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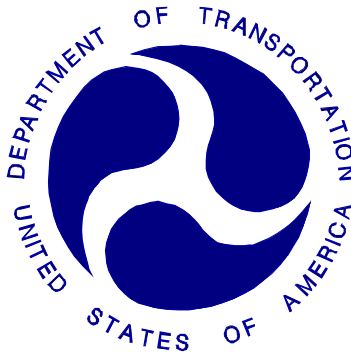
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

MAZDA MOTOR CORPORATION
2007 MAZDA CX-7
MPV

NHTSA NUMBER: M75400

CALSPAN TEST NUMBER: 8642-NCAP-78

CALSPAN CORPORATION
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July 14, 2006

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
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Approval Date:

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16. Abstract A frontal load cell barrier test of a 2007 Mazda CX-7 MPV was performed at Calspan Corporation's crash test facility in Buffalo, New York, on July 14, 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 575 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and force limiters, knee bolsters, head restraints 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 (061)</th> <th>Passenger (064)</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC - 36 ms)</td> <td>-</td> <td>1000</td> <td>408.4</td> <td>341.6</td> </tr> <tr> <td>Maximum Thorax Acceleration (3 ms Clip)</td> <td>g's</td> <td>60 g's</td> <td>39.4</td> <td>39.4</td> </tr> <tr> <td>Chest Displacement</td> <td>mm</td> <td>-76 mm</td> <td>-23.1</td> <td>-27.9</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>-10000 N</td> <td>-2458.8</td> <td>-3471.5</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>-10000 N</td> <td>-1147.8</td> <td>-3808.9</td> </tr> </tbody> </table>						Measurement Description	Units	Threshold	Driver (061)	Passenger (064)	Head Injury Criteria (HIC - 36 ms)	-	1000	408.4	341.6	Maximum Thorax Acceleration (3 ms Clip)	g's	60 g's	39.4	39.4	Chest Displacement	mm	-76 mm	-23.1	-27.9	Left Femur Force	Newtons	-10000 N	-2458.8	-3471.5	Right Femur Force	Newtons	-10000 N	-1147.8	-3808.9
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17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5111 Washington, DC 20590																																
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TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
1 PURPOSE AND SUMMARY OF NCAP TEST	1-1
2 OCCUPANT AND VEHICLE INFORMATION	2-1
<u>Data Sheet</u> <u>Description</u>	
1. CRASH TEST SUMMARY	2-1
2. GENERAL TEST AND VEHICLE PARAMETER DATA	2-2
3. TEST VEHICLE TIRE INFORMATION	2-4
4. TEST VEHICLE INFORMATION	2-5
5. DUMMY POSITIONING IN VEHICLE	2-7
6. SEAT BELT POSITIONING DATA	2-9
7. VEHICLE ACCELEROMETER LOCATIONS	2-10
8. SUMMARY OF FMVSS 212 and FMVSS 219 (Partial) DATA	2-11
9. SUMMARY OF FMVSS NO. 301 DATA	2-12
10. VEHICLE MEASUREMENTS	2-13
11. HIGH-SPEED CAMERA LOCATIONS	2-16
12. VEHICLE REFERENCE PHOTO TARGET LOCATIONS	2-18
13. VEHICLE INTRUSION MEASUREMENTS	2-19
14. LOAD CELL LOCATIONS ON FIXED BARRIER	2-23
15. ACCIDENT INVESTIGATION DIVISION DATA	2-24
16. VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART	2-25
APPENDIX A PHOTOGRAPHS	A-1
APPENDIX B VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA	B-1
APPENDIX C PART 572E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION TESTS	C-1
APPENDIX D DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION	D-1
APPENDIX E VEHICLE INTERIOR INTRUSION MEASUREMENTS	E-1

SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.65 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-32005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated December 1999. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301 "Fuel System Integrity" performance. Procedures for receiving, inspection testing and reporting of test results are described in the test procedures and are not repeated in this report.

One real-time camera and 14 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented, 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. 061) and the right-front passenger (position 2) ATD (Serial No.064) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 129 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 Mazda CX-7 MPV at a velocity of 56.65 kph. The test was performed at Calspan on July 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	408.4	65.9	101.9	39.4	59.7	62.7	-23.1	-2458.8	-1147.8
Passenger	341.6	63.7	99.7	39.4	85.4	88.4	-27.9	-3471.5	-3808.9

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

TEST NOTES	
Data Channel	Anomalies
V1P1 Head CG Red z	Channel Opened
V1P1 Left Lower Tibia Mx	Data Clipped
V1P1 Left Foot Aft z	Channel Opened
V1P2 Left Foot Aft x	Questionable data after 60 ms

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M75400 Test Mode: 56.3 kph Frontal Barrier
 Test Date: July 14, 2006 Time: 11:22 Temperature: 21 °C
 Vehicle Make/Model/Body Style: 2007 Mazda CX-7 MPV
 Vehicle Test Weight: 1968.0 kg Impact Velocity: 56.65 kph (55.5 – 57.1 kph)
 Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 575 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	Three point safety belt with torso belt pretensioner and force limiter, Airbag, Knee Bolster and Head Restraint	Three point safety belt with torso belt pretensioner and force limiter, Airbag, Knee Bolster and Head Restraint
Head Contact:	The face to the center of the airbag, the top of the head to the sunvisor and the back of the head to the center of the head restraint	The face to the center of the airbag, the top of the head to the sunvisor and the back of the head to the center of the head restraint
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, latched and operable without tools	Closed, latched and operable without tools
Rear Door Opening	Closed, latched and operable without tools	Closed, latched and operable without tools
Hatch/Other Door Opening	-	Closed, latched and operable without tools
Front Seat Track Shift (mm)	0	+ 8 mm
Front Seat Back Failure	None	None
Glazing Damage	The windshield crack from the passenger airbag deployment	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	588	660	675	641

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	1060	1090
Lap belt length as measured on ATD	mm	890	690
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	1950	1780

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2007 Mazda CX-7 MPV

NHTSA No. : M75400 ; VIN: JM3ER29L470103959 ; Color: Black Cherry

Engine Data: 4 cylinders; - CID; 2.3 Liters; - cc

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

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

Final Drive: - Rear Wheel Drive; - Front Wheel Drive; X 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; X N/A

DEALER AND DELIVERY INFORMATION:

Date Received: 06-21-2006 ; Odometer Reading 48 km

Selling Dealer: Nothtown Mazda

Dealer Address: 3900 Sheridan Drive Amherst, New York 14226

TEST VEHICLE OPTIONS:

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

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

SAFETY BELT FEATURES:

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

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

AIRBAG FEATURES:

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

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Mazda Motor Corporation

Date of Manufacture 04/06

GVWR: 2267 kg; GAWR: 1189 kg FRONT; 1083 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 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 =	518.5	518.5	58.4	1037.0
Rear =	380.5	359.0	41.6	739.5
Total Delivered Weight (UDW) =				1776.5

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	1776.5	kg
Rated Cargo/Luggage Weight (RCLW)	=	44.8	kg
Weight of 2 p.572 Dummies @ 76 each	=	152	kg
TARGET TEST WEIGHT	=	1973.3	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 39.5 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	556.0	553.5	56.4	1109.5
Rear =	440.0	418.5	43.6	858.5
Total Vehicle Test Weight (ATW) =				1968.0

Weight of Ballast Secured in Vehicle Trunk Area¹ = 0 kg

Vehicle Components Removed for Weight Reduction: Rear head Restraints, Spare Tire, Jack

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG ²
AS DELIVERED:	812	817	826	840	1144.3
FULLY LOADED:	801	806	801	822	-
AS TESTED:	803	811	814	823	1199.2

Vehicle's Wheel Base: 2749 Mm

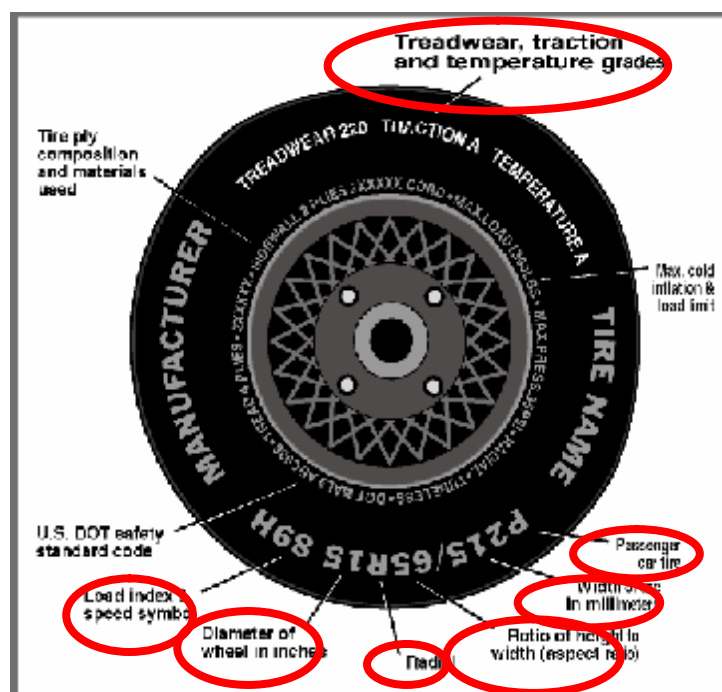
¹Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

²Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2007 Mazda CX-7 MPV

NHTSA Test No.: M75400 Test Date: July 14, 2006



Measured Parameter	Front	Rear
Maximum Tire Pressure (from sidewall - kPa)	300	300
Cold Pressure (from tire placard - kPa)*	220	220
Recommended Tire Size (from tire placard)	P235/60R18	P235/60R18
Tire size on Vehicle	P235/60R18	P235/60R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Name	Turanza El42	Turanza El42
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	60	60
Radial	Yes	Yes
Wheel Diameter	18	18
Load Index & Speed Symbol	102H	102H
Treadwear	300	300
Traction Grade	A	A
Temperature Grade	A	A

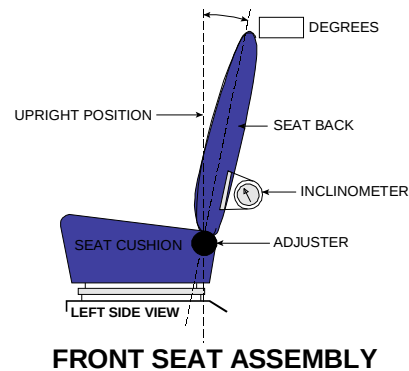
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2007 Vehicle Model: Mazda CX-7 Body Style : MPV

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



Seat back angle for driver's seat: 17.7

Measurement instructions: With the seat cushion in the lowest height position, recline seatback until the angle of the outboard head restraint post is 17.7° from a level sill.

Seat back angle for passenger's seat: 14.0

Measurement instructions: Adjust the seatback to the seventh detent rearward from full forward (0). The angle of the outboard head restraint post should read 14° from a level sill.

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: The total travel is 270 mm. The mid position is 135 mm forward from the full rearward, full down position.

Positioning of the passenger's seat: There are 27 detents labeled 0 to 26. The test position is detent 13. The seat travel is 260 mm, test position is 130 mm forward of the full rearward position.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 68.9 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 = 63.4 to 64.8 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 64.0 liters

3.3 One-Third of Useable Capacity = 23.0 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 ignition is turned on 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: The steering column tilted from 27.6 to 21.6 degrees. The column
was set to 24.6 degrees. This resulted in an angle of 23.8 degrees from level sill.

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: There are four total detents. The test position is detent 0 (uppermost)

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

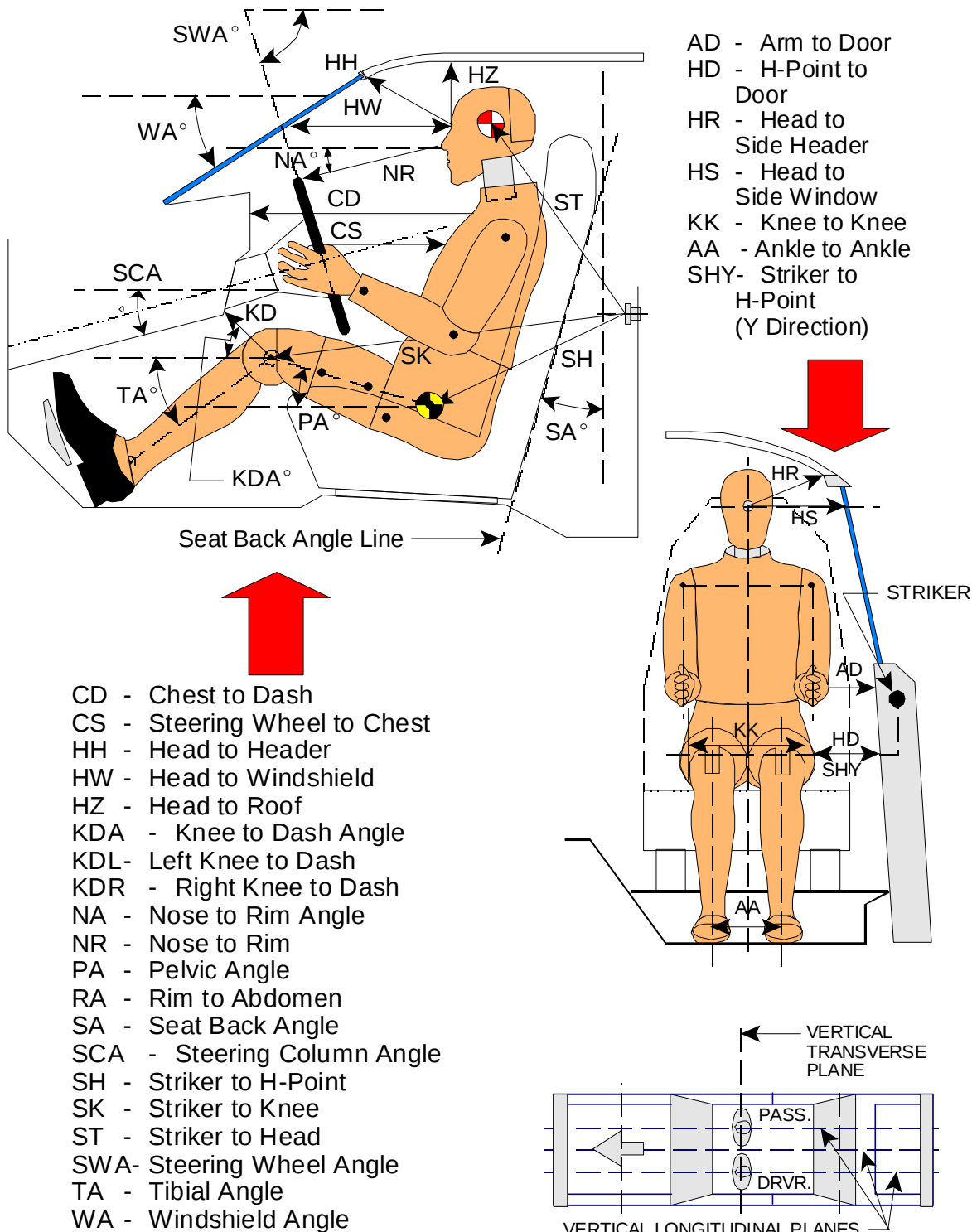
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; - No; X N/A

Comments: This vehicle is not equipped with automatic door locks. The doors were tested in the unlocked
condition.

DATA SHEET NO. 5

FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



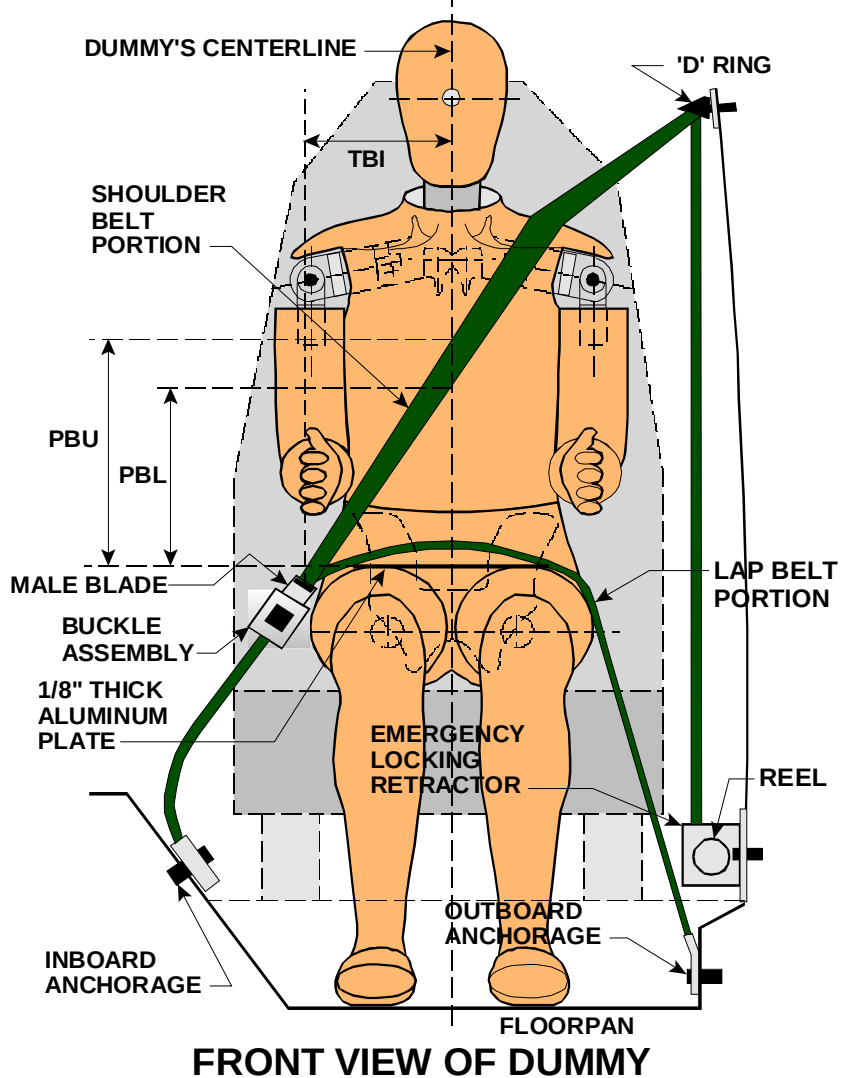
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	22.5 deg.			N/A		
SWA ^o	23.8 deg.			N/A		
SCA ^o	66.2 deg.			N/A		
SA ^o	17.7 deg.			14.0 deg.		
HZ	215			172		
HH	387			351		
HW	772			708		
HR	241			220		
NR	447	Angle	-17 deg.	N/A		
CD	533			540		
CS	333			N/A		
RA	212			N/A		
KDL	184	Angle (KDA)	29 deg.	98		
KDR	147			133	Angle (KDA)	35 deg.
PA ^o	23.7 deg.			24.0 deg.		
TA ^o	44.4 deg.			40.0 deg.		
KK	270			216		
AA	302			220		
ST	523	Angle	12 deg.	559	Angle	12 deg.
SK	583	Angle	92 deg.	635	Angle	93 deg.
SH	222	Angle	131 deg.	250	Angle	119 deg.
SHY	260			260		
HS	342			344		
HD	156			158		
AD	140			146		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

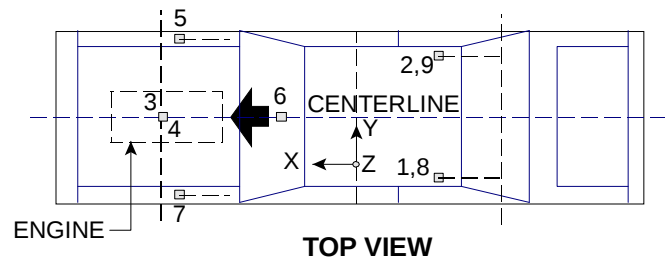
SEAT BELT POSITIONING DATA



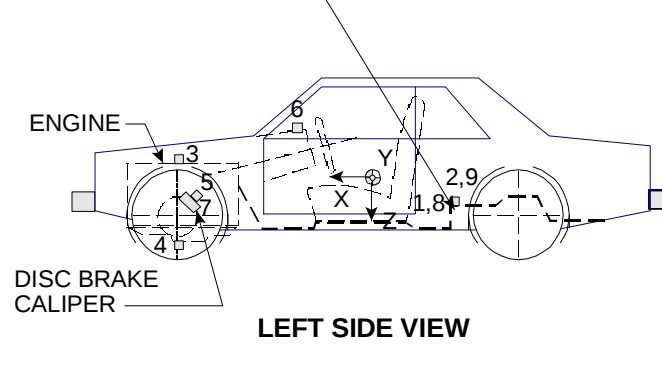
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	340	370
PBL-- Top surface of alum. plate to belt lower edge	262	290
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	1798	-581	-487
2	Right Rear Seat Cross Member X	1796	600	-500
3	Top of Engine Block	4101	-156	-825
4	Bottom of Engine	3786	194	-276
5	Disc Brake Caliper @ Right Side	3663	673	-372
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	3663	-673	-372
8	Left Rear Seat Cross Member Z	1798	-581	-487
9	Right Rear Seat Cross Member Z	1796	600	-500

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.

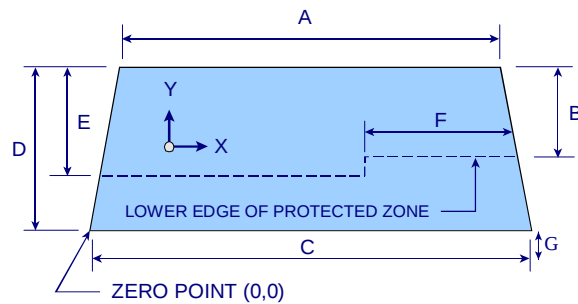
FMVSS 212 REQUIREMENTS:

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°C.

FMVSS 212 TEST DATA

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



DIMENSIONS (mm)	
A	1260
B	605
C	1520
D	905
E	600
F	720
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.	-	-

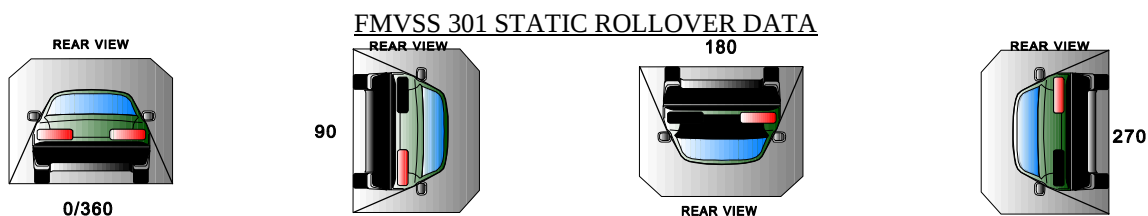
DATA SHEET NO. 9
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: _____ M75400 _____ TEST DATE: _____ July 14, 2006
VEHICLE MAKE/MODEL: _____ 2007 Mazda CX-7 MPV _____
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

FUEL SPILLAGE MEASUREMENT:

Time Interval	Amount	Maximum Allowable Spillage
Impact Until Motion Ceases		28 g
First Five Minutes Following Impact		142 g
Next 25 Minutes		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	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
90° - 180°	1	minutes	05	seconds	5	minutes	6	minutes	5	seconds	7	minutes
180°-270°	1	minutes	05	seconds	5	minutes	6	minutes	5	seconds	7	minutes
270°-360°	1	minutes	07	seconds	5	minutes	6	minutes	7	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:

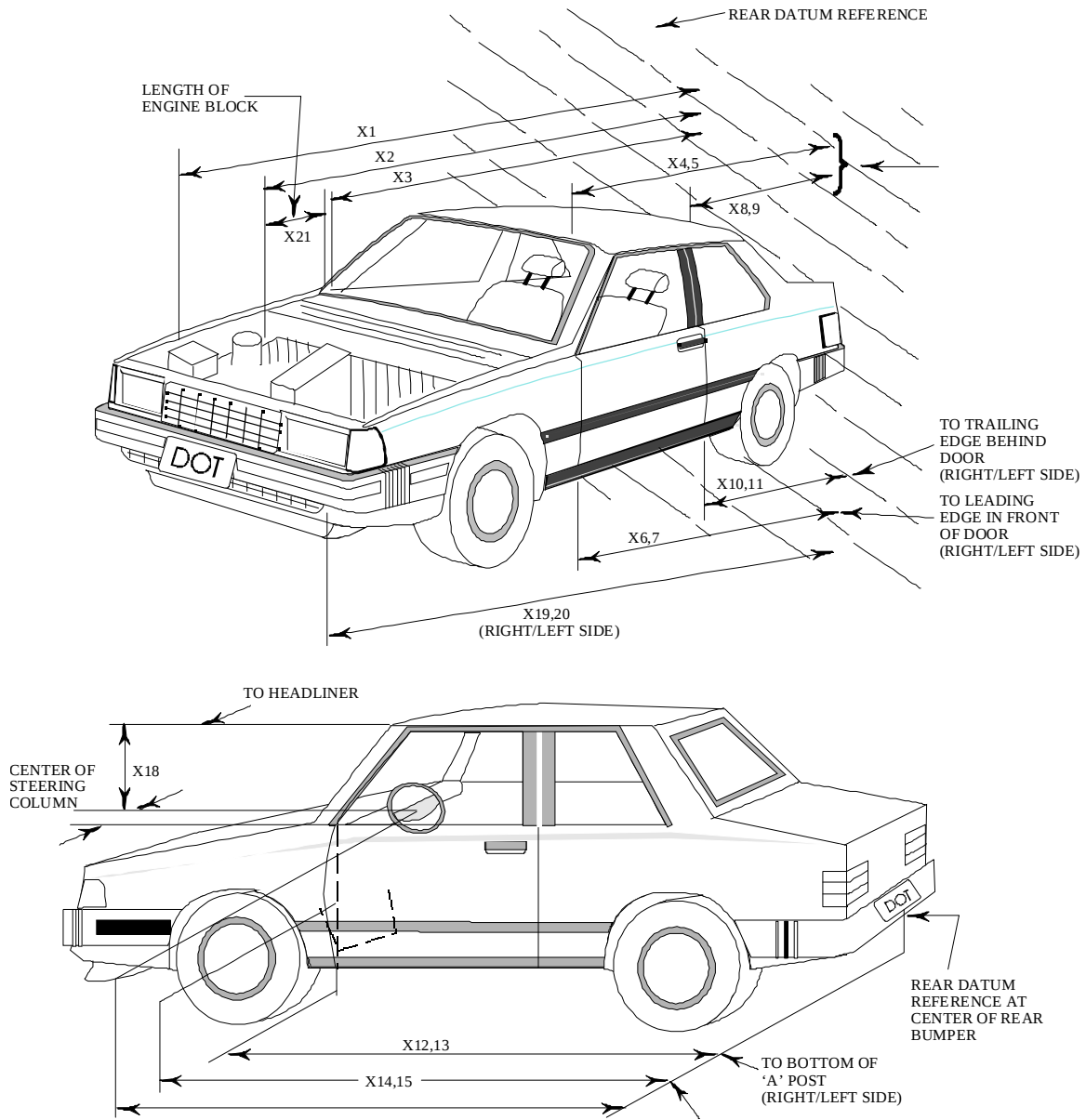
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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.: M75400 TEST DATE: July 14, 2006
VEHICLE MAKE/MODEL: 2007 Mazda CX-7 MPV

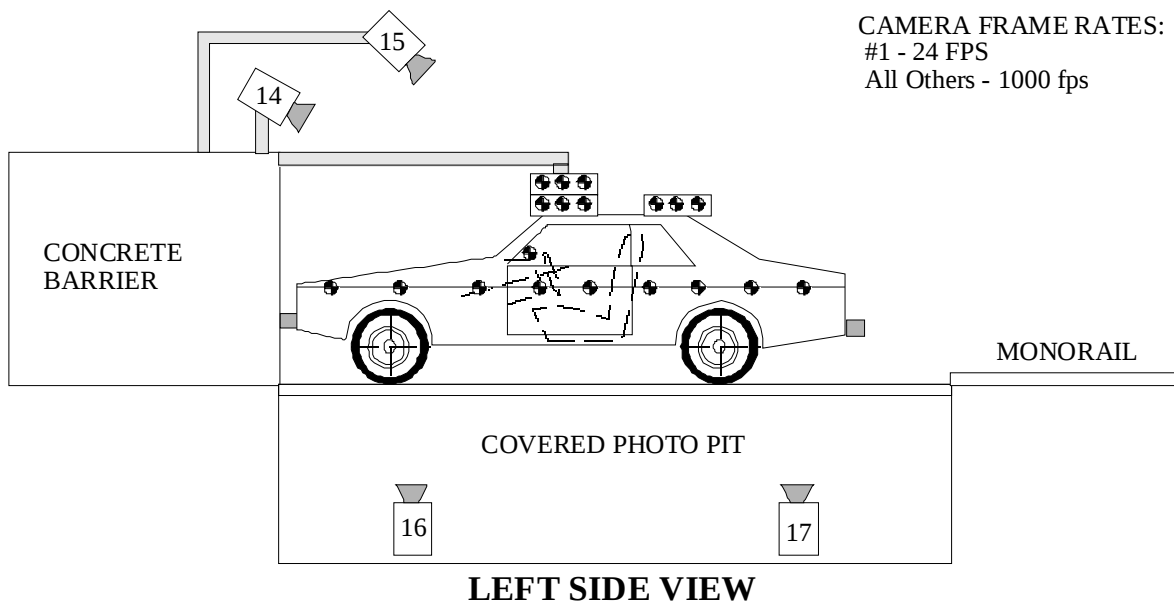
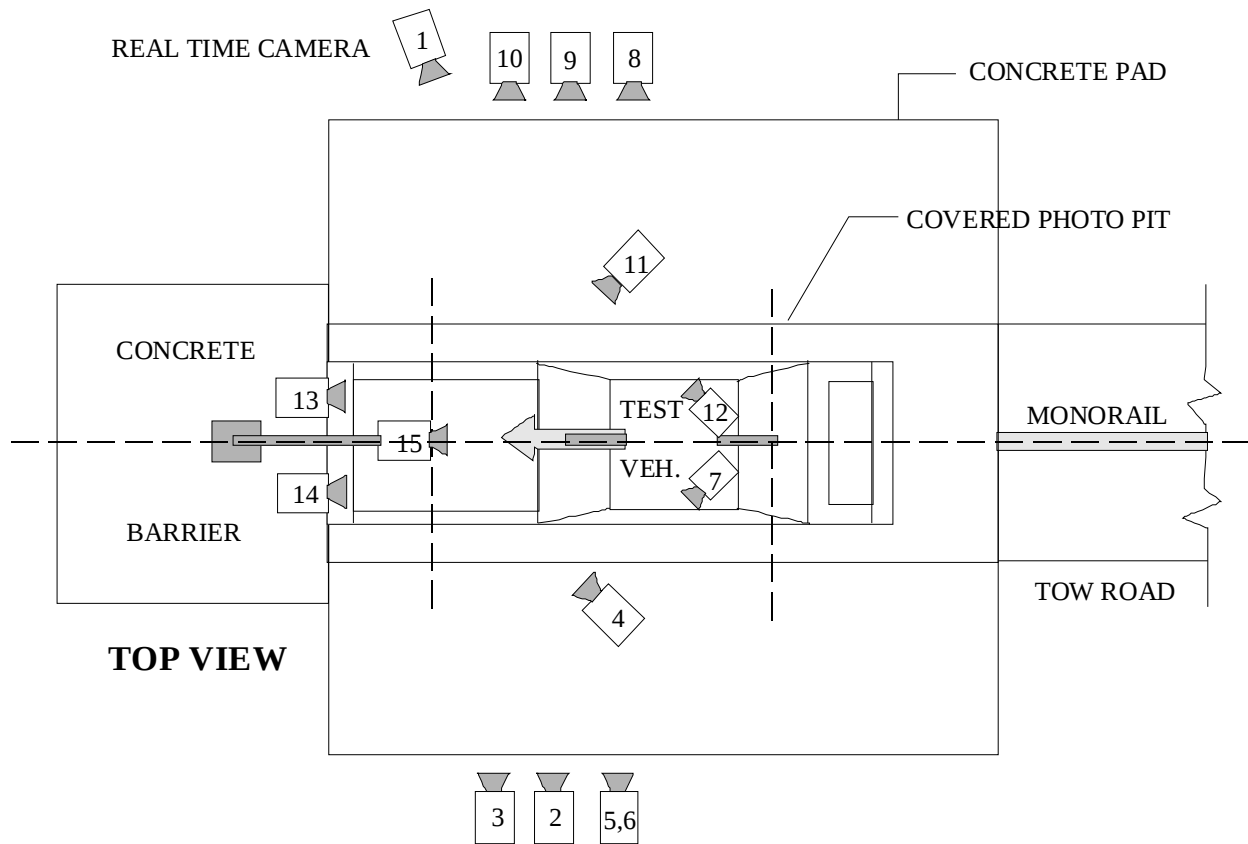
No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4677	4102	575
X2	Rear Surface of Vehicle to Front of Engine	4186	3896	290
X3	Rear Surface of Vehicle to Firewall	3715	3666	49
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3155	3155	0
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3158	3158	0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3126	3126	0
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3129	3130	-1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2056	2057	-1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2058	2058	0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2126	2126	0
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2129	2129	0
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3375	3374	1
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3375	3374	1
X14	Rear Surface of Vehicle to Firewall, Right Side	3769	3746	23
X15	Rear Surface of Vehicle to Firewall, Left Side	3771	3739	32
X16	Rear Surface of Vehicle to Steering Column	2698	2726	-28
X17	Center of Steering Column to "A" Post	302	265	37
X18	Center of Steering Column to Headliner	422	413	9
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4578	4171	407
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4576	4122	454
X21	Length of Engine Block	418	418	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2964	2964	0
CD	Rear Surface of Vehicle to Center of Dash Panel	3005	3000	5
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2966	2966	0

All Dimensions in mm

NHTSA TEST No.: M75400 TEST DATE: July 14, 2006
VEHICLE MAKE/MODEL: 2007 Mazda CX-7 MPV

	Elements	Pre-Test (mm)
1	Total length	4677
2	Total Width	1838
3	Bumper Top Height	704
4	Bumper Bottom Height	563
5	Longitudinal Member Top Height	704
6	Distance Between Longitudinal Members	994
7	Longitudinal Member Width	32
8	Engine top height	1017
9	Engine bottom height	228
10	Engine and gearbox width	803
11	Front bumper-engine distance	490
12	Front shock absorber fixing height	1050
13	Bonnet leading edge height	854
14	Front shock absorber fixing width	1274
15	Front bumper – front axle distance	980
16	Front axle – a pillar distance	1103
17	A-pillar – B pillar distance	985
18	B-pillar – rear axle distance	1197
19	B-pillar – C Pillar distance	889
20	Roof sill bottom height	1530
21	Roof sill top height	1620
22	Floor sill bottom height	275
23	Floor sill top height	452

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS



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

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

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	6944	1874	1170	-6	6550	24	1000
3	Left Side View	9594	886	1093	-2	9200	52	1000
4	Driver and Interior View	7658	2615	2060	-9	-	35	500
5	Steering Column (Bottom)	7428	1625	1177	-3	7034	25	1000
6	Steering Column (Top)	7428	1625	1777	-8	7034	28.70	1000
8	Overall Right Side	7140	1899	1062	-3	9894	24	500
9	Right Side View	9615	1249	987	-2	8321	52	1000
10	Right Passenger View	8042	1900	1413	-5	7899	35	1000
11	Passenger and Interior View	7620	2834	2223	-7	-	35	500
13	Passenger Front View	620	-92	1987	-35	-	13	500
14	Driver Front View	620	-92	1987	-36	-	13	500
15	Windshield View	0	-530	3374	-49	-	20	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0	3054	-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

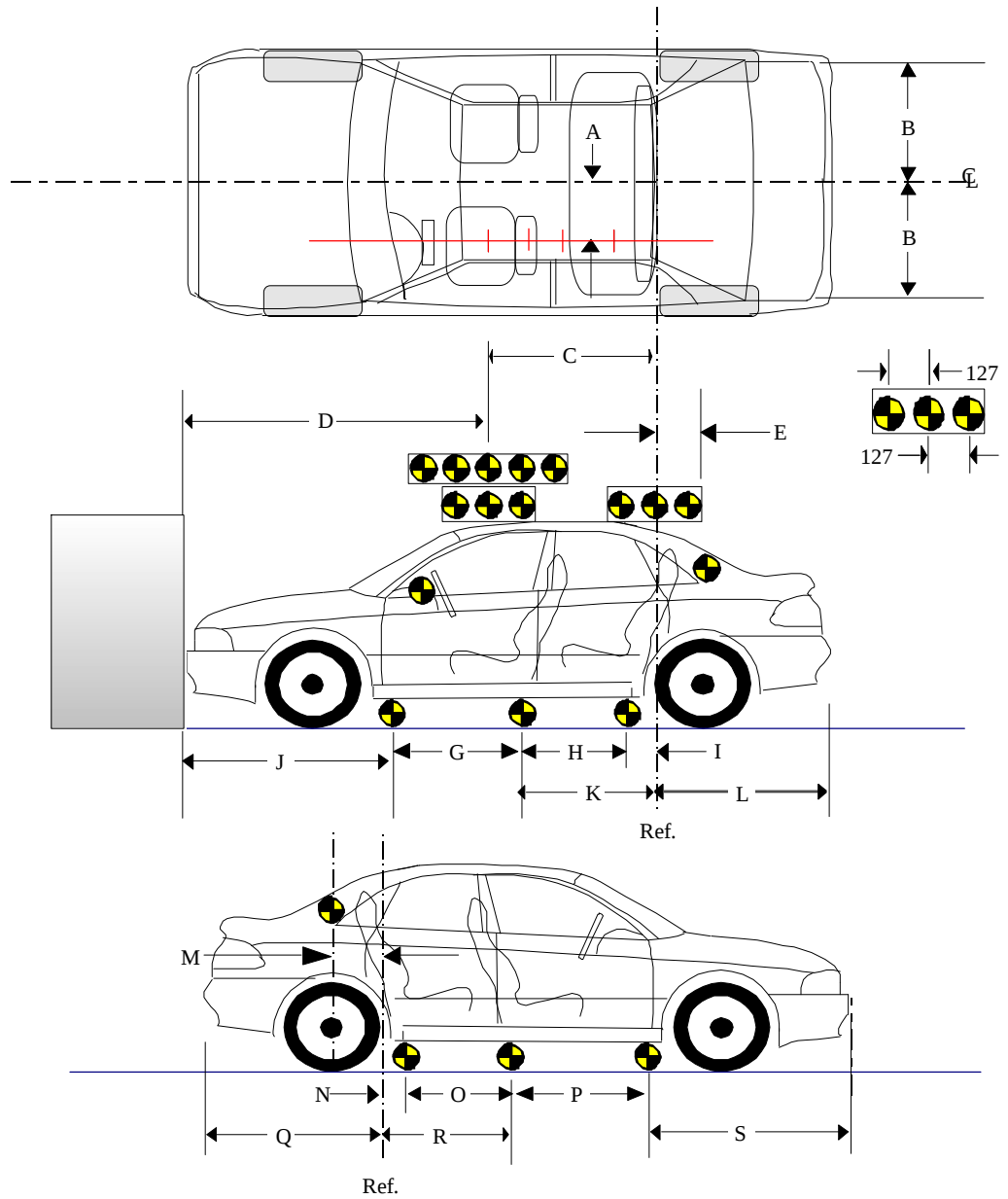
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

(Dimensions in millimeters)

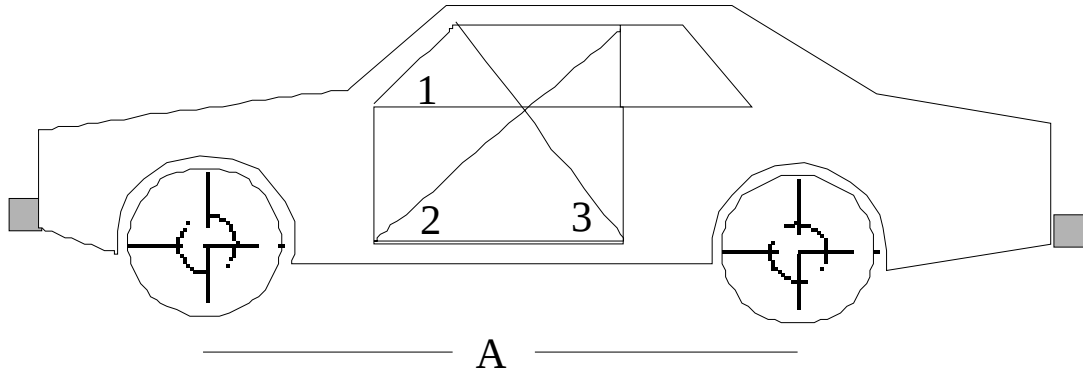
A	355
B	673
C	1223
D	2143
E	687
F	1559
G	848
H	854
I	153
J	1499
K	1007
L	1323
M	712
N	153
O	849
P	854
Q	1319
R	1002
S	1501



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



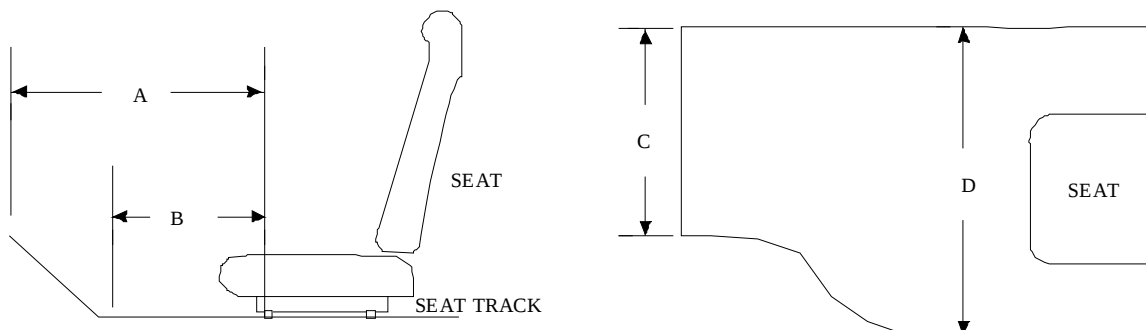
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	992	1525	992	993	1529	990
AFTER TEST	991	1525	993	993	1530	991
DIFFERENCE	1	0	-1	0	-1	-1

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2749	2747
AFTER TEST	2698	2728
DIFFERENCE	51	19

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	675	666	9
B	499	497	2
C	456	452	4
D	440	443	-3

PASSENGER

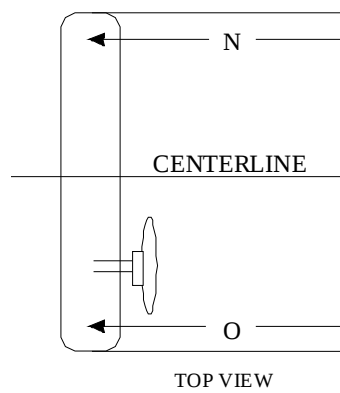
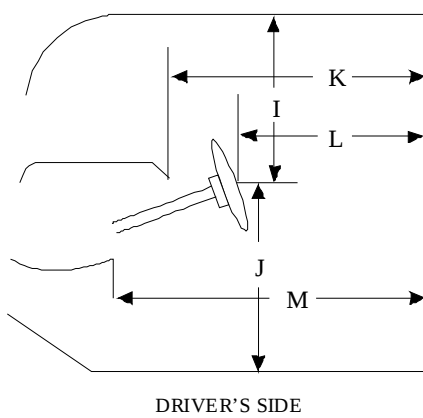
Measurement	Pre-Test	Post-Test	Difference
A	674	673	1
B	512	509	3
C	453	457	-4
D	464	471	-7

Units = mm

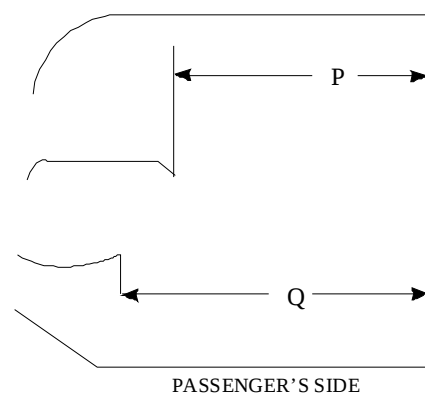
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

STATIC PASSENGER COMPARTMENT INTRUSION



MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



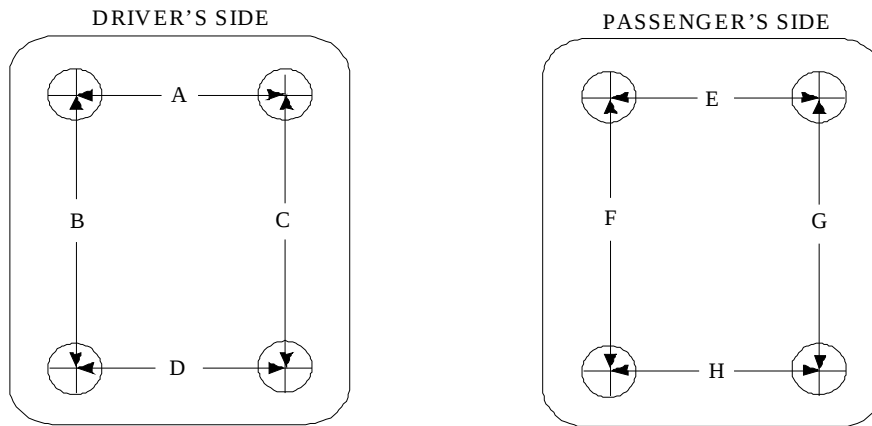
Measurement	Pre-Test	Post-Test	Difference
I	422	413	9
J	675	696	-21
K	740	739	1
L	548	577	-29
M	811	814	-3
N	815	816	-1
O	816	817	-1
P = K (PASS.)	820	821	-1
Q = M (PASS.)	781	794	-13

Units = mm

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

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

FLOORBOARD DEFORMATION



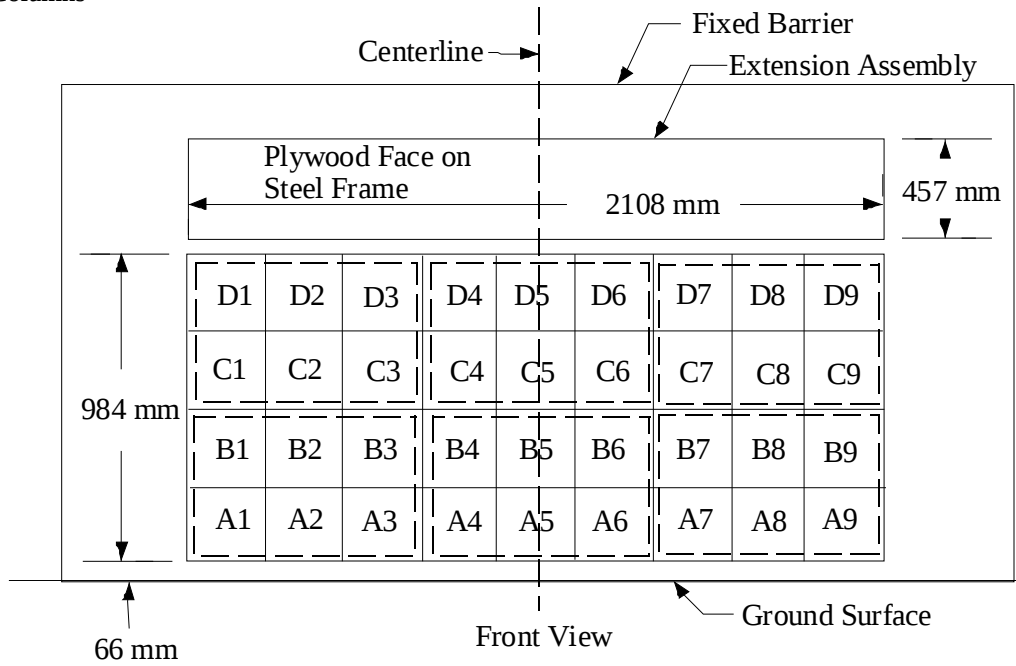
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	456	452	4
B	356	359	-3
C	385	378	7
D	440	443	-3
E	453	457	-4
F	338	332	6
G	318	322	-4
H	464	471	-7

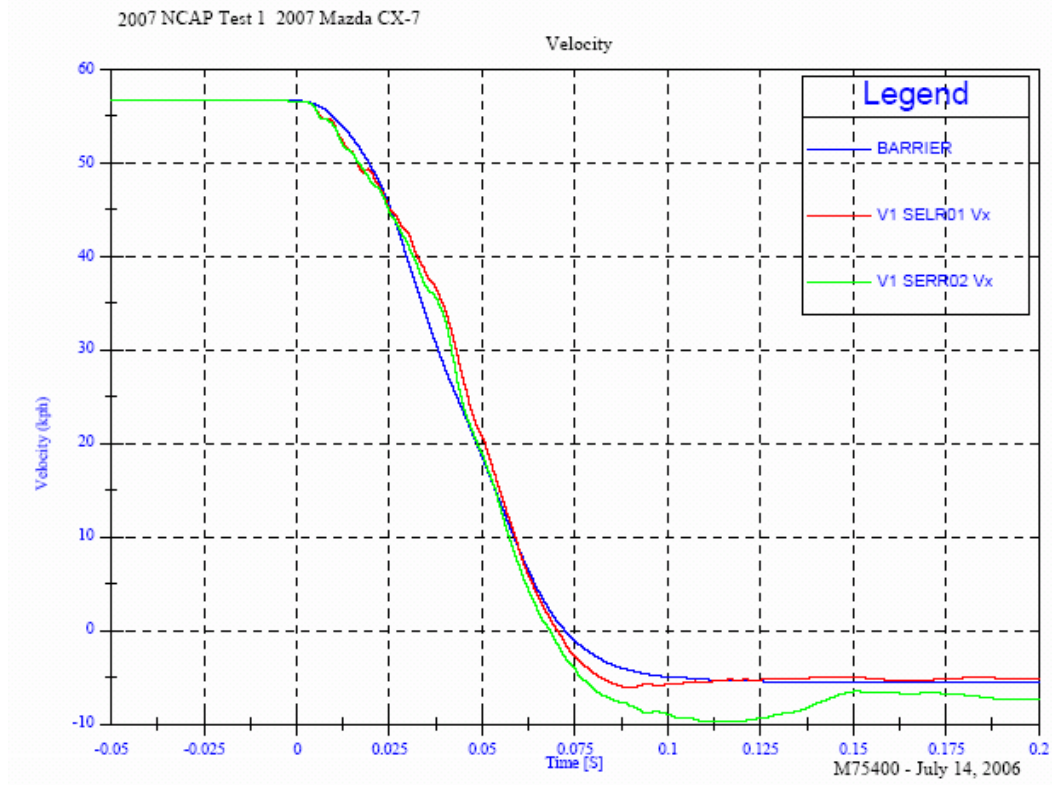
Units = mm

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: Mazda CX-7 MPV

NHTSA Test No.: M75400 VIN: JM3ER29L470103959

Model Year: 2007 Build Date: 04/06 Test Date: July 14, 2006

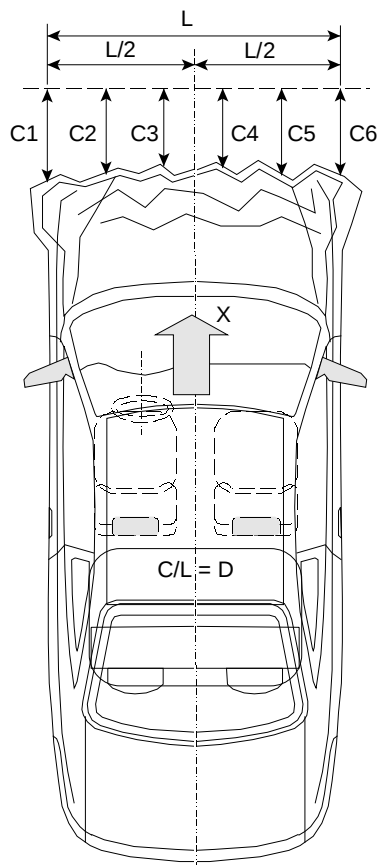
Vehicle Size Category: MPV Test Weight: 1968.0 kg

Vehicle Wheelbase: 2749 mm; Front Overhang: 978 mm; Overall Width: 1838 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4297	4170	127
C2 =	4542	4148	394
C3 =	4654	4095	559
C4 =	4654	4107	547
C5 =	4542	4192	350
C6 =	4301	4262	39



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

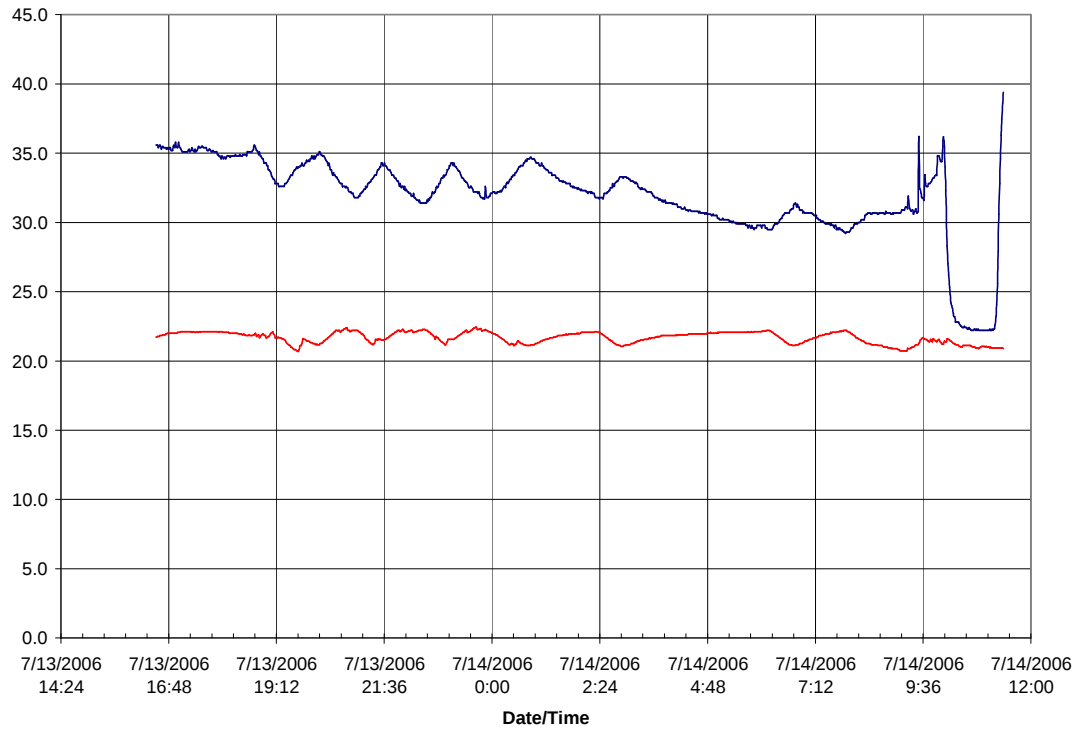
Length of Damaged Region:

L1=	<u>1719</u>	mm
L2=	<u>859.5</u>	mm
L5=	<u>343.8</u>	mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M75400 Vehicle: 2007 Mazda CX-7 MPV

2007 Mazda CX-7 M75400 Environmental Conditions



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Title</u>	<u>Page</u>
A-1	Load Cell Locations	A-4
A-2	Vehicle Certification Placard	A-5
A-3	Tire Placard	A-5
A-4	Right Front, As Received	A-6
A-5	Left Rear, As Received	A-6
A-6	Pre-Test Front View	A-7
A-7	Post-Test Front View	A-7
A-8	Pre-Test Left Side View	A-8
A-9	Post-Test Left Side View	A-8
A-10	Pre-Test Right Side View	A-9
A-11	Post-Test Right Side View	A-9
A-12	Pre-Test Right Front Three-Quarter View	A-10
A-13	Post-Test Right Front Three-Quarter View	A-10
A-14	Pre-Test Left Rear Three-Quarter View	A-11
A-15	Post-Test Left Rear Three-Quarter View	A-11
A-16	Left Rear Three-Quarter View Of Doors After Impact	A-12
A-17	Right Rear Three-Quarter View Of Doors After Impact	A-12
A-18	Pre-Test Windshield View	A-13
A-19	Post-Test Windshield View	A-13
A-20	Pre-Test Engine Compartment View	A-14
A-21	Post-Test Engine Compartment View	A-14
A-22	Pre-Test Fuel Cap View	A-15
A-23	Post-Test Fuel Cap View	A-15
A-24	Pre-Test Front Underbody View	A-16
A-25	Post-Test Front Underbody View	A-16
A-26	Pre-Test Mid Underbody View	A-17
A-27	Post-Test Mid Underbody View	A-17
A-28	Pre-Test Rear Underbody View	A-18
A-29	Post-Test Rear Underbody View	A-18
A-30	Pre-Test Driver Head Location	A-19
A-31	Post-Test Driver Head Location	A-19
A-32	Pre-Test Driver Position View	A-20
A-33	Post-Test Driver Position View	A-20
A-34	Pre-Test Driver And Interior View	A-21
A-35	Post-Test Driver And Interior View	A-21
A-36	Pre-Test Driver Feet View	A-22
A-37	Post-Test Driver Feet View	A-22
A-38	Pre-Test Driver Knee Bolster View	A-23
A-39	Post-Test Driver Knee Bolster View	A-23
A-40	Pre-Test Driver Floor Pan View	A-24
A-41	Post-Test Driver Floor Pan View	A-24
A-42	Post-Test Driver Head View	A-25
A-43	Post-Test Driver Contact To Airbag	A-25

TABLE OF PHOTOGRAPHS (CONTINUED)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
A-44	Pre-Test Passenger Head Location	A-26
A-45	Post-Test Passenger Head Location	A-26
A-46	Pre-Test Passenger Position View	A-27
A-47	Post-Test Passenger Position View	A-27
A-48	Pre-Test Passenger And Interior View	A-28
A-49	Post-Test Passenger And Interior View	A-28
A-50	Pre-Test Passenger Feet View	A-29
A-51	Post-Test Passenger Feet View	A-29
A-52	Pre-Test Passenger Knee Bolster View	A-30
A-53	Post-Test Passenger Knee Bolster View	A-30
A-54	Pre-Test Passenger Floor Pan View	A-31
A-55	Post-Test Passenger Floor Pan View	A-31
A-56	Post-Test Passenger Head View	A-32
A-57	Post-Test Passenger Contact To Airbag	A-32
A-58	Rollover View - 90°	A-33
A-59	Rollover View - 180°	A-33
A-60	Rollover View - 270°	A-34
A-61	Rollover View - 360°	A-34
A-62	Impact View	A-35



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

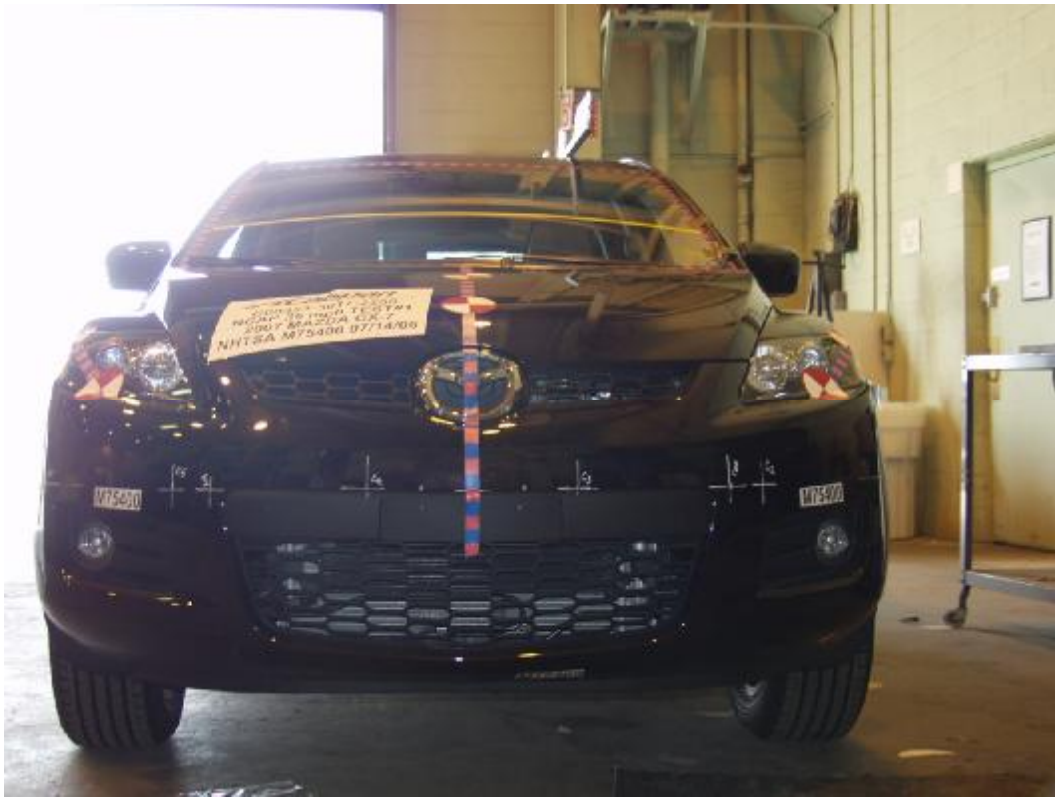


Figure A-6: Pre-Test Front View



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

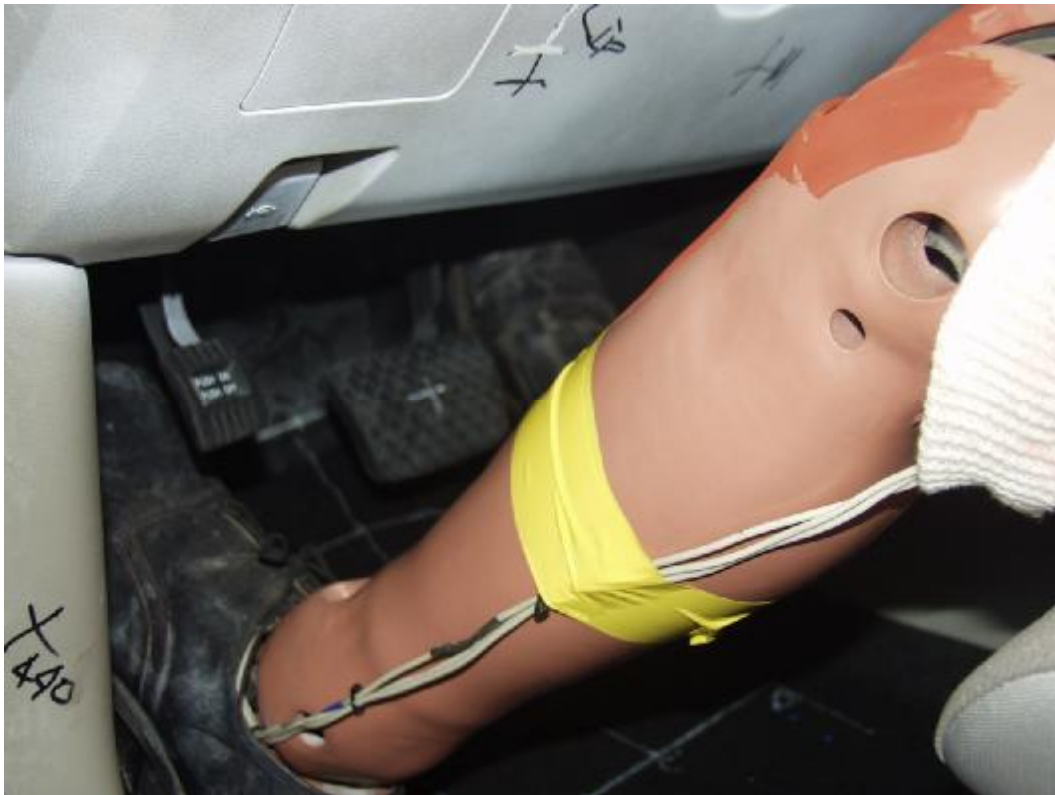


Figure A-36: Pre-Test Driver Feet View



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.: M75400

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

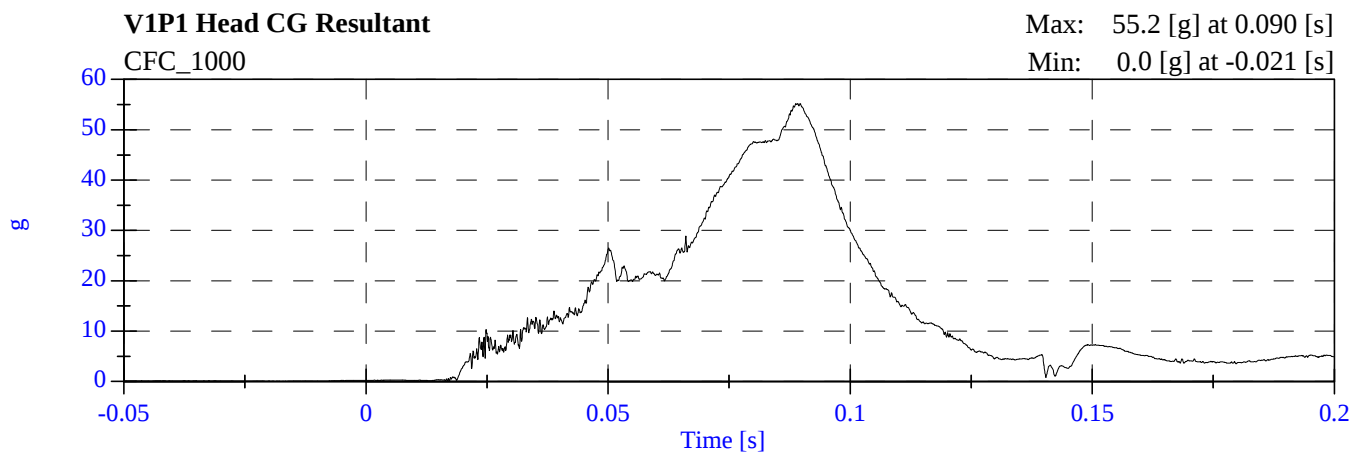
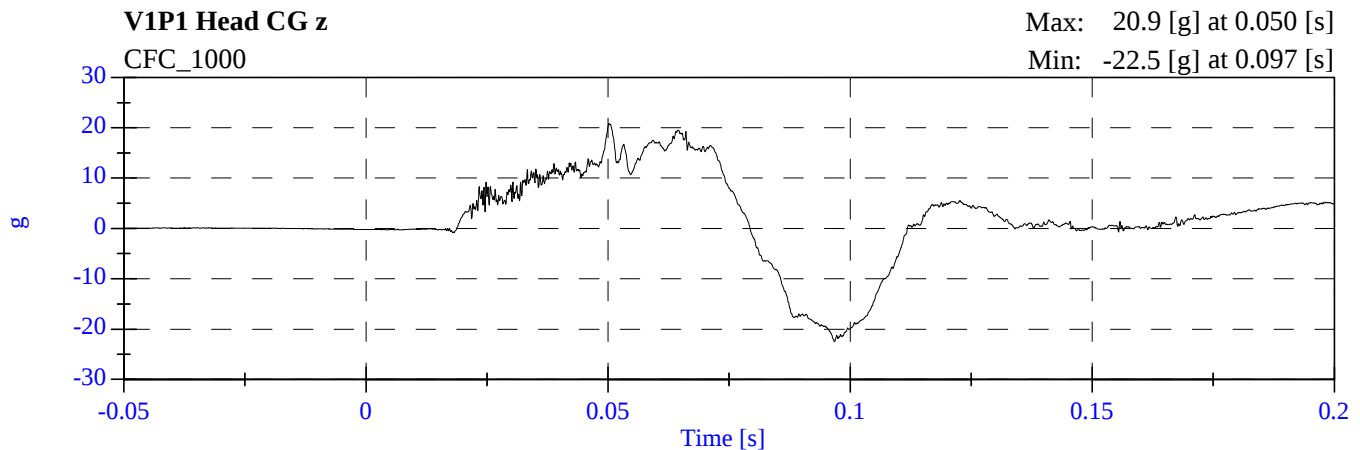
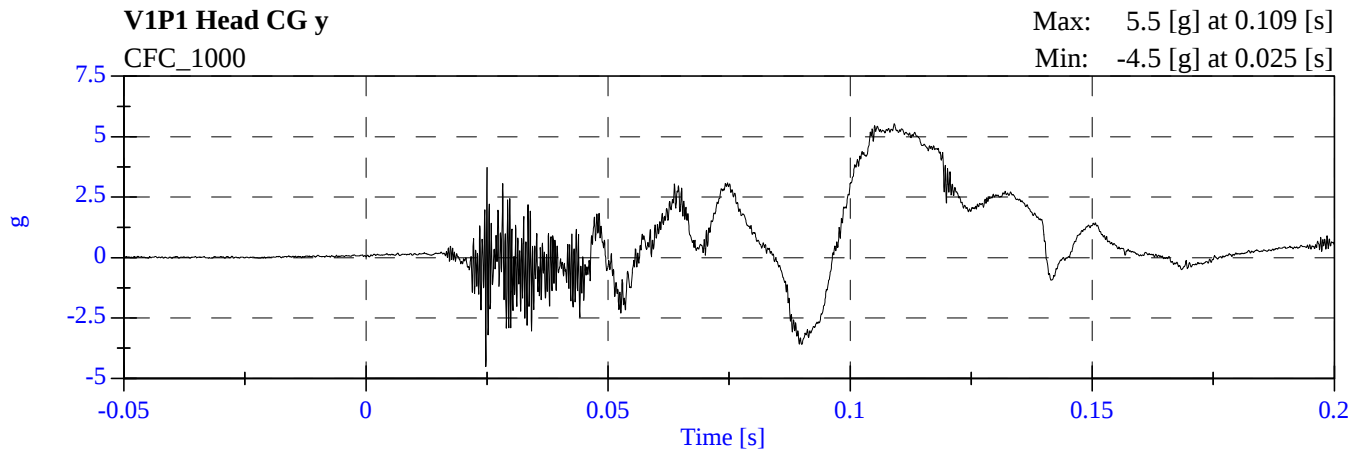
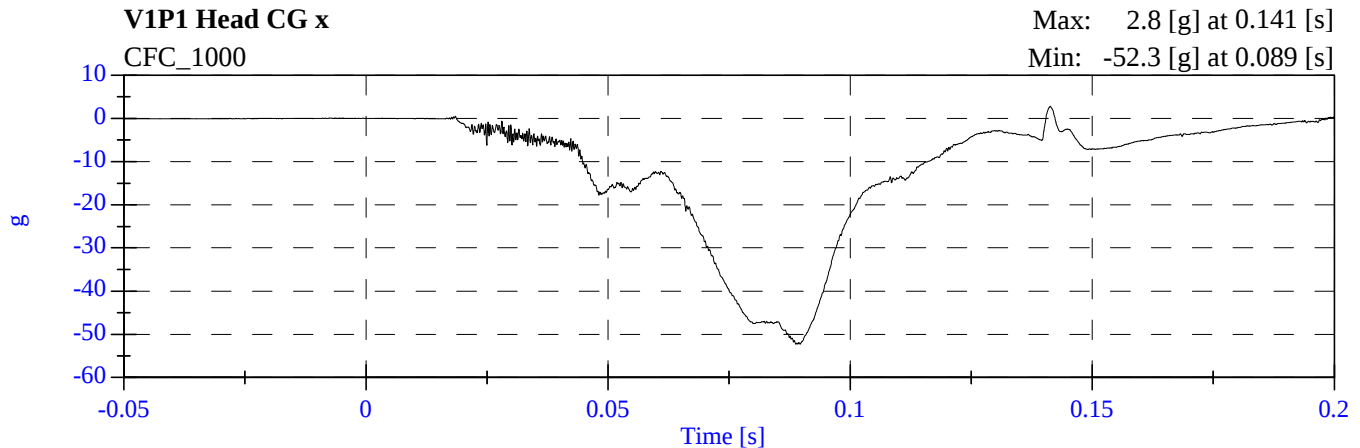
V1P1 Head CG Ax	V1P1 Lap Belt Load
V1P1 Head CG Ay	V1P1 Shoulder Belt Load
V1P1 Head CG Az	V1P2 Lap Belt Load
V1P1 Head CG Red Ax	V1P2 Shoulder Belt Load
V1P1 Head CG Red Ay	V1 Left Rear #1x
V1P1 Head CG Red Az	V1 Right Rear #2x
V1P1 Upper Neck Fx	V1 Engine Top #3x
V1P1 Upper Neck Fy	V1 Engine Bottom #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 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	

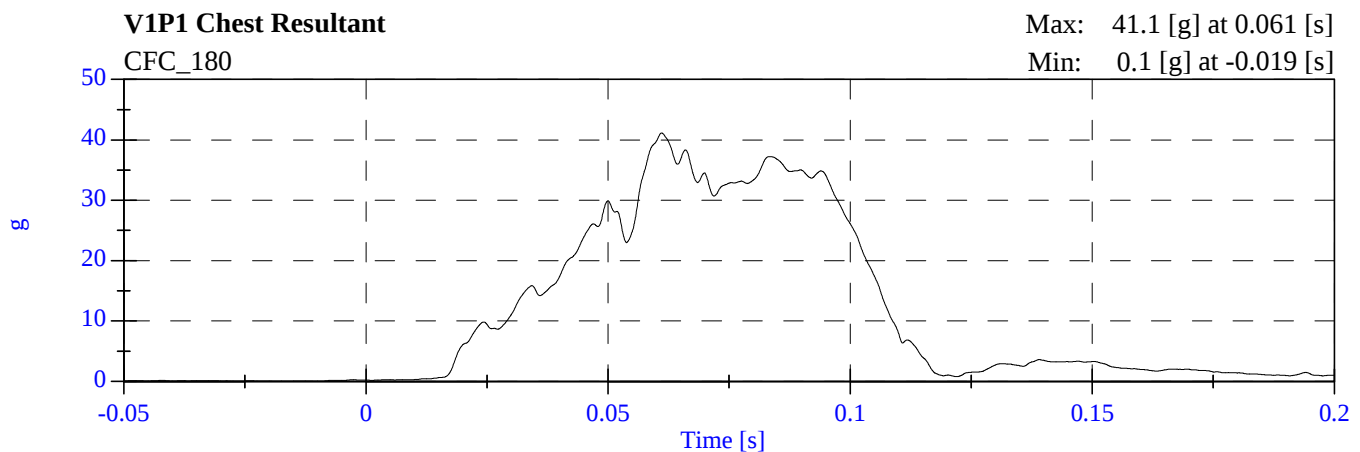
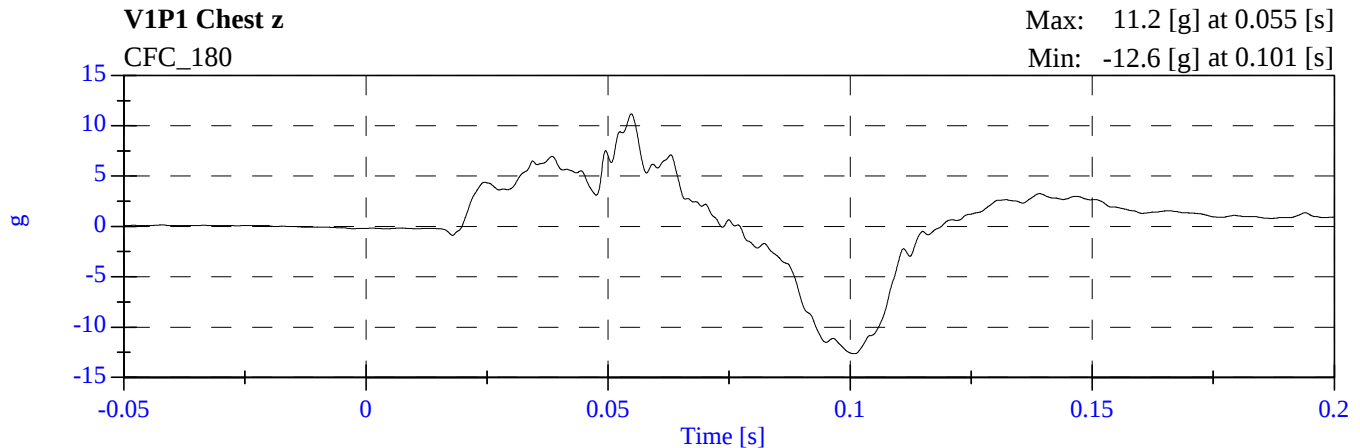
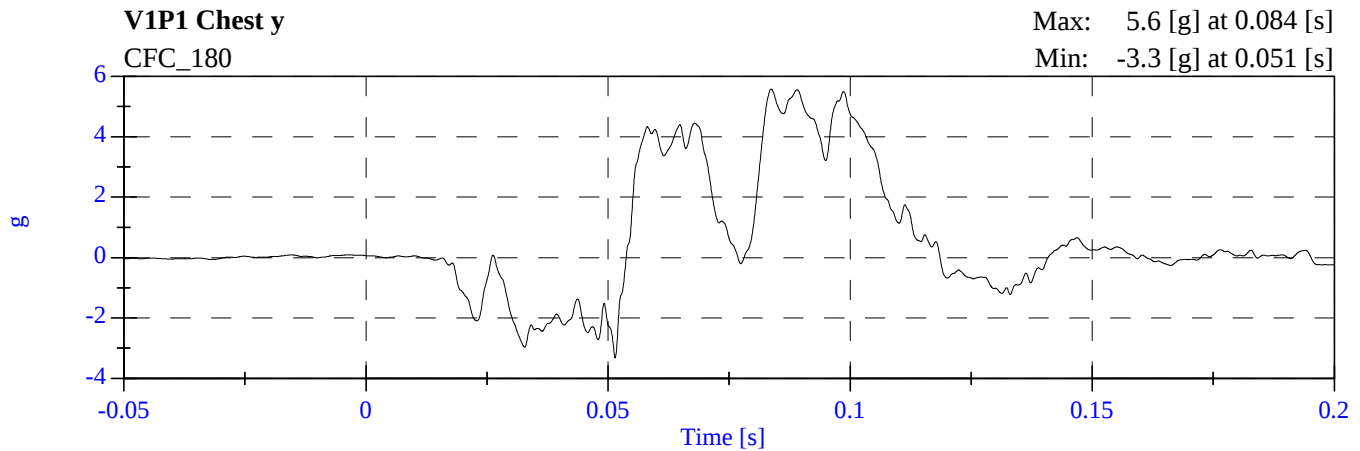
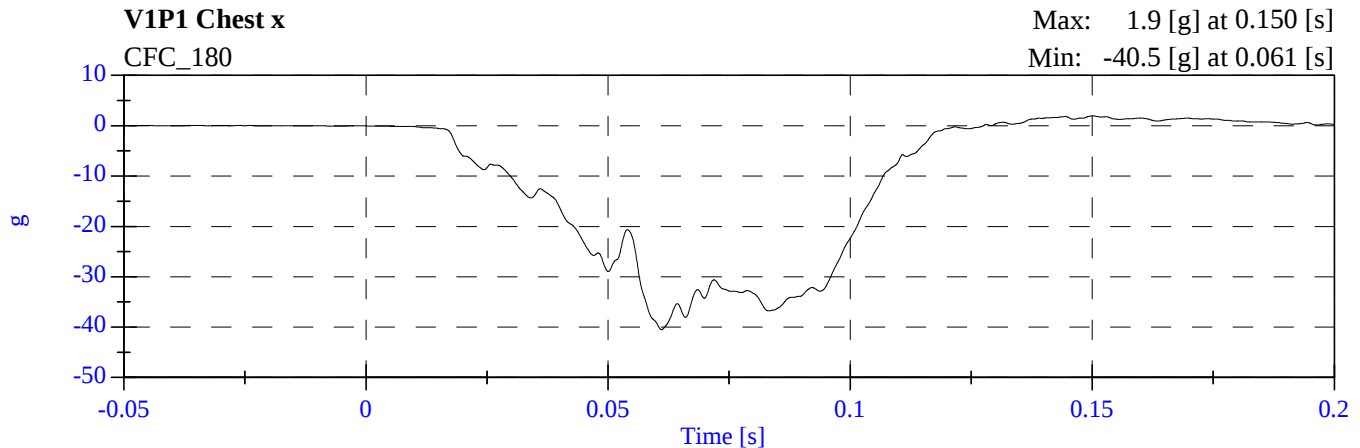
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Barrier Load Cell C2 Fx	
Barrier Load Cell C3 Fx	
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Barrier Load Cell C5 Fx	
Barrier Load Cell C6 Fx	
Barrier Load Cell C7 Fx	
Barrier Load Cell C8 Fx	
Barrier Load Cell C9 Fx	
Barrier Load Cell D1 Fx	
Barrier Load Cell D2 Fx	
Barrier Load Cell D3 Fx	
Barrier Load Cell D4 Fx	
Barrier Load Cell D5 Fx	
Barrier Load Cell D6 Fx	
Barrier Load Cell D7 Fx	
Barrier Load Cell D8 Fx	
Barrier Load Cell D9 Fx	

TEST NOTES	
Data Channel	Anomalies
V1P1 Head CG Red z	Channel Opened
V1P1 Left Lower Tibia Mx	Data Clipped
V1P1 Left Foot Aft z	Chanel Opened
V1P2 Left Foot Aft x	Questionable data after 60 ms

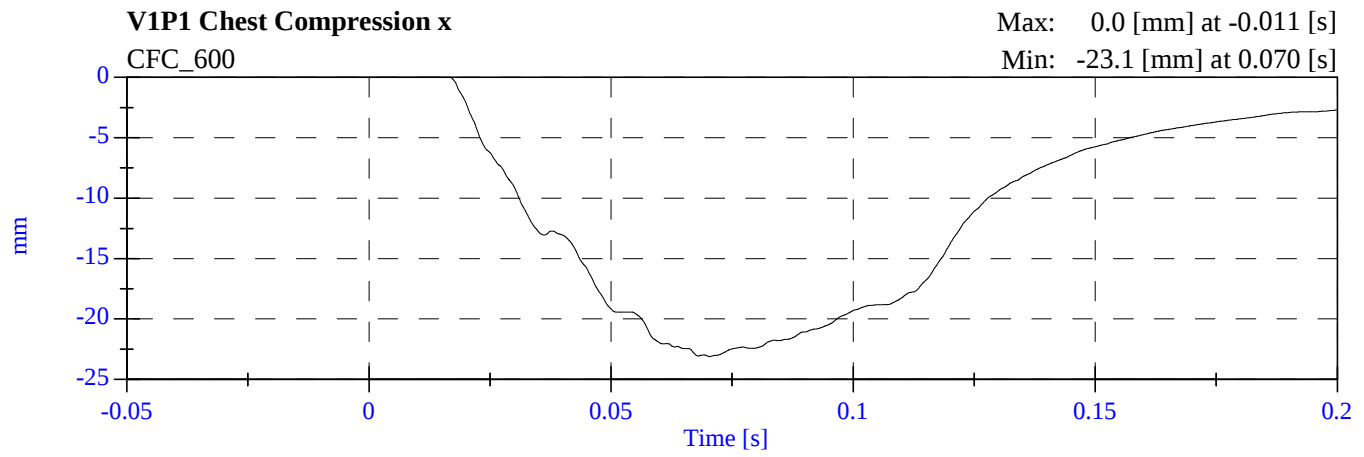
2007 NCAP Test 1 2007 Mazda CX-7 M75400 - July 14, 2006



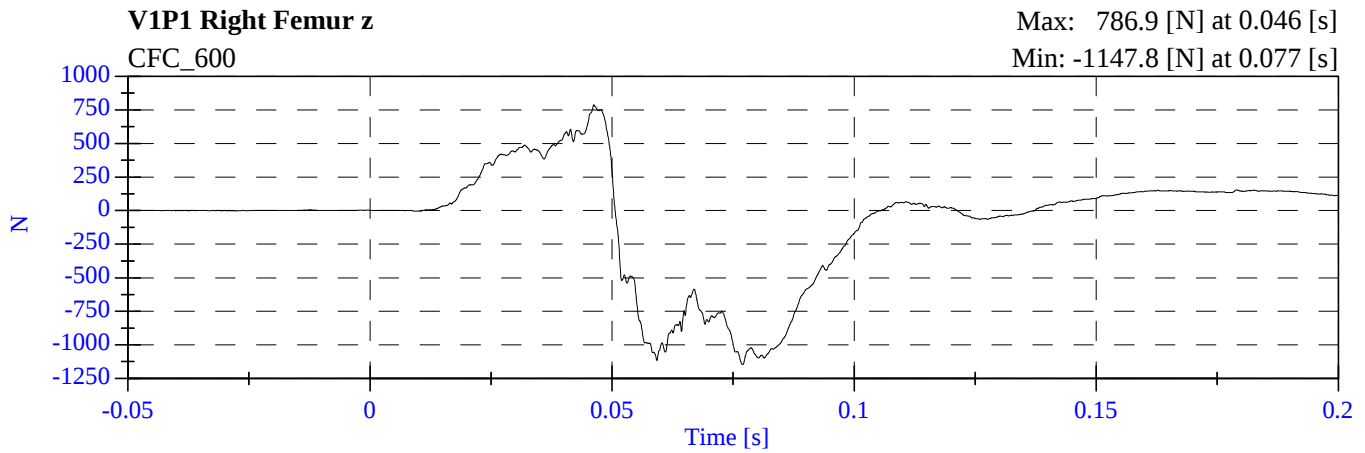
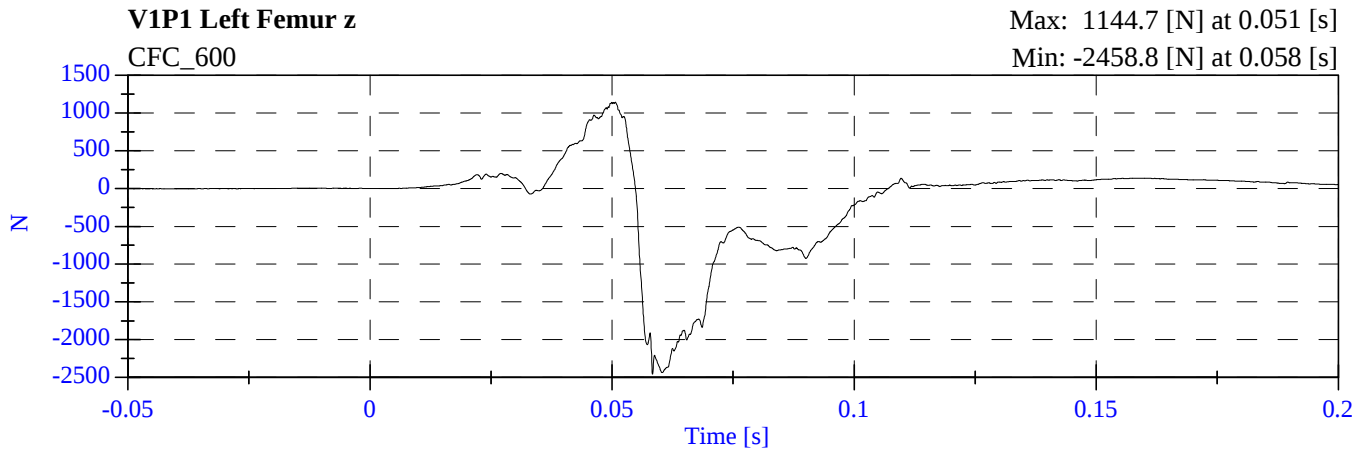
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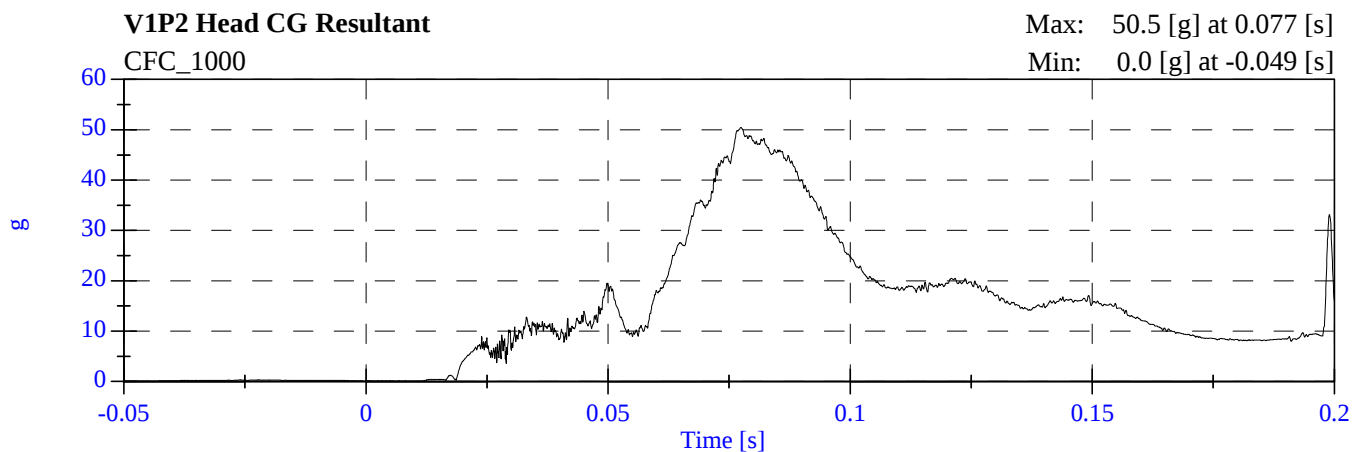
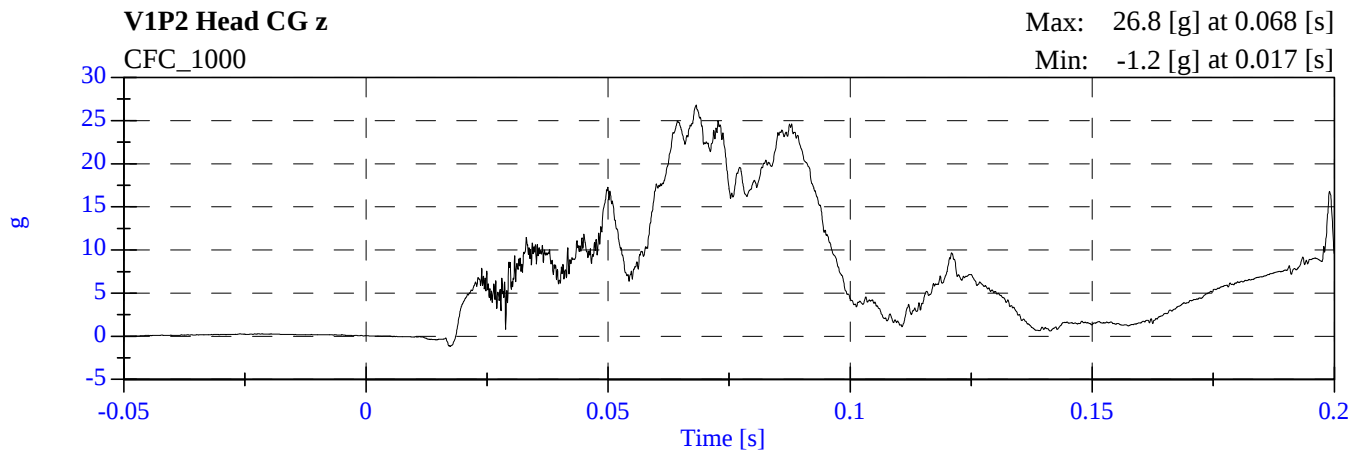
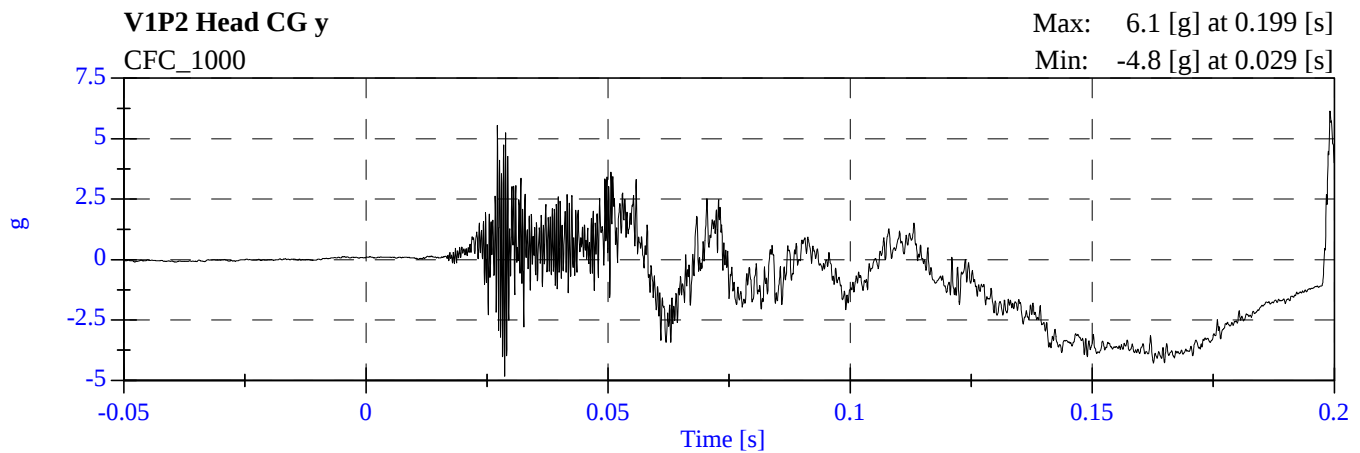
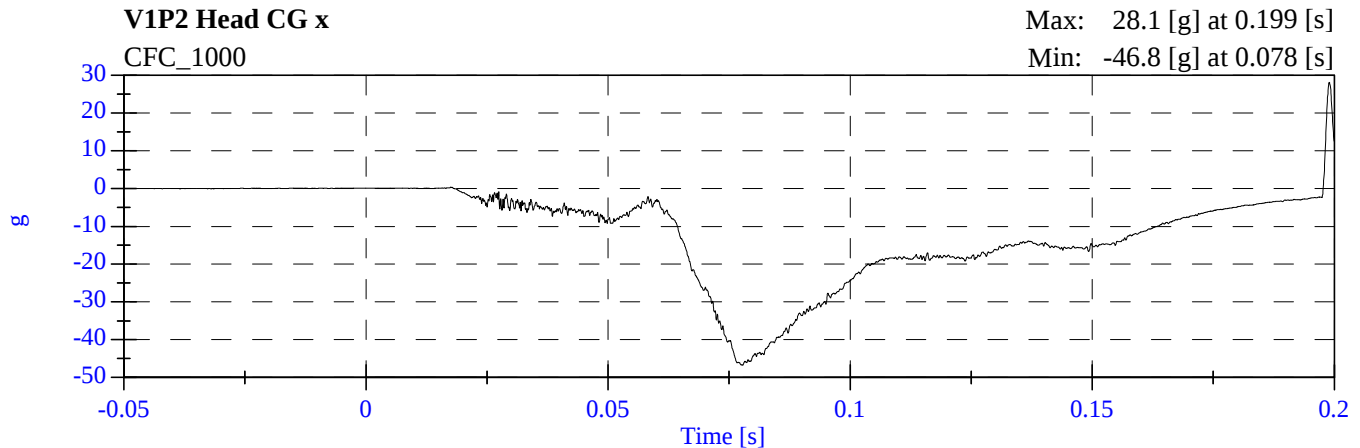
**2007 NCAP Test 1 2007 Mazda CX-7
M75400 - July 14, 2006**



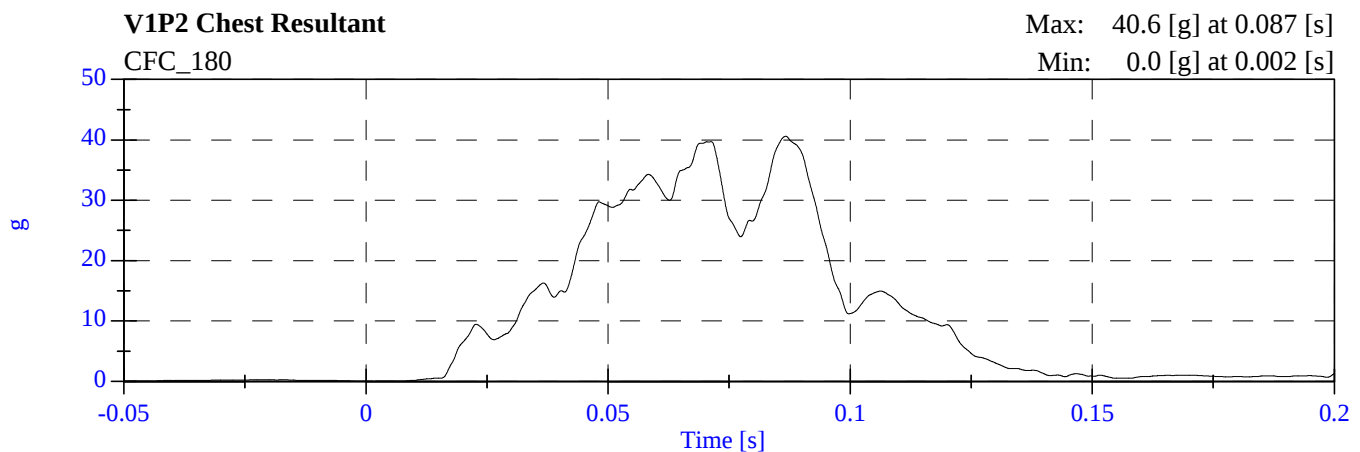
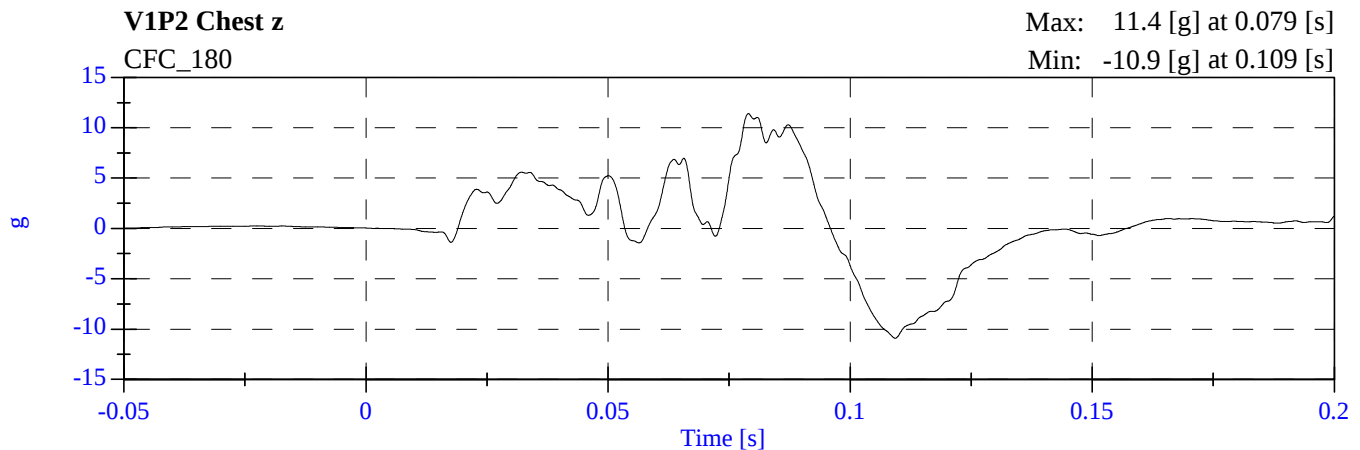
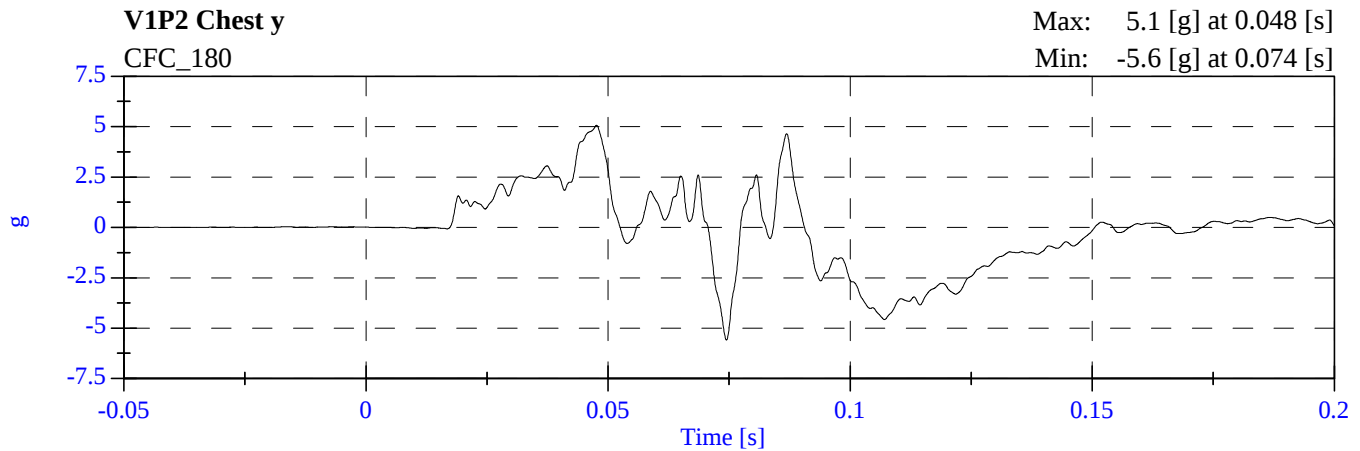
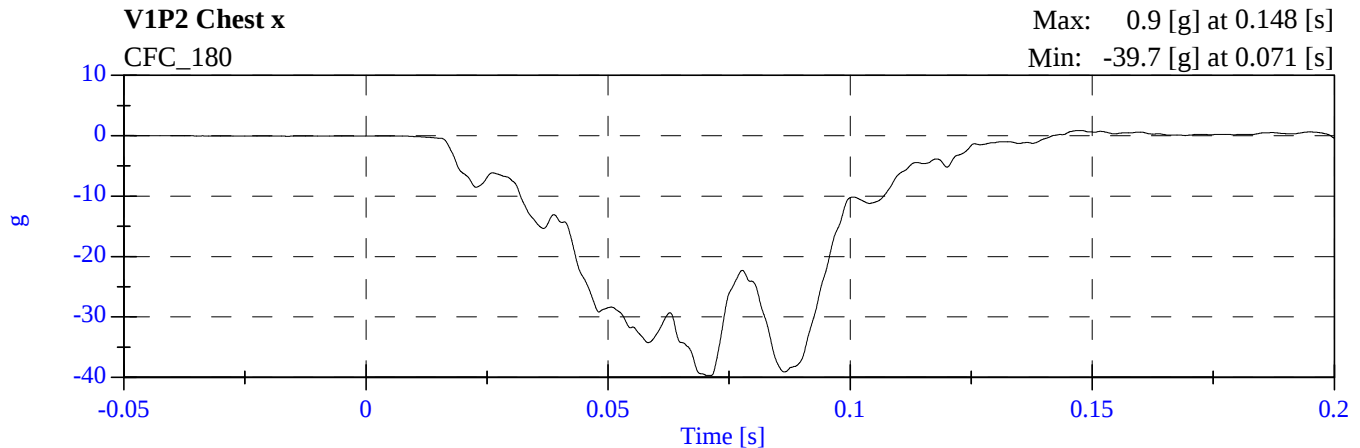
**2007 NCAP Test 1 2007 Mazda CX-7
M75400 - July 14, 2006**



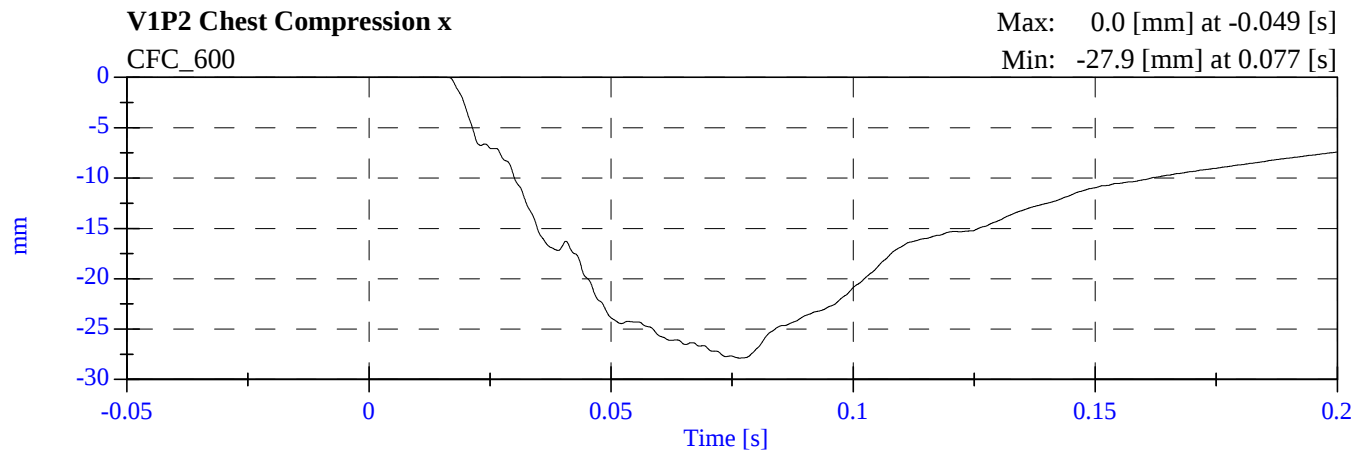
2007 NCAP Test 1 2007 Mazda CX-7 M75400 - July 14, 2006



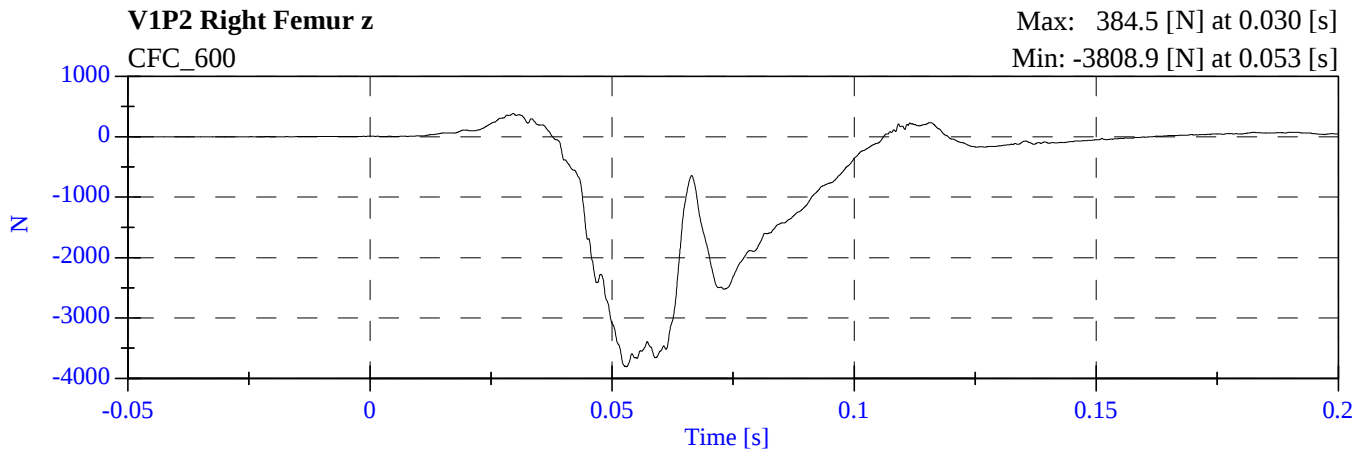
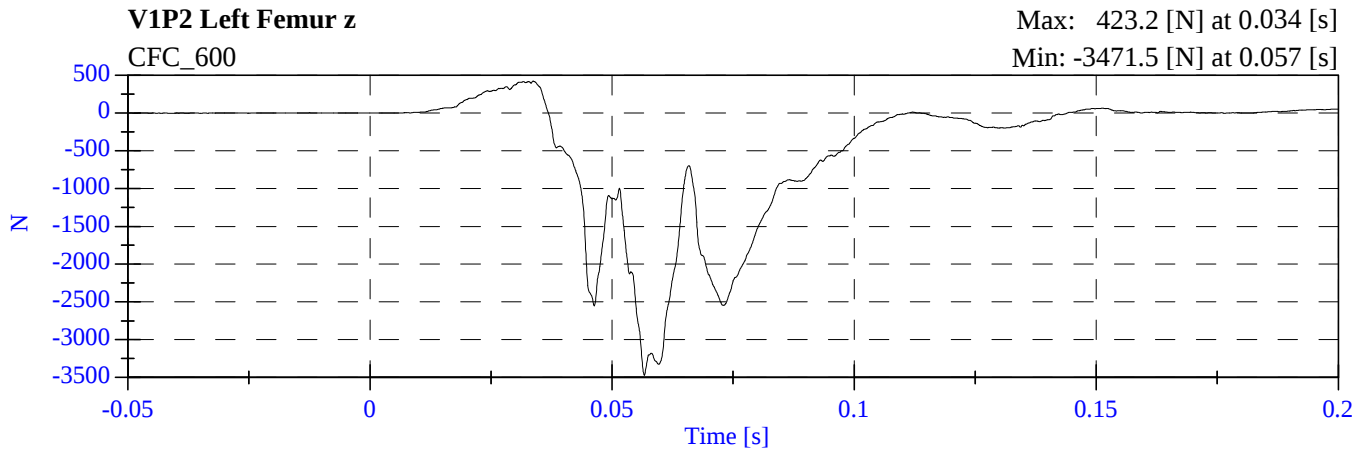
2007 NCAP Test 1 2007 Mazda CX-7 M75400 - July 14, 2006



**2007 NCAP Test 1 2007 Mazda CX-7
M75400 - July 14, 2006**



**2007 NCAP Test 1 2007 Mazda CX-7
M75400 - July 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:

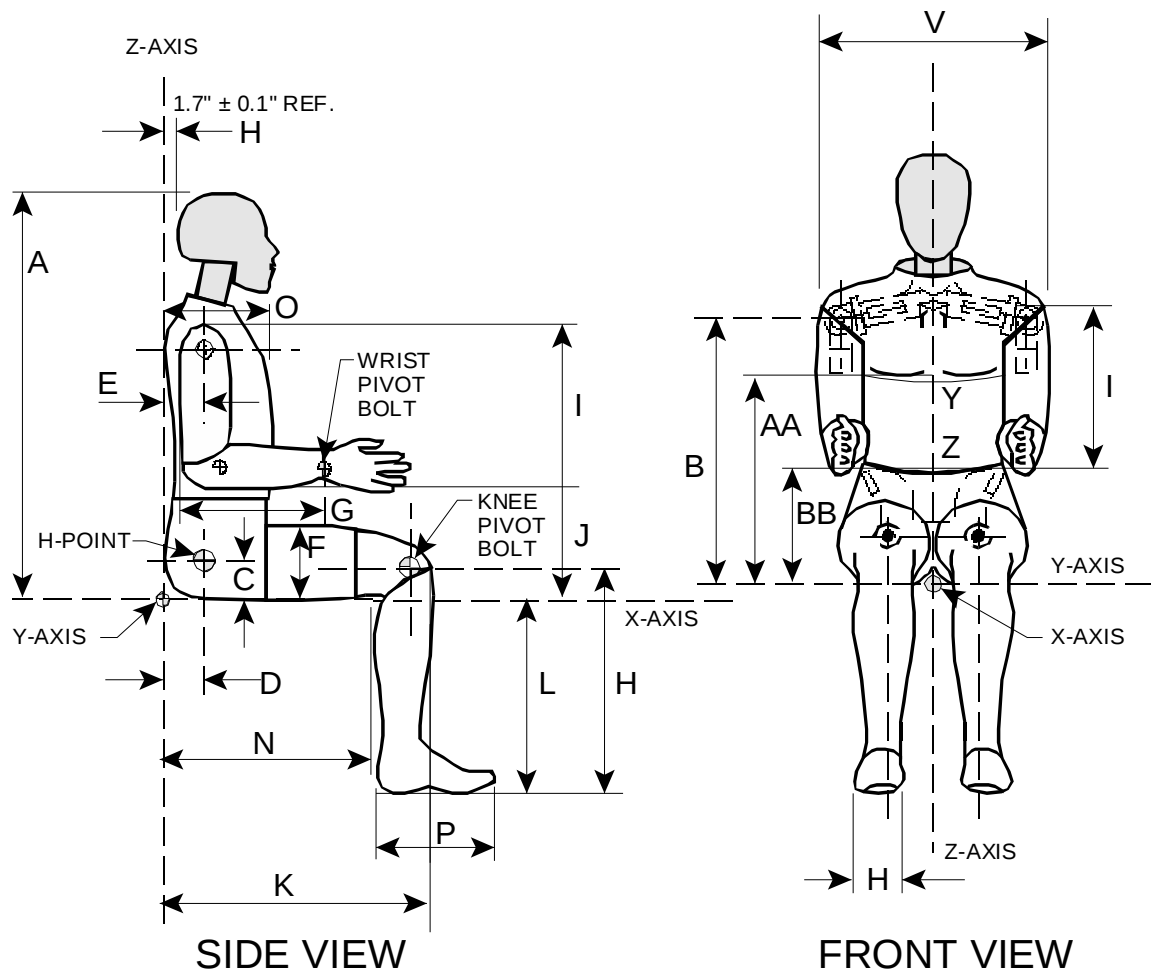
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	July 12, 2006
#2/Right Front Passenger	064	July 12, 2006

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.

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



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

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 1
Date July 6, 2006
Workfile 061H

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.11
Relative Humidity	10% - 70%	50.00
Peak Resultant Acceleration	225-275 G's	256.12
Peak Lateral Acceleration	15 G's Max	14.75
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	July 10, 2006	6 Axis Neck Transducer
Workfile	061NF	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.00
Impact Velocity		6.89 – 7.13 m/s	6.98
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.44
	20 ms	17.60 - 22.60 G's	18.71
	30 ms	12.50 - 18.50 G's	18.11
Max Pendulum G's Above 30 ms		29 G's Max	20.15
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.20
D Plane Rotation	Max	64 - 78 Deg	64.79
	Time	57 - 64 ms	62.70
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	104.10
	Time	47 - 58 ms	54.60
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.90
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	102.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	July 10, 2006	6 Axis Neck Transducer
Workfile	061NE	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.00
Impact Velocity		5.94 – 6.19 m/s	6.07
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.66
	20 ms	14.00 - 19.00 G's	15.20
	30 ms	11.00 - 16.00 G's	14.89
Max Pendulum G's Above 30 ms		22 G's Max	14.89
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.80
D Plane Rotation	Max	81 - 106 Deg	86.08
	Time	72 - 82 ms	72.60
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-78.78
	Time	65 - 79 ms	68.40
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	147.30
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	129.70

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date July 11, 2006
Workfile 061T

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Pendulum Velocity	6.58 – 6.83 m/s	6.71
Maximum Deflection	63.50 – 72.64 mm	66.11
Maximum Resistive Force	5159.9 – 5893.9 N	5199.03
Internal Hysteresis	69 - 85 %	73.52

Remarks:

Laboratory Technician:

_____ B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date July 11, 2006
Workfile 061LF/061RF

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5521.7
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5733.19

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date July 12, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
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	34.6
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	6.1
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.1
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Buttock Knee Length	K	22.8 - 23.8 in	23.4
Popliteal Height	L	16.9 - 17.9 in	17.5
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	8.4
Foot Length	P	9.9 - 10.5 in	10.1
Shoulder Breadth	V	16.6 - 17.2 in	16.7
Foot Breadth	W	3.6 - 4.2 in	3.9
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	38.5
Waist Circumference	Z	32.9 - 34.1 in	33.4

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 1
Date July 7, 2006
Workfile 064H

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Peak Resultant Acceleration	225-275 G's	267.44
Peak Lateral Acceleration	15 G's Max	4.64
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	July 10, 2006	6 Axis Neck Transducer
Workfile	064NE	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.00
Impact Velocity		6.89 – 7.13 m/s	6.98
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.89
	20 ms	17.60 - 22.60 G's	21.38
	30 ms	12.50 - 18.50 G's	18.32
Max Pendulum G's Above 30 ms		29 G's Max	18.32
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	35.50
D Plane Rotation	Max	64 - 78 Deg	64.38
	Time	57 - 64 ms	59.00
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	103.58
	Time	47 - 58 ms	48.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	115.30
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.10

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	July 10, 2006	6 Axis Neck Transducer
Workfile	064NF	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	50.00
Impact Velocity		5.94 – 6.19 m/s	5.96
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.29
	20 ms	14.00 - 19.00 G's	17.05
	30 ms	11.00 - 16.00 G's	15.84
Max Pendulum G's Above 30 ms		22 G's Max	15.84
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.50
D Plane Rotation	Max	81 - 106 Deg	85.78
	Time	72 - 82 ms	73.60
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-71.89
	Time	65 - 79 ms	70.30
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	153.30
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	138.20

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date July 11, 2006
Workfile 064T

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Pendulum Velocity	6.58 – 6.83 m/s	6.74
Maximum Deflection	63.50 – 72.64 mm	71.35
Maximum Resistive Force	5159.9 – 5893.9 N	5833.58
Internal Hysteresis	69 - 85 %	70.51

Remarks:

Laboratory Technician:

_____ B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date July 11, 2006
Workfile 064LF; 064RF

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	4834.51
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	50.00
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5331.51

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date July 12, 2006

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70
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	34.6
Shoulder Pivot Height	B	19.9 - 20.5 in	20.5
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	3.5
Thigh Clearance	F	5.5 - 6.1 in	5.9
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	7.8
Buttock Knee Length	K	22.8 - 23.8 in	23.5
Popliteal Height	L	16.9 - 17.9 in	17.5
Knee Pivot Height	M	19.1 - 19.7 in	19.1
Buttock Popliteal Length	N	17.8 - 18.8 in	18.7
Chest Depth	O	8.4 - 9.0 in	8.5
Foot Length	P	9.9 - 10.5 in	10.2
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Foot Breadth	W	3.6 - 4.2 in	3.8
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	38.5
Waist Circumference	Z	32.9 - 34.1 in	33.4

Remarks:

Laboratory Technician:

B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-J20018	20-Apr-06	20-Oct-06
	Y	ENDEVCO	AC-P16755	20-Apr-06	20-Oct-06
	Z	ENDEVCO	AC-J14667	20-Apr-06	20-Oct-06
Head	X (R)	ENDEVCO	AC-J20580	20-Apr-06	20-Oct-06
	Y (R)	ENDEVCO	AC-J20569	20-Apr-06	20-Oct-06
	Z (R)	ENDEVCO	AC-J21963	20-Apr-06	20-Oct-06
Neck Load Cell	X	DENTON	LC-1916Fx	12-May-06	11-Nov-06
	Y	DENTON	LC-1916Fy	12-May-06	11-Nov-06
	Z	DENTON	LC-1916Fz	12-May-06	11-Nov-06
Neck Moment	X	DENTON	LC-1916Mx	12-May-06	11-Nov-06
	Y	DENTON	LC-1916My	12-May-06	11-Nov-06
	Z	DENTON	LC-1916Mz	12-May-06	11-Nov-06
Chest	X	ENDEVCO	AC-AAKC6	20-Apr-06	20-Oct-06
	Y	ENDEVCO	AC-AAKD0	20-Apr-06	20-Oct-06
	Z	ENDEVCO	AC-J27470	20-Apr-06	20-Oct-06
Chest	X (R)	ENDEVCO	AC-J21988	20-Apr-06	20-Oct-06
	Y (R)	ENDEVCO	AC-J20027	20-Apr-06	20-Oct-06
	Z (R)	ENDEVCO	AC-J36741	20-Apr-06	20-Oct-06
Chest Deflection	X	SERVO	DS-061	07-Apr-06	07-Oct-06
Pelvic	X	ENTRAN	AC-99H30-Z13	20-Apr-06	20-Oct-06
	Y	ENTRAN	AC-01G18-F14	19-Apr-06	19-Oct-06
	Z	ENTRAN	AC-02I02I05-F06	19-Apr-06	19-Oct-06

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1532	21-Apr-06	21-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1533	21-Apr-06	21-Oct-06
Left Upper Tibia	Mx	DENTON	LC-268Mx	21-Apr-06	21-Oct-06
	My	DENTON	LC-268My	21-Apr-06	21-Oct-06
Left Lower Tibia	Fz	DENTON	LC-196Fz	21-Apr-06	21-Oct-06
	Mx	DENTON	LC-196Mx	21-Apr-06	21-Oct-06
	My	DENTON	LC-196My	21-Apr-06	21-Oct-06
Right Upper Tibia	Mx	DENTON	LC-266Mx	17-Apr-06	17-Oct-06
	My	DENTON	LC-266My	17-Apr-06	17-Oct-06
Right Lower Tibia	Fz	DENTON	LC-179Fz	17-Apr-06	17-Oct-06
	Mx	DENTON	LC-179Mx	17-Apr-06	17-Oct-06
	My	DENTON	LC-179My	17-Apr-06	17-Oct-06
Left Foot Rear	X	ENDEVCO	AC-J18662	20-Apr-06	20-Oct-06
	Z	ENDEVCO	AC-J19927	20-Apr-06	20-Oct-06
Left Foot Front	Z	ENDEVCO	AC-J20030	20-Apr-06	20-Oct-06
Right Foot Rear	X	ENDEVCO	AC-DE54J	20-Apr-06	20-Oct-06
	Z	ENDEVCO	AC-J19440	20-Apr-06	20-Oct-06
Right Foot Front	Z	ENDEVCO	AC-J20382	20-Apr-06	20-Oct-06
Lap Belt Load Cell		First Technology	LC-159	11-Jul-06	10-Jan-07
Shoulder Belt Load Cell		First Technology	LC-173	11-Jul-06	10-Jan-07

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-J27517	18-Apr-06	18-Oct-06
	Y	ENDEVCO	AC-AAKB1	18-Apr-06	18-Oct-06
	Z	ENDEVCO	AC-AAK48	18-Apr-06	18-Oct-06
Head	X (R)	ENDEVCO	AC-P16194	18-Apr-06	18-Oct-06
	Y (R)	ENDEVCO	AC-J14688	18-Apr-06	18-Oct-06
	Z (R)	ENDEVCO	AC-P21399	28-Jun-06	28-Dec-06
Neck Load Cell	X	DENTON	LC-1912Fx	10-May-06	09-Nov-06
	Y	DENTON	LC-1912Fy	10-May-06	09-Nov-06
	Z	DENTON	LC-1912Fz	10-May-06	09-Nov-06
Neck Moment	X	DENTON	LC-1912Mx	10-May-06	09-Nov-06
	Y	DENTON	LC-1912My	10-May-06	09-Nov-06
	Z	DENTON	LC-1912Mz	10-May-06	09-Nov-06
Chest	X	ENDEVCO	AC-J23946	20-Apr-06	20-Oct-06
	Y	ENDEVCO	AC-AGAC4	20-Apr-06	20-Oct-06
	Z	ENDEVCO	AC-P16225	20-Apr-06	20-Oct-06
Chest	X (R)	ENTRAN	AC-03E03E21-M20	20-Apr-06	20-Oct-06
	Y (R)	ENDEVCO	AC-P15638	20-Apr-06	20-Oct-06
	Z (R)	ENDEVCO	AC-P16517	20-Apr-06	20-Oct-06
Chest Deflection	X	SERVO	DS-064	12-Jun-06	12-Dec-06
Pelvic	X	ENDEVCO	AC-AJ5R0	19-Apr-06	19-Oct-06
	Y	ENDEVCO	AC-J22036	19-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-P32204	28-Jun-06	28-Dec-06

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1525	21-Apr-06	21-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1526	21-Apr-06	21-Oct-06
Left Upper Tibia	Mx	DENTON	LC-404Mx	09-May-06	08-Nov-06
	My	DENTON	LC-404My	09-May-06	08-Nov-06
Left Lower Tibia	Fz	DENTON	LC-396Fz	09-May-06	08-Nov-06
	Mx	DENTON	LC-396Mx	09-May-06	08-Nov-06
	My	DENTON	LC-396My	09-May-06	08-Nov-06
Right Upper Tibia	Mx	DENTON	LC-374Mx	02-Dec-05	03-Jun-06
	My	DENTON	LC-374My	02-Dec-05	03-Jun-06
Right Lower Tibia	Fz	DENTON	LC-372Fz	14-Nov-05	16-May-06
	Mx	DENTON	LC-372Mx	14-Nov-05	16-May-06
	My	DENTON	LC-372My	14-Nov-05	16-May-06
Left Foot Rear	X	ENDEVCO	AC-P17837	19-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-P16899	19-Apr-06	19-Oct-06
Left Foot Front	Z	ENDEVCO	AC-P17912	19-Apr-06	19-Oct-06
Right Foot Rear	X	ENDEVCO	AC-J20209	19-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J14234	19-Apr-06	19-Oct-06
Right Foot Front	Z	ENDEVCO	AC-J14669	19-Apr-06	19-Oct-06
Lap Belt Load Cell		First Technology	LC-178	11-Jul-06	10-Jan-07
Shoulder Belt Load Cell		First Technology	LC-180	11-Jul-06	10-Jan-07

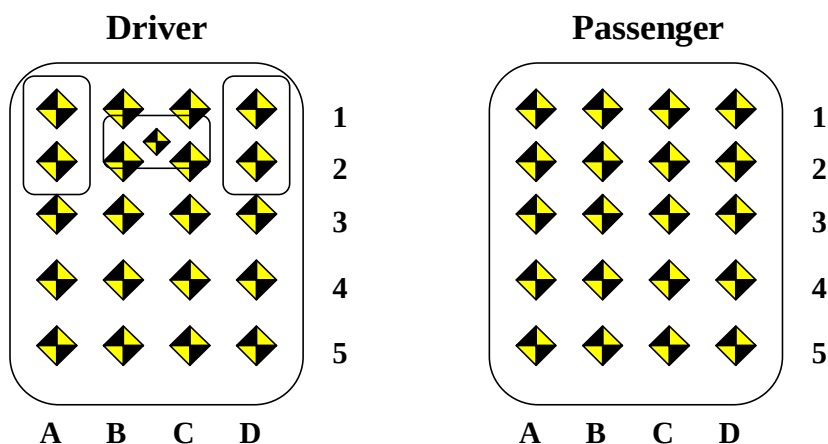
INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ICS	AC-FGP19	11-Jul-06	10-Jan-07
Right Rear Seat Crossmember X	GS SENSORS	AC-9440-046	11-Jul-06	10-Jan-07
Top of Engine	ICS	AC-FGP37	11-Jul-06	10-Jan-07
Bottom of Engine	GS SENSORS	AC-9440-006	03-Apr-06	03-Oct-06
Right Disc Brake Caliper	GS SENSORS	AC-9440-032	03-Apr-06	03-Oct-06
Left Disc Brake Caliper	GS SENSORS	AC-9440-039	03-Apr-06	03-Oct-06
Left Seat Rear Crossmember Z	ICS	AC-FGP29	11-Jul-06	10-Jan-07
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	11-Jul-06	10-Jan-07

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

DRIVER SIDE INTRUSION MEASUREMENTS



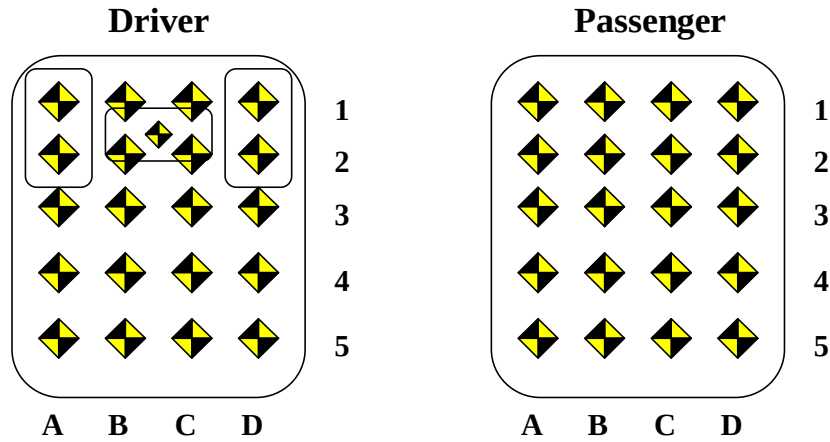
Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3237	-560	-491	3236	-557	-496	1	-3	5
B1	3345	-436	-489	3337	-427	-503	8	-9	14
C1	3350	-329	-488	3343	-315	-507	7	-14	19
D1	3339	-190	-488	3310	-177	-501	29	-13	13
A2	3186	-562	-442	3183	-558	-443	3	-4	1
B2	3271	-437	-438	3270	-429	-443	1	-8	5
C2	3278	-328	-441	3275	-319	-438	3	-9	-3
D2	3224	-192	-437	3220	-192	-435	4	0	-2
A3	3130	-560	-388	3132	-557	-392	-2	-3	4
B3	3178	-436	-390	3178	-433	-390	0	-3	0
C3	3174	-325	-389	3174	-319	-384	0	-6	-5
D3	3148	-203	-391	3143	-197	-389	5	-6	-2
A4	3096	-563	-381	3098	-559	-383	-2	-4	2
B4	3100	-437	-381	3098	-435	-373	2	-2	-8
C4	3097	-326	-383	3099	-323	-373	-2	-3	-10
D4	3091	-207	-386	3093	-201	-375	-2	-6	-11
A5	3023	-559	-373	3023	-557	-372	0	-2	-1
B5	3020	-441	-380	3021	-438	-371	-1	-3	-9
C5	3020	-325	-382	3021	-323	-373	-1	-2	-9
D5	3019	-208	-386	3017	-204	-372	2	-4	-14
BP	3193	-348	-560	3138	-360	-606	55	12	46
G	2972	-521	-785	2971	-523	-788	1	2	3
H	2957	-223	-781	2962	-224	-781	-5	1	0
L	2698	-371	-1060	2726	-408	-1068	-28	37	8
AB	2675	-569	-434	2677	-565	-432	-2	-4	-2

BP=Brake Pedal, G=Left side of bolster, H=Right side of bolster, L=Steering wheel center;

AB = Front outboard seat anchor bolt

PASSENGER SIDE INTRUSION MEASUREMENTS



Passenger Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3325	206	-489	3321	204	-487	4	2	-2
B1	3343	330	-488	3339	324	-489	4	6	1
C1	3342	458	-490	3340	451	-493	2	7	3
D1	3277	560	-493	3277	559	-489	0	1	-4
A2	3271	202	-440	3271	201	-439	0	1	-1
B2	3277	327	-443	3275	324	-448	2	3	5
C2	3276	456	-442	3274	449	-448	2	7	6
D2	3263	563	-440	3262	561	-440	1	2	0
A3	3175	208	-388	3176	206	-383	-1	2	-5
B3	3176	330	-391	3177	328	-388	-1	2	-3
C3	3180	456	-392	3176	451	-390	4	5	-2
D3	3181	561	-391	3178	561	-390	3	0	-1
A4	3085	213	-380	3086	209	-373	-1	4	-7
B4	3088	333	-383	3087	331	-379	1	2	-4
C4	3090	457	-385	3091	453	-380	-1	4	-5
D4	3089	560	-386	3090	560	-380	-1	0	-6
A5	2997	217	-382	2996	210	-374	1	7	-8
B5	3000	334	-381	2999	331	-376	1	3	-5
C5	3001	457	-381	3000	452	-377	1	5	-4
D5	2995	563	-380	2995	561	-376	0	2	-4
R	2920	251	-826	2937	250	-827	-17	1	1
S	2943	554	-828	2948	552	-827	-5	2	-1
AB	2667	574	-440	2667	574	-440	0	0	0

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

AB = Front outboard seat anchor bolt