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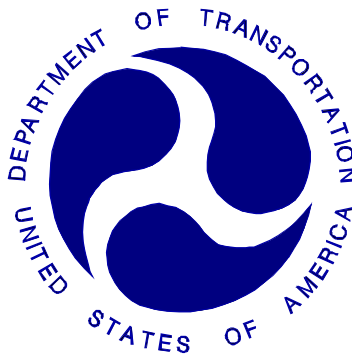
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

GENERAL MOTORS CORPORATION
2007 PONTIAC SOLSTICE
2-DOOR CONVERTIBLE

NHTSA NUMBER: M70104

CALSPAN TEST NUMBER: 8806-NCAP-04

CALSPAN CORPORATION
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October 10, 2006

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
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16. Abstract A frontal load cell barrier test of a 2007 Pontiac Solstice 2-Door Convertible was performed at Calspan Corporation's crash test facility in Buffalo, New York, on October 10, 2006. The impact velocity was 56.17 kph and the temperature at the barrier face was 21.1°C. The maximum post-test vehicle crush was 440 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements. The occupant injury criteria summary is as follows:					
Measurement Description		Units	Threshold	Driver (142)	Passenger (150)
Head Injury Criteria (HIC - 36 ms)		-	1000	446.8	318.2
Maximum Thorax Acceleration (3 ms Clip)		g's	60 g's	48.7	47.4
Chest Displacement		mm	-76 mm	-31.6	-32.7
Left Femur Force		Newtons	-10000 N	-4601.2	-2146.6
Right Femur Force		Newtons	-10000 N	-2102.9	-4748.4
17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5111 Washington, DC 20590		
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.17 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-D-00024. 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 48.3 kph requirements.

The 56.17 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.17 kph 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.

One real-time camera 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 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 chest and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also installed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 142) and the right-front passenger (position 2) ATD (Serial No.150) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 128 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Appendix C contains the dummy calibration data and Appendix D contains the transducer calibration dates.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 load cells was impacted by a 2007 Pontiac Solstice 2-Door Convertible at a velocity of 56.17 kph. The test was performed at Calspan on October 10, 2006. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

ATD	HIC	T ₁	T ₂	Clip (g)	T ₁	T ₂	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver	446.8	59.2	95.2	48.7	76.3	79.3	-31.6	-4601.2	-2102.9
Passenger	318.2	75.4	111.4	47.4	75.3	78.3	-32.7	-2146.6	-4748.4

The test data can be found on the NHTSA website at www.nhtsa.dot.gov

TEST NOTES	
Data Channel	Anomalies
V1P1 Left Upper Tibia Mx	Questionable Data
V1 Engine Bottom #4x	Channel Opened 25 ms

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M70104 Test Mode: 56.3 kph Frontal Barrier
 Test Date: October 10, 2006 Time: 16:19 Temperature: 21.1 °C
 Vehicle Make/Model/Body Style: 2007 Pontiac Solstice 2-Door Convertible
 Vehicle Test Weight: 1506.4 kg Impact Velocity: 56.17 kph (55.5 – 57.1 kph)
 Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 440 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	Three-point safety belt with torso belt pretensioner and load limiter, airbag, knee bolster and head restraint	Three-point safety belt with torso belt pretensioner and load limiter, airbag, knee bolster and head restraint
Head Contact:	Face to the center of the airbag; Back of the head to the inboard half of the head restraint	Face to the upper right of the airbag; Back of the head to the outboard half of the head restraint
Abdomen Contact:	None	None
Chest Contact:	Airbag	None
Left Knee Contact:	Knee bolster	Left edge of the glove compartment door
Right Knee Contact:	Knee bolster	Right edge of the glove compartment door

DOOR OPENING, SEAT TRACK AND GLAZING INFORMATION

Description	Driver Side	Passenger Side
Door Lock Status	Locked	Locked
Front Door Opening	Closed, latched and operable without tools	Closed, latched and operable without tools
Rear Door Opening	Not Applicable	Not Applicable
Hatch/Other Door Opening	Not Applicable	Not Applicable
Front Seat Track Shift (mm)	0 mm	0 mm
Front Seat Back Failure	None	None
Glazing Damage	Windshield cracked along its lower edge	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	829	728	787	781

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	935	935
Lap belt length as measured on ATD	mm	670	650
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	1605	1585

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2007 Pontiac Solstice 2-Door Convertible

NHTSA No. : M70104 ; VIN: 1G2MB35B37Y104876 ; Color: Gray

Engine Data: 4 Cylinders; - CID; 2.4 Liters; - cc

Placement: X Longitudinal or In-Line; - Transverse or Lateral

Transmission Data: 5 Speeds; - Manual; X Automatic; X Overdrive

Final Drive: X Rear Wheel Drive; - Front Wheel Drive; - Four Wheel Drive

AUTOMATIC DOOR LOCKS:

Is test vehicle equipped with Automatic Door Locks (ADLs)? X Yes; - No;

Does vehicle owner's manual describe how to deactivate ADLs? - Yes; X No; - N/A

DEALER AND DELIVERY INFORMATION:

Date Received: 09/26/2006 ; Odometer Reading 77 km

Selling Dealer: Jim Murphy Pontiac-GMC Truck Inc.

Dealer Address: 3000 Walden Ave., Depew, NY 14043-2608

TEST VEHICLE OPTIONS:

X AC; X Power Steering; X Power Brakes; X Power Locks; - Power Seats

- ABS; X Tilt Wheel; - Stability Control - Traction Control X Anti-Theft

SAFETY BELT FEATURES:

Driver: X Pretensioner (Shoulder); X Load Limiter; - Adjustable Anchorage

Passenger: X Pretensioner (Shoulder); X Load Limiter; - Adjustable Anchorage

AIRBAG FEATURES:

Position	Frontal	Knee Bolster	Side Torso	Side Head/Torso Combination	Side Curtain
Driver:	Yes	No	No	No	No
Passenger:	Yes	No	No	No	No
Rear Passenger:	N/A	N/A	N/A	N/A	N/A

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: General Motors Corporation

Date of Manufacture 07/06

GVWR: 1517 kg; GAWR: 776 kg FRONT; 741 kg REAR

VEHICLE CAPACITY DATA:

Type of Front Seats: - Bench; X Bucket; - Split Bench

Number of Occupants: 2 Front; - Rear; 2 Total

Vehicle Capacity Weight (VCW) = 164.0 kg

No. of Occupants x 68.04 kg = 136.1 kg

Rated Cargo/Luggage Weight (RCLW) = 27.9 kg

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

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	348.5	351.5	52.3	700.0
Rear =	319.0	320.0	47.7	639.0
Total Delivered Weight (UDW) =				1339.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	1339.0	kg
Rated Cargo/Luggage Weight (RCLW) =	27.9	kg
Weight of 2 p.572 Dummies @ 76 each =	152	kg
TARGET TEST WEIGHT =	1518.9	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 15.4 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	367.0	377.0	49.4	744.0
Rear =	381.2	381.2	50.6	762.4
Total Vehicle Test Weight (ATW) =				1506.4

Weight of Ballast Secured in Vehicle Trunk Area¹ = 0 kg

Vehicle Components Removed for Weight Reduction: Tail pipe, rear bumper cover, rear inner fenders, side view mirrors, rear window, and trunk trim.

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG ²
AS DELIVERED:	733	733	748	749	1152.0
FULLY LOADED:	724	724	727	728	-
AS TESTED:	732	732	727	728	1221.7

Vehicle's Wheel Base: 2414 mm

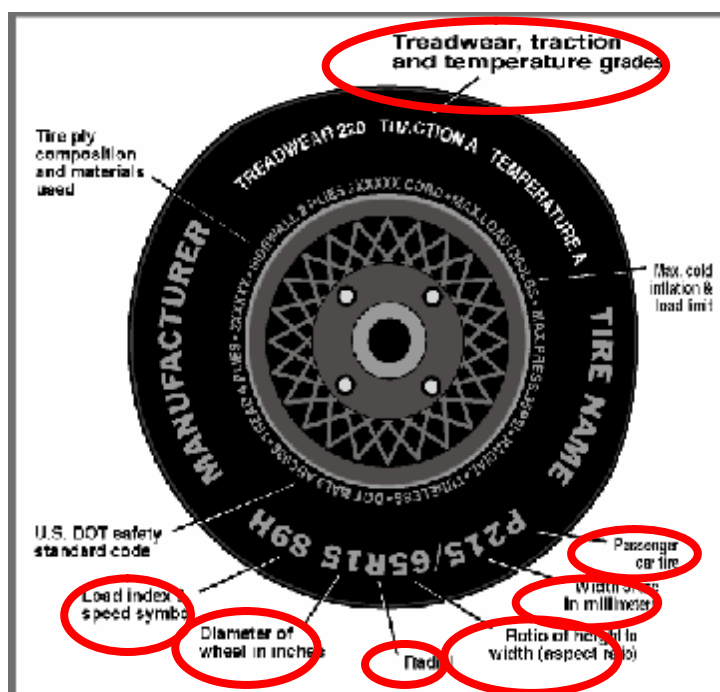
¹Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

²Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2007 Pontiac Solstice 2-Door Convertible

NHTSA Test No.: M70104 Test Date: October 10, 2006



Measured Parameter	Front	Rear
Maximum Tire Pressure (from sidewall - kPa)	300	300
Cold Pressure (from tire placard - kPa)*	200	200
Recommended Tire Size (from tire placard)	P245/45R18	P245/45R18
Tire size on Vehicle	P245/45R18	P245/45R18
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle RS-A	Eagle RS-A
Tire Type	P	P
Tire Width (mm)	245	245
Ratio of Height to Width (aspect ratio)	45	45
Radial	R	R
Wheel Diameter	18	18
Load Index & Speed Symbol	96V	96V
Treadwear	260	260
Traction Grade	A	A
Temperature Grade	A	A

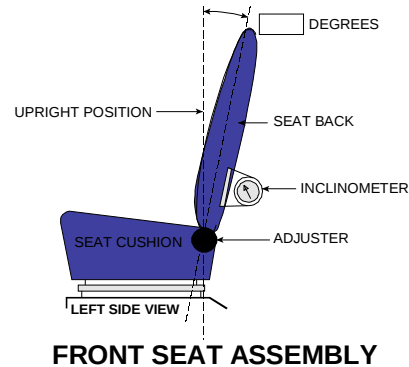
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2007 Vehicle Model: Pontiac Solstice Body Style : 2-Door Convertible

1. NOMINAL DESIGN RIDING POSITION:
for adjustable driver and passenger seat backs.
Please describe how to position the inclinometer to
measure the seat back angle. Include description of
the location of the adjustment latch detent, if
applicable.



Seat back angle for driver's seat: 10.6 degrees

Measurement instructions: Seat back angle measured on the lower outboard recliner bracket with the vehicle level.

Seat back angle for passenger's seat: 10.6 degrees

Measurement instructions: Seat back angle measured on the lower outboard recliner bracket with the vehicle level.

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: The seat was placed in detent 11 where the forward-most detent is defined as 0 (22 detents total). The total travel was 210 mm.

Positioning of the passenger's seat: The seat was placed in detent 11 where the forward-most detent is defined as 0 (22 detents total). The total travel was 210 mm.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 51.48 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification
testing to requirements of FMVSS 301 = 47.4 to 48.4 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 4.5 liters

3.3 One-Third of Usable Capacity = 17.2 liters

3.4 Is vehicle equipped with electric fuel pump? Yes- X ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

The fuel pump operates briefly when the ignition is placed in the "ON" position and the vehicle is not started and continuously while the engine is operating.

DATA SHEET NO. 4
TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS:

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: The steering column was placed in the mid-tilt position. The upper-most angle was 18.3 degrees, the lower-most angle was 14.1 degrees, and the final set position was 16.2 degrees.

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: Not adjustable.

6. AUTOMATIC DOOR LOCKS: Is test vehicle equipped with ADLs? X Yes; - No;

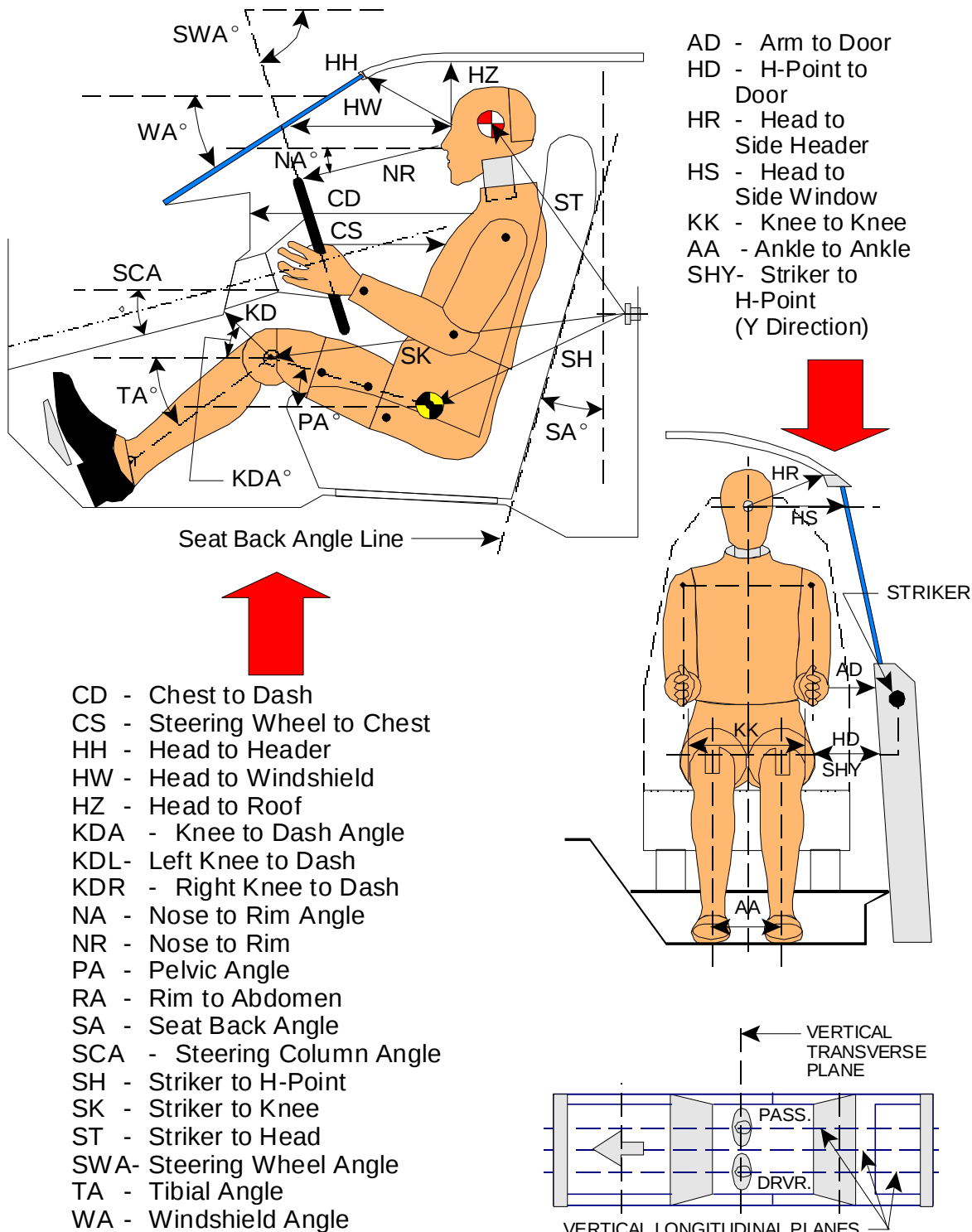
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; X No; - N/A

Comments: The door locks were placed in the locked position for the test.

DATA SHEET NO. 5

FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



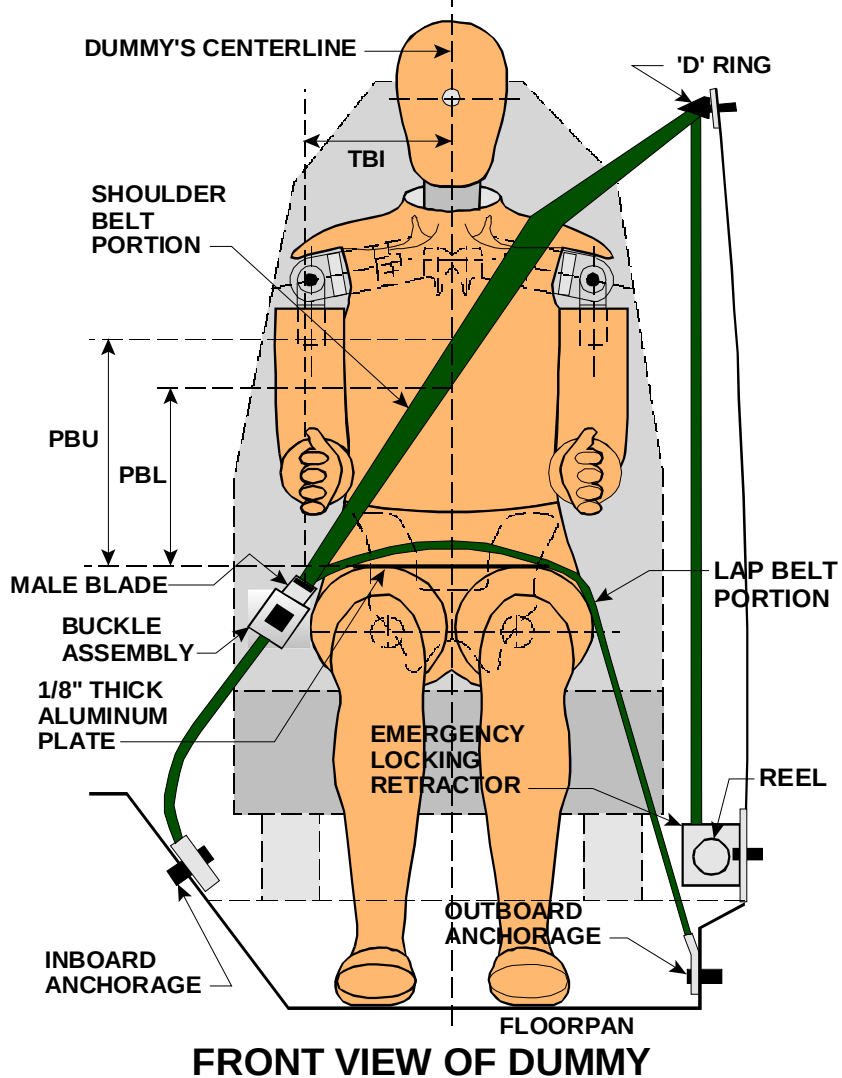
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #142)			PASS. (Serial #150)		
WA ^o	29.1 deg.			N/A		
SWA ^o	73.8 deg.			N/A		
SCA ^o	16.2 deg.			N/A		
SA ^o	10.6 deg.			10.6 deg.		
HZ	196			203		
HH	429			420		
HW	623			607		
HR	191			207		
NR	373	Angle	9 deg.	N/A		
CD	612			468		
CS	320			N/A		
RA	224			N/A		
KDL	157	Angle (KDA)	43 deg.	159		
KDR	163			150	Angle (KDA)	48 deg.
PA ^o	22.8 deg.			23.9 deg.		
TA ^o	32.9 deg.			35.4 deg.		
KK	308			270		
AA	298			219		
ST	435	Angle	29 deg.	420	Angle	31 deg.
SK	745	Angle	105 deg.	745	Angle	103 deg.
SH	380	Angle	135 deg.	380	Angle	130 deg.
SHY	215			215		
HS	267			283		
HD	88			92		
AD	80			81		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

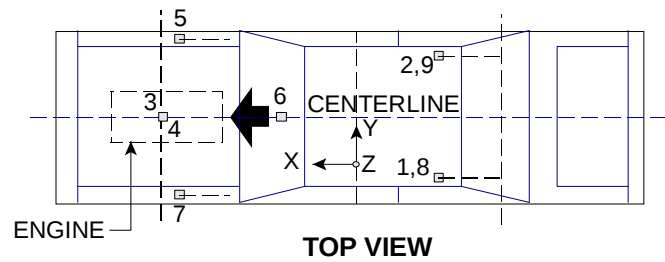
SEAT BELT POSITIONING DATA



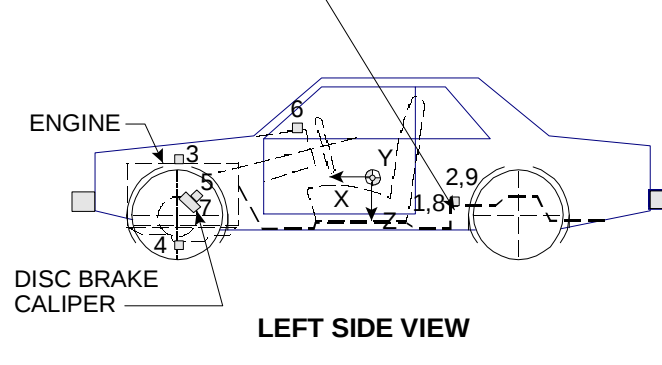
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	335	326
PBL-- Top surface of alum. plate to belt lower edge	260	245
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATIONS

VEHICLE ACCELEROMETER LOCATIONS



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



No.	LOCATION	PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	1390	-584	-180
2	Right Rear Seat Cross Member X	1390	584	-180
3	Top of Engine Block	2959	-182	-730
4	Bottom of Engine	2918	-5	-154
5	Disc Brake Caliper @ Right Side	3114	750	-395
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	3114	-750	-395
8	Left Rear Seat Cross Member Z	1390	-584	-180
9	Right Rear Seat Cross Member Z	1390	584	-180

X – From rear surface of vehicle (+ forward)

Y – From vehicle centerline (+ right)

Z – From ground plane (+ up)

** Accelerometer was not requested by the COTR

DATA SHEET NO.8
SUMMARY OF FMVSS 212 and FMVSS 219 (Partial) DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with a 0 mm molding.

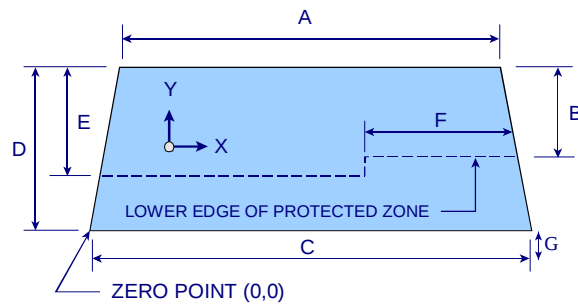
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

Temperature of windshield molding during test: 21.1°C.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	1787.5	1787.5	100.0%
LEFT SIDE	1787.5	1787.5	100.0%
TOTAL	3575	3575	100.0%



DIMENSIONS (mm)	
A	1150
B	255
C	1505
D	460
E	295
F	750
G	0

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

	COORDINATES	
	X	Y
1.	-	-
2.	-	-
3.	-	-
4.	-	-

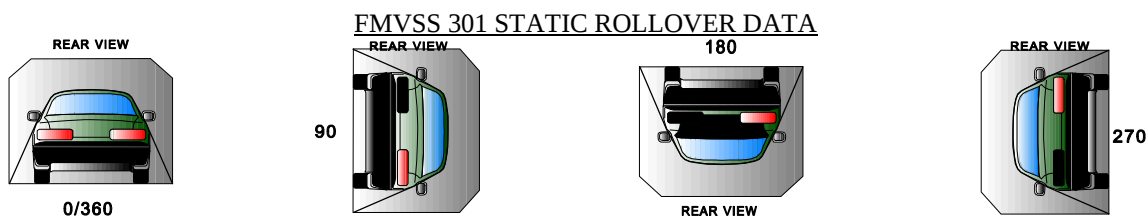
DATA SHEET NO. 9
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: _____ M70104 _____ TEST DATE: _____ October 10, 2006
VEHICLE MAKE/MODEL: _____ 2007 Pontiac Solstice 2-Door Convertible _____
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

FUEL SPILLAGE MEASUREMENT:

Time Interval	Amount	Maximum Allowable Spillage
Impact Until Motion Ceases	0	28 g
First Five Minutes Following Impact	0	142 g
Next 25 Minutes	0	28 g / 1 minute

SOLVENT SPILLAGE DETAILS: None



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	14	seconds	5	minutes	6	minutes	14	seconds	7	minutes
90° - 180°	1	minutes	6	seconds	5	minutes	6	minutes	6	seconds	7	minutes
180°-270°	1	minutes	8	seconds	5	minutes	6	minutes	8	seconds	7	minutes
270°-360°	1	minutes	5	seconds	5	minutes	6	minutes	5	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

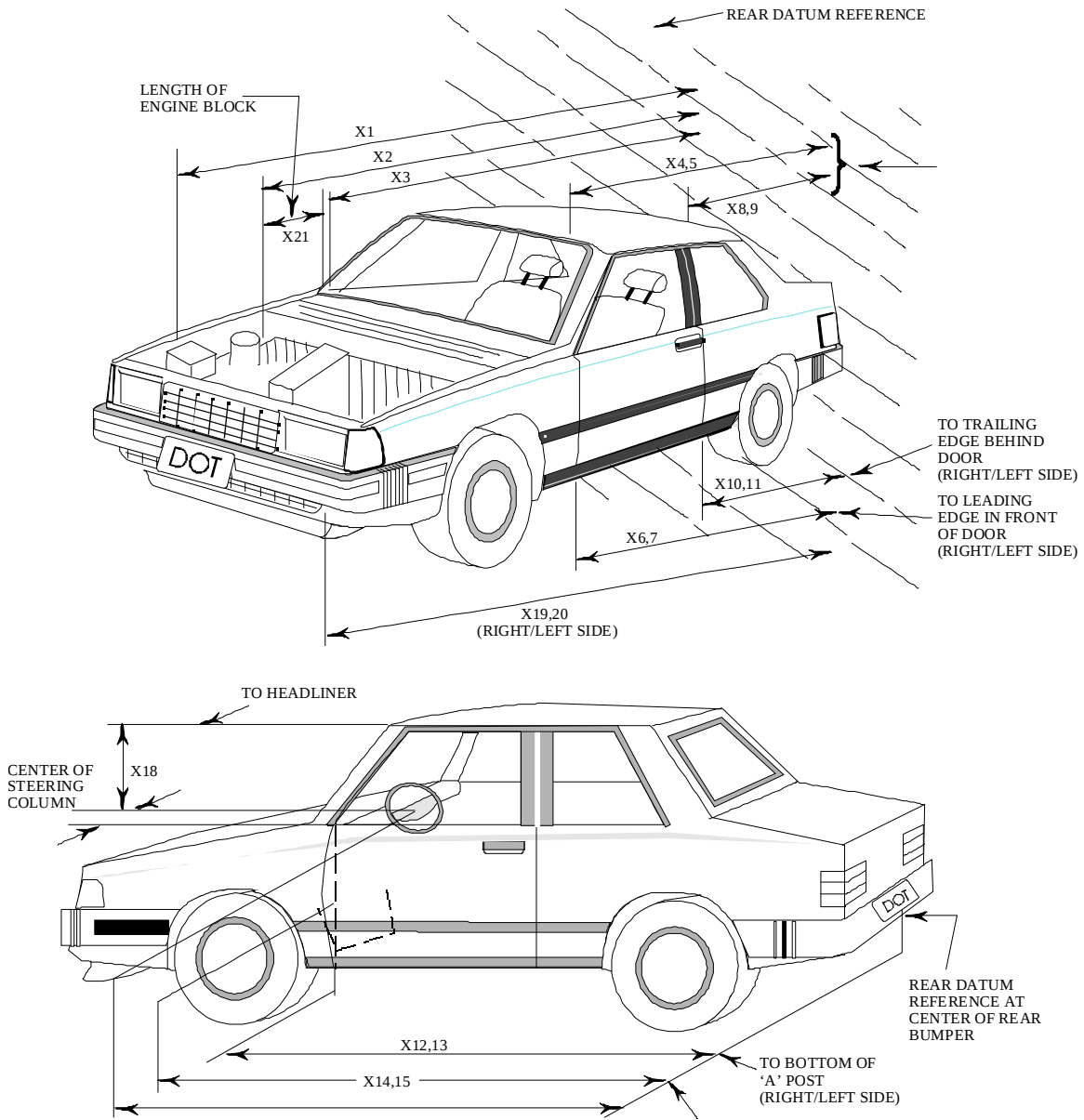
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0° - 90°	None
90° - 180°	None
180°-270°	None
270°-360°	None

DATA SHEET NO. 10
TEST VEHICLE MEASUREMENTS



DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M70104 TEST DATE: October 10, 2006
VEHICLE MAKE/MODEL: 2007 Pontiac Solstice 2-Door Convertible

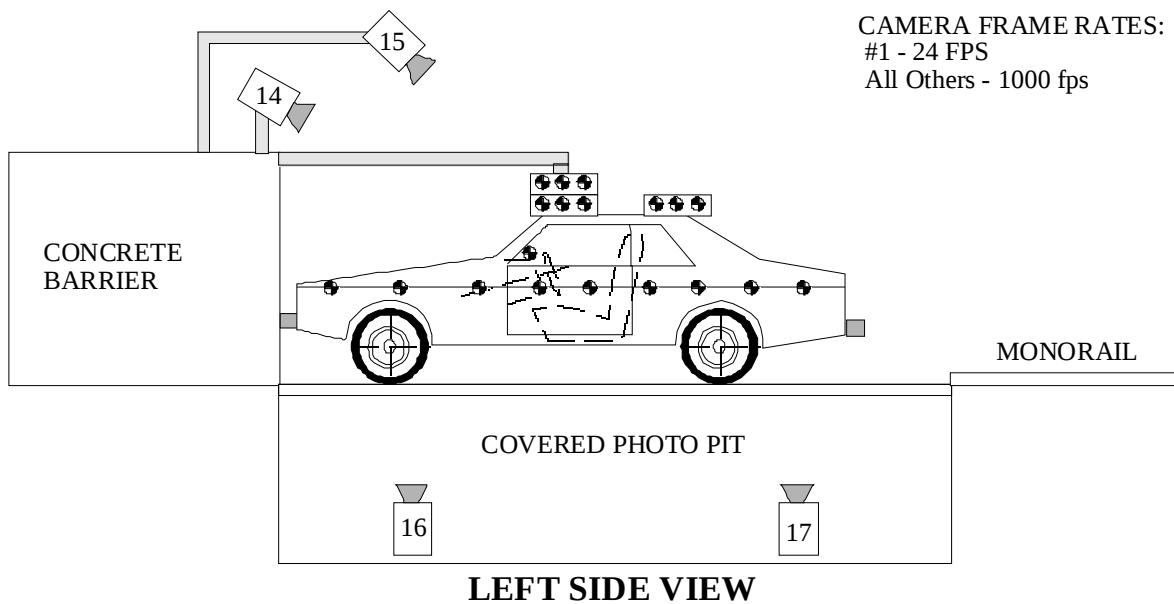
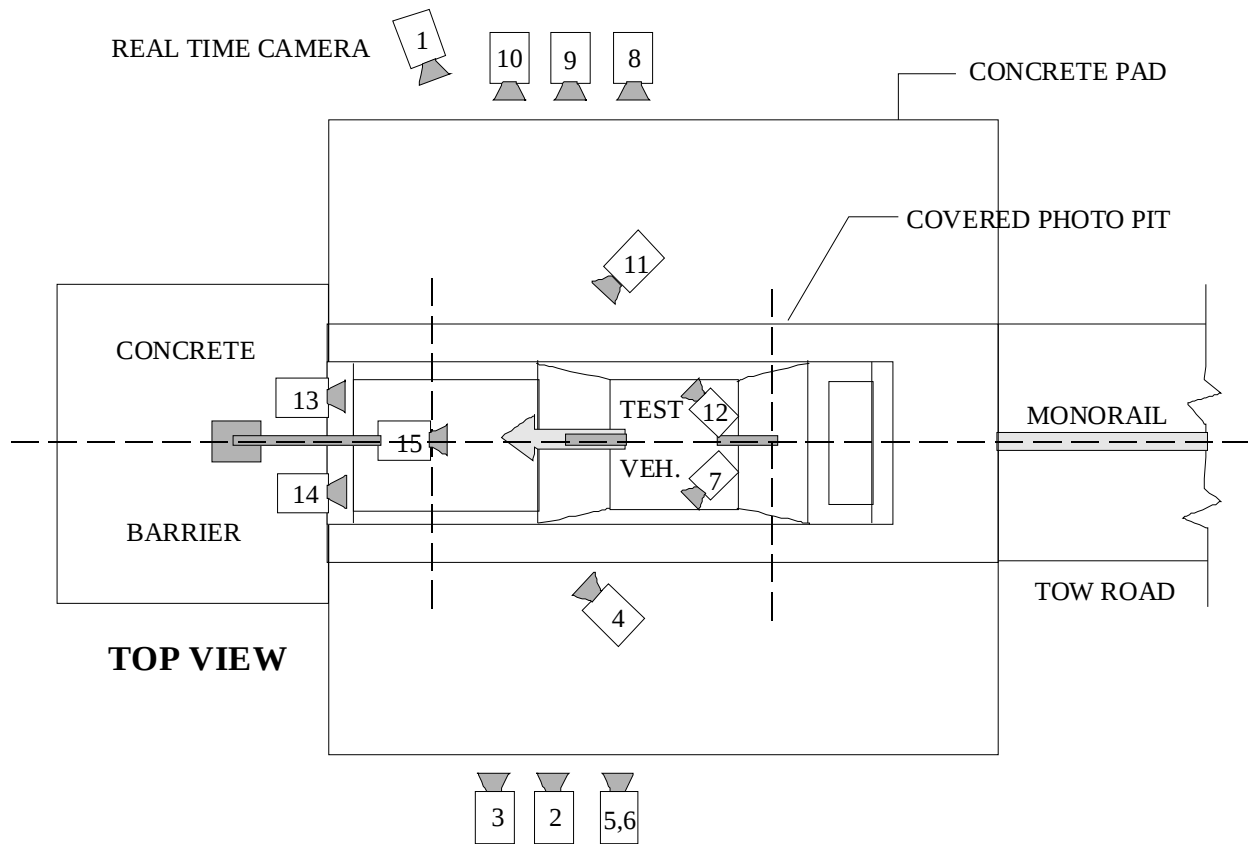
No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	3990	3636	354
X2	Rear Surface of Vehicle to Front of Engine	3271	3109	162
X3	Rear Surface of Vehicle to Firewall	2777	2642	135
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	2363	2347	16
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	2361	2358	3
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	2386	2384	2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	2395	2396	-1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	1250	1234	16
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	1249	1246	3
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	1345	1342	3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	1349	1354	-5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	2310	2303	7
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	2310	2306	4
X14	Rear Surface of Vehicle to Firewall, Right Side	2628	2621	7
X15	Rear Surface of Vehicle to Firewall, Left Side	2629	2624	5
X16	Rear Surface of Vehicle to Steering Column	1964	1987	-23
X17	Center of Steering Column to "A" Post	245	246	-1
X18	Center of Steering Column to Headliner	364	333	31
X19	Rear Surface of Vehicle to Right Side of Front Bumper	3888	3581	307
X20	Rear Surface of Vehicle to Left Side of Front Bumper	3889	3446	443
X21	Length of Engine Block	470	470	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2095	2091	4
CD	Rear Surface of Vehicle to Center of Dash Panel	2165	2156	9
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2097	2093	4

All Dimensions in mm

NHTSA TEST No.: M70104 TEST DATE: October 10, 2006
VEHICLE MAKE/MODEL: 2007 Pontiac Solstice 2-Door Convertible

	Elements	Pre-Test (mm)
1	Total length	3990
2	Total Width	1796
3	Bumper Top Height	490
4	Bumper Bottom Height	380
5	Longitudinal Member Top Height	490
6	Distance Between Longitudinal Members	872
7	Longitudinal Member Width	90
8	Engine top height	803
9	Engine bottom height	380
10	Engine and gearbox width	559
11	Front bumper-engine distance	721
12	Front shock absorber fixing height	566
13	Bonnet leading edge height	613
14	Front shock absorber fixing width	920
15	Front bumper – front axle distance	769
16	Front axle – A pillar distance	913
17	A-pillar – B pillar distance	1104
18	B-pillar – rear axle distance	402
19	B-pillar – C Pillar distance	0
20	Roof sill bottom height	1085
21	Roof sill top height	1140
22	Floor sill bottom height	171
23	Floor sill top height	319

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS



CAMERA FRAME RATES:
#1 - 24 FPS
All Others - 1000 fps

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS (cont.)

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	30
2	Overall Left Side	7550	1617	1075	-4.0	7109	28	1000
3	Left Side View	9414	975	1102	-3.0	8973	50	1000
4	Driver and Interior View	7525	2670	2050	-9.2	-	35	500
5	Steering Column (Bottom)	7315	1810	1170	-4.3	6874	25	1000
6	Steering Column (Top)	7315	1810	1785	-9.3	6874	28-70	1000
7	Left CRS Lateral View	-	-	-	-	-	-	-
8	Overall Right Side	6716	1890	1050	-1.6	6275	28	500
9	Right Side View	9270	1115	1105	-1.6	8829	50	1000
10	Right Passenger View	8240	1995	1455	-4.1	7799	35	1000
11	Passenger and Interior View	7670	2940	2025	-10.4	-	35	500
12	Right CRS Lateral View	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-37.0	-	13	500
14	Driver Front View	620	-92	1987	-36.9	-	13	500
15	Windshield View	0	-530	3374	-52.7	-	20	500
16	Pit View of Engine	0	615	-3048	90.0	-	13	500
17	Pit View of Fuel Tank	0	3000	-3048	90.0	-	13	500

*X = film plane to monorail centerline ** = referenced to horizontal plane

Y = film plane to impact location N.T. indicates No Timing

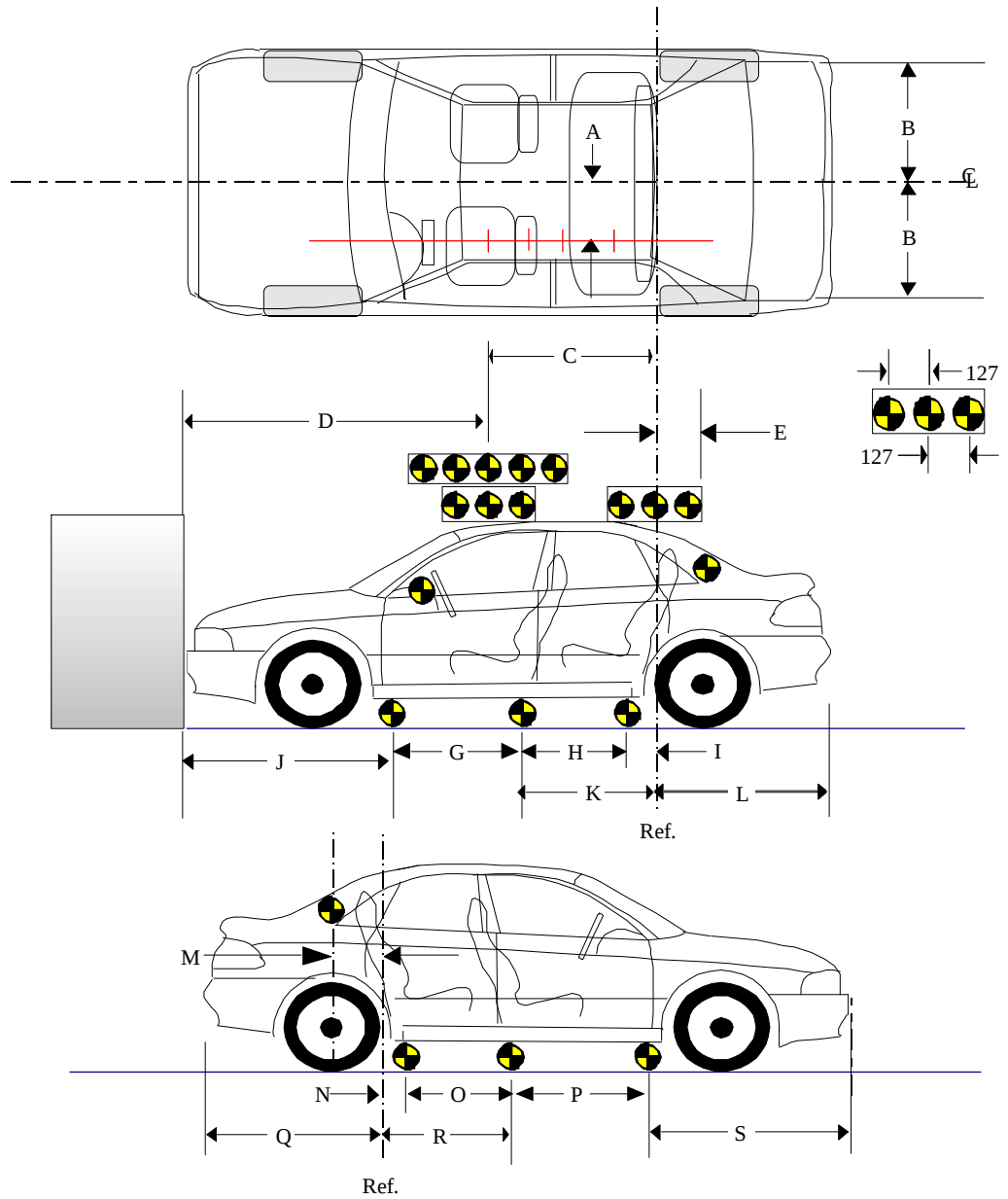
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

(Dimensions in millimeters)

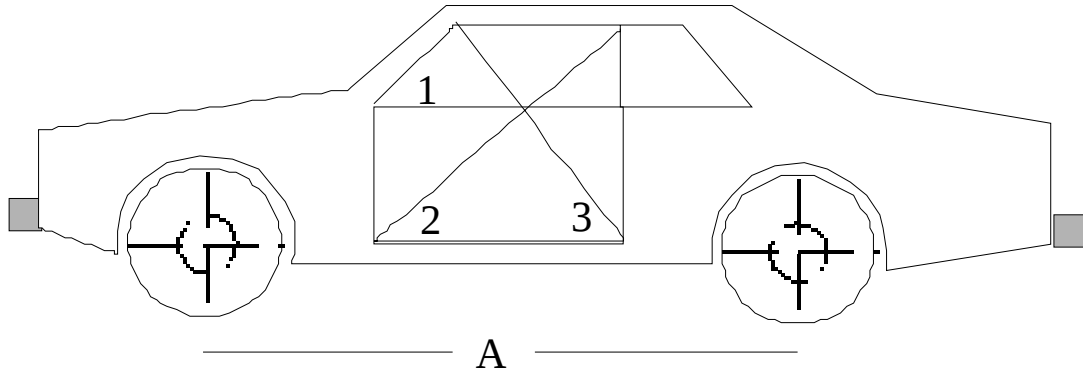
A	365
B	547
C	383
D	2456
E	61
F	2132
G	736
H	743
I	119
J	1241
K	862
L	1151
M	1
N	116
O	751
P	728
Q	1150
R	867
S	1245



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



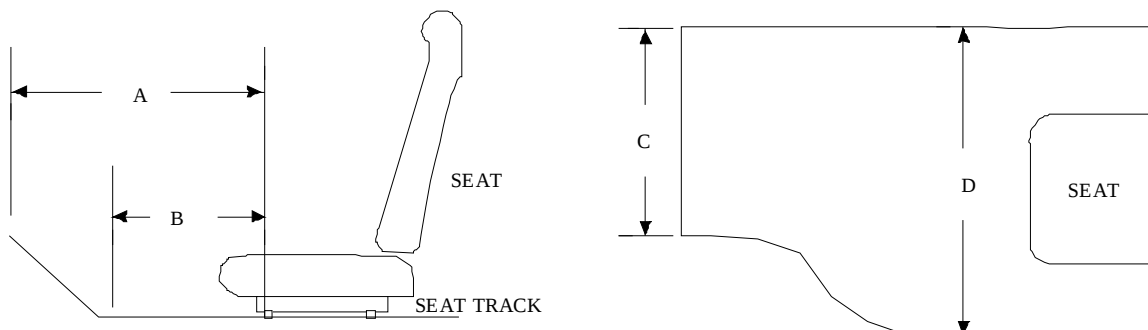
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1079	1143	833	1079	1152	833
AFTER TEST	1075	1183	840	1072	1166	840
DIFFERENCE	4	-40	-7	7	-14	-7

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2414	2414
AFTER TEST	2295	2295
DIFFERENCE	119	119

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	708	691	17
B	637	643	-6
C	351	358	-7
D	440	442	-2

PASSENGER

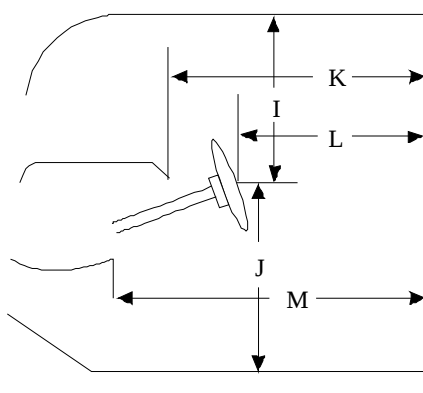
Measurement	Pre-Test	Post-Test	Difference
A	601	592	9
B	538	552	-14
C	321	322	-1
D	463	456	7

Units = mm

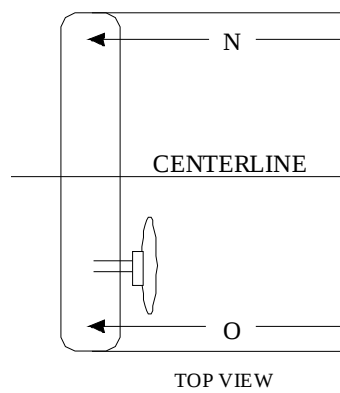
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

STATIC PASSENGER COMPARTMENT INTRUSION

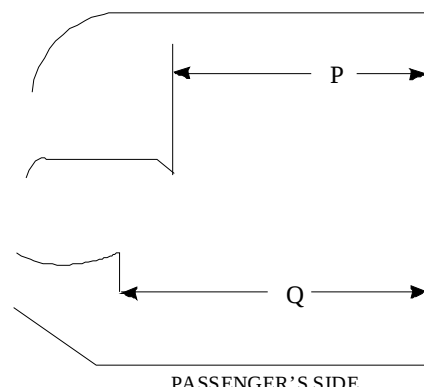


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



PASSENGER'S SIDE

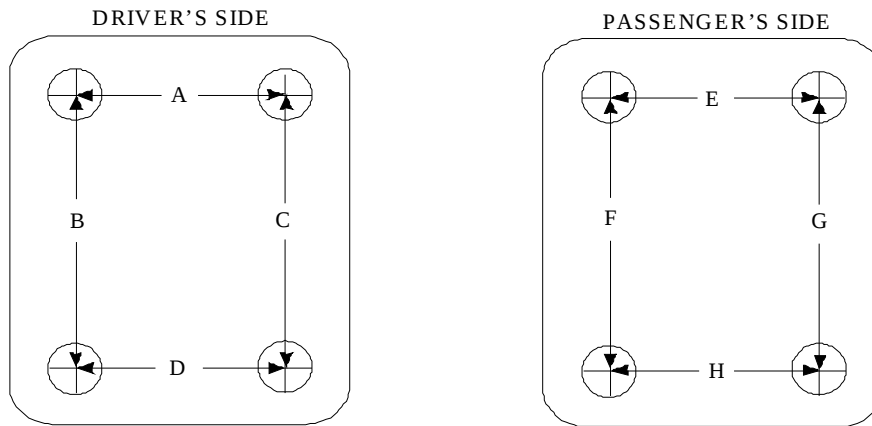
Measurement	Pre-Test	Post-Test	Difference
I	364	333	31
J	577	607	-30
K	955	928	27
L	687	711	-24
M	982	982	0
N	816	812	4
O	820	817	3
P = K (PASS.)	963	937	26
Q = M (PASS.)	925	925	0

Units = mm

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

FLOORBOARD DEFORMATION



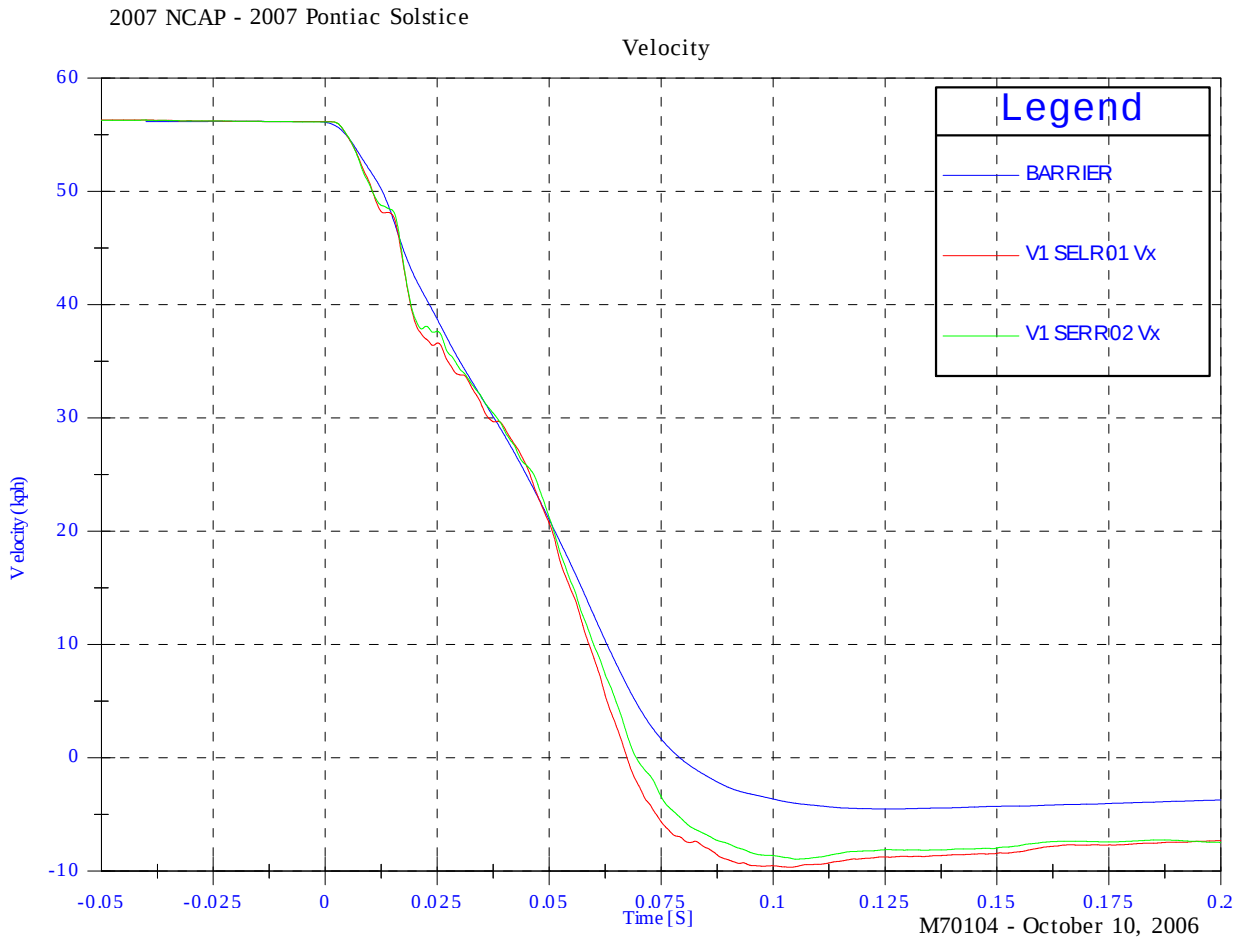
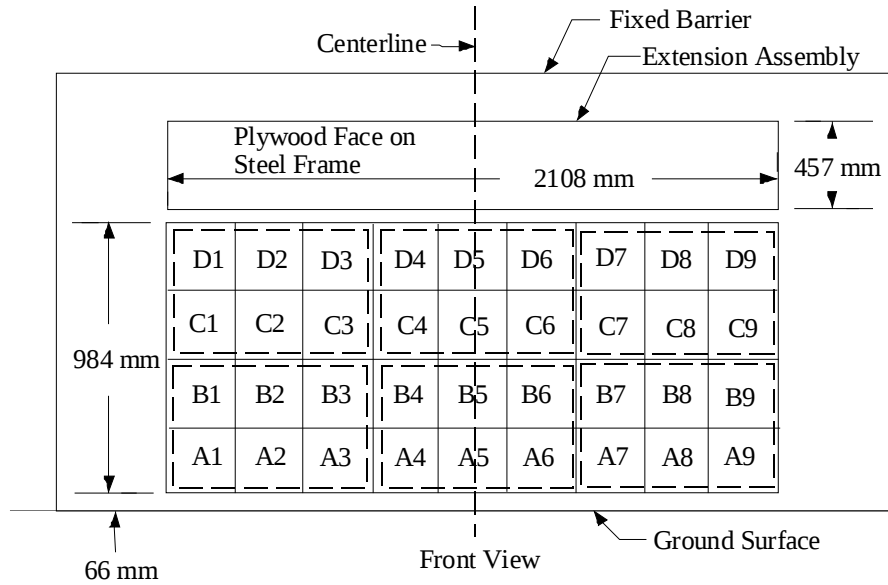
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	351	358	-7
B	525	525	0
C	448	447	1
D	440	442	-2
E	321	322	-1
F	476	480	-4
G	435	446	-11
H	463	456	7

Units = mm

DATA SHEET NO.14
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
4 Rows
9 Columns



DATA SHEET NO. 15
ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Pontiac Solstice 2-Door Convertible

NHTSA Test No.: M70104 VIN: 1G2MB35B37Y104876

Model Year: 2007 Build Date: 07/06 Test Date: October 10, 2006

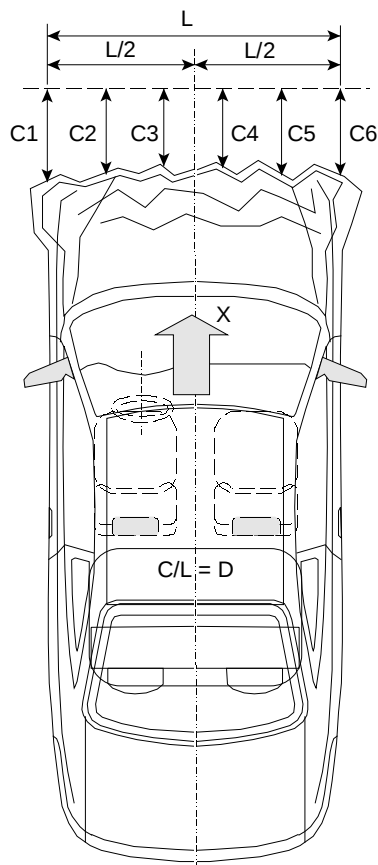
Vehicle Size Category: _____ Test Weight: 1506.4 kg

Vehicle Wheelbase: 2414 mm; Front Overhang: 766 mm; Overall Width: 1810 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	3690	3467	223
C2 =	3882	3442	440
C3 =	3974	3604	370
C4 =	3970	3645	325
C5 =	3879	3586	293
C6 =	3686	3512	174



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

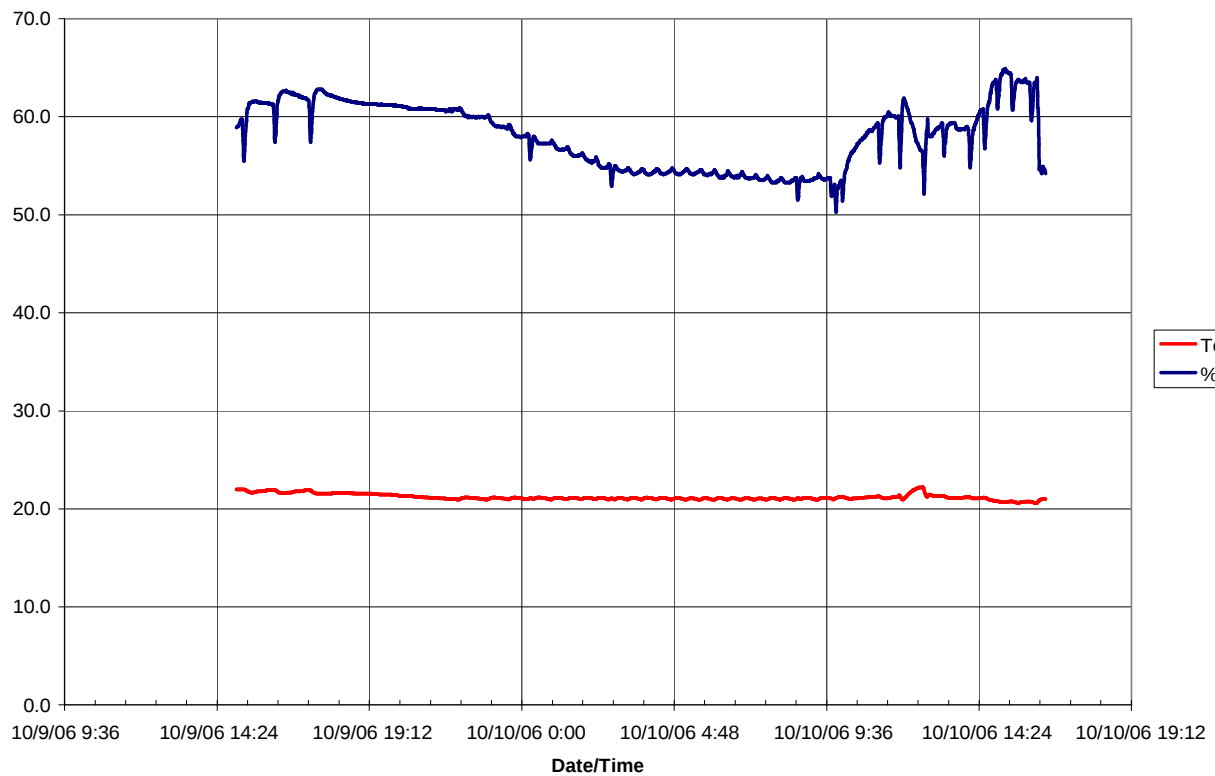
Length of Damaged Region:

L1=	<u>1596</u>	mm
L2=	<u>798.0</u>	mm
L5=	<u>319.2</u>	mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M70104 Vehicle: 2007 Pontiac Solstice 2-Door Convertible

2007 Pontiac Solstice M70104 Environmental Conditions



APPENDIX A
PHOTOGRAPHS

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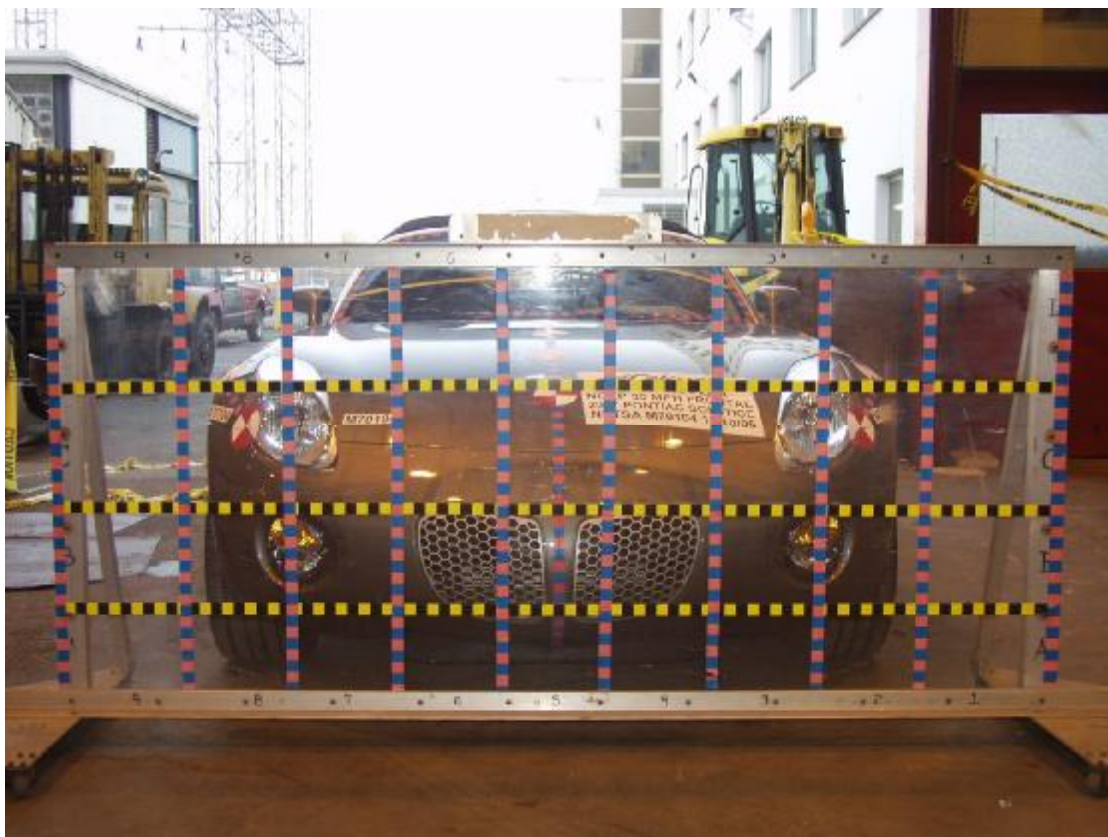


Figure A-1: Load Cell Locations

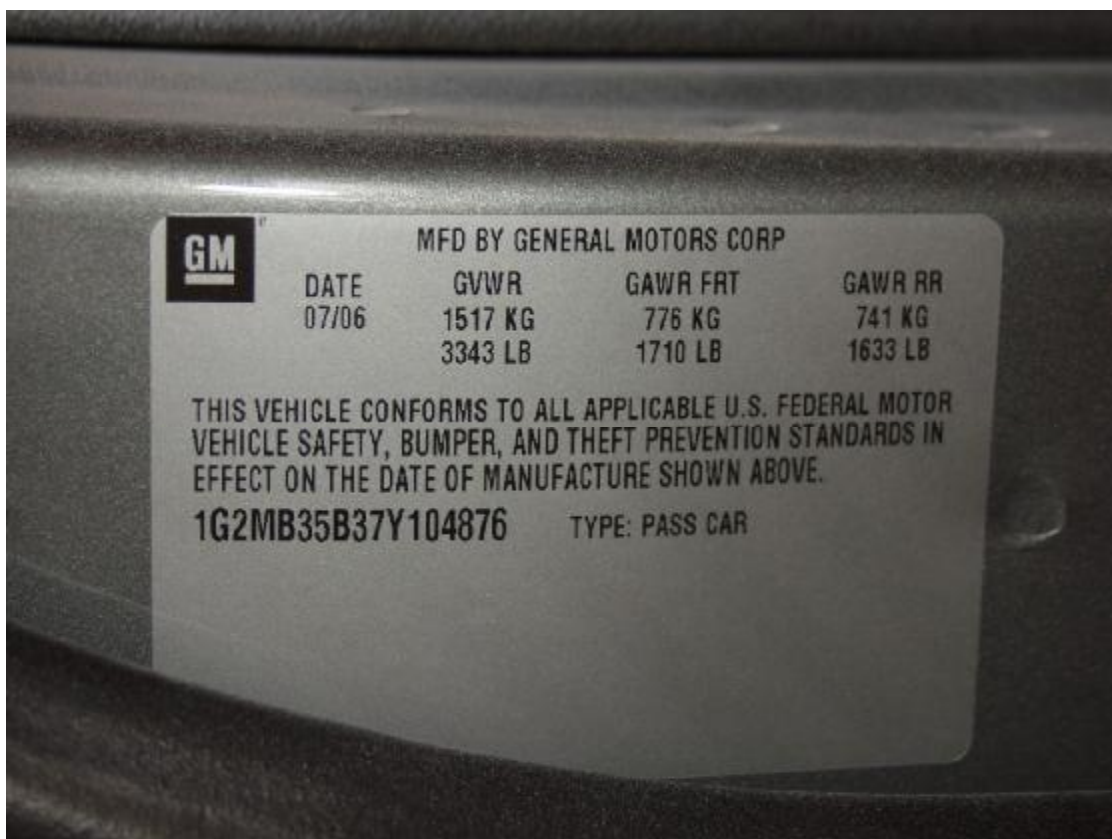


Figure A-2: Vehicle Certification Placard

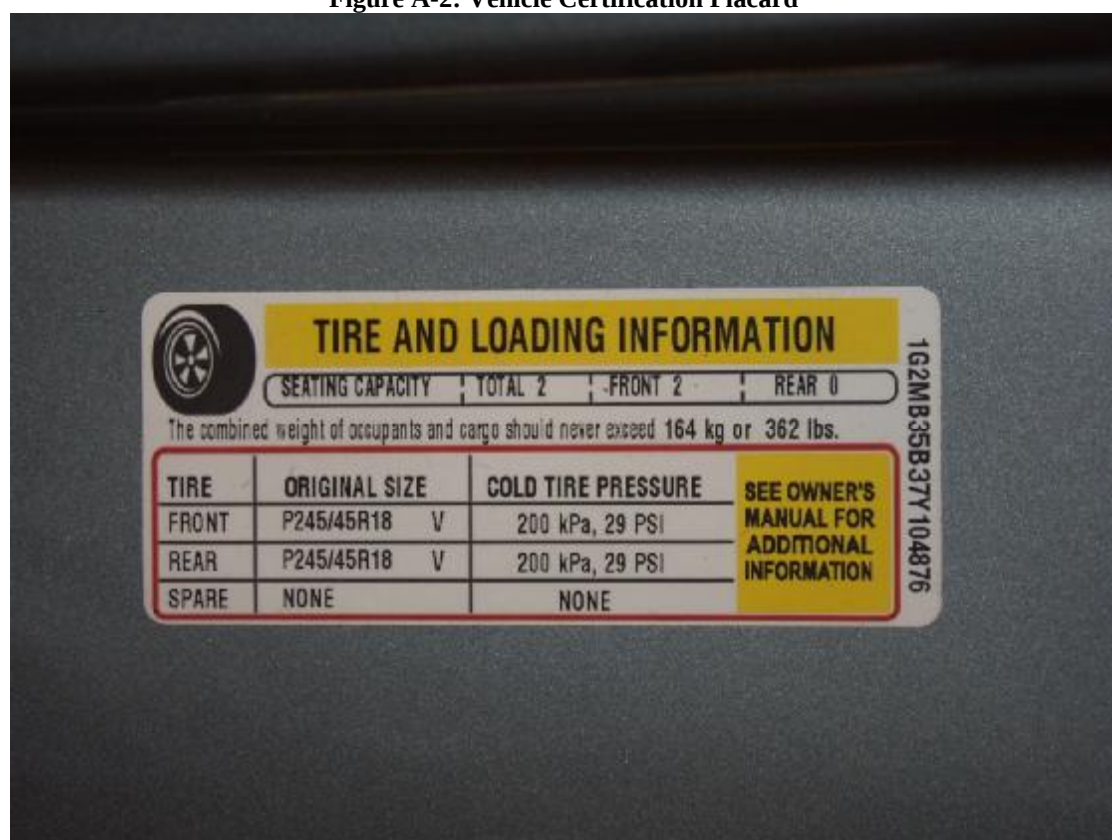


Figure A-3: Vehicle Tire Placard



Figure A-4: Right Front, As Received



Figure A-5: Left Rear, As Received



Figure A-6: Pre-Test Front View



Figure A-7: Post-Test Front View



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 Three-Quarter View



Figure A-13: Post-Test Right Front Three-Quarter View



Figure A-14: Pre-Test Left Rear Three-Quarter View



Figure A-15: Post-Test Left Rear Three-Quarter View



Figure A-16: Left Rear Three-Quarter View of Doors After Impact



Figure A-17: Right Rear Three-Quarter View of Doors After Impact



Figure A-18: Pre-Test Windshield View



Figure A-19: Post-Test Windshield View



Figure A-20: Pre-Test Engine Compartment View

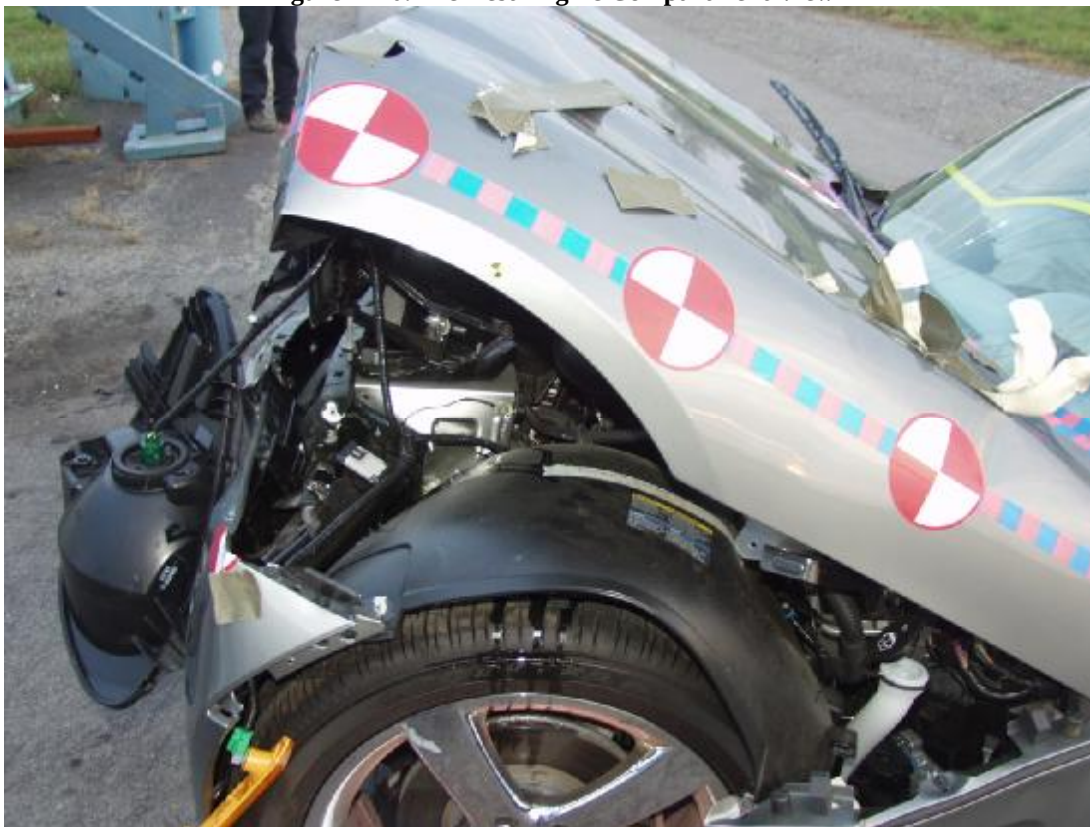


Figure A-21: Post-Test Engine Compartment View



Figure A-22: Pre-Test Fuel Cap View

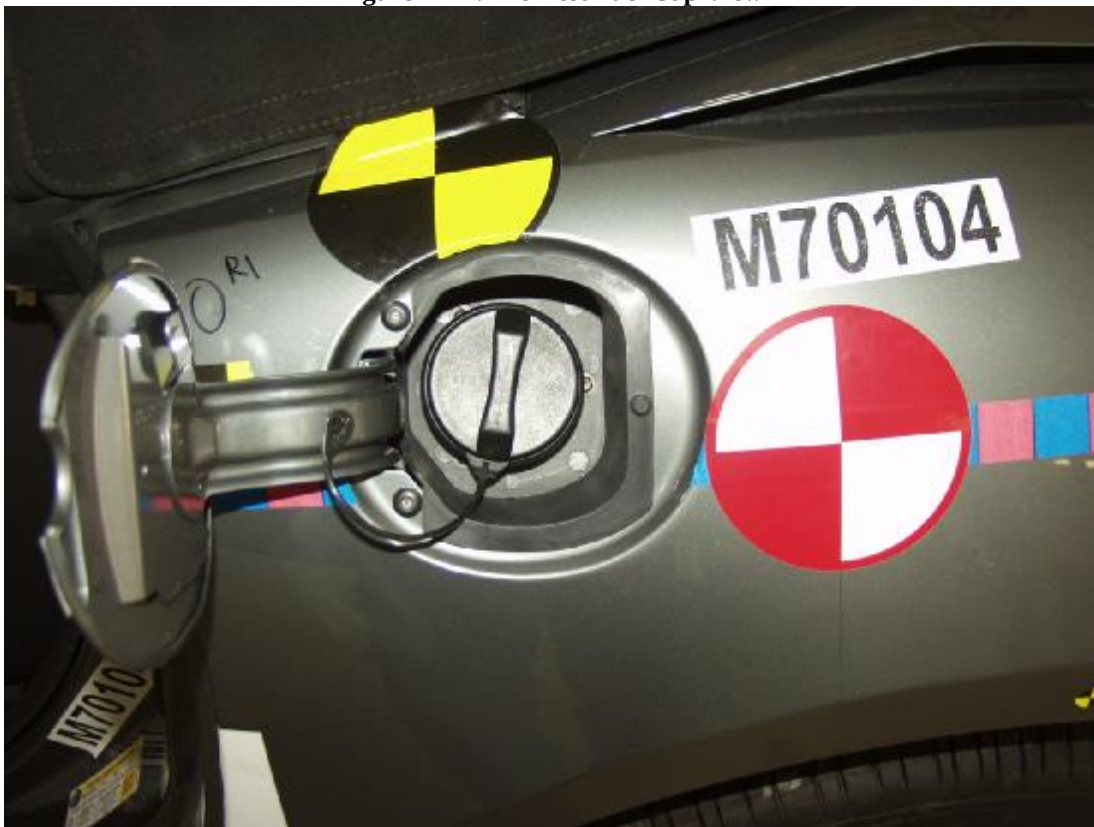


Figure A-23: Post-Test Fuel Cap View



Figure A-24: Pre-Test Front Underbody View



Figure A-25: Post-Test Front Underbody View



Figure A-26: Pre-Test Mid Underbody View



Figure A-27: Post-Test Mid Underbody View



Figure A-28: Pre-Test Rear Underbody View



Figure A-29: Post-Test Rear Underbody View



Figure A-30: Pre-Test Driver Head Location



Figure A-31: Post-Test Driver Head Location



Figure A-32: Pre-Test Driver Position View



Figure A-33: Post-Test Driver Position View



Figure A-34: Pre-Test Driver and Interior View



Figure A-35: Post-Test Driver and Interior View

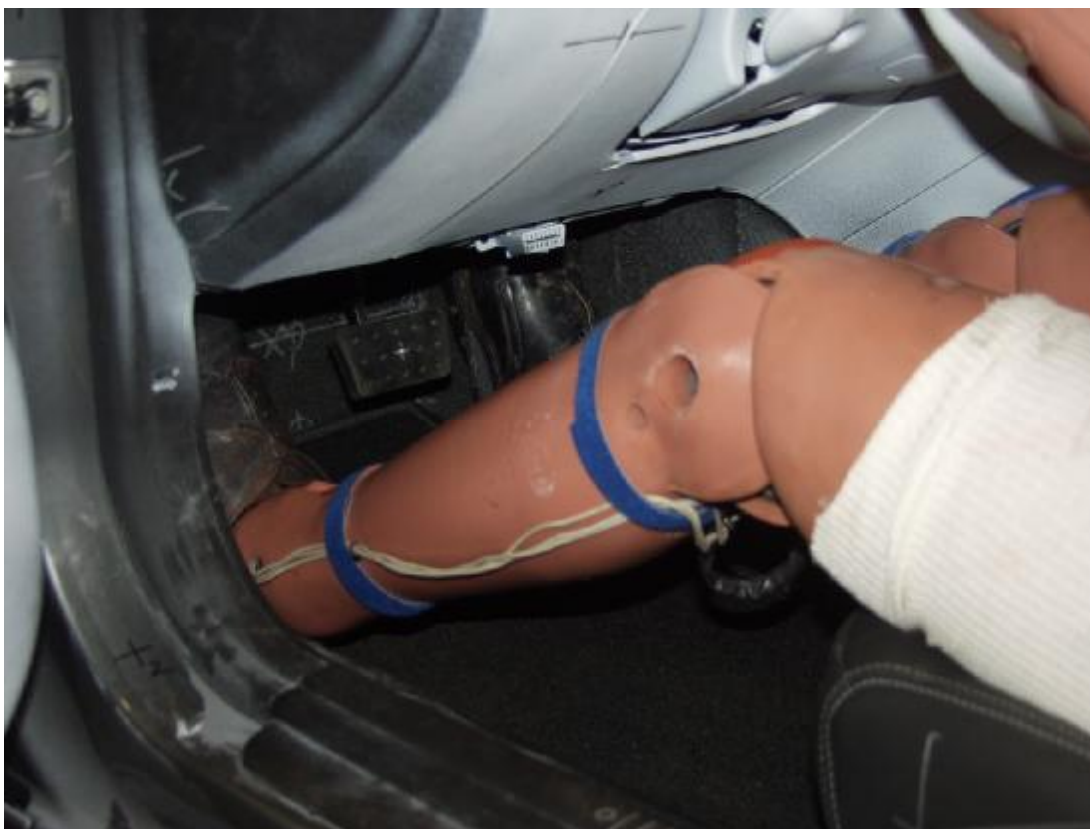


Figure A-36: Pre-Test Driver Feet View



Figure A-37: Post-Test Driver Feet View



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



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



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



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



Figure A-42: Post-Test Driver Head View



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



Figure A-44: Pre-Test Passenger Head Location



Figure A-45: Post-Test Passenger Head Location



Figure A-46: Pre-Test Passenger Position View



Figure A-47: Post-Test Passenger Position View



Figure A-48: Pre-Test Passenger and Interior View



Figure A-49: Post-Test Passenger and Interior View



Figure A-50: Pre-Test Passenger Feet View



Figure A-51: Post-Test Passenger Feet View

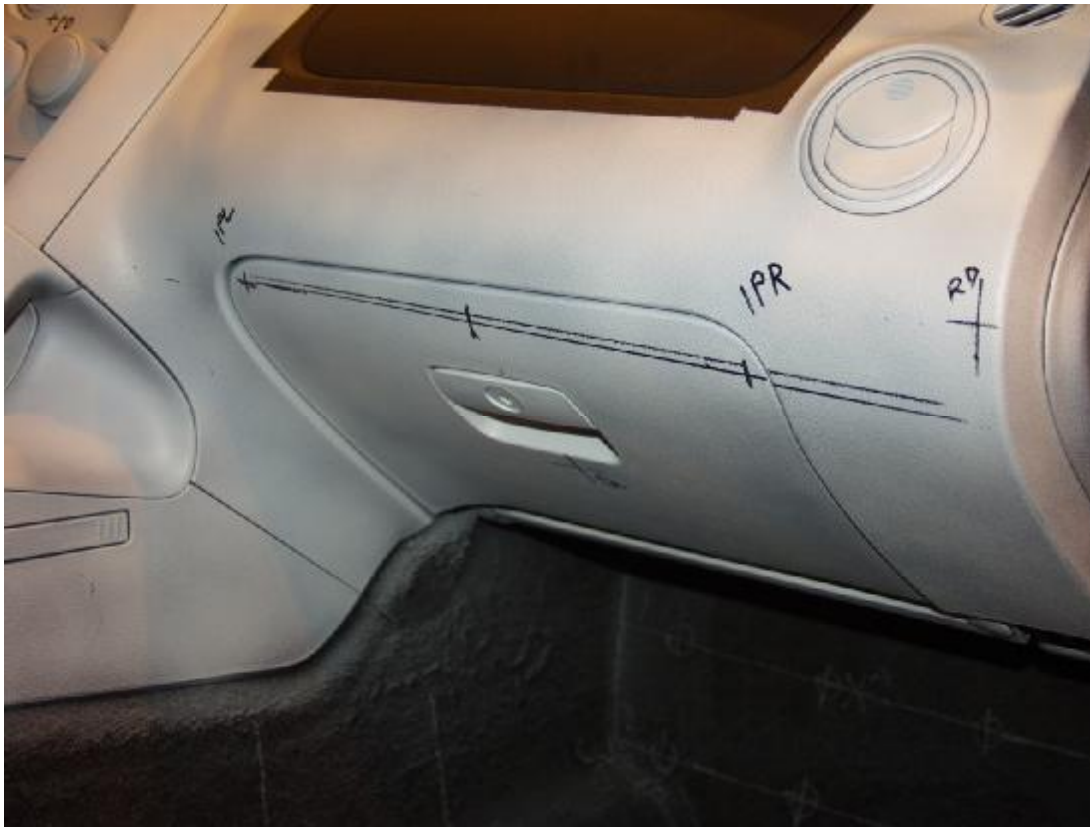


Figure A-52: Pre-Test Passenger Knee Bolster View



Figure A-53: Post-Test Passenger Knee Bolster View



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



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



Figure A-56: Post-Test Passenger Head View



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



Figure A-58: Rollover View - 90°



Figure A-59: Rollover View - 180°



Figure A-60: Rollover View - 270°



Figure A-61: Rollover View - 360°



Figure A-62: Impact View

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

Transducer	SAE Sign Convention (positive unless noted)	
Upper Neck Load Cell	Fx	Head rearward
	Fy	Head left
	Fz	Neck in tension
	Mx	Left ear to left shoulder
	My	Chin to chest (flexion)
	Mz	Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative	
Pelvic Load Cell (Lower Lumbar)	Fx	Chest rearward
	Fy	Chest left
	Fz	Spine in tension
Femur Load Cell	Compression is negative	
Upper Tibia Load Cell (right and left leg)	Mx	Support tibia at ends, load left side center
	My	Support tibia at ends, load front (shin) center
Lower Tibia Load Cell (right and left leg)	Fz	Tibia in tension
	Mx	Support tibia at ends, load left side center
	My	Support tibia at ends, load front (shin) center

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO.: M70104

DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	600
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle Displacement Integrations	180
Load Cell Barrier Forces	60

Table of Data Plots

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	V1P1 Head CG x [g, CFC_1000]	B-8
2	V1P1 Head CG y [g, CFC_1000]	B-8
3	V1P1 Head CG z [g, CFC_1000]	B-8
4	V1P1 Head CG Resultant [g, CFC_1000]	B-8
5	V1P1 Chest x [g, CFC_180]	B-9
6	V1P1 Chest y [g, CFC_180]	B-9
7	V1P1 Chest z [g, CFC_180]	B-9
8	V1P1 Chest Resultant [g, CFC_180]	B-9
9	V1P1 Chest Compression x [mm, CFC_600]	B-10
10	V1P1 Left Femur z [N, CFC_600]	B-11
11	V1P1 Right Femur z [N, CFC_600]	B-11
12	V1P2 Head CG x [g, CFC_1000]	B-12
13	V1P2 Head CG y [g, CFC_1000]	B-12
14	V1P2 Head CG z [g, CFC_1000]	B-12
15	V1P2 Head CG Resultant [g, CFC_1000]	B-12
16	V1P2 Chest x [g, CFC_180]	B-13
17	V1P2 Chest y [g, CFC_180]	B-13
18	V1P2 Chest z [g, CFC_180]	B-13
19	V1P2 Chest Resultant [g, CFC_180]	B-13
20	V1P2 Chest Compression x [mm, CFC_600]	B-14
21	V1P2 Left Femur z [N, CFC_600]	B-15
22	V1P2 Right Femur z [N, CFC_600]	B-15

The following dummy, vehicle and load cell response data can be found in the research and development section of the NHTSA website at: www.nhtsa.dot.gov

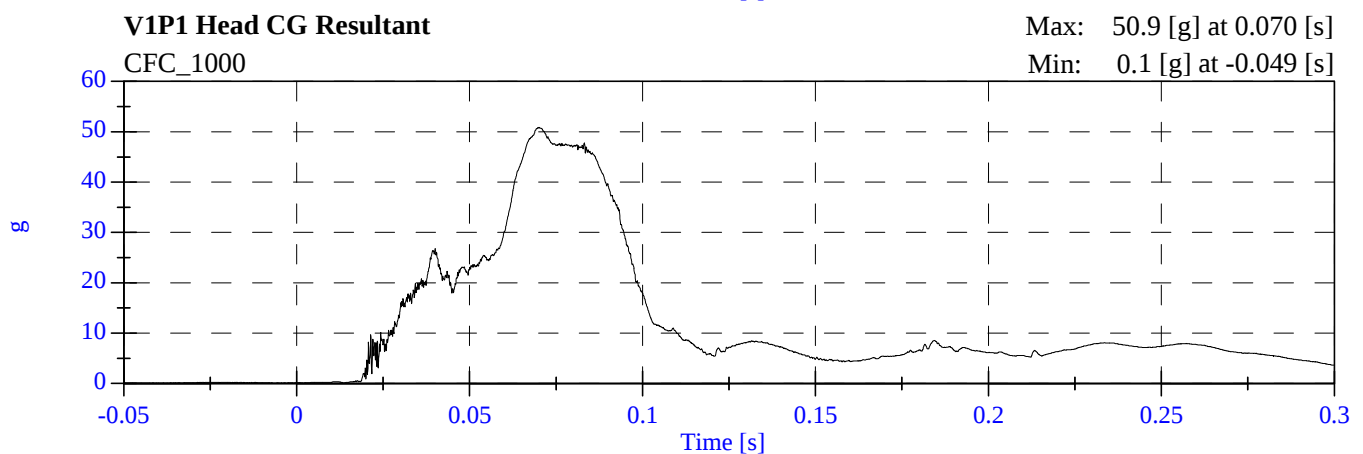
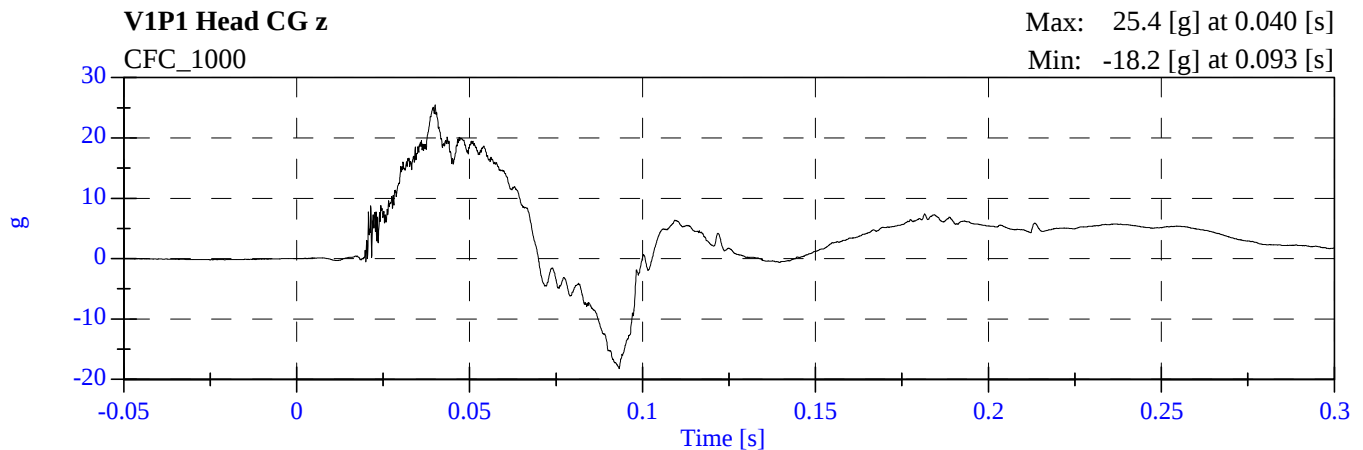
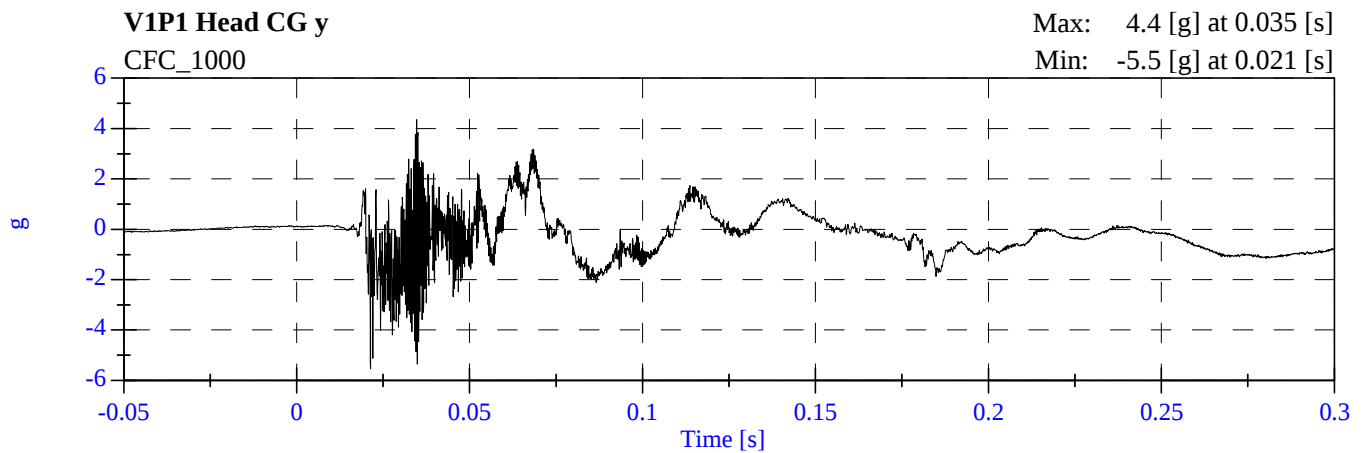
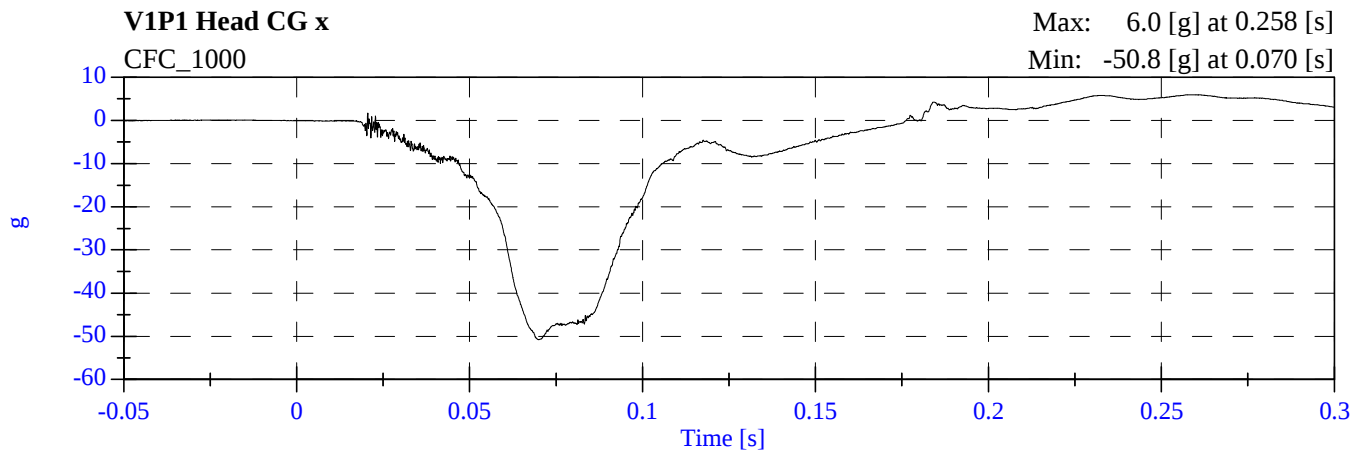
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V1P1 Head CG Ay	
V1P1 Head CG Az	
V1P1 Head CG Red Ax	
V1P1 Head CG Red Ay	
V1P1 Head CG Red Az	
V1P1 Upper Neck Fx	
V1P1 Upper Neck Fy	
V1P1 Upper Neck Fz	
V1P1 Upper Neck Mx	
V1P1 Upper Neck My	
V1P1 Upper Neck Mz	
V1P1 Chest Ax	
V1P1 Chest Ay	
V1P1 Chest Az	
V1P1 Chest Red Ax	
V1P1 Chest Red Ay	
V1P1 Chest Red Az	
V1P1 Chest Compression	
V1P1 Pelvic Ax	
V1P1 Pelvic Ay	
V1P1 Pelvic Az	
V1P1 Left Femur Fz	
V1P1 Right Femur Fz	
V1P1 Left Upper Tibia Mx	
V1P1 Left Upper Tibia My	
V1P1 Left Lower Tibia Fz	
V1P1 Left Lower Tibia Mx	
V1P1 Left Lower Tibia My	
V1P1 Right Upper Tibia Fz	
V1P1 Right Upper Tibia Mx	
V1P1 Right Upper Tibia My	
V1P1 Right Lower Tibia Mx	
V1P1 Right Lower Tibia My	
V1P1 Left Foot Aft Ax	
V1P1 Left Foot Aft Az	
V1P1 Left Foot Fore Az	
V1P1 Right Foot Aft Ax	
V1P1 Right Foot Aft Az	
V1P1 Right Foot Fore z	
V1P1 Lap Belt Load	
V1P1 Shoulder Belt Load	
V1P2 Head CG Ax	
V1P2 Head CG Ay	
V1P2 Head CG Az	
V1P2 Head CG Red Ax	
V1P2 Head CG Red Ay	

V1P2 Head CG Red Az	
V1P2 Upper Neck Fx	
V1P2 Upper Neck Fy	
V1P2 Upper Neck Fz	
V1P2 Upper Neck Mx	
V1P2 Upper Neck My	
V1P2 Upper Neck Mz	
V1P2 Chest Ax	
V1P2 Chest Ay	
V1P2 Chest Az	
V1P2 Chest Red Ax	
V1P2 Chest Red Ay	
V1P2 Chest Red Az	
V1P2 Chest Compression	
V1P2 Pelvic Ax	
V1P2 Pelvic Ay	
V1P2 Pelvic Az	
V1P2 Left Femur Fz	
V1P2 Right Femur Fz	
V1P2 Left Upper Tibia Fz	
V1P2 Left Upper Tibia Mx	
V1P2 Left Upper Tibia My	
V1P2 Left Lower Tibia Mx	
V1P2 Left Lower Tibia My	
V1P2 Right Upper Tibia Mx	
V1P2 Right Upper Tibia My	
V1P2 Right Lower Tibia Fz	
V1P2 Right Lower Tibia Mx	
V1P2 Right Lower Tibia My	
V1P2 Left Foot Aft Ax	
V1P2 Left Foot Aft Az	
V1P2 Left Foot Fore Az	
V1P2 Right Foot Aft Ax	
V1P2 Right Foot Aft Az	
V1P2 Right Foot Fore Az	
V1P2 Lap Belt Load	
V1P2 Shoulder Belt Load	
Barrier Load Cell A1 Fx	
Barrier Load Cell A2 Fx	
Barrier Load Cell A3 Fx	
Barrier Load Cell A4 Fx	
Barrier Load Cell A5 Fx	
Barrier Load Cell A6 Fx	
Barrier Load Cell A7 Fx	
Barrier Load Cell A8 Fx	
Barrier Load Cell A9 Fx	
Barrier Load Cell B1 Fx	
Barrier Load Cell B2 Fx	
Barrier Load Cell B3 Fx	

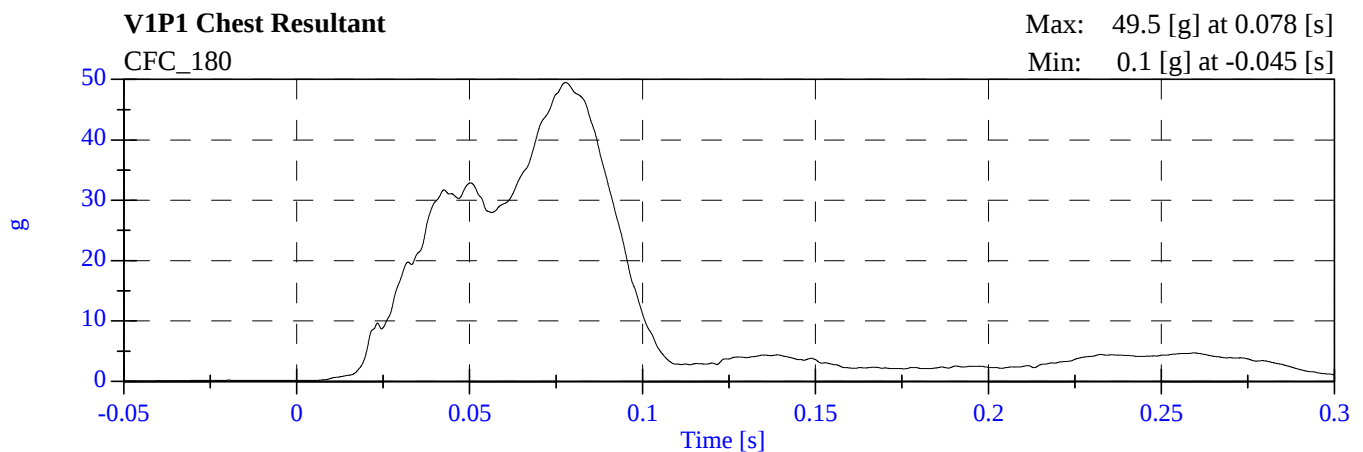
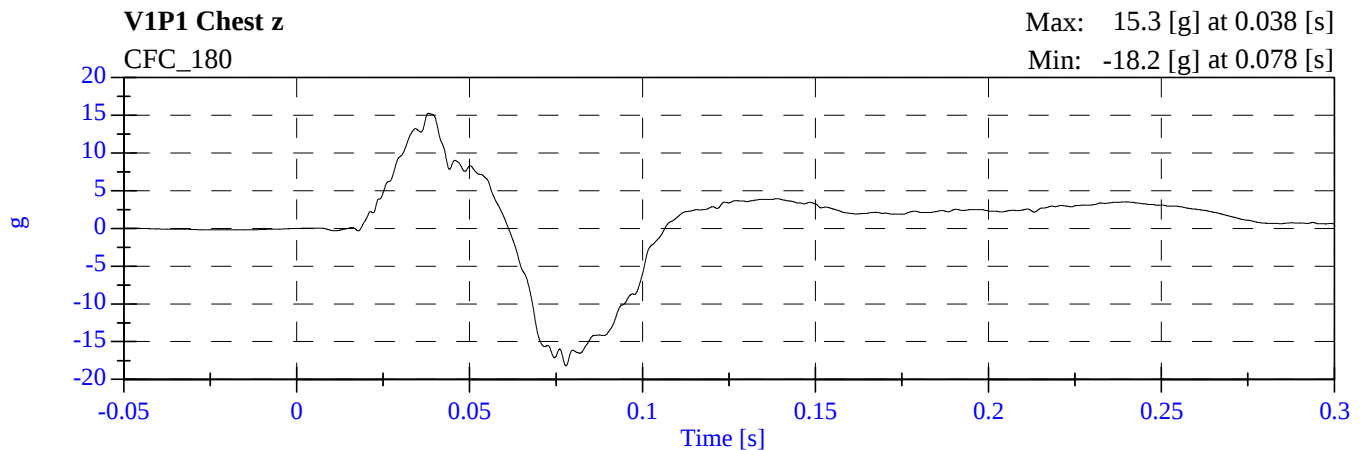
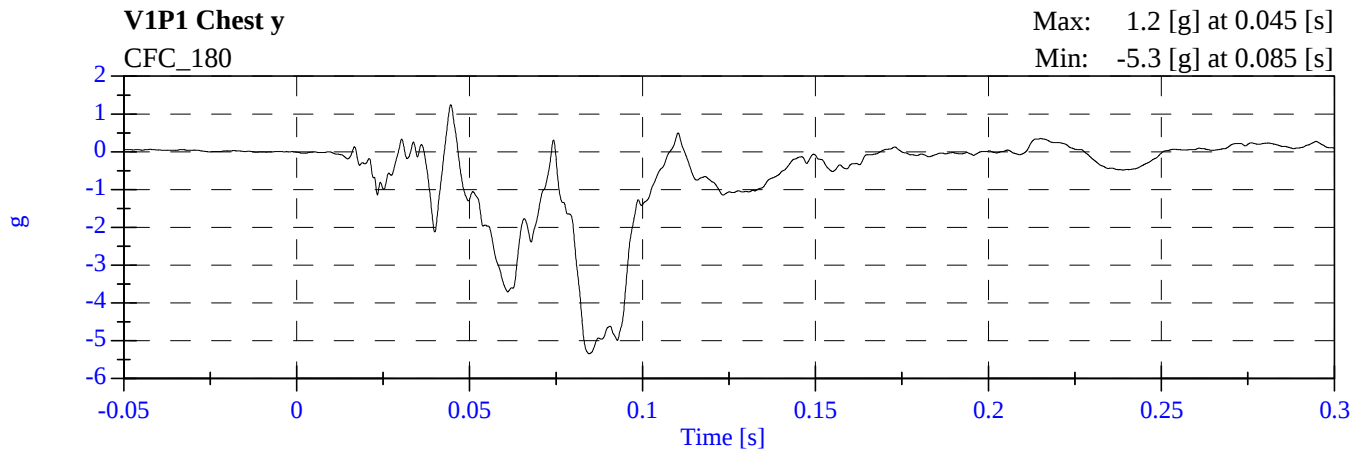
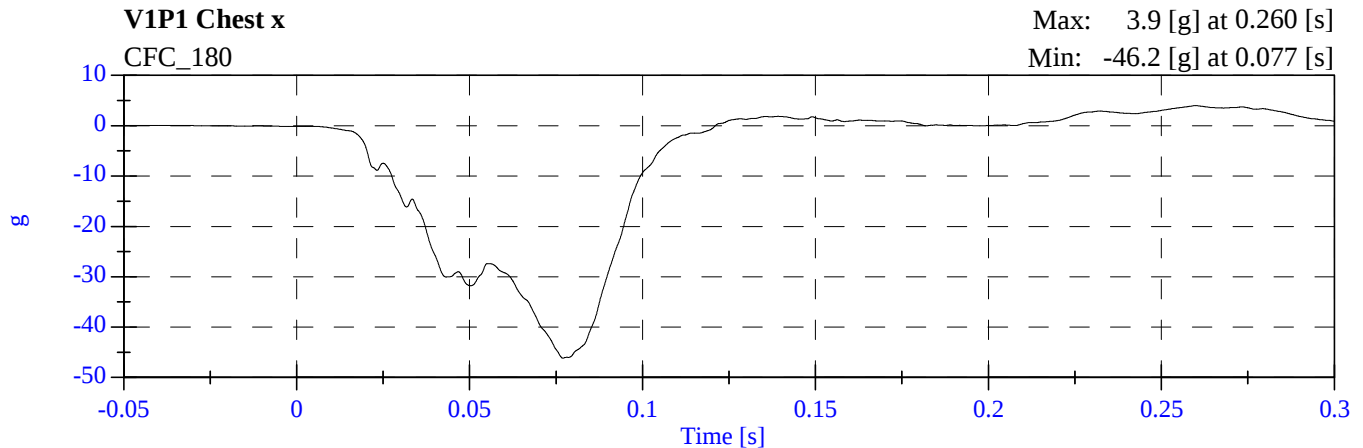
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Barrier Load Cell C1 Fx	
Barrier Load Cell C2 Fx	
Barrier Load Cell C3 Fx	
Barrier Load Cell C4 Fx	
Barrier Load Cell C5 Fx	
Barrier Load Cell C6 Fx	
Barrier Load Cell C7 Fx	
Barrier Load Cell C8 Fx	
Barrier Load Cell C9 Fx	
Barrier Load Cell D1 Fx	
Barrier Load Cell D2 Fx	
Barrier Load Cell D3 Fx	
Barrier Load Cell D4 Fx	
Barrier Load Cell D5 Fx	
Barrier Load Cell D6 Fx	
Barrier Load Cell D7 Fx	
Barrier Load Cell D8 Fx	
Barrier Load Cell D9 Fx	
V1 Left Rear #1x	
V1 Right Rear #2x	
V1 Engine Top #3x	
V1 Engine Bottom #4x	
V1 Right Caliper #5x	
V1 Left Caliper #7x	
V1 Left Rear #8z	
V1 Right Rear #9z	

TEST NOTES	
Data Channel	Anomalies
V1P1 Left Upper Tibia Mx	Questionable Data
V1 Engine Bottom #4x	Channel Opened 25 ms

2007 NCAP - 2007 Pontiac Solstice M70104 - October 10, 2006

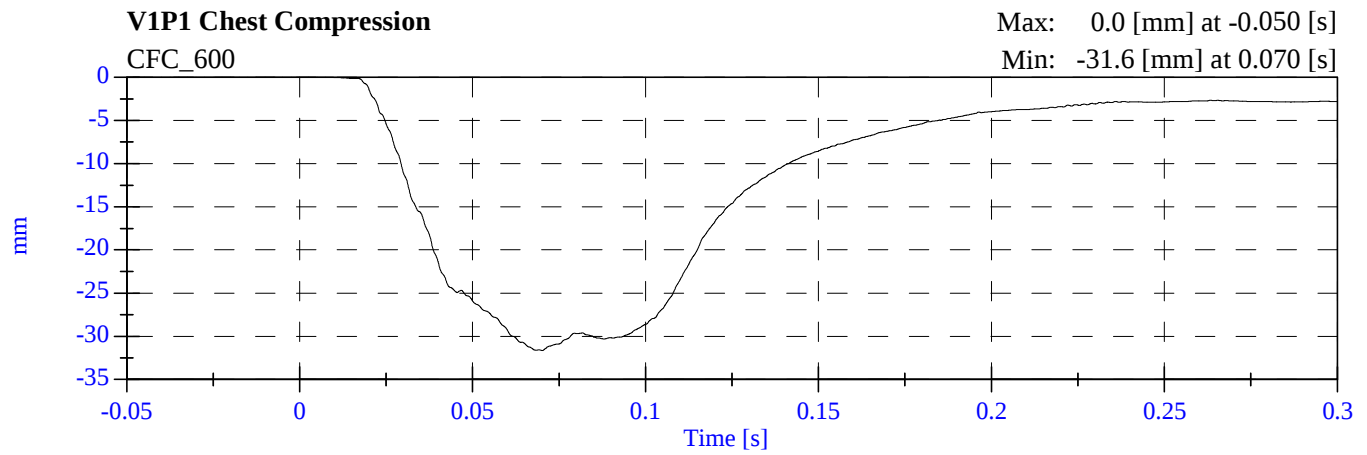


2007 NCAP - 2007 Pontiac Solstice M70104 - October 10, 2006

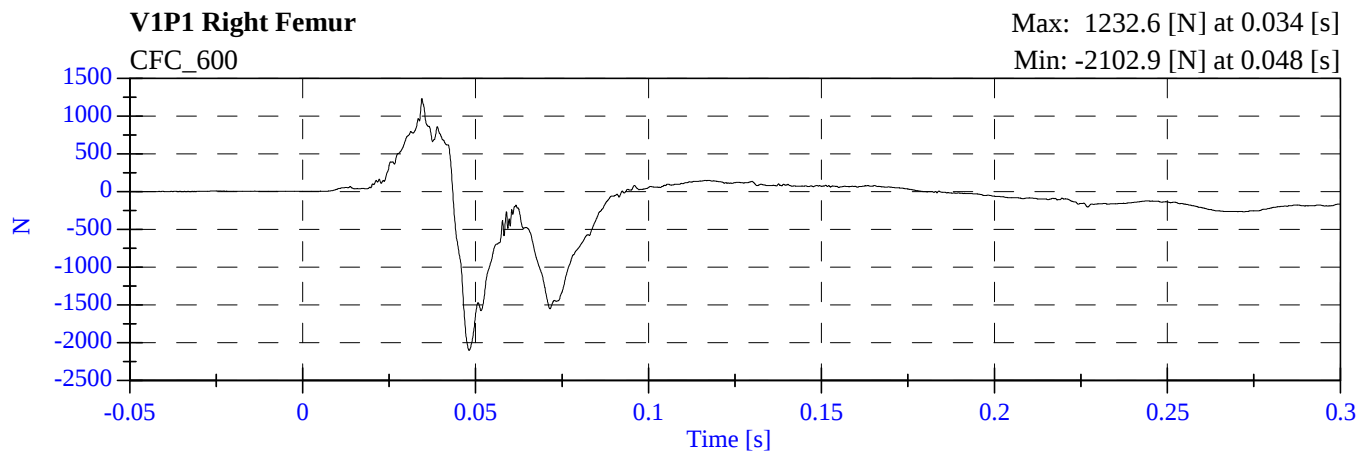
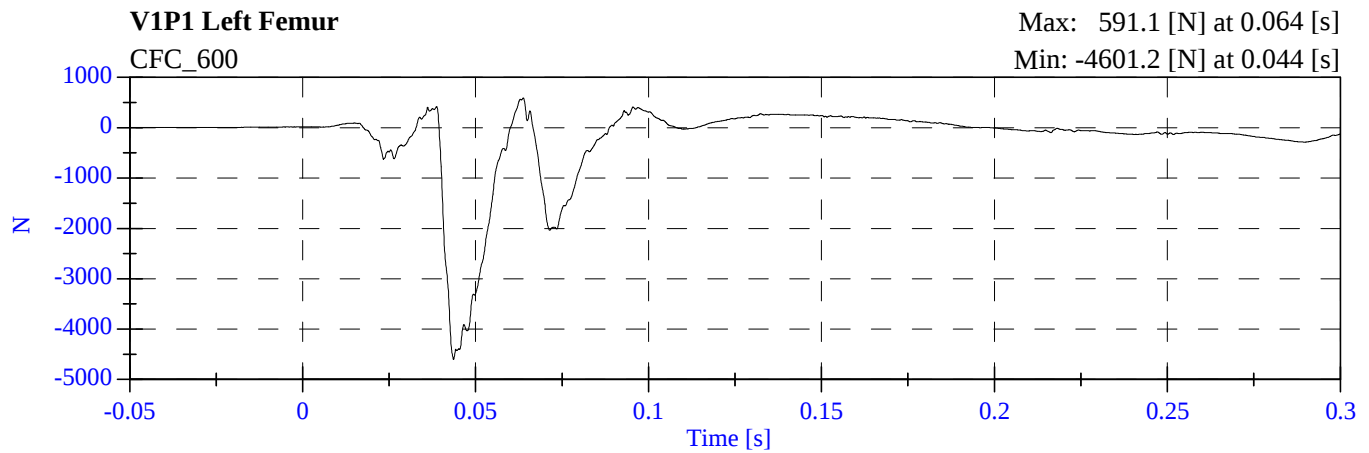


2007 NCAP - 2007 Pontiac Solstice

M70104 - October 10, 2006

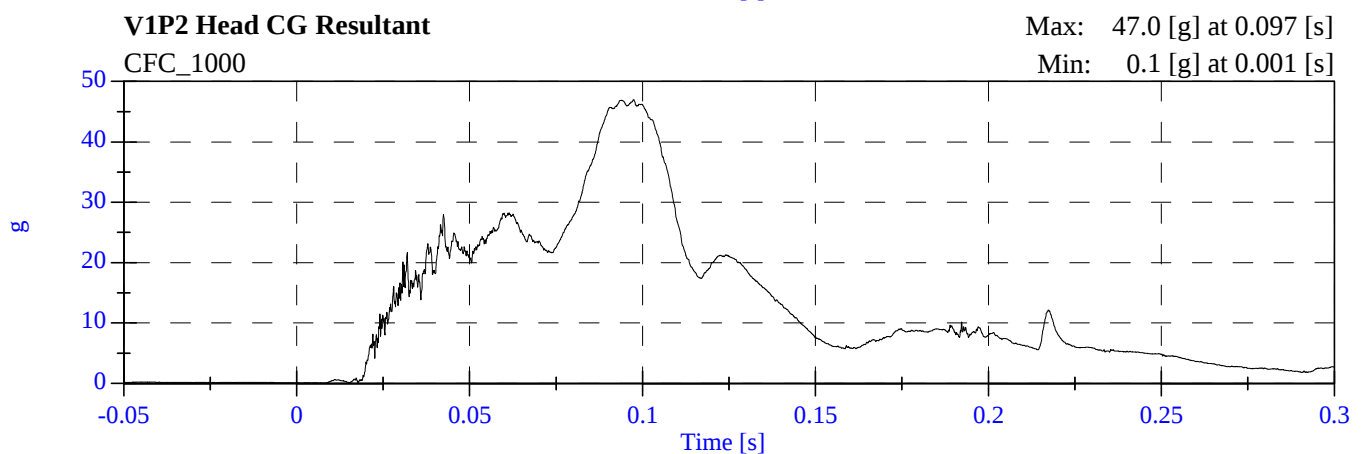
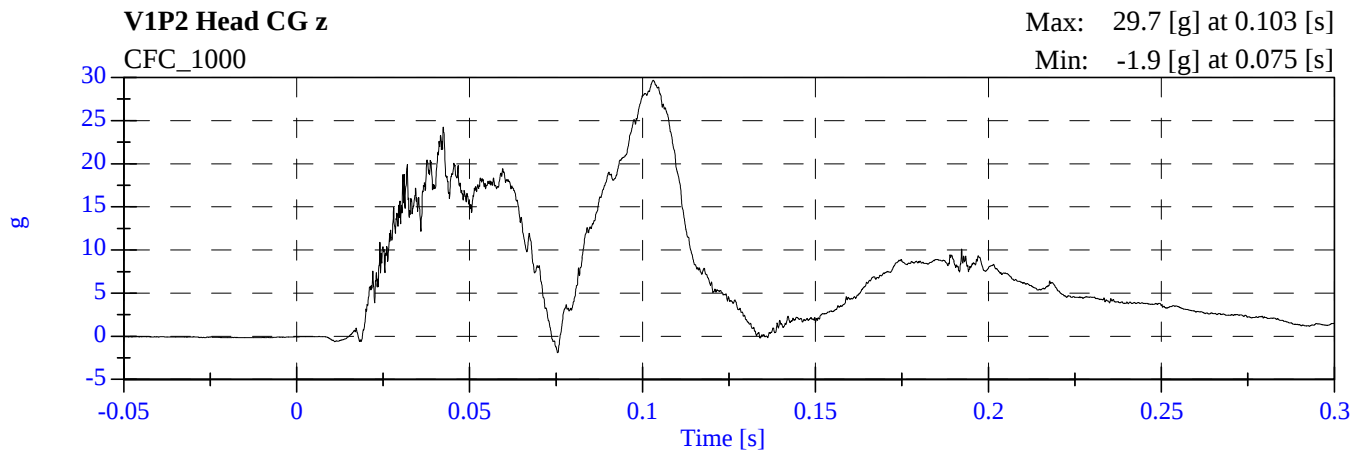
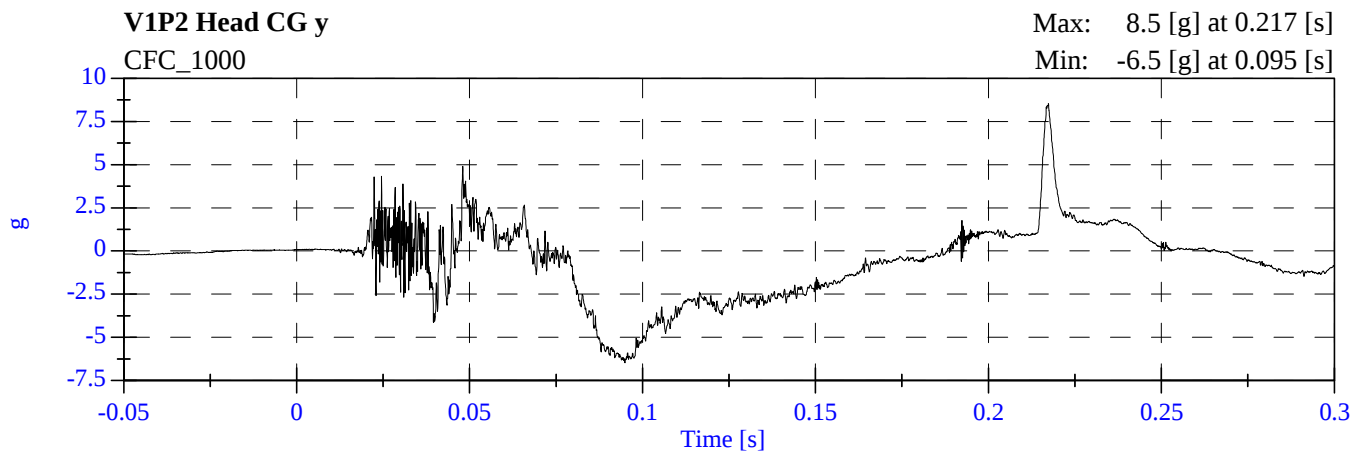
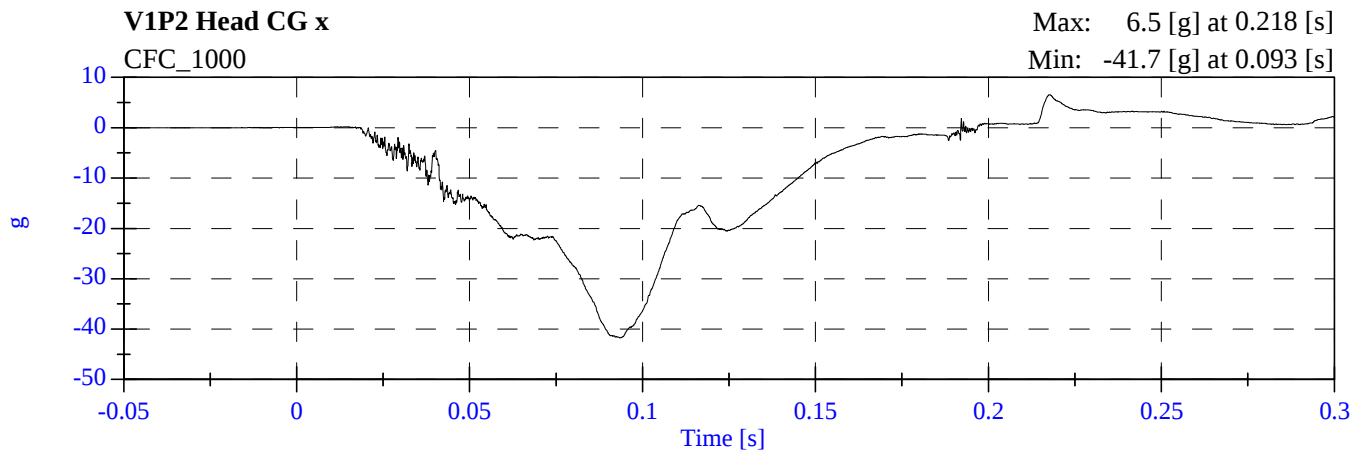


2007 NCAP - 2007 Pontiac Solstice M70104 - October 10, 2006

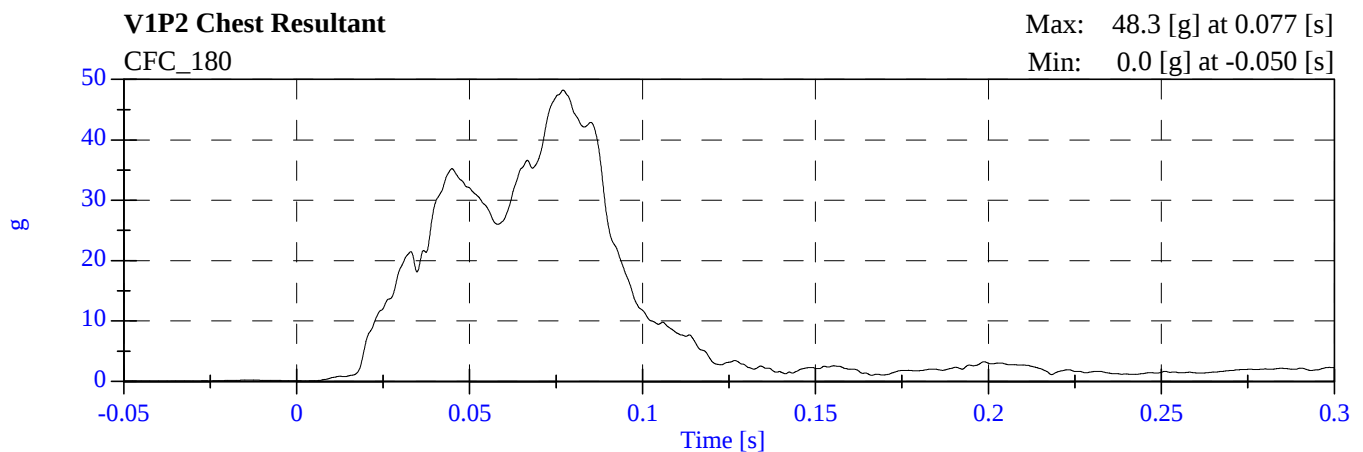
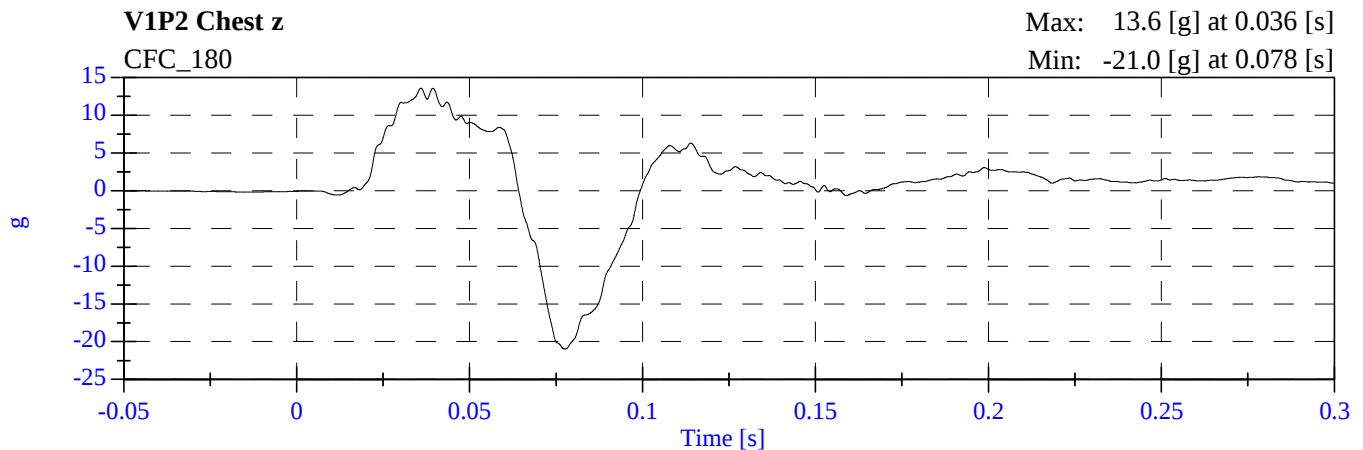
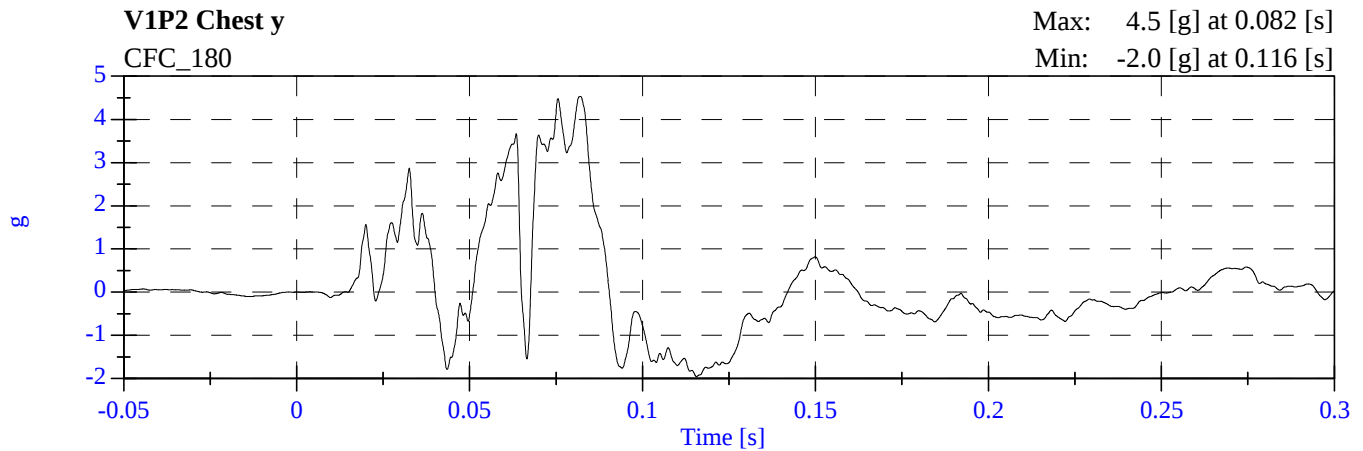
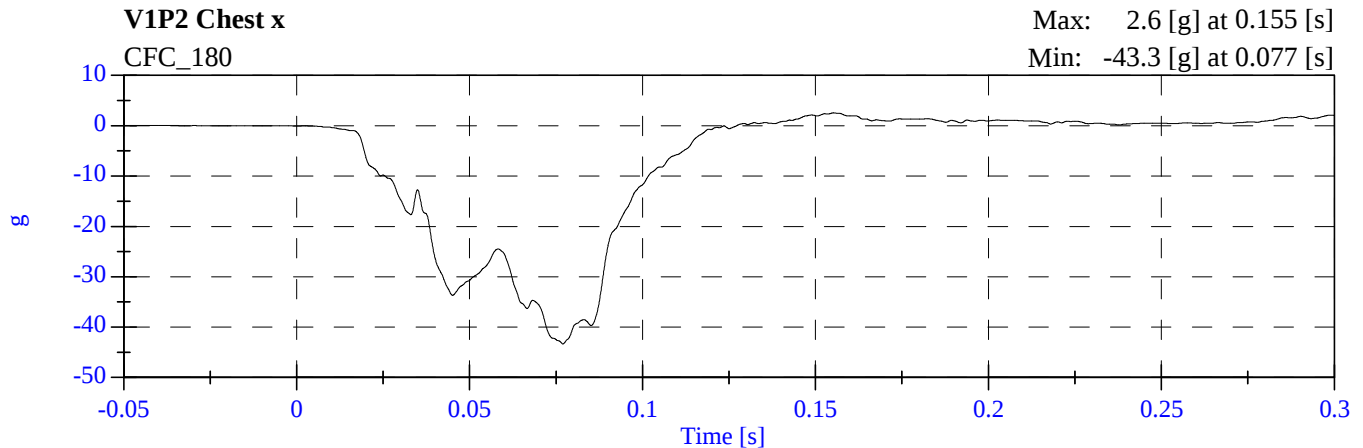


2007 NCAP - 2007 Pontiac Solstice

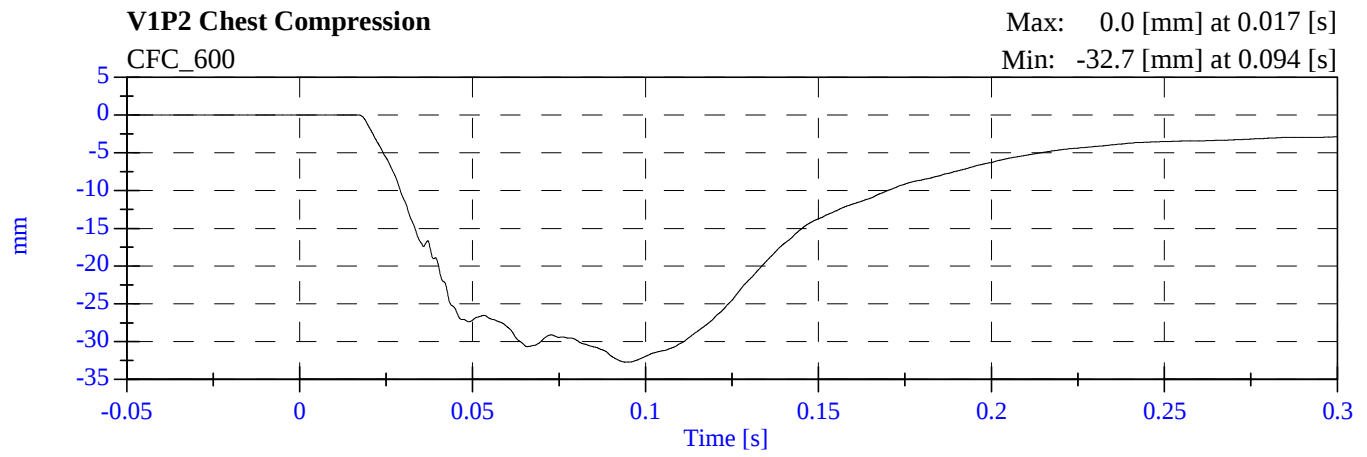
M70104 - October 10, 2006



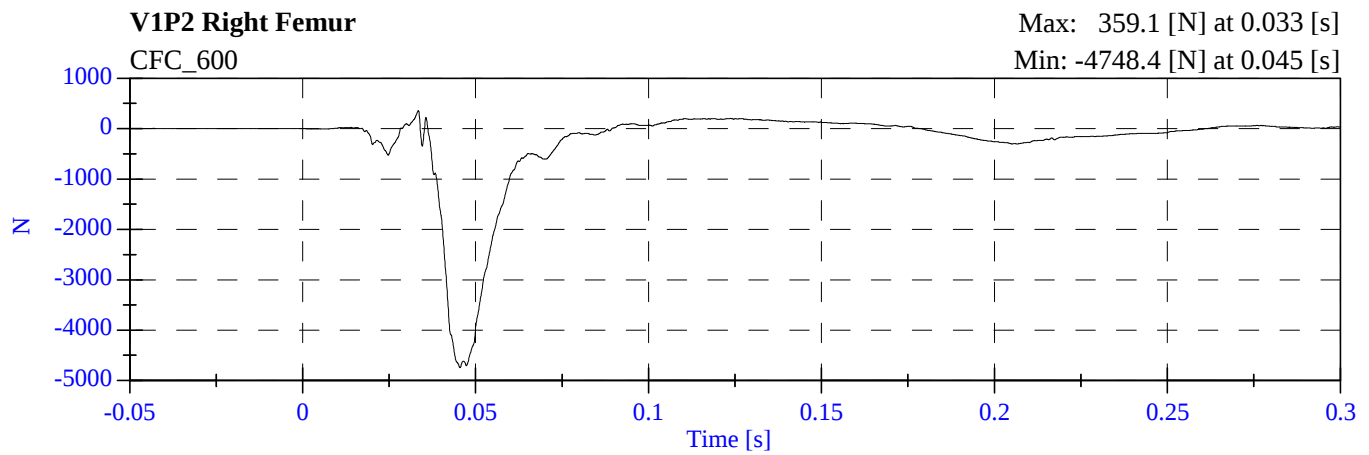
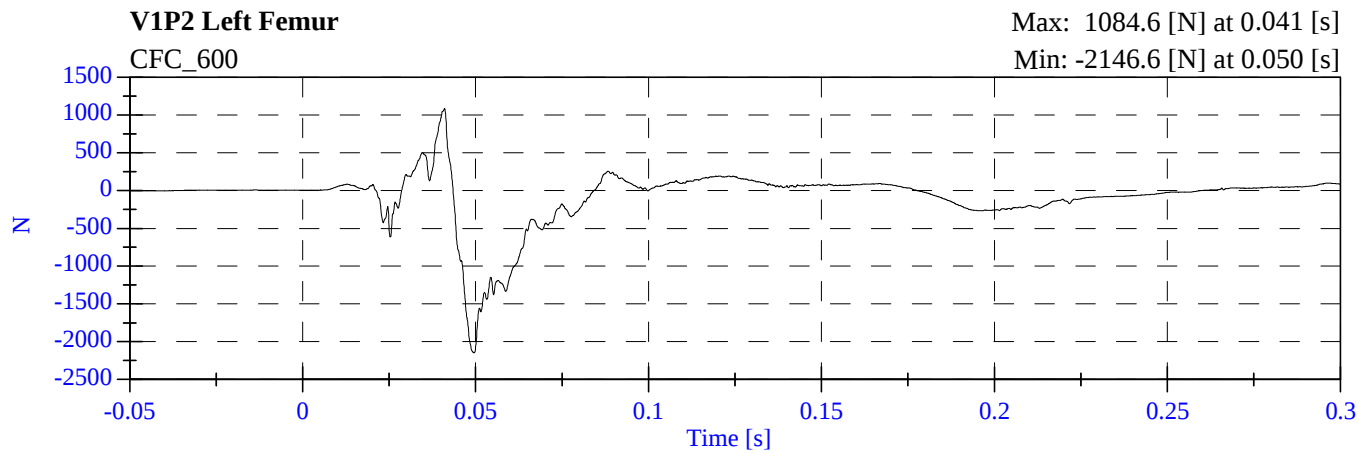
2007 NCAP - 2007 Pontiac Solstice M70104 - October 10, 2006



2007 NCAP - 2007 Pontiac Solstice
M70104 - October 10, 2006



2007 NCAP - 2007 Pontiac Solstice M70104 - October 10, 2006



APPENDIX C

PART 572B/E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Calspan. A summary of the test results, and Part 572 specifications are included in this Appendix.

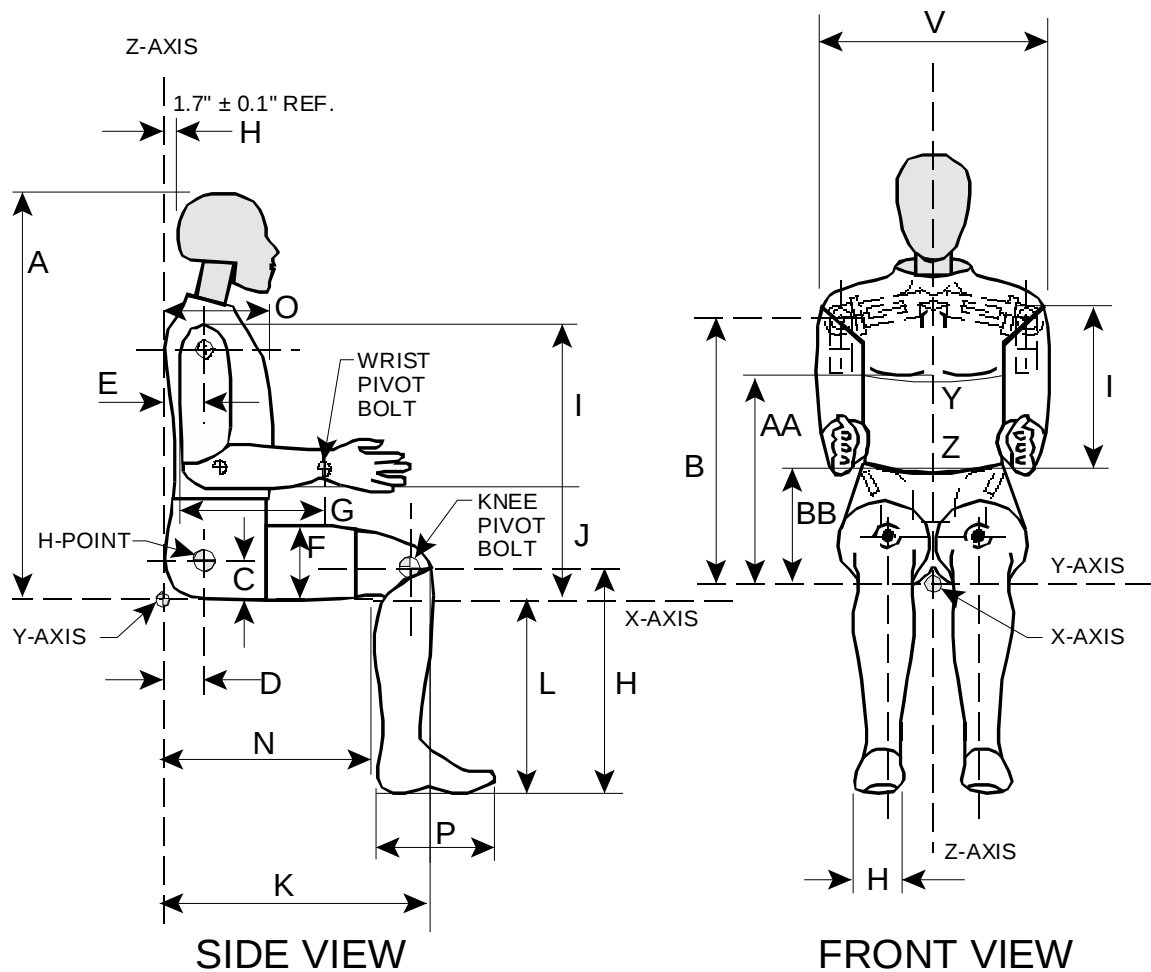
Dummy serial numbers and certification dates are:

<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	142	8/4/2006
#2/Right Front Passenger	150	8/4/2006

Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Inducant Testing Final Report No. 6525-V-1.

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude.
(REF: S572.31(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 142
Sequential Test Number 3
Date July 31, 2006
Workfile 142H 07-31-06.dat

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Peak Resultant Acceleration	225-275 G's	248.06
Peak Lateral Acceleration	15 G's Max	13.26
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	142	
Sequential Test Number	3	
Date	August 01, 2006	6 Axis Neck Transducer
Workfile	142NF 08-01-06.dat	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		6.89 – 7.13 m/s	6.99
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.84
	20 ms	17.60 - 22.60 G's	21.18
	30 ms	12.50 - 18.50 G's	17.63
Max Pendulum G's Above 30 ms		29 G's Max	17.63
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	34.90
D Plane Rotation	Max	64 - 78 Deg	64.08
	Time	57 - 64 ms	60.90
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	89.06
	Time	47 - 58 ms	49.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.80
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.10

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	142	
Sequential Test Number	3	
Date	August 02, 2006	6 Axis Neck Transducer
Workfile	142NF 08-02-06.dat	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		5.94 – 6.19 m/s	5.97
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.38
	20 ms	14.00 - 19.00 G's	17.90
	30 ms	11.00 - 16.00 G's	15.77
Max Pendulum G's Above 30 ms		22 G's Max	15.77
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.00
D Plane Rotation	Max	81 - 106 Deg	81.16
	Time	72 - 82 ms	76.30
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-73.50
	Time	65 - 79 ms	71.30
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	157.30
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	148.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E THORAX IMPACT TEST

Dummy Serial Number	142
Sequential Test Number	3
Date	August 03, 2006
Workfile	142T 08-03-06.dat

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Pendulum Velocity	6.58 – 6.83 m/s	6.71
Maximum Deflection	63.50 – 72.64 mm	64.04
Maximum Resistive Force	5159.9 – 5893.9 N	5440.18
Internal Hysteresis	69 - 85 %	70.83

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 142
Sequential Test Number 3
Date August 02, 2006
Workfile 142LF 08-02-06.dat; 142RF 08-02-06.dat

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5075.18
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5351.09

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 142
Sequential Test Number 3
Date August 03, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1
Relative Humidity			50.0
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Total Sitting Height	A	34.6 - 35.0 in	34.9
Shoulder Pivot Height	B	19.9 - 20.5 in	20.3
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Thigh Clearance	F	5.5 - 6.1 in	6.0
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.5
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.5
Elbow Rest Height	J	7.5 - 8.3 in	8.1
Buttock Knee Length	K	22.8 - 23.8 in	23.5
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.2
Buttock Popliteal Length	N	17.8 - 18.8 in	18.6
Chest Depth	O	8.4 - 9.0 in	8.9
Foot Length	P	9.9 - 10.5 in	10.3
Shoulder Breadth	V	16.6 - 17.2 in	16.9
Foot Breadth	W	3.6 - 4.2 in	4.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	38.9
Waist Circumference	Z	32.9 - 34.1 in	33.2

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 150
Sequential Test Number 3
Date July 31, 2006
Workfile 150H 07-31-2006.dat

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Peak Resultant Acceleration	225-275 G's	268.54
Peak Lateral Acceleration	15 G's Max	7.06
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	150	
Sequential Test Number	3	
Date	August 01, 2006	6 Axis Neck Transducer
Workfile	150NF 08-01-06.dat	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		6.89 – 7.13 m/s	6.99
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.66
	20 ms	17.60 - 22.60 G's	21.08
	30 ms	12.50 - 18.50 G's	18.16
Max Pendulum G's Above 30 ms		29 G's Max	18.16
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	35.80
D Plane Rotation	Max	64 - 78 Deg	64.32
	Time	57 - 64 ms	58.80
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	93.00
	Time	47 - 58 ms	48.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	116.90
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.10

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	150	
Sequential Test Number	3	
Date	August 01, 2006	6 Axis Neck Transducer
Workfile	150NE 08-01-06.dat	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	50.0
Impact Velocity		5.94 – 6.19 m/s	5.97
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.65
	20 ms	14.00 - 19.00 G's	17.40
	30 ms	11.00 - 16.00 G's	15.48
Max Pendulum G's Above 30 ms		22 G's Max	16.56
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.10
D Plane Rotation	Max	81 - 106 Deg	82.36
	Time	72 - 82 ms	77.20
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-71.35
	Time	65 - 79 ms	74.50
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	160.80
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	144.30

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 150
Sequential Test Number 3
Date August 04, 2006
Workfile 150T 08-04-06.dat

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Pendulum Velocity	6.58 – 6.83 m/s	6.77
Maximum Deflection	63.50 – 72.64 mm	65.18
Maximum Resistive Force	5159.9 – 5893.9 N	5823.33
Internal Hysteresis	69 - 85 %	69.67

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 150
Sequential Test Number 3
Date August 02, 2006
Workfile 150LF 08-02-06.dat; 150RF 08-02-06.dat

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4944.39
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4737.28

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 150
Sequential Test Number 3
Date August 03, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1
Relative Humidity			50.0
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Total Sitting Height	A	34.6 - 35.0 in	34.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.2
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Thigh Clearance	F	5.5 - 6.1 in	6.0
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Elbow Rest Height	J	7.5 - 8.3 in	8.2
Buttock Knee Length	K	22.8 - 23.8 in	23.5
Popliteal Height	L	16.9 - 17.9 in	17.8
Knee Pivot Height	M	19.1 - 19.7 in	19.5
Buttock Popliteal Length	N	17.8 - 18.8 in	18.5
Chest Depth	O	8.4 - 9.0 in	9.0
Foot Length	P	9.9 - 10.5 in	10.2
Shoulder Breadth	V	16.6 - 17.2 in	16.9
Foot Breadth	W	3.6 - 4.2 in	4.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.1
Waist Circumference	Z	32.9 - 34.1 in	33.8

Remarks:

Laboratory Technician:

B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 142)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENTRAN	AC-02A16-A09	19-Apr-06	18-Oct-06
	Y	ENTRAN	AC-02I0210-N20	19-Apr-06	18-Oct-06
	Z	ENDEVCO	AC-J19244	17-Apr-06	16-Oct-06
Head	X (R)	ENDEVCO	AC-P16591	18-Jul-06	16-Jan-07
	Y (R)	ENDEVCO	AC-P16286	18-Jul-06	16-Jan-07
	Z (R)	ENDEVCO	AC-J23996	17-Apr-06	16-Oct-06
Neck Load Cell	X	DENTON	LC-280Fx	21-Apr-06	20-Oct-06
	Y	DENTON	LC-280Fy	21-Apr-06	20-Oct-06
	Z	DENTON	LC-280Fz	21-Apr-06	20-Oct-06
Neck Moment	X	DENTON	LC-280Mx	21-Apr-06	20-Oct-06
	Y	DENTON	LC-280My	21-Apr-06	20-Oct-06
	Z	DENTON	LC-280Mz	21-Apr-06	20-Oct-06
Chest	X	ENTRAN	AC-03E03D16-F16	16-May-06	14-Nov-06
	Y	ENTRAN	AC-05H31-Z04	15-May-06	13-Nov-06
	Z	ENTRAN	AC-04J04I20-Z04	16-May-06	14-Nov-06
Chest	X (R)	ENTRAN	AC-03E03E21-M02	15-May-06	13-Nov-06
	Y (R)	ENTRAN	AC-01G18-F08	16-May-06	14-Nov-06
	Z (R)	ENTRAN	AC-03F03E29-N04	16-May-06	14-Nov-06
Chest Deflection	X	SERVO	DS-142	5-Apr-06	4-Oct-06
Pelvic	X	ENTRAN	AC-00L13-F10	19-Apr-06	18-Oct-06
	Y	ENTRAN	AC-03F03F09-N06	19-Apr-06	18-Oct-06
	Z	ENTRAN	AC-03E03E21-M06	19-Apr-06	18-Oct-06

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 142)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1523	21-Apr-06	20-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1524	21-Apr-06	20-Oct-06
Left Upper Tibia	Mx	DENTON	LC-265Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-265My	24-Apr-06	23-Oct-06
Left Lower Tibia	Fz	DENTON	LC-178Fz	24-Apr-06	23-Oct-06
	Mx	DENTON	LC-178Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-178My	24-Apr-06	23-Oct-06
Right Upper Tibia	Mx	DENTON	LC-200Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-200My	24-Apr-06	23-Oct-06
Right Lower Tibia	Fz	DENTON	LC-128Fz	24-Apr-06	23-Oct-06
	Mx	DENTON	LC-128Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-128My	24-Apr-06	23-Oct-06
Left Foot Rear	X	ENDEVCO	AC-AJ7G1	17-Apr-06	16-Oct-06
	Z	ENDEVCO	AC-J20084	17-Apr-06	16-Oct-06
Left Foot Front	Z	ENDEVCO	AC-J20004	17-Apr-06	16-Oct-06
Right Foot Rear	X	ENDEVCO	AC-J27079	18-Apr-06	17-Oct-06
	Z	ENDEVCO	AC-ACCE6	18-Apr-06	17-Oct-06
Right Foot Front	Z	ENDEVCO	AC-AAMP6	18-Apr-06	17-Oct-06
Lap Belt Load Cell		First Technology	LC-159	11-Jul-06	9-Jan-07
Shoulder Belt Load Cell		First Technology	LC-173	11-Jul-06	9-Jan-07

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-J19996	19-Apr-06	18-Oct-06
	Y	ENDEVCO	AC-J14381	19-Apr-06	18-Oct-06
	Z	ENDEVCO	AC-J19547	19-Apr-06	18-Oct-06
Head	X (R)	ENDEVCO	AC-AJ4P7	19-Apr-06	18-Oct-06
	Y (R)	ENDEVCO	AC-J27366	18-Apr-06	17-Oct-06
	Z (R)	ENDEVCO	AC-P16676	7-Jul-06	5-Jan-07
Neck Load Cell	X	DENTON	LC-157Fx	21-Apr-06	20-Oct-06
	Y	DENTON	LC-157Fy	21-Apr-06	20-Oct-06
	Z	DENTON	LC-157Fz	21-Apr-06	20-Oct-06
Neck Moment	X	DENTON	LC-157Mx	21-Apr-06	20-Oct-06
	Y	DENTON	LC-157My	21-Apr-06	20-Oct-06
	Z	DENTON	LC-157Mz	21-Apr-06	20-Oct-06
Chest	X	ENDEVCO	AC-J20083	20-Apr-06	19-Oct-06
	Y	ENTRAN	AC-04J04J07-M02	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J19223	20-Apr-06	19-Oct-06
Chest	X (R)	ENDEVCO	AC-P35817	10-Jul-06	8-Jan-07
	Y (R)	ENDEVCO	AC-P35790	10-Jul-06	8-Jan-07
	Z (R)	ENDEVCO	AC-P39574	10-Jul-06	8-Jan-07
Chest Deflection	X	SERVO	DS-150	13-Apr-06	12-Oct-06
Pelvic	X	ENDEVCO	AC-J21985	19-Apr-06	18-Oct-06
	Y	ENDEVCO	AC-AAMW5	19-Apr-06	18-Oct-06
	Z	ENDEVCO	AC-AJ5P9	19-Apr-06	18-Oct-06

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1527	21-Apr-06	20-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1528	21-Apr-06	20-Oct-06
Left Upper Tibia	Mx	DENTON	LC-263Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-263My	24-Apr-06	23-Oct-06
Left Lower Tibia	Fz	DENTON	LC-174Fz	24-Apr-06	23-Oct-06
	Mx	DENTON	LC-174Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-174My	24-Apr-06	23-Oct-06
Right Upper Tibia	Mx	DENTON	LC-274Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-274My	24-Apr-06	23-Oct-06
Right Lower Tibia	Fz	Denton	LC-185Fz	24-Apr-06	23-Oct-06
	Mx	DENTON	LC-185Mx	24-Apr-06	23-Oct-06
	My	DENTON	LC-185My	24-Apr-06	23-Oct-06
Left Foot Rear	X	ENDEVCO	AC-P14914	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-AGRP4	20-Apr-06	19-Oct-06
Left Foot Front	Z	ENDEVCO	AC-AJ4G1	20-Apr-06	19-Oct-06
Right Foot Rear	X	ENDEVCO	AC-J36723	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J27496	20-Apr-06	19-Oct-06
Right Foot Front	Z	ENDEVCO	AC-J35747	20-Apr-06	19-Oct-06
Lap Belt Load Cell		First Technology	LC-178	11-Jul-06	9-Jan-07
Shoulder Belt Load Cell		First Technology	LC-180	11-Jul-06	9-Jan-07

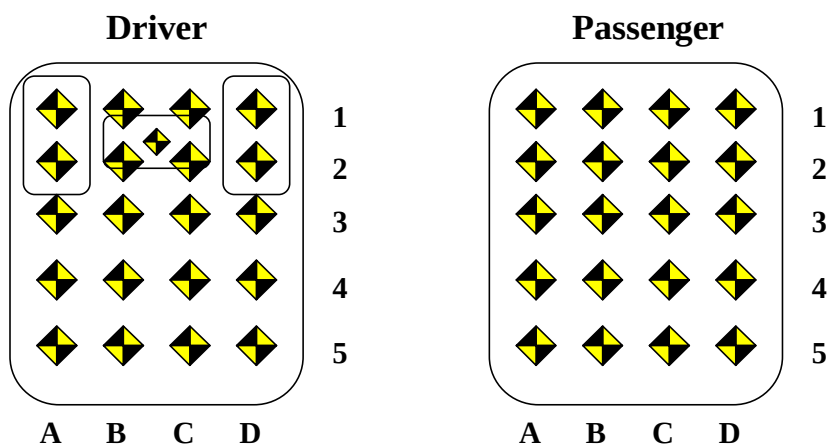
INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	GS SENSORS	AC-9440-046	11-Jul-06	9-Jan-07
Right Rear Seat Crossmember X	ICS	AC-FGP19	11-Jul-06	9-Jan-07
Top of Engine	ICS	AC-FGP35	11-Jul-06	9-Jan-07
Bottom of Engine	ICS	AC-8062-003	17-Jun-06	16-Dec-06
Right Disc Brake Caliper	ICS	AC-FGP37	11-Jul-06	9-Jan-07
Left Disc Brake Caliper	ICS	AC-FGP49	26-Jul-06	24-Jan-07
Left Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	11-Jul-06	9-Jan-07
Right Seat Rear Crossmember Z	ICS	AC-FGP29	11-Jul-06	9-Jan-07

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

DRIVER SIDE INTRUSION MEASUREMENTS

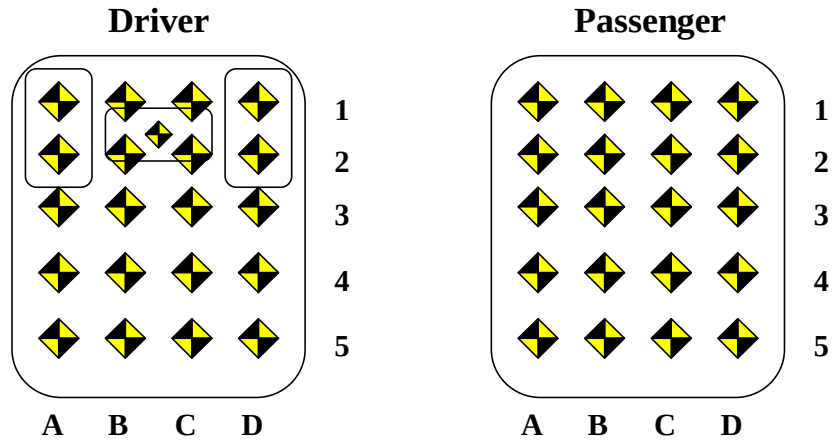


Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	2528	-604	-365	2529	-605	-384	-1	1	19
B1	2634	-484	-367	2627	-479	-394	7	-5	27
C1	2636	-368	-366	2626	-363	-387	10	-5	21
D1	2631	-250	-368	2630	-240	-387	1	-10	19
A2	2504	-604	-289	2507	-606	-306	-3	2	17
B2	2637	-487	-288	2636	-483	-316	1	-4	28
C2	2633	-367	-288	2633	-366	-310	0	-1	22
D2	2626	-251	-287	2630	-246	-303	-4	-5	16
A3	2497	-606	-204	2500	-609	-223	-3	3	19
B3	2565	-486	-209	2575	-484	-231	-10	-2	22
C3	2569	-367	-212	2574	-367	-236	-5	0	24
D3	2568	-247	-210	2572	-247	-232	-4	0	22
A4	2419	-607	-197	2428	-606	-218	-9	-1	21
B4	2416	-487	-201	2424	-487	-227	-8	0	26
C4	2417	-372	-205	2426	-368	-233	-9	-4	28
D4	2417	-253	-206	2426	-250	-225	-9	-3	19
A5	2270	-609	-196	2278	-607	-211	-8	-2	15
B5	2271	-489	-197	2278	-488	-218	-7	-1	21
C5	2268	-370	-206	2275	-367	-231	-7	-3	25
D5	2269	-252	-203	2276	-249	-223	-7	-3	20
BP	2483	-381	-385	2517	-398	-381	-34	17	-4
G	2116	-542	-646	2114	-544	-660	2	2	14
H	2116	-220	-646	2112	-223	-657	4	3	11
L	1964	-374	-779	1987	-378	-827	-23	4	48
AB	1928	-596	-206	1933	-597	-211	-5	1	5

BP=Brake Pedal, G=Left side of bolster, H=Right side of bolster, L=Steering wheel center;
 AB = Front outboard seat anchor bolt

PASSENGER SIDE INTRUSION MEASUREMENTS



Passenger Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	2532	248	-362	2526	240	-401	6	8	39
B1	2531	369	-357	2526	362	-398	5	7	41
C1	2528	490	-355	2527	484	-399	1	6	44
D1	2529	607	-355	2531	598	-400	-2	9	45
A2	2507	255	-282	2512	250	-318	-5	5	36
B2	2504	368	-279	2510	364	-318	-6	4	39
C2	2504	489	-278	2511	482	-318	-7	7	40
D2	2500	608	-278	2517	603	-316	-17	5	38
A3	2496	248	-253	2502	241	-293	-6	7	40
B3	2468	365	-206	2486	362	-240	-18	3	34
C3	2467	489	-203	2489	484	-238	-22	5	35
D3	2471	606	-206	2492	600	-241	-21	6	35
A4	2316	246	-257	2325	239	-283	-9	7	26
B4	2317	367	-202	2340	364	-233	-23	3	31
C4	2315	486	-196	2338	487	-228	-23	-1	32
D4	2316	609	-194	2343	606	-224	-27	3	30
A5	2162	249	-259	2175	247	-276	-13	2	17
B5	2160	366	-198	2184	368	-220	-24	-2	22
C5	2163	486	-193	2187	488	-216	-24	-2	23
D5	2164	610	-193	2189	610	-214	-25	0	21
R	2114	228	-652	2110	228	-665	4	0	13
S	2112	530	-642	2111	529	-657	1	1	15
AB	1929	593	-198	1935	599	-207	-6	-6	9

R=Left side of bolster, S=Right side of bolster, L=Steering wheel center;

AB = Front outboard seat anchor bolt