

**REPORT NUMBER TR-P27001-09-NC**

**NEW CAR ASSESSMENT PROGRAM  
FRONTAL BARRIER IMPACT TEST**

**TOYOTA MOTOR MANUFACTURING  
2007 TOYOTA TUNDRA CREWMAX SR5  
4-DOOR TRUCK**

**NHTSA NUMBER: M75106**

**PREPARED BY:  
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**APRIL 19, 2007**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
RULEMAKING  
OFFICE OF CRASHWORTHINESS STANDARDS  
MAIL CODE: NVS-111  
400 SEVENTH STREET, SW, ROOM 5311  
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-06-D-00027

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# Technical Report Documentation Page

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| <b>4. Title and Subtitle</b><br>Final Report of New Car Assessment Program Testing of a<br>2007 Toyota Tundra CrewMax SR5 4-Door Truck<br>NHTSA No. M75106                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                |                  | <b>5. Report Date</b><br>4/19/2007                                                                                                                                                                                        |                      |
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| <b>15. Supplementary Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                |                  |                                                                                                                                                                                                                           |                      |
| <b>16. Abstract</b><br><br>A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2007 Toyota Tundra Crewmax 4-Door Truck at Karco Engineering, LLC on 04/19/07. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.21 km/h. The ambient temperature at the barrier face at the time of impact is 16.0 degrees Celcius. The vehicle's maximum post-test static crush is 473 mm to the left of the vehicle's centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows: |  |                                                                |                  |                                                                                                                                                                                                                           |                      |
| <b>Measurement Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>Units</b>                                                   | <b>Threshold</b> | <b>Driver ATD</b>                                                                                                                                                                                                         | <b>Passenger ATD</b> |
| Head Injury Criteria (HIC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | N/A                                                            | 1000             | 460.0                                                                                                                                                                                                                     | 676.5                |
| Max. Chest Accel. (3 msec Clip)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | G's                                                            | 60               | 45.0                                                                                                                                                                                                                      | 48.9                 |
| Left Femur Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Newtons                                                        | 10008            | -3054.8                                                                                                                                                                                                                   | -3375.1              |
| Right Femur Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Newtons                                                        | 10008            | -3011.6                                                                                                                                                                                                                   | -2995.3              |
| <b>17. Key Words</b><br>56.3 km/h NCAP Frontal Barrier Impact Test<br>New Car Assessment Program (NCAP)<br>2007 Toyota Tundra CrewMax SR5 4-Door Truck<br>NHTSA No. M75106                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                |                  | <b>18. Distribution of Statement</b><br>Copies of this report available from:<br>NHTSA Technical Reference Division<br>National Highway Traffic Safety Admin.<br>400 Seventh St., SW, Room 5108<br>Washington, D.C. 20590 |                      |
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## **SECTION 1**

### **PURPOSE AND SUMMARY OF TEST M75106**

#### **1.1 PURPOSE**

This 35 mph (56.3 km/h) frontal barrier impact test is part of the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-D-00027. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48.3 km/h) requirements.

The 35 mph (56.3 km/h) frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated July 2005. Data was obtained indicant of FMVSS 208 "Occupant Crash Protection", FMVSS 212, "Windshield Retention", FMVSS 219, "Windshield Zone Intrusion (Partial)", and FMVSS 301 "Fuel System Integrity", performance. Procedures for receiving, inspection, testing and reporting of test results are described in the test procedures and are not repeated in this report.

#### **1.2 SUMMARY**

A load cell barrier consisting of 45 load cells was impacted by a 2007 Toyota Tundra CrewMax SR5 4-Door Truck at a velocity of 56.21 km/h. The test was performed at Karco Engineering, LLC on April 19, 2007.

Three (3) real-time and fourteen (14) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet number 14 (page number 24) of this report.

Two Part 572E, 50<sup>th</sup> percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head (primary and redundant), chest (primary and redundant) and pelvis triaxial accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were placed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. Shoulder belt spool-off was measured for the driver and passenger dummies. The driver (position 1) ATD (Serial No. 034) and the right-front passenger (position 2) ATD (Serial No. 035) were calibrated one test prior to this test.

One hundred and forty one (141) channels of data were recorded using a TDAS data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the Dummy Response data traces, Appendix C contains the Dummy Calibration data, and Appendix D contains the Child Restraint System Report.

There was 100 percent windshield retention and there was no intrusion into the protected zone of the windshield during the impact event. There was no stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 473 mm at crush zone 3 (left side of bumper) and both the driver and the passenger side doors remained closed and latched during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver ATD's head and chest contacted the airbag and the abdomen had no contact. Both knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD's head and chest contacted the airbag. Both knees contacted the glove box.

Occupant injury data is contained in table below.

| OCCUPANT DATA SUMMARY |        |          |                  |                |                 |
|-----------------------|--------|----------|------------------|----------------|-----------------|
| ATD Position          | HIC 36 | Clip (g) | Chest Defl. (mm) | Left Femur (N) | Right Femur (N) |
| Driver                | 460.0  | 45.0     | -23.3            | -3054.8        | -3011.6         |
| Passenger             | 676.5  | 48.9     | -27.3            | -3375.1        | -2995.3         |

Additional data plots for this test are available in the research and development section of the NHTSA website. The website can be found at: [www.NHTSA.Dot.Gov](http://www.NHTSA.Dot.Gov)

## SECTION 2

### OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

#### CONVERSION FACTORS USED IN THIS REPORT\*

| Quantity           | Typical Application | Std Units           | Metric Unit | Multiply By      |
|--------------------|---------------------|---------------------|-------------|------------------|
| Mass               | Vehicle Weight      | lb                  | kg          | 0.4536           |
| Linear Velocity    | Impact Velocity     | miles/hr            | km/hr       | 1.609            |
| Length or Distance | Measurements        | in                  | mm          | 25.4             |
| Volume             | Fuel Systems        | gal                 | liter       | 3.785            |
| Volume             | Small Fluids        | oz                  | mL          | 29.573           |
| Pressure           | Tire Pressures      | lbf/in <sup>2</sup> | kPa         | 7.0              |
| Volume             | Liquid              | gal                 | liter       | 3.785            |
| Temperature        | General Use         | °F                  | °C          | $=(tf - 32)/1.8$ |
| Force              | Dynamic Forces      | lbf                 | N           | 4.448            |
| Moment             | Torque              | lbf/ft              | Nm          | 1.355            |

\* Based on the Recommended Practice in SAE J916, May 85

**DATA SHEET NO. 1****CRASH TEST SUMMARY**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**PRIMARY IMPACT DATA**

| Measured Parameter   | Units   | Value |
|----------------------|---------|-------|
| Velocity at Impact   | km/h    | 56.21 |
| Test Weight          | kg      | 2884  |
| Impact Angle         | degrees | 0     |
| Average Rebound      | mm      | 552   |
| Maximum Static Crush | mm      | 473   |

**DOOR OPENING AND SEAT TRACK INFORMATION**

| Description           | Driver                                        | Passenger                                     |
|-----------------------|-----------------------------------------------|-----------------------------------------------|
| Front Door opening    | Remained closed and latched, opened w/o tools | Remained closed and latched, opened w/o tools |
| Rear Door Opening     | Remained closed and latched, opened w/o tools | Remained closed and latched, opened w/o tools |
| Seat Track Shift (mm) | None                                          | None                                          |
| Seat Back Failure     | No                                            | No                                            |

**TEST DUMMY INFORMATION**

| Description            | Driver                      | Passenger                   |
|------------------------|-----------------------------|-----------------------------|
| Dummy Type/ Serial No. | 50% Male Hybrid III No. 034 | 50% Male Hybrid III No. 035 |
| Head Contact           | Airbag                      | Airbag                      |
| Chest Contact          | Airbag                      | Airbag                      |
| Abdomen Contact        | None                        | Airbag                      |
| Left Knee Contact      | Knee Bolster                | Glovebox                    |
| Right Knee Contact     | Knee Bolster                | Glovebox                    |

**MOVIE COVERAGE**

| Cameras    | Standard | Additional |
|------------|----------|------------|
| High Speed | 14       | 0          |
| Real Time  | 1        | 2          |
| Total      | 15       | 2          |

**DATA CHANNELS**

|                                  |     |
|----------------------------------|-----|
| Driver ATD Sensors               | 40  |
| Passenger ATD Sensors            | 40  |
| Belt Assessment Sensors          | 8   |
| Vehicle Structure Accelerometers | 8   |
| Rigid Barrier Load Cells         | 45  |
| Total                            | 141 |

## DATA SHEET NO. 2

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### TEST VEHICLE INFORMATION AND OPTIONS

|                  |                   |                       |      |
|------------------|-------------------|-----------------------|------|
| NHTSA No.        | M75106            | Anti-Lock Brakes      | Yes  |
| Make             | Toyota            | All Wheel Drive       | No   |
| Model            | Tundra CrewMax    | Power Steering        | Yes  |
| Body Style       | 4-Door Truck      | Driver Front Airbag   | Yes  |
| Vin No.          | 5TBDV54117S459654 | Driver Side Airbag    | No   |
| Color            | Black             | Driver Head Airbag    | No   |
| Delivery Date    | 4/11/2007         | Driver Curtain Airbag | Yes  |
| Odometer (Miles) | 28.0              | Pass. Airbag          | Yes  |
| Dealer           | Valley-Hi Toyota  | Pass. Side Airbag     | No   |
| Transmission     | 6-Speed Automatic | Pass. Head Airbag     | No   |
| Final Drive      | Rear              | Pass. Curtain Airbag  | Yes  |
| Type/No. Cyl.    | V8                | Pre-Tensioners        | Yes  |
| Engine Disp. (L) | 5.7               | Load Limiters         | Yes  |
| Engine Placement | Longitudinal      | Bucket Seats          | Yes  |
| Roof Rack        | No                | Air. Cond.            | Yes  |
| Sunroof/T-Top    | No                | AM/FM CD              | Yes  |
| Tinted Glass     | Yes               | Tilt Steering         | Yes  |
| Traction Control | Yes               | Automatic Door Locks  | Yes  |
| Power Brakes     | Yes               | Power Windows         | Yes  |
| Front Disc       | Yes               | Power Seats           | Yes  |
| Rear Disc        | Yes               | Other                 | None |

Does Owners Manual provide instructions to turn off automatic door locks.

No

### DATA FROM MANUFACTURER

|                     |                            |                 |      |
|---------------------|----------------------------|-----------------|------|
| Manufactured By     | Toyota Motor Manufacturing | GVWR (kg)       | 3265 |
| Date of Manufacture | Mar-07                     | GAWR Front (kg) | 1810 |
|                     |                            | GAWR Rear (kg)  | 1880 |

### VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

| Measured Parameter         | Front  | Rear  | Third | Total |
|----------------------------|--------|-------|-------|-------|
| Type of Seats              | Bucket | Bench |       |       |
| Number of Occupants        | 2      | 3     |       | 5     |
| Capacity Weight (VCW) (kg) |        |       |       | 600   |
| Cargo Weight (RCLW) (kg)   |        |       |       | 136   |

## DATA SHEET NO. 2...(CONTINUED)

### GENERAL TEST AND VEHICLE PARAMETER DATA

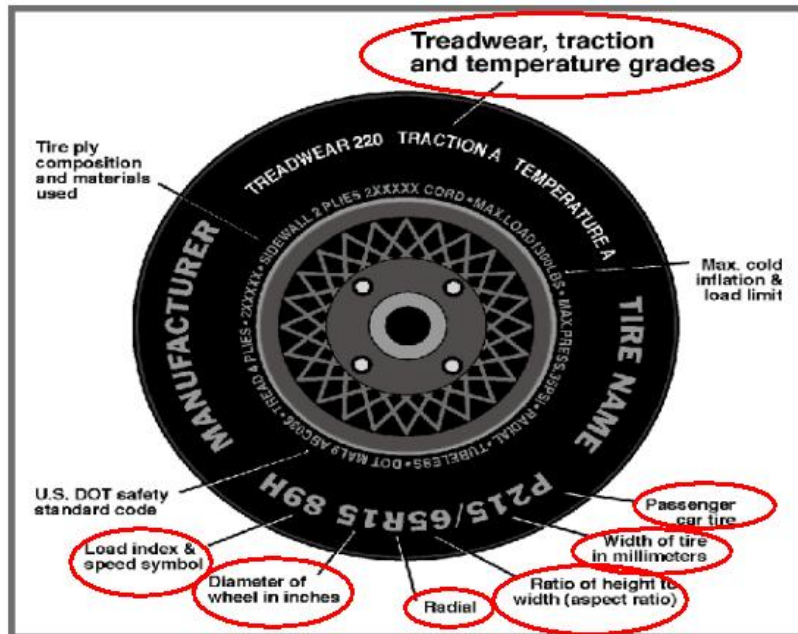
Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



### TIRE INFORMATION

| Measured Parameter       | Front                             | Rear                              |
|--------------------------|-----------------------------------|-----------------------------------|
| Max. Tire Pressure (kpa) | 308                               | 308                               |
| Cold Pressure (kpa)      | 210                               | 230                               |
| Recommended Tire Size    | P275/65R18                        | P275/65R18                        |
| Tire Size on Vehicle     | P275/65R18                        | P275/65R18                        |
| Tire Manufacturer        | Michelin                          | Michelin                          |
| Treadwear                | 420                               | 420                               |
| Traction                 | A                                 | A                                 |
| Temperature Grades       | B                                 | B                                 |
| Tire Plies Sidewall      | 2 Polyester                       | 2 Polyester                       |
| Tire Plies Body          | 2 Polyester + 2Polymide + 2 Steel | 2 Polyester + 2Polymide + 2 Steel |
| Load Index/Speed Symbol  | N/A                               | N/A                               |
| Tire Material            | 2 Polyester + 2Polymide + 2 Steel | 2 Polyester + 2Polymide + 2 Steel |
| DOT Safety Code Right    | DOT M5B9 VJXX 1007                | DOT M5B9 VJXX 1007                |
| DOT Safety Code Left     | DOT M5B9 VJXX 1007                | DOT M5B9 VJXX 1007                |

# DATA SHEET NO. 2...(CONTINUED)

## GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### TEST VEHICLE WEIGHTS

|        | Units | As Delivered Weights (UVW) |           |       | As Tested Weights (ATW) |           |       |
|--------|-------|----------------------------|-----------|-------|-------------------------|-----------|-------|
|        |       | Front Axle                 | Rear Axle | Total | Front Axle              | Rear Axle | Total |
| Left   | kg    | 772                        | 563       | 1335  | 822                     | 660       | 1482  |
| Right  | kg    | 715                        | 553       | 1268  | 764                     | 638       | 1402  |
| Ratio  | %     | 57                         | 43        | 100   | 55                      | 45        | 100   |
| Totals | kg    | 1487                       | 1116      | 2603  | 1586                    | 1298      | 2884  |

### TARGET TEST WEIGHT CALCULATION

| Measured Parameter                   | Units | Value |
|--------------------------------------|-------|-------|
| Total Delivered Weight (UVW)         | kg    | 2603  |
| Weight of 2 P572 ATD's               | kg    | 152   |
| Rated Cargo/Luggage Wt. (RCLW)       | kg    | 136   |
| Calculated Vehicle Target Wt. (TVTW) | kg    | 2891  |

### TEST VEHICLE ATTITUDE AND CG

|              | Units | LF  | RF  | LR   | RR   | CG (aft of front axle) |
|--------------|-------|-----|-----|------|------|------------------------|
| As Delivered | mm    | 940 | 948 | 1020 | 1030 | 1586                   |
| As Tested    | mm    | 930 | 935 | 992  | 993  | 1665                   |

Vehicle Wheel Base (mm) 3700

Weight of Ballast Secured in cargo area (kg) 20

Weight of Items Removed (kg) 28

Vehicle Components Removed Rear Windows, Rear Door Panels, Bed liner

\* Ballast weight does not include cameras, instrumentation and brake abort system.

### FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 99.92

Actual Test Volume with entire fuel System Filled (L) 92.74

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Red

Is Vehicle Fuel Pump Electric or Mechanical? Electric

If electric, does pump operate with ignition switch "On" & engine "OFF" Yes

Fuel System Particulars: Electric fuel pump. Activated when electrical system is activated.

Fuel pump will run during the operation of the engine.

**DATA SHEET NO. 3****POST-TEST IMPACT DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**SPEED TRAP DATA**

| Measured Parameter           | Units | Requirement    | Value |
|------------------------------|-------|----------------|-------|
| Trap No.1 Velocity (Primary) | km/h  | 55.51 to 57.12 | 56.21 |
| Trap No.2 Velocity (Redun.)  | km/h  | 55.51 to 57.12 | 56.19 |

**VEHICLE STATIC CRUSH**

| Measured Parameter | Units | Pre-Test | Post-Test | Difference |
|--------------------|-------|----------|-----------|------------|
| Left Side          | mm    | 5710     | 5254      | -456       |
| Center             | mm    | 5835     | 5365      | -470       |
| Right Side         | mm    | 5710     | 5280      | -430       |

**VEHICLE REBOUND FROM BARRIER**

| Measured Parameter | Units | Value |
|--------------------|-------|-------|
| Left Side          | mm    | 580   |
| Center             | mm    | 495   |
| Right Side         | mm    | 580   |
| Average            | mm    | 552   |

## DATA SHEET NO. 4

### TEST VEHICLE INFORMATION

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

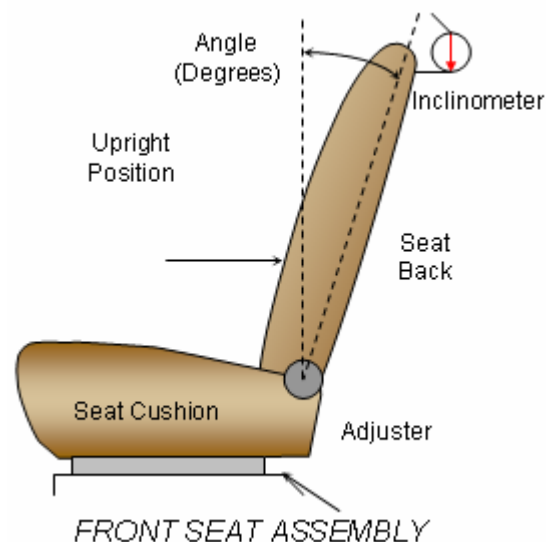
Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturer's designated angle. The procedure is as follows:

Seat back angle was measured at the headrest of the seat using a digital inclinometer.



### SEAT BACK ANGLES

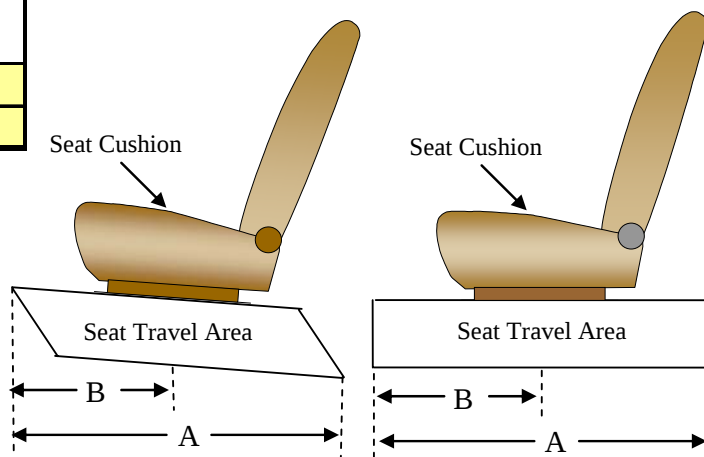
|                          | Deg.           |
|--------------------------|----------------|
| Driver w/seated Dummy    | 1.0 @ Headrest |
| Passenger w/seated Dummy | 1.0 @ Headrest |

### SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position. There were vertical adjustments on the seats that were equipped with the vehicle. They were placed at the lowermost position.

### SEAT FORE/AFT POSITIONING

|                | Total Fore/Aft Travel | Placed in Position     |
|----------------|-----------------------|------------------------|
| Driver Seat    | 265 mm                | 132.5 mm               |
| Passenger Seat | 17 Detents            | 9 <sup>th</sup> Detent |



### SEAT BELT UPPER ANCHORAGE

Position number two (2) from the uppermost position.

### SEAT BELT UPPER ANCHORAGE

|                | Total # of Positions | Placed in Position # |
|----------------|----------------------|----------------------|
| Driver Seat    | 4                    | 2                    |
| Passenger Seat | 4                    | 2                    |

## DATA SHEET NO. 4...(CONTINUED)

### TEST VEHICLE INFORMATION

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

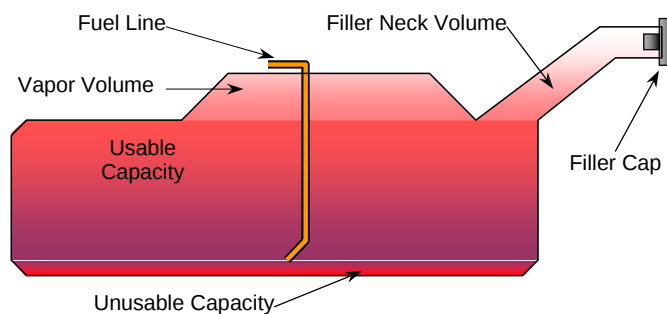
Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### FUEL TANK CAPACITY

|                                    | Liters         |
|------------------------------------|----------------|
| Usable Capacity of "Standard Tank" | 99.92          |
| Usable Capacity of "Optional" Tank |                |
| Usable Capacity used for FMVSS 301 | 91.90 to 93.91 |
| Actual Amount of Solvent used      | 92.74          |

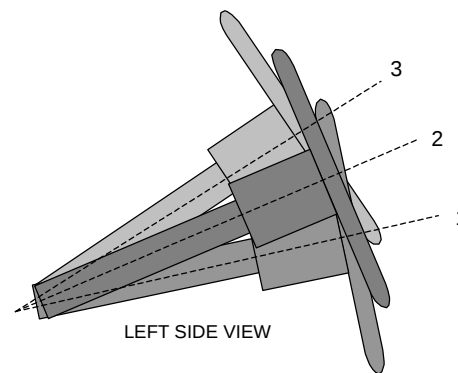
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



VEHICLE FUEL TANK ASSEMBLY

### STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

### STEERING COLUMN POSITIONS

|                                 | Degrees | Fore/Aft Position (mm) |
|---------------------------------|---------|------------------------|
| Lowermost position No. 1        | 25.6    | 240                    |
| Geometric center position No. 2 | 28.7    | 257                    |
| Uppermost position No. 3        | 31.9    | 275                    |

# DATA SHEET NO. 5

## DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### TEST DUMMY POSITION MEASUREMENTS

| Code | Measurement Description | Driver      |                | Passenger   |                |
|------|-------------------------|-------------|----------------|-------------|----------------|
|      |                         | Length (mm) | Angle (deg)    | Length (mm) | Angle (deg)    |
| WA   | Windshield Angle        |             | 35.2           |             |                |
| SWA  | Steering Wheel Angle    |             | 63.0           |             |                |
| SCA  | Steering Column Angle   |             | 28.7           |             |                |
| SA   | Seat Back Angle         |             | 1.0 @ Headrest |             | 1.0 @ Headrest |
| HZ   | Head to Roof (Z)        | 230         | 90.0           | 220         | 90.0           |
| HH   | Head to Header          | 438         |                | 435         |                |
| HW   | Head to Windshield      | 710         |                | 670         |                |
| HR   | Head to Side Header (Y) | 298         |                | 300         |                |
| NR   | Nose to Rim             | 400         | 16.0           |             |                |
| CD   | Chest to Dash           | 540         |                | 545         |                |
| CS   | Chest to Steering Hub   | 293         |                |             |                |
| RA   | Rim to Abdomen          | 175         |                |             |                |
| KDL  | Left Knee to Dash       | 140         | 6.5            | 100         |                |
| KDR  | Right Knee to Dash      | 150         |                | 120         | 8.0            |
| PA   | Pelvic Angle            |             | 23.5           |             | 24.5           |
| TA   | Tibia Angle             |             | 56.0           |             | 48.0           |
| KK   | Knee to Knee (Y)        | 300         |                | 290         |                |
| SK   | Striker to Knee         | 695         | 6.4            | 710         | 7.1            |
| ST   | Striker to Head         | 525         | 73.0           | 530         | 72.0           |
| SH   | Striker to H-Point      | 320         | 30.9           | 330         | 28.5           |
| SHY  | Striker to H-Point (Y)  | 250         |                | 262         |                |
| HS   | Head to Side Window     | 325         |                | 330         |                |
| HD   | H-Point to Door (Y)     | 190         |                | 150         |                |
| AD   | Arm to Door (Y)         | 140         |                | 50          |                |

# DATA SHEET NO. 5...(CONTINUED)

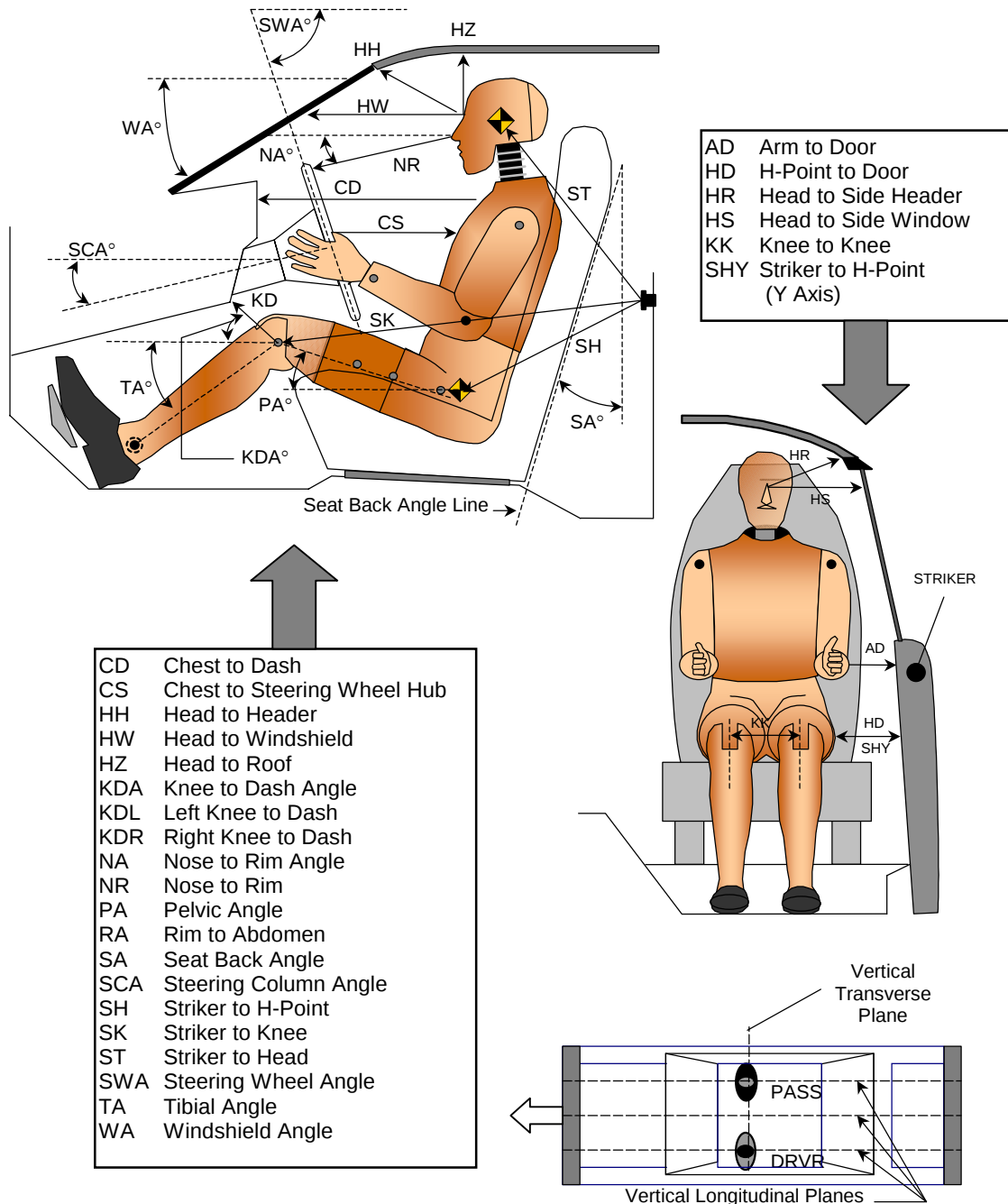
## DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



## DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

## DATA SHEET NO. 6

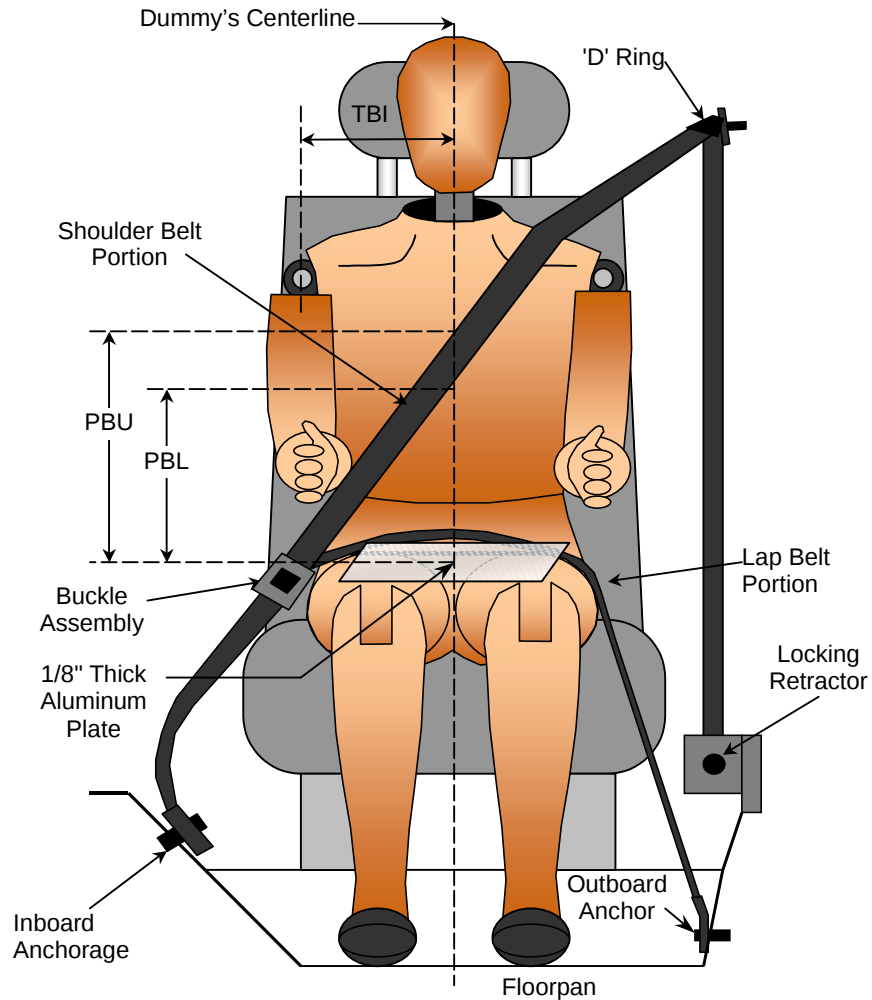
### SEAT BELT POSITIONING DATA

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



### SEAT BELT POSITIONING MEASUREMENTS

| Measured Parameter                                | Units   | Driver    | Passenger |
|---------------------------------------------------|---------|-----------|-----------|
| TBI - Dummy C/L to Lap/Shoulder Belt Intersect    | mm      | 230       | 230       |
| PBU - Top Surface of reference to belt upper edge | mm      | 320       | 340       |
| PBL - Top Surface of reference to belt lower edge | mm      | 250       | 270       |
| Lap Belt Tension                                  | Newtons | 10        | 10        |
| Shoulder Belt Tension                             | N/A     | Retractor | Retractor |

**DATA SHEET NO. 7**  
**VEHICLE ACCELEROMETER LOCATION**

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

Test Date: 4/19/07

Test Program: 2007 NHTSA 35mph NCAP

NHTSA No.: M75106

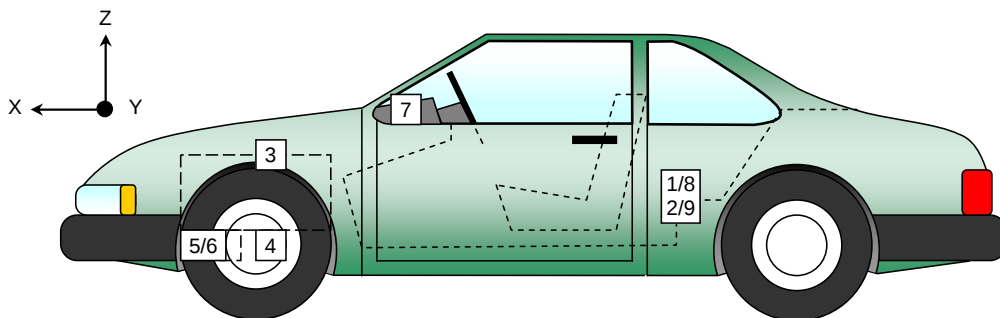
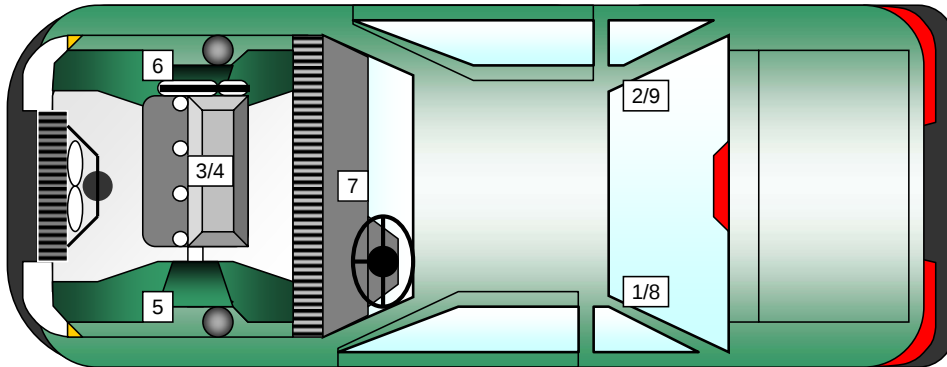
**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

| No. | Accelerometer Location       | Measurements (mm) |      |     |
|-----|------------------------------|-------------------|------|-----|
|     |                              | X                 | Y    | Z   |
| 1   | Left Rear X-Member           | 2693              | -785 | 615 |
| 2   | Right Rear X-Member          | 2693              | 785  | 615 |
| 3   | Engine Top                   |                   |      |     |
| 4   | Engine Bottom                | 4790              | 163  | 418 |
| 5   | Left Brake Caliper           | 4807              | -785 | 420 |
| 6   | Right Brake Caliper          | 4807              | 785  | 420 |
| 7   | Instrument Panel             |                   |      |     |
| 8   | Left Rear X-Member (Z-Axis)  | 2693              | -785 | 615 |
| 9   | Right Rear X-Member (Z-Axis) | 2693              | 785  | 615 |

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

1.) Instrument Panel no longer used by NHTSA

2.) Insufficient room for installation



**DATA SHEET NO. 8****SEAT BELT ASSESSMENT TEST DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**SEAT BELT POSITIONING MEASUREMENTS**

| Measurement Description                          | Units | Driver | Passenger |
|--------------------------------------------------|-------|--------|-----------|
| Retractor Reel to "D" ring                       | mm    | 880    | 880       |
| Shoulder Belt length as measured on ATD          | mm    | 948    | 975       |
| Lap Belt length as measured on ATD               | mm    | 850    | 920       |
| Remainder of belt on reel                        | mm    | 810    | 750       |
| Total belt length for continuous webbing systems | mm    | 3488   | 3525      |

**SHOULDER BELT SPOOL-OFF DATA**

| Measurement Description      | Units | Driver | Passenger |
|------------------------------|-------|--------|-----------|
| As determined mechanically   | mm    | 197    | 180       |
| As determined electronically | mm    | 263*   | 0**       |

\* Data was questionable due to the driver side curtain airbag deployment

\*\* Channel Failed, No Data

**BELT STRETCH DATA**

| Measurement Description                            | Units | Driver | Passenger |
|----------------------------------------------------|-------|--------|-----------|
| Electronically between belt load cell and "D" ring | mm/cm | *      | *         |
| Mechanically                                       | mm/cm |        |           |

\* Not used with shoulder belt pre-tensioner systems

**DATA SHEET NO. 9****SUMMARY OF FMVSS 212 DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07

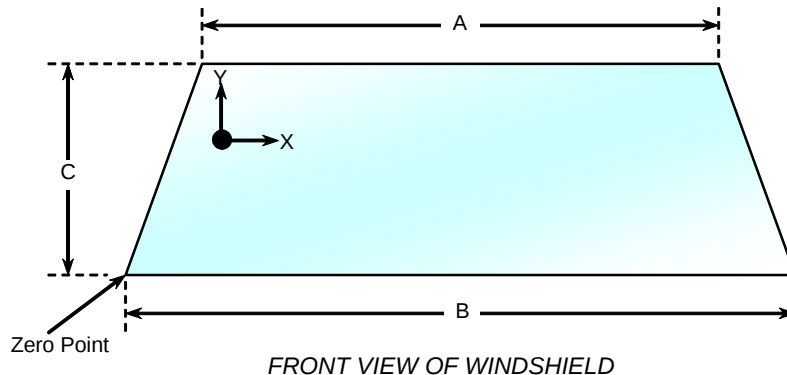
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

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

Temperature of windshield molding during test: 28.0 °C

**WINDSHIELD PERIPHERY MEASUREMENTS**

| Measurement | Pre-Test(mm) | Post-Test(mm) | % of Retention |
|-------------|--------------|---------------|----------------|
| Left Side   | 2574         | 2574          | 100            |
| Right Side  | 2574         | 2574          | 100            |
| Total       | 5148         | 5148          | 100            |

**WINDSHIELD DIMENSIONS**

| Item    | Units | Segment Length | Molding Width |
|---------|-------|----------------|---------------|
| A       | mm    | 1414           | 4             |
| B       | mm    | 434            | 39            |
| C-Left  | mm    | 1650           | 15            |
| C-Right | mm    | 1650           | 15            |

# DATA SHEET NO. 10

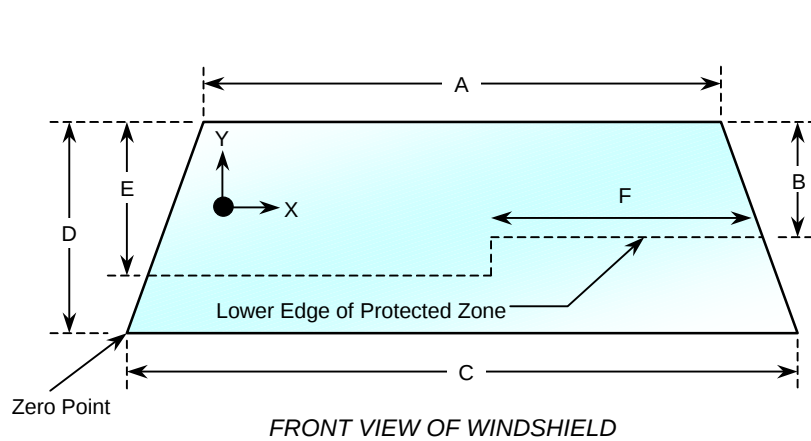
## WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



### WINDSHIELD AND PROTECTED ZONE

| Item | Units | Value |
|------|-------|-------|
| A    | mm    | 1414  |
| B    | mm    | 434   |
| C    | mm    | 1650  |
| D    | mm    | 820   |
| E    | mm    | 492   |
| F    | mm    | 635   |

### AREA OF PROTECTED ZONE FAILURES

- A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one that is normally in contact with the windshield.

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

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

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

**DATA SHEET NO. 11**

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

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck NHTSA No.: M75106  
Test Program: 2007 NHTSA 35mph NCAP Test Date: 04/19/07

Test Time: 1:00 PM

Temperature: 16.0 ° C

**STODDARD SOLVENT SPILLAGE MEASUREMENTS**

- A. From impact until vehicle motion ceases: 0.0 oz.  
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0.0 oz.  
(Maximum Allowable = 5 ounces)
- C. For the following 25 minutes: 0.0 oz.  
(Maximum Allowable = 1 oz./minute)
- D. Spillage Location Details: No leakage occurred

## DATA SHEET NO. 12

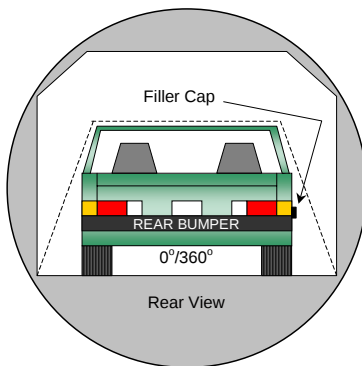
### FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

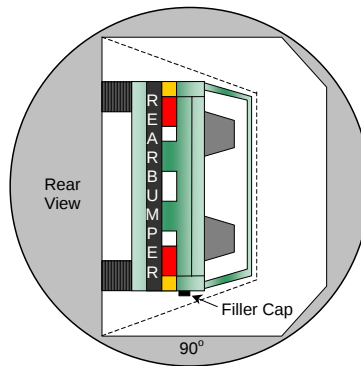
NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

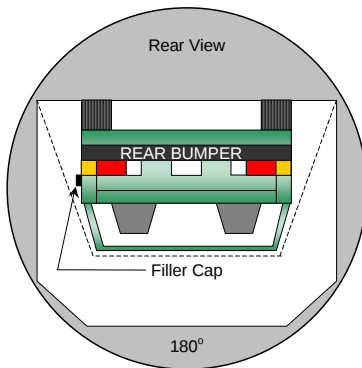
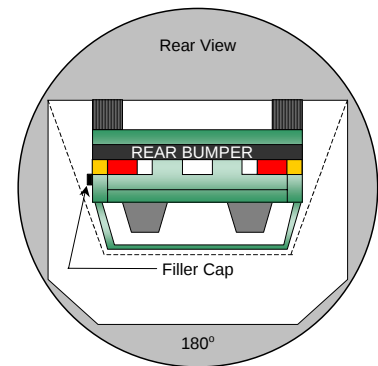
Test Date: 04/19/07



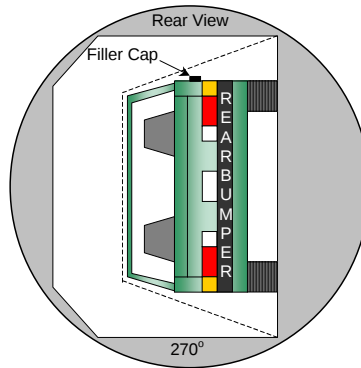
**0° to 90°**



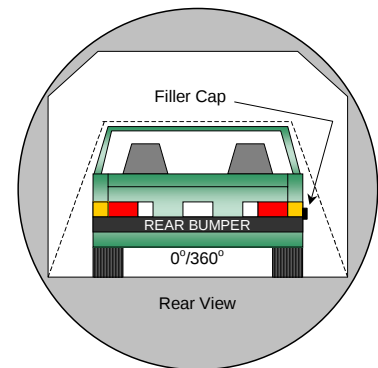
**90° to 180°**



**180° to 270°**



**270° to 360°**



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. No solvent leakage occurred during rollover.

**DATA SHEET NO. 12...(CONTINUED)****FMVSS 301 STATIC ROLLOVER DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**SOLVENT COLLECTION TIME TABLE IN SECONDS**

| Test Phase   | Rotation Time | Hold Time | Total Time |
|--------------|---------------|-----------|------------|
| 0° to 90°    | 82            | 301       | 383        |
| 90° to 180°  | 81            | 302       | 383        |
| 180° to 270° | 87            | 302       | 389        |
| 270° to 360° | 84            | 304       | 388        |

**FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)**

|                 |     |
|-----------------|-----|
| First 5 Minutes | 5.0 |
| Sixth Minute    | 1.0 |
| Seventh Minute  | 1.0 |
| Eighth Minute   | 1.0 |

**ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)**

| Test Phase   | First 5 Minutes | Sixth Minute | Seventh Minute | Eighth 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             |

**SOLVENT SPILLAGE LOCATION TABLE**

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

**DATA SHEET NO. 13****VEHICLE MEASUREMENTS**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**VEHICLE MEASUREMENT TABLE**

| No. | Measurement Description                      | Units | Pre-Test | Post-Test | Diff. |
|-----|----------------------------------------------|-------|----------|-----------|-------|
| 1   | Total length of vehicle at centerline        | mm    | 5835     | 5365      | -470  |
| 2   | RSOV to front of engine                      | mm    | 5158     | 5090      | -68   |
| 3   | RSOV to firewall centerline                  | mm    | 4600     | 4562      | -38   |
| 4   | RSOV to leading edge of right door           | mm    | 4400     | 4452      | 52    |
| 5   | RSOV to leading edge of left door            | mm    | 4407     | 4458      | 51    |
| 6   | RSOV to lower leading edge of right door     | mm    | 4292     | 4330      | 38    |
| 7   | RSOV to lower leading edge of left door      | mm    | 4300     | 4330      | 30    |
| 8   | RSOV to upper trailing edge of right door    | mm    | 3234     | 3293      | 59    |
| 9   | RSOV to upper trailing edge of left door     | mm    | 3248     | 3298      | 50    |
| 10  | RSOV to lower trailing edge of right door    | mm    | 3203     | 3240      | 37    |
| 11  | RSOV to lower trailing edge of left door     | mm    | 3210     | 3240      | 30    |
| 12  | RSOV to bottom of right 'A' pillar           | mm    | 4368     | 4426      | 58    |
| 13  | RSOV to bottom of left 'A' pillar            | mm    | 4377     | 4426      | 49    |
| 14  | RSOV to firewall on right side               | mm    | 4590     | 4610      | 20    |
| 15  | RSOV to firewall on left side                | mm    | 4594     | 4640      | 46    |
| 16  | RSOV to steering column                      | mm    | 3870     | 3935      | 65    |
| 17  | Center of steering column to left 'A' pillar | mm    | 405      | 410       | 5     |
| 18  | Center of steering column to headlining      | mm    | 440      | 410       | -30   |
| 19  | RSOV to right side of front bumper           | mm    | 5710     | 5280      | -430  |
| 20  | RSOV to left side of front bumper            | mm    | 5710     | 5254      | -456  |
| 21  | Length of engine block                       | mm    | 615      | 615       | 0     |
| RD  | RSOV to right side of dash panel             | mm    | 4147     | 4205      | 58    |
| CD  | RSOV to center of dash panel                 | mm    | 4135     | 4181      | 46    |
| LD  | RSOV to left side of dash panel              | mm    | 4110     | 4060      | -50   |

**DATA SHEET NO. 13...(CONTINUED)****VEHICLE STRUCTURAL MEASUREMENTS**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**VEHICLE STRUCTURAL MEASUREMENT TABLE**

| No. | Measurement Description               | Units | Pre-Test | Post-Test | Diff. |
|-----|---------------------------------------|-------|----------|-----------|-------|
| 1   | Total length                          | mm    | 5835     | 5365      | -470  |
| 2   | Total width                           | mm    | 2030     | 2050      | 20    |
| 3   | Bumper top height                     | mm    | 831      | 715       | -116  |
| 4   | Bumper bottom height                  | mm    | 282      | 280       | -2    |
| 5   | Longitudinal member top height        | mm    | 531      | 638       | 107   |
| 6   | Longitudinal member bottom height     | mm    | 414      | 483       | 69    |
| 7   | Distance between longitudinal members | mm    | 860      | 766       | -94   |
| 8   | Longitudinal member width             | mm    | 72       | 80        | 8     |
| 9   | Engine top height                     | mm    | 1105     | 1130      | 25    |
| 10  | Engine bottom height                  | mm    | 225      | 230       | 5     |
| 11  | Engine and gear box width             | mm    | 800      | 800       | 0     |
| 12  | Front bumper to engine distance       | mm    | 682      | 340       | -342  |
| 13  | Front shock absorber fixing width     | mm    | 783      | 830       | 47    |
| 14  | Bonnet leading edge height            | mm    | 1170     | 1185      | 15    |
| 15  | Front shock absorber fixing width     | mm    | 840      | 840       | 0     |
| 16  | Front bumper to front axle distance   | mm    | 892      | 935       | 43    |
| 17  | Front axle to 'A' pillar distance     | mm    | 517      | 475       | -42   |
| 18  | 'A' pillar to 'B' pillar distance     | mm    | 1154     | 1068      | -86   |
| 19  | 'B' pillar to rear axle distance      | mm    | 2026     | 2020      | -6    |
| 20  | 'B' pillar to 'C' pillar distance     | mm    | 1188     | 1066      | -122  |
| 21  | Roof sill bottom height               | mm    | 1766     | 1748      | -18   |
| 22  | Roof sill top height                  | mm    | 1945     | 1828      | -117  |
| 23  | Floor sill bottom height              | mm    | 400      | 423       | 23    |
| 24  | Floor sill top height                 | mm    | 541      | 522       | -19   |

# DATA SHEET NO. 13...(CONTINUED)

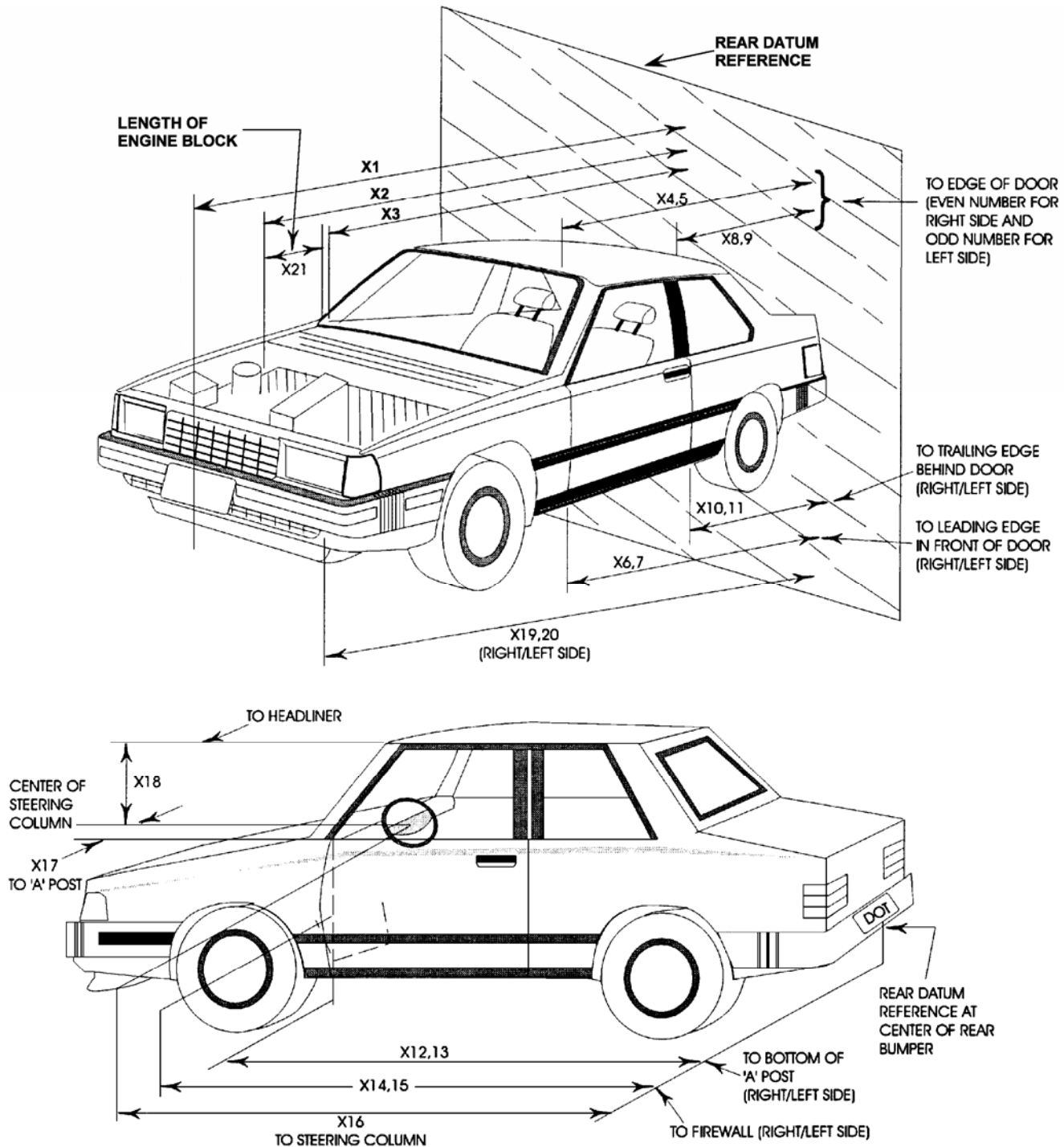
## VEHICLE MEASUREMENTS

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



**DATA SHEET NO. 14****CAMERA LOCATIONS**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**VEHICLE CAMERA MEASUREMENT TABLE**

| No. | Camera View                 | Location (mm) |        |       | Angle (deg.) | Film Plane to Head | Lens (mm) | Speed (fps) |
|-----|-----------------------------|---------------|--------|-------|--------------|--------------------|-----------|-------------|
|     |                             | X             | Y      | Z     |              |                    |           |             |
| 1   | Real Time Camera (Panning)  | -15316        | -7910  | -1584 | 0            |                    |           | 30          |
| 2   | Overall Left Side           | -2347         | -7585  | -1128 | 0            | 8286               | 20mm      | 1000        |
| 3   | Closeup Left Side           | -1689         | -7128  | -1123 | 0            | 7860               | 50mm      | 1000        |
| 4   | Driver and Interior View    | -8696         | -12562 | -4511 | -17          | 15570              | ZOOM      | 1000        |
| 5   | Steering Column (Bottom)    | -1631         | -8234  | -2682 | -13          | 9453               | 35mm      | 1000        |
| 6   | Steering Column (Top)       | -1663         | -8153  | -3078 | -13          | 9549               | 35mm      | 1000        |
| 7   | Overall Right Side          | -2985         | 3987   | -1128 | 0            | 4398               | 20mm      | 1000        |
| 8   | Closeup Right Side          | -2014         | 6548   | -1167 | 0            | 6635               | 50mm      | 1000        |
| 9   | Passenger and Interior View | -5330         | 9365   | -2407 | -10          | 10211              | ZOOM      | 1000        |
| 10  | Right Side View             | -2006         | 6967   | -1463 | -6           | 7134               | ZOOM      | 1000        |
| 11  | Windshield View             | -589          | 0      | -5556 | -90          |                    | 24mm      | 1000        |
| 12  | Driver Front View           | 378           | -286   | -2438 | -34          |                    | 25mm      | 1000        |
| 13  | Passenger Front View        | 375           | 413    | -2439 | -34          |                    | 25mm      | 1000        |
| 14  | Pit View of Engine          | -756          | 0      | 1495  | 90           |                    | 12mm      | 1000        |
| 15  | Pit View of Fuel Tank       | -3568         | 0      | 1495  | 90           |                    | 8mm       | 1000        |
| 16  | Real Time Driver            | -2458         | -7598  | 1301  | -1           |                    |           | 30          |
| 17  | Real Time Passenger         | -2985         | 3981   | -1284 | -1           |                    |           | 30          |

All measurements are made relative to the point of impact.

# DATA SHEET NO. 15

## PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

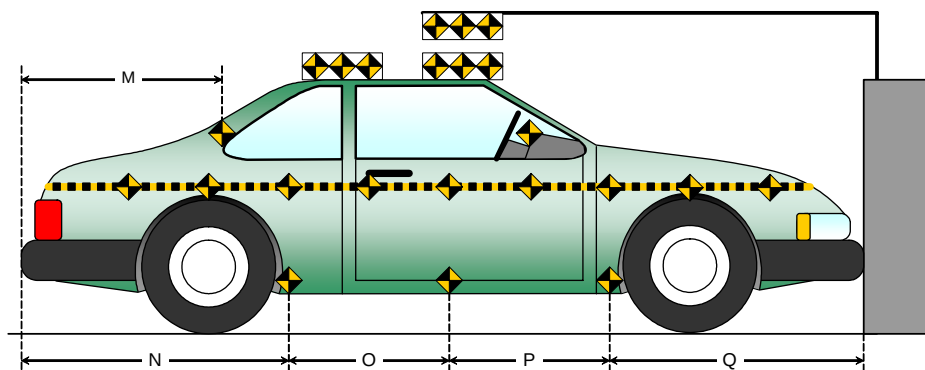
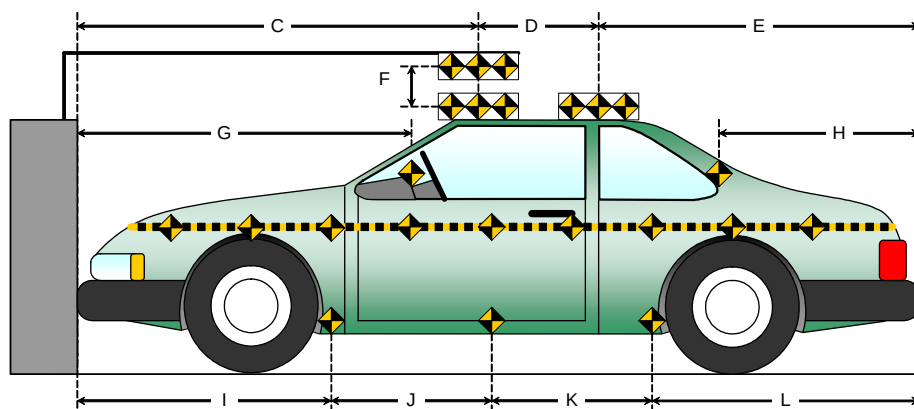
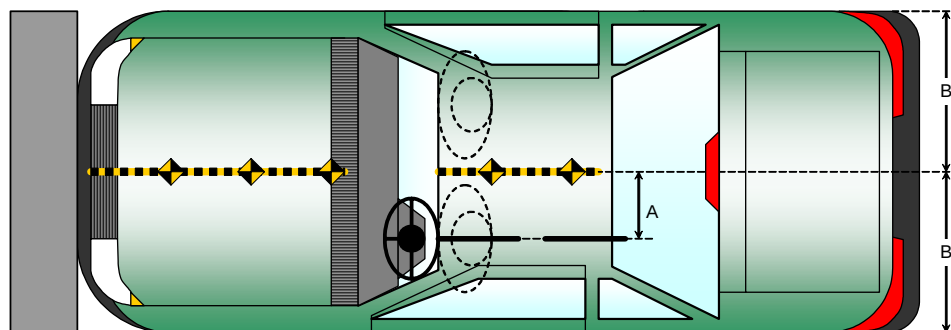
Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

| All Dimensions in (mm) |       |
|------------------------|-------|
| Item                   | Value |
| A                      | 506   |
| B                      | 1015  |
| C                      | 2330  |
| D                      | 615   |
| E                      | 2947  |
| F                      | 155   |
| G                      | 4030  |
| H                      | 1977  |
| I                      | 1433  |
| J                      | 1137  |
| K                      | 1137  |
| L                      | 2105  |
| M                      | 1977  |
| N                      | 2105  |
| O                      | 1137  |
| P                      | 1137  |
| Q                      | 1433  |



# DATA SHEET NO. 16

## VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

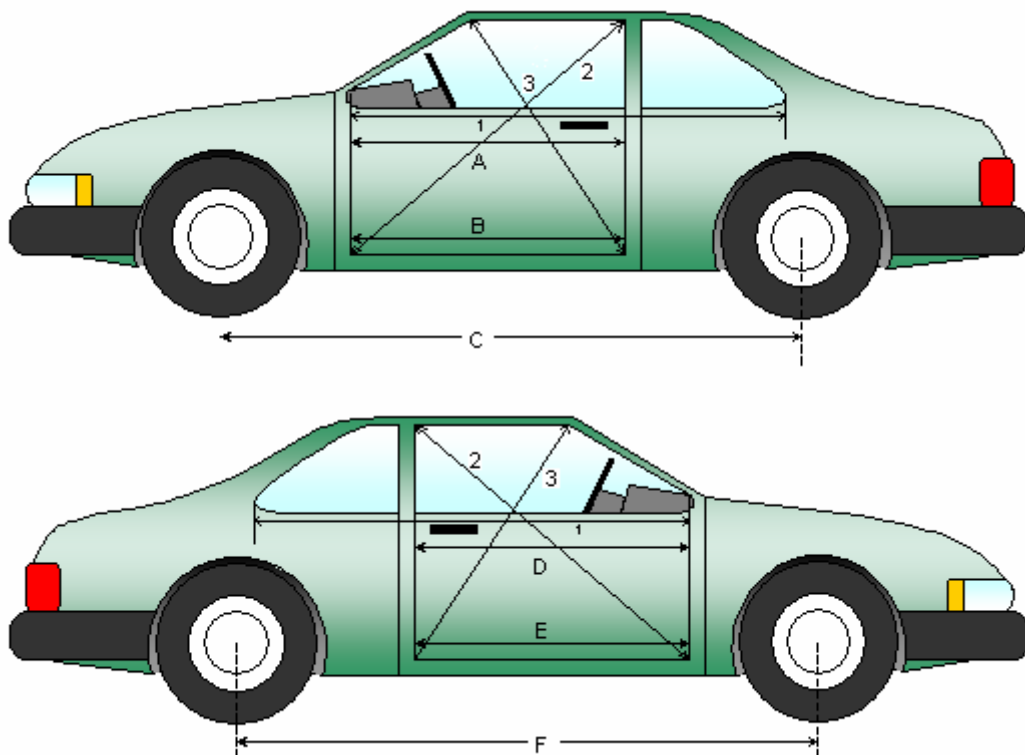
Test Date: 04/19/07

**DOOR OPENING WIDTH TABLE**

| Item | Description             | Units | Pre-Test | Post-Test | Diff. |
|------|-------------------------|-------|----------|-----------|-------|
| 1L   | Left Side               | mm    | 1069     | 1073      | 4     |
| 2L   | Left Side (Diagonally)  | mm    | 1615     | 1613      | -2    |
| 3L   | Left Side (Diagonally)  | mm    | 1210     | 1205      | -5    |
| 1R   | Right Side              | mm    | 1062     | 1065      | 3     |
| 2R   | Right Side (Diagonally) | mm    | 1612     | 1608      | -4    |
| 3R   | Right Side (Diagonally) | mm    | 1182     | 1198      | 16    |

**WHEELBASE MEASUREMENT TABLE**

| Item | Description           | Units | Pre-Test | Post-Test | Diff. |
|------|-----------------------|-------|----------|-----------|-------|
| C    | Left Side Wheel Base  | mm    | 3700     | 3660      | -40   |
| F    | Right Side Wheel Base | mm    | 3700     | 3637      | -63   |



**DATA SHEET NO. 16...(CONTINUED)**

**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

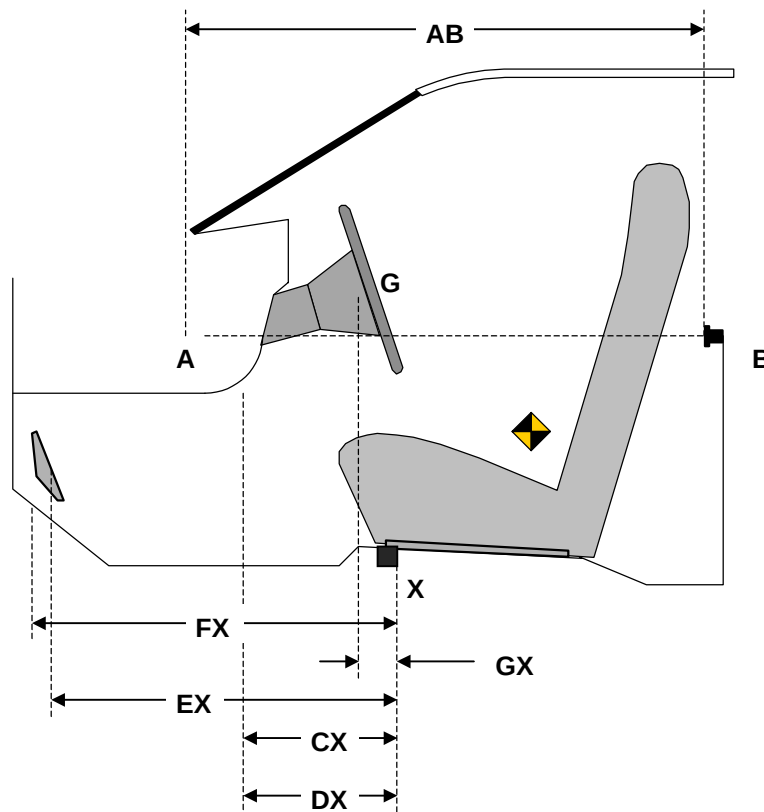
NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

**DRIVER COMPARTMENT INTRUSION TABLE**

| Item | Description                       | Units | Pre-Test | Post-Test | Diff. |
|------|-----------------------------------|-------|----------|-----------|-------|
| AB   | Door Opening (Inside window jam)  | mm    | 1076     | 1063      | -13   |
| CX   | Left Knee Bolster to X            | mm    | 302      | 310       | 8     |
| DX   | Right Knee Bolster to X           | mm    | 290      | 302       | 12    |
| EX   | Brake Pedal to X                  | mm    | 559      | 513       | -46   |
| FX   | Foot Rest to X                    | mm    | 566      | 570       | 4     |
| GX   | Center of Steering Wheel Hub to X | mm    | 36       | 60        | 24    |



# DATA SHEET NO. 16...(CONTINUED)

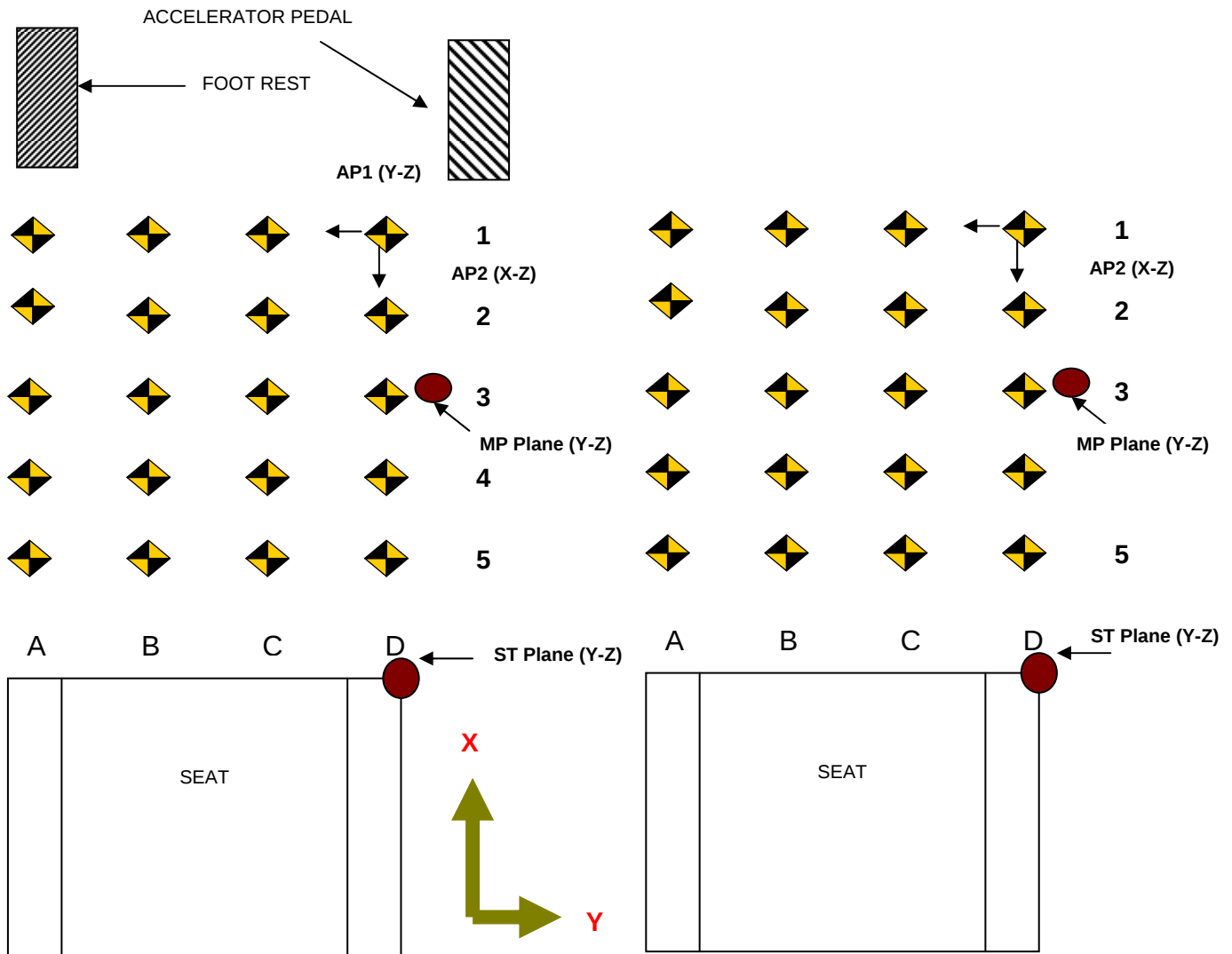
## VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

MP: Y-Z plane, halfway between the ST plane and AP1 plane

CF Plane: X-Z plane passes through center of footrest.

BP Plane: X-Z plane passes through center of brake pedal

TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

# DATA SHEET NO. 16...(CONTINUED)

## VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

All measurements in mm

### DRIVER FLOOR PAN X-AXIS

|   | Pre-Test |      |      |      | Post-Test |      |      |      | Difference |    |    |     |
|---|----------|------|------|------|-----------|------|------|------|------------|----|----|-----|
|   | A        | B    | C    | D    | A         | B    | C    | D    | A          | B  | C  | D   |
| 1 | -646     | -693 | -710 | -667 | -658      | -692 | -708 | -647 | 12         | -1 | -2 | -20 |
| 2 | -599     | -622 | -612 | -600 | -595      | -629 | -632 | -625 | -4         | 7  | 20 | 25  |
| 3 | -527     | -523 | -521 | -518 | -522      | -532 | -543 | -553 | -5         | 9  | 22 | 35  |
| 4 | -420     | -426 | -420 | -418 | -419      | -436 | -446 | -443 | -1         | 10 | 26 | 25  |
| 5 | -332     | -326 | -322 | -319 | -331      | -337 | -350 | -346 | -1         | 11 | 28 | 27  |

### DRIVER FLOOR PAN Y-AXIS

|   | Pre-Test |      |      |      | Post-Test |      |      |      | Difference |     |     |     |
|---|----------|------|------|------|-----------|------|------|------|------------|-----|-----|-----|
|   | A        | B    | C    | D    | A         | B    | C    | D    | A          | B   | C   | D   |
| 1 | -26      | -152 | -266 | -403 | 15        | -116 | -236 | -358 | -41        | -36 | -30 | -45 |
| 2 | -27      | -147 | -259 | -407 | -6        | -117 | -234 | -358 | -21        | -30 | -25 | -49 |
| 3 | -26      | -150 | -262 | -405 | -9        | -129 | -240 | -386 | -17        | -21 | -22 | -19 |
| 4 | -23      | -150 | -257 | -404 | -20       | -141 | -250 | -394 | -3         | -9  | -7  | -10 |
| 5 | -24      | -141 | -255 | -403 | -26       | -142 | -257 | -407 | 2          | 1   | 2   | 4   |

### DRIVER FLOOR PAN Z-AXIS

|   | Pre-Test |     |    |     | Post-Test |     |    |     | Difference |    |    |    |
|---|----------|-----|----|-----|-----------|-----|----|-----|------------|----|----|----|
|   | A        | B   | C  | D   | A         | B   | C  | D   | A          | B  | C  | D  |
| 1 | -55      | -15 | 10 | -42 | -32       | -13 | -3 | -78 | -23        | -2 | 13 | 36 |
| 2 | 27       | 55  | 57 | 58  | 50        | 63  | 65 | 3   | -23        | -8 | -8 | 55 |
| 3 | 93       | 83  | 82 | 86  | 106       | 86  | 75 | 62  | -13        | -3 | 7  | 24 |
| 4 | 87       | 102 | 97 | 92  | 93        | 98  | 84 | 68  | -6         | 4  | 13 | 24 |
| 5 | 88       | 81  | 83 | 86  | 90        | 73  | 70 | 58  | -2         | 8  | 13 | 28 |

# DATA SHEET NO. 16...(CONTINUED)

## VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

All measurements in mm

### PASSENGER FLOOR PAN X-AXIS

|   | Pre-Test |     |     |     | Post-Test |     |     |     | Difference |    |    |     |
|---|----------|-----|-----|-----|-----------|-----|-----|-----|------------|----|----|-----|
|   | A        | B   | C   | D   | A         | B   | C   | D   | A          | B  | C  | D   |
| 1 | 648      | 699 | 710 | 695 | 600       | 651 | 691 | 701 | 48         | 48 | 19 | -6  |
| 2 | 589      | 608 | 616 | 619 | 496       | 573 | 611 | 629 | 93         | 35 | 5  | -10 |
| 3 | 501      | 514 | 525 | 554 | 497       | 510 | 524 | 552 | 4          | 4  | 1  | 2   |
| 4 | 404      | 410 | 422 | 431 | 397       | 409 | 421 | 431 | 7          | 1  | 1  | 0   |
| 5 | 307      | 313 | 322 | 335 | 301       | 311 | 323 | 335 | 6          | 2  | -1 | 0   |

### PASSENGER FLOOR PAN Y-AXIS

|   | Pre-Test |      |      |      | Post-Test |      |      |      | Difference |    |    |    |
|---|----------|------|------|------|-----------|------|------|------|------------|----|----|----|
|   | A        | B    | C    | D    | A         | B    | C    | D    | A          | B  | C  | D  |
| 1 | -464     | -349 | -239 | -102 | -470      | -361 | -260 | -120 | 6          | 12 | 21 | 18 |
| 2 | -453     | -335 | -227 | -80  | -445      | -328 | -235 | -88  | -8         | -7 | 8  | 8  |
| 3 | -445     | -329 | -221 | -70  | -446      | -330 | -222 | -74  | 1          | 1  | 1  | 4  |
| 4 | -439     | -323 | -212 | -60  | -440      | -323 | -212 | -62  | 1          | 0  | 0  | 2  |
| 5 | -432     | -323 | -207 | -54  | -430      | -322 | -206 | -57  | -2         | -1 | -1 | 3  |

### PASSENGER FLOOR PAN Z-AXIS

|   | Pre-Test |    |     |     | Post-Test |     |     |     | Difference |     |     |     |
|---|----------|----|-----|-----|-----------|-----|-----|-----|------------|-----|-----|-----|
|   | A        | B  | C   | D   | A         | B   | C   | D   | A          | B   | C   | D   |
| 1 | -41      | 1  | 10  | -70 | -38       | 1   | 22  | -53 | -3         | 0   | -12 | -17 |
| 2 | 51       | 53 | 58  | -1  | 98        | 72  | 85  | 19  | -47        | -19 | -27 | -20 |
| 3 | 81       | 85 | 82  | 92  | 98        | 100 | 99  | 105 | -17        | -15 | -17 | -13 |
| 4 | 96       | 95 | 102 | 89  | 111       | 110 | 114 | 97  | -15        | -15 | -12 | -8  |
| 5 | 87       | 83 | 90  | 87  | 102       | 98  | 101 | 93  | -15        | -15 | -11 | -6  |

# DATA SHEET NO. 17

## FIXED BARRIER LOAD CELL LOCATIONS

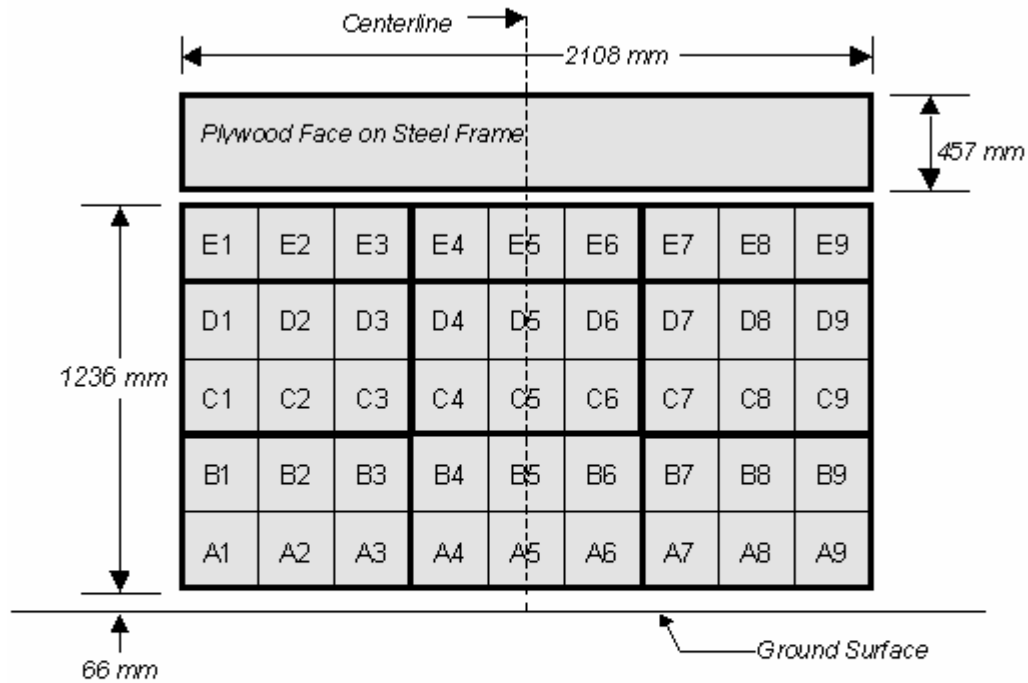
Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### 45 Load Cell Rigid Barrier (NHTSA Standard) Load Cell Locations on Fixed Barrier



|                    |                    |                    |                                |
|--------------------|--------------------|--------------------|--------------------------------|
| Group 4<br>C1 – D3 | Group 5<br>C4 – D6 | Group 6<br>C7 – D9 | R&D Additional<br>Group E1– E9 |
| Group 1<br>A1 – B3 | Group 2<br>A4 – B6 | Group 3<br>A7 – B9 |                                |

6 Groups of 6 Load Cells Each

# DATA SHEET NO. 18

## ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

### VEHICLE INFORMATION

VIN: 5TBDV54117S459654

Wheel base (mm): 3700

Vehicle Size Category: 4-Door Truck

Test Weight (kg): 2884

### ACCELEROMETER DATA

Accelerometer Location: Left rear cross member

Cal. Procedure/Interval: 6 months / drop test

Integration Algorithm: NHTSA Standard

Linearity: Good

Impact Velocity (km/h): 56.21

Velocity Change (km/h): 65.3

Time of Separation (msec): 58.1

### CRUSH PROFILE

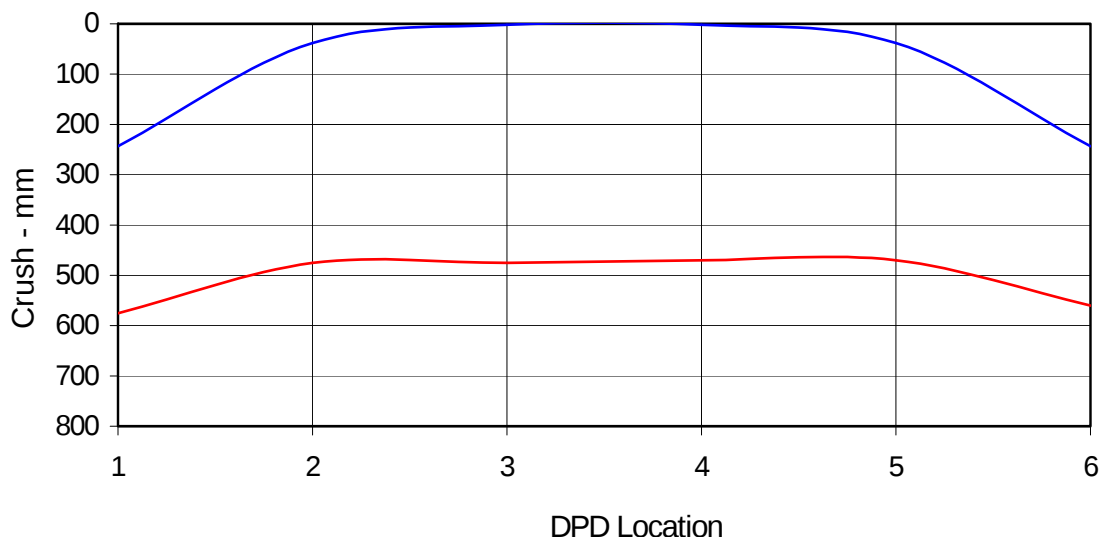
Collision Deformation Classification: 12FDEW6

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1452

Impact Mode: Full Frontal

| No. | Measurement Description    | Units | Pre-Test | Post-Test | Difference |
|-----|----------------------------|-------|----------|-----------|------------|
| C1  | Crush zone 1 at left side  | mm    | 243      | 575       | -332       |
| C2  | Crush zone 2 on left side  | mm    | 38       | 475       | -437       |
| C3  | Crush zone 3 on left side  | mm    | 2        | 475       | -473       |
| C4  | Crush zone 4 on right side | mm    | 2        | 470       | -468       |
| C5  | Crush zone 5 on right side | mm    | 38       | 470       | -432       |
| C6  | Crush zone 6 at right side | mm    | 243      | 560       | -317       |



DATA SHEET NO. 19

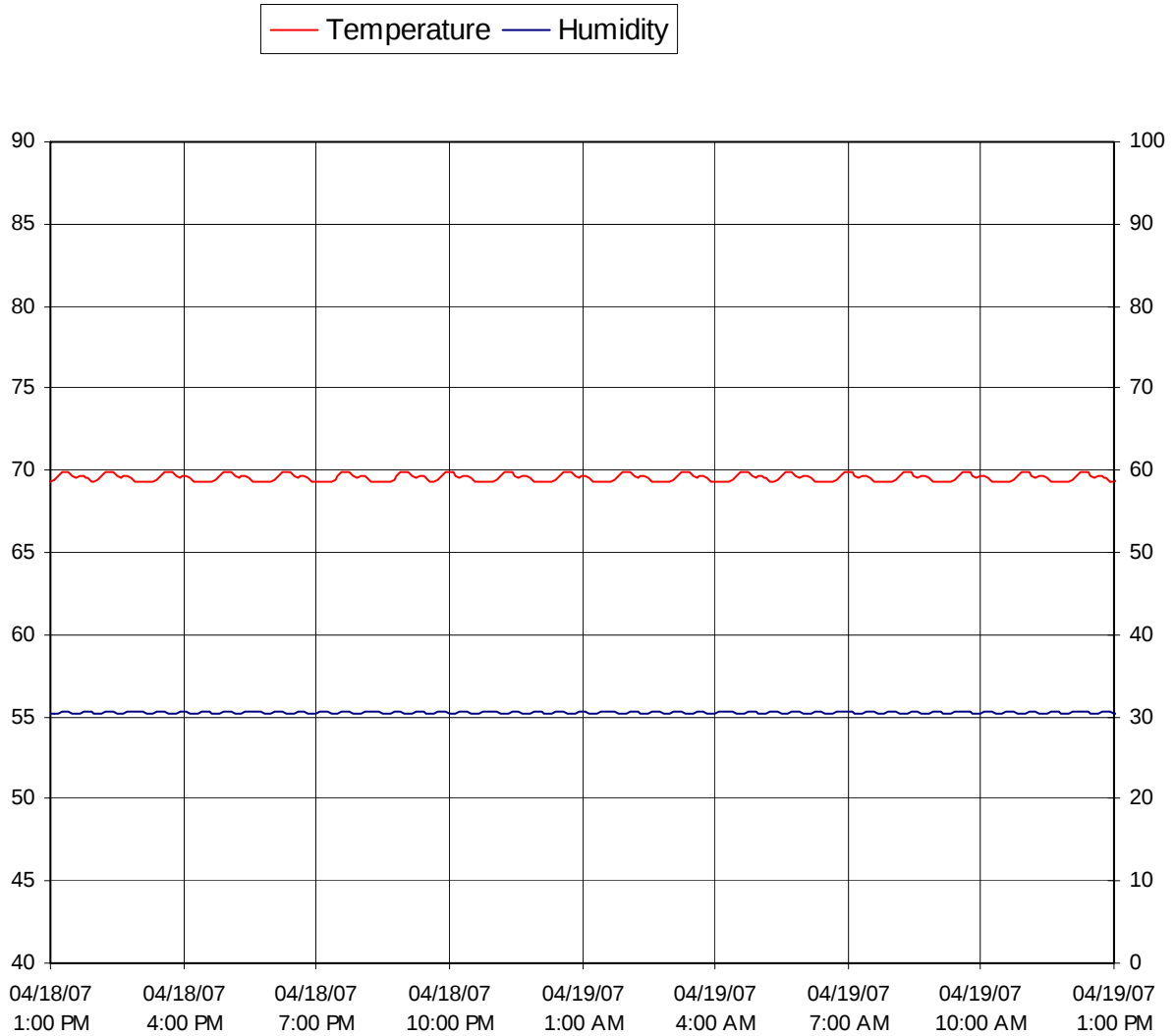
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



APPENDIX A  
PHOTOGRAPHS

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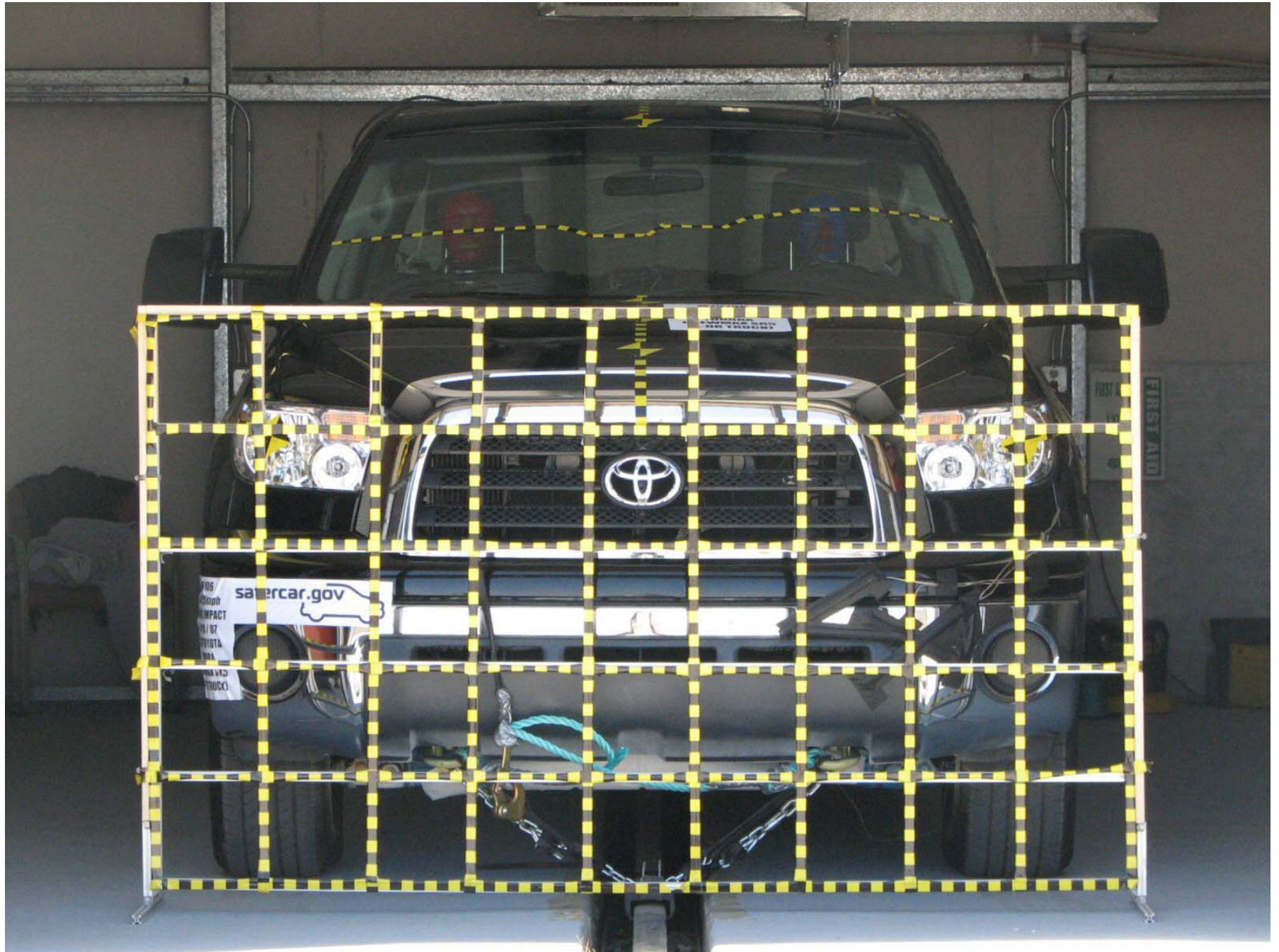


Figure A-1: Load Cell Location

MFD. BY: TOYOTA MOTOR MANUFACTURING, INDIANA, INC.

03/07

GVWR: 3265KG (7200LB)

GAWR: FRT. 1810KG (4000LB) WITH P275/65R18 TIRES,  
18X8J RIMS, AT 210KPA (30PSI) COLD.  
RR. 1880KG (4150LB) WITH P275/65R18 TIRES,  
18X8J RIMS, AT 230KPA (33PSI) COLD.

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR  
VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON  
THE DATE OF MANUFACTURE SHOWN ABOVE.

5TBDV54117S459654 TRUCK



C/TR: 202/FC13

USK56L-PSTSKA

A/TM: B02A/AB60F

MADE IN U.S.A.

738

A

Figure A-2: Manufacturer's Label



## TIRE AND LOADING INFORMATION

### RENSEIGNEMENTS RELATIFS AUX PNEUS ET À LA CHARGE DU VÉHICULE

|                                      |                   |                   |                    |
|--------------------------------------|-------------------|-------------------|--------------------|
| SEATING CAPACITY<br>NOMBRE DE PLACES | TOTAL<br>TOTAL: 5 | FRONT<br>AVANT: 2 | REAR<br>ARRIÈRE: 3 |
|--------------------------------------|-------------------|-------------------|--------------------|

The combined weight of occupants and cargo should never exceed 600kg or 1325lbs.  
La charge du véhicule (occupants et bagages) ne doit jamais dépasser 600kg ou 1325lb.

| TIRE<br>PNEUS    | ORIGINAL TIRE SIZE<br>DIMENSIONS DES PNEUS<br>D'ORIGINE | COLD TIRE INFLATION PRESSURE<br>PRESSION DE GONFLAGE À FROID |
|------------------|---------------------------------------------------------|--------------------------------------------------------------|
| FRONT<br>AVANT   | P275/65R18                                              | 210 kPa, 30 PSI                                              |
| REAR<br>ARRIÈRE  | P275/65R18                                              | 230 kPa, 33 PSI                                              |
| SPARE<br>SECOURS | P255/70R18                                              | SEE ABOVE / VOIR CI-DESSUS                                   |

**SEE OWNER'S  
MANUAL FOR  
ADDITIONAL  
INFORMATION**

CONSULTER LE GUIDE  
DU PROPRIÉTAIRE POUR  
DE PLUS AMPLES  
RENSEIGNEMENTS



45K5T 65068

Figure A-3: Tire Placard



Figure A-4: Right Front  $\frac{3}{4}$  View, As Received



Figure A-5: Left Rear  $\frac{3}{4}$  View, as Received



Figure A-6: Pre-Test Front View

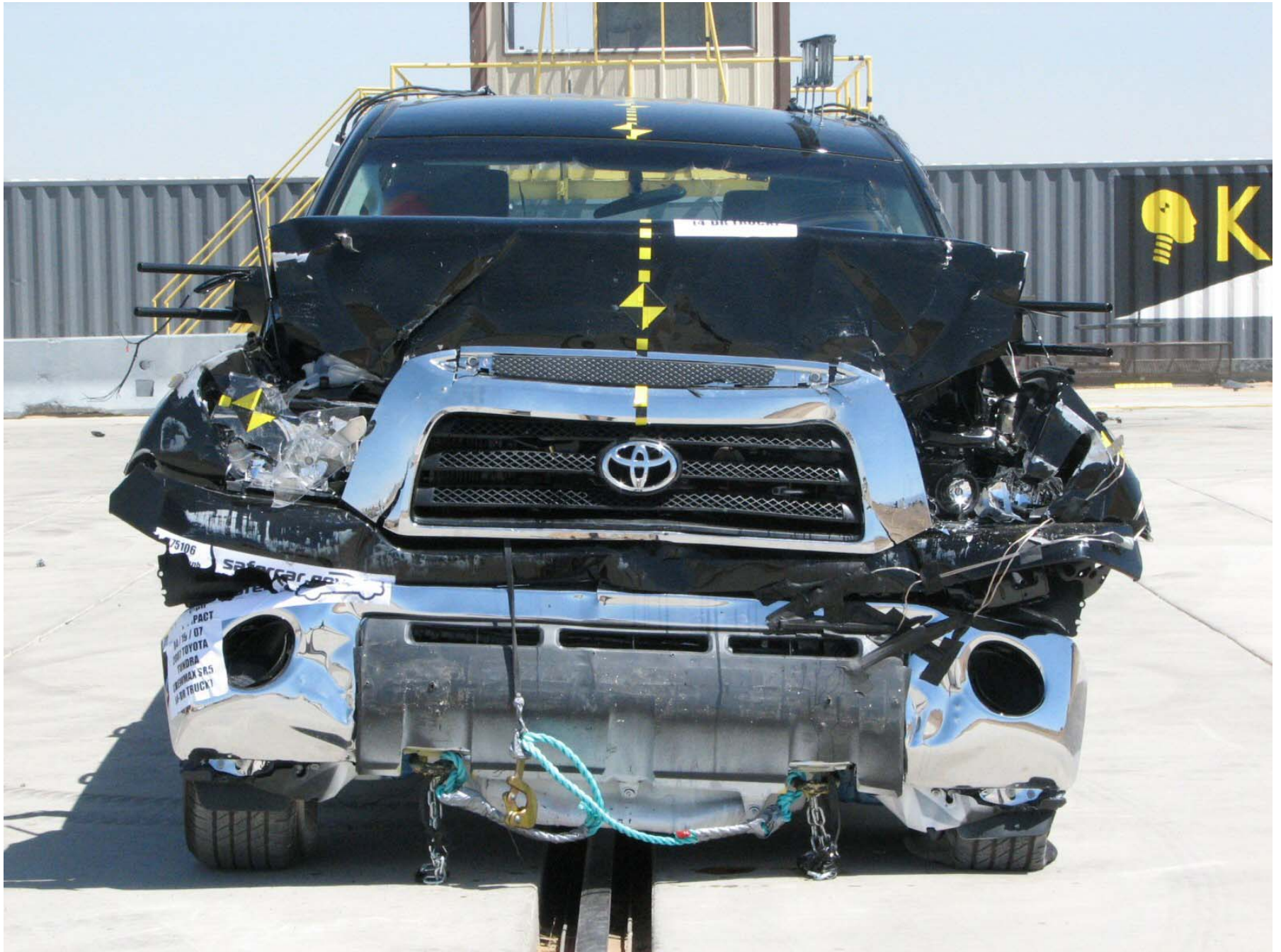


Figure A-7: Post-Test Front View (Vehicle Moved)



Figure A-8: Pre-Test Left Side View



Figure A-9: Post-Test Left Side View



Figure A-10: Pre-Test Right Side View



Figure A-11: Post-Test Right Side View



Figure A-12: Pre-Test Right Front 3/4 View



Figure A-13: Post-Test Right Front ¾ View (Vehicle Moved)





Figure A-15: Post-Test Left Rear  $\frac{3}{4}$  View



Figure A-16: Post-Test Left Side ¾ View of Doors After Impact



Figure A-17: Post-Test Right Side  $\frac{3}{4}$  View of Doors After Impact

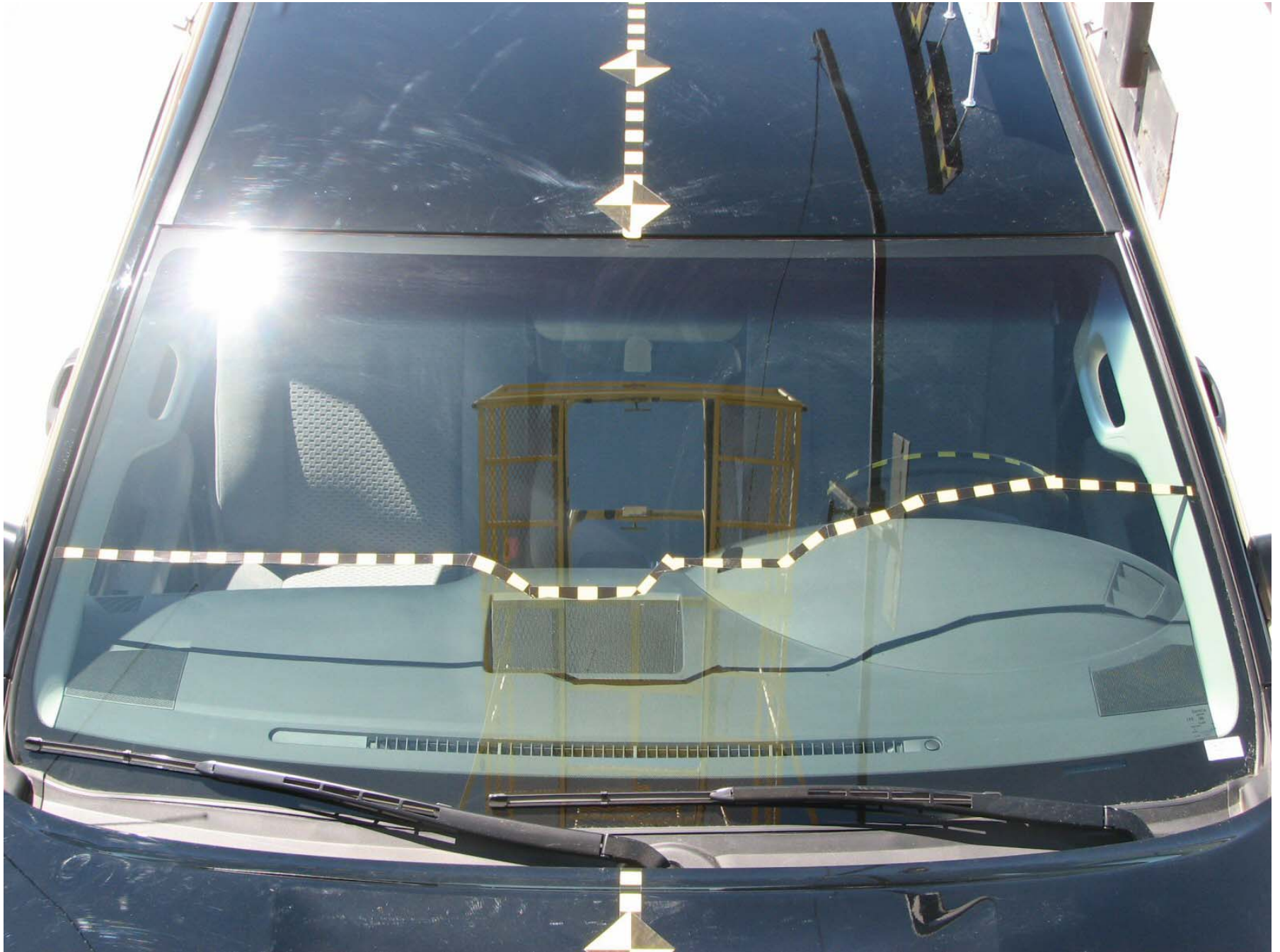


Figure A-18: Pre-Test Windshield



Figure A-19: Post-Test Windshield



Figure A-20: Pre-Test Engine Compartment



Figure A-21: Post-Test Engine Compartment (Vehicle Moved)



Figure A-22: Pre-Test Fuel Cap



Figure A-23: Post-Test Fuel Cap

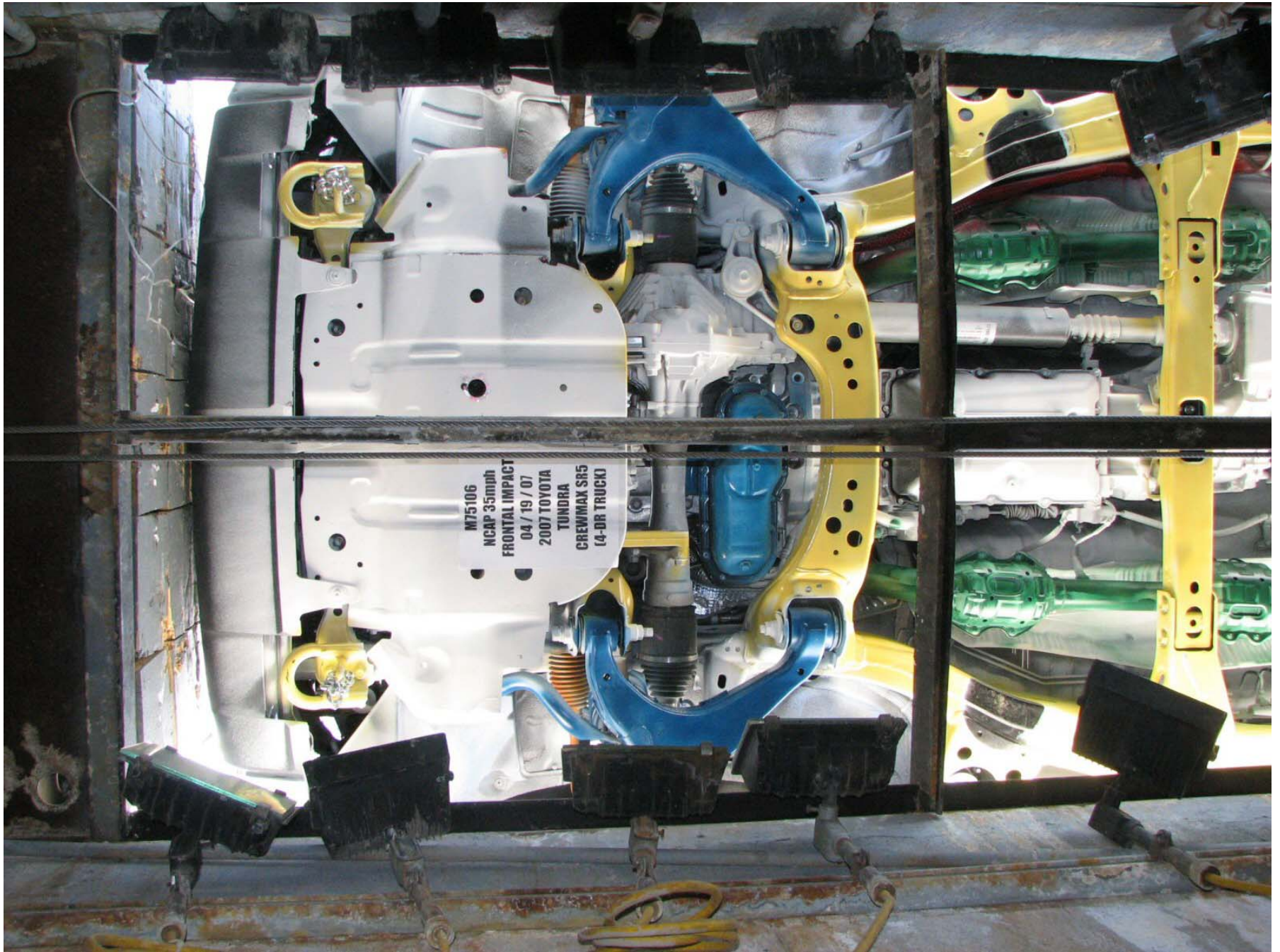


Figure A-24: Pre-Test Front Underbody

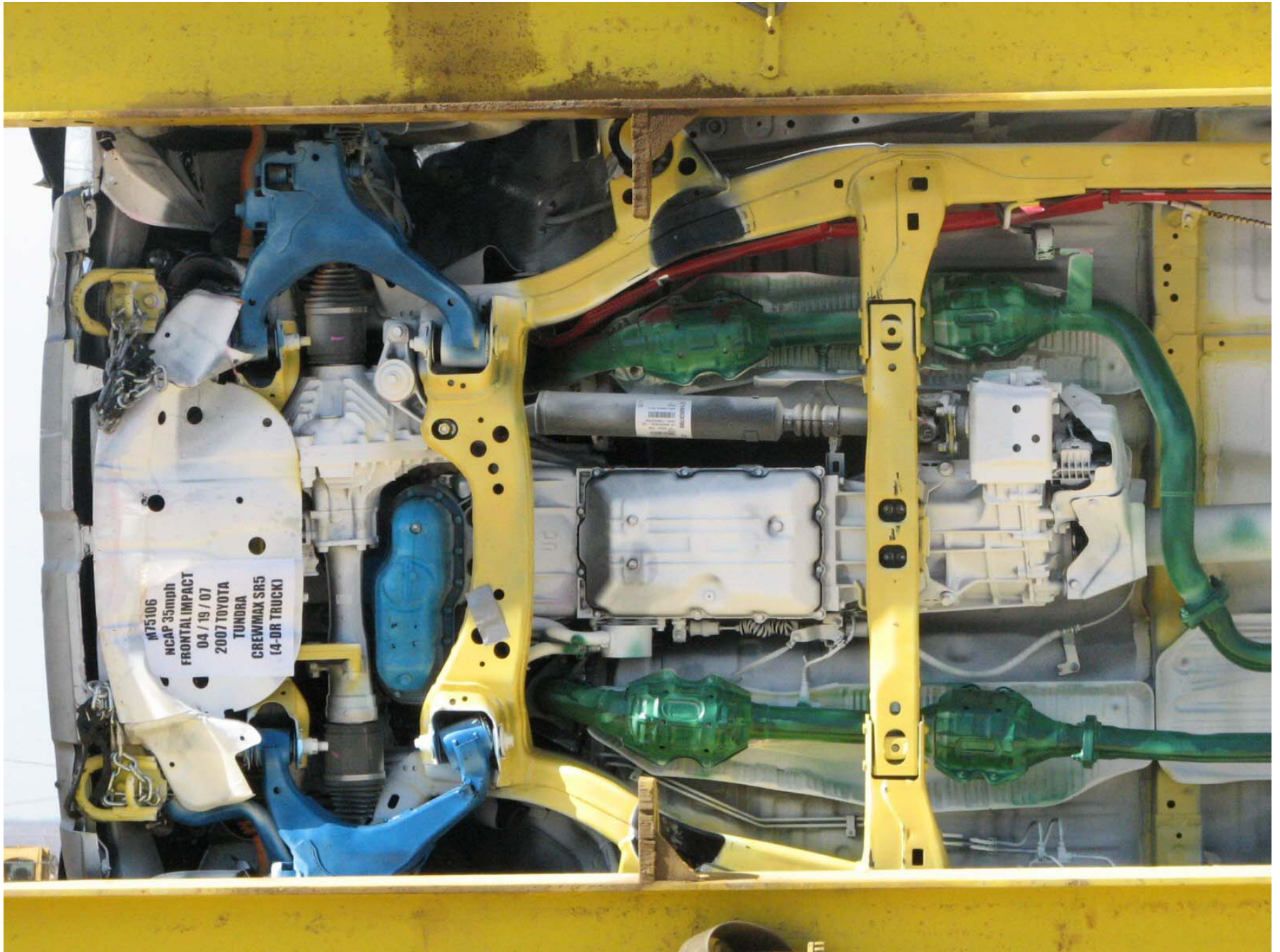


Figure A-25: Post-Test Front Underbody

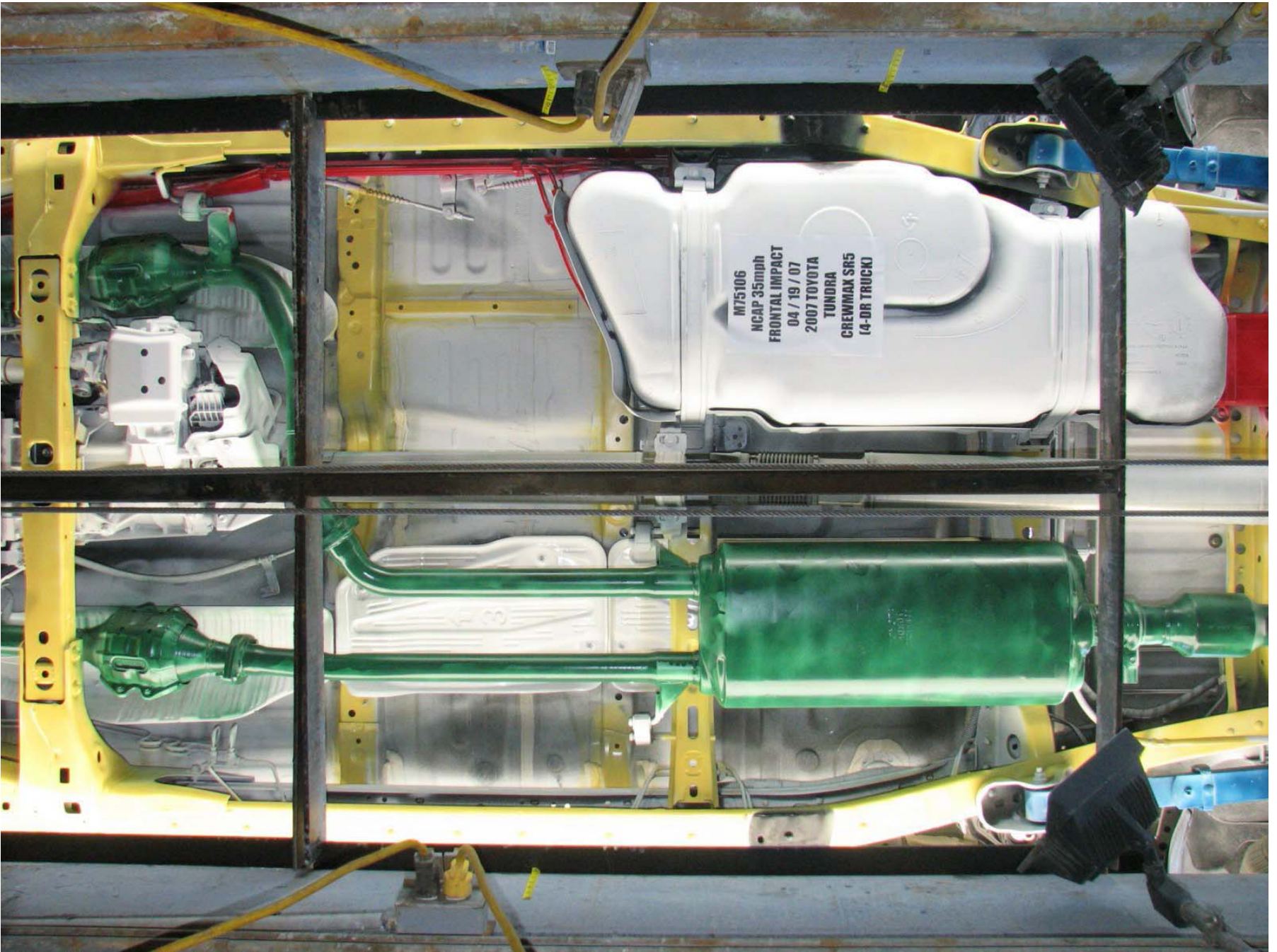


Figure A-26: Pre-Test Mid Underbody

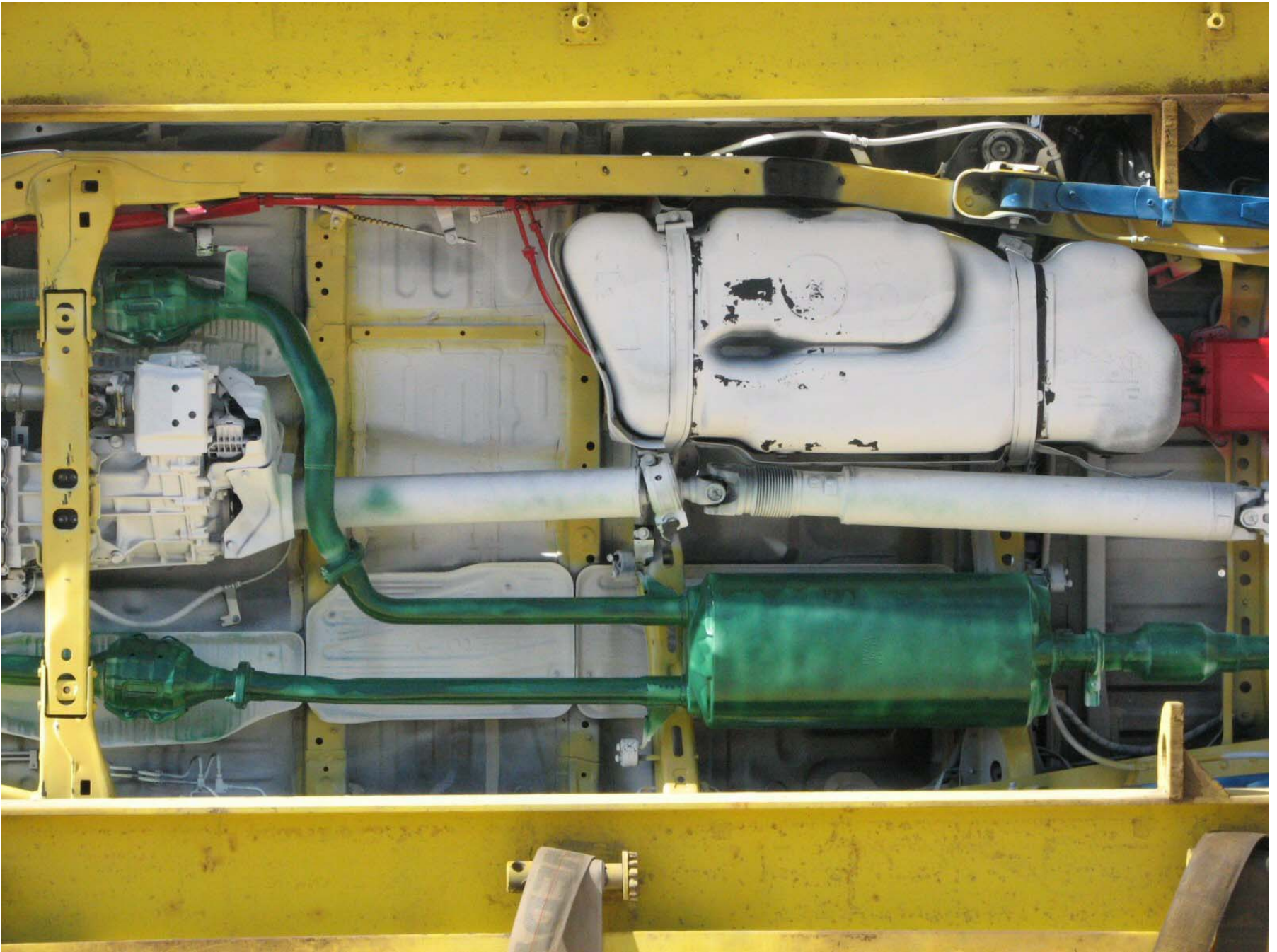


Figure A-27: Post-Test Mid Underbody

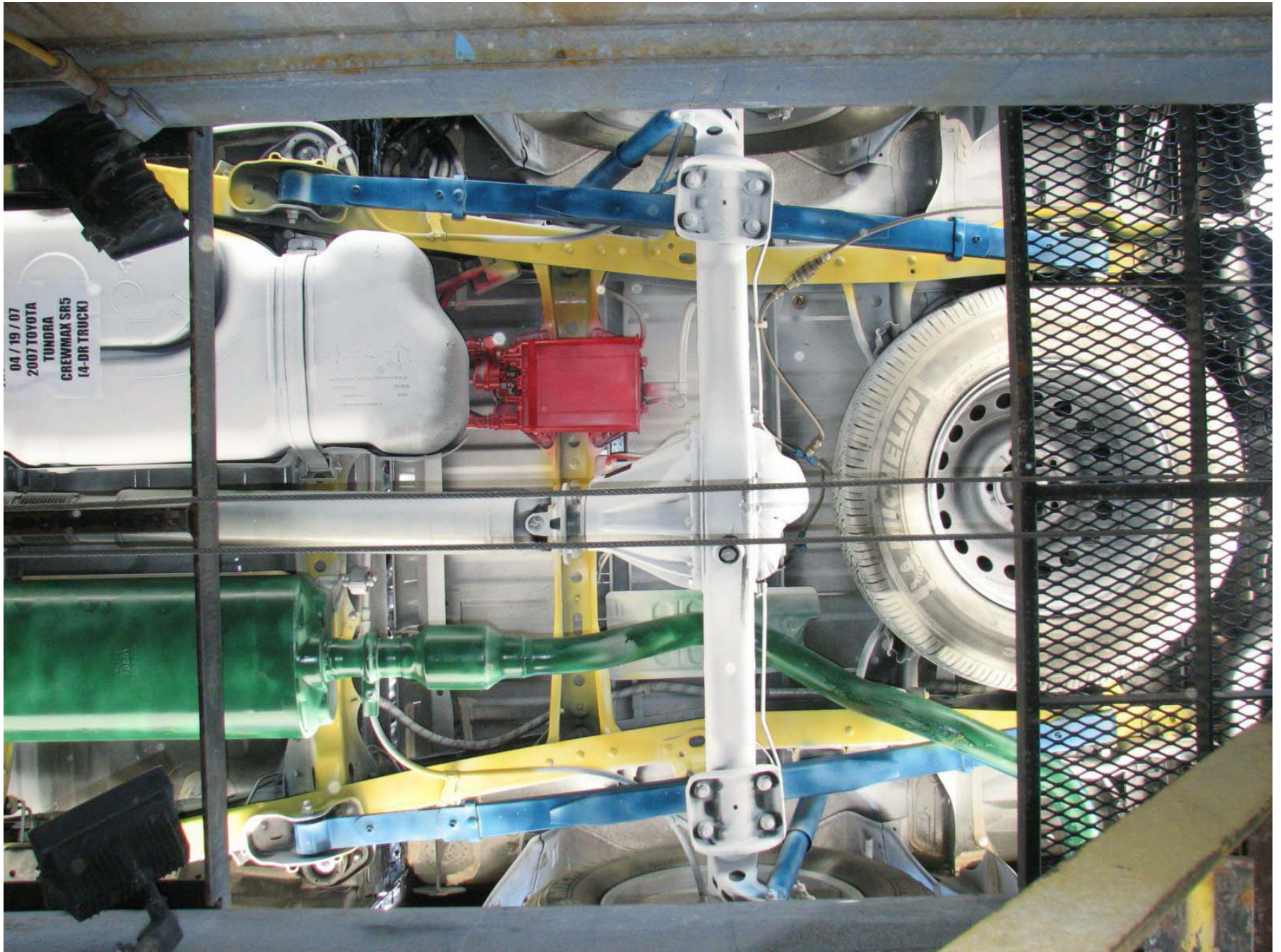


Figure A-28: Pre-Test Rear Underbody

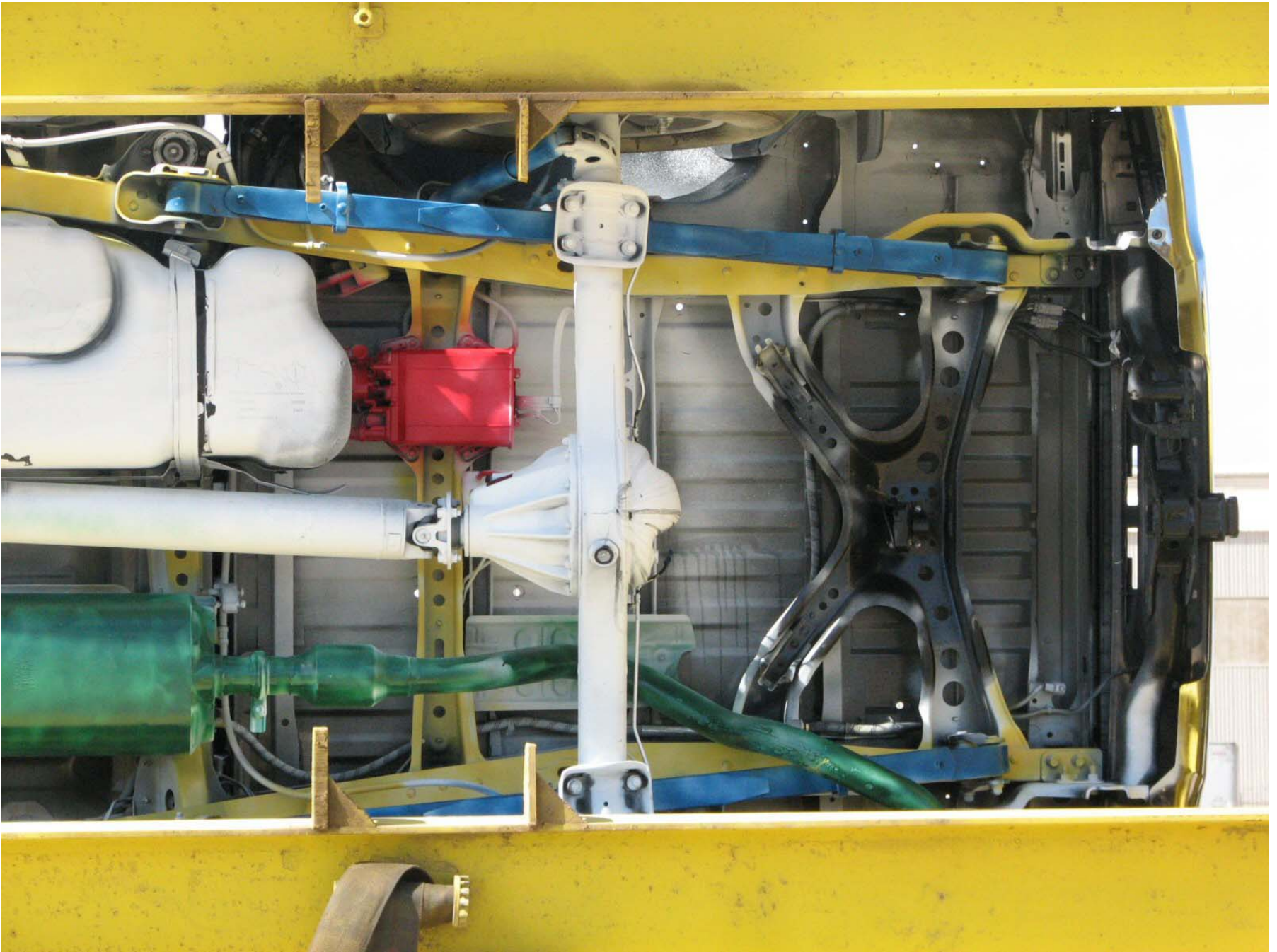


Figure A-29: Post-Test Rear Underbody

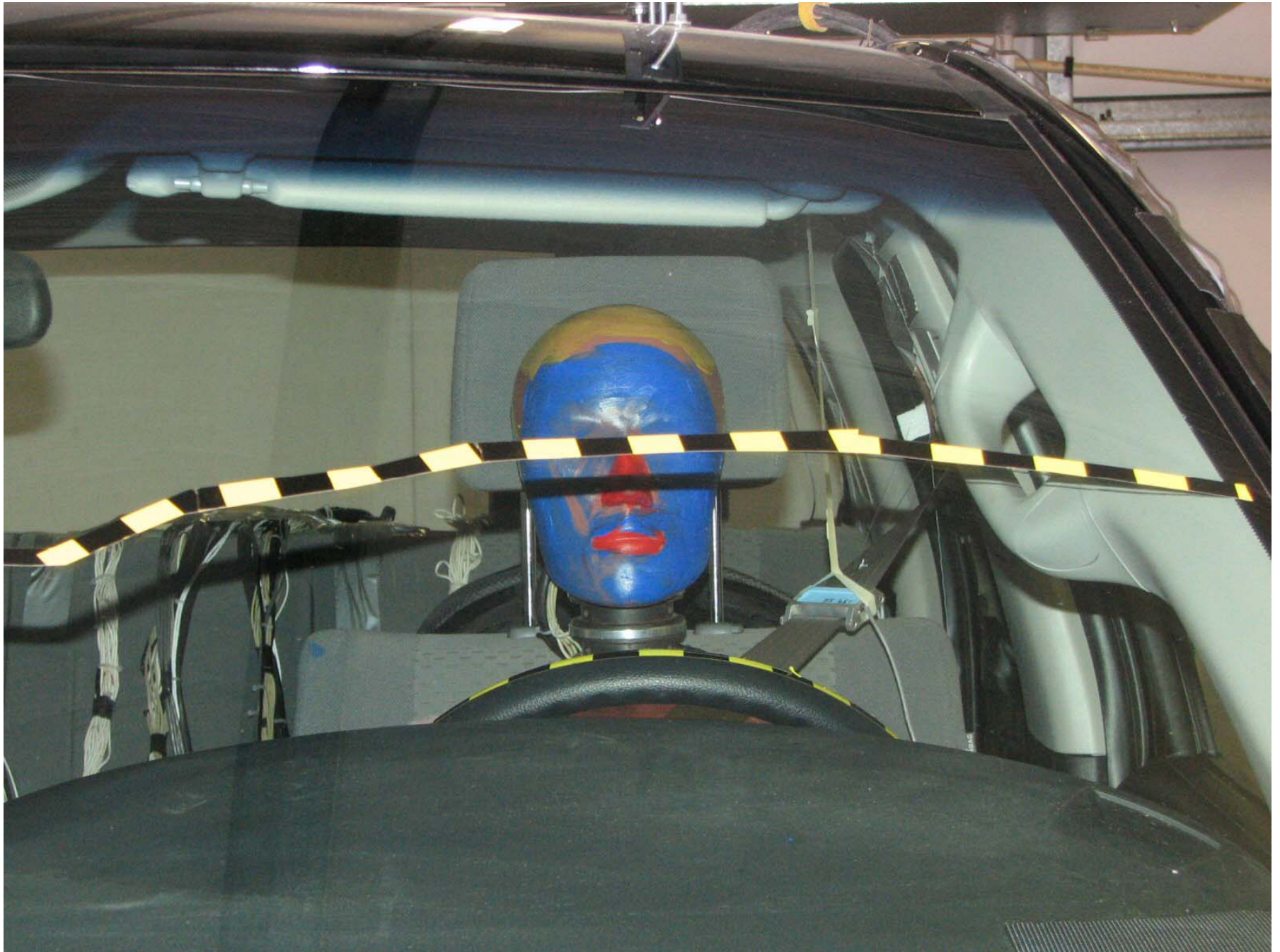


Figure A-30: Pre-Test Driver Dummy Front View (Head Position)



Figure A-31: Post-Test Driver Dummy Front View (Head Position)



Figure A-32: Pre-Test Driver Dummy (Through Window)



Figure A-33: Post-Test Driver Dummy (Through Window)



Figure A-34: Pre-Test Driver Dummy (Door Open)



Figure A-35: Post-Test Driver Dummy (Door Open)



Figure A-36: Pre-Test Driver Dummy Feet



Figure A-37: Post-Test Driver Dummy Feet



Figure A-38: Pre-Test Driver Side Knee Bolster



Figure A-39: Post-Test Driver Side Knee Bolster



Figure A-40: Pre-Test Driver Side Floor Pan



Figure A-41: Post-Test Driver Side Floor Pan



Figure A-42: Post-Test Driver Dummy Head



Figure A-43: Post-Test Driver Dummy Airbag Contact



Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)



Figure A-45: Post-Test Passenger Dummy Front View (Head Position)



Figure A-46: Pre-Test Passenger Dummy (Through Window)



Figure A-47: Post-Test Passenger Dummy (Through Window)



Figure A-48: Pre-Test Passenger Dummy (Door Open)



Figure A-49: Post-Test Passenger Dummy (Door Open)



Figure A-50: Pre-Test Passenger Dummy Feet



Figure A-51: Post-Test Passenger Dummy Feet



Figure A-52: Pre-Test Passenger Side Glove Box



Figure A-53: Post-Test Passenger Side Glove Box

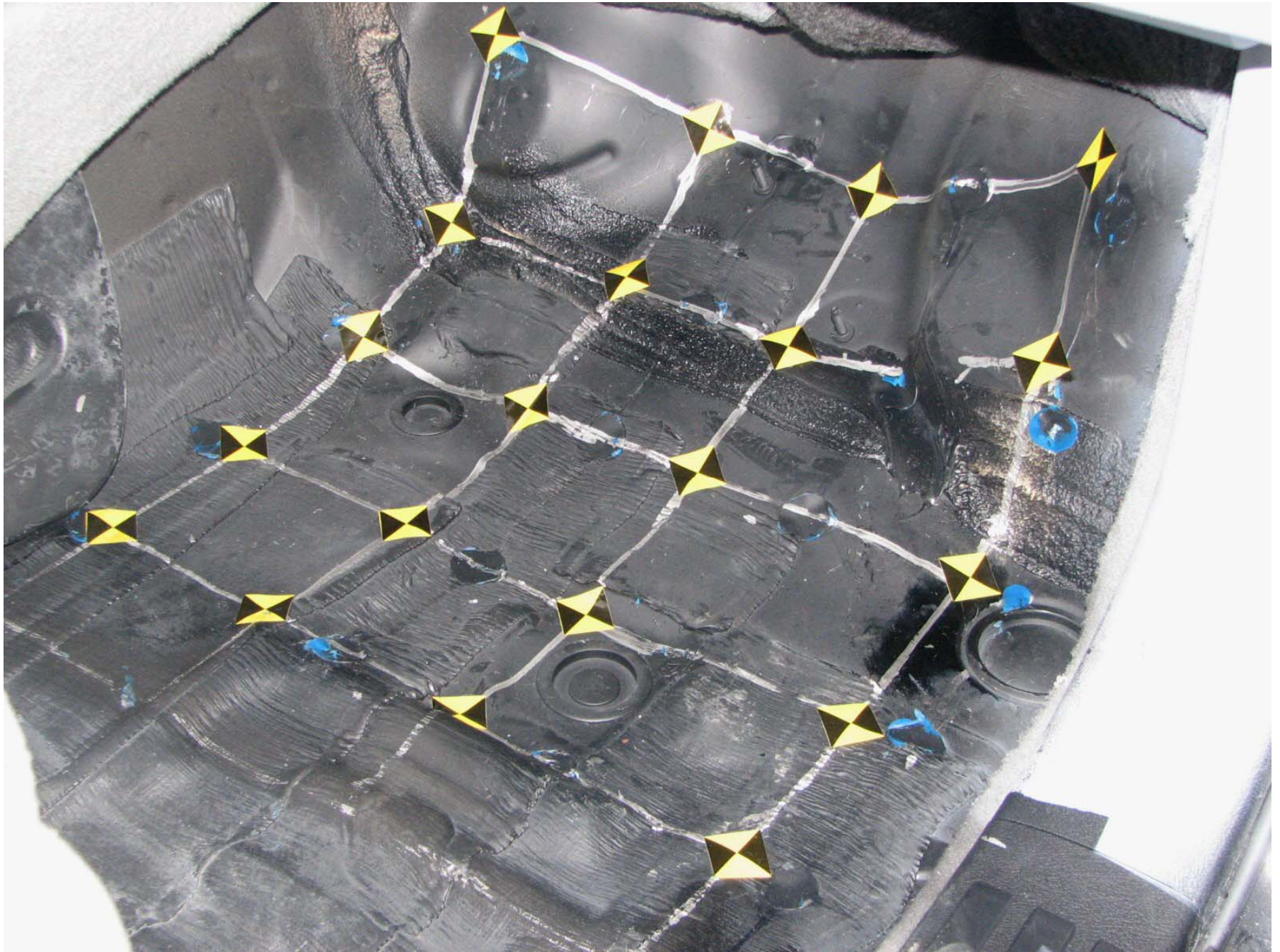


Figure A-54: Pre-Test Passenger Side Floor Pan



Figure A-55: Post-Test Passenger Side Floor Pan



Figure A-56: Post-Test Passenger Dummy Head



Figure A-57: Post-Test Passenger Dummy Airbag Contact



Figure A-58: Vehicle on Rollover Device (0°)



Figure A-59: Vehicle on Rollover Device (90°)



Figure A-60: Vehicle on Rollover Device (180°)



Figure A-61: Vehicle on Rollover Device (270°)



Figure A-62: Vehicle Impact

APPENDIX B  
DATA PLOTS

# LIST OF DATA PLOTS

| Data Plot | Page                              |
|-----------|-----------------------------------|
| B-1       | Driver Head Primary X             |
|           | Driver Head Primary Y             |
|           | Driver Head Primary Z             |
|           | Driver Head Resultant Primary     |
| B-2       | Driver Chest Primary X            |
|           | Driver Chest Primary Y            |
|           | Driver Chest Primary Z            |
|           | Driver Chest Resultant Primary    |
| B-3       | Driver Left Femur Force Z         |
|           | Driver Right Femur Force Z        |
| B-4       | Passenger Head Primary X          |
|           | Passenger Head Primary Y          |
|           | Passenger Head Primary Z          |
|           | Passenger Head Resultant Primary  |
| B-5       | Passenger Chest Primary X         |
|           | Passenger Chest Primary Y         |
|           | Passenger Chest Primary Z         |
|           | Passenger Chest Resultant Primary |
| B-6       | Passenger Left Femur Force Z      |
|           | Passenger Right Femur Force Z     |

## LIST OF DATA PLOTS...(CONTINUED)

The following additional data plots 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).

- Driver Head Primary X Velocity
- Driver Head Primary X Displacement
- Driver Head Redundant X
- Driver Head Redundant Y
- Driver Head Redundant Z
- Driver Head Resultant Redundant
- Driver Head Redundant X Velocity
- Driver Head Redundant X Displacement
- Driver Upper Neck Force X
- Driver Upper Neck Force Y
- Driver Upper Neck Force Z
- Driver Upper Neck Force Resultant
- Driver Upper Neck Moment X
- Driver Upper Neck Moment Y
- Driver Upper Neck Moment Z
- Driver Upper Neck Moment Resultant
- Driver Chest Primary X Velocity
- Driver Chest Primary X Displacement
- Driver Chest Redundant X
- Driver Chest Redundant Y
- Driver Chest Redundant Z
- Driver Chest Resultant Redundant
- Driver Chest Redundant X Velocity
- Driver Chest Redundant X Displacement
- Driver Chest Displacement
- Driver Pelvis X
- Driver Pelvis Y
- Driver Pelvis Z
- Driver Pelvis Resultant
- Driver Pelvis X Velocity
- Driver Pelvis X Displacement
- Driver Left Upper Tibia Moment X
- Driver Left Upper Tibia Moment Y
- Driver Right Upper Tibia Moment X

## LIST OF DATA PLOTS...(CONTINUED)

Driver Right Upper Tibia Moment Y  
Driver Left Lower Tibia Moment X  
Driver Left Lower Tibia Moment Y  
Driver Left Lower Tibia Force Z  
Driver Right Lower Tibia Moment X  
Driver Right Lower Tibia Moment Y  
Driver Right Lower Tibia Force Z  
Driver Left Foot Aft X  
Driver Left Foot Aft Z  
Driver Left Foot Fore Z  
Driver Right Foot Aft X  
Driver Right Foot Aft Z  
Driver Right Foot Fore Z  
Driver Lap Belt Force  
Driver Shoulder Belt Force  
Driver Shoulder Belt Pullout  
Driver Shoulder Belt Elongation  
Passenger Head Primary X Velocity  
Passenger Head Primary X Displacement  
Passenger Head Redundant X  
Passenger Head Redundant Y  
Passenger Head Redundant Z  
Passenger Head Resultant Redundant  
Passenger Head Redundant X Velocity  
Passenger Head Redundant X Displacement  
Passenger Upper Neck Force X  
Passenger Upper Neck Force Y  
Passenger Upper Neck Force Z  
Passenger Upper Neck Force Resultant  
Passenger Upper Neck Moment X  
Passenger Upper Neck Moment Y  
Passenger Upper Neck Moment Z  
Passenger Upper Neck Moment Resultant  
Passenger Chest Primary X Velocity  
Passenger Chest Primary X Displacement  
Passenger Chest Redundant X

## LIST OF DATA PLOTS...(CONTINUED)

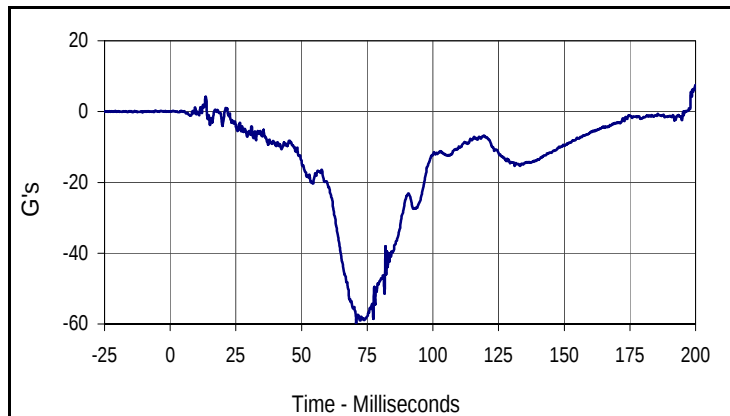
Passenger Chest Redundant Y  
Passenger Chest Redundant Z  
Passenger Chest Resultant Redundant  
Passenger Chest Redundant X Velocity  
Passenger Chest Redundant X Displacement  
Passenger Chest Displacement  
Passenger Pelvis X  
Passenger Pelvis Y  
Passenger Pelvis Z  
Passenger Pelvis Resultant  
Passenger Pelvis X Velocity  
Passenger Pelvis X Displacement  
Passenger Left Femur Force  
Passenger Right Femur Force  
Passenger Left Upper Tibia Moment X  
Passenger Left Upper Tibia Moment Y  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Left Lower Tibia Moment X  
Passenger Left Lower Tibia Moment Y  
Passenger Left Lower Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower Tibia Moment Y  
Passenger Right Lower Tibia Force Z  
Passenger Left Foot Aft X  
Passenger Left Foot Aft Z  
Passenger Left Foot Fore Z  
Passenger Right Foot Aft X  
Passenger Right Foot Aft Z  
Passenger Right Foot Fore Z  
Passenger Lap Belt Force  
Passenger Shoulder Belt Force  
Passenger Shoulder Belt Pullout  
Passenger Shoulder Belt Elongation  
Vehicle Left Rear X  
Vehicle Left Rear X Velocity

## LIST OF DATA PLOTS...(CONTINUED)

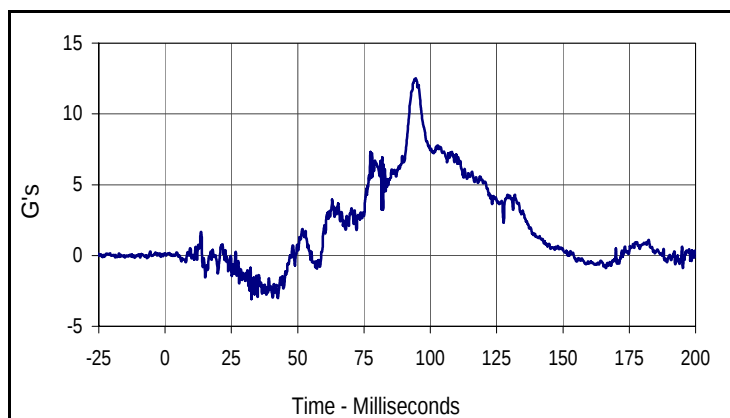
Vehicle Left Rear X Displacement  
Vehicle Right Rear X  
Vehicle Right Rear X Velocity  
Vehicle Right Rear X Displacement  
Vehicle Engine Top  
Vehicle Engine Top Velocity  
Vehicle Engine Top Displacement  
Vehicle Engine Bottom  
Vehicle Engine Bottom Velocity  
Vehicle Engine Bottom Displacement  
Vehicle Left Brake Caliper  
Vehicle Left Brake Caliper Velocity  
Vehicle Left Brake Caliper Displacement  
Vehicle Right Brake Caliper  
Vehicle Right Brake Caliper Velocity  
Vehicle Right Brake Caliper Displacement  
Vehicle Instrument Panel  
Vehicle Instrument Panel Velocity  
Vehicle Instrument Panel Displacement  
Vehicle Left Rear Z  
Vehicle Left Rear Z Velocity  
Vehicle Left Rear Z Displacement  
Vehicle Right Rear Z  
Vehicle Right Rear Z Velocity  
Vehicle Right Rear Z Displacement

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

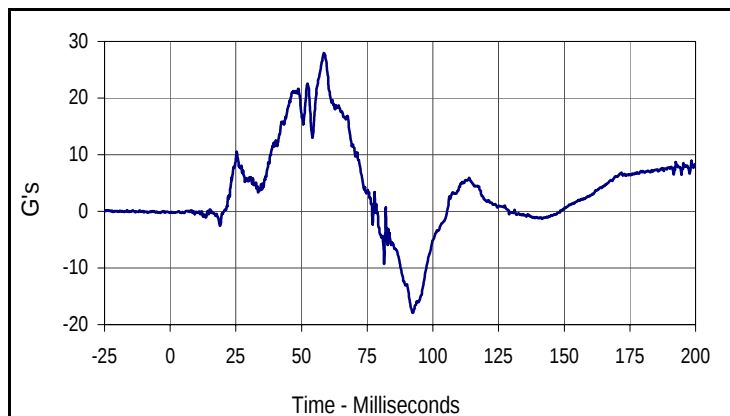
Test Date: 4/19/07  
 NHTSA No.: M75106



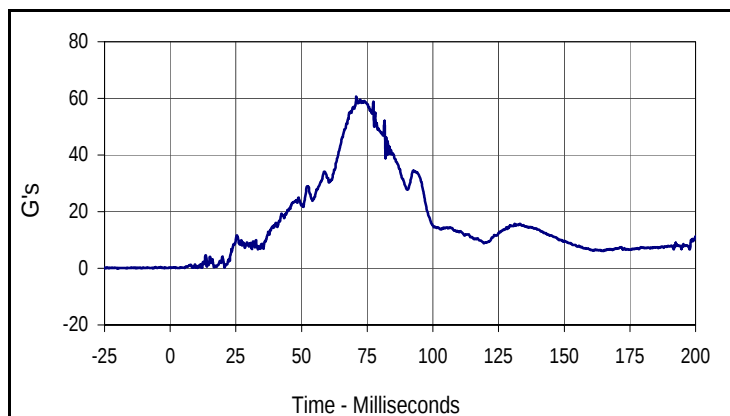
| Curve Description     |       |           |       |
|-----------------------|-------|-----------|-------|
| Driver Head Primary X |       |           |       |
| CURNO                 | Type  | SAE Class | Units |
| 001                   | FIL   | 1000      | G's   |
| Max                   | Time  | Min       | Time  |
| 7.5                   | 200.0 | -59.8     | 70.8  |



| Curve Description     |      |           |       |
|-----------------------|------|-----------|-------|
| Driver Head Primary Y |      |           |       |
| CURNO                 | Type | SAE Class | Units |
| 002                   | FIL  | 1000      | G's   |
| Max                   | Time | Min       | Time  |
| 12.5                  | 94.4 | -3.1      | 32.6  |



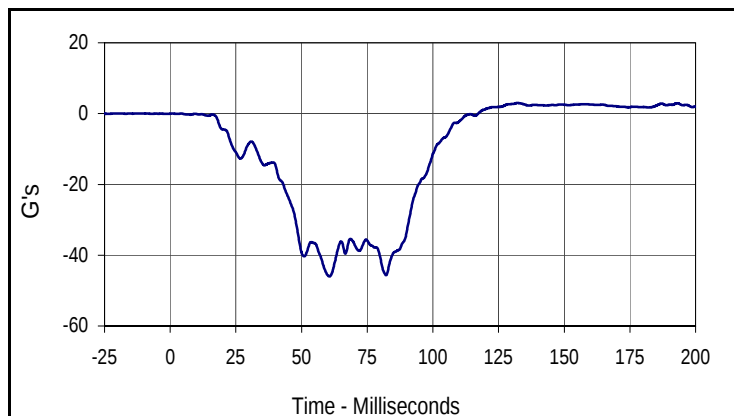
| Curve Description     |      |           |       |
|-----------------------|------|-----------|-------|
| Driver Head Primary Z |      |           |       |
| CURNO                 | Type | SAE Class | Units |
| 003                   | FIL  | 1000      | G's   |
| Max                   | Time | Min       | Time  |
| 27.9                  | 58.5 | -17.9     | 92.4  |



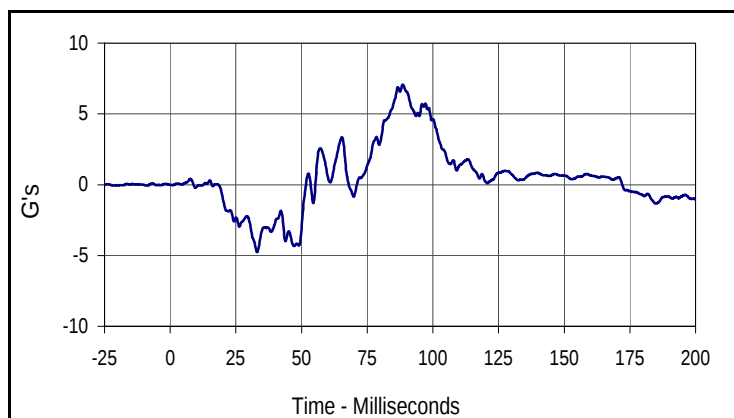
| Curve Description             |      |           |       |
|-------------------------------|------|-----------|-------|
| Driver Head Resultant Primary |      |           |       |
| CURNO                         | Type | SAE Class | Units |
| 001                           | RES  | 1000      | G's   |
| Max                           | Time | Min       | Time  |
| 60.7                          | 70.8 | 0.1       | 2.6   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

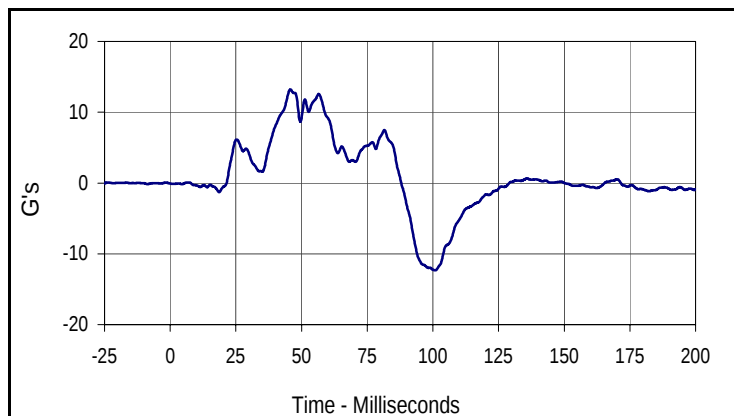
Test Date: 4/19/07  
 NHTSA No.: M75106



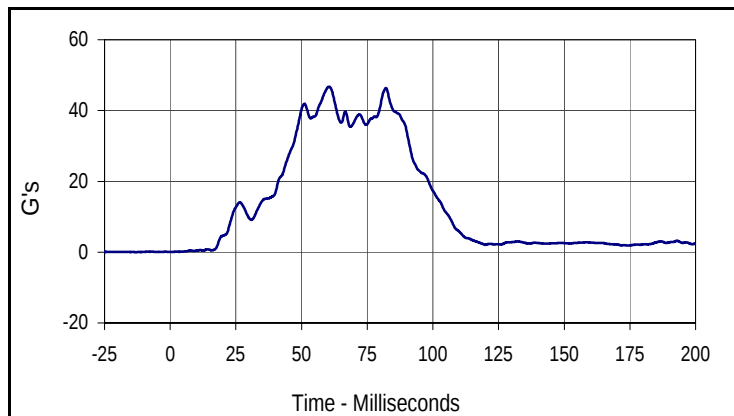
| Curve Description      |       |           |       |
|------------------------|-------|-----------|-------|
| Driver Chest Primary X |       |           |       |
| CURNO                  | Type  | SAE Class | Units |
| 004                    | FIL   | 180       | G's   |
| Max                    | Time  | Min       | Time  |
| 3.0                    | 132.2 | -46.0     | 60.6  |



| Curve Description      |      |           |       |
|------------------------|------|-----------|-------|
| Driver Chest Primary Y |      |           |       |
| CURNO                  | Type | SAE Class | Units |
| 005                    | FIL  | 180       | G's   |
| Max                    | Time | Min       | Time  |
| 7.1                    | 88.5 | -4.8      | 33.1  |



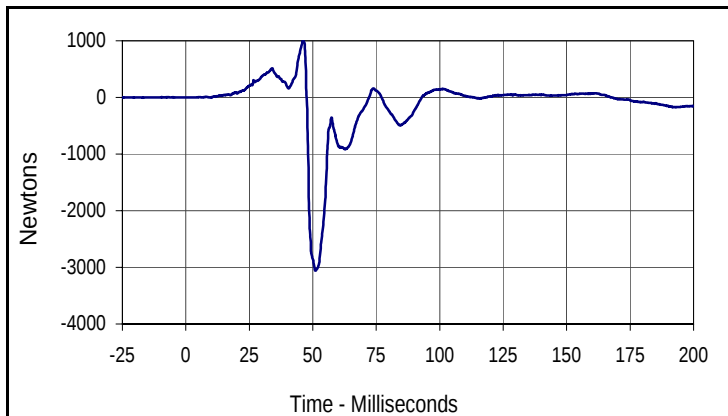
| Curve Description      |      |           |       |
|------------------------|------|-----------|-------|
| Driver Chest Primary Z |      |           |       |
| CURNO                  | Type | SAE Class | Units |
| 006                    | FIL  | 180       | G's   |
| Max                    | Time | Min       | Time  |
| 13.2                   | 45.7 | -12.3     | 101.0 |



| Curve Description              |      |           |       |
|--------------------------------|------|-----------|-------|
| Driver Chest Resultant Primary |      |           |       |
| CURNO                          | Type | SAE Class | Units |
| 004                            | RES  | 180       | G's   |
| Max                            | Time | Min       | Time  |
| 46.7                           | 60.5 | 0.1       | 0.0   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

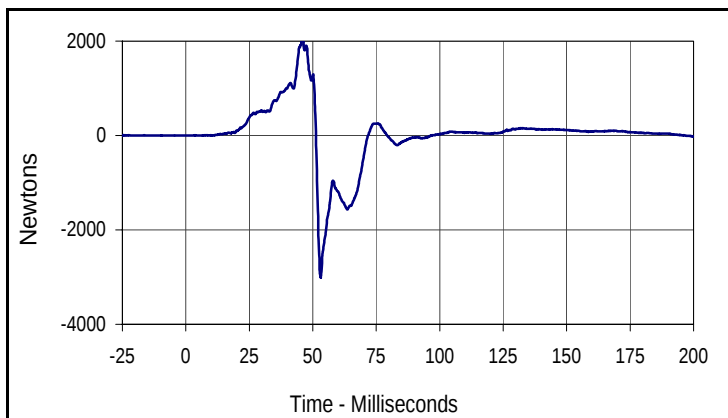
Test Date: 4/19/07  
 NHTSA No.: M75106



Curve Description

Driver Left Femur Force Z

| CURNO | Type | SAE Class | Units   |
|-------|------|-----------|---------|
| 007   | FIL  | 600       | Newtons |
| Max   | Time | Min       | Time    |
| 998.6 | 46.2 | -3054.8   | 51.1    |



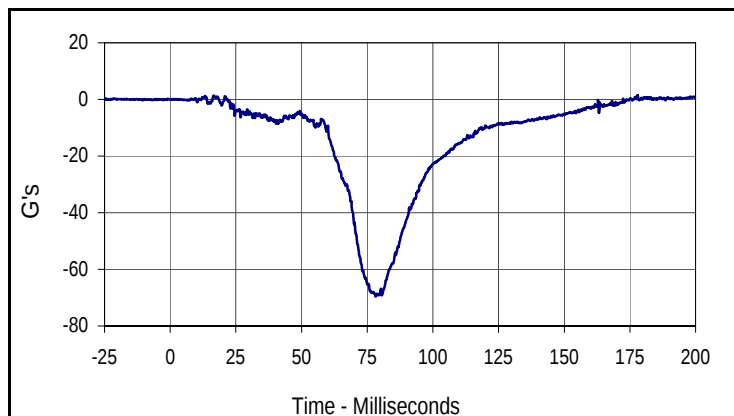
Curve Description

Driver Right Femur Force Z

| CURNO  | Type | SAE Class | Units   |
|--------|------|-----------|---------|
| 008    | FIL  | 600       | Newtons |
| Max    | Time | Min       | Time    |
| 2125.7 | 45.9 | -3011.6   | 53.1    |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

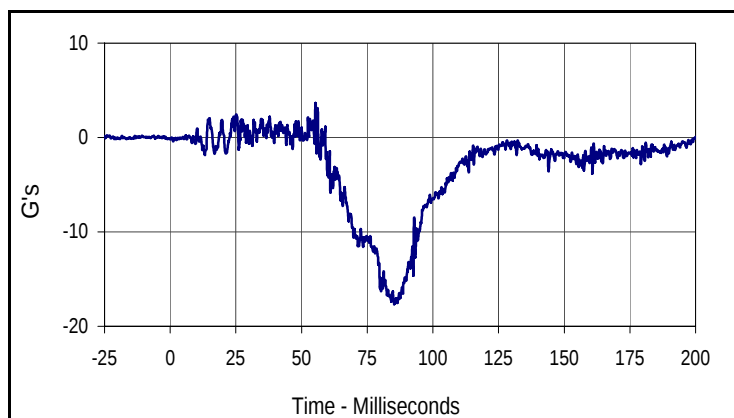
Test Date: 4/19/07  
 NHTSA No.: M75106



Curve Description

Passenger Head Primary X

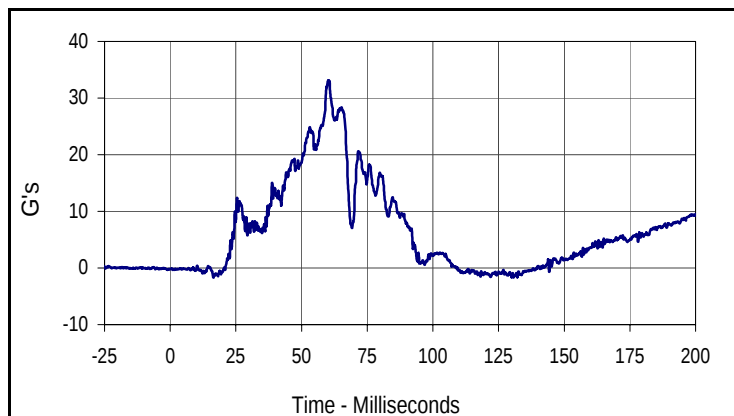
| CURNO | Type  | SAE Class | Units |
|-------|-------|-----------|-------|
| 009   | FIL   | 1000      | G's   |
| Max   | Time  | Min       | Time  |
| 1.5   | 178.0 | -69.6     | 78.2  |



Curve Description

Passenger Head Primary Y

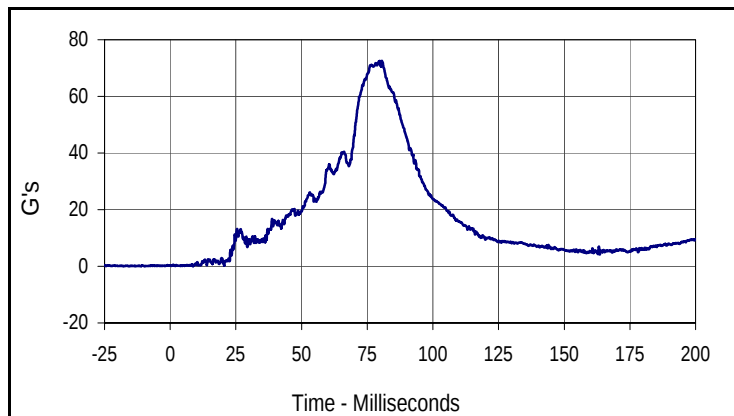
| CURNO | Type | SAE Class | Units |
|-------|------|-----------|-------|
| 010   | FIL  | 1000      | G's   |
| Max   | Time | Min       | Time  |
| 3.6   | 55.3 | -17.7     | 85.3  |



Curve Description

Passenger Head Primary Z

| CURNO | Type | SAE Class | Units |
|-------|------|-----------|-------|
| 011   | FIL  | 1000      | G's   |
| Max   | Time | Min       | Time  |
| 33.1  | 60.1 | -1.7      | 130.7 |



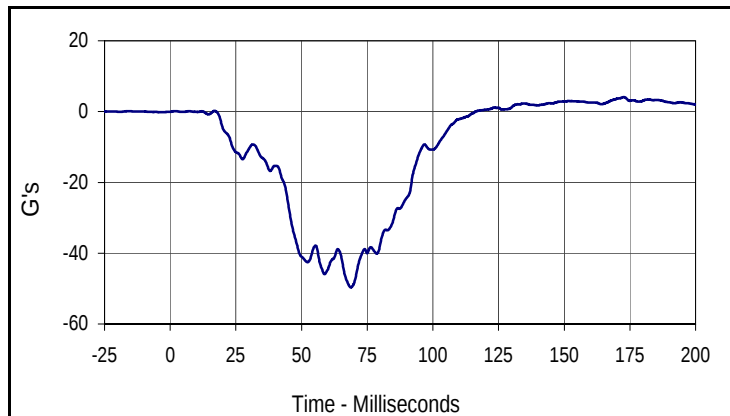
Curve Description

Passenger Head Resultant Primary

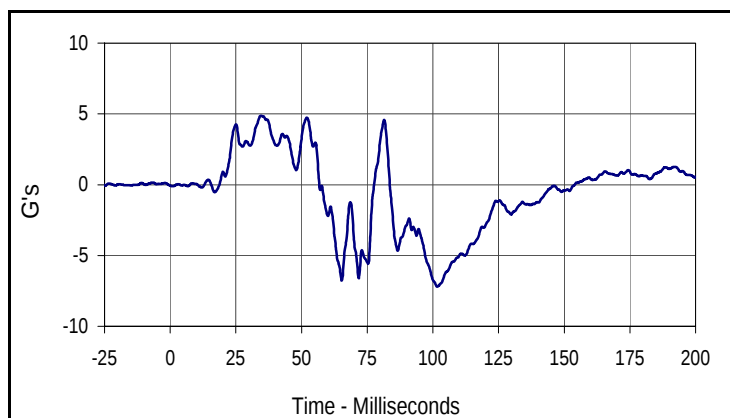
| CURNO | Type | SAE Class | Units |
|-------|------|-----------|-------|
| 009   | RES  | 1000      | G's   |
| Max   | Time | Min       | Time  |
| 72.5  | 80.6 | 0.0       | 8.6   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

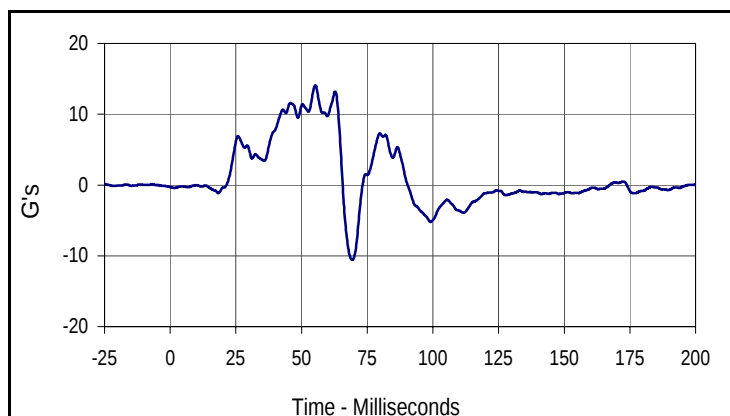
Test Date: 4/19/07  
 NHTSA No.: M75106



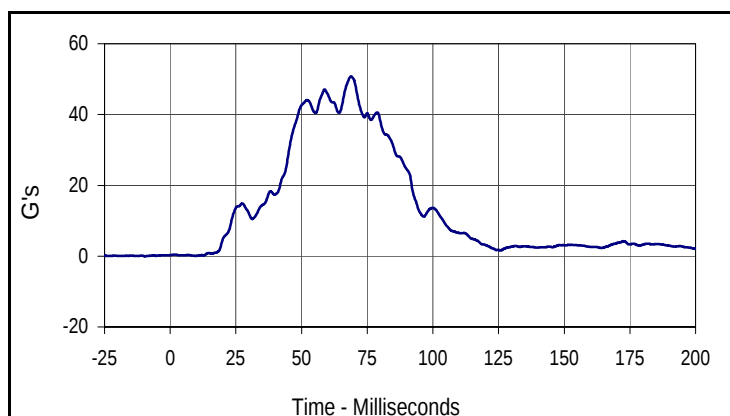
| Curve Description         |       |           |       |
|---------------------------|-------|-----------|-------|
| Passenger Chest Primary X |       |           |       |
| CURNO                     | Type  | SAE Class | Units |
| 012                       | FIL   | 180       | G's   |
| Max                       | Time  | Min       | Time  |
| 4.1                       | 172.7 | -49.7     | 68.8  |



| Curve Description         |      |           |       |
|---------------------------|------|-----------|-------|
| Passenger Chest Primary Y |      |           |       |
| CURNO                     | Type | SAE Class | Units |
| 013                       | FIL  | 180       | G's   |
| Max                       | Time | Min       | Time  |
| 4.9                       | 34.5 | -7.2      | 101.6 |



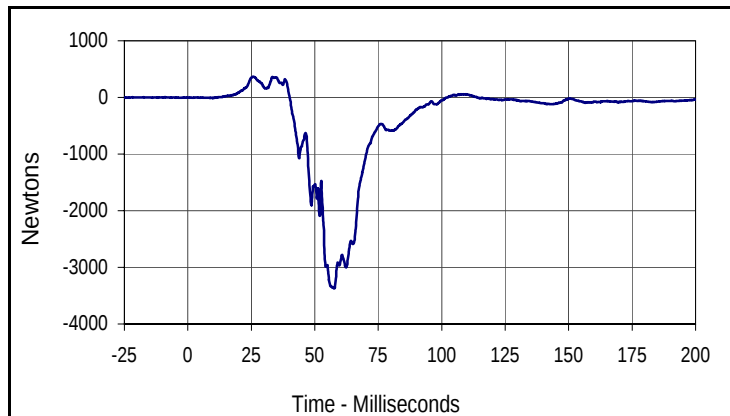
| Curve Description         |      |           |       |
|---------------------------|------|-----------|-------|
| Passenger Chest Primary Z |      |           |       |
| CURNO                     | Type | SAE Class | Units |
| 014                       | FIL  | 180       | G's   |
| Max                       | Time | Min       | Time  |
| 14.1                      | 55.3 | -10.5     | 69.2  |



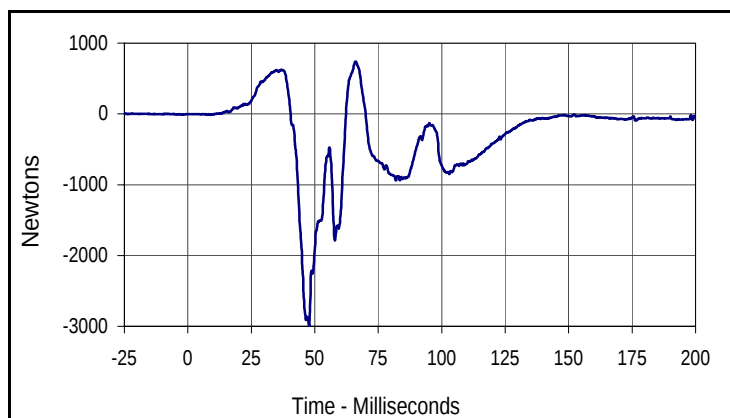
| Curve Description                 |      |           |       |
|-----------------------------------|------|-----------|-------|
| Passenger Chest Resultant Primary |      |           |       |
| CURNO                             | Type | SAE Class | Units |
| 012                               | RES  | 180       | G's   |
| Max                               | Time | Min       | Time  |
| 50.8                              | 68.8 | 0.1       | 9.7   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 4/19/07  
 NHTSA No.: M75106



| Curve Description            |      |           |         |
|------------------------------|------|-----------|---------|
| Passenger Left Femur Force Z |      |           |         |
| CURNO                        | Type | SAE Class | Units   |
| 015                          | FIL  | 600       | Newtons |
| Max                          | Time | Min       | Time    |
| 366.3                        | 25.6 | -3375.1   | 57.7    |



| Curve Description             |      |           |         |
|-------------------------------|------|-----------|---------|
| Passenger Right Femur Force Z |      |           |         |
| CURNO                         | Type | SAE Class | Units   |
| 016                           | FIL  | 600       | Newtons |
| Max                           | Time | Min       | Time    |
| 738.4                         | 66.0 | -2995.3   | 47.8    |

APPENDIX C  
DUMMY CALIBRATION DATA

Test Program: Hybrid III 50th Percentile Male Head Drop Test

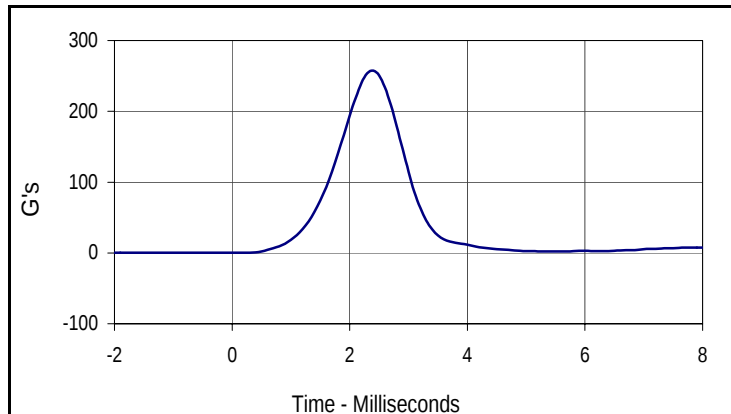
Test Date: 3/30/07

ATD Serial No.: 034

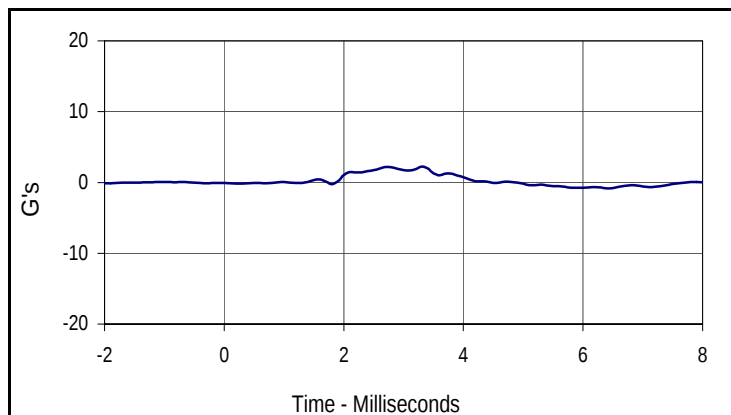
Test I.D.: HD03C



| Tested Parameter             | Units  | Specification  | Result | Pass/Fail |
|------------------------------|--------|----------------|--------|-----------|
| Laboratory Temperature       | °C     | 18.9 to 25.6   | 21.1   | Pass      |
| Laboratory Relative Humidity | %      | 10 to 70       | 30     | Pass      |
| Peak Resultant Acceleration  | G's    | 225.0 to 275.0 | 257.7  | Pass      |
| Peak Lateral Acceleration    | G's    | ≤15.0          | 2.3    | Pass      |
| Is Acceleration Unimodal?    | Yes/No | Yes            | Yes    | Pass      |
| Overall Test Results         |        |                | Pass   |           |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Resultant    |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | RES  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 257.7             | 2.4  | 0.1       | -1.1  |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Y            |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 002               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 2.3               | 3.3  | -0.7      | 5.9   |

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

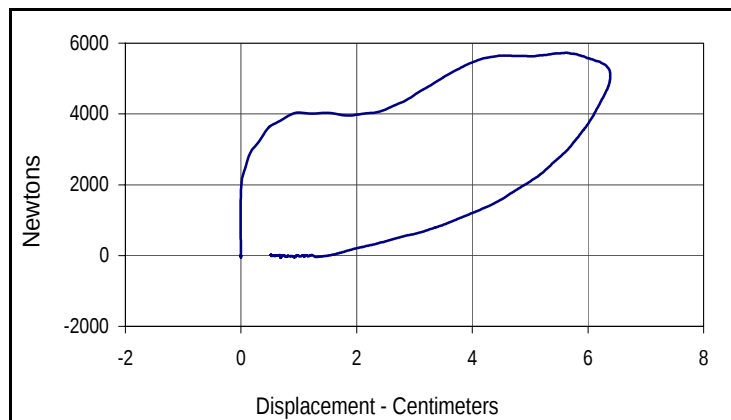
Test Date: 4/2/07

ATD Serial No.: 034

Test I.D.: CH04A



| Tested Parameter             | Units   | Specification | Result | Pass/Fail |
|------------------------------|---------|---------------|--------|-----------|
| Laboratory Temperature       | °C      | 20.6 to 22.2  | 21.1   | Pass      |
| Laboratory Relative Humidity | %       | 10 to 70      | 30     | Pass      |
| Probe Velocity               | m/s     | 6.58 to 6.82  | 6.79   | Pass      |
| Peak Probe Force             | Newtons | 5159 to 5893  | 5725   | Pass      |
| Peak Sternum Deflection      | CM      | 6.35 to 7.26  | 6.39   | Pass      |
| Internal Hysteresis          | %       | 69 to 85      | 75.4   | Pass      |
| Overall Test Results         |         |               |        | Pass      |



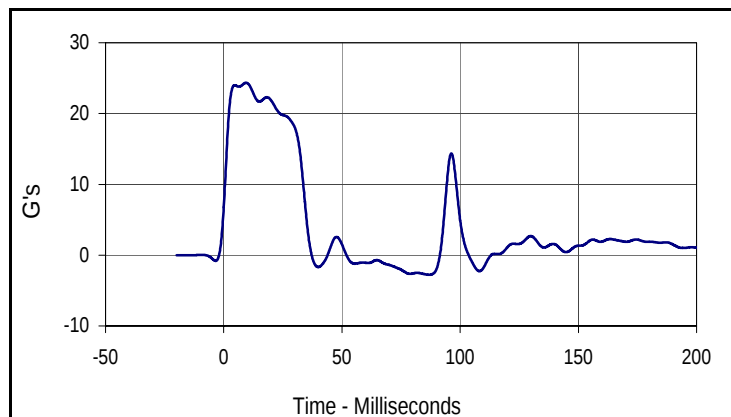
| Curve Description                |      |                       |            |
|----------------------------------|------|-----------------------|------------|
| Probe Force vs. Chest Deflection |      |                       |            |
| CURNO                            | Type | SAE Class             | Hysteresis |
| 001                              | FIL  | 180                   | 75.4       |
| Peak Probe Force                 |      | Peak Chest Deflection |            |
| 5725                             |      | 6.39                  |            |

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test  
 ATD Serial No.: 034

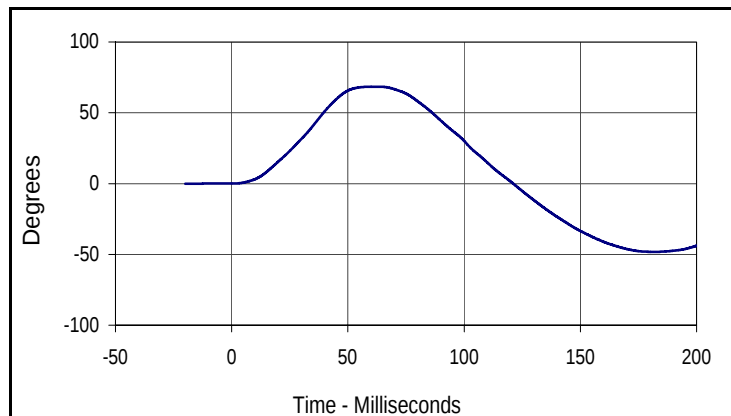
Test Date: 3/29/07  
 Test I.D.: NF03G



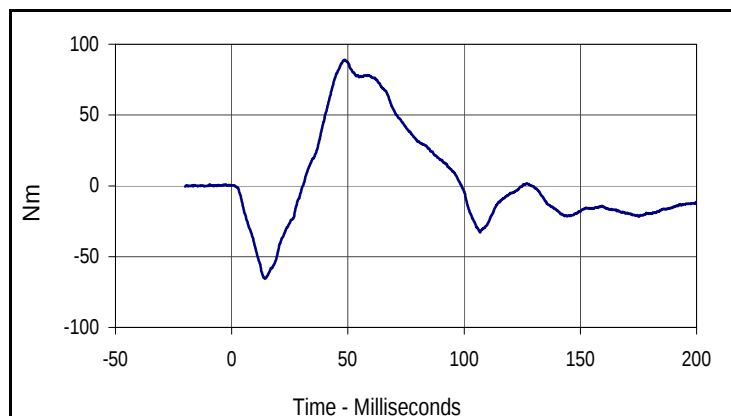
| Tested Parameter                                |          | Units   | Specification        | Result | Pass/Fail |
|-------------------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature                          |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity                    |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                               |          | m/s     | 6.89 to 7.13         | 7.08   | Pass      |
| Pendulum Deceleration                           | 10 Msec. | G's     | 22.5 to 27.5         | 24.3   | Pass      |
|                                                 | 20 Msec. | G's     | 17.6 to 22.6         | 21.9   | Pass      |
|                                                 | 30 Msec. | G's     | 12.5 to 18.5         | 18.1   | Pass      |
| Peak Pendulum Decel. after 30 Msec.             |          | G's     | ≤ 29.0               | 18.1   | Pass      |
| Deceleration Decay, Time to Cross 5 G's         |          | Msec.   | 34.0 to 42.0         | 35.1   | Pass      |
| Maximum "D" Plane Rotation                      | Max      | Degrees | 64.0 to 78.0         | 68.4   | Pass      |
|                                                 | Time     | Msec.   | 57.0 to 64.0         | 62.4   | Pass      |
| "D" Plane Rotation Decay, Time To Zero Crossing |          | Msec.   | 113.0 to 128.0       | 121.1  | Pass      |
| Moment About Occ. Condyle                       | Max      | Nm      | 84.1 to 108.5        | 88.9   | Pass      |
|                                                 | Time     | Msec.   | 47.0 to 58.0         | 48.6   | Pass      |
| Positive Moment Decay, Time To Zero Crossing    |          | Msec.   | 97.0 to 107.0        | 99.0   | Pass      |
|                                                 |          |         | Overall Test Results |        | Pass      |



| Curve Description     |      |           |       |
|-----------------------|------|-----------|-------|
| Pendulum Deceleration |      |           |       |
| CURNO                 | Type | SAE Class | Units |
| 001                   | FIL  | 60        | G's   |
| Max                   | Time | Min       | Time  |
| 24.3                  | 9.5  | -2.8      | 87.1  |



| Curve Description  |      |           |         |
|--------------------|------|-----------|---------|
| "D" Plane Rotation |      |           |         |
| CURNO              | Type | SAE Class | Units   |
| 003                | FIL  | 60        | Degrees |
| Max                | Time | Min       | Time    |
| 68.4               | 62.4 | -48.2     | 181.9   |



| Curve Description              |      |           |       |
|--------------------------------|------|-----------|-------|
| Moment About Occipital Condyle |      |           |       |
| CURNO                          | Type | SAE Class | Units |
| 004                            | FIL  | 600       | Nm    |
| Max                            | Time | Min       | Time  |
| 88.9                           | 48.6 | -65.5     | 14.5  |

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

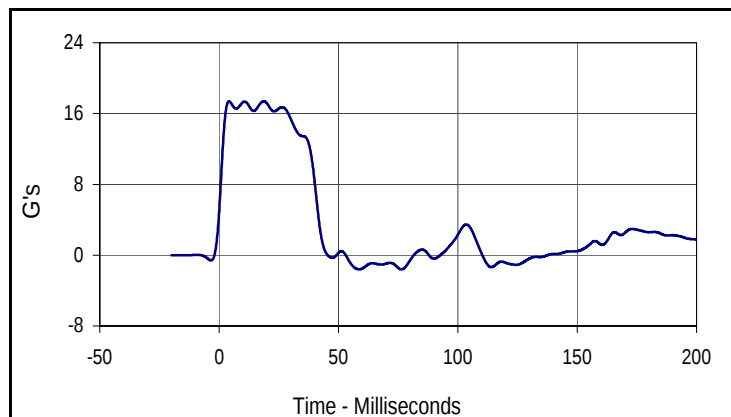
Test Date: 3/29/07

ATD Serial No.: 034

Test I.D.: NE03H



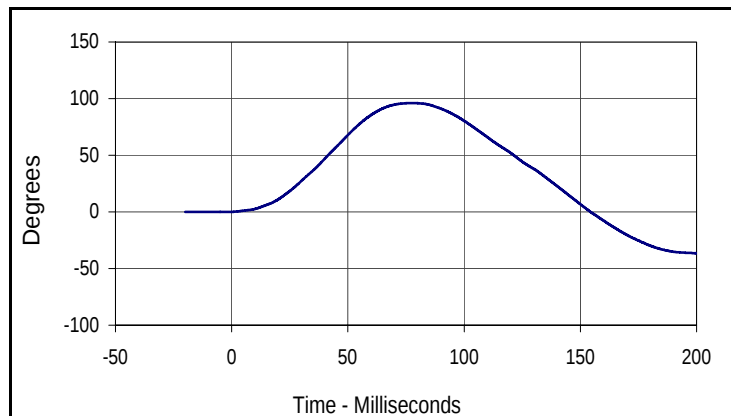
| Tested Parameter                                |          | Units   | Specification  | Result | Pass/Fail |
|-------------------------------------------------|----------|---------|----------------|--------|-----------|
| Laboratory Temperature                          |          | °C      | 20.6 to 22.2   | 21.1   | Pass      |
| Laboratory Relative Humidity                    |          | %       | 10 to 70       | 30     | Pass      |
| Pendulum Velocity                               |          | m/s     | 5.94 to 6.19   | 6.14   | Pass      |
| Pendulum Deceleration                           | 10 Msec. | G's     | 17.2 to 21.2   | 17.3   | Pass      |
|                                                 | 20 Msec. | G's     | 14.0 to 19.0   | 17.2   | Pass      |
|                                                 | 30 Msec. | G's     | 11.0 to 16.0   | 15.4   | Pass      |
| Peak Pendulum Decel. after 30 Msec.             |          | G's     | ≤ 22.0         | 15.4   | Pass      |
| Deceleration Decay, Time to Cross 5 G's         |          | Msec.   | 38.0 to 46.0   | 41.4   | Pass      |
| Maximum "D" Plane Rotation                      | Max      | Degrees | 81.0 to 106.0  | 96.0   | Pass      |
|                                                 | Time     | Msec.   | 72.0 to 82.0   | 77.6   | Pass      |
| "D" Plane Rotation Decay, Time To Zero Crossing |          | Msec.   | 147.0 to 174.0 | 154.4  | Pass      |
| Moment About Occ. Condyle                       | Max      | Nm      | -52.9 to- 79.9 | -76.4  | Pass      |
|                                                 | Time     | Msec.   | 65.0 to 79.0   | 68.3   | Pass      |
| Positive Moment Decay, Time To Zero Crossing    |          | Msec.   | 120.0 to 148.0 | 142.3  | Pass      |
| Overall Test Results                            |          |         |                |        | Pass      |



## Curve Description

## Pendulum Deceleration

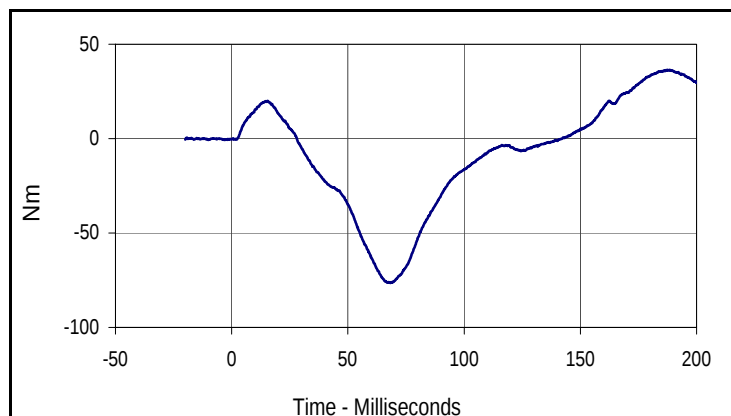
| CURNO | Type | SAE Class | Units |
|-------|------|-----------|-------|
| 001   | FIL  | 60        | G's   |
| Max   | Time | Min       | Time  |
| 17.4  | 4.1  | -1.6      | 58.6  |



## Curve Description

## "D" Plane Rotation

| CURNO | Type | SAE Class | Units   |
|-------|------|-----------|---------|
| 003   | FIL  | 60        | Degrees |
| Max   | Time | Min       | Time    |
| 96.0  | 77.6 | -36.4     | 200.0   |



## Curve Description

## Moment About Occipital Condyle

| CURNO | Type  | SAE Class | Units |
|-------|-------|-----------|-------|
| 004   | FIL   | 600       | Nm    |
| Max   | Time  | Min       | Time  |
| 36.4  | 187.5 | -76.4     | 68.3  |

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 4/2/07

ATD Serial No.: 034

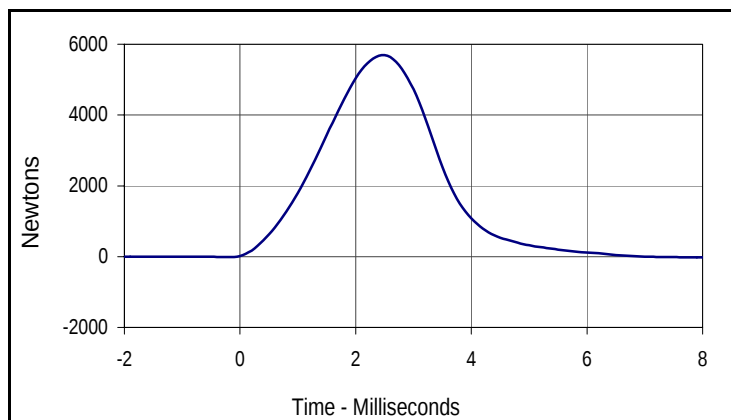
Test I.D.: LK04A , RK04B

**Left Knee**

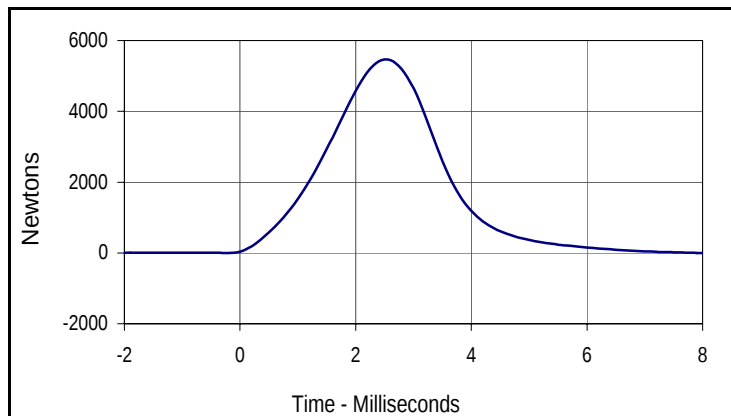
| Tested Parameter             | Units   | Specification | Result | Pass/Fail |
|------------------------------|---------|---------------|--------|-----------|
| Laboratory Temperature       | °C      | 18.9 to 25.6  | 21.1   | Pass      |
| Laboratory Relative Humidity | %       | 10 to 70      | 30     | Pass      |
| Pendulum Velocity at T=0     | m/sec   | 2.07 to 2.13  | 2.12   | Pass      |
| Peak Probe Force             | Newtons | 4715 to 5782  | 5691   | Pass      |
| Overall Test Results         |         |               |        | Pass      |

**Right Knee**

|                          |         |              |      |      |
|--------------------------|---------|--------------|------|------|
| Pendulum Velocity at T=0 | m/sec   | 2.07 to 2.13 | 2.09 | Pass |
| Peak Probe Force         | Newtons | 4715 to 5782 | 5465 | Pass |
| Overall Test Results     |         |              |      | Pass |

**Curve Description****Left Knee Probe Force**

| CURNO  | Type | SAE Class | Units   |
|--------|------|-----------|---------|
| 001    | FIL  | 600       | Newtons |
| Max    | Time | Min       | Time    |
| 5691.0 | 2.5  | -25.0     | 8.8     |

**Curve Description****Right Knee Probe Force**

| CURNO  | Type | SAE Class | Units   |
|--------|------|-----------|---------|
| 002    | FIL  | 600       | Newtons |
| Max    | Time | Min       | Time    |
| 5465.2 | 2.5  | -195.5    | 9.7     |

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 3/29/07

ATD Serial No.: 034

Test I.D.: N/A



| Tested Parameter                      | Units | Specification | Result | Pass/Fail |
|---------------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature                | °C    | 20.6 to 22.2  | 21.1   | Pass      |
| Laboratory Relative Humidity          | %     | 10 to 70      | 30     | Pass      |
| A - Total sitting height              | mm    | 879 to 889    | 880    | Pass      |
| B - Shoulder pivot height             | mm    | 505 to 521    | 513    | Pass      |
| C - "H" point height                  | mm    | 84 to 89      | 86     | Pass      |
| D - "H" point from seat back          | mm    | 135 to 140    | 138    | Pass      |
| E - Shoulder pivot from back          | mm    | 84 to 94      | 85     | Pass      |
| F - Thigh clearance                   | mm    | 140 to 155    | 150    | Pass      |
| G - Elbow back to wrist pivot         | mm    | 290 to 305    | 300    | Pass      |
| H - Skull cap to back line            | mm    | 41 to 46      | 42     | Pass      |
| I - Shoulder to elbow length          | mm    | 330 to 345    | 336    | Pass      |
| J - Elbow rest height                 | mm    | 190 to 211    | 207    | Pass      |
| K - Buttock to knee length            | mm    | 579 to 604    | 598    | Pass      |
| L - Popliteal length                  | mm    | 429 to 455    | 450    | Pass      |
| M - Knee pivot height                 | mm    | 485 to 500    | 489    | Pass      |
| N - Buttock popliteal length          | mm    | 452 to 477    | 475    | Pass      |
| O - Chest depth                       | mm    | 213 to 229    | 225    | Pass      |
| P - Foot length                       | mm    | 251 to 267    | 255    | Pass      |
| V - Shoulder breadth                  | mm    | 422 to 437    | 434    | Pass      |
| W - Foot breadth                      | mm    | 91 to 107     | 102    | Pass      |
| Y - Chest circumference               | mm    | 970 to 1001   | 986    | Pass      |
| Z - Waist circumference               | mm    | 836 to 866    | 850    | Pass      |
| AA - Location for chest circumference | mm    | 429 to 434    | 431    | Pass      |
| BB - Location for waist circumference | mm    | 226 to 231    | 229    | Pass      |
| Overall Test Results                  |       |               |        | Pass      |

Test Program: Hybrid III 50th Percentile Male Head Drop Test

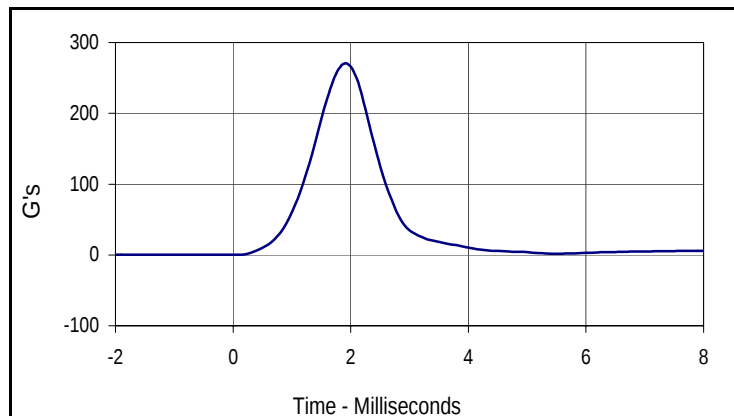
Test Date: 3/30/07

ATD Serial No.: 035

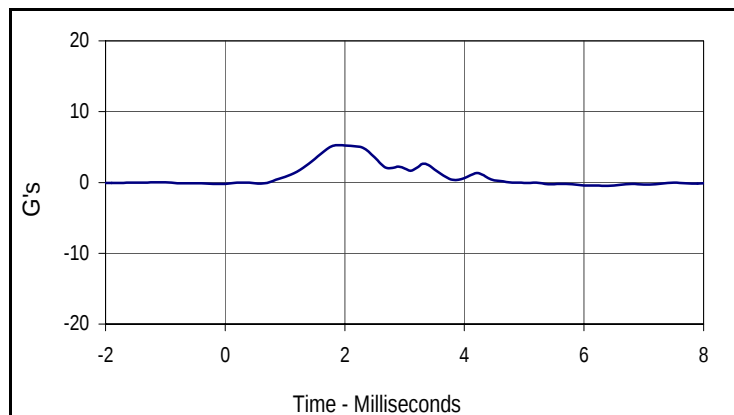
Test I.D.: HD03D



| Tested Parameter             | Units  | Specification  | Result | Pass/Fail |
|------------------------------|--------|----------------|--------|-----------|
| Laboratory Temperature       | °C     | 18.9 to 25.6   | 21.1   | Pass      |
| Laboratory Relative Humidity | %      | 10 to 70       | 30     | Pass      |
| Peak Resultant Acceleration  | G's    | 225.0 to 275.0 | 270.5  | Pass      |
| Peak Lateral Acceleration    | G's    | ≤15.0          | 5.3    | Pass      |
| Is Acceleration Unimodal?    | Yes/No | Yes            | Yes    | Pass      |
| Overall Test Results         |        |                |        | Pass      |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Resultant    |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | RES  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 270.5             | 1.9  | 0.1       | -1.4  |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Y            |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 002               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 5.3               | 1.9  | -0.4      | 6.0   |

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

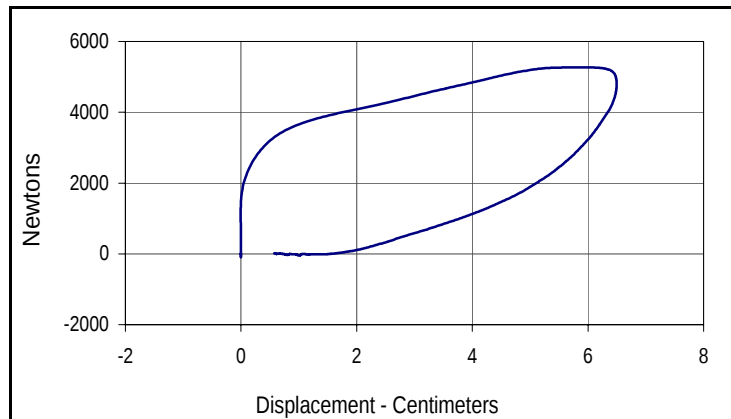
Test Date: 4/2/07

ATD Serial No.: 035

Test I.D.: CH04B



| Tested Parameter             | Units   | Specification | Result | Pass/Fail |
|------------------------------|---------|---------------|--------|-----------|
| Laboratory Temperature       | °C      | 20.6 to 22.2  | 21.1   | Pass      |
| Laboratory Relative Humidity | %       | 10 to 70      | 30     | Pass      |
| Probe Velocity               | m/s     | 6.58 to 6.82  | 6.71   | Pass      |
| Peak Probe Force             | Newtons | 5159 to 5893  | 5266   | Pass      |
| Peak Sternum Deflection      | CM      | 6.35 to 7.26  | 6.50   | Pass      |
| Internal Hysteresis          | %       | 69 to 85      | 75.4   | Pass      |
| Overall Test Results         |         |               | Pass   |           |



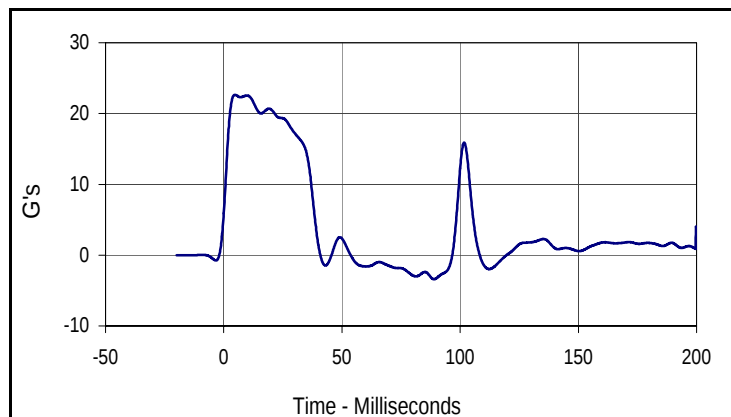
| Curve Description                |      |                       |            |
|----------------------------------|------|-----------------------|------------|
| Probe Force vs. Chest Deflection |      |                       |            |
| CURNO                            | Type | SAE Class             | Hysteresis |
| 001                              | FIL  | 180                   | 75.4       |
| Peak Probe Force                 |      | Peak Chest Deflection |            |
| 5266                             |      | 6.50                  |            |

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test  
 ATD Serial No.: 035

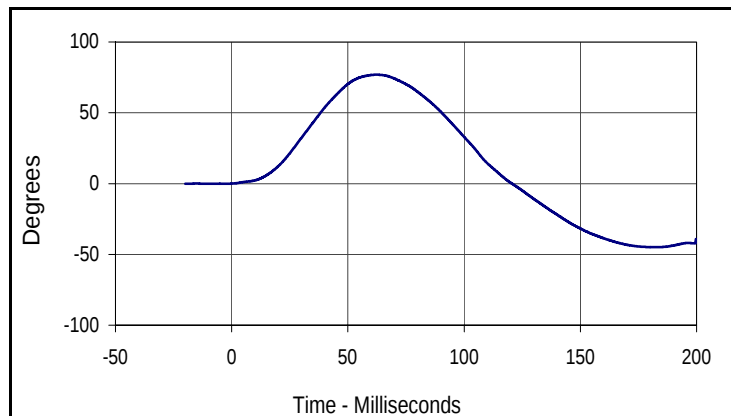
Test Date: 3/29/07  
 Test I.D.: NF03D



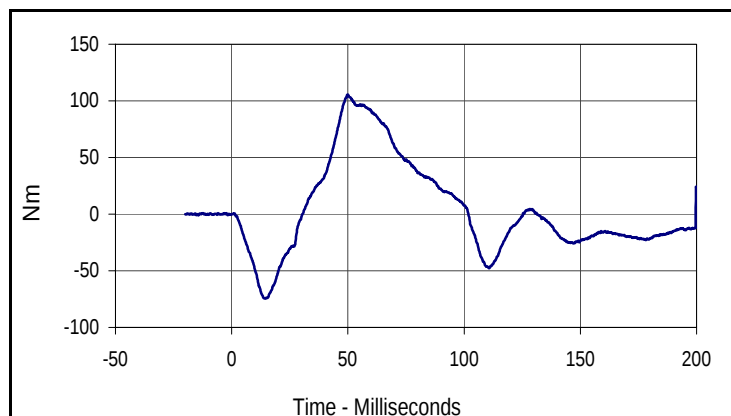
| Tested Parameter                                |          | Units   | Specification        | Result | Pass/Fail |
|-------------------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature                          |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity                    |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                               |          | m/s     | 6.89 to 7.13         | 7.07   | Pass      |
| Pendulum Deceleration                           | 10 Msec. | G's     | 22.5 to 27.5         | 22.5   | Pass      |
|                                                 | 20 Msec. | G's     | 17.6 to 22.6         | 20.6   | Pass      |
|                                                 | 30 Msec. | G's     | 12.5 to 18.5         | 17.2   | Pass      |
| Peak Pendulum Decel. after 30 Msec.             |          | G's     | ≤ 29.0               | 17.2   | Pass      |
| Deceleration Decay, Time to Cross 5 G's         |          | Msec.   | 34.0 to 42.0         | 38.6   | Pass      |
| Maximum "D" Plane Rotation                      | Max      | Degrees | 64.0 to 78.0         | 76.9   | Pass      |
|                                                 | Time     | Msec.   | 57.0 to 64.0         | 62.3   | Pass      |
| "D" Plane Rotation Decay, Time To Zero Crossing |          | Msec.   | 113.0 to 128.0       | 120.6  | Pass      |
| Moment About Occ. Condyle                       | Max      | Nm      | 84.1 to 108.5        | 105.6  | Pass      |
|                                                 | Time     | Msec.   | 47.0 to 58.0         | 49.9   | Pass      |
| Positive Moment Decay, Time To Zero Crossing    |          | Msec.   | 97.0 to 107.0        | 101.9  | Pass      |
|                                                 |          |         | Overall Test Results |        | Pass      |



| Curve Description     |      |           |       |
|-----------------------|------|-----------|-------|
| Pendulum Deceleration |      |           |       |
| CURNO                 | Type | SAE Class | Units |
| 001                   | FIL  | 60        | G's   |
| Max                   | Time | Min       | Time  |
| 22.6                  | 4.7  | -3.4      | 88.9  |



| Curve Description  |      |           |         |
|--------------------|------|-----------|---------|
| "D" Plane Rotation |      |           |         |
| CURNO              | Type | SAE Class | Units   |
| 003                | FIL  | 60        | Degrees |
| Max                | Time | Min       | Time    |
| 76.9               | 62.3 | -44.9     | 182.3   |



| Curve Description              |      |           |       |
|--------------------------------|------|-----------|-------|
| Moment About Occipital Condyle |      |           |       |
| CURNO                          | Type | SAE Class | Units |
| 004                            | FIL  | 600       | Nm    |
| Max                            | Time | Min       | Time  |
| 105.6                          | 49.9 | -74.6     | 14.5  |

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

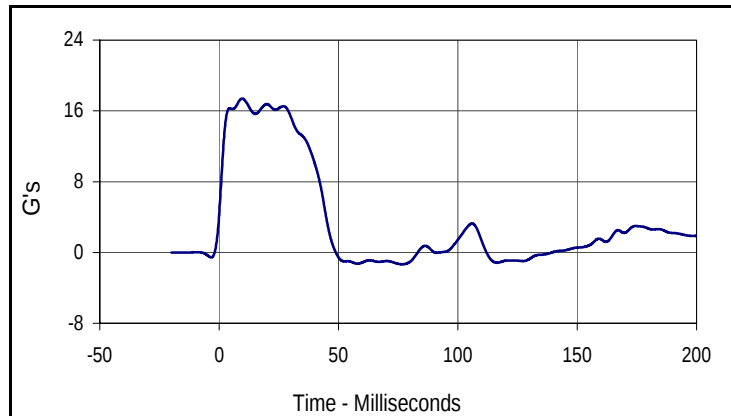
Test Date: 3/30/07

ATD Serial No.: 035

Test I.D.: NE03E



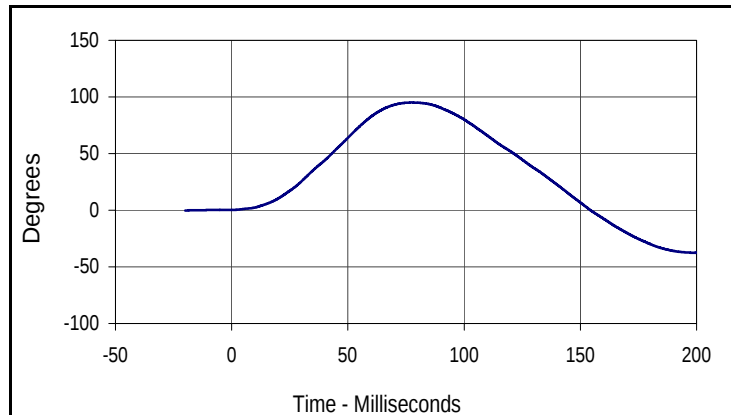
| Tested Parameter                                |          | Units   | Specification        | Result | Pass/Fail |
|-------------------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature                          |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity                    |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                               |          | m/s     | 5.94 to 6.19         | 6.05   | Pass      |
| Pendulum Deceleration                           | 10 Msec. | G's     | 17.2 to 21.2         | 17.4   | Pass      |
|                                                 | 20 Msec. | G's     | 14.0 to 19.0         | 16.8   | Pass      |
|                                                 | 30 Msec. | G's     | 11.0 to 16.0         | 15.3   | Pass      |
| Peak Pendulum Decel. after 30 Msec.             |          | G's     | ≤ 22.0               | 15.3   | Pass      |
| Deceleration Decay, Time to Cross 5 G's         |          | Msec.   | 38.0 to 46.0         | 44.2   | Pass      |
| Maximum "D" Plane Rotation                      | Max      | Degrees | 81.0 to 106.0        | 95.1   | Pass      |
|                                                 | Time     | Msec.   | 72.0 to 82.0         | 77.4   | Pass      |
| "D" Plane Rotation Decay, Time To Zero Crossing |          | Msec.   | 147.0 to 174.0       | 154.4  | Pass      |
| Moment About Occ. Condyle                       | Max      | Nm      | -52.9 to- 79.9       | -75.1  | Pass      |
|                                                 | Time     | Msec.   | 65.0 to 79.0         | 67.9   | Pass      |
| Positive Moment Decay, Time To Zero Crossing    |          | Msec.   | 120.0 to 148.0       | 143.7  | Pass      |
|                                                 |          |         | Overall Test Results |        | Pass      |



## Curve Description

## Pendulum Deceleration

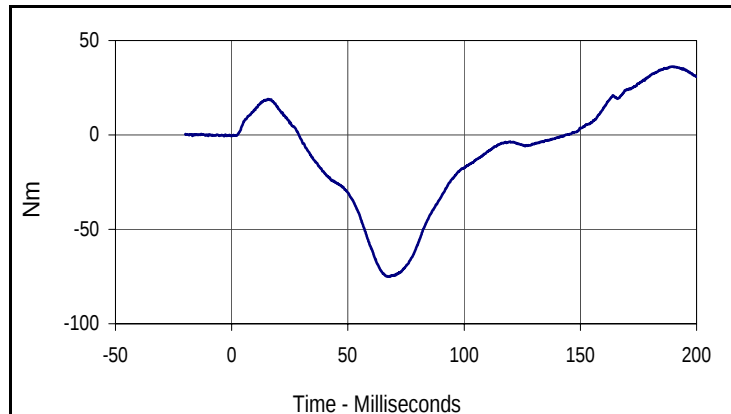
| CURNO | Type | SAE Class | Units |
|-------|------|-----------|-------|
| 001   | FIL  | 60        | G's   |
| Max   | Time | Min       | Time  |
| 17.4  | 9.6  | -1.3      | 76.6  |



## Curve Description

## "D" Plane Rotation

| CURNO | Type | SAE Class | Units   |
|-------|------|-----------|---------|
| 003   | FIL  | 60        | Degrees |
| Max   | Time | Min       | Time    |
| 95.1  | 77.4 | -37.6     | 200.0   |



## Curve Description

## Moment About Occipital Condyle

| CURNO | Type  | SAE Class | Units |
|-------|-------|-----------|-------|
| 004   | FIL   | 600       | Nm    |
| Max   | Time  | Min       | Time  |
| 36.2  | 189.5 | -75.1     | 67.9  |

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 4/2/07

ATD Serial No.: 035

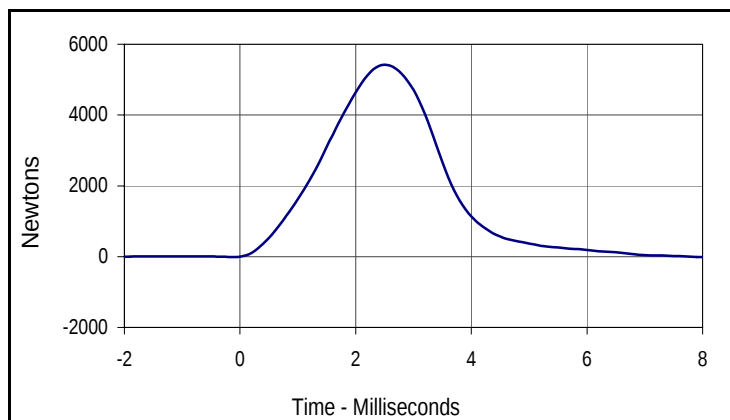
Test I.D.: LK04C , RK04D

**Left Knee**

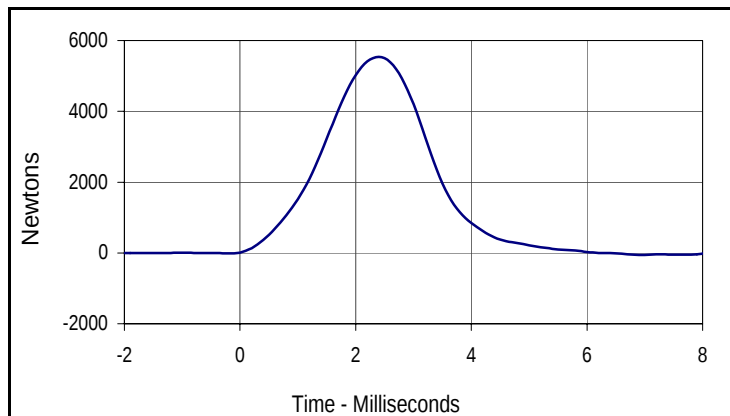
| Tested Parameter             | Units   | Specification | Result | Pass/Fail |
|------------------------------|---------|---------------|--------|-----------|
| Laboratory Temperature       | °C      | 18.9 to 25.6  | 21.1   | Pass      |
| Laboratory Relative Humidity | %       | 10 to 70      | 30     | Pass      |
| Pendulum Velocity at T=0     | m/sec   | 2.07 to 2.13  | 2.09   | Pass      |
| Peak Probe Force             | Newtons | 4715 to 5782  | 5425   | Pass      |
| Overall Test Results         |         |               |        | Pass      |

**Right Knee**

|                          |         |              |      |      |
|--------------------------|---------|--------------|------|------|
| Pendulum Velocity at T=0 | m/sec   | 2.07 to 2.13 | 2.11 | Pass |
| Peak Probe Force         | Newtons | 4715 to 5782 | 5538 | Pass |
| Overall Test Results     |         |              |      | Pass |

**Curve Description****Left Knee Probe Force**

| CURNO  | Type | SAE Class | Units   |
|--------|------|-----------|---------|
| 001    | FIL  | 600       | Newtons |
| Max    | Time | Min       | Time    |
| 5425.0 | 2.5  | -29.6     | 8.6     |

**Curve Description****Right Knee Probe Force**

| CURNO  | Type | SAE Class | Units   |
|--------|------|-----------|---------|
| 002    | FIL  | 600       | Newtons |
| Max    | Time | Min       | Time    |
| 5538.5 | 2.4  | -58.0     | 6.9     |

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 3/29/07

ATD Serial No.: 035

Test I.D.: N/A



| Tested Parameter                      | Units | Specification | Result | Pass/Fail |
|---------------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature                | °C    | 20.6 to 22.2  | 21.1   | Pass      |
| Laboratory Relative Humidity          | %     | 10 to 70      | 30     | Pass      |
| A - Total sitting height              | mm    | 879 to 889    | 886    | Pass      |
| B - Shoulder pivot height             | mm    | 505 to 521    | 510    | Pass      |
| C - "H" point height                  | mm    | 84 to 89      | 86     | Pass      |
| D - "H" point from seat back          | mm    | 135 to 140    | 140    | Pass      |
| E - Shoulder pivot from back          | mm    | 84 to 94      | 85     | Pass      |
| F - Thigh clearance                   | mm    | 140 to 155    | 150    | Pass      |
| G - Elbow back to wrist pivot         | mm    | 290 to 305    | 300    | Pass      |
| H - Skull cap to back line            | mm    | 41 to 46      | 45     | Pass      |
| I - Shoulder to elbow length          | mm    | 330 to 345    | 336    | Pass      |
| J - Elbow rest height                 | mm    | 190 to 211    | 206    | Pass      |
| K - Buttock to knee length            | mm    | 579 to 604    | 580    | Pass      |
| L - Popliteal length                  | mm    | 429 to 455    | 449    | Pass      |
| M - Knee pivot height                 | mm    | 485 to 500    | 489    | Pass      |
| N - Buttock popliteal length          | mm    | 452 to 477    | 474    | Pass      |
| O - Chest depth                       | mm    | 213 to 229    | 225    | Pass      |
| P - Foot length                       | mm    | 251 to 267    | 253    | Pass      |
| V - Shoulder breadth                  | mm    | 422 to 437    | 435    | Pass      |
| W - Foot breadth                      | mm    | 91 to 107     | 102    | Pass      |
| Y - Chest circumference               | mm    | 970 to 1001   | 985    | Pass      |
| Z - Waist circumference               | mm    | 836 to 866    | 850    | Pass      |
| AA - Location for chest circumference | mm    | 429 to 434    | 430    | Pass      |
| BB - Location for waist circumference | mm    | 226 to 231    | 230    | Pass      |
| Overall Test Results                  |       |               |        | Pass      |

Test Program: Dummy Damage Checklist  
 ATD Serial No.: 034

Test Date: 4/2/07  
 Test I.D.: N/A



| GENERAL                                                              | DAMAGED | OK |
|----------------------------------------------------------------------|---------|----|
| Outer skin on entire dummy                                           |         | X  |
| Head ballast secure                                                  |         | X  |
| Gashes, rips, general appearance, etc.                               |         | X  |
| Neck-Broken or cracks in rubber                                      |         | X  |
| Check that upper neck bracket is firmly attached to lwr neck bracket |         | X  |
| Three rubber bumpers in place                                        |         | X  |
| Spine- Broken or cracks in rubber                                    |         | X  |
| Check for looseness at the condyle joint                             |         | X  |
| Nodding blocks- cracked or out of position                           |         | X  |
| Ribs- Check all ribs and rib supports for damage (bent or broken)    |         | X  |
| Check damping material or separation or cracks                       |         | X  |
| <b>OTHER</b>                                                         |         |    |
|                                                                      |         |    |
|                                                                      |         |    |
| <b>CHEST DISPLACEMENT ASSEMBLY</b>                                   |         |    |
| Bent shaft                                                           |         | X  |
| Slider arm riding correctly, in track                                |         | X  |
| <b>TRANSDUCER LEADS</b>                                              |         |    |
| Torn cables                                                          |         | X  |
| <b>ACCELEROMETER MOUNTINGS</b>                                       |         |    |
| Check for secure mounting                                            |         | X  |
| <b>KNEES</b>                                                         |         |    |
| Check outer skin, insert and casting (without removing insert)       |         | X  |
| Knee sliders - Wires intact                                          |         | X  |
| Knee sliders- Rubber returned to "at rest position"                  |         | X  |
| <b>LIMBS</b>                                                         |         |    |
| Check for normal movement and adjustment                             |         | X  |
| <b>PELVIS</b>                                                        |         |    |
| Inspect for breakage, especially at iliac crest                      |         | X  |

Comments on repair or replacement parts:

---



---

Test Program: Dummy Damage Checklist  
 ATD Serial No.: 035

Test Date: 4/2/07  
 Test I.D.: N/A



| GENERAL                                                              | DAMAGED | OK |
|----------------------------------------------------------------------|---------|----|
| Outer skin on entire dummy                                           |         | X  |
| Head ballast secure                                                  |         | X  |
| Gashes, rips, general appearance, etc.                               |         | X  |
| Neck-Broken or cracks in rubber                                      |         | X  |
| Check that upper neck bracket is firmly attached to lwr neck bracket |         | X  |
| Three rubber bumpers in place                                        |         | X  |
| Spine- Broken or cracks in rubber                                    |         | X  |
| Check for looseness at the condyle joint                             |         | X  |
| Nodding blocks- cracked or out of position                           |         | X  |
| Ribs- Check all ribs and rib supports for damage (bent or broken)    |         | X  |
| Check damping material or separation or cracks                       |         | X  |
| <b>OTHER</b>                                                         |         |    |
|                                                                      |         |    |
|                                                                      |         |    |
| <b>CHEST DISPLACEMENT ASSEMBLY</b>                                   |         |    |
| Bent shaft                                                           |         | X  |
| Slider arm riding correctly, in track                                |         | X  |
| <b>TRANSDUCER LEADS</b>                                              |         |    |
| Torn cables                                                          |         | X  |
| <b>ACCELEROMETER MOUNTINGS</b>                                       |         |    |
| Check for secure mounting                                            |         | X  |
| <b>KNEES</b>                                                         |         |    |
| Check outer skin, insert and casting (without removing insert)       |         | X  |
| Knee sliders - Wires intact                                          |         | X  |
| Knee sliders- Rubber returned to "at rest position"                  |         | X  |
| <b>LIMBS</b>                                                         |         |    |
| Check for normal movement and adjustment                             |         | X  |
| <b>PELVIS</b>                                                        |         |    |
| Inspect for breakage, especially at iliac crest                      |         | X  |

Comments on repair or replacement parts:

---



---

APPENDIX D  
CHILD RESTRAINT SYSTEM

**REPORT NUMBER TR-P27001-09-NC**

**NEW CAR ASSESSMENT PROGRAM  
FRONTAL BARRIER IMPACT TEST**

**TOYOTA MOTOR MANUFACTURING  
2007 TOYOTA TUNDRA CREWMAX SR5  
4-DOOR TRUCK**

**NHTSA NUMBER: M75106**

**PREPARED BY:  
KARCO ENGINEERING, LLC  
9270 HOLLY ROAD  
ADELANTO, CALIFORNIA 92301**



**APRIL 19, 2007**

**FINAL REPORT**

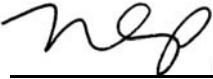
**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
RULEMAKING  
OFFICE OF CRASHWORTHINESS STANDARDS  
MAIL CODE: NVS-111  
400 SEVENTH STREET, SW, ROOM 5311  
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-06-D-00027.

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Prepared by:   
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KARCO Engineering, LLC

Date: April 19, 2007

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KARCO Engineering, LLC

Date: April 19, 2007

Approved by:   
Mr. Frank D. Richardson, Program Manager  
KARCO Engineering, LLC

Date: April 19, 2007

FINAL REPORT ACCEPTED BY:

\_\_\_\_\_  
Manager, New Car Assessment Program

\_\_\_\_\_  
Date of Acceptance

\_\_\_\_\_  
COTR, NCAP Frontal Impact Program

\_\_\_\_\_  
Date of Acceptance

# Technical Report Documentation Page

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                |                  |                                                                                                                                                                                                                           |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>1. Report No.</b><br>TR-P27001-09-NC                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>2. Government Accession No.</b>                             |                  | <b>3. Recipients Catalog No.</b>                                                                                                                                                                                          |                        |
| <b>4. Title and Subtitle</b><br>Final Report of one (1) Graco Snugride CRS<br>Final Report of one (1) Britax Companion CRS<br>NHTSA NO. M75106                                                                                                                                                                                                                                                                                                                |  |                                                                |                  | <b>5. Report Date</b><br>4/19/2007                                                                                                                                                                                        |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                |                  | <b>6. Performing Organization Code</b><br>KAR                                                                                                                                                                             |                        |
| <b>7. Authors</b><br>Mr. Johnny H. Dutto, Project Engineer, Karco<br>Mr. Frank Richardson, Program Manager, Karco                                                                                                                                                                                                                                                                                                                                             |  |                                                                |                  | <b>8. Performing Organization Report No.</b><br>TR-P27001-09-NC                                                                                                                                                           |                        |
| <b>9. Performing Organization Name and Address</b><br>Karco Engineering, LLC<br>9270 Holly Rd.<br>Adelanto, CA, 92301                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                  | <b>10. Work Unit No.</b>                                                                                                                                                                                                  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                |                  | <b>11. Contract or Grant No.</b><br>DTNH22-06-D-00027                                                                                                                                                                     |                        |
| <b>12. Sponsoring Agency Name and Address</b><br>U. S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Rulemaking<br>Office of Crashworthiness Standards<br>Mail Code NPS-111<br>400 Seventh Street, SW, Room 5311<br>Washington, D.C 20590                                                                                                                                                                                 |  |                                                                |                  | <b>13. Type of Report and Period Covered</b><br>Final Test Report<br>Base Year                                                                                                                                            |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                |                  | <b>14. Sponsoring Agency Code</b><br>DOT/NHTSA/NRM/OCS                                                                                                                                                                    |                        |
| <b>15. Supplementary Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                |                  |                                                                                                                                                                                                                           |                        |
| <b>16. Abstract</b><br><br>A frontal impact test was conducted on one (1) Graco Snugride CRS and one (1) Britax Companion CRS in conjunction with frontal barrier impact NCAP testing on a 2007 Toyota Tundra CrewMax SR5 4-Door Truck and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on April 19, 2007. |  |                                                                |                  |                                                                                                                                                                                                                           |                        |
| <b>Measurement Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                |  | <b>Units</b>                                                   | <b>Threshold</b> | <b>Left Rear (P4)</b>                                                                                                                                                                                                     | <b>Right Rear (P3)</b> |
| Head Injury Criteria (HIC15)                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | N/A                                                            | 390              | 647.5                                                                                                                                                                                                                     | 839.1                  |
| 3 msec. Chest Clip                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | G's                                                            | 50               | 67.1                                                                                                                                                                                                                      | 64.6                   |
| <b>17. Key Words</b><br>New Car Assessment Program (Frontal NCAP)<br>Frontal Barrier Impact Test<br>Final Report of a Graco Snugride CRS<br>Final Report of a Britax Companion CRS                                                                                                                                                                                                                                                                            |  |                                                                |                  | <b>18. Distribution of Statement</b><br>Copies of this report available from:<br>NHTSA Technical Reference Division<br>National Highway Traffic Safety Admin.<br>400 Seventh St., SW, Room 5108<br>Washington, D.C. 20590 |                        |
| <b>19. Security Classification (this report)</b><br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                              |  | <b>20. Security Classification (this page)</b><br>Unclassified |                  | <b>21. No. of Pages</b><br>69                                                                                                                                                                                             | <b>22. Price</b>       |

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## SECTION D1

### PURPOSE AND SUMMARY OF TEST M75106

The purpose of this test is to obtain CRS performance data during 35 mph (56.3 km/h) frontal barrier impact NCAP test.

The frontal barrier impact NCAP test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

### SUMMARY

Two 12-month old CRABI's (P3 & P4) was instrumented with head, chest, and six-axis upper neck load cells. A tri-axial accelerometer was installed on the CRS and the CRS base.

The left rear (Serial No. 022) and rear rear (Serial No. 017) CRABI's were calibrated prior to this test. CRABI calibration information is found in Section D4.

| CHILD DUMMY VALUES |              |                    |
|--------------------|--------------|--------------------|
| Location           | HIC15 Values | 3 Msec. Chest Clip |
| CRABI (P3)         | 839.1        | 64.6               |
| CRABI (P4)         | 647.5        | 67.2               |

**DATA SHEET NO.1**  
**CRASH TEST SUMMARY**

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07

**CHILD RESTRAINT SYSTEM INFORMATION**

| Description      | Position #3 CRS | Position #4 CRS |
|------------------|-----------------|-----------------|
| Manufacturer     | Graco           | Britax          |
| Model Name       | Snugride        | Companion       |
| Serial No.       | 8649MTR3        | E9L8069 006348  |
| Type             | Infant          | Infant          |
| Forward/Rearward | Rearward        | Rearward        |

**VISIBLE DUMMY CONTACT POINTS**

| Description        | Position #3 CRS | Position #4 CRS |
|--------------------|-----------------|-----------------|
| Head Contact       | Rear Headrest   | Rear Headrest   |
| Chest Contact      | None            | None            |
| Abdomen Contact    | None            | None            |
| Left Knee Contact  | None            | None            |
| Right Knee Contact | None            | None            |
| Left Toe Contact   | None            | None            |
| Right Toe Contact  | None            | None            |

**POST-TEST DOOR OPENINGS**

| Description     | Position #3 CRS                               | Position #4 CRS                               |
|-----------------|-----------------------------------------------|-----------------------------------------------|
| Right Rear Door | Remained closed and latched, opened w/o tools | Remained closed and latched, opened w/o tools |

**CAMERA COVERAGE**

| Description | Standard |
|-------------|----------|
| High Speed  | 2        |
| Real Time   | 0        |
| Total       | 2        |

**DATA CHANNELS**

|                         |    |
|-------------------------|----|
| CRABI (P3 & P4) Sensors | 26 |
| Belt Sensors            | 4  |
| CRS Sensors             | 12 |
| Total                   | 42 |

**DATA SHEET NO.2****VEHICLE PARAMETER DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**TEST VEHICLE WEIGHTS**

|        | Units | As Delivered Weights (UVW) |           |       | As Tested Weights (ATW) |           |       |
|--------|-------|----------------------------|-----------|-------|-------------------------|-----------|-------|
|        |       | Front Axle                 | Rear Axle | Total | Front Axle              | Rear Axle | Total |
| Left   | kg    | 772                        | 563       | 1335  | 822                     | 660       | 1482  |
| Right  | kg    | 715                        | 553       | 1268  | 764                     | 638       | 1402  |
| Ratio  | %     | 57                         | 43        | 100   | 55                      | 45        | 100   |
| Totals | kg    | 1487                       | 1116      | 2603  | 1586                    | 1298      | 2884  |

**TARGET TEST WEIGHT CALCULATION**

| Measured Parameter                   | Units | Value |
|--------------------------------------|-------|-------|
| Total Delivered Weight (UVW)         | kg    | 2603  |
| Weight of 2 P572 ATD's               | kg    | 152   |
| Rated Cargo/Luggage Wt. (RCLW)       | kg    | 136   |
| Calculated Vehicle Target Wt. (TVTW) | kg    | 2891  |

### DATA SHEET NO.3

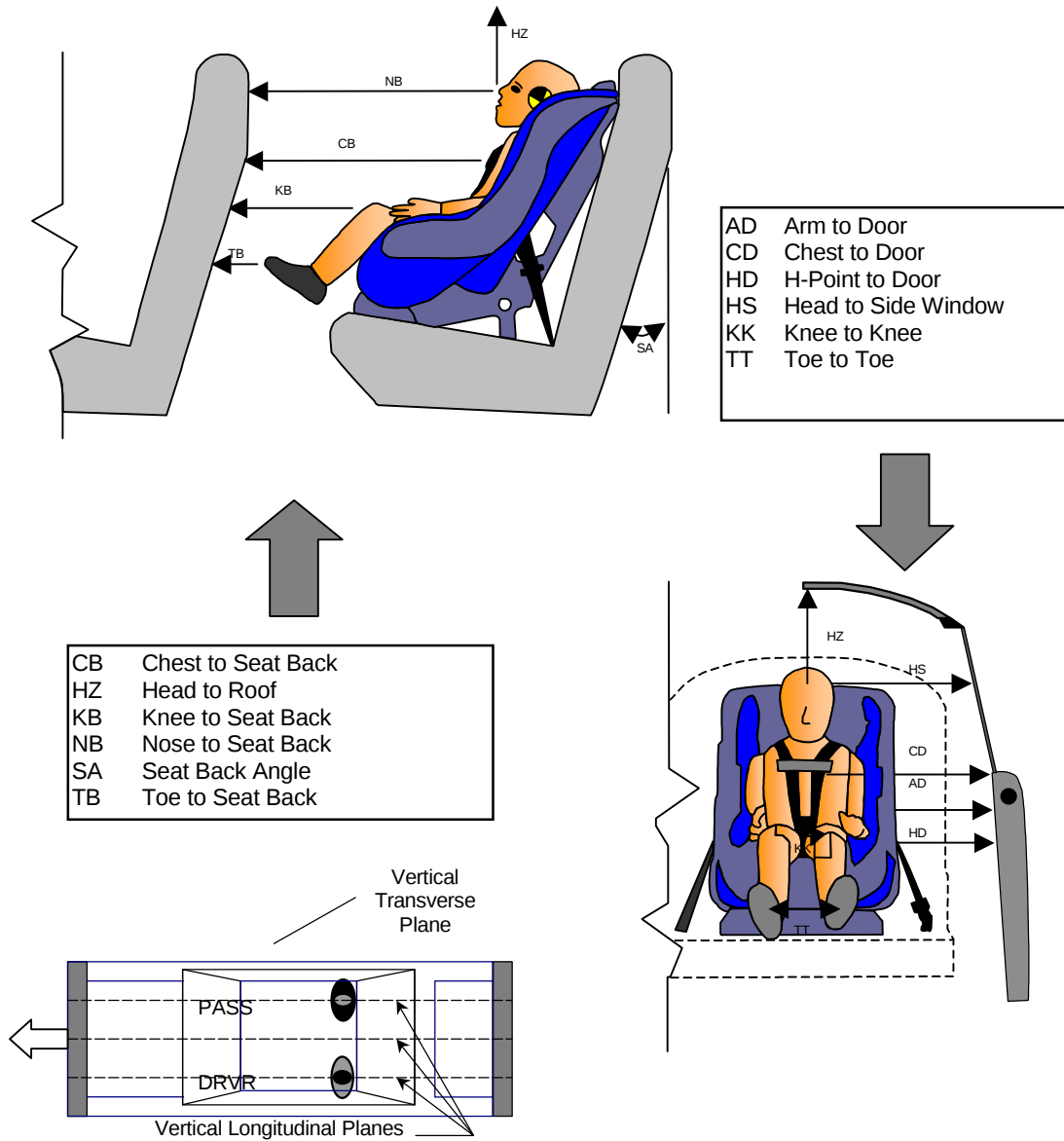
#### CRABI POSITIONING IN VEHICLE

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 04/19/07



#### DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

**DATA SHEET NO.3****CRABI POSITIONING IN VEHICLE...(CONTINUED)**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**CRABI MEASUREMENTS**

| Code     | Measurement         | Units | CRABI (P4) Serial No. 017 | CRABI (P3) Serial No. 022 |
|----------|---------------------|-------|---------------------------|---------------------------|
| SA       | Seat Back Angle     | deg.  | 18.4                      | 18.4                      |
| HZ       | Head to Roof (Z)    | mm    | 460                       | 435                       |
| CD       | Chest to Door       | mm    | 320                       | 405                       |
| KK       | Knee to Knee (Y)    | mm    | 115                       | 95                        |
| HS       | Head to Side Window | mm    | 435                       | 420                       |
| HD       | H-Point to Door (Y) | mm    | 268                       | 320                       |
| AD       | Arm to Door         | mm    | 225                       | 260                       |
| NB       | Nose to Seat Back   | mm    | 475                       | 458                       |
| CB       | Chest to Seat Back  | mm    | 373                       | 374                       |
| FF       | Foot to Foot        | mm    | 125                       | 84                        |
| KB-Left  | Knee to Seat Back   | mm    | 175                       | 172                       |
| KB-Right | Knee to Seat Back   | mm    | 168                       | 168                       |
| TB-Left  | Toe to Seat Back    | mm    | 62                        | 38                        |
| TB-Right | Toe to Seat Back    | mm    | 65                        | 41                        |
| CCA      | Car Cushion Angle   | deg.  | 13.4                      | 13.4                      |
| BA       | Back Angle          | deg.  | 36                        | 26.6                      |
| SCA      | Seat Cushion Angle  | deg.  | 26.6                      | 14.5                      |

**DATA SHEET NO.4****CRS PERFORMANCE DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**CRS PERFORMANCE DATA**

| Location                    | CRS (P4) |           | CRS (P3) |                     |
|-----------------------------|----------|-----------|----------|---------------------|
|                             | Damage   | Post-Test | Damage   | Post-Test           |
| Upper Tether Strap          |          |           |          |                     |
| Upper Tether Buckle         |          |           |          |                     |
| Upper Tether Hook           |          |           |          |                     |
| Veh. Upper Tether Anchor    |          |           |          |                     |
| Lower Anchor Strap          |          |           |          |                     |
| Lower Anchor Buckle         |          |           |          |                     |
| Lower Anchor Hooks          | No       | None      | No       | None                |
| Veh. Lower CRS Anchors      | No       | None      | No       | None                |
| 5-Point Harness Connections | No       | None      | No       | None                |
| Cracks on CRS               | No       | None      | Yes      | Outer / Inner Walls |
| Fabric Tears on CRS         | No       | None      | No       | None                |
| Vehicle Seat Structure      | No       | None      | No       | None                |
| Vehicle Seat Fabric Tears   | No       | None      | No       | None                |

**DATA SHEET NO. 7...(CONTINUED)**  
**CRS ACCELEROMETER LOCATIONS**

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck

NHTSA No.: M75106

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 4/19/07

**CRS ACCELEROMETER PRE-TEST LOCATIONS**

| Loc.<br>No. | Accelerometer Location | Measurements (mm) |      |      |
|-------------|------------------------|-------------------|------|------|
|             |                        | X                 | Y    | Z    |
| 1           | CRS (P4)               | 2603              | -572 | 1070 |
| 2           | CRS Base (P4)          | 2603              | -570 | 1000 |
| 3           | CRS (P3)               | 2603              | 485  | 1135 |
| 4           | CRS Base (P3)          | 2603              | 485  | 1022 |

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

**DATA SHEET NO.6****CRS CAMERA LOCATIONS AND DATA**Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door TruckNHTSA No.: M75106Test Program: 2007 NHTSA 35mph NCAPTest Date: 04/19/07**CAMERA LOCATIONS**

| No. | Camera View                   | Location(mm) |      |      | Angle<br>(Deg.) | Film<br>Plane to<br>Head | Lens<br>(mm) | Speed<br>(fps) |
|-----|-------------------------------|--------------|------|------|-----------------|--------------------------|--------------|----------------|
|     |                               | X            | Y    | Z    |                 |                          |              |                |
| 1   | Driver Side Upper CRS View    | -1651        | -722 | -951 | -2              | 172                      | 12           | 1000           |
| 2   | Passenger Side Lower CRS View | -1651        | 722  | -951 | -1              | 172                      | 12           | 1000           |

X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Time Marks

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MODEL **8649MTR3**

NAME **SNUGRIDE**

Manufactured in 031507 10

GRACO CHILDREN'S PRODUCTS, INC.

EXTON, PA 19341 1-888-224-6549

Made in U.S.A.

PB-25777

Figure D2-1: Position 3 CRS Label



Figure D2-2: Pre-Test Frontal View of Position 3 CRS



Figure D2-3: Post-Test Frontal View of Position 3 CRS



Figure D2-4: Pre-Test Rear View of Position 3 CRS



Figure D2-5: Post-Test Rear View of Position 3 CRS



Figure D2-6: Pre-Test Right Side View of Position 3 CRS



Figure D2-7: Post-Test Right Side View of Position 3 CRS



Figure D2-8: Pre-Test Left Side View of Position 3 CRS

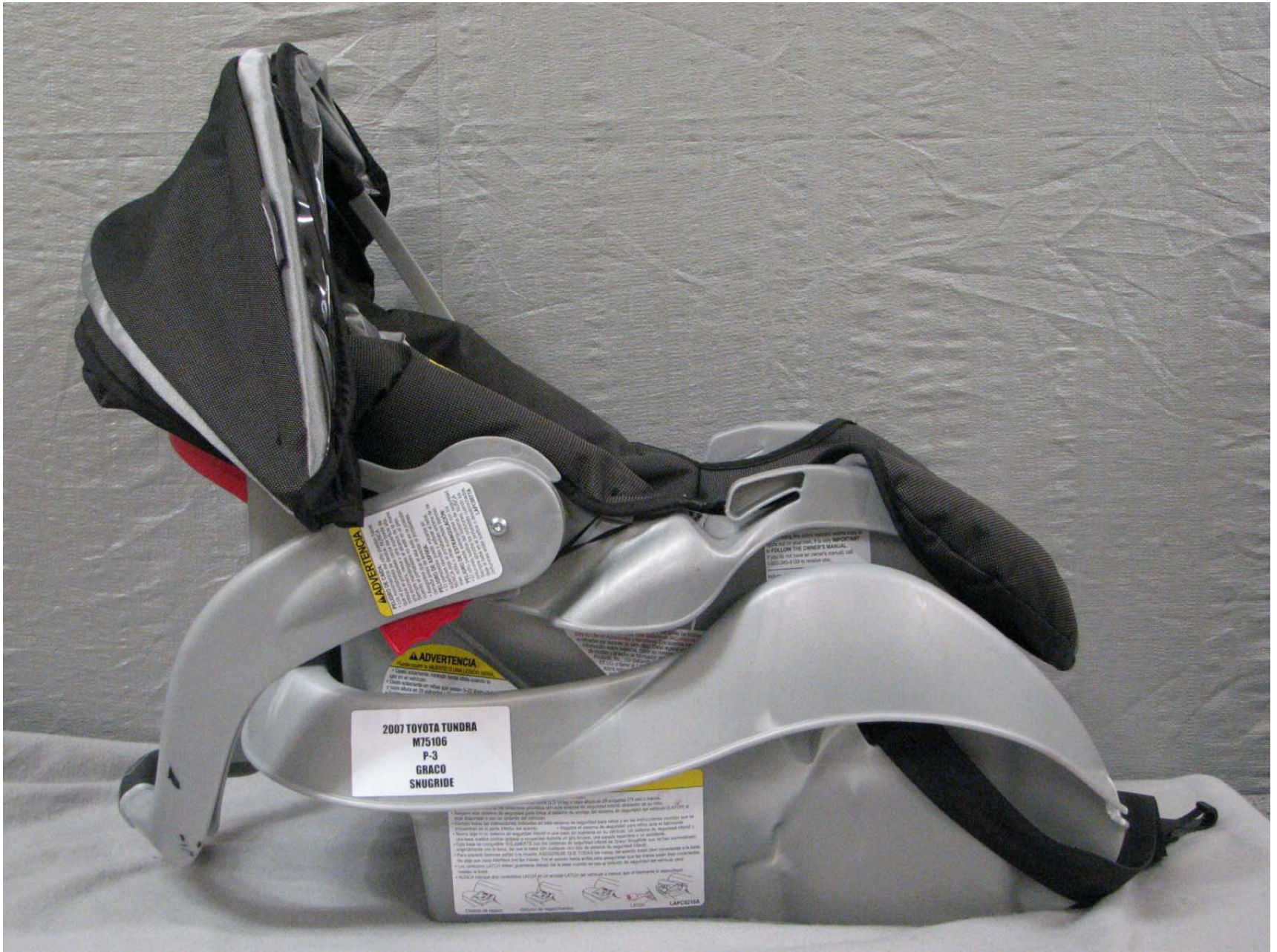


Figure D2-9: Post-Test Left Side View of Position 3 CRS



Figure D2-10: Pre-Test Position 3 Front View (Head and Seat Belt Position)



Figure D2-11: Post-Test Position 3 Front View (Head and Seat Belt Position)



Figure D2-12: Pre-Test Position 3 Front View (Seat Belt Position)



Figure D2-13: Post-Test Position 3 Front View (Seat Belt Position)



Figure D2-14: Pre-Test Position 3 Right Side View



Figure D2-15: Post-Test Position 3 Right Side View



Figure D2-16: Pre-Test Position 3 Right Side View (Through Window)



Figure D2-17: Post-Test Position 3 Right Side View (Through Window)



Figure D2-18: Post-Test Position 3 Dummy Legs

**Serial #: E9L8069006348**

**Model #: E9L8069**

**Batch #: J000008674**

**Manufactured In: 03/08/07**

**Manufactured in Charlotte, NC, USA**



Figure D2-19: Position 4 CRS Label



Figure D2-20: Pre-Test Frontal View of Position 4 CRS



Figure D2-21: Post-Test Frontal View of Position 4 CRS



Figure D2-22: Pre-Test Rear View of Position 4 CRS



Figure D2-23: Post-Test Rear View of Position 4 CRS



Figure D2-24: Pre-Test Right Side View of Position 4 CRS



Figure D2-25: Post-Test Right Side View of Position 4 CRS





Figure D2-27: Post-Test Left Side View of Position 4 CRS



Figure D2-28: Pre-Test Position 4 Front View (Head & Seat Belt Position)



Figure D2-29: Post-Test Position 4 Front View (Head & Seat Belt Position)



Figure D2-30: Pre-Test Position 4 Front View (Seat Belt Position)



Figure D2-31: Post-Test Position 4 Front View (Seat Belt Position)



Figure D2-32: Pre-Test Position 4 Left Side View



Figure D2-33: Post-Test Position 4 Left Side View



Figure D2-34: Pre-Test Position 4 Left Side View



Figure D2-35: Post-Test Position 4 Left Side View



Figure D2-36: Post-Test Position 4 Dummy Legs

## SECTION D3

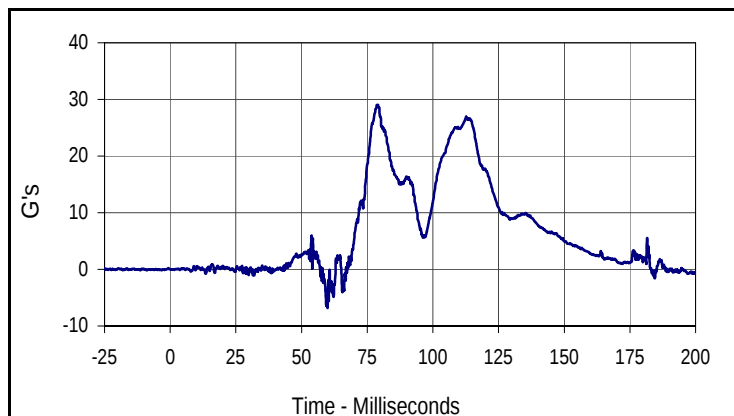
### CRABI RESPONSE AND CRS DATA TRACES

# LIST OF DATA PLOTS

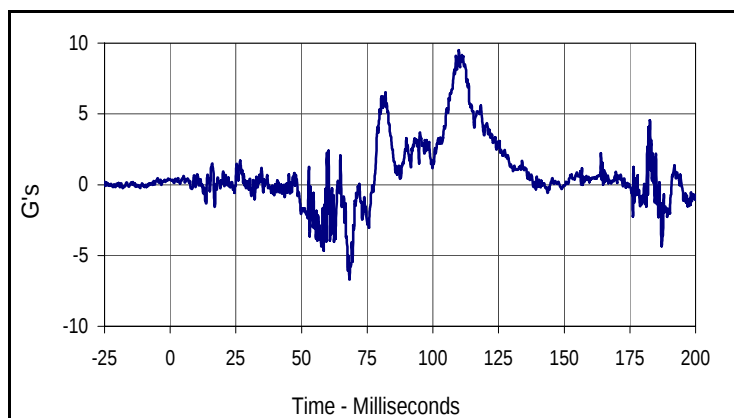
| <u>Data Plot</u> |                                       | <u>Page</u> |
|------------------|---------------------------------------|-------------|
| D3-1             | Right Rear CRABI (P3) Head X          | D3-1        |
|                  | Right Rear CRABI (P3) Head Y          | D3-1        |
|                  | Right Rear CRABI (P3) Head Z          | D3-1        |
|                  | Right Rear CRABI (P3) Head Resultant  | D3-1        |
| D3-2             | Right Rear CRABI (P3) Chest X         | D3-2        |
|                  | Right Rear CRABI (P3) Chest Y         | D3-2        |
|                  | Right Rear CRABI (P3) Chest Z         | D3-2        |
|                  | Right Rear CRABI (P3) Chest Resultant | D3-2        |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

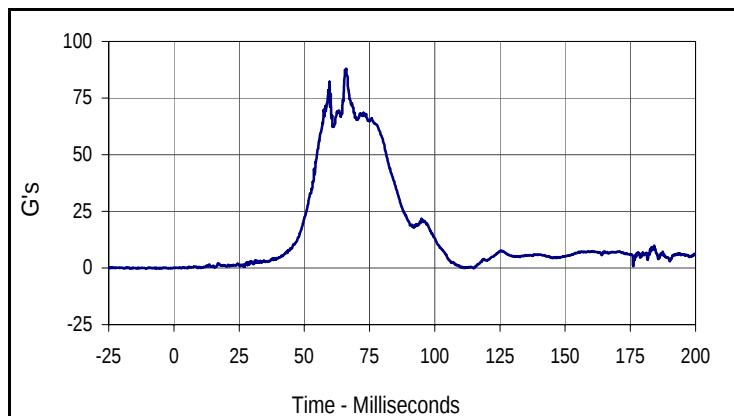
Test Date: 4/19/07  
 NHTSA No.: M75106



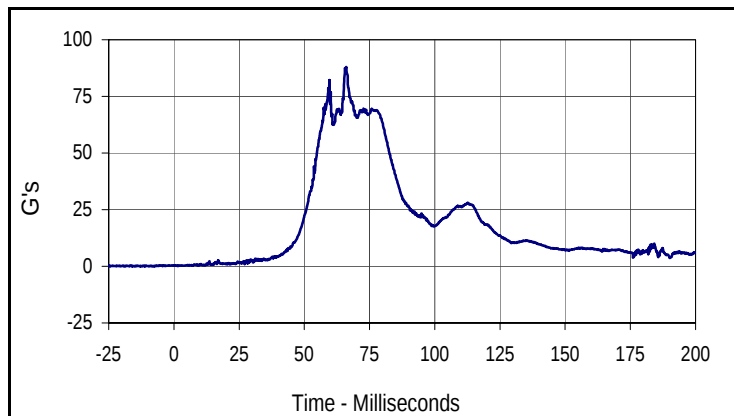
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| CRABI Head X (P4) |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 142               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 29.1              | 78.7 | -6.8      | 59.9  |



| Curve Description |       |           |       |
|-------------------|-------|-----------|-------|
| CRABI Head Y (P4) |       |           |       |
| CURNO             | Type  | SAE Class | Units |
| 143               | FIL   | 1000      | G's   |
| Max               | Time  | Min       | Time  |
| 9.5               | 109.9 | -6.7      | 68.3  |



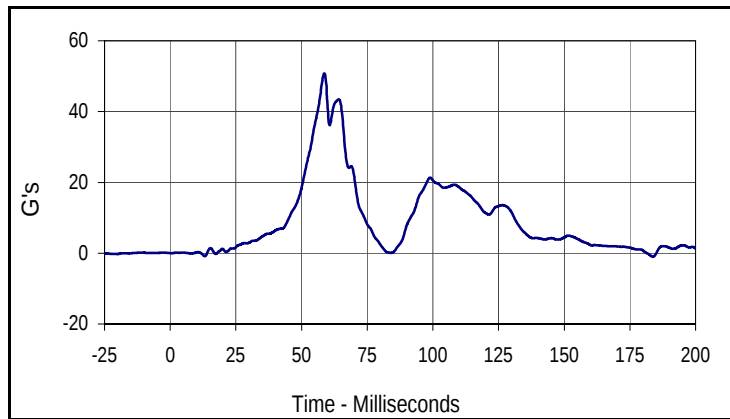
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| CRABI Head Z (P4) |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 144               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 87.9              | 66.0 | -0.1      | 2.8   |



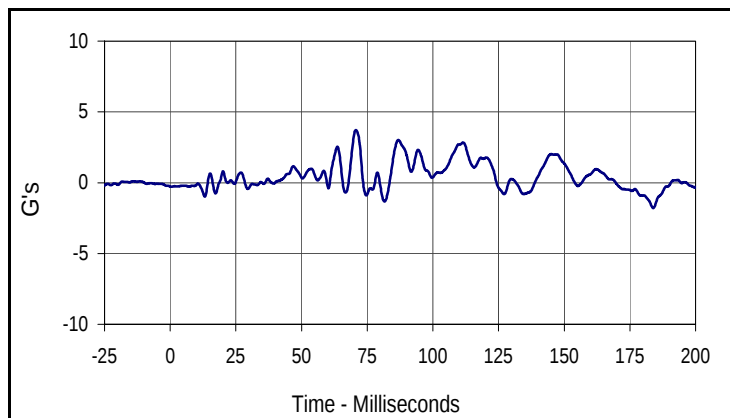
| Curve Description         |      |           |       |
|---------------------------|------|-----------|-------|
| CRABI Head Resultant (P4) |      |           |       |
| CURNO                     | Type | SAE Class | Units |
| 142                       | RES  | 1000      | G's   |
| Max                       | Time | Min       | Time  |
| 88.0                      | 66.0 | 0.2       | 1.4   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

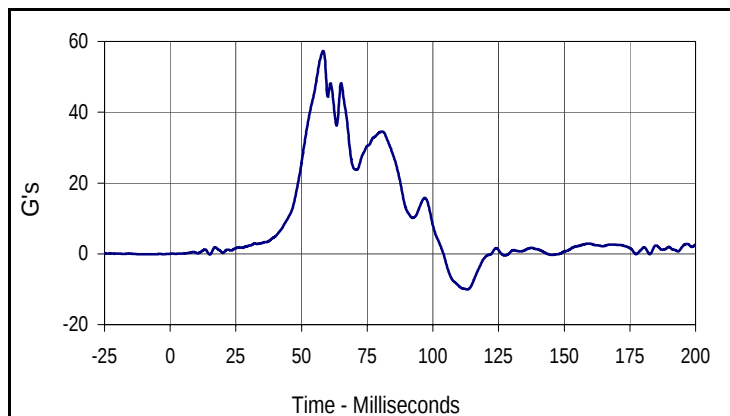
Test Date: 4/19/07  
 NHTSA No.: M75106



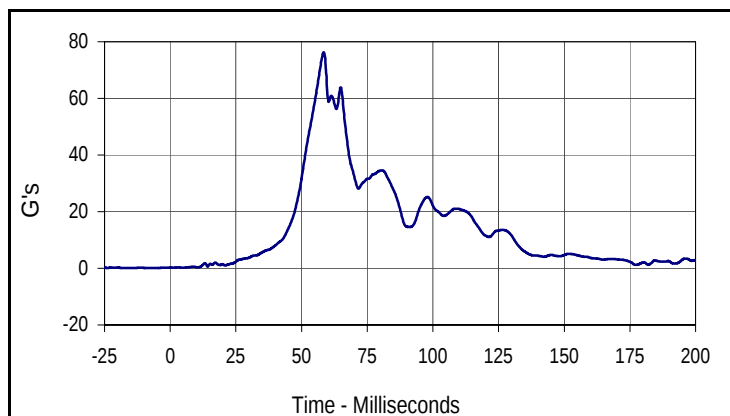
| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| CRABI Chest X (P4) |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 145                | FIL  | 180       | G's   |
| Max                | Time | Min       | Time  |
| 50.8               | 58.7 | -1.0      | 183.8 |



| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| CRABI Chest Y (P4) |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 146                | FIL  | 180       | G's   |
| Max                | Time | Min       | Time  |
| 3.7                | 70.7 | -1.8      | 183.9 |



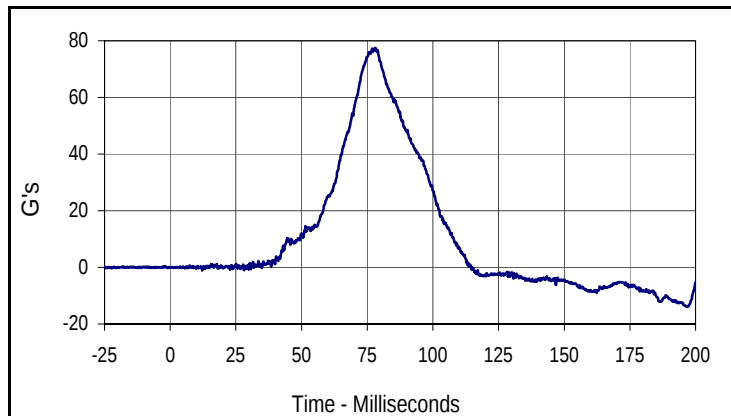
| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| CRABI Chest Z (P4) |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 147                | FIL  | 180       | G's   |
| Max                | Time | Min       | Time  |
| 57.3               | 58.2 | -10.0     | 113.0 |



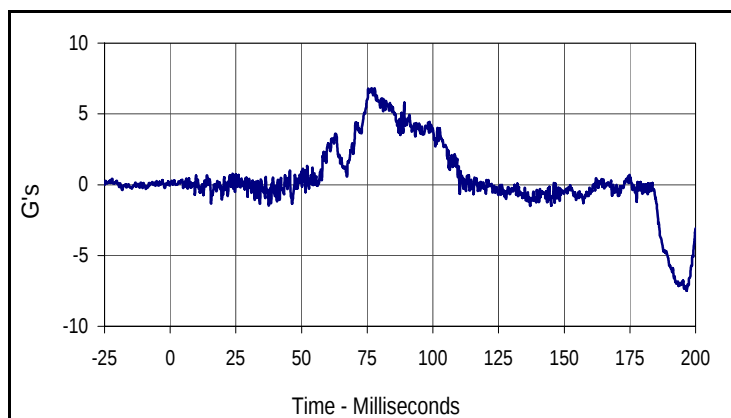
| Curve Description          |      |           |       |
|----------------------------|------|-----------|-------|
| CRABI Chest Resultant (P4) |      |           |       |
| CURNO                      | Type | SAE Class | Units |
| 145                        | RES  | 180       | G's   |
| Max                        | Time | Min       | Time  |
| 76.3                       | 58.4 | 0.3       | 1.4   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

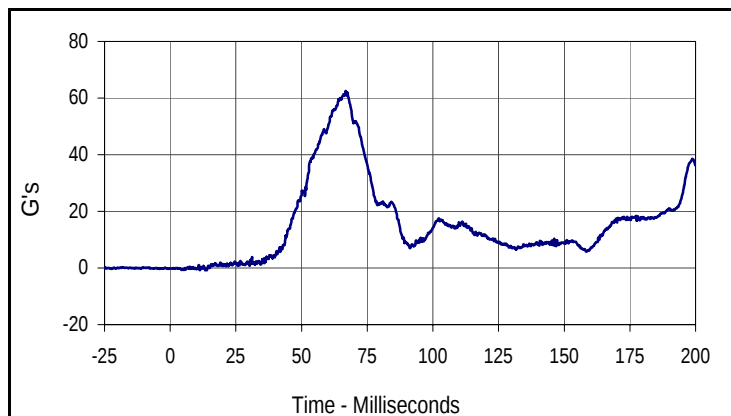
Test Date: 4/19/07  
 NHTSA No.: M75106



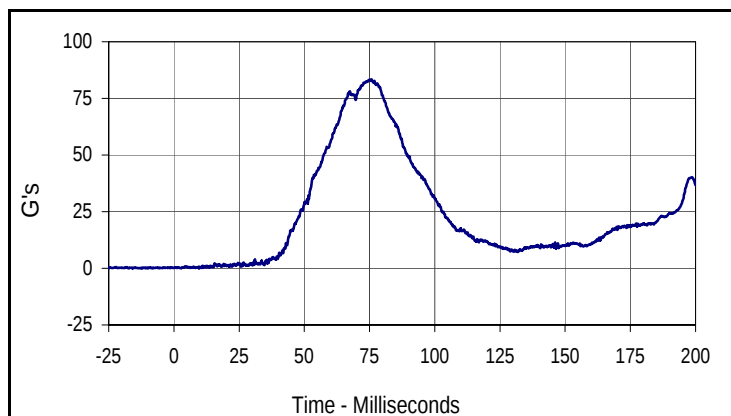
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| CRABI Head X (P3) |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 163               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 77.5              | 78.0 | -13.9     | 196.8 |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| CRABI Head Y (P3) |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 164               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 6.8               | 76.7 | -7.5      | 196.6 |



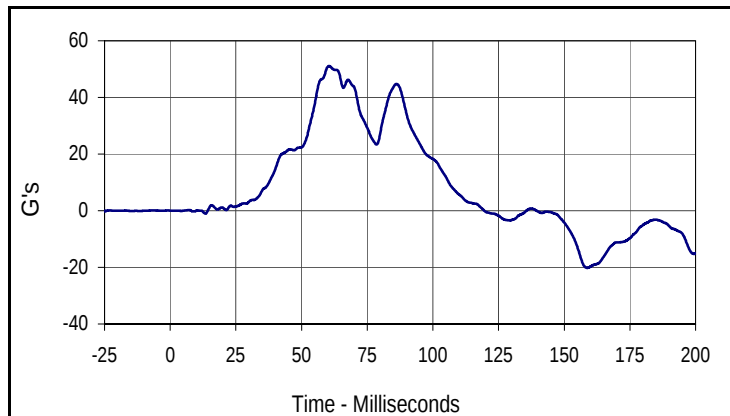
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| CRABI Head Z (P3) |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 165               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 62.4              | 66.9 | -0.8      | 14.0  |



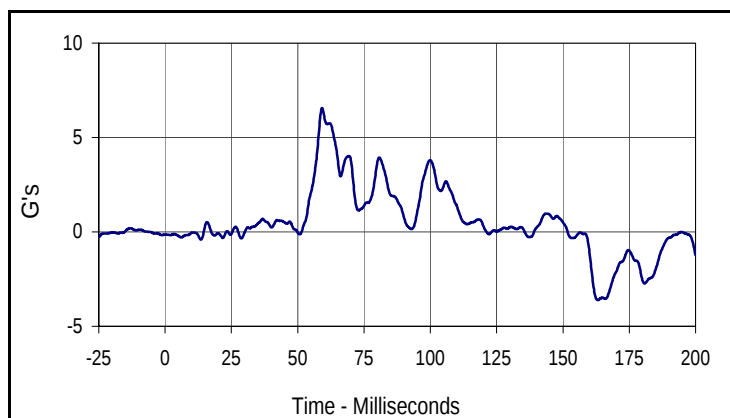
| Curve Description         |      |           |       |
|---------------------------|------|-----------|-------|
| CRABI Head Resultant (P3) |      |           |       |
| CURNO                     | Type | SAE Class | Units |
| 163                       | RES  | 1000      | G's   |
| Max                       | Time | Min       | Time  |
| 83.3                      | 75.6 | 0.0       | 2.8   |

Test Vehicle: 2007 Toyota Tundra CrewMax SR5 4-Door Truck  
 Test Program: 2007 NHTSA 35mph NCAP

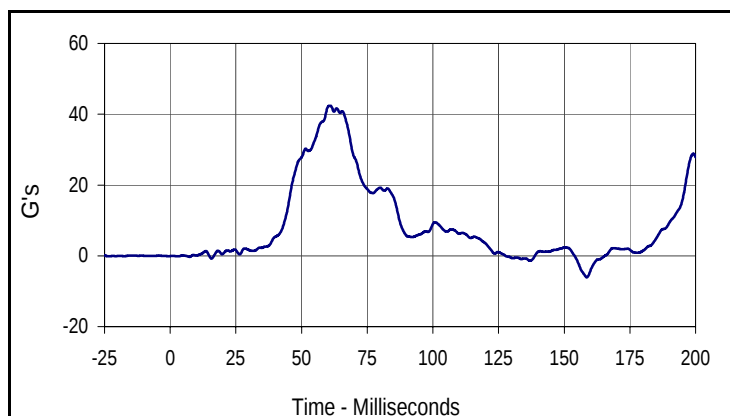
Test Date: 4/19/07  
 NHTSA No.: M75106



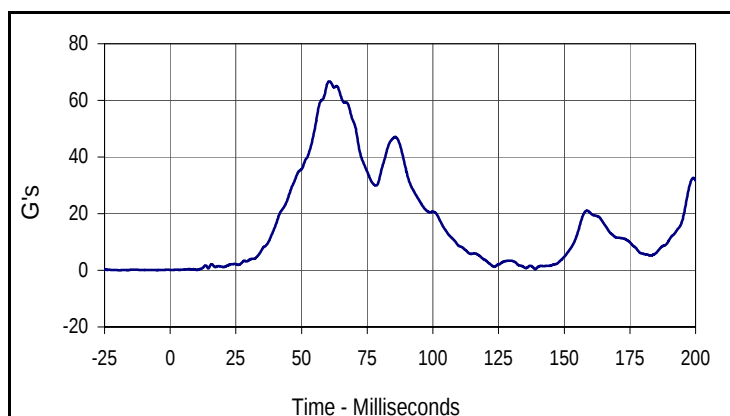
| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| CRABI Chest X (P3) |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 166                | FIL  | 180       | G's   |
| Max                | Time | Min       | Time  |
| 51.1               | 60.5 | -20.2     | 158.8 |



| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| CRABI Chest Y (P3) |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 167                | FIL  | 180       | G's   |
| Max                | Time | Min       | Time  |
| 6.6                | 59.2 | -3.6      | 163.2 |



| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| CRABI Chest Z (P3) |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 168                | FIL  | 180       | G's   |
| Max                | Time | Min       | Time  |
| 42.4               | 60.9 | -6.1      | 158.6 |



| Curve Description          |      |           |       |
|----------------------------|------|-----------|-------|
| CRABI Chest Resultant (P3) |      |           |       |
| CURNO                      | Type | SAE Class | Units |
| 166                        | RES  | 180       | G's   |
| Max                        | Time | Min       | Time  |
| 66.6                       | 60.5 | 0.1       | 10.1  |

## SECTION D4

### CRABI CALIBRATION INFORMATION

Test Program: CRABI 12 Month Old Frontal Head Drop Test

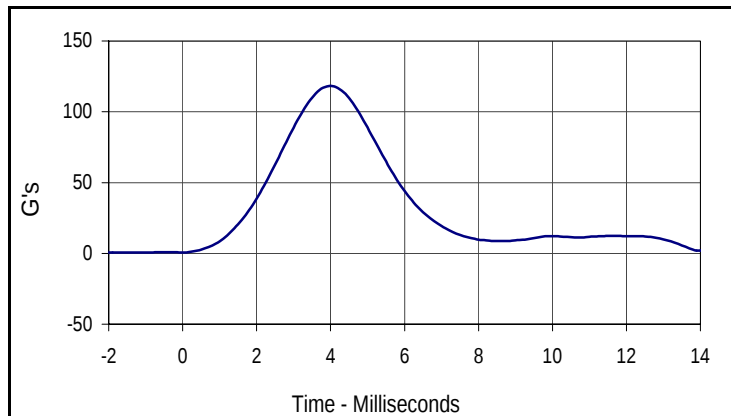
Test Date: 3/30/07

ATD Serial No.: 017

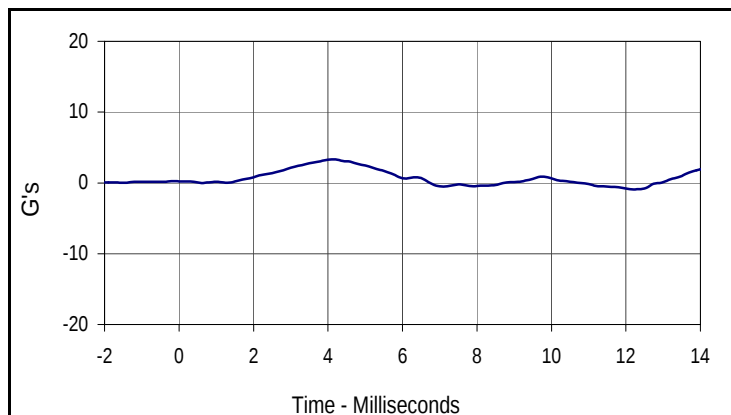
Test I.D.: HD017A



| Tested Parameter             | Units  | Specification  | Result | Pass/Fail |
|------------------------------|--------|----------------|--------|-----------|
| Laboratory Temperature       | °C     | 18.9 to 25.6   | 21.1   | Pass      |
| Laboratory Relative Humidity | %      | 10 to 70       | 30     | Pass      |
| Peak Resultant Acceleration  | G's    | 100.0 to 120.0 | 118.3  | Pass      |
| Peak Lateral Acceleration    | G's    | ≤15.0          | 3.3    | Pass      |
| Is Acceleration Unimodal?    | Yes/No | Yes            | Yes    | Pass      |
| Overall Test Results         |        |                | Pass   |           |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Resultant    |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | RES  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 118.3             | 4.0  | 0.5       | 0.0   |



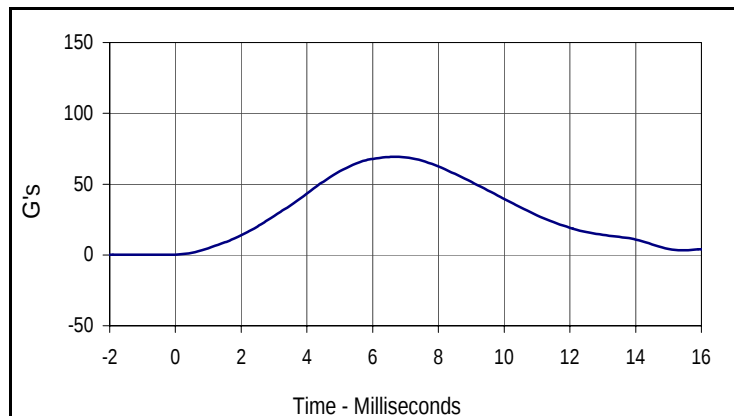
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Y            |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 002               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 3.3               | 4.1  | 0.0       | 0.6   |

Test Program: CRABI 12 Month Old Rear Head Drop Test  
 ATD Serial No.: 017

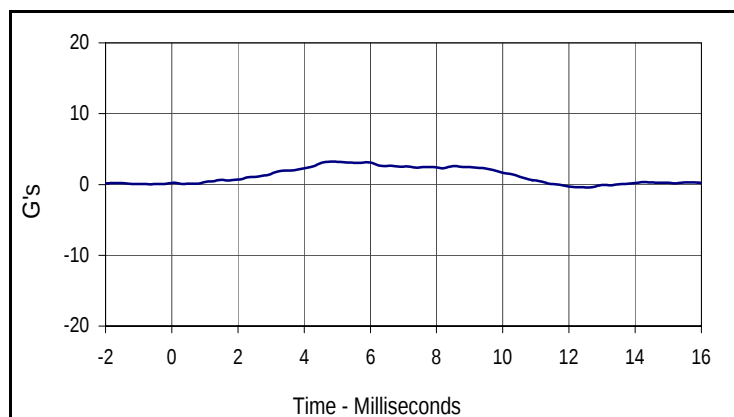
Test Date: 3/28/07  
 Test I.D.: HDR17A



| Tested Parameter             | Units  | Specification | Result | Pass/Fail |
|------------------------------|--------|---------------|--------|-----------|
| Laboratory Temperature       | °C     | 18.9 to 25.6  | 21.1   | Pass      |
| Laboratory Relative Humidity | %      | 10 to 70      | 30     | Pass      |
| Peak Resultant Acceleration  | G's    | 55.0 to 71.0  | 67.8   | Pass      |
| Peak Lateral Acceleration    | G's    | ≤15.0         | 3.2    | Pass      |
| Is Acceleration Unimodal?    | Yes/No | Yes           | Yes    | Pass      |
| Overall Test Results         |        |               |        | Pass      |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Resultant    |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | RES  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 67.8              | 6.0  | 0.1       | -1.1  |



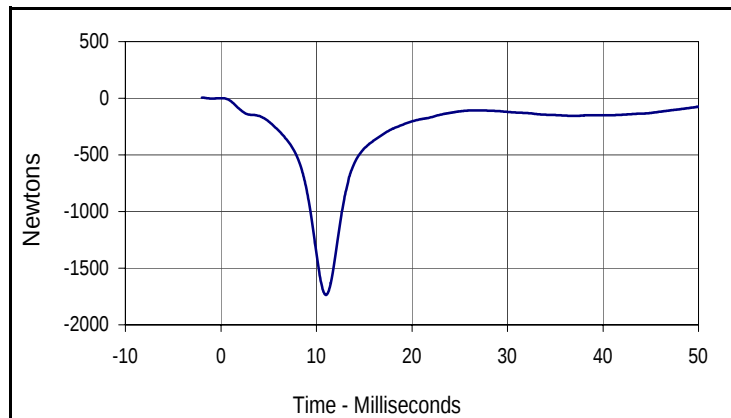
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Y            |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 002               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 3.2               | 4.8  | 0.0       | -0.6  |

Test Program: CRABI 12 Month Old Thorax Impact Test  
 ATD Serial No.: 017

Test Date: 3/28/07  
 Test I.D.: TH02K



| Tested Parameter             | Units   | Specification  | Result | Pass/Fail |
|------------------------------|---------|----------------|--------|-----------|
| Laboratory Temperature       | °C      | 20.6 to 22.2   | 21.1   | Pass      |
| Laboratory Relative Humidity | %       | 10 to 70       | 30     | Pass      |
| Pendulum Velocity at T=0     | m/sec   | 4.90 to 5.10   | 4.90   | Pass      |
| Peak Probe Force             | Newtons | -1514 to -1796 | -1736  | Pass      |
| Overall Test Results         |         |                |        | Pass      |



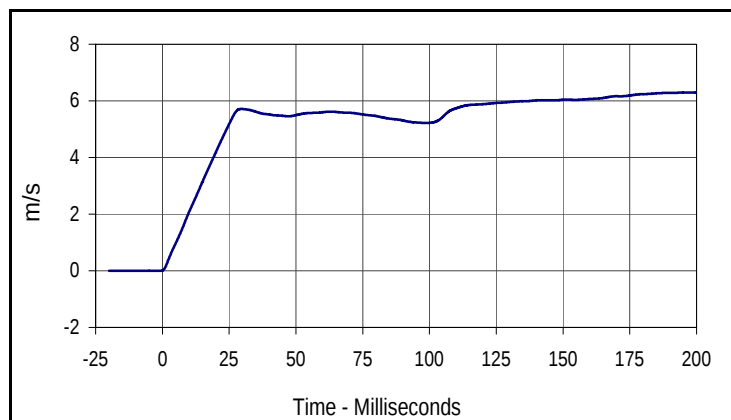
| Curve Description |      |           |         |
|-------------------|------|-----------|---------|
| Probe Force       |      |           |         |
| CURNO             | Type | SAE Class | Units   |
| 001               | FIL  | 180       | Newtons |
| Max               | Time | Min       | Time    |
| 7.0               | -2.0 | -1736.1   | 11.0    |

Test Program: CRABI 12-Month Old Neck Flexion Test  
 ATD Serial No.: 017

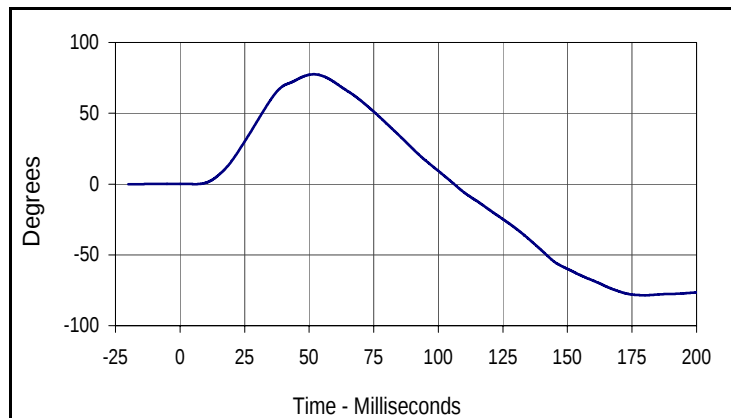
Test Date: 3/28/07  
 Test I.D.: NF08A



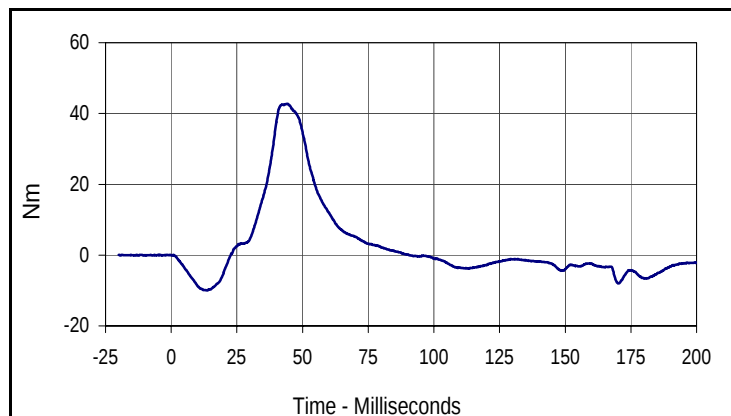
| Tested Parameter                    |          | Units   | Specification        | Result | Pass/Fail |
|-------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature              |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity        |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                   |          | m/s     | 5.10 to 5.30         | 5.18   | Pass      |
| Pendulum Deceleration               | 10 Msec. | m/s     | 1.6 to 2.3           | 2.1    | Pass      |
|                                     | 20 Msec. | m/s     | 3.4 to 4.2           | 4.2    | Pass      |
|                                     | 25 Msec. | m/s     | 4.3 to 5.2           | 5.2    | Pass      |
| "D" Plane Rotation                  | Max      | Degrees | 75.0 to 86.0         | 77.5   | Pass      |
| Peak Moment in Rotation             | Max      | Nm      | 36.0 to 45.0         | 40.7   | Pass      |
| Positive Moment Decay, Time To 5 Nm |          | Msec.   | 60.0 to 80.0         | 70.7   | Pass      |
|                                     |          |         | Overall Test Results |        | Pass      |



| Curve Description |       |           |       |
|-------------------|-------|-----------|-------|
| Pendulum Velocity |       |           |       |
| CURNO             | Type  | SAE Class | Units |
| 001               | FIL   | 180       | m/s   |
| Max               | Time  | Min       | Time  |
| 6.3               | 199.3 | 0.0       | -0.7  |



| Curve Description  |      |           |         |
|--------------------|------|-----------|---------|
| "D" Plane Rotation |      |           |         |
| CURNO              | Type | SAE Class | Units   |
| 003                | FIL  | 60        | Degrees |
| Max                | Time | Min       | Time    |
| 77.5               | 51.8 | -78.5     | 179.8   |



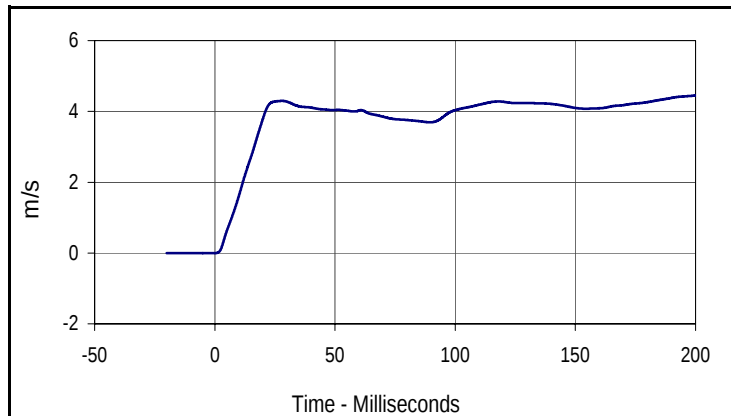
| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| Upper Neck Force Y |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 002                | FIL  | 600       | Nm    |
| Max                | Time | Min       | Time  |
| 42.8               | 44.3 | -9.9      | 13.5  |

Test Program: CRABI 12-Month Old Neck Extension Test  
 ATD Serial No.: 017

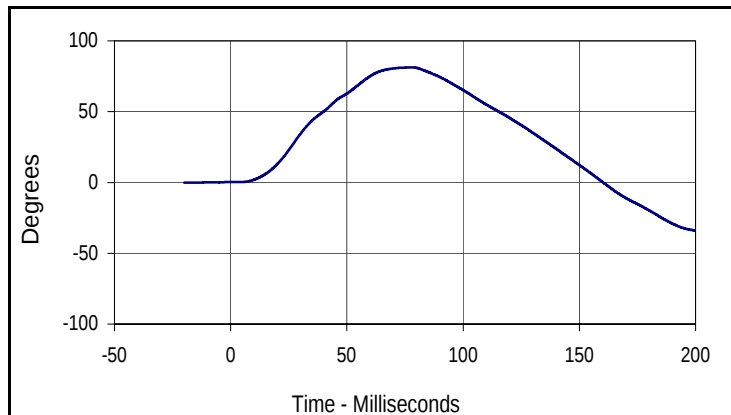
Test Date: 3/29/07  
 Test I.D.: NE02C



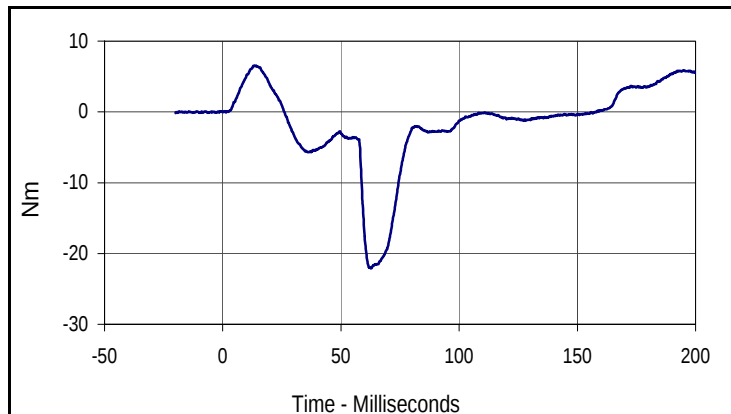
| Tested Parameter                     |          | Units   | Specification        | Result | Pass/Fail |
|--------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature               |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity         |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                    |          | m/s     | 2.4 to 2.6           | 2.45   | Pass      |
| Pendulum Deceleration                | 6 Msec.  | m/s     | 0.8 to 1.2           | 0.8    | Pass      |
|                                      | 10 Msec. | m/s     | 1.5 to 2.1           | 1.6    | Pass      |
|                                      | 14 Msec. | m/s     | 2.2 to 2.9           | 2.5    | Pass      |
| "D" Plane Rotation                   | Max      | Degrees | 80.0 to 92.0         | 81.3   | Pass      |
| Peak Moment in Rotation              | Max      | Nm      | -12 to -23           | -20.4  | Pass      |
| Positive Moment Decay, Time To -5 Nm |          | Msec.   | 76.0 to 90.0         | 77.3   | Pass      |
|                                      |          |         | Overall Test Results |        | Pass      |



| Curve Description |       |           |       |
|-------------------|-------|-----------|-------|
| Pendulum Velocity |       |           |       |
| CURNO             | Type  | SAE Class | Units |
| 001               | FIL   | 180       | m/s   |
| Max               | Time  | Min       | Time  |
| 4.4               | 200.0 | 0.0       | 0.1   |



| Curve Description  |      |           |         |
|--------------------|------|-----------|---------|
| "D" Plane Rotation |      |           |         |
| CURNO              | Type | SAE Class | Units   |
| 003                | FIL  | 60        | Degrees |
| Max                | Time | Min       | Time    |
| 81.3               | 77.8 | -34.0     | 200.0   |



| Curve Description   |      |           |       |
|---------------------|------|-----------|-------|
| Upper Neck Moment Y |      |           |       |
| CURNO               | Type | SAE Class | Units |
| 002                 | FIL  | 600       | Nm    |
| Max                 | Time | Min       | Time  |
| 6.5                 | 13.2 | -22.1     | 62.8  |

Test Program: CRABI 12 Month Old External Dimensions  
 ATD Serial No.: 017

Test Date: 3/30/07  
 Test I.D.: N/A



| Tested Parameter                            | Units | Specification  | Result | Pass/Fail |
|---------------------------------------------|-------|----------------|--------|-----------|
| Laboratory Temperature                      | °C    | 20.6 to 22.2   | 21.1   | Pass      |
| Laboratory Relative Humidity                | %     | 10 to 70       | 30     | Pass      |
| A - Total sitting height                    | mm    | 456.0 to 471.2 | 458    | Pass      |
| B - Shoulder pivot height                   | mm    | 276.6 to 291.8 | 282    | Pass      |
| C - "H" point height                        | mm    | 27.9 to 38.1   | 37     | Pass      |
| D - "H" point from backline                 | mm    | 40.1 to 50.3   | 49     | Pass      |
| E - Shoulder pivot from back                | mm    | 50.3 to 60.5   | 54     | Pass      |
| F - Thigh clearance                         | mm    | 63.0 to 73.2   | 70     | Pass      |
| G - Elbow pivot to fingertip                | mm    | 176.6 to 191.8 | 187    | Pass      |
| I - Shoulder pivot to elbow pivot           | mm    | 99.1 to 114.3  | 103    | Pass      |
| J - Elbow rest height                       | mm    | 150.1 to 165.3 | 155    | Pass      |
| K - Buttock to knee length                  | mm    | 202.7 to 217.9 | 205    | Pass      |
| L - Popliteal length                        | mm    | 138.7 to 153.9 | 140    | Pass      |
| M - Knee pivot height                       | mm    | 165.1 to 180.3 | 170    | Pass      |
| N - Buttock popliteal length                | mm    | 144.8 to 160.0 | 150    | Pass      |
| O - Chest depth with jacket                 | mm    | 107.5 to 122.7 | 112    | Pass      |
| P - Foot length                             | mm    | 92.4 to 102.6  | 102    | Pass      |
| Q- Stature                                  | mm    | 727.7 to 753.1 | N/A    | N/A       |
| R - Buttock to knee pivot length            | mm    | 178.5 to 188.7 | 181    | Pass      |
| S - Head Breadth                            | mm    | 124.4 to 134.6 | 129    | Pass      |
| T - Head Depth                              | mm    | 149.9 to 165.1 | 154    | Pass      |
| U - Hip breadth                             | mm    | 158.5 to 173.7 | 165    | Pass      |
| V - Shoulder breadth                        | mm    | 200.7 to 215.9 | 213    | Pass      |
| W - Foot breadth                            | mm    | 39.1 to 49.3   | 47     | Pass      |
| Y - Chest circumference with jacket         | mm    | 452.4 to 477.8 | 463    | Pass      |
| Z - Waist circumference                     | mm    | 447.0 to 472.4 | 454    | Pass      |
| AA - Reference location for dimension Y & O | mm    | 256.5 to 266.7 | 265    | Pass      |
| BB - Reference Location For dimension Z     | mm    | 106.7 to 116.9 | 110    | Pass      |
| CC - Shoulder Height                        | mm    | 299.7 to 314.9 | 305    | Pass      |
| DD - Chin Height                            | mm    | 289.6 to 304.8 | 302    | Pass      |
| Overall Test Results                        |       |                |        | Pass      |

Test Program: CRABI 12 Month Old Frontal Head Drop Test

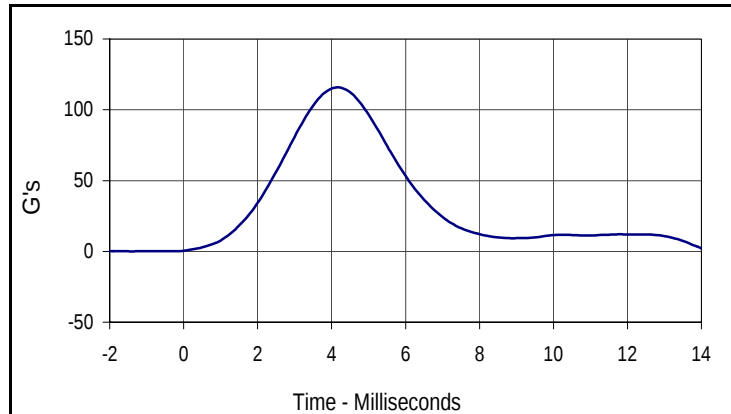
Test Date: 3/29/07

ATD Serial No.: 022

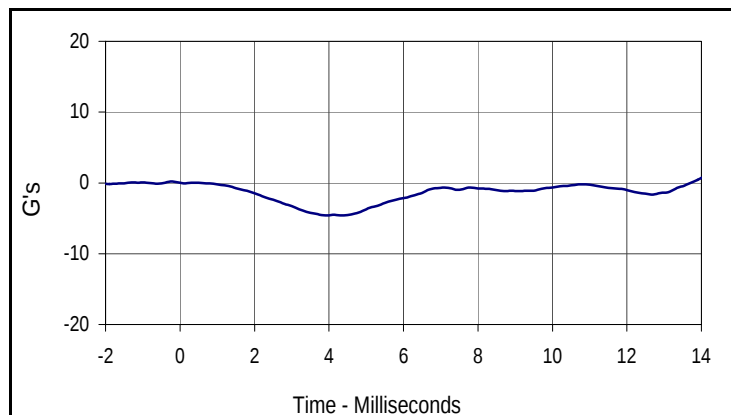
Test I.D.: HD022H



| Tested Parameter             | Units  | Specification  | Result | Pass/Fail |
|------------------------------|--------|----------------|--------|-----------|
| Laboratory Temperature       | °C     | 18.9 to 25.6   | 21.1   | Pass      |
| Laboratory Relative Humidity | %      | 10 to 70       | 30     | Pass      |
| Peak Resultant Acceleration  | G's    | 100.0 to 120.0 | 115.8  | Pass      |
| Peak Lateral Acceleration    | G's    | ≤15.0          | 4.6    | Pass      |
| Is Acceleration Unimodal?    | Yes/No | Yes            | Yes    | Pass      |
| Overall Test Results         |        |                |        | Pass      |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Resultant    |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | RES  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 115.8             | 4.2  | 0.0       | -1.4  |



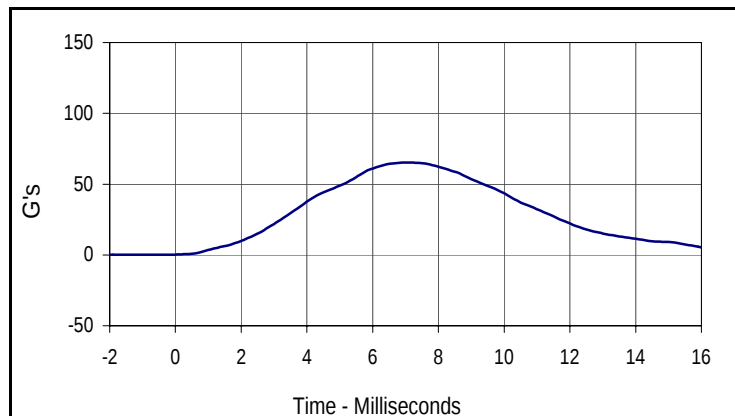
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Y            |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 002               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 0.2               | -0.2 | -4.6      | 3.9   |

Test Program: CRABI 12 Month Old Rear Head Drop Test  
 ATD Serial No.: 022

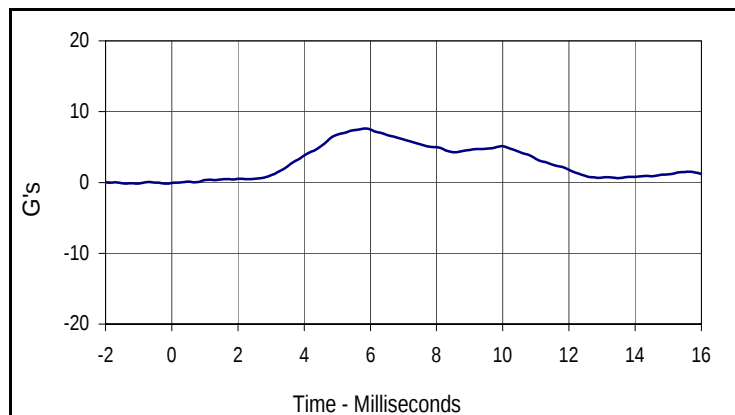
Test Date: 3/30/07  
 Test I.D.: HDR22S



| Tested Parameter             | Units  | Specification | Result | Pass/Fail |
|------------------------------|--------|---------------|--------|-----------|
| Laboratory Temperature       | °C     | 18.9 to 25.6  | 21.1   | Pass      |
| Laboratory Relative Humidity | %      | 10 to 70      | 30     | Pass      |
| Peak Resultant Acceleration  | G's    | 55.0 to 71.0  | 61.1   | Pass      |
| Peak Lateral Acceleration    | G's    | ≤15.0         | 7.6    | Pass      |
| Is Acceleration Unimodal?    | Yes/No | Yes           | Yes    | Pass      |
| Overall Test Results         |        |               |        | Pass      |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Resultant    |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | RES  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 61.1              | 6.0  | 0.1       | -0.9  |



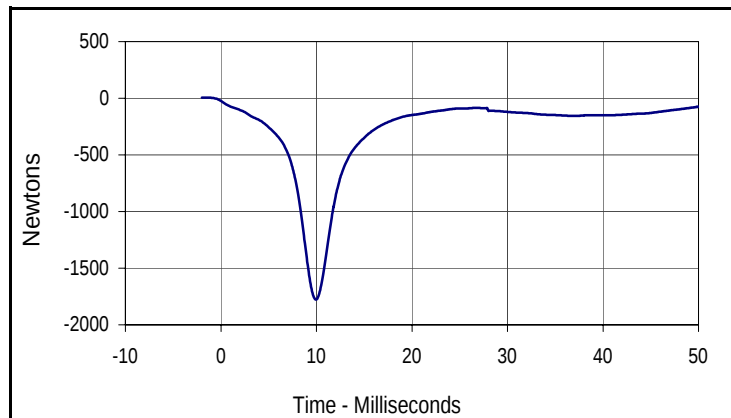
| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Head Y            |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 002               | FIL  | 1000      | G's   |
| Max               | Time | Min       | Time  |
| 7.6               | 5.8  | -0.2      | -1.4  |

Test Program: CRABI 12 Month Old Thorax Impact Test  
 ATD Serial No.: 022

Test Date: 3/28/07  
 Test I.D.: TH02X



| Tested Parameter             | Units   | Specification  | Result | Pass/Fail |
|------------------------------|---------|----------------|--------|-----------|
| Laboratory Temperature       | °C      | 20.6 to 22.2   | 21.1   | Pass      |
| Laboratory Relative Humidity | %       | 10 to 70       | 30     | Pass      |
| Pendulum Velocity at T=0     | m/sec   | 4.90 to 5.10   | 4.90   | Pass      |
| Peak Probe Force             | Newtons | -1514 to -1796 | -1776  | Pass      |
| Overall Test Results         |         |                |        | Pass      |



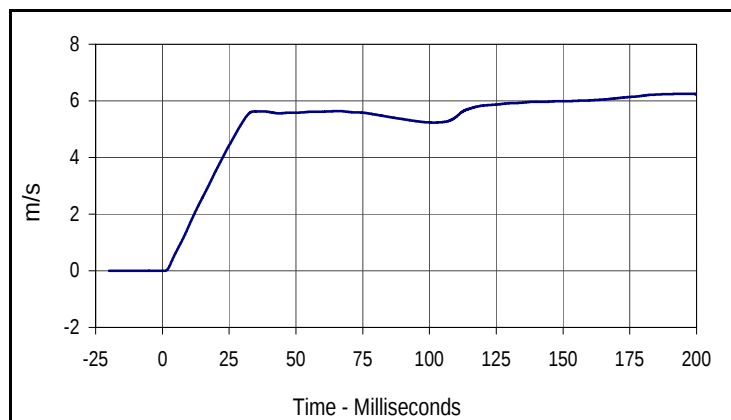
| Curve Description |      |           |         |
|-------------------|------|-----------|---------|
| Probe Force       |      |           |         |
| CURNO             | Type | SAE Class | Units   |
| 001               | FIL  | 180       | Newtons |
| Max               | Time | Min       | Time    |
| 6.1               | -1.6 | -1776.2   | 10.0    |

Test Program: CRABI 12-Month Old Neck Flexion Test  
 ATD Serial No.: 022

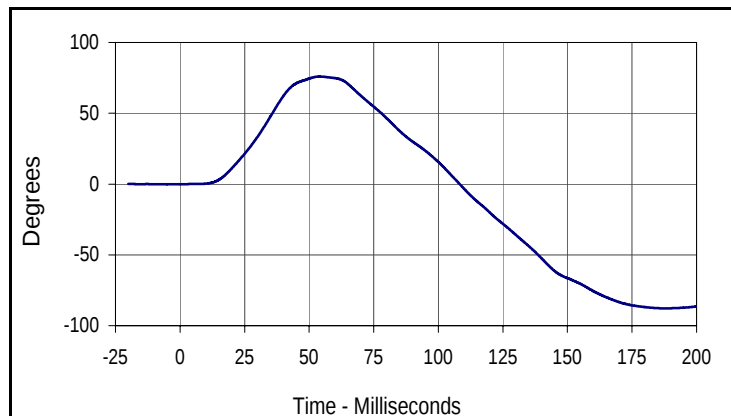
Test Date: 3/30/07  
 Test I.D.: NF02P



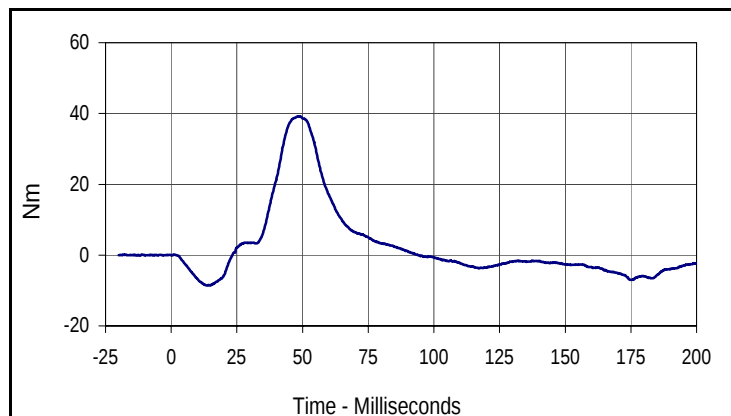
| Tested Parameter                    |          | Units   | Specification        | Result | Pass/Fail |
|-------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature              |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity        |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                   |          | m/s     | 5.10 to 5.30         | 5.29   | Pass      |
| Pendulum Deceleration               | 10 Msec. | m/s     | 1.6 to 2.3           | 1.6    | Pass      |
|                                     | 20 Msec. | m/s     | 3.4 to 4.2           | 3.5    | Pass      |
|                                     | 25 Msec. | m/s     | 4.3 to 5.2           | 4.4    | Pass      |
| "D" Plane Rotation                  | Max      | Degrees | 75.0 to 86.0         | 75.9   | Pass      |
| Peak Moment in Rotation             | Max      | Nm      | 36.0 to 45.0         | 38.4   | Pass      |
| Positive Moment Decay, Time To 5 Nm |          | Msec.   | 60.0 to 80.0         | 75.1   | Pass      |
|                                     |          |         | Overall Test Results |        | Pass      |



| Curve Description |       |           |       |
|-------------------|-------|-----------|-------|
| Pendulum Velocity |       |           |       |
| CURNO             | Type  | SAE Class | Units |
| 001               | FIL   | 180       | m/s   |
| Max               | Time  | Min       | Time  |
| 6.2               | 197.7 | 0.0       | 0.6   |



| Curve Description  |      |           |         |
|--------------------|------|-----------|---------|
| "D" Plane Rotation |      |           |         |
| CURNO              | Type | SAE Class | Units   |
| 003                | FIL  | 60        | Degrees |
| Max                | Time | Min       | Time    |
| 75.9               | 54.0 | -87.8     | 188.0   |



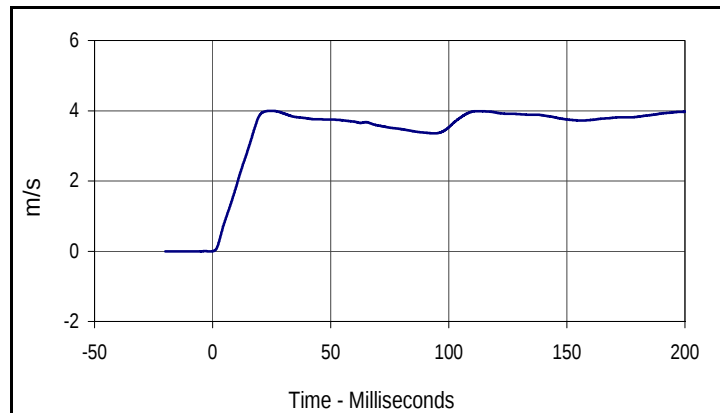
| Curve Description  |      |           |       |
|--------------------|------|-----------|-------|
| Upper Neck Force Y |      |           |       |
| CURNO              | Type | SAE Class | Units |
| 002                | FIL  | 600       | Nm    |
| Max                | Time | Min       | Time  |
| 39.2               | 48.7 | -8.6      | 13.7  |

Test Program: CRABI 12-Month Old Neck Extension Test  
 ATD Serial No.: 022

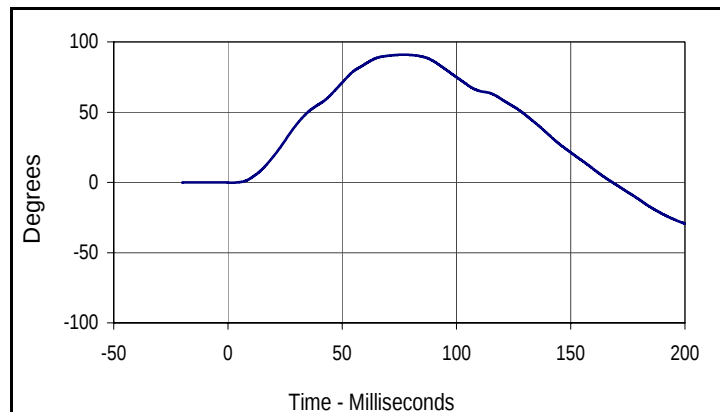
Test Date: 3/28/07  
 Test I.D.: NE02G



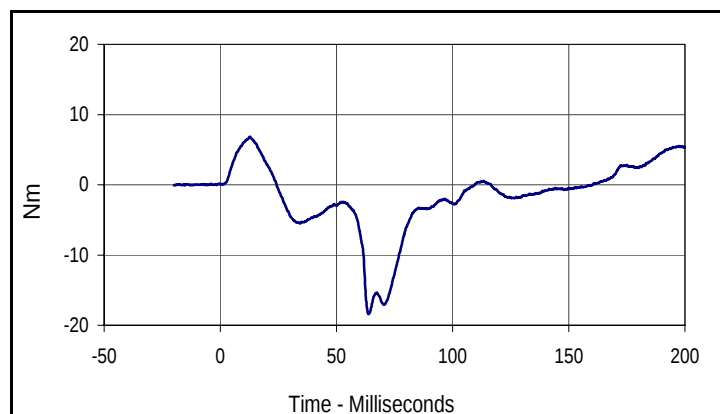
| Tested Parameter                     |          | Units   | Specification        | Result | Pass/Fail |
|--------------------------------------|----------|---------|----------------------|--------|-----------|
| Laboratory Temperature               |          | °C      | 20.6 to 22.2         | 21.1   | Pass      |
| Laboratory Relative Humidity         |          | %       | 10 to 70             | 30     | Pass      |
| Pendulum Velocity                    |          | m/s     | 2.4 to 2.6           | 2.43   | Pass      |
| Pendulum Deceleration                | 6 Msec.  | m/s     | 0.8 to 1.2           | 1.0    | Pass      |
|                                      | 10 Msec. | m/s     | 1.5 to 2.1           | 1.8    | Pass      |
|                                      | 14 Msec. | m/s     | 2.2 to 2.9           | 2.7    | Pass      |
| "D" Plane Rotation                   | Max      | Degrees | 80.0 to 92.0         | 90.9   | Pass      |
| Peak Moment in Rotation              | Max      | Nm      | -12 to -23           | -18.4  | Pass      |
| Positive Moment Decay, Time To -5 Nm |          | Msec.   | 76.0 to 90.0         | 80.1   | Pass      |
|                                      |          |         | Overall Test Results |        | Pass      |



| Curve Description |      |           |       |
|-------------------|------|-----------|-------|
| Pendulum Velocity |      |           |       |
| CURNO             | Type | SAE Class | Units |
| 001               | FIL  | 180       | m/s   |
| Max               | Time | Min       | Time  |
| 4.0               | 24.6 | 0.0       | -0.7  |



| Curve Description  |      |           |         |
|--------------------|------|-----------|---------|
| "D" Plane Rotation |      |           |         |
| CURNO              | Type | SAE Class | Units   |
| 003                | FIL  | 60        | Degrees |
| Max                | Time | Min       | Time    |
| 90.9               | 77.0 | -29.3     | 200.0   |



| Curve Description   |      |           |       |
|---------------------|------|-----------|-------|
| Upper Neck Moment Y |      |           |       |
| CURNO               | Type | SAE Class | Units |
| 002                 | FIL  | 600       | Nm    |
| Max                 | Time | Min       | Time  |
| 6.8                 | 12.8 | -18.4     | 63.8  |

Test Program: CRABI 12 Month Old External Dimensions  
 ATD Serial No.: 022

Test Date: 3/30/07  
 Test I.D.: N/A



| Tested Parameter                            | Units | Specification  | Result | Pass/Fail |
|---------------------------------------------|-------|----------------|--------|-----------|
| Laboratory Temperature                      | °C    | 20.6 to 22.2   | 21.1   | Pass      |
| Laboratory Relative Humidity                | %     | 10 to 70       | 30     | Pass      |
| A - Total sitting height                    | mm    | 456.0 to 471.2 | 457    | Pass      |
| B - Shoulder pivot height                   | mm    | 276.6 to 291.8 | 281    | Pass      |
| C - "H" point height                        | mm    | 27.9 to 38.1   | 36     | Pass      |
| D - "H" point from backline                 | mm    | 40.1 to 50.3   | 48     | Pass      |
| E - Shoulder pivot from back                | mm    | 50.3 to 60.5   | 56     | Pass      |
| F - Thigh clearance                         | mm    | 63.0 to 73.2   | 65     | Pass      |
| G - Elbow pivot to fingertip                | mm    | 176.6 to 191.8 | 183    | Pass      |
| I - Shoulder pivot to elbow pivot           | mm    | 99.1 to 114.3  | 105    | Pass      |
| J - Elbow rest height                       | mm    | 150.1 to 165.3 | 157    | Pass      |
| K - Buttock to knee length                  | mm    | 202.7 to 217.9 | 203    | Pass      |
| L - Popliteal length                        | mm    | 138.7 to 153.9 | 139    | Pass      |
| M - Knee pivot height                       | mm    | 165.1 to 180.3 | 169    | Pass      |
| N - Buttock popliteal length                | mm    | 144.8 to 160.0 | 151    | Pass      |
| O - Chest depth with jacket                 | mm    | 107.5 to 122.7 | 110    | Pass      |
| P - Foot length                             | mm    | 92.4 to 102.6  | 102    | Pass      |
| Q- Stature                                  | mm    | 727.7 to 753.1 | N/A    | N/A       |
| R - Buttock to knee pivot length            | mm    | 178.5 to 188.7 | 180    | Pass      |
| S - Head Breadth                            | mm    | 124.4 to 134.6 | 130    | Pass      |
| T - Head Depth                              | mm    | 149.9 to 165.1 | 155    | Pass      |
| U - Hip breadth                             | mm    | 158.5 to 173.7 | 164    | Pass      |
| V - Shoulder breadth                        | mm    | 200.7 to 215.9 | 215    | Pass      |
| W - Foot breadth                            | mm    | 39.1 to 49.3   | 45     | Pass      |
| Y - Chest circumference with jacket         | mm    | 452.4 to 477.8 | 462    | Pass      |
| Z - Waist circumference                     | mm    | 447.0 to 472.4 | 454    | Pass      |
| AA - Reference location for dimension Y & O | mm    | 256.5 to 266.7 | 264    | Pass      |
| BB - Reference Location For dimension Z     | mm    | 106.7 to 116.9 | 108    | Pass      |
| CC - Shoulder Height                        | mm    | 299.7 to 314.9 | 308    | Pass      |
| DD - Chin Height                            | mm    | 289.6 to 304.8 | 300    | Pass      |
| Overall Test Results                        |       |                |        | Pass      |