**REPORT NUMBER: MCW-DOT-07SN01**

# NEW CAR ASSESSMENT PROGRAM
# SIDE IMPACT TEST

## 2007 MAZDA 6 4-DOOR SEDAN

**NHTSA NUMBER: M75402**

**PREPARED BY:**
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**TEST DATE: 04 OCTOBER 2006**

**REPORT DATE: 11 OCTOBER 2006**

**FINAL REPORT**

**PREPARED FOR:**
**U.S. DEPARTMENT OF TRANSPORTATION**
**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
**RULEMAKING**
**OFFICE OF CRASHWORTHINESS STANDARDS**
**400 SEVENTH STREET, SW, ROOM 5311**
**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-42005.



Prepared by:_____ Date:

Reviewed by:_____ Date:

**Technical Report Documentation Page**

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| *9. Performing Organization Name and Address*<br>Medical College of Wisconsin<br>5000 W. National Ave.<br>Research 151<br>Milwaukee, WI 53295 | | *10. Work Unit No.*<br>*11. Contract or Grant No.*<br>DTNH22-03-D-42005 |
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*16. Abstract*

A 55/28 km/h 90° Moving Deformable Barrier (MDB) New Car Assessment Program (NCAP) side impact was conducted on the subject 2007 Mazda 6 4-door sedan to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at the Medical College of Wisconsin (MCW) in Milwaukee, Wisconsin on 04 October 2006. The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck side (driver's) of the vehicle was 22 °C. The target vehicle's maximum post test static crush was 327 mm at level 2. The test vehicle's occupant performance is as follows:

| | Units | DRIVER | PASS. |
|---|---|---|---|
| Left upper rib (LUR) acceleration | G | 48.91 | 64.20 |
| Left lower rib (LLR) acceleration | G | 52.58 | 67.21 |
| Lower spine ($T_{12}$) acceleration | G | 70.92 | 72.61 |
| Thoracic Trauma Index (TTI) | | 62 | 70 |
| Pelvis (PEV) acceleration | G | 77 | 84 |
| HIC | | 216.2 | 198.8 |

The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

| | | | |
|---|---|---|---|
| *17. Key Words*<br>New Car Assessment Program (NCAP)<br>Side impact<br>Side Impact Hybrid III Dummy (SID/HIII)<br>Occupant side impact protection | | *18. Distribution Statement*<br>Copies of this report are available from:<br>National Highway Traffic Safety Adm.<br>Technical Ref. Division,<br>Room 5108 (NPO-230)<br>400 Seventh Street, S.W.<br>Washington, D.C. 20590 | |
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## SECTION 1

## PURPOSE AND TEST PROCEDURE

### PURPOSE

This side impact test was conducted as part of the FY'07 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-42005. The purpose of this test was to evaluate side impact protection of a manufactured by Mazda Motor Corporation.

### TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

**SECTION 2**

**SUMMARY OF NCAP SIDE IMPACT TEST**

A 2007 Mazda 6 4-door sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) modeling a 90° impact as if the test vehicle were moving forward at 28 km/h perpendicular to and across the path of the MDB traveling forward at 55 km/h. Here the test vehicle was stationary and positioned 27° from perpendicular to the MDB tow road guidance system and the MDB was towed 27° ("crabbed") from the guidance system. [See p 26.] The 1608 kg test vehicle was impacted by the 1360.8 kg MDB traveling at a speed of 62.0 km/h (measured inline with the guidance system.) The test was conducted at the Medical College of Wisconsin on 04 October 2006.

Two (2) 50th percentile adult male Hybrid III-Side Impact Dummies (SID/HIIIs) were placed in designated seating positions within the test vehicle: one (1) driver, and one (1) left rear passenger; serial numbers 056 and 058 respectively. Each SID/HIII was instrumented in the following locations:

- Left upper rib uni-axial (Y) accelerometers (primary and redundant)
- Left lower rib uni-axial (Y) accelerometers (primary and redundant)
- Lower thoracic spine uni-axial (Y) accelerometers (primary and redundant)
- Pelvis uni-axial (Y) accelerometers (primary and redundant)
- Head center of gravity tri-axial (X, Y, Z)accelerometers (primary and redundant)
- Upper neck tri-axial (X, Y, Z) force load cells and tri-axial (X, Y, Z) moment load cells

The test vehicle was instrumented with twenty-one (21) structural accelerometers and the MDB was instrumented with six (6) accelerometers. All data channels were recorded with a fully self contained on-board DTS TDAS Pro Data Acquisition System. The data were digitally sampled at 12.5 kHz and processed according to SAEJ211-1(March 1995).

One (1) real-time video camera and nine (9) high-speed video cameras were used to document the impact event. The pre test and post test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

All of the above was conducted in accordance to the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002.

## 2.2 GENERAL COMMENTS

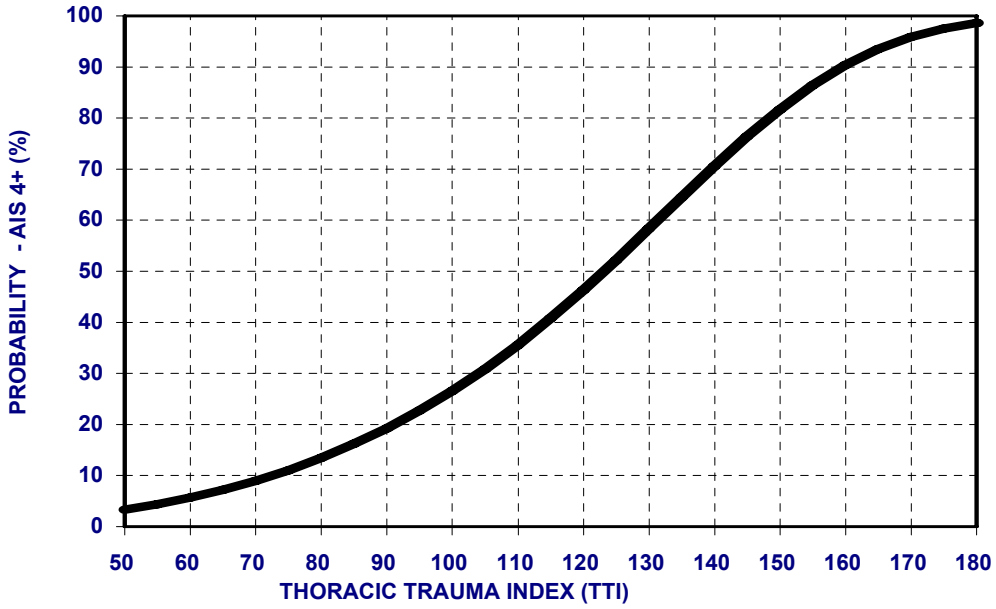
The test vehicle sustained a maximum static crush of 327 mm at level 2, 1050 mm rearward of the vertical impact line.

Test summaries, post test observations, vehicle, MDB, camera, and occupant measurements are presented in datasheets 1-16. Appendix A contains the still photograph prints. Appendix B contains selected driver and passenger SID/HIII's response data traces. Appendix C contains the SID/HIII's configuration and performance verification data.

| OCCUPANT SUMMARY | | |
|---|---|---|
| **Injury criteria** | **Driver (P1)** | **Left rear passenger (P4)** |
| HIC36 | 216.2 | 198.8 |
| T1 (ms) | 37.6 | 38.4 |
| T2 (ms) | 65.9 | 58.6 |
| TTI | 62 | 70 |
| Maximum pelvic acceleration (G) | 77 | 84 |

Head Injury Criterion (HIC) is the standardized calculation using resultant head acceleration to assess head injury. Generally, a higher HIC represents an increase in the likelihood of a serious head injury. HIC36 specifies a time 'window' of 36 milliseconds over which the integral is calculated. T1 and T2 represent the time of the lower and upper bounds of the window in which the HIC is calculated.

The Thoracic Trauma Index (TTI) is computed from the crash test dummy's accelerations at the upper rib, lower rib, and lower spine to quantify the risk of a serious thorax injury during a typical near side impact crash. The injury risk curve is shown below. The vertical axis of the curve is the probability of sustaining an Abbreviated Injury Scale (AIS) level 4 or greater injury. AIS is an anatomical scoring system used to assess a 'threat to life' associated with a specific injury; injuries are ranked on a scale of 1 to 6, with 1 being 'minor', 4 'severe' and 6 an 'unsurvivable' injury. A lower TTI corresponds to a decreased probability of a severe thorax injury. (www.trauma.org)




The maximum pelvic acceleration is used to assess the likelihood of injury to the pelvis during a side impact crash. Higher pelvic accelerations correspond to an increase in the likelihood of sustaining a severe pelvis injury.

| SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION | | | | |
|---|---|---|---|---|
| **Restraint type** | **Left front (driver) occupant Location 01** | | **Left rear (passenger) occupant Location 04** | |
| | Installed | Operation | Installed | Operation |
| Front airbag | Yes – steering wheel | Did not deploy | No | N/a |
| Side airbag | Yes - seat back | Deployed | No | N/a |
| Head airbag | No | N/a | No | N/a |
| Curtain airbag | Yes | Deployed | Yes | Deployed |
| Seat belt pretensioner | Yes | Deployed | No | N/a |
| Seat belt load limiter | Yes | N/a | No | N/a |

These test data and report can be found in detail on the NHTSA website at www.nhtsa.dot.gov.

A brief summary of the crash test can be located at www.safercar.gov

**TEST NOTES**

The on board hood camera lost power 26 milliseconds after impact.

**DATA SHEET NO. 1**
**GENERAL TEST AND VEHICLE PARAMETER DATA**

| VEHICLE INFORMATION | |
|---|---|
| Year | 2007 |
| Make | Mazda |
| Model | 6 |
| Body style | 4-door sedan |
| NHTSA number | M75402 |
| MCW test ID | 07SN01 |
| VIN | 1YVHP80C175M03273 |
| Color | Smokestone |
| Build date | July 2006 |
| Engine No. of cylinders | 4 |
| Engine Displacement (L) | 2.3 |
| Engine Placement | Lateral |
| Transmission | 5-speed manual |
| Final drive | Front wheel drive |
| Delivery date | 14Sep2006 |
| Odometer reading | 44 miles |

| VEHICLE OPTIONS | |
|---|---|
| Air conditioning | Yes |
| Anti-lock brakes | Yes |
| AM/FM radio | Yes |
| All wheel drive | No |
| Clock | Yes |
| Console | Yes |
| Cruise/speed control | Yes |
| Disc brakes, front | Yes |
| Disc brakes, rear | Yes |
| Power brakes | Yes |
| Power door locks | No |
| Power steering | Yes |
| Power windows | Yes |
| Rear window defroster | Yes |
| Roof rack | No |
| Tilt steering wheel | Yes |

| CERTIFICATION LABEL INFORMATION | | | |
|---|---|---|---|
| Manufacturer | Auto Alliance International | GVWR (kg) | 1941 |
| | | GAWR front(kg) | 1005 |
| Date of manufacture | July 2006 | GAWR rear (kg) | 936 |

| SEAT INFORMATION | | | |
|---|---|---|---|
| | **Number of occupants** | **Seat type** | **Seat back type** |
| Front | 2 | Bucket | Adjustable |
| Back | 3 | Contoured bench | Fixed |
| Third | - | - | - |
| Total | 5 | | |

| CARGO CAPACITY CALCULATION | | | |
|---|---|---|---|
| | **Units** | **Value** | **Reference label** |
| Vehicle maximum capacity | kg | 385.6 | (A) |
| Number of occupants (5) X 68.04 kg | kg | 340.2 | (B) |
| Cargo capacity (RCLW) † | kg | 45.4 | (C) = (A)-(B) † |

† Note if RCLW is > 136.1 kg (300 lbs), use 136.1 kg

**DATA SHEET NO. 1**
**GENERAL TEST AND VEHICLE PARAMETER DATA (CONTINUED)**

| TEST VEHICLE MASS INFORMATION | | | | |
|---|---|---|---|---|
| | **Units** | **As delivered** | **As tested** | **Fully loaded** |
| Left front | kg | 430.5 | 458.6 | 459.5 |
| Right front | kg | 403.7 | 429.6 | 429.1 |
| Left rear | kg | 276.2 | 367.0 | 370.1 |
| Right rear | kg | 296.6 | 352.8 | 354.7 |
| Total front | kg | 834.2 | 888.2 | 888.6 |
| % Total front | % | 59.3 | 55.2 | 55.1 |
| Total rear | kg | 572.8 | 719.8 | 724.8 |
| %Total rear | % | 40.7 | 44.8 | 44.9 |
| Total | kg | 1407.0 | 1608.0 | 1613.4 |

*As delivered mass is vehicle mass with maximum fluids*
*Fully loaded mass is the as delivered mass + 1 or 2 ATD's + RCLW*
*As tested mass is the mass of test vehicle with 1 or 2 ATD's + instrumentation + ballast (if necessary)*

| CALCULATION OF TEST VEHICLE TARGET MASS | | | |
|---|---|---|---|
| | **Units** | **Value** | **Reference label** |
| As delivered test vehicle mass | kg | 1407.0 | (D) |
| Maximum cargo capacity (RCLW) | kg | 45.4 | (C) |
| Mass of SID HIII's (1 or 2) | kg | 161.0 | (E) |
| Test vehicle target mass (TVTW) | kg | 1613.4 | (D) + (C) + (E) |

*As tested mass must be 4.5 kg to 9 kg less than the test vehicle target mass*

| BALLAST INFORMATION | |
|---|---|
| Mass of ballast added (kg) | N/a |
| Location | N/a |
| Components removed from test vehicle<br>Non-struck front and rear door glasses<br>Non-struck front and rear door interior panels<br>(2) Mufflers and exhaust system up to and including catalytic converter | |

| IMPACT LOCATION ON TEST VEHICLE | |
|---|---|
| Wheelbase | 2674 mm |
| Nominal impact point | 397 mm rearward of front axle |
| Actual impact point | 399 mm rearward of front axle |

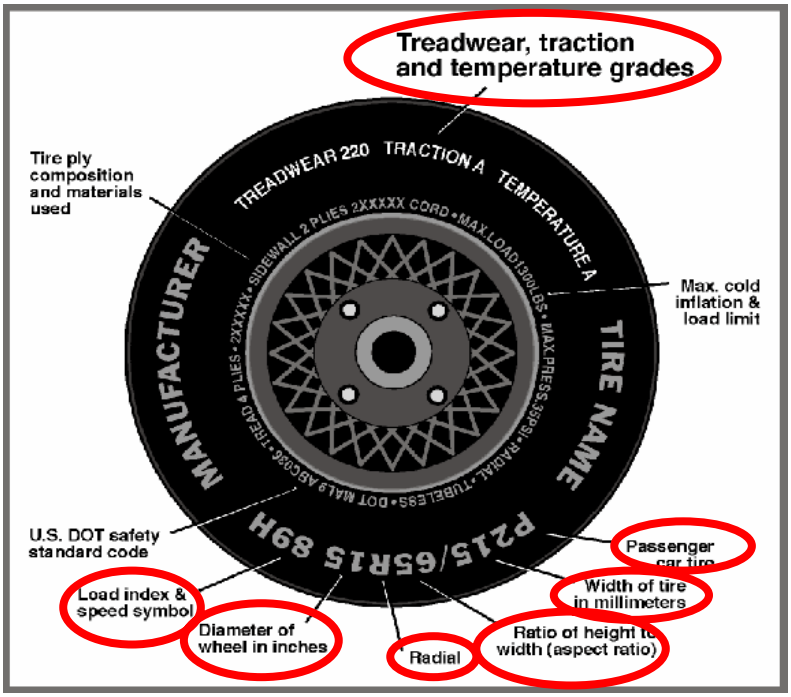
**DATA SHEET NO. 1**
**GENERAL TEST AND VEHICLE PARAMETER DATA (CONTINUED)**

| TEST VEHICLE ATTITUDES | | | | |
|---|---|---|---|---|
| | **Units** | **As delivered** | **As tested** | **Fully loaded** |
| Left front | mm | 728 | 718 | 719 |
| Right front | mm | 734 | 716 | 720 |
| Left rear | mm | 710 | 674 | 676 |
| Right rear | mm | 713 | 682 | 683 |
| CG (X) | mm | 1088 | 1198 | 1201 |

*As tested attitudes must be between as delivered and fully loaded attitudes*
*CG (X) measured rearward from front axle centerline*

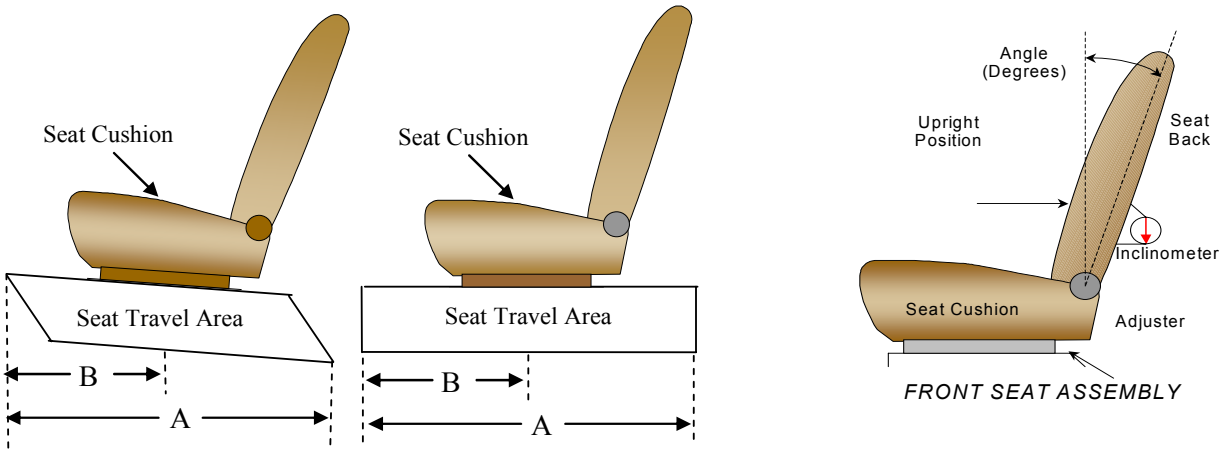
| AUTOMATIC DOOR LOCK (ADL) INFORMATION | | | | |
|---|---|---|---|---|
| | **Left front** | **Left rear** | **Right front** | **Right rear** |
| ADL present | No | No | No | No |
| ADL deactivated | N/a | N/a | N/a | N/a |
| Deactivation method | N/a | | | |
| Door lock status | Unlocked | Unlocked | Unlocked | Unlocked |

**DATA SHEET NO. 2**
**TEST VEHICLE TIRE INFORMATION**




| TIRE INFORMATION | | |
|---|---|---|
| **Measured Parameter** | **Front** | **Rear** |
| Maximum tire pressure (kPa) | 280 | 280 |
| Cold / test pressure (kPa) | 220 | 220 |
| Recommended tire size | P215 50 R17 | P215 50 R17 |
| Tire size on vehicle | P215 50 R17 | P215 50 R17 |
| Tire manufacturer | Michelin | Michelin |
| Tire name | HX MXM4 | HX MXM4 |
| Tire type | Passenger | Passenger |
| Tire width (mm) | 215 | 215 |
| Ratio of height to width (aspect ratio) | 50 | 50 |
| Radial | Yes | Yes |
| Wheel diameter (inches) | 17 | 17 |
| Load index & speed symbol | 93V | 93V |
| Tread wear | 300 | 300 |
| Traction grade | A | A |
| Temperature grade | A | A |

**DATA SHEET NO. 3**
**TEST VEHICLE INFORMATION**




**Seat fore/aft positions**
The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.

| SEAT FORE/AFT POSITION | | |
|---|---|---|
| | **Left front seat** | **Left rear seat** |
| Type | Power – bucket | Fixed- contoured |
| Fore/aft total travel (mm) | 256 mm | N/a |
| Number of detents | N/a | N/a |
| Test position | Mid position<br>128 mm from full forward | N/a |

**Seat back position**
The driver and passenger seat back is positioned according to the manufacturers designated angle.

| SEAT BACK POSITION | | |
|---|---|---|
| | **Left front seat** | **Left rear seat** |
| Total number of detents | Power | Fixed |
| Test position | 20 degrees from full forward | N/a |
| Seat back angle in test position | 20 degrees from full forward | N/a |
| Location of measurement | Head rest post | N/a |
| Seat back angle @ head rest post | 20 degrees from full forward | N/a |

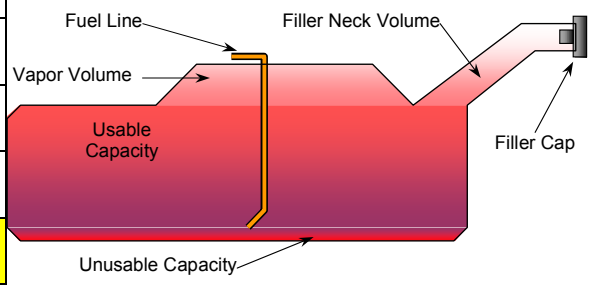
‡Full upright = notch 0

**Seat belt position**
The adjustable anchorage locations are positioned according to the manufacture's specifications.

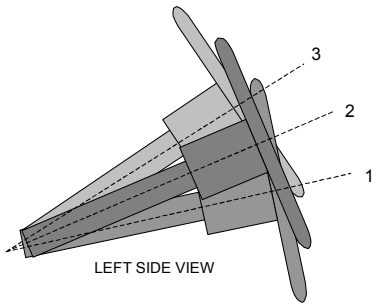
| SEAT BELT ADJUSTABLE ANCHORAGE (D-RING) | | |
|---|---|---|
| | **Left Front Seat** | **Left Rear Seat** |
| Adjustable anchor present | Yes | No |
| Total travel (mm) | 68 | N/a |
| Test position | Highest position | N/a |

**DATA SHEET NO. 3**
**TEST VEHICLE INFORMATION (continued)**

**Fuel tank information**

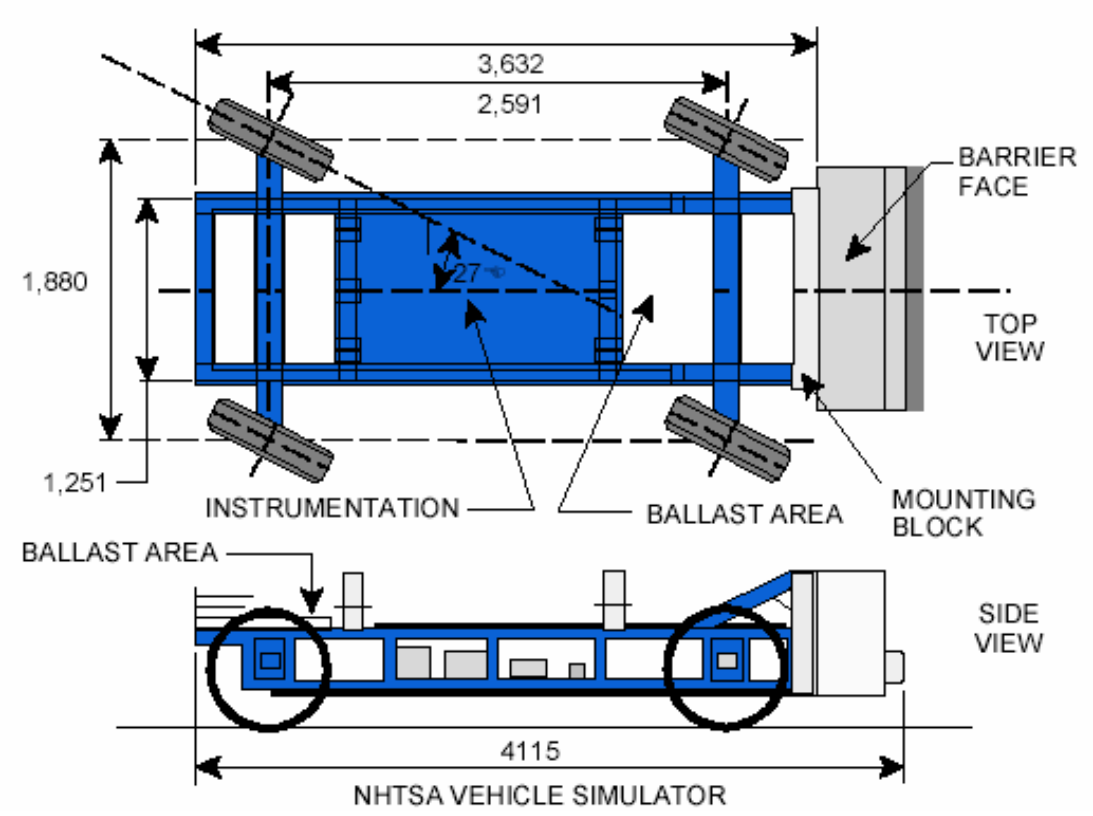
| STODDARD INFORMATION | | | |
|---|---|---|---|
| **Description** | **Units** | **Value** |   *VEHICLE FUEL TANK ASSEMBLY* |
| Usable capacity of standard equipment fuel tank | L | 68.1 | |
| Usable capacity of optional equipment fuel tank | L | N/a | |
| Usable capacity of vehicle used for certification testing to requirements | L | 68.1 | |
| Amount of stoddard added for test | L | 63.4 | |
| % Usable capacity (92%-94%) | % | 93.1 | |
| Operational instructions | None | | |
| Electric fuel pump present | Yes | | |
| Operating condition of test vehicle for fuel pump operation | The fuel pump operates when starter or engine is activated | | |

**Steering wheel information**
Steering wheel and column adjustments are placed according to the manufacturer's specifications.

| ADJUSTABLE STEERING COLUMN | | |
|---|---|---|
| Adjustable column | Yes |   *STEERING COLUMN ASSEMBLY* |
| Steering wheel angle in upper most position | 26.1 | |
| Steering wheel fore/aft travel | 23.3 | |
| Number of detents | N/a | |
| Test position | Steering wheel positioned 23.3 relative to vertical. The steering column also had a telescope adjustment and it was set so that it was 97 mm from the dash panel to the trim hole for the turn signal | |

**DATA SHEET NO. 4**
**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**

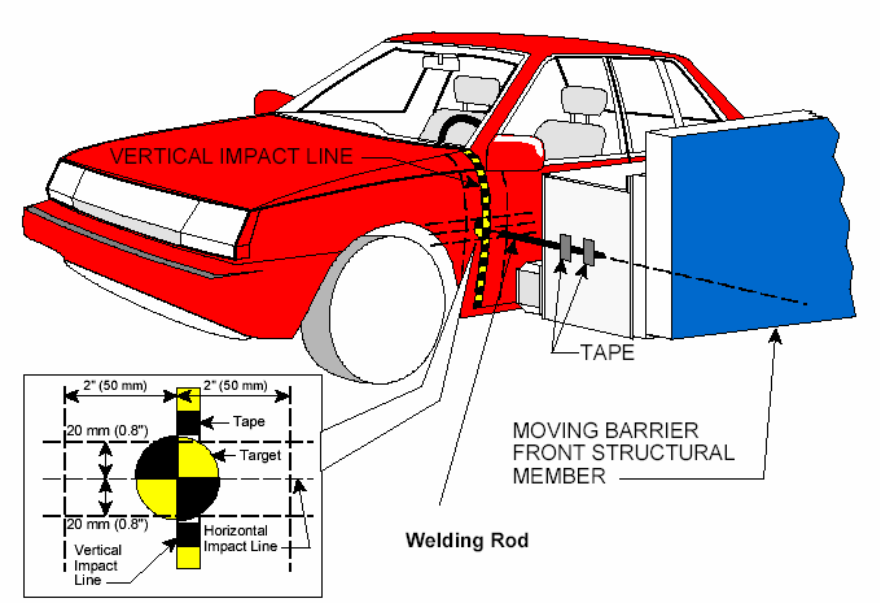
| MDB SPECIFICATIONS | | | | |
|---|---|---|---|---|
| | **Units** | **Specification** | **Range** | **Value** |
| Overall Width of Framework Carriage | mm | 1251 | 1226-1276 | 1245 |
| Overall Length w/Impactor Face | mm | 4115 | 4090-4140 | 4101 |
| Overall Length w/o Impactor Face | mm | 3632 | 3607-3657 | 3617 |
| Longitudinal Cg from Front Axle | mm | 1123 | 1098-1148 | 1135 |
| Track Width | mm | 1880 | 1855-2005 | 1864 |
| Mass | kg | 1361 | 1356.5-1365.5 | 1360.8 |
| MOI (X) | kg-m$^2$ | 508 | 483-533 | 496 |
| MOI (Y) | kg-m$^2$ | 2263 | 2150-2376 | 2227 |
| MOI (Z) | kg-m$^2$ | 2572 | 2443-2701 | 2609 |



**DATA SHEET NO. 4**
**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS (Continued)**

| MDB MASS INFORMATION | | |
|---|---|---|
| | **Units** | **As tested** |
| Left front | kg | 458.4 |
| Right front | kg | 307.8 |
| Left rear | kg | 228.7 |
| Right rear | kg | 365.9 |
| Total front | kg | 766.2 |
| % Total front | % | 56.3 |
| Total rear | kg | 594.6 |
| %Total rear | % | 43.7 |
| Total | kg | 1360.8 |

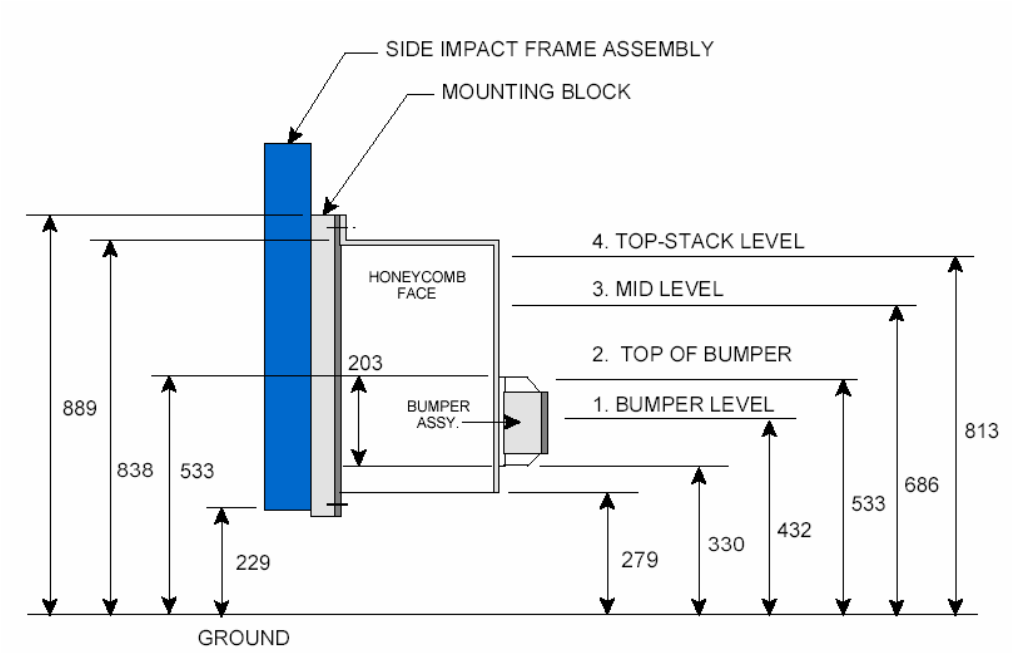
| IMPACT SPEED | | | | |
|---|---|---|---|---|
| | **Units** | **Specification** | **Range** | **Value** |
| Primary speed trap | kmh | 61.9 | 61.1-62.7 | 62.0 |
| Redundant speed trap | kmh | 61.9 | 61.1-62.7 | 61.9 |




| IMPACT POINT INFORMATION | | |
|---|---|---|
| Vertical impact line is | 397 mm rearward of front axle | |
| Actual impact is | 399 mm rearward of front axle | |
| **Measurement** | **Value** | **Tolerance** |
| Impact point distance from vertical impact line | 2 mm rearward | +/- 50 mm |
| Impact point distance from horizontal impact line | 14 mm below | +/- 20 mm |

**DATA SHEET NO. 4**
**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS (Continued)**

| HONEYCOMB FACE CLEARANCE | | | | | |
|---|---|---|---|---|---|
| | **Units** | **Specification** | **Range** | **Left** | **Right** |
| Bottom of barrier | mm | 279 | 276-282 | 277 | 276 |
| Bottom of bumper | mm | 330 | 327-333 | 331 | 331 |
| Top of bumper | mm | 533 | 530-536 | 534 | 534 |
| Top of barrier | mm | 838 | 835-841 | 838 | 838 |




RIGHT SIDE VIEW

**DATA SHEET NUMBER 5**
**POST TEST OBSERVATIONS**

| TEST DUMMY INFORMATION AND CONTACT POINTS | | |
|---|---|---|
| **Description** | **Left front seat** | **Left rear seat** |
| Dummy type / serial no. | SID HIII/056 | SID HIII/058 |
| Head contact | To side curtain air bag | To side curtain air bag and c-pillar |
| Upper torso contact | To seat mounted side air bag | To left rear door panel 160 mm below window sill |
| Lower torso contact | To left front door panel at arm rest | To left rear door panel at arm rest |
| Left leg contact | To left front door panel 150 mm below arm rest | To left rear door panel 80 mm below arm rest |
| Left knee contact | To left front door panel 140 mm below arm rest | To left rear door panel at arm rest 190 mm rearward of b-pillar |

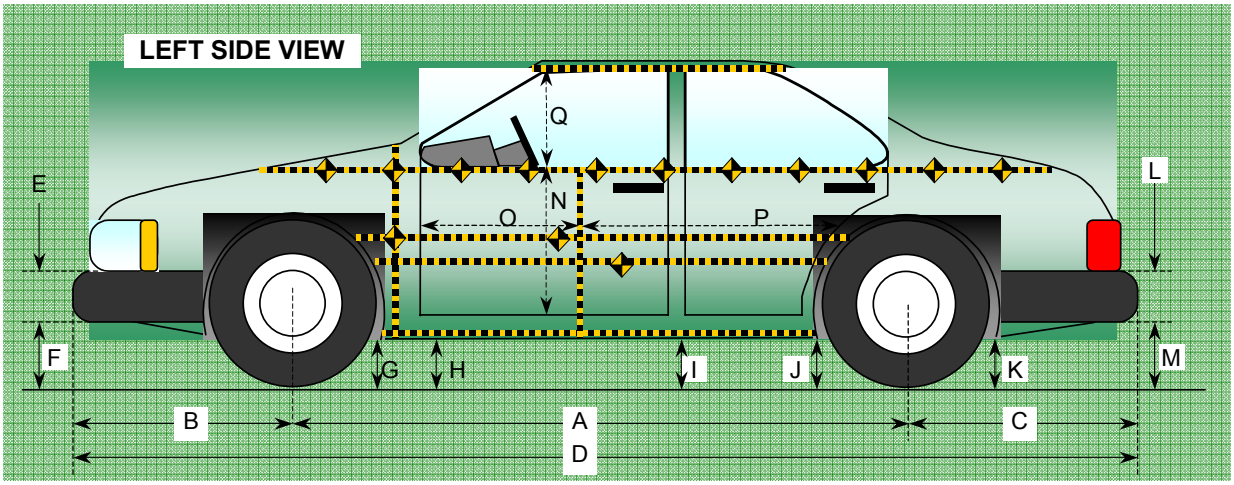
| POST TEST DOOR OPENING AND SEAT TRACK INFORMATION | | |
|---|---|---|
| **Description** | **Front** | **Rear** |
| Locked/unlocked doors | Unlocked | Unlocked |
| Left side door opening | Closed/latched/inoperable | Closed/latched/inoperable |
| Right side door opening | Closed/latched/operable | Closed/latched/operable |
| Seat movement | ~50 mm of seat crush | ~160 mm of seat crush |
| Seat back failure | None | None |

| POST TEST STRUCTURAL OBSERVATIONS | |
|---|---|
| **Critical areas of performance** | **Observations/conclusions** |
| Pillar performance | None |
| Sill separation | Sill separation noted underneath b-pillar |
| Windshield damage | None |
| Window damage | Front and rear struck side door windows and rear window shattered on impact |
| Other notable effects | None |

**DATA SHEET NUMBER 5**
**POST TEST OBSERVATIONS (continued)**

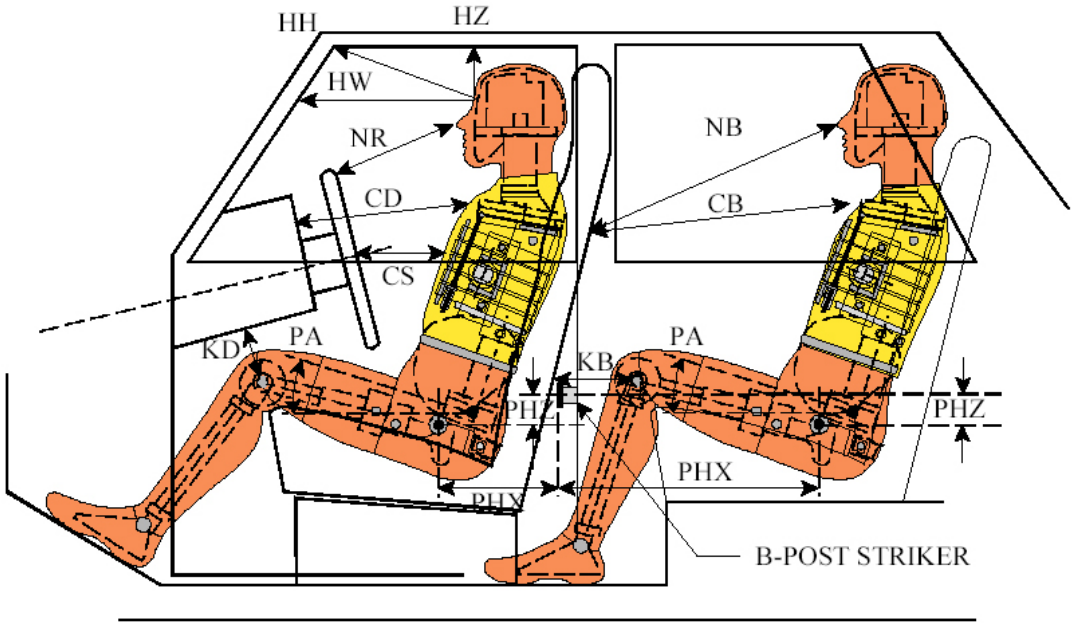
| SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION | | | | |
|---|---|---|---|---|
| **Restraint Type** | **Left front (Driver) occupant Location 01** | | **Left rear (passenger) occupant Location 04** | |
| | Installed | Operation | Installed | Operation |
| Front airbag | Yes – steering wheel | Did not deploy | No | N/a |
| Side airbag | Yes - seat back | Deployed | No | N/a |
| Head airbag | No | N/a | No | N/a |
| Curtain airbag | Yes | Deployed | Yes | Deployed |
| Seat belt pretensioner | Yes | Deployed | No | N/a |
| Seat belt load limiter | Yes | N/a | No | N/a |

**DATA SHEET NUMBER 6**
**VEHICLE PRE AND POST MEASURMENTS**



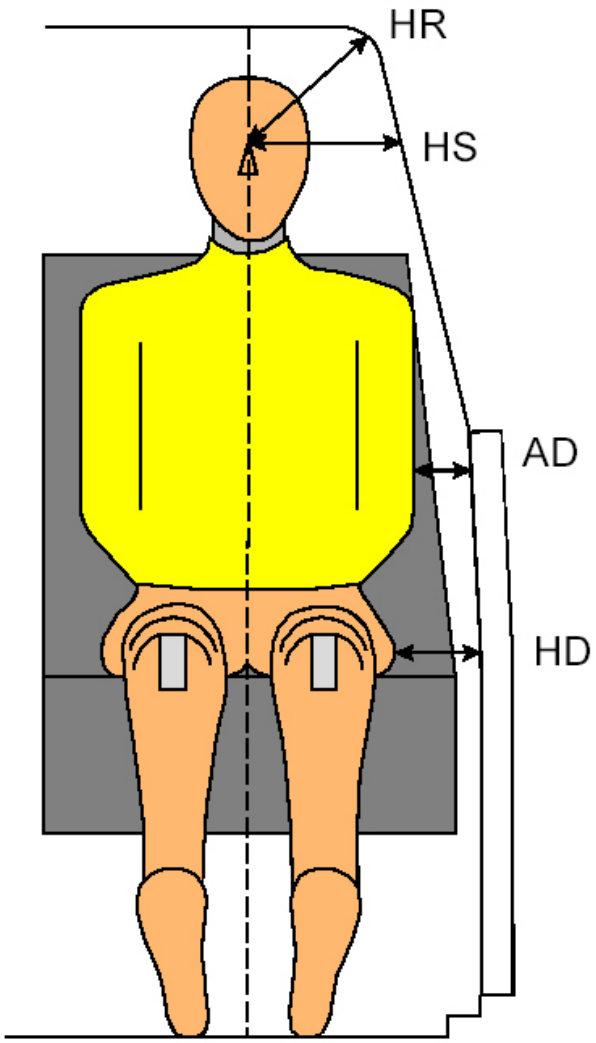

| VEHICLE DIMENSIONS | | | | |
|---|---|---|---|---|
| **Code** | **Description** | **Pre test** | **Post test** | **Change** |
| | | **mm** | **mm** | **mm** |
| A | Wheelbase | 2674 | 2653 | -21 |
| B | Front axle to front side of vehicle | 626 | 622 | -4 |
| C | Rear axle to rear side of vehicle | 870 | 855 | -15 |
| D | Total length at centerline | 4743 | 4732 | -11 |
| E | Front bumper thickness | 300 | 300 | 0 |
| F | Front bumper bottom to ground | 257 | 263 | 6 |
| G | Sill height at front wheel well | 197 | 191 | -6 |
| H | Sill height at front door leading edge | 197 | 185 | -12 |
| I | Sill height at b-pillar | 197 | 172 | -25 |
| J1 | Sill height at rear wheel well | 143 | 151 | 8 |
| J2 | Pinch weld height at rear wheel well | 187 | 166 | -21 |
| K | Sill height aft of rear wheel well | 213 | 207 | -6 |
| L | Rear bumper thickness | 224 | 224 | 0 |
| M | Rear bumper bottom to ground | 335 | 334 | -1 |
| N | Sill height to window bottom sill | 722 | 681 | -41 |
| O | Front door leading edge to impact C/L | 1106 | 1017 | -89 |
| P | Rear door trailing edge to impact C/L | 873 | 793 | -80 |
| Q | Front window opening | 437 | 414 | -23 |
| R | Right side length | 4170 | 4176 | 6 |
| S | Left side length | 4170 | 4130 | -40 |
| T | Vehicle width at b-pillar | 1776 | 1605 | -171 |

**DATA SHEET NUMBER 7**
**SID HIII LONGITUDINAL CLEARANCES**



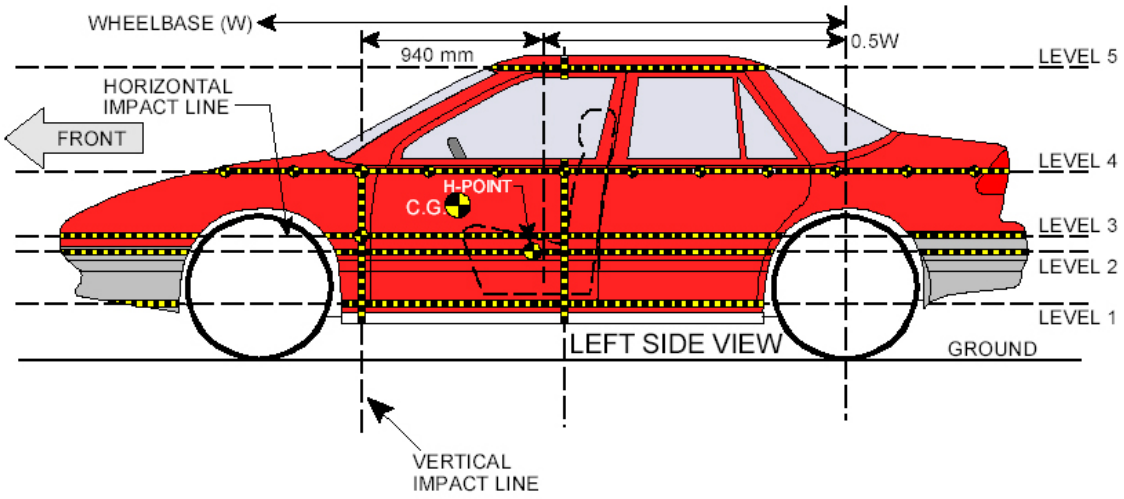

| SID HIII LONGITUDINAL CLEARANCE MEASUREMENTS | | | | | |
|---|---|---|---|---|---|
| **Driver code** | **Pass. code** | **Measurement description** | **Units** | **Left front seat** | **Left rear seat** |
| | | ATD serial number | - | 056 | 058 |
| HH | - | Head to header | mm | 316 | N/a |
| HW | - | Head to windshield | mm | 599 | N/a |
| HZ | HZ | Head to roof | mm | 167 | 169 |
| NR | NB | Nose to rim/nose to seatback | mm | 364 | 656 |
| CD | CB | Chest to dash or seatback | mm | 485 | 593 |
| CS | - | Chest to steering wheel | mm | 285 | N/a |
| KDL | KBL | Left knee to dash or seatback length | mm | 193 | 243 |
| KDA | KBA | Left knee to dash or seatback angle | ° | 28.6 | 10.9 |
| KDR | KBR | Right Knee to dash or seatback length | mm | 194 | 217 |
| KDA | KDA | Right knee to dash or seatback angle | ° | 31.4 | 13.6 |
| PA | PA | Pelvic angle | ° | 23.5 | 23.8 |
| PHX | PHX | H-Point to striker (x-axis) | mm | 174 | 299 |
| PHZ | PHZ | H-Point to striker (z-axis) | mm | 114 | 375 |

**DATA SHEET NUMBER 8**
**SID HIII LATERALL CLEARANCES**




| SID HIII LATERAL CLEARANCE MEASUREMENTS | | | | |
|---|---|---|---|---|
| **Code** | **Measurement description** | **Units** | **Left front seat** | **Left rear seat** |
| - | ATD serial number | - | 056 | 058 |
| HR | Head to side header | mm | 183 | 200 |
| HS | Head to side window | mm | 288 | 224 |
| - | Shoulder to door | mm | 109 | 129 |
| AD | Arm to door | mm | 124 | 148 |
| HD | H-Point to door | mm | 155 | 204 |

**DATA SHEET 9**
**VEHICLE SIDE MEASUREMENTS**




| VEHICLE STATIC CRUSH SUMMARY | | | | |
|---|---|---|---|---|
| **Level** | **Description** | **Height above ground (mm)** | **Maximum static crush (mm)** | **Longitudinal (X) distance from impact point (mm)** |
| 5 | Window top | 1329 | 51 | 51 |
| 4 | Window sill | 925 | 200 | 1650 |
| 3 | Mid-door | 593 | 310 | 900 |
| 2 | Driver H-point | 464 | 327 | 1050 |
| 1 | Axle centerline or sill top | 201 | 138 | 900 |
| **Maximum static crush** | | **327 mm at level 2- 1050 mm rearward from vertical impact line** | | |

Height measurements taken 750 mm rearward from vertical impact line.

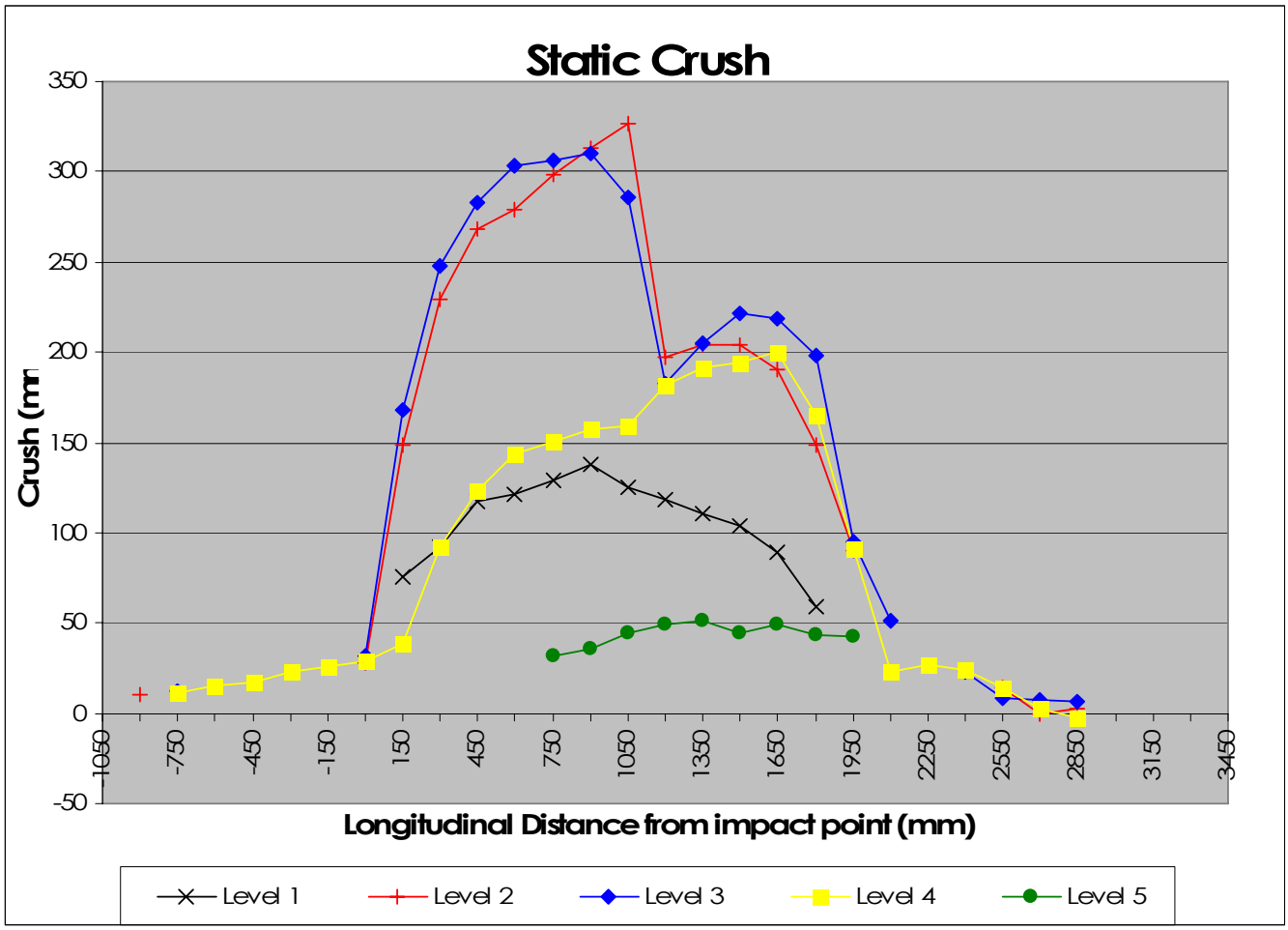
**DATA SHEET 10**
**VEHICLE STATIC CRUSH PROFILE**

Note: All dimensions are in millimeters with a tolerance of ±3 mm

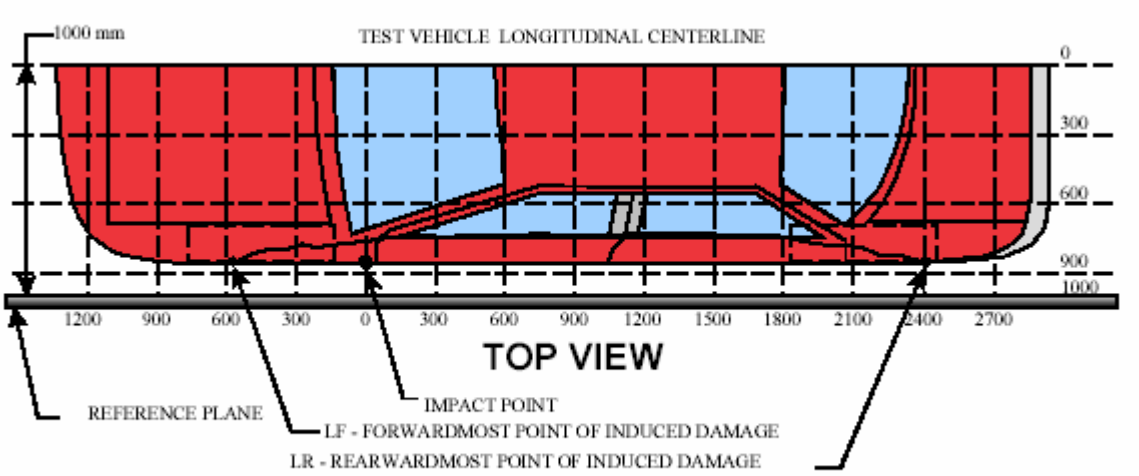
**TEST VEHICLE STATIC CRUSH**

| | Level | 1 | | | 2 | | | 3 | | | 4 | | | 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Height | 201 | | | 464 | | | 593 | | | 925 | | | 1329 | | |
| | | Pre | Post | Crush | Pre | Post | Crush | Pre | Post | Crush | Pre | Post | Crush | Pre | Post | Crush |
| DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT | -1050 | | | | | | | | | | | | | | | |
| | -900 | | | | 232 | 242 | 10 | | | | | | | | | |
| | -750 | | | | | | | 191 | 203 | 12 | 307 | 318 | 11 | | | |
| | -600 | | | | | | | | | | 295 | 310 | 15 | | | |
| | -450 | | | | | | | | | | 290 | 307 | 17 | | | |
| | -300 | | | | | | | | | | 285 | 308 | 23 | | | |
| | -150 | | | | | | | | | | 286 | 312 | 26 | | | |
| | 0 | | | | 181 | 209 | 28 | 178 | 210 | 32 | 283 | 312 | 29 | | | |
| | 150 | 208 | 284 | 76 | 185 | 334 | 149 | 179 | 347 | 168 | 285 | 324 | 39 | | | |
| | 300 | 205 | 297 | 92 | 183 | 412 | 229 | 177 | 425 | 248 | 280 | 372 | 92 | | | |
| | 450 | 198 | 315 | 117 | 181 | 449 | 268 | 176 | 459 | 283 | 279 | 402 | 123 | | | |
| | 600 | 197 | 318 | 121 | 180 | 459 | 279 | 174 | 477 | 303 | 276 | 420 | 144 | | | |
| | 750 | 195 | 324 | 129 | 179 | 477 | 298 | 173 | 479 | 306 | 274 | 424 | 150 | 508 | 540 | 32 |
| | 900 | 195 | 333 | 138 | 177 | 490 | 313 | 172 | 482 | 310 | 271 | 428 | 157 | 516 | 552 | 36 |
| | 1050 | 194 | 319 | 125 | 176 | 503 | 327 | 171 | 457 | 286 | 273 | 432 | 159 | 520 | 564 | 44 |
| | 1200 | 195 | 313 | 118 | 175 | 372 | 197 | 170 | 353 | 183 | 273 | 455 | 182 | 522 | 571 | 49 |
| | 1350 | 196 | 307 | 111 | 175 | 379 | 204 | 170 | 375 | 205 | 275 | 466 | 191 | 524 | 575 | 51 |
| | 1500 | 197 | 301 | 104 | 176 | 380 | 204 | 171 | 393 | 222 | 277 | 471 | 194 | 525 | 569 | 44 |
| | 1650 | 197 | 286 | 89 | 177 | 367 | 190 | 173 | 392 | 219 | 280 | 480 | 200 | 525 | 574 | 49 |
| | 1800 | 199 | 258 | 59 | 178 | 327 | 149 | 175 | 373 | 198 | 285 | 450 | 165 | 524 | 567 | 43 |
| | 1950 | | | | 170 | 260 | 90 | 175 | 270 | 95 | 289 | 380 | 91 | 523 | 565 | 42 |
| | 2100 | | | | | | | 165 | 216 | 51 | 294 | 317 | 23 | | | |
| | 2250 | | | | | | | | | | 298 | 325 | 27 | | | |
| | 2400 | | | | | | | 166 | 189 | 23 | 307 | 331 | 24 | | | |
| | 2550 | | | | 176 | 190 | 14 | 194 | 202 | 8 | 317 | 331 | 14 | | | |
| | 2700 | | | | 219 | 219 | 0 | 222 | 229 | 7 | 330 | 333 | 3 | | | |
| | 2850 | | | | 232 | 235 | 3 | 252 | 258 | 6 | 342 | 340 | -2 | | | |
| | 3000 | | | | | | | | | | | | | | | |
| | 3150 | | | | | | | | | | | | | | | |
| | 3330 | | | | | | | | | | | | | | | |
| | 3450 | | | | | | | | | | | | | | | |

**DATA SHEET 10**
**VEHICLE STATIC CRUSH PROFILE (continued)**

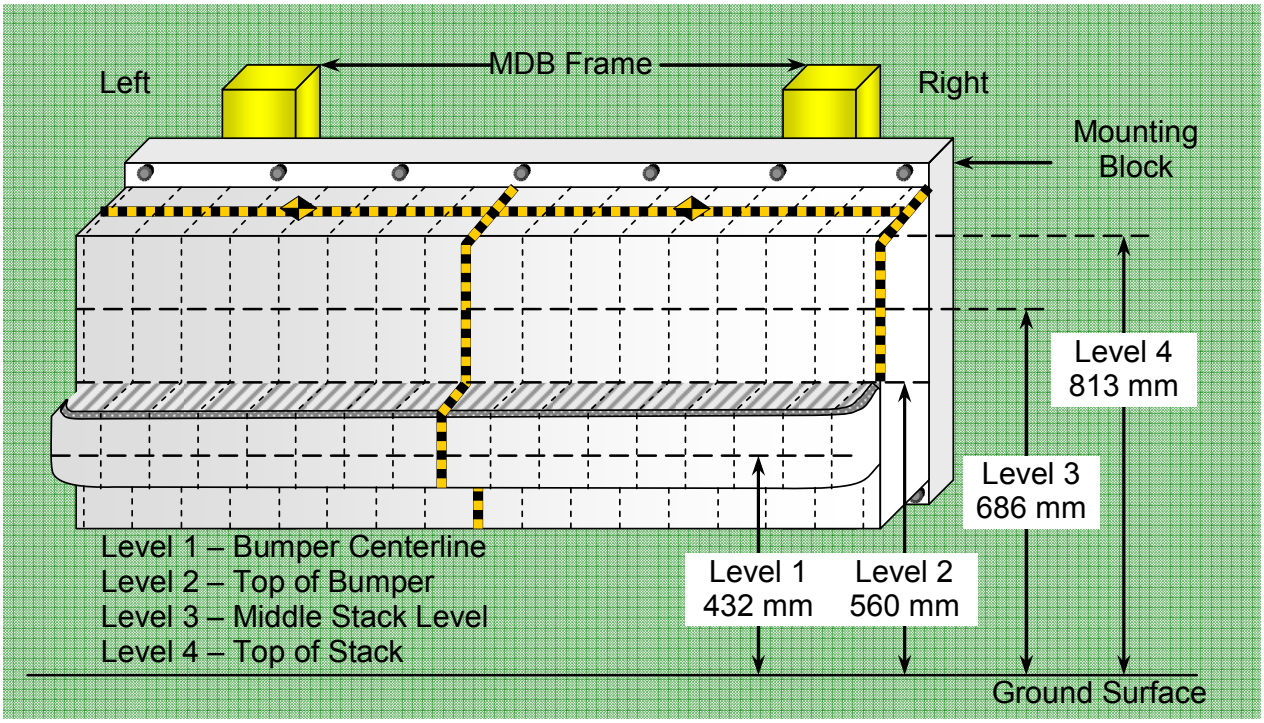


**DATA SHEET 11**
**VEHICLE DAMAGE PROFILE DISTANCES (DPD)**




| DPD MEASUREMENTS | | | | |
|---|---|---|---|---|
| | **DPD measurement (mm)** | **Pre test (mm)** | **Post test (mm)** | **Crush (mm)** |
| 1 | 2400 | 191 | 191 | 0 |
| 2 | 1920 | 285 | 196 | 89 |
| 3 | 1440 | 383 | 196 | 197 |
| 4 | 960 | 500 | 202 | 298 |
| 5 | 480 | 457 | 205 | 252 |
| 6 | 0 | 209 | 209 | 0 |

**DATA SHEET 12**
**DEFORMABLE BARRIER STATIC CRUSH**

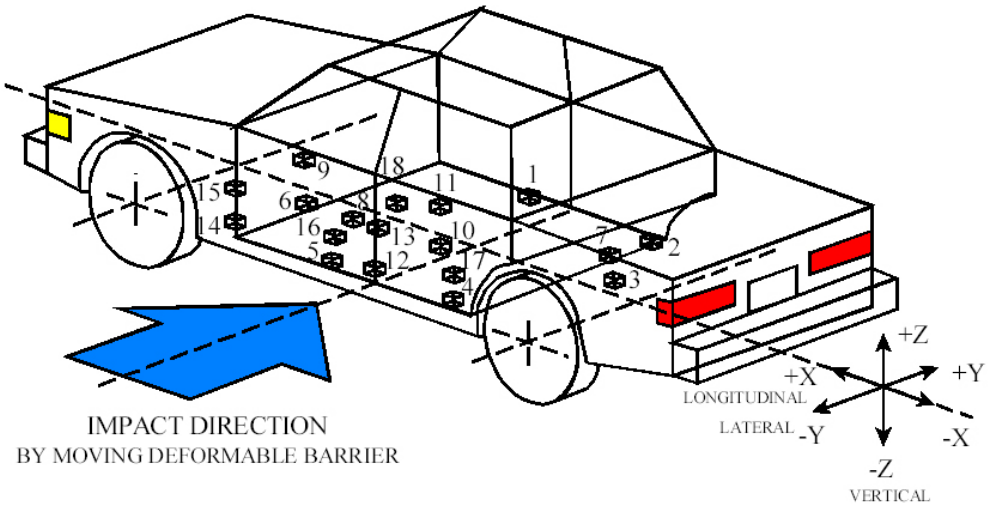



| DEFORMABLE BARRIER FACE SUMMARY | | |
|---|---|---|
| Barrier face manufacturer | | Plascore |
| Serial number | | 186B0706 164A0806 |
| **Level** | **Description** | **Maximum crush** |
| 1 | Center of bumper | 182 |
| 2 | Top of bumper | 70 |
| 3 | Middle of stack | 80 |
| 4 | Top of stack | 117 |
| **Maximum post test intrusion is 117 mm at level 4** | | |

| BARRIER STATIC CRUSH | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Distance left of center** | | | | | | | | **$C_L$** | **Distance right of center** | | | | | | | |
| | 800 | 700 | 600 | 500 | 400 | 300 | 200 | 100 | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| **4** | 74 | 20 | 7 | 7 | 14 | 30 | 54 | 41 | 23 | 18 | 13 | 17 | 14 | 19 | 32 | 66 | 117 |
| **3** | 38 | 11 | 12 | 11 | 11 | 20 | 48 | 39 | 19 | 14 | 10 | 11 | 10 | 14 | 18 | 34 | 80 |
| **2** | 70 | 55 | 37 | 28 | 24 | 24 | 22 | 24 | 21 | 26 | 27 | 27 | 29 | 29 | 35 | 48 | 70 |
| **1** | 182 | 150 | 121 | 112 | 106 | 106 | 104 | 104 | 102 | 102 | 101 | 102 | 100 | 101 | 107 | 118 | 128 |

all values in mm

**DATA SHEET 13**
**VEHICLE ACCELEROMETER LOCATIONS**



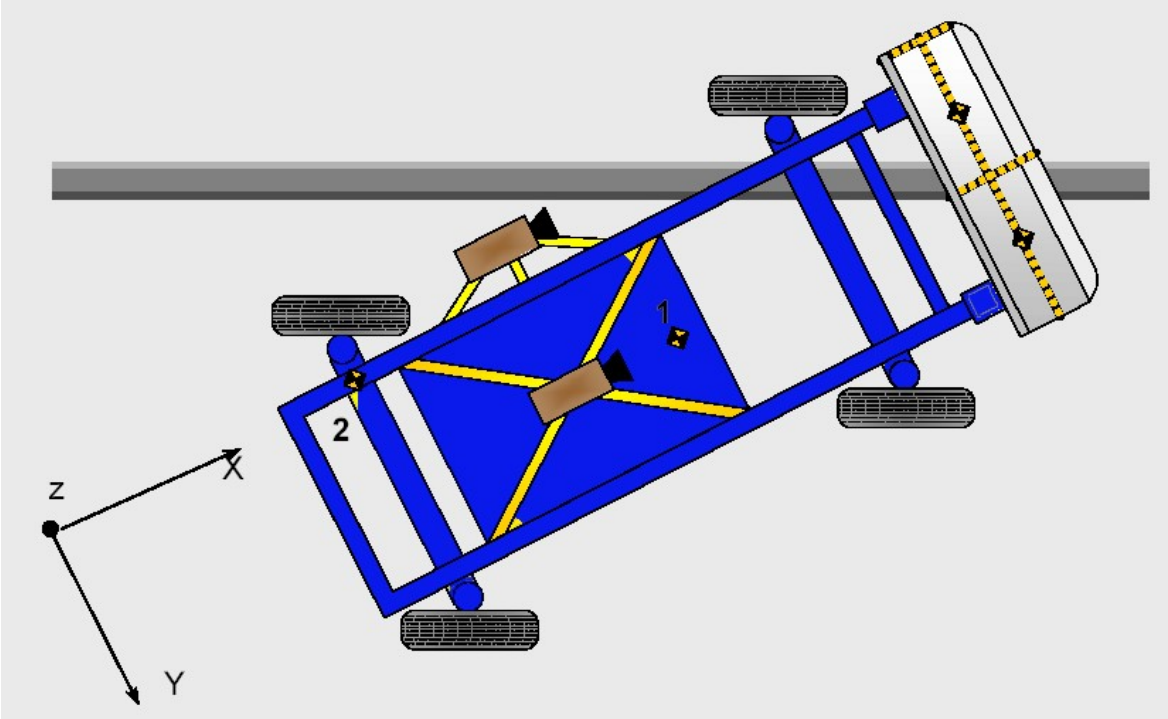

| TEST VEHICLE ACCELEROMETER LOCATIONS | | | | |
|---|---|---|---|---|
| **Loc. no.** | **Accelerometer location** | **Measurements (mm)** | | |
| | | **X** | **Y** | **Z** |
| 1 | Right sill at front seat | 2816 | 711 | 429 |
| 2 | Right sill at rear seat | 2011 | 716 | 425 |
| 3 | Rear floor pan above axle | 1112 | 48 | 61 |
| 4 | Left sill at rear door | 1988 | -695 | 430 |
| 5 | Left sill at front door | 2782 | -695 | 426 |
| 6 | Left front door C/L | † | † | † |
| 7 | Rear occupant compartment | 1879 | 292 | 293 |
| 8 | Left front door mid-rear | † | † | † |
| 9 | Left front door upper C/L | † | † | † |
| 10 | Left rear door mid-rear | † | † | † |
| 11 | Left rear door upper C/L | † | † | † |
| 12 | Left lower b-pillar | 2247 | -734 | 40 |
| 13 | Left middle b-pillar | 2208 | -719 | 107 |
| 14 | Left lower a-pillar | 3377 | -805 | 95 |
| 15 | Left middle a-pillar | 3378 | -784 | -59 |
| 16 | Front seat track | 2288 | -554 | 240 |
| 17 | Rear seat track or structure | 1889 | -274 | 289 |
| 18 | Vehicle CG | 2630 | 16 | 204 |

Origin
X Rear bumper
Y Midline of vehicle
Z Top of rear bumper

Orientation
X +(X) Forward
Y +(Y) Right
Z +(Z) Down

† Front and rear door accelerometers not installed as per NCAP policy (02Nov05)

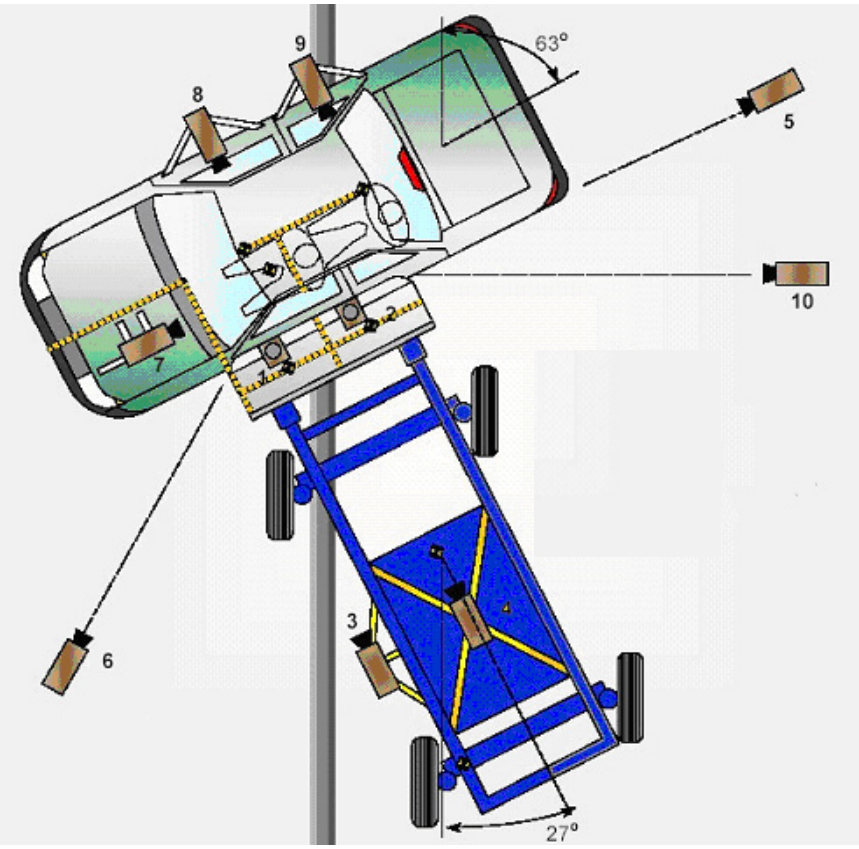
**DATA SHEET 14**
**MDB ACCELEROMETER LOCATIONS**




| MDB ACCELEROMETER LOCATIONS | | | |
|---|---|---|---|
| **Location** | **Measurements (mm)** | | |
| | **X** | **Y** | **Z** |
| Center of gravity | 1113 | -1 | 311 |
| Right rear | 2812 | -614 | 585 |

| Origin | | Orientation | |
|---|---|---|---|
| X | Rear structural member | X | +(X) Forward |
| Y | Midline of MDB | Y | +(Y) Right |
| Z | Middle of rear structural member | Z | +(Z) Down |

**DATA SHEET 15**
**HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY**




| | View | Coordinates † | | | Angle | Lens | Rate |
|---|---|---|---|---|---|---|---|
| | | X | Y | Z | | | |
| | | mm | mm | mm | ° | mm | fps |
| 1 | Overhead view of test vehicle | -249 | -640 | 4812 | 90 | 10 | 1000 |
| 2 | Overhead close-up view of impact plane | -550 | -125 | 4340 | 90 | 16 | 1000 |
| 3 | MDB onboard close-up view of impact point | -1542 | -1026 | 25 | 0 | 25 | 1000 |
| 4 | MDB onboard view of driver dummy | -1415 | -1891 | 780 | 5 | 13 | 1000 |
| 5 | Right side ground level overall view | -2311 | -699 | 879 | 7 | 55 | 1000 |
| 6 | Left side ground level overall view | 668 | -1184 | 848 | 10 | 12.5 | 1000 |
| 7 | Test vehicle onboard driver front view | † | † | † | 15† | 25† | 1000 † |
| 8 | Test vehicle onboard driver side view | | | | 10 | 12.5 | 1000 |
| 9 | Test vehicle onboard passenger side view | | | | 10 | 12.5 | 1000 |
| 10 | Real-time film coverage of test | - | - | - | - | - | - |

† On board hood camera lost power 26 milliseconds after impact

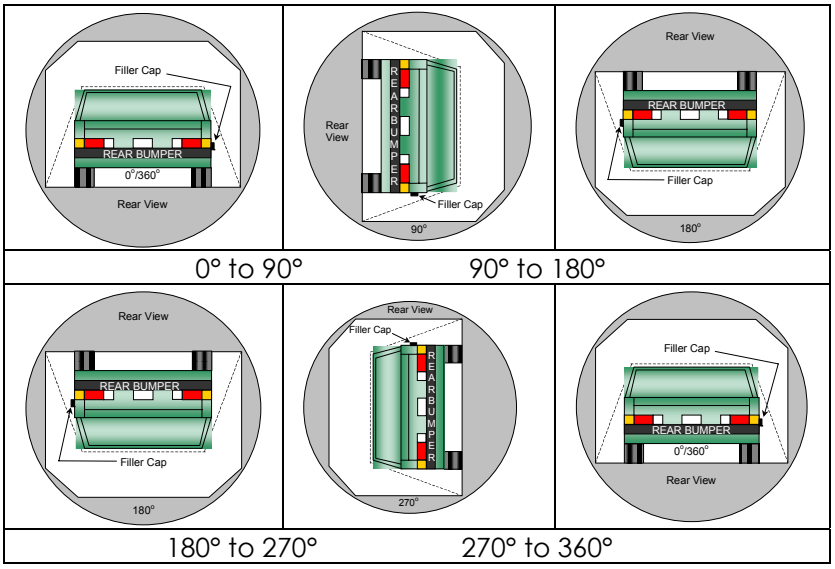
| Origin | | Orientation | |
|---|---|---|---|
| X | Impact Point | X | +(X) Forward |
| Y | Impact Point | Y | +(Y) Right |
| Z | Impact Point | Z | +(Z) Down |

**DATA SHEET 16**
**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 22° C Test Time: 2:24 pm

| STODDARD SOLVENT SPILLAGE MEASUREMENTS | | | | |
|---|---|---|---|---|
| **Period** | **Description** | **Maximum allowable spillage** | **Spillage** | |
| | | | **Amount** | **Location** |
| A | From impact until vehicle motion ceases | 1 oz | 0 | N/a |
| B | 5 minutes after vehicle motion ceases | 5 oz | 0 | N/a |
| C | Next 25 minutes | 1 oz/minute | 0 | N/a |

**FMVSS 301 STATIC ROLLOVER**




| FMVSS301 STATIC ROLLOVER DATA | | | |
|---|---|---|---|
| **Test phase** | **Rotation time (sec.)** | **Hold time (sec.)** | **Total time (sec.)** |
| Tolerance | 60-180 | >= 300 | - |
| 0° to 90° | 63 | 300 | 363 |
| 90° to 180° | 65 | 300 | 365 |
| 180° to 270° | 63 | 301 | 364 |
| 270° to 360° | 63 | 300 | 363 |

**DATA SHEET 16**
**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA (CONTINUED)**

| FMVSS301 STATIC ROLLOVER - SPILLAGE | | | | |
|---|---|---|---|---|
| | **First five minutes (oz)** | **Sixth minute (oz)** | **Seventh minute (oz)** | **Eighth minute (oz)** |
| **Max allowable leakage** | **5.0** | **1.0** | **1.0** | **1.0** |
| 0° to 90° | 0 | 0 | 0 | N/a |
| 90° to 180° | 0 | 0 | 0 | N/a |
| 180° to 270° | 0 | 0 | 0 | N/a |
| 270° to 360° | 0 | 0 | 0 | N/a |

| SPILLAGE LOCATION(S) | |
|---|---|
| 0° to 90° | N/a |
| 90° to 180° | N/a |
| 180° to 270° | N/a |
| 270° to 360° | N/a |

**APPENDIX A**

**PHOTOGRAPHS**

LIST OF PHOTOGRAPHS

Figure A-1: Left front 3/4 view, as delivered


Figure A-2: Right rear 3/4 view, as delivered

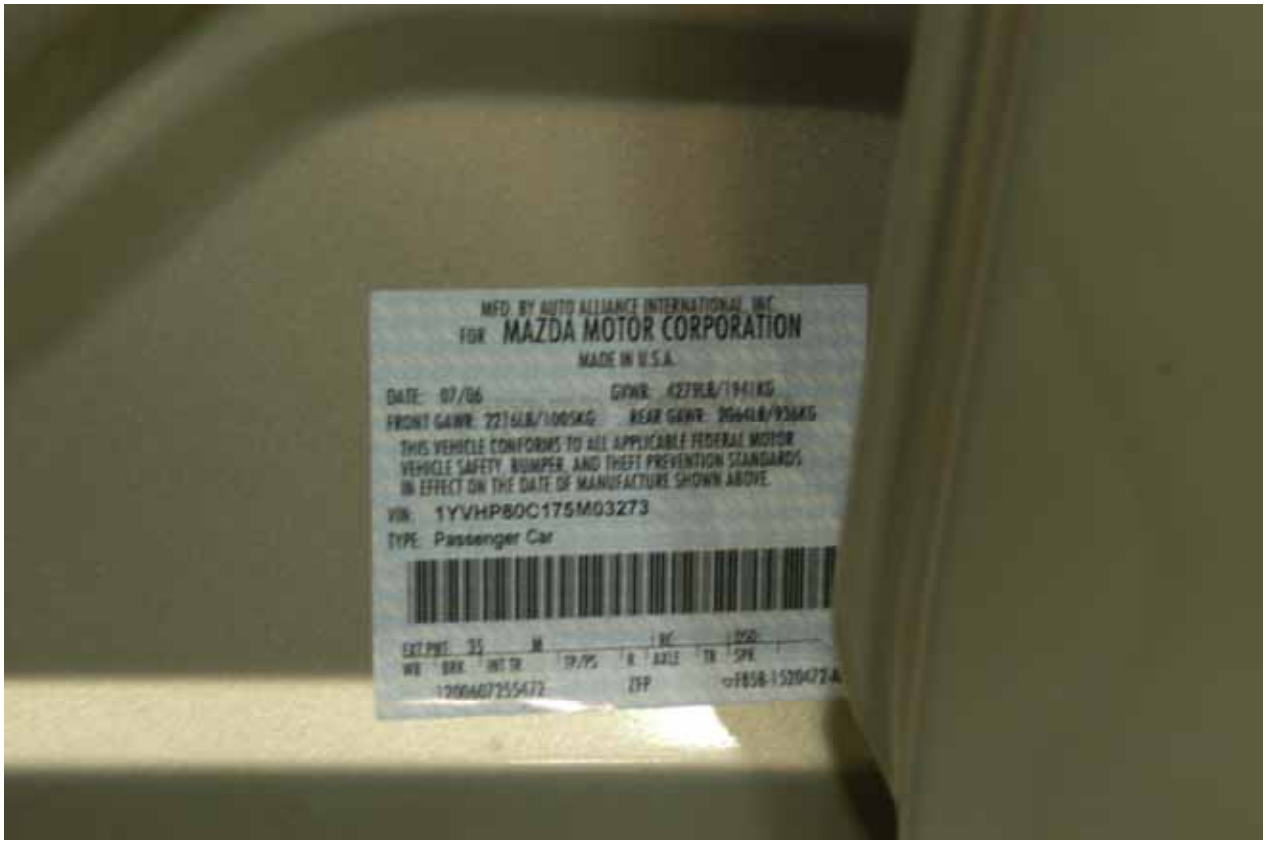



Figure A-3: Manufacturer's label


Figure A-4: Tire placard


Figure A-5: Pre test front view of test vehicle

Figure A-6: Post test front view of test vehicle

Figure A-7: Pre test left front 3/4 view of test vehicle

Figure A-8: Post test left front 3/4 view of test vehicle

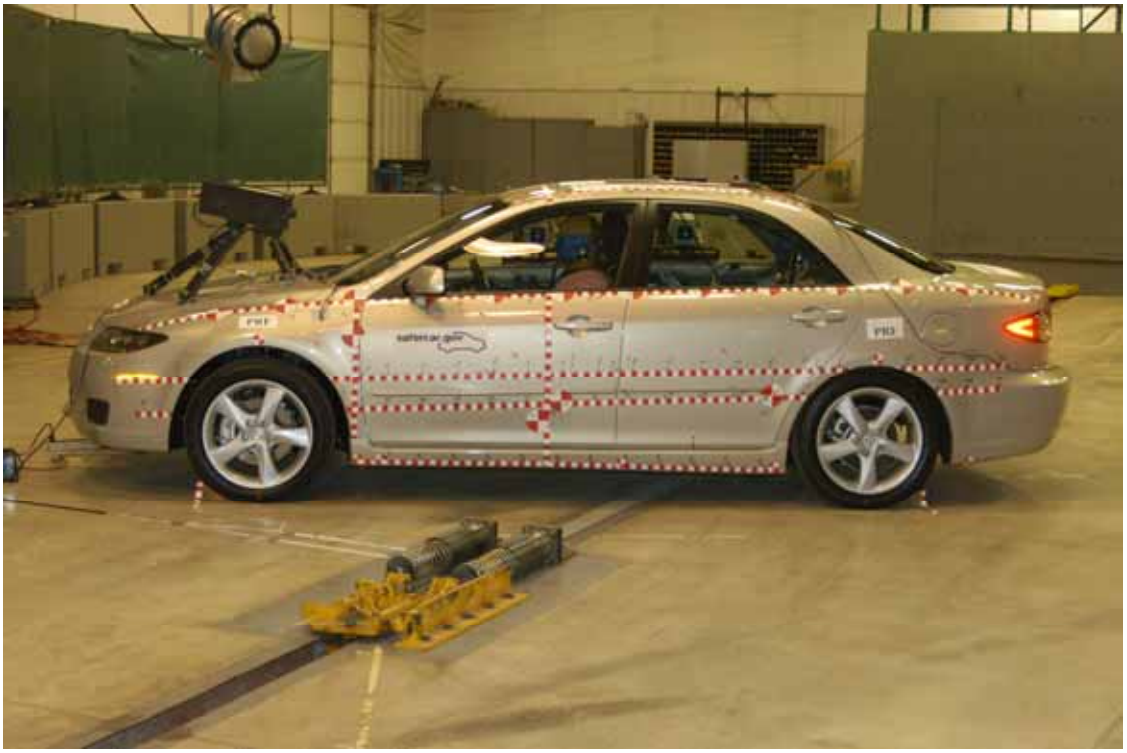


Figure A-9: Pre test left side view of test vehicle

Figure A-10: Post test left side view of test vehicle

Figure A-11: Pre test left rear 3/4 view of test vehicle

Figure A-12: Post test left rear 3/4 view of test vehicle


Figure A-13: Pre test rear view of test vehicle

Figure A-14: Post test rear view of test vehicle


Figure A-15: Pre test right rear 3/4 view of test vehicle

Figure A-16: Post test right rear 3/4 view of test vehicle

Figure A-17: Pre test right side view of test vehicle

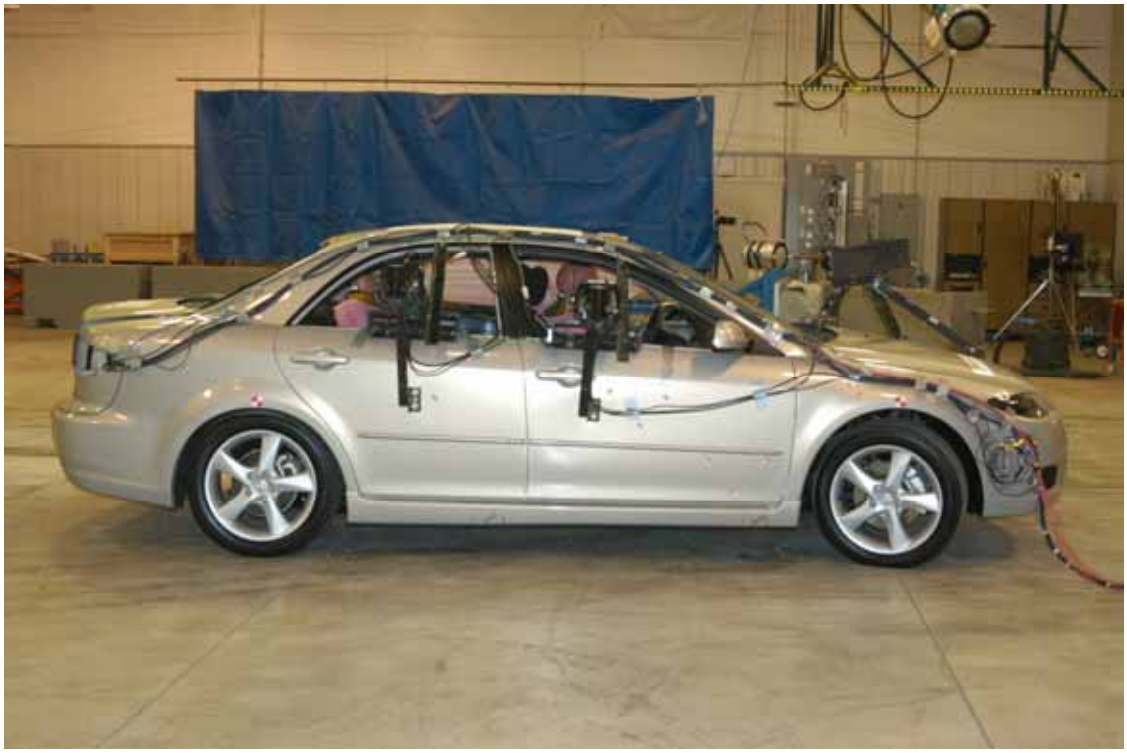


Figure A-18: Post test right side view of test vehicle

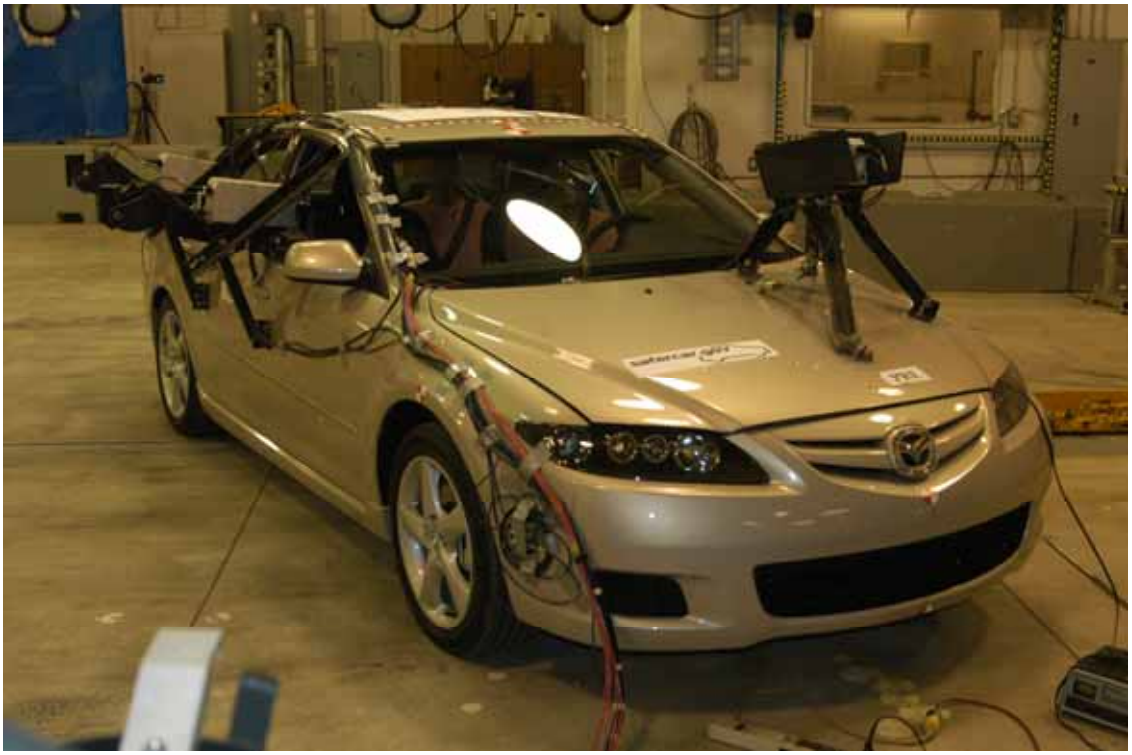


Figure A-19: Pre test right front 3/4 view of test vehicle

Figure A-20: Post test right front 3/4 view of test vehicle

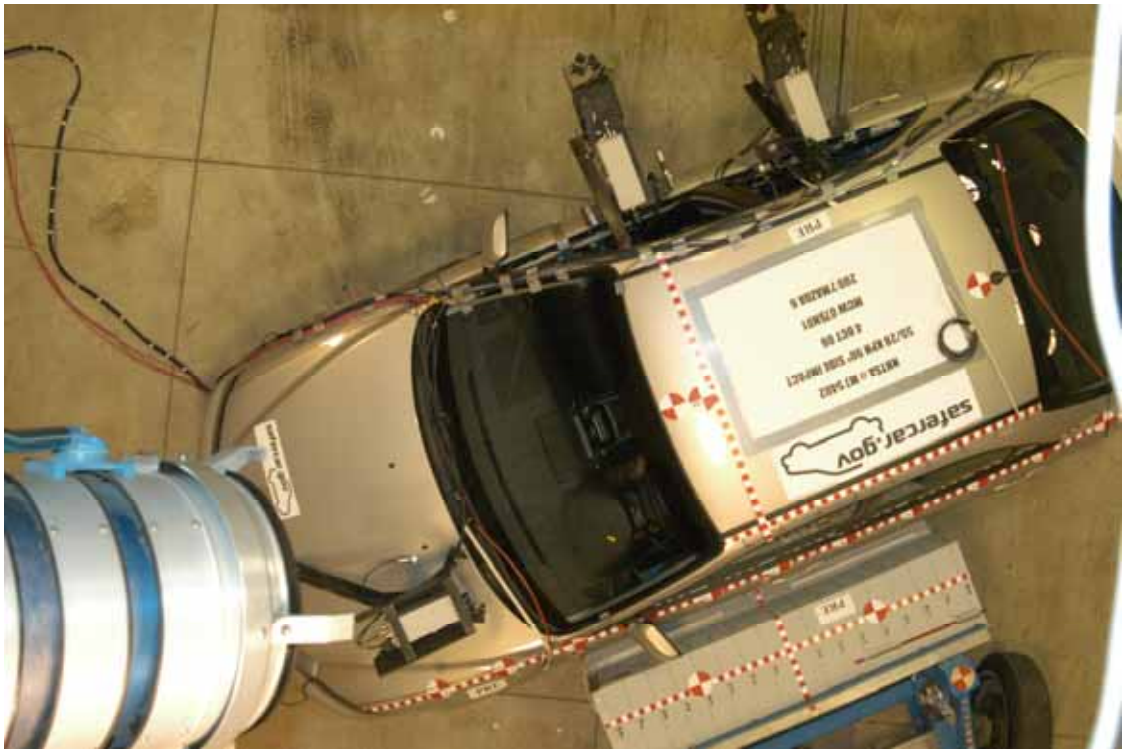



Figure A-21: Pre test overhead view


Figure A-22: Post test overhead view

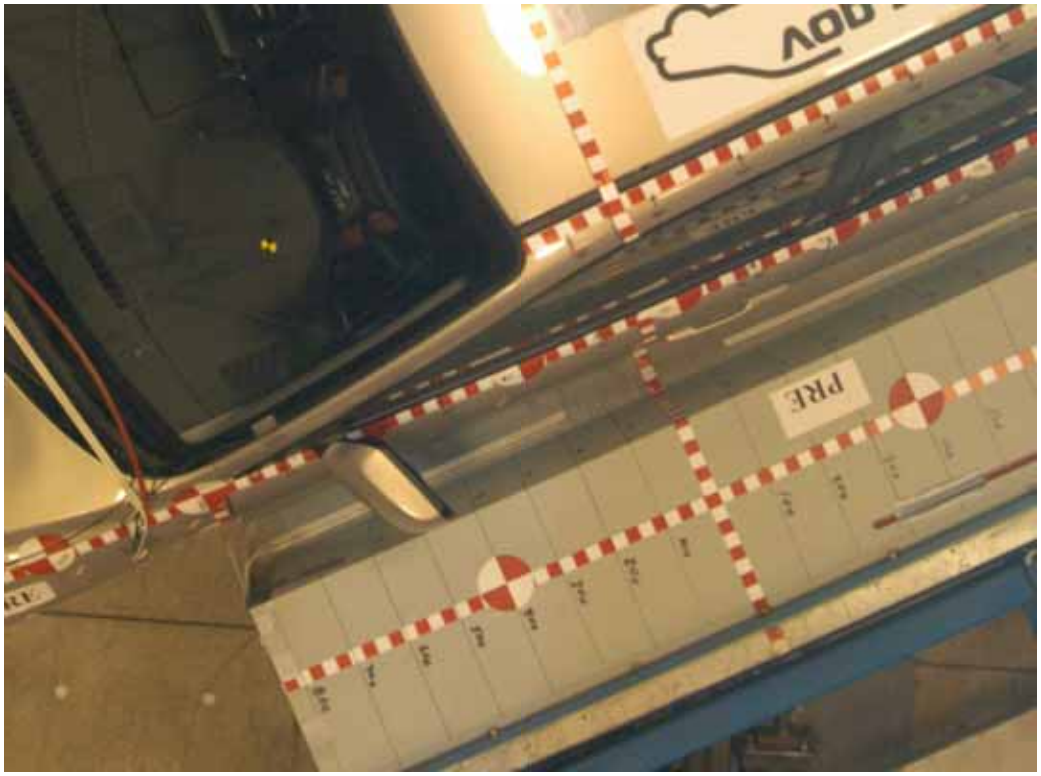



Figure A-23: Pre test overhead close-up view


Figure A-24: Post test overhead view


Figure A-25: Pre test impact point


Figure A-26: Post test impact point


Figure A-27: Pre test front 3/4 view of left side doors

Figure A-28: Post test front 3/4 view of left side doors


Figure A-29: Pre test rear 3/4 view of left side doors


Figure A-30: Post test rear 3/4 view of left side doors


Figure A-31: Pre test left front door


Figure A-32: Post test left front door


Figure A-33: Pre test left rear door

Figure A-34: Post test left rear door

Figure A-35: Pre test driver left side view

Figure A-36: Post test driver left side view

Figure A-37: Pre test driver shoulder clearance

Figure A-38: Post test driver shoulder clearance


Figure A-39: Pre test driver right side view

Figure A-40: Post test driver right side view

Figure A-41: Post test driver contact locations (1)

Figure A-42: Post test driver contact locations (2)


Figure A-43: Pre test passenger left side view

Figure A-44: Post test passenger left side view

Figure A-45: Pre test passenger shoulder clearance

Figure A-46: Post test passenger shoulder clearance


Figure A-47: Pre test passenger right side view

Figure A-48: Post test passenger right side view

Figure A-49: Post test passenger contact locations (1)

Figure A-50: Post test passenger contact locations (2)

Figure A-51: Pre test front view of MDB barrier face

Figure A-52: Post test front view of MDB barrier face

Figure A-53: Pre test right side view of MDB barrier face

Figure A-54: Post test right side view of MDB barrier face

Figure A-55: Pre test left side view of MDB barrier face

Figure A-56: Post test left side view of MDB barrier face

Figure A-57: Pre test overhead view of MDB barrier face

Figure A-58: Post test left side view of MDB barrier face

Figure A-59: FMVSS 301 0 degrees

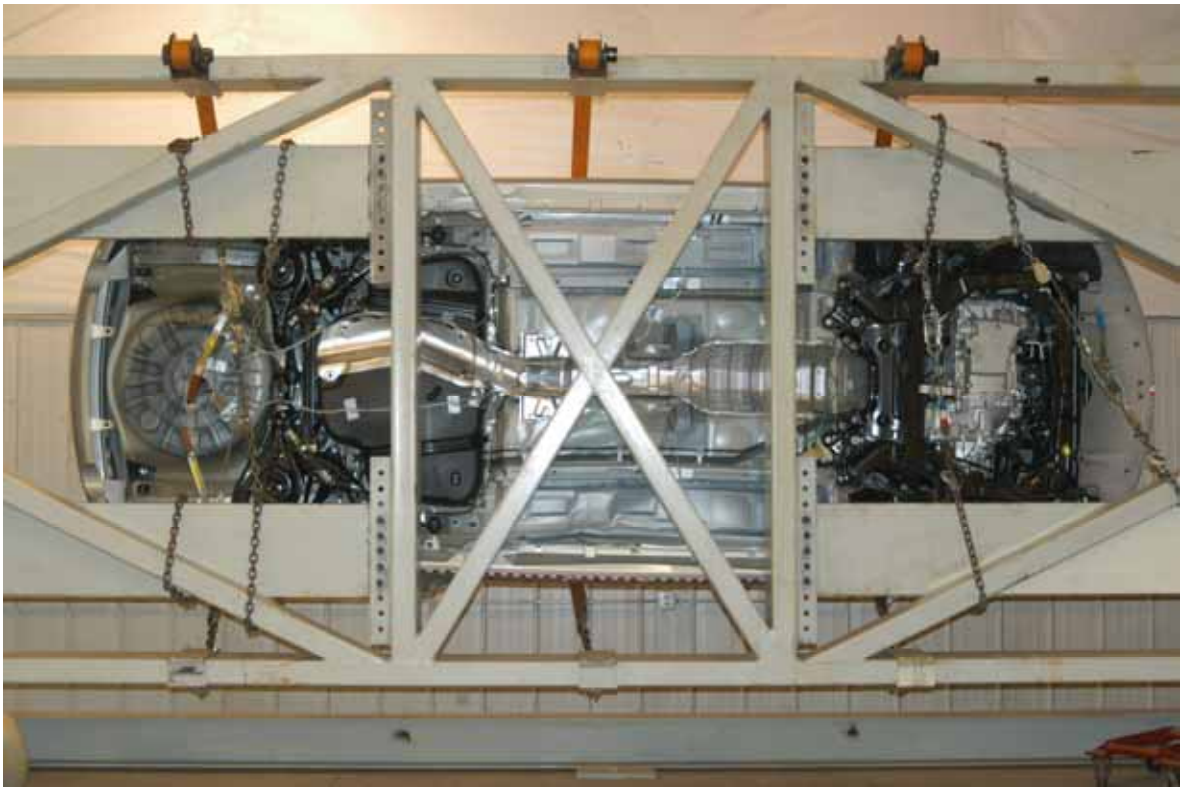


Figure A-60: FMVSS 301 90 degrees

Figure A-61: FMVSS 301 180 degrees

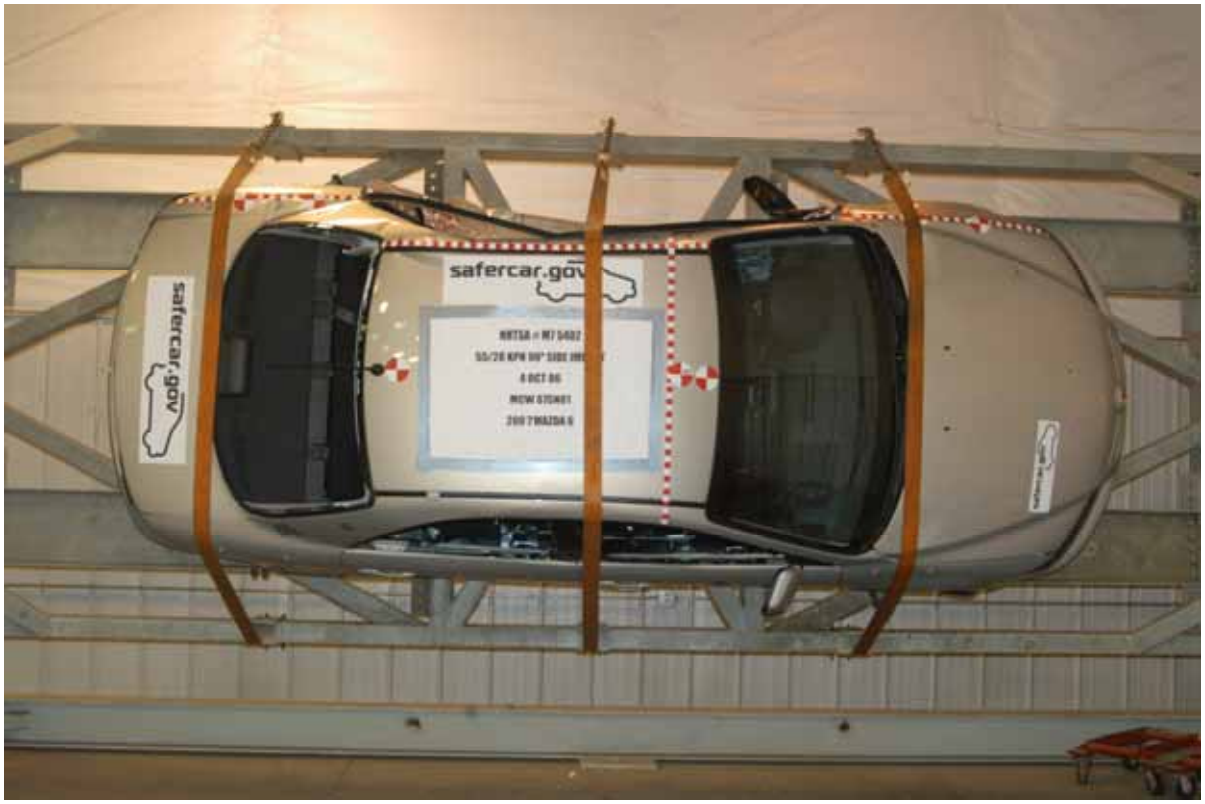



Figure A-62: FMVSS 301 270 degrees

Figure A-63: FMVSS 301 360 degrees

Figure A-64: Impact

**APPENDIX B**
**SID/HIII, VEHICLE AND MDB RESPONSE DATA**

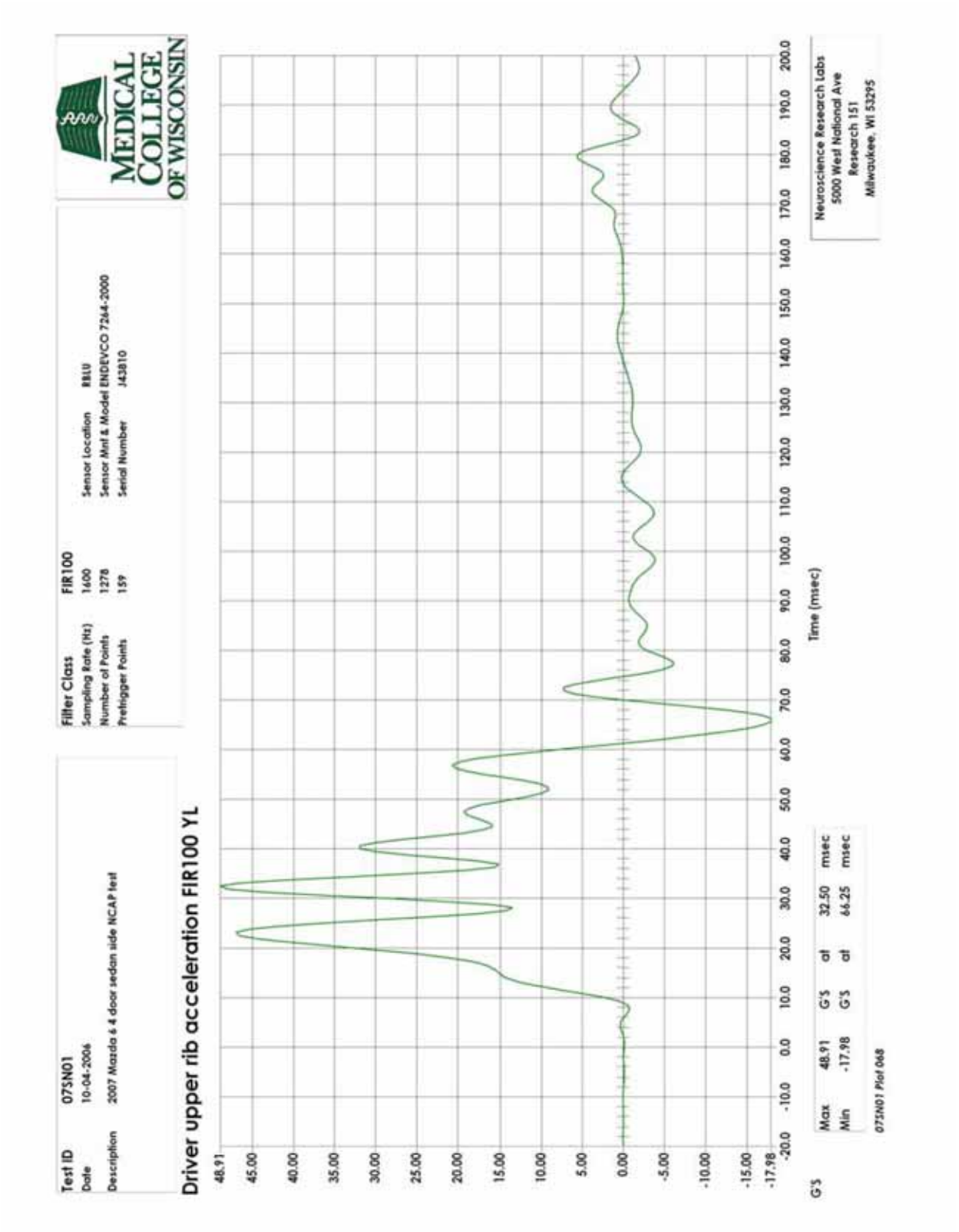
**The following plots are provided in the test report**

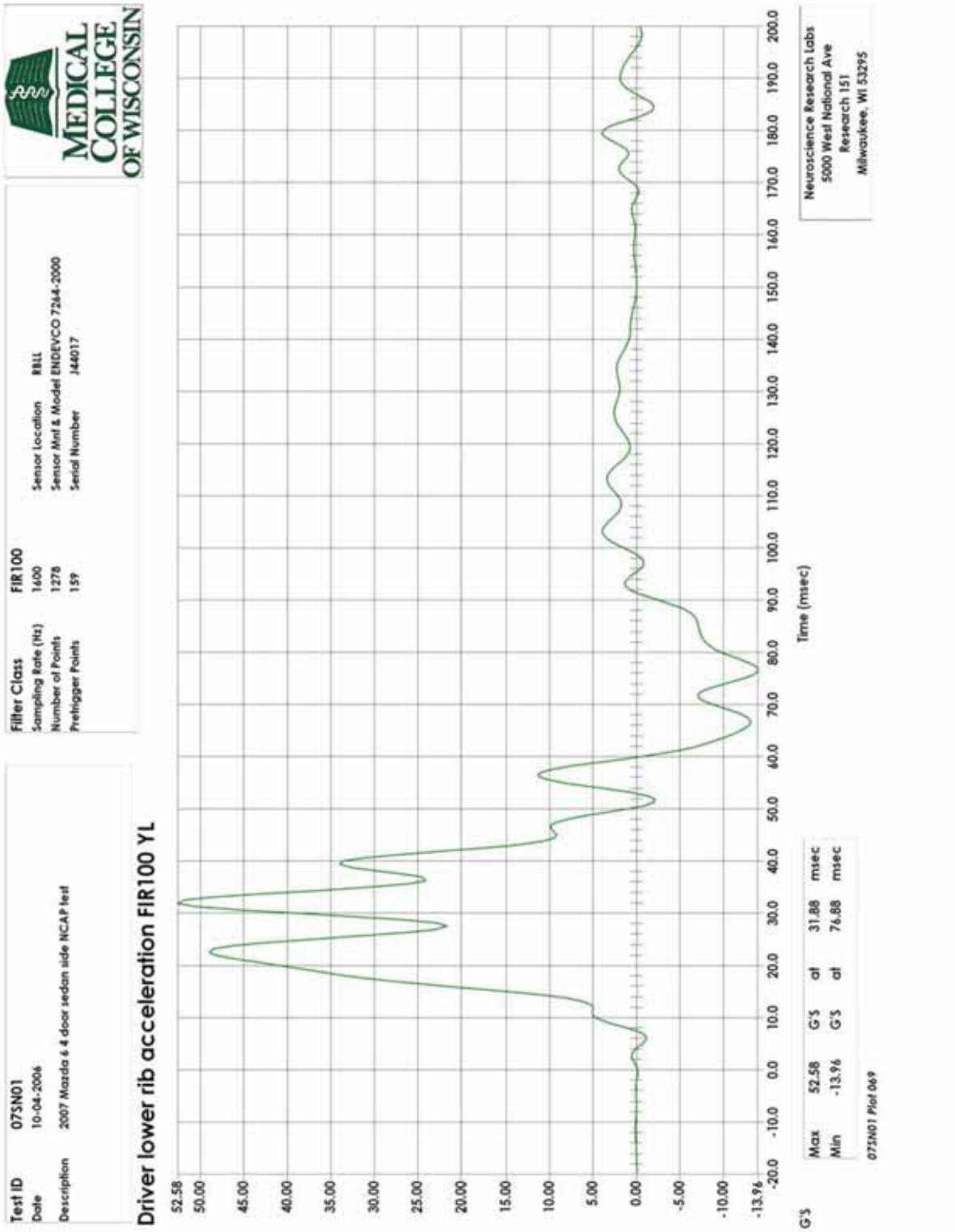


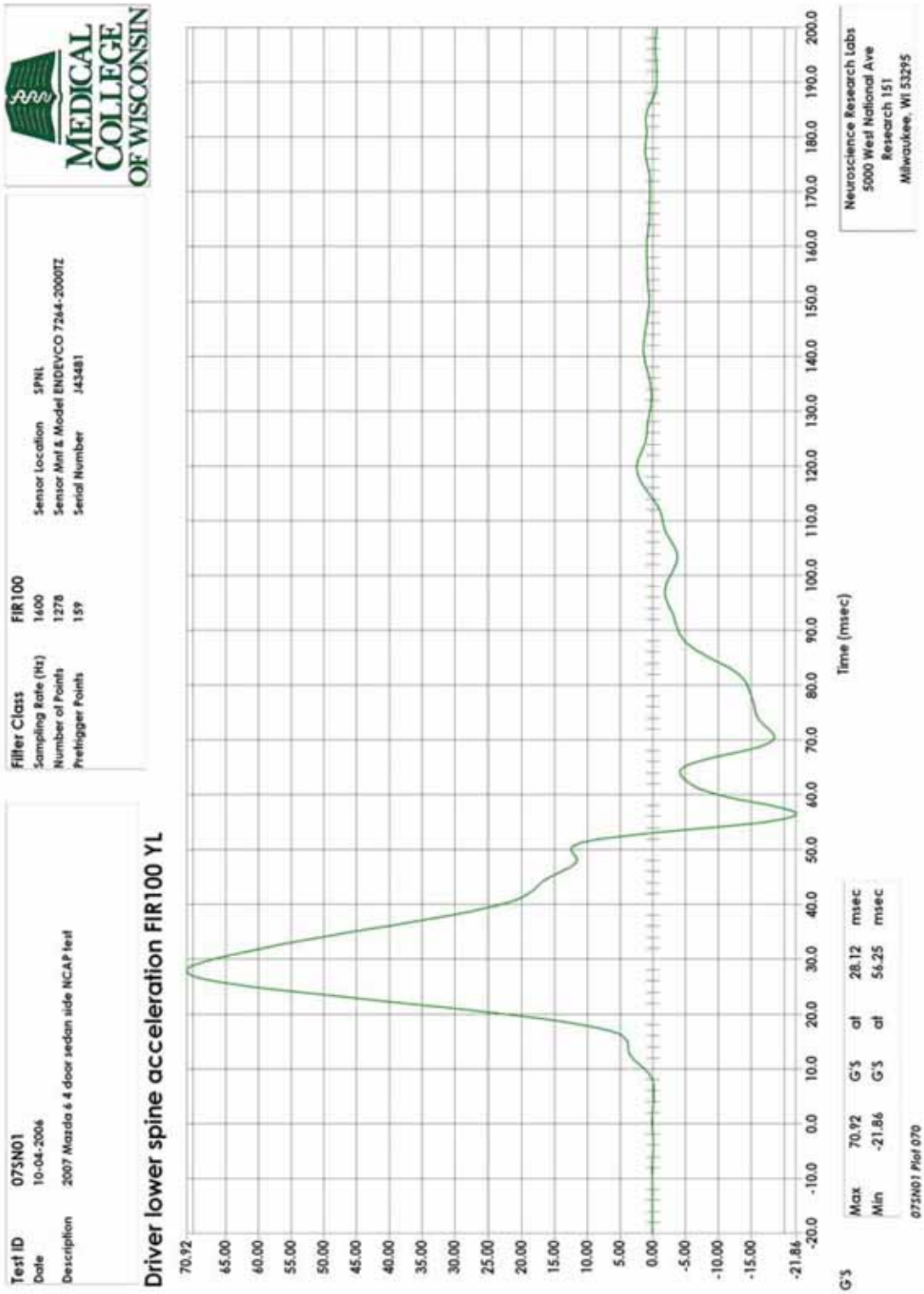
**The following dummy, vehicle, and MDB response data can be found in the R&D section of the NHTSA website at:** www-nrd.nhtsa.dot.gov/database/nrd-11/veh_db.html.

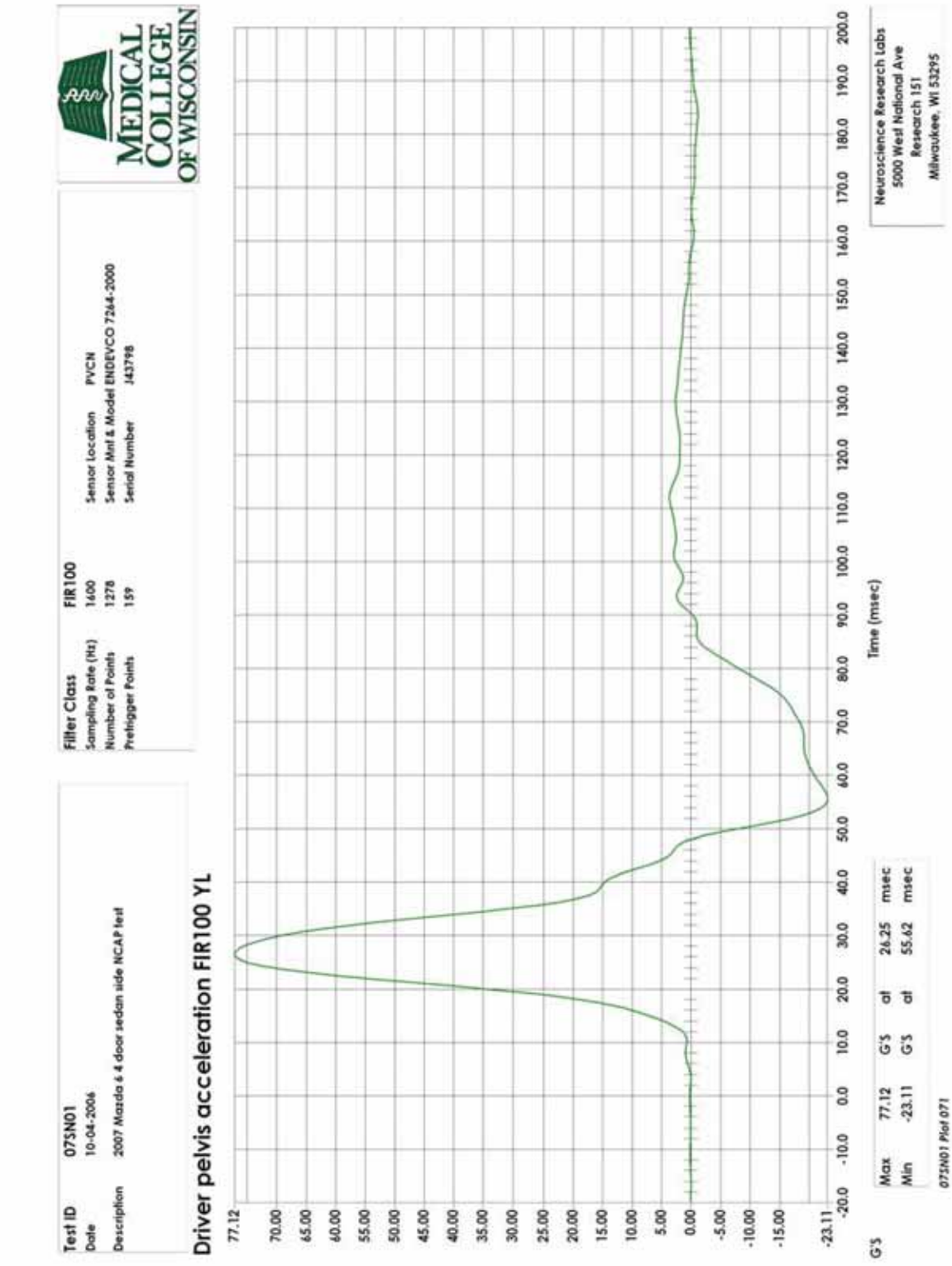
| Description |
|---|
| Driver head (x) acceleration |
| Driver head (y) acceleration |
| Driver head (z) acceleration |
| Driver upper neck (x) force |
| Driver upper neck (y) force |
| Driver upper neck (z) force |
| Driver upper neck (x) moment |
| Driver upper neck (y) moment |
| Driver upper neck (z) moment |
| Driver upper rib (y) acceleration – redundant |
| Driver lower rib (y) acceleration – redundant |
| Driver lower spine (y) acceleration – redundant |
| Driver pelvis (y) acceleration – redundant |
| Passenger head (x) acceleration |
| Passenger head (y) acceleration |
| Passenger head (z) acceleration |
| Passenger upper neck (x) force |
| Passenger upper neck (y) force |
| Passenger upper neck (z) force |
| Passenger upper neck (x) moment |
| Passenger upper neck (y) moment |
| Passenger upper neck (z) moment |
| Passenger upper rib (y) acceleration – redundant |
| Passenger lower rib (y) acceleration – redundant |
| Passenger lower spine (y) acceleration – redundant |
| Passenger pelvis (y) acceleration – redundant |
| Vehicle right side sill at front seat (x) acceleration |
| Vehicle right side sill at front seat (y) acceleration |
| Vehicle right side sill at front seat (z) acceleration |
| Vehicle right side sill at rear seat (x) acceleration |
| Vehicle right side sill at rear seat (y) acceleration |
| Vehicle right side sill at rear seat (z) acceleration |
| Vehicle rear floor pan above axle (x) acceleration |
| Vehicle rear floor pan above axle (y) acceleration |
| Vehicle rear floor pan above axle (z) acceleration |
| Vehicle left side sill at rear seat (y) acceleration |
| Vehicle left side sill at front seat (y) acceleration |
| Vehicle right rear occupant compartment (y) acceleration |

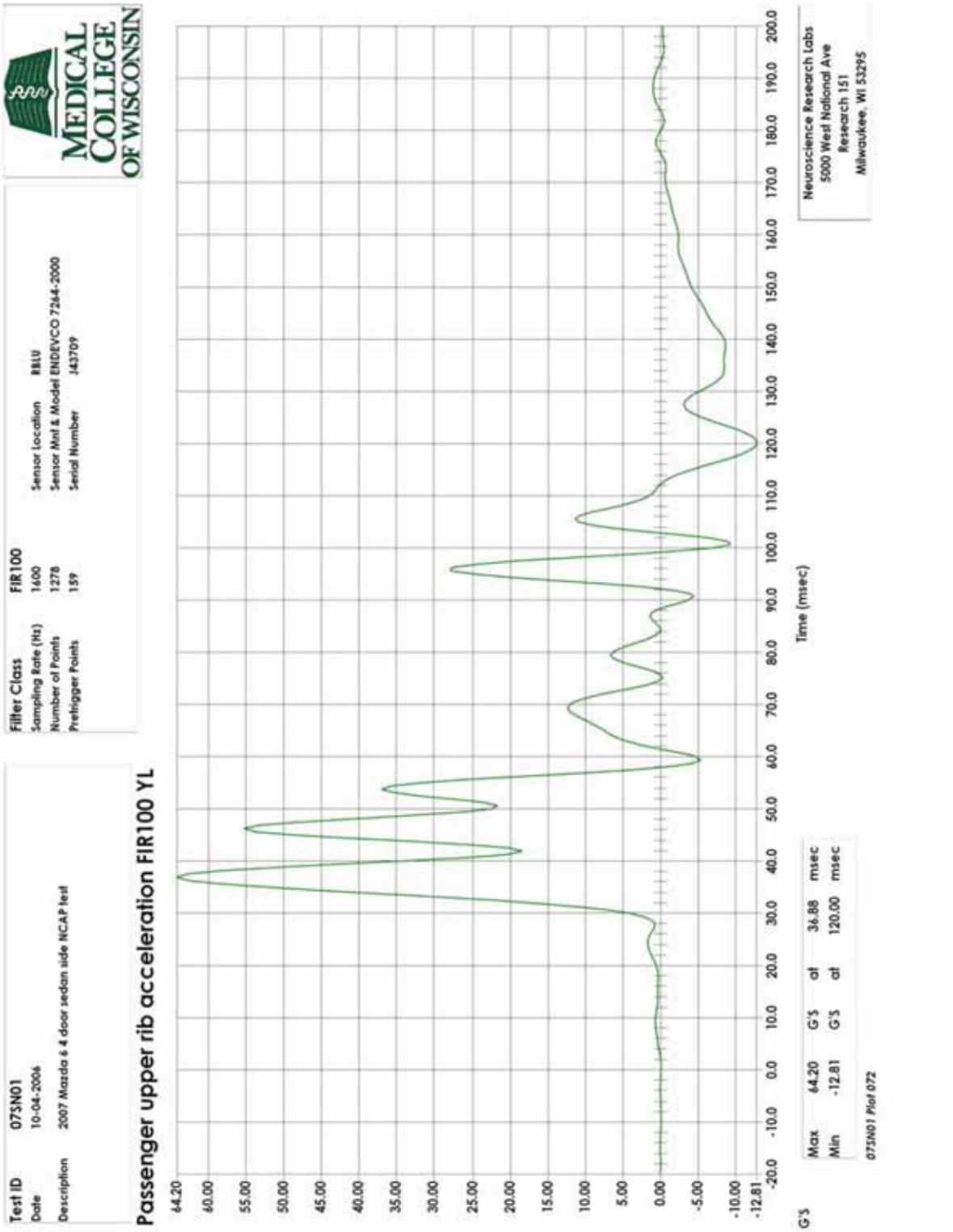
Vehicle left lower b-pillar (y) acceleration
Vehicle left middle b-pillar (y) acceleration
Vehicle left lower a-pillar (y) acceleration
Vehicle left middle a-pillar (y) acceleration
Vehicle front seat track (y) acceleration
Vehicle rear seat track/structure (y) acceleration
Vehicle center of gravity (x) acceleration
Vehicle center of gravity (y) acceleration
Vehicle center of gravity (z) acceleration
MDB center of gravity (x) acceleration
MDB center of gravity (y) acceleration
MDB center of gravity (z) acceleration
MDB rear (x) acceleration
MDB rear (y) acceleration

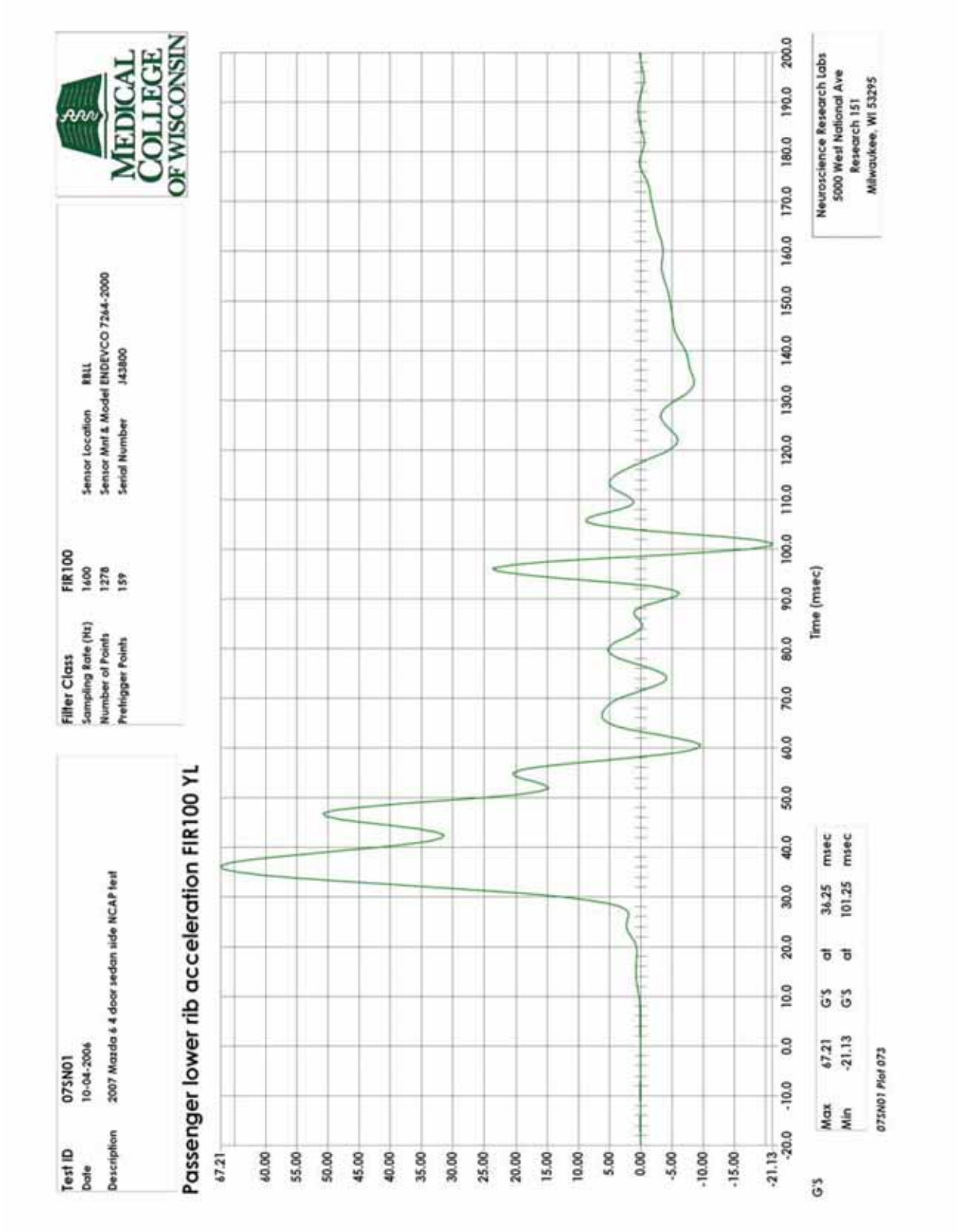

MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prehigger Points 159
Sensor Location RBLU
Sensor Mnf & Model ENDEVCO 7264-2000
Serial Number J43810
Driver upper rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G'S
Time (msec)
Max 48.91 G'S at 32.50 msec
Min -17.98 G'S at 66.25 msec
07SN01 Plot 068

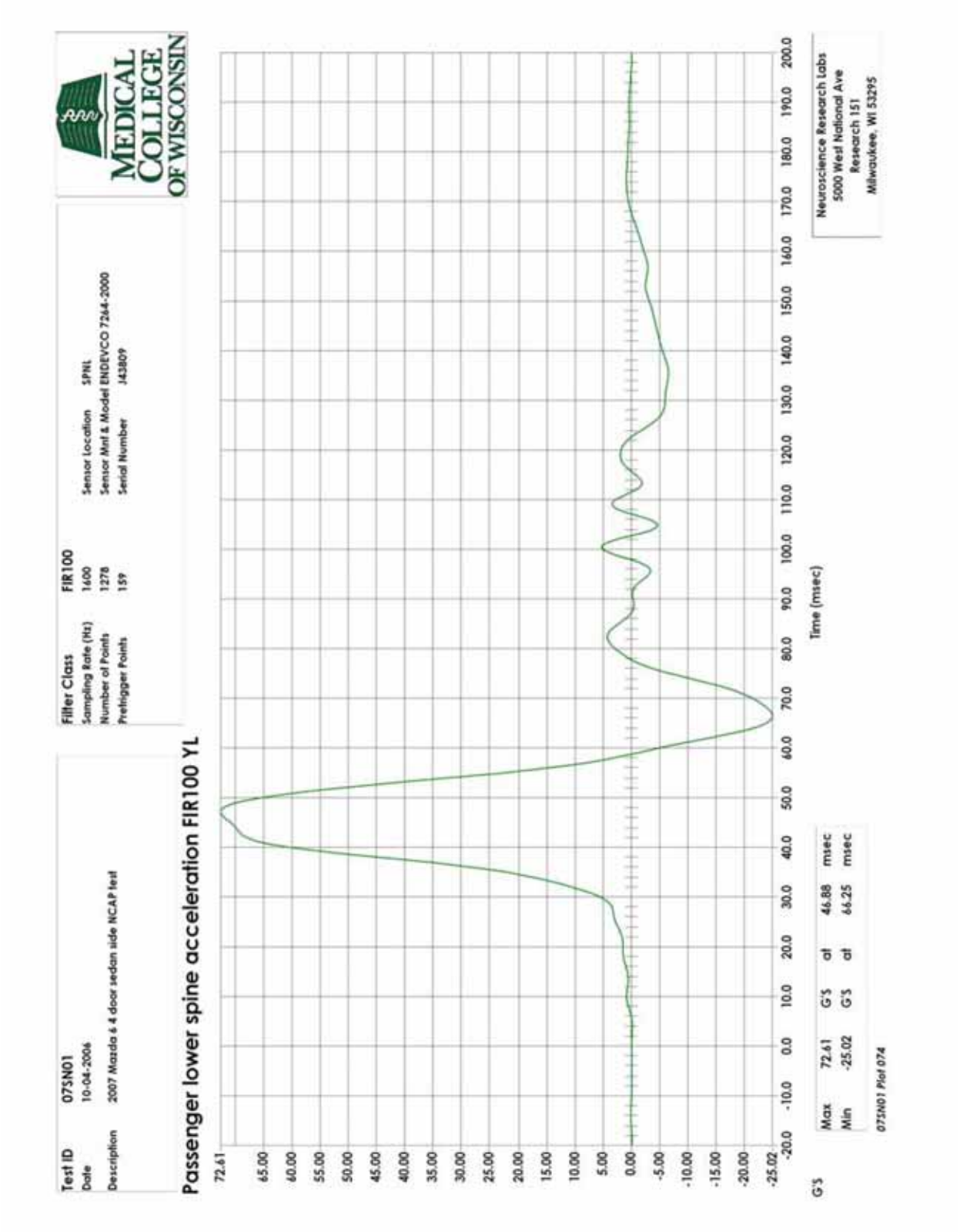

MEDICAL COLLEGE OF WISCONSIN
Test ID 073N01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location RBLL
Sensor Mnf & Model ENDEVCO 7244-2000
Serial Number 144017
Driver lower rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
Time (msec)
G's
Max 52.58 G's at 31.88 msec
Min -13.96 G's at 76.88 msec
073N01 Plot 069

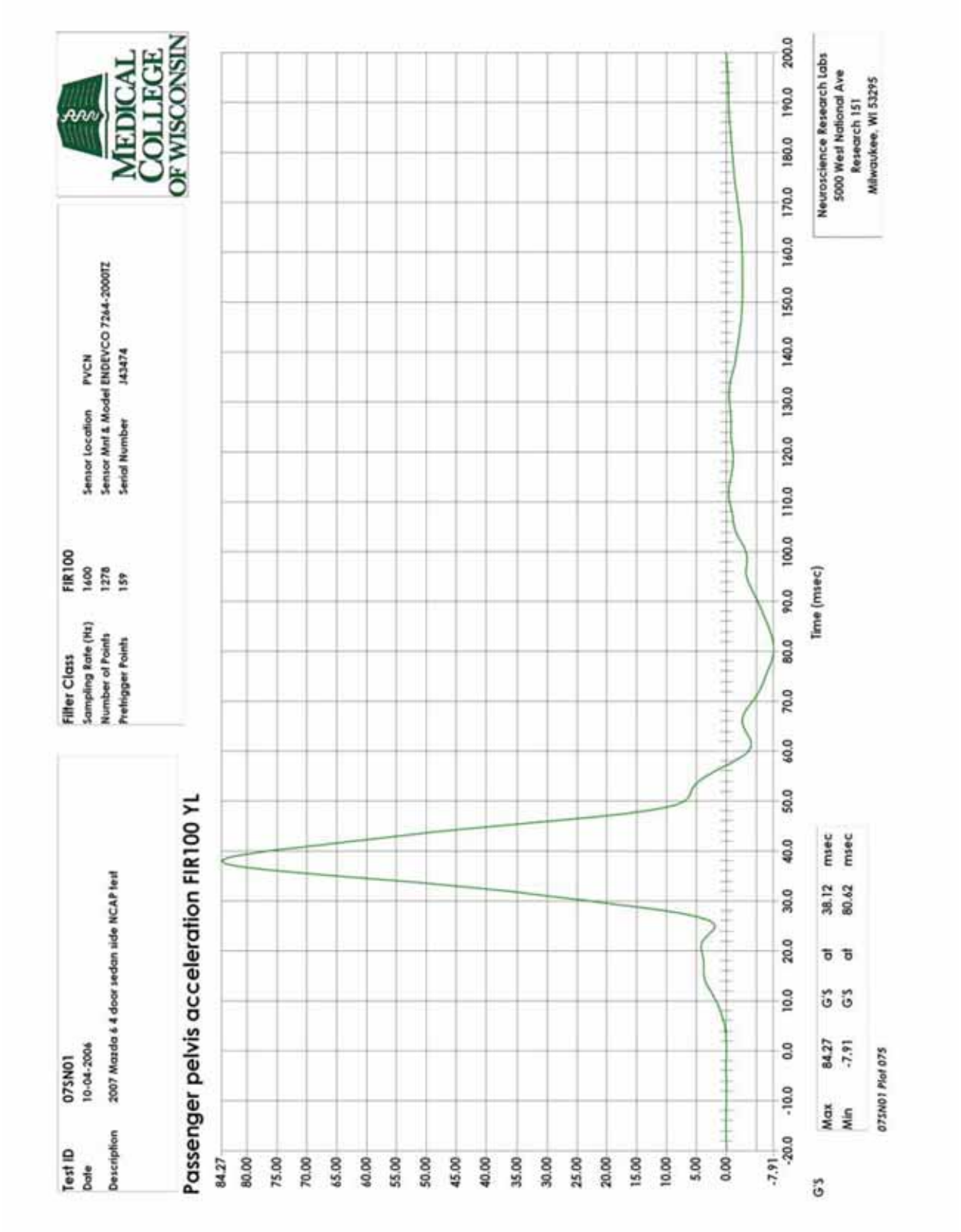

MEDICAL COLLEGE OF WISCONSIN
Test ID 073N01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location SPNL
Sensor Mnf & Model ENDEVCO 7244-2000TZ
Serial Number 143481
Driver lower spine acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 70.92 G's at 28.12 msec
Min -21.86 G's at 56.25 msec
073N01 Plot 070


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prehigger Points 159
Sensor Location PVCN
Sensor Mnf & Model ENDEVCO 7264-2000
Serial Number J43798
Driver pelvis acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G'S
Time (msec)
Max 77.12 G'S at 26.25 msec
Min -23.11 G'S at 55.62 msec
07SN01 Plot 071


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Pretrigger Points 159
Sensor Location RBLU
Sensor Mnf & Model ENDEVCO 7244-2000
Serial Number J43709
Passenger upper rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 64.20 G's at 36.88 msec
Min -12.81 G's at 120.00 msec
07SN01 Plot 072


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prehigger Points 159
Sensor Location RBL
Sensor Mnf & Model ENDEVCO 7244-2000
Serial Number J43800
Passenger lower rib acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 67.21 G's at 36.25 msec
Min -21.13 G's at 101.25 msec
07SN01 Plot 073


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prehigger Points 159
Sensor Location SPNL
Sensor Mnf & Model ENDEVCO 7244-2000
Serial Number J43809
Passenger lower spine acceleration FIR100 YL
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295
G's
Time (msec)
Max 72.61 G's at 46.88 msec
Min -25.02 G's at 66.25 msec
07SN01 Plot 074


MEDICAL COLLEGE OF WISCONSIN
Test ID 07SN01
Date 10-04-2006
Description 2007 Mazda 6 4 door sedan side NCAP test
Filter Class FIR100
Sampling Rate (Hz) 1600
Number of Points 1278
Prehigger Points 159
Sensor Location PVCN
Sensor Mnf & Model ENDEVCO 7244-2000TZ
Serial Number J43474
Passenger pelvis acceleration FIR100 YL
84.27
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-7.91
-20.0 -10.0 0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0 110.0 120.0 130.0 140.0 150.0 160.0 170.0 180.0 190.0 200.0
Time (msec)
G's
Max 84.27 G's at 38.12 msec
Min -7.91 G's at 80.62 msec
07SN01 Plot 075
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

# APPENDIX C

# DUMMY CALIBRATION DATA

NHTSA Number: M75402 Test Vehicle: 2007 Mazda 6 4-door sedan

**VERIFICATION TEST RESULTS SUMMARY**
**PRE AND POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial Number 056 Test Sequences 1 and 2

| TEST | PRE | | POST | |
|---|---|---|---|---|
| | COMMENTS | BY | COMMENTS | BY |
| EXTERNAL DIMENSIONS | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| THORACIC SHOCK ABSORBER TEST | Pass all requirements | Mark Meyer | | |
| LATERAL THORAX IMPACT TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LATERAL PELVIS IMPACT TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| ABDOMINAL COMPRESSION | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LUMBAR FLEXION | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL NECK TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL HEAD DROP | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |

SID Serial Number 058 Test Sequences 1 and 2

| TEST | PRE | | POST | |
|---|---|---|---|---|
| | COMMENTS | BY | COMMENTS | BY |
| EXTERNAL DIMENSIONS | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| THORACIC SHOCK ABSORBER TEST | Pass all requirements | Mark Meyer | | |
| LATERAL THORAX IMPACT TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LATERAL PELVIS IMPACT TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| ABDOMINAL COMPRESSION | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LUMBAR FLEXION | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL NECK TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL HEAD DROP | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |

**SUMMARY**
**SID H3 PRE AND POST VERIFICATION**

**CONFIGURED FOR LEFT SIDE IMPACT**

| TEST PARAMETER | SPEC | SID HIII/056 | | SID HIII/058 | |
|---|---|---|---|---|---|
| | | PRE | POST | PRE | POST |
| **MEASUREMENTS** | | | | | |
| Date | - | 29Sep06 | 13Oct06 | 29Sep06 | 13Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 20.5 | 19.1 | 19.8 | 19.0 |
| Relative Humidity (%) | 10-70 | 40.8 | 27.2 | 33.3 | 26.8 |
| SH – Seated Height (mm) | 889-909 | 909 | 908 | 909 | 906 |
| RH – Rib Height (mm) | 501-521 | 503 | 504 | 515 | 507 |
| HP – Hip Pivot Height (mm) | 99 | 99/99 | 99/99 | 99/99 | 99/99 |
| RD – Rib From Back Line (mm) | 229-241 | 229 | 229 | 229 | 229 |
| KH – Knee Pivot from Back Line (mm) | 511-526 | 517/514 | 517/516 | 525/526 | 517/520 |
| KV – Knee Pivot to Floor (mm) | 490-505 | 495/491 | 499/496 | 504/497 | 502/498 |
| HW – Hip Width (mm) | 356-391 | 373 | 365 | 360 | 361 |
| **THORAX IMPACTS** | | | | | |
| Date | - | 01Oct06 | 14Oct06 | 02Oct06 | 14Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 20.0 | 19.7 | 20.0 | 19.7 |
| Relative Humidity (%) | 10-70 | 45.2 | 29.7 | 56.6 | 29.4 |
| Probe Speed (m/s) | 4.21-4.33 | 4.27 | 4.27 | 4.27 | 4.27 |
| Upper Rib Acceleration (G) | 37-46 | 42.2 | 40.3 | 43.1 | 42.3 |
| Lower Rib Acceleration (G) | 37-46 | 41.2 | 39.0 | 39.9 | 39.9 |
| Lower Spine Acceleration (G) | 15-22 | 20.1 | 19.2 | 20.9 | 21.2 |
| **PELVIS IMPACTS** | | | | | |
| Date | - | 01Oct06 | 14Oct06 | 02Oct06 | 14Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 20.0 | 19.6 | 20.3 | 19.0 |
| Relative Humidity (%) | 10-70 | 45.6 | 30.1 | 55.2 | 29.4 |
| Probe Speed (m/s) | 4.21-4.33 | 4.27 | 4.27 | 4.29 | 4.27 |
| Pelvis Acceleration (G) | 40-60 | 47.3 | 51.5 | 49.0 | 47.2 |
| **THORACIC SHOCK ABSORBER** | | | | | |
| Shock Absorber ID Number | - | 1746 | N/a | 31310164 | N/a |
| Damper Setting | 1-10 | 5 | N/a | 5 | N/a |
| Date | - | 27Sep06 | N/a | 27Sep06 | N/a |
| Sequential Test Number | - | 1 | N/a | 1 | N/a |
| Temperature | 18.9-25.5 | 20.5 | N/a | 20.5 | N/a |
| Relative Humidity | 10-70 | 48.1 | N/a | 47.6 | N/a |
| Probe Speed (m/s) Low | 3.05 | 3.05 | N/a | 3.06 | N/a |
| Force (N) | 836 – 1125 | 1012.6 | N/a | 894.2 | N/a |
| Displacement (mm) | 30 – 35 | 30.1 | N/a | 30.3 | N/a |
| Probe Speed (m/s) Middle | 4.27 | 4.27 | N/a | 4.27 | N/a |
| Force (N) | 1730 – 2099 | 1858.0 | N/a | 1755.4 | N/a |
| Displacement (mm) | 32 – 37 | 32.6 | N/a | 34.4 | N/a |
| Probe Speed (m/s) High | 6.10 | 6.10 | N/a | 6.10 | N/a |
| Force (N) | 3741 – 4448 | 4047.9 | N/a | 4098.3 | N/a |
| Displacement (mm) | 33 - 40 | 36.3 | N/a | 36.5 | N/a |

| TEST PARAMETER | SPEC | SID HIII/056 | | SID HIII/058 | |
|---|---|---|---|---|---|
| | | PRE | POST | PRE | POST |
| **ABDOMINAL COMPRESSION** | | | | | |
| Date | - | 26Sep06 | 12Oct06 | 26Sep06 | 12Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 19.4 | 20.1 | 19.1 | 20.5 |
| Relative Humidity (%) | 10-70 | 43.1 | 29.4 | 38.8 | 28.9 |
| Force at 13 mm (N) | 104-162 | 148.7 | 134.1 | 128.1 | 140.0 |
| Force at 19 mm (N) | 163-221 | 198.2 | 195.5 | 180.0 | 193.4 |
| Force at 25 mm (N) | 222-280 | 256.5 | 271.2 | 241.1 | 259.0 |
| Force at 33 mm (N) | 325-391 | 342.7 | 390.6 | 346.4 | 366.4 |
| **LUMBAR FLEXION** | | | | | |
| Date | - | 26Sep06 | 12Oct06 | 26Sep06 | 11Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 20.0 | 20.9 | 20.2 | 21.2 |
| Relative Humidity (%) | 10-70 | 39.7 | 29.4 | 41.3 | 40.7 |
| Force at 0° (N) | 0-26.7 | 0 | 0 | 0 | 0 |
| Force at 0° (N) | 97.8-151.2 | 124.1 | 140.5 | 130.4 | 101.7 |
| Force at 0° (N) | 151.2-204.6 | 154.3 | 178.2 | 171.4 | 157.8 |
| Force at 0° (N) | 204.6-258 | 215.3 | 207.8 | 207.6 | 221.0 |
| Return Angle | 12° Maximum | 7.6 | 7.4 | 3.2 | 6.9 |
| **HYBRID III LATERAL NECK** | | | | | |
| Date | - | 27Sep06 | 10Oct06 | 27Sep06 | 11Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 19.4 | 20.1 | 20.0 | 20.5 |
| Relative Humidity (%) | 10-70 | 43.7 | 40.7 | 44.5 | 41.6 |
| Pendulum Speed (m/s) | 6.89-7.13 | 7.07 | 7.09 | 7.08 | 7.07 |
| Pendulum Pulse 10ms (m/s) | 1.96-2.55 | 2.07 | 2.13 | 2.25 | 1.97 |
| Pendulum Pulse 20ms (m/s) | 4.12-5.10 | 4.47 | 4.42 | 4.47 | 4.34 |
| Pendulum Pulse 30ms (m/s) | 5.73-7.01 | 6.73 | 6.50 | 6.79 | 6.73 |
| Pendulum Pulse 40 –70 ms (m/s) | 6.27-7.64 | 6.82 | 6.68 | 6.98 | 7.23 |
| Max Head rotation (deg) | 66-82 | 75.6 | 75.0 | 79.1 | 72.7 |
| Head angle crosses zero (ms) | 58-67 | 64.5 | 58.3 | 59.8 | 64.1 |
| Peak Moment (Nm) | 73-88 | 77.5 | 75.0 | 77.8 | 74.6 |
| Moment crosses zero (ms) | 49-63 | 51.3 | 49.4 | 51.2 | 58.2 |
| Max rotation wrt pk. moment (ms) | 2-15 | 3.0 | 9.60 | 6.4 | 6.16 |
| **HYBRID III LATERAL HEAD DROP** | | | | | |
| Date | - | 26Sep06 | 09Oct06 | 25Sep06 | 09Oct06 |
| Sequential Test Number | - | 1 | 2 | 1 | 2 |
| Temperature (°C) | 18.9-25.5 | 20.2 | 20.6 | 20.1 | 20.5 |
| Relative Humidity (%) | 10-70 | 43.1 | 43.9 | 47.7 | 43.9 |
| Resultant Max (G) | 120-150 | 130.8 | 129.4 | 138.7 | 140.1 |
| Longitudinal Max (G) | <15 | 3.8 | 4.0 | 4.9 | 4.8 |

**DUMMY INSPECTION LIST**
**PRE AND POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

| | | SID H3 056 | | SID H3 058 | |
|---|---|---|---|---|---|
| | | PRE | POST | PRE | POST |
| | Date | 03Oct06 | 05Oct06 | 03Oct06 | 05Oct06 |
| | Performed By | Mark Meyer | Mark Meyer | Mark Meyer | Mark Meyer |
| PART | INSPECTION | RESULT | RESULT | RESULT | RESULT |
| Skin | Visual | Pass | Pass | Pass | Pass |
| Head | Visual, Ballast, Accelerometer Mount | Pass | Pass | Pass | Pass |
| Neck | Visual and Palpated, Cable Torque | Pass | Pass | Pass | Pass |
| Spine Box | Visual, Ballast, Weldment, Accelerometer Mount | Pass | Pass | Pass | Pass |
| Rib Cage | Visual, Palpated, Measured, Stiffness | Pass | Pass | Pass | Pass |
| Sternum | Visual | Pass | Pass | Pass | Pass |
| Lumbar Spine | Visual | Pass | Pass | Pass | Pass |
| Abdomen | Visual | Pass | Pass | Pass | Pass |
| Pelvis | Visual, Palpated, Accelerometer Mount | Pass | Pass | Pass | Pass |
| Upper Legs | Visual | Pass | Pass | Pass | Pass |
| Knees | Visual, Stops, Inserts | Pass | Pass | Pass | Pass |
| Lower Legs | Visual, Range of Motion | Pass | Pass | Pass | Pass |
| Ankles | Visual, Range of Motion | Pass | Pass | Pass | Pass |
| Feet | Visual, Range of Motion | Pass | Pass | Pass | Pass |
| Joints | 1 to 2 G Range | Pass | Pass | Pass | Pass |
| Other | | N/a | N/a | N/a | N/a |