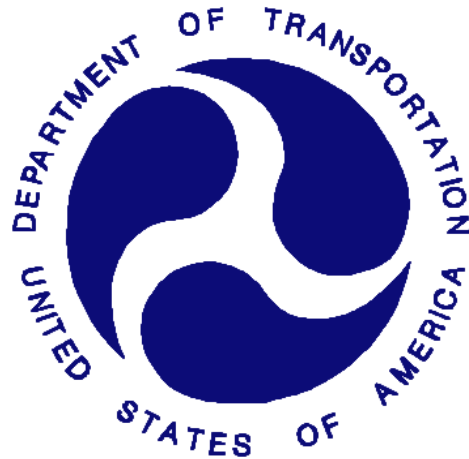


**REPORT NUMBER: SPNCAP-MGA-2014-001**

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

**KIA MOTORS CORPORATION  
2014 Kia Forte LX 4-Dr Sedan  
NHTSA No.: M20144201**

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



**Test Date: July 8, 2013**

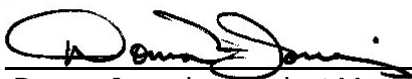
**Final Report Date: July 26, 2013**

**FINAL REPORT**

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

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Prepared by:   
Donna Janovicz, Project Manager

Approved by:   
Ben Fischer, Project Engineer

Approval Date: July 26, 2013

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-2014-001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>2. Government Accession No.</b>                         | <b>3. Recipient's Catalog No.</b>                                                                                                                                                                                                                                                                                                |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
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| <b>4. Title and Subtitle</b><br>Final Report of New Car Assessment Program<br>Side Impact Pole Testing of a 2014 Kia Forte LX 4-Dr Sedan,<br>NHTSA No.: M20144201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                            | <b>5. Report Date</b><br>July 26, 2013                                                                                                                                                                                                                                                                                           |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
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| <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-2014-001                                                                                                                                                                                                                                                              |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| <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>                                                                                                                                                                                                                                                                                                         |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
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| <b>12. Sponsoring Agency Name and Address</b><br>United States Department of Transportation<br>National Highway Traffic Safety Administration<br>Office of Crashworthiness Standards (NVS-111)<br>1200 New Jersey Ave, SE, Room W43-410<br>Washington, DC 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                            | <b>13. Type of Report and Period Covered:</b><br>Final Test Report<br>July 8, 2013 to July 26, 2013                                                                                                                                                                                                                              |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
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| <b>15. Supplementary Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |                                                                                                                                                                                                                                                                                                                                  |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| <b>16. Abstract</b><br>A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2014 Kia Forte LX 4-Dr Sedan in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP 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 July 8, 2013.<br><br>The impact velocity was 32.1 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.7°C. The test vehicle post-test maximum crush was 355 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; width: 80%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3" style="text-align: center;">Driver ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">244</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">Gs</td> <td style="text-align: center;">82</td> <td style="text-align: center;">46</td> </tr> <tr> <td>Total Pelvic Force<br/>(sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">3720</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38*</td> <td style="text-align: center;">24</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">24</td> </tr> </tbody> </table> <p style="text-align: center;">*Proposed IARV</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. |                                                            |                                                                                                                                                                                                                                                                                                                                  |                  |  | Driver ATD (SID-IIs) |  |  | Measurement Description | Units | Threshold | Result | Head Injury Criteria (HIC <sub>36</sub> ) | N/A | 1000 | 244 | Resultant Lower Spine Acceleration | Gs | 82 | 46 | Total Pelvic Force<br>(sum of acetabular and iliac forces) | N | 5525 | 3720 | Maximum Thoracic Rib Deflection | mm | 38* | 24 | Maximum Abdomen Rib Deflection | mm | 45* | 24 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Driver ATD (SID-IIs)                                       |                                                                                                                                                                                                                                                                                                                                  |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| Measurement Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Units                                                      | Threshold                                                                                                                                                                                                                                                                                                                        | Result           |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| Head Injury Criteria (HIC <sub>36</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | N/A                                                        | 1000                                                                                                                                                                                                                                                                                                                             | 244              |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| Resultant Lower Spine Acceleration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Gs                                                         | 82                                                                                                                                                                                                                                                                                                                               | 46               |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| Total Pelvic Force<br>(sum of acetabular and iliac forces)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N                                                          | 5525                                                                                                                                                                                                                                                                                                                             | 3720             |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| Maximum Thoracic Rib Deflection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | mm                                                         | 38*                                                                                                                                                                                                                                                                                                                              | 24               |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| Maximum Abdomen Rib Deflection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | mm                                                         | 45*                                                                                                                                                                                                                                                                                                                              | 24               |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| <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 Administration<br>Technical Information Services Division, NPO-411<br>1200 New Jersey Ave, SE<br>Washington, DC 20590<br>e-mail: <a href="mailto:tis@nhtsa.dot.gov">tis@nhtsa.dot.gov</a><br>FAX: 202-493-2833 |                  |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |
| <b>19. Security Classification of Report</b><br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>20. Security Classification of Page</b><br>Unclassified | <b>21. No. of Pages</b><br>134                                                                                                                                                                                                                                                                                                   | <b>22. Price</b> |  |                      |  |  |                         |       |           |        |                                           |     |      |     |                                    |    |    |    |                                                            |   |      |      |                                 |    |     |    |                                |    |     |    |

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## **SECTION 1**

### **TEST PURPOSE AND PROCEDURE**

This side impact test is part of the MY 2014 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 2014 Kia Forte LX 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 September 2012.

## SECTION 2 SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2014 Kia Forte LX 4-Dr Sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.1 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin, on July 8, 2013. 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 Side NCAP Pole Laboratory Test Procedure dated September 2012. Camera locations and other pertinent camera information are included in this report.

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

Primary and Redundant Head CG Triaxial Accelerometers  
 Thorax Upper, Middle, and Lower Rib Displacement Potentiometers  
 Abdomen Upper Rib and Lower Rib Displacement Potentiometers  
 Lower Spine (T12) 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. Appendix D contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

| Measurement Description                                    | Driver ATD (SID-IIs) |           |        |
|------------------------------------------------------------|----------------------|-----------|--------|
|                                                            | Units                | Threshold | Result |
| Head Injury Criteria (HIC <sub>36</sub> )                  | N/A                  | 1000      | 244    |
| Resultant Lower Spine Acceleration                         | Gs                   | 82        | 46     |
| Total Pelvic Force<br>(sum of acetabular and iliac forces) | N                    | 5525      | 3720   |
| Maximum Thoracic Rib Deflection                            | mm                   | 38*       | 24     |
| Maximum Abdominal Rib Deflection                           | mm                   | 45*       | 24     |

\*Proposed IARV

Supplemental restraint information is given below:

| Restraint Type                   | Left Front (Driver)<br>Occupant Location 1 |          | Left Rear (Passenger)<br>Occupant Location 4 |          |
|----------------------------------|--------------------------------------------|----------|----------------------------------------------|----------|
|                                  | Mounted                                    | Deployed | Mounted                                      | Deployed |
| Frontal Airbag                   | Yes                                        | No       |                                              |          |
| Knee Airbag                      | No                                         |          |                                              |          |
| Side Curtain Airbag              | Yes                                        | Yes      | Yes                                          | Yes      |
| Side Torso/Abdomen/Pelvis Airbag | Yes                                        | Yes      | No                                           |          |
| Seat Belt Pretensioner           | Yes                                        | Yes      | No                                           |          |
| Seat Belt Load Limiter           | Yes                                        | Yes      | No                                           |          |
| Other                            |                                            |          |                                              |          |

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 Floor Sill Y after 42ms

Left Mid A-Post Y is questionable from 52-54ms and 109-111ms

Right Roof Y is questionable from 38-51ms

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: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013

**TEST VEHICLE INFORMATION AND OPTIONS**

|                          |                   |                                   |     |
|--------------------------|-------------------|-----------------------------------|-----|
| NHTSA No.                | M20144201         | Traction Control System (TCS)     | Yes |
| Model Year               | 2014              | Auto-Leveling System              | No  |
| Make                     | Kia               | Automatic Door Locks (ADL)        | Yes |
| Model                    | Forte             | Power Window Auto-Reverse         | Yes |
| Body Style               | Sedan             | Other Optional Feature            | N/A |
| VIN                      | KNAFK4A68E5065975 | Driver Front Airbag               | Yes |
| Body Color               | Abyss Blue        | Driver Curtain Airbag             | Yes |
| Odometer Reading (km/mi) | 140 / 87          | Driver Head/Torso Airbag          | No  |
| Engine Displacement (L)  | 1.8               | Driver Torso Airbag               | No  |
| Type/No. Cylinders       | 4                 | Driver Torso/Pelvis Airbag        | Yes |
| Engine Placement         | Lateral           | Driver Pelvis Airbag              | No  |
| Transmission Type        | Automatic         | Driver Knee Airbag                | No  |
| Transmission Speeds      | 6                 | Rear Pass. Curtain Airbag         | Yes |
| Overdrive                | Yes               | Rear Pass. Head/Torso Airbag      | No  |
| Final Drive              | Front             | Rear Pass. Torso Airbag           | No  |
| Roof Rack                | No                | Rear Pass. Torso/Pelvis Airbag    | No  |
| Sunroof/T-Top            | No                | Rear Pass. Pelvis Airbag          | No  |
| Running Boards           | No                | Driver Seat Belt Pretensioner     | Yes |
| Tilt Steering Wheel      | Yes               | Rear Pass. Seat Belt Pretensioner | No  |
| Power Seats              | No                | Driver Load Limiter               | Yes |
| Anti-Lock Brakes (ABS)   | Yes               | Rear Pass. Load Limiter           | No  |
|                          |                   | Other Safety Restraint            | N/A |

|                                                                            |    |
|----------------------------------------------------------------------------|----|
| Does owner's manual provide instructions to turn off automatic door locks? | No |
|----------------------------------------------------------------------------|----|

**DATA FROM CERTIFICATION LABEL**

|                     |                        |                 |      |
|---------------------|------------------------|-----------------|------|
| Manufactured By     | Kia Motors Corporation | GVWR (kg)       | 1760 |
| Date of Manufacture | 04/13                  | GAWR Front (kg) | 980  |
| Vehicle Type        | Passenger Car          | GAWR Rear (kg)  | 910  |

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

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

**VEHICLE SEAT TYPE**

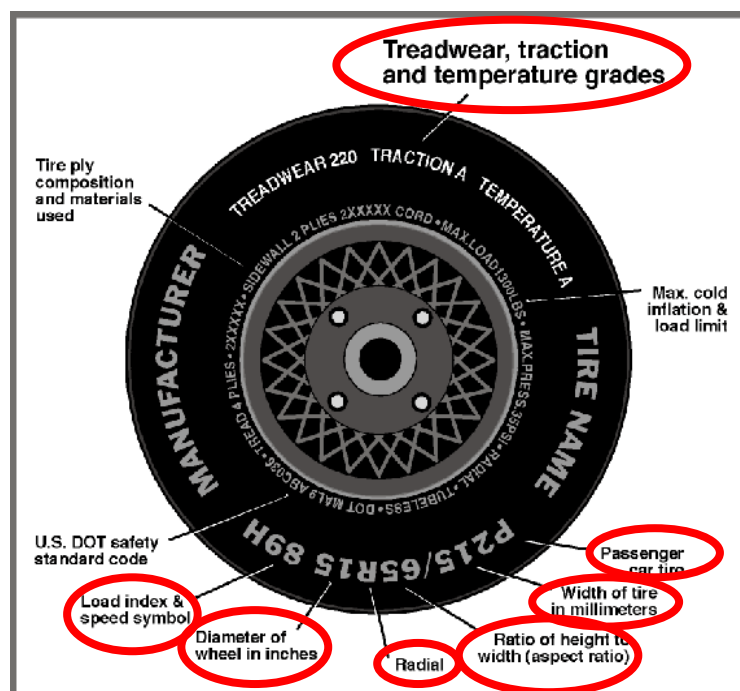
| Seating Location   | Type of Seat Pan |       |             |           | Type of Seat Back |            |       |
|--------------------|------------------|-------|-------------|-----------|-------------------|------------|-------|
|                    | Bucket           | Bench | Split Bench | Contoured | Fixed             | Adjustable |       |
|                    |                  |       |             |           |                   | Manual     | Power |
| 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: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013

**VEHICLE TIRE INFORMATION**



| Measured Parameter       | Front                | Rear                 |
|--------------------------|----------------------|----------------------|
| Max. Tire Pressure (kPa) | 300                  | 300                  |
| Cold Pressure (kPa)      | 220                  | 220                  |
| Recommended Tire Size    | P195/65R15           | P195/65R15           |
| Tire Size on Vehicle     | P195/65R15           | P195/65R15           |
| Tire Manufacturer        | NEXEN                | NEXEN                |
| Tire Model               | CP671                | CP671                |
| Treadwear                | 440                  | 440                  |
| Traction                 | A                    | A                    |
| Temperature Grade        | A                    | A                    |
| Tire Plies Sidewall      | 1 Polyester          | 1 Polyester          |
| Tire Plies Body          | 1 Polyester, 2 Steel | 1 Polyester, 2 Steel |
| Load Index/Speed Symbol  | 89T                  | 89T                  |
| Tire Material            | Rubber               | Rubber               |
| DOT Safety Code Left     | 8E8T FACL 1313       | 8E8T FACL 1313       |
| DOT Safety Code Right    | 8E8T CMKL 1313       | 8E8T BMDR 1313       |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013

**TEST PRESSURES**

|                | Units | LF  | RF  | LR  | RR  |
|----------------|-------|-----|-----|-----|-----|
| As Delivered   | kpa   | 220 | 220 | 220 | 220 |
| Tire Placard   | kpa   | 220 | 220 | 220 | 220 |
| Owner's Manual | kpa   |     |     |     |     |
| As Tested      | kpa   | 220 | 220 | 220 | 220 |

**TEST VEHICLE WEIGHTS**

|        | Units | As Delivered (UVW) |       |        | As Tested (ATW) |       |        | Fully Loaded |       |        |
|--------|-------|--------------------|-------|--------|-----------------|-------|--------|--------------|-------|--------|
|        |       | Front              | Rear  | Total  | Front           | Rear  | Total  | Front        | Rear  | Total  |
| Left   | kg    | 393.7              | 255.4 |        | 416.0           | 296.7 |        | 411.9        | 298.9 |        |
| Right  | kg    | 396.9              | 233.6 |        | 396.4           | 260.8 |        | 400.5        | 265.4 |        |
| Ratio  | %     | 61.8               | 38.2  |        | 59.3            | 40.7  |        | 59.0         | 41.0  |        |
| Totals | kg    | 790.6              | 489.0 | 1279.6 | 812.4           | 557.5 | 1369.9 | 812.4        | 564.3 | 1376.7 |

**TARGET TEST WEIGHT CALCULATION**

| Measured Parameter                              | Units | Value  |         |
|-------------------------------------------------|-------|--------|---------|
| Total Delivered Weight (UVW)                    | kg    | 1279.6 | (A)     |
| Actual Weight of 1 P572V ATD (SID-IIs) ATD Used | kg    | 52.2   | (B)     |
| Rated Cargo/Luggage Weight (RCLW)               | kg    | 45     | (C)     |
| Calculated Vehicle Target Weight (TVTW)         | kg    | 1376.8 | (A+B+C) |

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? **YES**

**TEST VEHICLE ATTITUDES AND CG**

|                                                                | Units | As Delivered | As Tested | Fully Loaded | Meets Requirement*** |
|----------------------------------------------------------------|-------|--------------|-----------|--------------|----------------------|
| Driver Door Sill Angle (front-to-rear)*                        | deg   | -0.6         | -0.6      | -0.2         | Yes                  |
| Front Pass. Sill Angle (front-to-rear)*                        | deg   | -0.9         | -0.7      | -0.5         | Yes                  |
| Front Bumper Angle (left-to-right)**                           | deg   | 0.0          | -0.2      | -0.2         | Yes                  |
| Rear Bumper Angle (left-to-right)**                            | deg   | 0.1          | 0.2       | 0.2          | Yes                  |
| Vehicle CG (Aft of Front Axle)                                 | mm    | 1032         | 1099      | 1107         |                      |
| Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline) | mm    | 11           | 32        | 26           |                      |

\*ND=Nose Down (-), NU=Nose Up (+)      \*\* LD=Left Down (-), LU=Left Up (+)

\*\*\* The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements.

**WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW**

| Component Description                                                                                                                                                                                                                                                              | Weight (kg) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Ballast (if any)                                                                                                                                                                                                                                                                   | 0.0         |
| Right taillight, right front headlight, both wiper arms, right rear door molding/trim panel, right rear window glass/motor/track, right rear speaker, rear headrests, left rear floor mat, cargo area carpet/divider, tire repair kit, right side trunk carpet, rear sill plastic. | 20.9        |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013

**SEAT POSITIONING**

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

**SCRL ANGLE RANGE**

| Seat                      | SCRL (°) |       |       |
|---------------------------|----------|-------|-------|
|                           | Max      | Min   | Mid   |
| Driver Seat               | 17.3     | 14.6  | 16.0  |
| Front Passenger Seat      | Fixed    | Fixed | Fixed |
| Front Center Seat         |          |       |       |
| Struck Side Rear Seat     | Fixed    | Fixed | Fixed |
| Non-Struck Side Rear Seat | Fixed    | Fixed | Fixed |
| Rear Center Seat          | Fixed    | Fixed | Fixed |

**SEAT HEIGHT AND ANGLE**

| Seat                         | As Tested<br>SCRL Angle<br>(Mid) (°) | As Tested<br>SCR Height<br>(mm) | SCR<br>Height<br>Position | SCR Height (mm) |                  |                  |
|------------------------------|--------------------------------------|---------------------------------|---------------------------|-----------------|------------------|------------------|
|                              |                                      |                                 |                           | Rear-<br>most   | Mid-<br>Fore/Aft | Forward-<br>Most |
| Driver Seat                  | 16.0                                 | Fixed                           | Max                       | Fixed           | Fixed            | Fixed            |
|                              | 16.0                                 | Fixed                           | Mid                       | Fixed           | Fixed            | Fixed            |
|                              | 16.0                                 | Fixed                           | Min                       | Fixed           | Fixed            | Fixed            |
| Front Passenger Seat         | Fixed                                | Fixed                           | Max                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Mid                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Min                       | Fixed           | Fixed            | Fixed            |
| Front Center Seat            |                                      |                                 | Max                       |                 |                  |                  |
|                              |                                      |                                 | Mid                       |                 |                  |                  |
|                              |                                      |                                 | Min                       |                 |                  |                  |
| Struck Side Rear Seat        | Fixed                                | Fixed                           | Max                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Mid                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Min                       | Fixed           | Fixed            | Fixed            |
| Non-Struck Side<br>Rear Seat | Fixed                                | Fixed                           | Max                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Mid                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Min                       | Fixed           | Fixed            | Fixed            |
| Rear Center Seat             | Fixed                                | Fixed                           | Max                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Mid                       | Fixed           | Fixed            | Fixed            |
|                              | Fixed                                | Fixed                           | Min                       | Fixed           | Fixed            | Fixed            |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

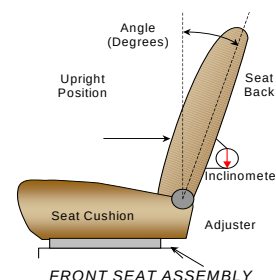
NHTSA No. M20144201  
 Test Date: 7/08/2013

**SEAT FORE/AFT POSITIONS**

| Seat                      | Total Fore/Aft Travel |                           | Test Position from Forward-most Position |                          |
|---------------------------|-----------------------|---------------------------|------------------------------------------|--------------------------|
|                           | mm                    | Detents                   | mm                                       | Detent                   |
| Driver Seat               | 240                   | 24 (1 <sup>st</sup> as 0) | 0                                        | 0 (1 <sup>st</sup> as 0) |
| Front Passenger Seat      | 240                   | 24 (1 <sup>st</sup> as 0) | 0                                        | 0 (1 <sup>st</sup> as 0) |
| Front Center Seat         |                       |                           |                                          |                          |
| Struck Side Rear Seat     | Fixed                 | Fixed                     | Fixed                                    | Fixed                    |
| Non-Struck Side Rear Seat | Fixed                 | Fixed                     | Fixed                                    | Fixed                    |
| Rear Center Seat          | Fixed                 | Fixed                     | Fixed                                    | Fixed                    |

**SEAT BACK ANGLE ADJUSTMENT**

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5<sup>th</sup> percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match the struck-side rear seat back.



| Seat                       | Total Seat Back Angle Range |                           | Test Position from Vertical |                                     |
|----------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------------------|
|                            | Degrees                     | Detents                   | Degree                      | Detent                              |
| Driver Seat w/Seated Dummy | 66.3                        | 34 (1 <sup>st</sup> as 1) | -3.0                        | 3 <sup>rd</sup> (forward-most as 0) |
| Front Passenger Seat       | 65.3                        | 34 (1 <sup>st</sup> as 1) | -3.3                        | 2 <sup>nd</sup> (forward-most as 0) |
| Front Center Seat          |                             |                           |                             |                                     |
| Struck Side Rear Seat      | Fixed                       | Fixed                     | Fixed                       | Fixed                               |
| Non-Struck Side Rear Seat  | Fixed                       | Fixed                     | Fixed                       | Fixed                               |
| Rear Center Seat           | Fixed                       | Fixed                     | Fixed                       | Fixed                               |

**SEAT BELT ANCHORAGE ADJUSTMENT**

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

|             | <b>Total # of Positions</b>      | <b>Placed in Position #</b> |
|-------------|----------------------------------|-----------------------------|
| Driver Seat | 4 detents (1 <sup>st</sup> as 1) | 0 (uppermost as 0)          |

**HEAD RESTRAINT ADJUSTMENT**

Head restraints are adjusted to the lowest and most full forward in-use position.

|             | <b>Total # of Positions</b> | <b>Placed in Position #</b> |
|-------------|-----------------------------|-----------------------------|
| Driver Seat | 5                           | Lowest                      |

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

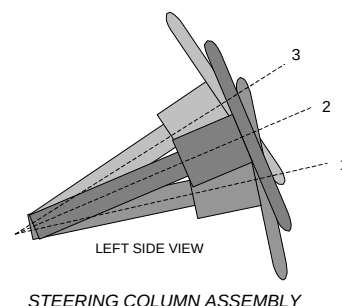
Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013

**STEERING COLUMN ADJUSTMENT**

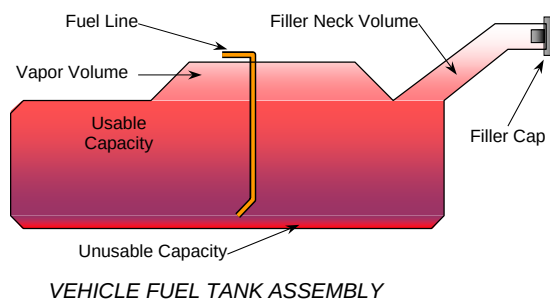
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

|                                   | Degrees | Fore/Aft Position (mm) |
|-----------------------------------|---------|------------------------|
| Lowermost, Position 1             | 69.2    | 228                    |
| Geometric Center, Position 2      | 66.9    | 208                    |
| Uppermost, Position 3             | 64.6    | 188                    |
| Telescoping Steering Wheel Travel |         | 40                     |
| Test Position                     | 66.9    | 208                    |



**FUEL PUMP**

Describe the fuel pump type, details about how it operates and the location of the fuel filler pipe.  
The vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when the key is in the "ON" position. The fuel pipe is on the left side.



**FUEL TANK CAPACITY DATA**

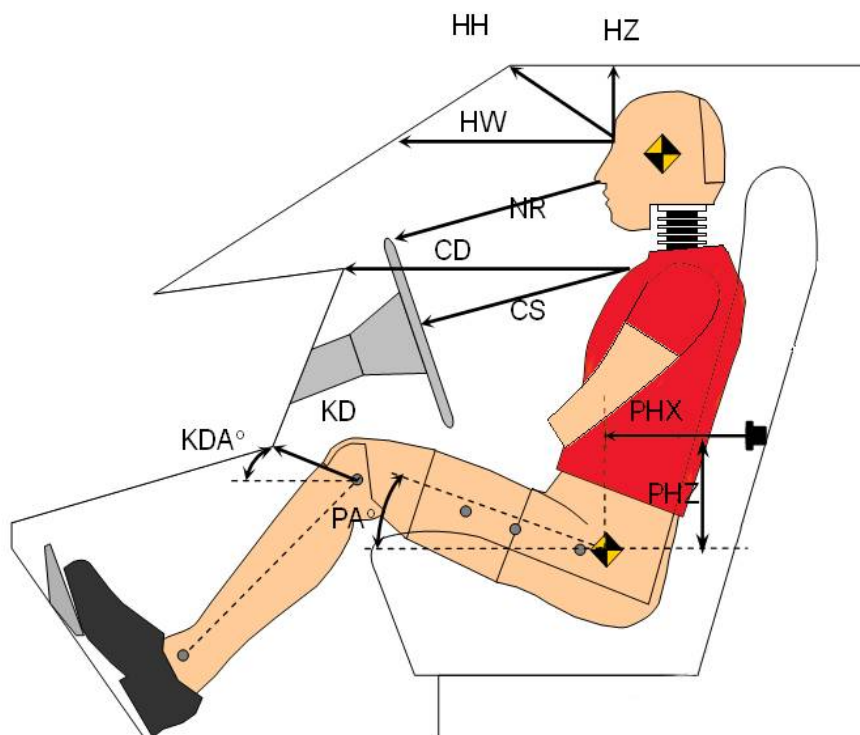
|                                                                 | Liters |
|-----------------------------------------------------------------|--------|
| Usable Capacity of "Standard Tank" (see Form No. 1)             | 50.0   |
| Usable Capacity of "Optional Tank" (see Form No. 1)             |        |
| Usable Capacity of Standard Tank as Specified in Owner's Manual | 50.0   |
| Usable Capacity of Optional Tank as Specified in Owner's Manual |        |
| 93% of Usable Capacity                                          | 46.5   |
| Actual Amount of Solvent Used                                   | 46.5   |
| 1/3 of Usable Capacity                                          | 16.7   |

Is the actual amount of solvent used in the test equal to 93%  $\pm$  1% of the Usable Capacity stated in Form No. 1? **YES**

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013



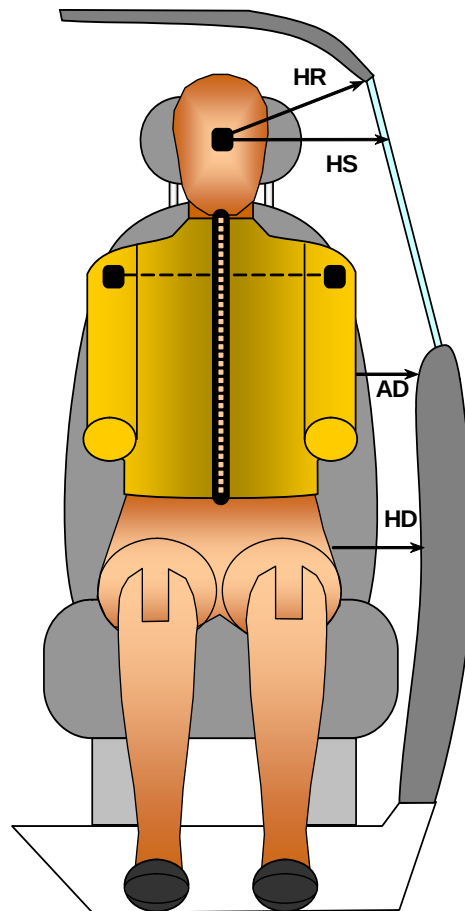
**LEFT SIDE VIEW**

| Code      | Measurement Description       | Driver S/N 296 |           |
|-----------|-------------------------------|----------------|-----------|
|           |                               | Length (mm)    | Angle (°) |
| HH        | Head to Header                | 228            |           |
| HW        | Head to Windshield            | 625            |           |
| HZ        | Head to Roof Liner            | 172            |           |
| NR        | Nose to Rim                   | 237            |           |
| CD        | Chest to Dashboard            | 405            |           |
| CS        | Chest to Steering Wheel       | 181            |           |
| KDL/KDAL° | Left Knee to Dash             | 145            | 43.3      |
| KDR/KDAR° | Right Knee to Dash            | 142            | 39.1      |
| PAX°      | Pelvic Tilt Angle (X-Axis)    |                | 18.1      |
| PAY°      | Pelvic Tilt Angle (Y-Axis)    |                | -1.2      |
| PHX       | Hip Point to Striker (X-Axis) | 355            |           |
| PHZ       | Hip Point to Striker (Z-Axis) | 221            |           |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013



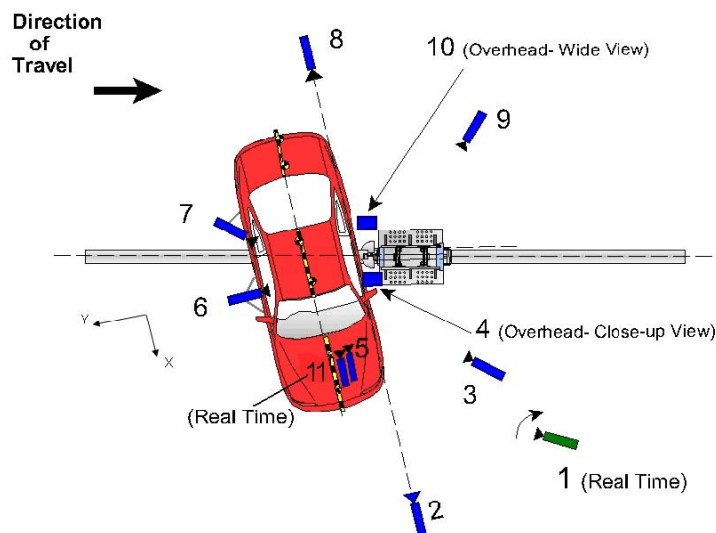
*FRONT VIEW OF DUMMY*

| Code | Measurement Description | Driver S/N 296 |
|------|-------------------------|----------------|
|      |                         | Length (mm)    |
| HR   | Head to Side Header     | 240            |
| HS   | Head to Side Window     | 362            |
| AD   | Arm to Door             | 182            |
| HD   | Hip Point to Door       | 160            |

## DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
Test Date: 7/08/2013



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         | -70              | 6120  | -1840 | 24        | 1000             |
| 3          | Impact Side 45° Forward    | -2410            | 5210  | -1880 | 20        | 1000             |
| 4          | Overhead Closeup           | 90               | 0     | -4410 | 50        | 1000             |
| 5          | Onboard – Driver Front     |                  |       |       | 16        | 1000             |
| 6          | Onboard – Driver Side      |                  |       |       | 8         | 1000             |
| 7          | Onboard – Driver Rear      |                  |       |       | 8         | 1000             |
| 8          | Rear Ground Level          | -100             | -6580 | -1860 | 24        | 1000             |
| 9          | Impact Side 45° Rearward   | -4370            | -4010 | -1910 | 20        | 1000             |
| 10         | Overhead Wide View         | 300              | 0     | -4610 | 14        | 1000             |
| 11         | Real-Time Dummy Front View |                  |       |       |           | 30               |

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

Note: Vehicle was at a 75° angle to the rigid pole.

Explain why camera(s) did not operate as intended: None

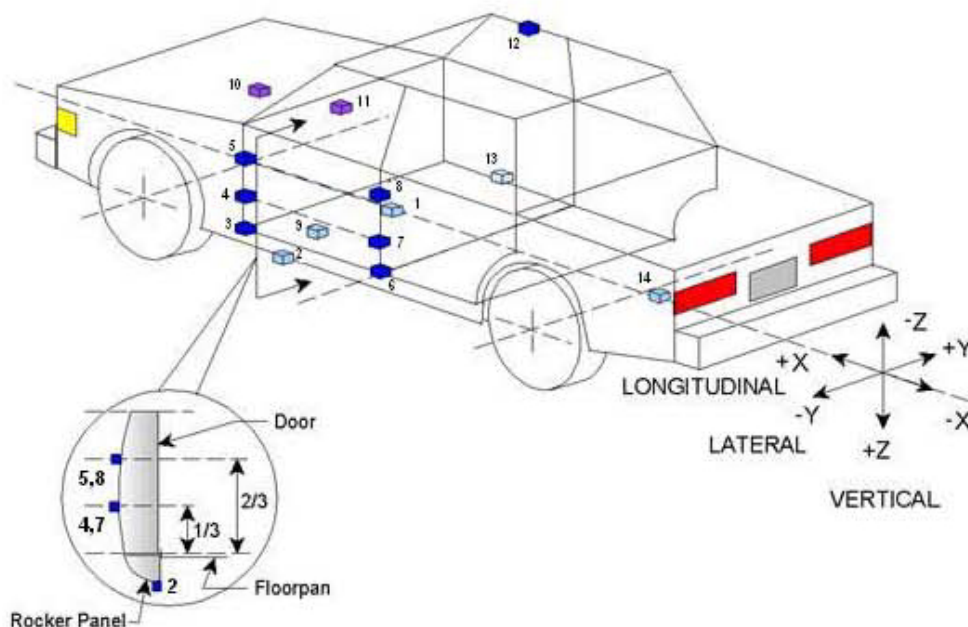
### INSTRUMENTATION

|                   | Number of Channels |
|-------------------|--------------------|
| Driver Dummy      | 16                 |
| Vehicle Structure | 18                 |
| Pole Load Cells   | 8                  |
| <b>TOTAL</b>      | <b>42</b>          |

**DATA SHEET NO. 6**  
**VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013



|    | Accelerometer Location |                  |      |       |
|----|------------------------|------------------|------|-------|
|    | ID                     | Coordinates (mm) |      |       |
|    |                        | X                | Y    | Z     |
| 1  | Vehicle CG             | 2486             | 224  | -157  |
| 2  | Left Floor Sill        | 2937             | -733 | -163  |
| 3  | A Pillar Sill          | 3218             | -735 | -164  |
| 4  | A Pillar Low           | 3187             | -798 | -474  |
| 5  | A Pillar Mid           | 3193             | -785 | -730  |
| 6  | B Pillar Sill          | 2046             | -733 | -181  |
| 7  | B Pillar Low           | 2142             | -726 | -621  |
| 8  | B Pillar Mid           | 2114             | -735 | -811  |
| 9  | Driver Seat Track      | 2322             | -337 | -200  |
| 10 | Engine Top             | 4017             | 8    | -835  |
| 11 | Firewall               | 3628             | 0    | -882  |
| 12 | Right Roof             | 1997             | 520  | -1444 |
| 13 | Right Floor Sill       | 2904             | 733  | -167  |
| 14 | Rear Floorpan          | 285              | -30  | -324  |

Reference:

X – Test Vehicle Rear Bumper (+forward)  
 Y – Test Vehicle Centerline (+ to right)  
 Z – Ground Plane (+ down)

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
Test Date: 7/08/2013



254 mm Diameter Rigid Pole

| Load Cell Locations |                                    |
|---------------------|------------------------------------|
| ID                  | Height From Impact Surface<br>(mm) |
| 1                   | 182                                |
| 2                   | 470                                |
| 3                   | 698                                |
| 4                   | 986                                |
| 5                   | 1212                               |
| 6                   | 1641                               |
| 7                   | 1854                               |
| 8                   | 2053                               |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
Test Date: 7/08/2013

**TEST DUMMY INFORMATION AND CONTACT POINTS**

| Description       | Driver SID-IIs Dummy     |
|-------------------|--------------------------|
| Face              | None                     |
| Top of Head       | Curtain Airbag, Headrest |
| Left Side of Head | Curtain Airbag           |
| Back of Head      | Curtain Airbag, Headrest |
| Left Shoulder     | Side Airbag, Seatback    |
| Upper Torso       | Side Airbag, Seatback    |
| Lower Torso       | Seatback                 |
| Left Hip          | Side Airbag, Seatback    |
| Left Knee         | Door Panel               |

**POST-TEST DOOR PERFORMANCE**

| Description                                                        | Struck Side |      | Non-Struck Side |      | Rear Hatch/<br>Other Door |
|--------------------------------------------------------------------|-------------|------|-----------------|------|---------------------------|
|                                                                    | Front       | Rear | Front           | Rear |                           |
| Remained Closed and Operational                                    | No          | No   | Yes             | Yes  | Yes                       |
| Total Separation from Vehicle at Hinges or Latches                 | No          | No   | No              | No   | No                        |
| Latch or Hinge Systems Pulled Out of Their Anchorages              | No          | No   | No              | No   | No                        |
| Disengaged from Latched Position                                   | No          | No   | No              | No   | No                        |
| Latch Separated from Striker                                       | No          | No   | No              | No   | No                        |
| Jammed Shut                                                        | Yes         | Yes  | No              | No   | No                        |
| If Door Opened at Striker, Record Width of Opening at Striker (mm) | N/A         | N/A  | N/A             | N/A  | N/A                       |

**POST-TEST SEAT PERFORMANCE**

| Description                              | Struck Side |      | Non-Struck Side |      |
|------------------------------------------|-------------|------|-----------------|------|
|                                          | Front       | Rear | Front           | Rear |
| Seat Movement Along Seat Track           | No          | No   | No              | No   |
| Seat Disengagement from Floor Pan        | No          | No   | No              | No   |
| Seat Back Movement from Initial Position | No          | No   | No              | No   |
| Seat Back Collapse                       | No          | No   | No              | No   |

**POST-TEST STRUCTURAL OBSERVATIONS**

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

**DATA SHEET NO. 8 (CONTINUED)**  
**POST-TEST OBSERVATIONS**

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
Test Date: 7/08/2013

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

| Restraint Type                   | Left Front (Driver)<br>Occupant Location 1 |          | Left Rear (Passenger)<br>Occupant Location 4 |          |
|----------------------------------|--------------------------------------------|----------|----------------------------------------------|----------|
|                                  | Mounted                                    | Deployed | Mounted                                      | Deployed |
| Frontal Airbag                   | Yes                                        | No       |                                              |          |
| Knee Airbag                      | No                                         |          |                                              |          |
| Side Curtain Airbag              | Yes                                        | Yes      | Yes                                          | Yes      |
| Side Torso/Abdomen/Pelvis Airbag | Yes                                        | Yes      | No                                           |          |
| Seat Belt Pretensioner           | Yes                                        | Yes      | No                                           |          |
| Seat Belt Load Limiter           | Yes                                        | Yes      | No                                           |          |
| Other                            |                                            |          |                                              |          |

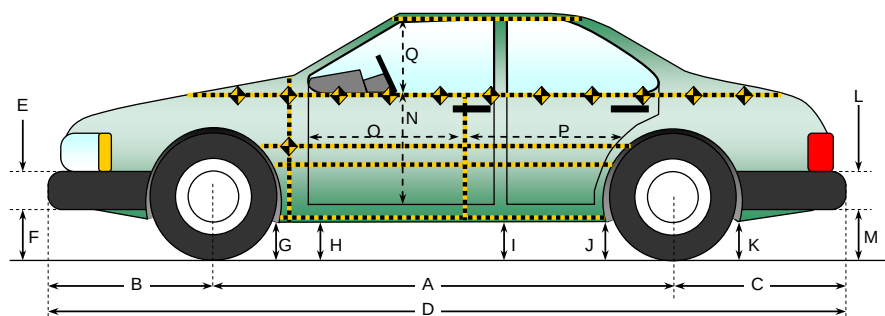
**VEHICLE SPEED, VEHICLE ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA**

| Measured Parameter                                                            | Units | Tolerance                          | Value |
|-------------------------------------------------------------------------------|-------|------------------------------------|-------|
| Vertical Impact Reference Line (Aft of Front Axle)<br>(Intended Impact Point) | mm    |                                    | 1095  |
| Actual Impact Point (Aft of Front Axle)                                       | mm    |                                    | 1105  |
| Horizontal Offset (+forward / -rearward)                                      | mm    | +/- 38 of Intended<br>Impact Point | -10   |
| Angle Between Vehicle's Longitudinal Centerline and<br>Line of Forward Motion | deg   | 75 +/- 3                           | 75    |
| Trap No. 1 Velocity (Primary)                                                 | km/h  | 31.4 to 33.0                       | 32.1  |
| Trap No. 2 Velocity (Redundant)                                               | km/h  | 31.4 to 33.0                       | 32.1  |

# **DATA SHEET NO. 9** **VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
Test Date: 7/08/2013



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

## **LEFT SIDE VIEW**

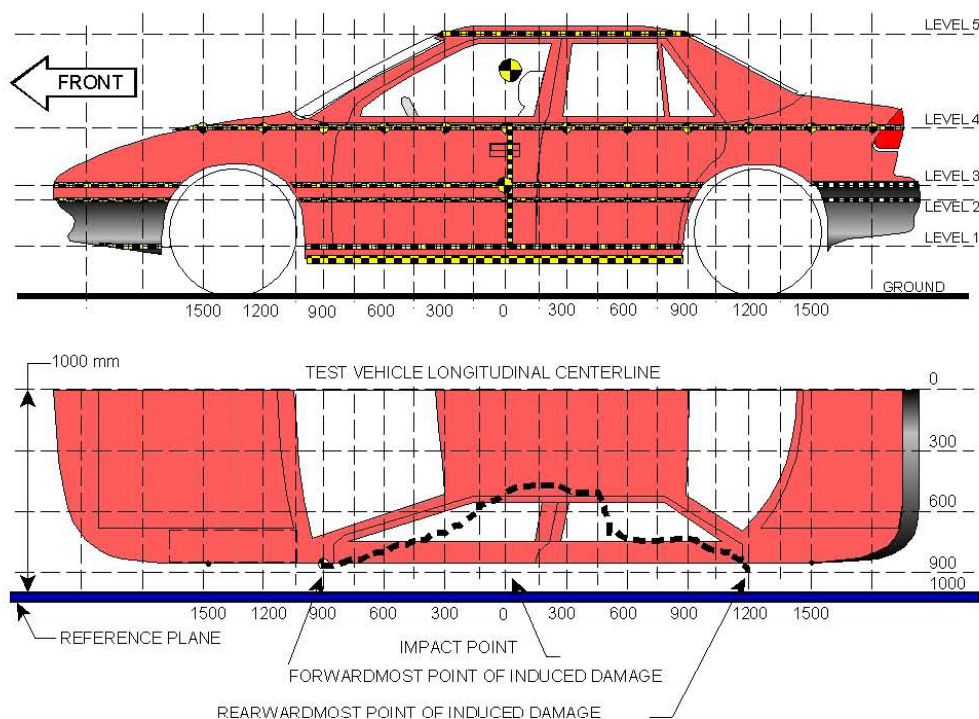
### **VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION**

| Code | Measurement Description                    | Pre-Test | Post-Test | Difference |
|------|--------------------------------------------|----------|-----------|------------|
| A    | Wheelbase                                  | 2700     | 2665      | 35         |
| B    | Front Axle to FSOV                         | 888      | 888       | 0          |
| C    | Rear Axle to RSOV                          | 982      | 982       | 0          |
| D    | Total Vehicle Length at Centerline         | 4570     | 4535      | 35         |
| E    | Front Bumper Thickness                     | 102      | 102       | 0          |
| F    | Front Bumper Bottom to Ground              | 190      | 204       | -14        |
| G    | Sill Height at Front Wheel Well            | 159      | 147       | 12         |
| H    | Sill Height at Front Door Leading Edge     | 160      | 134       | 26         |
| I    | Sill Height at B-Pillar                    | 167      | 176       | -9         |
| J1   | Sill Height at Rear Wheel Well             | 162      | 195       | -33        |
| J2   | Pinch Weld Height at Rear Wheel Well       | 163      | 191       | -28        |
| K    | Sill Height Aft of Rear Wheel Well         | 222      | 230       | -8         |
| L    | Rear Bumper Thickness                      | 150      | 150       | 0          |
| M    | Rear Bumper Bottom to Ground               | 296      | 296       | 0          |
| N    | Sill Height to Bottom of Front Window Sill | 683      | 700       | -17        |
| O    | Front Door Leading Edge to Impact CL       | 689      | 688       | 1          |
| P    | Rear Door Trailing Edge to Impact CL       | 1283     | 1310      | -27        |
| Q    | Front Window Opening                       | 400      | 372       | 28         |
| R    | Right Side Length                          | 3154     | 3170      | -16        |
| S    | Left Side Length                           | 3154     | 3055      | 99         |
| T    | Vehicle Width at B-Pillars                 | 1770     | 1663      | 107        |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013



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

## **MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

| Level | Measurement Description | Height Above Ground (mm) | Maximum Exterior Static Crush | Distance from Impact |
|-------|-------------------------|--------------------------|-------------------------------|----------------------|
| 1     | Sill Top                | 228                      | 333                           | 0                    |
| 2     | Occupant Hip Point      | 533                      | 354                           | 0                    |
| 3     | Mid Door                | 599                      | 355                           | 0                    |
| 4     | Window Sill             | 865                      | 318                           | 75                   |
| 5     | Window Top              | 1346                     | 136                           | 0                    |

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

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013

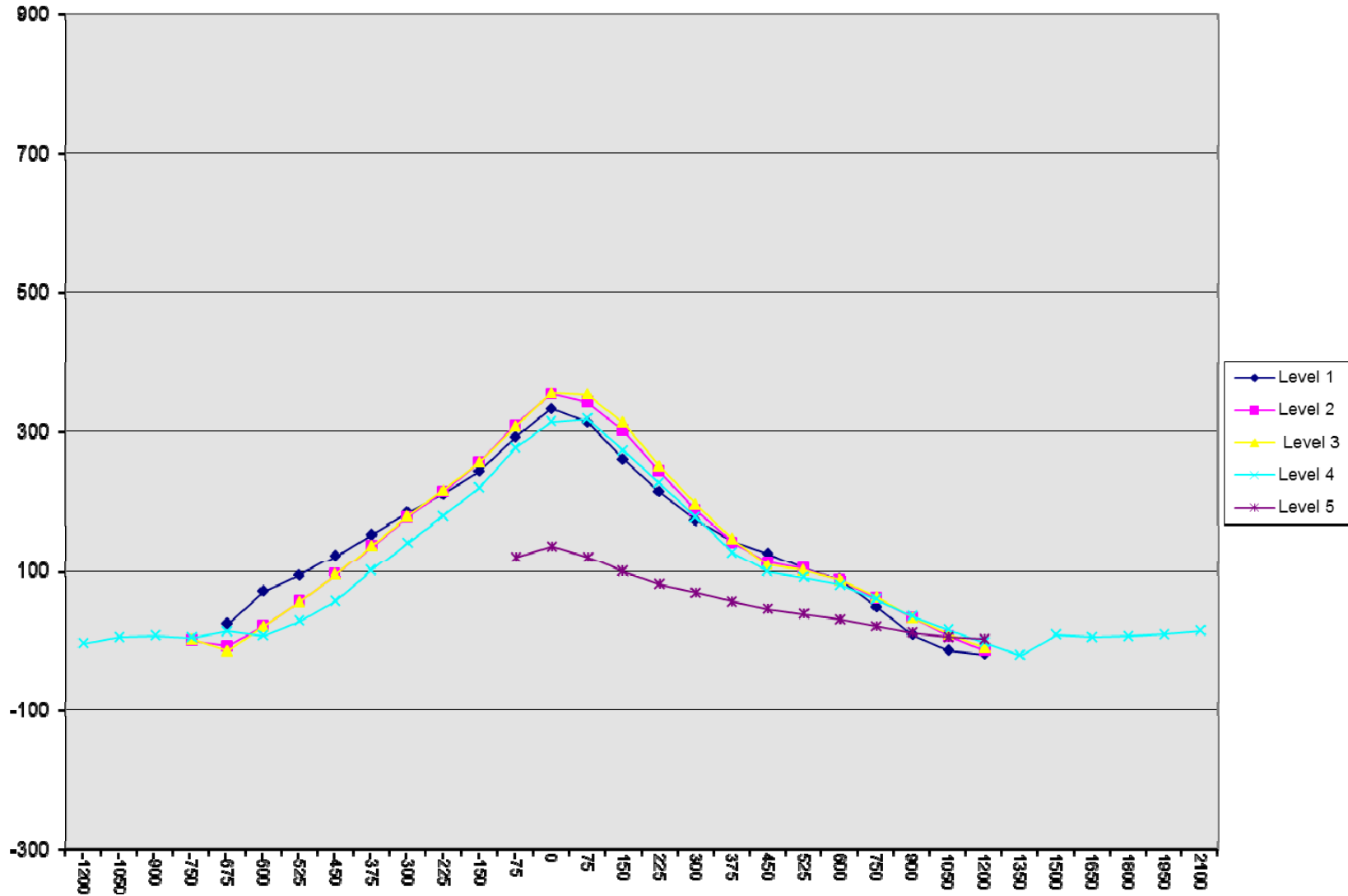
|       | Pre-Test |     |     |     |     | Post-Test |     |     |     |     | Difference |     |     |     |     |
|-------|----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----|------------|-----|-----|-----|-----|
|       | 1        | 2   | 3   | 4   | 5   | 1         | 2   | 3   | 4   | 5   | 1          | 2   | 3   | 4   | 5   |
| -1200 |          |     |     | 338 |     |           |     |     | 335 |     |            |     |     | -3  |     |
| -1050 |          |     |     | 316 |     |           |     |     | 322 |     |            |     |     | 6   |     |
| -900  |          |     |     | 301 |     |           |     |     | 309 |     |            |     |     | 8   |     |
| -750  |          | 211 | 215 | 295 |     |           | 212 | 218 | 300 |     |            | 1   | 3   | 5   |     |
| -675  | 239      | 212 | 218 | 295 |     | 264       | 205 | 204 | 309 |     | 25         | -7  | -14 | 14  |     |
| -600  | 245      | 220 | 221 | 294 |     | 316       | 242 | 242 | 302 |     | 71         | 22  | 21  | 8   |     |
| -525  | 247      | 221 | 221 | 291 |     | 341       | 278 | 277 | 320 |     | 94         | 57  | 56  | 29  |     |
| -450  | 247      | 221 | 221 | 285 |     | 370       | 316 | 316 | 343 |     | 123        | 95  | 95  | 58  |     |
| -375  | 247      | 221 | 220 | 278 |     | 400       | 358 | 358 | 379 |     | 153        | 137 | 138 | 101 |     |
| -300  | 247      | 221 | 220 | 274 |     | 430       | 398 | 398 | 416 |     | 183        | 177 | 178 | 142 |     |
| -225  | 247      | 220 | 219 | 272 |     | 456       | 433 | 434 | 450 |     | 209        | 213 | 215 | 178 |     |
| -150  | 247      | 220 | 218 | 269 |     | 489       | 475 | 473 | 487 |     | 242        | 255 | 255 | 218 |     |
| -75   | 247      | 220 | 218 | 265 | 509 | 538       | 529 | 525 | 541 | 630 | 291        | 309 | 307 | 276 | 121 |
| 0     | 247      | 220 | 217 | 260 | 495 | 580       | 574 | 572 | 574 | 631 | 333        | 354 | 355 | 314 | 136 |
| 75    | 248      | 220 | 216 | 257 | 486 | 561       | 562 | 569 | 575 | 607 | 313        | 342 | 353 | 318 | 121 |
| 150   | 250      | 220 | 216 | 254 | 482 | 510       | 521 | 528 | 526 | 581 | 260        | 301 | 312 | 272 | 99  |
| 225   | 251      | 220 | 216 | 251 | 479 | 464       | 462 | 466 | 476 | 560 | 213        | 242 | 250 | 225 | 81  |
| 300   | 252      | 220 | 216 | 248 | 479 | 425       | 407 | 411 | 425 | 548 | 173        | 187 | 195 | 177 | 69  |
| 375   | 253      | 221 | 216 | 246 | 479 | 397       | 363 | 363 | 374 | 535 | 144        | 142 | 147 | 128 | 56  |
| 450   | 254      | 222 | 216 | 244 | 480 | 380       | 335 | 325 | 343 | 526 | 126        | 113 | 109 | 99  | 46  |
| 525   | 256      | 223 | 216 | 242 | 481 | 361       | 326 | 317 | 333 | 520 | 105        | 103 | 101 | 91  | 39  |
| 600   | 257      | 224 | 218 | 241 | 482 | 345       | 311 | 305 | 321 | 513 | 88         | 87  | 87  | 80  | 31  |
| 750   | 259      | 226 | 220 | 238 | 484 | 308       | 287 | 283 | 298 | 505 | 49         | 61  | 63  | 60  | 21  |
| 900   | 260      | 228 | 223 | 237 | 487 | 269       | 262 | 257 | 273 | 499 | 9          | 34  | 34  | 36  | 12  |
| 1050  | 256      | 230 | 226 | 240 | 494 | 243       | 237 | 236 | 256 | 500 | -13        | 7   | 10  | 16  | 6   |
| 1200  | 245      | 216 | 221 | 243 | 508 | 226       | 203 | 212 | 241 | 511 | -19        | -13 | -9  | -2  | 3   |
| 1350  |          |     |     | 248 |     |           |     |     | 228 |     |            |     |     | -20 |     |
| 1500  |          |     |     | 253 |     |           |     |     | 262 |     |            |     |     | 9   |     |
| 1650  |          |     |     | 263 |     |           |     |     | 269 |     |            |     |     | 6   |     |
| 1800  |          |     |     | 273 |     |           |     |     | 280 |     |            |     |     | 7   |     |
| 1950  |          |     |     | 288 |     |           |     |     | 298 |     |            |     |     | 10  |     |
| 2100  |          |     |     | 310 |     |           |     |     | 325 |     |            |     |     | 15  |     |

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 pile grid is established prior to the test based on an estimated impact point. The final distance from 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: 2014 Kia Forte LX 4-Dr Sedan  
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
Test Date: 7/08/2013



**DATA SHEET NO. 11**  
**FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

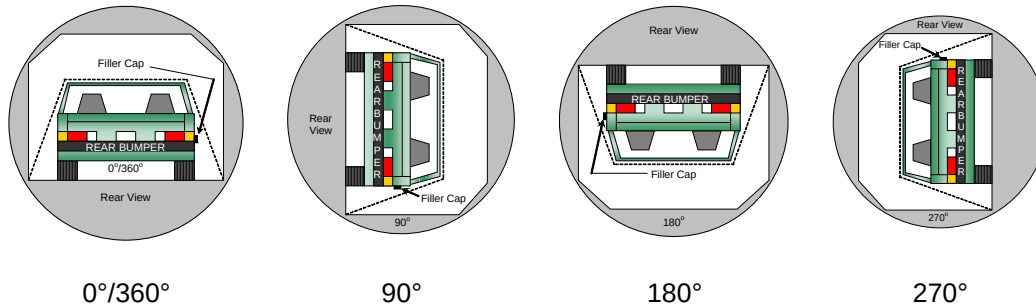
NHTSA No. M20144201  
 Test Date: 7/08/2013

Test Time: 10:11 am

Temperature: 21.7°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°    | 113           | 300       | 413        |
| 90° to 180°  | 109           | 300       | 409        |
| 180° to 270° | 109           | 300       | 409        |
| 270° to 360° | 111           | 300       | 411        |

**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            |

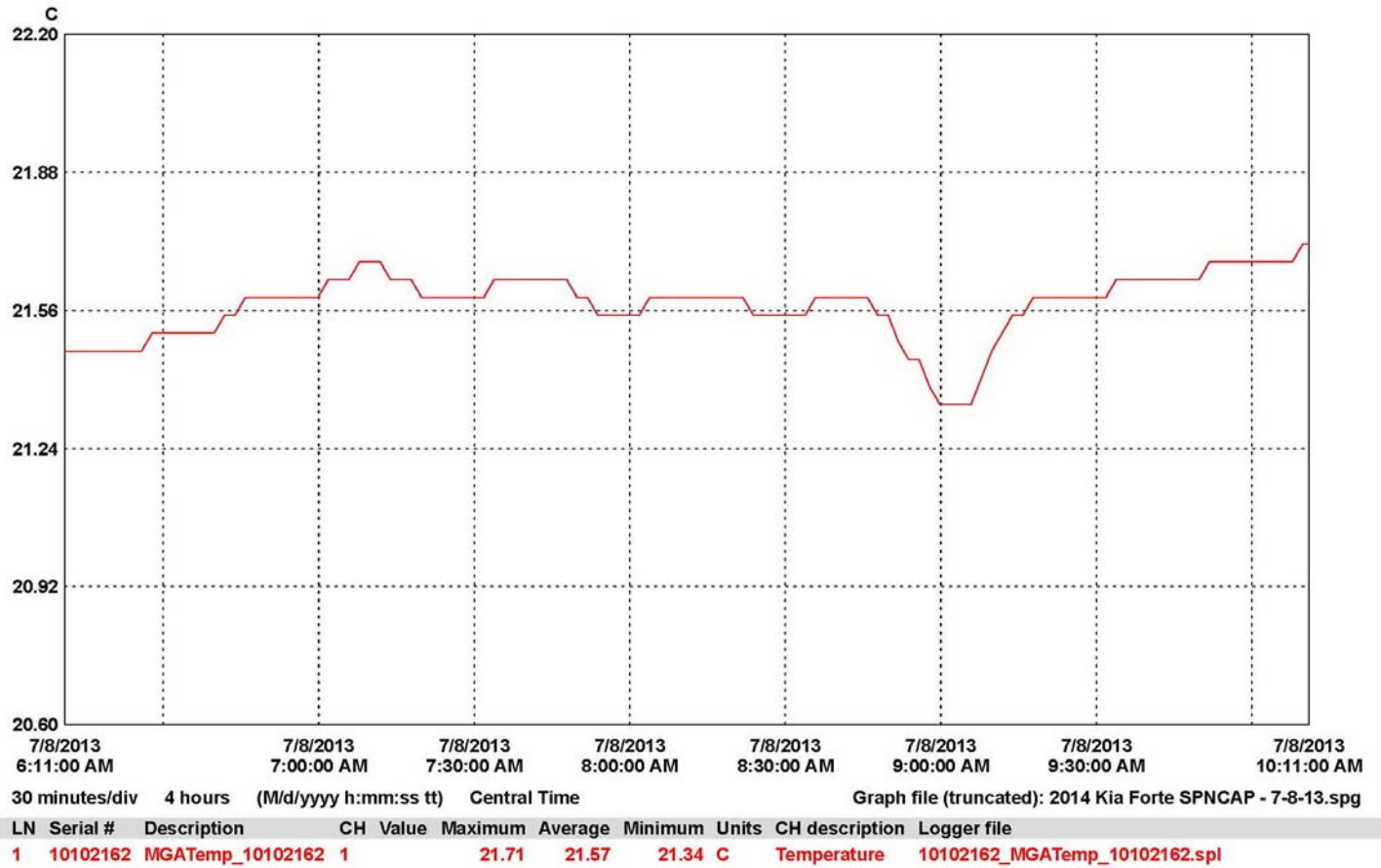
**ROLLOVER SOLVENT SPILLAGE LOCATION TABLE**

| 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: 2014 Kia Forte LX 4-Dr Sedan  
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20144201  
 Test Date: 7/08/2013



**APPENDIX A**  
**PHOTOGRAPHS**

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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



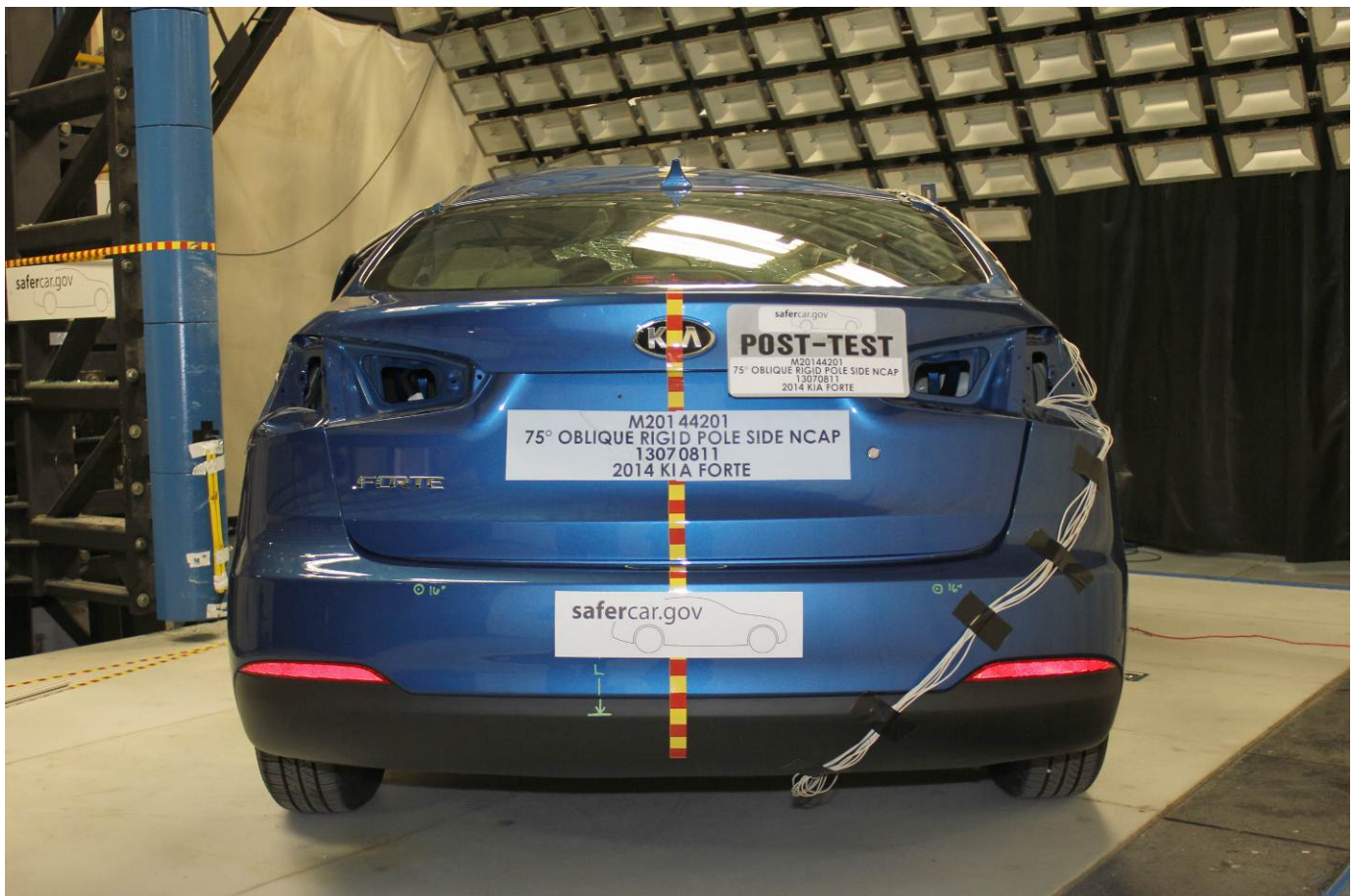
Pre-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle



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



Pre-Test Rear View of Test Vehicle



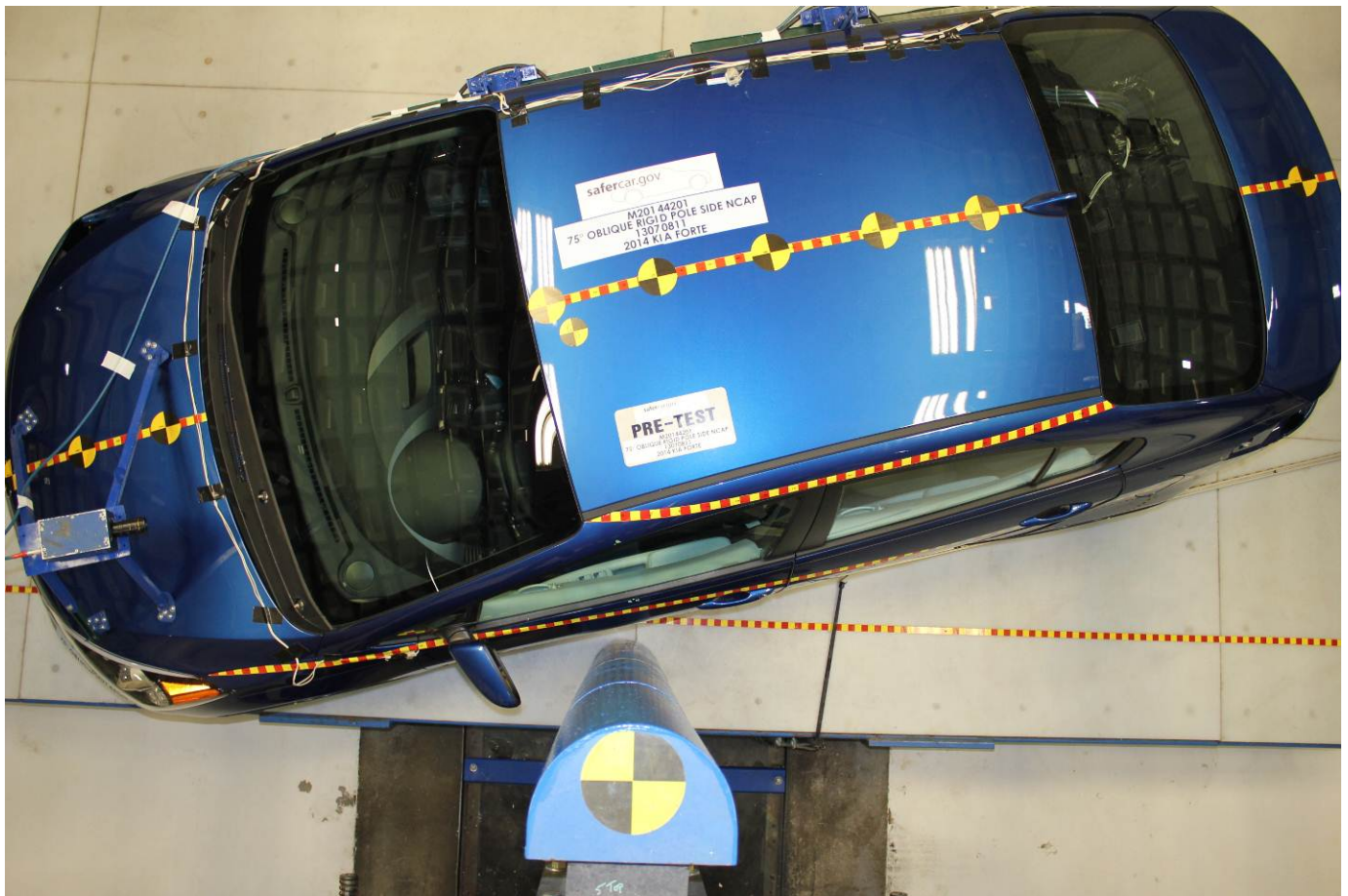
Post-Test Rear View of Test Vehicle



Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Area



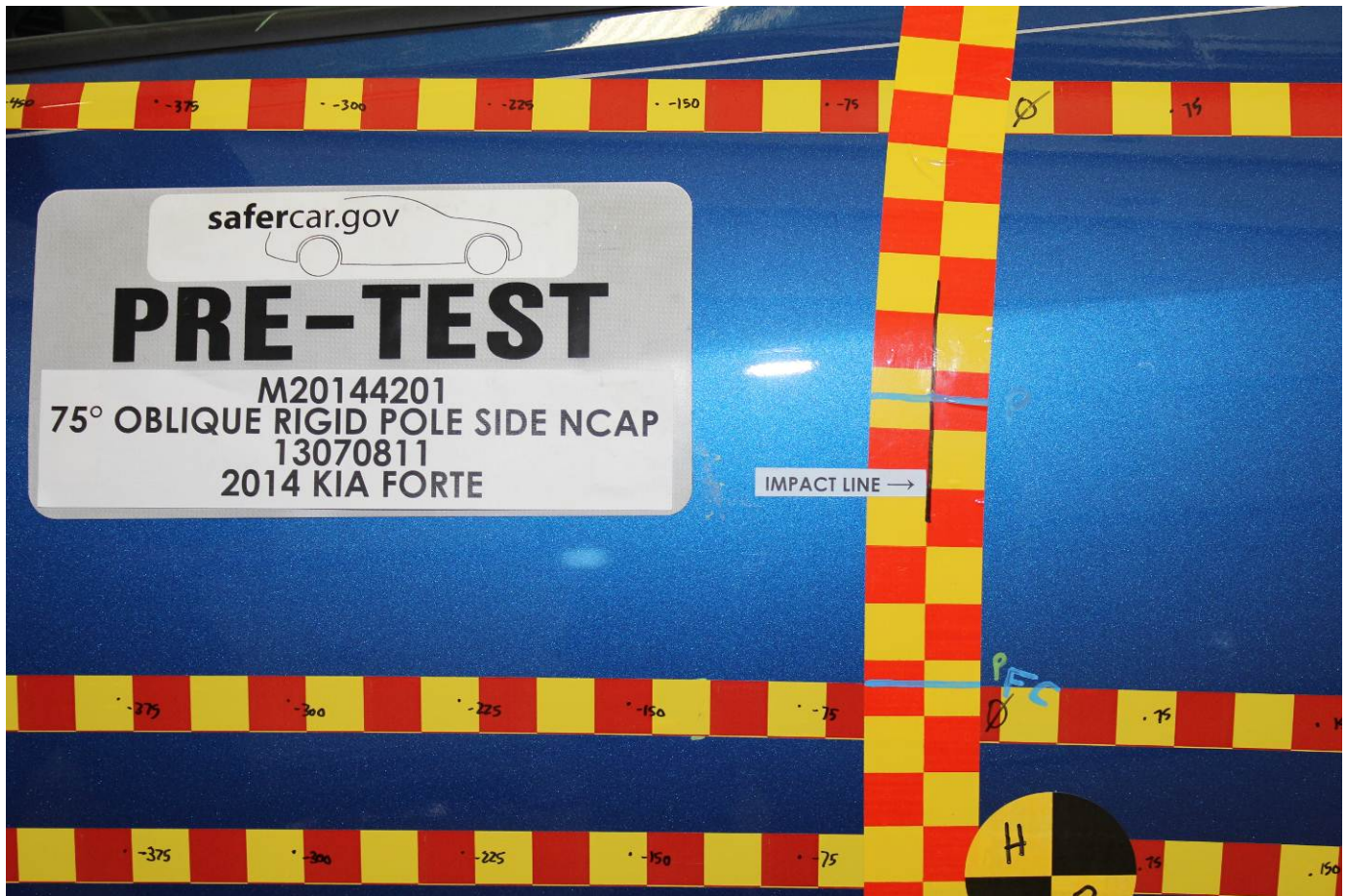
Post-Test Overhead View of Test Area



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 Head and Chest



Post-Test Front Close-Up View of Dummy



Pre-Test Left Side View of Dummy Showing Belt and Chalking



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 Front View of Seat Back Prior to Dummy Positioning



Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



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



Pre-Test Overhead View of Dummy Thighs on Seat Pan



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



Pre-Test Left Side 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



Pre-Test Left Side View of Steering Wheel

**PHOTOGRAPH NOT AVAILABLE**

Pre-Test View of Disengaged Parking Brake



Pre-Test View of Parking Brake



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



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



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



Pre-Test Dummy and Door Clearance View



Post-Test Dummy and Door Clearance View



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



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



Pre-Test Inner Door Panel View



Post-Test Inner Door Panel View Showing Dummy Contact Location



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



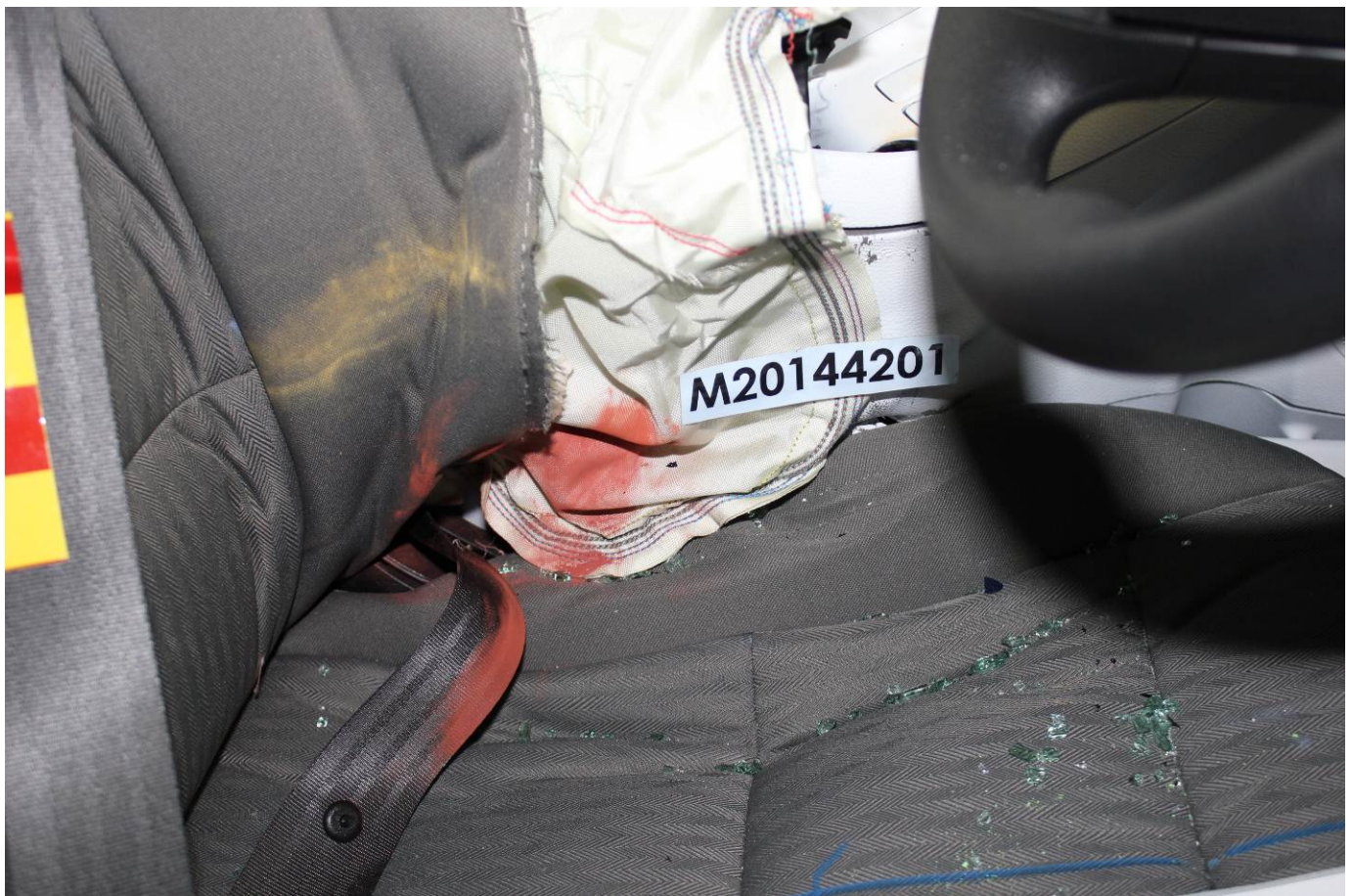
Post-Test Dummy Close-Up Head Contact with Side Air Bag View



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



Post-Test Dummy Close-Up Torso Contact with Side Air Bag View



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



Post-Test Dummy Close-Up Pelvis Contact with Side Air Bag View



Post-Test Dummy Close-Up Knee Contact with Vehicle Interior 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



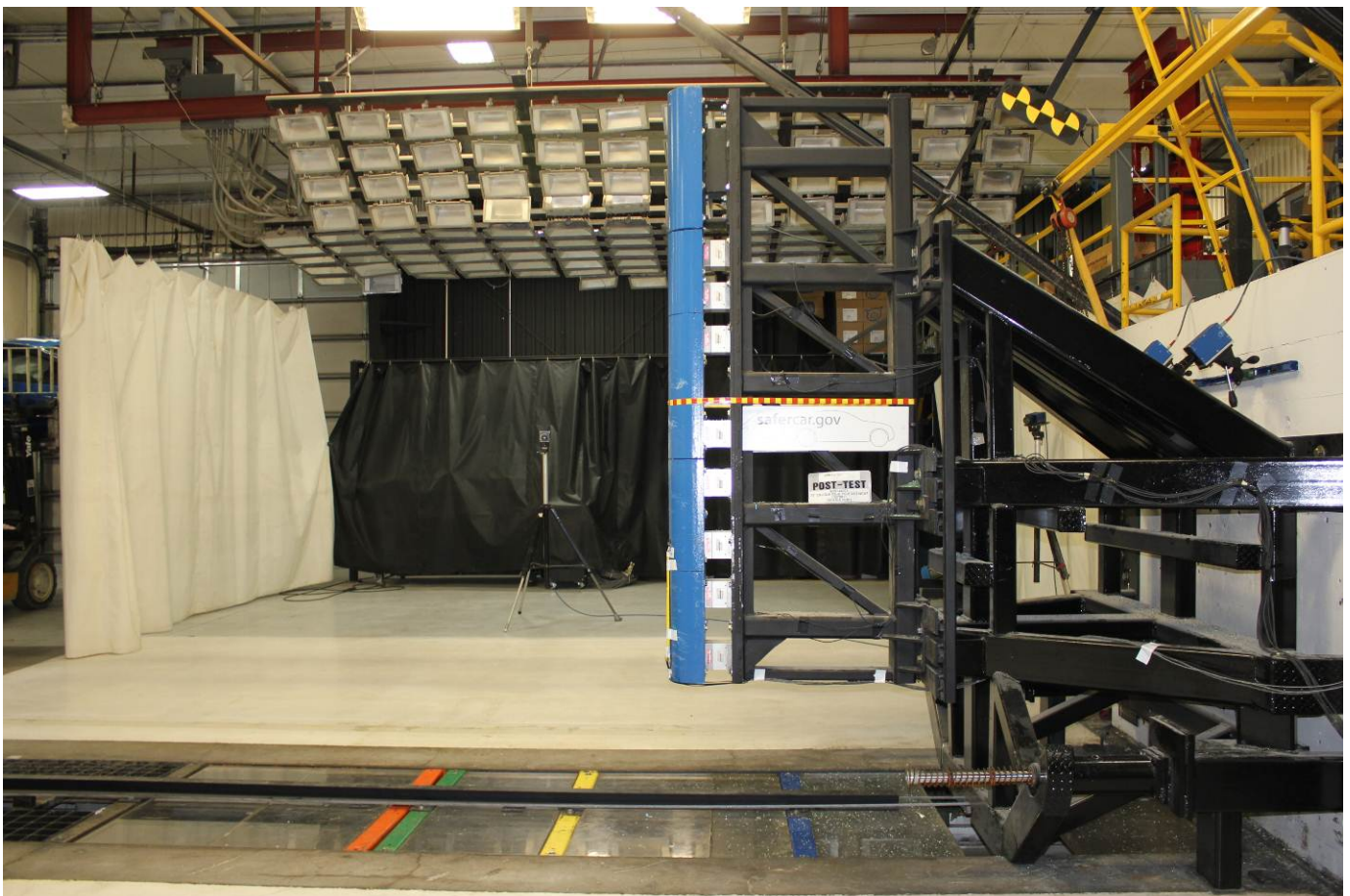
Pre-Test Pole Barrier Front View



Post-Test Pole Barrier Front View



Pre-Test Pole Barrier Side View



Post-Test Pole Barrier Side View

PHOTOGRAPH NOT APPLICABLE

Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



FMVSS No. 301 Static Rollover 0 Degrees



FMVSS No. 301 Static Rollover 90 Degrees



FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event

**2014 KIA FORTE LX**

MODEL / OPTION CODE: C3422 / 020  
 EXTERIOR / INTERIOR: ABYSS BLUE/GRAY  
 VEHICLE ID NUMBER: KNAFK4A68E5065975  
 ENGINE NUMBER: G4NBDH00  
 PORT OF ENTRY: TACOMA  
 MODE OF TRANSPORT: TRUCK

SOLD TO: IL071  
 GERALD KIA OF NORTH AURORA  
 204 HANSEN BLVD.  
 NORTH AURORA IL 60542

SHIP TO: IL071

kia.com

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**STANDARD FEATURES**

**MECHANICAL**  
 1.8L DOHC D-CVVT 4-Cylinder Engine  
 6-Speed Automatic Transmission w/ Sportmatic  
 Front and Rear Disc Brakes

**SAFETY**  
 Dual Front Advanced Airbags  
 Front Seat-Mounted Side Airbags  
 Full-Length Side Curtain Airbags  
 Lower Anchors and Tethers for Children (LATCH)  
 Anti-Lock Braking System (ABS) w/ Brake Assist (BAS)  
 Traction Control System (TCS)  
 Electronic Stability Control (ESC)  
 Vehicle Stability Management (VSM)  
 Hill-start Assist Control (HAC)  
 Tire Pressure Monitoring System (TPMS)

**INTERIOR**  
 Air Conditioning  
 Power Windows and Door Locks  
 AM/FM/CD/MP3 Audio System  
 SIRIUS/XM Satellite Radio w/free 3-mo. subscription\*  
 USB/Auxiliary Input Jacks  
 BLUETOOTH® WIRELESS TECHNOLOGY  
 Multi-Adjustable Driver's Seat  
 60/40 Split Folding Rear Seats  
 Tilt & Telescopic Steering Column  
 Steering Wheel Mounted Audio Controls  
 Center Console w/ Armrest

**EXTERIOR**  
 Power Heated Outside Mirrors  
 Variable Intermittent Front Windshield Wipers  
 5-mph Bumpers

**WARRANTY**  
 10 Year/100,000 Mile Limited Powertrain Warranty  
 5 Year/60,000 Mile Limited Basic Warranty  
 5 Year/60,000 Mile Roadside Assistance  
 \*Ask dealer for details

**MANUFACTURER'S SUGGESTED RETAIL PRICE** ▶ **\$17,400.00**

**ADDITIONAL INSTALLED EQUIPMENT:**  
 (In addition to or in place of standard features)  
 Carpeted Floor Mats **\$115.00**

---

**MSRP INCLUDING OPTIONS** **\$17,515.00**

**INLAND FREIGHT AND HANDLING** **\$800.00**

---

**TOTAL MANUFACTURER'S SUGGESTED RETAIL PRICE** ▶ **\$18,315.00**

**Fuel Economy and Environment**

**Fuel Economy**  
**29** MPG combined city/hwy  
**25** city  
**36** highway  
 3.4 gallons per 100 miles

**Annual fuel cost**  
**\$1800**

**Fuel Economy & Greenhouse Gas Rating** (tailpipe only) Smog Rating (tailpipe only)  
 7 5

**You save \$2500** in fuel costs over 5 years compared to the average new vehicle.

**GOVERNMENT 5-STAR SAFETY RATINGS**

| Overall Vehicle Score | Not Rated |
|-----------------------|-----------|
| Frontal Crash         | Not Rated |
| Driver Passenger      | Not Rated |
| Side Crash            | Not Rated |
| Front seat            | Not Rated |
| Rear seat             | Not Rated |
| Rollover              | Not Rated |

**PARTS CONTENT INFORMATION**

**FOR VEHICLES IN THIS CAR LINE U.S./CANADIAN PARTS CONTENT: 1%**

**MAJOR SOURCES OF FOREIGN PARTS: KOREA: 95%**

**FOR THIS VEHICLE FINAL ASSEMBLY POINT: KOREA**

**COUNTRY OF ORIGIN: KOREA**

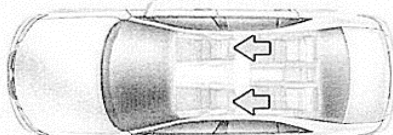
**ENGINE: KOREA**

**TRANSMISSION: KOREA**

## Monroney Label

### Safety features of your vehicle

#### Headrest (for front seat)



OMG038400

The driver's and front passenger's seats are equipped with a headrest for the occupant's safety and comfort. The headrest not only provides comfort for the driver and front passenger, but also helps protect the head and neck in the event of a collision.

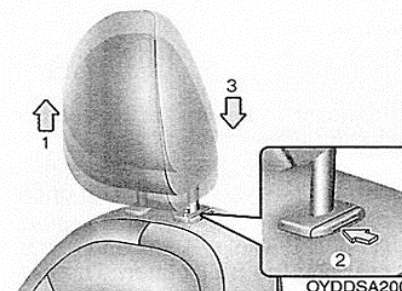
For maximum effectiveness in case of an accident, the headrest should be adjusted so the middle of the headrest is at the same height of the center of gravity of an occupant's head. Generally, the center of gravity of most people's head is similar with the height of the top of their eyes. Also, adjust the headrest as close to your head as possible.

For this reason, the use of a cushion that holds the body away from the seatback is not recommended.

#### **WARNING - Headrest removal/adjustment**

- Do not operate the vehicle with the headrests removed. Headrests can provide critical neck and head support in a crash.
- Do not adjust the headrest height while the vehicle is in motion. Driver may lose control of the vehicle.

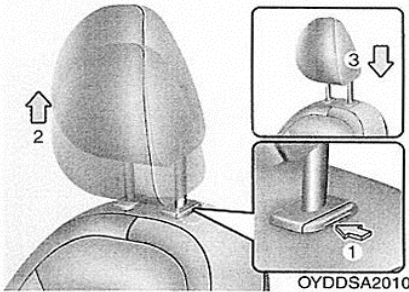
#### Adjusting the height up and down



OYDDSA2009

To raise the headrest, pull it up to the desired position (1). To lower the headrest, push and hold the release button (2) on the headrest support and lower the headrest to the desired position (3).

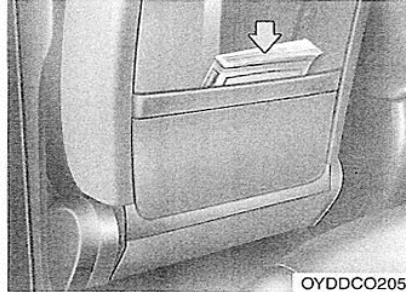
### Removal and installation



To remove the headrest, raise it as far as it can go then press the release button (1) while pulling the headrest up (2).

To reinstall the headrest, put the headrest poles (3) into the holes while pressing the release button (1). Then adjust it to the appropriate height.

### Seatback pocket



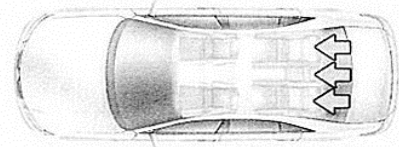
The seatback pocket is provided on the back of the front passenger's seatback.

#### **⚠ WARNING - Seatback pocket**

**Do not put heavy or sharp objects in the seatback pocket. An occupant could contact such objects in a crash. Heavy objects in the front passenger seatback could also interfere with the air bag sensing system.**

### Rear seat adjustment

#### Headrest (for rear seat)



ONF039401

The rear seat is equipped with headrests in all the seating positions for the occupant's safety and comfort.

The headrest not only provides comfort for passengers, but also helps protect the head and neck in the event of a collision.

3 | 11

### Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



Post-Test View of Shattered Vehicle Inner Door Panel

**APPENDIX B**  
**VEHICLE AND DUMMY RESPONSE DATA PLOTS**

**TABLE OF DATA PLOTS**  
**Driver Dummy Instrumentation Plots**

|                |                                                        | <u>Page No.</u> |
|----------------|--------------------------------------------------------|-----------------|
| Figure No. 1.  | Driver Head CG Acceleration (X) vs. Time               | B-1             |
| Figure No. 2.  | Driver Head CG Acceleration (Y) vs. Time               | B-1             |
| Figure No. 3.  | Driver Head CG Acceleration (Z) vs. Time               | B-1             |
| Figure No. 4.  | Driver Head CG Resultant Acceleration (X) 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 additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at**  
[www.NHTSA.dot.gov](http://www.NHTSA.dot.gov)

**Additional Driver Dummy Instrumentation Data**

Driver Head CG Redundant Acceleration (X) vs. Time

Driver Head CG Redundant Acceleration (Y) vs. Time

Driver Head CG Redundant Acceleration (Z) vs. Time

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)

### **Vehicle Instrumentation Data**

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

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 Hip 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)

### **Pole Instrumentation Data**

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

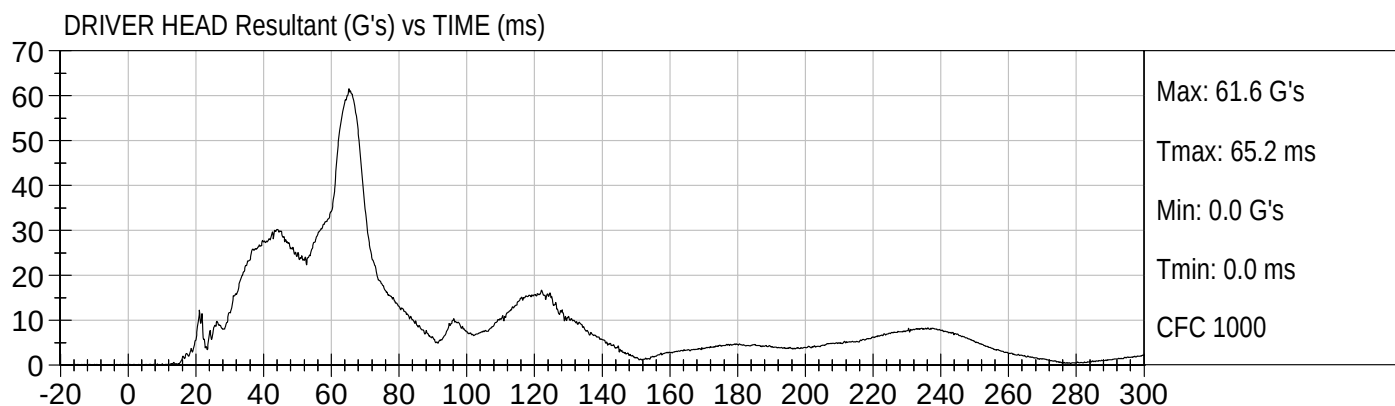
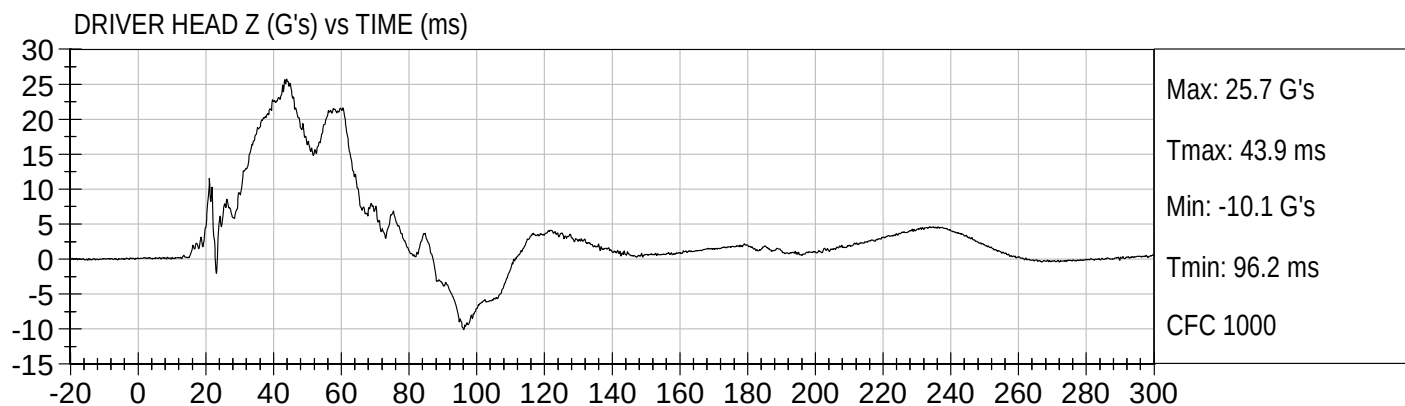
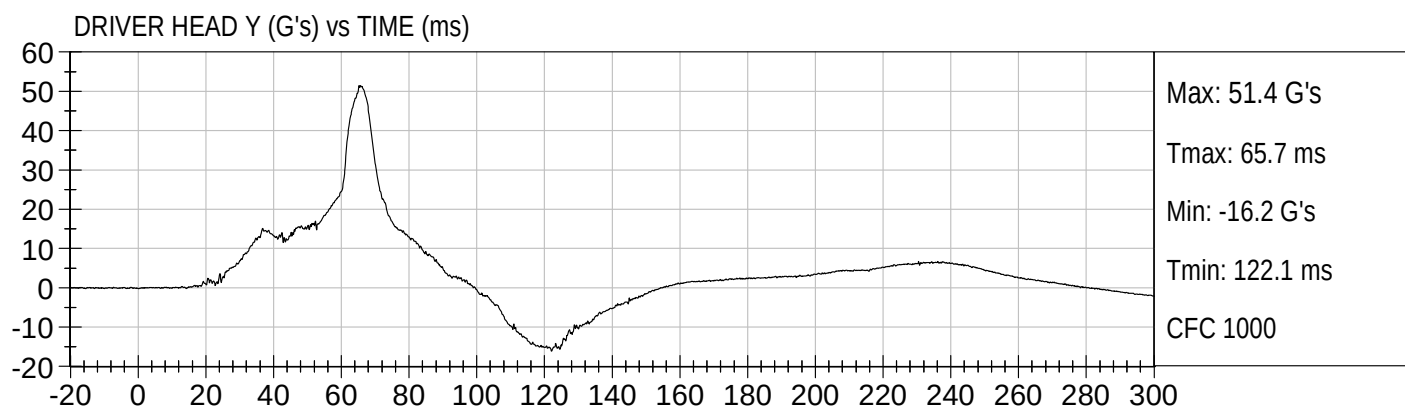
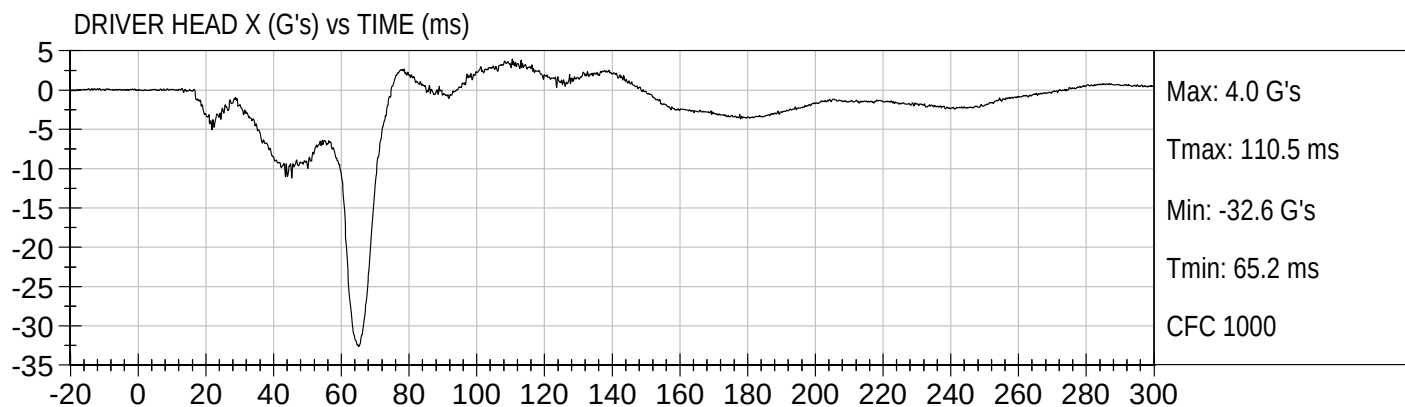
Load Cell Pole Barrier #4 Force (Y)

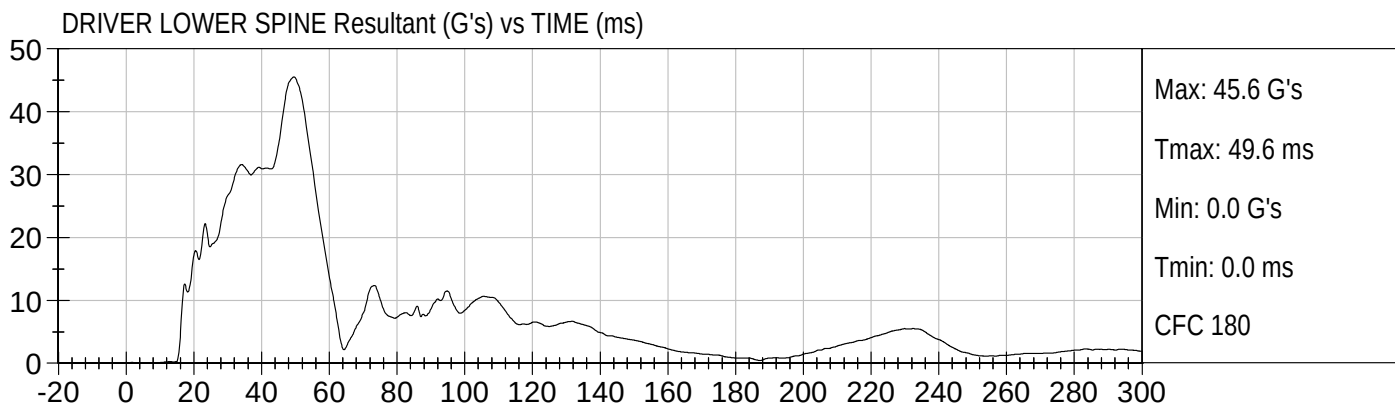
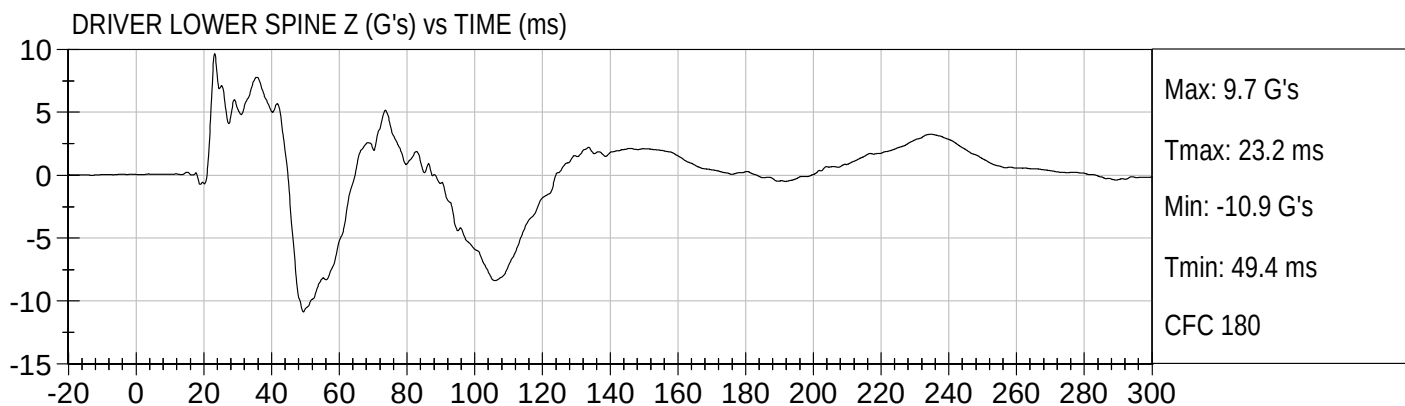
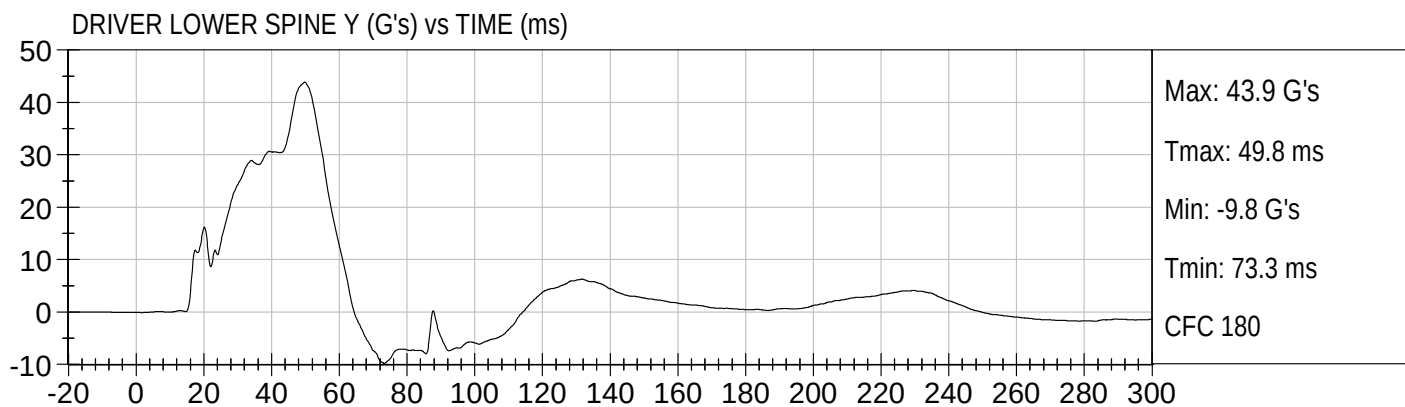
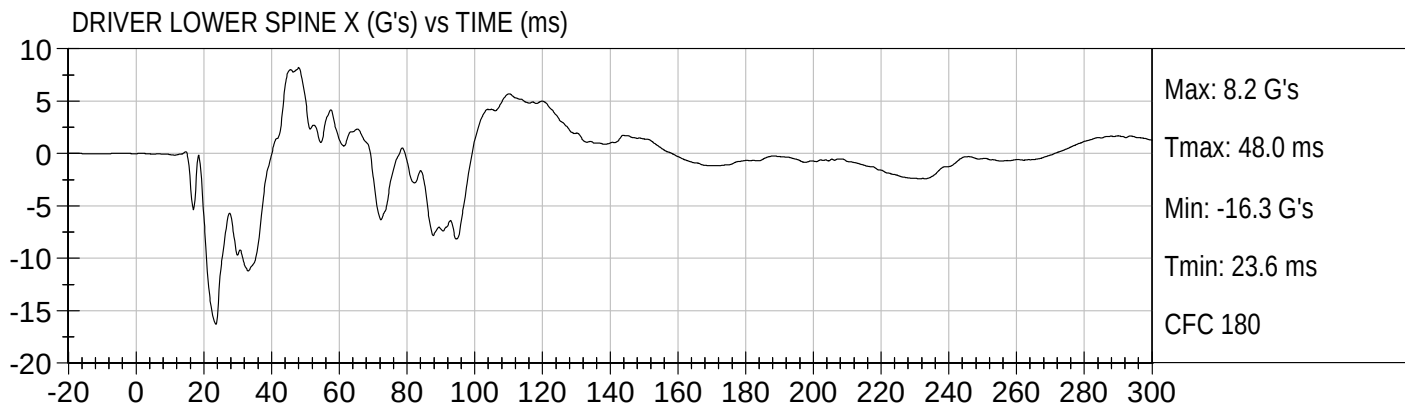
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

Load Cell Pole Barrier #7 Force (Y)

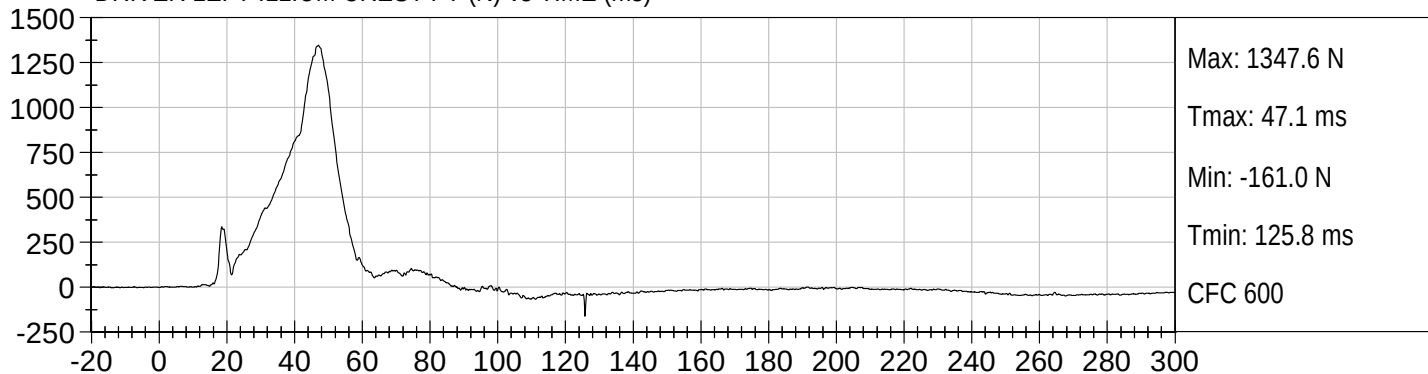
Load Cell Pole Barrier #8 Force (Y)



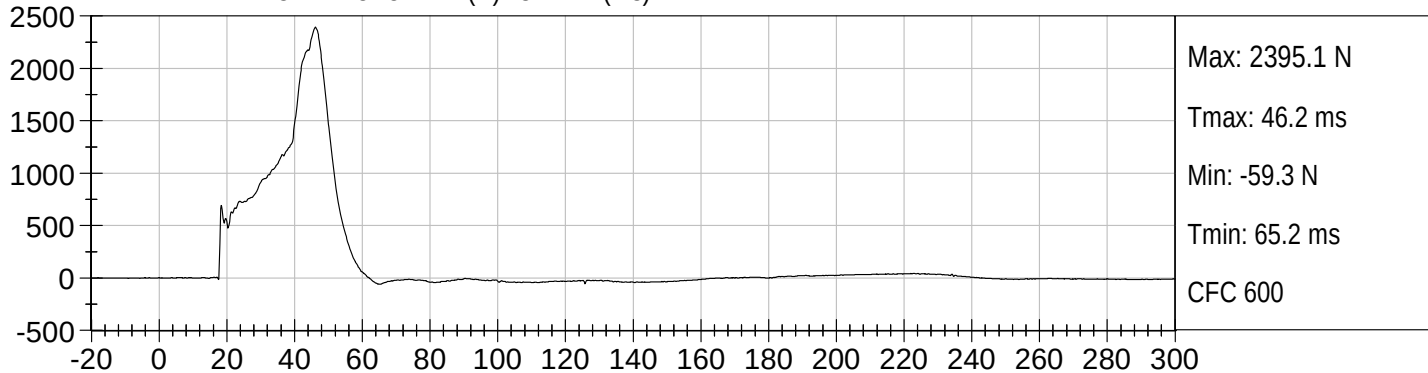




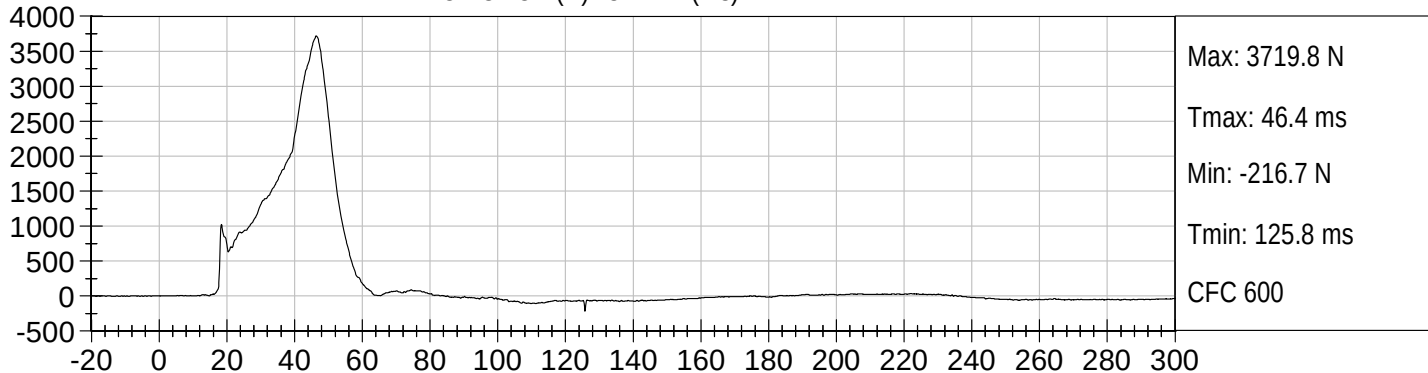
DRIVER LEFT ILLIUM CREST FY (N) vs TIME (ms)



DRIVER LEFT ACETABULUM FY (N) vs TIME (ms)



DRIVER LEFT LATERAL PELVIC FORCE (N) vs TIME (ms)



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

**SID-IIsD External Measurements**  
**SN: 296**

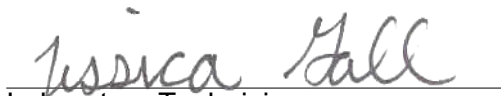
| <b>No.</b> | <b>Name</b>                   | <b>Spec. (mm)</b> | <b>Result</b> | <b>Pass/Fail</b> |
|------------|-------------------------------|-------------------|---------------|------------------|
| <b>A</b>   | Sitting Height                | 772 - 788         | 784           | Pass             |
| <b>B</b>   | Shoulder Pivot Height         | 437 - 453         | 442           | Pass             |
| <b>C</b>   | H-point Height                | 79 - 89           | 83            | Pass             |
| <b>D</b>   | H-point from Seatback         | 141 - 151         | 145           | Pass             |
| <b>E</b>   | Shoulder Pivot from Backline  | 97 - 107          | 99            | Pass             |
| <b>F</b>   | Thigh Clearance               | 119 -135          | 121           | Pass             |
| <b>G</b>   | Head Breadth                  | 140 - 148         | 142           | Pass             |
| <b>H</b>   | Head Back from Backline       | 40 - 46           | 45            | Pass             |
| <b>I</b>   | Head Depth                    | 178 - 188         | 180           | Pass             |
| <b>J</b>   | Head Circumference            | 541 - 551         | 548           | Pass             |
| <b>K</b>   | Buttock to Knee Length        | 514 - 540         | 535           | Pass             |
| <b>L</b>   | Popliteal Height              | 343 - 369         | 358           | Pass             |
| <b>M</b>   | Knee Pivot to Floor Height    | 392 - 409         | 404           | Pass             |
| <b>N</b>   | Buttock Popliteal Length      | 416 - 442         | 435           | Pass             |
| <b>O</b>   | Chest Depth w/o Jacket        | 195 - 211         | 206           | Pass             |
| <b>P</b>   | Foot Length                   | 216 - 232         | 219           | Pass             |
| <b>Q</b>   | Hip Breadth (w/ pelvic plugs) | 313 - 323         | 316           | Pass             |
| <b>R</b>   | Arm Length                    | 249 - 259         | 250           | Pass             |
| <b>S</b>   | Knee Joint to Seatback        | 477 - 493         | 481           | Pass             |
| <b>V</b>   | Shoulder Width                | 341 - 357         | 346           | Pass             |
| <b>W</b>   | Foot Width                    | 78 - 94           | 85            | Pass             |
| <b>Y</b>   | Chest Circumference w/ jacket | 851 - 881         | 870           | Pass             |
| <b>Z</b>   | Waist Circumference           | 761 - 791         | 772           | Pass             |

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

**ATD Serial No:** 296

**Test ID:** D132031

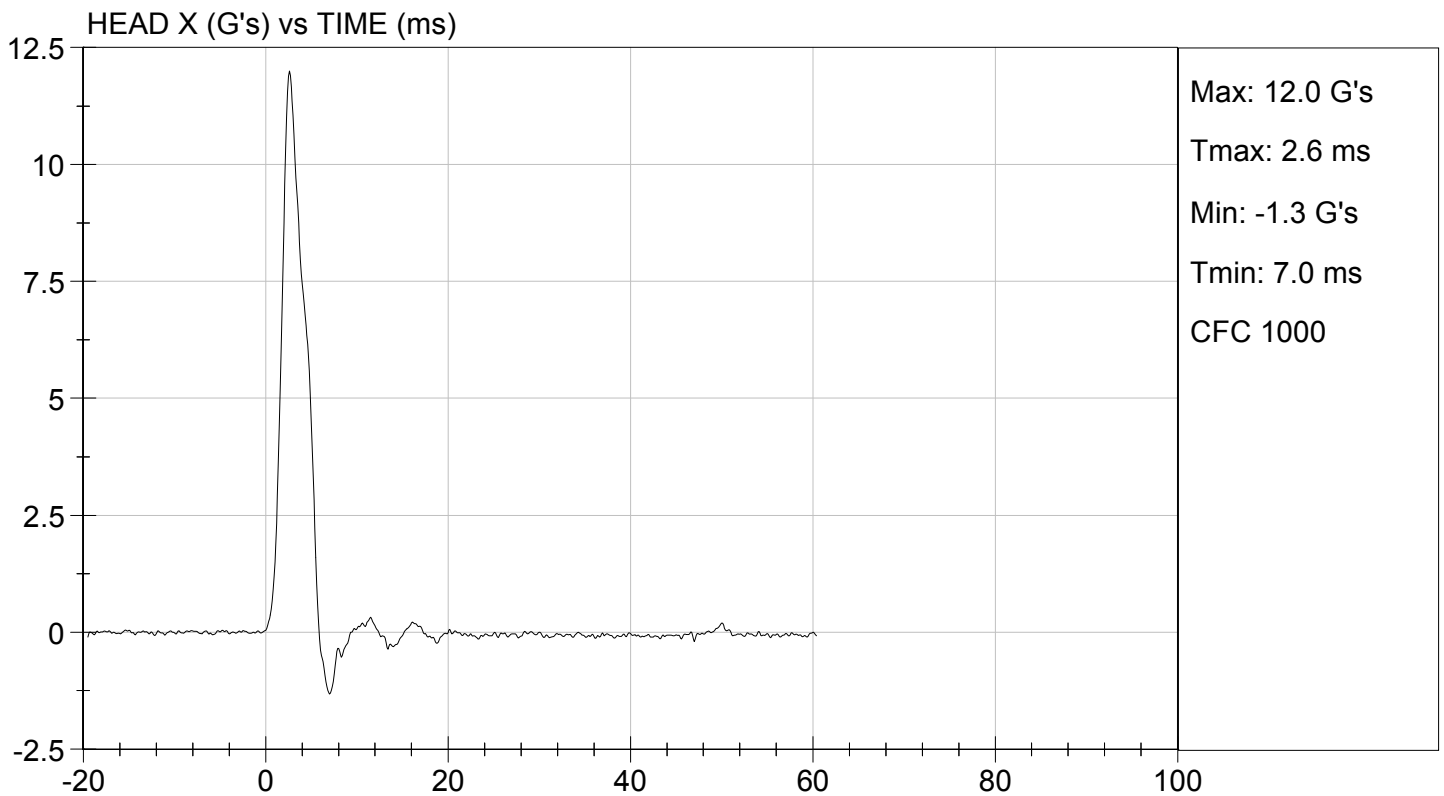
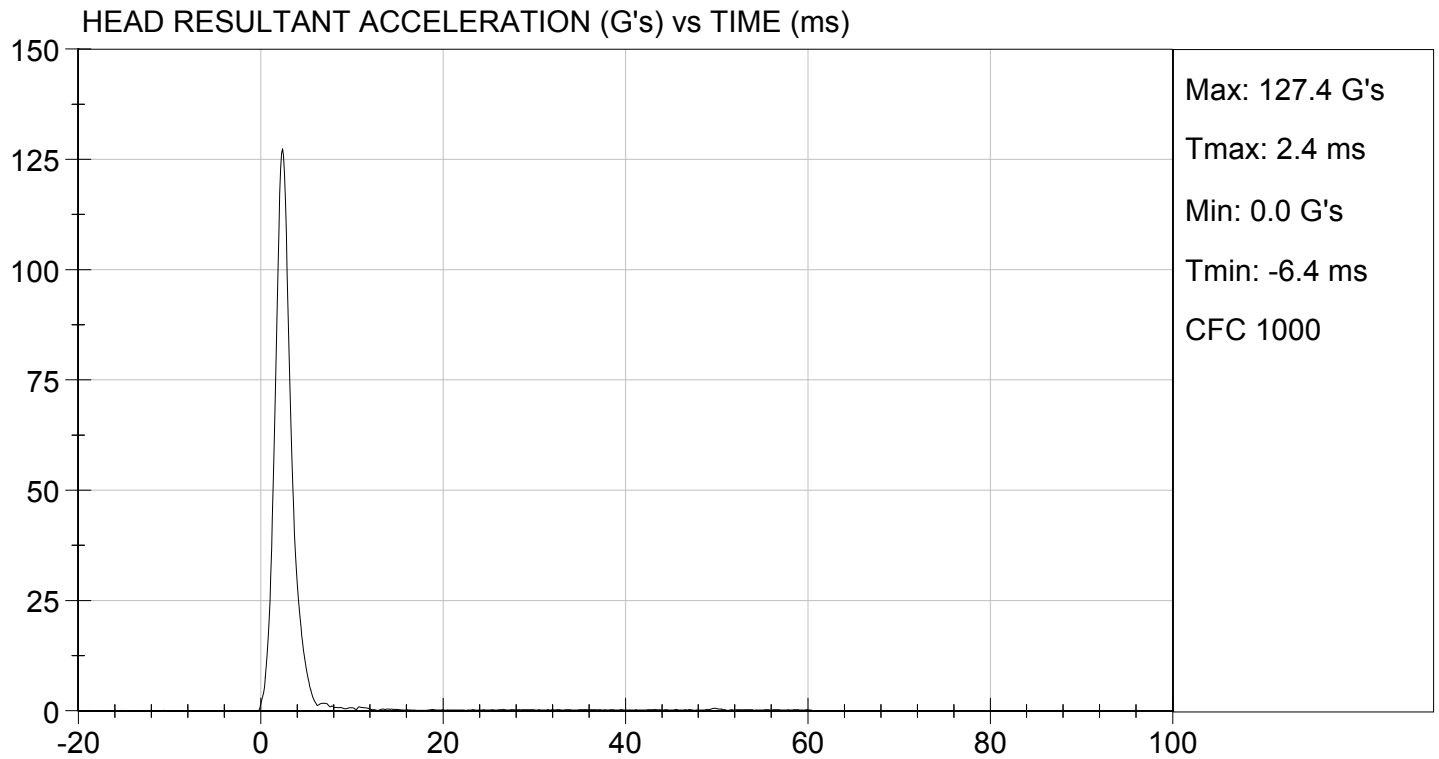
| Tested Parameter               | Units | Specification | Result | Pass/Fail |
|--------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature         | deg C | 20.6 to 22.2  | 21.2   | Pass      |
| Laboratory Relative Humidity   | %     | 10 to 70      | 49     | Pass      |
| Peak Resultant Acceleration    | G's   | 115 to 137    | 127    | Pass      |
| Peak Longitudinal Acceleration | G's   | +/- 15        | 12.0   | Pass      |
| Unimodal                       | N/A   | Yes           | Yes    | Pass      |
| Oscillations                   | N/A   | <15%          | Yes    | Pass      |
| Overall Test Results           |       |               | Pass   |           |

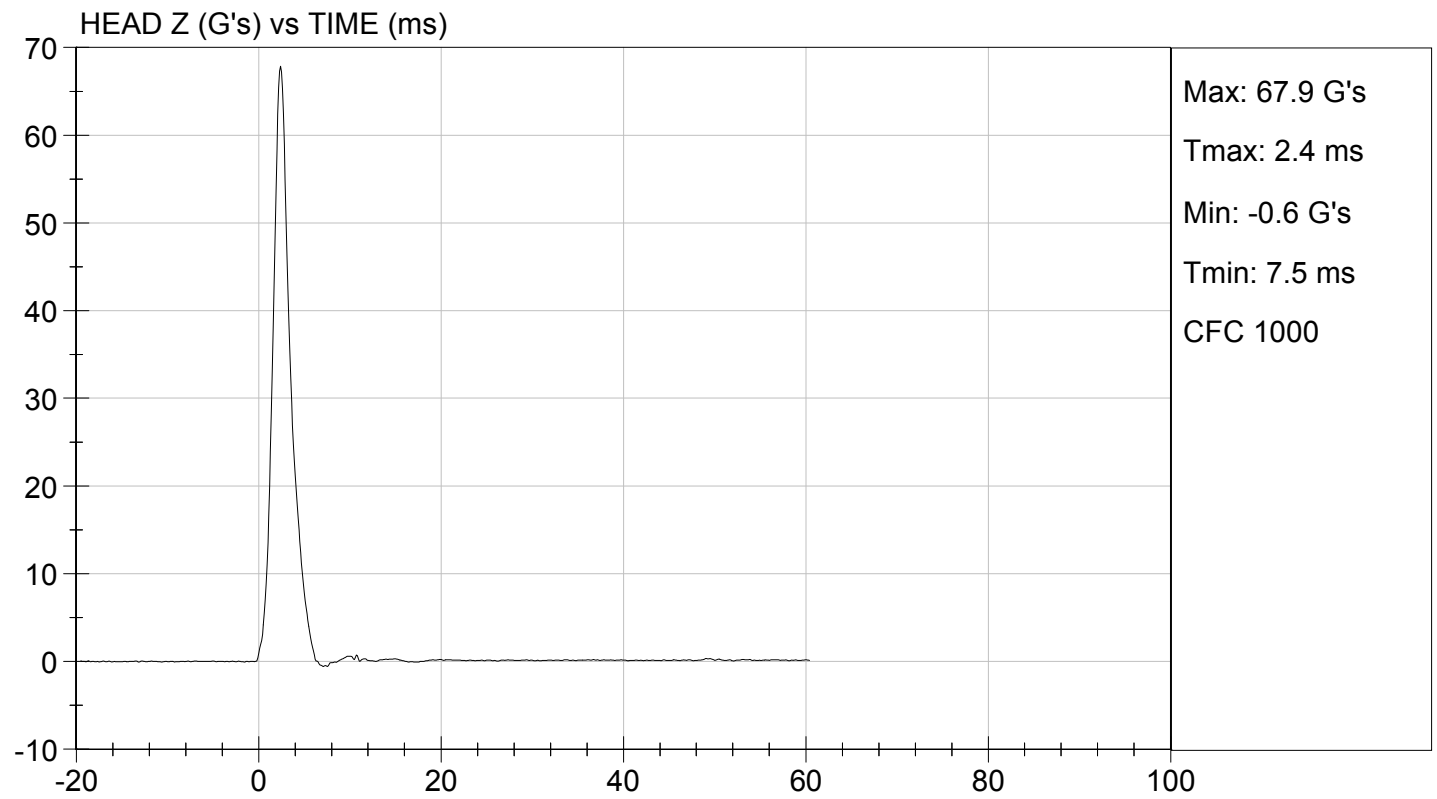
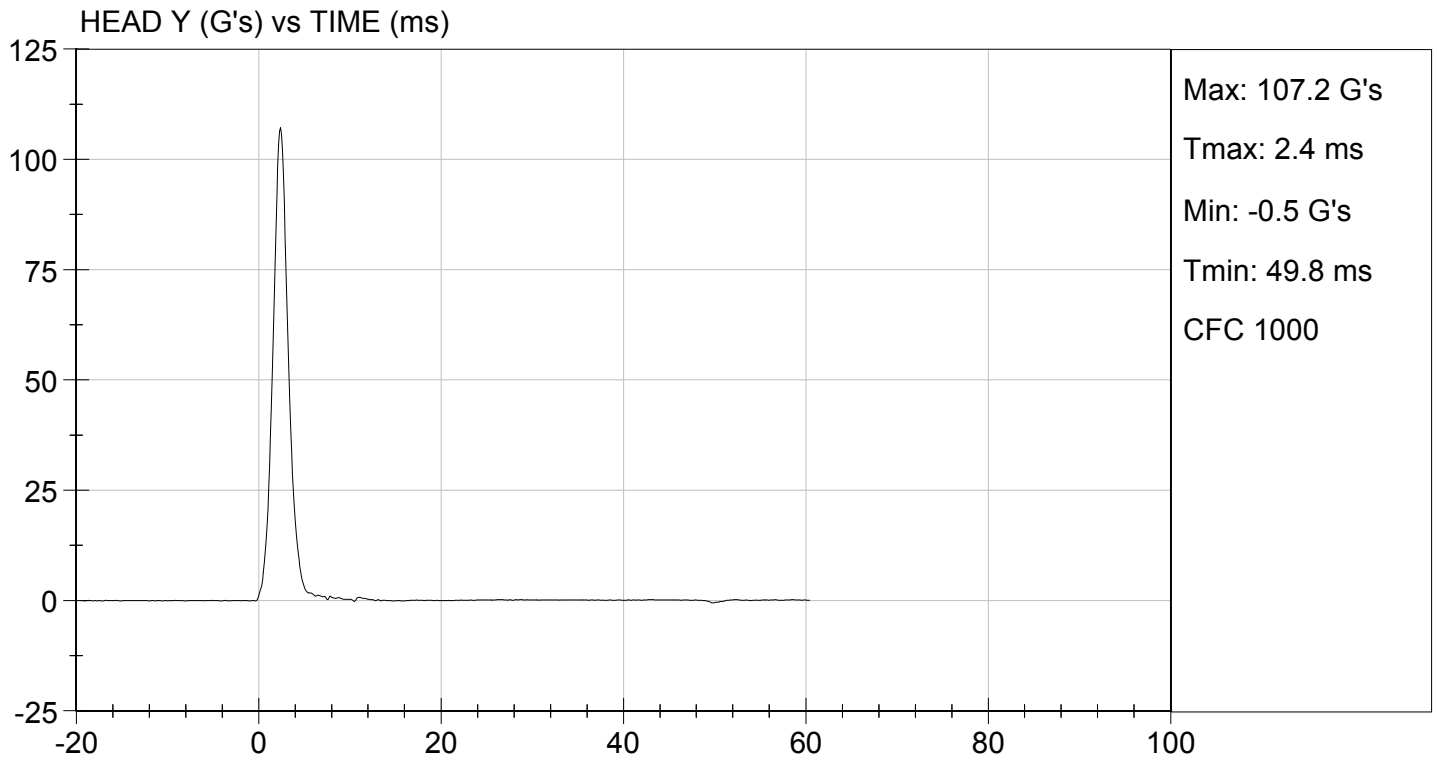
  
Laboratory Technician

06/26/2013

Test Date

  
Approved By





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

**ATD Serial No:** 296

**Test I.D:** D132032

| Tested Parameter                 |           | Units | Specification | Result | Pass/Fail |
|----------------------------------|-----------|-------|---------------|--------|-----------|
| Temperature                      |           | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Humidity                         |           | %     | 10 to 70      | 49     | Pass      |
| Impact Velocity                  |           | m/s   | 5.51 to 5.63  | 5.52   | Pass      |
| Pendulum Velocity                | 10 ms     | m/s   | 2.20 to 2.80  | 2.38   | Pass      |
|                                  | 15 ms     | m/s   | 3.30 to 4.10  | 3.41   | Pass      |
|                                  | 20 ms     | m/s   | 4.40 to 5.40  | 4.52   | Pass      |
|                                  | 25 ms     | m/s   | 5.40 to 6.10  | 5.41   | Pass      |
|                                  | 25-100 ms | m/s   | 5.50 to 6.20  | 5.50   | Pass      |
| Maximum D-Plane Rotation         |           | deg   | 71 to 81      | 71     | Pass      |
| Time of Maximum D-Plane Rotation |           | ms    | 50 to 70      | 64     | Pass      |
| Maximum Occipital Condyle Moment |           | Nm    | -44 to -36    | -38    | Pass      |
| Time of Moment Decay to 0 Nm     |           | ms    | 102 to 126    | 116    | Pass      |
| Overall Test Results             |           |       |               |        | Pass      |

Jessica Hall  
Laboratory Technician

06/26/2013

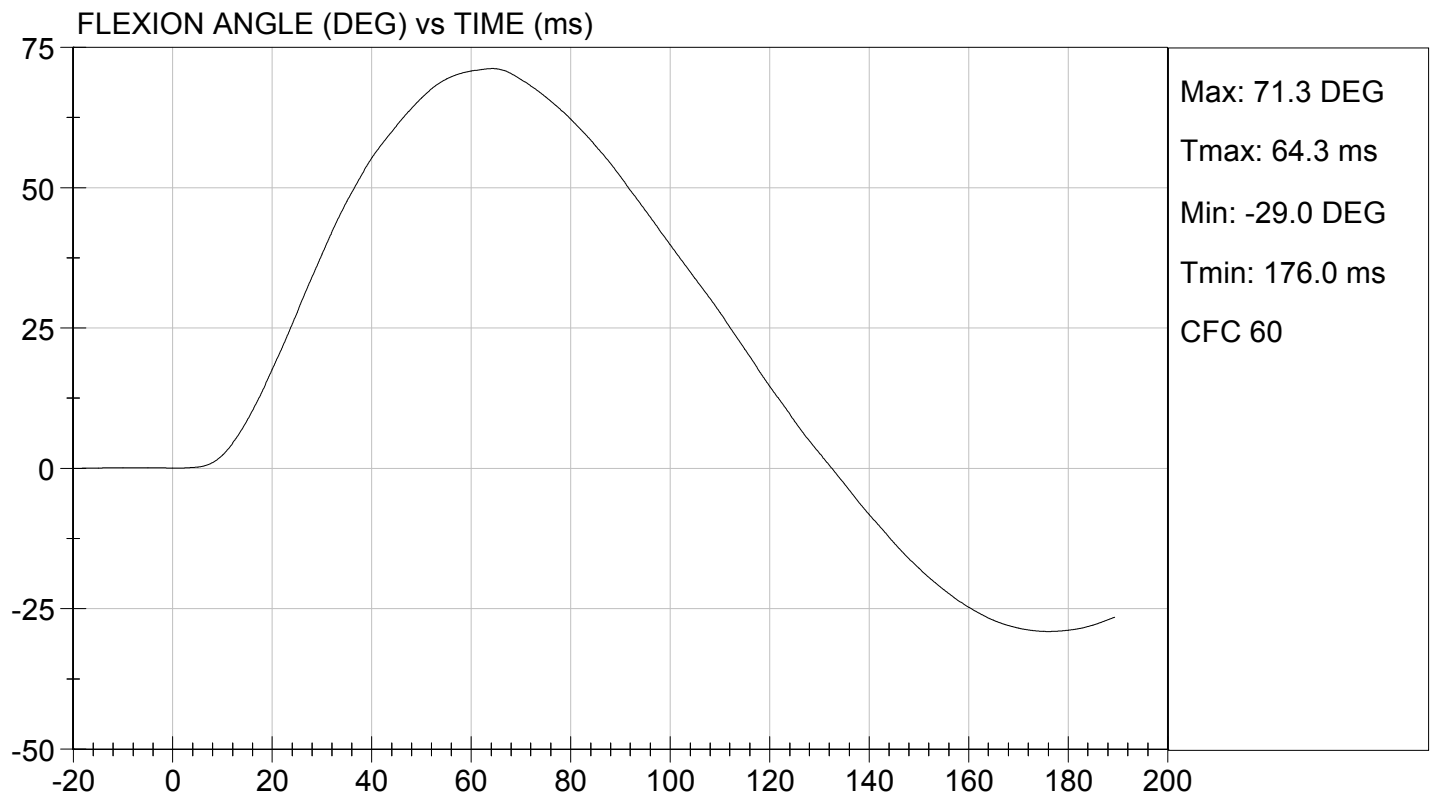
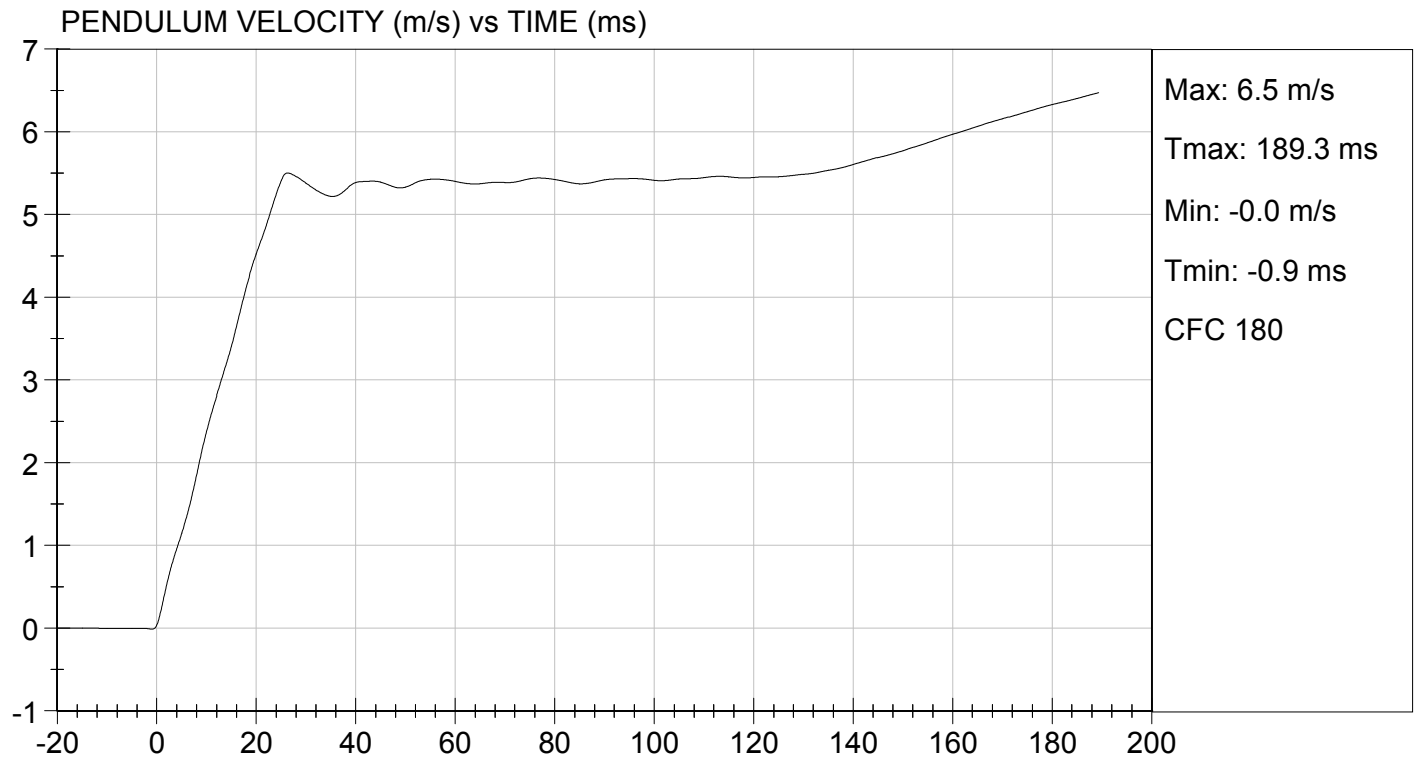
Test Date

David Winkelbauer  
Approved By



TEST DESC: NECK BENDING  
VELOCITY: 18.12 ft/s, 5.52 m/s

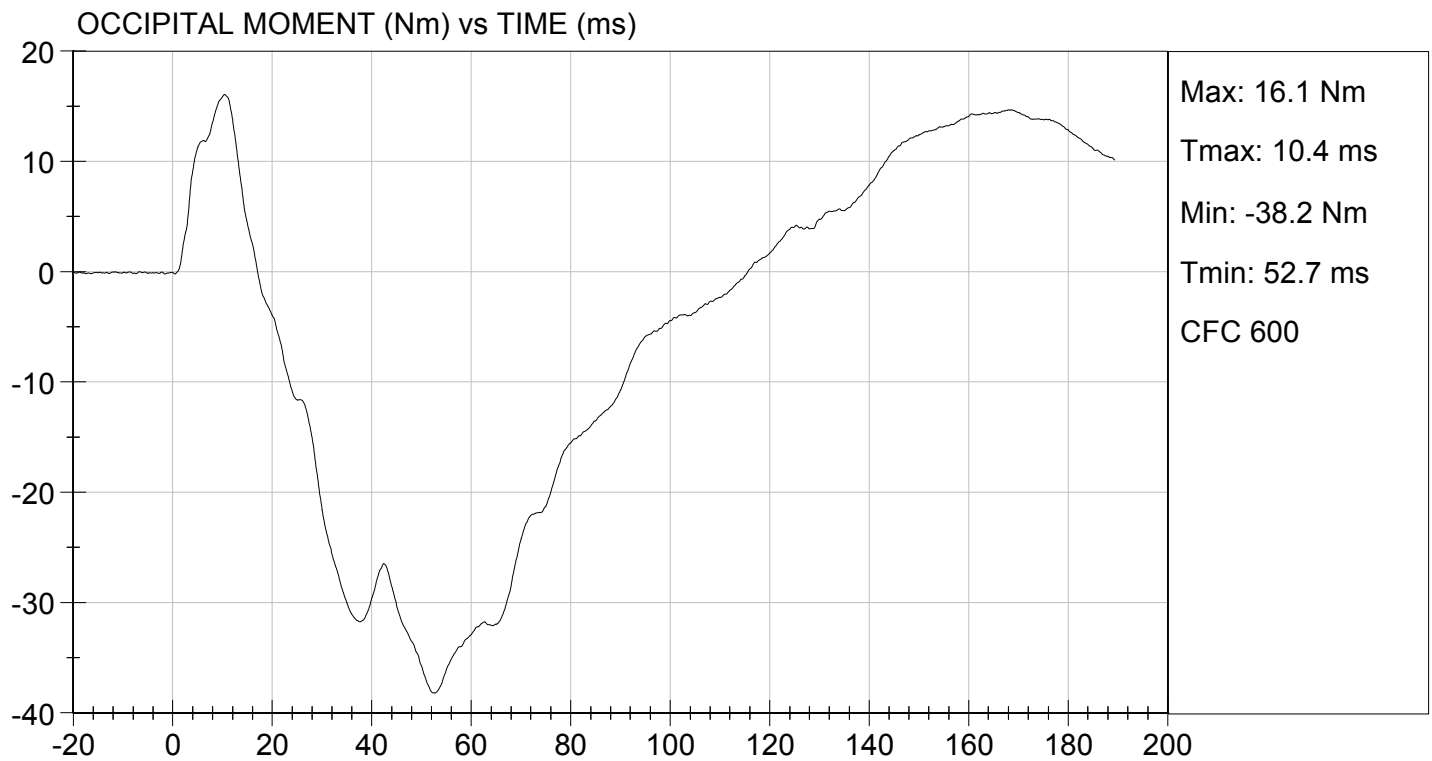
TEST DATE: 06/26/2013  
TEST #: D132032





TEST DESC: NECK BENDING  
VELOCITY: 18.12 ft/s, 5.52 m/s

TEST DATE: 06/26/2013  
TEST #: D132032

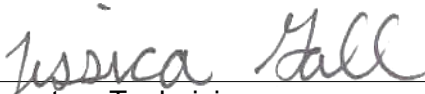


**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D132033

| Tested Parameter                | Units | Specification | Result               | Pass/Fail |
|---------------------------------|-------|---------------|----------------------|-----------|
| Laboratory Temperature          | deg C | 20.6 to 22.2  | 21.3                 | Pass      |
| Laboratory Relative Humidity    | %     | 10 to 70      | 51                   | 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      | 31                   | Pass      |
| Upper Spine (T1) Y Acceleration | G's   | 17 to 22      | 17                   | Pass      |
|                                 |       |               | Overall Test Results | Pass      |

  
Laboratory Technician

06/26/2013

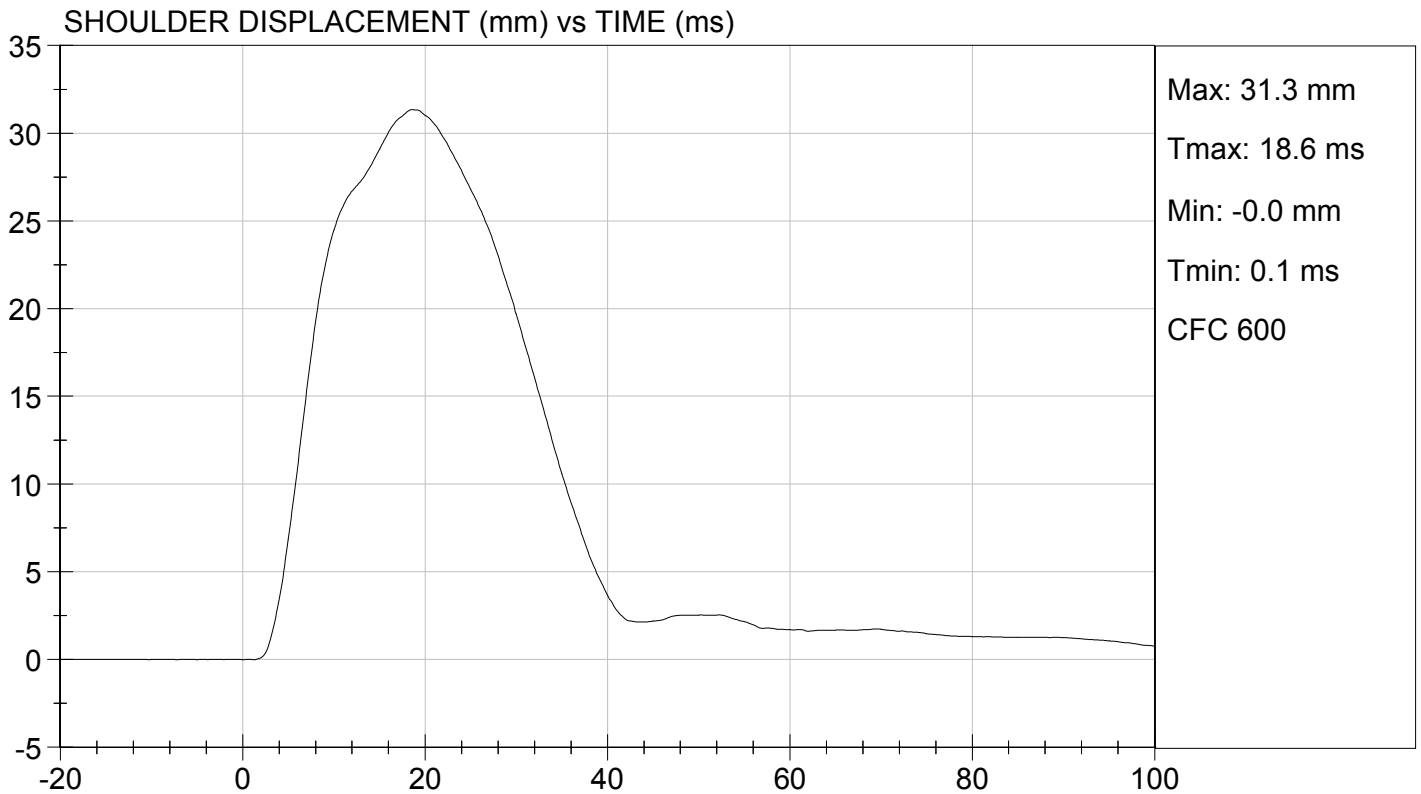
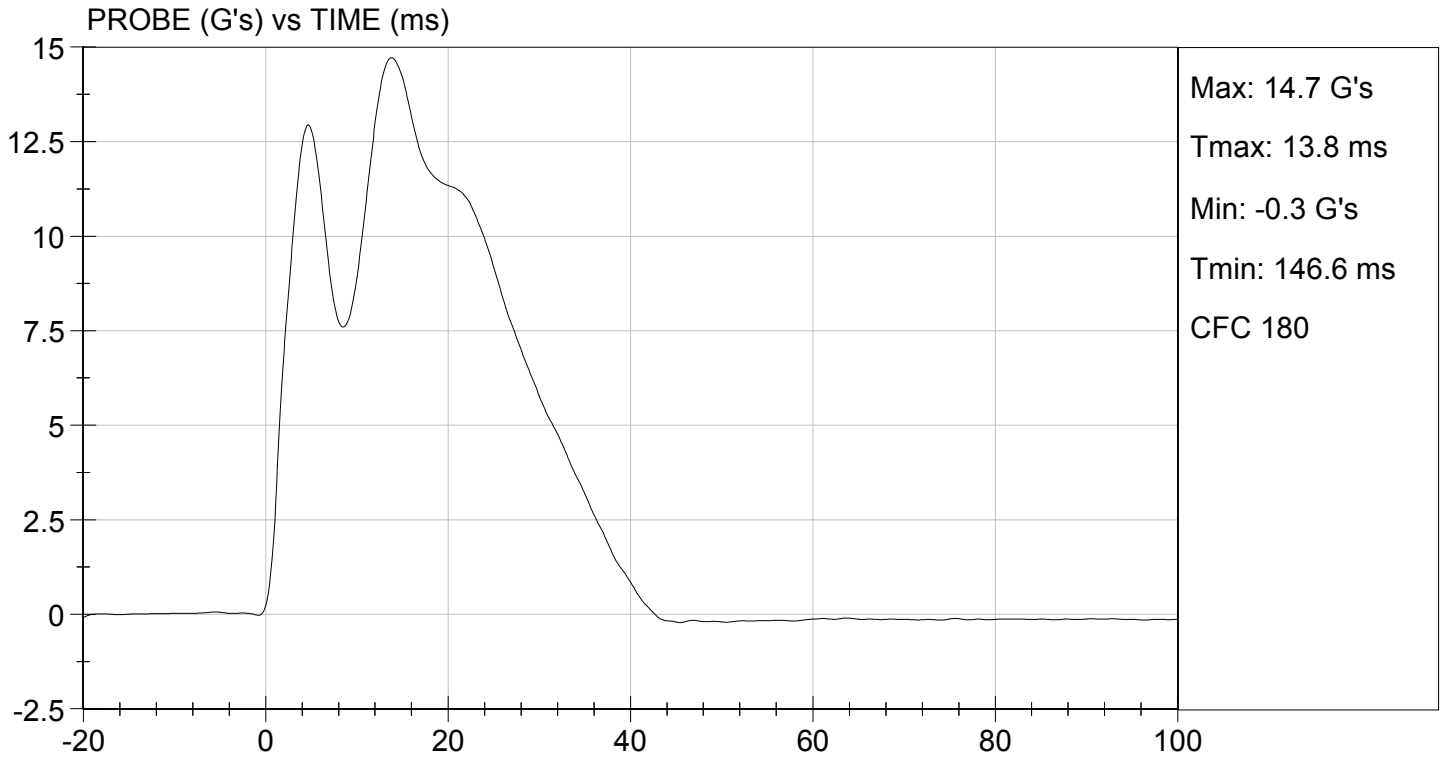
Test Date

  
Approved By



TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.12 ft/s, 4.30 m/s

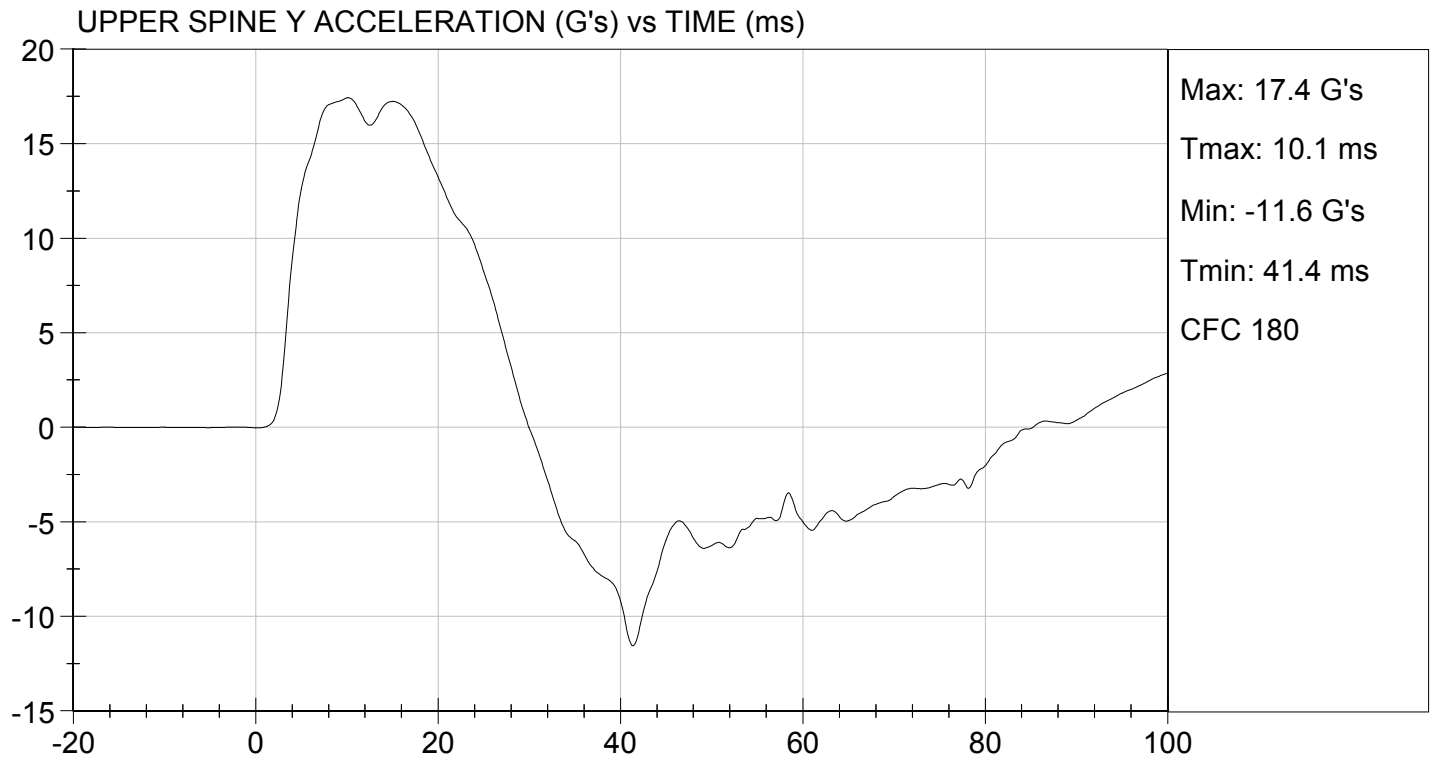
TEST DATE: 06/26/2013  
TEST #: D132033





TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 06/26/2013  
TEST #: D132033



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

**ATD Serial No:** 296

**Test I.D:** D132034

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                         | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Maximum Probe Acceleration       | G's   | 30 to 36      | 30     | 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      | 34     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 34 to 43      | 38     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 29 to 37      | 30     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
 Laboratory Technician

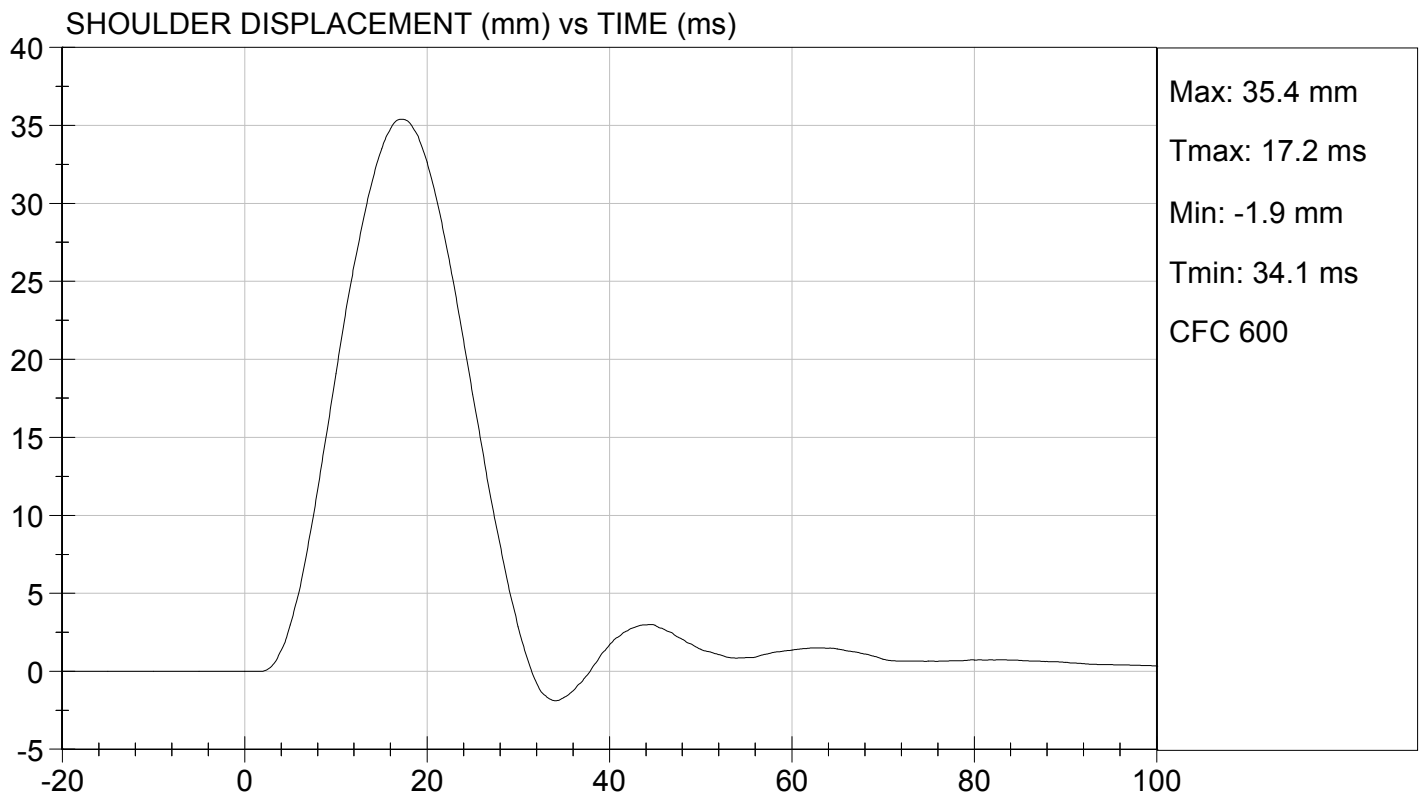
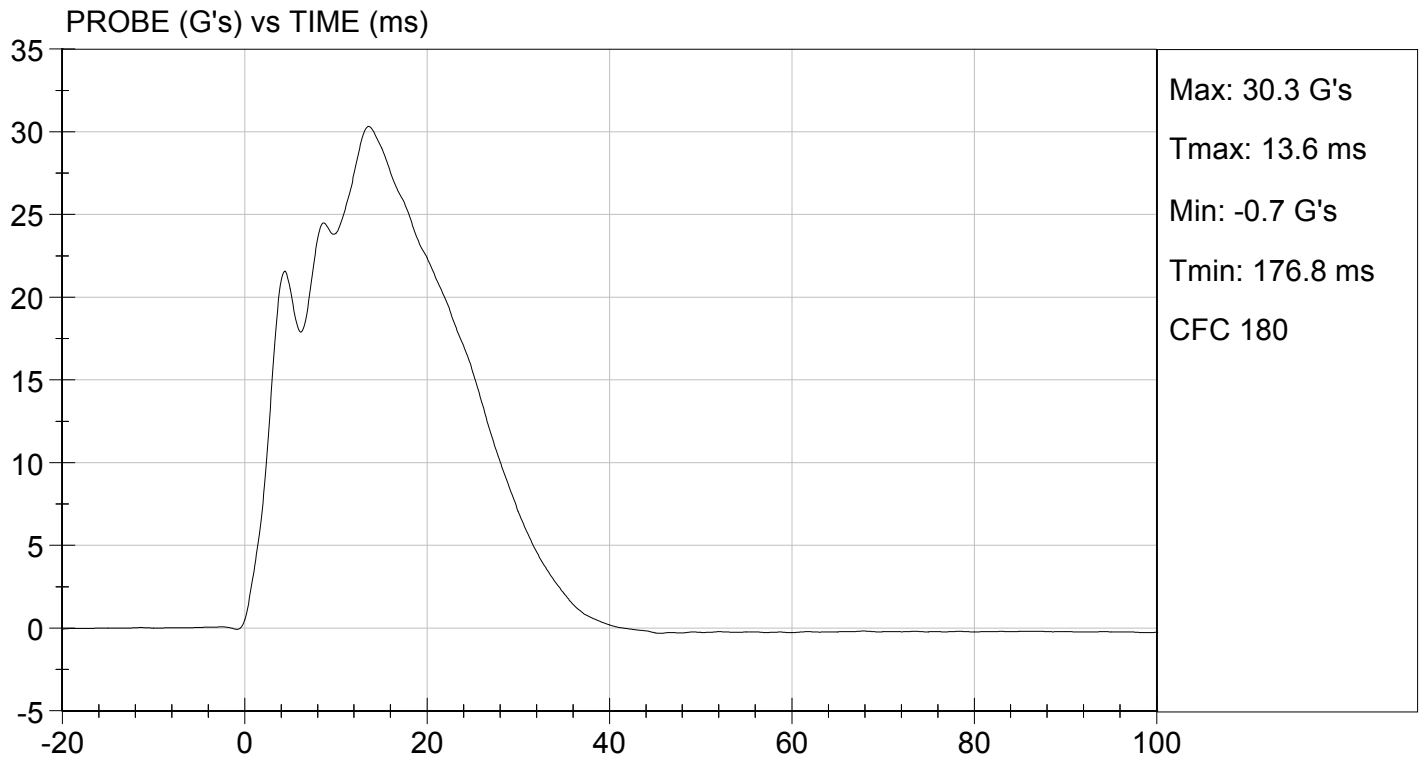
06/26/2013  
 Test Date

  
 Approved By



TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

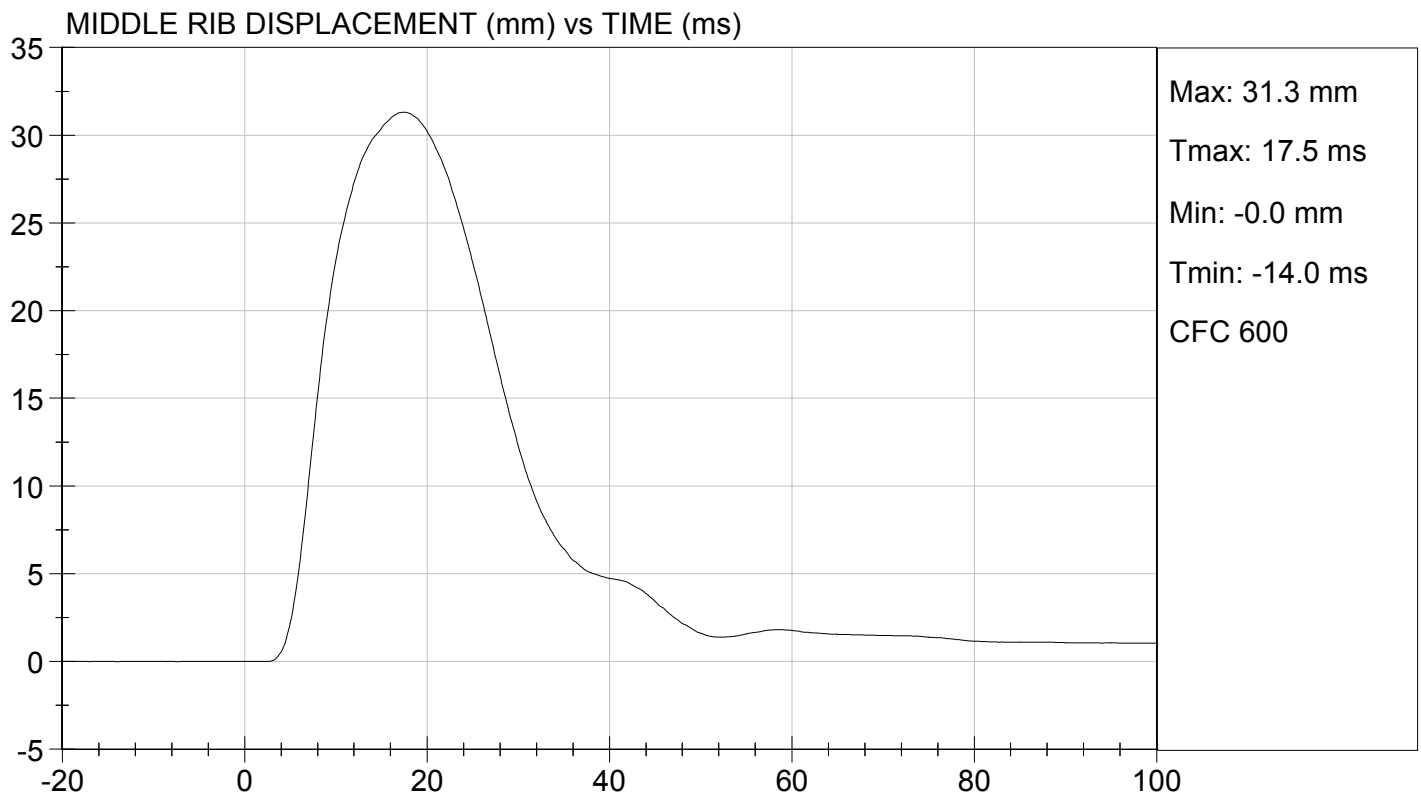
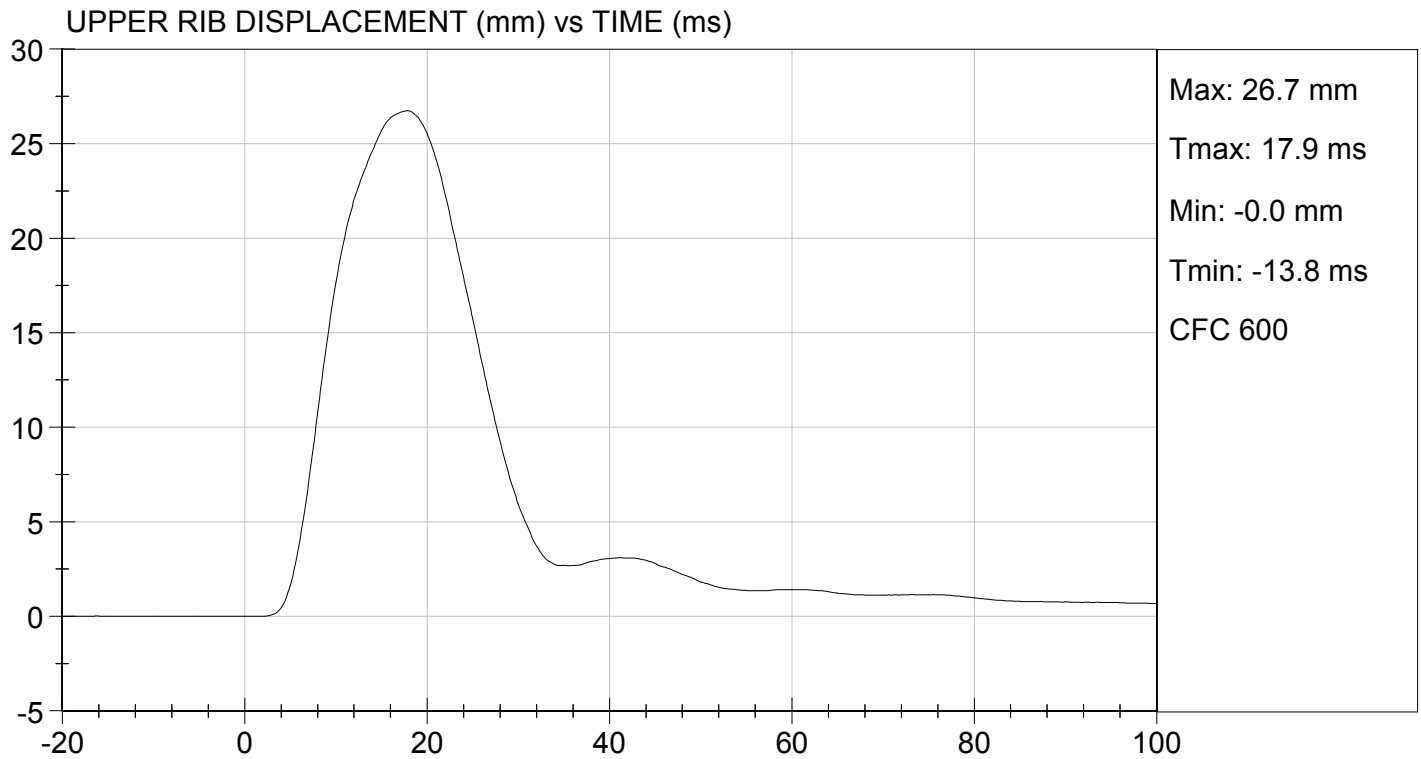
TEST DATE: 06/26/2013  
TEST #: D132034





TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 06/26/2013  
TEST #: D132034

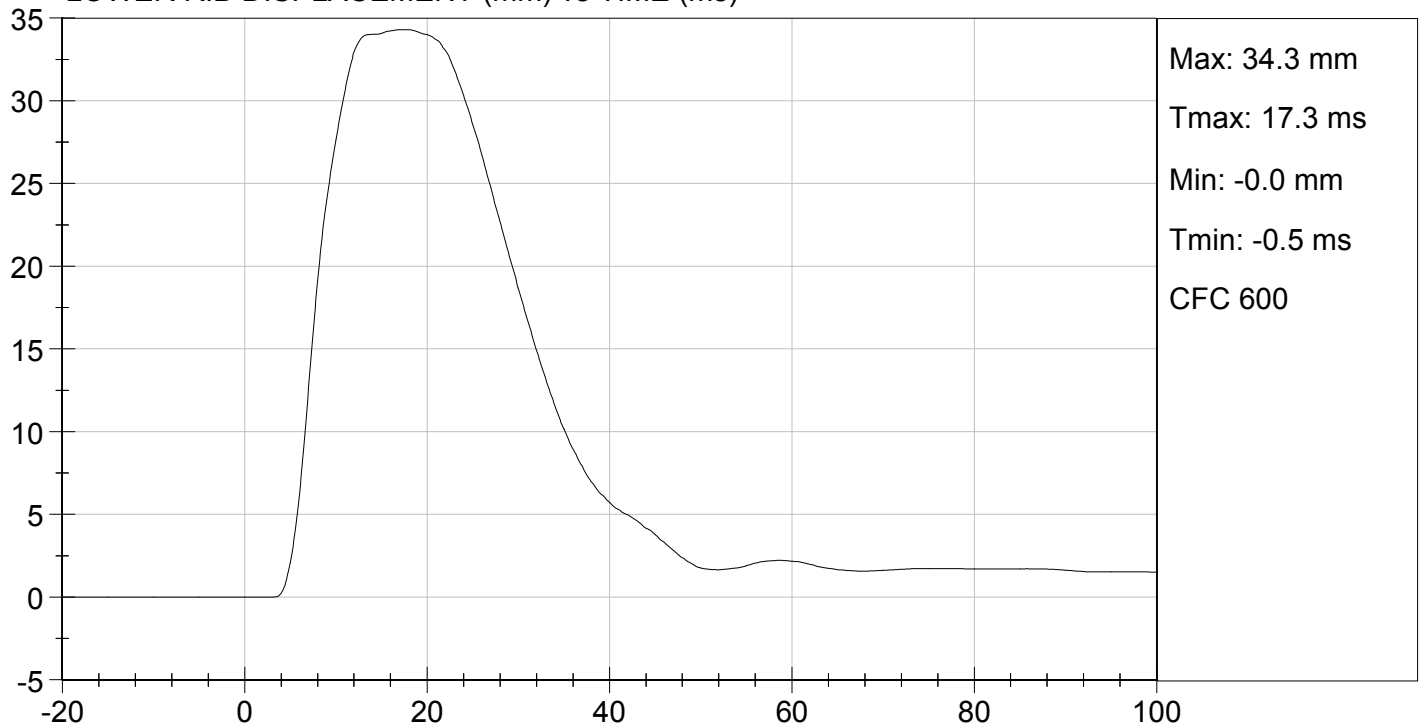




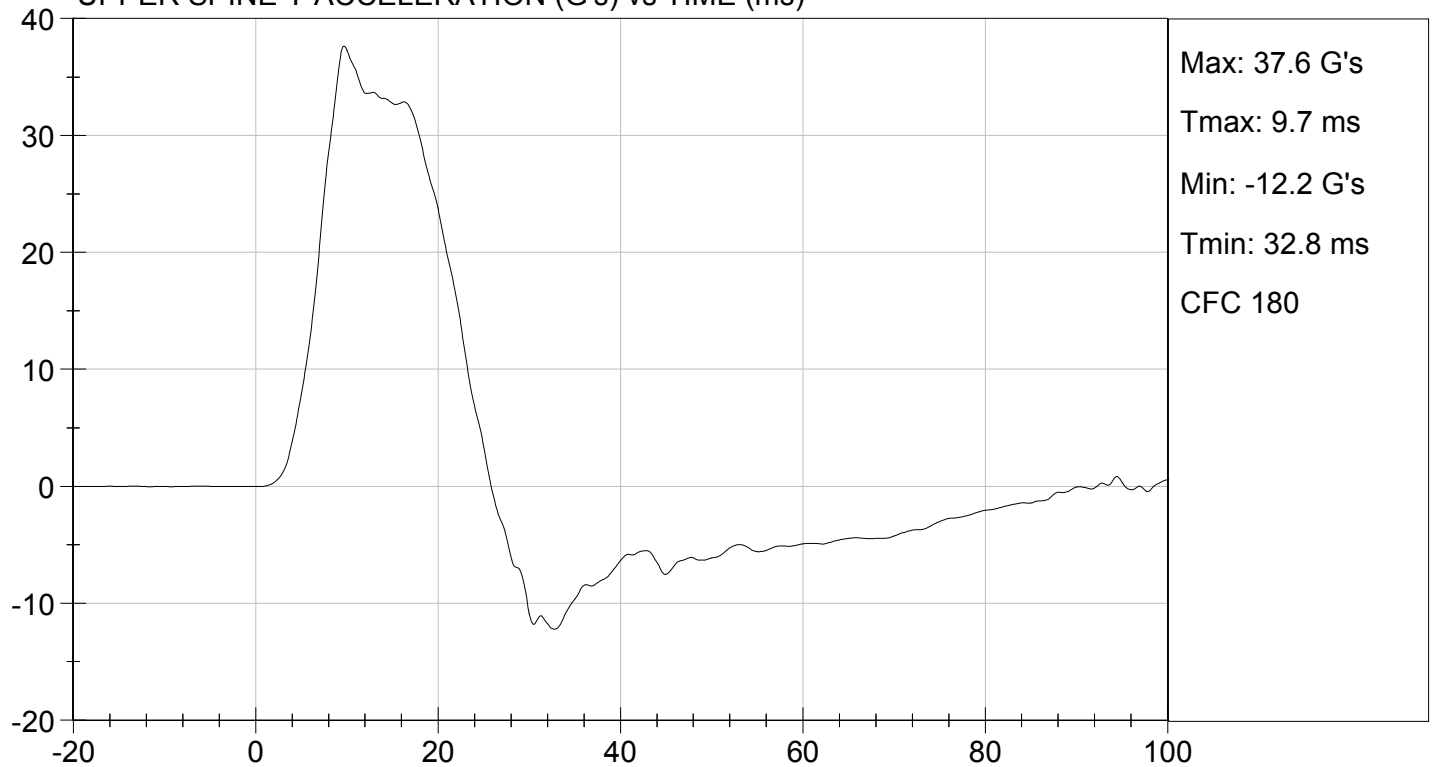
TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 06/26/2013  
TEST #: D132034

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



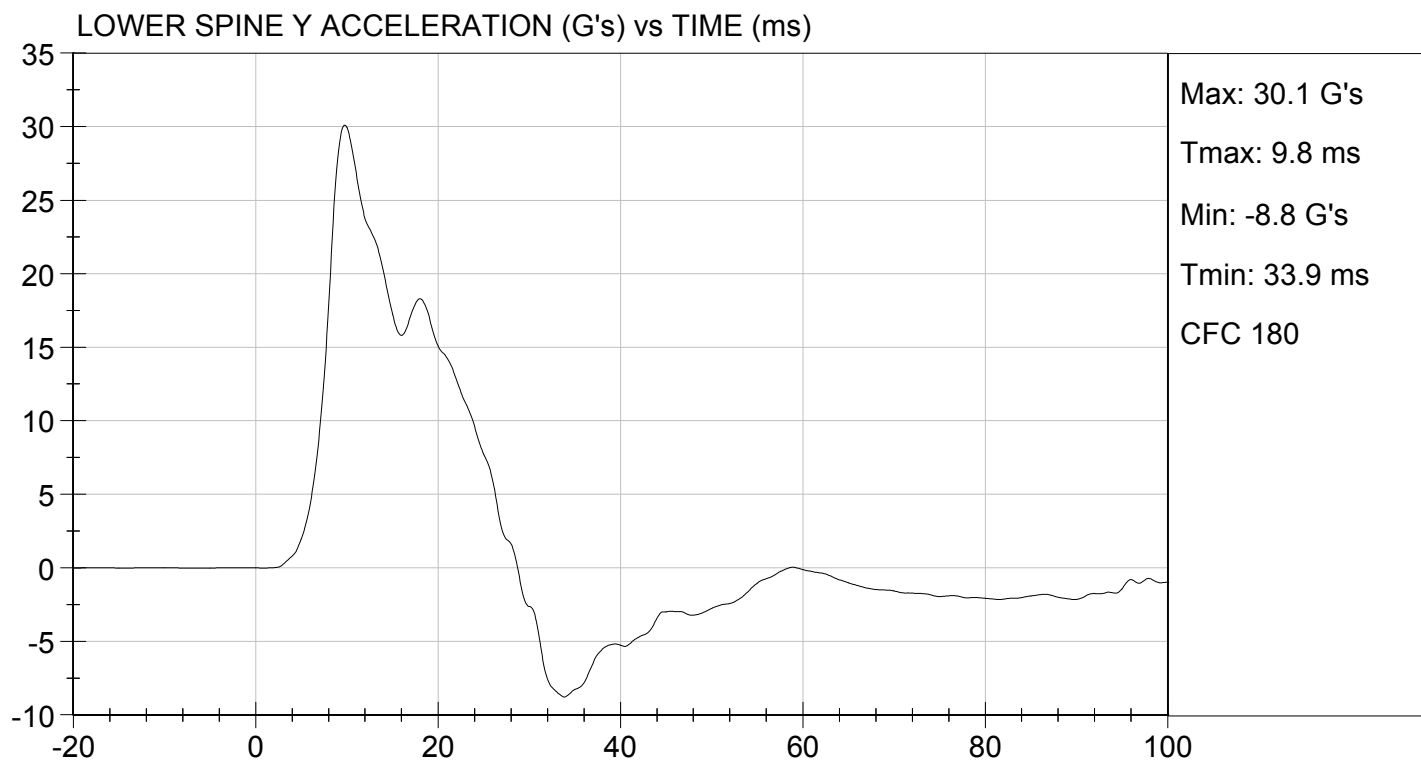
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 06/26/2013  
TEST #: D132034

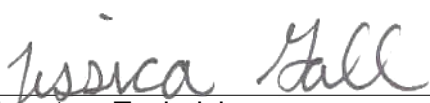


**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132035

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                         | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Maximum Probe Acceleration       | G's   | 14 to 18      | 14     | 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      | 40     | 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      |

  
 Laboratory Technician

06/26/2013

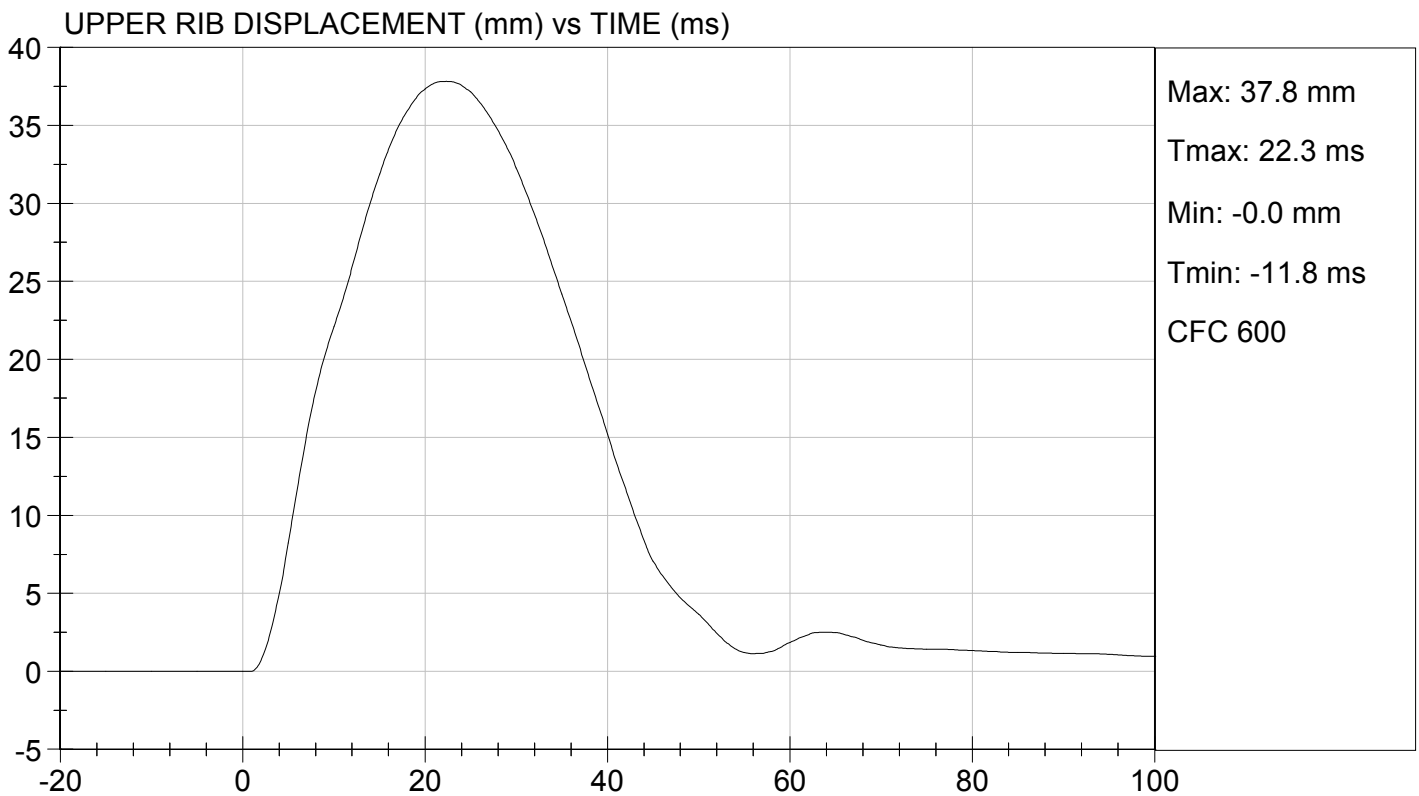
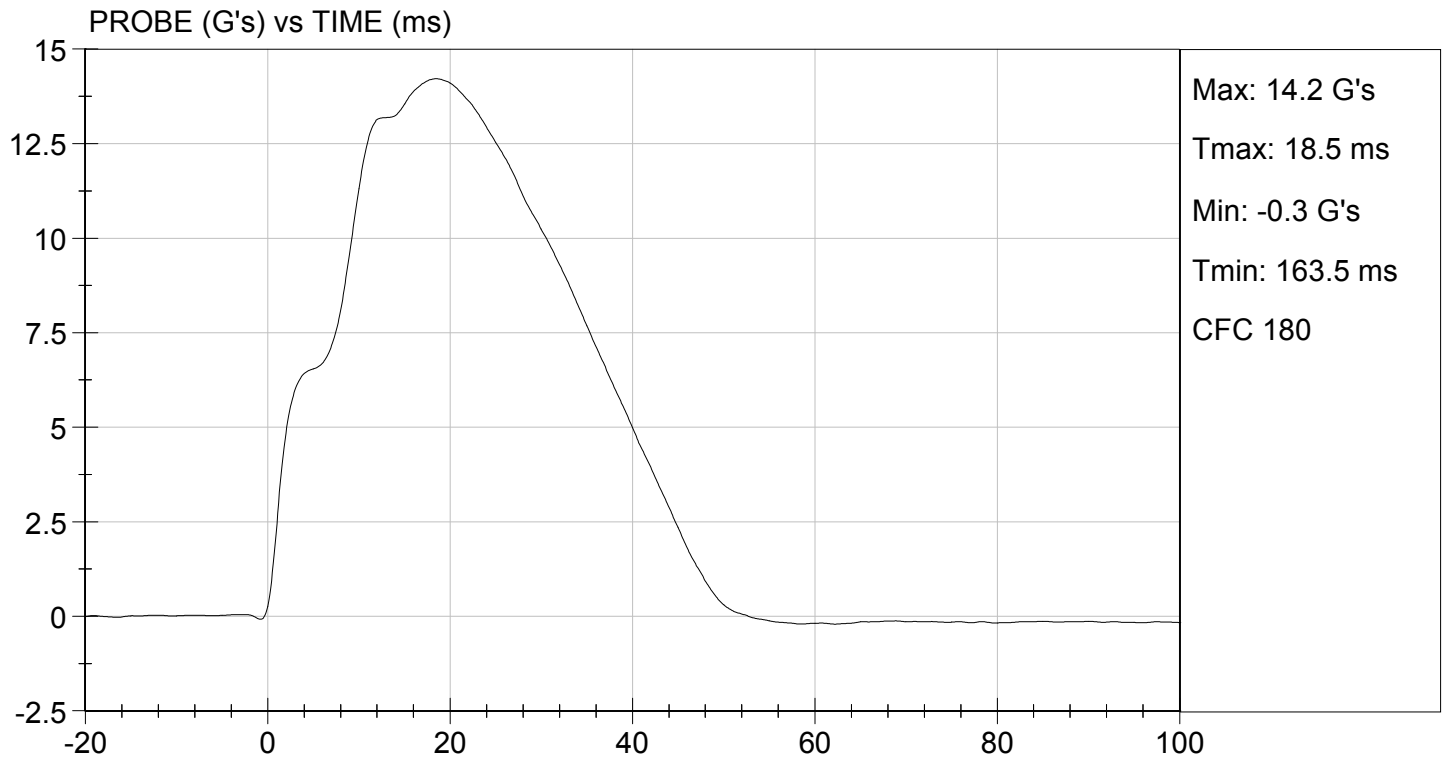
Test Date

  
 Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 06/26/2013  
TEST #: D132035

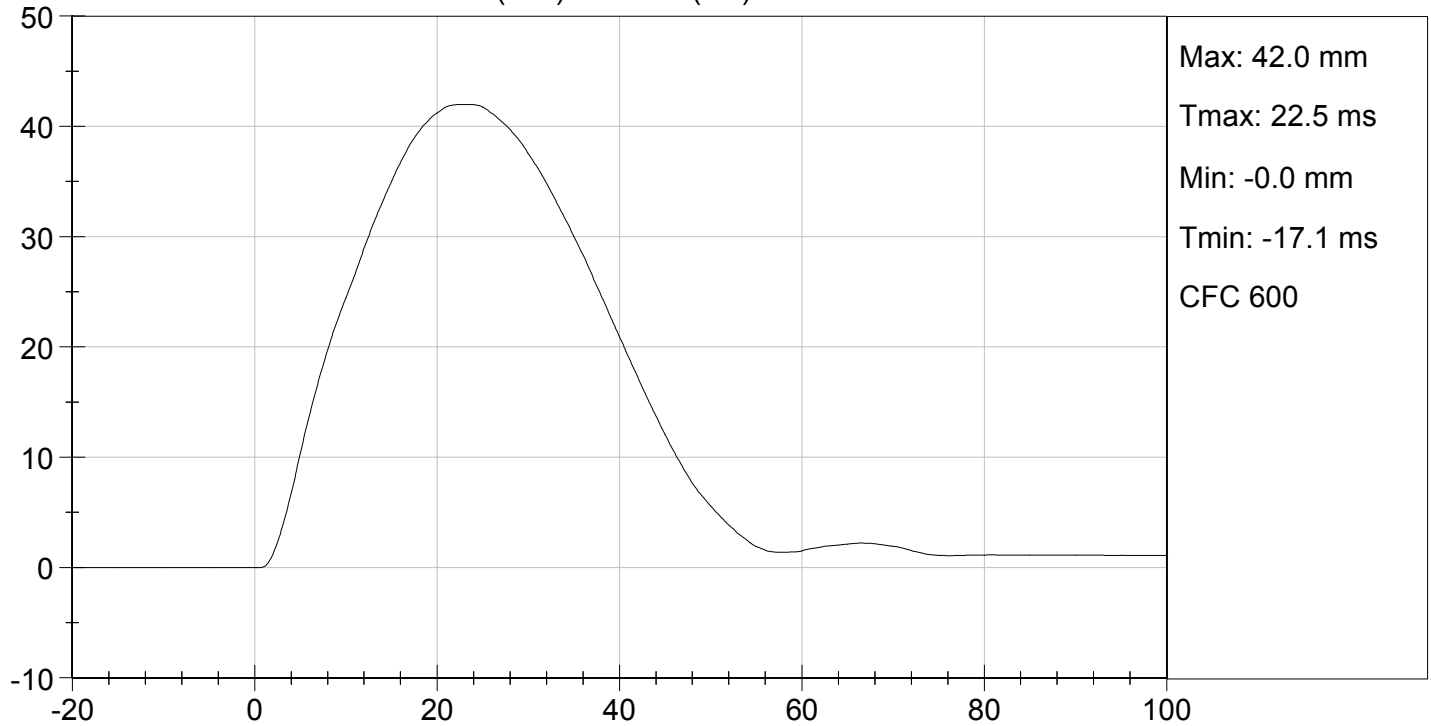




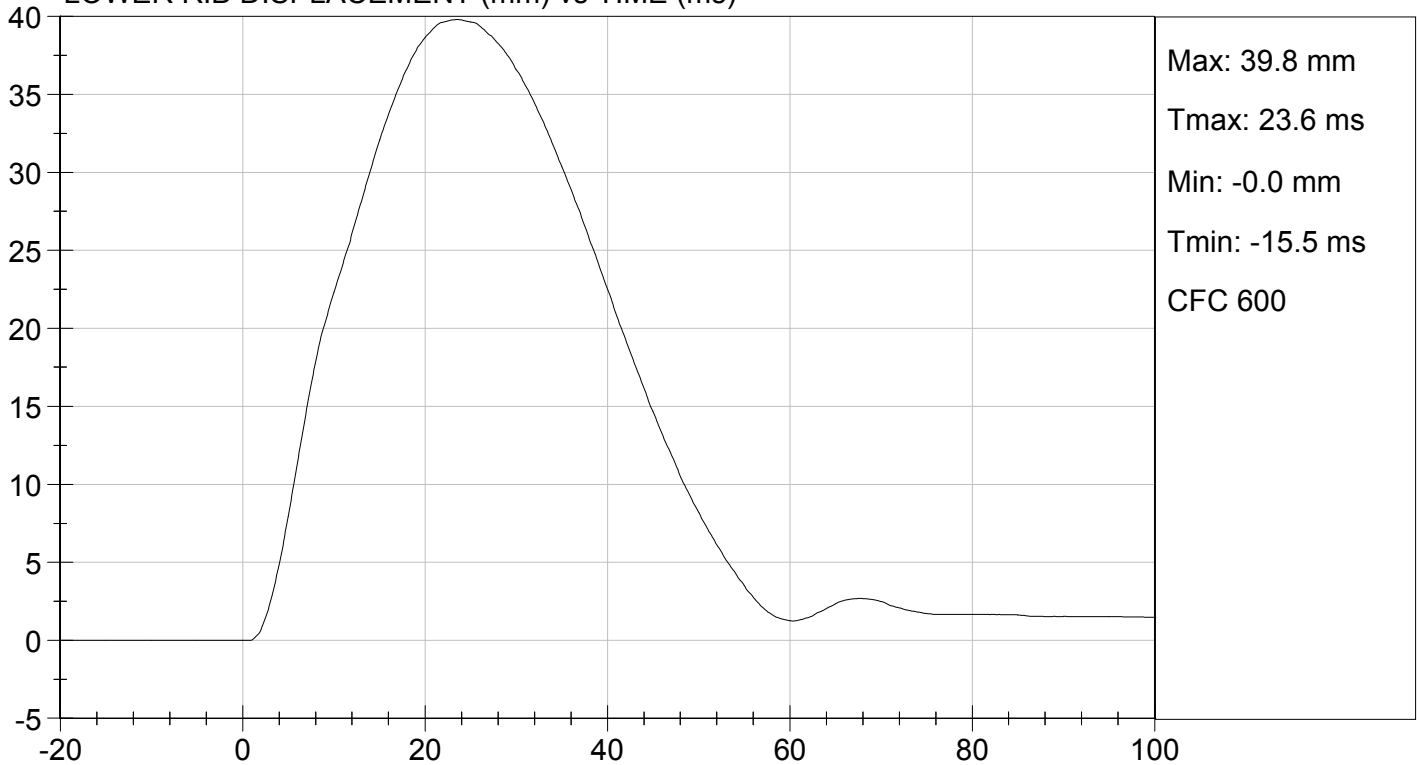
TEST DESC: THORAX IMPACT WITHOUT ARM  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 06/26/2013  
TEST #: D132035

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

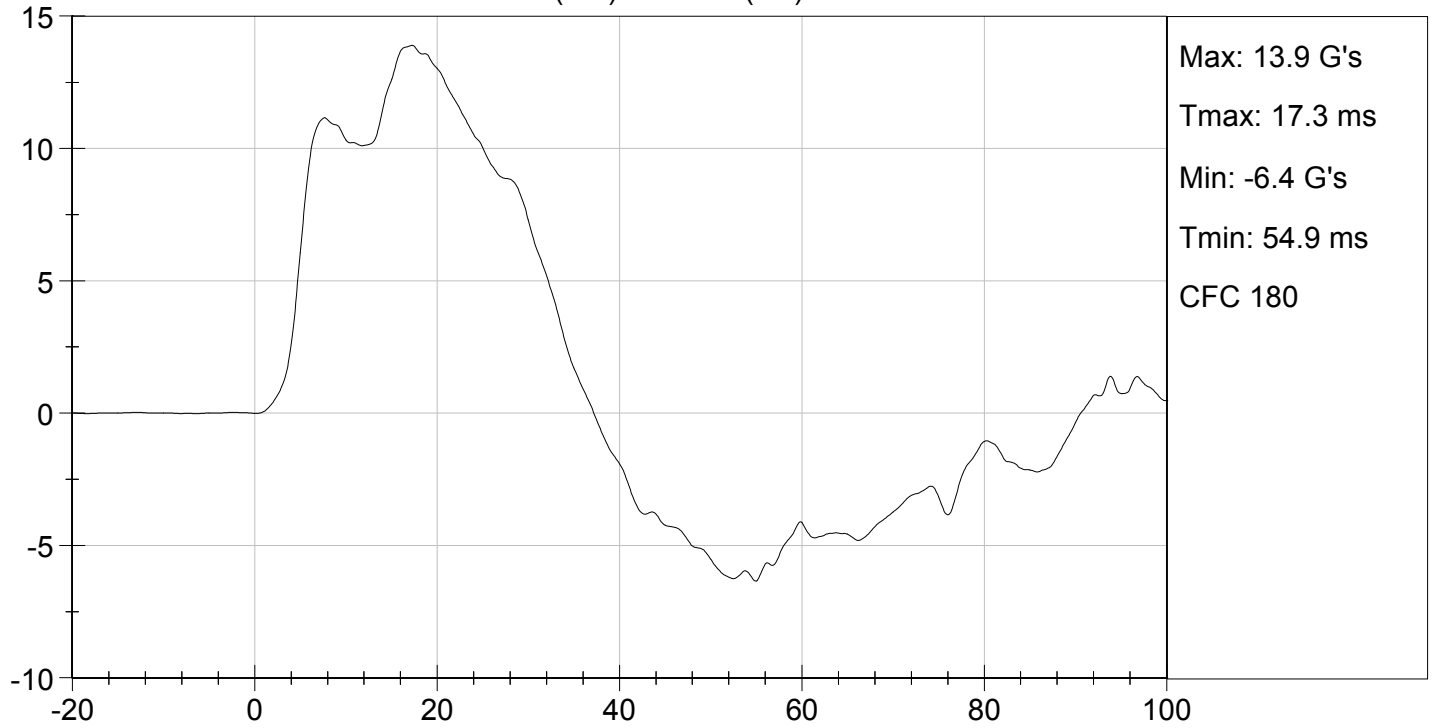




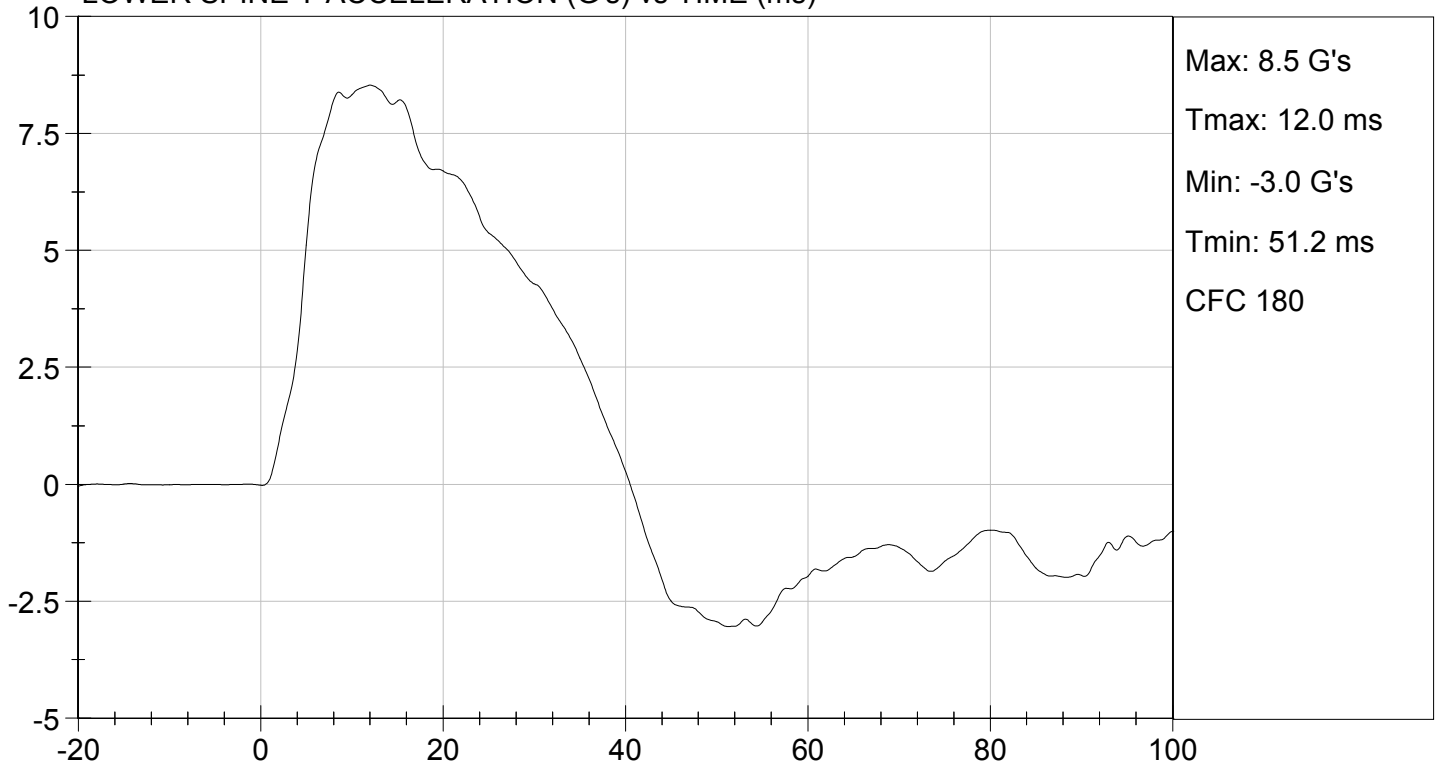
TEST DESC: THORAX IMPACT WITHOUT ARM  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 06/26/2013  
TEST #: D132035

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



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



**MGA RESEARCH CORPORATION**

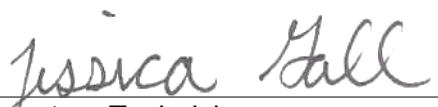
**ABDOMINAL IMPACT TEST**

**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132036

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                         | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Maximum Probe Acceleration       | G's   | 12 to 16      | 13     | Pass      |
| Upper Abdomen Rib Displacement   | mm    | 36 to 47      | 43     | Pass      |
| Lower Abdomen Rib Displacement   | mm    | 33 to 44      | 39     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 9 to 14       | 10     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

06/26/2013

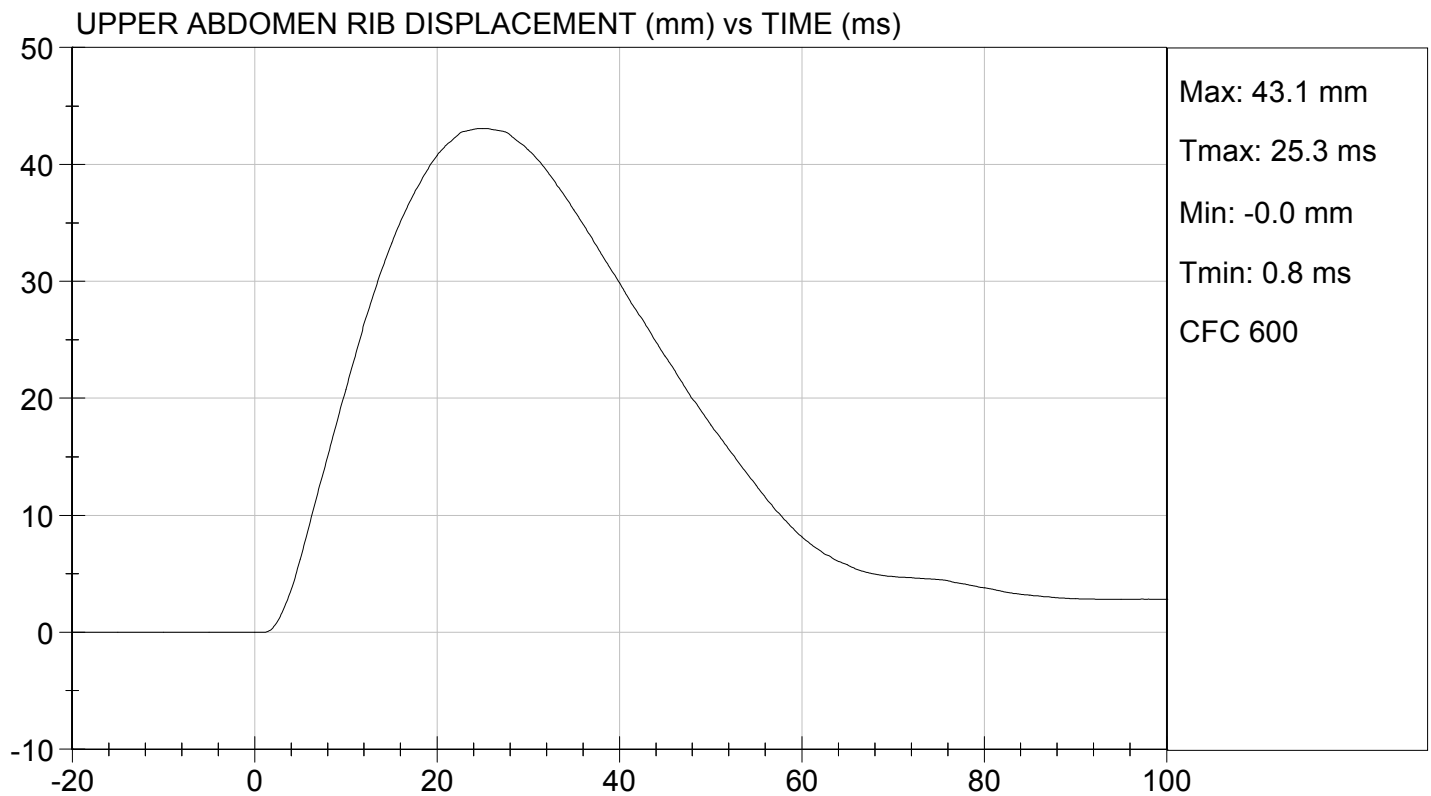
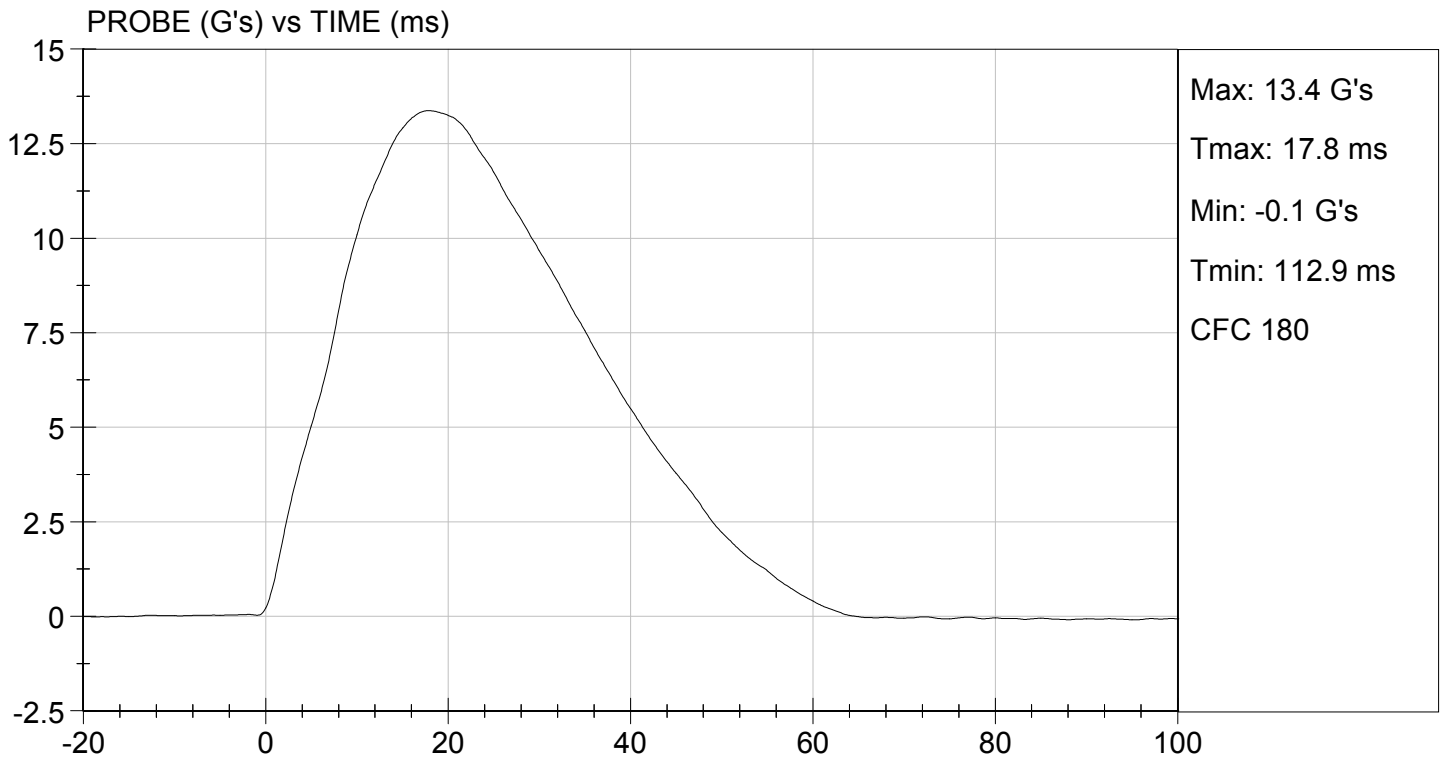
Test Date

  
Approved By



TEST DESC: ABDOMEN IMPACT  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 06/26/2013  
TEST #: D132036

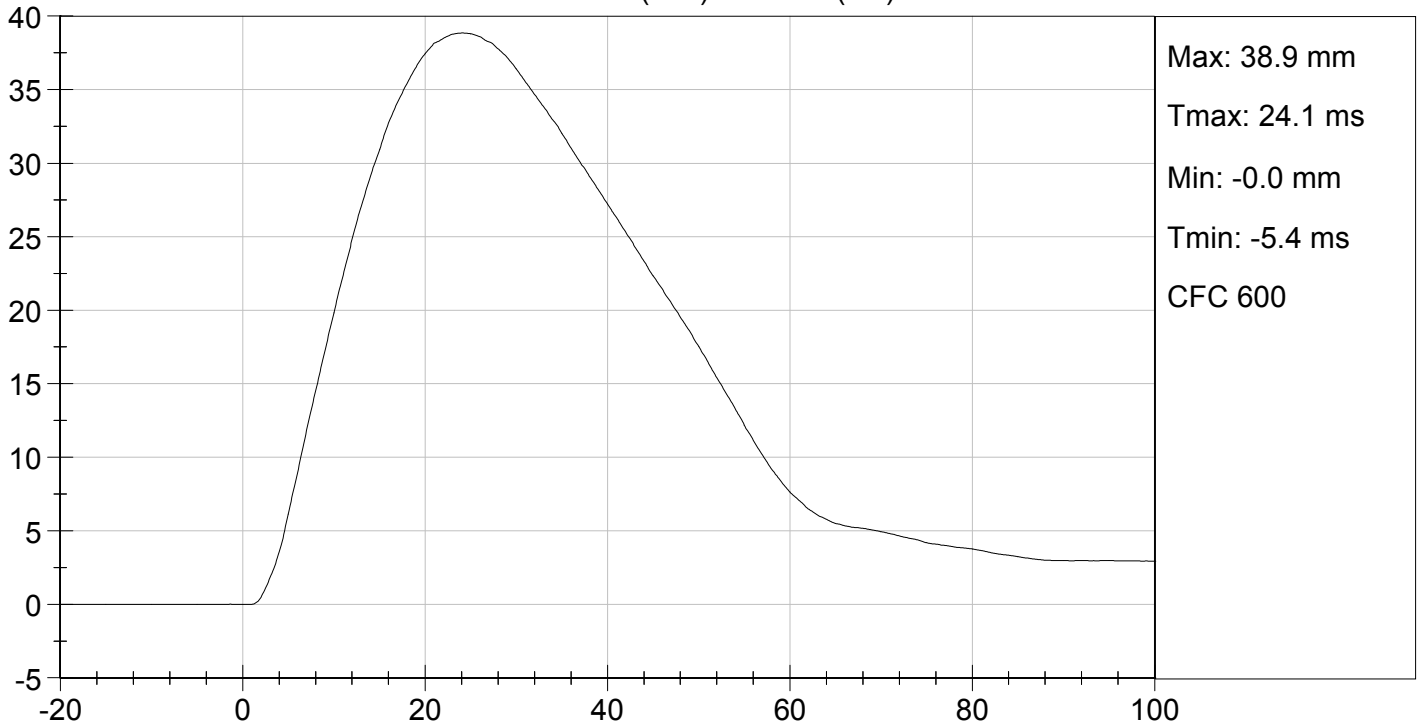




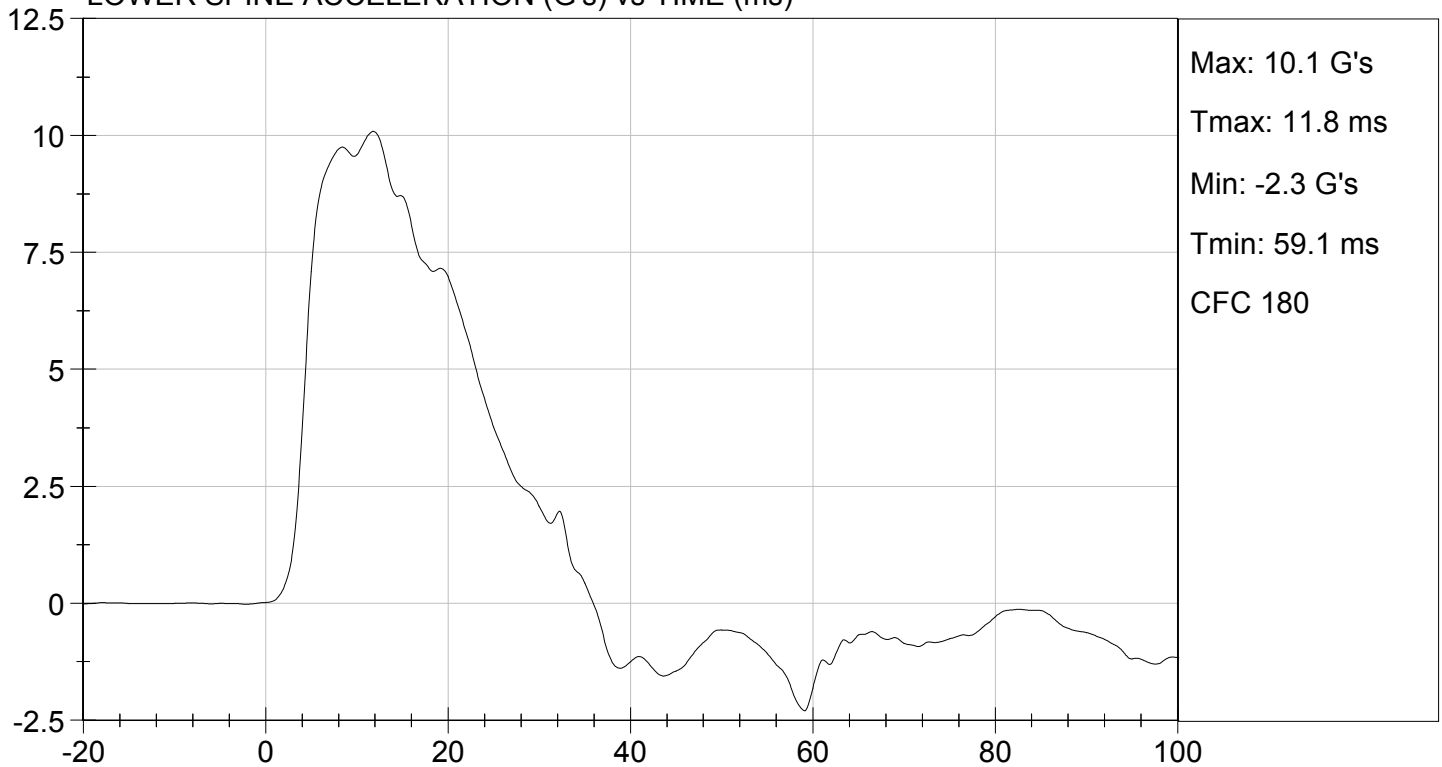
TEST DESC: ABDOMEN IMPACT  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 06/26/2013  
TEST #: D132036

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



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



**MGA RESEARCH CORPORATION**

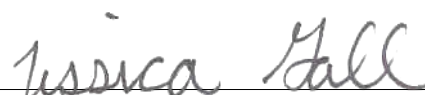
**PELVIS IMPACT TEST**

**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132037

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                         | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Maximum Probe Acceleration       | G's   | 38 to 47      | 43     | Pass      |
| Pelvis Y Acceleration After 6 ms | G's   | 34 to 42      | 38     | Pass      |
| Peak Acetabulum Force            | N     | 3600 to 4300  | 4,032  | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

06/26/2013

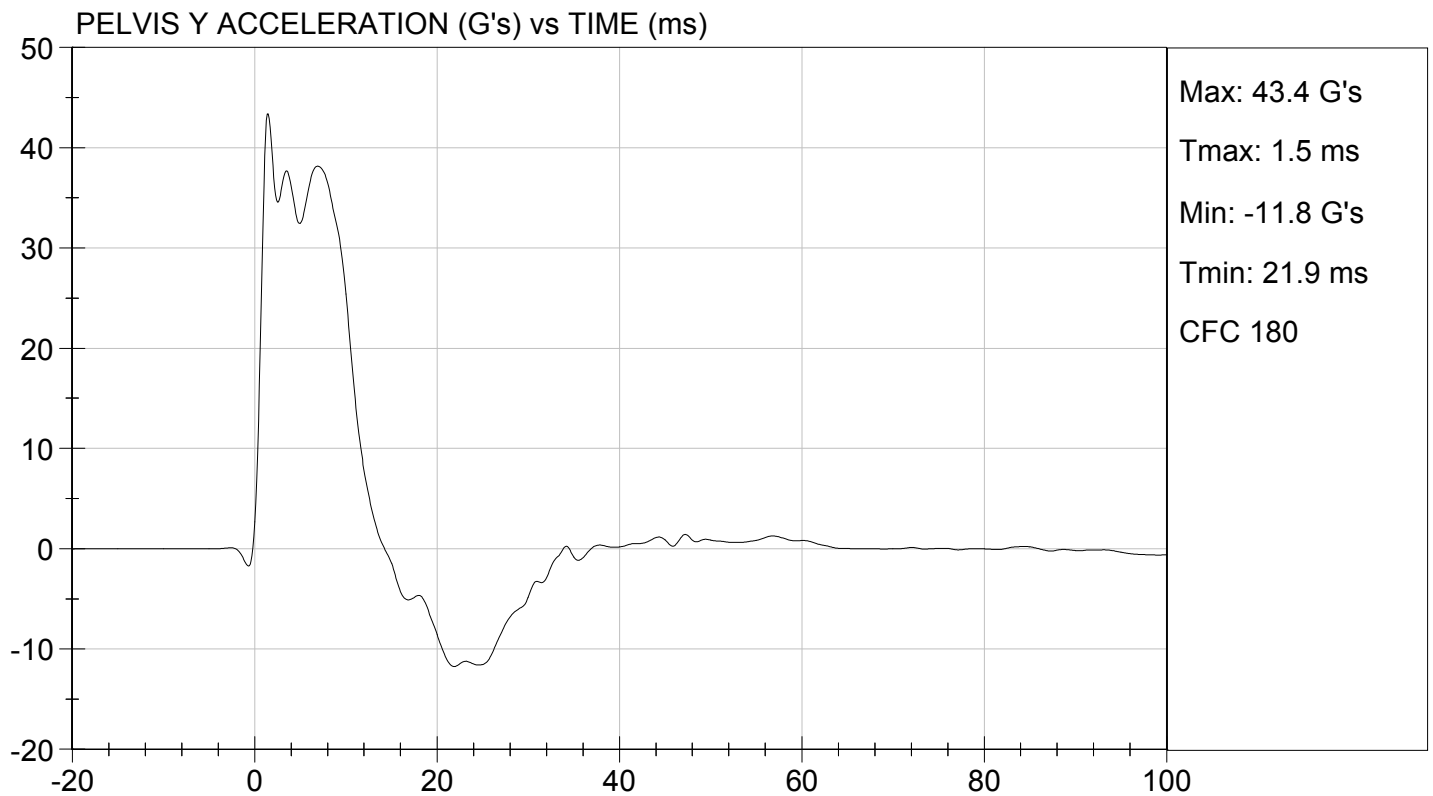
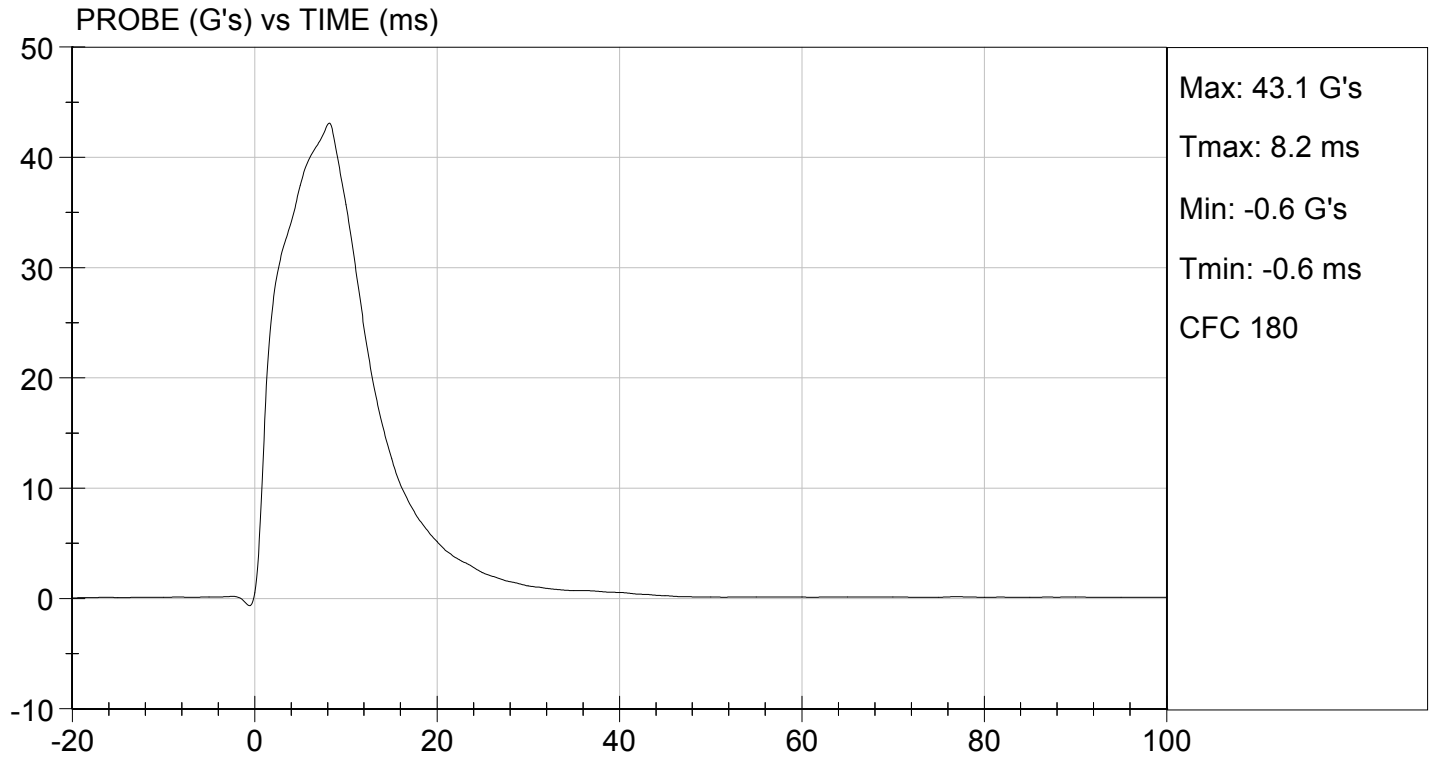
Test Date

  
Approved By



TEST DESC: PELVIS IMPACT  
VELOCITY: 22.22 ft/s, 6.77 m/s

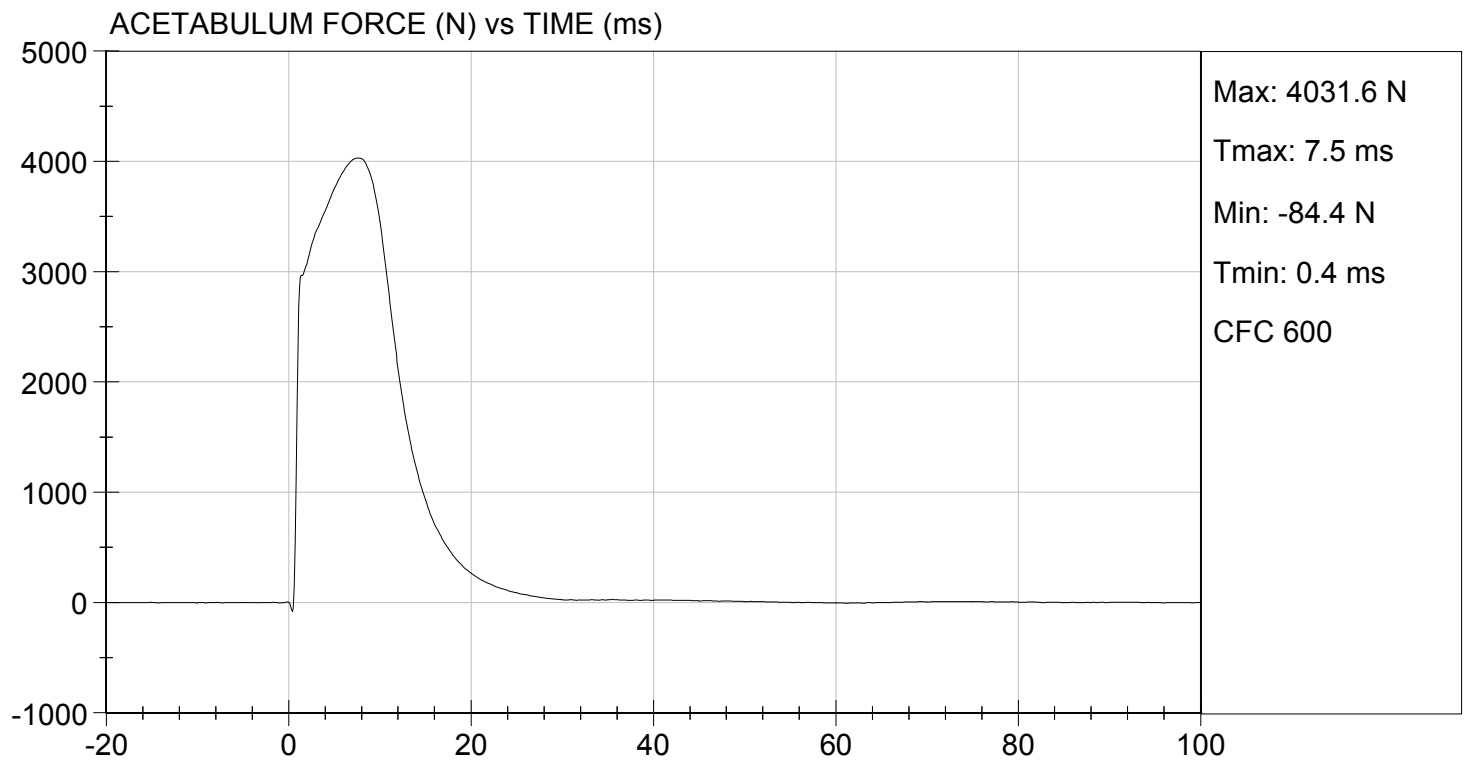
TEST DATE: 06/26/2013  
TEST #: D132037





TEST DESC: PELVIS IMPACT  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 06/26/2013  
TEST #: D132037



**MGA RESEARCH CORPORATION**

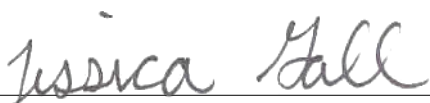
**ILIAC IMPACT TEST**

**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132038

| Tested Parameter           | Units | Specification | Result | Pass/Fail |
|----------------------------|-------|---------------|--------|-----------|
| Temperature                | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                   | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity            | m/s   | 4.20 to 4.40  | 4.23   | Pass      |
| Maximum Probe Acceleration | G's   | 36 to 45      | 40     | Pass      |
| Pelvis Y Acceleration      | G's   | 28 to 39      | 33     | Pass      |
| Peak Pelvis Iliac Force    | N     | 4100 to 5100  | 4,784  | Pass      |
| Overall Test Results       |       |               |        | Pass      |

  
Laboratory Technician

06/26/2013

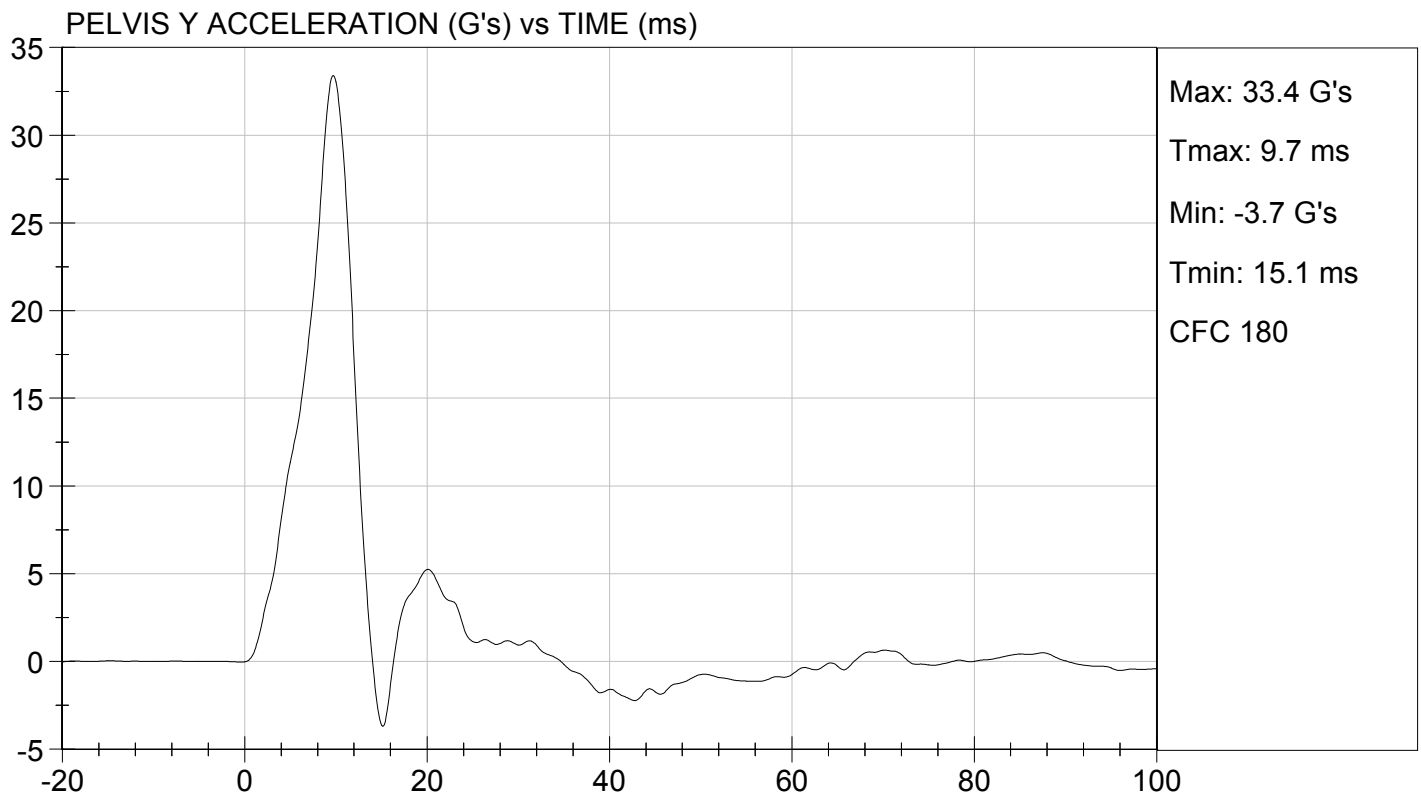
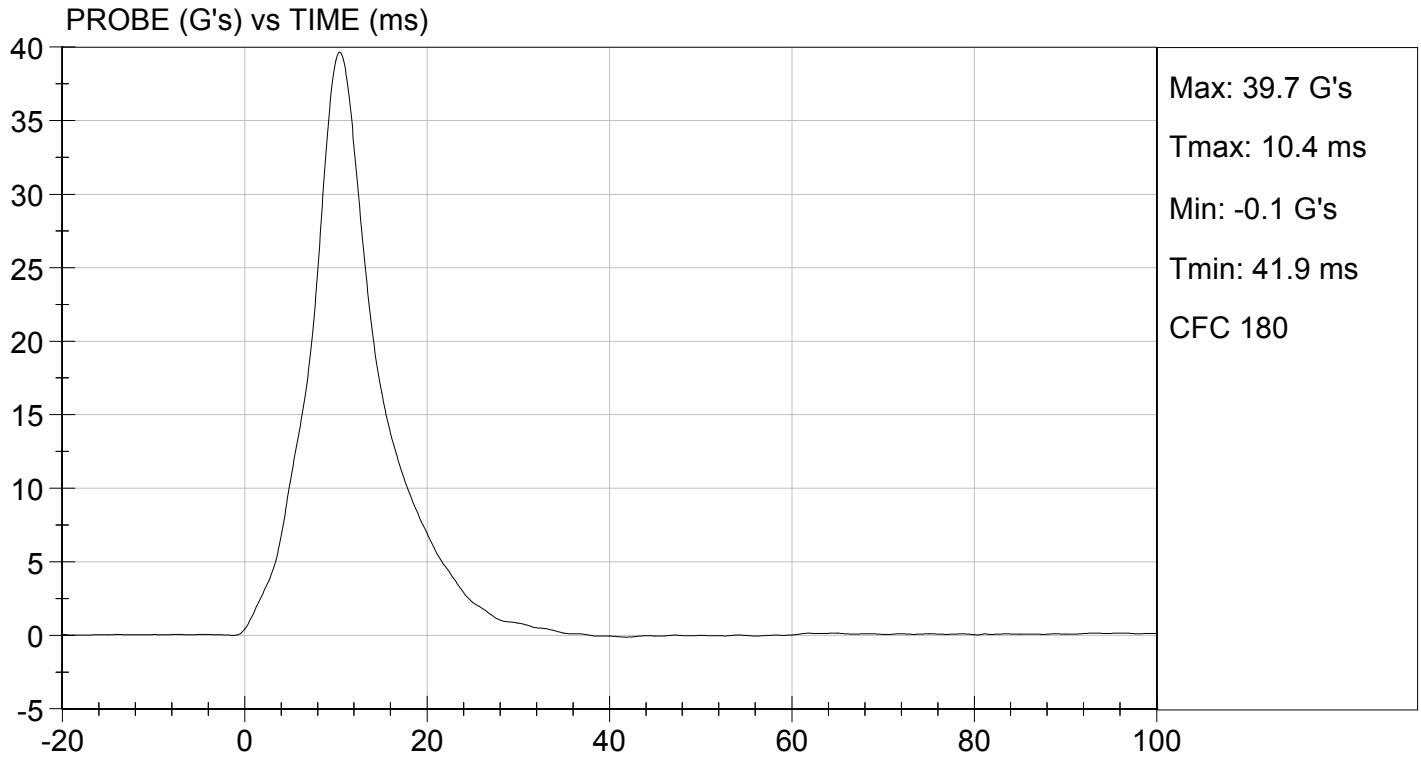
Test Date

  
Approved By



TEST DESC: ILLIAC  
VELOCITY: 13.89 ft/s, 4.23 m/s

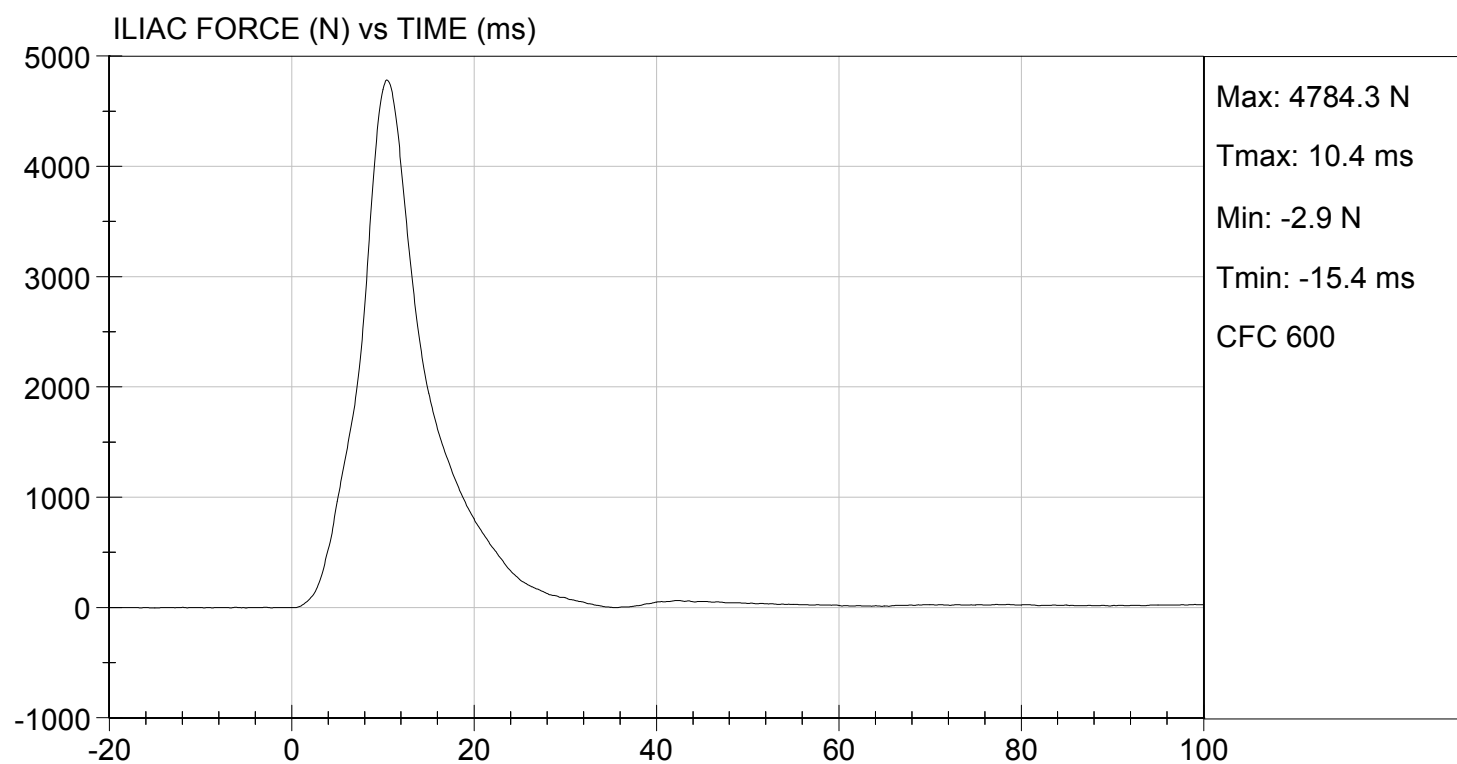
TEST DATE: 06/26/2013  
TEST #: D132038





TEST DESC: ILLIAC  
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 06/26/2013  
TEST #: D132038

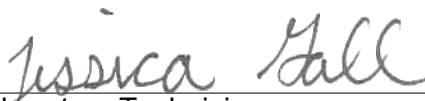


**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D132181

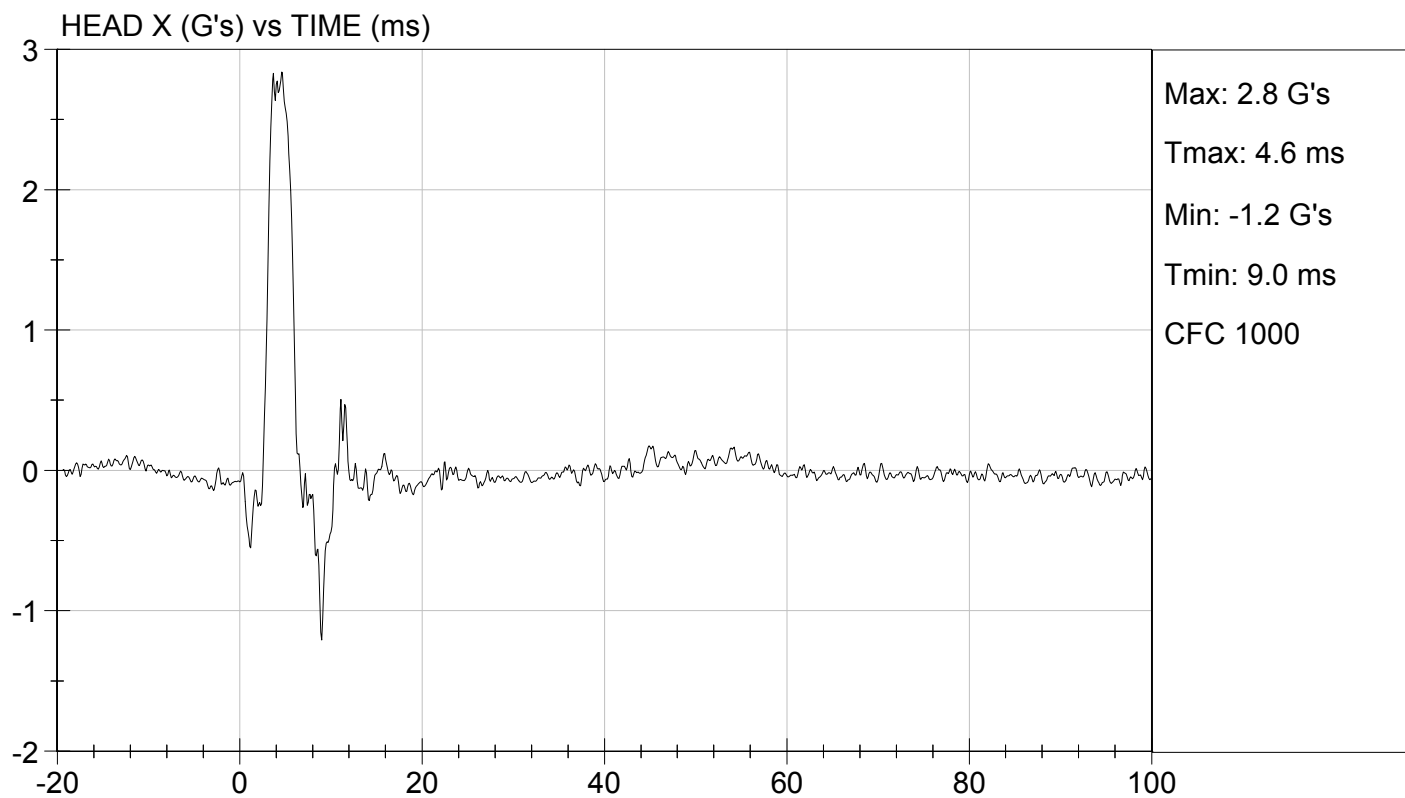
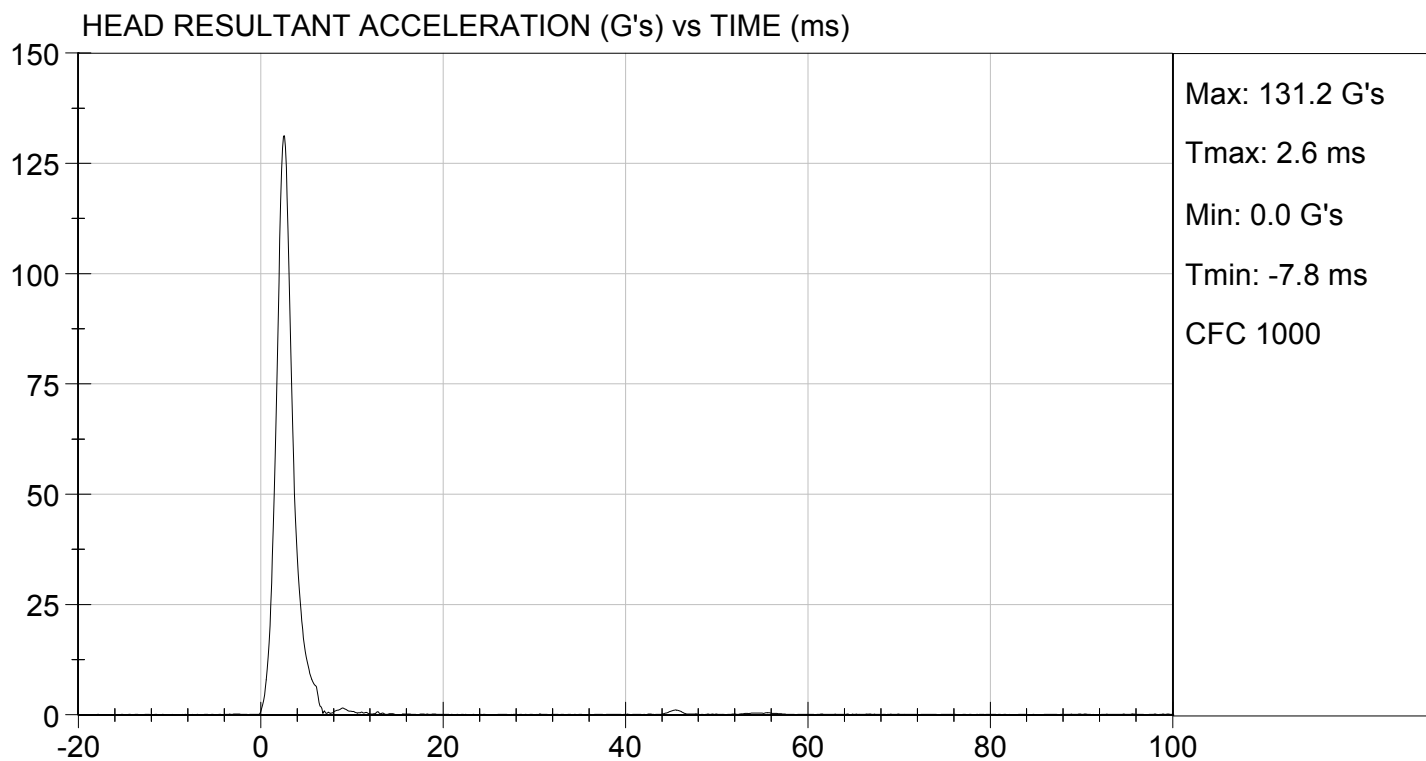
| Tested Parameter               | Units | Specification | Result               | Pass/Fail |
|--------------------------------|-------|---------------|----------------------|-----------|
| Laboratory Temperature         | deg C | 20.6 to 22.2  | 21.0                 | Pass      |
| Laboratory Relative Humidity   | %     | 10 to 70      | 50                   | Pass      |
| Peak Resultant Acceleration    | G's   | 115 to 137    | 131                  | Pass      |
| Peak Longitudinal Acceleration | G's   | +/- 15        | 2.8                  | Pass      |
| Unimodal                       | N/A   | Yes           | Yes                  | Pass      |
| Oscillations                   | N/A   | <15%          | Yes                  | Pass      |
|                                |       |               | Overall Test Results | Pass      |

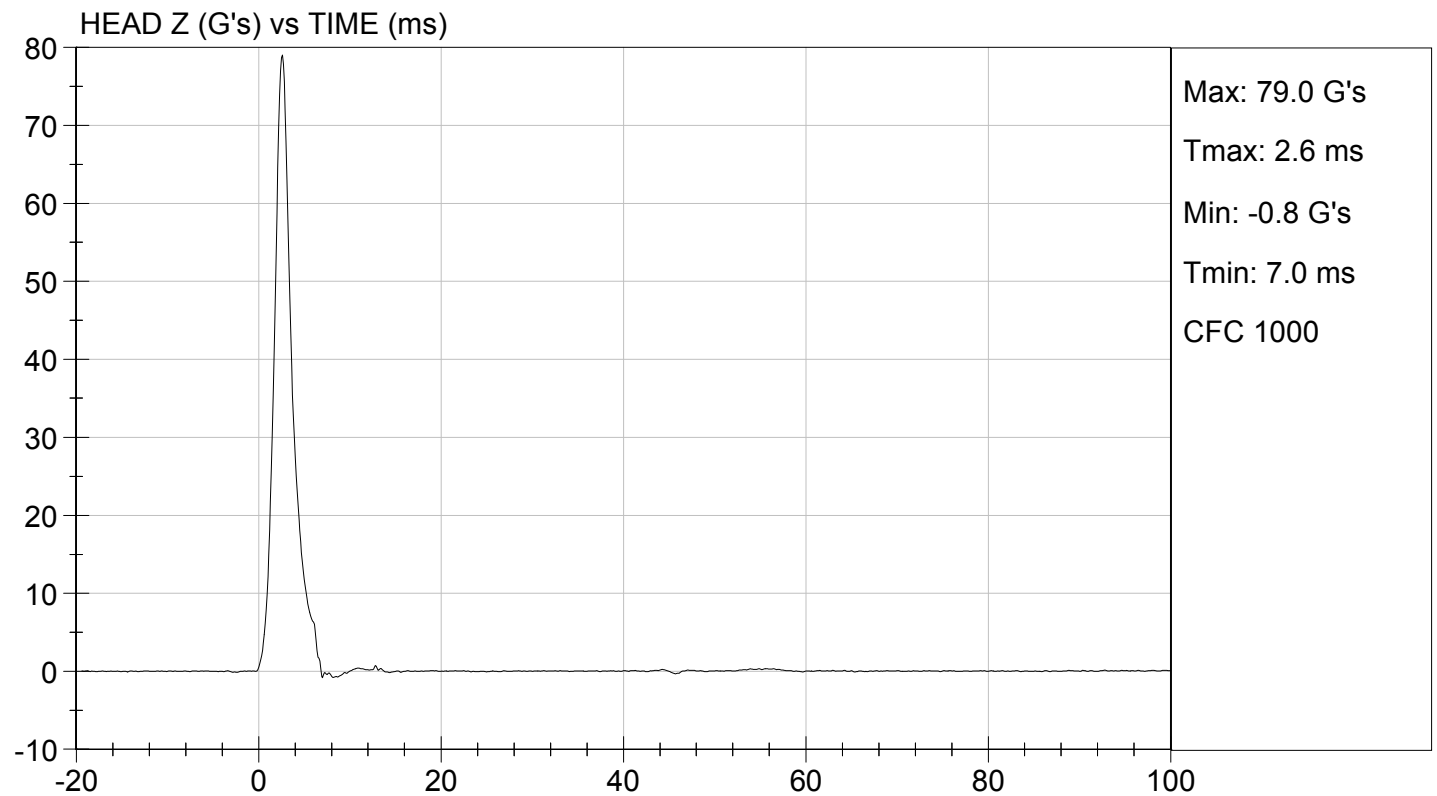
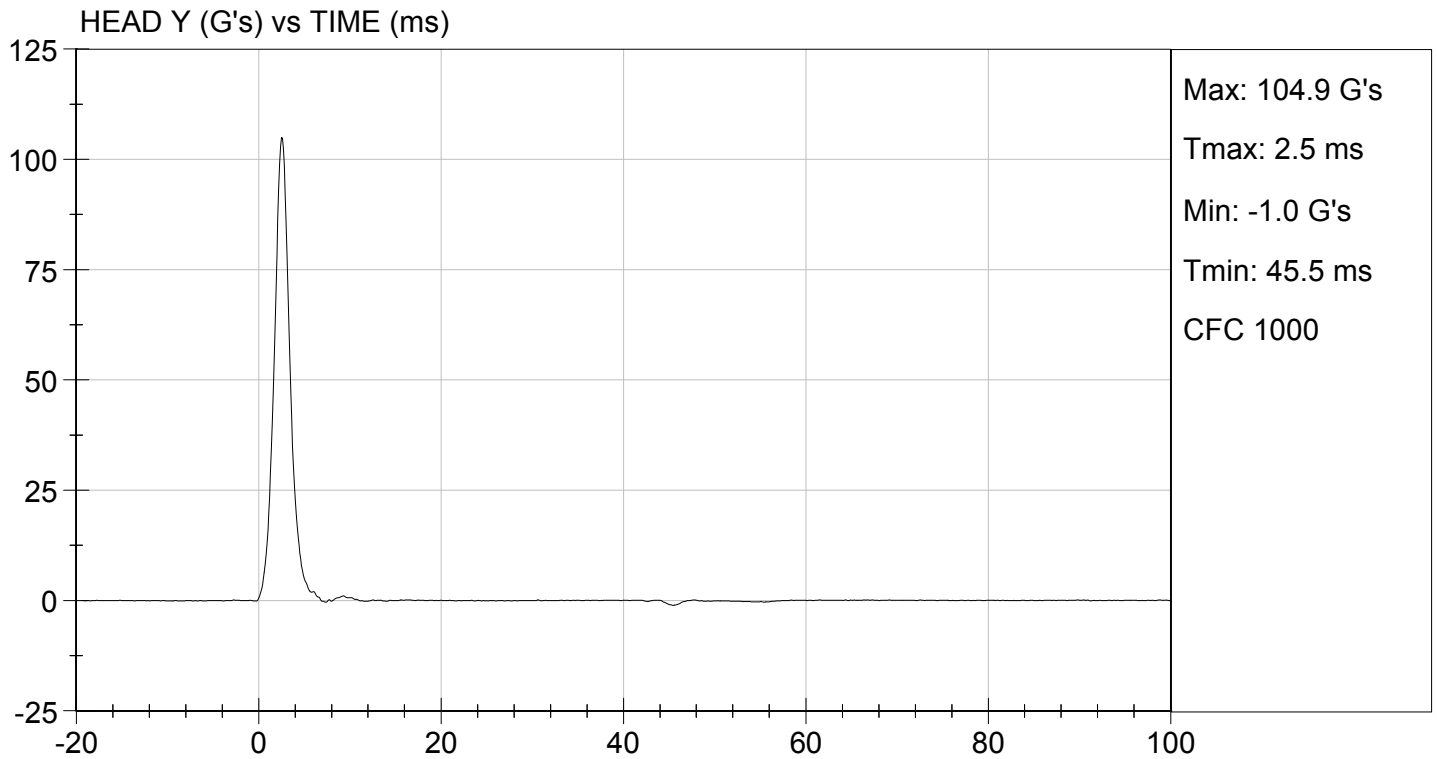
  
Laboratory Technician

07/08/2013

Test Date

  
Approved By



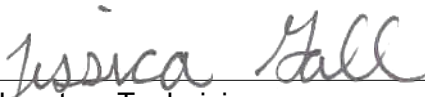


**MGA RESEARCH CORPORATION**  
**LATERAL NECK PENDULUM TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132182

| Tested Parameter                 |           | Units | Specification | Result | Pass/Fail |
|----------------------------------|-----------|-------|---------------|--------|-----------|
| Temperature                      |           | deg C | 20.6 to 22.2  | 21.2   | Pass      |
| Humidity                         |           | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  |           | m/s   | 5.51 to 5.63  | 5.58   | Pass      |
| Pendulum Velocity                | 10 ms     | m/s   | 2.20 to 2.80  | 2.46   | Pass      |
|                                  | 15 ms     | m/s   | 3.30 to 4.10  | 3.56   | Pass      |
|                                  | 20 ms     | m/s   | 4.40 to 5.40  | 4.66   | Pass      |
|                                  | 25 ms     | m/s   | 5.40 to 6.10  | 5.49   | Pass      |
|                                  | 25-100 ms | m/s   | 5.50 to 6.20  | 5.60   | Pass      |
| Maximum D-Plane Rotation         |           | deg   | 71 to 81      | 71     | Pass      |
| Time of Maximum D-Plane Rotation |           | ms    | 50 to 70      | 61     | Pass      |
| Maximum Occipital Condyle Moment |           | Nm    | -44 to -36    | -40    | Pass      |
| Time of Moment Decay to 0 Nm     |           | ms    | 102 to 126    | 112    | Pass      |
| Overall Test Results             |           |       |               |        | Pass      |

  
 Laboratory Technician

07/08/2013

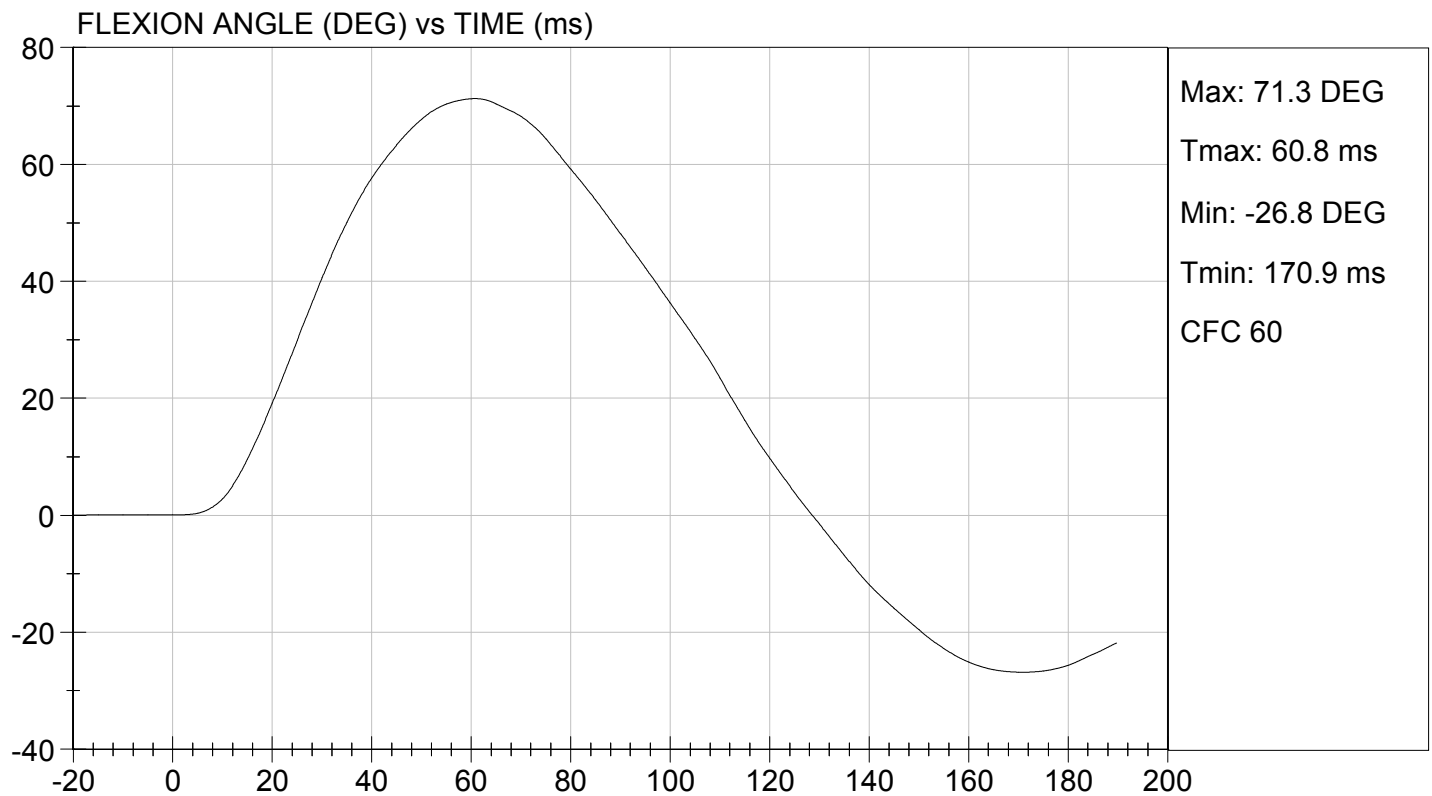
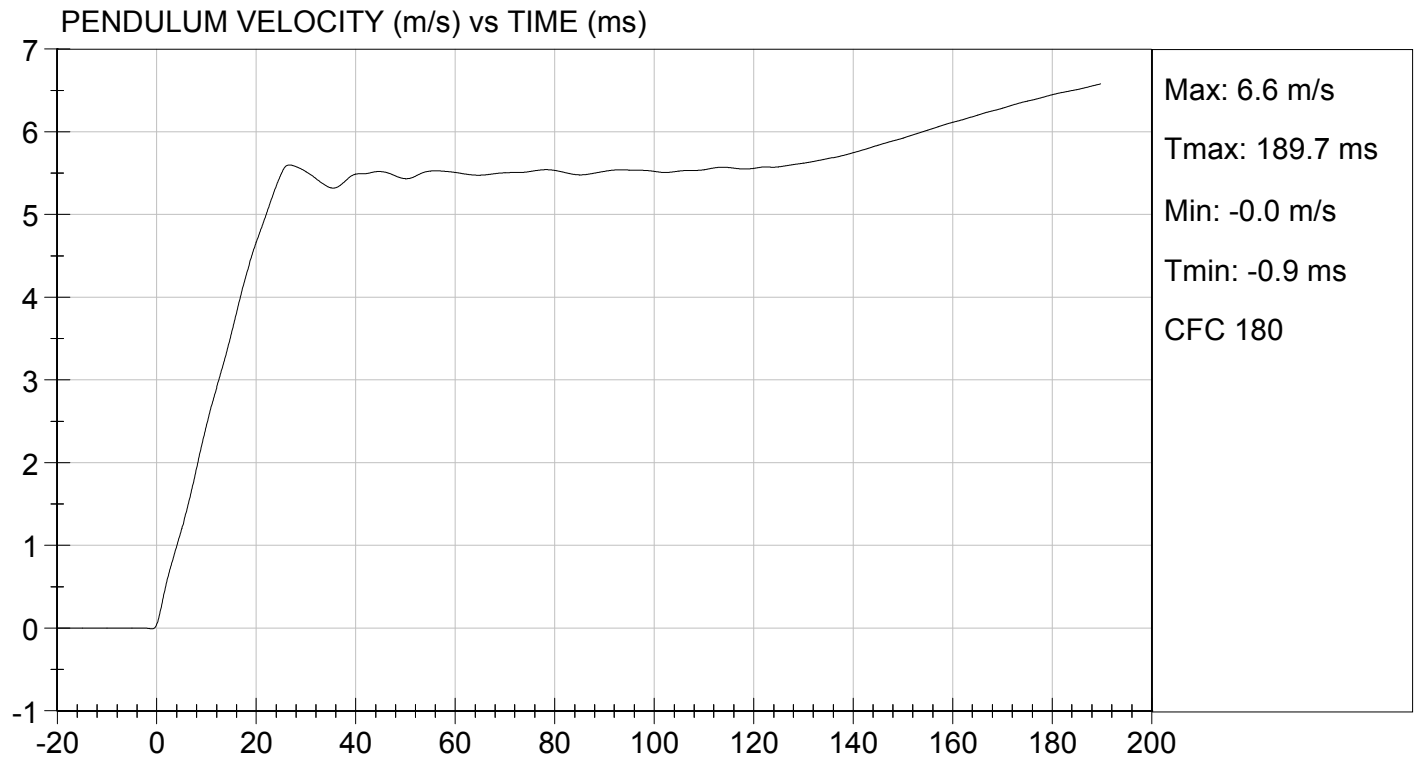
Test Date

  
 Approved By



TEST DESC: NECK BENDING  
VELOCITY: 18.31 ft/s, 5.58 m/s

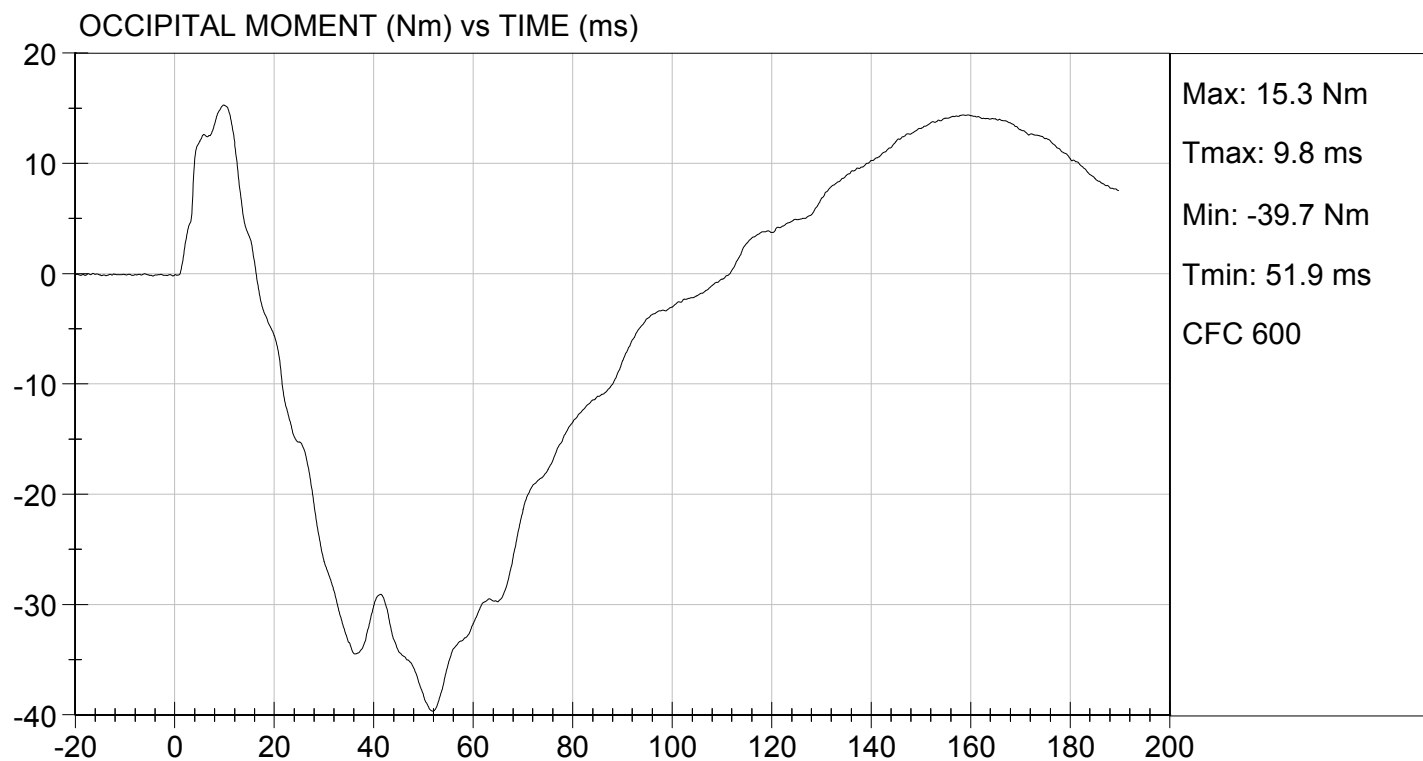
TEST DATE: 07/08/2013  
TEST #: D132182





TEST DESC: NECK BENDING  
VELOCITY: 18.31 ft/s, 5.58 m/s

TEST DATE: 07/08/2013  
TEST #: D132182



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

**ATD Serial No:** 296

**Test ID:** D132183

| Tested Parameter                | Units | Specification | Result | Pass/Fail |
|---------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature          | deg C | 20.6 to 22.2  | 21.1   | Pass      |
| Laboratory Relative Humidity    | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity                 | m/s   | 4.20 to 4.40  | 4.34   | Pass      |
| Maximum Probe Acceleration      | G's   | 13 to 18      | 15     | Pass      |
| Shoulder Displacement           | mm    | 28 to 37      | 32     | Pass      |
| Upper Spine (T1) Y Acceleration | G's   | 17 to 22      | 18     | Pass      |
| Overall Test Results            |       |               | Pass   |           |

  
Laboratory Technician

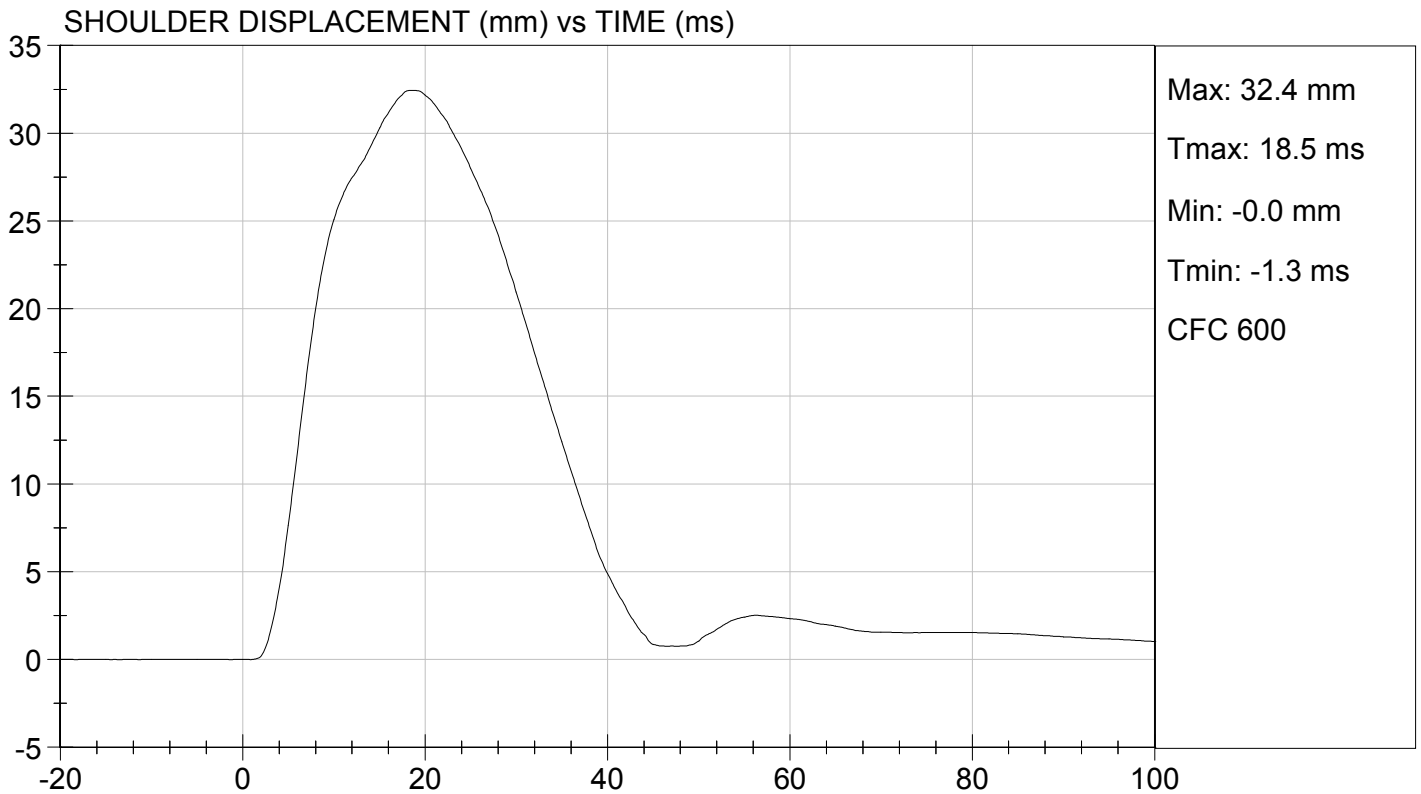
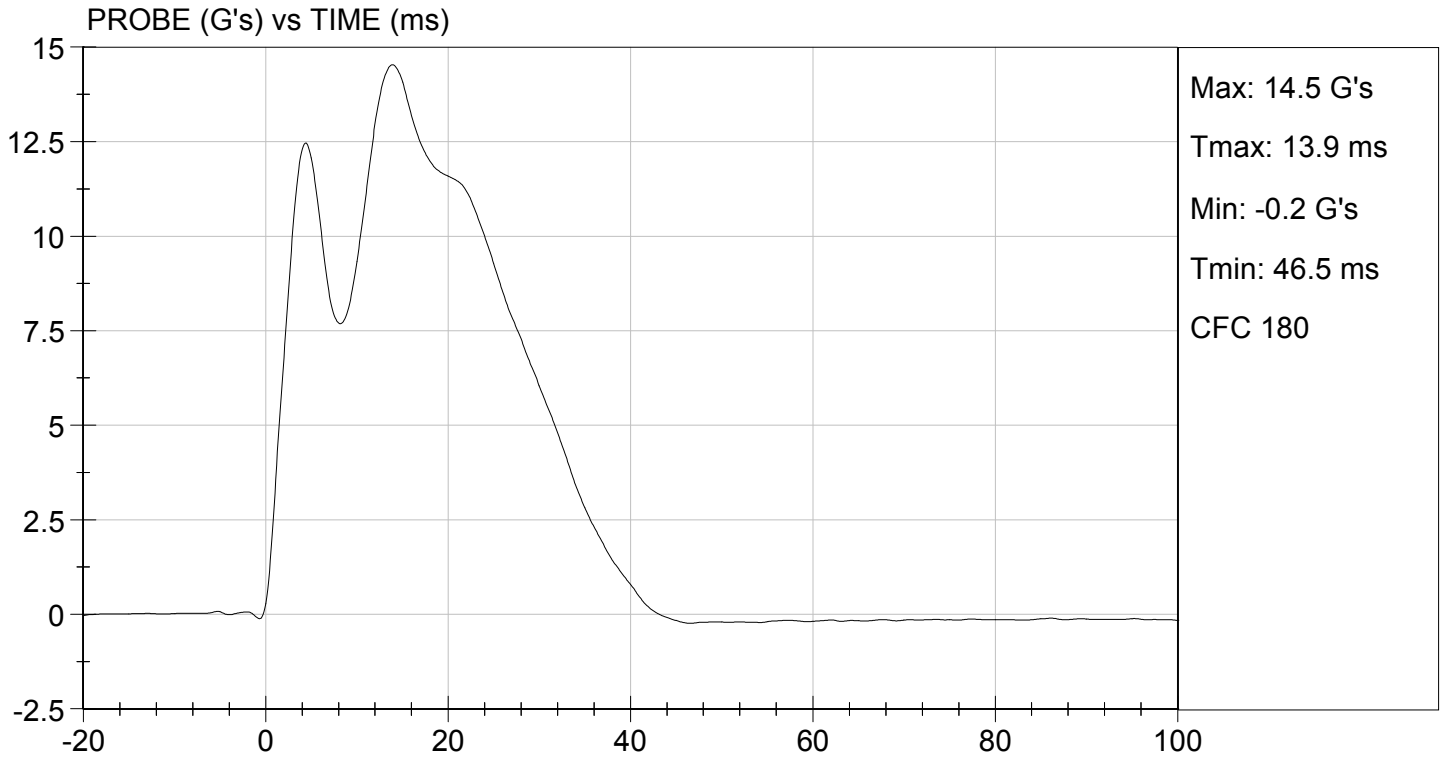
07/08/2013  
Test Date

  
Approved By



TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.25 ft/s, 4.34 m/s

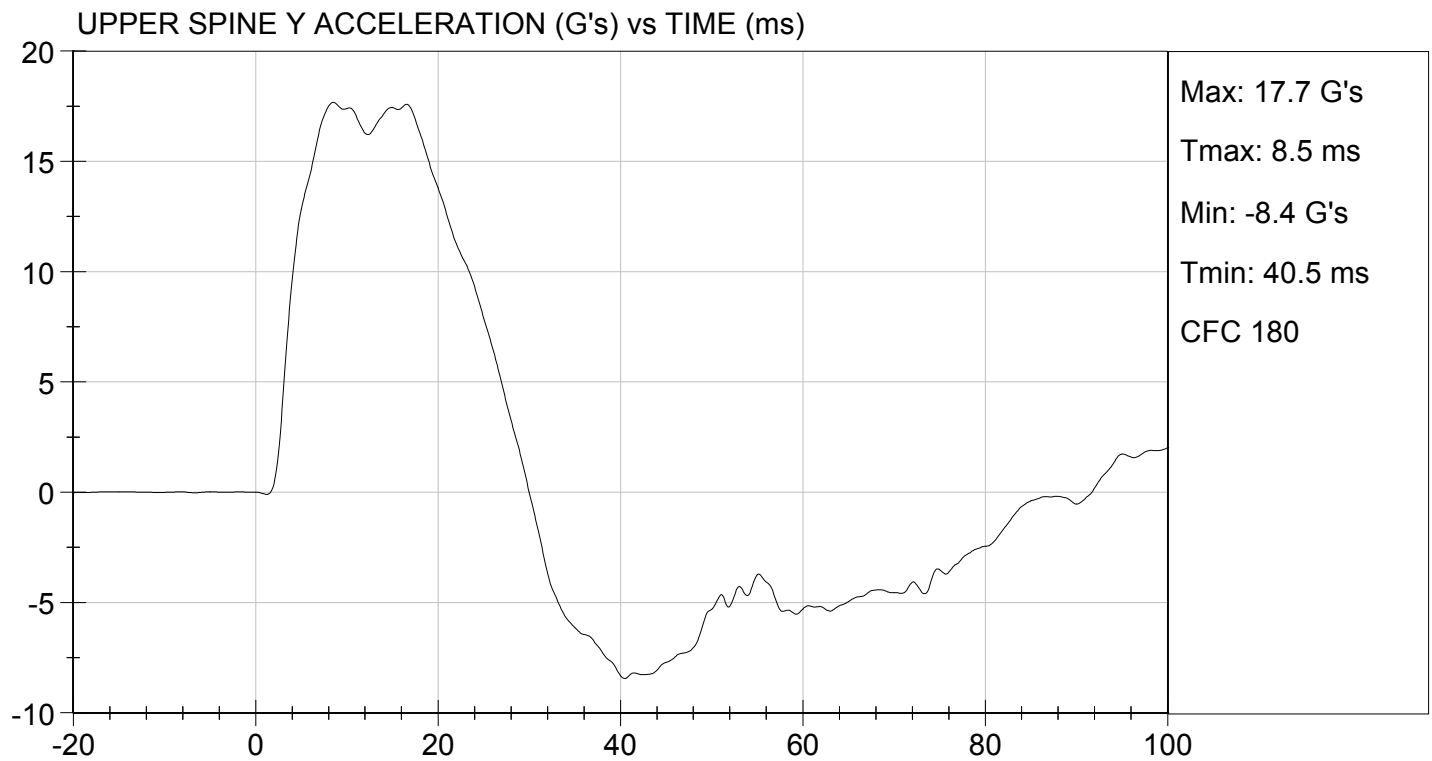
TEST DATE: 07/08/2013  
TEST #: D132183





TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 07/08/2013  
TEST #: D132183

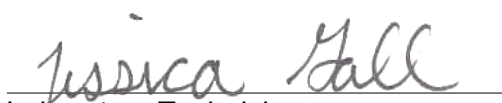


**MGA RESEARCH CORPORATION**  
**THORAX (WITH ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132184

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.1   | Pass      |
| Humidity                         | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Maximum Probe Acceleration       | G's   | 30 to 36      | 30     | Pass      |
| Shoulder Displacement            | mm    | 31 to 40      | 37     | Pass      |
| Upper Rib Displacement           | mm    | 25 to 32      | 29     | Pass      |
| Middle Rib Displacement          | mm    | 30 to 36      | 32     | Pass      |
| Lower Rib Displacement           | mm    | 32 to 38      | 35     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 34 to 43      | 35     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 29 to 37      | 35     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

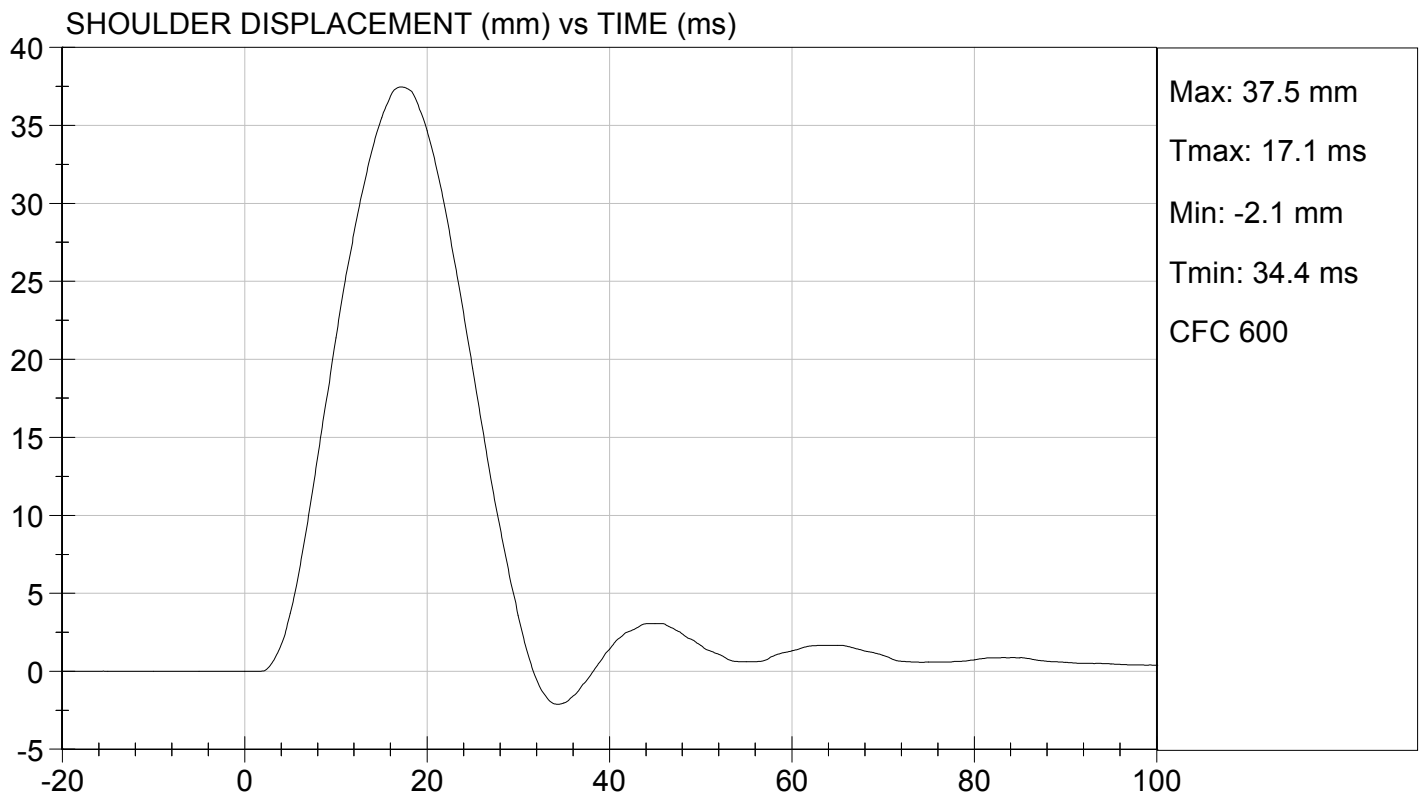
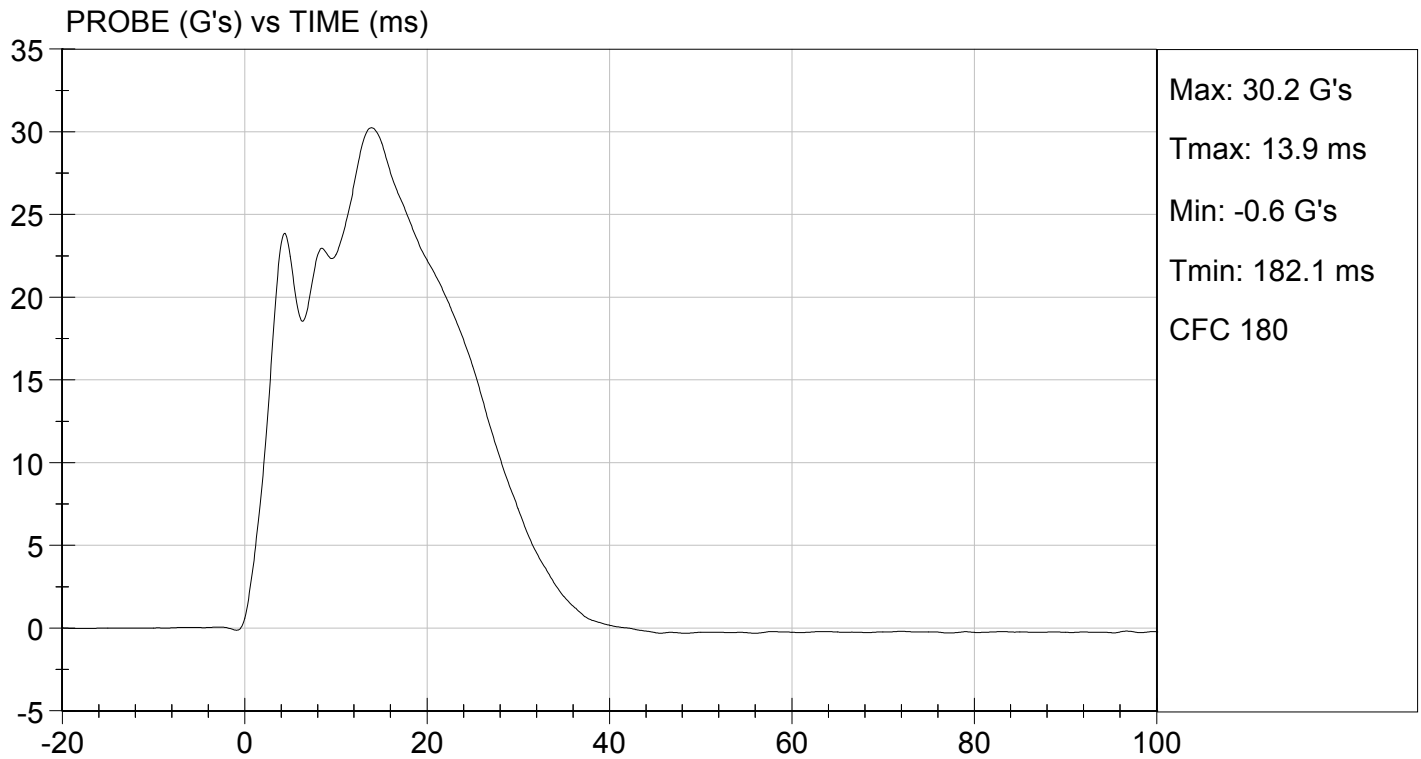
07/08/2013  
Test Date

  
Approved By



TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

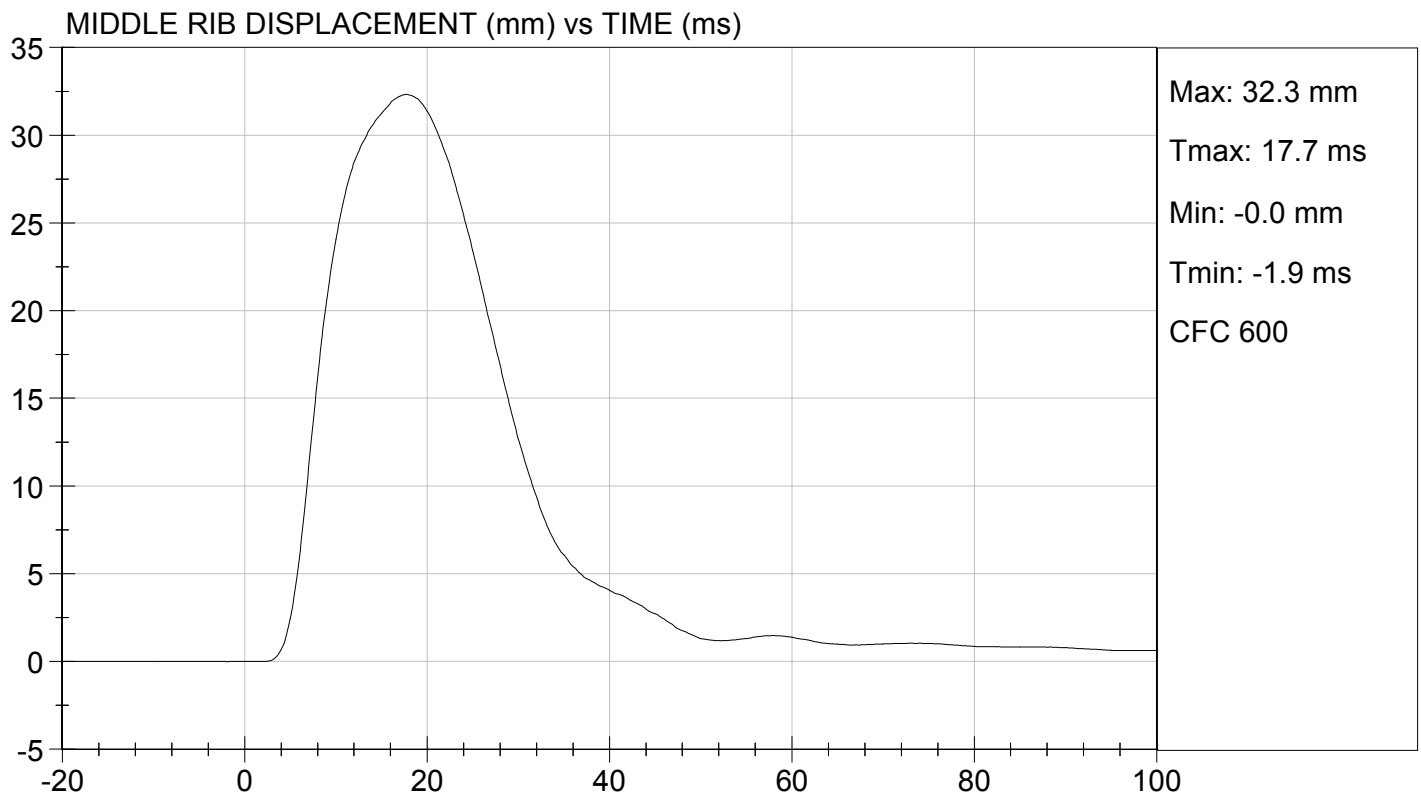
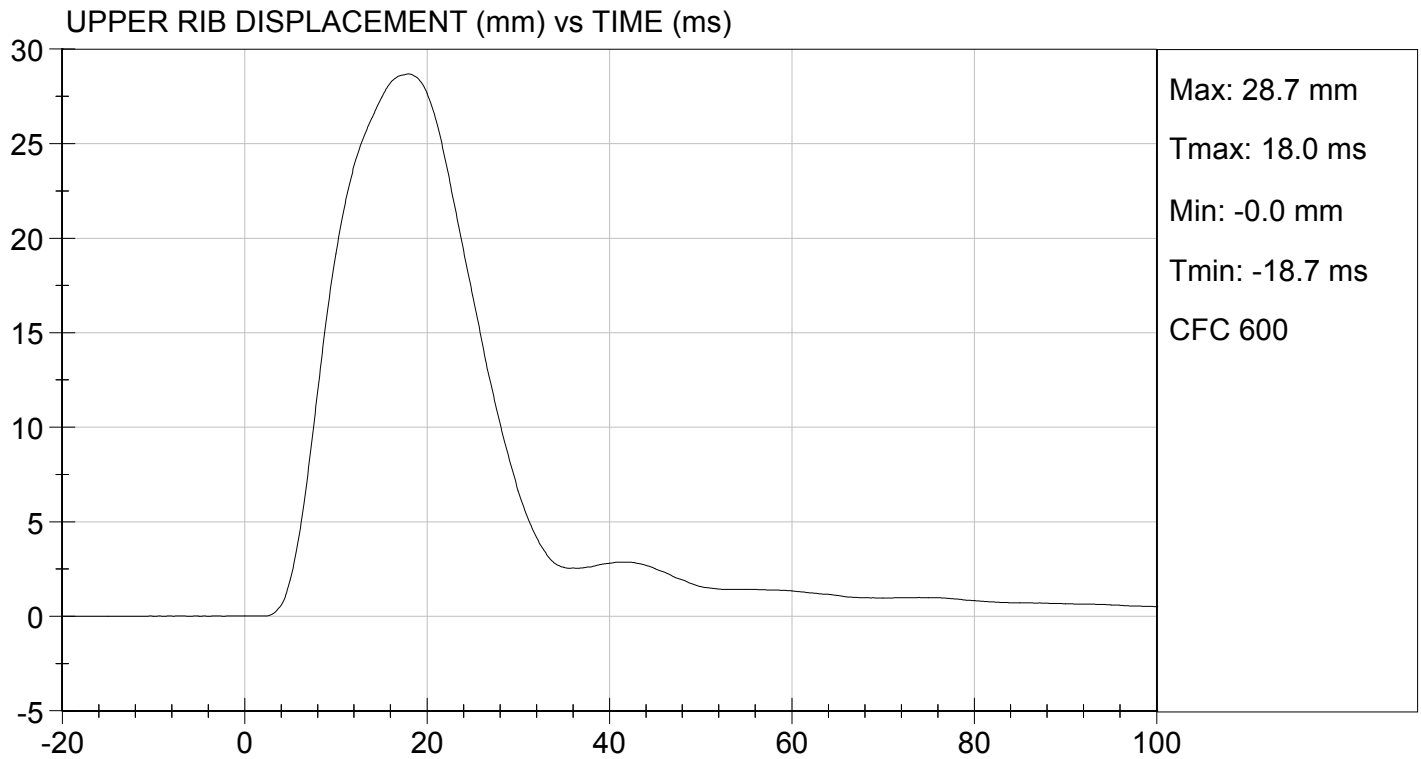
TEST DATE: 07/08/2013  
TEST #: D132184





TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 07/08/2013  
TEST #: D132184

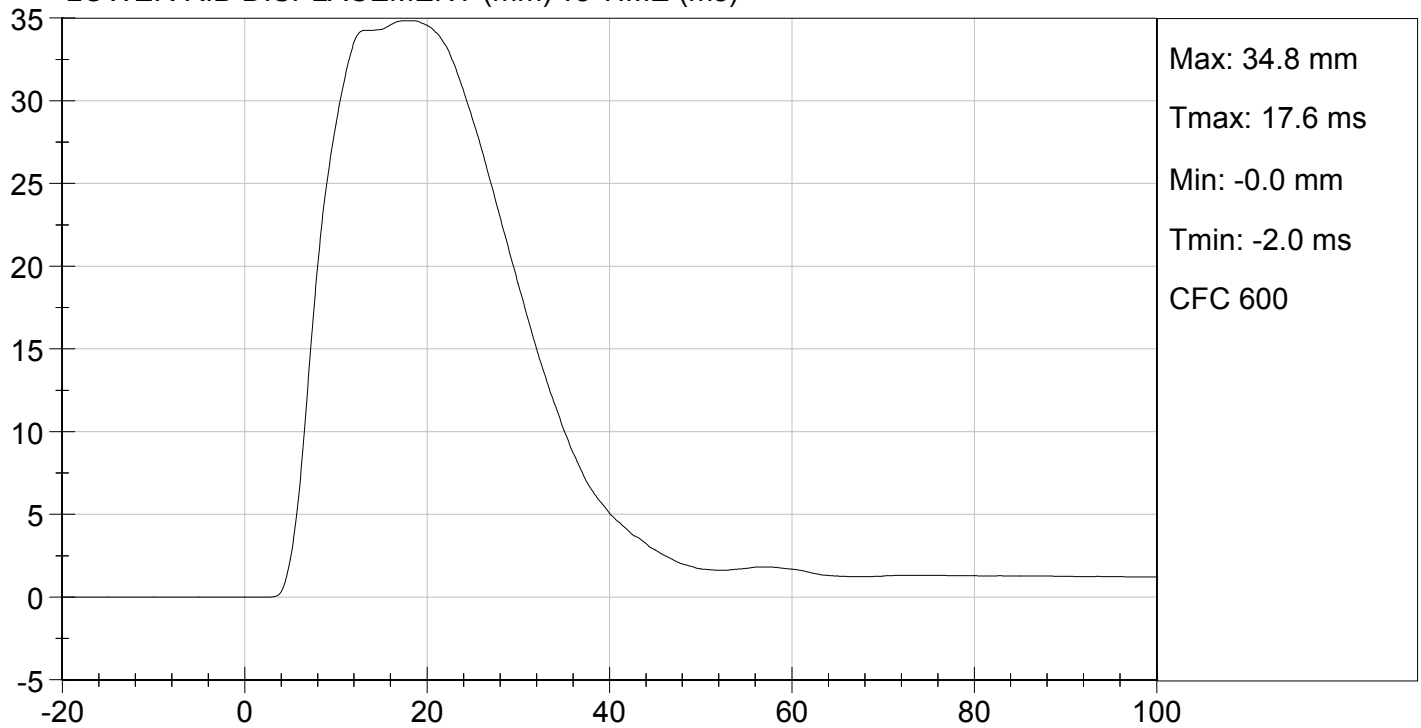




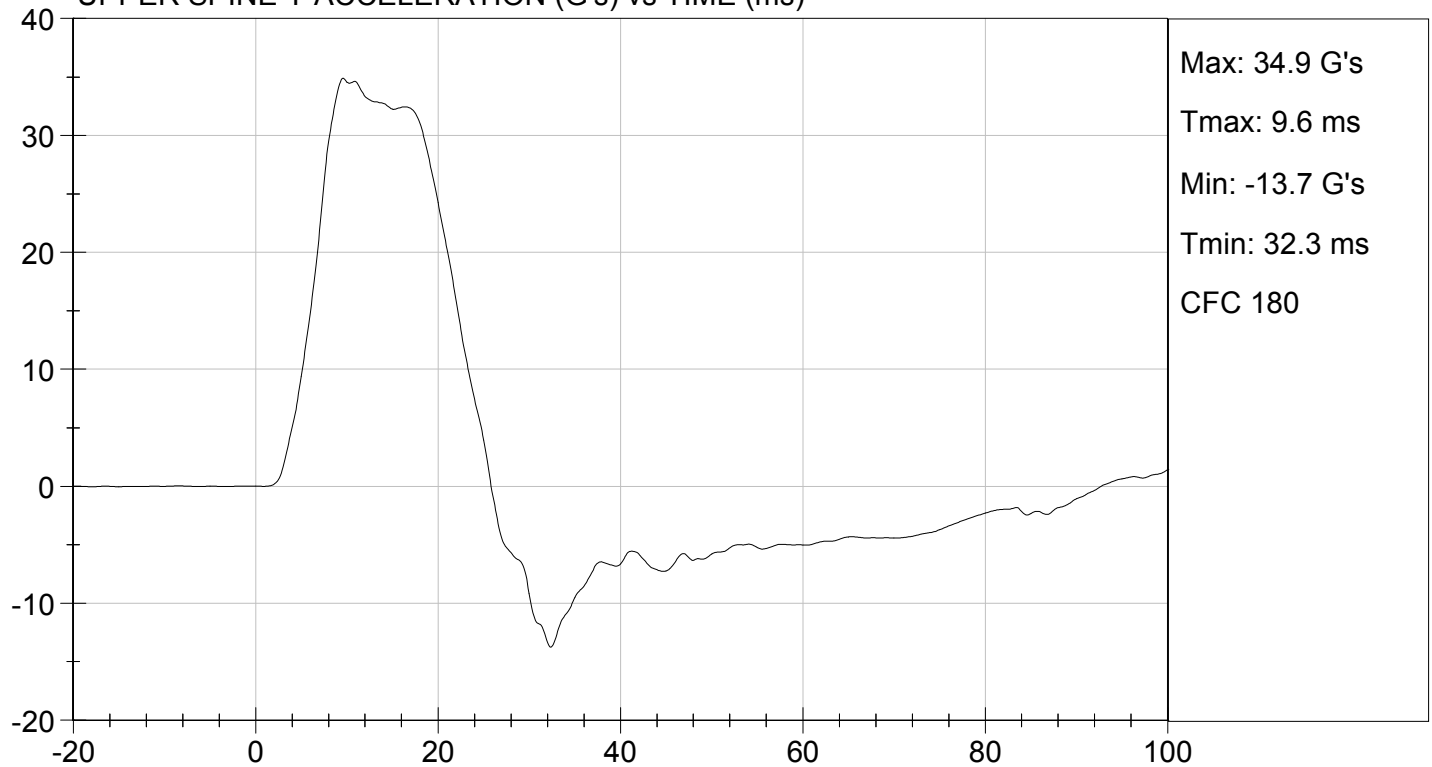
TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 07/08/2013  
TEST #: D132184

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



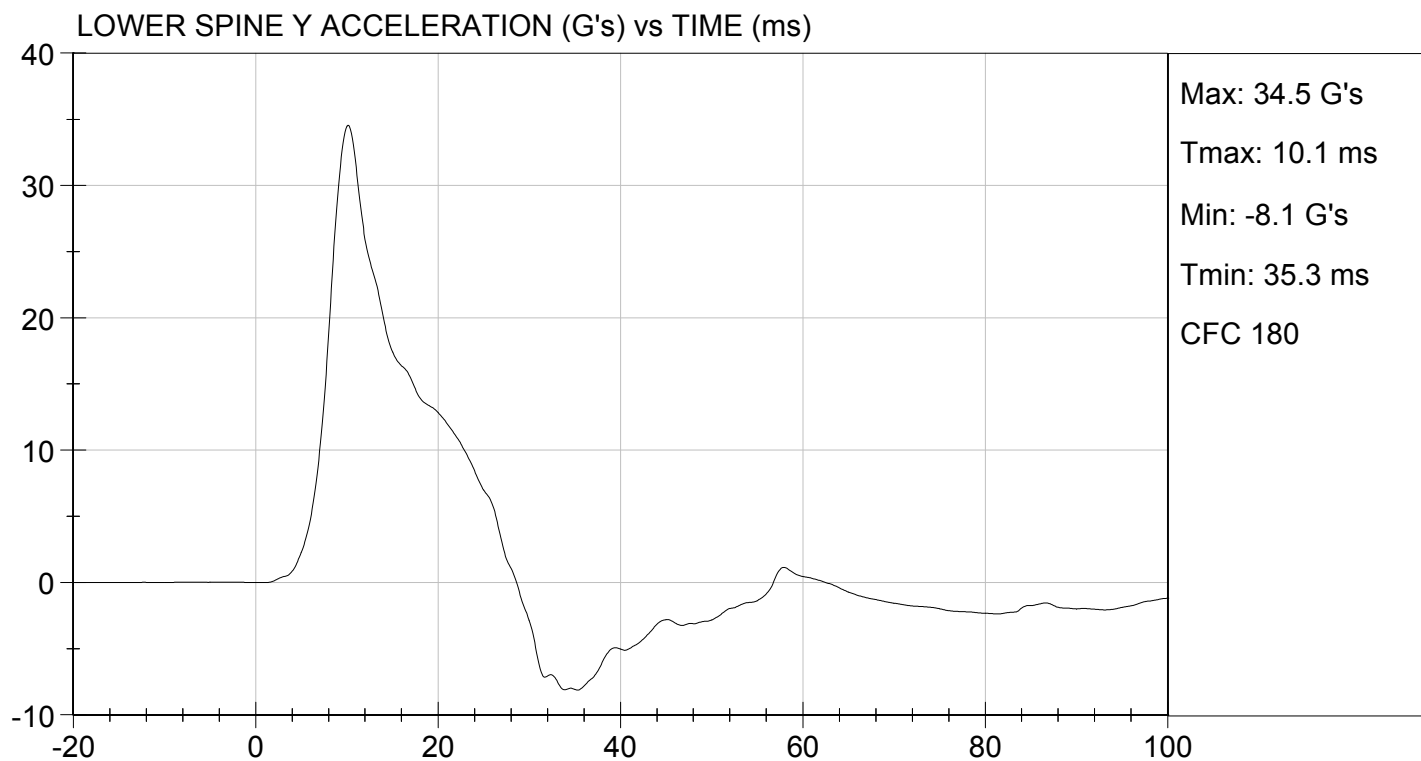
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





TEST DESC: THORAX IMPACT WITH ARM  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 07/08/2013  
TEST #: D132184

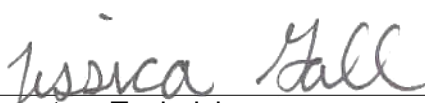


**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132185

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.1   | Pass      |
| Humidity                         | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Maximum Probe Acceleration       | G's   | 14 to 18      | 14     | Pass      |
| Upper Rib Displacement           | mm    | 32 to 40      | 39     | Pass      |
| Middle Rib Displacement          | mm    | 39 to 45      | 43     | Pass      |
| Lower Rib Displacement           | mm    | 35 to 43      | 40     | 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      |

  
 Laboratory Technician

07/08/2013

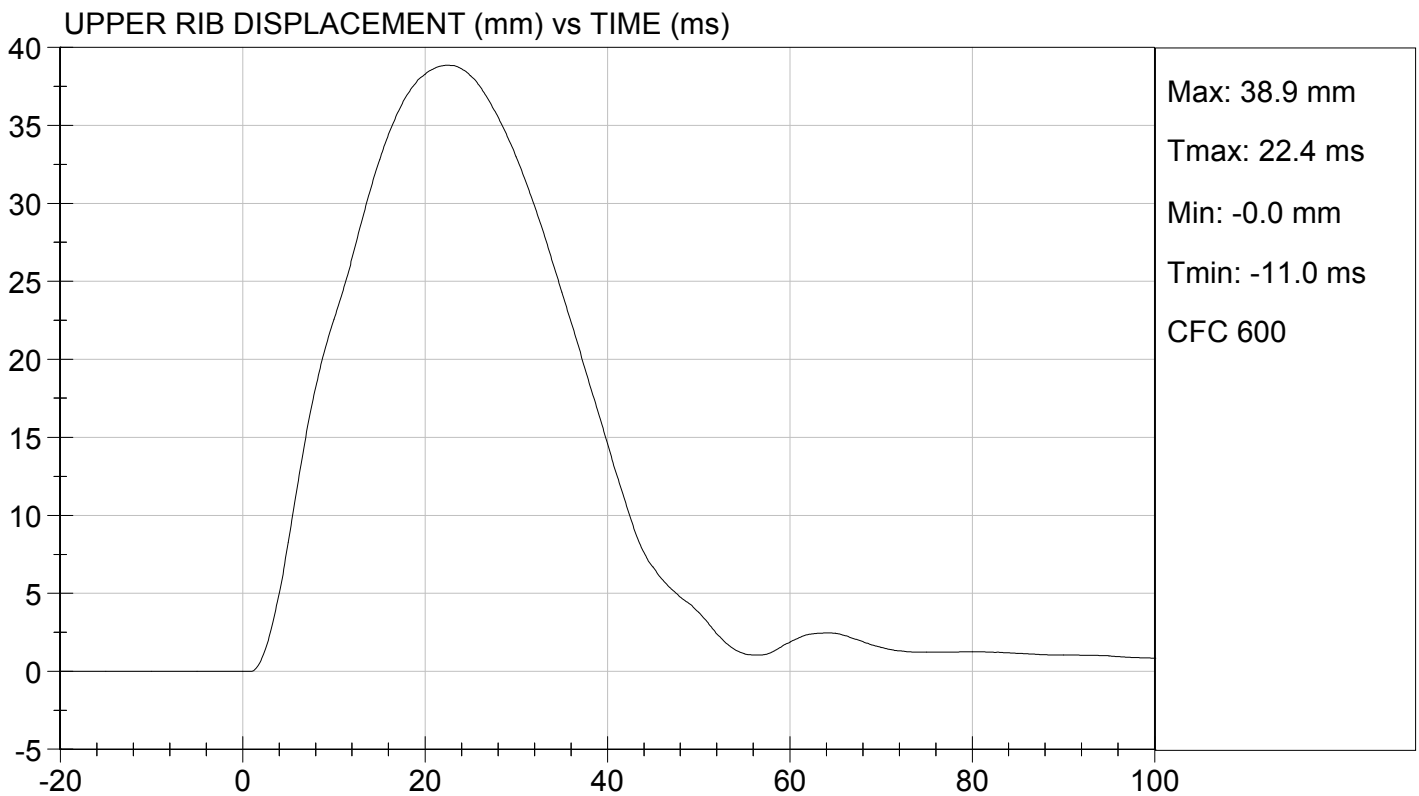
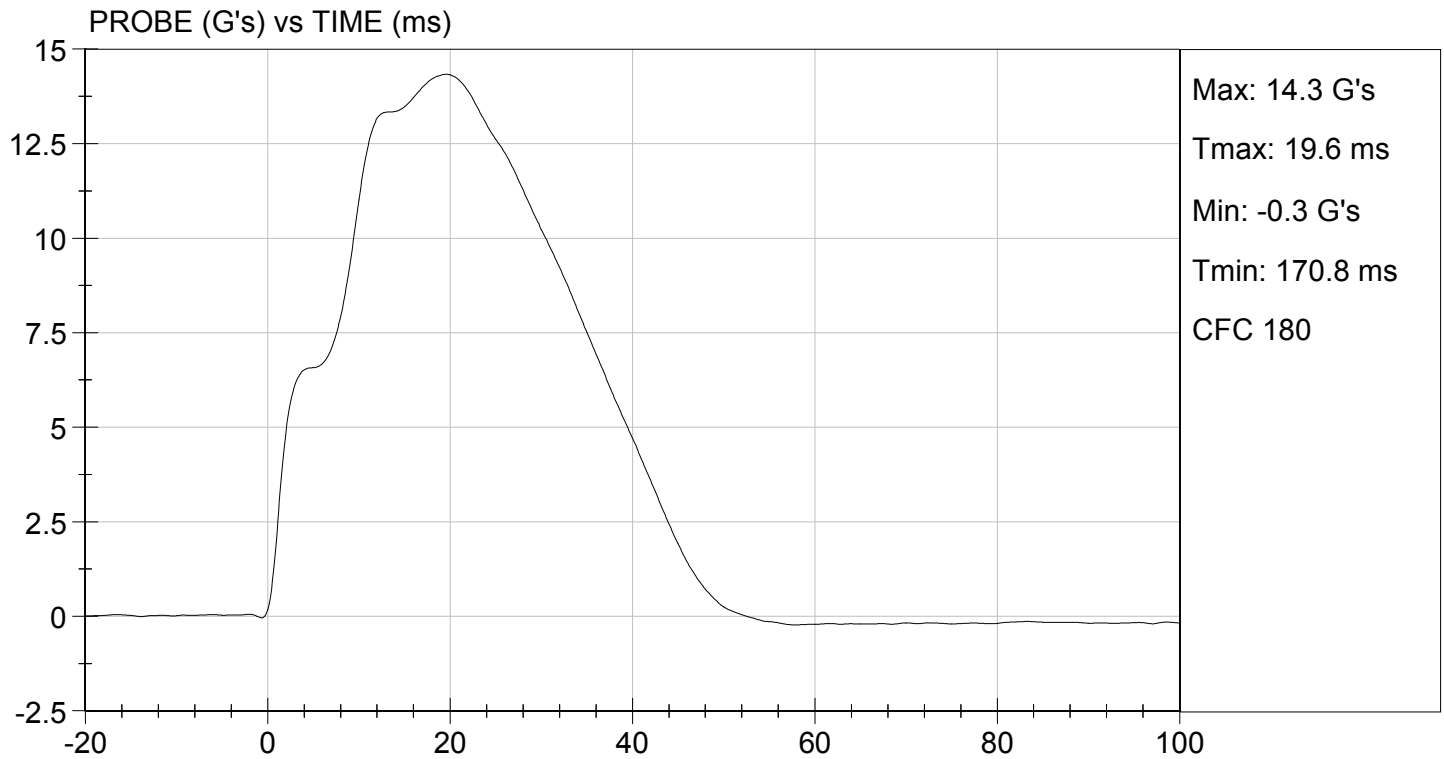
Test Date

  
 Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 07/08/2013  
TEST #: D132185

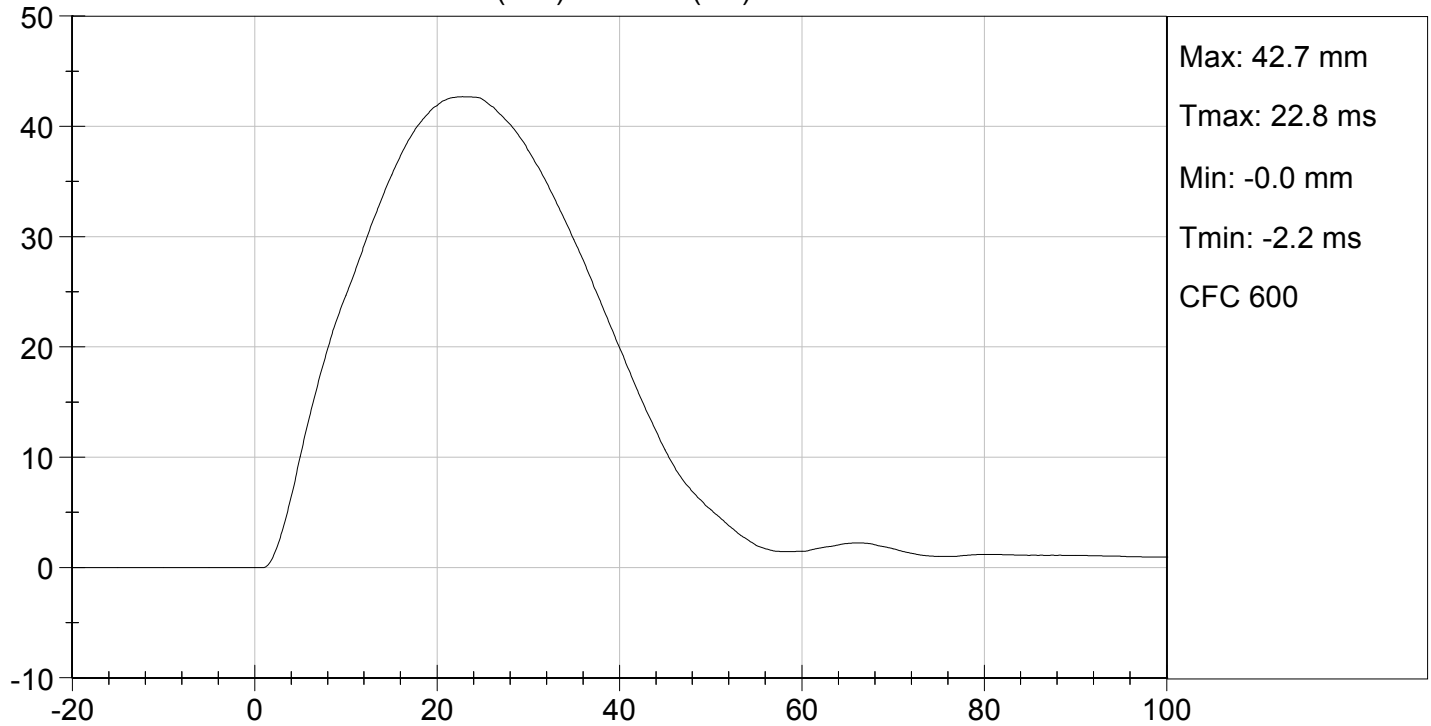




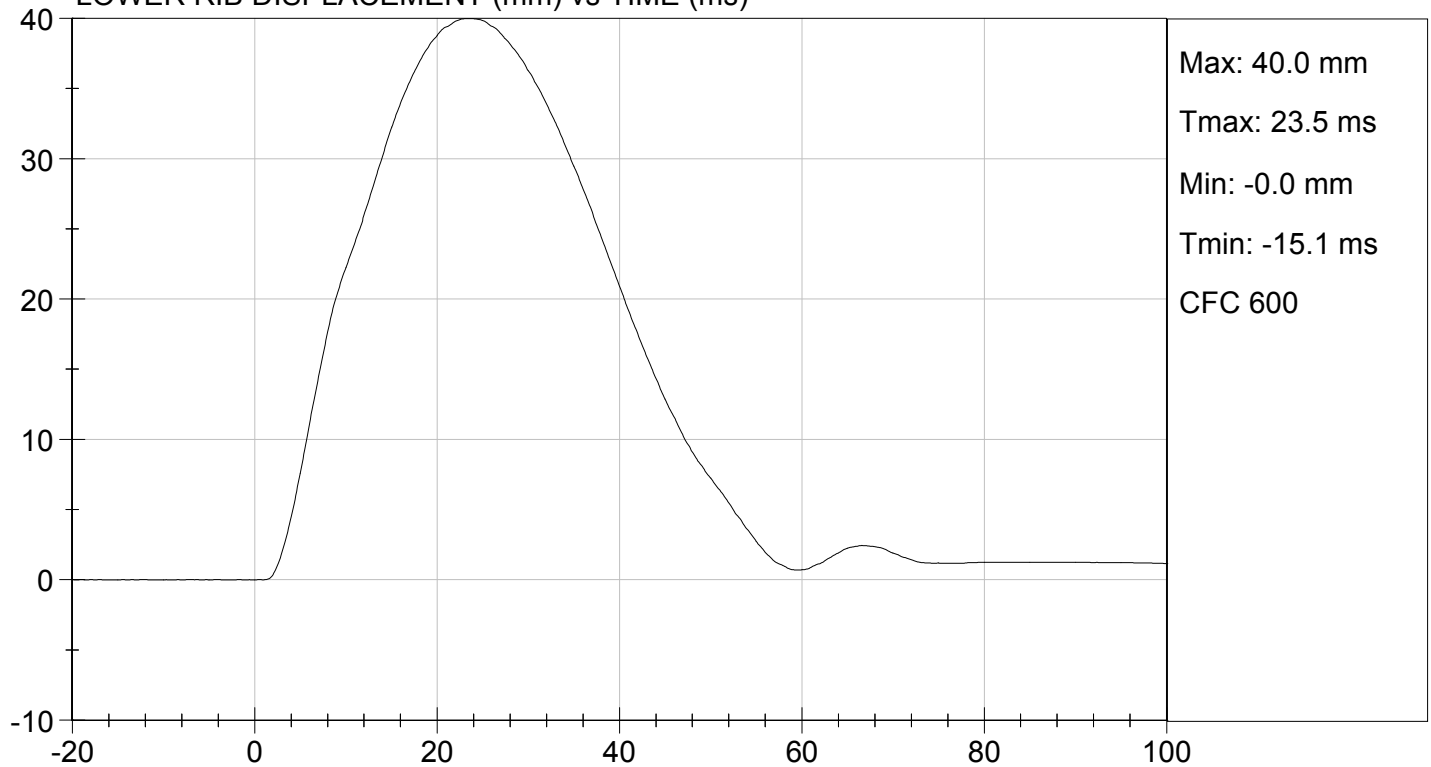
TEST DESC: THORAX IMPACT WITHOUT ARM  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 07/08/2013  
TEST #: D132185

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

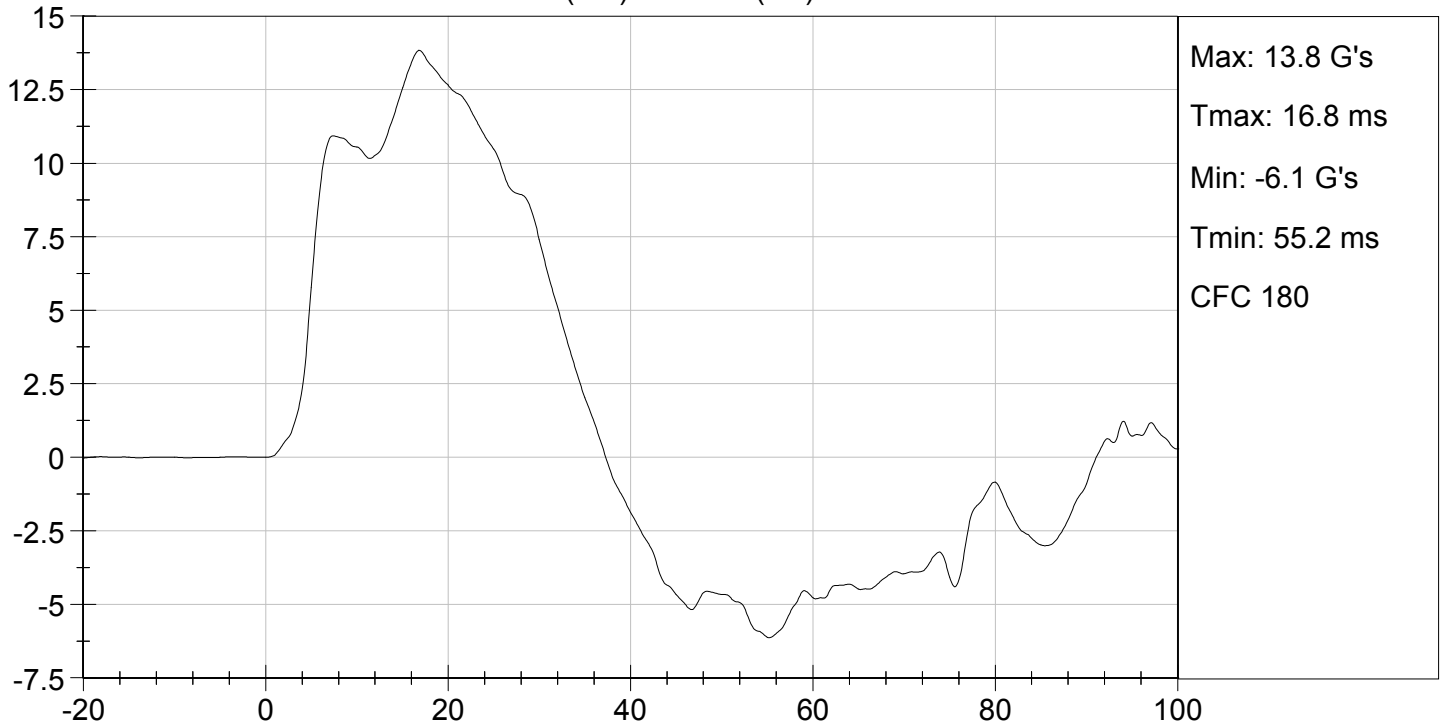




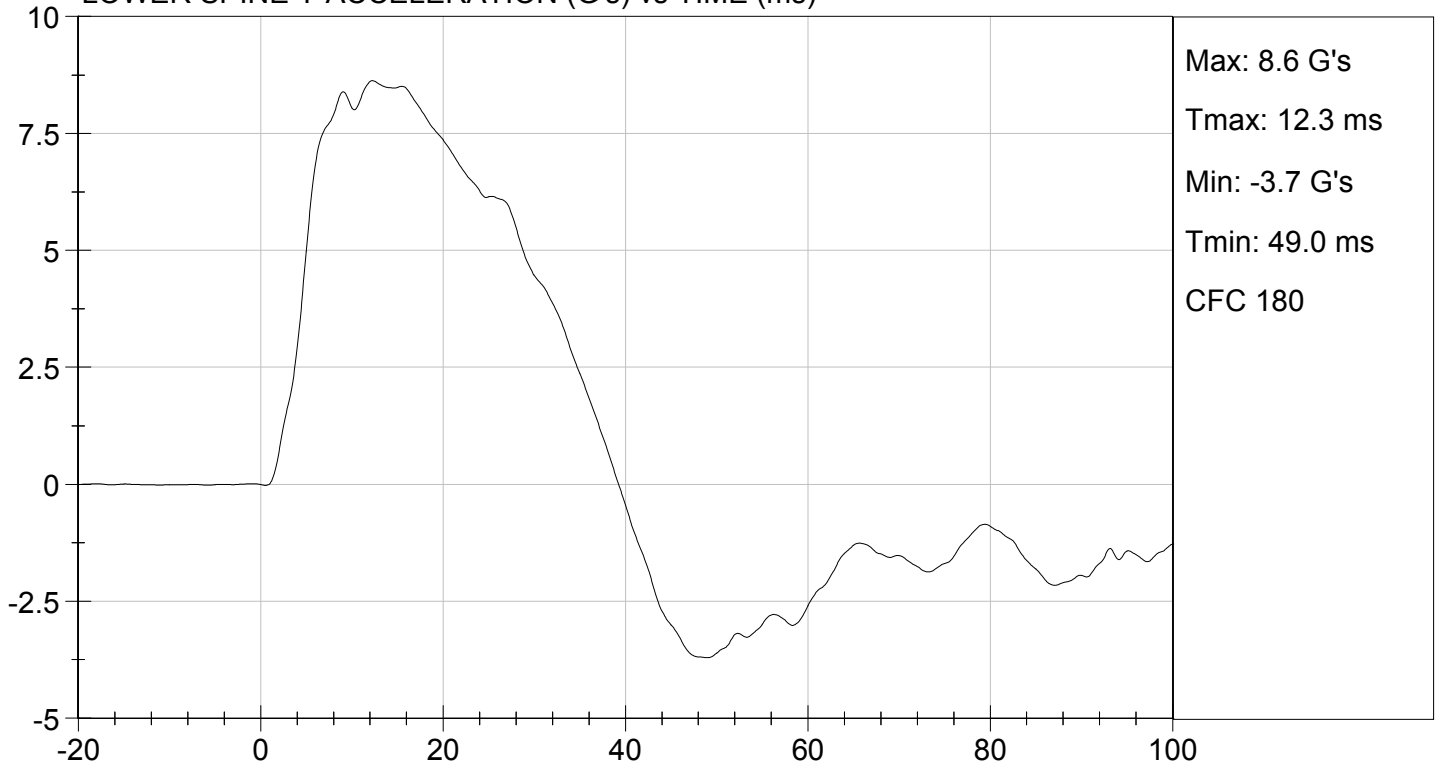
TEST DESC: THORAX IMPACT WITHOUT ARM  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 07/08/2013  
TEST #: D132185

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



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



**MGA RESEARCH CORPORATION**

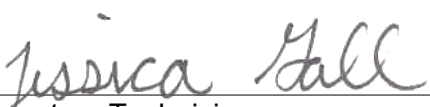
**ABDOMINAL IMPACT TEST**

**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132186

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.1   | Pass      |
| Humidity                         | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Maximum Probe Acceleration       | G's   | 12 to 16      | 13     | Pass      |
| Upper Abdomen Rib Displacement   | mm    | 36 to 47      | 42     | Pass      |
| Lower Abdomen Rib Displacement   | mm    | 33 to 44      | 39     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 9 to 14       | 10     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

07/08/2013

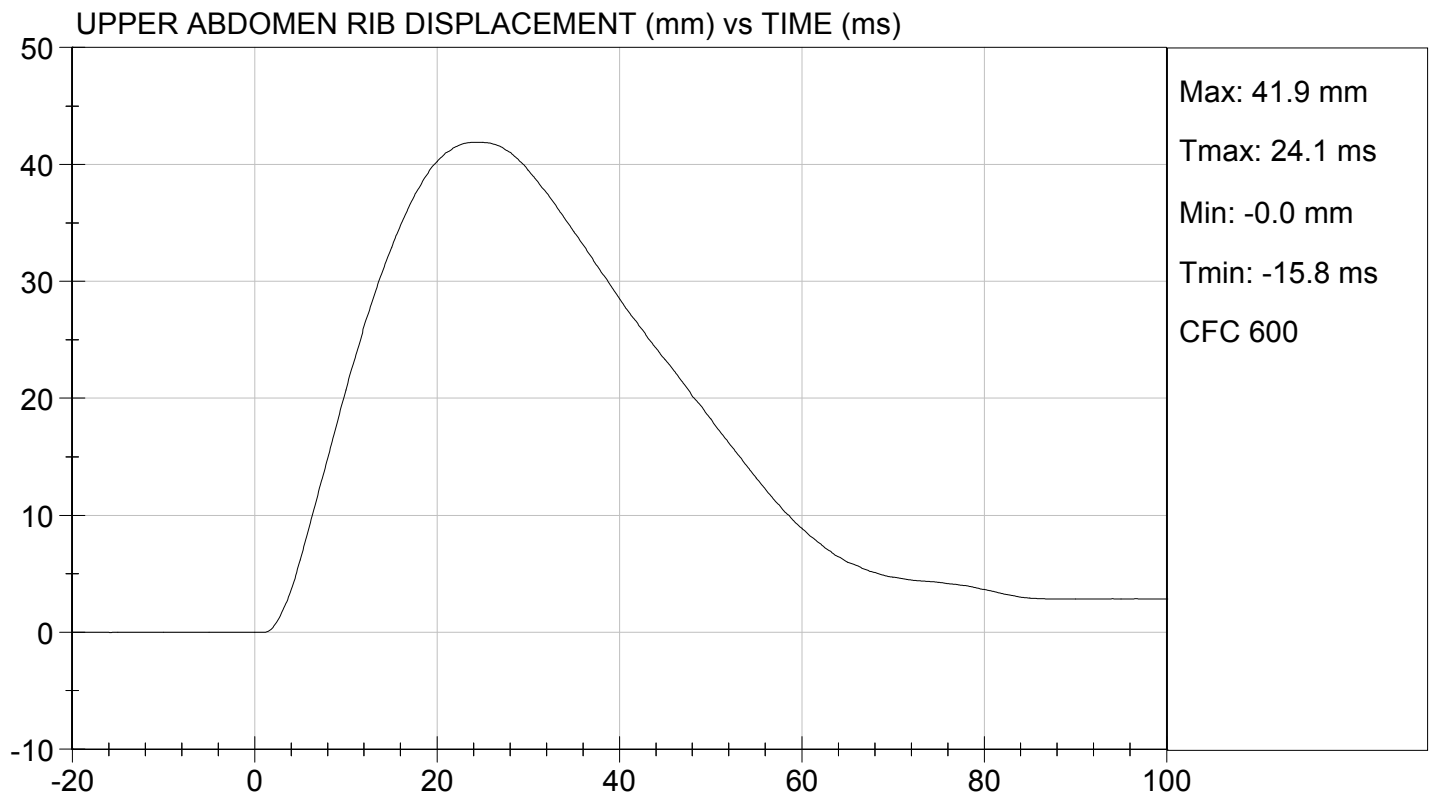
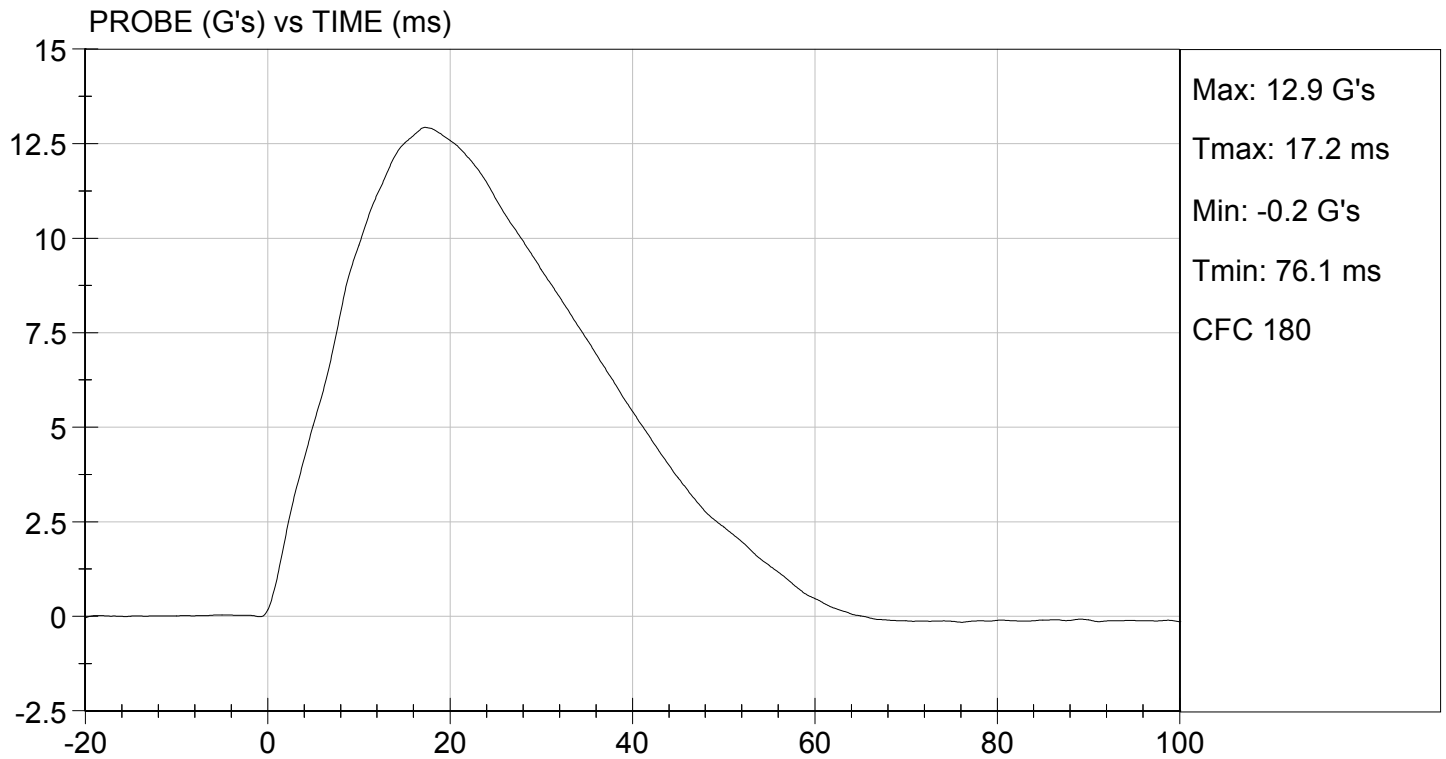
Test Date

  
Approved By



TEST DESC: ABDOMEN IMPACT  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 07/08/2013  
TEST #: D132186

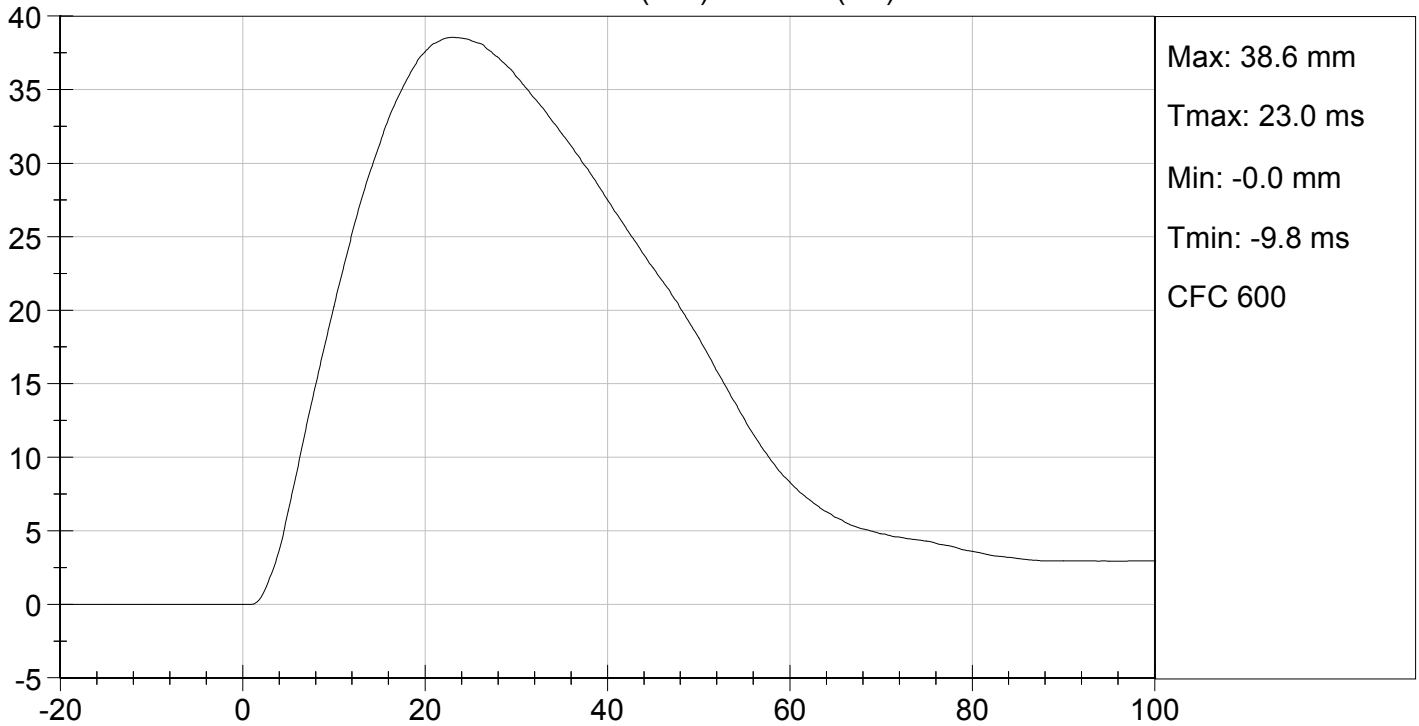




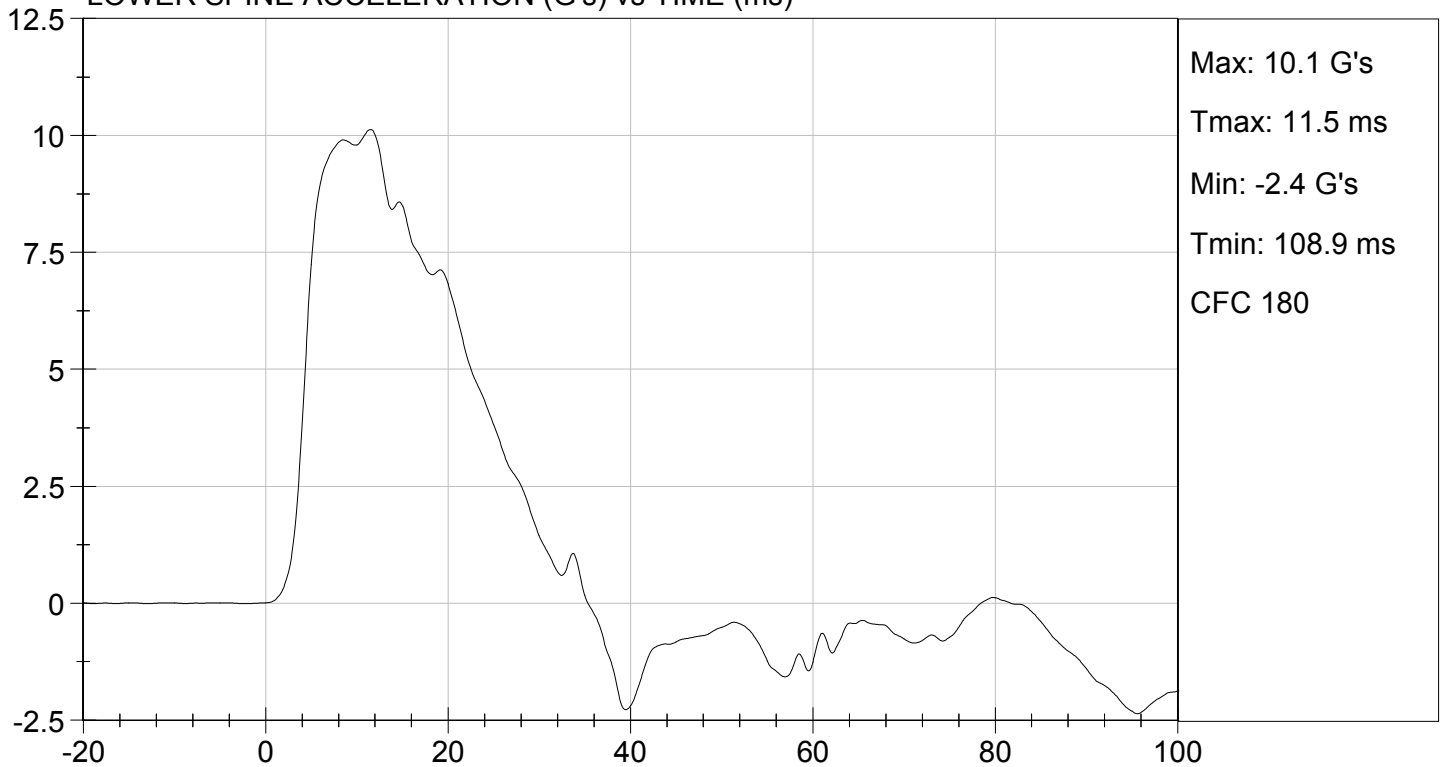
TEST DESC: ABDOMEN IMPACT  
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 07/08/2013  
TEST #: D132186

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



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



**MGA RESEARCH CORPORATION**

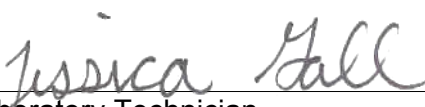
**PELVIS IMPACT TEST**

**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132187

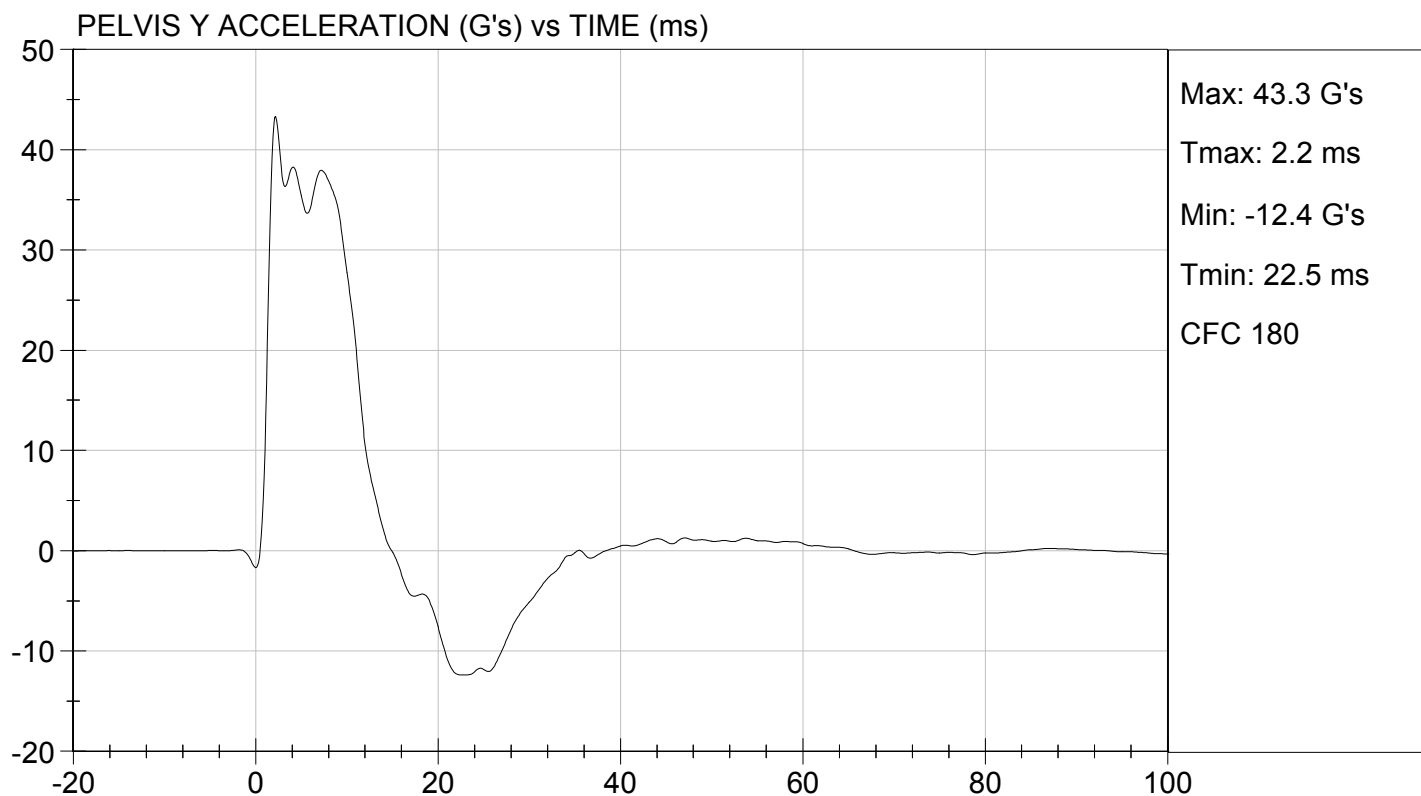
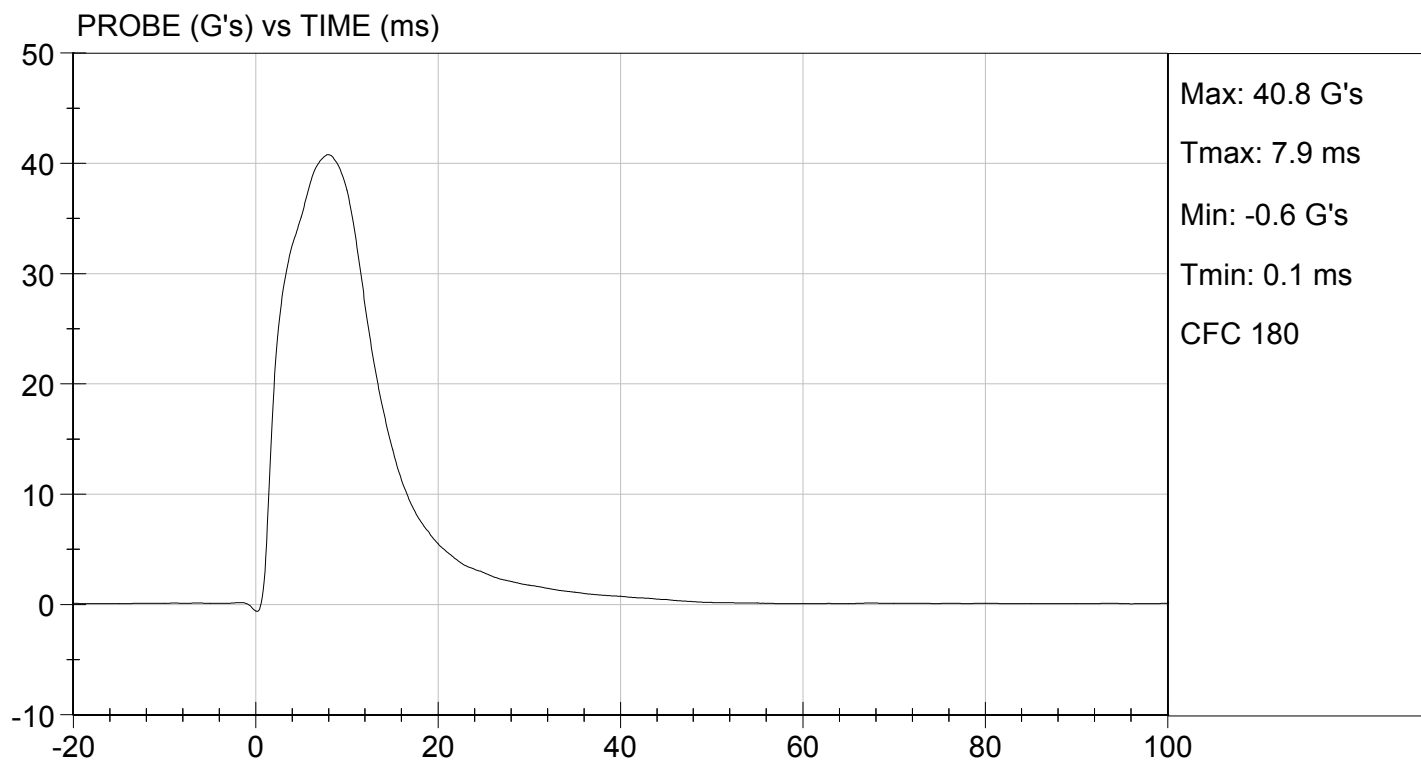
| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.1   | Pass      |
| Humidity                         | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Maximum Probe Acceleration       | G's   | 38 to 47      | 41     | Pass      |
| Pelvis Y Acceleration After 6 ms | G's   | 34 to 42      | 38     | Pass      |
| Peak Acetabulum Force            | N     | 3600 to 4300  | 4,026  | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

07/08/2013

Test Date

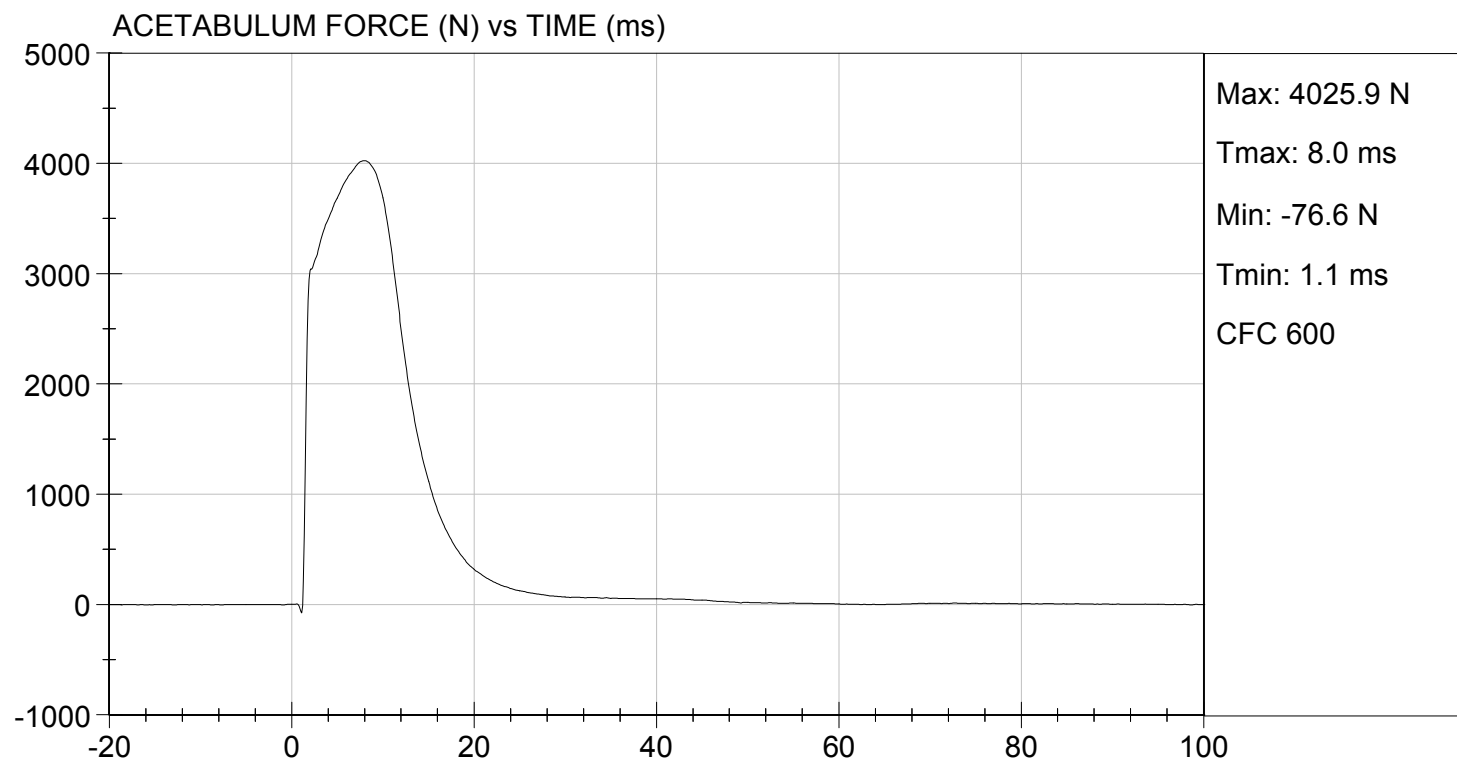
  
Approved By





TEST DESC: PELVIS IMPACT  
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 07/08/2013  
TEST #: D132187



**MGA RESEARCH CORPORATION**

**ILIAC IMPACT TEST**

**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D132188

| Tested Parameter           | Units | Specification | Result | Pass/Fail |
|----------------------------|-------|---------------|--------|-----------|
| Temperature                | deg C | 20.6 to 22.2  | 21.1   | Pass      |
| Humidity                   | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity            | m/s   | 4.20 to 4.40  | 4.31   | Pass      |
| Maximum Probe Acceleration | G's   | 36 to 45      | 41     | Pass      |
| Pelvis Y Acceleration      | G's   | 28 to 39      | 37     | Pass      |
| Peak Pelvis Iliac Force    | N     | 4100 to 5100  | 5,043  | Pass      |
| Overall Test Results       |       |               |        | Pass      |

Jessica Hall  
Laboratory Technician

07/08/2013

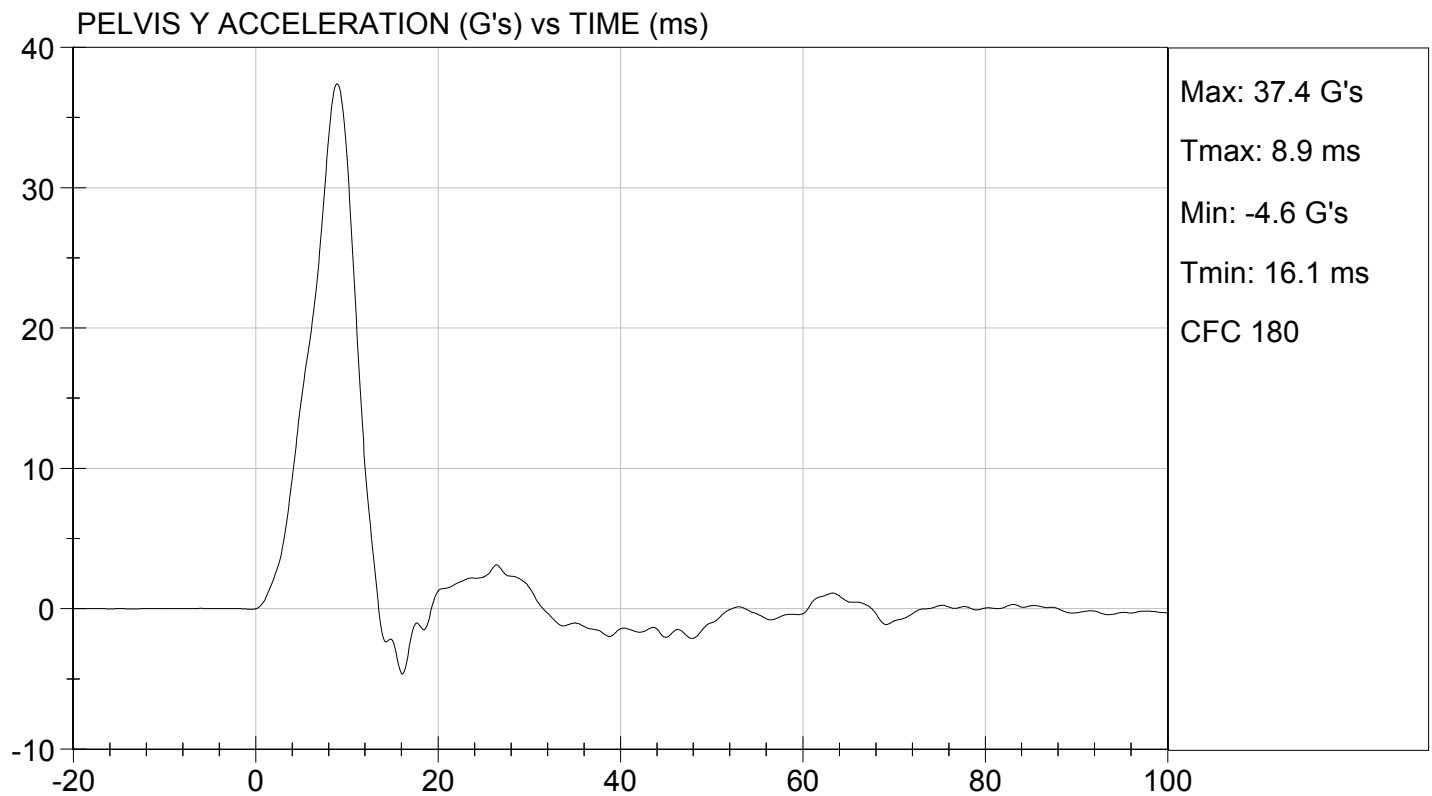
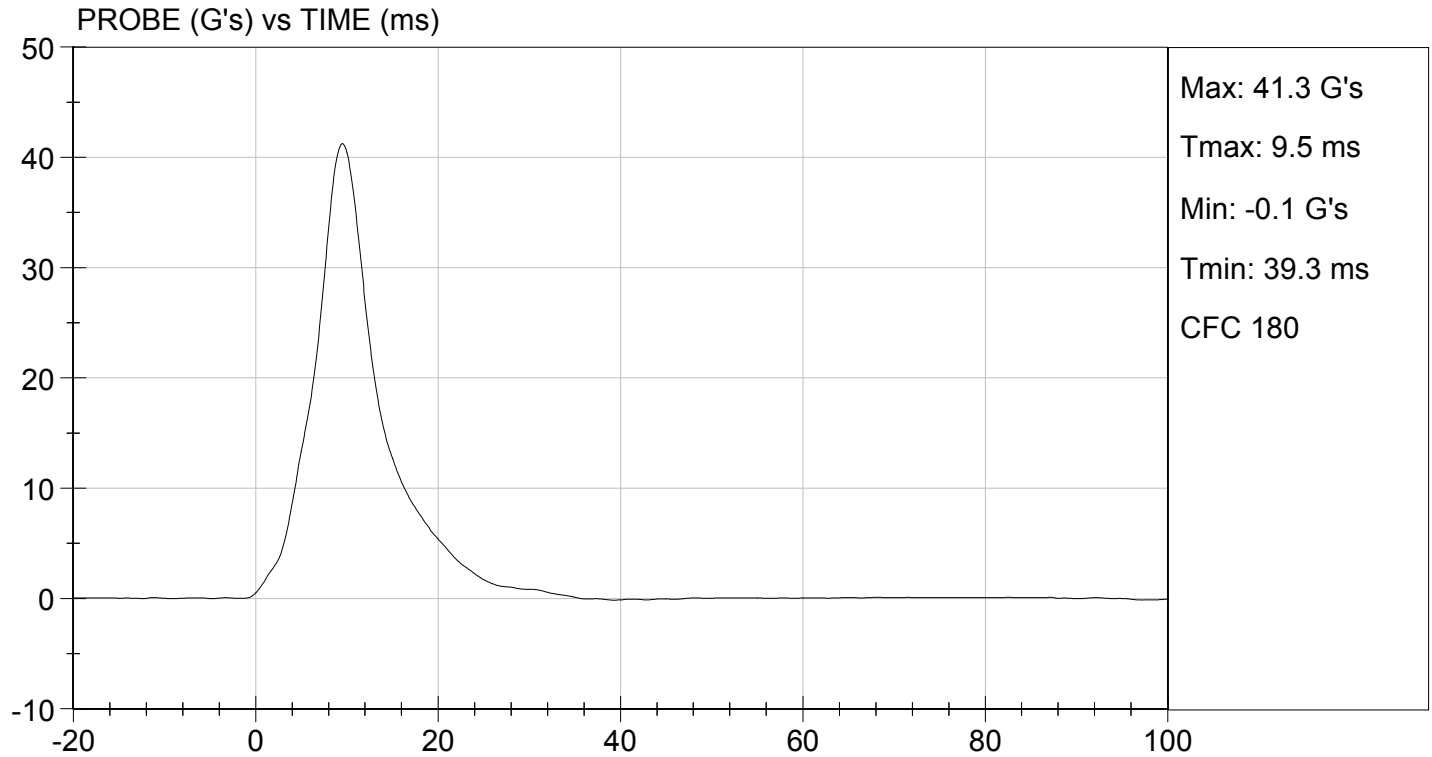
Test Date

David Winkelbauer  
Approved By



TEST DESC: ILLIAC  
VELOCITY: 14.15 ft/s, 4.31 m/s

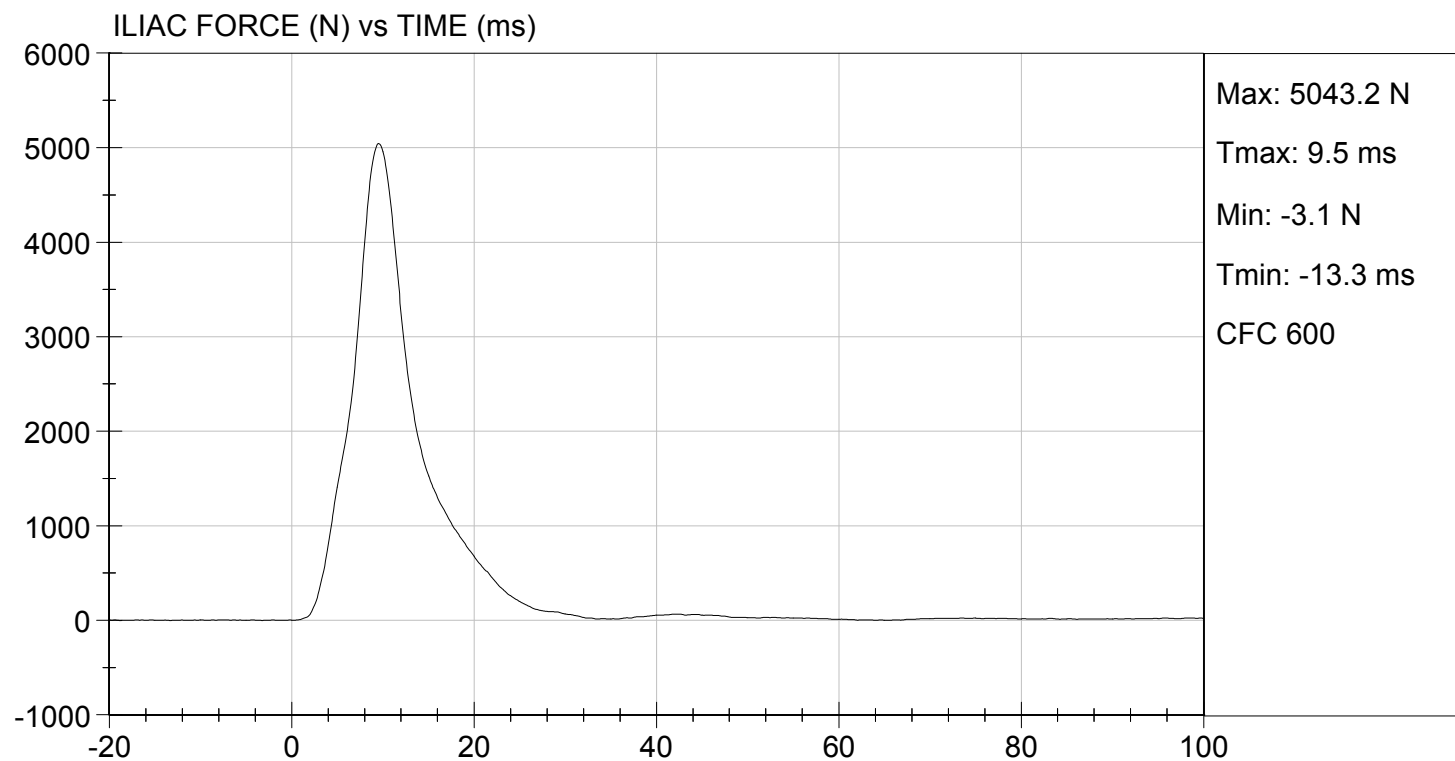
TEST DATE: 07/08/2013  
TEST #: D132188



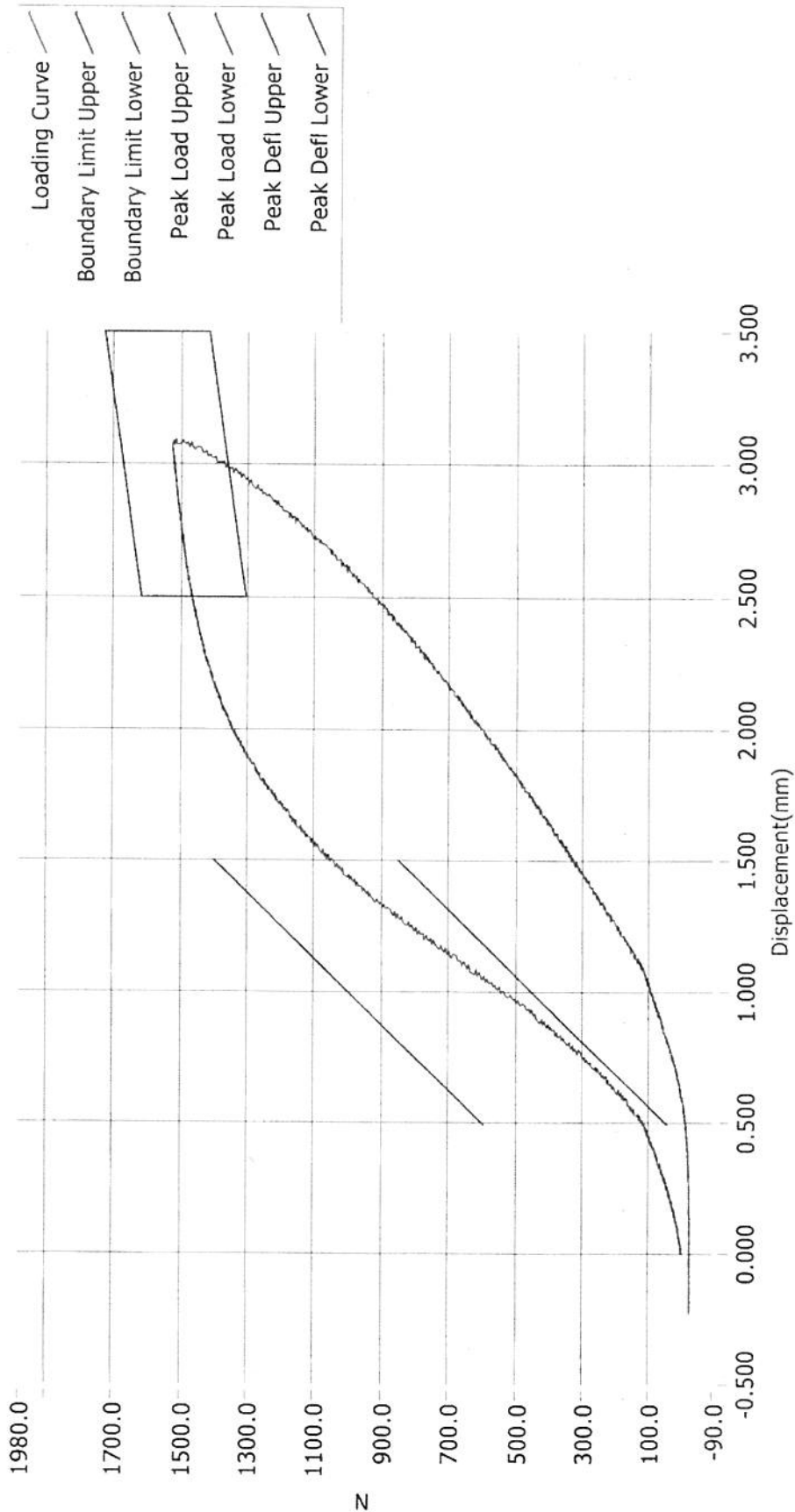


TEST DESC: ILLIAC  
VELOCITY: 14.15 ft/s, 4.31 m/s

TEST DATE: 07/08/2013  
TEST #: D132188



# Resultant Data - SIDIIs Plug Compression



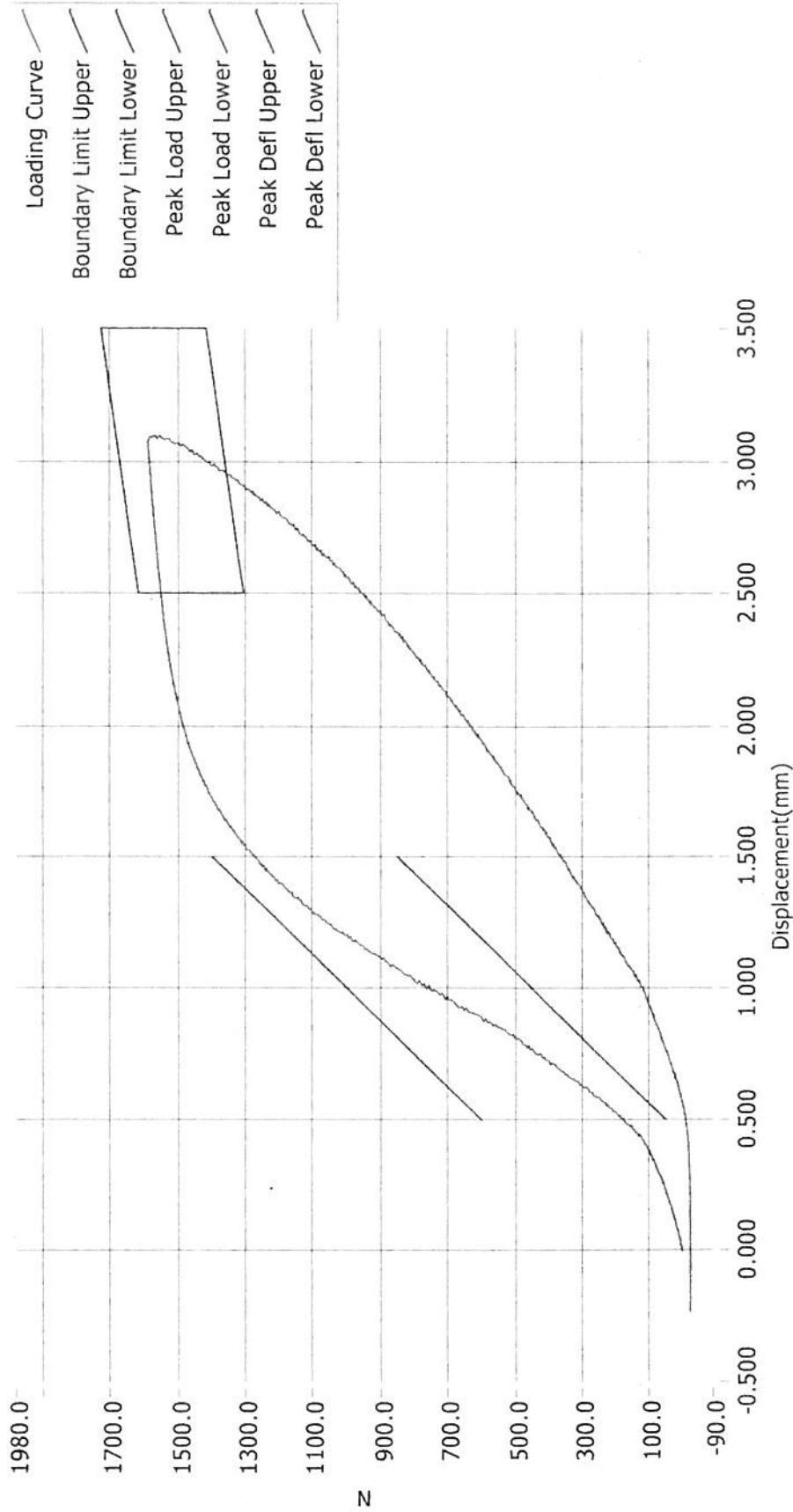
ATD Calibration Lab

| Test ID | Part Serial Number | Test Date | Test Time |
|---------|--------------------|-----------|-----------|
|         | 48918              | 12/5/2011 | 8:53 PM   |
| Cert ID | ATD Serial Number  | ATD Type  |           |
|         | N/A                | SIDIIs    |           |

Current Date : 12/5/2011

Current Time : 20:54:12

# Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

| Test ID | Part Serial Number | Test Date | Test Time |
|---------|--------------------|-----------|-----------|
|         | 48983              | 12/6/2011 | 10:33 PM  |
| Cert ID | ATD Serial Number  | ATD Type  |           |
|         | N/A                | SIDIIs    |           |

Current Date : 12/6/2011

Current Time : 22:34:17

**APPENDIX D**  
**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

**Table 1 – Dummy Instrumentation**

|                                  |               |        |   | SID-IIs S/N 296 |              |                  |          |
|----------------------------------|---------------|--------|---|-----------------|--------------|------------------|----------|
|                                  |               |        |   | Serial Number   | Manufacturer | Calibration Date |          |
| Head CG Accelerometers           |               |        |   | X               | P79623       | Endevco          | 04/05/13 |
|                                  |               |        |   | Y               | P79624       | Endevco          | 04/05/13 |
|                                  |               |        |   | Z               | P79625       | Endevco          | 04/05/13 |
|                                  |               |        |   | Xr              | P79627       | Endevco          | 04/05/13 |
|                                  |               |        |   | Yr              | P79637       | Endevco          | 06/17/13 |
|                                  |               |        |   | Zr              | P79629       | Endevco          | 04/05/13 |
| Displacement Potentiometers      | Thoracic Rib  | Upper  | Y | G012            | Servo        | 04/09/13         |          |
|                                  |               | Middle | Y | G1163           | FTSS         | 04/09/13         |          |
|                                  |               | Lower  | Y | G1158           | FTSS         | 04/09/13         |          |
|                                  | Abdominal Rib | Upper  | Y | G1146           | FTSS         | 04/09/13         |          |
|                                  |               | Lower  | Y | G1126           | FTSS         | 04/09/13         |          |
| Lower Spine Accelerometers (T12) |               |        |   | X               | P80109       | Endevco          | 04/05/13 |
|                                  |               |        |   | Y               | P80110       | Endevco          | 04/05/13 |
|                                  |               |        |   | Z               | P80111       | Endevco          | 04/05/13 |
| Acetabulum Load Cell             |               |        |   | Y               | ACG268       | Denton           | 01/03/13 |
| Iliac Wing Load Cell             |               |        |   | Y               | IWG282       | Denton           | 01/03/13 |
| Pelvis Plug (struck side)        |               |        |   |                 | 48918        | FTSS             | 12/05/11 |
| Pelvis Plug (non-struck side)    |               |        |   |                 | 48983        | FTSS             | 12/06/11 |

**Table 2 – Vehicle Instrumentation**

|                           |   | Serial Number | Manufacturer | Calibration Date |
|---------------------------|---|---------------|--------------|------------------|
| Vehicle Center of Gravity | X | P66815        | Endevco      | 04/15/13         |
| Vehicle Center of Gravity | Y | P66814        | Endevco      | 04/15/13         |
| Vehicle Center of Gravity | Z | P66813        | Endevco      | 04/15/13         |
| Left Floor Sill           | Y | P66533        | Endevco      | 01/17/13         |
| A-Pillar Sill             | Y | P63538        | Endevco      | 06/06/13         |
| A-Pillar Low              | Y | P66594        | Endevco      | 04/29/13         |
| A-Pillar Mid              | Y | P66593        | Endevco      | 04/29/13         |
| B-Pillar Sill             | Y | P78926        | Endevco      | 04/29/13         |
| B-Pillar Low              | Y | P66831        | Endevco      | 04/15/13         |
| B-Pillar Mid              | V | P66830        | Endevco      | 04/15/13         |
| Driver Seat               | Y | P59277        | Endevco      | 04/22/13         |
| Engine Top                | X | P66515        | Endevco      | 05/29/13         |
| Engine Top                | Y | P66516        | Endevco      | 05/29/13         |
| Firewall                  | Y | P66842        | Endevco      | 04/23/13         |
| Right Roof                | Y | P47852        | Endevco      | 03/04/13         |
| Right Floor Sill          | Y | P59321        | Endevco      | 04/15/13         |
| Rear Floorpan             | X | P66869        | Endevco      | 04/25/13         |
| Rear Floorpan             | Y | P66870        | Endevco      | 04/23/13         |

**Table 3 – Pole Instrumentation**

|             | Serial Number | Manufacturer | Calibration Date |
|-------------|---------------|--------------|------------------|
| Load Cell 1 | DG6277        | FTSS         | 09/05/12         |
| Load Cell 2 | DG6278        | FTSS         | 09/05/12         |
| Load Cell 3 | DG6279        | FTSS         | 09/05/12         |
| Load Cell 4 | DG6280        | FTSS         | 09/05/12         |
| Load Cell 5 | DG6281        | FTSS         | 09/05/12         |
| Load Cell 6 | DG6283        | FTSS         | 09/05/12         |
| Load Cell 7 | DG6284        | FTSS         | 09/05/12         |
| Load Cell 8 | DG6582        | FTSS         | 09/05/12         |