REPORT NUMBER: CAL-07-09

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION
2007 SATURN OUTLOOK
MPV

NHTSA NUMBER: M70106

CALSPAN TEST NUMBER: 8806-NCAP-09

CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
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January 18, 2007

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
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400 Seventh Street, SW, Room No. 5311
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15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 2007 Saturn Outlook MPV was performed at Calspan Corporation's crash test facility in Buffalo, New York, on January 18, 2007.

The impact velocity was 55.84 kph and the temperature at the barrier face was 21.0°C. The maximum post-test vehicle crush was 494 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and force limiter, knee bolsters, airbags and adjustable head restraints 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	281.1	412.8
Maximum Thorax Acceleration (3 ms Clip)	g's	60 g's	45.3[1]	38.0
Chest Displacement	mm	-76 mm	-31.7	-31.1
Left Femur Force	Newtons	-10000 N	-4951.0	-5487.6
Right Femur Force	Newtons	-10000 N	-2627.1	-4281.6

[1]Calculated using chest redundant Y data

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 55.84 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 55.84 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 55.84 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 16 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, 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 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 used in one test (M70502) previous to this test where they did not exceed FMVSS 208 head, chest or femur requirements. 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 162 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 Saturn Outlook MPV at a velocity of 55.84 kph. The test was performed at Calspan on January 18, 2007. 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	281.1	51.1	87.1	45.3[1]	68.8	71.8	-31.7	-4951.0	-2627.1
Passenger	412.8	62.4	98.4	38.0	84.6	97.6	-31.1	-5487.6	-4281.6

[1]Calculated using chest redundant Y data

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

TEST NOTES	
Data Channel	Anomalies
V1P1 Chest y	Channel Opened at 71 ms
V1P1 Right Foot Aft x	Channel Opened
V1P1 Right Foot Fore z	Data is not accurate after 73 ms
V1 Engine Top #3x	Channel Opened at 40 ms
Barrier Load Cell C8 Fx	Did Not Record

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M70106 Test Mode: 56.3 kph Frontal Barrier
Test Date: January 18, 2007 Time: 13:57 Temperature: 21.0 °C
Vehicle Make/Model/Body Style: 2007 Saturn Outlook MPV
Vehicle Test Weight: 2414.0 kg Impact Velocity: 55.84 kph (55.5 – 57.1 kph)
Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 494 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	Seatbelt with torso belt force limiters and pre-tensioners, airbag, knee bolster, head restraint	Seatbelt with torso belt force limiters and pre-tensioners, airbag, knee bolster, head restraint
Head Contact:	The face to the center of the airbag and the back of the head to the center of the head restraint	The face to the top center of the airbag and the back of the head to the center of the head restraint
Abdomen Contact:	-	-
Chest Contact:	Airbag	Airbag
Left Knee Contact:	Knee Bolster	Knee Bolster
Right Knee Contact:	Knee Bolster	Knee Bolster

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	Closed, latched and operable without tools	Closed, latched and operable without tools
Hatch/Other Door Opening	Closed, latched and operable without tools	Closed, latched and operable without tools
Front Seat Track Shift (mm)	0	0
Front Seat Back Failure	None	None
Glazing Damage	The windshield was cracked from bottom to top to the left of center	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	821	767	842	810

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	880	890
Lap belt length as measured on ATD	mm	700	700
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	1580	1590

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2007 Saturn Outlook MPV

NHTSA No. : M70106 ; VIN: 5GZER13767J100892 ; Color: White

Engine Data: 6 cylinders; - CID; 3.6 Liters; - cc

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

Transmission Data: 6 speeds; - Manual; X Automatic; X Overdrive

Final Drive: - Rear Wheel Drive; X 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: 1/4/2007 ; Odometer Reading 79 km

Selling Dealer: Saturn of Orchard Park

Dealer Address: 3559 Southwestern Boulevard Orchard Park, New York 14127

TEST VEHICLE OPTIONS:

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

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

SAFETY BELT FEATURES:

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

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

AIRBAG FEATURES:

Position	Frontal	Knee Bolster	Side Torso	Side Head/Torso Combination	Side Curtain
Driver:	X	-	X	-	X
Passenger:	X	-	X	-	X
Rear Passenger:	-	-		-	X

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: General Motors Corporation

Date of Manufacture 11/06

GVWR: 2903 kg; GAWR: 1450 kg FRONT; 1600 kg REAR

VEHICLE CAPACITY DATA:

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

Number of Occupants: 2 Front; 6 Rear; 8 Total

Vehicle Capacity Weight (VCW) = 749.0 kg

No. of Occupants x 68.04 kg = 544.3 kg

Rated Cargo/Luggage Weight (RCLW) = 204.7 kg (136.1 kg maximum)

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 =	609.5	598.0	56.6	1207.5
Rear =	465.5	461.5	43.4	927.0
			Total Delivered Weight (UDW) =	2134.5

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	2134.5	kg	
Rated Cargo/Luggage Weight (RCLW) =	136.1	kg	(maximum)
Weight of 2 p.572 Dummies @ 76 each =	152	kg	
TARGET TEST WEIGHT =	2422.6	kg	

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 127.5 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	660.0	644.5	54.0	1304.5
Rear =	556.0	553.5	46.0	1109.5
			Total Vehicle Test Weight (ATW) =	2414.0

Weight of Ballast Secured in Vehicle Trunk Area[1] = 34 kg

Vehicle Components Removed for Weight Reduction: The third row seats

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG[2]
AS DELIVERED:	882	881	918	912	1311.6
FULLY LOADED:	875	875	890	890	-
AS TESTED:	879	877	892	892	1388.0

Vehicle's Wheel Base: 3020 mm

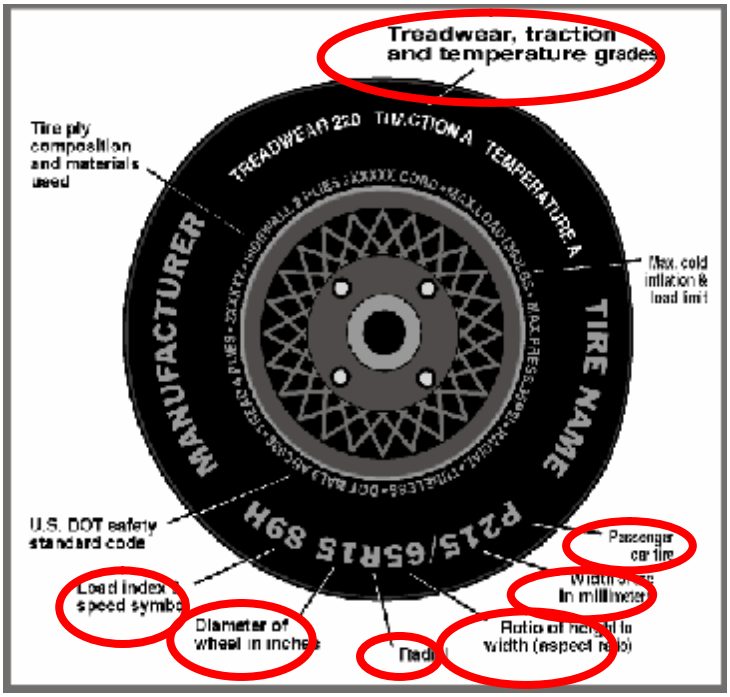
[1]Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

[2]Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2007 Saturn Outlook MPV

NHTSA Test No.: M70106 Test Date: January 18, 2007



Measured Parameter	Front	Rear
Maximum Tire Pressure (from sidewall - kPa)	300	300
Cold Pressure (from tire placard - kPa)*	240	240
Recommended Tire Size (from tire placard)	P255/65R18S	P255/65R18S
Tire size on Vehicle	P255/65R18S	P255/65R18S
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Fortera	Fortera
Tire Type	P	P
Tire Width (mm)	255	255
Ratio of Height to Width (aspect ratio)	65	65
Radial	Yes	Yes
Wheel Diameter	18	18
Load Index & Speed Symbol	109S	109S
Treadwear	540	540
Traction Grade	A	A
Temperature Grade	B	B

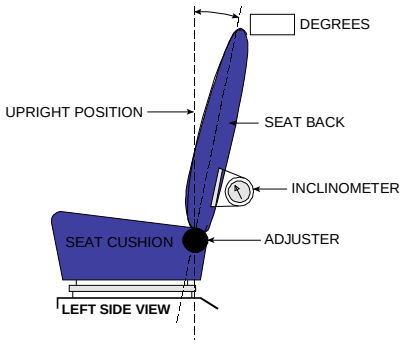
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2007 Vehicle Model: Saturn Outlook Body Style : MPV

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.



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 3.0°

Measurement instructions: Recline the seat to the 6th detent rearward from full upright position (detent 0).

Seat back angle for passenger's seat: 3.0°

Measurement instructions: Recline the seat to the 6th detent rearward from full upright position (detent 0).

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: The seat has 250 mm of total travel, the seat was placed at 125 mm.

Positioning of the passenger's seat: There are 25 detents numbered 0 to 24 with a total travel of 240 mm. The seat was position in detent 12 at a travel of 120 mm rearward of full forward (detent 0).

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 82.1 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 = 75.5 to 77.2 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 76.5 liters

3.3 One-Third of Useable Capacity = 27.4 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 pump will run when the vehicle engine is running and briefly when the ignition key is turned to the 'ON' position.

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 column tilts from 19° to 25°, the test angle is 22°. The column telescopes from 0 to 50 mm, the column telescoping mechanism was placed at 25 mm.

5. SEAT BELT UPPER ANCHORAGE:

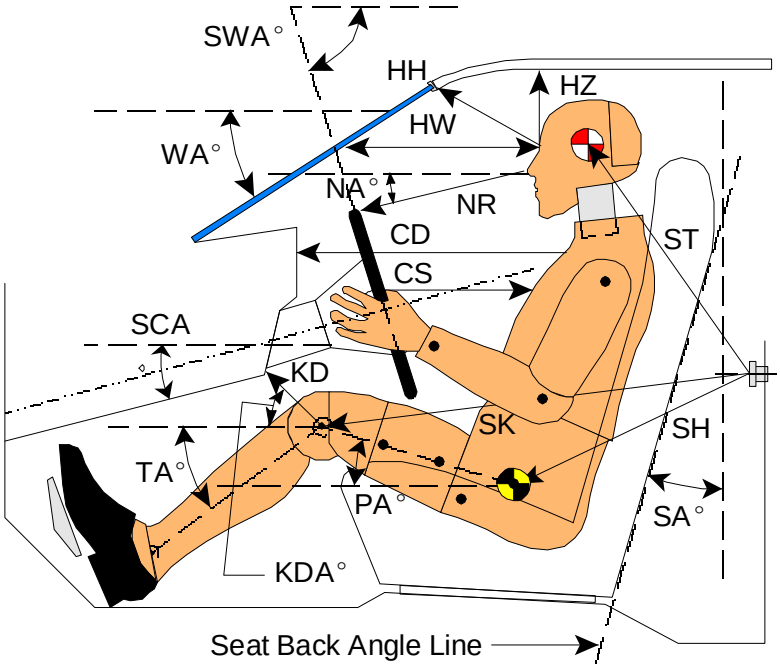
Nominal design riding position: There are five detents numbered 0 (uppermost) to 4. The test detent is position 0.

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

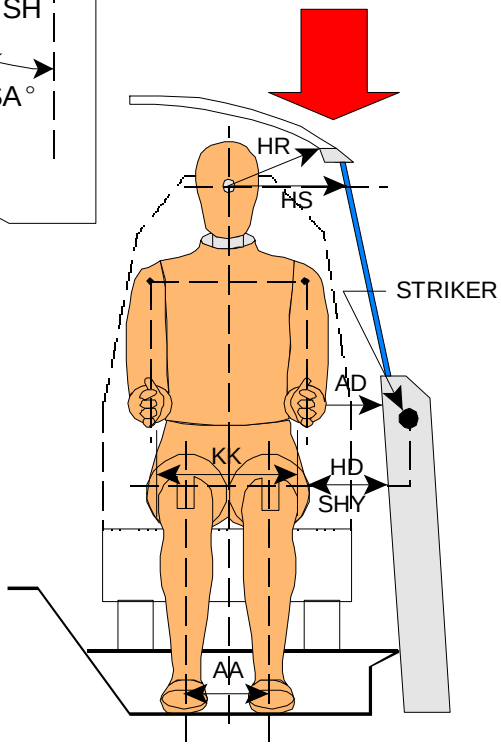
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; X No; - N/A

Comments: The automatic door lock feature cannot be disabled on this vehicle

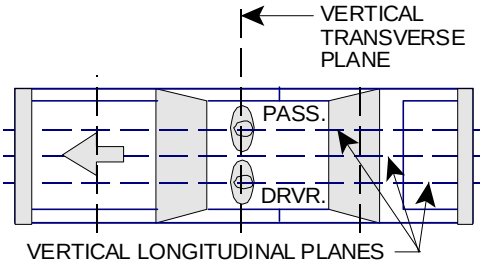
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



AD - Arm to Door
HD - H-Point to Door
HR - Head to Side Header
HS - Head to Side Window
KK - Knee to Knee
AA - Ankle to Ankle
SHY- Striker to H-Point (Y Direction)



CD - Chest to Dash
CS - Steering Wheel to Chest
HH - Head to Header
HW - Head to Windshield
HZ - Head to Roof
KDA - Knee to Dash Angle
KDL- Left Knee to Dash
KDR - Right Knee to Dash
NA - Nose to Rim Angle
NR - Nose to Rim
PA - Pelvic Angle
RA - Rim to Abdomen
SA - Seat Back Angle
SCA - Steering Column Angle
SH - Striker to H-Point
SK - Striker to Knee
ST - Striker to Head
SWA- Steering Wheel Angle
TA - Tibial Angle
WA - Windshield Angle



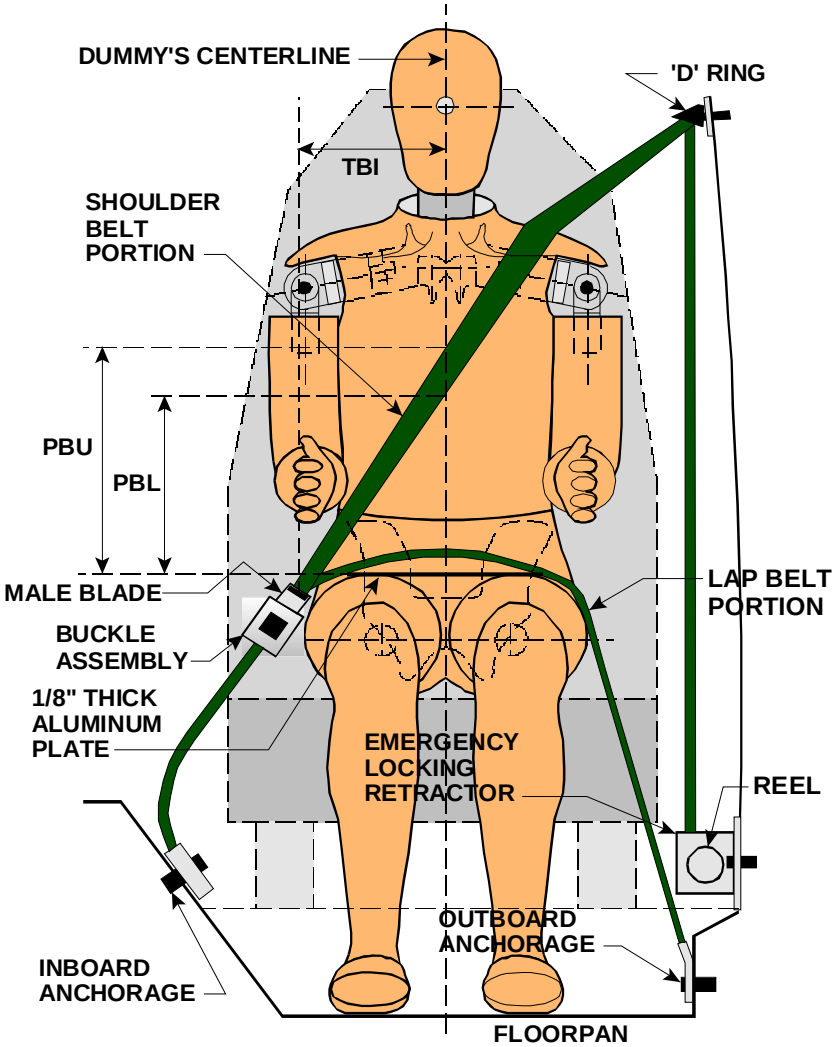
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #142)			PASS. (Serial #150)		
WA^O	29 deg.			N/A		
SWA^O	68 deg.			N/A		
SCA^O	22 deg.			N/A		
SA^O	3 deg.			3 deg.		
HZ	270			231		
HH	464			446		
HW	758			756		
HR	248			250		
NR	387	Angle	-10 deg.	N/A		
CD	587			544		
CS	318			N/A		
RA	212			N/A		
KDL	198	Angle (KDA)	28 deg.	163		
KDR	197			180	Angle (KDA)	24 deg.
PA^O	21.1 deg.			24.2 deg.		
TA^O	46.3 deg.			47.0 deg.		
KK	296			259		
AA	305			228		
ST	560	Angle	4 deg.	612	Angle	7 deg.
SK	590	Angle	85 deg.	610	Angle	85 deg.
SH	200	Angle	113 deg.	216	Angle	98 deg.
SHY	293			288		
HS	342			347		
HD	164			172		
AD	135			159		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

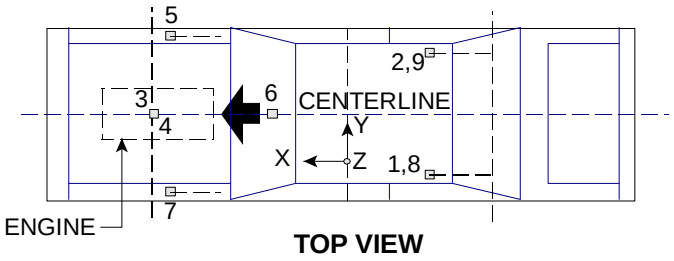


FRONT VIEW OF DUMMY

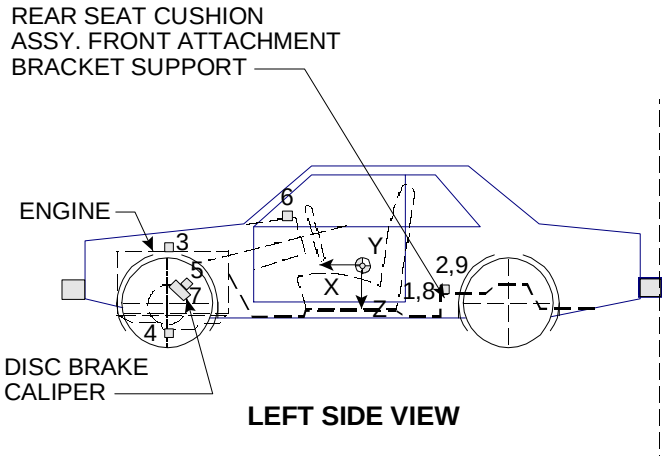
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	340	200
PBL-- Top surface of alum. plate to belt lower edge	260	230
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATIONS

VEHICLE ACCELEROMETER LOCATIONS



TOP VIEW



LEFT SIDE VIEW

		PRE-TEST LENGTH (mm)		
No.	LOCATION	X	Y	Z
1	Left Rear Seat Cross Member X	1574	-663	516
2	Right Rear Seat Cross Member X	1573	667	518
3	Top of Engine Block	4373	382	965
4	Bottom of Engine	4228	-25	339
5	Disc Brake Caliper @ Right Side	4087	701	414
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	4088	-707	413
8	Left Rear Seat Cross Member Z	1774	-663	516
9	Right Rear Seat Cross Member Z	1773	667	518

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.

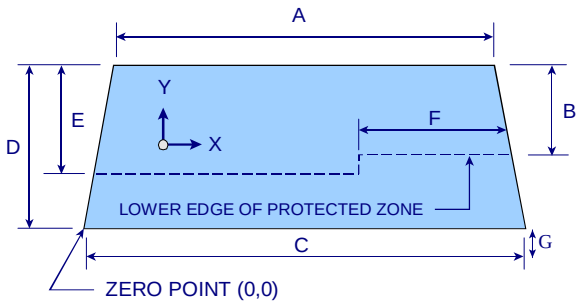
FMVSS 212 REQUIREMENTS:

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: 21.0ºC.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2295.0	2295.0	100.0%
LEFT SIDE	2295.0	2295.0	100.0%
TOTAL	4590	4590	100.0%



FRONT VIEW OF WINDSHIELD

DIMENSIONS (mm)	
A	1300
B	572
C	1650
D	820
E	580
F	590
G	0

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.: M70106 TEST DATE: January 18, 2007

VEHICLE MAKE/MODEL: 2007 Saturn Outlook MPV

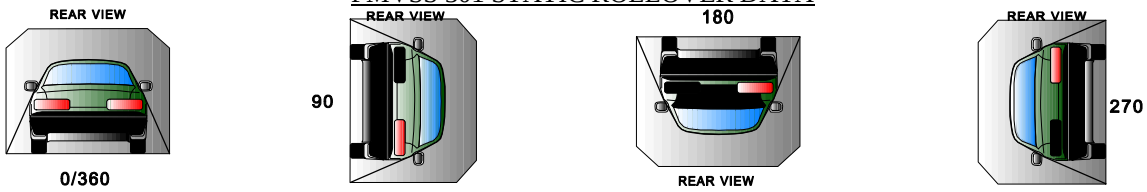
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

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

FMVSS 301 STATIC ROLLOVER DATA



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	
0º - 90º	1	minutes	17	seconds	5	minutes	6	minutes	17	seconds	7	minutes
90º - 180º	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
180º-270º	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
270º-360º	1	minutes	17	seconds	5	minutes	6	minutes	17	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:

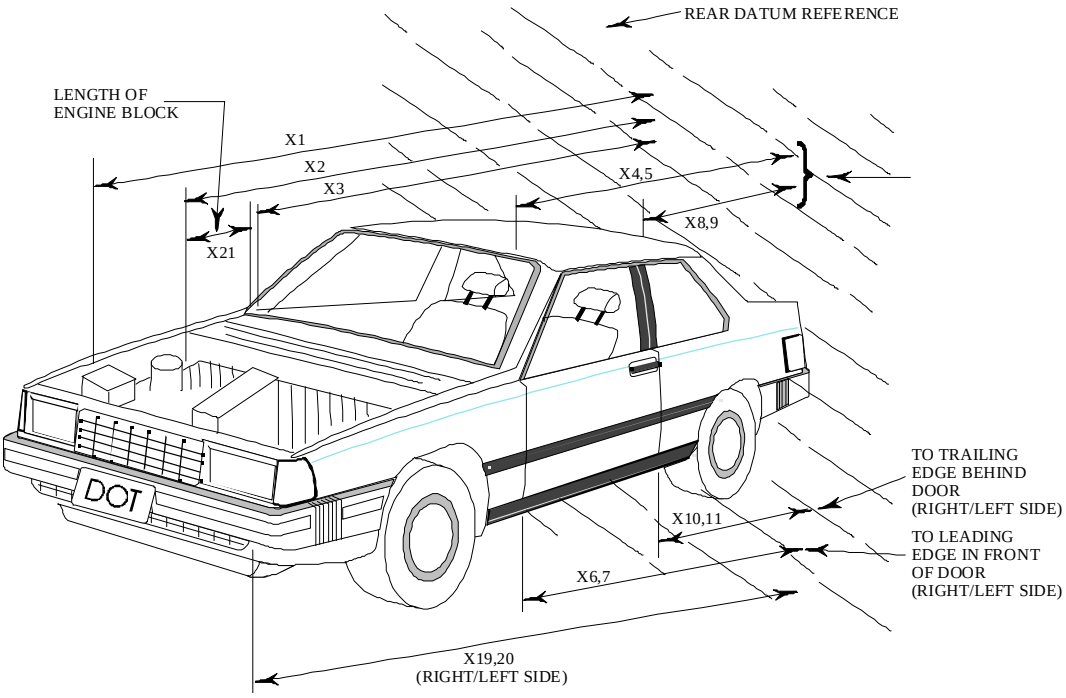
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

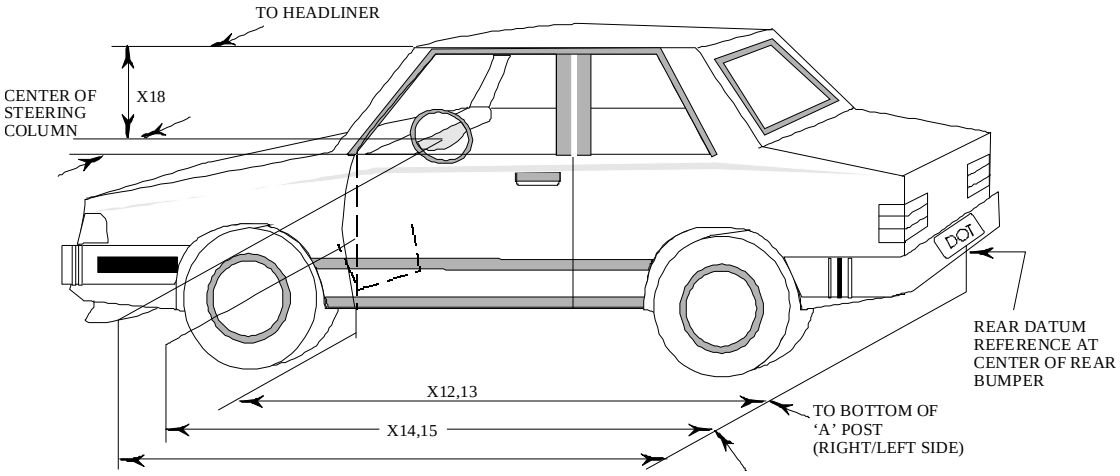
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

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

DATA SHEET NO. 10
TEST VEHICLE MEASUREMENTS





DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M70106 TEST DATE: January 18, 2007

VEHICLE MAKE/MODEL: 2007 Saturn Outlook MPV

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5103	4609	494
X2	Rear Surface of Vehicle to Front of Engine	4530	4326	204
X3	Rear Surface of Vehicle to Firewall	4220	4164	56
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3604	3603	1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3603	3602	1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3597	3596	1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3593	3593	0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2516	2514	2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2512	2510	2
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2525	2525	0
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2525	2525	0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3774	3772	2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3774	3774	0
X14	Rear Surface of Vehicle to Firewall, Right Side	4207	4160	47
X15	Rear Surface of Vehicle to Firewall, Left Side	4208	4181	27
X16	Rear Surface of Vehicle to Steering Column	3132	3169	-37
X17	Center of Steering Column to "A" Post	301	295	6
X18	Center of Steering Column to Headliner	459	479	-20
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5002	4539	463
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4999	4539	460
X21	Length of Engine Block	250	250	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3331	3327	4
CD	Rear Surface of Vehicle to Center of Dash Panel	3329	3328	1
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3331	3315	16

All Dimensions in mm

DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

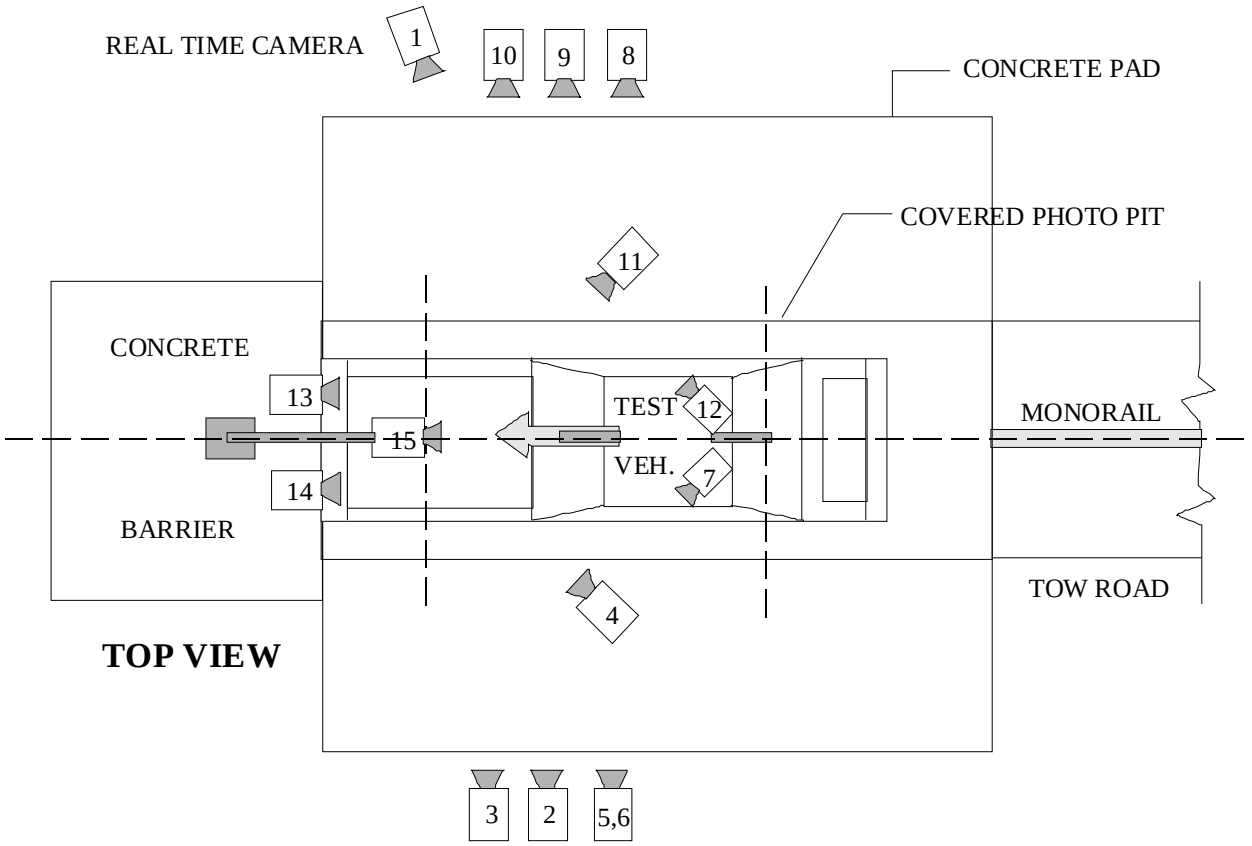
NHTSA TEST No.: M70106 TEST DATE: January 18, 2007

VEHICLE MAKE/MODEL: 2007 Saturn Outlook MPV

TARGET VEHICLE STRUCTURAL MEASUREMENTS

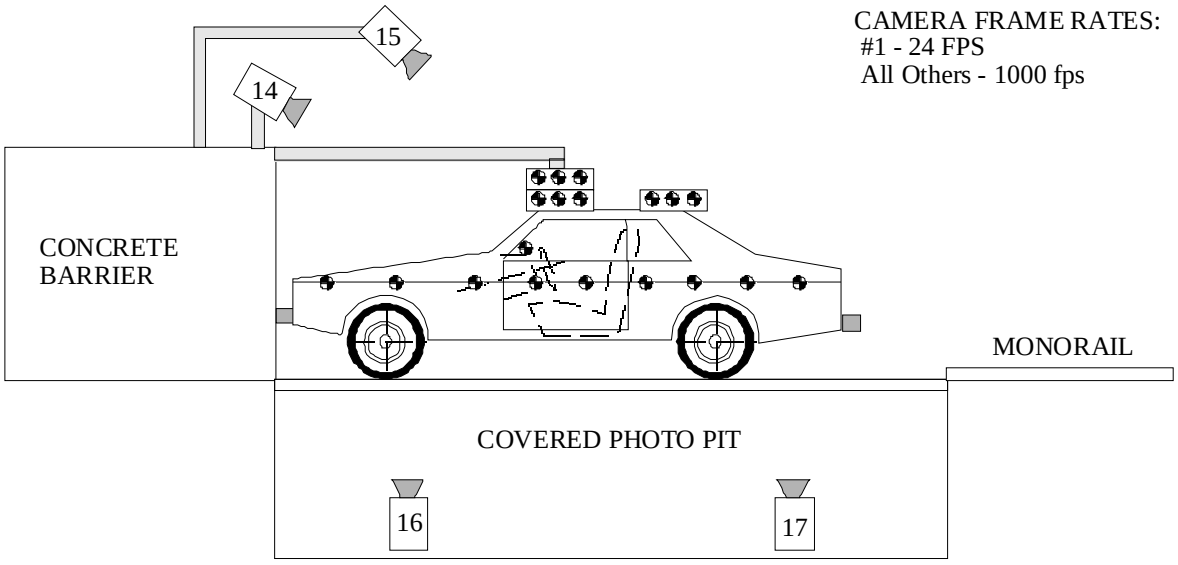
	Elements	Pre-Test (mm)
1	Total length	5103
2	Total Width	1954
3	Bumper Top Height	657
4	Bumper Bottom Height	500
5	Longitudinal Member Top Height	645
6	Distance Between Longitudinal Members	1154
7	Longitudinal Member Width	69
8	Engine top height	1089
9	Engine bottom height	240
10	Engine and gearbox width	781
11	Front bumper-engine distance	572
12	Front shock absorber fixing height	999
13	Bonnet leading edge height	971
14	Front shock absorber fixing width	1326
15	Front bumper – front axle distance	973
16	Front axle – A pillar distance	1056
17	A-pillar – B pillar distance	510
18	B-pillar – rear axle distance	1455
19	B-pillar – C Pillar distance	996
20	Roof sill bottom height	1646
21	Roof sill top height	1728
22	Floor sill bottom height	316
23	Floor sill top height	452

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS



TOP VIEW

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



LEFT SIDE VIEW

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

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)* X	Y	Z	ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	-	30
2	Overall Left Side	8179	1697	1086	1	7715	28	1000
3	Left Side View		807	1100	-3	-464	52	1000
4	Driver and Interior View	8817	3280	2063	-8	-	52	500
5	Steering Column (Bottom)	8149	1957	1200	-4	7685	24-70	1000
6	Steering Column (Top)	8149	1957	1812	-8	7685	28-70	1000
7	Left CRS Lateral View	2804	902	1353	-12	-	12.5	1000
8	Overall Right Side	7711	1519	1034	-3	7247	28	500
9	Right Side View	9547	933	1029	0	9083	50	1000
10	Right Passenger View	8580	1764	1368	-2	8116	52	1000
11	Passenger and Interior View	5084	2879	2012	-18	-	25	500
12	Right CRS Lateral View	2814	902	1344	-8	-	12.5	1000
13	Passenger Front View	620	-92	1987	-35	-	28	500
14	Driver Front View	620	-92	1987	-30	-	28	500
15	Windshield View	0	-530	3374	-40	-	20	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0		-3048	90	-	13	500

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

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

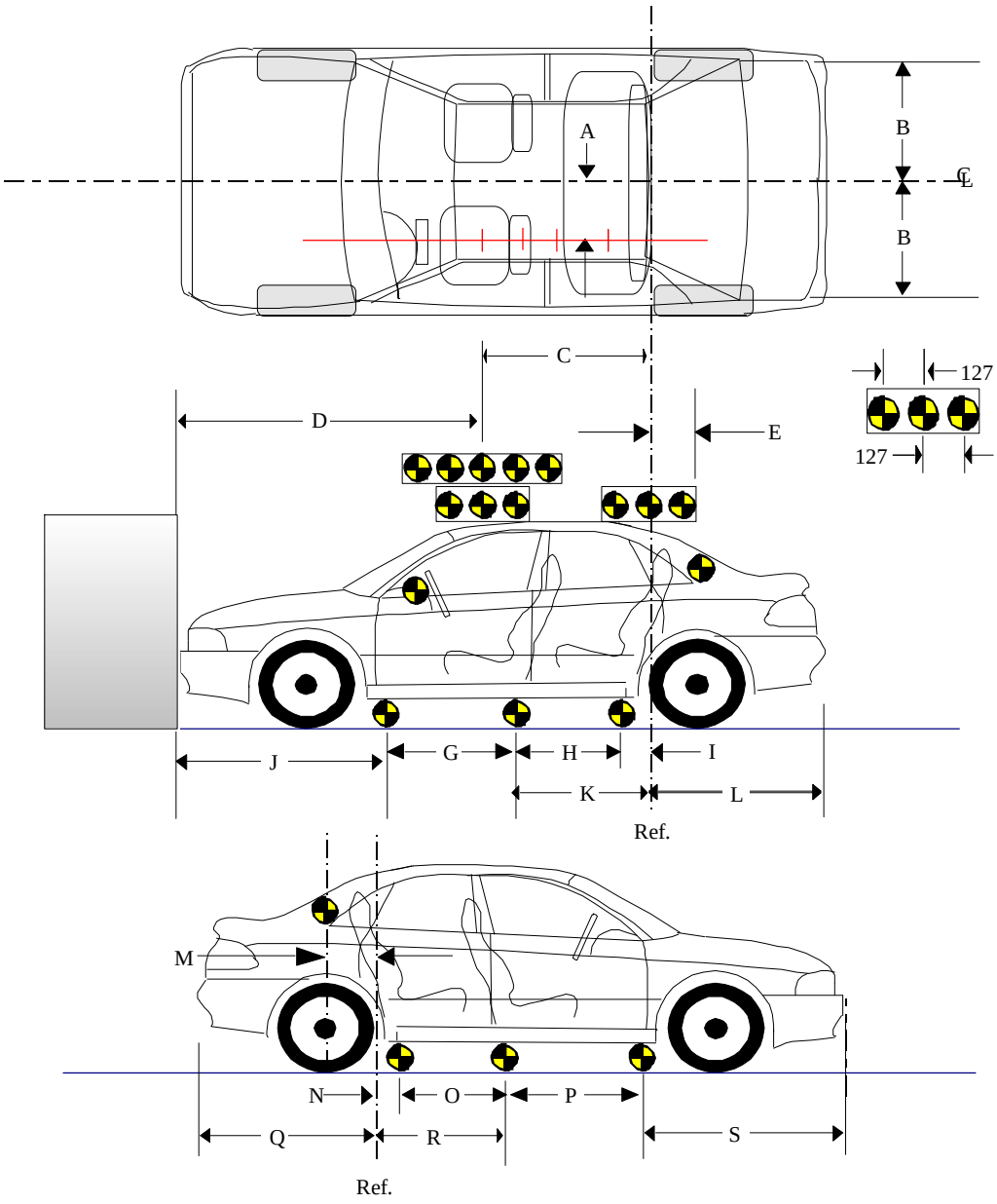
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV

(Dimensions in millimeters)

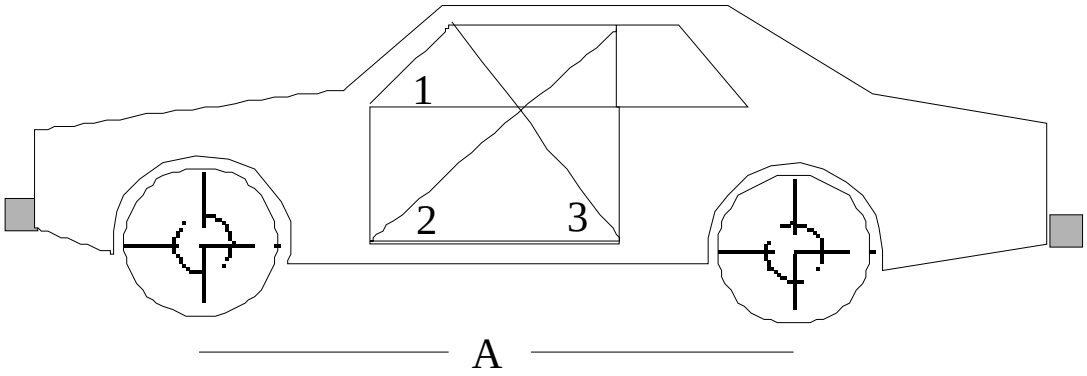
A	388
B	757
C	915
D	2651
E	29
F	1757
G	995
H	999
I	103
J	1500
K	1102
L	1505
M	20
N	105
O	986
P	1005
Q	1507
R	1091
S	1499



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



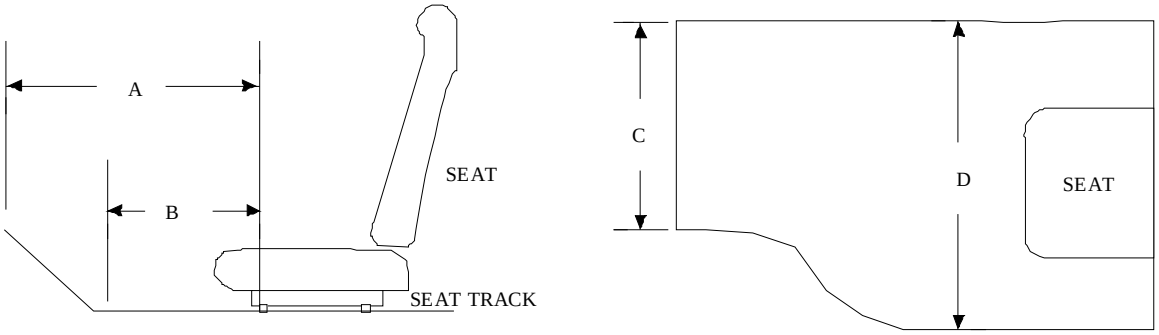
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	972	1512	1130	969	1514	1128
AFTER TEST	973	1509	1133	969	1512	1131
DIFFERENCE	-1	3	-3	0	2	-3

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3021	3019
AFTER TEST	2951	2958
DIFFERENCE	70	61

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	709	701	8
B	529	533	-4
C	537	528	9
D	575	579	-4

PASSENGER

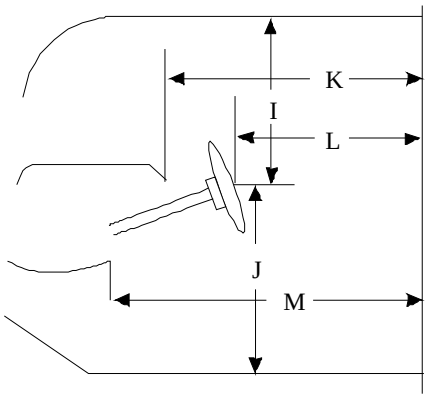
Measurement	Pre-Test	Post-Test	Difference
A	699	685	14
B	546	548	-2
C	496	498	-2
D	552	547	5

Units = mm

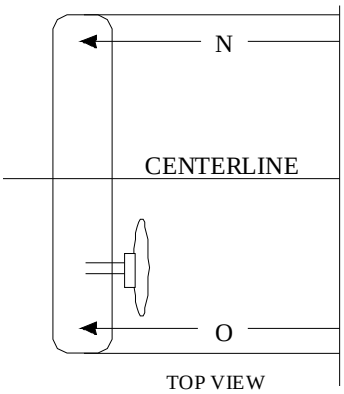
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV

STATIC PASSENGER COMPARTMENT INTRUSION

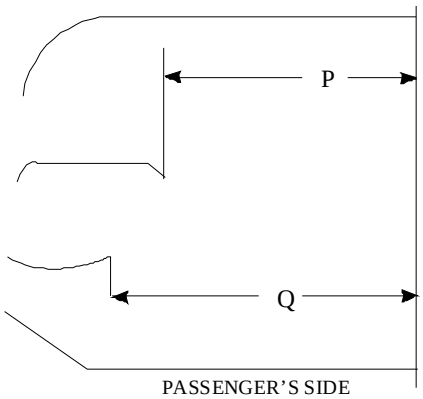


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



PASSENGER'S SIDE

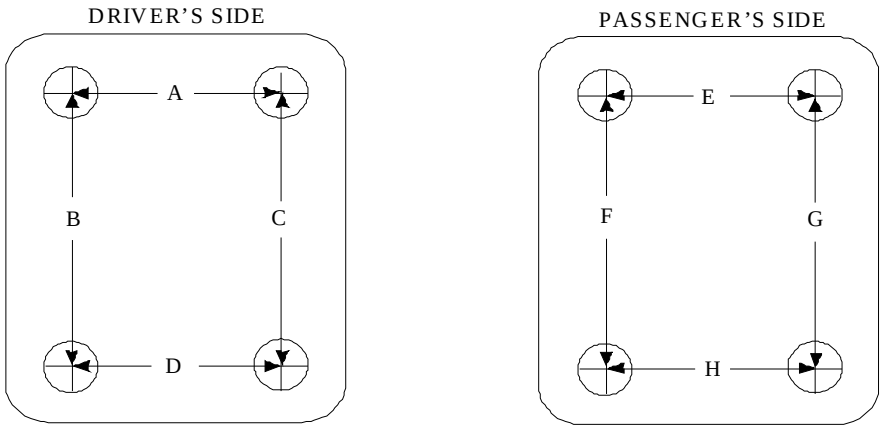
Measurement	Pre-Test	Post-Test	Difference
I	459	479	-20
J	683	665	18
K	811	798	13
L	563	604	-41
M	757	762	-5
N	763	761	2
O	762	750	12
P = K (PASS.)	940	941	-1
Q = M (PASS.)	793	789	4

Units = mm

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

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV

FLOORBOARD DEFORMATION



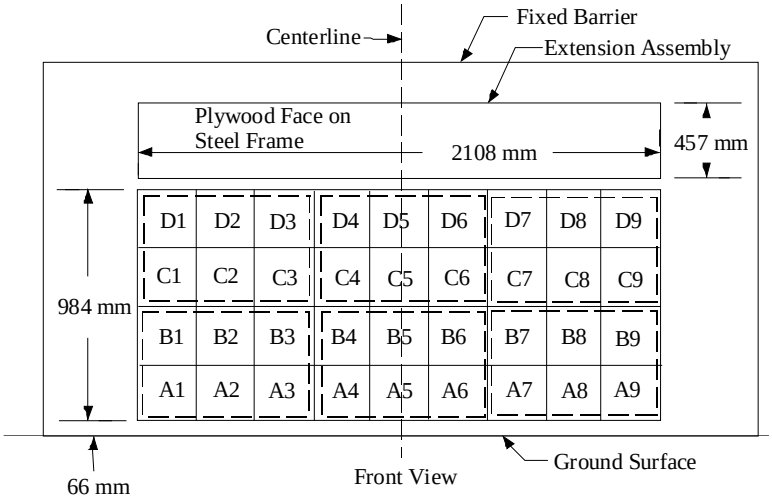
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	537	528	9
B	392	395	-3
C	363	355	8
D	575	579	-3
E	496	498	-2
F	377	378	0
G	370	366	4
H	552	547	5

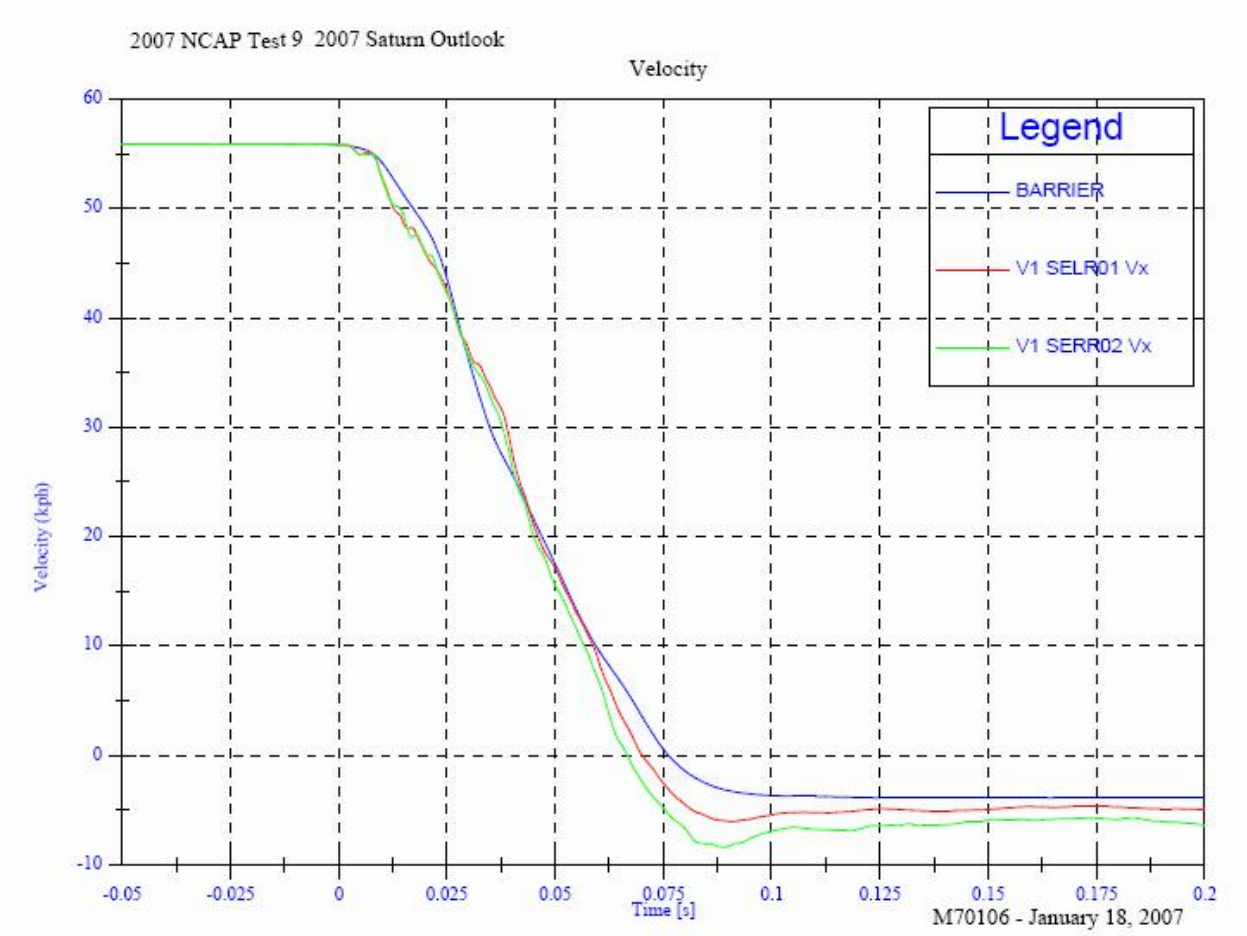
Units = mm

DATA SHEET NO.14
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
4 Rows
9 Columns



Momentum Plot



DATA SHEET NO. 15
ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Saturn Outlook MPV

NHTSA Test No.: M70106 VIN: 5GZER13767J100892

Model Year: 2007 Build Date: 11/06 Test Date: January 18, 2007

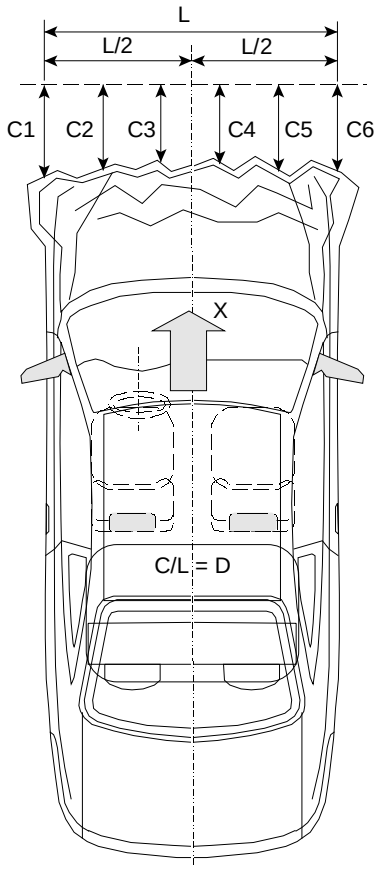
Vehicle Size Category: MPV Test Weight: 2414.0 kg

Vehicle Wheelbase: 3020 mm; Front Overhang: 974 mm; Overall Width: 1954 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4852	4611	241
C2 =	5001	4543	458
C3 =	5083	4596	487
C4 =	5083	4598	485
C5 =	5002	4547	455
C6 =	4853	4588	265



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

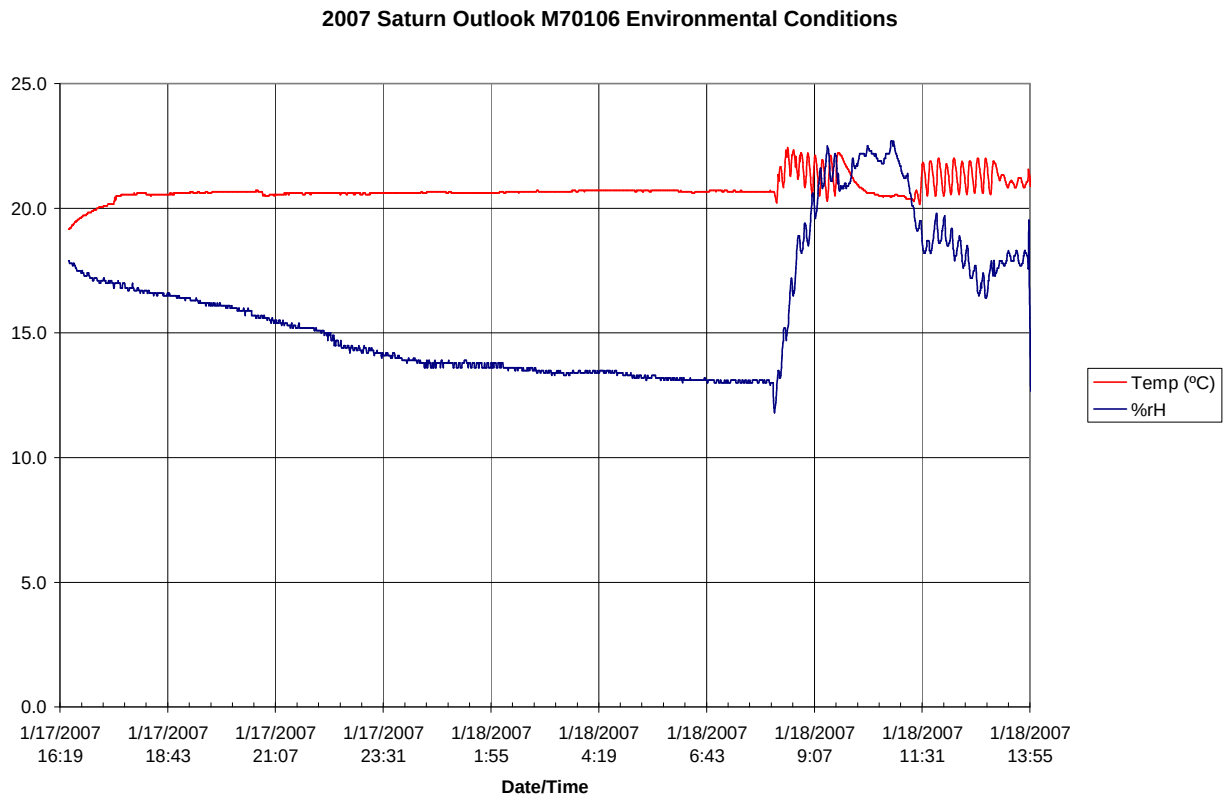
Length of Damaged Region: L1= 1548 mm

L2= 774.0 mm

L5= 309.6 mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M70106 Vehicle: 2007 Saturn Outlook MPV



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

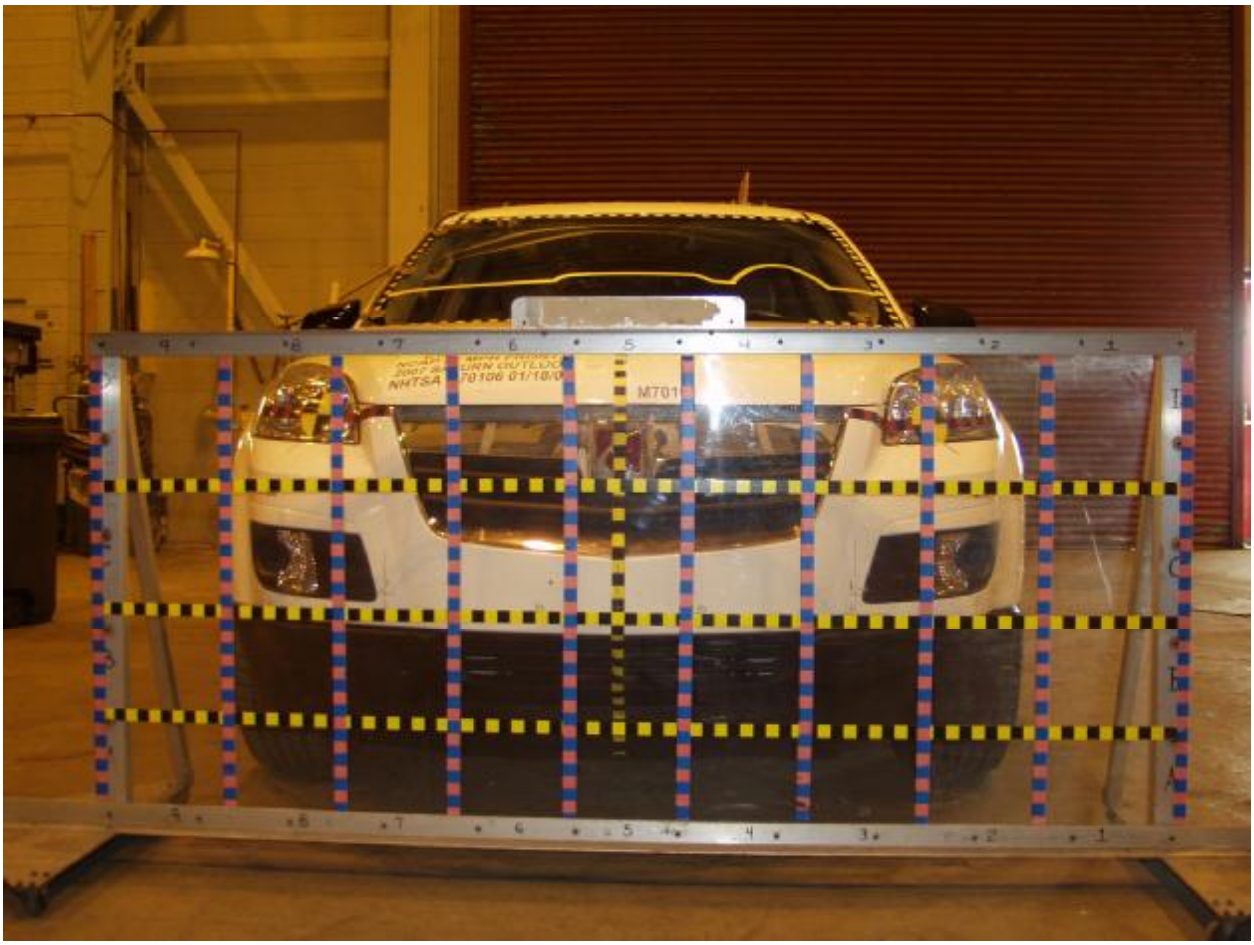


Figure A-1: Load Cell Locations

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

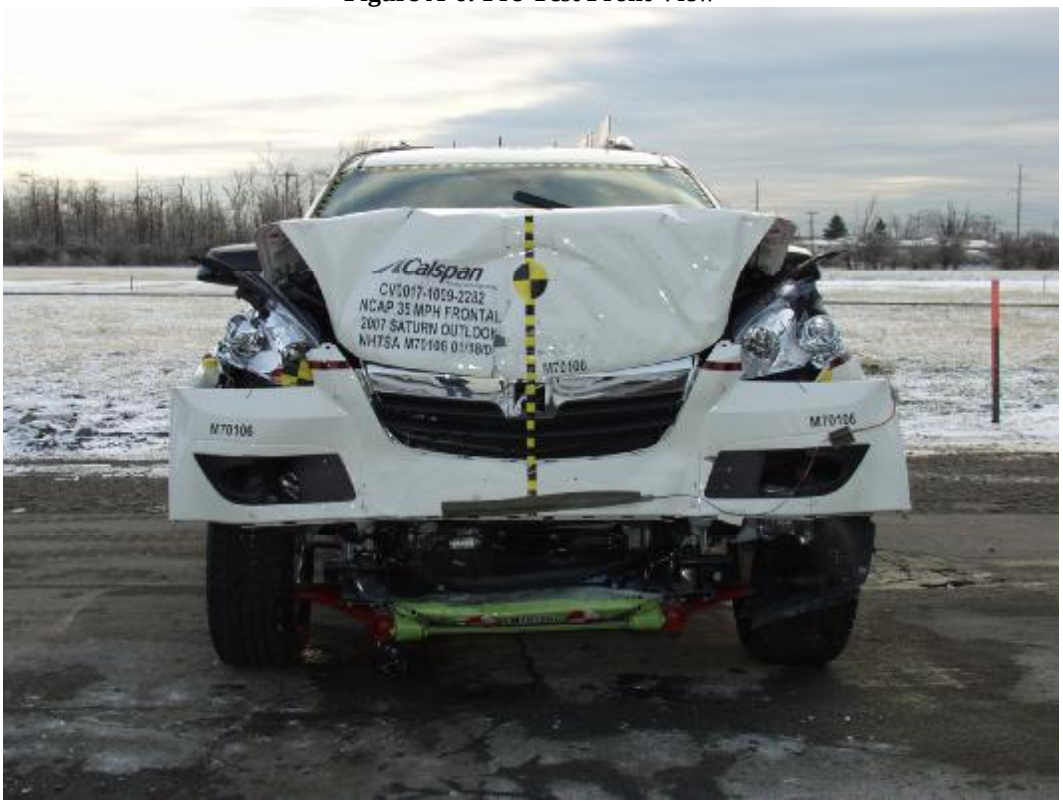


Figure A-7: Post-Test Front View

Figure A-8: Pre-Test Left Side View

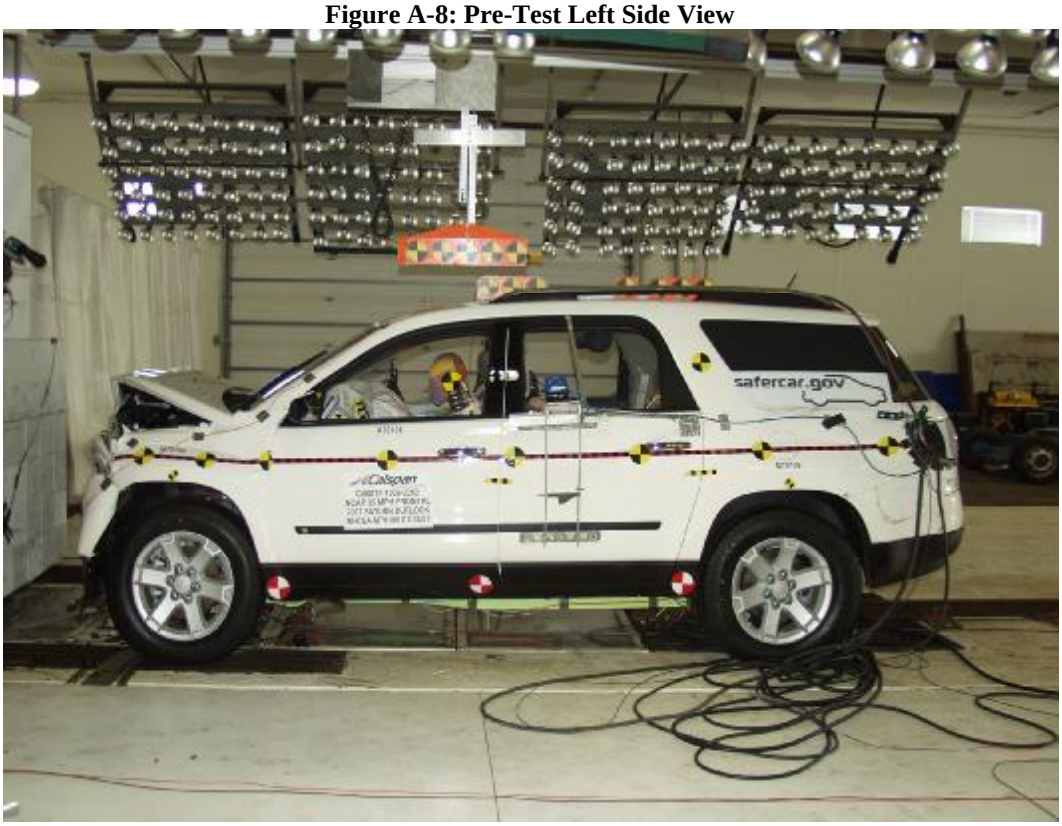


Figure A-9: Post-Test Left Side View

Figure A-10: Pre-Test Right Side View

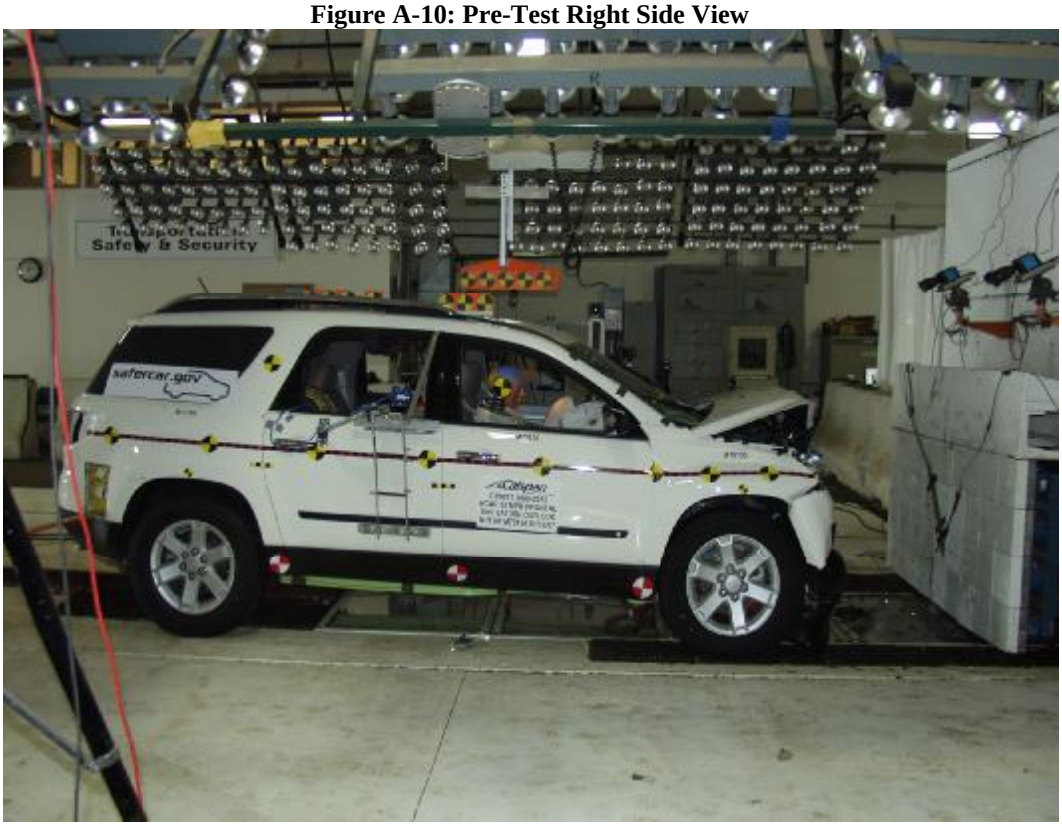


Figure A-11: Post-Test Right Side View

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

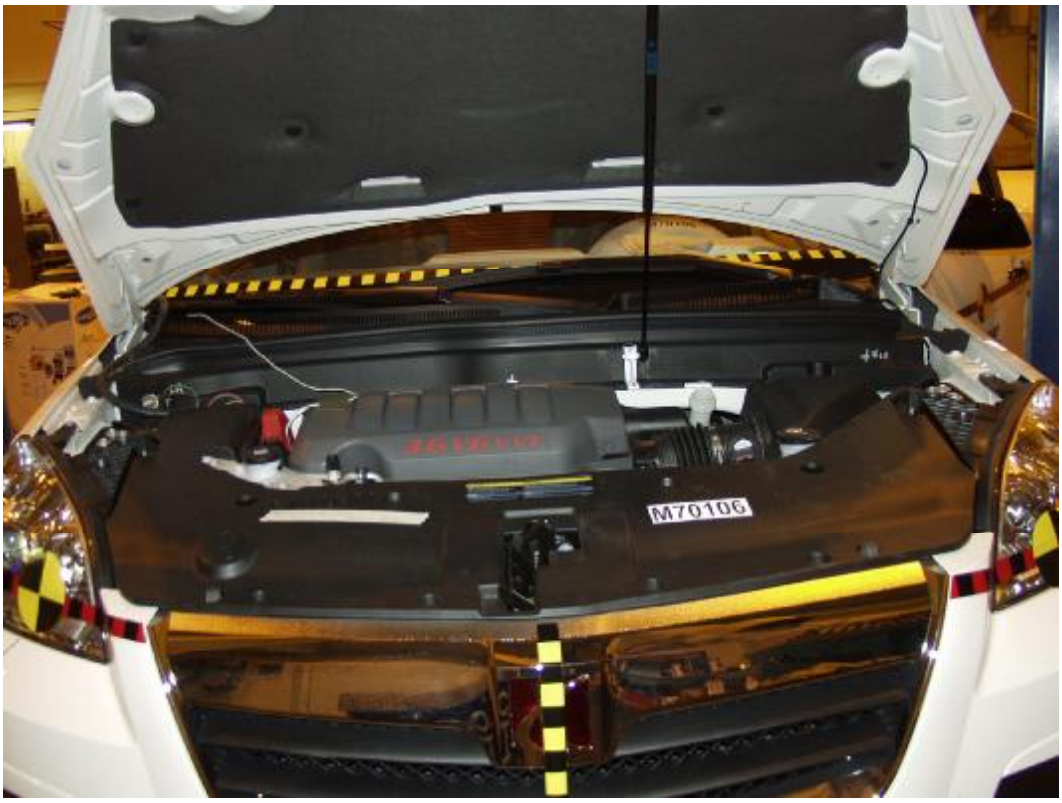


Figure A-20: Pre-Test Engine Compartment View

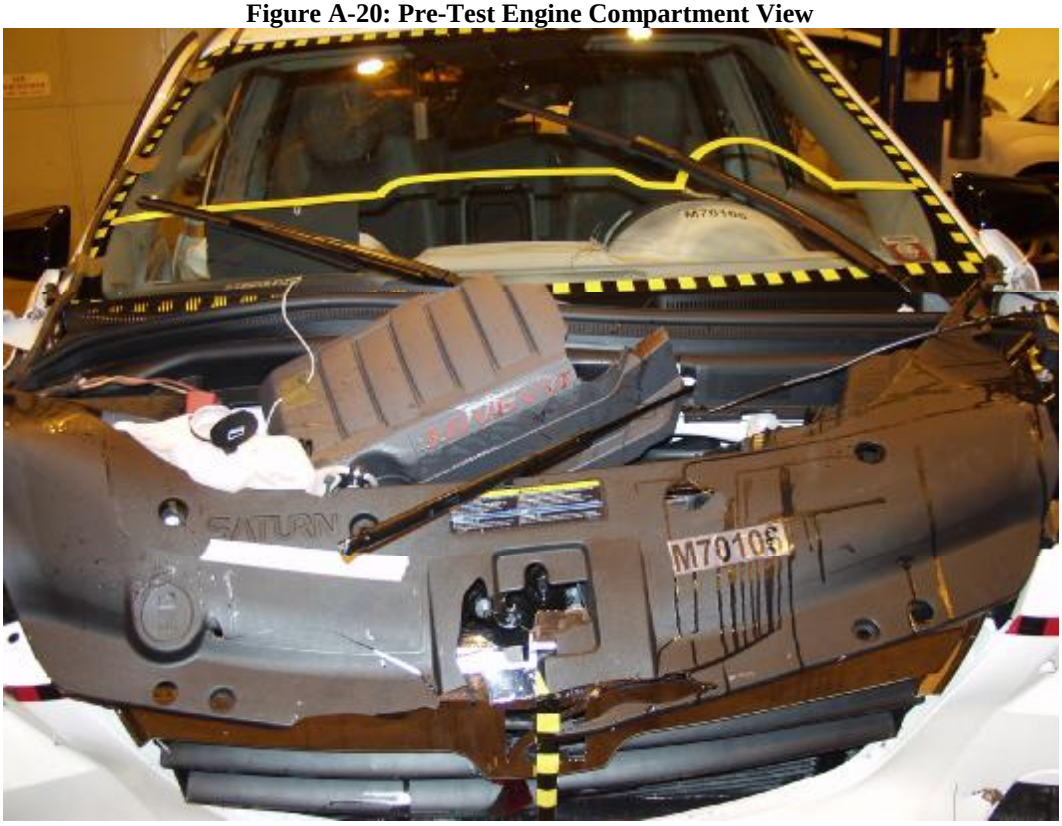


Figure A-21: Post-Test Engine Compartment View

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

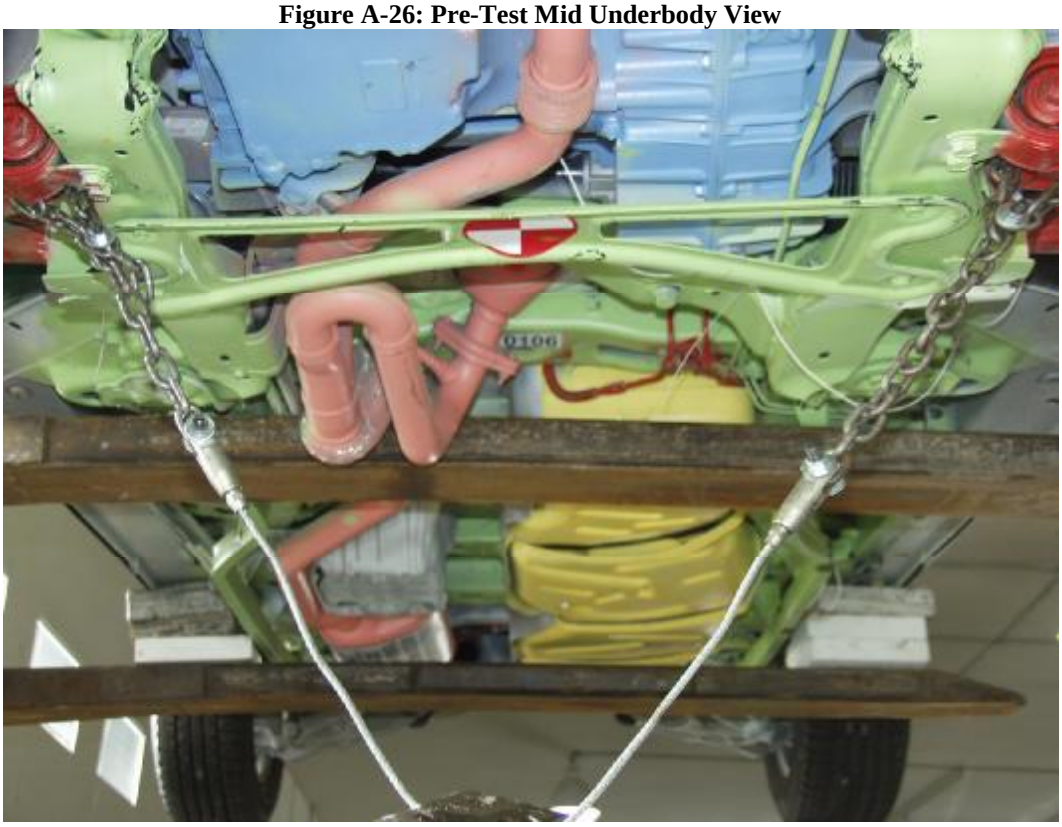


Figure A-27: Post-Test Mid Underbody View

Figure A-28: Pre-Test Rear Underbody View

Figure A-29: Post-Test Rear Underbody View

Figure A-30: Pre-Test Driver Head Location

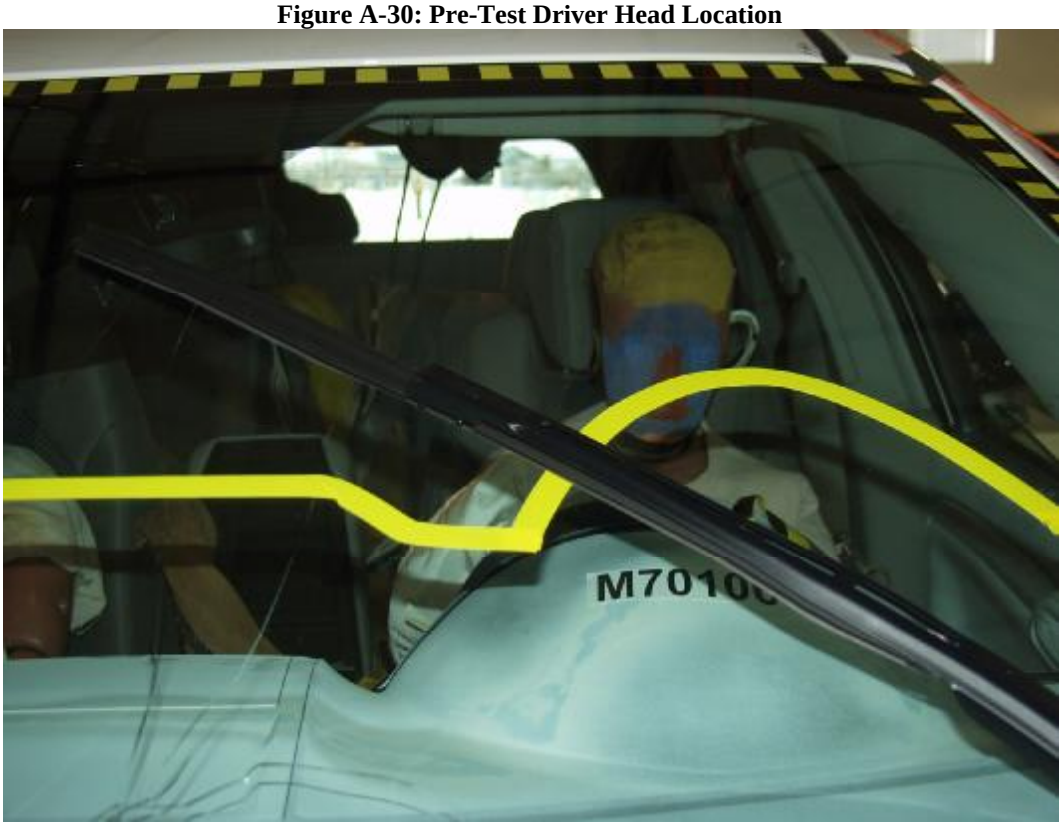


Figure A-31: Post-Test Driver Head Location

Figure A-32: Pre-Test Driver Position View

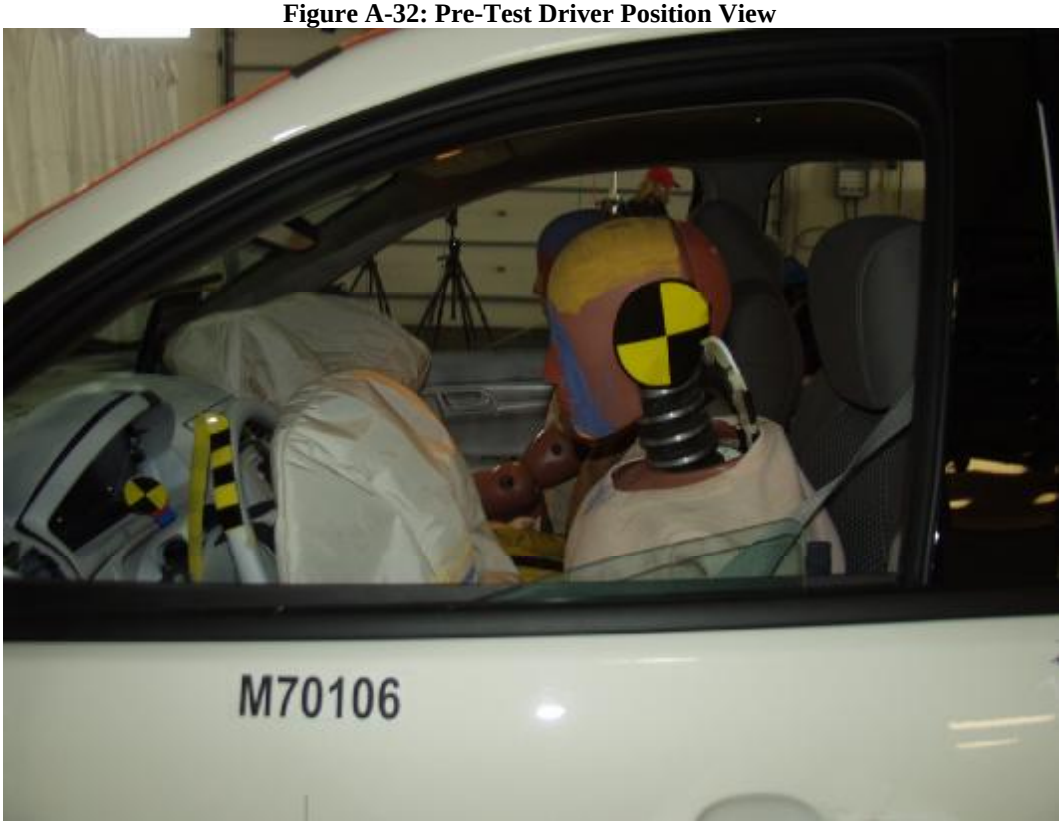


Figure A-33: Post-Test Driver Position View

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

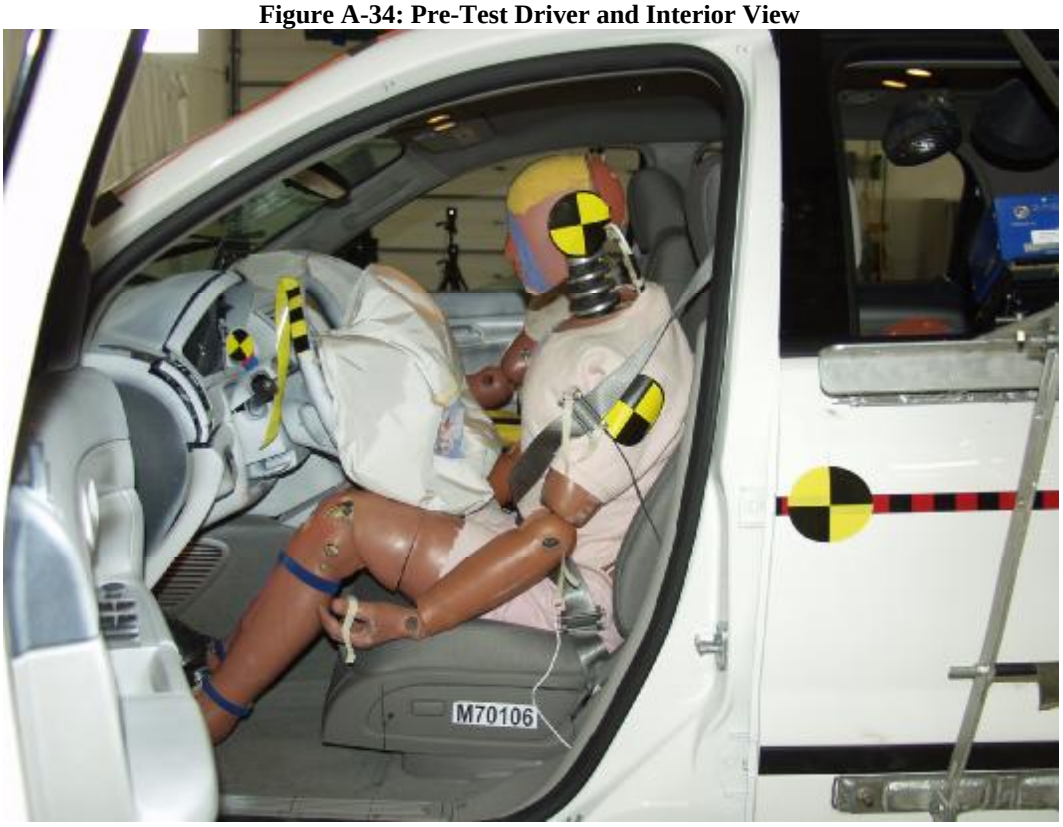


Figure A-35: Post-Test Driver and Interior View

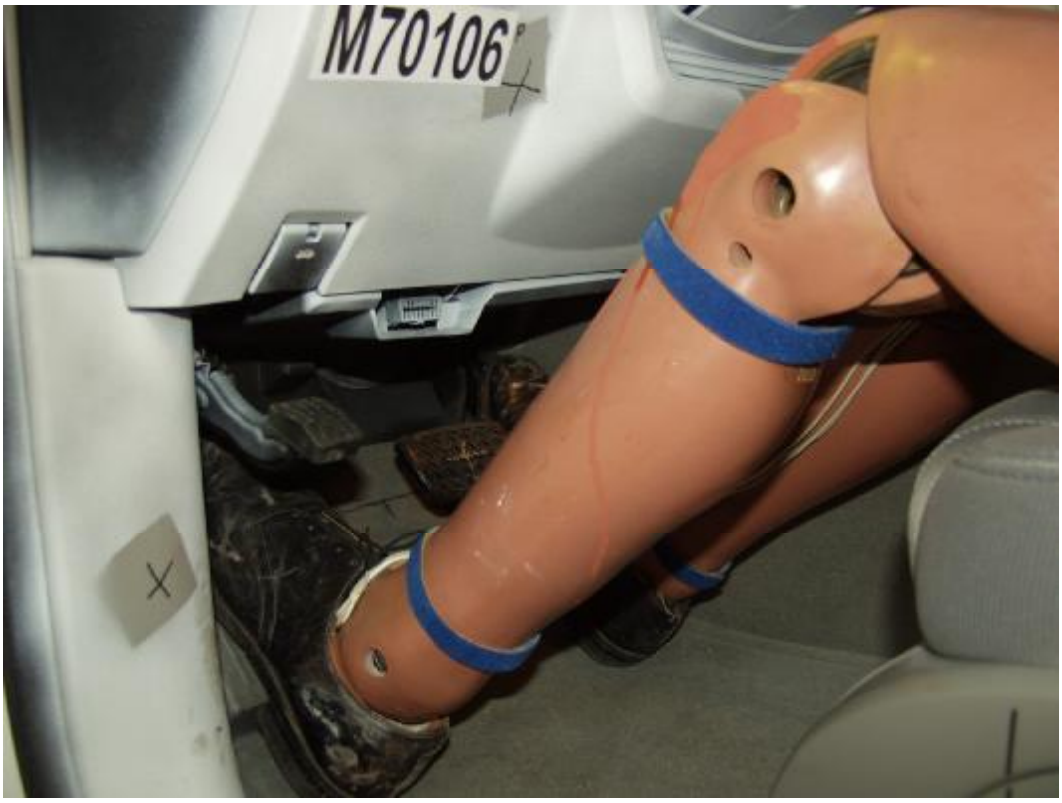


Figure A-36: Pre-Test Driver Feet View

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

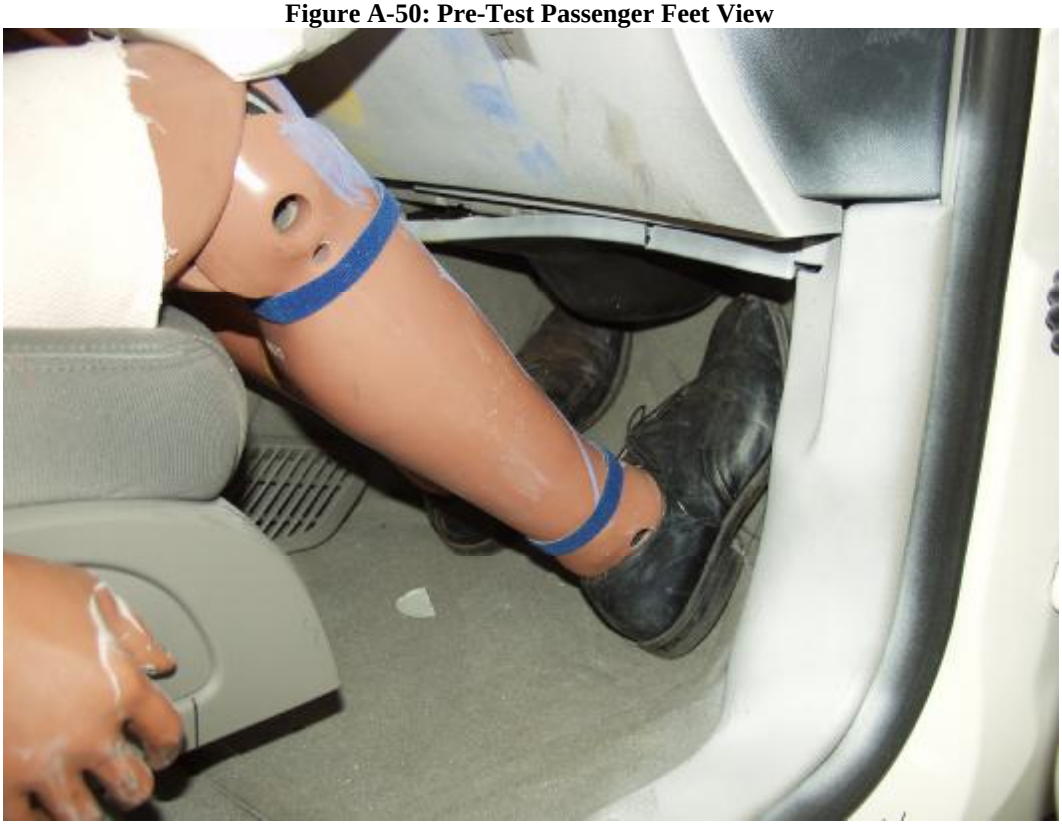


Figure A-51: Post-Test Passenger Feet View

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

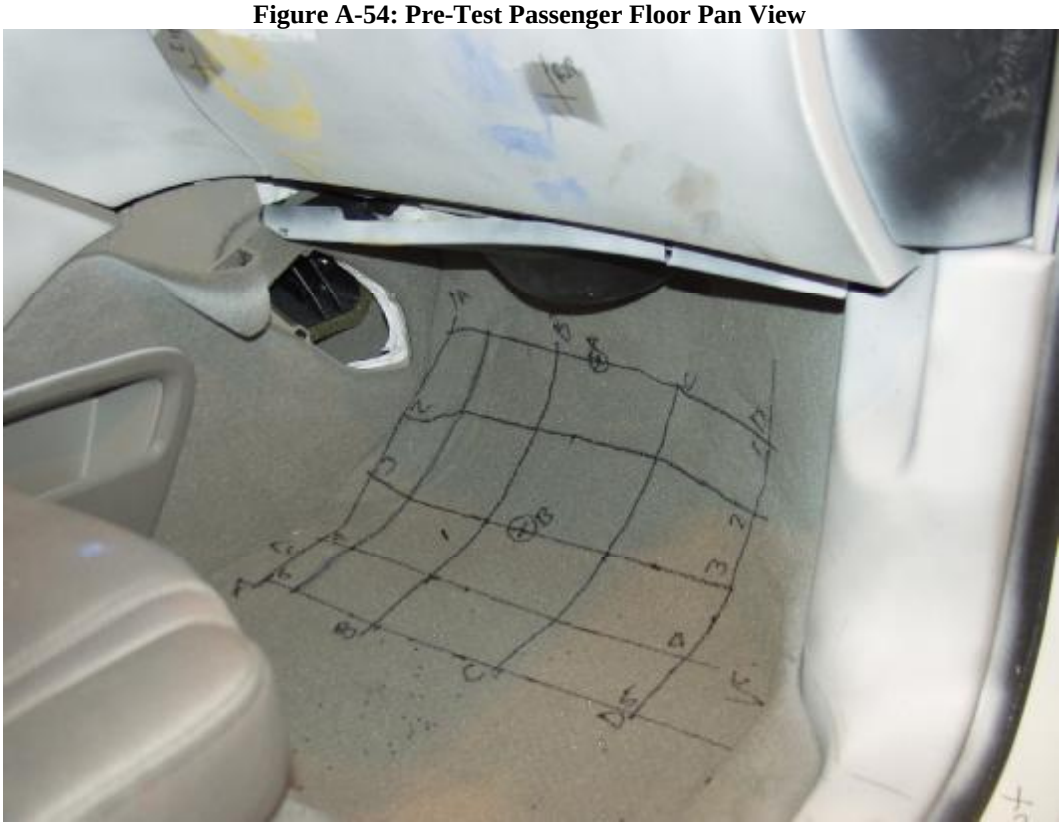


Figure A-55: Post-Test Passenger Floor Pan View

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.: M70106

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

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

V1P1 Head CG Ax	V1P1 Lap Belt Load
V1P1 Head CG Ay	V1P1 Shoulder Belt Load
V1P1 Head CG Az	V1P2 Lap Belt Load
V1P1 Head CG Red Ax	V1P2 Shoulder Belt Load
V1P1 Head CG Red Ay	V1 Left Rear #1x
V1P1 Head CG Red Az	V1 Right Rear #2x
V1P1 Upper Neck Fx	V1 Engine Top #3x
V1P1 Upper Neck Fy	V1 Engine Bottom #4x
V1P1 Upper Neck Fz	V1 Right Caliper #5x
V1P1 Upper Neck Mx	V1 Left Caliper #7x
V1P1 Upper Neck My	V1 Left Rear #8z
V1P1 Upper Neck Mz	V1 Right Rear #9z
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	
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	

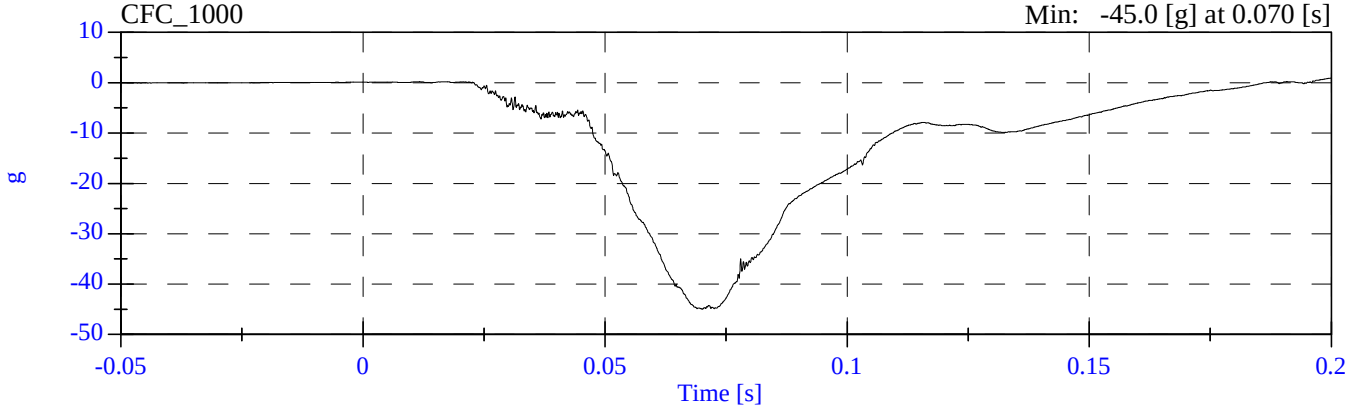
V1P2 Upper Neck Fy	
V1P2 Upper Neck Fz	
V1P2 Upper Neck Mx	
V1P2 Upper Neck My	
V1P2 Upper Neck Mz	
V1P2 Chest Ax	
V1P2 Chest Ay	
V1P2 Chest Az	
V1P2 Chest Red Ax	
V1P2 Chest Red Ay	
V1P2 Chest Red Az	
V1P2 Chest Compression	
V1P2 Pelvic Ax	
V1P2 Pelvic Ay	
V1P2 Pelvic Az	
V1P2 Left Femur Fz	
V1P2 Right 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	
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	
Barrier Load Cell B4 Fx	
Barrier Load Cell B5 Fx	
Barrier Load Cell B6 Fx	
Barrier Load Cell B7 Fx	

Barrier Load Cell B8 Fx	
Barrier Load Cell B9 Fx	
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	

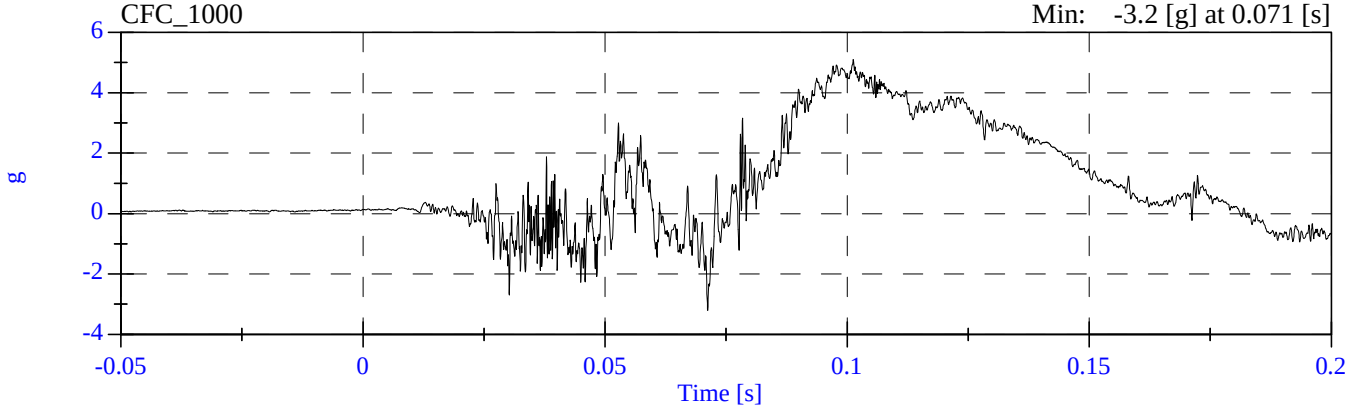
TEST NOTES	
Data Channel	Anomalies
V1P1 Chest y	Channel Opened at 71 ms
V1P1 Right Foot Aft x	Channel Opened
V1P1 Right Foot Fore z	Data is not accurate after 73 ms
V1 Engine Top #3x	Channel Opened at 40 ms
Barrier Load Cell C8 Fx	Did Not Record

2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

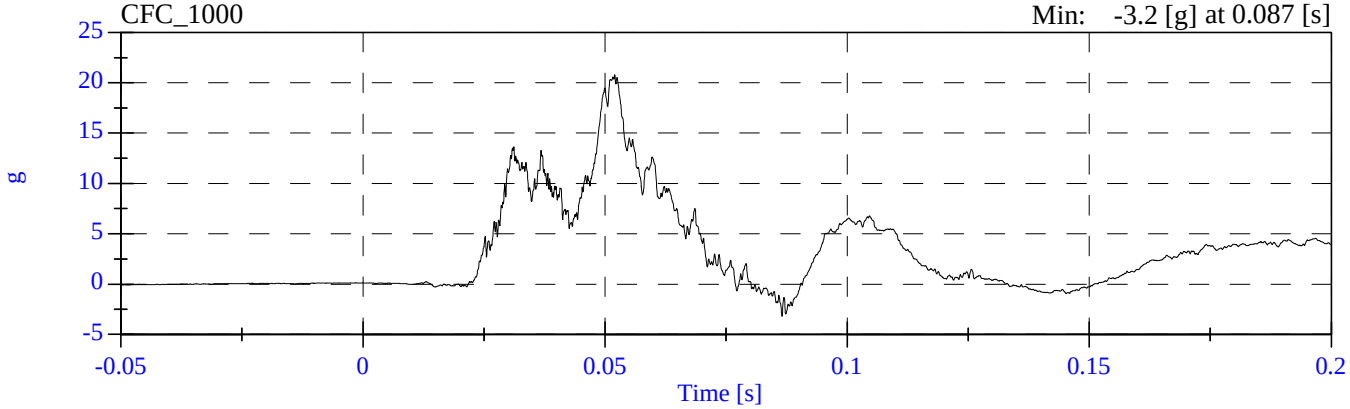
V1P1 Head CG x
CFC_1000
Max: 0.9 [g] at 0.200 [s]
Min: -45.0 [g] at 0.070 [s]



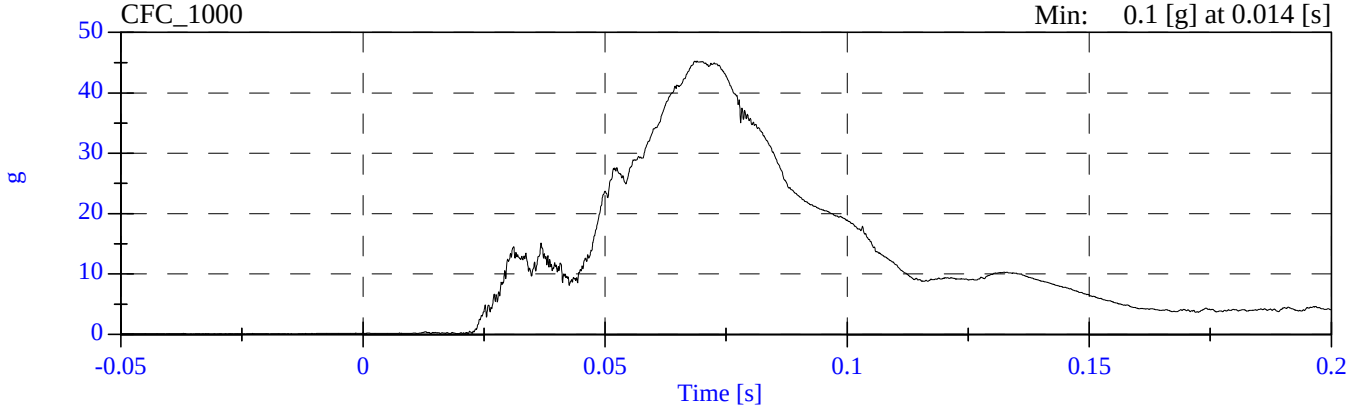
V1P1 Head CG y
CFC_1000
Max: 5.1 [g] at 0.101 [s]
Min: -3.2 [g] at 0.071 [s]



V1P1 Head CG z
CFC_1000
Max: 20.8 [g] at 0.052 [s]
Min: -3.2 [g] at 0.087 [s]

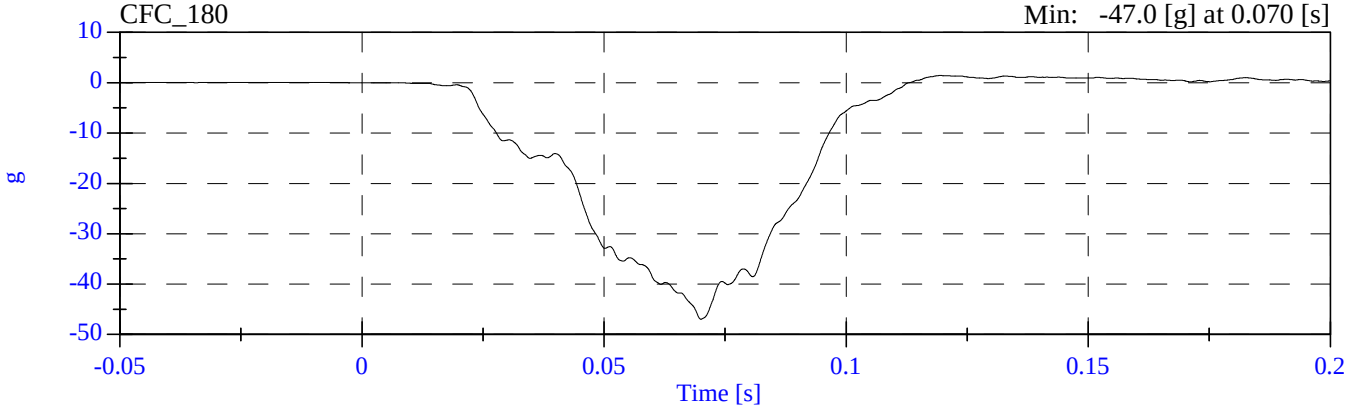


V1P1 Head CG Resultant
CFC_1000
Max: 45.3 [g] at 0.069 [s]
Min: 0.1 [g] at 0.014 [s]

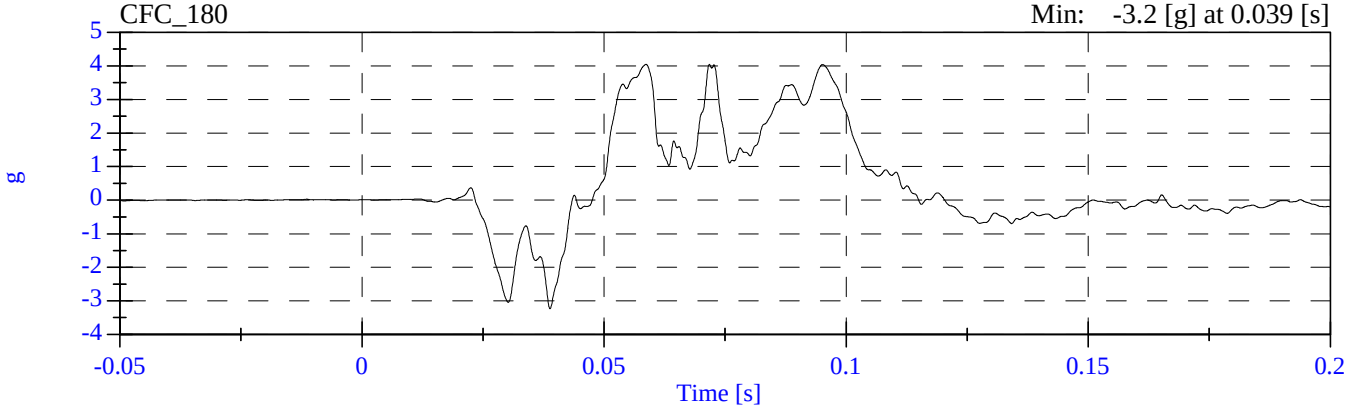


2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

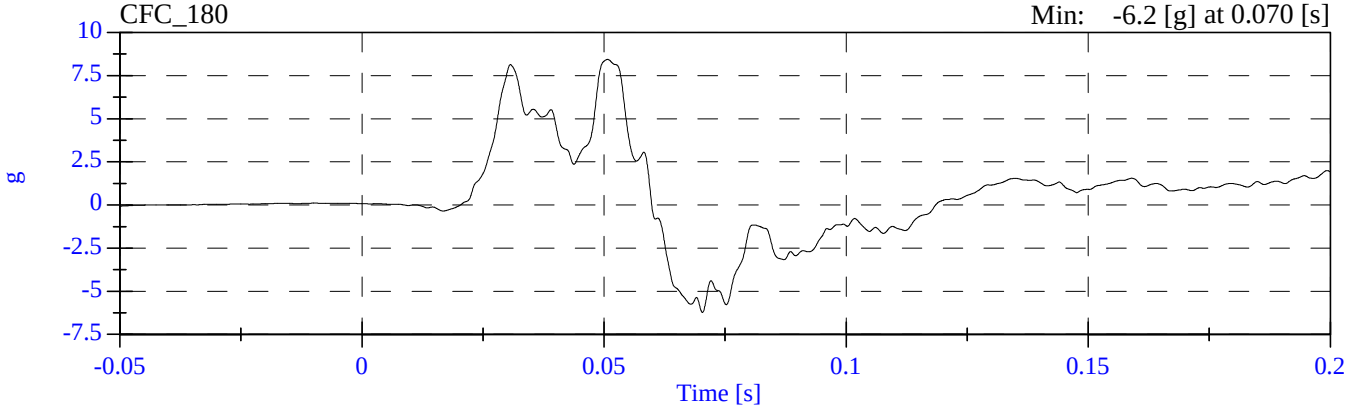
V1P1 Chest x
CFC_180
Max: 1.4 [g] at 0.119 [s]
Min: -47.0 [g] at 0.070 [s]



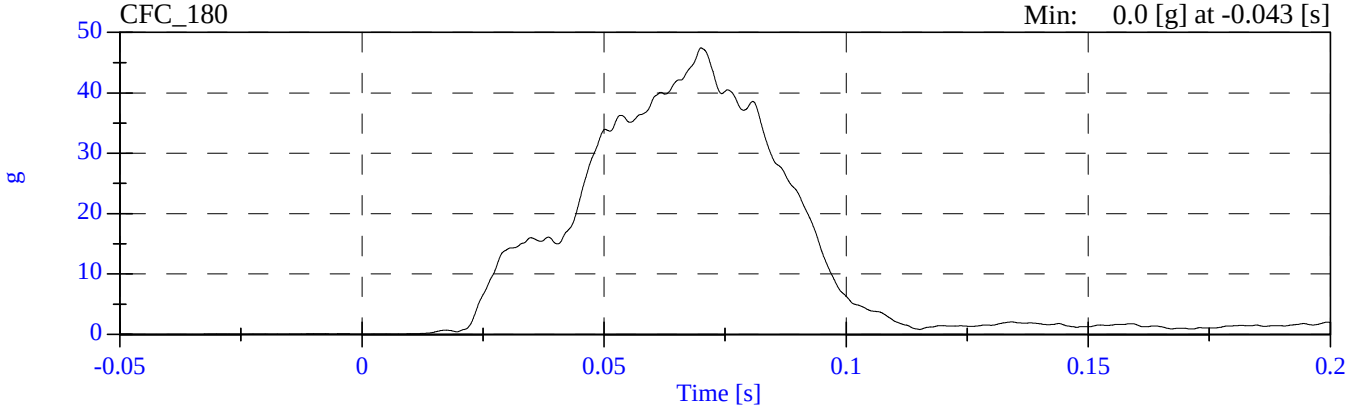
V1P1 Chest Redundant y
CFC_180
Max: 4.1 [g] at 0.072 [s]
Min: -3.2 [g] at 0.039 [s]



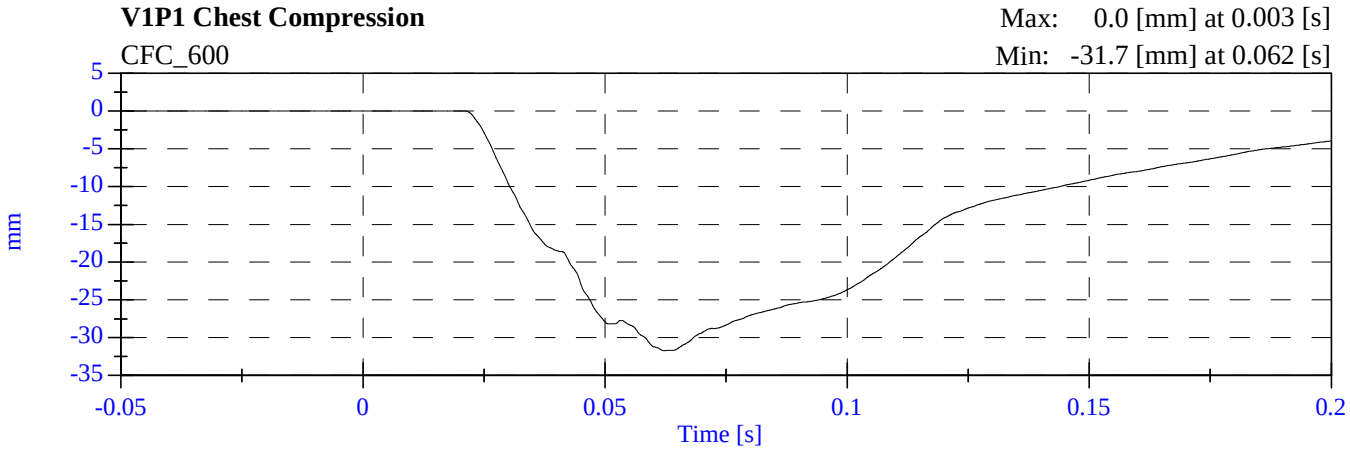
V1P1 Chest z
CFC_180
Max: 8.4 [g] at 0.051 [s]
Min: -6.2 [g] at 0.070 [s]



V1P1 Chest Resultant
CFC_180
Max: 47.4 [g] at 0.070 [s]
Min: 0.0 [g] at -0.043 [s]

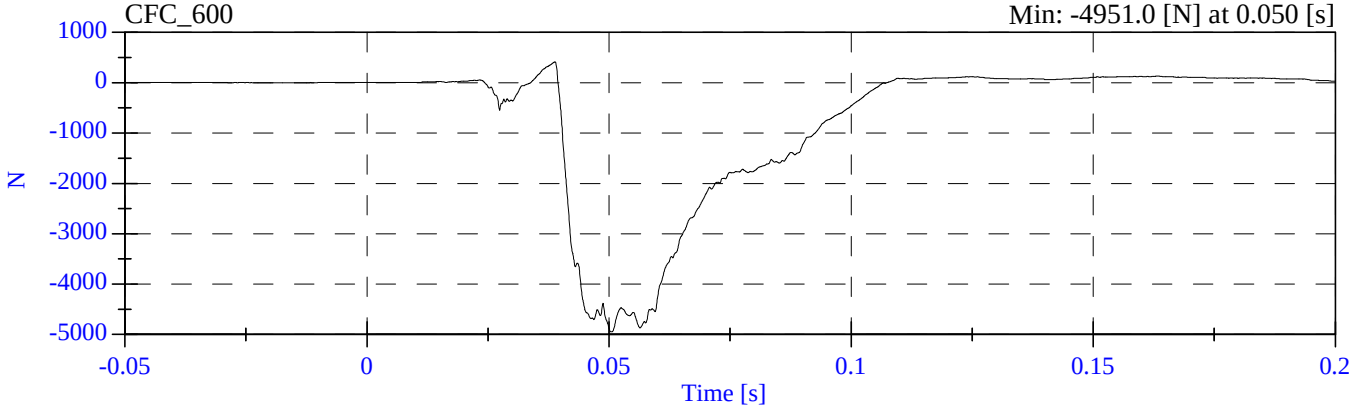


2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

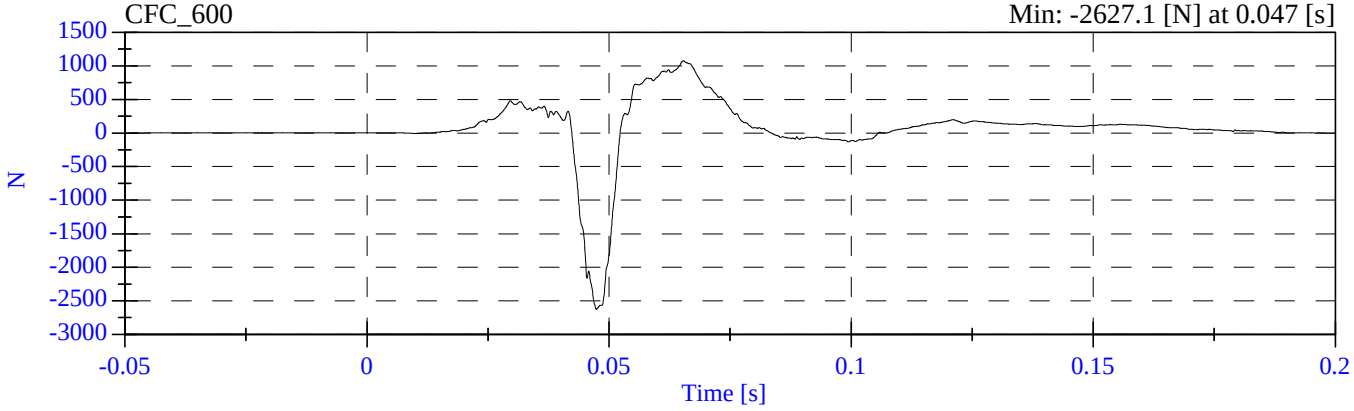


2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

V1P1 Left Femur
CFC_600
Max: 414.8 [N] at 0.039 [s]
Min: -4951.0 [N] at 0.050 [s]

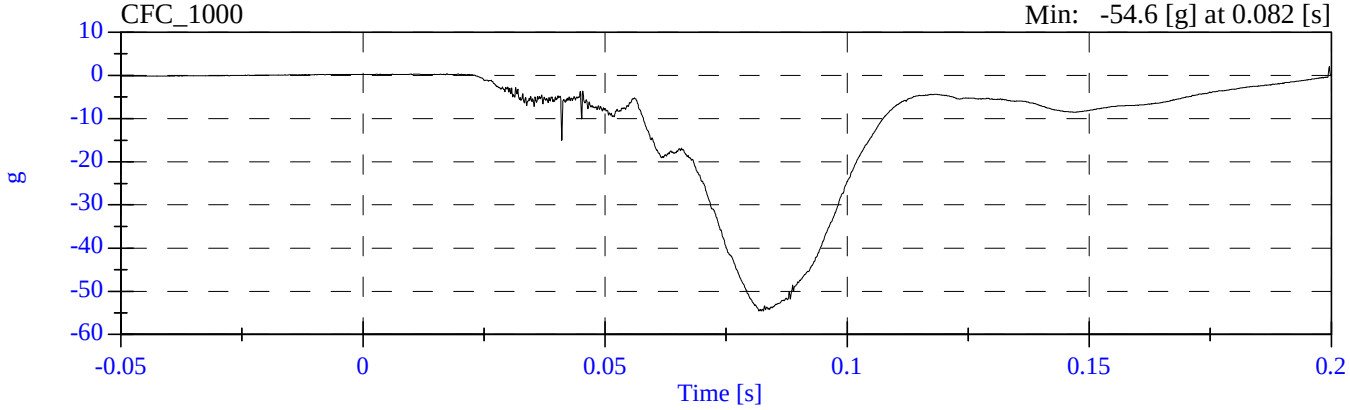


V1P1 Right Femur
CFC_600
Max: 1076.8 [N] at 0.065 [s]
Min: -2627.1 [N] at 0.047 [s]

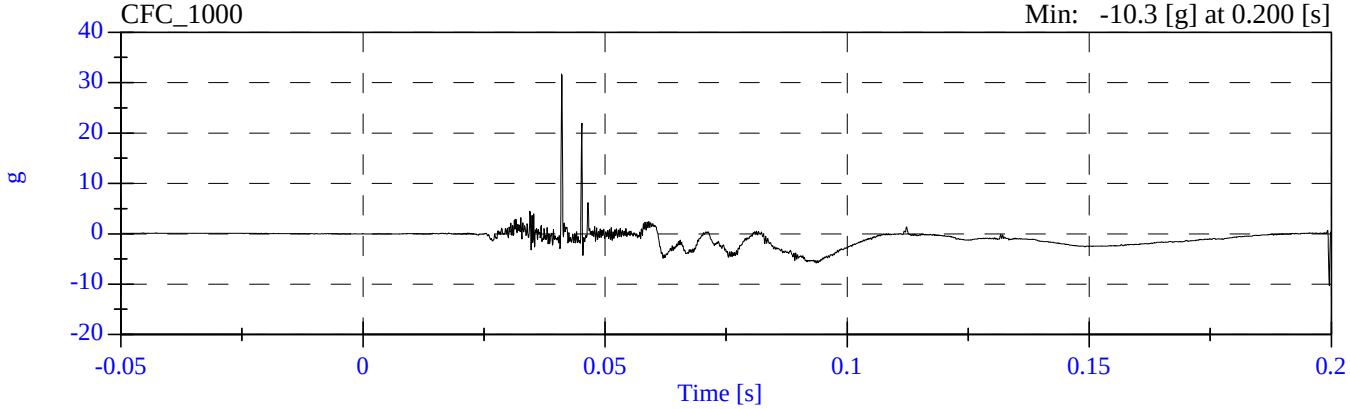


2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

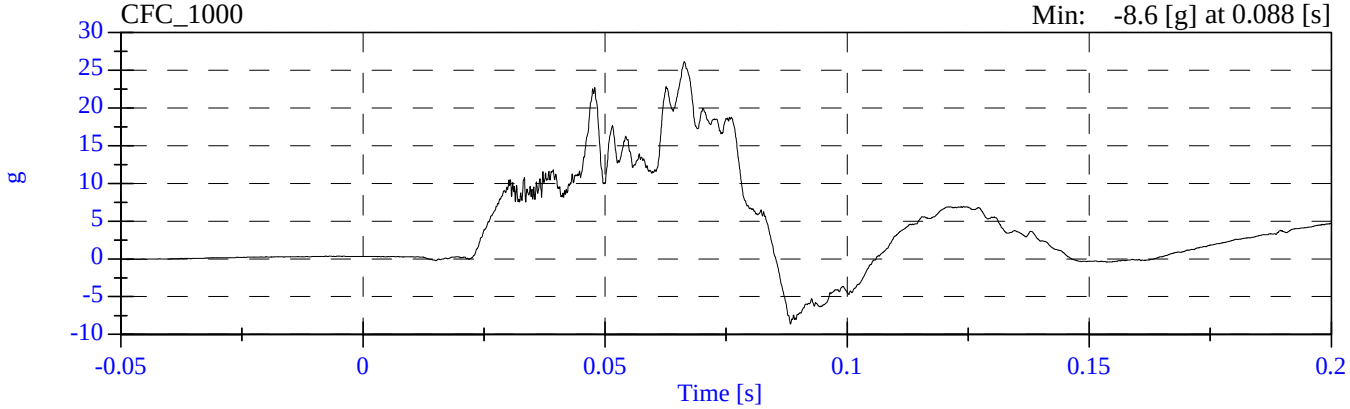
V1P2 Head CG x
CFC_1000
Max: 2.1 [g] at 0.200 [s]
Min: -54.6 [g] at 0.082 [s]



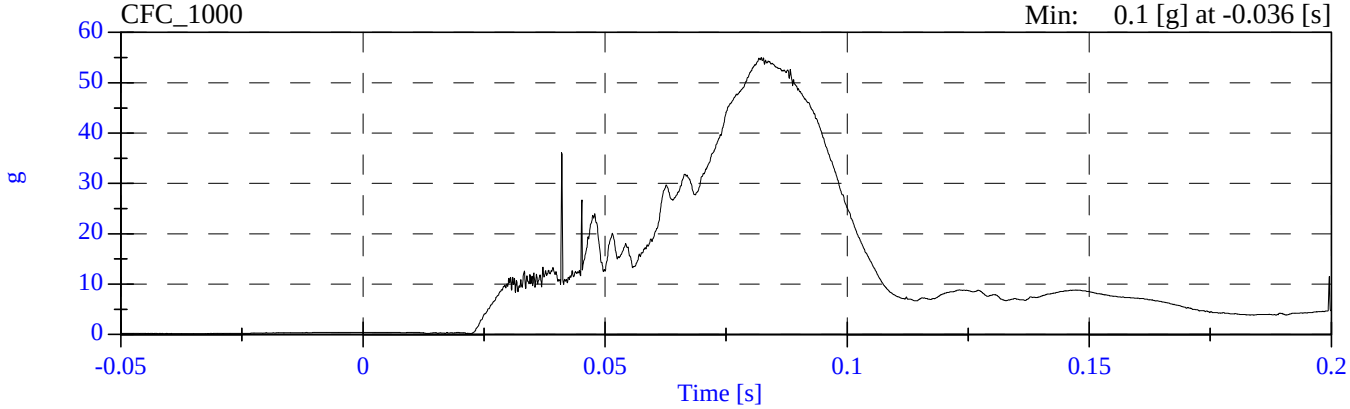
V1P2 Head CG y
CFC_1000
Max: 31.7 [g] at 0.041 [s]
Min: -10.3 [g] at 0.200 [s]



V1P2 Head CG z
CFC_1000
Max: 26.2 [g] at 0.066 [s]
Min: -8.6 [g] at 0.088 [s]

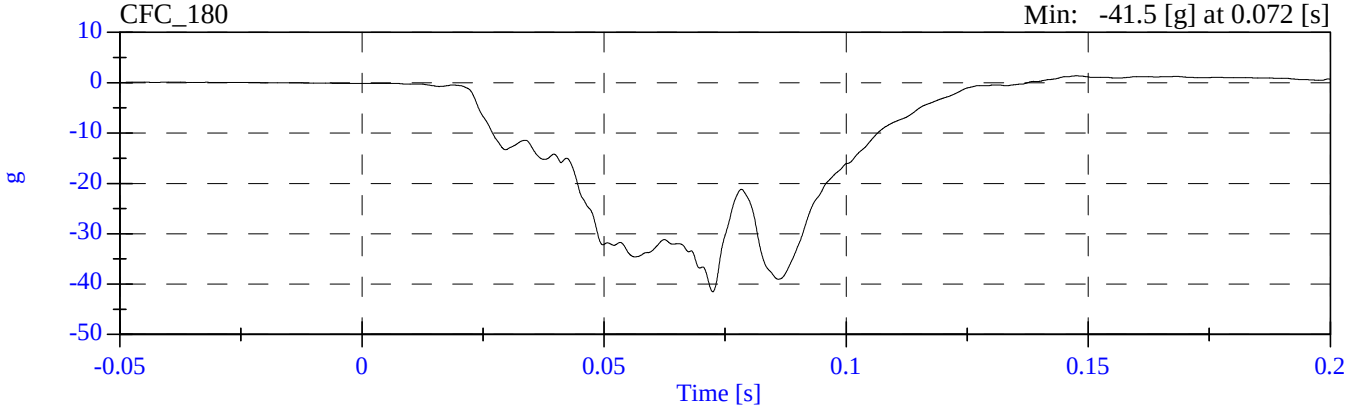


V1P2 Head CG Resultant
CFC_1000
Max: 55.0 [g] at 0.082 [s]
Min: 0.1 [g] at -0.036 [s]

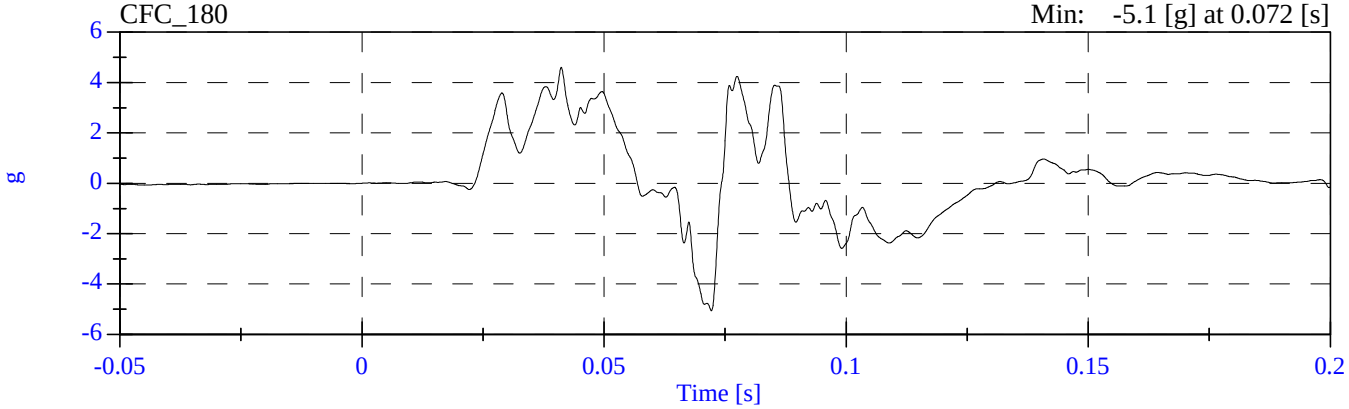


2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

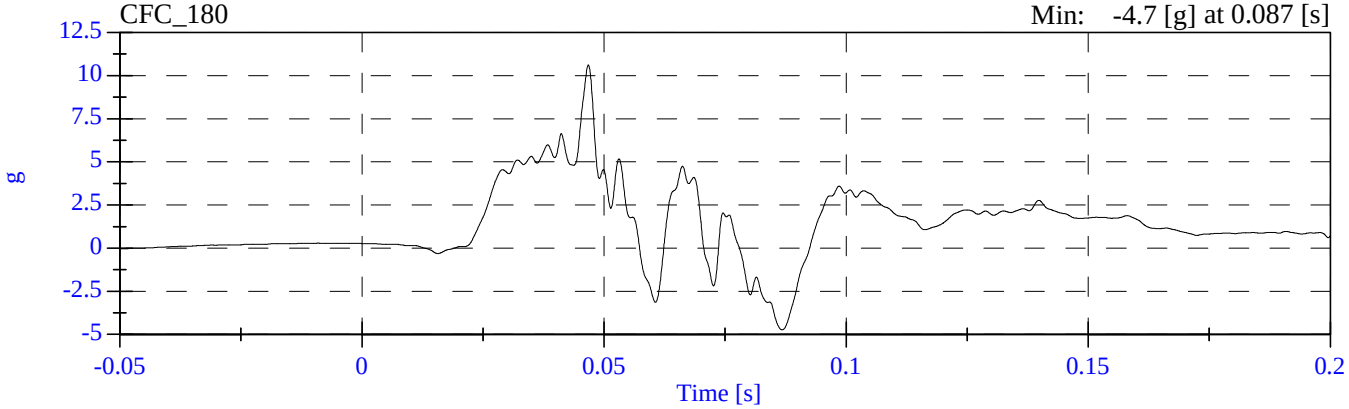
V1P2 Chest x
CFC_180
Max: 1.4 [g] at 0.148 [s]
Min: -41.5 [g] at 0.072 [s]



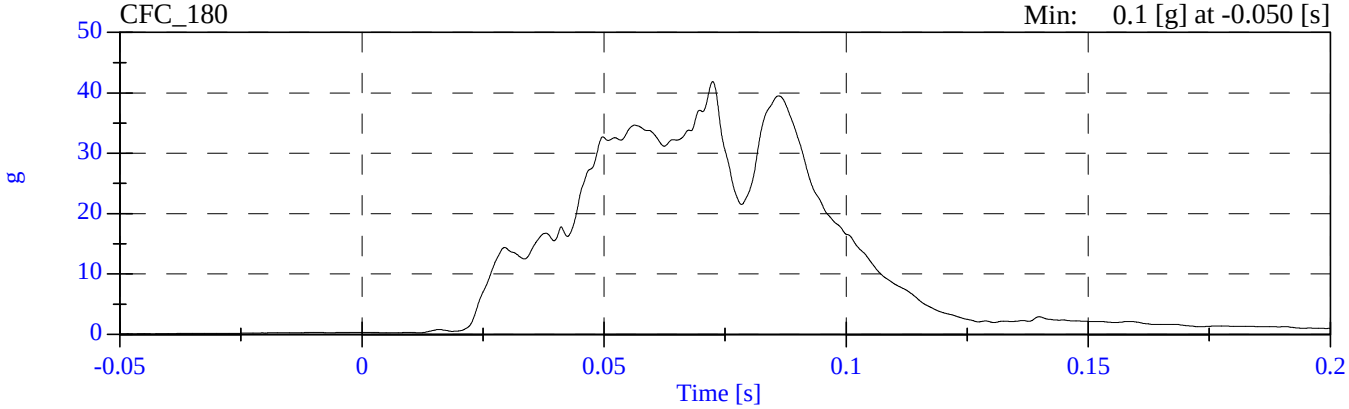
V1P2 Chest y
CFC_180
Max: 4.6 [g] at 0.041 [s]
Min: -5.1 [g] at 0.072 [s]



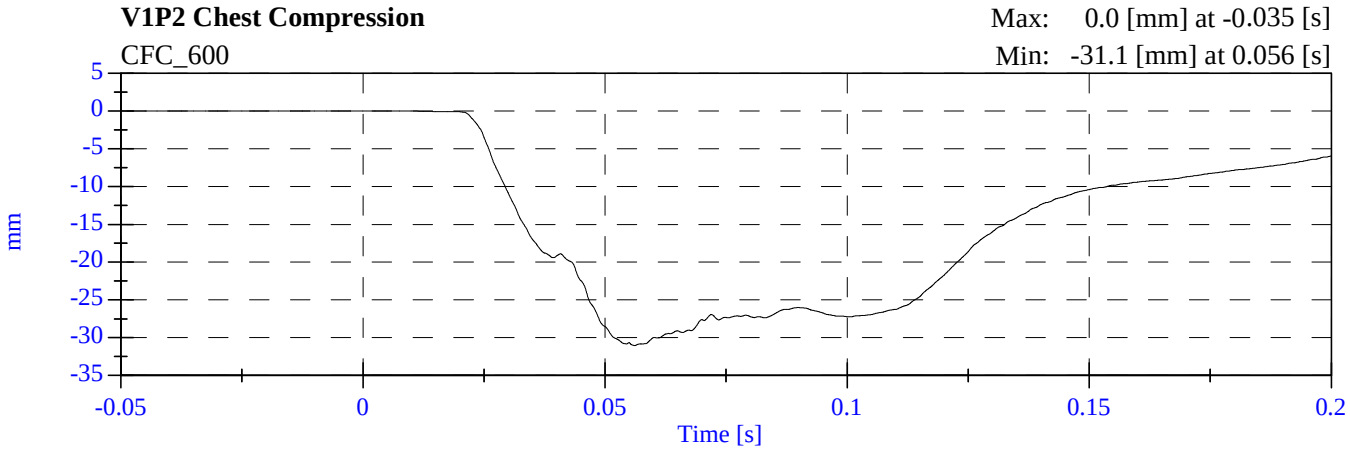
V1P2 Chest z
CFC_180
Max: 10.6 [g] at 0.047 [s]
Min: -4.7 [g] at 0.087 [s]



V1P2 Chest Resultant
CFC_180
Max: 41.9 [g] at 0.072 [s]
Min: 0.1 [g] at -0.050 [s]



2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007



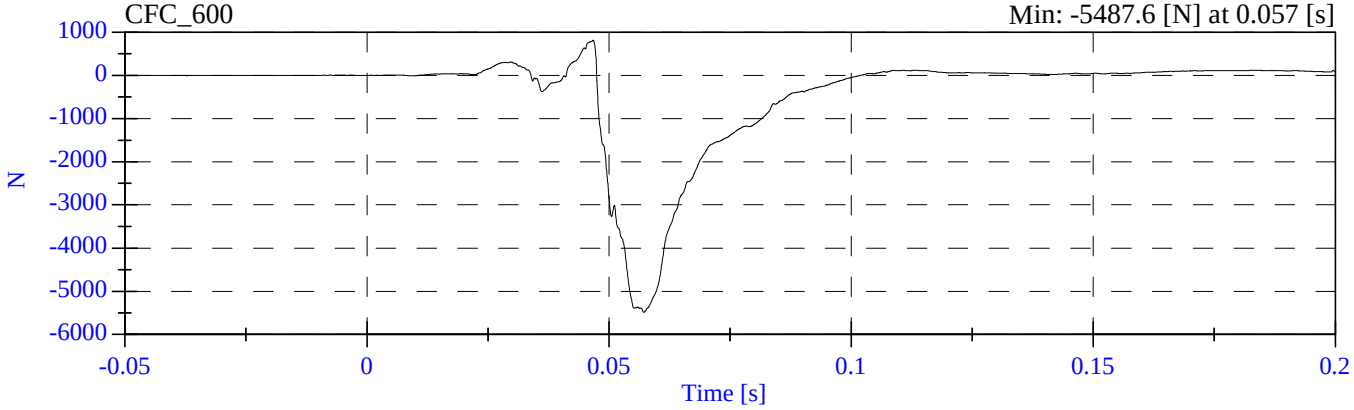
2007 NCAP Test 9 2007 Saturn Outlook
M70106 - January 18, 2007

V1P2 Left Femur

CFC_600

Max: 816.8 [N] at 0.047 [s]

Min: -5487.6 [N] at 0.057 [s]

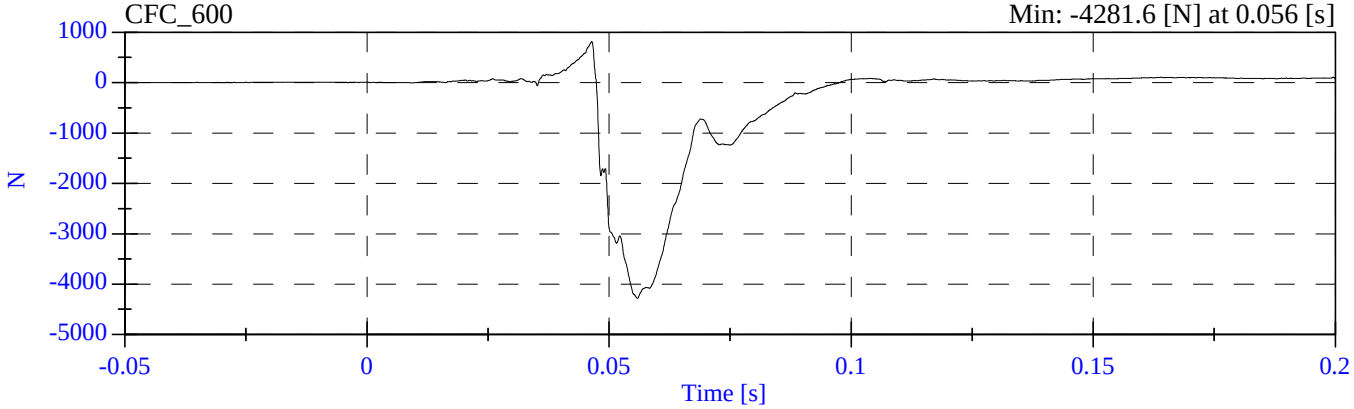


V1P2 Right Femur

CFC_600

Max: 812.0 [N] at 0.046 [s]

Min: -4281.6 [N] at 0.056 [s]



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.

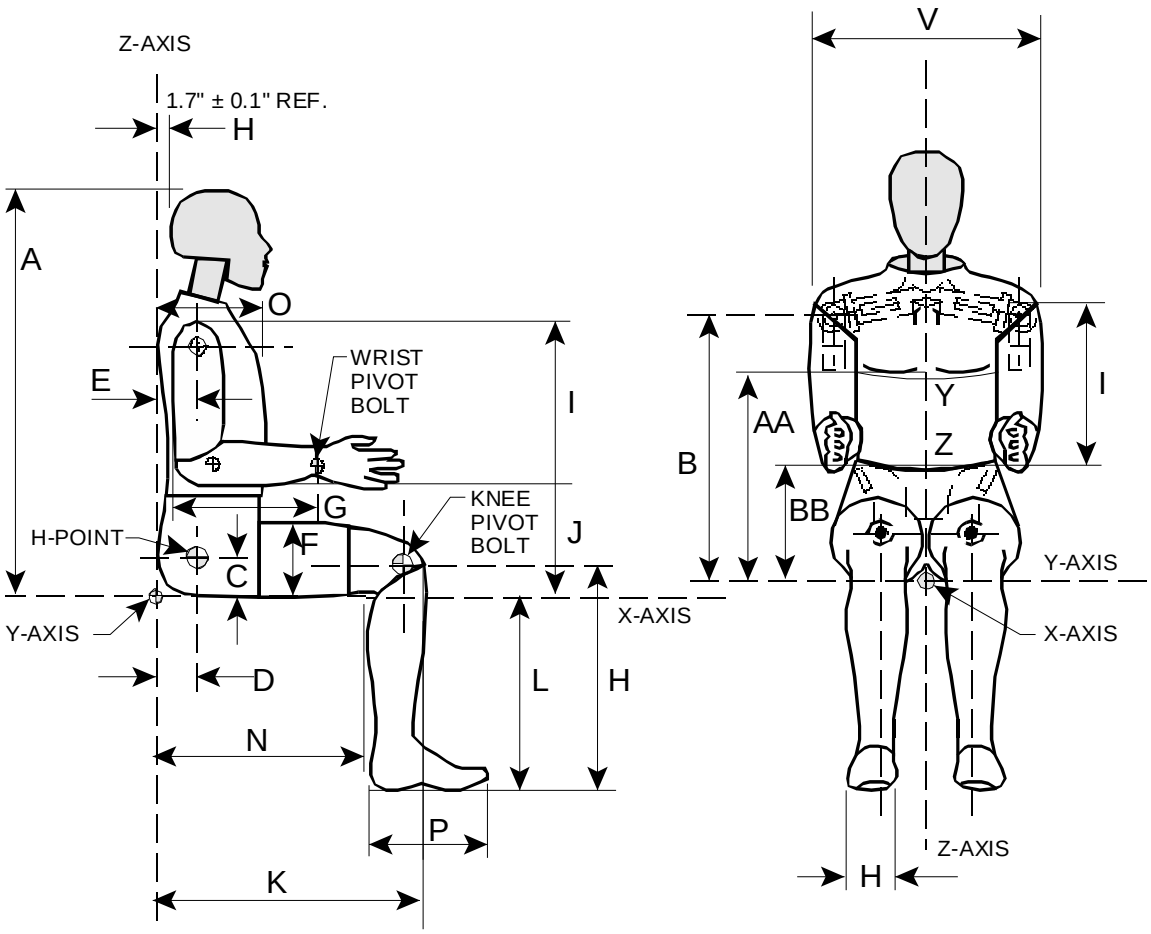
Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	142	11/13/2006
#2/Right Front Passenger	150	11/13/2006

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 Indicant 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	1
Date	11/07/2006
Workfile	142HD 11-07-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	37.00
Peak Resultant Acceleration	225-275 G's	244.51
Peak Lateral Acceleration	15 G's Max	5.51
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	142	
Sequential Test Number	1	
Date	11/08/2006	6 Axis Neck Transducer
Workfile	142NF1 11-08-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	33.00
Impact Velocity		6.89 – 7.13 m/s	7.00
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	25.17
	20 ms	17.60 - 22.60 G's	21.42
	30 ms	12.50 - 18.50 G's	17.10
Max Pendulum G's Above 30 ms		29 G's Max	17.10
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.10
D Plane Rotation	Max	64 - 78 Deg	66.13
	Time	57 - 64 ms	59.50
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	93.58
	Time	47 - 58 ms	50.00
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.60
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	142	
Sequential Test Number	1	
Date	11/08/2006	6 Axis Neck Transducer
Workfile	142NE 11-08-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	33.00
Impact Velocity		5.94 – 6.19 m/s	6.08
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.93
	20 ms	14.00 - 19.00 G's	18.73
	30 ms	11.00 - 16.00 G's	14.60
Max Pendulum G's Above 30 ms		22 G's Max	14.60
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	40.30
D Plane Rotation	Max	81 - 106 Deg	87.73
	Time	72 - 82 ms	74.80
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-68.95
	Time	65 - 79 ms	70.00
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	154.20
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	134.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	142
Sequential Test Number	1
Date	11/13/2006
Workfile	142T 11-13-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	37.00
Pendulum Velocity	6.58 – 6.83 m/s	6.65
Maximum Deflection	63.50 – 72.64 mm	66.3
Maximum Resistive Force	5159.9 – 5893.9 N	5315.63
Internal Hysteresis	69 - 85 %	75.21

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	142
Sequential Test Number	1
Date	11/13/2006
Workfile	142LF 11-13-06/142RF 11-13-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5267.10
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5364.4

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 142
Sequential Test Number 1
Date 11/13/2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			34
Location for Chest Circumference	AA	16.9 -17.1 in	17.1
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Total Sitting Height	A	34.6 - 35.0 in	35.0
Shoulder Pivot Height	B	19.9 - 20.5 in	20.4
H-Point Height	C	3.3 - 3.5 in	3.5
H-Point from Backline	D	5.3 - 5.5 in	5.3
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.7
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	8.2
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	19.2
Buttock Popliteal Length	N	17.8 - 18.8 in	18.6
Chest Depth	O	8.4 - 9.0 in	9.0
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	39.0
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	1
Date	11/07/2006
Workfile	150HD 11-07-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	37.00
Peak Resultant Acceleration	225-275 G's	261.94
Peak Lateral Acceleration	15 G's Max	2.86
Is Acceleration Curve Unimodal?	YES	Yes

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	150	
Sequential Test Number	1	
Date	11/08/2006	6 Axis Neck Transducer
Workfile	150NF 11-08-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	33.00
Impact Velocity		6.89 – 7.13 m/s	7.00
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.87
	20 ms	17.60 - 22.60 G's	22.02
	30 ms	12.50 - 18.50 G's	18.02
Max Pendulum G's Above 30 ms		29 G's Max	18.02
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	36.60
D Plane Rotation	Max	64 - 78 Deg	66.17
	Time	57 - 64 ms	57.50
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	91.71
	Time	47 - 58 ms	47.70
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	115.10
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.50

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	150	
Sequential Test Number	2	
Date	11/08/2006	6 Axis Neck Transducer
Workfile	150NE2 11-08-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	33.00
Impact Velocity		5.94 – 6.19 m/s	6.08
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.57
	20 ms	14.00 - 19.00 G's	17.83
	30 ms	11.00 - 16.00 G's	13.94
Max Pendulum G's Above 30 ms		22 G's Max	13.94
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.10
D Plane Rotation	Max	81 - 106 Deg	91.70
	Time	72 - 82 ms	73.90
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-68.97
	Time	65 - 79 ms	69.60
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	153.30
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	132.50

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	150
Sequential Test Number	1
Date	11/13/2006
Workfile	150T 11-13-2006

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	37.0
Pendulum Velocity	6.58 – 6.83 m/s	6.67
Maximum Deflection	63.50 – 72.64 mm	64.0
Maximum Resistive Force	5159.9 – 5893.9 N	5399.4
Internal Hysteresis	69 - 85 %	75.29

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	150
Sequential Test Number	1
Date	11/13/2006
Workfile	150LF 11-13-2006/150RF 11-13-2006

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5400.4
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5609.5

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 150
Sequential Test Number 1
Date 11/13/2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
Relative Humidity			34
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	20.0
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.5
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	13.2
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	34.0

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	ENDEVCO	AC-J19996	05-Dec-06	05-Jun-07
	Y	ENDEVCO	AC-J14381	05-Dec-06	05-Jun-07
	Z	ENDEVCO	AC-J19547	05-Dec-06	05-Jun-07
Head	X (R)	ENDEVCO	AC-AJ4P7	05-Dec-06	05-Jun-07
	Y (R)	ENDEVCO	AC-J27366	05-Dec-06	05-Jun-07
	Z (R)	ENDEVCO	AC-P16676	05-Dec-06	05-Jun-07
Neck Load Cell	X	DENTON	LC-157Fx	21-Apr-06	21-Oct-06
	Y	DENTON	LC-157Fy	21-Apr-06	21-Oct-06
	Z	DENTON	LC-157Fz	21-Apr-06	21-Oct-06
Neck Moment	X	DENTON	LC-157Mx	21-Apr-06	21-Oct-06
	Y	DENTON	LC-157My	21-Apr-06	21-Oct-06
	Z	DENTON	LC-157Mz	21-Apr-06	21-Oct-06
Chest	X	ENDEVCO	AC-J20083	05-Dec-06	05-Jun-07
	Y	ENDEVCO	AC-P17848	19-Oct-06	19-Apr-07
	Z	ENDEVCO	AC-J19223	05-Dec-06	05-Jun-07
Chest	X (R)	ENDEVCO	AC-P35817	05-Dec-06	05-Jun-07
	Y (R)	ENDEVCO	AC-P35790	05-Dec-06	05-Jun-07
	Z (R)	ENDEVCO	AC-P39574	05-Dec-06	05-Jun-07
Chest Deflection	X	SERVO	DS-150	13-Apr-06	13-Oct-06
Pelvic	X	ENDEVCO	AC-J21985	05-Dec-06	05-Jun-07
	Y	ENDEVCO	AC-AAMW5	05-Dec-06	05-Jun-07
	Z	ENDEVCO	AC-AJ5P9	05-Dec-06	05-Jun-07

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-1527	21-Apr-06	21-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1528	21-Apr-06	21-Oct-06
Left Upper Tibia	Mx	DENTON	LC-263Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-263My	24-Apr-06	24-Oct-06
Left Lower Tibia	Fz	DENTON	LC-174Fz	24-Apr-06	24-Oct-06
	Mx	DENTON	LC-174Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-174My	24-Apr-06	24-Oct-06
Right Upper Tibia	Mx	DENTON	LC-274Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-274My	24-Apr-06	24-Oct-06
Right Lower Tibia	Fz	DENTON	LC-185Fz	24-Apr-06	24-Oct-06
	Mx	DENTON	LC-185Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-185My	24-Apr-06	24-Oct-06
Left Foot Rear	X	ENDEVCO	AC-P14914	06-Dec-06	06-Jun-07
	Z	ENDEVCO	AC-AGRP4	06-Dec-06	06-Jun-07
Left Foot Front	Z	ENDEVCO	AC-AJ4G1	06-Dec-06	06-Jun-07
Right Foot Rear	X	ENDEVCO	AC-J36723	06-Dec-06	06-Jun-07
	Z	ENDEVCO	AC-J27496	06-Dec-06	06-Jun-07
Right Foot Front	Z	ENDEVCO	AC-J35747	06-Dec-06	06-Jun-07
Lap Belt Load Cell		LEBOW	LC-706	01-Nov-06	01-May-07
Shoulder Belt Load Cell		First Technology	LC-159	11-Jul-06	11-Jan-07

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENTRAN	AC-02A16-A09	08-Jan-07	08-Jul-07
	Y	ENTRAN	AC-02I0210-N20	08-Jan-07	08-Jul-07
	Z	ENDEVCO	AC-J19244	08-Jan-07	08-Jul-07
Head	X (R)	ENDEVCO	AC-P16591	08-Jan-07	08-Jul-07
	Y (R)	ENDEVCO	AC-P16286	08-Jan-07	08-Jul-07
	Z (R)	ENDEVCO	AC-J23996	08-Jan-07	08-Jul-07
Neck Load Cell	X	DENTON	LC-280Fx	21-Apr-06	21-Oct-06
	Y	DENTON	LC-280Fy	21-Apr-06	21-Oct-06
	Z	DENTON	LC-280Fz	21-Apr-06	21-Oct-06
Neck Moment	X	DENTON	LC-280Mx	21-Apr-06	21-Oct-06
	Y	DENTON	LC-280My	21-Apr-06	21-Oct-06
	Z	DENTON	LC-280Mz	21-Apr-06	21-Oct-06
Chest	X	ENTRAN	AC-03E03D16-F16	08-Jan-07	08-Jul-07
	Y	ENTRAN	AC-05H31-Z04	08-Jan-07	08-Jul-07
	Z	ENTRAN	AC-04J04I20-Z04	08-Jan-07	08-Jul-07
Chest	X (R)	ENTRAN	AC-03E03E21-M02	08-Jan-07	08-Jul-07
	Y (R)	ENTRAN	AC-01G18-F08	08-Jan-07	08-Jul-07
	Z (R)	ENTRAN	AC-03F03E29-N04	08-Jan-07	08-Jul-07
Chest Deflection	X	SERVO	DS-142	05-Apr-06	05-Oct-06
Pelvic	X	ENTRAN	AC-00L13-F10	08-Jan-07	08-Jul-07
	Y	ENTRAN	AC-03F03F09-N06	08-Jan-07	08-Jul-07
	Z	ENTRAN	AC-03E03E21-M06	08-Jan-07	08-Jul-07

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

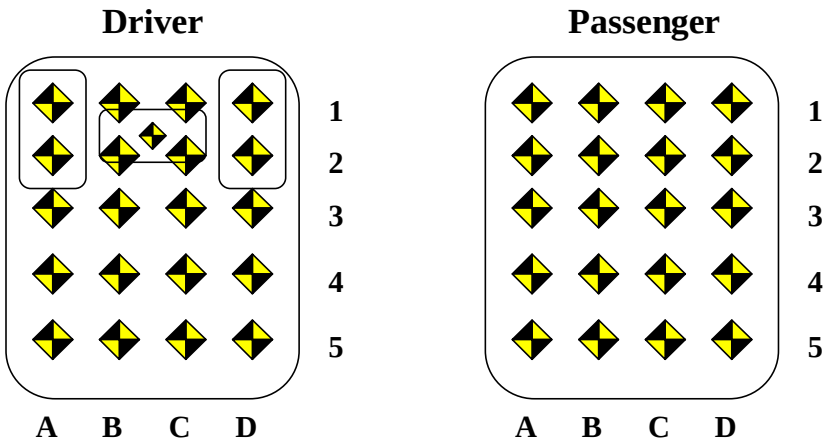
PASSENGER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1523	21-Apr-06	21-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1524	21-Apr-06	21-Oct-06
Left Upper Tibia	Mx	DENTON	LC-265Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-265My	24-Apr-06	24-Oct-06
Left Lower Tibia	Fz	DENTON	LC-178Fz	24-Apr-06	24-Oct-06
	Mx	DENTON	LC-178Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-178My	24-Apr-06	24-Oct-06
Right Upper Tibia	Mx	DENTON	LC-200Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-200My	24-Apr-06	24-Oct-06
Right Lower Tibia	Fz	DENTON	LC-128Fz	24-Apr-06	24-Oct-06
	Mx	DENTON	LC-128Mx	24-Apr-06	24-Oct-06
	My	DENTON	LC-128My	24-Apr-06	24-Oct-06
Left Foot Rear	X	ENDEVCO	AC-AJ7G1	08-Jan-07	08-Jul-07
	Z	ENDEVCO	AC-J20084	08-Jan-07	08-Jul-07
Left Foot Front	Z	ENDEVCO	AC-J20004	08-Jan-07	08-Jul-07
Right Foot Rear	X	ENDEVCO	AC-J27079	09-Jan-07	09-Jul-07
	Z	ENDEVCO	AC-ACCE6	09-Jan-07	09-Jul-07
Right Foot Front	Z	ENDEVCO	AC-J20580	09-Jan-07	09-Jul-07
Lap Belt Load Cell		First Technology	LC-173	11-Jul-06	11-Jan-07
Shoulder Belt Load Cell		First Technology	LC-178	11-Jul-06	11-Jan-07

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-FGP19	12-Jan-07	12-Jul-07
Right Rear Seat Crossmember X	GS SENSORS	AC-9440-046	12-Jan-07	12-Jul-07
Top of Engine	ENDEVCO	AC-P19374	05-Jan-07	05-Jul-07
Bottom of Engine	ICS	AC-FA2484	12-Jan-07	12-Jul-07
Right Disc Brake Caliper	ICS	AC-FA2473	09-Jan-07	09-Jul-07
Left Disc Brake Caliper	ICS	AC-FA2486	09-Jan-07	09-Jul-07
Left Seat Rear Crossmember Z	ICS	AC-FGP29	12-Jan-07	12-Jul-07
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	12-Jan-07	12-Jul-07

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

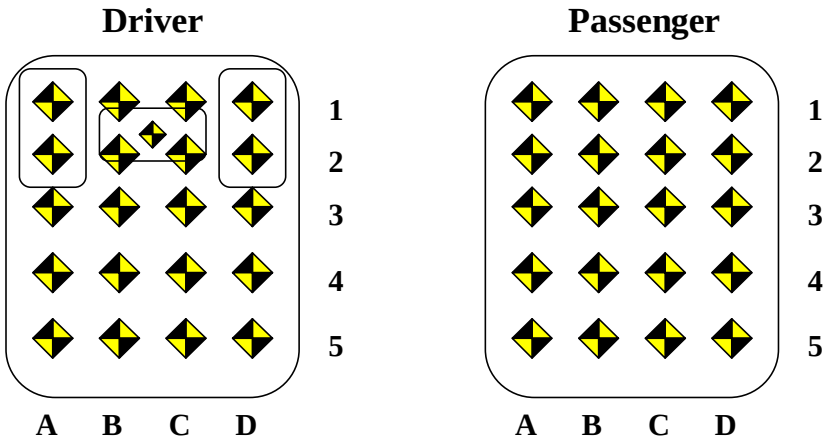


Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3629	-627	570	3624	-629	569	5	2	1
B1	3763	-520	569	3751	-516	577	12	-4	-8
C1	3758	-386	570	3749	-385	572	9	-1	-2
D1	3759	-264	570	3752	-257	567	7	-7	3
A2	3574	-623	510	3570	-624	507	4	1	3
B2	3691	-512	512	3685	-510	511	6	-2	1
C2	3693	-382	509	3690	-383	508	3	1	1
D2	3706	-257	509	3704	-255	507	2	-2	2
A3	3565	-629	455	3559	-627	451	6	-2	4
B3	3573	-500	453	3575	-501	448	-2	1	5
C3	3583	-376	455	3582	-374	448	1	-2	7
D3	3588	-248	454	3587	-244	446	1	-4	8
A4	3478	-619	441	3475	-620	438	3	1	3
B4	3484	-490	448	3486	-490	442	-2	0	6
C4	3493	-367	447	3495	-366	439	-2	-1	8
D4	3502	-240	449	3504	-240	440	-2	0	9
A5	3397	-612	446	3395	-613	446	2	1	0
B5	3402	-486	449	3402	-482	443	0	-4	6
C5	3410	-362	450	3409	-359	441	1	-3	9
D5	3418	-233	449	3417	-230	439	1	-3	10
BP	3615	-404	638	3605	-405	645	10	1	-7
G	3387	-566	904	3390	-559	913	-3	-7	-9
H	3392	-262	903	3391	-258	908	1	-4	-5
L	3132	-404	1130	3169	-406	1108	-37	2	22
AB	3050	-619	504	3048	-616	502	2	-3	2

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	3736	223	568	3728	221	576	8	2	-8
B1	3748	345	565	3737	341	578	11	4	-13
C1	3732	483	571	3732	478	574	0	5	-3
D1	3671	598	562	3669	598	569	2	0	-7
A2	3642	219	519	3636	225	524	6	-6	-5
B2	3690	347	509	3694	344	514	-4	3	-5
C2	3687	479	511	3692	478	516	-5	1	-5
D2	3642	598	511	3645	598	512	-3	0	-1
A3	3583	219	480	3584	223	481	-1	-4	-1
B3	3594	345	460	3599	348	457	-5	-3	3
C3	3592	476	460	3600	478	459	-8	-2	1
D3	3592	598	466	3599	600	466	-7	-2	0
A4	3505	217	448	3512	218	443	-7	-1	5
B4	3507	343	450	3514	346	443	-7	-3	7
C4	3508	473	449	3516	476	444	-8	-3	5
D4	3510	597	450	3516	599	448	-6	-2	2
A5	3423	220	448	3432	221	443	-9	-1	5
B5	3424	344	448	3430	346	443	-6	-2	5
C5	3420	471	449	3431	473	444	-11	-2	5
D5	3419	596	450	3429	601	448	-10	-5	2
R	3385	262	899	3381	261	899	4	1	0
S	3390	564	901	3389	566	906	1	-2	-5
AB	3049	625	506	3053	630	502	-4	-5	4

R=Left side of bolster, S=Right side of bolster, L=Steering wheel center;
AB = Front outboard seat anchor bolt