REPORT NUMBER: CAL-06-09

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

HYUNDAI MOTOR COMPANY
2006 HYUNDAI AZERA
4-DOOR SEDAN

NHTSA NUMBER: M60504

CALSPAN TEST NUMBER: 8642-NCAP-68

CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
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January 26, 2006

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
400 Seventh Street, SW, Room No. 5311
Washington, DC 20590

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Approval Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. *Report No.* CAL-06-09	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of NEW CAR ASSESSMENT PROGRAM (NCAP) Testing of a 2006 Hyundai Azera 4-Door Sedan NHTSA No. M60504		*5. Report Date* January 26, 2006
		6. Performing Organization Code CAL
7. Author(s) David J. Travale, Program Manager Lawrence Q. Valvo, Project Engineer		*8. Performing Organization Report No.* 8642-NCAP-68
9. Performing Organization Name and Address Calspan Corporation 4455 Genesee Street Buffalo, New York 14225		*10. Work Unit No.*
		11. Contract or Grant No. DTNH22-01-D-32005
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NVS-111 400 Seventh, SW, Room 5311 Washington, D.C. 20590		*13. Type of Report and Period Covered* Final Report January, 2006
		14. Sponsoring Agency Code NVS-111

15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 2006 Hyundai Azera 4-Door Sedan was performed at Calspan Corporation's crash test facility in Buffalo, New York, on January 26, 2006.

The impact velocity was 56.65 kph and the temperature at the barrier face was 21.1°C. The maximum post-test vehicle crush was 478 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 (061)**	**Passenger (064)**
Head Injury Criteria (HIC - 36 ms)	-	1000	698.0	388.8
Maximum Thorax Acceleration (3 ms Clip)	g's	60 g's	44.7	48.4
Chest Displacement	mm	-76 mm	-41.3	-29.5
Left Femur Force	Newtons	-10000 N	-7276.1	-5326.1
Right Femur Force	Newtons	-10000 N	-5346.5	-1885.7

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

19. Security Classif. (of this report) UNCLASSIFIED	*20. Security Classif. (of this page)* UNCLASSIFIED	*21. No. of Pages* 105	*22. Price*

Form DOT F1700.7 (8-69)

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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.65 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. DTNH22-01-D-32005. 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 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.65 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 nine accelerometer array heads, 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. 061) and the right-front passenger (position 2) ATD (Serial No.064) 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 140 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 2006 Hyundai Azera 4-Door Sedan at a velocity of 56.65 kph. The test was performed at Calspan on January 26, 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	698.0	61.9	97.8	44.7	48.2	51.2	-41.3	-7276.1	-5346.5
Passenger	388.8	62.3	98.3	48.4	68.3	71.3	-29.5	-5326.1	-1885.7

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

TEST NOTES	
Data Channel	Anomalies
V1P1 Left Upper Tibia My	Channel Clipped: 24-69 ms
V1 Engine Top #3x	Transducer Failed

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M60504 Test Mode: 56.3 kph Frontal Barrier
Test Date: January 26, 2006 Time: 15:47 Temperature: 21.1 °C
Vehicle Make/Model/Body Style: 2006 Hyundai Azera 4-Door Sedan
Vehicle Test Weight: 1939.0 kg Impact Velocity: 56.65 kph (55.5 – 57.1 kph)
Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 478 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	3-point belt with shoulder and buckle pretensioners and force limiter, airbag, knee bolster and head restraint	3-point belt with shoulder and buckle pretensioners and force limiter, airbag, knee bolster and head restraint
Head Contact:	Face to upper half of airbag; Back of head to outboard half of head restraint	Face to center of airbag; Top of head to outboard half of sun visor
Abdomen Contact:	None	None
Chest Contact:	Airbag	Airbag
Left Knee Contact:	Knee bolster left of steering column	Left edge of glove compartment door
Right Knee Contact:	Knee bolster right of steering column	Right half of 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	Closed, latched and operable without tools	Closed, latched and operable without tools
Hatch/Other Door Opening	-	-
Front Seat Track Shift (mm)	0	0
Front Seat Back Failure	None	None
Glazing Damage	The windshield cracked above the passenger airbag cover and radiated from this area across the entire windshield. The windshield had a retention loss of 770 mm along its lower edge with 550 mm on the passenger side and 220 mm on the driver side.	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	1105	1074	1055	1078

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	879	844
Lap belt length as measured on ATD	mm	860	825
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	1739	1669

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2006 Hyundai Azera 4-Door Sedan

NHTSA No. : M60504 ; VIN: KMHFC46FX6A039195 ; Color: Aubergine

Engine Data: 6 cylinders; - CID; 3.8 Liters; - cc

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

Transmission Data: 5 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: 01/17/2006 ; Odometer Reading 739 km

Selling Dealer: Vision Hyundai

Dealer Address: 2525 W, Henrietta Road, Rochester, NY 14623

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 Pretensioners (Shoulder and buckle); X Load Limiter; X Adjustable Anchorage

Passenger: X Pretensioners (Shoulder and buckle); X Load Limiter; X Adjustable Anchorage

AIRBAG FEATURES:

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

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Hyundai Motor Company

Date of Manufacture OCT/11/05

GVWR: 2136 kg; GAWR: 1260 kg FRONT; 1115 kg REAR

VEHICLE CAPACITY DATA:

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

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 390 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 49.8 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 =	530.0	528.0	60.7	1058.0
Rear =	357.0	328.0	39.3	685.0
			Total Delivered Weight (UDW) =	1743.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	1743.0	kg
Rated Cargo/Luggage Weight (RCLW) =	49.8	kg
Weight of 2 p.572 Dummies @ 76 each =	152	kg
TARGET TEST WEIGHT =	1944.8	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 44.0 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	573.0	556.0	58.2	1129.0
Rear =	412.0	398.0	41.8	810.0
			Total Vehicle Test Weight (ATW) =	1939.0

Weight of Ballast Secured in Vehicle Trunk Area[1] = 0 kg

Vehicle Components Removed for Weight Reduction: Rear head restraints and spare tire.

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG[2]
AS DELIVERED:	722	727	719	726	1093
FULLY LOADED:	714	720	693	698	-
AS TESTED:	715	720	694	698	1161

Vehicle's Wheel Base: 2780 mm

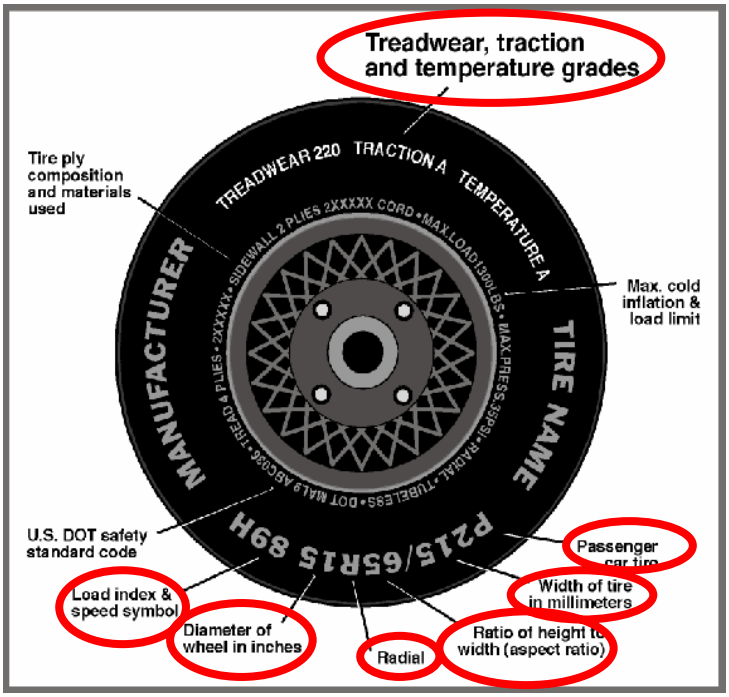
[1]Ballast weight does not include the weight of instrumentation and data acquisition system

[2]Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2006 Hyundai Azera 4-Door Sedan

NHTSA Test No.: M60504 Test Date: January 26, 2006



Measured Parameter	Front	Rear
Maximum Tire Pressure (from sidewall - kPa)	300	300
Cold Pressure (from tire placard - kPa)*	210	210
Recommended Tire Size (from tire placard)	P235/55R17	P235/55R17
Tire size on Vehicle	P235/55R17 98V	P235/55R17 98V
Tire Manufacturer	Michelin	Michelin
Tire Name	Energy MXV4	Energy MXV4
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	55	55
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	98V	98V
Treadwear	440	440
Traction Grade	A	A
Temperature Grade	A	A

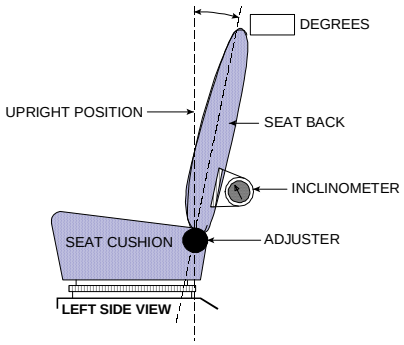
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2006 Vehicle Model: Hyundai Azera Body Style : 4-Door Sedan

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: 25 degrees (torso angle)

Measurement instructions: The seat was reclined 24 degreed from its forward most locking position. The head restraint post measured 8.8 degrees back from vertical in this position.

Seat back angle for passenger's seat: 25 degrees (torso angle)

Measurement instructions: The seat was reclined 24 degreed from its forward most locking position. The head restraint post measured 8.8 degrees back from vertical in this position.

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: The seat was position 128 mm rearward of its absolute forward most position. Absolute fore/aft seat travel was 256 mm.

Positioning of the passenger's seat: The seat was position 120 mm rearward of its absolute forward most position. Absolute fore/aft seat travel is 240mm.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 65.0 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 = 59.8 to 61.1 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 59.8 liters

3.3 One-Third of Useable Capacity = 21.7 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 engine is not started and continuously while the engine is running.

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 at its middle telescope and middle tilt position (tilt was7 degrees down from its upper most position, or 21.8 degrees from horizontal).

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: Anchorage was placed in detent 1, where the uppermost detent is defined as 0 with 4 possible positions. (position is 25 down from upper most position)

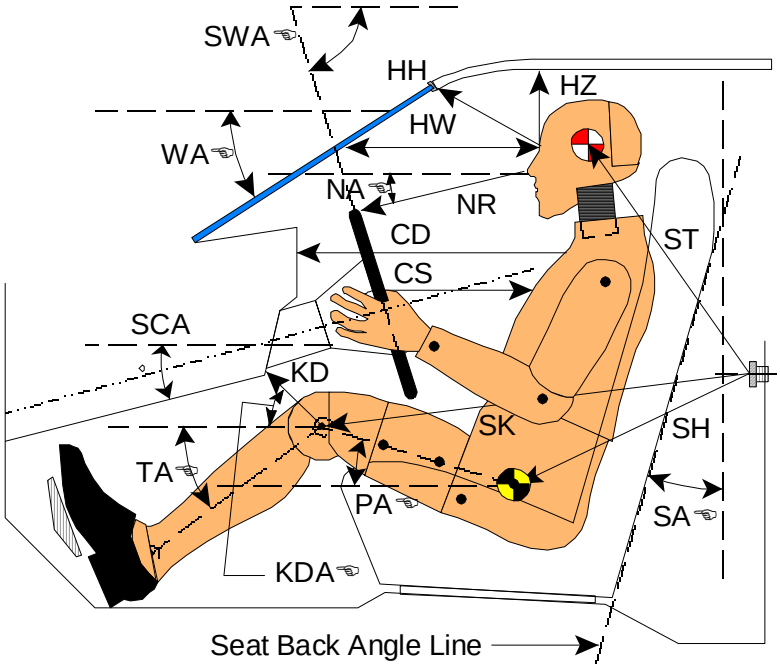
6. AUTOMATIC DOOR LOCKS: Is test vehicle equipped with ADLs? X Yes; - No;

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

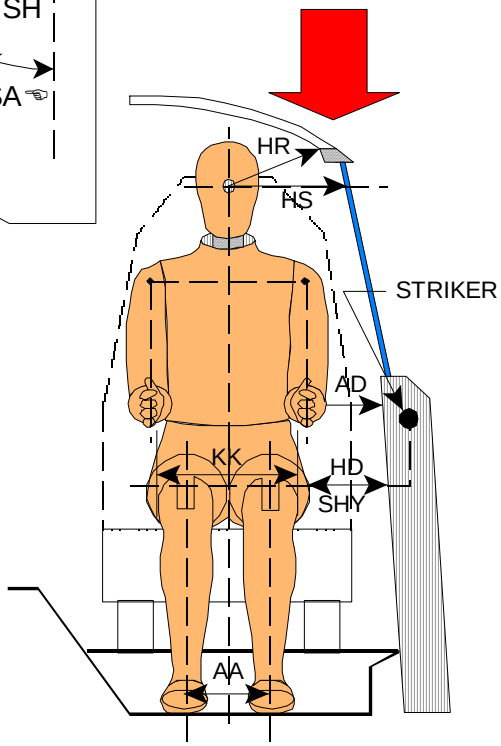
Comments: None

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

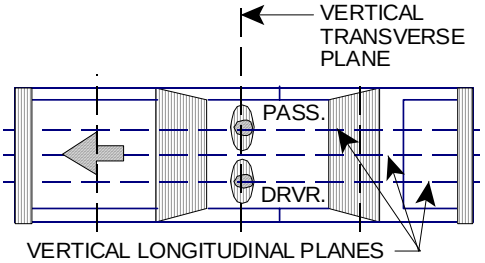
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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



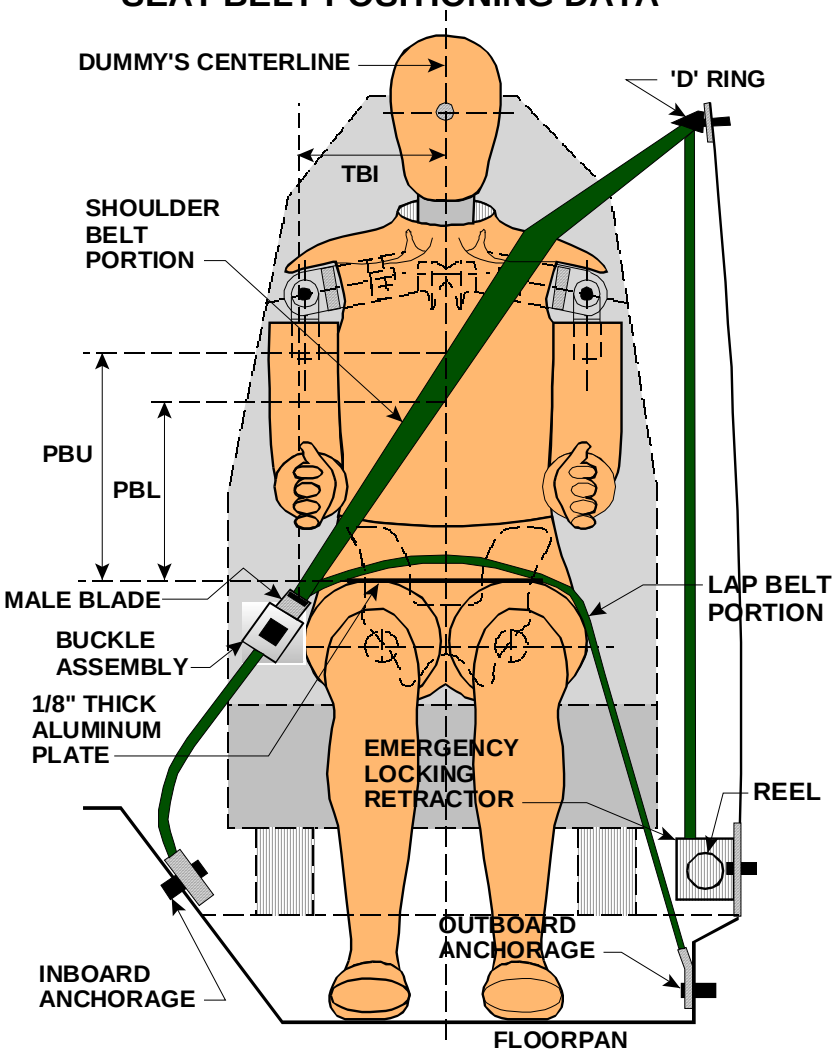
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA^O	28.0 deg.			N/A		
SWA^O	68.2 deg.			N/A		
SCA^O	21.8 deg.			N/A		
SA^O	25 deg. (8.8 on head restraint post)			25 deg. (8.8 on head restraint post)		
HZ	157			158		
HH	320			318		
HW	620			593		
HR	212			208		
NR	385	Angle	13 deg.	N/A		
CD	535			555		
CS	269			N/A		
RA	173			N/A		
KDL	162	Angle (KDA)	40 deg.	164		
KDR	135			184	Angle (KDA)	48 deg.
PA^O	22.1 deg.			24.0 deg.		
TA^O	42.2 deg.			35.0 deg.		
KK	375			270		
AA	385			218		
ST	470	Angle	10 deg.	466	Angle	9 deg.
SK	620	Angle	100 deg.	616	Angle	102 deg.
SH	312	Angle	135 deg.	302	Angle	132 deg.
SHY	243			240		
HS	347			343		
HD	192			187		
AD	125			125		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

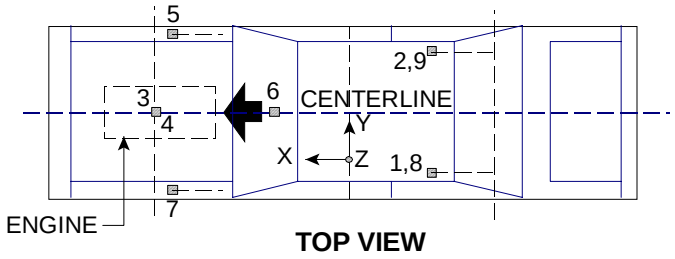


FRONT VIEW OF DUMMY

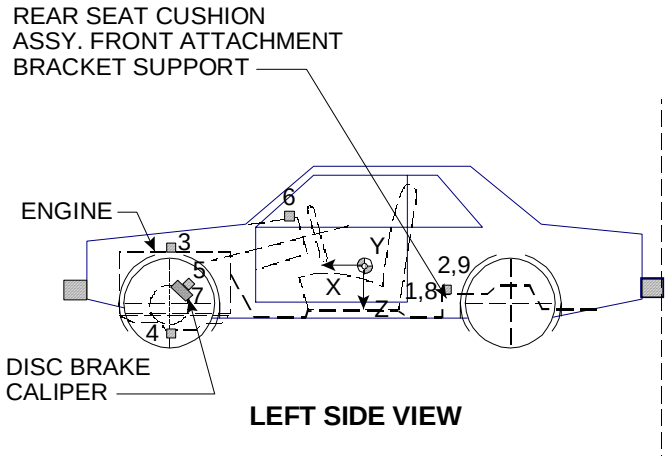
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	320	325
PBL-- Top surface of alum. plate to belt lower edge	240	240
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	2034	-581	-224
2	Right Rear Seat Cross Member X	2034	572	-217
3	Top of Engine Block	4255	-140	-708
4	Bottom of Engine	3985	240	-210
5	Disc Brake Caliper @ Right Side	3768	730	-388
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	3771	-731	-391
8	Left Rear Seat Cross Member Z	2034	-581	-224
9	Right Rear Seat Cross Member Z	2034	572	-217

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 20 mm molding.

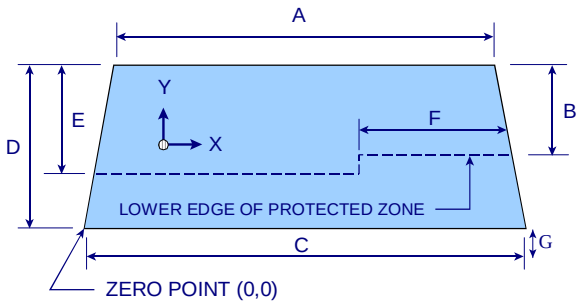
FMVSS 212 REQUIREMENTS:

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: 21.1ºC.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2262.5	2042.5	90.3%
LEFT SIDE	2262.5	1712.5	75.7%
TOTAL	4525	3755	83.0%



FRONT VIEW OF WINDSHIELD

DIMENSIONS (mm)	
A	1215
B	519
C	1590
D	860
E	522
F	570
G	20

FAILURE DETAILS: The windshield lost retention along its lower edge, from point (575, 0) to point (1345, 0). The windshield appeared to meet the FMVSS 212 windshield retention requirements.

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.: M60504 TEST DATE: January 26, 2006

VEHICLE MAKE/MODEL: 2006 Hyundai Azera 4-Door Sedan

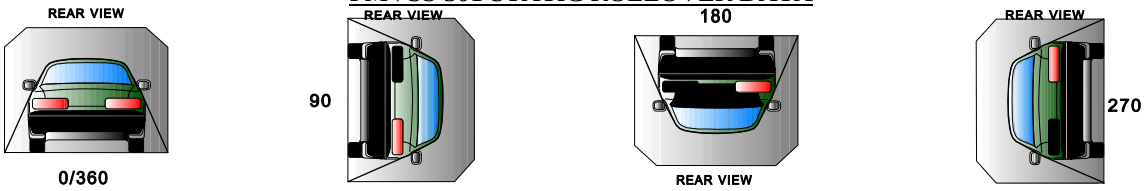
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

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	11	seconds	5	minutes	6	minutes	11	seconds	7	minutes
90º - 180º	1	minutes	7	seconds	5	minutes	6	minutes	7	seconds	7	minutes
180º-270º	1	minutes	5	seconds	5	minutes	6	minutes	5	seconds	7	minutes
270º-360º	1	minutes	11	seconds	5	minutes	6	minutes	11	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:

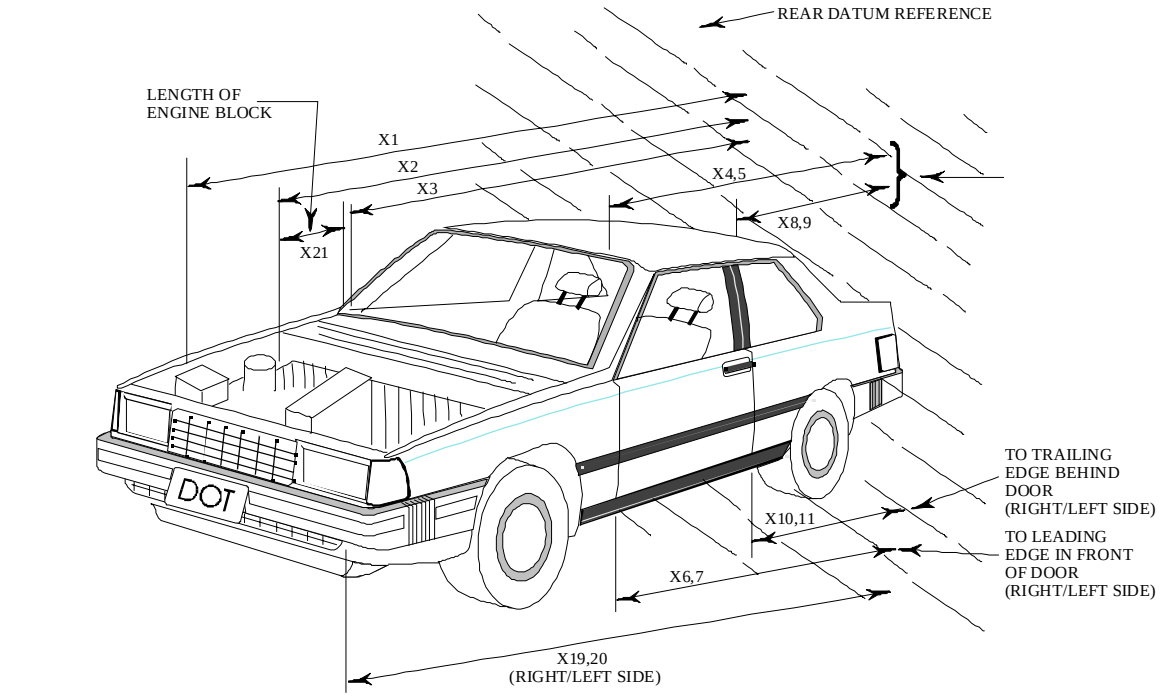
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

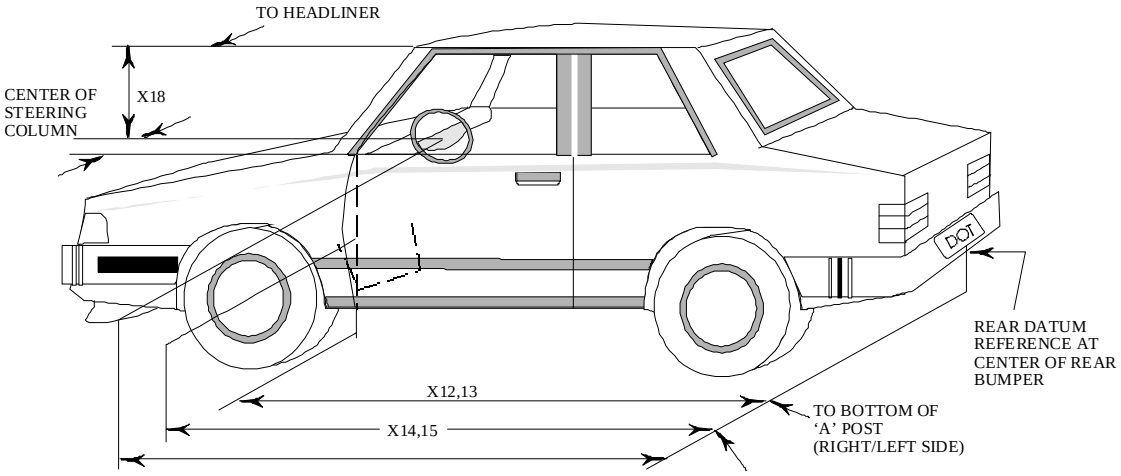
Note: Record spillage for whole minute intervals only as determined above.

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.: M60504 TEST DATE: January 26, 2006

VEHICLE MAKE/MODEL: 2006 Hyundai Azera 4-Door Sedan

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4895	4437	458
X2	Rear Surface of Vehicle to Front of Engine	4415	4196	219
X3	Rear Surface of Vehicle to Firewall	3803	3656	147
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3387	3387	0
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3383	3383	0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3419	3418	1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3416	3415	1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2316	2316	0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2315	2316	-1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2340	2338	2
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2337	2337	0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3425	3423	2
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3421	3419	2
X14	Rear Surface of Vehicle to Firewall, Right Side	3779	3678	101
X15	Rear Surface of Vehicle to Firewall, Left Side	3801	3724	77
X16	Rear Surface of Vehicle to Steering Column	2922	2917	5
X17	Center of Steering Column to "A" Post	321	309	12
X18	Center of Steering Column to Headliner	421	428	-7
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4810	4419	391
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4810	4407	403
X21	Length of Engine Block	567	567	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3138	3129	9
CD	Rear Surface of Vehicle to Center of Dash Panel	3179	3157	22
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3136	3130	6

All Dimensions in mm

DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

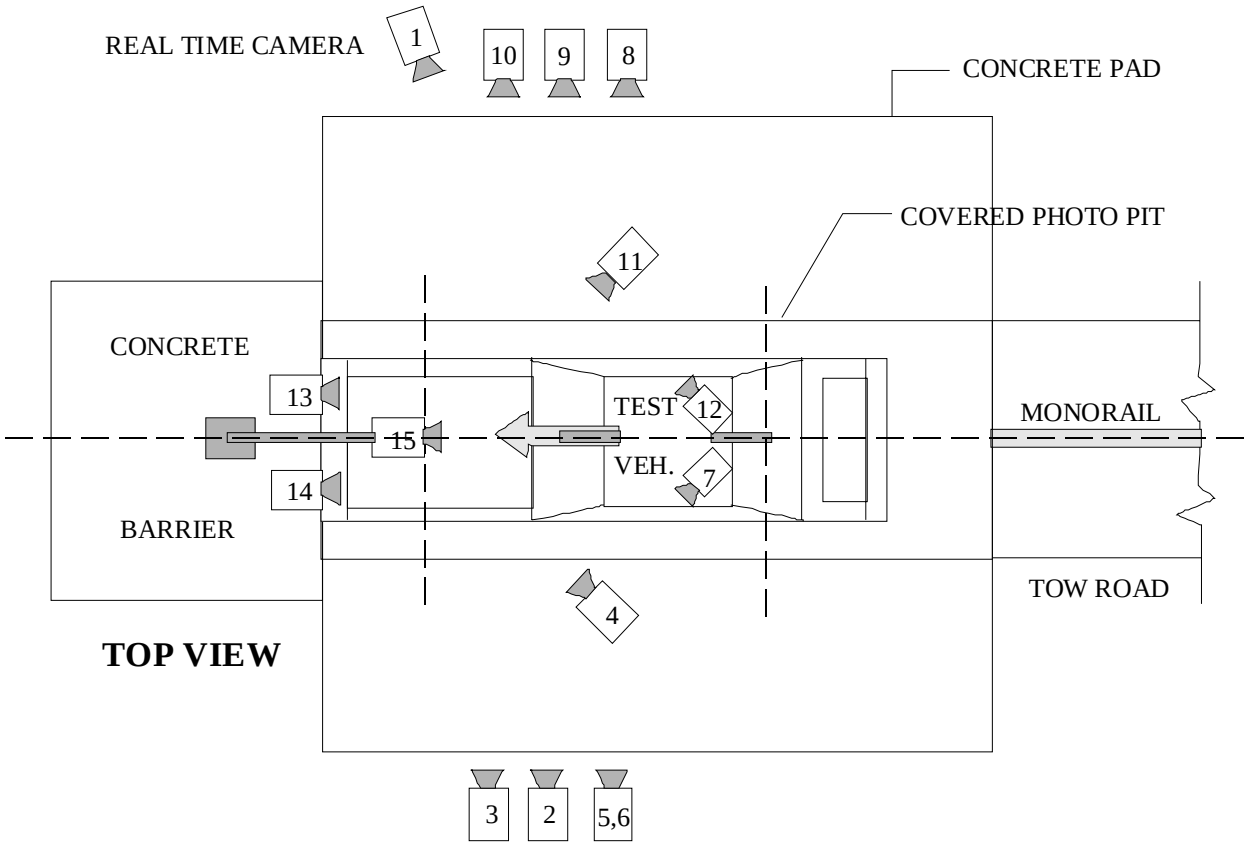
NHTSA TEST No.: M60504 TEST DATE: January 26, 2006

VEHICLE MAKE/MODEL: 2006 Hyundai Azera 4-Door Sedan

TARGET VEHICLE STRUCTURAL MEASUREMENTS

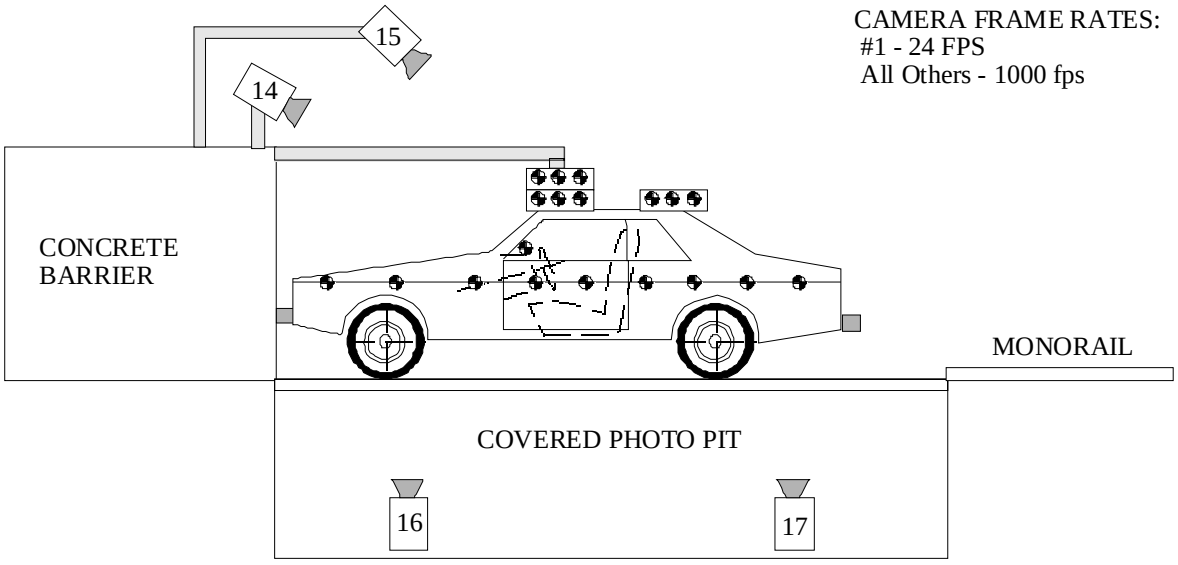
	Elements	Pre-Test (mm)
1	Total length	4895
2	Total Width	1809
3	Bumper Top Height	540
4	Bumper Bottom Height	405
5	Longitudinal Member Top Height	555
6	Distance Between Longitudinal Members	960
7	Longitudinal Member Width	50
8	Engine top height	820
9	Engine bottom height	198
10	Engine and gearbox width	880
11	Front bumper-engine distance	400
12	Front shock absorber fixing height	880
13	Bonnet leading edge height	735
14	Front shock absorber fixing width	1110
15	Front bumper – front axle distance	964
16	Front axle – a pillar distance	510
17	A-pillar – B pillar distance	1090
18	B-pillar – rear axle distance	1181
19	B-pillar – C Pillar distance	760
20	Roof sill bottom height	1385
21	Roof sill top height	1522
22	Floor sill bottom height	225
23	Floor sill top height	354

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.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan

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	7830	1805	-1095	-3.9	7515	28	1000
3	Left Side View	8310	955	-1085	-2.3	7995	50	1000
4	Driver and Interior View	7210	2670	-2045	-8.6	-	35	500
5	Steering Column (Bottom)	8260	2051	-1155	-3.5	7945	25	1000
6	Steering Column (Top)	8260	2051	-1790	-8.5	7945	28-70	1000
7	Left CRS Lateral View	-	-	-	-	-	-	-
8	Overall Right Side	7860	2197	-1085	-3.5	8162	28	500
9	Right Side View		1325	-1100	-2.7	302	50	1000
10	Right Passenger View	8455	1840	-1414	-3.6	8757	35	1000
11	Passenger and Interior View	7440	2640	-2030	-8.4	-	35	500
12	Right CRS Lateral View	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-36.0	-	13	500
14	Driver Front View	620	-92	1987	-36.0	-	13	500
15	Windshield View	0	-530	3374	-50.0	-	20	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0	2550	-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

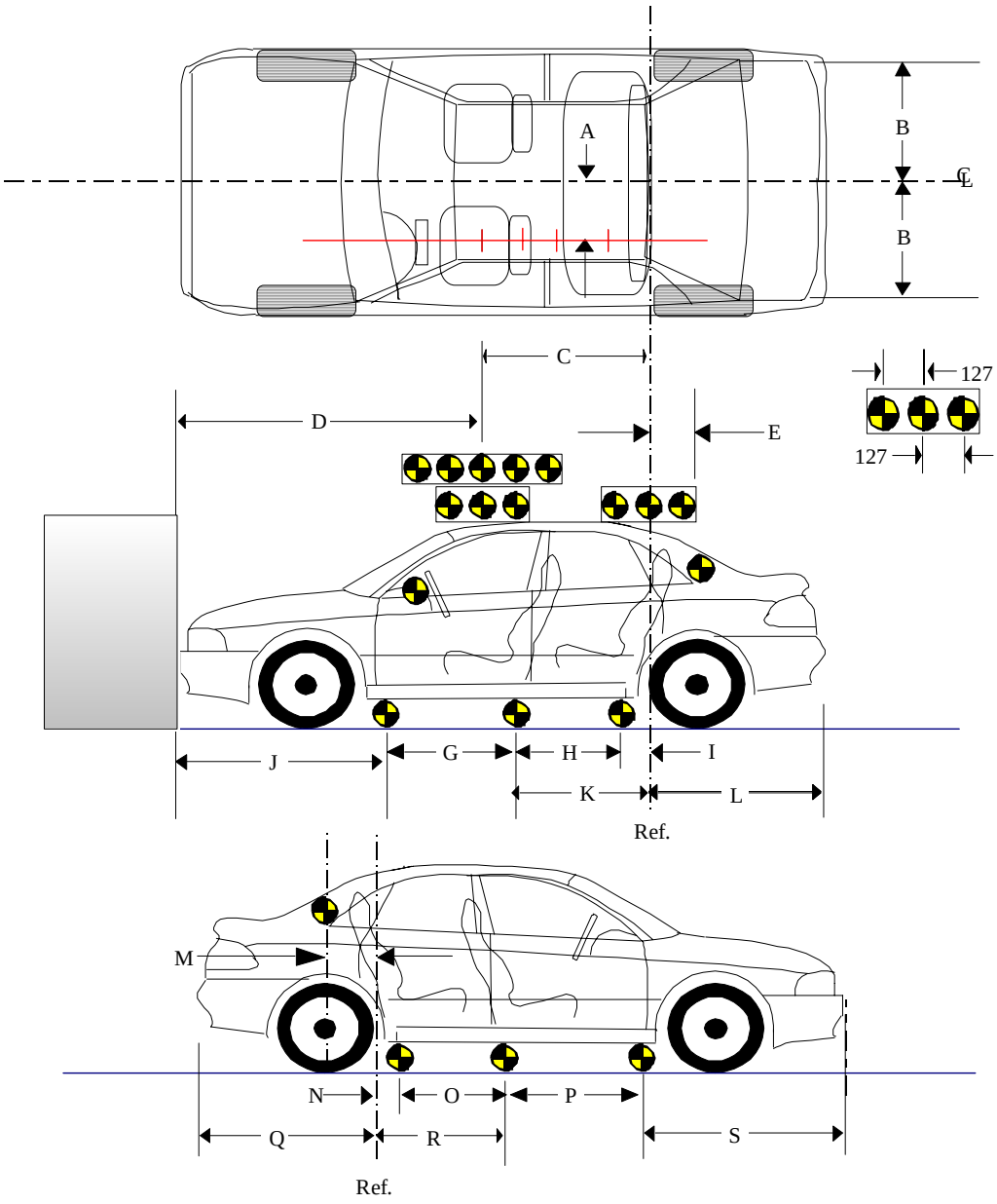
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan

(Dimensions in millimeters)

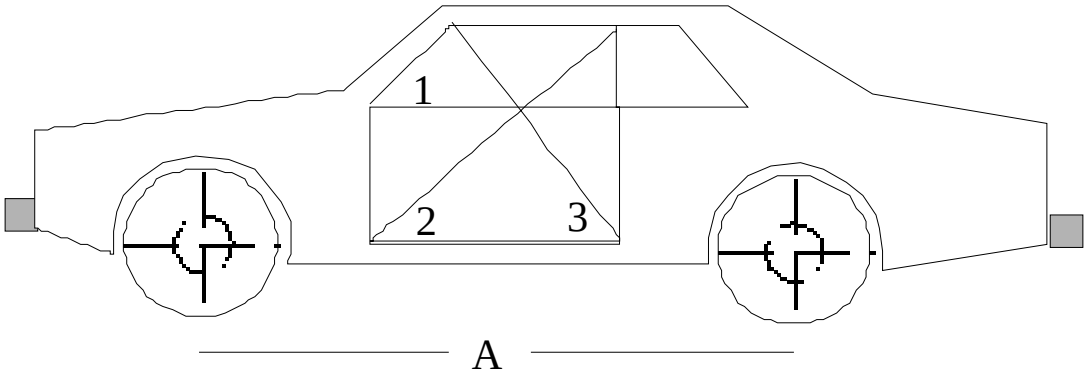
A	378
B	617
C	1220
D	2196
E	306
F	1607
G	926
H	954
I	92
J	1420
K	1046
L	1503
M	304
N	98
O	944
P	940
Q	1497
R	1042
S	1415



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



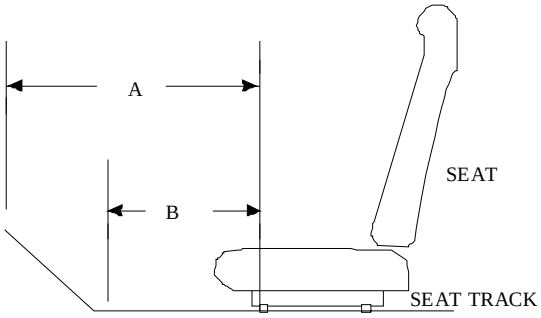
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	983	1480	966	982	1477	963
AFTER TEST	980	1481	967	981	1476	965
DIFFERENCE	3	-1	-1	1	1	-2

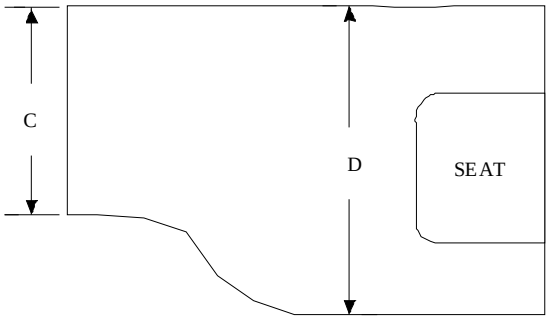
UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2780	2780
AFTER TEST	2706	2703
DIFFERENCE	74	77

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan

STATIC FOOTWELL DEFORMATION





DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	713	661	52
B	531	516	15
C	510	509	1
D	511	520	-9

PASSENGER

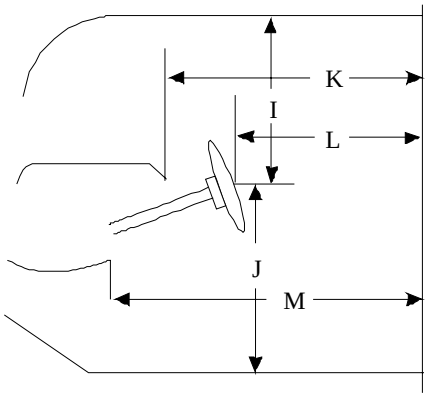
Measurement	Pre-Test	Post-Test	Difference
A	717	698	19
B	536	531	5
C	465	463	2
D	511	509	2

Units = mm

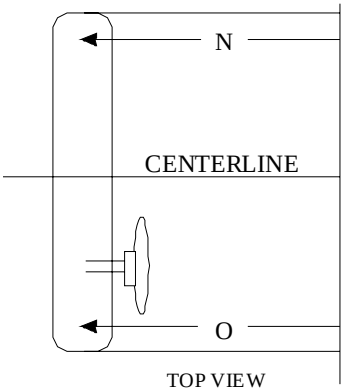
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan

STATIC PASSENGER COMPARTMENT INTRUSION

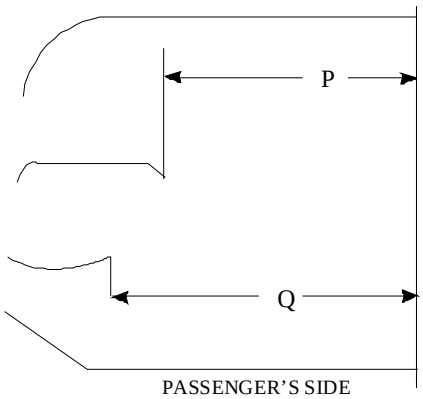


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



PASSENGER'S SIDE

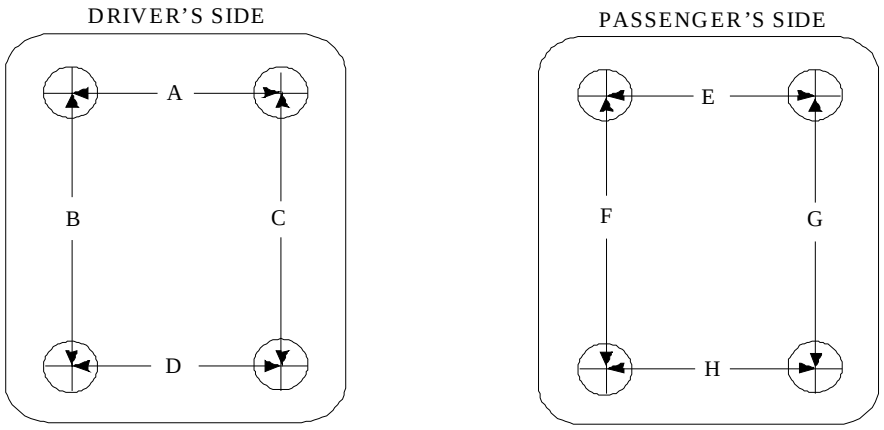
Measurement	Pre-Test	Post-Test	Difference
I	421	428	-7
J	644	643	1
K	278	260	18
L	43	39	4
M	332	321	11
N	259	250	9
O	257	251	6
P = K (PASS.)	304	292	12
Q = M (PASS.)	377	349	28

Units = mm

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

NHTSA Test No.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan

FLOORBOARD DEFORMATION



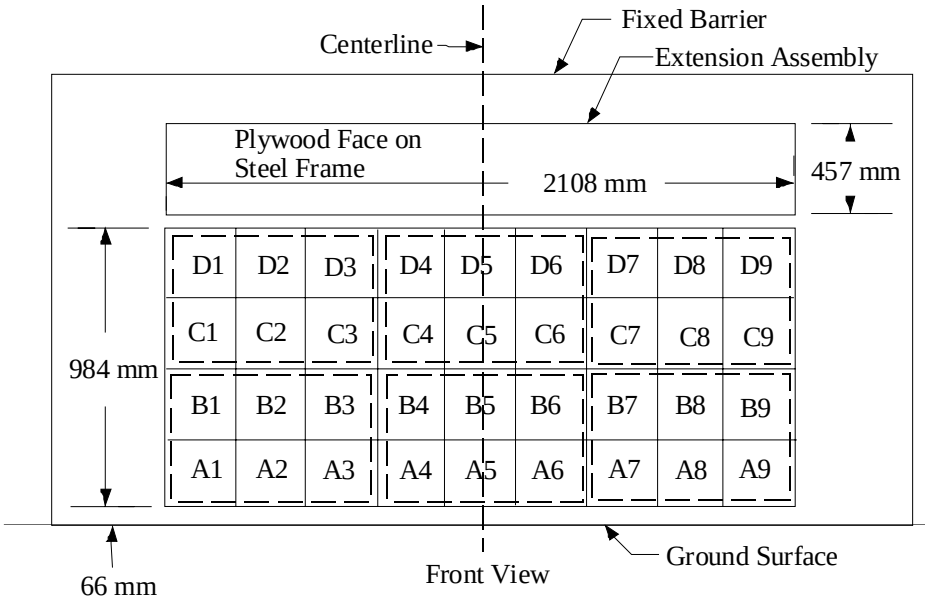
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	510	509	1
B	497	494	3
C	505	498	7
D	511	520	-9
E	465	463	2
F	506	506	0
G	504	508	-4
H	511	509	2

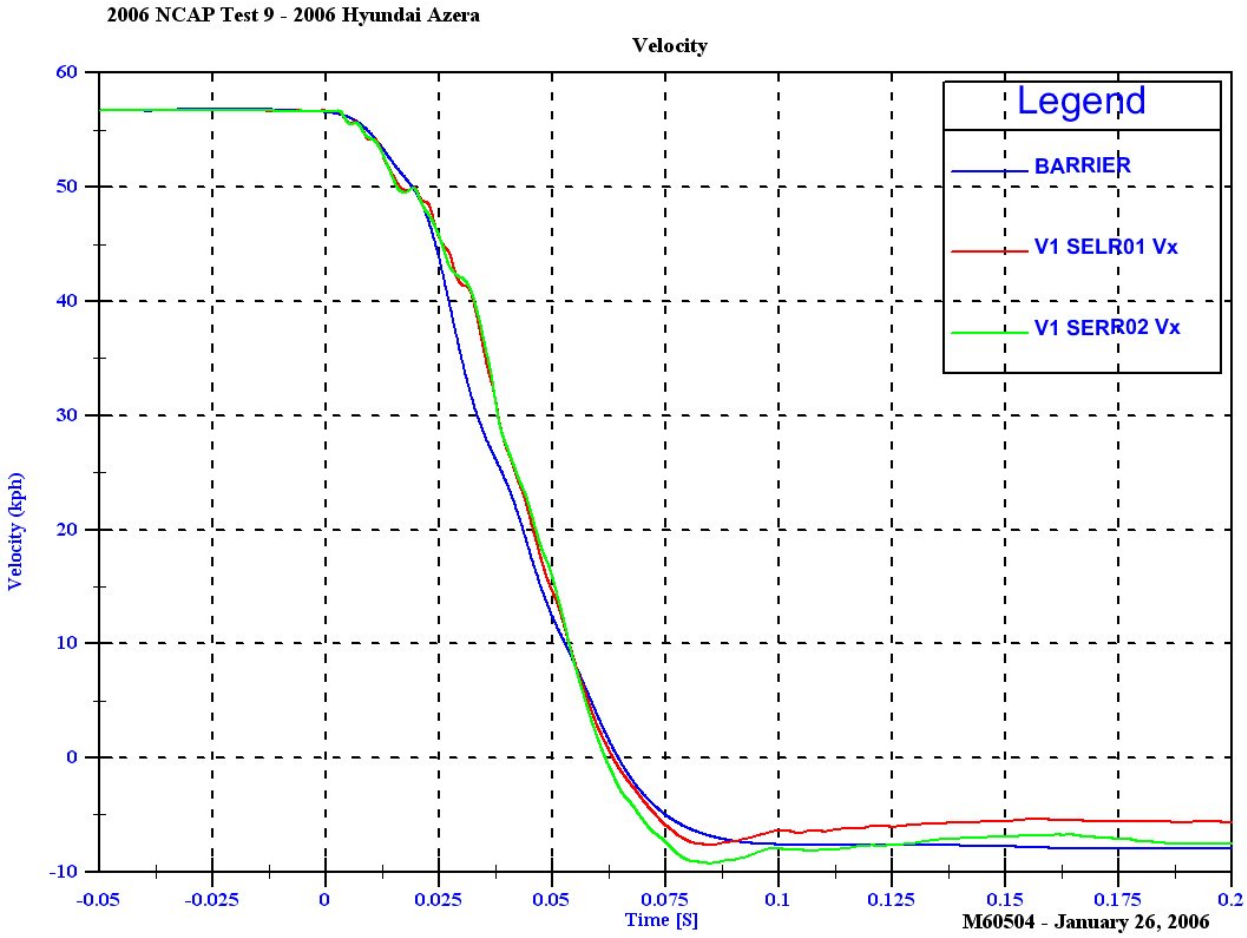
Units = mm

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: Hyundai Azera 4-Door Sedan

NHTSA Test No.: M60504 VIN: KMHFC46FX6A039195

Model Year: 2006 Build Date: OCT/11/05 Test Date: January 26, 2006

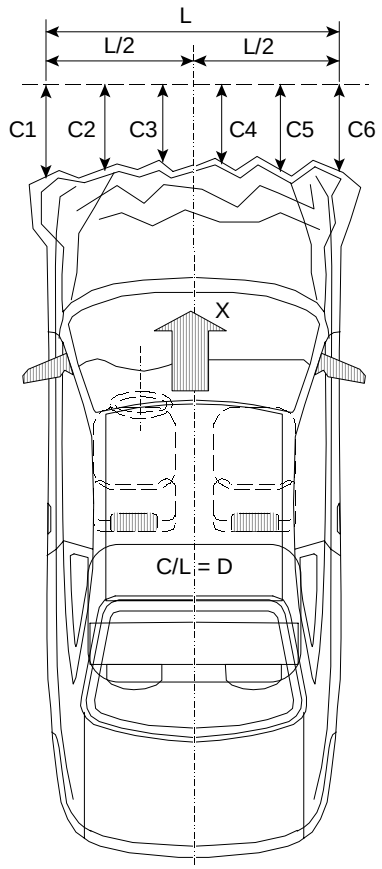
Vehicle Size Category: Passenger Car Test Weight: 1939.0 kg

Vehicle Wheelbase: 2780 mm; Front Overhang: 964 mm; Overall Width: 1850 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4685	4402	283
C2 =	4824	4401	423
C3 =	4884	4406	478
C4 =	4885	4432	453
C5 =	4825	4409	416
C6 =	4686	4383	303



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

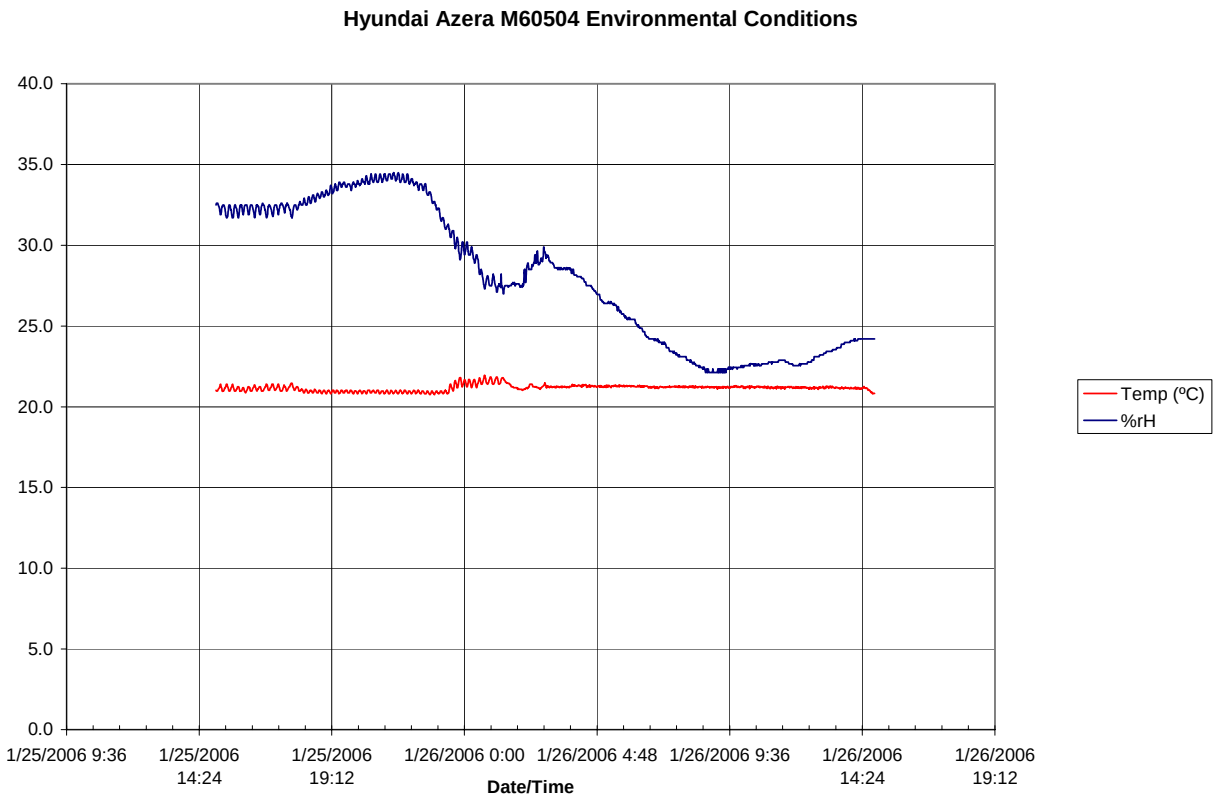
Length of Damaged Region: L1= 1585 mm

L2= 792.5 mm

L5= 317 mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M60504 Vehicle: 2006 Hyundai Azera 4-Door Sedan



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

Figure A-1: Load Cell Locations

Figure A-2: Vehicle Certification Placard

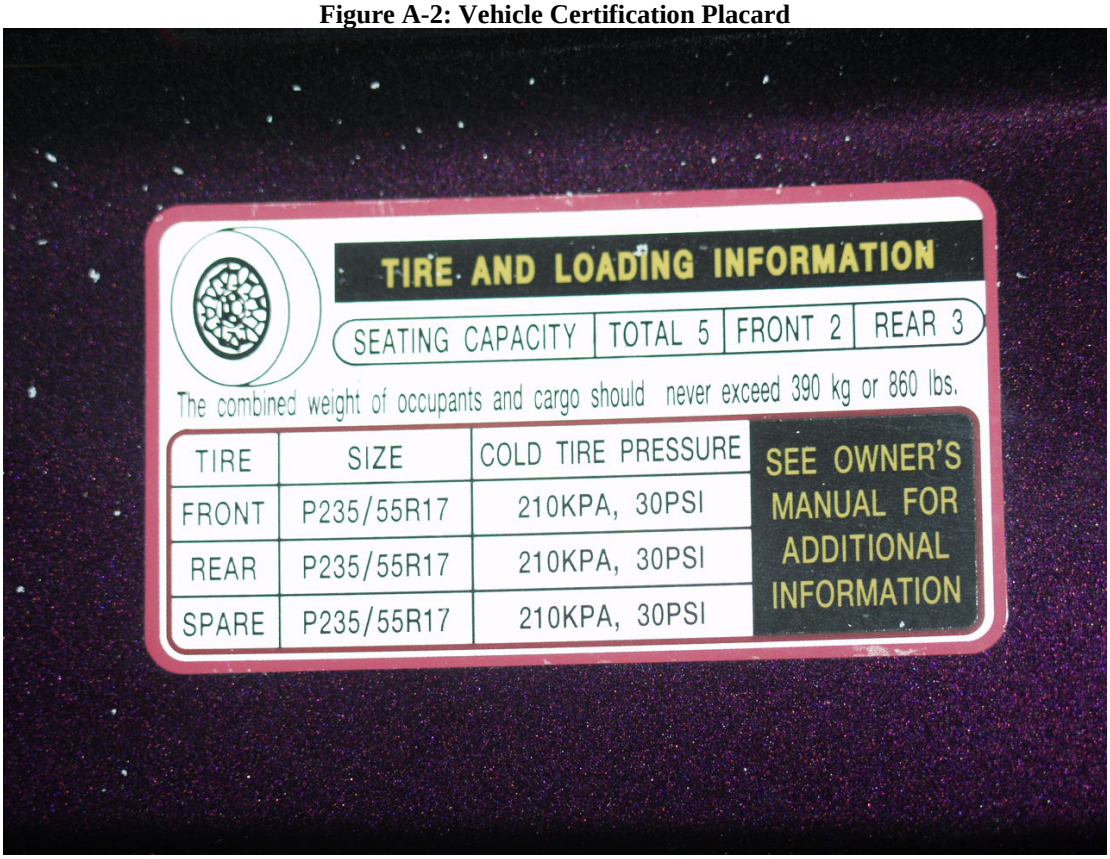


Figure A-3: Vehicle Tire Placard

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

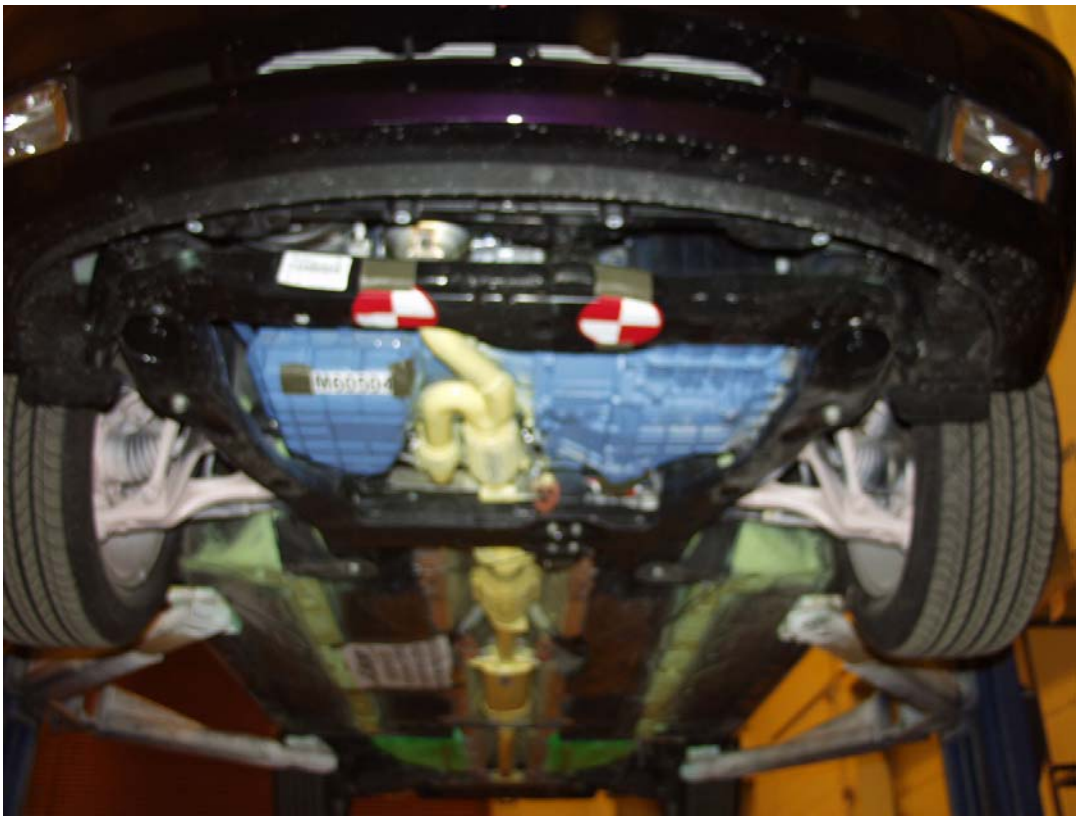


Figure A-24: Pre-Test Front Underbody View

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

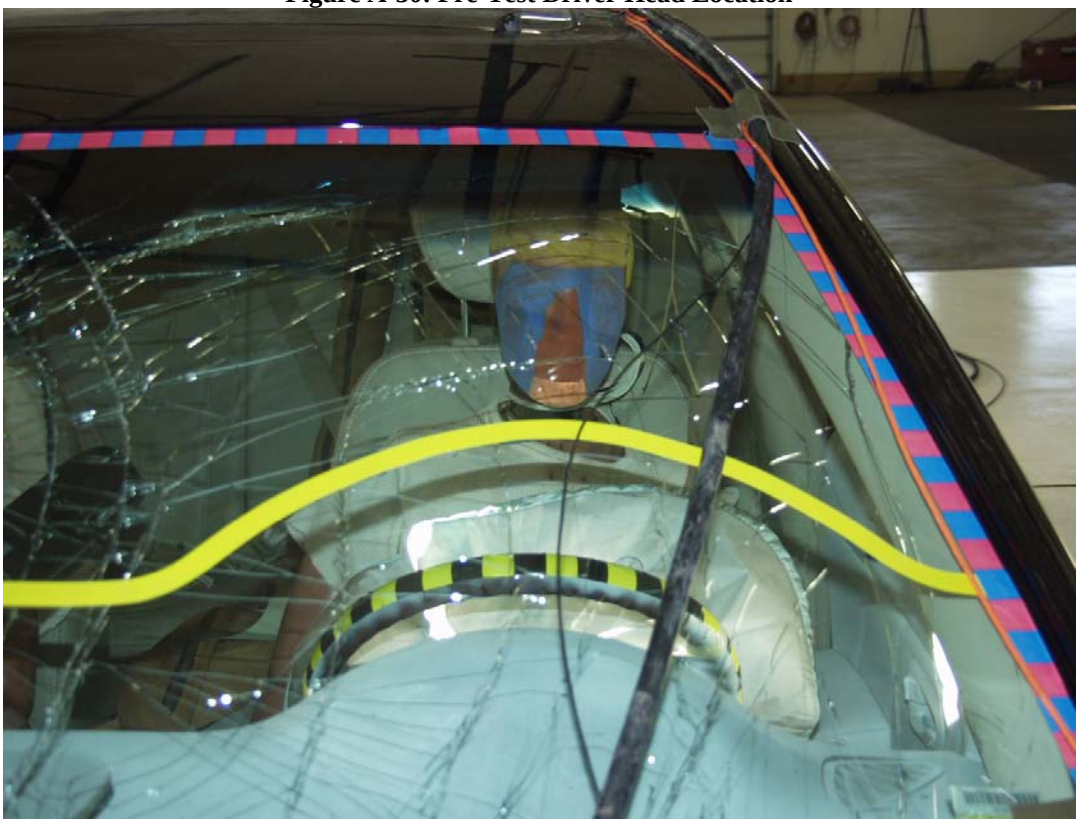


Figure A-31: Post-Test Driver Head Location

Figure A-32: Pre-Test Driver Position View

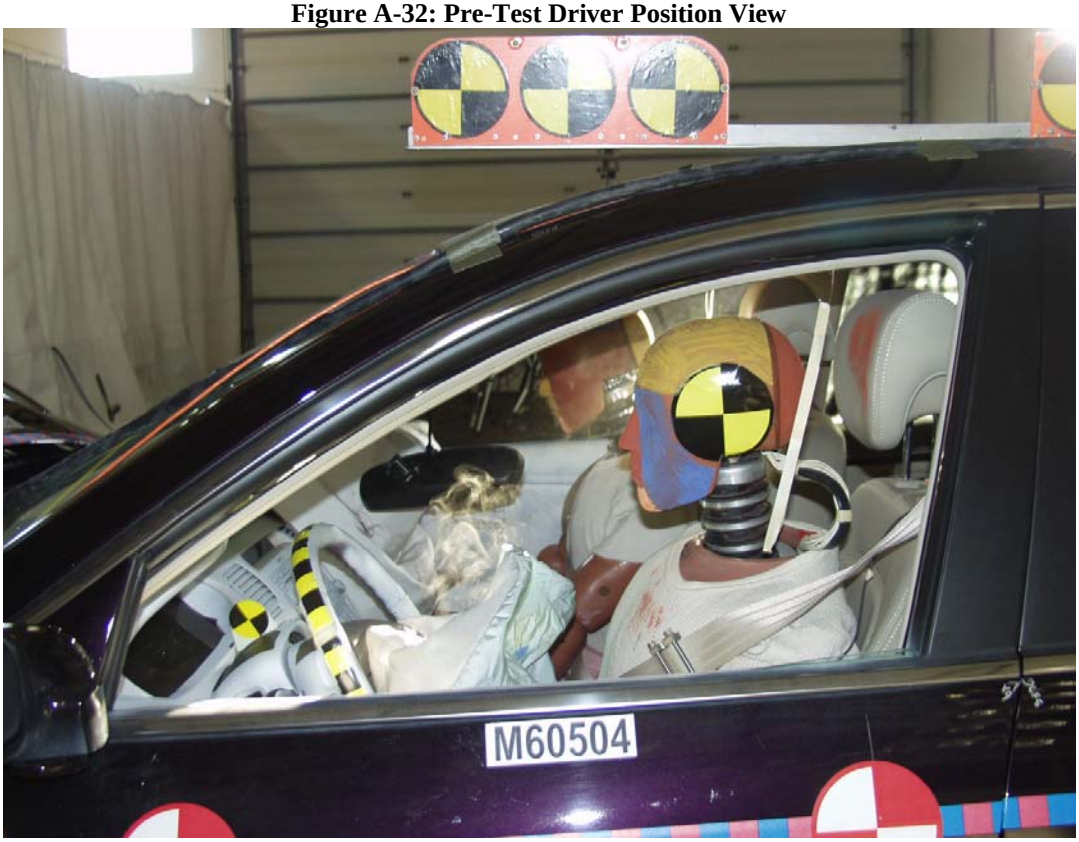


Figure A-33: Post-Test Driver Position View

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

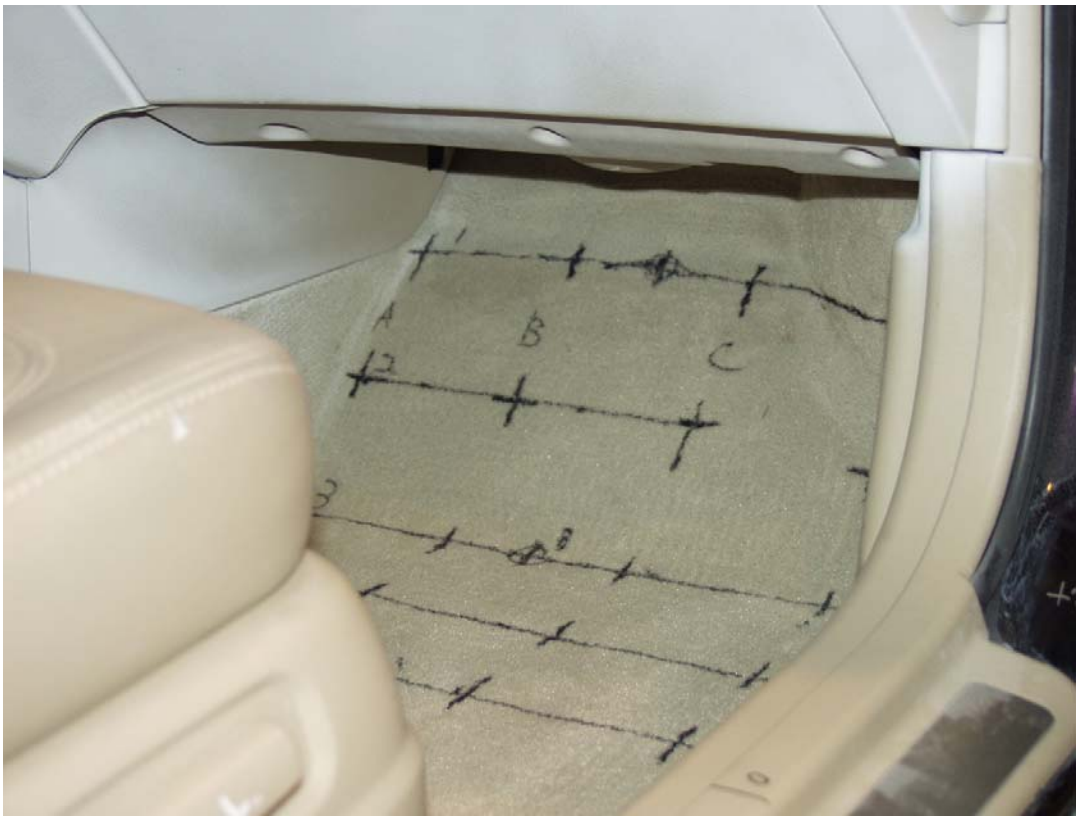


Figure A-54: Pre-Test Passenger Floor Pan View

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. M60504

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 9 Array X Arm Ay	
V1P1 Head 9 Array X Arm Az	
V1P1 Head 9 Array Y Arm Ax	
V1P1 Head 9 Array Y Arm Az	
V1P1 Head 9 Array Z Arm Ax	
V1P1 Head 9 Array Z Arm Ay	
V1P1 Head CG Ax	
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 Dx	
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 Mx	
V1P1 Right Upper Tibia My	
V1P1 Right Lower Tibia Fz	
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 Az	
V1 Driver Lap Belt F	

V1 Driver Torso Belt F	
V1P2 Head 9 Array X Arm Ay	
V1P2 Head 9 Array X Arm Az	
V1P2 Head 9 Array Y Arm Ax	
V1P2 Head 9 Array Y Arm Az	
V1P2 Head 9 Array Z Arm Ax	
V1P2 Head 9 Array Z Arm Ay	
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 Dx	
V1P2 Pelvic Ax	
V1P2 Pelvic Ay	
V1P2 Pelvic Az	
V1P2 Left Femur Fz	
V1P2 Right Femur Fz	
V1P2 Left Upper Tibia Mx	
V1P2 Left Upper Tibia My	
V1P2 Left Lower Tibia Fz	
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	
V1 RFP Lap Belt F	
V1 RFP Torso Belt F	

V1 Left Rear #1 Ax	Barrier Load Cell C7 Fx
V1 Right Rear #2 Ax	Barrier Load Cell C8 Fx
V1 Engine Top #3 Ax	Barrier Load Cell C9 Fx
V1 Engine Bottom #4 Ax	Barrier Load Cell D1 Fx
V1 Right Caliper #5 Ax	Barrier Load Cell D2 Fx
V1 Left Caliper #7 Ax	Barrier Load Cell D3 Fx
V1 Left Rear #8 Az	Barrier Load Cell D4 Fx
V1 Right Rear #9 Az	Barrier Load Cell D5 Fx
Barrier Load Cell A1 Fx	Barrier Load Cell D6 Fx
Barrier Load Cell A2 Fx	Barrier Load Cell D7 Fx
Barrier Load Cell A3 Fx	Barrier Load Cell D8 Fx
Barrier Load Cell A4 Fx	Barrier Load Cell D9 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	

TEST NOTES	
Data Channel	Anomalies
V1P1 Left Upper Tibia My	Channel clipped 24-69 ms
V1 Engine Top #3x	Transducer Failed

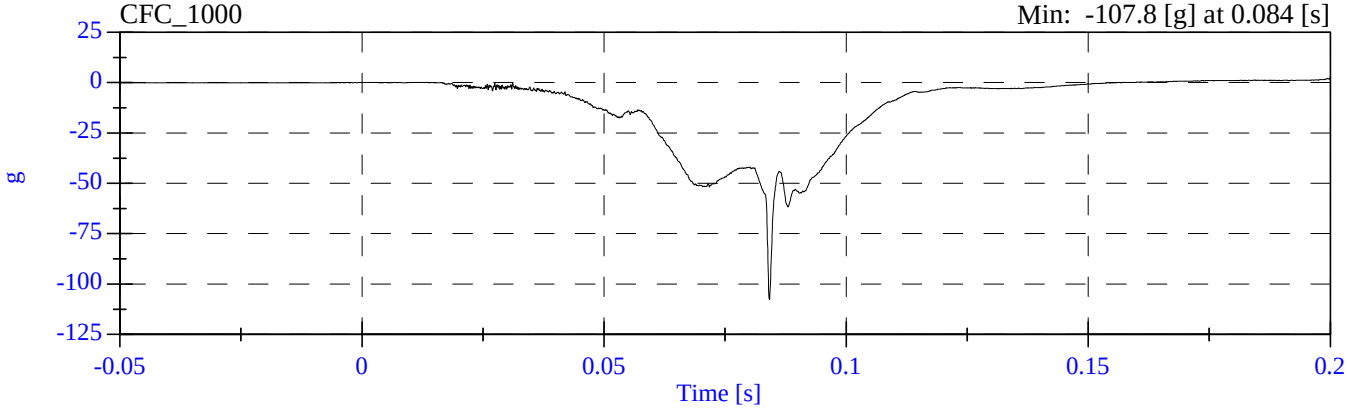
2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

V1P1 Head CG x

Max: 2.5 [g] at 0.200 [s]

CFC_1000

Min: -107.8 [g] at 0.084 [s]

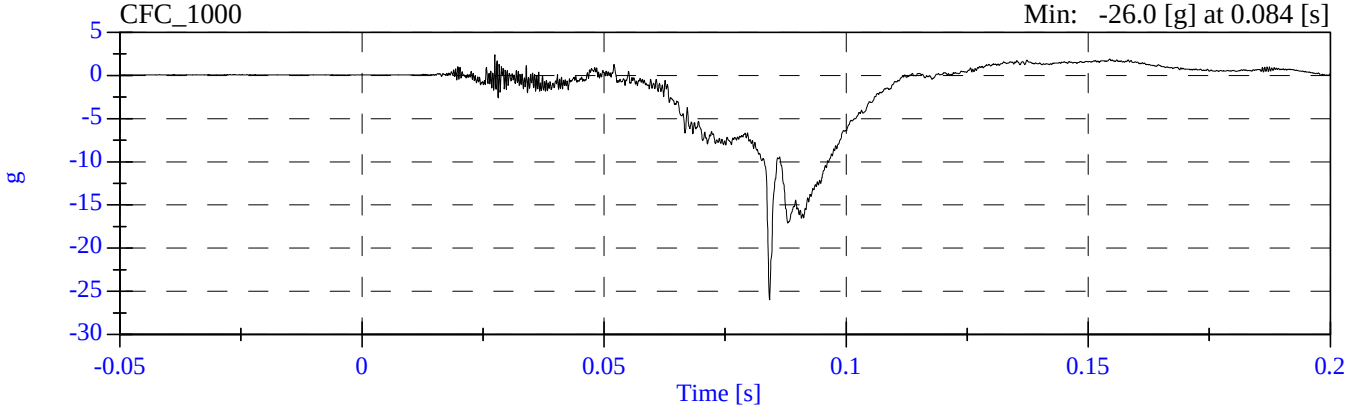


V1P1 Head CG y

Max: 2.4 [g] at 0.027 [s]

CFC_1000

Min: -26.0 [g] at 0.084 [s]

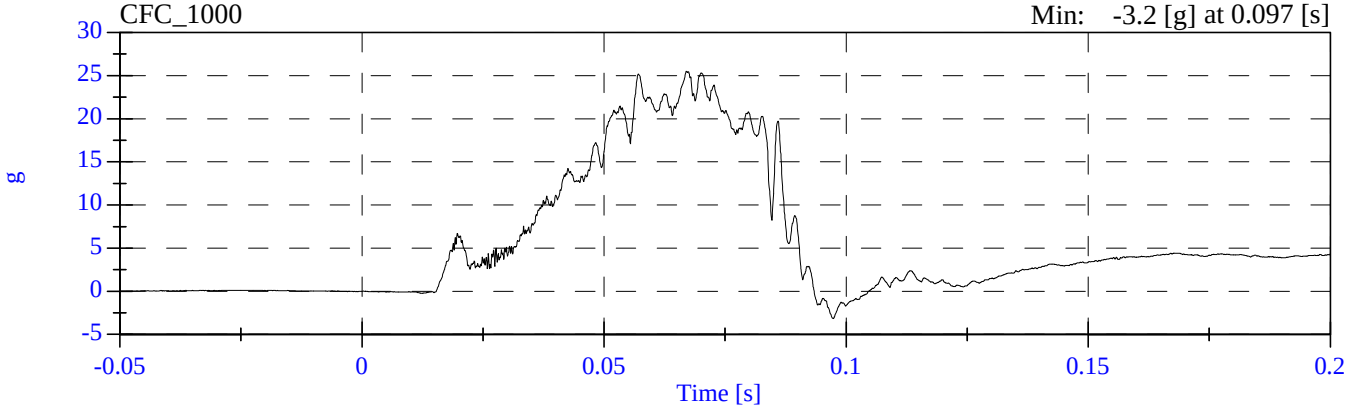


V1P1 Head CG z

Max: 25.5 [g] at 0.067 [s]

CFC_1000

Min: -3.2 [g] at 0.097 [s]

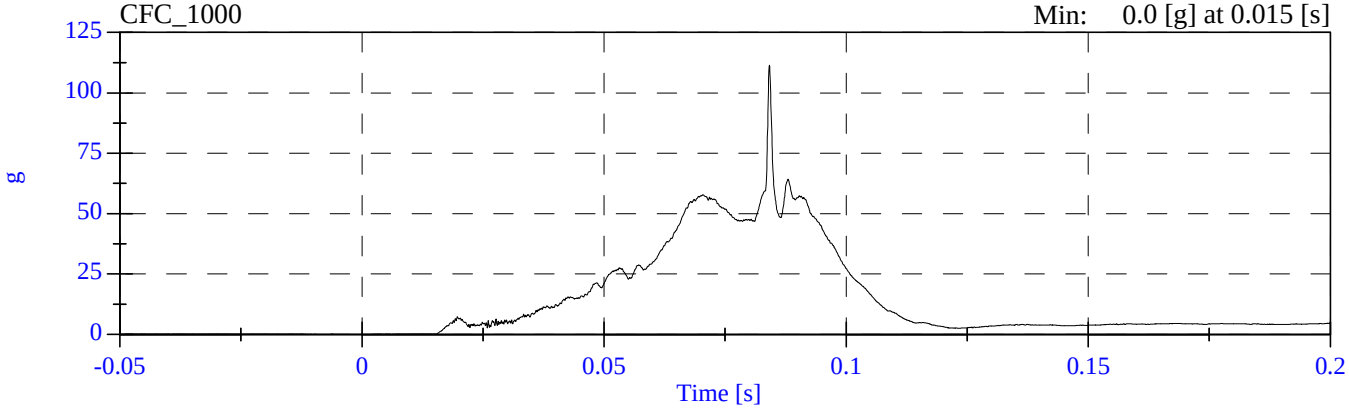


V1P1 Head CG Resultant

Max: 111.5 [g] at 0.084 [s]

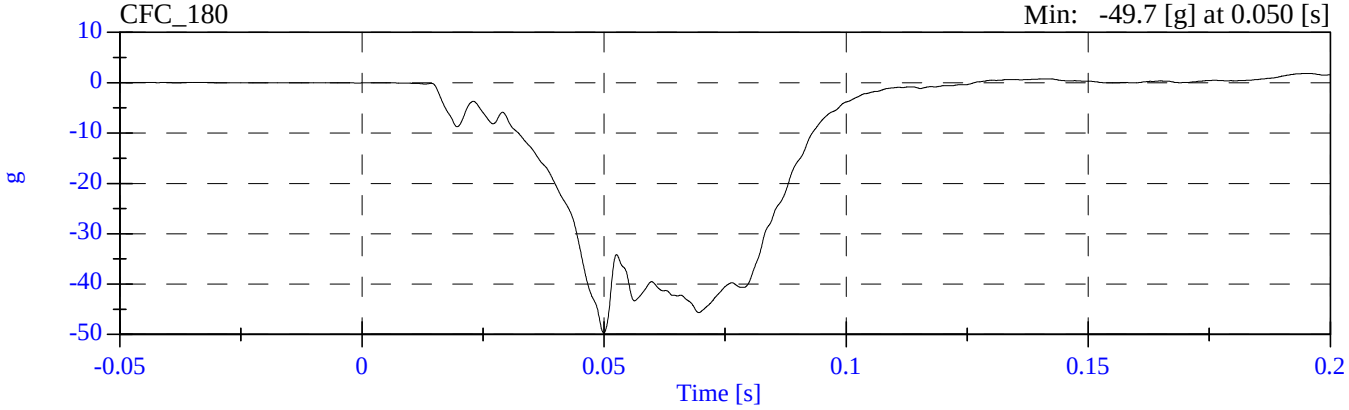
CFC_1000

Min: 0.0 [g] at 0.015 [s]

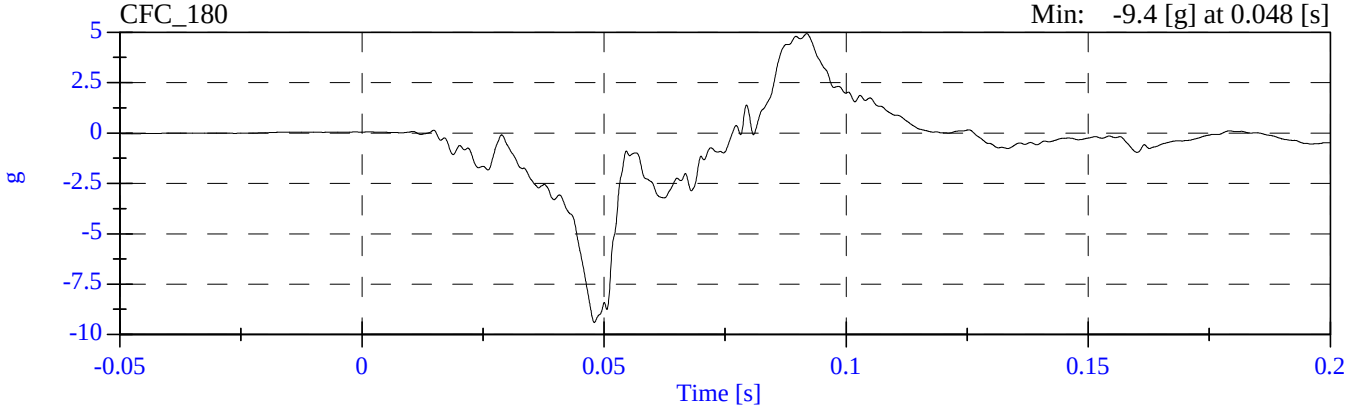


2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

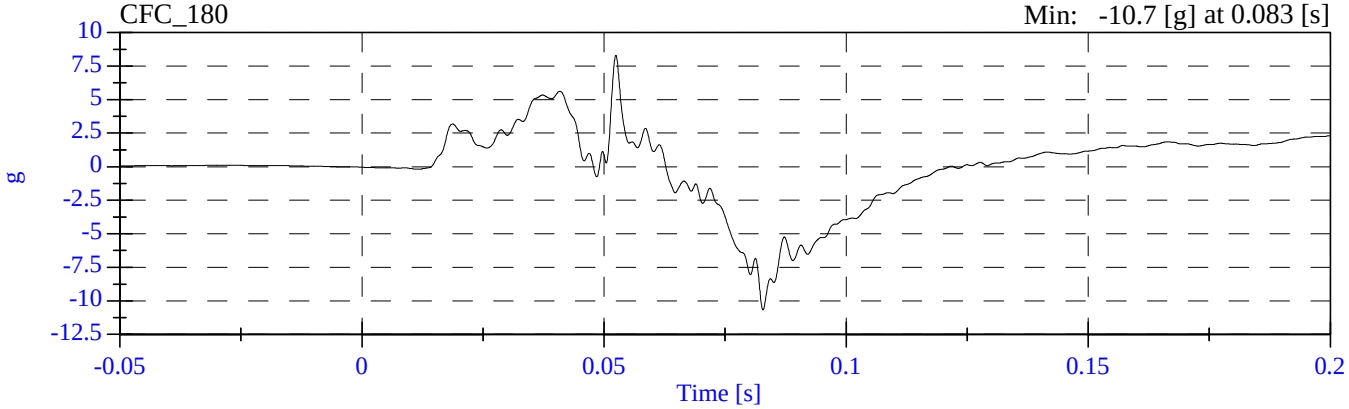
V1P1 Chest x
CFC_180
Max: 1.8 [g] at 0.196 [s]
Min: -49.7 [g] at 0.050 [s]



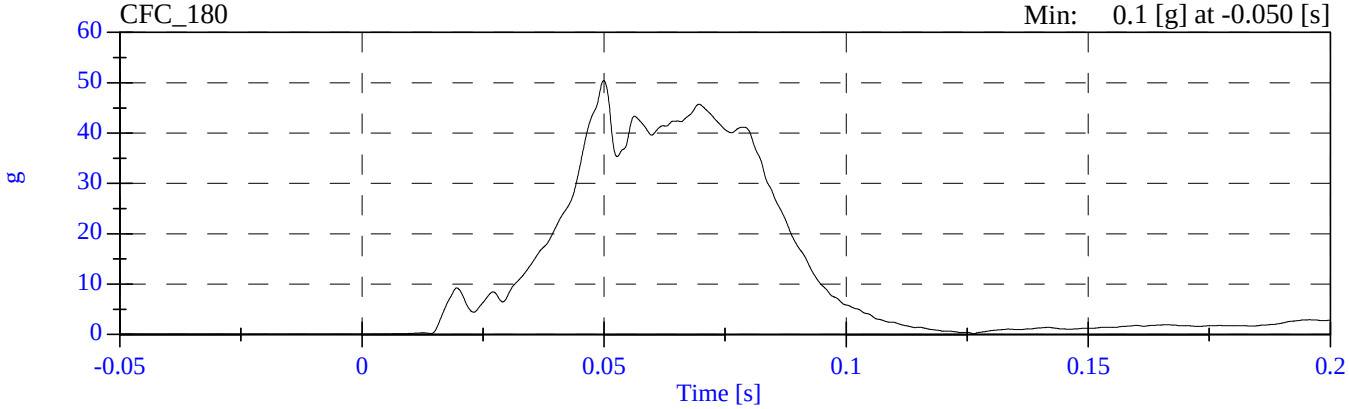
V1P1 Chest y
CFC_180
Max: 4.9 [g] at 0.092 [s]
Min: -9.4 [g] at 0.048 [s]



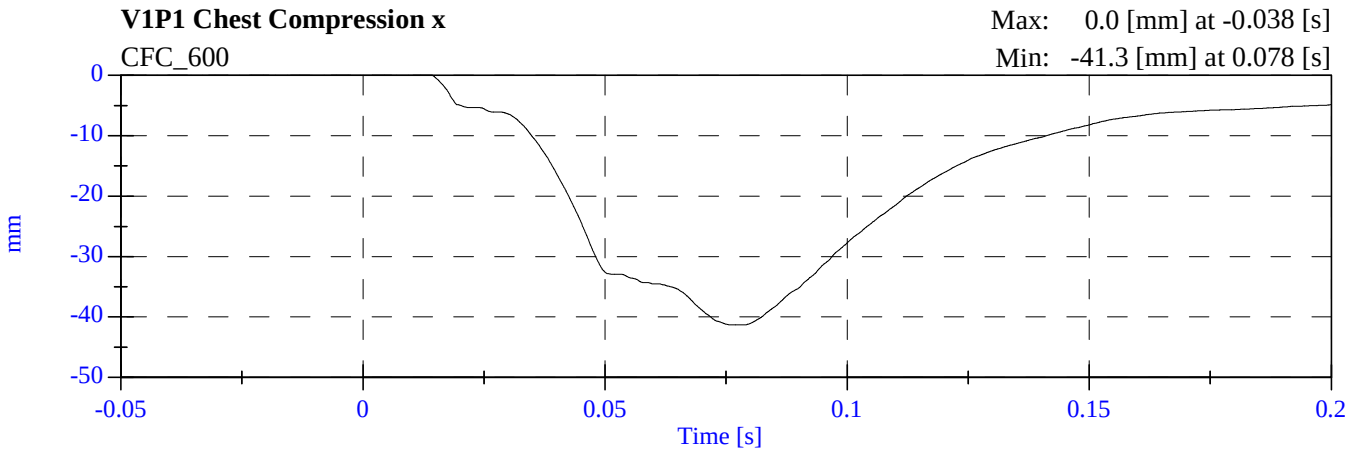
V1P1 Chest z
CFC_180
Max: 8.3 [g] at 0.052 [s]
Min: -10.7 [g] at 0.083 [s]



V1P1 Chest Resultant
CFC_180
Max: 50.4 [g] at 0.050 [s]
Min: 0.1 [g] at -0.050 [s]



2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006



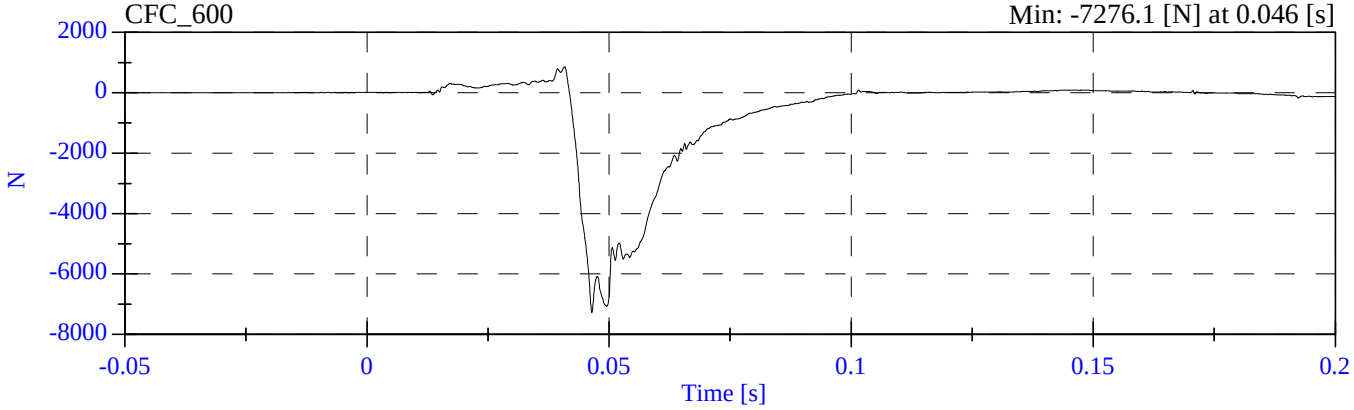
2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

V1P1 Left Femur z

CFC_600

Max: 857.7 [N] at 0.041 [s]

Min: -7276.1 [N] at 0.046 [s]

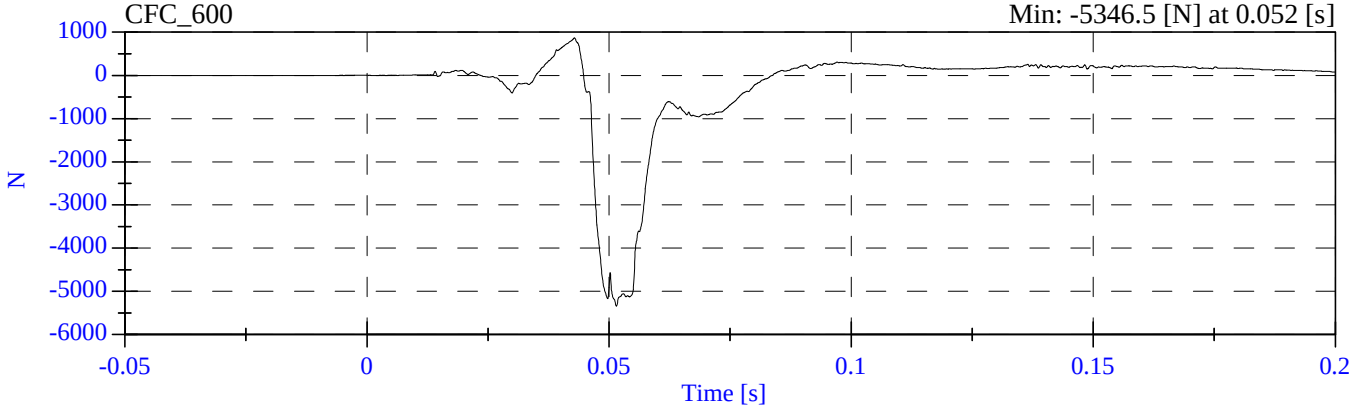


V1P1 Right Femur z

CFC_600

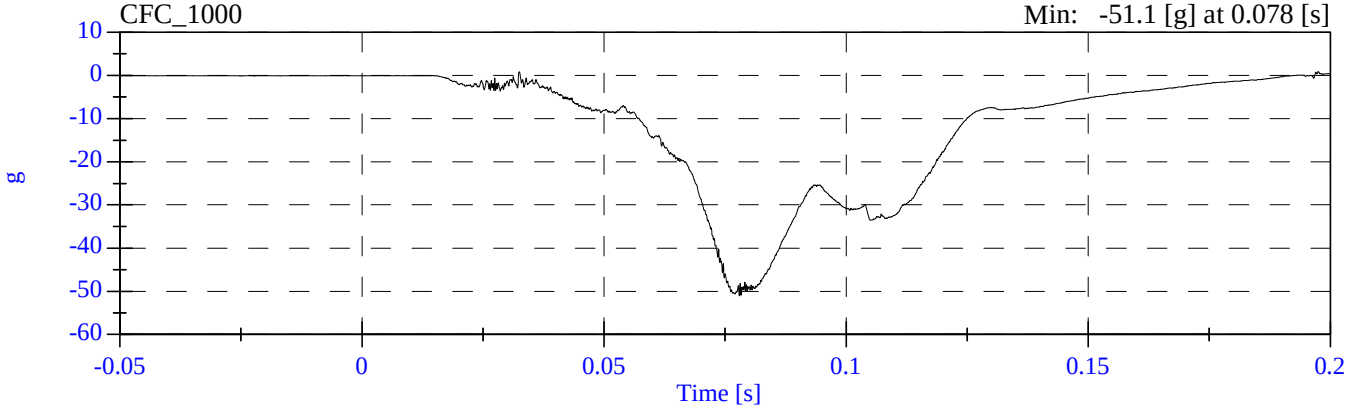
Max: 869.6 [N] at 0.043 [s]

Min: -5346.5 [N] at 0.052 [s]

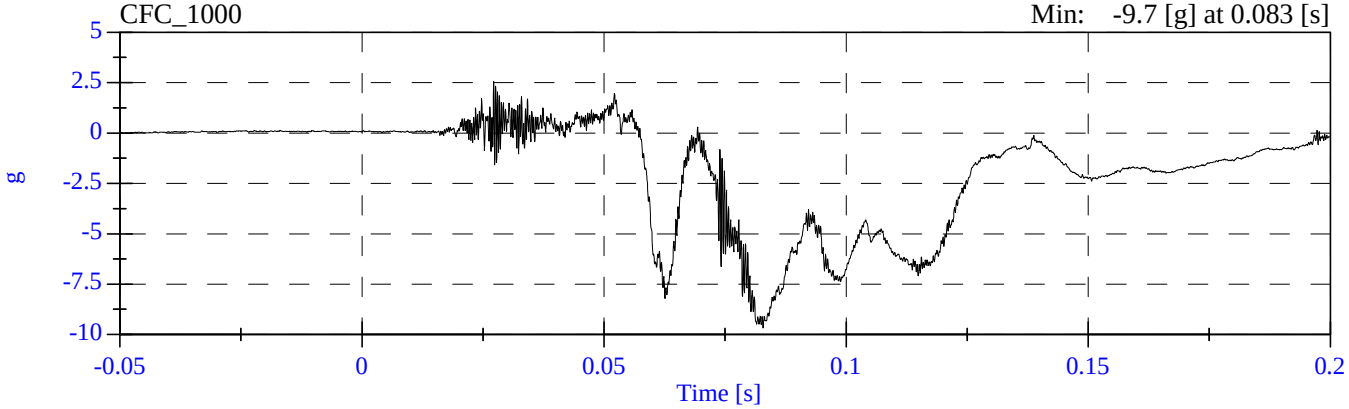


2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

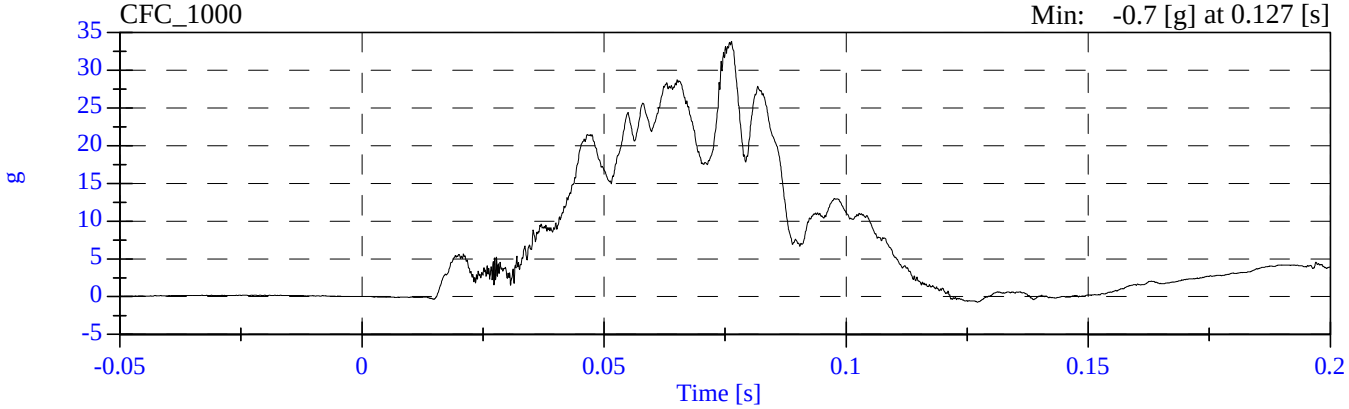
V1P2 Head CG x
CFC_1000
Max: 0.8 [g] at 0.197 [s]
Min: -51.1 [g] at 0.078 [s]



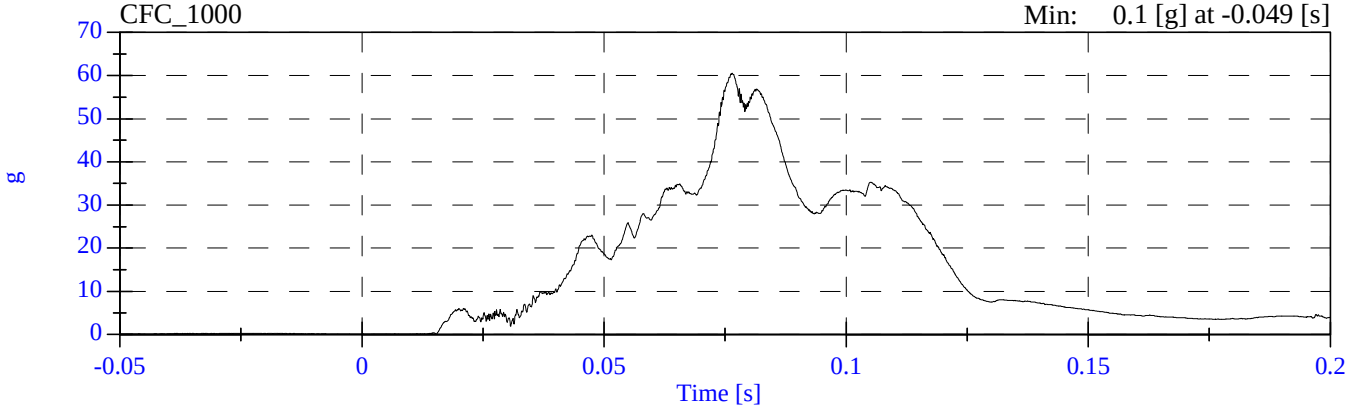
V1P2 Head CG y
CFC_1000
Max: 2.6 [g] at 0.027 [s]
Min: -9.7 [g] at 0.083 [s]



V1P2 Head CG z
CFC_1000
Max: 33.8 [g] at 0.076 [s]
Min: -0.7 [g] at 0.127 [s]

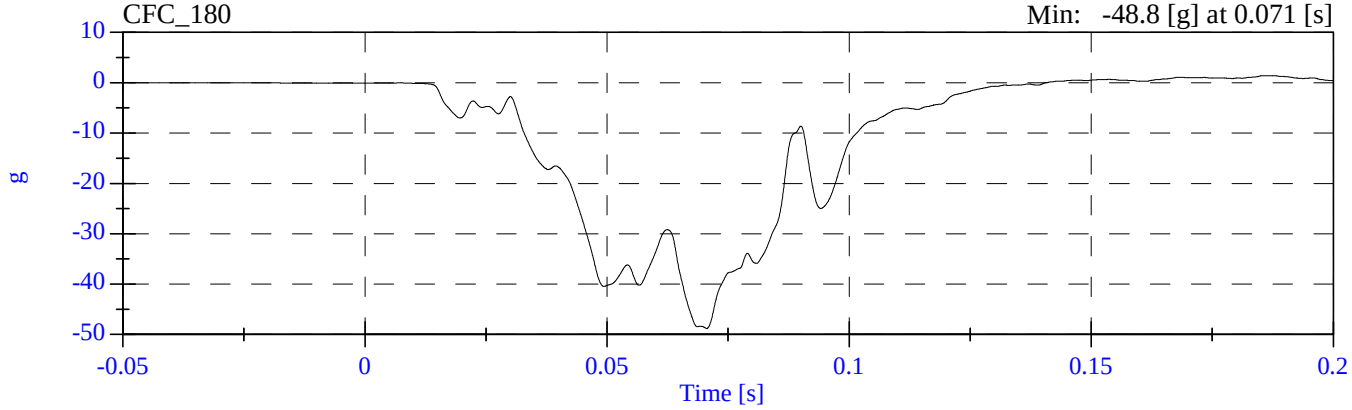


V1P2 Head CG Resultant
CFC_1000
Max: 60.5 [g] at 0.076 [s]
Min: 0.1 [g] at -0.049 [s]

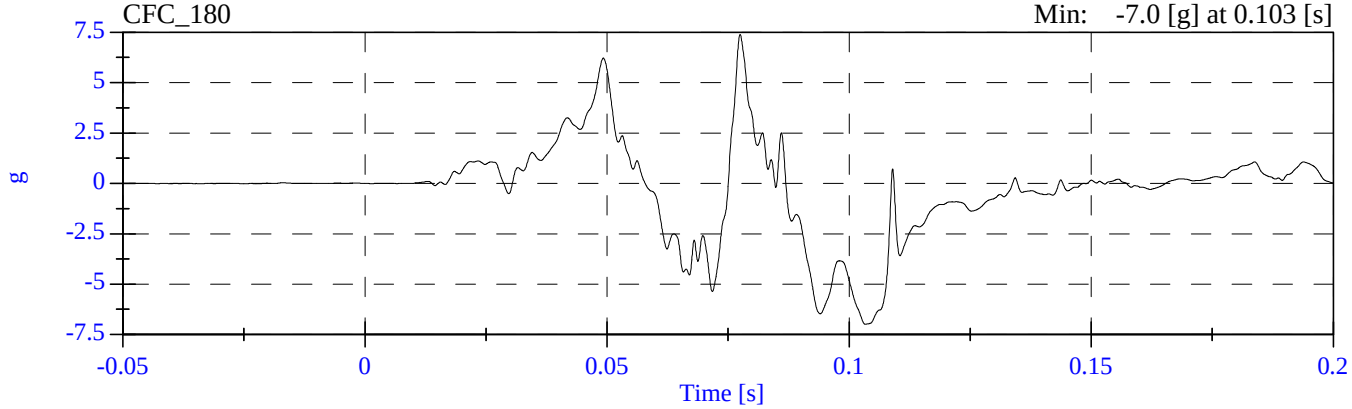


2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

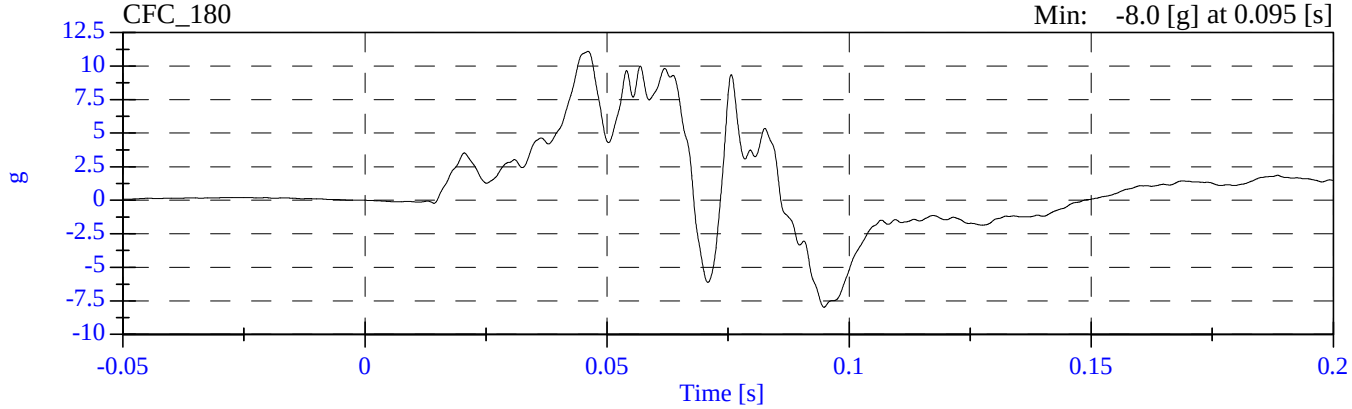
V1P2 Chest x
CFC_180
Max: 1.4 [g] at 0.188 [s]
Min: -48.8 [g] at 0.071 [s]



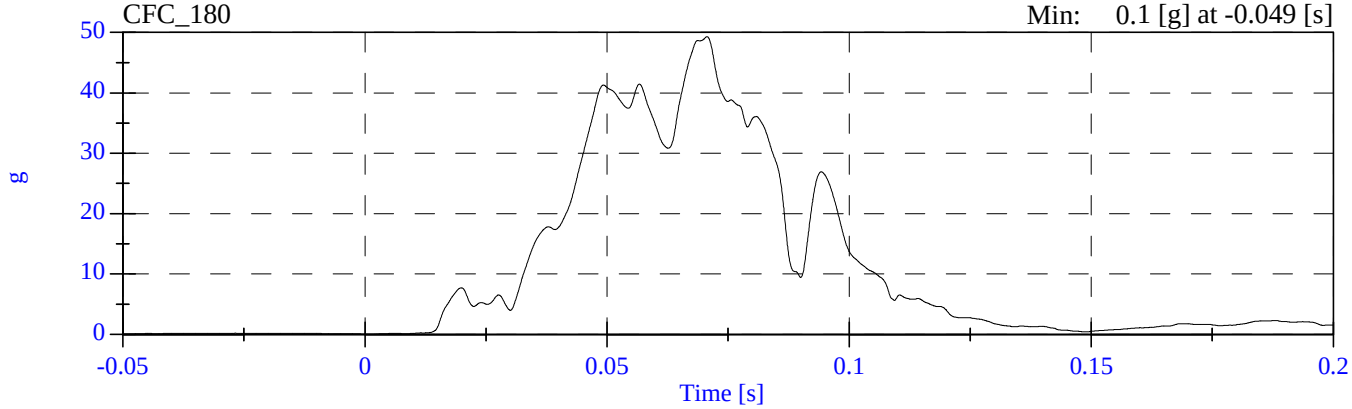
V1P2 Chest y
CFC_180
Max: 7.4 [g] at 0.077 [s]
Min: -7.0 [g] at 0.103 [s]



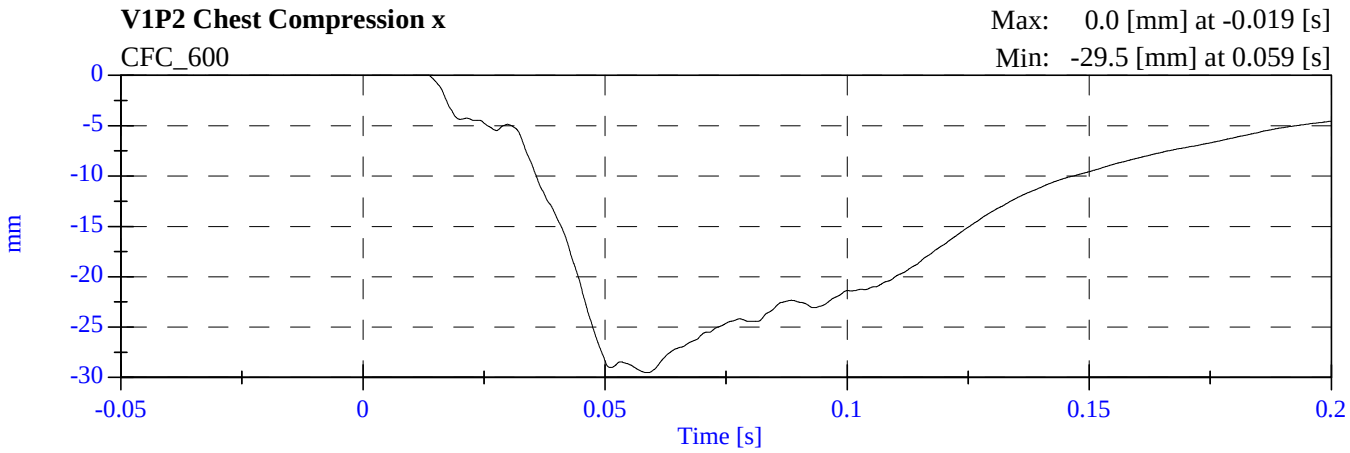
V1P2 Chest z
CFC_180
Max: 11.1 [g] at 0.046 [s]
Min: -8.0 [g] at 0.095 [s]



V1P2 Chest Resultant
CFC_180
Max: 49.3 [g] at 0.071 [s]
Min: 0.1 [g] at -0.049 [s]

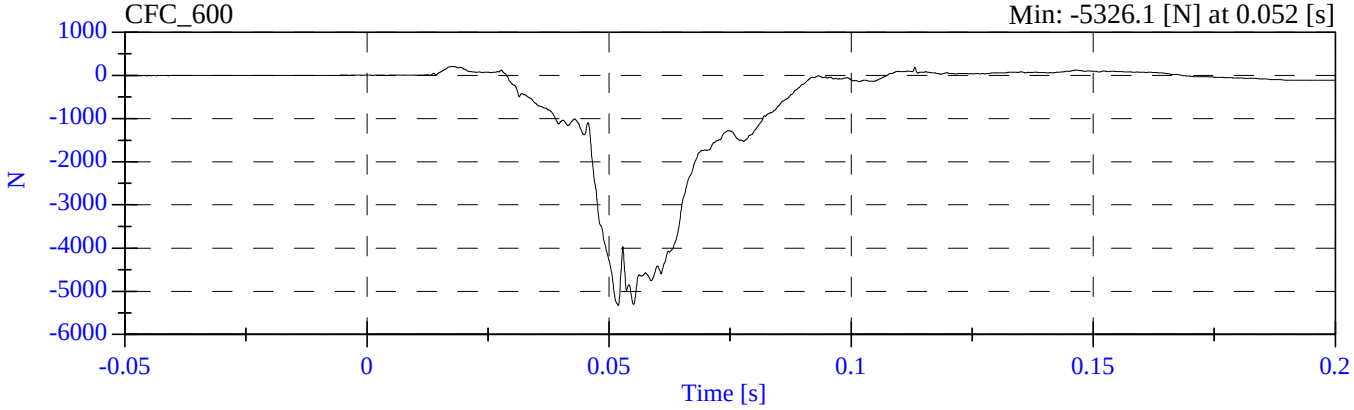


2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

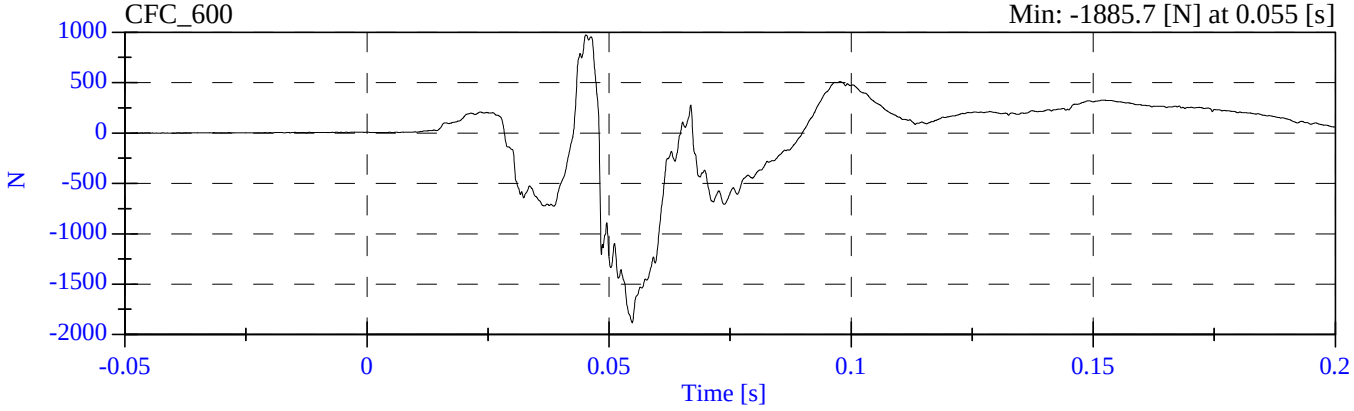


2006 NCAP Test 9 - 2006 Hyundai Azera
M60504 - January 26, 2006

V1P2 Left Femur z
CFC_600
Max: 209.2 [N] at 0.018 [s]
Min: -5326.1 [N] at 0.052 [s]



V1P2 Right Femur z
CFC_600
Max: 972.2 [N] at 0.045 [s]
Min: -1885.7 [N] at 0.055 [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.

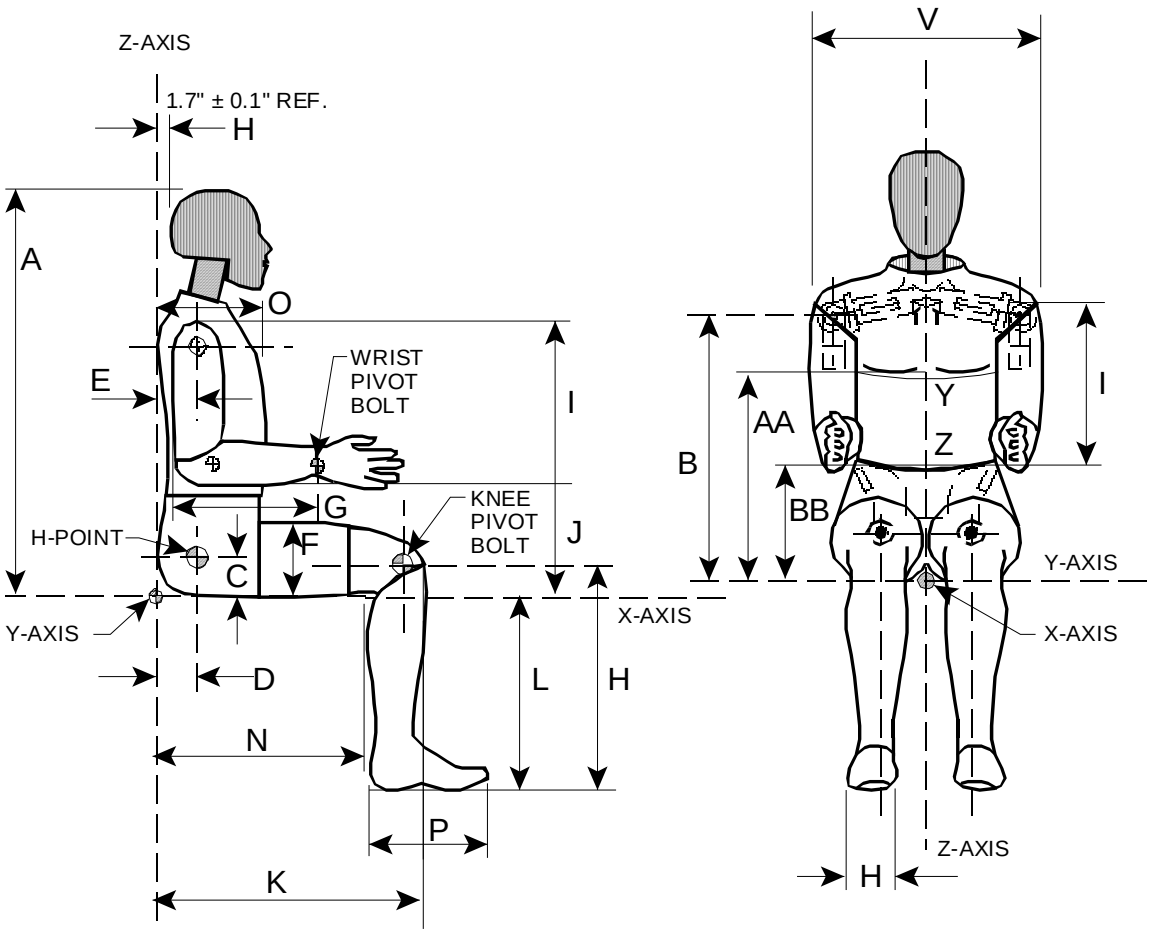
Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	061	10/25/2005
#2/Right Front Passenger	064	10/25/2005

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	061
Sequential Test Number	3
Date	October 18, 2005
Workfile	061h2 10-18-05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	33.00
Peak Resultant Acceleration	225-275 G's	233.56
Peak Lateral Acceleration	15 G's Max	5.59
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	3	
Date	October 19, 2005	6 Axis Neck Transducer
Workfile	061nfl 10-19-05	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	35.00
Impact Velocity		6.89 – 7.13 m/s	6.94
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.87
	20 ms	17.60 - 22.60 G's	22.26
	30 ms	12.50 - 18.50 G's	17.73
Max Pendulum G's Above 30 ms		29 G's Max	17.73
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.30
D Plane Rotation	Max	64 - 78 Deg	66.76
	Time	57 - 64 ms	59.40
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	102.73
	Time	47 - 58 ms	52.40
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.40
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	99.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	3	
Date	October 19, 2005	6 Axis Neck Transducer
Workfile	061ne1 10-19-05	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	35.00
Impact Velocity		5.94 – 6.19 m/s	6.03
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.33
	20 ms	14.00 - 19.00 G's	18.69
	30 ms	11.00 - 16.00 G's	15.65
Max Pendulum G's Above 30 ms		22 G's Max	15.65
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	39.80
D Plane Rotation	Max	81 - 106 Deg	94.48
	Time	72 - 82 ms	73.60
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-79.22
	Time	65 - 79 ms	69.30
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	149.90
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	132.40

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	061
Sequential Test Number	3
Date	October 20, 2005
Workfile	061T 10-20-05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.11
Relative Humidity	10% - 70%	35.00
Pendulum Velocity	6.58 – 6.83 m/s	6.78
Maximum Deflection	63.50 – 72.64 mm	63.75
Maximum Resistive Force	5159.9 – 5893.9 N	5523.45
Internal Hysteresis	69 - 85 %	76.38

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	061
Sequential Test Number	3
Date	October 25, 2005
Workfile	061LF 10-25-05/ 061RF 10-25-05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	37.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5196.6
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	37.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4902.5

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 3
Date October 25, 2005

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.00
Relative Humidity			37.00
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	20.1
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	3.5
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	13.4
Elbow Rest Height	J	7.5 - 8.3 in	7.8
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Chest Depth	O	8.4 - 9.0 in	8.4
Foot Length	P	9.9 - 10.5 in	10.1
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Foot Breadth	W	3.6 - 4.2 in	3.8
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.6

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number	064
Sequential Test Number	3
Date	October 19, 2005
Workfile	064h 10-19-2005

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	35.00
Peak Resultant Acceleration	225-275 G's	257.17
Peak Lateral Acceleration	15 G's Max	13.59
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	3	
Date	October 19, 2005	6 Axis Neck Transducer
Workfile	064nf 10-19-05	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	35.00
Impact Velocity		6.89 – 7.13 m/s	6.94
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.70
	20 ms	17.60 - 22.60 G's	22.14
	30 ms	12.50 - 18.50 G's	16.29
Max Pendulum G's Above 30 ms		29 G's Max	16.29
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.10
D Plane Rotation	Max	64 - 78 Deg	66.71
	Time	57 - 64 ms	57.20
Moment About Occipital	Max	88.13 – 108.47 N-m	102.43
Condyle	Time	47 - 58 ms	50.50
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	114.80
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.80

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	3	
Date	October 19, 2005	6 Axis Neck Transducer
Workfile	064ne1 10-19-05	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	35.00
Impact Velocity		5.94 – 6.19 m/s	6.03
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	20.27
	20 ms	14.00 - 19.00 G's	18.95
	30 ms	11.00 - 16.00 G's	14.61
Max Pendulum G's Above 30 ms		22 G's Max	15.49
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.36
D Plane Rotation	Max	81 - 106 Deg	99.15
	Time	72 - 82 ms	74.26
Moment About Occipital	Max	-79.99 - -52.88 N-m	-77.32
Condyle	Time	65 - 79 ms	69.86
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	153.86
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	137.96

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	064
Sequential Test Number	3
Date	October 21, 2005
Workfile	064T1 10-21-05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.11
Relative Humidity	10% - 70%	35.00
Pendulum Velocity	6.58 – 6.83 m/s	6.75
Maximum Deflection	63.50 – 72.64 mm	64.00
Maximum Resistive Force	5159.9 – 5893.9 N	5528.70
Internal Hysteresis	69 - 85 %	75.02

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	064
Sequential Test Number	3
Date	October 25, 2005
Workfile	064LF 10-25-05/064RF 10-25-05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	37.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5233.42
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	37.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5316.11

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 3
Date October 25, 2005

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.00
Relative Humidity			37.00
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	20.4
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	13.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Chest Depth	O	8.4 - 9.0 in	8.6
Foot Length	P	9.9 - 10.5 in	10.2
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Foot Breadth	W	3.6 - 4.2 in	3.8
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
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 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-P16832	04-Jan-06	05-Jul-06
	X Arm Z	ENDEVCO	AC-P16286	04-Jan-06	05-Jul-06
	Y Arm X	ENDEVCO	AC-P16591	04-Jan-06	05-Jul-06
	Y Arm Z	ENDEVCO	AC-P17141	04-Jan-06	05-Jul-06
	Z Arm X	ENDEVCO	AC-P17242	04-Jan-06	05-Jul-06
	Z Arm Y	ENDEVCO	AC-P35789	20-Dec-05	20-Jun-06
Head	X	ENDEVCO	AC-P39575	04-Jan-06	05-Jul-06
	Y	ENDEVCO	AC-P35758	04-Jan-06	05-Jul-06
	Z	ENDEVCO	AC-P39743	04-Jan-06	05-Jul-06
Head	X (R)	ENDEVCO	AC-P35803	04-Jan-06	05-Jul-06
	Y (R)	ENDEVCO	AC-P35804	04-Jan-06	05-Jul-06
	Z (R)	ENDEVCO	AC-P35818	04-Jan-06	05-Jul-06
Neck Load Cell	X	DENTON	LC-280FX	14-Jul-05	12-Jan-06
	Y	DENTON	LC-280FY	14-Jul-05	12-Jan-06
	Z	DENTON	LC-280FZ	14-Jul-05	12-Jan-06
Neck Moment	X	DENTON	LC-280MX	14-Jul-05	12-Jan-06
	Y	DENTON	LC-280MY	14-Jul-05	12-Jan-06
	Z	DENTON	LC-280MZ	14-Jul-05	12-Jan-06
Chest	X	ENDEVCO	AC-P23303	04-Jan-06	05-Jul-06
	Y	ENDEVCO	AC-P15526	04-Jan-06	05-Jul-06
	Z	ENDEVCO	AC-P19255	04-Jan-06	05-Jul-06
Chest	X (R)	ENDEVCO	AC-P16576	04-Jan-06	05-Jul-06
	Y (R)	ENDEVCO	AC-P15534	04-Jan-06	05-Jul-06
	Z (R)	ENDEVCO	AC-P19216	04-Jan-06	05-Jul-06
Chest Deflection	X	SERVO	DS-061	30-Jun-05	29-Dec-05
Pelvic	X	ENDEVCO	AC-P23993	04-Jan-06	05-Jul-06
	Y	ENDEVCO	AC-P23939	04-Jan-06	05-Jul-06
	Z	ENDEVCO	AC-P23999	04-Jan-06	05-Jul-06

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-558	09-Aug-05	07-Feb-06
Right Femur Load Cell	Fz	DENTON	LC-560	09-Aug-05	07-Feb-06
Left Upper Tibia	Mx	DENTON	LC-274MX	28-Jun-05	27-Dec-05
	My	DENTON	LC-274MY	28-Jun-05	27-Dec-05
Left Lower Tibia	Fz	DENTON	LC-185FZ	28-Jun-05	27-Dec-05
	Mx	DENTON	LC-185MX	28-Jun-05	27-Dec-05
	My	DENTON	LC-185MY	28-Jun-05	27-Dec-05
Right Upper Tibia	Mx	DENTON	LC-200MX	28-Jun-05	27-Dec-05
	My	DENTON	LC-200MY	28-Jun-05	27-Dec-05
Right Lower Tibia	Fz	DENTON	LC-128FZ	29-Jun-05	28-Dec-05
	Mx	DENTON	LC-128MX	29-Jun-05	28-Dec-05
	My	DENTON	LC-128MY	29-Jun-05	28-Dec-05
Left Foot Rear	X	ENDEVCO	AC-P16225	05-Aug-05	03-Feb-06
	Z	ENDEVCO	AC-P15638	04-Jan-06	05-Jul-06
Left Foot Front	Z	ENDEVCO	AC-P16517	04-Jan-06	05-Jul-06
Right Foot Rear	X	ENTRAN	AC-03E03E21-M20	05-Jan-06	06-Jul-06
	Z	ENDEVCO	AC-AGAC4	04-Jan-06	05-Jul-06
Right Foot Front	Z	ENDEVCO	AC-J23946	04-Jan-06	05-Jul-06
Lap Belt Load Cell		FIRST TECHNOLOGY	LC-159	01-Oct-05	01-Apr-06
Shoulder Belt Load Cell		FIRST TECHNOLOGY	LC-178	01-Oct-05	01-Apr-06

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-P18785	22-Dec-05	22-Jun-06
	X Arm Z	ENDEVCO	AC-P32218	22-Dec-05	22-Jun-06
	Y Arm X	ENDEVCO	AC-P23926	22-Dec-05	22-Jun-06
	Y Arm Z	ENDEVCO	AC-P17563	22-Dec-05	22-Jun-06
	Z Arm X	ENDEVCO	AC-P18948	22-Dec-05	22-Jun-06
	Z Arm Y	ENDEVCO	AC-P14965	22-Dec-05	22-Jun-06
Head	X	ENDEVCO	AC-P39736	22-Dec-05	22-Jun-06
	Y	ENDEVCO	AC-P35811	22-Dec-05	22-Jun-06
	Z	ENDEVCO	AC-P39729	22-Dec-05	22-Jun-06
Head	X (R)	ENDEVCO	AC-P35788	22-Dec-05	22-Jun-06
	Y (R)	ENDEVCO	AC-P35761	22-Dec-05	22-Jun-06
	Z (R)	ENDEVCO	AC-P35764	22-Dec-05	22-Jun-06
Neck Load Cell	X	DENTON	LC-441FX	27-Jun-05	26-Dec-05
	Y	DENTON	LC-441FY	27-Jun-05	26-Dec-05
	Z	DENTON	LC-441FZ	27-Jun-05	26-Dec-05
Neck Moment	X	DENTON	LC-441MX	27-Jun-05	26-Dec-05
	Y	DENTON	LC-441MY	27-Jun-05	26-Dec-05
	Z	DENTON	LC-441MZ	27-Jun-05	26-Dec-05
Chest	X	ENDEVCO	AC-P16863	23-Dec-05	23-Jun-06
	Y	ENDEVCO	AC-P17285	23-Dec-05	23-Jun-06
	Z	ENDEVCO	AC-P14393	03-Jan-06	04-Jul-06
Chest	X (R)	ENDEVCO	AC-P23640	23-Dec-05	23-Jun-06
	Y (R)	ENDEVCO	AC-P17283	23-Dec-05	23-Jun-06
	Z (R)	ENDEVCO	AC-P17235	03-Jan-06	04-Jul-06
Chest Deflection	X	SERVO	DS-064	29-Jun-05	28-Dec-05
Pelvic	X	ENDEVCO	AC-P35790	23-Dec-05	23-Jun-06
	Y	ENDEVCO	AC-P35817	23-Dec-05	23-Jun-06
	Z	ENDEVCO	AC-P39574	23-Dec-05	23-Jun-06

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

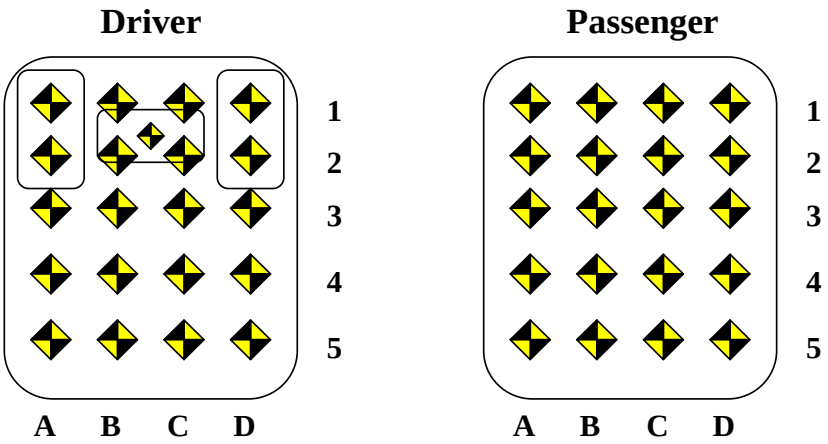
PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-255	09-Aug-05	07-Feb-06
Right Femur Load Cell	Fz	GSE	LC-756	09-Aug-05	07-Feb-06
Left Upper Tibia	Mx	DENTON	LC-108MX	20-Jun-05	19-Dec-05
	My	DENTON	LC-108MY	20-Jun-05	19-Dec-05
Left Lower Tibia	Fz	DENTON	LC-113FZ	20-Jun-05	19-Dec-05
	Mx	DENTON	LC-113MX	20-Jun-05	19-Dec-05
	My	DENTON	LC-113MY	20-Jun-05	19-Dec-05
Right Upper Tibia	Mx	DENTON	LC-103MX	22-Jun-05	21-Dec-05
	My	DENTON	LC-103MY	22-Jun-05	21-Dec-05
Right Lower Tibia	Fz	DENTON	LC-133FZ	22-Jun-05	21-Dec-05
	Mx	DENTON	LC-133MX	22-Jun-05	21-Dec-05
	My	DENTON	LC-133MY	22-Jun-05	21-Dec-05
Left Foot Rear	X	ENDEVCO	AC-J31412	03-Jan-06	04-Jul-06
	Z	ENDEVCO	AC-P15951	03-Jan-06	04-Jul-06
Left Foot Front	Z	ENDEVCO	AC-P12566	03-Jan-06	04-Jul-06
Right Foot Rear	X	ENDEVCO	AC-FG97J	03-Jan-06	04-Jul-06
	Z	ENDEVCO	AC-J23941	03-Jan-06	04-Jul-06
Right Foot Front	Z	ENDEVCO	AC-J28727	03-Jan-06	04-Jul-06
Lap Belt Load Cell		FIRST TECHNOLOGY	LC-168	01-Oct-05	01-Apr-06
Shoulder Belt Load Cell		FIRST TECHNOLOGY	LC-173	01-Oct-05	01-Apr-06

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-FGP19	17-Oct-05	17-Apr-06
Right Rear Seat Crossmember X	GS SENSORS	AC-9440-046	17-Oct-05	17-Apr-06
Top of Engine	GS SENSORS	AC-9440-029	12-Oct-05	12-Apr-06
Bottom of Engine	GS SENSORS	AC-9440-032	13-Oct-05	13-Apr-06
Right Disc Brake Caliper	ICS	AC-FGP22	12-Oct-05	12-Apr-06
Left Disc Brake Caliper	ICS	AC-FGP37	12-Oct-05	12-Apr-06
Left Seat Rear Crossmember Z	ICS	AC-FGP29	17-Oct-05	17-Apr-06
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	17-Oct-05	17-Apr-06

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

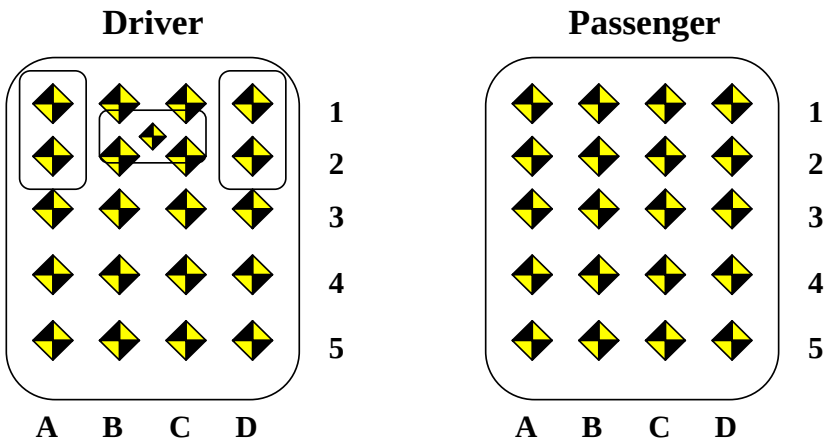


Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3504	-598	-396	3479	-602	-400	25	4	4
B1	3596	-461	-394	3543	-454	-422	53	-7	28
C1	3590	-323	-393	3529	-307	-433	61	-16	40
D1	3588	-190	-393	3525	-188	-427	63	-2	34
A2	3458	-600	-335	3437	-602	-335	21	2	0
B2	3510	-466	-321	3476	-461	-340	34	-5	19
C2	3510	-327	-321	3462	-322	-342	48	-5	21
D2	3509	-189	-321	3471	-192	-334	38	3	13
A3	3410	-603	-268	3404	-601	-259	6	-2	-9
B3	3409	-471	-264	3399	-463	-257	10	-8	-7
C3	3409	-330	-268	3396	-329	-252	13	-1	-16
D3	3407	-194	-276	3393	-190	-257	14	-4	-19
A4	3323	-604	-254	3318	-600	-252	5	-4	-2
B4	3325	-469	-254	3320	-468	-245	5	-1	-9
C4	3321	-333	-256	3314	-335	-245	7	2	-11
D4	3324	-197	-261	3317	-195	-247	7	-2	-14
A5	3238	-604	-251	3233	-602	-258	5	-2	7
B5	3237	-468	-254	3232	-470	-236	5	2	-18
C5	3237	-334	-258	3227	-332	-235	10	-2	-23
D5	3236	-199	-263	3228	-197	-245	8	-2	-18
BP	3439	-350	-441	3463	-359	-431	-24	9	-10
G	3203	-526	-703	3195	-529	-699	8	3	-4
H	3179	-226	-708	3167	-231	-708	12	5	0
L	2922	-374	-908	2917	-390	-897	5	16	-11
AB	2879	-619	-337	2879	-619	-330	0	0	-7

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	3590	204	-402	3570	192	-411	20	12	9
B1	3597	328	-406	3576	316	-416	21	12	10
C1	3595	465	-404	3576	449	-414	19	16	10
D1	3539	596	-403	3520	584	-400	19	12	-3
A2	3506	205	-333	3491	192	-338	15	13	5
B2	3508	334	-332	3484	319	-342	24	15	10
C2	3509	466	-333	3491	454	-338	18	12	5
D2	3498	593	-322	3490	581	-322	8	12	0
A3	3416	209	-268	3416	197	-265	0	12	-3
B3	3415	334	-265	3405	324	-259	10	10	-6
C3	3414	466	-265	3409	451	-259	5	15	-6
D3	3419	597	-268	3413	584	-261	6	13	-7
A4	3331	202	-264	3324	190	-260	7	12	-4
B4	3332	336	-259	3323	324	-254	9	12	-5
C4	3330	470	-258	3324	457	-252	6	13	-6
D4	3328	599	-258	3324	585	-260	4	14	2
A5	3243	201	-263	3235	192	-257	8	9	-6
B5	3245	333	-259	3238	321	-251	7	12	-8
C5	3246	465	-258	3238	455	-253	8	10	-5
D5	3246	594	-257	3240	583	-266	6	11	9
R	3168	240	-707	3135	227	-691	33	13	-16
S	3205	539	-708	3167	526	-683	38	13	-25
AB	2879	619	-341	2879	619	-333	0	0	-8

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