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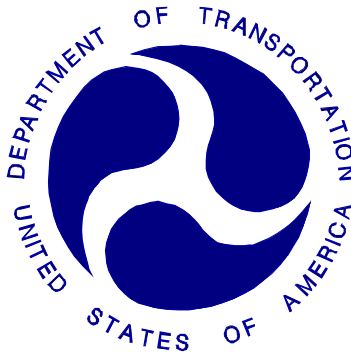
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

FORD MOTOR COMPANY
2007 FORD RANGER
TWO-DOOR PICKUP

NHTSA NUMBER: M70200

CALSPAN TEST NUMBER: 8806-NCAP-02

CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
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August 15, 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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Washington, DC 20590

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16. Abstract A frontal load cell barrier test of a 2007 Ford Ranger Two-Door Pickup was performed at Calspan Corporation's crash test facility in Buffalo, New York, on August 15, 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 574 mm. The test vehicle was equipped with 3-point restraint systems with torso belt pretensioners and force limiters, knee bolsters, adjustable 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:					
Measurement Description		Units	Threshold	Driver (061)	Passenger (064)
Head Injury Criteria (HIC - 36 ms)		-	1000	546.3	534.9
Maximum Thorax Acceleration (3 ms Clip)		g's	60 g's	38.1	45.0 ¹
Chest Displacement		mm	-76 mm	-36.1	-32.8
Left Femur Force		Newtons	-10000 N	-3873.8	-2327.1
Right Femur Force		Newtons	-10000 N	-4551.9	-1971.3
¹ Calculated using P2 Redundant Chest Z data					
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.65 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-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 56.65 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Inducant 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 Inducant 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 Inducant 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. 061) and the right-front passenger (position 2) ATD (Serial No.064) were used in two tests (M75400 and M70102) previous to this test where they did not exceed FMVSS 208 head, chest or femur requirements. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 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 Ford Ranger Two-Door Pickup at a velocity of 56.65 kph. The test was performed at Calspan on August 15, 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	546.3	55.3	91.3	38.1	72.4	76.5	-36.1	-3873.8	-4551.9
Passenger	534.9	63.5	97.9	45.0 ¹	79.8	82.8	-32.8	-2327.1	-1971.3

¹Calculated using P2 Redundant Chest Z data

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

TEST NOTES	
Data Channel	Anomalies
V1P1 Head CG Red X	Questionable data
V1P1 Left Lower Tibia Mx	Transducer cable failed
V1P1 Right Lower Tibia Mx	Transducer cable failed
V1P1 Left Foot Aft z	Channel Opened - Loose Connector
V1P2 Chest z	Transducer failed
V1 RFP Lap Belt	Spikes in data

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M70200 Test Mode: 56.3 kph Frontal Barrier
 Test Date: August 15, 2006 Time: 11:15 Temperature: 21 °C
 Vehicle Make/Model/Body Style: 2007 Ford Ranger Two-Door Pickup
 Vehicle Test Weight: 1913.5 kg Impact Velocity: 56.65 kph (55.5 – 57.1 kph)
 Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 574 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 load limiter, Airbag, Knee Bolster and Adjustable Head Restraint	Three-point safety belt with torso belt pretensioner and load limiter, Airbag, Knee Bolster and Adjustable Head Restraint
Head Contact:	The face to the top of the center of the airbag, the back of the head to the center of the head restraint.	The face to the center of the airbag, the back of the head to the right of 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	Not Applicable	Not Applicable
Hatch/Other Door Opening	Not Applicable	Not Applicable
Front Seat Track Shift (mm)	Rotated Counterclockwise	Rotated Clockwise
Front Seat Back Failure	None	None
Glazing Damage	None	

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Left Side (mm)	Center (mm)	Right Side (mm)	Average (mm)
Value	812	797	807	805

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	1250	1240
Lap belt length as measured on ATD	mm	790	790
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	2040	2030

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2007 Ford Ranger Two-Door Pickup

NHTSA No. : M70200 ; VIN: 1FTYR11U37PA02312 ; Color: White

Engine Data: 6 cylinders; - CID; 3.0 Liters; - cc

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

Transmission Data: 5 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: 7-28-2006 ; Odometer Reading 515 km

Selling Dealer: Ricart Ford

Dealer Address: Columbus, OH 43227

TEST VEHICLE OPTIONS:

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

X ABS; - Tilt Wheel; - Stability Control - 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:	Yes	No	No	No	No
Passenger:	Yes	No	No	No	No
Rear Passenger:	N/A	N/A	N/A	N/A	N/A

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Ford Motor Company

Date of Manufacture 05/06

GVWR: 2915 kg; GAWR: 1138 kg FRONT; 1157 kg REAR

VEHICLE CAPACITY DATA:

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

Number of Occupants: 3 Front; N/A Rear; 3 Total

Vehicle Capacity Weight (VCW) = 565.0 kg

No. of Occupants x 68.04 kg = 204.1 kg

Rated Cargo/Luggage Weight (RCLW) = 360.9 kg (136.1 kg maximum)

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	510.0	467.0	59.9	977.0
Rear =	329.0	324.0	40.1	653.0
Total Delivered Weight (UDW) =				1630.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	1630.0	kg	(maximum)
Rated Cargo/Luggage Weight (RCLW)	=	136.1	kg	
Weight of 2 p.572 Dummies @ 76 each	=	152	kg	
TARGET TEST WEIGHT	=	1918.1	kg	

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 131.5 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	544.0	509.5	55.1	1053.5
Rear =	433.0	427.0	44.9	860.0
Total Vehicle Test Weight (ATW) =				1913.5

Weight of Ballast Secured in Vehicle Trunk Area¹ = 50 kg

Vehicle Components Removed for Weight Reduction: Jack

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG ²
AS DELIVERED:	853	867	920	921	1196.6
FULLY LOADED:	846	859	884	886	-
AS TESTED:	854	862	887	887	1342.5

Vehicle's Wheel Base: 2987 mm

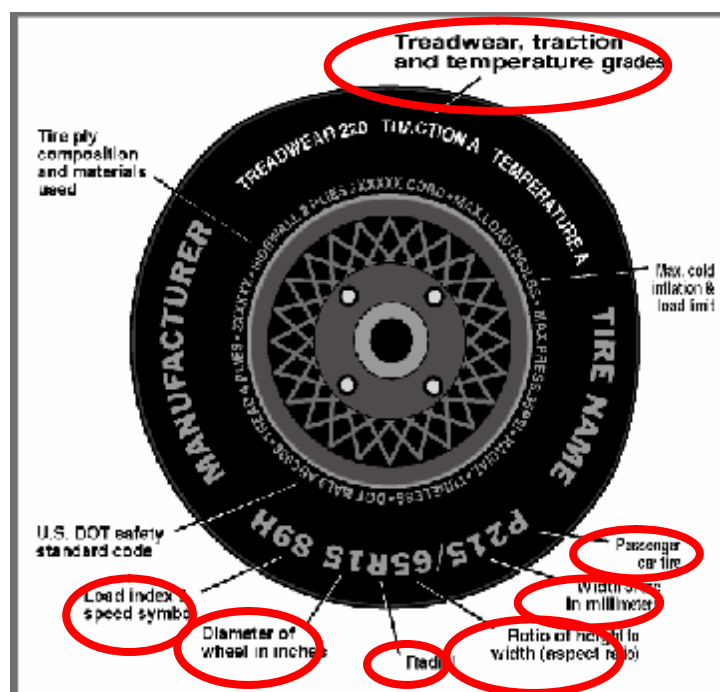
¹Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

²Rearward of the front axle centerline.

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Vehicle Year/Make/Model/Body Style: 2007 Ford Ranger Two-Door Pickup

NHTSA Test No.: M70200 Test Date: August 15, 2006



Measured Parameter	Front	Rear
Maximum Tire Pressure (from sidewall - kPa)	300	300
Cold Pressure (from tire placard - kPa)*	240	240
Recommended Tire Size (from tire placard)	P235/75R15	P235/75R15
Tire size on Vehicle	P235/75R15	P235/75R15
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Wrangler	Wrangler
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	75	75
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index & Speed Symbol	105S	105S
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	B	B

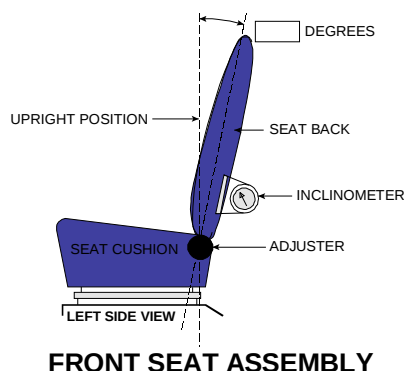
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2007 Vehicle Model: Ford Ranger Body Style : Two-Door Pickup

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: 11.3°

Measurement instructions: Measured relative to a level sill 50 mm above the seatback pivot point on the rear outboard seat frame on 3 mm thick reinforcement plate.

Seat back angle for passenger's seat: 11.3°

Measurement instructions: The same as the driver's seat

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: There are 230 mm of total travel. The seat was placed at 115 mm from full forward

Positioning of the passenger's seat: There are 230 mm of total travel. The seat was placed at 115 mm from full forward

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 76.8 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 = 70.7 to 72.2 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 715 liters

3.3 One-Third of Useable Capacity = 25.6 liters

3.4 Is vehicle equipped with electric fuel pump? Yes- X ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

The pump operates for 2 seconds to pressurize the fuel system when the ignition is turned to the 'ON' position

The fuel pump runs 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 column was not adjustable.

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: There are four detents. With the uppermost detent being labeled detent 0.
The test detent was detent 2.

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

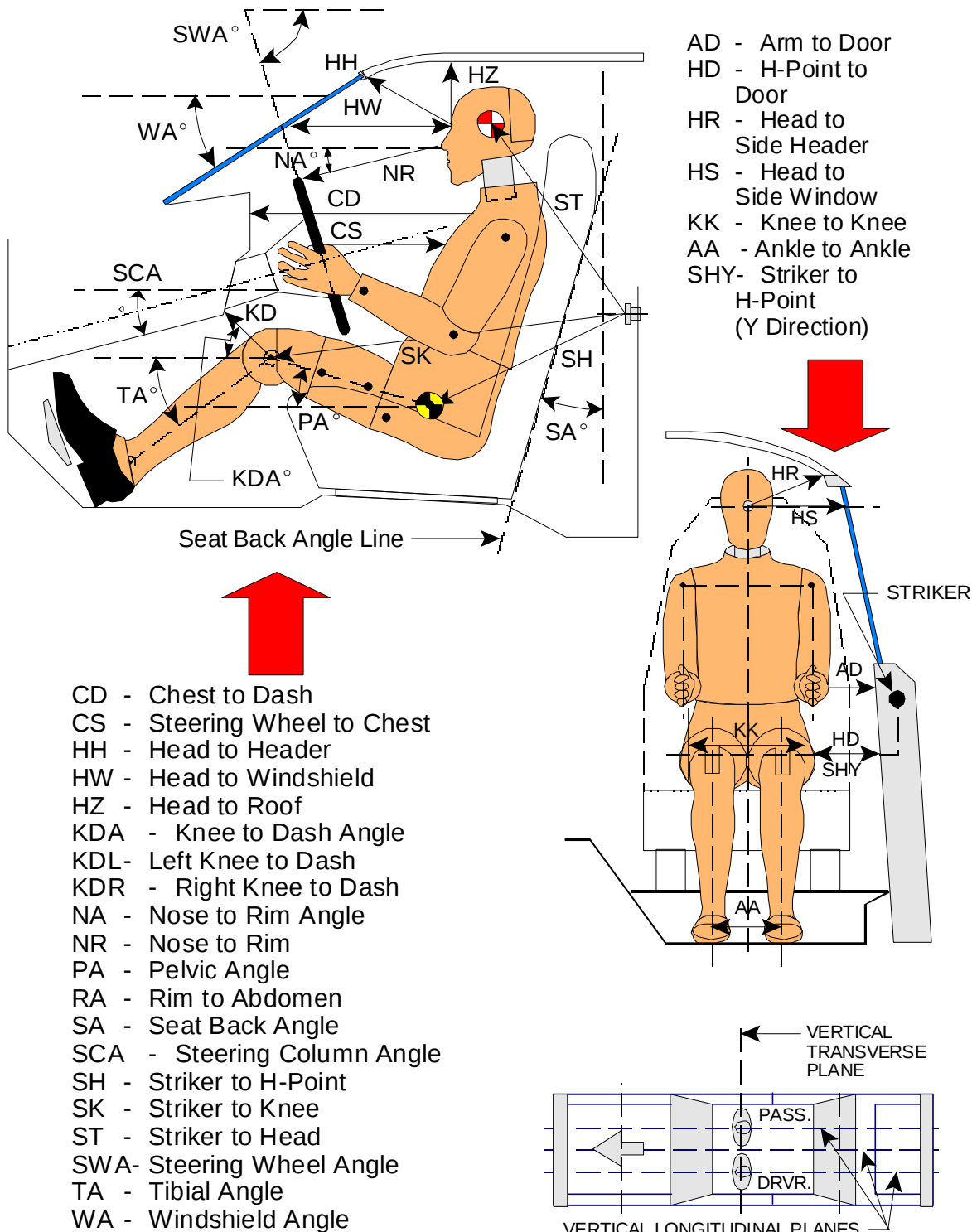
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; - No; X N/A

Comments: Automatic door locks were not available on this vehicle

DATA SHEET NO. 5

FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



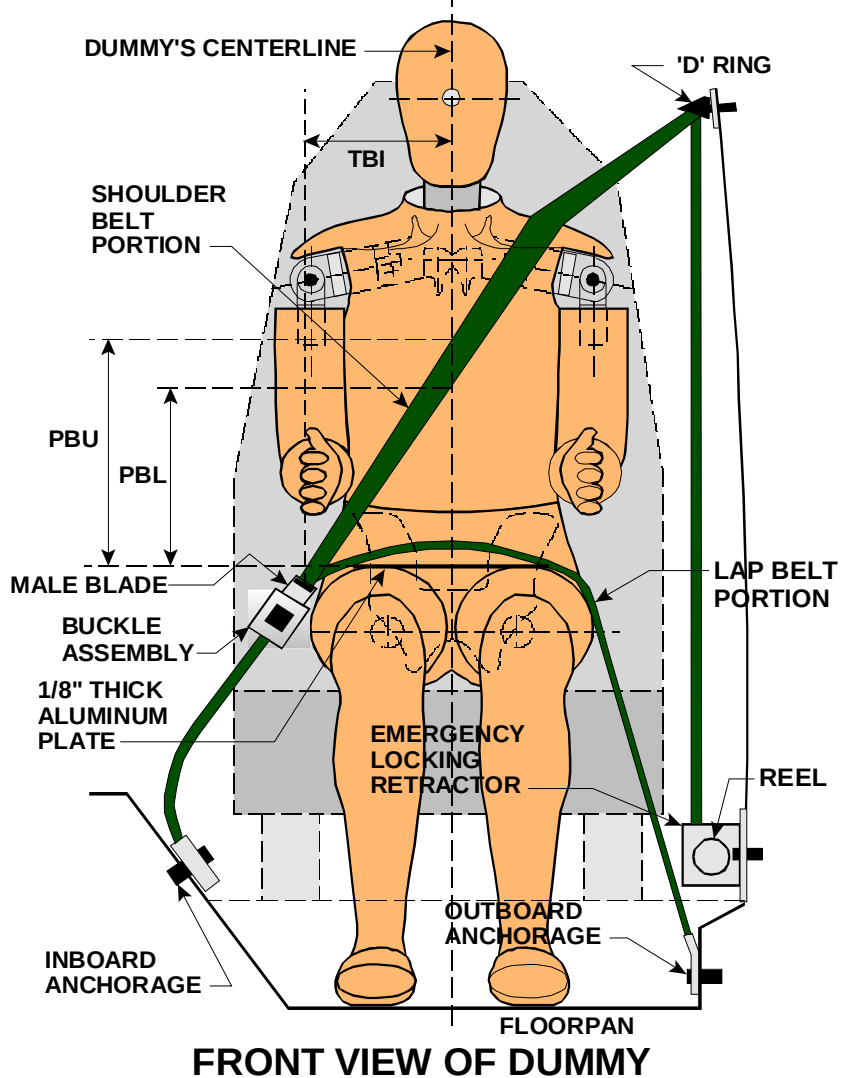
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	42.5 deg.			N/A		
SWA ^o	68.0 deg.			N/A		
SCA ^o	22.0 deg.			N/A		
SA ^o	11.3 deg.			11.3 deg.		
HZ	197			206		
HH	460			457		
HW	593			581		
HR	218			220		
NR	371	Angle	-10 deg.	N/A		
CD	510			548		
CS	275			N/A		
RA	172			N/A		
KDL	159	Angle (KDA)	32 deg.	149		
KDR	150			159	Angle (KDA)	31 deg.
PA ^o	23.8 deg.			22.7 deg.		
TA ^o	42.0 deg.			40.3 deg.		
KK	310			274		
AA	290			240		
ST	540	Angle	20 deg.	554	Angle	20 deg.
SK	700	Angle	92 deg.	690	Angle	91 deg.
SH	335	Angle	119 deg.	335	Angle	110 deg.
SHY	210			203		
HS	323			330		
HD	140			143		
AD	83			80		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

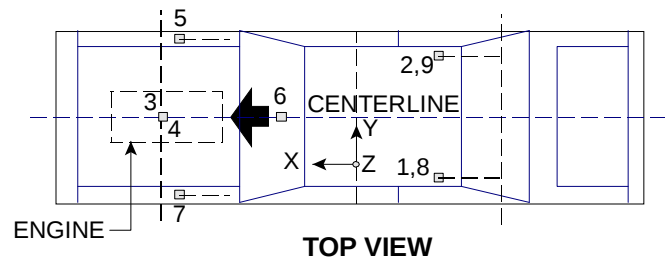
SEAT BELT POSITIONING DATA



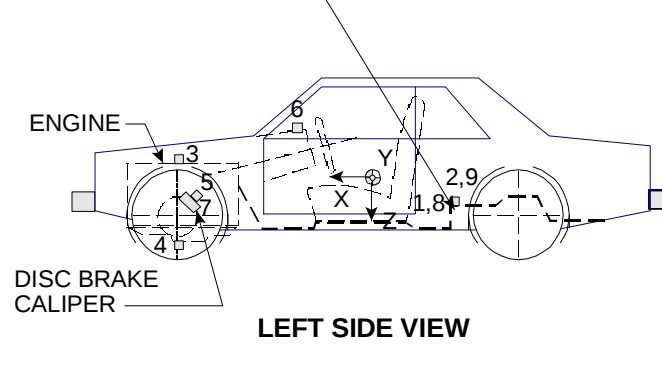
	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	330	310
PBL-- Top surface of alum. plate to belt lower edge	250	240
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	2524	-571	-743
2	Right Rear Seat Cross Member X	2563	597	-733
3	Top of Engine Block	4451	-179	-973
4	Bottom of Engine	3988	-3	-276
5	Disc Brake Caliper @ Right Side	4150	442	-403
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	4150	-442	-403
8	Left Rear Seat Cross Member Z	2524	-571	-743
9	Right Rear Seat Cross Member Z	2563	597	-733

X – From rear surface of vehicle (+ forward)

Y – From vehicle centerline (+ right)

Z – From ground plane (+ up)

** Accelerometer was not requested by the COTR

DATA SHEET NO.8
SUMMARY OF FMVSS 212 and FMVSS 219 (Partial) DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with a 18 mm molding.

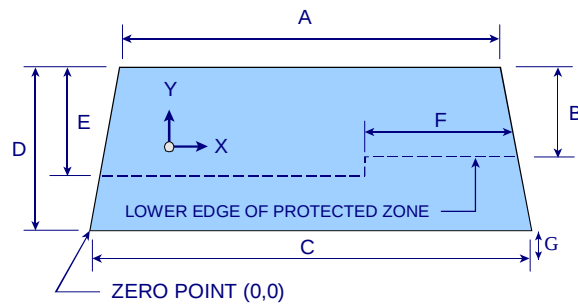
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

Temperature of windshield molding during test: 21°C.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	1380.5	1380.5	100.0%
LEFT SIDE	1380.5	1380.5	100.0%
TOTAL	2761	2761	100.0%



DIMENSIONS (mm)	
A	123
B	325
C	1490
D	574
E	360
F	707
G	18

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS: None

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm:

None

	COORDINATES	
	X	Y
1.	-	-
2.	-	-
3.	-	-
4.	-	-

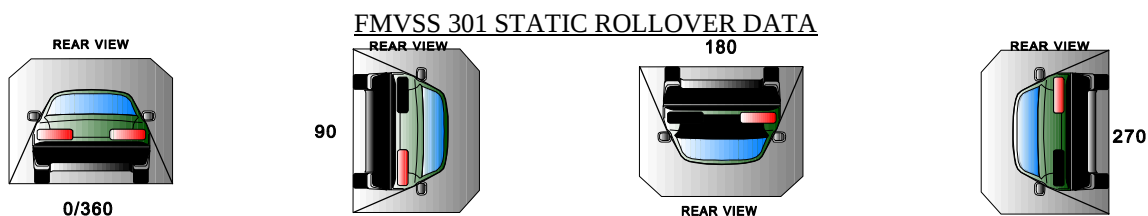
DATA SHEET NO. 9
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: _____ M70200 _____ TEST DATE: _____ August 15, 2006
VEHICLE MAKE/MODEL: _____ 2007 Ford Ranger Two-Door Pickup _____
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	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes
90° - 180°	1	minutes	07	seconds	5	minutes	6	minutes	7	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:

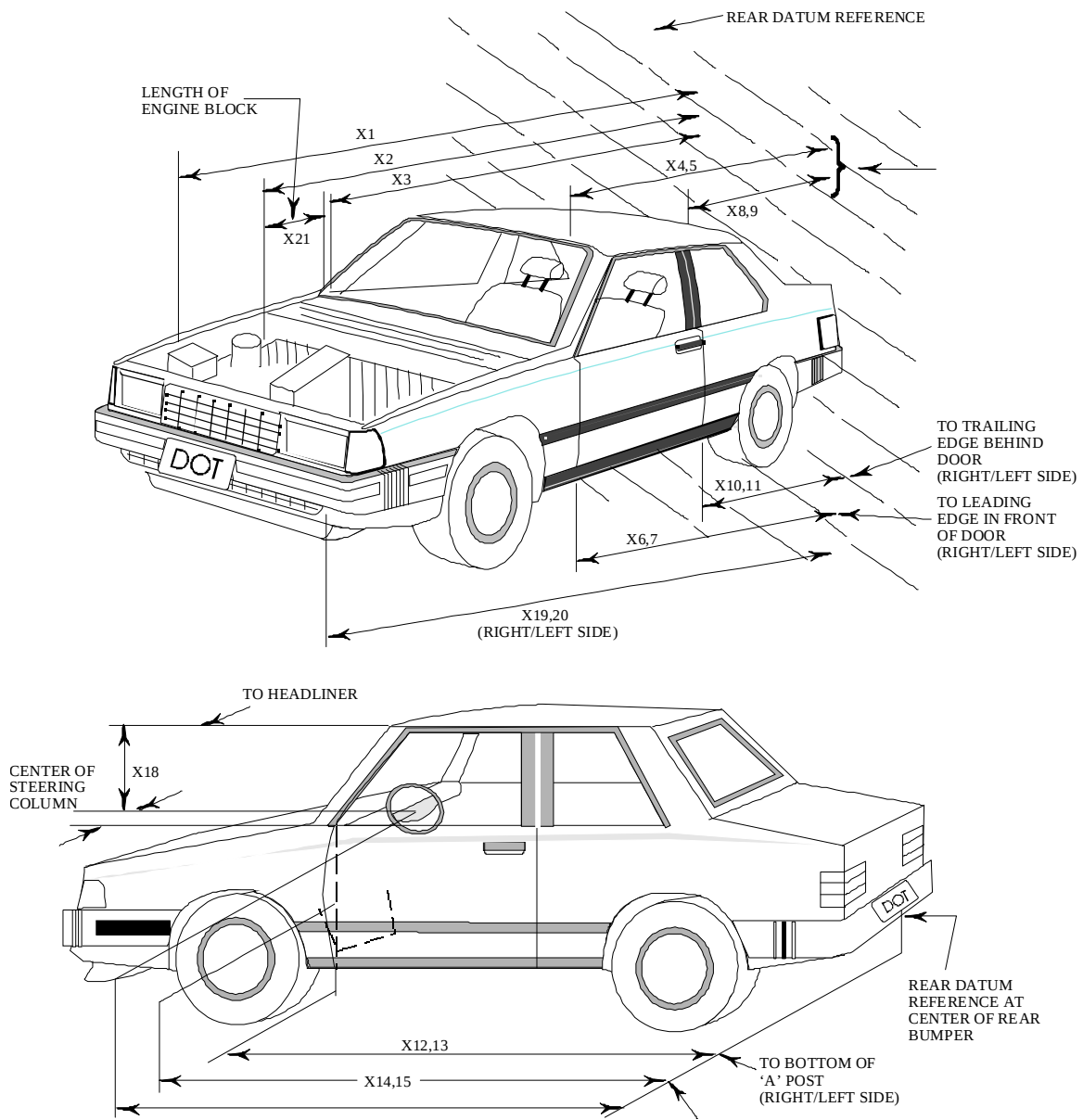
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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.: M70200 TEST DATE: August 15, 2006
VEHICLE MAKE/MODEL: 2007 Ford Ranger Two-Door Pickup

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5109	4535	574
X2	Rear Surface of Vehicle to Front of Engine	4502	4282	220
X3	Rear Surface of Vehicle to Firewall	3960	3923	37
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3686	3672	14
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3687	3654	33
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3601	3584	17
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3600	3569	31
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2558	2545	13
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2555	2529	26
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2550	2531	19
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2549	2516	33
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3645	3634	11
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3651	3630	21
X14	Rear Surface of Vehicle to Firewall, Right Side	3897	3895	2
X15	Rear Surface of Vehicle to Firewall, Left Side	3915	3893	22
X16	Rear Surface of Vehicle to Steering Column	3201	3202	-1
X17	Center of Steering Column to "A" Post	282	300	-18
X18	Center of Steering Column to Headliner	408	367	41
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5056	4499	557
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5056	4536	520
X21	Length of Engine Block	458	458	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3407	3407	0
CD	Rear Surface of Vehicle to Center of Dash Panel	3481	3480	1
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3410	3388	22

All Dimensions in mm

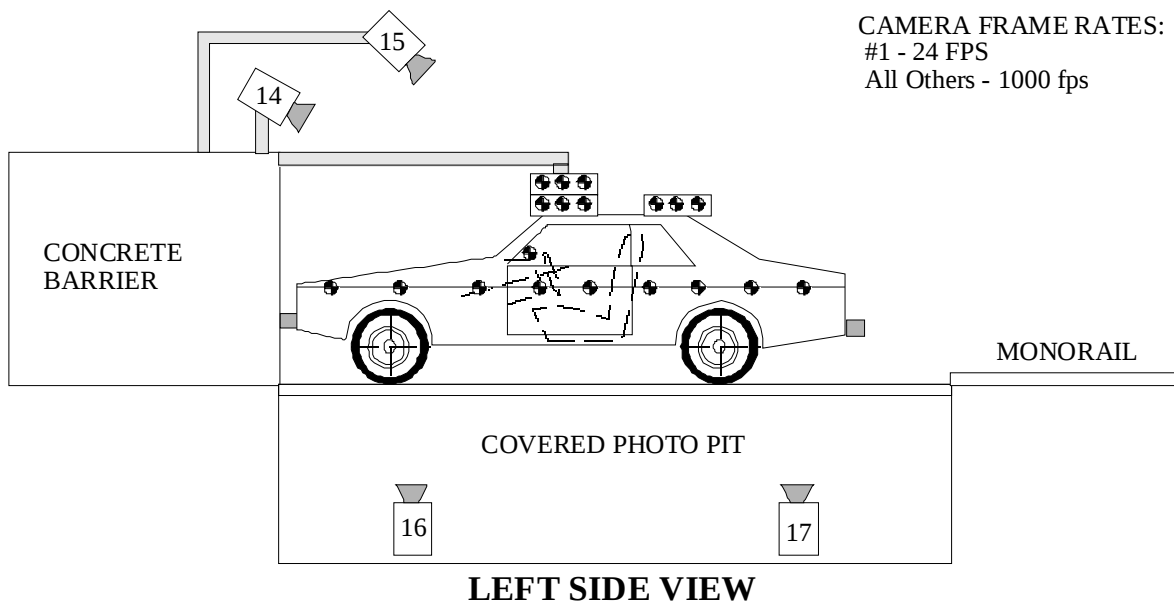
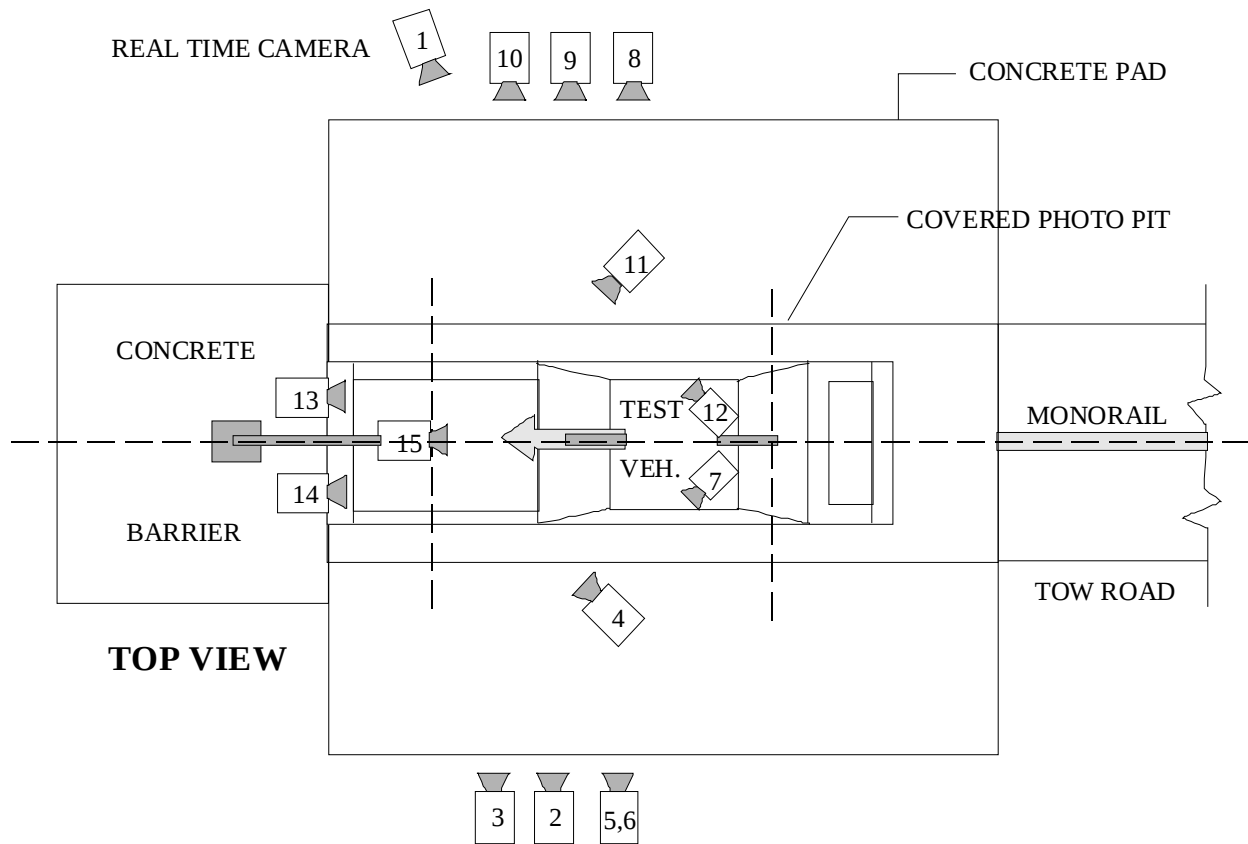
DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M70200 TEST DATE: August 15, 2006
VEHICLE MAKE/MODEL: 2007 Ford Ranger Two-Door Pickup

TARGET VEHICLE STRUCTURAL MEASUREMENTS

	Elements	Pre-Test (mm)
1	Total length	5109
2	Total Width	1739
3	Bumper Top Height	679
4	Bumper Bottom Height	579
5	Longitudinal Member Top Height	598
6	Distance Between Longitudinal Members	728
7	Longitudinal Member Width	72
8	Engine top height	1059
9	Engine bottom height	272
10	Engine and gearbox width	339
11	Front bumper-engine distance	606
12	Front shock absorber fixing height	787
13	Bonnet leading edge height	1024
14	Front shock absorber fixing width	796
15	Front bumper – front axle distance	856
16	Front axle – a pillar distance	1058
17	A-pillar – B pillar distance	1018
18	B-pillar – rear axle distance	1318
19	B-pillar – C Pillar distance	-1018
20	Roof sill bottom height	1621
21	Roof sill top height	1700
22	Floor sill bottom height	441
23	Floor sill top height	556

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS



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

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

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	8307	1804	1214	-4	7930	28	1000
3	Left Side View	9781	876	1095	-3	9404	52	1000
4	Driver and Interior View	7765	2494	2060	-7	-	35	500
5	Steering Column (Bottom)	7620	1444	1750	-2	7243	25	1000
6	Steering Column (Top)	7620	1444	1795	-7	7243	24-70	1000
7	Left CRS Lateral View	-	-	-	-	-	-	-
8	Overall Right Side	11328	1947	1115	-1	11631	28	500
9	Right Side View	9687	1080	1164	-2	9990	50	1000
10	Right Passenger View	9144	1867	1449	-4	9447	35	1000
11	Passenger and Interior View	7620	2614	2033	-7	-	35	500
12	Right CRS Lateral View	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-29	-	13	500
14	Driver Front View	620	-92	1987	-26	-	13	500
15	Windshield View	0	-530	3374	-50	-	20	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0	2320	-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

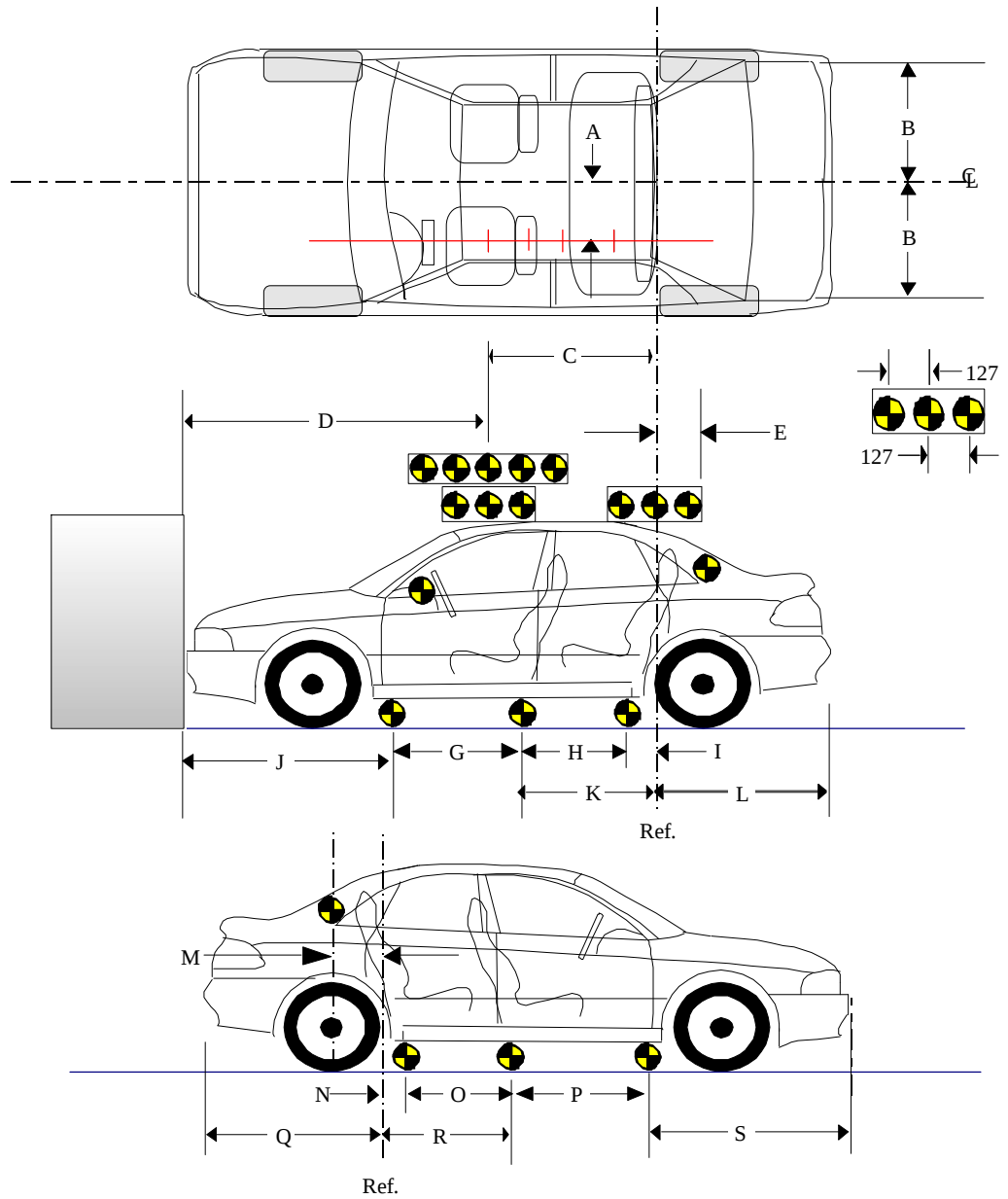
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

(Dimensions in millimeters)

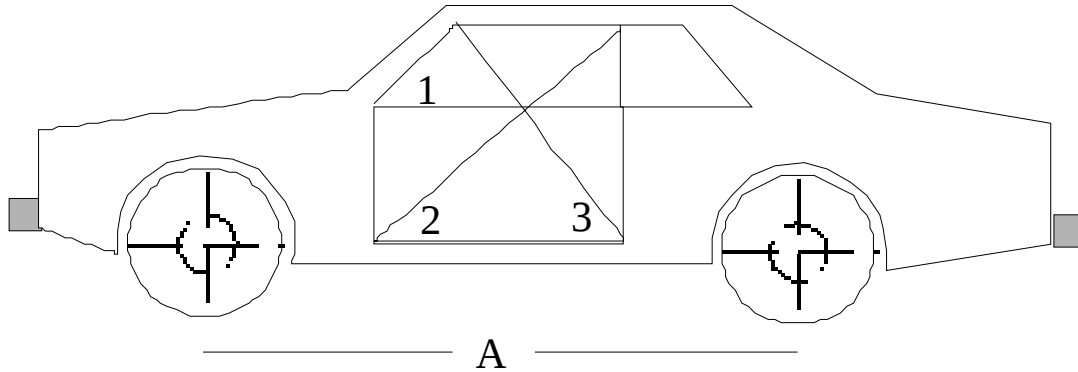
A	379
B	680
C	253
D	2102
E	-212
F	630
G	635
H	633
I	824
J	1381
K	1457
L	1636
M	218
N	820
O	643
P	645
Q	1631
R	1463
S	1370



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



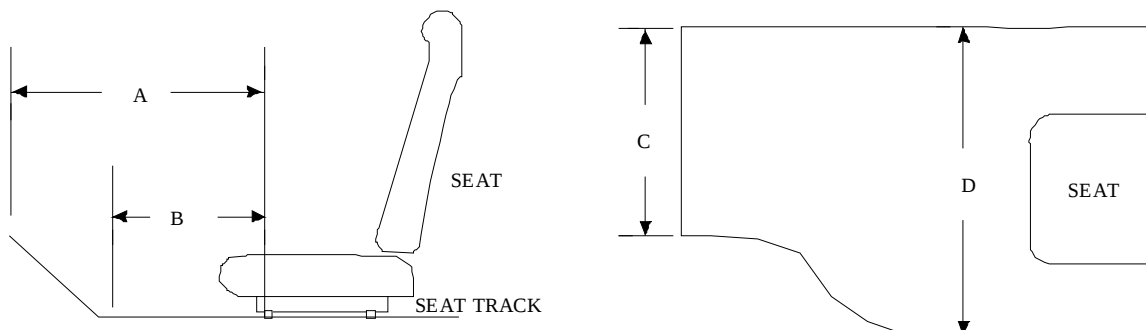
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1018	1426	1184	1018	1426	1184
AFTER TEST	1007	1407	1211	1011	1417	1196
DIFFERENCE	11	19	-27	7	9	-12

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2987	2989
AFTER TEST	2951	2918
DIFFERENCE	36	71

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	709	640	69
B	480	476	4
C	442	441	1
D	399	390	9

PASSENGER

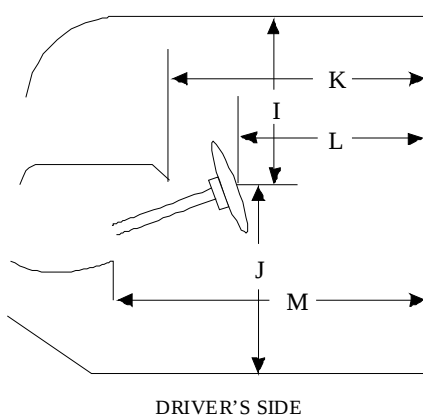
Measurement	Pre-Test	Post-Test	Difference
A	620	610	10
B	486	482	4
C	400	396	4
D	435	414	21

Units = mm

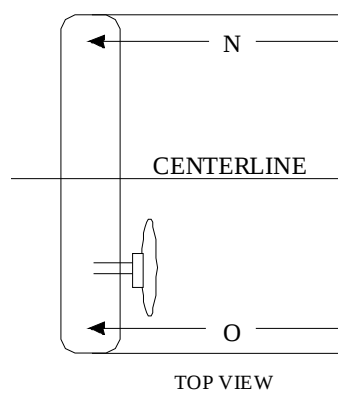
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

STATIC PASSENGER COMPARTMENT INTRUSION

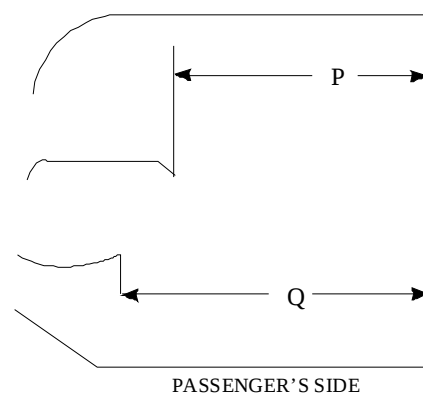


DRIVER'S SIDE



TOP VIEW

MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



PASSENGER'S SIDE

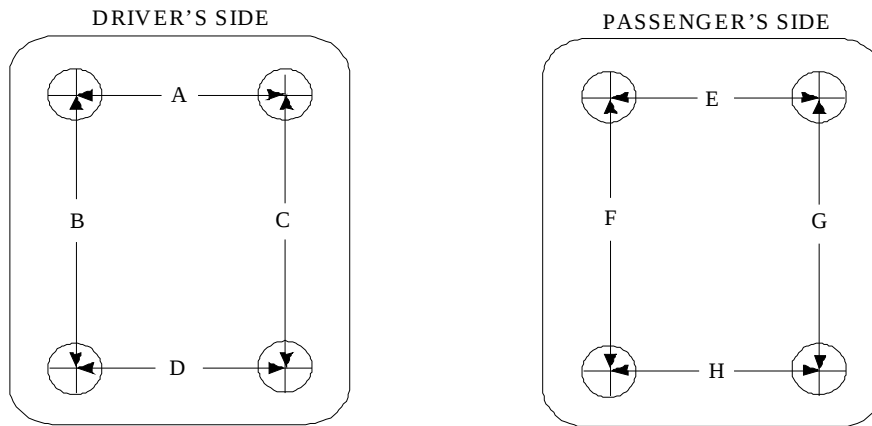
Measurement	Pre-Test	Post-Test	Difference
I	408	367	41
J	643	720	-77
K	838	849	-11
L	619	638	-19
M	836	831	5
N	826	835	-9
O	827	824	3
P = K (PASS.)	884	892	-8
Q = M (PASS.)	894	914	-20

Units = mm

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

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

FLOORBOARD DEFORMATION



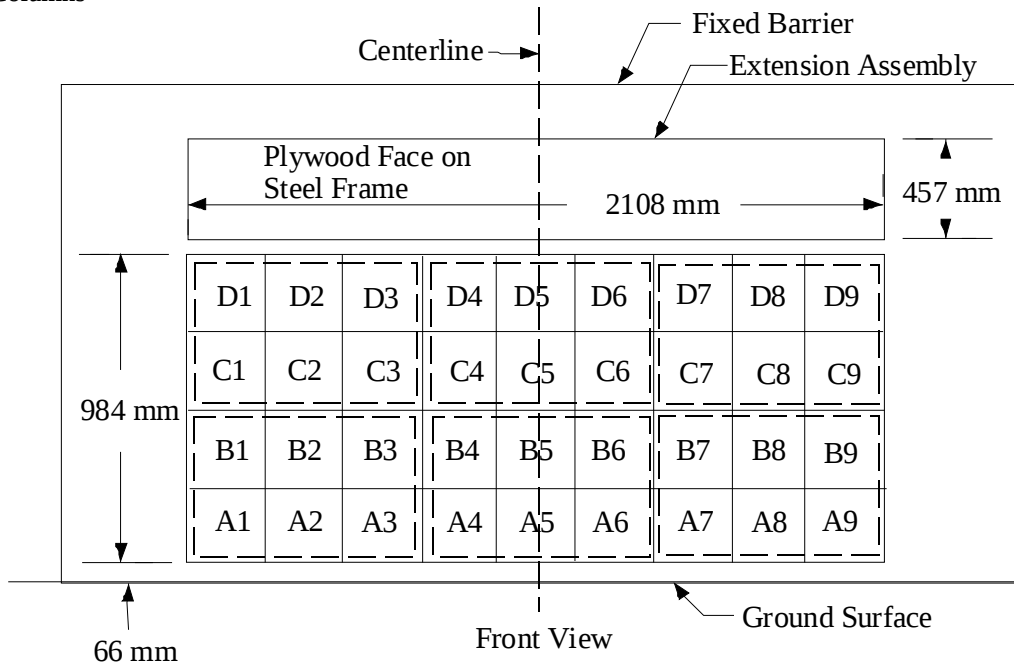
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	442	441	1
B	368	373	-5
C	277	276	1
D	399	390	9
E	400	396	4
F	255	246	9
G	253	227	26
H	435	414	21

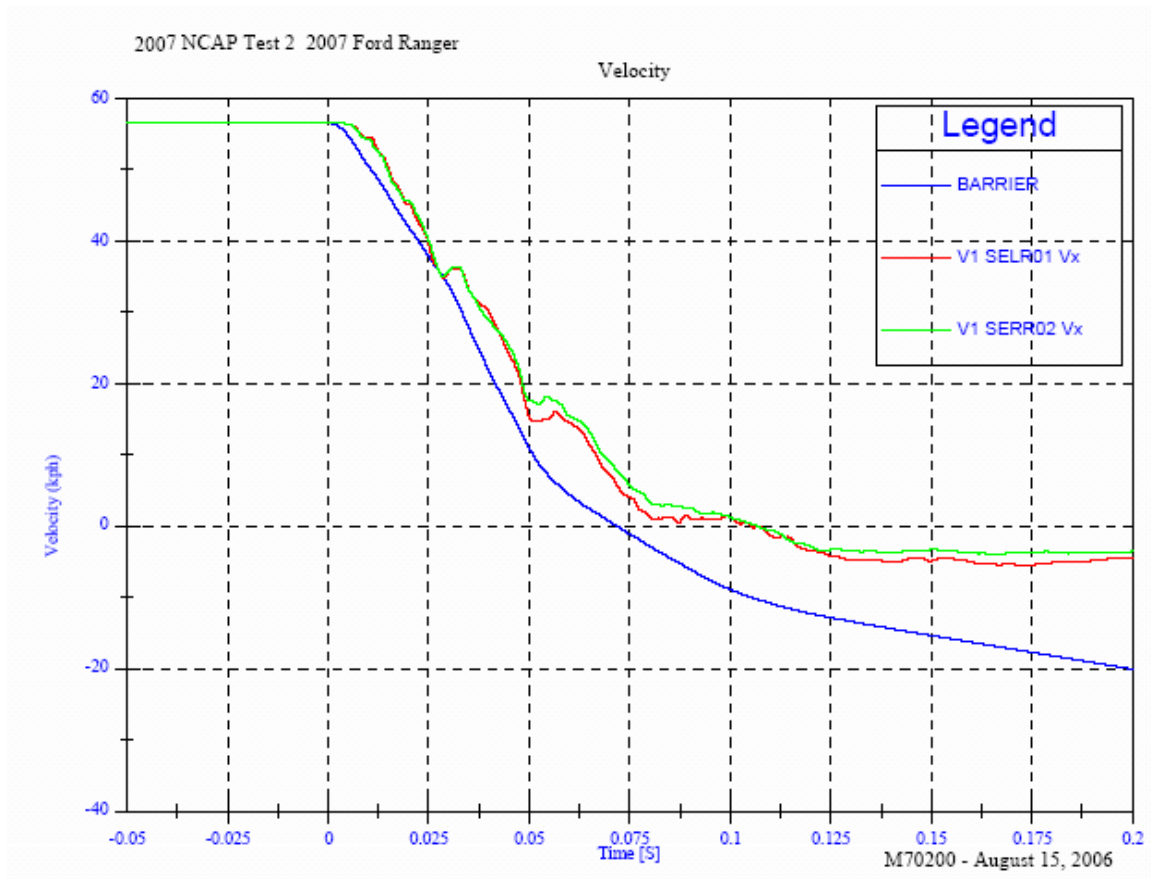
Units = mm

DATA SHEET NO.14
LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
4 Rows
9 Columns



Momentum Plot



DATA SHEET NO. 15
ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Ford Ranger Two-Door Pickup

NHTSA Test No.: M70200 VIN: 1FTYR11U37PA02312

Model Year: 2007 Build Date: 05/06 Test Date: August 15, 2006

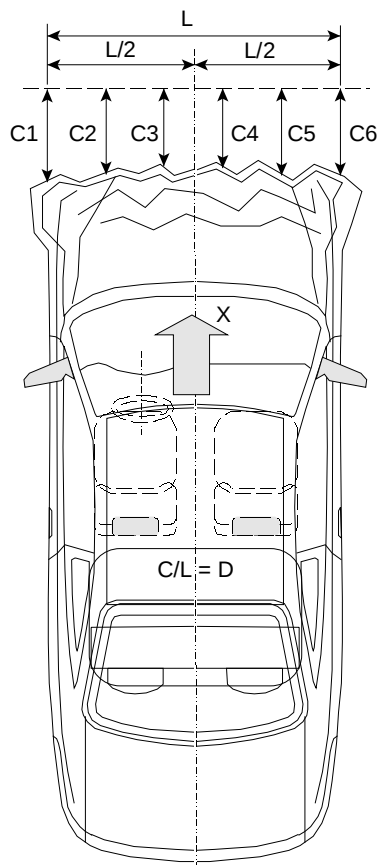
Vehicle Size Category: Standard Pickup Test Weight: 1913.5 kg

Vehicle Wheelbase: 2987 mm; Front Overhang: 855 mm; Overall Width: 1739 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4985	4538	447
C2 =	5067	4532	535
C3 =	5105	4534	571
C4 =	5104	4530	574
C5 =	5067	4498	569
C6 =	4983	4485	498



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

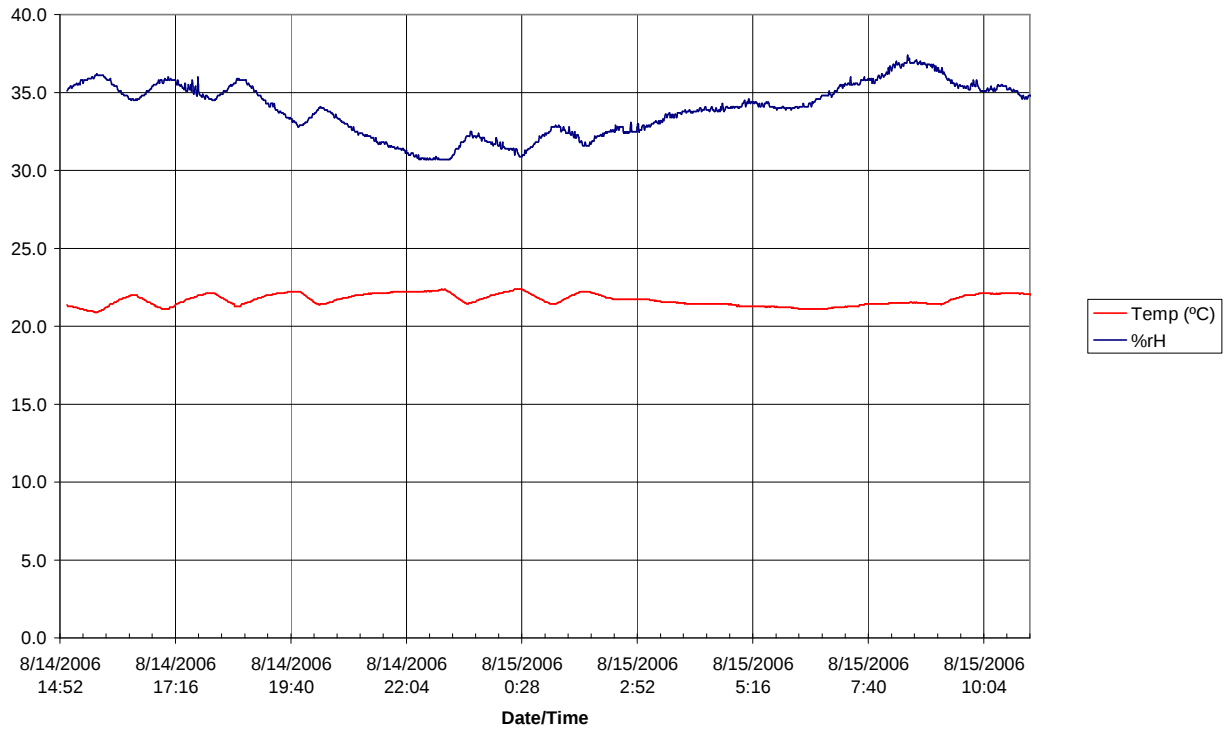
Length of Damaged Region:

L1=	<u>1472</u>	mm
L2=	<u>736.0</u>	mm
L5=	<u>294.4</u>	mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M70200 Vehicle: 2007 Ford Ranger Two-Door Pickup

2007 Ford Ranger M70200 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

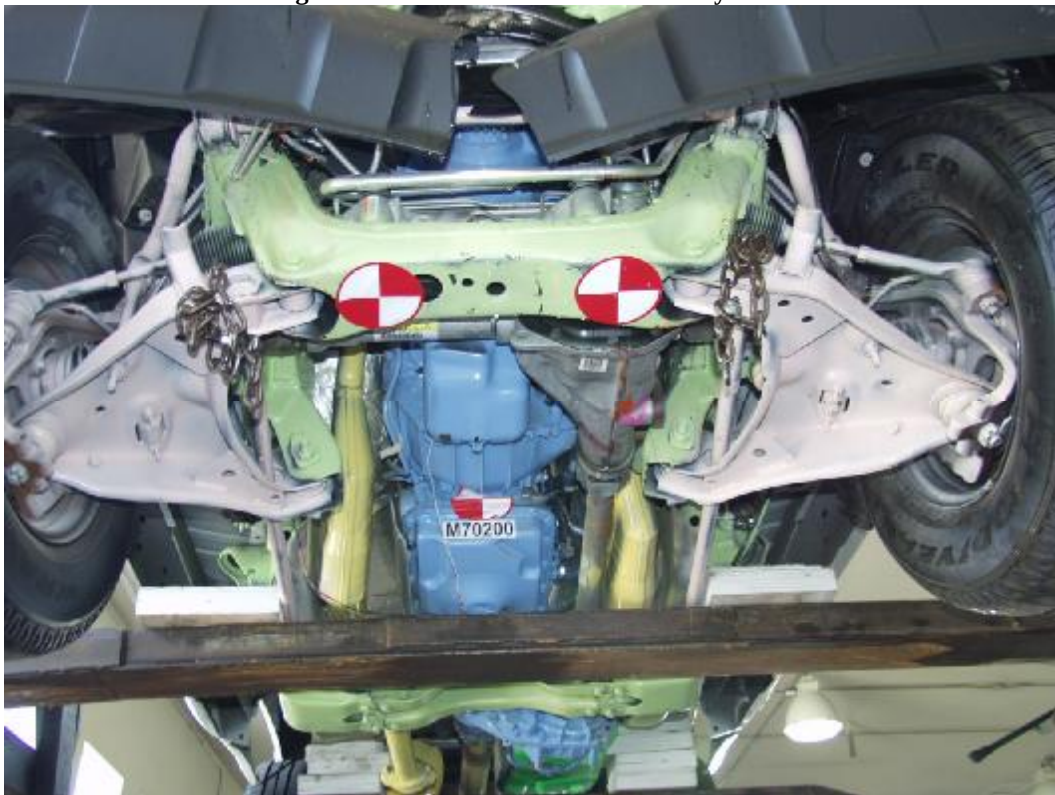


Figure A-25: Post-Test Front Underbody View



Figure A-26: Pre-Test Mid Underbody View

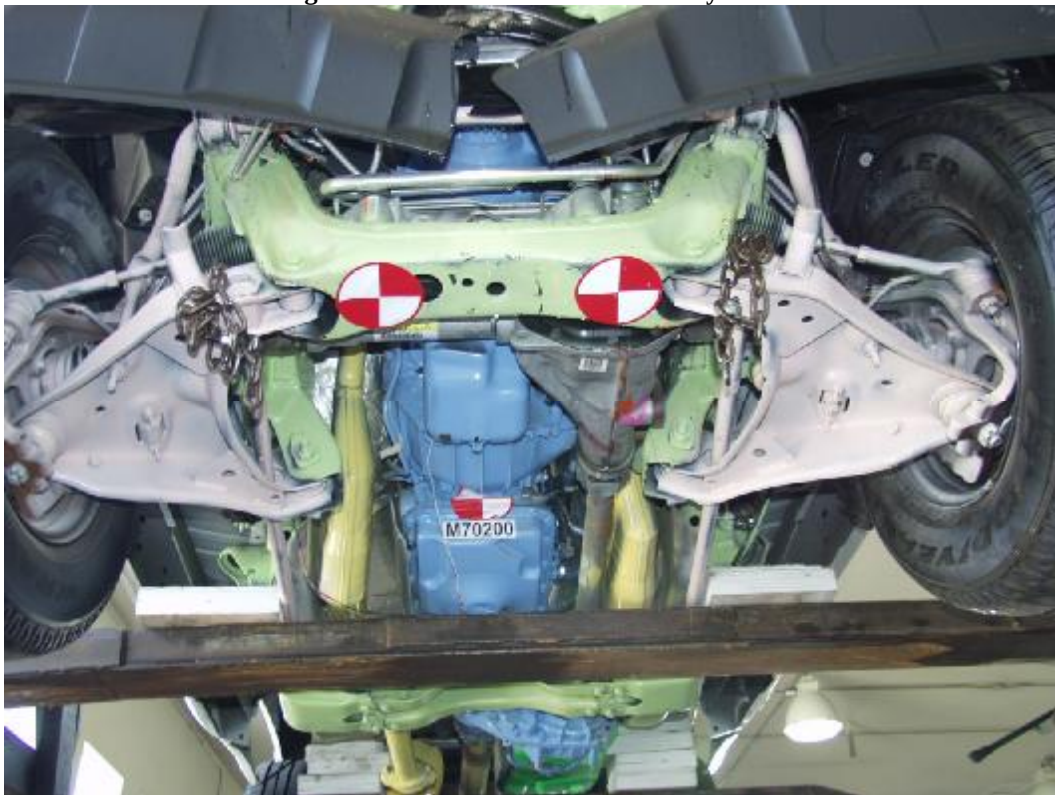


Figure A-27: Post-Test Mid Underbody View



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.: M70200

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

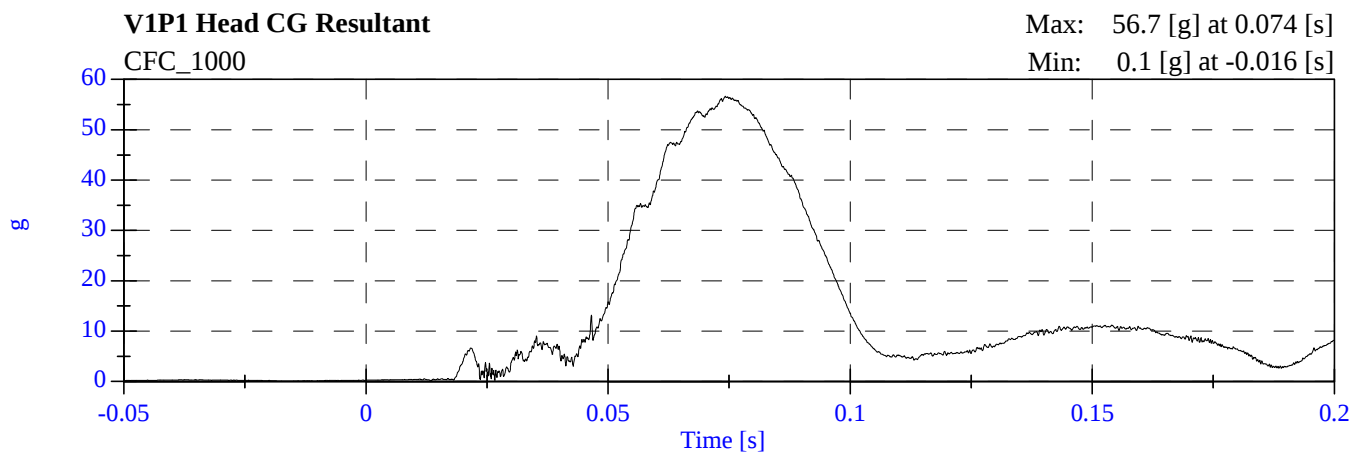
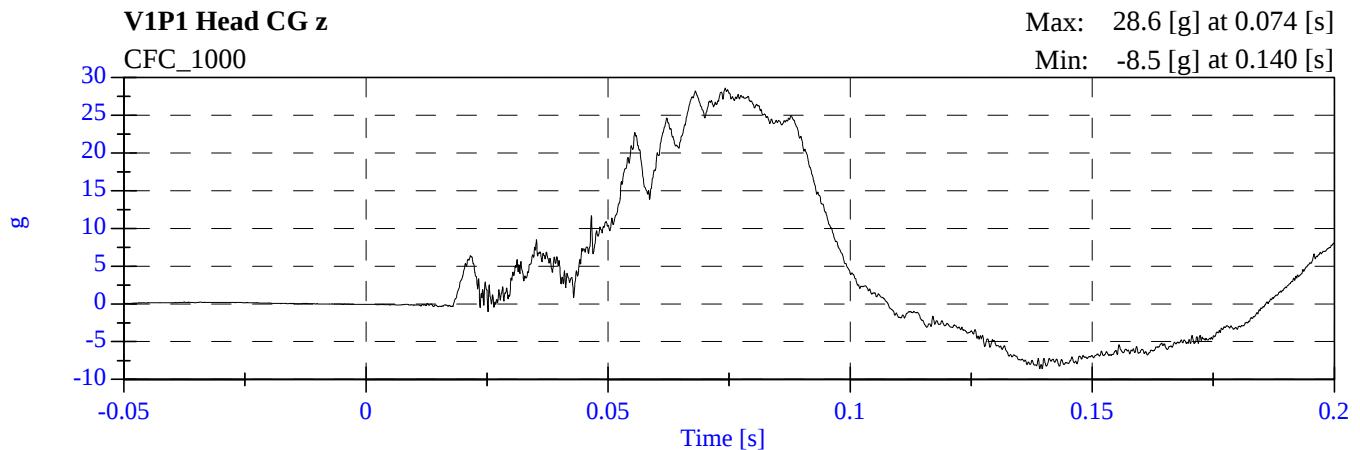
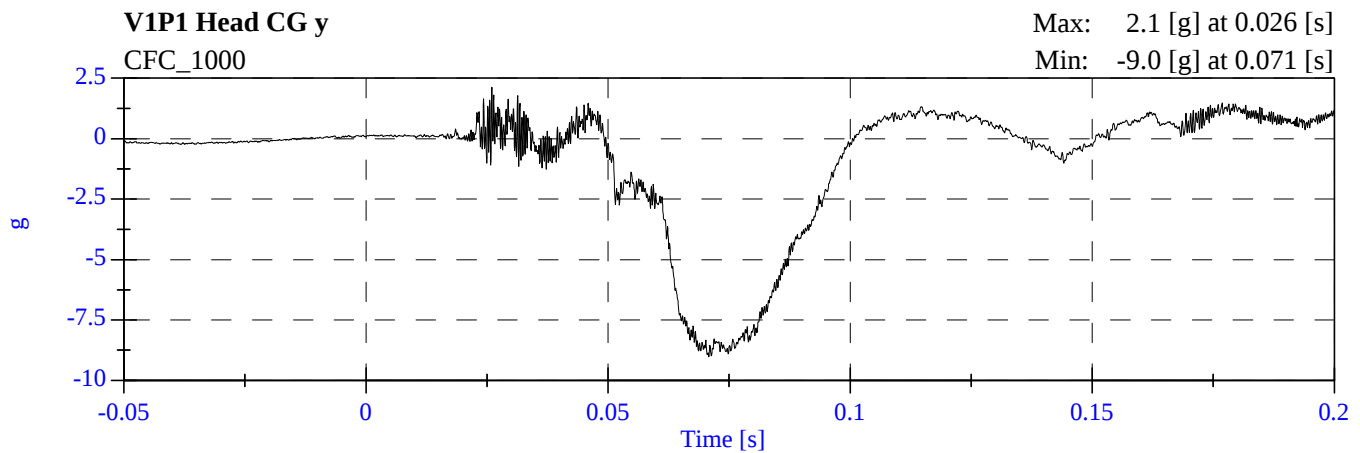
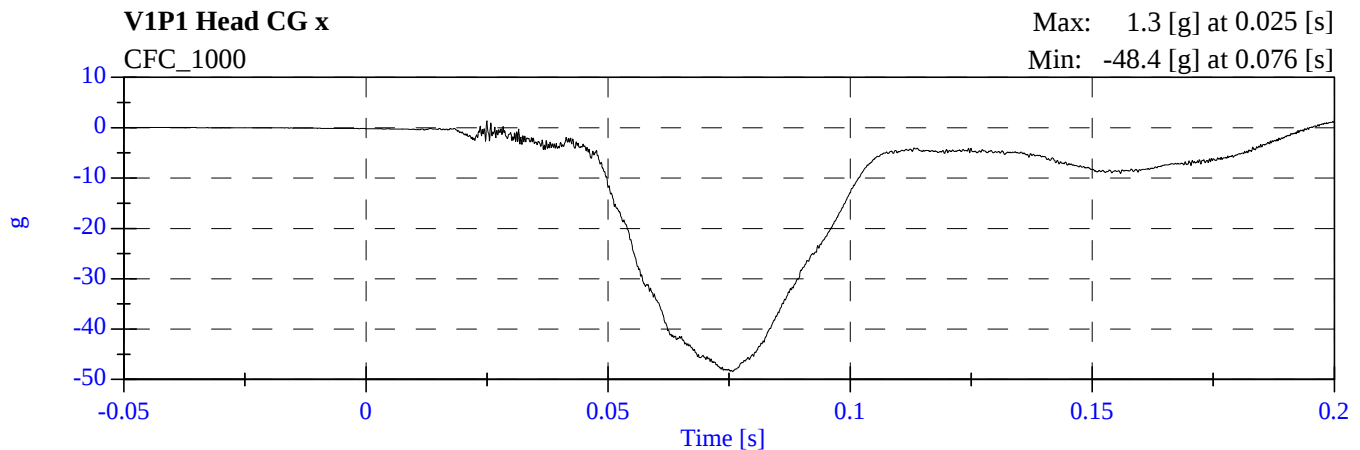
V1P1 Head CG Ax	V1P1 Lap Belt Load
V1P1 Head CG Ay	V1P1 Shoulder Belt Load
V1P1 Head CG Az	V1P2 Lap Belt Load
V1P1 Head CG Red Ax	V1P2 Shoulder Belt Load
V1P1 Head CG Red Ay	V1 Left Rear #1x
V1P1 Head CG Red Az	V1 Right Rear #2x
V1P1 Upper Neck Fx	V1 Engine Top #3x
V1P1 Upper Neck Fy	V1 Engine Bottom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

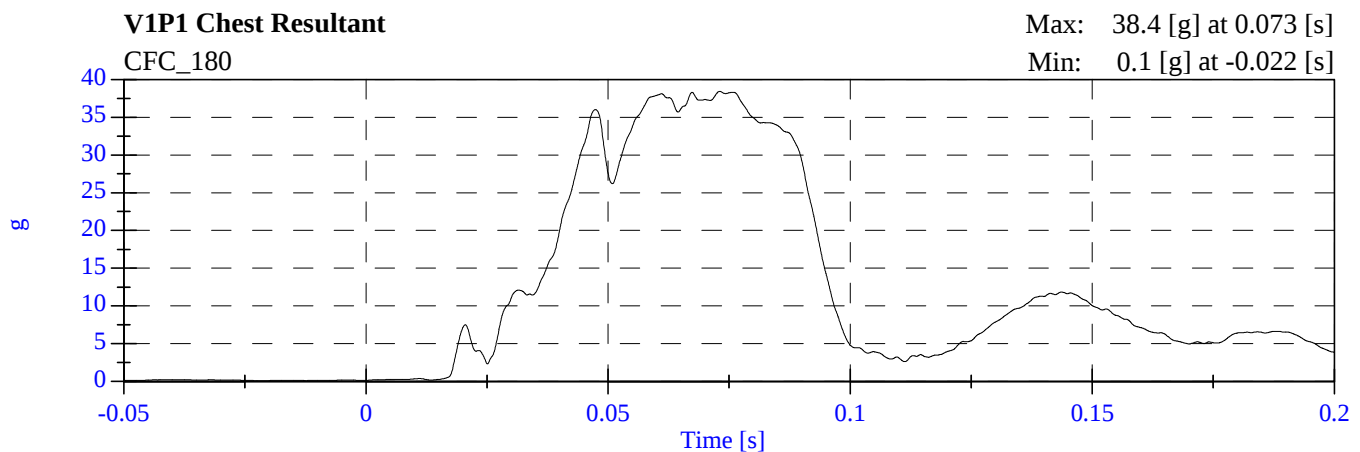
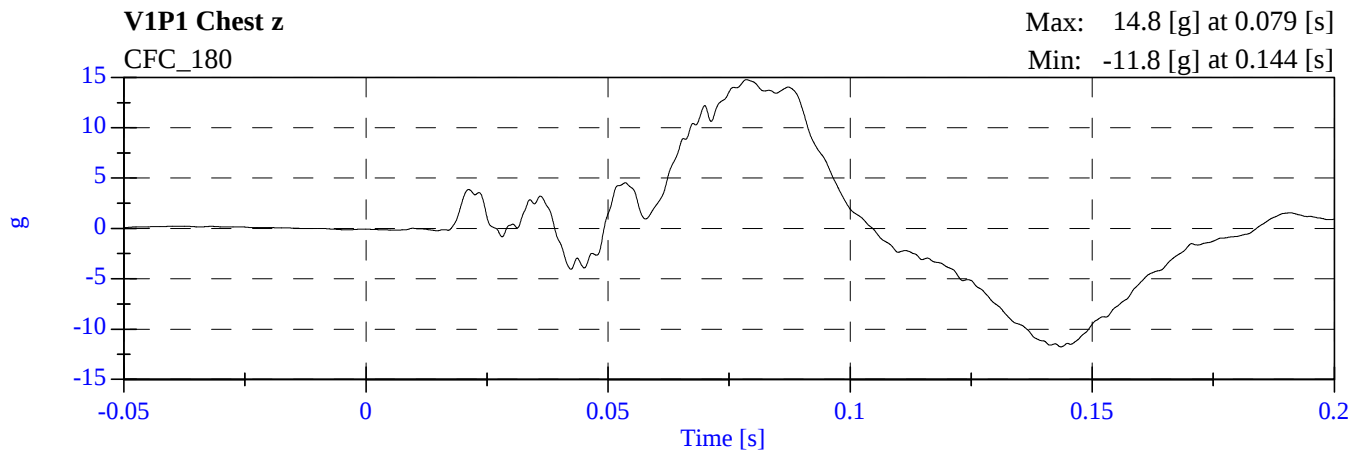
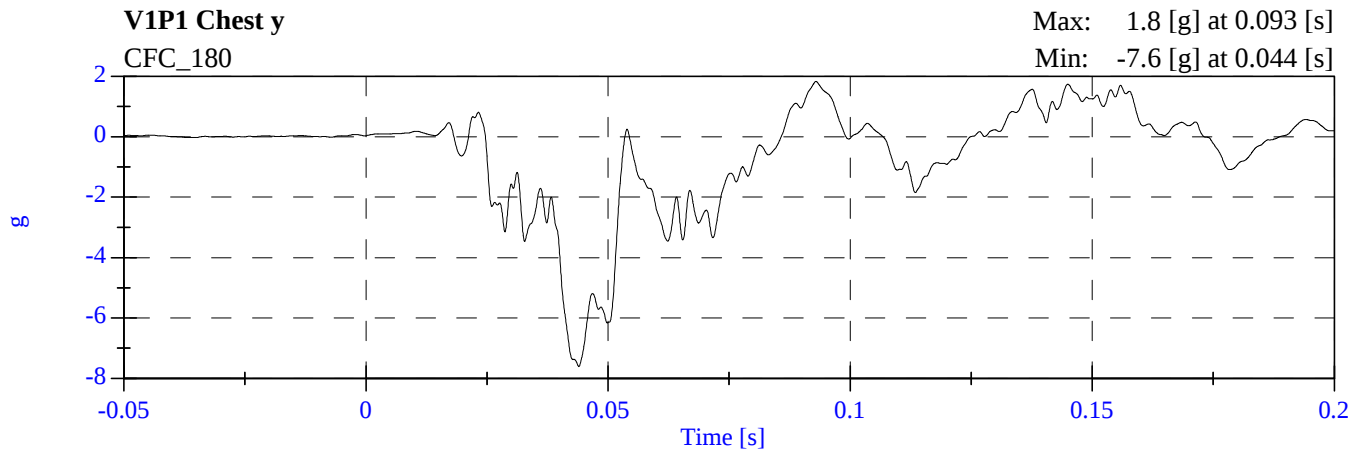
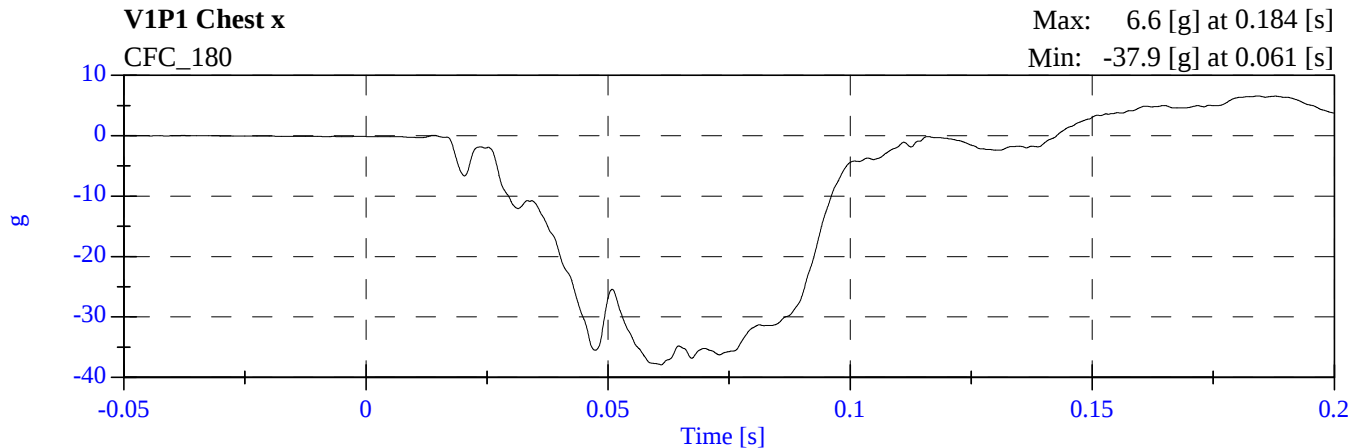
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Barrier Load Cell C1 Fx	
Barrier Load Cell C2 Fx	
Barrier Load Cell C3 Fx	
Barrier Load Cell C4 Fx	
Barrier Load Cell C5 Fx	
Barrier Load Cell C6 Fx	
Barrier Load Cell C7 Fx	
Barrier Load Cell C8 Fx	
Barrier Load Cell C9 Fx	
Barrier Load Cell D1 Fx	
Barrier Load Cell D2 Fx	
Barrier Load Cell D3 Fx	
Barrier Load Cell D4 Fx	
Barrier Load Cell D5 Fx	
Barrier Load Cell D6 Fx	
Barrier Load Cell D7 Fx	
Barrier Load Cell D8 Fx	
Barrier Load Cell D9 Fx	

TEST NOTES	
Data Channel	Anomalies
V1P1 Head CG Red X	Questionable data
V1P1 Left Lower Tibia Mx	Transducer cable failed
V1P1 Right Lower Tibia Mx	Transducer cable failed
V1P1 Left Foot Aft z	Channel Opened - Loose Connector
V1P2 Chest z	Transducer failed
V1 RFP Lap Belt	Spikes in data

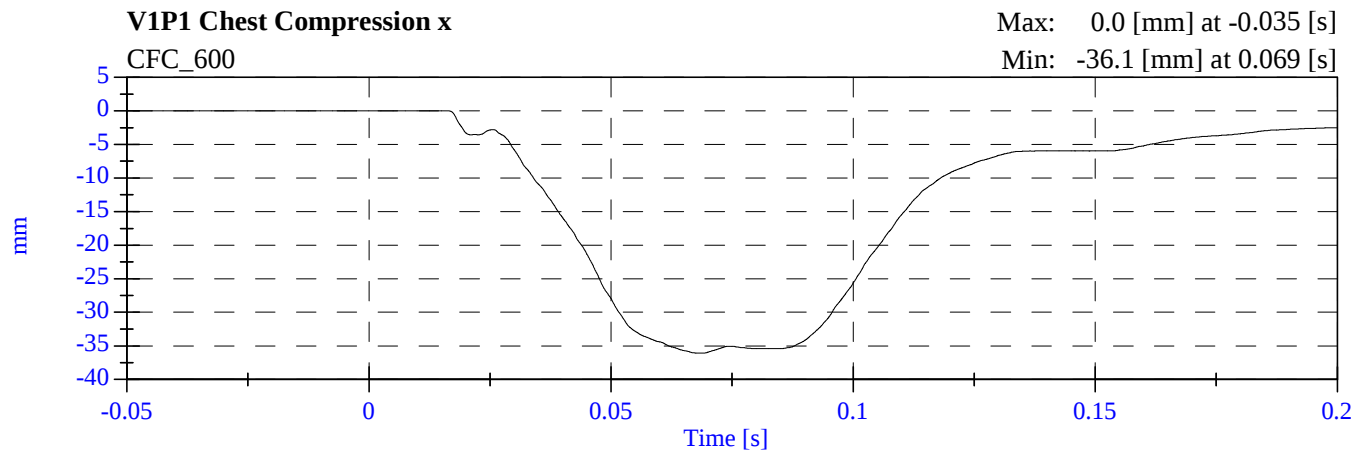
2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



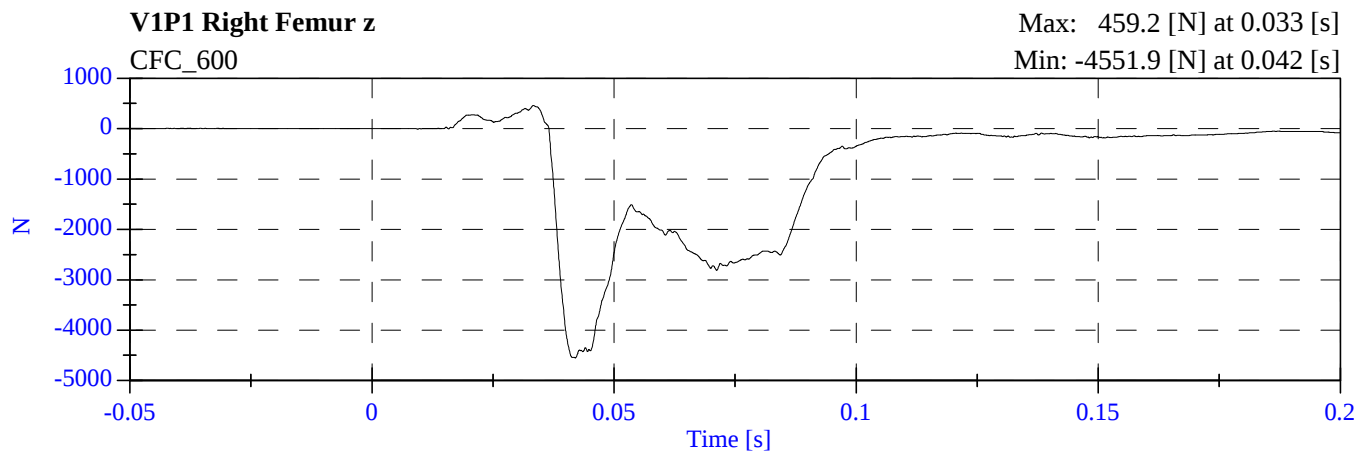
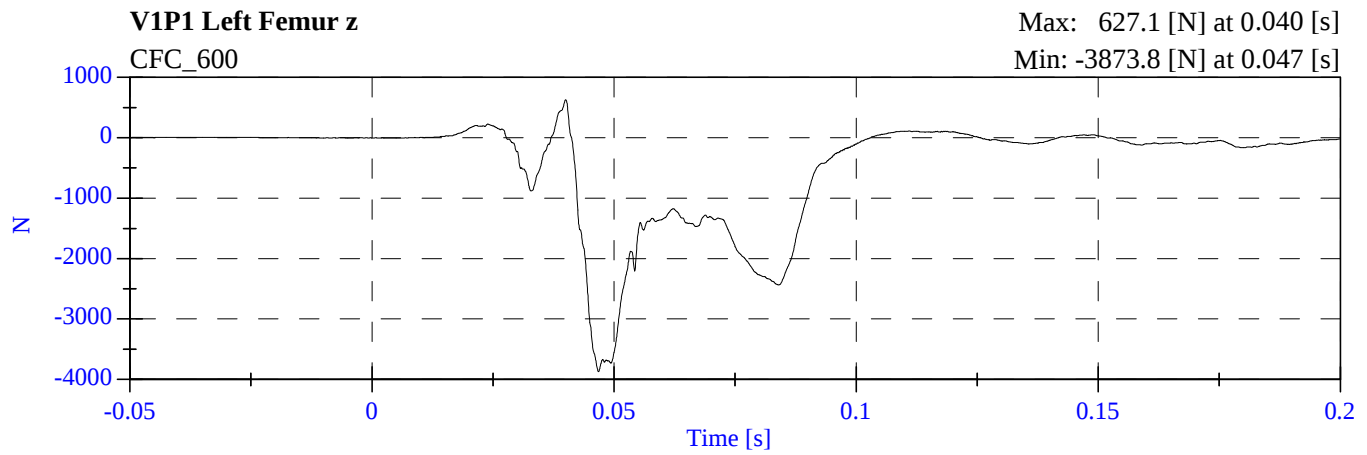
2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



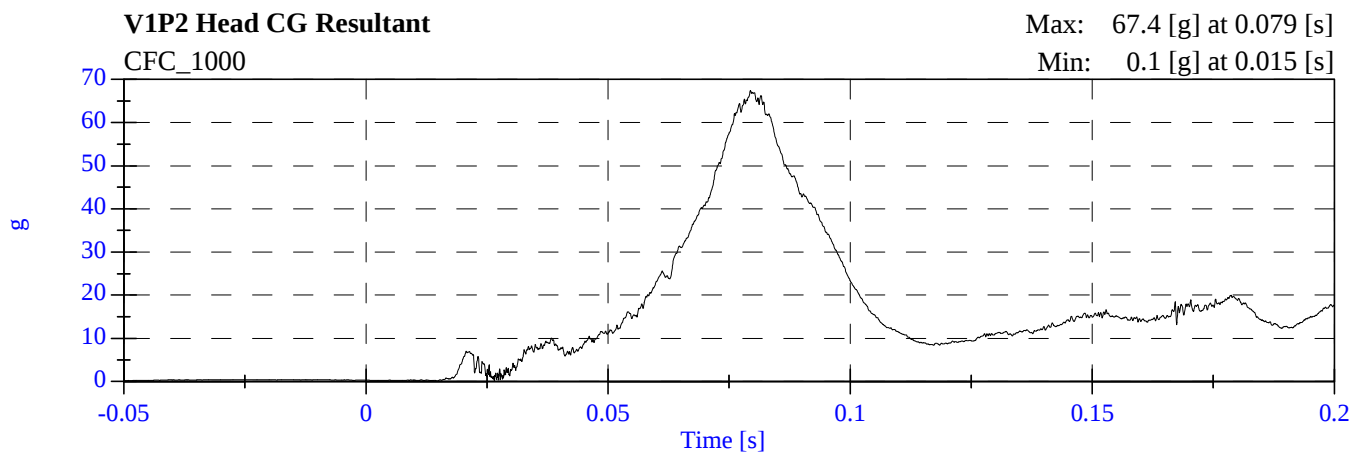
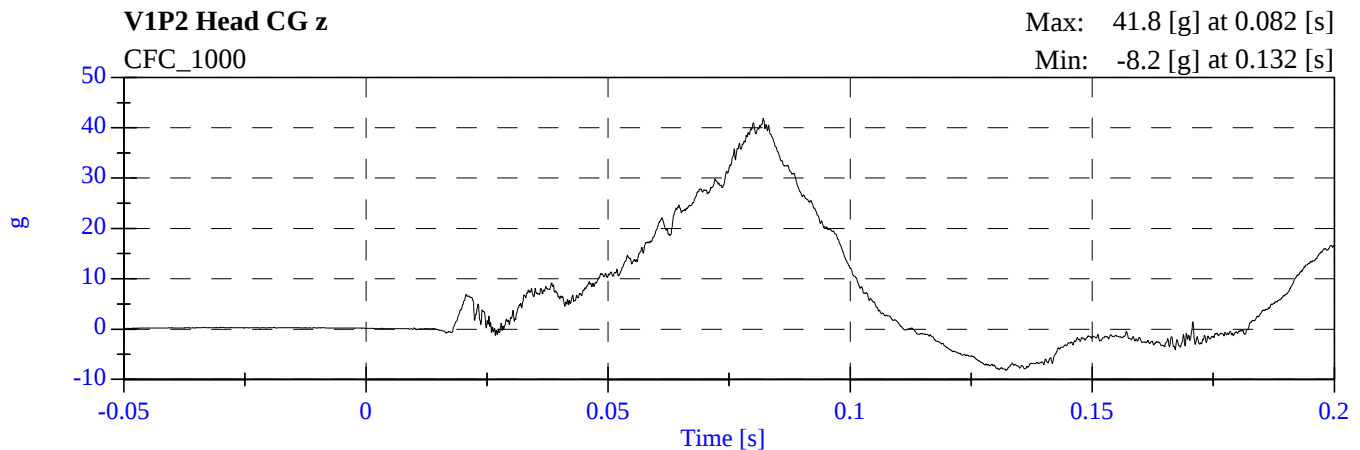
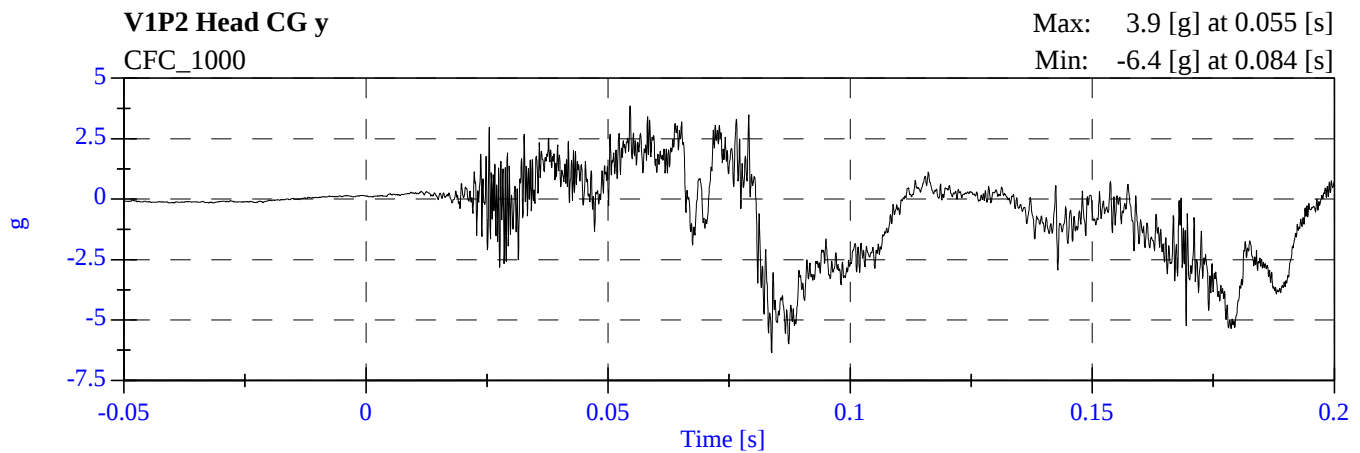
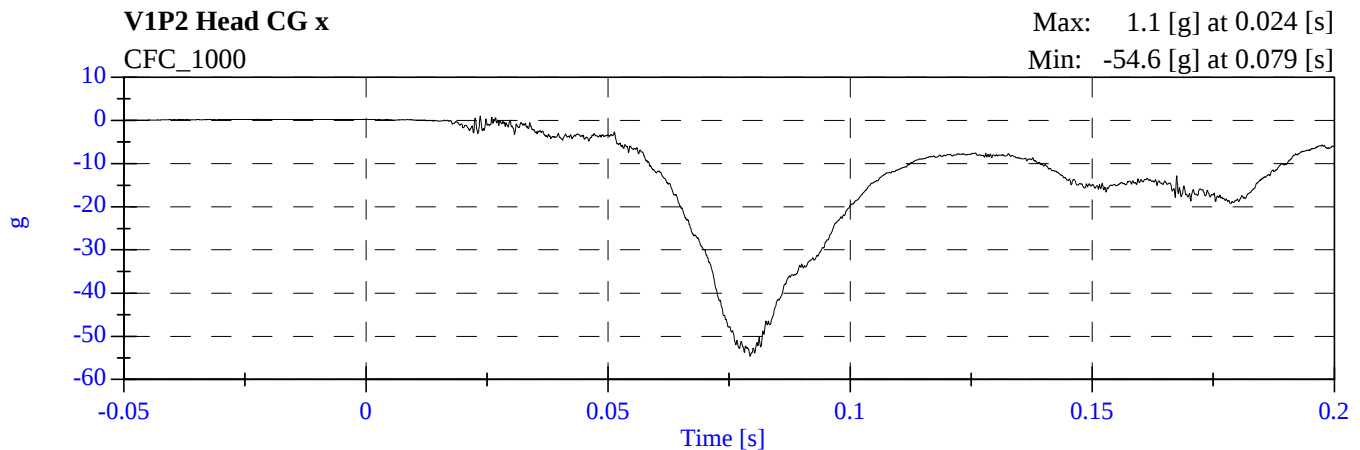
2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



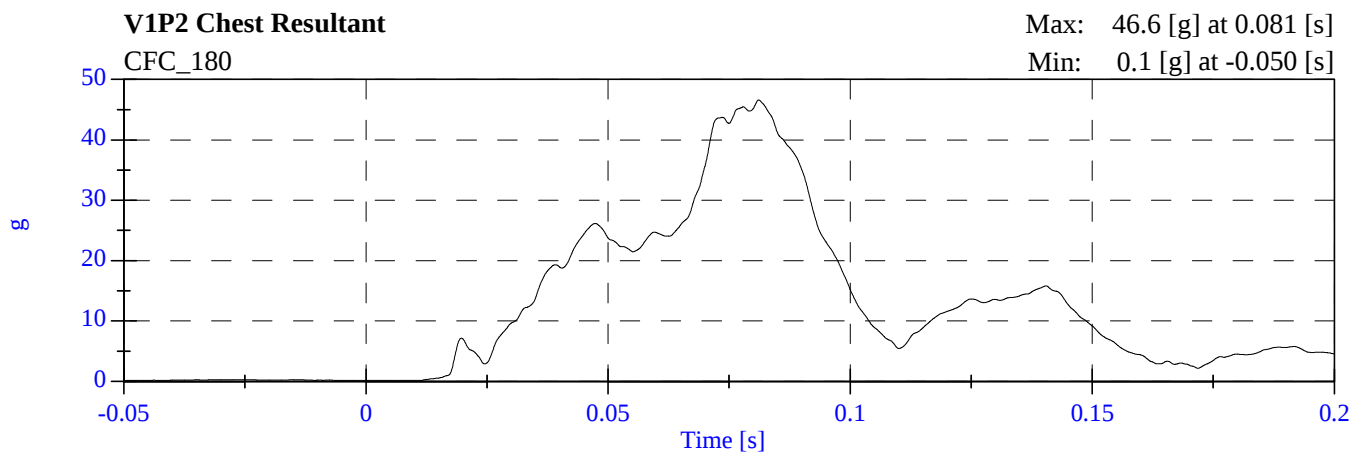
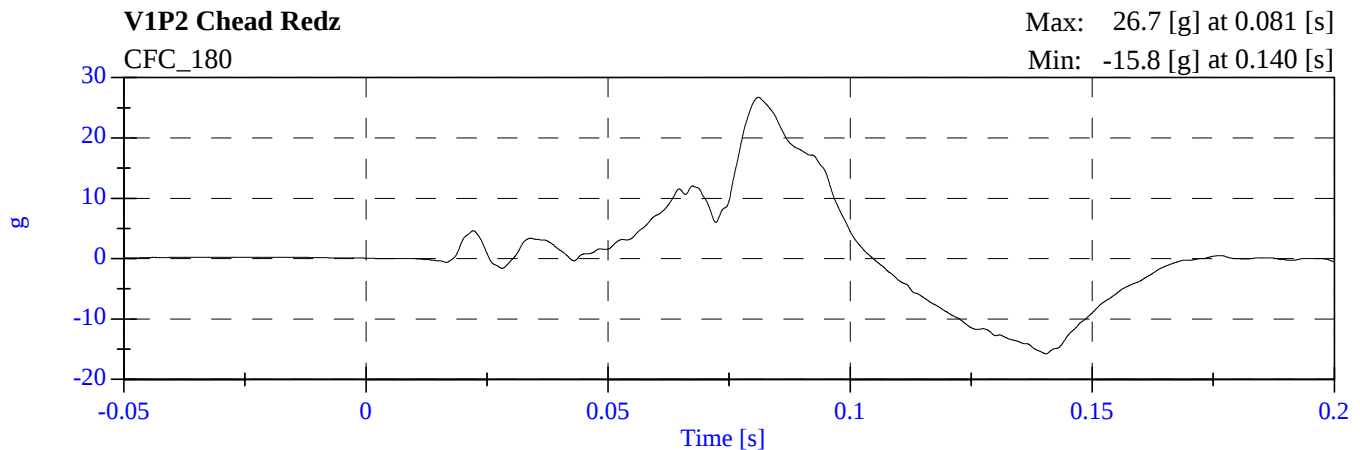
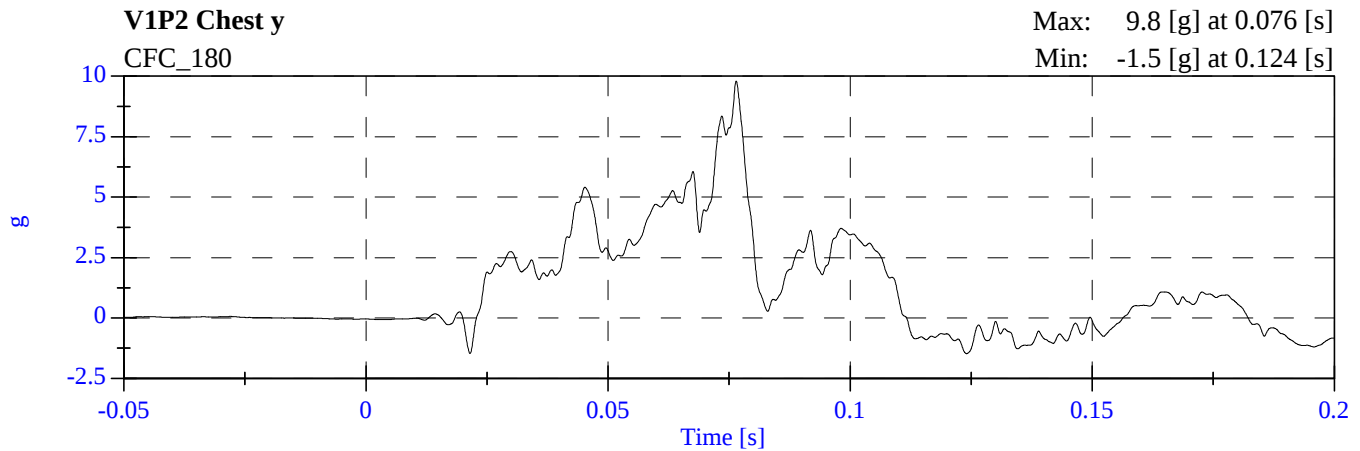
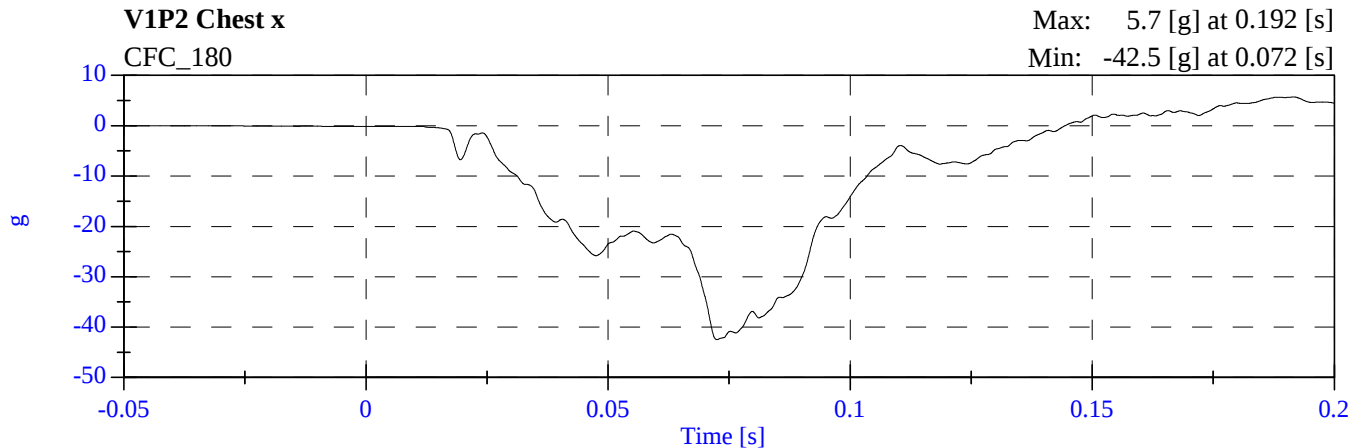
2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



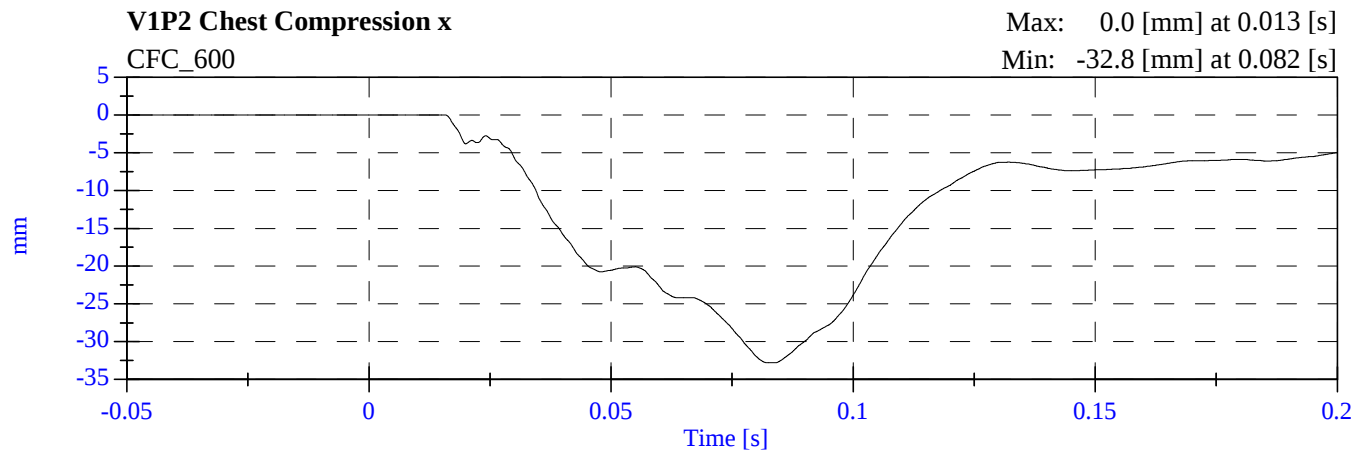
2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



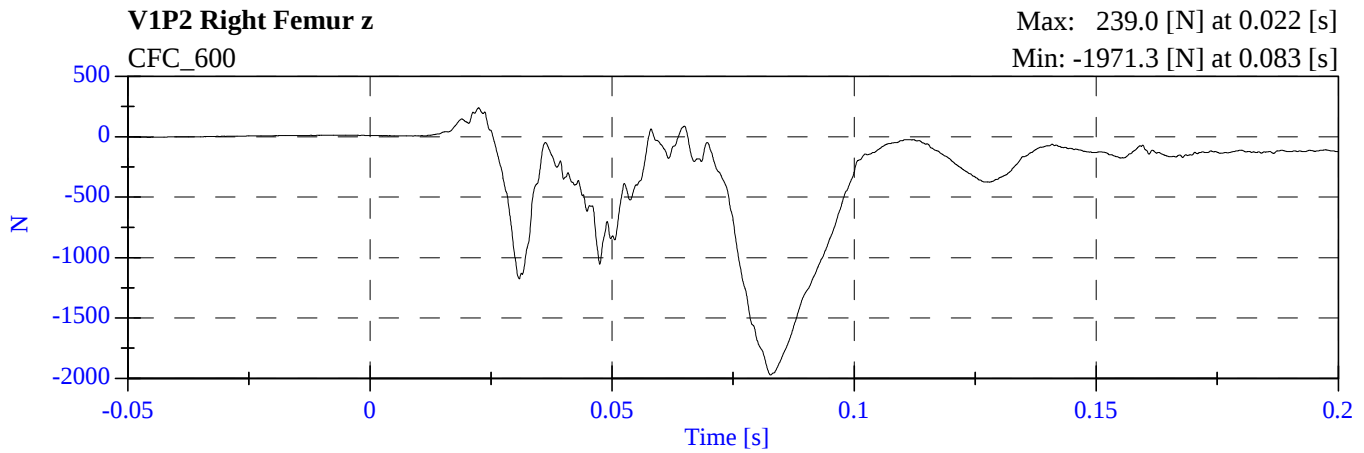
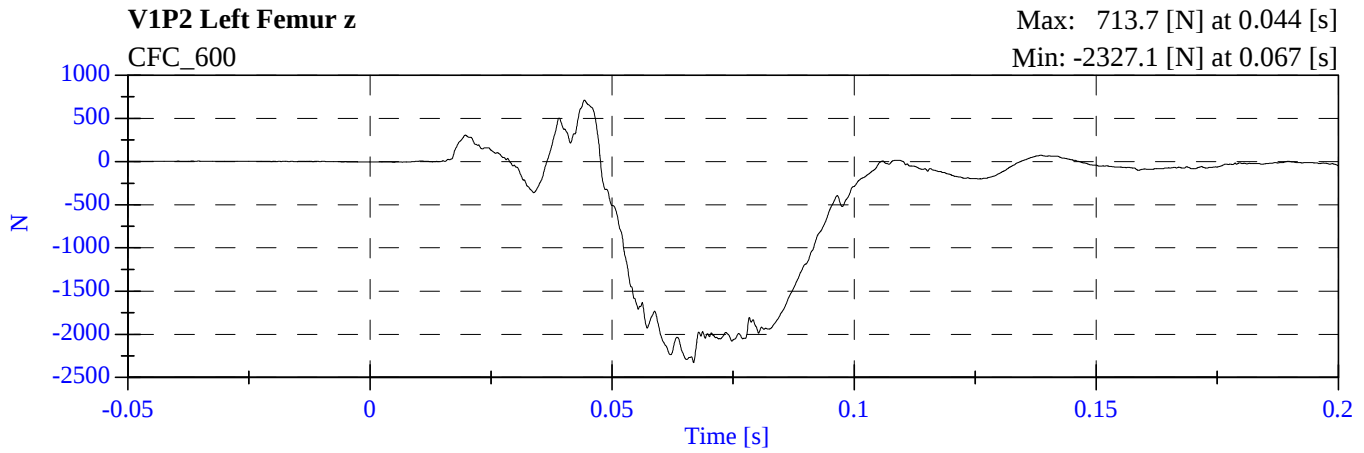
2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 2006



2007 NCAP Test 2 2007 Ford Ranger M70200 - August 15, 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.

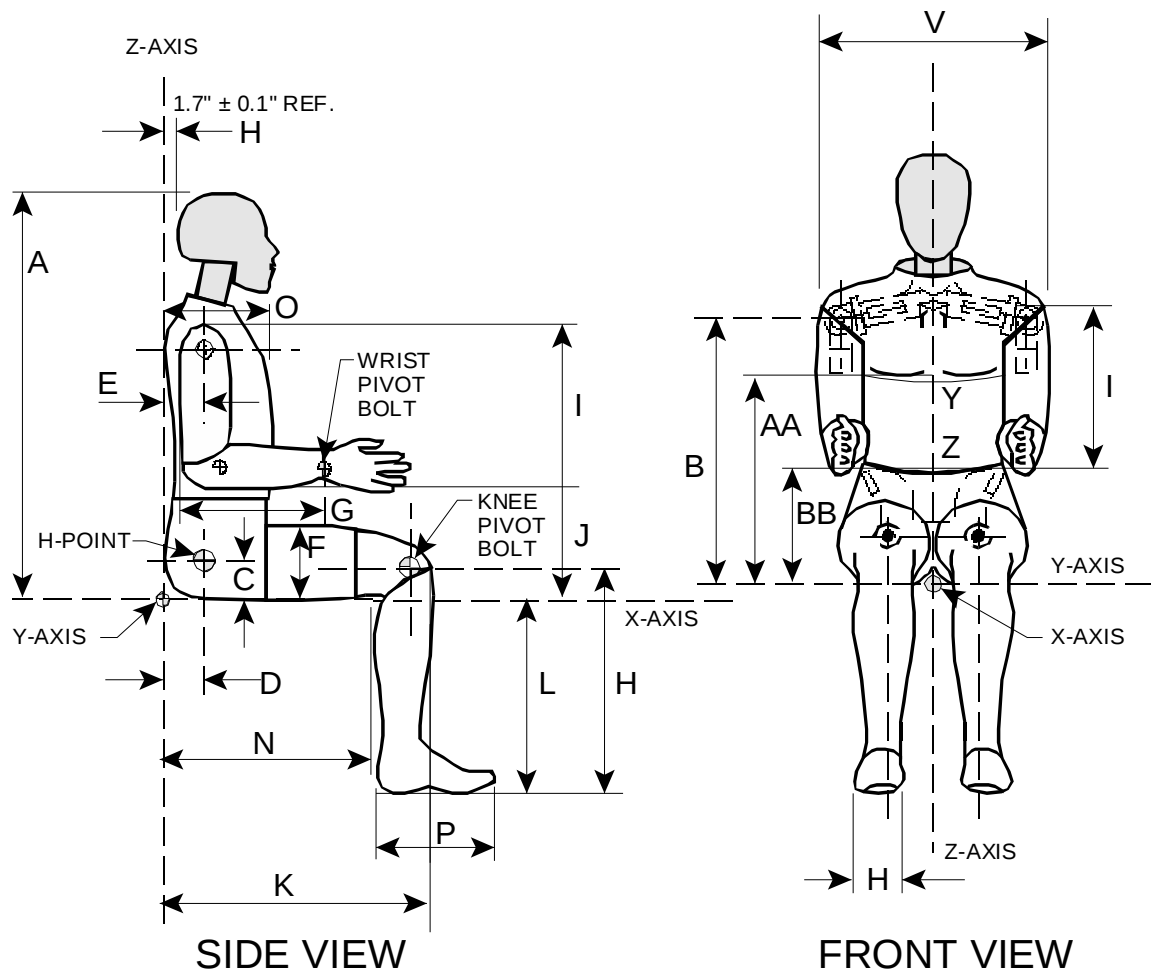
Dummy serial numbers and certification dates are:

<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.

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	19-Oct-06
	Y	ENDEVCO	AC-P16755	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J14667	20-Apr-06	19-Oct-06
Head	X (R)	ENDEVCO	AC-J20580	20-Apr-06	19-Oct-06
	Y (R)	ENDEVCO	AC-J20569	20-Apr-06	19-Oct-06
	Z (R)	ENDEVCO	AC-J21963	20-Apr-06	19-Oct-06
Neck Load Cell	X	DENTON	LC-1916Fx	12-May-06	10-Nov-06
	Y	DENTON	LC-1916Fy	12-May-06	10-Nov-06
	Z	DENTON	LC-1916Fz	12-May-06	10-Nov-06
Neck Moment	X	DENTON	LC-1916Mx	12-May-06	10-Nov-06
	Y	DENTON	LC-1916My	12-May-06	10-Nov-06
	Z	DENTON	LC-1916Mz	12-May-06	10-Nov-06
Chest	X	ENDEVCO	AC-AAKC6	20-Apr-06	19-Oct-06
	Y	ENDEVCO	AC-AAKD0	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J27470	20-Apr-06	19-Oct-06
Chest	X (R)	ENDEVCO	AC-J21988	20-Apr-06	19-Oct-06
	Y (R)	ENDEVCO	AC-J20027	20-Apr-06	19-Oct-06
	Z (R)	ENDEVCO	AC-J36741	20-Apr-06	19-Oct-06
Chest Deflection	X	SERVO	DS-061	07-Apr-06	06-Oct-06
Pelvic	X	ENTRAN	AC-99H30-Z13	20-Apr-06	19-Oct-06
	Y	ENTRAN	AC-01G18-F14	19-Apr-06	18-Oct-06
	Z	ENTRAN	AC-02I02I05-F06	19-Apr-06	18-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	20-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1533	21-Apr-06	20-Oct-06
Left Upper Tibia	Mx	DENTON	LC-268Mx	21-Apr-06	20-Oct-06
	My	DENTON	LC-268My	21-Apr-06	20-Oct-06
Left Lower Tibia	Fz	DENTON	LC-196Fz	21-Apr-06	20-Oct-06
	Mx	DENTON	LC-196Mx	21-Apr-06	20-Oct-06
	My	DENTON	LC-196My	21-Apr-06	20-Oct-06
Right Upper Tibia	Mx	DENTON	LC-266Mx	17-Apr-06	16-Oct-06
	My	DENTON	LC-266My	17-Apr-06	16-Oct-06
Right Lower Tibia	Fz	DENTON	LC-179Fz	17-Apr-06	16-Oct-06
	Mx	DENTON	LC-179Mx	17-Apr-06	16-Oct-06
	My	DENTON	LC-179My	17-Apr-06	16-Oct-06
Left Foot Rear	X	ENDEVCO	AC-J18662	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J19927	20-Apr-06	19-Oct-06
Left Foot Front	Z	ENDEVCO	AC-J20030	20-Apr-06	19-Oct-06
Right Foot Rear	X	ENDEVCO	AC-DE54J	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-J19440	20-Apr-06	19-Oct-06
Right Foot Front	Z	ENDEVCO	AC-J20382	20-Apr-06	19-Oct-06
Lap Belt Load Cell		First Technology	LC-159	11-Jul-06	09-Jan-07
Shoulder Belt Load Cell		First Technology	LC-173	11-Jul-06	09-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	17-Oct-06
	Y	ENDEVCO	AC-AAKB1	18-Apr-06	17-Oct-06
	Z	ENDEVCO	AC-AAK48	18-Apr-06	17-Oct-06
Head	X (R)	ENDEVCO	AC-P16194	18-Apr-06	17-Oct-06
	Y (R)	ENDEVCO	AC-J14688	18-Apr-06	17-Oct-06
	Z (R)	ENDEVCO	AC-P21399	28-Jun-06	27-Dec-06
Neck Load Cell	X	DENTON	LC-1912Fx	10-May-06	08-Nov-06
	Y	DENTON	LC-1912Fy	10-May-06	08-Nov-06
	Z	DENTON	LC-1912Fz	10-May-06	08-Nov-06
Neck Moment	X	DENTON	LC-1912Mx	10-May-06	08-Nov-06
	Y	DENTON	LC-1912My	10-May-06	08-Nov-06
	Z	DENTON	LC-1912Mz	10-May-06	08-Nov-06
Chest	X	ENDEVCO	AC-J23946	20-Apr-06	19-Oct-06
	Y	ENDEVCO	AC-AGAC4	20-Apr-06	19-Oct-06
	Z	ENDEVCO	AC-P16225	20-Apr-06	19-Oct-06
Chest	X (R)	ENTRAN	AC-03E03E21-M20	20-Apr-06	19-Oct-06
	Y (R)	ENDEVCO	AC-P15638	20-Apr-06	19-Oct-06
	Z (R)	ENDEVCO	AC-P16517	20-Apr-06	19-Oct-06
Chest Deflection	X	SERVO	DS-064	12-Jun-06	11-Dec-06
Pelvic	X	ENDEVCO	AC-AJ5R0	19-Apr-06	18-Oct-06
	Y	ENDEVCO	AC-J22036	19-Apr-06	18-Oct-06
	Z	ENDEVCO	AC-P32204	28-Jun-06	27-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	20-Oct-06
Right Femur Load Cell	Fz	DENTON	LC-1526	21-Apr-06	20-Oct-06
Left Upper Tibia	Mx	DENTON	LC-404Mx	09-May-06	07-Nov-06
	My	DENTON	LC-404My	09-May-06	07-Nov-06
Left Lower Tibia	Fz	DENTON	LC-396Fz	09-May-06	07-Nov-06
	Mx	DENTON	LC-396Mx	09-May-06	07-Nov-06
	My	DENTON	LC-396My	09-May-06	07-Nov-06
Right Upper Tibia	Mx	DENTON	LC-374Mx	02-Dec-05	02-Jun-06
	My	DENTON	LC-374My	02-Dec-05	02-Jun-06
Right Lower Tibia	Fz	DENTON	LC-372Fz	14-Nov-05	15-May-06
	Mx	DENTON	LC-372Mx	14-Nov-05	15-May-06
	My	DENTON	LC-372My	14-Nov-05	15-May-06
Left Foot Rear	X	ENDEVCO	AC-J33376	04-Aug-06	02-Feb-07
	Z	ENDEVCO	AC-P16899	19-Apr-06	18-Oct-06
Left Foot Front	Z	ENDEVCO	AC-P17912	19-Apr-06	18-Oct-06
Right Foot Rear	X	ENDEVCO	AC-J20209	19-Apr-06	18-Oct-06
	Z	ENDEVCO	AC-J14234	19-Apr-06	18-Oct-06
Right Foot Front	Z	ENDEVCO	AC-J14669	19-Apr-06	18-Oct-06
Lap Belt Load Cell		First Technology	LC-178	11-Jul-06	09-Jan-07
Shoulder Belt Load Cell		First Technology	LC-180	11-Jul-06	09-Jan-07

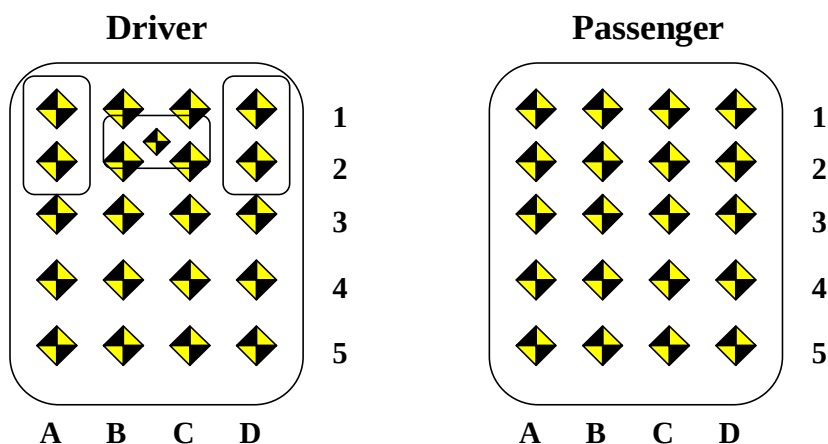
INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	GS SENSORS	AC-9440-046	11-Jul-06	09-Jan-07
Right Rear Seat Crossmember X	ICS	AC-FGP19	11-Jul-06	09-Jan-07
Top of Engine	ICS	AC-8062-003	17-Jun-06	16-Dec-06
Bottom of Engine	ICS	AC-8086-047	10-Jul-06	08-Jan-07
Right Disc Brake Caliper	GS SENSORS	AC-9440-045	26-Jul-06	24-Jan-07
Left Disc Brake Caliper	ICS	AC-FGP03	26-Jul-06	24-Jan-07
Left Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	11-Jul-06	09-Jan-07
Right Seat Rear Crossmember Z	ICS	AC-FGP29	11-Jul-06	09-Jan-07

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

DRIVER SIDE INTRUSION MEASUREMENTS



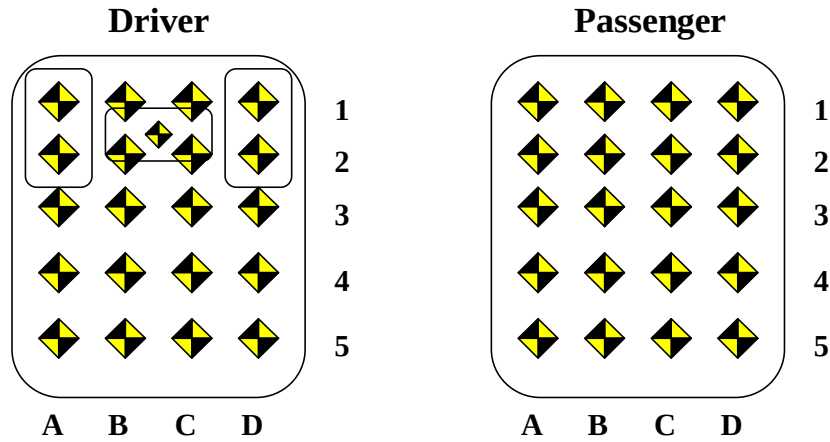
Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3827	-578	-716	3796	-559	-693	31	-19	-23
B1	3881	-475	-707	3852	-459	-687	29	-16	-20
C1	3908	-337	-708	3808	-329	-713	100	-8	5
D1	3823	-233	-710	3721	-229	-714	102	-4	4
A2	3753	-585	-627	3721	-566	-613	32	-19	-14
B2	3785	-482	-630	3754	-465	-604	31	-17	-26
C2	3800	-355	-632	3753	-348	-609	47	-7	-23
D2	3791	-232	-632	3714	-235	-630	77	3	-2
A3	3683	-591	-570	3650	-585	-554	33	-6	-16
B3	3682	-481	-574	3646	-470	-548	36	-11	-26
C3	3679	-354	-579	3644	-340	-547	35	-14	-32
D3	3681	-233	-572	3644	-218	-538	37	-15	-34
A4	3560	-597	-556	3525	-589	-542	35	-8	-14
B4	3560	-478	-558	3524	-471	-534	36	-7	-24
C4	3556	-350	-562	3522	-344	-530	34	-6	-32
D4	3556	-228	-570	3515	-223	-529	41	-5	-41
A5	3442	-598	-555	3407	-587	-542	35	-11	-13
B5	3448	-476	-559	3410	-466	-534	38	-10	-25
C5	3445	-352	-562	3414	-341	-529	31	-11	-33
D5	3445	-232	-577	3410	-223	-545	35	-9	-32
BP	3720	-380	-746	3653	-376	-741	67	-4	-5
G	3458	-488	-988	3438	-488	-994	20	0	6
H	3462	-195	-988	3437	-195	-999	25	0	11
L	3201	-365	-1206	3202	-355	-1251	-1	-10	45
AB	3199	-491	-598	3168	-490	-564	31	-1	-34

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	3779	249	-706	3747	233	-675	32	16	-31
B1	3812	347	-704	3779	338	-680	33	9	-24
C1	3820	453	-706	3791	443	-682	29	10	-24
D1	3820	561	-702	3798	552	-684	22	9	-18
A2	3692	240	-620	3658	254	-594	34	-14	-26
B2	3733	349	-623	3711	339	-598	22	10	-25
C2	3743	460	-625	3718	448	-603	25	12	-22
D2	3740	570	-620	3720	562	-601	20	8	-19
A3	3662	238	-602	3634	242	-575	28	-4	-27
B3	3682	351	-585	3657	344	-556	25	7	-29
C3	3686	463	-582	3662	452	-558	24	11	-24
D3	3691	574	-578	3670	566	-561	21	8	-17
A4	3556	237	-580	3530	233	-550	26	4	-30
B4	3569	354	-561	3536	345	-537	33	9	-24
C4	3567	467	-560	3541	458	-542	26	9	-18
D4	3573	578	-558	3545	571	-541	28	7	-17
A5	3440	245	-568	3413	238	-542	27	7	-26
B5	3446	357	-560	3419	352	-537	27	5	-23
C5	3443	470	-558	3423	462	-537	20	8	-21
D5	3448	584	-556	3423	578	-540	25	6	-16
R	3464	180	-985	3455	194	-1010	9	-14	25
S	3470	495	-987	3477	502	-1003	-7	-7	16
AB	3201	499	-598	3180	496	-574	21	3	-24

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

AB = Front outboard seat anchor bolt