

**REPORT NUMBER: NCAP-CAL-13-006**

**NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST**

**Ford Motor Co  
2013 Ford Focus  
Four Door Sedan**

**NHTSA No: MD0211**

**PREPARED BY:  
CALSPAN CORPORATION  
P.O. BOX 400  
BUFFALO, NEW YORK 14225**



**November 12, 2012**

**FINAL REPORT**

**PREPARED FOR:  
U. S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF CRASHWORTHINESS STANDARDS  
1200 NEW JERSEY AVE SE, ROOM W43-410  
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Administration, in response to Contract Number DTNH22-12-D-00260.

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Date: November 12, 2012

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Date: November 12, 2012

#### **FINAL REPORT ACCEPTANCE BY OCWS:**

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Division Chief, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

\_\_\_\_\_  
COTR, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

# **TECHNICAL REPORT DOCUMENTATION PAGE**

| <b>1. Report No.</b><br>NCAP-CAL-13-006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       | <b>2. Government Accession No.</b>                        |           | <b>3. Recipient's Catalog No.</b>                                                                                                                                                                                                                                                                                                |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
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| <b>4. Title and Subtitle</b><br>Final Report of New Car Assessment Program<br>Frontal Impact Testing of a<br>2013 Ford Focus Four Door Sedan<br>NHTSA No.: MD0211                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                           |           | <b>5. Report Date</b><br>November 12, 2012                                                                                                                                                                                                                                                                                       |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
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| <b>9. Performing Organization Name and Address</b><br>Calspan Corporation<br>Transportation Test Operations<br>P.O. Box 400<br>Buffalo, New York 14225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                           |           | <b>10. Work Unit No.</b>                                                                                                                                                                                                                                                                                                         |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
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| <b>12. Sponsoring Agency Name and Address</b><br>U.S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Office of Crashworthiness Standards (NVS-111)<br>1200 New Jersey Ave., SE, Room W43-410<br>Washington, D.C. 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                           |           | <b>13. Type of Report and Period Covered:</b><br>Final Test Report<br>October 11, 2012 - November 12, 2012                                                                                                                                                                                                                       |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
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| <b>15. Supplementary Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                           |           |                                                                                                                                                                                                                                                                                                                                  |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| <b>16. Abstract</b><br><p>A 56.30 km/h (35 mph), NCAP Frontal Impact Test was conducted on a 2013 Ford Focus four door sedan in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on October 11, 2012.</p> <p>The impact velocity of the vehicle was 56.42 km/h, and the ambient temperature at the barrier face at the time of impact was 8°C. The target vehicle's maximum post-test static crush was 547 mm at the vehicle's centerline. The test vehicle's occupant performance data is as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD<br/>(Serial No. 64)</th> <th colspan="2">Passenger ATD<br/>(Serial No. 139)</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>15</sub>)</td> <td></td> <td>700</td> <td>179.38</td> <td>700</td> <td>275.69</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-18.37</td> <td>52</td> <td>-10.93</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.28</td> <td>1</td> <td>0.54</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>834.39</td> <td>2,620</td> <td>698.82</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-188.05</td> <td>2,520</td> <td>-349.15</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-1,277.59</td> <td>6,805</td> <td>-1,536.25</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-1366.09</td> <td>6,805</td> <td>-200.02</td> </tr> </tbody> </table> |       |                                                           |           |                                                                                                                                                                                                                                                                                                                                  |           | Measurement Description | Units | Driver ATD<br>(Serial No. 64) |  | Passenger ATD<br>(Serial No. 139) |  | Threshold | Result | Threshold | Result | Head Injury Criteria (HIC <sub>15</sub> ) |  | 700 | 179.38 | 700 | 275.69 | Maximum Chest Compression | mm | 63 | -18.37 | 52 | -10.93 | Nij |  | 1 | 0.28 | 1 | 0.54 | Neck Tension | N | 4,170 | 834.39 | 2,620 | 698.82 | Neck Compression | N | 4,000 | -188.05 | 2,520 | -349.15 | Left Femur Force | N | 10,008 | -1,277.59 | 6,805 | -1,536.25 | Right Femur Force | N | 10,008 | -1366.09 | 6,805 | -200.02 |
| Measurement Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Units | Driver ATD<br>(Serial No. 64)                             |           | Passenger ATD<br>(Serial No. 139)                                                                                                                                                                                                                                                                                                |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
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| Head Injury Criteria (HIC <sub>15</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       | 700                                                       | 179.38    | 700                                                                                                                                                                                                                                                                                                                              | 275.69    |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| Maximum Chest Compression                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | mm    | 63                                                        | -18.37    | 52                                                                                                                                                                                                                                                                                                                               | -10.93    |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| Nij                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       | 1                                                         | 0.28      | 1                                                                                                                                                                                                                                                                                                                                | 0.54      |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| Neck Tension                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | N     | 4,170                                                     | 834.39    | 2,620                                                                                                                                                                                                                                                                                                                            | 698.82    |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| Neck Compression                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | N     | 4,000                                                     | -188.05   | 2,520                                                                                                                                                                                                                                                                                                                            | -349.15   |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| Left Femur Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | N     | 10,008                                                    | -1,277.59 | 6,805                                                                                                                                                                                                                                                                                                                            | -1,536.25 |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| Right Femur Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | N     | 10,008                                                    | -1366.09  | 6,805                                                                                                                                                                                                                                                                                                                            | -200.02   |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| <b>17. Key Words</b><br>35 mph Frontal Barrier Impact Test<br>New Car Assessment Program (NCAP)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                           |           | <b>18. Distribution Statement</b><br>Copies of this report are available from:<br>National Highway Traffic Safety Administration<br>Technical Information Services Division, NPO-411<br>1200 New Jersey Ave, SE<br>Washington, DC 20590<br>e-mail: <a href="mailto:tis@nhtsa.dot.gov">tis@nhtsa.dot.gov</a><br>FAX: 202-493-2833 |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| <b>19. Security Class. (of this report)</b><br>UNCLASSIFIED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       | <b>20. Security Class. (of this page)</b><br>UNCLASSIFIED |           | <b>21. No. of Pages</b><br>215                                                                                                                                                                                                                                                                                                   |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |
| <b>22. Price</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                           |           |                                                                                                                                                                                                                                                                                                                                  |           |                         |       |                               |  |                                   |  |           |        |           |        |                                           |  |     |        |     |        |                           |    |    |        |    |        |     |  |   |      |   |      |              |   |       |        |       |        |                  |   |       |         |       |         |                  |   |        |           |       |           |                   |   |        |          |       |         |

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## **SECTION 1**

### **PURPOSE AND SUMMARY OF TEST**

#### **PURPOSE**

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-12-D-00260. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test procedure, dated September 2012.

#### **SUMMARY**

A load cell barrier consisting of 36 load cells was impacted by a 2013 Ford Focus four door sedan at a velocity of 56.42 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on October 11, 2012. Pre- and post-test photographs of the vehicle and dummies to document the test can be found in Appendix A. One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One Part 572E, 50<sup>th</sup> percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5<sup>th</sup> percentile female ATD was placed in the right-front passenger according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure. Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right / left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap to measure dummy pelvic section loading. The shoulder load cell was not used in this test per the Form 1 requirements. The driver (position 1) ATD (Serial No. 64) and the right-front passenger (position 2) ATD (Serial No. 139) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

The 136 channels of data were recorded on an on-board data acquisition system. Please refer to Appendix B for the dummy response data traces.

There was 100.0 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was a total of 0.0 grams of Stoddard solvent leakage after the event and including all phases of the static rollover. The maximum static crush of the test vehicle was 547 mm located at the vehicle's centerline. During and after the impact event, the driver's side door remained closed and operational and the passenger's side door remained closed and operational.

The driver's visible contact points were as follows: The driver's head contacted the frontal airbag and then the head restraint. The upper torso contacted the frontal airbag. Both knees contacted the knee airbag.

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and then the head restraint. The upper torso contacted the frontal airbag. Both knees contacted the glovebox.

The occupant data is summarized below.

| ATD Position                 | HIC <sub>15</sub> | Nij  | Neck Tension (N) | Neck Comp. (N) | 3ms Chest Clip (Gs) | Chest Disp. (mm) | Left Femur (N) | Right Femur (N) |
|------------------------------|-------------------|------|------------------|----------------|---------------------|------------------|----------------|-----------------|
| Driver (50 <sup>th</sup> )   | 179.38            | 0.28 | 834.39           | -188.05        | 43.77               | -18.37           | -1,277.59      | -1,366.09       |
| Passenger (5 <sup>th</sup> ) | 275.69            | 0.54 | 698.82           | -349.15        | 46.06               | -10.93           | -1,536.25      | -200.02         |

**GENERAL COMMENTS:**

1. P1 (Driver) serial number – 64
2. P2 (Passenger) serial number – 139
3. Shoulder Belt load cells were not used per Form 1.

**Data Anomalies:**

- V1P1 Left Lower Tibia My is questionable after 93ms, cut wire
- V1P2 Chest Redundant z is questionable after 49ms, cut wire
- V1P2 Left Foot Aft z is questionable after 62ms, cut wire
- V1 Top of Engine Ax is questionable after 55 ms, cut wire

## **SECTION 2**

### **OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS**

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 – General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat Adjustment, Fuel System, and Steering Wheel Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

Data Sheet No. 6 – High-Speed Camera Locations and Data

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

Data Sheet No. 9 – Load Cell Locations on Fixed Barrier

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

Data Sheet No. 15 – Summary of FMVSS 212, 219 (Partial), and 301 Data

Data Sheet No. 16 – FMVSS 301 Static Rollover Results

Data Sheet No. 17 – Dummy/Vehicle Temperature Stabilization Chart

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

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

**TEST VEHICLE INFORMATION AND OPTIONS**

|                          |                   |
|--------------------------|-------------------|
| NHTSA No.                | MD0211            |
| Model Year               | 2013              |
| Make                     | Ford              |
| Model                    | Focus             |
| Body Style               | Four Door Sedan   |
| VIN                      | 1FADP3F23DL111238 |
| Color                    | Light gray/silver |
| Odometer Reading (km/mi) | 273.6/170.0       |
| Engine Displacement (L)  | 2.0               |
| Type/No. Cylinders       | I4                |
| Engine Placement         | Transverse        |
| Transmission Type        | Automatic         |
| Transmission Speed       | 6-Speed           |
| Overdrive                | Yes               |
| Final Drive              | Front Wheel Drive |
| Roof Rack                | No                |
| Sunroof/T-Top            | No                |
| Running Boards           | No                |
| Tilt Steering Wheel      | Yes               |
| Power Seats              | No                |
| Anti-Lock Brakes         | Yes               |
| Automatic Door Locks     | Yes               |

|                                 |     |
|---------------------------------|-----|
| Traction Control                | Yes |
| Power Steering                  | Yes |
| Power Window Auto-Reverse       | No  |
| Driver Frontal Airbag           | Yes |
| Driver Curtain Airbag           | Yes |
| Driver Head/Torso Airbag        | No  |
| Driver Torso Airbag             | No  |
| Driver Torso/Pelvis Airbag      | Yes |
| Driver Pelvis Airbag            | No  |
| Driver Knee Airbag              | Yes |
| Front Pass. Frontal Airbag      | Yes |
| Front Pass. Curtain Airbag      | Yes |
| Front Pass. Head/Torso Airbag   | No  |
| Front Pass. Torso Airbag        | No  |
| Front Pass. Torso/Pelvis Airbag | Yes |
| Front Pass. Pelvis Airbag       | No  |
| Front Pass. Knee Airbag         | No  |
| Driver Pretensioners            | Yes |
| Driver Load Limiters            | Yes |
| Front Pass. Pretensioners       | Yes |
| Front Pass. Load Limiters       | Yes |
| Other                           | --  |

Does owner's manual provide instructions to turn off automatic door locks?

Yes

**DATA FROM CERTIFICATION LABEL**

|                     |               |
|---------------------|---------------|
| Manufactured By     | Ford Motor Co |
| Date of Manufacture | 08/12         |

|                 |       |
|-----------------|-------|
| GVWR (kg)       | 1,810 |
| GAWR Front (kg) | 972   |
| GAWR Rear (kg)  | 880   |

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

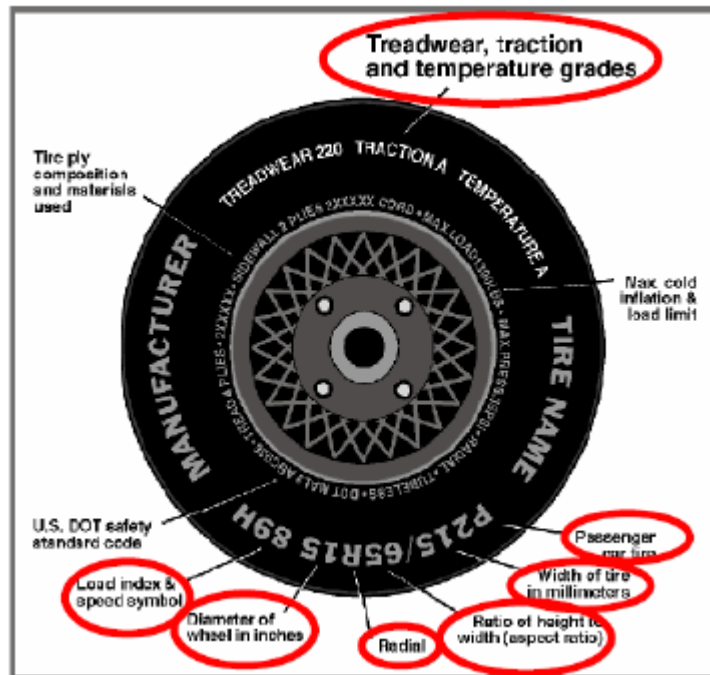
| Measured Parameter      | Front  | Rear  | Third | Total |
|-------------------------|--------|-------|-------|-------|
| Type of Seats           | Bucket | Bench |       |       |
| Number of Occupants     | 2      | 3     |       | 5     |
| Capacity Wt. (VCW) (kg) |        |       |       | 375.0 |
| Cargo Wt. (RCLW) (kg)   |        |       |       | 34.8  |

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

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

Collect items circled in red, tire manufacturer, and tire name.



**VEHICLE TIRE INFORMATION**

| Measured Parameter          | Front                         | Rear                          |
|-----------------------------|-------------------------------|-------------------------------|
| Maximum Tire Pressure (kPa) | 350                           | 350                           |
| Cold Pressure (kPa)         | 240                           | 240                           |
| Recommended Tire Size       | P215/55R16                    | P215/55R16                    |
| Tire Size on Vehicle        | P215/55R16                    | P215/55R16                    |
| Tire Manufacturer           | Continental                   | Continental                   |
| Tire Model                  | ContiproContact               | ContiproContact               |
| Treadwear                   | 500                           | 500                           |
| Traction                    | AA                            | AA                            |
| Temperature Grades          | A                             | A                             |
| Tire Plies Sidewall         | 1 Polyester Rayon             | 1 Polyester Rayon             |
| Tire Plies Body             | 1 Rayon, 2 Steel, 2 Polyamide | 1 Rayon, 2 Steel, 2 Polyamide |
| Load Index / Speed Symbol   | 93H                           | 93H                           |
| Tire Material               | Rubber                        | Rubber                        |
| DOT Safety Code Left        | CNB347AB2312                  | CNB347AB2312                  |
| DOT Safety Code Right       | CNB347AB2112                  | CNB347AB2312                  |

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

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

**TEST VEHICLE WEIGHTS**

|        | Units | As Delivered Weights (UVW) |           |         | As Tested Weights (ATW) |           |         |
|--------|-------|----------------------------|-----------|---------|-------------------------|-----------|---------|
|        |       | Front Axle                 | Rear Axle | Total   | Front Axle              | Rear Axle | Total   |
| Left   | kg    | 396.0                      | 274.5     |         | 431.0                   | 341.0     |         |
| Right  | kg    | 410.0                      | 265.5     |         | 428.5                   | 314.5     |         |
| Ratio  | %     | 59.9                       | 40.1      |         | 56.7                    | 43.3      |         |
| Totals | kg    | 806.0                      | 540.0     | 1,346.0 | 859.5                   | 655.5     | 1,515.0 |

**TARGET TEST WEIGHT CALCULATION**

| Measured Parameter                      | Units | Value   |         |
|-----------------------------------------|-------|---------|---------|
| Total Delivered Weight (UVW)            | kg    | 1,346.0 | (A)     |
| Weight of 1 P572E ATD & 1 P572O ATD     | kg    | 140.6   | (B)     |
| Rated Cargo / Luggage Weight (RCLW)     | kg    | 34.8    | (C)     |
| Calculated Vehicle Target Weight (TVTW) | kg    | 1,521.4 | (A+B+C) |

**TEST VEHICLE ATTITUDES AND CG**

| Condition    | Units | LF  | RF  | LR  | RR  | CG (aft of front axle) |
|--------------|-------|-----|-----|-----|-----|------------------------|
| As Delivered | mm    | 684 | 690 | 739 | 741 | 1,062                  |
| As Tested    | mm    | 673 | 677 | 678 | 678 | 1,145                  |
| Post-Test    | mm    | 716 | 702 | 693 | 986 |                        |

**GENERAL TEST VEHICLE DATA**

| Measurement Description                 | Units | Value |
|-----------------------------------------|-------|-------|
| Total Vehicle Wheel Base                | mm    | 2,646 |
| Total Vehicle Length at Left Side       | mm    | 4,452 |
| Total Vehicle Length at Centerline      | mm    | 4,532 |
| Total Vehicle Length at Right Side      | mm    | 4,453 |
| Weight of Ballast in Cargo Area         | kg    | 0.0   |
| Weight of Vehicle Components Removed    | kg    | 17.5  |
| Amount of Stoddard Solvent in Fuel Tank | L     | 43.5  |

**LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:**

Trunk carpeting, spare tire and jack were removed.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

| No. | Description                           | Pre-Test |
|-----|---------------------------------------|----------|
| 1   | Total Length                          | 4,532    |
| 2   | Total Width                           | 1,781    |
| 3   | Bumper Top Height                     | -527     |
| 4   | Bumper Bottom Height                  | -404     |
| 5   | Longitudinal Member Top Height        | -561     |
| 6   | Distance Between Longitudinal Members | 1,079    |
| 7   | Longitudinal Member Width             | 85       |
| 8   | Engine Top Height                     | -755     |
| 9   | Engine Bottom Height                  | -175     |
| 10  | Engine and Gearbox Width              | 509      |
| 11  | Front Bumper-Engine Distance          | 556      |
| 12  | Front Shock Absorber Fixing Height    | -847     |
| 13  | Bonnet Leading Edge Height            | -717     |
| 14  | Front Shock Absorber Fixing Width     | 1,181    |
| 15  | Front Bumper – Front Axle Distance    | 903      |
| 16  | Front Axle – A Pillar Distance        | 480      |
| 17  | A-Pillar – B-Pillar Distance          | 1,062    |
| 18  | B-Pillar – Rear Axle Distance         | 1,102    |
| 19  | B-Pillar – C-Pillar Distance          | 939      |
| 20  | Roof Sill Bottom Height               | -1,314   |
| 21  | Roof Sill Top Height                  | -1,427   |
| 22  | Floor Sill Bottom Height              | -250     |
| 23  | Floor Sill Top Height                 | -358     |

\*All measurements are in millimeters

## DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

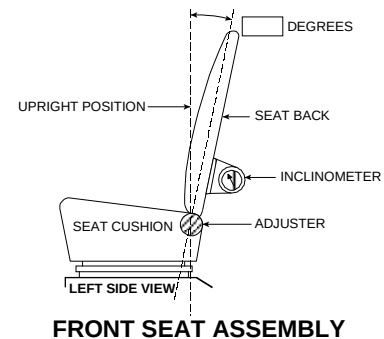
Test Vehicle: 2013 Ford Focus four door sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
Test Date: 10/11/2012

### NOMINAL DESIGN RIDING POSITION

The driver's seat back was set to the manufacturer's designated angle. The passenger's seat back was positioned in a similar manner as the driver's seat back. Seat back angles are measured at the headrest post bezel using a digital inclinometer.

| Seating Position          | Degrees |
|---------------------------|---------|
| Driver Seat Back Angle    | 11.9    |
| Passenger Seat Back Angle | 8.1     |



### SEAT FORE / AFT POSITIONS

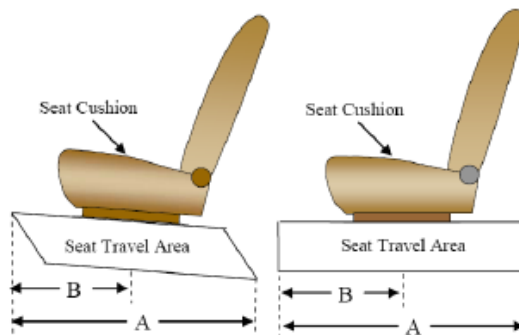
The driver's seat was positioned at the mid-point of fore/aft travel. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

| Seating Position | Total Fore / Aft Travel | Placed in Position # |
|------------------|-------------------------|----------------------|
| Driver Seat      | 26                      | 10                   |
| Passenger Seat   | 26                      | 0                    |

### SEAT BELT UPPER ANCHORAGE

The driver's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 50<sup>th</sup> percentile adult male ATD. The passenger's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 5<sup>th</sup> percentile adult female ATD. For this test zero is defined as the uppermost position.

| Seating Position | Total # of Positions | Placed in Position # |
|------------------|----------------------|----------------------|
| Driver Seat      | 4                    | 0                    |
| Passenger Seat   | 4                    | 0                    |





**DATA SHEET NO. 2 ... (CONTINUED)**  
**SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

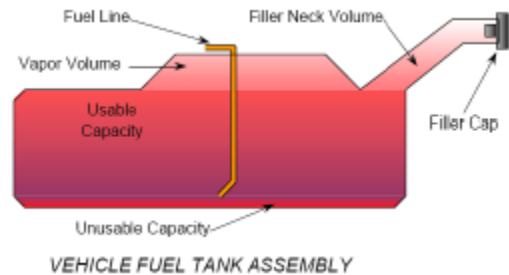
NHTSA No.: MD0211  
 Test Date: 10/11/2012

**FUEL TANK CAPACITY**

| Description                        | Liters      |
|------------------------------------|-------------|
| Usable Capacity of "Standard Tank" | 46.9        |
| Usable Capacity of "Optional Tank" |             |
| 92%-94% of Usable Capacity         | 43.2 - 44.1 |
| Actual Amount of Solvent Used      | 43.5        |
| 1/3 of Usable Capacity             | 15.6        |

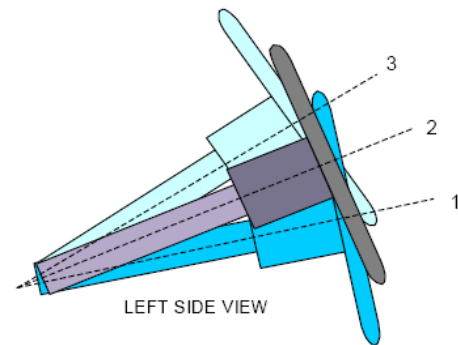
**FUEL PUMP**

The vehicle is equipped with an electric fuel pump. The fuel filler neck is on the right side of the vehicle. The pump creates positive pressure in the fuel lines, pushing the gasoline to the engine. See form 1 for more information.



**STEERING COLUMN ADJUSTMENT**

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. For angular measurements, a digital inclinometer was used to measure a plate which was placed across the steering wheel rim. A tape measure was used to measure the telescoping steering wheel travel.



STEERING COLUMN ASSEMBLY

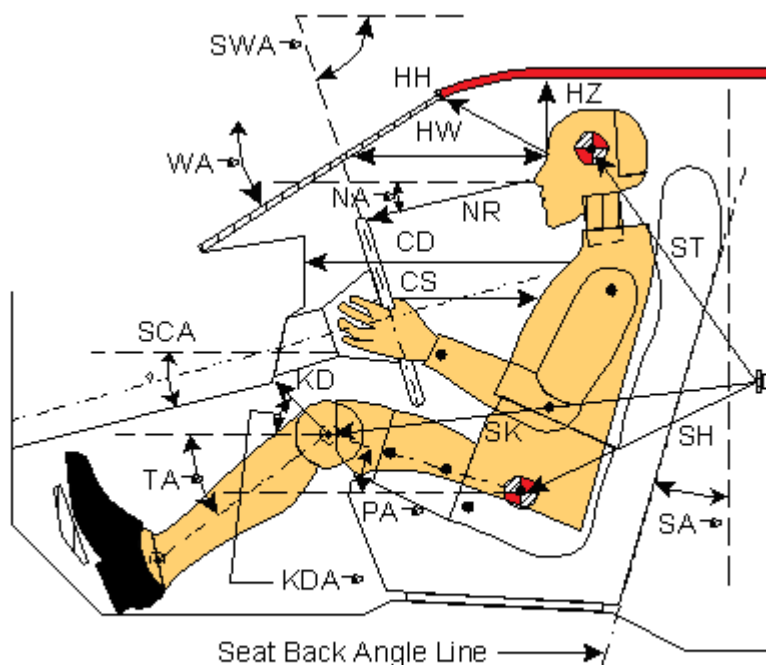
**STEERING COLUMN POSITIONS**

| Description                       | Degrees | Fore / Aft Position (mm) |
|-----------------------------------|---------|--------------------------|
| Lowermost position No. 1          | 18.5    | 0                        |
| Geometric center position No. 2   | 21.6    | 21                       |
| Uppermost position No. 3          | 24.7    | 42                       |
| Telescoping Steering Wheel Travel |         | 42                       |
| Test Position                     | 21.6    | 21                       |

**DATA SHEET NO. 3**  
**DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



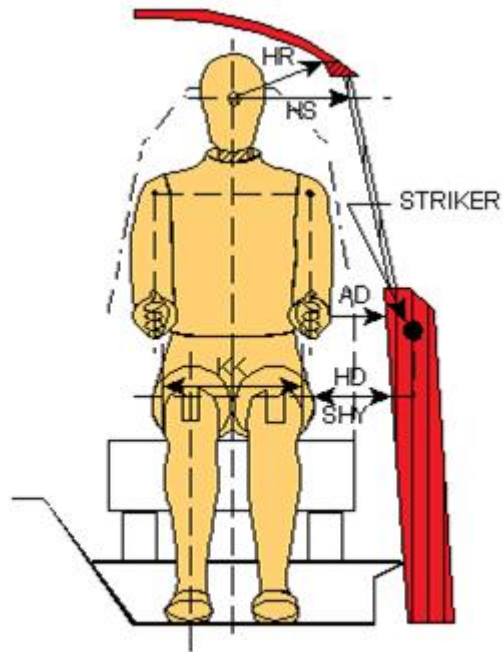
**Left Side View**

| Code | Measurement Description            | Driver (SN: 64) |           | Passenger (SN: 139) |           |
|------|------------------------------------|-----------------|-----------|---------------------|-----------|
|      |                                    | Length (mm)     | Angle (°) | Length (mm)         | Angle (°) |
| WA°  | Windshield Angle                   |                 | -23.6     |                     |           |
| SWA° | Steering Wheel Angle               |                 | 23.2      |                     |           |
| SCA° | Steering Column Angle              |                 | 66.8      |                     |           |
| SA°  | Seat Back Angle (on headrest post) |                 | 12.0      |                     | 8.1       |
| HZ   | Head to Roof (Z)                   | 210             | 90.0      | 210                 | 90.0      |
| HH   | Head to Header                     | 377             | 28.5      | 300                 | 50.1      |
| HW   | Head to Windshield                 | 766             | 0.0       | 704                 | 0.0       |
| NR   | Nose to Rim                        | 397             | -6.1      | n/a                 | n/a       |
| CD   | Chest to Dash                      | 547             |           | 359                 |           |
| CS   | Chest to Steering Hub              | 326             | 3.0       |                     |           |
| RA   | Rim to Abdomen                     | 203             | 5.7       |                     |           |
| KDL  | Left Knee to Dash                  | 156             | 29.0      | 79                  | 40.6      |
| KDR  | Right Knee to Dash                 | 148             | 28.5      | 104                 | 41.2      |
| PA°  | Pelvic Angle                       |                 | 23.3      |                     | 21.1      |
| TA°  | Tibia Angle                        |                 | 34.6      |                     | -35.2     |
| SK   | Striker to Knee                    | 553             | 0.0       | 652                 | -3.7      |
| ST   | Striker to Head                    | 500             | 84.6      | 512                 | 66.5      |
| SH   | Striker to H-Point                 | 234             | 46.1      | 328                 | -24.1     |

**DATA SHEET NO. 4**  
**DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



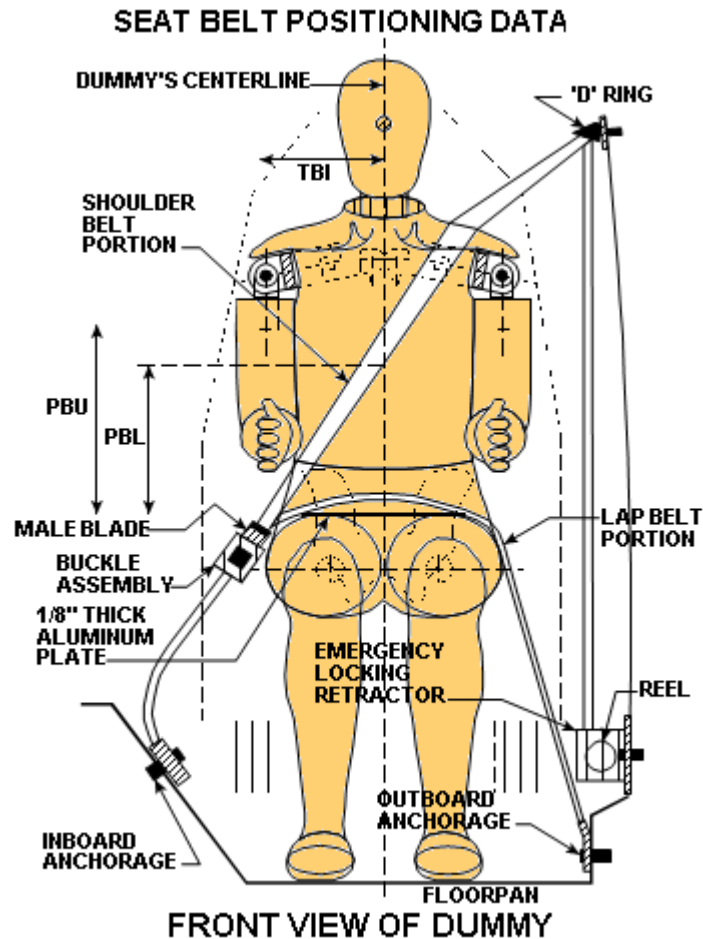
**Front View**

| Code | Description                      | Driver (mm) | Passenger (mm) |
|------|----------------------------------|-------------|----------------|
| AD   | Arm to Door                      | 104         | 92             |
| HD   | H-Point to Door                  | 157         | 172            |
| HR   | Head to Side Header              | 224         | 251            |
| HS   | Head to Side Window              | 367         | 384            |
| KK   | Knee to Knee                     | 270         | 165            |
| SHY  | Striker to H-Point (Y Direction) | 245         | 265            |
| AA   | Ankle to Ankle                   | 297         | 170            |

## DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



### SEAT BELT POSITIONING MEASUREMENTS

| Measurement Description                                  | Units | Driver | Passenger |
|----------------------------------------------------------|-------|--------|-----------|
| <b>PBU</b> — Top surface of reference to belt upper edge | mm    | 355    | 295       |
| <b>PBL</b> — Top surface of reference to belt lower edge | mm    | 280    | 200       |

### BELT LENGTH DATA

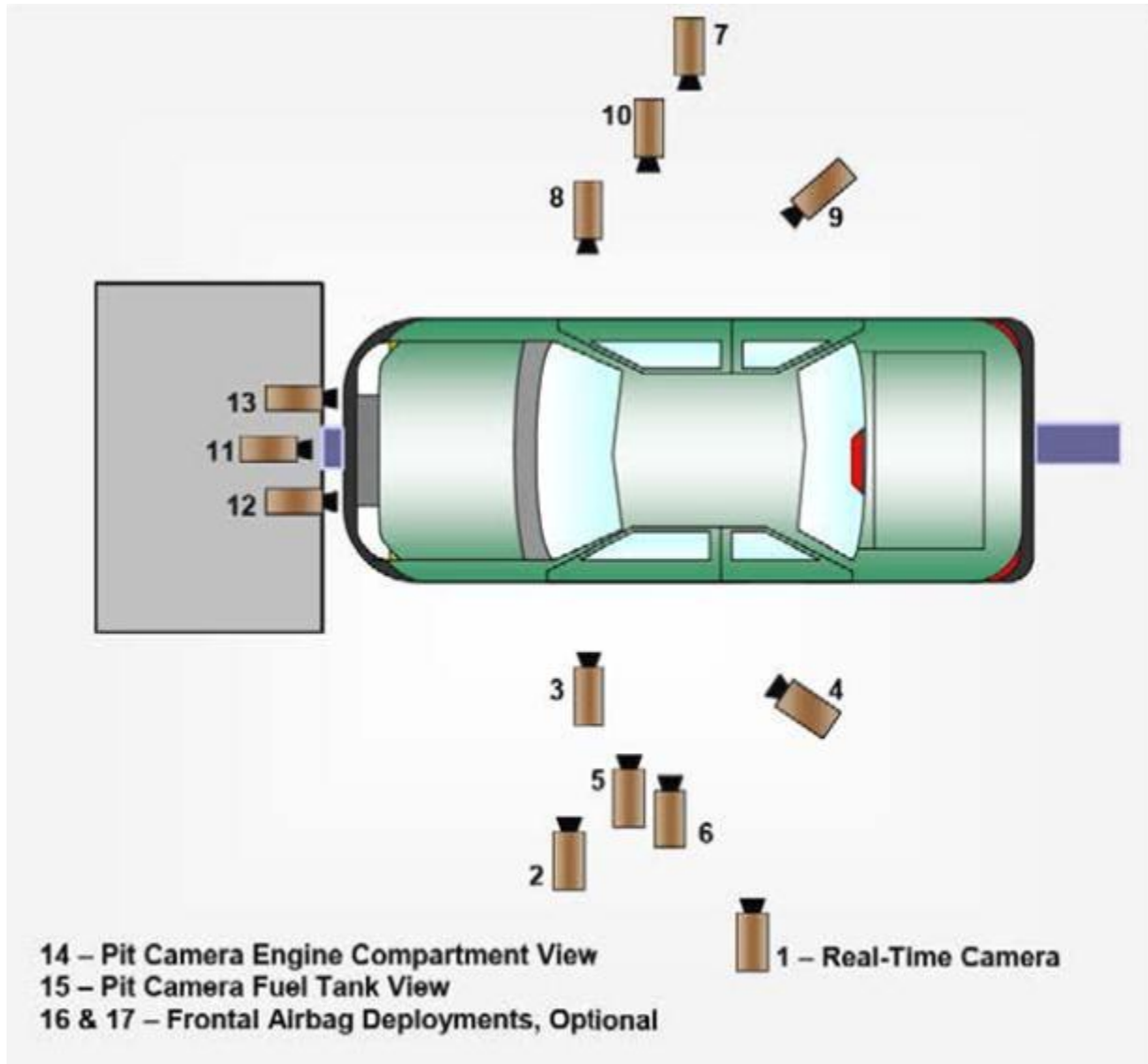
| Measurement Description                          | Units | Driver | Passenger |
|--------------------------------------------------|-------|--------|-----------|
| Shoulder belt length as measured on ATD          | mm    | 815    | 894       |
| Lap Belt Length as measured on ATD               | mm    | 650    | 735       |
| Remainder of belt on reel                        | mm    | 1035   | 771       |
| Total belt length for continuous webbing systems | mm    | 2500   | 2400      |

**DATA SHEET NO. 6**  
**HIGH-SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2013 Ford Focus four door sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
Test Date: 10/11/2012

**CAMERA POSITIONS FOR FRONTAL IMPACTS**



Top View

**DATA SHEET NO. 6 ... (CONTINUED)**  
**HIGH-SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

**CAMERA LOCATIONS**

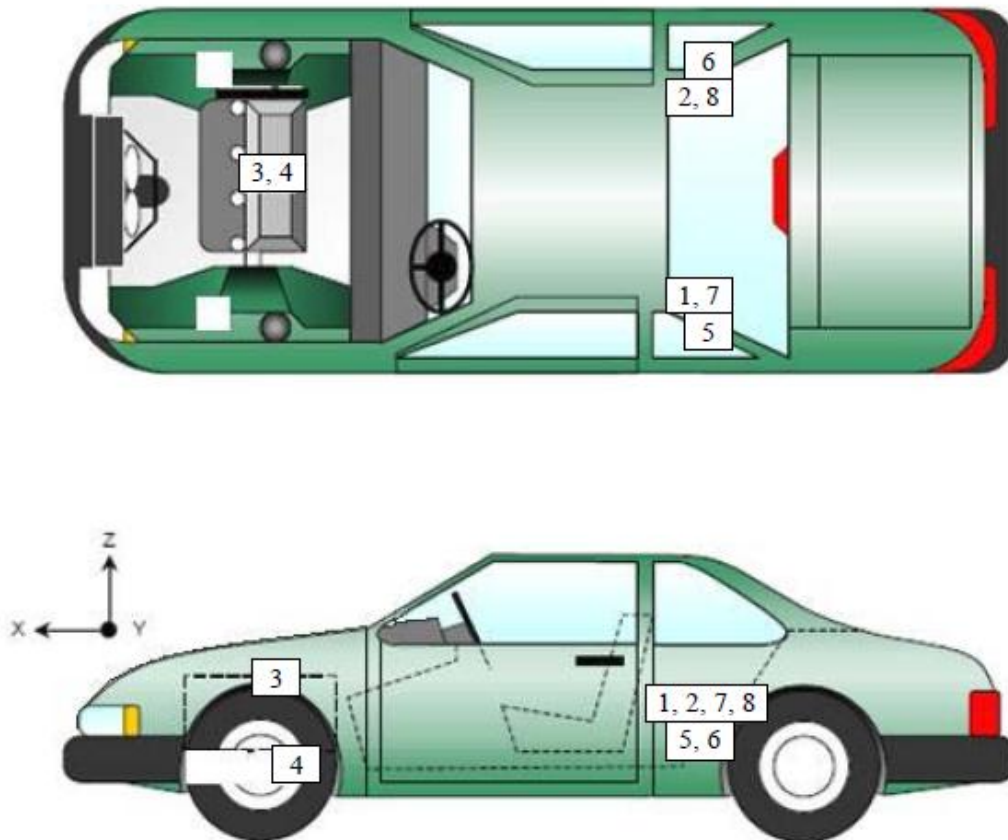
| No. | Camera View                         | Location (mm) |       |      | Lens (mm) | Speed (fps) |
|-----|-------------------------------------|---------------|-------|------|-----------|-------------|
|     |                                     | X             | Y     | Z    |           |             |
| 1   | Real-Time Left Overall              | --            | --    | --   |           | 24          |
| 2   | Driver Close-Up                     | 1830          | -7995 | 1151 | 50        | 1000        |
| 3   | Left Front Half                     | 1250          | -9048 | 971  | 50        | 1000        |
| 4   | Left Angle                          | 3077          | -2992 | 2135 | 28        | 1000        |
| 5   | Steering Column - Top               | 1703          | -8293 | 1787 | 24 - 70   | 1000        |
| 6   | Steering Column - Bottom            | 1703          | -8293 | 1195 | 28 - 70   | 1000        |
| 7   | Right Overall                       | 2012          | 7000  | 921  | 24        | 1000        |
| 8   | Passenger Close-Up                  | 1885          | 7557  | 1183 | 50        | 1000        |
| 9   | Right Front Half                    | 1389          | 9381  | 944  | 50        | 1000        |
| 10  | Right Angle                         | 3082          | 3000  | 2155 | 24        | 1000        |
| 11  | Windshield                          | 480           | 0     | 3219 | 24        | 1000        |
| 12  | Driver Windshield                   | 260           | -602  | 2012 | 12.5      | 1000        |
| 13  | Passenger Windshield                | 260           | 583   | 1971 | 12.5      | 1000        |
| 14  | Pit Front                           | 948           | 0     | 1740 | 6.5       | 1000        |
| 15  | Pit Rear                            | 2454          | 0     | 1740 | 6.5       | 1000        |
| 16  | Onboard Driver Airbag (Optional)    |               |       |      |           |             |
| 17  | Onboard Passenger Airbag (Optional) |               |       |      |           |             |

\* COORDINATES:      +X = forward of impact plane  
                              +Y = right of monorail center  
                              +Z = into ground

# **DATA SHEET NO. 7** **VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



## **VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

| No. | Accelerometer Location                           | Measurements (mm) |      |      |
|-----|--------------------------------------------------|-------------------|------|------|
|     |                                                  | X                 | Y    | Z    |
| 1   | Left Rear Accelerometer – X Direction            | 1,995             | -479 | -227 |
| 2   | Right Rear Accelerometer – X Direction           | 2,021             | 509  | -231 |
| 3   | Engine Top X                                     | 3,897             | 141  | -755 |
| 4   | Engine Bottom X                                  | 3,686             | 159  | -331 |
| 5   | Left Rear Accelerometer – Z Direction            | 1,995             | -479 | -227 |
| 6   | Right Rear Accelerometer – Z Direction           | 2,021             | 509  | -231 |
| 7   | Left Rear Accelerometer – X Direction Redundant  | 1,995             | -479 | -227 |
| 8   | Right Rear Accelerometer – X Direction Redundant | 2,021             | 509  | -231 |

*Reference Points:*      *X – Rear Surface of Vehicle (+ forward)*  
                                  *Y – Vehicle Centerline (+ to right)*  
                                  *Z – Ground Plane (+ down)*

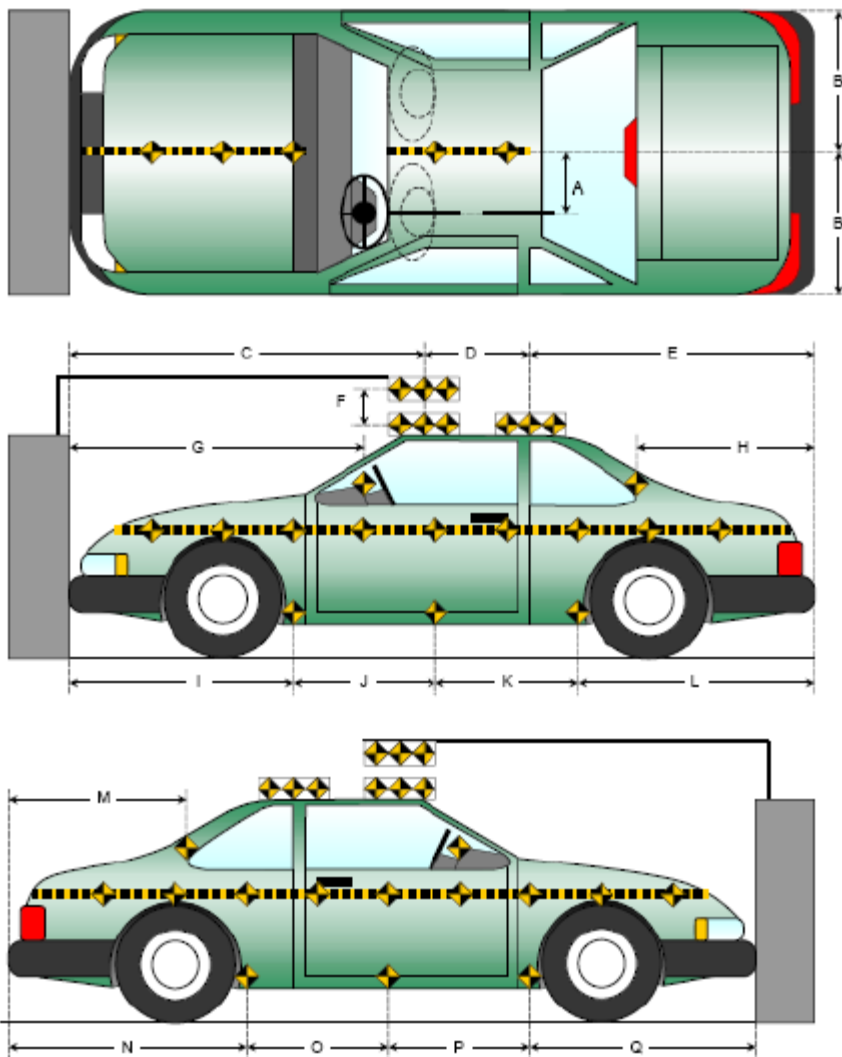
# **DATA SHEET NO. 8** **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

| Item | Value |
|------|-------|
| A    | 379   |
| B    | 890   |
| C    | 2,176 |
| D    | 1,220 |
| E    | 1,136 |
| F    | 147   |
| G    | 1,702 |
| H    | 763   |
| I    | 1,329 |
| J    | 898   |
| K    | 893   |
| L    | 1,411 |
| M    | 764   |
| N    | 1,416 |
| O    | 895   |
| P    | 898   |
| Q    | 1,324 |

All units in millimeters





# **DATA SHEET NO. 9** **LOAD CELL LOCATIONS ON FIXED BARRIER**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

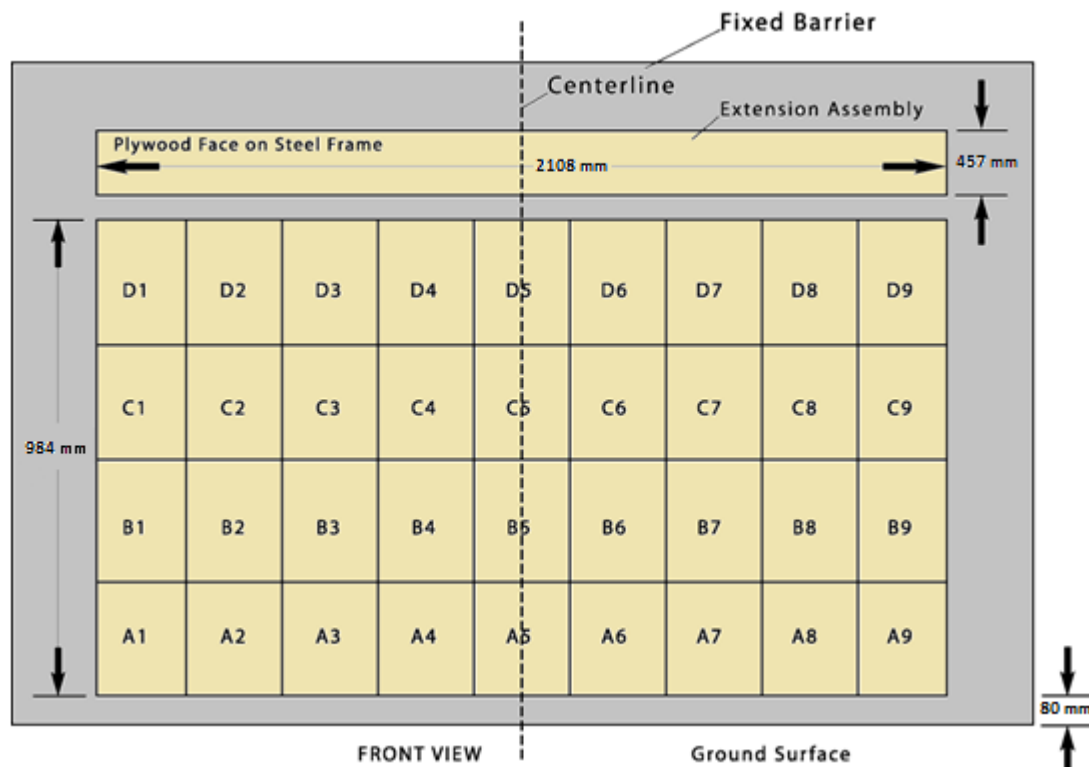


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension

**DATA SHEET NO. 10**  
**TEST VEHICLE SUMMARY OF RESULTS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

**INSTRUMENTATION**

| Instrumentation                  | Number of Channels Collected |
|----------------------------------|------------------------------|
| Driver Dummy Accelerometers      | 46                           |
| Passenger Dummy Accelerometers   | 46                           |
| Vehicle Structure Accelerometers | 8                            |
| Load Cell Barrier                | 36                           |
| <b>Total</b>                     | <b>136</b>                   |

**CAMERA COVERAGE**

| Type of Camera             | Number Used in this Test |
|----------------------------|--------------------------|
| High-Speed Vehicle Onboard | 0                        |
| High-Speed Offboard        | 14                       |
| Real-Time Panning          | 1                        |
| <b>Total</b>               | <b>15</b>                |

**DATA SHEET NO. 11**  
**POST-TEST OBSERVATIONS**

Test Vehicle: 2013 Ford Focus four door sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
Test Date: 10/11/2012

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

| Description             | Driver                           | Passenger                          |
|-------------------------|----------------------------------|------------------------------------|
| Dummy Type / Serial No. | P572E 50 <sup>TH</sup> male / 64 | P5720 5 <sup>th</sup> female / 139 |
| Head Contact            | Front airbag & Headrest          | Front airbag & Headrest            |
| Upper Torso Contact     | Front airbag                     | Front airbag                       |
| Lower Torso Contact     | None                             | None                               |
| Left Knee Contact       | Knee Airbag                      | Glove Box                          |
| Right Knee Contact      | Knee Airbag                      | Glove Box                          |

**DOOR OPENING AND SEAT TRACK INFORMATION**

| Description             | Driver               | Passenger            |
|-------------------------|----------------------|----------------------|
| Locked / Unlocked Doors | Unlocked             | Unlocked             |
| Front Door Opening      | Closed & Operational | Closed & Operational |
| Rear Door Opening       | Closed & Operational | Closed & Operational |
| Seat Track Shift (mm)   | 0                    | 0                    |
| Seat Back Failure       | No                   | No                   |
| Glazing Damage          | None                 | None                 |

**POST-TEST STRUCTURAL OBSERVATIONS**

| Critical Areas of Performance | Observations and Conclusions |
|-------------------------------|------------------------------|
| Windshield Damage             | None                         |
| Window Damage                 | None                         |
| Other Notable Effects         | None                         |

**VEHICLE REBOUND FROM BARRIER**

| Measured Parameter | Units | Value |
|--------------------|-------|-------|
| Left Side          | mm    | 613   |
| Center             | mm    | 618   |
| Right Side         | mm    | 657   |
| Average            | mm    | 629   |

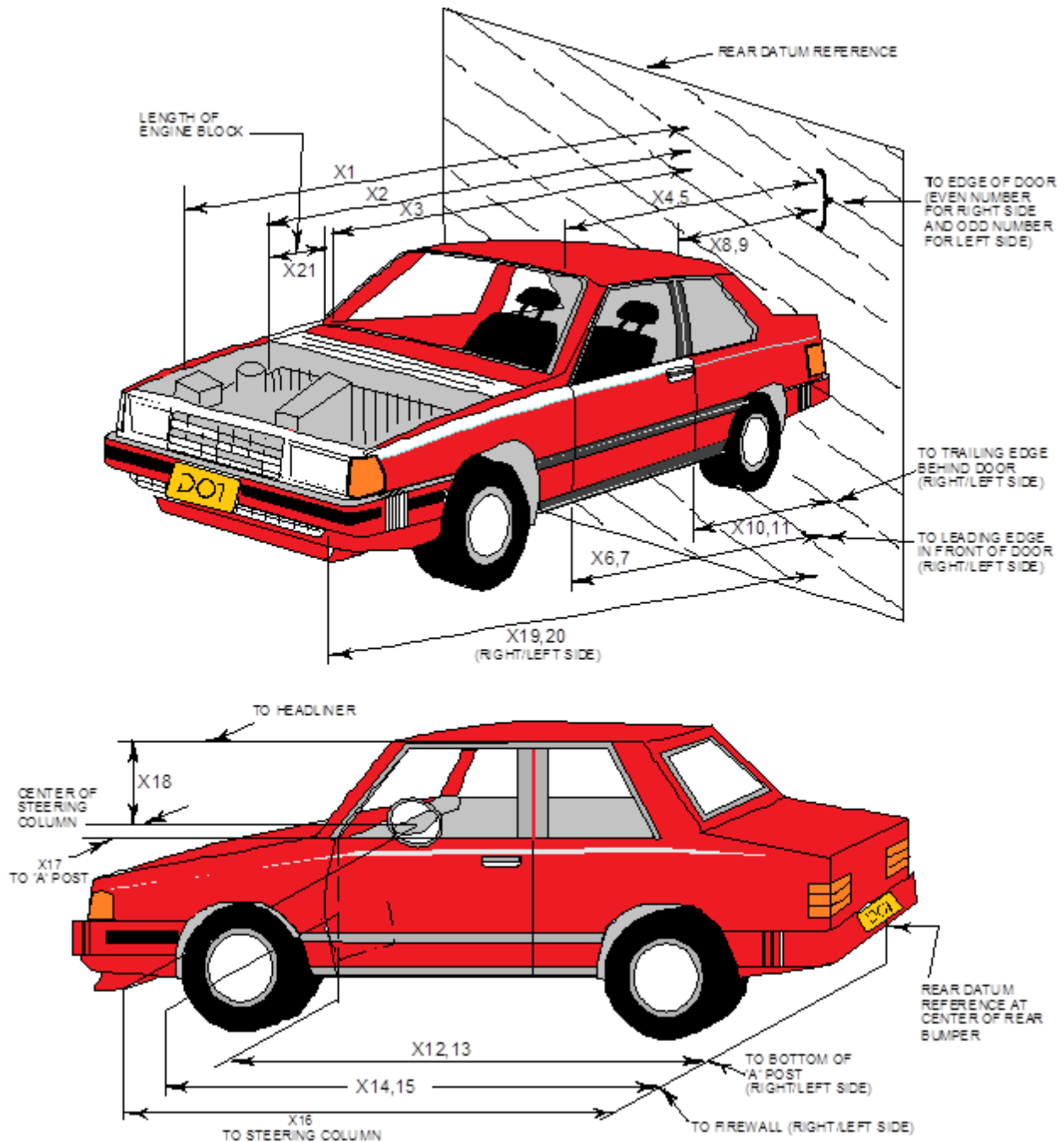
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

| Restraint Type                | Driver    |          | Passenger |          |
|-------------------------------|-----------|----------|-----------|----------|
|                               | Installed | Deployed | Installed | Deployed |
| Front Airbag                  | Yes       | Yes      | Yes       | Yes      |
| Side Airbag 1 - Curtain       | Yes       | No       | Yes       | No       |
| Side Airbag 2 - Torso/ Pelvis | Yes       | No       | Yes       | No       |
| Knee Airbag                   | Yes       | Yes      | No        | NA       |
| Seat Belt Pretensioner        | Yes       | Yes      | Yes       | Yes      |
| Seat Belt Load Limiter        | Yes       | Yes      | Yes       | Yes      |
| Other                         |           |          |           |          |

# **DATA SHEET NO. 12** **VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



**DATA SHEET NO. 12 ... (CONTINUED)**  
**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

| No. | Measurement Description                           | Pre-Test | Post-Test | Difference |
|-----|---------------------------------------------------|----------|-----------|------------|
| 1   | Total Length of Vehicle at Centerline             | 4,532    | 3,985     | -547       |
| 2   | Rear Surface of Vehicle (RSOV) to Front of Engine | 3,976    | 3,821     | -155       |
| 3   | RSOV to Firewall                                  | 3,610    | 3,614     | 4          |
| 4   | RSOV to Upper Leading Edge of Right Door          | 3,147    | 3,149     | 2          |
| 5   | RSOV to Upper Leading Edge of Left Door           | 3,145    | 3,145     | 0          |
| 6   | RSOV to Lower Leading Edge of Right Door          | 3,133    | 3,131     | -2         |
| 7   | RSOV to Lower Leading Edge of Left Door           | 3,130    | 3,127     | -3         |
| 8   | RSOV to Upper Trailing Edge of Right Door         | 2,093    | 2,095     | 2          |
| 9   | RSOV to Upper Trailing Edge of Left Door          | 2,090    | 2,092     | 2          |
| 10  | RSOV to Lower Trailing Edge of Right Door         | 2,100    | 2,100     | 0          |
| 11  | RSOV to Lower Trailing Edge of Left Door          | 2,096    | 2,095     | -1         |
| 12  | RSOV to Bottom of "A" Post of Right Side          | 3,426    | 3,425     | -1         |
| 13  | RSOV to Bottom of "A" Post of Left Side           | 3,426    | 3,424     | -2         |
| 14  | RSOV to Firewall, Right Side                      | 3,700    | 3,683     | -17        |
| 15  | RSOV to Firewall, Left Side                       | 3,701    | 3,672     | -29        |
| 16  | RSOV to Steering Column                           | 2,680    | 2,762     | 82         |
| 17  | Center of Steering Column to "A" Post             | 290      | 282       | -8         |
| 18  | Center of Steering Column to Headliner            | 405      | 415       | 10         |
| 19  | RSOV to Right Side of Front Bumper                | 4,453    | 4,041     | -412       |
| 20  | RSOV to Left Side of Front Bumper                 | 4,452    | 4,104     | -348       |
| 21  | Length of Engine Block                            | 228      | 228       | 0          |
| RD  | RSOV to Right Side of Dash Panel                  | 2,802    | 2,800     | -2         |
| CD  | RSOV to Center of Dash Panel                      | 2,735    | 2,733     | -2         |
| LD  | RSOV to Left Side of Dash Panel                   | 2,799    | 2,797     | -2         |

All Dimensions in mm

**DATA SHEET NO. 13**  
**ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2013 Ford Focus four door sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
Test Date: 10/11/2012

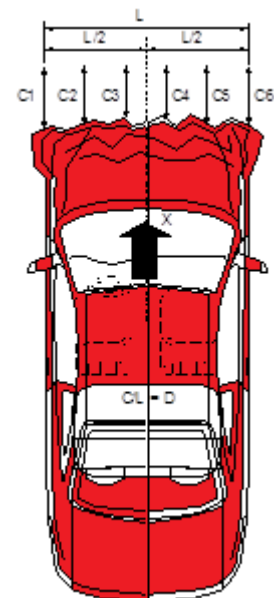
**VEHICLE INFORMATION**

VIN: 1FADP3F23DL111238  
Vehicle Size Category: Four Door Sedan

Wheelbase (mm): 2,646  
Test Weight (kg): 1,515

**ACCELEROMETER DATA**

Accelerometer Locations: Please See Data Sheet No. 7  
Cal. Procedure / Interval: Calspan Procedure / 6 month  
Integration Algorithm: Trapezoidal  
Linearity: > 99%  
Impact Velocity (km/h): 56.42  
Velocity Change (km/h): 56.42  
Time of Separation (ms): 117



**CRUSH PROFILE**

Collision Deformation Classification: 12FDEW3  
Midpoint of Damage: Vehicle Centerline  
Damage Region Length (mm): 1132  
Impact Mode: Frontal

| No. | Measurement Description    | Units | Pre-Test | Post-Test | Difference |
|-----|----------------------------|-------|----------|-----------|------------|
| C1  | Crush Zone 1 at Left Side  | mm    | 4394     | 4013      | 381        |
| C2  | Crush Zone 2 at Left Side  | mm    | 4499     | 4005      | 494        |
| C3  | Crush Zone 3 at Left Side  | mm    | 4515     | 3978      | 537        |
| C4  | Crush Zone 4 at Right Side | mm    | 4514     | 3978      | 536        |
| C5  | Crush Zone 5 at Right Side | mm    | 4496     | 4007      | 489        |
| C6  | Crush Zone 6 at Right Side | mm    | 4393     | 3997      | 396        |
| L   | C1 to C6                   | mm    | 1132     | 1175      | -42        |

**DATA SHEET NO. 14**  
**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

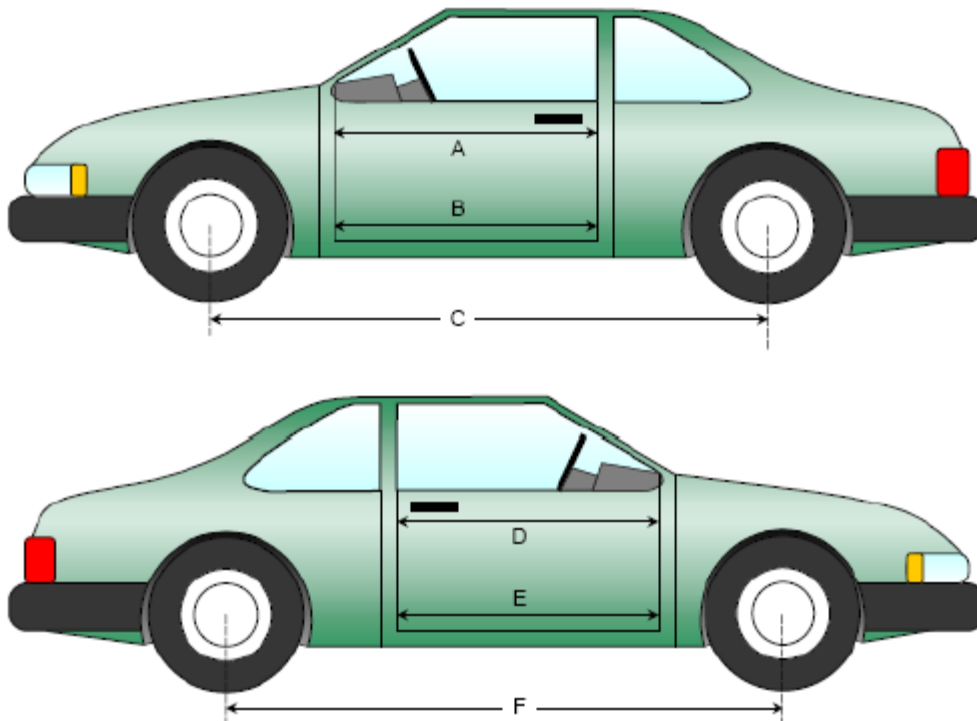
NHTSA No.: MD0211  
 Test Date: 10/11/2012

**DOOR OPENING WIDTH**

| Item | Description      | Units | Pre-Test | Post-Test | Difference |
|------|------------------|-------|----------|-----------|------------|
| A    | Left Side Upper  | mm    | 938      | 937       | -1         |
| B    | Left Side Lower  | mm    | 857      | 856       | -1         |
| D    | Right Side Upper | mm    | 934      | 932       | -2         |
| E    | Right Side Lower | mm    | 887      | 885       | -2         |

**WHEELBASE MEASUREMENTS**

| Item | Description          | Units | Pre-Test | Post-Test | Difference |
|------|----------------------|-------|----------|-----------|------------|
| C    | Left Side Wheelbase  | mm    | 2,646    | 2,535     | -109       |
| F    | Right Side Wheelbase | mm    | 2,646    | 2,545     | -102       |



**Left & Right Side Views**

**DATA SHEET NO.14 ... (CONTINUED)**  
**VEHICLE INTRUSION MEASUREMENTS**

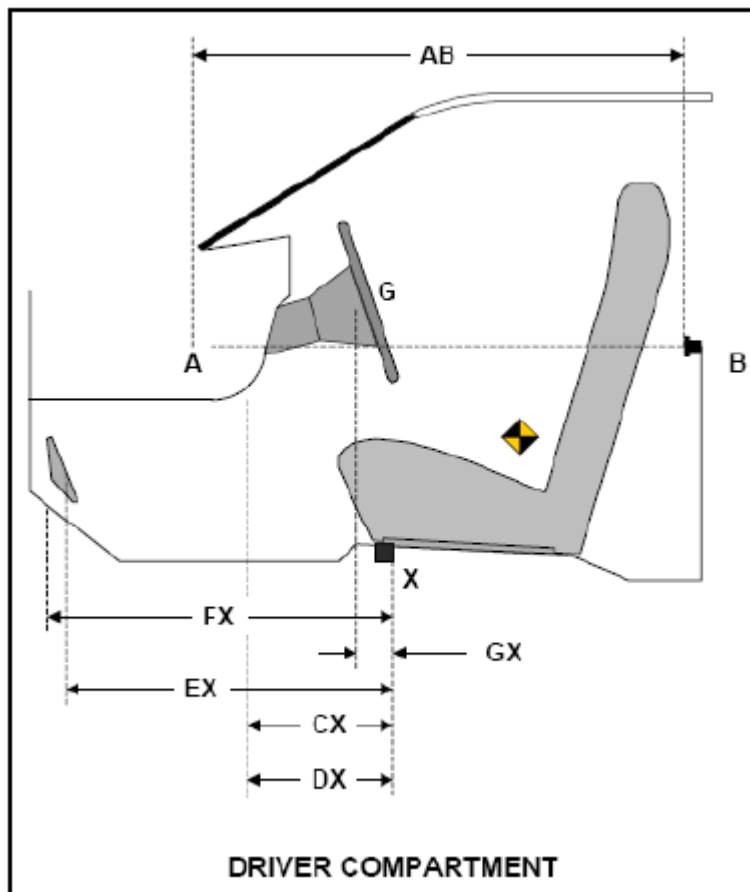
Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

**DRIVER COMPARTMENT INTRUSION**

| Item | Description                              | Units | Pre-Test | Post-Test | Difference |
|------|------------------------------------------|-------|----------|-----------|------------|
| AB   | Door Opening (Inside Window Jam)         | mm    | 811      | 812       | 1          |
| CX   | Left Knee Bolster to X                   | mm    | 269      | 269       | 0          |
| DX   | Right Knee Bolster to X                  | mm    | 237      | 231       | -6         |
| EX   | Brake Pedal to X                         | mm    | 510      | 527       | 17         |
| FX   | Foot Rest to X                           | mm    | 517      | 503       | -14        |
| GX   | Center of Steering Column Wheel Hub to X | mm    | 50       | 131       | 81         |

*X = Front of Seat Track (Stationary)*





**DATA SHEET NO. 15**  
**SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012

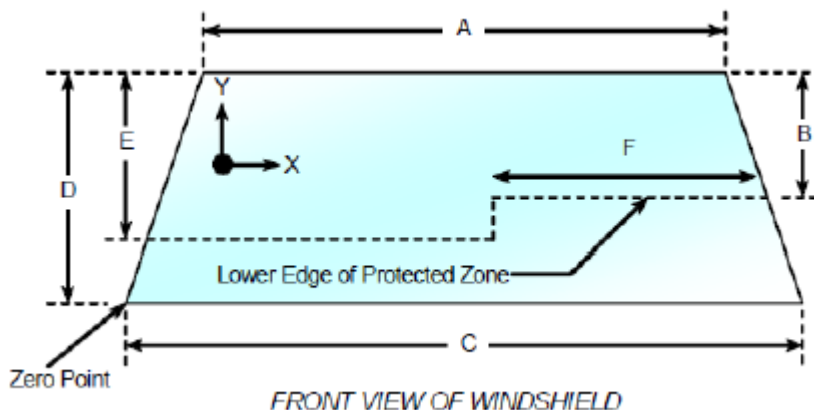
**Windshield Mounting Details:** A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

*The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.*

**Temperature of windshield molding during test:** 8 °C

**WINDSHIELD PERIPHERY MEASUREMENTS**

| Measurement | Pre-Test (mm) | Post-Test (mm) | % Retention |
|-------------|---------------|----------------|-------------|
| Left Side   | 2,242         | 2,242          | 100         |
| Right Side  | 2,242         | 2,242          | 100         |
| Total       | 4,484         | 4,484          | 100         |



| Item | Units | Value |
|------|-------|-------|
| A    | mm    | 1,184 |
| B    | mm    | 512   |
| C    | mm    | 1,475 |
| D    | mm    | 912   |
| E    | mm    | 587   |
| F    | mm    | 457   |

**AREAS OF PROTECTED ZONE FAILURES**

A. *Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.*

- No Penetration

| X | Y |
|---|---|
|   |   |
|   |   |
|   |   |

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

- No Penetration

| X | Y |
|---|---|
|   |   |
|   |   |
|   |   |

**DATA SHEET NO. 15 ... (CONTINUED)**  
**SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA**

Test Vehicle: 2013 Ford Focus four door sedan  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
Test Date: 10/11/2012

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

Temperature at Time of Impact: 8 ° C

Test Time: 12:29 PM

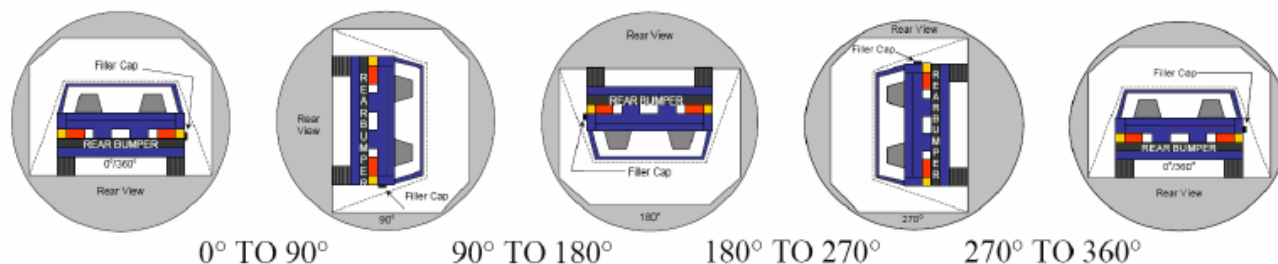
**STODDARD SOLVENT SPILLAGE MEASUREMENTS**

- A. From impact until vehicle motion ceases: 0 oz.  
(Maximum allowable is 1 oz.)
- B. For the 5-minute period after motion ceases: 0 oz.  
(Maximum allowable is 5 oz.)
- C. For the following 25 minutes: 0 oz.  
(Maximum allowable is 1 oz./minute)
- D. Spillage: Total Spillage was 0 oz. No Spillage Occurred

**DATA SHEET NO. 16**  
**FMVSS 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2013 Ford Focus four door sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



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: Total Spillage was 0 oz. No Spillage Occurred

**SOLVENT COLLECTION TIME TABLE IN SECONDS**

| Test Phase   | Rotation Time | Hold Time | Total Time |
|--------------|---------------|-----------|------------|
| 0° to 90°    | 74            | 300       | 374        |
| 90° to 180°  | 61            | 300       | 361        |
| 180° to 270° | 60            | 300       | 360        |
| 270° to 360° | 70            | 300       | 370        |

**FMVSS 301 SPILLAGE TABLE**

| Test Phase   | First 5 Minutes | Sixth Minute | Seventh Minute | Eighth Minute |
|--------------|-----------------|--------------|----------------|---------------|
| 0° to 90°    | 0               | 0            | 0              | -             |
| 90° to 180°  | 0               | 0            | 0              | -             |
| 180° to 270° | 0               | 0            | 0              | -             |
| 270° to 360° | 0               | 0            | 0              | -             |

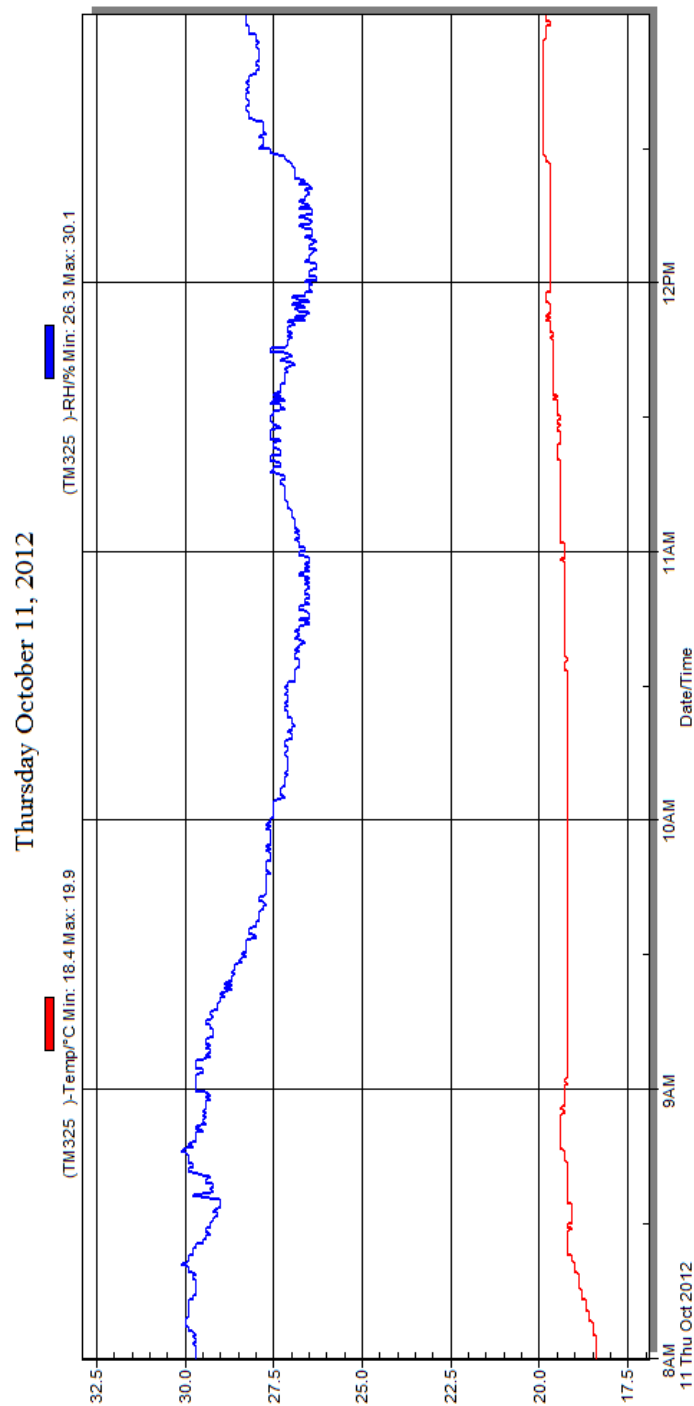
**SOLVENT SPILLAGE LOCATION TABLE**

| Test Phase   | Spillage Location |
|--------------|-------------------|
| 0° to 90°    | None              |
| 90° to 180°  | None              |
| 180° to 270° | None              |
| 270° to 360° | None              |

# **DATA SHEET NO. 17** **DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART**

Test Vehicle: 2013 Ford Focus Four Door Sedan  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: MD0211  
 Test Date: 10/11/2012



**Temperature and Humidity Stabilization Chart/Data for Dummies and Test Vehicle**

**APPENDIX A**  
**PHOTOGRAPHS**

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<sup>1</sup>**NOTE:** *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*





Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall

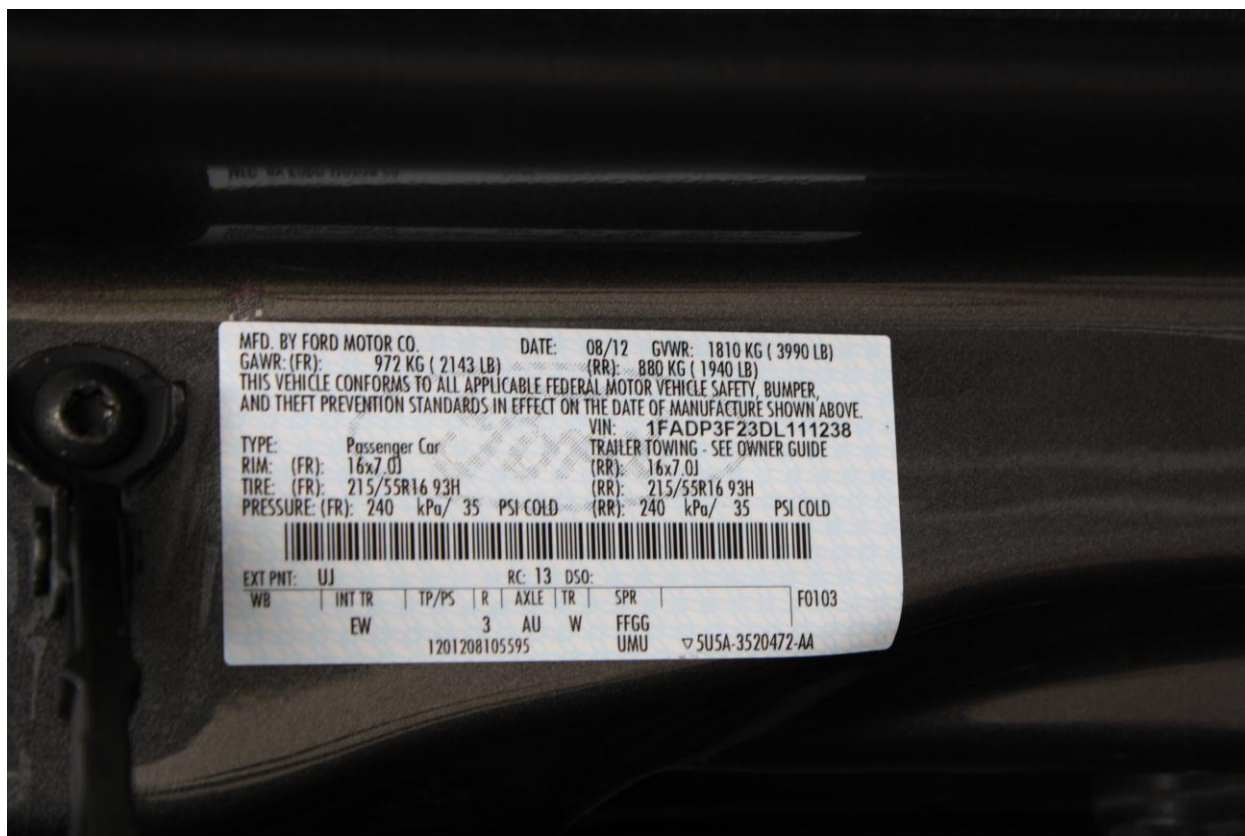


Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard





**Figure A-5: 2013 Ford Focus Frontal As Delivered**

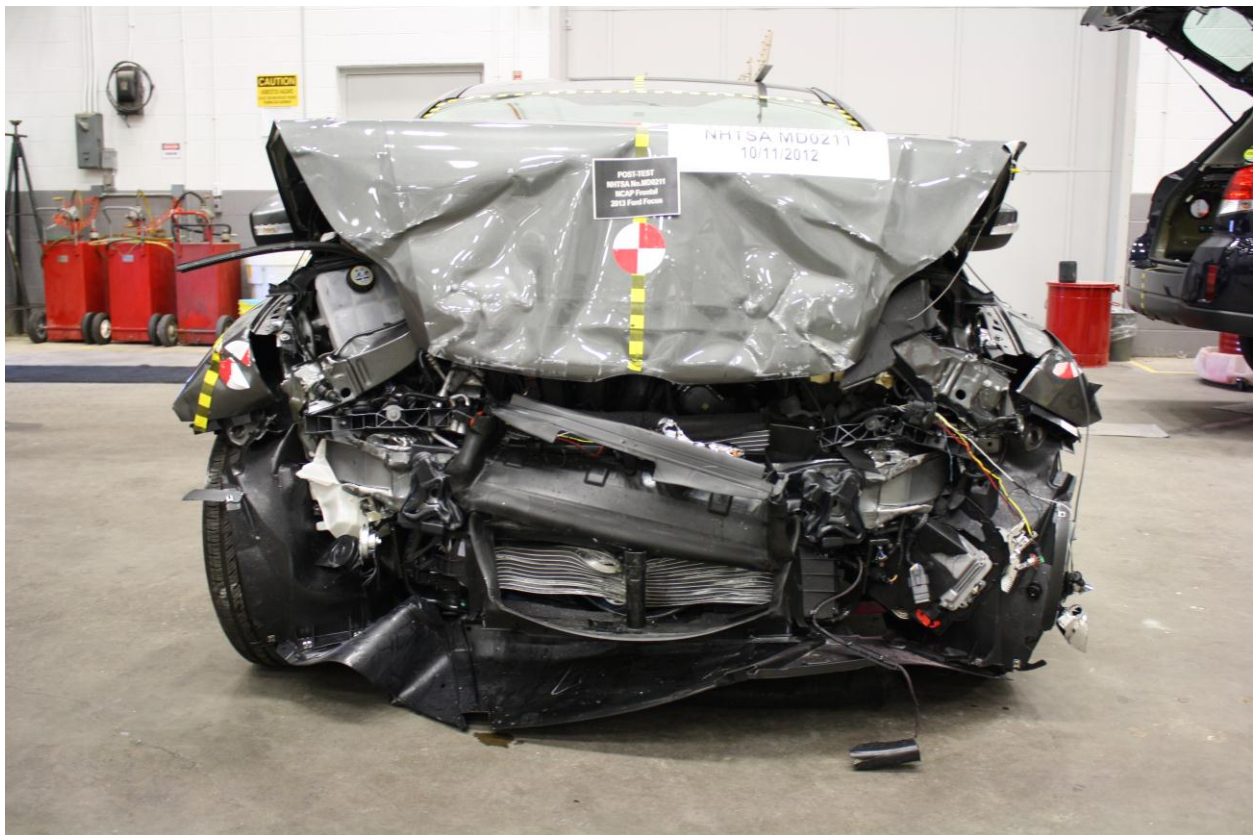


**Figure A-6: Left Rear 3-4 View, As Received**





**Figure A-7: Pre-Test Front View of Test Vehicle**

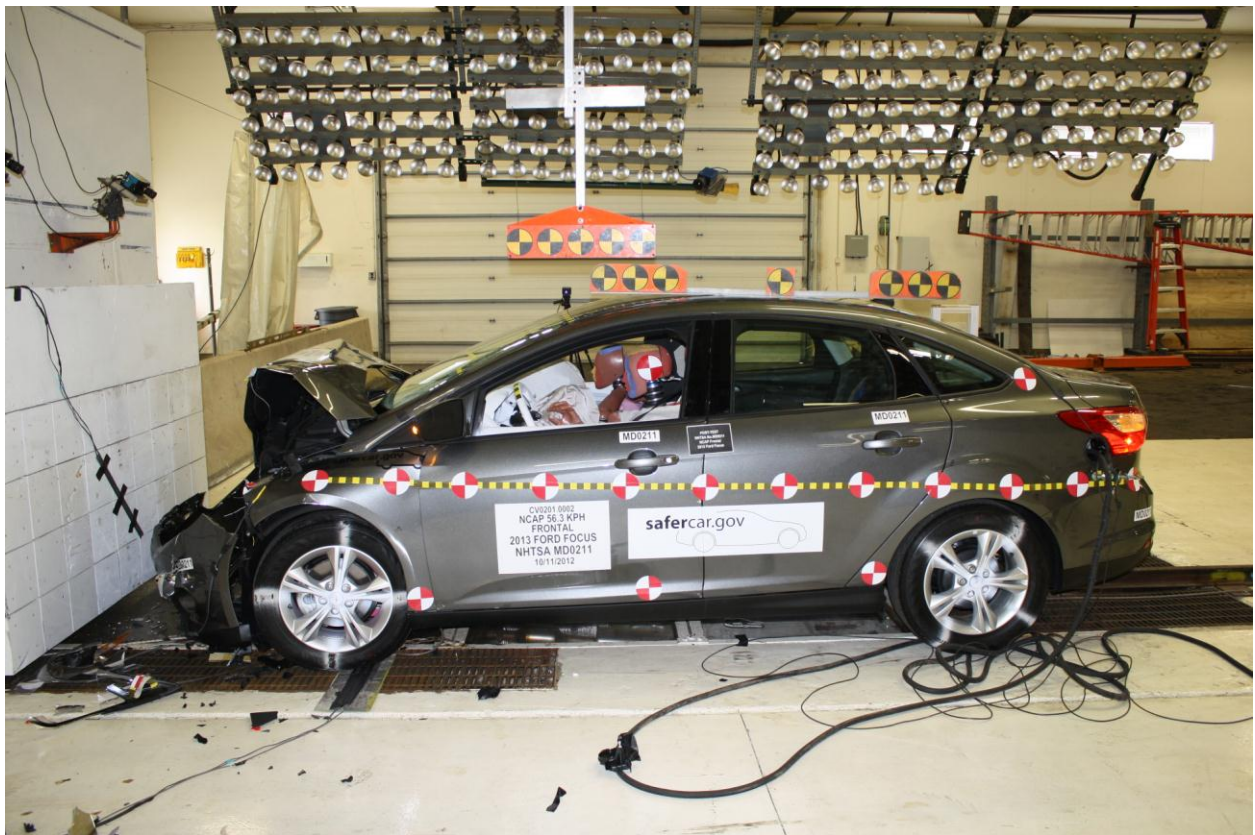


**Figure A-8: Post-Test Front View of Test Vehicle**





**Figure A-9: Pre-Test Left View of Test Vehicle**



**Figure A-10: Post-Test Left View of Test Vehicle**





**Figure A-11: Pre-Test Right View of Test Vehicle**



**Figure A-12: Post-Test Right View of Test Vehicle**





**Figure A-13: Pre-Test Right Front 3-4 View**



**Figure A-14: Post-Test Right Front 3-4 View**





**Figure A-15: Pre-Test Left Rear 3-4 View**



**Figure A-16: Post-Test Left Rear 3-4 View**





Figure A-17: Pre-Test Windshield View

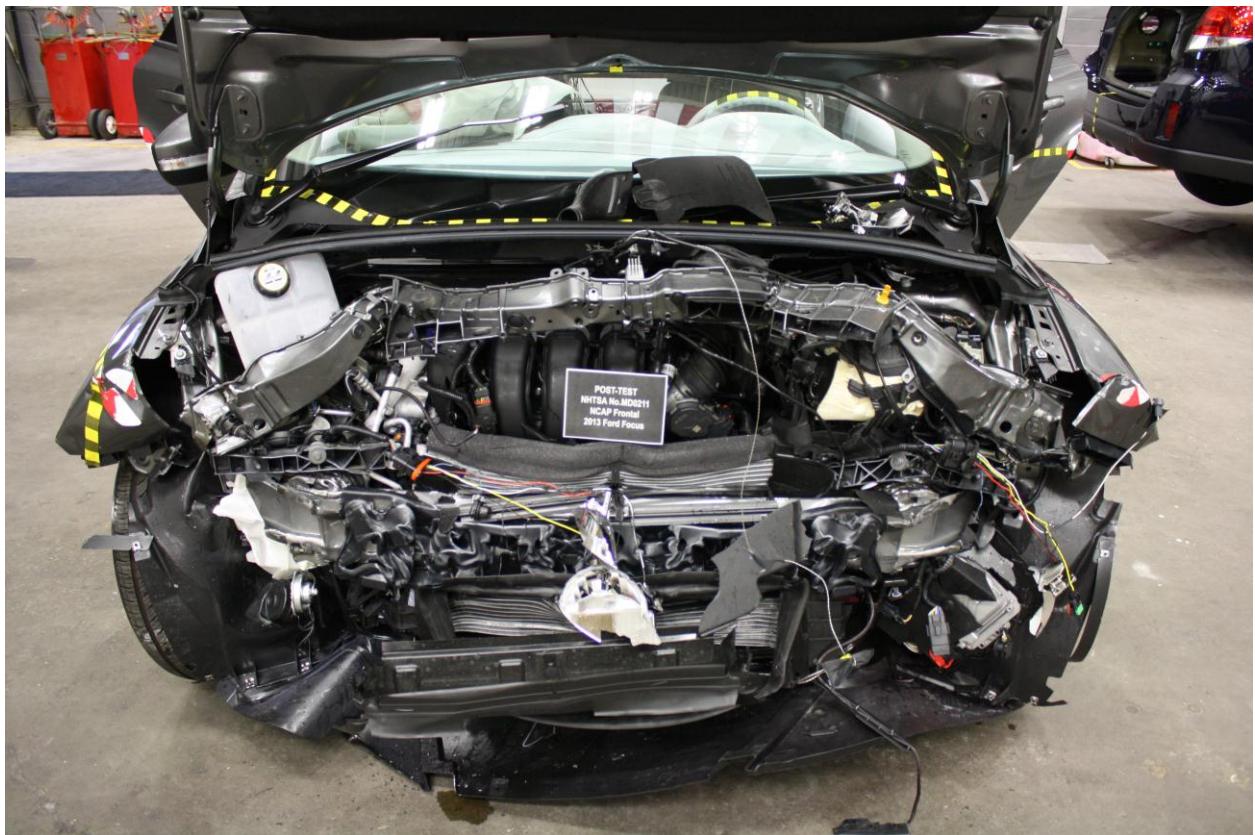


Figure A-18: Post-Test Windshield View





**Figure A-19: Pre-Test Engine Compartment View**



**Figure A-20: Post-Test Engine Compartment View**





Figure A-21: Pre-Test Fuel Filler Cap View



Figure A-22: Post-Test Fuel Filler Cap View



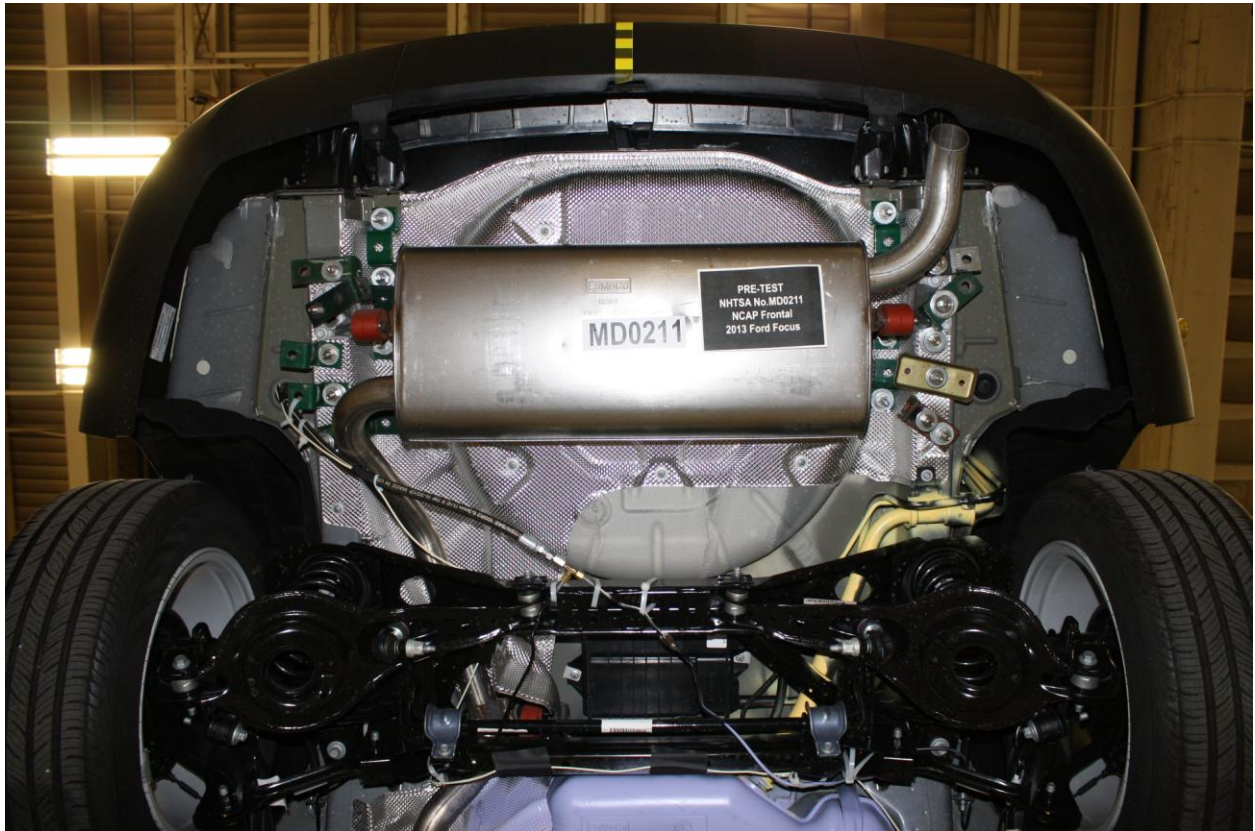


**Figure A-23: Pre-Test Front Underbody View**



**Figure A-24: Post-Test Front Underbody View**





**Figure A-25: Pre-Test Rear Underbody View**

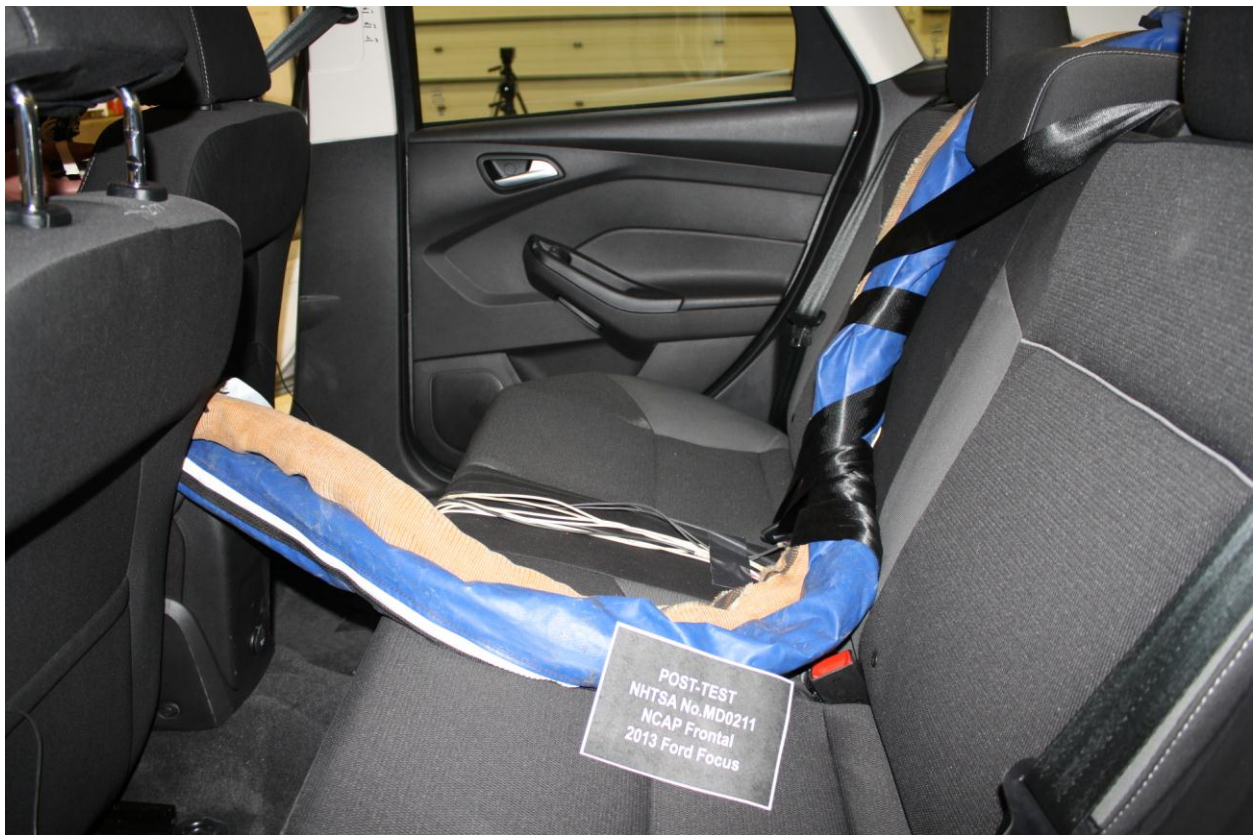


**Figure A-26: Post-Test Rear Underbody View**





**Figure A-27: Pre-Test Dummy Cable Routing**

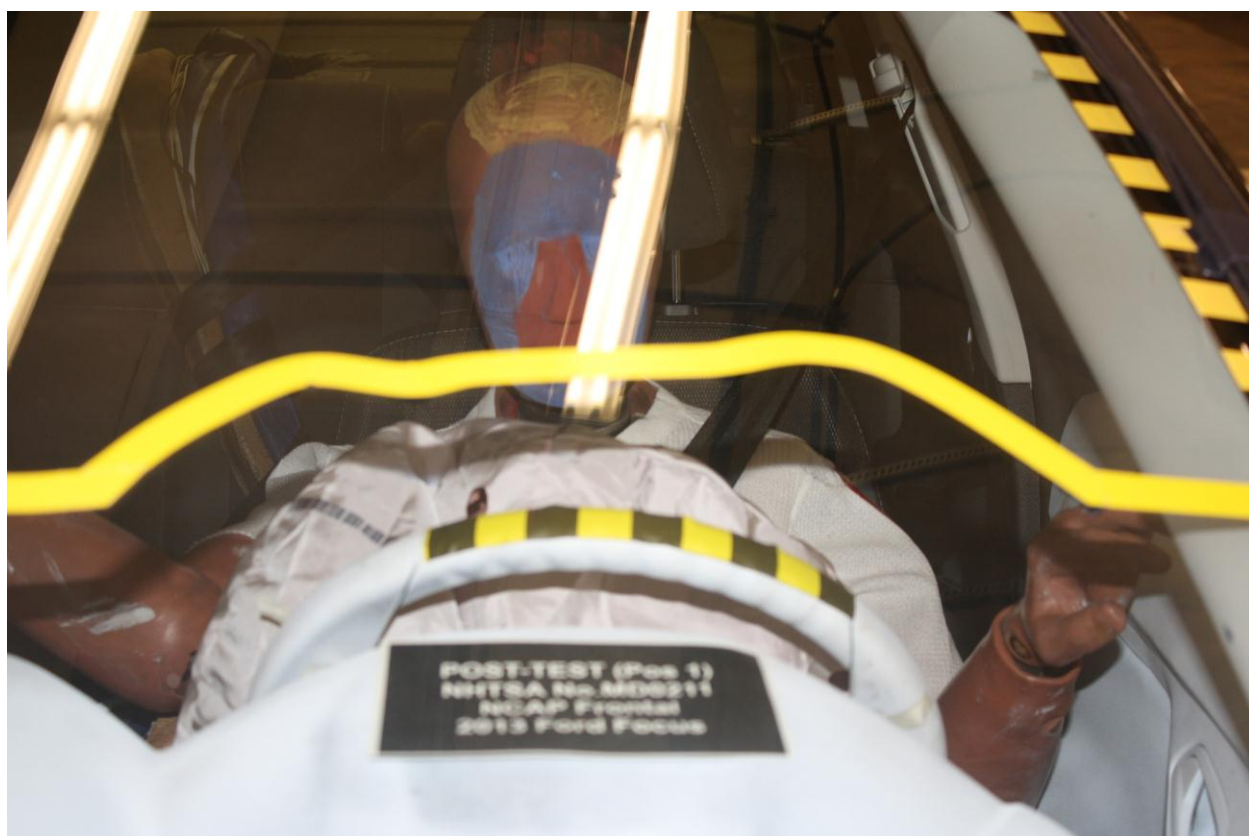


**Figure A-28: Post-Test Dummy Cable Routing**





**Figure A-29: Pre-Test Driver Dummy Front View**



**Figure A-30: Post-Test Driver Dummy Front View**



**Figure A-31: Pre-Test Driver Dummy Window View**



**Figure A-32: Post-Test Driver Dummy Window View**





**Figure A-33: Pre-Test Driver Dummy and Vehicle Interior View**



**Figure A-34: Post-Test Driver Dummy and Vehicle Interior View**





Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings



Figure A-36: Post-Test Driver's Seat Fore-Aft Markings





**Figure A-37: Pre-Test View of Belt Anchorage for Driver Dummy**



**Figure A-38: Post-Test View of Belt Anchorage for Driver Dummy**



**Figure A-39: Pre-Test Driver Dummy Feet**



**Figure A-40: Post-Test Driver Dummy Feet**





**Figure A-41: Pre-Test Driver's Side Knee Bolster**



**Figure A-42: Post-Test Driver's Side Knee Bolster**



**Figure A-43: Pre-Test Driver's Side Floorpan**



**Figure A-44: Post-Test Driver's Side Floorpan**





**Figure A-45: Post-Test Driver Dummy Face**



**Figure A-46: Post-Test Driver Dummy Contact With Airbag**



**Figure A-47: Post-Test Driver Dummy Contact With Headrest**

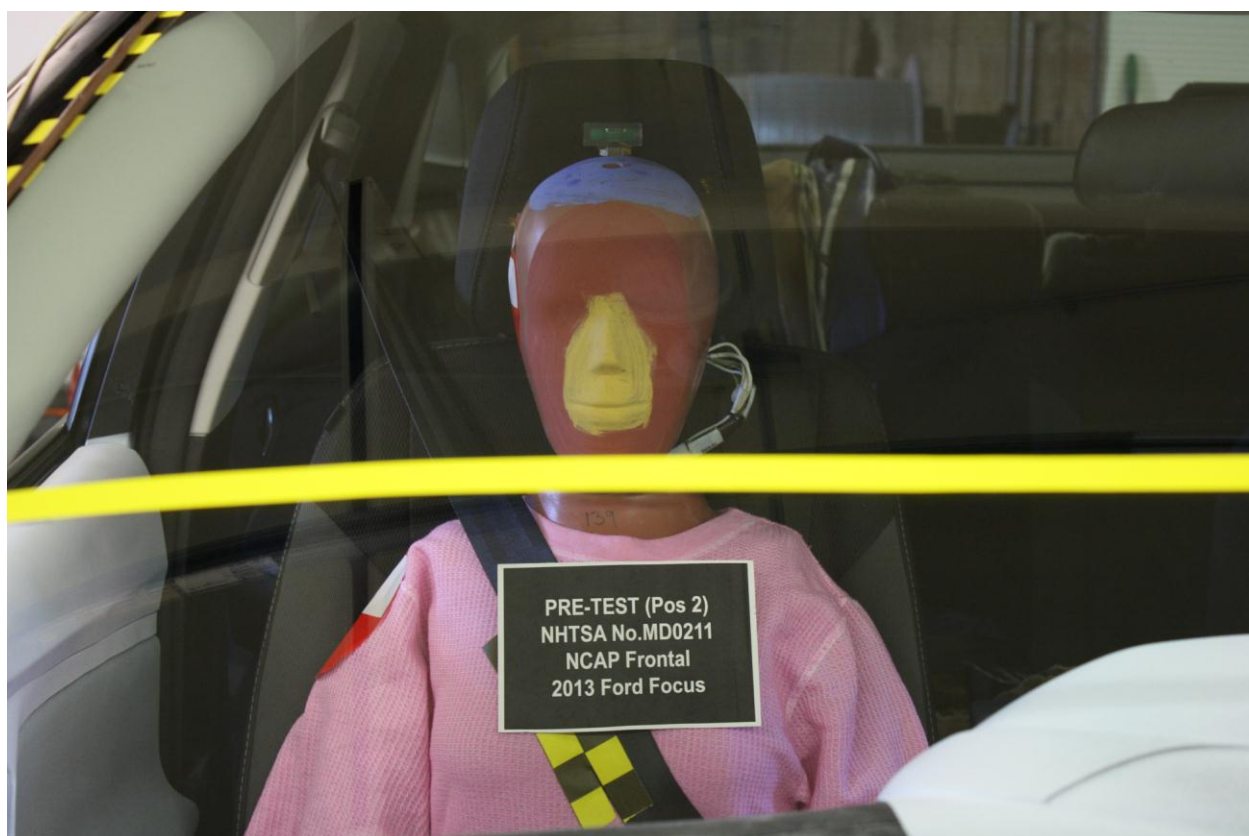


**Figure A-48: Pre-Test View of the Steering Wheel**





**Figure A-49: Post-Test View of the Steering Wheel**



**Figure A-50: Pre-Test Passenger Dummy Front View**



**Figure A-51: Post-Test Passenger Dummy Front View**



**Figure A-52: Pre-Test Passenger Dummy Window View**





**Figure A-53: Post-Test Passenger Dummy Window View**



**Figure A-54: Pre-Test Passenger Dummy and Vehicle Interior View**





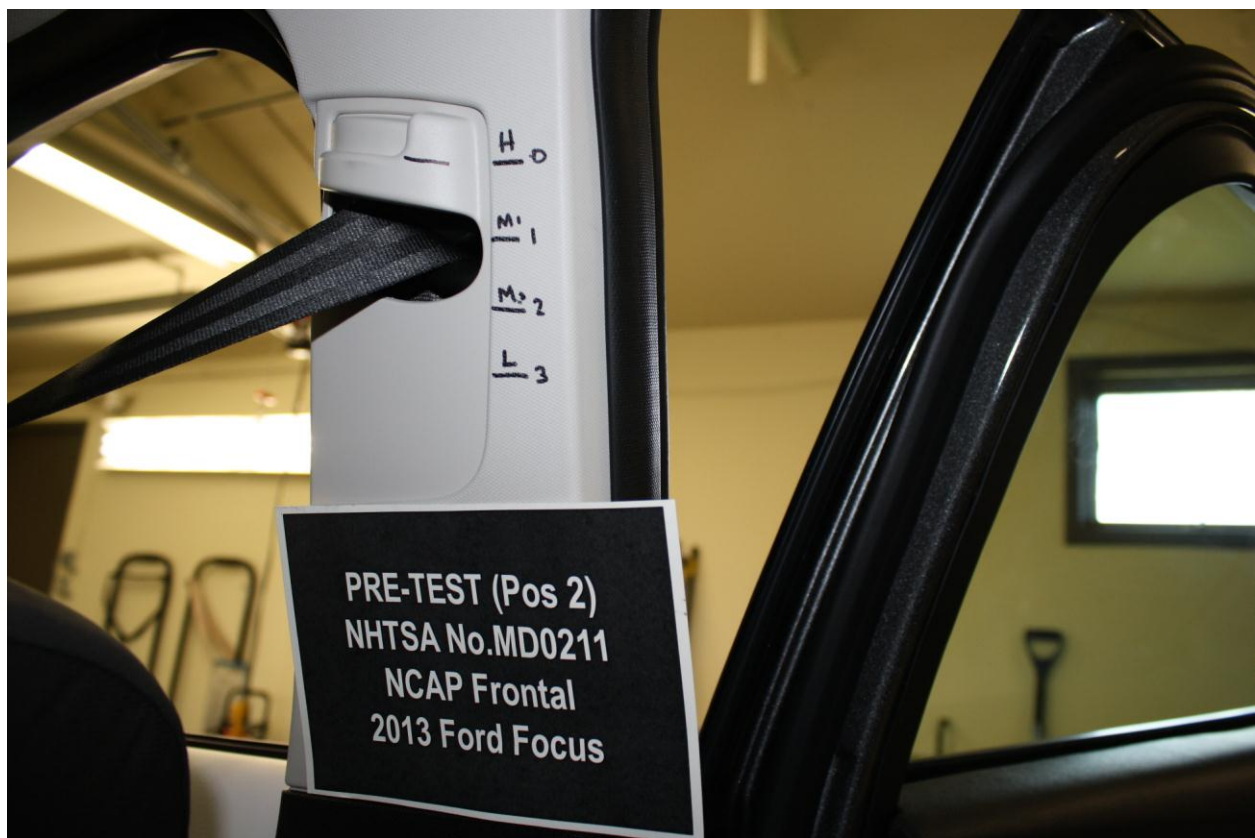
**Figure A-55: Post-Test Passenger Dummy and Vehicle Interior View**



**Figure A-56: Pre-Test Passenger's Seat Fore-Aft Markings**



**Figure A-57: Post-Test Passenger's Seat Fore-Aft Markings**



**Figure A-58: Pre-Test View of Belt Anchorage for Passenger Dummy**





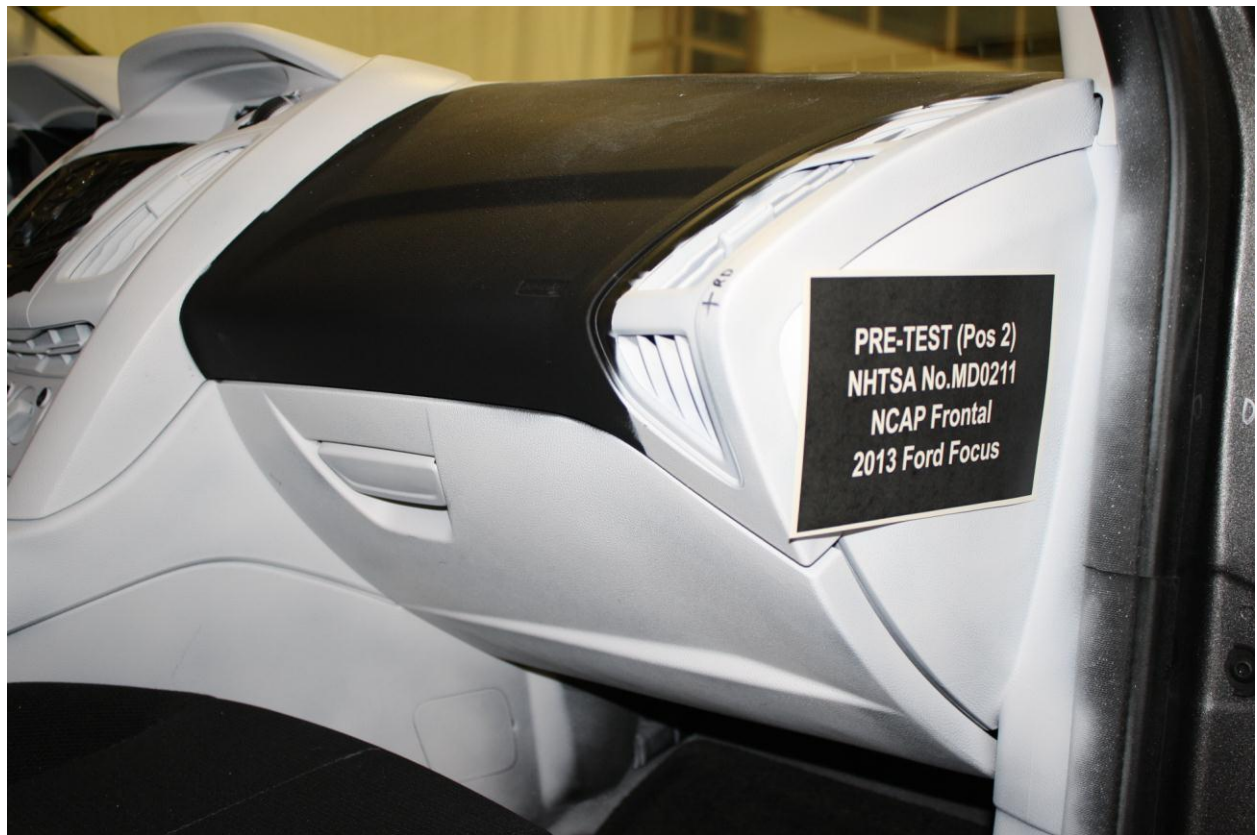
**Figure A-59: Post-Test View of Belt Anchorage for Passenger Dummy**



**Figure A-60: Pre-Test Passenger Dummy Feet**



**Figure A-61: Post-Test Passenger Dummy Feet**



**Figure A-62: Pre-Test Passenger's Side Knee Bolster**





**Figure A-63: Post-Test Passenger's Side Knee Bolster**



**Figure A-64: Pre-Test Passenger's Side Floorpan**





**Figure A-65: Post-Test Passenger's Side Floorpan**



**Figure A-66: Post-Test Passenger Dummy Contact With Airbag**



**Figure A-66a: Post-Test Passenger Dummy Contact With Headrest**



**Figure A-66b: Post-Test Passenger Dummy Contact With Glovebox**





**Figure A-67: Photograph of Ballast Installed in Vehicle**

**Photo Not Applicable**

**Figure A-68: Post-Test Stoddard Solvent Spillage Location View, If Required**





**Figure A-69: Post-Test Speed Trap Read-Out**



**Figure A-70: Vehicle at 0° on Static Rollover Device**



**Figure A-71: Vehicle at 90° on Static Rollover Device**



**Figure A-72: Vehicle at 180° on Static Rollover Device**





**Figure A-73: Vehicle at 270° on Static Rollover Device**



**Figure A-74: Vehicle at 360° on Static Rollover Device**





Figure A-75: 2013 Ford Focus Frontal Impact Event

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                |  |                                                                                                                                                                                                        |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Go Further</b><br>ford.com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>VEHICLE DESCRIPTION</b><br><b>FOCUS</b><br>2013 4-DOOR SEDAN SE<br>5-PASSENGER<br>2.0L I4 GDI ENGINE<br>6-SPD AUTO TRANSMISSION                                                                                                                                                                                            |  | <b>DL 111238</b><br><b>EXTERIOR</b><br>STERLING GRAY METALLIC<br><b>INTERIOR</b><br>CHARCOAL BLACK CLOTH SEATS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | <b>EPA DOT Fuel Economy and Environment</b><br><b>Gasoline Vehicle</b><br><b>Fuel Economy</b><br><b>31 MPG</b><br>combined city/hwy<br>27 city<br>38 highway<br>3.2 gallons per 100 miles<br>Compacts range from 14 to 60 MPG. The best vehicle rates 112 MPG. |  | <b>You save \$3,100</b><br>in fuel costs over 5 years compared to the average new vehicle.                                                                                                             |  |
| <b>STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE</b><br><b>EXTERIOR</b><br>• 16" ALLOY PANTED WHEELS<br>• HALOGEN HEADLAMPS<br><b>INTERIOR</b><br>• DRIVER SEAT 4-WAY MANUAL<br>• MANUAL PASS SEAT - 2-WAY<br>• 2ND ROW FOLD FLAT SEATING<br>• AIR CONDITIONING<br>• AUXILIARY AUDIO INPUT JACK<br>• CENTER CONSOLE W/ARMREST<br>• CRUISE CONTROL/TILT WHEEL<br>• DUAL SUNVISORS<br>• FRONT FLOOR MATS<br>• ILLUMINATED ENTRY<br>• TILT/TELESCOPE STR COLUMN<br>• 1-TOUCH DOWN DRIVER WINDOW<br><b>FUNCTIONAL</b><br>• AM/FM SINGLE CD/MP3, 6SPKR<br>• ADVANCETRAC W/ESC<br>• EASY FUEL CAPLESS FILLER<br>• FRONT DISC REAR DRUM BRAKES (ABS)<br>• COMPASS/TEMP/TRIP COMPUTER<br>• DOME LAMP & MAP LIGHTS<br>• MIRRORS - POWER OPERATED, MANUAL FOLDING, BLACK<br>• REAR WINDOW DEFROSTER<br>• 12V POWERPOINT<br>• POWER WINDOWS & LOCKS<br>• SYNC W/ MYFORD<br>• VARIABLE INTERVAL WIPERS<br><b>SAFETY/SECURITY</b><br>• DRIVER/PASSENGER AIR BAGS<br>• SIDE AIR BAGS/CURTAINS<br>• LATCH CHILD SAFETY SYSTEM<br>• MYKEY<br>• REMOTE KEYLESS ENTRY<br>• SECURILOCK PASS ANTI THEFT<br><b>WARRANTY</b><br>• 3YR/36,000 BUMPER-TO-BUMPER<br>• 5YR/60,000 POWERTRAIN<br>• 5YR/60,000 ROADSIDE ASSIST |  | <b>INCLUDED ON THIS VEHICLE</b><br><b>EQUIPMENT GROUP 300A</b><br>6-SPD AUTO TRANSMISSION<br>80 STATE EMISSIONS<br>PZEV EMISSIONS<br>1,095.00<br>NO CHARGE<br>NO CHARGE<br><b>PRICE INFORMATION</b><br>BASE PRICE \$18,200.00<br>TOTAL OPTIONS 1,095.00<br>TOTAL VEHICLE & OPTIONS DESTINATION & DELIVERY 19,295.00<br>795.00 |  | <b>GOVERNMENT 5-STAR SAFETY RATINGS</b><br><b>Overall Vehicle Score</b> Not Rated<br>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.<br><b>Frontal Crash</b> Driver Not Rated, Passenger Not Rated<br>Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.<br><b>Side Crash</b> Front seat Not Rated, Rear seat Not Rated<br>Based on the risk of injury in a side impact.<br><b>Rollover</b> ★★★★★<br>Based on the risk of rollover in a single-vehicle crash. Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).<br><a href="http://www.safercar.gov">www.safercar.gov</a> or 1-888-327-4236 |  | <b>IIHS Ratings</b><br><b>Top Safety Pick Award Winner</b><br>Frontal Offset GOOD<br>Side Impact GOOD<br>Rear Impact GOOD<br>Roof Strength GOOD<br>The Institute rates vehicles Good, Acceptable, Marginal, or Poor based on performance.                      |  |                                                                                                                                                                                                        |  |
| SOLD TO: Farrello Ford/Lincoln<br>2472 Corning Road<br>Elkhart KY 46505<br>BHP TO: (if printed leave blank)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 13H 529<br>RAMP ONE<br><b>RA43</b><br>RAMP TWO<br>FINAL ASSEMBLY PLANT<br><b>MICHIGAN</b><br>METHOD OF TRANSIT<br><b>RAIL</b><br>ITEM #1: 13-2000 O/T 2<br>CH042 N RA 2X 315 000314 08 04 12                                                                                                                                  |  | <b>TOTAL MSRP \$20,090.00</b><br>This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | <b>fueleconomy.gov</b><br>Calculate personalized estimates and compare vehicles<br><b>1-800-935-3333</b><br>1A0P3F23DL111238                                                                                                                                   |  | Scan this code to experience this vehicle or text 1FDL111238 to 48028 or Visit <a href="http://ford.com/windowstickler">ford.com/windowstickler</a><br>Standard messaging & data plan rates may apply. |  |

Figure A-76: Monroney Label Photograph

**APPENDIX B**

**DUMMY RESPONSE DATA TRACES**

## TABLE OF DATA PLOTS

### Driver & Passenger Dummy Instrumentation Plots

| Fig. | Description                                             | Page |
|------|---------------------------------------------------------|------|
| 1    | Driver Head X Acceleration vs. Time Primary             | B-5  |
| 2    | Driver Head Y Acceleration vs. Time Primary             | B-5  |
| 3    | Driver Head Z Acceleration vs. Time Primary             | B-6  |
| 4    | Driver Head Resultant Acceleration vs. Time Primary     | B-6  |
| 5    | Driver Chest X Deflection vs. Time                      | B-7  |
| 6    | Driver Chest X Acceleration vs. Time Primary            | B-7  |
| 7    | Driver Chest Y Acceleration vs. Time Primary            | B-8  |
| 8    | Driver Chest Z Acceleration vs. Time Primary            | B-8  |
| 9    | Driver Chest Resultant Acceleration vs. Time Primary    | B-9  |
| 10   | Driver Upper Neck Force X vs. Time Primary              | B-9  |
| 11   | Driver Upper Neck Force Z vs. Time Primary              | B-10 |
| 12   | Driver Upper Neck Moment Y vs. Time Primary             | B-10 |
| 13   | Driver Nij vs. Time Primary                             | B-11 |
| 14   | Driver Left Femur Force vs. Time                        | B-11 |
| 15   | Driver Right Femur Force vs. Time                       | B-12 |
| 16   | Passenger Head X Acceleration vs. Time Primary          | B-12 |
| 17   | Passenger Head Y Acceleration vs. Time Primary          | B-13 |
| 18   | Passenger Head Z Acceleration vs. Time Primary          | B-13 |
| 19   | Passenger Head Resultant Acceleration vs. Time Primary  | B-14 |
| 20   | Passenger Chest X Deflection vs. Time                   | B-14 |
| 21   | Passenger Chest X Acceleration vs. Time Primary         | B-15 |
| 22   | Passenger Chest Y Acceleration vs. Time Primary         | B-15 |
| 23   | Passenger Chest Z Acceleration vs. Time Primary         | B-16 |
| 24   | Passenger Chest Resultant Acceleration vs. Time Primary | B-16 |
| 25   | Passenger Upper Neck Force X vs. Time Primary           | B-17 |
| 26   | Passenger Upper Neck Force Z vs. Time Primary           | B-17 |
| 27   | Passenger Upper Neck Moment Y vs. Time Primary          | B-18 |
| 28   | Passenger Nij vs. Time Primary                          | B-18 |
| 29   | Passenger Left Femur Force vs. Time                     | B-19 |
| 30   | Passenger Right Femur Force vs. Time                    | B-19 |



The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

#### **Additional Driver Dummy Instrumentation Data**

Driver Head X Acceleration Redundant  
Driver Head Y Acceleration Redundant  
Driver Head Z Acceleration Redundant  
Driver Upper Neck Force Y  
Driver Upper Neck Moment X  
Driver Upper Neck Moment Z  
Driver Chest X Acceleration Redundant  
Driver Chest Y Acceleration Redundant  
Driver Chest Z Acceleration Redundant  
Driver Pelvis X  
Driver Pelvis Y  
Driver Pelvis Z  
Driver Left Femur Redundant  
Driver Right Femur Redundant  
Driver Left Upper Tibia Moment X  
Driver Left Upper Tibia Moment Y  
Driver Left Upper Tibia Force Z  
Driver Left Lower Tibia Moment X  
Driver Left Lower Tibia Moment Y  
Driver Left Lower Tibia Force Z  
Driver Right Upper Tibia Moment X  
Driver Right Upper Tibia Moment Y  
Driver Right Upper Tibia Force Z  
Driver Right Lower Tibia Moment X  
Driver Right Lower Tibia Moment Y  
Driver Right Lower Tibia Force Z  
Driver Left Foot Fore Z  
Driver Left Foot Aft X  
Driver Left Foot Aft Z  
Driver Right Foot Fore Z  
Driver Right Foot Aft X  
Driver Right Foot Aft Z  
Driver Shoulder Belt Force  
Driver Lap Belt Force

#### **Additional Passenger Dummy Instrumentation Data**

Passenger Head X Acceleration Redundant  
Passenger Head Y Acceleration Redundant  
Passenger Head Z Acceleration Redundant  
Passenger Upper Neck Force X  
Passenger Upper Neck Force Z  
Passenger Upper Neck Moment Y  
Passenger Chest X Acceleration Redundant  
Passenger Chest Y Acceleration Redundant  
Passenger Chest Z Acceleration Redundant  
Passenger Pelvis X

## **Additional Passenger Dummy Instrumentation Data ... (continued)**

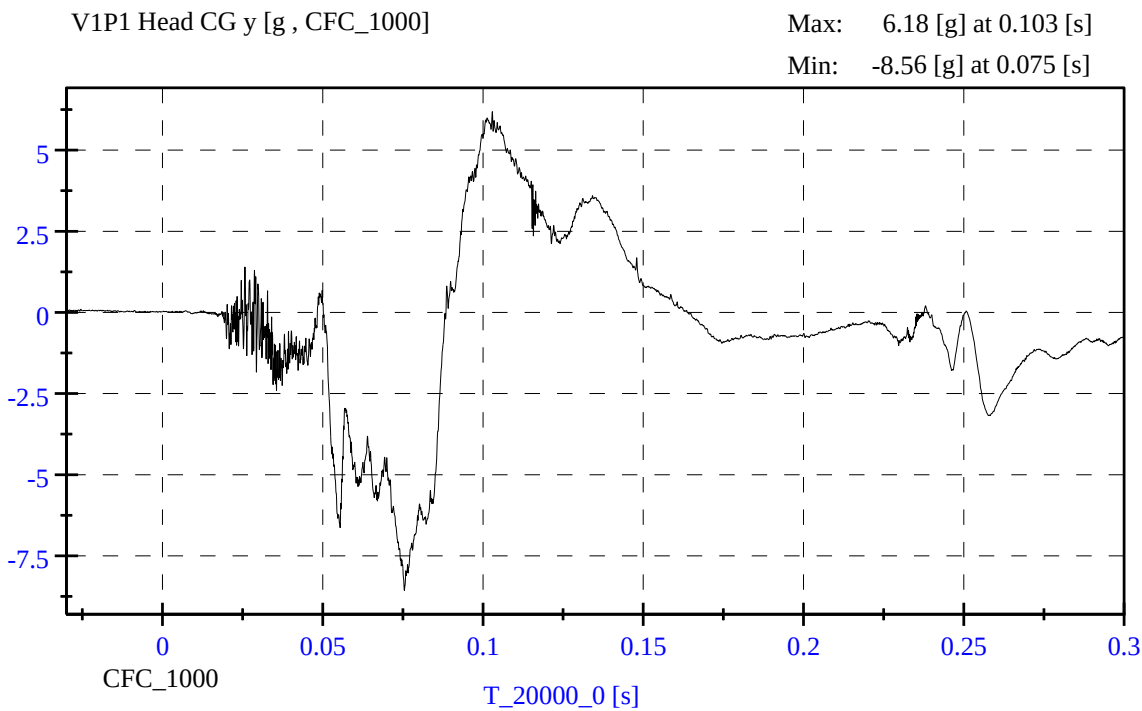
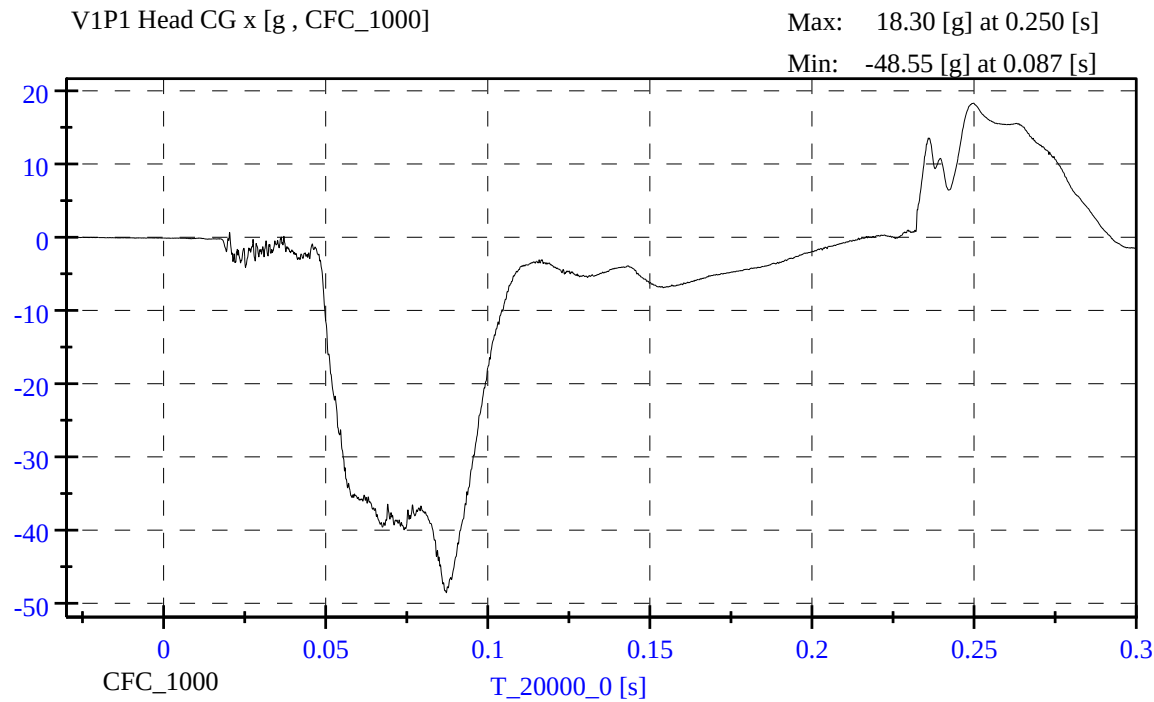
Passenger Pelvis Y  
Passenger Pelvis Z  
Passenger Left Femur Redundant  
Passenger Right Femur Redundant  
Passenger Left Upper Tibia Moment X  
Passenger Left Upper Tibia Moment Y  
Passenger Left Upper Tibia Force Z  
Passenger Left Lower Tibia Moment X  
Passenger Left Lower Tibia Moment Y  
Passenger Left Lower Tibia Force Z  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Right Upper Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower Tibia Moment Y  
Passenger Right Lower Tibia Force Z  
Passenger Left Foot Fore Z  
Passenger Left Foot Aft X  
Passenger Left Foot Aft Z  
Passenger Right Foot Fore Z  
Passenger Right Foot Aft X  
Passenger Right Foot Aft Z  
Passenger Shoulder Belt Force  
Passenger Lap Belt Force

### **Vehicle Instrumentation Data**

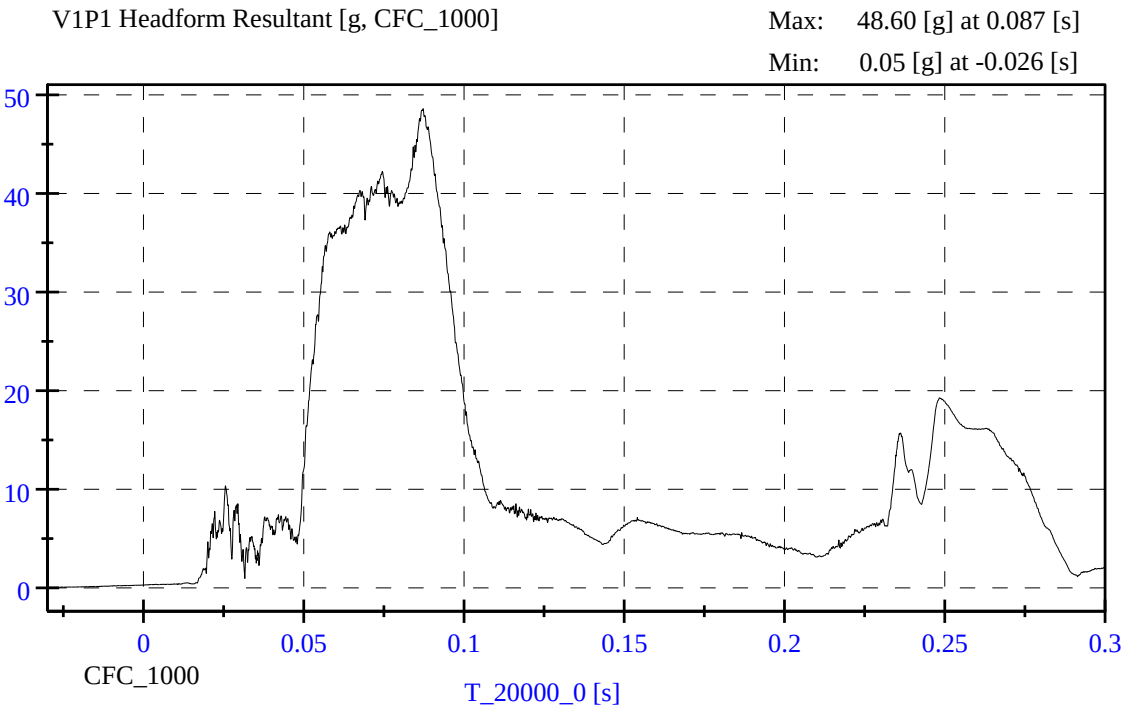
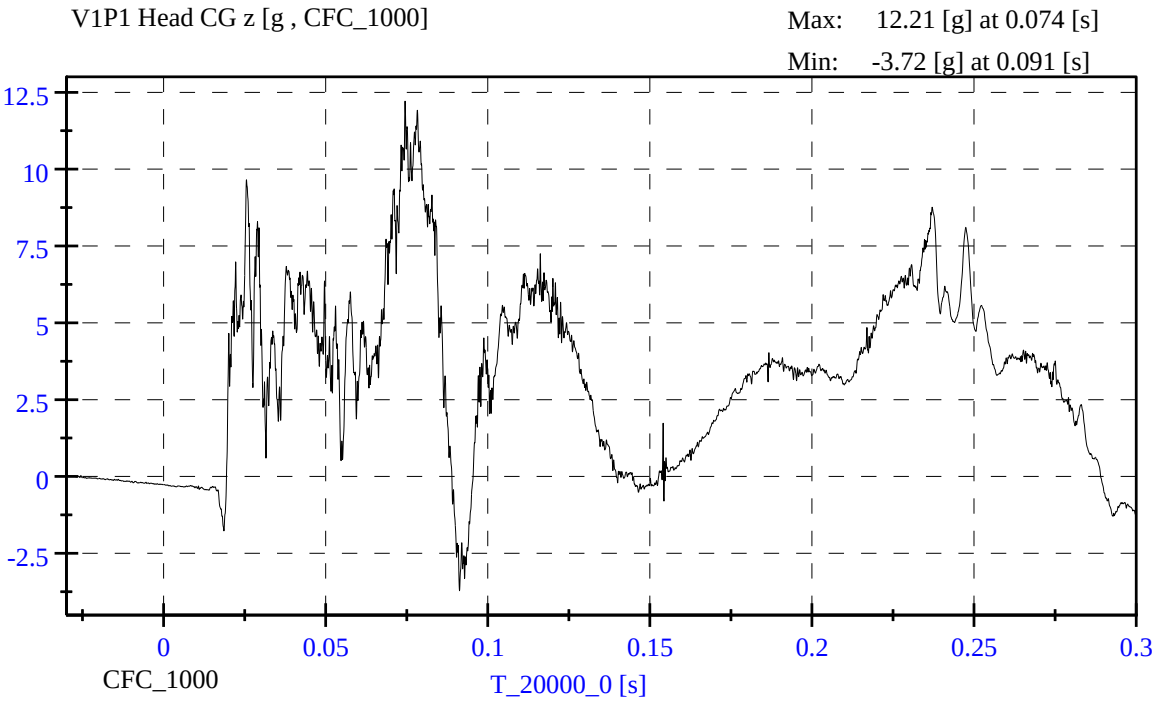
Left Rear Seat Crossmember X  
Left Rear Seat Crossmember Z  
Right Rear Seat Crossmember X  
Right Rear Seat Crossmember Z  
Left Rear Seat Crossmember X Redundant  
Right Rear Seat Crossmember X Redundant  
Vehicle Engine Top X  
Vehicle Engine Bottom X

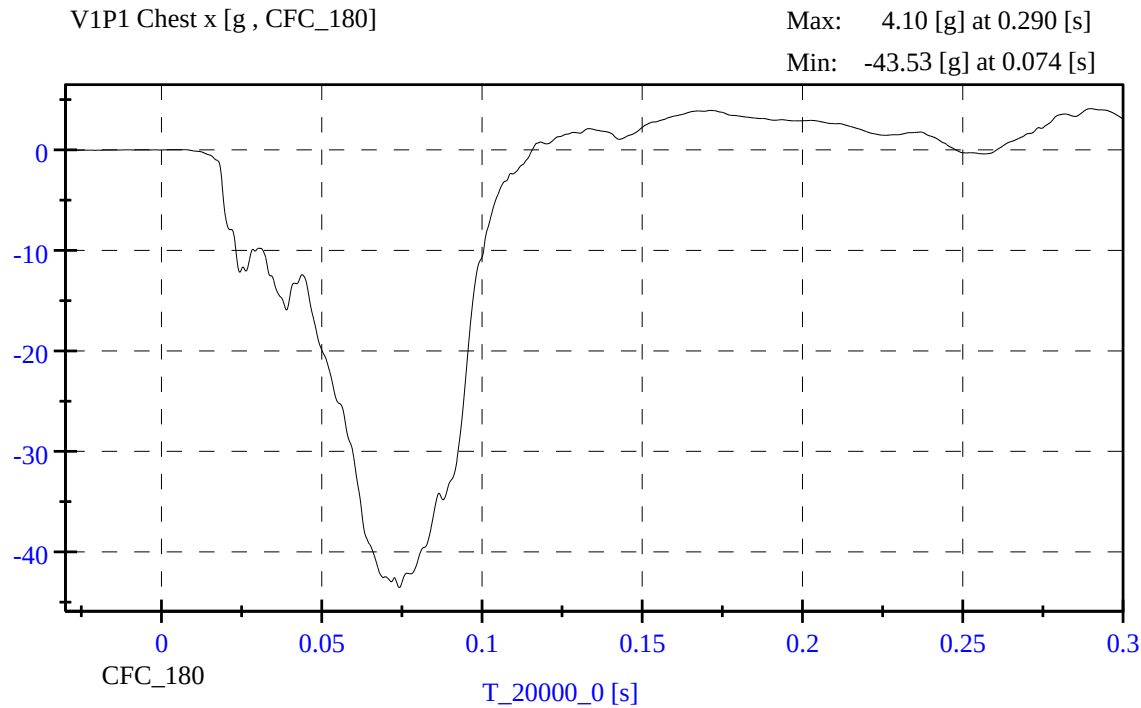
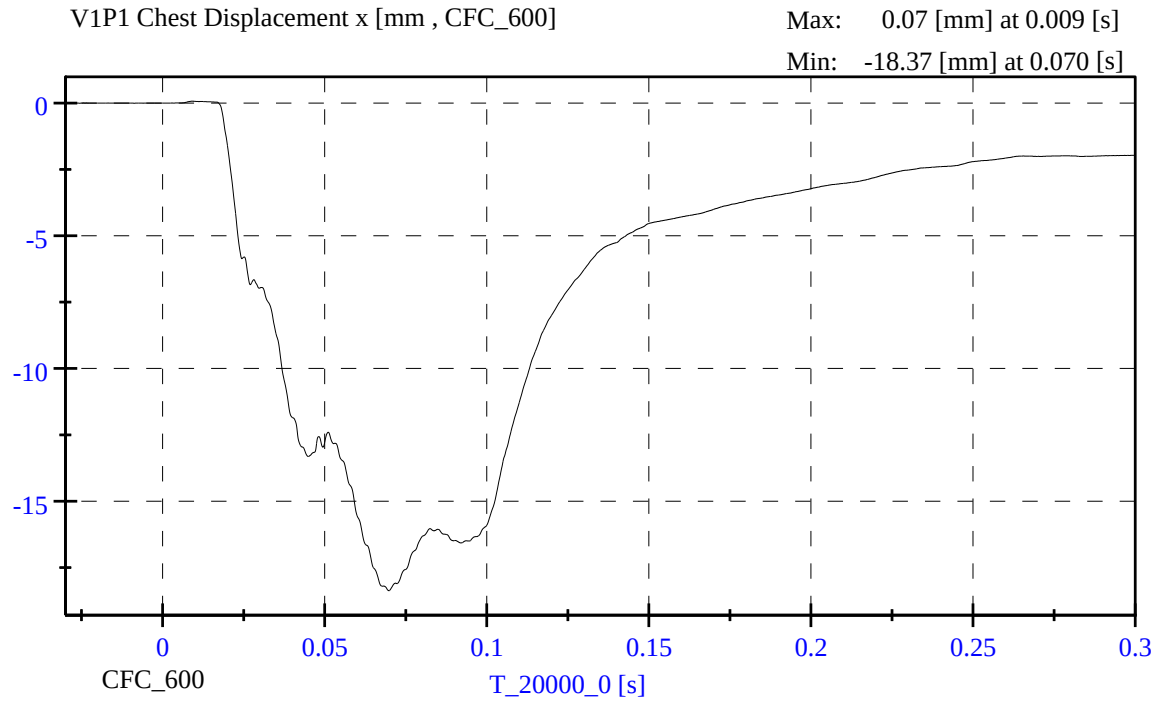
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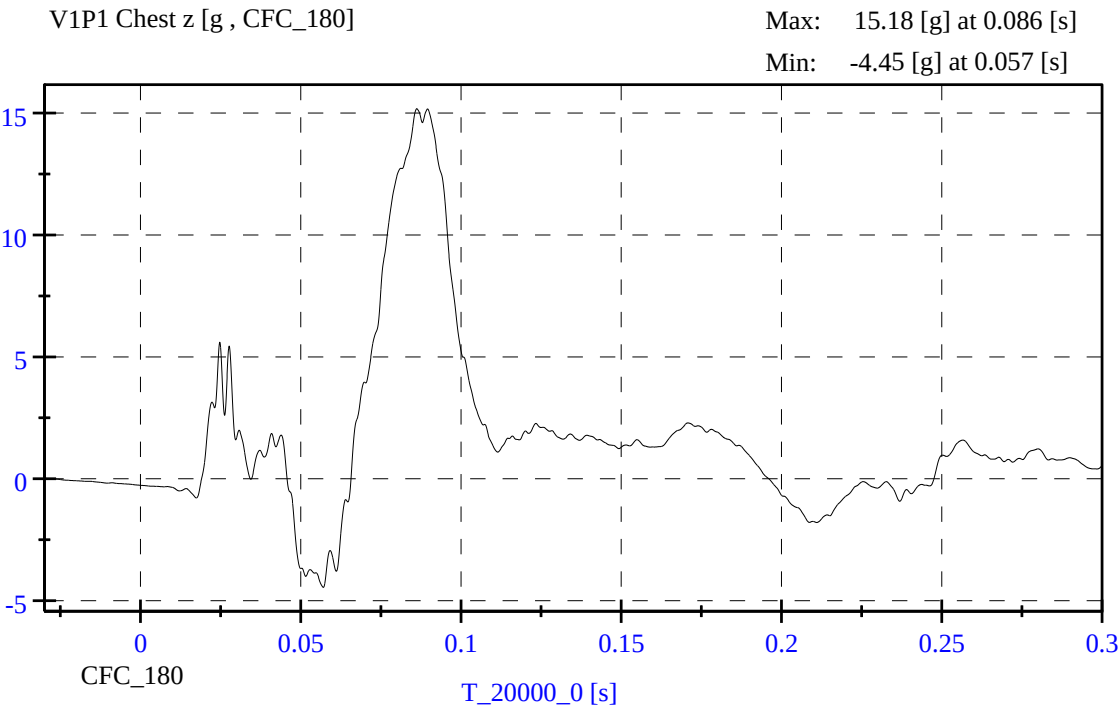
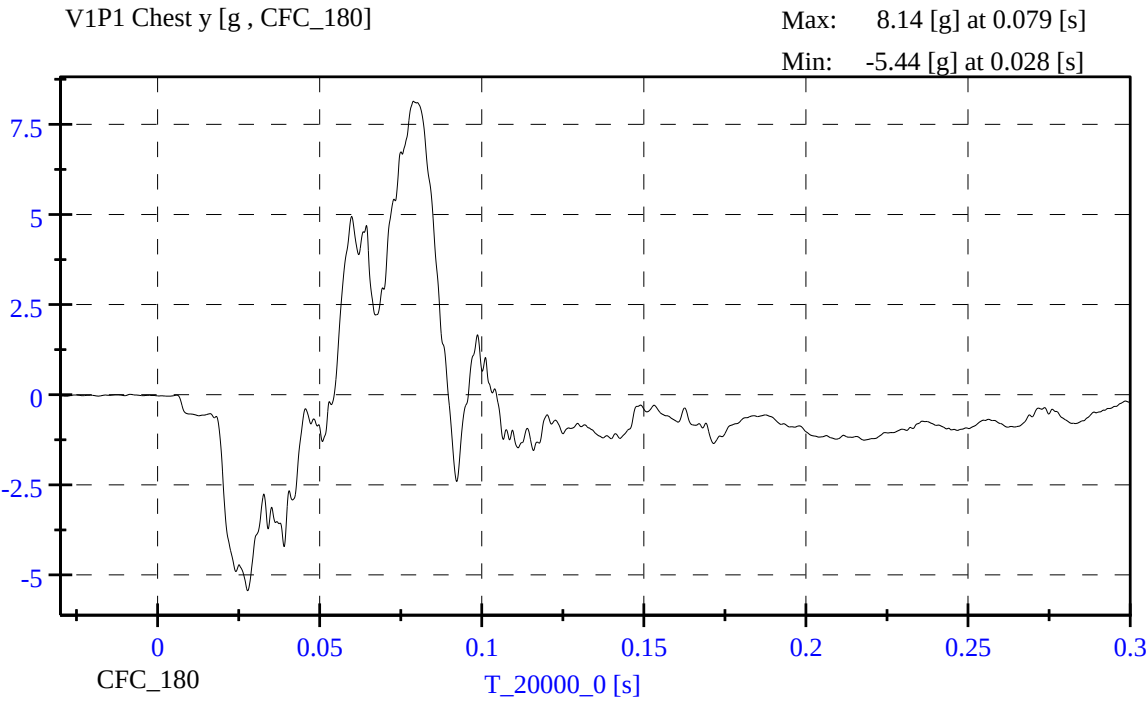
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Load Cell Barrier B1-A9  
Load Cell Barrier C1-A9  
Load Cell Barrier D1-A9



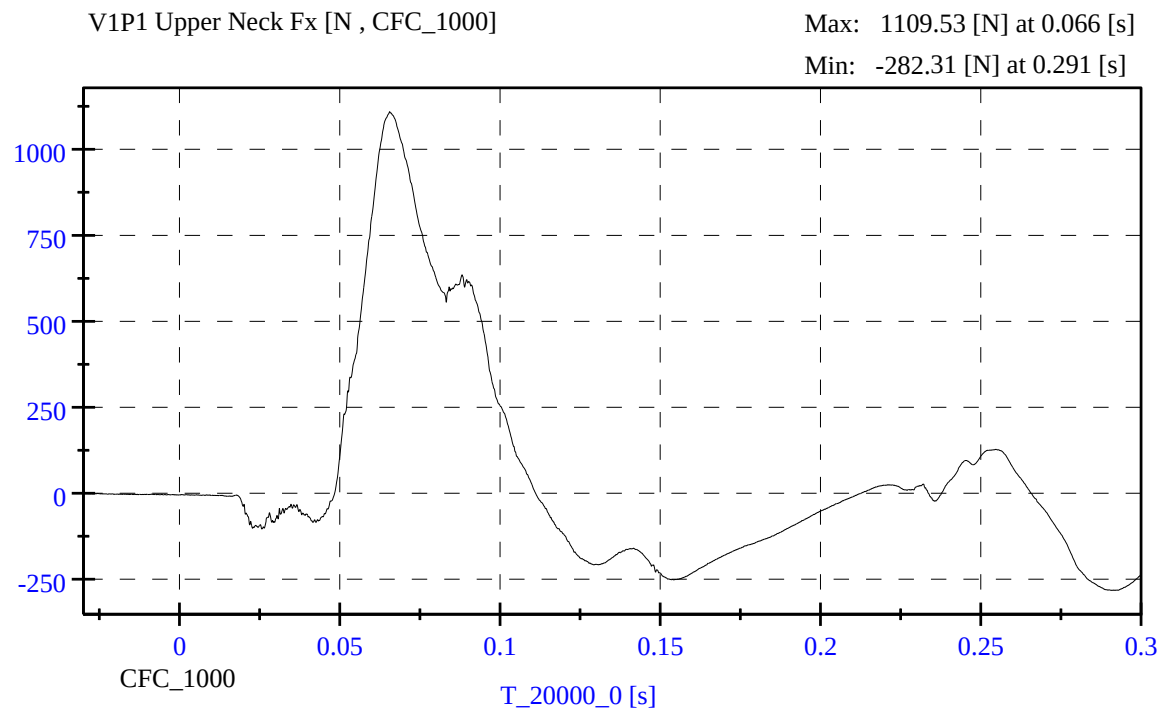
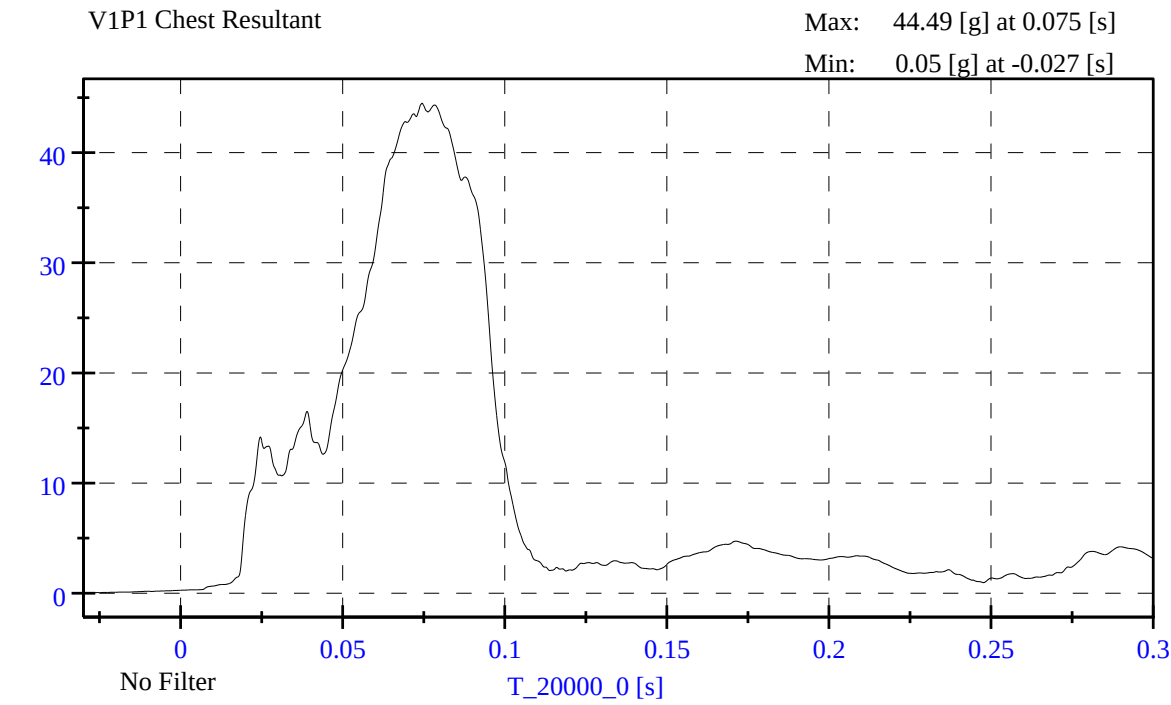


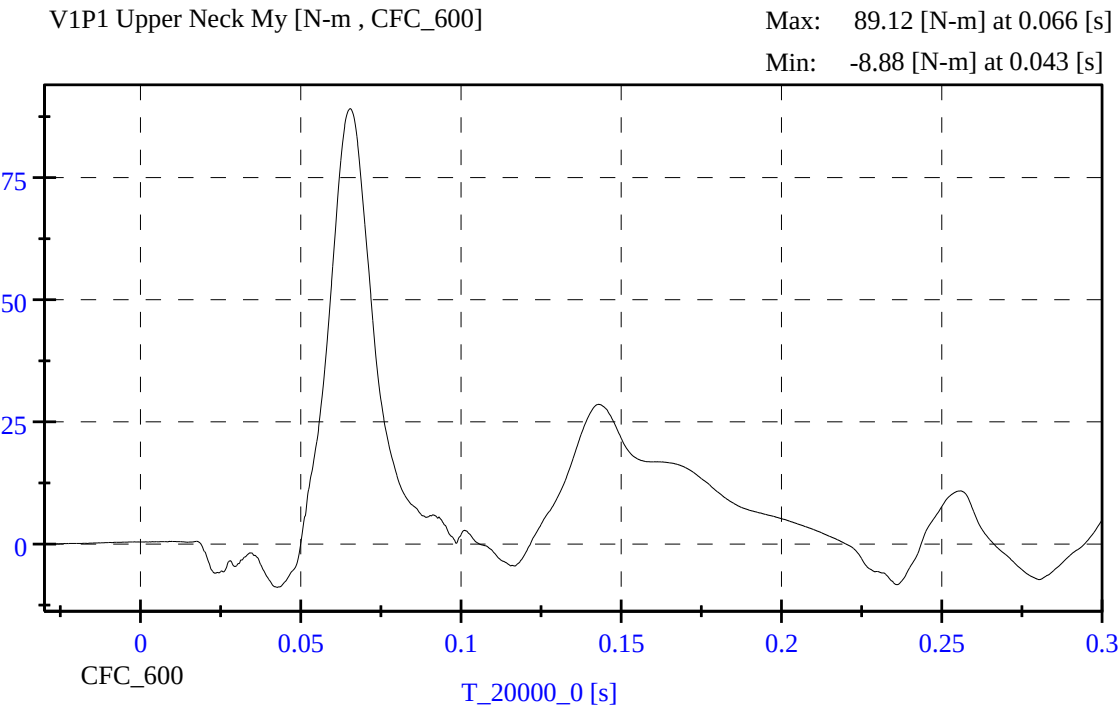
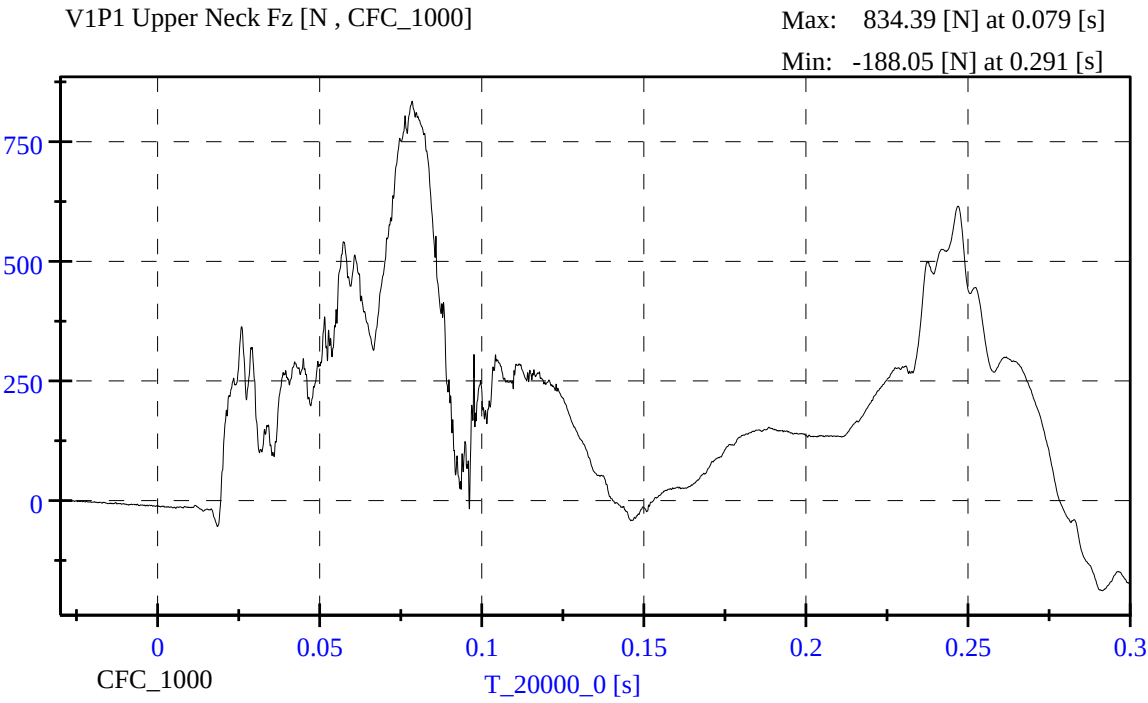


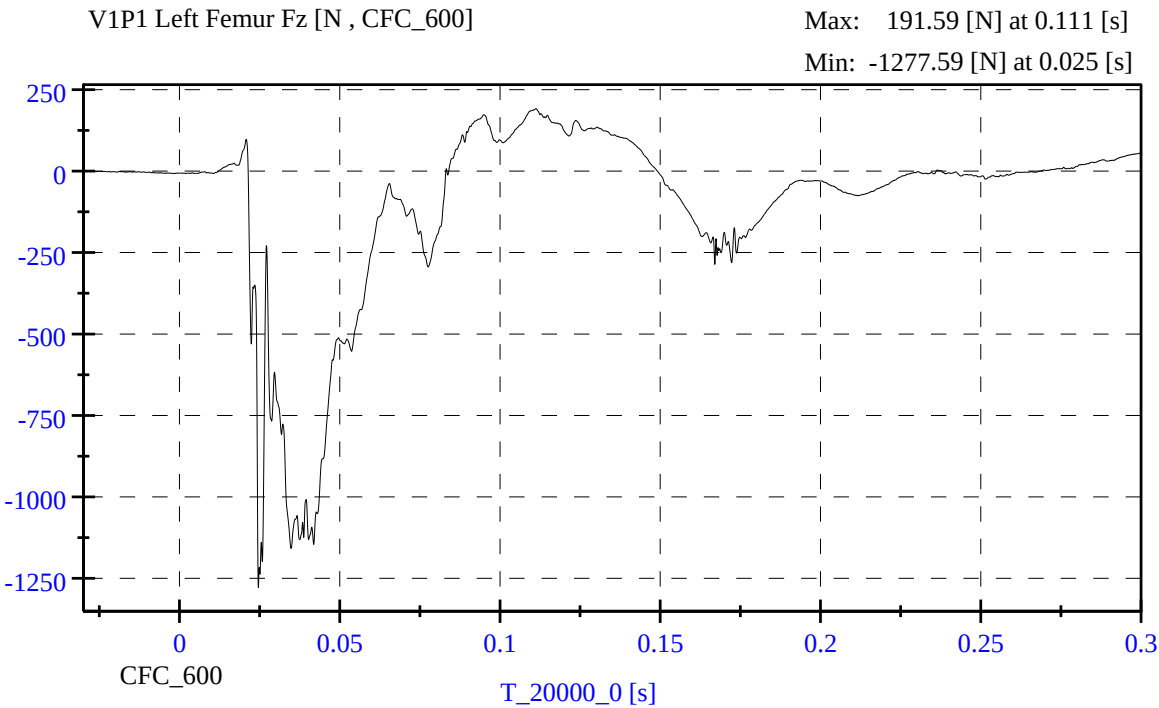
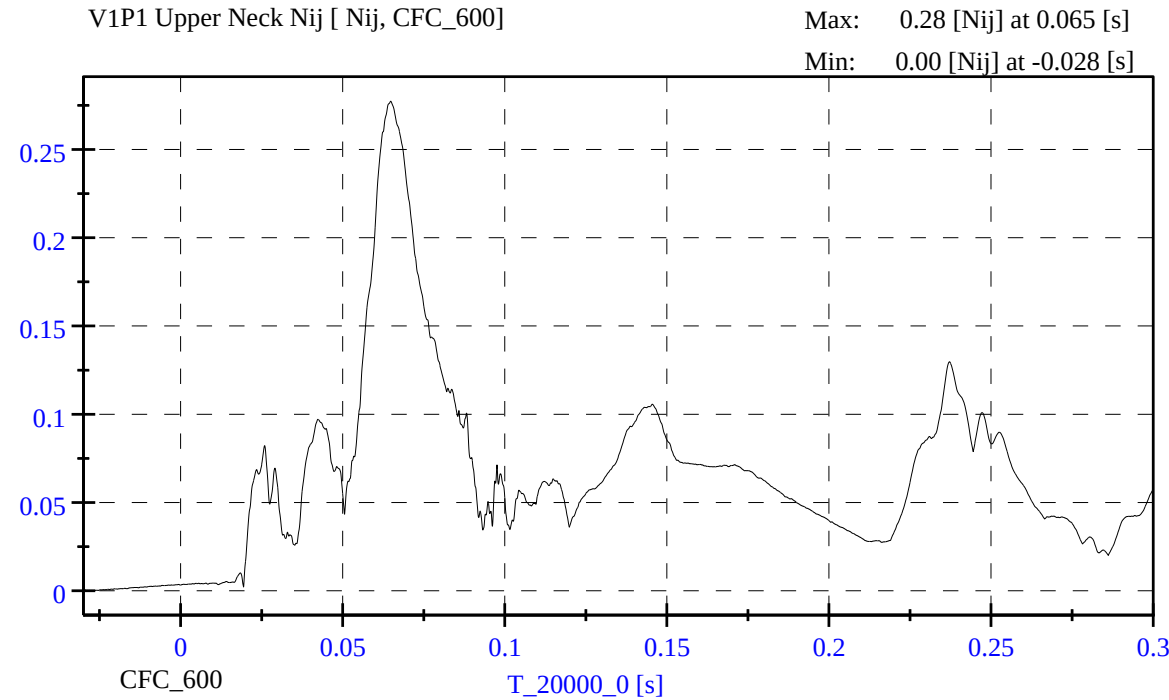




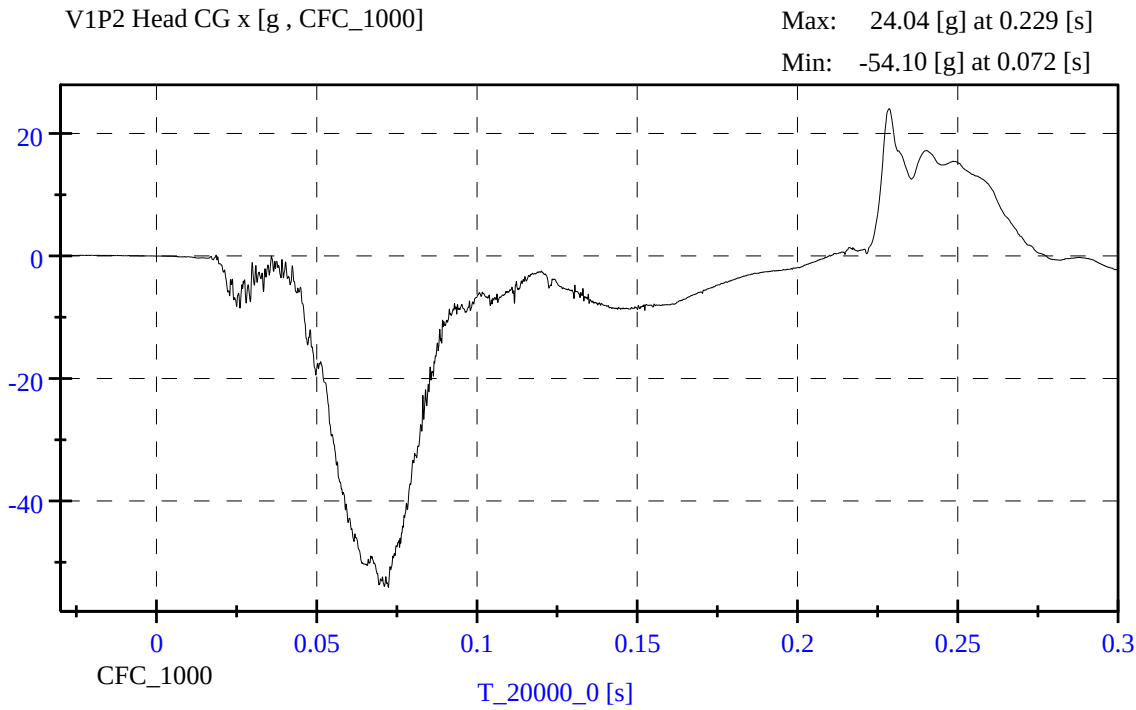
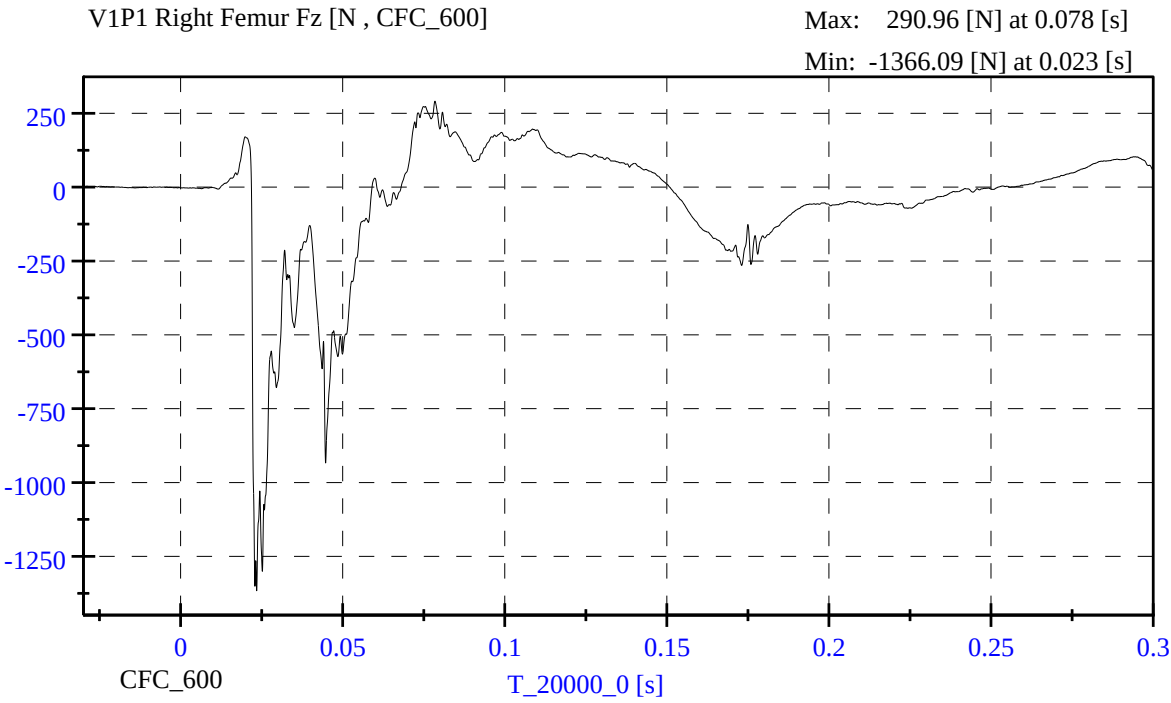


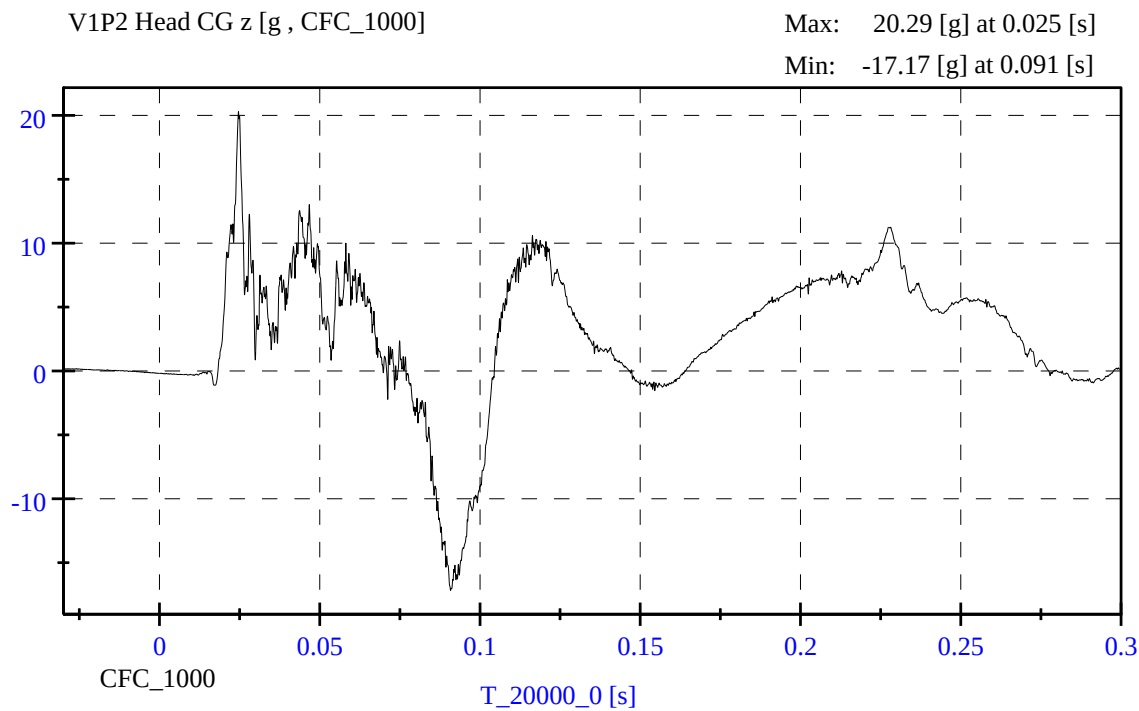
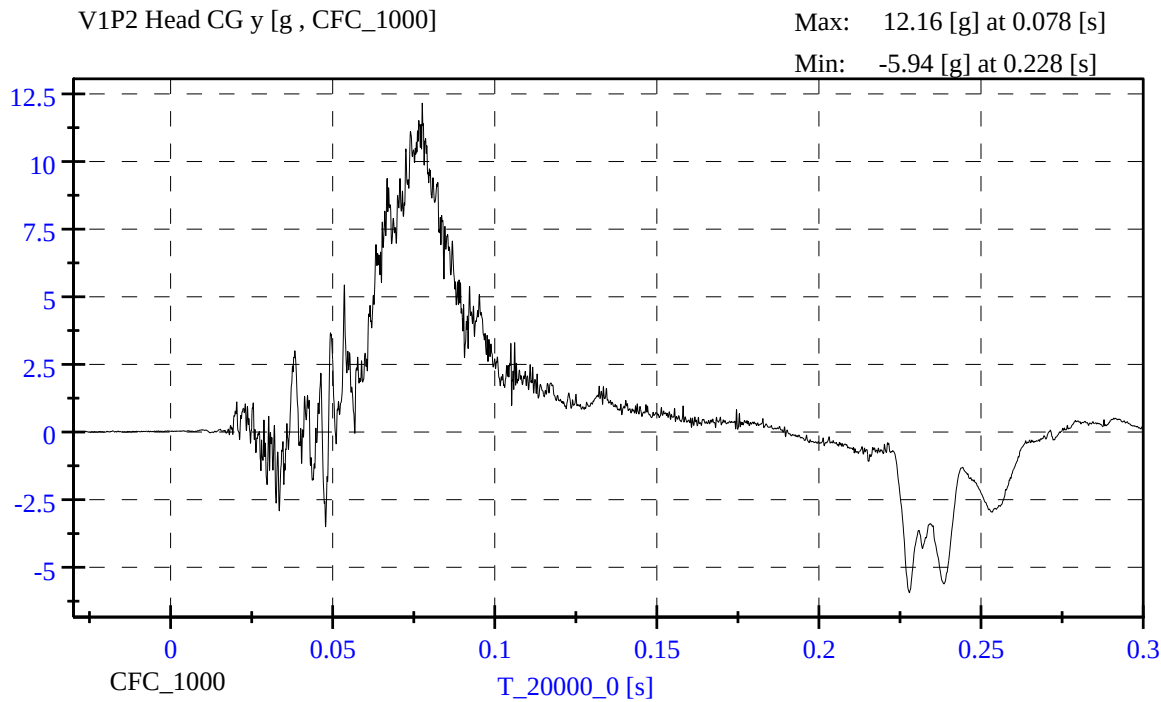


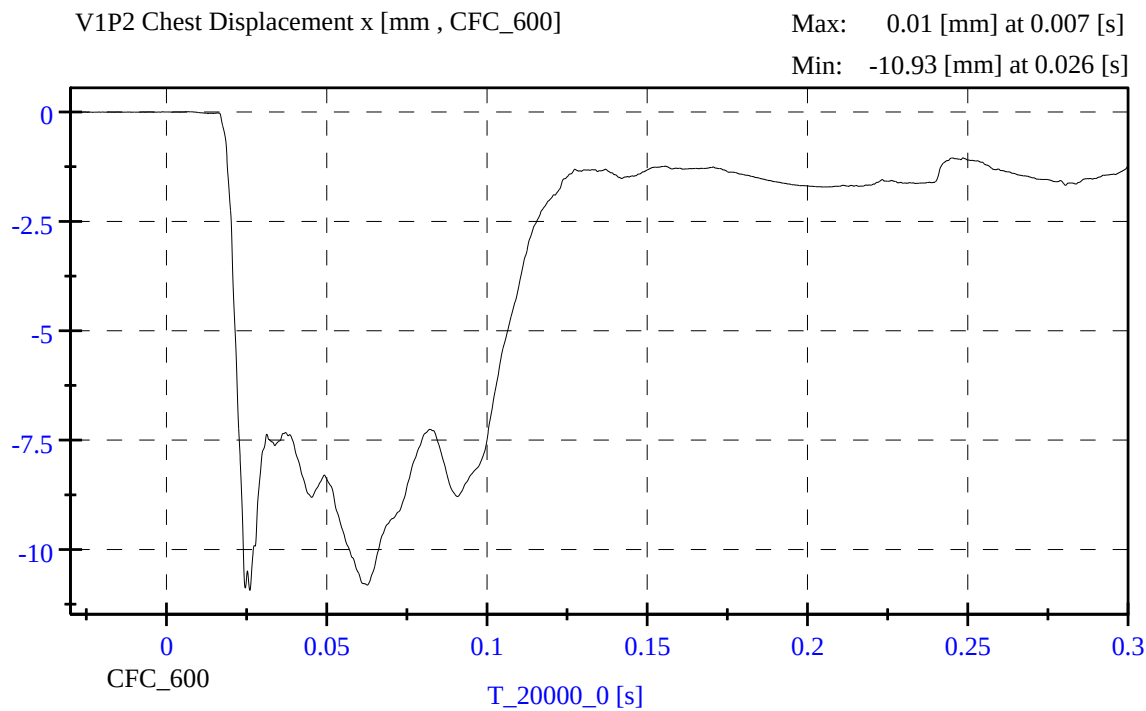
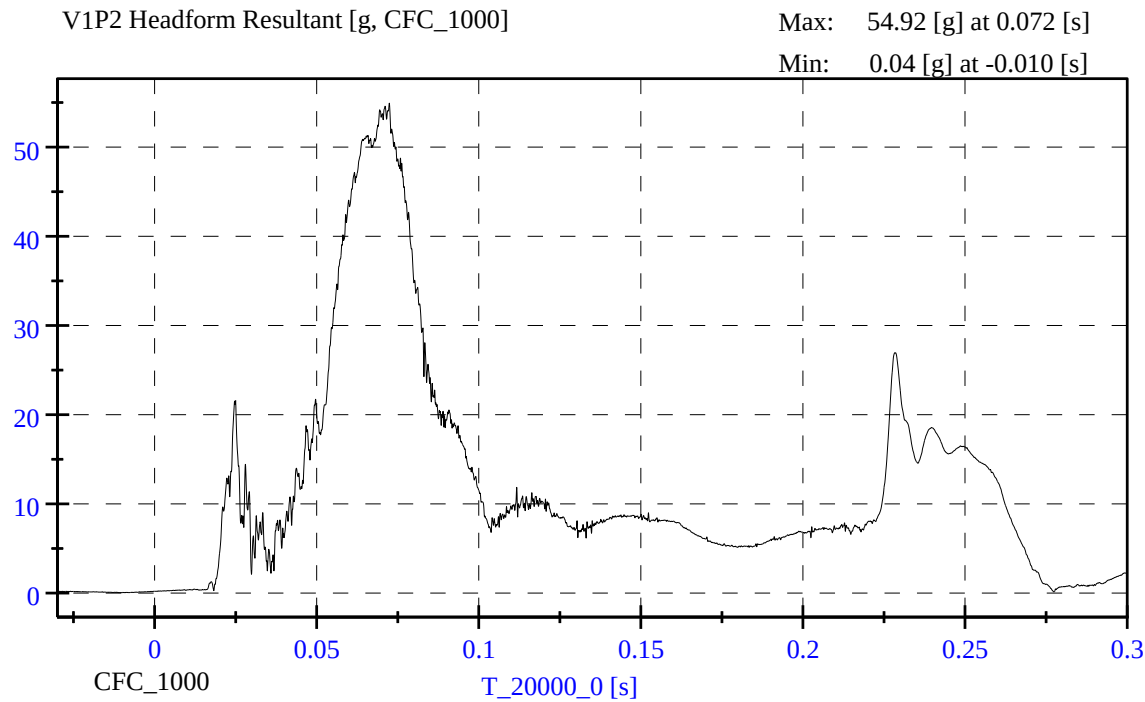




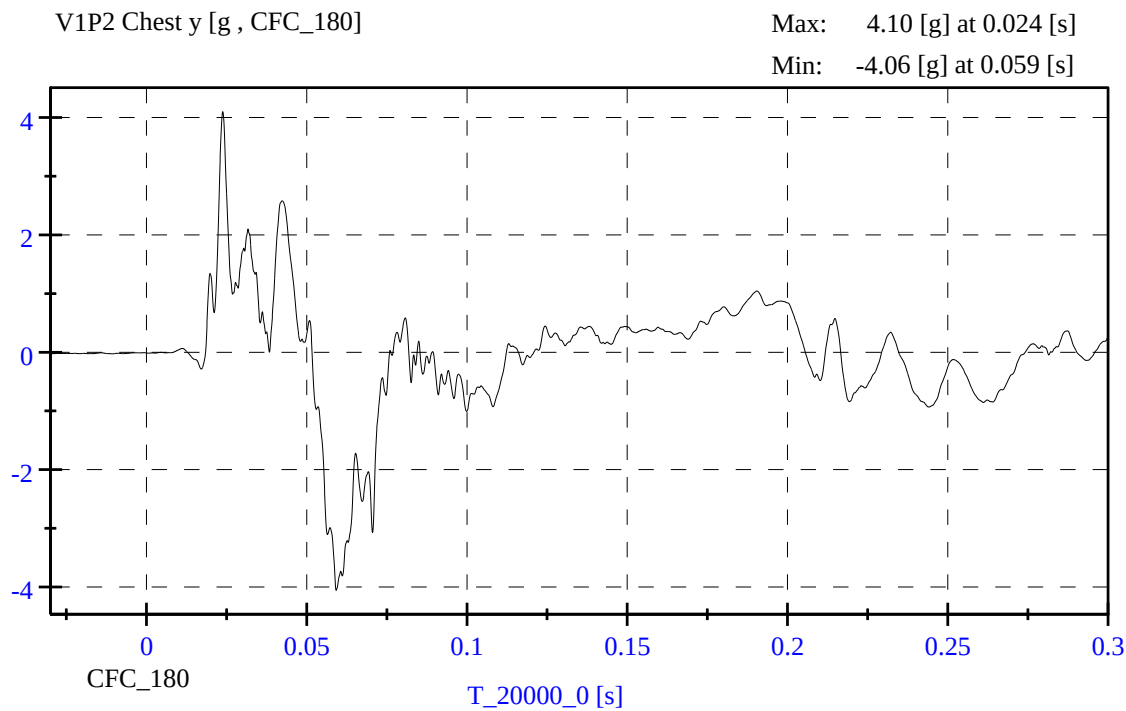
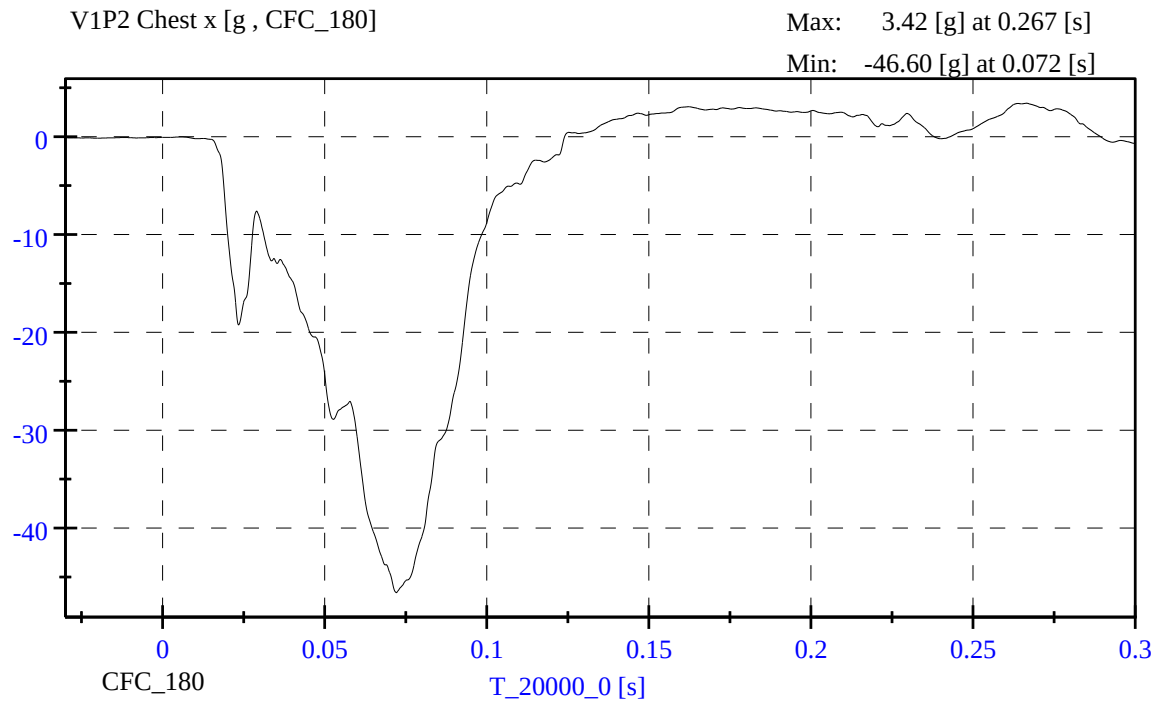


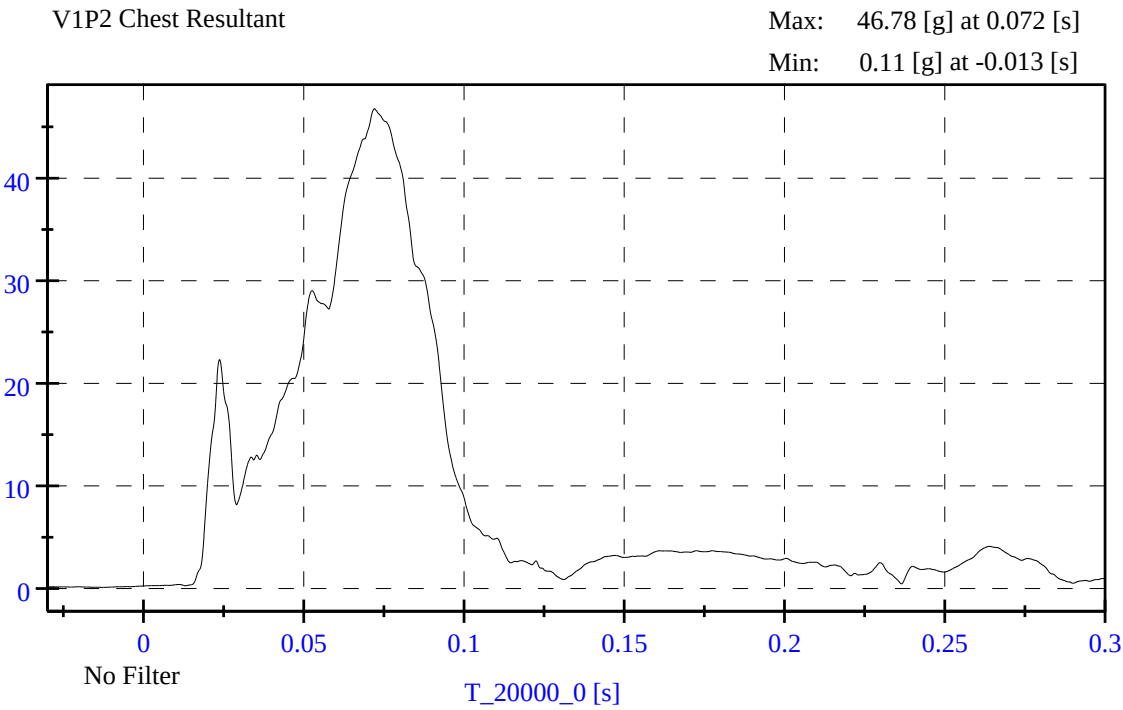
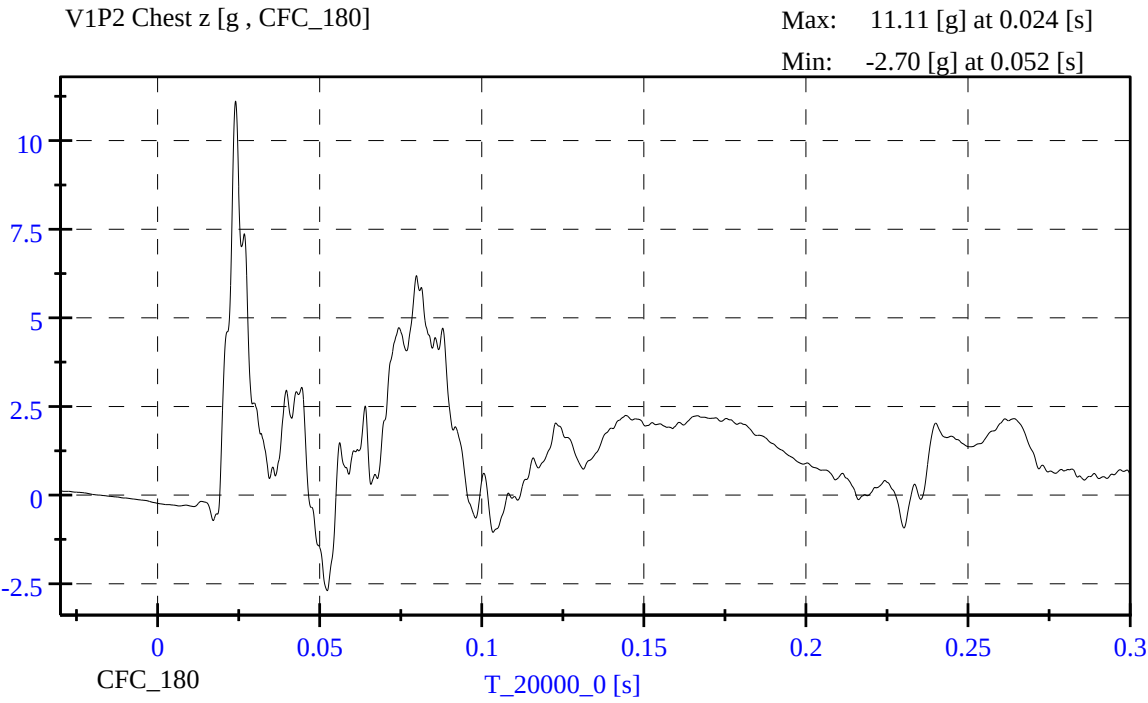


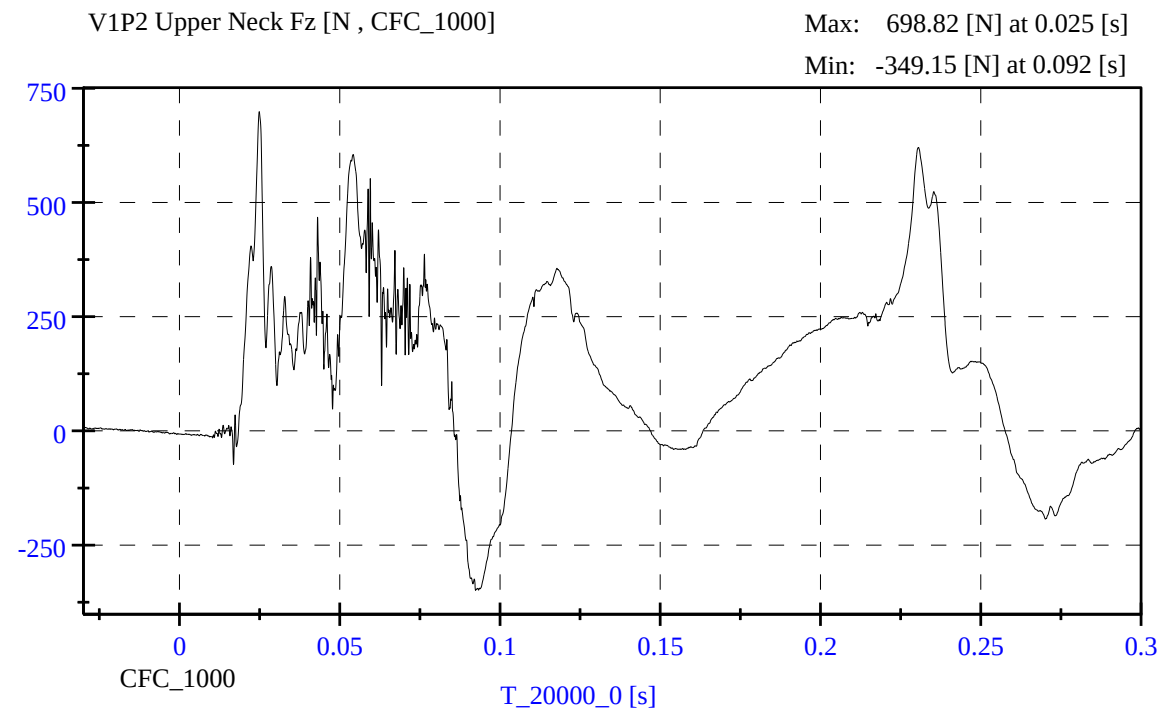
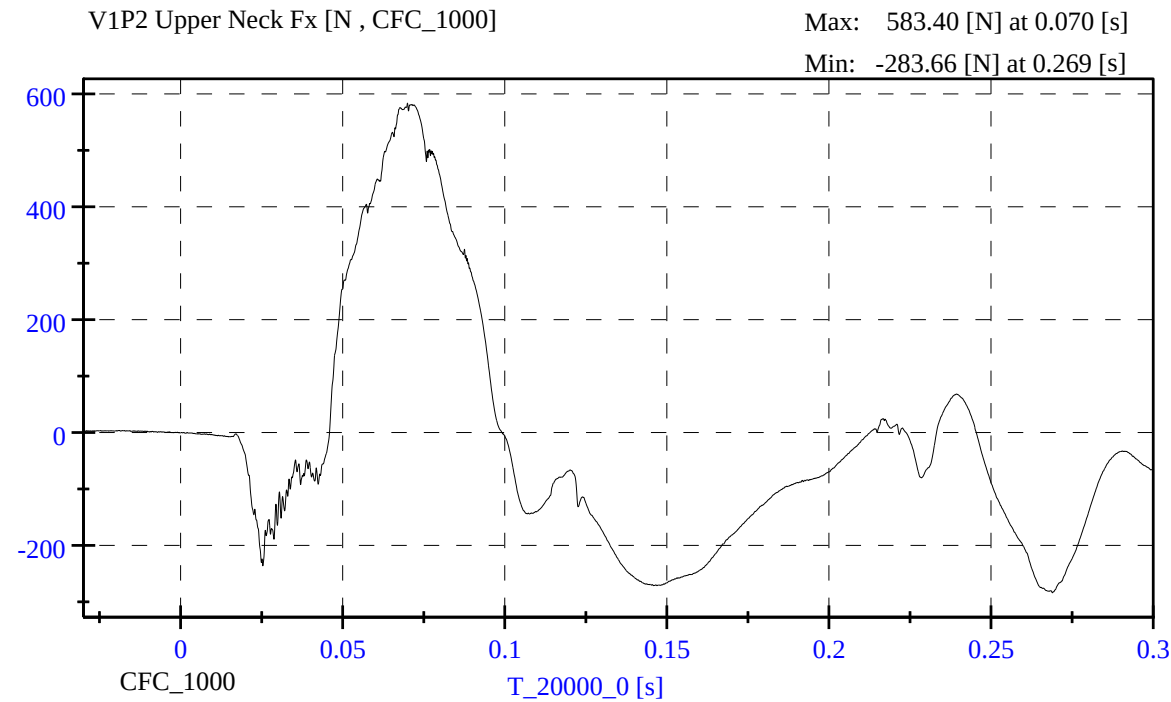




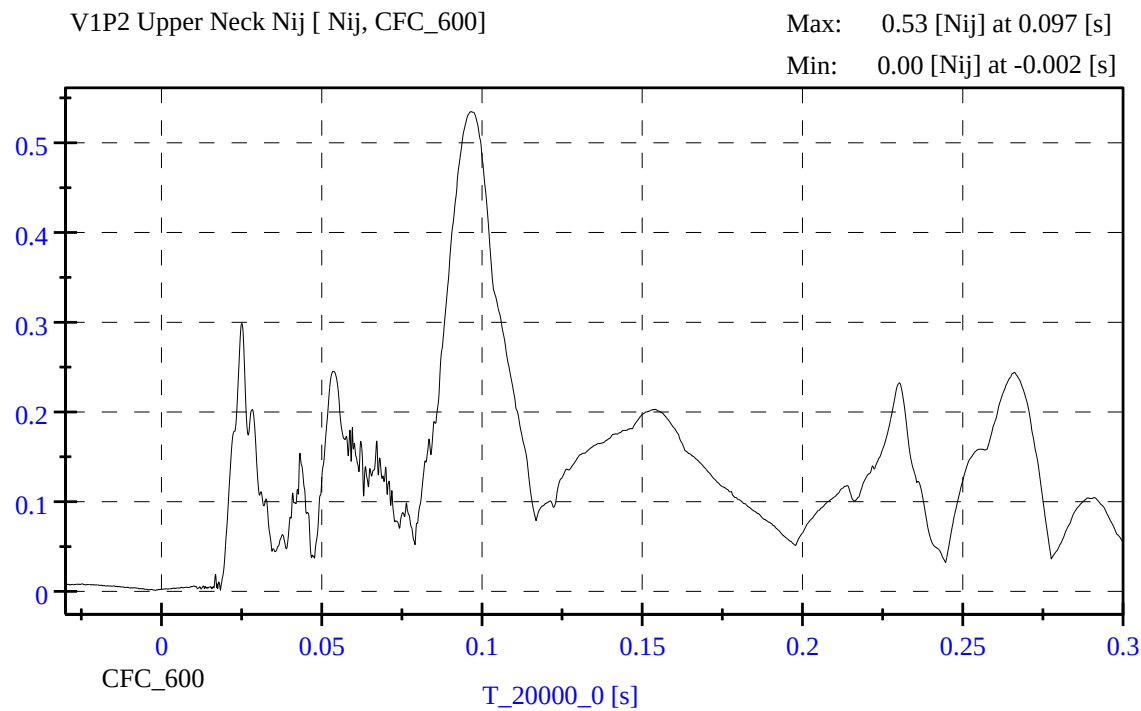
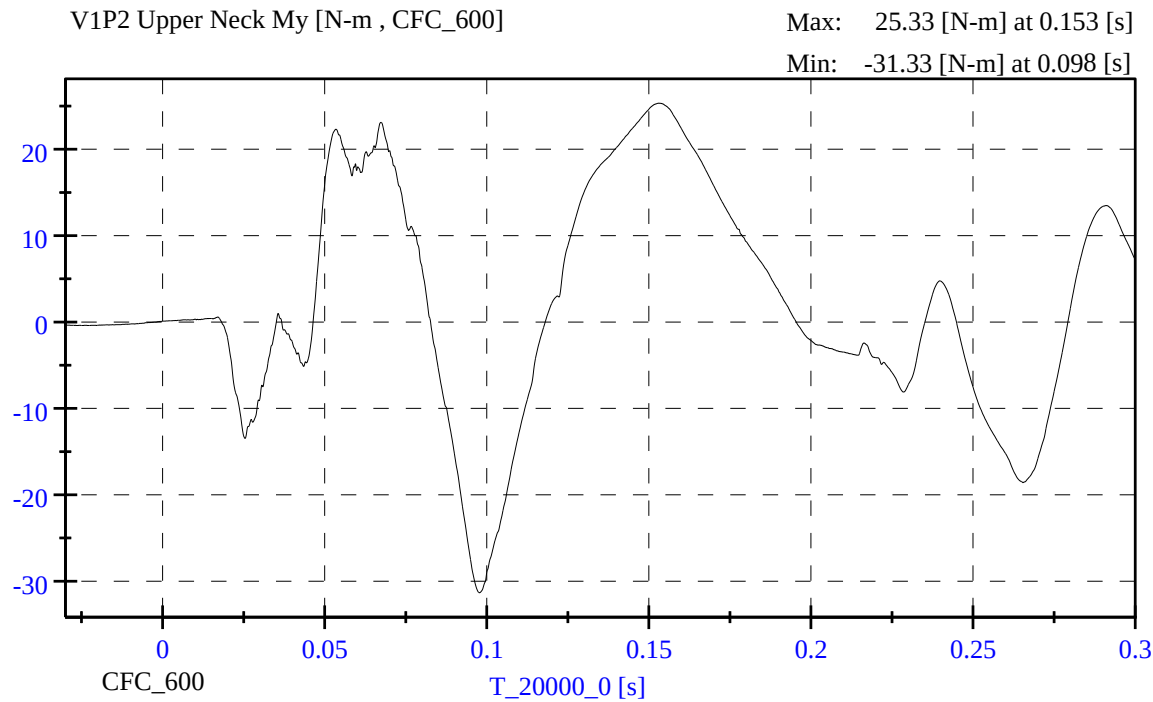


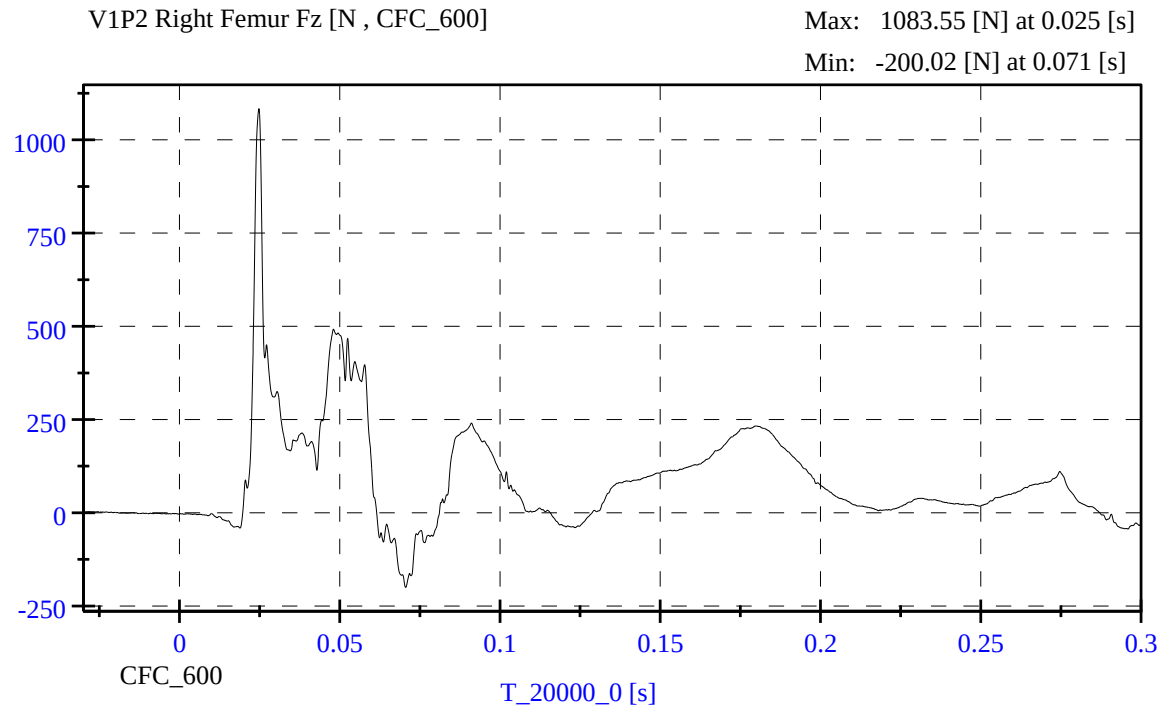
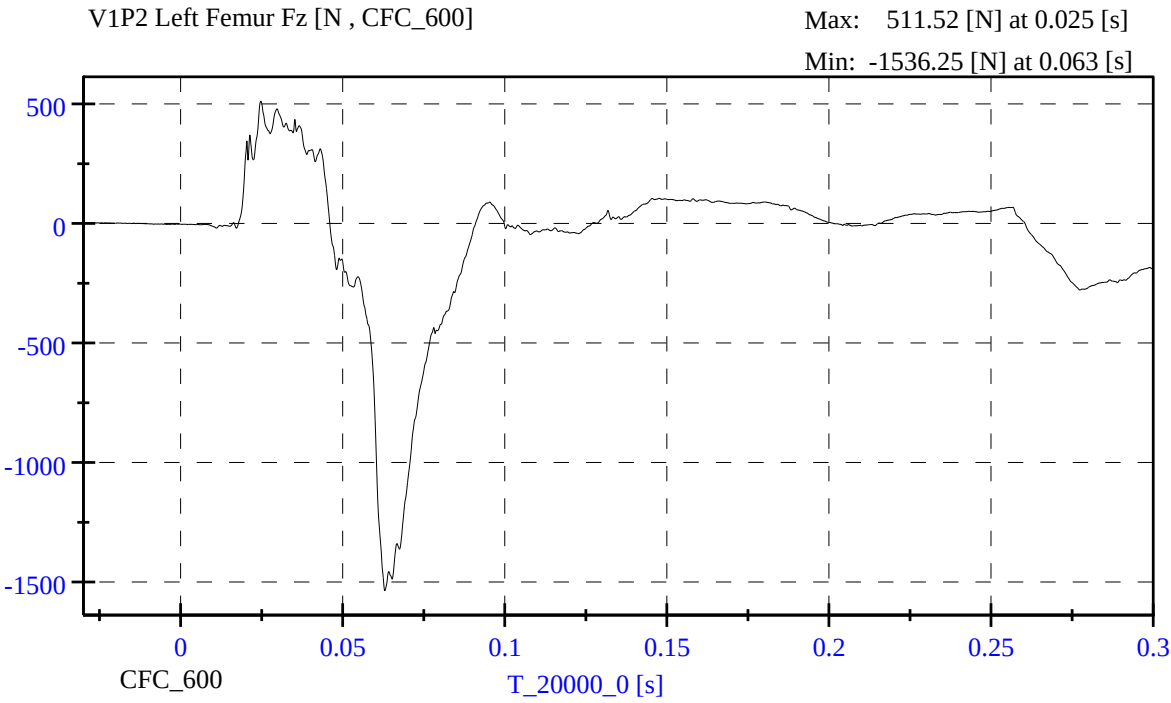












## **APPENDIX C**

### **DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA**



## **CALIBRATION TEST RESULTS**

### **PRE-TEST**

**HYBRID III 50<sup>TH</sup> PERCENTILE MALE - DRIVER ATD**

**SERIAL NO: 64**



www.calspan.com

## Calspan - Transportation Research Group

4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

### 50<sup>th</sup> Male External Measurements

S/N 064

| Symbol | Description                              | Specification | Results | Pass |
|--------|------------------------------------------|---------------|---------|------|
|        |                                          | in            | in      |      |
| A      | Sitting Height                           | 34.6 – 35.0   | 34.8    | Yes  |
| B      | Shoulder Pivot Height                    | 19.9 – 20.5   | 20.2    | Yes  |
| C      | H-Point Height                           | 3.3 – 3.5     | 3.5     | Yes  |
| D      | H-Point from Backline                    | 5.3 – 5.5     | 5.5     | Yes  |
| E      | Shoulder Pivot from Backline             | 3.3 – 3.7     | 3.5     | Yes  |
| F      | Thigh Clearance                          | 5.5 – 6.1     | 6.1     | Yes  |
| G      | Back of Elbow to Wrist Pivot             | 11.4 – 12.0   | 11.6    | Yes  |
| H      | Head Back to Backline                    | 1.6 – 1.8     | 1.7     | Yes  |
| I      | Shoulder to Elbow Length                 | 13.0 – 13.6   | 13.5    | Yes  |
| J      | Elbow Rest Height                        | 7.5 – 8.3     | 7.8     | Yes  |
| K      | Buttock to Knee Length                   | 22.8 – 23.8   | 23.7    | Yes  |
| L      | Popliteal Height                         | 16.9 – 17.9   | 17.3    | Yes  |
| M      | Knee Pivot Height                        | 19.1 – 19.7   | 19.2    | Yes  |
| N      | Buttock Popliteal Length                 | 17.8 – 18.8   | 18.7    | Yes  |
| O      | Chest Depth without Jacket               | 8.4 – 9.0     | 8.5     | Yes  |
| P      | Foot Length (right)                      | 9.9 – 10.5    | 10.2    | Yes  |
| V      | Shoulder Breadth                         | 16.3 – 17.2   | 16.9    | Yes  |
| W      | Foot Breadth                             | 3.6 – 4.2     | 3.9     | Yes  |
| Y      | Chest Circumference with Jacket          | 38.2 – 39.4   | 38.9    | Yes  |
| Z      | Waist Circumference                      | 32.9 – 34.1   | 33.7    | Yes  |
| AA     | Reference Location (Chest Circumference) | 16.9 – 17.1   | 17.0    | Yes  |
| BB     | Reference Location (Waist Circumference) | 8.9 – 9.1     | 9.0     | Yes  |

Technician: MPG

Date: 6/6/2012



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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

### VERIFICATION REPORT

|                    |                         |            |                   |
|--------------------|-------------------------|------------|-------------------|
| Test Name:         | <b>Head Drop</b>        | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                   |
| ATD Serial Number: | <b>064</b>              |            |                   |
| Test ID:           |                         | Test Date: | <b>5/16/2012</b>  |
| Test Number:       | <b>1</b>                | Test Time: | <b>2:49:12 PM</b> |

|                              |                         |
|------------------------------|-------------------------|
| Component Part Number        | Component Serial Number |
| <b>Head Skin - 78051-228</b> | <b>7997</b>             |

| Test Parameters        | Test Specifications | Test Results        |
|------------------------|---------------------|---------------------|
| Temperature            | 18.9 -- 25.6        | <b>21.9</b> deg C P |
| Humidity               | 10 -- 70            | <b>46</b> %RH P     |
| Resultant Acceleration | 225 -- 275          | <b>250</b> g P      |
| Oscillation            | 0.0 -- 10.0         | <b>2.3</b> % P      |
| Lateral Acceleration   | -15.00 -- 15.00     | <b>8.27</b> g P     |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **2:49:12 PM**

Test Date: **5/16/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u> | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|--------------|----------------------|-------------------------|
| Endevco             | 7264-2000    | P58871               | 5/16/2012               |
| Endevco             | 7264-2000    | P51924               | 5/15/2012               |
| Endevco             | 7264-2000    | P52133               | 5/16/2012               |

Test Time: 2:49:12 PM

Test Date: 5/16/2012

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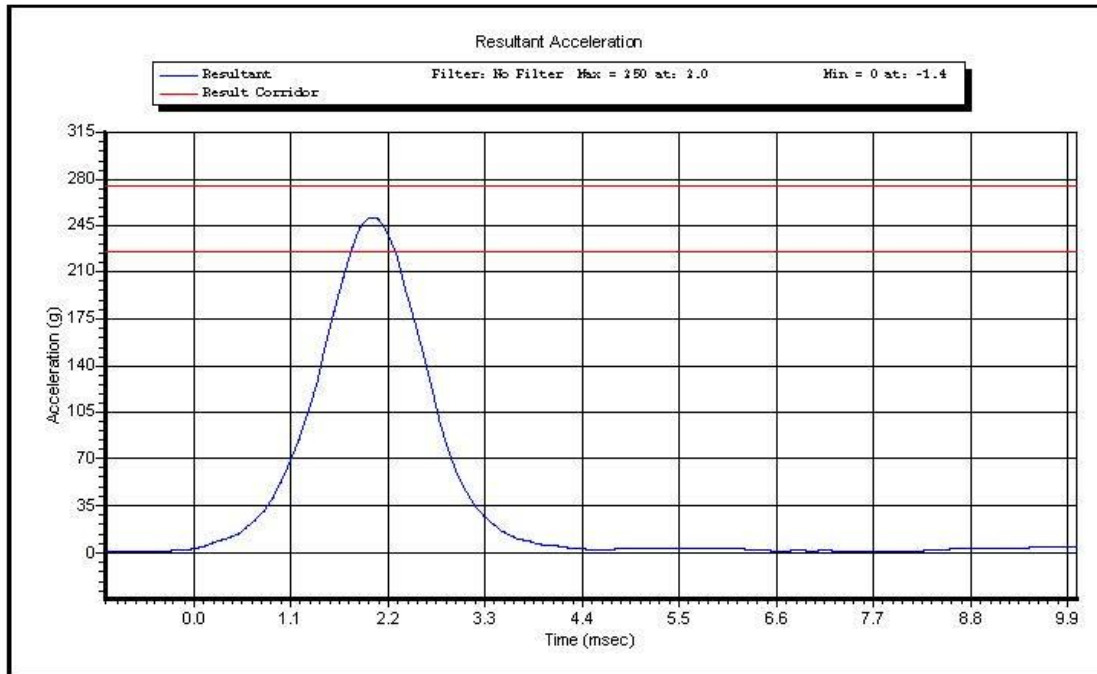


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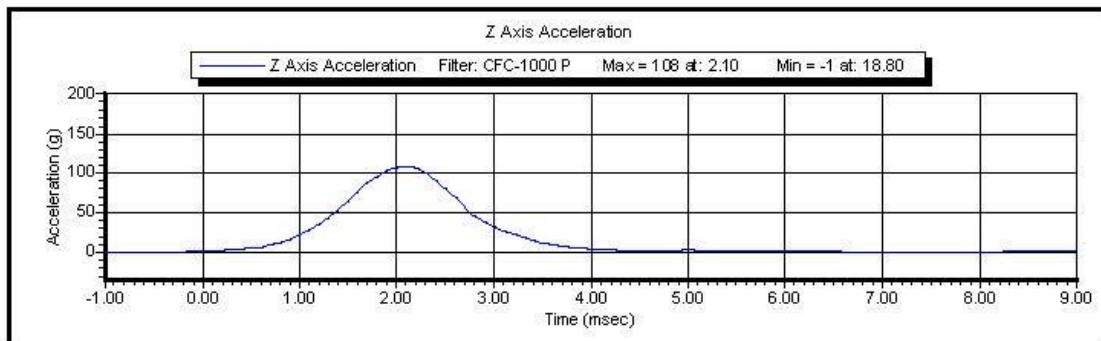
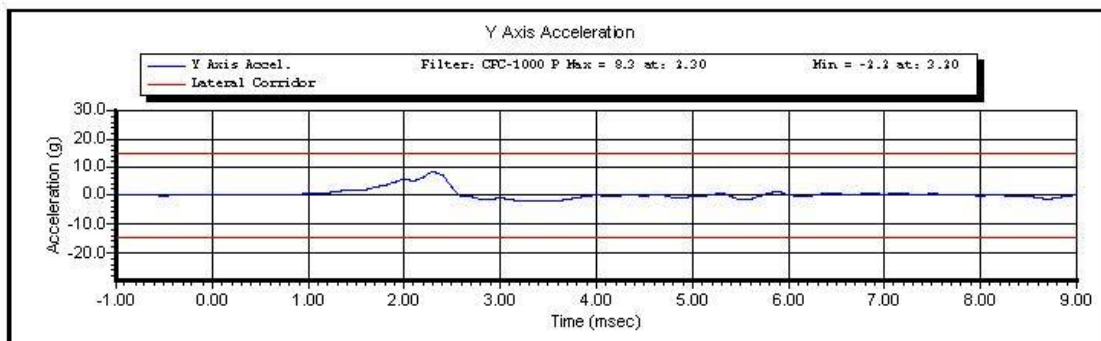
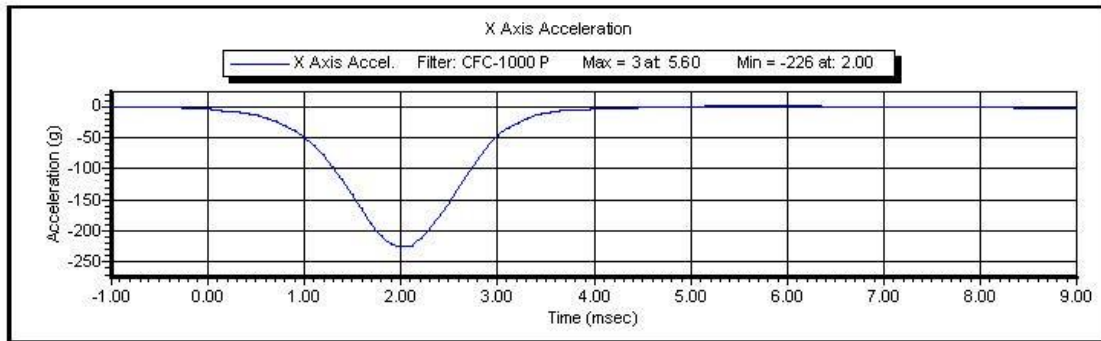
|                    |                 |            |            |
|--------------------|-----------------|------------|------------|
| Test Name:         | Head Drop       | Revision:  | 10/1/2001  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50th |            |            |
| ATD Serial Number: | 064             |            |            |
| Test ID:           |                 | Test Date: | 5/16/2012  |
| Test Number:       | 1               | Test Time: | 2:49:12 PM |



Test Time: 2:49:12 PM

Test Date: 5/16/2012

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Test Time: 2:49:12 PM

Test Date: 5/16/2012

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**VERIFICATION REPORT**

|                    |                         |            |                    |
|--------------------|-------------------------|------------|--------------------|
| Test Name:         | <b>Neck Flexion</b>     | Revision:  | <b>10/1/2001</b>   |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>       |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                    |
| ATD Serial Number: | <b>064</b>              |            |                    |
| Test ID:           |                         | Test Date: | <b>5/30/2012</b>   |
| Test Number:       | <b>3</b>                | Test Time: | <b>11:09:25 AM</b> |

|                         |                         |
|-------------------------|-------------------------|
| Component Part Number   | Component Serial Number |
| <b>Neck - 78051-336</b> | <b>02-1692</b>          |

|           |
|-----------|
| Comments: |
|-----------|

| Test Parameters                 |       | Test Specifications |          | Test Results         |   |
|---------------------------------|-------|---------------------|----------|----------------------|---|
| Temperature                     |       | 20.6                | -- 22.2  | <b>21.8</b> deg C    | P |
| Humidity                        |       | 10                  | -- 70    | <b>51</b> %RH        | P |
| Velocity                        |       | 6.89                | -- 7.13  | <b>7.05</b> m/s      | P |
| Pendulum Deceleration at        | 10 ms | 22.5                | -- 27.5  | <b>23.6</b> g        | P |
| Pendulum Deceleration at        | 20 ms | 17.6                | -- 22.6  | <b>21.1</b> g        | P |
| Pendulum Deceleration at        | 30 ms | 12.5                | -- 18.5  | <b>15.3</b> g        | P |
| Max Pendulum Deceleration After | 30 ms | 0.0                 | -- 29.0  | <b>15.3</b> g        | P |
| Deceleration time to            | 5 g   | 34.0                | -- 42.0  | <b>38.7</b> ms       | P |
| D Plane Rotation                |       | -78.0               | -- -64.0 | <b>-71.0</b> degrees | P |
| Time at max rotation            |       | 57.0                | -- 64.0  | <b>60.2</b> ms       | P |
| Rotation Decay to Zero          |       | 113.0               | -- 128.0 | <b>114.1</b> ms      | P |
| Moment about OC                 |       | 88.1                | -- 108.4 | <b>95.4</b> Nm       | P |
| Time at Max Moment              |       | 47.0                | -- 58.0  | <b>54.0</b> ms       | P |
| Moment Decay to Zero            |       | 97.0                | -- 107.0 | <b>105.1</b> ms      | P |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **11:09:25 AM**

Test Date: **5/30/2012**



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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 2/8/2012                |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-2186 My           | 5/21/2012               |
| Denton              | 1716A         | LC-2186 Fx           | 5/21/2012               |

Test Time: 11:09:25 AM

Test Date: 5/30/2012

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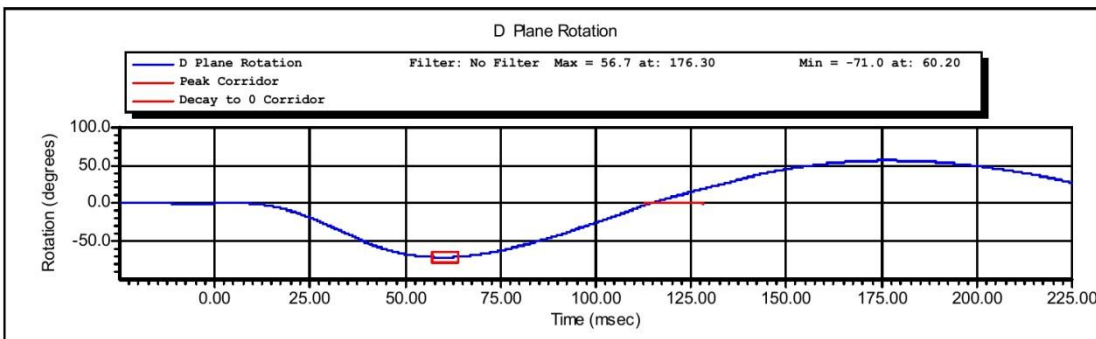
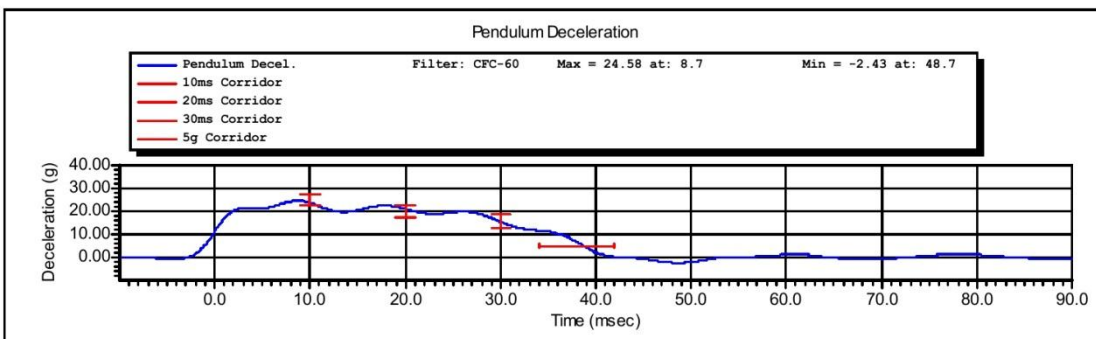


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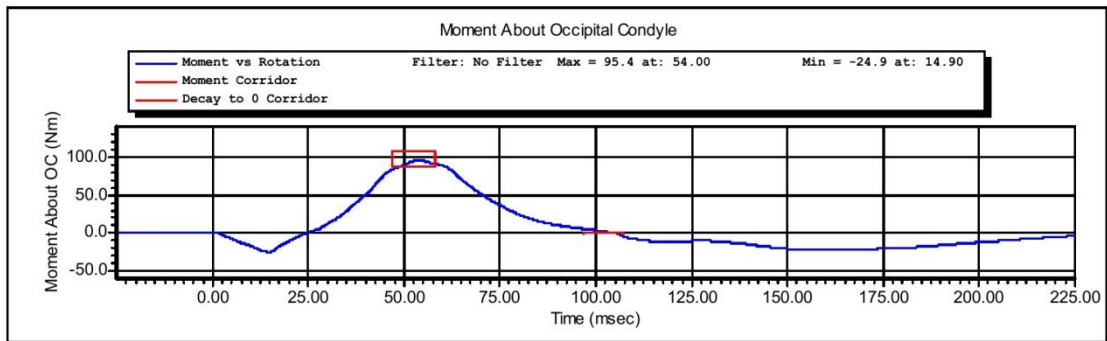
|                    |                  |               |             |
|--------------------|------------------|---------------|-------------|
| Name of Test:      | Neck Flexion     | REVISION:     | 10/1/2001   |
| Name of Sub Test:  |                  | Type of Spec: | NHTSA       |
| Type of ATD:       | Hybrid III 50'th |               |             |
| ATD Serial Number: | 064              |               |             |
| ID of Test:        |                  | Date:         | 5/30/2012   |
| Number of Test:    | 3                | Time of Test: | 11:09:25 AM |



Time of Test: 11:09:25 AM

Date of Test: 5/30/2012

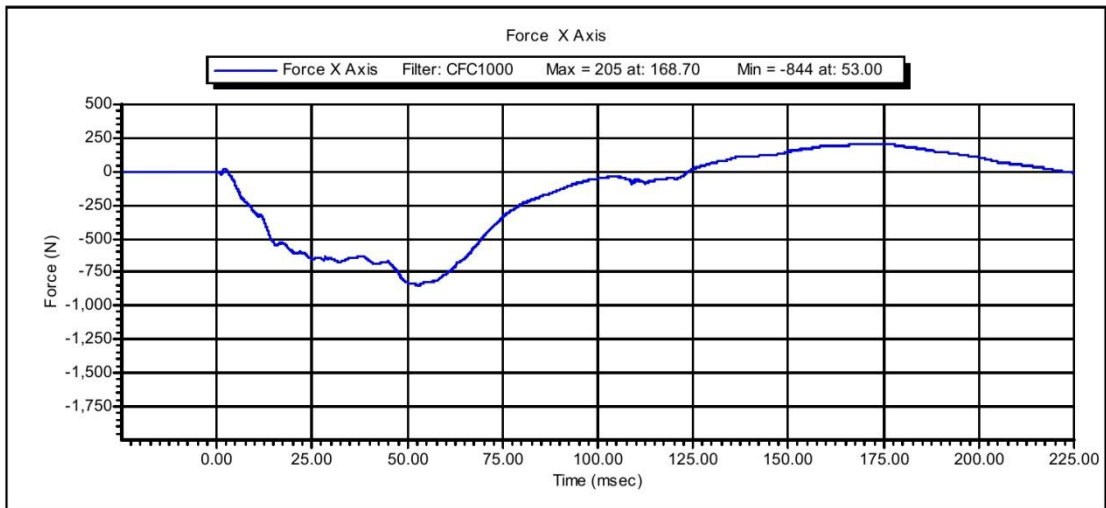
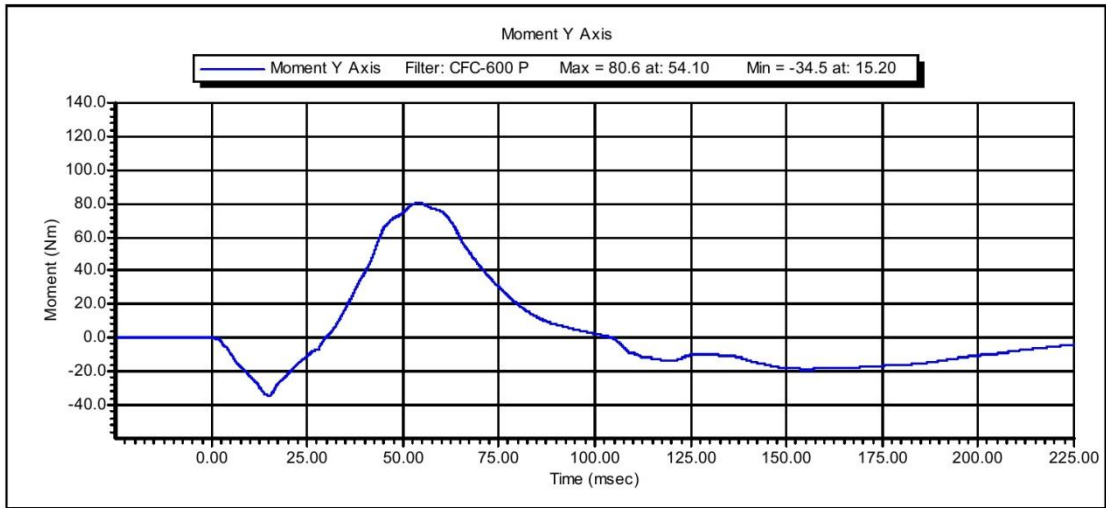
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Time of Test: 11:09:25 AM

Date of Test: 5/30/2012

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Time of Test: **11:09:25 AM**

Date of Test: **5/30/2012**

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**VERIFICATION REPORT**

|                    |                         |            |                   |
|--------------------|-------------------------|------------|-------------------|
| Test Name:         | <b>Neck Extension</b>   | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                   |
| ATD Serial Number: |                         |            |                   |
| Test ID:           |                         | Test Date: | <b>5/30/2012</b>  |
| Test Number:       | <b>1</b>                | Test Time: | <b>1:40:20 PM</b> |

|                         |                         |
|-------------------------|-------------------------|
| Component Part Number   | Component Serial Number |
| <b>Neck - 78051-336</b> | <b>02-1692</b>          |

| Test Parameters                 |       | Test Specifications |          | Test Results        |   |
|---------------------------------|-------|---------------------|----------|---------------------|---|
| Temperature                     |       | 20.6                | -- 22.2  | <b>22.0</b> deg C   | P |
| Humidity                        |       | 10                  | -- 70    | <b>47</b> %RH       | P |
| Velocity                        |       | 5.94                | -- 6.19  | <b>6.12</b> m/s     | P |
| Pendulum Deceleration at        | 10 ms | 17.2                | -- 21.2  | <b>19.4</b> g       | P |
| Pendulum Deceleration at        | 20 ms | 14.0                | -- 19.0  | <b>16.3</b> g       | P |
| Pendulum Deceleration at        | 30 ms | 11.0                | -- 16.0  | <b>12.8</b> g       | P |
| Max Pendulum Deceleration after | 30 ms | 0.0                 | -- 22.0  | <b>13.2</b> g       | P |
| Decel Time to                   | 5 g   | 38.0                | -- 46.0  | <b>41.9</b> ms      | P |
| D Plane Rotation                |       | 81.0                | -- 106.0 | <b>97.5</b> degrees | P |
| Time at Max Rotation            |       | 72.0                | -- 82.0  | <b>78.4</b> ms      | P |
| Rotation Decay to Zero          |       | 147.0               | -- 174.0 | <b>155.9</b> ms     | P |
| Moment About Occipital Condyle  |       | -80.0               | -- -52.9 | <b>-68.9</b> Nm     | P |
| Time at Max Moment              |       | 65.0                | -- 79.0  | <b>73.5</b> ms      | P |
| Moment Decay to Zero            |       | 120.0               | -- 148.0 | <b>145.1</b> ms     | P |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **1:40:20 PM**

Test Date: **5/30/2012**





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#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 2/8/2012                |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-2186 My           | 5/21/2012               |
| Denton              | 1716A         | LC-2186 Fx           | 5/21/2012               |

Test Time: 1:40:20 PM

Test Date: 5/30/2012

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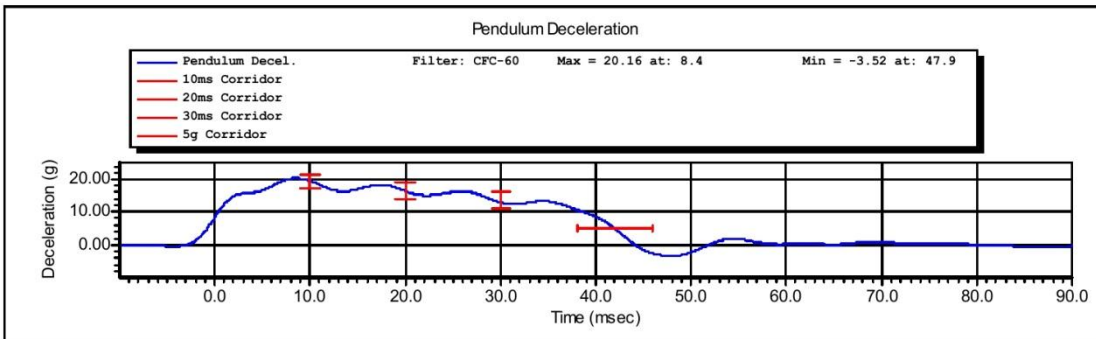
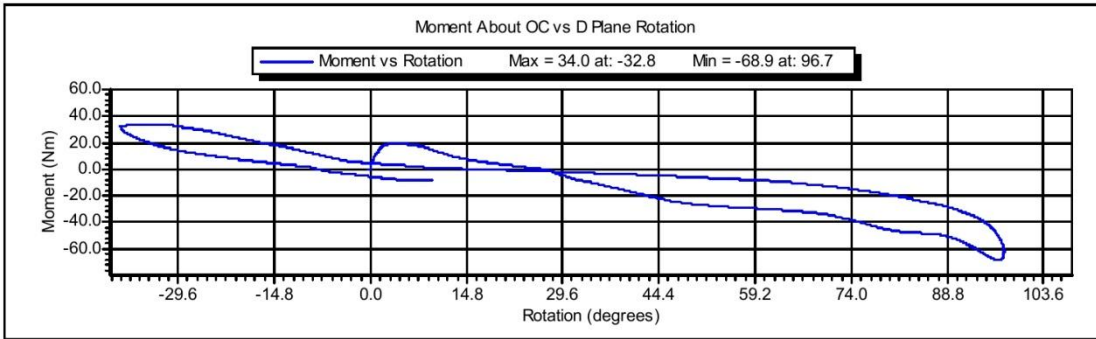


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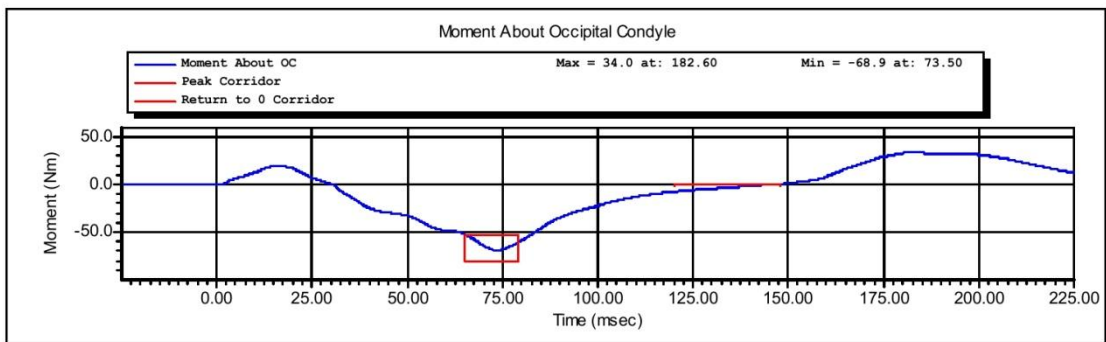
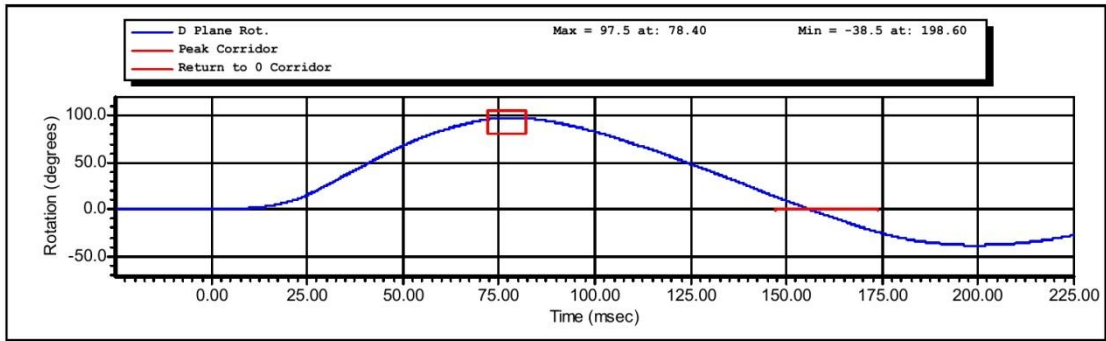
|                    |                  |               |            |
|--------------------|------------------|---------------|------------|
| Name of Test:      | Neck Extension   | REVISION:     | 10/1/2001  |
| Name of Sub Test:  |                  | Type of Spec: | NHTSA      |
| Type of ATD:       | Hybrid III 50'th |               |            |
| ATD Serial Number: |                  |               |            |
| ID of Test:        |                  | Date:         | 5/30/2012  |
| Number of Test:    | 1                | Time of Test: | 1:40:20 PM |



Time of Test: 1:40:20 PM

Date of Test: 5/30/2012

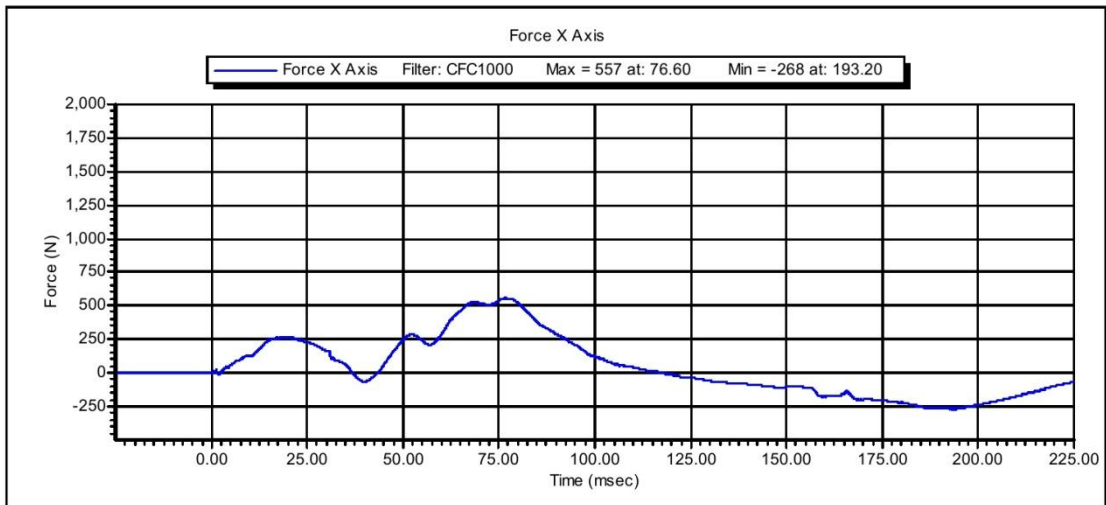
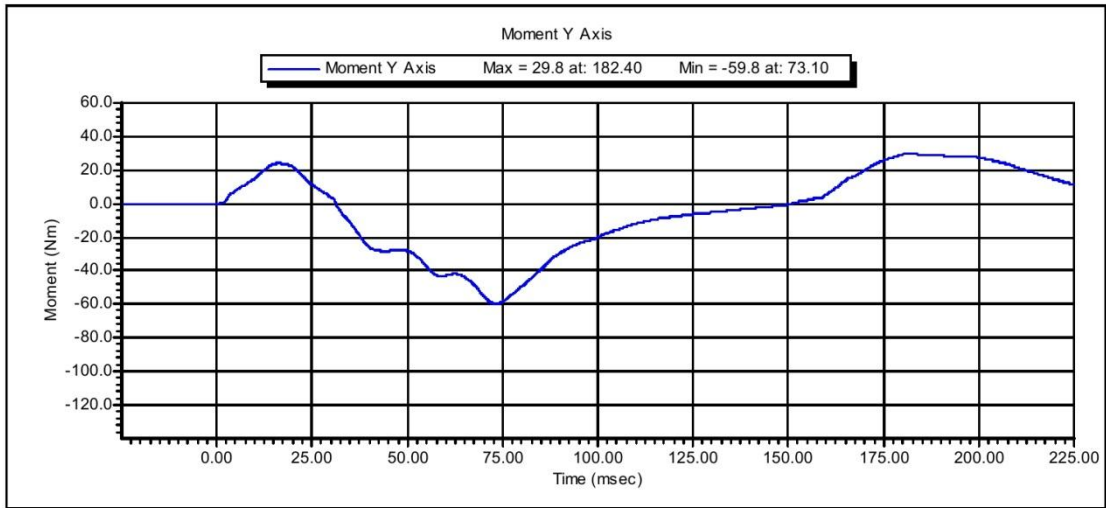
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Time of Test: 1:40:20 PM

Date of Test: 5/30/2012

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Time of Test: **1:40:20 PM**

Date of Test: **5/30/2012**

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### VERIFICATION REPORT

|                    |                         |            |                   |
|--------------------|-------------------------|------------|-------------------|
| Test Name:         | <b>Thorax Impact</b>    | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                   |
| ATD Serial Number: | <b>064</b>              |            |                   |
| Test ID:           |                         | Test Date: | <b>5/25/2012</b>  |
| Test Number:       | <b>3</b>                | Test Time: | <b>8:08:50 AM</b> |

|                                 |                         |
|---------------------------------|-------------------------|
| Component Part Number           | Component Serial Number |
| <b>Ribs 78051-RS</b>            | <b>3964</b>             |
| <b>Chest Jacket - 78051-169</b> | <b>2589</b>             |
| <b>Lumbar Spine - 78051-66</b>  |                         |

| Test Parameters      | Test Specifications | Test Results        |
|----------------------|---------------------|---------------------|
| Temperature          | 20.6 -- 22.2        | <b>21.7</b> deg C P |
| Humidity             | 10.0 -- 70.0        | <b>63.0</b> %RH P   |
| Velocity             | 6.59 -- 6.83        | <b>6.75</b> m/s P   |
| Resistive Force      | -5.894 -- -5.160    | <b>-5.472</b> kN P  |
| Sternum Displacement | -72.6 -- -63.5      | <b>-63.8</b> mm P   |
| Hysteresis           | 69 -- 85            | <b>76</b> % P       |

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **8:08:50 AM**

Test Date: **5/25/2012**

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#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C14953               | 2/8/2012                |
| DentonATD           | 78051-342     | DS-064               | 5/18/2012               |

Test Time: 8:08:50 AM

Test Date: 5/25/2012

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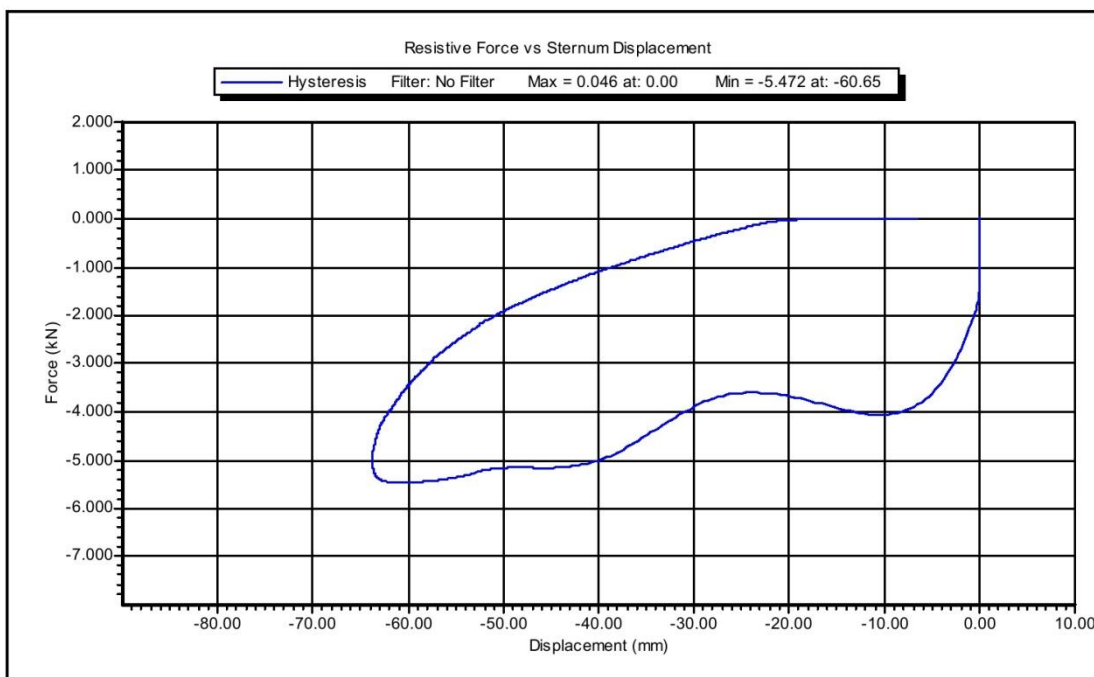


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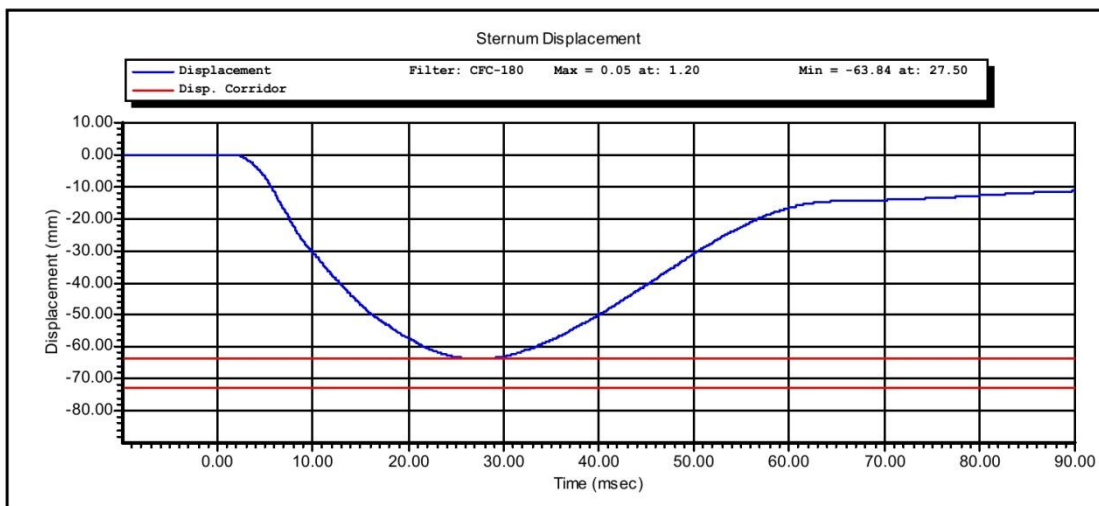
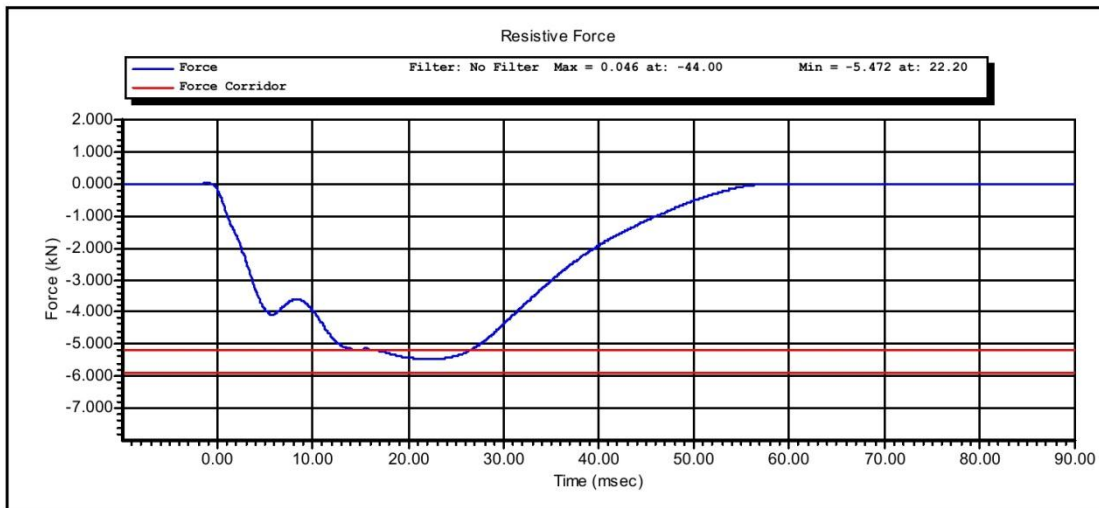
|                    |                  |            |            |
|--------------------|------------------|------------|------------|
| Test Name:         | Thorax Impact    | Revision:  | 10/1/2001  |
| Sub Test Name:     |                  | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th |            |            |
| ATD Serial Number: | 064              |            |            |
| Test ID:           |                  | Test Date: | 5/25/2012  |
| Test Number:       | 3                | Test Time: | 8:08:50 AM |



Test Time: 8:08:50 AM

Test Date: 5/25/2012

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Test Time: **8:08:50 AM**

Test Date: **5/25/2012**

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**VERIFICATION REPORT**

|                    |                          |            |                   |
|--------------------|--------------------------|------------|-------------------|
| Test Name:         | <b>Hip Flexion (ROM)</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                          | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>  |            |                   |
| ATD Serial Number: | <b>064</b>               |            |                   |
| Test ID:           | <b>Hip ROM Right</b>     | Test Date: | <b>6/20/2012</b>  |
| Test Number:       | <b>1</b>                 | Test Time: | <b>3:07:12 PM</b> |

|                                 |                         |
|---------------------------------|-------------------------|
| Component Part Number           | Component Serial Number |
| <b>Pelvis Assembly 78051-60</b> | <b>1445</b>             |

|           |
|-----------|
| Comments: |
|-----------|

| Test Parameters      | Test Specifications | Test Results          |
|----------------------|---------------------|-----------------------|
| Temperature          | 18.9 -- 25.6        | <b>22.2</b> deg C P   |
| Humidity             | 10 -- 70            | <b>53</b> %RH P       |
| Average Velocity     | 5.0 -- 10.0         | <b>6.9</b> deg/s P    |
| Angle at 203 Nm      | 40.0 -- 50.0        | <b>40.1</b> degrees P |
| Moment at 30 degrees | 0.0 -- 94.9         | <b>80.9</b> Nm P      |

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **3:07:12 PM**

Test Date: **6/20/2012**



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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| Key                 | 2301-02       | 115                  | 12/15/2011              |
| Transducers/PCB     | 14CB1-3615    | 0008                 | 3/16/2012               |
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| DentonATD           |               |                      |                         |

Test Time: 3:07:12 PM

Test Date: 6/20/2012

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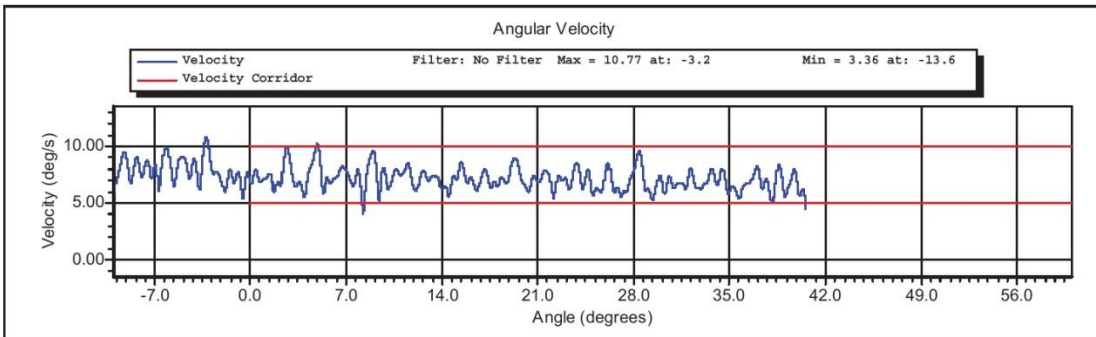
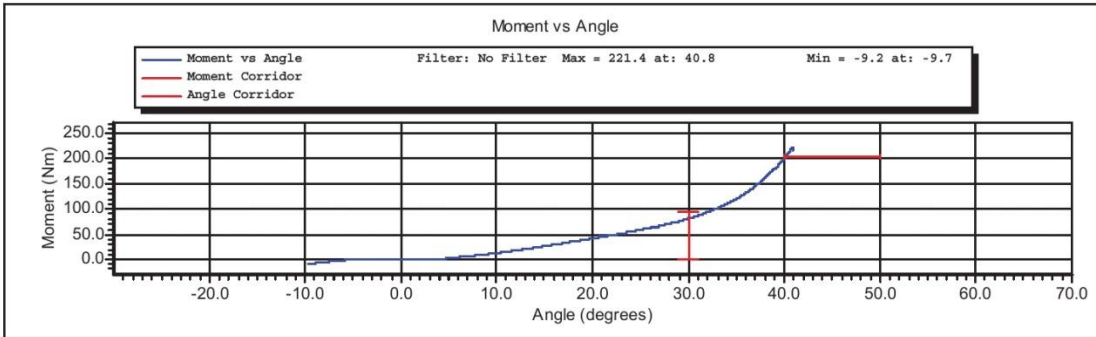


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|                    |                   |            |            |
|--------------------|-------------------|------------|------------|
| Test Name:         | Hip Flexion (ROM) | Revision:  | 10/1/2001  |
| Sub Test Name:     |                   | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th  |            |            |
| ATD Serial Number: | 064               |            |            |
| Test ID:           | Hip ROM Right     | Test Date: | 6/20/2012  |
| Test Number:       | 1                 | Test Time: | 3:07:12 PM |



Test Time: 3:07:12 PM

Test Date: 6/20/2012

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**VERIFICATION REPORT**

|                    |                          |            |                    |
|--------------------|--------------------------|------------|--------------------|
| Test Name:         | <b>Hip Flexion (ROM)</b> | Revision:  | <b>10/1/2001</b>   |
| Sub Test Name:     |                          | Spec Type: | <b>NHTSA</b>       |
| ATD Type:          | <b>Hybrid III 50'th</b>  |            |                    |
| ATD Serial Number: | <b>064</b>               |            |                    |
| Test ID:           |                          | Test Date: | <b>6/20/2012</b>   |
| Test Number:       | <b>1</b>                 | Test Time: | <b>10:14:08 AM</b> |

|                                 |                         |
|---------------------------------|-------------------------|
| Component Part Number           | Component Serial Number |
| <b>Pelvis Assembly 78051-60</b> | <b>1445</b>             |

|           |
|-----------|
| Comments: |
| Left Side |

| Test Parameters      | Test Specifications | Test Results          |
|----------------------|---------------------|-----------------------|
| Temperature          | 18.9 -- 25.6        | <b>21.6</b> deg C P   |
| Humidity             | 10 -- 70            | <b>55</b> %RH P       |
| Average Velocity     | 5.0 -- 10.0         | <b>6.9</b> deg/s P    |
| Angle at 203 Nm      | 40.0 -- 50.0        | <b>41.2</b> degrees P |
| Moment at 30 degrees | 0.0 -- 94.9         | <b>72.8</b> Nm P      |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **10:14:08 AM**

Test Date: **6/20/2012**



**VERIFICATION REPORT**

## REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| Key                 | 2301-02       | 115                  | 12/15/2011              |
| Transducers/PCB     | 14CB1-3615    | 0008                 | 3/16/2012               |
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| DentonATD           |               |                      |                         |

Test Time: **10:14:08 AM**Test Date: **6/20/2012**

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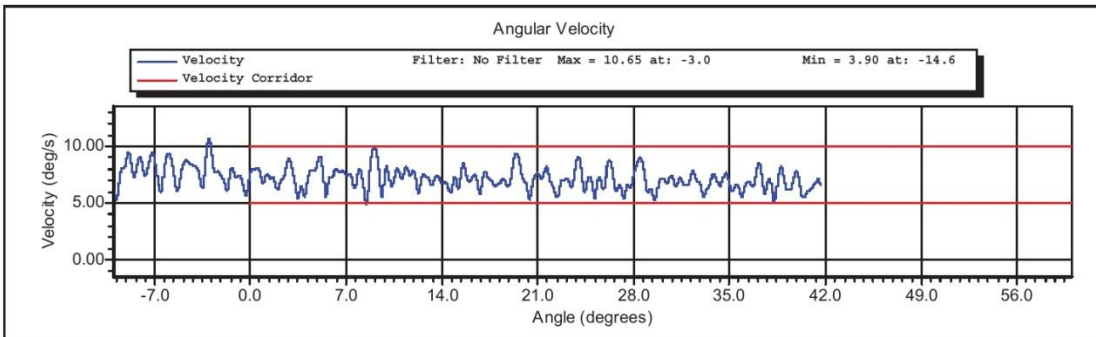
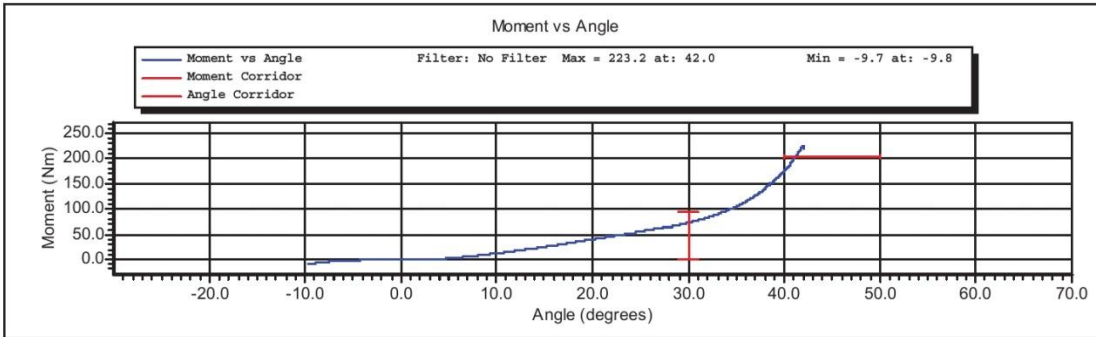


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|                    |                   |            |             |
|--------------------|-------------------|------------|-------------|
| Test Name:         | Hip Flexion (ROM) | Revision:  | 10/1/2001   |
| Sub Test Name:     |                   | Spec Type: | NHTSA       |
| ATD Type:          | Hybrid III 50'th  |            |             |
| ATD Serial Number: | 064               |            |             |
| Test ID:           |                   | Test Date: | 6/20/2012   |
| Test Number:       | 1                 | Test Time: | 10:14:08 AM |



Test Time: 10:14:08 AM

Test Date: 6/20/2012

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|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>     |            |                   |
| ATD Serial Number: | <b>064</b>                  |            |                   |
| Test ID:           | <b>Left Knee</b>            | Test Date: | <b>5/17/2012</b>  |
| Test Number:       | <b>1</b>                    | Test Time: | <b>3:57:23 PM</b> |

|                             |                         |
|-----------------------------|-------------------------|
| Component Part Number       | Component Serial Number |
| <b>Knee Skin - 78051(L)</b> | <b>2882</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>22.2</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>27.0</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.08</b> m/s P   |
| Resistive Force | -5.78 -- -4.72      | <b>-4.96</b> kN P   |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **3:57:23 PM**

Test Date: **5/17/2012**

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#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 12/10/2011              |

Test Time: 3:57:23 PM

Test Date: 5/17/2012

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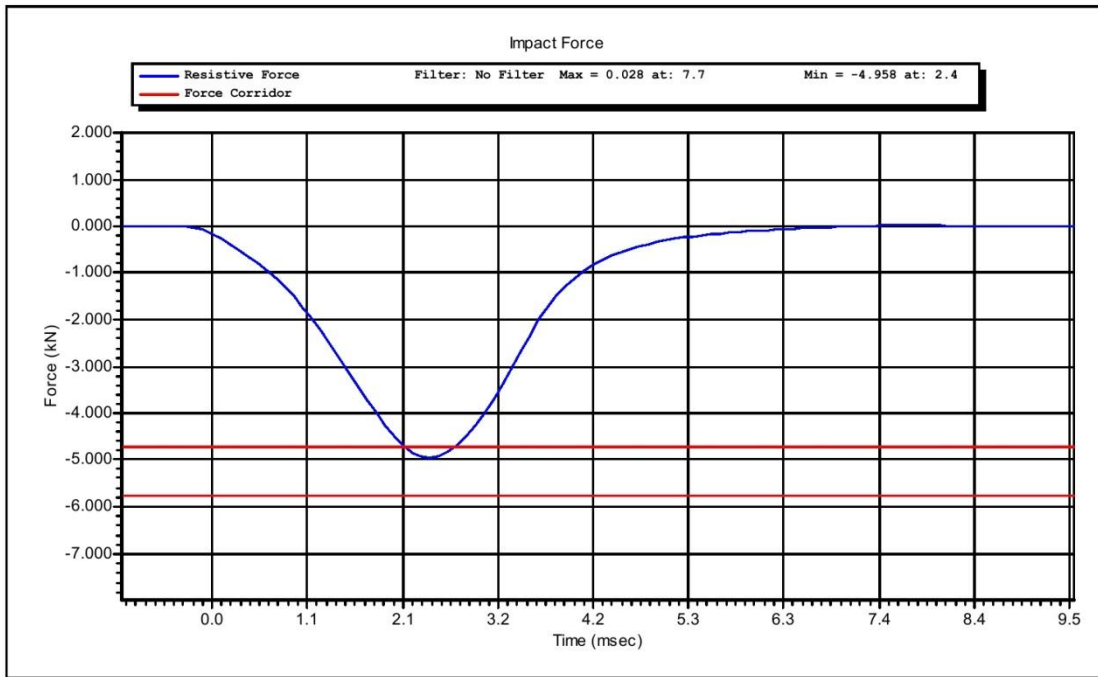


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 10/1/2001  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th     |            |            |
| ATD Serial Number: | 064                  |            |            |
| Test ID:           | Left Knee            | Test Date: | 5/17/2012  |
| Test Number:       | 1                    | Test Time: | 3:57:23 PM |



Test Time: 3:57:23 PM

Test Date: 5/17/2012

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**VERIFICATION REPORT**

|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>     |            |                   |
| ATD Serial Number: |                             |            |                   |
| Test ID:           | <b>Right Knee</b>           | Test Date: | <b>5/18/2012</b>  |
| Test Number:       | <b>1</b>                    | Test Time: | <b>8:56:36 AM</b> |

|                              |                         |
|------------------------------|-------------------------|
| Component Part Number        | Component Serial Number |
| <b>Knee Skin - 780516(R)</b> | <b>2531</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>21.8</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>34.7</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.08</b> m/s P   |
| Resistive Force | -5.78 -- -4.72      | <b>-5.64</b> kN P   |

All test parameters are within specifications

Technician: **S. Zito**Supervisor: **D. Travale**Test Time: **8:56:36 AM**Test Date: **5/18/2012**

**VERIFICATION REPORT**

REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 12/10/2011              |

Test Time: **8:56:36 AM**

Test Date: **5/18/2012**

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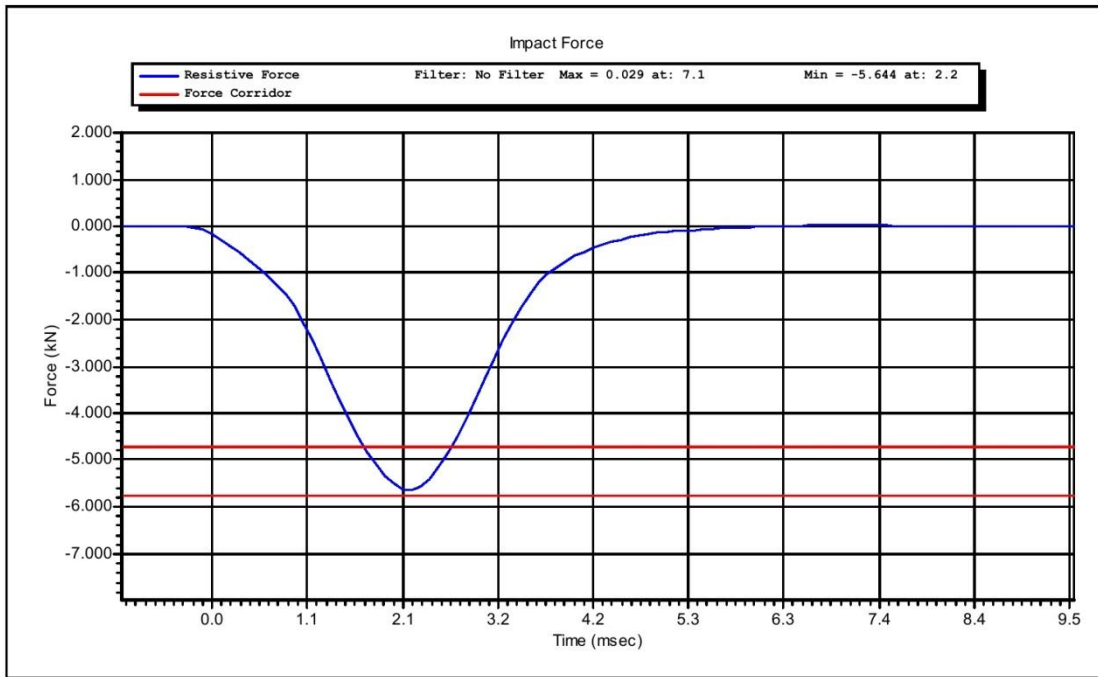


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 10/1/2001  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th     |            |            |
| ATD Serial Number: |                      |            |            |
| Test ID:           | Right Knee           | Test Date: | 5/18/2012  |
| Test Number:       | 1                    | Test Time: | 8:56:36 AM |



Test Time: 8:56:36 AM

Test Date: 5/18/2012

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## **CALIBRATION TEST RESULTS**

### **PRE-TEST**

**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

**SERIAL NO: 139**



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### External Measurements

#### 5<sup>th</sup> Female SN 139

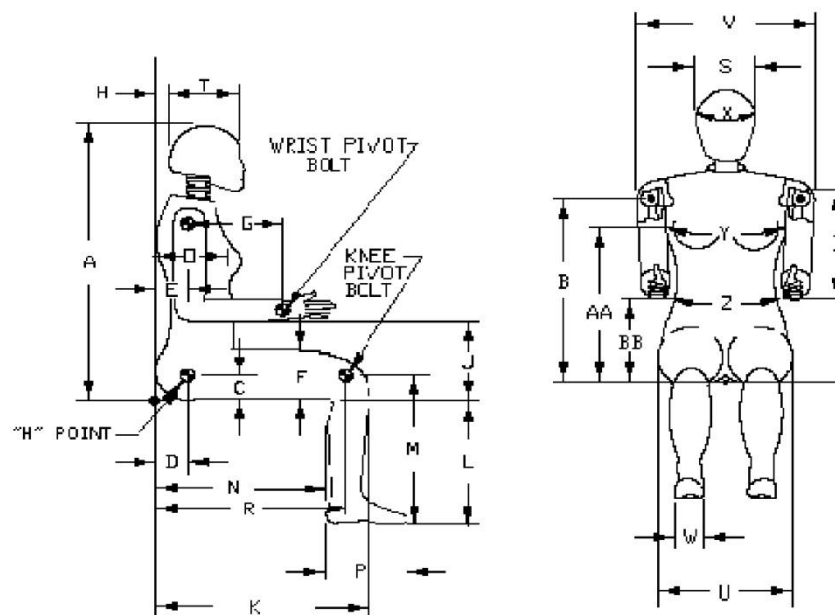
| Symbol | Description                              | Specification | Results | Pass |
|--------|------------------------------------------|---------------|---------|------|
|        |                                          | mm            | mm      |      |
| A      | Sitting Height                           | 774.7 – 800.1 | 781     | Yes  |
| B      | Shoulder Pivot Height                    | 431.8 – 457.2 | 445     | Yes  |
| C      | H-Point Height                           | 81.3 – 86.3   | 85      | Yes  |
| D      | H-Point from Backline                    | 144.8 – 149.8 | 146     | Yes  |
| E      | Shoulder Pivot from Backline             | 68.6 – 83.8   | 72      | Yes  |
| F      | Thigh Clearance                          | 119.4 – 134.6 | 134     | Yes  |
| G      | Back of Elbow to Wrist Pivot             | 243.9 – 259.1 | 245     | Yes  |
| H      | Head Back to Backline                    | 43.2 – 48.2   | 46      | Yes  |
| I      | Shoulder to Elbow Length                 | 276.8 – 297.2 | 285     | Yes  |
| J      | Elbow Rest Height                        | 182.8 – 203.2 | 190     | Yes  |
| K      | Buttock to Knee Length                   | 520.7 – 546.1 | 543     | Yes  |
| L      | Popliteal Height                         | 355.6 – 376   | 357     | Yes  |
| M      | Knee Pivot Height                        | 393.7 – 419.1 | 395     | Yes  |
| N      | Buttock Popliteal Length                 | 414 – 439.4   | 435     | Yes  |
| O      | Chest Depth without Jacket               | 175.3 – 190.5 | 187     | Yes  |
| P      | Foot Length (right)                      | 218.5 – 233.7 | 219     | Yes  |
| R      | Buttock To Knee Pivot Length             | 457.2 – 482.6 | 480     | Yes  |
| S      | Head Breadth                             | 137.1 – 147.3 | 143     | Yes  |
| T      | Head Depth                               | 177.8 – 188   | 184     | Yes  |
| U      | Hip Breadth                              | 299.7 – 314.9 | 303     | Yes  |
| V      | Shoulder Breadth                         | 350.5 – 365.7 | 361     | Yes  |
| W      | Foot Breadth                             | 78.8 – 94     | 82      | Yes  |
| X      | Head Circumference                       | 528.3 – 548.7 | 542     | Yes  |
| Y      | Chest Circumference with Jacket          | 850.9 – 881.3 | 858     | Yes  |
| Z      | Waist Circumference                      | 759.5 – 789.9 | 770     | Yes  |
| AA     | Reference Location (Chest Circumference) | 332.7 – 358.1 | 345     | Yes  |
| BB     | Reference Location (Waist Circumference) | 160.1 – 170.2 | 165     | Yes  |

Technician: MPG

Date: 6/6/2012

# Hybrid III 5<sup>th</sup> Female External Measurements

## Reference Diagram





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### VERIFICATION REPORT

|                    |                        |            |                    |
|--------------------|------------------------|------------|--------------------|
| Test Name:         | <b>Head Drop</b>       | Revision:  | <b>7/15/2002</b>   |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>       |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                    |
| ATD Serial Number: | <b>139</b>             |            |                    |
| Test ID:           |                        | Test Date: | <b>5/18/2012</b>   |
| Test Number:       | <b>1</b>               | Test Time: | <b>11:18:46 AM</b> |

|                              |                         |
|------------------------------|-------------------------|
| Component Part Number        | Component Serial Number |
| <b>Head Skin - 78051-228</b> | <b>05067</b>            |

| Test Parameters        | Test Specifications | Test Results        |
|------------------------|---------------------|---------------------|
| Temperature            | 18.9 -- 25.6        | <b>22.0</b> deg C P |
| Humidity               | 10 -- 70            | <b>32</b> %RH P     |
| Resultant Acceleration | 250 -- 300          | <b>259</b> g P      |
| Oscillation            | 0.0 -- 10.0         | <b>0.0</b> % P      |
| Lateral Acceleration   | -15.00 -- 15.00     | <b>1.67</b> g P     |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **11:18:46 AM**

Test Date: **5/18/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u> | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|--------------|----------------------|-------------------------|
| Endevco             | 7264-2000    | P58833               | 5/18/2012               |
| Endevco             | 7264-2000    | P51667               | 5/18/2012               |
| Endevco             | 7264-2000    | P52114               | 5/18/2012               |

Test Time: **11:18:46 AM**

Test Date: **5/18/2012**

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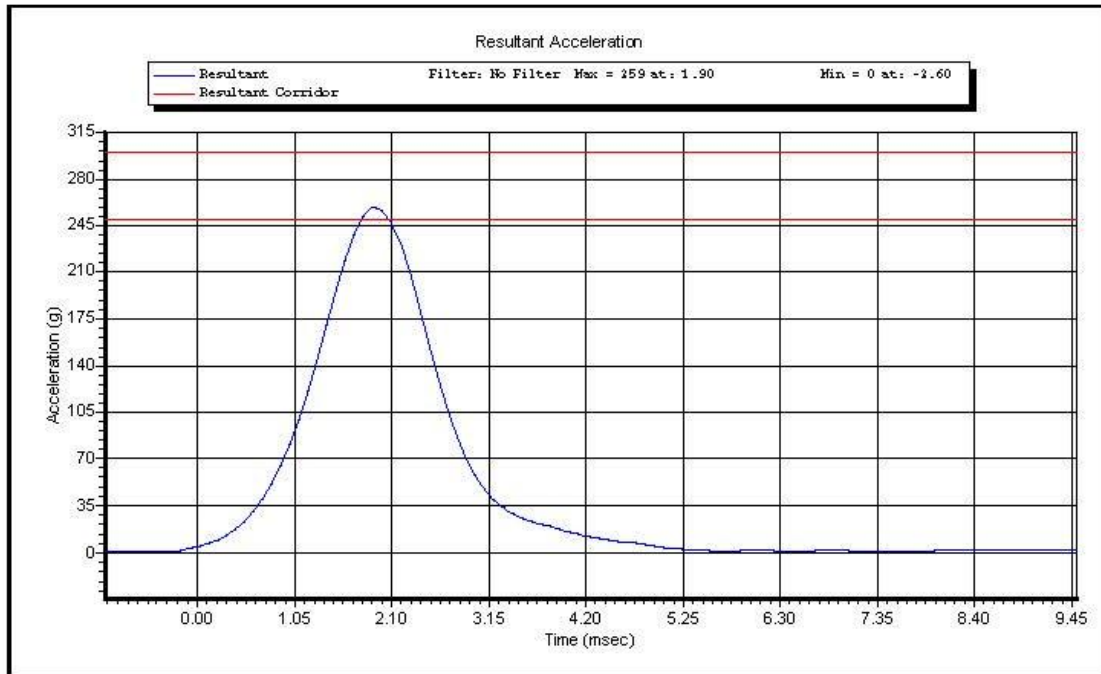


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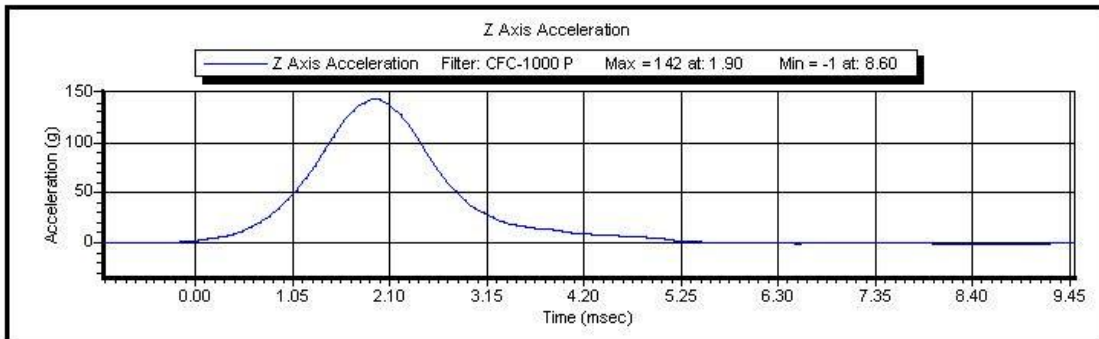
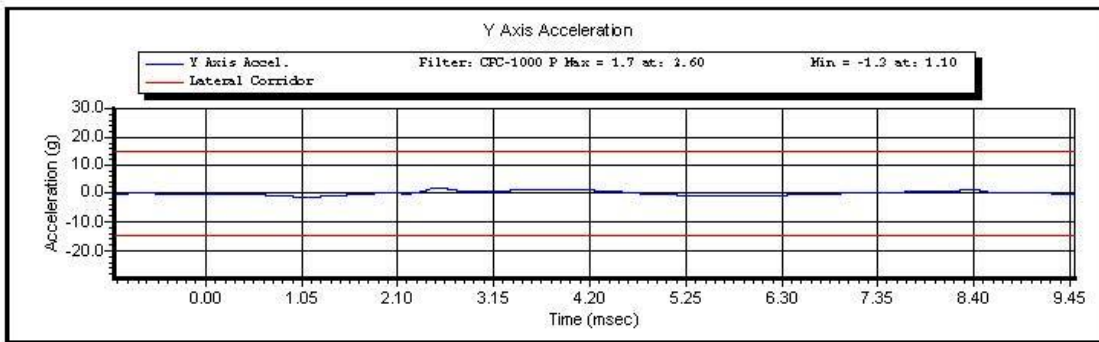
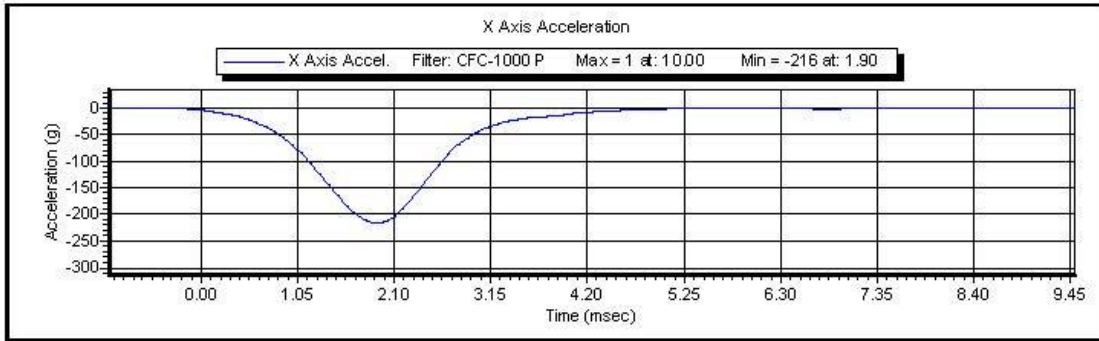
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|--------------------|-----------------|------------|-------------|
| Test Name:         | Head Drop       | Revision:  | 7/15/2002   |
| Sub Test Name:     |                 | Spec Type: | NHTSA       |
| ATD Type:          | Hybrid III 5'th |            |             |
| ATD Serial Number: | 139             |            |             |
| Test ID:           |                 | Test Date: | 5/18/2012   |
| Test Number:       | 1               | Test Time: | 11:18:46 AM |



Test Time: 11:18:46 AM

Test Date: 5/18/2012

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Test Time: 11:18:46 AM

Test Date: 5/18/2012

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### VERIFICATION REPORT

|                    |                        |            |                   |
|--------------------|------------------------|------------|-------------------|
| Test Name:         | <b>Neck Flexion</b>    | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                   |
| ATD Serial Number: | <b>139</b>             |            |                   |
| Test ID:           |                        | Test Date: | <b>5/29/2012</b>  |
| Test Number:       | <b>3</b>               | Test Time: | <b>1:09:08 PM</b> |

|                          |                         |
|--------------------------|-------------------------|
| Component Part Number    | Component Serial Number |
| <b>Neck - 880105-255</b> | <b>1952</b>             |

| Test Parameters                 | Test Specifications | Test Results           |
|---------------------------------|---------------------|------------------------|
| Temperature                     | 20.6 -- 22.2        | <b>22.1</b> deg C P    |
| Humidity                        | 10 -- 70            | <b>57</b> %RH P        |
| Velocity                        | 6.89 -- 7.13        | <b>7.12</b> m/s P      |
| Pendulum Impulse at 10 ms       | 2.10 -- 2.50        | <b>2.27</b> m/s P      |
| Pendulum Impulse at 20 ms       | 4.00 -- 5.00        | <b>4.66</b> m/s P      |
| Pendulum Impulse at 30 ms       | 5.80 -- 7.00        | <b>6.65</b> m/s P      |
| D Plane Rotation                | -91.0 -- -77.0      | <b>-77.9</b> degrees P |
| Moment During Rotation Interval | 69.0 -- 83.0        | <b>73.0</b> Nm P       |
| Moment Decay to 10.0 Nm         | 80.0 -- 100.0       | <b>85.4</b> ms P       |

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **1:09:08 PM**

Test Date: **5/29/2012**

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#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 2/8/2012                |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-443 My            | 5/21/2012               |
| Denton              | 1716A         | LC-443 Fx            | 5/21/2012               |

Test Time: 1:09:08 PM

Test Date: 5/29/2012

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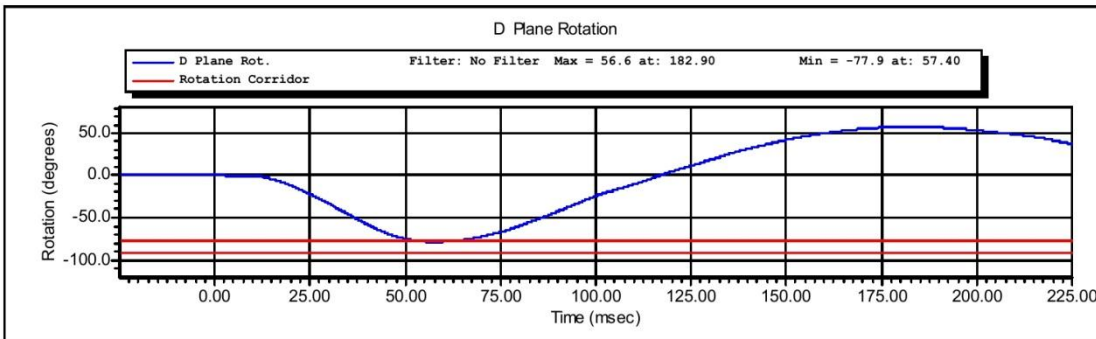
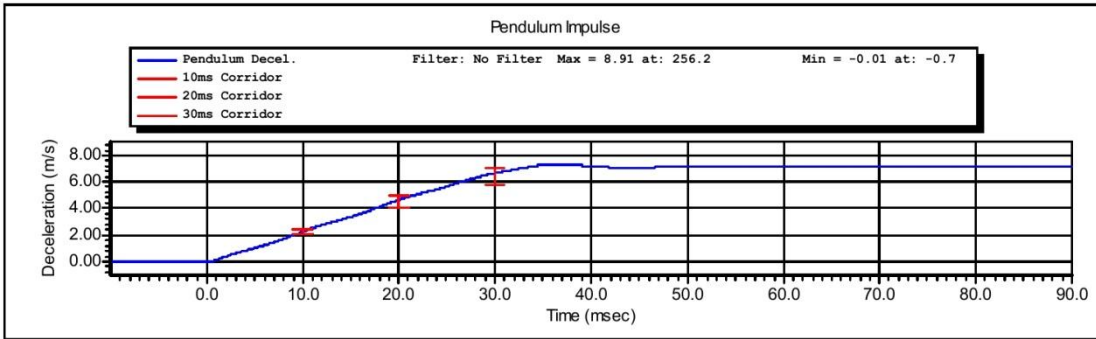


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|                    |                 |            |            |
|--------------------|-----------------|------------|------------|
| Test Name:         | Neck Flexion    | Revision:  | 7/15/2002  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th |            |            |
| ATD Serial Number: | 139             |            |            |
| Test ID:           |                 | Test Date: | 5/29/2012  |
| Test Number:       | 3               | Test Time: | 1:09:08 PM |



Test Time: 1:09:08 PM

Test Date: 5/29/2012

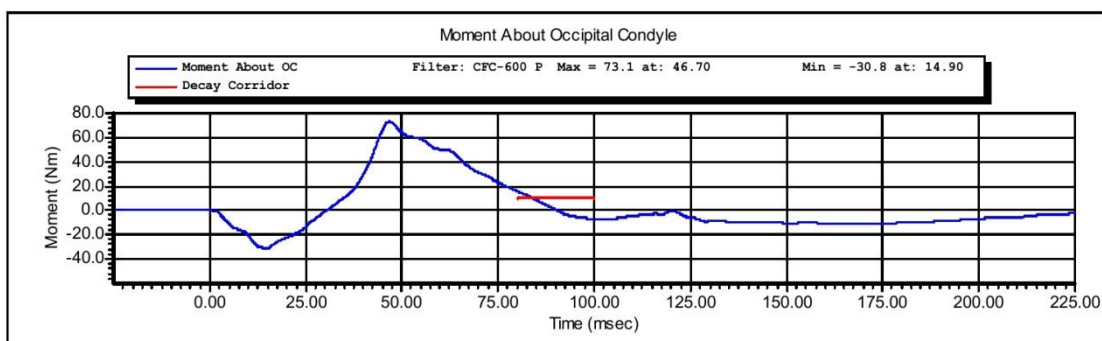
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Test Time: 1:09:08 PM

Test Date: 5/29/2012

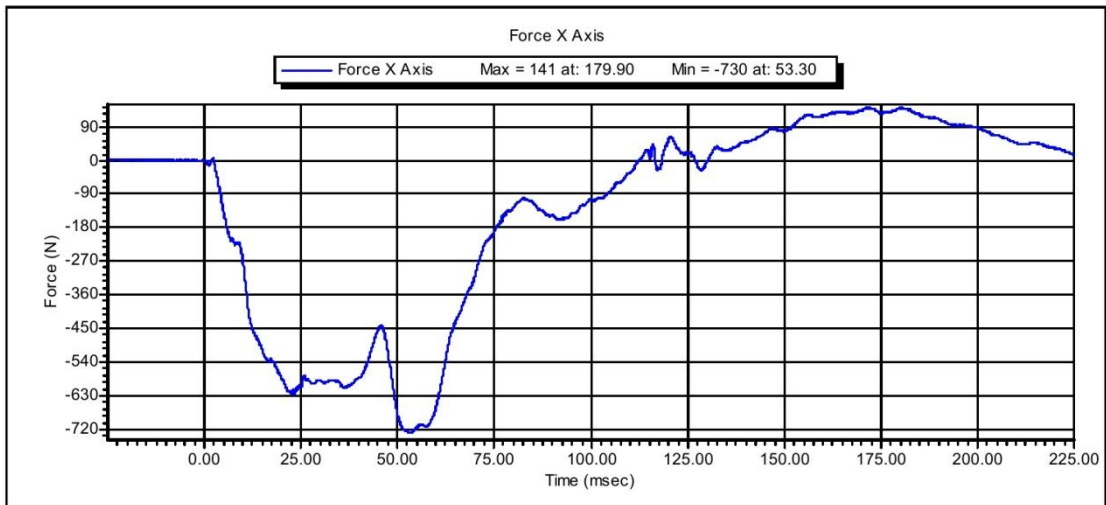
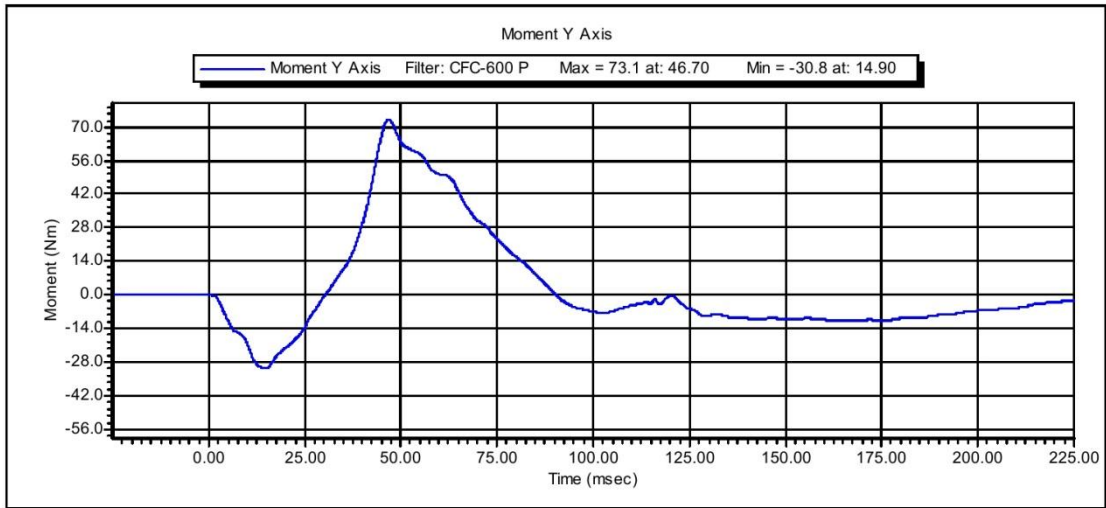
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Test Date: 5/29/2012

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**VERIFICATION REPORT**

|                    |                        |            |                   |
|--------------------|------------------------|------------|-------------------|
| Test Name:         | <b>Neck Extension</b>  | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                   |
| ATD Serial Number: |                        |            |                   |
| Test ID:           |                        | Test Date: | <b>5/29/2012</b>  |
| Test Number:       | <b>1</b>               | Test Time: | <b>1:42:15 PM</b> |

|                          |                         |
|--------------------------|-------------------------|
| Component Part Number    | Component Serial Number |
| <b>Neck - 880105-255</b> | <b>1952</b>             |

| Test Parameters                 | Test Specifications | Test Results           |
|---------------------------------|---------------------|------------------------|
| Temperature                     | 20.6 -- 22.2        | <b>21.9</b> deg C P    |
| Humidity                        | 10 -- 70            | <b>55</b> %RH P        |
| Velocity                        | 5.95 -- 6.19        | <b>6.15</b> m/s P      |
| Pendulum Impulse at 10 ms       | 1.50 -- 1.90        | <b>1.54</b> m/s P      |
| Pendulum Impulse at 20 ms       | 3.10 -- 3.90        | <b>3.41</b> m/s P      |
| Pendulum Impulse at 30 ms       | 4.60 -- 5.60        | <b>5.09</b> m/s P      |
| D Plane Rotation                | 99.0 -- 114.0       | <b>102.5</b> degrees P |
| Moment During Rotation Interval | -65.0 -- -53.0      | <b>-57.3</b> Nm P      |
| Moment Decay to -10.0 Nm        | 94.0 -- 114.0       | <b>103.2</b> ms P      |

All test parameters are within specifications

Technician: **M. Goehle**  
 Supervisor: **D. Travale**

Test Time: **1:42:15 PM**

Test Date: **5/29/2012**





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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 2/8/2012                |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-443 My            | 5/21/2012               |
| Denton              | 1716A         | LC-443 Fx            | 5/21/2012               |

Test Time: 1:42:15 PM

Test Date: 5/29/2012

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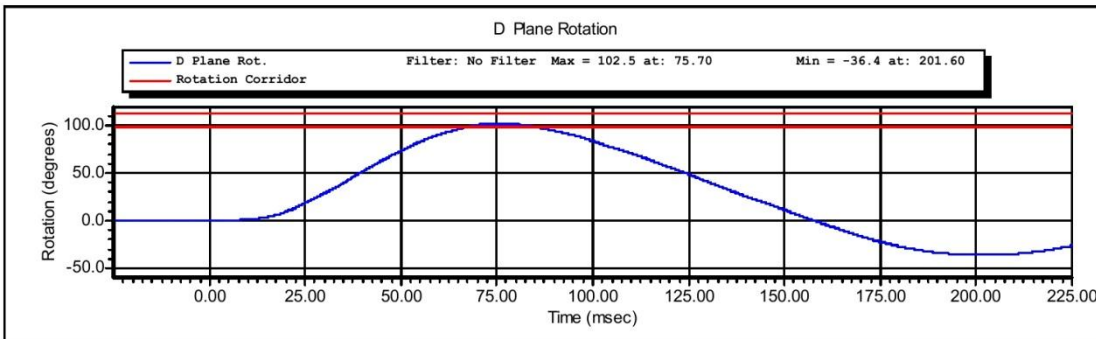
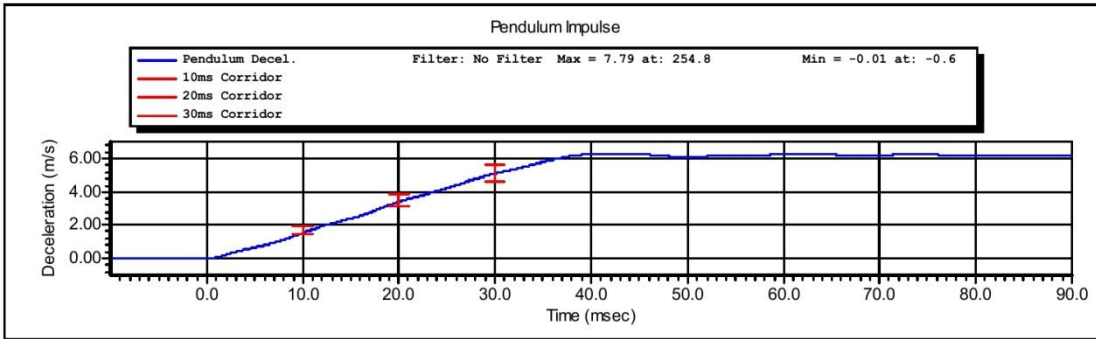


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|                    |                 |            |            |
|--------------------|-----------------|------------|------------|
| Test Name:         | Neck Extension  | Revision:  | 7/15/2002  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th |            |            |
| ATD Serial Number: |                 |            |            |
| Test ID:           |                 | Test Date: | 5/29/2012  |
| Test Number:       | 1               | Test Time: | 1:42:15 PM |



Test Time: 1:42:15 PM

Test Date: 5/29/2012

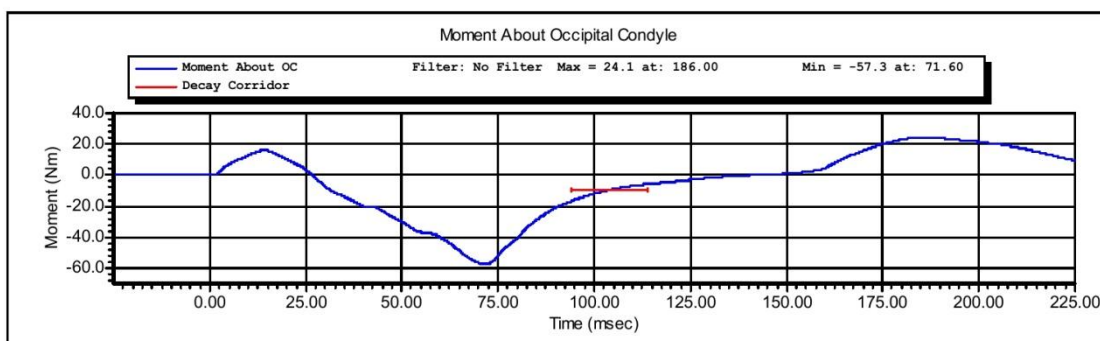
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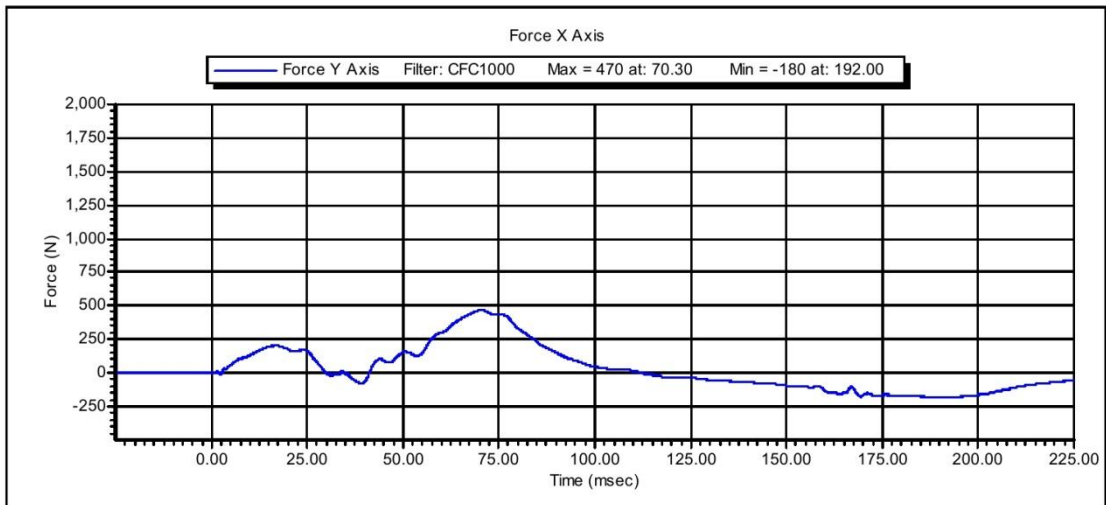
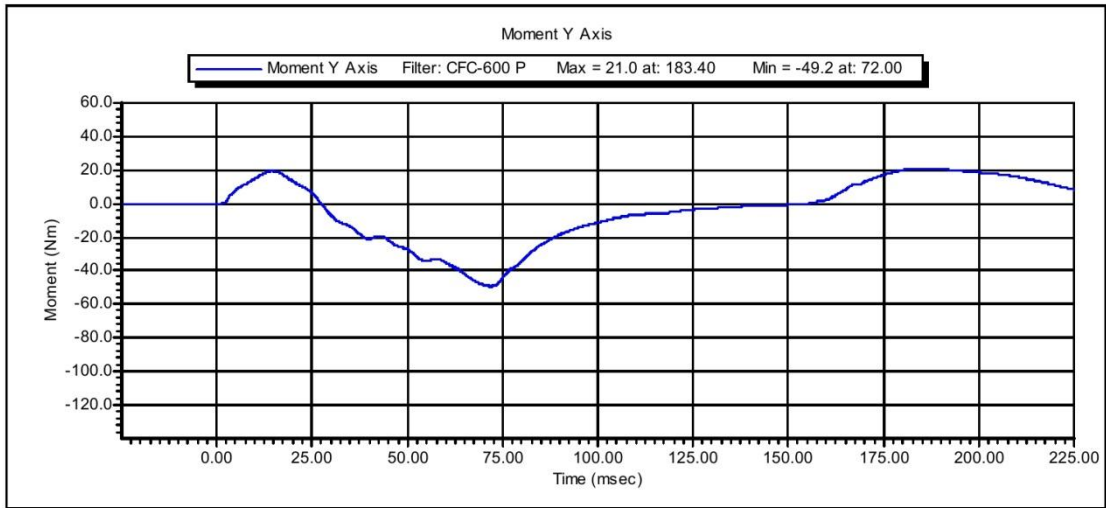
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Test Time: 1:42:15 PM

Test Date: 5/29/2012

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Test Time: **1:42:15 PM**

Test Date: **5/29/2012**

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### VERIFICATION REPORT

|                    |                        |            |                   |
|--------------------|------------------------|------------|-------------------|
| Test Name:         | <b>Thorax Impact</b>   | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                   |
| ATD Serial Number: | <b>139</b>             |            |                   |
| Test ID:           |                        | Test Date: | <b>5/22/2012</b>  |
| Test Number:       | <b>2</b>               | Test Time: | <b>1:25:24 PM</b> |

|                                    |                         |
|------------------------------------|-------------------------|
| Component Part Number              | Component Serial Number |
| <b>Ribs 880105-RS</b>              | <b>05032011A</b>        |
| <b>Chest Jacket - 880105-355-E</b> | <b>05177</b>            |
| <b>Lumbar Spine - 880105-1095</b>  | <b>050327</b>           |

| Test Parameters                    | Test Specifications | Test Results        |
|------------------------------------|---------------------|---------------------|
| Temperature                        | 20.6 -- 22.2        | <b>21.5</b> deg C P |
| Humidity                           | 10.0 -- 70.0        | <b>56.8</b> %RH P   |
| Velocity                           | 6.59 -- 6.83        | <b>6.65</b> m/s P   |
| Sternum Displacement               | -58.0 -- -50.0      | <b>-51.2</b> mm P   |
| Force During Displacement Interval | -4400 -- -3900      | <b>-4204</b> N P    |
| Force -18.0 to -50.0 Displacement  | -4600 -- 0          | <b>-4204</b> N P    |
| Hysteresis                         | 69 -- 85            | <b>74</b> % P       |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **1:25:24 PM**

Test Date: **5/22/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C14953               | 2/8/2012                |
| DentonATD           | H3CD          | DS-139               | 5/21/2012               |

Test Time: 1:25:24 PM

Test Date: 5/22/2012

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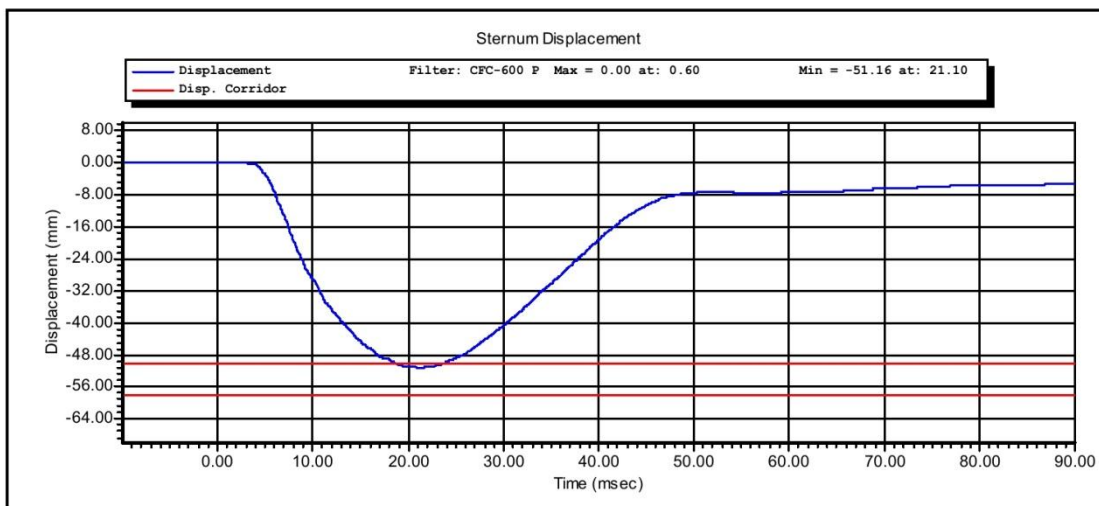
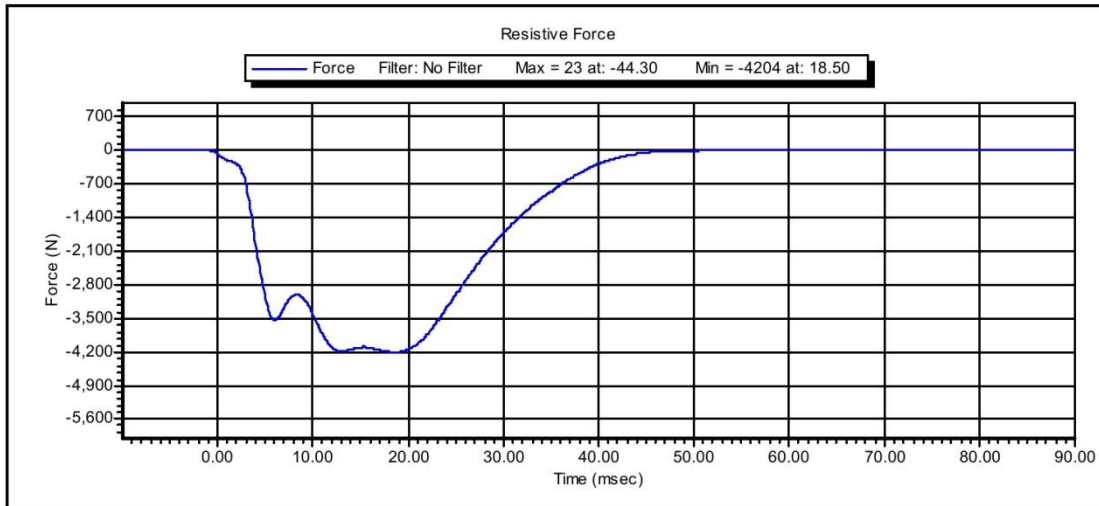
|                    |                 |            |            |
|--------------------|-----------------|------------|------------|
| Test Name:         | Thorax Impact   | Revision:  | 7/15/2002  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th |            |            |
| ATD Serial Number: | 139             |            |            |
| Test ID:           |                 | Test Date: | 5/22/2012  |
| Test Number:       | 2               | Test Time: | 1:25:24 PM |



Test Time: 1:25:24 PM

Test Date: 5/22/2012

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Test Time: 1:25:24 PM

Test Date: 5/22/2012

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## Torso Flexion

### Pre-Test

#### Part 572O HIII 5% Female

ATD Serial No: 139

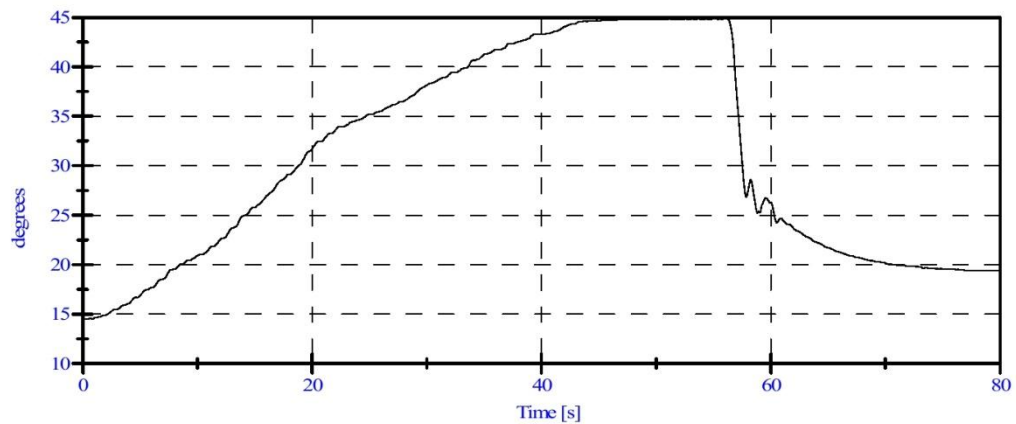
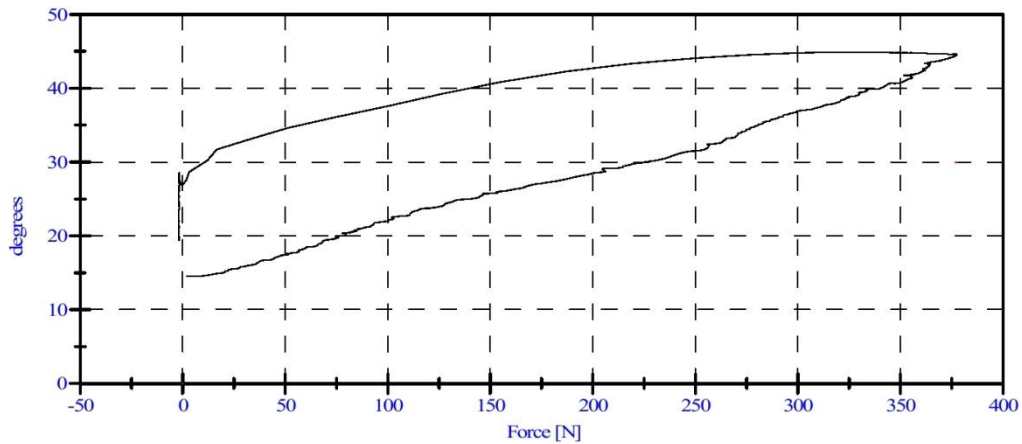
Laboratory Supervisor: D. Travale

Date: 10/4/2012

Laboratory Technician: M. Goehle

| TEST PARAMETER   | SPECIFICATION          | TEST RESULTS | STATUS |
|------------------|------------------------|--------------|--------|
| Lab Temperature: | 18.9-25.6 C            | 22.0 C       | Passed |
| Lab Humidity:    | 10-70 %                | 49.00 %      | Passed |
| Initial Angle:   | 0.00-20.00 deg         | 14.51 deg    | Passed |
| Force at 45 Deg  | 320.00-390.00 N        | 377.74 N     | Passed |
| Return Angle     | 8 Deg Max from Initial | 18.09 deg    | Passed |

### LUMBAR SPINE FLEXION TEST



**VERIFICATION REPORT**

|                    |                             |            |                    |
|--------------------|-----------------------------|------------|--------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>7/15/2002</b>   |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>       |
| ATD Type:          | <b>Hybrid III 5'th</b>      |            |                    |
| ATD Serial Number: | <b>139</b>                  |            |                    |
| Test ID:           |                             | Test Date: | <b>5/17/2012</b>   |
| Test Number:       | <b>1</b>                    | Test Time: | <b>11:45:49 AM</b> |

|                               |                         |
|-------------------------------|-------------------------|
| Component Part Number         | Component Serial Number |
| <b>Knee Skin - 880105-508</b> | <b>1350</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>22.2</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>32.0</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.10</b> m/s P   |
| Resistive Force | -4060 -- -3450      | <b>-3535</b> N P    |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **11:45:49 AM**

Test Date: **5/17/2012**





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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 12/10/2011              |

Test Time: 11:45:49 AM

Test Date: 5/17/2012

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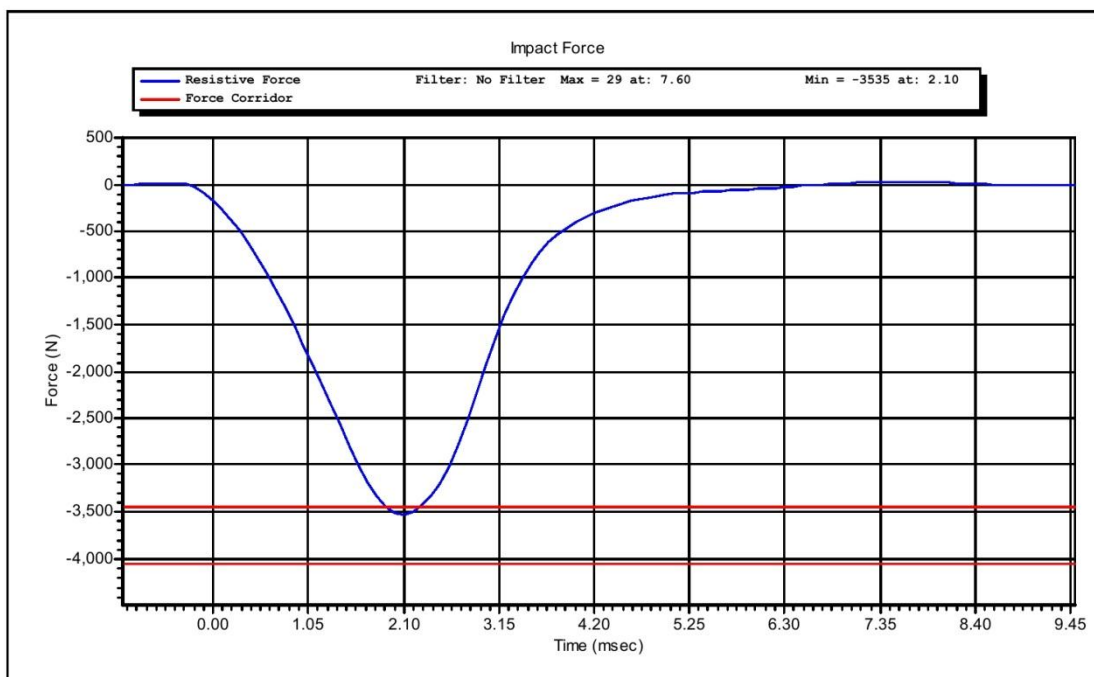


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|                    |                      |            |             |
|--------------------|----------------------|------------|-------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 7/15/2002   |
| Sub Test Name:     |                      | Spec Type: | NHTSA       |
| ATD Type:          | Hybrid III 5'th      |            |             |
| ATD Serial Number: | 139                  |            |             |
| Test ID:           |                      | Test Date: | 5/17/2012   |
| Test Number:       | 1                    | Test Time: | 11:45:49 AM |



Test Time: 11:45:49 AM

Test Date: 5/17/2012

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### VERIFICATION REPORT

|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b>      |            |                   |
| ATD Serial Number: | <b>139</b>                  |            |                   |
| Test ID:           | <b>Right Knee</b>           | Test Date: | <b>5/17/2012</b>  |
| Test Number:       | <b>1</b>                    | Test Time: | <b>1:43:32 PM</b> |

|                               |                         |
|-------------------------------|-------------------------|
| Component Part Number         | Component Serial Number |
| <b>Knee Skin - 880105-508</b> | <b>1359</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>22.2</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>29.0</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.10</b> m/s P   |
| Resistive Force | -4060 -- -3450      | <b>-3671</b> N P    |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **1:43:32 PM**

Test Date: **5/17/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 12/10/2011              |

Test Time: 1:43:32 PM

Test Date: 5/17/2012

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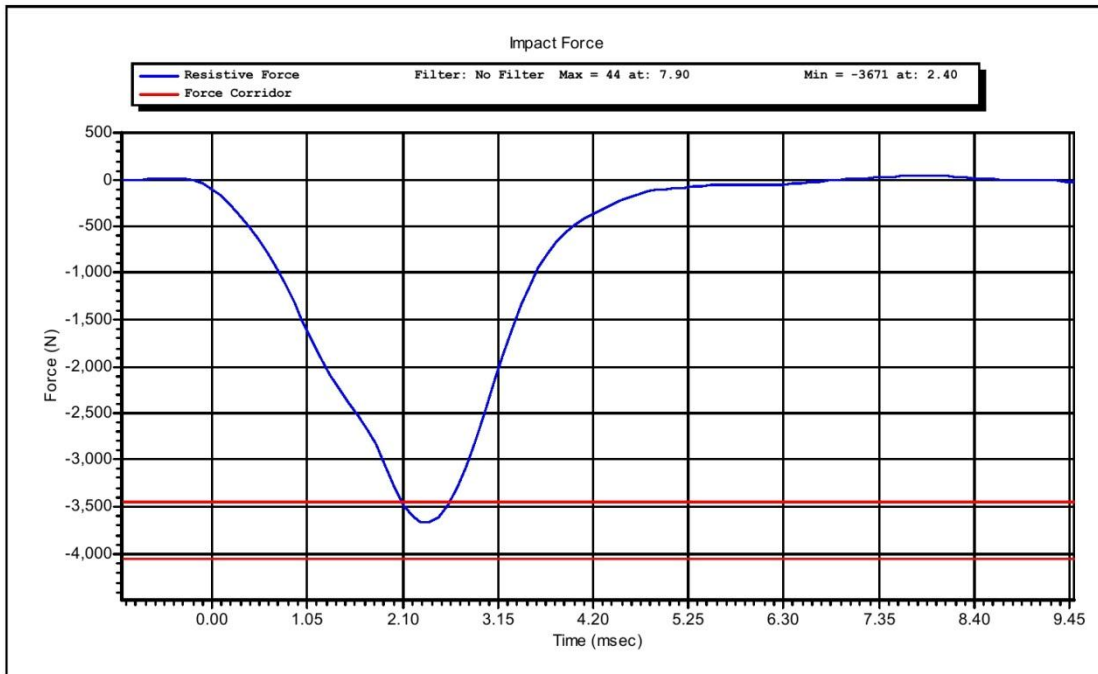


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 7/15/2002  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th      |            |            |
| ATD Serial Number: | 139                  |            |            |
| Test ID:           | Right Knee           | Test Date: | 5/17/2012  |
| Test Number:       | 1                    | Test Time: | 1:43:32 PM |



Test Time: 1:43:32 PM

Test Date: 5/17/2012

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# **CALIBRATION TEST RESULTS**

## **POST-TEST**

**HYBRID III 50<sup>TH</sup> PERCENTILE MALE - DRIVER ATD**

**SERIAL NO: 64**



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### 50<sup>th</sup> Male External Measurements

S/N 064

| Symbol | Description                              | Specification | Results | Pass |
|--------|------------------------------------------|---------------|---------|------|
|        |                                          | in            | in      |      |
| A      | Sitting Height                           | 34.6 – 35.0   | 34.8    | Yes  |
| B      | Shoulder Pivot Height                    | 19.9 – 20.5   | 20.2    | Yes  |
| C      | H-Point Height                           | 3.3 – 3.5     | 3.4     | Yes  |
| D      | H-Point from Backline                    | 5.3 – 5.5     | 5.5     | Yes  |
| E      | Shoulder Pivot from Backline             | 3.3 – 3.7     | 3.5     | Yes  |
| F      | Thigh Clearance                          | 5.5 – 6.1     | 6.1     | Yes  |
| G      | Back of Elbow to Wrist Pivot             | 11.4 – 12.0   | 11.6    | Yes  |
| H      | Head Back to Backline                    | 1.6 – 1.8     | 1.7     | Yes  |
| I      | Shoulder to Elbow Length                 | 13.0 – 13.6   | 13.4    | Yes  |
| J      | Elbow Rest Height                        | 7.5 – 8.3     | 7.8     | Yes  |
| K      | Buttock to Knee Length                   | 22.8 – 23.8   | 23.2    | Yes  |
| L      | Popliteal Height                         | 16.9 – 17.9   | 17.3    | Yes  |
| M      | Knee Pivot Height                        | 19.1 – 19.7   | 19.4    | Yes  |
| N      | Buttock Popliteal Length                 | 17.8 – 18.8   | 18.8    | Yes  |
| O      | Chest Depth without Jacket               | 8.4 – 9.0     | 8.5     | Yes  |
| P      | Foot Length (right)                      | 9.9 – 10.5    | 10.2    | Yes  |
| V      | Shoulder Breadth                         | 16.3 – 17.2   | 16.9    | Yes  |
| W      | Foot Breadth                             | 3.6 – 4.2     | 3.9     | Yes  |
| Y      | Chest Circumference with Jacket          | 38.2 – 39.4   | 38.9    | Yes  |
| Z      | Waist Circumference                      | 32.9 – 34.1   | 33.7    | Yes  |
| AA     | Reference Location (Chest Circumference) | 16.9 – 17.1   | 16.9    | Yes  |
| BB     | Reference Location (Waist Circumference) | 8.9 – 9.1     | 9.0     | Yes  |

Technician: SPZ

10/15/2012



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### VERIFICATION REPORT

|                    |                         |            |                   |
|--------------------|-------------------------|------------|-------------------|
| Test Name:         | <b>Head Drop</b>        | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                   |
| ATD Serial Number: | <b>064</b>              |            |                   |
| Test ID:           |                         | Test Date: | <b>10/15/2012</b> |
| Test Number:       | <b>1</b>                | Test Time: | <b>3:55:28 PM</b> |

|                              |                         |
|------------------------------|-------------------------|
| Component Part Number        | Component Serial Number |
| <b>Head Skin - 78051-228</b> | <b>7997</b>             |

| Test Parameters        | Test Specifications | Test Results        |
|------------------------|---------------------|---------------------|
| Temperature            | 18.9 -- 25.6        | <b>22.2</b> deg C P |
| Humidity               | 10 -- 70            | <b>38</b> %RH P     |
| Resultant Acceleration | 225 -- 275          | <b>256</b> g P      |
| Oscillation            | 0.0 -- 10.0         | <b>2.4</b> % P      |
| Lateral Acceleration   | -15.00 -- 15.00     | <b>-4.39</b> g P    |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **3:55:28 PM**

Test Date: **10/15/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u> | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|--------------|----------------------|-------------------------|
| Endevco             | 7264-2000    | P58871               | 5/16/2012               |
| Endevco             | 7264-2000    | P12359               | 5/23/2012               |
| Endevco             | 7264-2000    | P52133               | 5/16/2012               |

Test Time: **3:55:28 PM**

Test Date: **10/15/2012**

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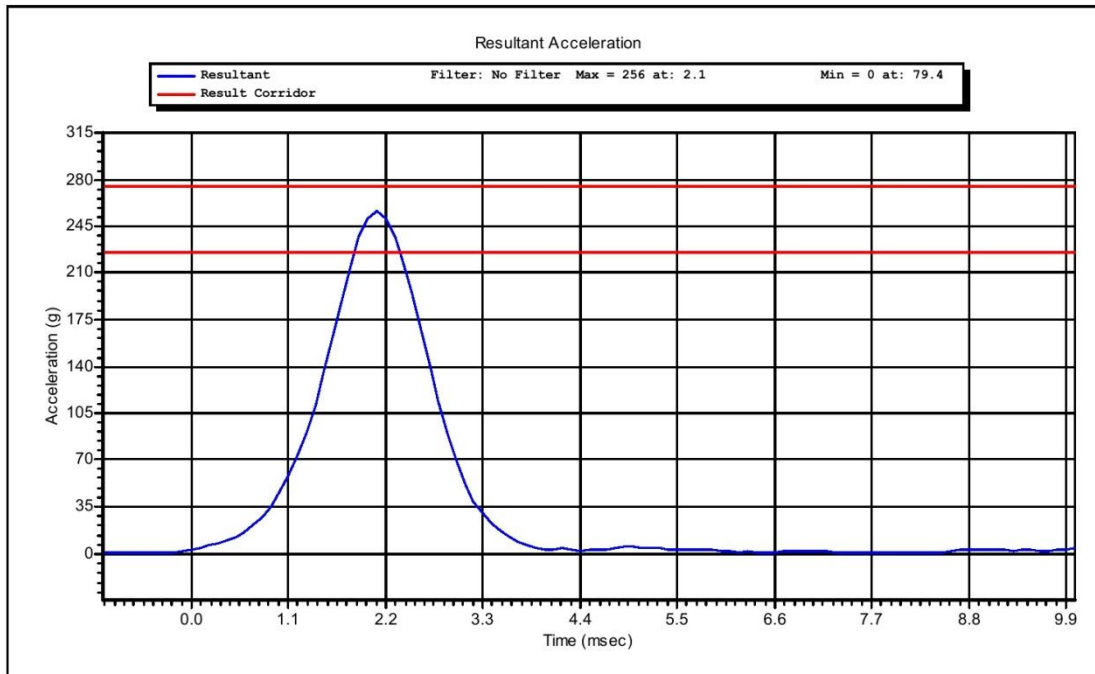


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|                    |                  |            |            |
|--------------------|------------------|------------|------------|
| Test Name:         | Head Drop        | Revision:  | 10/1/2001  |
| Sub Test Name:     |                  | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th |            |            |
| ATD Serial Number: | 064              |            |            |
| Test ID:           |                  | Test Date: | 10/15/2012 |
| Test Number:       | 1                | Test Time: | 3:55:28 PM |

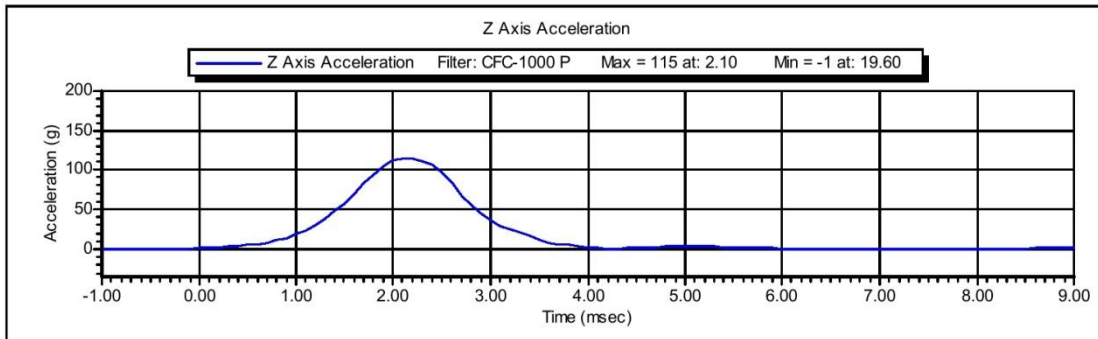
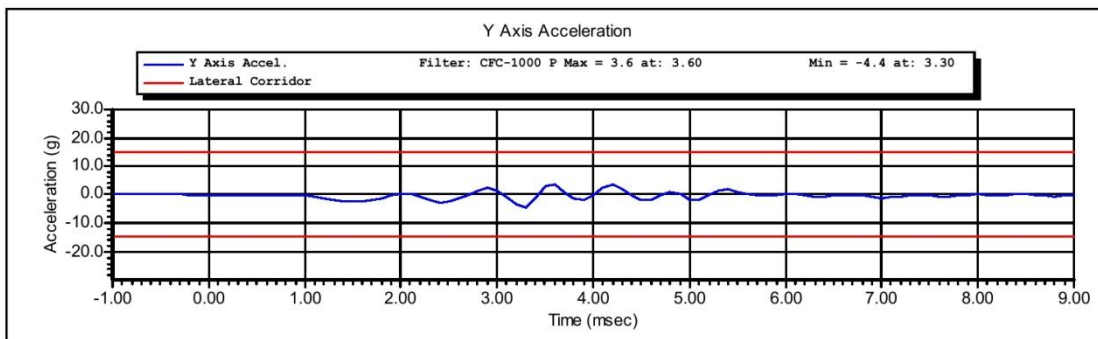
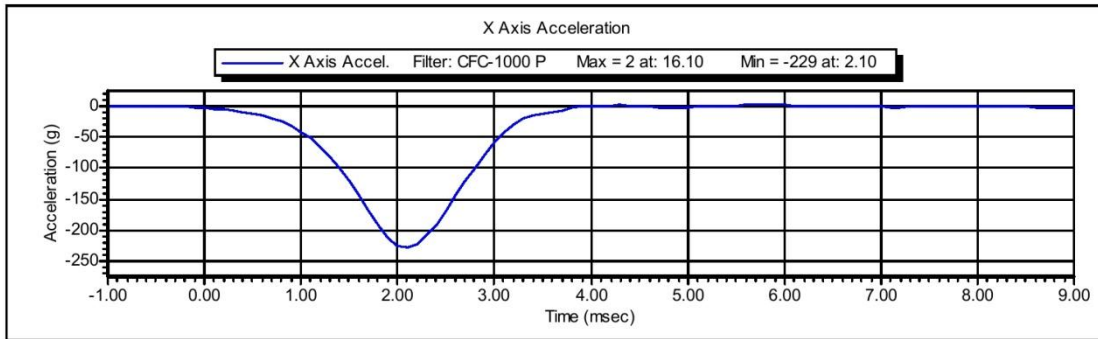


Test Time: 3:55:28 PM

Test Date: 10/15/2012

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Test Time: 3:55:28 PM

Test Date: 10/15/2012

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**VERIFICATION REPORT**

|                    |                         |            |                    |
|--------------------|-------------------------|------------|--------------------|
| Test Name:         | <b>Neck Flexion</b>     | Revision:  | <b>10/1/2001</b>   |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>       |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                    |
| ATD Serial Number: | <b>064</b>              |            |                    |
| Test ID:           |                         | Test Date: | <b>10/16/2012</b>  |
| Test Number:       | <b>3</b>                | Test Time: | <b>11:56:02 AM</b> |

|                         |                         |
|-------------------------|-------------------------|
| Component Part Number   | Component Serial Number |
| <b>Neck - 78051-336</b> | <b>02-1692</b>          |

| Test Parameters                       | Test Specifications | Test Results           |
|---------------------------------------|---------------------|------------------------|
| Temperature                           | 20.6 -- 22.2        | <b>21.4</b> deg C P    |
| Humidity                              | 10 -- 70            | <b>34</b> %RH P        |
| Velocity                              | 6.89 -- 7.13        | <b>7.07</b> m/s P      |
| Pendulum Deceleration at 10 ms        | 22.5 -- 27.5        | <b>23.6</b> g P        |
| Pendulum Deceleration at 20 ms        | 17.6 -- 22.6        | <b>21.8</b> g P        |
| Pendulum Deceleration at 30 ms        | 12.5 -- 18.5        | <b>16.3</b> g P        |
| Max Pendulum Deceleration After 30 ms | 0.0 -- 29.0         | <b>16.3</b> g P        |
| Deceleration time to 5 g              | 34.0 -- 42.0        | <b>37.5</b> ms P       |
| D Plane Rotation                      | -78.0 -- -64.0      | <b>-65.3</b> degrees P |
| Time at max rotation                  | 57.0 -- 64.0        | <b>59.2</b> ms P       |
| Rotation Decay to Zero                | 113.0 -- 128.0      | <b>114.8</b> ms P      |
| Moment about OC                       | 88.1 -- 108.4       | <b>94.1</b> Nm P       |
| Time at Max Moment                    | 47.0 -- 58.0        | <b>48.5</b> ms P       |
| Moment Decay to Zero                  | 97.0 -- 107.0       | <b>98.6</b> ms P       |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **11:56:02 AM**

Test Date: **10/16/2012**



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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 8/15/2012               |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-2186 My           | 5/21/2012               |
| Denton              | 1716A         | LC-2186 Fx           | 5/21/2012               |

Test Time: 11:56:02 AM

Test Date: 10/16/2012

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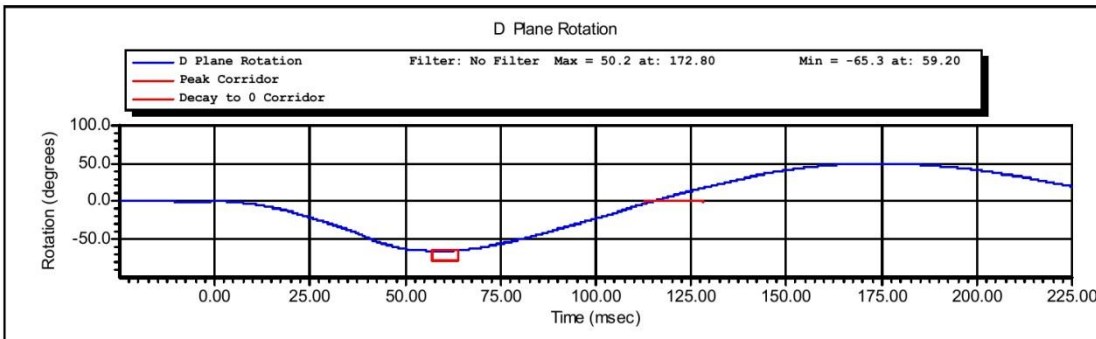
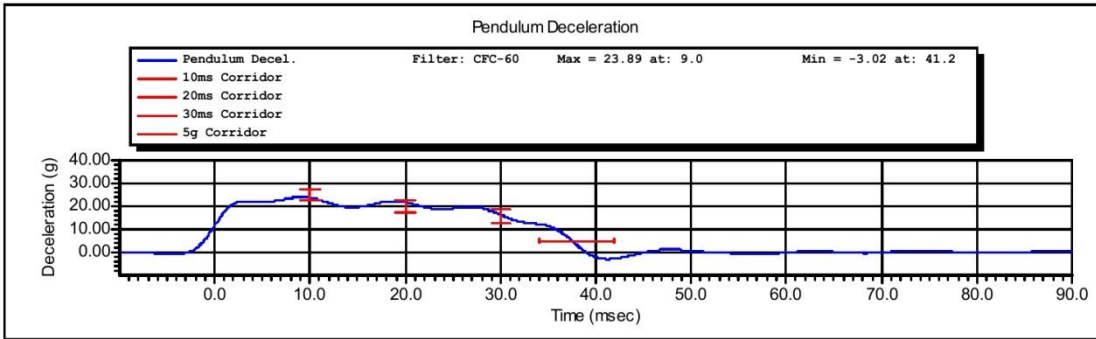


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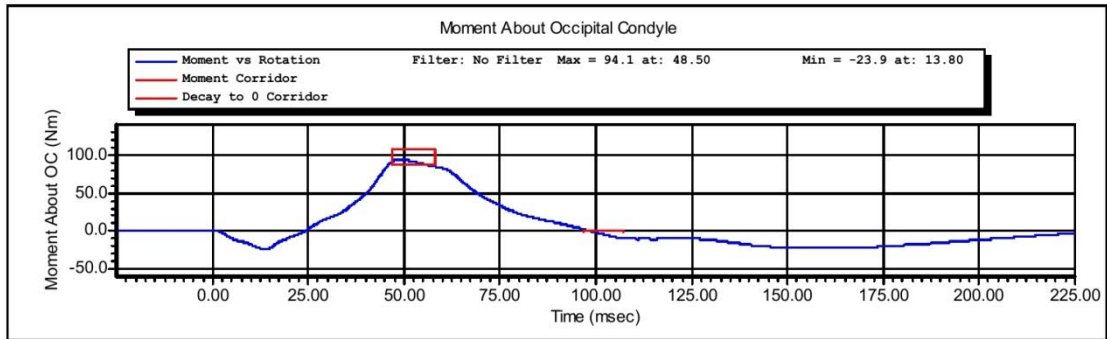
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|--------------------|------------------|---------------|-------------|
| Name of Test:      | Neck Flexion     | REVISION:     | 10/1/2001   |
| Name of Sub Test:  |                  | Type of Spec: | NHTSA       |
| Type of ATD:       | Hybrid III 50'th |               |             |
| ATD Serial Number: | 064              |               |             |
| ID of Test:        |                  | Date:         | 10/16/2012  |
| Number of Test:    | 3                | Time of Test: | 11:56:02 AM |



Time of Test: 11:56:02 AM

Date of Test: 10/16/2012

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Time of Test: **11:56:02 AM**

Date of Test: **10/16/2012**

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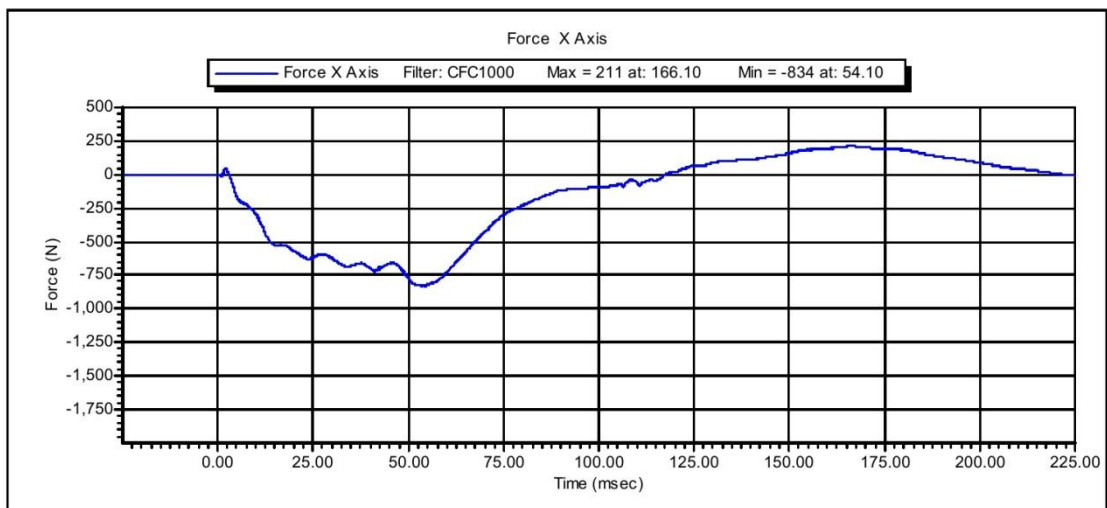
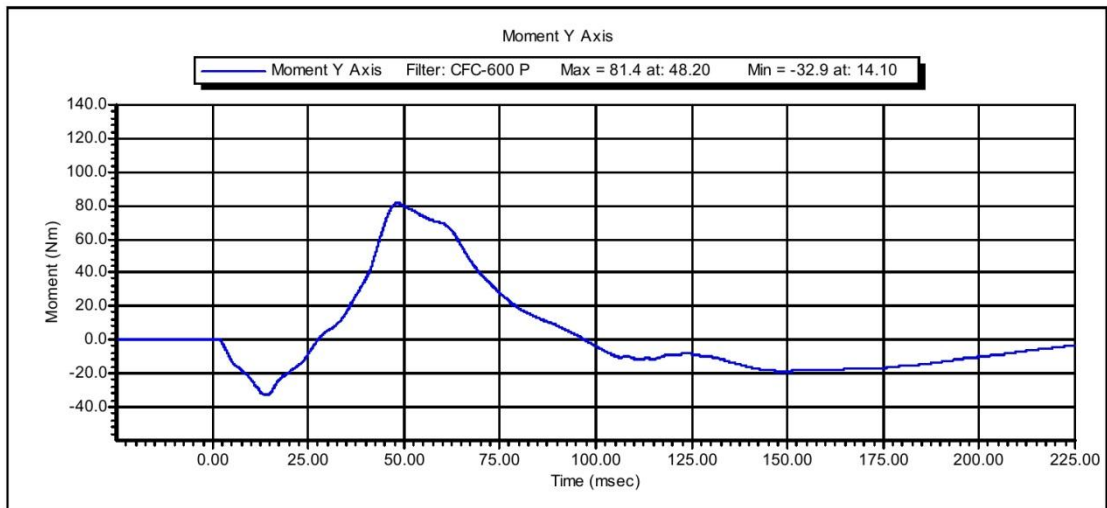




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Time of Test: 11:56:02 AM

Date of Test: 10/16/2012

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**VERIFICATION REPORT**

|                    |                         |            |                   |
|--------------------|-------------------------|------------|-------------------|
| Test Name:         | <b>Neck Extension</b>   | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                   |
| ATD Serial Number: |                         |            |                   |
| Test ID:           |                         | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                | Test Time: | <b>1:18:24 PM</b> |

|                         |                         |
|-------------------------|-------------------------|
| Component Part Number   | Component Serial Number |
| <b>Neck - 78051-336</b> | <b>02-1692</b>          |

| Test Parameters                 |       | Test Specifications |          | Test Results        |   |
|---------------------------------|-------|---------------------|----------|---------------------|---|
| Temperature                     |       | 20.6                | -- 22.2  | <b>21.4</b> deg C   | P |
| Humidity                        |       | 10                  | -- 70    | <b>33</b> %RH       | P |
| Velocity                        |       | 5.94                | -- 6.19  | <b>6.13</b> m/s     | P |
| Pendulum Deceleration at        | 10 ms | 17.2                | -- 21.2  | <b>18.2</b> g       | P |
| Pendulum Deceleration at        | 20 ms | 14.0                | -- 19.0  | <b>16.4</b> g       | P |
| Pendulum Deceleration at        | 30 ms | 11.0                | -- 16.0  | <b>13.1</b> g       | P |
| Max Pendulum Deceleration after | 30 ms | 0.0                 | -- 22.0  | <b>13.1</b> g       | P |
| Decel Time to                   | 5 g   | 38.0                | -- 46.0  | <b>43.2</b> ms      | P |
| D Plane Rotation                |       | 81.0                | -- 106.0 | <b>91.6</b> degrees | P |
| Time at Max Rotation            |       | 72.0                | -- 82.0  | <b>79.3</b> ms      | P |
| Rotation Decay to Zero          |       | 147.0               | -- 174.0 | <b>158.6</b> ms     | P |
| Moment About Occipital Condyle  |       | -80.0               | -- -52.9 | <b>-58.8</b> Nm     | P |
| Time at Max Moment              |       | 65.0                | -- 79.0  | <b>74.9</b> ms      | P |
| Moment Decay to Zero            |       | 120.0               | -- 148.0 | <b>144.2</b> ms     | P |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **1:18:24 PM**

Test Date: **10/16/2012**



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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 8/15/2012               |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-2186 My           | 5/21/2012               |
| Denton              | 1716A         | LC-2186 Fx           | 5/21/2012               |

Test Time: **1:18:24 PM**

Test Date: **10/16/2012**

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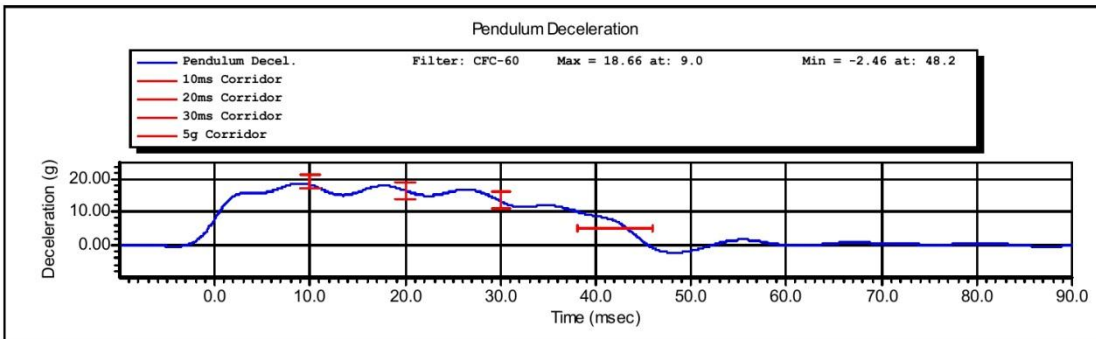
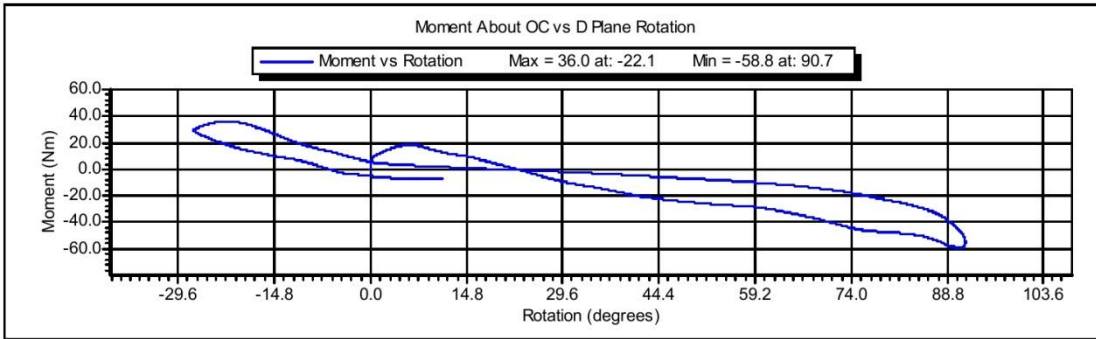


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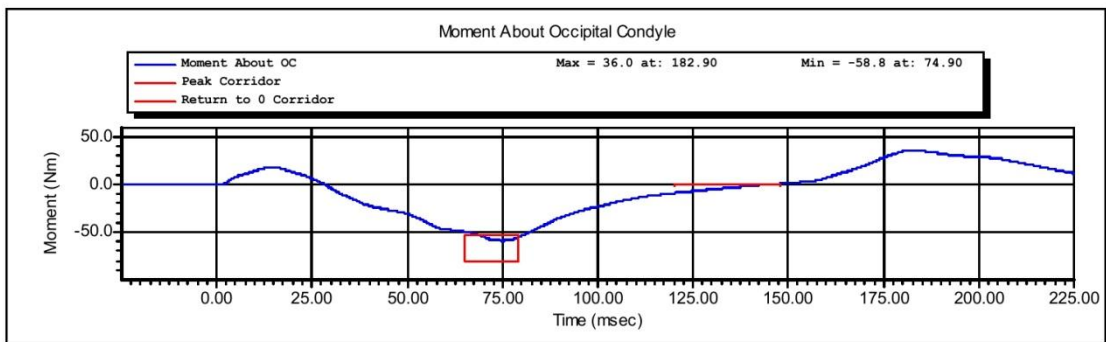
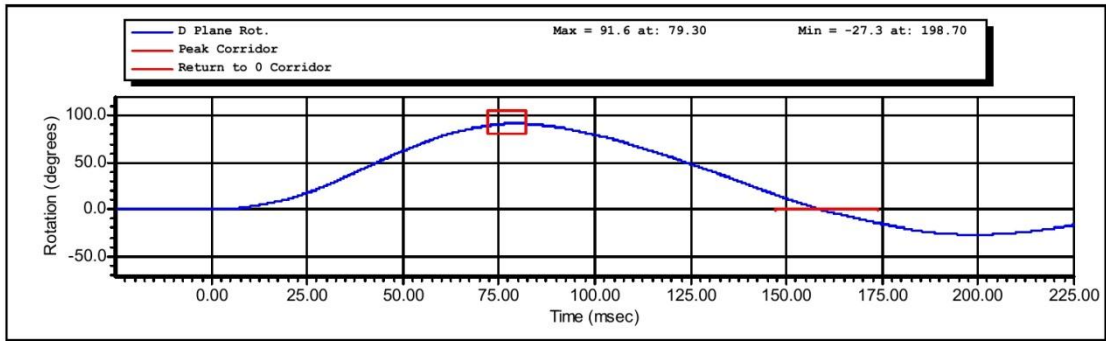
|                    |                  |               |            |
|--------------------|------------------|---------------|------------|
| Name of Test:      | Neck Extension   | REVISION:     | 10/1/2001  |
| Name of Sub Test:  |                  | Type of Spec: | NHTSA      |
| Type of ATD:       | Hybrid III 50'th |               |            |
| ATD Serial Number: |                  |               |            |
| ID of Test:        |                  | Date:         | 10/16/2012 |
| Number of Test:    | 1                | Time of Test: | 1:18:24 PM |



Time of Test: 1:18:24 PM

Date of Test: 10/16/2012

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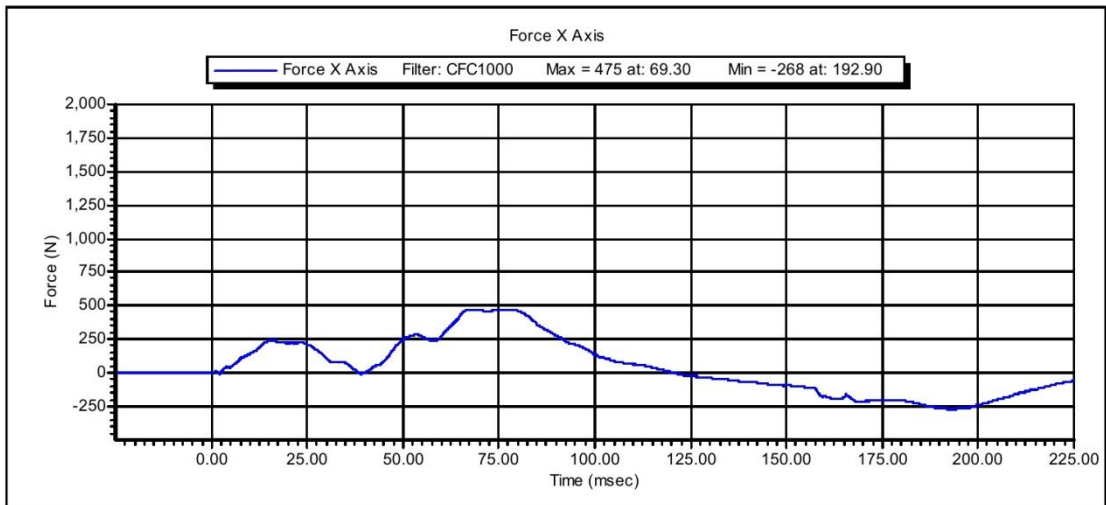
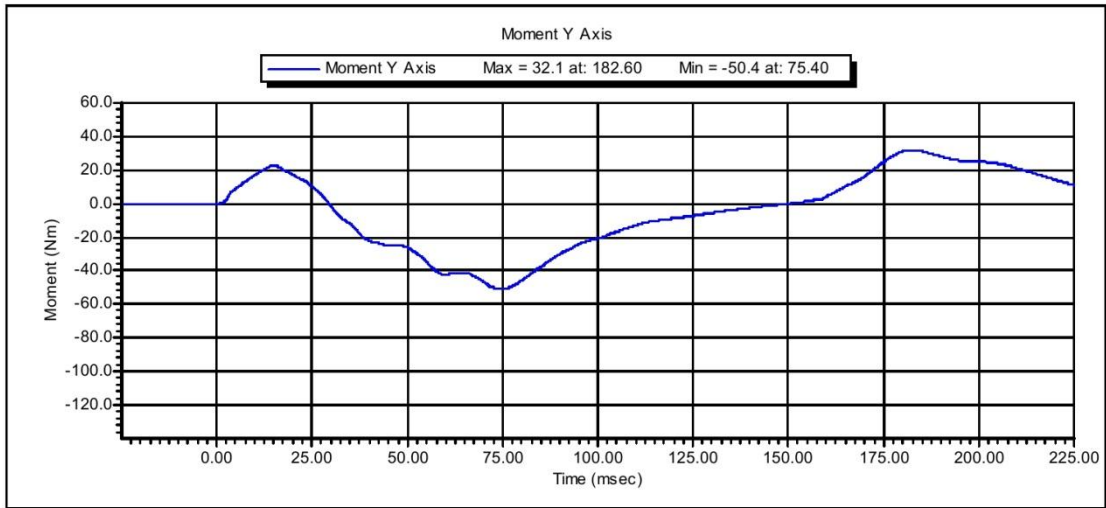


Time of Test: 1:18:24 PM

Date of Test: 10/16/2012

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Time of Test: **1:18:24 PM**

Date of Test: **10/16/2012**

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**VERIFICATION REPORT**

|                    |                         |            |                   |
|--------------------|-------------------------|------------|-------------------|
| Test Name:         | <b>Thorax Impact</b>    | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                         | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b> |            |                   |
| ATD Serial Number: | <b>064</b>              |            |                   |
| Test ID:           |                         | Test Date: | <b>10/17/2012</b> |
| Test Number:       | <b>1</b>                | Test Time: | <b>8:02:39 AM</b> |

|                                 |                         |
|---------------------------------|-------------------------|
| Component Part Number           | Component Serial Number |
| <b>Ribs 78051-RS</b>            | <b>3964</b>             |
| <b>Chest Jacket - 78051-169</b> | <b>2589</b>             |

| Test Parameters      | Test Specifications | Test Results        |
|----------------------|---------------------|---------------------|
| Temperature          | 20.6 -- 22.2        | <b>21.0</b> deg C P |
| Humidity             | 10.0 -- 70.0        | <b>31.0</b> %RH P   |
| Velocity             | 6.59 -- 6.83        | <b>6.76</b> m/s P   |
| Resistive Force      | -5.894 -- -5.160    | <b>-5.502</b> kN P  |
| Sternum Displacement | -72.6 -- -63.5      | <b>-66.6</b> mm P   |
| Hysteresis           | 69 -- 85            | <b>75</b> % P       |

All test parameters are within specifications

Technician: **S. Zito**  
Supervisor: **D. Travale**

Test Time: **8:02:39 AM**Test Date: **10/17/2012**



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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C14953               | 5/25/2012               |
| DentonATD           | 78051-342     | DS-064               | 5/18/2012               |

Test Time: 8:02:39 AM

Test Date: 10/17/2012

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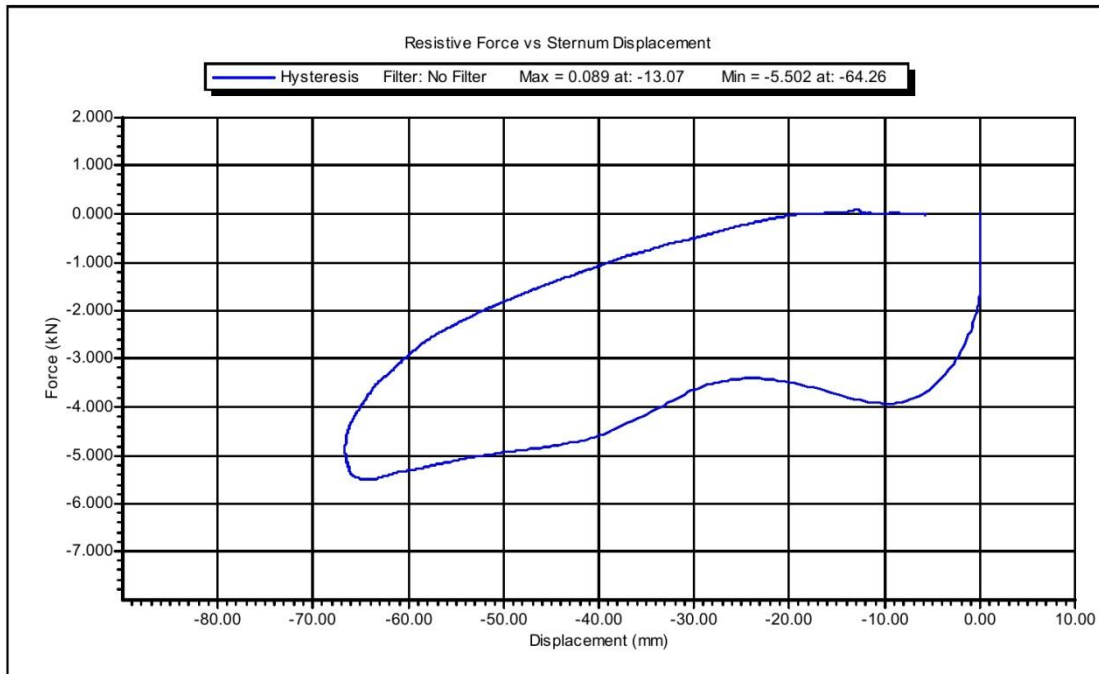


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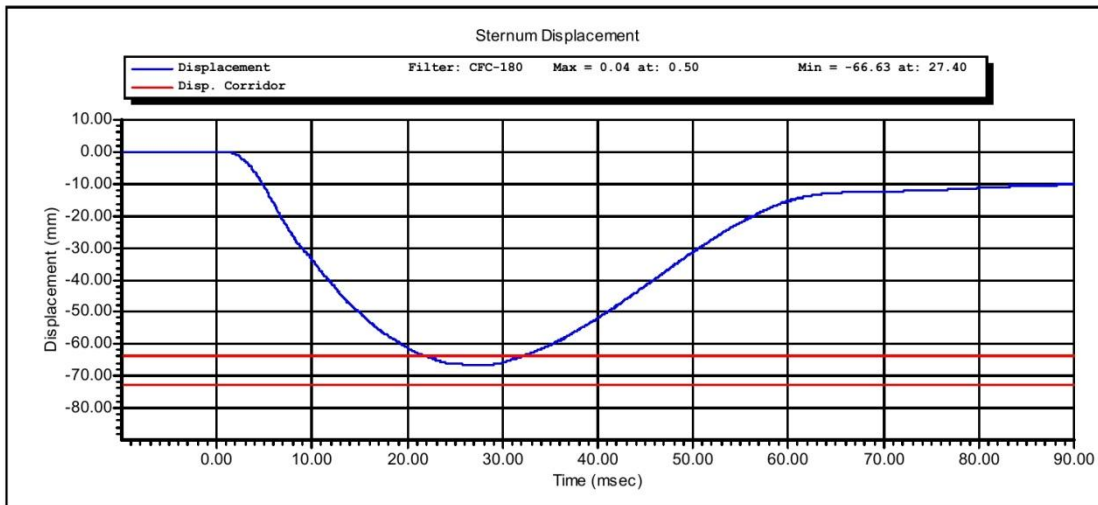
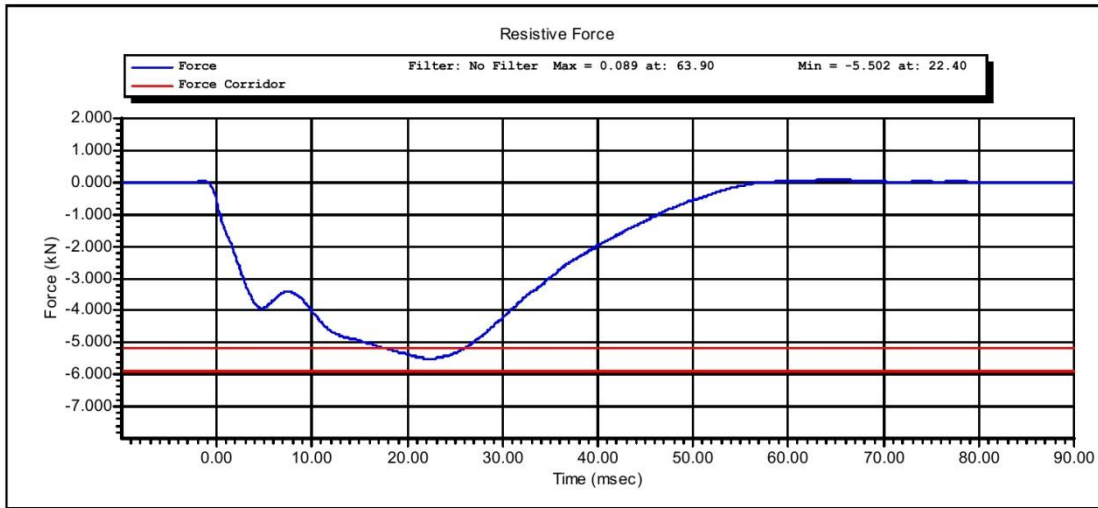
|                    |                  |            |            |
|--------------------|------------------|------------|------------|
| Test Name:         | Thorax Impact    | Revision:  | 10/1/2001  |
| Sub Test Name:     |                  | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th |            |            |
| ATD Serial Number: | 064              |            |            |
| Test ID:           |                  | Test Date: | 10/17/2012 |
| Test Number:       | 1                | Test Time: | 8:02:39 AM |



Test Time: 8:02:39 AM

Test Date: 10/17/2012

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Test Time: **8:02:39 AM**

Test Date: **10/17/2012**

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|                    |                          |            |                   |
|--------------------|--------------------------|------------|-------------------|
| Test Name:         | <b>Hip Flexion (ROM)</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                          | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>  |            |                   |
| ATD Serial Number: | <b>064</b>               |            |                   |
| Test ID:           | <b>Hip ROM Right</b>     | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                 | Test Time: | <b>9:27:44 AM</b> |

|                                 |                         |
|---------------------------------|-------------------------|
| Component Part Number           | Component Serial Number |
| <b>Pelvis Assembly 78051-60</b> | <b>1445</b>             |

| Test Parameters      | Test Specifications | Test Results          |
|----------------------|---------------------|-----------------------|
| Temperature          | 18.9 -- 25.6        | <b>21.5</b> deg C P   |
| Humidity             | 10 -- 70            | <b>36</b> %RH P       |
| Average Velocity     | 5.0 -- 10.0         | <b>6.9</b> deg/s P    |
| Angle at 203 Nm      | 40.0 -- 50.0        | <b>40.0</b> degrees P |
| Moment at 30 degrees | 0.0 -- 94.9         | <b>89.2</b> Nm P      |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **9:27:44 AM**

Test Date: **10/16/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| Key                 | 2301-02       | 115                  | 12/15/2011              |
| Transducers/PCB     | 14CB1-3615    | 0008                 | 3/16/2012               |
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| DentonATD           |               |                      |                         |

Test Time: 9:27:44 AM

Test Date: 10/16/2012

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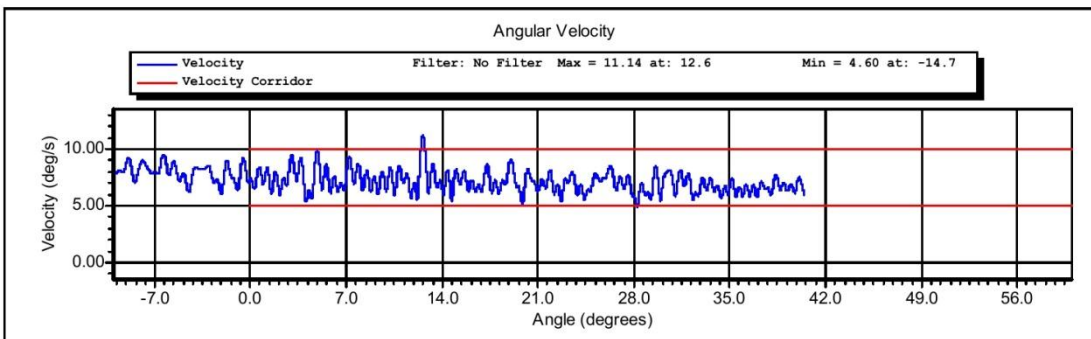
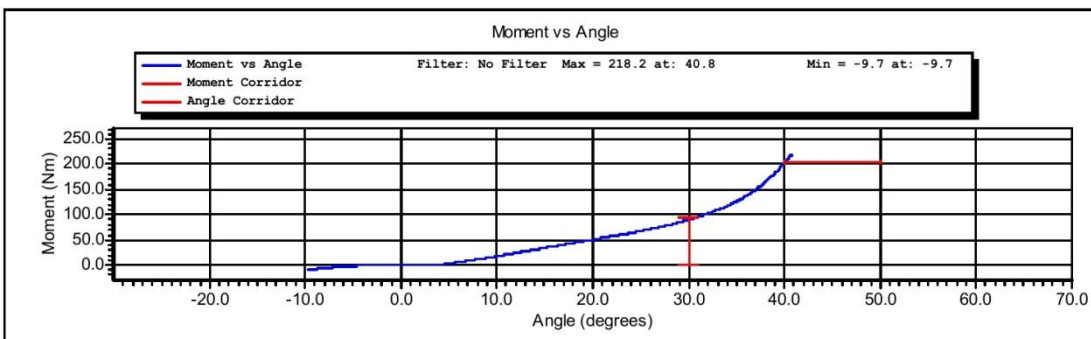


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|                    |                   |            |            |
|--------------------|-------------------|------------|------------|
| Test Name:         | Hip Flexion (ROM) | Revision:  | 10/1/2001  |
| Sub Test Name:     |                   | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th  |            |            |
| ATD Serial Number: | 064               |            |            |
| Test ID:           | Hip ROM Right     | Test Date: | 10/16/2012 |
| Test Number:       | 1                 | Test Time: | 9:27:44 AM |



Test Time: 9:27:44 AM

Test Date: 10/16/2012

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### VERIFICATION REPORT

|                    |                          |            |                   |
|--------------------|--------------------------|------------|-------------------|
| Test Name:         | <b>Hip Flexion (ROM)</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                          | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>  |            |                   |
| ATD Serial Number: | <b>064</b>               |            |                   |
| Test ID:           | <b>Hip ROM Left</b>      | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                 | Test Time: | <b>9:51:05 AM</b> |

|                                 |                         |
|---------------------------------|-------------------------|
| Component Part Number           | Component Serial Number |
| <b>Pelvis Assembly 78051-60</b> | <b>1445</b>             |

| Test Parameters      | Test Specifications | Test Results          |
|----------------------|---------------------|-----------------------|
| Temperature          | 18.9 -- 25.6        | <b>21.4</b> deg C P   |
| Humidity             | 10 -- 70            | <b>36</b> %RH P       |
| Average Velocity     | 5.0 -- 10.0         | <b>6.7</b> deg/s P    |
| Angle at 203 Nm      | 40.0 -- 50.0        | <b>41.2</b> degrees P |
| Moment at 30 degrees | 0.0 -- 94.9         | <b>75.4</b> Nm P      |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **9:51:05 AM**

Test Date: **10/16/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| Key                 | 2301-02       | 115                  | 12/15/2011              |
| Transducers/PCB     | 14CB1-3615    | 0008                 | 3/16/2012               |
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| DentonATD           |               |                      |                         |

Test Time: 9:51:05 AM

Test Date: 10/16/2012

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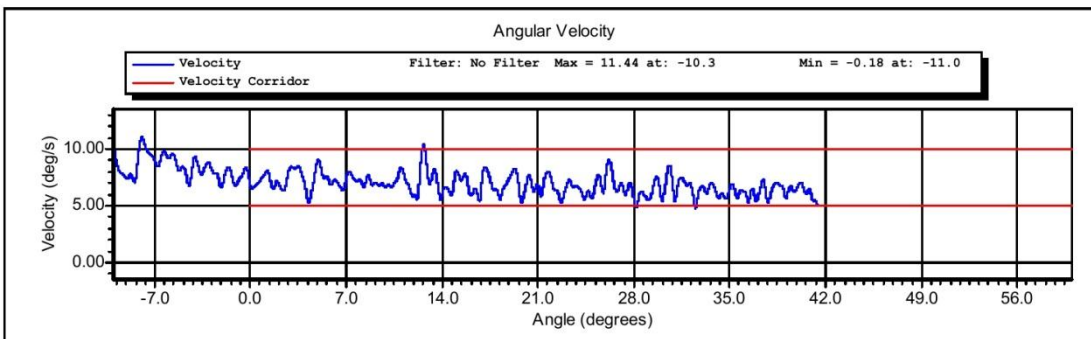
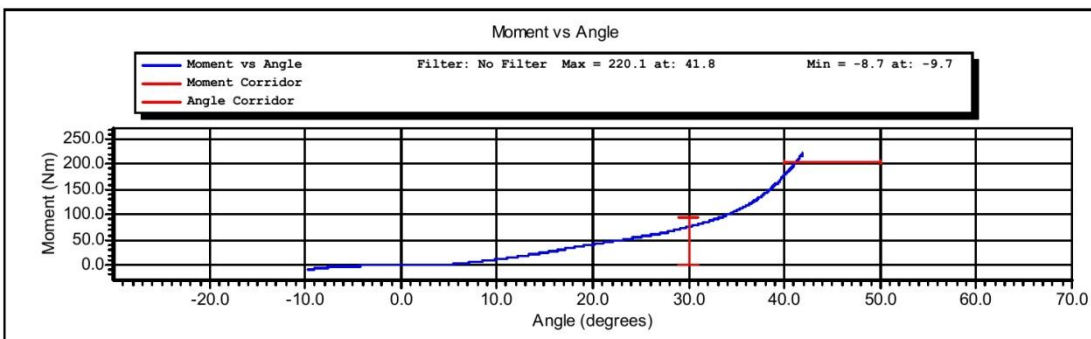


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|                    |                   |            |            |
|--------------------|-------------------|------------|------------|
| Test Name:         | Hip Flexion (ROM) | Revision:  | 10/1/2001  |
| Sub Test Name:     |                   | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th  |            |            |
| ATD Serial Number: | 064               |            |            |
| Test ID:           | Hip ROM Left      | Test Date: | 10/16/2012 |
| Test Number:       | 1                 | Test Time: | 9:51:05 AM |



Test Time: 9:51:05 AM

Test Date: 10/16/2012

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### VERIFICATION REPORT

|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>     |            |                   |
| ATD Serial Number: | <b>064</b>                  |            |                   |
| Test ID:           | <b>Knee Impact Left</b>     | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                    | Test Time: | <b>2:18:14 PM</b> |

|                             |                         |
|-----------------------------|-------------------------|
| Component Part Number       | Component Serial Number |
| <b>Knee Skin - 78051(L)</b> | <b>2882</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>21.9</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>28.7</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.10</b> m/s P   |
| Resistive Force | -5.78 -- -4.72      | <b>-5.38</b> kN P   |

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **2:18:14 PM**

Test Date: **10/16/2012**

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**VERIFICATION REPORT**

REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 6/15/2012               |

Test Time: **2:18:14 PM**

Test Date: **10/16/2012**

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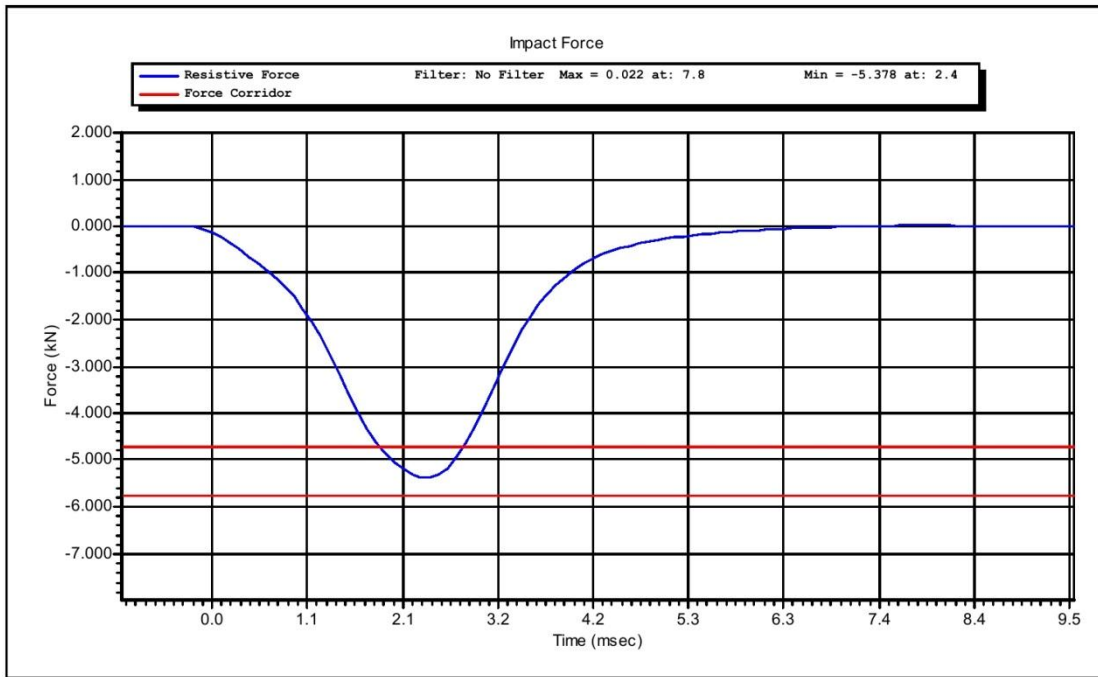


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 10/1/2001  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th     |            |            |
| ATD Serial Number: | 064                  |            |            |
| Test ID:           | Knee Impact Left     | Test Date: | 10/16/2012 |
| Test Number:       | 1                    | Test Time: | 2:18:14 PM |



Test Time: 2:18:14 PM

Test Date: 10/16/2012

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### VERIFICATION REPORT

|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>10/1/2001</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 50'th</b>     |            |                   |
| ATD Serial Number: | <b>Knee Impact Right</b>    |            |                   |
| Test ID:           | <b>064</b>                  | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                    | Test Time: | <b>2:45:58 PM</b> |

|                                     |                         |
|-------------------------------------|-------------------------|
| Component Part Number               | Component Serial Number |
| <b>Knee Skin - 78051(L) or 6(R)</b> | <b>2531</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>22.1</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>29.0</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.10</b> m/s P   |
| Resistive Force | -5.78 -- -4.72      | <b>-5.51</b> kN P   |

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **2:45:58 PM**

Test Date: **10/16/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 6/15/2012               |

Test Time: 2:45:58 PM

Test Date: 10/16/2012

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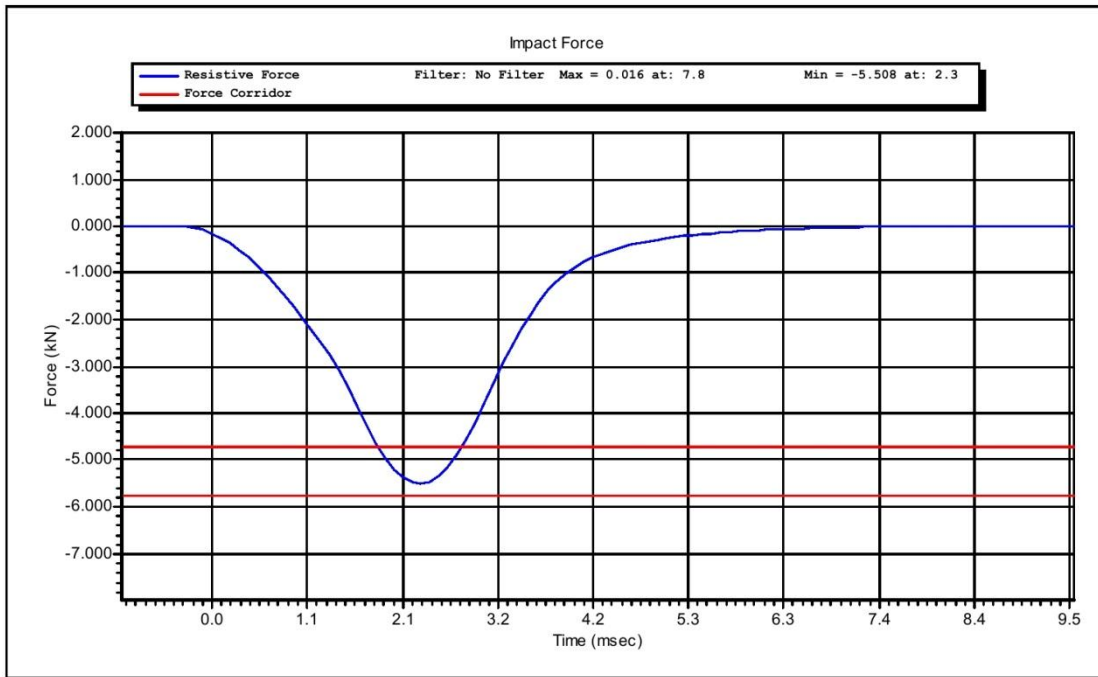


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 10/1/2001  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 50'th     |            |            |
| ATD Serial Number: | Knee Impact Right    |            |            |
| Test ID:           | 064                  | Test Date: | 10/16/2012 |
| Test Number:       | 1                    | Test Time: | 2:45:58 PM |



Test Time: 2:45:58 PM

Test Date: 10/16/2012

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**CALIBRATION TEST RESULTS**

**POST-TEST**

**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

**SERIAL NO: 139**



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### External Measurements

5<sup>th</sup> Female SN 139

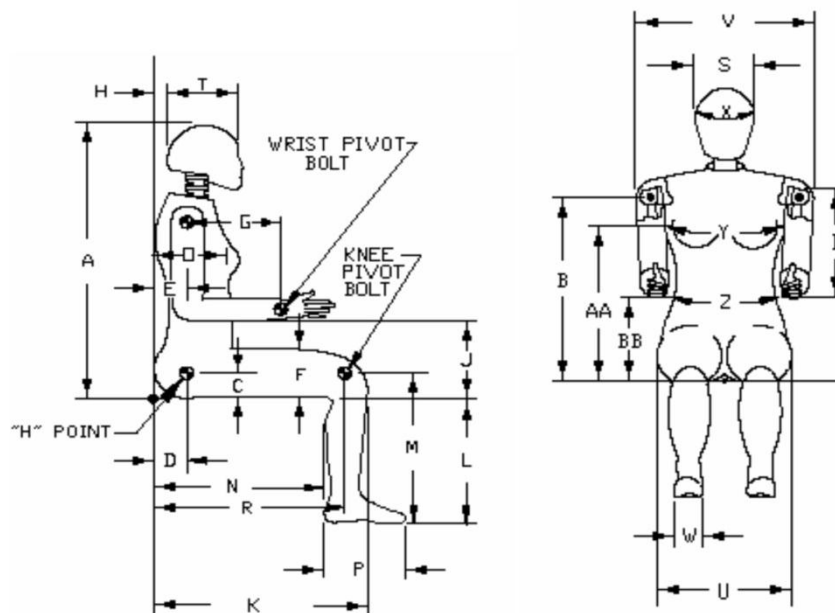
| Symbol | Description                              | Specification | Results | Pass |
|--------|------------------------------------------|---------------|---------|------|
|        |                                          | mm            | mm      |      |
| A      | Sitting Height                           | 774.7 – 800.1 | 783     | Yes  |
| B      | Shoulder Pivot Height                    | 431.8 – 457.2 | 447     | Yes  |
| C      | H-Point Height                           | 81.3 – 86.3   | 85.5    | Yes  |
| D      | H-Point from Backline                    | 144.8 – 149.8 | 147     | Yes  |
| E      | Shoulder Pivot from Backline             | 68.6 – 83.8   | 72      | Yes  |
| F      | Thigh Clearance                          | 119.4 – 134.6 | 134     | Yes  |
| G      | Back of Elbow to Wrist Pivot             | 243.9 – 259.1 | 245     | Yes  |
| H      | Head Back to Backline                    | 43.2 – 48.2   | 46      | Yes  |
| I      | Shoulder to Elbow Length                 | 276.8 – 297.2 | 285     | Yes  |
| J      | Elbow Rest Height                        | 182.8 – 203.2 | 190     | Yes  |
| K      | Buttock to Knee Length                   | 520.7 – 546.1 | 544     | Yes  |
| L      | Popliteal Height                         | 355.6 – 376   | 357     | Yes  |
| M      | Knee Pivot Height                        | 393.7 – 419.1 | 395     | Yes  |
| N      | Buttock Popliteal Length                 | 414 – 439.4   | 435     | Yes  |
| O      | Chest Depth without Jacket               | 175.3 – 190.5 | 188     | Yes  |
| P      | Foot Length (right)                      | 218.5 – 233.7 | 219     | Yes  |
| R      | Buttock To Knee Pivot Length             | 457.2 – 482.6 | 480     | Yes  |
| S      | Head Breadth                             | 137.1 – 147.3 | 143.5   | Yes  |
| T      | Head Depth                               | 177.8 – 188   | 185     | Yes  |
| U      | Hip Breadth                              | 299.7 – 314.9 | 303     | Yes  |
| V      | Shoulder Breadth                         | 350.5 – 365.7 | 361     | Yes  |
| W      | Foot Breadth                             | 78.8 – 94     | 82      | Yes  |
| X      | Head Circumference                       | 528.3 – 548.7 | 542     | Yes  |
| Y      | Chest Circumference with Jacket          | 850.9 – 881.3 | 858     | Yes  |
| Z      | Waist Circumference                      | 759.5 – 789.9 | 770     | Yes  |
| AA     | Reference Location (Chest Circumference) | 332.7 – 358.1 | 345     | Yes  |
| BB     | Reference Location (Waist Circumference) | 160.1 – 170.2 | 166     | Yes  |

Technician: SPZ

Date: 10/17/2012

# Hybrid III 5<sup>th</sup> Female External Measurements

## Reference Diagram







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### VERIFICATION REPORT

|                    |                        |            |                   |
|--------------------|------------------------|------------|-------------------|
| Test Name:         | <b>Head Drop</b>       | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                   |
| ATD Serial Number: | <b>139</b>             |            |                   |
| Test ID:           |                        | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>               | Test Time: | <b>2:17:37 PM</b> |

|                              |                         |
|------------------------------|-------------------------|
| Component Part Number        | Component Serial Number |
| <b>Head Skin - 78051-228</b> | <b>05067</b>            |

| Test Parameters        | Test Specifications | Test Results        |
|------------------------|---------------------|---------------------|
| Temperature            | 18.9 -- 25.6        | <b>21.4</b> deg C P |
| Humidity               | 10 -- 70            | <b>33</b> %RH P     |
| Resultant Acceleration | 250 -- 300          | <b>260</b> g P      |
| Oscillation            | 0.0 -- 10.0         | <b>0.0</b> % P      |
| Lateral Acceleration   | -15.00 -- 15.00     | <b>-3.03</b> g P    |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **2:17:37 PM**

Test Date: **10/16/2012**

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**VERIFICATION REPORT**

REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u> | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|--------------|----------------------|-------------------------|
| Endevco             | 7264-2000    | P58833               | 5/18/2012               |
| Endevco             | 7264-2000    | P51667               | 5/18/2012               |
| Endevco             | 7264-2000    | P52114               | 5/18/2012               |

Test Time: **2:17:37 PM**

Test Date: **10/16/2012**

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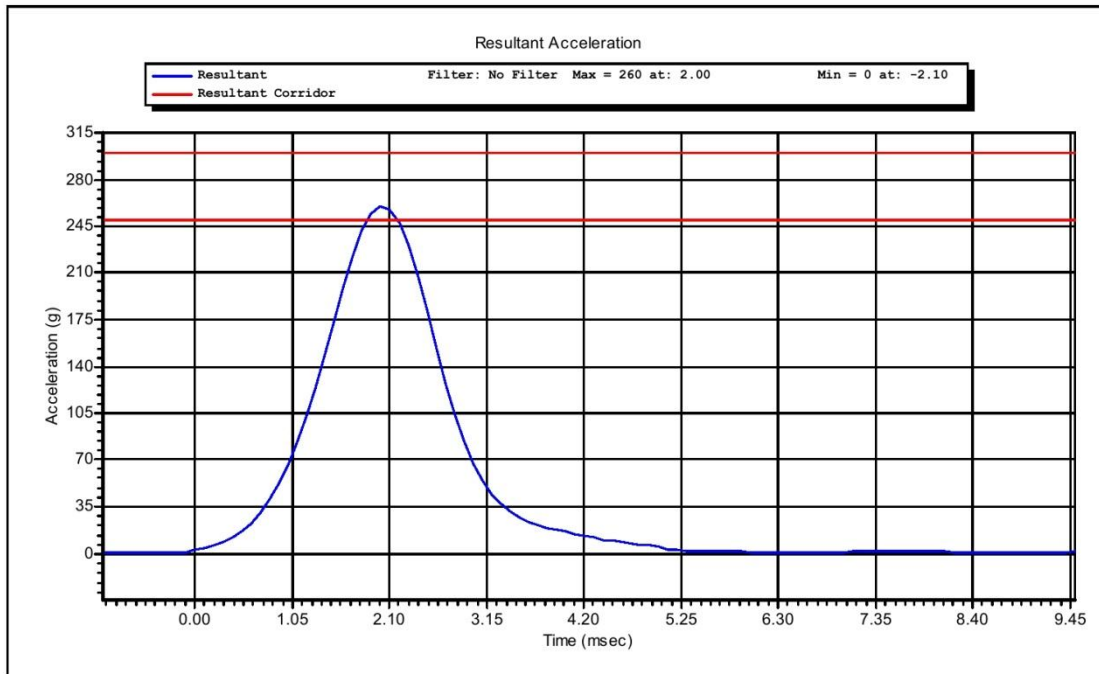


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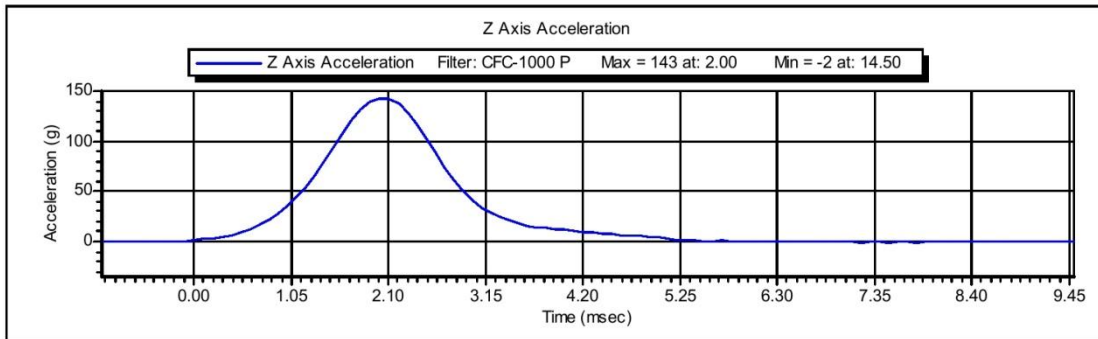
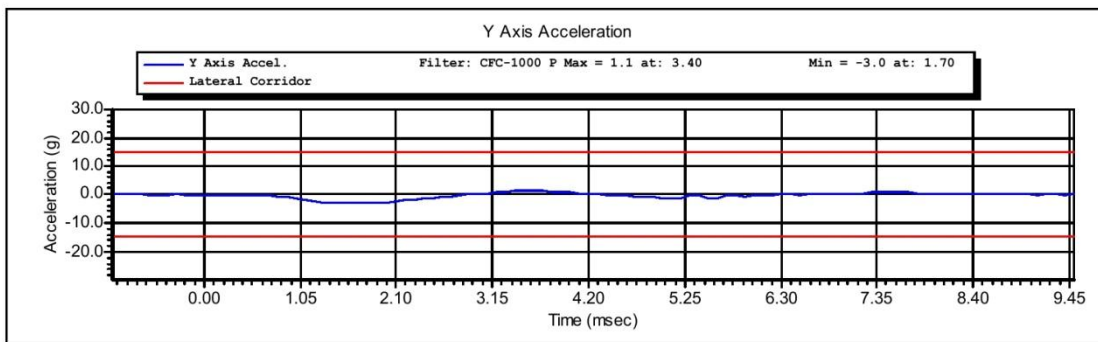
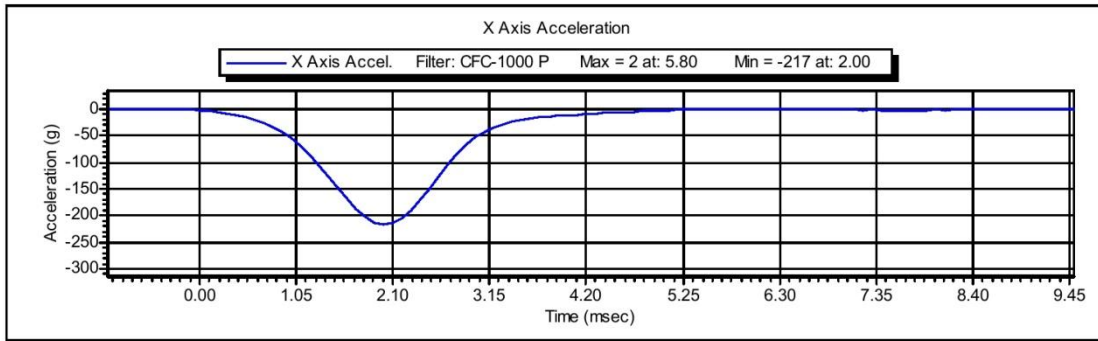
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|--------------------|-----------------|------------|------------|
| Test Name:         | Head Drop       | Revision:  | 7/15/2002  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th |            |            |
| ATD Serial Number: | 139             |            |            |
| Test ID:           |                 | Test Date: | 10/16/2012 |
| Test Number:       | 1               | Test Time: | 2:17:37 PM |



Test Time: 2:17:37 PM

Test Date: 10/16/2012

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Test Time: **2:17:37 PM**

Test Date: **10/16/2012**

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### VERIFICATION REPORT

|                    |                        |            |                   |
|--------------------|------------------------|------------|-------------------|
| Test Name:         | <b>Neck Flexion</b>    | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                   |
| ATD Serial Number: | <b>139</b>             |            |                   |
| Test ID:           |                        | Test Date: | <b>11/2/2012</b>  |
| Test Number:       | <b>2</b>               | Test Time: | <b>1:32:34 PM</b> |

|                                        |                         |
|----------------------------------------|-------------------------|
| Component Part Number                  | Component Serial Number |
| <b>Neck - 880105-255</b>               | <b>DJ1701 NEW Neck</b>  |
| <b>Front Nodding Block - 78051-351</b> | <b>85</b>               |
| <b>Rear Nodding Block - 78051-351</b>  | <b>85</b>               |

| Test Parameters                 | Test Specifications | Test Results           |
|---------------------------------|---------------------|------------------------|
| Temperature                     | 20.6 -- 22.2        | <b>21.6</b> deg C P    |
| Humidity                        | 10 -- 70            | <b>30</b> %RH P        |
| Velocity                        | 6.89 -- 7.13        | <b>7.12</b> m/s P      |
| Pendulum Impulse at 10 ms       | 2.10 -- 2.50        | <b>2.34</b> m/s P      |
| Pendulum Impulse at 20 ms       | 4.00 -- 5.00        | <b>4.68</b> m/s P      |
| Pendulum Impulse at 30 ms       | 5.80 -- 7.00        | <b>6.72</b> m/s P      |
| D Plane Rotation                | -91.0 -- -77.0      | <b>-78.7</b> degrees P |
| Moment During Rotation Interval | 69.0 -- 83.0        | <b>70.3</b> Nm P       |
| Moment Decay to 10.0 Nm         | 80.0 -- 100.0       | <b>84.1</b> ms P       |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **1:32:34 PM**

Test Date: **11/2/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 8/15/2012               |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-2018My            | 5/21/2012               |
| Denton              | 1716A         | LC-2018Fx            | 5/21/2012               |

Test Time: 1:32:34 PM

Test Date: 11/2/2012

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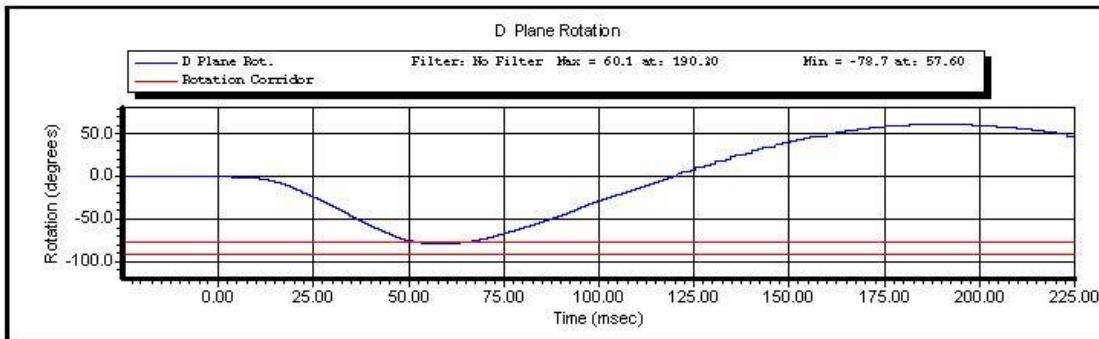
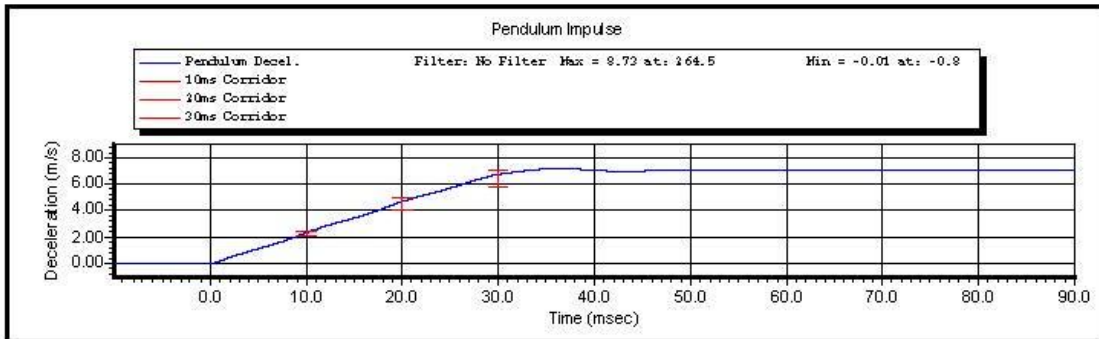


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|                    |                 |            |            |
|--------------------|-----------------|------------|------------|
| Test Name:         | Neck Flexion    | Revision:  | 7/15/2002  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th |            |            |
| ATD Serial Number: | 139             |            |            |
| Test ID:           |                 | Test Date: | 11/2/2012  |
| Test Number:       | 2               | Test Time: | 1:32:34 PM |



Test Time: 1:32:34 PM

Test Date: 11/2/2012

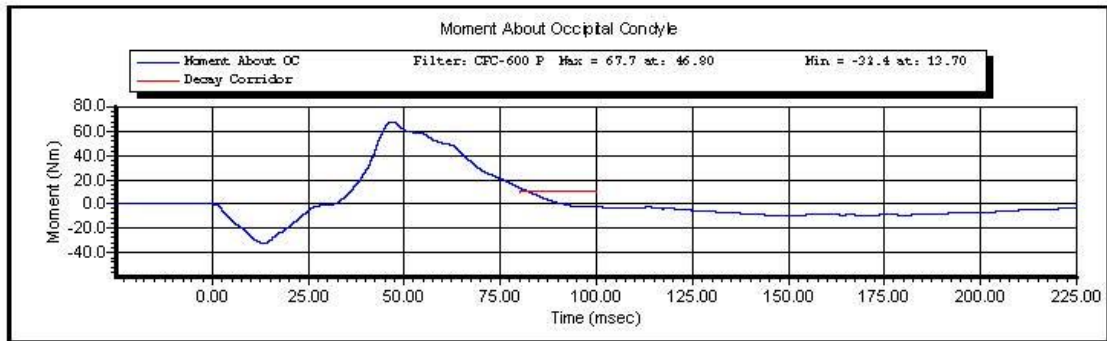
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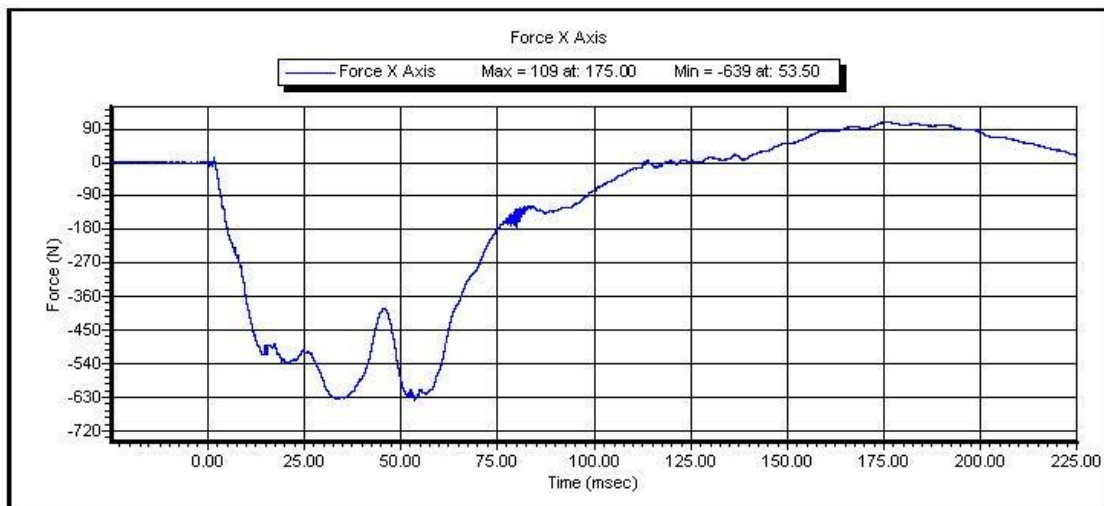
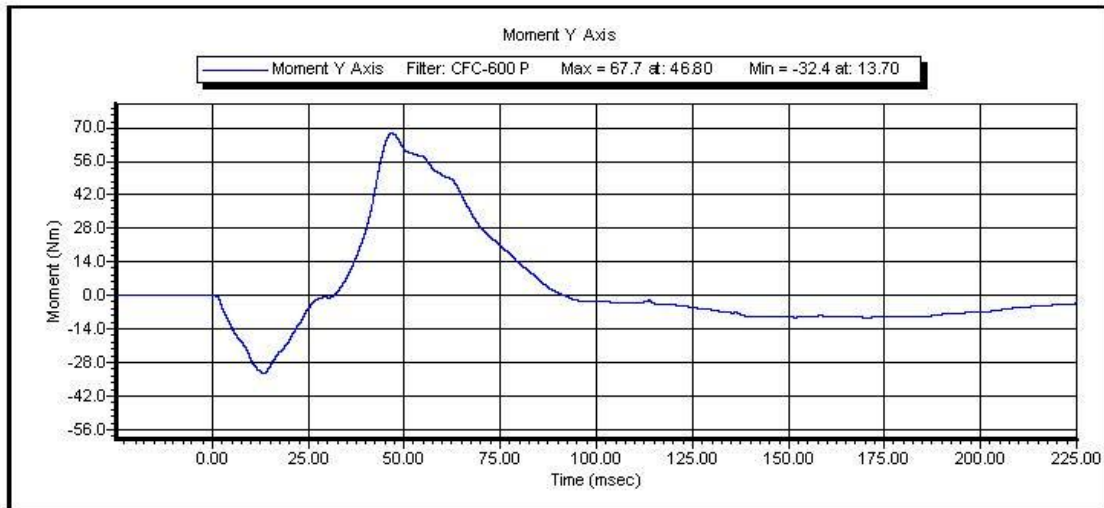
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Test Time: 1:32:34 PM

Test Date: 11/2/2012

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Test Time: **1:32:34 PM**

Test Date: **11/2/2012**

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### VERIFICATION REPORT

|                    |                        |            |                   |
|--------------------|------------------------|------------|-------------------|
| Test Name:         | <b>Neck Extension</b>  | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                   |
| ATD Serial Number: | <b>139</b>             |            |                   |
| Test ID:           |                        | Test Date: | <b>11/2/2012</b>  |
| Test Number:       | <b>1</b>               | Test Time: | <b>2:26:02 PM</b> |

|                                        |                         |
|----------------------------------------|-------------------------|
| Component Part Number                  | Component Serial Number |
| <b>Neck - 880105-255</b>               | <b>DJ1701 NEW Neck</b>  |
| <b>Front Nodding Block - 78051-351</b> | <b>85</b>               |
| <b>Rear Nodding Block - 78051-351</b>  | <b>85</b>               |

| Test Parameters                 |       | Test Specifications |          | Test Results         |   |
|---------------------------------|-------|---------------------|----------|----------------------|---|
| Temperature                     |       | 20.6                | -- 22.2  | <b>21.3</b> deg C    | P |
| Humidity                        |       | 10                  | -- 70    | <b>30</b> %RH        | P |
| Velocity                        |       | 5.95                | -- 6.19  | <b>6.17</b> m/s      | P |
| Pendulum Impulse at             | 10 ms | 1.50                | -- 1.90  | <b>1.80</b> m/s      | P |
| Pendulum Impulse at             | 20 ms | 3.10                | -- 3.90  | <b>3.65</b> m/s      | P |
| Pendulum Impulse at             | 30 ms | 4.60                | -- 5.60  | <b>5.40</b> m/s      | P |
| D Plane Rotation                |       | 99.0                | -- 114.0 | <b>109.6</b> degrees | P |
| Moment During Rotation Interval |       | -65.0               | -- -53.0 | <b>-53.1</b> Nm      | P |
| Moment Decay to -10.0 Nm        |       | 94.0                | -- 114.0 | <b>101.3</b> ms      | P |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **2:26:02 PM**

Test Date: **11/2/2012**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C15016               | 8/15/2012               |
| DentonATD           | 78051-342     | PENDULUM POT         | 1/25/2012               |
| DentonATD           | 78051-342     | CONDYLE POT          | 1/25/2012               |
| Denton              | 1716A         | LC-2018My            | 5/21/2012               |
| Denton              | 1716A         | LC-2018Fx            | 5/21/2012               |

Test Time: 2:26:02 PM

Test Date: 11/2/2012

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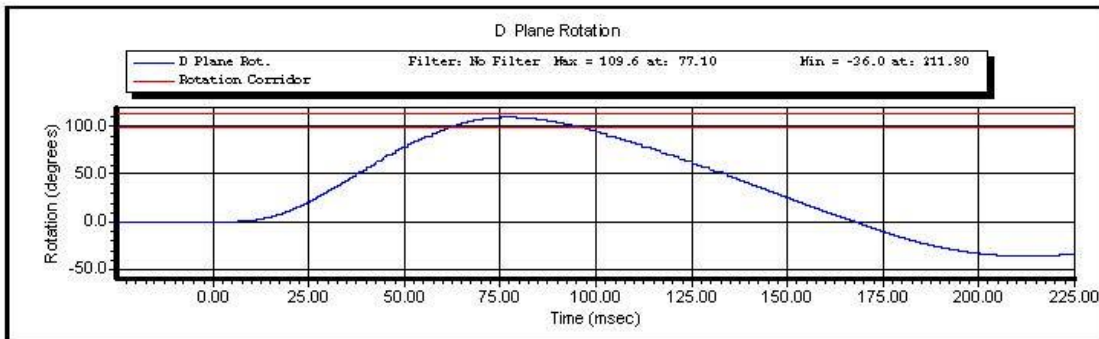
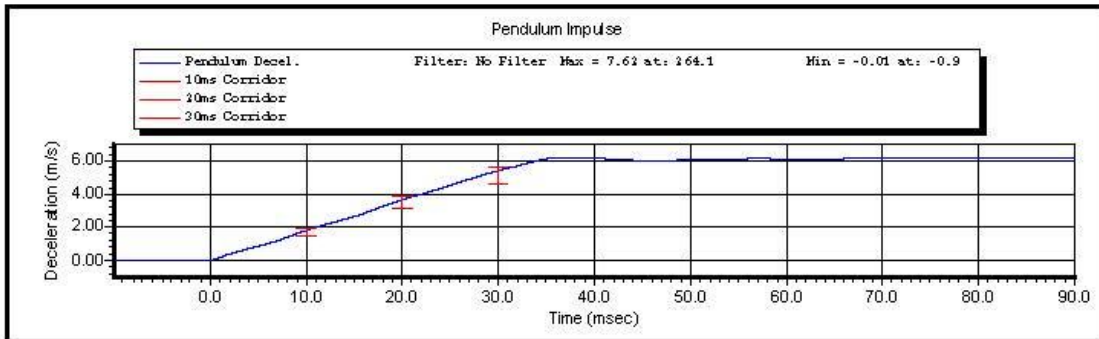


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|                    |                 |            |            |
|--------------------|-----------------|------------|------------|
| Test Name:         | Neck Extension  | Revision:  | 7/15/2002  |
| Sub Test Name:     |                 | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th |            |            |
| ATD Serial Number: | 139             |            |            |
| Test ID:           |                 | Test Date: | 11/2/2012  |
| Test Number:       | 1               | Test Time: | 2:26:02 PM |



Test Time: 2:26:02 PM

Test Date: 11/2/2012

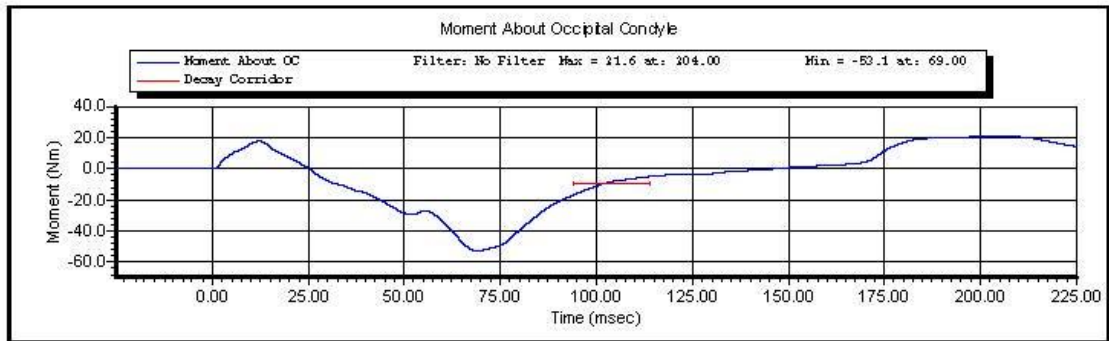
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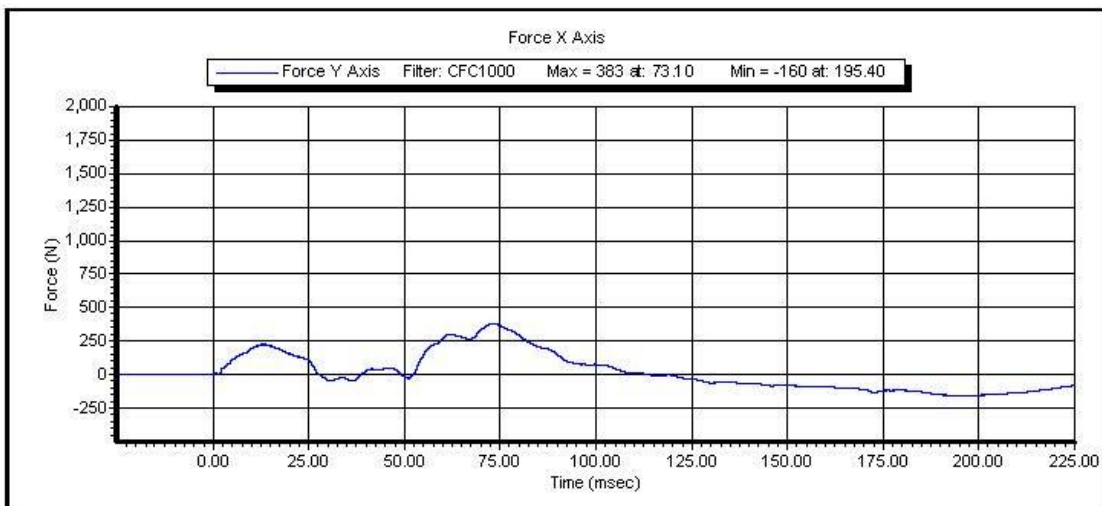
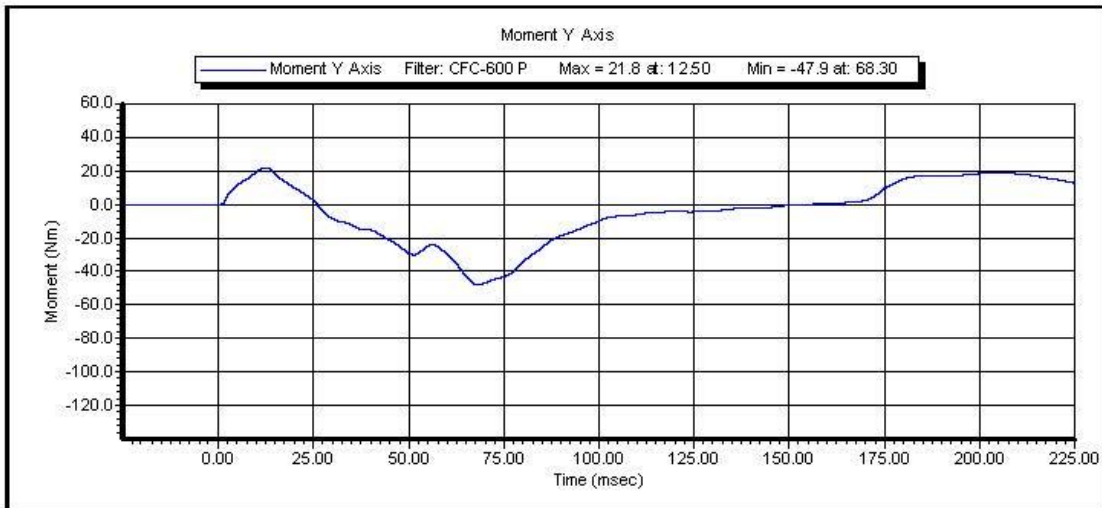
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Test Time: 2:26:02 PM

Test Date: 11/2/2012

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Test Time: **2:26:02 PM**

Test Date: **11/2/2012**

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### VERIFICATION REPORT

|                    |                        |            |                    |
|--------------------|------------------------|------------|--------------------|
| Test Name:         | <b>Thorax Impact</b>   | Revision:  | <b>7/15/2002</b>   |
| Sub Test Name:     |                        | Spec Type: | <b>NHTSA</b>       |
| ATD Type:          | <b>Hybrid III 5'th</b> |            |                    |
| ATD Serial Number: | <b>139</b>             |            |                    |
| Test ID:           |                        | Test Date: | <b>10/17/2012</b>  |
| Test Number:       | <b>1</b>               | Test Time: | <b>11:28:37 AM</b> |

|                                    |                         |
|------------------------------------|-------------------------|
| Component Part Number              | Component Serial Number |
| <b>Ribs 880105-RS</b>              | <b>05032011A</b>        |
| <b>Chest Jacket - 880105-355-E</b> | <b>05177</b>            |
| <b>Lumbar Spine - 880105-1095</b>  | <b>050327</b>           |

| Test Parameters                    | Test Specifications | Test Results        |
|------------------------------------|---------------------|---------------------|
| Temperature                        | 20.6 -- 22.2        | <b>21.9</b> deg C P |
| Humidity                           | 10.0 -- 70.0        | <b>30.0</b> %RH P   |
| Velocity                           | 6.59 -- 6.83        | <b>6.59</b> m/s P   |
| Sternum Displacement               | -58.0 -- -50.0      | <b>-51.5</b> mm P   |
| Force During Displacement Interval | -4400 -- -3900      | <b>-4157</b> N P    |
| Force -18.0 to -50.0 Displacement  | -4600 -- 0          | <b>-4157</b> N P    |
| Hysteresis                         | 69 -- 85            | <b>74</b> % P       |

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **11:28:37 AM**

Test Date: **10/17/2012**

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**VERIFICATION REPORT**

REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7231CT        | C14953               | 5/25/2012               |
| DentonATD           | H3CD          | DS-139               | 5/21/2012               |

Test Time: 11:28:37 AM

Test Date: 10/17/2012

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|                    |                 |            |             |
|--------------------|-----------------|------------|-------------|
| Test Name:         | Thorax Impact   | Revision:  | 7/15/2002   |
| Sub Test Name:     |                 | Spec Type: | NHTSA       |
| ATD Type:          | Hybrid III 5'th |            |             |
| ATD Serial Number: | 139             |            |             |
| Test ID:           |                 | Test Date: | 10/17/2012  |
| Test Number:       | 1               | Test Time: | 11:28:37 AM |

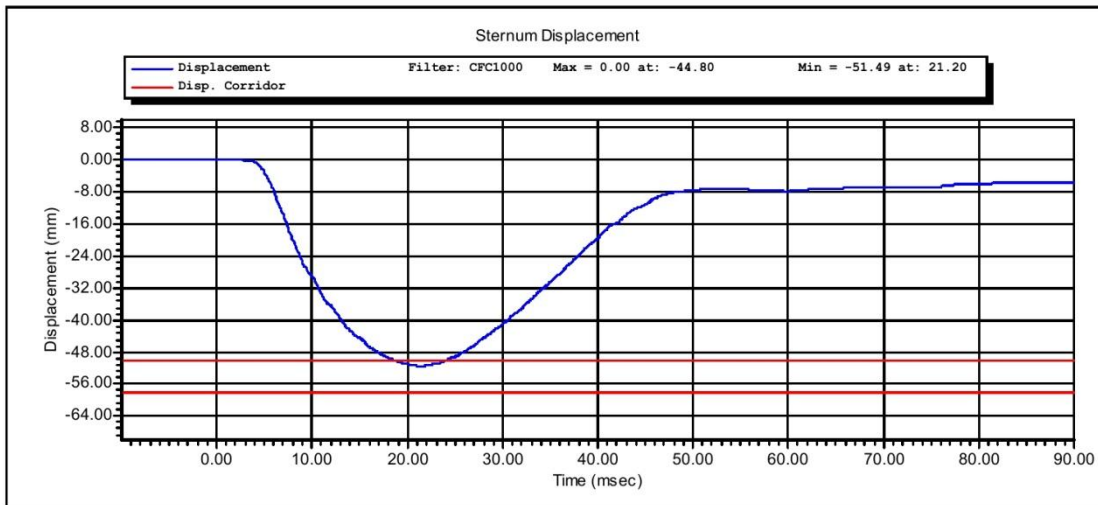
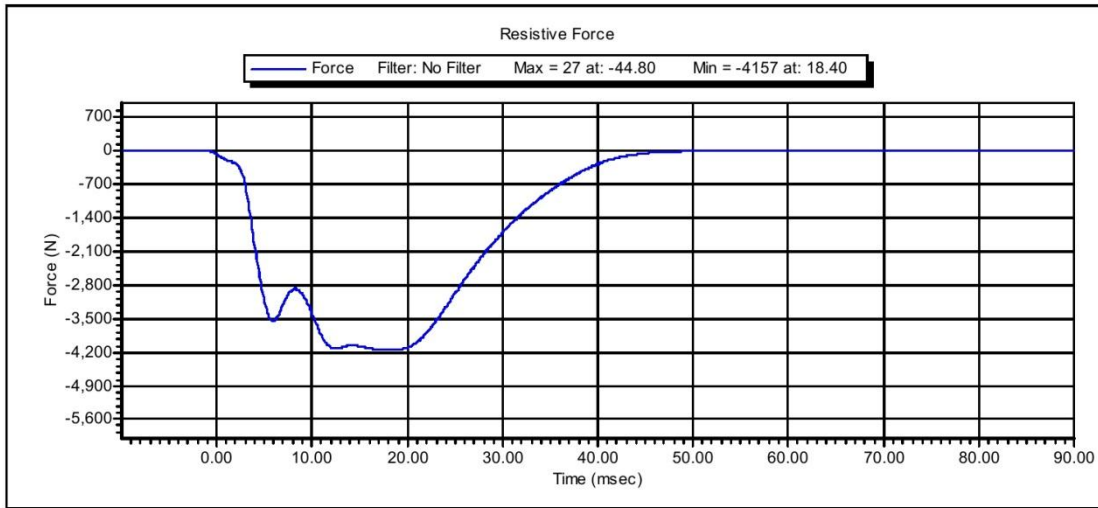


Test Time: 11:28:37 AM

Test Date: 10/17/2012

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Test Time: 11:28:37 AM

Test Date: 10/17/2012

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## Torso Flexion

### Pre-Test

#### Part 5720 HIII 5% Female

ATD Serial No: 139

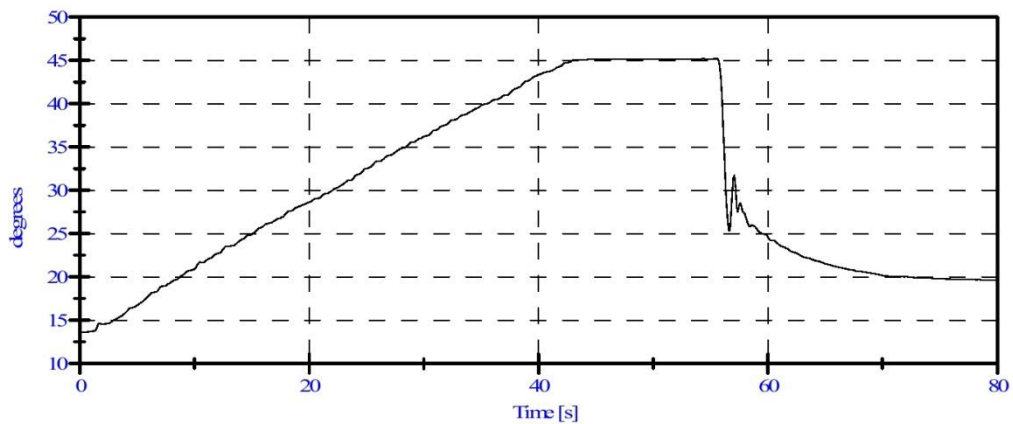
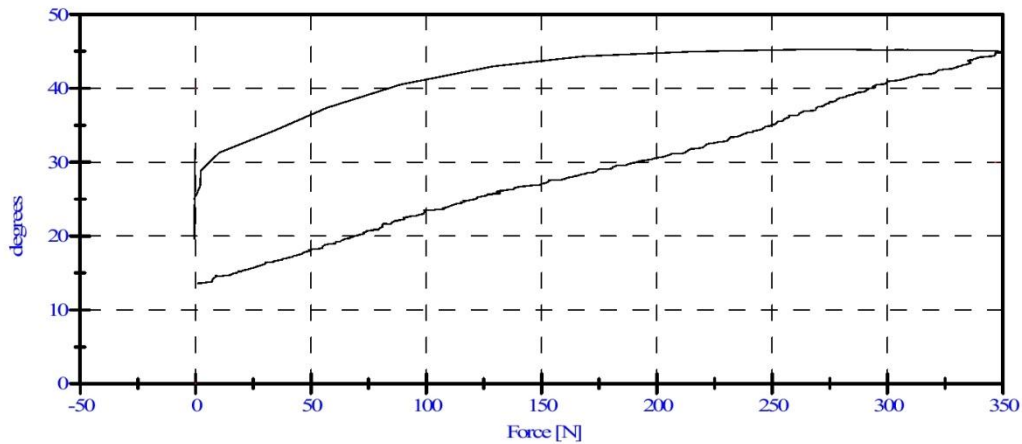
Laboratory Supervisor: D. Travale

Date: 10/16/2012

Laboratory Technician: M. Goehle

| TEST PARAMETER   | SPECIFICATION          | TEST RESULTS | STATUS |
|------------------|------------------------|--------------|--------|
| Lab Temperature: | 18.9-25.6 C            | 21.0 C       | Passed |
| Lab Humidity:    | 10-70 %                | 29.00 %      | Passed |
| Initial Angle:   | 0.00-20.00 deg         | 13.58 deg    | Passed |
| Force at 45 Deg  | 320.00-390.00 N        | 349.88 N     | Passed |
| Return Angle     | 8 Deg Max from Initial | 19.02 deg    | Passed |

### LUMBAR SPINE FLEXION TEST





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### VERIFICATION REPORT

|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b>      |            |                   |
| ATD Serial Number: | <b>139</b>                  |            |                   |
| Test ID:           | <b>Knee Impact Left</b>     | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                    | Test Time: | <b>1:32:19 PM</b> |

|                               |                         |
|-------------------------------|-------------------------|
| Component Part Number         | Component Serial Number |
| <b>Knee Skin - 880105-508</b> | <b>1350</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>21.7</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>30.0</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.10</b> m/s P   |
| Resistive Force | -4060 -- -3450      | <b>-3833</b> N P    |

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **1:32:19 PM**

Test Date: **10/16/2012**

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## Calspan - Transportation Research Group

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 6/15/2012               |

Test Time: 1:32:19 PM

Test Date: 10/16/2012

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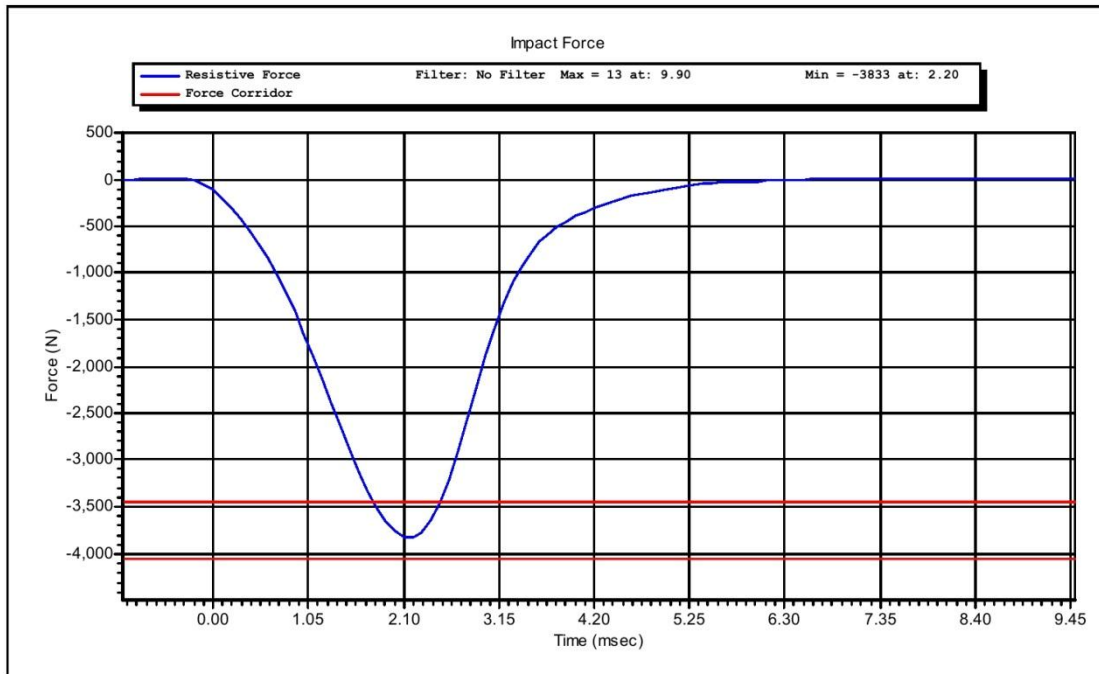


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 7/15/2002  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th      |            |            |
| ATD Serial Number: | 139                  |            |            |
| Test ID:           | Knee Impact Left     | Test Date: | 10/16/2012 |
| Test Number:       | 1                    | Test Time: | 1:32:19 PM |



Test Time: 1:32:19 PM

Test Date: 10/16/2012

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### VERIFICATION REPORT

|                    |                             |            |                   |
|--------------------|-----------------------------|------------|-------------------|
| Test Name:         | <b>Knee Impact PENDULUM</b> | Revision:  | <b>7/15/2002</b>  |
| Sub Test Name:     |                             | Spec Type: | <b>NHTSA</b>      |
| ATD Type:          | <b>Hybrid III 5'th</b>      |            |                   |
| ATD Serial Number: | <b>139</b>                  |            |                   |
| Test ID:           |                             | Test Date: | <b>10/16/2012</b> |
| Test Number:       | <b>1</b>                    | Test Time: | <b>1:51:13 PM</b> |

|                               |                         |
|-------------------------------|-------------------------|
| Component Part Number         | Component Serial Number |
| <b>Knee Skin - 880105-508</b> | <b>1359</b>             |

| Test Parameters | Test Specifications | Test Results        |
|-----------------|---------------------|---------------------|
| Temperature     | 18.9 -- 25.6        | <b>21.4</b> deg C P |
| Humidity        | 10.0 -- 70.0        | <b>30.0</b> %RH P   |
| Velocity        | 2.07 -- 2.13        | <b>2.11</b> m/s P   |
| Resistive Force | -4060 -- -3450      | <b>-3890</b> N P    |

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **1:51:13 PM**

Test Date: **10/16/2012**

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**VERIFICATION REPORT**

REFERENCE EQUIPMENT

| <u>Manufacturer</u> | <u>Model</u>  | <u>Serial Number</u> | <u>Calibration Date</u> |
|---------------------|---------------|----------------------|-------------------------|
| DentonATD           | Velocity Trap | 1                    | 1/11/2012               |
| Endevco             | 7264-2000     | P66927               | 6/15/2012               |

Test Time: **1:51:13 PM**

Test Date: **10/16/2012**

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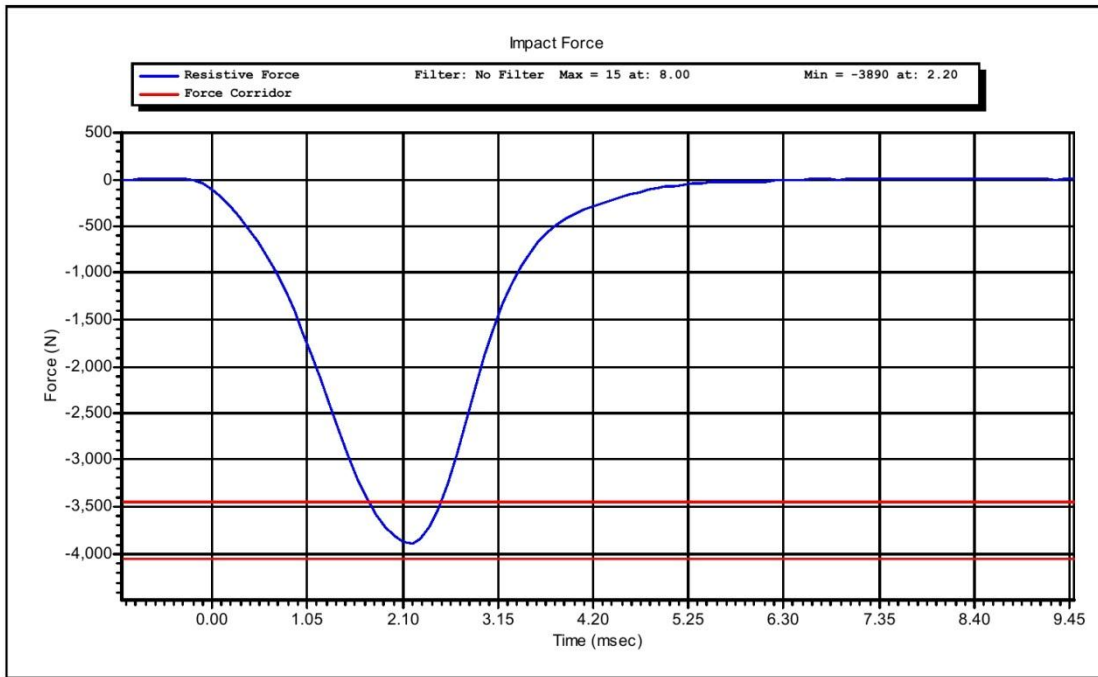


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|                    |                      |            |            |
|--------------------|----------------------|------------|------------|
| Test Name:         | Knee Impact PENDULUM | Revision:  | 7/15/2002  |
| Sub Test Name:     |                      | Spec Type: | NHTSA      |
| ATD Type:          | Hybrid III 5'th      |            |            |
| ATD Serial Number: | 139                  |            |            |
| Test ID:           |                      | Test Date: | 10/16/2012 |
| Test Number:       | 1                    | Test Time: | 1:51:13 PM |



Test Time: 1:51:13 PM

Test Date: 10/16/2012

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