

**REPORT NUMBER: SPNCAP-MGA-2011-038**

**NEW CAR ASSESSMENT PROGRAM (NCAP)  
Side Impact Pole Test**

**HONDA MFG. OF INDIANA, LLC  
2011 Honda Civic 4-Dr Sedan  
NHTSA No.: MB5309**

**MGA RESEARCH CORPORATION  
5000 Warren Road  
Burlington, WI 53105**



**Test Date: November 8, 2010**

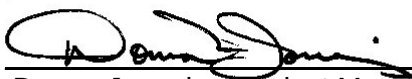
**Final Report Date: December 13, 2010**

**FINAL REPORT**

**U.S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Office of Crashworthiness Standards  
1200 New Jersey Ave, SE  
Mail Code: NVS 111, Room W43-410  
Washington, DC 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-09-D-00124.

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

Prepared by:   
Donna Janovicz, Project Manager

Approved by:   
Ben Fischer, Project Engineer

Approval Date: December 13, 2010

FINAL REPORT ACCEPTANCE BY OCWS:

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

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

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

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

### Technical Report Documentation Page

| <b>1. Report No.</b><br>SPNCAP-MGA-2011-038                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>2. Government Accession No.</b>                          | <b>3. Recipient's Catalog No.</b>                                                                                                                                                                           |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------|----------------------|--|--|-------|-----------|--------|-------------------------------------------|-----|------|-----|------------------------------------|----|----|----|--------------------------------------------|---|------|------|
| <b>4. Title and Subtitle</b><br>Final Report of New Car Assessment Program<br>Side Impact Pole Testing of 2011 Honda Civic 4-Dr Sedan<br>NHTSA No.: MB5309                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             | <b>5. Report Date</b><br>December 13, 2010                                                                                                                                                                  |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             | <b>6. Performing Organization Code</b><br>MGA                                                                                                                                                               |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>7. Author(s)</b><br>Donna Janovicz, Project Manager<br>Ben Fischer, Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             | <b>8. Performing Organization Report No.</b><br>SPNCAP-MGA-2011-038                                                                                                                                         |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>9. Performing Organization Name and Address</b><br>MGA Research Corporation<br>5000 Warren Road<br>Burlington, WI 53105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             | <b>10. Work Unit No.</b>                                                                                                                                                                                    |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             | <b>11. Contract or Grant No.</b><br>DTNH22-09-D-00124                                                                                                                                                       |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>12. Sponsoring Agency Name and Address</b><br>U.S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Office of Crashworthiness Standards<br>1200 New Jersey Ave, SE, Room W43-410<br>Washington, DC 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                             | <b>13. Type of Report and Period Covered:</b><br>Final Test Report<br>November 8 to December 13, 2010                                                                                                       |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             | <b>14. Sponsoring Agency Code</b><br>NVS-111                                                                                                                                                                |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>15. Supplementary Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |                                                                                                                                                                                                             |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>16. Abstract</b><br><p>A 32.2 km/h (20 mph), 75° oblique impact NCAP Side Pole Test was conducted on the subject 2011 Honda Civic 4-Dr Sedan in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on November 8, 2010.</p> <p>The impact velocity was 32.5 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The test vehicle post-test maximum crush was 341 mm at level 2. The test vehicle's performance was as follows:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="text-align: left;">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Head Injury Criteria (HIC<sub>36</sub>)</td> <td>N/A</td> <td>1000</td> <td>253</td> </tr> <tr> <td style="text-align: left;">Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>60</td> </tr> <tr> <td style="text-align: left;">Combined Acetabular and Iliac Pelvic Force</td> <td>N</td> <td>5525</td> <td>4019</td> </tr> </tbody> </table> <p>The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.</p> |                                                             |                                                                                                                                                                                                             |                  | Measurement Description | Driver ATD (SID-IIs) |  |  | Units | Threshold | Result | Head Injury Criteria (HIC <sub>36</sub> ) | N/A | 1000 | 253 | Resultant Lower Spine Acceleration | Gs | 82 | 60 | Combined Acetabular and Iliac Pelvic Force | N | 5525 | 4019 |
| Measurement Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Driver ATD (SID-IIs)                                        |                                                                                                                                                                                                             |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Units                                                       | Threshold                                                                                                                                                                                                   | Result           |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| Head Injury Criteria (HIC <sub>36</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | N/A                                                         | 1000                                                                                                                                                                                                        | 253              |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| Resultant Lower Spine Acceleration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Gs                                                          | 82                                                                                                                                                                                                          | 60               |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| Combined Acetabular and Iliac Pelvic Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N                                                           | 5525                                                                                                                                                                                                        | 4019             |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>17. Key Words</b><br>New Car Assessment Program (NCAP)<br>Side Impact<br>Pole<br>Part 572V<br>SID-IIs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             | <b>18. Distribution Statement</b><br>Copies of this report are available from:<br>National Highway Traffic Safety Adm.<br>Technical Reference Division<br>1200 New Jersey Ave, SE<br>Washington, D.C. 20590 |                  |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |
| <b>19. Security Classif. (of this report)</b><br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>20. Security Classif. (of this page)</b><br>Unclassified | <b>21. No. of Pages</b><br><br>127                                                                                                                                                                          | <b>22. Price</b> |                         |                      |  |  |       |           |        |                                           |     |      |     |                                    |    |    |    |                                            |   |      |      |

## TABLE OF CONTENTS

| <u>Section</u> |  | <u>Page No.</u> |
|----------------|--|-----------------|
|----------------|--|-----------------|

|   |                                  |   |
|---|----------------------------------|---|
| 1 | Test Purpose and Procedure       | 1 |
| 2 | Summary of Test Results          | 2 |
| 3 | Occupant and Vehicle Information | 4 |

| <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 System Data | 8  |
| 3  | Dummy Longitudinal Clearance Dimensions                          | 10 |
| 4  | Dummy Lateral Clearance Dimensions                               | 11 |
| 5  | Camera and Instrumentation Data                                  | 12 |
| 6  | Vehicle Accelerometer Data                                       | 13 |
| 7  | Rigid Pole Load Cell Data                                        | 14 |
| 8  | Post Test Observations                                           | 15 |
| 9  | Vehicle Profile Measurements                                     | 16 |
| 10 | Vehicle Exterior Crush Measurements                              | 17 |
| 11 | FMVSS 301 Fuel System Integrity Post-Impact Data                 | 21 |
| 12 | Dummy/Vehicle Temperature Stabilization Data                     | 22 |

### Appendix

|   |                                                     |   |
|---|-----------------------------------------------------|---|
| A | Photographs                                         | A |
| B | Dummy Response Data                                 | B |
| C | Dummy Calibration and Performance Verification Data | C |

**SECTION 1**  
**TEST PURPOSE AND PROCEDURE**

This side impact test is part of the MY 2011 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00124. The purpose of this test is to generate comparative side impact performance in a 2011 Honda Civic 4-Dr Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated January 2010.

## SECTION 2

### SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2011 Honda Civic 4-Dr Sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.5 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin, on November 8, 2010. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS NCAP Side Pole Laboratory Test Procedure dated January 2010. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

Head CG Triaxial Accelerometers  
 Thorax Upper, Middle, and Lower Rib Displacement Potentiometers  
 Abdomen Upper and Lower Rib Displacement Potentiometers  
 Lower Spine Triaxial Accelerometers  
 Iliac Load Cell  
 Acetabulum Load Cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report.

The following table summarizes the results of the test:

| DUMMY INJURY VALUES                       |            |                                    |                  |      |
|-------------------------------------------|------------|------------------------------------|------------------|------|
| Dummy                                     | HIC (36ms) | Resultant Lower Spine Acceleration | Pelvic Force (N) |      |
| SID-IIs 5 <sup>th</sup> Percentile Female | 253        | 60                                 | Iliac Wing       | 747  |
|                                           |            |                                    | Acetabular       | 3314 |
|                                           |            |                                    | Sum              | 4019 |

#### SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

| Restraint Type           | Left Front (Driver) P1 |          | Left Rear (Passenger) P4 |          |
|--------------------------|------------------------|----------|--------------------------|----------|
|                          | Mounted                | Deployed | Mounted                  | Deployed |
| Frontal Airbag           | Yes                    | No       | No                       |          |
| Knee Airbag              | No                     |          | No                       |          |
| Side Curtain Airbag      | Yes                    | Yes      | Yes                      | Yes      |
| Side Torso/Pelvis Airbag | Yes                    | Yes      | No                       |          |
| Seat Belt Pretensioner   | Yes                    | Yes      | No                       |          |
| Seat Belt Load Limiter   | Yes                    |          | No                       |          |

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

#### **GENERAL COMMENTS**

There was no valid data collected for:

- Left B-Post at Sill Y
- Left Lower B-Post Y after 10 msec.
- Driver Seat Track Y

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

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

# DATA SHEET NO. 1

## GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
Test Date: 11/08/2010

## TEST VEHICLE INFORMATION AND OPTIONS

|                                                                           |                   |                                |     |
|---------------------------------------------------------------------------|-------------------|--------------------------------|-----|
| NHTSA No.                                                                 | MB5309            | Anti-Lock Brakes               | Yes |
| Model Year                                                                | 2011              | All Wheel Drive                | No  |
| Make                                                                      | Honda             | Power Steering                 | Yes |
| Model                                                                     | Civic             | Driver Front Airbag            | Yes |
| Body Style                                                                | Sedan             | Driver Curtain Airbag          | Yes |
| VIN                                                                       | 19XFA1F30BE006390 | Driver Head/Torso Airbag       | No  |
| Body Color                                                                | Atomic Blue Metal | Driver Torso Airbag            | No  |
| Delivery Date                                                             | 10/19/2010        | Driver Torso/Pelvis Airbag     | Yes |
| Odometer (mi)                                                             | 107               | Driver Pelvis Airbag           | No  |
| Odometer (km)                                                             | 172               | Driver Knee Airbag             | No  |
| Dealer                                                                    | Rosen Honda       | Rear Pass. Front Airbag        | No  |
| Transmission                                                              | Automatic         | Rear Pass. Curtain Airbag      | Yes |
| Final Drive                                                               | Front             | Rear Pass. Head/Torso Airbag   | No  |
| Type/No. Cylinders                                                        | 4                 | Rear Pass. Torso Airbag        | No  |
| Engine Displacement (L)                                                   | 1.8               | Rear Pass. Torso/Pelvis Airbag | No  |
| Engine Placement                                                          | Lateral           | Rear Pass. Pelvis Airbag       | No  |
| Roof Rack                                                                 | No                | Rear Pass. Knee Airbag         | No  |
| Sunroof/T-Top                                                             | No                | Pretensioners                  | Yes |
| Tinted Glass                                                              | No                | Load Limiters                  | Yes |
| Traction Control                                                          | No                | Automatic Door Locks           | No  |
| Power Brakes                                                              | Yes               | Bucket Seats                   | Yes |
| Front Disc                                                                | Yes               | Tilt Steering                  | Yes |
| Rear Disc                                                                 | Yes               | Power Seats                    | No  |
| Does owner's manual provide instruction to turn off automatic door locks? |                   |                                | N/A |

## DATA FROM CERTIFICATION LABEL

|                     |                            |                 |      |
|---------------------|----------------------------|-----------------|------|
| Manufactured By     | Honda Mfg. of Indiana, LLC | GVWR (kg)       | 1665 |
| Date of Manufacture | 09/'10                     | GAWR Front (kg) | 880  |
|                     |                            | GAWR Rear (kg)  | 785  |

## VEHICLE SEATING AND WEIGHT CAPACITY DATA

| Measured Parameter                | Front | Rear | Third | Total |       |
|-----------------------------------|-------|------|-------|-------|-------|
| Designated Seating Capacity (DSC) | 2     | 3    |       | 5     |       |
| Capacity Weight (VCW) (kg)        |       |      |       | 385   | (A)   |
| DSC x 68.04 kg                    |       |      |       | 340   | (B)   |
| Cargo Weight (RCLW) (kg)          |       |      |       | 45    | (A-B) |

## VEHICLE SEAT TYPE

| Seating Location   | Type of Seat Pan |       |             |           | Type of Seat Back |            |  |
|--------------------|------------------|-------|-------------|-----------|-------------------|------------|--|
|                    | Bucket           | Bench | Split Bench | Contoured | Fixed             | Adjustable |  |
| Front Seat         | X                |       |             |           |                   | w/Lever    |  |
| Rear or Second Row |                  | X     |             |           | X                 |            |  |
| Third Row Seat     |                  |       |             |           |                   |            |  |

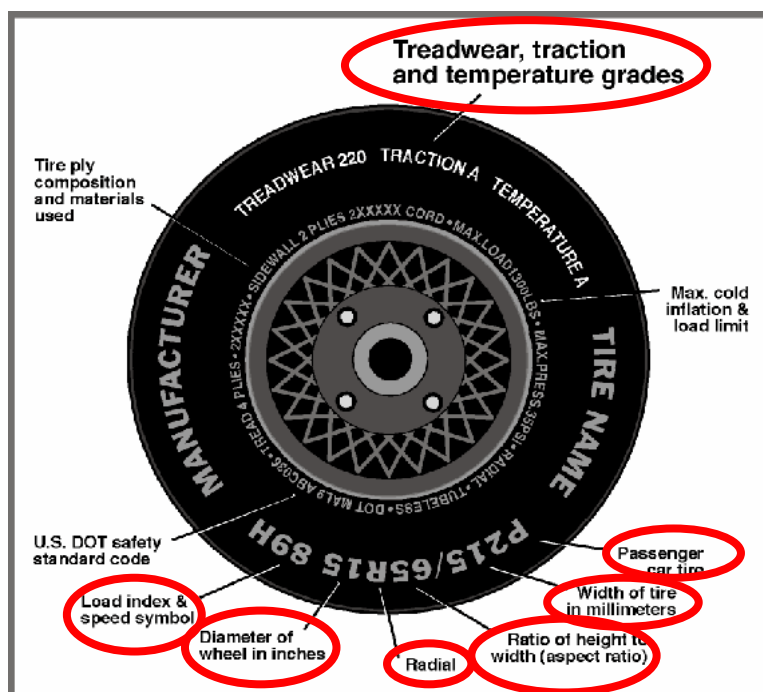
## DATA SHEET NO. 1 (continued)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

### VEHICLE TIRE INFORMATION



| Measured Parameter          | Front         | Rear          |
|-----------------------------|---------------|---------------|
| Maximum Tire Pressure (kPa) | 350           | 350           |
| Cold Pressure (kPa)         | 210           | 210           |
| Recommended Tire Size       | P195/65R15    | P195/65R15    |
| Tire Size on Vehicle        | P195/65R15    | P195/65R15    |
| Tire Manufacturer           | Dunlop        | Dunlop        |
| Tire Model                  | SP Sport 5000 | SP Sport 5000 |
| Treadwear                   | 340           | 340           |
| Traction                    | A             | A             |
| Temperature Grades          | A             | A             |
| Tire Plies Sidewall         | 1             | 1             |
| Tire Plies Body             | 4             | 4             |
| Load Index & Speed Symbol   | 89H           | 89H           |
| Tire Material               | Rubber        | Rubber        |
| DOT Safety Code Right       | EU9N          | EU9N          |
| DOT Safety Code Left        | EU9N          | EU9N          |

## DATA SHEET NO. 1 (continued)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

### TEST VEHICLE WEIGHTS

|        | Units | As Delivered (UVW) |       |        | As Tested (ATW) |       |        | Fully Loaded |       |        |
|--------|-------|--------------------|-------|--------|-----------------|-------|--------|--------------|-------|--------|
|        |       | Front              | Rear  | Total  | Front           | Rear  | Total  | Front        | Rear  | Total  |
| Left   | kg    | 383.7              | 243.6 |        | 396.0           | 279.0 |        | 404.2        | 285.3 |        |
| Right  | kg    | 372.9              | 236.8 |        | 386.0           | 266.7 |        | 377.4        | 267.6 |        |
| Ratio  | %     | 61.2               | 38.8  |        | 58.9            | 41.4  |        | 58.6         | 41.4  |        |
| Totals | kg    | 756.6              | 480.4 | 1237.0 | 782.0           | 545.7 | 1327.7 | 781.6        | 552.9 | 1334.5 |

### TARGET TEST WEIGHT CALCULATION

| Measured Parameter                              | Units | Value  |         |
|-------------------------------------------------|-------|--------|---------|
| Total Delivered Weight (UVW)                    | kg    | 1237.0 | (A)     |
| Actual Weight of 1 P572V ATD (SID-IIs) ATD Used | kg    | 52.2   | (B)     |
| Rated Cargo/Luggage Weight (RCLW)               | kg    | 45     | (C)     |
| Calculated Target Vehicle Test Weight (TVTW)    | kg    | 1334.2 | (A+B+C) |

### TEST VEHICLE ATTITUDES AND CG

|                                                                | Units | As Delivered | As Tested | Fully Loaded |
|----------------------------------------------------------------|-------|--------------|-----------|--------------|
| Driver Door Sill Angle (front-to-rear)*                        | deg   | -0.6         | -0.6      | 0.0          |
| Front Passenger Sill Angle (front-to-rear)*                    | deg   | -0.6         | -0.6      | -0.4         |
| Front Bumper Angle (left-to-right)**                           | deg   | 0.1          | -0.2      | -0.2         |
| Rear Bumper Angle (left-to-right)**                            | deg   | -0.3         | -0.3      | -0.4         |
| Vehicle CG (Aft of Front Axle)                                 | mm    | 1050         | 1111      | 1120         |
| Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline) | mm    | 11           | 13        | 25           |

\*Front up is positive    \*\* Left up is positive

### GENERAL VEHICLE TEST DATA

| Measurement Description              | Units | Value |
|--------------------------------------|-------|-------|
| Weight of Ballast in Cargo Area      | kg    | 0.0   |
| Weight of Vehicle Components Removed | kg    | 35.4  |

Vehicle components removed to meet target vehicle test weight: Trunk compartment, jack & tools, splash guards, third row seats, radiator plastic cover.

### TEST VEHICLE IMPACT POINT DATA

| Measurement Parameter                              | Units | Value |
|----------------------------------------------------|-------|-------|
| Vertical Impact Reference Line (Aft of Front Axle) | mm    | 1079  |
| Actual Impact Point (Aft of Front Axle)            | mm    | 1086  |
| Impact Point Difference (- forward / + rearward)   | mm    | 7     |

## DATA SHEET NO. 2

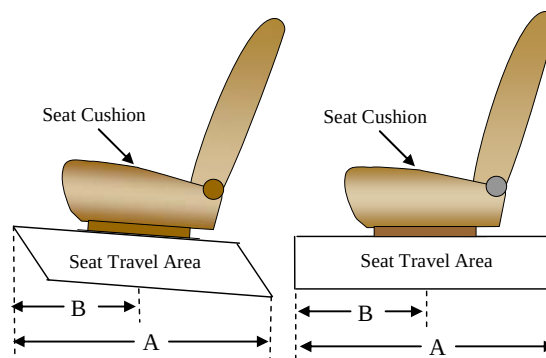
### SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

#### SEAT FORE/AFT POSITIONS

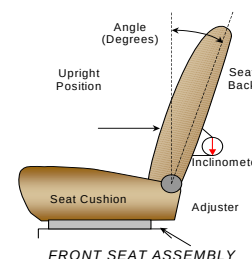
The driver seat was a manual fore/aft adjustable seat with a manual height/angle adjustment. The seat travel was set as specified in Appendix B of the TP dated January 2010. The right front passenger seat was set to match the driver seat. The rear passenger seats were non-adjustable.



| SEAT FORE/AFT POSITIONING   | Total Fore/Aft Travel | Placed in Detent # or Position |
|-----------------------------|-----------------------|--------------------------------|
| Driver Seat                 | 25 detents            | 0 detent (full forward)        |
| Front Passenger Seat        | 25 detents            | 0 detent (full forward)        |
| Rear Seat – Struck Side     | Fixed                 |                                |
| Rear Seat – Non-Struck Side | Fixed                 |                                |

#### SEAT BACK ANGLE POSITION

The seat back was set as specified in Appendix B of the TP dated January 2010. The seat back angle measurement was made relative to the rocker sill on the headrest post.



| SEAT BACK ANGLE                                | Degrees | Detents                             |
|------------------------------------------------|---------|-------------------------------------|
| Driver Seat Back Angle with Seated Dummy       | 5.3     | 0 detent (forward locking position) |
| Front Passenger Seat Back Angle                | 5.8     | 0 detent (forward locking position) |
| Struck Side Rear Seat Back Angle               |         | Fixed                               |
| Non-Struck Side Rear Passenger Seat Back Angle |         | Fixed                               |

#### SEAT BELT UPPER ANCHORAGE

The driver seat belt upper anchorage was set at the manufacturer's specified placement in Form 1.

| SEAT BELT UPPER ANCHORAGES | Total # of Positions | Placed in Position # |
|----------------------------|----------------------|----------------------|
| Driver Seat                | 4 detents            | 0 (uppermost as 0)   |

## DATA SHEET NO. 2 (CONTINUED)

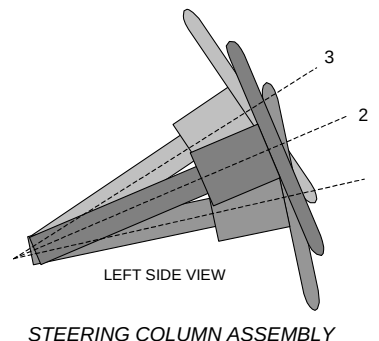
### SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

#### 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.

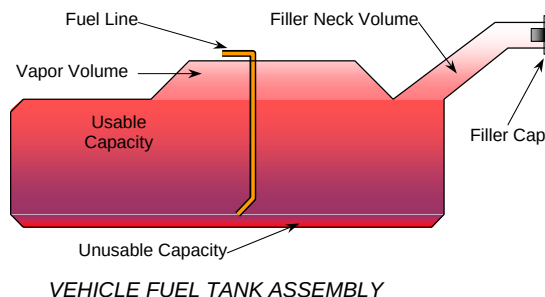


#### STEERING COLUMN POSITIONING

|                                   | Degrees | Fore/Aft Position (mm) |
|-----------------------------------|---------|------------------------|
| Lowermost - Position 1            | 68.6    | 245                    |
| Geometric Center – Position 2     | 65.6    | 225                    |
| Uppermost – Position 3            | 62.6    | 205                    |
| Telescoping Steering Wheel Travel |         | 40                     |
| Test Position                     | 65.6    | 225                    |

#### FUEL PUMP

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe. The vehicle is equipped with an electric fuel pump. After the ignition key is turned from LOCK (0) to ON (II) position, the pump will be filled up for two seconds, and then the pressure is maintained. The fuel pipe is on the left side.



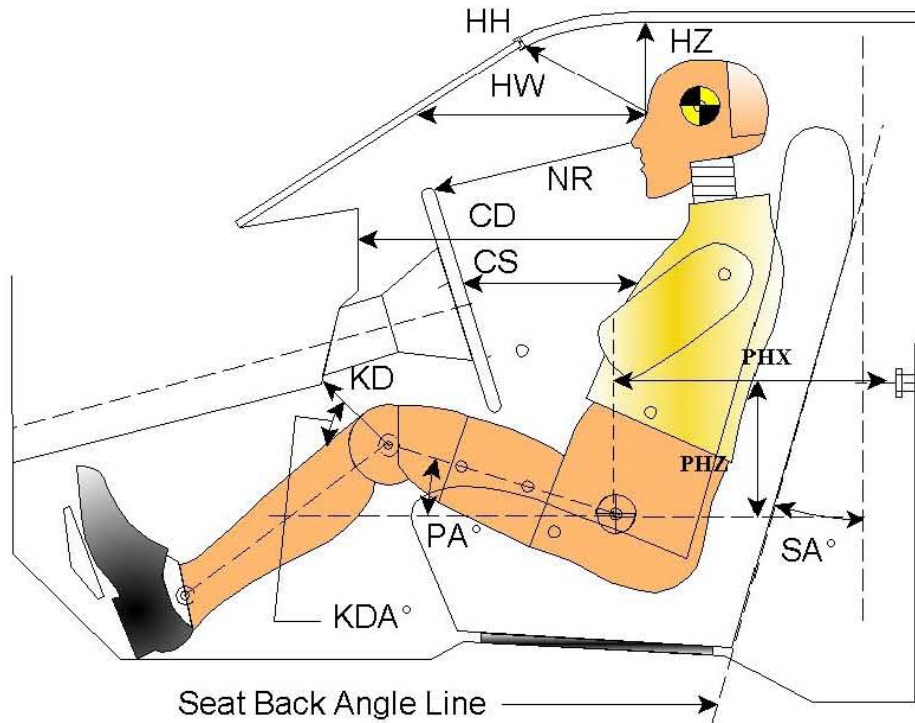
#### FUEL TANK CAPACITY DATA

|                                                                 | Liters       |
|-----------------------------------------------------------------|--------------|
| Usable Capacity of "Standard" Tank                              | 50.0         |
| Usable Capacity of "Optional" Tank                              |              |
| Usable Capacity of Standard Tank as Specified in Owner's Manual | 50.0         |
| Usable Capacity of Optional Tank as Specified in Owner's Manual |              |
| 92-94% of Usable Capacity                                       | 46.0 to 47.0 |
| Actual Amount of Solvent Used                                   | 46.2         |
| 1/3 of Usable Capacity                                          | 16.7         |

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

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

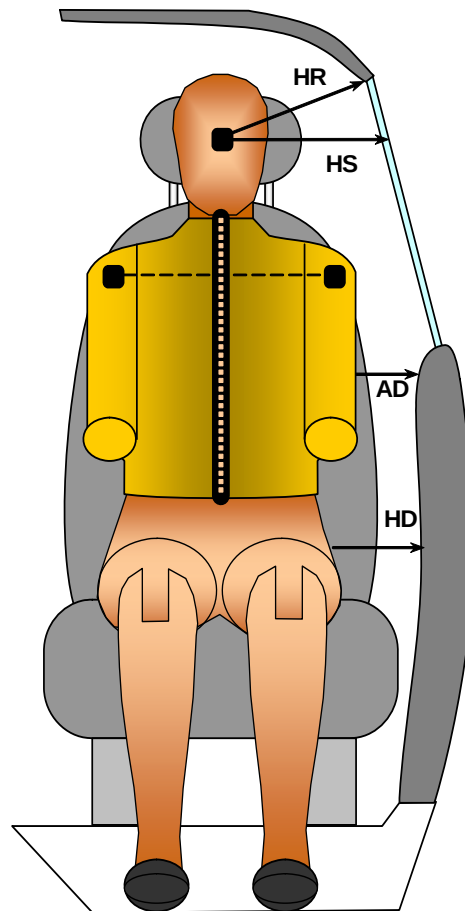


| Code     | Measurement Description     | Driver S/N 296 |           |
|----------|-----------------------------|----------------|-----------|
|          |                             | Length (mm)    | Angle (°) |
| HH       | Head to Header              | 231            |           |
| HW       | Head to Windshield          | 586            |           |
| HZ       | Head to Roof                | 163            |           |
| NR       | Nose to Rim                 | 213            |           |
| CD       | Chest to Dash               | 424            |           |
| CS       | Chest to Steering Wheel     | 162            |           |
| KDL/KDAL | Left Knee to Dash           | 99             | 34.0      |
| KDR/KDAR | Right Knee to Dash          | 96             | 30.6      |
| PA       | Pelvic Angle                |                | 17.7      |
| PHX      | H-Point to Striker (X-Axis) | 375            |           |
| PHZ      | H-Point to Striker (Z-Axis) | 140            |           |
| SA       | Seat Back Angle             |                | 5.3       |

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

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010



*FRONT VIEW OF DUMMY*

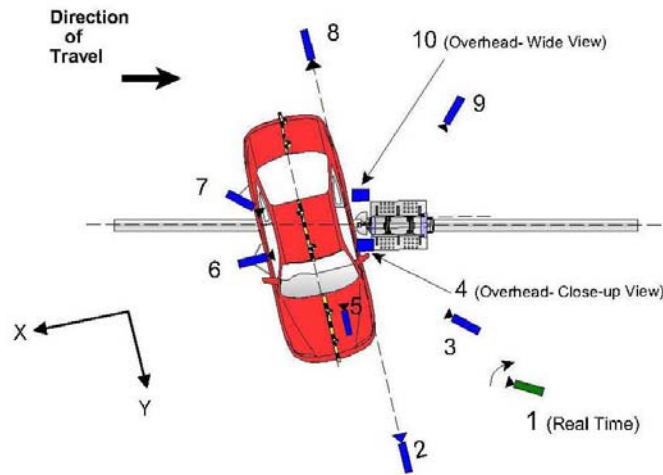
| Code | Measurement Description | Driver S/N 296 |
|------|-------------------------|----------------|
|      |                         | Length (mm)    |
| HR   | Head to Side Header     | 258            |
| HS   | Head to Side Window     | 377            |
| AD   | Arm to Door             | 160            |
| HD   | H-Point to Door         | 176            |

## DATA SHEET NO. 5

### CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010



Reference: From Point of Impact for X and Y; from Ground for Z):  
 +X = Forward of Impact, + Y = Right of Impact, +Z = Down

| Camera No. | View                       | Coordinates (mm) |       |       | Lens (mm) | Film Speed (fps) |
|------------|----------------------------|------------------|-------|-------|-----------|------------------|
|            |                            | X*               | Y*    | Z*    |           |                  |
| 1          | Real-Time Pan View         |                  |       |       |           | 30               |
| 2          | Front Ground Level         | 50               | 5500  | -1530 | 24        | 1000             |
| 3          | Impact Side 45° Forward    | -1790            | 4150  | -1550 | 20        | 1000             |
| 4          | Overhead Closeup           | 30               | 0     | -4520 | 50        | 1000             |
| 5          | Onboard – Driver Front     |                  |       |       | 12.5      | 1000             |
| 6          | Onboard – Driver Side      |                  |       |       | 8         | 1000             |
| 7          | Onboard – Driver Rear      |                  |       |       | 8         | 1000             |
| 8          | Rear Ground Level          | 0                | -6530 | -1520 | 24        | 1000             |
| 9          | Impact Side 45° Rearward   | -3510            | -2820 | -1510 | 20        | 1000             |
| 10         | Overhead Wide View         | 160              | 0     | -4610 | 14        | 1000             |
| 11         | Real-Time Dummy Front View |                  |       |       |           | 30               |

\* All measurements accurate to  $\pm 6$  mm

Note: Vehicle was at a 15° angle to the rigid pole.

### INSTRUMENTATION

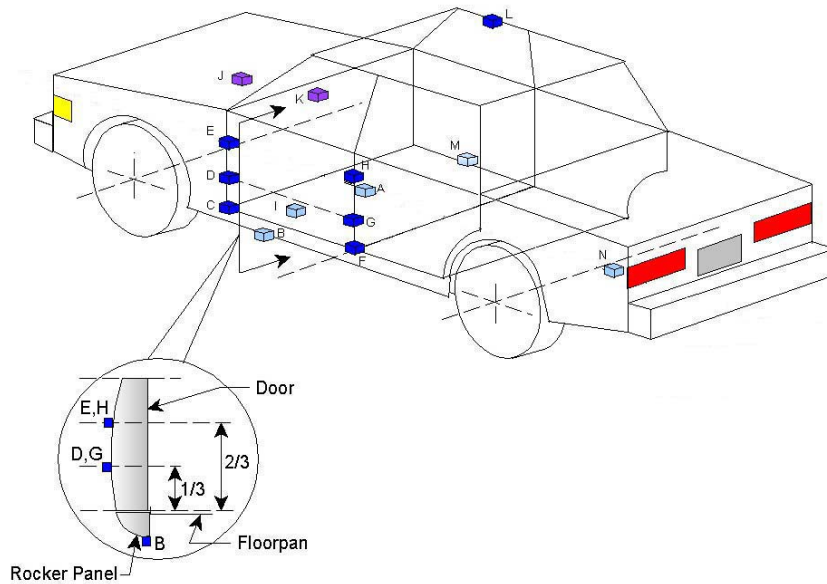
|                            | Number of Channels |
|----------------------------|--------------------|
| Driver Dummy               | 16                 |
| Vehicle Structure          | 21                 |
| Pole Load Cells – Not used | 8                  |
| Contact Switches           | 3                  |
| Airbag Timing              | 2                  |
| Total No. of Data Channels | 50                 |

## DATA SHEET NO. 6

### VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010



|   | Accelerometer Location |                  |      |       |
|---|------------------------|------------------|------|-------|
|   | ID                     | Coordinates (mm) |      |       |
|   |                        | X                | Y    | Z     |
| A | Vehicle CG             | 2510             | 0    | -220  |
|   | Vehicle CG Sensor      | 2510             | 0    | -220  |
| B | Left Floor Sill        | 2853             | -740 | -190  |
| C | A Pillar Sill          | 3070             | -740 | -185  |
| D | A Pillar Low           | 3055             | -700 | -424  |
| E | A Pillar Mid           | 3100             | -780 | -704  |
| F | B Pillar Sill          | 1972             | -735 | -203  |
| G | B Pillar Low           | 1952             | -708 | -474  |
| H | B Pillar Mid           | 2012             | -695 | -707  |
| I | Driver Seat            | 2350             | -545 | -275  |
| L | Engine Top             | 3874             | 60   | -780  |
| J | Firewall               | 3712             | 0    | -858  |
| K | Right Roof             | 2247             | 602  | -1400 |
| M | Right Floor Sill       | 2539             | 740  | -190  |
| N | Rear Floorpan          | 177              | 0    | -370  |

Reference: From Point of Impact for X and Y; from Ground for Z):  
 +X = Forward of Vehicle, + Y = Right of Vehicle, +Z = Down

**DATA SHEET NO. 7**  
**RIGID POLE LOAD CELL DATA**

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
Test Date: 11/08/2010



254 mm Diameter Rigid Pole

The pole was not instrumented.

| Load Cell Locations |                        |
|---------------------|------------------------|
| ID                  | Height From Ground (m) |
| 1                   |                        |
| 2                   |                        |
| 3                   |                        |
| 4                   |                        |
| 5                   |                        |
| 6                   |                        |
| 7                   |                        |
| 8                   |                        |

**DATA SHEET NO. 8****POST-TEST OBSERVATIONS**

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

**TEST DUMMY INFORMATION AND CONTACT**

| Description             | Driver                   |
|-------------------------|--------------------------|
| Dummy Type / Serial No. | SID-IIs / 296            |
| Head Contact            | Curtain Airbag, Headrest |
| Upper Torso Contact     | Side Airbag              |
| Lower Torso Contact     | Side Airbag              |
| Left Knee Contact       | Door Panel               |
| Right Knee Contact      | Left Knee                |

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

| Description           | Front                           | Rear                            |
|-----------------------|---------------------------------|---------------------------------|
| Left Side Doors       | Remained closed and jammed shut | Remained closed and jammed shut |
| Right Side Doors      | Remained closed and operational | Remained closed and operational |
| Hatch and Other Doors | Remained closed and operational | Remained closed and operational |
| Seat Movement         | 0                               | 0                               |
| Seat Back Failure     | None                            | None                            |

**POST-TEST STRUCTURAL OBSERVATIONS**

| Critical Areas of Performance | Observations and Conclusions |
|-------------------------------|------------------------------|
| Pillar Performance            | No Separation                |
| Sill Separation               | None                         |
| Windshield Damage             | Cracked                      |
| Window Damage                 | Left Front Window Broke      |
| Other Notable Effects         | None                         |

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

| Restraint Type           | Left Front (Driver) P1 |          | Left Rear (Passenger) P4 |          |
|--------------------------|------------------------|----------|--------------------------|----------|
|                          | Mounted                | Deployed | Mounted                  | Deployed |
| Frontal Airbag           | Yes                    | No       | No                       |          |
| Knee Airbag              | No                     |          | No                       |          |
| Side Curtain Airbag      | Yes                    | Yes      | Yes                      | Yes      |
| Side Torso/Pelvis Airbag | Yes                    | Yes      | No                       |          |
| Seat Belt Pretensioner   | Yes                    | Yes      | No                       |          |
| Seat Belt Load Limiter   | Yes                    |          | No                       |          |

**VEHICLE SPEED AND IMPACT DATA**

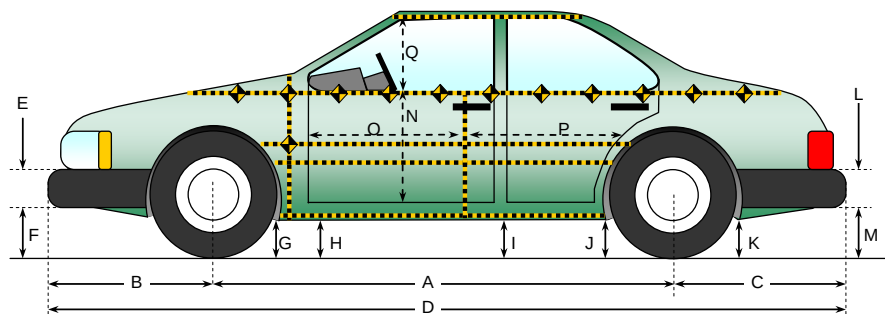
| Measured Parameter                                    | Units | Requirement  | Value |
|-------------------------------------------------------|-------|--------------|-------|
| Horizontal Offset from Vertical Impact Reference Line | mm    | +/- 38       | 7     |
| Trap No. 1 Velocity (Primary)                         | km/h  | 31.4 to 33.0 | 32.5  |
| Trap No. 2 Velocity (Redundant)                       | km/h  | 31.4 to 33.0 | 32.5  |

## DATA SHEET NO. 9

### VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010



All measurements in (mm) with tolerance of  $\pm 3$  mm

### LEFT SIDE VIEW

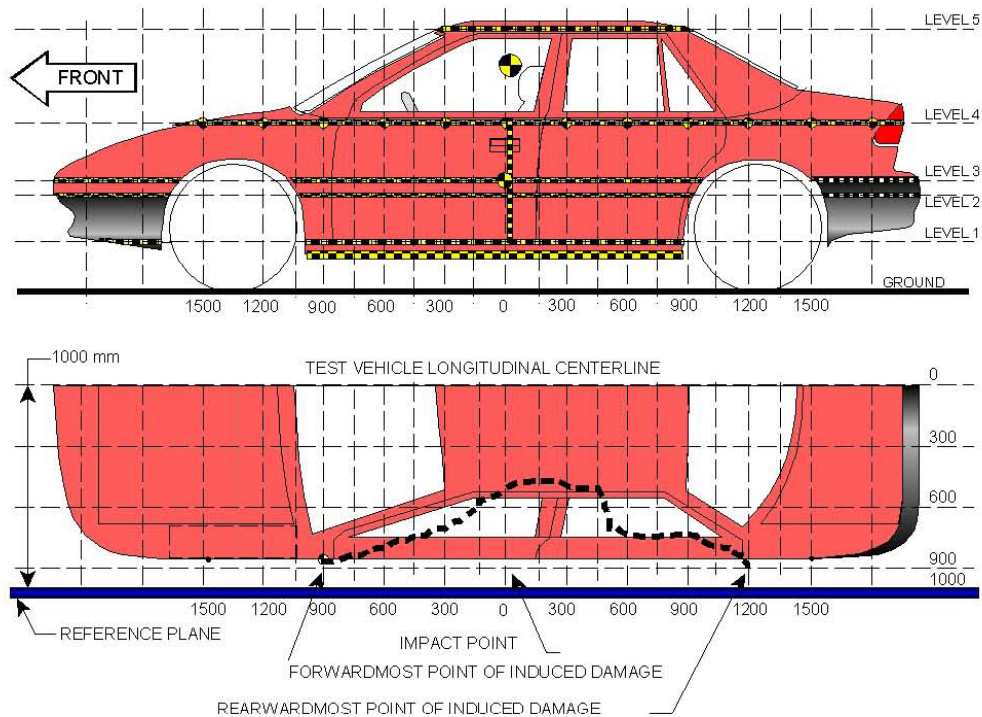
#### VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

| Code | Measurement Description                | Pre-Test | Post-Test | Difference |
|------|----------------------------------------|----------|-----------|------------|
| A    | Wheelbase                              | 2703     | 2625      | 78         |
| B    | Front Axle to FSOV                     | 898      | 860       | 38         |
| C    | Rear Axle to RSOV                      | 903      | 866       | 37         |
| D1   | Total Vehicle Length at Left Side      | 3610     | 3492      | 118        |
| D2   | Total Vehicle Length at Centerline     | 4504     | 4351      | 153        |
| D3   | Total Vehicle Length at Right Side     | 3610     | 3621      | -11        |
| E    | Front Bumper Thickness                 | 100      | 100       | 0          |
| F    | Front Bumper Bottom to Ground          | 236      | 257       | -21        |
| G    | Sill Height at Front Wheel Well        | 158      | 154       | 4          |
| H    | Sill Height at Front Door Leading Edge | 164      | 150       | 14         |
| I    | Sill Height at B Pillar                | 175      | 188       | -13        |
| J1   | Sill Height at Rear Wheel Well         | 172      | 190       | -18        |
| J2   | Pinch Weld Height at Rear Wheel Well   | 180      | 182       | -2         |
| K    | Sill Height Aft of Rear Wheel Well     | 248      | 245       | 3          |
| L    | Rear Bumper Thickness                  | 95       | 95        | 0          |
| M    | Rear Bumper Bottom to Ground           | 290      | 270       | 20         |
| N    | Sill Height to Window Bottom Sill      | 665      | 690       | -25        |
| O    | Front Door Leading Edge to Impact CL   | 619      | 620       | -1         |
| P    | Rear Door Trailing Edge to Impact CL   | 1347     | 1335      | 12         |
| Q    | Front Window Opening                   | 400      | 353       | 47         |
| R    | Right Side Length                      | 3610     | 3621      | -11        |
| S    | Left Side Length                       | 3610     | 3492      | 118        |
| T    | Vehicle Width at B Post                | 1740     | 1634      | 106        |

# **DATA SHEET NO. 10** **VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010



NOTE: The measurements are taken along the vertical impact reference line.  
 Vehicle measurements forward of the vertical impact reference line are negative.

| Level | Measurement Description | Height Above Ground (mm) |
|-------|-------------------------|--------------------------|
| 1     | Sill Top                | 265                      |
| 2     | Occupant H-Point        | 536                      |
| 3     | Mid-Door                | 613                      |
| 4     | Window Sill             | 892                      |
| 5     | Window Top              | 1326                     |

**DATA SHEET NO. 10 (CONTINUED)**  
**VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

|       | Pre-Test |     |     |     |     | Post-Test |     |     |     |     | Difference |     |     |     |     |
|-------|----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----|------------|-----|-----|-----|-----|
|       | 1        | 2   | 3   | 4   | 5   | 1         | 2   | 3   | 4   | 5   | 1          | 2   | 3   | 4   | 5   |
| -1200 |          |     |     | 359 |     |           |     |     | 351 |     |            |     |     | -8  |     |
| -1050 |          |     |     | 332 |     |           |     |     | 328 |     |            |     |     | -4  |     |
| -900  |          |     |     | 312 |     |           |     |     | 309 |     |            |     |     | -3  |     |
| -750  |          | 229 | 227 | 302 |     |           | 212 | 220 | 282 |     |            | -17 | -7  | -20 |     |
| -600  | 260      | 232 | 231 | 294 |     | 253       | 227 | 216 | 304 |     | -7         | -5  | -15 | 10  |     |
| -525  | 259      | 233 | 231 | 292 |     | 249       | 272 | 264 | 302 |     | -10        | 39  | 33  | 10  |     |
| -450  | 258      | 233 | 232 |     |     | 322       | 310 | 306 |     |     | 64         | 77  | 74  |     |     |
| -375  | 257      | 233 | 233 | 285 |     | 352       | 339 | 340 | 357 |     | 95         | 106 | 107 | 72  |     |
| -300  | 256      | 233 | 233 | 280 |     | 381       | 368 | 368 | 386 |     | 125        | 135 | 135 | 106 |     |
| -225  | 255      | 233 | 232 | 278 |     | 419       | 411 | 410 | 427 |     | 164        | 178 | 178 | 149 |     |
| -150  | 255      | 232 | 232 | 275 | 480 | 459       | 462 | 459 | 472 | 595 | 204        | 230 | 227 | 197 | 115 |
| -75   | 254      | 232 | 232 | 275 | 476 | 515       | 509 | 510 | 521 | 620 | 261        | 277 | 278 | 246 | 144 |
| 0     | 254      | 231 | 231 | 272 | 475 | 567       | 558 | 557 | 564 | 622 | 313        | 327 | 326 | 292 | 147 |
| 75    | 253      | 230 | 230 | 269 | 471 | 555       | 571 | 570 | 569 | 609 | 302        | 341 | 340 | 300 | 138 |
| 150   | 253      | 230 | 230 | 267 | 473 | 510       | 527 | 534 | 539 | 581 | 257        | 297 | 304 | 272 | 108 |
| 225   | 252      | 229 | 229 | 267 | 474 | 464       | 478 | 488 | 490 | 569 | 212        | 249 | 259 | 223 | 95  |
| 300   | 251      | 228 | 228 | 264 | 475 | 432       | 431 | 440 | 440 | 549 | 181        | 203 | 212 | 176 | 74  |
| 375   | 250      | 228 | 228 | 264 | 477 | 403       | 388 | 393 | 392 | 532 | 153        | 160 | 165 | 128 | 55  |
| 450   | 250      | 227 | 227 | 264 | 479 | 373       | 346 | 345 | 348 | 517 | 123        | 119 | 118 | 84  | 38  |
| 525   | 249      | 228 | 227 | 265 | 481 | 346       | 306 | 304 | 331 | 506 | 97         | 78  | 77  | 66  | 25  |
| 600   | 249      | 228 | 228 | 264 | 483 | 319       | 290 | 286 | 315 | 491 | 70         | 62  | 58  | 51  | 8   |
| 750   | 248      | 228 | 227 | 264 | 487 | 277       | 268 | 265 | 302 | 489 | 29         | 40  | 38  | 38  | 2   |
| 900   | 248      | 228 | 227 | 265 | 491 | 240       | 243 | 242 | 284 | 486 | -8         | 15  | 15  | 19  | -5  |
| 1050  | 244      | 227 | 227 | 266 | 497 | 215       | 220 | 221 | 273 | 493 | -29        | -7  | -6  | 7   | -4  |
| 1200  | 239      | 227 | 227 | 271 | 506 | 190       | 200 | 201 | 268 | 503 | -49        | -27 | -26 | -3  | -3  |
| 1350  |          |     | 226 | 272 | 524 |           |     | 207 | 251 | 518 |            |     | -19 | -21 | -6  |
| 1500  |          |     |     | 275 |     |           |     |     | 239 |     |            |     |     | -36 |     |
| 1650  |          |     |     | 282 |     |           |     |     | 277 |     |            |     |     | -5  |     |
| 1800  |          |     |     | 291 |     |           |     |     | 293 |     |            |     |     | 2   |     |
| 1950  |          |     |     | 305 |     |           |     |     | 303 |     |            |     |     | -2  |     |

NOTE: The measurements are taken along the vertical impact reference line.  
 Vehicle measurements forward of the vertical impact reference line are negative.

**DATA SHEET NO. 10 (CONTINUED)**  
**VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
Test Date: 11/08/2010

**MAXIMUM CRUSH DATA**

|                           | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---------------------------|---------|---------|---------|---------|---------|
| Maximum Crush (mm)        | 313     | 341     | 340     | 300     | 147     |
| Distance From Impact (mm) | 0       | 75      | 75      | 75      | 0       |

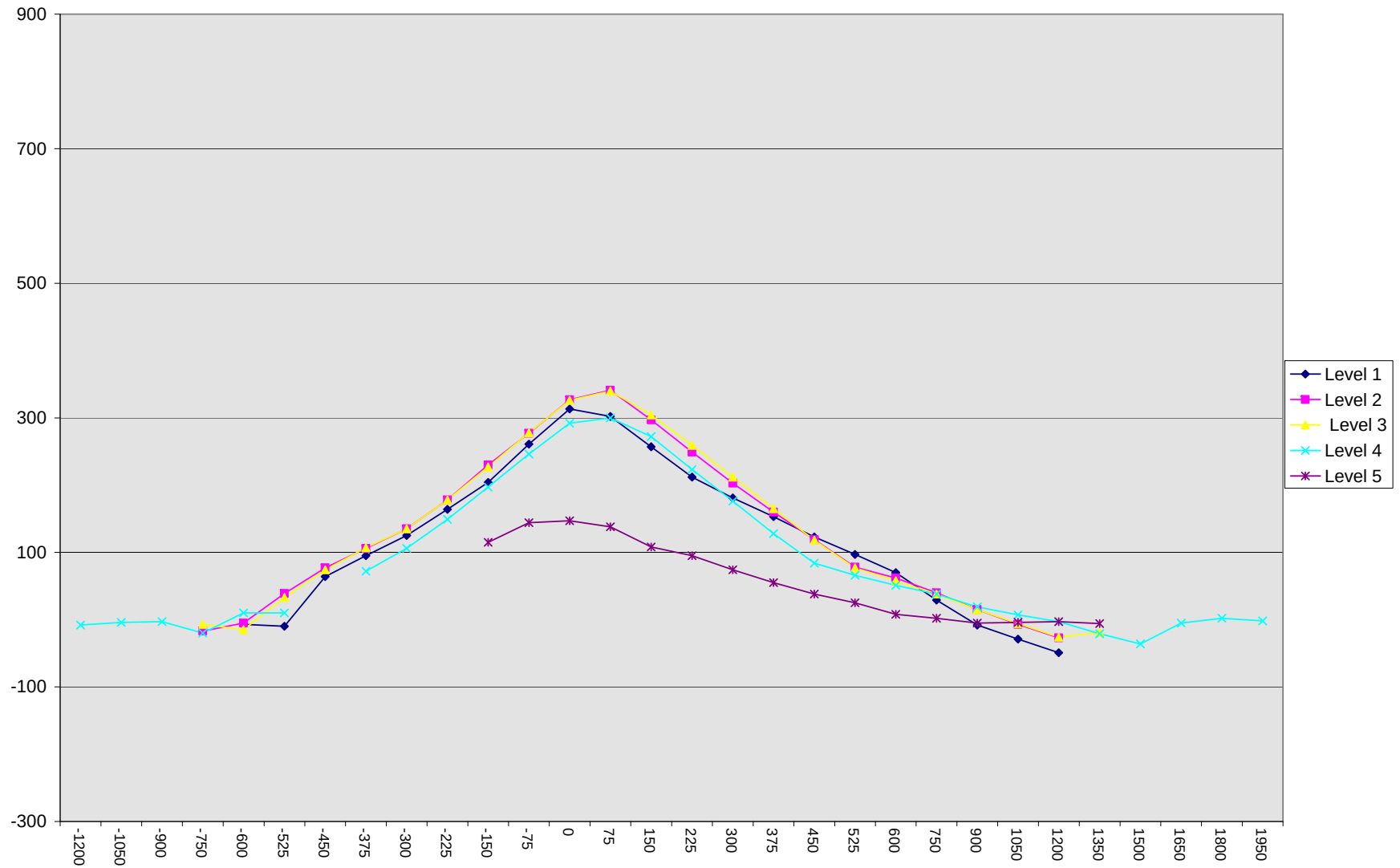
Note: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to test based on an estimated impact point. The final distance to impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

**DATA SHEET NO. 10 (CONTINUED)**  
**VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
Test Date: 11/08/2010

20



## DATA SHEET NO. 11

### FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

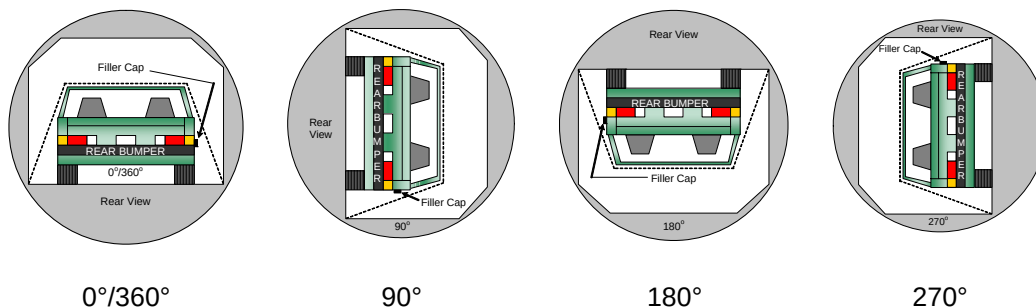
Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
 Test Date: 11/08/2010

Test Time: 11:14 am      Temperature: 21° C

- A. From impact until vehicle motion ceases: 0 oz.  
 (Maximum Allowable = 1 ounce)  
 B. For the 5 minute period after motion ceases: None  
 (Maximum allowable = 5 ounces)  
 C. For the following 25 minutes: None  
 (Maximum allowable = 1 oz./minute)  
 D. Spillage Details: None

### FMVSS 301 STATIC ROLLOVER DATA



### ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

| Test Phase   | Rotation Time | Hold Time | Total Time |
|--------------|---------------|-----------|------------|
| 0° to 90°    | 127           | 300       | 427        |
| 90° to 180°  | 118           | 300       | 418        |
| 180° to 270° | 107           | 300       | 407        |
| 270° to 360° | 114           | 300       | 414        |

### FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

### ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

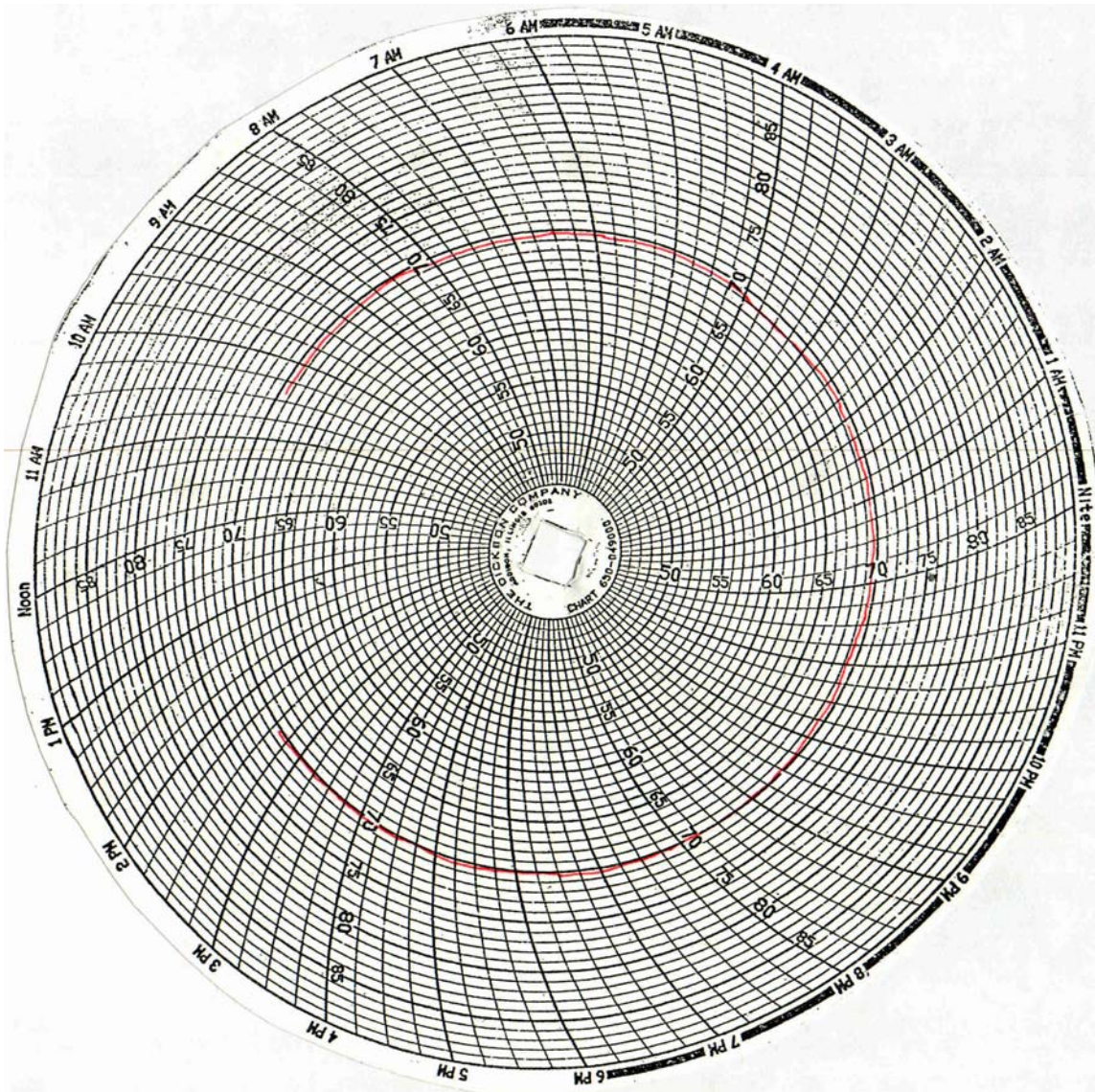
| Test Phase   | Spillage Location |
|--------------|-------------------|
| 0° to 90°    |                   |
| 90° to 180°  |                   |
| 180° to 270° |                   |
| 270° to 360° |                   |

## DATA SHEET NO. 12

### DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Honda Civic 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5309  
Test Date: 11/08/2010



**APPENDIX A**  
**PHOTOGRAPHS**

## TABLE OF PHOTOGRAPHS

|                                                                                      | <u>Page No.</u> |
|--------------------------------------------------------------------------------------|-----------------|
| Photo No. 1. As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle             | A-1             |
| Photo No. 2. As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle               | A-1             |
| Photo No. 3. Pre-Test Frontal View of Test Vehicle                                   | A-2             |
| Photo No. 4. Post-Test Frontal View of Test Vehicle                                  | A-2             |
| Photo No. 5. Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle                  | A-3             |
| Photo No. 6. Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle                 | A-3             |
| Photo No. 7. Pre-Test Left Side View of Test Vehicle                                 | A-4             |
| Photo No. 8. Post-Test Left Side View of Test Vehicle                                | A-4             |
| Photo No. 9. Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle                   | A-5             |
| Photo No. 10. Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle                 | A-5             |
| Photo No. 11. Pre-Test Rear View of Test Vehicle                                     | A-6             |
| Photo No. 12. Post-Test Rear View of Test Vehicle                                    | A-6             |
| Photo No. 13. Pre-Test Right Side View of Test Vehicle                               | A-7             |
| Photo No. 14. Post-Test Right Side View of Test Vehicle                              | A-7             |
| Photo No. 15. Pre-Test Overhead View of Test Vehicle and Pole                        | A-8             |
| Photo No. 16. Post-Test Overhead View of Test Vehicle and Pole                       | A-8             |
| Photo No. 17. Pre-Test Left Side View of Pole Positioned Against Side of Vehicle     | A-9             |
| Photo No. 18. Pre-Test Right Side View of Pole Positioned Against Side of Vehicle    | A-9             |
| Photo No. 19. Pre-Test Close-Up View of Impact Point Target                          | A-10            |
| Photo No. 20. Post-Test Close-Up View of Impact Point Target Showing Impact Location | A-10            |

|               |                                                                                              | <u>Page No.</u> |
|---------------|----------------------------------------------------------------------------------------------|-----------------|
| Photo No. 21. | Pre-Test Front Close-Up View of Dummy (through front window)                                 | A-11            |
| Photo No. 22. | Post-Test Front Close-Up View of Dummy (through front window)                                | A-11            |
| Photo No. 23. | Pre-Test Left Side View of Dummy Showing Belts, Chalking, and Contact Switches (Door Open)   | A-12            |
| Photo No. 24. | Pre-Test Left Side View of Dummy Shoulder and Door Top View                                  | A-12            |
| Photo No. 25. | Post-Test Left Side View of Dummy Shoulder and Door Top View                                 | A-13            |
| Photo No. 26. | Pre-Test Frontal View of Seat Back Prior to Dummy Positioning                                | A-13            |
| Photo No. 27. | Pre-Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint              | A-14            |
| Photo No. 28. | Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning                                 | A-14            |
| Photo No. 29. | Pre-Test Overhead View of Dummy Thighs on Seat Pan                                           | A-15            |
| Photo No. 30. | Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket                    | A-15            |
| Photo No. 31. | Pre-Test View of Dummy's Head Showing Dummy's Head is Level                                  | A-16            |
| Photo No. 32. | Pre-Test Placement of Dummy's Feet                                                           | A-16            |
| Photo No. 33. | Pre-Test View of Belt Anchorage for Dummy to Show Position                                   | A-17            |
| Photo No. 34. | Pre-Test Left Side View of Steering Wheel to Show Position                                   | A-17            |
| Photo No. 35. | Pre-Test View of Parking Brake                                                               | A-18            |
| Photo No. 36. | Pre-Test Close-Up Left Side View of Driver Seat Track Showing Test Position                  | A-18            |
| Photo No. 37. | Pre-Test Close-Up Left Side View of Driver Seat Back Showing Test Position                   | A-19            |
| Photo No. 38. | Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position | A-19            |
| Photo No. 39. | Pre-Test Dummy and Door Clearance View                                                       | A-20            |
| Photo No. 40. | Post-Test Dummy and Door Clearance View                                                      | A-20            |

|               |                                                                        | <u>Page No.</u> |
|---------------|------------------------------------------------------------------------|-----------------|
| Photo No. 41. | Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment  | A-21            |
| Photo No. 42. | Post-Test Right Side View of Dummy and Front Seat Occupant Compartment | A-21            |
| Photo No. 43. | Pre-Test Inner Driver Door Panel View                                  | A-22            |
| Photo No. 44. | Post-Test Inner Driver Door Panel View Showing Dummy Contact Location  | A-22            |
| Photo No. 45. | Post-Test Dummy Close-Up Head Contact with Vehicle Interior View       | A-23            |
| Photo No. 46. | Post-Test Dummy Close-Up Head Contact with Side Airbag View            | A-23            |
| Photo No. 47. | Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View      | A-24            |
| Photo No. 48. | Post-Test Dummy Close-Up Torso Contact with Side Airbag View           | A-24            |
| Photo No. 49. | Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View     | A-25            |
| Photo No. 50. | Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View          | A-25            |
| Photo No. 51. | Pre-Test View of Fuel Filler Cap or Fuel Filler Neck                   | A-26            |
| Photo No. 52. | Post-Test View of Fuel Filler Cap or Fuel Filler Neck                  | A-26            |
| Photo No. 53. | Close-Up View of Vehicle's Certification Label                         | A-27            |
| Photo No. 54. | Close-Up View of Vehicle's Tire Information Placard or Label           | A-27            |
| Photo No. 55. | Pre-Test Pole Barrier Front View                                       | A-28            |
| Photo No. 56. | Post-Test Pole Barrier Front View                                      | A-28            |
| Photo No. 57. | Pre-Test Pole Barrier Side View                                        | A-29            |
| Photo No. 58. | Post-Test Pole Barrier Side View                                       | A-29            |
| Photo No. 59. | Pre-Test Ballast View                                                  | A-30            |
| Photo No. 60. | Post-Test Primary and Redundant Speed Trap Read-Out                    | A-30            |
| Photo No. 61. | FMVSS No. 301/305 Rollover 0 Degrees                                   | A-31            |

|                                                                                         | <u>Page No.</u> |
|-----------------------------------------------------------------------------------------|-----------------|
| Photo No. 62. FMVSS No. 301/305 Rollover 90 Degrees                                     | A-31            |
| Photo No. 63. FMVSS No. 301/305 Rollover 180 Degrees                                    | A-32            |
| Photo No. 64. FMVSS No. 301/305 Rollover 270 Degrees                                    | A-32            |
| Photo No. 65. FMVSS No. 301/305 Rollover 360 Degrees                                    | A-33            |
| Photo No. 66. Impact Event                                                              | A-33            |
| Photo No. 67. Monroney Label                                                            | A-34            |
| Photo No. 68. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual | A-35            |
| Photo No. 69. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual | A-36            |
| Photo No. 70. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual | A-37            |



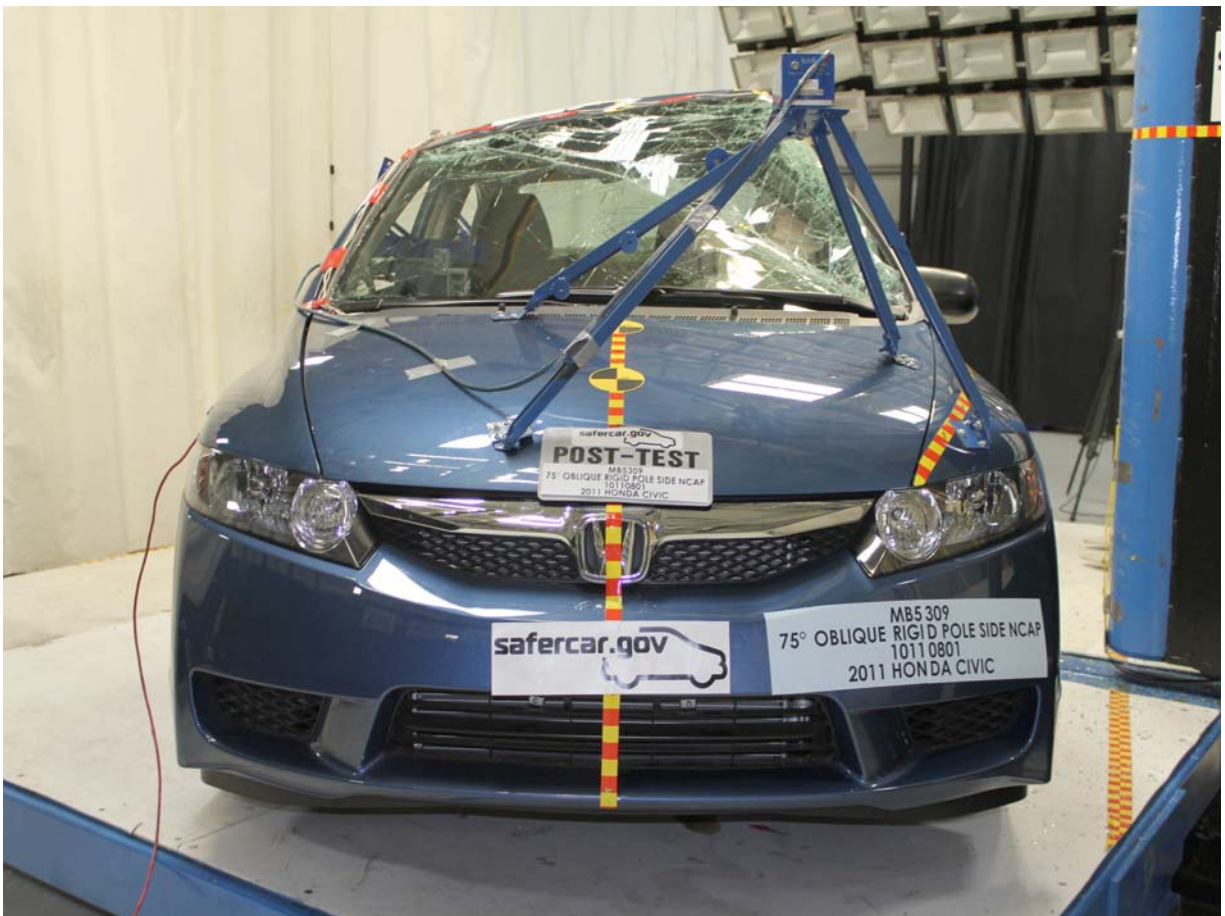
As Delivered Right Front  $\frac{3}{4}$  View of Test Vehicle



As Delivered Left Rear  $\frac{3}{4}$  View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



Post-Test Frontal View of Test Vehicle



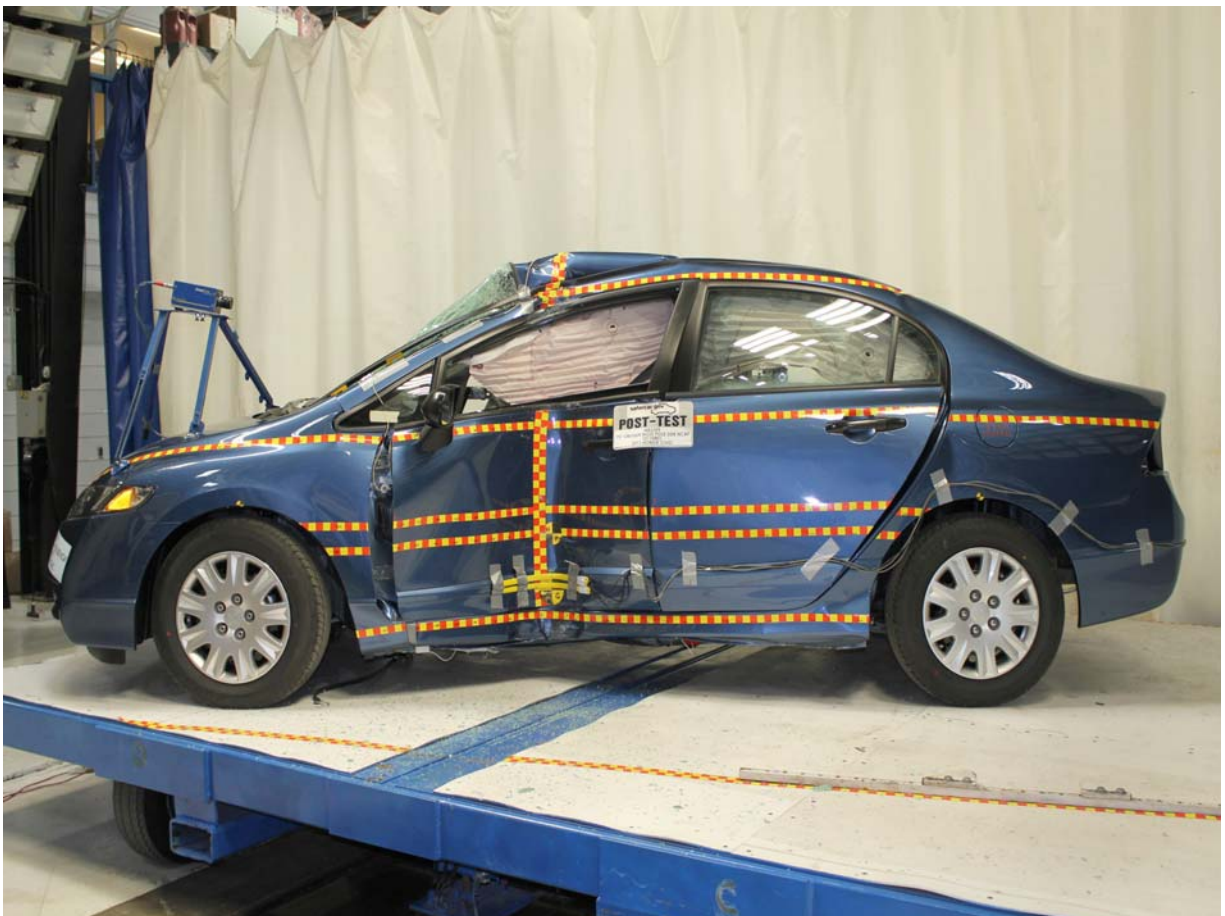
Pre-Test Left Front  $\frac{3}{4}$  View of Test Vehicle



Post-Test Left Front  $\frac{3}{4}$  View of Test Vehicle



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle



Post-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle



Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Vehicle and Pole



Post-Test Overhead View of Test Vehicle and Pole



Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



Pre-Test Right Side View of Pole Positioned Against Side of Vehicle



Pre-Test Close-Up View of Impact Point Target



Post-Test Close-Up View of Impact Point Target Showing Impact Location



Pre-Test Front Close-Up View of Dummy (through front window)



Post-Test Front Close-Up View of Dummy (through front window)



Pre-Test Left Side View of Dummy Showing Belts, Chalking, and Contact Switches (Door Open)



Pre-Test Left Side View of Dummy Shoulder and Door Top View



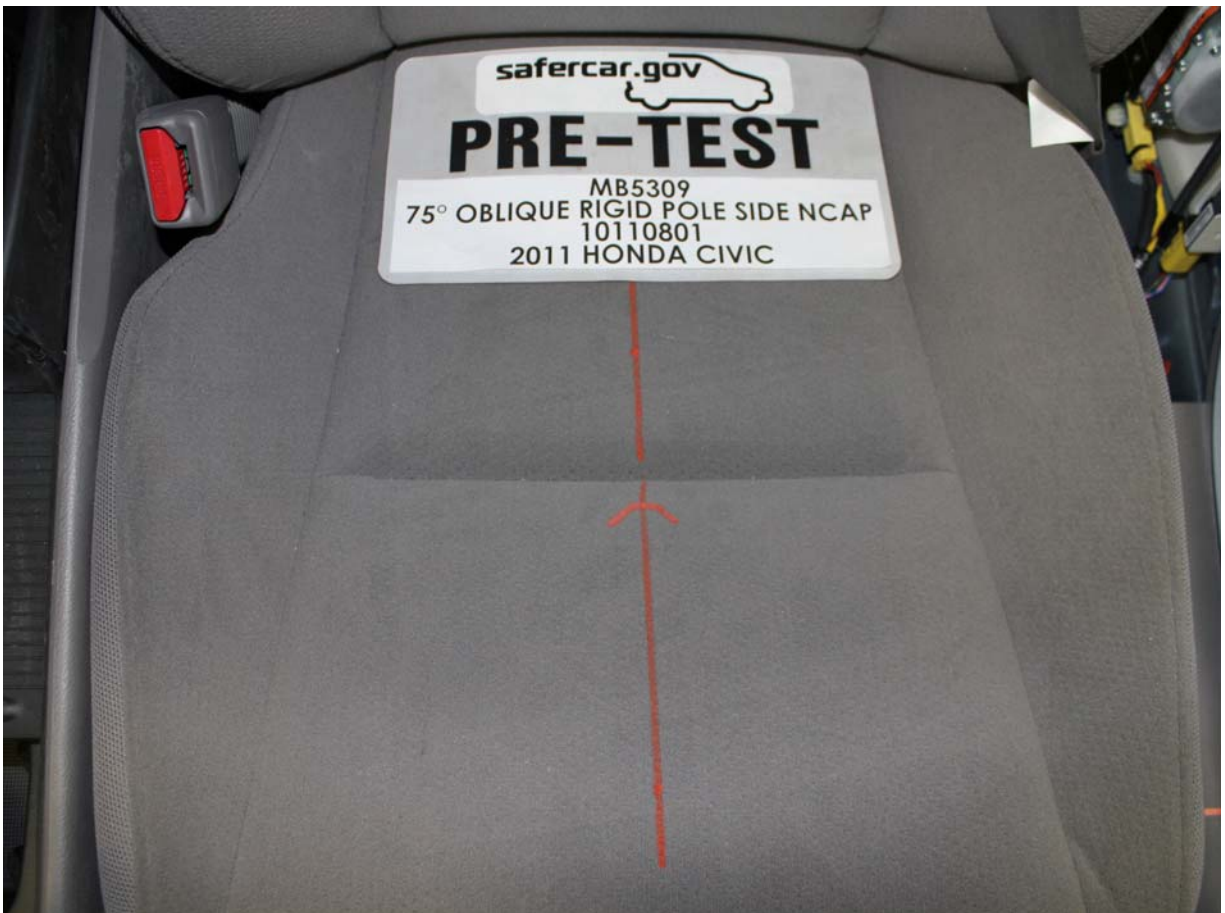
Post-Test Left Side View of Dummy Shoulder and Door Top View



Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



Pre-Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint



Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



Pre-Test Overhead View of Dummy Thighs on Seat Pan



Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket



Pre-Test View of Dummy's Head Showing Dummy's Head is Level



Pre-Test Placement of Dummy's Feet



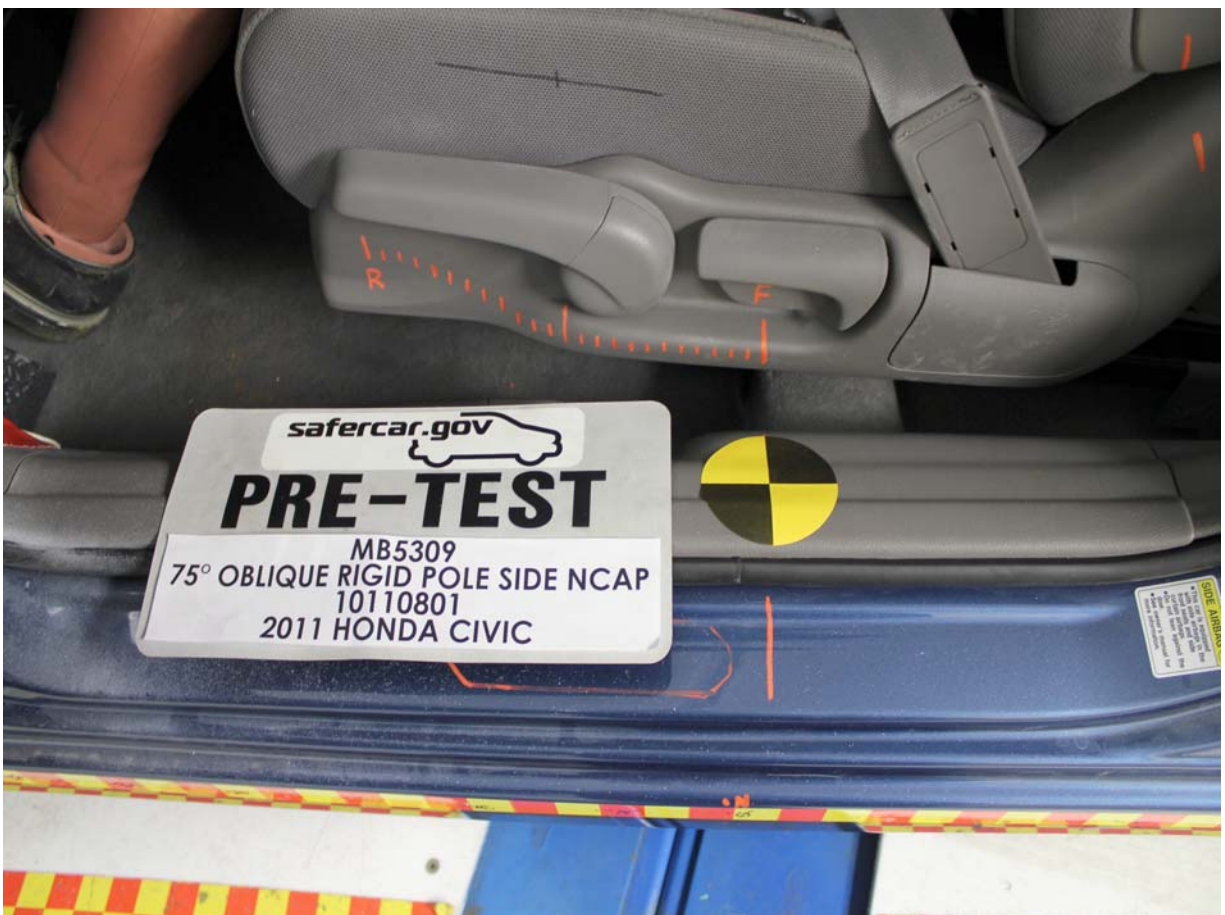
Pre-Test View of Belt Anchorage for Dummy to Show Position



Pre-Test Left Side View of Steering Wheel to Show Position



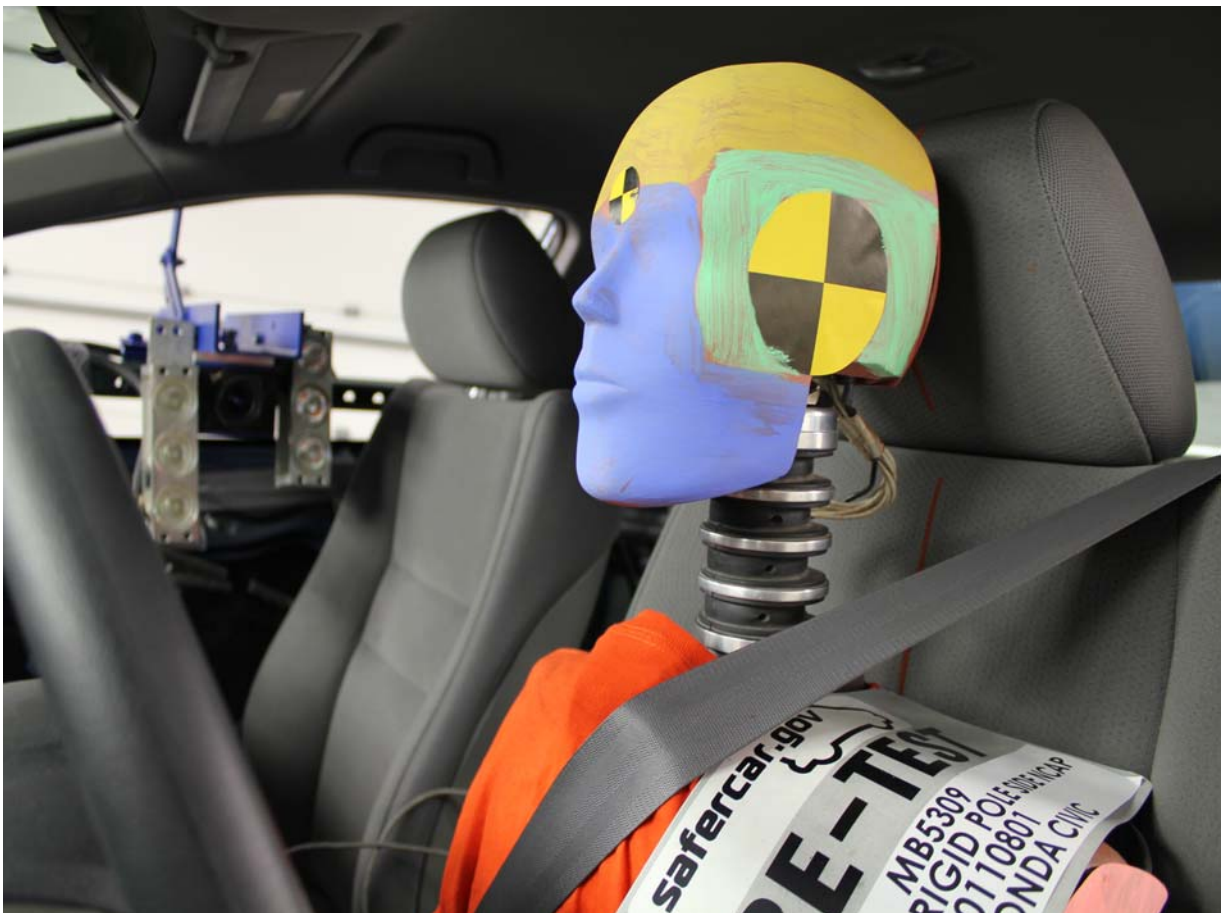
Pre-Test View of Parking Brake



Pre-Test Close-Up Left Side View of Driver Seat Track Showing Test Position



Pre-Test Close-Up Left Side View of Driver Seat Back Showing Test Position



Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position



Pre-Test Dummy and Door Clearance View



Post-Test Dummy and Door Clearance View



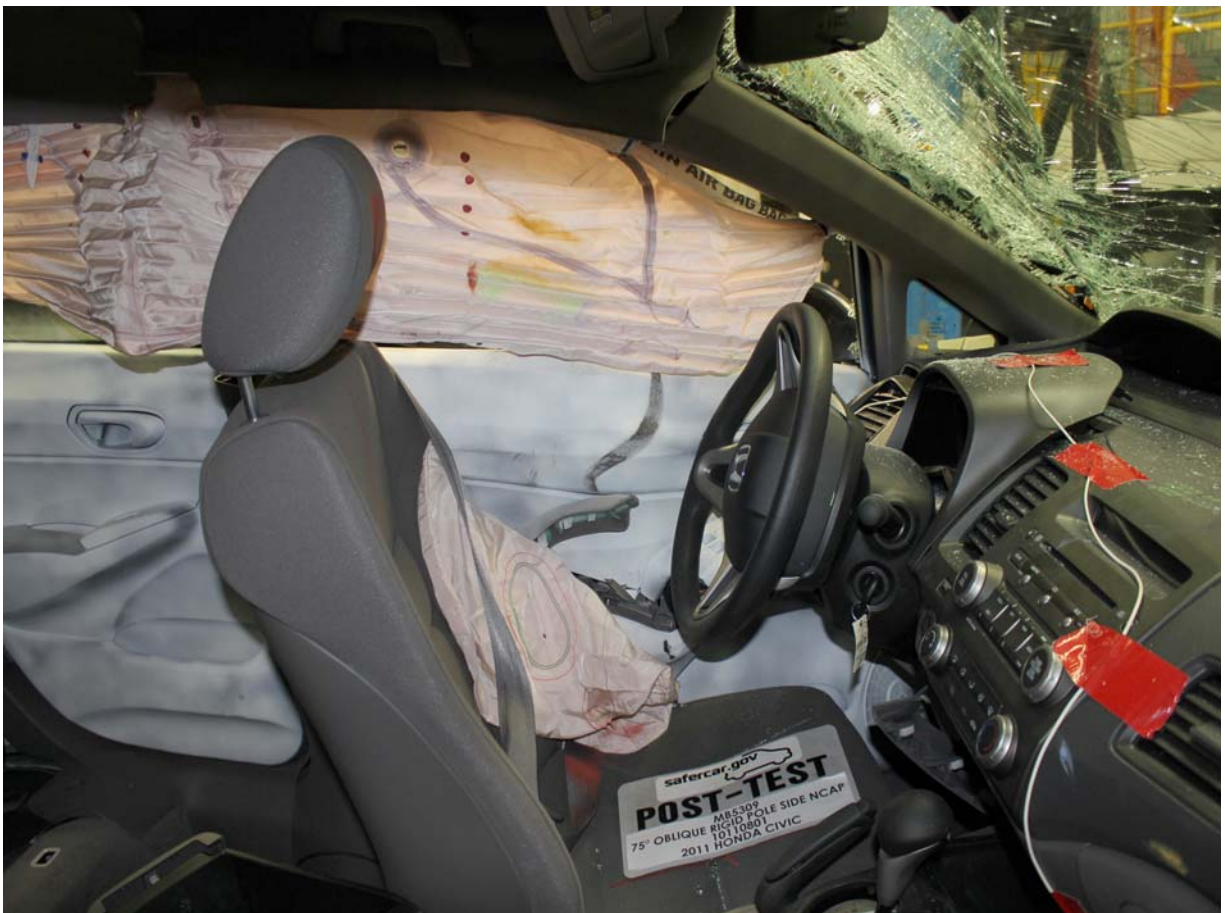
Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment



Post-Test Right Side View of Dummy and Front Seat Occupant Compartment



Pre-Test Inner Driver Door Panel View



Post-Test Inner Driver Door Panel View Showing Dummy Contact Location



Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



Post-Test Dummy Close-Up Head Contact with Side Airbag View



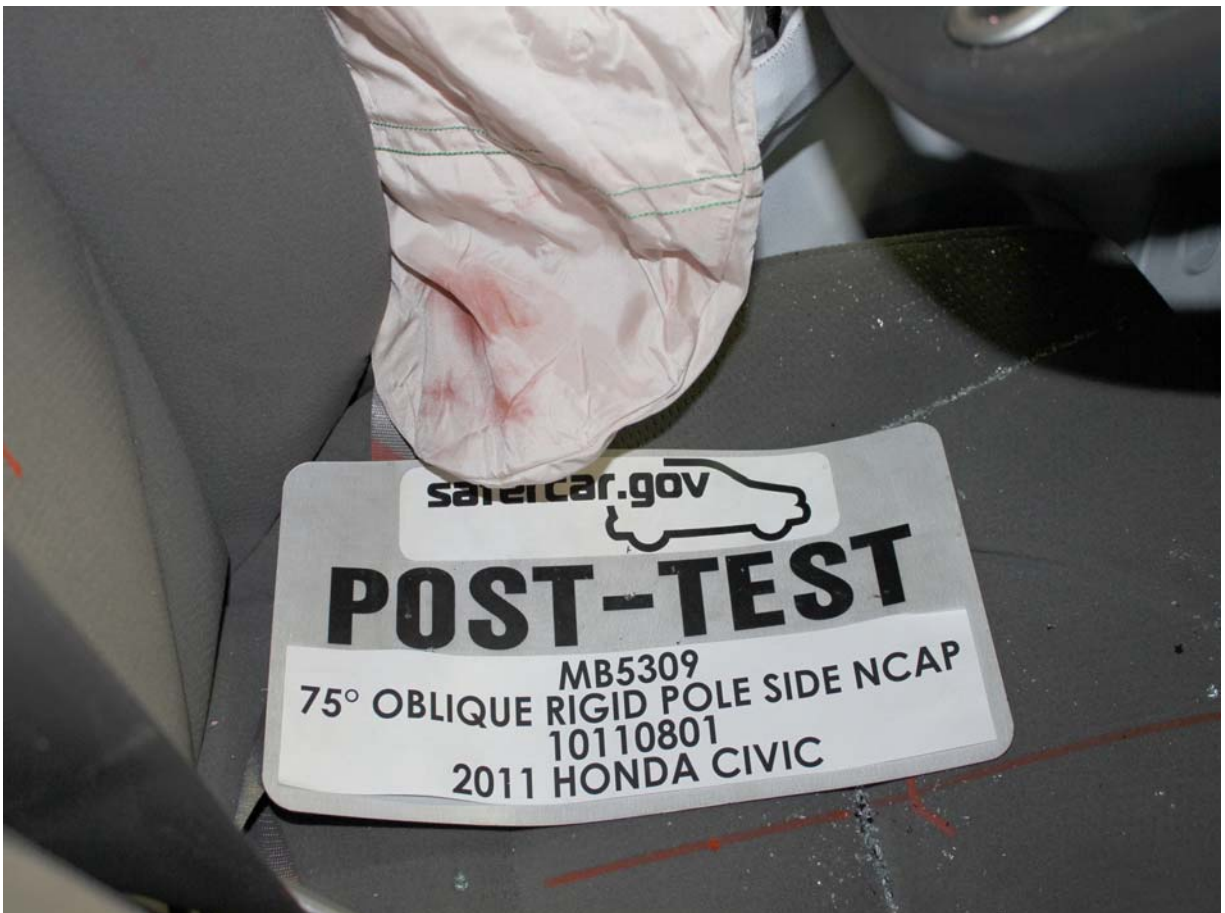
Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Post-Test Dummy Close-Up Torso Contact with Side Airbag View



Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



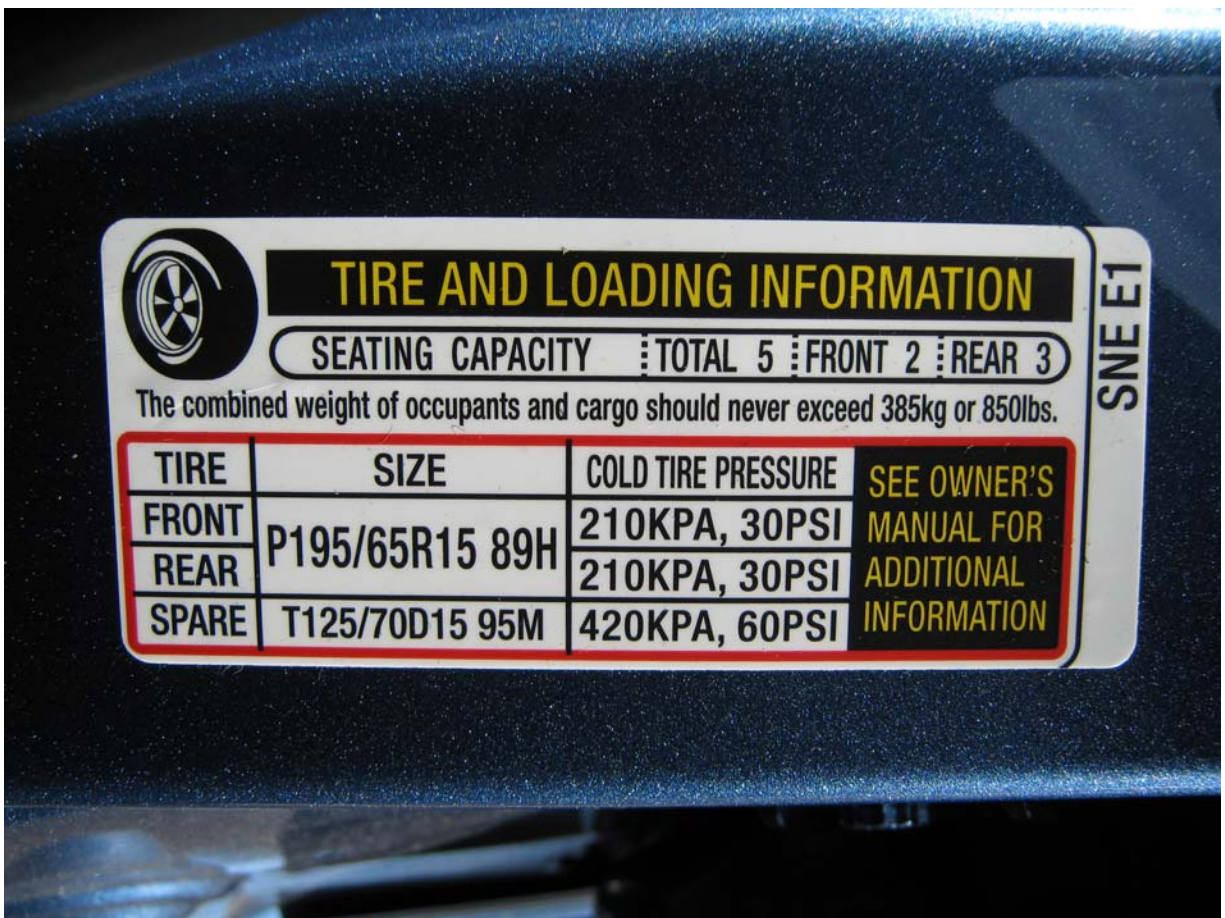
Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Close-Up View of Vehicle's Certification Label



Close-Up View of Vehicle's Tire Information Placard or Label



Pre-Test Pole Barrier Front View



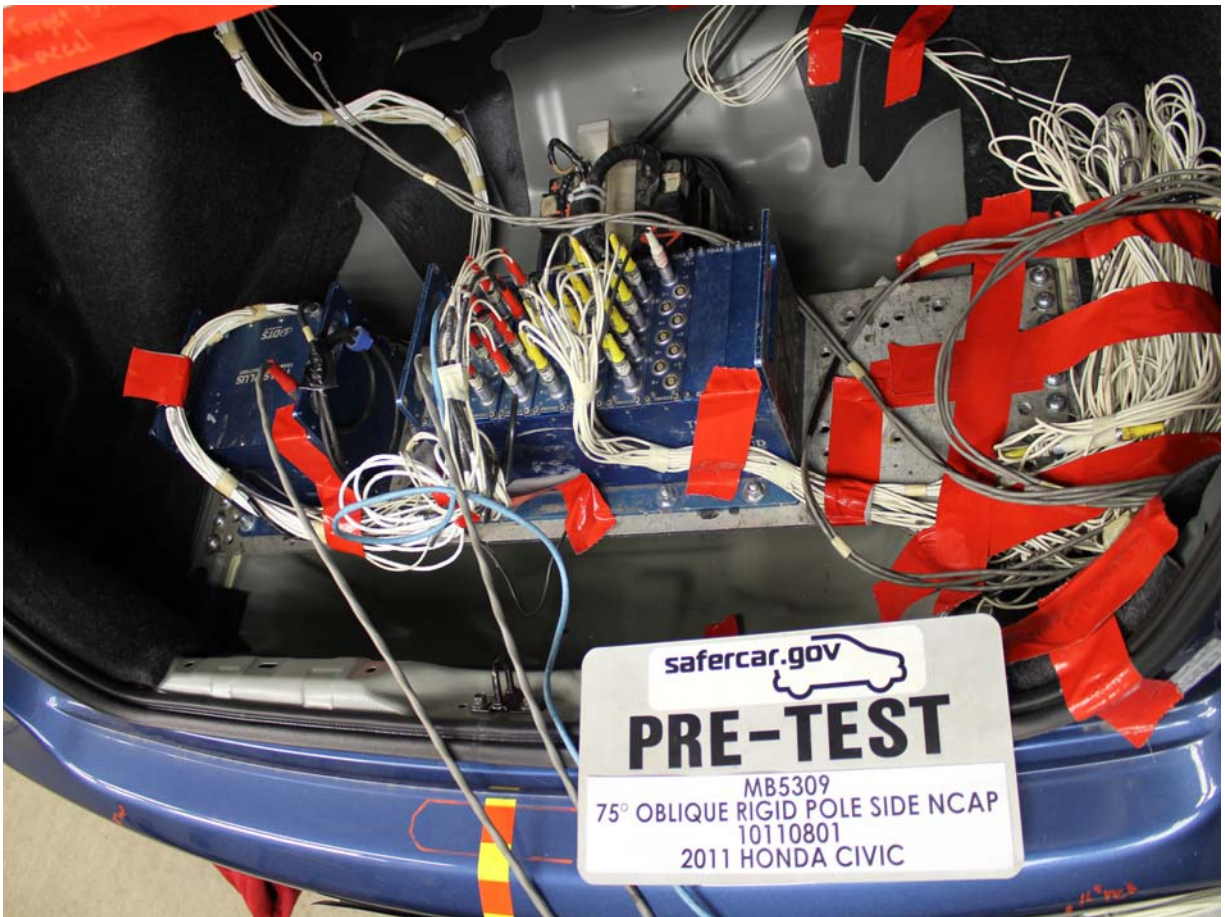
Post-Test Pole Barrier Front View



Pre-Test Pole Barrier Side View



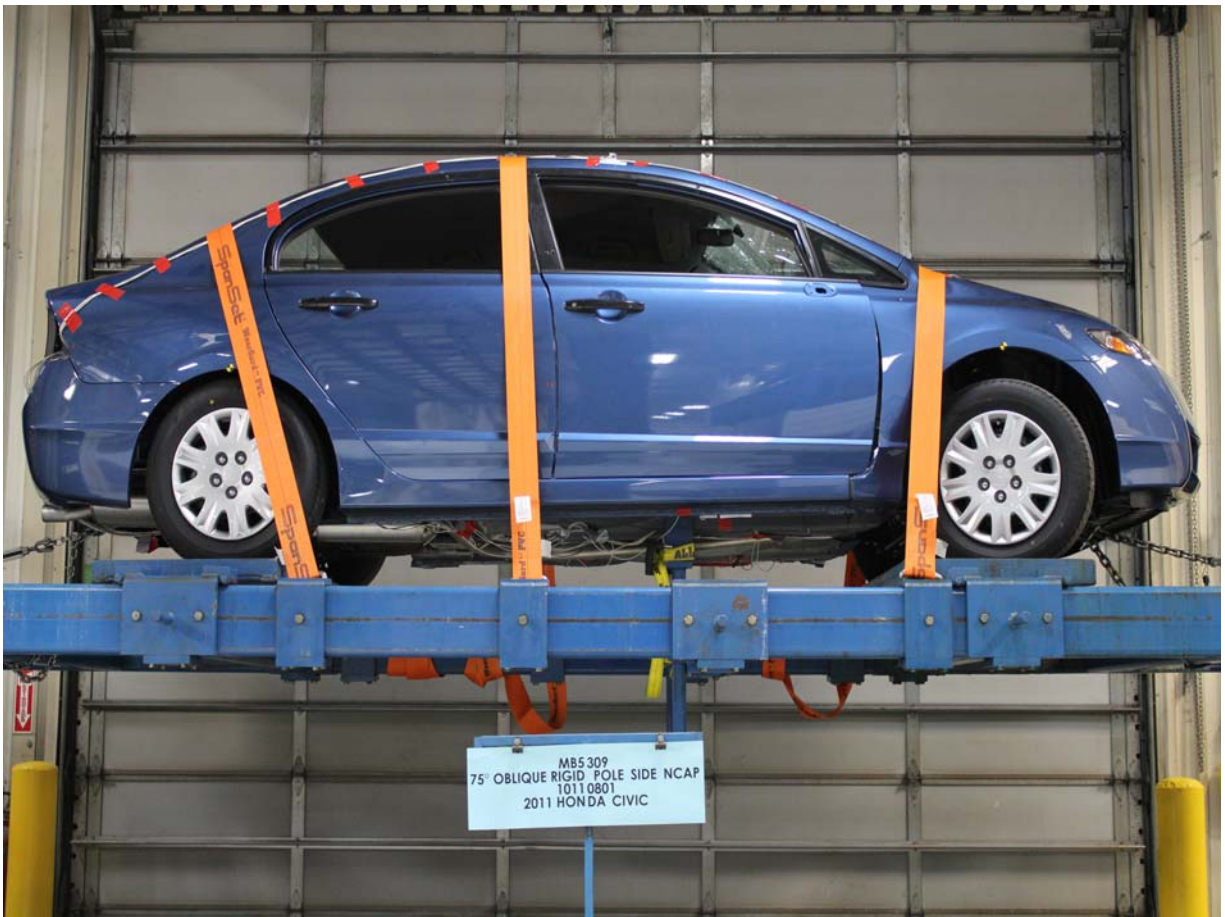
Post-Test Pole Barrier Side View



Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



FMVSS No. 301/305 Rollover 0 Degrees



FMVSS No. 301/305 Rollover 90 Degrees



FMVSS No. 301/305 Rollover 180 Degrees



FMVSS No. 301/305 Rollover 270 Degrees



FMVSS No. 301/305 Rollover 360 Degrees

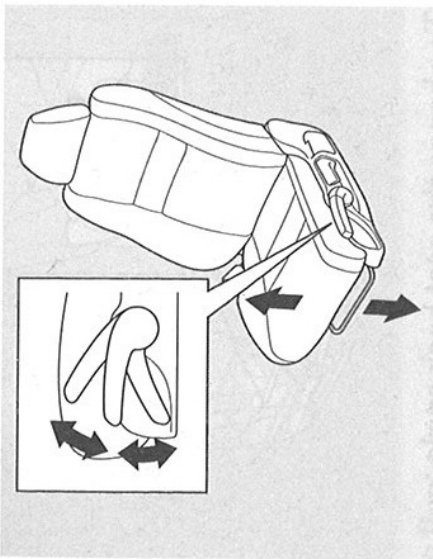


Impact Event



## Seats

### Driver's Seat Height Adjustment

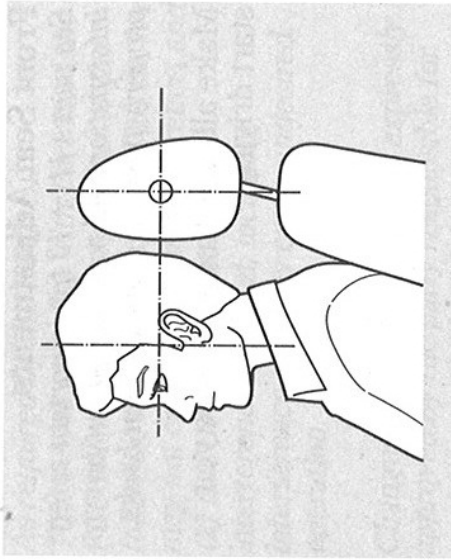


The height of your driver's seat is adjustable. To raise the seat, repeatedly pull up the lever on the outside of the seat cushion. To lower the seat, push the lever down repeatedly.

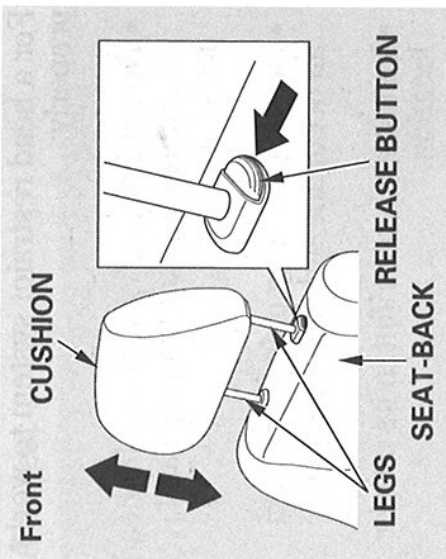
### Head Restraints

See page 13 for important safety information and a warning about improperly positioning head restraints.

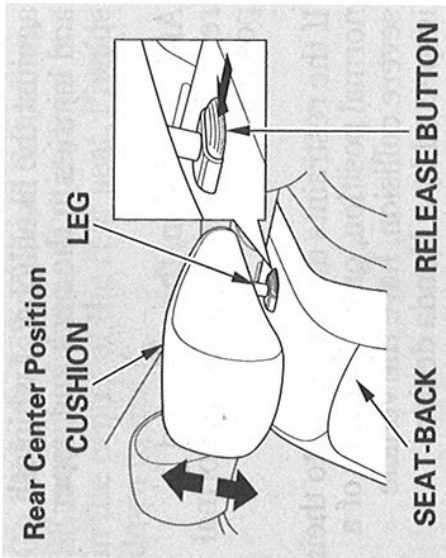
Your vehicle is equipped with head restraints in all seating positions to help protect you and your passengers from the likelihood of whiplash and other injuries.



They are most effective when you adjust them so the center of the back of the occupant's head rests against the center of the restraint.



**Adjusting the Head Restraint**  
The head restraints adjust for height. You need both hands to adjust a restraint. Do not attempt to adjust it while driving. To raise it, pull upward. To lower the restraint, push the release button sideways, and push the restraint down.



When a passenger is seated in the rear center seating position, the center head restraint should be adjusted up or down, to match the passenger's height.

**Removing the Head Restraint**  
To remove a head restraint for cleaning or repair, pull it up as far as it will go. Push the release button, then pull the restraint out of the seat-back.

### ⚠ WARNING

Failure to reinstall the head restraints can result in severe injury during a crash.

Always replace the head restraints before driving.

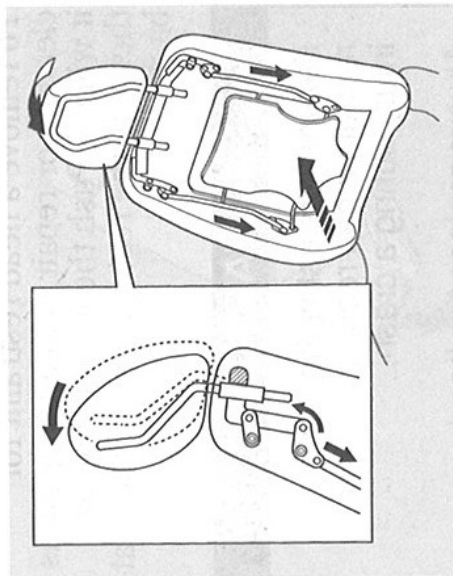
When reinstalling a head restraint, put the legs back in place. Then adjust it to the appropriate height while pressing the release button.

Make sure the head restraint locks in position when you reinstall it.

CONTINUED

## Seats

### Active Head Restraints



The driver's and front passenger's seats have active head restraints. If the vehicle is struck severely from the rear, the occupant properly secured with the seat belt will be pushed against the seat-back and the head restraint will automatically move forward.

This reduces the distance between the restraint and the occupant's head. It also helps protect the occupants

against the likelihood of whiplash and injuries to the neck and upper spine.

After a collision, the activated restraint should return to its normal position.

If the restraints do not return to their normal position, or in the event of a severe collision, have the vehicle inspected by a Honda dealer.

For a head restraint system to work properly:

- Do not hang any items on the head restraints, or from the restraint legs.
- Do not place any object between an occupant and the seat-back.
- Install each restraint in its proper location.
- Only use genuine Honda replacement head restraints.

**APPENDIX B**  
**DUMMY RESPONSE DATA**

## TABLE OF DATA PLOTS

|                                                       |                                                        | <u>Page No.</u> |
|-------------------------------------------------------|--------------------------------------------------------|-----------------|
| <b>List of Data Plots Provided in the Test Report</b> |                                                        |                 |
| Figure No. 1.                                         | Driver Head Acceleration (X) Primary vs. Time          | B-1             |
| Figure No. 2.                                         | Driver Head Acceleration (Y) Primary vs. Time          | B-1             |
| Figure No. 3.                                         | Driver Head Acceleration (Z) Primary vs. Time          | B-1             |
| Figure No. 4.                                         | Driver Head Resultant Primary Acceleration vs. Time    | B-1             |
| Figure No. 5.                                         | Driver Lower Spine T12 Acceleration (X) vs. Time       | B-2             |
| Figure No. 6.                                         | Driver Lower Spine T12 Acceleration (Y) vs. Time       | B-2             |
| Figure No. 7.                                         | Driver Lower Spine T12 Acceleration (Z) vs. Time       | B-2             |
| Figure No. 8.                                         | Driver Lower Spine T12 Resultant Acceleration vs. Time | B-2             |
| Figure No. 9.                                         | Driver Iliac Wing Force on Impact Side (Y) vs. Time    | B-3             |
| Figure No. 10.                                        | Driver Acetabulum Force on Impact Side (Y) vs. Time    | B-3             |
| Figure No. 11.                                        | Driver Total Pelvis Force on Impact Side (Y) vs. Time  | B-3             |

**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 Acceleration (X) Redundant

Driver Head Acceleration (Y) Redundant

Driver Head Acceleration (Z) Redundant

Driver Upper Thorax Rib Deflection (Y)

Driver Middle Thorax Rib Deflection (Y)

Driver Lower Thorax Rib Deflection (Y)

Driver Upper Abdomen Rib Deflection (Y)

Driver Lower Abdomen Rib Deflection (Y)

Driver Shoulder Contact Switch

Driver Torso Contact Switch

Driver Pelvis Contact Switch

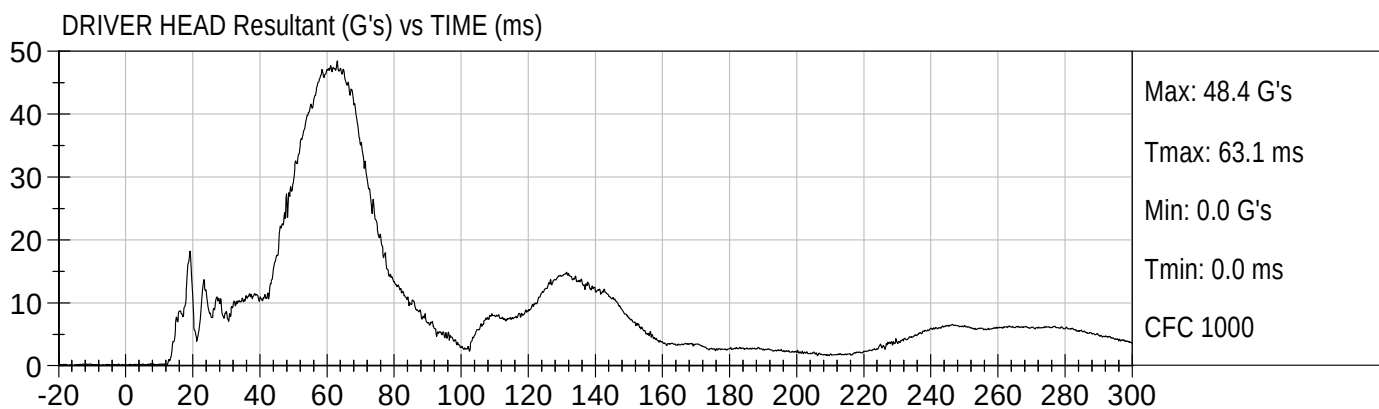
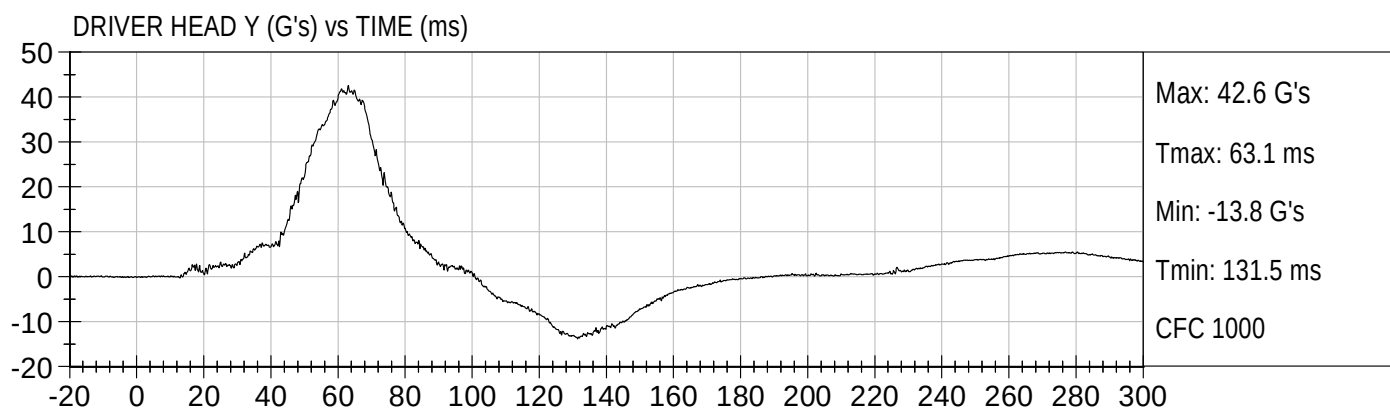
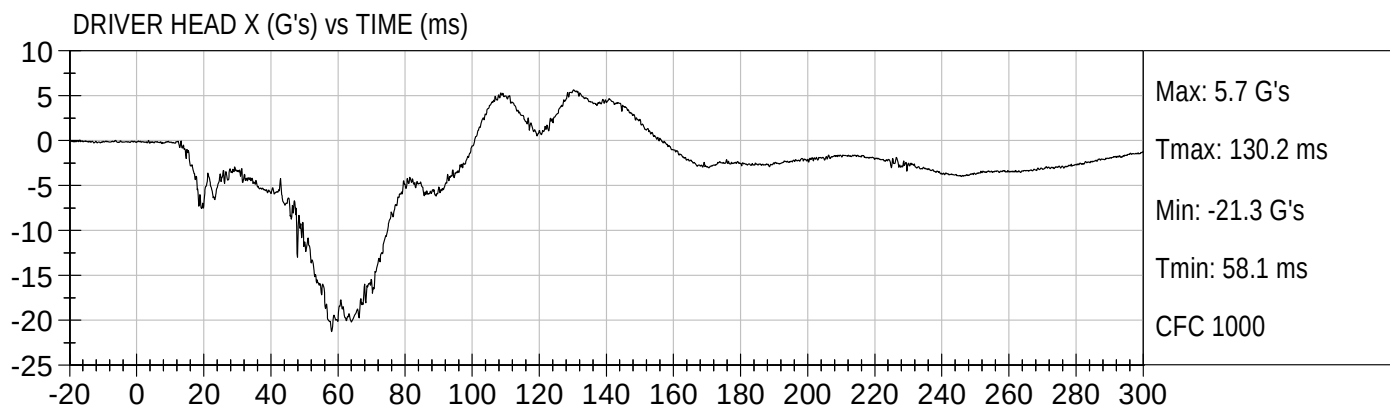
Vehicle CG Acceleration (X)

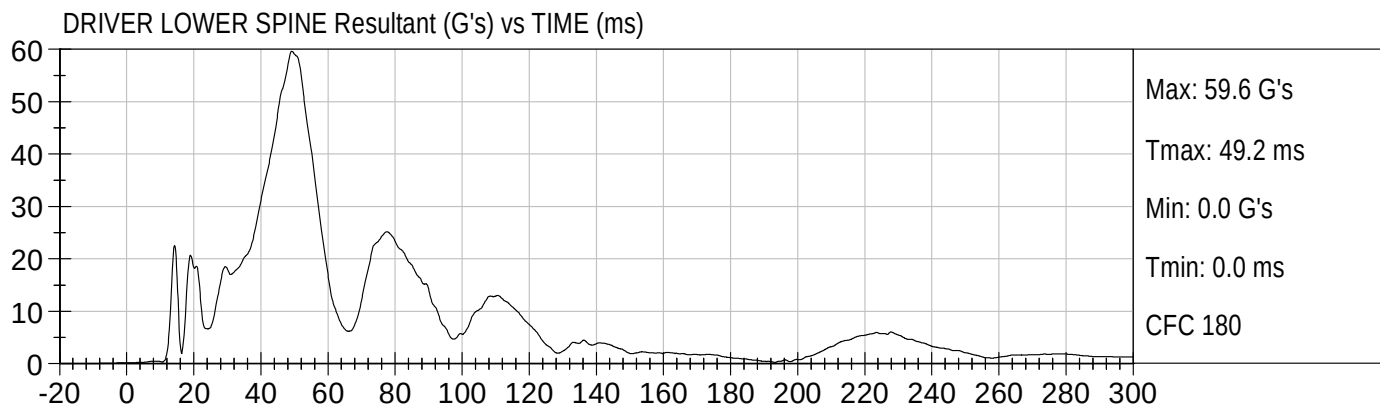
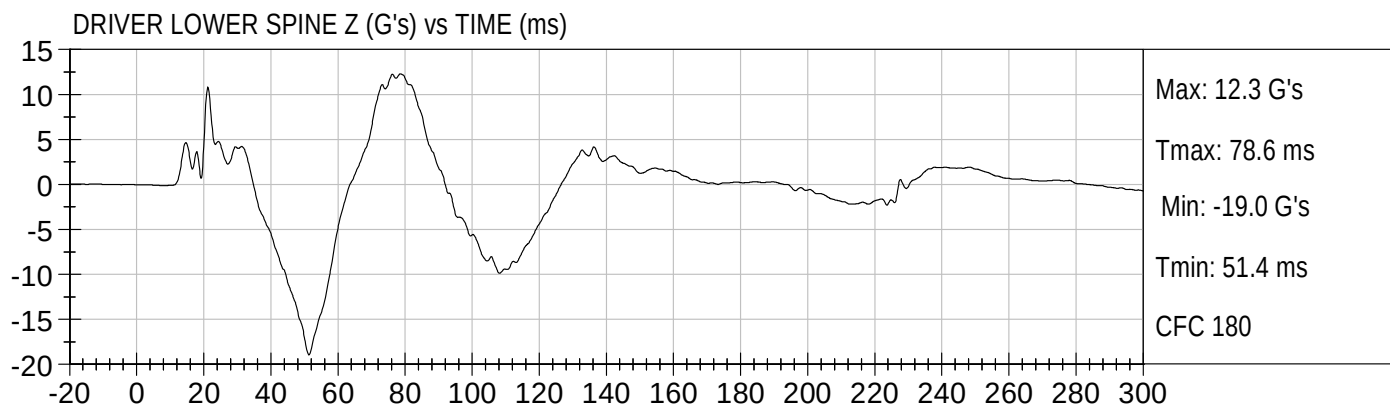
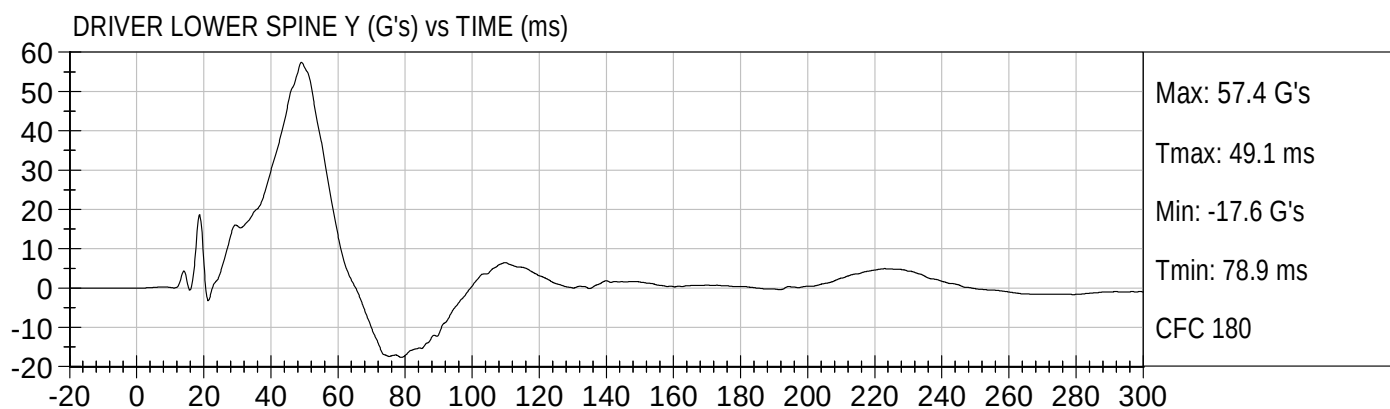
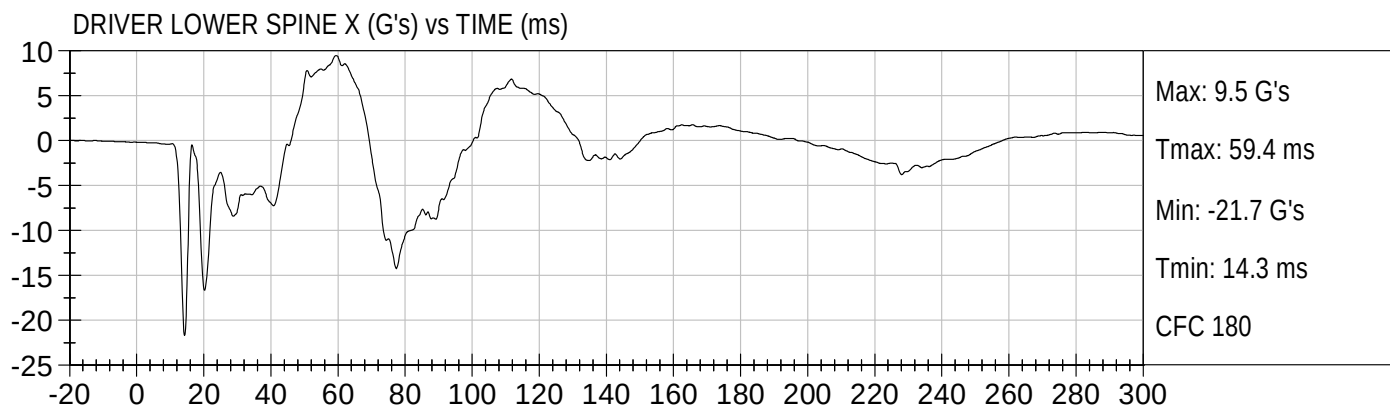
Vehicle CG Acceleration (Y)

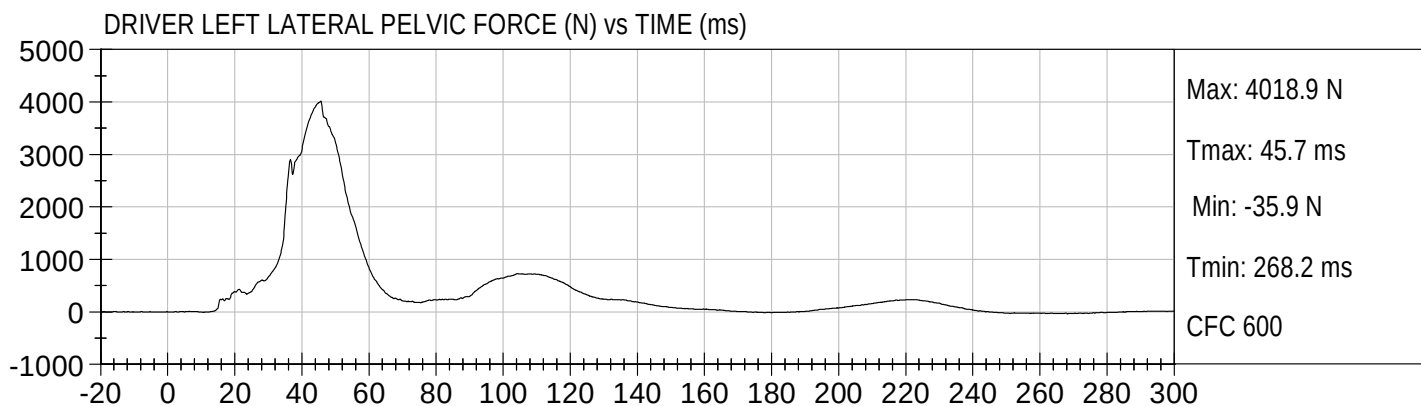
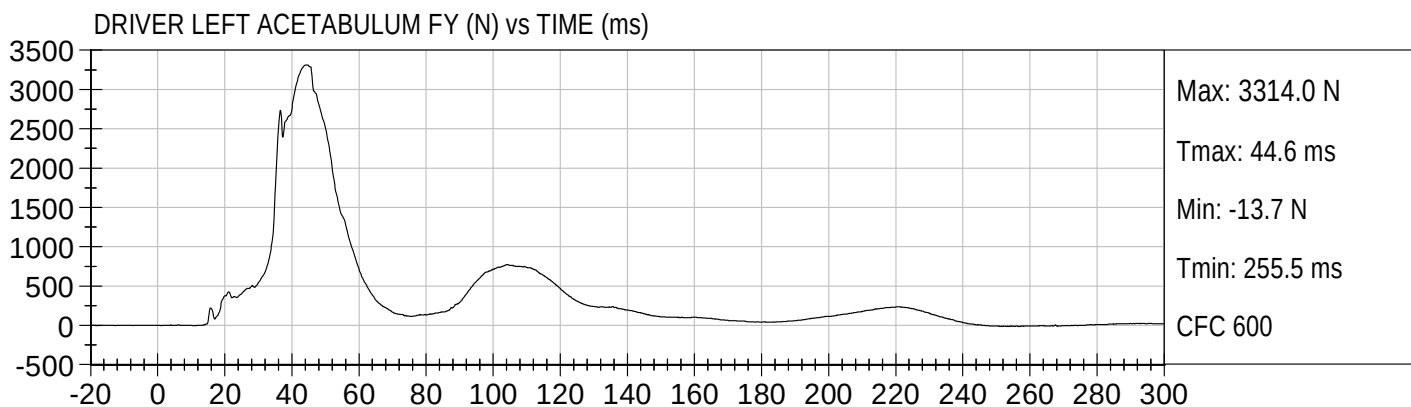
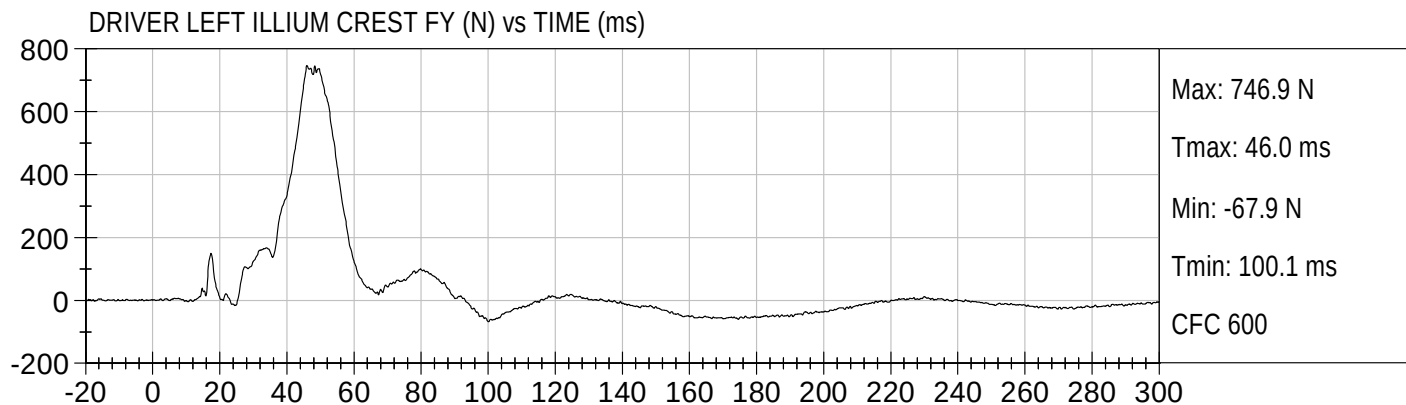
Vehicle CG Acceleration (Z)

Vehicle CG Angular Rate About X (Roll)

Vehicle CG Angular Rate About Y (Pitch)  
Vehicle CG Angular Rate About Z (Yaw)  
Left Floor Sill Acceleration (Y)  
Left A-Pillar Sill Acceleration (Y)  
Left Lower A-Pillar Acceleration (Y)  
Left Mid A-Pillar Acceleration (Y)  
Left B-Pillar Sill Acceleration (Y)  
Left Lower B-Pillar Acceleration (Y)  
Left Mid B-Pillar Acceleration (Y)  
Driver Seat Track at Dummy H-Point Acceleration (Y)  
Engine Top Acceleration (X)  
Engine Top Acceleration (Y)  
Firewall Center Acceleration (Y)  
Right Roof at Vertical Impact Reference Line Acceleration (Y)  
Right Sill at Vertical Impact Reference Line Acceleration (Y)  
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)  
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)  
Driver Side Airbag Timing  
Driver Side Curtain Airbag Timing – Not Installed  
Load Cell Pole Barrier #1 Force (Y) – Not used  
Load Cell Pole Barrier #2 Force (Y) – Not used  
Load Cell Pole Barrier #3 Force (Y) – Not used  
Load Cell Pole Barrier #4 Force (Y) – Not used  
Load Cell Pole Barrier #5 Force (Y) – Not used  
Load Cell Pole Barrier #6 Force (Y) – Not used  
Load Cell Pole Barrier #7 Force (Y) – Not used  
Load Cell Pole Barrier #8 Force (Y) – Not used







## **APPENDIX C**

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

**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**SID-Its BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D103721

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 22.1   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 27     | Pass      |
| Peak Resultant Acceleration  | G's   | 115 to 137    | 124    | Pass      |
| Peak Lateral Acceleration    | G's   | +/- 15        | 2.4    | Pass      |
| Unimodal                     | N/A   | <15%          | Yes    | Pass      |
| Overall Test Results         |       |               |        | Pass      |

  
\_\_\_\_\_  
Laboratory Technician

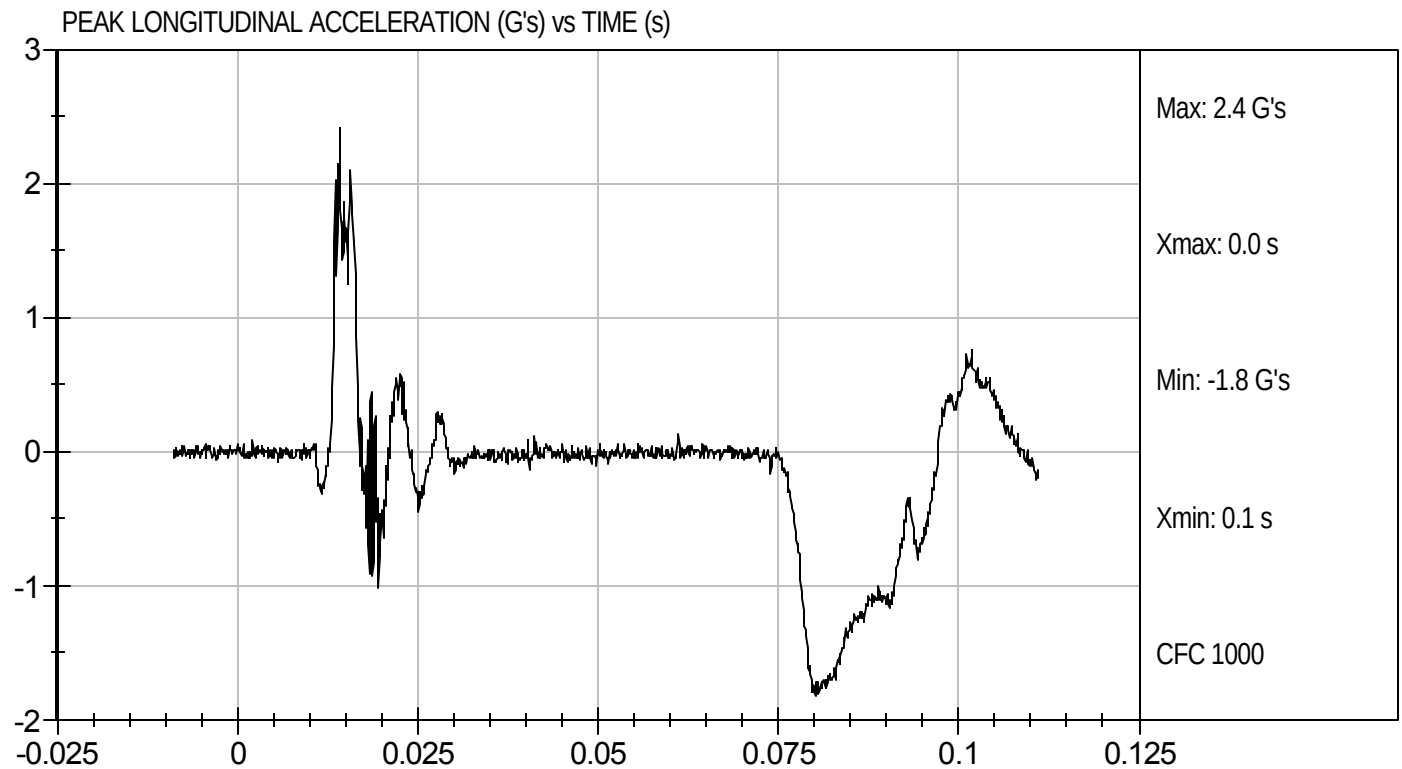
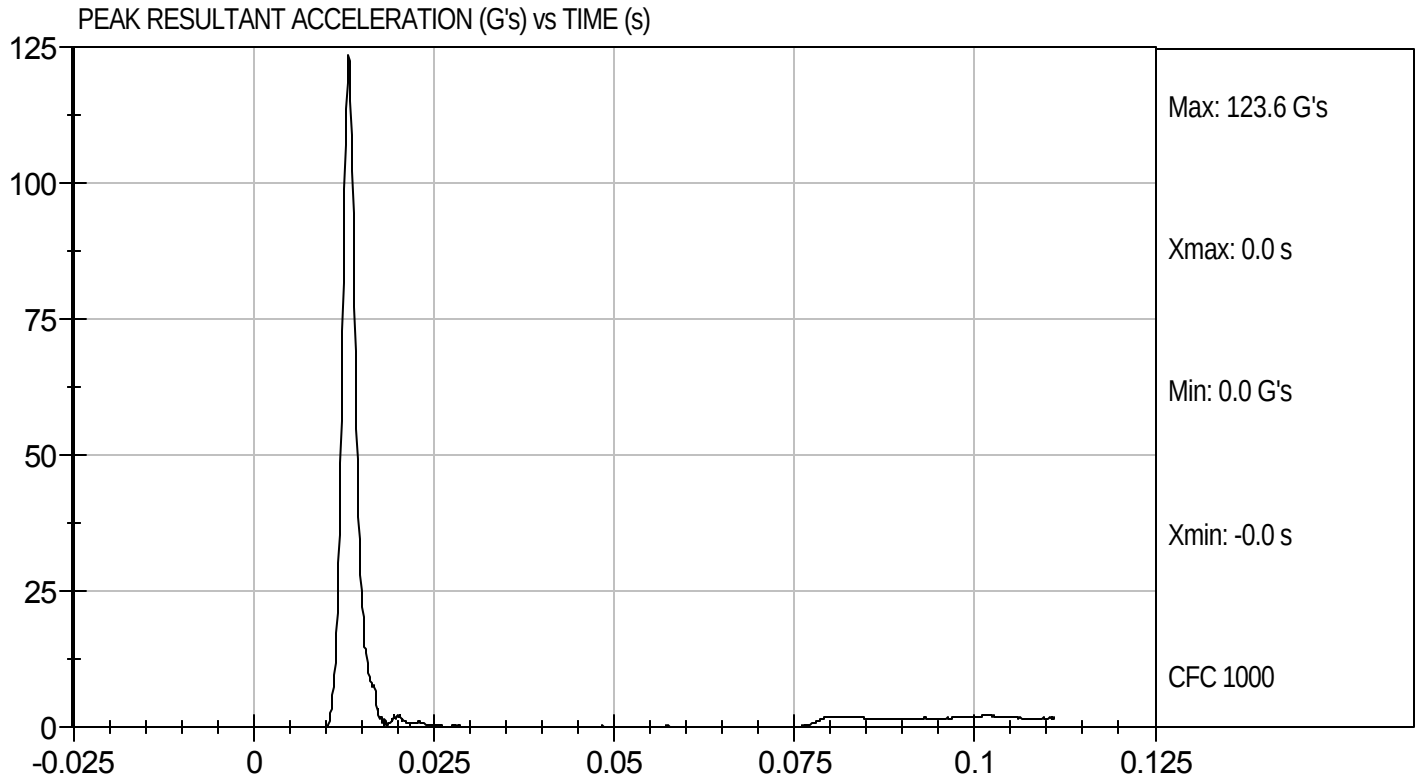
10/29/10  
Test Date

  
\_\_\_\_\_  
Approved By



Test Desc: Head Drop  
Component ID: D103721

Test Date: 10/29/10  
Velocity: 0 ft/s, 0 m/s

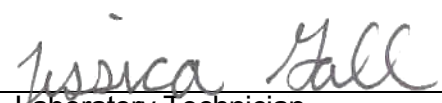


**MGA RESEARCH CORPORATION**  
**LATERAL NECK PENDULUM TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 296

Test I.D: D103722

| Tested Parameter                                             |           | Units | Specification | Result | Pass/Fail |
|--------------------------------------------------------------|-----------|-------|---------------|--------|-----------|
| Temperature                                                  |           | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                                                     |           | %     | 10 to 70      | 25     | Pass      |
| Impact Velocity                                              |           | m/s   | 5.51 to 5.63  | 5.58   | Pass      |
| Delta Velocity                                               | 10 ms     | m/s   | 2.20 to 2.80  | 2.57   | Pass      |
|                                                              | 15 ms     | m/s   | 3.30 to 4.10  | 3.60   | Pass      |
|                                                              | 20 ms     | m/s   | 4.40 to 5.40  | 4.85   | Pass      |
|                                                              | 25 ms     | m/s   | 5.40 to 6.10  | 5.60   | Pass      |
|                                                              | 25-100 ms | m/s   | 5.50 to 6.20  | 5.61   | Pass      |
| Maximum D-Plane Rotation                                     |           | deg   | 71 to 81      | 75     | Pass      |
| Time of Maximum D-Plane Rotation                             |           | ms    | 50 to 70      | 61     | Pass      |
| Maximum Occipital Condyle Moment during Rotation Interval Nm |           |       | -44 to -36    | -44    | Pass      |
| Time of Moment Decay to 0 Nm                                 |           | ms    | 102 to 126    | 118    | Pass      |
| Overall Test Results                                         |           |       |               | Pass   |           |

  
 Laboratory Technician

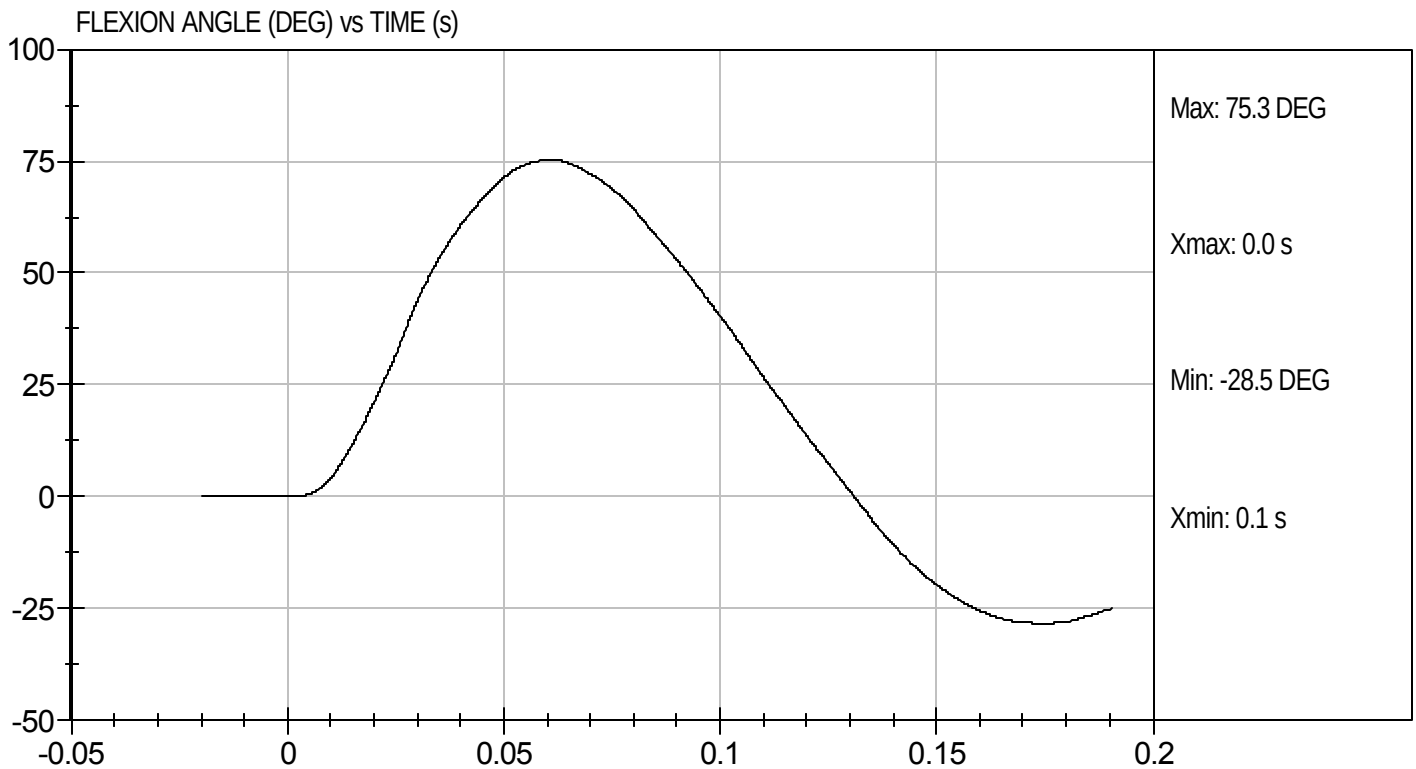
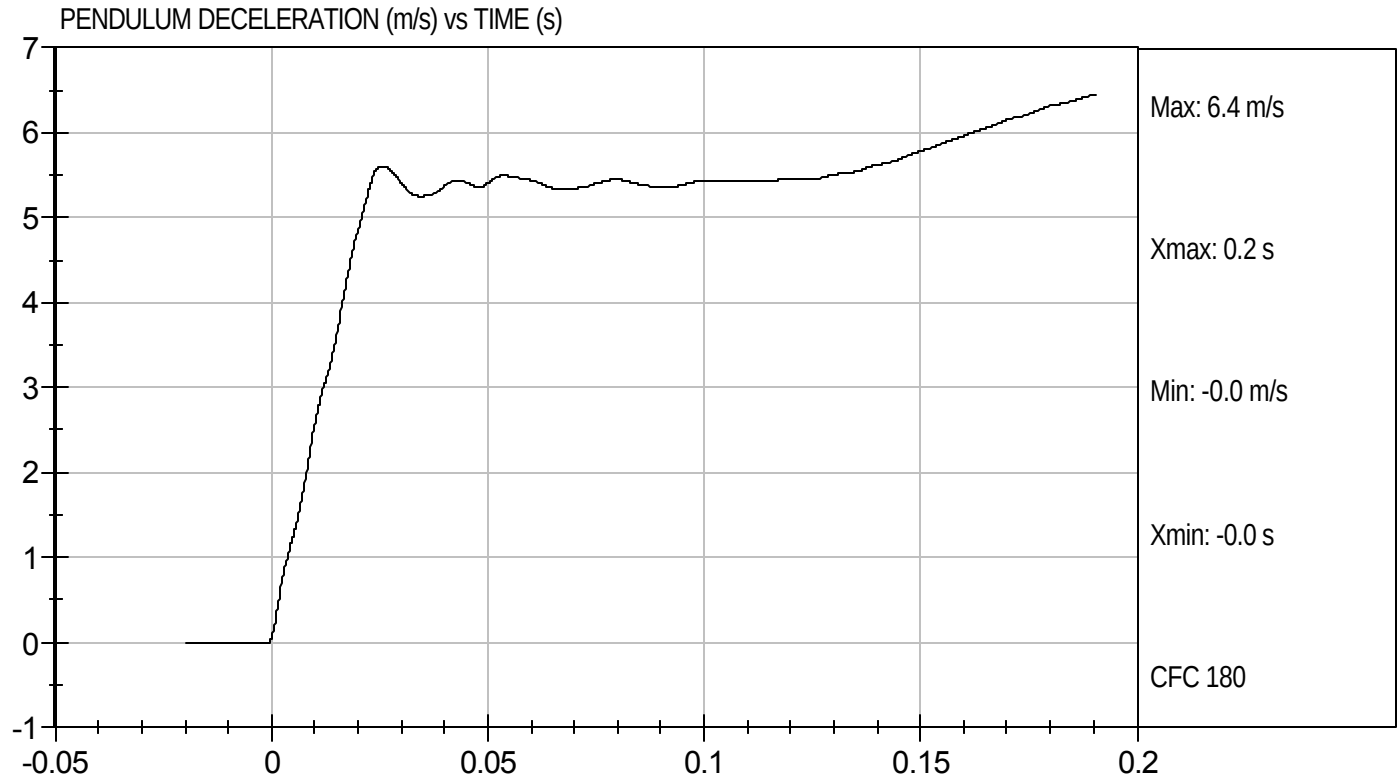
10/29/10  
 Test Date

  
 Approved By



Test Desc: Neck Bending  
Component ID: D103722

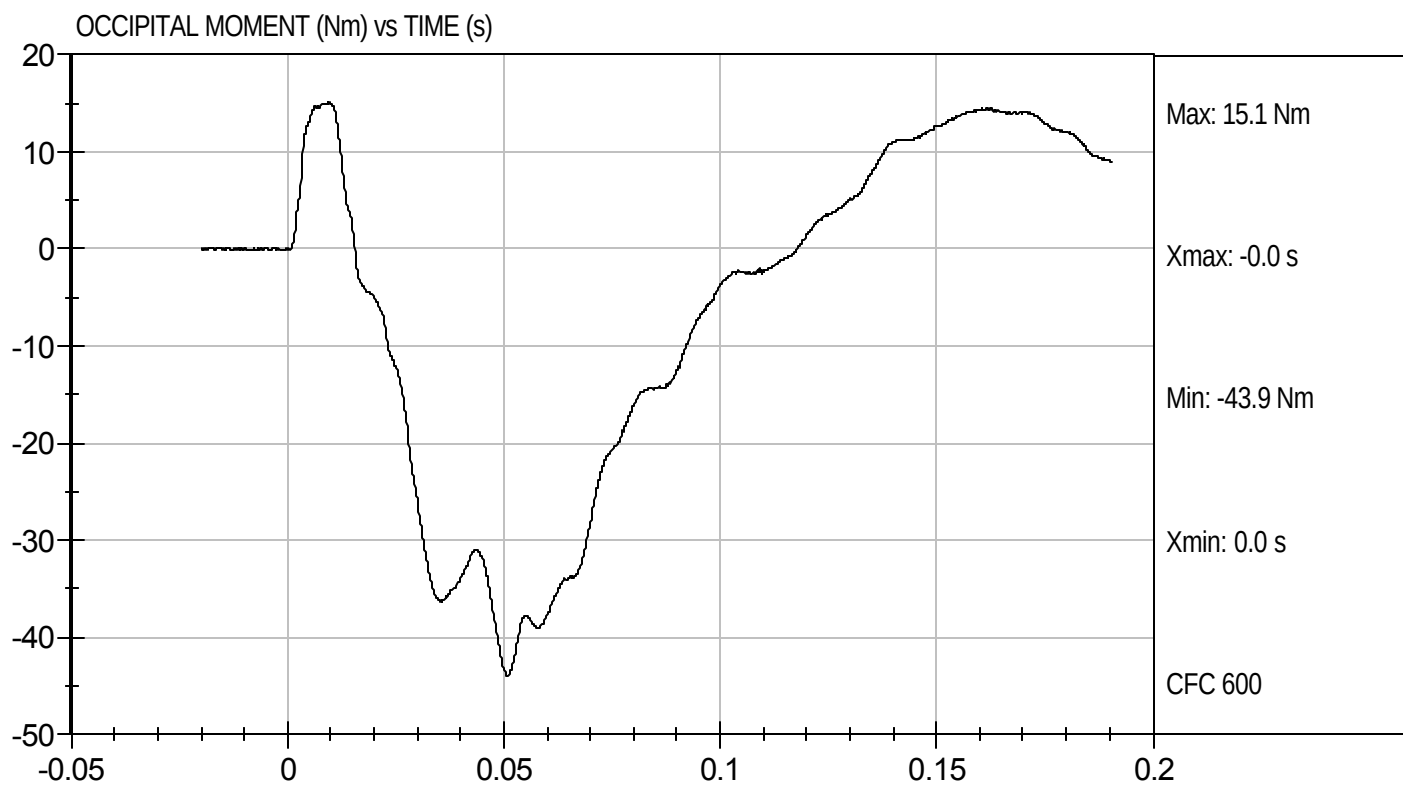
Test Date: 10/29/10  
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending  
Component ID: D103722

Test Date: 10/29/10  
Velocity: 18.32 ft/s, 5.58 m/s



**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**SID-11s BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D103723

| Tested Parameter                | Units | Specification | Result | Pass/Fail |
|---------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature          | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Laboratory Relative Humidity    | %     | 10 to 70      | 27     | Pass      |
| Impact Velocity                 | m/s   | 4.20 to 4.40  | 4.27   | Pass      |
| Maximum Probe Acceleration      | G's   | 13 to 18      | 15     | Pass      |
| Shoulder Displacement           | mm    | 28 to 37      | 31     | Pass      |
| Upper Spine (T1) Y Acceleration | G's   | 17 to 22      | 19     | Pass      |
| Overall Test Results            |       |               |        | Pass      |

  
Laboratory Technician

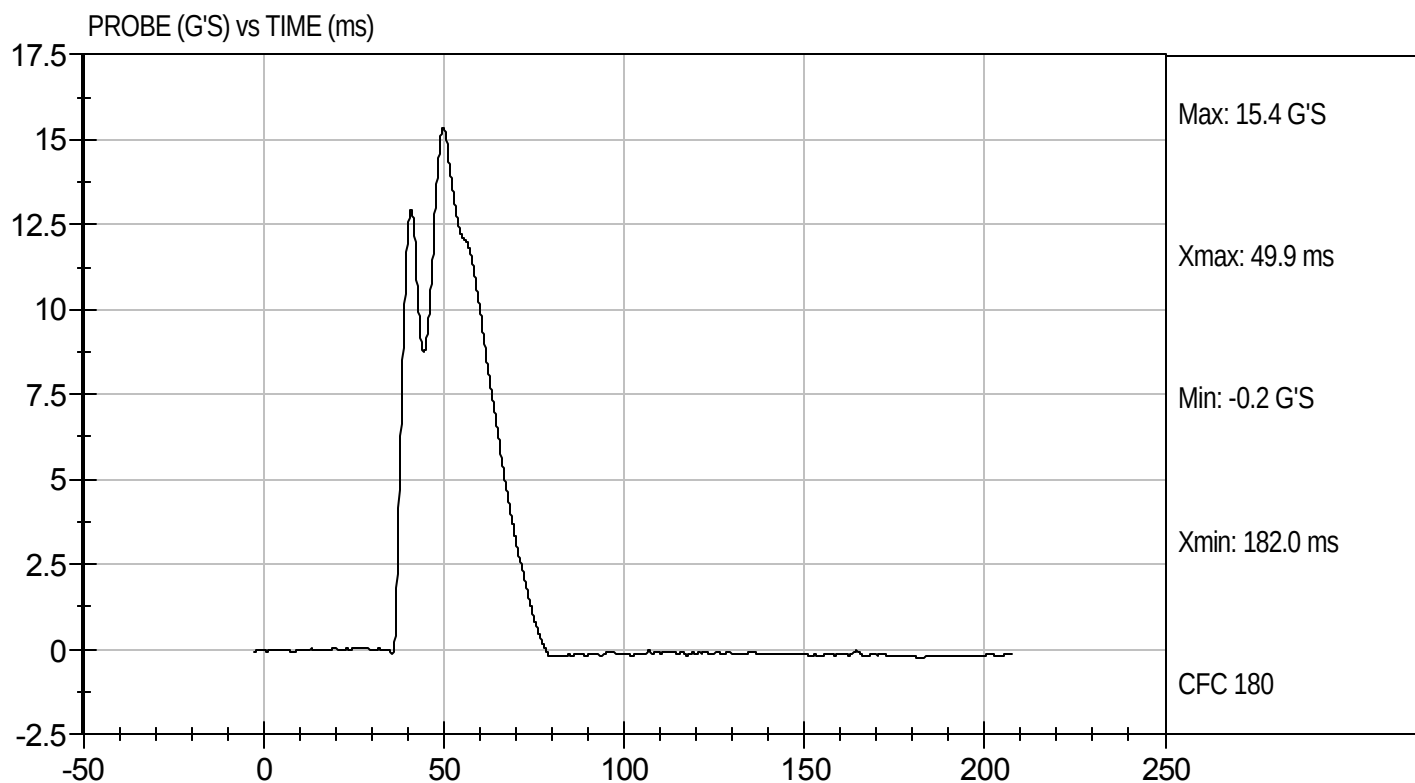
10/29/10  
Test Date

  
Approved By



Test Desc: Shoulder Impact  
Component ID: D103723

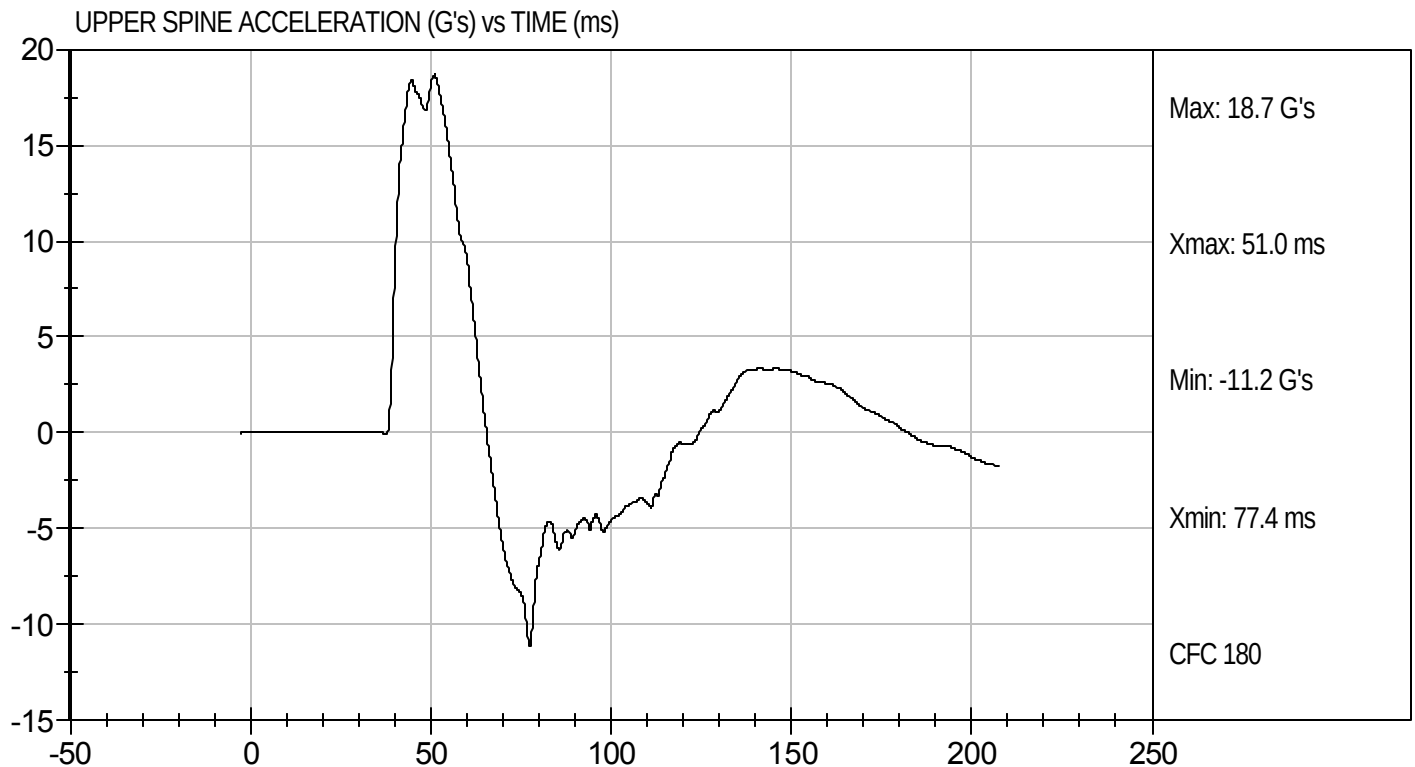
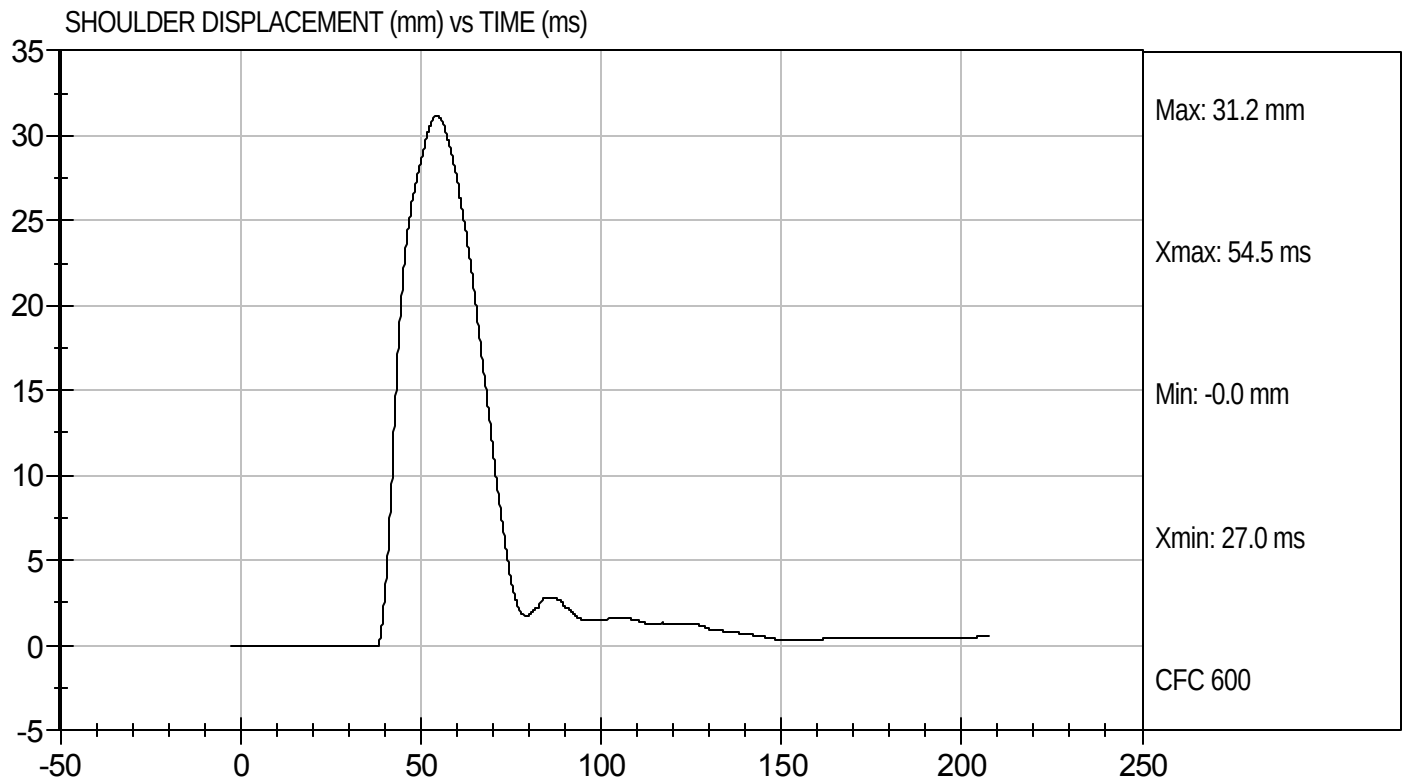
Test Date: 10/29/10  
Velocity: 14.00 ft/s, 4.27 m/s





Test Desc: Shoulder Impact  
Component ID: D103723

Test Date: 10/29/10  
Velocity: 14.00 ft/s, 4.27 m/s



**MGA RESEARCH CORPORATION**  
**THORAX (WITH ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103724

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                         | %     | 10 to 70      | 27     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.68   | Pass      |
| Peak Impactor Acceleration       | G's   | 30 to 36      | 33     | Pass      |
| Shoulder Displacement            | mm    | 31 to 40      | 35     | Pass      |
| Upper Rib Displacement           | mm    | 25 to 32      | 27     | Pass      |
| Middle Rib Displacement          | mm    | 30 to 36      | 31     | Pass      |
| Lower Rib Displacement           | mm    | 32 to 38      | 33     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 34 to 43      | 38     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 29 to 37      | 33     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

Jessica Hall  
Laboratory Technician

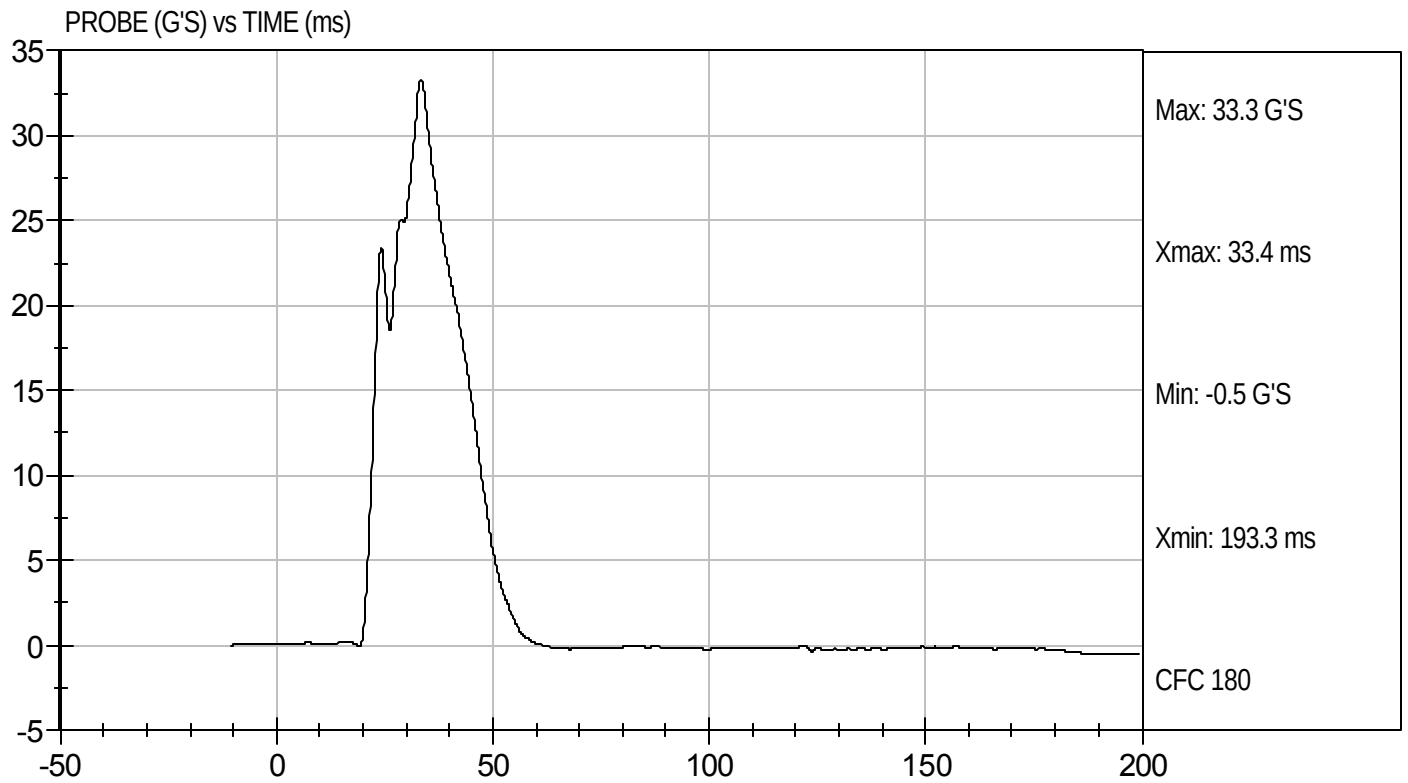
10/29/10  
Test Date

David Winkelbauer  
Approved By



Test Desc: Thorax With Arm  
Component ID: D103724

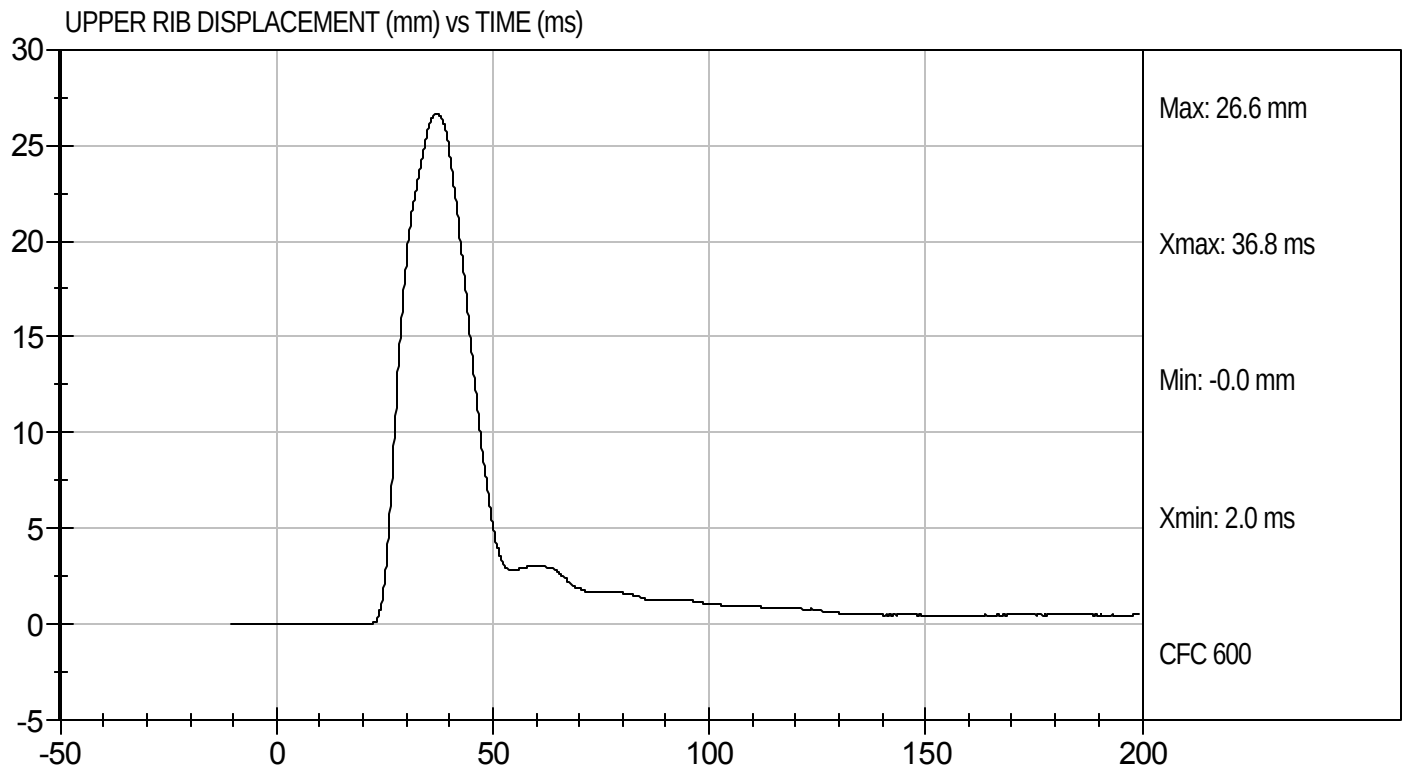
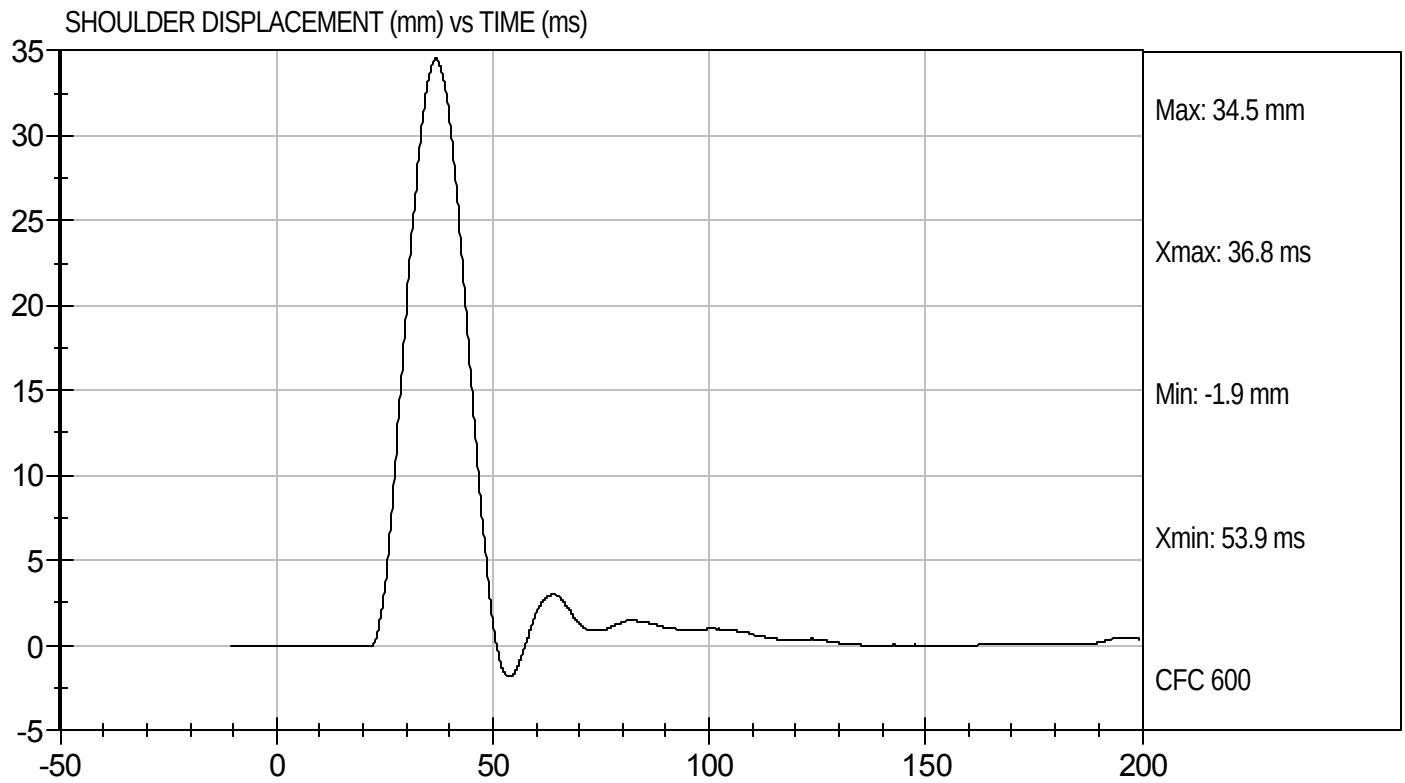
Test Date: 10/29/10  
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D103724

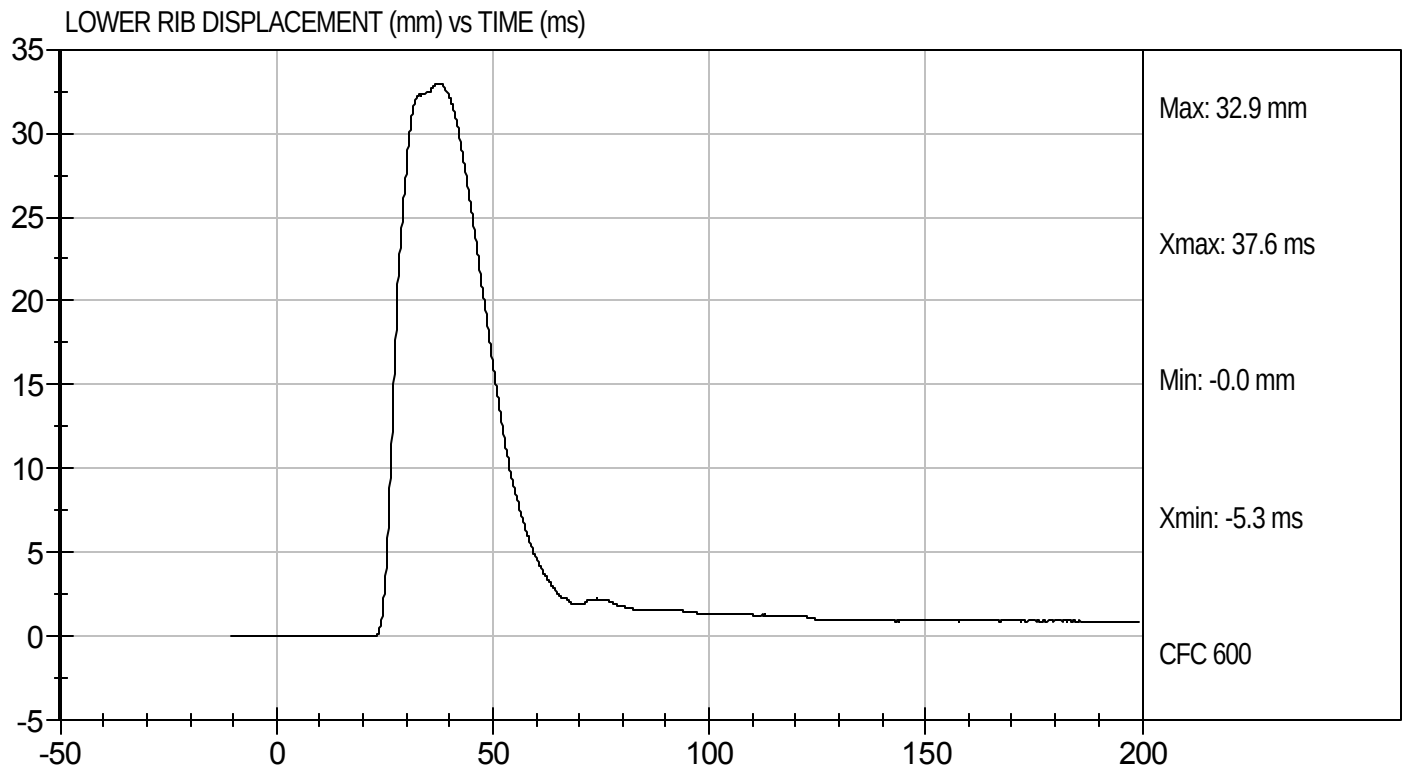
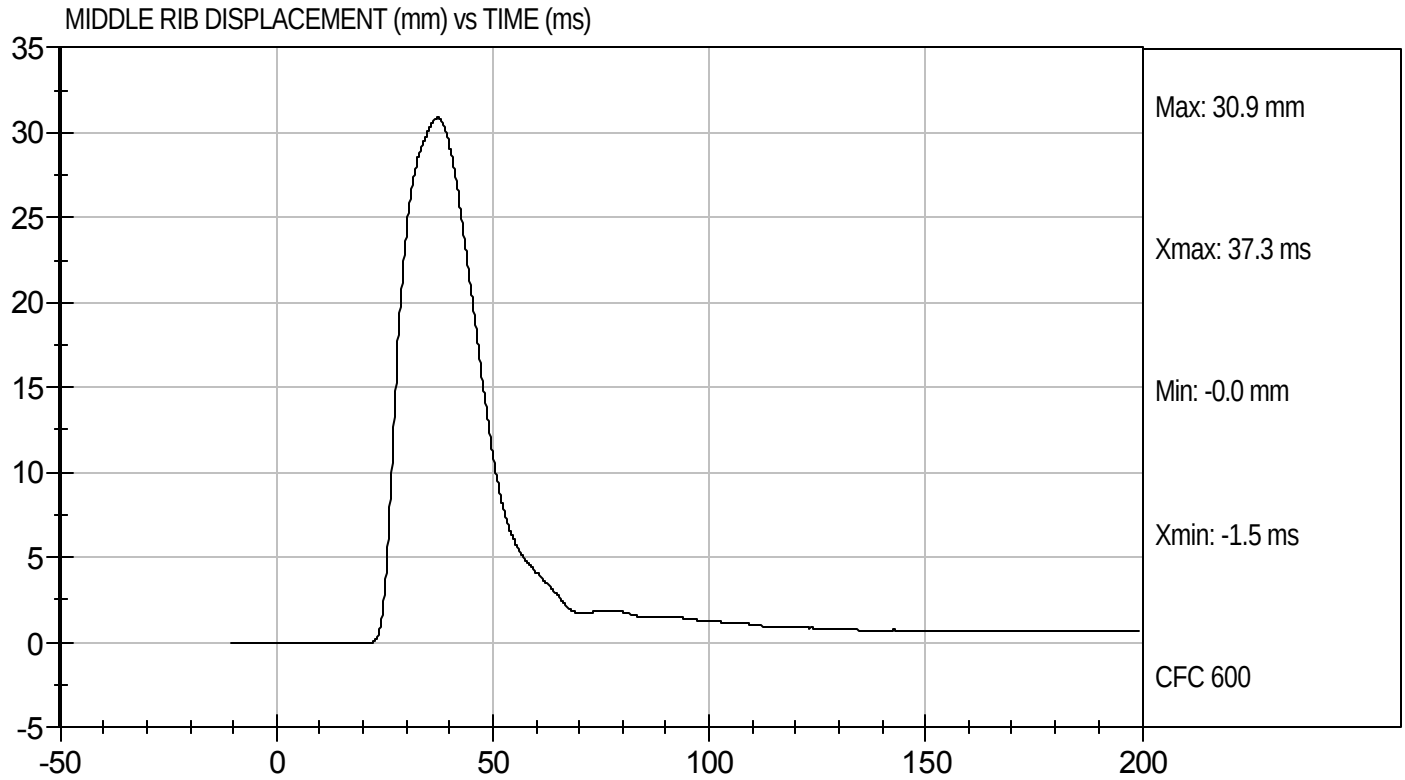
Test Date: 10/29/10  
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D103724

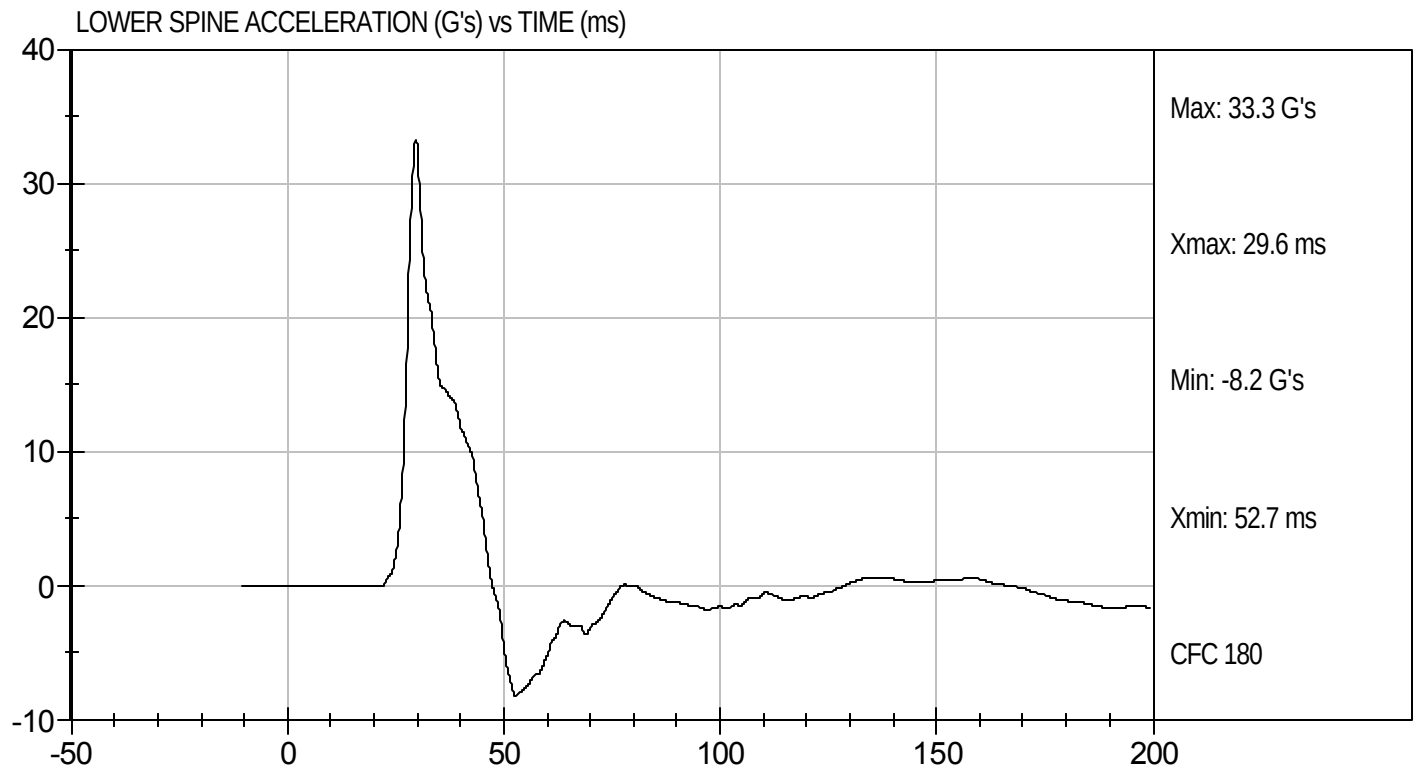
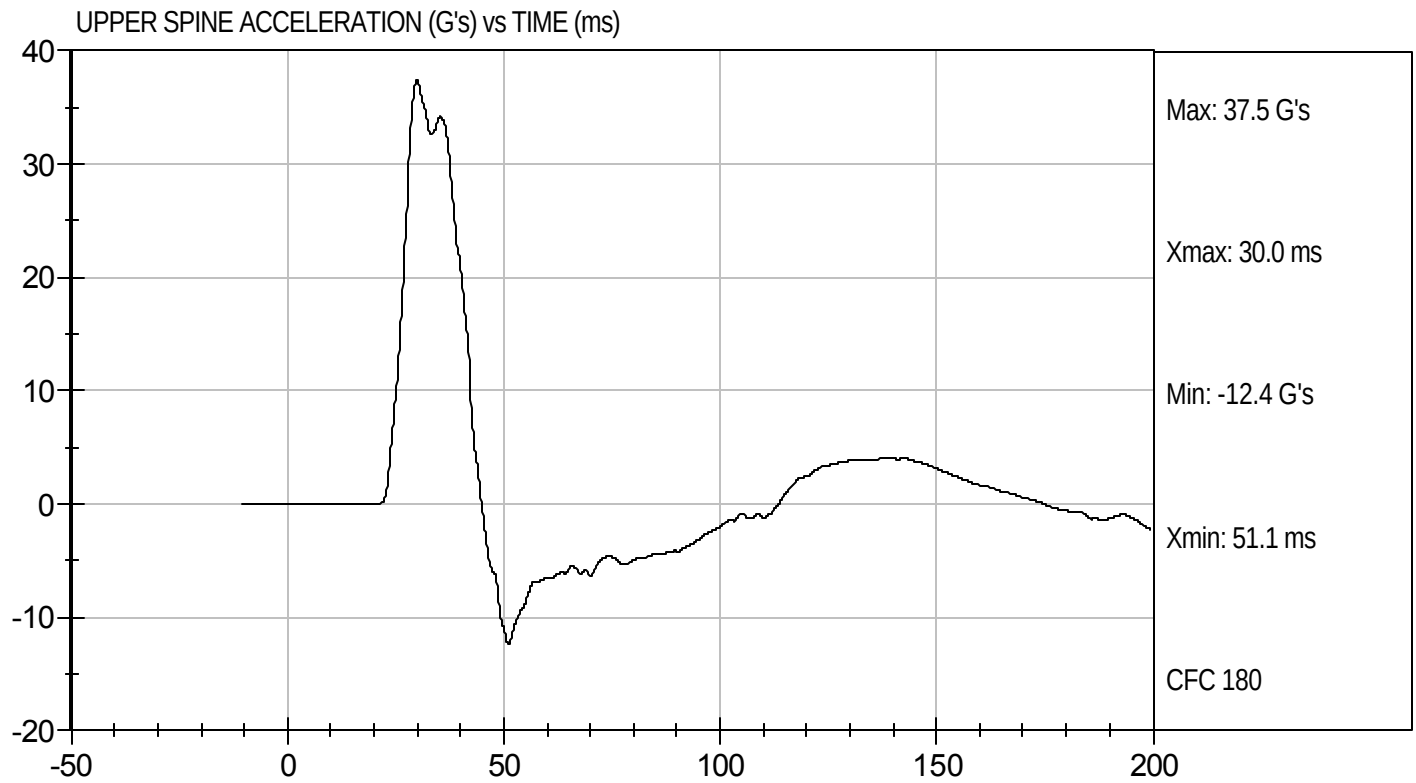
Test Date: 10/29/10  
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D103724

Test Date: 10/29/10  
Velocity: 21.9 ft/s, 6.68 m/s



**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103725

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                         | %     | 10 to 70      | 27     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.34   | Pass      |
| Peak Impactor Force              | G's   | 14 to 18      | 15     | Pass      |
| Upper Rib Displacement           | mm    | 32 to 40      | 34     | Pass      |
| Middle Rib Displacement          | mm    | 39 to 45      | 40     | Pass      |
| Lower Rib Displacement           | mm    | 35 to 43      | 38     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 13 to 17      | 14     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 7 to 11       | 8      | Pass      |
| Overall Test Results             |       |               | Pass   |           |

  
Laboratory Technician

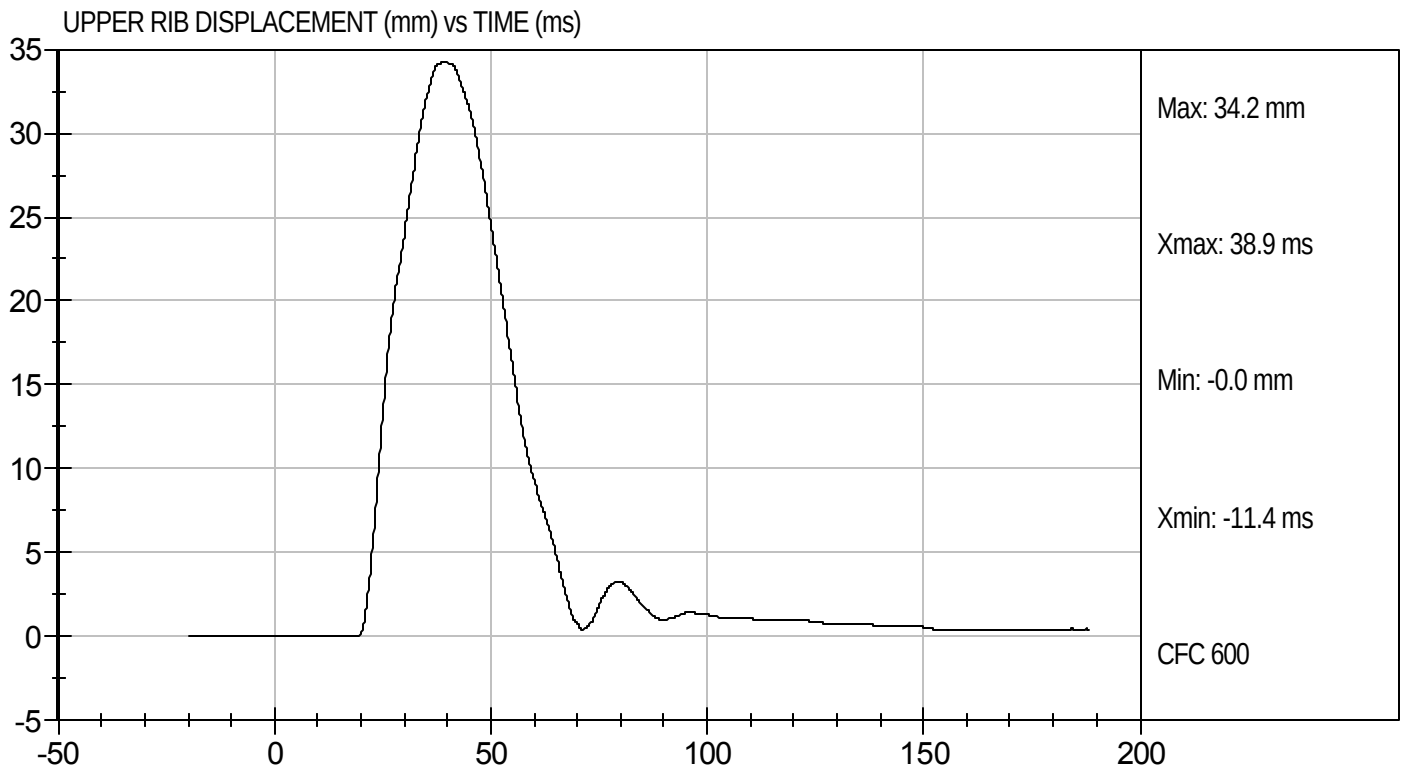
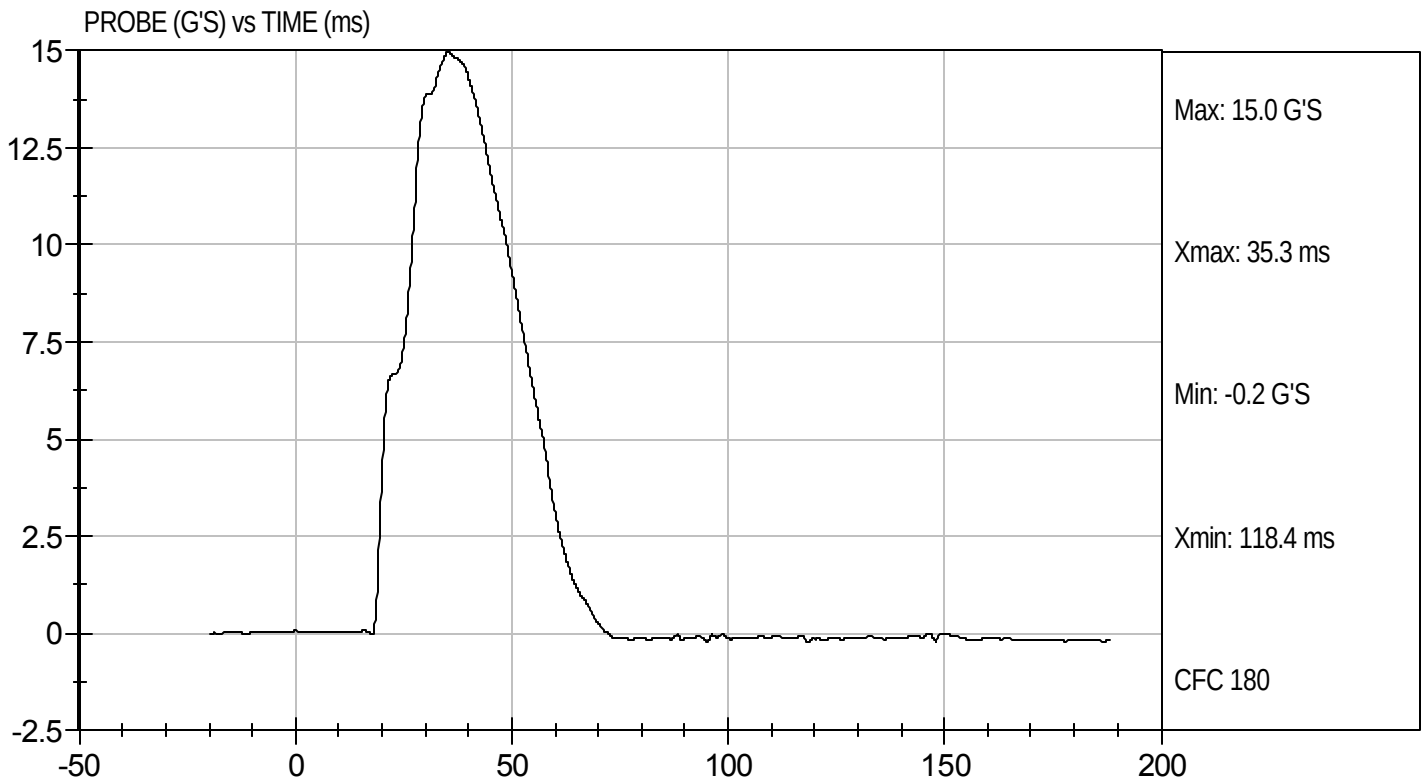
10/29/10  
Test Date

  
Approved By



Test Desc: Thorax Without Arm  
Component ID: D103725

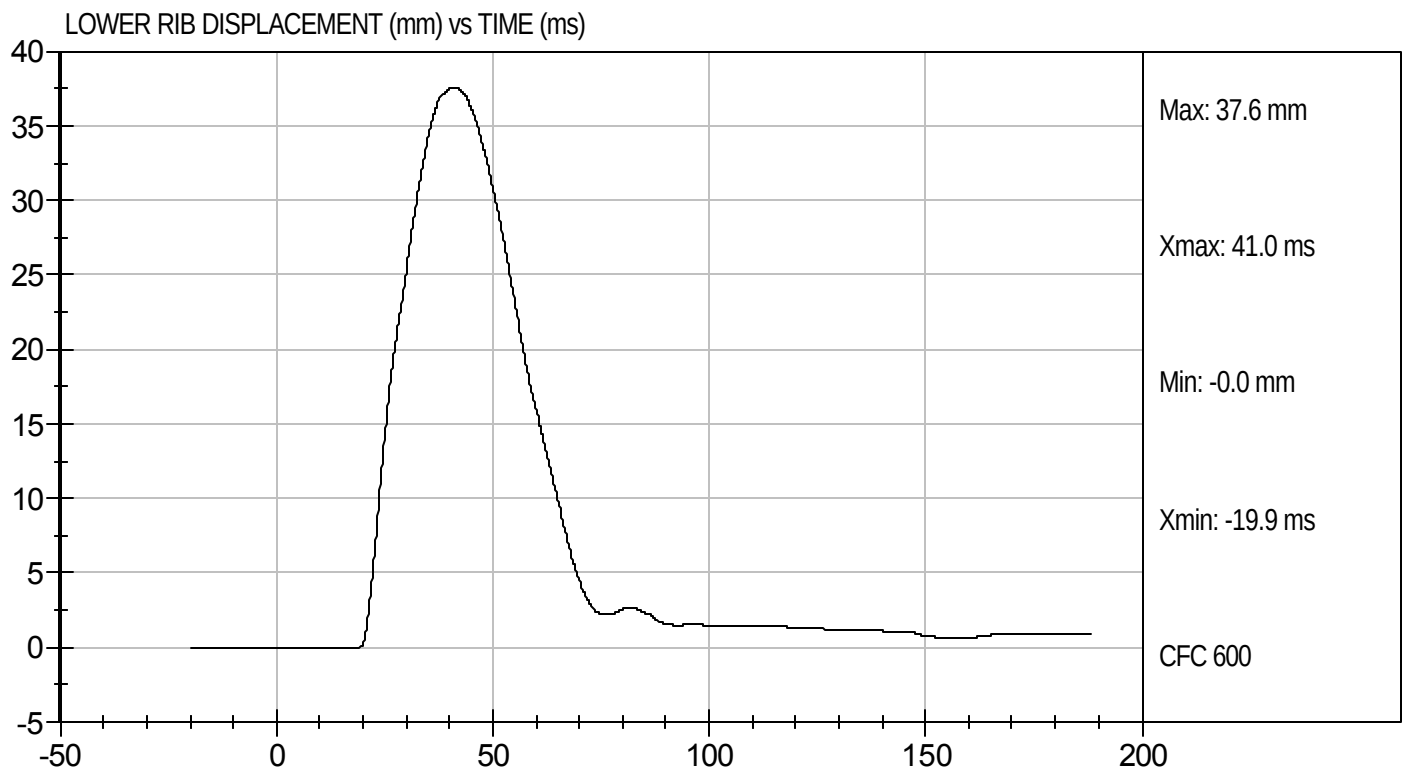
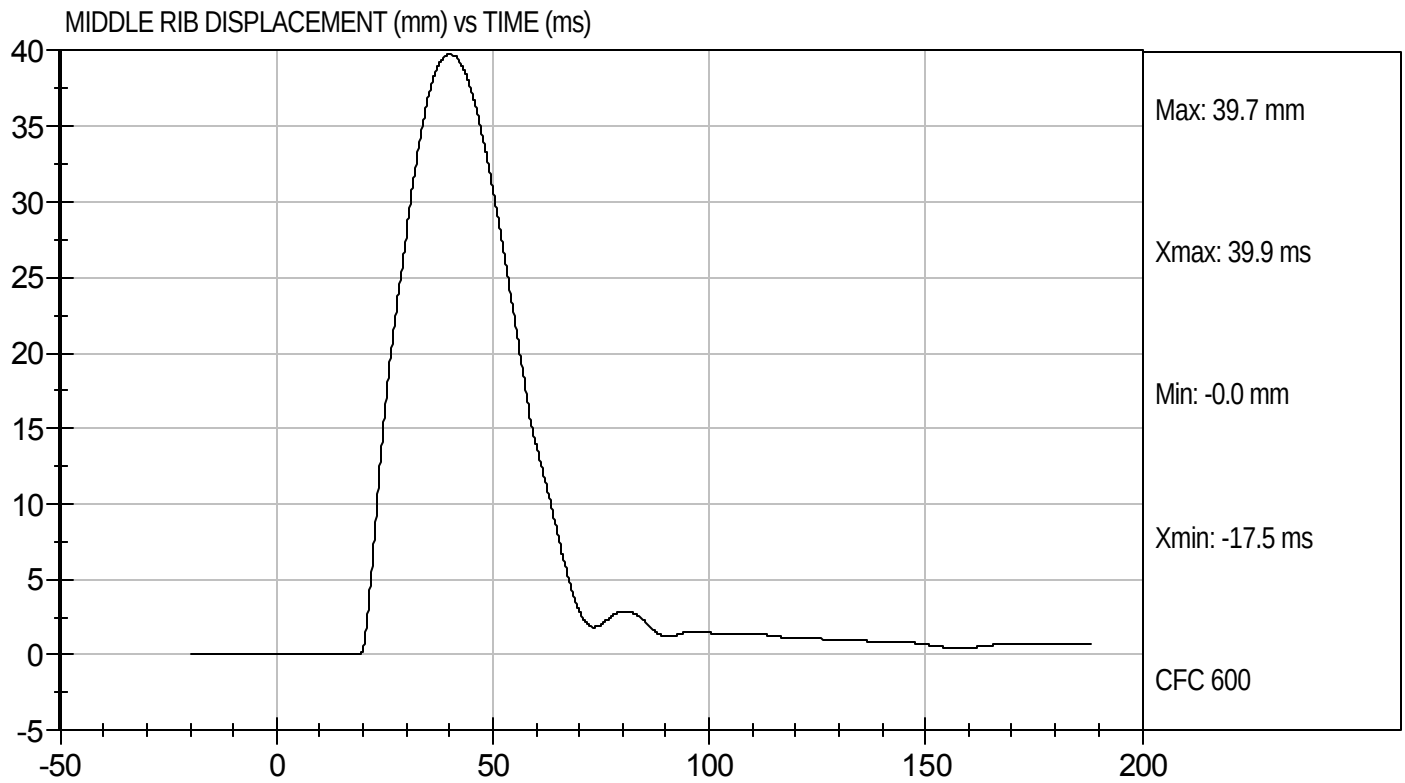
Test Date: 10/29/10  
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm  
Component ID: D103725

Test Date: 10/29/10  
Velocity: 14.24 ft/s, 4.34 m/s

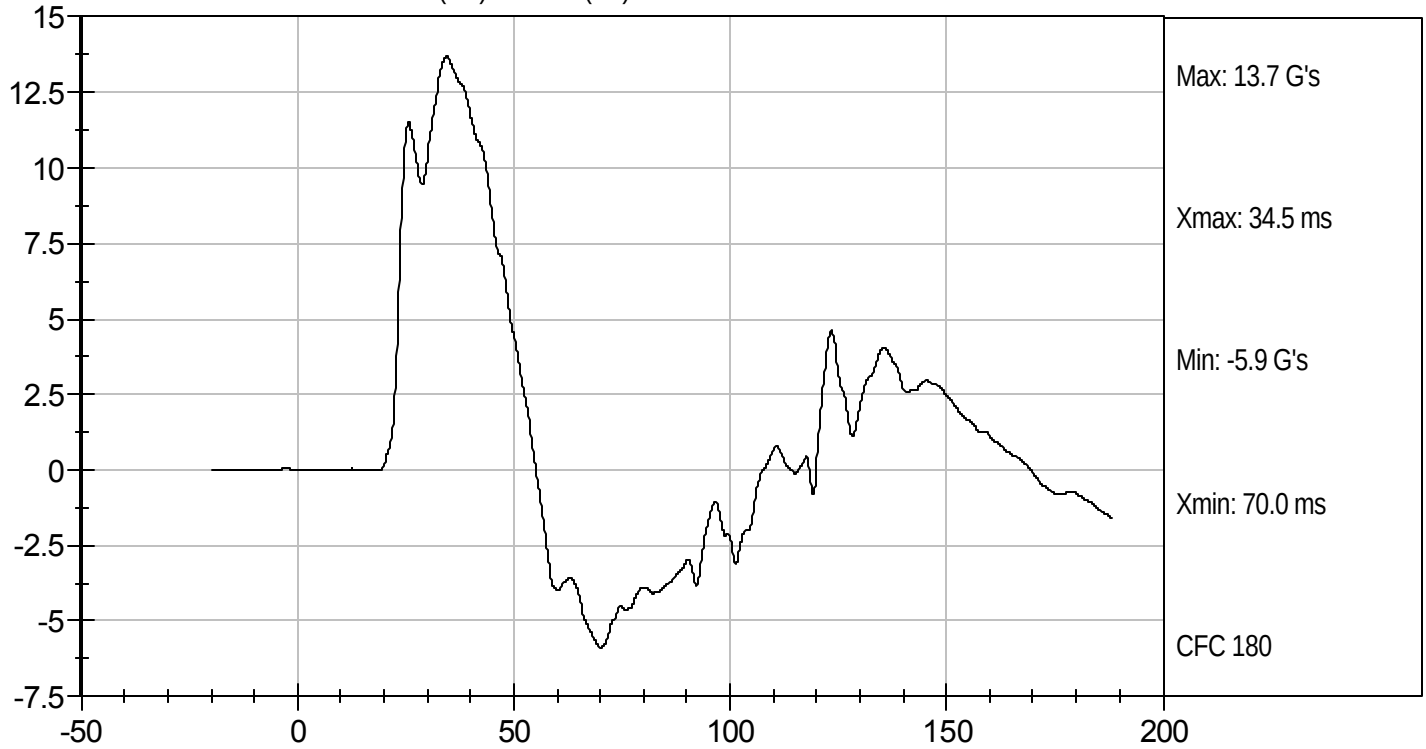




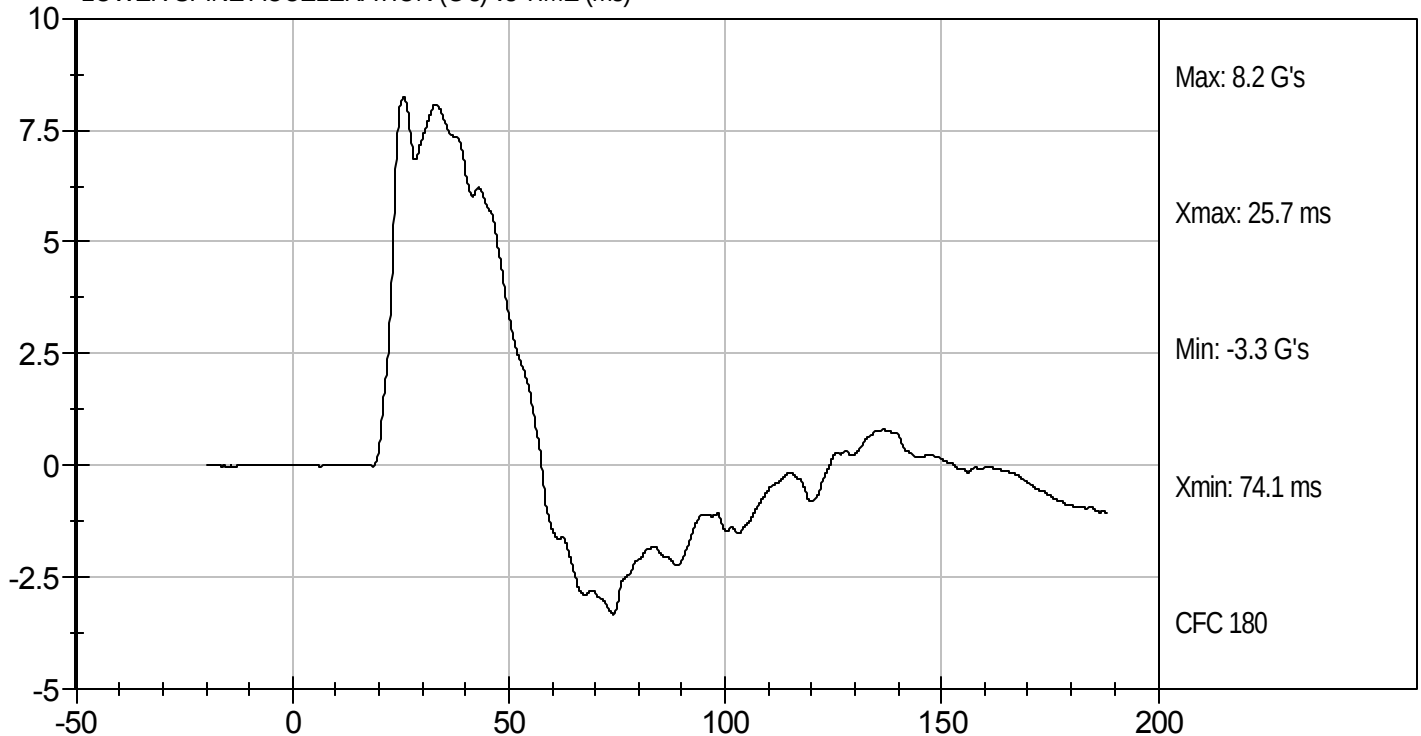
Test Desc: Thorax Without Arm  
Component ID: D103725

Test Date: 10/29/10  
Velocity: 14.24 ft/s, 4.34 m/s

UPPER SPINE ACCELERATION (G's) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**ABDOMINAL IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103726

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                         | %     | 10 to 70      | 27     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.34   | Pass      |
| Peak Impactor Acceleration       | G's   | 12 to 16      | 14     | Pass      |
| Upper Rib Displacement           | mm    | 36 to 47      | 40     | Pass      |
| Lower Rib Displacement           | mm    | 33 to 44      | 38     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 9 to 14       | 11     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

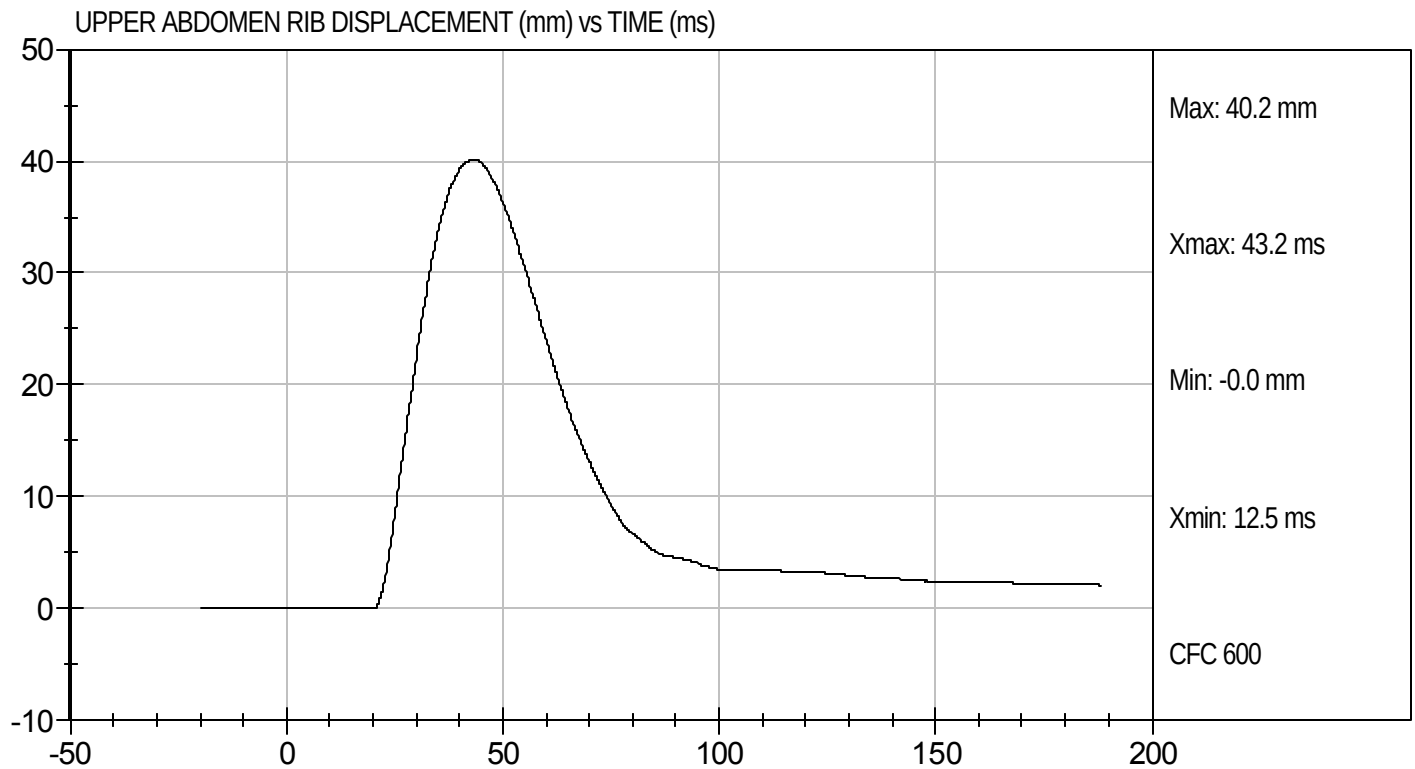
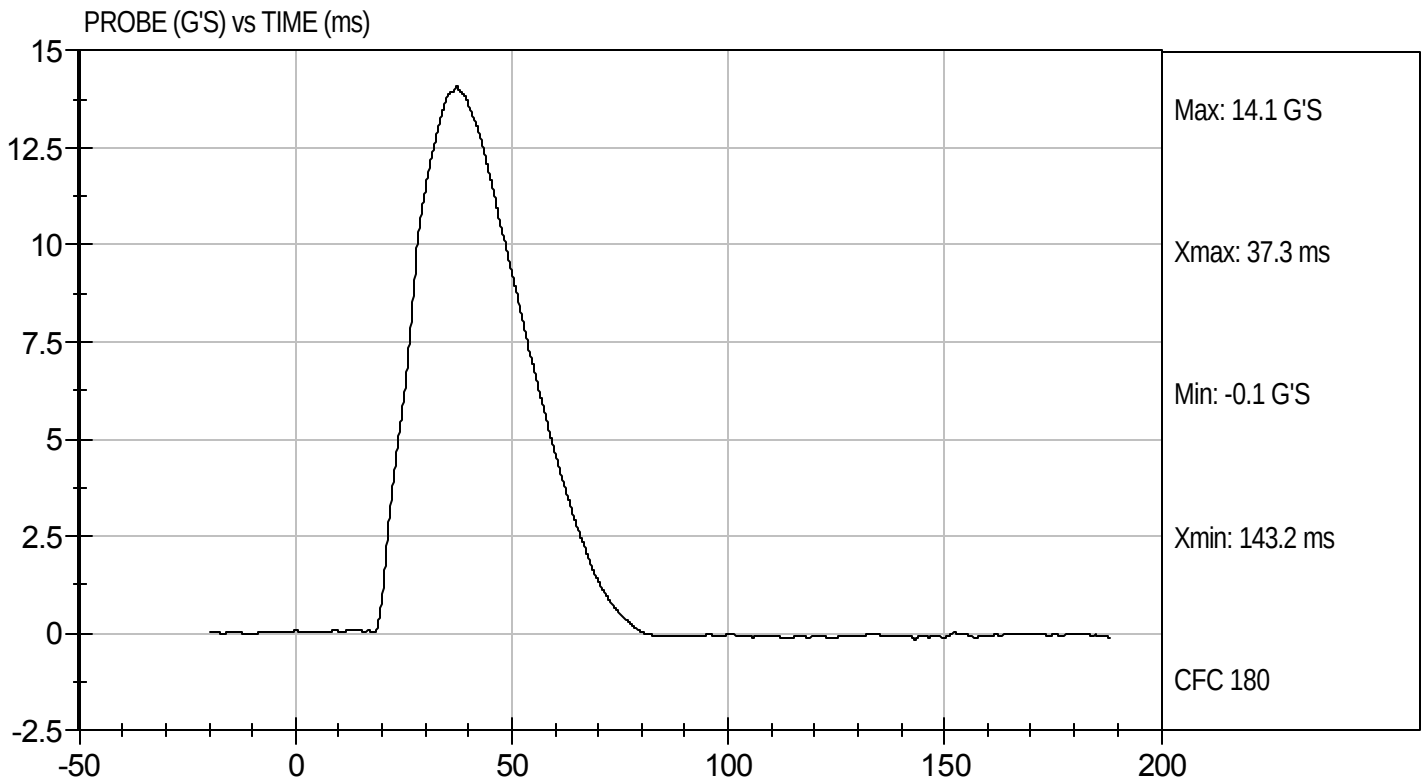
10/29/10  
Test Date

  
Approved By



Test Desc: Abdomen Impact  
Component ID: D103726

Test Date: 10/29/10  
Velocity: 14.24 ft/s, 4.34 m/s

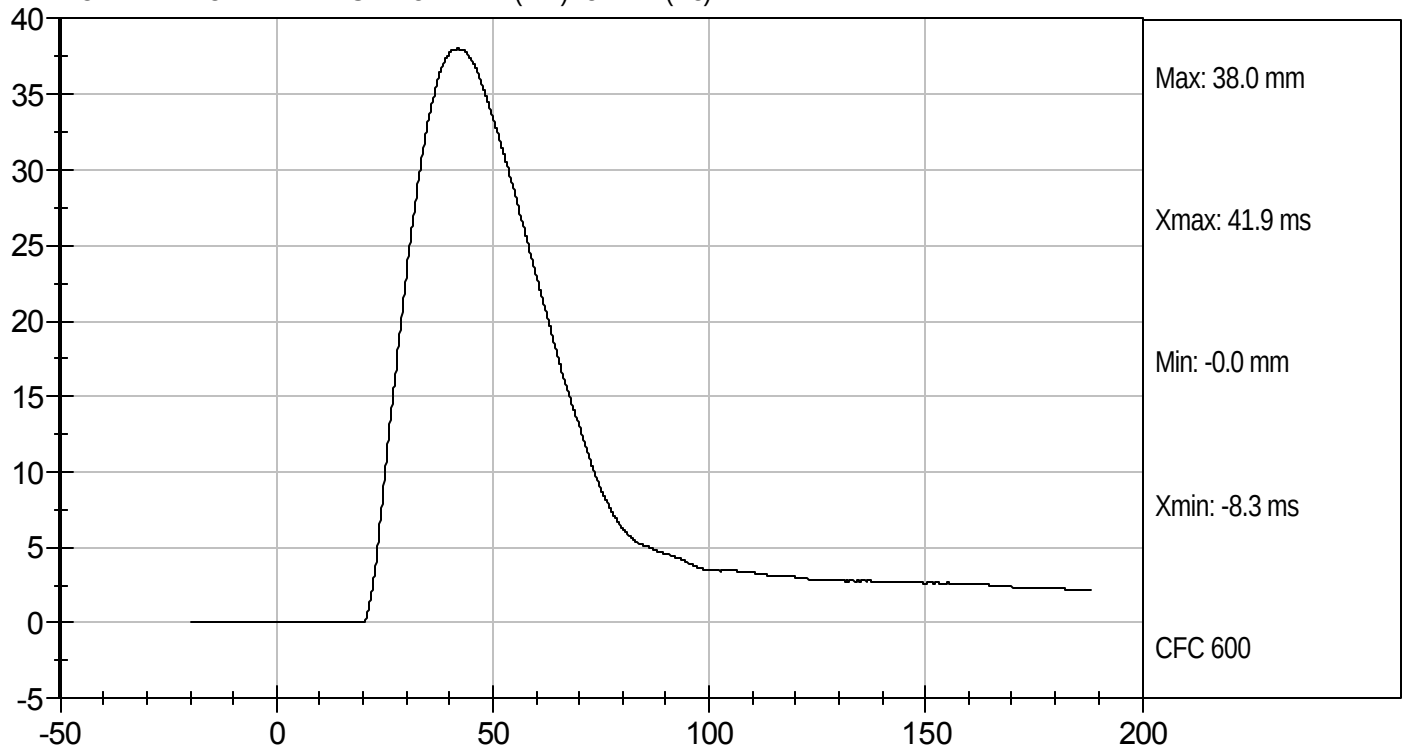




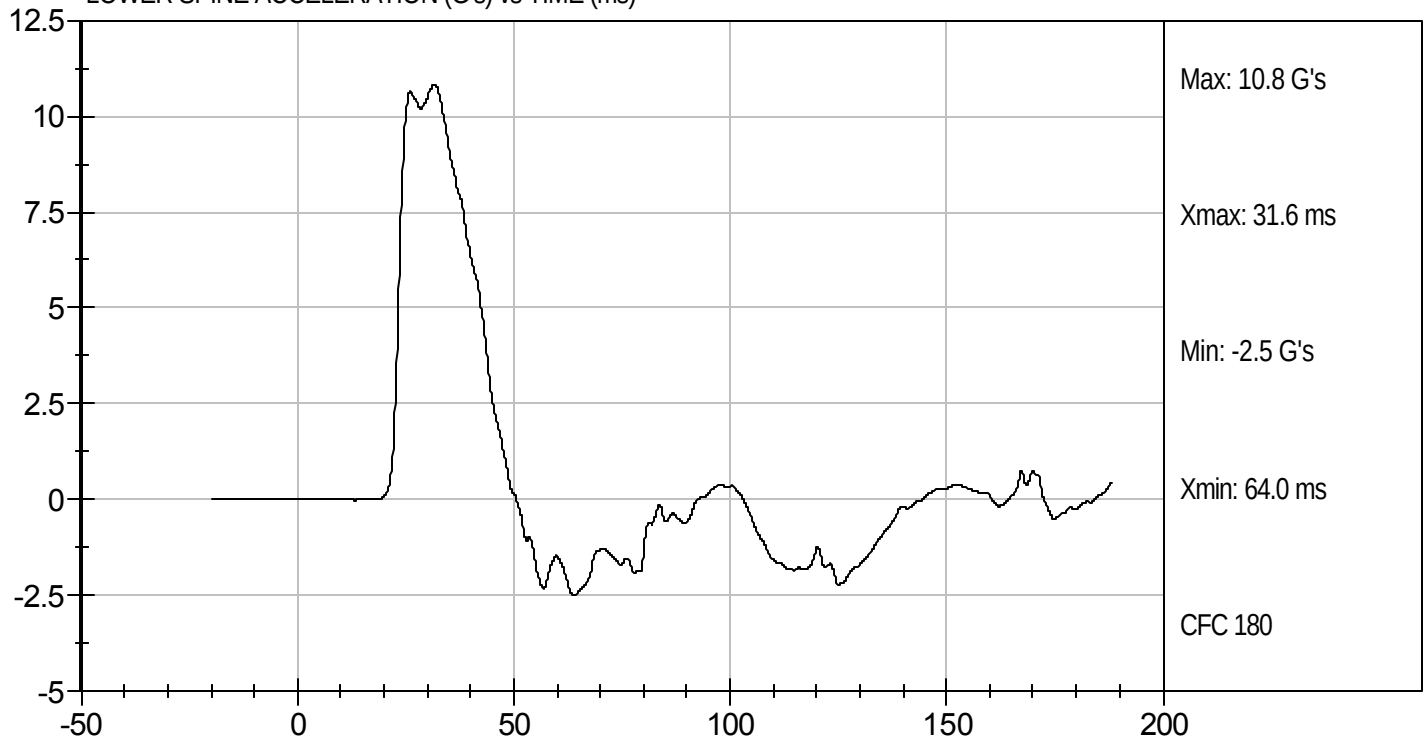
Test Desc: Abdomen Impact  
Component ID: D103726

Test Date: 10/29/10  
Velocity: 14.24 ft/s, 4.34 m/s

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)

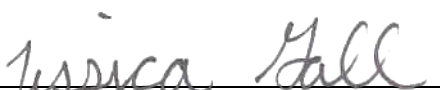


**MGA RESEARCH CORPORATION**  
**PELVIS IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103727

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                         | %     | 10 to 70      | 27     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.74   | Pass      |
| Peak Impactor Acceleration       | G's   | 38 to 47      | 44     | Pass      |
| Pelvis Y Acceleration after 6 ms | G's   | 34 to 42      | 42     | Pass      |
| Peak Acetabulum Force            | N     | 3600 to 4300  | 4114   | Pass      |
| Overall Test Results             |       |               | Pass   |           |

  
Laboratory Technician

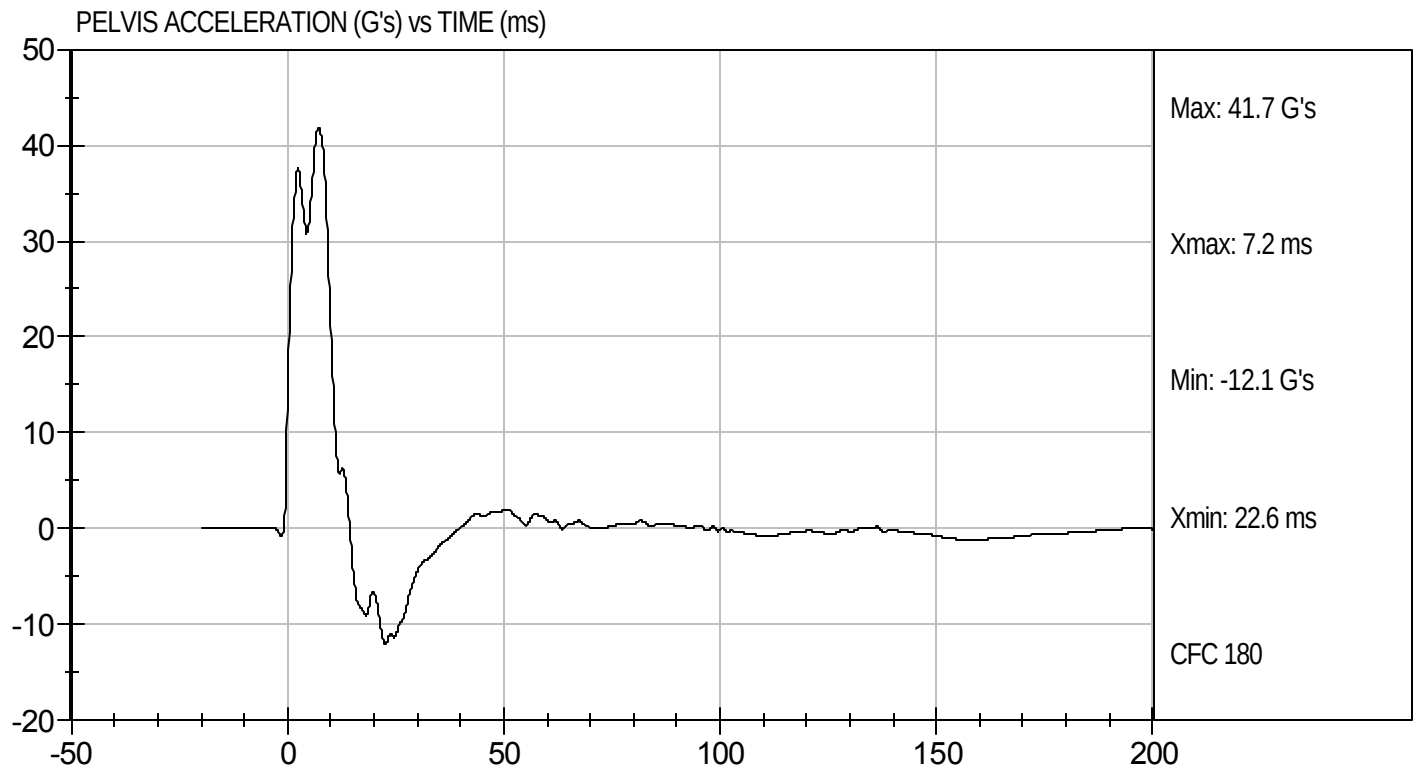
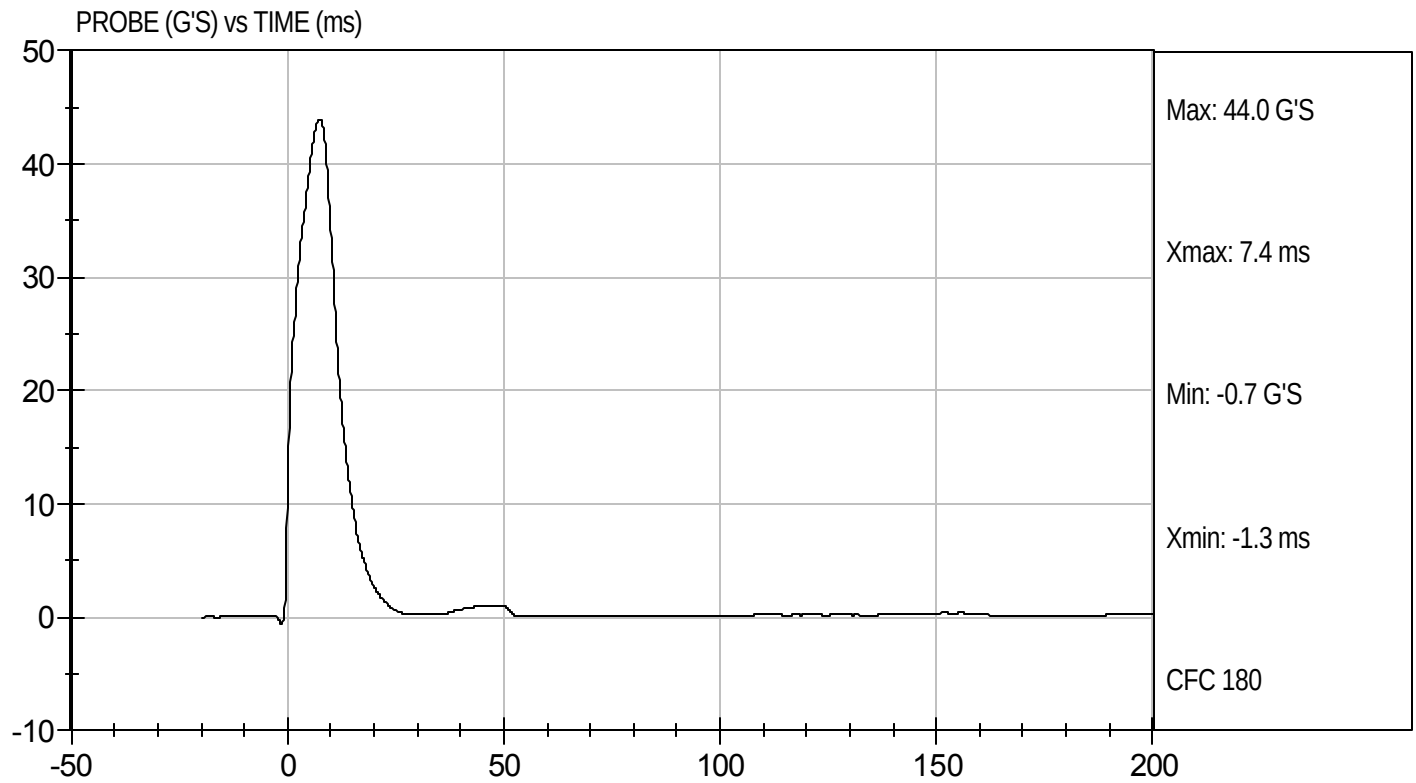
10/29/10  
Test Date

  
Approved By



Test Desc: Pelvis Impact  
Component ID: D103727

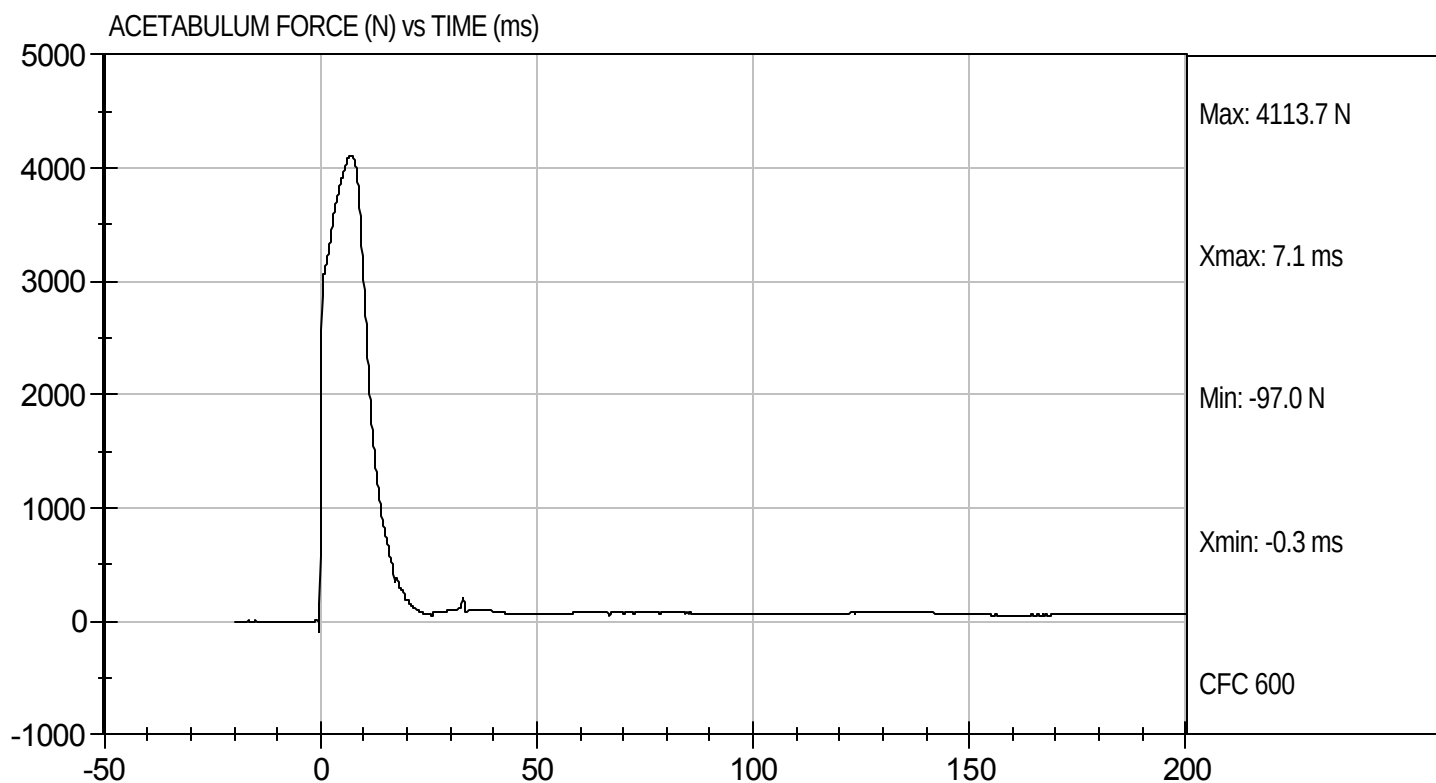
Test Date: 10/29/10  
Velocity: 22.1 ft/s, 6.74 m/s





Test Desc: Pelvis Impact  
Component ID: D103727

Test Date: 10/29/10  
Velocity: 22.1 ft/s, 6.74 m/s

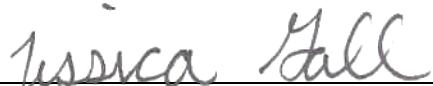


**MGA RESEARCH CORPORATION**  
**ILIAC IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103728

| Tested Parameter           | Units | Specification | Result | Pass/Fail |
|----------------------------|-------|---------------|--------|-----------|
| Temperature                | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                   | %     | 10 to 70      | 27     | Pass      |
| Impact Velocity            | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Peak Impactor Acceleration | G's   | 36 to 45      | 38     | Pass      |
| Pelvis Y Acceleration      | G's   | 28 to 39      | 32     | Pass      |
| Peak Pelvis Iliac Force    | N     | 4100 to 5100  | 4510   | Pass      |
| Overall Test Results       |       |               | Pass   |           |

  
Laboratory Technician

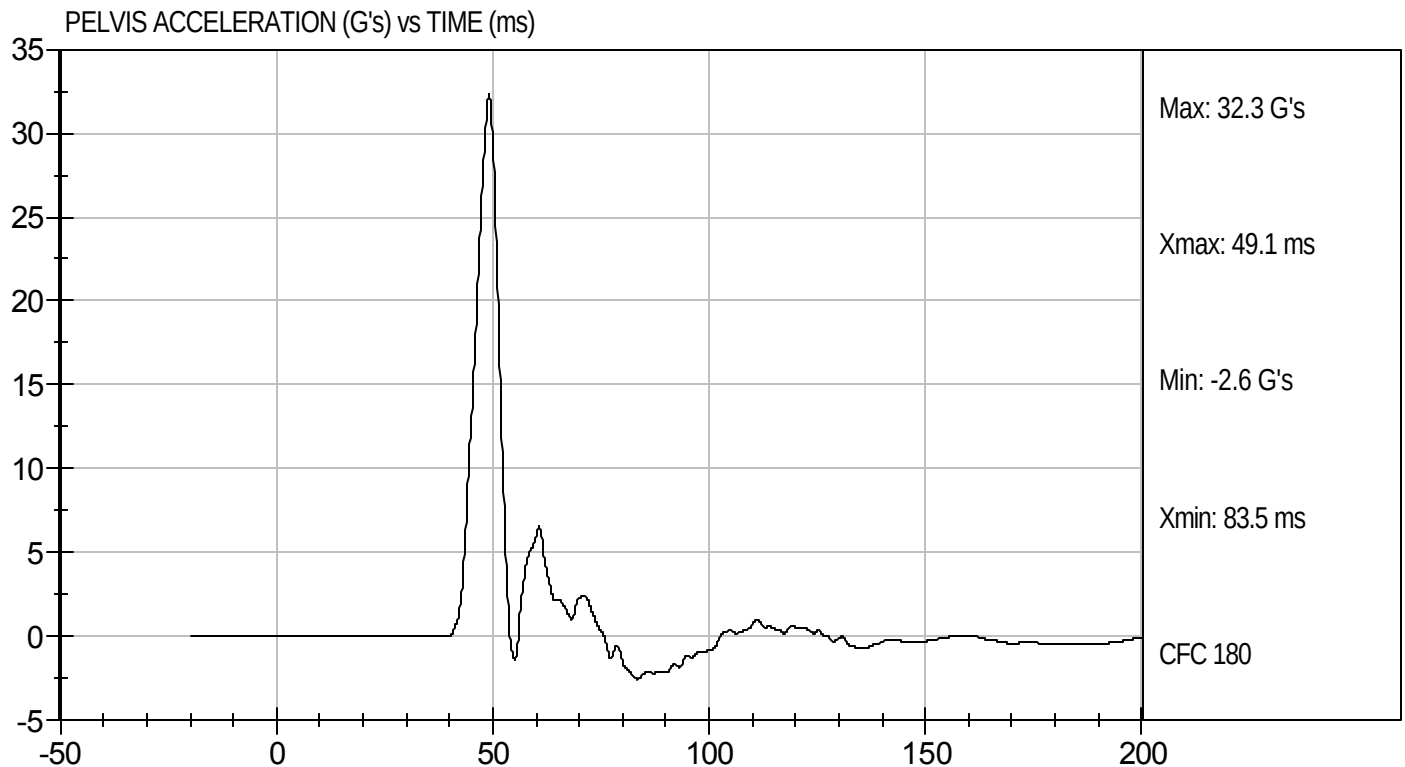
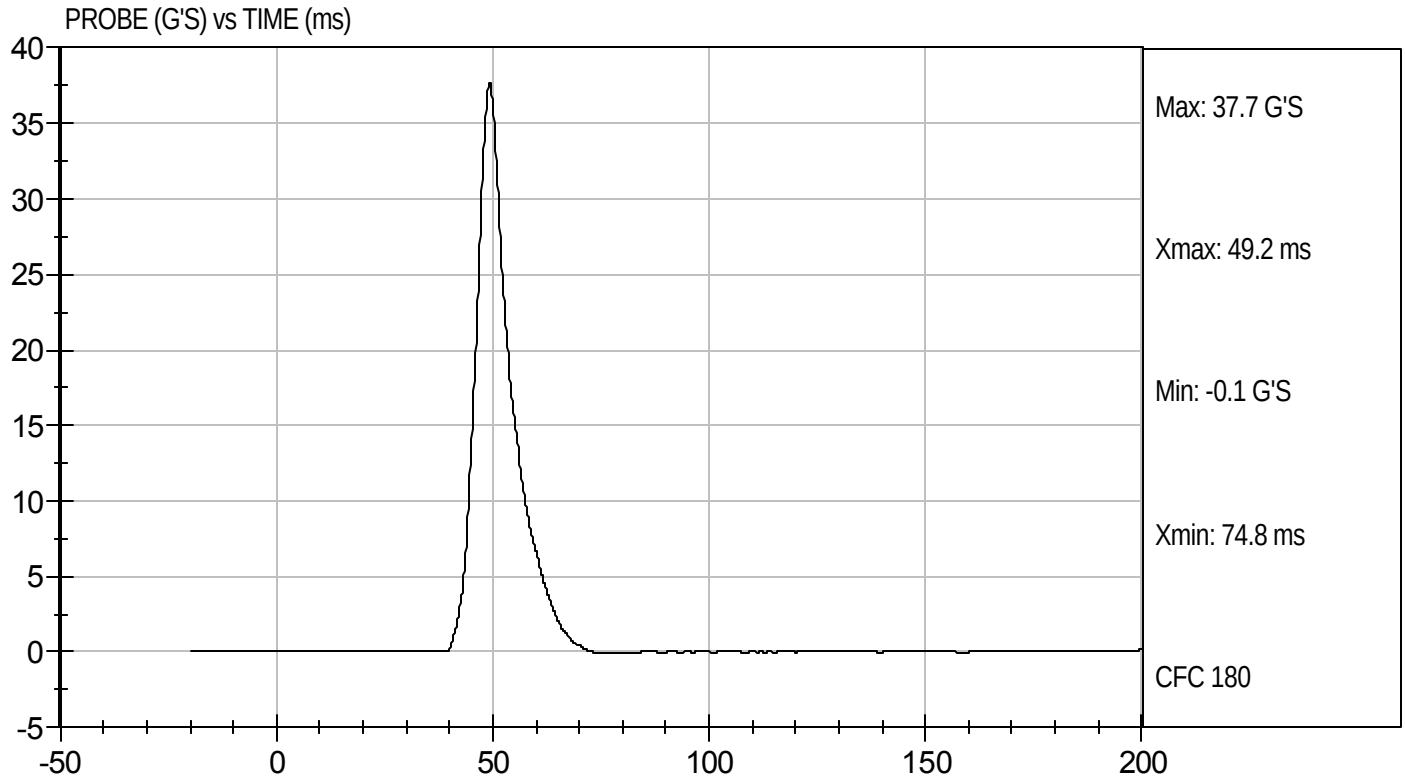
10/29/10  
Test Date

  
Approved By



Test Desc: Iliac Impact  
Component ID: D103728

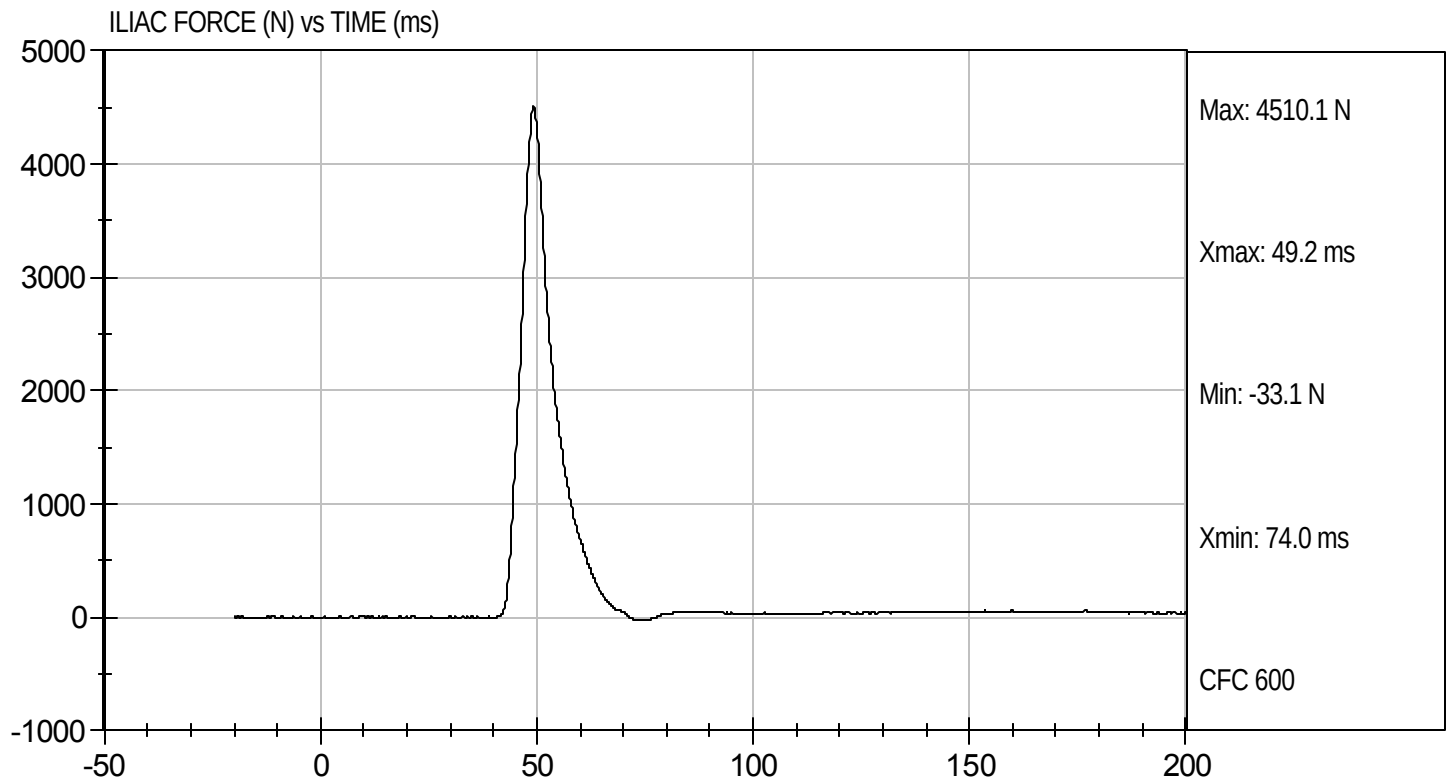
Test Date: 10/29/10  
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Iliac Impact  
Component ID: D103728

Test Date: 10/29/10  
Velocity: 14.36 ft/s, 4.38 m/s



**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**SID-Its BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D103861

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 28     | Pass      |
| Peak Resultant Acceleration  | G's   | 115 to 137    | 123    | Pass      |
| Peak Lateral Acceleration    | G's   | +/- 15        | 2      | Pass      |
| Unimodal                     | N/A   | <15%          | Yes    | Pass      |
| Overall Test Results         |       |               |        | Pass      |

Jessica Hall  
Laboratory Technician

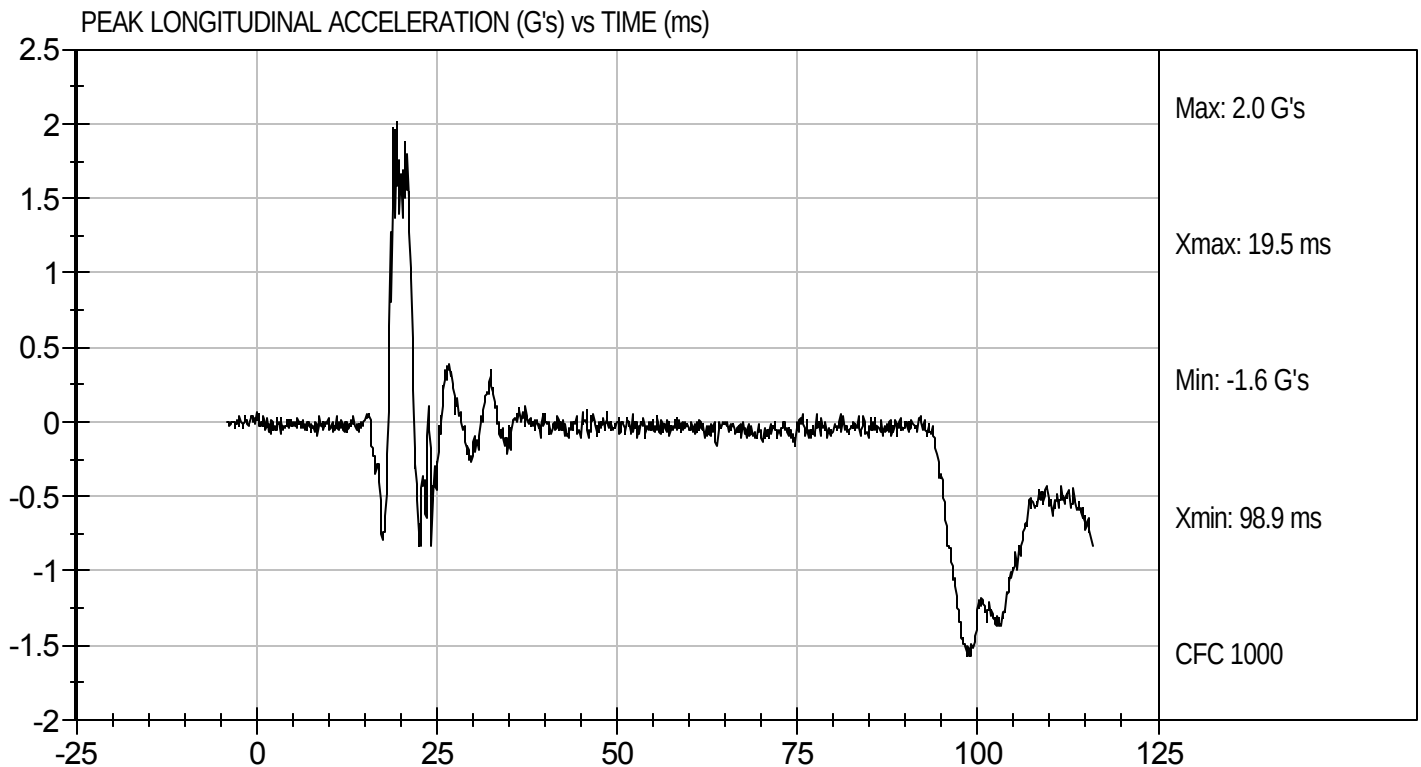
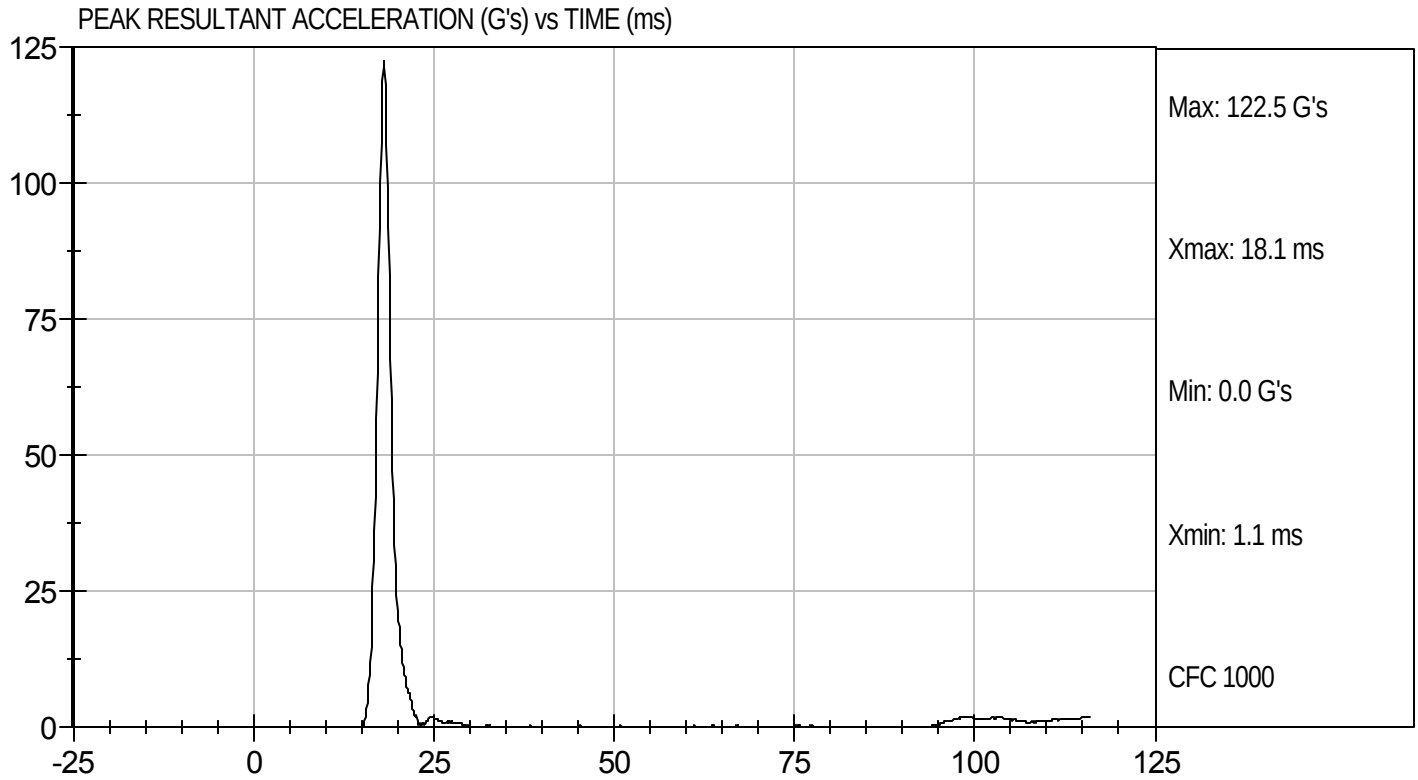
11/8/10  
Test Date

David Winkelbauer  
Approved By



Test Desc: Head Drop  
Component ID: D103861

Test Date: 11/8/10  
Velocity: 0 ft/s, 0 m/s



**MGA RESEARCH CORPORATION**  
**LATERAL NECK PENDULUM TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

ATD Serial No: 296

Test I.D: D103862

| Tested Parameter                                             |           | Units | Specification | Result | Pass/Fail |
|--------------------------------------------------------------|-----------|-------|---------------|--------|-----------|
| Temperature                                                  |           | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                                                     |           | %     | 10 to 70      | 31     | Pass      |
| Impact Velocity                                              |           | m/s   | 5.51 to 5.63  | 5.58   | Pass      |
| Delta Velocity                                               | 10 ms     | m/s   | 2.20 to 2.80  | 2.44   | Pass      |
|                                                              | 15 ms     | m/s   | 3.30 to 4.10  | 3.48   | Pass      |
|                                                              | 20 ms     | m/s   | 4.40 to 5.40  | 4.74   | Pass      |
|                                                              | 25 ms     | m/s   | 5.40 to 6.10  | 5.54   | Pass      |
|                                                              | 25-100 ms | m/s   | 5.50 to 6.20  | 5.55   | Pass      |
| Maximum D-Plane Rotation                                     |           | deg   | 71 to 81      | 71     | Pass      |
| Time of Maximum D-Plane Rotation                             |           | ms    | 50 to 70      | 60     | Pass      |
| Maximum Occipital Condyle Moment during Rotation Interval Nm |           |       | -44 to -36    | -38    | Pass      |
| Time of Moment Decay to 0 Nm                                 |           | ms    | 102 to 126    | 115    | Pass      |
| Overall Test Results                                         |           |       |               | Pass   |           |

  
 Laboratory Technician

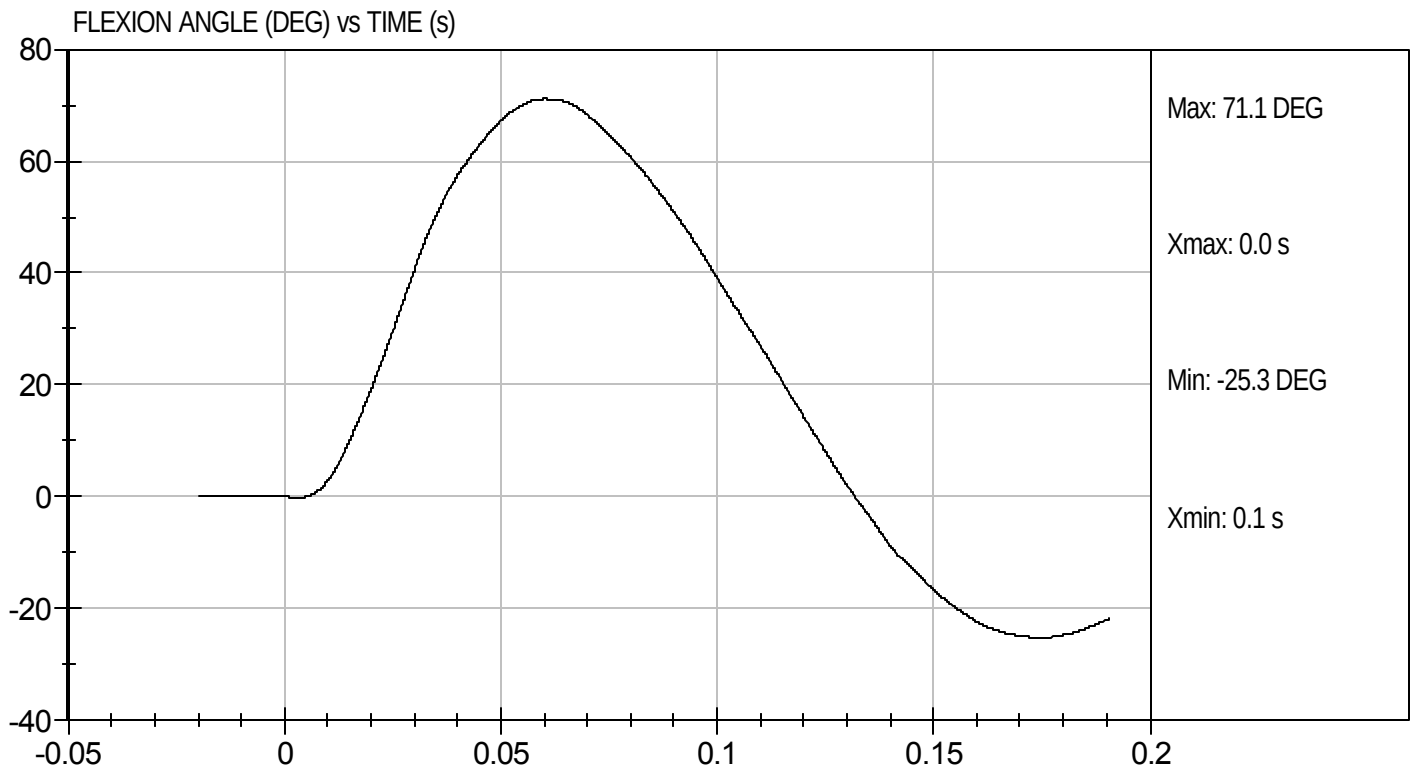
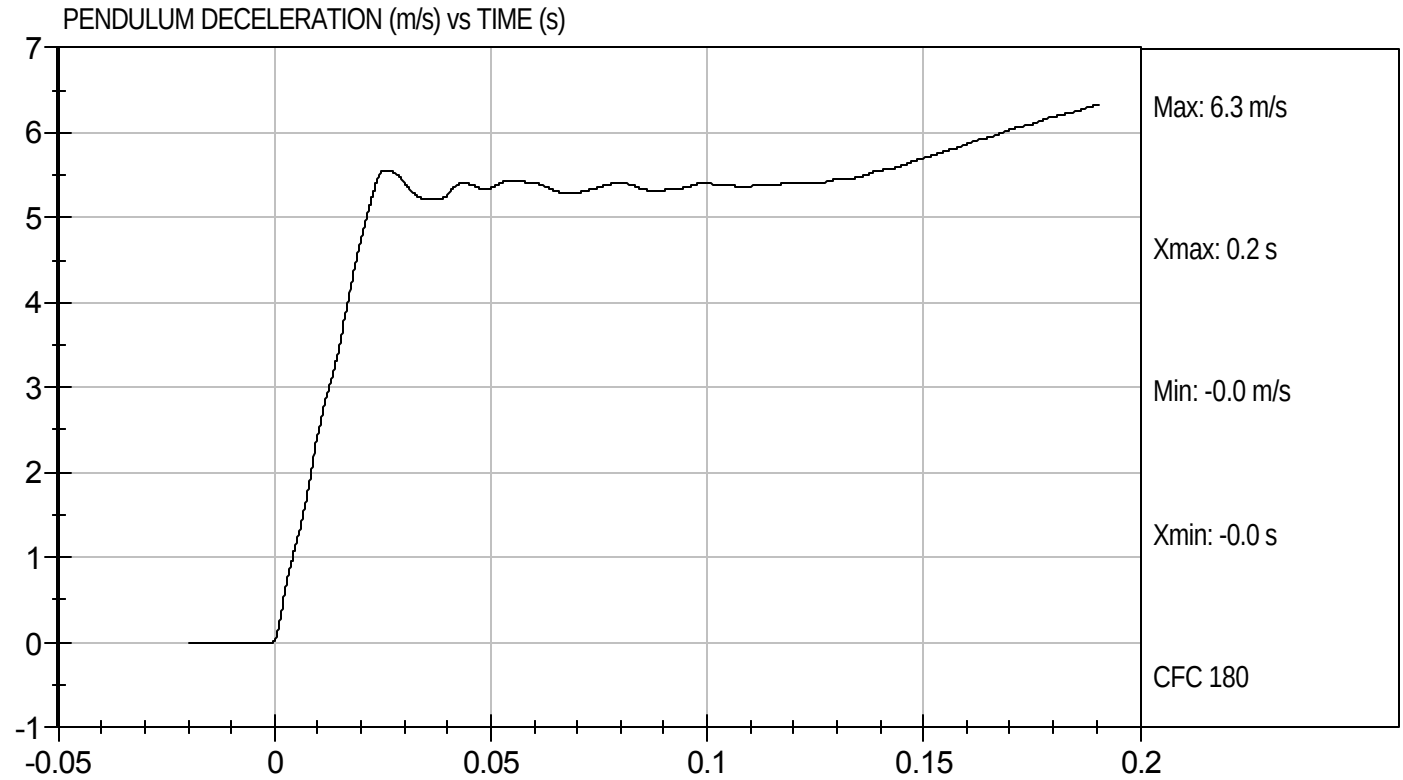
11/8/10  
 Test Date

  
 Approved By



Test Desc: Neck Bending  
Component ID: D103862

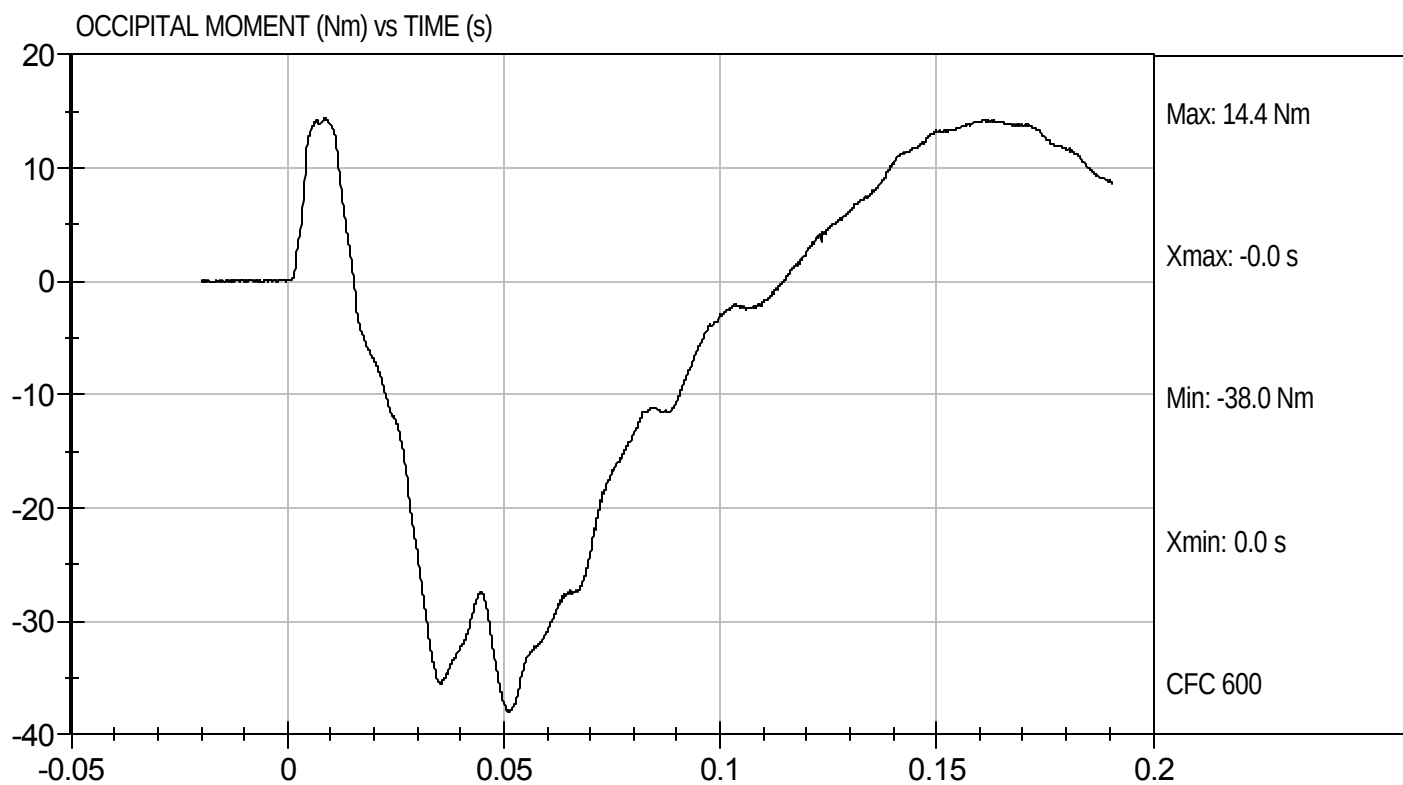
Test Date: 11/8/10  
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending  
Component ID: D103862

Test Date: 11/8/10  
Velocity: 18.32 ft/s, 5.58 m/s



**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**SID-Its BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D103863

| Tested Parameter                | Units | Specification | Result | Pass/Fail |
|---------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature          | deg C | 20.6 to 22.2  | 22.1   | Pass      |
| Laboratory Relative Humidity    | %     | 10 to 70      | 28     | Pass      |
| Impact Velocity                 | m/s   | 4.20 to 4.40  | 4.30   | Pass      |
| Maximum Probe Acceleration      | G's   | 13 to 18      | 15     | Pass      |
| Shoulder Displacement           | mm    | 28 to 37      | 33     | Pass      |
| Upper Spine (T1) Y Acceleration | G's   | 17 to 22      | 19     | Pass      |
| Overall Test Results            |       |               |        | Pass      |

Jessica Hall  
Laboratory Technician

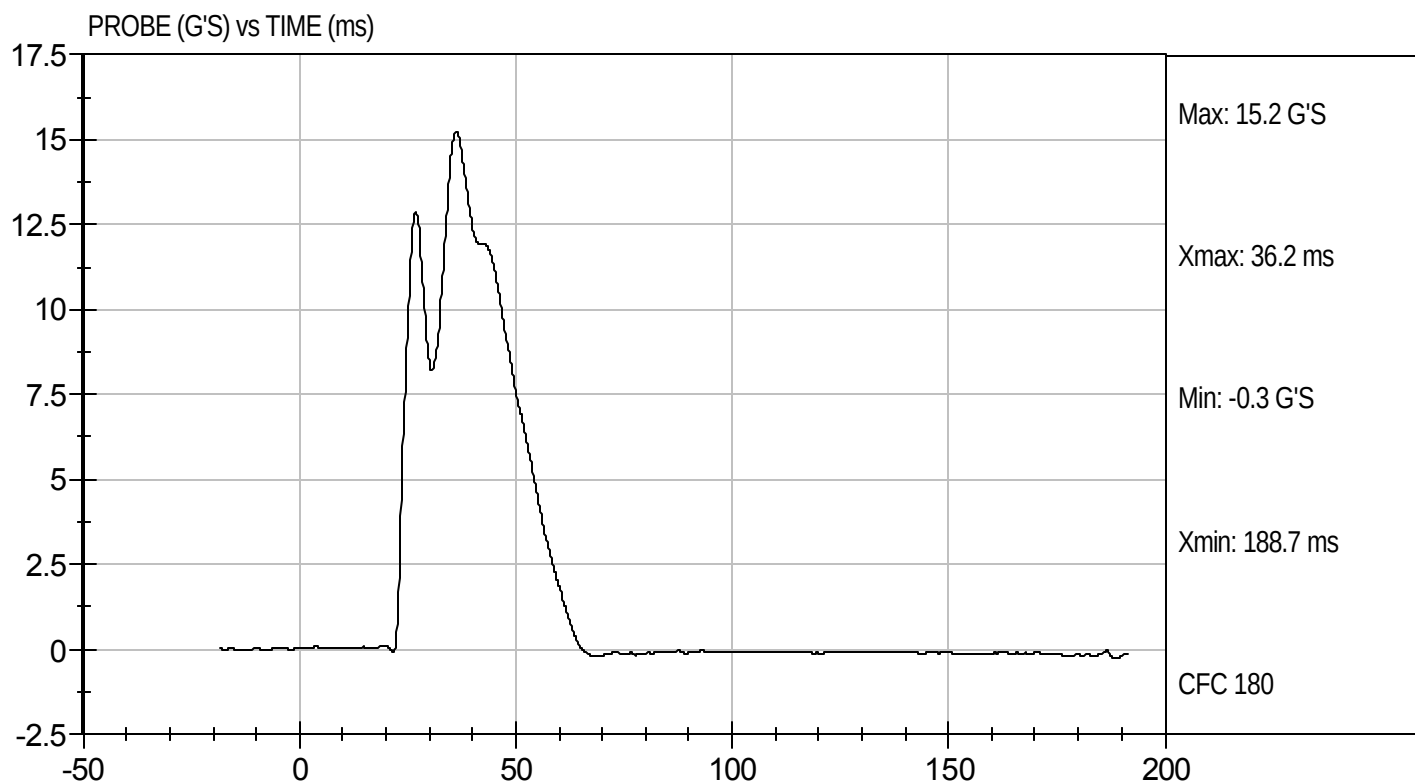
11/8/10  
Test Date

David Winkelbauer  
Approved By



Test Desc: Shoulder Impact  
Component ID: D103863

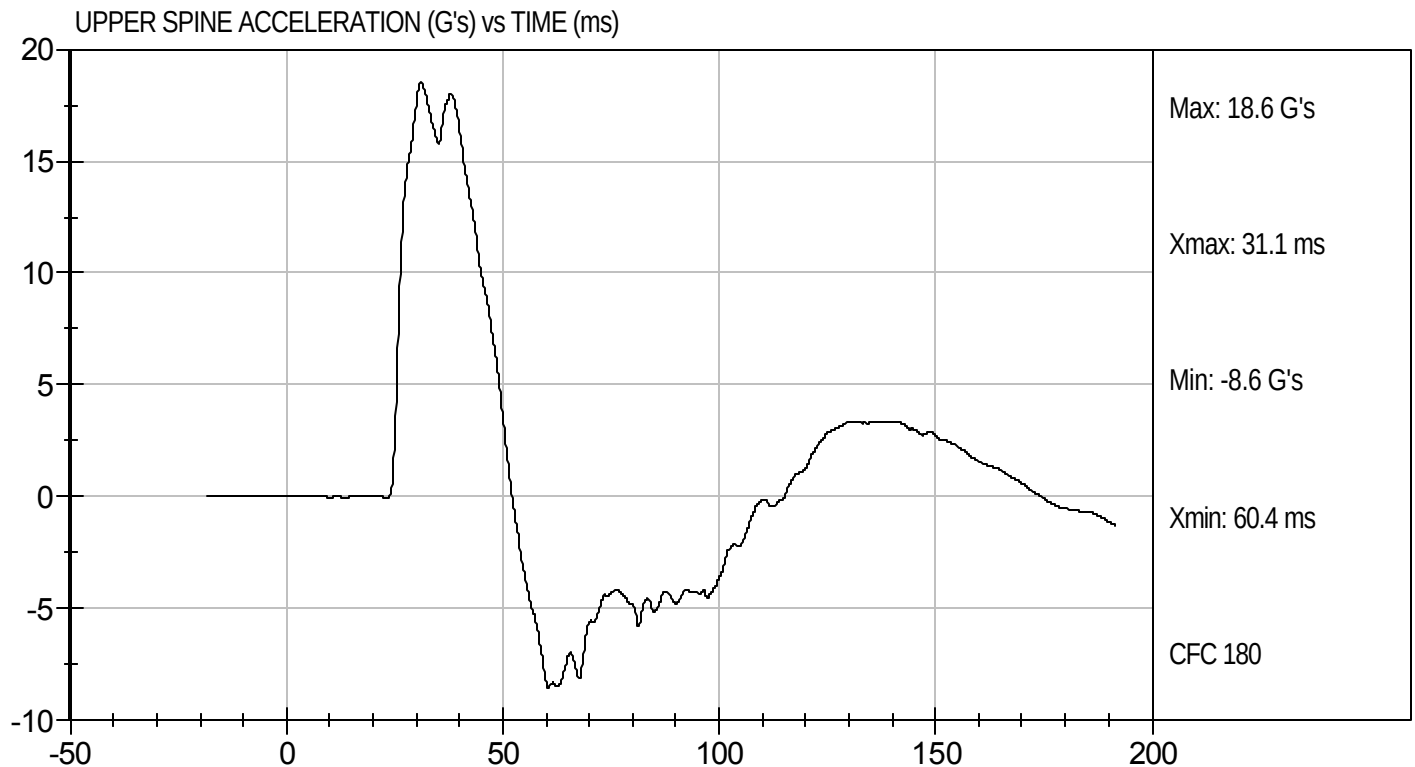
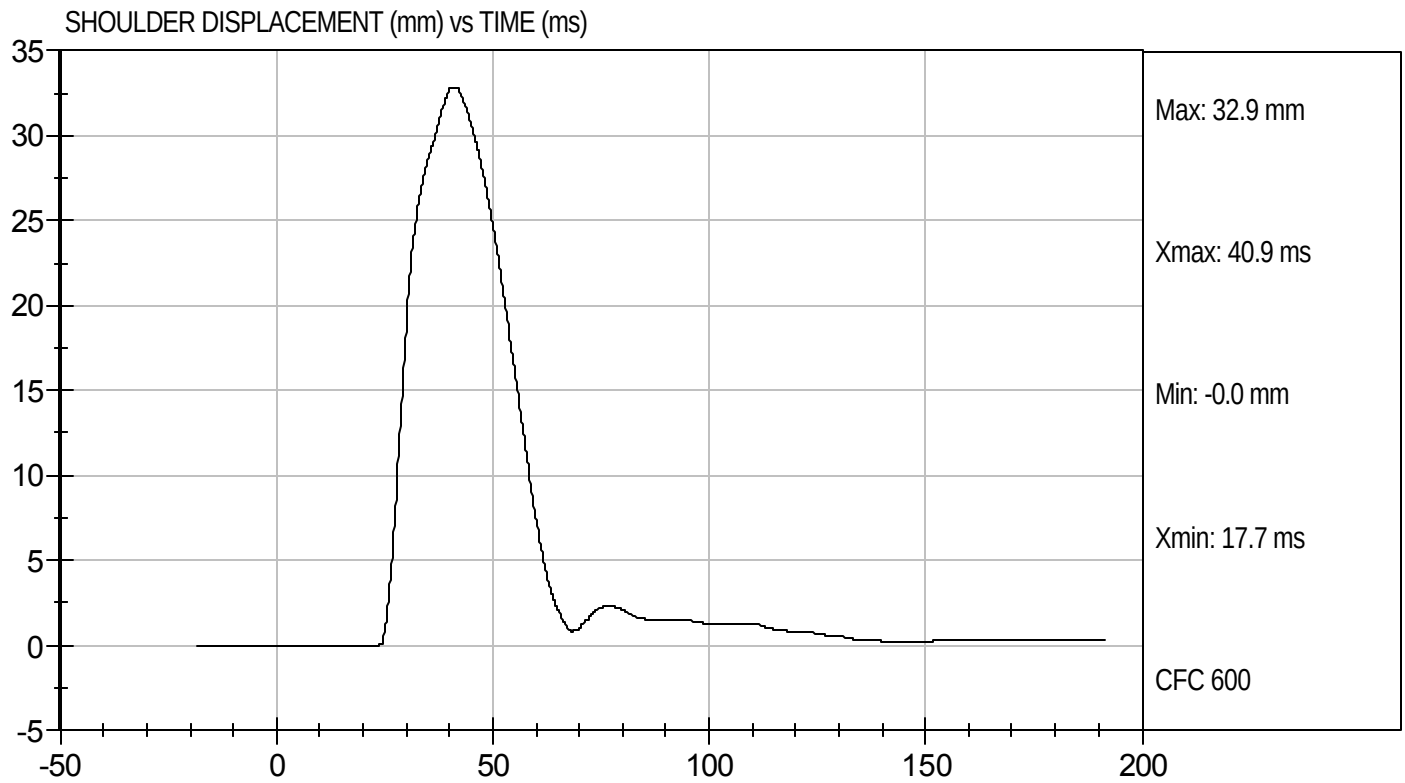
Test Date: 11/8/10  
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Shoulder Impact  
Component ID: D103863

Test Date: 11/8/10  
Velocity: 14.12 ft/s, 4.30 m/s



**MGA RESEARCH CORPORATION**  
**THORAX (WITH ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103864

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                         | %     | 10 to 70      | 26     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.68   | Pass      |
| Peak Impactor Acceleration       | G's   | 30 to 36      | 33     | Pass      |
| Shoulder Displacement            | mm    | 31 to 40      | 37     | Pass      |
| Upper Rib Displacement           | mm    | 25 to 32      | 28     | Pass      |
| Middle Rib Displacement          | mm    | 30 to 36      | 31     | Pass      |
| Lower Rib Displacement           | mm    | 32 to 38      | 33     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 34 to 43      | 37     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 29 to 37      | 33     | Pass      |
| Overall Test Results             |       |               | Pass   |           |

Jessica Hall  
Laboratory Technician

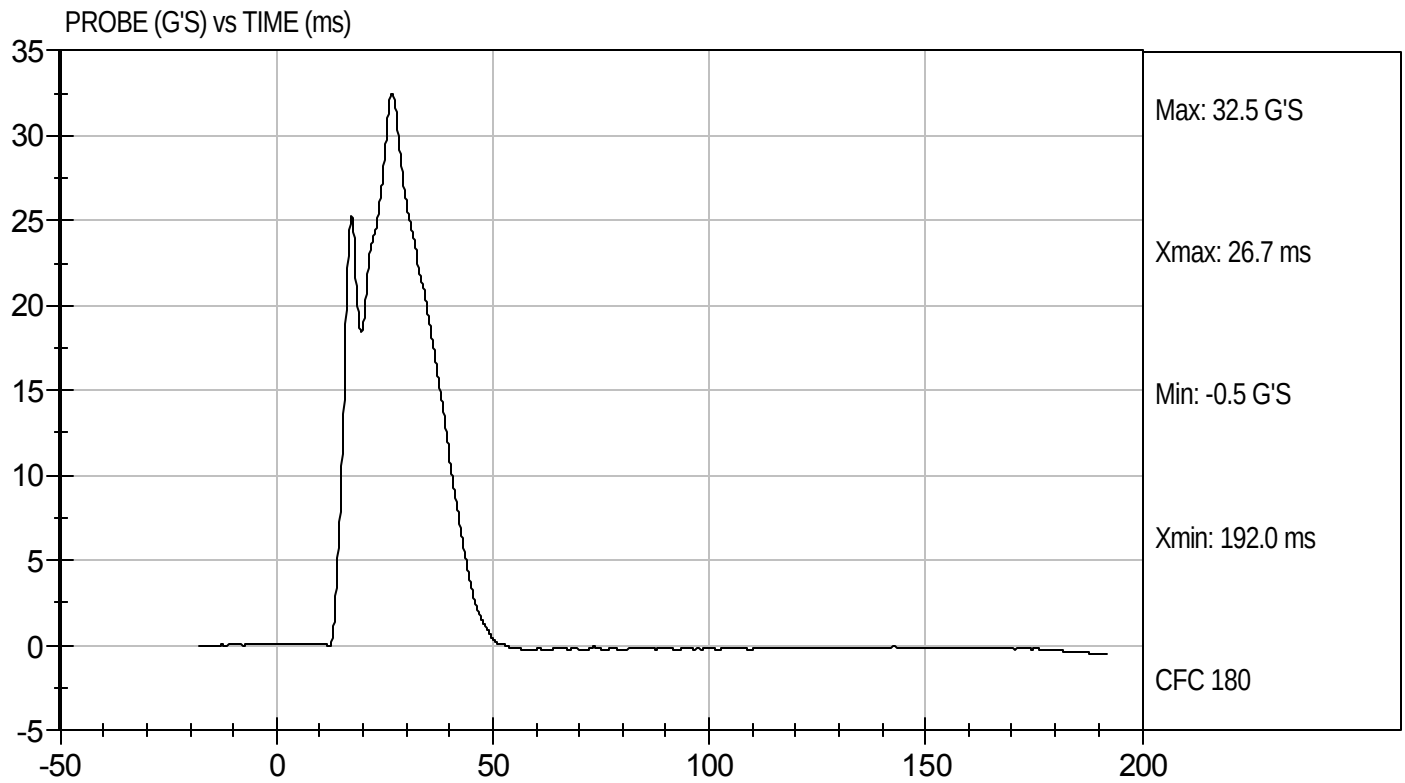
11/8/10  
Test Date

David Winkelbauer  
Approved By



Test Desc: Thorax With Arm  
Component ID: D103864

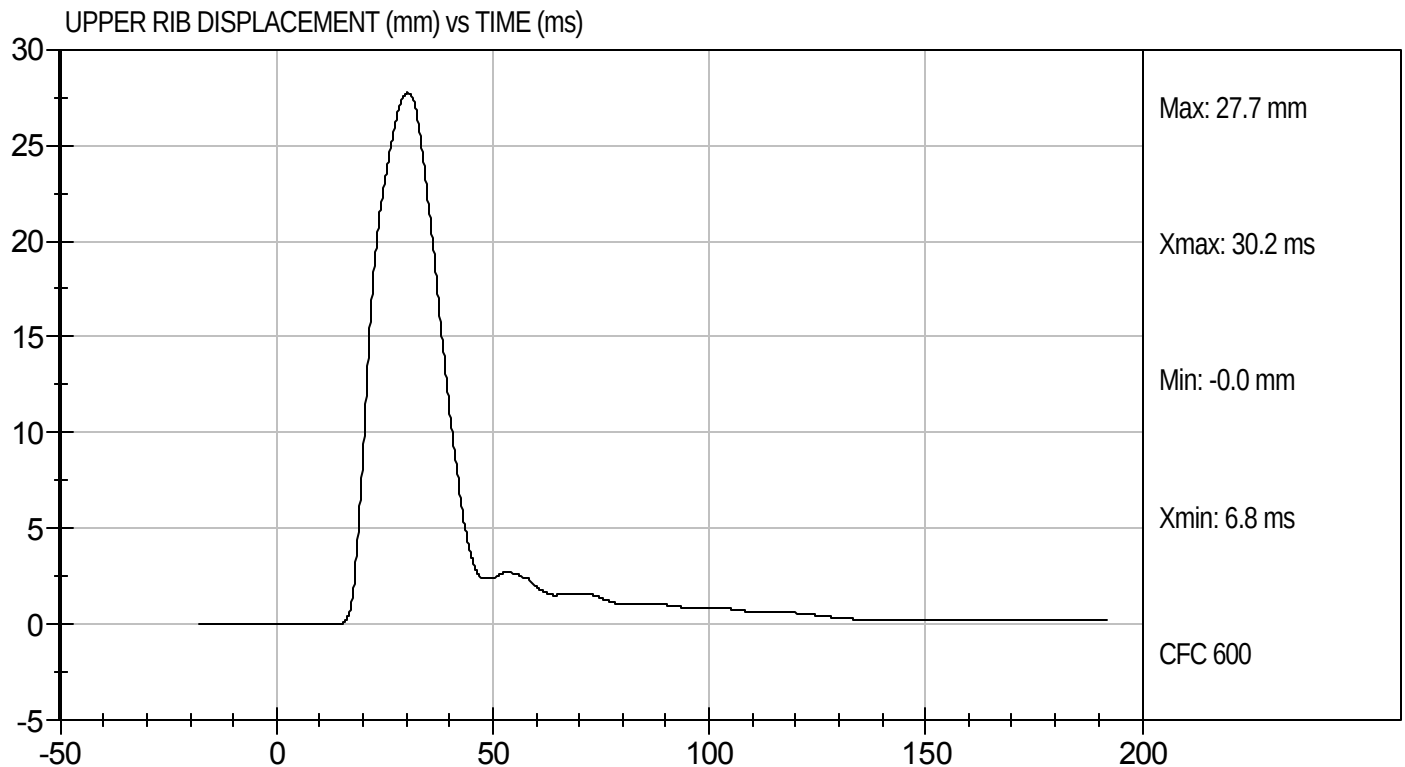
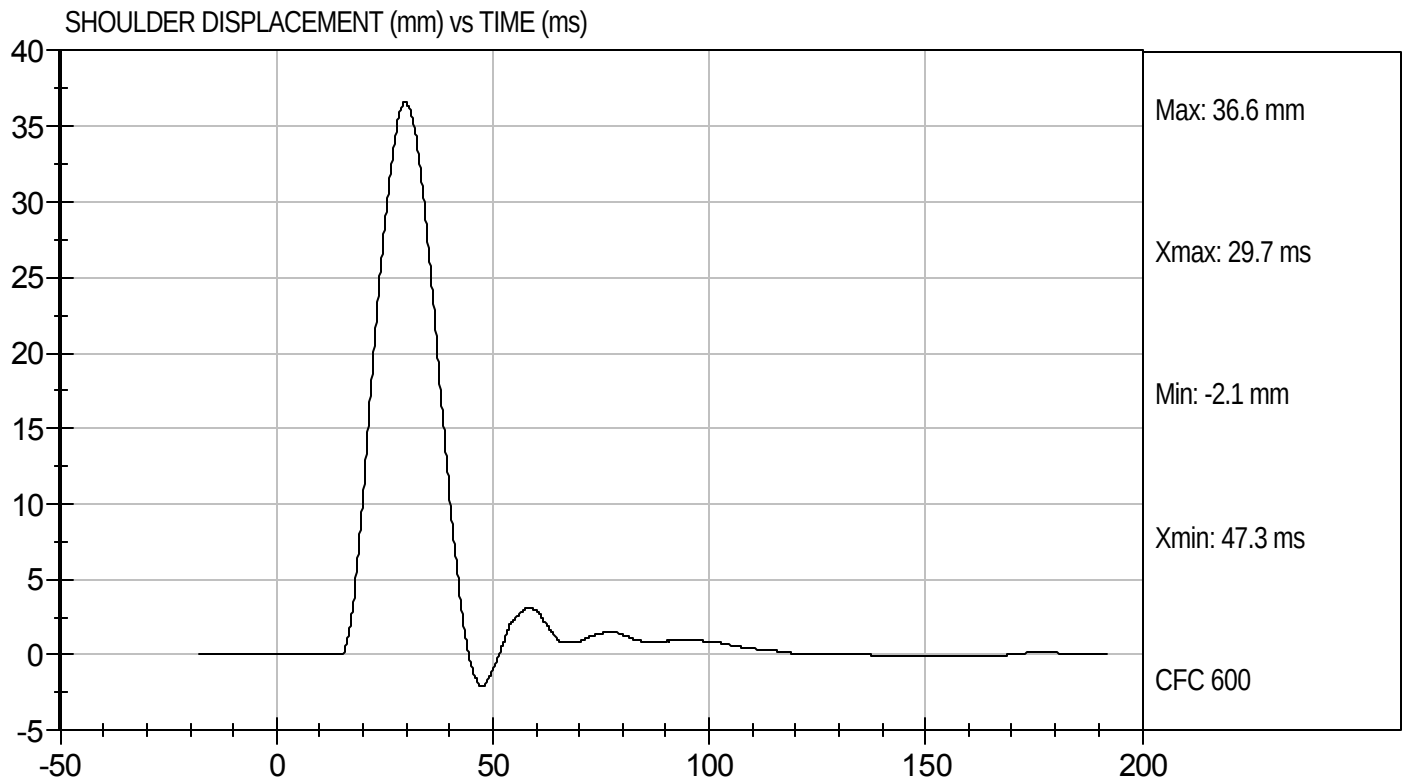
Test Date: 11/8/10  
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D103864

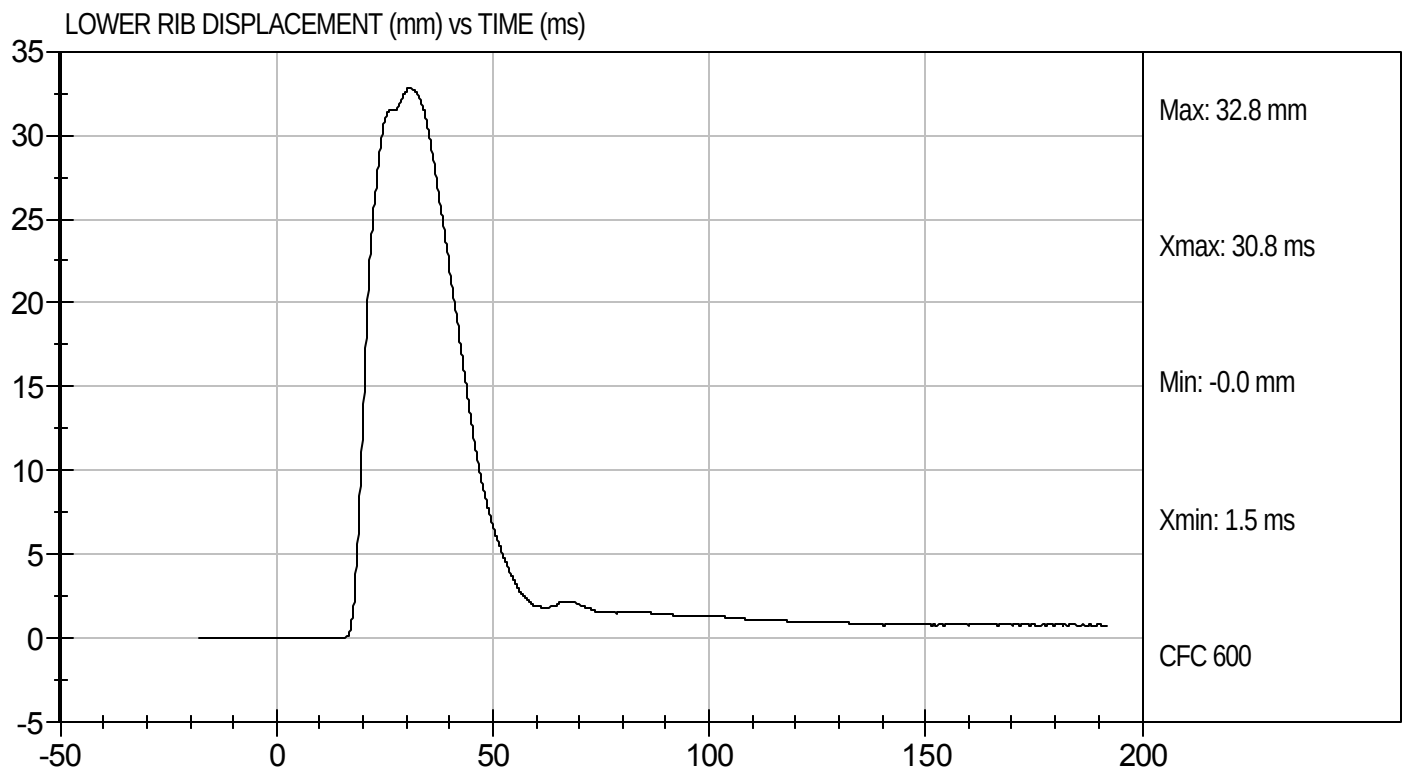
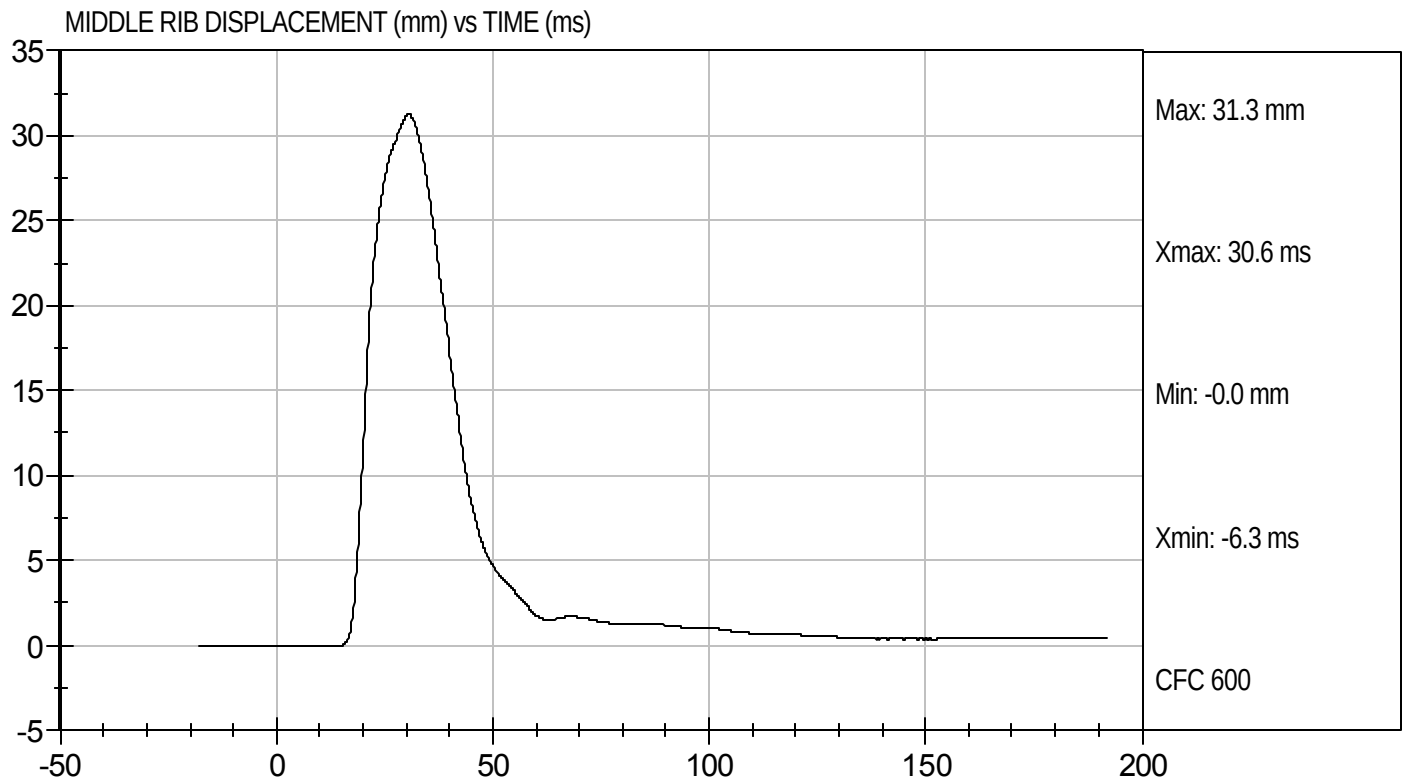
Test Date: 11/8/10  
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D103864

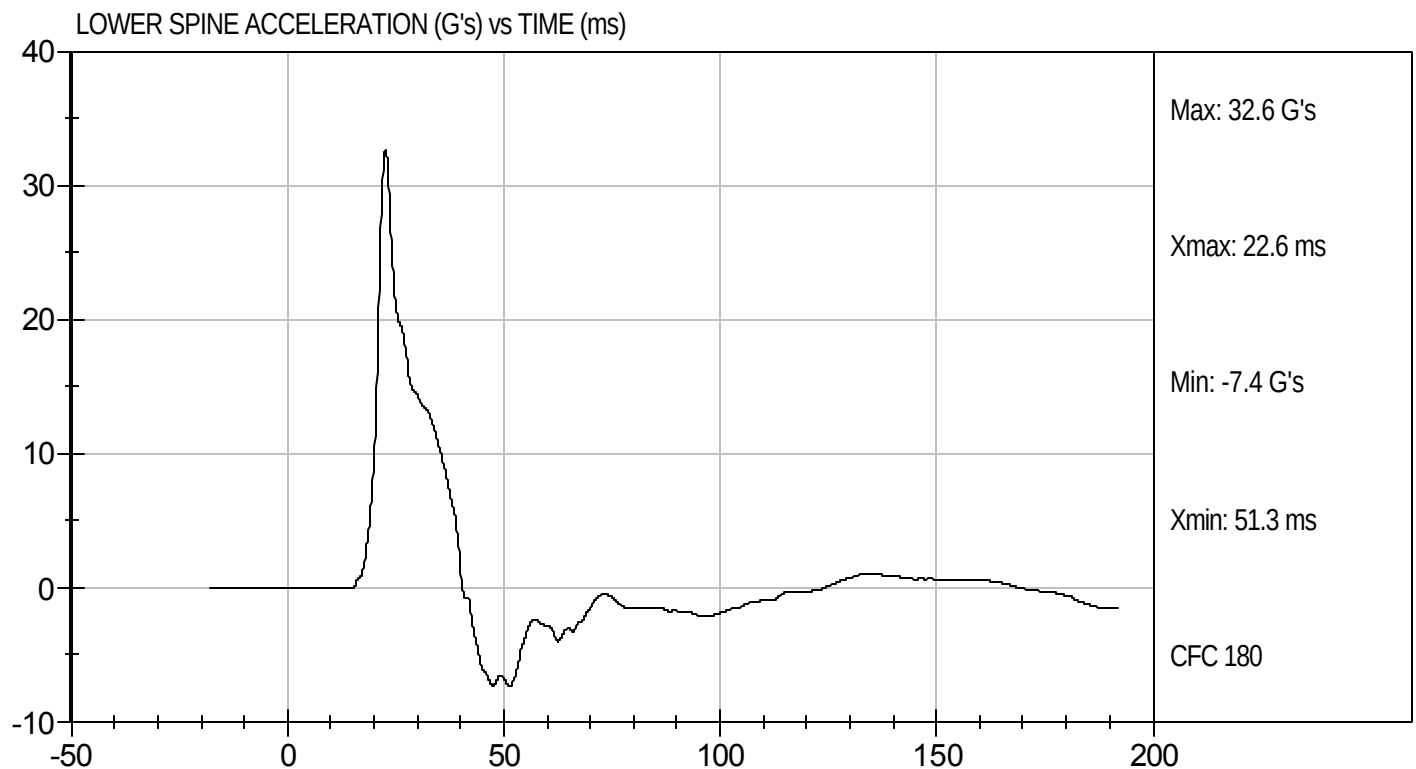
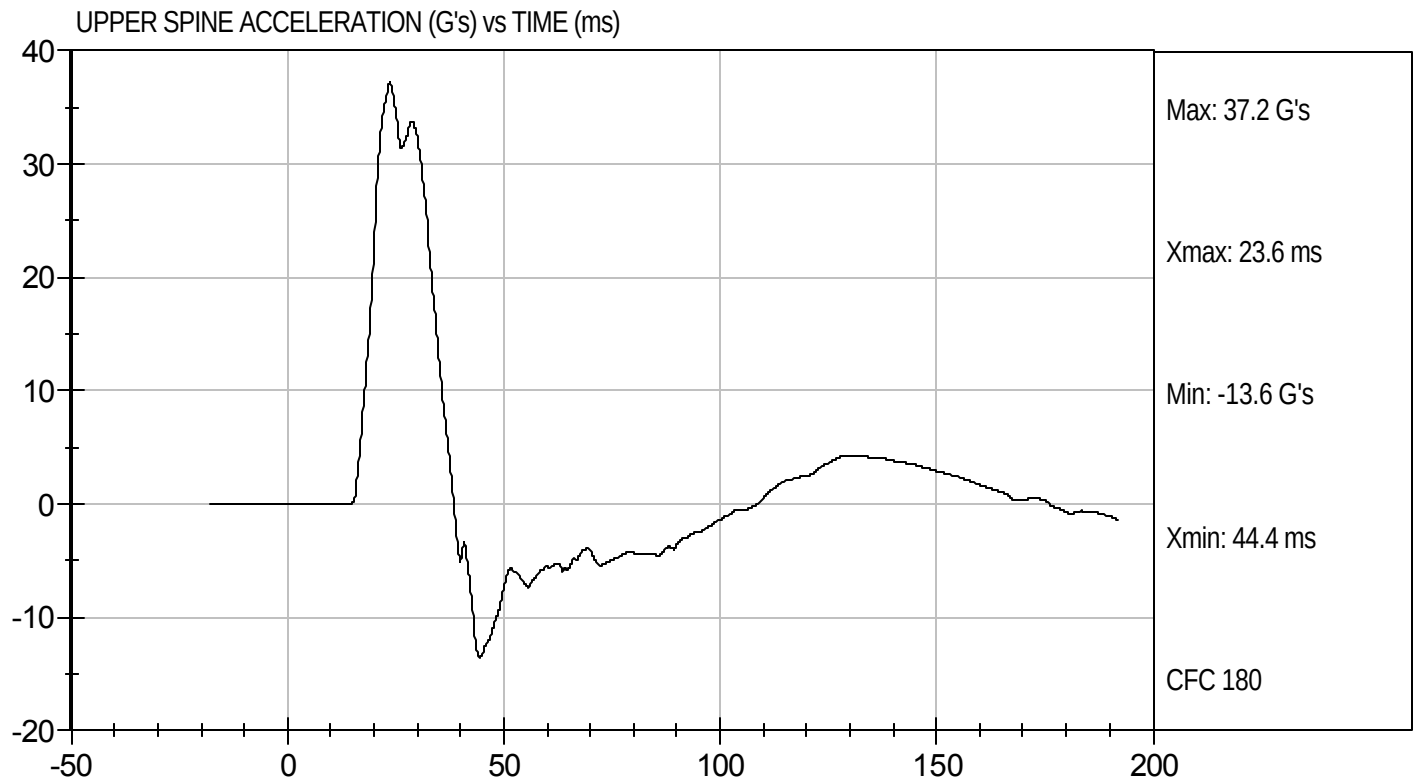
Test Date: 11/8/10  
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D103864

Test Date: 11/8/10  
Velocity: 21.9 ft/s, 6.68 m/s



**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103865

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                         | %     | 10 to 70      | 26     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.23   | Pass      |
| Peak Impactor Force              | G's   | 14 to 18      | 15     | Pass      |
| Upper Rib Displacement           | mm    | 32 to 40      | 38     | Pass      |
| Middle Rib Displacement          | mm    | 39 to 45      | 42     | Pass      |
| Lower Rib Displacement           | mm    | 35 to 43      | 37     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 13 to 17      | 14     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 7 to 11       | 9      | Pass      |
| Overall Test Results             |       |               |        | Pass      |

*Jessica Hall*  
Laboratory Technician

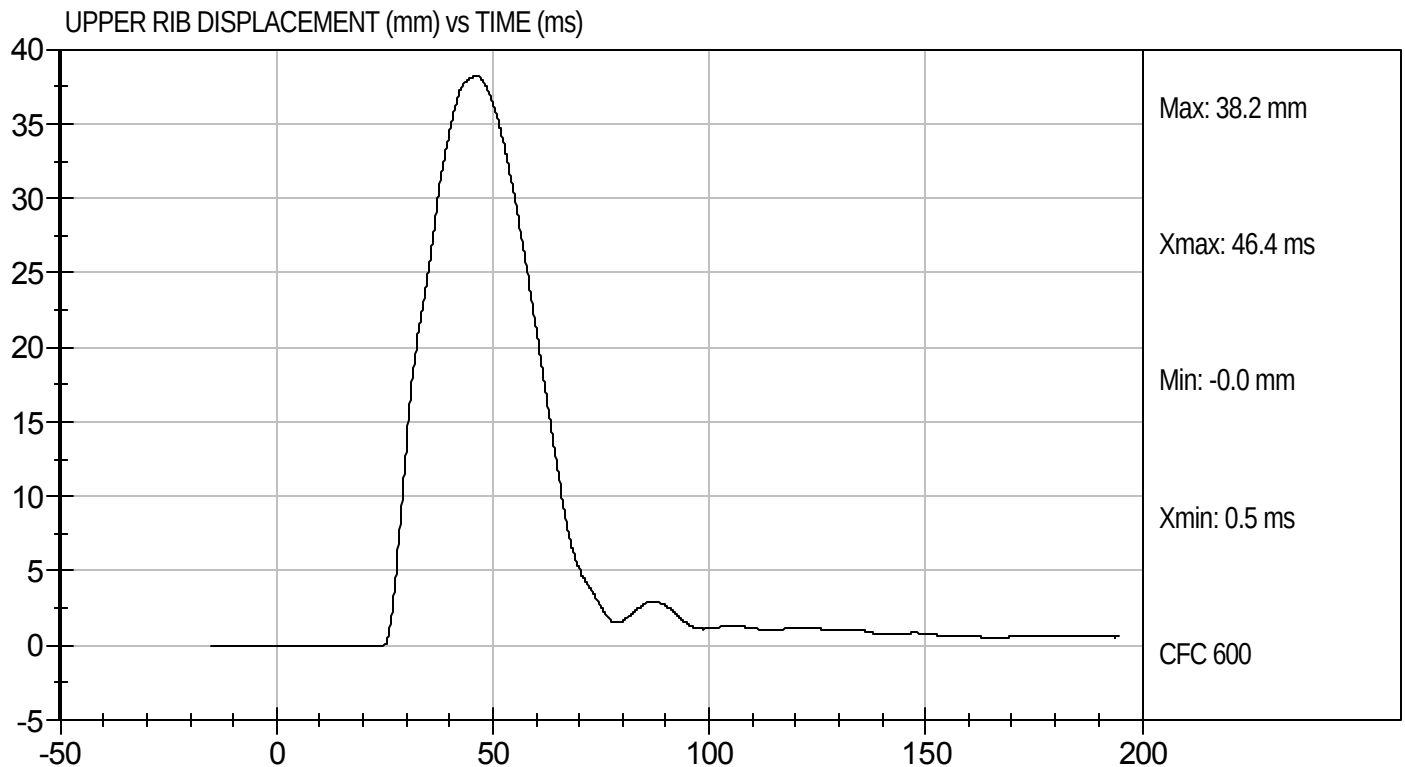
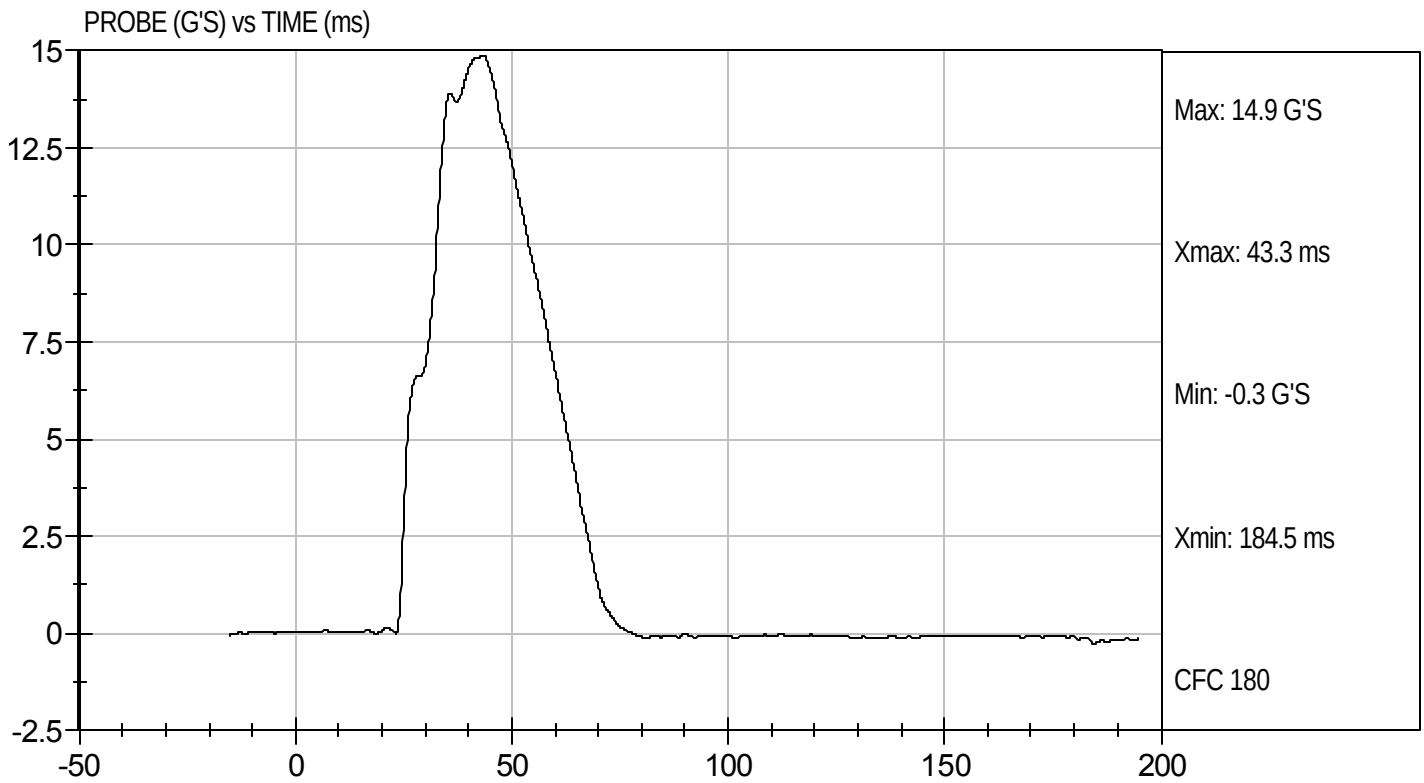
11/8/10  
Test Date

*David Winkelbauer*  
Approved By



Test Desc: Thorax Without Arm  
Component ID: D103865

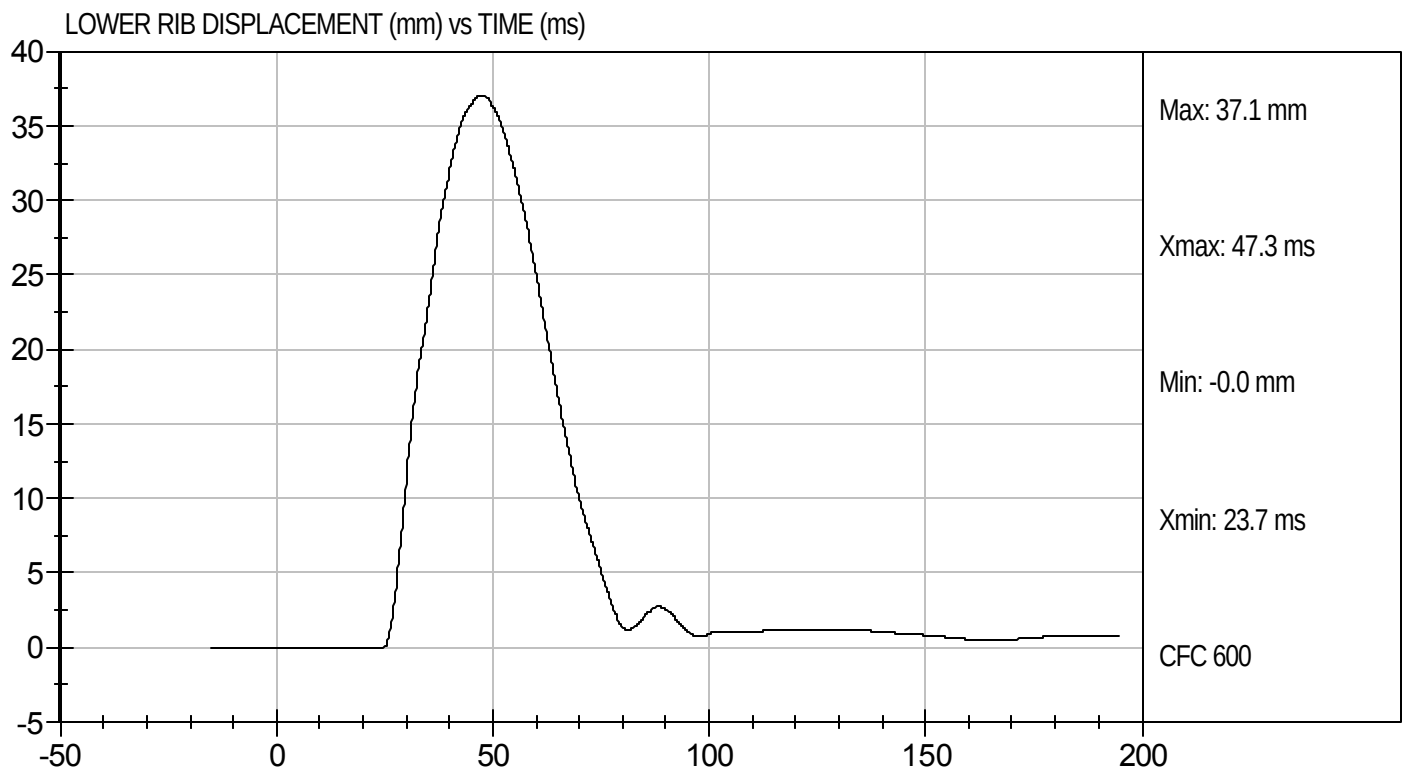
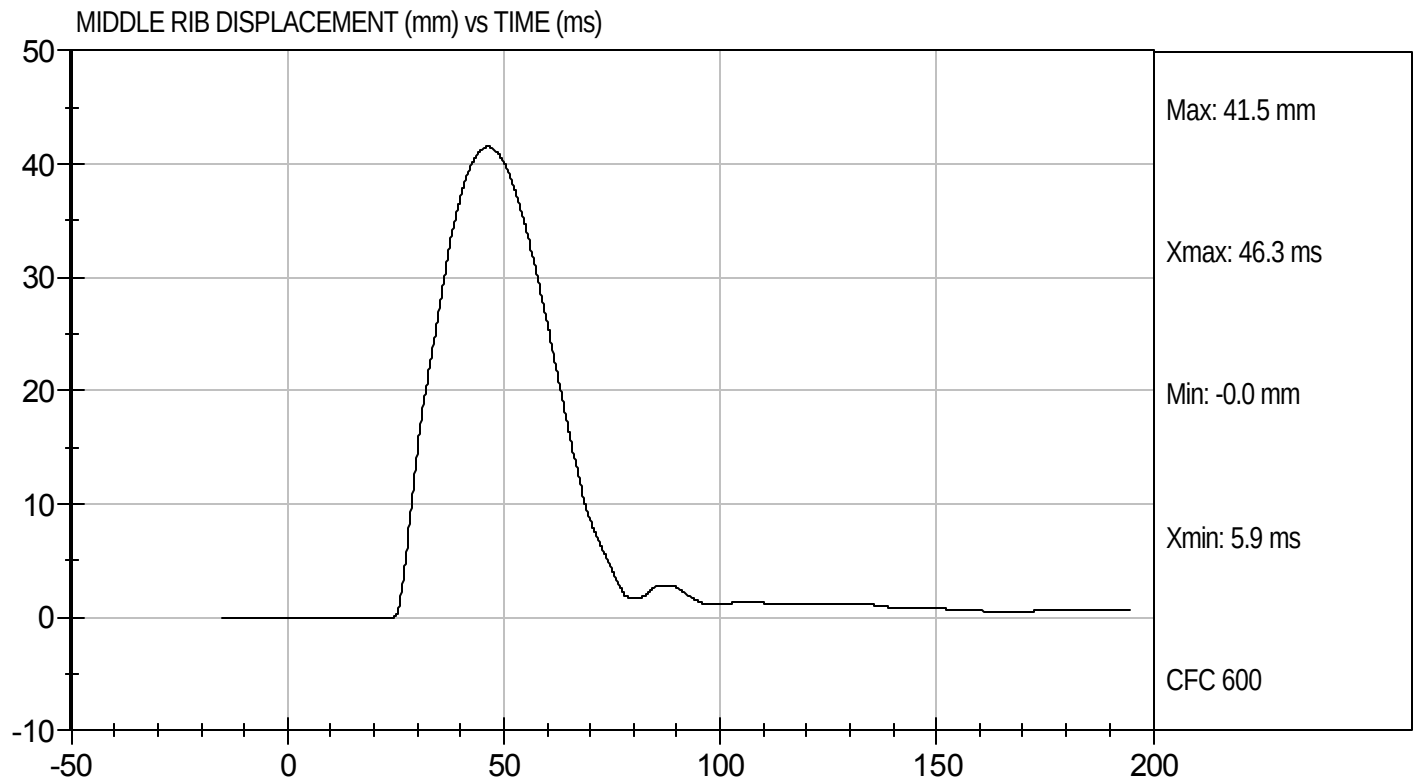
Test Date: 11/8/10  
Velocity: 13.88 ft/s, 4.23 m/s





Test Desc: Thorax Without Arm  
Component ID: D103865

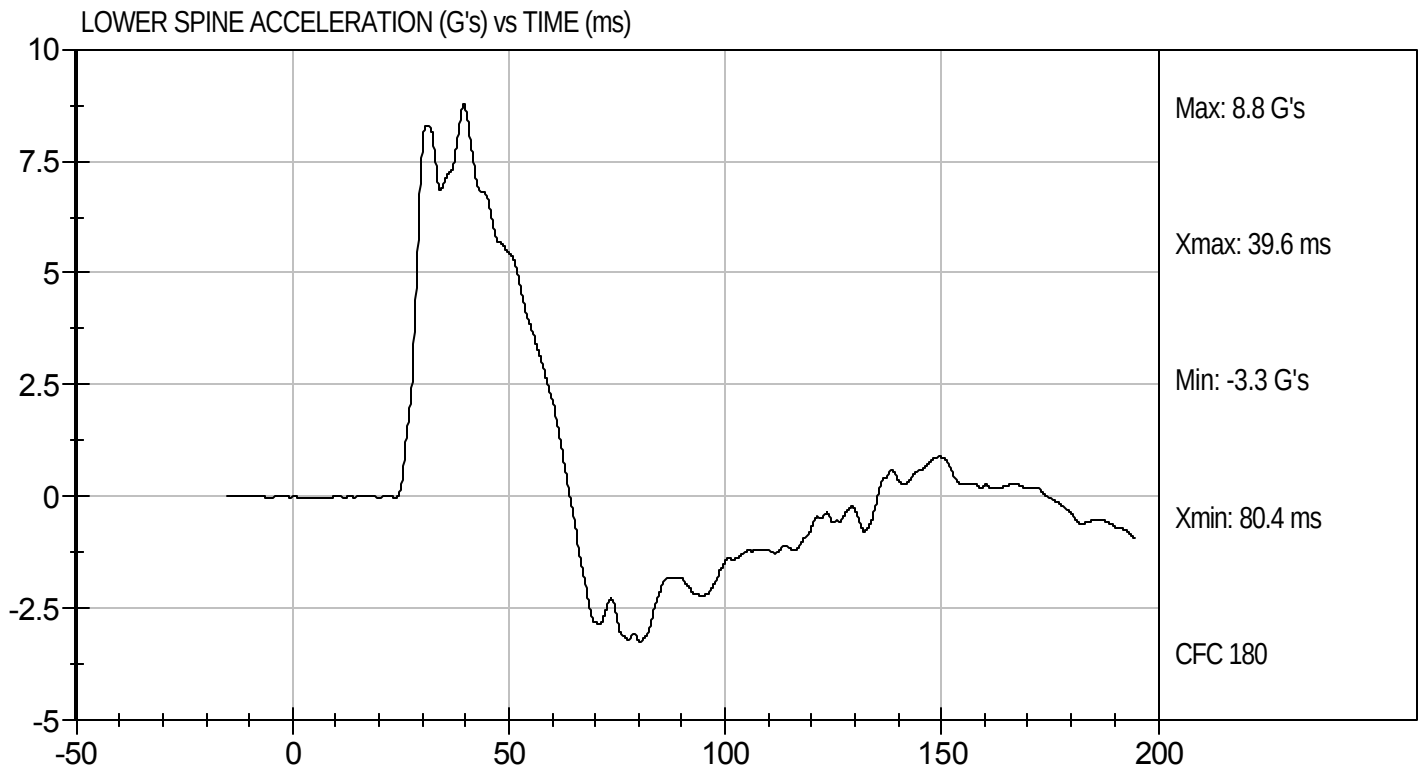
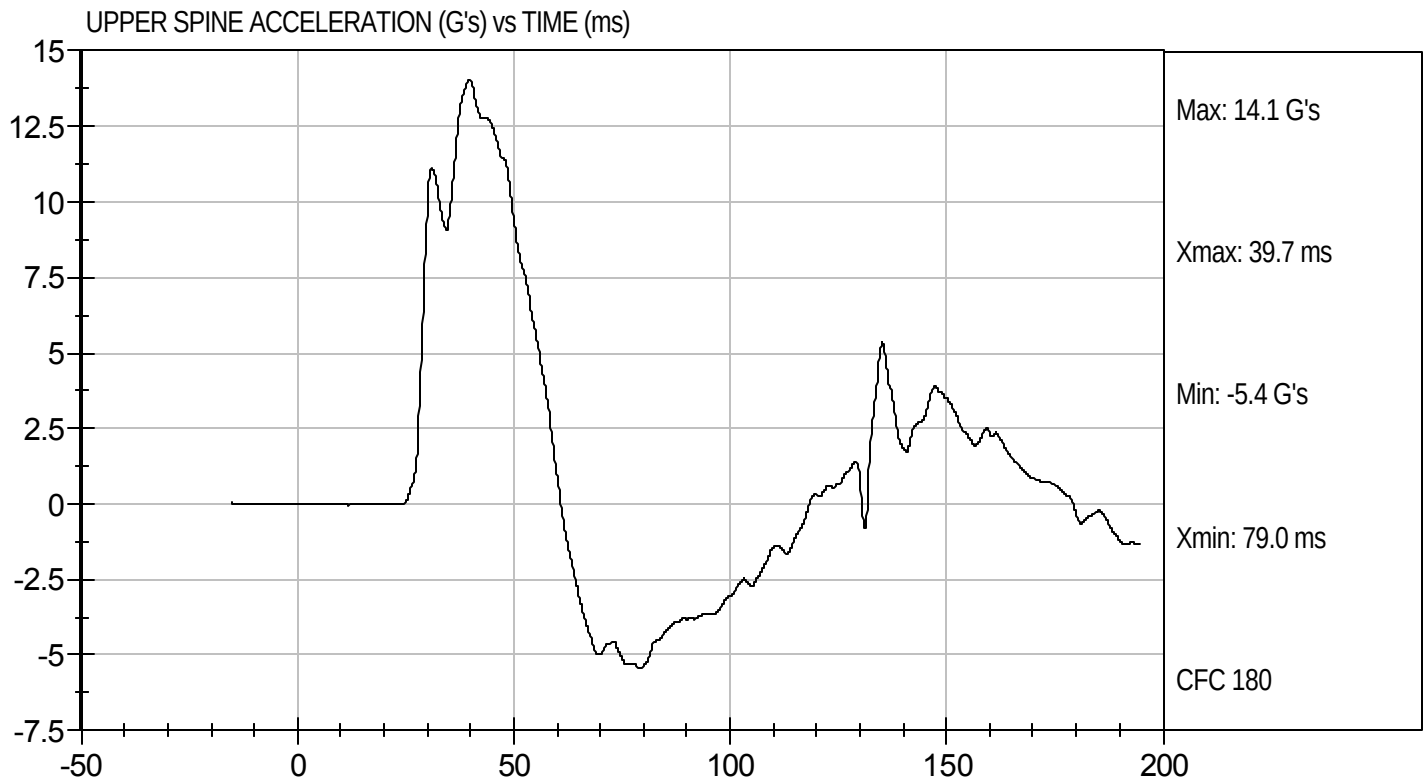
Test Date: 11/8/10  
Velocity: 13.88 ft/s, 4.23 m/s





Test Desc: Thorax Without Arm  
Component ID: D103865

Test Date: 11/8/10  
Velocity: 13.88 ft/s, 4.23 m/s



**MGA RESEARCH CORPORATION**  
**ABDOMINAL IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103866

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                         | %     | 10 to 70      | 28     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Peak Impactor Acceleration       | G's   | 12 to 16      | 14     | Pass      |
| Upper Rib Displacement           | mm    | 36 to 47      | 42     | Pass      |
| Lower Rib Displacement           | mm    | 33 to 44      | 39     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 9 to 14       | 11     | Pass      |
| Overall Test Results             |       |               | Pass   |           |

  
Laboratory Technician

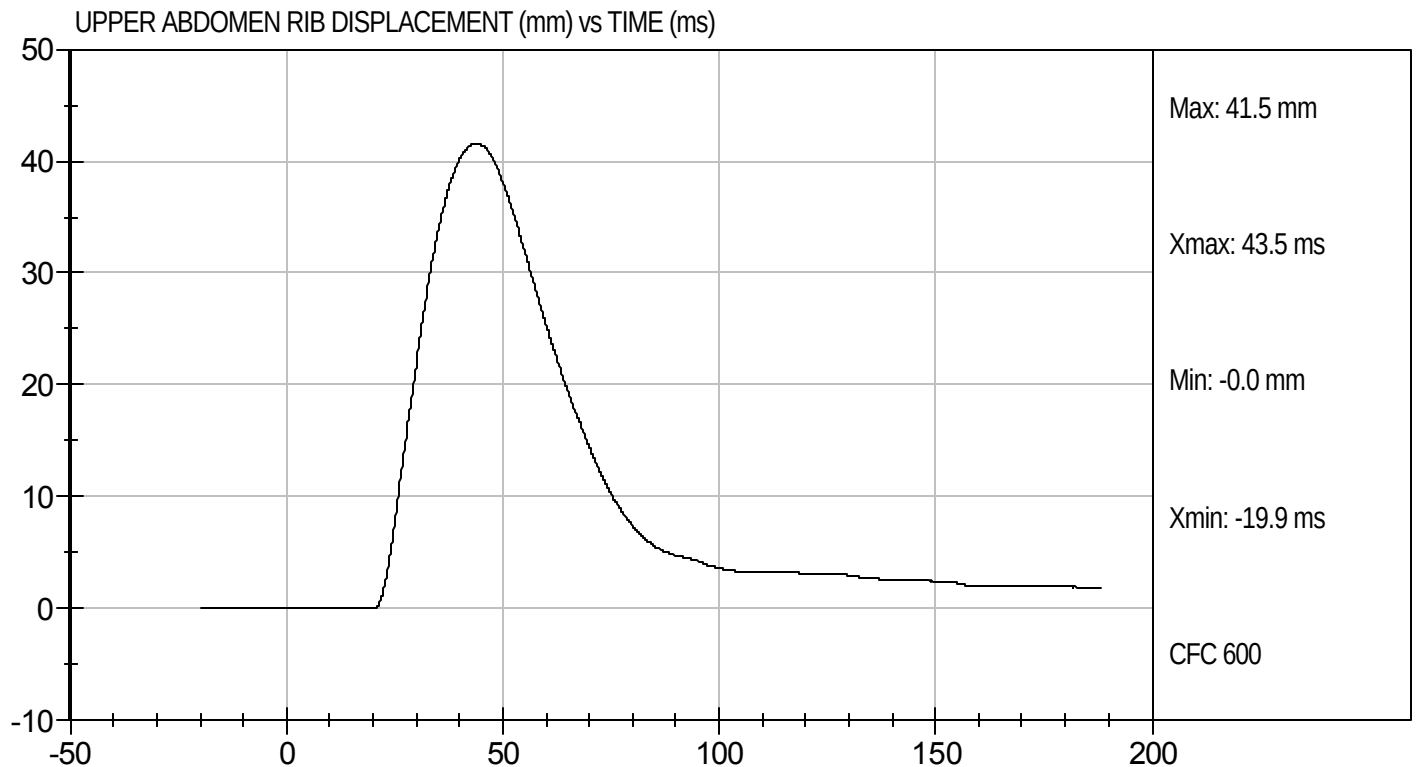
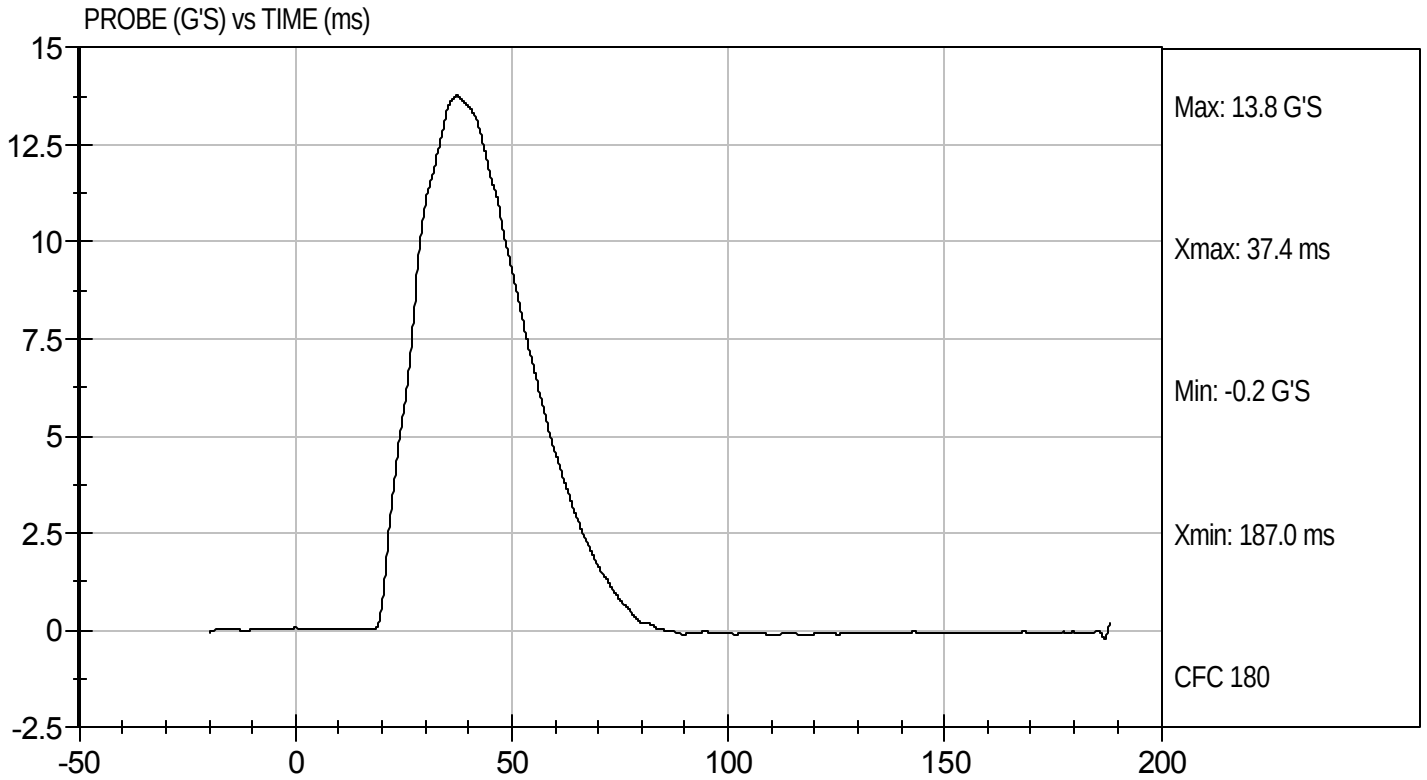
11/8/10  
Test Date

  
Approved By



Test Desc: Abdomen Impact  
Component ID: D103866

Test Date: 11/8/10  
Velocity: 14.36 ft/s, 4.38 m/s

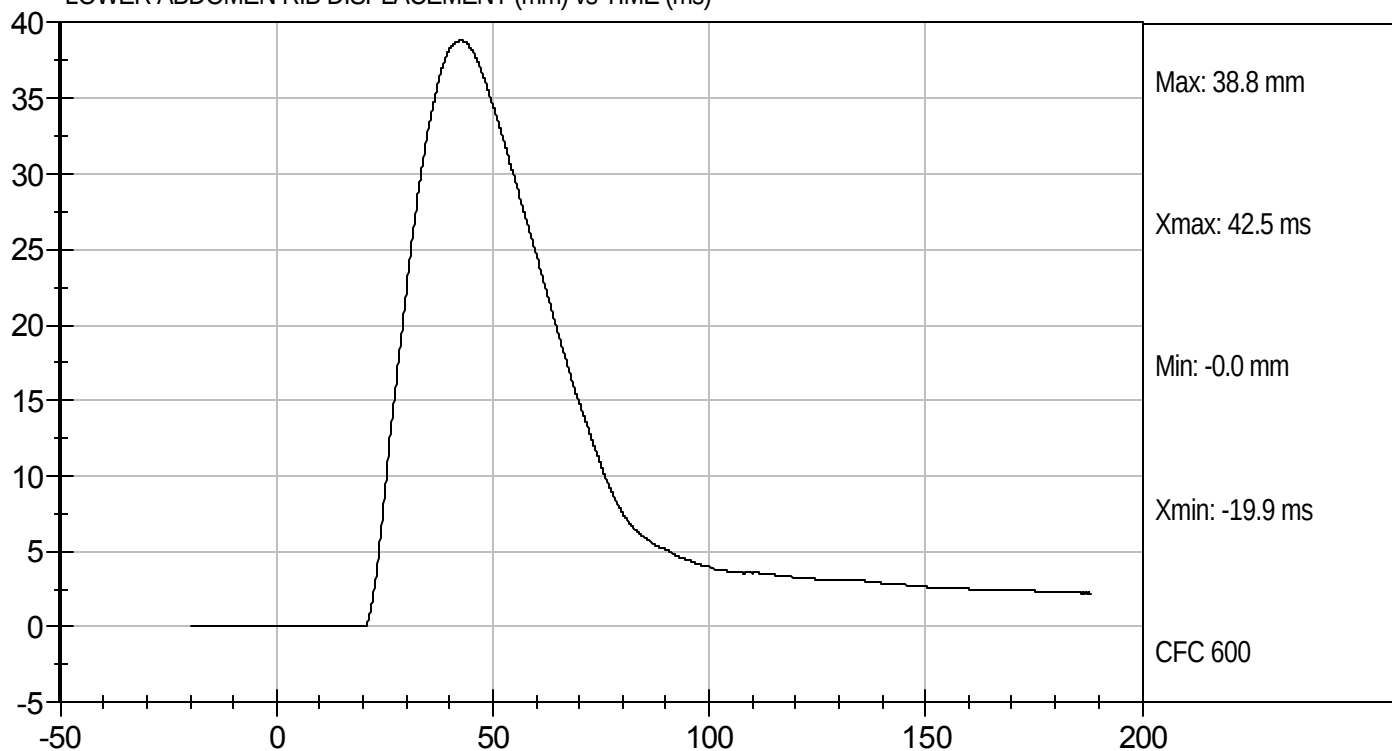




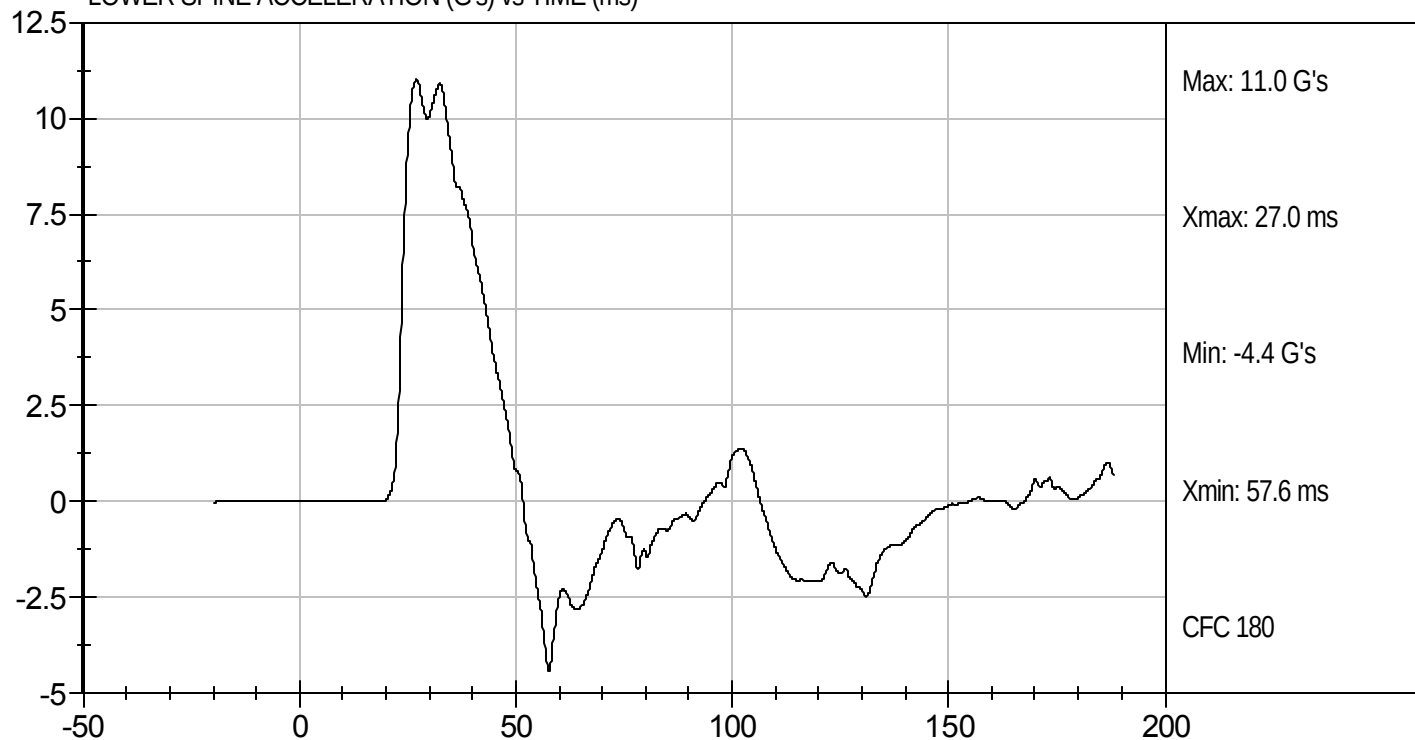
Test Desc: Abdomen Impact  
Component ID: D103866

Test Date: 11/8/10  
Velocity: 14.36 ft/s, 4.38 m/s

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**PELVIS IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103867

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                         | %     | 10 to 70      | 28     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.74   | Pass      |
| Peak Impactor Acceleration       | G's   | 38 to 47      | 44     | Pass      |
| Pelvis Y Acceleration after 6 ms | G's   | 34 to 42      | 42     | Pass      |
| Peak Acetabulum Force            | N     | 3600 to 4300  | 4111   | Pass      |
| Overall Test Results             |       |               | Pass   |           |

Jessica Hall  
Laboratory Technician

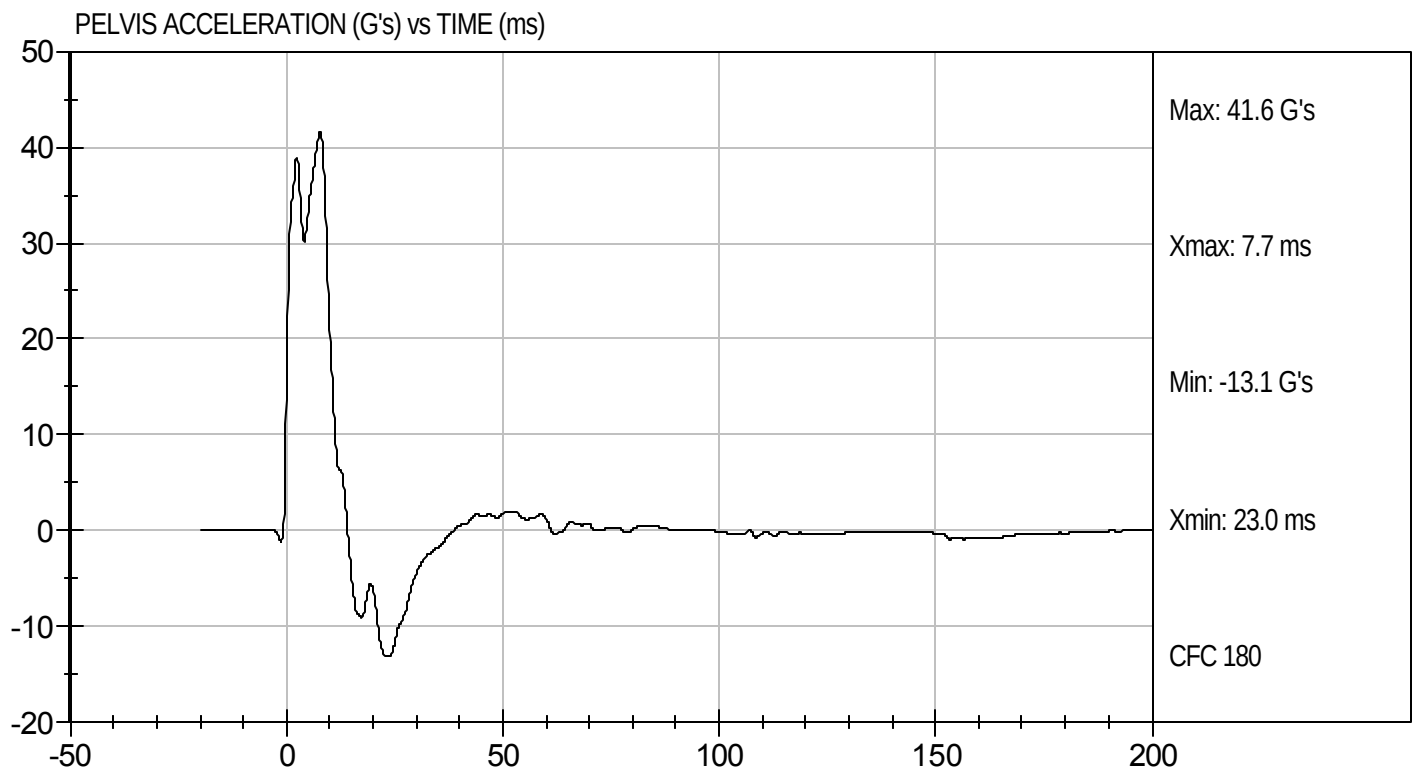
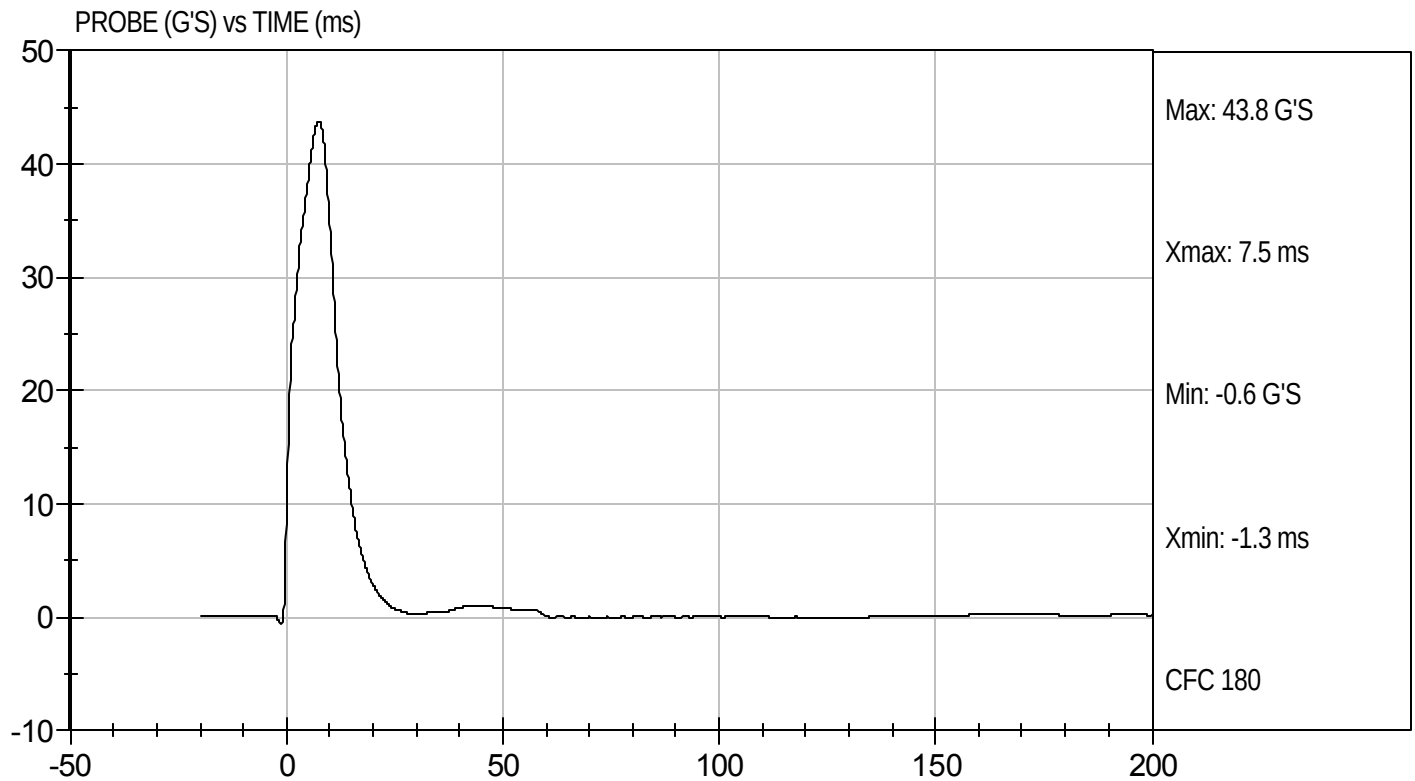
11/8/10  
Test Date

David Winkelbauer  
Approved By



Test Desc: Pelvis Impact  
Component ID: D103867

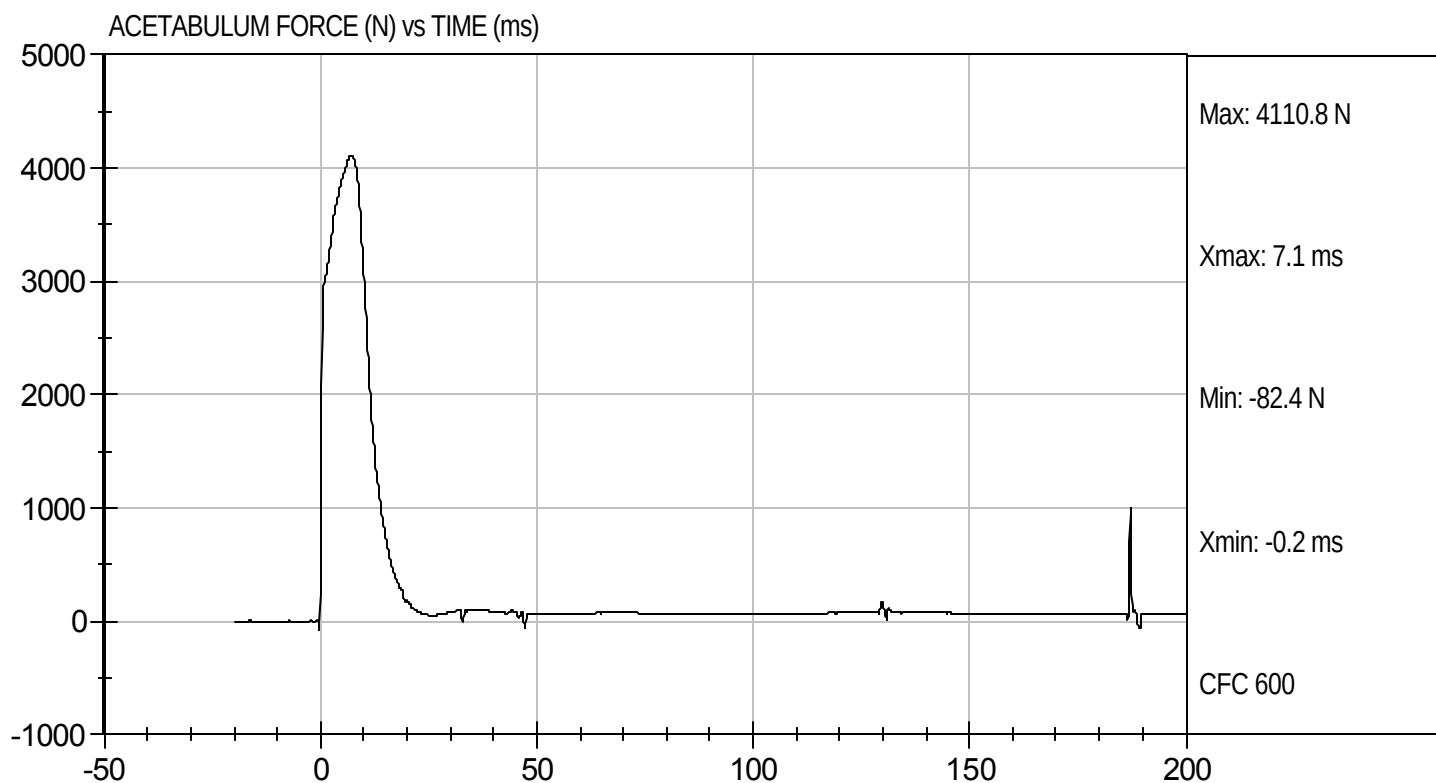
Test Date: 11/8/10  
Velocity: 22.1 ft/s, 6.74 m/s





Test Desc: Pelvis Impact  
Component ID: D103867

Test Date: 11/8/10  
Velocity: 22.1 ft/s, 6.74 m/s



**MGA RESEARCH CORPORATION**  
**ILIAC IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D103868

| Tested Parameter           | Units | Specification | Result | Pass/Fail |
|----------------------------|-------|---------------|--------|-----------|
| Temperature                | deg C | 20.6 to 22.2  | 22.0   | Pass      |
| Humidity                   | %     | 10 to 70      | 28     | Pass      |
| Impact Velocity            | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Peak Impactor Acceleration | G's   | 36 to 45      | 37     | Pass      |
| Pelvis Y Acceleration      | G's   | 28 to 39      | 31     | Pass      |
| Peak Pelvis Iliac Force    | N     | 4100 to 5100  | 4390   | Pass      |
| Overall Test Results       |       |               | Pass   |           |

Jessica Gall  
Laboratory Technician

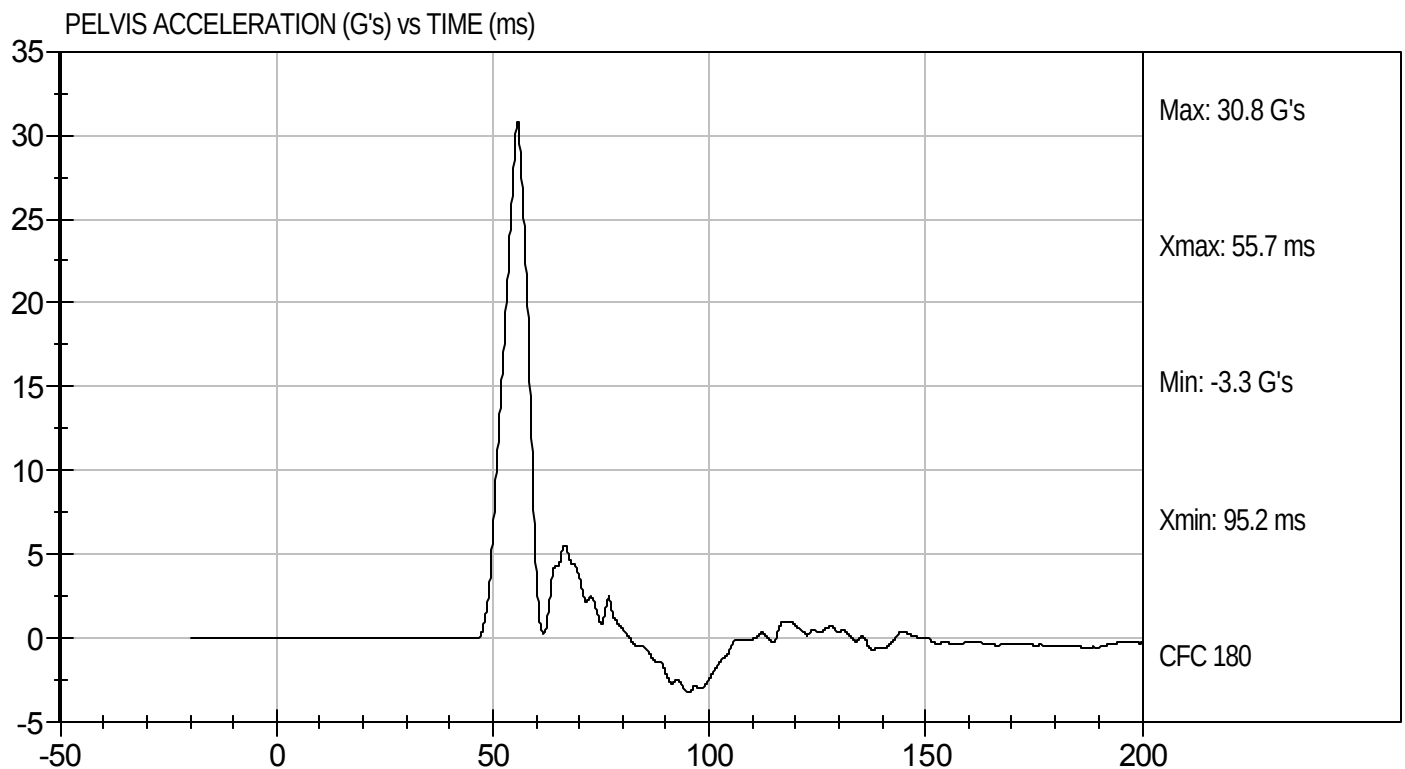
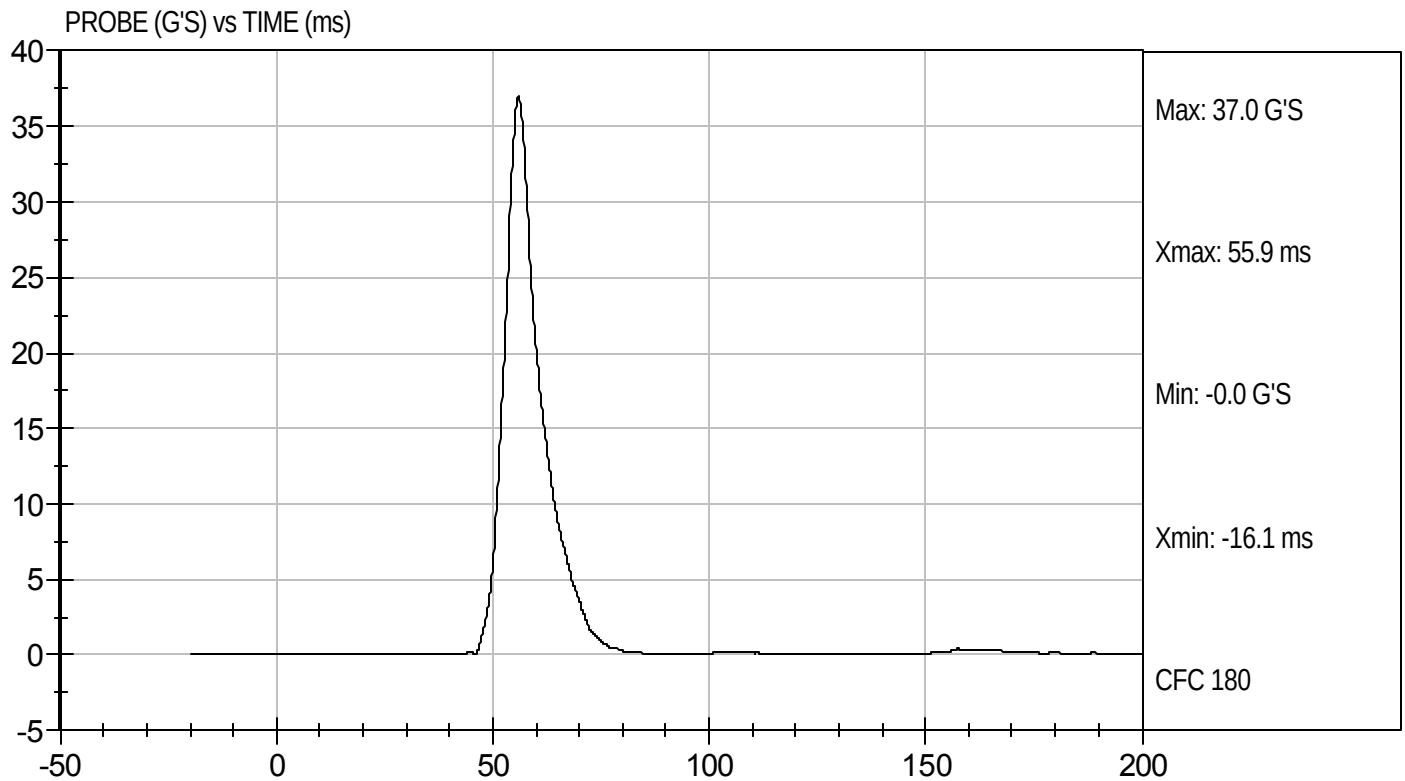
11/8/10  
Test Date

David Winkelbauer  
Approved By



Test Desc: Iliac Impact  
Component ID: D103868

Test Date: 11/8/10  
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Iliac Impact  
Component ID: D103868

Test Date: 11/8/10  
Velocity: 14.36 ft/s, 4.38 m/s

