.2(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)
12. Suppression tests with newborn infant (Part 572, Subpart K)
13. Suppression tests with 3-year-old dummy (Part 572, Subpart P)
14. Suppression tests with 6-year-old dummy (Part 572, Subpart N)
15. Test of reactivation of the passenger air bag system with an unbelted 5th percentile female dummy
16. Low risk deployment test with 12-month-old dummy (Part 572, Subpart R)
17. Low risk deployment test with 3-year-old dummy (Part 572, Subpart P)
18. Low risk deployment test with 6-year-old dummy (Part 572, Subpart N)
19. Low risk deployment test with 5th female dummy (Part 572, Subpart O)

Impact Tests

Frontal Oblique
- 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°
- 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) (S5.1.1.(b)(2))
- 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)

21. Sled Test: unbelted 50th male dummy driver and passenger (S13)

22. FMVSS 204 Indicant Test

X 23. FMVSS 212 Indicant Test

X 24. FMVSS 219 Indicant Test

X 25. FMVSS 301 Frontal Indicant Test

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 vehicle appears to meet all of the performance requirements to which it was tested.

The last front crash sensor was disconnected.
SECTION 3
INJURY RESULT SUMMARY FOR FMVSS 208 TESTS

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
NHTSA No.: C50313
Test Dates: 9/12/06

40 kmph Frontal Crash

Impact Angle: Zero degrees

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: 2203.1 kg

Driver Dummy: ___5th female   X 50th male
Passenger Dummy: ___5th female   X 50th male

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

<table>
<thead>
<tr>
<th>Injury Criteria</th>
<th>Max. Allowable Injury Assessment Values</th>
<th>Driver</th>
<th>Passenger</th>
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<tbody>
<tr>
<td>HIC15</td>
<td>700</td>
<td>289</td>
<td>59</td>
</tr>
<tr>
<td>N_{te}</td>
<td>1.0</td>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>N_{tf}</td>
<td>1.0</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>N_{ce}</td>
<td>1.0</td>
<td>0.3</td>
<td>0.0</td>
</tr>
<tr>
<td>N_{cf}</td>
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<td>0.2</td>
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<tr>
<td>Neck Tension</td>
<td>4170 N</td>
<td>2566</td>
<td>499</td>
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<tr>
<td>Neck Compression</td>
<td>4000 N</td>
<td>2485</td>
<td>699</td>
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<tr>
<td>Chest g</td>
<td>60 g</td>
<td>27</td>
<td>30</td>
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<tr>
<td>Chest Displacement</td>
<td>63 mm</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Left Femur</td>
<td>10,000 N</td>
<td>3139</td>
<td>6640</td>
</tr>
<tr>
<td>Right Femur</td>
<td>10,000 N</td>
<td>1719</td>
<td>6618</td>
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</tbody>
</table>
SECTION 4
DISCUSSION OF TESTS

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
NHTSA No.: C50313  
Test Date: 9/12/06  

The vehicle met all performance requirements.

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 passenger H-point was conducted without the right leg. The right leg was removed due to a wheelwell projection.
SECTION 5
TEST DATA SHEETS

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
NHTSA No.: C50313
Test Dates: 9/12/06
DATA SHEET 1
COTR VEHICLE WORK ORDER

Test Vehicle: 2005 Dodge Grand Caravan  
NHTSA No.: C50313  
Test Program: FMVSS 208  
Test Date: 9/12/06

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

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Position</th>
<th>Position</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britax Handle with Care 191</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Assura 4553</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Avanta SE 41530</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Smart Fit 4543</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco Arriva 02727</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco Opus 35 02603</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Discovery Adjust Right 212</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo First Choice 204</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo On My Way Position Right V 282</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Graco Infant 8457</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
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Section C

<table>
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<tr>
<th>Child Restraint</th>
<th>Position</th>
<th>Position</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britax Roundabout 161</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<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>

12. Suppression tests with newborn infant (Part 572, Subpart K) using the following indicated child restraints.

Section A

<table>
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<tr>
<th>Child Restraint</th>
<th>Position</th>
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<tbody>
<tr>
<td>Cosco Dream Ride 02-719</td>
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</table>

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

Section C

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Track Position 1</th>
<th>Track Position 2</th>
<th>Track Position 3</th>
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<tr>
<td>Britax Roundabout 161</td>
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<td>Century Encore 4612</td>
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<td>Century STE 1000 4416</td>
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<td>Cosco Olympian 02803</td>
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<td>Cosco Touriva 02519</td>
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<td>Mid Position</td>
<td>Full Forward</td>
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<tr>
<td>Evenflo Horizon V 425</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
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<tr>
<td>Evenflo Medallion 254</td>
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Section D

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Track Position 1</th>
<th>Track Position 2</th>
<th>Track Position 3</th>
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</thead>
<tbody>
<tr>
<td>Britax Roadster 9004</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Next Step 4920</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco High Back Booster 02-442</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Right Fit 245</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Position 1</th>
<th>Position 2</th>
<th>Position 3</th>
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<tbody>
<tr>
<td>Britax Roadster 9004</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Next Step 4920</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco High Back Booster 02-442</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Right Fit 245</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
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</table>

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

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Position 1</th>
<th>Position 2</th>
<th>Position 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britax Roadster 9004</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Next Step 4920</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Cosco High Back Booster 02-442</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Right Fit 245</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
</tbody>
</table>

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)

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)

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.

<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Position 1</th>
<th>Position 2</th>
<th>Position 3</th>
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<tr>
<td>Britax Handle with Care 191</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
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<tr>
<td>Century Assura 4553</td>
<td>Full Rearward</td>
<td>Mid Position</td>
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<tr>
<td>Century Avanta SE 41530</td>
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<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<tr>
<td>Century Smart Fit 4543</td>
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<tr>
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<td>Cosco Opus 35 02603</td>
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<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo Discovery Adjust Right 212</td>
<td>Full Rearward</td>
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<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo First Choice 204</td>
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<td>Full Forward</td>
</tr>
<tr>
<td>Evenflo On My Way Position Right V 282</td>
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<td>Graco Infant 8457</td>
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<table>
<thead>
<tr>
<th>Child Restraint</th>
<th>Position 1</th>
<th>Position 2</th>
<th>Position 3</th>
</tr>
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<tr>
<td>Britax Roundabout 161</td>
<td>Full Rearward</td>
<td>Mid Position</td>
<td>Full Forward</td>
</tr>
<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>
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<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
   - Position 1
   - Position 2

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

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

27. Impact Tests
   - Frontal Oblique – Test Speed: 39.9km/h
     - Belted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.1(a))
     - Unbelted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.2(a)(1))
     - Unbelted 50th male dummy driver and passenger (32 to 40 km/h) (S5.1.2(a)(1) or S5.1.2(b))
   - Frontal 0° - Test Speed:
     - Belted 50th male dummy driver (0 to 48 km/h) (S5.1.1.(b)(1) or S5.1.1(a))
     - Belted 50th male dummy passenger (0 to 48 km/h) (S5.1.1.(b)(1) or S5.1.1(a))
     - Belted 5th female dummy driver (0 to 48 km/h) (S16.1(a))
     - Belted 5th female dummy passenger (0 to 48 km/h) (S16.1(a))
     - Belted 50th male dummy driver and passenger (0 to 56 km/h) (S5.1.1.(b)(2))
     - Unbelted 50th male dummy driver and passenger (0 to 48 km/h) (S5.1.2(a)(1))
     - Unbelted 50th male dummy driver (32 to 40 km/h) (S5.1.2.(a)(2) or S5.1.2(b))
     - Unbelted 50th male dummy passenger (32 to 40 km/h) (S5.1.2.(a)(2) or S5.1.2(b))
     - Unbelted 5th female dummy driver (32 to 40 km/h) (S16.1(b))
     - Unbelted 5th female dummy passenger (32 to 40 km/h) (S16.1(b))
   - 40% Offset 0° Belted 5th male dummy driver and passenger (0 to 40 km/h) (S18.1)

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
Test Program: FMVSS 208
NHTSA No.: C50313
Test Dates: 9/12/06

CONTRACT NO. DTNH22-03-D-11002 Date: 9/19/06
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: 06/04
NHTSA NO. C50313
BODY COLOR: Red
VIN: 2D4GP44L25R224618
GVWR: 2586 kg (5700 lbs)
GAWR (Fr): 1293 kg (2850 lbs)
GAWR (Rr): 1339 kg (2950 lbs)

ODOMETER READINGS: ARRIVAL (miles): 31159 DATE: 8/25/06
COMPLETION (miles): 31161 DATE: 9/12/06

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: _X_ Yes ___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
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.  C50313

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: 9/12/2006
APPROVED BY: David Winkelbauer  DATE: 9/12/2006

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:  

###  

### Certification Label

<table>
<thead>
<tr>
<th>Manufacturer:</th>
<th>Diamler Chrysler Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Manufacture:</td>
<td>06/04</td>
</tr>
<tr>
<td>VIN:</td>
<td>2D4GP44L25R224618</td>
</tr>
<tr>
<td>Vehicle Certified As (Pass. Car/MPV/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

| 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: | 250 kpa (36 psi) |
| Recommended Cold Tire Inflation Pressure Rear: | 250 kpa (36 psi) |
| Recommended Tire Size: | P215/65R16 |

Not applicable, vehicle is not a passenger car and does not have a tire placard. 
This is not a passenger car, but all or part of this information is still contained on a vehicle label and is reported here.

Signature: Nick Kosinski

Date: 9/12/06
DATA SHEET 14
MARKING OF REFERENCE POINTS FOR VARIOUS TEST POSITIONS AND POINTS

Test Vehicle: 2005 Dodge Grand Caravan  
NHTSA No.: C50313

Test Program: FMVSS 208  
Test Date: 9/12/06

Test Technician: Eric Peschman

DATA SHEET 14.2
MARKING OF REFERENCE POINTS FOR 50TH MALE

X Driver Seat __ Passenger Seat ____________ Other seat

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

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

X 3. Use all the seat controls that have any affect on the fore-aft movement of the seat to move the seat cushion to the rearmost position. Mark this position for future reference. (8/31/95 legal interp to Hogan and Hartson)

X 4. Use all the seat controls that have any affect on the fore-aft movement of the seat to move the seat cushion to the foremost position. Mark this position for future reference. (8/31/95 legal interp to Hogan and Hartson)

X 5. Mark each fore-aft position so that there is a visual indication when the seat is at a particular position. For manual seats, 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. Determine the mid fore-aft seat position based on the foremost and rearmost positions determined in items 3 and 4. (8/31/95 legal interp to Hogan and Hartson)

X 6. Move the seat to the mid position.

X 7. While maintaining the mid position, move the seat to its lowest position. Mark the height position for future reference. For seats with adjustable seat cushions, use the manufacturer’s recommended seat cushion angle for determining the lowest height position.

X 8. Visually mark for future reference the seat back angle, if adjustable, at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer.
   __ N/A – No seat back angle adjustment
   _X Previously marked during Data Sheet 14.1 go to 9
   Manufacturer’s design seat back angle 22° on seat back or 8° from upright position

X 9. Is the seat a bucket seat?
   _X Previously marked during data sheet 14.1. This form is complete.
   _X Yes, go to 10 and skip 11
   __ No, go to 11 and skip 10
10. 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. (S10.4.1.2 and S16.3.1.10)

11. Bench seats (complete ONLY the one that is applicable to the seat being marked):
   11.1 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. (S10.4.1.1)

   11.2 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. (S10.4.1.1)
   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. _______

I certify that I have read and performed each instruction.

___________________________  _____9/12/06_____
I certify that I have read and performed each instruction.   Date
DATA SHEET 14.2

MARKING OF REFERENCE POINTS FOR 50TH MALE

__Driver Seat  X Passenger Seat  ________________Other seat

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

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

X 3. Use all the seat controls that have any affect on the fore-aft movement of the seat to move the seat cushion to the rearmost position. **Mark** this position for future reference. (8/31/95 legal interp to Hogan and Hartson)

X 4. Use all the seat controls that have any affect on the fore-aft movement of the seat to move the seat cushion to the foremost position. **Mark** this position for future reference. (8/31/95 legal interp to Hogan and Hartson)

X 5. **Mark** each fore-aft position so that there is a visual indication when the seat is at a particular position. For manual seats, **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. Determine the mid fore-aft seat position based on the foremost and rearmost positions determined in items 3 and 4. (8/31/95 legal interp to Hogan and Hartson)

X 6. Move the seat to the mid position.

X 7. While maintaining the mid position, move the seat to its lowest position. **Mark** the height position for future reference. For seats with adjustable seat cushions, use the manufacturer’s recommended seat cushion angle for determining the lowest height position.

X 8. Visually **mark** for future reference the seat back angle, if adjustable, at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer.

   __ N/A – No seat back angle adjustment
   X Previously marked during Data Sheet 14.1 go to 9
   Manufacturer’s design seat back angle 18° on seat back or 4° from upright position

X 9. Is the seat a bucket seat?
   X Previously marked during data sheet 14.1. This form is complete.
   X Yes, go to 10 and skip 11
   __No, go to 11 and skip 10

X 10. 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. (S10.4.1.2 and S16.3.1.10)

X 11. Bench seats (complete ONLY the one that is applicable to the seat being marked):
11.1 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. (S10.4.1.1)

11.2 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. (S10.4.1.1)
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. _______

I certify that I have read and performed each instruction.

__________________________  _____9/12/06_____
I certify that I have read and performed each instruction.  Date
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.  
   X N/A – steering wheel is not adjustable in and out.

I certify that I have read and performed each instruction.

[Signature]  __________  9/12/06

I certify that I have read and performed each instruction.  Date
DATA SHEET 15
H-POINT DETERMINATION FOR 50TH PERCENTILE MALE DUMMY

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
Test Technician: Wayne Dahlke

X Driver Designated Seating Position  
X Passenger Designated Seating Position

1. Place the seat in the mid-fore-aft position and full down position, with the head restraint full down and the seat back in the manufacturer’s nominal design riding position for the 50th percentile male as determined during the completion of Data Sheet 14.2.

2. Place a 910 mm² piece of muslin cotton cloth over the seat area. (The muslin cloth shall be comparable to 48 threads/in² and density of 2.85 lb/yd.) Tuck the muslin cloth in a sufficient amount to prevent hammocking of the material.

3. Place the seat and back assembly of the H-Point machine at the centerline of the seat as determined in Data Sheet 14.1 or 14.2.

4. Install the lower leg, and foot segments.

5. Set the length of the lower leg segment at 16.3 inches and the length of the thigh bar at 15.8 inches.

6. Leg and foot placement
   X 6.1 Driver Designated Seating Position
      X 6.1.1 Insert the pin so that the foot angle is never less than 87 degrees.
      X 6.1.2 Place the right foot on the undepressed accelerator pedal with the sole of the foot on the pedal and the heel as far forward as allowable. Do not place the heel on the toe board.
      X 6.1.2 Adjust the left leg to be the same distance from H-point machine centerline as the right leg.
      X 6.1.3 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
         Foot on toe board
         X Foot on floor pan

   X 6.2 Passenger Designated Seating Position
      X 6.2.1 Insert the pin so that the foot angle is never less than 87 degrees.
      X 6.2.2 Space the lower legs 10.6 inches apart, equally spaced about the centerline of the H-point machine.
      X 6.2.3 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
         Foot on toe board
         X Foot on floor pan.
      X 6.2.3 With the T-bar level, place the right foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
         Foot on toe board
         X Foot on floor pan.

7. Apply the lower leg weights.

8. Apply the thigh weights.
X 9. Tilt the back pan forward against the forward stop and draw the H-point machine away from the seatback using the T-bar.

X 10. Repositioning the back pan

X 10.1 Allow the H-point machine to slide rearward until a forward horizontal restraining load on the T-bar is no longer required due to the seat pan contacting the seat back.

X 10.2 The seat pan does not slide rearward. Go to 10.2

X 11. Apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.

X 12. Again apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.

X 13. Carefully return the back pan to the seat back.

X 14. Install the right and left buttock weights.

X 15. Install the eight torso weights alternately the installation between right and left.

X 16. Tilt the back pan forward until the stop is contacted.

X 17. Rock the H-point from side to side over a 10 degree arc (5 degrees to each side of the vertical centerline) for three complete cycles. Restrain the T-bar during rocking so that the seat pan does not change position. Minimize any inadvertent exterior loads applied in a vertical or fore-aft direction. The feet are free to move during this rocking motion.

X 18. Without applying a forward or lateral load lift the right foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

X 19. Lower the right foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor, toe board, or undepressed accelerator pedal.

X 20. Without applying a forward or lateral load lift the left foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

X 21. Lower the left foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.

X 22. Is the seat pan level?

X Yes. Go to 24

__ No. Go to 23

X 23. Apply a sufficient lateral load to the top of the seatback pan to level the H-point machine seat pan on the seat.

X 24. Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, return the seatback pan to the seatback.

X 25. Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, apply sufficient rearward force perpendicular to the back angle bar just above the torso weights to increase the hip angle 3 degrees. Minimize the exterior downward or side forces applied to the H-point machine. Release the force. Repeat this step until the hip angle readout is identical. Complete as many force applications as necessary and record the results in the following table:

<table>
<thead>
<tr>
<th>Force Application</th>
<th>Hip Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>99</td>
</tr>
<tr>
<td>2</td>
<td>99</td>
</tr>
<tr>
<td>3</td>
<td>99</td>
</tr>
<tr>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
26. Is the H-point machine level?
   X Yes, go to 27.
   __No, relevel. Go back to step 16 and repeat using a new data sheet.

27. Record the H-point location.
   Describe and mark the measuring reference point.

<table>
<thead>
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<th>Driver H-Point</th>
<th></th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>HP to Hinge X</td>
<td>739</td>
</tr>
<tr>
<td>HP to Sill Y</td>
<td>182</td>
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<tr>
<td>HP to Striker X</td>
<td>344</td>
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<tr>
<td>HP to Dash X</td>
<td>605</td>
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<tr>
<td>HP to Header Z</td>
<td>771</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Left Knee</td>
<td>113</td>
</tr>
<tr>
<td>Right Knee</td>
<td>113</td>
</tr>
<tr>
<td>Left Foot Angle</td>
<td>84°</td>
</tr>
<tr>
<td>Right Foot Angle</td>
<td>87°</td>
</tr>
<tr>
<td>Left Leg</td>
<td>157</td>
</tr>
<tr>
<td>Right Leg</td>
<td>175</td>
</tr>
<tr>
<td>Hip Angle</td>
<td>99°</td>
</tr>
<tr>
<td>Back Angle</td>
<td>25°</td>
</tr>
</tbody>
</table>

[Signature]
Date 9/12/06

I certify that I have read and performed each instruction.
DATA SHEET 15
H-POINT DETERMINATION FOR 50TH PERCENTILE MALE DUMMY

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Wayne Dahlke

NHTSA No.: C50313
Test Date: 9/12/06

__Driver Designated Seating Position  X Passenger Designated Seating Position

X 1. Place the seat in the mid-fore-aft position and full down position, with the head restraint full down and the seat back in the manufacturer’s nominal design riding position for the 50th percentile male as determined during the completion of Data Sheet 14.2.

X 2. Place a 910 mm² piece of muslin cotton cloth over the seat area. (The muslin cloth shall be comparable to 48 threads/in² and density of 2.85 lb/yd.) Tuck the muslin cloth in a sufficient amount to prevent hammocking of the material.

X 3. Place the seat and back assembly of the H-Point machine at the centerline of the seat as determined in Data Sheet 14.1 or 14.2.

X 4. Install the lower leg, and foot segments.

X 5. Set the length of the lower leg segment at 16.3 inches and the length of the thigh bar at 15.8 inches.

X 6. Leg and foot placement

__6.1  Driver Designated Seating Position

__6.1.1 Insert the pin so that the foot angle is never less than 87 degrees.

__6.1.2 Place the right foot on the undepressed accelerator pedal with the sole of the foot on the pedal and the heel as far forward as allowable. Do not place the heel on the toe board.

__6.1.2 Adjust the left leg to be the same distance from H-point machine centerline as the right leg.

__6.1.3 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toe board, set it on the floor pan.

__Foot on toe board
__Foot on floor pan

X 6.2  Passenger Designated Seating Position

X 6.2.1 Insert the pin so that the foot angle is never less than 87 degrees.

X 6.2.2 Space the lower legs 10.6 inches apart, equally spaced about the centerline of the H-point machine.

X 6.2.3 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toe board, set it on the floor pan.

__Foot on toe board
__Foot on floor pan

X 6.2.3 With the T-bar level, place the right foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toe board, set it on the floor pan.

__Foot on toe board
__Foot on floor pan

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Wayne Dahlke

NHTSA No.: C50313
Test Date: 9/12/06
The right leg was removed due to a wheelwell projection. During the installation of the H-Point Machines lower leg assembly, (step 3, Data Sheet 15), the seat and back assembly of the H-Point machine could no longer be maintained at the centerline of the seat. This is due to the interference of the right lower leg with the inside wheelwell projection.

1. Apply the lower leg weights.
2. Apply the thigh weights.
3. Tilt the back pan forward against the forward stop and draw the H-point machine away from the seatback using the T-bar.
4. Repositioning the back pan
   4.1 Allow the H-point machine to slide rearward until a forward horizontal restraining load on the T-bar is no longer required due to the seat pan contacting the seat back.
   __The seat pan does not slide rearward. Go to 10.2
5. Slide the H-point machine rearward by a horizontal rearward load applied at the T-bar until the seat pan contacts the seat back.
6. Apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.
7. Again apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.
8. Carefully return the back pan to the seat back.
9. Install the right and left buttock weights.
10. Install the eight torso weights alternately the installation between right and left.
11. Tilt the back pan forward until the stop is contacted.
12. Rock the H-point from side to side over a 10degree arc (5 degrees to each side of the vertical centerline) for three complete cycles. Restrain the T-bar during rocking so that the seat pan does not change position. Minimize any inadvertent exterior loads applied in a vertical or fore-aft direction. The feet are free to move during this rocking motion.
13. Without applying a forward or lateral load lift the right foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.
14. Lower the right foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor, toe board, or undepressed accelerator pedal.
15. Without applying a forward or lateral load lift the left foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.
16. Lower the left foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.
17. Is the seat pan level?
   __Yes. Go to 24
   __No. Go to 23
18. Apply a sufficient lateral load to the top of the seatback pan to level the H-point machine seat pan on the seat.
19. Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, return the seatback pan to the seat back.
25. Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, apply sufficient rearward force perpendicular to the back angle bar just above the torso weights to increase the hip angle 3 degrees. Minimize the exterior downward or side forces applied to the H-point machine. Release the force. Repeat this step until the hip angle readout is identical. Complete as many force applications as necessary and record the results in the following table:

<table>
<thead>
<tr>
<th>Force Application</th>
<th>Hip Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98</td>
</tr>
<tr>
<td>2</td>
<td>99</td>
</tr>
<tr>
<td>3</td>
<td>99</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

26. Is the H-point machine level?
   - Yes, go to 27.
   - No, relevel. Go back to step 16 and repeat using a new data sheet.

27. Record the H-point location. Describe and mark the measuring reference point.

<table>
<thead>
<tr>
<th>Passenger H-Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP to Floor Z</td>
</tr>
<tr>
<td>HP to Hinge X</td>
</tr>
<tr>
<td>HP to Sill Y</td>
</tr>
<tr>
<td>HP to Striker X</td>
</tr>
<tr>
<td>HP to Dash X</td>
</tr>
<tr>
<td>HP to Header Z</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H-Point Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Knee</td>
</tr>
<tr>
<td>Right Knee</td>
</tr>
<tr>
<td>Left Foot Angle</td>
</tr>
<tr>
<td>Right Foot Angle</td>
</tr>
<tr>
<td>Left Leg</td>
</tr>
<tr>
<td>Right Leg</td>
</tr>
<tr>
<td>Hip Angle</td>
</tr>
<tr>
<td>Back Angle</td>
</tr>
</tbody>
</table>

*The Right leg was removed due to a wheelwell projection.

Signed: [Signature]  Date: 9/12/06

I certify that I have read and performed each instruction.
DATA SHEET 32
VEHICLE WEIGHT, FUEL TANK, AND ATTITUDE DATA

Test Vehicle: 2005 Dodge Grand Caravan  NHTSA No.: C50313
Test Program: FMVSS 208  Test Date: 9/12/06
Test Technician: Nick Kosinski

IMPACT ANGLE: Zero Degrees
BELTED DUMMIES (YES/NO): No

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

DRIVER DUMMY:
- _ 5th female
- X 50th male

PASSENGER DUMMY:
- _ 5th female
- X 50th male

1. Fill the transmission with transmission fluid to the satisfactory range.
2. Drain fuel from vehicle
3. Run the engine until fuel remaining in the fuel delivery system is used and the engine stops.
4. Record the 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: 36psi
   - LF: 36psi
   - RR: 36psi
   - LR: 36psi
   Owner’s manual pressure:
   - RF: 36psi
   - LF: 36psi
   - RR: 36psi
   - LR: 36psi
   Actual inflated pressure:
   - RF: 36psi
   - LF: 36psi
   - RR: 36psi
   - LR: 36psi
12. Record the vehicle weight at each wheel to determine the unloaded vehicle weight (UVW), i.e. "as delivered" weight.
   Right Front (kg): 533.4  Right Rear (kg): 459.0
   Left Front (kg): 578.8  Left Rear (kg): 435.9
   Total Front (kg): 1112.2  Total Rear (kg): 894.9
   % Total Weight: 55.4  % Total Weight: 44.6
   UVW = TOTAL FRONT PLUS TOTAL REAR (KG): 2007.1
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>767</td>
<td>767</td>
<td>770</td>
<td>700</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
- No, go to 14.2

14.2 VCW = Gross Vehicle Weight – UVW

\[
VCW = \text{________} - \text{________} = \text{________}
\]

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 = ________

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

14.8 Is the vehicle certified as an 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): 2208.5 kg

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

- Driver: ___ 5th female X 50th male
- Passenger: ___ 5th female X 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>Right Rear (kg):</th>
</tr>
</thead>
<tbody>
<tr>
<td>577.9</td>
<td>515.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Left Front (kg):</th>
<th>Left Rear (kg):</th>
</tr>
</thead>
<tbody>
<tr>
<td>624.6</td>
<td>490.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Front (kg):</th>
<th>Total Rear (kg):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1202.5</td>
<td>1006.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Total Weight:</th>
<th>% Total Weight:</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.5</td>
<td>45.6</td>
</tr>
</tbody>
</table>

(% GVW = Axle GVW divided by Vehicle GVW)

Fully Loaded Weight = Total Front Plus Total Rear (kg): 2208.5

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

16.1 Place the vehicle on a level surface.
16.2 Measure perpendicular to the level surface to the 4 points marked on the body (see 13.1 above) and record the measurements

RF: 747  LF: 745  RR: 743  LR: 750

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)

2208.1 kg = 2007.1 kg + 45.0 kg + 156.0 kg

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

Max. Test Weight = Calculated Test Weight – 4.5 kg = 2203.6 kg

Min. Test Weight = Calculated Test Weight – 9 kg = 2199.1 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

Weight of Ballast:

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>584.2</th>
<th>Right Rear (kg):</th>
<th>511.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Front (kg):</td>
<td>625.1</td>
<td>Left Rear (kg):</td>
<td>482.6</td>
</tr>
<tr>
<td>Total Front (kg):</td>
<td>1209.3</td>
<td>Total Rear (kg):</td>
<td>993.8</td>
</tr>
<tr>
<td>% Total Weight:</td>
<td>54.9</td>
<td>% Total Weight:</td>
<td>45.1</td>
</tr>
<tr>
<td>% GVW</td>
<td>50.0</td>
<td>% GVW</td>
<td>51.7</td>
</tr>
</tbody>
</table>

(% GVW = Axle GVW divided by Vehicle GVW)

TOTAL FRONT PLUS TOTAL REAR (kg): 2203.1
28. Is the test weight between the Max. Weight and the Min. Weight (See 20.2)?
   
   Yes
   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: 748, LF: 746, RR: 748, LR: 760

30. Summary of test attitude
   30.1 AS DELIVERED:

   RF: 767, LF: 767, RR: 770, LR: 770

   AS TESTED:

   RF: 748, LF: 746, RR: 748, LR: 760

   FULLY LOADED:

   RF: 747, LF: 745, RR: 743, LR: 750

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

REMARKS:

I certify that I have read and performed each instruction.

Signature: [Signature]

Date: 9/12/06
DATA SHEET 33

VEHICLE ACCELEROMETER LOCATION AND MEASUREMENT

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

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>No</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>___ 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>___ 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: 9/12/06

Test Vehicle: 2005 Dodge Grand Caravan
Test Program: FMVSS 208
Test Technician: Nick Kosinski
NHTSA No.: C50313
Test Date: 9/12/06
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>123</td>
</tr>
<tr>
<td>B (RH Rear Seat Xmbr)</td>
<td>123</td>
</tr>
<tr>
<td>C (Engine Top)</td>
<td>4448</td>
</tr>
<tr>
<td>D (Engine Bottom)</td>
<td>4315</td>
</tr>
<tr>
<td>E (Caliper)</td>
<td>Right Side 4240</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>1928</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>123</td>
</tr>
<tr>
<td>B (RH Rear Seat Xmbr)</td>
<td>123</td>
</tr>
<tr>
<td>C (Engine Top)</td>
<td>4410</td>
</tr>
<tr>
<td>D (Engine Bottom)</td>
<td>4251</td>
</tr>
<tr>
<td>E (Caliper)</td>
<td>Right Side 4246</td>
</tr>
<tr>
<td>F (Left Caliper)</td>
<td>635</td>
</tr>
<tr>
<td>G (IP)</td>
<td>3541</td>
</tr>
<tr>
<td>H (Seat)</td>
<td>1928</td>
</tr>
<tr>
<td>J (Right Caliper)</td>
<td>726</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): 610 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): 610 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.
- No, this form is complete.

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: 9/12/06
REFERENCE PHOTO TARGETS

CONCRETE BARRIER

915 mm

100 mm 100 mm

COVERED PHOTO PIT

LEFT SIDE VIEW

MONORAIL

A1

B

C1

C2

610 mm

610 mm
RESECTION PANEL TARGETING ALIGNMENT

TEST RUN STEERING COLUMN CAMERA VIEW OF TYPICAL TIME ZERO VEHICLE POSITION
PRE-RUN STEERING COLUMN HIGH SPEED CAMERA VIEW

LEFT SIDE VIEW

914 mm
DATA SHEET 35
CAMERA LOCATIONS

Test Vehicle: 2005 Dodge Grand Caravan  
Test Program: FMVSS 208  
NHTSA No.: C50313  
Test Date: 9/12/06  
Time: 11:15 am

<table>
<thead>
<tr>
<th>CAMERA NO.</th>
<th>VIEW</th>
<th>CAMERA POSITIONS (mm) *</th>
<th>LENS (mm)</th>
<th>SPEED (fps)</th>
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<td></td>
<td>X</td>
<td>Y</td>
<td>Z</td>
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<tr>
<td>1</td>
<td>Real Time Left Side View</td>
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<tr>
<td>2</td>
<td>Left Side View (Barrier face to front seat backs)</td>
<td>835</td>
<td>-4450</td>
<td>1085</td>
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<td>3</td>
<td>Left Side View (Driver)</td>
<td>1285</td>
<td>-6095</td>
<td>1405</td>
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<td>4</td>
<td>Left Side View (B-post aimed toward center of steering wheel)</td>
<td>5780</td>
<td>-4385</td>
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<td>5</td>
<td>Left Side View (Steering Column)</td>
<td>945</td>
<td>-4750</td>
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<td>Left Side View (Steering Column)</td>
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<td>Right Side View (Overall)</td>
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<td>Right Side View (Passenger)</td>
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<td>9</td>
<td>Right Side View (Angle)</td>
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<td>5715</td>
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<td>10</td>
<td>Right Side View (Front door)</td>
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<td>6800</td>
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<td>Front View Windshield</td>
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<td>Front View Passenger</td>
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<td>2275</td>
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<td>14</td>
<td>Overhead Barrier Impact View</td>
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<td>15</td>
<td>Pit Camera Engine View</td>
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<td>16</td>
<td>Pit Camera Fuel Tank View</td>
<td>2180</td>
<td>650</td>
<td>-3150</td>
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*COORDINATES:  
+X - forward of impact plane  
+Y - right of monorail centerline  
+Z - above ground level
CAMERA POSITIONS FOR FMVSS 208

1. REAL TIME CAMERA
2. CONCRETE BARRIER
3. TOP VIEW
4. CONCRETE BARRIER
5. COVERED PHOTO PIT
6. MONORAIL
7. CONCRETE PAD
8. TOW ROAD
9. COVERED PHOTO PIT
10. MONORAIL
11. LEFT SIDE VIEW
12. CONCRETE BARRIER
13. COVERED PHOTO PIT
14. CONCRETE BARRIER
15. LEFT SIDE VIEW
16. CONCRETE BARRIER
DATA SHEET 36
APPENDIX F
DUMMY POSITIONING PROCEDURES
FOR DRIVER TEST DUMMY CONFORMING TO SUBPART E OF PART 572

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

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

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

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

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

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

5. The seat back angle, if adjustable, is set at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)
   __ N/A – No seat back angle adjustment
   Manufacturer’s design seat back angle 22° on seat back or 8° from upright position
   Tested seat back angle 8° from upright position or 11.7° on Head rest post

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

7. Place any adjustable seat belt anchorages at the vehicle manufacturer’s nominal design position for a 50th percentile adult male occupant (S8.1.3)
   __ N/A – No adjustable upper seat belt anchorage
   Manufacturer’s specified anchorage position.
   Tested anchorage position 2nd Down From Top
   2nd Down From Top (Unbelted Test)

8. Place the adjustable accelerator pedal in the full forward position.
   __ N/A – the accelerator pedal is not adjustable.
9. Set the steering wheel hub at the geometric center of the full range of driving positions including any telescoping positions as determined in data sheet 14.

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

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

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

Adjust the dummy position until these three measurements are within the specifications. (S10.4.2.1 and S10.4.2.2)

.236 horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
.261 vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
22.6° pelvic angle (20° to 25°) (S10.4.2.2)

13. Is the head level within ± 0.5°? (S10.1)
   □ Yes, go to 14
   □ No, go to 13.1

13.1 Adjust the position of the H-point. (S10.1)

13.2 Is the head level within ± 0.5°? (S10.1)
   □ Yes, record the following, then go to 15. □ No, go to 13.3
   □ horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   □ vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   □ pelvic angle (20° to 25°) (S10.4.2.2)

13.3 Adjust the pelvic angle. (S10.1)

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

14. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.

10.6″ measured distance (10.6 inches) (S10.5)

15. Can the right foot be placed on the accelerator?
Yes, go to 15.1 and skip 15.2
No, go to 15.2

15.1. To the extent practicable keep the right thigh and the leg in a vertical plane (S10.5)
while resting the foot on the undepressed accelerator pedal with the rearmost point of
the heel on the floor pan in the plane of the pedal. (S10.6.1.1)

15.2. Initially set the foot perpendicular to the leg and then place it as far forward as possible
in the direction of the pedal centerline with the rearmost point of the heel resting on the
floor pan. (S10.6.1.1)

15.2.1 Move the adjustable pedal to its most rearward position or until the right foot is flat on
the pedal, whichever occurs first. (S10.6.1.1)
N/A – the accelerator pedal is not adjustable

16. Does the vehicle have a foot rest?
Yes, go to 16.1
No, go to 17

16.1. With the left thigh and leg in a vertical plane, place the foot on the foot rest with the heel
resting on the floor pan. (S10.6.1.2)

16.1.1 Is the left foot elevated above the right foot?
Yes, go to 16.1.2 and position the foot off the foot rest
No, go to 17
16.1.2 Check the ONLY one of the following that applies

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

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

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

__N/A – the foot does not reach the toeboard, go to 16.1.3

16.1.3 Check the ONLY one of the following that applies

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

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

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

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

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

__Yes, continue

__No, go to 19

18.1 Fasten the seat belt around the dummy.

18.2 Remove all slack from the lap belt portion. (S10.9)
18.3 Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times. (S10.9)

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

18.5 Is the belt system equipped with a tension-relieving device?
   Yes, continue
   No, go to 19

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

X 19. Place the left upper arm adjacent to the torso with the centerline as close to a vertical plane as possible. (S10.2.1)

X 20. Place the right hand with the palm in contact with the steering wheel at the rim's horizontal centerline and with the thumb over the steering wheel. (S10.3.1)

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

X 22. Tape the thumb of each hand to the steering wheel by using masking tape with a width of 0.25 inch. The length of the tape shall only be enough to go around the thumb and steering wheel one time.

REMARKS:

I certify that I have read and performed each instruction.

Signature:  Date: 9/12/06
# APPENDIX F

**DUMMY POSITIONING PROCEDURES FOR PASSENGER TEST DUMMY CONFORMING TO SUBPART E OF PART 572**

<table>
<thead>
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<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50313</th>
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<tr>
<td>Test Program:</td>
<td>FMVSS 208</td>
<td>Test Date:</td>
<td>9/12/06</td>
</tr>
<tr>
<td>Test Technician:</td>
<td>Joe Fleck</td>
<td></td>
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<th>IMPACT ANGLE:</th>
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<td>BELTED DUMMIES (YES/NO):</td>
<td>No</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>_ 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>_ 5th female</td>
</tr>
</tbody>
</table>

**X 1.** The seat is a bench seat for which the adjustments have already been made for the driver and there are no independent adjustments that can be made for the passenger. Go to 7.

**X N/A-** the passenger seat adjusts independently of the driver seat.

**X 2.** Position the seat’s adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. (S8.1.3)

**X N/A –** No lumbar adjustment

**X 3.** Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S20.1.8.2)

**X N/A –** No additional support adjustment

**X 4.** If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S20.1.9.3)

**X N/A –** No independent fore-aft seat cushion adjustment

**X 5.** Use the seat markings determined during the completion of Data Sheet 14 to set the mid-fore-aft position, full down height position and the seat cushion angle. (S8.1.2)

**X 6.** The seat back angle, if adjustable, is set at the manufacturer’s nominal design riding position for a 50th percentile adult male in the manner specified by the manufacturer. (S4.5.4.1 (b) and S8.1.3)

**_N/A –** No seat back angle adjustment

Manufacturer’s design seat back angle 18° on seat back or 4° from upright position
Tested seat back angle 4° from upright position or 8.5° on Head rest post

**X 7.** If adjustable, set the head restraint at the full up and full forward position. Any adjustment of the head restraint shall be used to position it full forward. For example, if it rotates, rotate it such that the head restraint extends as far forward as possible. (S8.1.3)

**_N/A –** No head restraint adjustment
8. Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant (S8.1.3)
   N/A – No adjustable upper seat belt anchorage
   Manufacturer's specified anchorage position, 2nd Down From Top
   Tested anchorage position 2nd Down From Top (Unbelted Test)
   N/A - the seat does not have a fore-aft adjustment

9. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in item 2.19 of Data Sheet 14 and the upper torso rests against the seat back. (S10.4.1.1 & S10.4.1.2)

10. Rest the thighs on the seat cushion. (S10.5)

11. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined by using the equipment and procedures specified in SAE J826 (APR 1980). (S10.4.2.1) Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage.

Adjust the dummy position until these three measurements are within the specifications. (S10.4.2.1 and S10.4.2.2)
   .118 horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   .065 vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
   24.2° pelvic angle (20° to 25°)

12. Is the head level within ± 0.5°? (S10.1)
   Yes, go to 13
   No, go to 12.1

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

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

   12.3 Adjust the pelvic angle. (S10.1)

   12.4 Is the head level within ± 0.5°? (S10.1)
      Yes, record the following, then go to 13.  No, go to 12.5
      horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
      vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (S10.4.2.1)
      pelvic angle (20° to 25°) (S10.4.2.2)
12.5 Adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted “0” setting until the head is level within ± 0.5°. (S10.1)

Record the following, then go to 13 (The neck bracket was moved four notches)

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

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

14. Check the only one of the following that applies:

To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, place the feet on the toeboard with the heels resting on the floor pan as close as possible to the intersection of the floor pan and toeboard.

The feet cannot be placed flat on the toeboard. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heels resting on the floor pan.

The vehicle has a wheelhouse projection. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heel resting on the floor pan.

The vehicle has a wheelhouse projection and the feet cannot be placed on the toeboard. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heel resting on the floor pan. Do not set the feet on the wheelhouse projection.

15. Place the left upper arm in contact with the seat back and side of the torso. (S10.2.2)

16. Is the passenger seat belt used for this test?

Yes, continue

No, go to 17

16.1 Fasten the seat belt around the dummy.

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

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

16.4 Apply a 2 to 4 pound tension load to the lap belt. (S10.9) pound load applied
16.5 Is the belt system equipped with a tension relieving device?
   __Yes, continue
   __No, go to 17

16.6 Introduce the maximum amount of slack into the upper torso belt that is recommended by the vehicle manufacturer in the vehicle owner’s manual. (S10.9). Go to 17.

X 17. Place the right upper arm in contact with the seat back and side of the torso. (S10.2.2)

X 18. Place the left hand palm in contact with the outside of the left thigh and the little finger in contact with the seat cushion. (S10.3.2)

X 19. Place the right hand palm in contact with the outside of the right thigh and the little finger in contact with the seat cushion. (S10.3.2)

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

Signature: ___________________________ Date: 9/12/06
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

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

Seat Back Angle Line

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

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)

Vertical Transverse Plane

Vertical Longitudinal Planes
### DATA SHEET 37

**DUMMY MEASUREMENTS**

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<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50313</th>
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<td>FMVSS 208</td>
<td>Test Date:</td>
<td>9/12/06</td>
</tr>
<tr>
<td>Test Technician:</td>
<td>Eric Peschman</td>
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#### TEST DUMMY POSITION MEASUREMENTS

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<tr>
<td>KDL</td>
<td>Left Knee to Dash</td>
<td>222</td>
<td>237</td>
</tr>
<tr>
<td>KDR</td>
<td>Right Knee to Dash</td>
<td>656</td>
<td>696</td>
</tr>
<tr>
<td>PA</td>
<td>Pelvic Angle</td>
<td>222</td>
<td>237</td>
</tr>
<tr>
<td>TA</td>
<td>Tibia Angle</td>
<td>222</td>
<td>237</td>
</tr>
<tr>
<td>KK</td>
<td>Knee to Knee (Y)</td>
<td>621</td>
<td>643</td>
</tr>
<tr>
<td>SK</td>
<td>Striker to Knee</td>
<td>656</td>
<td>696</td>
</tr>
<tr>
<td>ST</td>
<td>Striker to Head</td>
<td>222</td>
<td>237</td>
</tr>
<tr>
<td>SH</td>
<td>Striker to H-Point</td>
<td>222</td>
<td>237</td>
</tr>
<tr>
<td>SHY</td>
<td>Striker to H-Point (Y)</td>
<td>222</td>
<td>237</td>
</tr>
<tr>
<td>HS</td>
<td>Head to Side Window</td>
<td>162</td>
<td>133</td>
</tr>
<tr>
<td>HD</td>
<td>H-Point to Door (Y)</td>
<td>162</td>
<td>133</td>
</tr>
<tr>
<td>AD</td>
<td>Arm to Door (Y)</td>
<td>162</td>
<td>133</td>
</tr>
<tr>
<td>AA</td>
<td>Ankle to Ankle</td>
<td>162</td>
<td>133</td>
</tr>
</tbody>
</table>
SEAT BELT POSITIONING DATA

dummy's centerline

'D' ring

shoulder belt portion

TBI

'1/8" thick aluminum plate'

emergency locking retractor

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>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PBL - Top surface of reference to belt lower edge</td>
<td>mm</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
**DATA SHEET 38**  
**CRASH TEST**

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>No</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>_ 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>_ 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  
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 _48 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.

- Driver Dummy: Head to A-Pillar and Air Bag; Chest to Air Bag; Knees to Knee Air Bag Bolster
- Passenger Dummy: Head to Air Bag and Visor; Chest to Air Bag; Knees to Glove Box

REMARKS:

I certify that I have read and performed each instruction.

Signature: ___________________________ Date: 9/12/06
DATA SHEET NO. 40
ACCIDENT INVESTIGATION DIVISION DATA

<table>
<thead>
<tr>
<th>Test Vehicle:</th>
<th>2005 Dodge Grand Caravan</th>
<th>NHTSA No.:</th>
<th>C50313</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Program:</td>
<td>FMVSS 208</td>
<td>Test Date:</td>
<td>9/12/06</td>
</tr>
<tr>
<td>Test Technician:</td>
<td>Nick Kosinski</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| IMPACT ANGLE:       | Zero Degrees             |            |        |
| BELTED DUMMIES (YES/NO): | No                      |            |        |
| TEST SPEED:         | X 32 to 40 kmph         | ___ 0 to 48 kmph | ___ 0 to 56 kmph |
| DRIVER DUMMY:       | ___ 5th female          | ___ 5th female | X 50th male |
| PASSENGER DUMMY:    | ___ 5th female          | ___ 5th female | X 50th male |

| Vehicle Year/Make/Model/Body Style: | 2005 Dodge Grand Caravan |
| VIN:                                | 2D4GP44L25R224618       |
| Wheelbase:                          | 3035 mm                 |
| Build Date:                         | 06/04                   |
| Vehicle Size Category:              | 5                       |
| Test Weight:                        | 2203.1 kg               |
| Front Overhang:                     | 965 mm                  |
| Overall Width:                      | 2040 mm                 |
| Overall Length Center:              | 5065 mm                 |

| Accelerometer Data                |                          |
| Location:                         | As per measurements on Data Sheet 31 |
| Linearity:                        | >99.9%                   |
| Integration Algorithm:            | Trapezoidal              |
| Vehicle Impact Speed:             | 39.9 kmph               |
| Time of Separation:               | 122.8 ms                |
| Velocity Change:                  | 40.9 kmph               |
CRUSH PROFILE

Collision Deformation Classification: 12FDEW6
Midpoint of Damage: Vehicle Longitudinal Centerline
Damage Region Length (mm): 1370
Impact Mode: LH Frontal Oblique 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>4913</td>
<td>4502</td>
<td>411</td>
</tr>
<tr>
<td>C2</td>
<td>Crush zone 2 at left side</td>
<td>mm</td>
<td>4996</td>
<td>4609</td>
<td>387</td>
</tr>
<tr>
<td>C3</td>
<td>Crush zone 3 at left side</td>
<td>mm</td>
<td>5050</td>
<td>4748</td>
<td>302</td>
</tr>
<tr>
<td>C4</td>
<td>Crush zone 4 at right side</td>
<td>mm</td>
<td>5047</td>
<td>4962</td>
<td>85</td>
</tr>
<tr>
<td>C5</td>
<td>Crush zone 5 at right side</td>
<td>mm</td>
<td>4996</td>
<td>5007</td>
<td>-11</td>
</tr>
<tr>
<td>C6</td>
<td>Crush zone 6 at right side</td>
<td>mm</td>
<td>4913</td>
<td>4906</td>
<td>7</td>
</tr>
</tbody>
</table>

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

Signature: [Signature]

Date: 9/12/06
DATA SHEET 41
WINDSHIELD MOUNTING (FMVSS 212)

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

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

X No – Pass. Skip to the table of measurements, complete it by repeating the pre-crash measurements in the post crash column, and calculate the retention percentage, which will be 100%.

X 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
### 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><strong>Left Side</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>610</td>
<td>610</td>
<td>100%</td>
</tr>
<tr>
<td>B</td>
<td>887</td>
<td>887</td>
<td>100%</td>
</tr>
<tr>
<td>C</td>
<td>883</td>
<td>883</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>2320</td>
<td>2320</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Right Side</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>610</td>
<td>610</td>
<td>100%</td>
</tr>
<tr>
<td>E</td>
<td>887</td>
<td>887</td>
<td>100%</td>
</tr>
<tr>
<td>F</td>
<td>883</td>
<td>883</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>2320</td>
<td>2320</td>
<td>100%</td>
</tr>
</tbody>
</table>

Indicate area of mounting failure. NONE

![Front View of Windshield Diagram](image)

**REMARKS:**

I certify that I have read and performed each instruction.

Signature: [Signature Image]

Date: 9/12/06
DATA SHEET 42
WINDSHIELD ZONE INTRUSION (FMVSS 219)

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

NHTSA No.: C50313
Test Date: 9/12/06

<table>
<thead>
<tr>
<th>IMPACT ANGLE:</th>
<th>Zero Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELTED DUMMIES (YES/NO):</td>
<td>No</td>
</tr>
<tr>
<td>TEST SPEED:</td>
<td>X 32 to 40 kmph</td>
</tr>
<tr>
<td>DRIVER DUMMY:</td>
<td>_ 5th female</td>
</tr>
<tr>
<td>PASSENGER DUMMY:</td>
<td>_ 5th female</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>1220</td>
</tr>
<tr>
<td>B</td>
<td>mm</td>
<td>520</td>
</tr>
<tr>
<td>C</td>
<td>mm</td>
<td>1645</td>
</tr>
<tr>
<td>D</td>
<td>mm</td>
<td>887</td>
</tr>
<tr>
<td>E</td>
<td>mm</td>
<td>583</td>
</tr>
<tr>
<td>F</td>
<td>mm</td>
<td>586</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: [Signature]
Date: 9/12/06
DATA SHEET 43
FUEL SYSTEM INTEGRITY (FMVSS 301)

Test Vehicle: 2005 Dodge Grand Caravan  
NHTSA No.: C50313
Test Program: FMVSS 208  
Test Date: 9/12/06
Test Technician: Eric Peschman

TYPE OF IMPACT: 25 mph Unbelted Flat 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
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>
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<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>
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</tbody>
</table>
APPENDIX A

CRASH TEST DATA
<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>
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<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>
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<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>
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<tr>
<td>38</td>
<td>Passenger Neck Moment Y vs. Time</td>
<td>A-11</td>
</tr>
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<td>39</td>
<td>Passenger Neck Moment Z vs. Time</td>
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<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>
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</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>
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**25 MPH LH OBLIQUE UNBELTED**

2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006

Speed: 24.8 mph (39.9 km/h)

**DRIVER HEAD X (G's) vs TIME (ms)**

- Max: 7.1 G's
- Tmax: 198.3 ms
- Min: -34.4 G's
- Tmin: 100.2 ms

**DRIVER HEAD Y (G's) vs TIME (ms)**

- Max: 87.4 G's
- Tmax: 102.4 ms
- Min: -10.3 G's
- Tmin: 110.3 ms

**DRIVER HEAD Z (G's) vs TIME (ms)**

- Max: 69.1 G's
- Tmax: 110.4 ms
- Min: -14.2 G's
- Tmin: 106.3 ms

**DRIVER HEAD Resultant (G's) vs TIME (ms)**

- Max: 96.8 G's
- Tmax: 102.4 ms
- Min: 0.0 G's
- Tmin: 0.0 ms

CFC 1000
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)
Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

Max: 41.4 kph
Tmax: 79.7 ms
Min: 1.8 kph
Tmin: 300.0 ms
CFC 180

Max: 21.8 kph
Tmax: 205.8 ms
Min: -0.8 kph
Tmin: 76.6 ms
CFC 180

Max: 32.1 kph
Tmax: 300.0 ms
Min: -0.9 kph
Tmin: 63.2 ms
CFC 180
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

DRIVER NECK FX (N) vs TIME (ms)
Max: 503.2 N
Tmax: 106.6 ms
Min: -252.4 N
Tmin: 164.7 ms
CFC 1000

DRIVER NECK FY (N) vs TIME (ms)
Max: 114.9 N
Tmax: 92.8 ms
Min: -890.3 N
Tmin: 145.8 ms
CFC 1000

DRIVER NECK FZ (N) vs TIME (ms)
Max: 2566.1 N
Tmax: 110.7 ms
Min: -2485.5 N
Tmin: 104.1 ms
CFC 1000

DRIVER NECK FResultant (N) vs TIME (ms)
Max: 2597.2 N
Tmax: 104.0 ms
Min: 1.4 N
Tmin: 0.0 ms
CFC 1000
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

DRIVER NECK MX (Nm) vs TIME (ms)
Max: 43.1 Nm
Tmax: 146.2 ms
Min: -33.0 Nm
Tmin: 120.8 ms
CFC 600

DRIVER NECK MY (Nm) vs TIME (ms)
Max: 35.0 Nm
Tmax: 99.6 ms
Min: -6.7 Nm
Tmin: 111.3 ms
CFC 600

DRIVER NECK MZ (Nm) vs TIME (ms)
Max: 16.2 Nm
Tmax: 110.9 ms
Min: -6.0 Nm
Tmin: 137.5 ms
CFC 600

DRIVER NECK MResultant (Nm) vs TIME (ms)
Max: 49.4 Nm
Tmax: 146.7 ms
Min: 0.1 Nm
Tmin: 0.0 ms
CFC 600
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

Max: 3.3 G's
Tmax: 171.3 ms
Min: -23.4 G's
Tmin: 103.0 ms
CFC 180

Max: 13.6 G's
Tmax: 124.9 ms
Min: -3.8 G's
Tmin: 98.5 ms
CFC 180

Max: 19.3 G's
Tmax: 103.9 ms
Min: -11.7 G's
Tmin: 110.3 ms
CFC 180

Max: 29.9 G's
Tmax: 103.5 ms
Min: 0.0 G's
Tmin: 3.5 ms
CFC 180
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

Max: 39.9 kph
Tmax: 0.0 ms
Min: 2.7 kph
Tmin: 142.6 ms
CFC 180

Max: 16.4 kph
Tmax: 217.6 ms
Min: -0.4 kph
Tmin: 104.5 ms
CFC 180

Max: 14.3 kph
Tmax: 300.0 ms
Min: -6.2 kph
Tmin: 98.2 ms
CFC 180

Max: 0.1 mm
Tmax: 38.5 ms
Min: -22.0 mm
Tmin: 115.4 ms
CFC 600

DRIVER CHEST X Velocity (kph) vs TIME (ms)

DRIVER CHEST Y Velocity (kph) vs TIME (ms)

DRIVER CHEST Z Velocity (kph) vs TIME (ms)

DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

Max: 207.4 N
Tmax: 156.5 ms
Min: -3139.1 N
Tmin: 115.0 ms
CFC 600

Max: 201.8 N
Tmax: 149.0 ms
Min: -1719.1 N
Tmin: 42.7 ms
CFC 600
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER HEAD X (G's) vs TIME (ms)
Max: 3.8 G's
Tmax: 144.9 ms
Min: -26.1 G's
Tmin: 109.6 ms
CFC 1000

PASSENGER HEAD Y (G's) vs TIME (ms)
Max: 13.0 G's
Tmax: 129.0 ms
Min: -3.0 G's
Tmin: 83.6 ms
CFC 1000

PASSENGER HEAD Z (G's) vs TIME (ms)
Max: 19.5 G's
Tmax: 101.4 ms
Min: -10.0 G's
Tmin: 79.0 ms
CFC 1000

PASSENGER HEAD Resultant (G's) vs TIME (ms)
Max: 29.4 G's
Tmax: 108.8 ms
Min: 0.0 G's
Tmin: 0.0 ms
CFC 1000
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER NECK FX (N) vs TIME (ms)
Max: 1260.8 N
Tmax: 111.0 ms
Min: -184.7 N
Tmin: 202.5 ms
CFC 1000

PASSENGER NECK FY (N) vs TIME (ms)
Max: 247.2 N
Tmax: 196.3 ms
Min: -351.3 N
Tmin: 121.9 ms
CFC 1000

PASSENGER NECK FZ (N) vs TIME (ms)
Max: 498.5 N
Tmax: 156.7 ms
Min: -698.6 N
Tmin: 130.2 ms
CFC 1000

PASSENGER NECK FResultant (N) vs TIME (ms)
Max: 1335.9 N
Tmax: 115.7 ms
Min: 0.5 N
Tmin: 0.0 ms
CFC 1000
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

PASSenger Neck MX (Nm) vs TIME (ms)

Max: 21.6 Nm
Tmax: 186.0 ms
Min: -14.6 Nm
Tmin: 137.7 ms
CFC 600

PASSenger Neck MY (Nm) vs TIME (ms)

Max: 89.0 Nm
Tmax: 104.3 ms
Min: -12.2 Nm
Tmin: 167.2 ms
CFC 600

PASSenger Neck MZ (Nm) vs TIME (ms)

Max: 13.8 Nm
Tmax: 213.0 ms
Min: -26.9 Nm
Tmin: 139.3 ms
CFC 600

PASSenger Neck MResultant (Nm) vs TIME (ms)

Max: 89.0 Nm
Tmax: 104.3 ms
Min: 0.0 Nm
Tmin: 0.0 ms
CFC 600
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)
Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

PASSENGER CHEST X Velocity (kph) vs TIME (ms)
Max: 39.9 kph
Tmax: 0.0 ms
Min: 3.6 kph
Tmin: 151.9 ms
CFC 180

PASSENGER CHEST Y Velocity (kph) vs TIME (ms)
Max: 6.7 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 103.8 ms
CFC 180

PASSENGER CHEST Z Velocity (kph) vs TIME (ms)
Max: 12.9 kph
Tmax: 279.9 ms
Min: -6.7 kph
Tmin: 91.0 ms
CFC 180

PASSENGER CHEST DISPLACEMENT (mm) vs TIME (ms)
Max: 0.5 mm
Tmax: 50.0 ms
Min: -9.0 mm
Tmin: 115.8 ms
CFC 600
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

Max: 0.2
Tmax: 115.7 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

Max: 0.4
Tmax: 110.8 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

Max: 0.4
Tmax: 104.0 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600

Max: 0.3
Tmax: 106.5 ms
Min: 0.0
Tmin: 0.0 ms
CFC 600
Pass. nij (NTF) () vs TIME (ms)

- Max: 0.3
- Tmax: 101.7 ms
- Min: 0.0
- Tmin: 0.0 ms

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

- Max: 0.1
- Tmax: 163.2 ms
- Min: 0.0
- Tmin: 0.0 ms

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

- Max: 0.2
- Tmax: 115.7 ms
- Min: 0.0
- Tmin: 0.0 ms

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

- Max: 0.0
- Tmax: 76.4 ms
- Min: 0.0
- Tmin: 0.0 ms
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

Max: 26.7 Nm
Tmax: 99.7 ms
Min: -7.6 Nm
Tmin: 79.0 ms
CFC 600

Max: 67.8 Nm
Tmax: 104.2 ms
Min: -11.4 Nm
Tmin: 167.2 ms
CFC 600

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

Pass. Occipital Condyle Moment (Nm) vs TIME (ms)
LEFT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)

- Max: 0.7 G's
- Tmax: 187.1 ms
- Min: -24.0 G's
- Tmin: 77.4 ms
- CFC 60

LEFT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)

- Max: 39.9 kph
- Tmax: 0.0 ms
- Min: -0.8 kph
- Tmin: 264.1 ms
- CFC 180

RIGHT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)

- Max: 1.2 G's
- Tmax: 131.1 ms
- Min: -23.5 G's
- Tmin: 77.7 ms
- CFC 60

RIGHT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)

- Max: 39.9 kph
- Tmax: 0.0 ms
- Min: -1.3 kph
- Tmin: 122.8 ms
- CFC 180
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

TOP OF ENGINE X (G's) vs TIME (ms)
Max: 4.6 G's
Tmax: 47.5 ms
Min: -36.6 G's
Tmin: 67.3 ms
CFC 60

TOP OF ENGINE X Velocity (kph) vs TIME (ms)
Max: 39.9 kph
Tmax: 0.0 ms
Min: 1.3 kph
Tmin: 296.0 ms
CFC 180

BOTTOM OF ENGINE X (G's) vs TIME (ms)
Max: 3.9 G's
Tmax: 178.3 ms
Min: -35.7 G's
Tmin: 47.3 ms
CFC 60

BOTTOM OF ENGINE X Velocity (kph) vs TIME (ms)
Max: 40.2 kph
Tmax: 6.4 ms
Min: -6.1 kph
Tmin: 300.0 ms
CFC 180
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

LEFT BRAKE CALIPER X (G's) vs TIME (ms)
Max: 107.1 G's
Tmax: 61.7 ms
Min: -106.7 G's
Tmin: 68.4 ms
CFC 60

LEFT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
Max: 40.0 kph
Tmax: 0.0 ms
Min: -8.5 kph
Tmin: 197.2 ms
CFC 180

RIGHT BRAKE CALIPER X (G's) vs TIME (ms)
Max: 11.0 G's
Tmax: 113.7 ms
Min: -37.2 G's
Tmin: 76.0 ms
CFC 60

RIGHT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
Max: 39.9 kph
Tmax: 0.0 ms
Min: -8.4 kph
Tmin: 107.4 ms
CFC 180
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

INSTRUMENT PANEL X (G's) vs TIME (ms)

Max: 21.0 G's
Tmax: 46.9 ms
Min: -49.0 G's
Tmin: 84.8 ms
CFC 60

INSTRUMENT PANEL X Velocity (kph) vs TIME (ms)

Max: 39.9 kph
Tmax: 0.0 ms
Min: -16.2 kph
Tmin: 300.0 ms
CFC 180

TRUNK Z (G's) vs TIME (ms)

Max: 5.7 G's
Tmax: 155.4 ms
Min: -11.8 G's
Tmin: 80.3 ms
CFC 60

TRUNK Z Velocity (kph) vs TIME (ms)

Max: 1.8 kph
Tmax: 300.0 ms
Min: -6.2 kph
Tmin: 110.2 ms
CFC 180
25 MPH LH OBLIQUE UNBELTED
2005 DODGE CARAVAN (C50313)

Test Date: 09/12/2006
Speed: 24.8 mph (39.9 km/h)

DRIVER AIRBAG TIMING (STAGE 1) (Volts) vs TIME (ms)
Max: 7.1 Volts
Tmax: 30.7 ms
Min: -0.4 Volts
Tmin: 100.5 ms
CFC 1000

DRIVER AIRBAG TIMING (STAGE 2) (Volts) vs TIME (ms)
Max: 9.6 Volts
Tmax: 129.5 ms
Min: -0.4 Volts
Tmin: 77.1 ms
CFC 1000

PASS. AIRBAG TIMING (STAGE 1) (Volts) vs TIME (ms)
Max: 9.8 Volts
Tmax: 29.5 ms
Min: -0.3 Volts
Tmin: 20.3 ms
CFC 1000

PASS. AIRBAG TIMING (STAGE 2) (Volts) vs TIME (ms)
Max: 4.1 Volts
Tmax: 38.2 ms
Min: -0.1 Volts
Tmin: 37.7 ms
CFC 1000
APPENDIX B

CRASH TEST PHOTOGRAPHS
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<td>Post-Test Mid Underbody View</td>
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<td>Pre-Test Fuel Tank View</td>
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<td>Post-Test Fuel Tank View</td>
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<td>Pre-Test Rear Underbody View</td>
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<td>Post-Test Rear Underbody View</td>
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<td>Pre-Test Driver Dummy Front View (head position)</td>
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<td>Pre-Test Driver Dummy Position Left Side View (Door Open)</td>
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<td>Post-Test Driver Dummy Position Left Side View (Door Open)</td>
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<td>Post-Test Driver Dummy Feet Position</td>
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<td>Pre-Test Driver Side Knee Bolster View</td>
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<td>Post-Test Driver Side Knee Bolster View</td>
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<td>Post-Test Driver Dummy Head Contact (a-pillar) View 1</td>
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<td>Post-Test Driver Dummy Head Contact (a-pillar) View 2</td>
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<td>Post-Test Driver Dummy Knee Contact (door)</td>
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<td>Post-Test Driver Dummy Knee Contact (left side view)</td>
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<td>Post-Test Driver Dummy Knee Contact (right side view)</td>
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<td>Post-Test Driver Dummy Airbag Contact</td>
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<td>Pre-Test Passenger Dummy Front View (head position)</td>
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<td>Post-Test Passenger Dummy Front View (head position)</td>
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<td>Pre-Test Passenger Dummy Position Right Side View</td>
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<td>Post-Test Passenger Dummy Position Right Side View</td>
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<td>Photo No. 55.</td>
<td>Pre-Test Passenger Dummy Position Right Side View (Door Open)</td>
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<tr>
<td>Photo No. 56.</td>
<td>Post-Test Passenger Dummy Position Right Side View (Door Open)</td>
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<td>Photo No. 57.</td>
<td>Pre-Test Passenger Dummy Seat Position</td>
<td>B-57</td>
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<td>Photo No. 58.</td>
<td>Post-Test Passenger Dummy Seat Position</td>
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<td>Photo No. 59.</td>
<td>Pre-Test Passenger Dummy Feet Position</td>
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<td>Photo No. 60.</td>
<td>Post-Test Passenger Dummy Feet Position</td>
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<tr>
<td>Photo No. 61.</td>
<td>Pre-Test Passenger Side Knee Bolster View</td>
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<tr>
<td>Photo No. 62.</td>
<td>Post-Test Passenger Side Knee Bolster View</td>
<td>B-62</td>
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<tr>
<td>Photo No. 63.</td>
<td>Post-Test Passenger Dummy Head Contact View (visor)</td>
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<td>Photo No. 64.</td>
<td>Post-Test Passenger Dummy Knee Contact</td>
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<td>Photo No. 65.</td>
<td>Post-Test Passenger Dummy Airbag Contact</td>
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<tr>
<td>Photo No. 66.</td>
<td>Temperature Plot</td>
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MFD BY DAIMLERCHRYSLER CORPORATION DATE OF MFR 6-04

GAIR FRONT WITH TIRES RIMS AT COLD
1293 KG(2850 LB) 215/65R16 16X6.5 250 KPA(36 PSI)

GAIR REAR WITH TIRES RIMS AT COLD
1339 KG(2950 LB) 215/65R16 16X6.5 250 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: 2D4GP44L25R224618 TYPE: MPV SINGLE X DUAL

MDH: 062213 006AB PNT:PEL VEHICLE MADE IN CANADA TRM:SLJ1 4648505
### Tire and Loading Information

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<th>Rear</th>
<th>Spare</th>
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SEATING CAPACITY – TOTAL 7  FRONT 2  REAR 5

THE COMBINED WEIGHT OF OCCUPANTS AND CARGO SHOULD NEVER EXCEED 521 KG OR 1150 LB

See Owners Manual for Additional Information
Pre-Test Front View of Test Vehicle
Post-Test Front View of Test Vehicle
Pre-Test Left Side View of Test Vehicle
Pre-Test Right Side View of Test Vehicle
Post-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
Pre-Test Left 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
Post-Test Windshield View
Post-Test Engine Compartment View
Pre-Test Fuel Filler Cap View
Post-Test Fuel Filler Cap View
Pre-Test Front Underbody View
Pre-Test Mid Underbody View
Pre-Test Fuel Tank View
Post-Test Rear Underbody View
Pre-Test Driver Dummy Front View (head position)
Post-Test Driver Dummy Position Left Side View (Door Open)
Pre-Test Driver Dummy Seat Position

PRE-TEST

C50313
30 DEGREE LH OBLIQUE
06091201
MGA RESEARCH CORP.
2005 DODGE CARAVAN
Post-Test Driver Dummy Seat Position
Post-Test Driver Dummy Feet Position
Pre-Test Driver Side Knee Bolster View
Post-Test Driver Dummy Head Contact (a-pillar) View 1
Post-Test Driver Dummy Head Contact (a-pillar) View 2
Post-Test Driver Dummy Knee Contact (door)
Post-Test Driver Dummy Knee Contact (left side view)
Post-Test Driver Dummy Knee Contact (right side view)
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 Seat Position
Post-Test Passenger Dummy Seat Position
Post-Test Passenger Dummy Feet Position
Post-Test Passenger Side Knee Bolster View
Post-Test Passenger Dummy Knee Contact
Post-Test Passenger Dummy Airbag Contact
APPENDIX C

INSTRUMENTATION CALIBRATION
## INSTRUMENTS FOR DRIVER DUMMY NO. 401

<table>
<thead>
<tr>
<th>SERIAL NO.</th>
<th>MANUFACTURER</th>
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<tbody>
<tr>
<td>Head X</td>
<td>AGH79</td>
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<td>AGH89</td>
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<td>Head Z</td>
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<td>Servo</td>
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## INSTRUMENTS FOR PASSENGER DUMMY NO. 403

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<td>C13081</td>
<td>Endevco</td>
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<td>C12883</td>
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