

REPORT NUMBER TR-P26001-02-NC

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

**GENERAL MOTORS OF CANADA LTD.
2006 CHEVROLET IMPALA SEDAN
4-DOOR SEDAN**

NHTSA NUMBER: M60110

**PREPARED BY:
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9270 HOLLY ROAD
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OCTOBER 19, 2005

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2006 Chevrolet Impala 4-Door Sedan at Karco Engineering, LLC on 10/19/05. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.57 km/h. The ambient temperature at the barrier face at the time of impact is 22.2 degrees Celcius. The vehicle's maximum post-test static crush is 720mm at 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:					
Measurement Description		Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)		N/A	1000	410.9	275.7
Max. Chest Accel. (3 msec Clip)		G's	60	32.7	37.6
Left Femur Force		Newtons	10008	-4050.3	-2354.4
Right Femur Force		Newtons	10008	-2739.7	-2071.6
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2006 Chevrolet Impala 4-Door Sedan NHTSA No. M60110				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M60110

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 Chevrolet Impala 4-Door Sedan at a velocity of 56.57 km/h. The test was performed at Karco Engineering, LLC on October 19, 2005.

Two (2) real-time and fifteen (15) 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 one test prior to this test.

Ninety seven (133) 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 720 mm at 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 36	Clip (g)	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	410.9	32.7	-16.6	-4050.3	-2739.7
Passenger	275.7	37.6	-21.1	-2354.4	-2071.6

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 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

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 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
Test Date: 10/19/05

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.57
Test Weight	kg	1851
Impact Angle	degrees	0
Average Rebound	mm	680
Maximum Static Crush	mm	720

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)	2.5	2.5
Seat Back Failure	No	No

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	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

MOVIE COVERAGE

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

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 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M60110	Anti-Lock Brakes	No
Make	Chevrolet	All Wheel Drive	No
Model	Impala LS	Power Steering	Yes
Body Style	4-Door	Driver Front Airbag	Yes
Vin No.	2G1WB58K069119598	Driver Side Airbag	No
Color	Silver	Driver Head Airbag	No
Delivery Date	10/3/2005	Driver Curtain Airbag	Yes
Odometer	91	Pass. Airbag	Yes
Dealer	Crest Chevrolet	Pass. Side Airbag	No
Transmission	4 Speed Automatic	Pass. Head Airbag	No
Final Drive	Front	Pass. Curtain Airbag	Yes
Type/No. Cyl.	V-6	Pre-Tensioners	Yes
Engine Disp. (L)	3.5	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	Yes	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	GVWR (kg)	2122
Date of Manufacture	Aug-05	GAWR Front (kg)	1145
		GAWR Rear (kg)	977

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

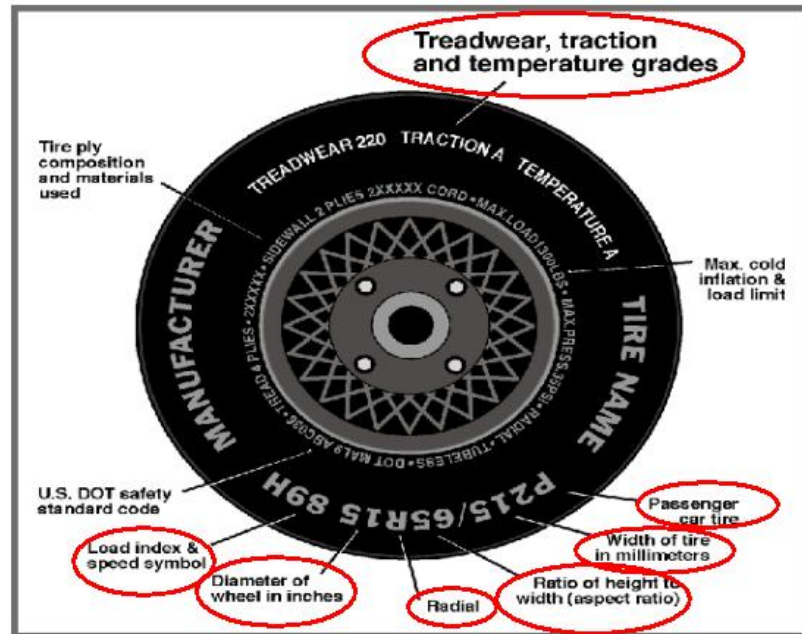
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
Number of Occupants	3	3		6
Capacity Weight (VCW) (kg)				496
Cargo Weight (RCLW) (kg)				87

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

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	P225/60R16	P225/60R16
Tire Size on Vehicle	P225/60R16	P225/60R16
Tire Manufacturer	Goodyear	Goodyear
Treadwear	460	460
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	3 Polyester + 2 Steel	3 Polyester + 2 Steel
Load Index/Speed Symbol	97S	97S
Tire Material	Polyester + Steel	Polyester + Steel
DOT Safety Code Right	DOT M6XO E6DR 3005	DOT M6XO E6DR 3005
DOT Safety Code Left	DOT M6XO E6DR 3005	DOT M6XO E6DR 3005

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UWV)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	494	304	798	534	387	921
Right	kg	507	310	817	544	386	930
Ratio	%	62.0	38.0	100	58.2	41.8	100
Totals	kg	1001	614	1615	1078	773	1851

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UWV)	kg	1615
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	88
Calculated Vehicle Target Wt. (TVTW)	kg	1855

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	740	736	739	741	1066
As Tested	mm	722	728	700	702	1172

Vehicle Wheel Base (mm) 2805

Weight of Ballast Secured in cargo area (kg) 16

Weight of Items Removed (kg) 24

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) 66.2

Actual Test Volume with entire fuel System Filled (L) 61.6

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 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 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	56.57
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	56.59
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	4929	4405	-524
Center	mm	5085	4365	-720
Right Side	mm	4929	4355	-574

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	670
Center	mm	685
Right Side	mm	685
Average	mm	680

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

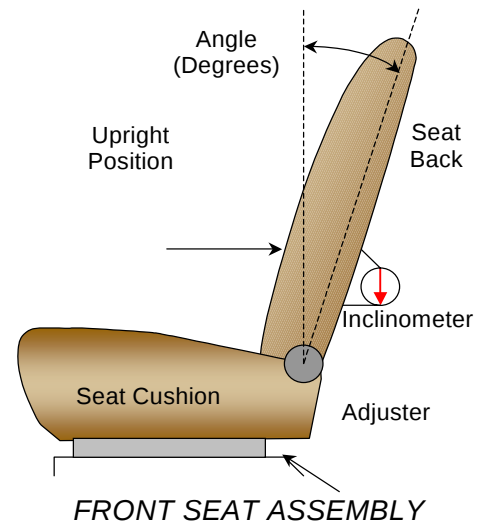
NHTSA No.: M60110
 Test Date: 10/19/05

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	10@headrest
Passenger w/seated Dummy	24@headrest

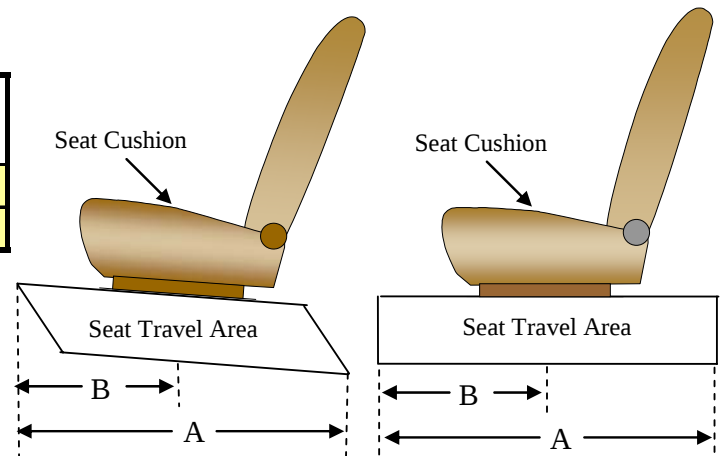


SEAT FORE/AFT POSITIONS

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 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	240mm	120mm
Passenger Seat	23	12



SEAT BELT UPPER ANCHORAGE

Position number one (1) is 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

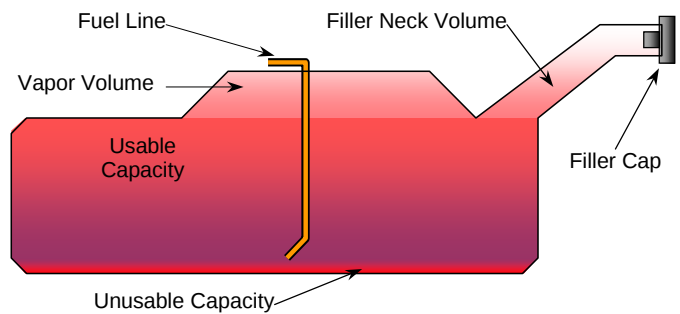
Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

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 62.27
Actual Amount of Solvent used	61.61

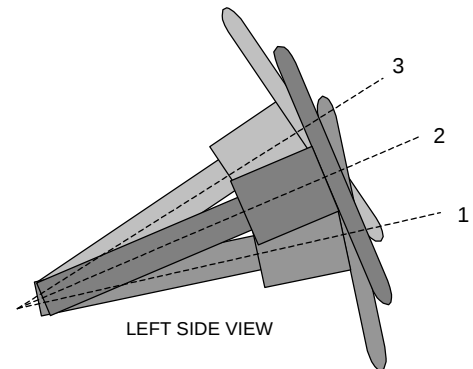
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies 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	12.0	
Geometric center position No. 2	23.7	
Uppermost position No. 3	35.4	

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
Test Date: 10/19/05

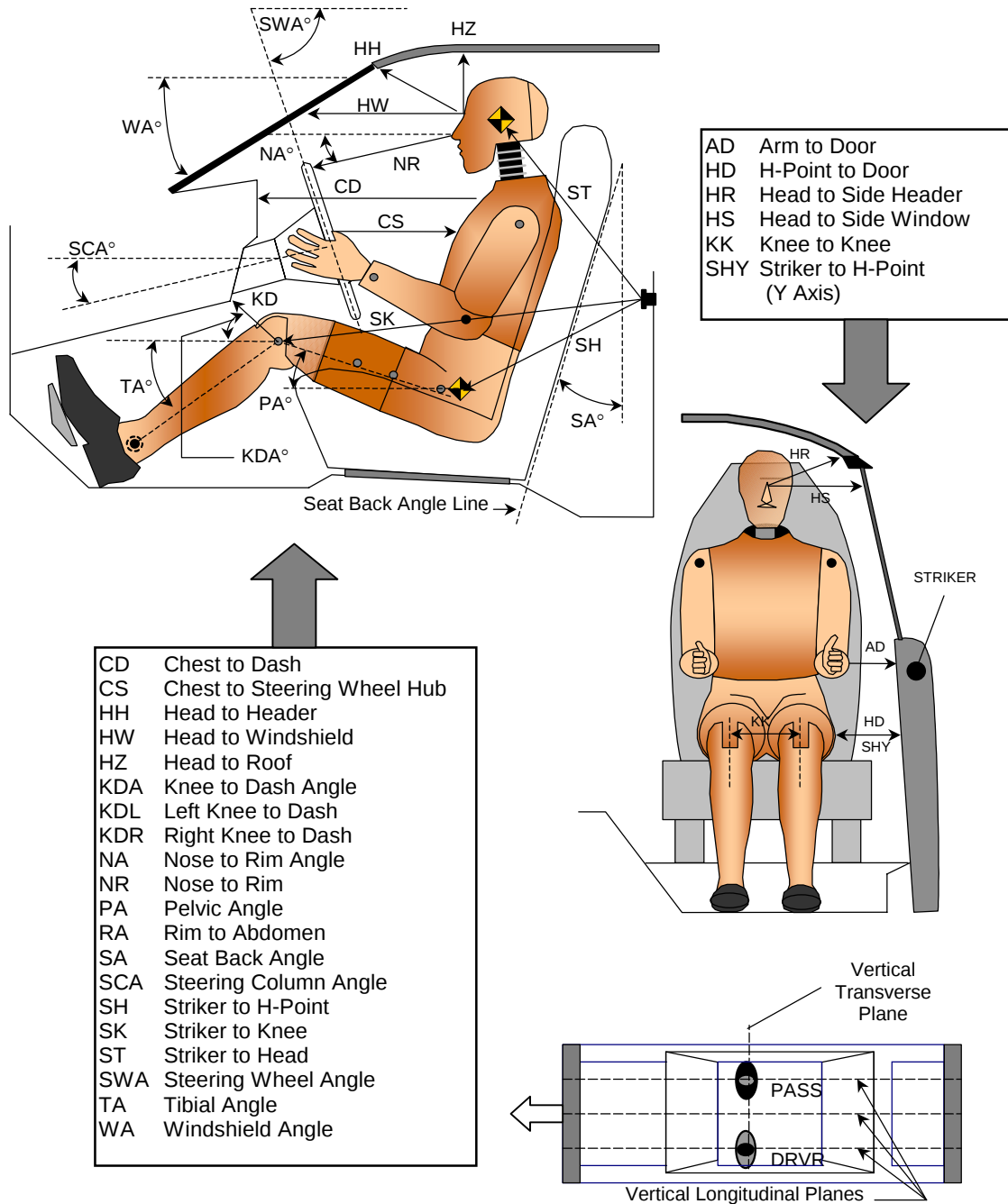
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		26.7		
SWA	Steering Wheel Angle		66.3		
SCA	Steering Column Angle		23.7		
SA	Seat Back Angle		10@headrest		24@headrest
HZ	Head to Roof (Z)	200	90.0	190	90.0
HH	Head to Header	340		330	
HW	Head to Windshield	640		645	
HR	Head to Side Header (Y)	230		290	
NR	Nose to Rim	410	17.0		
CD	Chest to Dash	540		565	
CS	Chest to Steering Hub	280			
RA	Rim to Abdomen	180			
KDL	Left Knee to Dash	260	3.7	210	
KDR	Right Knee to Dash	245		290	5.8
PA	Pelvic Angle		20.4		24.9
TA	Tibia Angle		39.0		38.0
KK	Knee to Knee (Y)	310		310	
SK	Striker to Knee	600		555	3.3
ST	Striker to Head	540	82.0	590	22.5
SH	Striker to H-Point	231	36.0	220	
SHY	Striker to H-Point (Y)	250		245	
HS	Head to Side Window	284		260	
HD	H-Point to Door (Y)	165		160	
AD	Arm to Door (Y)	125		125	

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

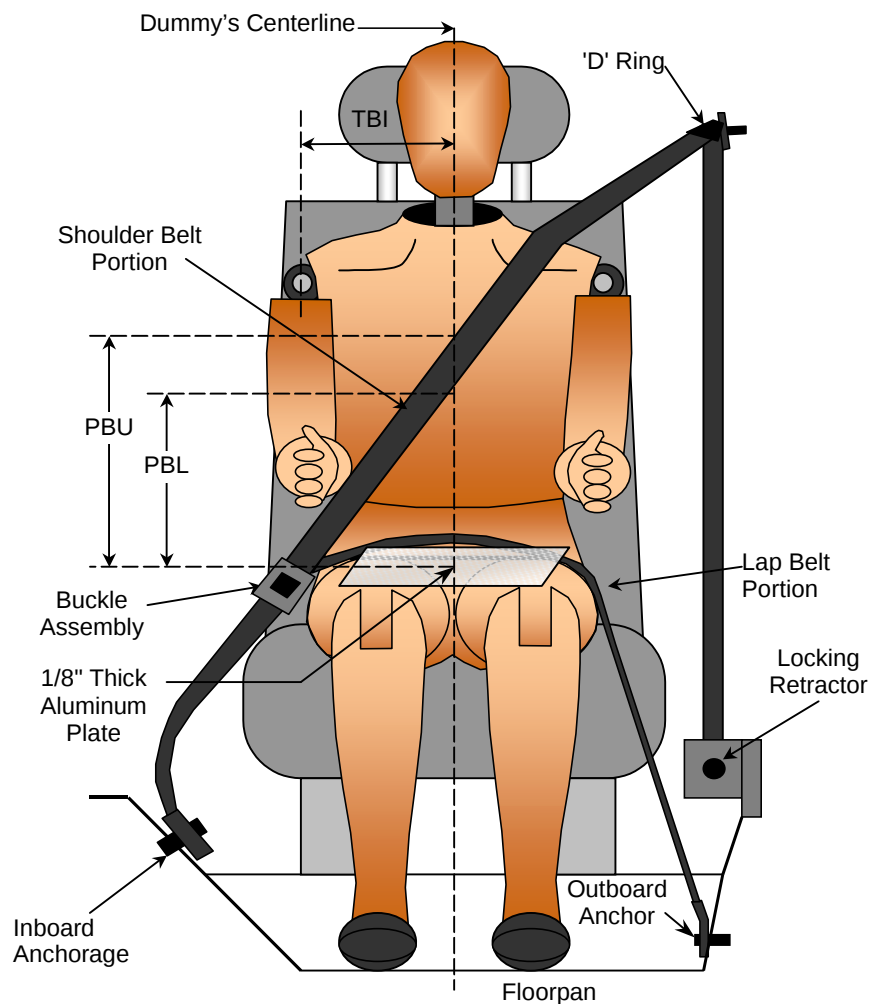
DATA SHEET NO. 6 **SEAT BELT POSITIONING DATA**

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	220	250
PBU - Top Surface of reference to belt upper edge	mm	305	280
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 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

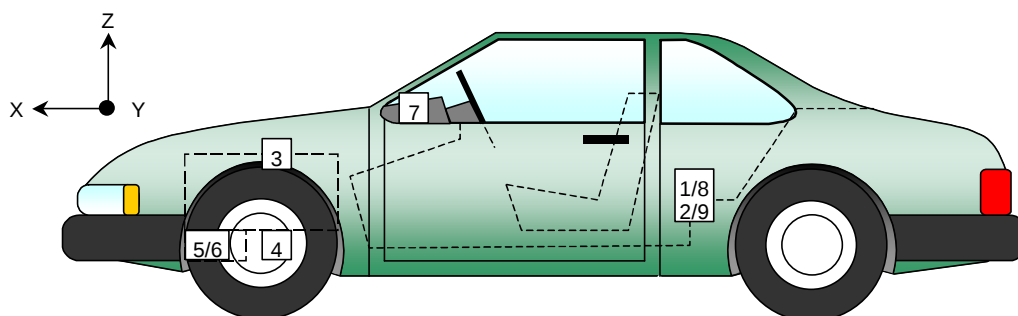
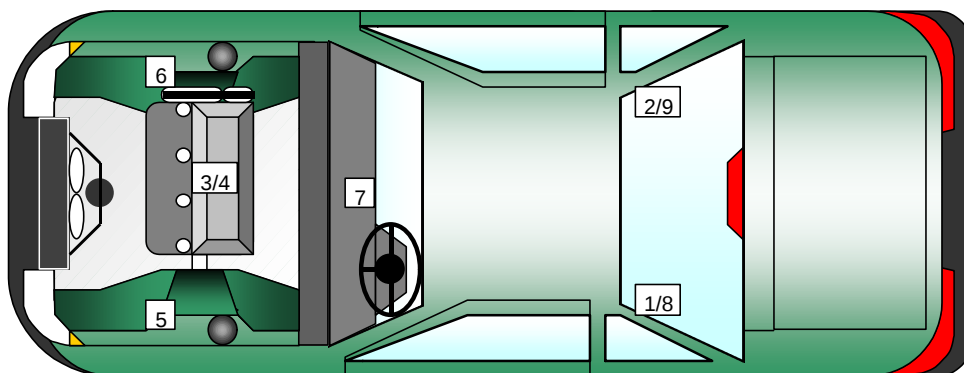
Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	2110	-620	255
2	Right Rear X-Member	2110	620	255
3	Engine Top	4210	0	895
4	Engine Bottom	4393	100	245
5	Left Brake Caliper	4025	-810	340
6	Right Brake Caliper	4025	810	340
7	Instrument Panel	3330	0	1150
8	Left Rear X-Member (Z-Axis)	2110	-620	255
9	Right Rear X-Member (Z-Axis)	2110	620	255

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 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	220	250
PBU - Top Surface of reference to belt upper edge	mm	305	280
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	600	600
Shoulder Belt length as measured on ATD	mm	900	920
Lap Belt length as measured on ATD	mm	670	640
Remainder of belt on reel	mm	760	745
Total belt length for continuous webbing systems	mm	2930	2905

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	186.0	328.0
As determined electronically	mm	87.2	171.1

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: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

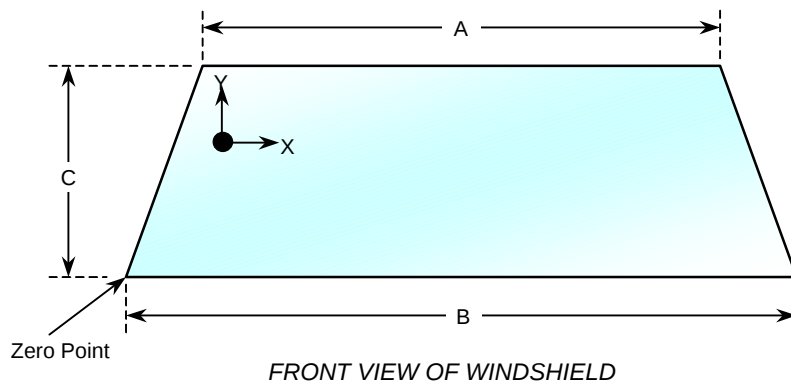
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

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	2248	2248	100
Right Side	2248	2248	100
Total	4495	4495	100



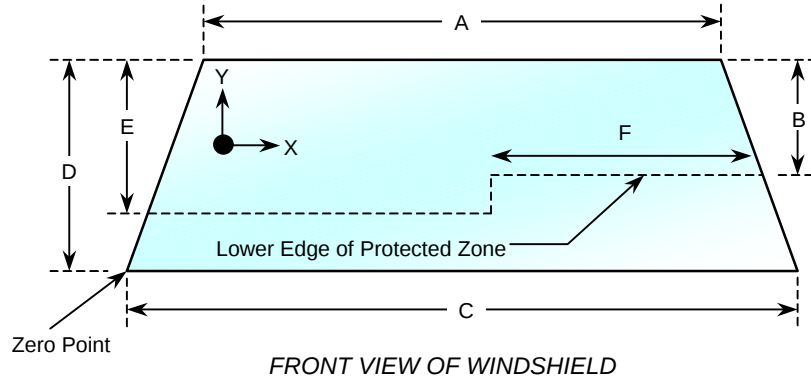
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1245	
B	mm	1580	
C-Left	mm	835	
C-Right	mm	835	

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1245
B	mm	585
C	mm	1580
D	mm	835
E	mm	542
F	mm	590

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 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

Test Time: 1:51 PM

Temperature: 22.2 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)

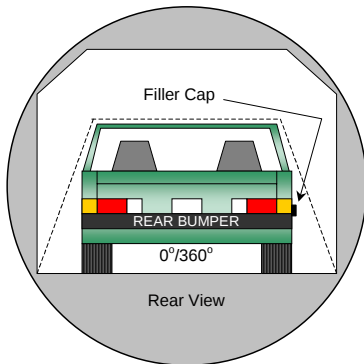
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)

D. Spillage Location Details: No leakage occurred

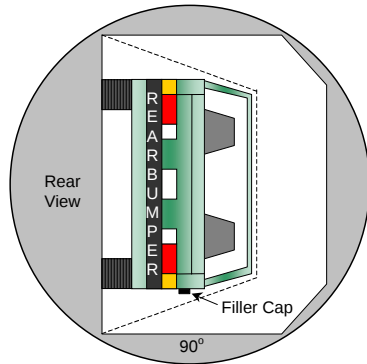
DATA SHEET NO. 12
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

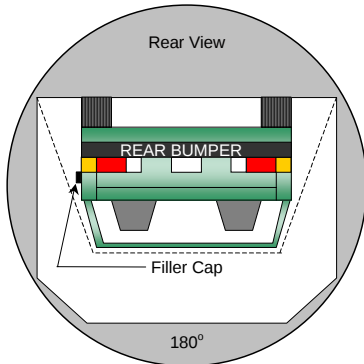
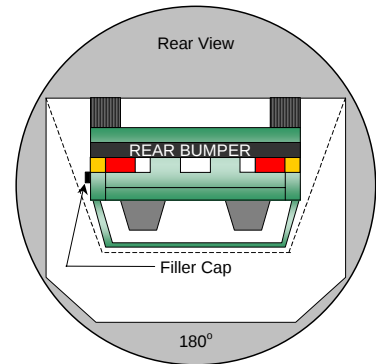
NHTSA No.: M60110
Test Date: 10/19/05



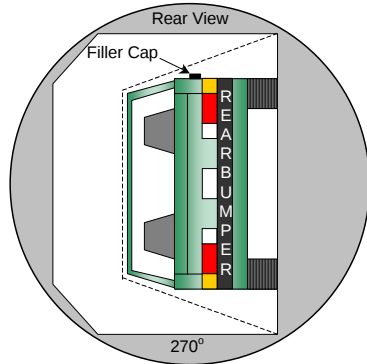
0° to 90°



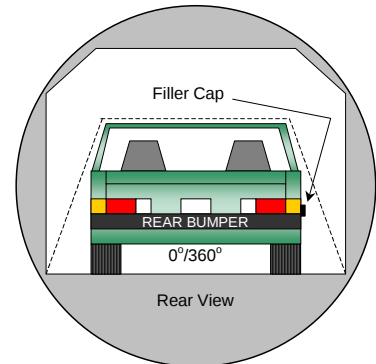
90° to 180°



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 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	84	300	384
90° to 180°	77	300	377
180° to 270°	81	300	381
270° to 360°	76	300	376

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 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
Test Date: 10/19/05

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	5085	4365	-720
2	RSOV to front of engine	mm	4457	4121	-336
3	RSOV to firewall centerline	mm	3902	3795	-107
4	RSOV to leading edge of right door	mm	3490	3486	-4
5	RSOV to leading edge of left door	mm	3493	3494	1
6	RSOV to lower leading edge of right door	mm	3475	3480	5
7	RSOV to lower leading edge of left door	mm	3485	3482	-3
8	RSOV to upper trailing edge of right door	mm	2405	2402	-3
9	RSOV to upper trailing edge of left door	mm	2415	2411	-4
10	RSOV to lower trailing edge of right door	mm	2394	2406	12
11	RSOV to lower trailing edge of left door	mm	2405	2410	5
12	RSOV to bottom of right 'A' pillar	mm	3471	3462	-9
13	RSOV to bottom of left 'A' pillar	mm	3470	3471	1
14	RSOV to firewall on right side	mm	3850	3803	-47
15	RSOV to firewall on left side	mm	3858	3805	-53
16	RSOV to steering column	mm	3042	3070	28
17	Center of steering column to left 'A' pillar	mm	405	425	20
18	Center of steering column to headlining	mm	435	375	-60
19	RSOV to right side of front bumper	mm	4929	4355	-574
20	RSOV to left side of front bumper	mm	4929	4405	-524
21	Length of engine block	mm	425	420	-5
RD	RSOV to right side of dash panel	mm	3296	3264	-32
CD	RSOV to center of dash panel	mm	3245	3264	19
LD	RSOV to left side of dash panel	mm	3280	3286	6

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

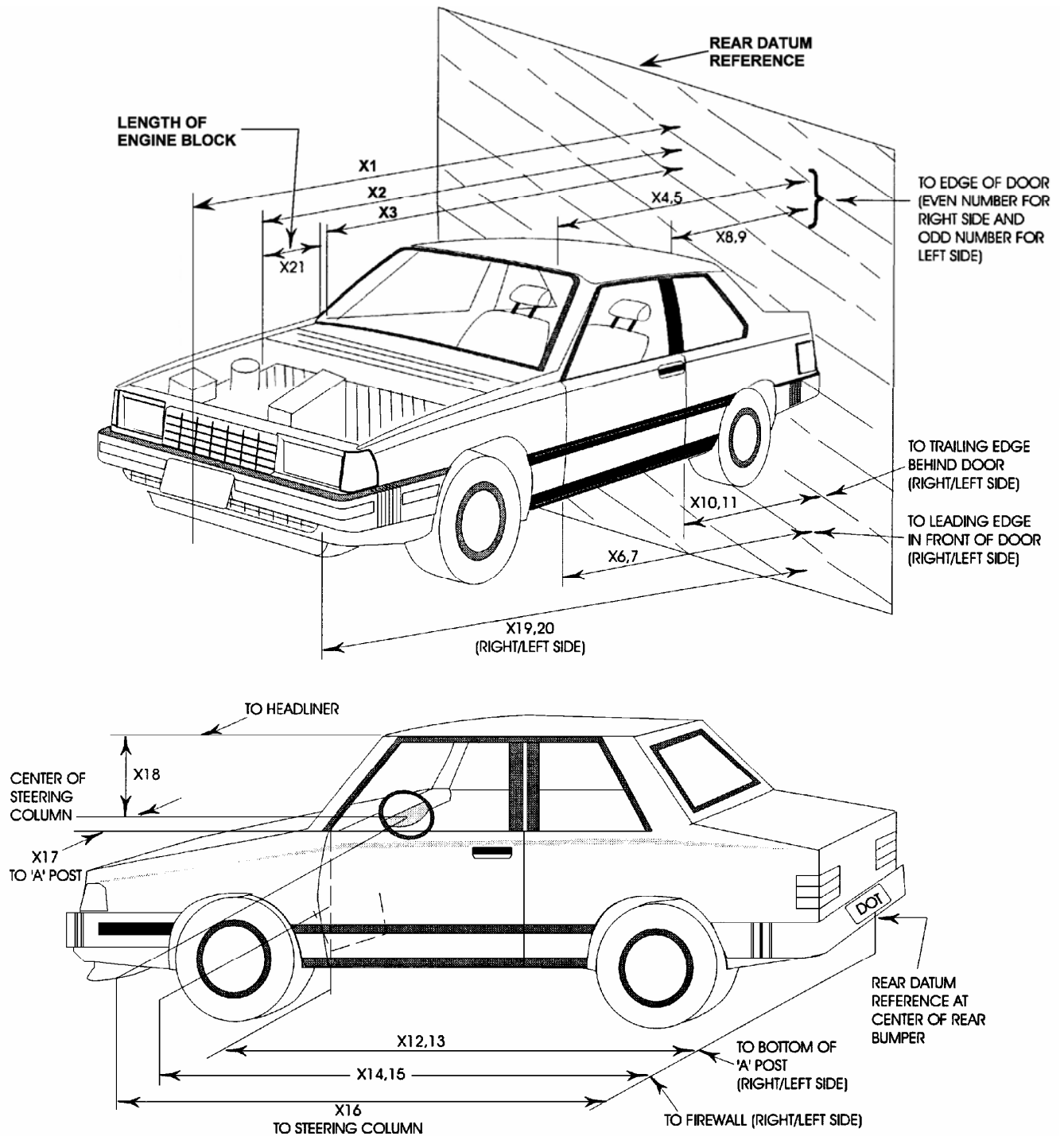
VEHICLE STRUCTURAL MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	5085	4365	-720
2	Total width	mm	1835	1831	-4
3	Bumper top height	mm	790	624	-166
4	Bumper bottom height	mm	400	234	-166
5	Longitudinal member top height	mm	551	640	89
6	Longitudinal member bottom height	mm	462	550	88
7	Distance between longitudinal members	mm	870	810	-60
8	Longitudinal member width	mm	35	35	0
9	Engine top height	mm	875	845	-30
10	Engine bottom height	mm	161	89	-72
11	Engine and gear box width	mm	614	614	0
12	Front bumper to engine distance	mm	632	205	-427
13	Front shock absorber fixing width	mm	905	950	45
14	Bonnet leading edge height	mm	669	720	51
15	Front shock absorber fixing width	mm	1193	1100	-93
16	Front bumper to front axle distance	mm	1086	445	-641
17	Front axle to 'A' pillar distance	mm	480	430	-50
18	'A' pillar to 'B' pillar distance	mm	1085	1080	-5
19	'B' pillar to rear axle distance	mm	1234	1234	0
20	'B' pillar to 'C' pillar distance	mm	950	950	0
21	Roof sill bottom height	mm	1314	1320	6
22	Roof sill top height	mm	1445	1460	15
23	Floor sill bottom height	mm	211	230	19
24	Floor sill top height	mm	360	385	25

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05



DATA SHEET NO. 14
CAMERA LOCATIONS

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
Test Date: 10/19/05

VEHICLE CAMERA MEASUREMENT TABLE

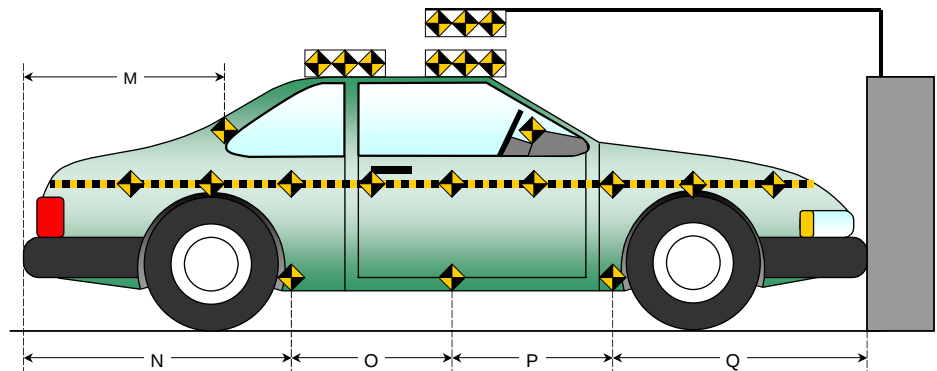
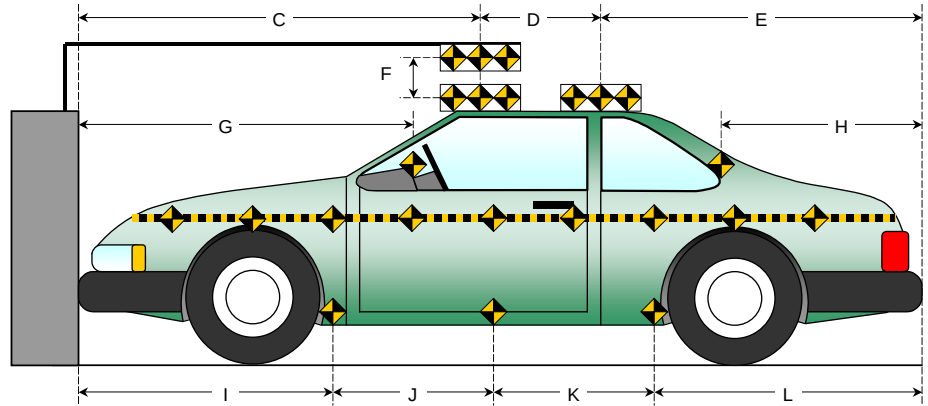
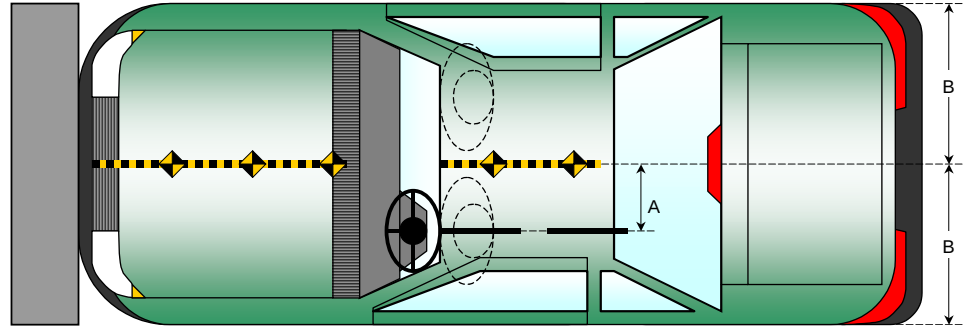
No.	Camera View	Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time Camera (Panning)	-15318	-7899	-1584	-5	6699	Zoom	30
2	Overall Left Side	-1795	-7137	-1127	0	7774	20mm	1000
3	Left Side View	1533	-7126	-1188	-3	14030	50mm	1000
4	Driver and Interior View	-8696	-12562	-4511	-13	7992	50mm	1000
5	Steering Column (Bottom)	-1631	-8244	-2682	-13	7993	35mm	1000
6	Steering Column (Top)	-1663	-8153	-3078	-17	6081	35mm	1000
7	Overall Right Side	-2536	6556	-1066	-2	6059	20mm	1000
8	Right Side View	-1999	6510	-1249	-4	9436	50mm	1000
9	Passenger and Interior View	-5330	9365	-2407	-10	6525	40mm	1000
10	Right Side View	-2006	6967	-1463	-8	N/A	25mm	1000
11	Windshield View	-601	0	-5547	-85	N/A	25mm	1000
12	Driver Front View	376	-286	-2438	-35	N/A	25mm	1000
13	Passenger Front View	371	413	-2439	-35	N/A	25mm	1000
14	Pit View of Engine	-823	0	1493	90	N/A	12mm	1000
15	Pit View of Fuel Tank	-2705	0	1493	90	N/A	8mm	1000
16	Real Time Camera	-3295	7934	-1341	0	N/A	Zoom	30
17	Driver & Pass Front View	334	-18	-2468	-32	N/A	12mm	1000

DATA SHEET NO. 15
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

All Dimensions in (mm)	
Item	Value
A	417
B	917
C	2365
D	607
E	2126
F	155
G	1850
H	1562
I	1554
J	940
K	940
L	1670
M	1560
N	1656
O	944
P	944
Q	1485



DATA SHEET NO. 16
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

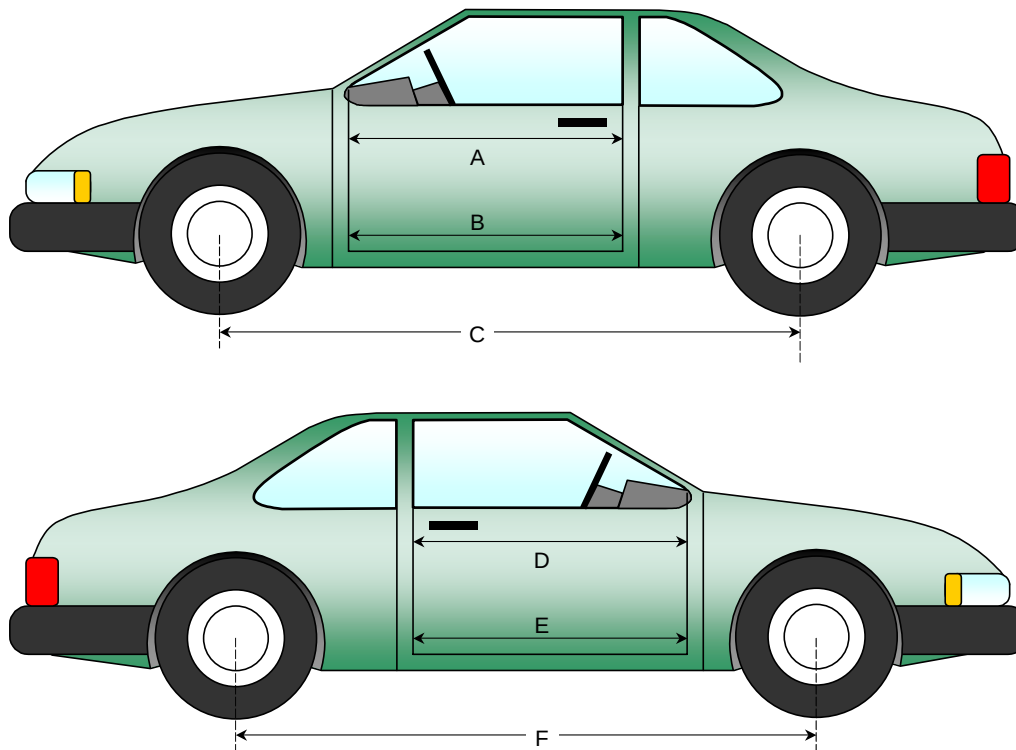
NHTSA No.: M60110
Test Date: 10/19/05

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	974	968	-6
B	Left Side Lower	mm	912	908	-4
D	Right Side Upper	mm	970	966	-4
E	Right Side Lower	mm	921	921	0

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2805	2720	-85
F	Right Side Wheel Base	mm	2805	2660	-145



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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

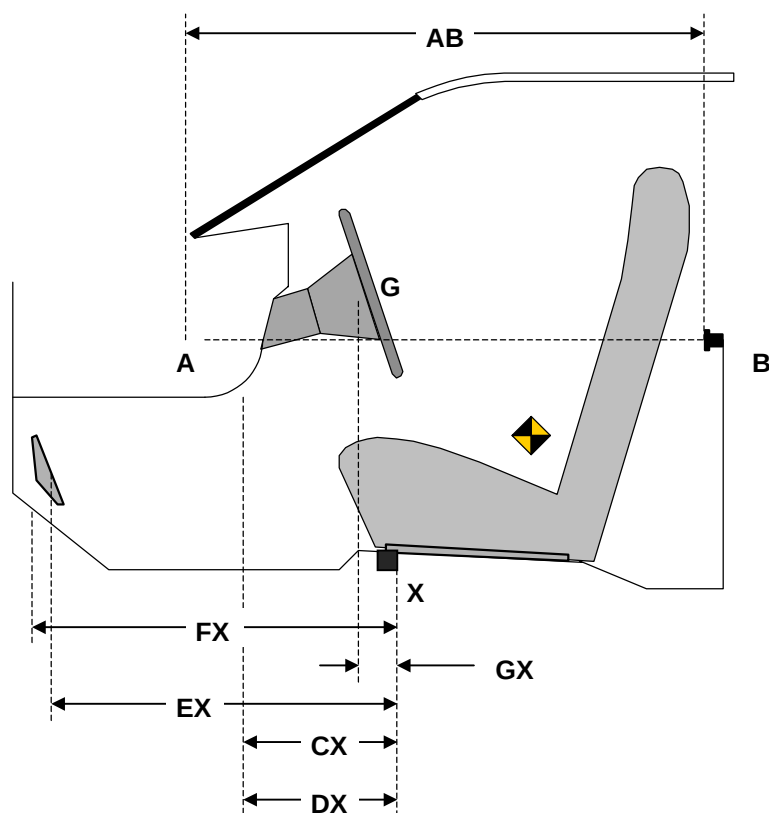
Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	974	968	-6
CX	Left Knee Bolster to X	mm	235	240	5
DX	Right Knee Bolster to X	mm	235	247	12
EX	Brake Pedal to X	mm	521	391	-130
FX	Foot Rest to X	mm	531	522	-9
GX	Center of Steering Wheel Hub to X	mm	0	56	56

X = Left Front Seat Outboard Anchor Bolt Head



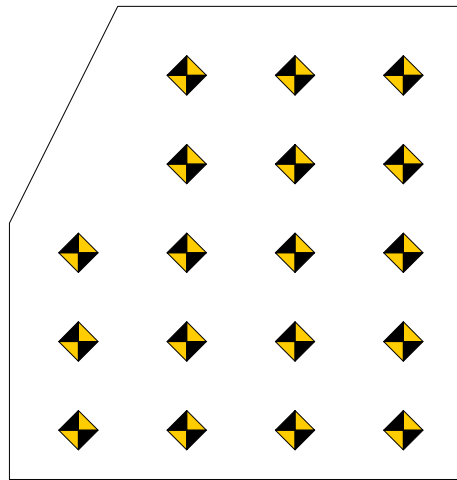
DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan

NHTSA No.: M60110

Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05



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		-238	-236	-236		-543	-550	-532		-305	-314	-296
2		-333	-328	-331		-472	-461	-430		-139	-133	-99
3	-241	-432	-427	-427	-415	-383	-373	-350	-174	49	54	77
4	-337	-526	-525	-522	-322	-304	-290	-300	15	222	235	222
5	-434	-603	-624	-622	-230	-225	-221	-223	204	378	403	399

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-107	-108	-122		10	-2	0		117	106	122
2		-107	-108	-121		-34	-52	-8		73	56	113
3	-119	-99	-100	-114	-96	-79	-86	-64	23	20	14	50
4	-120	-84	-94	-96	-111	-136	-142	-140	9	-52	-48	-44
5	-113	-48	-73	-67	-113	-131	-157	-167	0	-83	-84	-100

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

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

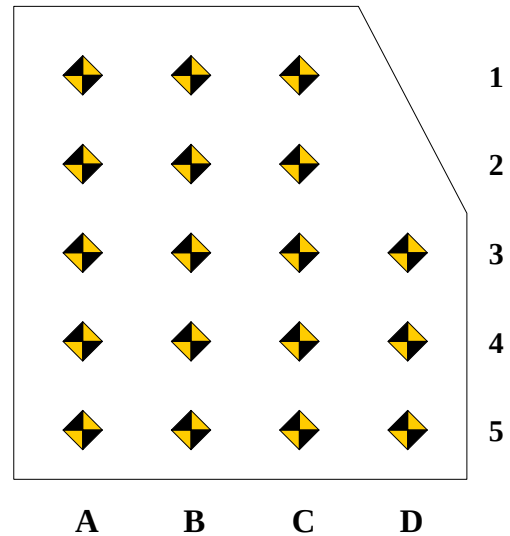
NHTSA No.: M60110
 Test Date: 10/19/05

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	258	259	261		558	572	569		300	313	308	
2	360	360	361		486	491	508		126	131	147	
3	453	455	455	263	374	386	412	422	-79	-69	-43	159
4	557	558	556	361	359	338	332	337	-198	-220	-224	-24
5	634	631	633	457	271	260	256	252	-363	-371	-377	-205

PASSENGER FLOOR PAN Z-AXIS

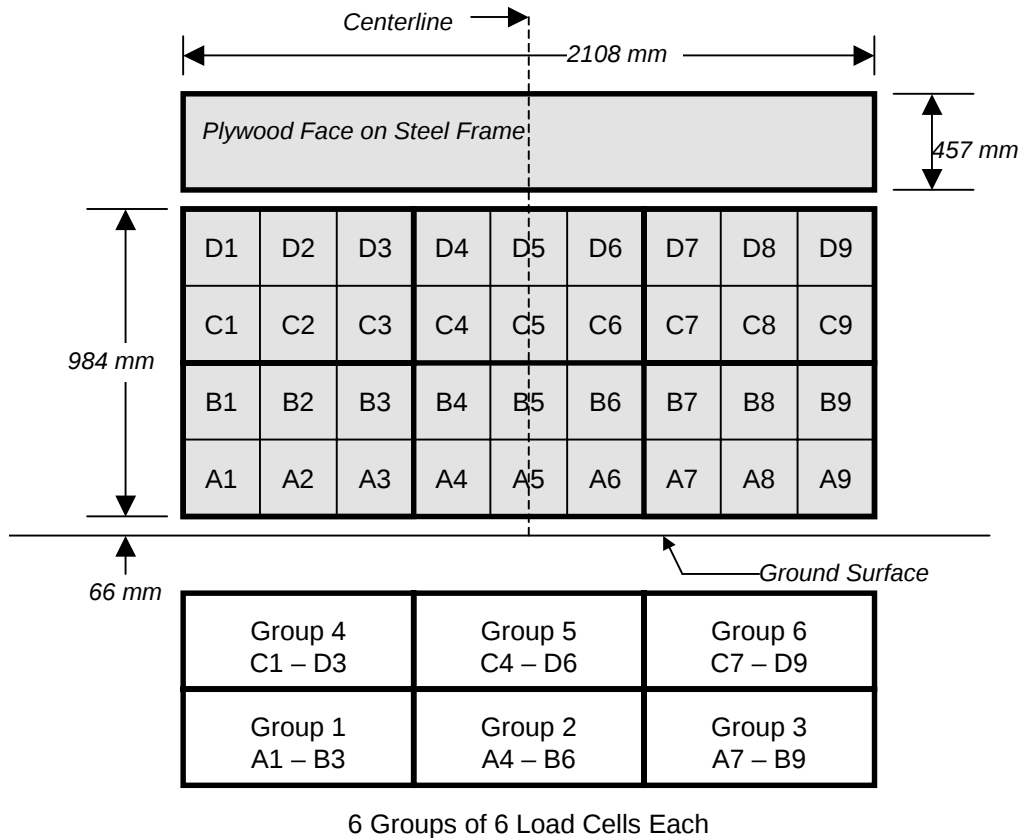
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-118	-119	-106		45	62	72		163	181	178	
2	-119	-119	-100		-16	3	-10		103	122	90	
3	-90	-92	-90	-104	-8	-11	-54	-65	82	81	36	39
4	-83	-80	-83	-100	-102	-97	-101	-109	-19	-17	-18	-9
5	-13	-12	-11	-89	-126	-139	-134	-113	-113	-127	-123	-24

DATA SHEET NO. 17
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

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



DATA SHEET NO. 18
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
 Test Date: 10/19/05

VEHICLE INFORMATION

VIN: 2G1WB58K069119598
 Vehicle Size Category: 4-Door

Wheel base (mm): 2805
 Test Weight (kg): 1851

ACCELEROMETER DATA

Accelerometer Location: Left rear cross member
 Cal. Procedure/Interval: 6 months / drop test
 Integration Algorithm: NHTSA Standard
 Impact Velocity (km/h): 56.57
 Velocity Change (km/h): 64.3

Linearity: Good

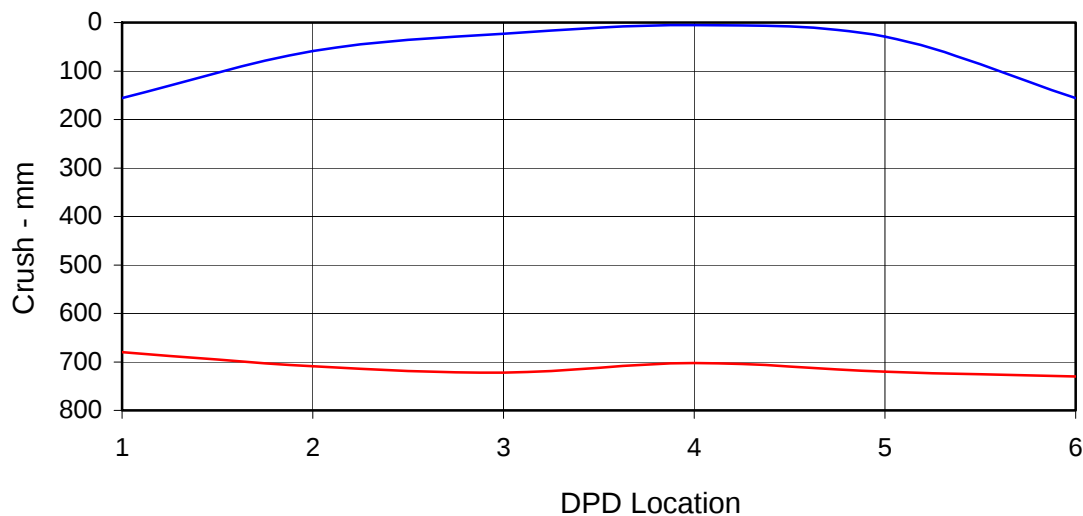
Time of Separation (msec): 89.7

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6
 Damage Region Length (mm): 1249

Midpoint of Damage: Vehicle Centerline
 Impact Mode: Full Frontal

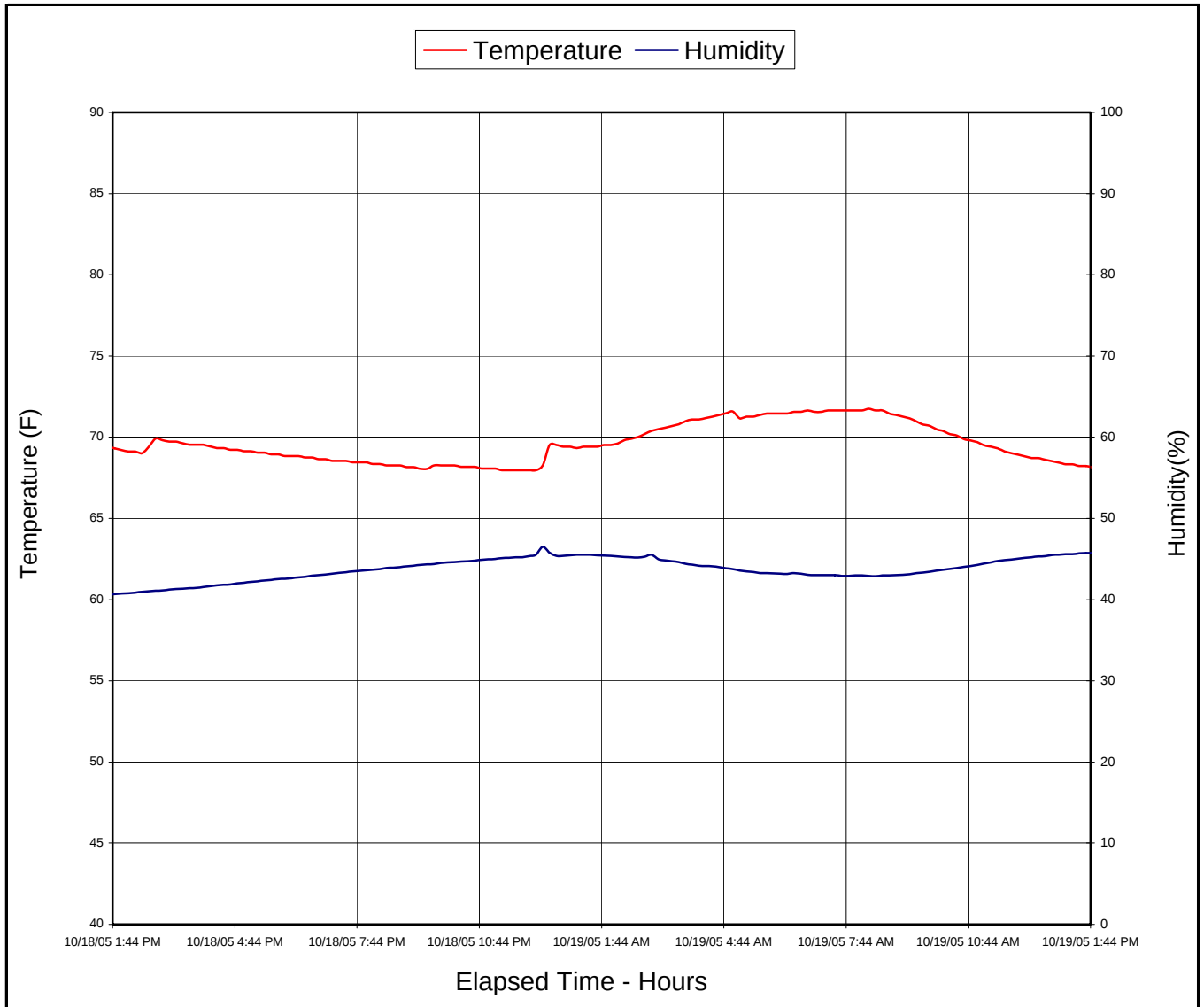
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	156	680	-524
C2	Crush zone 2 on left side	mm	59	709	-650
C3	Crush zone 3 on left side	mm	23	722	-699
C4	Crush zone 4 on right side	mm	5	702	-697
C5	Crush zone 5 on right side	mm	29	720	-691
C6	Crush zone 6 at right side	mm	156	730	-574



DATA SHEET NO. 19
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
Test Program: 2006 NHTSA 35mph NCAP

NHTSA No.: M60110
Test Date: 10/19/05



APPENDIX A
PHOTOGRAPHS

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A-49	Post-Test Passenger Dummy (Door Open)	A-49
A-50	Pre-Test Passenger Dummy Feet	A-50
A-51	Post-Test Passenger Dummy Feet	A-51
A-52	Pre-Test Passenger Side Glove Box	A-52
A-53	Post-Test Passenger Side Glove Box	A-53
A-54	Pre-Test Passenger Side Floor Pan	A-54
A-55	Post-Test Passenger Side Floor Pan	A-55
A-56	Post-Test Passenger Dummy Head	A-56
A-57	Post-Test Passenger Dummy Airbag Contact	A-57
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A-60	Vehicle on Rollover Device (180°)	A-60
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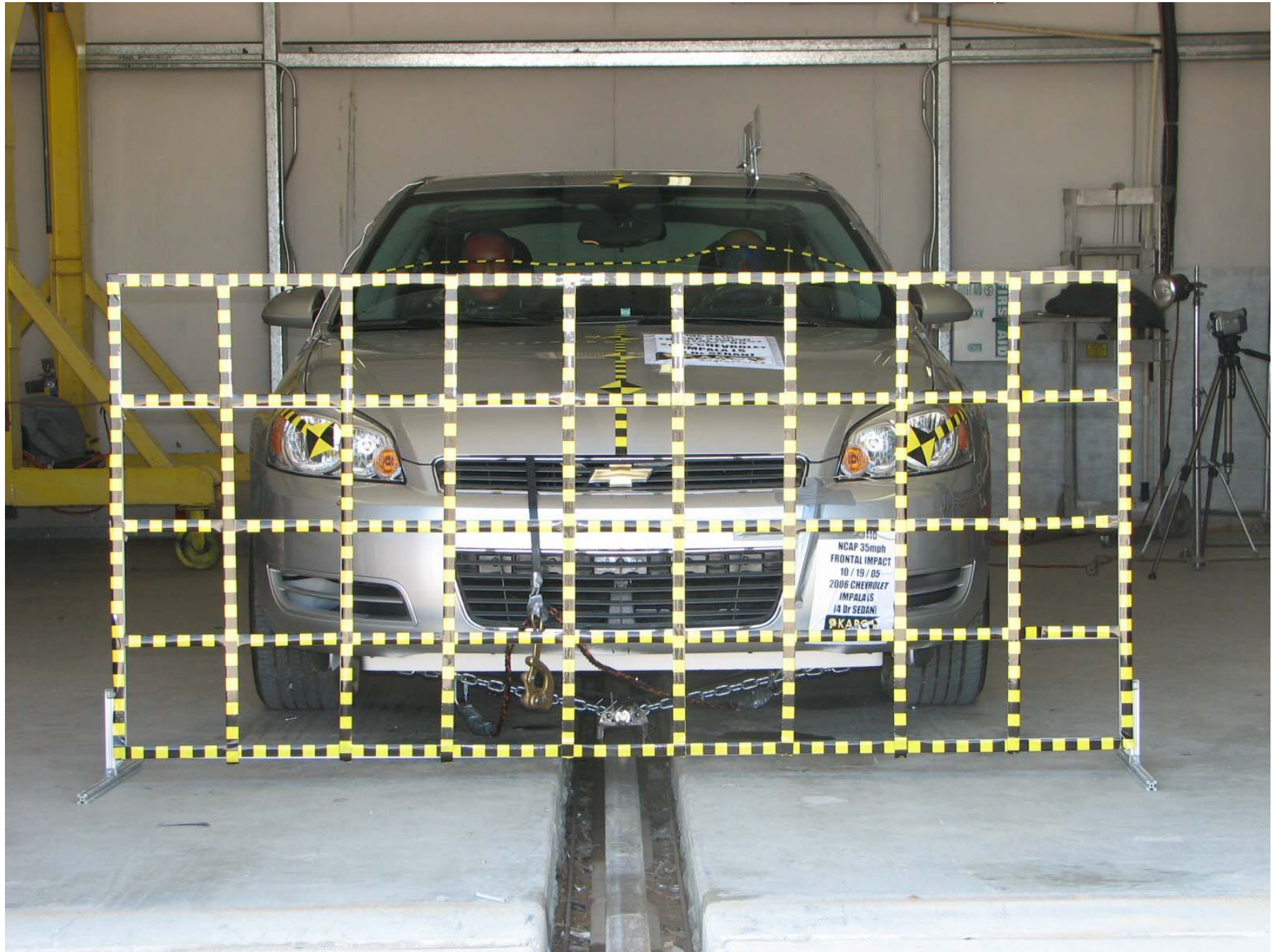


Figure A-1: Load Cell Location

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MFD BY GENERAL MOTORS OF CANADA LTD.

DATE	GVWR	GAWR FRT	GAWR RR
08/05	2122 KG	1145 KG	977 KG
	4678 LB	2524 LB	2154 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.

2G1WB58K069119598 TYPE: PASS CAR

Figure A-2: Manufacturer's Label



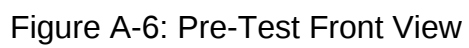
Figure A-3: Tire Placard



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



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



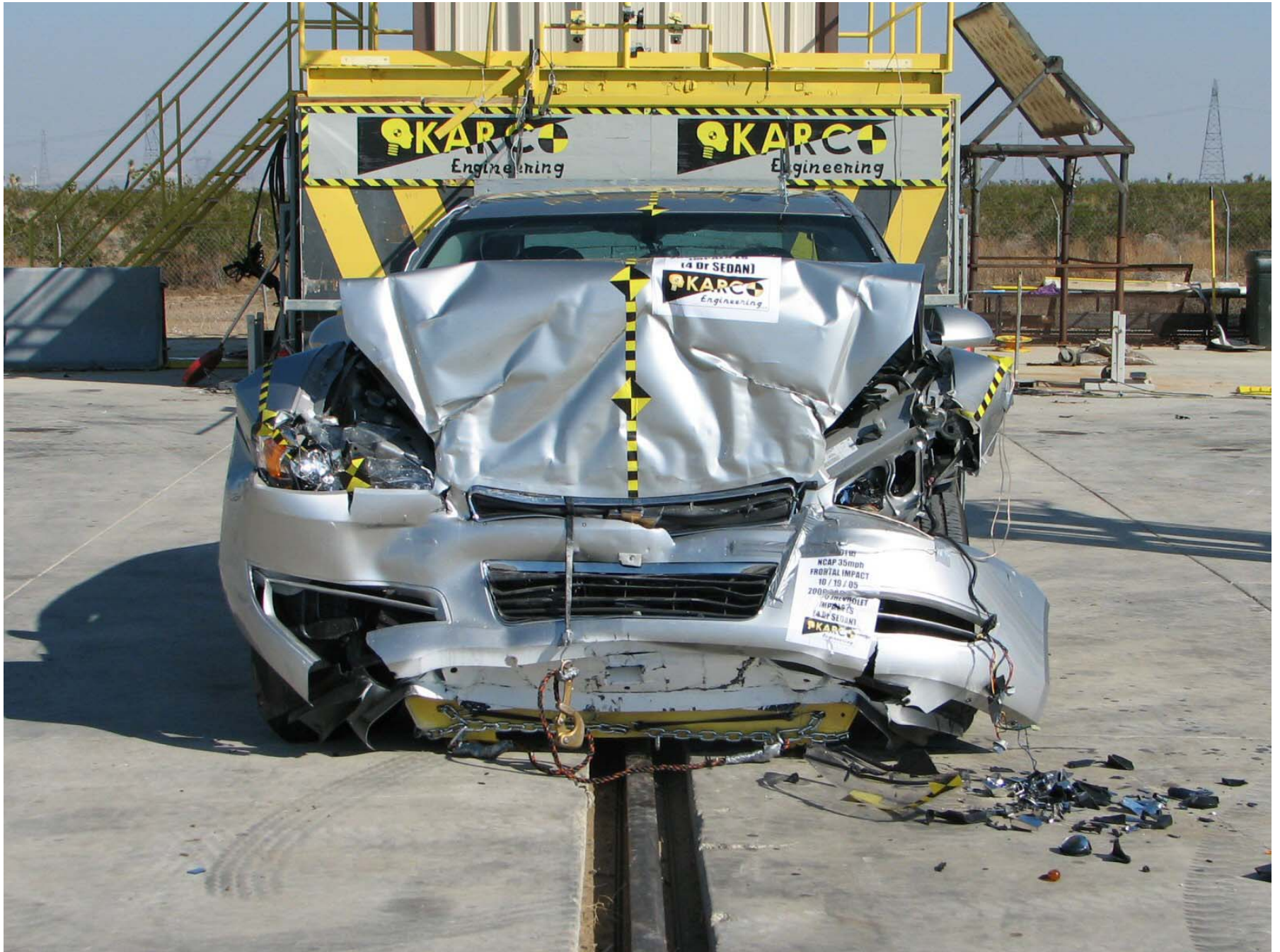


Figure A-7: Post-Test Front View (Vehicle Moved)



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 ¾ View



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



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



Figure A-15: Post-Test Left Rear ¾ 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

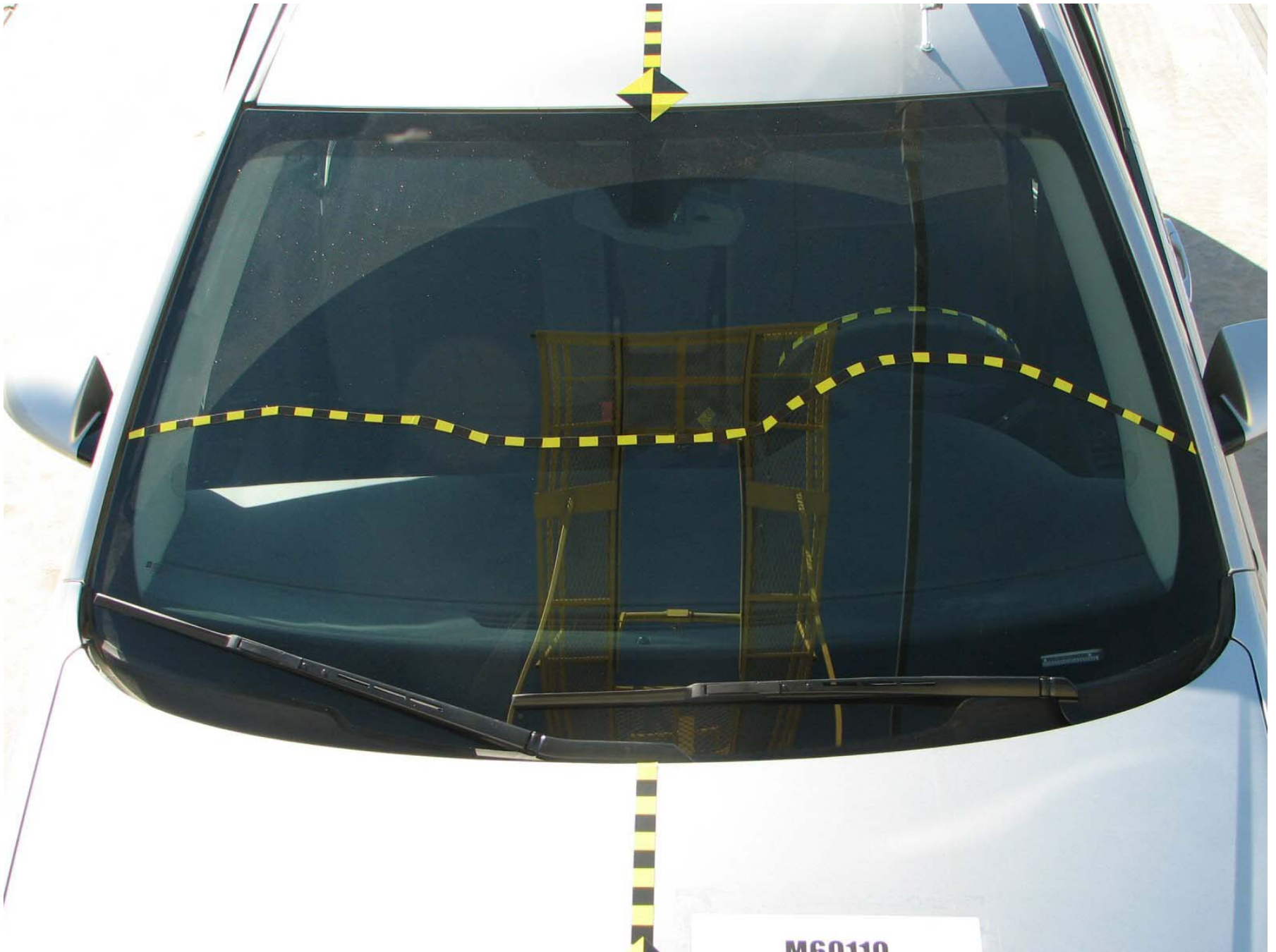


Figure A-18: Pre-Test Windshield



Figure A-19: Post-Test Windshield



Figure A-20: Pre-Test Engine Compartment

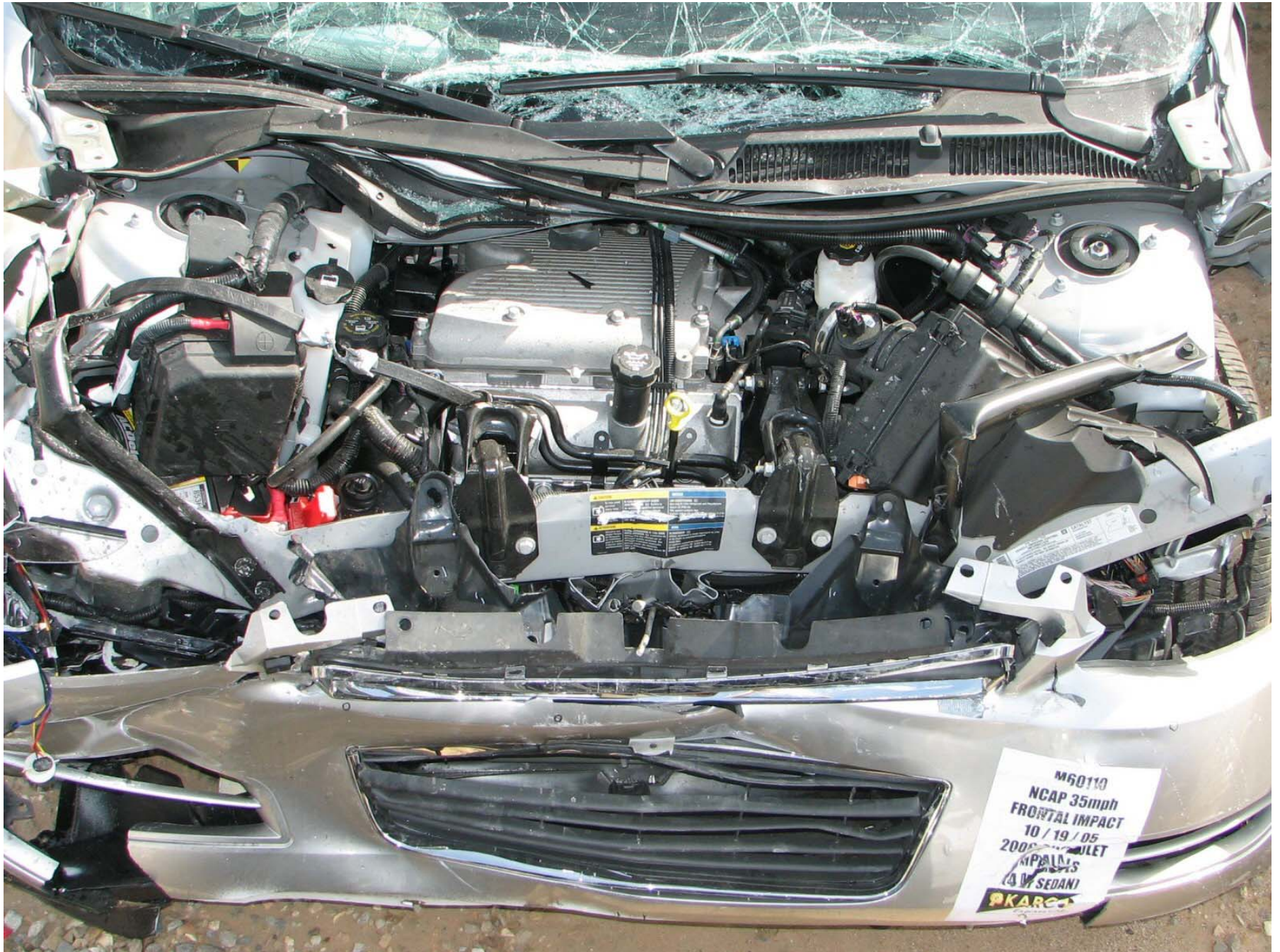


Figure A-21: Post-Test Engine Compartment (Vehicle Moved)



Figure A-22: Pre-Test Fuel Cap



2006 CHEVROLET IMPALA LS
M60110
STODDARD SOLVENT ADDED
16.2 GALLONS
(61.3) LITERS)



Figure A-23: Post-Test Fuel Cap

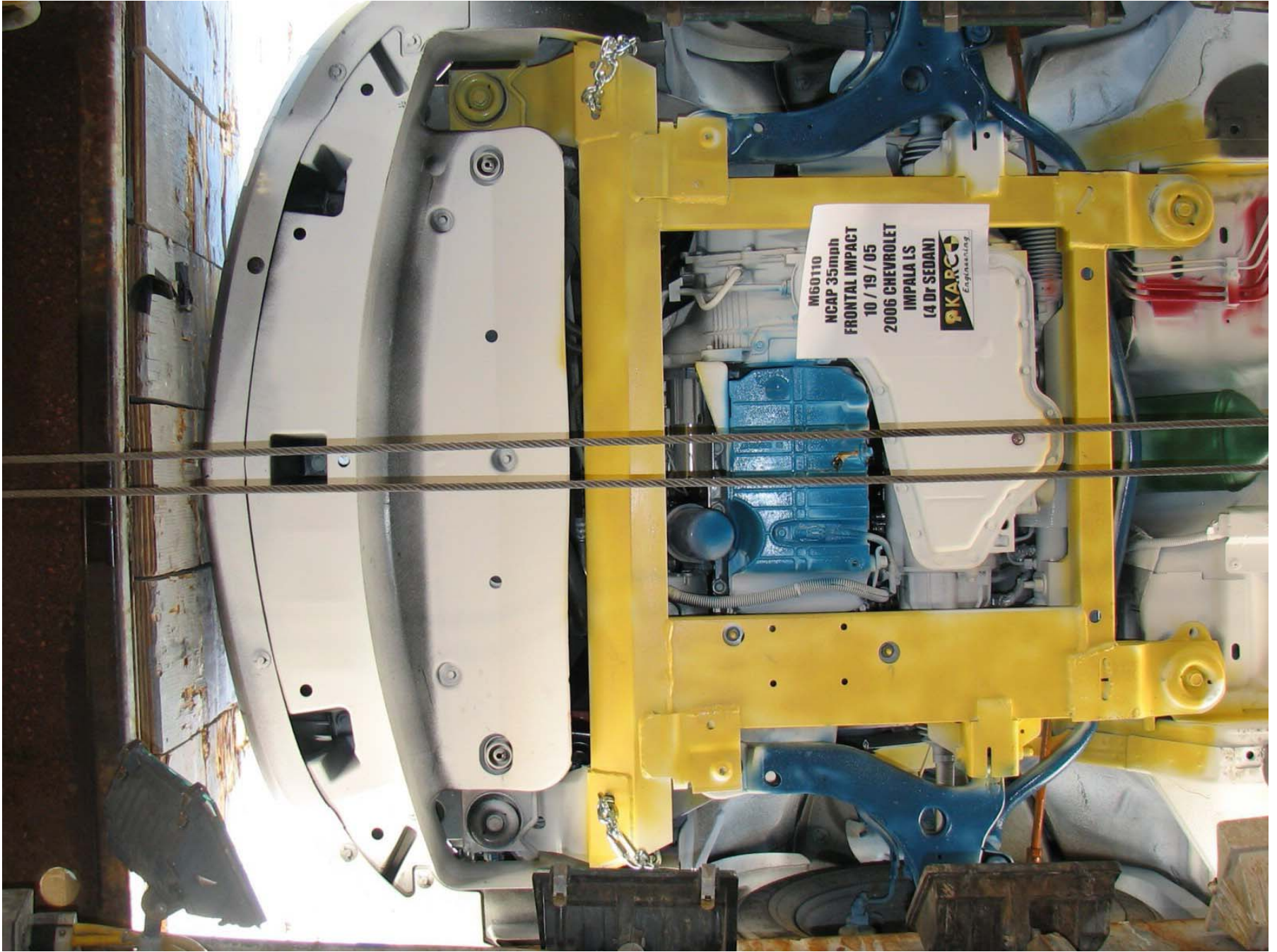


Figure A-24: Pre-Test Front Underbody

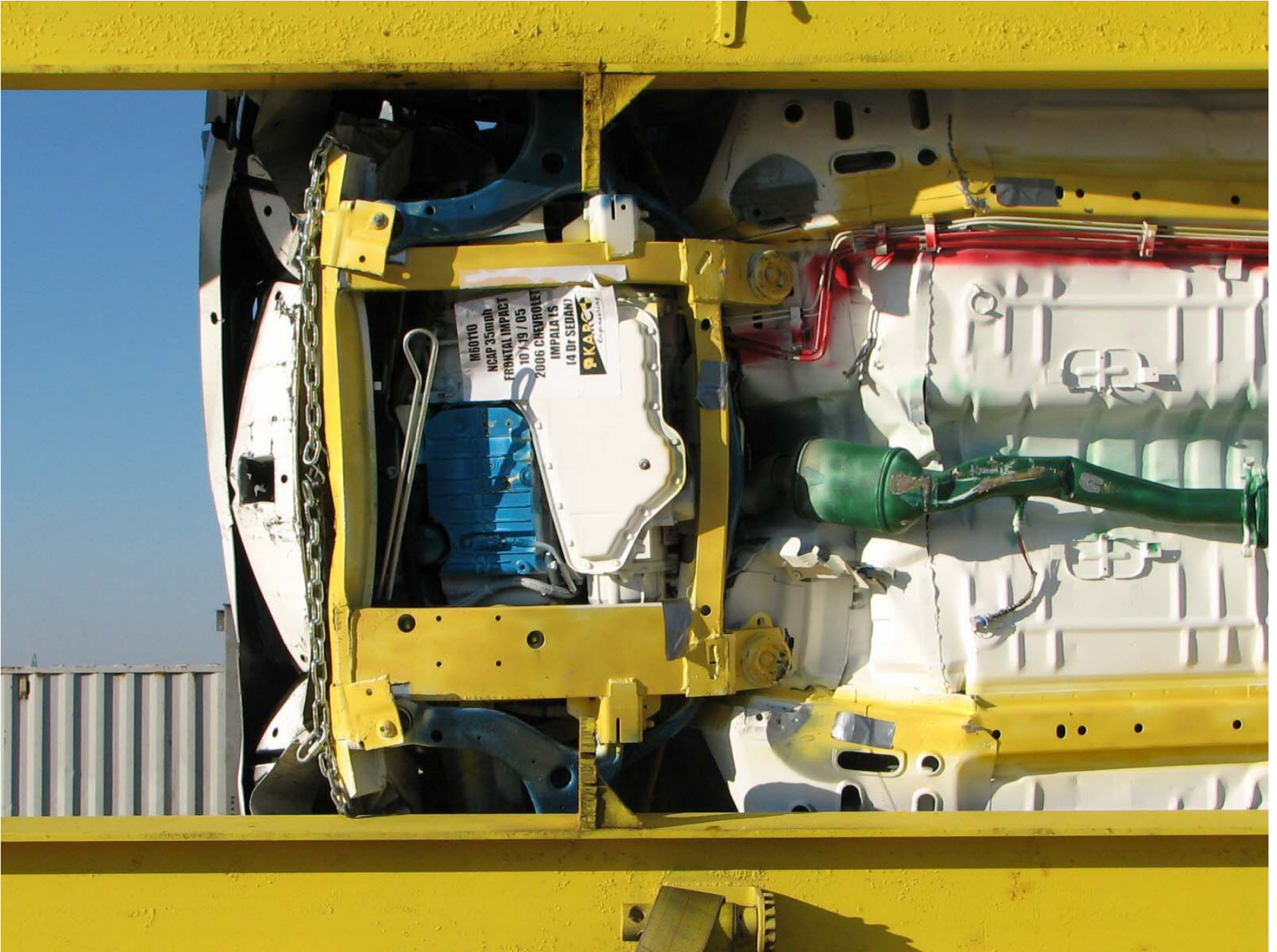


Figure A-25: Post-Test Front Underbody

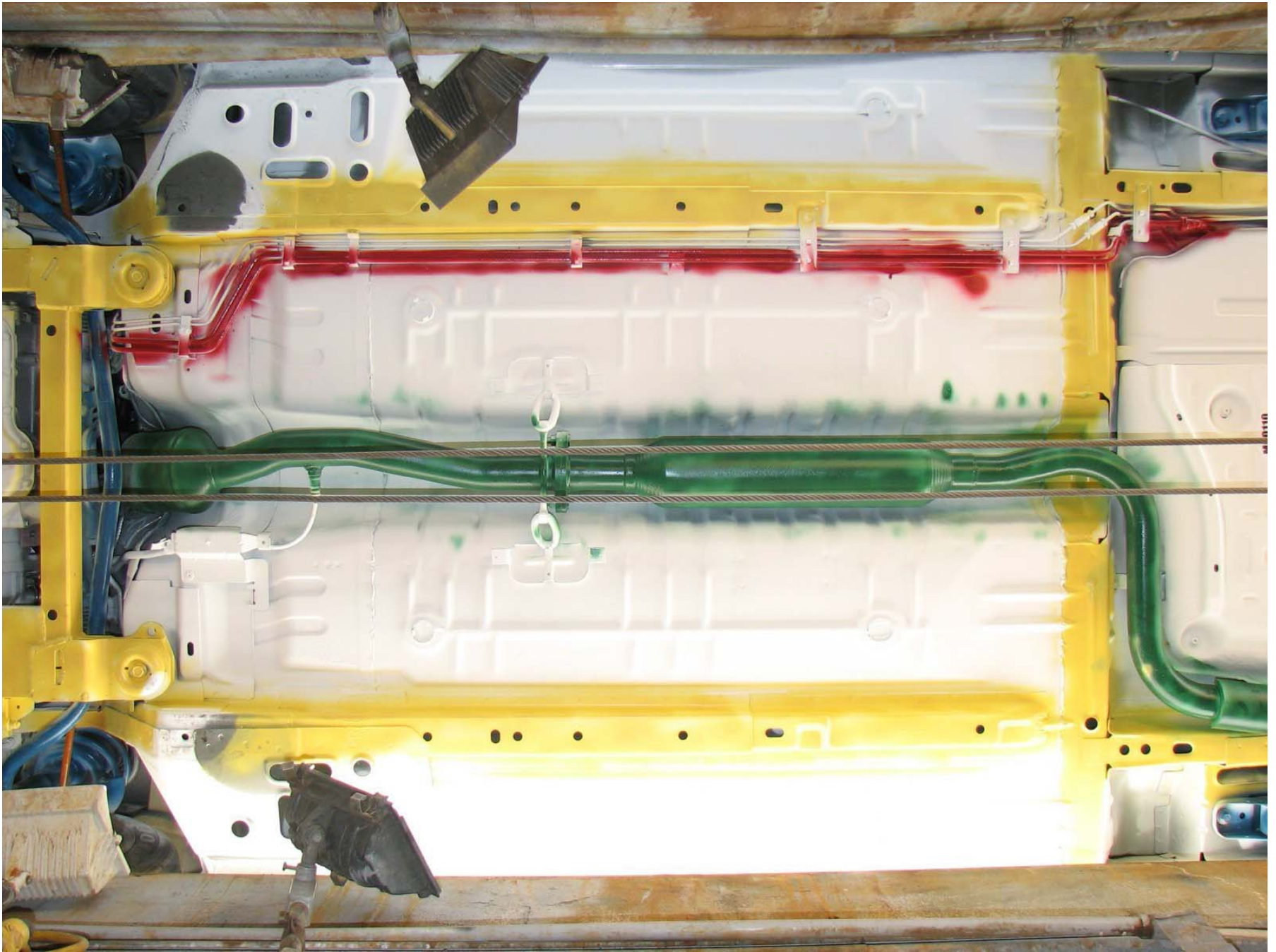


Figure A-26: Pre-Test Mid Underbody

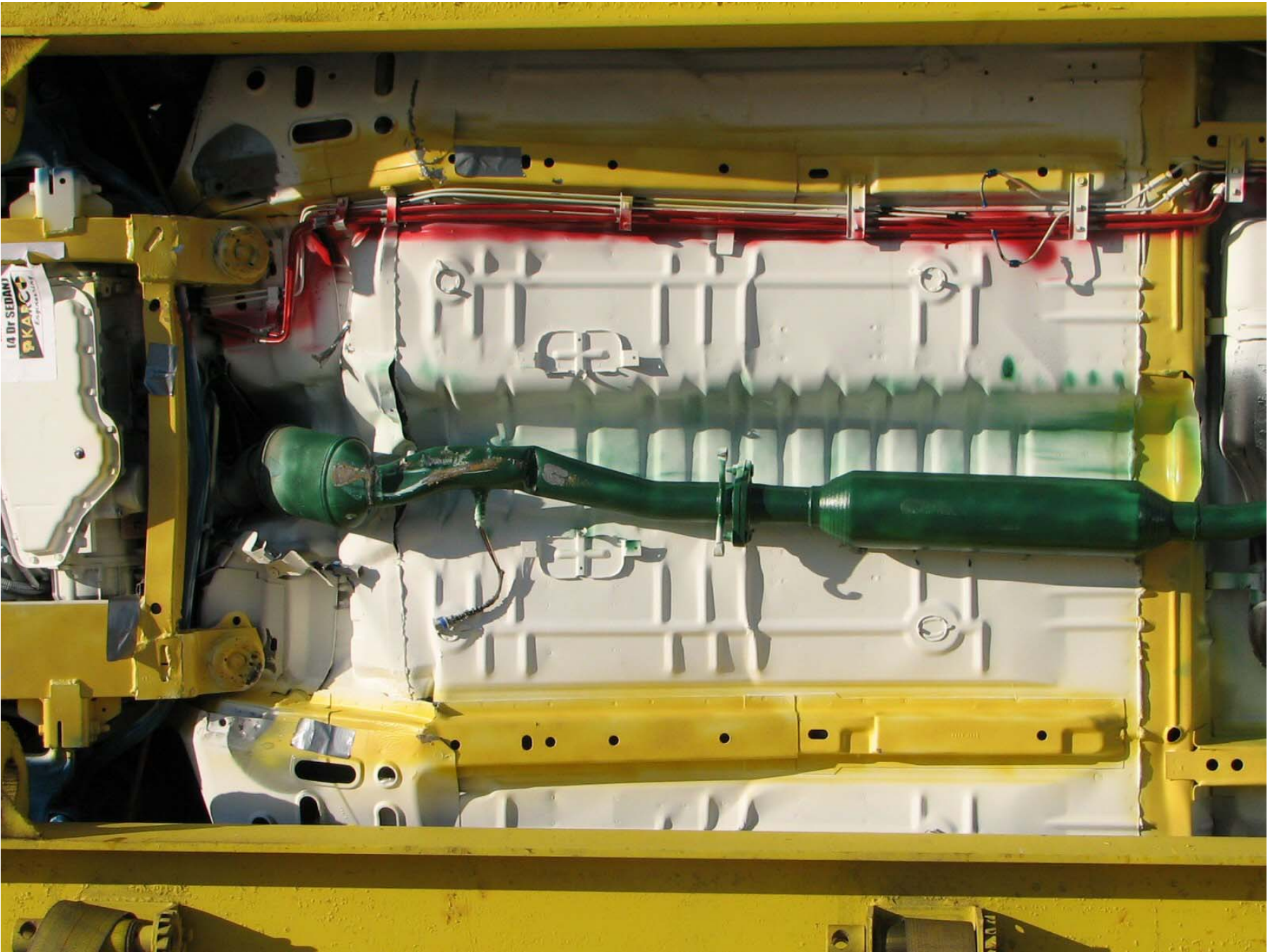


Figure A-27: Post-Test Mid Underbody

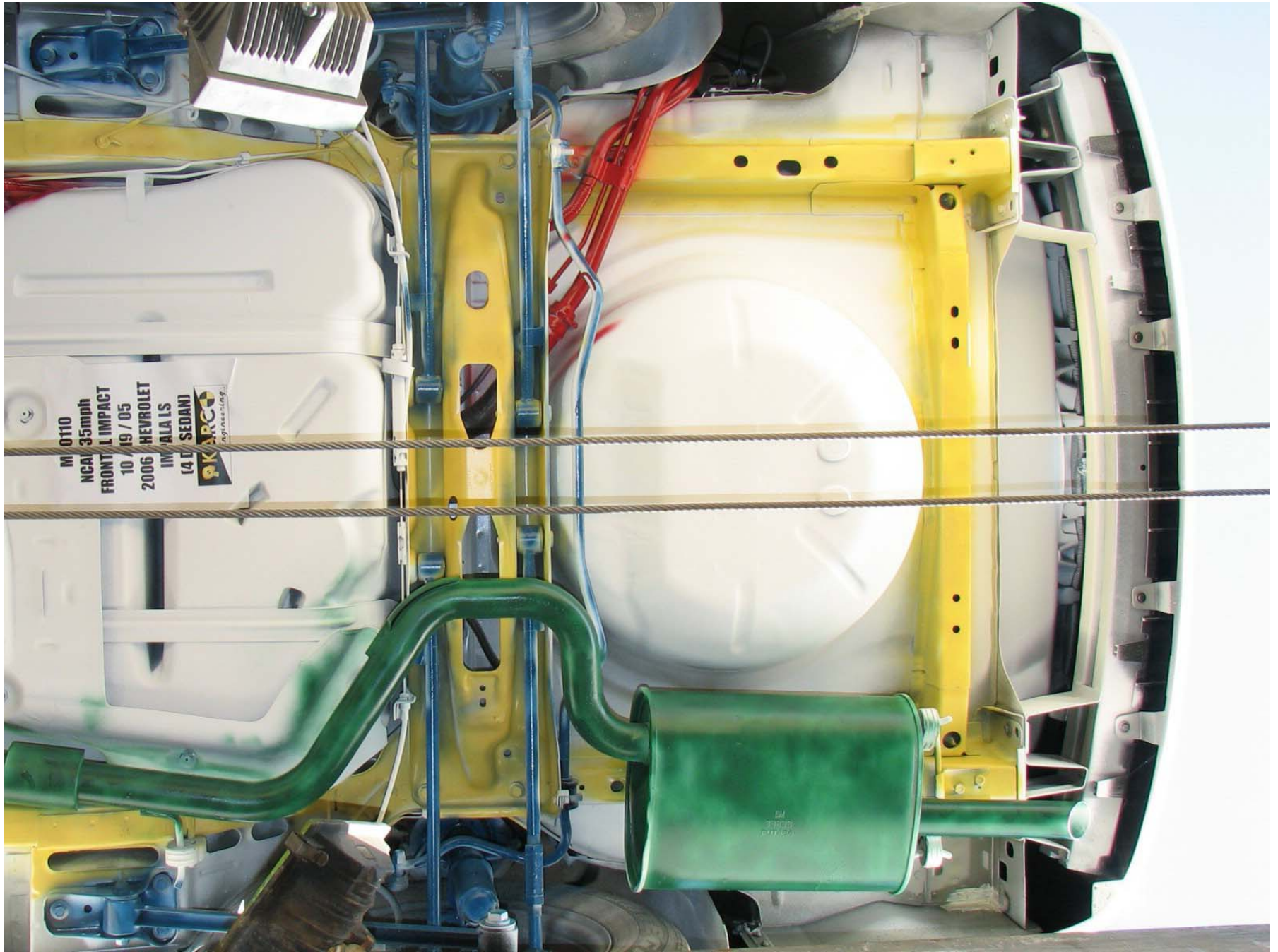


Figure A-28: Pre-Test Rear Underbody



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)

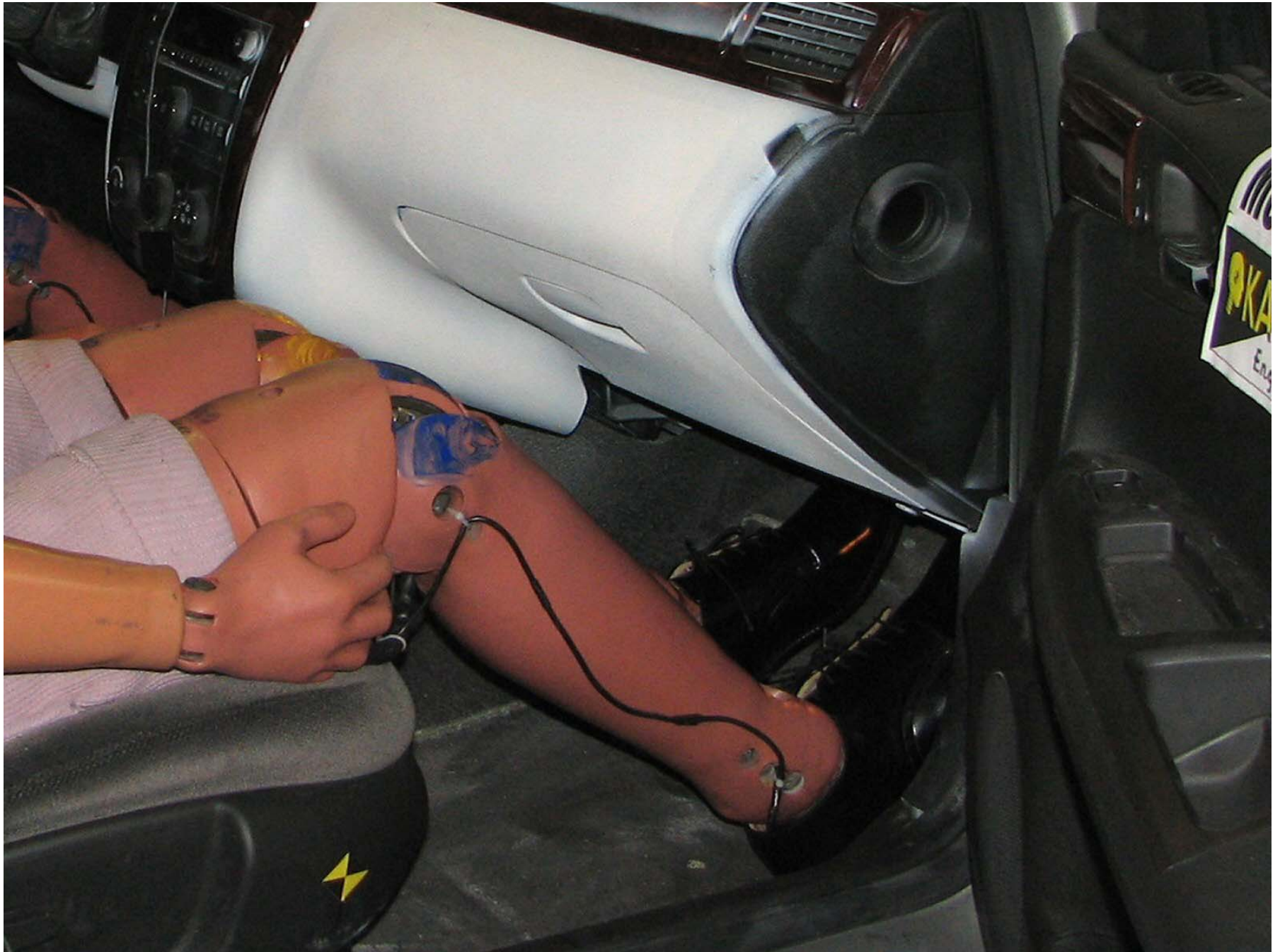


Figure A-50: Pre-Test Passenger Dummy Feet



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

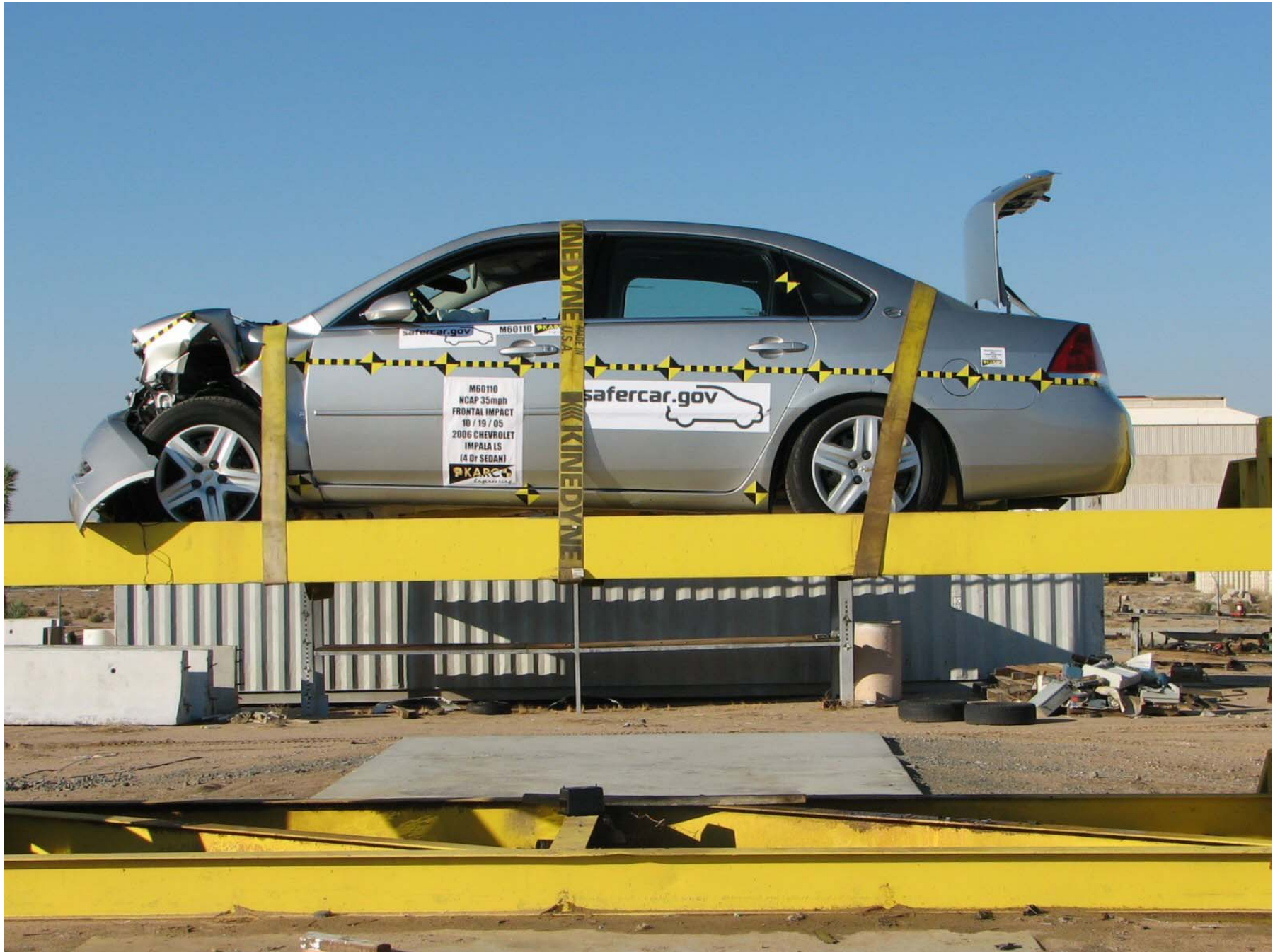


Figure A-58: Vehicle on Rollover Device (0°)



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



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

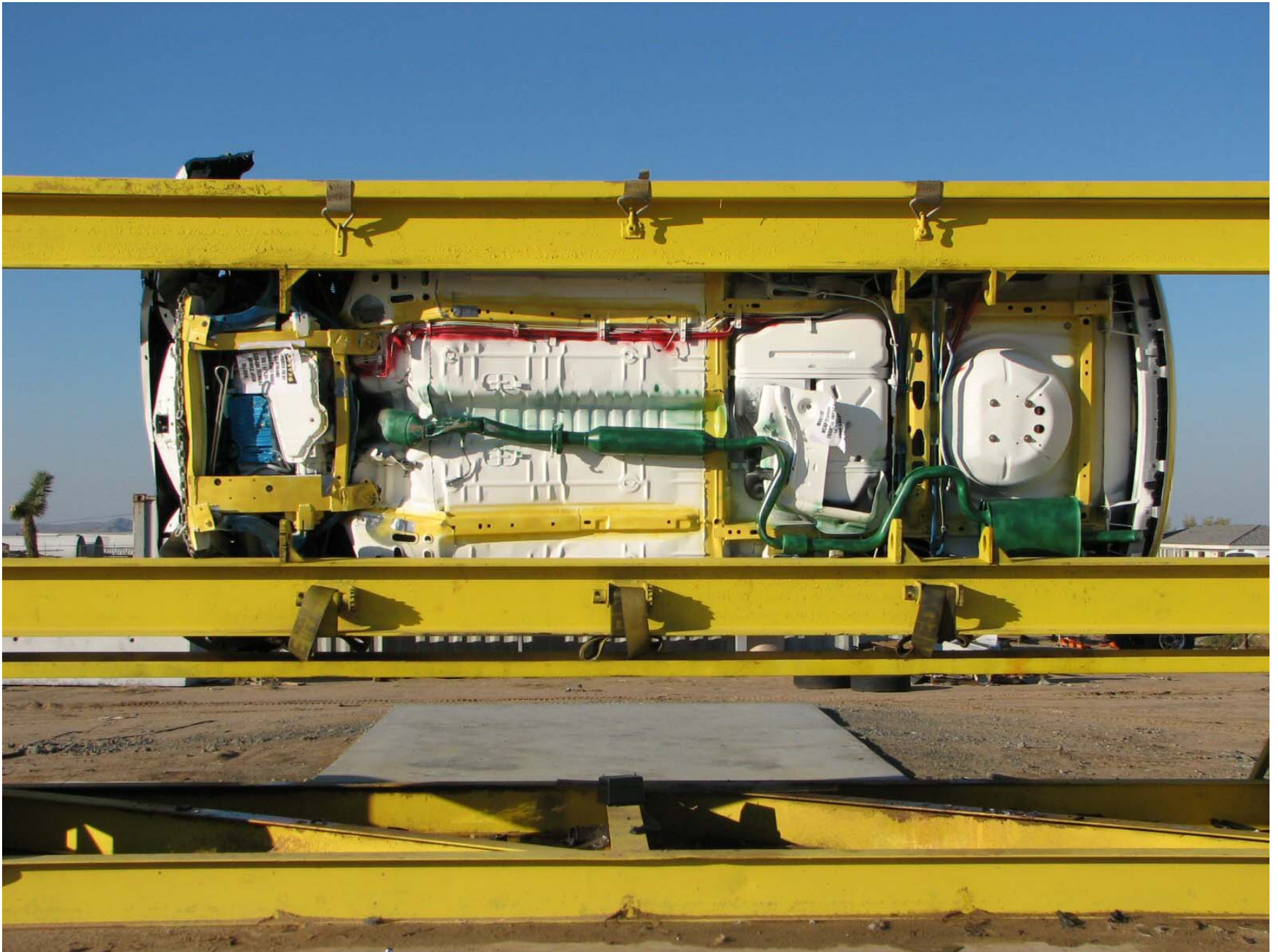


Figure A-61: Vehicle on Rollover Device (270°)



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.

- 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)

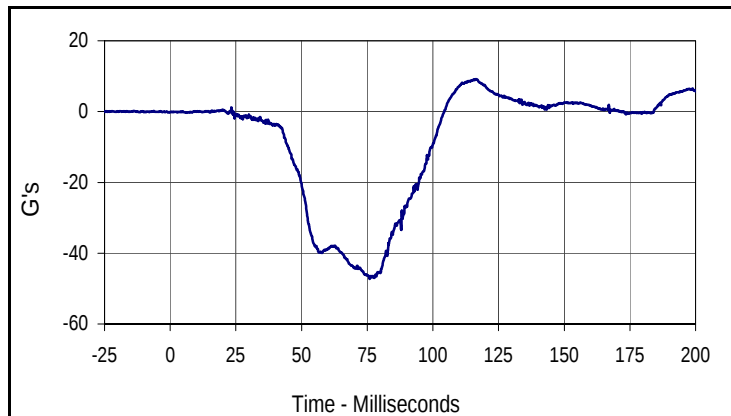
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X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

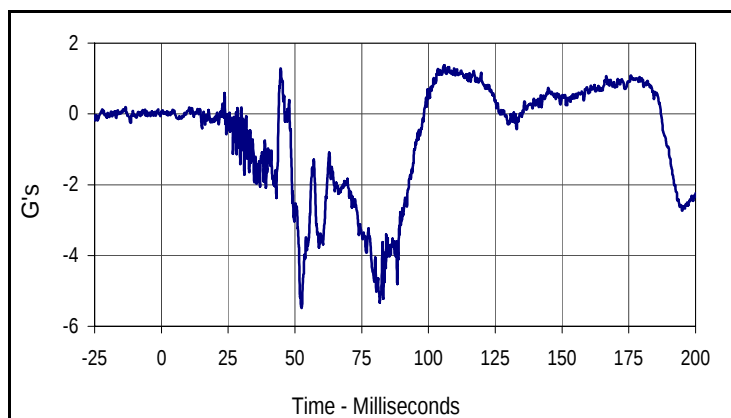
Vehicle Left Rear X Displacement
Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
Vehicle Left Brake 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: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

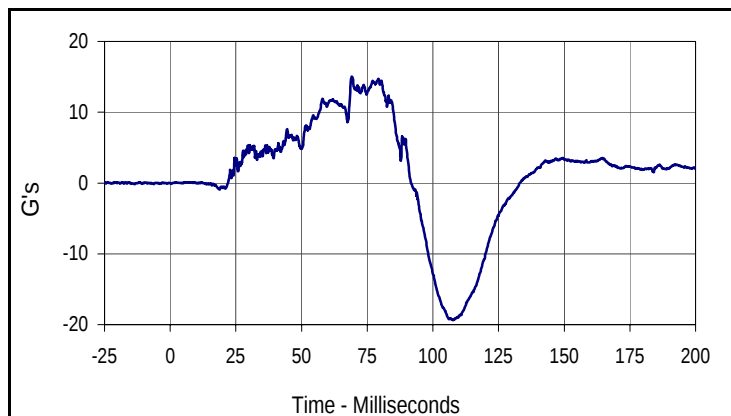
Test Date: 10/19/05
 NHTSA No.: M60110



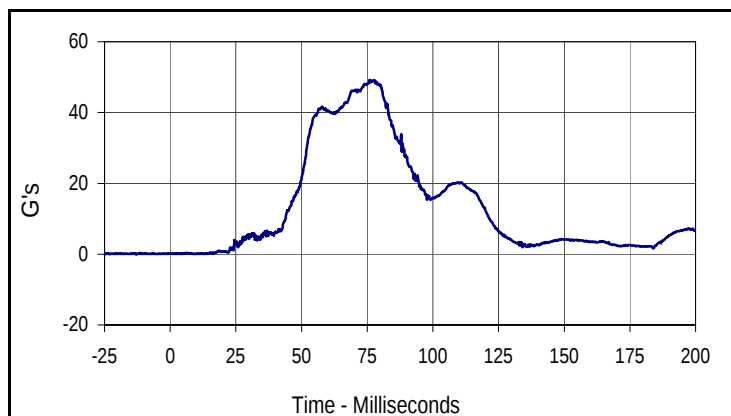
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CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
9.2	116.5	-47.2	76.0



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.4	106.0	-5.5	52.5



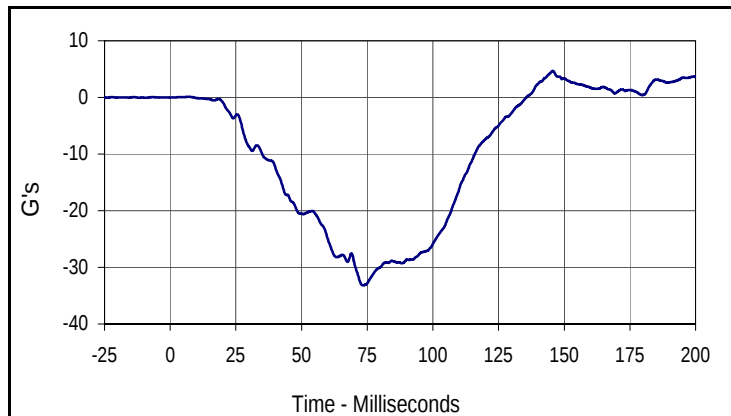
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
15.0	69.1	-19.4	107.6



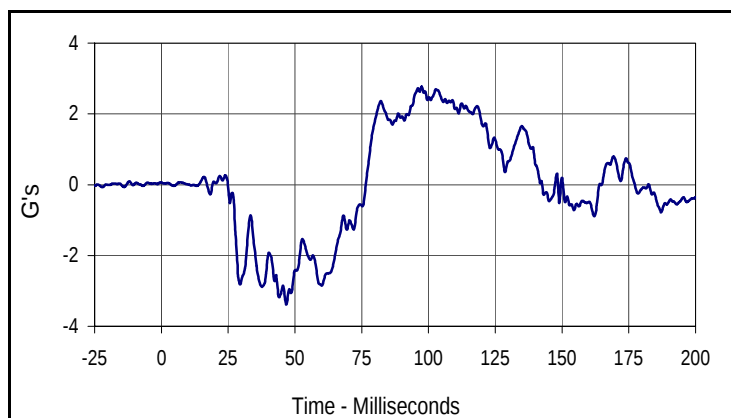
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
49.3	76.0	0.1	9.0

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

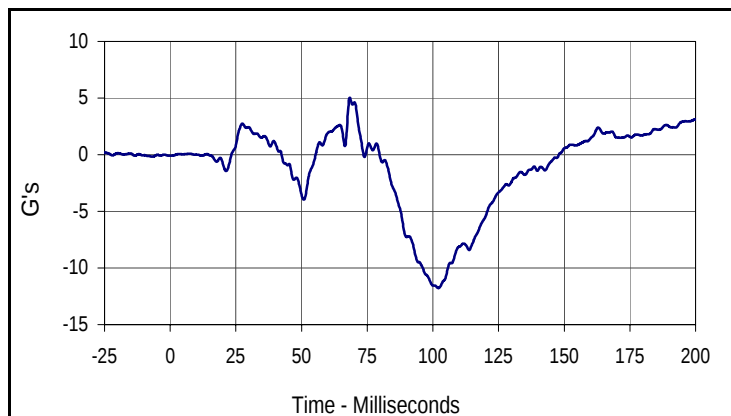
Test Date: 10/19/05
 NHTSA No.: M60110



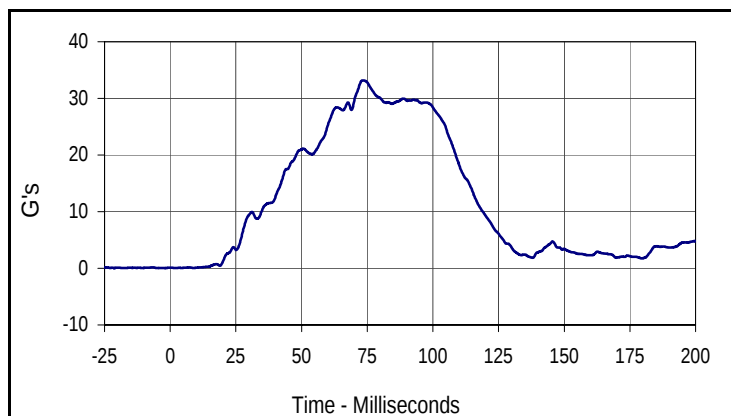
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Driver Chest Primary X			
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Max	Time	Min	Time
4.7	145.6	-33.2	73.4



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
2.8	97.5	-3.4	46.8



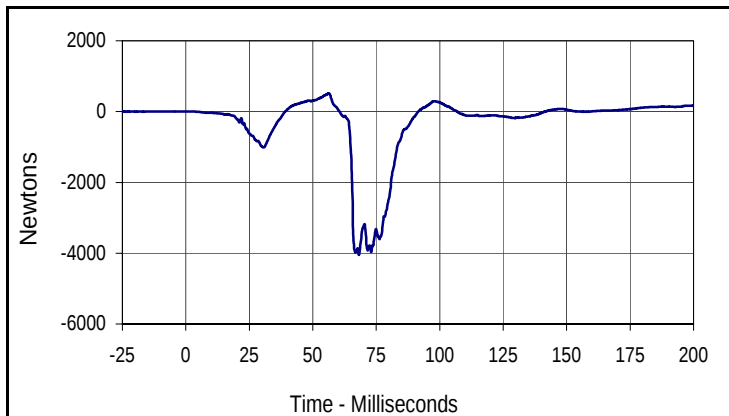
Curve Description			
Driver Chest Primary Z			
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Max	Time	Min	Time
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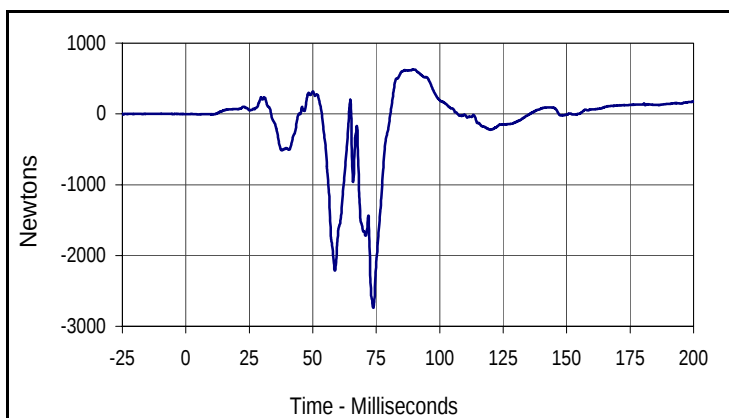
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
33.2	73.4	0.0	9.0

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05
 NHTSA No.: M60110



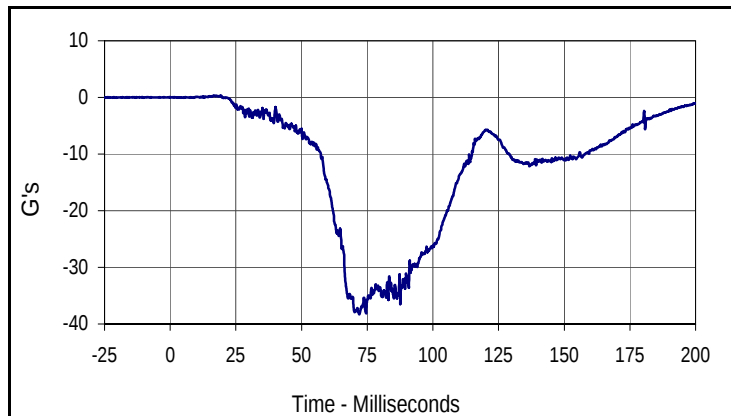
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
513.4	56.3	-4050.3	68.2



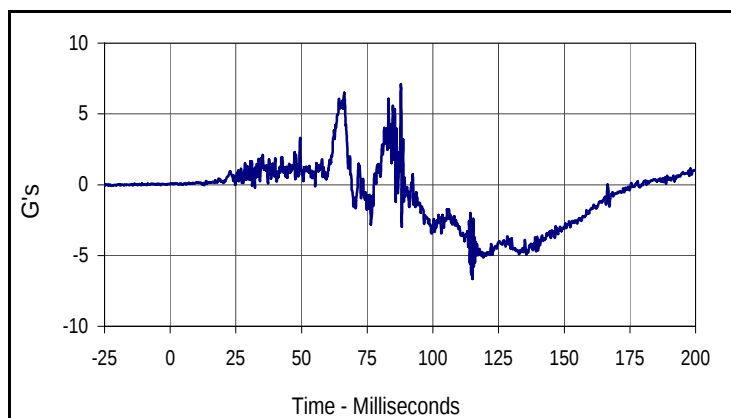
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
627.2	89.6	-2739.7	73.9

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

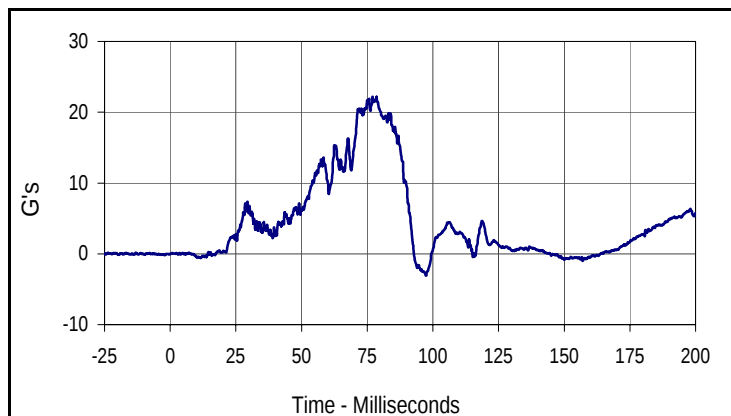
Test Date: 10/19/05
 NHTSA No.: M60110



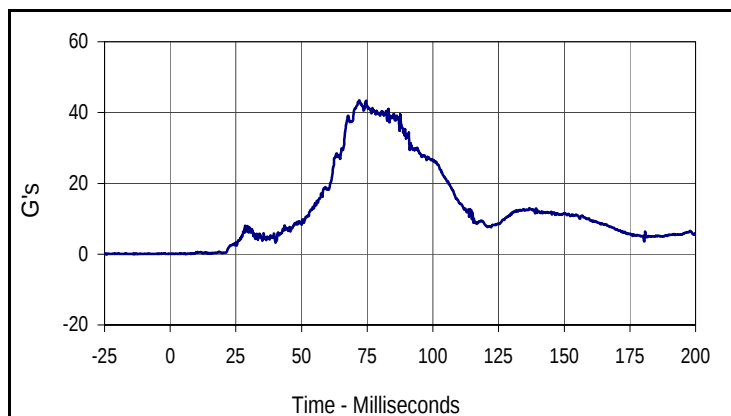
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
0.3	19.4	-38.3	72.0



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
7.1	87.8	-6.6	115.1



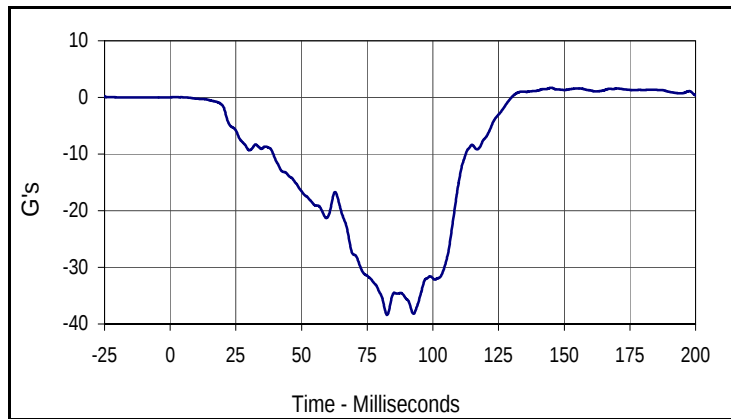
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
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Max	Time	Min	Time
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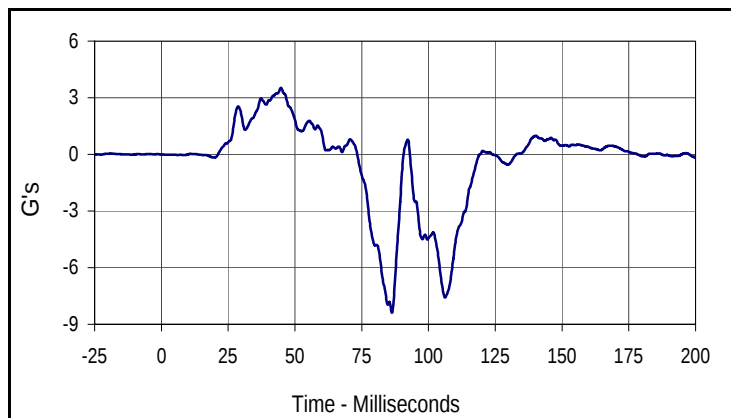
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
43.5	72.0	0.0	6.0

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

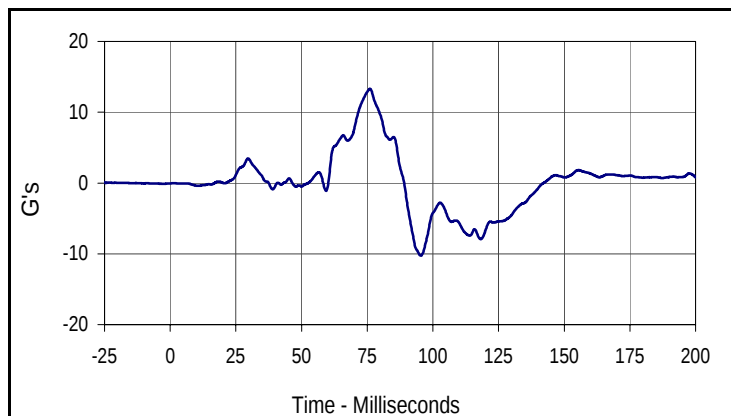
Test Date: 10/19/05
 NHTSA No.: M60110



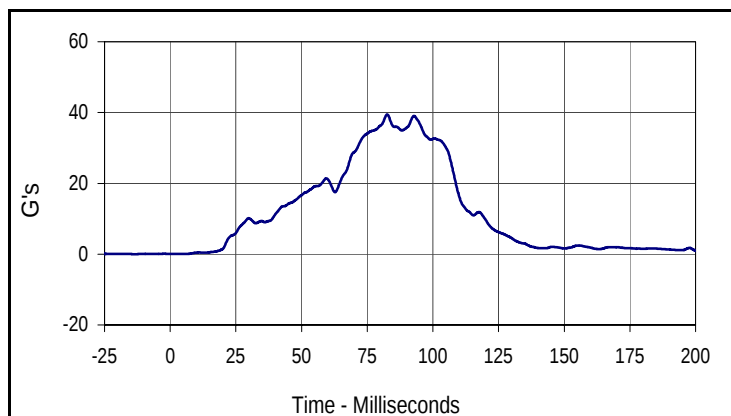
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
1.7	145.0	-38.4	82.5



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
3.5	44.8	-8.4	86.3



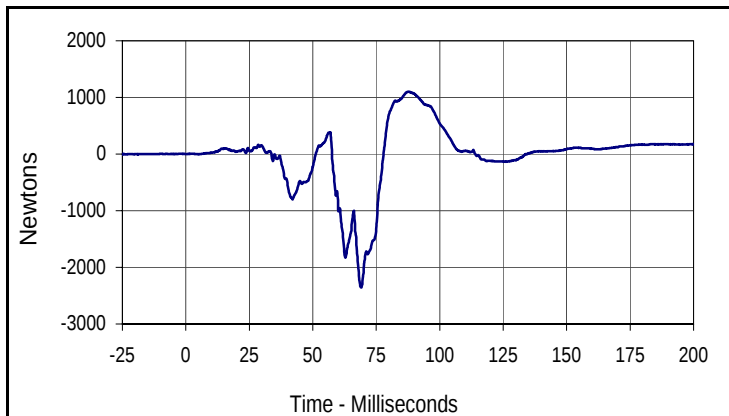
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
13.3	76.0	-10.3	95.4



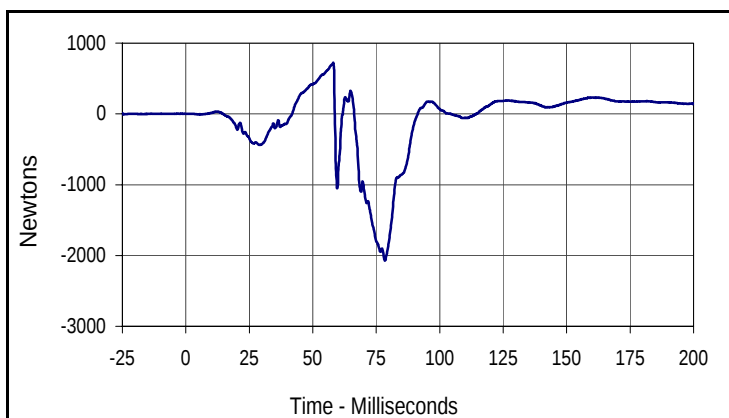
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
39.4	82.6	0.0	0.8

Test Vehicle: 2006 Chevrolet Impala 4-Door Sedan
 Test Program: 2006 NHTSA 35mph NCAP

Test Date: 10/19/05
 NHTSA No.: M60110



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
1101.4	87.8	-2354.4	69.0



Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
722.5	58.1	-2071.6	78.4

APPENDIX C

DUMMY CALIBRATION DATA

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

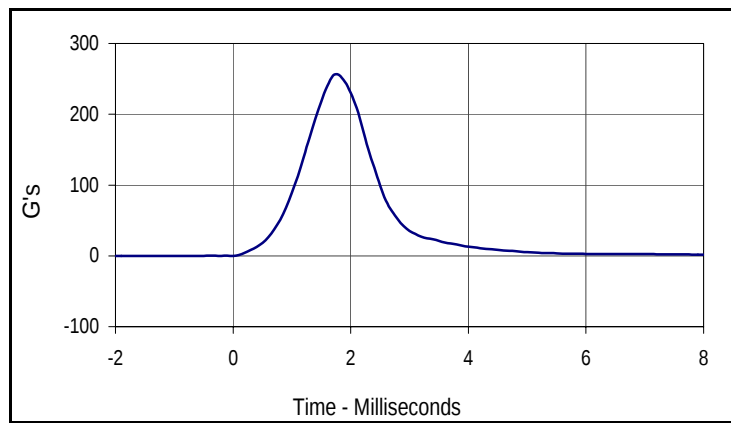
Test Date: 10/5/05

ATD Serial No.: 034

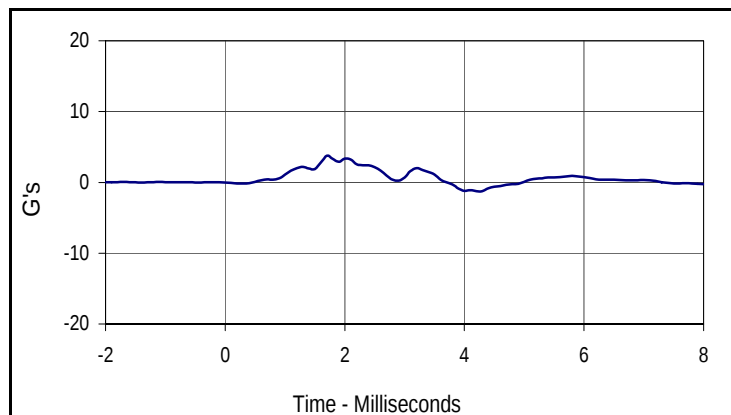
Test I.D.: HD10A



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	255.9	Pass
Peak Lateral Acceleration	G's	≤15.0	3.8	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
255.9	1.8	0.0	-1.5



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.8	1.7	-1.2	4.2

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

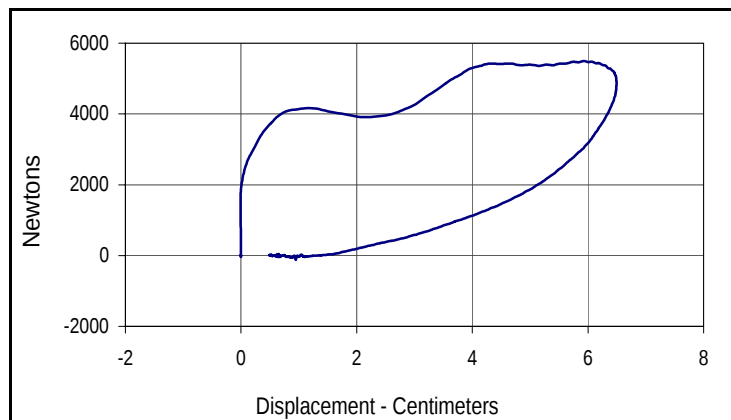
Test Date: 10/7/05

ATD Serial No.: 034

Test I.D.: CH10A



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	6.74	Pass
Peak Probe Force	Newtons	5159 to 5893	5493	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.49	Pass
Internal Hysteresis	%	69 to 85	76.3	Pass
Overall Test Results				Pass



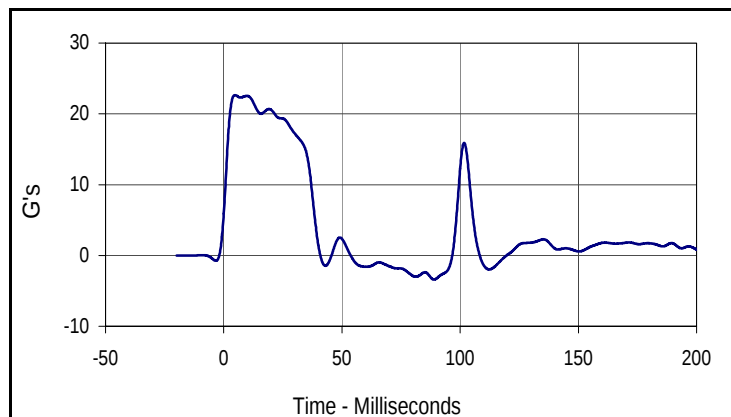
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	76.3
Peak Probe Force		Peak Chest Deflection	
5493		6.49	

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

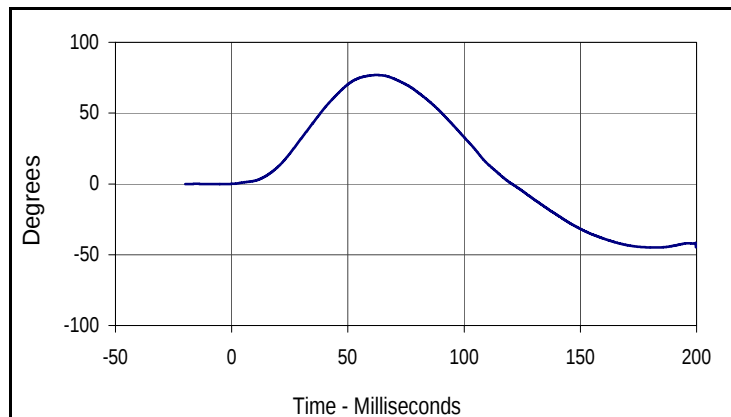
Test Date: 10/6/05
 Test I.D.: NF10A



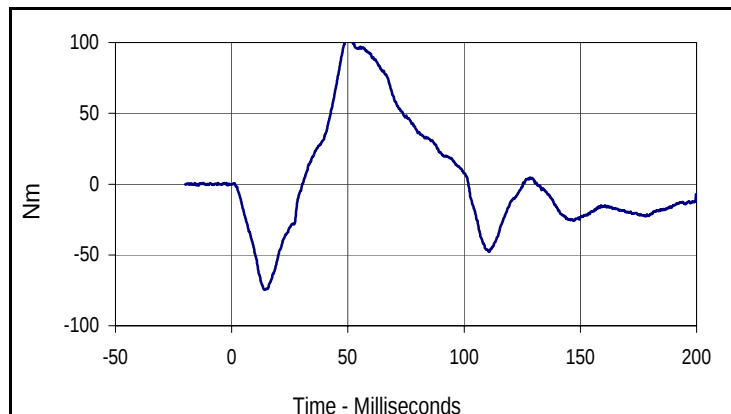
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.98	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.5	Pass
	20 Msec.	G's	17.6 to 22.6	20.6	Pass
	30 Msec.	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

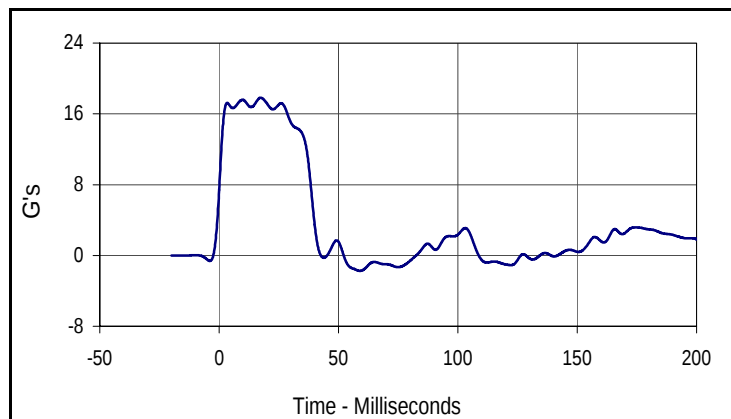
Test Date: 10/6/05

ATD Serial No.: 034

Test I.D.: NE10A



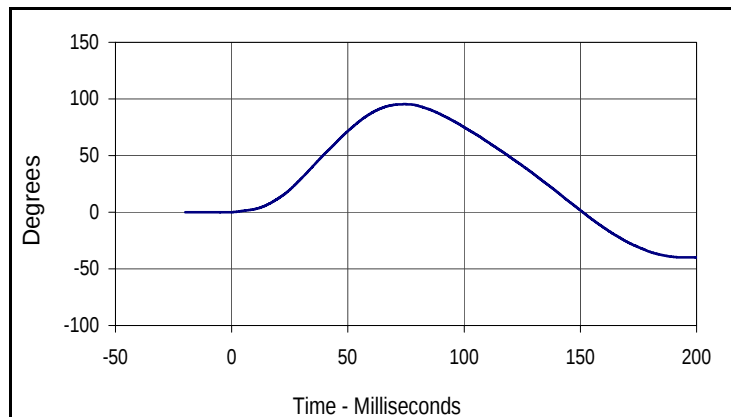
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.01	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.6	Pass
	20 Msec.	G's	14.0 to 19.0	17.2	Pass
	30 Msec.	G's	11.0 to 16.0	15.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.4	Pass
	Time	Msec.	72.0 to 82.0	74.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151.1	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-76.2	Pass
	Time	Msec.	65.0 to 79.0	66.5	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.0	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

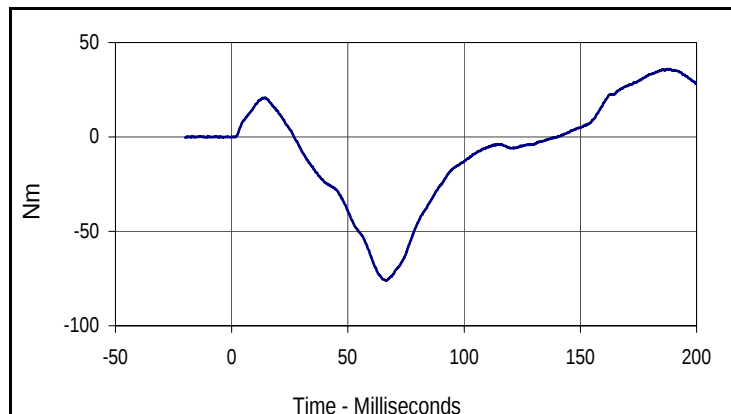
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.8	17.3	-1.7	59.0



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.4	74.4	-39.9	197.4



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.0	187.9	-76.2	66.5

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

Test Date: 10/5/05

ATD Serial No.: 034

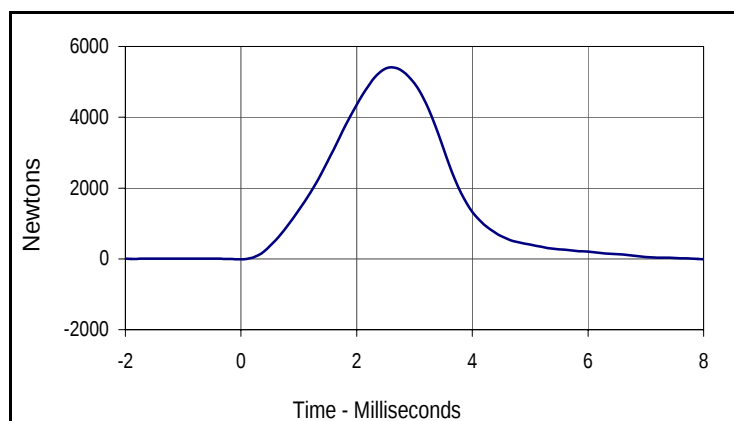
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**Left Knee**

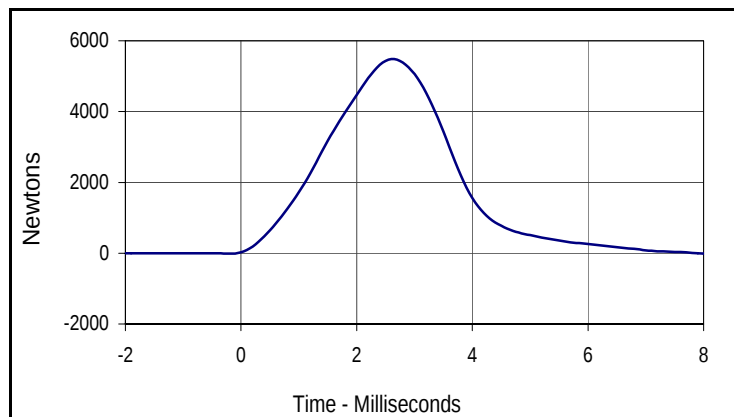
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5414	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5482	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5414.2	2.6	-29.6	8.7

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5481.7	2.6	-32.4	8.8

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 10/7/05

ATD Serial No.: 034

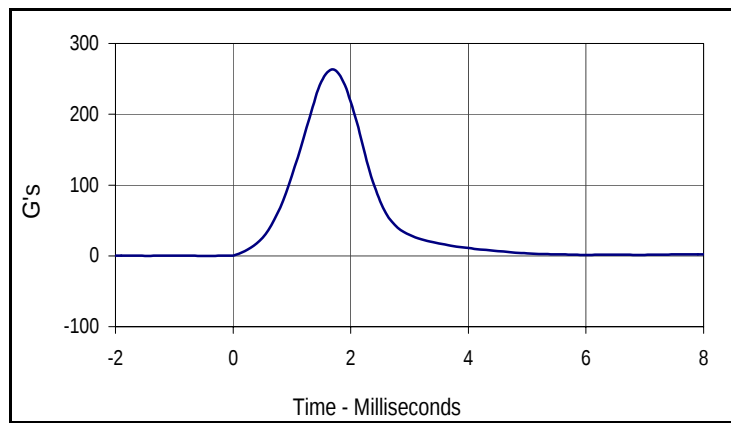
Test I.D.: N/A



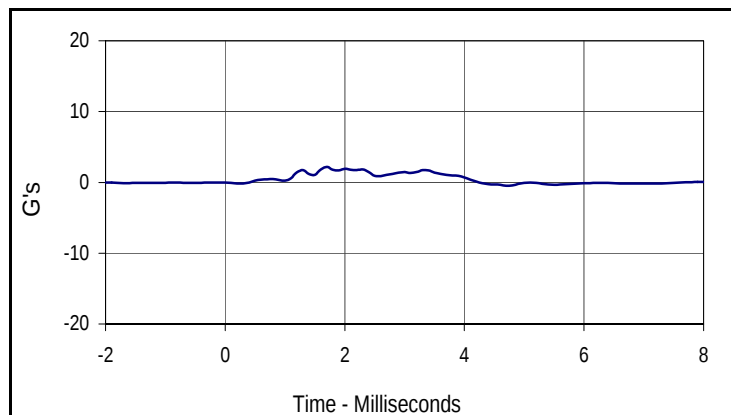
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	140	Pass
E - Shoulder pivot from back	mm	84 to 94	91	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	333	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	450	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	470	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	265	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	985	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	227	Pass
Overall Test Results				Pass

Test Program: Hybrid III 50th Percentile Male Head Drop TestTest Date: 10/5/05ATD Serial No.: 035Test I.D.: HD10B

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	263.3	Pass
Peak Lateral Acceleration	G's	≤15.0	2.2	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
263.3	1.7	0.1	-0.4



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.2	1.7	-0.5	4.7

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

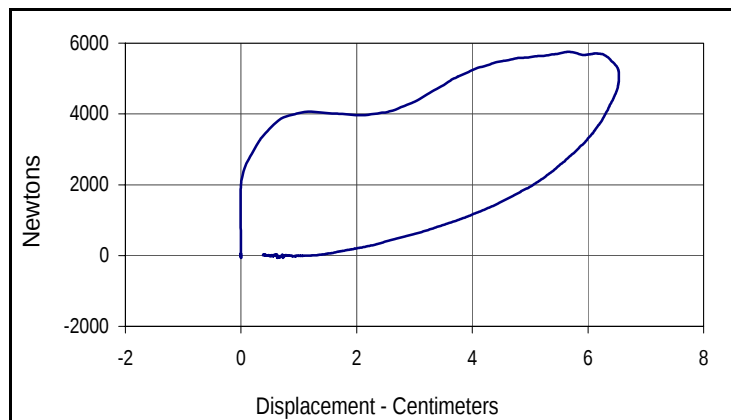
Test Date: 10/7/05

ATD Serial No.: 035

Test I.D.: CH10B



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	6.66	Pass
Peak Probe Force	Newtons	5159 to 5893	5752	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.53	Pass
Internal Hysteresis	%	69 to 85	75.3	Pass
Overall Test Results				Pass



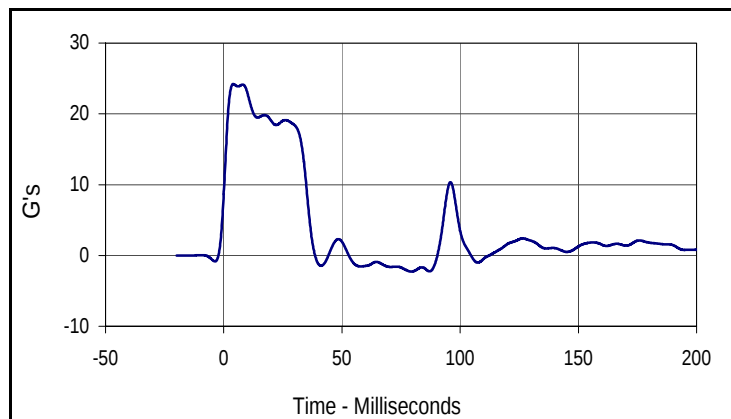
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.3
Peak Probe Force		Peak Chest Deflection	
5752		6.53	

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

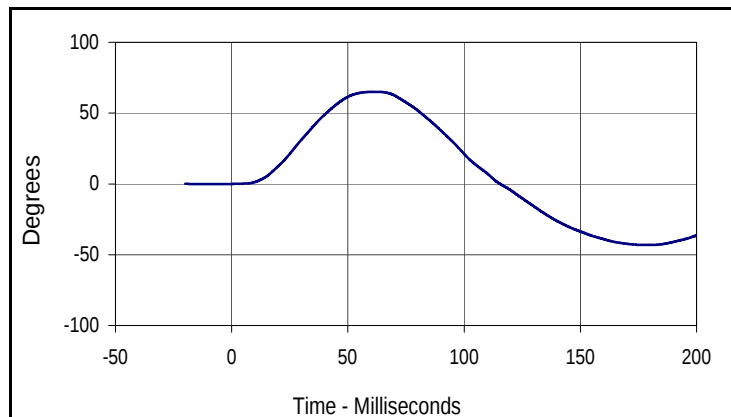
Test Date: 10/6/05
 Test I.D.: NF10B



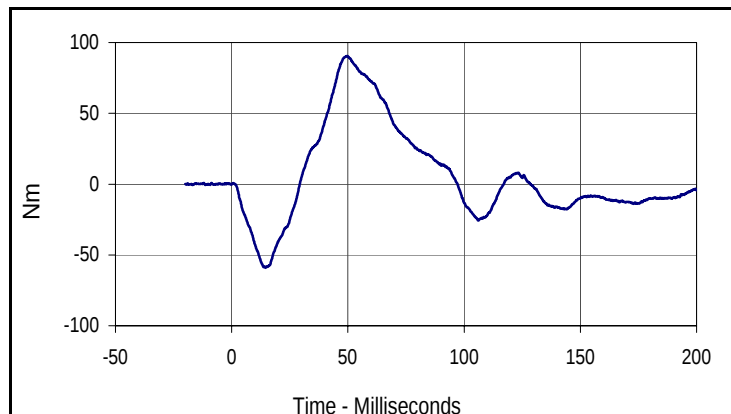
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	19.1	Pass
	30 Msec.	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	97.2	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

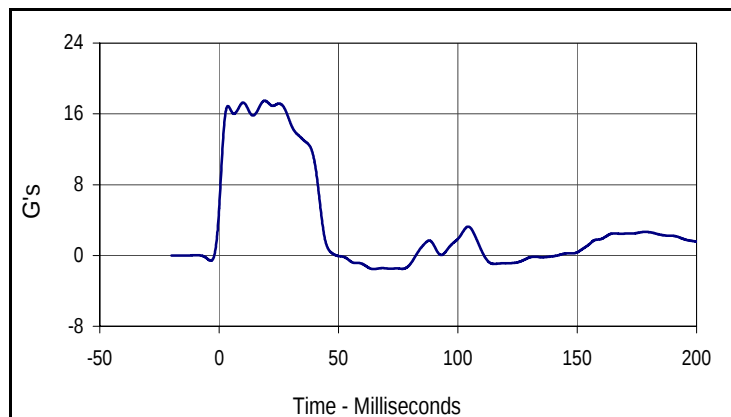
Test Date: 10/6/05

ATD Serial No.: 035

Test I.D.: NE10B



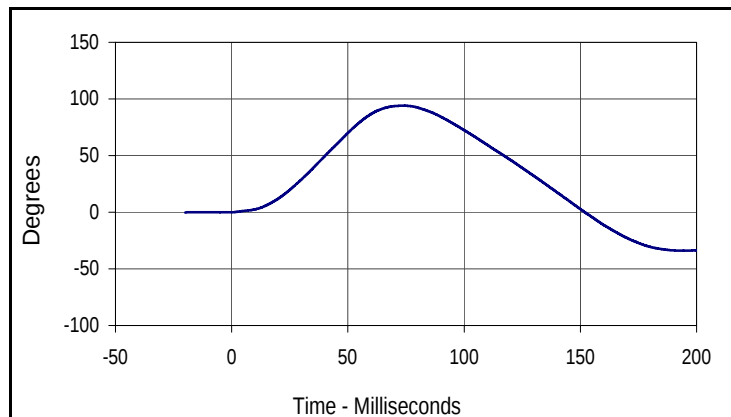
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.10	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.3	Pass
	20 Msec.	G's	14.0 to 19.0	17.4	Pass
	30 Msec.	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	-78.2	Pass
	Time	Msec.	65.0 to 79.0	66.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.5	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

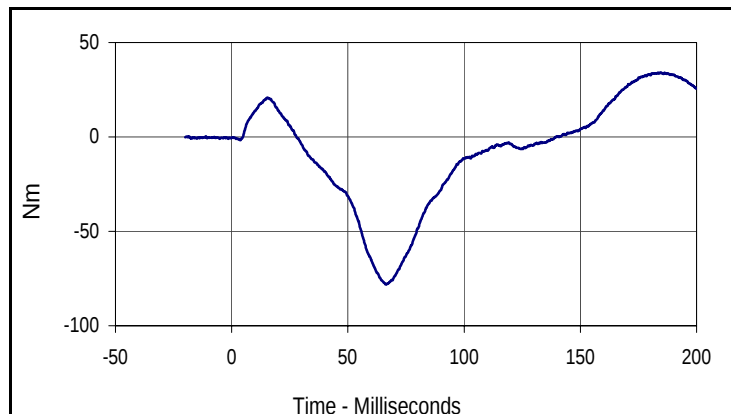
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.5	19.1	-1.5	64.7



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
34.1	183.4	-78.2	66.3

Test Program: Hybrid III 50th Percentile Male Knee Impact TestTest Date: 10/5/05ATD Serial No.: 035Test I.D.: LK10B , RK10B**Left Knee**

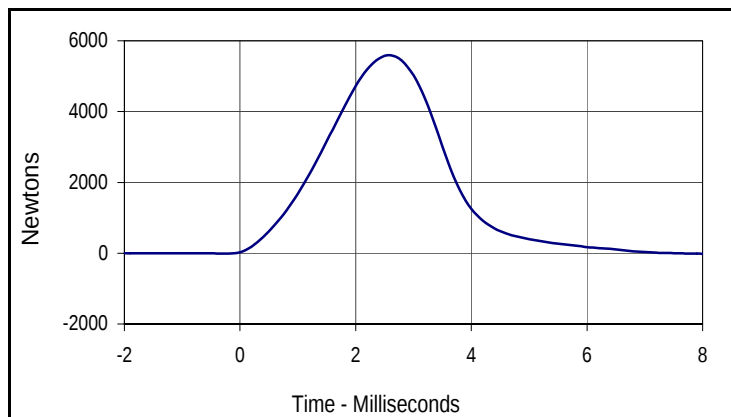
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5694	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5590	Pass
Overall Test Results				Pass



Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5693.6	2.6	-25.0	8.9



Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5590.4	2.6	-26.1	9.0

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 10/7/05

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	883	Pass
B - Shoulder pivot height	mm	505 to 521	511	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	86	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	294	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	340	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	450	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	470	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	429	Pass
W - Foot breadth	mm	91 to 107	95	Pass
Y - Chest circumference	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	861	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	228	Pass
Overall Test Results				Pass