REPORT NUMBER: CAL-06-10

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

KIA MOTORS CORPORATION
2006 KIA SEDONA
MINIVAN

NHTSA NUMBER: M60512

CALSPAN TEST NUMBER: 8642-NCAP-69

CALSPAN CORPORATION
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February 02, 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-06-10	*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 Kia Sedona Minivan NHTSA No. M60512		*5. Report Date* February 02, 2006
		6. Performing Organization Code CAL
7. Author(s) David J. Travale, Program Manager James Czarnecki, Project Engineer		*8. Performing Organization Report No.* 8642-NCAP-69
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 FEBRUARY, 2006
		14. Sponsoring Agency Code NVS-111

15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 2006 Kia Sedona Minivan was performed at Calspan Corporation's crash test facility in Buffalo, New York, on February 02, 2006.

The impact velocity was 56.65 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 549 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, and airbags at both the driver and right outboard passenger seating positions.

With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements. The occupant injury criteria summary is as follows:

Measurement Description	**Units**	**Threshold**	**Driver (142)**	**Passenger (150)**
Head Injury Criteria (HIC - 36 ms)	-	1000	367.0	452.2
Maximum Thorax Acceleration (3 ms Clip)	g's	60 g's	40.4	33.9
Chest Displacement	mm	-76 mm	-42.8	-31.6
Left Femur Force	Newtons	-10000 N	-4712.9	-4129.4
Right Femur Force	Newtons	-10000 N	-4614.4	-4233.6

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 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 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 on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 142) and the right-front passenger (position 2) ATD (Serial No.150) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 142 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 Kia Sedona Minivan at a velocity of 56.65 kph. The test was performed at Calspan on February 02, 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	367.0	54.5	90.5	40.4	60.0	64.5	42.8	-4712.9	-4614.4
Passenger	452.2	72.0	103.7	33.9	92.1	95.1	31.6	-4129.4	-4233.6

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

TEST NOTES	
Data Channel	Anomalies
V1P2 HEAD9 ARRAY Y ARM Az	QUESTIONABLE DATA
V1 ENGINE TOP #3X	QUESTIONABLE DATA
V1 ENGINE BOTTOM #4X	TRANSDUCER FAILED
V1 LEFT CALIPER #7X	TRANSDUCER FAILED

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M60512 Test Mode: 56.3 kph Frontal Barrier
Test Date: February 02, 2006 Time: 13:00 Temperature: 21 °C
Vehicle Make/Model/Body Style: 2006 Kia Sedona Minivan
Vehicle Test Weight: 2265 kg Impact Velocity: 56.65 kph (55.5 – 57.1 kph)
Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 549 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	Seatbelt, Front Airbags, Seat Side Airbags, Curtain Airbags, Knee Bolster	Seatbelt, Front Airbags, Seat Side Airbags, Curtain Airbags, Knee Bolster
Head Contact:	Head into Airbag, Back of Head into Headrest, Back of Head into B-pillar	Head into Airbag, Back of Head into Headrest
Abdomen Contact:	None	None
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	-	-
Front Seat Track Shift (mm)	0	0
Front Seat Back Failure	None	None
Glazing Damage	The windshield was cracked along its bottom.	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	1071	999	1021	1030

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	850	847
Lap belt length as measured on ATD	mm	776	709
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	1626	1556

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2006 Kia Sedona Minivan

NHTSA No. : M60512 ; VIN: KNDMB233766018840 ; Color:

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

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

Transmission Data: 5 speeds; - Manual; x Automatic; - 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: 1/26/06 ; Odometer Reading 84 km

Selling Dealer: West Herr Kia

Dealer Address: 5140 Camp Rd. Hamburg, N.Y 14075

TEST VEHICLE OPTIONS:

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

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

SAFETY BELT FEATURES:

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

Passenger: x Pretensioner (Shoulder); - 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: Kia Motors Corporation

Date of Manufacture 10/05

GVWR: 2675 kg; GAWR: 1360 kg FRONT; 1390 kg REAR

VEHICLE CAPACITY DATA:

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

Number of Occupants: 2 Front; 5 Rear; 7 Total

Vehicle Capacity Weight (VCW) = 525 kg

No. of Occupants x 68.04 kg = 476.3 kg

Rated Cargo/Luggage Weight (RCLW) = 48.7 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 =	605	595	57.9	1200.0
Rear =	452	419	42.1	871.0
			Total Delivered Weight (UDW) =	2071.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	2071.0	kg
Rated Cargo/Luggage Weight (RCLW) =	48.7	kg
Weight of 2 p.572 Dummies @ 76 each =	152	kg
TARGET TEST WEIGHT =	2271.7	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 42.0 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	644	629	56.2	1273.0
Rear =	515	477	43.8	992.0
			Total Vehicle Test Weight (ATW) =	2265.0

Weight of Ballast Secured in Vehicle Trunk Area[1] = 25 kg

Vehicle Components Removed for Weight Reduction: Rear Radiator, Third Row Seat, Rear Floor Trim Pieces

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG[2]
AS DELIVERED:	799	805	801	806	1270.1
FULLY LOADED:	791	796	785	790	-
AS TESTED:	794	798	785	791	1322.7

Vehicle's Wheel Base: 3020 mm

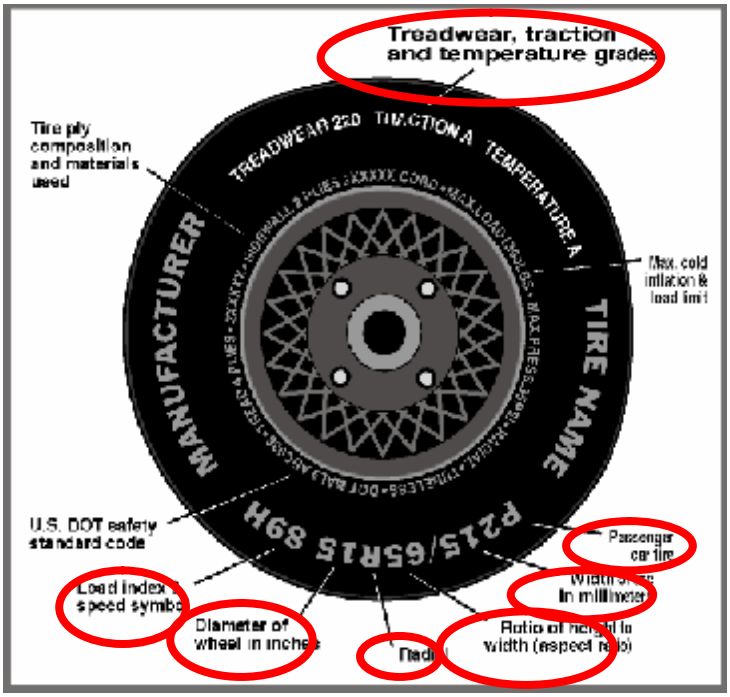
[1]Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

[2]Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2006 Kia Sedona Minivan

NHTSA Test No.: M60512 Test Date: February 02, 2006



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)	225/70R16	225/70R16
Tire size on Vehicle	225/70R16	225/70R16
Tire Manufacturer	HANKOOK	HANKOOK
Tire Name	OPTIMO H418	OPTIMO H418
Tire Type	P	P
Tire Width (mm)	225	225
Ratio of Height to Width (aspect ratio)	70	70
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	102T	102T
Treadwear	400	400
Traction Grade	A	A
Temperature Grade	A	A

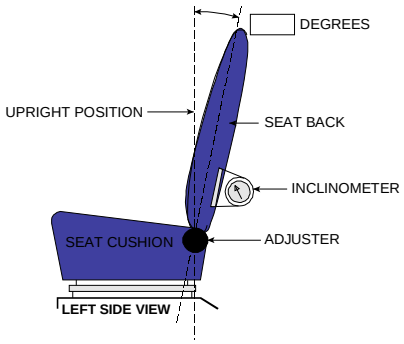
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2006 Vehicle Model: Kia Sedona Body Style : Minivan

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: 24

Measurement instructions: Position is located with seat back adjusted to the 11th latch position From the initial 1st lock position.

Seat back angle for passenger's seat: 24

Measurement instructions: Position is located with seat back adjusted to the 11th latch position From the initial 1st lock position.

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: There are 23 detents labeled 1 to 23; test position is detent 12 or at 110 mm of 220 mm total travel.

Positioning of the passenger's seat: There are 23 detents labeled 1 to 23; test position is detent 12 or at 110 mm of 220 mm total travel.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 82.9 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 = 76.3 to 77.9 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 76.7 liters

3.3 One-Third of Useable Capacity = 27.6 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.
When the vehicle ignition is turned to the 'On' position to prime fuel system and 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: Steering wheel is set at the angle of 64.3 degrees.

5. SEAT BELT UPPER ANCHORAGE:

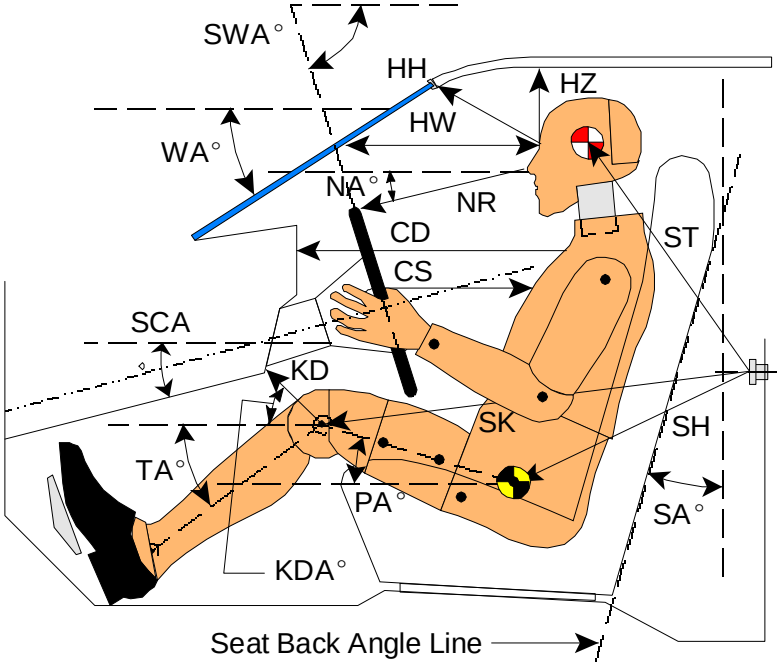
Nominal design riding position: Placed in mechanical middle.

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

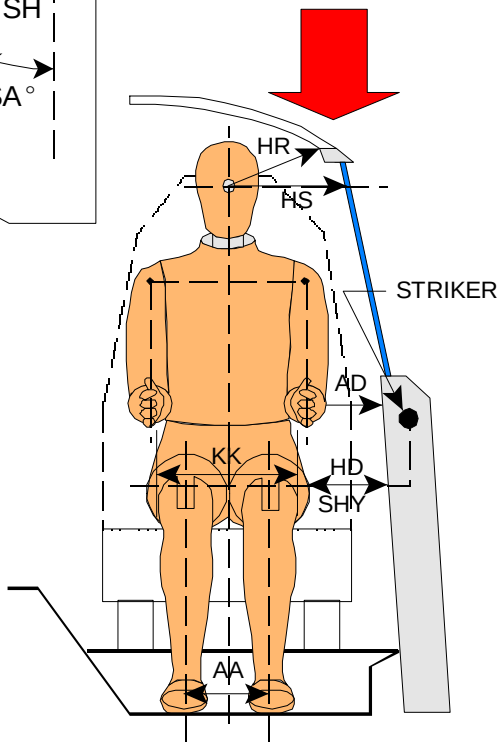
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; x No; - N/A

Comments: There is no information about ADL's in the vehicle owners manual.

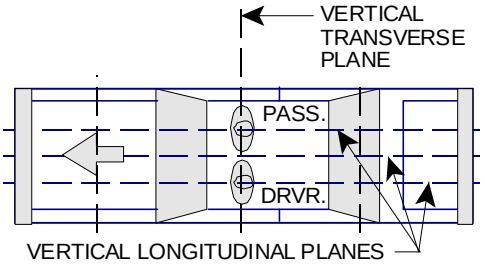
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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



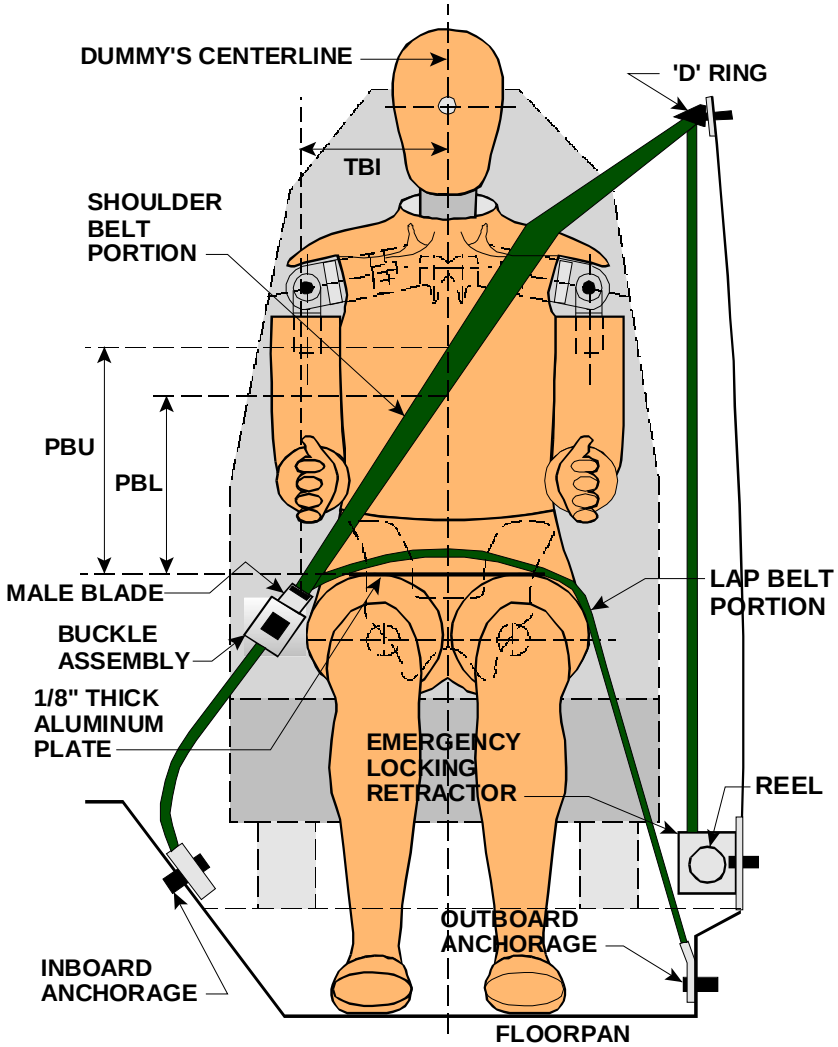
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #142)			PASS. (Serial #150)		
WA^O	30.7 deg.			N/A		
SWA^O	64.3 deg.			N/A		
SCA^O	25.7 deg.			N/A		
SA^O	24 deg.			24 deg.		
HZ	224			201		
HH	419			387		
HW	689			680		
HR	218			215		
NR	430	Angle	13 deg.	N/A		
CD	558			558		
CS	304			N/A		
RA	206			N/A		
KDL	160	Angle (KDA)	30 deg.	159		
KDR	131			139	Angle (KDA)	31 deg.
PA^O	21.6 deg.			24 deg.		
TA^O	59.1 deg.			53.7 deg.		
KK	346			270		
AA	361			241		
ST	549	Angle	81 deg.	576	Angle	deg.
SK	606	Angle	93 deg.	623	Angle	deg.
SH	212	Angle	119 deg.	224	Angle	deg.
SHY	254			249		
HS	333			329		
HD	161			151		
AD	112			128		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

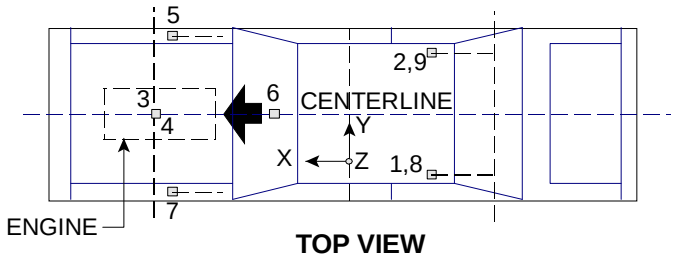


FRONT VIEW OF DUMMY

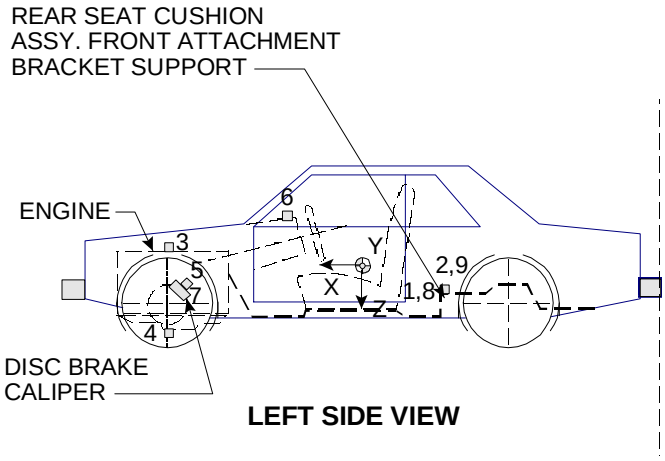
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	302	301
PBL-- Top surface of alum. plate to belt lower edge	225	221
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	1789	-724	-495
2	Right Rear Seat Cross Member X	1797	730	-498
3	Top of Engine Block	4474	-145	-791
4	Bottom of Engine	4195	246	-275
5	Disc Brake Caliper @ Right Side	4133	709	-368
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	4134	-726	-380
8	Left Rear Seat Cross Member Z	1789	-724	-495
9	Right Rear Seat Cross Member Z	1797	730	-498

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 18 mm molding.

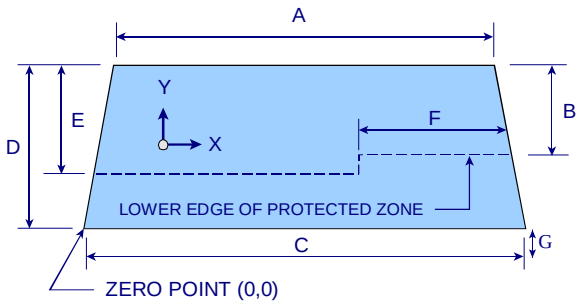
FMVSS 212 REQUIREMENTS:

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: 21ºC.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2345.0	2345.0	100.0%
LEFT SIDE	2345.0	2345.0	100.0%
TOTAL	4690	4690	100.0%



FRONT VIEW OF WINDSHIELD

DIMENSIONS (mm)	
A	1270
B	550
C	1640
D	890
E	560
F	580
G	18

FAILURE DETAILS: None

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm:

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

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

NHTSA TEST No.: M60512 TEST DATE: February 02, 2006

VEHICLE MAKE/MODEL: 2006 Kia Sedona Minivan

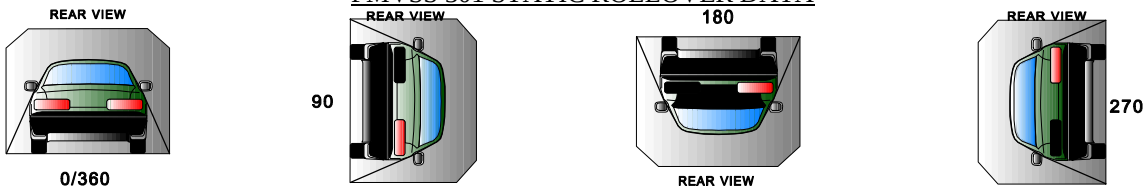
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

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	15	seconds	5	minutes	6	minutes	15	seconds	7	minutes
90º - 180º	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
180º-270º	1	minutes	13	seconds	5	minutes	6	minutes	13	seconds	7	minutes
270º-360º	1	minutes	12	seconds	5	minutes	6	minutes	12	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:

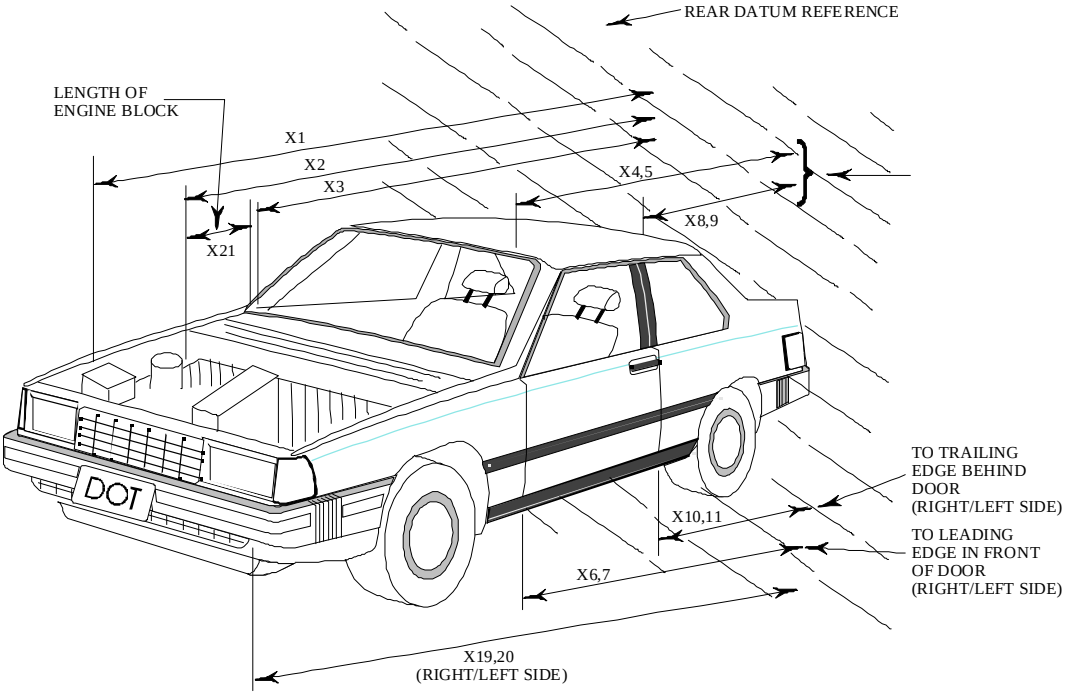
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

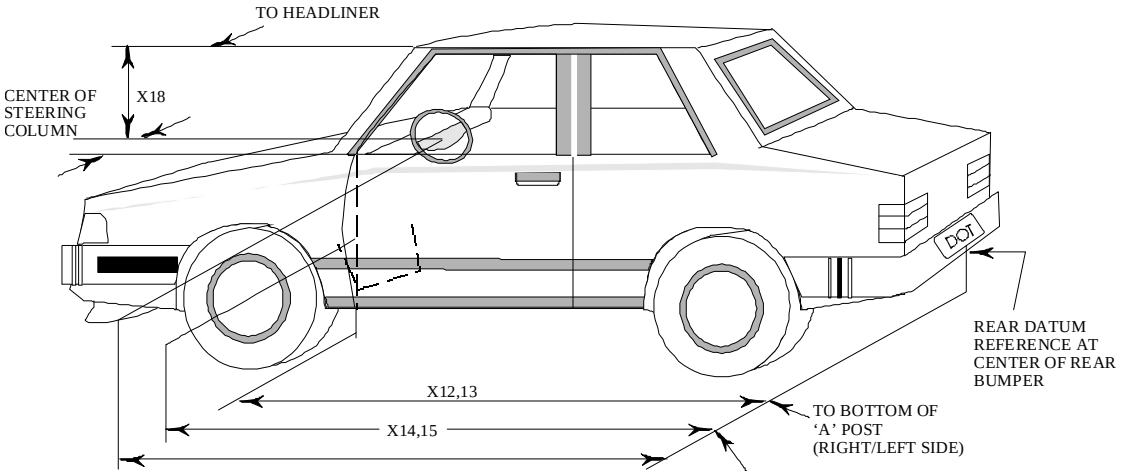
Note: Record spillage for whole minute intervals only as determined above.

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.: M60512 TEST DATE: February 02, 2006

VEHICLE MAKE/MODEL: 2006 Kia Sedona Minivan

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5127	4582	545
X2	Rear Surface of Vehicle to Front of Engine	4665	4376	289
X3	Rear Surface of Vehicle to Firewall	4231	4103	128
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3688	3689	-1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3687	3687	0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3613	3615	-2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3607	3608	-1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2624	2626	-2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2622	2621	1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2617	2620	-3
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2616	2615	1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3763	3763	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3763	3760	3
X14	Rear Surface of Vehicle to Firewall, Right Side	4201	4104	97
X15	Rear Surface of Vehicle to Firewall, Left Side	4196	4090	106
X16	Rear Surface of Vehicle to Steering Column	3240	3229	11
X17	Center of Steering Column to "A" Post	298	271	27
X18	Center of Steering Column to Headliner	472	452	20
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5071	4526	545
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5069	4556	513
X21	Length of Engine Block	496	496	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3422	3416	6
CD	Rear Surface of Vehicle to Center of Dash Panel	3451	3403	48
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3420	3413	7

All Dimensions in mm

DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

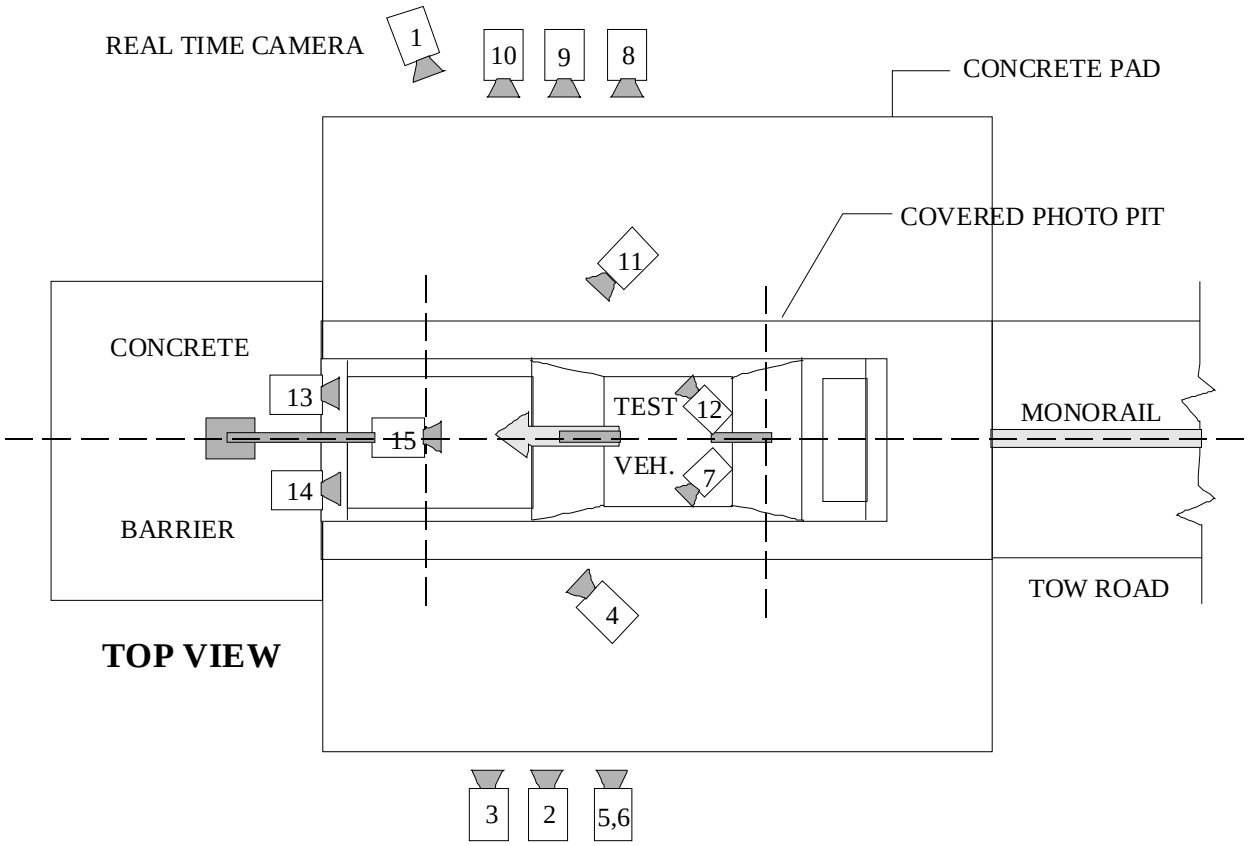
NHTSA TEST No.: M60512 TEST DATE: February 02, 2006

VEHICLE MAKE/MODEL: 2006 Kia Sedona Minivan

TARGET VEHICLE STRUCTURAL MEASUREMENTS

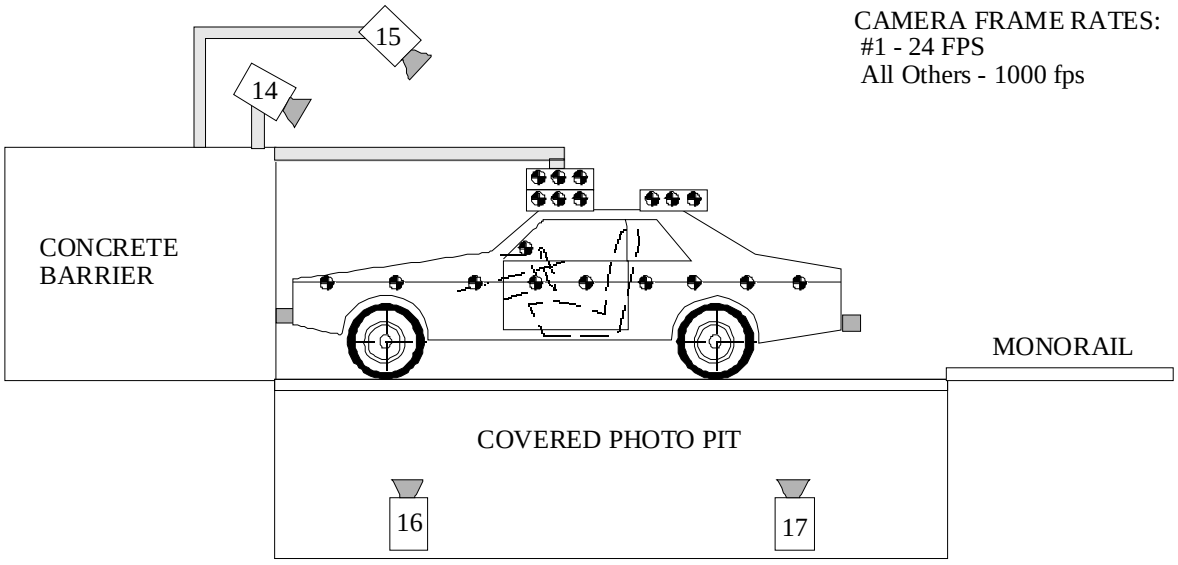
	Elements	Pre-Test (mm)
1	Total length	5127
2	Total Width	1943
3	Bumper Top Height	596
4	Bumper Bottom Height	249
5	Longitudinal Member Top Height	595
6	Distance Between Longitudinal Members	1150
7	Longitudinal Member Width	60
8	Engine top height	973
9	Engine bottom height	249
10	Engine and gearbox width	870
11	Front bumper-engine distance	462
12	Front shock absorber fixing height	989
13	Bonnet leading edge height	788
14	Front shock absorber fixing width	1392
15	Front bumper – front axle distance	977
16	Front axle – a pillar distance	969
17	A-pillar – B pillar distance	942
18	B-pillar – rear axle distance	1545
19	B-pillar – C Pillar distance	1035
20	Roof sill bottom height	1629
21	Roof sill top height	1738
22	Floor sill bottom height	263
23	Floor sill top height	378

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.: M60512 Vehicle: 2006 Kia Sedona Minivan

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	8240	2247	1095	-3	8018	28	1000
3	Left Side View	9806	1140	1086	-2	9584	50	1000
4	Driver and Interior View	7520	2762	2039	-7	-	28-70	500
5	Steering Column (Bottom)	8635	1997	1107	-2	8413	25	1000
6	Steering Column (Top)	8635	1997	1774	-7	8413	25	1000
7	Left CRS Lateral View	-	-	-	-	-	-	-
8	Overall Right Side	8181	2002	1099	-2	8513	28	500
9	Right Side View	9864	1096	1095	-2	10196	50	1000
10	Right Passenger View	8581	1747	1406	-3	8913	35	1000
11	Passenger and Interior View	7696	2672	2027	-8	-	35	500
12	Right CRS Lateral View	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-34	-	13	500
14	Driver Front View	620	-92	1987	-34	-	13	500
15	Windshield View	0	-530	3374	-50	-	28	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0	2753	-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

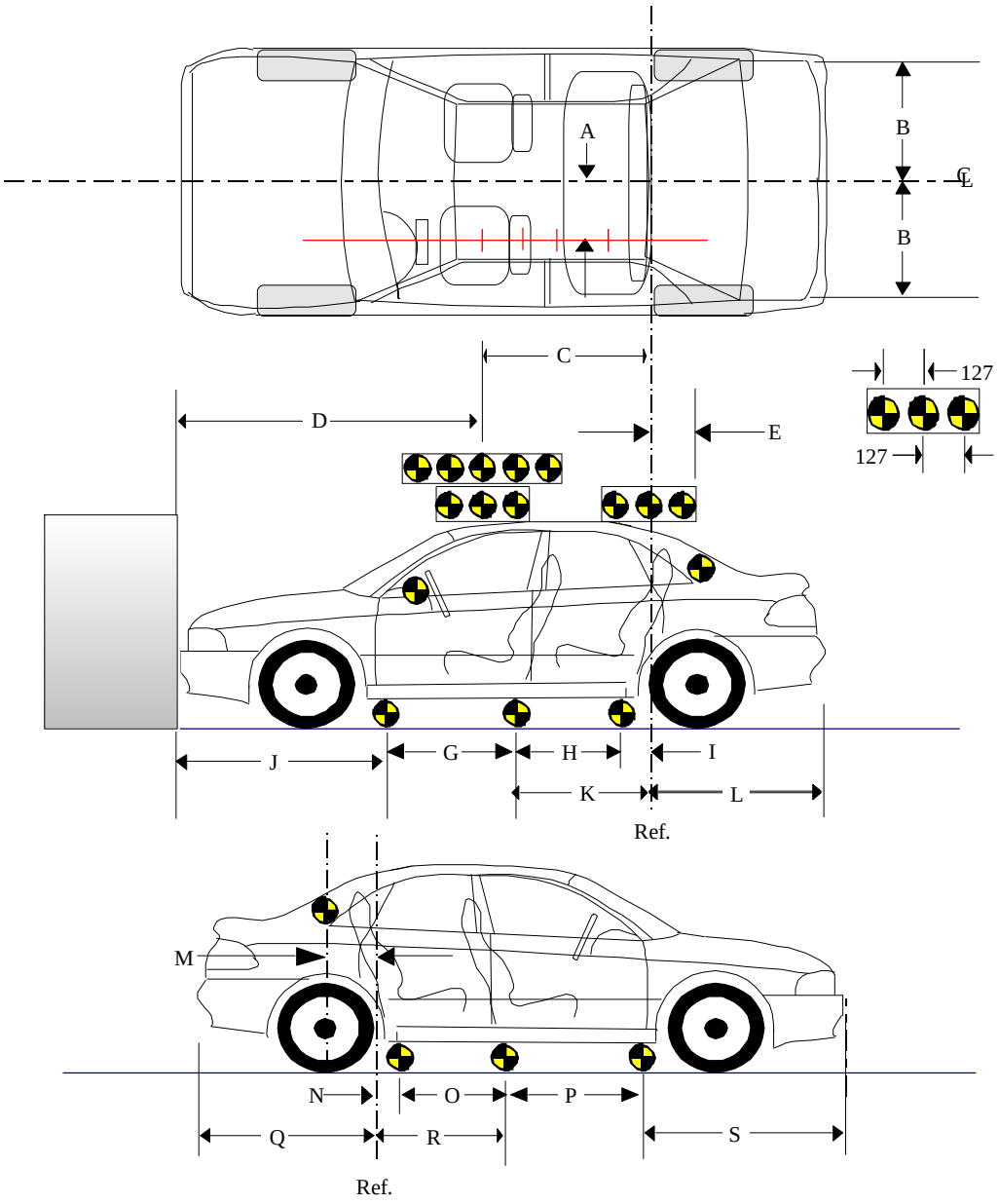
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M60512 Vehicle: 2006 Kia Sedona Minivan

(Dimensions in millimeters)

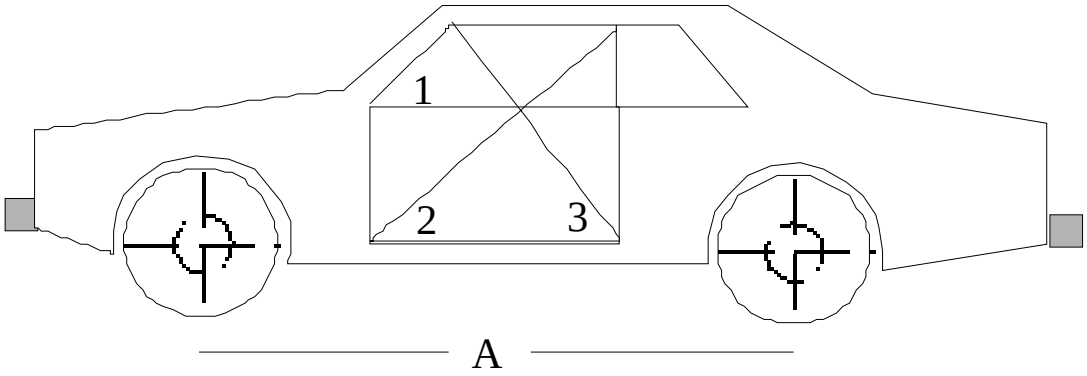
A	408
B	554
C	1223
D	2367
E	904
F	1872
G	1027
H	1035
I	114
J	1459
K	1149
L	1493
M	893
N	113
O	1029
P	1036
Q	1492
R	1142
S	1456



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M60512 Vehicle: 2006 Kia Sedona Minivan

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



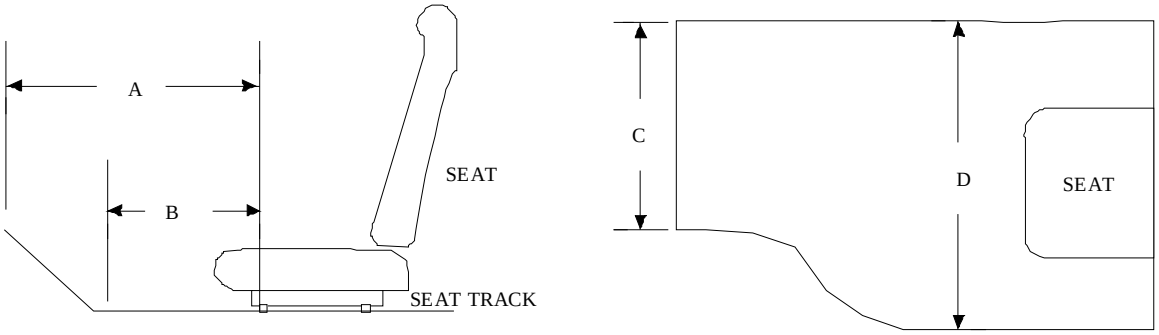
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	943	1505	1179	943	1502	1196
AFTER TEST	940	1505	1180	943	1502	1196
DIFFERENCE	3	0	-1	0	0	0

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3020	3020
AFTER TEST	2970	2968
DIFFERENCE	50	52

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M60512 Vehicle: 2006 Kia Sedona Minivan

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	698	628	70
B	471	464	7
C	579	571	8
D	621	613	8

PASSENGER

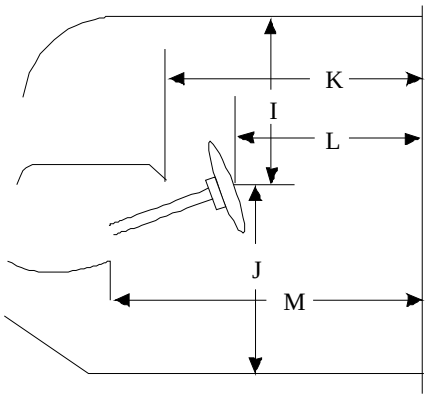
Measurement	Pre-Test	Post-Test	Difference
A	673	594	79
B	580	577	3
C	579	573	6
D	636	615	21

Units = mm

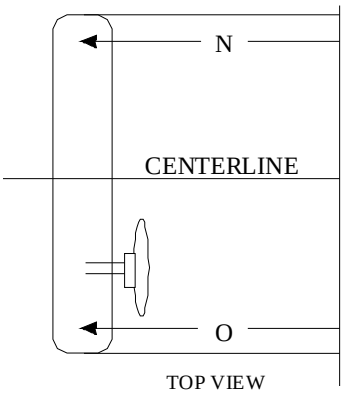
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M60512 Vehicle: 2006 Kia Sedona Minivan

STATIC PASSENGER COMPARTMENT INTRUSION

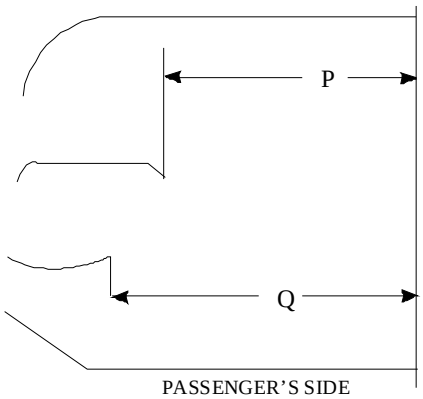


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



PASSENGER'S SIDE

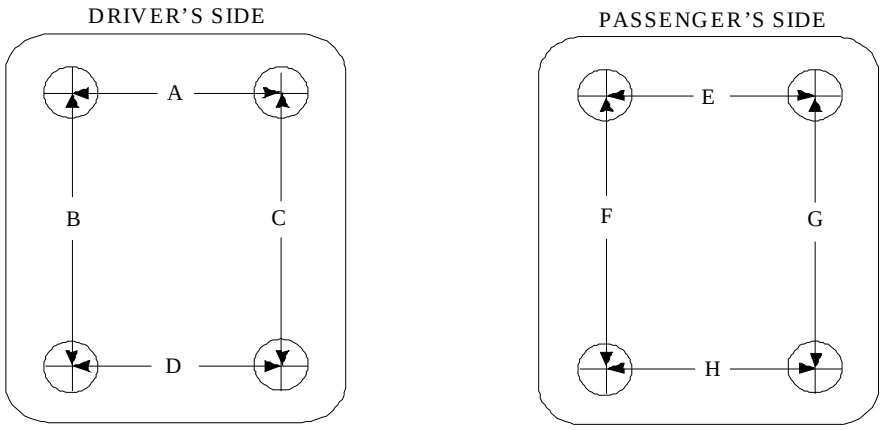
Measurement	Pre-Test	Post-Test	Difference
I	472	452	20
J	689	707	-18
K	781	737	44
L	559	548	11
M	798	782	16
N	740	734	6
O	740	732	8
P = K (PASS.)	852	824	28
Q = M (PASS.)	831	791	40

Units = mm

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

NHTSA Test No.: M60512 Vehicle: 2006 Kia Sedona Minivan

FLOORBOARD DEFORMATION



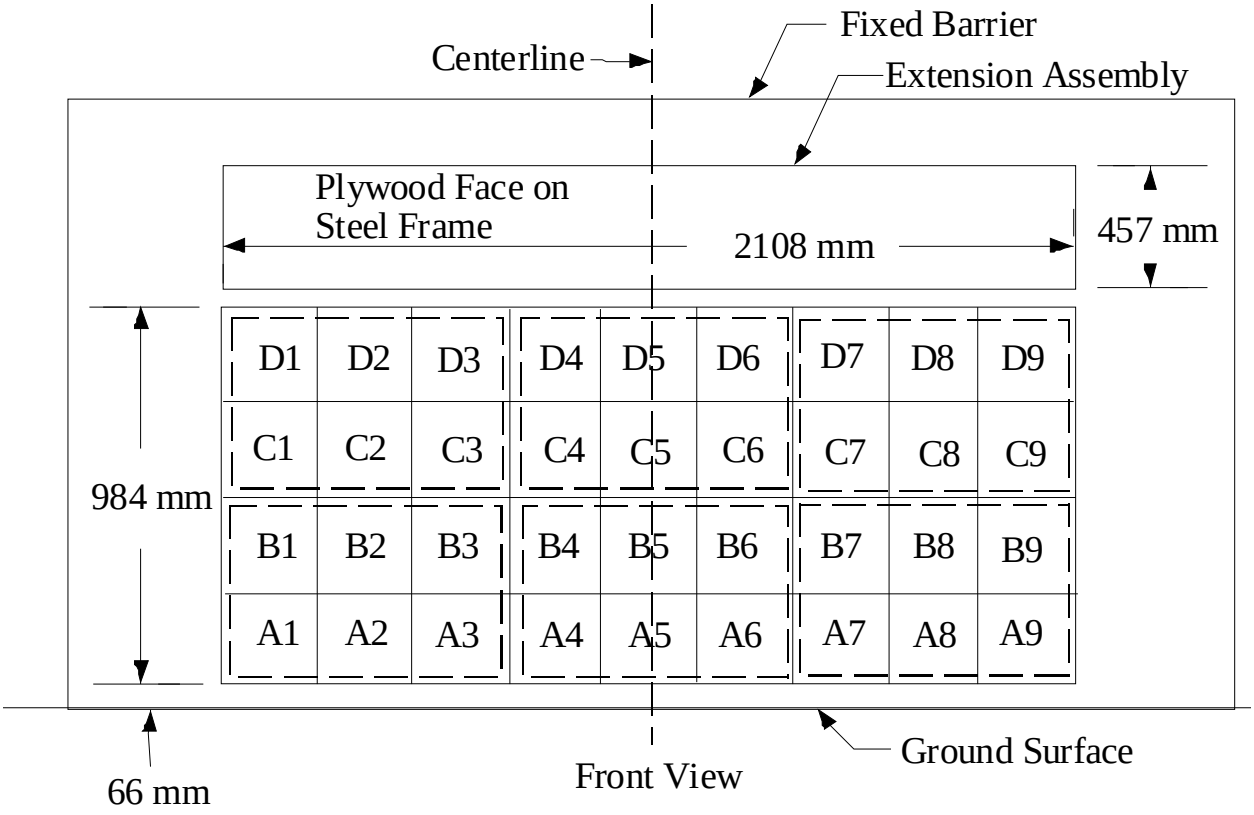
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	579	571	8
B	233	235	-2
C	252	251	1
D	621	613	8
E	579	573	6
F	281	284	-3
G	297	261	36
H	636	615	21

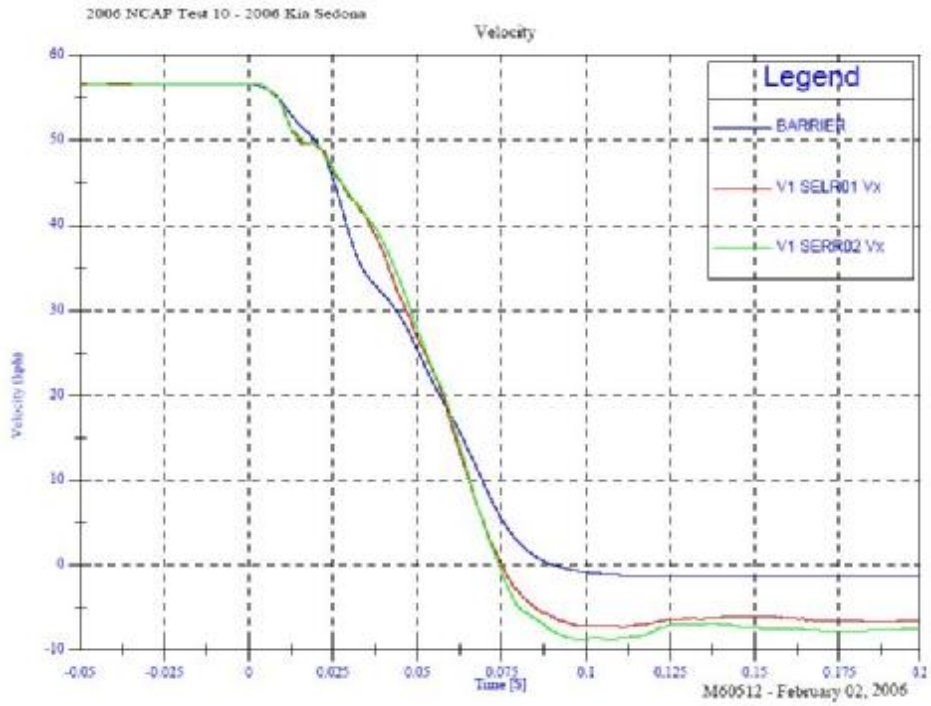
Units = mm

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: Kia Sedona Minivan

NHTSA Test No.: M60512 VIN: KNDMB233766018840

Model Year: 2006 Build Date: 10/05 Test Date: February 02, 2006

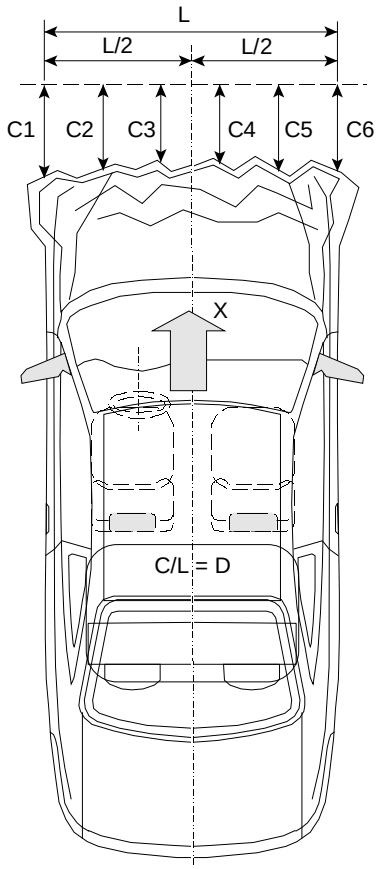
Vehicle Size Category: Minivan Test Weight: 2265 kg

Vehicle Wheelbase: 3020 mm; Front Overhang: 977 mm; Overall Width: 1943 mm

Collision Deformation Classification (CDC) Code: 12FDEW4

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4943	4605	338
C2 =	5073	4558	515
C3 =	5125	4586	539
C4 =	5126	4578	548
C5 =	5076	4527	549
C6 =	4948	4591	357



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

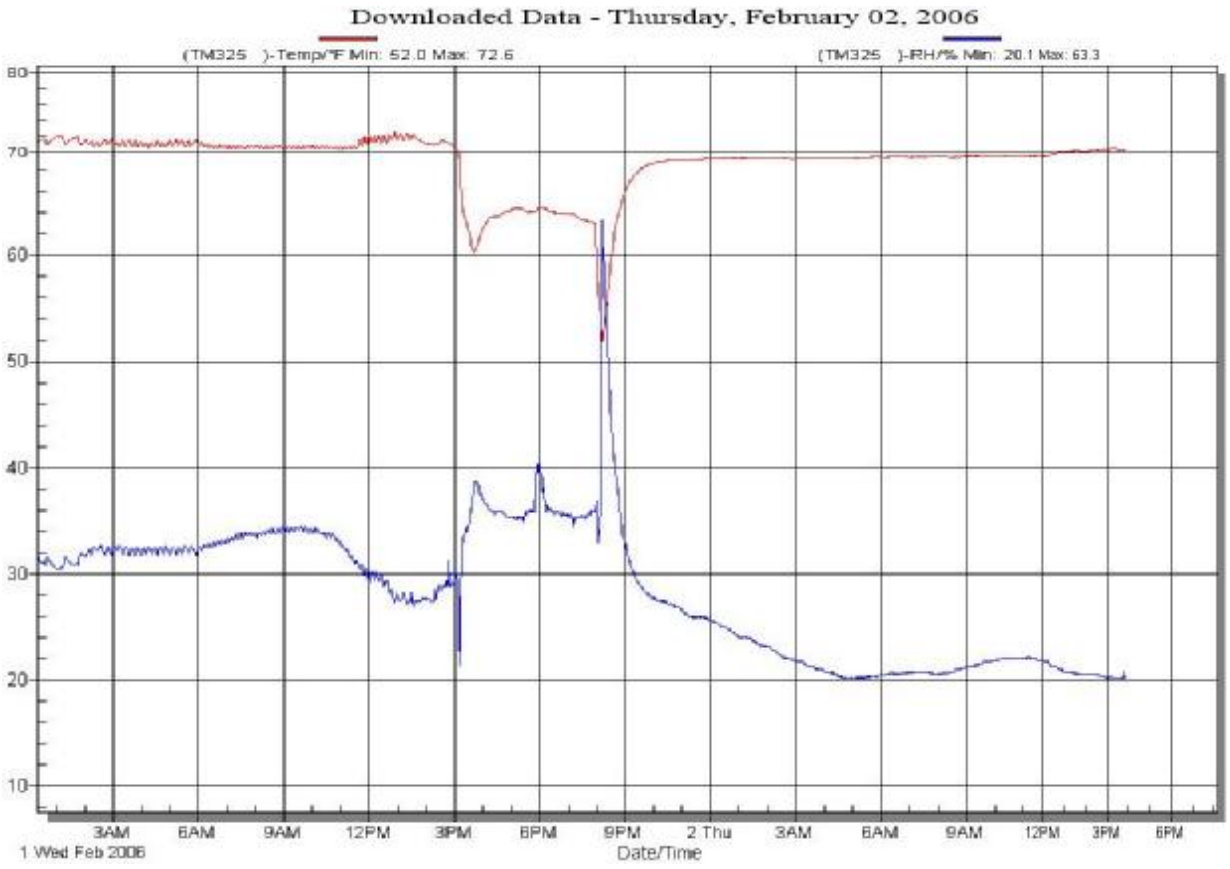
Length of Damaged Region: L1= 1559 mm

L2= 779.5 mm

L5= 311.8 mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M60512 Vehicle: 2006 Kia Sedona Minivan



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

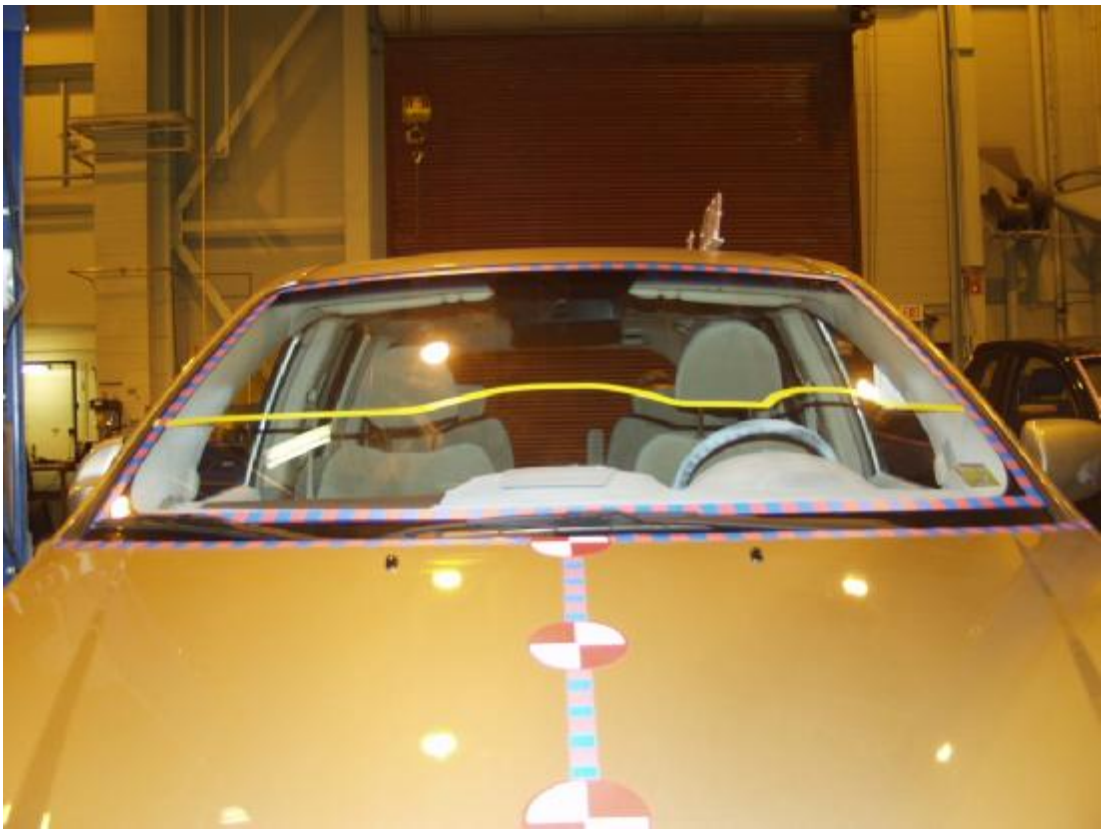


Figure A-18: Pre-Test Windshield View

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

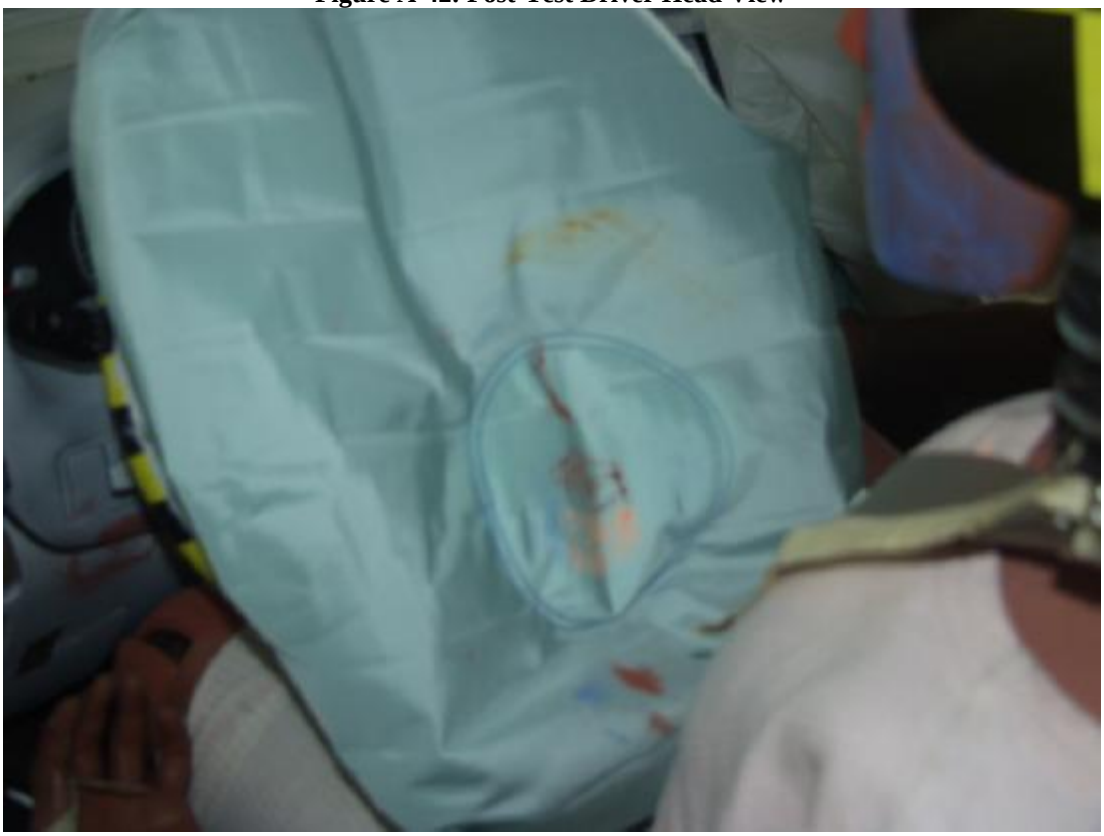


Figure A-43: Post-Test Driver Contact to Airbag

Figure A-44: Pre-Test Passenger Head Location

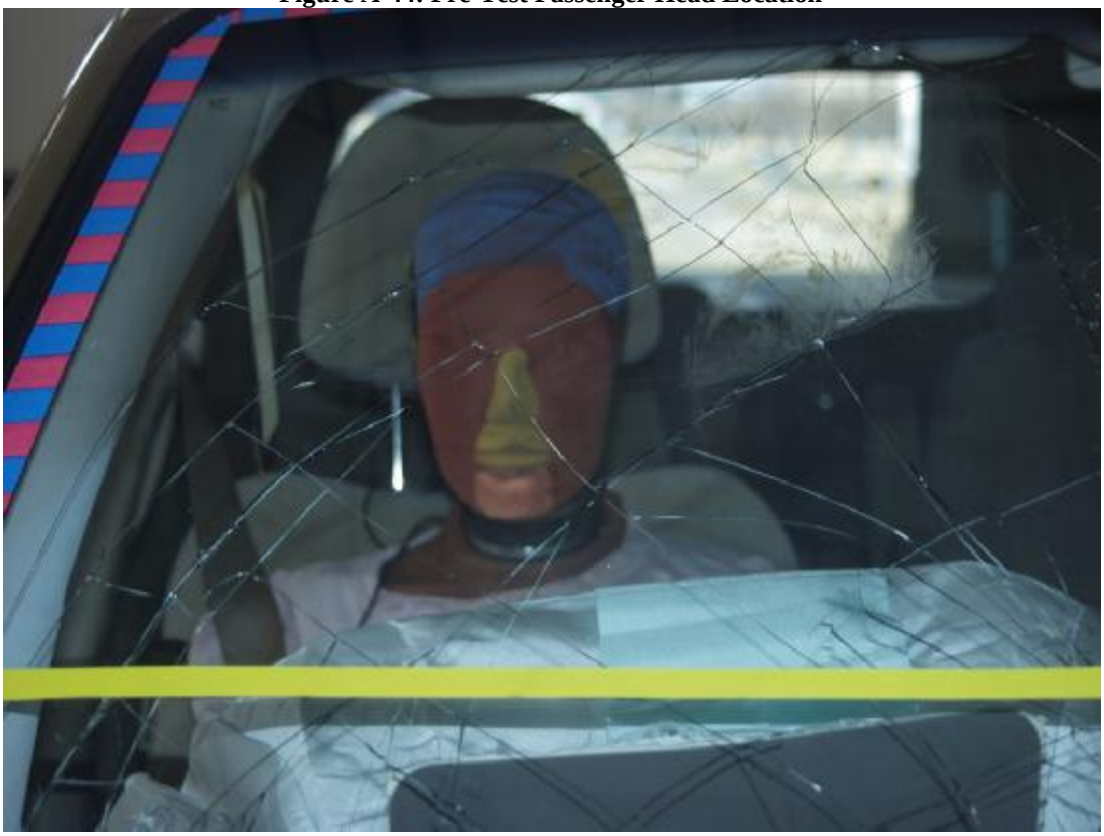


Figure A-45: Post-Test Passenger Head Location

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

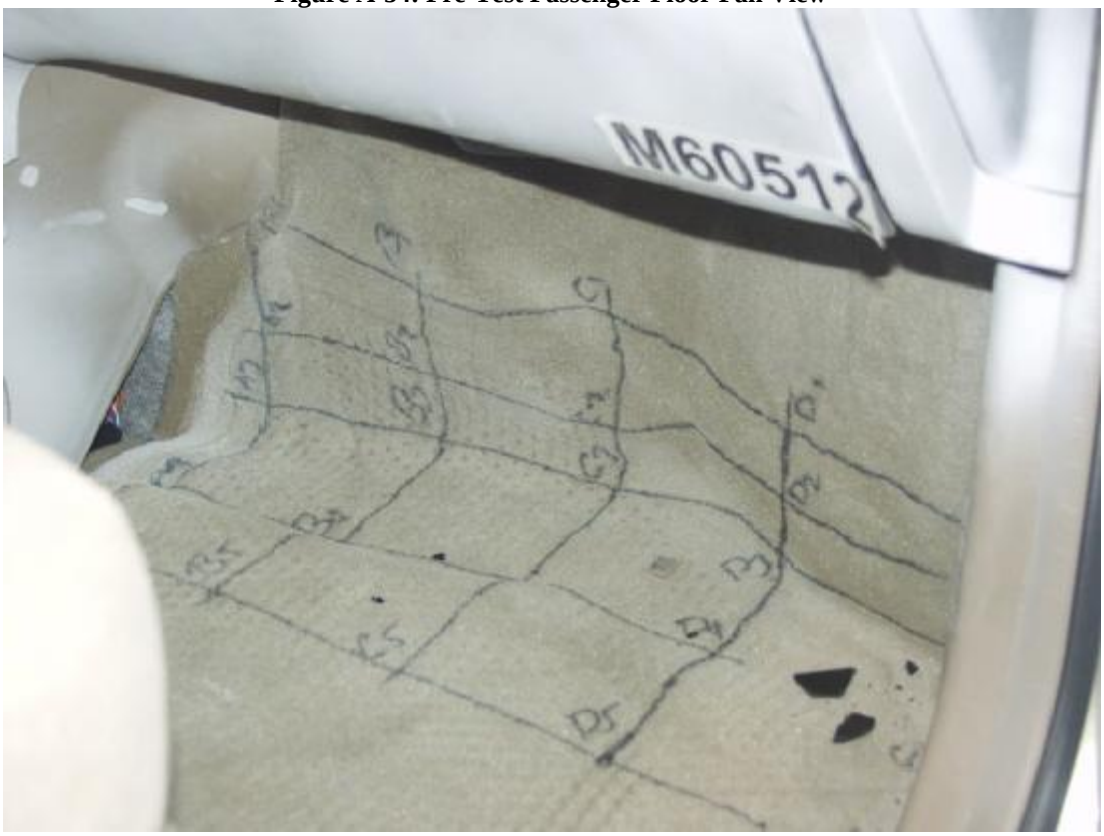


Figure A-55: Post-Test Passenger Floor Pan View

Figure A-56: Post-Test Passenger Head View

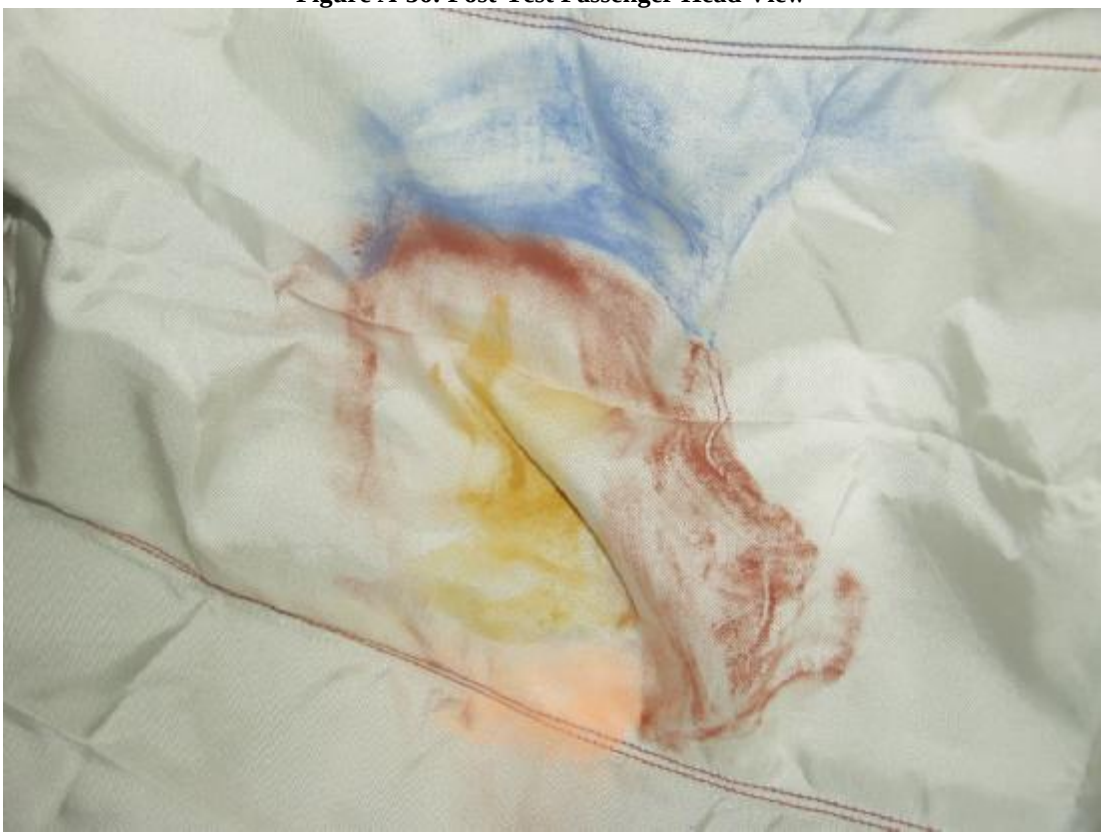


Figure A-57: Post-Test Passenger Contact to Airbag

Figure A-58: Rollover View - 90°

Figure A-59: Rollover View - 180°

Photo Not Available – Sun Glare Washed Out Picture

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.

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 Lap Belt Load
V1P1 Head 9 Array X Arm Az	V1P1 Shoulder Belt Load
V1P1 Head 9 Array Y Arm Ax	V1P2 Lap Belt Load
V1P1 Head 9 Array Y Arm Az	V1P2 Shoulder Belt Load
V1P1 Head 9 Array Z Arm Ax	V1 Left Rear #1x
V1P1 Head 9 Array Z Arm Ay	V1 Right Rear #2x
V1P1 Head CG Ax	V1 Engine Top #3x
V1P1 Head CG Ay	V1 Engine Bottom #4x
V1P1 Head CG Az	V1 Right Caliper #5x
V1P1 Head CG Red Ax	V1 Left Caliper #7x
V1P1 Head CG Red Ay	V1 Left Rear #8z
V1P1 Head CG Red Az	V1 Right Rear #9z
V1P1 Upper Neck Fx	
V1P1 Upper Neck Fy	
V1P1 Upper Neck Fz	
V1P1 Upper Neck Mx	
V1P1 Upper Neck My	
V1P1 Upper Neck Mz	
V1P1 Chest Ax	
V1P1 Chest Ay	
V1P1 Chest Az	
V1P1 Chest Red Ax	
V1P1 Chest Red Ay	
V1P1 Chest Red Az	
V1P1 Chest Compression	
V1P1 Pelvic Ax	
V1P1 Pelvic Ay	
V1P1 Pelvic Az	
V1P1 Left Femur Fz	
V1P1 Right Femur Fz	
V1P1 Left Upper Tibia Mx	
V1P1 Left Upper Tibia My	
V1P1 Left Lower Tibia Fz	
V1P1 Left Lower Tibia Mx	
V1P1 Left Lower Tibia My	
V1P1 Right Upper Tibia Fz	
V1P1 Right Upper Tibia Mx	
V1P1 Right Upper Tibia My	
V1P1 Right Lower Tibia Mx	
V1P1 Right Lower Tibia My	
V1P1 Left Foot Aft Ax	
V1P1 Left Foot Aft Az	
V1P1 Left Foot Fore Az	
V1P1 Right Foot Aft Ax	
V1P1 Right Foot Aft Az	
V1P1 Right Foot Fore z	
V1P2 Head 9 Array X Arm Ay	

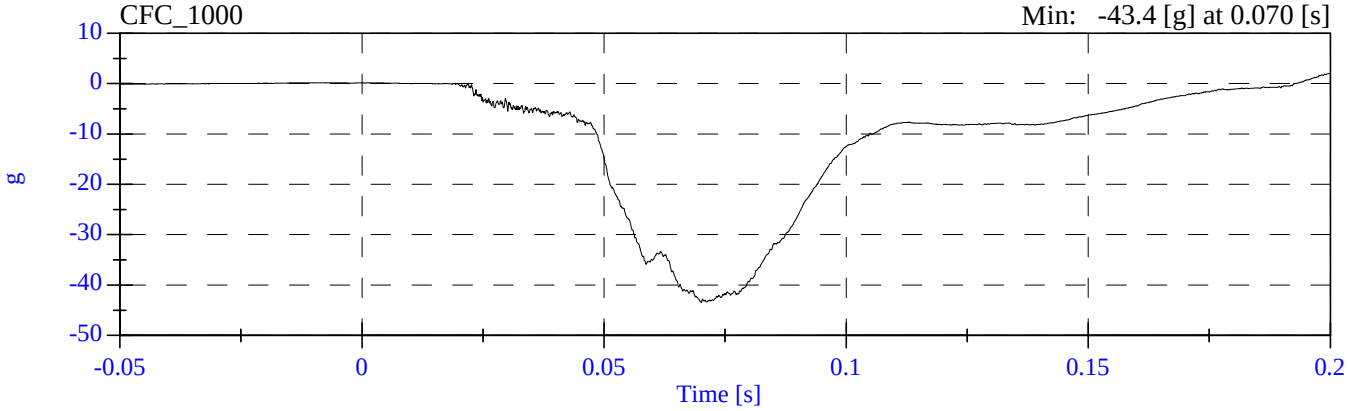
V1P2 Head 9 Array X Arm Az	
V1P2 Head 9 Array Y Arm Ax	
V1P2 Head 9 Array Y Arm Az	
V1P2 Head 9 Array Z Arm Ax	
V1P2 Head 9 Array Z Arm Ay	
V1P2 Head CG Ax	
V1P2 Head CG Ay	
V1P2 Head CG Az	
V1P2 Head CG Red Ax	
V1P2 Head CG Red Ay	
V1P2 Head CG Red Az	
V1P2 Upper Neck Fx	
V1P2 Upper Neck Fy	
V1P2 Upper 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	
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	

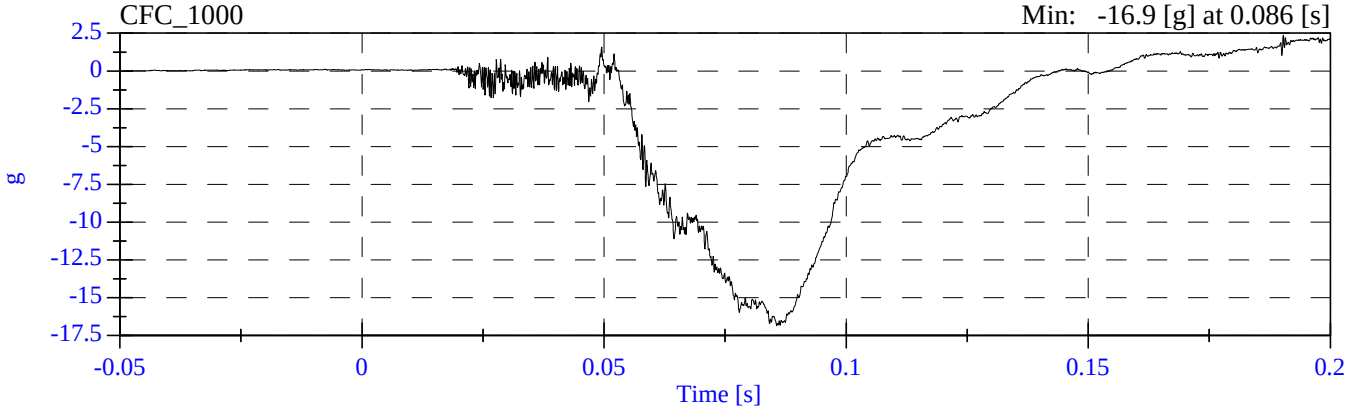
TEST NOTES	
Data Channel	Anomalies
V1P2 HEAD9 ARRAY Y ARM Az	QUESTIONABLE DATA
V1 ENGINE TOP #3X	QUESTIONABLE DATA
V1 ENGINE BOTTOM #4X	TRANSDUCER FAILED
V1 LEFT CALIPER #7X	TRANSDUCER FAILED

2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

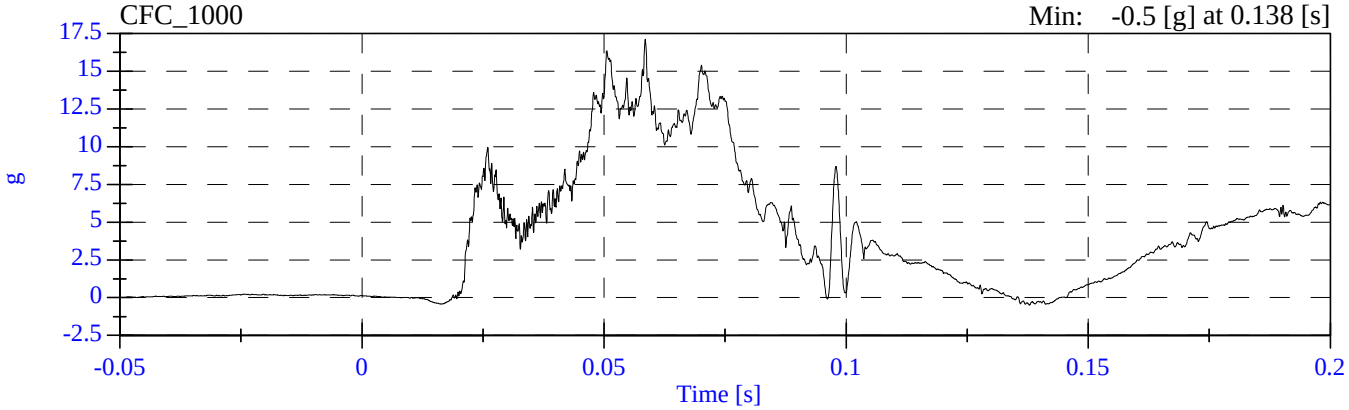
V1P1 Head CG x
CFC_1000
Max: 2.0 [g] at 0.200 [s]
Min: -43.4 [g] at 0.070 [s]



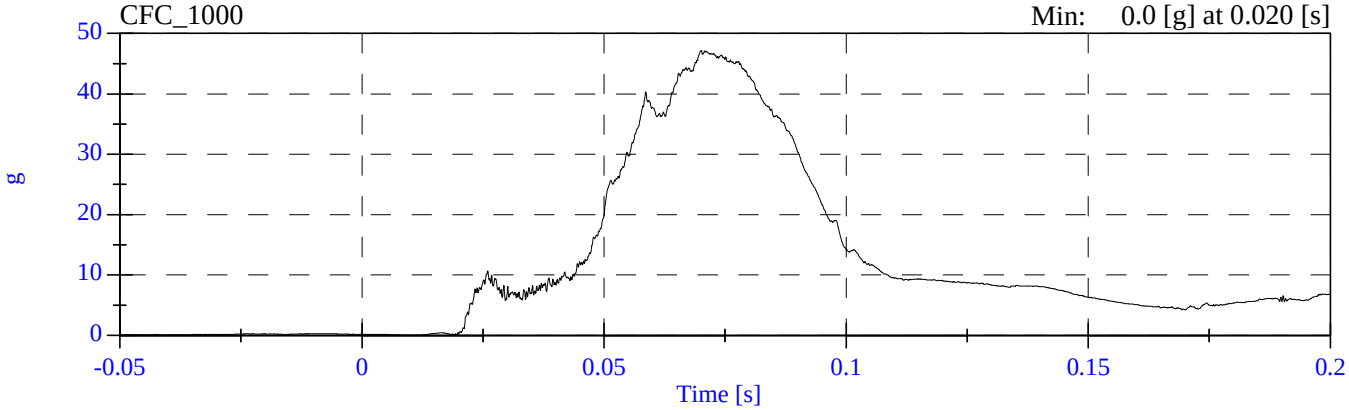
V1P1 Head CG y
CFC_1000
Max: 2.4 [g] at 0.190 [s]
Min: -16.9 [g] at 0.086 [s]



V1P1 Head CG z
CFC_1000
Max: 17.1 [g] at 0.059 [s]
Min: -0.5 [g] at 0.138 [s]

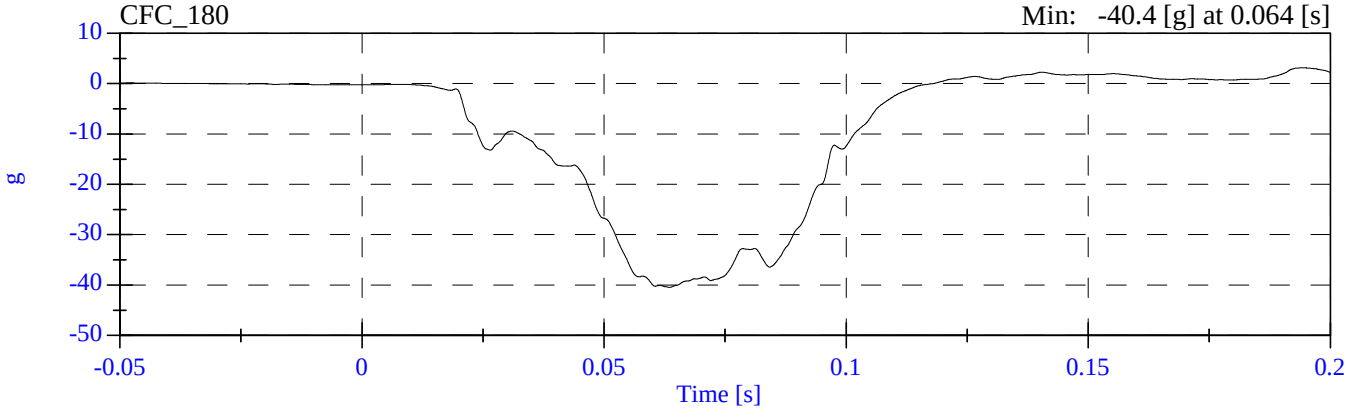


V1P1 Head CG Resultant
CFC_1000
Max: 47.2 [g] at 0.070 [s]
Min: 0.0 [g] at 0.020 [s]

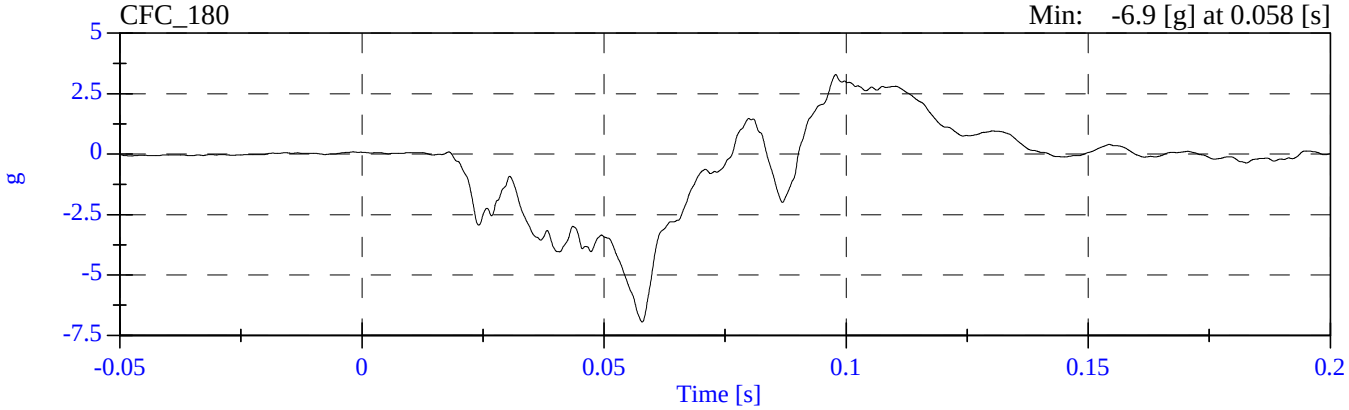


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

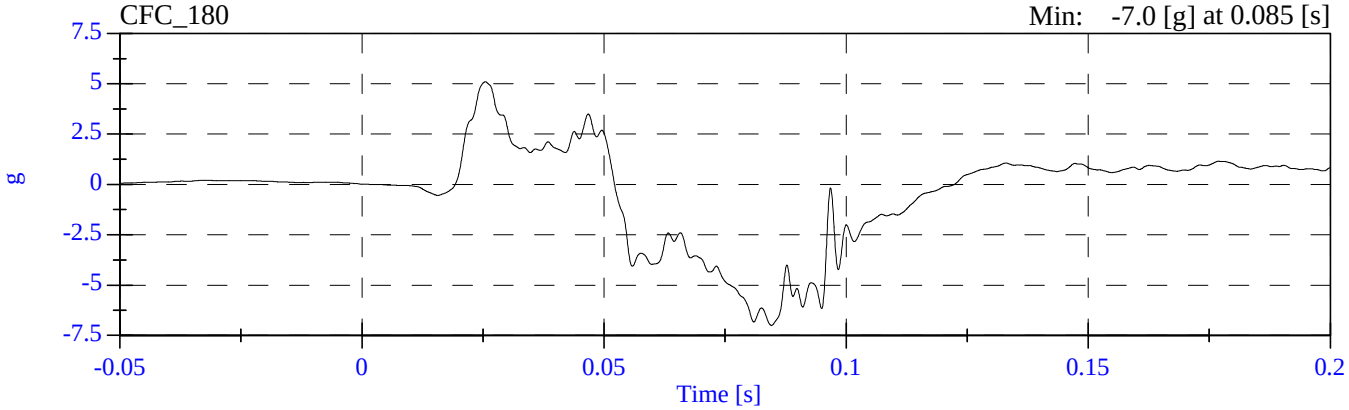
V1P1 Chest x
CFC_180
Max: 3.1 [g] at 0.194 [s]
Min: -40.4 [g] at 0.064 [s]



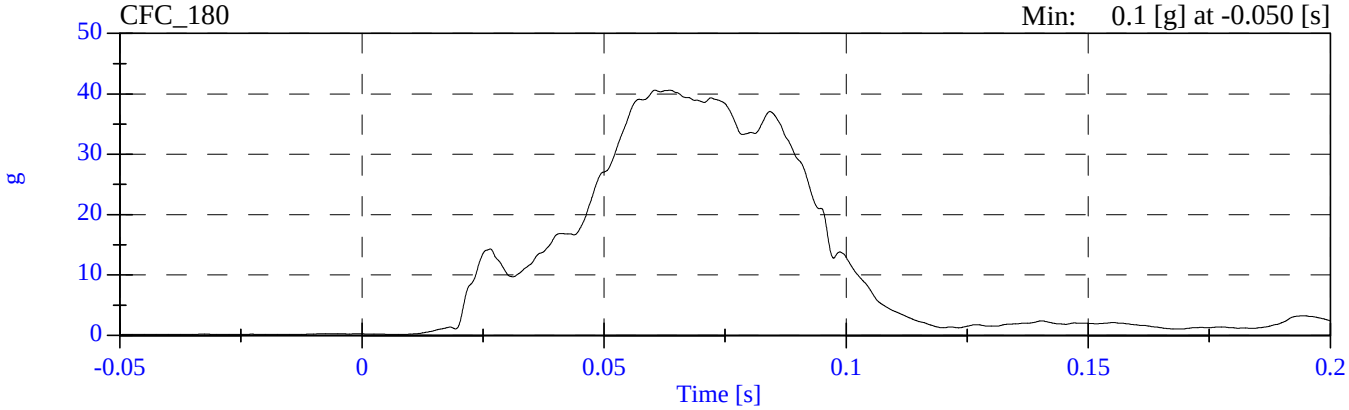
V1P1 Chest y
CFC_180
Max: 3.3 [g] at 0.098 [s]
Min: -6.9 [g] at 0.058 [s]



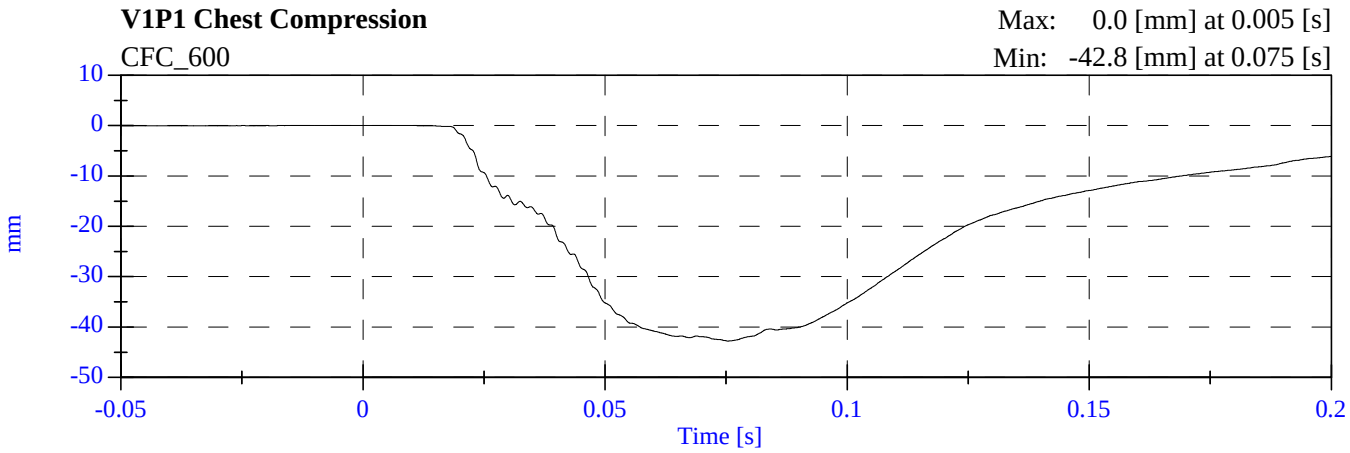
V1P1 Chest z
CFC_180
Max: 5.1 [g] at 0.026 [s]
Min: -7.0 [g] at 0.085 [s]



V1P1 Chest Resultant
CFC_180
Max: 40.6 [g] at 0.060 [s]
Min: 0.1 [g] at -0.050 [s]

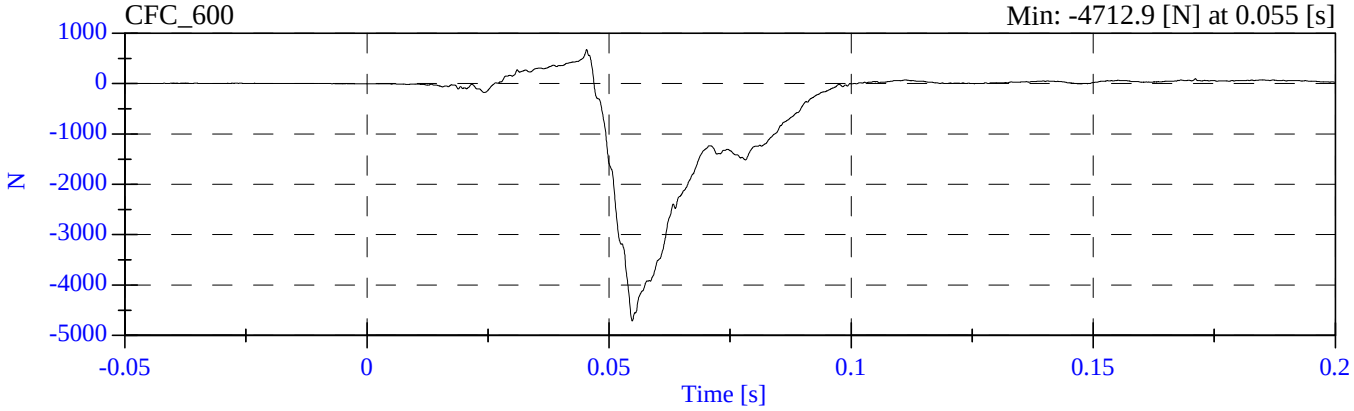


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

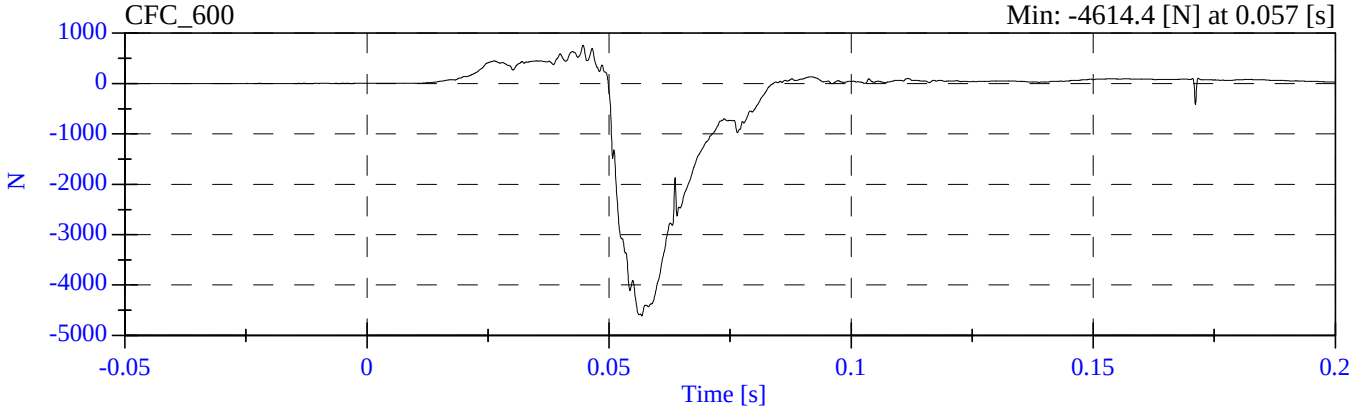


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

V1P1 Left Femur
CFC_600
Max: 676.7 [N] at 0.045 [s]
Min: -4712.9 [N] at 0.055 [s]

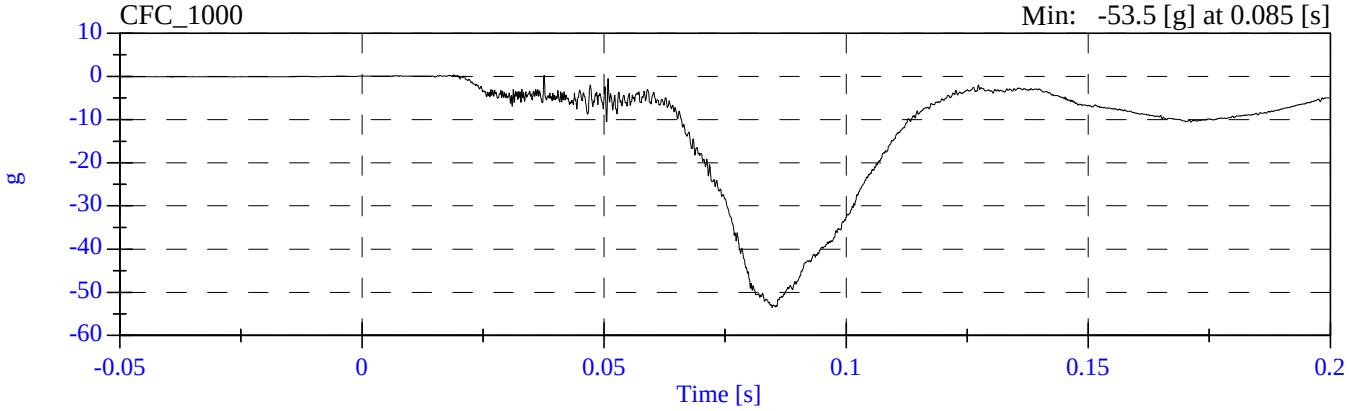


V1P1 Right Femur
CFC_600
Max: 761.8 [N] at 0.045 [s]
Min: -4614.4 [N] at 0.057 [s]

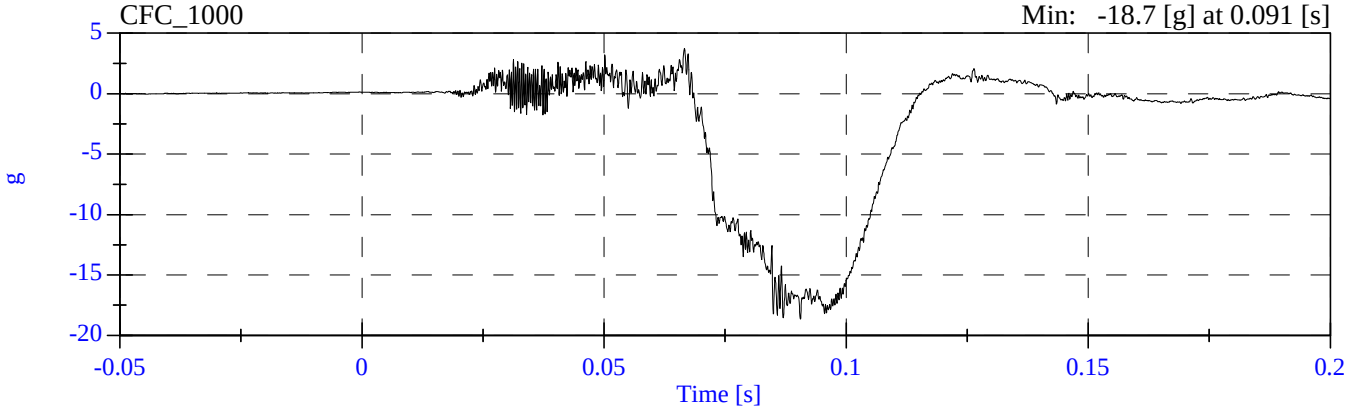


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

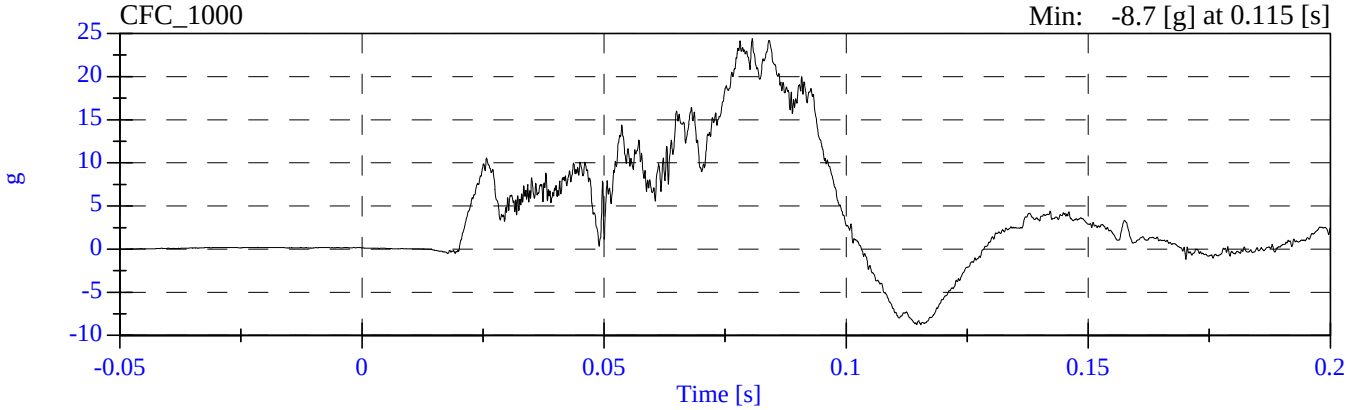
V1P2 Head CG x
CFC_1000
Max: 0.3 [g] at 0.019 [s]
Min: -53.5 [g] at 0.085 [s]



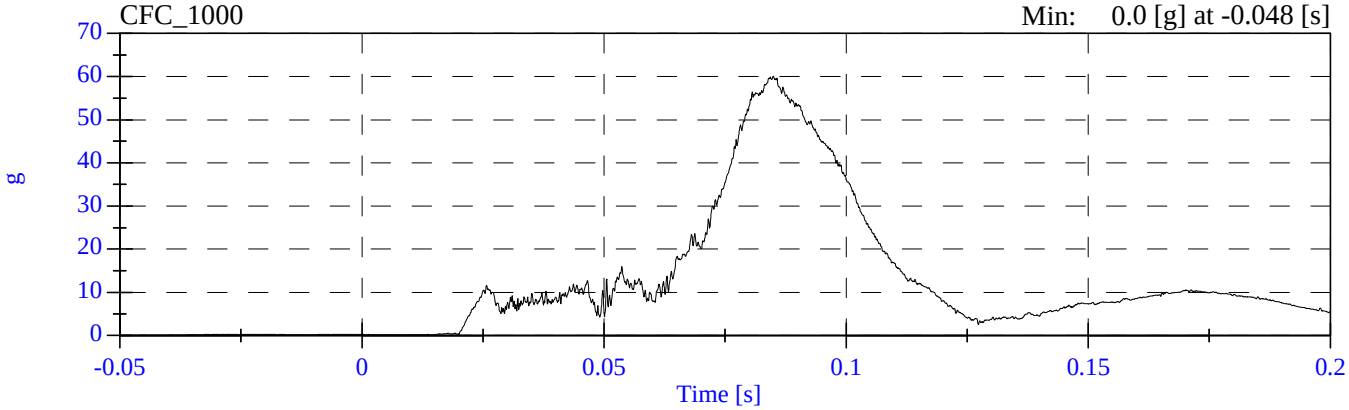
V1P2 Head CG y
CFC_1000
Max: 3.7 [g] at 0.067 [s]
Min: -18.7 [g] at 0.091 [s]



V1P2 Head CG z
CFC_1000
Max: 24.4 [g] at 0.081 [s]
Min: -8.7 [g] at 0.115 [s]

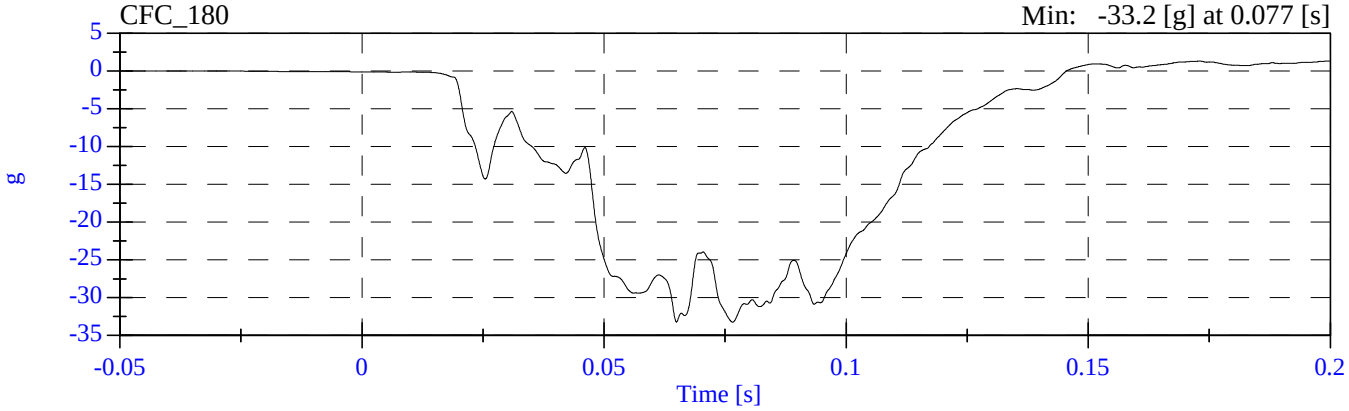


V1P2 Head CG Resultant
CFC_1000
Max: 60.1 [g] at 0.085 [s]
Min: 0.0 [g] at -0.048 [s]

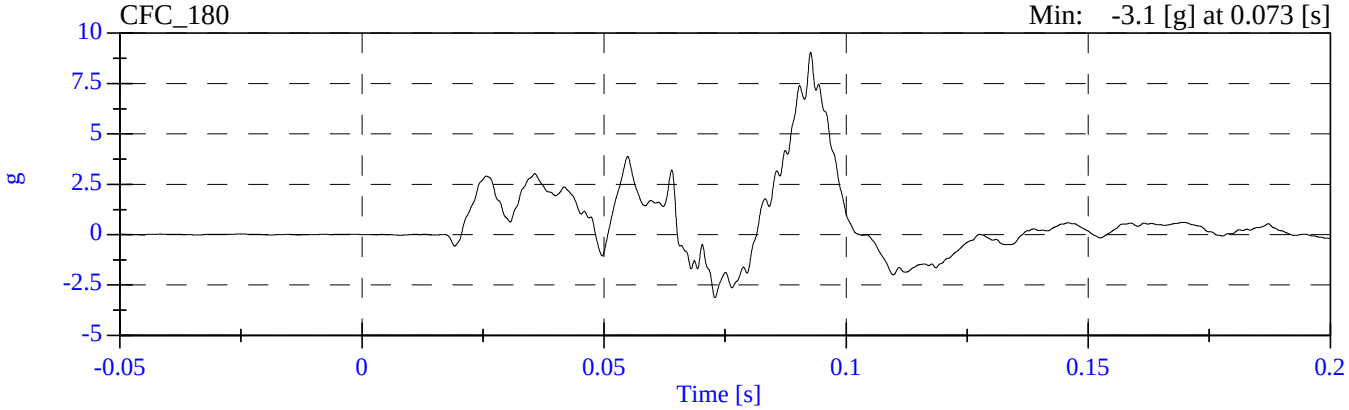


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

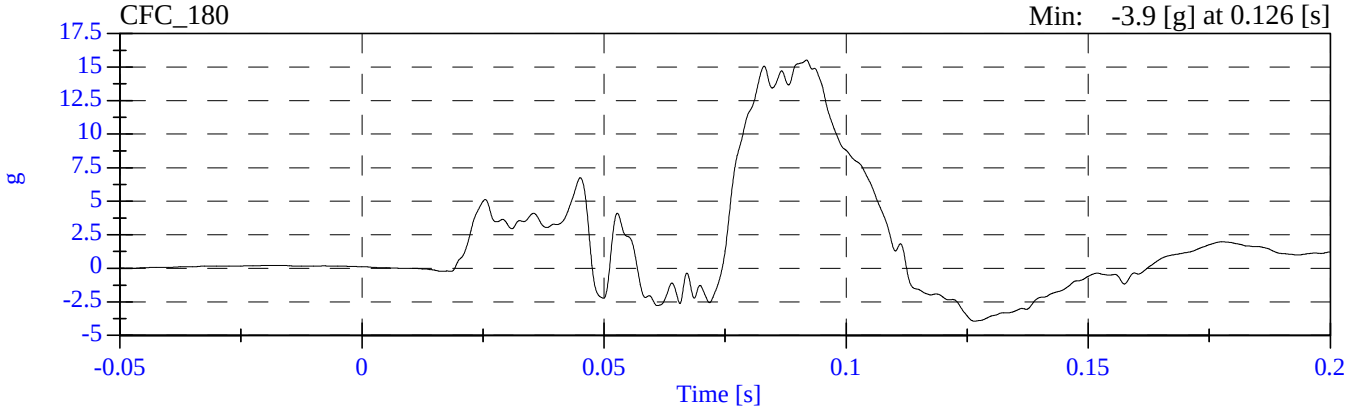
V1P2 Chest x
CFC_180
Max: 1.3 [g] at 0.200 [s]
Min: -33.2 [g] at 0.077 [s]



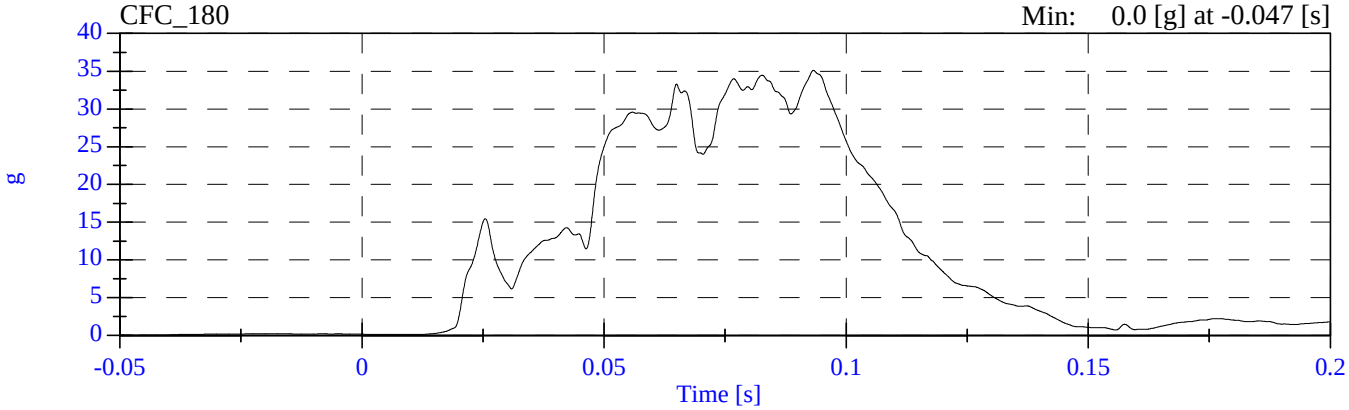
V1P2 Chest y
CFC_180
Max: 9.1 [g] at 0.093 [s]
Min: -3.1 [g] at 0.073 [s]



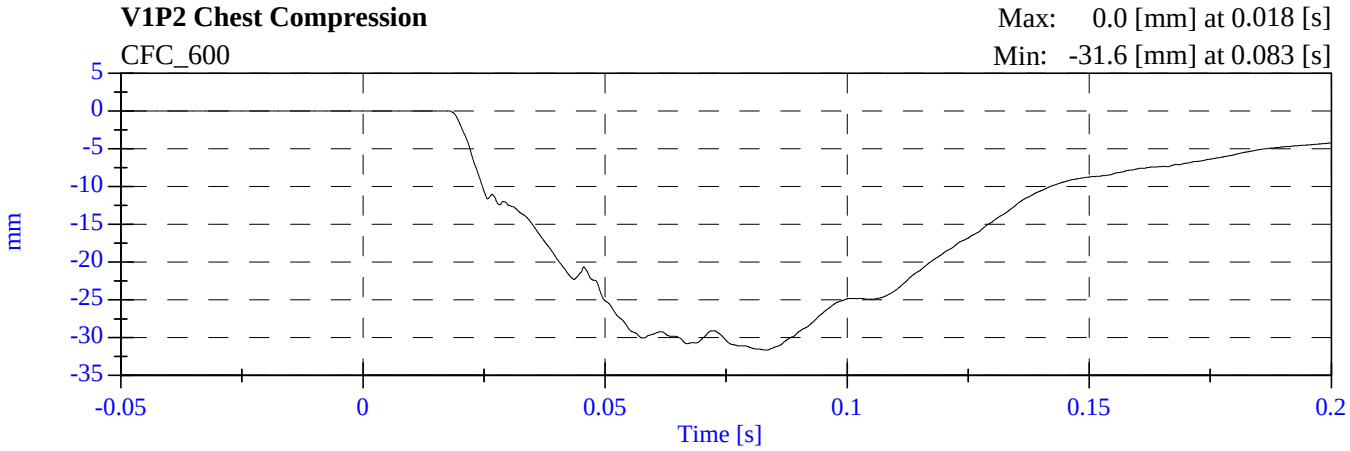
V1P2 Chest z
CFC_180
Max: 15.5 [g] at 0.092 [s]
Min: -3.9 [g] at 0.126 [s]



V1P2 Chest Resultant
CFC_180
Max: 35.1 [g] at 0.093 [s]
Min: 0.0 [g] at -0.047 [s]

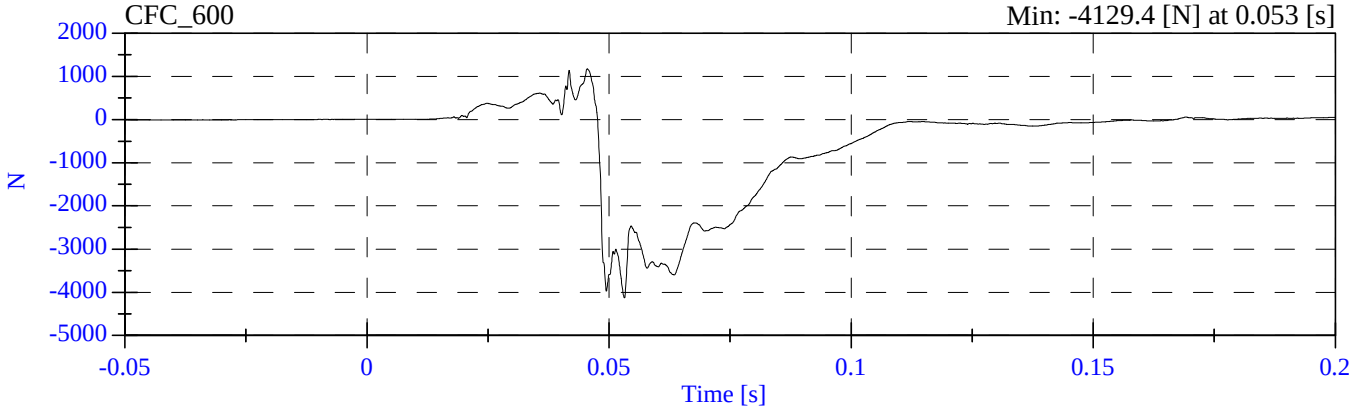


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

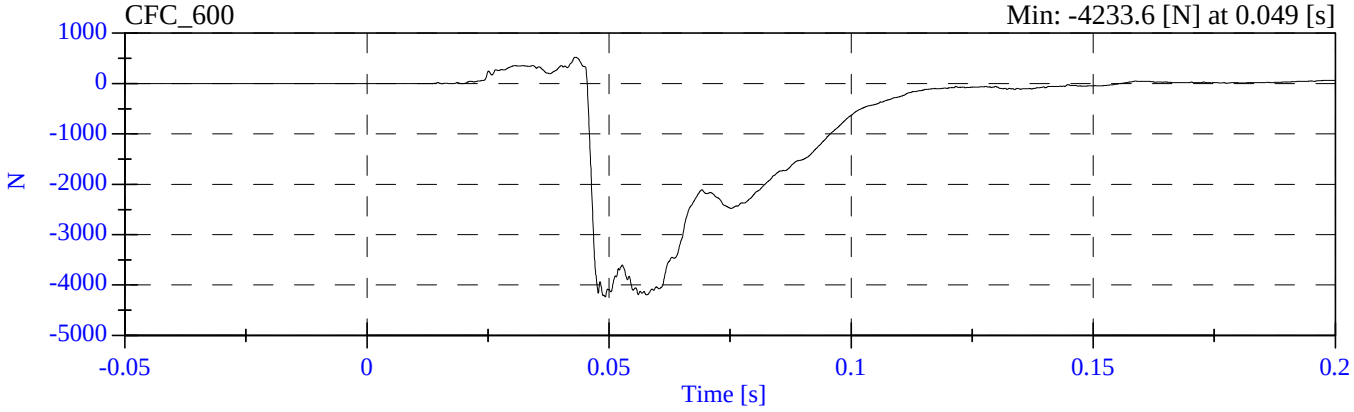


2006 NCAP Test 10 - 2006 Kia Sedona
M60512 - February 02, 2006

V1P2 Left Femur
CFC_600
Max: 1174.8 [N] at 0.046 [s]
Min: -4129.4 [N] at 0.053 [s]



V1P2 Right Femur
CFC_600
Max: 523.9 [N] at 0.043 [s]
Min: -4233.6 [N] at 0.049 [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.

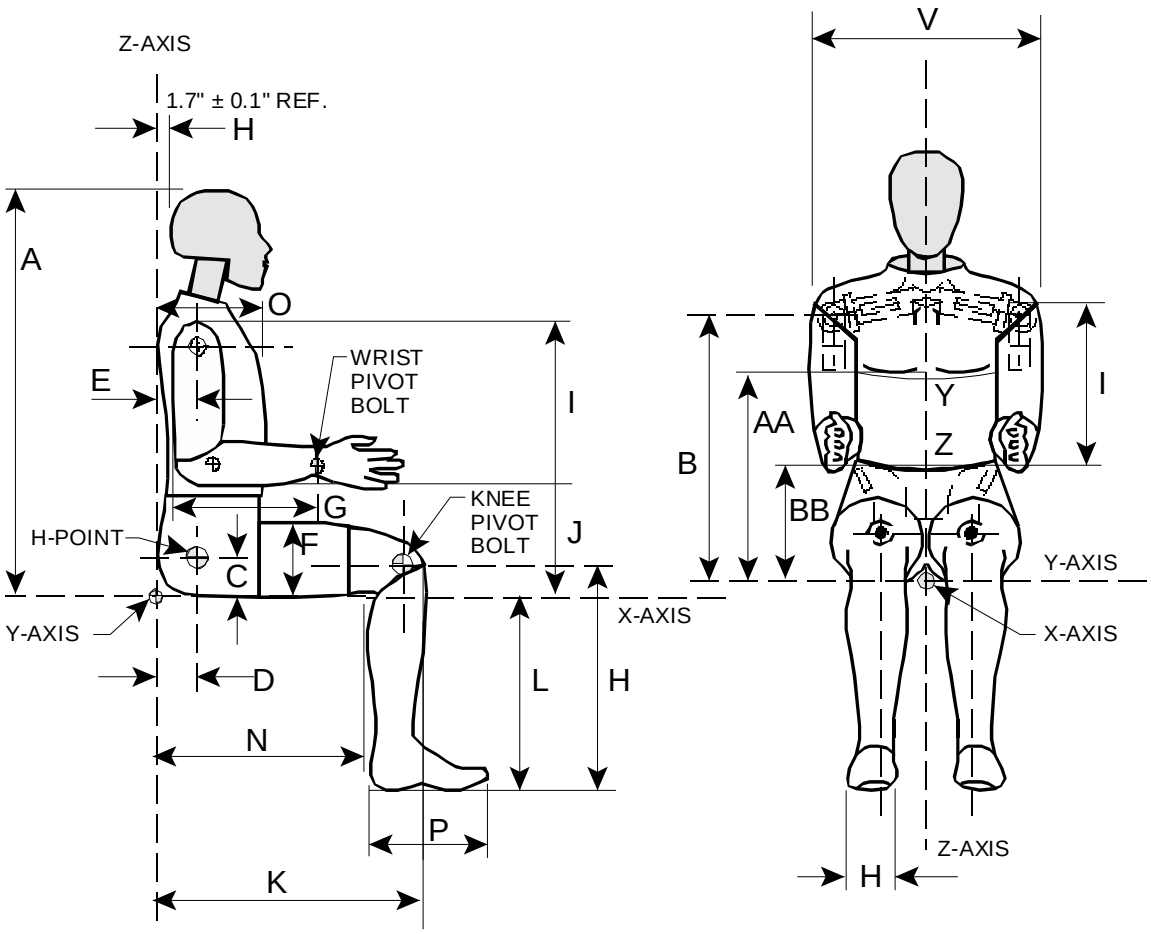
Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	142	January 26, 2006
#2/Right Front Passenger	150	January 26, 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	2
Date	January 23, 2006
Workfile	142H 01-23-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	33.00
Peak Resultant Acceleration	225-275 G's	253.11
Peak Lateral Acceleration	15 G's Max	4.43
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	142	
Sequential Test Number	2	
Date	January 24, 2006	6 Axis Neck Transducer
Workfile	142NF1 01-24-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	28.00
Impact Velocity		6.89 – 7.13 m/s	7.00
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.50
	20 ms	17.60 - 22.60 G's	22.51
	30 ms	12.50 - 18.50 G's	15.53
Max Pendulum G's Above 30 ms		29 G's Max	15.53
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.50
D Plane Rotation	Max	64 - 78 Deg	64.56
	Time	57 - 64 ms	57.50
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	98.70
	Time	47 - 58 ms	49.90
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.20
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.10

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	142	
Sequential Test Number	2	
Date	January 24, 2006	6 Axis Neck Transducer
Workfile	142NE 01-24-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	28.00
Impact Velocity		5.94 – 6.19 m/s	6.07
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.47
	20 ms	14.00 - 19.00 G's	17.09
	30 ms	11.00 - 16.00 G's	13.95
Max Pendulum G's Above 30 ms		22 G's Max	13.95
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	44.60
D Plane Rotation	Max	81 - 106 Deg	92.37
	Time	72 - 82 ms	75.90
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-70.26
	Time	65 - 79 ms	70.40
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	159.10
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	134.50

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	142
Sequential Test Number	2
Date	January 25, 2006
Workfile	142T 01-25-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.11
Relative Humidity	10% - 70%	37.00
Pendulum Velocity	6.58 – 6.83 m/s	6.65
Maximum Deflection	64.52 – 72.64 mm	65.28
Maximum Resistive Force	5159.9 – 5893.9 N	5535.10
Internal Hysteresis	69 - 85 %	76.11

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	142
Sequential Test Number	2
Date	January 26, 2006
Workfile	142LF 01-26-06/142RF 01-26-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	29.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4951.23
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	29.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4754.30

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 142
Sequential Test Number 2
Date January 26, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21
Relative Humidity			38
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	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.2
Buttock Popliteal Length	N	17.8 - 18.8 in	18.7
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	38.8
Waist Circumference	Z	32.9 - 34.1 in	33.0

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number	150
Sequential Test Number	2
Date	January 23, 2006
Workfile	150H 01-23-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	35.00
Peak Resultant Acceleration	225-275 G's	259.21
Peak Lateral Acceleration	15 G's Max	1.13
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	150	
Sequential Test Number	2	
Date	January 24, 2006	6 Axis Neck Transducer
Workfile	150NF 01-24-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	28.00
Impact Velocity		6.89 – 7.13 m/s	6.99
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.82
	20 ms	17.60 - 22.60 G's	22.33
	30 ms	12.50 - 18.50 G's	16.02
Max Pendulum G's Above 30 ms		29 G's Max	16.02
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.60
D Plane Rotation	Max	64 - 78 Deg	67.10
	Time	57 - 64 ms	59.00
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	92.43
	Time	47 - 58 ms	54.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	117.90
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	99.60

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	150	
Sequential Test Number	2	
Date	January 24, 2006	6 Axis Neck Transducer
Workfile	150NE 01-24-06	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	28.00
Impact Velocity		5.94 – 6.19 m/s	6.13
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.37
	20 ms	14.00 - 19.00 G's	18.96
	30 ms	11.00 - 16.00 G's	15.28
Max Pendulum G's Above 30 ms		22 G's Max	15.28
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.50
D Plane Rotation	Max	81 - 106 Deg	92.16
	Time	72 - 82 ms	72.00
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-69.84
	Time	65 - 79 ms	66.90
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	153.90
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	130.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number	150
Sequential Test Number	2
Date	January 25, 2006
Workfile	150T 01-25-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.11
Relative Humidity	10% - 70%	37.00
Pendulum Velocity	6.58 – 6.83 m/s	6.66
Maximum Deflection	64.52 – 72.64 mm	64.77
Maximum Resistive Force	5159.9 – 5893.9 N	5565.93
Internal Hysteresis	69 - 85 %	74.36

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number	150
Sequential Test Number	2
Date	January 26, 2006
Workfile	150LF 01-26-06/150RF 01-26-06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	29.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5192.00
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	29.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5194.54

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 150
Sequential Test Number 2
Date January 26, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21
Relative Humidity			38
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	5.5
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	13.2
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 9 Array	X Arm Y	ENDEVCO	AC-J35933	31-Jan-06	31-Jul-06
	X Arm Z	ENDEVCO	AC-J36038	31-Jan-06	31-Jul-06
	Y Arm X	ENDEVCO	AC-J36605	31-Jan-06	31-Jul-06
	Y Arm Z	ENDEVCO	AC-J21907	31-Jan-06	31-Jul-06
	Z Arm X	ENDEVCO	AC-J19843	31-Jan-06	31-Jul-06
	Z Arm Y	ENDEVCO	AC-AJ507	31-Jan-06	31-Jul-06
Head	X	ENDEVCO	AC-J14189	31-Jan-06	31-Jul-06
	Y	ENDEVCO	AC-J20125	31-Jan-06	31-Jul-06
	Z	ENDEVCO	AC-J36744	31-Jan-06	31-Jul-06
Head	X (R)	ENDEVCO	AC-J21989	31-Jan-06	31-Jul-06
	Y (R)	ENDEVCO	AC-J35921	31-Jan-06	31-Jul-06
	Z (R)	ENDEVCO	AC-ACCY2	31-Jan-06	31-Jul-06
Neck Load Cell	X	DENTON	LC-297Fx	13-Jul-05	10-Jan-06
	Y	DENTON	LC-297Fy	13-Jul-05	10-Jan-06
	Z	DENTON	LC-297Fz	13-Jul-05	10-Jan-06
Neck Moment	X	DENTON	LC-297Mx	13-Jul-05	10-Jan-06
	Y	DENTON	LC-297My	13-Jul-05	10-Jan-06
	Z	DENTON	LC-297Mz	13-Jul-05	10-Jan-06
Chest	X	ENDEVCO	AC-AC9F9	31-Jan-06	31-Jul-06
	Y	ENDEVCO	AC-P16194	31-Jan-06	31-Jul-06
	Z	ENDEVCO	AC-J14688	31-Jan-06	31-Jul-06
Chest	X (R)	ENDEVCO	AC-AAK48	31-Jan-06	31-Jul-06
	Y (R)	ENDEVCO	AC-AAKB1	31-Jan-06	31-Jul-06
	Z (R)	ENDEVCO	AC-J27517	31-Jan-06	31-Jul-06
Chest Deflection	X	SERVO	DS-142	28-Jun-05	26-Dec-05
Pelvic	X	ENDEVCO	AC-AJ5R0	31-Jan-06	31-Jul-06
	Y	ENDEVCO	AC-J22036	31-Jan-06	31-Jul-06
	Z	ENDEVCO	AC-J17649	31-Jan-06	31-Jul-06

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 142)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-729	20-Feb-05	20-Aug-05
Right Femur Load Cell	Fz	GSE	LC-631	16-Feb-05	16-Aug-05
Left Upper Tibia	Mx	DENTON	LC-266Mx	24-Jun-05	22-Dec-05
	My	DENTON	LC-266My	24-Jun-05	22-Dec-05
Left Lower Tibia	Fz	DENTON	LC-179Fz	22-Jun-05	20-Dec-05
	Mx	DENTON	LC-179Mx	22-Jun-05	20-Dec-05
	My	DENTON	LC-179My	22-Jun-05	20-Dec-05
Right Upper Tibia	Mx	DENTON	LC-265Mx	28-Jun-05	26-Dec-05
	My	DENTON	LC-265My	28-Jun-05	26-Dec-05
Right Lower Tibia	Fz	DENTON	LC-178Fz	28-Jun-05	26-Dec-05
	Mx	DENTON	LC-178Mx	28-Jun-05	26-Dec-05
	My	DENTON	LC-178My	28-Jun-05	26-Dec-05
Left Foot Rear	X	ENTRAN	AC-02I02I05-F06	01-Feb-06	01-Aug-06
	Z	ENTRAN	AC-01G18-F14	01-Feb-06	01-Aug-06
Left Foot Front	Z	ENTRAN	AC-99H30-Z13	01-Feb-06	01-Aug-06
Right Foot Rear	X	ENTRAN	AC-02I20I16-A13	01-Feb-06	01-Aug-06
	Z	ENTRAN	AC-03D03D16-F01	01-Feb-06	01-Aug-06
Right Foot Front	Z	ENTRAN	AC-00L20-A15	31-Jan-06	31-Jul-06
Lap Belt Load Cell		First Technology	LC-159	01-Oct-05	31-Mar-06
Shoulder Belt Load Cell		First Technology	LC-178	01-Oct-05	31-Mar-06
Belt Stretch Transducer		-	-	-	-

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-J27470	30-Jan-06	30-Jul-06
	X Arm Z	ENDEVCO	AC-J36741	30-Jan-06	30-Jul-06
	Y Arm X	ENDEVCO	AC-J20027	27-Jan-06	27-Jul-06
	Y Arm Z	ENDEVCO	AC-J21988	30-Jan-06	30-Jul-06
	Z Arm X	ENDEVCO	AC-AAKC6	27-Jan-06	27-Jul-06
	Z Arm Y	ENDEVCO	AC-AAKD0	30-Jan-06	30-Jul-06
Head	X	ENDEVCO	AC-J20061	30-Jan-06	30-Jul-06
	Y	ENDEVCO	AC-AJ4F8	30-Jan-06	30-Jul-06
	Z	ENDEVCO	AC-AHRW5	30-Jan-06	30-Jul-06
Head	X (R)	ENDEVCO	AC-AJ7Y4	30-Jan-06	30-Jul-06
	Y (R)	ENDEVCO	AC-AJ454	30-Jan-06	30-Jul-06
	Z (R)	ENDEVCO	AC-J19563	30-Jan-06	30-Jul-06
Neck Load Cell	X	DENTON	LC-157Fx	14-Jul-05	11-Jan-06
	Y	DENTON	LC-157Fy	14-Jul-05	11-Jan-06
	Z	DENTON	LC-157Fz	14-Jul-05	11-Jan-06
Neck Moment	X	DENTON	LC-157Mx	14-Jul-05	11-Jan-06
	Y	DENTON	LC-157My	14-Jul-05	11-Jan-06
	Z	DENTON	LC-157Mz	14-Jul-05	11-Jan-06
Chest	X	ENDEVCO	AC-J20580	30-Jan-06	30-Jul-06
	Y	ENDEVCO	AC-J20018	30-Jan-06	30-Jul-06
	Z	ENDEVCO	AC-J20569	30-Jan-06	30-Jul-06
Chest	X (R)	ENDEVCO	AC-J21963	30-Jan-06	30-Jul-06
	Y (R)	ENDEVCO	AC-P16755	30-Jan-06	30-Jul-06
	Z (R)	ENDEVCO	AC-J14667	30-Jan-06	30-Jul-06
Chest Deflection	X	SERVO	DS-150	23-Jun-05	21-Dec-05
Pelvic	X	ENDEVCO	AC-J34378	27-Jan-06	27-Jul-06
	Y	ENDEVCO	AC-J23757	27-Jan-06	27-Jul-06
	Z	ENDEVCO	AC-J27513	27-Jan-06	27-Jul-06

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

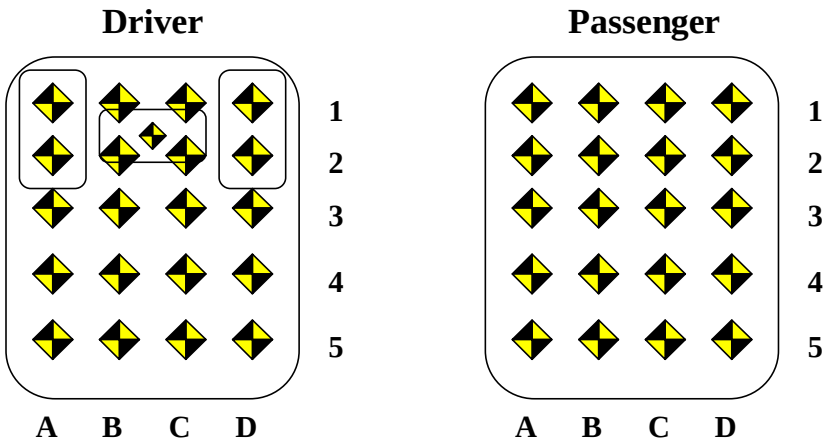
PASSENGER DUMMY (S/N 150)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-261	02-Jul-05	30-Dec-05
Right Femur Load Cell	Fz	DENTON	LC-264	02-Jul-05	30-Dec-05
Left Upper Tibia	Mx	DENTON	LC-263Mx	29-Jun-05	27-Dec-05
	My	DENTON	LC-263My	29-Jun-05	27-Dec-05
Left Lower Tibia	Fz	DENTON	LC-174Fz	28-Jun-05	26-Dec-05
	Mx	DENTON	LC-174Mx	28-Jun-05	26-Dec-05
	My	DENTON	LC-174My	28-Jun-05	26-Dec-05
Right Upper Tibia	Mx	DENTON	LC-268Mx	27-Jun-05	25-Dec-05
	My	DENTON	LC-268My	27-Jun-05	25-Dec-05
Right Lower Tibia	Fz	DENTON	LC-196Fz	27-Jun-05	25-Dec-05
	Mx	DENTON	LC-196Mx	27-Jun-05	25-Dec-05
	My	DENTON	LC-196My	27-Jun-05	25-Dec-05
Left Foot Rear	X	ENDEVCO	AC-J19223	30-Jan-06	30-Jul-06
	Z	ENDEVCO	AC-J20083	30-Jan-06	30-Jul-06
Left Foot Front	Z	ENTRAN	AC-04J04J07-M02	30-Jan-06	30-Jul-06
Right Foot Rear	X	ENDEVCO	AC-J35747	30-Jan-06	30-Jul-06
	Z	ENDEVCO	AC-J27496	30-Jan-06	30-Jul-06
Right Foot Front	Z	ENDEVCO	AC-J36723	30-Jan-06	30-Jul-06
Lap Belt Load Cell		First Technology	LC-168	01-Oct-05	31-Mar-06
Shoulder Belt Load Cell		First Technology	LC-173	01-Oct-05	31-Mar-06
Belt Stretch Transducer		-	-	-	-

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	16-Apr-06
Right Rear Seat Crossmember X	GS SENSORS	AC-9440-023	17-Oct-05	16-Apr-06
Top of Engine	ICS	AC-FGP22	12-Oct-05	11-Apr-06
Bottom of Engine	GS SENSORS	AC-9440-024	13-Oct-05	12-Apr-06
Right Disc Brake Caliper	ICS	AC-9026-042	13-Oct-05	12-Apr-06
Left Disc Brake Caliper	GS SENSORS	AC-9440-029	12-Oct-05	11-Apr-06
Left Seat Rear Crossmember Z	ICS	AC-FGP29	17-Oct-05	16-Apr-06
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-046	17-Oct-05	16-Apr-06

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

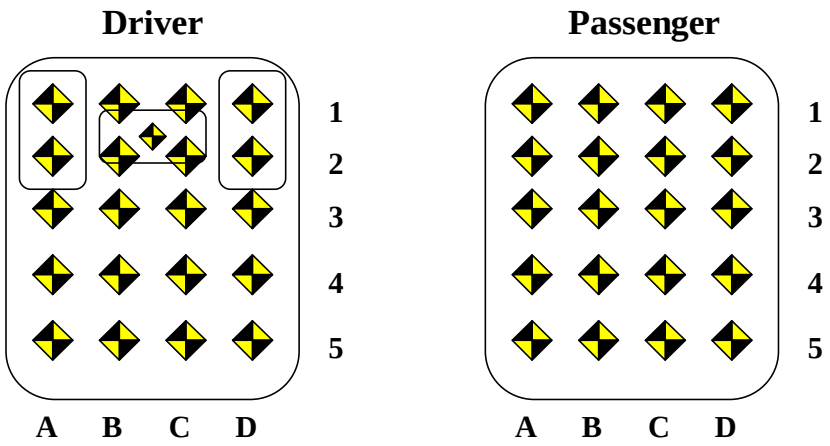


Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3707	-603	-508	3700	-587	-509	7	-16	1
B1	3860	-499	-496	3811	-478	-513	49	-21	17
C1	3872	-378	-497	3801	-361	-526	71	-17	29
D1	3872	-258	-497	3769	-243	-531	103	-15	34
A2	3633	-605	-457	3627	-592	-456	6	-13	-1
B2	3799	-496	-449	3790	-484	-454	9	-12	5
C2	3794	-373	-448	3770	-363	-447	24	-10	-1
D2	3795	-252	-449	3739	-248	-451	56	-4	2
A3	3569	-606	-410	3565	-597	-406	4	-9	-4
B3	3642	-490	-416	3636	-485	-422	6	-5	6
C3	3645	-372	-414	3637	-366	-433	8	-6	19
D3	3649	-246	-414	3622	-237	-426	27	-9	12
A4	3546	-607	-408	3542	-598	-407	4	-9	-1
B4	3578	-490	-419	3577	-484	-419	1	-6	0
C4	3581	-370	-419	3579	-362	-428	2	-8	9
D4	3586	-248	-420	3585	-241	-431	1	-7	11
A5	3513	-609	-410	3514	-600	-410	-1	-9	0
B5	3518	-489	-418	3515	-482	-417	3	-7	-1
C5	3522	-369	-417	3521	-359	-424	1	-10	7
D5	3526	-246	-418	3528	-234	-423	-2	-12	5
BP	3689	-423	-579	3656	-421	-588	33	-2	9
G	3497	-587	-820	3487	-589	-826	10	2	6
H	3509	-284	-819	3485	-284	-834	24	0	15
L	3240	-419	-1106	3229	-448	-1125	11	29	19
AB	3174	-639	-423	3173	-634	-419	1	-5	-4

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	3877	256	-502	3698	273	-571	179	-17	69
B1	3863	373	-499	3709	386	-551	154	-13	52
C1	3847	492	-506	3767	475	-528	80	17	22
D1	3753	615	-498	3735	610	-504	18	5	6
A2	3807	255	-457	3719	260	-493	88	-5	36
B2	3808	377	-457	3734	375	-482	74	2	25
C2	3800	493	-456	3748	490	-469	52	3	13
D2	3743	617	-461	3734	608	-466	9	9	5
A3	3752	251	-426	3723	251	-434	29	0	8
B3	3756	376	-428	3742	370	-428	14	6	0
C3	3753	496	-428	3750	490	-426	3	6	-2
D3	3733	618	-425	3730	609	-428	3	9	3
A4	3639	255	-414	3630	245	-409	9	10	-5
B4	3641	376	-414	3631	375	-407	10	1	-7
C4	3636	494	-416	3636	491	-412	0	3	-4
D4	3643	615	-411	3640	616	-407	3	-1	-4
A5	3526	253	-419	3523	249	-422	3	4	3
B5	3526	378	-421	3523	377	-423	3	1	2
C5	3521	498	-422	3523	497	-415	-2	1	-7
D5	3523	618	-412	3520	617	-412	3	1	0
R	3509	303	-818	3459	306	-827	50	-3	9
S	3500	573	-817	3476	577	-821	24	-4	4
AB	3174	646	-427	3172	648	-425	2	-2	-2

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