

**REPORT NUMBER: SNCAP-TRC-2009-004**

**NEW CAR ASSESSMENT PROGRAM (NCAP)  
SIDE IMPACT TEST**

**FORD MOTOR CO.  
2010 FORD TAURUS SEL  
NHTSA NUMBER: MA0216**

**PREPARED BY:  
TRANSPORTATION RESEARCH CENTER INC.  
10820 STATE ROUTE 347  
P. O. Box B-67  
EAST LIBERTY, OH 43319**



**Test Date: October 16, 2009**

**Report Date: December 3, 2009**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF CRASHWORTHINESS STANDARDS  
MAIL CODE: NVS-111  
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 Safety Administration, under Contract No. DTNH22-09-D-00125. This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

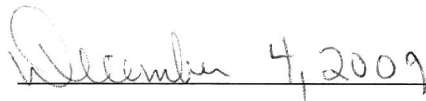
Test Performed By: John Shultz, Supervisor

Michael Tonneman, Project Manager

Report Approved By: \_\_\_\_\_

  
Diana Spurgeon, Project Manager  
Transportation Research Center Inc.

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



FINAL REPORT ACCEPTANCE BY OCWS:

---

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

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

FINAL REPORT ACCEPTANCE BY OCWS:

---

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

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



| 1. Report No.<br>SNCAP-TRC-2009-004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2. Government Accession No.                                | 3. Recipient's Catalog No.                                                                                                                                                                                          |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------|--|----------------------|--|------------------------------|-------------|-----|-------------|-----|------------------------------|-------------|-----|-------------|-----|---------------------------|-------------|-----|-------------|-----|-------------------------------|-------------|-----|-------------------------|-----|----------------------------|-------------|-----|-------------|-----|----------------------------|------------|--|------------|--|
| 4. Title and Subtitle<br>Final Report New Car Assessment Program<br>Side Impact Testing of a<br>2010 Ford Taurus SEL Sedan,<br>NHTSA No.: MA0216                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                            | 5. Report Date<br><br>November 3, 2009                                                                                                                                                                              |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            | 6. Performing Organization Code<br>TRC Inc.                                                                                                                                                                         |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 7. Author(s)<br>Michael Tonneman, Project Manager<br>Transportation Research Center Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                            | 8. Performing Organization Report No.<br><br>SNCAP-TRC-2009-004                                                                                                                                                     |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 9. Performing Organization Name and Address<br>Transportation Research Center Inc.<br>10820 State Route 347<br>East Liberty, OH 43319                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                            | 10. Work Unit No. (TRAIS)                                                                                                                                                                                           |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            | 11. Contract or Grant No.<br>DTNH22-09-D-00125                                                                                                                                                                      |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 12. Sponsoring Agency Name and Address<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, DC 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            | 13. Type of Report and Period Covered<br>Final Report<br>October – December 2009                                                                                                                                    |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            | 14. Sponsoring Agency Code<br><br>NVS-111                                                                                                                                                                           |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 15. Supplemental Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                            |                                                                                                                                                                                                                     |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 16. Abstract<br><p>This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject vehicle, a 2010 Ford Taurus SEL Sedan, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on October 16, 2009.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 61.9 km/h, and the ambient temperature at the struck (Driver's Side) side of the target vehicle at the time of impact was 21° C. The target vehicle's post-test maximum crush was 243 mm at Level 3.</p> <p>The test or target vehicle's performance is given below (with FIR filter):</p> <table border="0"> <thead> <tr> <th></th><th><u>Front SID HIII</u></th><th></th><th><u>Rear SID HIII</u></th><th></th></tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td><td><u>31.3</u></td><td>g's</td><td><u>34.5</u></td><td>g's</td></tr> <tr> <td>Left Lower Rib Acceleration:</td><td><u>24.5</u></td><td>g's</td><td><u>43.3</u></td><td>g's</td></tr> <tr> <td>Lower Spine Acceleration:</td><td><u>28.0</u></td><td>g's</td><td><u>23.9</u></td><td>g's</td></tr> <tr> <td>Thoracic Trauma Index, (TTI):</td><td><u>29.6</u></td><td>g's</td><td><u>50.9<sup>1</sup></u></td><td>g's</td></tr> <tr> <td>Pelvis Acceleration (PEV):</td><td><u>44.6</u></td><td>g's</td><td><u>60.6</u></td><td>g's</td></tr> <tr> <td>Head Injury Criteria HIC):</td><td><u>131</u></td><td></td><td><u>199</u></td><td></td></tr> </tbody> </table> <p>The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.</p> <p><sup>1</sup> The passenger TTI was calculated using the redundant lower rib data channel.</p> |                                                            |                                                                                                                                                                                                                     |                         | <u>Front SID HIII</u> |  | <u>Rear SID HIII</u> |  | Left Upper Rib Acceleration: | <u>31.3</u> | g's | <u>34.5</u> | g's | Left Lower Rib Acceleration: | <u>24.5</u> | g's | <u>43.3</u> | g's | Lower Spine Acceleration: | <u>28.0</u> | g's | <u>23.9</u> | g's | Thoracic Trauma Index, (TTI): | <u>29.6</u> | g's | <u>50.9<sup>1</sup></u> | g's | Pelvis Acceleration (PEV): | <u>44.6</u> | g's | <u>60.6</u> | g's | Head Injury Criteria HIC): | <u>131</u> |  | <u>199</u> |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <u>Front SID HIII</u>                                      |                                                                                                                                                                                                                     | <u>Rear SID HIII</u>    |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| Left Upper Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <u>31.3</u>                                                | g's                                                                                                                                                                                                                 | <u>34.5</u>             | g's                   |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| Left Lower Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <u>24.5</u>                                                | g's                                                                                                                                                                                                                 | <u>43.3</u>             | g's                   |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| Lower Spine Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <u>28.0</u>                                                | g's                                                                                                                                                                                                                 | <u>23.9</u>             | g's                   |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| Thoracic Trauma Index, (TTI):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <u>29.6</u>                                                | g's                                                                                                                                                                                                                 | <u>50.9<sup>1</sup></u> | g's                   |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| Pelvis Acceleration (PEV):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <u>44.6</u>                                                | g's                                                                                                                                                                                                                 | <u>60.6</u>             | g's                   |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| Head Injury Criteria HIC):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <u>131</u>                                                 |                                                                                                                                                                                                                     | <u>199</u>              |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 17. Key Words<br>New Car Assessment Program (NCAP)<br>Side Impact<br>Side Impact Hybrid III Dummy (SID HIII)<br>Occupant Side Impact Protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                            | 18. Distribution Statement<br><u>Copies of this report are available from:</u><br>National Highway Traffic Safety Administration<br>Technical Reference Division<br>1200 New Jersey Ave, SE<br>Washington, DC 20590 |                         |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |
| 19. Security Classification (of this report)<br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20. Security Classification (of this page)<br>Unclassified | 21. Number of Pages<br>167                                                                                                                                                                                          | 22. Price               |                       |  |                      |  |                              |             |     |             |     |                              |             |     |             |     |                           |             |     |             |     |                               |             |     |                         |     |                            |             |     |             |     |                            |            |  |            |  |

## TABLE OF CONTENTS

| <u>Section</u>        |                                                                  | <u>Page No.</u> |
|-----------------------|------------------------------------------------------------------|-----------------|
| 1                     | Purpose and Test Procedure                                       | 1               |
| 2                     | Summary of Test Results                                          | 2               |
| 3                     | Occupant and Vehicle Information                                 | 3               |
| <u>Data Sheet No.</u> |                                                                  | <u>Page No.</u> |
| 1                     | General Test and Vehicle Parameter Data                          | 5               |
| 2                     | Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data | 8               |
| 3                     | Post-Test Observations                                           | 10              |
| 4                     | Vehicle Profile Measurements                                     | 12              |
| 5                     | Dummy Longitudinal Clearance Dimensions                          | 13              |
| 6                     | Dummy Lateral Clearance Dimensions                               | 14              |
| 7                     | Vehicle Exterior Crush Measurements                              | 15              |
| 8                     | Deformable Barrier Honeycomb Face Static Crush                   | 18              |
| 9                     | Vehicle Accelerometer Data                                       | 19              |
| 10                    | MDB Data                                                         | 20              |
| 11                    | Camera and Instrumentation Data                                  | 21              |
| 12                    | Summary of FMVSS 301 Data                                        | 22              |
| 13                    | Dummy/Vehicle Temperature Stabilization Data                     | 23              |
| <u>Appendix</u>       |                                                                  |                 |
| A                     | Photographs                                                      | A-1             |
| B                     | SID/HIII, Vehicle and MDB Response Data Plots                    | B-1             |
| C                     | Dummy Configuration and Performance Verification Data            | C-1             |

## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

#### **PURPOSE**

This side impact test was conducted as part of the FY 2010 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test was to generate comparative side impact performance in a 2010 Ford Taurus SEL manufactured by Ford Motor Company. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated November 2002.

#### **TEST PROCEDURE**

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

TRC Inc. does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

## SECTION 2

### SUMMARY OF TEST RESULTS

A model year 2010 Ford Taurus SEL was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 61.9 km/h. The target vehicle was stationary and positioned at an angle of 63° to the line of forward motion. The weight of the vehicle as tested was 2026.2 kg and the test weight of the MDB was 1363.0 kg. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, OH, on October 16, 2009.

One (1) real-time motion picture camera and nine (9) high-speed digital motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre-test and post-test photographs of the test vehicle and the moving deformable barrier (MDB), and the side impact dummies (SID/HIIs) are included in Appendix A.

Two 50th percentile adult male SID/HIIs were placed in the driver and left rear passenger designated seating positions according to instructions specified in the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002. Each SID/HII was instrumented in the following locations:

- Left Upper Rib (LUR) uniaxial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uniaxial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uniaxial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uniaxial accelerometer (Y-axis primary)
- Head Center of Gravity (CG) triaxial accelerometers (X, Y and Z axis)
- Upper Neck load cell (Fx, Fy, Fz, Mx, My, Mz)

The test vehicle was instrumented with twenty-one (21) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self-contained onboard Kayser Threde Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Test Data Disposition 12.2 Section 7, of the Test Procedure.

The driver and left rear passenger SID/HII's, Serial Nos. 002 and 001 respectively, were calibrated prior to this test.

Appendix A contains the still photograph prints. Appendix B contains the SID/HII's, vehicle, and MDB response data traces. Appendix C contains the SID/HII's configuration and performance verification data.

## OCCUPANT AND VEHICLE INFORMATION

Occupant Data Summary

| ATD position | HIC | T <sup>1</sup> | T <sup>2</sup> | TTI (G's)         | Peak Pelvis (G's) |
|--------------|-----|----------------|----------------|-------------------|-------------------|
| Driver       | 131 | 37.9           | 69.2           | 29.6              | 44.6              |
| Passenger    | 199 | 46.0           | 69.8           | 50.9 <sup>1</sup> | 60.6              |

Supplemental Restraint Information

| Restraint Type           | Left Front (Driver) |          | Left Rear Passenger |          |
|--------------------------|---------------------|----------|---------------------|----------|
|                          | Installed           | Deployed | Installed           | Deployed |
| Front Airbag             | Yes                 | No       | No                  | N/A      |
| Side Torso Airbag        | Yes                 | Yes      | No                  | N/A      |
| Side Torso/Head Airbag   | No                  | N/A      | No                  | N/A      |
| Side Head Curtain Airbag | Yes                 | Yes      | Yes                 | Yes      |

The test data can be found on the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov).

### TEST NOTES

The driver dummy's Neck X, Y, and Z force data channels recorded multiple questionable data spikes, throughout the event.

The left rear passenger dummy lower spine (T12) Y-axis acceleration data channel recorded questionable data throughout the event. The redundant data channel was used for the TTI calculation.

The vehicles left lower A-post Y-axis acceleration data channel exceeded the full scale value at 25.9 milliseconds and lost data thereafter. This affected the velocity calculation.

The vehicle left lower B-post Y-axis acceleration data channel exceeded the full scale value at 32.0 milliseconds and lost data thereafter. This affected the velocity calculation.

The moving deformable barrier's left and right side contact switches did not record valid data.

<sup>1</sup> The passenger TTI was calculated using the redundant lower rib data channel.

**SECTION 3**  
**OCCUPANT AND VEHICLE INFORMATION**

## DATA SHEET NO. 1

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Taurus SEL  
 Test Program: NCAP Side Impact

NHTSA No.: MA0216  
 Test Date: 10/16/09

### TEST VEHICLE INFORMATION AND OPTIONS

|                                                                            |                   |                                      |     |
|----------------------------------------------------------------------------|-------------------|--------------------------------------|-----|
| Make                                                                       | Ford              | Driver Front Airbag                  | Yes |
| Model Year                                                                 | 2010              | Driver Side Torso Airbag             | Yes |
| Model                                                                      | Taurus SEL        | Driver Head / Torso Airbag           | No  |
| Body Style                                                                 | Sedan             | Driver Curtain Airbag                | Yes |
| NHTSA No.                                                                  | MA0216            | Driver Knee Airbag                   | No  |
| VIN                                                                        | 1FAHP2EW0AG106891 | Rear Pass. Front Airbag              | No  |
| Color                                                                      | White             | Rear Pass. Side Airbag               | No  |
| Delivery Date                                                              | 9/17/2009         | Rear Pass. Head Airbag               | No  |
| Odometer Reading                                                           | 75.4 miles        | Rear Pass. Curtain Airbag            | Yes |
| Dealer                                                                     | Ricart Ford       | Rear Pass. Knee Airbag               | No  |
| Transmission                                                               | Automatic         | Load Limiters                        | Yes |
| Final Drive                                                                | 2 wheel drive     | Anti-lock Brakes                     | Yes |
| Type /No. of Cylinders                                                     | V6                | All-Wheel Drive                      | No  |
| Engine Displacement                                                        | 3.5 L             | Pretensioners                        | Yes |
| Engine Placement                                                           | Transverse        | Air Conditioning                     | Yes |
| Roof Rack                                                                  | No                | Tilt Wheel                           | Yes |
| Sunroof / T-Top                                                            | No                | Power Seats                          | Yes |
| Tinted Glass                                                               | Yes               | Power Windows                        | Yes |
| Traction Control                                                           | Yes               | Power Steering                       | Yes |
| Power Brakes                                                               | Yes               | AM/FM CD                             | Yes |
| Front Disc                                                                 | Yes               | Automatic Door Locks                 | Yes |
| Rear Disc                                                                  | Yes               | Other – tire pressure monitor system | Yes |
| Does owner's manual provide instructions to turn off automatic door locks? |                   |                                      | Yes |

### DATA FROM CERTIFICATION LABEL

|                     |                |                 |      |
|---------------------|----------------|-----------------|------|
| Manufactured by     | Ford Motor Co. | GVWR (kg)       | 2386 |
| Date of Manufacture | 07/09          | GAWR Front (kg) | 1279 |
|                     |                | GAWR Rear (kg)  | 1143 |

### TEST VEHICLE SEAT TYPE AND CAPACITY

| Measured Parameter                | Front             | Mid | Rear  | Total |
|-----------------------------------|-------------------|-----|-------|-------|
| Type of Seats                     | Bucket            | N/A | bench |       |
| Designated Seating Capacity (DSC) | 2                 | 0   | 3     | 5     |
| Type of Seat Back                 | manual adjustable | N/A | fixed |       |
| (A) Capacity Wt. (VCW) (kg)       |                   |     |       | 430   |
| (B) DSC x 68.08 kg                |                   |     |       | 340   |
| (A-B) Cargo Wt. (RCLW) (kg)       |                   |     |       | 90    |

**DATA SHEET NO. 1 (CONTINUED)****GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2010 Ford Taurus SELNHTSA No.: MA0216Test Program: NCAP Side ImpactTest Date: 10/16/09**TEST VEHICLE WEIGHTS**

|        | Units | As Delivered (UVW) |       |        | As Tested (ATW) |       |        | Fully Loaded |       |        |
|--------|-------|--------------------|-------|--------|-----------------|-------|--------|--------------|-------|--------|
|        |       | Front              | Rear  | Total  | Front           | Rear  | Total  | Front        | Rear  | Total  |
| Left   | kg    | 548.0              | 352.6 |        | 596.0           | 441.4 |        | 582.4        | 472.8 |        |
| Right  | kg    | 535.8              | 354.4 |        | 547.2           | 441.6 |        | 542.6        | 453.6 |        |
| Ratio  | %     | 60.5               | 39.5  |        | 56.4            | 43.6  |        | 54.8         | 45.2  |        |
| Totals | kg    | 1083.8             | 707.0 | 1790.8 | 1143.2          | 883.0 | 2026.2 | 1125.0       | 926.4 | 2051.4 |

**TARGET TEST WEIGHT CALCULATION**

| Measured Parameter                    | Units | Value  |
|---------------------------------------|-------|--------|
| (A) Total Delivered Weight (UVW)      | kg    | 1790.8 |
| (B) Weight of 2 P572M ATDs            | kg    | 152.0  |
| (C) Rated Cargo/Luggage Weight (RCLW) | kg    | 90.0   |
| (A+B+C) Vehicle Target Weight (TVTW)  | kg    | 2032.8 |

**TEST VEHICLE ATTITUDES AND CG**

|              | Units | LF  | RF  | LR  | RR  | CG (aft of front axle) |
|--------------|-------|-----|-----|-----|-----|------------------------|
| As Delivered | mm    | 760 | 760 | 782 | 788 | 1133                   |
| As Tested    | mm    | 747 | 752 | 750 | 761 | 1251                   |
| Fully Loaded | mm    | 754 | 757 | 752 | 757 |                        |

**GENERAL TEST VEHICLE DATA**

| Measurement Description                 | Units  | Value |
|-----------------------------------------|--------|-------|
| Test Vehicle Wheelbase                  | mm     | 2870  |
| Total Vehicle Length at Left Side       | mm     | 4840  |
| Total Vehicle Length at Centerline      | mm     | 5135  |
| Total Vehicle Length at Right Side      | mm     | 4840  |
| Weight of Ballast in Cargo Area         | kg     | 13.6  |
| Weight of Vehicle Components Removed    | kg     | 0     |
| Amount of Stoddard Solvent in Fuel Tank | liters | 67.0  |

Vehicle parts removed to make Target Vehicle Test Weight: None

**TEST VEHICLE VERTICAL IMPACT LINE DATA**

| Measurement Description               | Units | Value |
|---------------------------------------|-------|-------|
| Test Vehicle Wheel Base               | mm    | 2870  |
| Target Impact Point Aft of Front Axle | mm    | 488   |
| Actual Impact Point Aft of Front Axle | mm    | 484   |
| Impact Point Difference               | mm    | 4     |

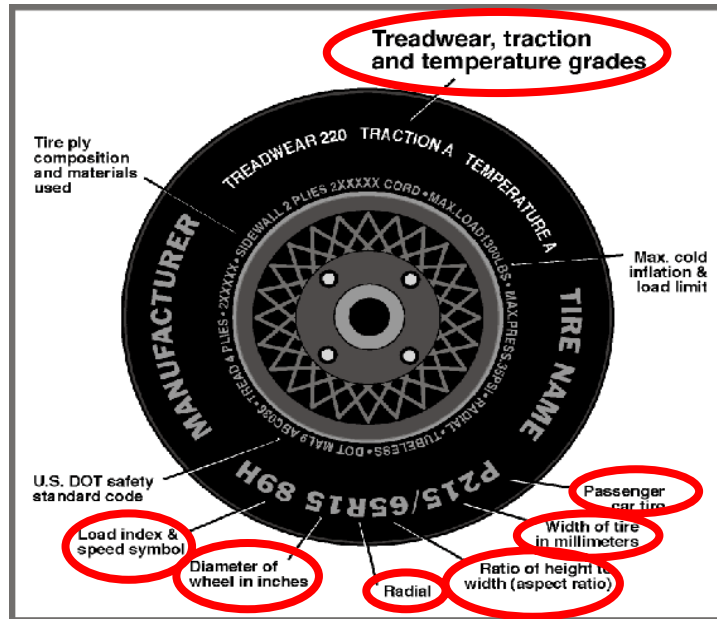


## DATA SHEET NO. 1 (CONTINUED)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Taurus SEL  
 Test Program: NCAP Side Impact

NHTSA No.: MA0216  
 Test Date: 10/16/09



### DATA FROM TIRE PLACARD

| Measured Parameter          | Front                                | Rear                                 |
|-----------------------------|--------------------------------------|--------------------------------------|
| Maximum Tire Pressure (kPa) | 300                                  | 300                                  |
| Cold / Test Pressure (kPa)  | 220                                  | 220                                  |
| Recommended Tire Size       | P235/55R18                           | P235/55R18                           |
| Tire Size on Vehicle        | P235 / 55R18                         | P235 / 55R18                         |
| Tire Manufacturer           | Michelin                             | Michelin                             |
| Tire Name                   | Pilot                                | Pilot                                |
| Load Index & Speed Symbol   | 99H                                  | 99H                                  |
| Treadwear                   | 300                                  | 300                                  |
| Traction Grade              | A                                    | A                                    |
| Temperature Grade           | A                                    | A                                    |
| Tire Plies Sidewall         | 2 polyester                          | 2 polyester                          |
| Tire Plies Tread            | 2 polyester,<br>1 polyamide, 2 steel | 2 polyester,<br>1 polyamide, 2 steel |
| Tire Material               | Polyester, polyamide,<br>and steel   | Polyester, polyamide,<br>and steel   |
| DOT Safety Code Left        | AP3J 002X 2509                       | AP3J 002X 2509                       |
| DOT Safety Code Right       | AP3J 002X 2509                       | AP3J 002X 2509                       |

**DATA SHEET NO. 2**  
**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND**  
**FUEL SYSTEMS DATA**

Test Vehicle: 2010 Ford Taurus SEL  
 Test Program: NCAP Side Impact

NHTSA No.: MA0216  
 Test Date: 10/16/09

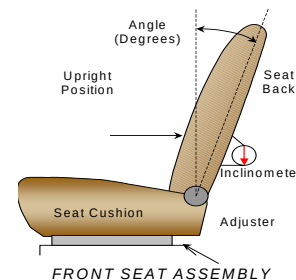
**NORMAL DESIGN RIDING POSITION**

**SEAT BACK ANGLE POSITION**

The seat back angle was measured relative to the rocker sill. The headrest was in the full up position and an inclinometer was placed on the outboard headrest post.

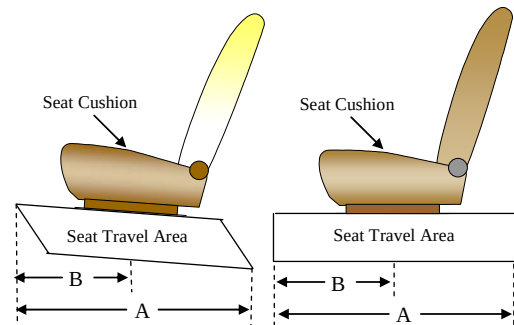
**SEAT BACK ANGLE**

|                               | Degrees | Detent |
|-------------------------------|---------|--------|
| Driver Seat with Seated Dummy | 21.6°   | N/A    |
| Front Passenger Seat          | 22.0°   | N/A    |
| Rear Seat – Struck Side       | 28.0°   | Fixed  |
| Rear Seat – Non-Struck Side   | 28.0°   | Fixed  |



**SEAT FORE/AFT POSITIONS**

For all seats (driver & passenger, power & manual seat tracks): Position the seat in the mechanical mid-position. Reference points are to be scribed on the seat and the seat track. The total seat travel is measured and the seat is then positioned in place.



**SEAT FORE/AFT POSITIONING**

|                               | Total Fore/Aft Travel (mm)<br>A | Placed in Detent # or Position (mm)<br>B |
|-------------------------------|---------------------------------|------------------------------------------|
| Driver Seat with Seated Dummy | 312                             | 156                                      |
| Front Passenger Seat          | N/A                             | N/A                                      |
| Rear Seat – Struck Side       | Fixed                           | N/A                                      |
| Rear Seat – Non-Struck Side   | Fixed                           | N/A                                      |

**SEAT BELT UPPER ANCHORAGE**

|             | Total No. of Positions | Placed in Position No. |
|-------------|------------------------|------------------------|
| Driver Seat | 80 mm                  | 0                      |
| Rear Seat   | Fixed                  | N/A                    |

Position zero is the uppermost adjustment position.

## DATA SHEET NO. 2 (CONTINUED)

### SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND

#### FUEL SYSTEMS DATA

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

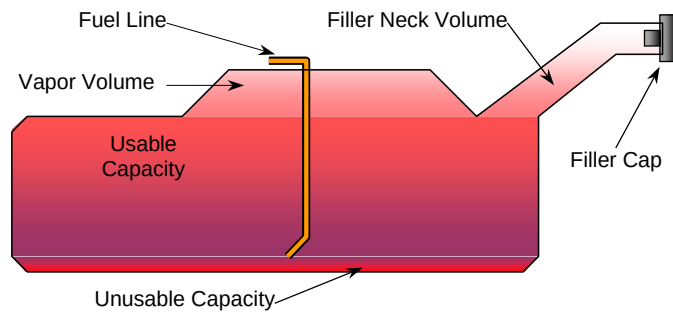
Test Program: NCAP Side Impact

Test Date: 10/16/09

#### FUEL TANK CAPACITY

|                                    | Liters |
|------------------------------------|--------|
| Usable Capacity of "Standard Tank" | 71.9   |
| Usable Capacity of "Optional" Tank | N/A    |
| Usable Capacity used for FMVSS301  | 68.5   |
| Actual Amount of Solvent used      | 67.0   |
| 1/3 of Usable Capacity             | 24.0   |

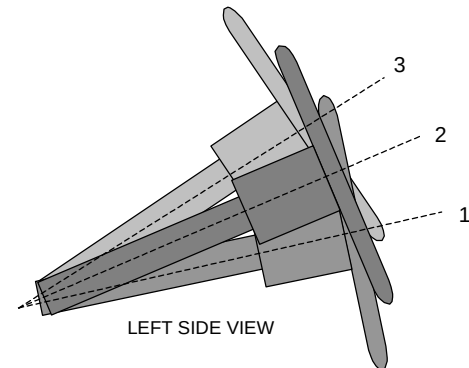
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



VEHICLE FUEL TANK ASSEMBLY

#### 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. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

#### STEERING COLUMN POSITIONS

|                                   | Degrees | Fore/Aft Position, mm |
|-----------------------------------|---------|-----------------------|
| Lowermost Position No. 1          | 20.9    |                       |
| Geometric Center Position No. 2   | 23.7    |                       |
| Uppermost Position No. 3          | 26.6    |                       |
| Telescoping Steering Wheel Travel |         | 0 - 50                |
| Test Position                     |         | 25                    |

**DATA SHEET NO. 3****POST-TEST OBSERVATIONS**Test Vehicle: 2010 Ford Taurus SELNHTSA No.: MA0216Test Program: NCAP Side ImpactTest Date: 10/16/09**POST-TEST DUMMY INFORMATION AND CONTACT POINTS**

| Description             | Front Seat          | Rear Seat           |
|-------------------------|---------------------|---------------------|
| Dummy Type / Serial No. | SID/HIII / 002      | SID/HIII / 001      |
| Head Contact            | Side Curtain Airbag | Side Curtain Airbag |
| Upper Torso Contact     | Side Torso Airbag   | Door Skin           |
| Lower Torso Contact     | None                | None                |
| Left Knee Contact       | Door Skin           | Door Skin           |
| Right Knee Contact      | None                | None                |

**POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION**

| Description             | Front              | Rear               |
|-------------------------|--------------------|--------------------|
| Locked/Unlocked Doors   | Unlocked           | Unlocked           |
| Left Side Door Opening  | Jammed and latched | Jammed and latched |
| Right Side Door Opening | Closed and latched | Closed and latched |
| Seat Movement           | None               | None               |
| Seat Back Failure       | None               | None               |

**POST-TEST STRUCTURAL OBSERVATIONS**

| Critical Areas of Performance | Observations and Conclusions                                                  |
|-------------------------------|-------------------------------------------------------------------------------|
| Pillar Performance            | Did not separate from vehicle                                                 |
| Sill Separation               | Did not separate from vehicle                                                 |
| Windshield Damage             | None                                                                          |
| Window Damage                 | Left front window shattered but not broken out;<br>Left rear window shattered |
| Other Notable Effects         | None                                                                          |

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

| Restraint Type         | Left Front (Driver) Occupant<br>Location 01 |           | Left Rear (Passenger)<br>Occupant Location 04 |           |
|------------------------|---------------------------------------------|-----------|-----------------------------------------------|-----------|
|                        | Installed                                   | Operation | Installed                                     | Operation |
| Front Airbag           | Yes                                         | No        | No                                            | N/A       |
| Side Torso Airbag      | Yes                                         | Yes       | No                                            | N/A       |
| Head Airbag            | No                                          | N/A       | No                                            | N/A       |
| Head/Torso Side Airbag | No                                          | N/A       | No                                            | N/A       |
| Curtain Airbag         | Yes                                         | Yes       | Yes                                           | Yes       |
| Seat Belt Pretensioner | Yes                                         | Unknown   | No                                            | N/A       |
| Seat Belt Load Limiter | Yes                                         | Unknown   | No                                            | N/A       |

### DATA SHEET NO. 3 (CONTINUED)

#### POST-TEST OBSERVATIONS

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09

#### SPEED AND IMPACT DATA

| Measured Parameter              | Units   | Requirement  | Value            |
|---------------------------------|---------|--------------|------------------|
| Trap No. 1 Velocity (Primary)   | km/h    | 61.1 to 62.7 | 61.9             |
| Trap No. 2 Velocity (Redundant) | km/h    | 61.1 to 62.7 | --- <sup>1</sup> |
| MDB CL to Target Vehicle CL     | degrees | 88.5 to 91.5 | 90.0             |

#### IMPACT TARGET DATA

| Measured Parameter | Units | Requirement | Primary Value | Redundant |
|--------------------|-------|-------------|---------------|-----------|
| Horizontal Offset  | Mm    | +/- 50      | 4 mm left     | 5 mm left |
| Vertical Offset    | Mm    | +/- 20      | 1 mm up       | 4 mm up   |

<sup>1</sup> The redundant light trap did not record test speed.

## DATA SHEET NO. 4

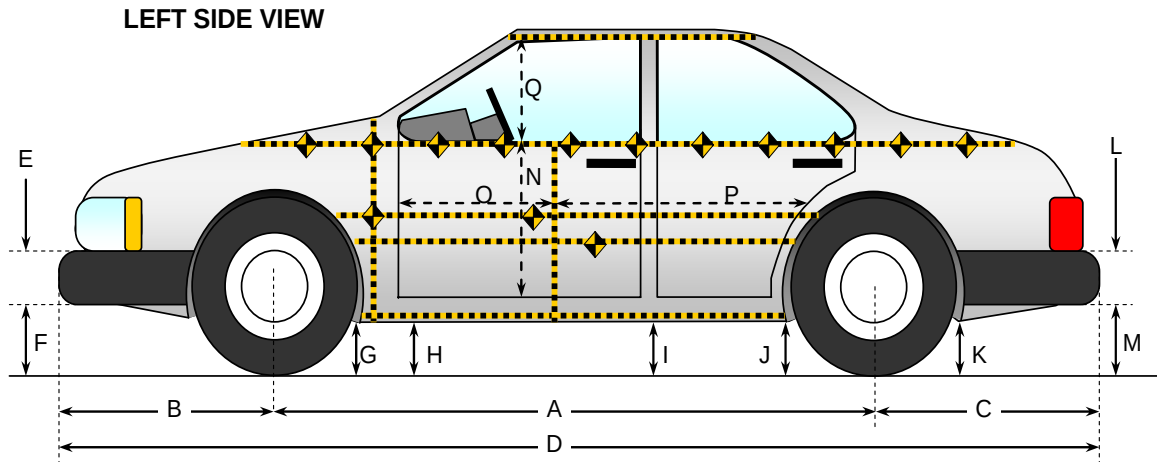
### VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09



| Code | Measurement Description                | Pre-Test | Post-Test | Difference |
|------|----------------------------------------|----------|-----------|------------|
| A    | Wheelbase                              | 2870     | 2860      | 10         |
| B    | Front Axle to Front Surface of Vehicle | 1012     | 1040      | -28        |
| C    | Rear Axle to Rear Surface of Vehicle   | 1253     | 1250      | 3          |
| D    | Total Length at Centerline             | 5135     | 5150      | -15        |
| E    | Front Bumper Thickness                 | 150      | 150       | 0          |
| F    | Front Bumper Bottom to Ground          | 447      | 460       | -13        |
| G    | Sill Height at Front Wheel Well        | 312      | 310       | 2          |
| H    | Sill Height at Front Door Leading Edge | 289      | 335       | -46        |
| I    | Sill Height at "B" Pillar              | 318      | 360       | -42        |
| J1   | Sill Height at Rear Wheel Well         | 340      | 465       | -125       |
| J2   | Pinch Weld Height at Rear Wheel Well   | 211      | 230       | -19        |
| K    | Sill Height Aft of Rear Wheel Well     | 417      | 470       | -53        |
| L    | Rear Bumper Thickness                  | 159      | 156       | 3          |
| M    | Rear Bumper Bottom to Ground           | 492      | 547       | -55        |
| N    | Sill Height to Window Bottom Sill      | 819      | 895       | -76        |
| O    | Front Door Leading Edge to Impact CL   | 838      | 775       | 63         |
| P    | Rear Door Trailing Edge to Impact CL   | 1358     | 1273      | 85         |
| Q    | Front Window Opening                   | 340      | 355       | -15        |
| R    | Right Side Length                      | 4840     | 4845      | -5         |
| S    | Left Side Length                       | 4840     | 4845      | -5         |
| T    | Vehicle Width at "B" Post              | 1335     | 1255      | 80         |
|      | Maximum Width                          | 1935     | 1935      | 0          |

All measurements are in millimeters.

## DATA SHEET NO. 5

### DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

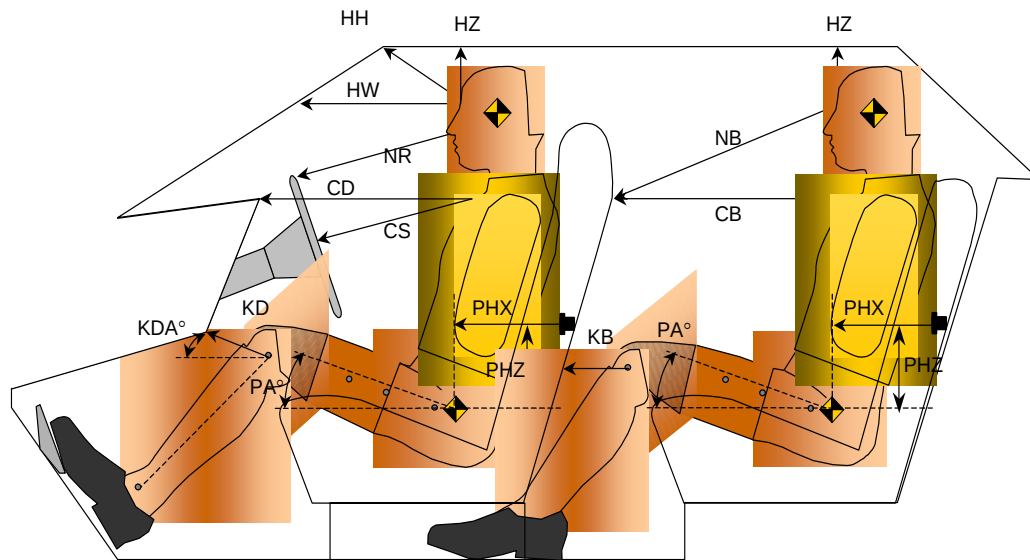
Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09

Dummy Temperature at Time of Impact: 20.6



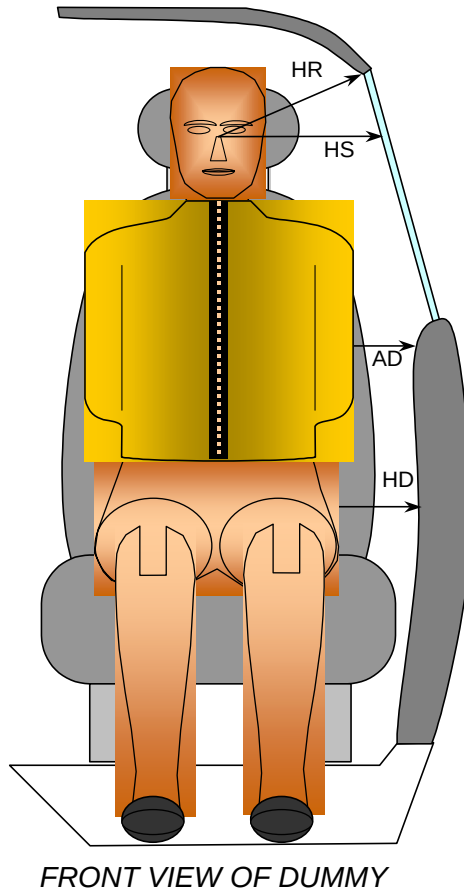
| Driver Code | Pass. Code | Measurement Description        | Driver S/N 002 |           | Passenger S/N 001 |           |
|-------------|------------|--------------------------------|----------------|-----------|-------------------|-----------|
|             |            |                                | Length (mm)    | Angle (°) | Length (mm)       | Angle (°) |
| HH          |            | Head to Header                 | 413            |           |                   |           |
| HW          |            | Head to Windshield             | 736            |           |                   |           |
| HZ          | HZ         | Head to Roof                   | 207            |           | 160               |           |
| NR          | NB         | Nose to Rim/Nose to Seatback   | 418            |           | 685               |           |
| CD          | CB         | Chest to Dash or Seatback      | 572            |           | 612               |           |
| CS          |            | Chest to Steering Wheel        | 335            |           |                   |           |
| KDL         | KBL        | Left Knee to Dash or Seatback  | 70             | 32.0      | 190               | 26.0      |
| KDR         | KBR        | Right Knee to Dash or Seatback | 55             | 42.9      | 188               | 24.7      |
| PA          | PA         | Pelvic Angle                   |                | 23.3      |                   | 23.7      |
| PHX         | PHX        | H-Point to Striker (X-Axis)    | 208            |           | 202               |           |
| PHZ         | PHZ        | H-Point to Striker (Z-Axis)    | 178            |           | 240               |           |

## DATA SHEET NO. 6

### DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Taurus SEL  
Test Program: NCAP Side Impact

NHTSA No.: MA0216  
Test Date: 10/16/09



| Code | Measurement Description | Units | Driver<br>S/N 002 | Passenger<br>S/N 001 |
|------|-------------------------|-------|-------------------|----------------------|
| HR   | Head to Side Header     | mm    | 168               | 126                  |
| HS   | Head to Side Window     | mm    | 312               | 270                  |
| AD   | Arm to Door             | mm    | 153               | 128                  |
| HD   | H-Point to Door         | mm    | 156               | 161                  |



## DATA SHEET NO. 7

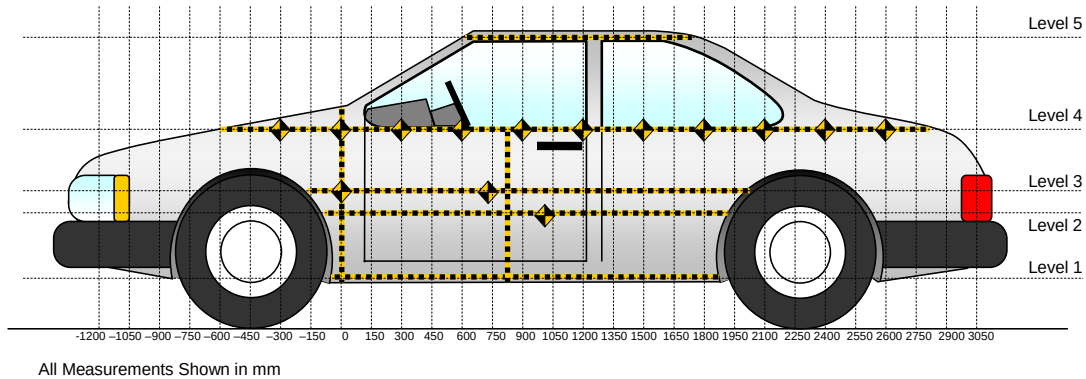
### VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Taurus SEL

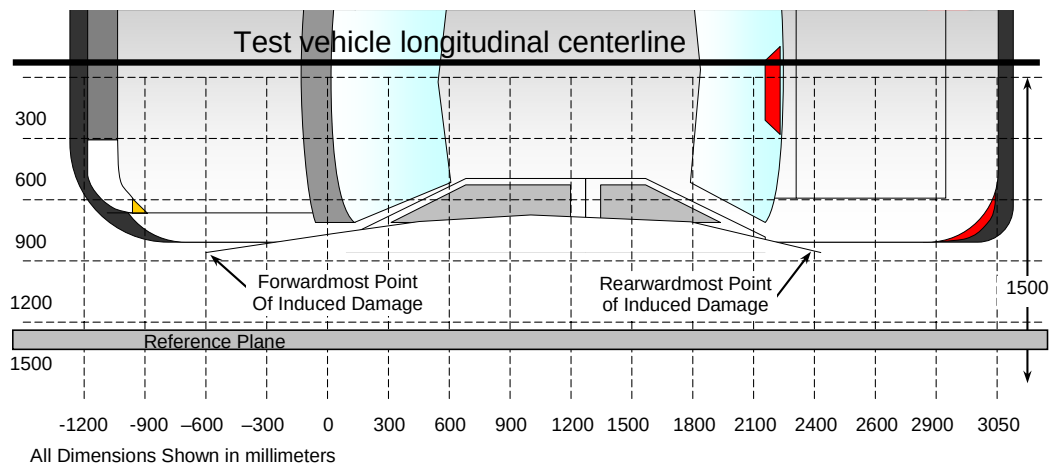
NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09



#### LEFT SIDE VIEW



#### TOP VIEW

Measurements are taken with vehicle in the as tested condition.

All measurements below are in millimeters

#### MAXIMUM EXTERIOR STATIC CRUSH

| Level | Measurement Description | Maximum Exterior Static Crush | Distance From Impact | Height Above Ground |
|-------|-------------------------|-------------------------------|----------------------|---------------------|
| 5     | Window Top              | 13                            | 150, 300, & 450      | 1240                |
| 4     | Window Sill             | 166                           | 1650                 | 955                 |
| 3     | Mid Door                | 243                           | 1650                 | 680                 |
| 2     | Occupant H-Point        | 218                           | 900                  | 508                 |
| 1     | Sill Top                | 134                           | 1050                 | 270                 |
|       |                         | Maximum Penetration           | 243                  |                     |

# DATA SHEET NO. 7 (CONTINUED)

## VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09

|      | Pre-Test |      |      |      |      | Post-Test |      |      |      |      | Difference |     |     |     |     |
|------|----------|------|------|------|------|-----------|------|------|------|------|------------|-----|-----|-----|-----|
|      | 1        | 2    | 3    | 4    | 5    | 1         | 2    | 3    | 4    | 5    | 1          | 2   | 3   | 4   | 5   |
| -900 |          |      |      |      |      |           |      |      |      |      |            |     |     |     |     |
| -750 |          |      |      |      |      |           |      |      |      |      |            |     |     |     |     |
| -600 |          |      |      |      |      |           |      |      |      |      |            |     |     |     |     |
| -450 |          |      |      |      |      |           |      |      |      |      |            |     |     |     |     |
| -300 |          |      |      | -831 |      |           |      |      | -847 |      |            |     |     | -16 |     |
| -150 |          | -951 | -951 | -843 |      |           | -959 | -957 | -858 |      |            | -8  | -6  | -15 |     |
| 0    | -941     | -944 | -937 | -857 |      | -945      | -952 | -946 | -872 |      | -4         | -8  | -9  | -15 |     |
| 150  | -941     | -940 | -935 | -868 | -777 | -881      | -827 | -825 | -871 | -790 | 60         | 113 | 110 | -3  | -13 |
| 300  | -944     | -940 | -937 | -878 | -738 | -850      | -785 | -768 | -858 | -751 | 94         | 155 | 169 | 20  | -13 |
| 450  | -949     | -942 | -940 | -885 | -703 | -841      | -774 | -752 | -844 | -716 | 108        | 168 | 188 | 41  | -13 |
| 600  | -952     | -943 | -942 | -893 | -669 | -835      | -763 | -737 | -824 | -681 | 117        | 180 | 205 | 69  | -12 |
| 750  | -954     | -944 | -944 | -900 | -647 | -830      | -741 | -737 | -824 | -657 | 124        | 203 | 207 | 76  | -10 |
| 900  | -955     | -945 | -945 | -904 | -636 | -827      | -727 | -713 | -826 | -644 | 128        | 218 | 232 | 78  | -8  |
| 1050 | -956     | -946 | -946 | -907 | -630 | -822      | -751 | -733 | -821 | -631 | 134        | 195 | 213 | 86  | -1  |
| 1200 | -954     | -944 | -945 | -908 | -627 | -865      | -783 | -739 | -814 | -629 | 89         | 161 | 206 | 94  | -2  |
| 1350 | -952     | -943 | -944 | -910 | -625 | -850      | -764 | -720 | -805 | -624 | 102        | 179 | 224 | 105 | 1   |
| 1500 | -949     | -942 | -944 | -911 | -625 | -834      | -753 | -710 | -785 | -625 | 115        | 189 | 234 | 126 | 0   |
| 1650 | -946     | -941 | -943 | -911 | -628 | -824      | -733 | -700 | -745 | -627 | 122        | 208 | 243 | 166 | 1   |
| 1800 | -942     | -943 | -944 | -910 | -636 | -869      | -759 | -725 | -788 | -636 | 73         | 184 | 219 | 122 | 0   |
| 1950 | -936     | -951 | -950 | -907 | -660 | -937      | -874 | -857 | -842 | -660 | -1         | 77  | 93  | 65  | 0   |
| 2100 |          |      | -954 | -903 | -693 |           |      | -956 | -902 | -692 |            |     | -2  | 1   | 1   |
| 2250 |          |      |      | -899 | -722 |           |      |      | -884 | -722 |            |     |     | 15  | 0   |
| 2400 |          |      |      | -894 | -750 |           |      |      | -886 | -748 |            |     |     | 8   | 2   |
| 2550 |          |      |      | -887 |      |           |      |      | -884 |      |            |     |     | 3   |     |
| 2700 |          |      |      | -878 |      |           |      |      | -878 |      |            |     |     | 0   |     |

Reference plane is parallel to test vehicle longitudinal centerline.

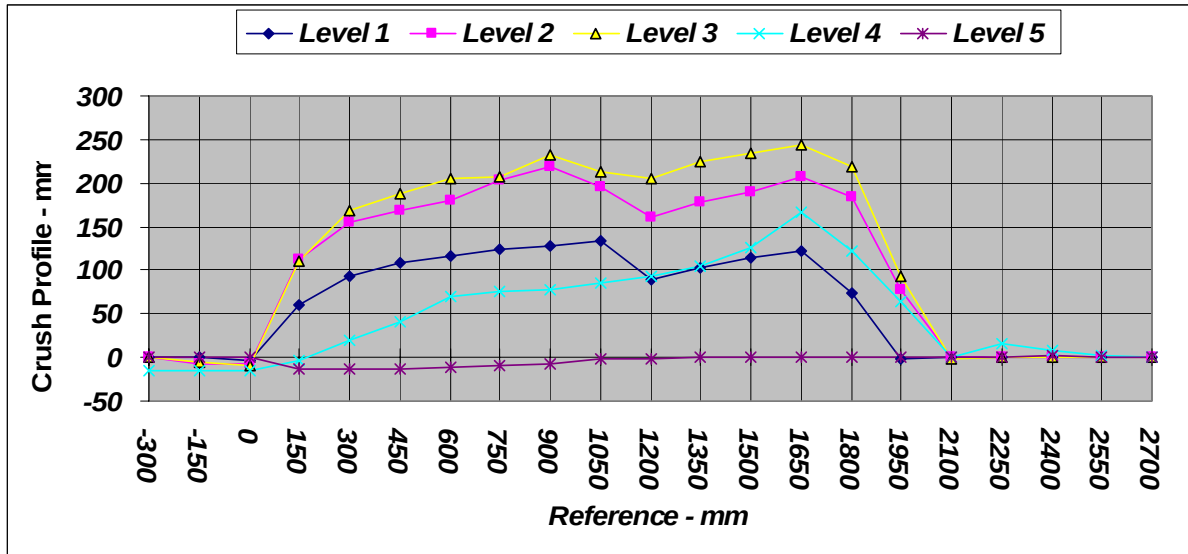
Given measurements = Reference plane to car body

## DATA SHEET NO. 7 (CONTINUED)

### VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Taurus SEL  
Test Program: NCAP Side Impact

NHTSA No.: MA0216  
Test Date: 10/16/09



## DATA SHEET NO. 8

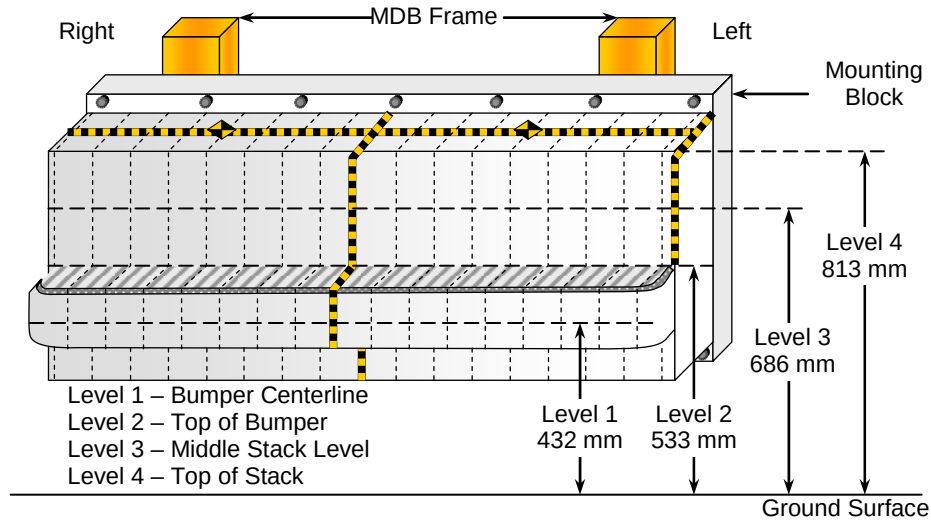
### DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09



### DEFORMABLE BARRIER STATIC CRUSH

| Stack          | Distance Right of Center |      |      |      |      |      |      |      |      | C/L  | Distance Left of Center |      |      |      |      |      |      |  |  |
|----------------|--------------------------|------|------|------|------|------|------|------|------|------|-------------------------|------|------|------|------|------|------|--|--|
| Level          | 800                      | 700  | 600  | 500  | 400  | 300  | 200  | 100  | 0    | 100  | 200                     | 300  | 400  | 500  | 600  | 700  | 800  |  |  |
| 1              | -41                      | -34  | -30  | -30  | -37  | -54  | -81  | -96  | -64  | -50  | -42                     | -38  | -46  | -53  | -70  | -88  | -127 |  |  |
| 2 <sup>1</sup> | -54                      | -33  | -30  | -31  | -32  | -31  | -35  | -46  | -37  | -27  | -25                     | -21  | -22  | -28  | -44  | -65  | -112 |  |  |
| 3              | -136                     | -133 | -129 | -133 | -120 | -117 | -119 | -111 | -101 | -106 | -97                     | -91  | -87  | -84  | -84  | -98  | -102 |  |  |
| 4              | -232                     | -230 | -215 | -202 | -192 | -186 | -182 | -178 | -175 | -170 | -167                    | -164 | -161 | -158 | -158 | -173 | -192 |  |  |

All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of + 0.1 mm.

<sup>1</sup> Top Bumper measurements are collected at 560 mm to eliminate post-test measurement point obstruction by the bumper element.

## DATA SHEET NO. 9

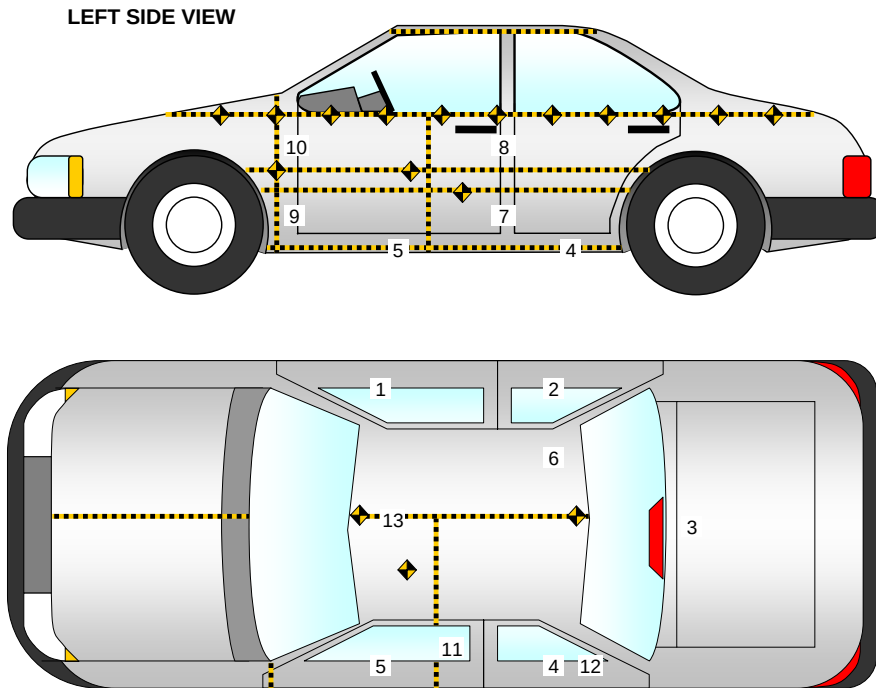
### VEHICLE ACCELEROMETER DATA

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09



| Loc. No. | Accelerometer Location       | Measurements (mm) |      |      |
|----------|------------------------------|-------------------|------|------|
|          |                              | X                 | Y    | Z    |
| 1        | Right Sill at Front Seat     | 3440              | 665  | -325 |
| 2        | Right Sill at Rear Seat      | 2475              | 679  | -380 |
| 3        | Rear Floorpan Above Axle     | 1370              | 0    | -590 |
| 4        | Left Sill at Rear Seat       | 2482              | -678 | -370 |
| 5        | Left Sill at Front Seat      | 3530              | -660 | -345 |
| 6        | Rear Occupant Compartment    | 2240              | 555  | -443 |
| 7        | Left Lower B-Post            | 2635              | -870 | -584 |
| 8        | Left Middle B-Post           | 2630              | -860 | -932 |
| 9        | Left Lower A-Post            | 3690              | -855 | -524 |
| 10       | Left Middle A-Post           | 3700              | -835 | -924 |
| 11       | Front Seat Track             | 2810              | 610  | -387 |
| 12       | Rear Seat Track or Structure | 2080              | 580  | -386 |
| 13       | Vehicle CG                   | 3335              | 0    | -509 |

Reference Points: X - Test Vehicle Rear Bumper (+ forward)  
Y - Test Vehicle Centerline (+ to right)  
Z - Ground Plane (+ down)

## DATA SHEET NO. 10

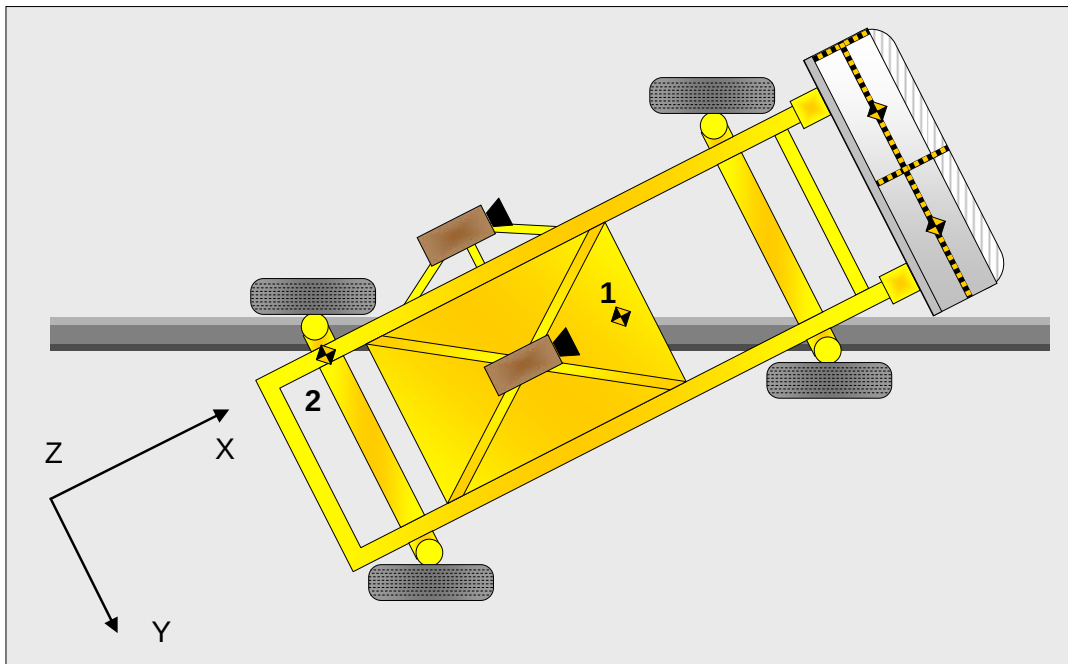
### MDB DATA

Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09



| Loc. No. | Accelerometer Location | Measurements (mm) |      |      |
|----------|------------------------|-------------------|------|------|
|          |                        | X                 | Y    | Z    |
| 1        | MDB CG                 | 1855              | 0    | -520 |
| 2        | MDB Rear               | 412               | -677 | -625 |

Reference Points: X - Test Vehicle Rear Bumper (+ forward)  
Y - Test Vehicle Centerline (+ to right)  
Z - Ground Plane (+ down)

### MDB SPECIFICATIONS

| Measurement Description                 | Length (mm) |
|-----------------------------------------|-------------|
| Overall Width of Framework Carriage     | 1252        |
| Overall Length Including Honeycomb Face | 4115        |
| Wheel base of Framework Carriage        | 2591        |
| C.G. Location aft of Front Axle         | 1103        |

### MDB WEIGHTS

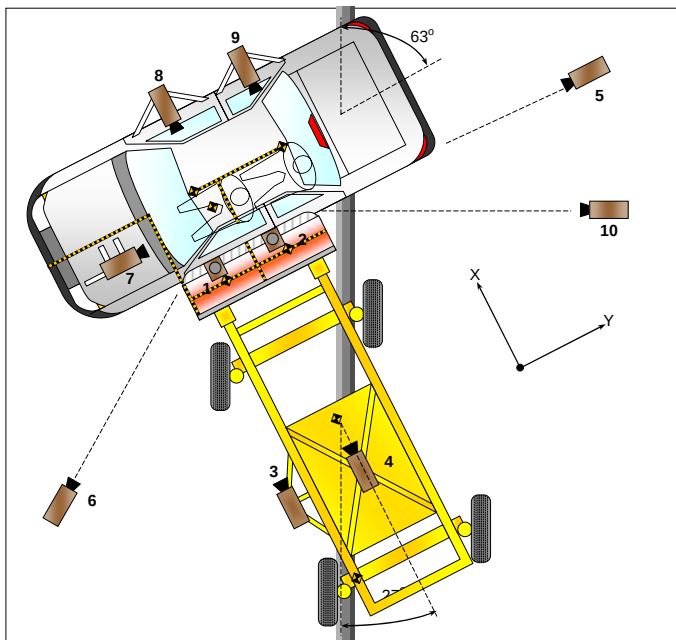
|        | Units | Front Axle | Rear Axle | Total  |
|--------|-------|------------|-----------|--------|
| Left   | kg    | 377.0      | 302.6     |        |
| Right  | kg    | 406.0      | 277.4     |        |
| Ratio  | %     | 57.4       | 42.6      |        |
| Totals | kg    | 783.0      | 580.0     | 1363.0 |

## DATA SHEET NO. 11

### CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2010 Ford Taurus SEL  
 Test Program: NCAP Side Impact

NHTSA No.: MA0216  
 Test Date: 10/16/09



REFERENCE (from Point of Impact for X and Y; from Ground for Z):  
 +X= Forward of MDB, +Y= Rear of vehicle, +Z= Down

| No. | Camera View                                  | Location (mm) |      |      | Lens (mm) | Frame Speed (fps) |
|-----|----------------------------------------------|---------------|------|------|-----------|-------------------|
|     |                                              | X             | Y    | Z    |           |                   |
| 1   | Overhead Wide                                | 0             | 240  | 5650 | 12.5      | 1000              |
| 2   | Overhead Tight                               | 0             | 120  | 5650 | 20        | 1000              |
| 3   | Onboard Cart at MDB left edge                |               |      |      | 25        | 1000              |
| 4   | Onboard cart centerline at struck side       |               |      |      | 12.5      | 1000              |
| 5   | Vehicle Rear at contact plane                | 10700         | 0    | 1250 | 16        | 1000              |
| 6   | Left Side Oblique                            | 3880          | 4950 | 1150 | 16        | 1000              |
| 7   | Onboard vehicle hood at Driver Dummy         |               |      |      | 25        | 1000              |
| 8   | Onboard vehicle door at Driver Dummy         |               |      |      | 12.5      | 1000              |
| 9   | Onboard vehicle door at Rear Passenger Dummy |               |      |      | 12.5      | 1000              |
| 10  | Real Time Coverage                           |               |      |      | zoom      | 1000              |

### INSTRUMENTATION

|                                   | Number of Channels |
|-----------------------------------|--------------------|
| Driver and Rear Pass. Dummies     | 44                 |
| Vehicle Structure                 | 21                 |
| Moving Deformable Barrier         | 5                  |
| Contact Switches                  | 2                  |
| <b>Total No. of Data Channels</b> | <b>72</b>          |

## DATA SHEET NO. 12

### SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2010 Ford Taurus SEL  
 Test Program: NCAP Side Impact

NHTSA No.: MA0216  
 Test Date: 10/16/09

### FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Rollover Start Time: 16:06

#### Stoddard Solvent Spillage Measurements

- A. From impact until vehicle motion ceases: 0.0 oz.  
 (Maximum allowable = 1 ounce)  
 B. For the 5 minute period after motion ceases: 0.0 oz.  
 (Maximum allowable = 5 ounces)  
 C. For the following 25 minutes: 0.0 oz.  
 (Maximum allowable = 1 oz./minute)  
 D. Spillage Details: None

### FMVSS 301 STATIC ROLLOVER DATA

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  | <p>1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.</p> <p>2. The position hold time at each position is 300 seconds (minimum).</p> <p>3. Details of Stoddard Solvent spillage locations: None</p> |
| <p>0° to 90°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          </p> |  |  |                                                                                                                                                                                                                                         |

| Test Phase   | Rotation Time (sec.) | Hold Time (sec.) | Spillage Collection Time (min) | Spillage (oz.) | Spillage Collection Time (min) | Spillage (oz.) | Spillage Collection Time (min) | Spillage (oz.) |
|--------------|----------------------|------------------|--------------------------------|----------------|--------------------------------|----------------|--------------------------------|----------------|
| 0° to 90°    | 120                  | 300              | First 5                        | 0              | Sixth                          | 0              | Seventh                        | 0              |
| 90° to 180°  | 120                  | 300              | First 5                        | 0              | Sixth                          | 0              | Seventh                        | 0              |
| 180° to 270° | 120                  | 300              | First 5                        | 0              | Sixth                          | 0              | Seventh                        | 0              |
| 270° to 360° | 120                  | 300              | First 5                        | 0              | Sixth                          | 0              | Seventh                        | 0              |



## DATA SHEET NO. 13

### DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

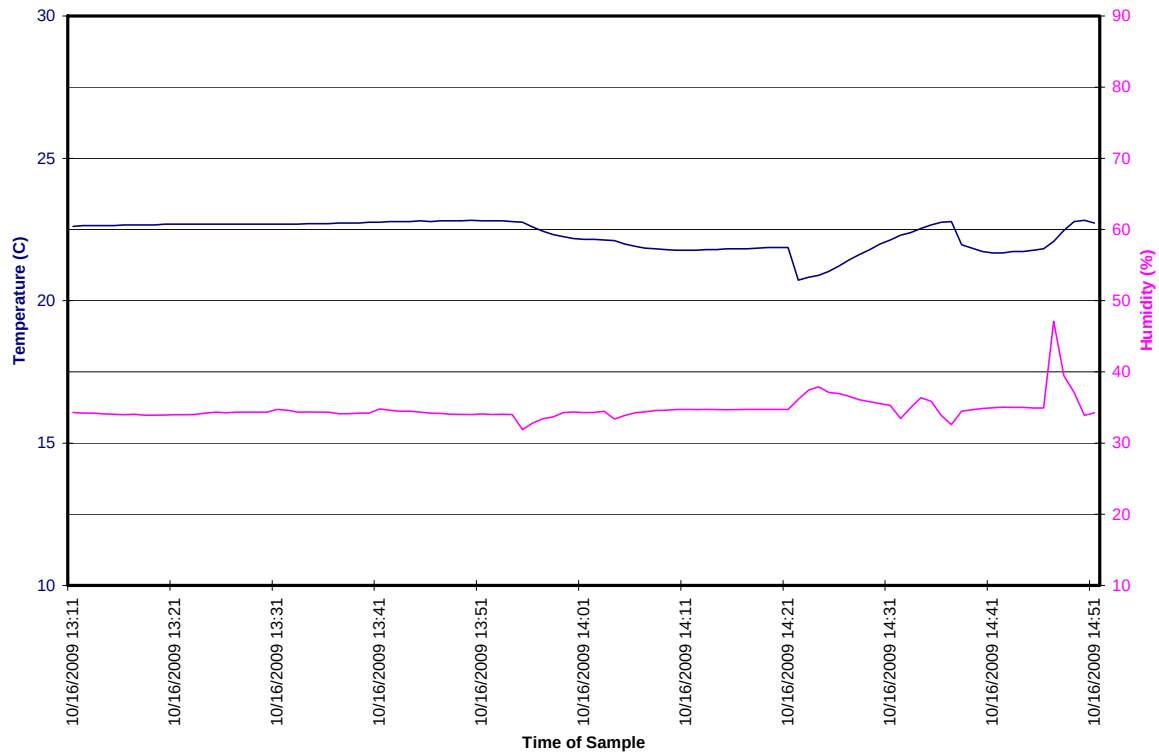
Test Vehicle: 2010 Ford Taurus SEL

NHTSA No.: MA0216

Test Program: NCAP Side Impact

Test Date: 10/16/09

2010 FORD TAURUS SEL LEFT SIDE IMPACT AT 62 KM/H, Test Time: 14:51



**APPENDIX A**  
**PHOTOGRAPHS**

## LIST OF PHOTOGRAPHS

| Figure |                                              | Page |
|--------|----------------------------------------------|------|
| A-1    | Pre-Test Front View of Test Vehicle          | A-5  |
| A-2    | Post-Test Front View of Test Vehicle         | A-5  |
| A-3    | Pre-Test Left Front View of Test Vehicle     | A-6  |
| A-4    | Post-Test Left Front View of Test Vehicle    | A-6  |
| A-5    | Pre-Test Impacted Side View of Test Vehicle  | A-7  |
| A-6    | Post-Test Impacted Side View of Test Vehicle | A-7  |
| A-7    | Pre-Test Left Rear View of Test Vehicle      | A-8  |
| A-8    | Post-Test Left Rear View of Test Vehicle     | A-8  |
| A-9    | Pre-Test Rear View of Test Vehicle           | A-9  |
| A-10   | Post-Test Rear View of Test Vehicle          | A-9  |
| A-11   | Pre-Test Right Rear View of Test Vehicle     | A-10 |
| A-12   | Post-Test Right Rear View of Test Vehicle    | A-10 |
| A-13   | Pre-Test Right Side View of Test Vehicle     | A-11 |
| A-14   | Post-Test Right Side View of Test Vehicle    | A-11 |
| A-15   | Pre-Test Right Front View of Test Vehicle    | A-12 |
| A-16   | Post-Test Right Front View of Test Vehicle   | A-12 |
| A-17   | Pre-Test Frontal View of Impactor Face       | A-13 |
| A-18   | Post-Test Frontal View of Impactor Face      | A-13 |
| A-19   | Pre-Test Left Side View of Impactor Face     | A-14 |
| A-20   | Post-Test Left Side View of Impactor Face    | A-14 |
| A-21   | Pre-Test Right Side View of Impactor Face    | A-15 |
| A-22   | Post-Test Right Side View of Impactor Face   | A-15 |
| A-23   | Pre-Test Top View of Impactor Face           | A-16 |
| A-24   | Post-Test Top View of Impactor Face          | A-16 |
| A-25   | Pre-Test Left Side View of Impactor          | A-17 |
| A-26   | Post-Test Left Side View of Impactor         | A-17 |
| A-27   | Pre-Test Right Side View of Impactor         | A-18 |
| A-28   | Post-Test Right Side View of Impactor        | A-18 |
| A-29   | Pre-Test Top View of Impactor                | A-19 |
| A-30   | Post-Test Top View of Impactor               | A-19 |

# LIST OF PHOTOGRAPHS (CONTINUED)

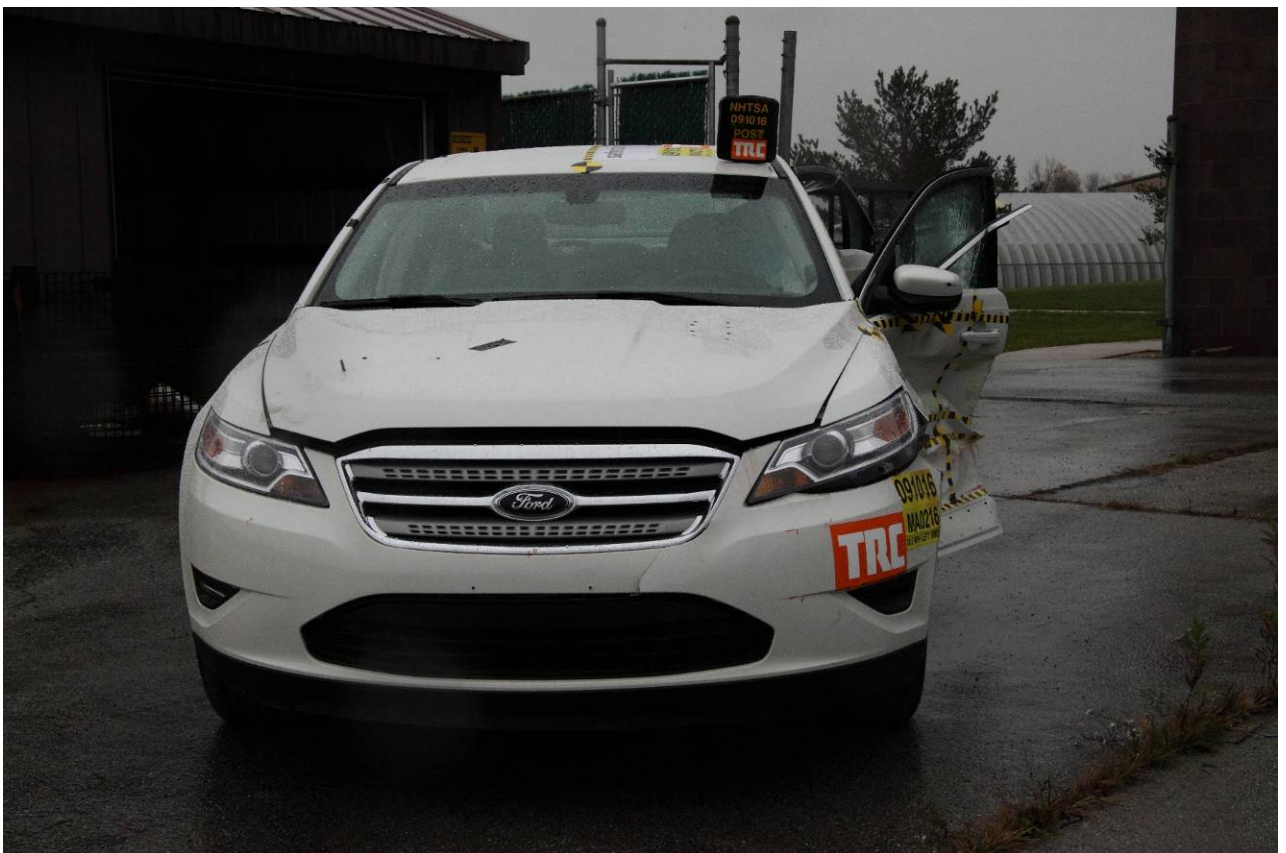
| Figure |                                                             | Page |
|--------|-------------------------------------------------------------|------|
| A-31   | Pre-Test Left Side Overall View of Impactor                 | A-20 |
| A-32   | Post-Test Left Side Overall View of Impactor                | A-20 |
| A-33   | Pre-Test Right Side Overall View of Impactor                | A-21 |
| A-34   | Post-Test Right Side Overall View of Impactor               | A-21 |
| A-35   | Pre-Test View of MDB Showing Contact Switches in Place      | A-22 |
| A-36   | Post-Test View of MDB Showing Contact Switches in Place     | A-22 |
| A-37   | Pre-Test Overhead View of MDB Aligned with Vehicle          | A-23 |
| A-38   | Post-Test Overhead View of MDB and Vehicle                  | A-23 |
| A-39   | Pre-Test Right Occupant Compartment View of Front SID HIII  | A-24 |
| A-40   | Post-Test Right Occupant Compartment View of Front SID HIII | A-24 |
| A-41   | Pre-Test Right Occupant Compartment View of Rear SID HIII   | A-25 |
| A-42   | Post-Test Right Occupant Compartment View of Rear SID HIII  | A-25 |
| A-43   | Pre-Test Left View of Front SID HIII                        | A-26 |
| A-44   | Post-Test Left View of Front SID HIII                       | A-26 |
| A-45   | Pre-Test Left View of Front SID HIII and Belt Position      | A-27 |
| A-46   | Pre-Test Left View of Front SID HIII and Door Clearance     | A-28 |
| A-47   | Post-Test Left View of Front SID HIII and Door Clearance    | A-28 |
| A-48   | Pre-Test Left View of Rear SID HIII                         | A-29 |
| A-49   | Post-Test Left View of Rear SID HIII                        | A-29 |
| A-50   | Pre-Test Left View of Rear SID HIII and Belt Position       | A-30 |
| A-51   | Pre-Test Left View of Rear SID HIII and Door Clearance      | A-31 |
| A-52   | Post-Test Left View of Rear SID HIII and Door Clearance     | A-31 |
| A-53   | Pre-Test Interior of Front Door                             | A-32 |
| A-54   | Post-Test Front SID HIII Contact – View 1                   | A-33 |
| A-55   | Post-Test Front SID HIII Contact – View 2                   | A-33 |
| A-56   | Post-Test Front SID HIII Contact – View 3                   | A-34 |
| A-57   | Pre-Test Interior of Rear Side Panel                        | A-35 |
| A-58   | Post-Test Interior of Rear Side Panel                       | A-35 |

# LIST OF PHOTOGRAPHS (CONTINUED)

| Figure |                                                                 | Page |
|--------|-----------------------------------------------------------------|------|
| A-59   | Post-Test Rear SID HIII Contact - View 1                        | A-36 |
| A-60   | Post-Test Rear SID HIII Contact - View 2                        | A-36 |
| A-61   | Pre-Test Left Side View of MDB With Impactor Face in Position   | A-37 |
| A-62   | Post-Test Left Side View of MDB With Impactor Face in Position  | A-37 |
| A-63   | Pre-Test Primary Impact Point View                              | A-38 |
| A-64   | Post-Test Primary Impact Point View                             | A-38 |
| A-65   | Pre-Test Right Side View of MDB With Impactor Face in Position  | A-39 |
| A-66   | Post-Test Right Side View of MDB With Impactor Face in Position | A-39 |
| A-67   | Pre-Test Secondary Impact Point View                            | A-40 |
| A-68   | Post-Test Secondary Impact Point View                           | A-40 |
| A-69   | Pre-Test Left Front View of MDB with Impactor Face in Position  | A-41 |
| A-70   | Post-Test Left Front View of MDB with Impactor Face             | A-41 |
| A-71   | Pre-Test Vehicle Certification Label View                       | A-42 |
| A-72   | Pre-Test Vehicle Recommended Tire Pressure Label View           | A-42 |
| A-73   | Post-Test Light Trap Digital Readout                            | A-43 |
| A-74   | Pre-Test Fuel Door View                                         | A-43 |
| A-75   | Impact Event                                                    | A-44 |
| A-76   | FMVSS 301 Rollover View at 90°                                  | A-45 |
| A-77   | FMVSS 301 Rollover View at 180°                                 | A-45 |
| A-78   | FMVSS 301 Rollover View at 270°                                 | A-46 |
| A-79   | FMVSS 301 Rollover View at 360°                                 | A-46 |



**Figure A-1 Pre-Test Front View of Test Vehicle**

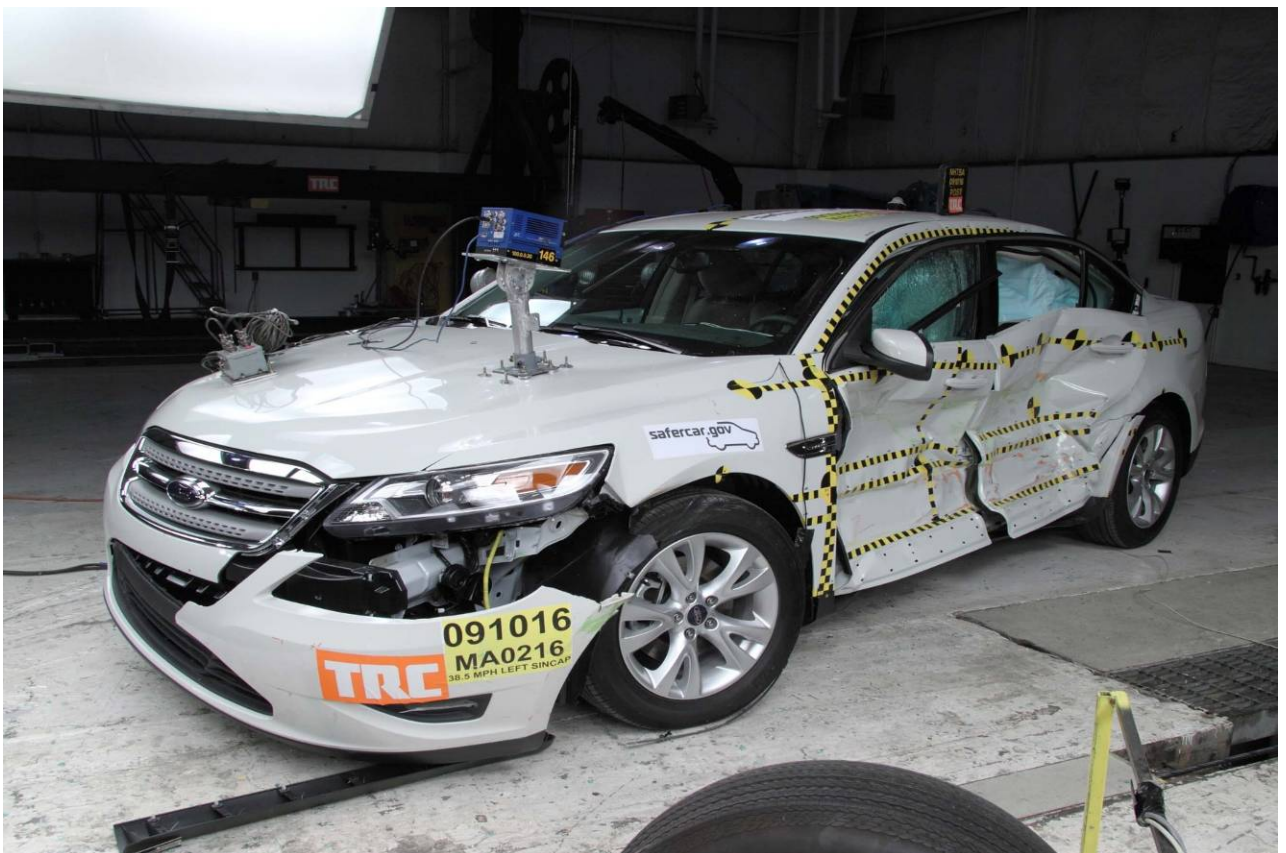


**Figure A-2 Post-Test Front View of Test Vehicle**





**Figure A-3 Pre-Test Left Front View of Test Vehicle**



**Figure A-4 Post-Test Left Front View of Test Vehicle**





**Figure A-5 Pre-Test Impacted Side View of Test Vehicle**



**Figure A-6 Post-Test Impacted Side View of Test Vehicle**





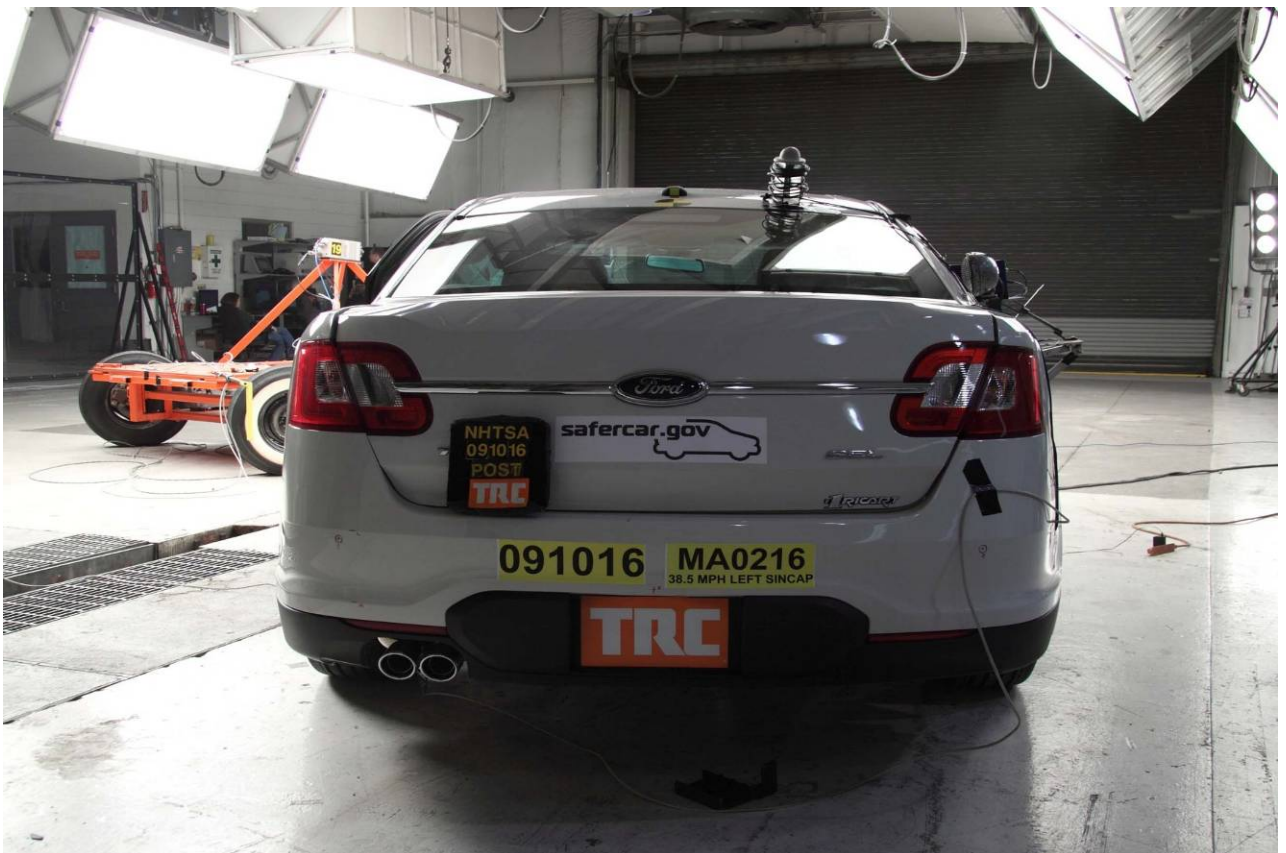
**Figure A-7 Pre-Test Left Rear View of Test Vehicle**



**Figure A-8 Post-Test Left Rear View of Test Vehicle**



**Figure A-9 Pre-Test Rear View of Test Vehicle**



**Figure A-10 Post-Test Rear View of Test Vehicle**





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



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

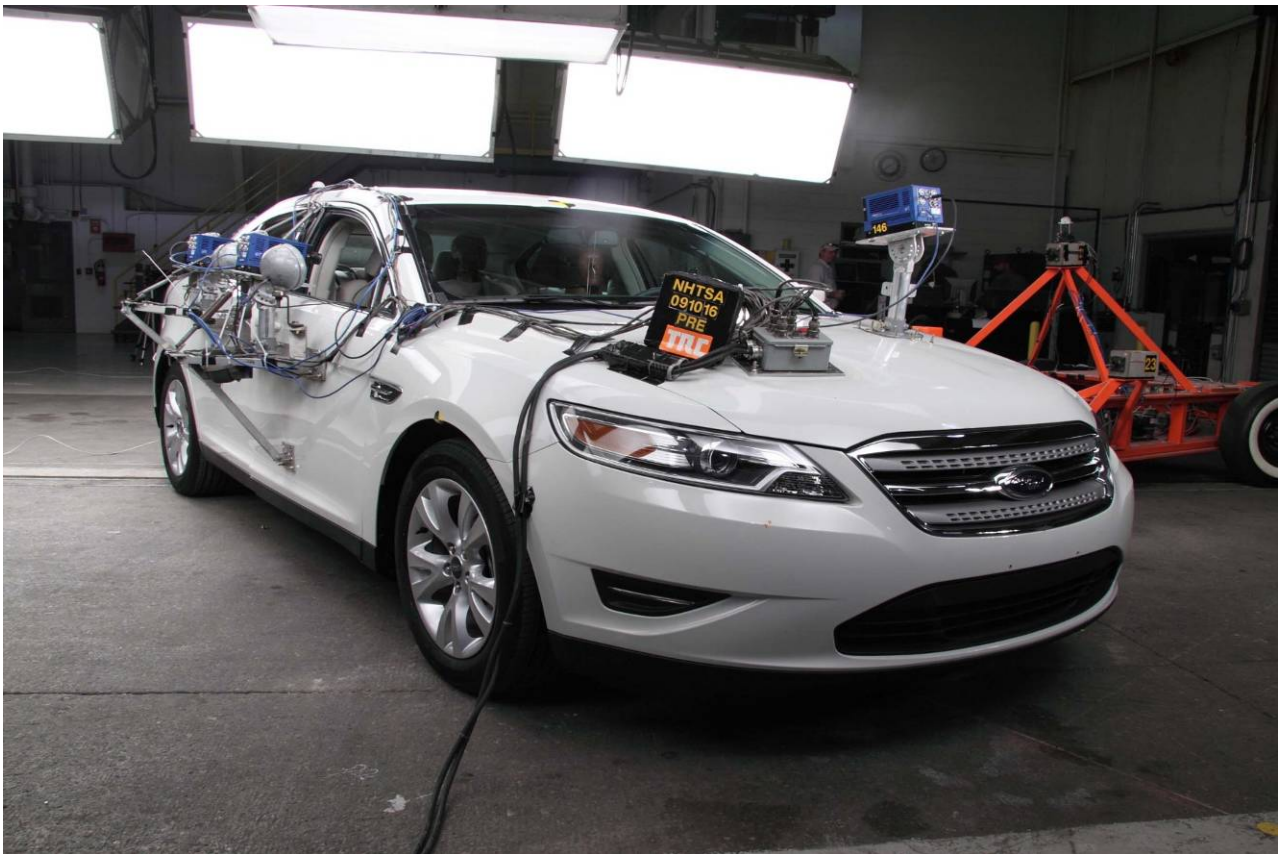


**Figure A-13 Pre-Test Right Side View of Test Vehicle**

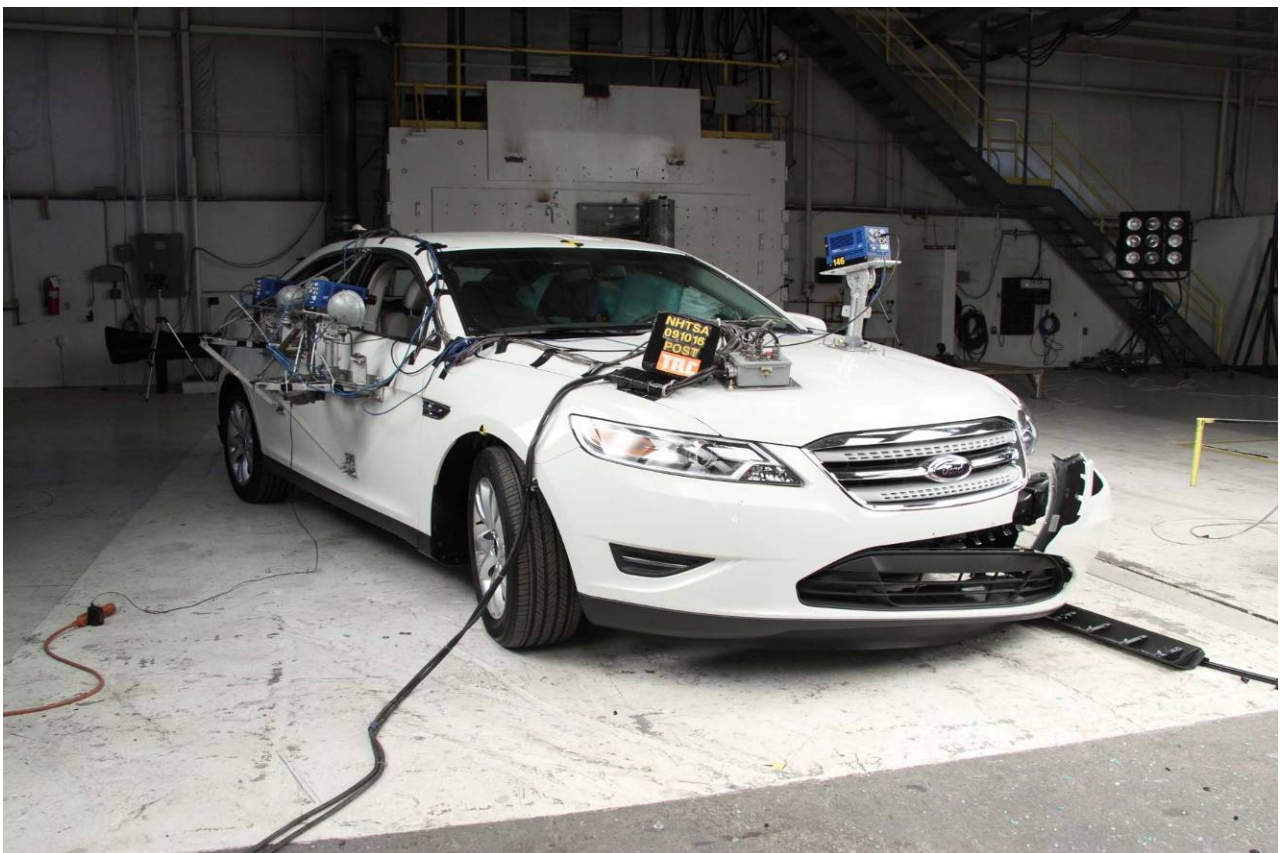


**Figure A-14 Post-Test Right Side View of Test Vehicle**





**Figure A-15 Pre-Test Right Front View of Test Vehicle**



**Figure A-16 Post-Test Right Front View of Test Vehicle**

**Photo Not Available**

**Figure A-17 Pre-Test Frontal View of Impactor Face**



**Figure A-18 Post-Test Frontal View of Impactor Face**



**Photo Not Available**

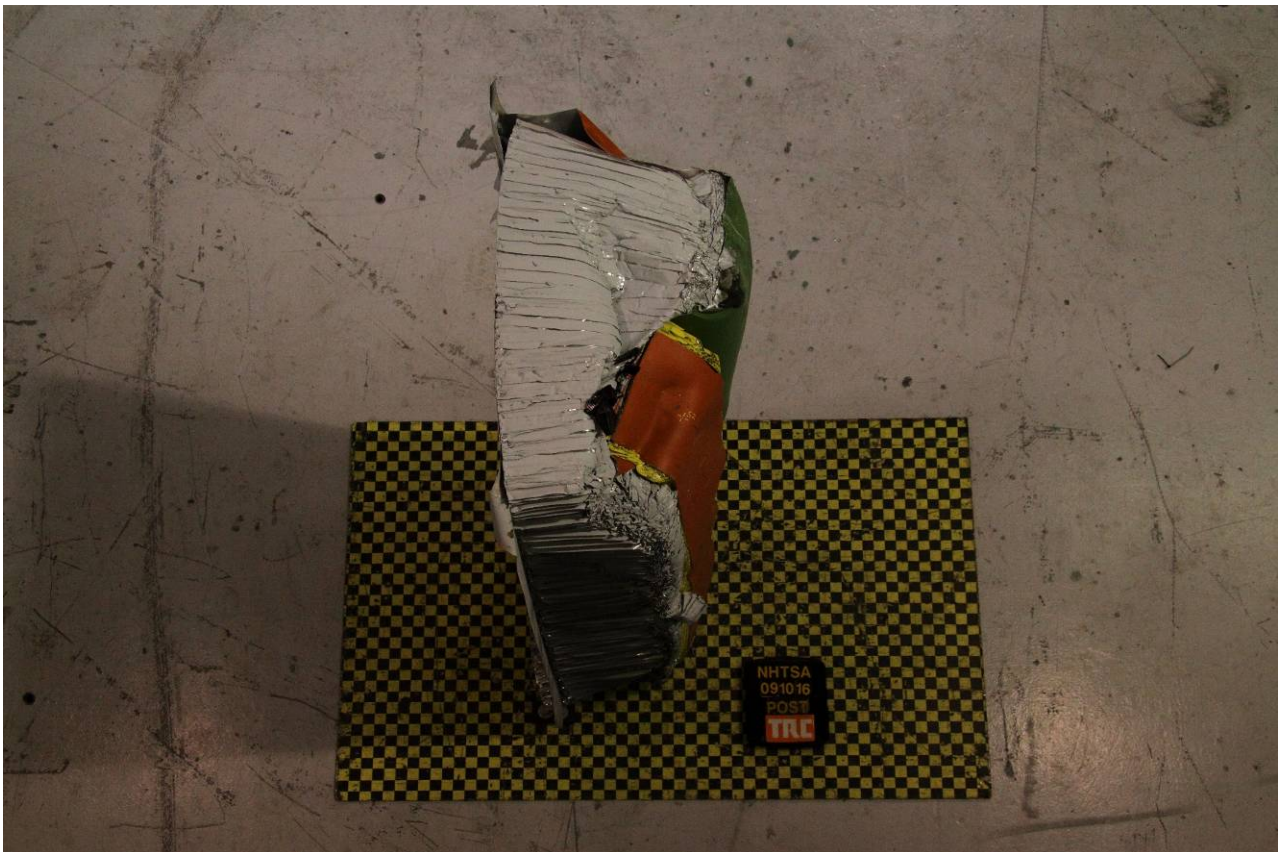
**Figure A-19 Pre-Test Left Side View of Impactor Face**



**Figure A-20 Post-Test Left Side View of Impactor Face**

**Photo Not Available**

**Figure A-21 Pre-Test Right Side View of Impactor Face**



**Figure A-22 Post-Test Right Side View of Impactor Face**



**Photo Not Available**

**Figure A-23 Post-Test Top View of Impactor Face**



**Figure A-24 Post-Test Top View of Impactor Face**



**Figure A-25 Pre-Test Left Side View of Impactor**



**Figure A-26 Post-Test Left Side View of Impactor**





**Figure A-27 Pre-Test Right Side View of Impactor**



**Figure A-28 Post-Test Right Side View of Impactor**





**Figure A-29 Pre-Test Top View of Impactor**



**Figure A-30 Post-Test Top View of Impactor**





**Figure A-31 Pre-Test Left Side Overall View of Impactor**



**Figure A-32 Post-Test Left Side Overall View of Impactor**





**Figure A-33 Pre-Test Right Side Overall View of Impactor**



**Figure A-34 Post-Test Right Side Overall View of Impactor**





**Figure A-35 Pre-Test View of MDB Showing Contact Switches in Place**

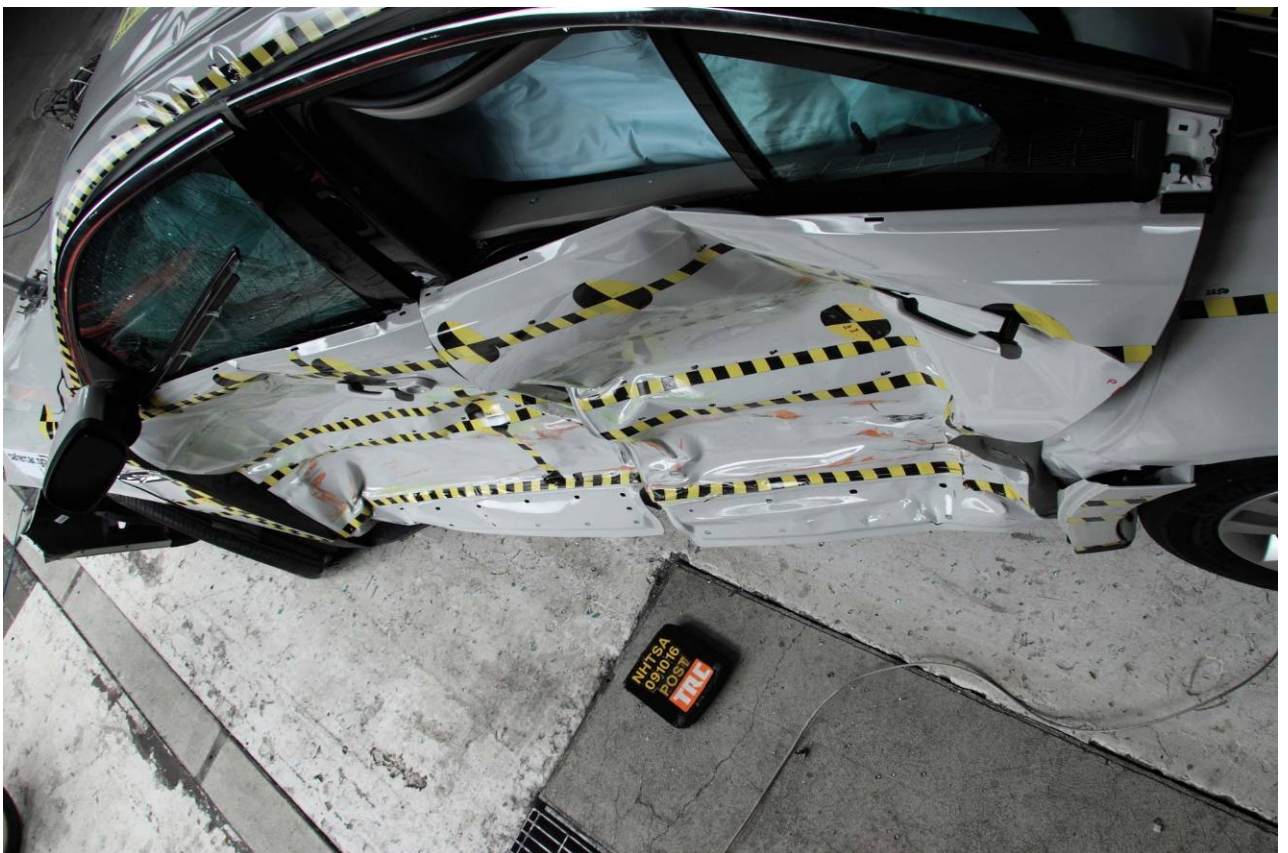


**Figure A-36 Post-Test View of MDB Showing Contact Switches in Place**





**Figure A-37 Pre-Test Overhead View of MDB Aligned with Vehicle**



**Figure A-38 Post-Test Overhead View of MDB and Vehicle**





**Figure A-39 Pre-Test Right Occupant Compartment View of Front SID HIII**



**Figure A-40 Post-Test Right Occupant Compartment View of Front SID HIII**





**Figure A-41 Pre-Test Right Occupant Compartment View of Rear SID HIII**



**Figure A-42 Post-Test Right Occupant Compartment View of Rear SID HIII**





**Figure A-43 Pre-Test Left View of Front SID HIII**



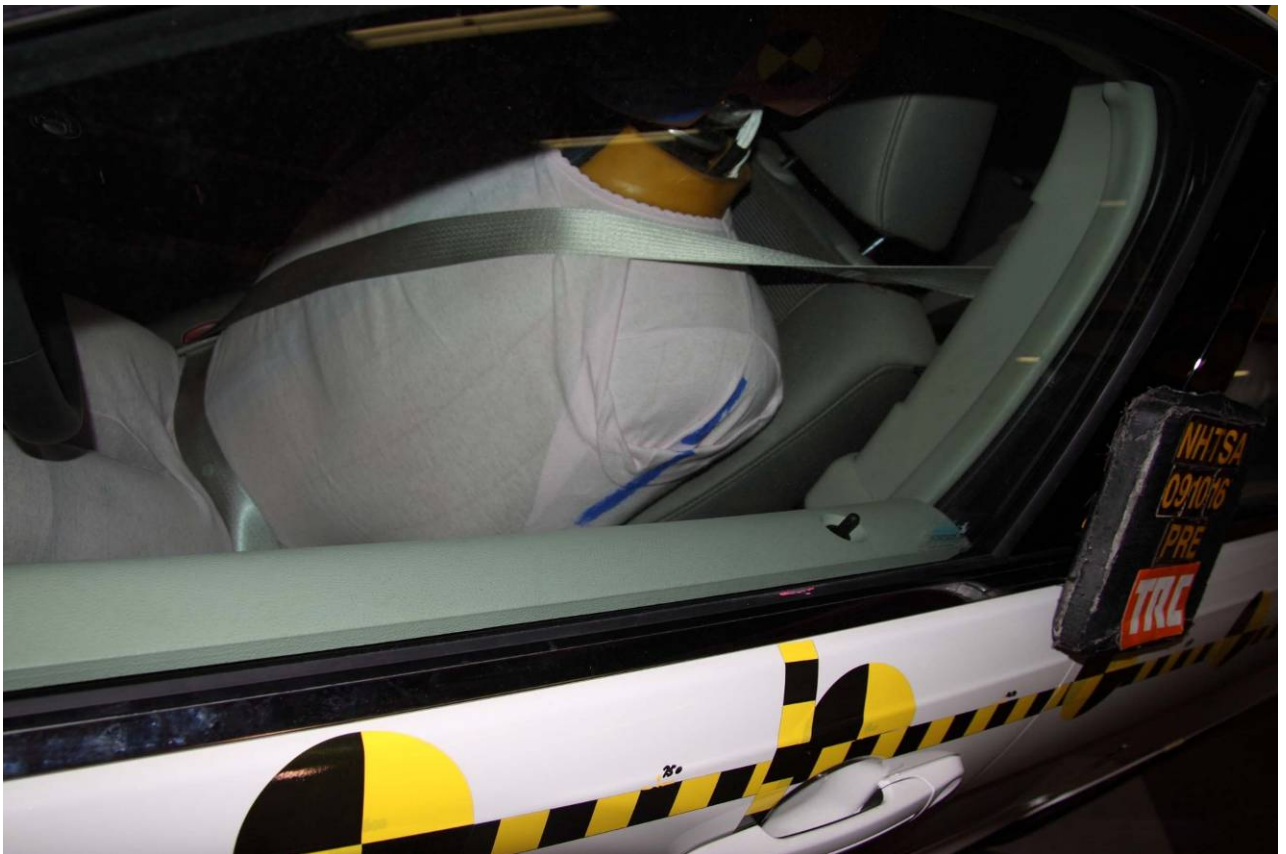
**Figure A-44 Post-Test Left View of Front SID HIII**



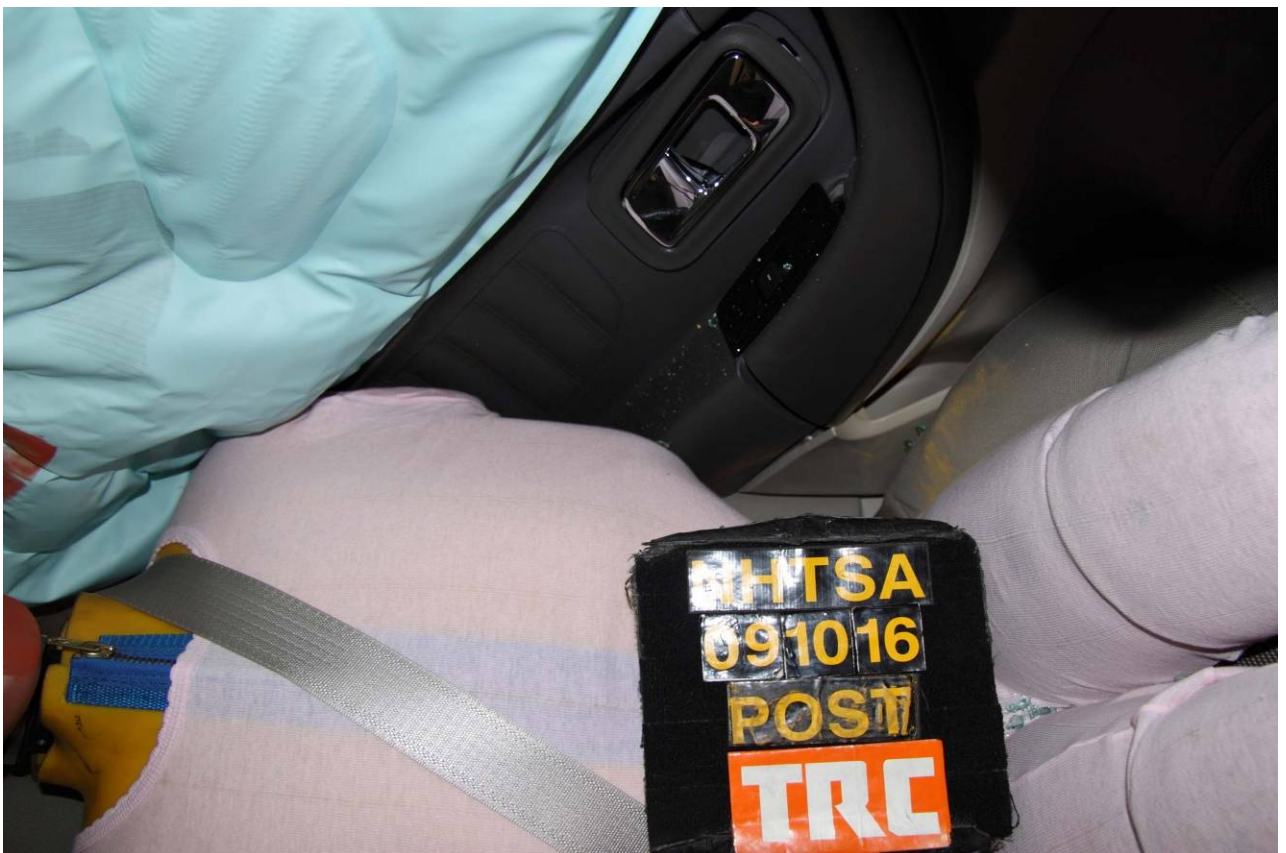
**Figure A-45 Pre-Test Left View of Front SID HIII and Belt Position**

**Intentionally Left Blank**





**Figure A-46 Pre-Test Left View of Front SID HIII and Door Clearance**



**Figure A-47 Post-Test Left View of Front SID HIII and Door Clearance**





**Figure A-48 Pre-Test Left View of Rear SID HIII**



**Figure A-49 Post-Test Left View of Rear SID HIII**



**Figure A-50 Pre-Test Left View of Rear SID HIII and Belt Position**

**Intentionally Left Blank**





**Figure A-51 Pre-Test Left View of Rear SID HIII and Door Clearance**



**Figure A-52 Post-Test Left View of Rear SID HIII and Door Clearance**



**Figure A-53 Pre-Test Interior of Front Door**

**Intentionally Left Blank**





**Figure A-54 Post-Test Front SID HIII Contact – View 1**



**Figure A-55 Post-Test Front SID HIII Contact – View 2**



**Figure A-56 Post-Test Front SID HIII Contact – View 3**

**Intentionally Left Blank**



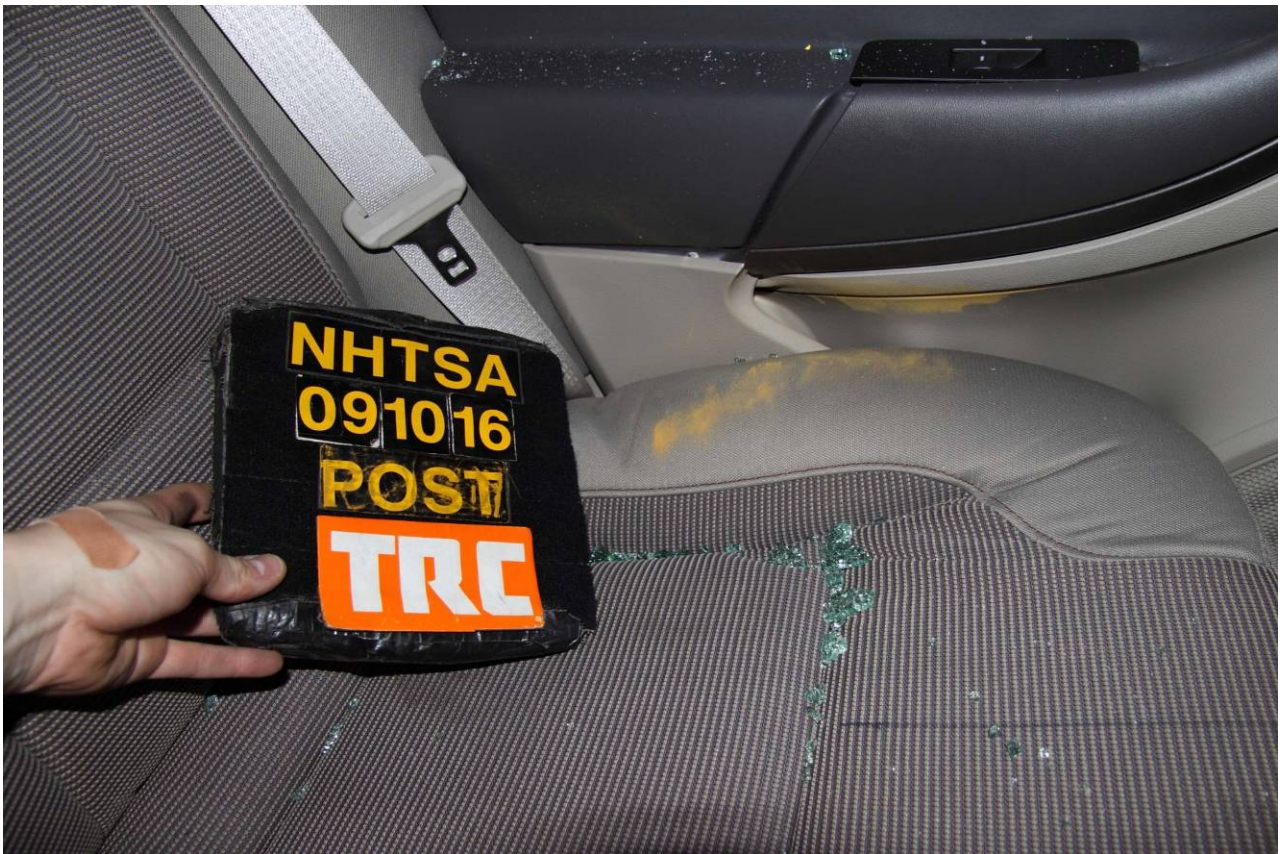


**Figure A-57 Pre-Test Interior of Rear Side Panel**



**Figure A-58 Post-Test Interior of Rear Side Panel**



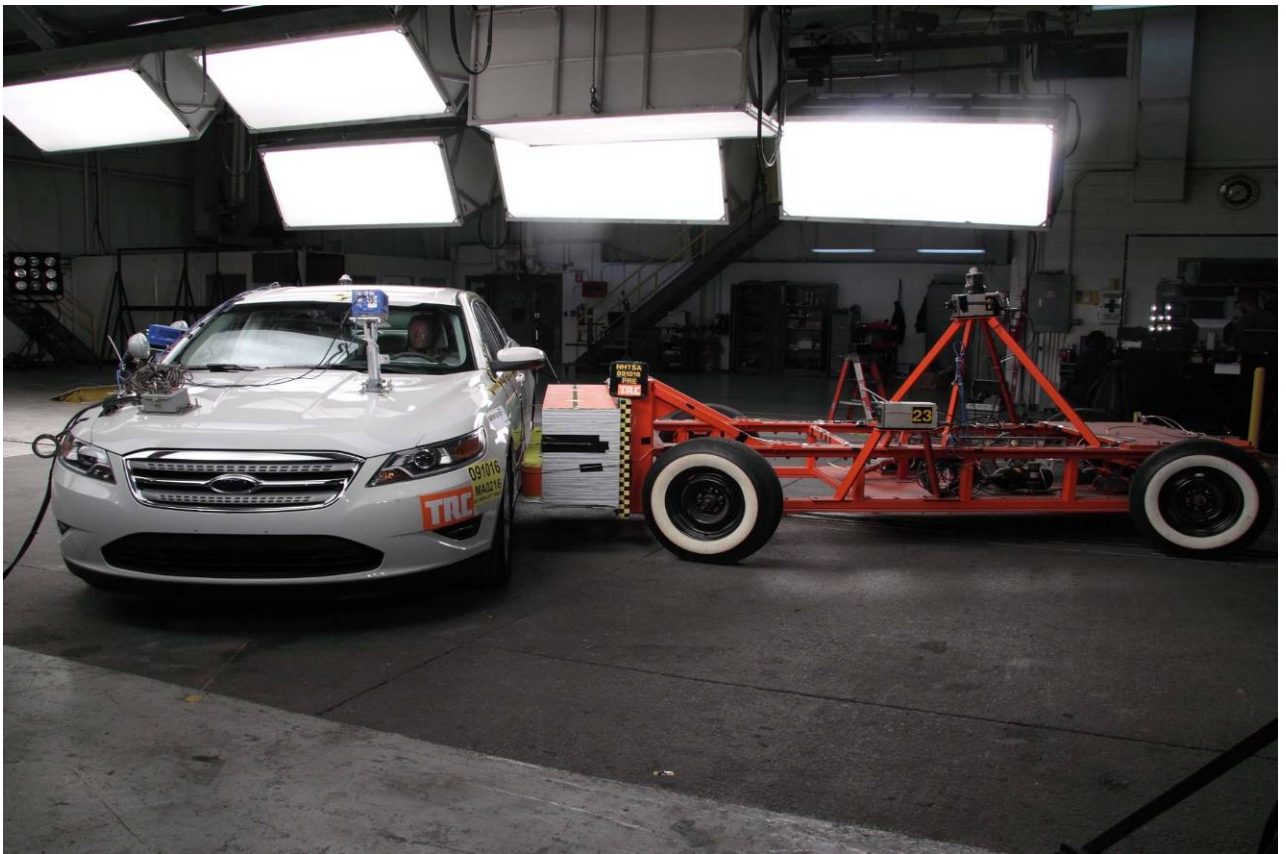


**Figure A-59 Post-Test Rear SID HIII Contact - View 1**



**Figure A-60 Post-Test Rear SID HIII Contact - View 2**





**Figure A-61 Pre-Test Left Side View of MDB With Impactor Face in Position**



**Figure A-62 Post-Test Left Side View of MDB With Impactor Face in Position**



Figure A-63 Pre-Test Primary Impact Point View

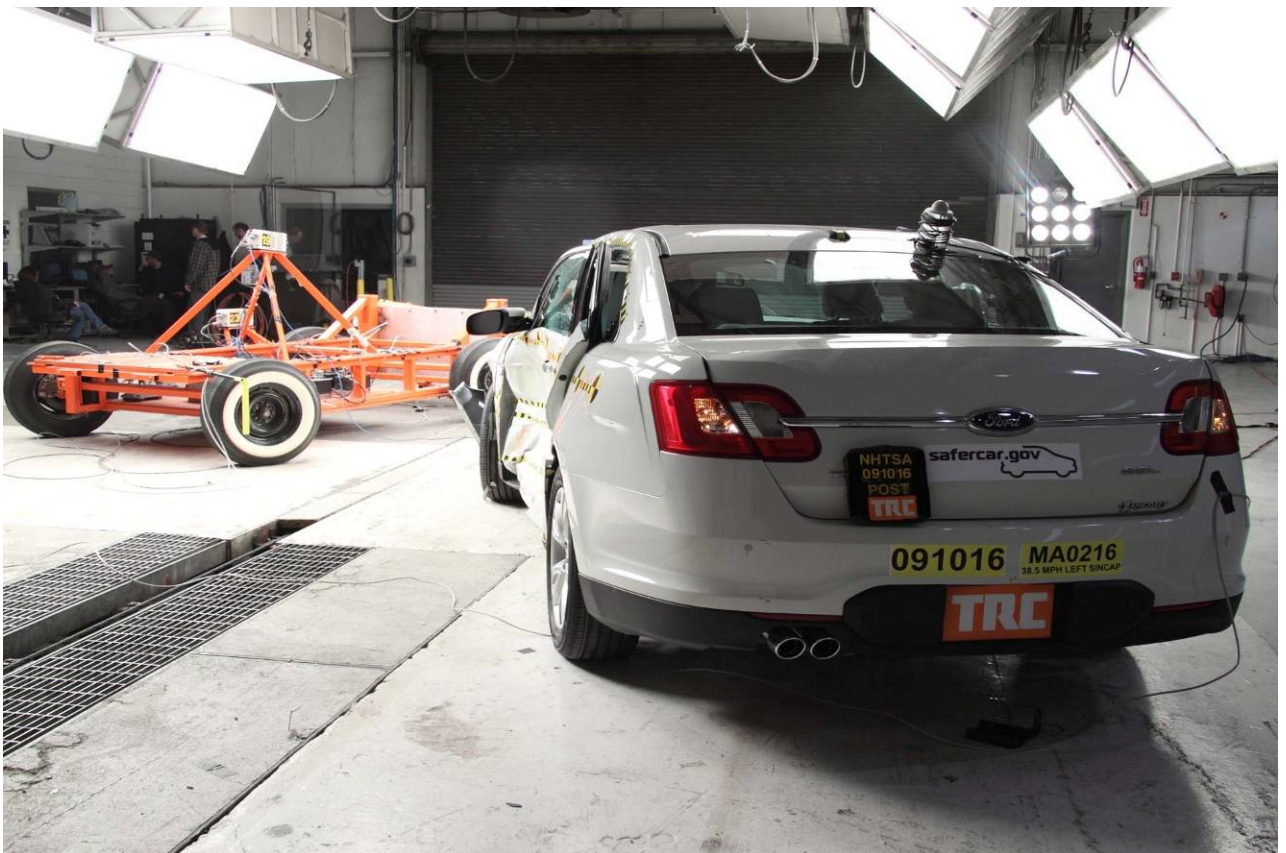


Figure A-64 Post-Test Primary Impact Point View





**Figure A-65 Pre-Test Right Side View of MDB With Impactor Face in Position**



**Figure A-66 Post-Test Right Side View of MDB With Impactor Face in Position**



Figure A-67 Pre-Test Secondary Impact Point View

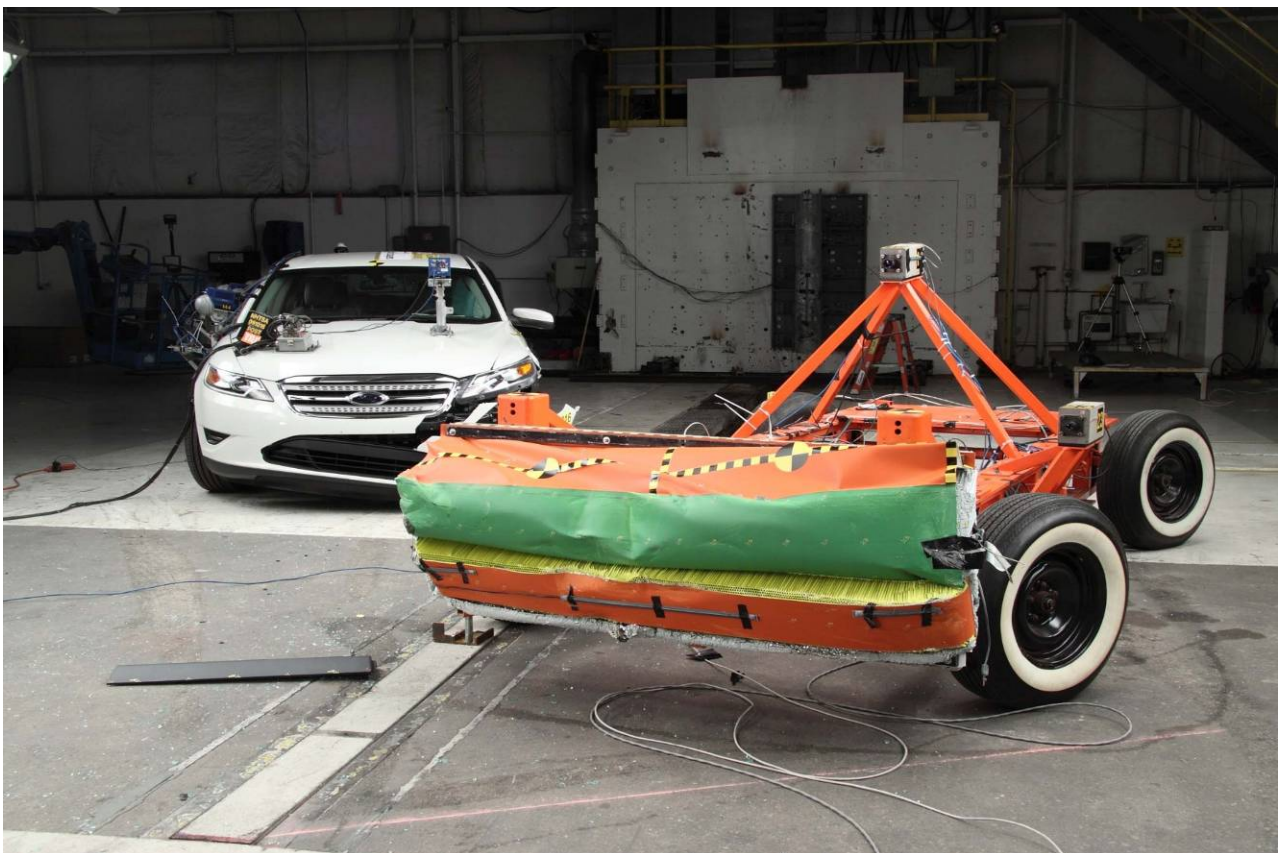


Figure A-68 Post-Test Secondary Impact Point View





**Figure A-69 Pre-Test Left Front View of MDB with Impactor Face in Position**



**Figure A-70 Post-Test Left Front View of MDB with Impactor Face**





Figure A-71 Pre-Test Vehicle Certification Label View



Figure A-72 Pre-Test Vehicle Recommended Tire Pressure Label View



Figure A-73 Post-Test Light Trap Digital Readout



Figure A-74 Pre-Test Fuel Door View



**Figure A-75 Impact Event**

**Intentionally Left Blank**





Figure A-76 FMVSS 301 Rollover View at 90°

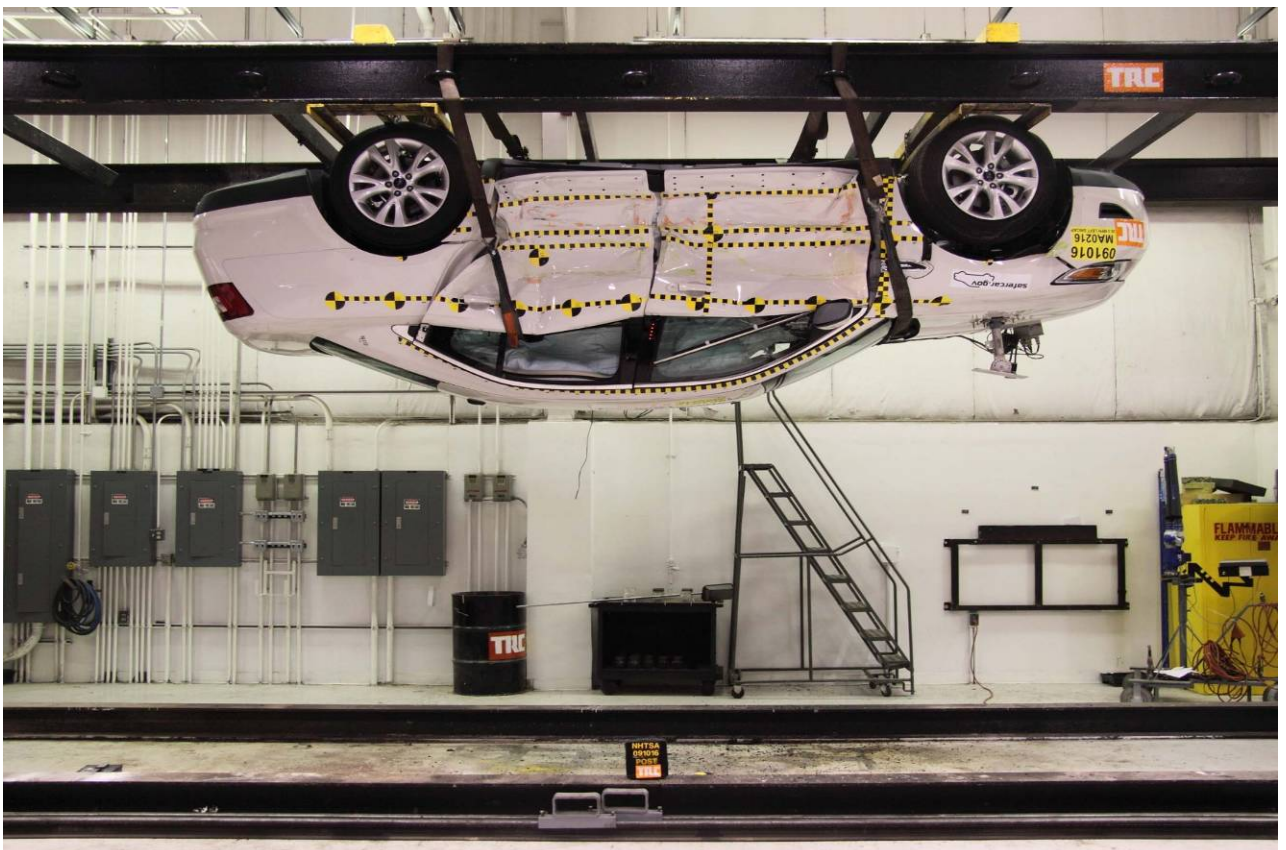


Figure A-77 FMVSS 301 Rollover View at 180°



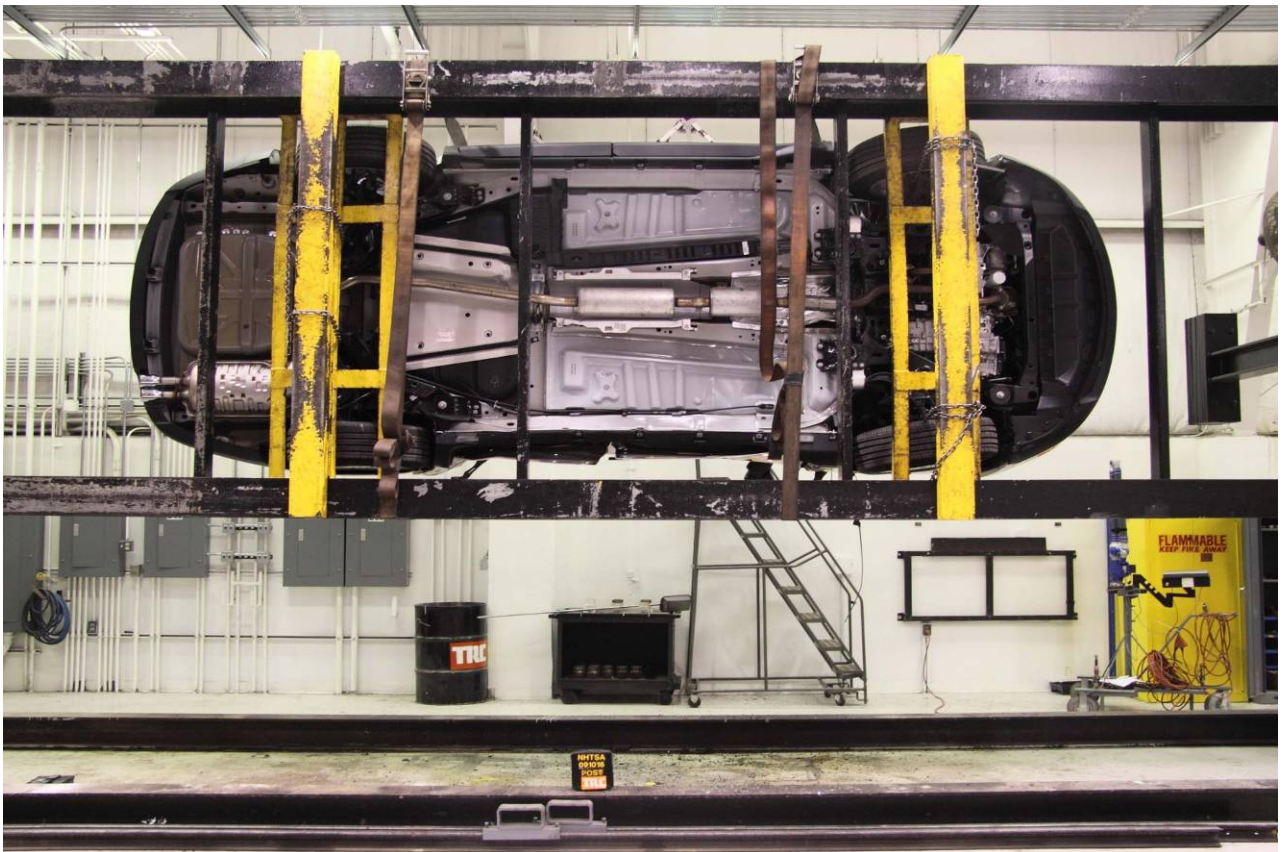


Figure A-78 FMVSS 301 Rollover View at 270°

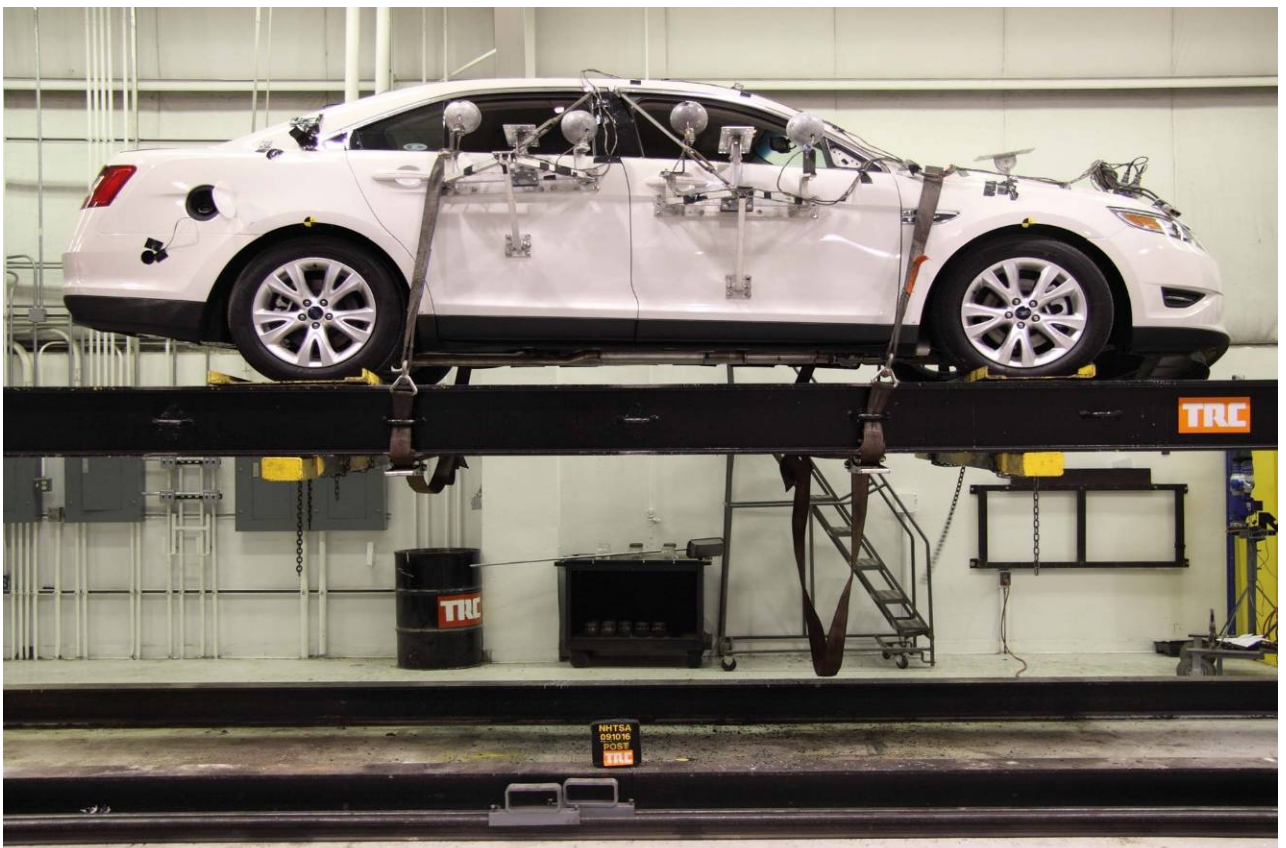


Figure A-79 FMVSS 301 Rollover View at 360°

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



| Data Plot | LIST OF DATA PLOTS PROVIDED IN THE TEST REPORT | Page |
|-----------|------------------------------------------------|------|
| B-1       | Driver Upper Rib Primary Y                     | B-6  |
| B-1       | Driver Lower Rib Primary Y                     | B-6  |
| B-1       | Driver Lower Spine Primary Y                   | B-6  |
| B-1       | Driver Pelvis Y                                | B-6  |
| B-2       | Driver Upper Rib Redundant Y                   | B-7  |
| B-2       | Driver Lower Rib Redundant Y                   | B-7  |
| B-2       | Driver Lower Spine Redundant Y                 | B-7  |
| B-2       | Driver Pelvis Redundant Y                      | B-7  |
| B-3       | Passenger Upper Rib Primary Y                  | B-8  |
| B-3       | Passenger Lower Rib Primary Y                  | B-8  |
| B-3       | Passenger Lower Spine Primary Y <sup>1</sup>   | B-8  |
| B-3       | Passenger Pelvis Y                             | B-8  |
| B-4       | Passenger Upper Rib Redundant Y                | B-9  |
| B-4       | Passenger Lower Rib Redundant Y                | B-9  |
| B-4       | Passenger Lower Spine Redundant Y              | B-9  |
| B-4       | Passenger Pelvis Redundant Y                   | B-9  |

<sup>1</sup>Reference Test Notes on page 3 of this report

The following 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):

Driver Head X-Axis Acceleration  
Driver Head Y-Axis Acceleration  
Driver Head Z-Axis Acceleration  
Driver Neck X-Axis Shear Force  
Driver Neck Y-Axis Shear Force  
Driver Neck Z-Axis Axial Force  
Driver Neck Moment About X Axis  
Driver Neck Moment About Y Axis  
Driver Neck Moment About Z Axis  
Driver Upper Rib Y-Axis Acceleration  
Driver Lower Rib Y-Axis Acceleration  
Driver Upper Spine Y-Axis Acceleration  
Driver Lower Spine Y-Axis Acceleration  
Driver Pelvis Y-Axis Acceleration  
Left Rear Passenger Head X-Axis Acceleration  
Left Rear Passenger Head Y-Axis Acceleration  
Left Rear Passenger Head Z-Axis Acceleration  
Left Rear Passenger Neck X-Axis Shear Force  
Left Rear Passenger Neck Y-Axis Shear Force  
Left Rear Passenger Neck Z-Axis Axial Force  
Left Rear Passenger Neck Moment About X Axis  
Left Rear Passenger Neck Moment About Y Axis  
Left Rear Passenger Neck Moment About Z Axis  
Left Rear Passenger Upper Rib Y-Axis Acceleration  
Left Rear Passenger Lower Rib Y-Axis Acceleration  
Left Rear Passenger Upper Spine Y-Axis Acceleration  
Left Rear Passenger Lower Spine Y-Axis Acceleration  
Left Rear Passenger Pelvis Y-Axis Acceleration

Driver Head X-Axis Redundant Acceleration  
Driver Head Y-Axis Redundant Acceleration  
Driver Head Z-Axis Redundant Acceleration  
Driver Upper Rib Y-Axis Redundant Acceleration  
Driver Lower Rib Y-Axis Redundant Acceleration  
Driver Upper Spine Y-Axis Redundant Acceleration  
Driver Lower Spine Y-Axis Redundant Acceleration  
Driver Pelvis Y-Axis Redundant Acceleration  
Left Rear Passenger Head X-Axis Redundant Acceleration  
Left Rear Passenger Head Y-Axis Redundant Acceleration  
Left Rear Passenger Head Z-Axis Redundant Acceleration  
Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration  
Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration  
Left Rear Passenger Upper Spine Y-Axis Redundant Acceleration  
Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration  
Left Rear Passenger Pelvis Y-Axis Redundant Acceleration  
Right Side Sill at Front Seat X-Axis Acceleration  
Right Side Sill at Front Seat Y-Axis Acceleration  
Right Side Sill at Front Seat Z-Axis Acceleration  
Right Side Sill at Rear Seat X-Axis Acceleration  
Right Side Sill at Rear Seat Y-Axis Acceleration  
Right Side Sill at Rear Seat Z-Axis Acceleration  
Rear Floorpan Above Axle X-Axis Acceleration  
Rear Floorpan Above Axle Y-Axis Acceleration  
Rear Floorpan Above Axle Z-Axis Acceleration  
Left Side Sill at Front Seat Y-Axis Acceleration  
Left Side Sill at Rear Seat Y-Axis Acceleration  
Right Rear Occupant Compartment Y-Axis Acceleration  
Left Lower A-Post Y-Axis Acceleration  
Left Mid A-Post Y-Axis Acceleration  
Left Lower B-Post Y-Axis Acceleration



Left Mid B-Post Y-Axis Acceleration  
Left Front Seat Track Y-Axis Acceleration  
Left Rear Seat Track Y-Axis Acceleration  
Vehicle Center of Gravity X-Axis Acceleration  
Vehicle Center of Gravity Y-Axis Acceleration  
Vehicle Center of Gravity Z-Axis Acceleration  
MDB Center of Gravity X-Axis Acceleration  
MDB Center of Gravity Y-Axis Acceleration  
MDB Center of Gravity Z-Axis Acceleration  
MDB Rear X-Axis Acceleration  
MDB Rear Y-Axis Acceleration  
MDB Right Contact Switch  
MDB Left Contact Switch

# NHTSA

Test Lab: CTF

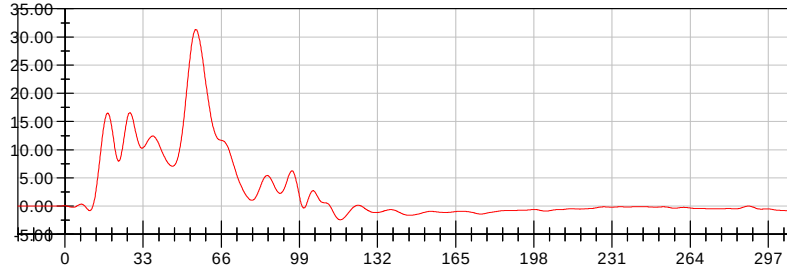
Test Number: 091016 (MA0216)

Position #1 SID H3 Dummy (002)

Position #4 SID H3 Dummy (001)

Test Date: 10/16/2009

DRIVER UPPER RIB Y-AXIS ACCELERATION (g) vs. Time [ms]



**<Max>**

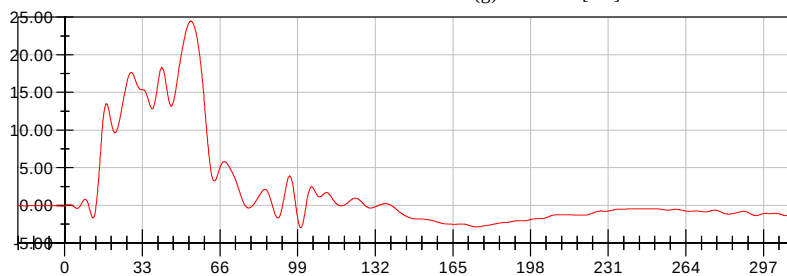
31.31 g at 55.00 ms

**<Min>**

-2.43 g at 116.20 ms

FIR\_100

DRIVER LOWER RIB Y-AXIS ACCELERATION (g) vs. Time [ms]



**<Max>**

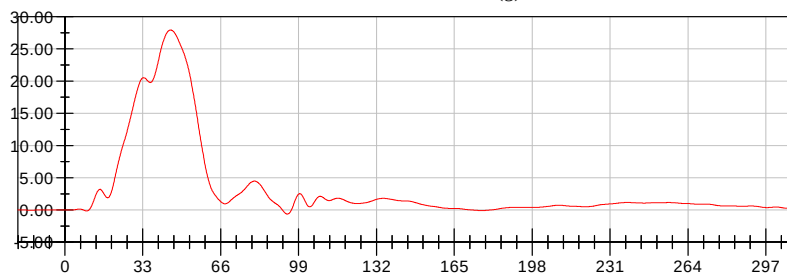
24.49 g at 53.70 ms

**<Min>**

-2.99 g at 100.60 ms

FIR\_100

DRIVER LOWER SPINE Y-AXIS ACCELERATION (g) vs. Time [ms]



**<Max>**

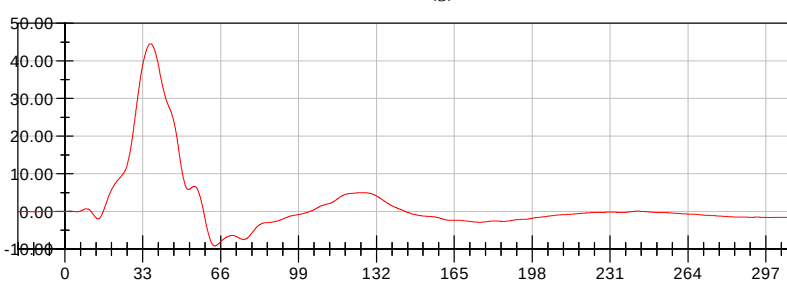
27.96 g at 45.00 ms

**<Min>**

-0.67 g at 94.40 ms

FIR\_100

DRIVER PELVIS Y-AXIS ACCELERATION (g) vs. Time [ms]



**<Max>**

44.55 g at 36.30 ms

**<Min>**

-9.15 g at 63.70 ms

FIR\_100



# NHTSA

Test Lab: CTF

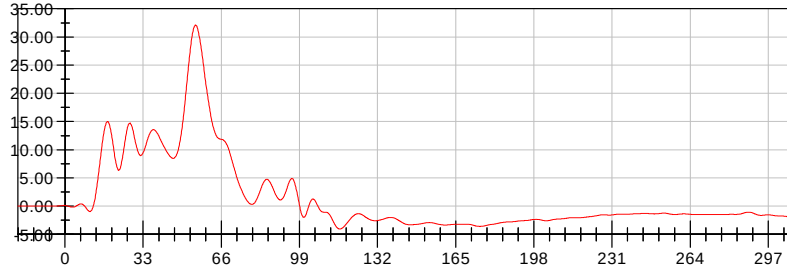
Test Number: 091016 (MA0216)

Position #1 SID H3 Dummy (002)

Position #4 SID H3 Dummy (001)

Test Date: 10/16/2009

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



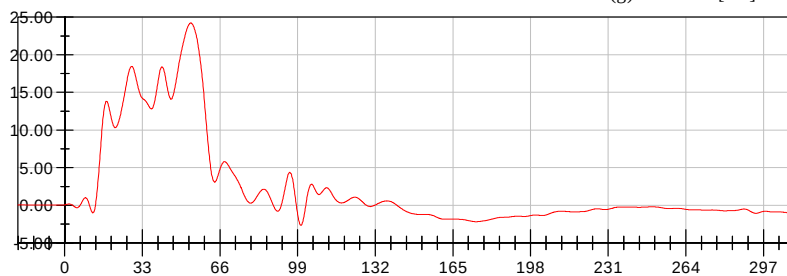
**<Max>**

32.14 g at 55.00 ms

**<Min>**

-4.05 g at 116.20 ms

DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



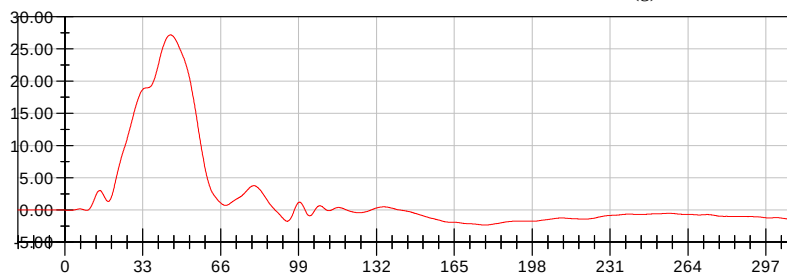
**<Max>**

24.24 g at 53.70 ms

**<Min>**

-2.70 g at 100.60 ms

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



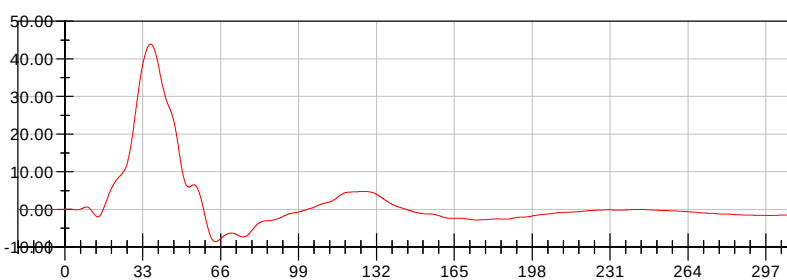
**<Max>**

27.19 g at 45.00 ms

**<Min>**

-2.34 g at 178.10 ms

DRIVER PELVIS Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



**<Max>**

43.91 g at 36.30 ms

**<Min>**

-8.59 g at 63.80 ms





# NHTSA

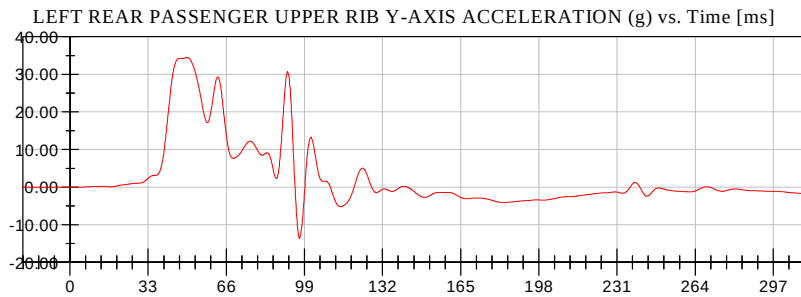
Test Lab: CTF

Test Number: 091016 (MA0216)

Position #1 SID H3 Dummy (002)

Position #4 SID H3 Dummy (001)

Test Date: 10/16/2009



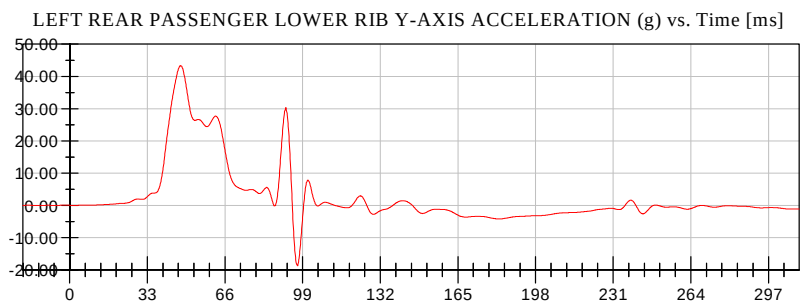
<Max>

34.48 g at 49.40 ms

<Min>

-13.69 g at 96.90 ms

FIR\_100



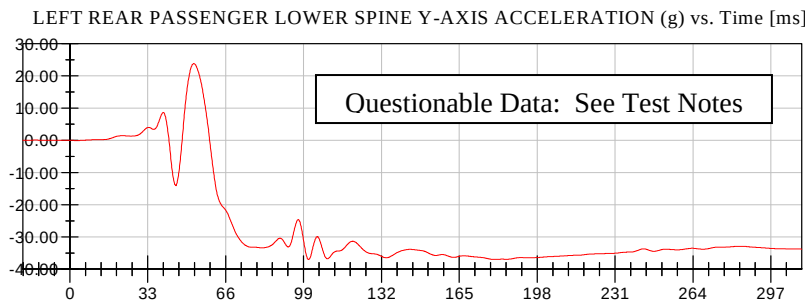
<Max>

43.27 g at 46.90 ms

<Min>

-18.80 g at 96.90 ms

FIR\_100



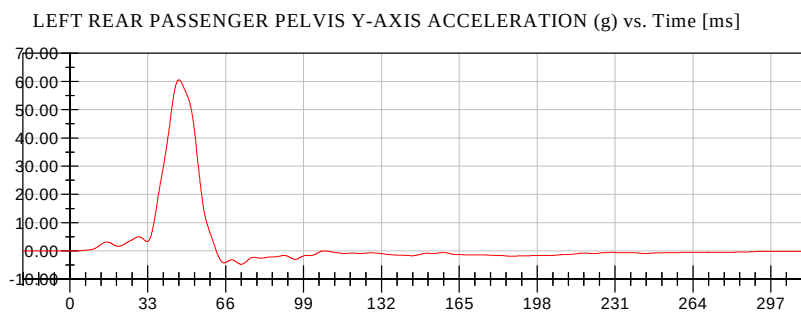
<Max>

23.89 g at 52.50 ms

<Min>

-37.07 g at 101.20 ms

FIR\_100



<Max>

60.60 g at 46.20 ms

<Min>

-4.75 g at 72.50 ms

FIR\_100



# NHTSA

Test Lab: CTF

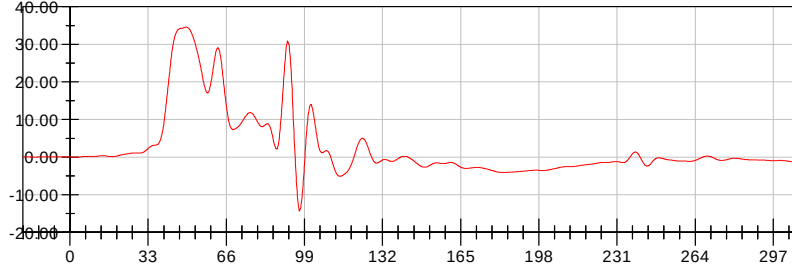
Test Number: 091016 (MA0216)

Position #1 SID H3 Dummy (002)

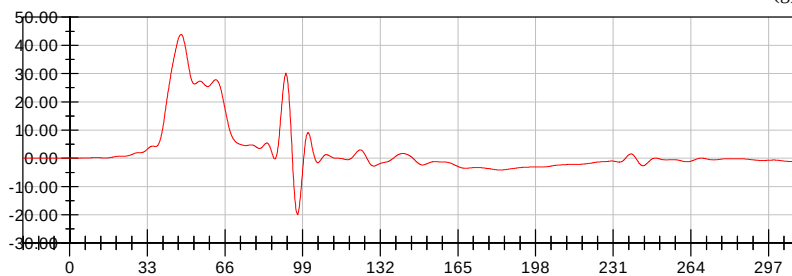
Position #4 SID H3 Dummy (001)

Test Date: 10/16/2009

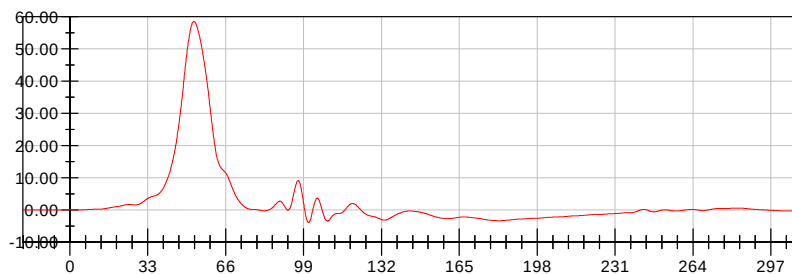
LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



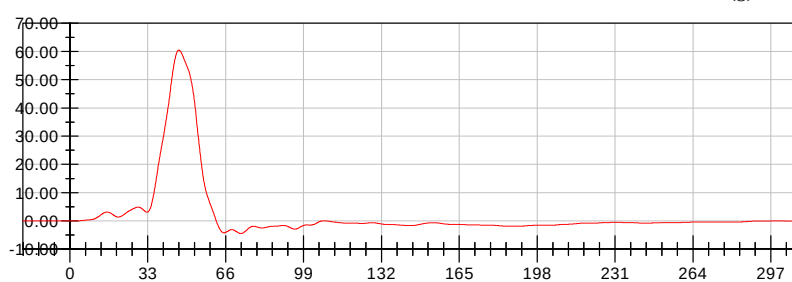
LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



LEFT REAR PASSENGER PELVIS REDUNDANT Y-AXIS ACCELERATION (g) vs. Time [ms]



**APPENDIX AXIS C**  
**DUMMY CONFIGURATION AND PERFORMANCE**  
**VERIFICATION DATA**



CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII: 002

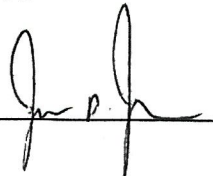
**Transportation Research Center Inc.**  
**572F SID Dummy**  
**External Dimensions**  
**Serial No. 002 Calibration No. 05**

| Test Parameter                                        | Dimension | Specification    | Results | Pass |
|-------------------------------------------------------|-----------|------------------|---------|------|
| Seated Height                                         | SH        | 889.0 - 909.3 mm | 907 mm  | Yes  |
| Rib Height                                            | RH        | 501.7 - 520.7 mm | 513 mm  | Yes  |
| Hip Pivot Height                                      | HP        | 99.1 REF mm      | 99.1 mm |      |
| Knee Pivot From Backline                              | KH        | 510.5 - 525.8 mm | 519 mm  | Yes  |
| Knee Pivot From Floor                                 | KV        | 490.2 - 505.5 mm | 501 mm  | Yes  |
| Hip Width                                             | HW        | 355.6 - 391.2 mm | 382 mm  | Yes  |
| Top Rib Width From C/L                                | RW-1      | 165.1 - 180.3 mm | 175 mm  | Yes  |
| Bottom Rib Width From C/L                             | RW-2      | 165.1 - 180.3 mm | 175 mm  | Yes  |
| Difference Between Top &<br>Bottom Rib Width from C/L |           | <= 2.5 mm        | 0.0 mm  | Yes  |

Technician



Approved





# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 002 Certification No. 5-1

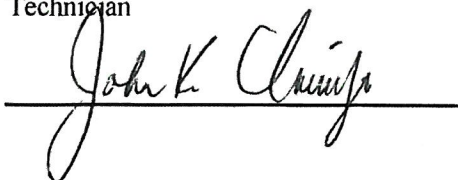
Test Date: 9/22/2009

| Test Parameter                                                       | Specification  | Test Results | Pass |
|----------------------------------------------------------------------|----------------|--------------|------|
| Temperature                                                          | 18.9 - 25.6 °C | 21.7 °C      | Yes  |
| Relative Humidity                                                    | 10 - 70 %      | 54 %         | Yes  |
| Peak Head Resultant Acceleration                                     | 120 - 150 g    | 143.9 g      | Yes  |
| Peak Head Longitudinal Acceleration                                  | (-15) - 15 g   | 7.7 g        | Yes  |
| Is Head Resultant Acceleration Curve<br>Unimodal Within 15% of Peak? | Yes            | Yes          | Yes  |

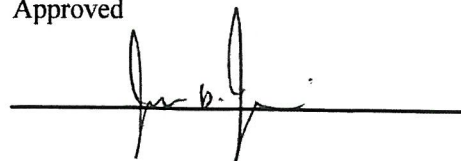
Test meets specifications.

Comments:

Technician



Approved



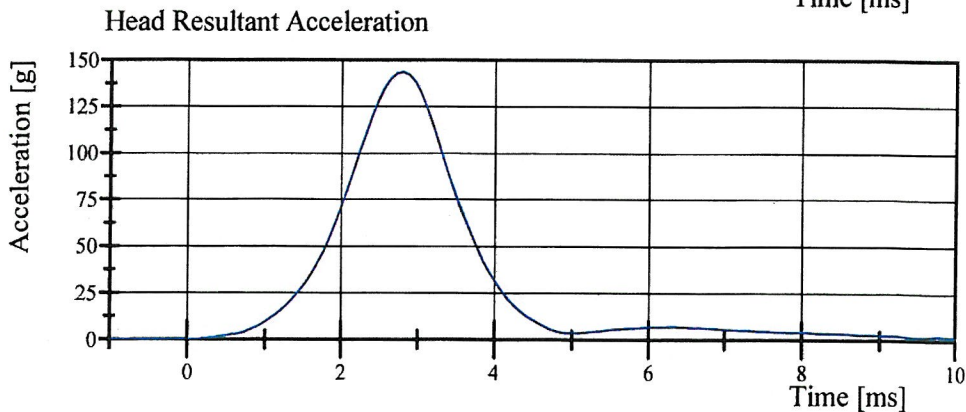
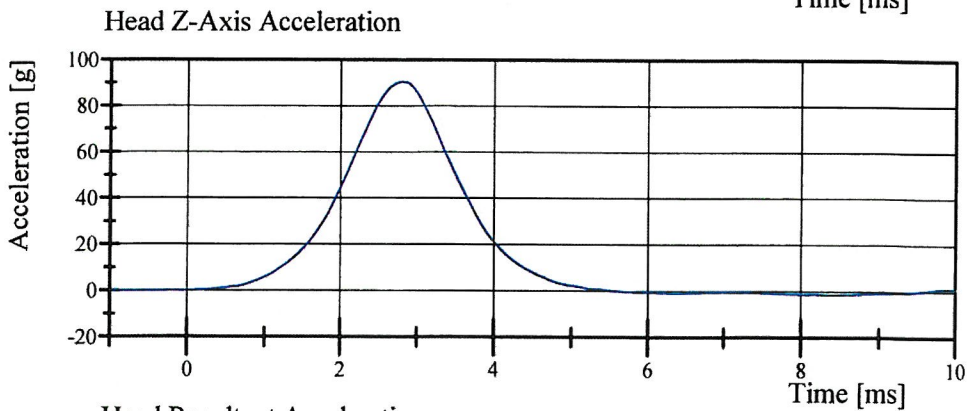
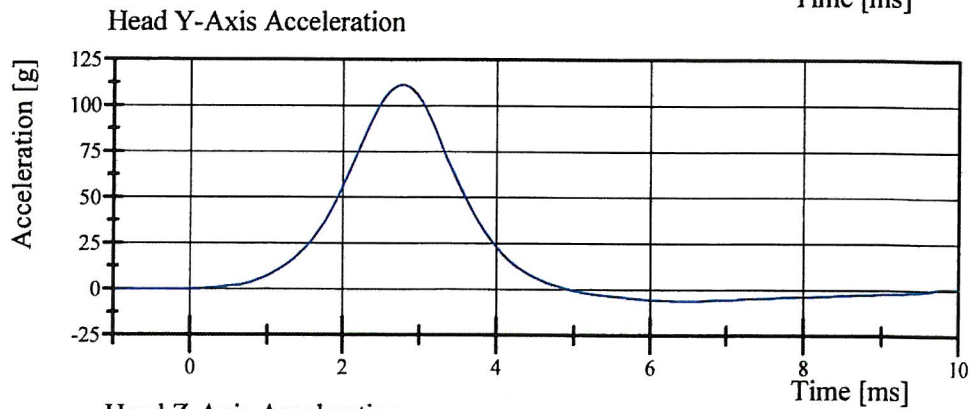
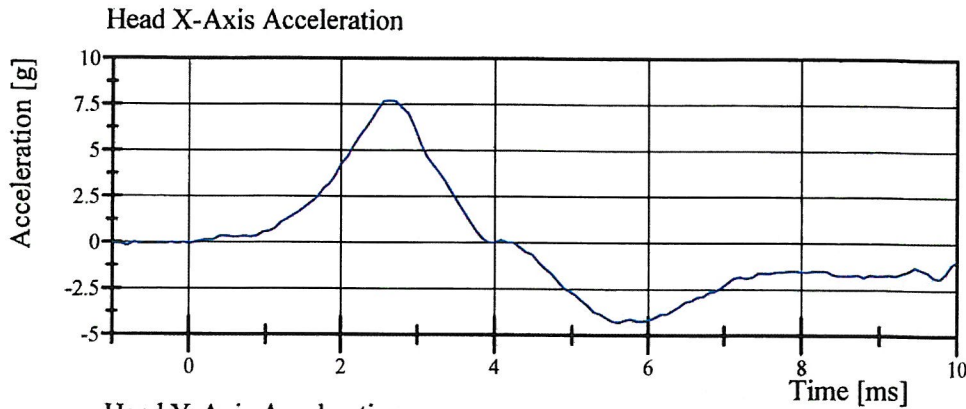


# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 002 Certification No. 5-1

Test Date: 9/22/2009



# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 5-5

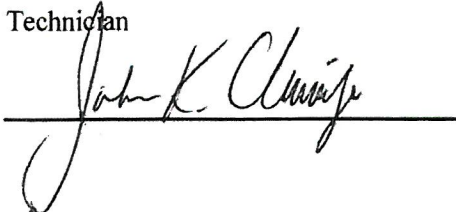
Test Date: 9/23/2009

| Test Parameter                                                         | Specification         | Test Results | Pass |
|------------------------------------------------------------------------|-----------------------|--------------|------|
| Temperature                                                            | 20.6 - 22.2 °C        | 21.5 °C      | Yes  |
| Relative Humidity                                                      | 10 - 70 %             | 52 %         | Yes  |
| Pendulum Velocity                                                      | (-6.89) - (-7.13) m/s | -7.013 m/s   | Yes  |
| Pendulum Integrated Velocity<br>Change at 10 ms                        | 1.96 - 2.55 m/s       | 2.220 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 20 ms                        | 4.12 - 5.10 m/s       | 4.529 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 30 ms                        | 5.73 - 7.01 m/s       | 6.284 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 40 to 70 ms                  | 6.27 - 7.64 m/s       | 7.350 m/s    | Yes  |
| Total Head D-Plane Rotation                                            | (-66) - (-82) °       | -73.9 °      | Yes  |
| Total Head D-Plane Rotation<br>Time to 0° after Peak Rotation          | 58 - 67 ms            | 58.1 ms      | Yes  |
| Total Neck Occipital Condyle Moment                                    | 73 - 88 N·m           | 87.8 N·m     | Yes  |
| Total Neck Occipital Condyle Moment<br>Time to 0 N·m after Peak Moment | 49 - 64 ms            | 51.4 ms      | Yes  |
| Time from Peak Moment to Peak Rotation                                 | 2 - 16 ms             | 8.5 ms       | Yes  |

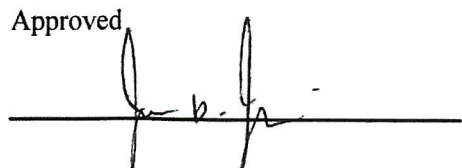
**Test meets specifications.**

**Comments:**

Technician



Approved



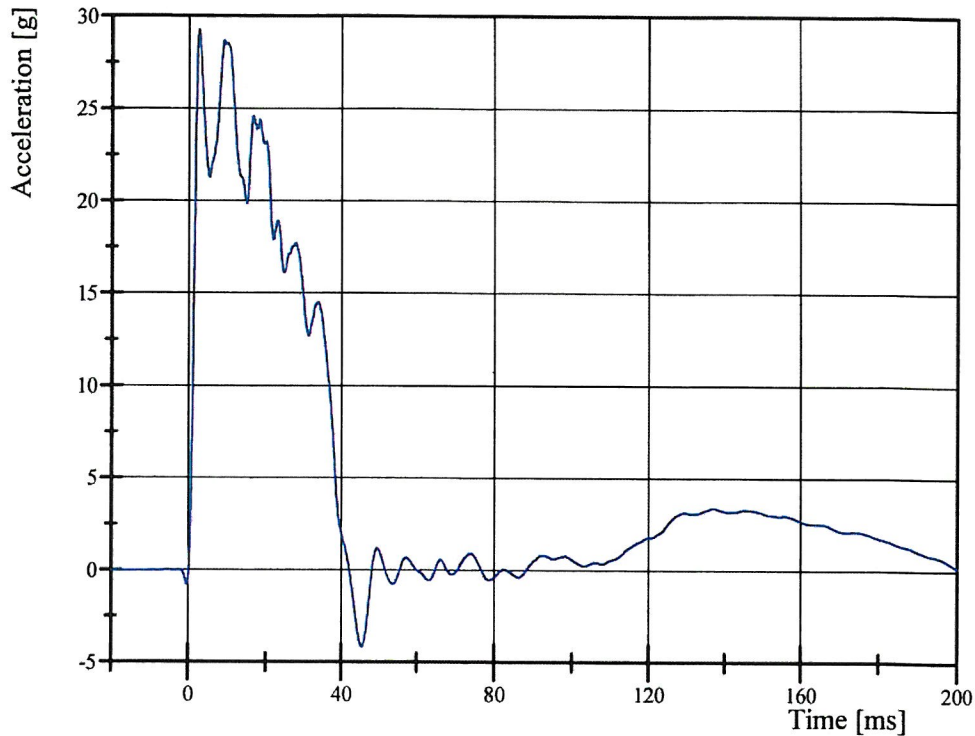
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 5-5

Test Date: 9/23/2009

Pendulum Acceleration

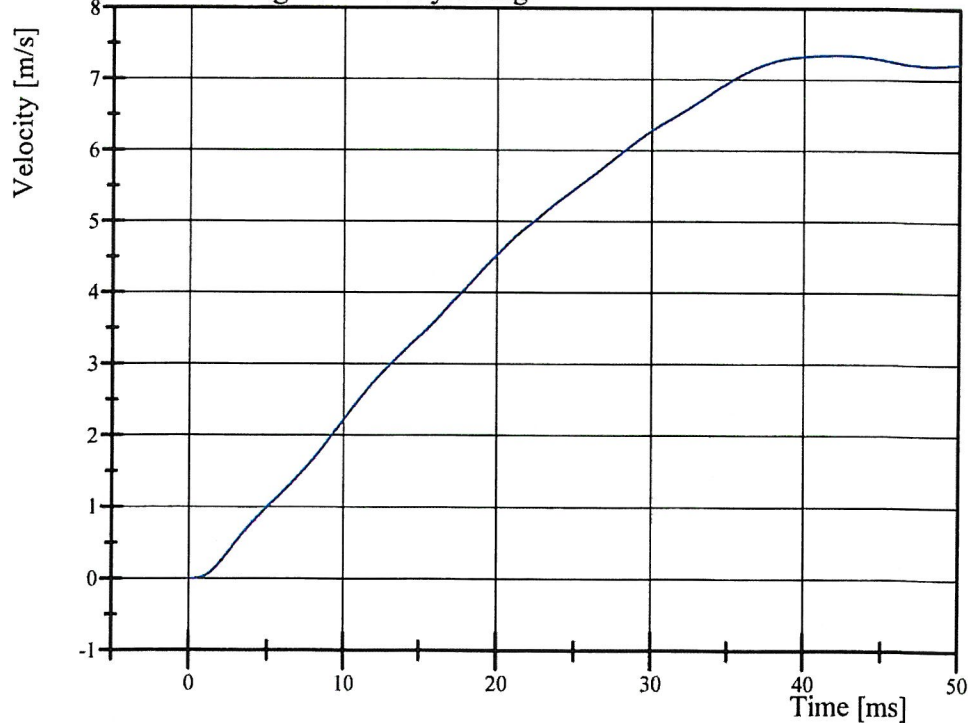


Filter Class: CFC\_180

Max: 29.3 g at 2.5 ms

Min: -4.2 g at 45.4 ms

Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 7.3 m/s at 42.1 ms

Min: -0.0 m/s at 0.1 ms



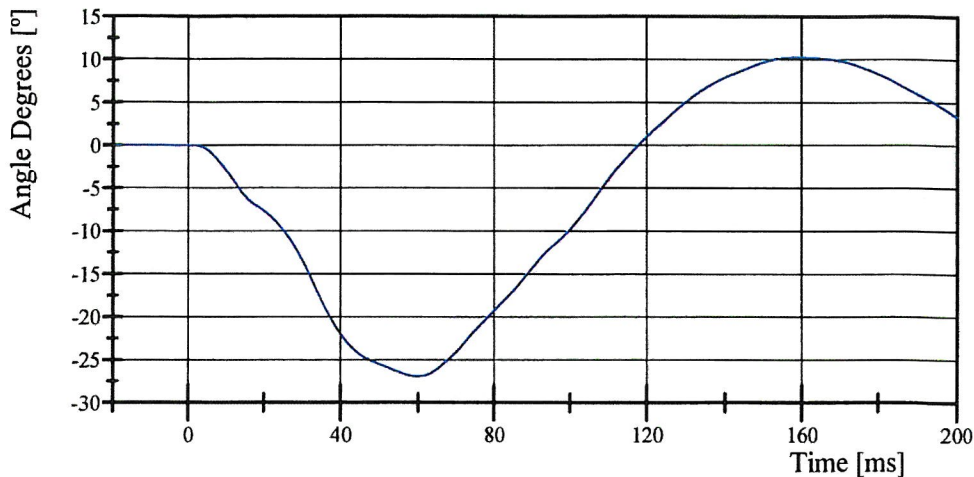
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 5-5

Test Date: 9/23/2009

Pot Rotation at the Base of Neck

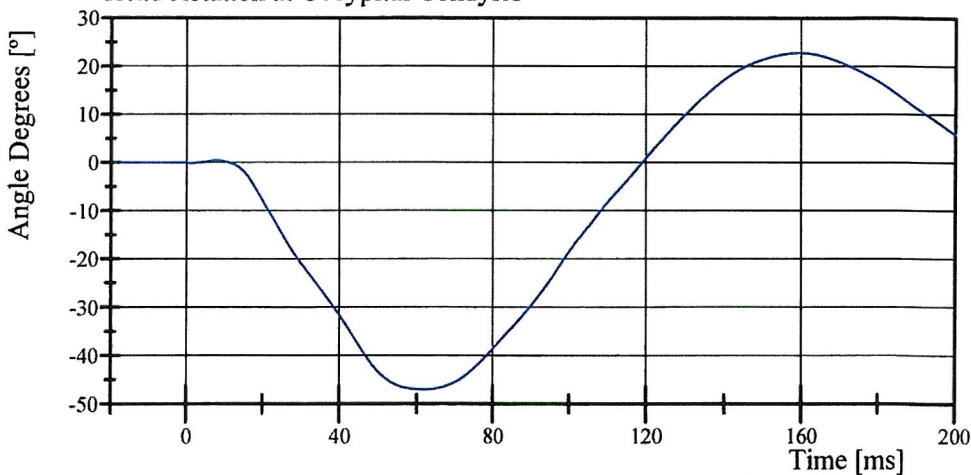


Filter Class: CFC\_60

Max: 10.3 ° at 159.0 ms

Min: -26.9 ° at 59.9 ms

Head Rotation at Occypital Condyles

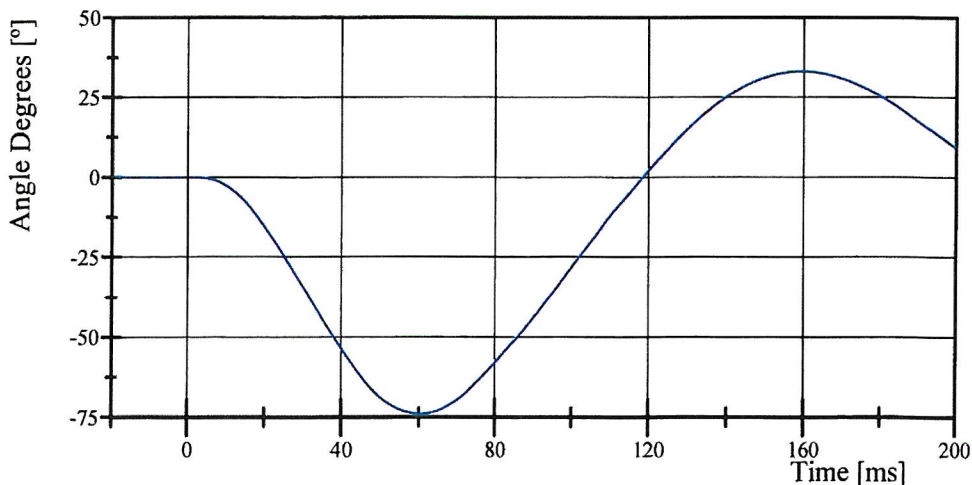


Filter Class: CFC\_60

Max: 22.8 ° at 159.6 ms

Min: -47.0 ° at 61.8 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60

Max: 33.1 ° at 159.4 ms

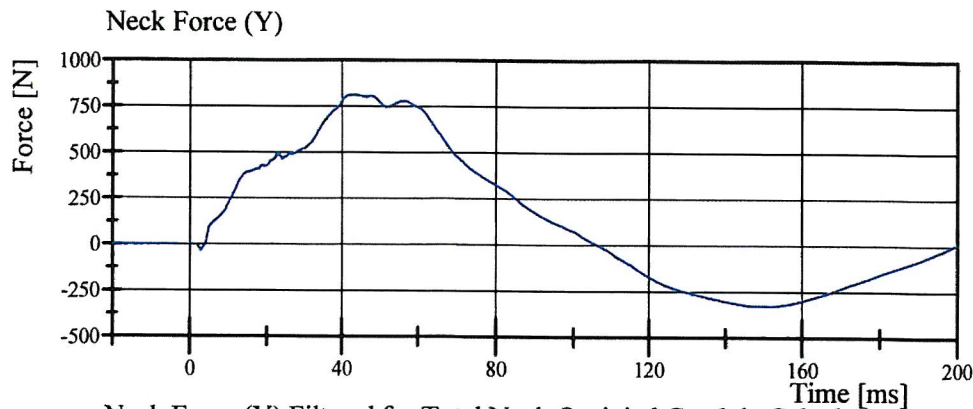
Min: -73.9 ° at 60.4 ms

# Transportation Research Center Inc.

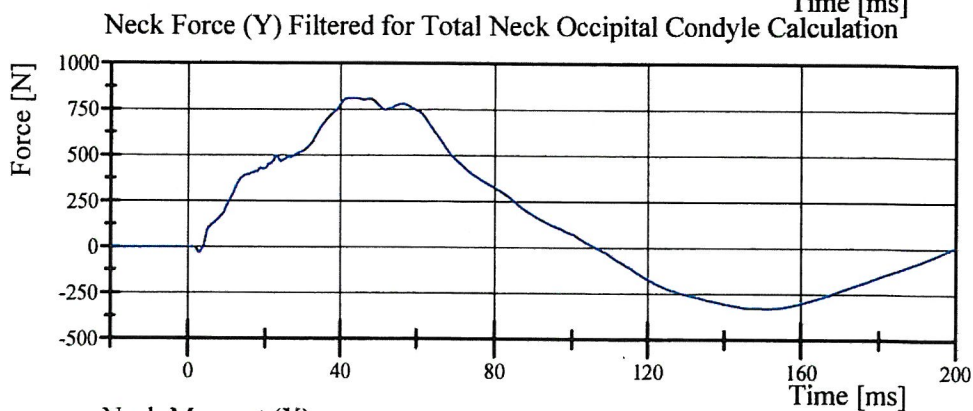
Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 5-5

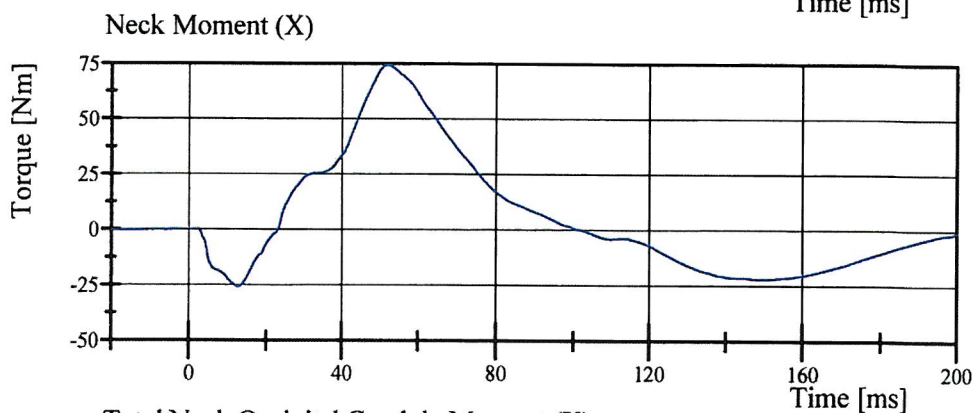
Test Date: 9/23/2009



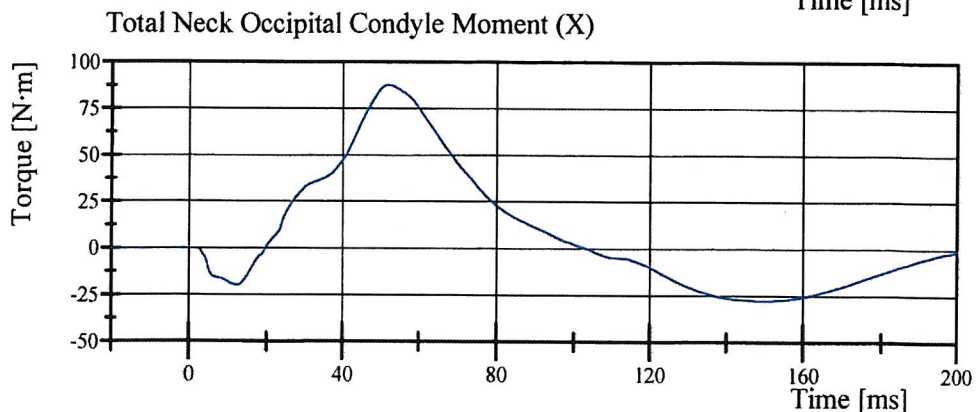
Filter Class: CFC\_1000  
Max: 814.1 N at 43.1 ms  
Min: -327.5 N at 150.2 ms



Filter Class: CFC\_600  
Max: 813.4 N at 43.2 ms  
Min: -327.3 N at 151.9 ms



Filter Class: CFC\_600  
Max: 74.5 Nm at 51.9 ms  
Min: -25.8 Nm at 12.6 ms



Filter Class: CFC\_600  
Max: 87.8 N·m at 51.9 ms  
Min: -27.7 N·m at 149.7 ms

# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-9

Test Date: 9/24/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 55 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 3,719 - 4,409 N  | 4,381.1 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 33.35 - 39.55 mm | 38.366 mm    | Yes  |

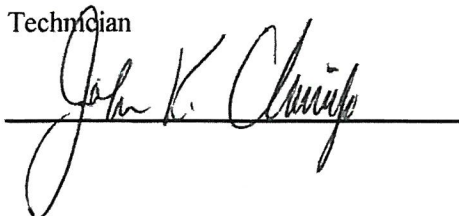
**Test meets specifications.**

**Comments:**

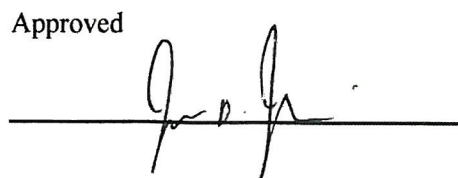
Actual Impactor Velocity (m/s): 6.077

Damper Setting: 7.5

Technician



Approved





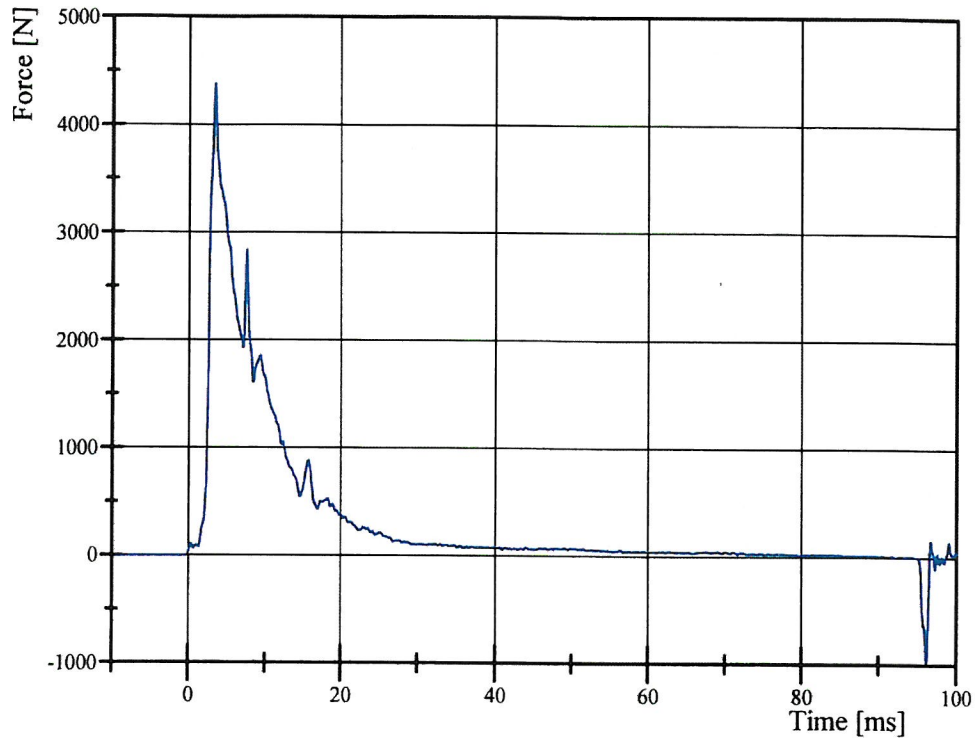
# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-9

Test Date: 9/24/2009

Shock Absorber Resistive Force

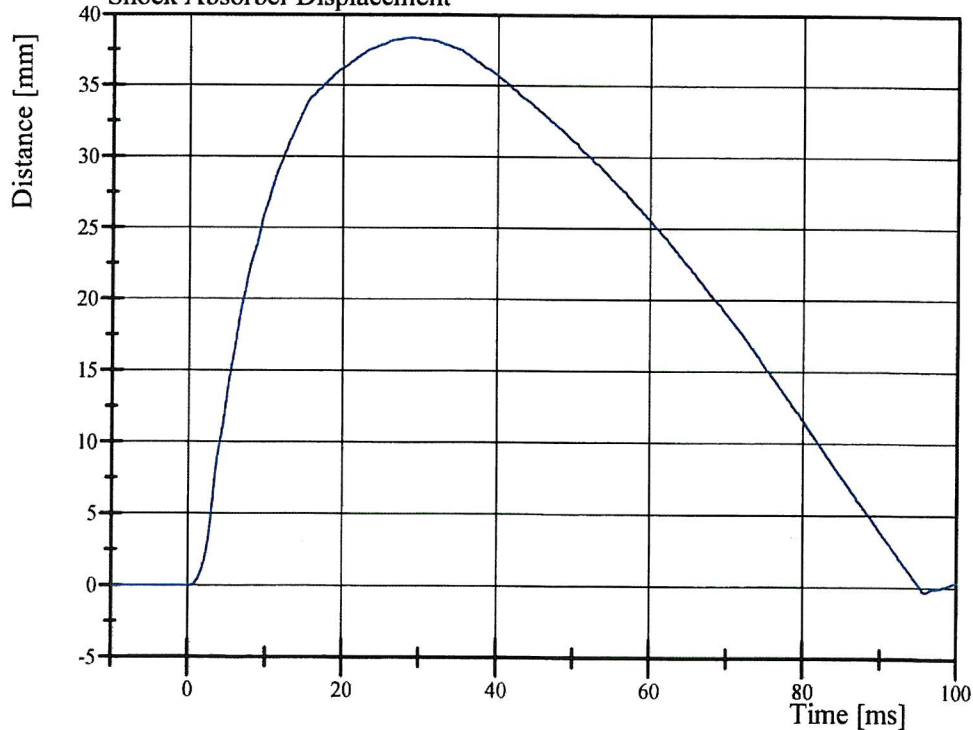


Filter Class: CFC\_1000

Max: 4,381.1 N at 3.3 ms

Min: -985.3 N at 96.2 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 38.4 mm at 28.8 ms

Min: -0.3 mm at 95.9 ms

# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-1

Test Date: 9/24/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 54 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 1,759 - 2,126 N  | 1,899.2 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 31.71 - 37.26 mm | 36.472 mm    | Yes  |

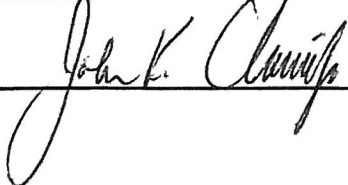
**Test meets specifications.**

## Comments:

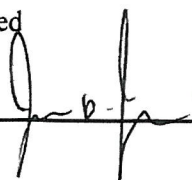
Actual Impactor Velocity (m/s): 4.295

Damper Setting: 7.5

Technician



Approved



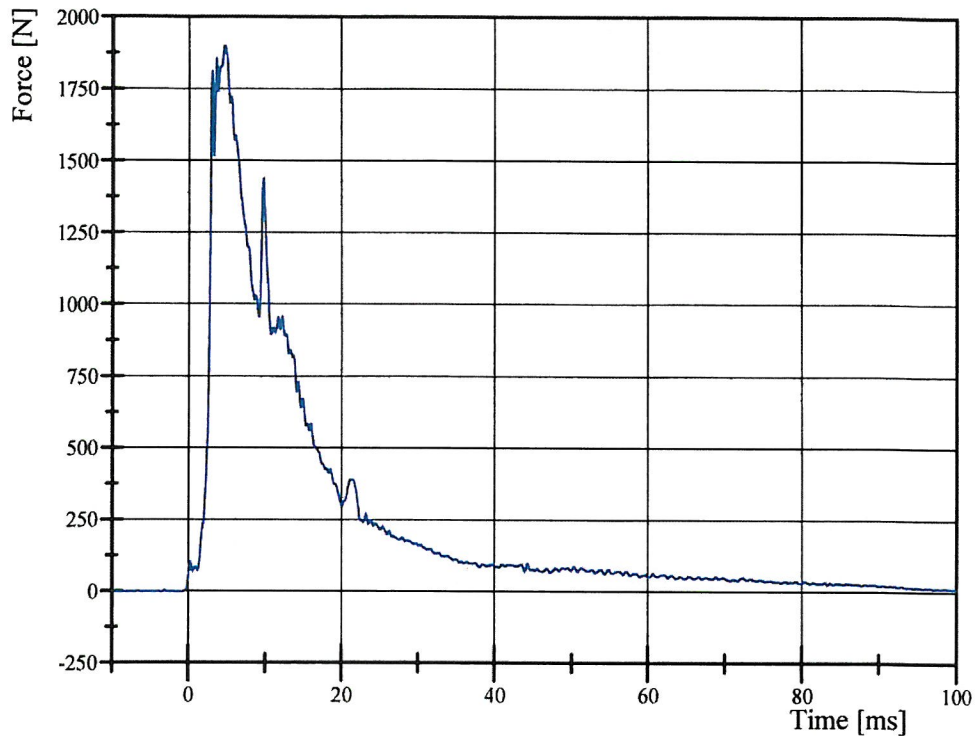
# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-1

Test Date: 9/24/2009

Shock Absorber Resistive Force

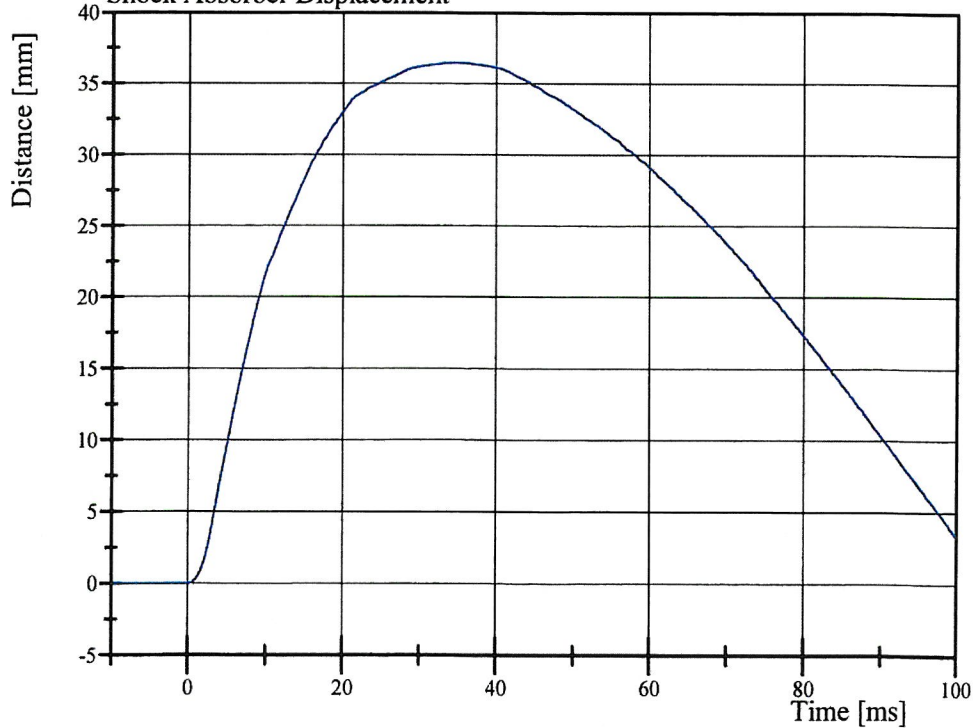


Filter Class: CFC\_1000

Max: 1,899.2 N at 4.7 ms

Min: -2.5 N at -9.1 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 36.5 mm at 34.3 ms

Min: -0.0 mm at -7.0 ms



# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-2

Test Date: 9/24/2009

| Test Parameter                           | Specification   | Test Results | Pass |
|------------------------------------------|-----------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C  | 21.7 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %       | 55 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 856 - 1,146 N   | 1,014.3 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 30.2 - 35.19 mm | 34.042 mm    | Yes  |

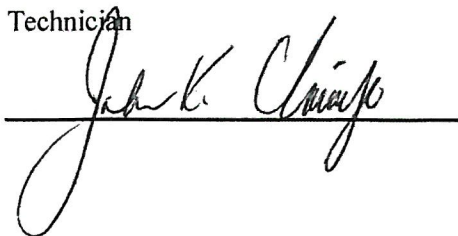
**Test meets specifications.**

## Comments:

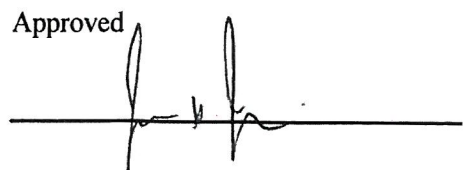
Actual Impactor Velocity (m/s): 3.076

Damper Setting: 7.5

Technician



Approved

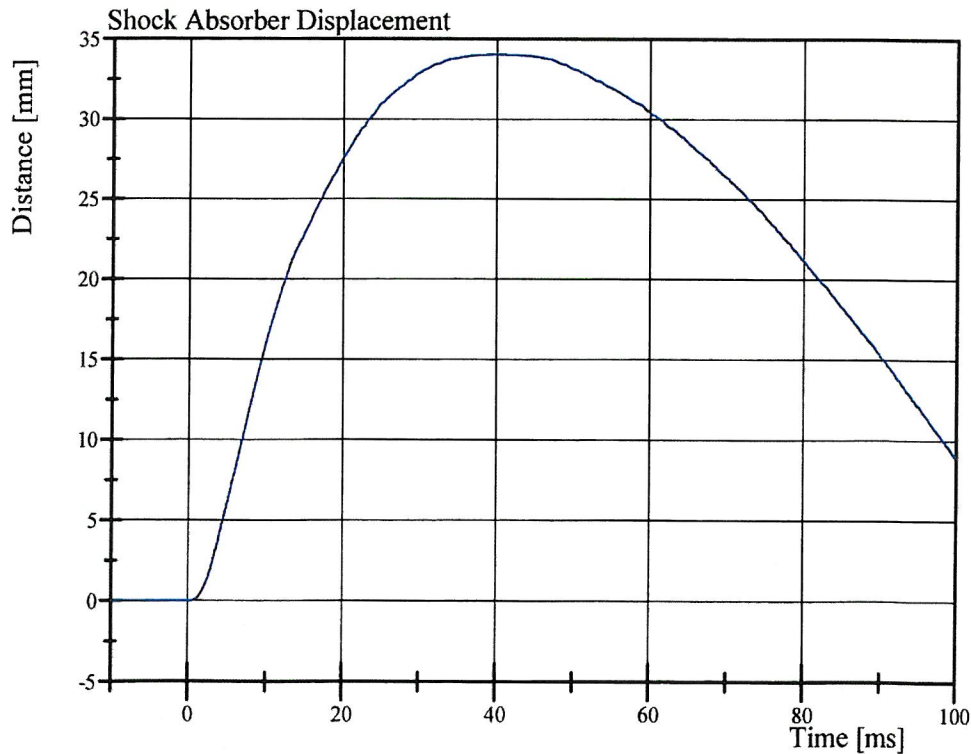
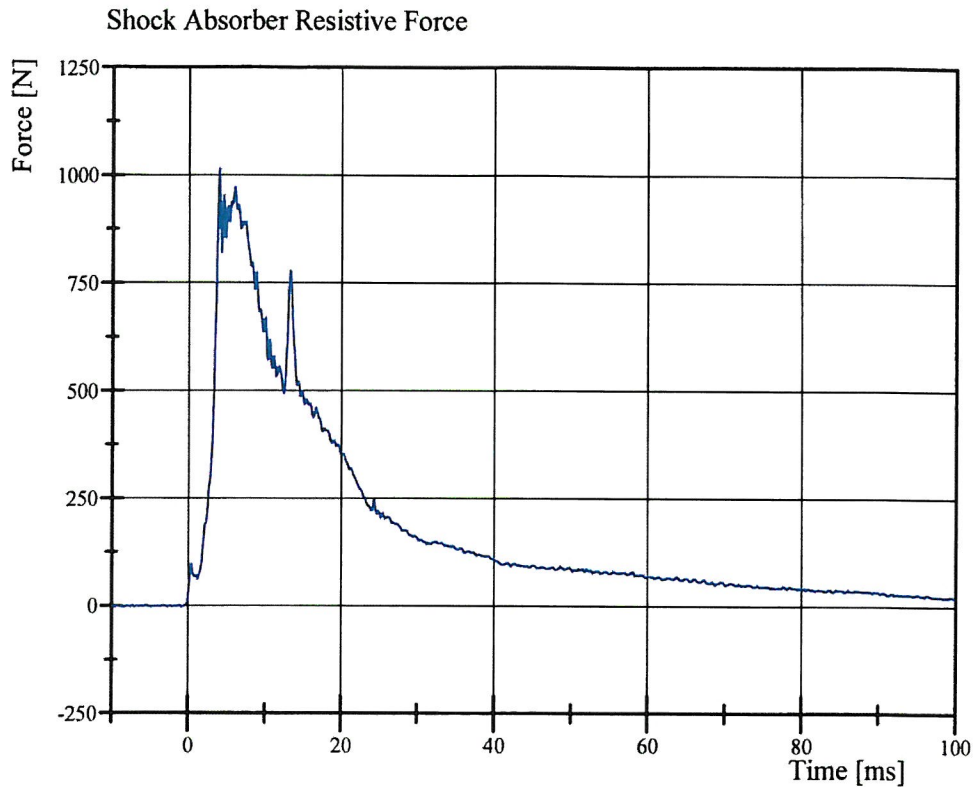


# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-2

Test Date: 9/24/2009



# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 002 Certification No. 5-5

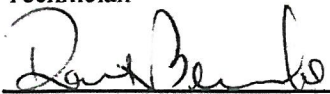
Test Date: 9/28/2009

| Test Parameter                   | Specification   | Test Results | Pass |
|----------------------------------|-----------------|--------------|------|
| Temperature                      | 18.9 - 25.6 °C  | 21.7 °C      | Yes  |
| Relative Humidity                | 10 - 70 %       | 54 %         | Yes  |
| Impactor Velocity                | 4.27 - 4.33 m/s | 4.272 m/s    | Yes  |
| Upper Rib Lateral Acceleration   | 37 - 46 g       | 41.6 g       | Yes  |
| Lower Rib Lateral Acceleration   | 37 - 46 g       | 38.4 g       | Yes  |
| Lower Spine Lateral Acceleration | 15 - 22 g       | 20.0 g       | Yes  |

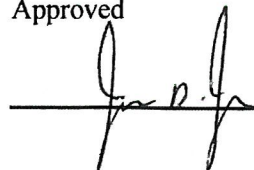
**Test meets specifications.**

**Comments:**

Technician



Approved

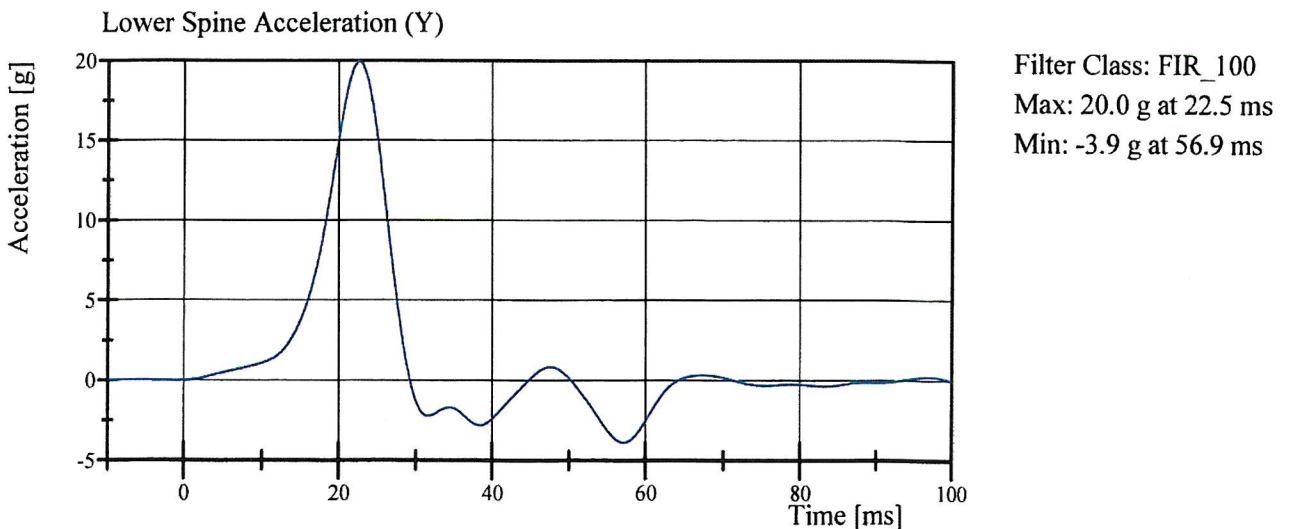
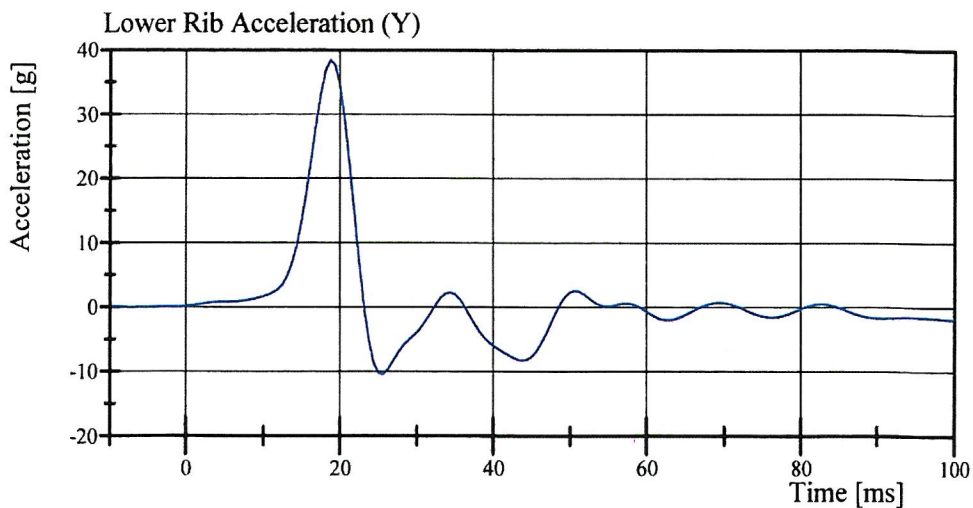
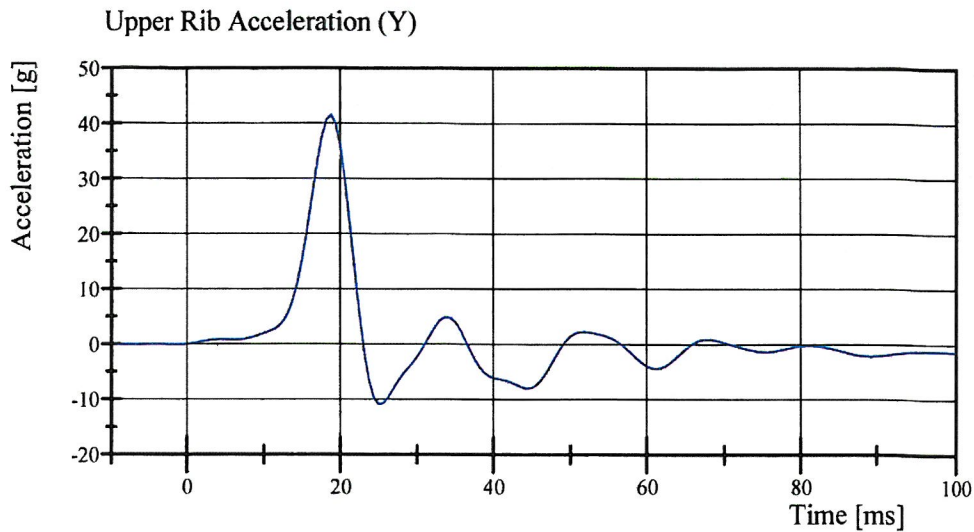


# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 002 Certification No. 5-5

Test Date: 9/28/2009





# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 002 Certification No. 5-3

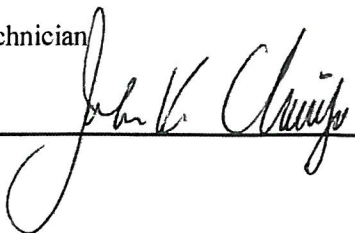
Test Date: 9/22/2009

| Test Parameter                 | Specification    | Test Results | Pass |
|--------------------------------|------------------|--------------|------|
| Temperature                    | 18.9 - 25.5 °C   | 21.7 °C      | Yes  |
| Relative Humidity              | 10 - 70 %        | 54 %         | Yes  |
| Probe Force<br>within Corridor | Yes              | Yes          | Yes  |
| Probe Velocity                 | 6.35 - 8.89 mm/s | 7.716 mm/s   | Yes  |

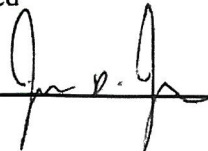
**Test meets specifications.**

**Comments:**

Technician



Approved

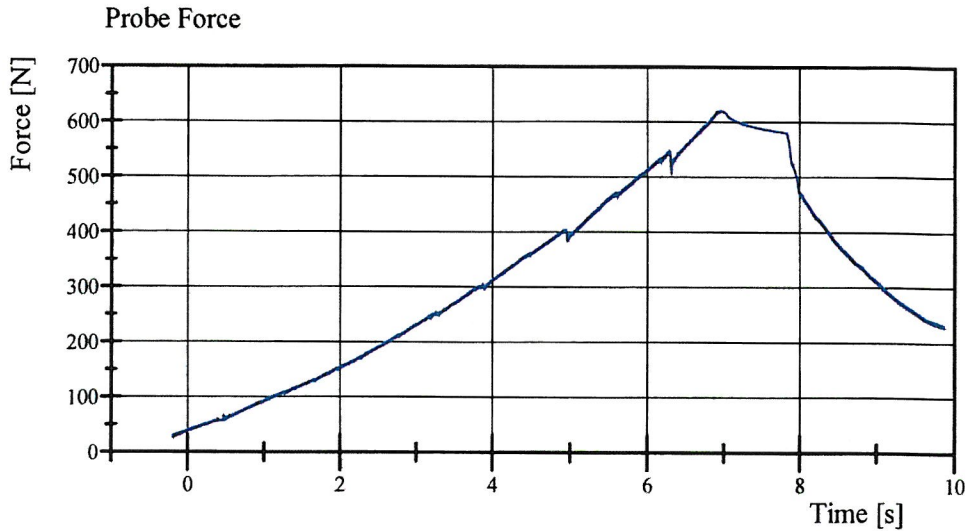


# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 002 Certification No. 5-3

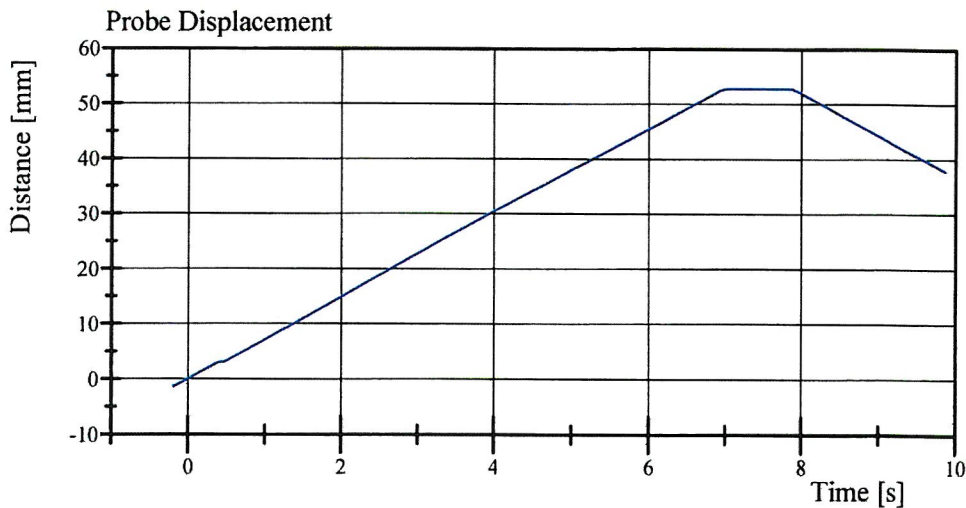
Test Date: 9/22/2009



Filter Class: CFC\_600

Max: 621.0 N at 7.0 s

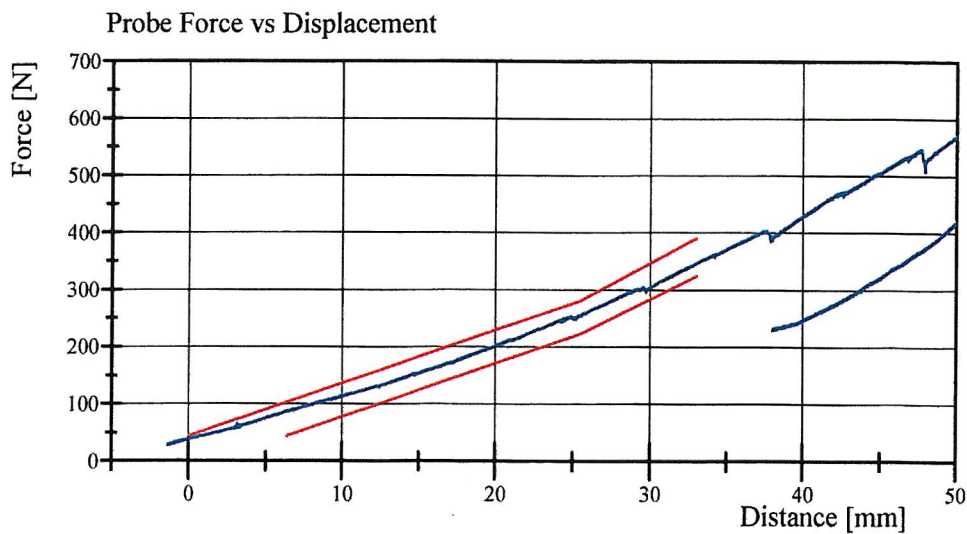
Min: 27.0 N at -0.2 s



Filter Class: CFC\_180

Max: 52.9 mm at 7.8 s

Min: -1.4 mm at -0.2 s



Filter Class: CFC\_600

Max: 621.0 N at 52.7 mm

Min: 27.0 N at -1.4 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 09-Sep-09

TRC, INC.

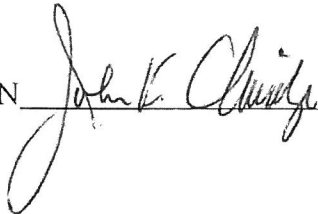
TEST NO: TOFL-01

572B SN 002 TORSO FLEX CAL 05

| TEST PARAMETER                      | SPECIFICATION  | TEST RESULTS |
|-------------------------------------|----------------|--------------|
| TEMPERATURE                         | 18.9 – 25.6° C | 21.6 °C      |
| RELATIVE HUMIDITY                   | 10 – 70 %      | 54 %         |
| FORCE AT 0 DEG. FLEXION             | -27 – 27 N     | 0 N          |
| FORCE AT 20 DEG OF FLEXION          | 98 – 151 N     | 142 N        |
| FORCE AT 30 DEG OF FLEXION          | 151 – 205 N    | 200 N        |
| FORCE AT 40 DEG OF FLEXION          | 205 – 258 N    | 234N         |
| NET RETURN ANGLE AFTER 3<br>MINUTES | < 12 °         | 7.8 °        |

TEST MEETS SPECIFICATIONS

TECHNICIAN



\_\_\_\_\_

# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 002 Certification No. 5-1

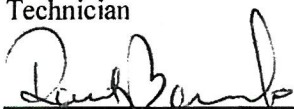
Test Date: 9/28/2009

| Test Parameter                            | Specification   | Test Results | Pass |
|-------------------------------------------|-----------------|--------------|------|
| Temperature                               | 18.9 - 25.5 °C  | 21.6 °C      | Yes  |
| Relative Humidity                         | 10 - 70 %       | 53 %         | Yes  |
| Impactor Velocity                         | 4.27 - 4.33 m/s | 4.317 m/s    | Yes  |
| Pelvis Lateral Acceleration               |                 |              |      |
| Duration above 20g                        | 3 - 7 ms        | 5.6 ms       | Yes  |
| Pelvis Lateral Acceleration               | 40 - 60 g       | 55.4 g       | Yes  |
| Is Acceleration Curve Unimodal Above 20g? | Yes             | Yes          | Yes  |

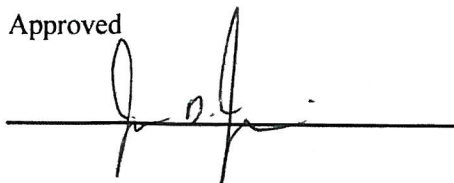
**Test meets specifications.**

**Comments:**

Technician



Approved



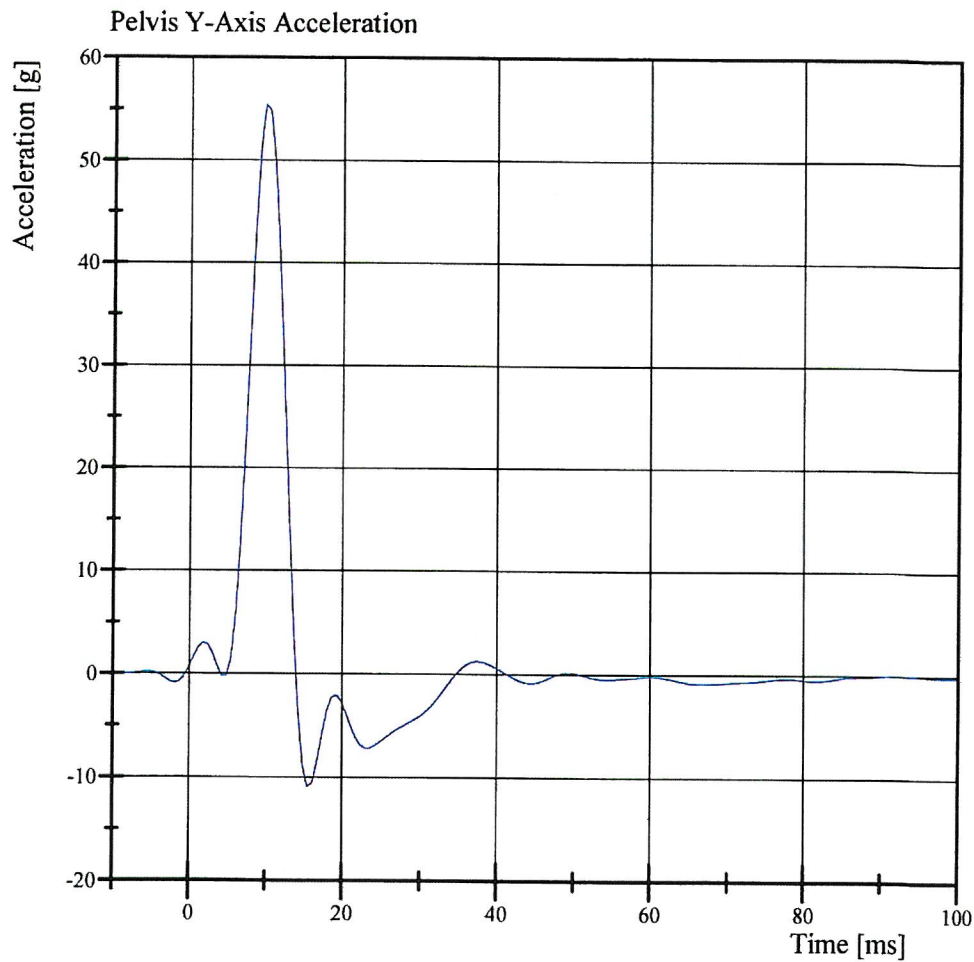


# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 002 Certification No. 5-1

Test Date: 9/28/2009



Filter Class: FIR\_100  
Max: 55.4 g at 9.8 ms  
Min: -10.9 g at 15.5 ms

CALIBRATION TEST RESULTS

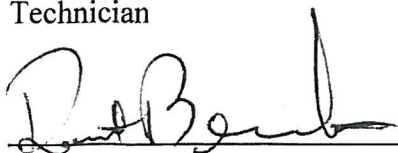
POST-TEST

SID/HIII: 002

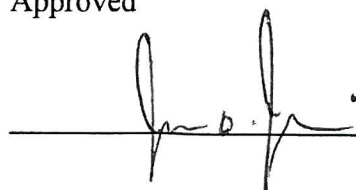
**Transportation Research Center Inc.**  
**572F SID Dummy**  
**External Dimensions**  
**Serial No. 002 Calibration No. 06**

| Test Parameter                                        | Dimension | Specification    | Results | Pass |
|-------------------------------------------------------|-----------|------------------|---------|------|
| Seated Height                                         | SH        | 889.0 - 909.3 mm | 908 mm  | Yes  |
| Rib Height                                            | RH        | 501.7 - 520.7 mm | 514 mm  | Yes  |
| Hip Pivot Height                                      | HP        | 99.1 REF mm      | 99 mm   |      |
| Knee Pivot From Backline                              | KH        | 510.5 - 525.8 mm | 520 mm  | Yes  |
| Knee Pivot From Floor                                 | KV        | 490.2 - 505.5 mm | 501 mm  | Yes  |
| Hip Width                                             | HW        | 355.6 - 391.2 mm | 382 mm  | Yes  |
| Top Rib Width From C/L                                | RW-1      | 165.1 - 180.3 mm | 175 mm  | Yes  |
| Bottom Rib Width From C/L                             | RW-2      | 165.1 - 180.3 mm | 175 mm  | Yes  |
| Difference Between Top &<br>Bottom Rib Width from C/L |           | <= 2.5 mm        | 0.0 mm  | Yes  |

Technician



Approved




# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 002 Certification No. 6-1

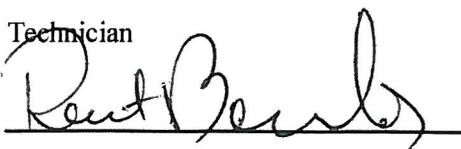
Test Date: 10/22/2009

| Test Parameter                                                       | Specification  | Test Results | Pass |
|----------------------------------------------------------------------|----------------|--------------|------|
| Temperature                                                          | 18.9 - 25.6 °C | 21.7 °C      | Yes  |
| Relative Humidity                                                    | 10 - 70 %      | 39 %         | Yes  |
| Peak Head Resultant Acceleration                                     | 120 - 150 g    | 138.6 g      | Yes  |
| Peak Head Longitudinal Acceleration                                  | (-15) - 15 g   | 7.6 g        | Yes  |
| Is Head Resultant Acceleration Curve<br>Unimodal Within 15% of Peak? | Yes            | Yes          | Yes  |

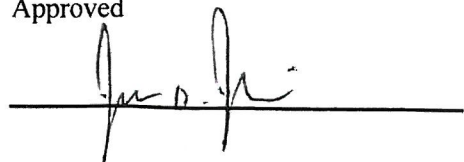
**Test meets specifications.**

**Comments:**

Technician



Approved



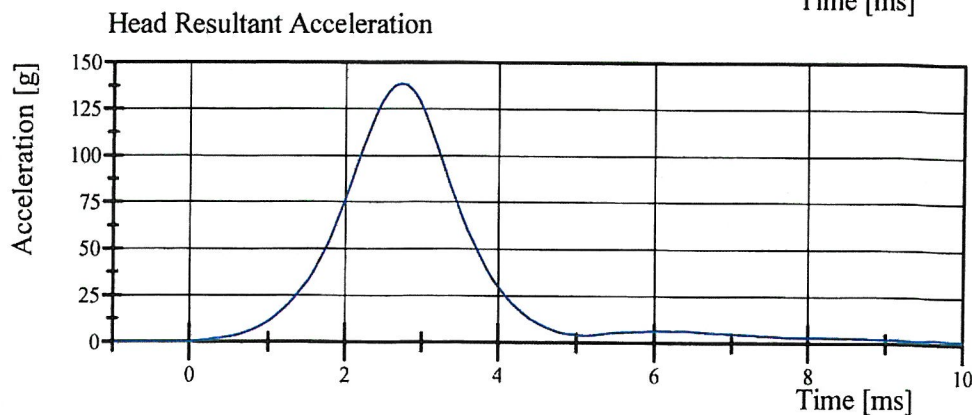
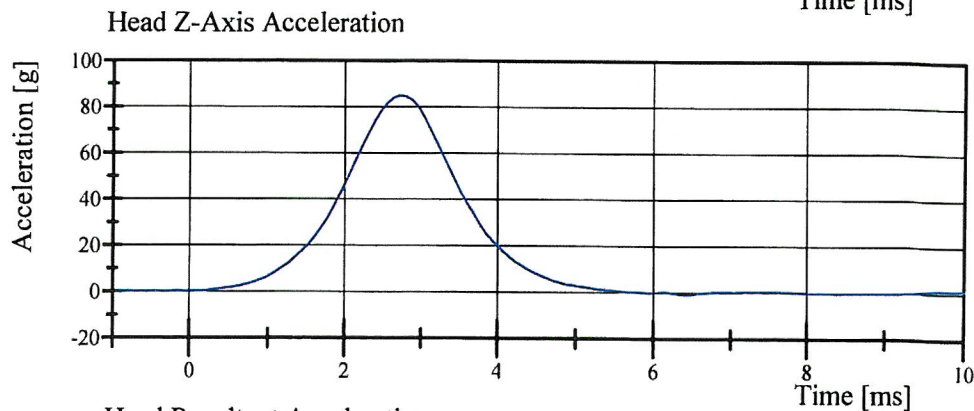
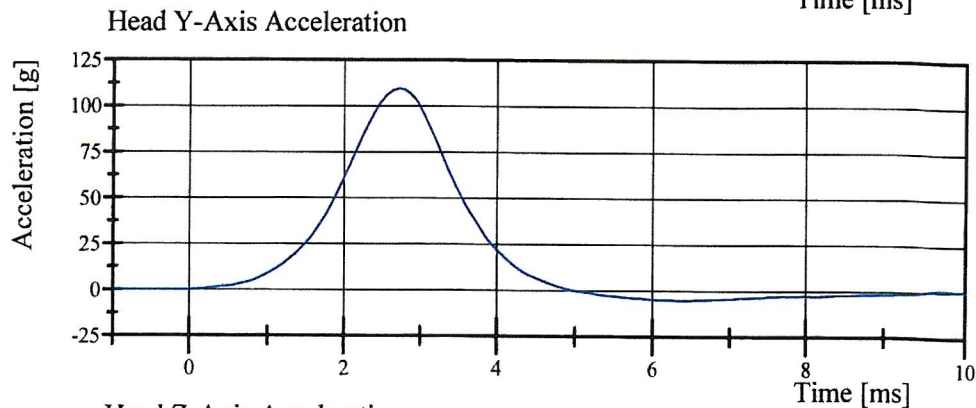
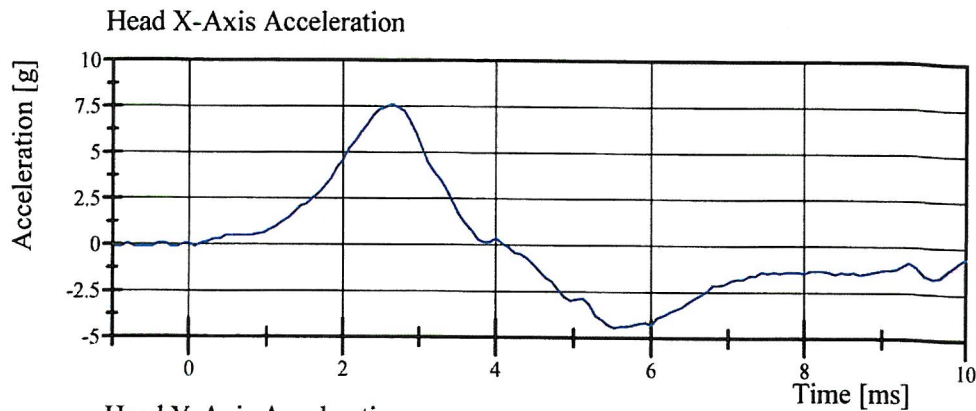


# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 002 Certification No. 6-1

Test Date: 10/22/2009



# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 6-1

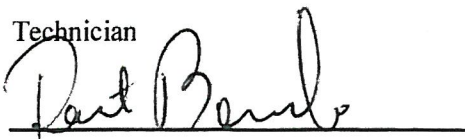
Test Date: 10/22/2009

| Test Parameter                                                         | Specification         | Test Results | Pass |
|------------------------------------------------------------------------|-----------------------|--------------|------|
| Temperature                                                            | 20.6 - 22.2 °C        | 21.7 °C      | Yes  |
| Relative Humidity                                                      | 10 - 70 %             | 40 %         | Yes  |
| Pendulum Velocity                                                      | (-6.89) - (-7.13) m/s | -7.027 m/s   | Yes  |
| Pendulum Integrated Velocity<br>Change at 10 ms                        | 1.96 - 2.55 m/s       | 2.031 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 20 ms                        | 4.12 - 5.10 m/s       | 4.332 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 30 ms                        | 5.73 - 7.01 m/s       | 6.235 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 40 to 70 ms                  | 6.27 - 7.64 m/s       | 7.339 m/s    | Yes  |
| Total Head D-Plane Rotation                                            | (-66) - (-82) °       | -74.6 °      | Yes  |
| Total Head D-Plane Rotation<br>Time to 0° after Peak Rotation          | 58 - 67 ms            | 62.4 ms      | Yes  |
| Total Neck Occipital Condyle Moment                                    | 73 - 88 N·m           | 84.9 N·m     | Yes  |
| Total Neck Occipital Condyle Moment<br>Time to 0 N·m after Peak Moment | 49 - 64 ms            | 52.6 ms      | Yes  |
| Time from Peak Moment to Peak Rotation                                 | 2 - 16 ms             | 8.2 ms       | Yes  |

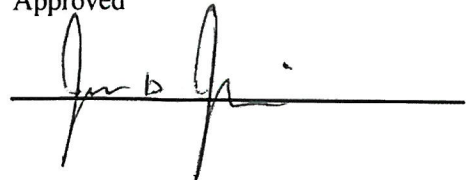
**Test meets specifications.**

**Comments:**

Technician



Approved



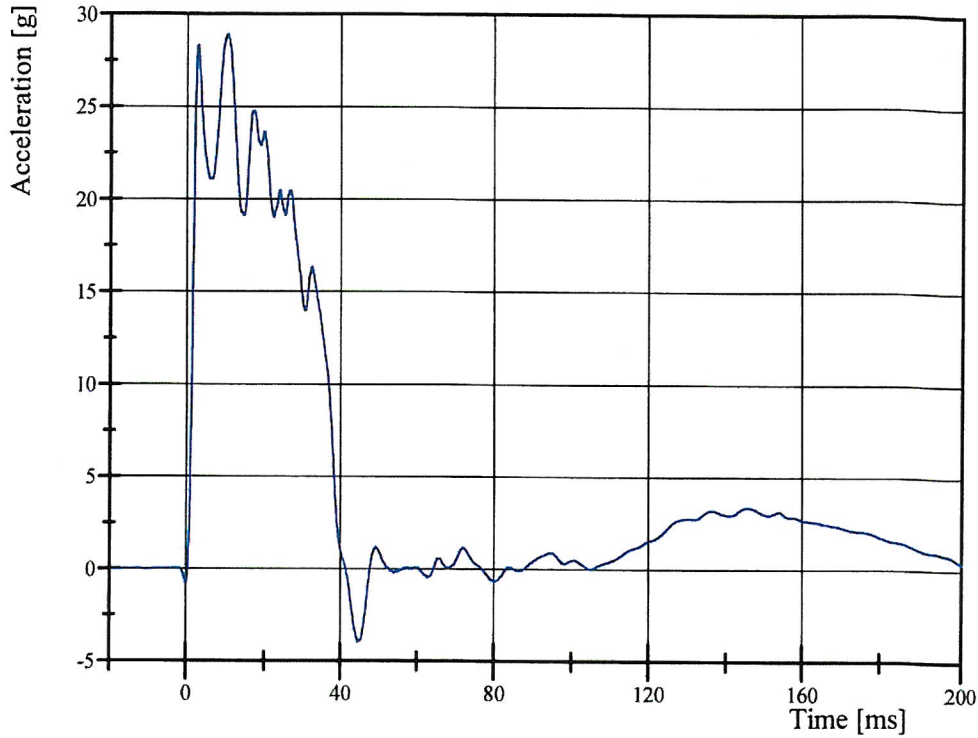
# Transportation Research Center Inc.

Left Lateral Neck

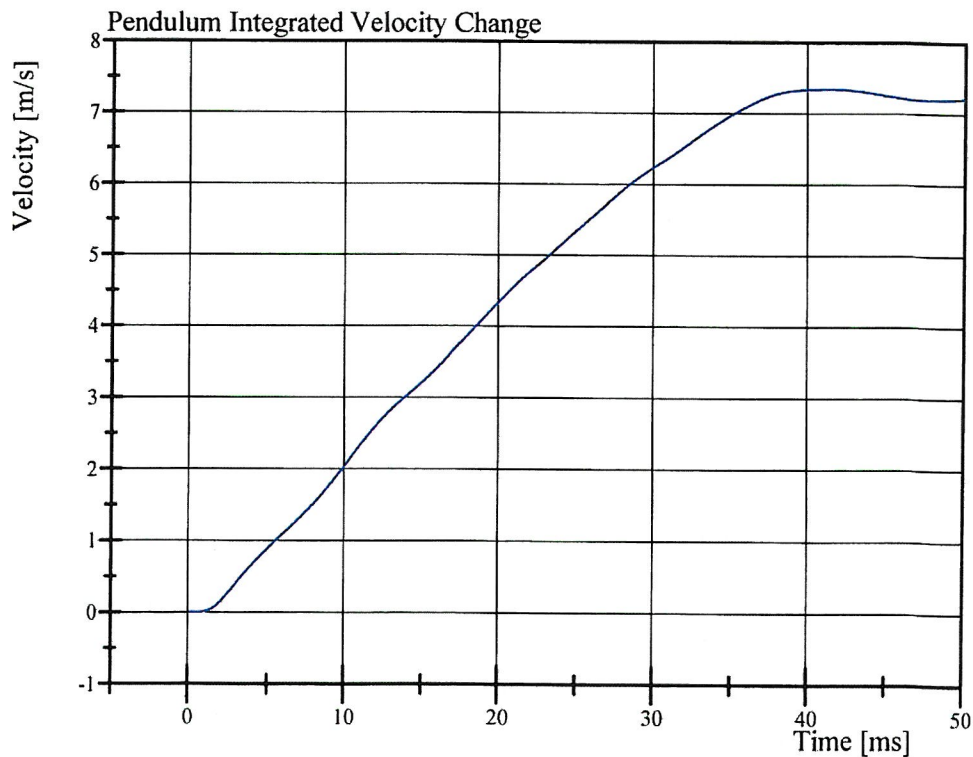
SID-HIII Serial No. 002 Certification No. 6-1

Test Date: 10/22/2009

Pendulum Acceleration



Filter Class: CFC\_180  
Max: 28.9 g at 10.4 ms  
Min: -4.0 g at 44.7 ms



Filter Class: CFC\_180  
Max: 7.3 m/s at 41.4 ms  
Min: -0.0 m/s at 0.6 ms

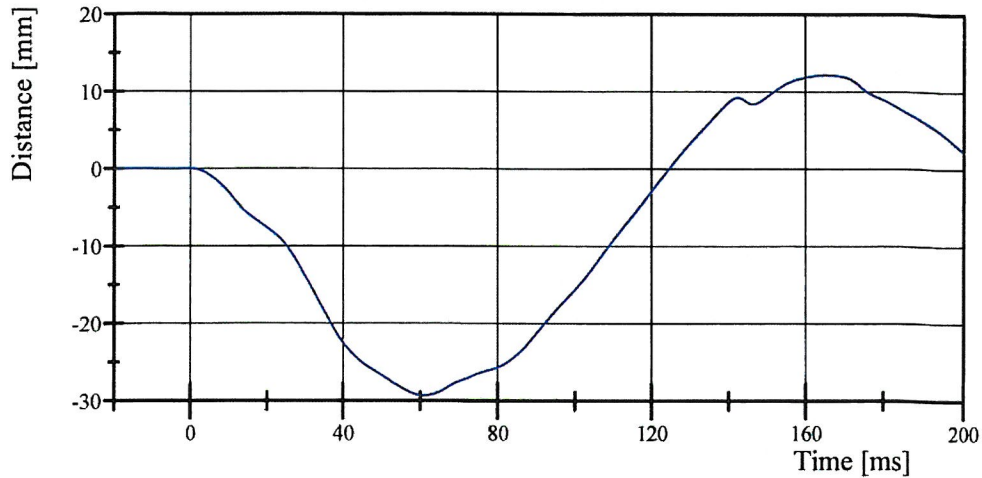
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 6-1

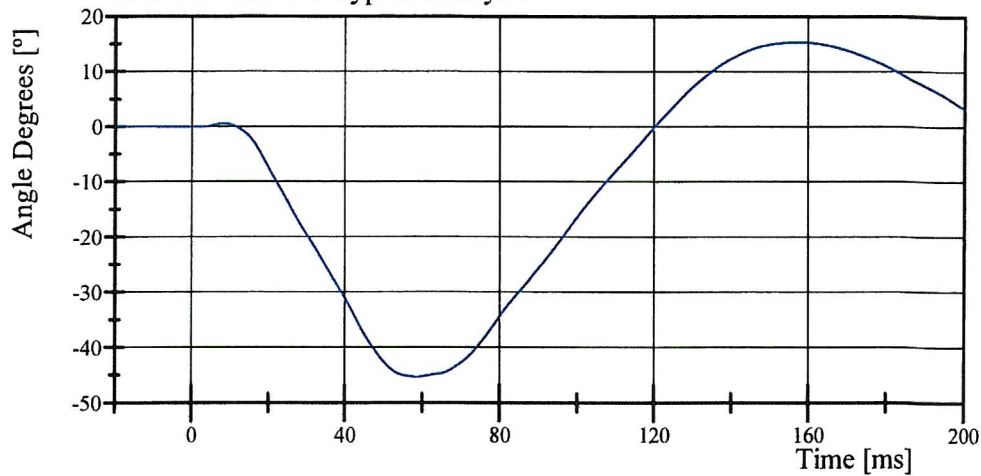
Test Date: 10/22/2009

Pot Rotation at the Base of Neck



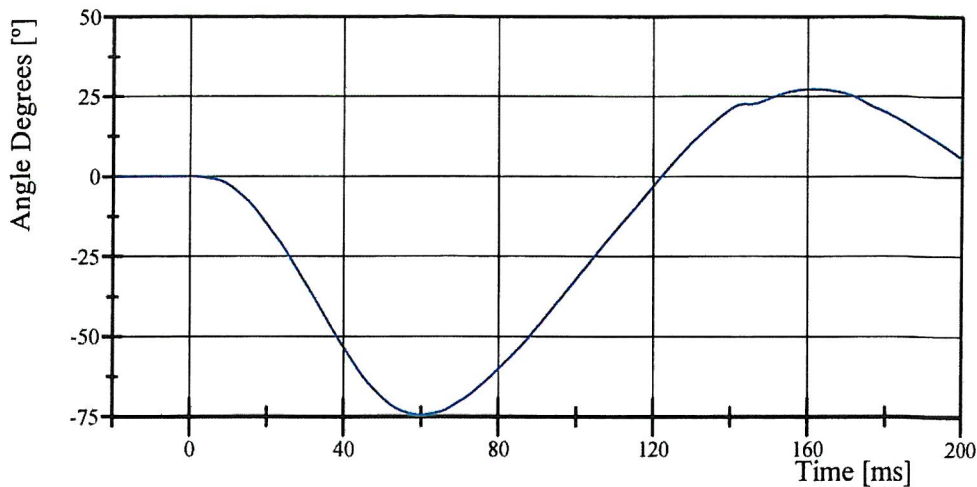
Filter Class: CFC\_60  
Max: 12.1 mm at 165.0 ms  
Min: -29.3 mm at 61.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 15.3 ° at 158.2 ms  
Min: -45.4 ° at 58.6 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60  
Max: 27.2 ° at 161.4 ms  
Min: -74.6 ° at 59.8 ms

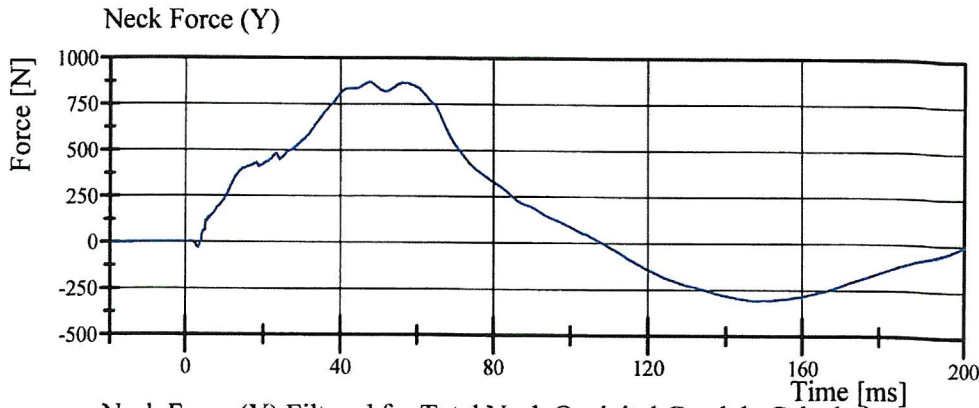


# Transportation Research Center Inc.

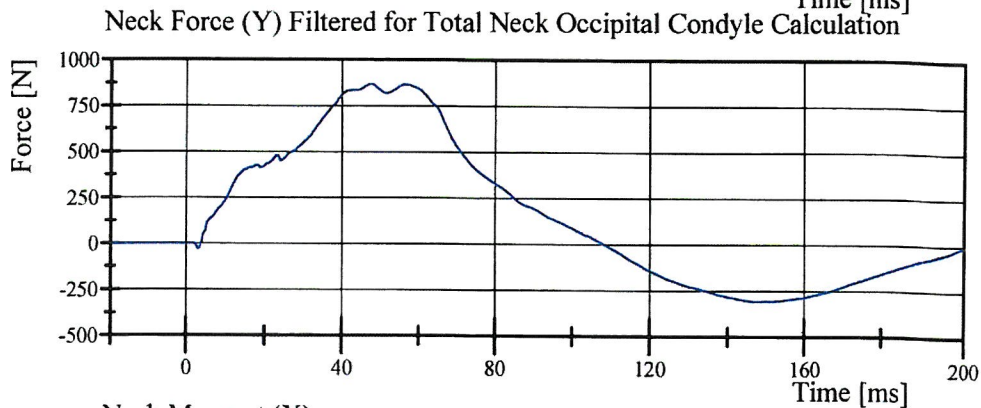
Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 6-1

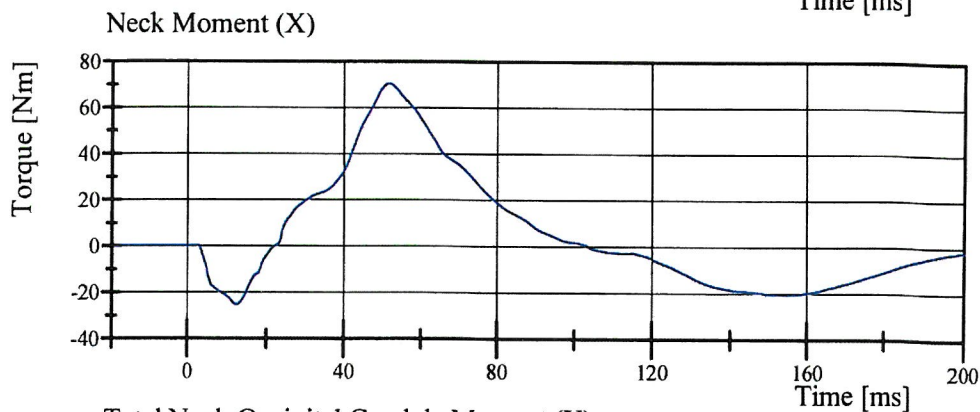
Test Date: 10/22/2009



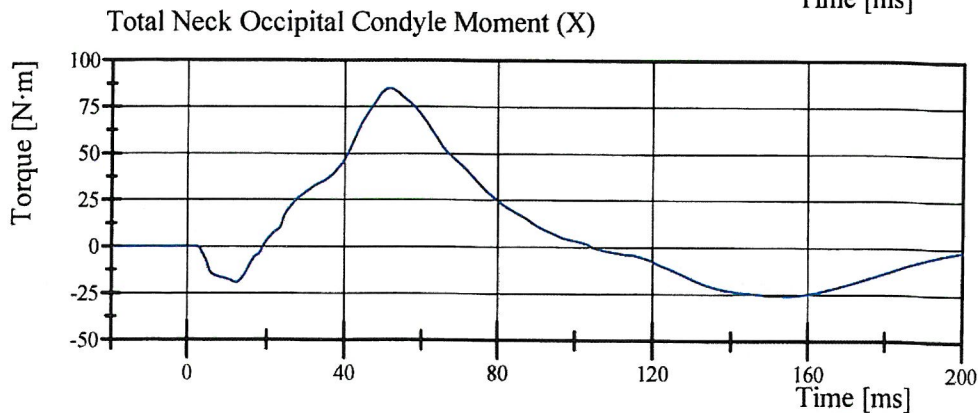
Filter Class: CFC\_1000  
Max: 867.4 N at 47.5 ms  
Min: -309.0 N at 147.6 ms



Filter Class: CFC\_600  
Max: 867.5 N at 47.7 ms  
Min: -308.7 N at 147.7 ms



Filter Class: CFC\_600  
Max: 70.4 Nm at 51.7 ms  
Min: -25.4 Nm at 12.6 ms



Filter Class: CFC\_600  
Max: 84.9 N·m at 51.7 ms  
Min: -26.0 N·m at 154.2 ms

# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-9

Test Date: 9/24/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 55 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 3,719 - 4,409 N  | 4,381.1 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 33.35 - 39.55 mm | 38.366 mm    | Yes  |

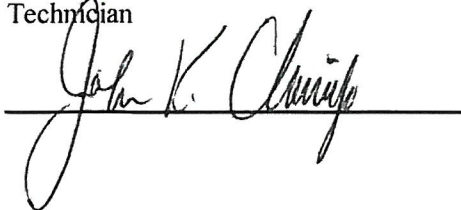
**Test meets specifications.**

**Comments:**

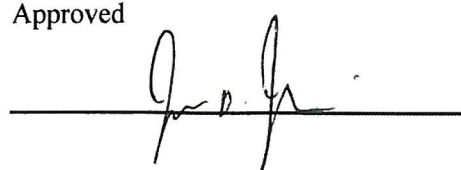
Actual Impactor Velocity (m/s): 6.077

Damper Setting: 7.5

Technician



Approved



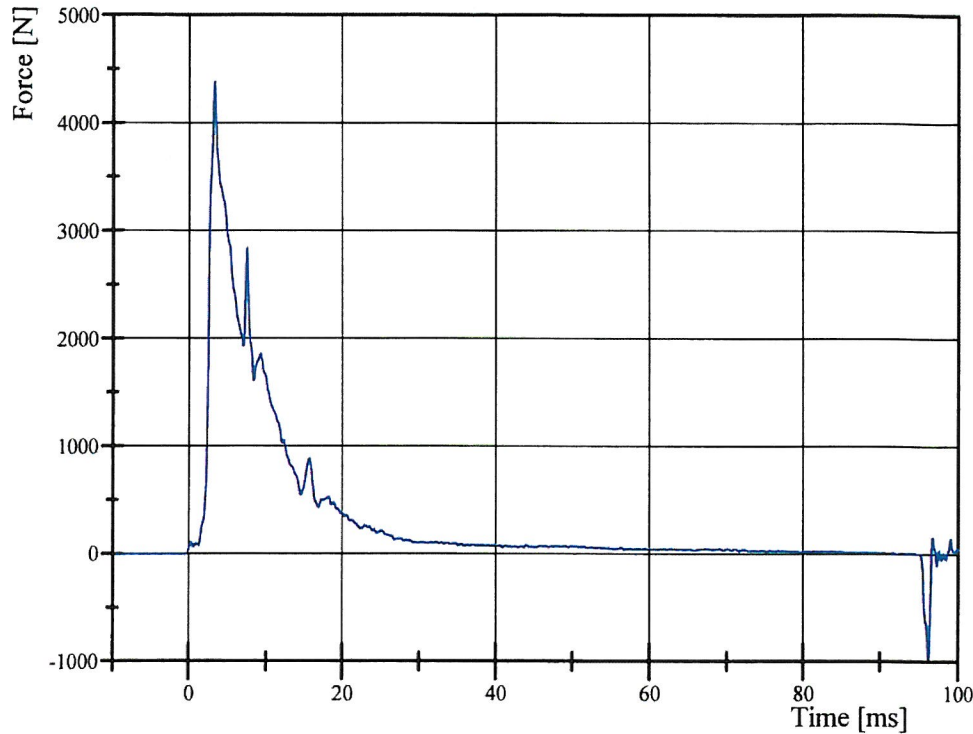
# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-9

Test Date: 9/24/2009

Shock Absorber Resistive Force

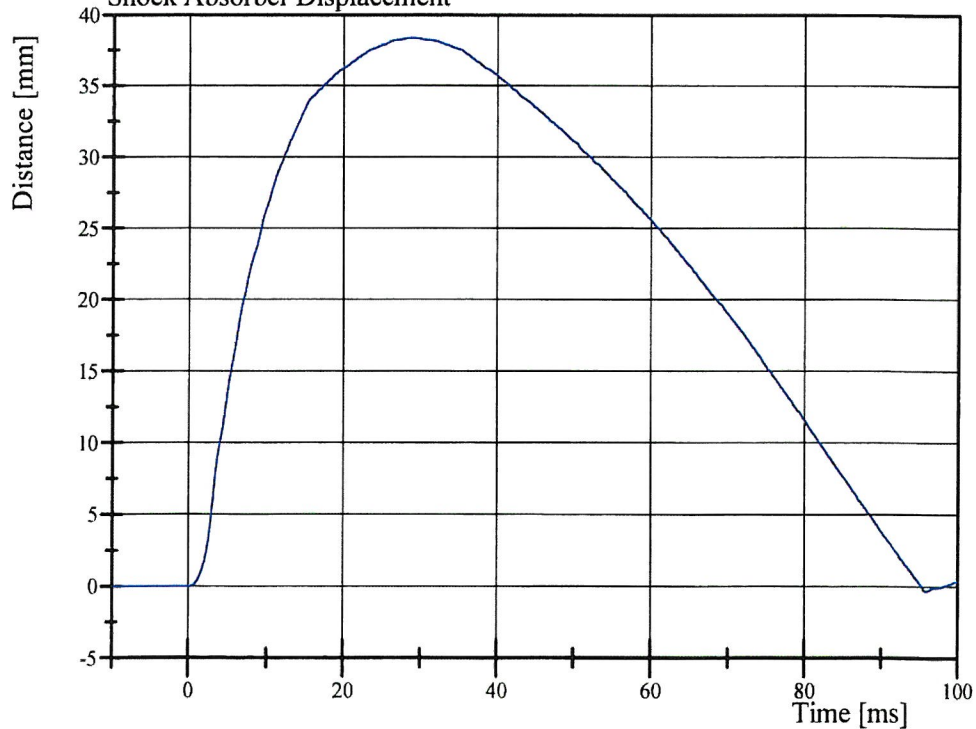


Filter Class: CFC\_1000

Max: 4,381.1 N at 3.3 ms

Min: -985.3 N at 96.2 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 38.4 mm at 28.8 ms

Min: -0.3 mm at 95.9 ms

# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-1

Test Date: 9/24/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 54 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 1,759 - 2,126 N  | 1,899.2 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 31.71 - 37.26 mm | 36.472 mm    | Yes  |

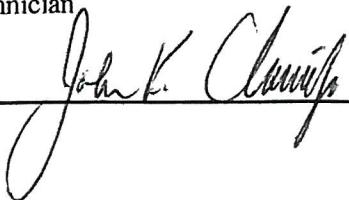
**Test meets specifications.**

## Comments:

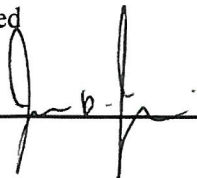
Actual Impactor Velocity (m/s): 4.295

Damper Setting: 7.5

Technician



Approved





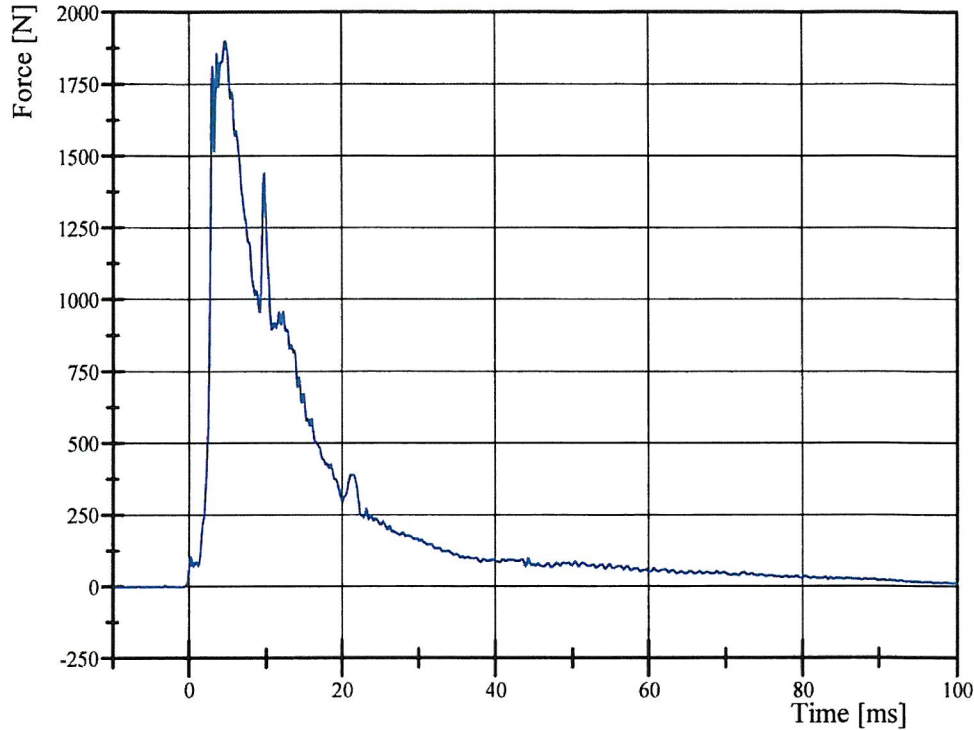
# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-1

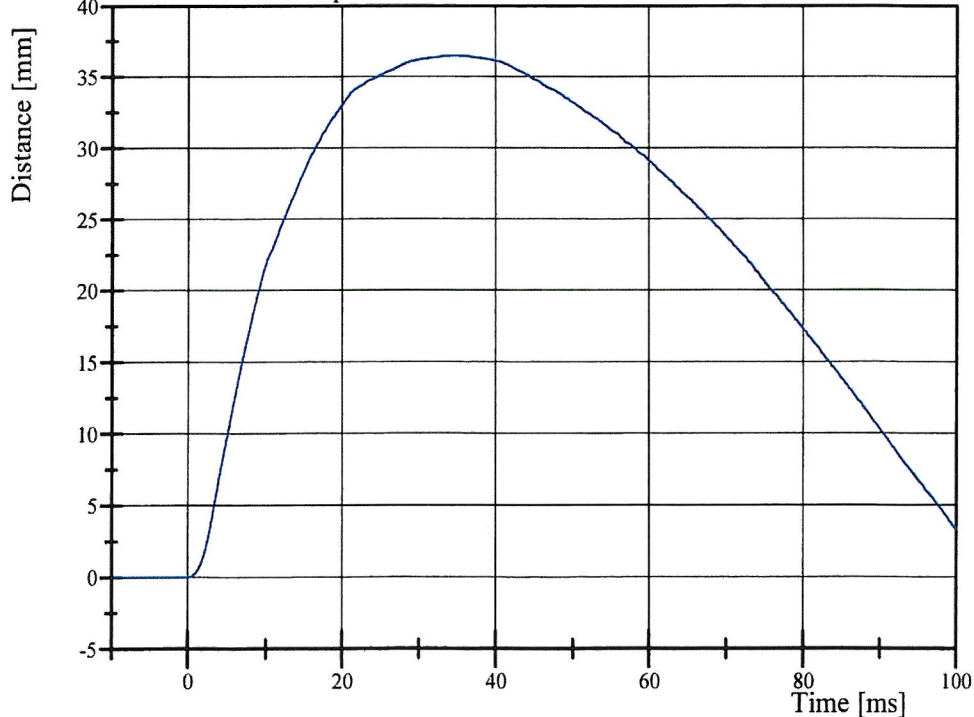
Test Date: 9/24/2009

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 1,899.2 N at 4.7 ms  
Min: -2.5 N at -9.1 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 36.5 mm at 34.3 ms  
Min: -0.0 mm at -7.0 ms

# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 002 Certification No. 5-2  
Test Date: 9/24/2009

| Test Parameter                           | Specification   | Test Results | Pass |
|------------------------------------------|-----------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C  | 21.7 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %       | 55 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 856 - 1,146 N   | 1,014.3 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 30.2 - 35.19 mm | 34.042 mm    | Yes  |

**Test meets specifications.**

**Comments:**

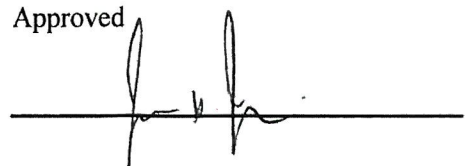
Actual Impactor Velocity (m/s): 3.076

Damper Setting: 7.5

Technician



Approved



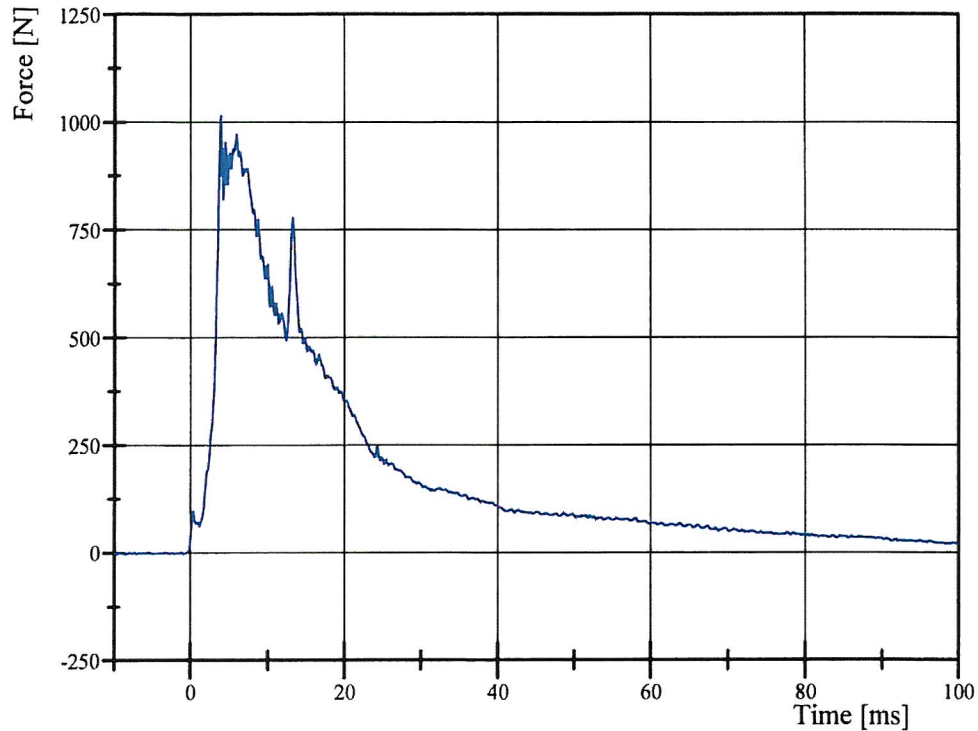
# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 002 Certification No. 5-2

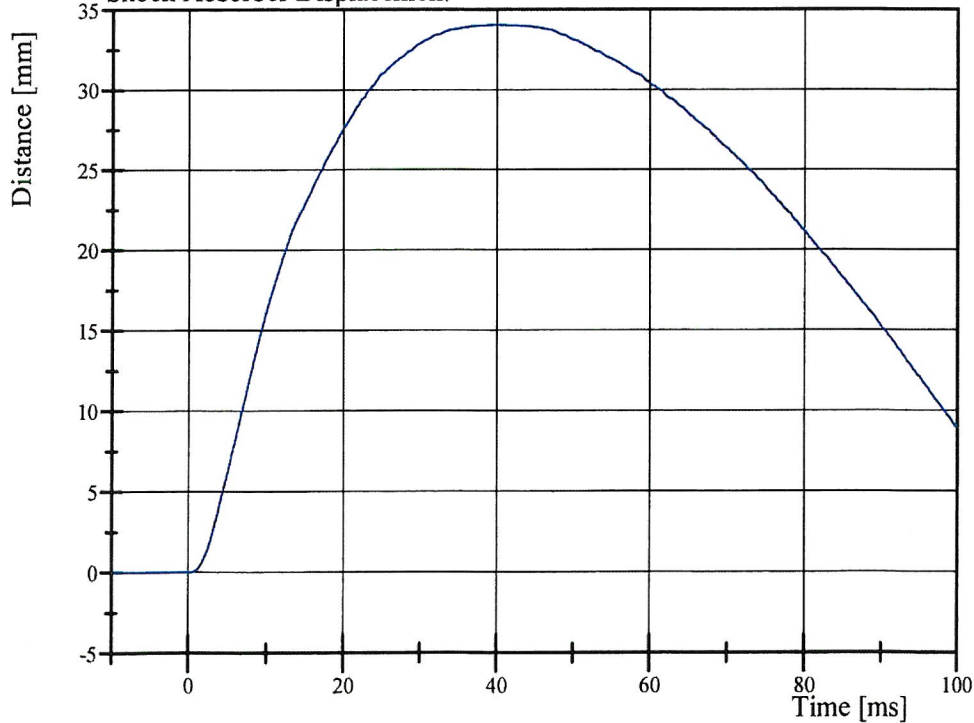
Test Date: 9/24/2009

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 1,014.3 N at 3.9 ms  
Min: -3.7 N at -9.6 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 34.0 mm at 39.3 ms  
Min: -0.0 mm at -5.1 ms

# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 002 Certification No. 6-6

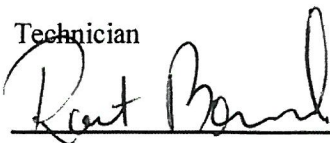
Test Date: 10/23/2009

| Test Parameter                   | Specification   | Test Results | Pass |
|----------------------------------|-----------------|--------------|------|
| Temperature                      | 18.9 - 25.6 °C  | 21.7 °C      | Yes  |
| Relative Humidity                | 10 - 70 %       | 56 %         | Yes  |
| Impactor Velocity                | 4.27 - 4.33 m/s | 4.287 m/s    | Yes  |
| Upper Rib Lateral Acceleration   | 37 - 46 g       | 43.3 g       | Yes  |
| Lower Rib Lateral Acceleration   | 37 - 46 g       | 40.6 g       | Yes  |
| Lower Spine Lateral Acceleration | 15 - 22 g       | 22.0 g       | Yes  |

**Test meets specifications.**

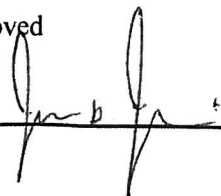
**Comments:**

Technician



---

Approved



---

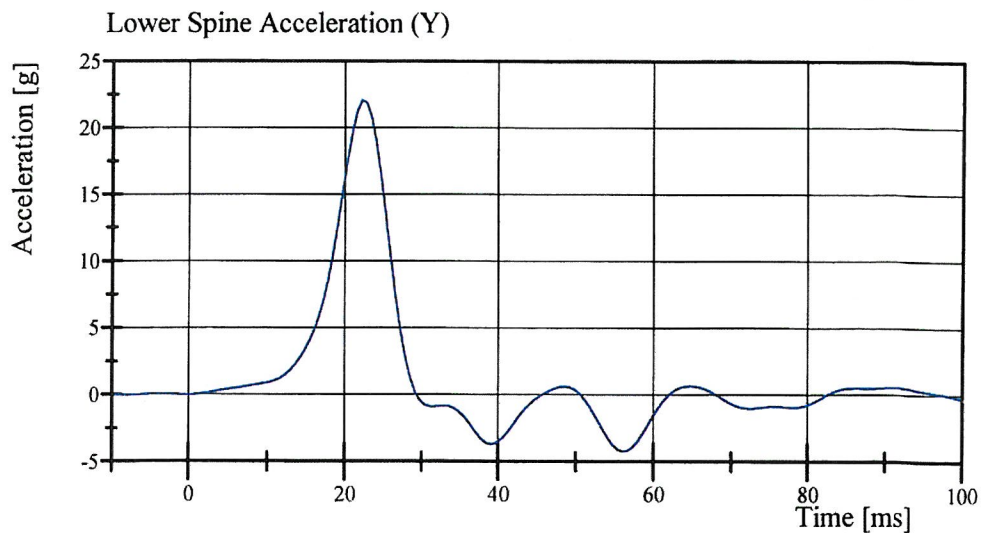
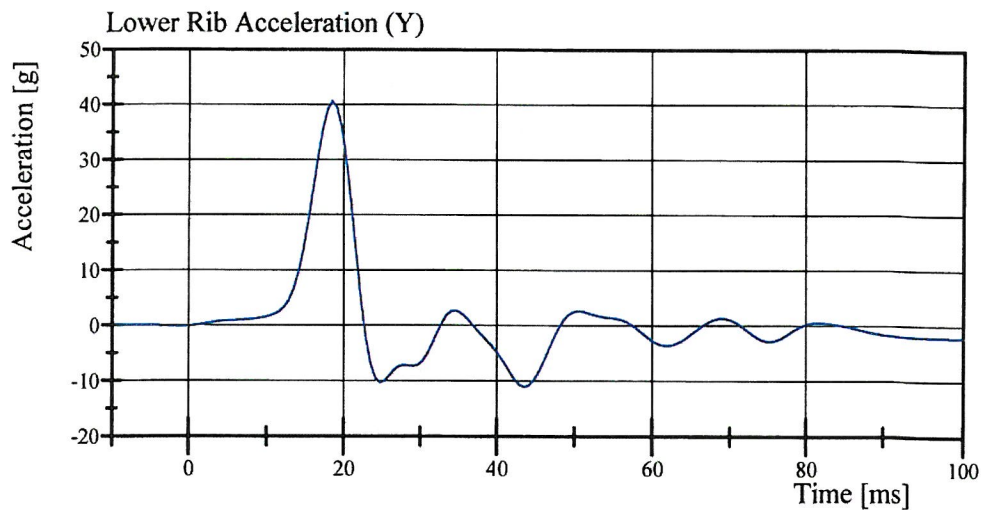
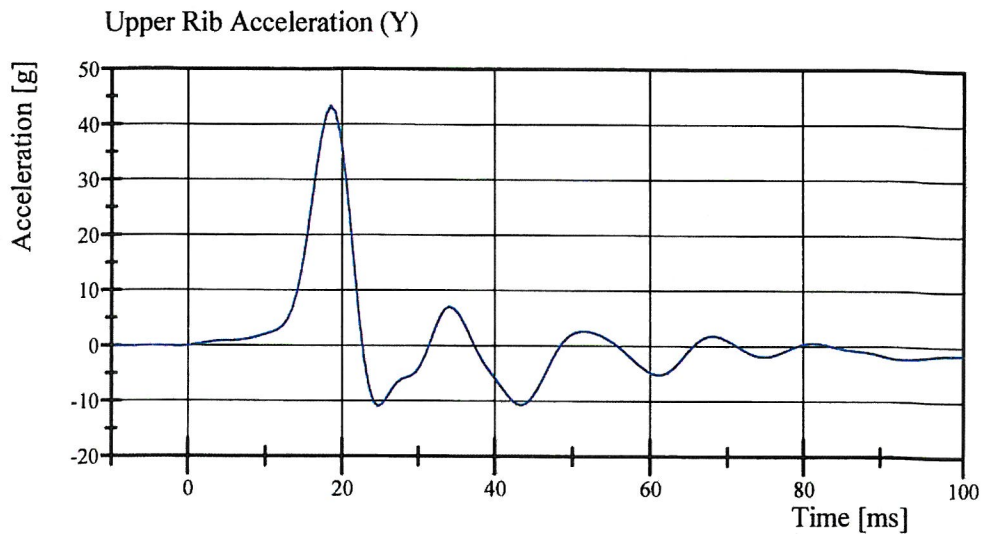


# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 002 Certification No. 6-6

Test Date: 10/23/2009



# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 002 Certification No. 6-1

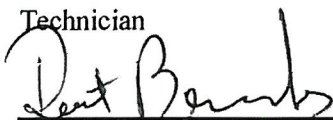
Test Date: 10/22/2009

| Test Parameter                 | Specification    | Test Results | Pass |
|--------------------------------|------------------|--------------|------|
| Temperature                    | 18.9 - 25.5 °C   | 21.7 °C      | Yes  |
| Relative Humidity              | 10 - 70 %        | 39 %         | Yes  |
| Probe Force<br>within Corridor | Yes              | Yes          | Yes  |
| Probe Velocity                 | 6.35 - 8.89 mm/s | 7.806 mm/s   | Yes  |

Test meets specifications.

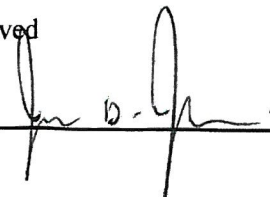
Comments:

Technician



---

Approved



---

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 002 Certification No. 6-1

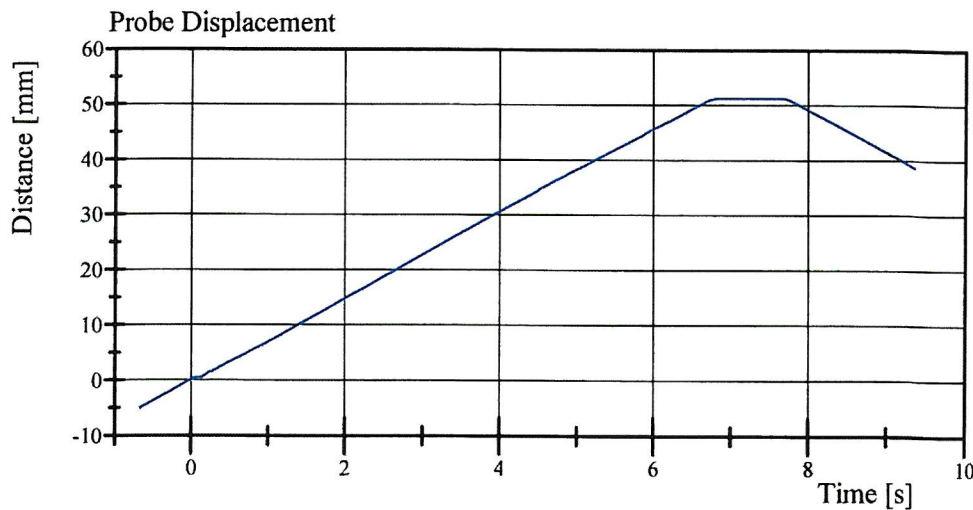
Test Date: 10/22/2009



Filter Class: CFC\_600

Max: 599.9 N at 6.7 s

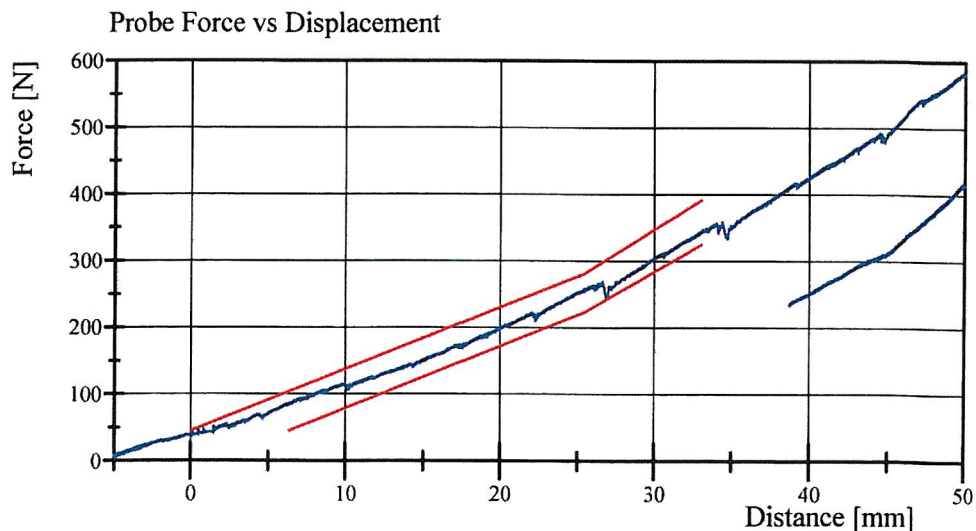
Min: 4.6 N at -0.7 s



Filter Class: CFC\_180

Max: 51.3 mm at 7.6 s

Min: -5.0 mm at -0.7 s



Filter Class: CFC\_600

Max: 599.9 N at 50.8 mm

Min: 4.6 N at -4.9 mm





# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 002 Certification No. 6-1

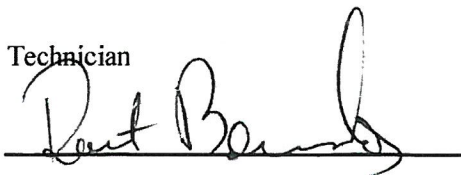
Test Date: 10/23/2009

| Test Parameter                                    | Specification   | Test Results | Pass |
|---------------------------------------------------|-----------------|--------------|------|
| Temperature                                       | 18.9 - 25.5 °C  | 21.7 °C      | Yes  |
| Relative Humidity                                 | 10 - 70 %       | 50 %         | Yes  |
| Impactor Velocity                                 | 4.27 - 4.33 m/s | 4.302 m/s    | Yes  |
| Pelvis Lateral Acceleration<br>Duration above 20g | 3 - 7 ms        | 5.8 ms       | Yes  |
| Pelvis Lateral Acceleration                       | 40 - 60 g       | 48.7 g       | Yes  |
| Is Acceleration Curve Unimodal<br>Above 20g?      | Yes             | Yes          | Yes  |

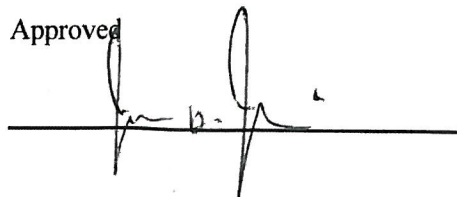
Test meets specifications.

Comments:

Technician



Approved

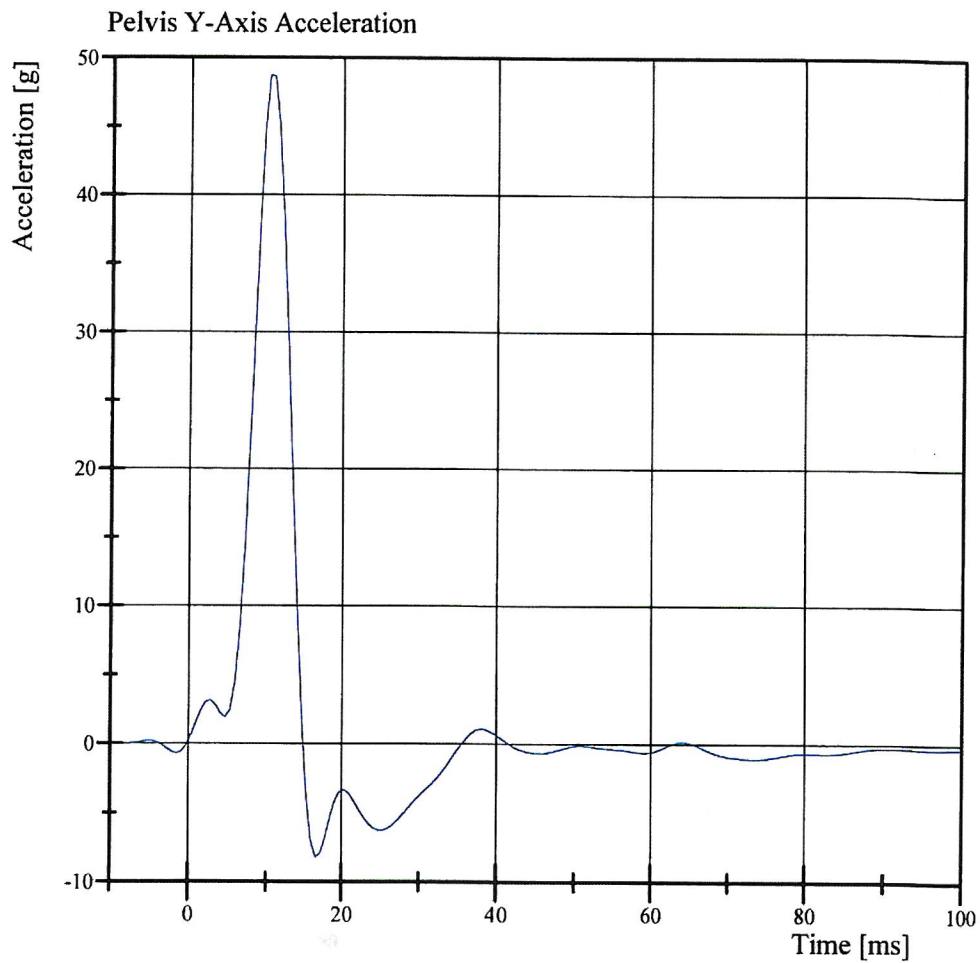


# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 002 Certification No. 6-1

Test Date: 10/23/2009



Filter Class: FIR\_100  
Max: 48.7 g at 10.3 ms  
Min: -8.3 g at 16.6 ms

CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII: 001

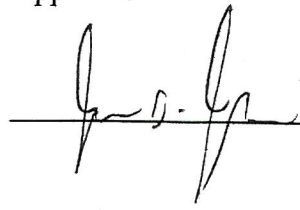
**Transportation Research Center Inc.**  
**572F SID Dummy**  
**External Dimensions**  
**Serial No. 001 Calibration No. 03**

| Test Parameter                                        | Dimension | Specification    | Results | Pass |
|-------------------------------------------------------|-----------|------------------|---------|------|
| Seated Height                                         | SH        | 889.0 - 909.3 mm | 902 mm  | Yes  |
| Rib Height                                            | RH        | 501.7 - 520.7 mm | 515 mm  | Yes  |
| Hip Pivot Height                                      | HP        | 99.1 REF mm      | 99.1 mm |      |
| Knee Pivot From Backline                              | KH        | 510.5 - 525.8 mm | 519 mm  | Yes  |
| Knee Pivot From Floor                                 | KV        | 490.2 - 505.5 mm | 497 mm  | Yes  |
| Hip Width                                             | HW        | 355.6 - 391.2 mm | 384 mm  | Yes  |
| Top Rib Width From C/L                                | RW-1      | 165.1 - 180.3 mm | 176 mm  | Yes  |
| Bottom Rib Width From C/L                             | RW-2      | 165.1 - 180.3 mm | 175 mm  | Yes  |
| Difference Between Top &<br>Bottom Rib Width from C/L |           | <= 2.5 mm        | 1.0 mm  | Yes  |

Technician



Approved







# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 001 Certification No. 3-1

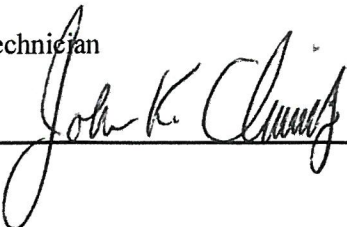
Test Date: 7/2/2009

| Test Parameter                                                       | Specification  | Test Results | Pass |
|----------------------------------------------------------------------|----------------|--------------|------|
| Temperature                                                          | 18.9 - 25.6 °C | 21.8 °C      | Yes  |
| Relative Humidity                                                    | 10 - 70 %      | 53 %         | Yes  |
| Peak Head Resultant Acceleration                                     | 120 - 150 g    | 135.2 g      | Yes  |
| Peak Head Longitudinal Acceleration                                  | (-15) - 15 g   | -6.1 g       | Yes  |
| Is Head Resultant Acceleration Curve<br>Unimodal Within 15% of Peak? | Yes            | Yes          | Yes  |

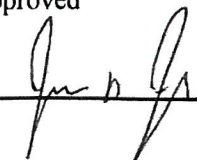
**Test meets specifications.**

**Comments:**

Technician



Approved



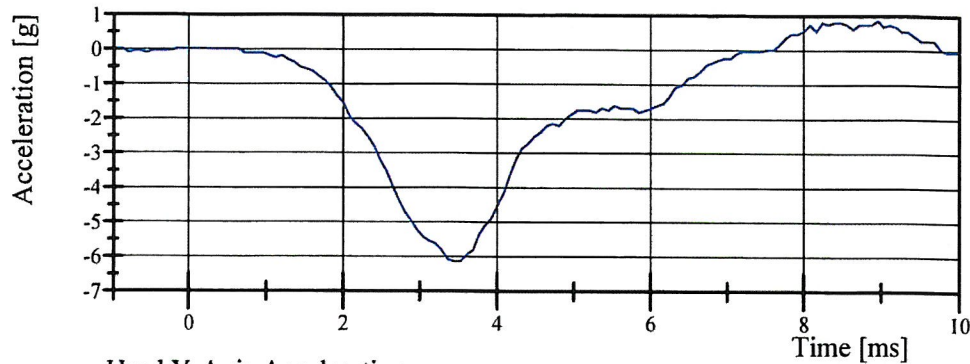
# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/2/2009

Head X-Axis Acceleration

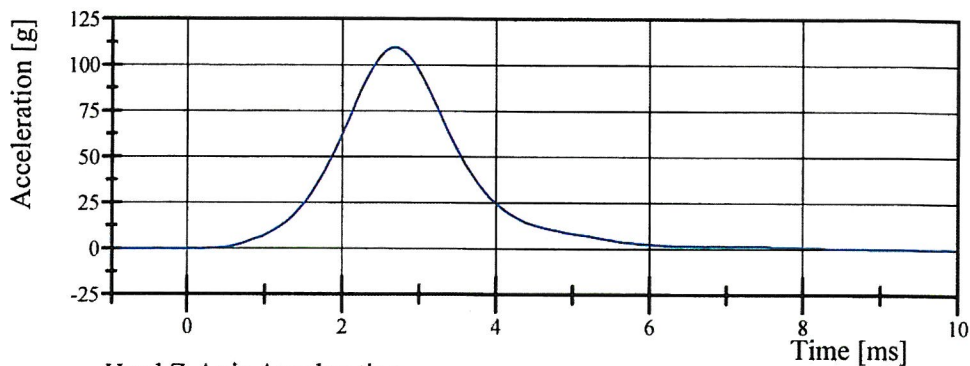


Filter Class: CFC\_1000

Max: 0.9 g at 9.0 ms

Min: -6.1 g at 3.4 ms

Head Y-Axis Acceleration

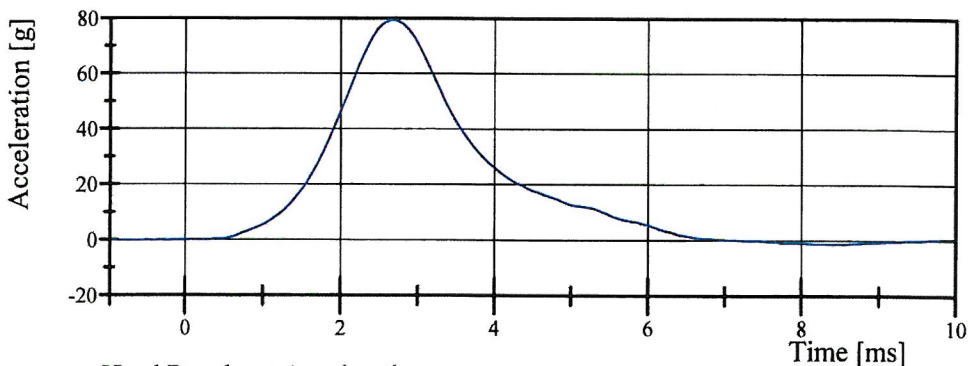


Filter Class: CFC\_1000

Max: 109.5 g at 2.6 ms

Min: -0.1 g at 9.7 ms

Head Z-Axis Acceleration

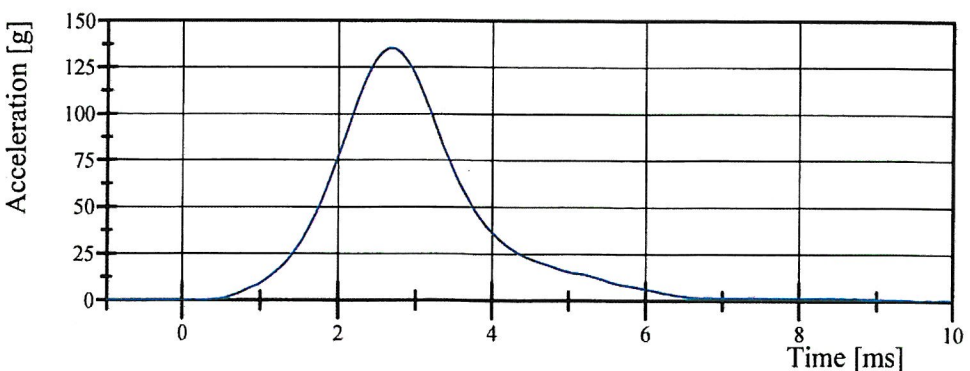


Filter Class: CFC\_1000

Max: 79.3 g at 2.6 ms

Min: -1.2 g at 8.4 ms

Head Resultant Acceleration



Filter Class: CFC\_1000

Max: 135.2 g at 2.6 ms

Min: 0.0 g at -0.9 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/2/2009

| Test Parameter                                                         | Specification         | Test Results | Pass |
|------------------------------------------------------------------------|-----------------------|--------------|------|
| Temperature                                                            | 20.6 - 22.2 °C        | 21.7 °C      | Yes  |
| Relative Humidity                                                      | 10 - 70 %             | 51 %         | Yes  |
| Pendulum Velocity                                                      | (-6.89) - (-7.13) m/s | -6.927 m/s   | Yes  |
| Pendulum Integrated Velocity<br>Change at 10 ms                        | 1.96 - 2.55 m/s       | 2.480 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 20 ms                        | 4.12 - 5.10 m/s       | 4.759 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 30 ms                        | 5.73 - 7.01 m/s       | 6.579 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 40 to 70 ms                  | 6.27 - 7.64 m/s       | 7.227 m/s    | Yes  |
| Total Head D-Plane Rotation                                            | (-66) - (-82) °       | -68.6 °      | Yes  |
| Total Head D-Plane Rotation<br>Time to 0° after Peak Rotation          | 58 - 67 ms            | 58.6 ms      | Yes  |
| Total Neck Occipital Condyle Moment                                    | 73 - 88 N·m           | 84.9 N·m     | Yes  |
| Total Neck Occipital Condyle Moment<br>Time to 0 N·m after Peak Moment | 49 - 64 ms            | 54.2 ms      | Yes  |
| Time from Peak Moment to Peak Rotation                                 | 2 - 16 ms             | 9.5 ms       | Yes  |

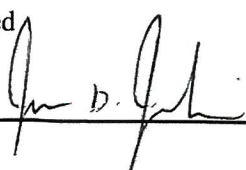
**Test meets specifications.**

**Comments:**

Technician



Approved

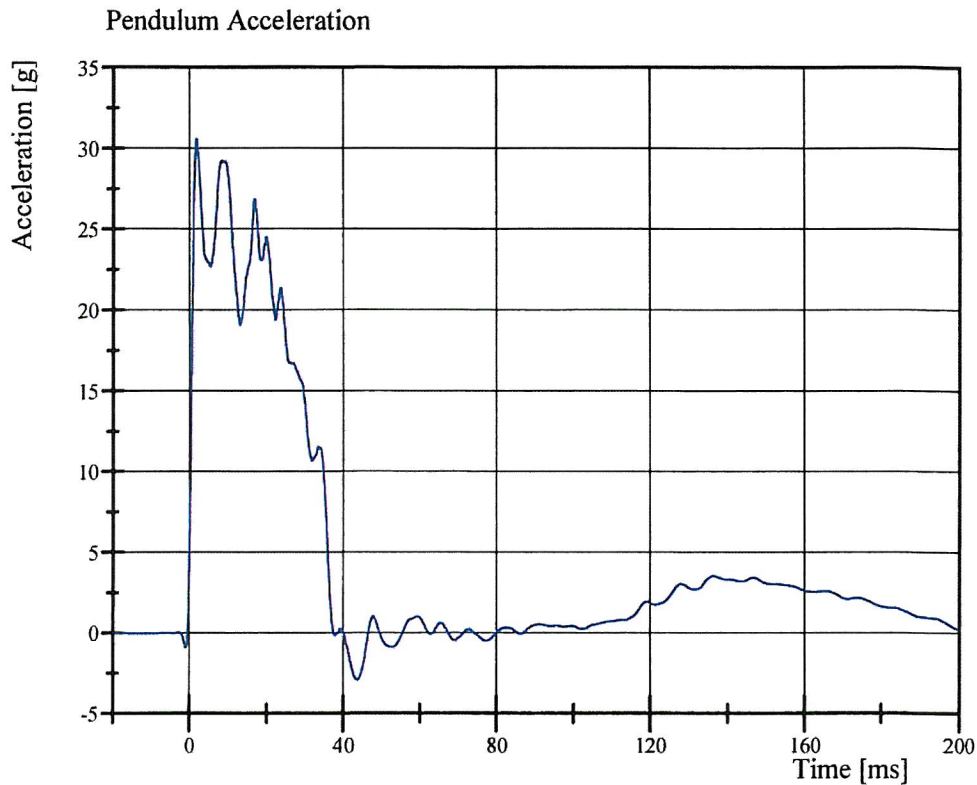


# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 3-1

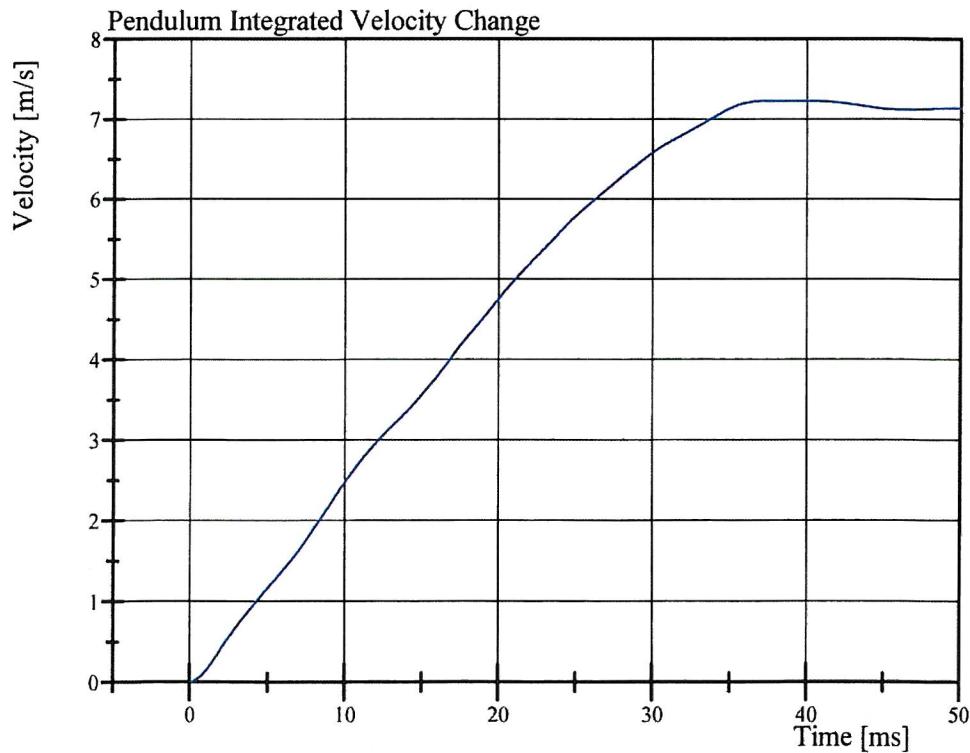
Test Date: 7/2/2009



Filter Class: CFC\_180

Max: 30.6 g at 1.8 ms

Min: -2.9 g at 43.6 ms



Filter Class: CFC\_180

Max: 7.2 m/s at 40.0 ms

Min: 0.0 m/s at 0.0 ms



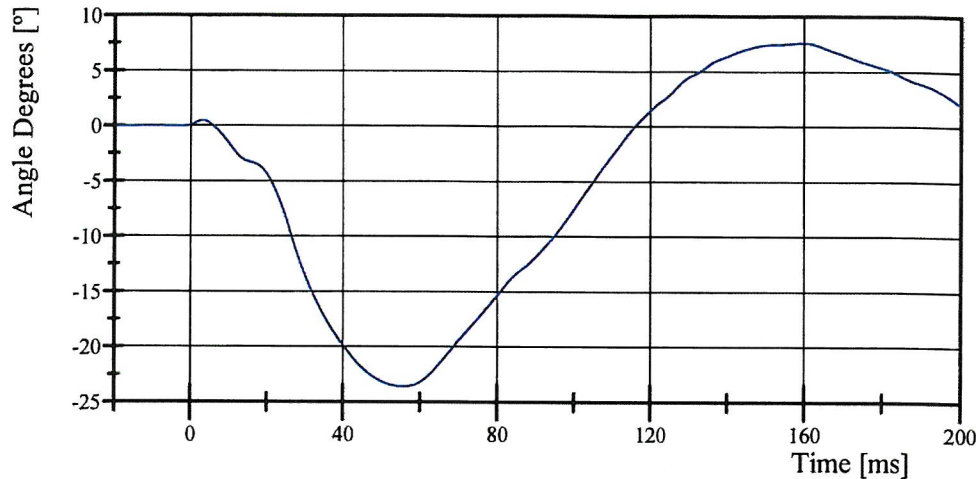
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 3-1

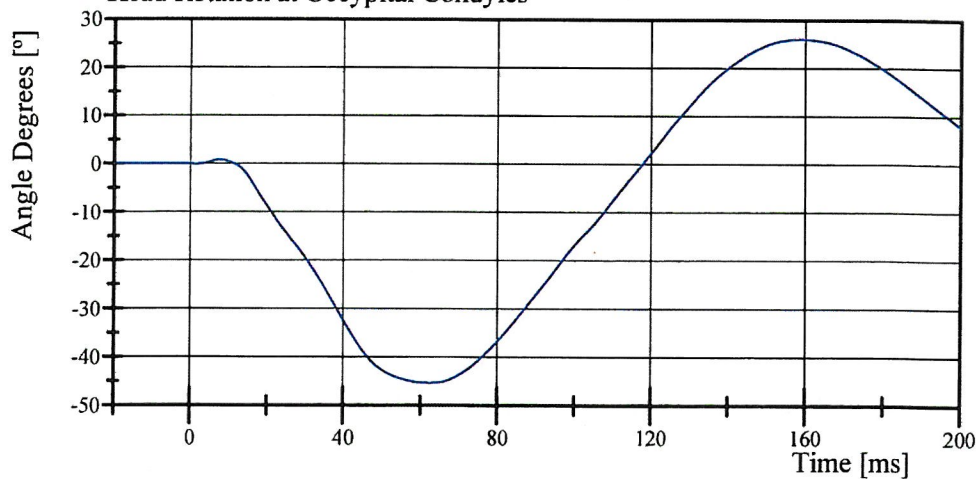
Test Date: 7/2/2009

Pot Rotation at the Base of Neck



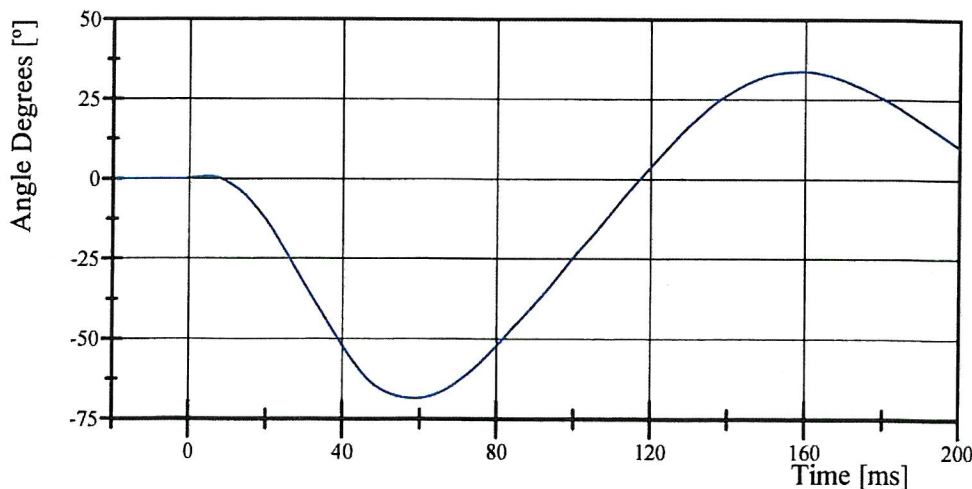
Filter Class: CFC\_60  
Max: 7.6 ° at 159.5 ms  
Min: -23.6 ° at 55.8 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 26.1 ° at 158.7 ms  
Min: -45.4 ° at 62.4 ms

Total Head D-Plane Rotation



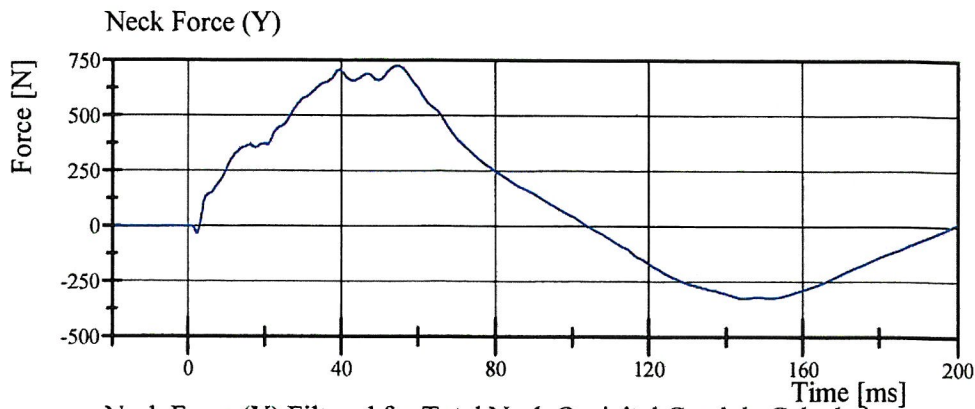
Filter Class: CFC\_60  
Max: 33.7 ° at 159.1 ms  
Min: -68.6 ° at 58.6 ms

# Transportation Research Center Inc.

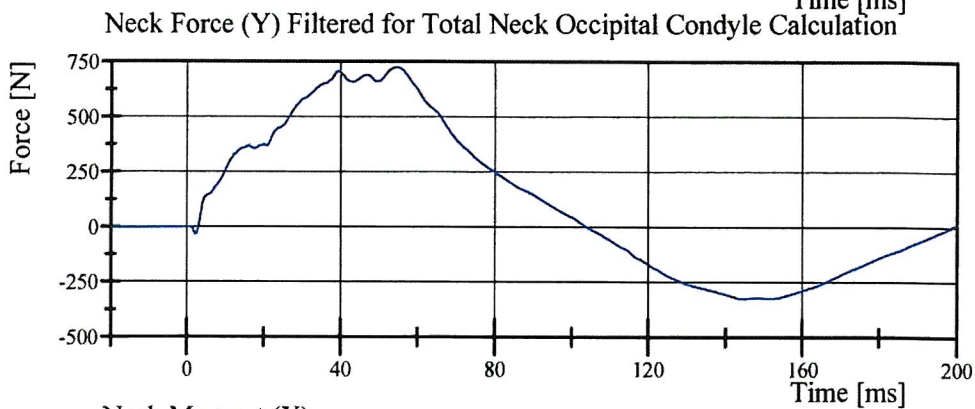
Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 3-1

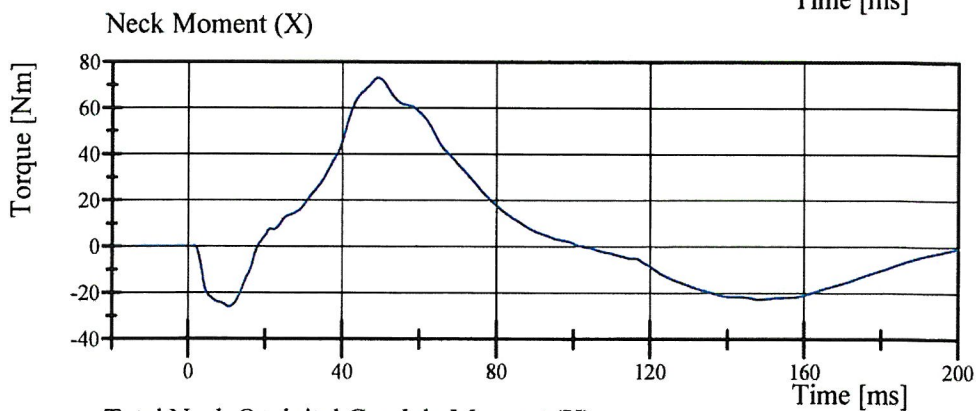
Test Date: 7/2/2009



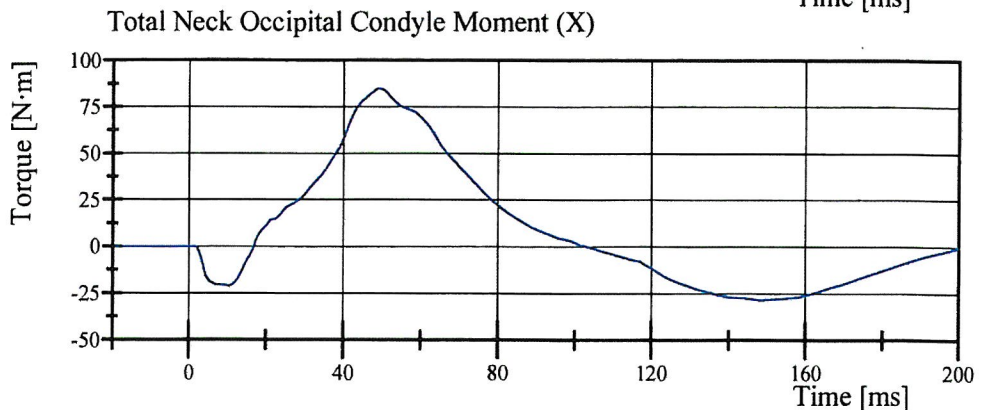
Filter Class: CFC\_1000  
Max: 727.3 N at 54.6 ms  
Min: -324.9 N at 144.3 ms



Filter Class: CFC\_600  
Max: 726.8 N at 54.7 ms  
Min: -324.5 N at 144.4 ms



Filter Class: CFC\_600  
Max: 73.1 Nm at 49.1 ms  
Min: -26.0 Nm at 10.5 ms



Filter Class: CFC\_600  
Max: 84.9 N·m at 49.0 ms  
Min: -28.4 N·m at 148.2 ms

# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 3-2

Test Date: 7/2/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.5 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 51 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 3,745 - 4,439 N  | 4,112.1 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 33.36 - 39.57 mm | 38.875 mm    | Yes  |

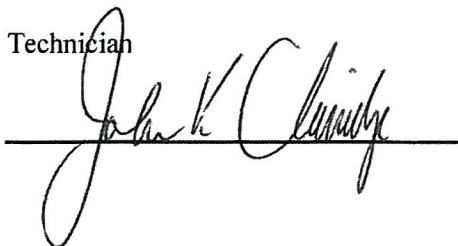
**Test meets specifications.**

## Comments:

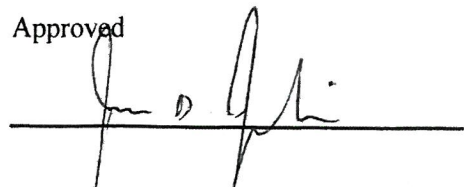
Actual Impactor Velocity (m/s): 6.096

Damper Setting: 7.5

Technician



Approved



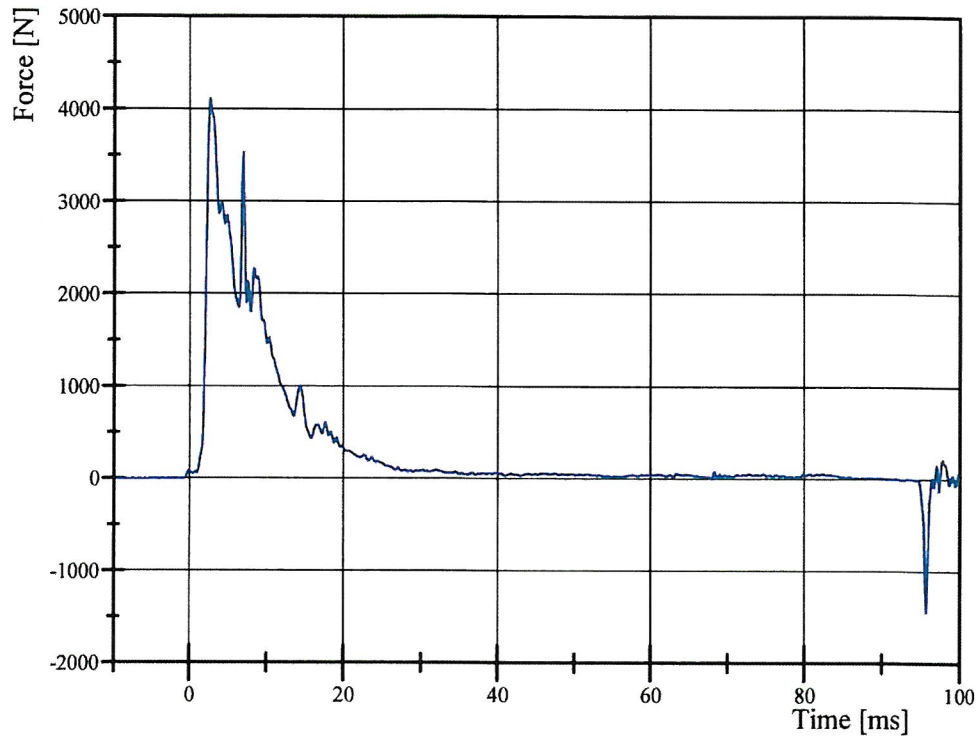
# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 3-2

Test Date: 7/2/2009

Shock Absorber Resistive Force

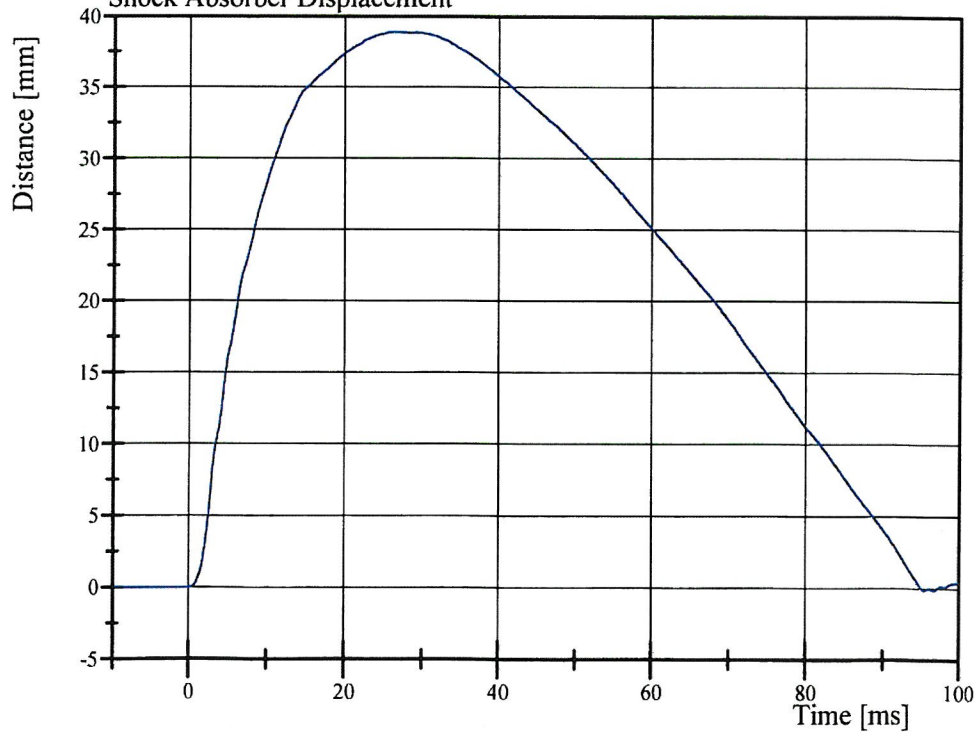


Filter Class: CFC\_1000

Max: 4,112.1 N at 2.6 ms

Min: -1,438.6 N at 95.8 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 38.9 mm at 26.6 ms

Min: -0.1 mm at 96.7 ms



# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/2/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 51 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 1,749 - 2,114 N  | 1,773.9 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 31.69 - 37.25 mm | 37.175 mm    | Yes  |

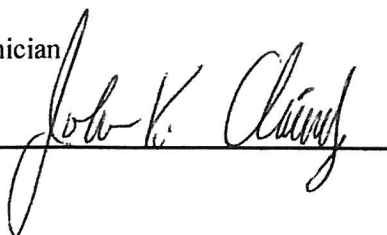
**Test meets specifications.**

## Comments:

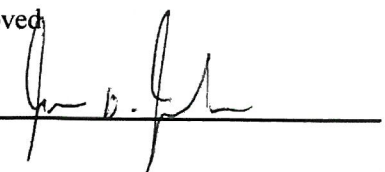
Actual Impactor Velocity (m/s): 4.283

Damper Setting: 7.5

Technician



Approved



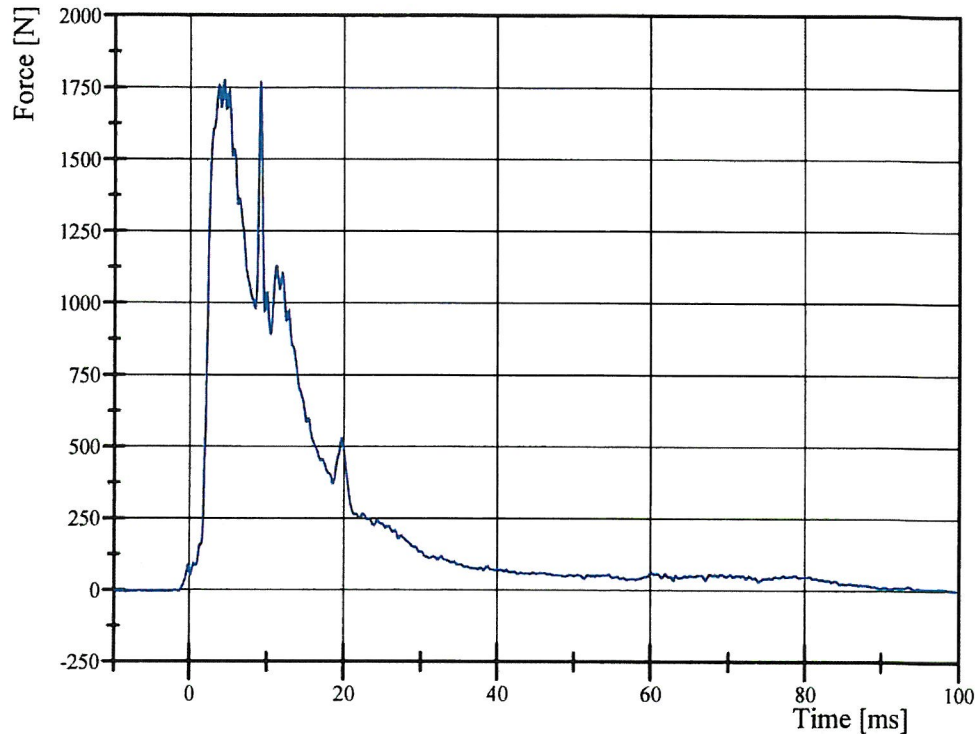
# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/2/2009

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 1,773.9 N at 4.4 ms  
Min: -6.0 N at -8.5 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 37.2 mm at 33.0 ms  
Min: -0.0 mm at -0.2 ms

# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/2/2009

| Test Parameter                           | Specification   | Test Results | Pass |
|------------------------------------------|-----------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C  | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %       | 50 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 856 - 1,146 N   | 955.8 N      | Yes  |
| Maximum Displacement at<br>Test Velocity | 30.2 - 35.19 mm | 35.015 mm    | Yes  |

**Test meets specifications.**

## Comments:

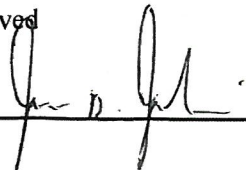
Actual Impactor Velocity (m/s): 3.076

Damper Setting: 7.5

Technician



Approved



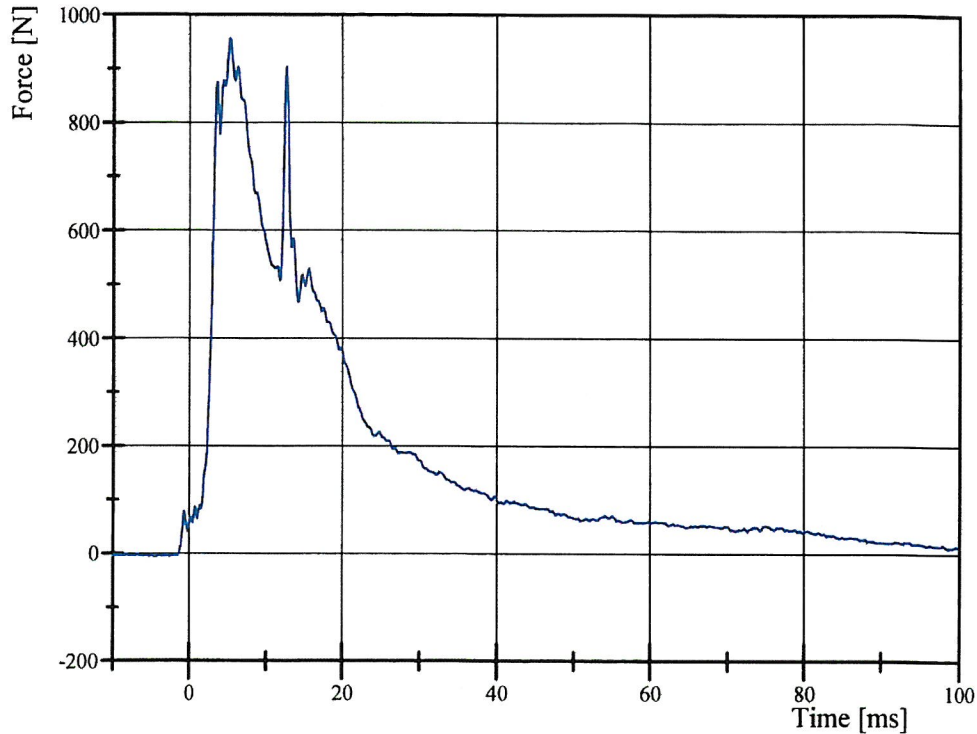
# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/2/2009

Shock Absorber Resistive Force

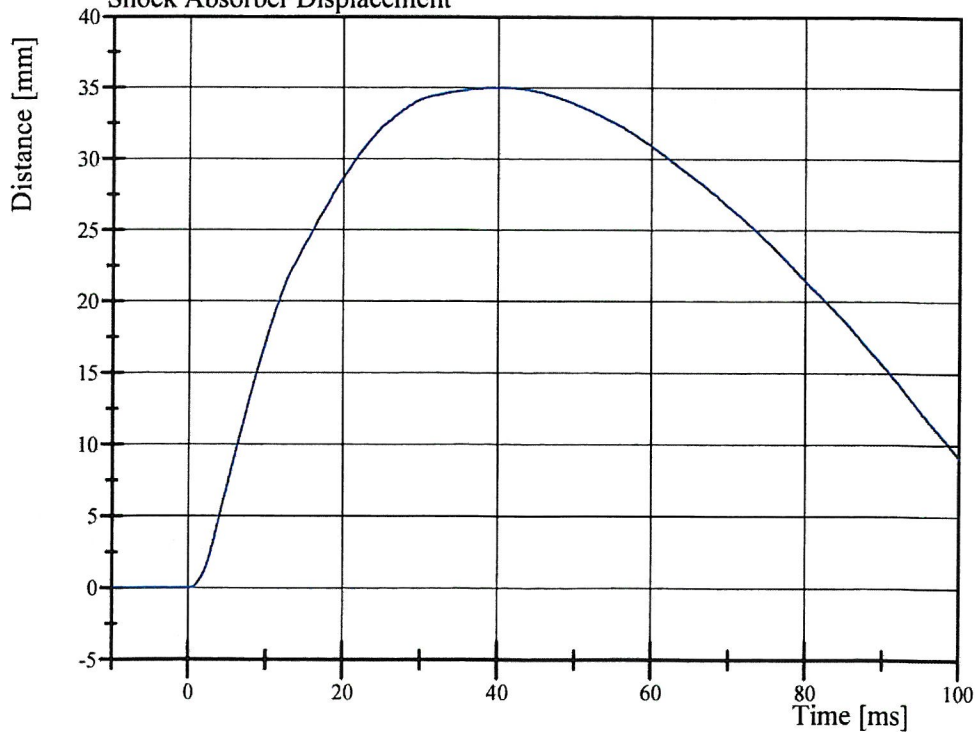


Filter Class: CFC\_1000

Max: 955.8 N at 5.2 ms

Min: -5.4 N at -9.9 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 35.0 mm at 39.6 ms

Min: -0.0 mm at -10.0 ms



# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 001 Certification No. 3-2

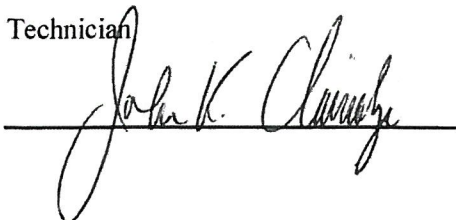
Test Date: 7/9/2009

| Test Parameter                   | Specification   | Test Results | Pass |
|----------------------------------|-----------------|--------------|------|
| Temperature                      | 18.9 - 25.6 °C  | 21.7 °C      | Yes  |
| Relative Humidity                | 10 - 70 %       | 50 %         | Yes  |
| Impactor Velocity                | 4.27 - 4.33 m/s | 4.313 m/s    | Yes  |
| Upper Rib Lateral Acceleration   | 37 - 46 g       | 42.9 g       | Yes  |
| Lower Rib Lateral Acceleration   | 37 - 46 g       | 42.7 g       | Yes  |
| Lower Spine Lateral Acceleration | 15 - 22 g       | 20.1 g       | Yes  |

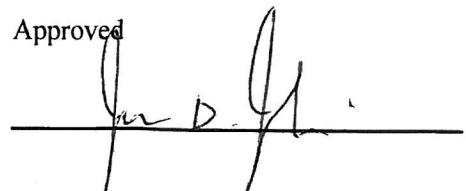
**Test meets specifications.**

**Comments:**

Technician



Approved



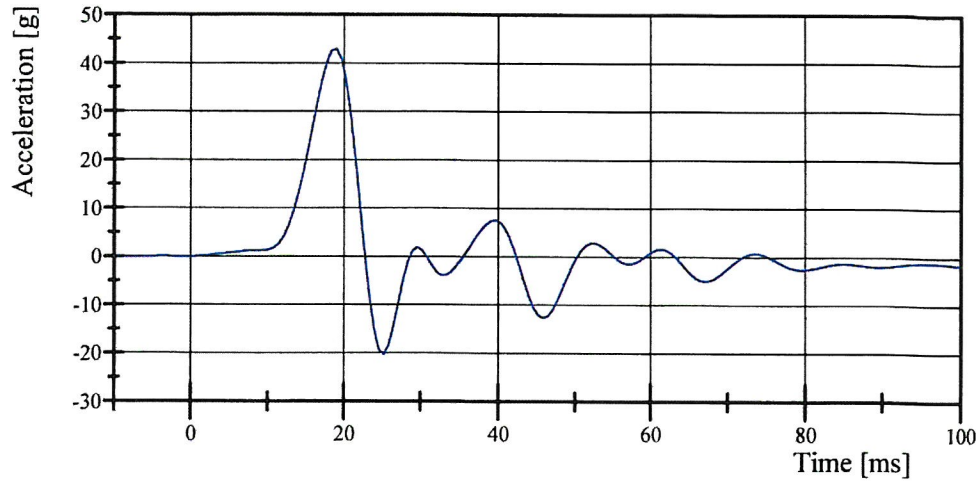
# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 001 Certification No. 3-2

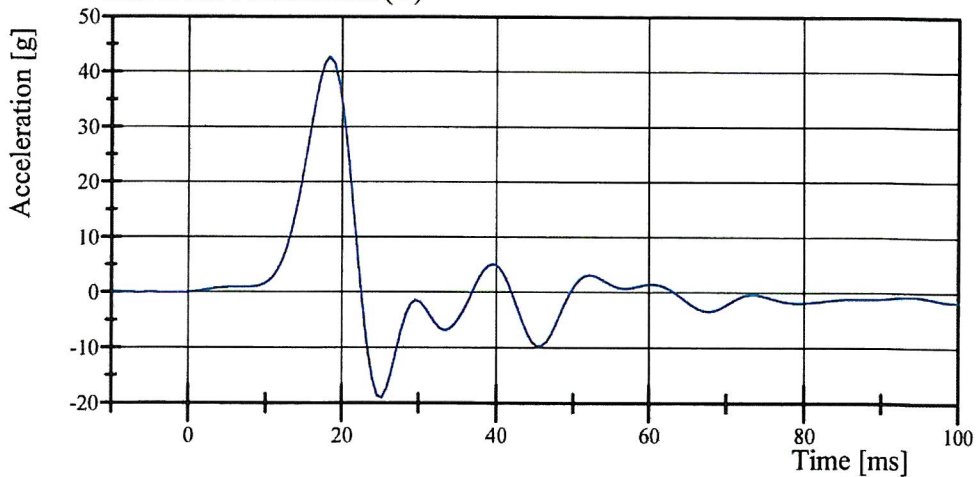
Test Date: 7/9/2009

Upper Rib Acceleration (Y)



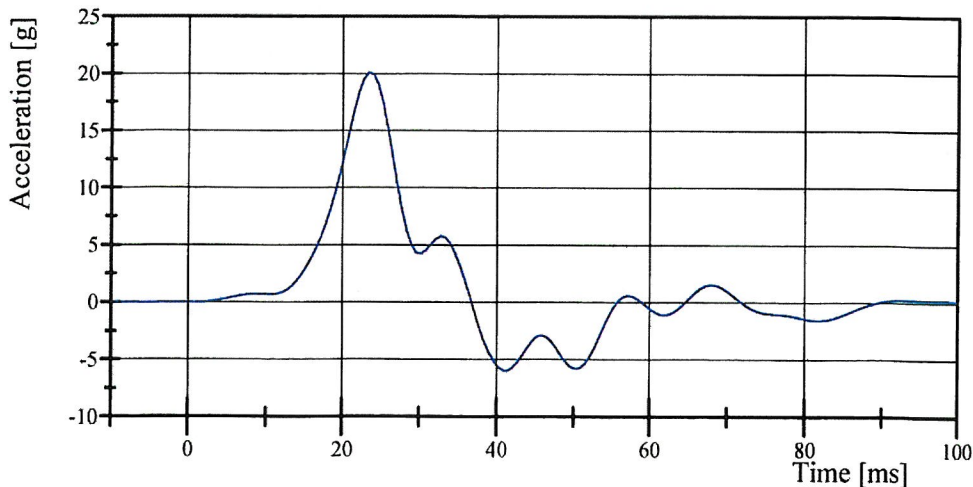
Filter Class: FIR\_100  
Max: 42.9 g at 19.0 ms  
Min: -20.2 g at 25.2 ms

Lower Rib Acceleration (Y)



Filter Class: FIR\_100  
Max: 42.7 g at 18.3 ms  
Min: -19.0 g at 25.2 ms

Lower Spine Acceleration (Y)



Filter Class: FIR\_100  
Max: 20.1 g at 23.4 ms  
Min: -6.0 g at 40.9 ms

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 001 Certification No. 3-4

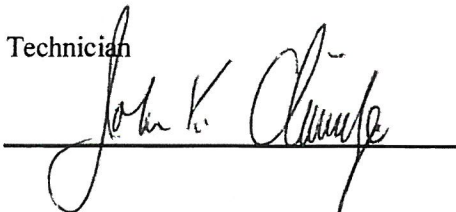
Test Date: 7/8/2009

| Test Parameter                 | Specification    | Test Results | Pass |
|--------------------------------|------------------|--------------|------|
| Temperature                    | 18.9 - 25.5 °C   | 21.7 °C      | Yes  |
| Relative Humidity              | 10 - 70 %        | 44 %         | Yes  |
| Probe Force<br>within Corridor | Yes              | Yes          | Yes  |
| Probe Velocity                 | 6.35 - 8.89 mm/s | 7.745 mm/s   | Yes  |

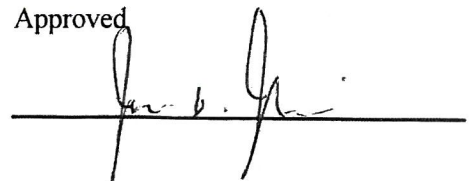
**Test meets specifications.**

**Comments:**

Technician



Approved

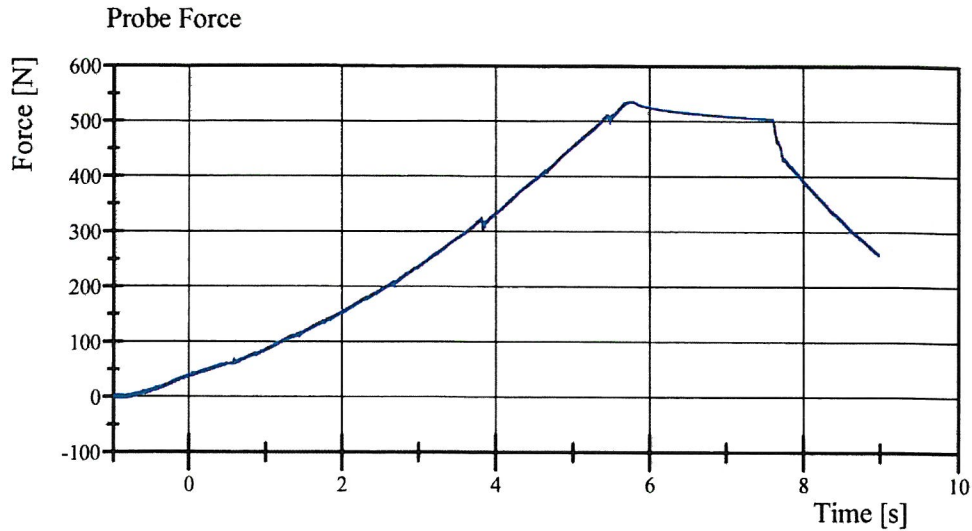


# Transportation Research Center Inc.

## Abdomen Compression

SID-HIII Serial No. 001 Certification No. 3-4

Test Date: 7/8/2009



Filter Class: CFC\_600

Max: 535.4 N at 5.7 s

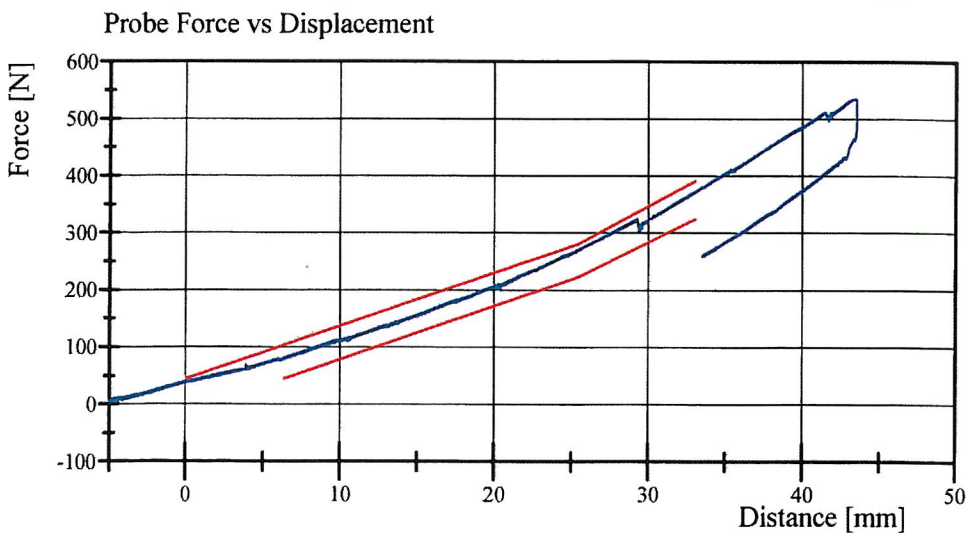
Min: -2.8 N at -0.8 s



Filter Class: CFC\_180

Max: 43.5 mm at 7.6 s

Min: -7.7 mm at -1.0 s



Filter Class: CFC\_600

Max: 535.4 N at 43.4 mm

Min: -3.2 N at -7.8 mm



**TRANSPORTATION RESEARCH CENTER INC.**

**LUMBAR FLEXION TEST**

**SID PART 572B**

**CAL DATE: 02-Jul-09**

**TRC, INC.**

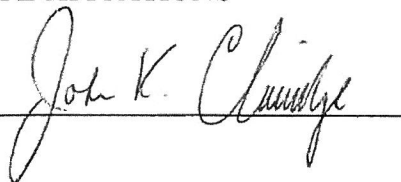
**TEST NO: TOFL-01**

**572B SN 001 TORSO FLEX CAL 03**

| TEST PARAMETER                      | SPECIFICATION  | TEST RESULTS |
|-------------------------------------|----------------|--------------|
| TEMPERATURE                         | 18.9 – 25.6° C | 21.7 °C      |
| RELATIVE HUMIDITY                   | 10 – 70 %      | 52 %         |
| FORCE AT 0 DEG. FLEXION             | -27 – 27 N     | 0 N          |
| FORCE AT 20 DEG OF FLEXION          | 98 – 151 N     | 132.5 N      |
| FORCE AT 30 DEG OF FLEXION          | 151 – 205 N    | 188.0 N      |
| FORCE AT 40 DEG OF FLEXION          | 205 – 258 N    | 225.5 N      |
| NET RETURN ANGLE AFTER 3<br>MINUTES | < 12 °         | 5.9 °        |

TEST MEETS SPECIFICATIONS

TECHNICIAN



# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 001 Certification No. 3-1

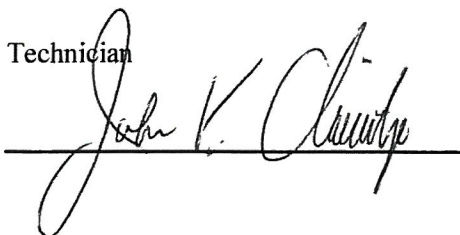
Test Date: 7/9/2009

| Test Parameter                                    | Specification   | Test Results | Pass |
|---------------------------------------------------|-----------------|--------------|------|
| Temperature                                       | 18.9 - 25.5 °C  | 21.7 °C      | Yes  |
| Relative Humidity                                 | 10 - 70 %       | 49 %         | Yes  |
| Impactor Velocity                                 | 4.27 - 4.33 m/s | 4.322 m/s    | Yes  |
| Pelvis Lateral Acceleration<br>Duration above 20g | 3 - 7 ms        | 6.4 ms       | Yes  |
| Pelvis Lateral Acceleration                       | 40 - 60 g       | 46.2 g       | Yes  |
| Is Acceleration Curve Unimodal<br>Above 20g?      | Yes             | Yes          | Yes  |

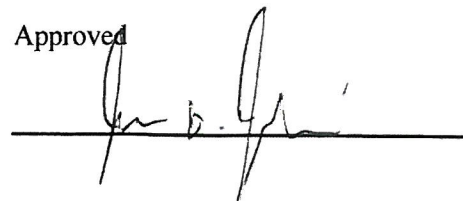
**Test meets specifications.**

**Comments:**

Technician



Approved

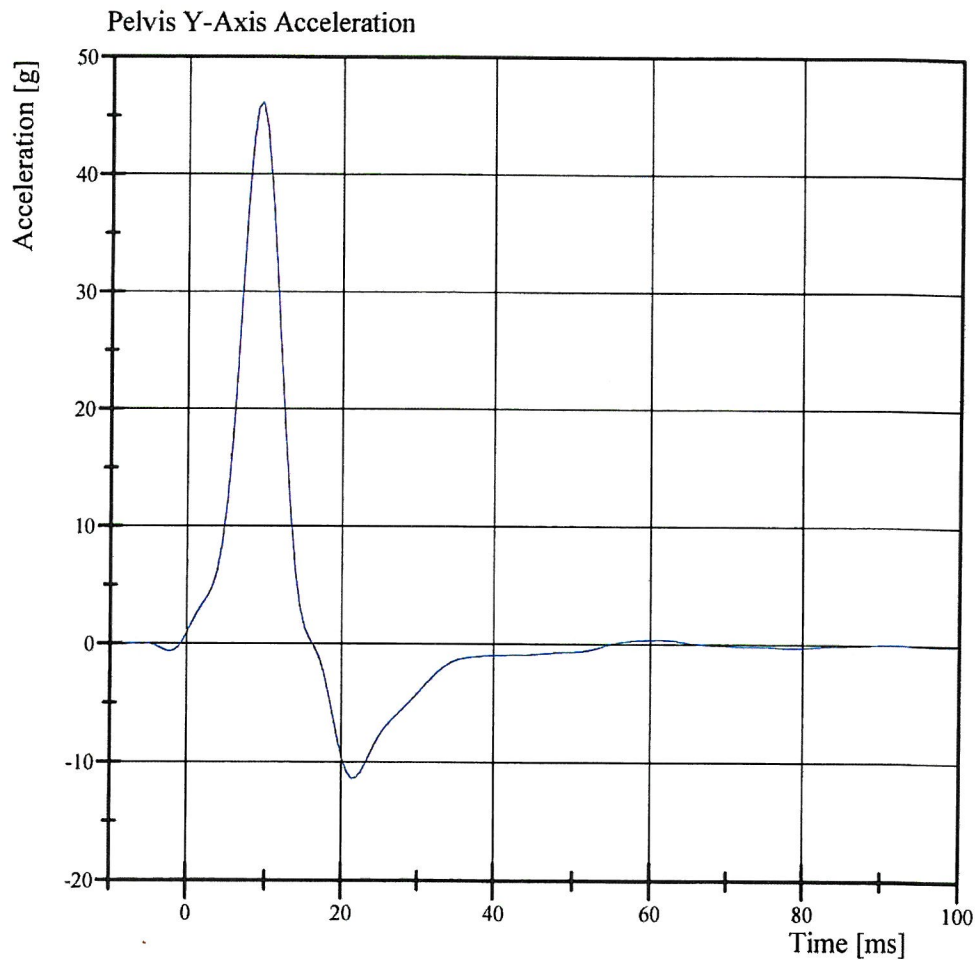


# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 001 Certification No. 3-1

Test Date: 7/9/2009



Filter Class: FIR\_100  
Max: 46.2 g at 9.4 ms  
Min: -11.4 g at 21.3 ms

CALIBRATION TEST RESULTS

POST-TEST

SID/HIII: 001



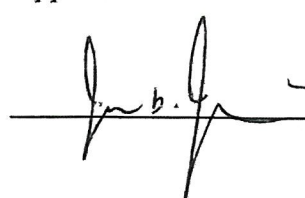
**Transportation Research Center Inc.**  
**572F SID Dummy**  
**External Dimensions**  
**Serial No. 001 Calibration No. 04**

| Test Parameter                                        | Dimension | Specification    | Results | Pass |
|-------------------------------------------------------|-----------|------------------|---------|------|
| Seated Height                                         | SH        | 889.0 - 909.3 mm | 902 mm  | Yes  |
| Rib Height                                            | RH        | 501.7 - 520.7 mm | 515 mm  | Yes  |
| Hip Pivot Height                                      | HP        | 99.1 REF mm      | 99.1 mm |      |
| Knee Pivot From Backline                              | KH        | 510.5 - 525.8 mm | 520 mm  | Yes  |
| Knee Pivot From Floor                                 | KV        | 490.2 - 505.5 mm | 498 mm  | Yes  |
| Hip Width                                             | HW        | 355.6 - 391.2 mm | 383 mm  | Yes  |
| Top Rib Width From C/L                                | RW-1      | 165.1 - 180.3 mm | 176 mm  | Yes  |
| Bottom Rib Width From C/L                             | RW-2      | 165.1 - 180.3 mm | 175 mm  | Yes  |
| Difference Between Top &<br>Bottom Rib Width from C/L |           | <= 2.5 mm        | 1.0 mm  | Yes  |

Technician



Approved





# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 001 Certification No. 4-1

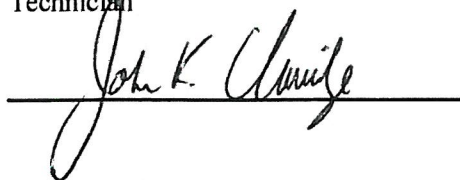
Test Date: 9/23/2009

| Test Parameter                                                       | Specification  | Test Results | Pass |
|----------------------------------------------------------------------|----------------|--------------|------|
| Temperature                                                          | 18.9 - 25.6 °C | 21.6 °C      | Yes  |
| Relative Humidity                                                    | 10 - 70 %      | 52 %         | Yes  |
| Peak Head Resultant Acceleration                                     | 120 - 150 g    | 147.7 g      | Yes  |
| Peak Head Longitudinal Acceleration                                  | (-15) - 15 g   | 5.1 g        | Yes  |
| Is Head Resultant Acceleration Curve<br>Unimodal Within 15% of Peak? | Yes            | Yes          | Yes  |

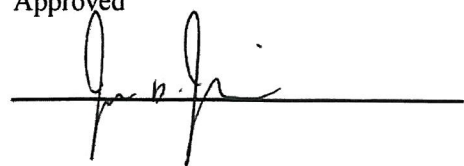
**Test meets specifications.**

**Comments:**

Technician



Approved

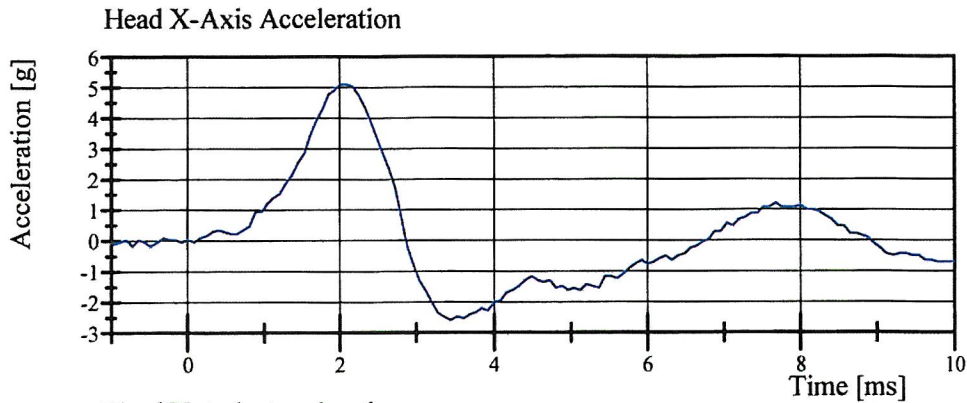


# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 001 Certification No. 4-1

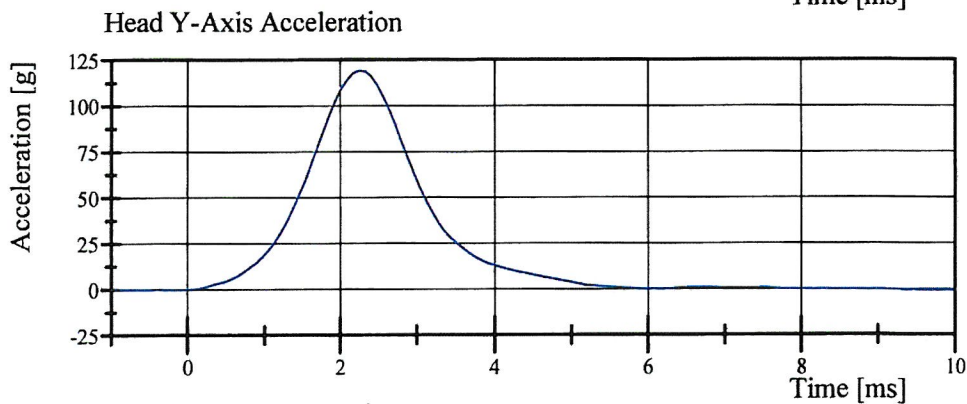
Test Date: 9/23/2009



Filter Class: CFC\_1000

Max: 5.1 g at 2.0 ms

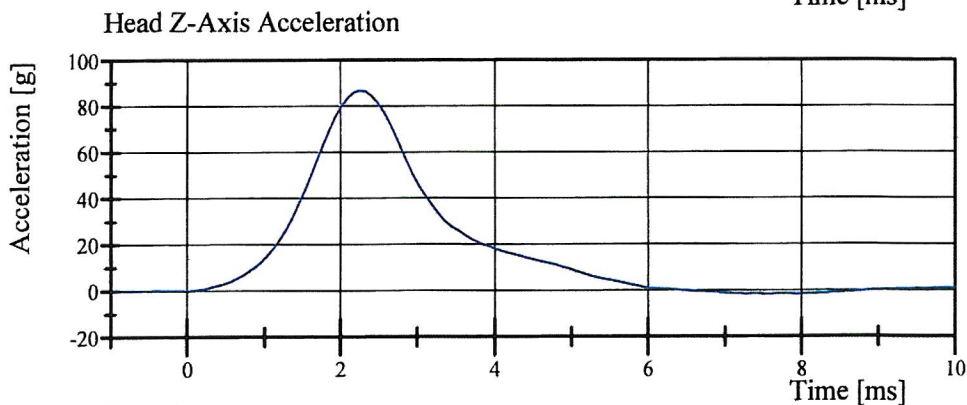
Min: -2.6 g at 3.4 ms



Filter Class: CFC\_1000

Max: 119.4 g at 2.2 ms

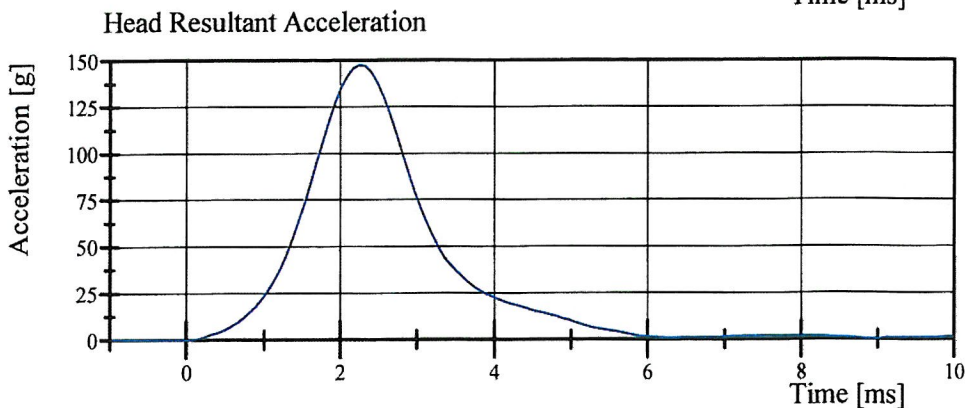
Min: -0.5 g at 10.0 ms



Filter Class: CFC\_1000

Max: 86.8 g at 2.2 ms

Min: -1.5 g at 7.3 ms



Filter Class: CFC\_1000

Max: 147.7 g at 2.2 ms

Min: 0.0 g at -1.0 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 4-3

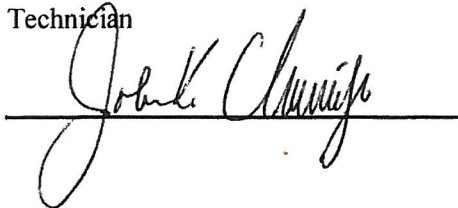
Test Date: 9/24/2009

| Test Parameter                                                         | Specification         | Test Results | Pass |
|------------------------------------------------------------------------|-----------------------|--------------|------|
| Temperature                                                            | 20.6 - 22.2 °C        | 21.6 °C      | Yes  |
| Relative Humidity                                                      | 10 - 70 %             | 54 %         | Yes  |
| Pendulum Velocity                                                      | (-6.89) - (-7.13) m/s | -6.941 m/s   | Yes  |
| Pendulum Integrated Velocity<br>Change at 10 ms                        | 1.96 - 2.55 m/s       | 2.370 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 20 ms                        | 4.12 - 5.10 m/s       | 4.718 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 30 ms                        | 5.73 - 7.01 m/s       | 6.676 m/s    | Yes  |
| Pendulum Integrated Velocity<br>Change at 40 to 70 ms                  | 6.27 - 7.64 m/s       | 7.250 m/s    | Yes  |
| Total Head D-Plane Rotation                                            | (-66) - (-82) °       | -74.6 °      | Yes  |
| Total Head D-Plane Rotation<br>Time to 0° after Peak Rotation          | 58 - 67 ms            | 59.4 ms      | Yes  |
| Total Neck Occipital Condyle Moment                                    | 73 - 88 N·m           | 86.7 N·m     | Yes  |
| Total Neck Occipital Condyle Moment<br>Time to 0 N·m after Peak Moment | 49 - 64 ms            | 53.9 ms      | Yes  |
| Time from Peak Moment to Peak Rotation                                 | 2 - 16 ms             | 9.7 ms       | Yes  |

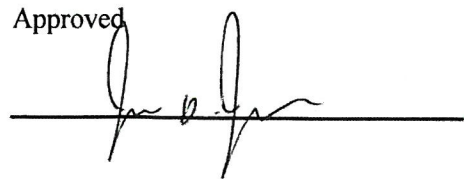
**Test meets specifications.**

**Comments:**

Technician



Approved





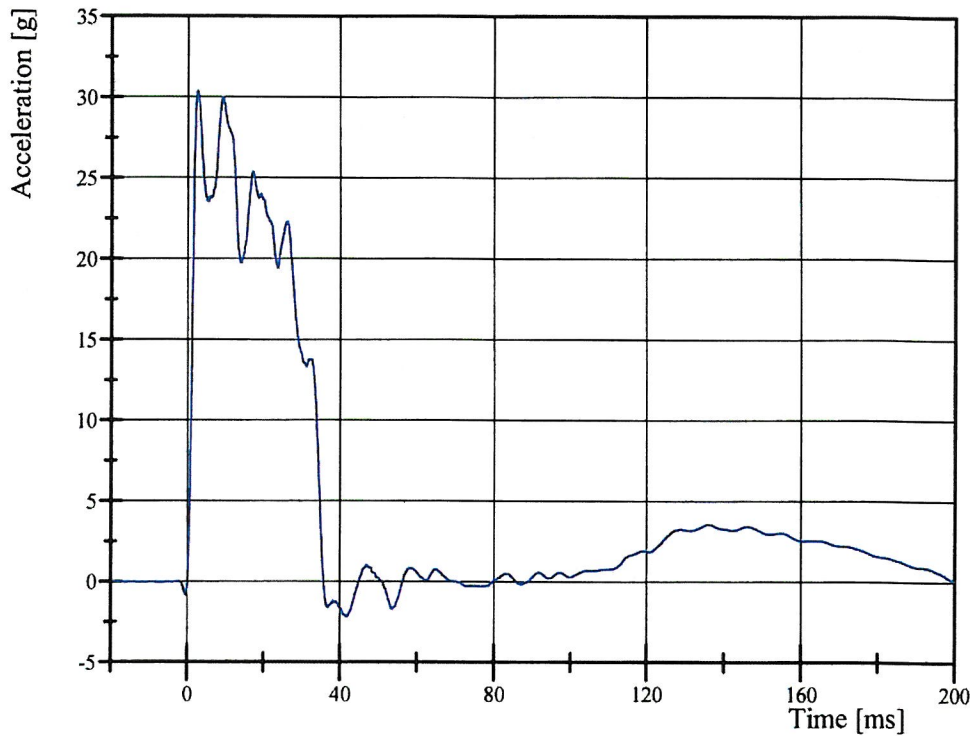
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 4-3

Test Date: 9/24/2009

Pendulum Acceleration

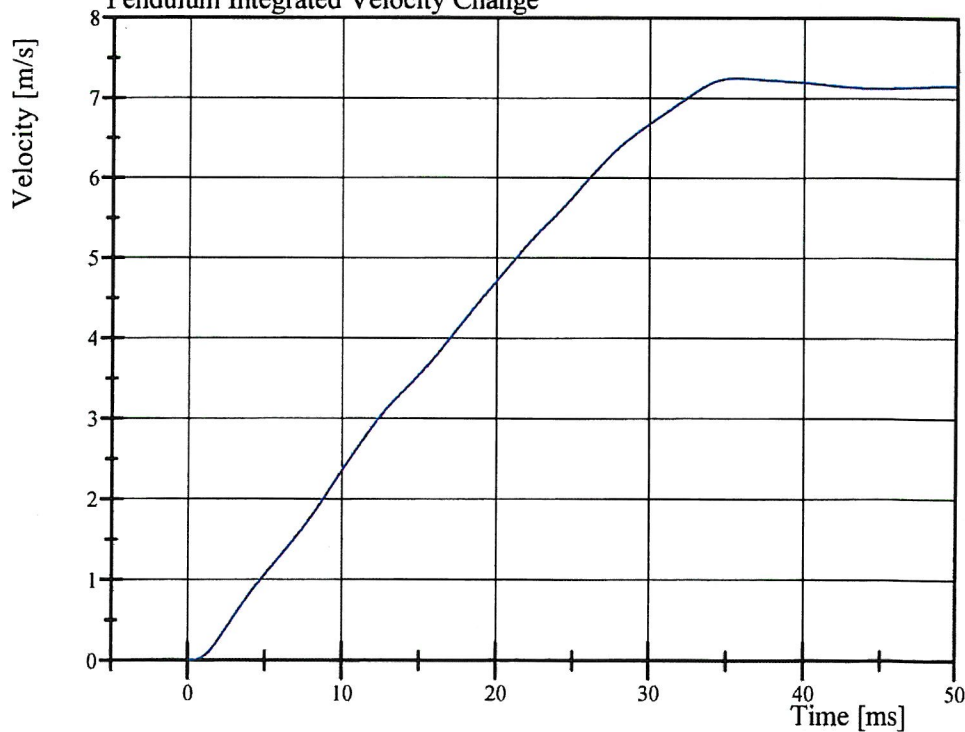


Filter Class: CFC\_180

Max: 30.4 g at 2.5 ms

Min: -2.2 g at 41.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 7.2 m/s at 35.6 ms

Min: 0.0 m/s at 0.0 ms

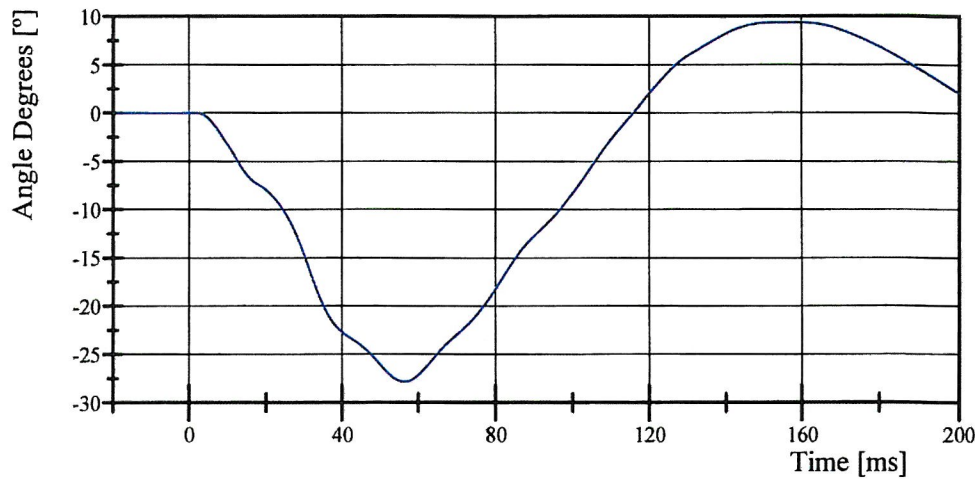
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 4-3

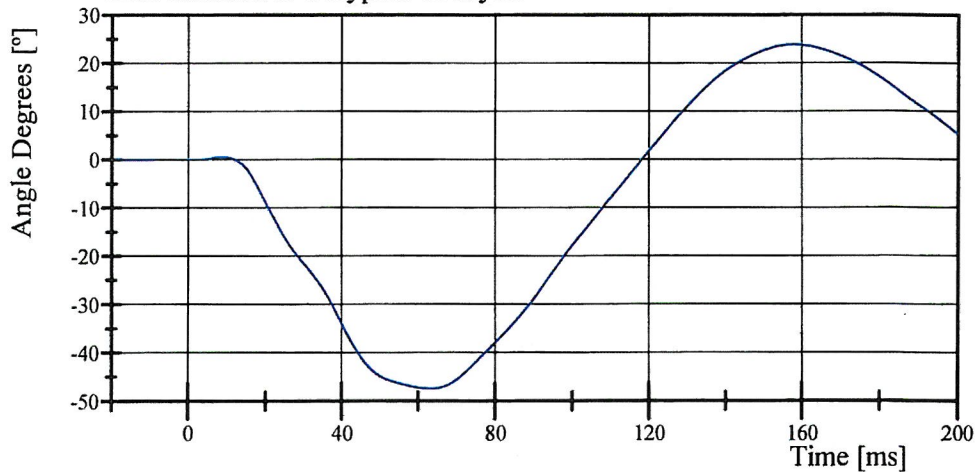
Test Date: 9/24/2009

Pot Rotation at the Base of Neck



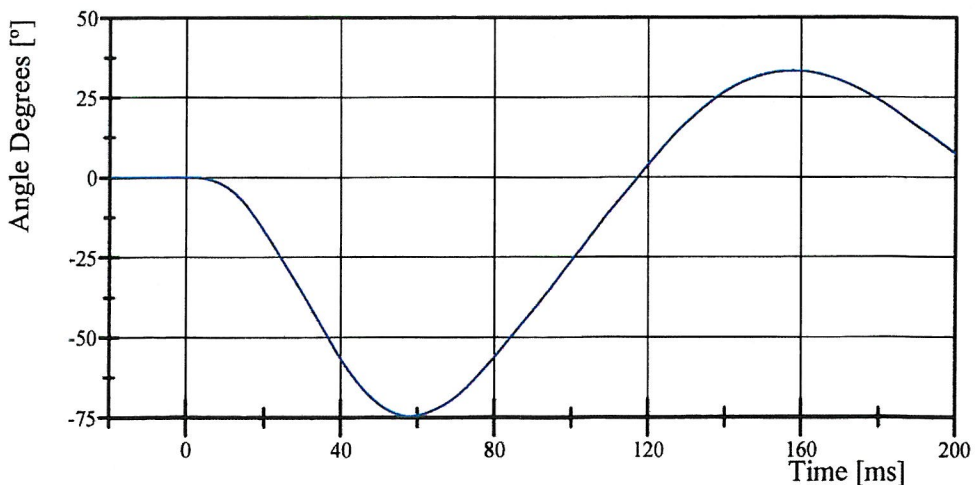
Filter Class: CFC\_60  
Max: 9.4 ° at 157.8 ms  
Min: -27.8 ° at 56.2 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 23.9 ° at 157.8 ms  
Min: -47.4 ° at 63.3 ms

Total Head D-Plane Rotation



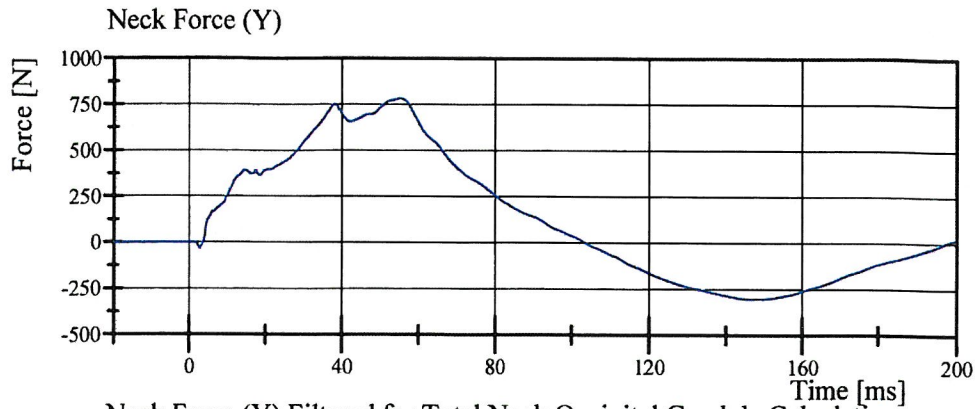
Filter Class: CFC\_60  
Max: 33.3 ° at 157.8 ms  
Min: -74.6 ° at 57.8 ms

# Transportation Research Center Inc.

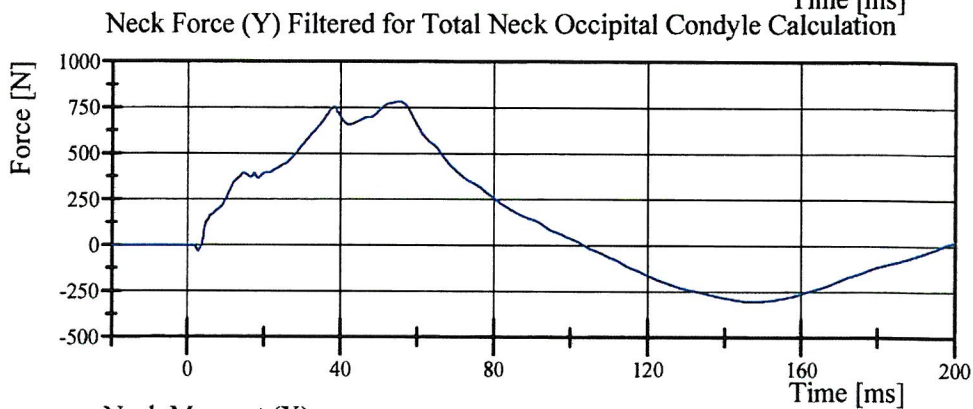
Left Lateral Neck

SID-HIII Serial No. 001 Certification No. 4-3

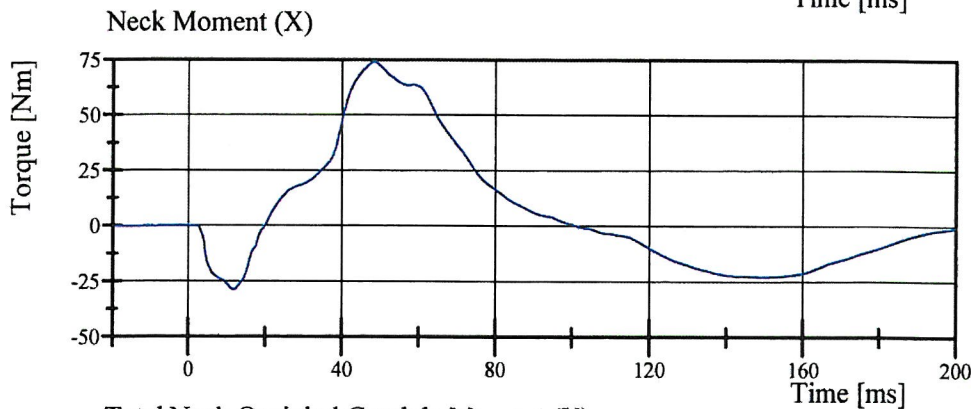
Test Date: 9/24/2009



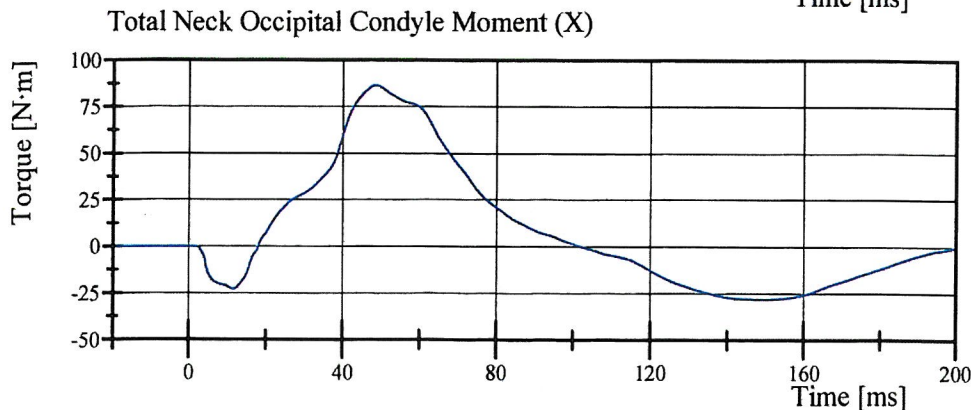
Filter Class: CFC\_1000  
Max: 785.5 N at 54.9 ms  
Min: -302.9 N at 146.6 ms



Filter Class: CFC\_600  
Max: 785.0 N at 55.0 ms  
Min: -302.5 N at 146.6 ms



Filter Class: CFC\_600  
Max: 74.2 Nm at 48.1 ms  
Min: -28.7 Nm at 11.7 ms



Filter Class: CFC\_600  
Max: 86.7 N·m at 48.2 ms  
Min: -28.1 N·m at 148.5 ms

# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 4-2

Test Date: 9/24/2009

| Test Parameter                           | Specification    | Test Results | Pass |
|------------------------------------------|------------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C   | 21.7 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %        | 55 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 3,706 - 4,394 N  | 4,077.2 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 33.34 - 39.54 mm | 39.068 mm    | Yes  |

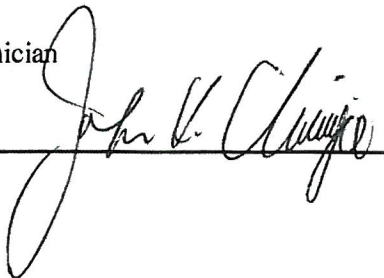
**Test meets specifications.**

## Comments:

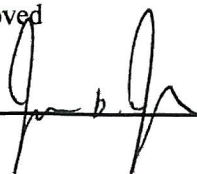
Actual Impactor Velocity (m/s): 6.067

Damper Setting: 7.5

Technician



Approved





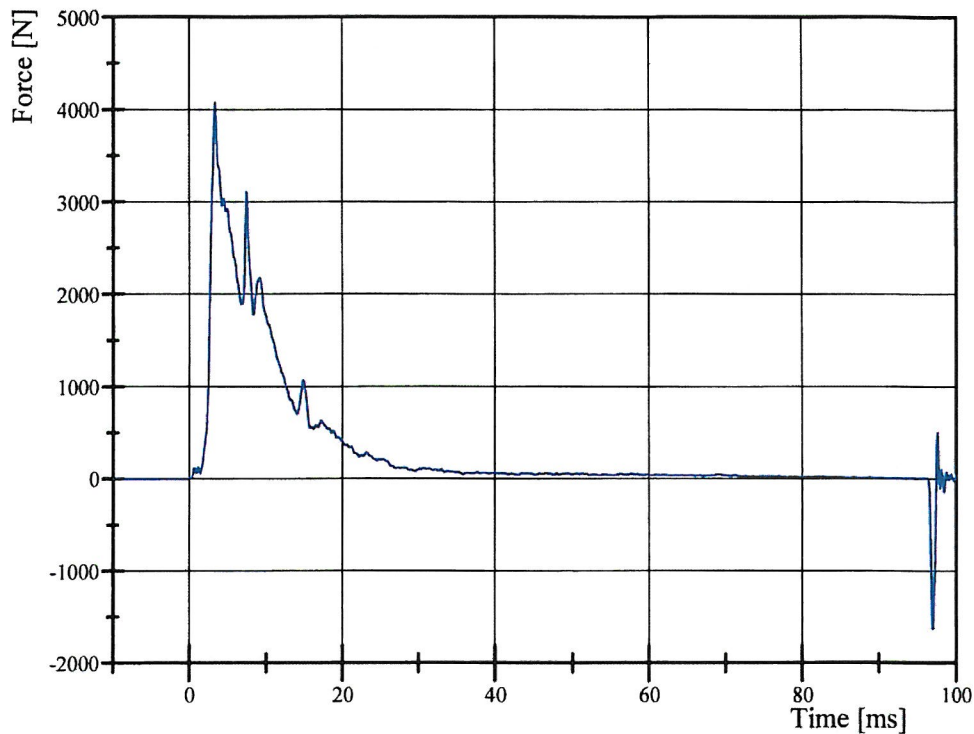
# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 4-2

Test Date: 9/24/2009

Shock Absorber Resistive Force

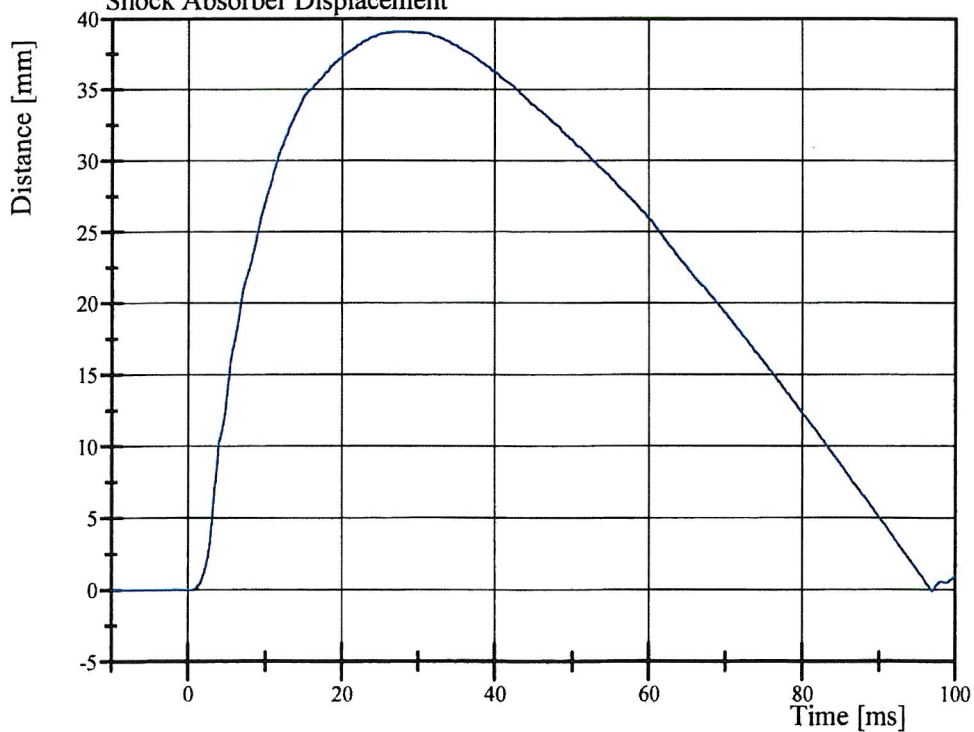


Filter Class: CFC\_1000

Max: 4,077.2 N at 3.4 ms

Min: -1,620.4 N at 96.9 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 39.1 mm at 27.4 ms

Min: -0.1 mm at 97.0 ms

# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 4-1

Test Date: 9/24/2009

| Test Parameter                           | Specification   | Test Results | Pass |
|------------------------------------------|-----------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C  | 21.6 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %       | 54 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 1,757 - 2,124 N | 1,776.2 N    | Yes  |
| Maximum Displacement at<br>Test Velocity | 31.7 - 37.26 mm | 37.182 mm    | Yes  |

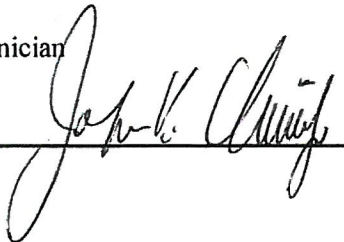
**Test meets specifications.**

## Comments:

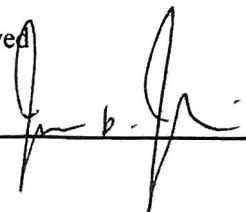
Actual Impactor Velocity (m/s): 4.293

Damper Setting: 7.5

Technician



Approved



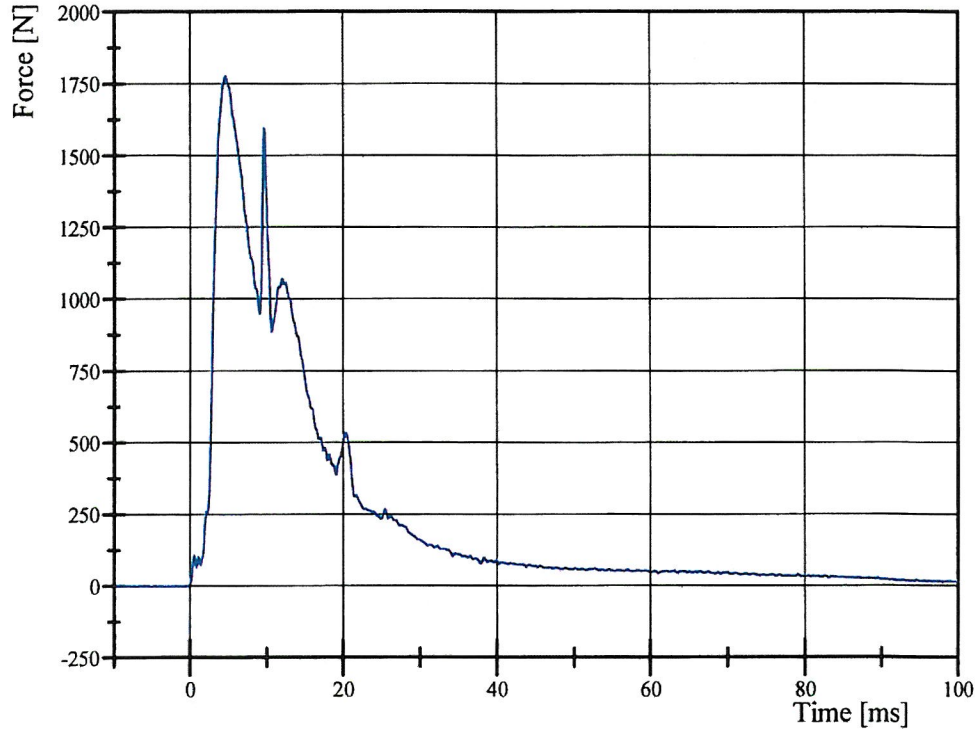
# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 4-1

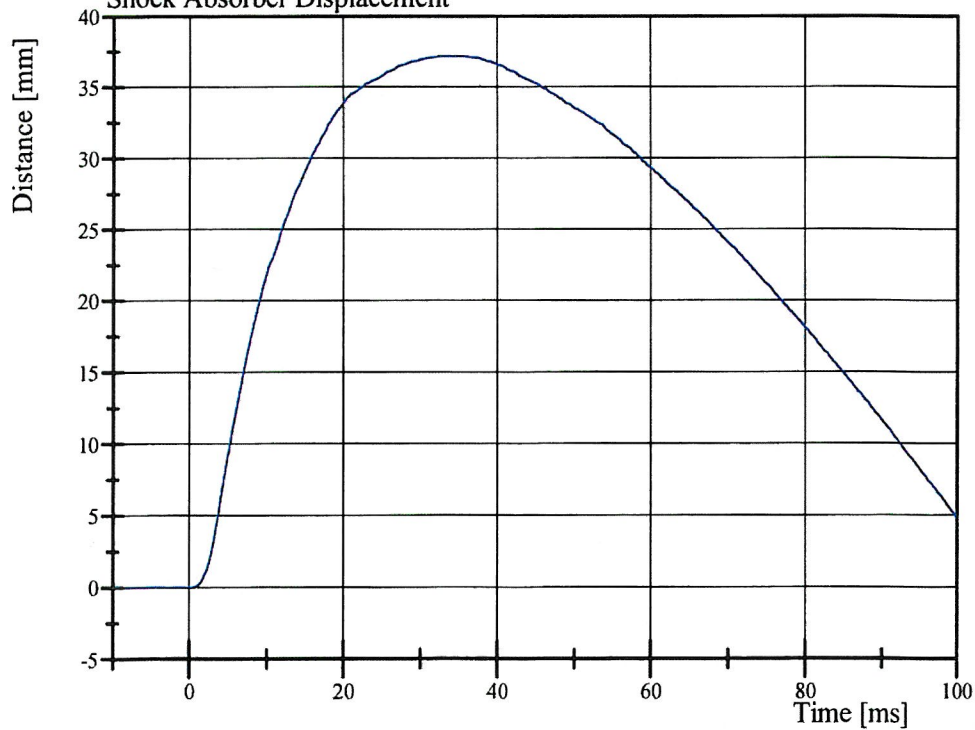
Test Date: 9/24/2009

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 1,776.2 N at 4.6 ms  
Min: -2.0 N at -5.2 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 37.2 mm at 33.8 ms  
Min: -0.0 mm at -9.6 ms

# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 4-1

Test Date: 9/24/2009

| Test Parameter                           | Specification   | Test Results | Pass |
|------------------------------------------|-----------------|--------------|------|
| Temperature                              | 18.9 - 25.5 °C  | 21.7 °C      | Yes  |
| Relative Humidity                        | 10 - 70 %       | 54 %         | Yes  |
| Maximum Force at<br>Test Velocity        | 856 - 1,145 N   | 921.4 N      | Yes  |
| Maximum Displacement at<br>Test Velocity | 30.2 - 35.19 mm | 34.770 mm    | Yes  |

**Test meets specifications.**

## Comments:

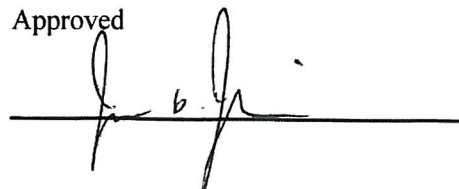
Actual Impactor Velocity (m/s): 3.075

Damper Setting: 7.5

Technician



Approved





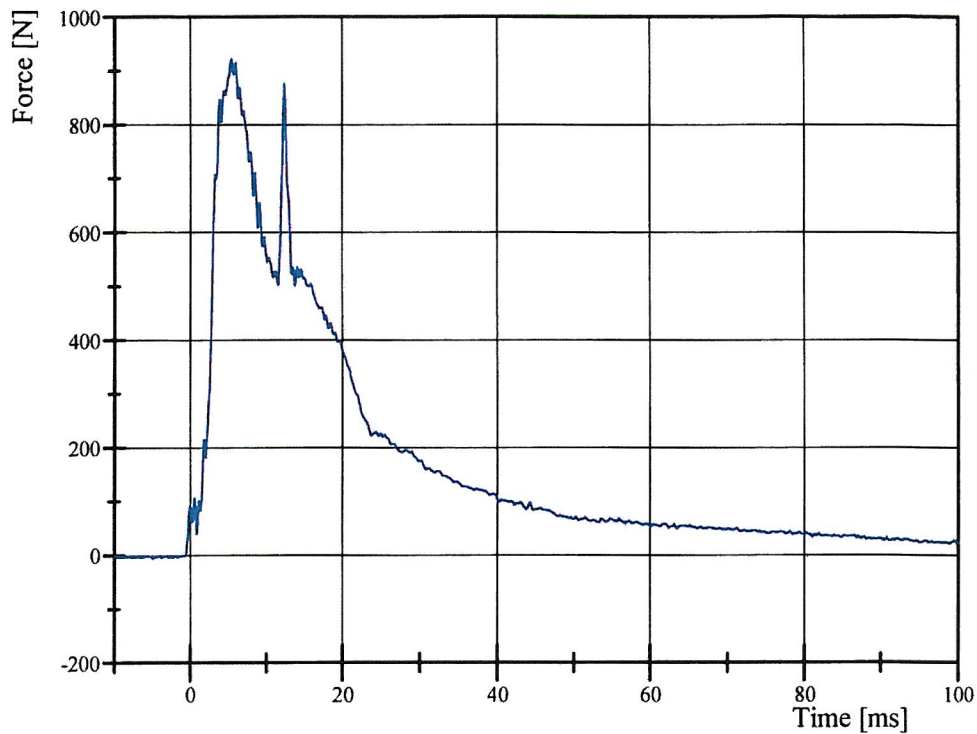
# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 001 Certification No. 4-1

Test Date: 9/24/2009

Shock Absorber Resistive Force

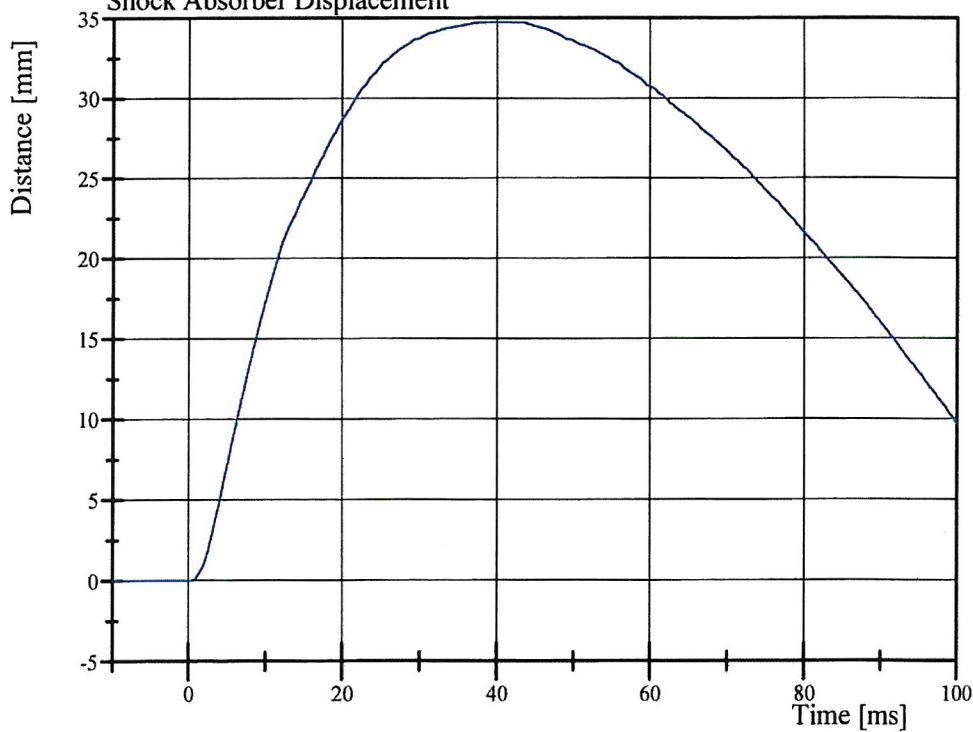


Filter Class: CFC\_1000

Max: 921.4 N at 5.3 ms

Min: -5.4 N at -5.0 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 34.8 mm at 40.0 ms

Min: -0.0 mm at -9.0 ms

# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 001 Certification No. 4-2

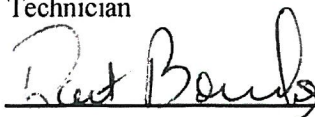
Test Date: 9/28/2009

| Test Parameter                   | Specification   | Test Results | Pass |
|----------------------------------|-----------------|--------------|------|
| Temperature                      | 18.9 - 25.6 °C  | 21.8 °C      | Yes  |
| Relative Humidity                | 10 - 70 %       | 45 %         | Yes  |
| Impactor Velocity                | 4.27 - 4.33 m/s | 4.283 m/s    | Yes  |
| Upper Rib Lateral Acceleration   | 37 - 46 g       | 42.0 g       | Yes  |
| Lower Rib Lateral Acceleration   | 37 - 46 g       | 41.5 g       | Yes  |
| Lower Spine Lateral Acceleration | 15 - 22 g       | 19.6 g       | Yes  |

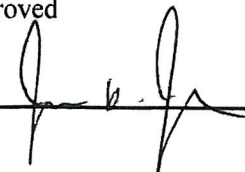
**Test meets specifications.**

**Comments:**

Technician

  
\_\_\_\_\_

Approved

  
\_\_\_\_\_

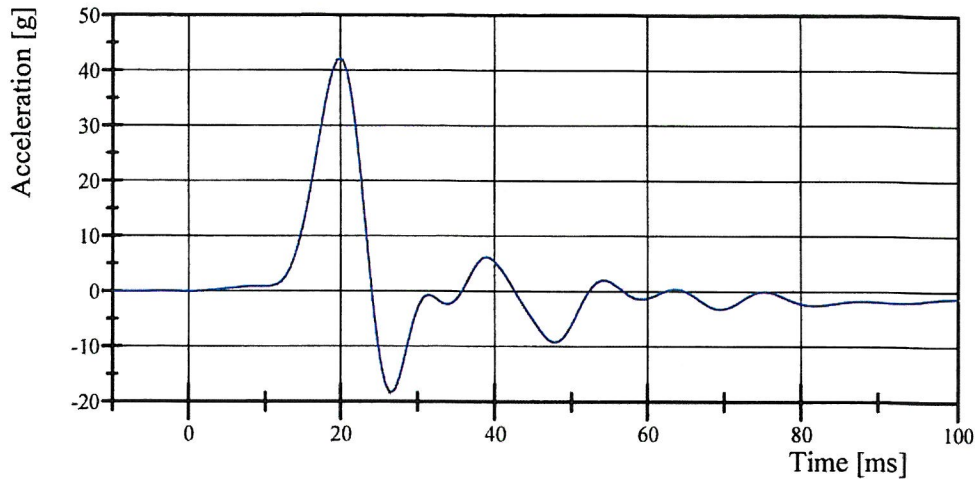
# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 001 Certification No. 4-2

Test Date: 9/28/2009

Upper Rib Acceleration (Y)

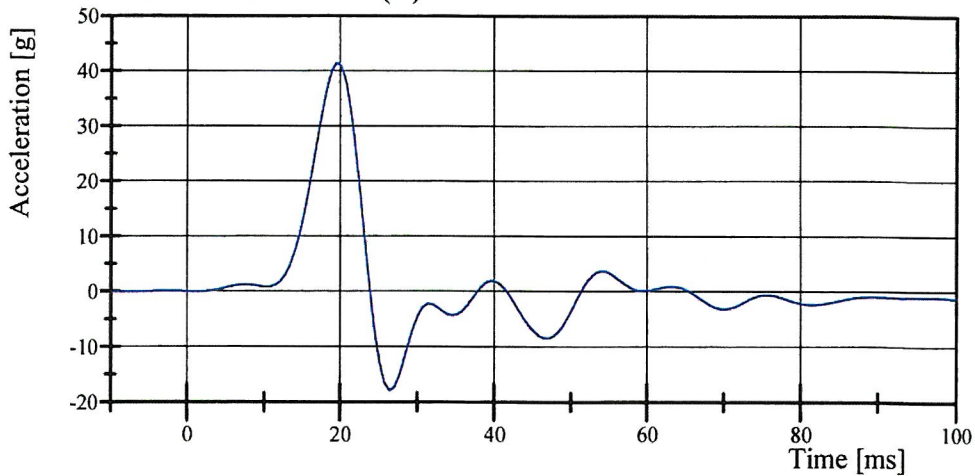


Filter Class: FIR\_100

Max: 42.0 g at 20.2 ms

Min: -18.5 g at 26.5 ms

Lower Rib Acceleration (Y)

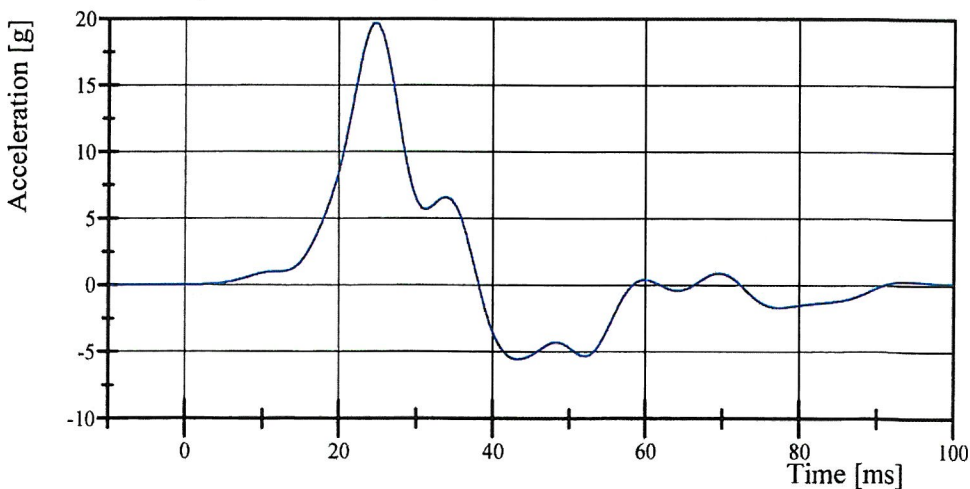


Filter Class: FIR\_100

Max: 41.5 g at 19.6 ms

Min: -17.9 g at 26.5 ms

Lower Spine Acceleration (Y)



Filter Class: FIR\_100

Max: 19.6 g at 24.6 ms

Min: -5.6 g at 43.4 ms

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 001 Certification No. 4-3

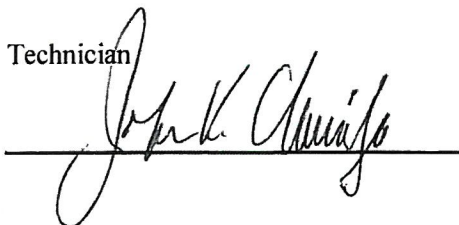
Test Date: 9/22/2009

| Test Parameter                 | Specification    | Test Results | Pass |
|--------------------------------|------------------|--------------|------|
| Temperature                    | 18.9 - 25.5 °C   | 21.7 °C      | Yes  |
| Relative Humidity              | 10 - 70 %        | 54 %         | Yes  |
| Probe Force<br>within Corridor | Yes              | Yes          | Yes  |
| Probe Velocity                 | 6.35 - 8.89 mm/s | 7.828 mm/s   | Yes  |

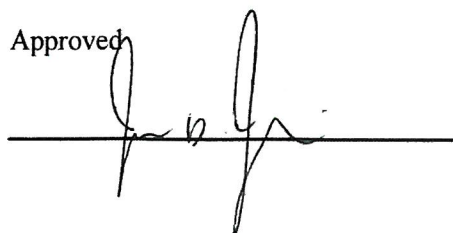
**Test meets specifications.**

**Comments:**

Technician



Approved



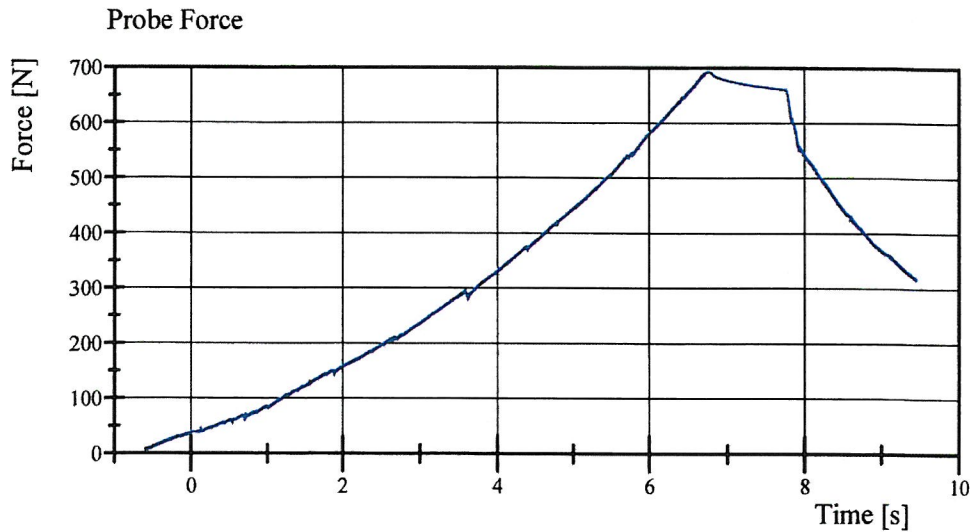


# Transportation Research Center Inc.

## Abdomen Compression

SID-HIII Serial No. 001 Certification No. 4-3

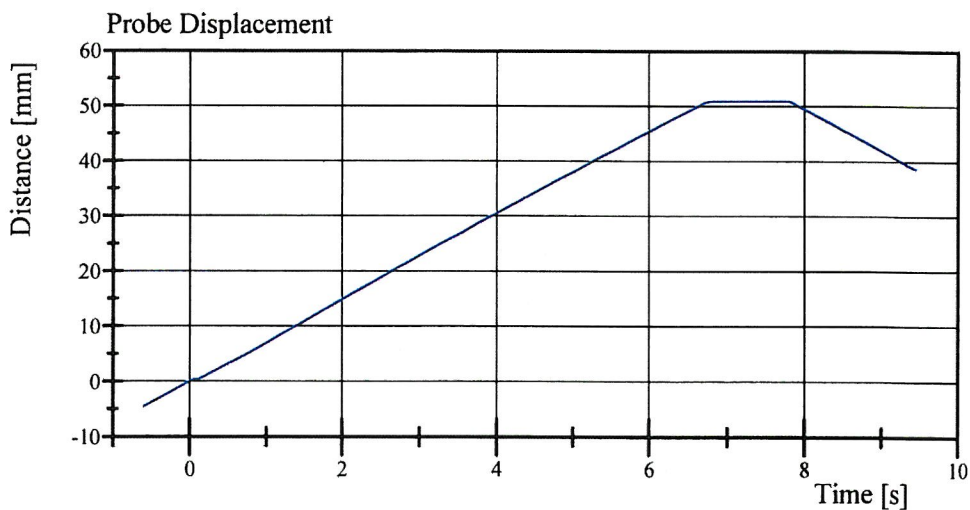
Test Date: 9/22/2009



Filter Class: CFC\_600

Max: 693.3 N at 6.8 s

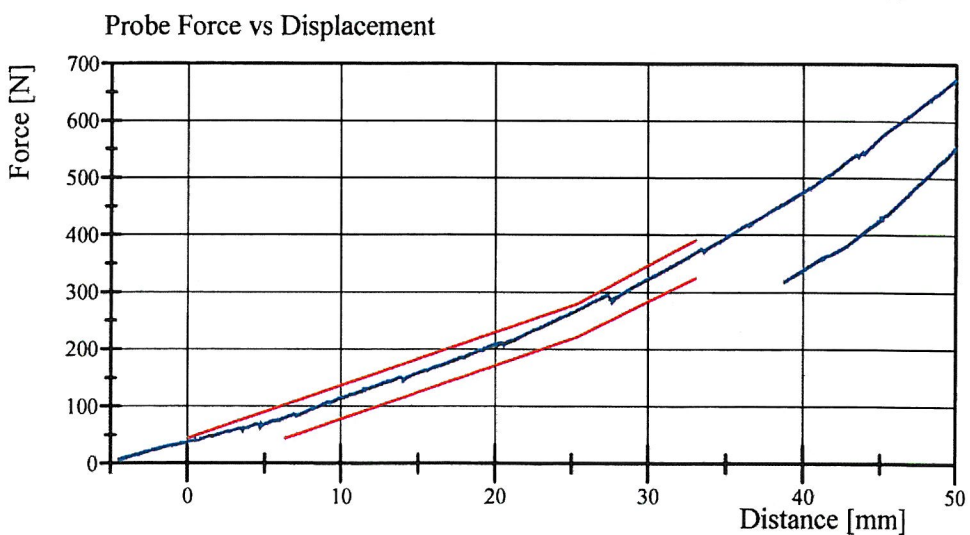
Min: 4.8 N at -0.6 s



Filter Class: CFC\_180

Max: 51.0 mm at 7.8 s

Min: -4.5 mm at -0.6 s



Filter Class: CFC\_600

Max: 693.3 N at 50.9 mm

Min: 4.8 N at -4.5 mm

**TRANSPORTATION RESEARCH CENTER INC.**

**LUMBAR FLEXION TEST**

**SID PART 572B**

**CAL DATE: 21-Sep-09**

**TRC, INC.**

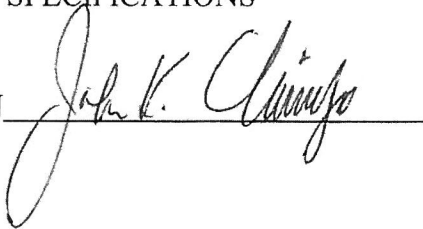
**TEST NO: TOFL-01**

**572B SN 001 TORSO FLEX CAL 04**

| TEST PARAMETER                      | SPECIFICATION  | TEST RESULTS |
|-------------------------------------|----------------|--------------|
| TEMPERATURE                         | 18.9 – 25.6° C | 21.6 °C      |
| RELATIVE HUMIDITY                   | 10 – 70 %      | 53 %         |
| FORCE AT 0 DEG. FLEXION             | -27 – 27 N     | 0 N          |
| FORCE AT 20 DEG OF FLEXION          | 98 – 151 N     | 134.5 N      |
| FORCE AT 30 DEG OF FLEXION          | 151 – 205 N    | 191.0 N      |
| FORCE AT 40 DEG OF FLEXION          | 205 – 258 N    | 228.5 N      |
| NET RETURN ANGLE AFTER 3<br>MINUTES | < 12 °         | 6.3 °        |

TEST MEETS SPECIFICATIONS

TECHNICIAN



# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 001 Certification No. 4-1

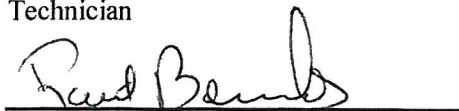
Test Date: 9/28/2009

| Test Parameter                               | Specification   | Test Results | Pass |
|----------------------------------------------|-----------------|--------------|------|
| Temperature                                  | 18.9 - 25.5 °C  | 21.7 °C      | Yes  |
| Relative Humidity                            | 10 - 70 %       | 49 %         | Yes  |
| Impactor Velocity                            | 4.27 - 4.33 m/s | 4.302 m/s    | Yes  |
| Pelvis Lateral Acceleration                  |                 |              |      |
| Duration above 20g                           | 3 - 7 ms        | 6.2 ms       | Yes  |
| Pelvis Lateral Acceleration                  | 40 - 60 g       | 46.3 g       | Yes  |
| Is Acceleration Curve Unimodal<br>Above 20g? | Yes             | Yes          | Yes  |

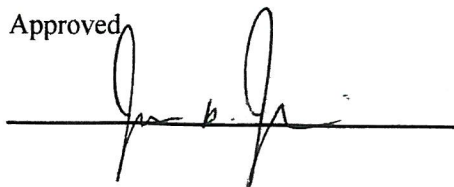
Test meets specifications.

Comments:

Technician



Approved

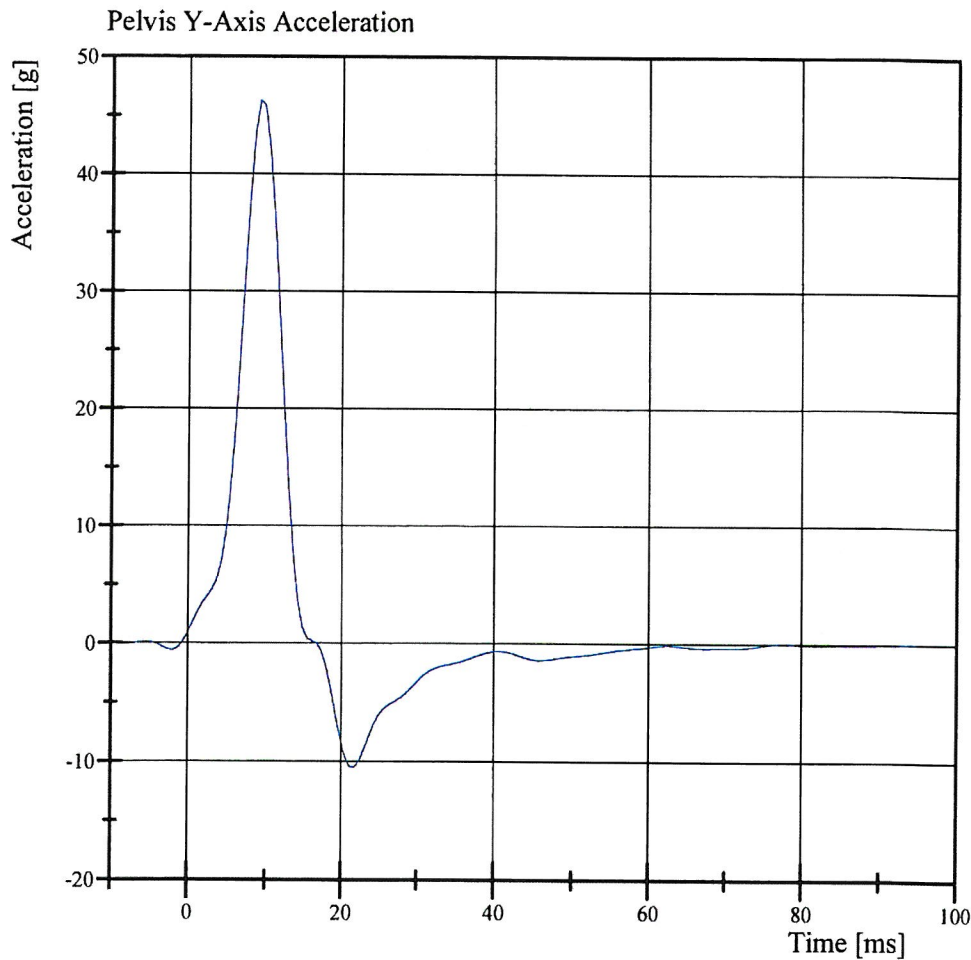


# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 001 Certification No. 4-1

Test Date: 9/28/2009



Filter Class: FIR\_100

Max: 46.3 g at 9.3 ms

Min: -10.5 g at 21.7 ms