

REPORT NUMBER TR-P25101-01-NC

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

**GENERAL MOTORS OF CANADA LTD.
2006 PONTIAC GRAND PRIX
4-DOOR SEDAN**

NHTSA NUMBER: G60100

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



9/19/05

FINAL REPORT

**PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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Date of Acceptance

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Date of Acceptance

Technical Report Documentation Page

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2006 Pontiac Grand Prix 4-Door Sedan at Karco Engineering, LLC on 9/9/05. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.48 km/h. The ambient temperature at the barrier face at the time of impact is 27.8 degrees Celcius. The vehicle's maximum post-test static crush is 679mm to the left of the vehicle 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: <table border="1"> <thead> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Driver ATD</th> <th>Passenger ATD</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>N/A</td> <td>1000</td> <td>474.3</td> <td>474.3</td> </tr> <tr> <td>Max. Chest Accel. (3 msec Clip)</td> <td>G's</td> <td>60</td> <td>42.7</td> <td>47.4</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-5109.1</td> <td>-4784.8</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-4712.9</td> <td>-3364.9</td> </tr> </tbody> </table>						Measurement Description	Units	Threshold	Driver ATD	Passenger ATD	Head Injury Criteria (HIC)	N/A	1000	474.3	474.3	Max. Chest Accel. (3 msec Clip)	G's	60	42.7	47.4	Left Femur Force	Newtons	10008	-5109.1	-4784.8	Right Femur Force	Newtons	10008	-4712.9	-3364.9
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SECTION 1

PURPOSE AND SUMMARY OF TEST G60100

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. DTNH22-01-D-02005. 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 December 1999. 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 36 load cells was impacted by a 2006 Pontiac Grand Prix 4-Door Sedan at a velocity of 56.48 km/h. The test was performed at Karco Engineering, LLC on September 9, 2005.

One real-time and 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, 50th 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 also placed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. Also, shoulder belt spool-off was measured for the driver and passenger dummy. The driver (position 1) ATD (Serial No. 34) and the right-front passenger (position 2) ATD (Serial No. 35) were calibrated two tests prior this test.

Ninety seven (97) channels of data were recorded using an on-board 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.

There was 100 percent windshield retention and 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 679 mm to the left of the vehicle centerline 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, 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, the abdomen had no contact. Both knees contacted the glove box.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC	T ¹	T ²	Clip (g)	T ¹	T ²	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver	474.3	60.5	96.5	42.7	83.2	86.2	-23.6	-5109.1	-4712.9
Passenger	474.3	61.1	96.3	47.4	83.5	86.5	-23.0	-4784.8	-3364.9

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

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

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	mile/h	km/h	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 ²	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: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.48
Test Weight	kg	1791
Impact Angle	degrees	0
Average Rebound	mm	832
Maximum Static Crush	mm	679

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door opening	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Rear Door Opening	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/ Serial No.	50% Male Hybrid III No. 34	50% Male Hybrid III No. 35
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

MOVIE COVERAGE

High Speed	14
Real Time	2
Total	16

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	36
Total	133

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	G60100	Anti-Lock Brakes	Yes
Make	Pontiac	All Wheel Drive	No
Model	Grand Prix	Power Steering	Yes
Body Style	4-Door Sedan	Driver Front Airbag	Yes
Vin No.	2G2WP552961115713	Driver Side Airbag	No
Color	Black	Driver Head Airbag	No
Delivery Date	8/24/2005	Driver Curtain Airbag	No
Odometer	15	Pass. Airbag	Yes
Dealer	Costa Mesa Nabers	Pass. Side Airbag	No
Transmission	4-Speed Automatic	Pass. Head Airbag	No
Final Drive	Front	Pass. Curtain Airbag	No
Type/No. Cyl.	V-6	Pre-Tensioners	Yes
Engine Disp. (L)	3.8	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air. Cond.	Yes
Sunroof/T-Top	No	AM/FM Cassette	Yes
Tinted Glass	No	Tilt Steering	Yes
Traction Control	No	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.

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors of Canada Ltd.	GVWR (kg)	2021
Date of Manufacture	Aug-05	GAWR Front (kg)	1112
		GAWR Rear (kg)	909

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

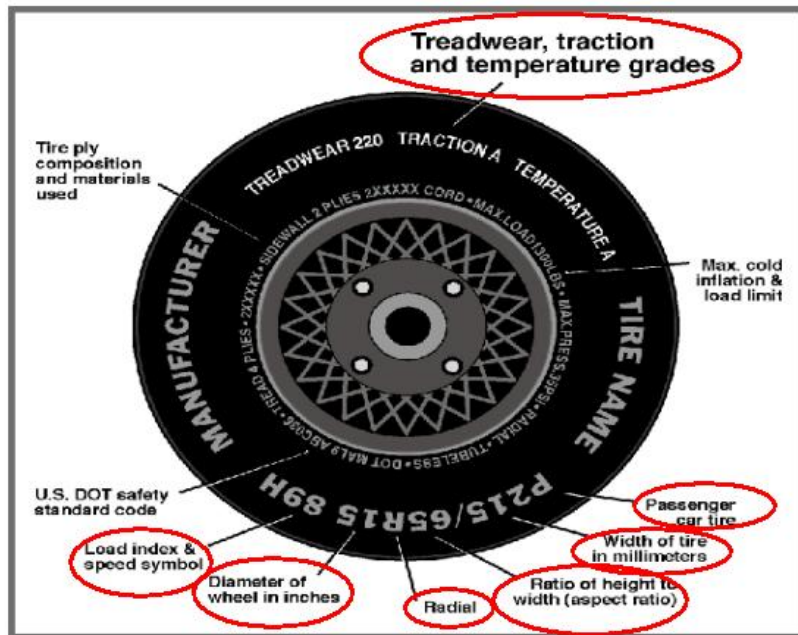
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				416
Cargo Weight (RCLW) (kg)				76

DATA SHEET NO. 2...(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

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	210
Recommended Tire Size	P255/60R16	P255/60R16
Tire Size on Vehicle	P225/60R16	P225/60R16
Tire Manufacturer	Goodyear	Goodyear
Treadwear	360	360
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Plies Polyester	2 Plies Polyester
Tire Plies Body	2 Polyester/2 Steel	2 Polyester/2 Steel
Load Index/Speed Symbol	97S	97S
Tire Material	Polyester/Steel/Rubber	Polyester/Steel/Rubber
DOT Safety Code Right	M6XO-BMMR	M6XO-BMMR
DOT Safety Code Left	M6XO-BMMR	M6XO-BMMR

DATA SHEET NO. 2...(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	482	289		525	359	
Right	kg	502	296		546	361	
Ratio	%	62.7	37.3		59.8	40.2	
Totals	kg	984	585	1569	1071	720	1791

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1569
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	76
Calculated Vehicle Target Wt. (TVTW)	kg	1797

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	732	725	752	752	1046
As Tested	mm	716	711	710	711	1128

Vehicle Wheel Base (mm) 2805

Weight of Ballast Secured in cargo area (kg) 0

Weight of Items Removed (kg) Unknown

Vehicle Components Removed Spare tire and tools.

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 66.24

Actual Test Volume with entire fuel System Filled (L) 61.32

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Purple

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 when electrical system is activated
Fuel pump will run for 3 seconds when ignition is in "on" position.

DATA SHEET NO. 3
POST-TEST IMPACT DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	56.48
Trap No. 1 Entry Distance	mm	<1524	1524
Trap No.1 Exit Distance	mm	<1524	305
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	56.50
Trap No.2 Entry Distance	mm	<1524	1524
Trap No.2 Exit Distance	mm	<1524	305

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4868	4294	-574
Center	mm	5028	4353	-675
Right Side	mm	4868	4273	-595

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	865
Center	mm	790
Right Side	mm	840
Average	mm	832

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

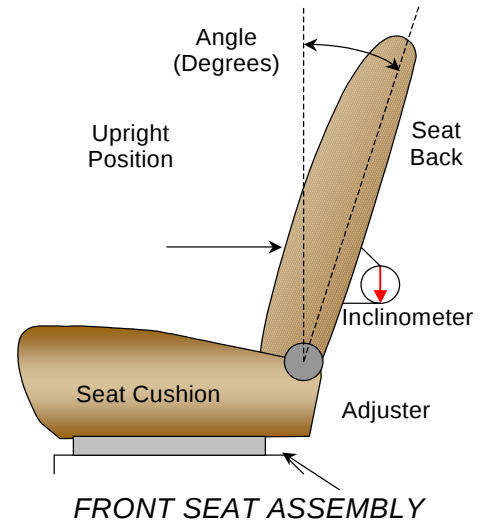
NHTSA No.: G60100
 Test Date: 9/9/05

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 back using a digital inclinometer.

SEAT BACK ANGLES

	Deg.
Driver w/seated Dummy	14.9
Passenger w/seated Dummy	16.7

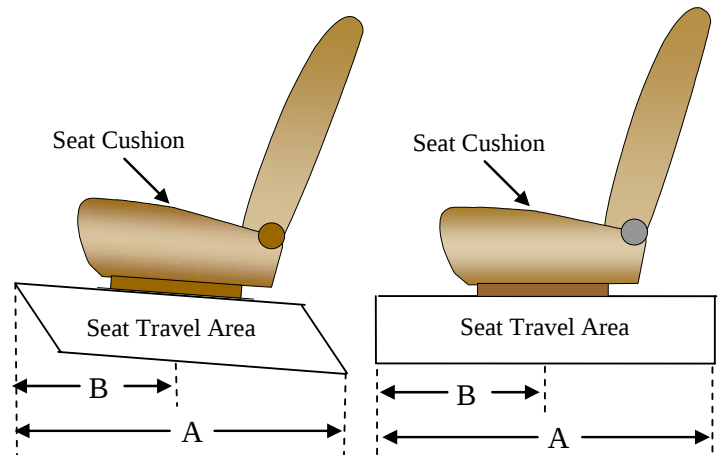


SEAT FORE/AFT POSITIONS

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 with the vertical adjustment at the lowest position obtainable for the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel (Detent)	Placed in Position (Detent)
Driver Seat	244mm	122mm
Passenger Seat	28	14



SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position.

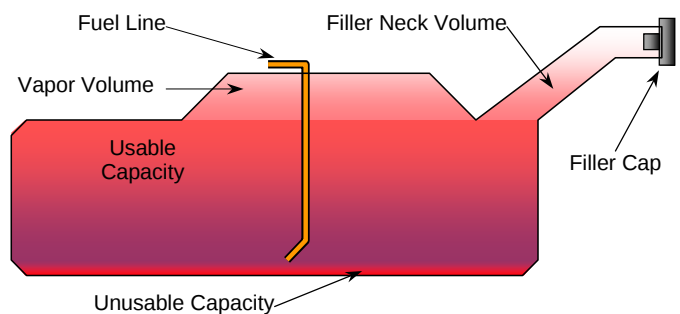
SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	2
Passenger Seat	5	2

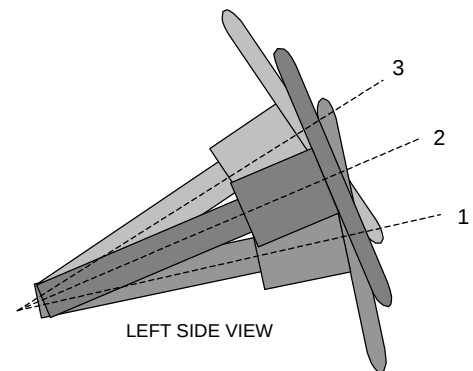
DATA SHEET NO. 4...(CONTINUED)**TEST VEHICLE INFORMATION**Test Vehicle: 2006 Pontiac Grand Prix 4-Door SedanNHTSA No.: G60100Test Program: 2005 NHTSA 35mph NCAPTest Date: 9/9/05**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank"	66.24
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	60.94 to 62.08
Actual Amount of Solvent used	61.32

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	12.5	
Geometric center position No. 2	23.9	
Uppermost position No. 3	35.2	

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
Test Date: 9/9/05

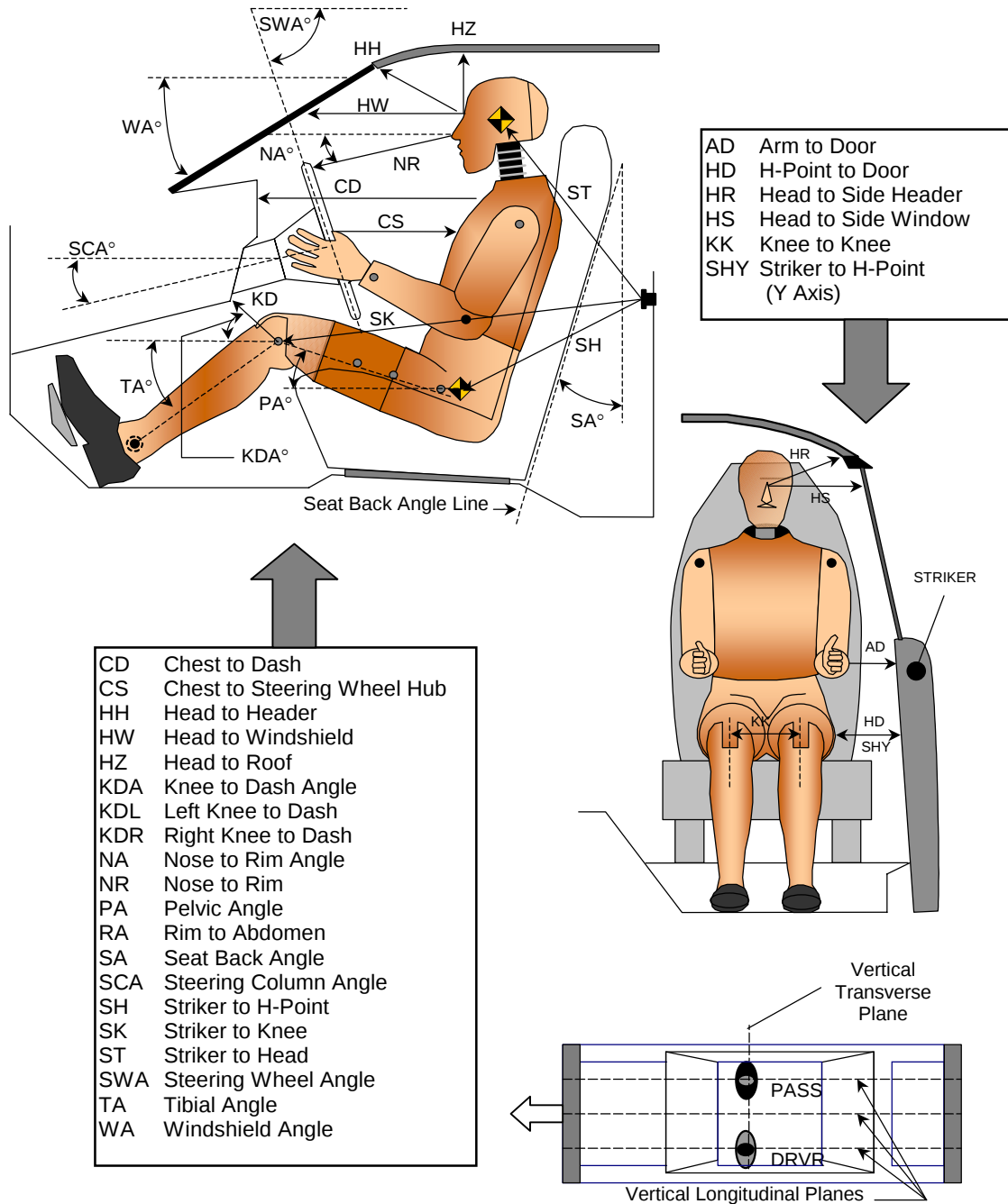
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		67.0		
SWA	Steering Wheel Angle		66.1		
SCA	Steering Column Angle		23.9		
SA	Seat Back Angle		14.9		16.7
HZ	Head to Roof (Z)	180	90.0	165	90.0
HH	Head to Header	305		285	
HW	Head to Windshield	595		540	
HR	Head to Side Header (Y)	240		260	
NR	Nose to Rim	365	10.0		
CD	Chest to Dash	535		565	
CS	Chest to Steering Hub	275			
RA	Rim to Abdomen	170			
KDL	Left Knee to Dash	145	35.0	190	
KDR	Right Knee to Dash	145		175	17.0
PA	Pelvic Angle		23.0		24.0
TA	Tibia Angle		39.0		40.0
KK	Knee to Knee (Y)	310		290	
SK	Striker to Knee	595		565	1.0
ST	Striker to Head	540	83.0	565	22.5
SH	Striker to H-Point	215	27.0	215	
SHY	Striker to H-Point (Y)	218		250	
HS	Head to Side Window	370		360	
HD	H-Point to Door (Y)	125		120	
AD	Arm to Door (Y)	120		45	

DATA SHEET NO. 5...(CONTINUED) **DUMMY POSITIONING IN VEHICLE**

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

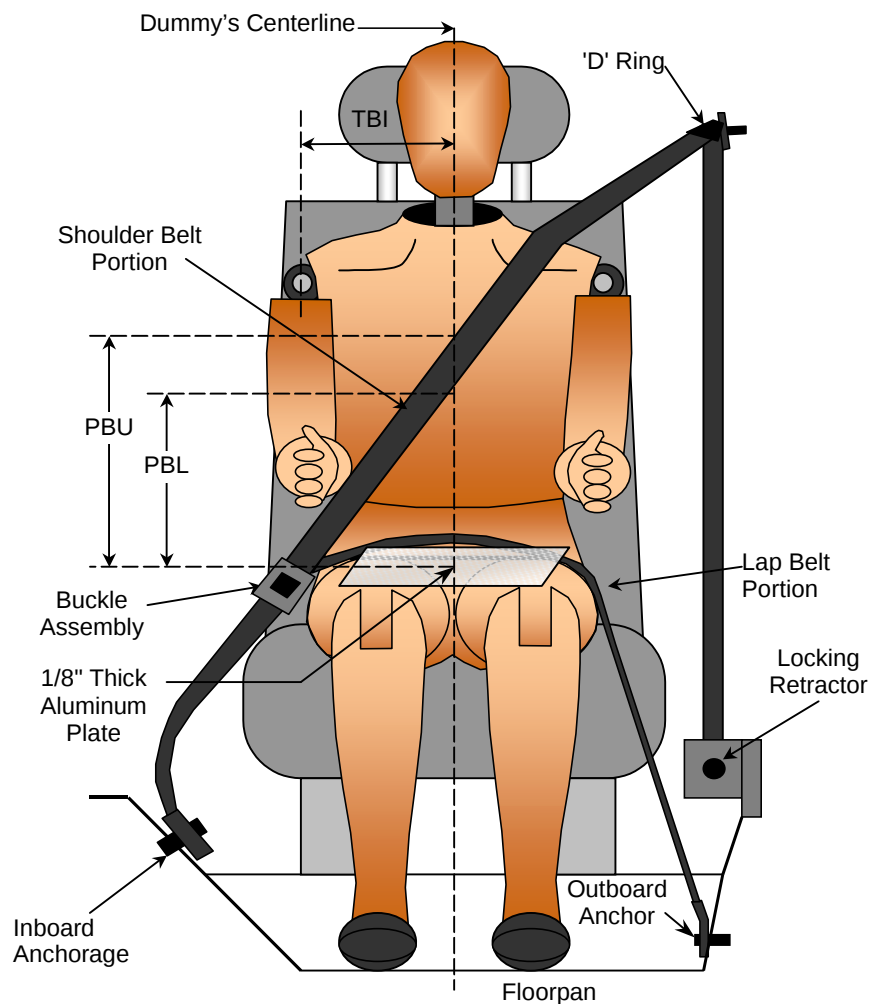
DATA SHEET NO. 6 **SEAT BELT POSITIONING DATA**

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	170	155
PBU - Top Surface of reference to belt upper edge	mm	300	300
PBL - Top Surface of reference to belt lower edge	mm	220	210
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION

Test Vehicle: 2006 Grand Prix 4-Door Sedan

NHTSA No.: G60100

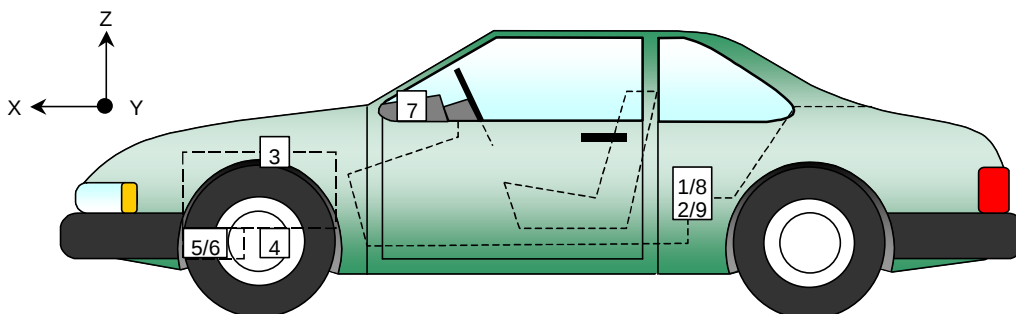
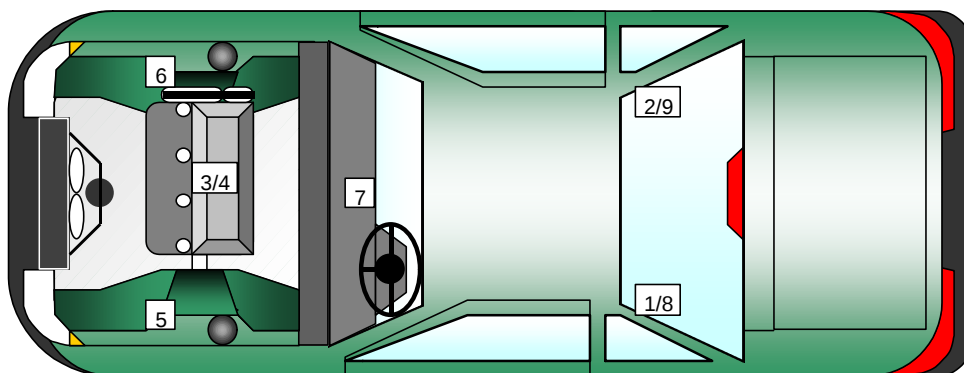
Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	1710	-720	310
2	Right Rear X-Member	1710	720	310
3	Engine Top	4115	0	820
4	Engine Bottom	4130	0	150
5	Left Brake Caliper	4400	-725	330
6	Right Brake Caliper	4400	725	330
7	Instrument Panel	3180	0	960
8	Left Rear X-Member (Z-Axis)	1650	-720	1650
9	Right Rear X-Member (Z-Axis)	1650	720	1650

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



DATA SHEET NO. 8
SEAT BELT ASSESSMENT TEST DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	170	155
PBU - Top Surface of reference to belt upper edge	mm	300	300
PBL - Top Surface of reference to belt lower edge	mm	220	210
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	830	830
Shoulder Belt length as measured on ATD	mm	785	800
Lap Belt length as measured on ATD	mm	640	600
Remainder of belt on reel	mm	1275	1270
Total belt length for continuous webbing systems	mm	3530	3500

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	220.0	235.0
As determined electronically	mm	296.1	274.4

BELT STRETCH DATA

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

* Not used with shoulder belt pre-tensioner systems

DATA SHEET NO. 9
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

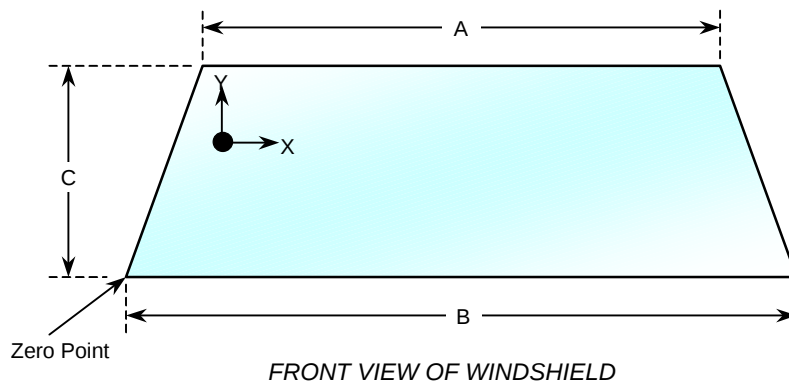
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

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: 21.1 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	2267.5	2267.5	100.0
Right Side	2267.5	2267.5	100.0
Total	4535.0	4535.0	100.0



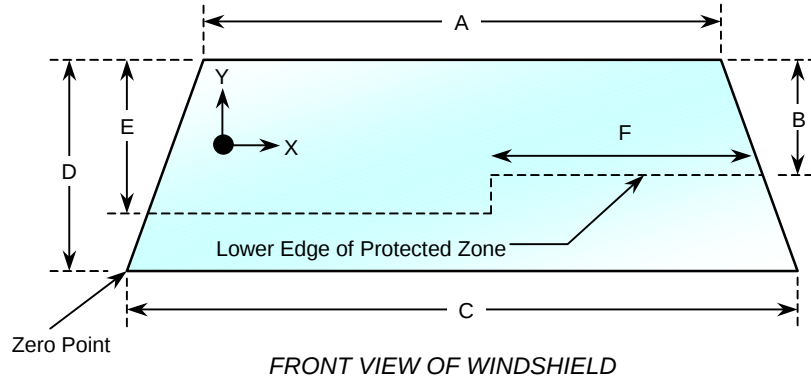
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1235.0	8.0
B	mm	1680.0	0.0
C-Left	mm	810.0	8.0
C-Right	mm	810.0	8.0

DATA SHEET NO. 10
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1235
B	mm	382
C	mm	1680
D	mm	810
E	mm	473
F	mm	555

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: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

Test Time: 1:50 PM

Temperature: 27.8 Deg. 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)

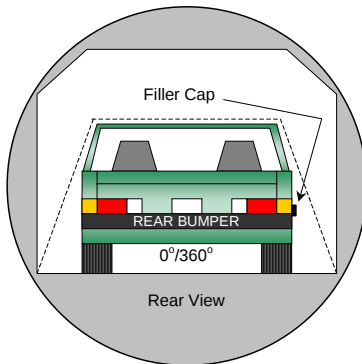
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)

D. Spillage Location Details: No leakage occurred

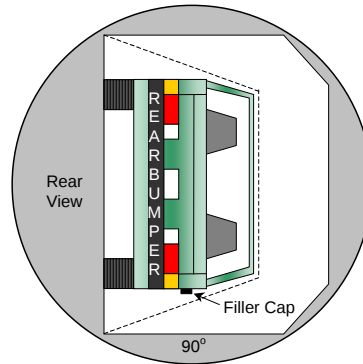
DATA SHEET NO. 12
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
Test Program: 2005 NHTSA 35mph NCAP

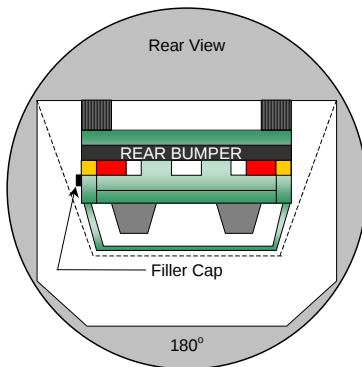
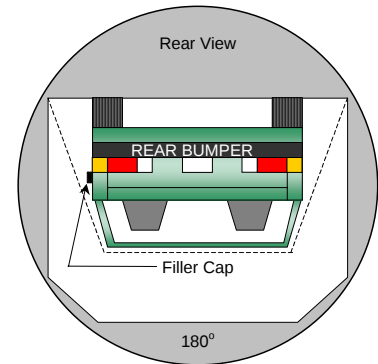
NHTSA No.: G60100
Test Date: 9/9/05



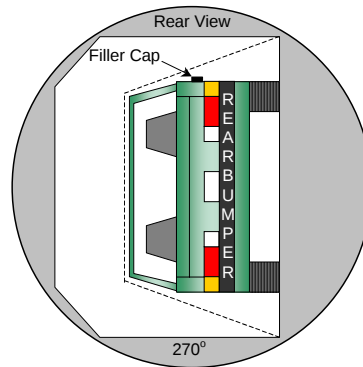
0° to 90°



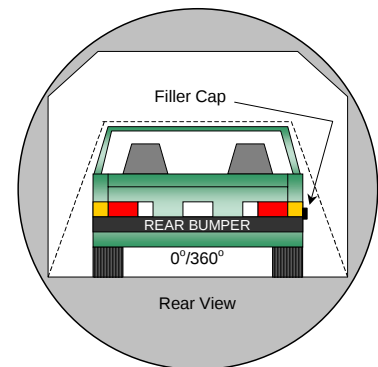
90° to 180°



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: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	85	300	385
90° to 180°	79	300	379
180° to 270°	77	300	377
270° to 360°	78	300	378

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: 2006 Pontiac Grand Prix 4-Door Sedan
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
Test Date: 9/9/05

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	5028	4353	-675
2	RSOV to front of engine	mm	4378	4102	-276
3	RSOV to firewall centerline	mm	3813	3761	-52
4	RSOV to leading edge of right door	mm	3412	3420	8
5	RSOV to leading edge of left door	mm	3420	3419	-1
6	RSOV to lower leading edge of right door	mm	3372	3380	8
7	RSOV to lower leading edge of left door	mm	3374	3380	6
8	RSOV to upper trailing edge of right door	mm	2312	2314	2
9	RSOV to upper trailing edge of left door	mm	2315	2314	-1
10	RSOV to lower trailing edge of right door	mm	2328	2335	7
11	RSOV to lower trailing edge of left door	mm	2330	2334	4
12	RSOV to bottom of right 'A' pillar	mm	3366	3374	8
13	RSOV to bottom of left 'A' pillar	mm	3368	3372	4
14	RSOV to firewall on right side	mm	3766	3707	-59
15	RSOV to firewall on left side	mm	3786	3721	-65
16	RSOV to steering column	mm	2915	2935	20
17	Center of steering column to left 'A' pillar	mm	405	396	-9
18	Center of steering column to headlining	mm	410	415	5
19	RSOV to right side of front bumper	mm	4868	4273	-595
20	RSOV to left side of front bumper	mm	4868	4294	-574
21	Length of engine block	mm	490	490	0
RD	RSOV to right side of dash panel	mm	3146	3138	-8
CD	RSOV to center of dash panel	mm	3055	3138	83
LD	RSOV to left side of dash panel	mm	3133	3127	-6

All measurements in millimeters

DATA SHEET NO. 13...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

VEHICLE STRUCTURAL MEASUREMENT TABLE

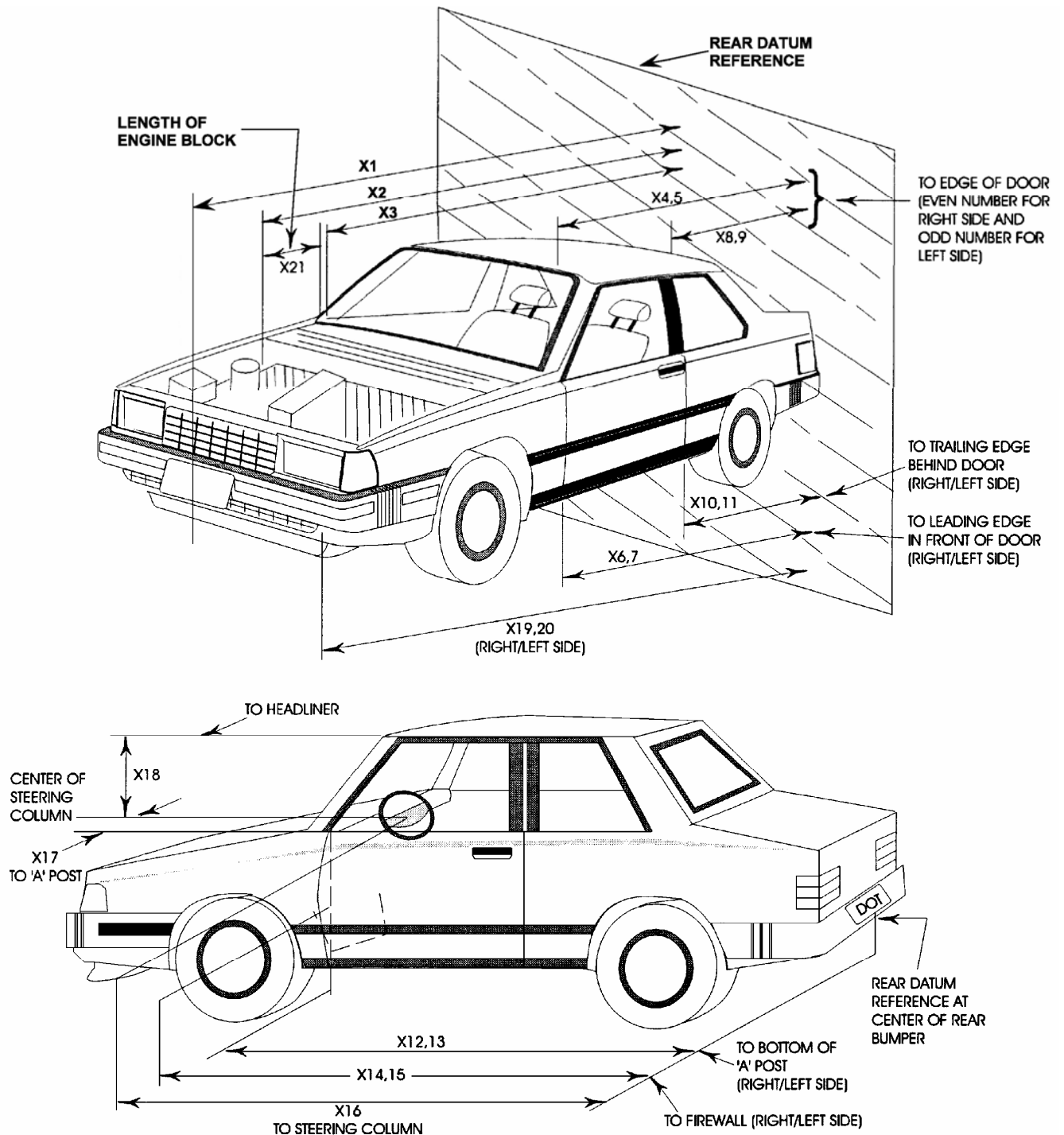
No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	5028	4353	-675
2	Total width	mm	1815	1810	-5
3	Bumper top height	mm	605	565	-40
4	Bumper bottom height	mm	222	217	-5
5	Longitudinal member top height	mm	517	307	-210
6	Longitudinal member bottom height	mm	421	374	-47
7	Distance between longitudinal members	mm	950	1107	157
8	Longitudinal member width	mm	90	90	0
9	Engine top height	mm	860	745	-115
10	Engine bottom height	mm	176	197	21
11	Engine and gear box width	mm	645	645	0
12	Front bumper to engine distance	mm	650	311	-339
13	Front shock absorber fixing width	mm	885	944	59
14	Bonnet leading edge height	mm	720	785	65
15	Front shock absorber fixing width	mm	1197	1160	-37
16	Front bumper to front axle distance	mm	1120	470	-650
17	Front axle to 'A' pillar distance	mm	485	435	-50
18	'A' pillar to 'B' pillar distance	mm	1085	1087	2
19	'B' pillar to rear axle distance	mm	1242	1238	-4
20	'B' pillar to 'C' pillar distance	mm	1030	1070	40
21	Roof sill bottom height	mm	1215	1235	20
22	Roof sill top height	mm	1385	1410	25
23	Floor sill bottom height	mm	215	245	30
24	Floor sill top height	mm	415	385	-30

All measurements in millimeters

DATA SHEET NO. 13...(CONTINUED)
VEHICLE MEASUREMENTS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05



DATA SHEET NO. 14
CAMERA LOCATIONS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
Test Date: 9/9/05

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)	-12192	-6096	-1651	-10	N/A	Zoom	30
2	Overall Left Side	-2489	-8280	-1143	-4	7874	24	1000
3	Left Side View	-1677	-7620	-1329	-4	7232	50	1000
4	Driver and Interior View	-6477	-10185	-4748	-13	11225	80	
5	Steering Column (Bottom)	-2134	-8230	-2997	-16	8022	19	990
6	Steering Column (Top)	-2134	-8230	-3404	-20	8122	19	DNR
7	Overall Right Side	-2083	8230	-1270	-6	8205	13	1000
8	Right Side View	-1677	7316	-1422	-4	7411	50	1000
9	Passenger and Interior View	-6781	9144	-2997	-9	10705	65	
10	Right Side View	-1829	7316	-1422	-4	7401	28	1000
11	Windshield View	-610	0	-5944	-90	N/A	13	1000
12	Driver Front View	610	-432	-2667	-40	N/A	13	1000
13	Passenger Front View	610	432	-2667	-40	N/A	13	1000
14	Pit View of Engine	-914	0	1499	90	N/A	9	
15	Pit View of Fuel Tank	-2438	0	1499	90	N/A	6	
	Extra Camera							
16	Real Time Camera	-1067	7976	-991	0	7966	Zoom	30

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

DATA SHEET NO. 15
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

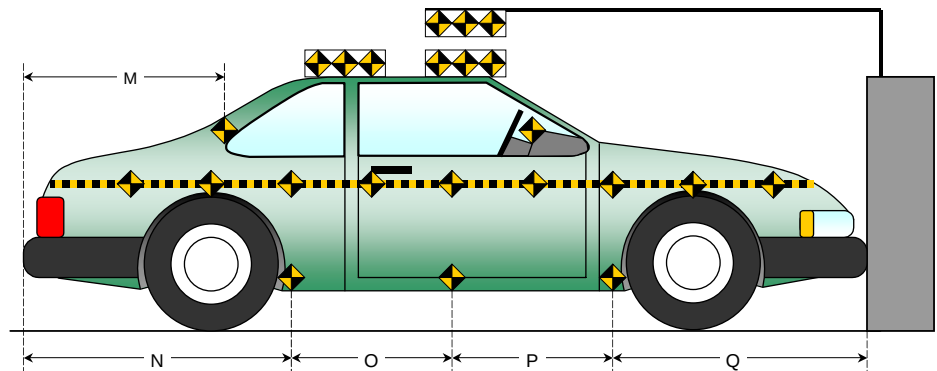
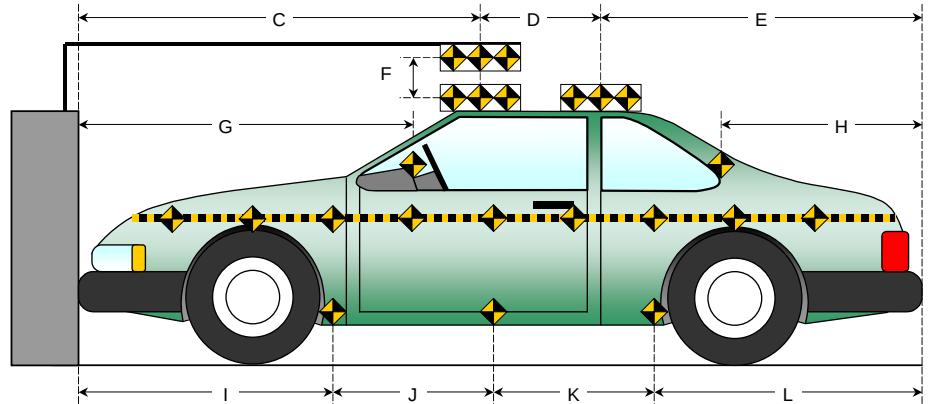
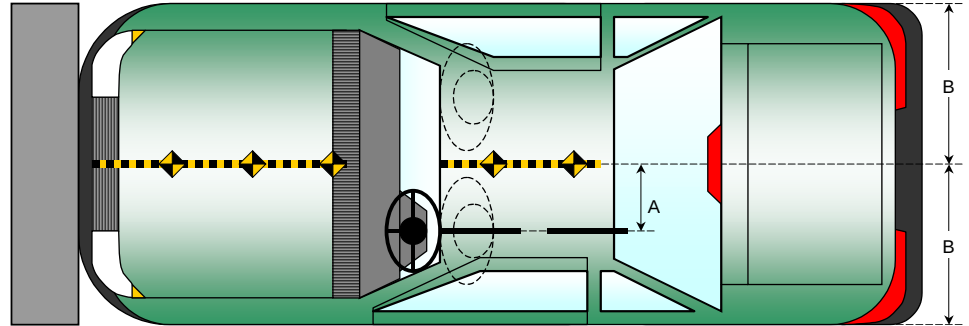
Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05

All Dimensions in (mm)	
Item	Value
A	360
B	907.5
C	2430
D	610
E	1998
F	155
G	3065
H	1202
I	1600
J	952
K	952
L	1537
M	1906
N	1540
O	950
P	950
Q	1607



DATA SHEET NO. 16
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

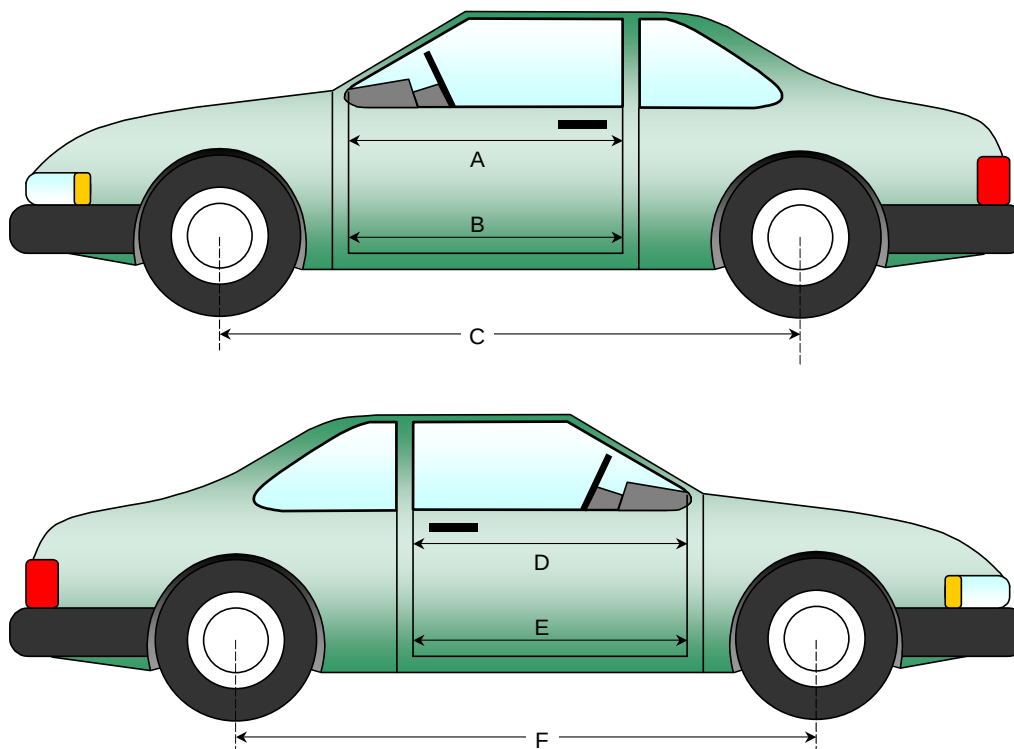
Test Date: 9/9/05

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	974	966	-8
B	Left Side Lower	mm	934	926	-8
D	Right Side Upper	mm	968	961	-7
E	Right Side Lower	mm	926	916	-10

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2805	2715	-90
F	Right Side Wheel Base	mm	2805	2680	-125



DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

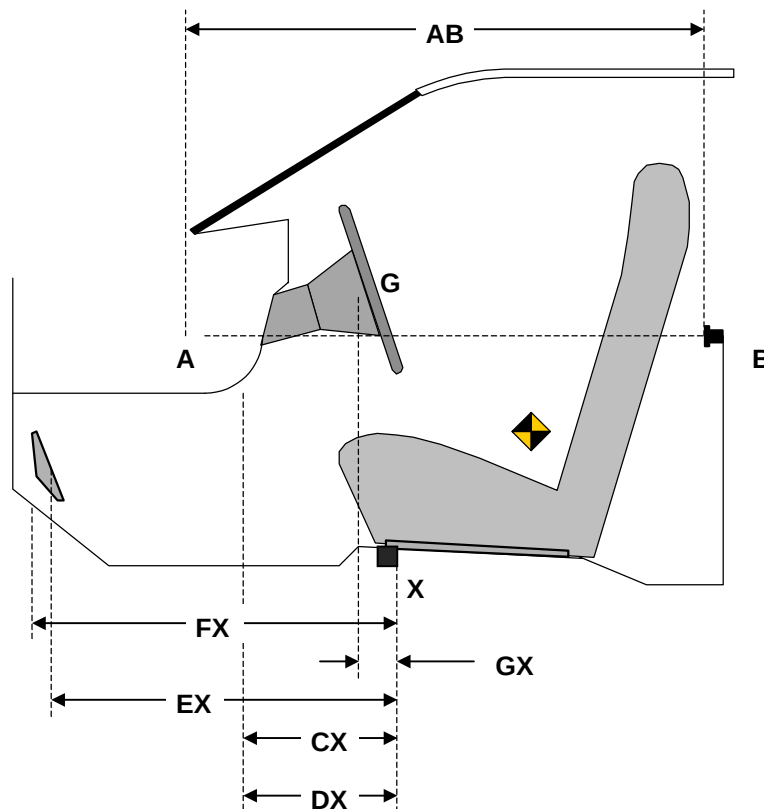
Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	974	966	-8
CX	Left Knee Bolster to X	mm	228	205	-23
DX	Right Knee Bolster to X	mm	200	210	10
EX	Brake Pedal to X	mm	540	425	-115
FX	Foot Rest to X	mm	575	573	-2
GX	Center of Steering Wheel Hub to X	mm	32	50	18

X = Left Front Seat Outboard Anchor Bolt Head



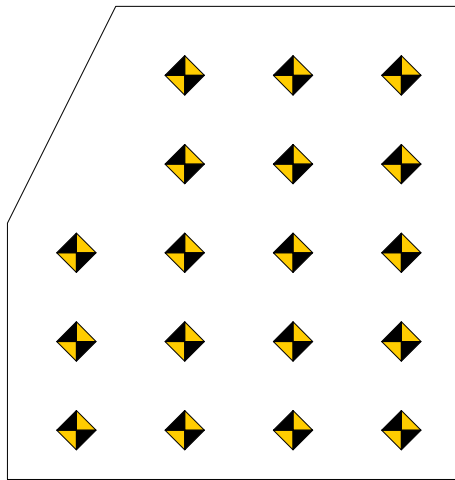
DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan

NHTSA No.: G60100

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05



A B C D

1

Measurement reference point for X and Z-axis is the forward outboard seat mounting bolt.

2

Columns A through D are evenly spaced.

3

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4 and 5 are located on the most level portion of the floor pan.

4

5

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-706	-716	-726		-625	-619	-601		81	97	125
2		-621	-630	-640		-540	-527	-526		81	103	114
3	-510	-519	-530	-534	-450	-444	-425	-422	60	75	105	112
4	-417	-424	-436	-445	-367	-354	-353	-364	50	70	83	81
5	-316	-326	-335	-340	-289	-282	-290	-285	27	44	45	55

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-9	-8	-6		25	22	25		34	30	31
2		-70	-67	-68		-42	-30	-46		28	37	22
3	-80	-79	-79	-76	-64	-72	-43	-54	16	7	36	22
4	-90	-88	-102	-109	-110	-108	-102	-116	-20	-20	0	-7
5	-102	-97	-114	-112	-144	-140	-172	-172	-42	-43	-58	-60

DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

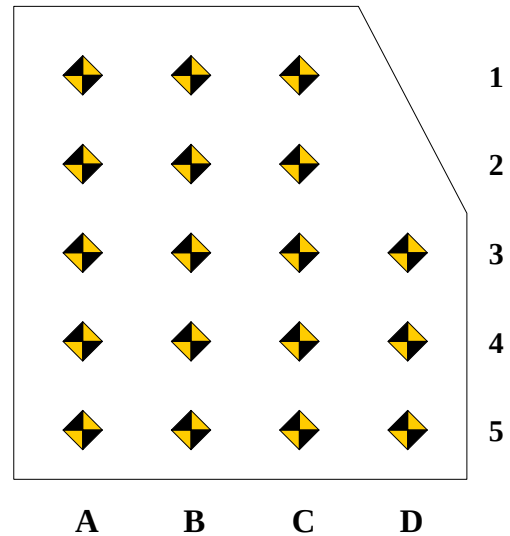
NHTSA No.: G60100
 Test Date: 9/9/05

Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4 and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-669	-672	-668		-573	-593	-579		96	79	89	
2	-607	-606	-609		-527	-528	-540		80	78	69	
3	-506	-505	-507	-501	-425	-427	-447	-453	81	78	60	48
4	-413	-412	-412	-409	-373	354	-362	-370	40	766	50	39
5	-309	-307	-309	-309	-283	-277	-271	-285	26	30	38	24

PASSENGER FLOOR PAN Z-AXIS

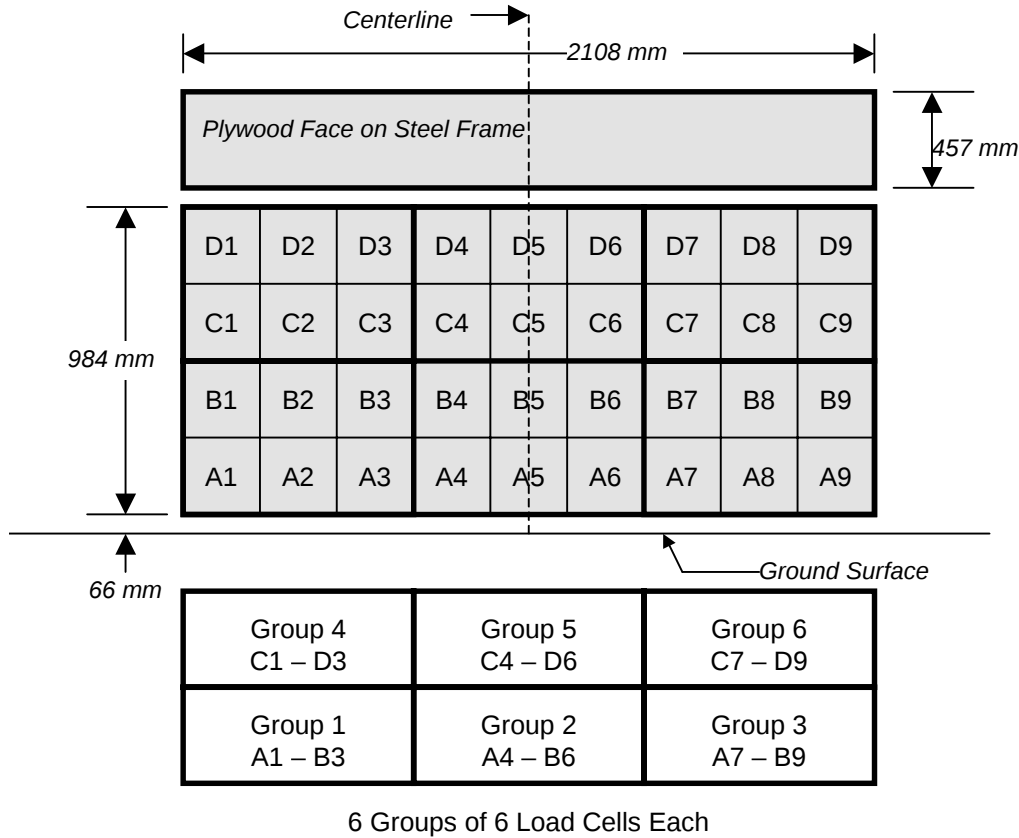
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	19	17	15		85	82	95		66	65	80	
2	-69	-67	-66		-7	6	5		62	73	71	
3	-84	-88	-87	-88	-32	-28	-54	-51	52	60	33	37
4	-117	-110	-94	-95	-99	-86	-89	-90	18	24	5	5
5	-120	-116	-104	-107	-143	-143	-127	-127	-23	-27	-23	-20

DATA SHEET NO. 17
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
 Test Date: 9/9/05

36 Load Cell Rigid Barrier (NHTSA Standard)
Load Cell Locations on Fixed Barrier



ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
Test Date: 9/9/05

VEHICLE INFORMATION

VIN: 2G2WP552961115713
Vehicle Size Category: 4-Door Sedan

Wheel base (mm): 2805
Test Weight (kg): 1791

ACCELEROMETER DATA

Accelerometer Location: Left rear cross member
Cal. Procedure/Interval: 6 months / drop test
Integration Algorithm: NHTSA Standard
Impact Velocity (km/h): 56.48
Velocity Change (km/h): 63.17

Linearity: Good

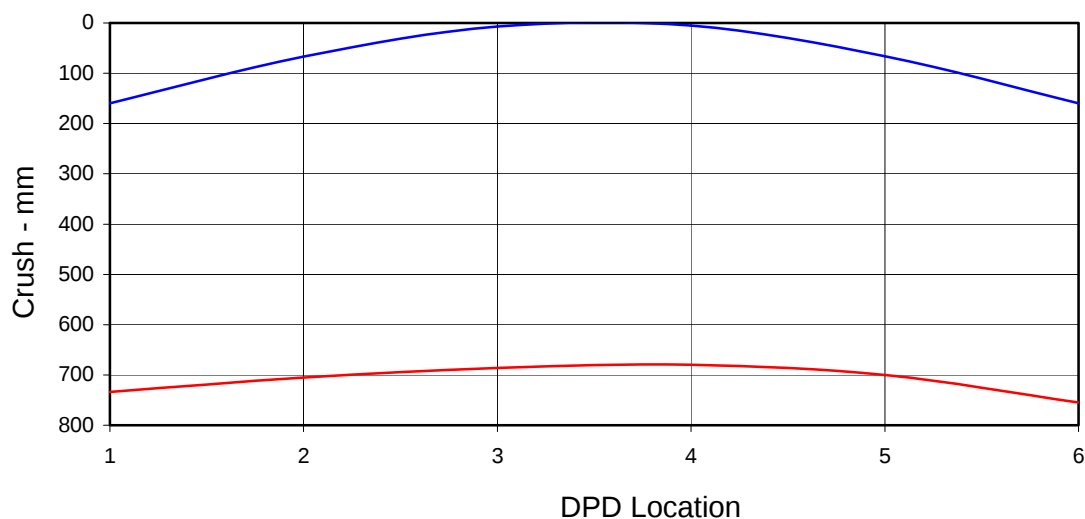
Time of Separation (msec): 74.9

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6
Damage Region Length (mm): 1238

Midpoint of Damage: Vehicle Centerline
Impact Mode: Full Frontal

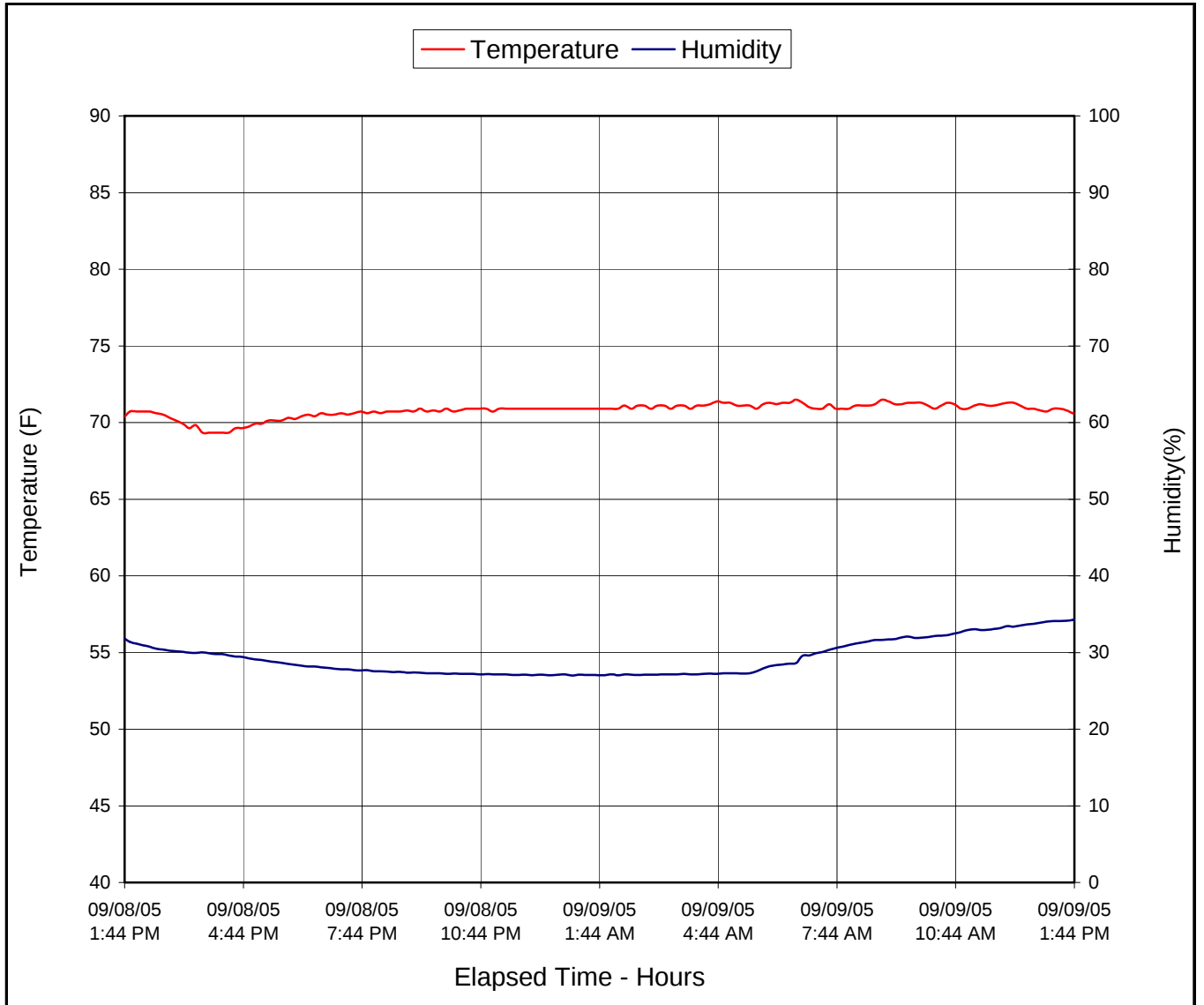
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	160	734	-574
C2	Crush zone 2 on left side	mm	67	705	-638
C3	Crush zone 3 on left side	mm	7	686	-679
C4	Crush zone 4 on right side	mm	5	680	-675
C5	Crush zone 5 on right side	mm	66	700	-634
C6	Crush zone 6 at right side	mm	160	755	-595



DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2006 Pontiac Grand Prix 4-Door Sedan
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: G60100
Test Date: 9/9/05



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>		<u>Page</u>
A-1	Load Cell Location	A-1
A-2	Vehicle Certification Label	A-2
A-3	Vehicle Tire Label	A-3
A-4	Right Front $\frac{3}{4}$ View, As Received	A-4
A-5	Left Rear $\frac{3}{4}$ View, As Received	A-5
A-6	Pre-Test Front View	A-6
A-7	Post-Test Front View	A-7
A-8	Pre-Test Left Side View	A-8
A-9	Post-Test Left Side View	A-9
A-10	Pre-Test Right Side View	A-10
A-11	Post-Test Right Side View	A-11
A-12	Pre-Test Right Front $\frac{3}{4}$ View	A-12
A-13	Post-Test Right Front $\frac{3}{4}$ View	A-13
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A-34	Pre-Test Driver Dummy Door Open	A-34
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A-47	Post-Test Passenger Dummy Front Through Window	A-47
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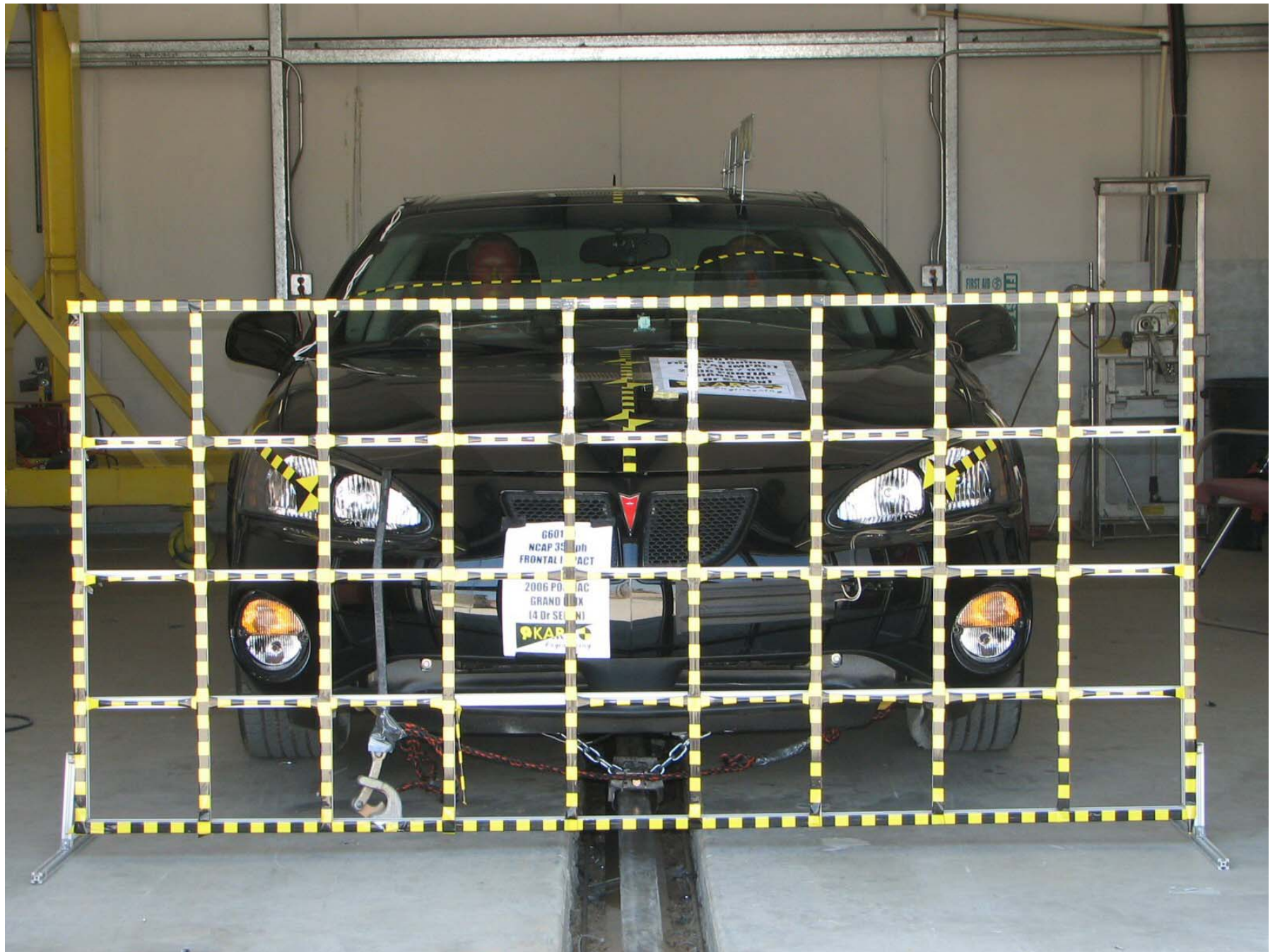


Figure A-1: Load Cell Location

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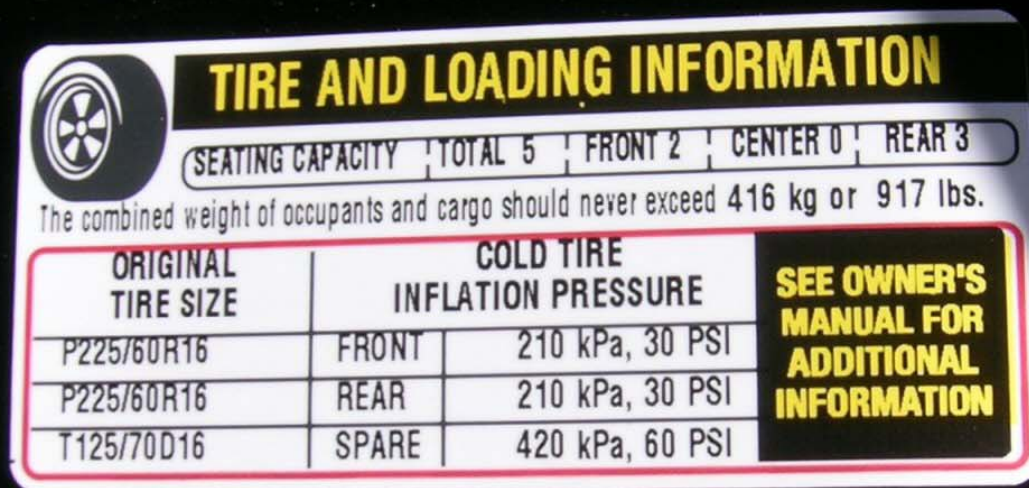
MFD BY GENERAL MOTORS OF CANADA LTD.

DATE	GVWR	GAWR FRT	GAWR RR
08/05	2021 KG	1112 KG	909 KG
	4455 LB	2451 LB	2004 LB

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

2G2WP552961115713 TYPE: PASS CAR

Figure A-2: Manufacturer's Label



TIRE AND LOADING INFORMATION

 **SEATING CAPACITY** TOTAL 5 FRONT 2 CENTER 0 REAR 3

The combined weight of occupants and cargo should never exceed 416 kg or 917 lbs.

ORIGINAL TIRE SIZE	COLD TIRE INFLATION PRESSURE	
P225/60R16	FRONT	210 kPa, 30 PSI
P225/60R16	REAR	210 kPa, 30 PSI
T125/70D16	SPARE	420 kPa, 60 PSI

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

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

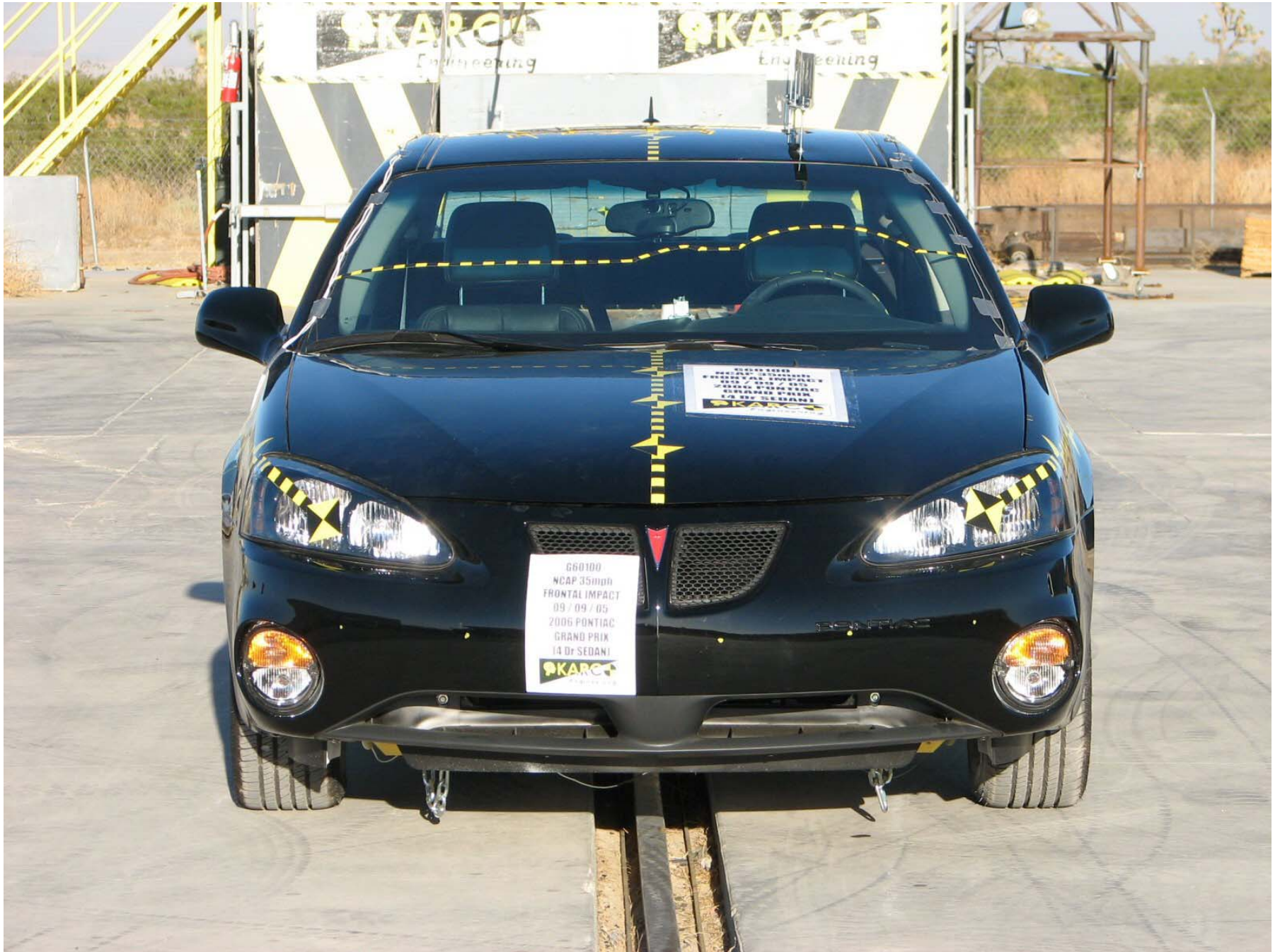


Figure A-6: Pre-Test Front View

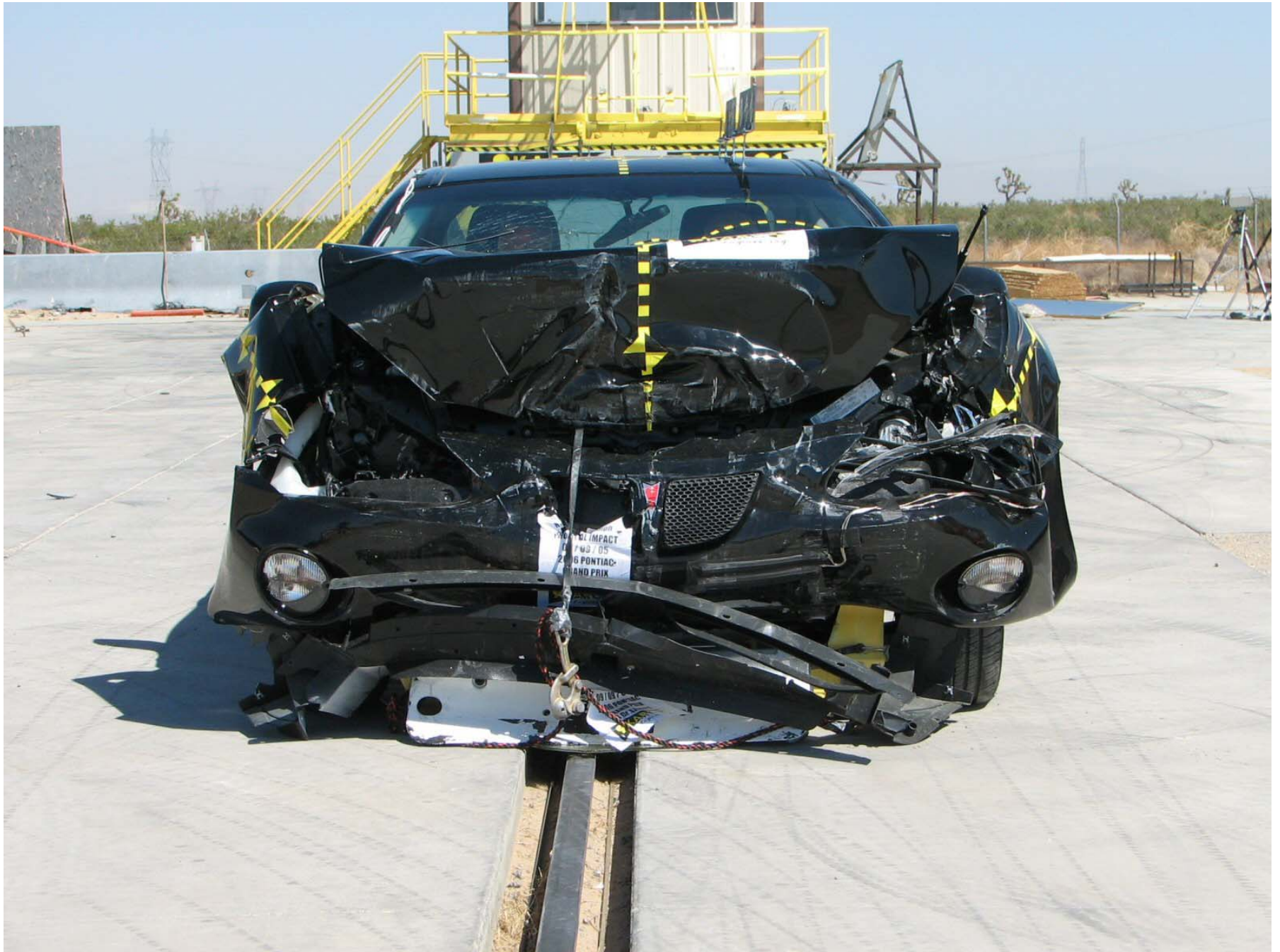


Figure A-7: Post-Test Front View (Vehicle Moved)



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

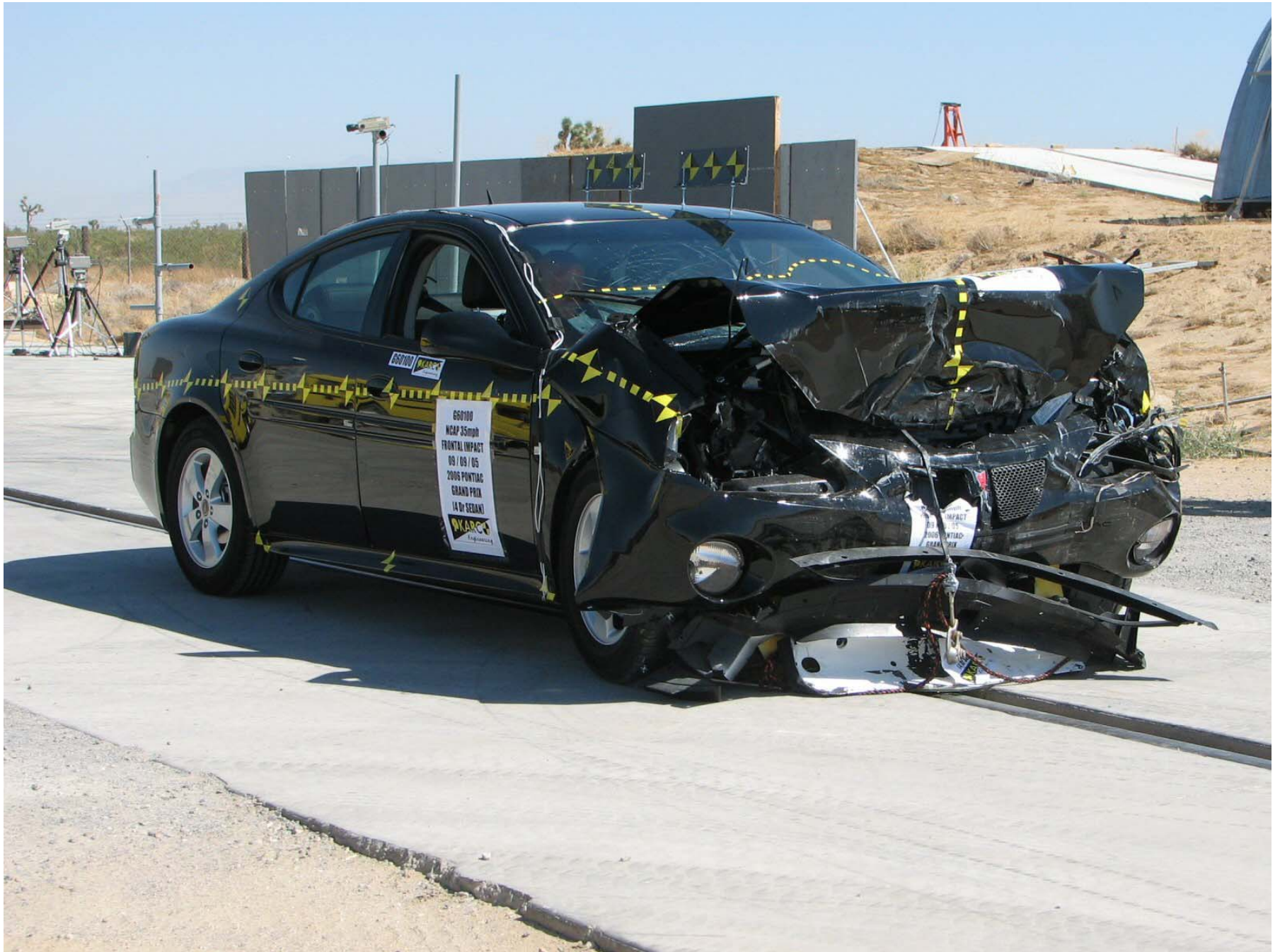


Figure A-13: Post-Test Right Front $\frac{3}{4}$ View (Vehicle Moved)



Figure A-14: Pre-Test Left Rear $\frac{3}{4}$ View



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



Figure A-16: Post-Test Left Side $\frac{3}{4}$ View of Doors After Impact



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

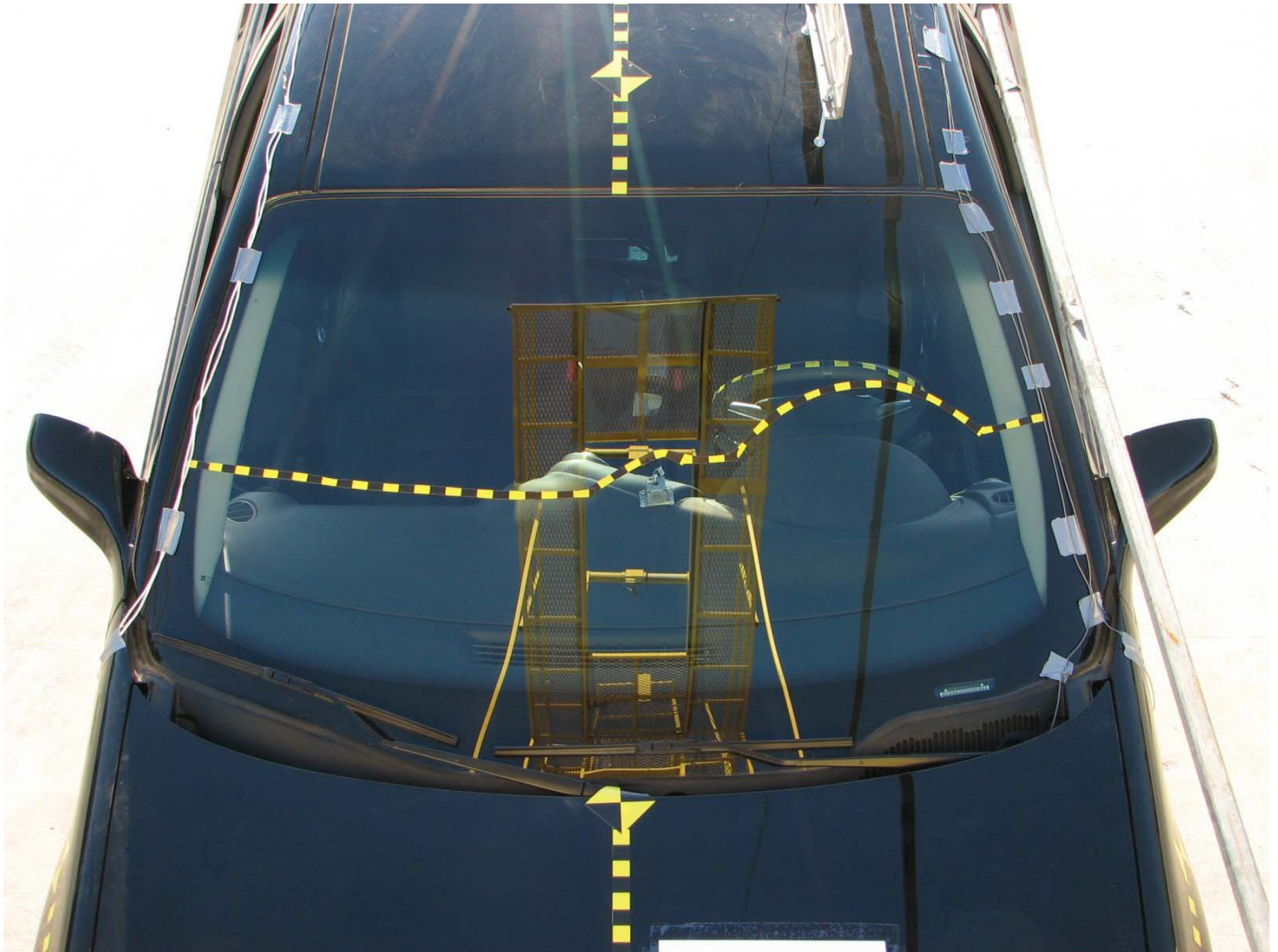


Figure A-18: Pre-Test Windshield



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

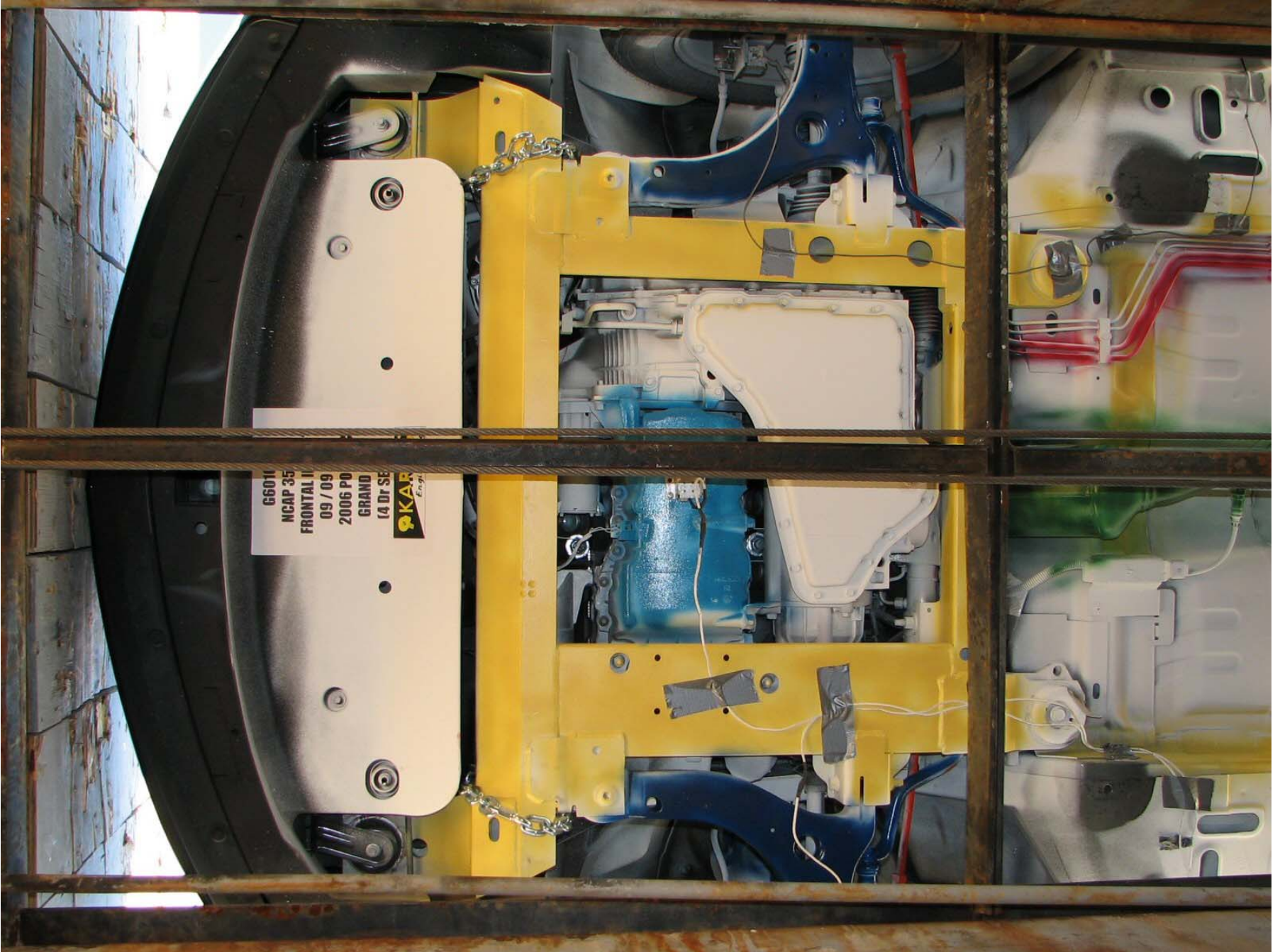


Figure A-24: Pre-Test Front Underbody

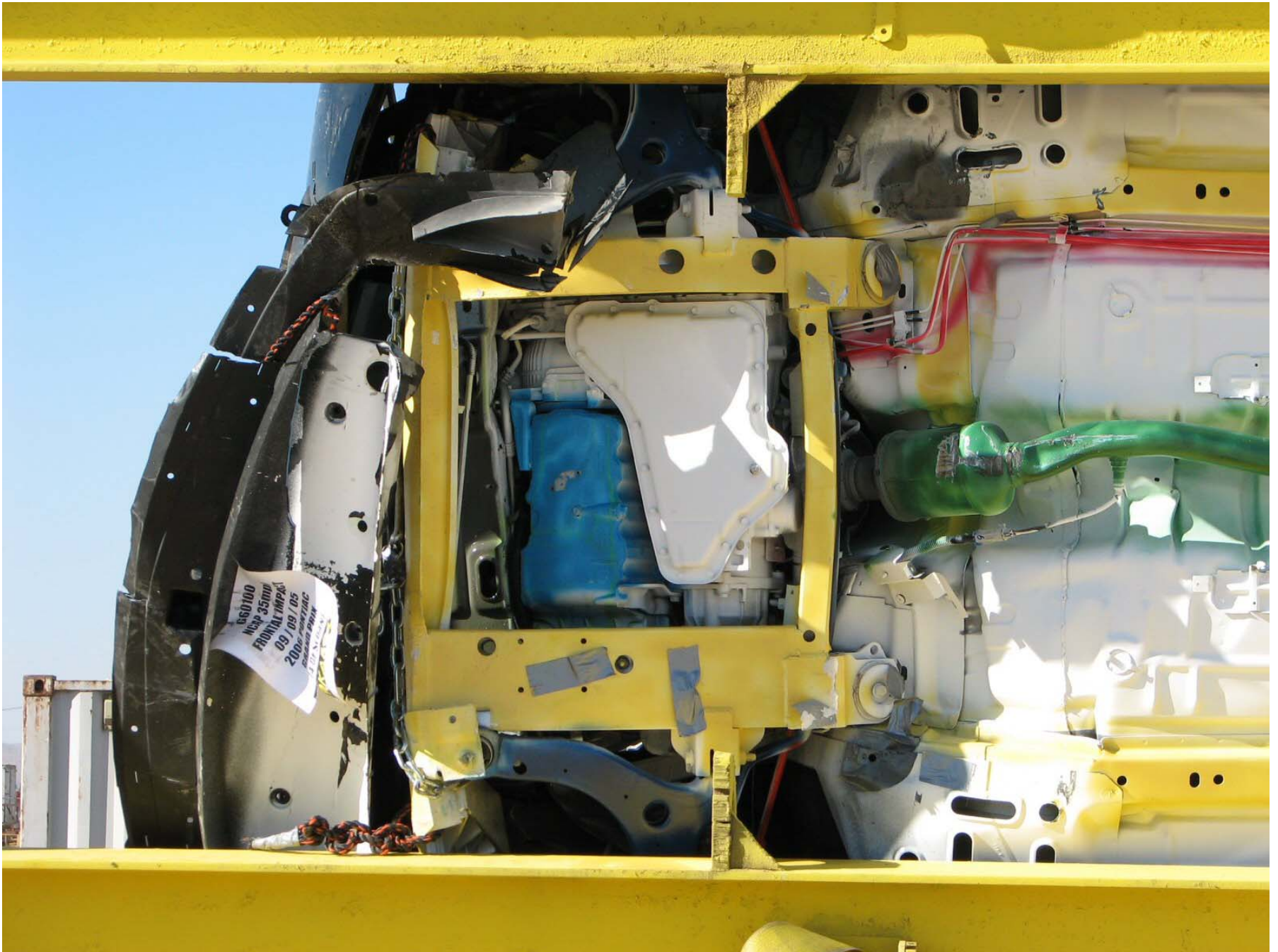


Figure A-25: Post-Test Front Underbody

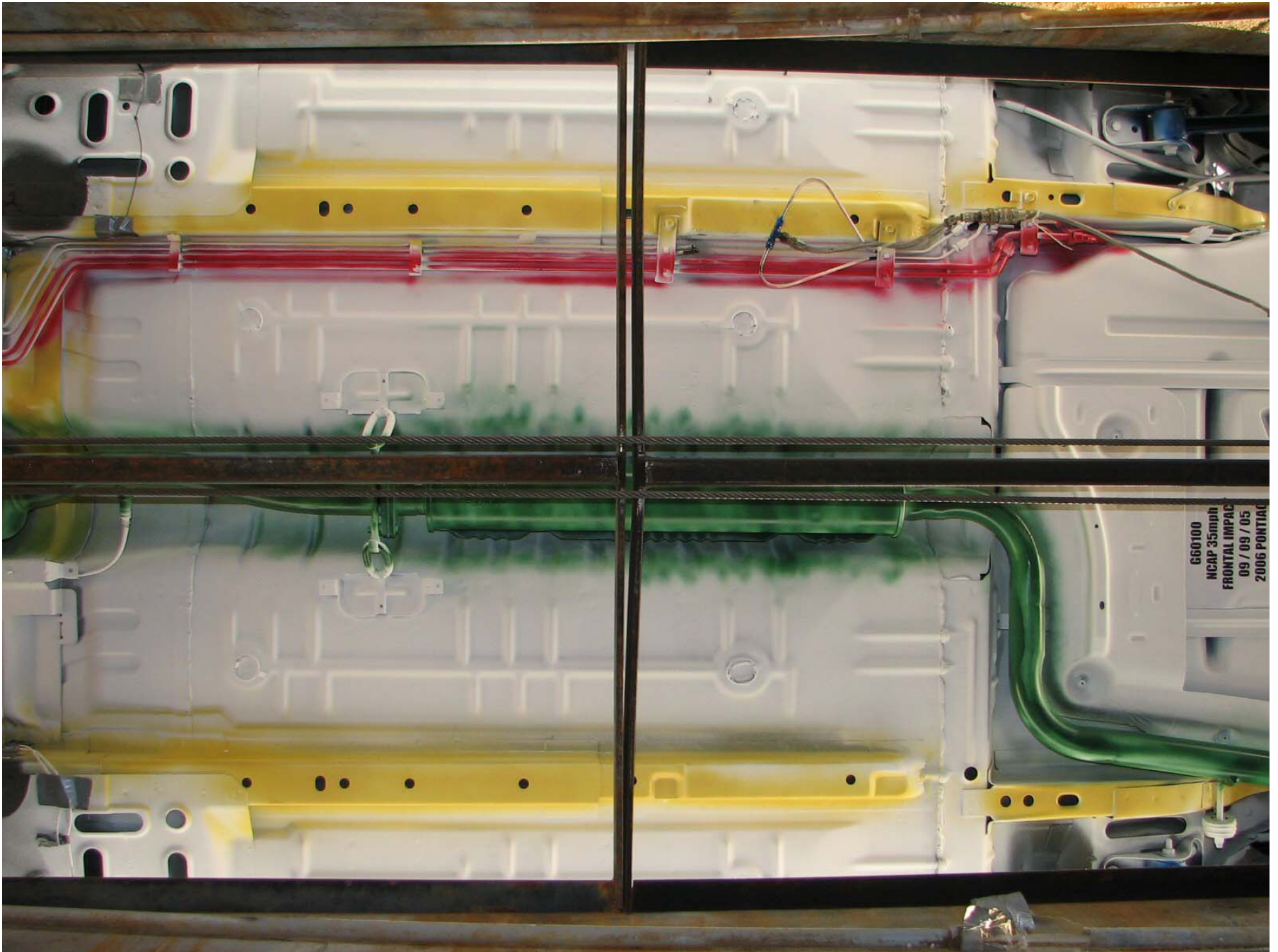


Figure A-26: Pre-Test Mid Underbody

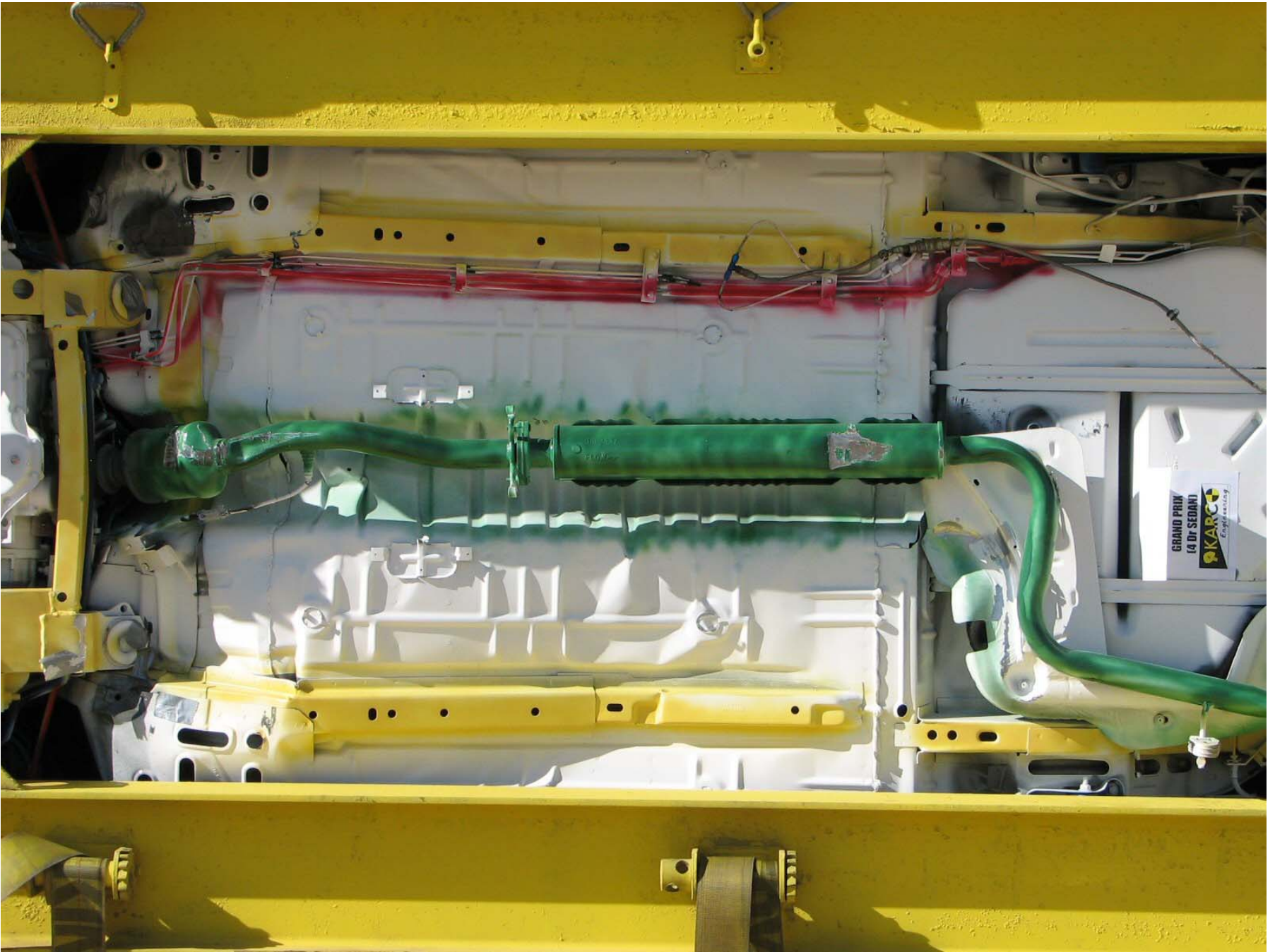


Figure A-27: Post-Test Mid Underbody



Figure A-28: Pre-Test Rear Underbody

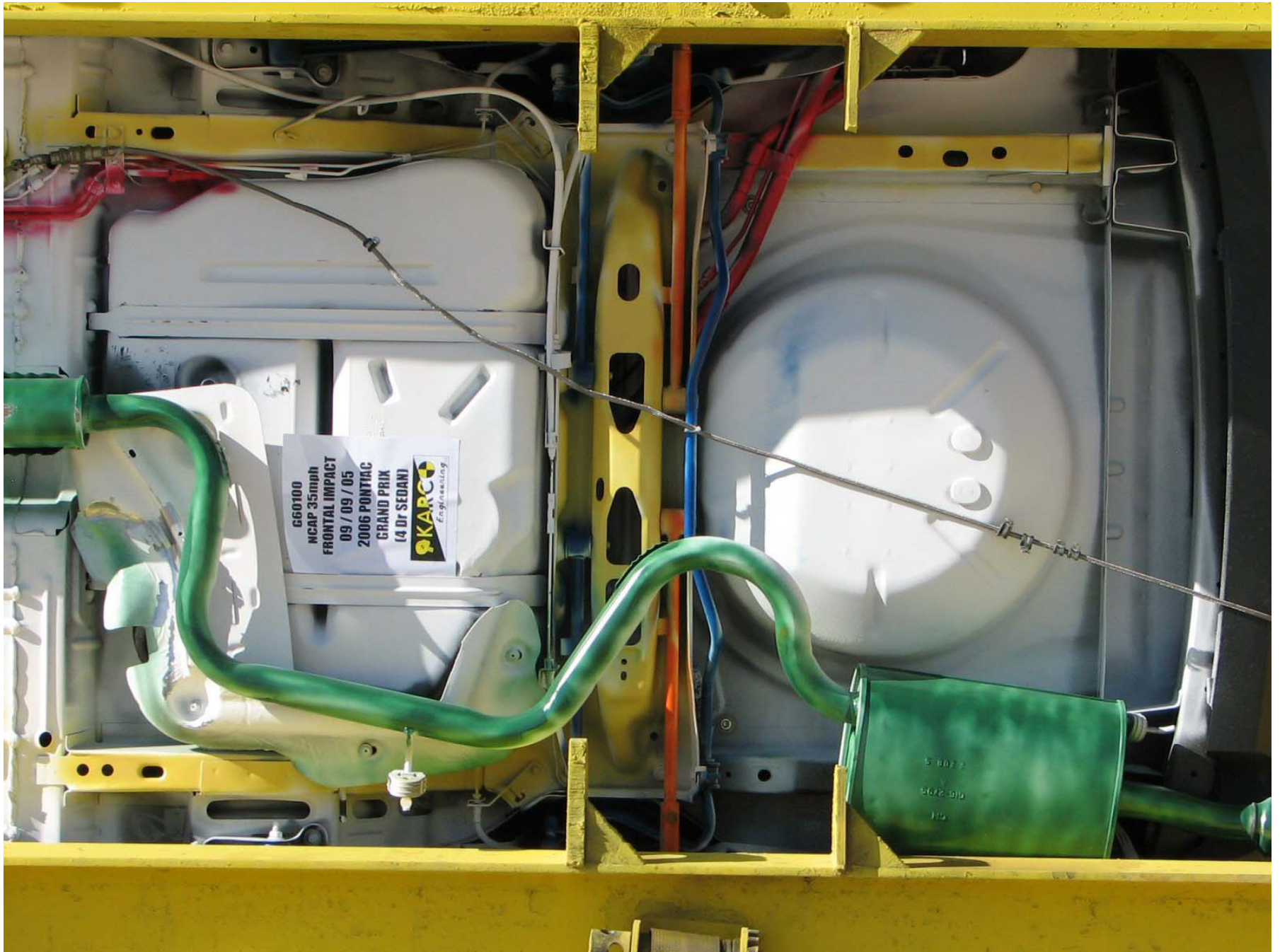


Figure A-29: Post-Test Rear Underbody



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)

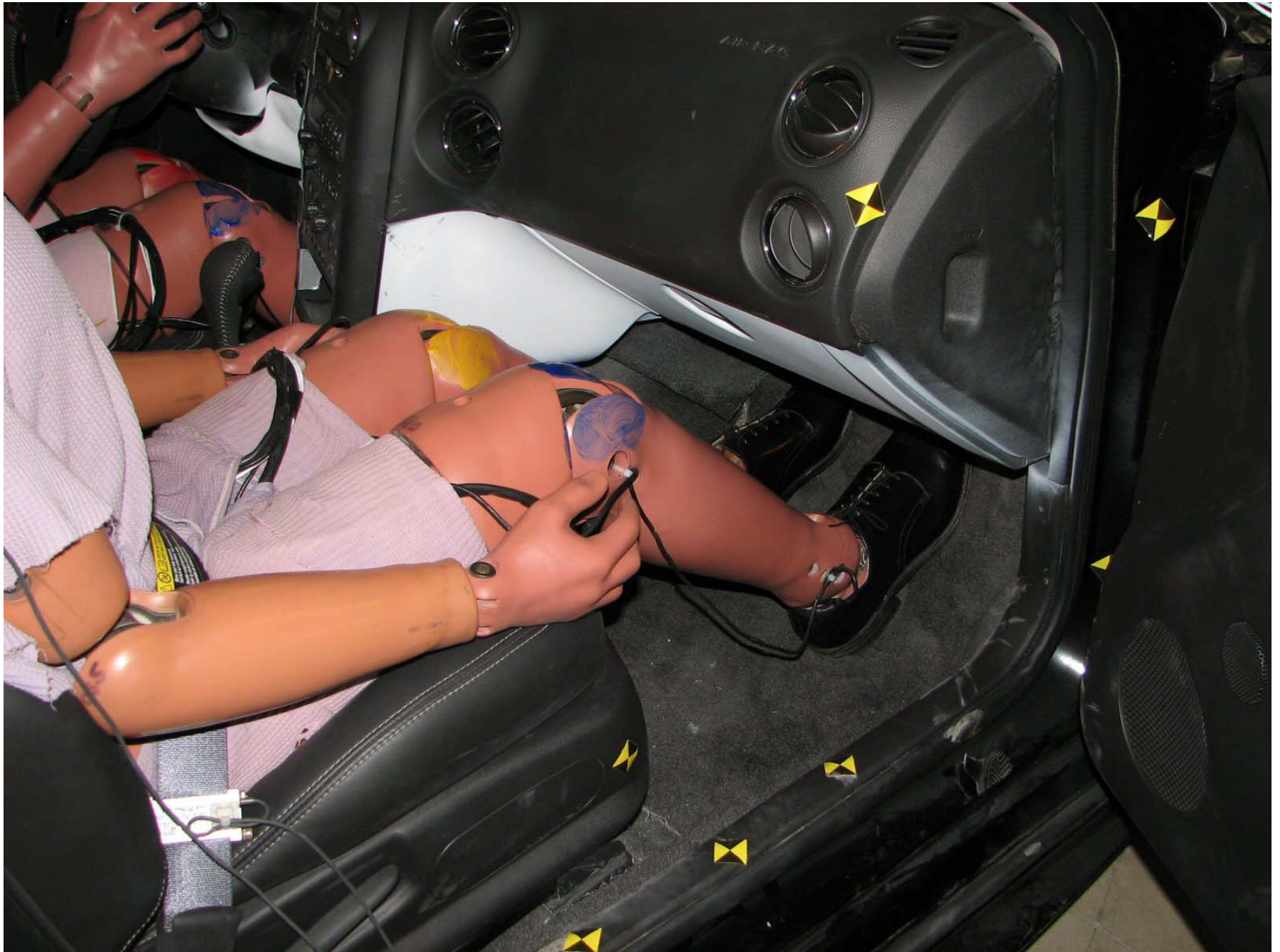


Figure A-50: Pre-Test Passenger Dummy Feet



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

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.

LIST OF DATA PLOTS

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)

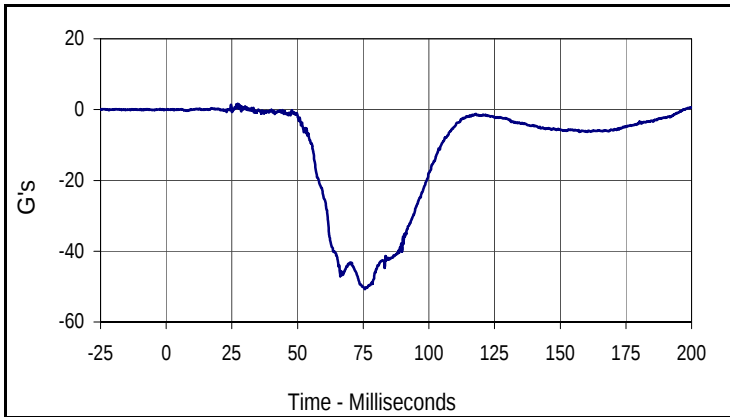
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X 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)

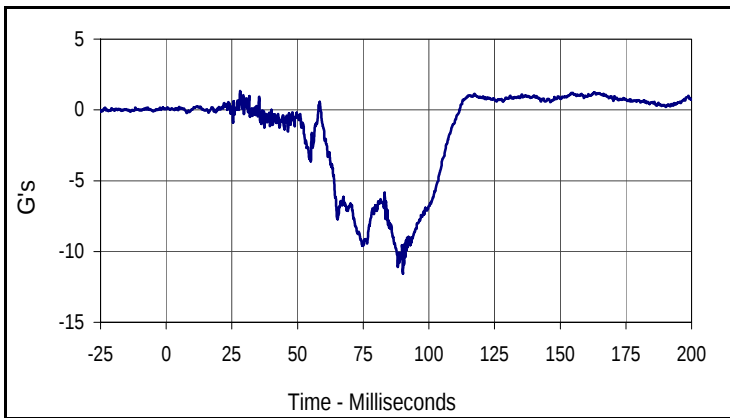
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Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
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: 2006 Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

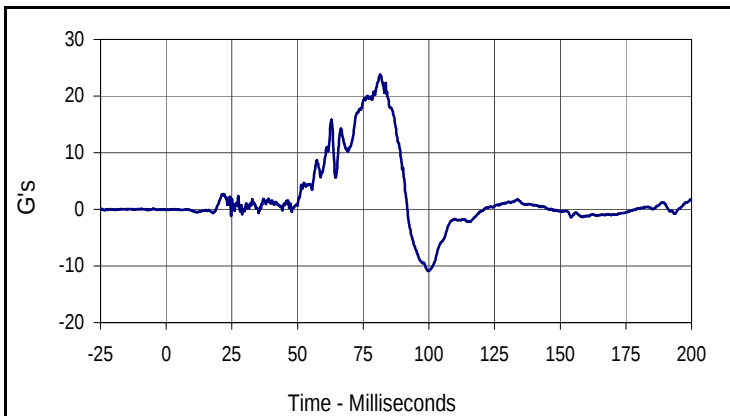
Test Date: 9/9/05
 NHTSA No.: G60100



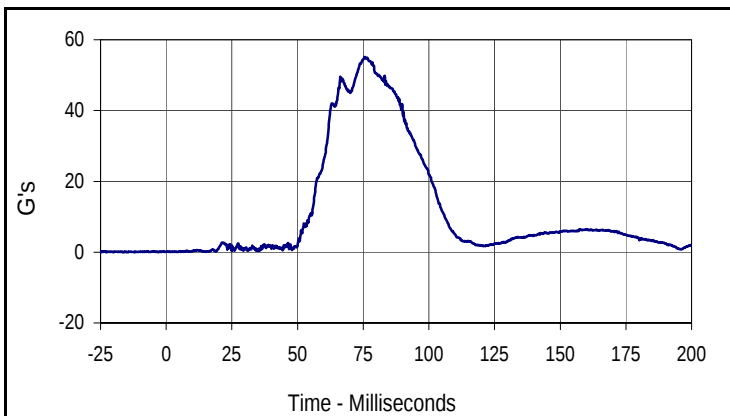
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
1.7	27.2	-50.7	75.6



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.3	28.1	-11.5	90.1



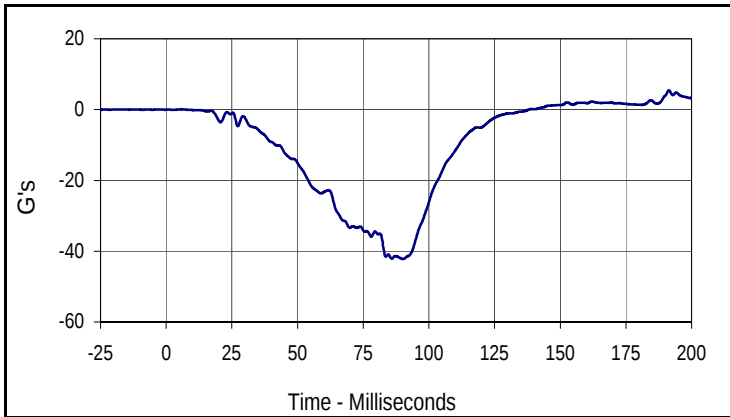
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
23.8	81.4	-10.9	99.6



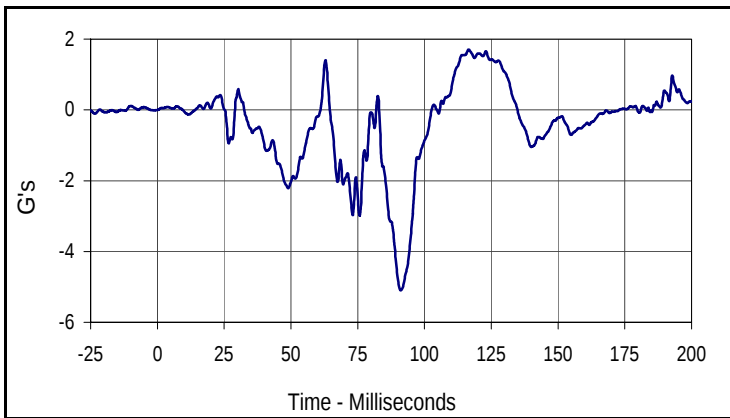
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
55.1	75.6	0.0	4.7

Test Vehicle: 2006 Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

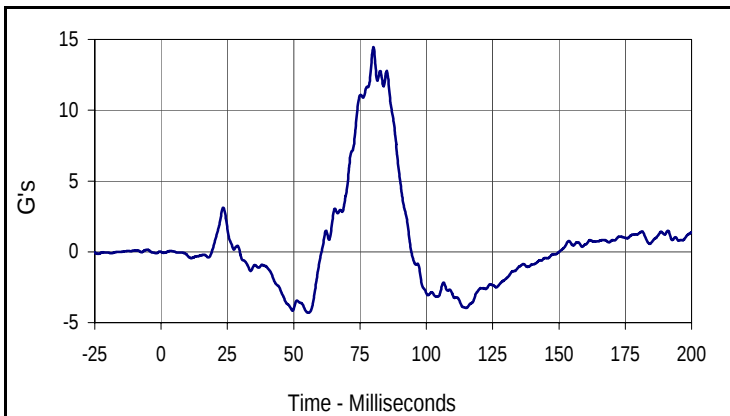
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 NHTSA No.: G60100



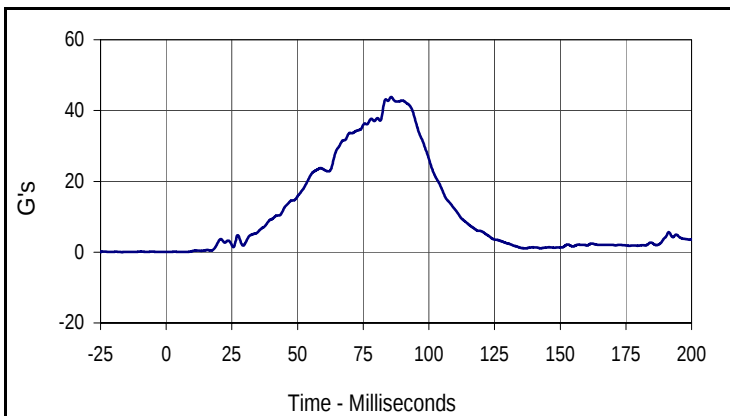
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Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
5.5	191.3	-42.2	90.0



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
1.7	116.6	-5.1	91.1



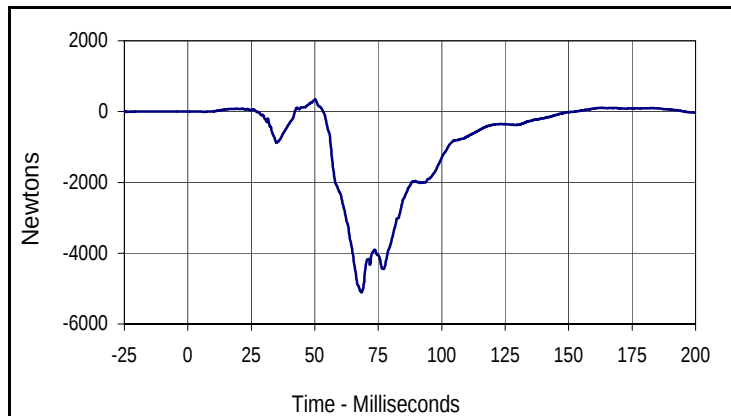
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
14.5	80.1	-4.3	55.5



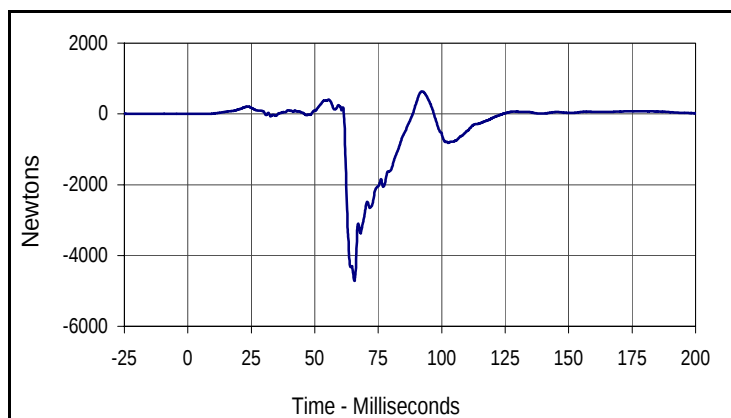
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
43.8	85.7	0.0	0.0

Test Vehicle: 2006 Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05
 NHTSA No.: G60100



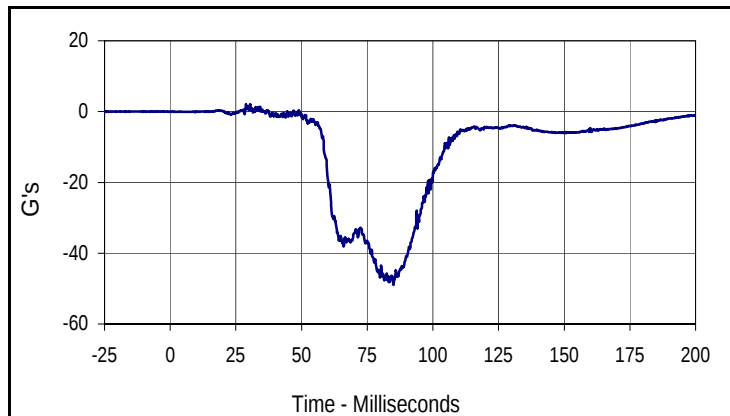
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
342.8	50.1	-5109.1	68.4



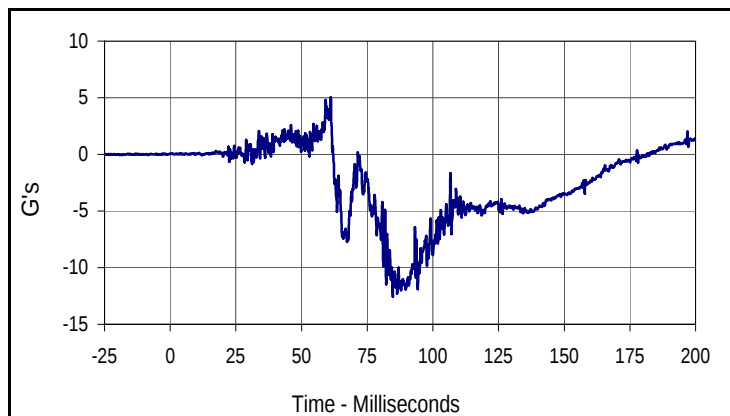
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
634.5	92.2	-4712.9	65.6

Test Vehicle: 2006 Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

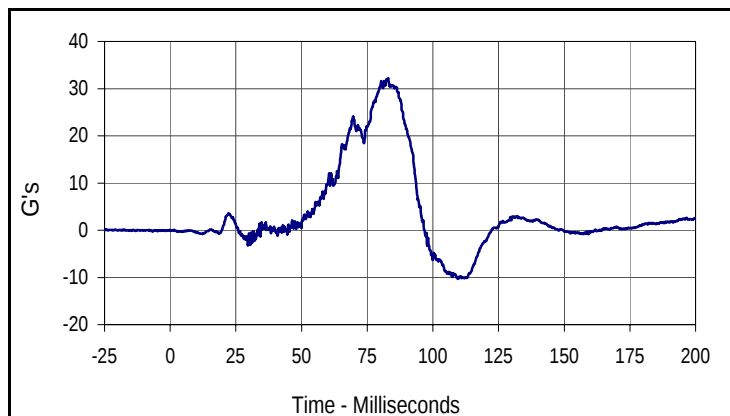
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 NHTSA No.: G60100



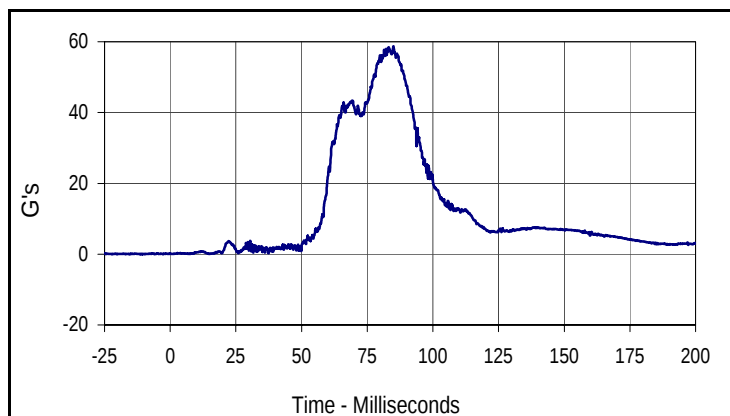
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
2.1	30.4	-49.0	85.0



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
5.0	61.1	-12.6	84.7



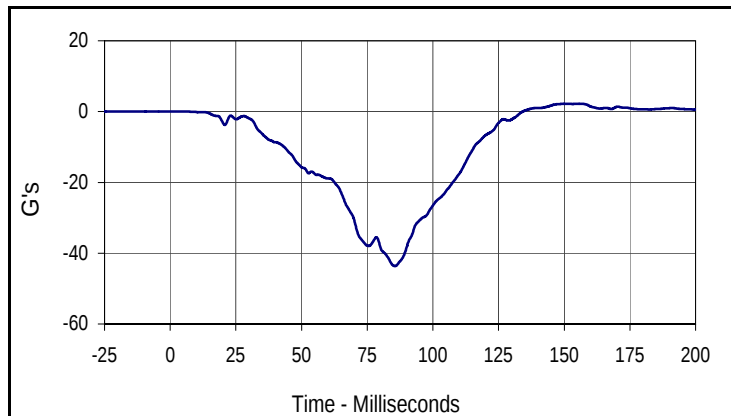
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
32.2	83.0	-10.3	109.6



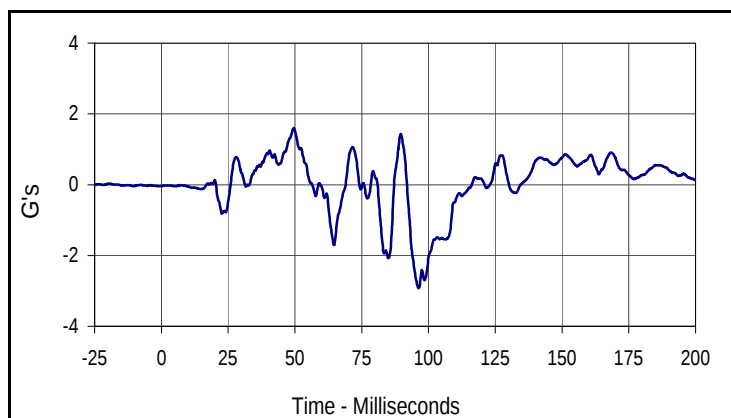
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
58.7	85.0	0.0	1.3

Test Vehicle: 2006 Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

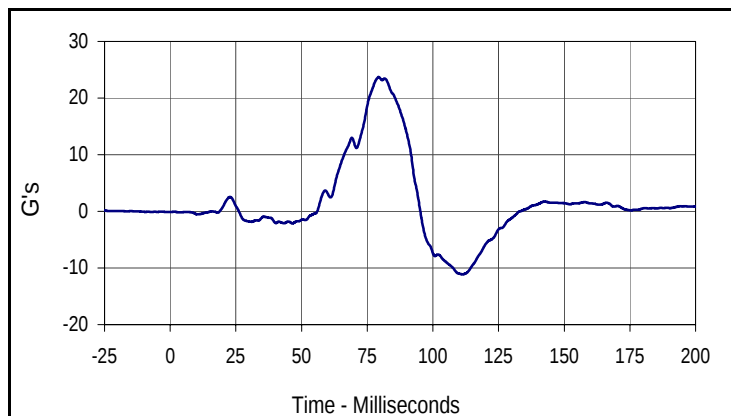
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 NHTSA No.: G60100



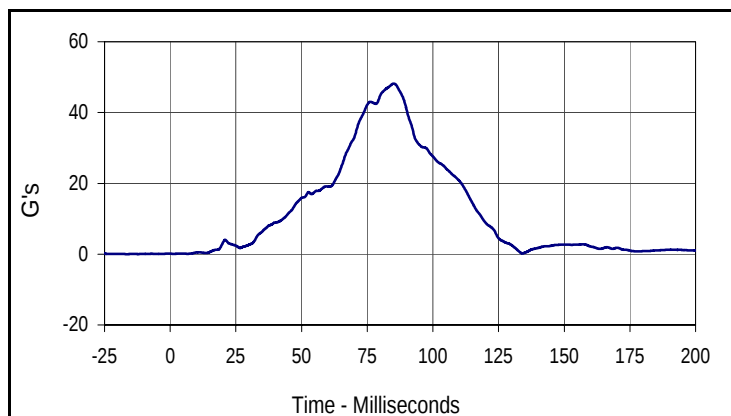
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
2.2	155.4	-43.7	85.6



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
1.6	49.6	-2.9	96.3



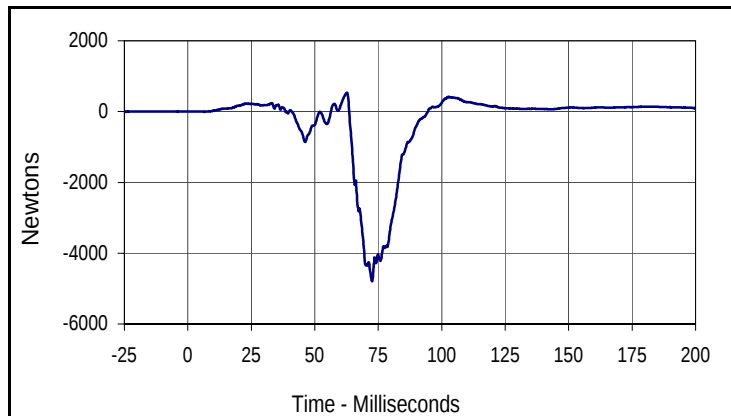
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
23.7	79.4	-11.1	111.2



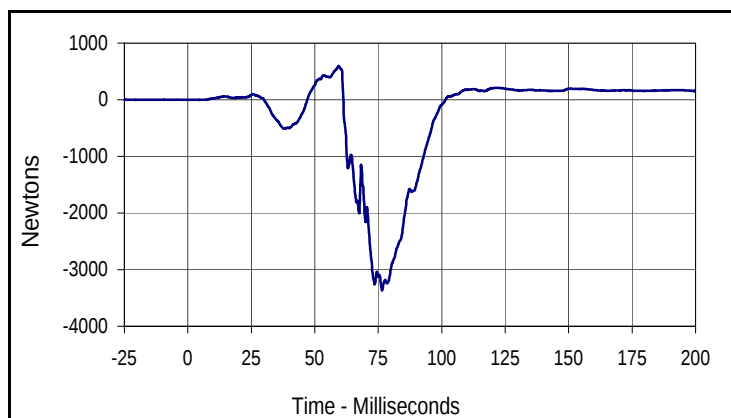
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
48.2	85.1	0.1	1.6

Test Vehicle: 2006 Grand Prix 4-Door Sedan
 Test Program: 2005 NHTSA 35mph NCAP

Test Date: 9/9/05
 NHTSA No.: G60100



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
534.2	62.7	-4784.8	72.5



Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
596.2	59.4	-3364.9	76.5

APPENDIX C

DUMMY CALIBRATION DATA

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

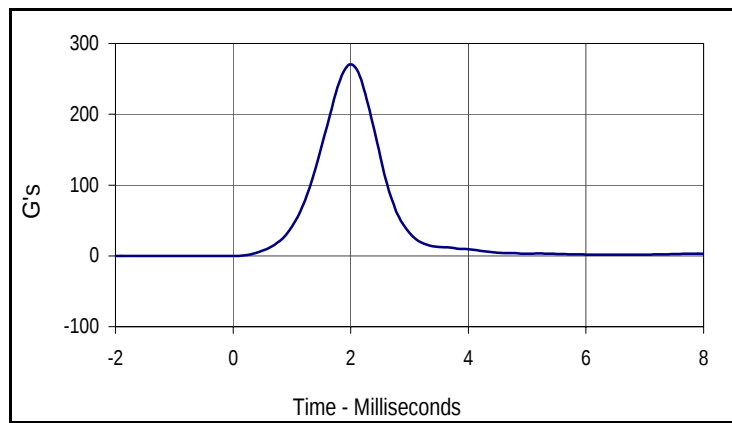
Test Date: 8/17/05

ATD Serial No.: 034

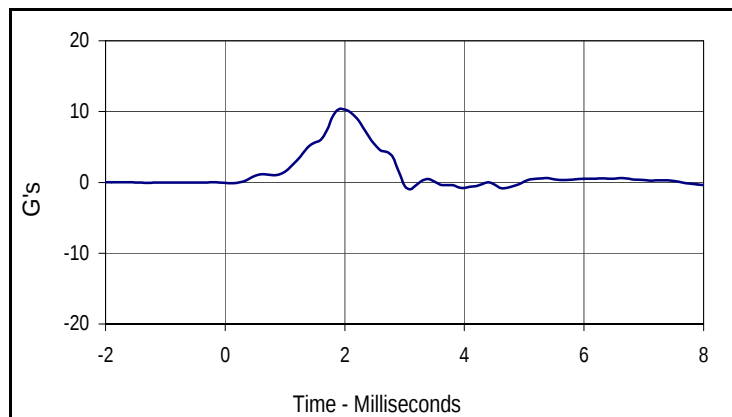
Test I.D.: HD08A



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	270.6	Pass
Peak Lateral Acceleration	G's	≤15.0	10.3	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
270.6	2.0	0.0	-0.2



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
10.3	1.9	-1.0	3.1

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

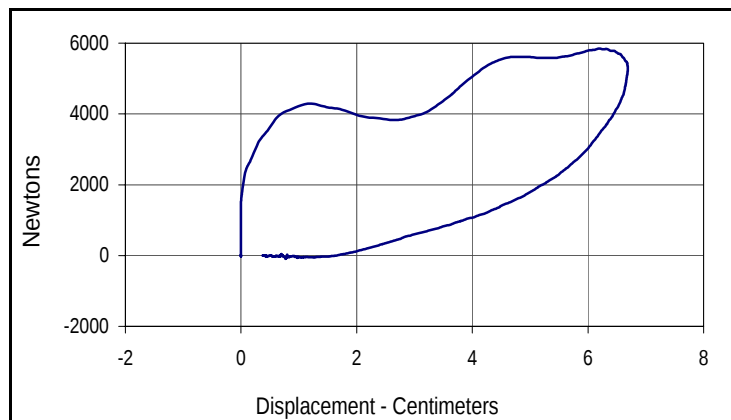
Test Date: 8/19/05

ATD Serial No.: 034

Test I.D.: CH08A



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	6.75	Pass
Peak Probe Force	Newtons	5159 to 5893	5846	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.69	Pass
Internal Hysteresis	%	69 to 85	75.5	Pass
Overall Test Results				Pass



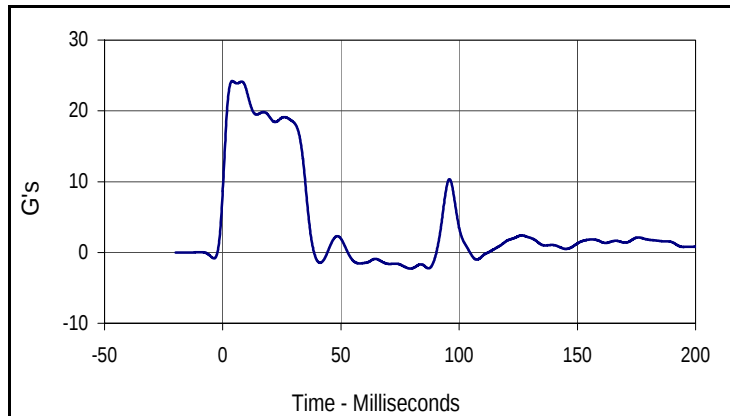
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.5
Peak Probe Force		Peak Chest Deflection	
5846		6.69	

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

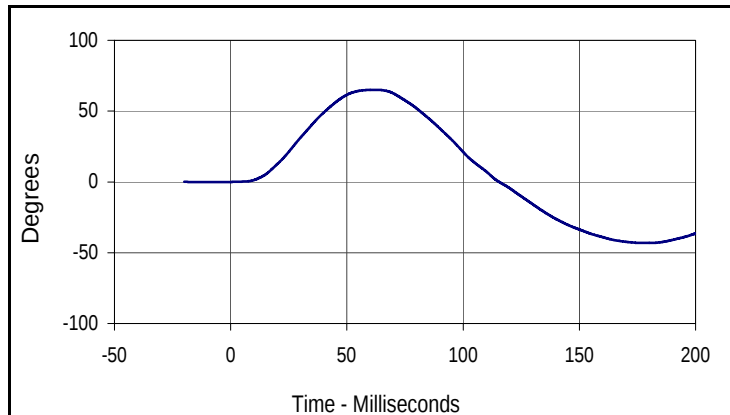
Test Date: 8/18/05
 Test I.D.: NF08A



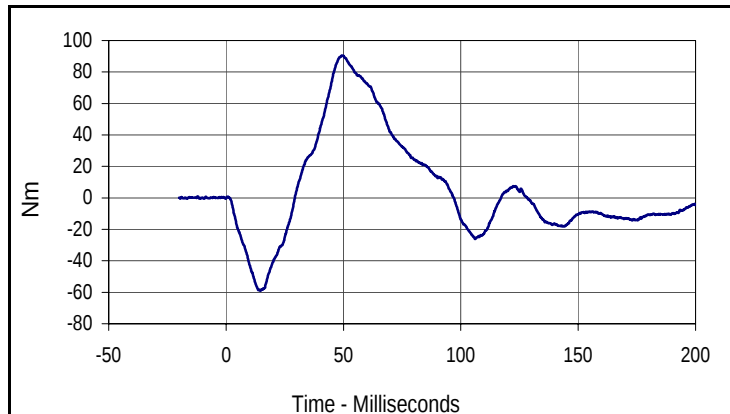
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	19.1	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	65.1	Pass
	Time	Msec.	57.0 to 64.0	62.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.5	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	90.5	Pass
	Time	Msec.	47.0 to 58.0	49.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.2	4.0	-2.3	79.4



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
65.1	62.0	-43.1	178.1



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
90.5	49.7	-59.1	14.5

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

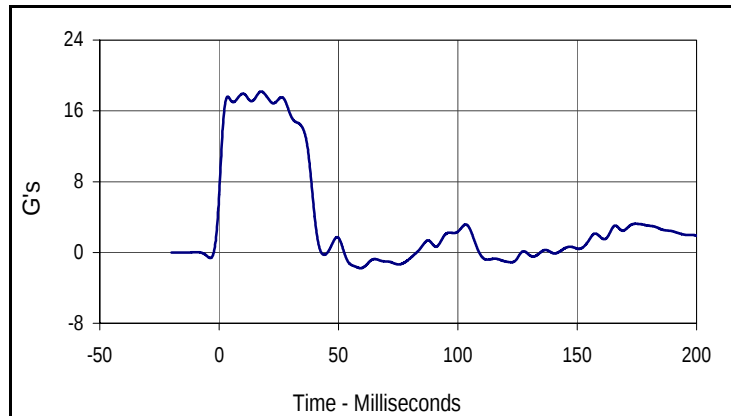
Test Date: 8/18/05

ATD Serial No.: 034

Test I.D.: NE08A



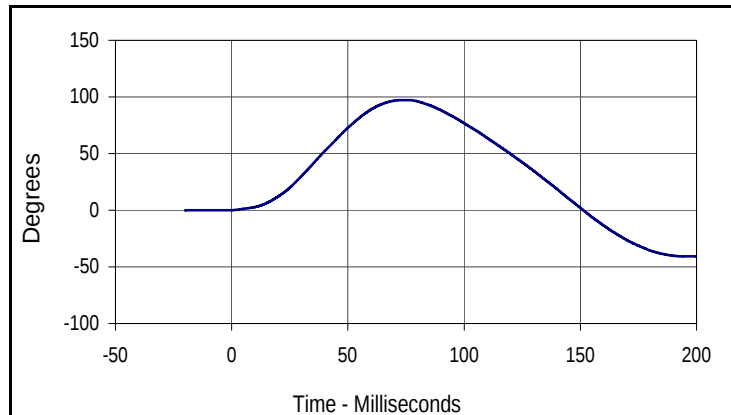
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.00	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.9	Pass
	20 Msec.	G's	14.0 to 19.0	17.6	Pass
	30 Msec.	G's	11.0 to 16.0	15.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	97.3	Pass
	Time	Msec.	72.0 to 82.0	74.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151.3	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-77.7	Pass
	Time	Msec.	65.0 to 79.0	66.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.2	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

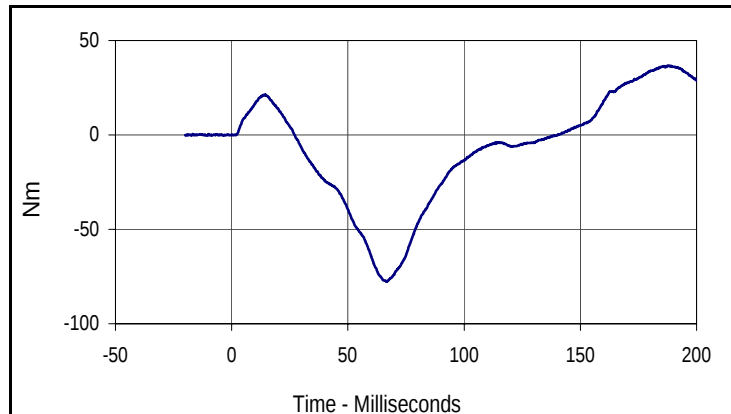
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.2	17.5	-1.8	59.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
97.3	74.6	-40.7	197.6



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.7	188.1	-77.7	66.7

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

Test Date: 8/19/05

ATD Serial No.: 034

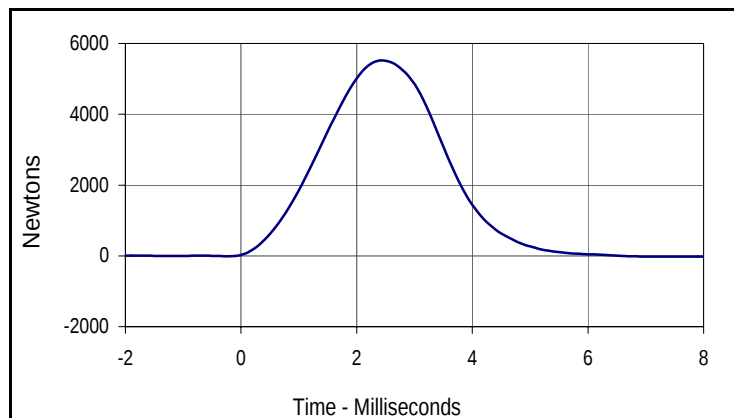
Test I.D.: LK08A , RK08A

**Left Knee**

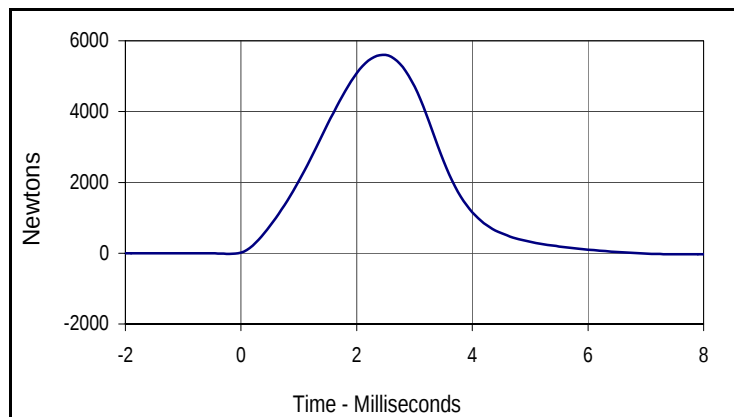
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5519	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5600	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5518.6	2.4	-23.7	7.2

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5600.1	2.5	-27.8	7.5

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 8/19/05

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	517	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	296	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	201	Pass
K - Buttock to knee length	mm	579 to 604	602	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	470	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	261	Pass
V - Shoulder breadth	mm	422 to 437	431	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	840	Pass
AA - Location for chest circumference	mm	429 to 434	430	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

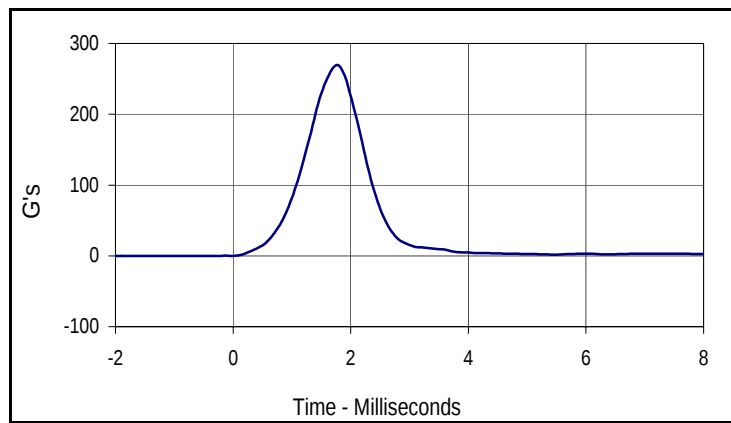
Test Date: 8/17/05

ATD Serial No.: 035

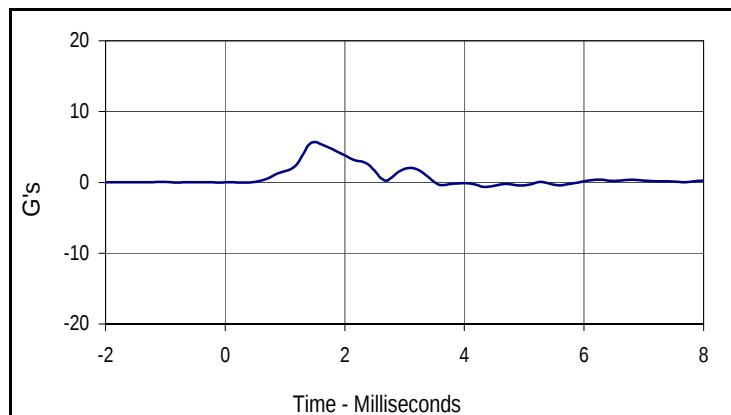
Test I.D.: HD08B



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	268.8	Pass
Peak Lateral Acceleration	G's	≤15.0	5.7	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
268.8	1.8	0.0	-1.6



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.7	1.5	-0.6	4.4

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

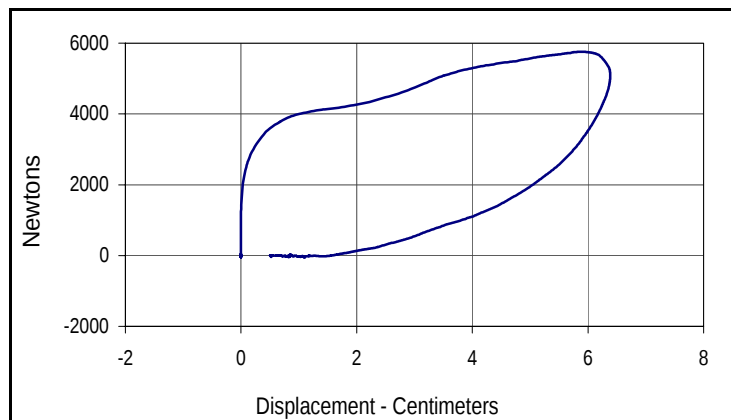
Test Date: 8/17/05

ATD Serial No.: 035

Test I.D.: CH08B



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	6.64	Pass
Peak Probe Force	Newtons	5159 to 5893	5755	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.39	Pass
Internal Hysteresis	%	69 to 85	77.3	Pass
Overall Test Results				Pass



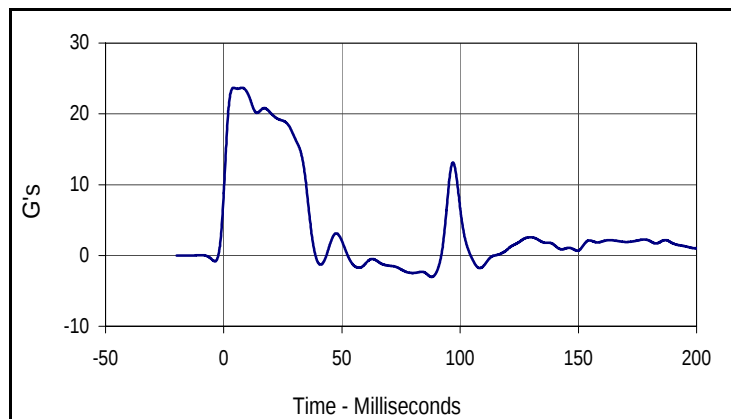
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	77.3
Peak Probe Force		Peak Chest Deflection	
5755		6.39	

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

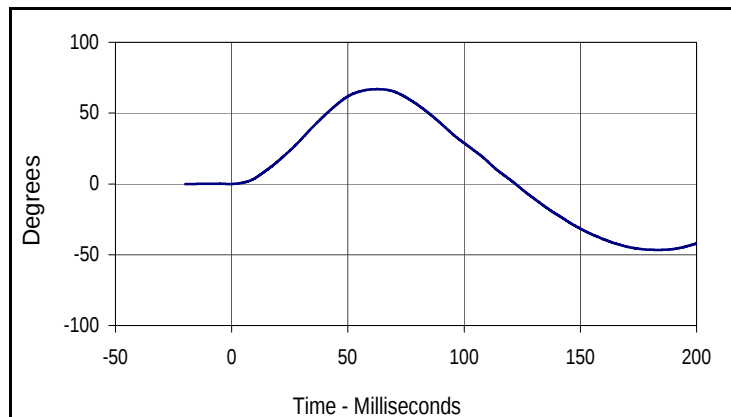
Test Date: 8/18/05
 Test I.D.: NF08B



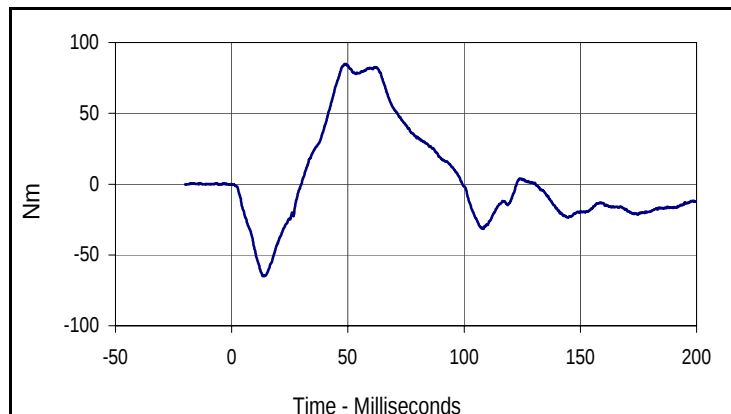
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	20.1	Pass
	30 Msec.	G's	12.5 to 18.5	16.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	66.9	Pass
	Time	Msec.	57.0 to 64.0	62.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	122.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	84.9	Pass
	Time	Msec.	47.0 to 58.0	48.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.3	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.7	7.7	-3.0	87.9



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
66.9	62.6	-46.6	183.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
84.9	48.8	-64.9	14.0

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

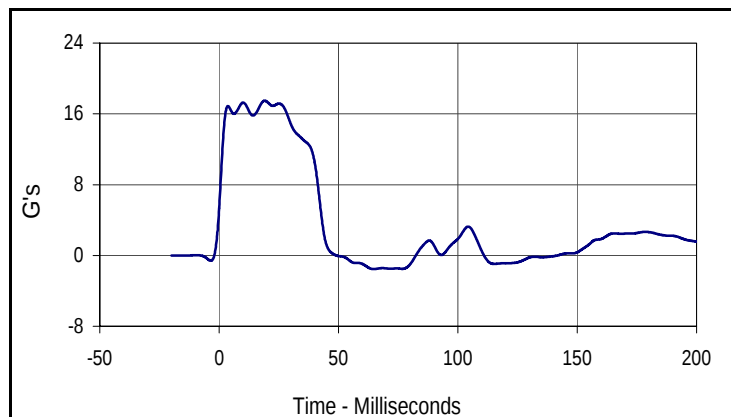
Test Date: 8/18/05

ATD Serial No.: 035

Test I.D.: NE08B



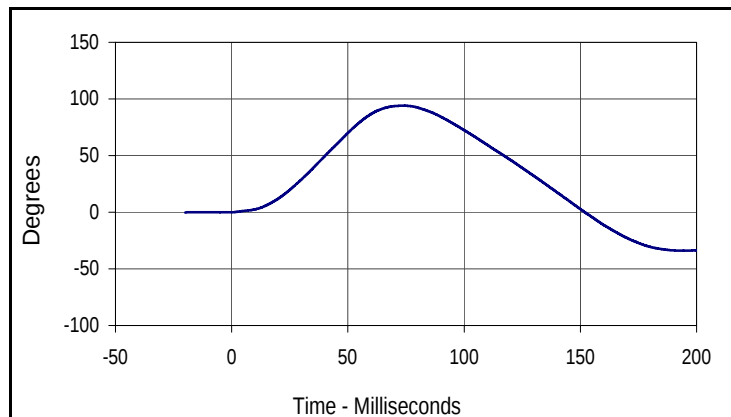
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.13	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.3	Pass
	20 Msec.	G's	14.0 to 19.0	17.4	Pass
	30 Msec.	G's	11.0 to 16.0	14.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	42.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	94.0	Pass
	Time	Msec.	72.0 to 82.0	73.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151.9	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-76.1	Pass
	Time	Msec.	65.0 to 79.0	64.3	Fail
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.3	Pass
Overall Test Results					Fail



Curve Description

Pendulum Deceleration

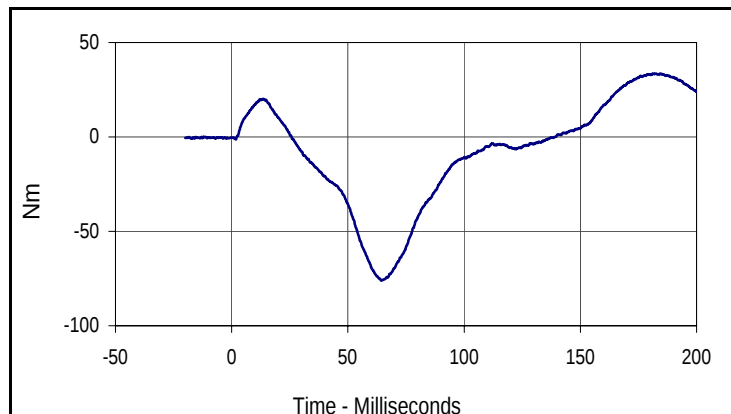
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.5	19.1	-1.5	64.7



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
94.0	73.9	-34.0	194.6



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
33.6	182.3	-76.1	64.3

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

Test Date: 8/19/05

ATD Serial No.: 035

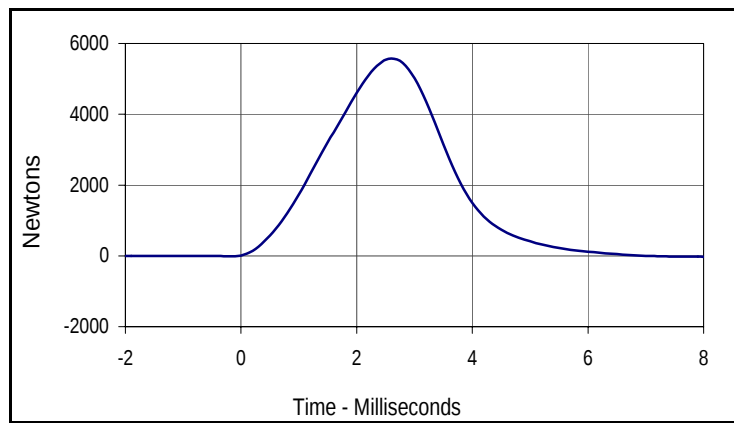
Test I.D.: LK08B , RK08B

**Left Knee**

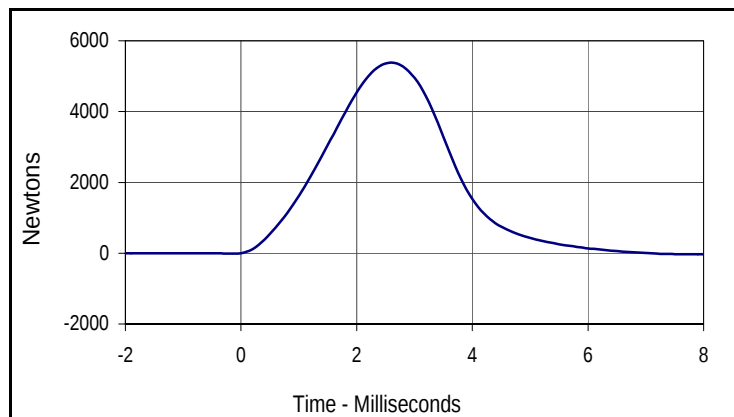
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	Newtons	4715 to 5782	5578	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5385	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5577.9	2.6	-25.5	9.6

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5384.7	2.6	-30.1	9.6

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 8/19/05

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	882	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	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	210	Pass
K - Buttock to knee length	mm	579 to 604	585	Pass
L - Popliteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	460	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	995	Pass
Z - Waist circumference	mm	836 to 866	860	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