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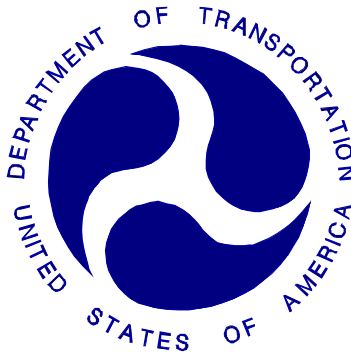
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

KIA MOTORS CORPORATION
2007 KIA SPECTRA
4-DOOR SEDAN

NHTSA NUMBER: M70507

CALSPAN TEST NUMBER: 8806-NCAP-06

CALSPAN CORPORATION
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December 14, 2006

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
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16. <i>Abstract</i> A frontal load cell barrier test of a 2007 Kia Spectra 4-Door Sedan was performed at Calspan Corporation's crash test facility in Buffalo, New York, on December 14, 2006. The impact velocity was 56.33 kph and the temperature at the barrier face was 21.0°C. The maximum post-test vehicle crush was 493 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: <table border="1"> <thead> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Driver (064)</th> <th>Passenger (061)</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC - 36 ms)</td> <td>-</td> <td>1000</td> <td>500.5</td> <td>344.2</td> </tr> <tr> <td>Maximum Thorax Acceleration (3 ms Clip)</td> <td>g's</td> <td>60 g's</td> <td>43.3</td> <td>38.6</td> </tr> <tr> <td>Chest Displacement</td> <td>mm</td> <td>-76 mm</td> <td>-25.7</td> <td>-25.4</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>-10000 N</td> <td>1424</td> <td>-2091.0</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>-10000 N</td> <td>-4113.2</td> <td>-914.1</td> </tr> </tbody> </table>						Measurement Description	Units	Threshold	Driver (064)	Passenger (061)	Head Injury Criteria (HIC - 36 ms)	-	1000	500.5	344.2	Maximum Thorax Acceleration (3 ms Clip)	g's	60 g's	43.3	38.6	Chest Displacement	mm	-76 mm	-25.7	-25.4	Left Femur Force	Newtons	-10000 N	1424	-2091.0	Right Femur Force	Newtons	-10000 N	-4113.2	-914.1
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17. <i>Key Words</i> 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. <i>Distribution Statement</i> <u>Copies of this report are available from:</u> NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5111 Washington, DC 20590																																
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.33 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-D-00024. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.33 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.33 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 head, 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. 064) and the right-front passenger (position 2) ATD (Serial No.061) 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 105 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Appendix C contains the dummy calibration data and Appendix D contains the transducer calibration dates.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 load cells was impacted by a 2007 Kia Spectra 4-Door Sedan at a velocity of 56.33 kph. The test was performed at Calspan on December 14, 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	500.5	51.8	79.8	43.3	59.8	62.8	-25.7	-289.5	-4113.2
Passenger	344.2	66.0	101.5	38.6	83.9	87.7	-25.4	-2091.0	-914.1

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

TEST NOTES	
Data Channel	Anomalies
V1P2 Right Lower Tibia My	Channel Opened: 33 ms
V1P2 Left Foot Aft z	Data Spike: 150 ms

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M70507 Test Mode: 56.3 kph Frontal Barrier
 Test Date: December 14, 2006 Time: 14:00 Temperature: 21.0 °C
 Vehicle Make/Model/Body Style: 2007 Kia Spectra 4-Door Sedan
 Vehicle Test Weight: 1501 kg Impact Velocity: 56.33 kph (55.5 – 57.1 kph)
 Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 493 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	Seatbelt, Airbag, Knee Bolster	Seatbelt, Airbag, Knee Bolster
Head Contact:	Back of head to headrest, Airbag	Back of head to headrest, Airbag
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	Unlocked	Unlocked
Front Door Opening	Closed / Operable	Closed / Operable
Rear Door Opening	Closed / Operable	Closed / Operable
Hatch/Other Door Opening	Closed / Operable	
Front Seat Track Shift (mm)	10	5
Front Seat Back Failure	None	None
Glazing Damage	Cracks on passenger side from airbag deployment	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	397	395	431	408

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	865	845
Lap belt length as measured on ATD	mm	831	839
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	0	0

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2007 Kia Spectra 4-Door Sedan

NHTSA No. : M70507 ; VIN: KNAFE122775379847 ; Color: Red

Engine Data: 4 cylinders; - CID; 2.0 Liters; - cc

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

Transmission Data: 4 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)? - Yes; x No;

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

DEALER AND DELIVERY INFORMATION:

Date Received: 11/30/06 ; Odometer Reading 50 km

Selling Dealer: West-Herr KIA

Dealer Address: 5140 Camp Rd Hamburg, NY 14075

TEST VEHICLE OPTIONS:

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

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

SAFETY BELT FEATURES:

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

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

AIRBAG FEATURES:

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

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Kia Motors Corporation

Date of Manufacture 10/06

GVWR: 1780 kg; GAWR: 980 kg FRONT; 960 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) = 385.0 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 44.8 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 =	413	408	62.6	821.0
Rear =	248	242	37.4	490.0
Total Delivered Weight (UDW) =				1311.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	1311.0	kg
Rated Cargo/Luggage Weight (RCLW)	=	44.8	kg
Weight of 2 p.572 Dummies @ 76 each	=	152	kg
TARGET TEST WEIGHT	=	1507.8	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 38.0 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	454	456	60.6	910.0
Rear =	301	290	39.4	591.0
Total Vehicle Test Weight (ATW) =				1501.0

Weight of Ballast Secured in Vehicle Trunk Area¹ = 0 kg

Vehicle Components Removed for Weight Reduction: Trunk lid and attachments, rear deck and accessories

Rear seat backs and tail lights

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG ²
AS DELIVERED:	682	684	667	668	977.8
FULLY LOADED:	669	669	640	641	-
AS TESTED:	672	671	645	645	1030.0

Vehicle's Wheel Base: 2616 mm

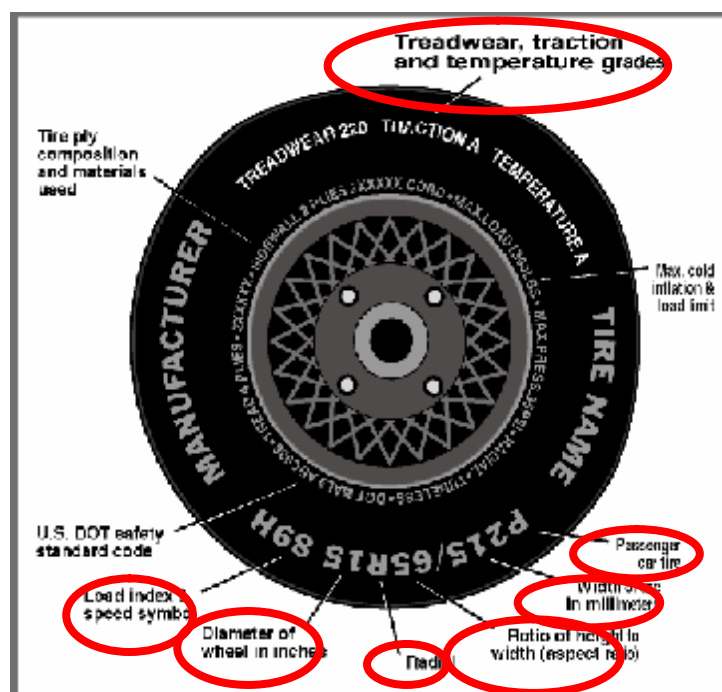
¹Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

²Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2007 Kia Spectra 4-Door Sedan

NHTSA Test No.: M70507 Test Date: December 14, 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)	P195/60R15	P195/60R15
Tire size on Vehicle	P195/60R15	P195/60R15
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle LS	Eagle LS
Tire Type	Passenger	Passenger
Tire Width (mm)	195	195
Ratio of Height to Width (aspect ratio)	60	60
Radial	Radial	Radial
Wheel Diameter	15	15
Load Index & Speed Symbol	87H	87H
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	A	A

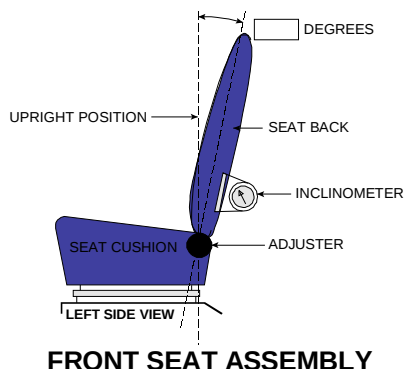
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2007 Vehicle Model: Kia Spectra 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.



Seat back angle for driver's seat: 25.0

Measurement instructions: Vehicle was set with Oscar back pan at 25 degrees and vehicle level

Seat back angle for passenger's seat: 25.0

Measurement instructions: Vehicle was set with Oscar back pan at 25 degrees and vehicle level

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: Full up forward to full rear down range was 280 mm. Seat was set 140 mm from 0 or notch 7 on track

Positioning of the passenger's seat: 17 notches total; seat was set at notch 8 from 0

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 54.9 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 = 50.5 to 51.6 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 51.1 liters

3.3 One-Third of Useable Capacity = 18.3 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.

Fuel pump operate on ignition "START"

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 column was set in mid angle range which was 63.1 degrees

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: 4 notches total; placed at notch 1 starting from 0

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

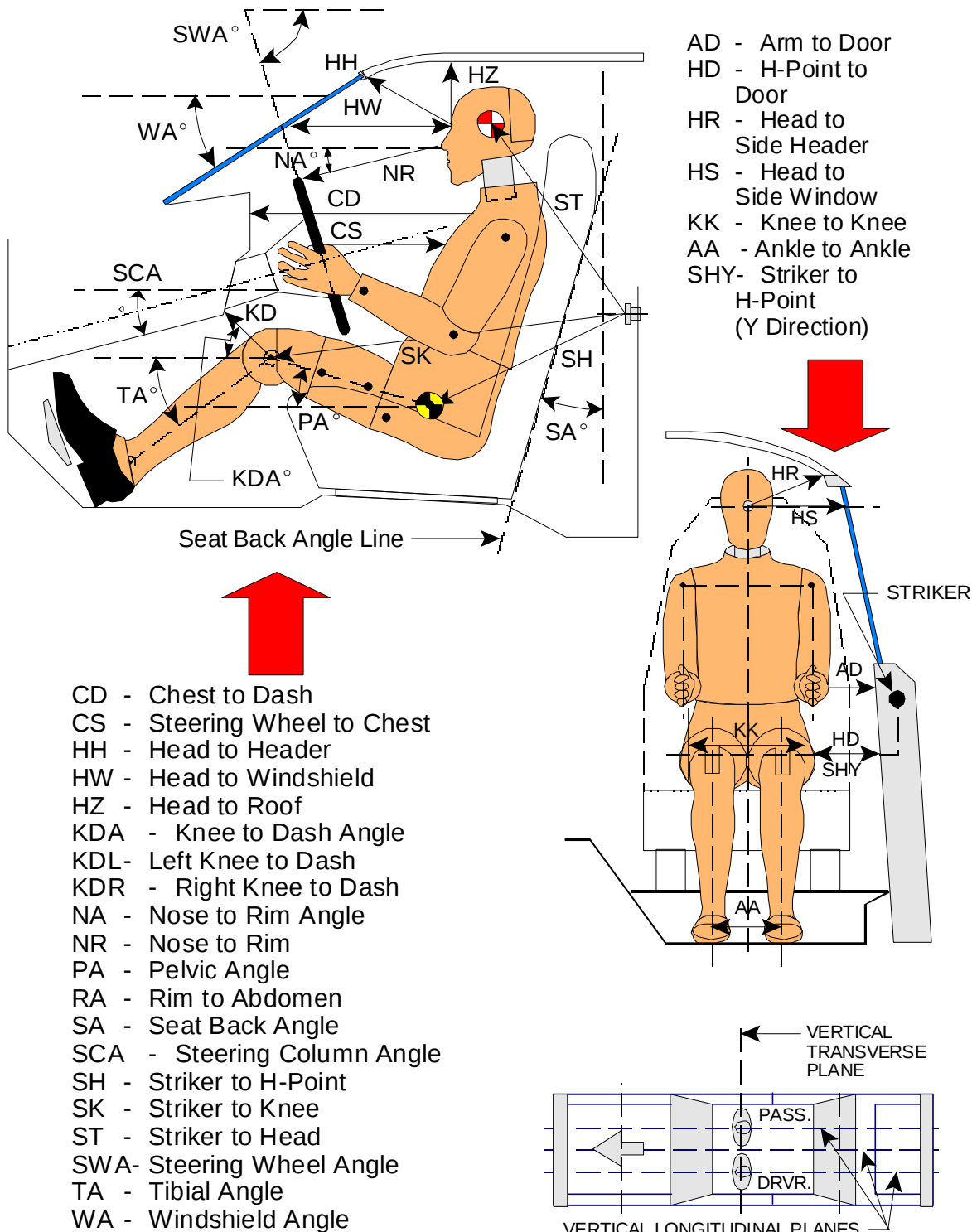
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; - No; - N/A

Comments: None

DATA SHEET NO. 5

FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



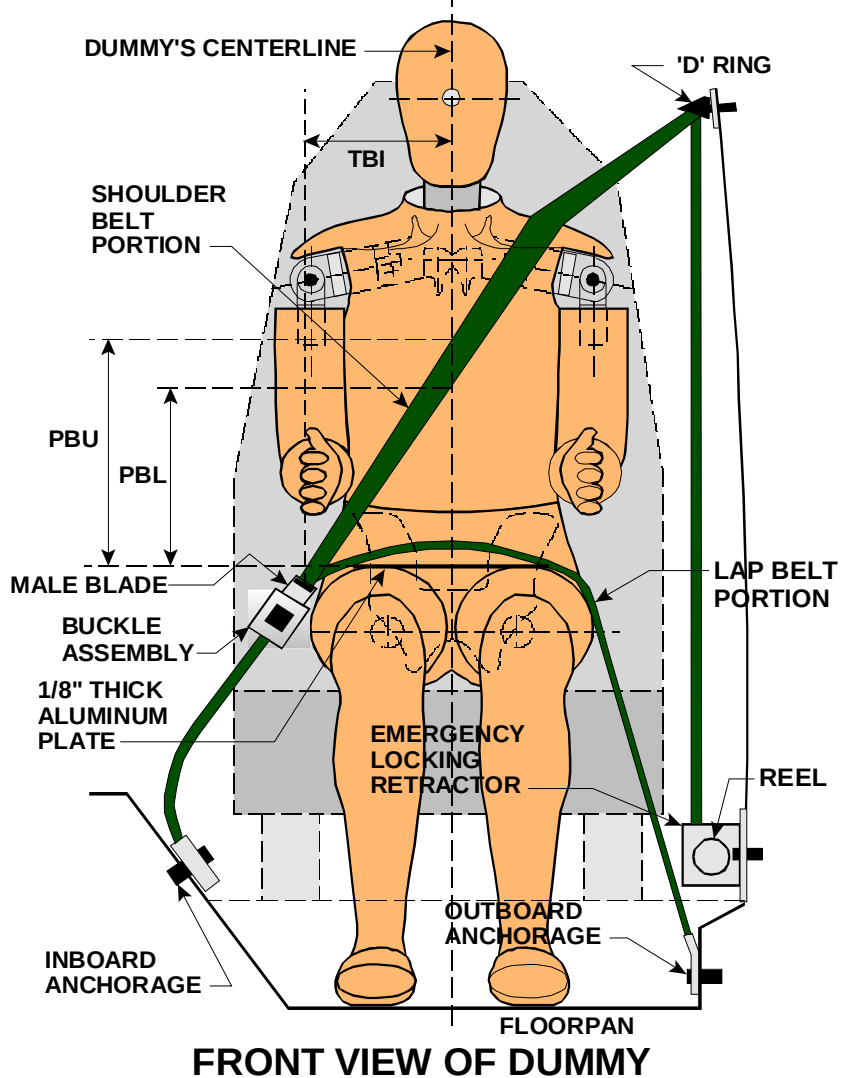
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #064)			PASS. (Serial #061)		
WA ^o	29 deg.			N/A		
SWA ^o	62 deg.			N/A		
SCA ^o	28 deg.			N/A		
SA ^o	24 deg.			24 deg.		
HZ	201			199		
HH	305			309		
HW	556			564		
HR	218			218		
NR	388	Angle	12 deg.	N/A		
CD	515			566		
CS	287			N/A		
RA	176			N/A		
KDL	176	Angle (KDA)	49 deg.	134		
KDR	138			177	Angle (KDA)	29 deg.
PA ^o	24.7 deg.			24.9 deg.		
TA ^o	53 deg.			46 deg.		
KK	351			270		
AA	391			234		
ST	510	Angle	83 deg.	513	Angle	80 deg.
SK	615	Angle	-4 deg.	619	Angle	-2 deg.
SH	244	Angle	34 deg.	238	Angle	31 deg.
SHY	214			209		
HS	336			327		
HD	151			131		
AD	118			134		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

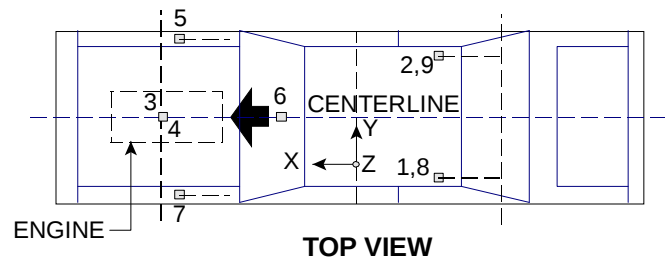
SEAT BELT POSITIONING DATA



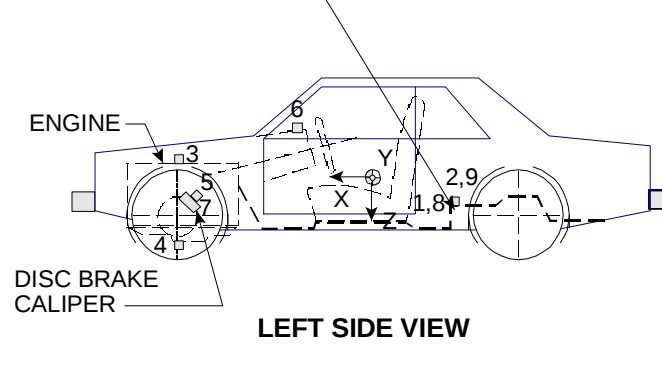
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	310	280
PBL-- Top surface of alum. plate to belt lower edge	230	210
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATIONS

VEHICLE ACCELEROMETER LOCATIONS



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



No.	LOCATION	PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	1811	571	246
2	Right Rear Seat Cross Member X	1813	-560	251
3	Top of Engine Block	3604	90	851
4	Bottom of Engine	3980	-89	257
5	Disc Brake Caliper @ Right Side	3476	-750	379
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	3453	749	331
8	Left Rear Seat Cross Member Z	1811	571	246
9	Right Rear Seat Cross Member Z	1813	-560	251

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 12 mm molding.

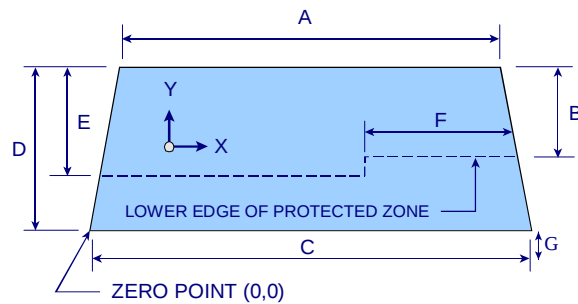
FMVSS 212 REQUIREMENTS:

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: 21.0°C.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	1987.5	1987.5	100.0%
LEFT SIDE	1987.5	1987.5	100.0%
TOTAL	3975	3975	100.0%



DIMENSIONS (mm)	
A	1118
B	460
C	1417
D	720
E	475
F	880
G	12

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: NONE

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm:

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

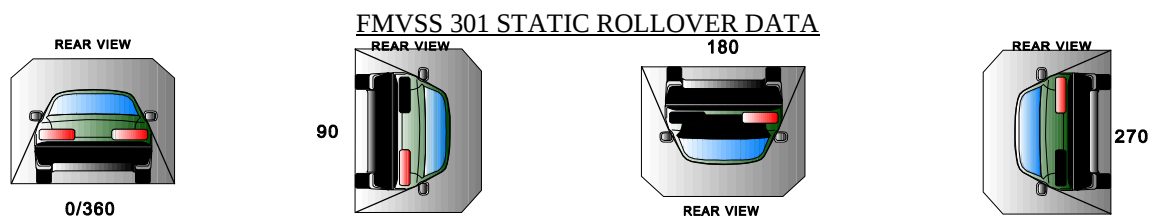
DATA SHEET NO. 9
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: _____ M70507 _____ TEST DATE: _____ December 14, 2006
VEHICLE MAKE/MODEL: _____ 2007 Kia Spectra 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



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	14	seconds	5	minutes	6	minutes	14	seconds	7	minutes
90° - 180°	1	minutes	13	seconds	5	minutes	6	minutes	13	seconds	7	minutes
180°-270°	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
270°-360°	1	minutes	14	seconds	5	minutes	6	minutes	14	seconds	7	minutes

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

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

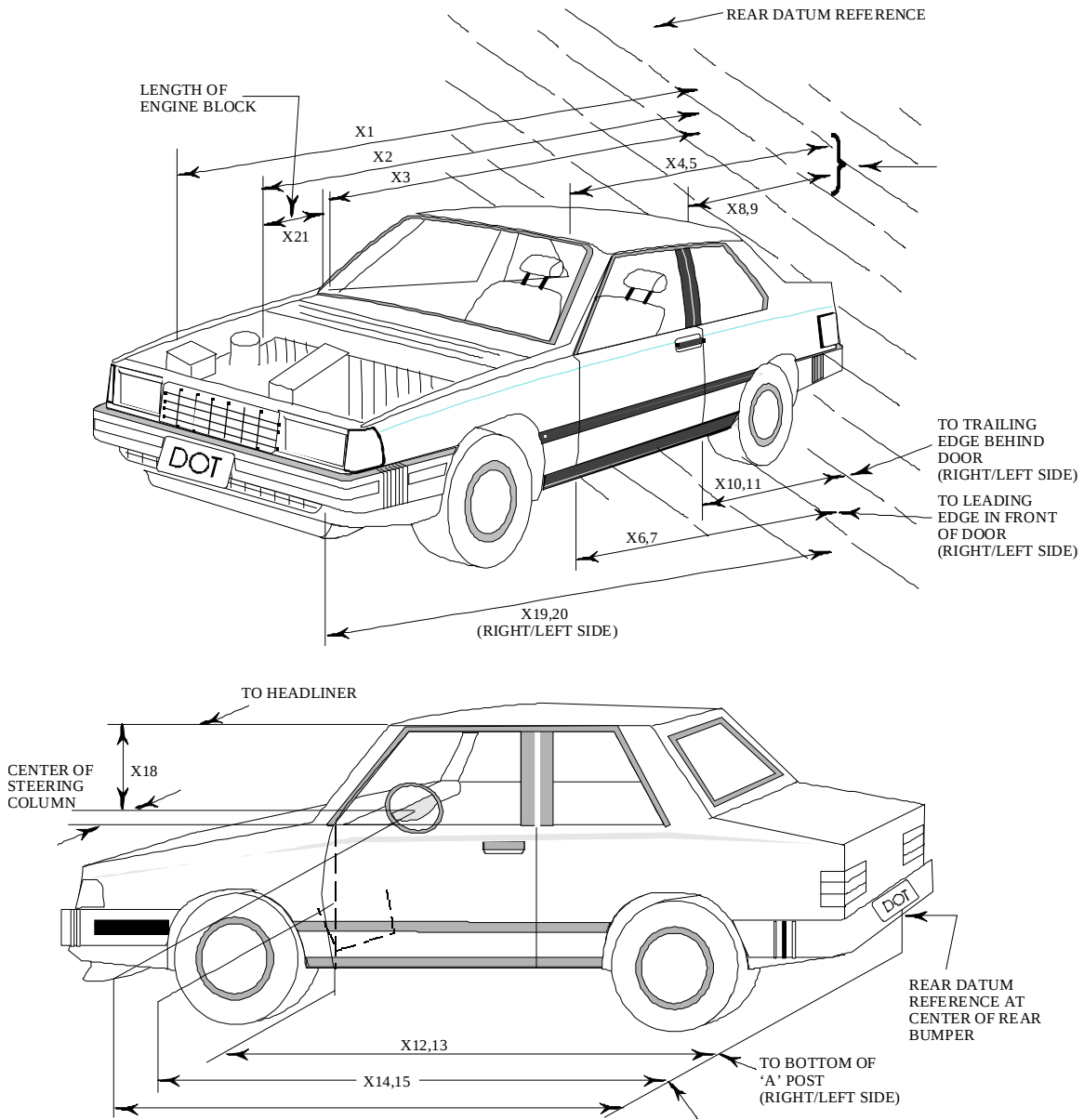
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

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

DATA SHEET NO. 10
TEST VEHICLE MEASUREMENTS



DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M70507 TEST DATE: December 14, 2006
VEHICLE MAKE/MODEL: 2007 Kia Spectra 4-Door Sedan

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4502	4011	491
X2	Rear Surface of Vehicle to Front of Engine	4034	3848	186
X3	Rear Surface of Vehicle to Firewall	3463	3423	40
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3110	3117	-7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3107	3109	-2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3089	3097	-8
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3088	3090	-2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2032	2038	-6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2032	2032	0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2041	2049	-8
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2041	2042	-1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3168	3175	-7
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3173	3171	2
X14	Rear Surface of Vehicle to Firewall, Right Side	3460	3433	27
X15	Rear Surface of Vehicle to Firewall, Left Side	3459	3438	21
X16	Rear Surface of Vehicle to Steering Column	2662	2655	7
X17	Center of Steering Column to "A" Post	301	291	10
X18	Center of Steering Column to Headliner	423	373	50
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4433	3991	442
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4432	3986	446
X21	Length of Engine Block	507	507	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2866	2829	37
CD	Rear Surface of Vehicle to Center of Dash Panel	2847	2840	7
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2859	2831	28

All Dimensions in mm

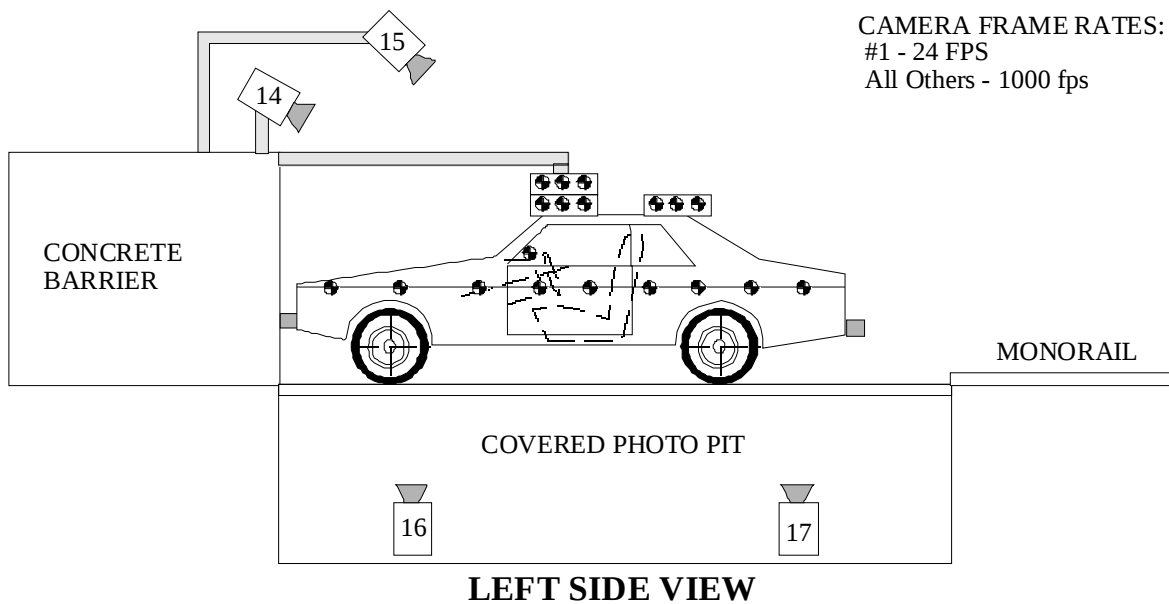
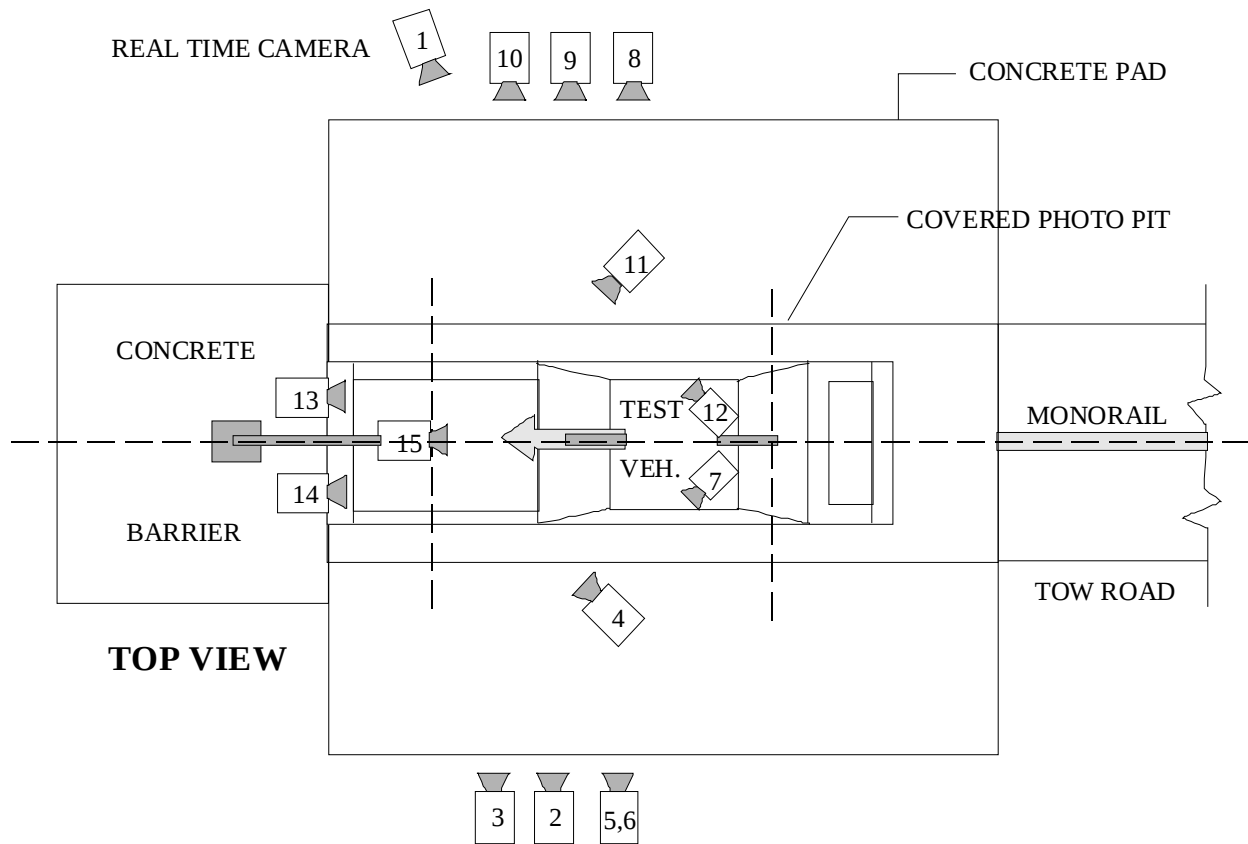
DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M70507 TEST DATE: December 14, 2006
VEHICLE MAKE/MODEL: 2007 Kia Spectra 4-Door Sedan

TARGET VEHICLE STRUCTURAL MEASUREMENTS

	Elements	Pre-Test (mm)
1	Total length	4502
2	Total Width	1746
3	Bumper Top Height	513
4	Bumper Bottom Height	406
5	Longitudinal Member Top Height	524
6	Distance Between Longitudinal Members	1077
7	Longitudinal Member Width	75
8	Engine top height	817
9	Engine bottom height	207
10	Engine and gearbox width	563
11	Front bumper-engine distance	466
12	Front shock absorber fixing height	849
13	Bonnet leading edge height	693
14	Front shock absorber fixing width	1128
15	Front bumper – front axle distance	913
16	Front axle – a pillar distance	447
17	A-pillar – B pillar distance	1114
18	B-pillar – rear axle distance	1056
19	B-pillar – C Pillar distance	1033
20	Roof sill bottom height	1310
21	Roof sill top height	1405
22	Floor sill bottom height	221
23	Floor sill top height	327

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS



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

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	30
2	Overall Left Side	6922	1699	1094	-3.5	6626	24	1000
3	Left Side View	9344	1085	1021	-2.3	9048	50	1000
4	Driver and Interior View	7767	2809	2049	-8.6	-	50	1000
5	Steering Column (Bottom)	8254	2097	1201	-3.6	7958	24	1000
6	Steering Column (Top)	8254	2097	1796	-7.7	7958	28	1000
7	Left CRS Lateral View	-	-	-	-	-	-	-
8	Overall Right Side	7984	1933	991	-3.1	8271	24	1000
9	Right Side View	6984	1054	1029	-3.5	7271	28	1000
10	Right Passenger View	8868	1736	1279	-2.9	9155	50	1000
11	Passenger and Interior View	7856	2365	2011	-7.7	-	50	1000
12	Right CRS Lateral View	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	39.1	-	28	1000
14	Driver Front View	620	-92	1987	40.8	-	28	1000
15	Windshield View	0	-530	3374	55.9	-	20	1000
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0	3119	-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

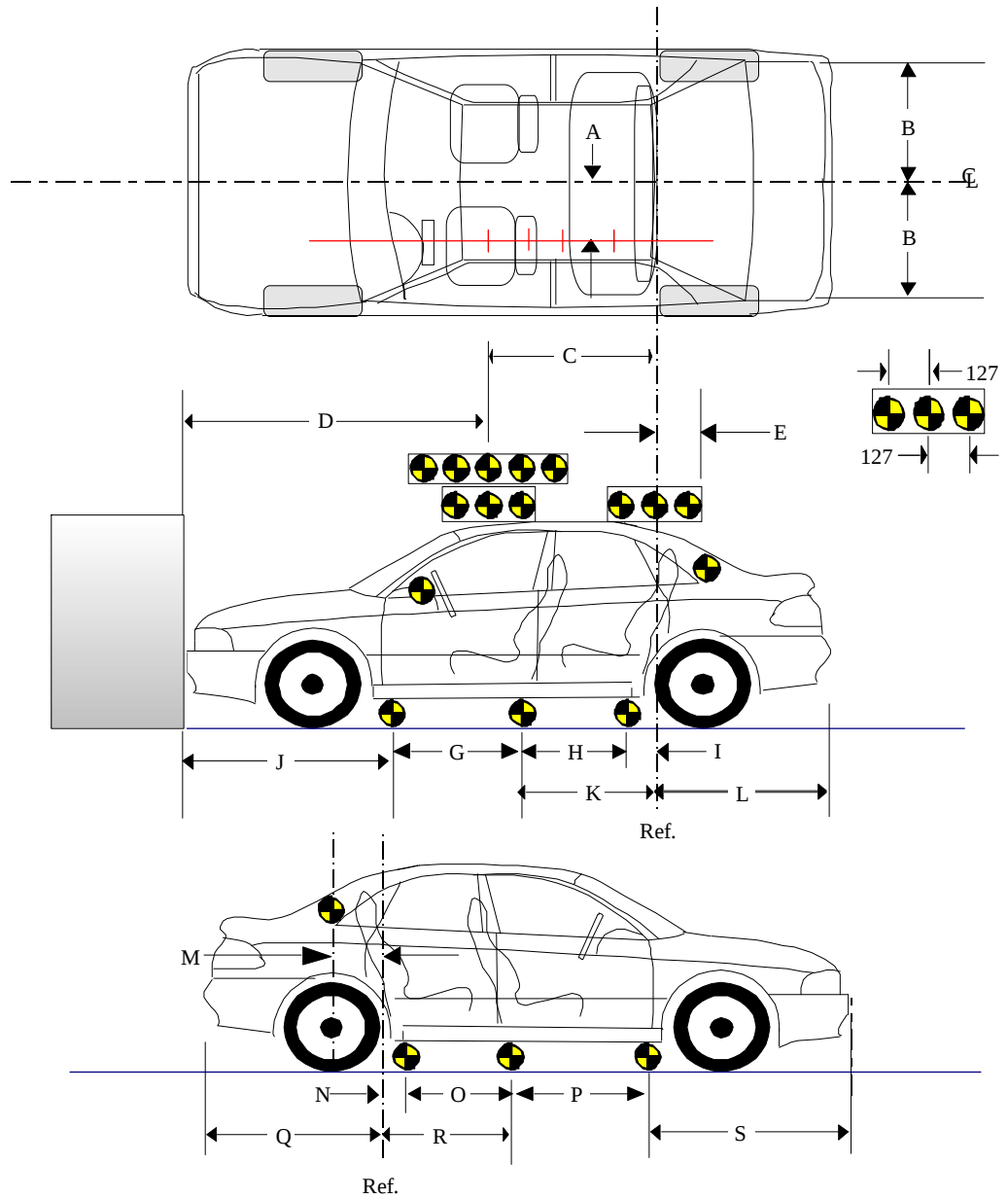
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

(Dimensions in millimeters)

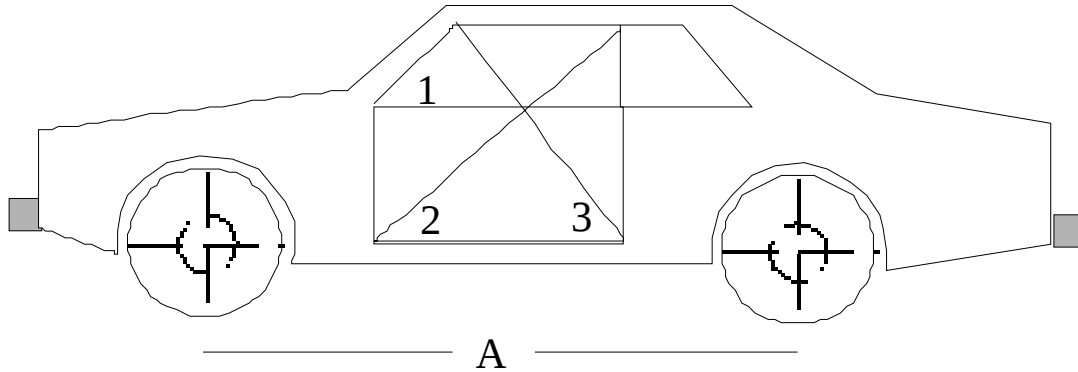
A	363
B	583
C	1223
D	1989
E	326
F	1544
G	874
H	893
I	113
J	1336
K	1006
L	1287
M	330
N	113
O	884
P	880
Q	1288
R	997
S	1337



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



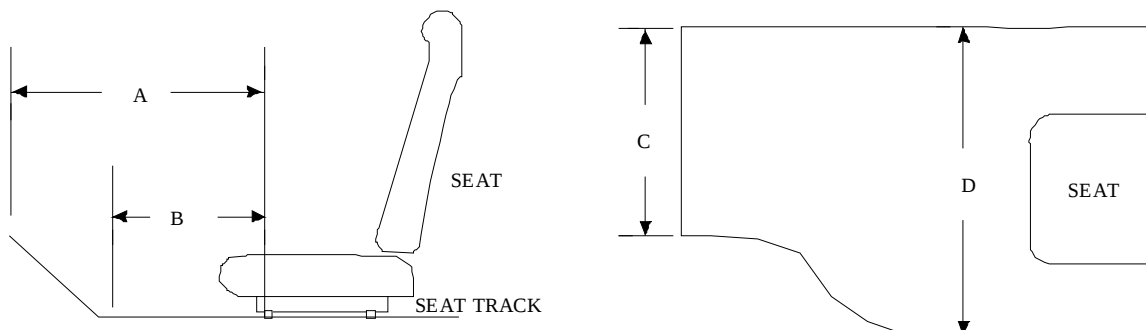
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	974	1481	978	973	1479	974
AFTER TEST	970	1482	980	970	1481	974
DIFFERENCE	4	-1	-2	3	-2	0

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2614	2612
AFTER TEST	2507	2534
DIFFERENCE	107	78

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	725	614	111
B	548	501	47
C	477	469	8
D	474	468	6

PASSENGER

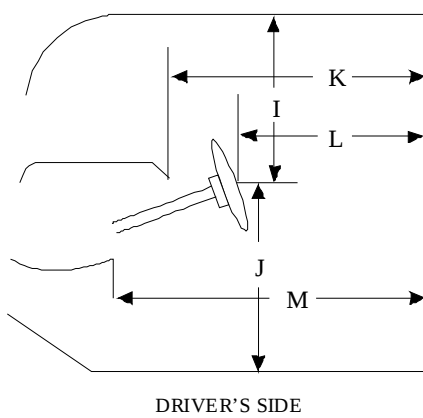
Measurement	Pre-Test	Post-Test	Difference
A	751	645	106
B	551	534	17
C	438	437	1
D	463	457	6

Units = mm

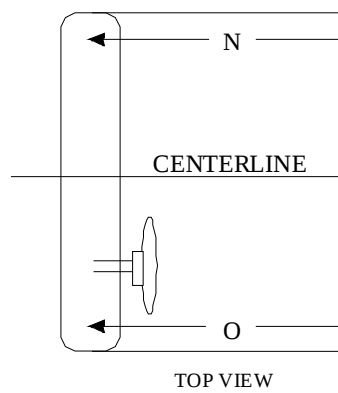
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

STATIC PASSENGER COMPARTMENT INTRUSION

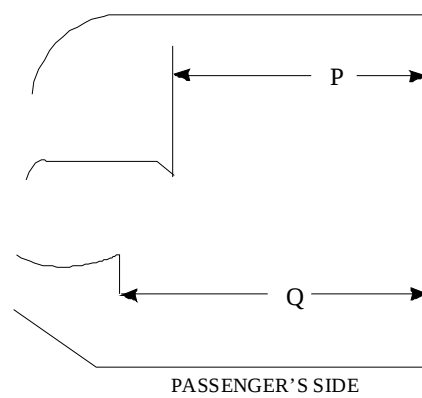


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



PASSENGER'S SIDE

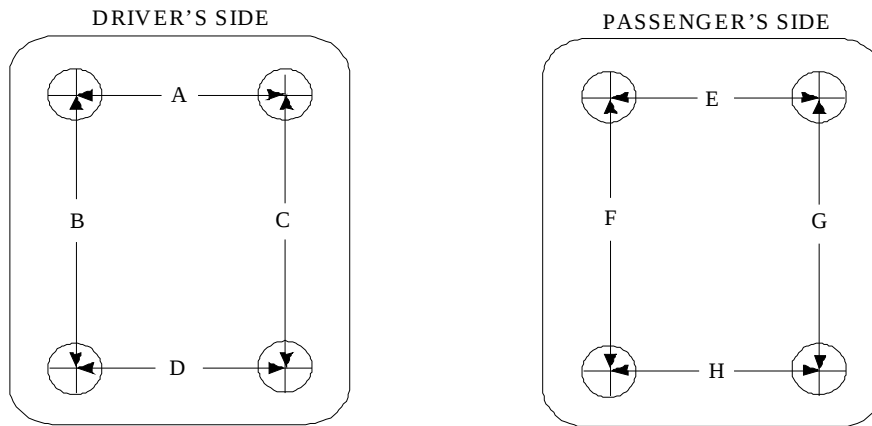
Measurement	Pre-Test	Post-Test	Difference
I	423	373	50
J	650	746	-96
K	747	743	4
L	552	544	8
M	846	794	52
N	755	709	46
O	750	720	30
P = K (PASS.)	805	799	6
Q = M (PASS.)	840	807	33

Units = mm

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

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

FLOORBOARD DEFORMATION



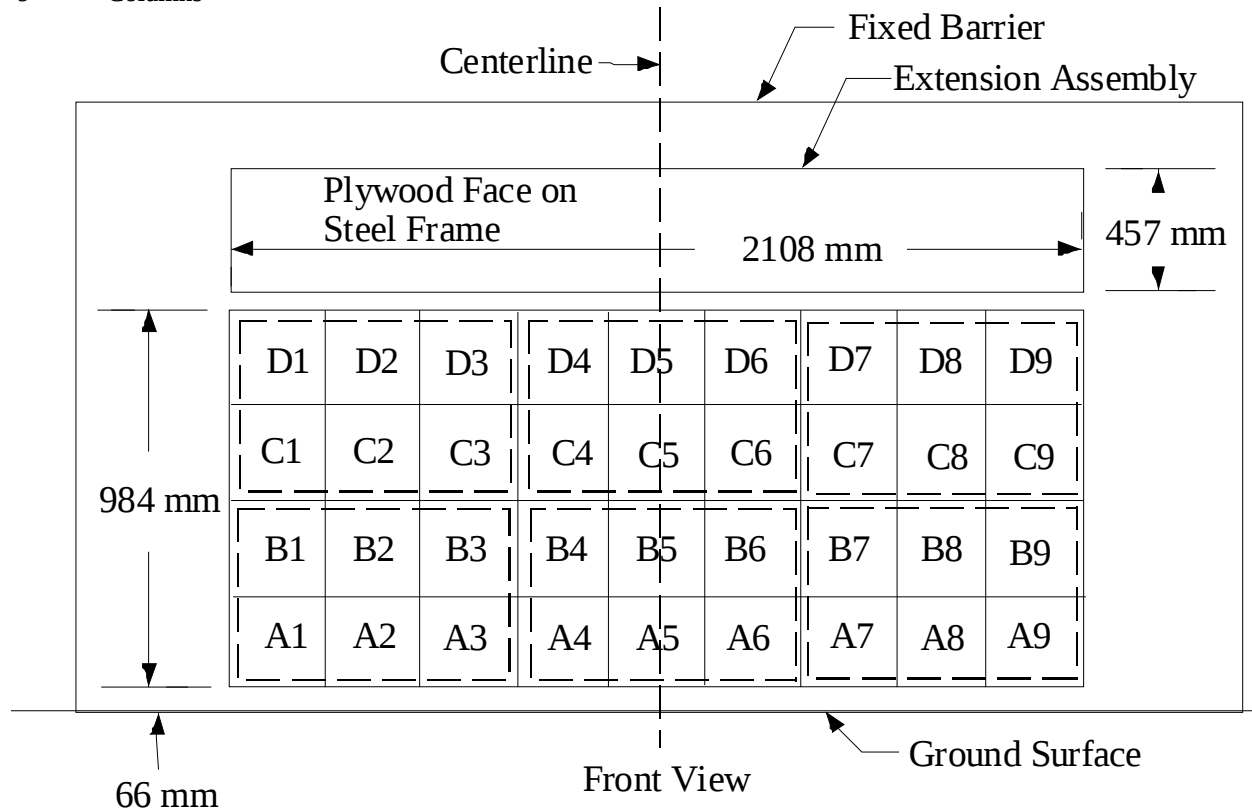
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	477	469	8
B	358	353	5
C	343	322	21
D	474	468	6
E	438	437	1
F	371	369	2
G	360	324	36
H	463	457	6

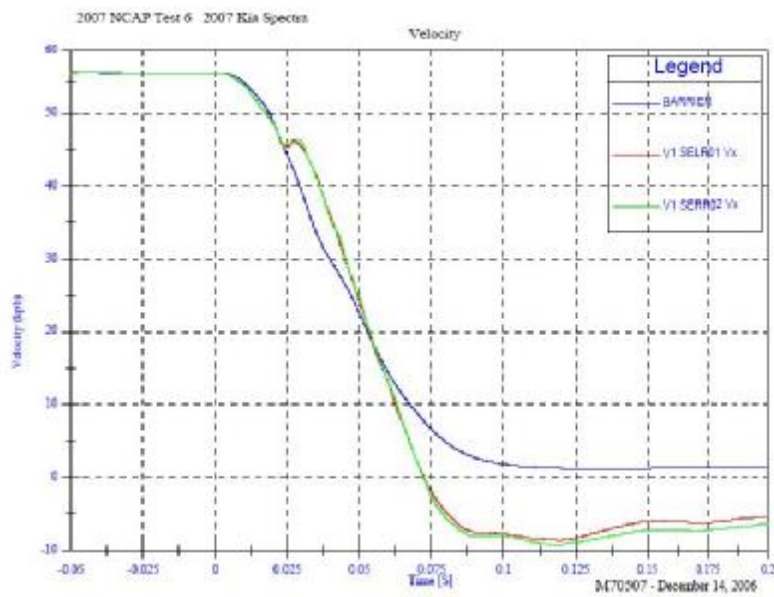
Units = mm

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 Spectra 4-Door Sedan

NHTSA Test No.: M70507 VIN: KNAFE122775379847

Model Year: 2007 Build Date: 10/06 Test Date: December 14, 2006

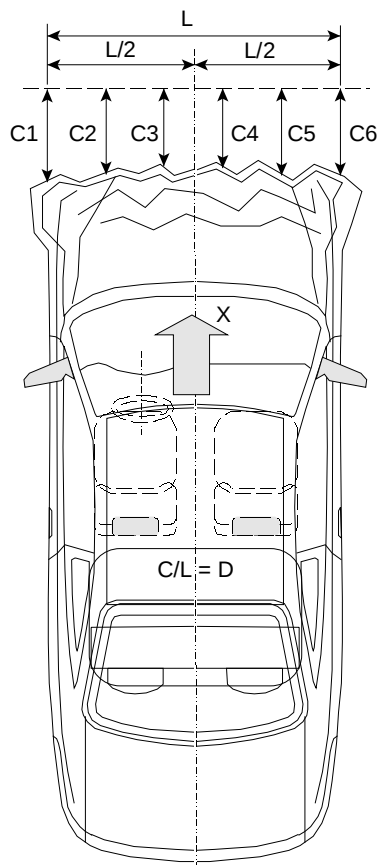
Vehicle Size Category: Sedan Test Weight: 1501 kg

Vehicle Wheelbase: 2616 mm; Front Overhang: 914 mm; Overall Width: 1746 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4314	3939	375
C2 =	4449	3983	466
C3 =	4497	4004	493
C4 =	4498	4014	484
C5 =	4452	3990	462
C6 =	4319	3983	336



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

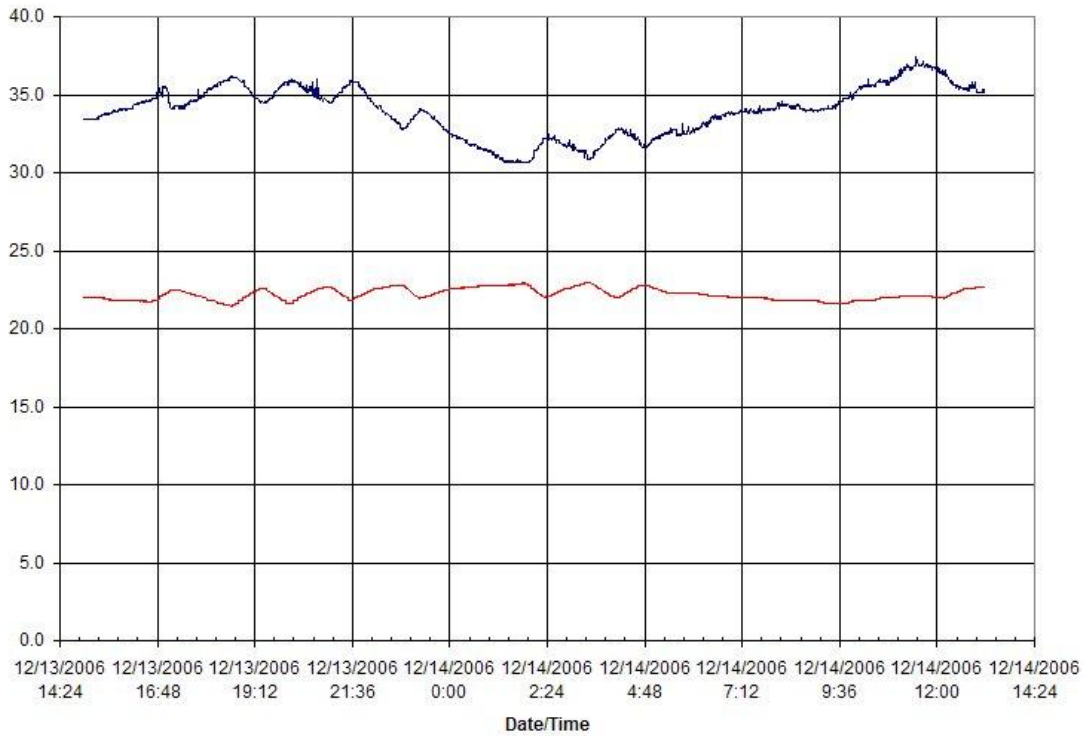
Length of Damaged Region:

L1=	<u>1393</u>	mm
L2=	<u>696.5</u>	mm
L5=	<u>278.6</u>	mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M70507 Vehicle: 2007 Kia Spectra 4-Door Sedan

M70507 Environmental Conditions



APPENDIX A
PHOTOGRAPHS

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Figure A-1: Load Cell Locations



Figure A-2: Vehicle Certification Placard



Figure A-3: Vehicle Tire Placard



Figure A-4: Right Front, As Received



Figure A-5: Left Rear, As Received



Figure A-6: Pre-Test Front View



Figure A-7: Post-Test Front View



Figure A-8: Pre-Test Left Side View



Figure A-9: Post-Test Left Side View



Figure A-10: Pre-Test Right Side View



Figure A-11: Post-Test Right Side View



Figure A-12: Pre-Test Right Front Three-Quarter View

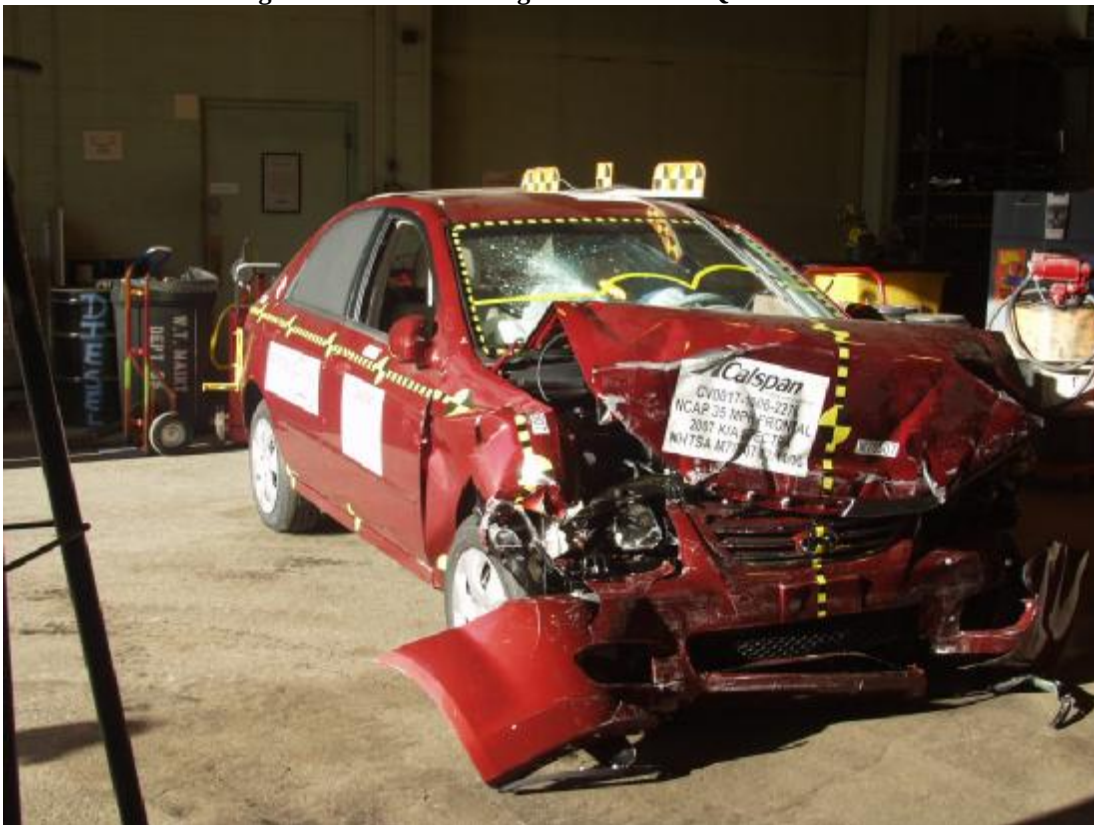


Figure A-13: Post-Test Right Front Three-Quarter View



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



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



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



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



Figure A-18: Pre-Test Windshield View



Figure A-19: Post-Test Windshield View



Figure A-20: Pre-Test Engine Compartment View



Figure A-21: Post-Test Engine Compartment View



Figure A-22: Pre-Test Fuel Cap View



Figure A-23: Post-Test Fuel Cap View



Figure A-24: Pre-Test Front Underbody View



Figure A-25: Post-Test Front Underbody View



Figure A-26: Pre-Test Mid Underbody View



Figure A-27: Post-Test Mid Underbody View



Figure A-28: Pre-Test Rear Underbody View



Figure A-29: Post-Test Rear Underbody View



Figure A-30: Pre-Test Driver Head Location



Figure A-31: Post-Test Driver Head Location



Figure A-32: Pre-Test Driver Position View



Figure A-33: Post-Test Driver Position View



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



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



Figure A-36: Pre-Test Driver Feet View



Figure A-37: Post-Test Driver Feet View



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



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



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



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



Figure A-42: Post-Test Driver Head View



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



Figure A-44: Pre-Test Passenger Head Location



Figure A-45: Post-Test Passenger Head Location



Figure A-46: Pre-Test Passenger Position View



Figure A-47: Post-Test Passenger Position View



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



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



Figure A-50: Pre-Test Passenger Feet View



Figure A-51: Post-Test Passenger Feet View



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



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



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



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



Figure A-56: Post-Test Passenger Head View



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



Figure A-58: Rollover View - 90°



Figure A-59: Rollover View - 180°



Figure A-60: Rollover View - 270°



Figure A-61: Rollover View - 360°



Figure A-62: Impact View

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

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

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

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO.: M70507

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

Table of Data Plots

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

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

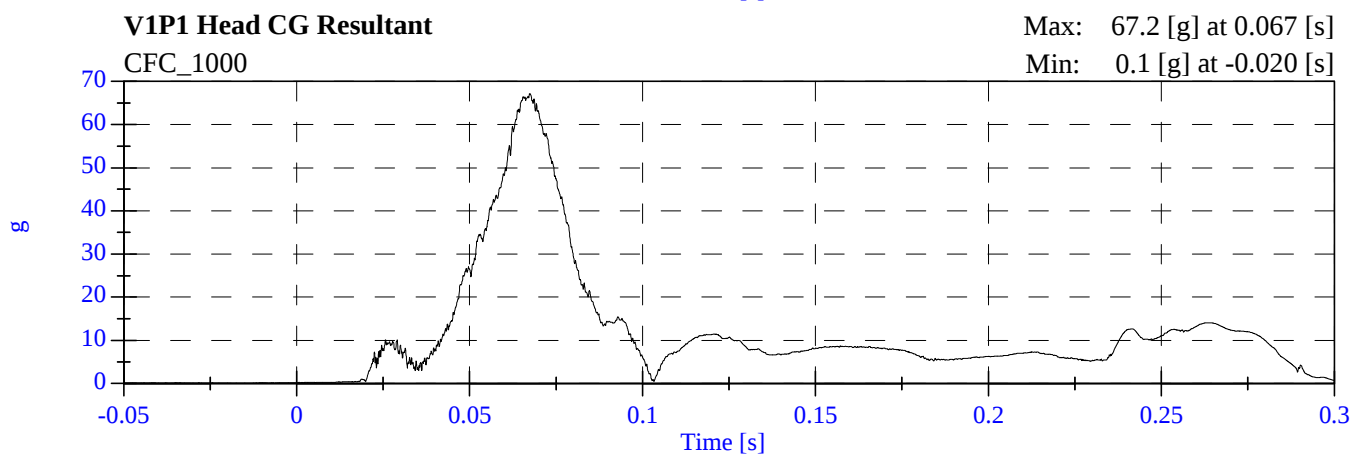
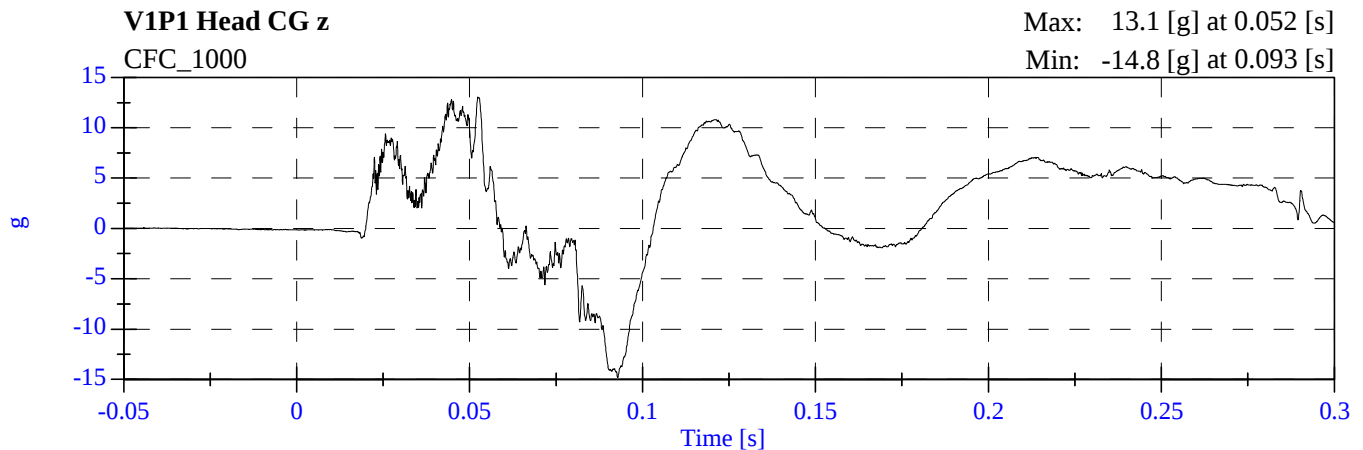
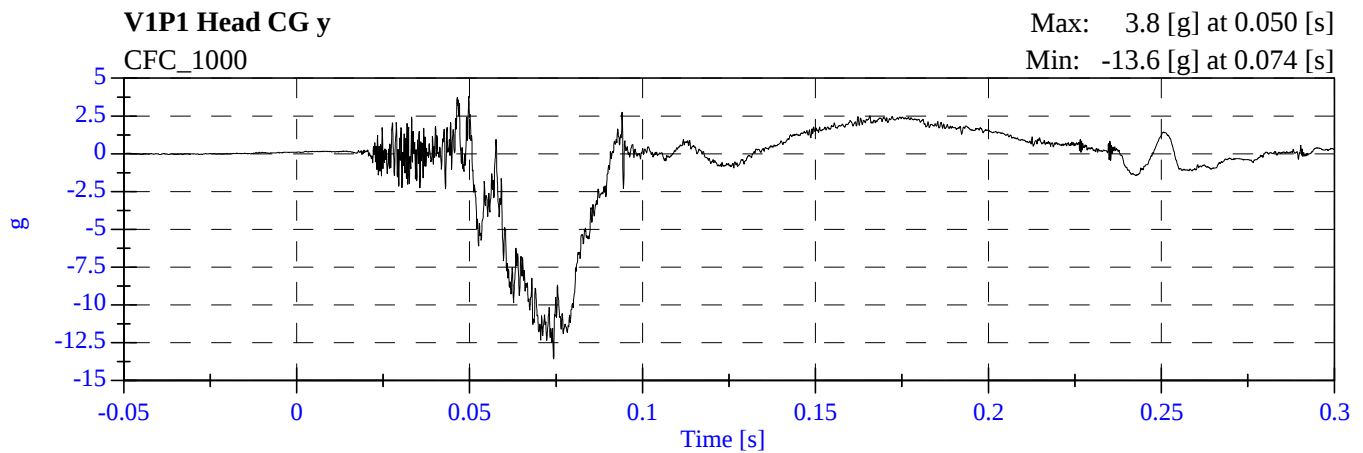
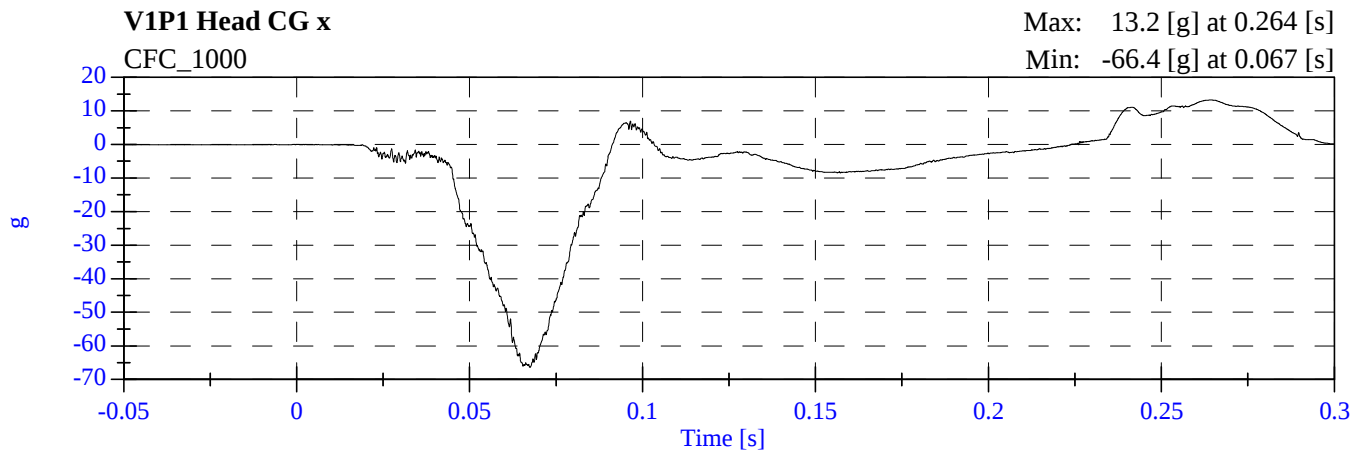
V1P1 Head CG Ax	V1P1 Lap Belt Load
V1P1 Head CG Ay	V1P1 Shoulder Belt Load
V1P1 Head CG Az	V1P2 Lap Belt Load
V1P1 Head CG Red Ax	V1P2 Shoulder Belt Load
V1P1 Head CG Red Ay	V1 Left Rear #1x
V1P1 Head CG Red Az	V1 Right Rear #2x
V1P1 Upper Neck Fx	V1 Engine Top #3x
V1P1 Upper Neck Fy	V1 Engine Bottom #4x
V1P1 Upper Neck Fz	V1 Right Caliper #5x
V1P1 Upper Neck Mx	V1 Left Caliper #7x
V1P1 Upper Neck My	V1 Left Rear #8z
V1P1 Upper Neck Mz	V1 Right Rear #9z
V1P1 Chest Ax	
V1P1 Chest Ay	
V1P1 Chest Az	
V1P1 Chest Red Ax	
V1P1 Chest Red Ay	
V1P1 Chest Red Az	
V1P1 Chest Compression	
V1P1 Pelvic Ax	
V1P1 Pelvic Ay	
V1P1 Pelvic Az	
V1P1 Left Femur Fz	
V1P1 Right Femur Fz	
V1P1 Left Upper Tibia Mx	
V1P1 Left Upper Tibia My	
V1P1 Left Lower Tibia Fz	
V1P1 Left Lower Tibia Mx	
V1P1 Left Lower Tibia My	
V1P1 Right Upper Tibia Fz	
V1P1 Right Upper Tibia Mx	
V1P1 Right Upper Tibia My	
V1P1 Right Lower Tibia Mx	
V1P1 Right Lower Tibia My	
V1P1 Left Foot Aft Ax	
V1P1 Left Foot Aft Az	
V1P1 Left Foot Fore Az	
V1P1 Right Foot Aft Ax	
V1P1 Right Foot Aft Az	
V1P1 Right Foot Fore z	
V1P2 Head 9 Array X Arm Ay	
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	
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Barrier Load Cell B6 Fx	
Barrier Load Cell B7 Fx	
Barrier Load Cell B8 Fx	

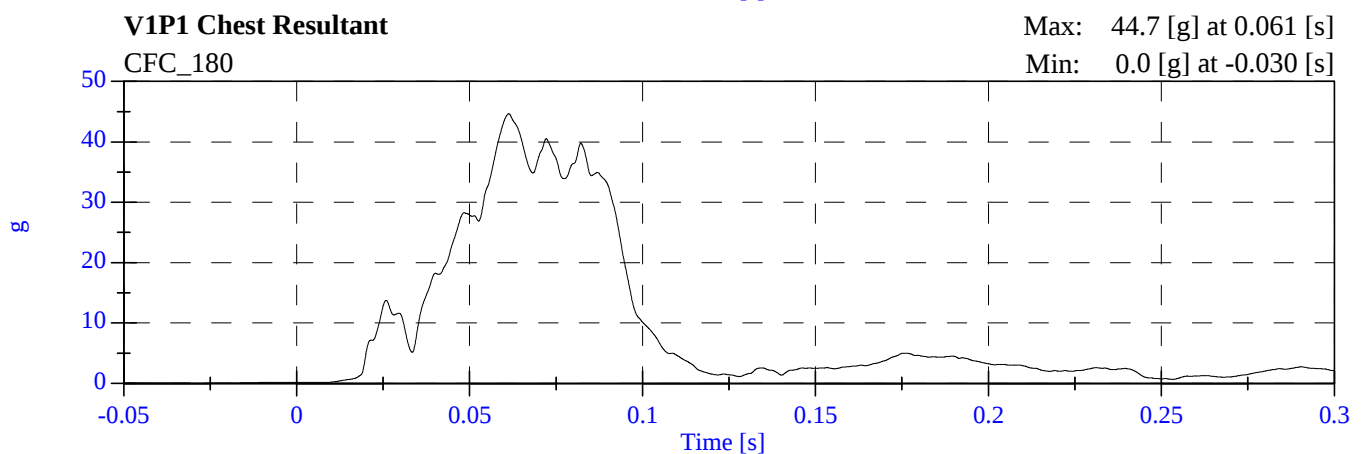
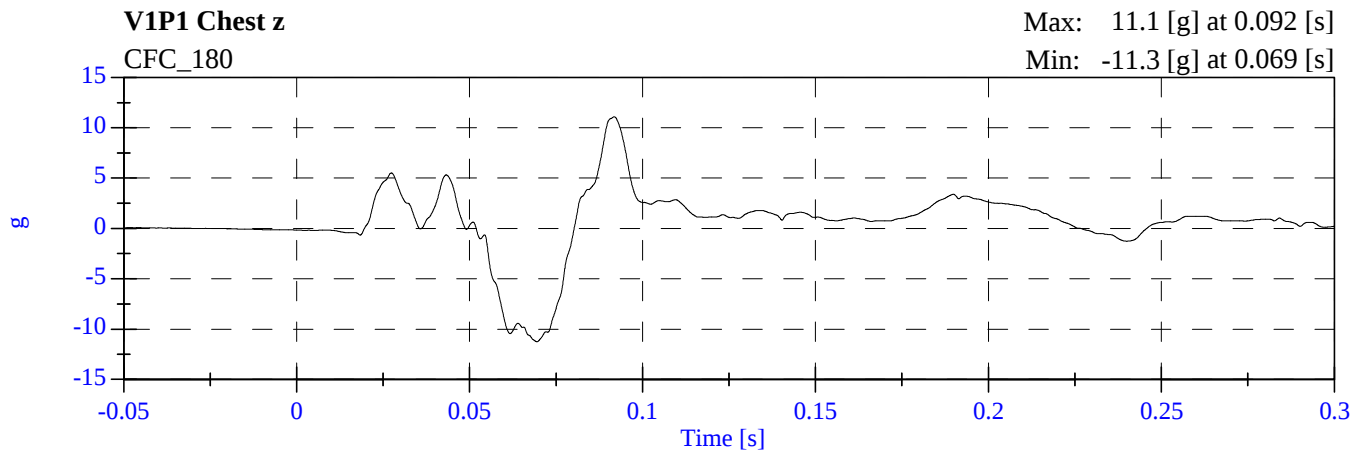
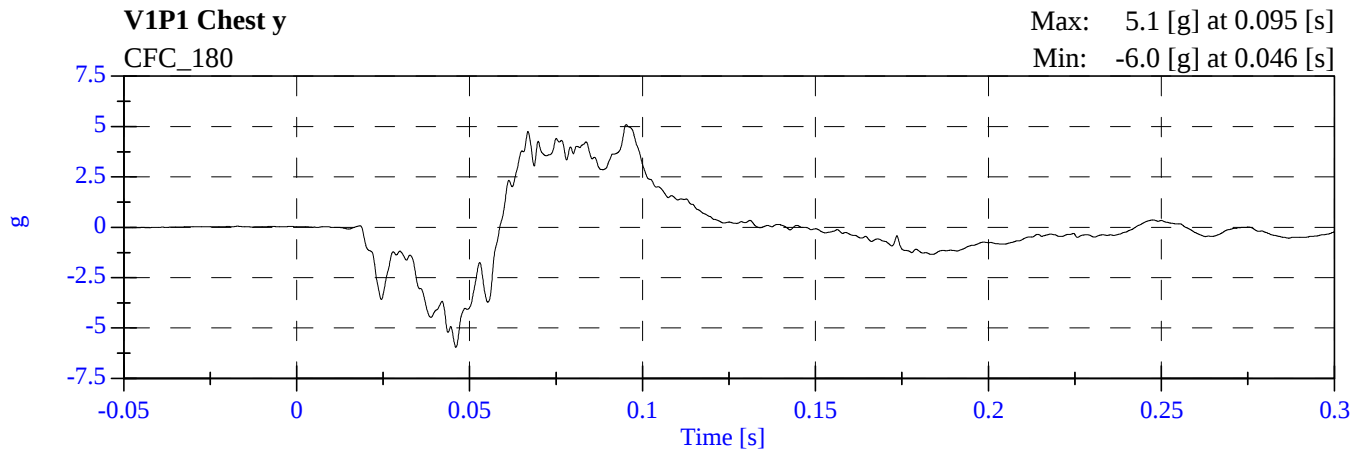
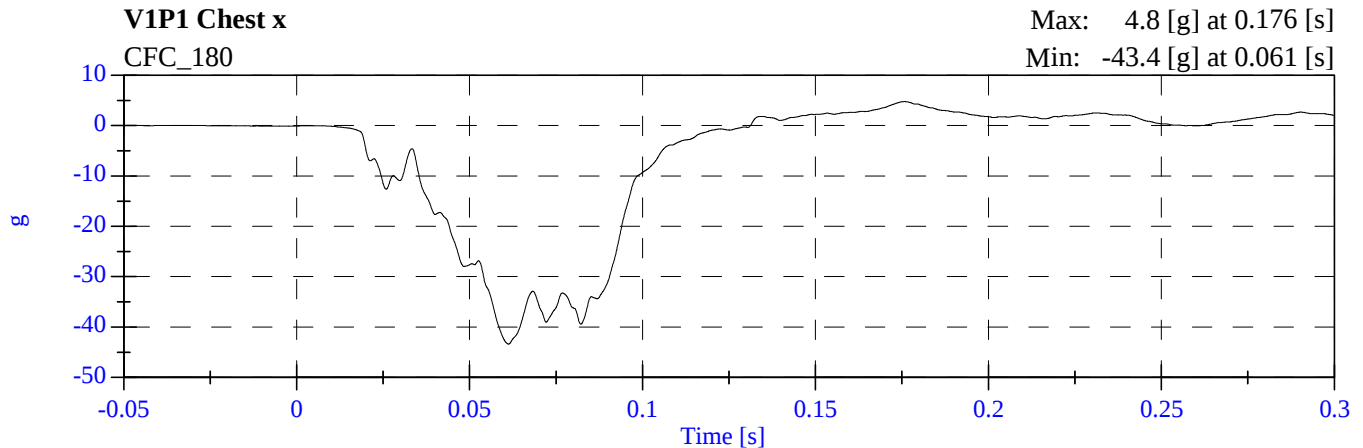
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Barrier Load Cell C6 Fx	
Barrier Load Cell C7 Fx	
Barrier Load Cell C8 Fx	
Barrier Load Cell C9 Fx	
Barrier Load Cell D1 Fx	
Barrier Load Cell D2 Fx	
Barrier Load Cell D3 Fx	
Barrier Load Cell D4 Fx	
Barrier Load Cell D5 Fx	
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Barrier Load Cell D7 Fx	
Barrier Load Cell D8 Fx	
Barrier Load Cell D9 Fx	

TEST NOTES	
Data Channel	Anomalies

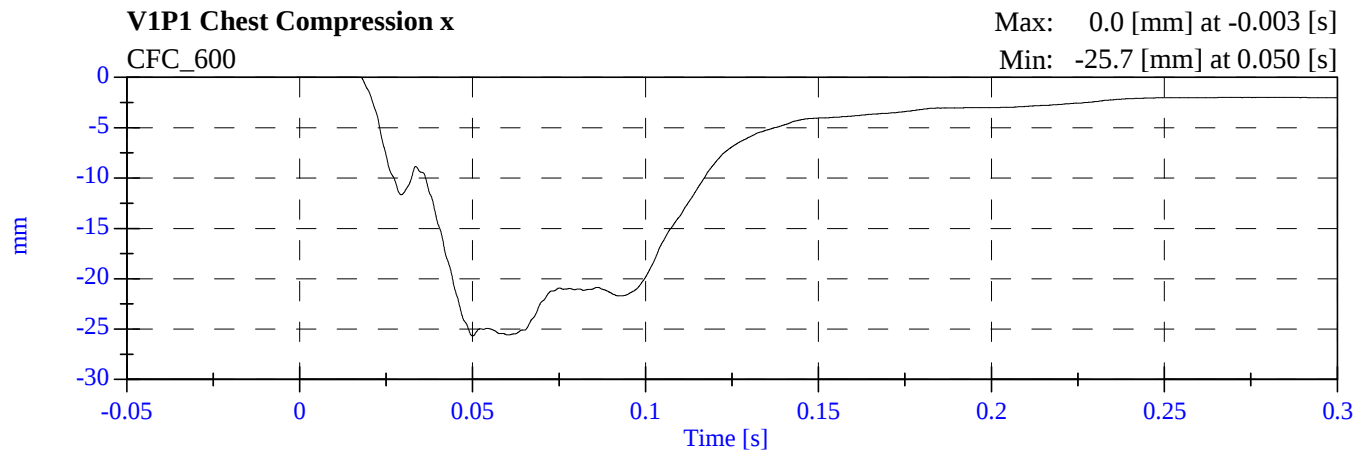
2007 NCAP Test 6 2007 Kia Spectra M70507 - December 14, 2006



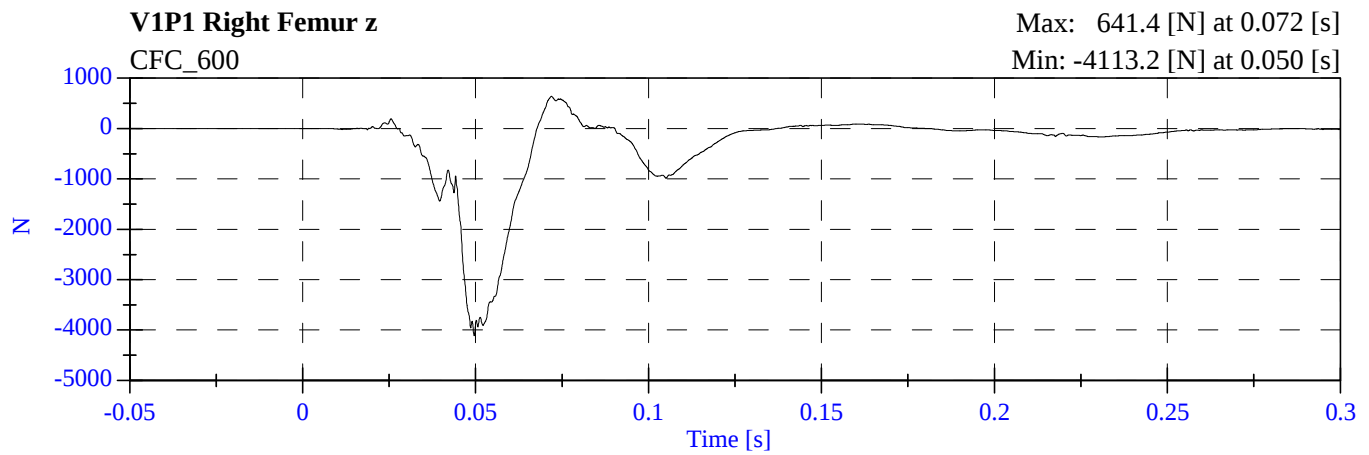
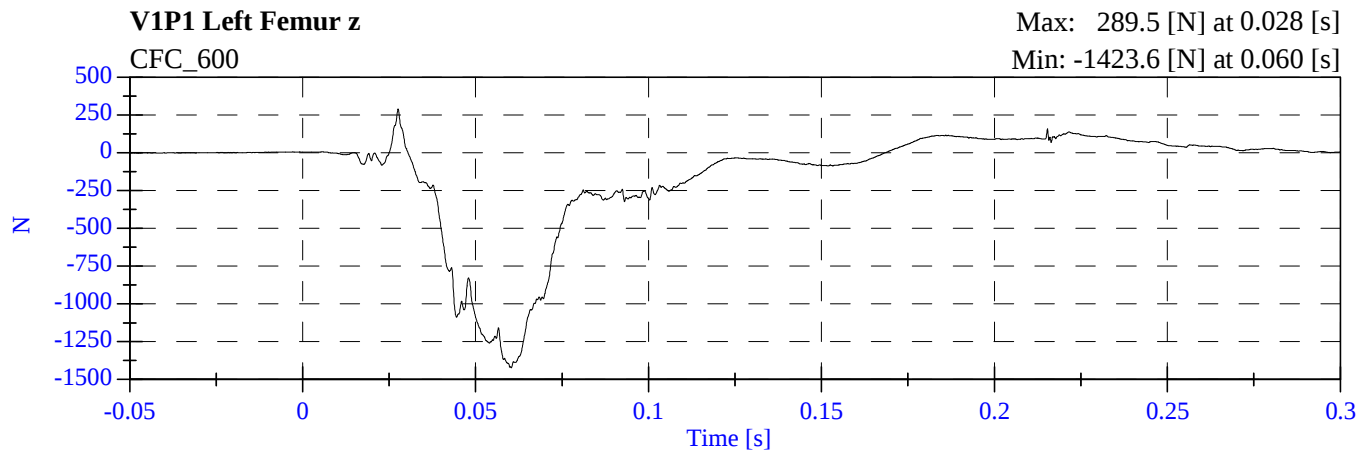
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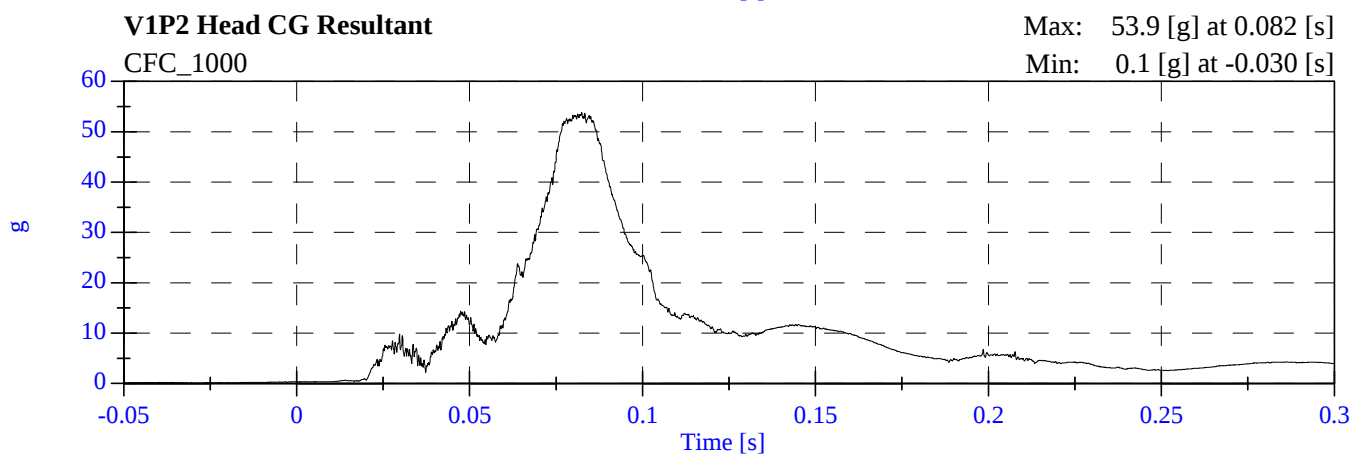
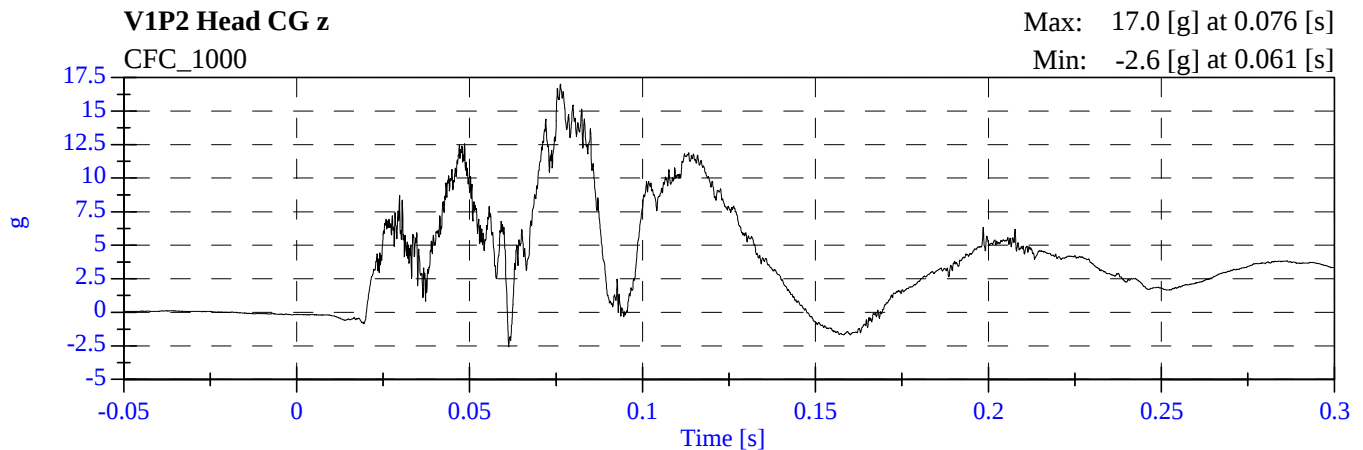
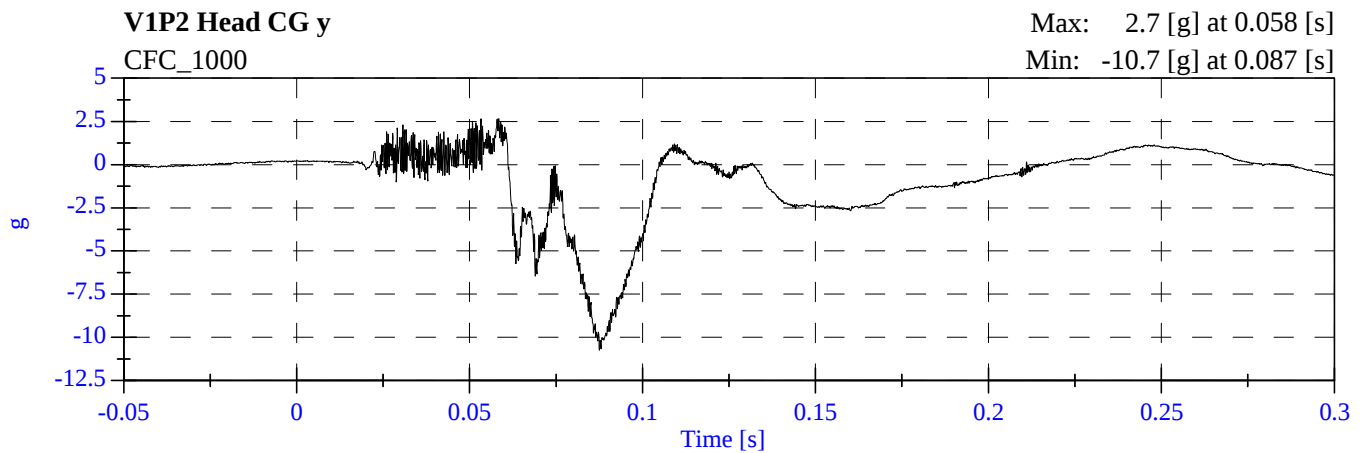
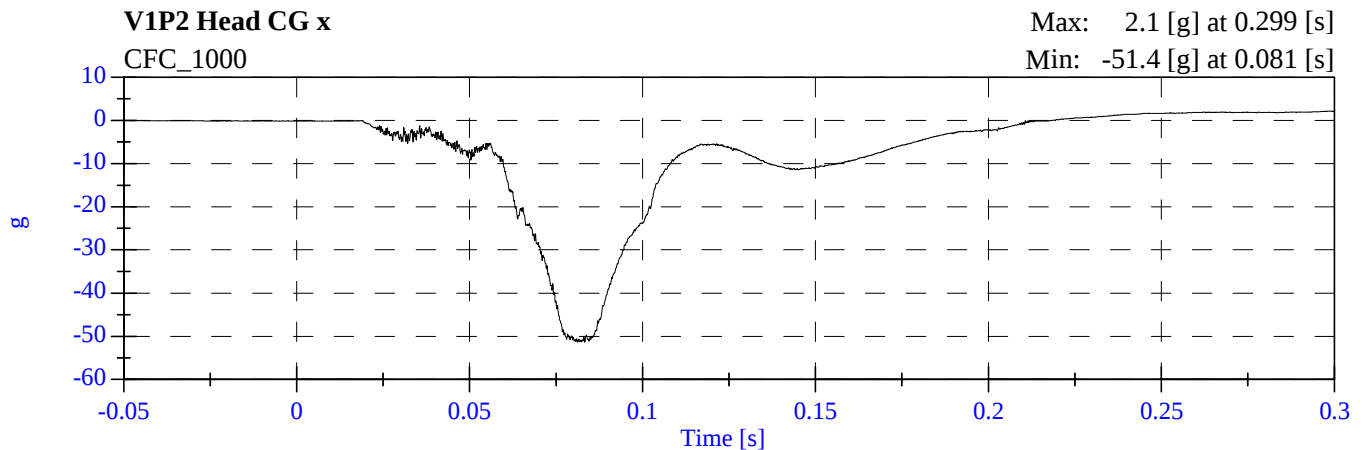
2007 NCAP Test 6 2007 Kia Spectra
M70507 - December 14, 2006



2007 NCAP Test 6 2007 Kia Spectra M70507 - December 14, 2006

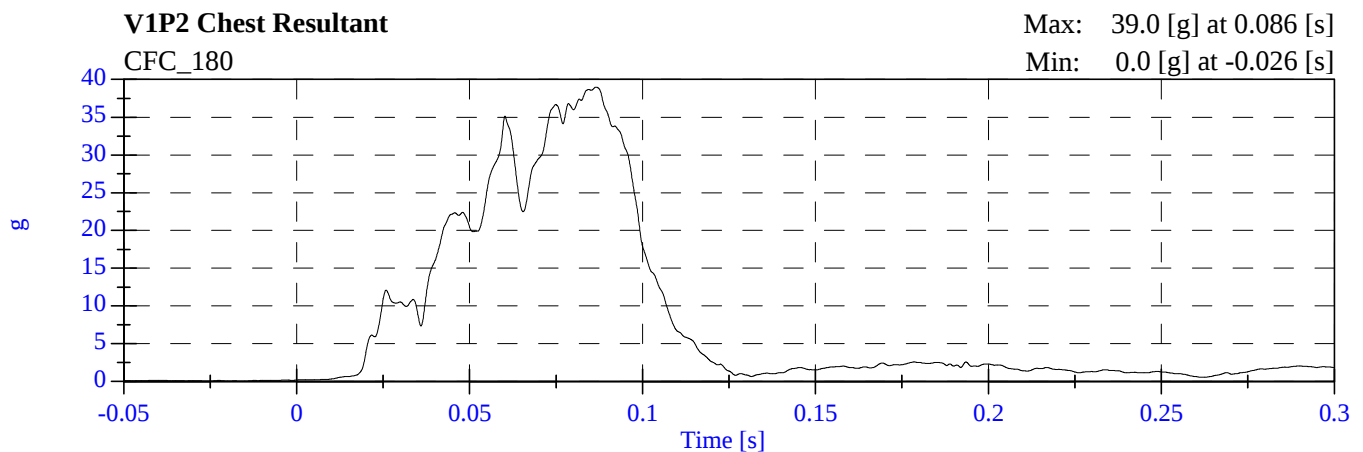
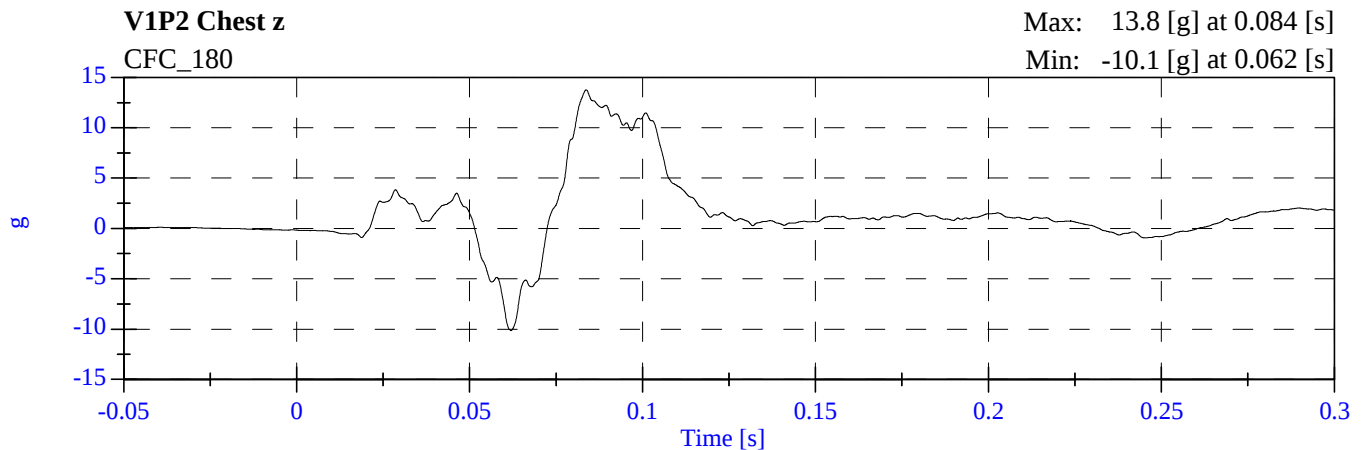
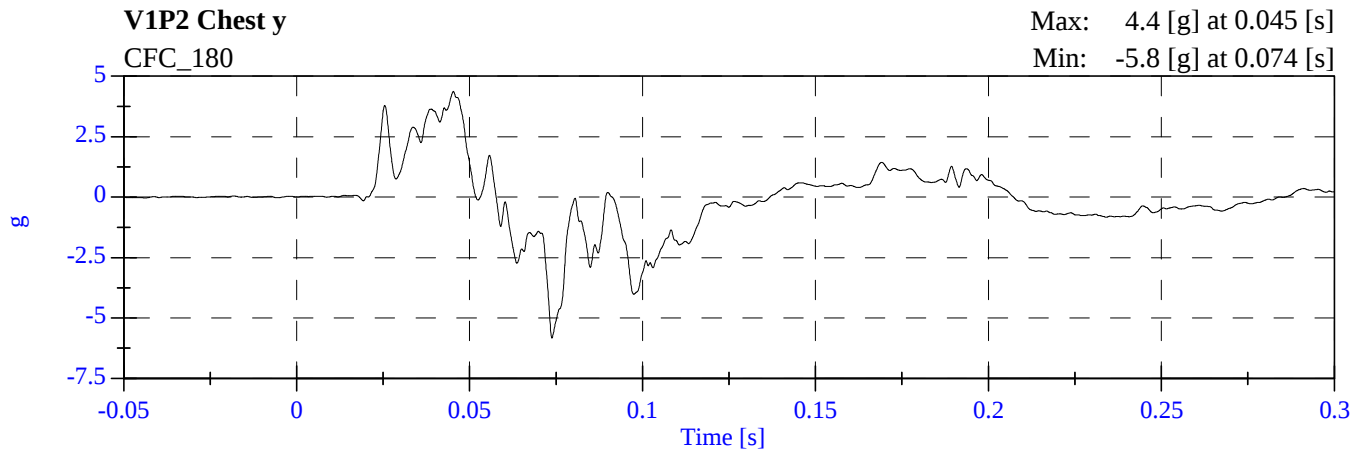
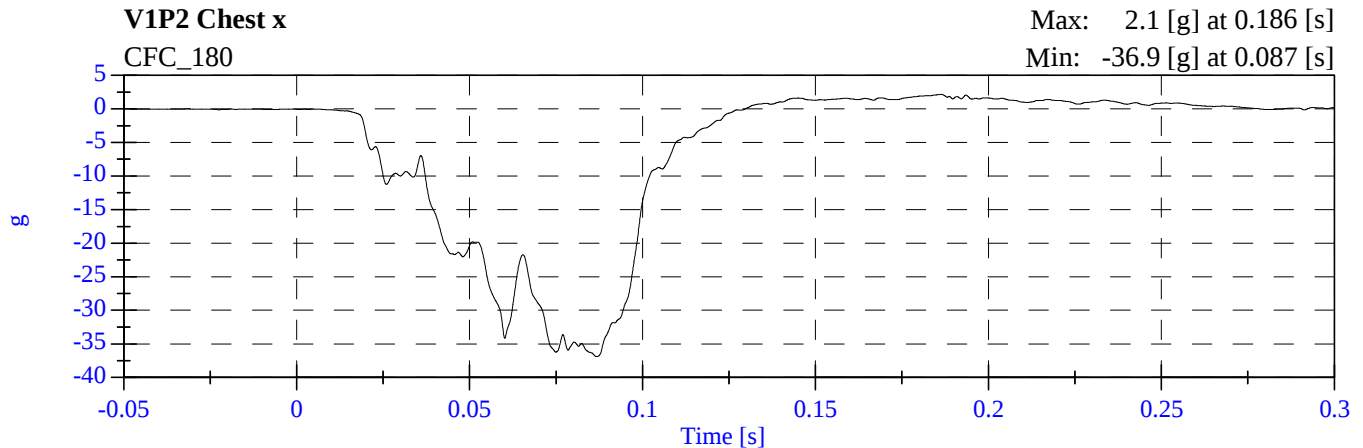


2007 NCAP Test 6 2007 Kia Spectra M70507 - December 14, 2006

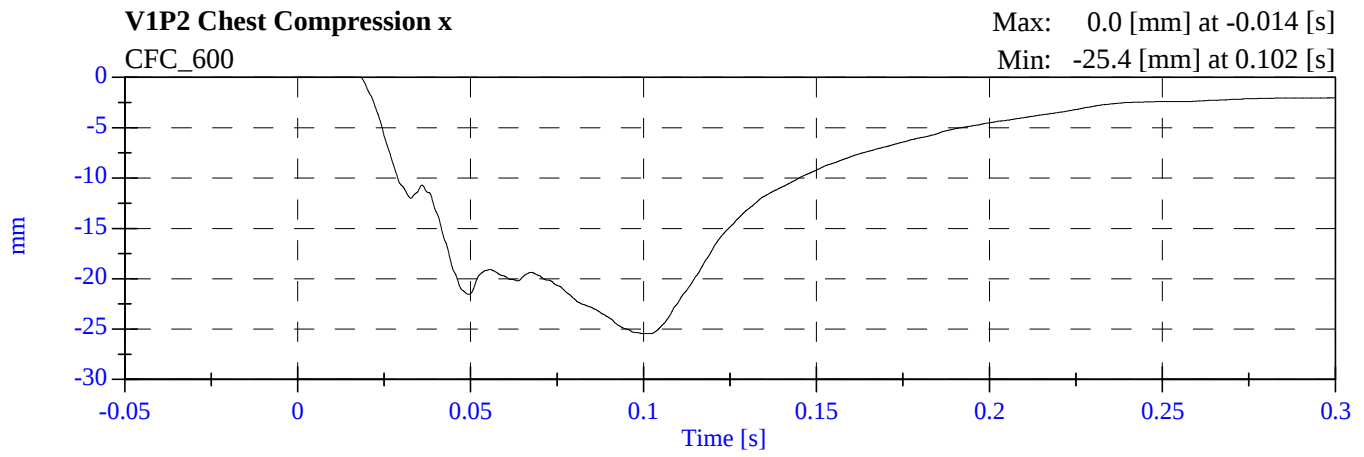


2007 NCAP Test 6 2007 Kia Spectra

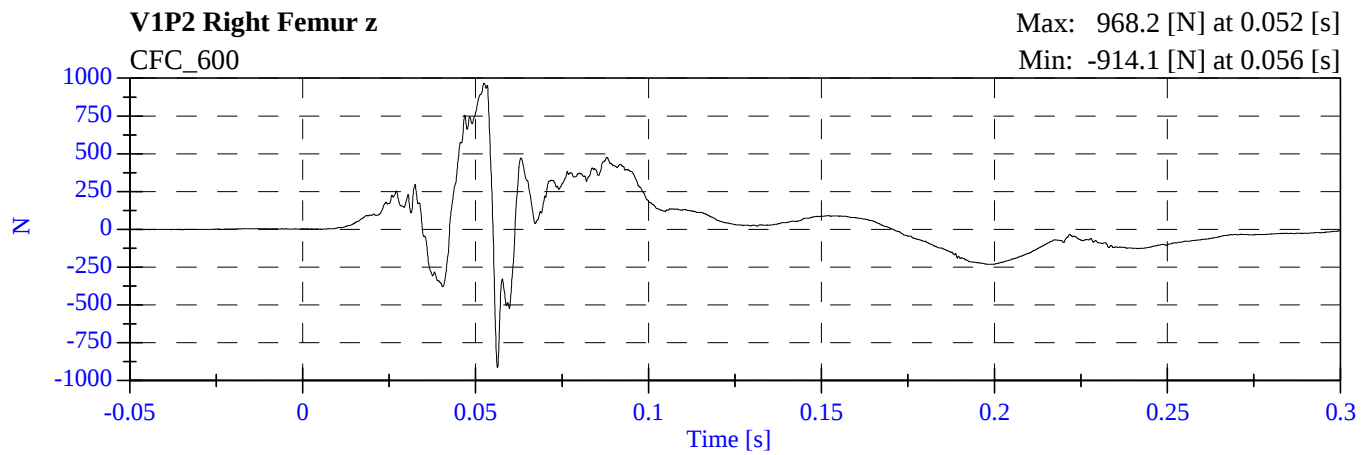
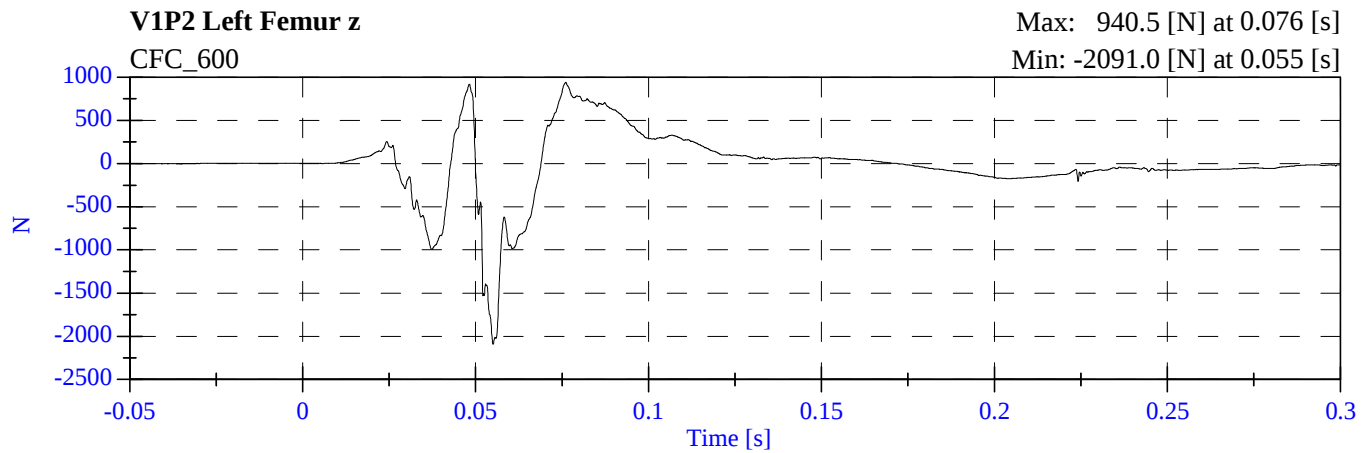
M70507 - December 14, 2006



2007 NCAP Test 6 2007 Kia Spectra
M70507 - December 14, 2006



2007 NCAP Test 6 2007 Kia Spectra M70507 - December 14, 2006



APPENDIX C

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

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

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

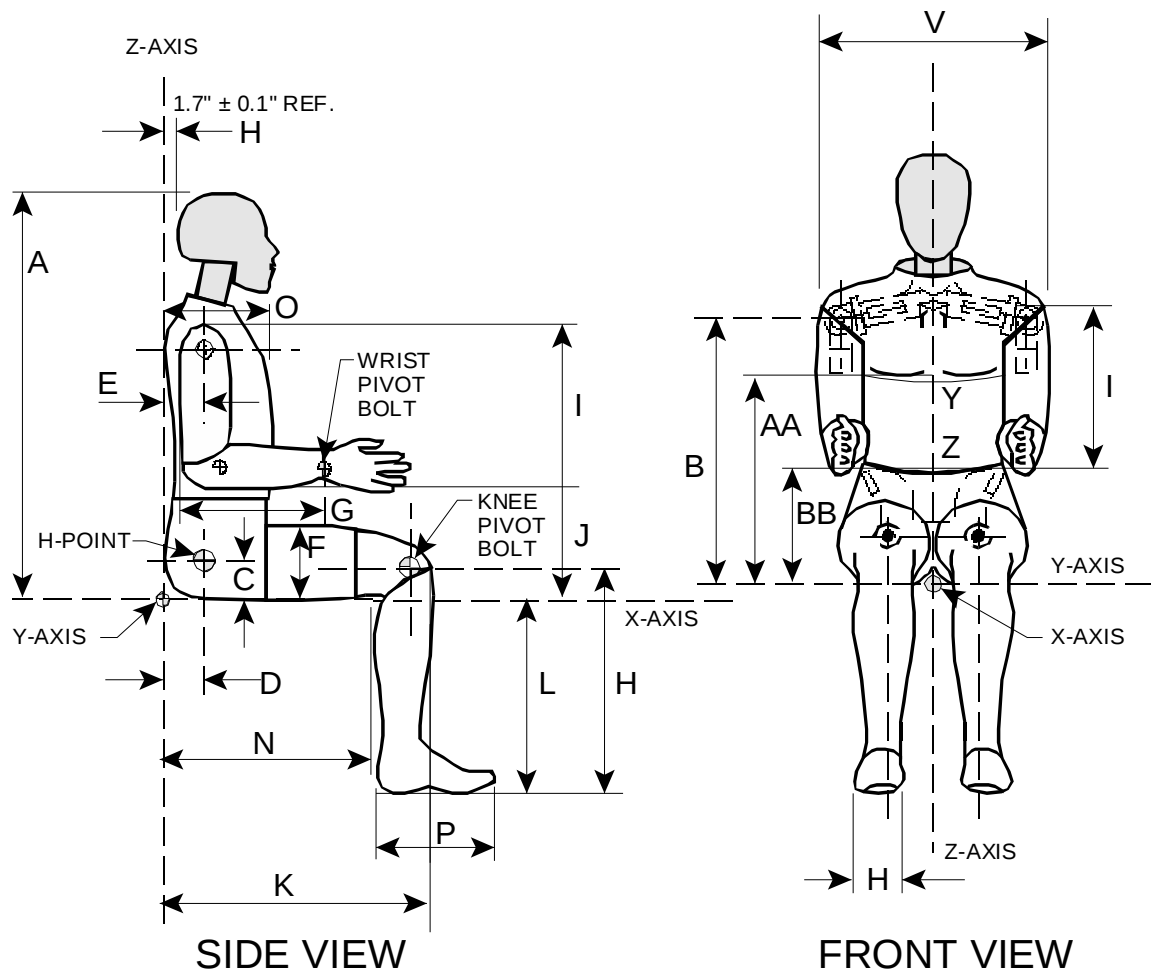
Dummy serial numbers and certification dates are:

<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	064	August 30, 2006
#2/Right Front Passenger	061	August 30, 2006

Electronic Test Equipment

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

EXTERNAL DIMENSIONS SPECIFICATIONS



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

PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 1
Date August 24, 2006
Workfile 4001

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Peak Resultant Acceleration	225-275 G's	260.36
Peak Lateral Acceleration	15 G's Max	10.42
Is Acceleration Curve Unimodal?	YES	8.21

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	August 28, 2006	6 Axis Neck Transducer
Workfile	4001	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		6.89 – 7.13 m/s	6.92
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.55
	20 ms	17.60 - 22.60 G's	21.04
	30 ms	12.50 - 18.50 G's	18.21
Max Pendulum G's Above 30 ms		29 G's Max	18.21
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.00
D Plane Rotation	Max	64 - 78 Deg	73.54
	Time	57 - 64 ms	62.40
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	90.53
	Time	47 - 58 ms	54.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	120.90
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	100.60

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	August 28, 2006	6 Axis Neck Transducer
Workfile	4001	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		5.94 – 6.19 m/s	6.07
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.70
	20 ms	14.00 - 19.00 G's	18.48
	30 ms	11.00 - 16.00 G's	15.03
Max Pendulum G's Above 30 ms		22 G's Max	15.03
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.20
D Plane Rotation	Max	81 - 106 Deg	104.11
	Time	72 - 82 ms	76.00
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-67.18
	Time	65 - 79 ms	70.90
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	156.30
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	146.70

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date August 30, 2006
Workfile 4001

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Pendulum Velocity	6.58 – 6.83 m/s	6.83
Maximum Deflection	63.50 – 72.64 mm	66.33
Maximum Resistive Force	5159.9 – 5893.9 N	5629.52
Internal Hysteresis	69 - 85 %	74.07

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date August 30, 2006
Workfile 4001

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5171.43
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4971.19

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date August 30, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1
Relative Humidity			50.0
Location for Chest Circumference	AA	16.9 - 17.1 in	16.9
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Total Sitting Height	A	34.6 - 35.0 in	34.7
Shoulder Pivot Height	B	19.9 - 20.5 in	19.9
H-Point Height	C	3.3 - 3.5 in	3.5
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	5.6
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.7
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	22.9
Popliteal Height	L	16.9 - 17.9 in	17.6
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	16.9
Foot Breadth	W	3.6 - 4.2 in	3.8
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.1
Waist Circumference	Z	32.9 - 34.1 in	33.6

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 1
Date August 24, 2007
Workfile 4001

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Peak Resultant Acceleration	225-275 G's	273.59
Peak Lateral Acceleration	15 G's Max	7.61
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	August 25, 2006	6 Axis Neck Transducer
Workfile	4001	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		6.89 – 7.13 m/s	7.01
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.89
	20 ms	17.60 - 22.60 G's	21.91
	30 ms	12.50 - 18.50 G's	18.38
Max Pendulum G's Above 30 ms		29 G's Max	19.77
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	40.70
D Plane Rotation	Max	64 - 78 Deg	68.92
	Time	57 - 64 ms	61.10
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	97.22
	Time	47 - 58 ms	51.40
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	116.20
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	061	
Sequential Test Number	1	
Date	August 28, 2006	6 Axis Neck Transducer
Workfile	4001	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.0
Impact Velocity		5.94 – 6.19 m/s	5.97
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.20
	20 ms	14.00 - 19.00 G's	16.89
	30 ms	11.00 - 16.00 G's	15.70
Max Pendulum G's Above 30 ms		22 G's Max	17.99
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.50
D Plane Rotation	Max	81 - 106 Deg	96.48
	Time	72 - 82 ms	78.80
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-78.98
	Time	65 - 79 ms	75.50
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	156.10
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	143.30

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date August 30, 2006
Workfile 4001

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Pendulum Velocity	6.58 – 6.83 m/s	6.74
Maximum Deflection	63.50 – 72.64 mm	64.26
Maximum Resistive Force	5159.9 – 5893.9 N	5736.68
Internal Hysteresis	69 - 85 %	74.71

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date August 30, 2006
Workfile 4001

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4844.17
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5222.28

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date August 30, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1
Relative Humidity			50
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	34.7
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	3.4
Thigh Clearance	F	5.5 - 6.1 in	5.9
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.8
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.3
Elbow Rest Height	J	7.5 - 8.3 in	7.7
Buttock Knee Length	K	22.8 - 23.8 in	22.9
Popliteal Height	L	16.9 - 17.9 in	17.5
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Buttock Popliteal Length	N	17.8 - 18.8 in	18.6
Chest Depth	O	8.4 - 9.0 in	8.6
Foot Length	P	9.9 - 10.5 in	10.0
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Foot Breadth	W	3.6 - 4.2 in	3.9
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.0
Waist Circumference	Z	32.9 - 34.1 in	33.6

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 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	J27517	12/4/2006	6/4/07
	Y	ENDEVCO	AAKB1	12/1/2006	6/1/07
	Z	ENDEVCO	AAK48	12/1/2006	6/1/07
Head	X (R)	ENDEVCO	P16194	12/4/2006	6/4/07
	Y (R)	ENDEVCO	J14688	12/4/2006	6/4/07
	Z (R)	ENDEVCO	P21399	12/1/2006	6/1/07
Neck Load Cell	X	DENTON	1912Fx	5/10/2006	11/10/06
	Y	DENTON	1912Fy	5/10/2006	11/10/06
	Z	DENTON	1912Fz	5/10/2006	11/10/06
Neck Moment	X	DENTON	1912Mx	5/10/2006	11/10/06
	Y	DENTON	1912My	5/10/2006	11/10/06
	Z	DENTON	1912Mz	5/10/2006	11/10/06
Chest	X	ENDEVCO	J23946	12/1/2006	6/1/07
	Y	ENDEVCO	AGAC4	12/1/2006	6/1/07
	Z	ENDEVCO	P16225	12/1/2006	6/1/07
Chest	X (R)	ENTRAN	03E03E21-M20	12/1/2006	6/1/07
	Y (R)	ENDEVCO	P15638	12/1/2006	6/1/07
	Z (R)	ENDEVCO	P16517	12/1/2006	6/1/07
Chest Deflection	X	SERVO	64	6/12/2006	12/12/06
Pelvic	X	ENDEVCO	AJ5R0	12/4/2006	6/4/07
	Y	ENDEVCO	J22036	12/4/2006	6/4/07
	Z	ENDEVCO	P32204	12/4/2006	6/4/07

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	1525	4/21/2006	10/21/06
Right Femur Load Cell	Fz	DENTON	1526	4/21/2006	10/21/06
Left Upper Tibia	Mx	DENTON	404Mx	5/9/2006	11/9/06
	My	DENTON	404My	5/9/2006	11/9/06
Left Lower Tibia	Fz	DENTON	396Fz	5/9/2006	11/9/06
	Mx	DENTON	396Mx	5/9/2006	11/9/06
	My	DENTON	396My	5/9/2006	11/9/06
Right Upper Tibia	Mx	DENTON	374Mx	12/2/2006	6/2/07
	My	DENTON	374My	12/2/2006	6/2/07
Right Lower Tibia	Fz	DENTON	372Fz	11/14/2006	5/14/07
	Mx	DENTON	372My	11/14/2006	5/14/07
	My	DENTON	372My	11/14/2006	5/14/07
Left Foot Rear	X	ENDEVCO	P17912	12/4/2006	6/4/07
	Z	ENDEVCO	J33376	12/4/2006	6/4/07
Left Foot Front	Z	ENDEVCO	P16899	12/4/2006	6/4/07
Right Foot Rear	X	ENDEVCO	J14669	12/4/2006	6/4/07
	Z	ENDEVCO	J20209	12/4/2006	6/4/07
Right Foot Front	Z	ENDEVCO	J14234	12/4/2006	6/4/07
Lap Belt Load Cell		First	156	7/11/2006	1/11/07
Shoulder Belt Load Cell		First	159	7/11/2006	1/11/07

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	J20018	11/16/2006	5/16/07
	Y	ENDEVCO	P16755	11/16/2006	5/16/07
	Z	ENDEVCO	J14667	11/16/2006	5/16/07
Head	X (R)	ENDEVCO	J38127	11/16/2006	5/16/07
	Y (R)	ENDEVCO	J20569	11/16/2006	5/16/07
	Z (R)	ENDEVCO	J21963	11/16/2006	5/16/07
Neck Load Cell	X	DENTON	1916Fx	5/12/2006	11/12/06
	Y	DENTON	1916Fy	5/12/2006	11/12/06
	Z	DENTON	1916Fz	5/12/2006	11/12/06
Neck Moment	X	DENTON	1916Mx	5/12/2006	11/12/06
	Y	DENTON	1916My	5/12/2006	11/12/06
	Z	DENTON	1916Mz	5/12/2006	11/12/06
Chest	X	ENDEVCO	AAKC6	11/16/2006	5/16/07
	Y	ENDEVCO	AAKD0	11/16/2006	5/16/07
	Z	ENDEVCO	J27470	11/16/2006	5/16/07
Chest	X (R)	ENDEVCO	J21988	11/16/2006	5/16/07
	Y (R)	ENDEVCO	J20027	11/16/2006	5/16/07
	Z (R)	ENDEVCO	J36741	11/16/2006	5/16/07
Chest Deflection	X	SERVO	61	4/7/2006	10/7/06
Pelvic	X	ENTRAN	99H30-Z13	11/16/2006	5/16/07
	Y	ENTRAN	01G18-F14	11/16/2006	5/16/07
	Z	ENTRAN	02I02I05-F06	11/16/2006	5/16/07

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	1532	4/21/2006	10/21/06
Right Femur Load Cell	Fz	DENTON	1533	4/21/2006	10/21/06
Left Upper Tibia	Mx	DENTON	268Mx	4/21/2006	10/21/06
	My	DENTON	268My	4/21/2006	10/21/06
Left Lower Tibia	Fz	DENTON	196Fz	4/21/2006	10/21/06
	Mx	DENTON	196Mx	4/21/2006	10/21/06
	My	DENTON	196My	4/21/2006	10/21/06
Right Upper Tibia	Mx	DENTON	266Mx	4/17/2006	10/17/07
	My	DENTON	266My	4/17/2006	10/17/07
Right Lower Tibia	Fz	DENTON	179Fz	4/17/2006	10/17/07
	Mx	DENTON	179Mx	4/17/2006	10/17/07
	My	DENTON	179My	4/17/2006	10/17/07
Left Foot Rear	X	ENDEVCO	J20030	11/16/2006	5/26/07
	Z	ENDEVCO	J18662	11/17/2006	5/17/07
Left Foot Front	Z	ENDEVCO	J119927	11/17/2006	5/17/07
Right Foot Rear	X	ENDEVCO	J20382	11/16/2006	5/16/07
	Z	ENDEVCO	DE54J	11/16/2006	5/16/07
Right Foot Front	Z	ENDEVCO	J19440	11/16/2006	5/16/07
Lap Belt Load Cell		First	173	7/11/2006	1/11/07
Shoulder Belt Load Cell		First	178	7/11/2006	1/11/07

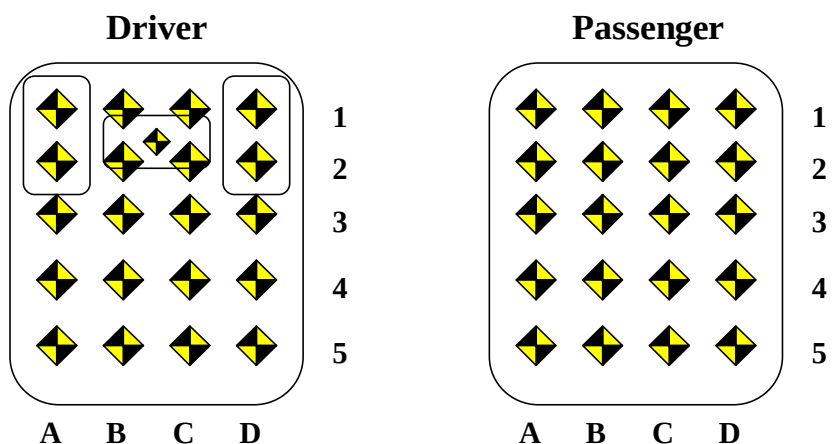
INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	FGP19	7/11/2006	1/11/07
Right Rear Seat Crossmember X	GS	9440-046	7/11/2006	1/11/07
Top of Engine	ICS	FGP50	7/26/2006	1/26/07
Bottom of Engine	ICS	FGP49	7/26/2006	1/26/07
Right Disc Brake Caliper	GS	9440-045	7/26/2006	1/26/07
Left Disc Brake Caliper	ICS	FGP03	7/26/2006	1/26/07
Left Seat Rear Crossmember Z	ICS	FGP29	7/11/2006	1/11/07
Right Seat Rear Crossmember Z	GS	9440-023	7/11/2006	1/11/07

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

DRIVER SIDE INTRUSION MEASUREMENTS

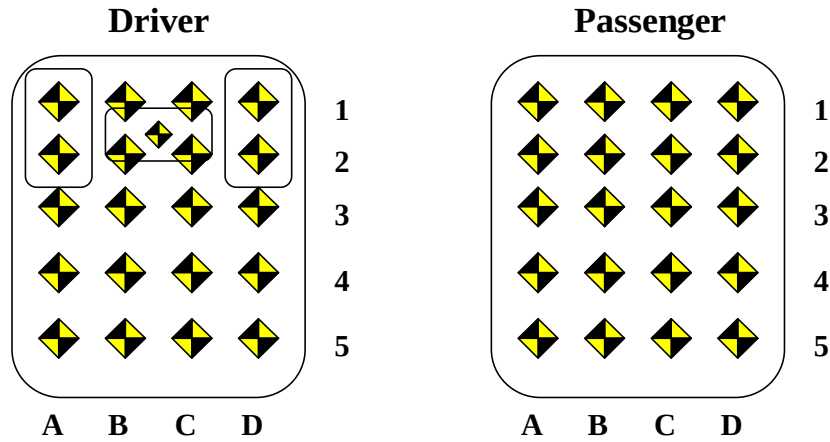


Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3205	592	434	3151	615	450	54	-23	-16
B1	3297	443	432	3185	446	470	112	-3	-38
C1	3314	306	434	3210	314	468	104	-8	-34
D1	3308	188	433	3223	190	455	85	-2	-22
A2	3141	595	340	3112	605	342	29	-10	-2
B2	3236	447	337	3115	444	393	121	3	-56
C2	3240	315	335	3134	316	376	106	-1	-41
D2	3237	184	337	3154	188	361	83	-4	-24
A3	3090	596	264	3079	600	258	11	-4	6
B3	3127	458	257	3097	457	267	30	1	-10
C3	3125	324	259	3077	326	265	48	-2	-6
D3	3122	192	261	3080	195	254	42	-3	7
A4	3055	597	251	3053	598	240	2	-1	11
B4	3053	464	252	3040	468	241	13	-4	11
C4	3049	331	254	3022	334	262	27	-3	-8
D4	3046	195	254	3023	199	246	23	-4	8
A5	2977	598	253	2972	600	238	5	-2	15
B5	2974	472	252	2968	475	230	6	-3	22
C5	2970	337	254	2961	343	220	9	-6	34
D5	2969	198	253	2960	205	213	9	-7	40
BP	3143	337	437	3083	338	472	60	-1	-35
G	2902	479	704	2864	481	731	38	-2	-27
H	2897	170	700	2861	170	725	36	0	-25
L	2662	331	905	2655	334	958	7	-3	-53
AB	2578	542	322	2582	543	297	-4	-1	25

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	3294	-188	433	3220	-181	458	74	-7	-25
B1	3329	-328	428	3248	-329	478	81	1	-50
C1	3281	-473	432	3205	-480	475	76	7	-43
D1	3199	-607	430	3163	-628	440	36	21	-10
A2	3240	-196	342	3186	-198	362	54	2	-20
B2	3239	-331	342	3174	-332	374	65	1	-32
C2	3238	-470	346	3177	-471	385	61	1	-39
D2	3170	-604	346	3162	-612	355	8	8	-9
A3	3126	-203	265	3104	-206	260	22	3	5
B3	3127	-332	261	3115	-336	261	12	4	0
C3	3126	-467	261	3124	-471	259	2	4	2
D3	3128	-601	266	3133	-605	266	-5	4	0
A4	3046	-204	260	3040	-218	241	6	14	19
B4	3047	-333	254	3052	-342	238	-5	9	16
C4	3048	-466	255	3054	-473	242	-6	7	13
D4	3051	-603	256	3059	-608	251	-8	5	5
A5	2964	-204	256	2966	-213	240	-2	9	16
B5	2968	-335	254	2971	-343	237	-3	8	17
C5	2967	-466	256	2974	-472	243	-7	6	13
D5	2970	-605	256	2978	-610	249	-8	5	7
R	2899	-254	705	2886	-253	722	13	-1	-17
S	2903	-553	706	2869	-551	702	34	-2	4
AB	2577	-544	327	2587	-548	316	-10	4	11

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

AB = Front outboard seat anchor bolt