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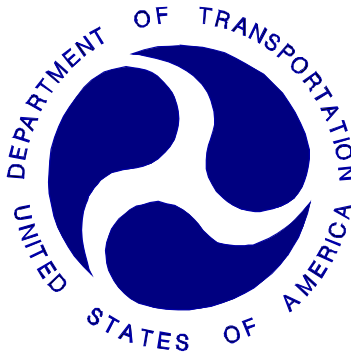
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

NEW UNITED MOTOR MANUFACTURING, INC.
2009 TOYOTA COROLLA
FOUR-DOOR SEDAN

NHTSA NUMBER: M95100

CALSPAN TEST NUMBER: 8806-NCAP-18

CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



March 4, 2008

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
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Prepared by:

Vincent M. Paolini, Project Engineer

Approved by:

David J. Travale, Program Manager
Transportation Science Center

Approval Date:

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16. Abstract A frontal load cell barrier test of a 2009 Toyota Corolla Four-Door Sedan was performed at Calspan Corporation's crash test facility in Buffalo, New York, on March 4, 2008. The impact velocity was 56.16 kph and the temperature at the barrier face was 20°C. The maximum post-test vehicle crush was 532 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements. The occupant injury criteria summary is as follows:					
Measurement Description		Units	Threshold	Driver (064)	Passenger (061)
Head Injury Criteria (HIC - 36 ms)		-	1000	389.6	280.4
Maximum Thorax Acceleration (3 ms Clip)		g's	60 g's	48.8	48.5
Chest Displacement		mm	-76 mm	-26.1	-24.3
Left Femur Force		Newtons	-10000 N	-1428.1	-1808.3
Right Femur Force		Newtons	-10000 N	-1569.9	-1216.6
17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave SE Washington, DC 20590		
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.16 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 56.16 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Inducant Test procedure.

1.2 TEST PROCEDURE

This 56.16 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 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 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. 064) and the right-front passenger (position 2) ATD (Serial No.061) were used in one test (M80502) previous to this test where they did not exceed FMVSS 208 head, chest or femur injury criteria. 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 2009 Toyota Corolla Four-Door Sedan at a velocity of 56.16 kph. The test was performed at Calspan on March 4, 2008. 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	389.6	51.2	87.2	48.8	62.2	65.2	-26.1	-1428.1	-1569.9
Passenger	280.4	53.9	89.9	48.5	67.9	70.9	-24.3	-1808.3	-1216.6

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

TEST NOTES	
Data Channel	Anomalies
V1P1 Upper Neck Fx	Channel did not record properly
V1P1 Upper Neck Fy	Data spikes after 119 msec
V1P1 Upper Neck Fz	Data spikes after 119 msec
V1P1 Chest z	Data spikes after 119 msec
V1P1 Pelvic x	Cut wire at 77 ms
V1P2 Left Upper Tibia Mx	Data spikes after 206 ms
V1 Engine Top #3x	Data spikes after 111 ms
V1 Engine Bottom #4x	Cut wire at 58 ms

SECTION 2
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle NHTSA No.: M95100 Test Mode: 56.3 kph Frontal Barrier
 Test Date: March 4, 2008 Time: 13:57 Temperature: 20 °C
 Vehicle Make/Model/Body Style: 2009 Toyota Corolla Four-Door Sedan
 Vehicle Test Weight: 1423.5 kg Impact Velocity: 56.16 kph (55.5 – 57.1 kph)
 Vehicle/Barrier Impact Angle: 0 ° Max Static Crush: 532 mm

ATD INFORMATION AND VISIBLE CONTACT POINTS

	DRIVER	PASSENGER
ATD Type:	Part 572E	Part 572E
Restraint System:	3 point safety belt with pretensioner and force limiter, airbag, knee bolster and head restraint	3 point safety belt with pretensioner and force limiter, airbag, knee bolster and head restraint
Head Contact:	Face to front airbag, left side to side curtain	Face to front airbag, right side to side curtain
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	-	Not Applicable
Front Seat Track Shift (mm)	0	0
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	771	812	758	780

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	860	864
Lap belt length as measured on ATD	mm	810	736
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems	mm	1670	1600

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2009 Toyota Corolla Four-Door Sedan

NHTSA No. : M95100 ; VIN: 1NXBU40E09Z001571 ; Color: Gold

Engine Data: 4 cylinders; - CID; 1.8 Liters; - cc

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

Transmission Data: 4 speeds; - Manual; X Automatic; X Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

AUTOMATIC DOOR LOCKS:

Is test vehicle equipped with Automatic Door Locks (ADLs)? X Yes; - No;

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

DEALER AND DELIVERY INFORMATION:

Date Received: 02-20-2008 ; Odometer Reading 14 km

Selling Dealer: West Herr Toyota Williamsville

Dealer Address: 8135 Main Street Williamsville, NY 14221

TEST VEHICLE OPTIONS:

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

X ABS; X Tilt Wheel; - 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: New United Motor Manufacturing, Inc.

Date of Manufacture 01/08

GVWR: 1742 kg; GAWR: 948 kg FRONT; 839 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) = 370 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 29.8 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 =	390.0	372.0	61.1	762.0
Rear =	242.0	243.0	38.9	485.0
Total Delivered Weight (UDW) =				1247.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	1247.0	kg
Rated Cargo/Luggage Weight (RCLW)	=	29.8	kg
Weight of 2 p.572 Dummies @ 76 each	=	152	kg
TARGET TEST WEIGHT	=	1428.8	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 24.5 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	426.5	403.0	58.3	829.5
Rear =	295.0	299.0	41.7	594.0
Total Vehicle Test Weight (ATW) =				1423.5

Weight of Ballast Secured in Vehicle Trunk Area¹ = 0 kg

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG ²
AS DELIVERED:	695	694	726	724	1013.6
FULLY LOADED:	679	679	698	698	-
AS TESTED:	681	684	702	705	1087.4

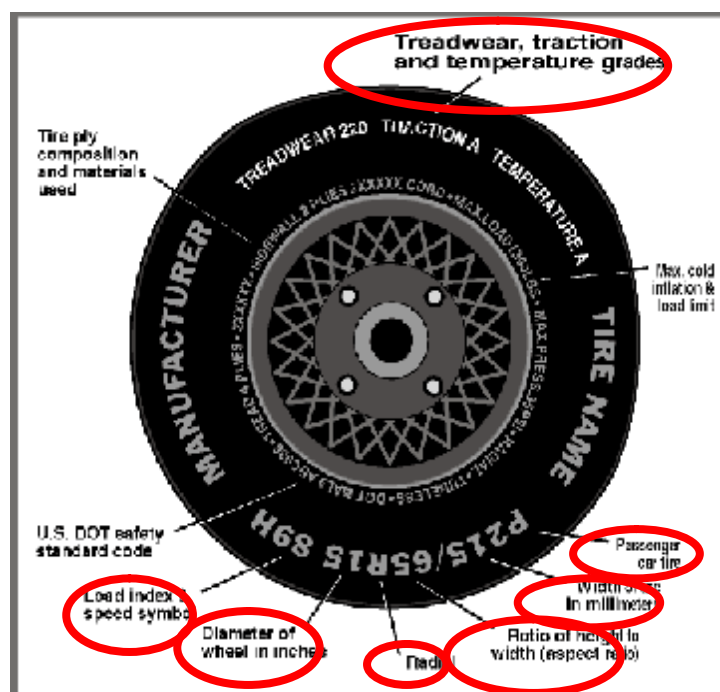
Vehicle's Wheel Base: 2606 mm

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: 2009 Toyota Corolla Four-Door Sedan
NHTSA Test No.: M95100 Test Date: March 4, 2008



Measured Parameter	Front	Rear
Maximum Tire Pressure (from sidewall - kPa)	350	350
Cold Pressure (from tire placard - kPa)*	210	210
Recommended Tire Size (from tire placard)	P195/65R15	P195/65R15
Tire size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle LS	Eagle LS
Tire Type	Passenger	Passenger
Tire Width (mm)	195	195
Ratio of Height to Width (aspect ratio)	65	65
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index & Speed Symbol	89S	89S
Treadwear	400	400
Traction Grade	A	A
Temperature Grade	B	B

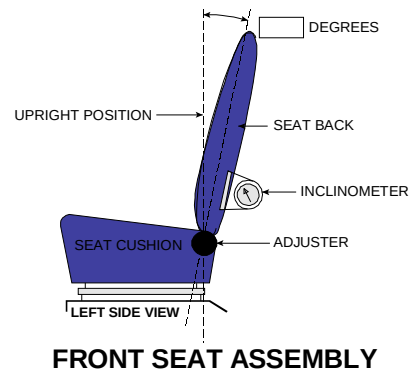
*Tire pressure used for test

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2009 Vehicle Model: Toyota Corolla Body Style : Four-Door Sedan

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



Seat back angle for driver's seat: 6°

Measurement instructions: The seatback was set to detent 3 from full upright (detent 0)

Seat back angle for passenger's seat: 6°

Measurement instructions: The seatback was set to detent 3 from full upright (detent 0)

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: The set was set in mid position (141 mm) of 282 mm travel or detent 9 of 16 total detents.

Positioning of the passenger's seat: The set was set in mid position (120 mm) of 240 mm travel or detent 8 of 16 total detents.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 50 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 = 46.0 to 47.0 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 46.2 liters

3.3 One-Third of Useable Capacity = 16.7 liters

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

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

When the ignition is turned to the 'ON' position 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 was set to mid angle (24.8°) and mid-telescope position (20 mm of 40 mm travel).

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: There are 5 total detents. The test position is detent 0 or full up.

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

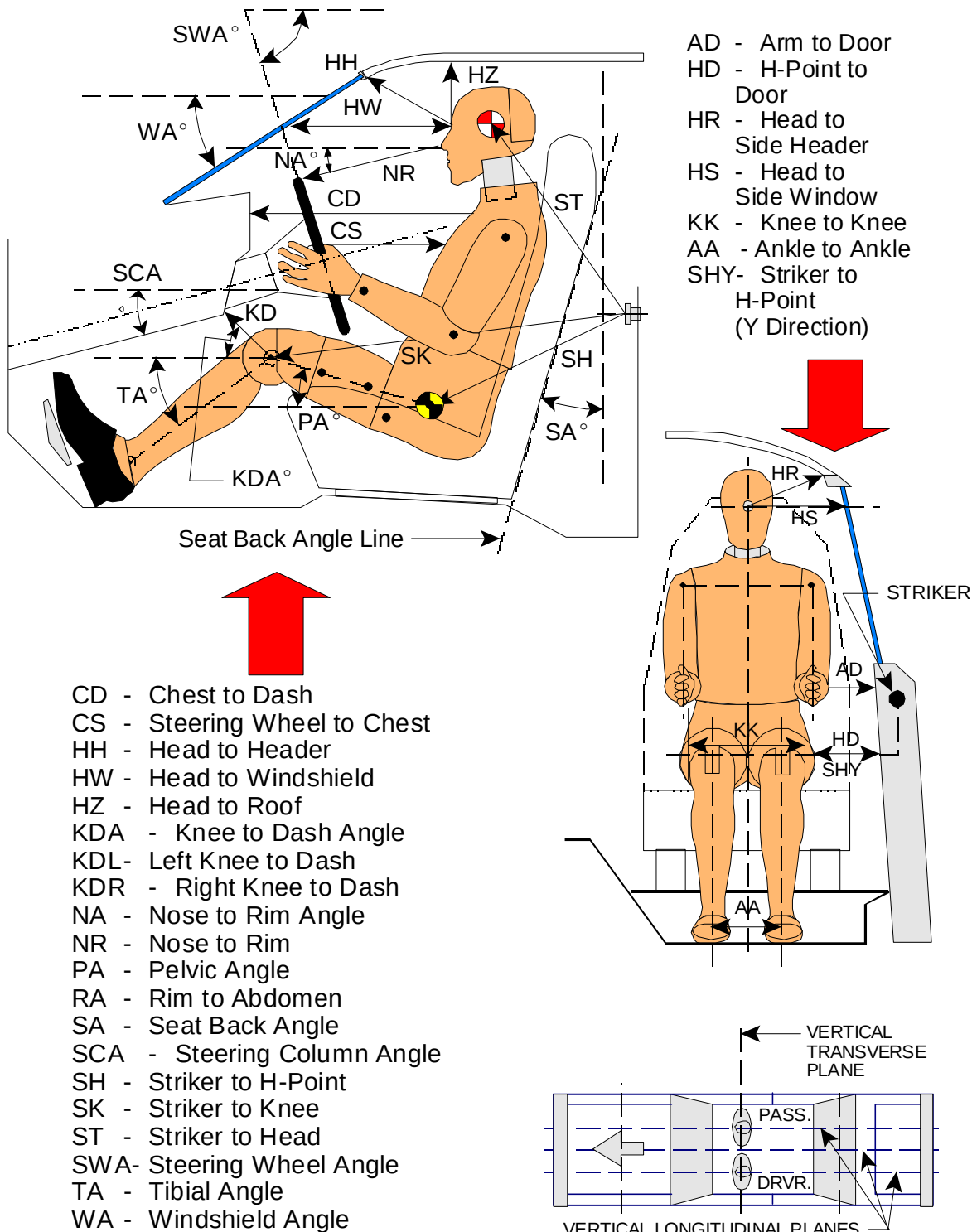
Does vehicle owner's manual describe how to deactivate ADLs? X Yes; - No; - N/A

Comments: The owner's manual describes the procedure on page 40.

DATA SHEET NO. 5

FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



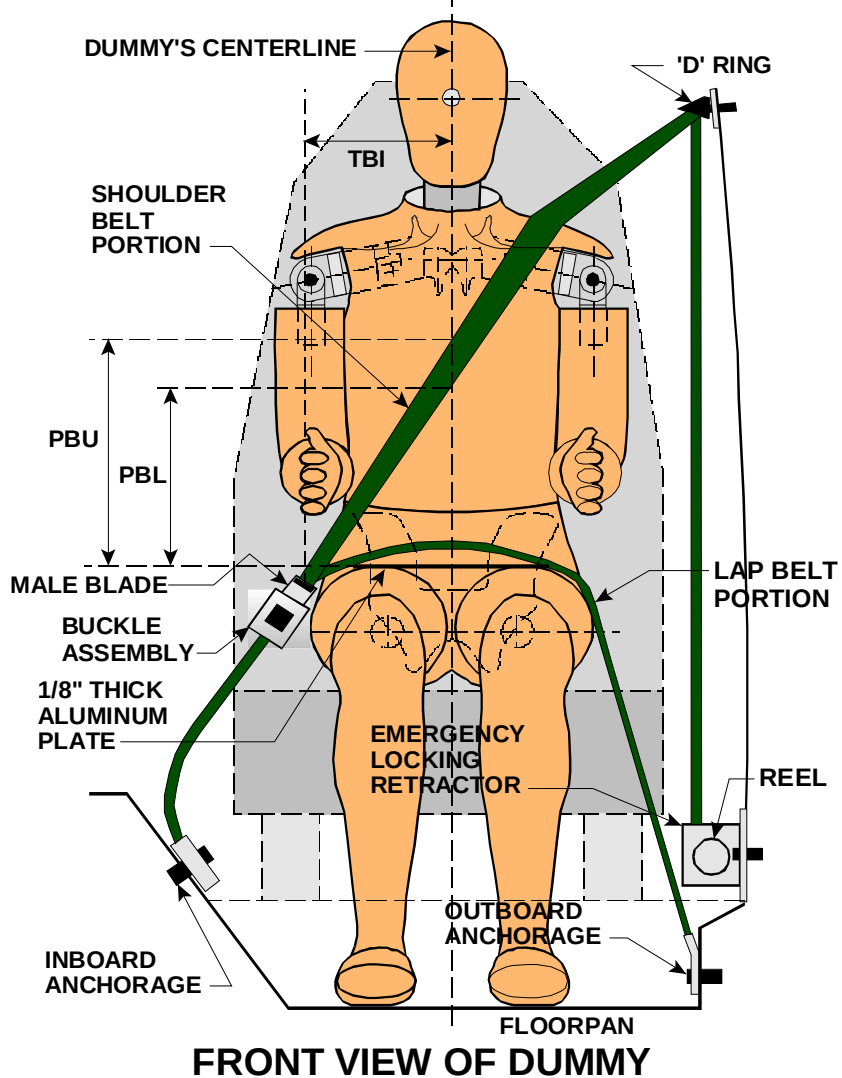
DATA SHEET NO. 5
FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #064)			PASS. (Serial #061)		
WA ^o	26.5 deg.			N/A		
SWA ^o	63 deg.			N/A		
SCA ^o	27 deg.			N/A		
SA ^o	6 deg.			6 deg.		
HZ	175			163		
HH	304			309		
HW	600			591		
HR	203			199		
NR	331	Angle	11.5 deg.	N/A		
CD	471			483		
CS	262			N/A		
RA	155			N/A		
KDL	100	Angle (KDA)	21.5 deg.	146		
KDR	105			144	Angle (KDA)	31 deg.
PA ^o	20.7 deg.			23.3 deg.		
TA ^o	58.6 deg.			49.0 deg.		
KK	345			270		
AA	292			209		
ST	422	Angle	38 deg.	439	Angle	85 deg.
SK	581	Angle	101 deg.	643	Angle	190 deg.
SH	355	Angle	143 deg.	331	Angle	130 deg.
SHY	290			251		
HS	335			329		
HD	150			154		
AD	125			132		

Dimensions in millimeters

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

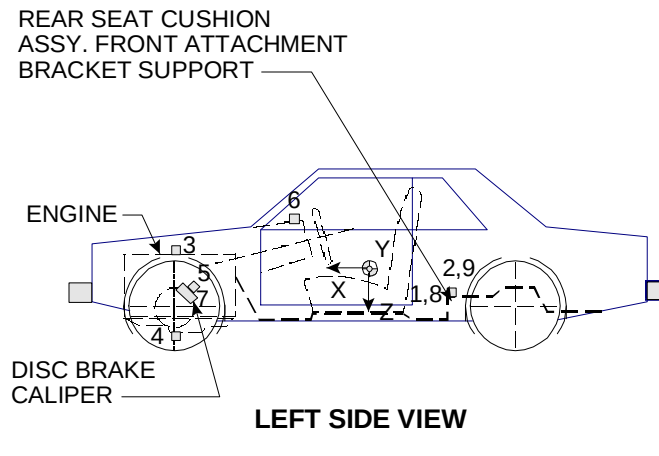
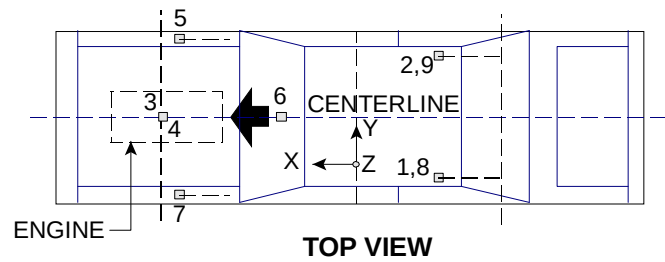
SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	335	310
PBL-- Top surface of alum. plate to belt lower edge	255	230
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATIONS

VEHICLE ACCELEROMETER LOCATIONS



No.	LOCATION	PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	1869	-457	-280
2	Right Rear Seat Cross Member X	1865	476	-311
3	Top of Engine Block	3790	419	-737
4	Bottom of Engine	3270	5	-222
5	Disc Brake Caliper @ Right Side	3472	755	-338
6	Instrument Panel**	-	-	-
7	Disc Brake Caliper @Left Side	3478	-743	-351
8	Left Rear Seat Cross Member Z	1869	-457	-280
9	Right Rear Seat Cross Member Z	1865	476	-311

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 3 mm molding.

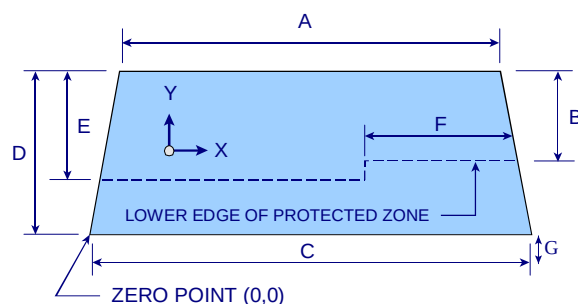
FMVSS 212 REQUIREMENTS:

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: 20°C.

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2105.0	2105.0	100.0%
LEFT SIDE	2105.0	2105.0	100.0%
TOTAL	4210	4210	100.0%



DIMENSIONS (mm)	
A	1150
B	570
C	1440
D	810
E	565
F	875
G	3

FRONT VIEW OF WINDSHIELD

FAILURE DETAILS:

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

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

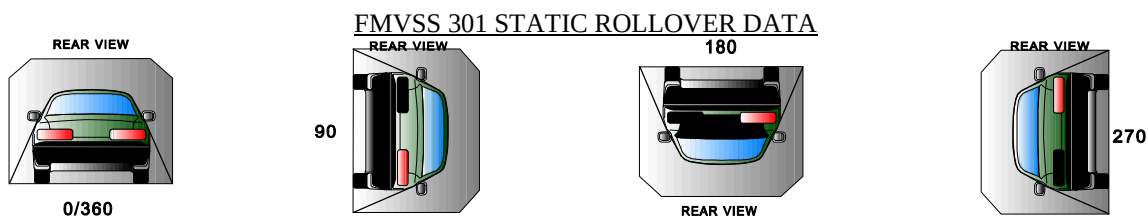
DATA SHEET NO. 9
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: _____ M95100 _____ TEST DATE: _____ March 4, 2008
VEHICLE MAKE/MODEL: _____ 2009 Toyota Corolla Four-Door Sedan _____
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

FUEL SPILLAGE MEASUREMENT:

Time Interval	Amount	Maximum Allowable Spillage
Impact Until Motion Ceases	0	28 g
First Five Minutes Following Impact	0	142 g
Next 25 Minutes	0	28 g / 1 minute

SOLVENT SPILLAGE DETAILS: None



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	13	seconds	5	minutes	6	minutes	13	seconds	7	minutes
90° - 180°	1	minutes	05	seconds	5	minutes	6	minutes	5	seconds	7	minutes
180°-270°	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
270°-360°	1	minutes	14	seconds	5	minutes	6	minutes	14	seconds	7	minutes

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

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

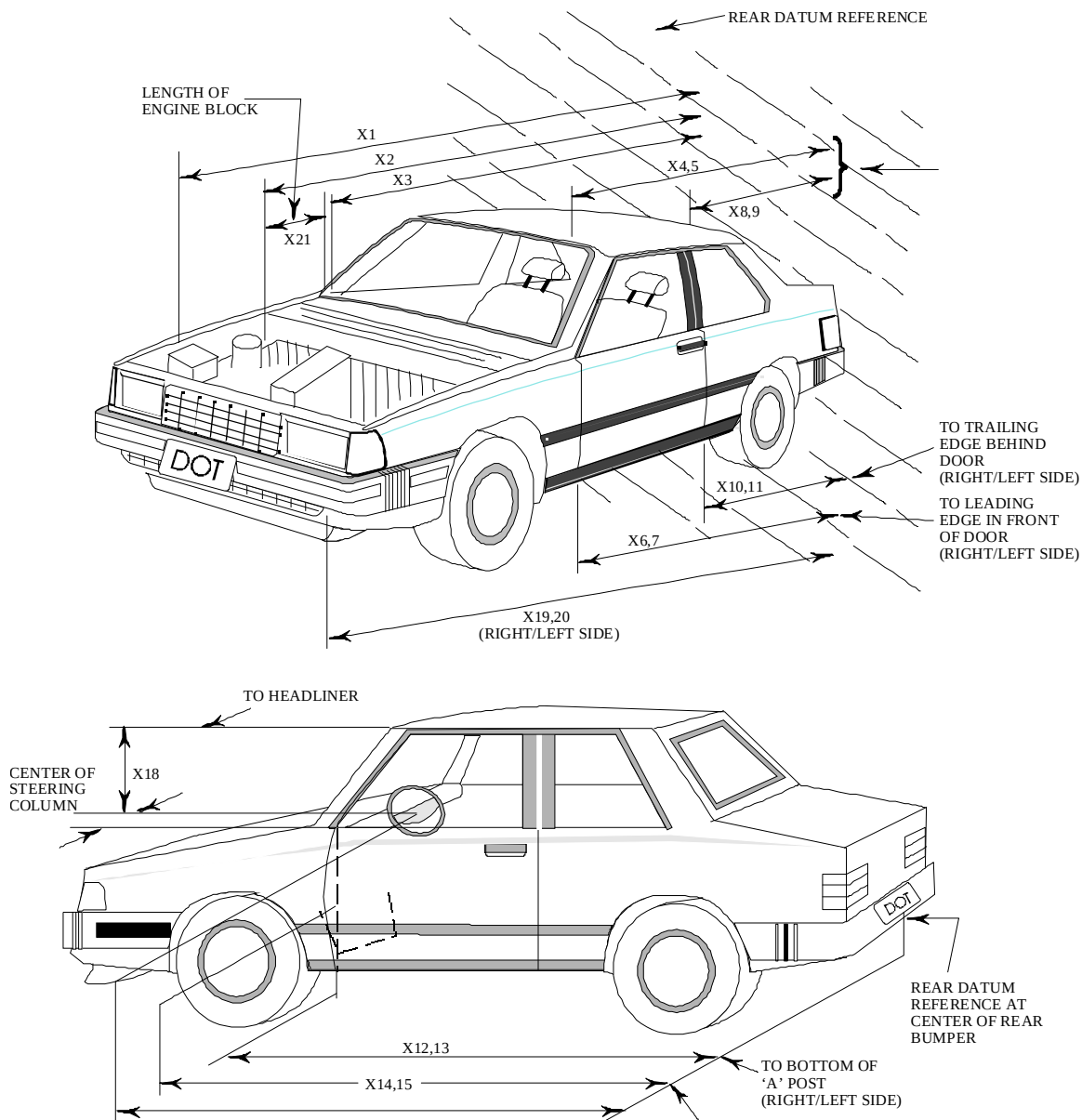
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

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

DATA SHEET NO. 10
TEST VEHICLE MEASUREMENTS



DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M95100 TEST DATE: March 4, 2008
VEHICLE MAKE/MODEL: 2009 Toyota Corolla Four-Door Sedan

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4529	4009	520
X2	Rear Surface of Vehicle to Front of Engine	4056	3802	254
X3	Rear Surface of Vehicle to Firewall	3632	3558	74
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3168	3169	-1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3166	3165	1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3119	3122	-3
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3114	3112	2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2096	2097	-1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2094	2093	1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2097	2098	-1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2096	2095	1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3252	3252	0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3253	3251	2
X14	Rear Surface of Vehicle to Firewall, Right Side	3699	3679	20
X15	Rear Surface of Vehicle to Firewall, Left Side	3697	3693	4
X16	Rear Surface of Vehicle to Steering Column	2682	2703	-21
X17	Center of Steering Column to "A" Post	279	279	0
X18	Center of Steering Column to Headliner	421	449	-28
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4459	4002	457
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4456	3984	472
X21	Length of Engine Block	453	453	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2853	2852	1
CD	Rear Surface of Vehicle to Center of Dash Panel	2866	2870	-4
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2852	2851	1

All Dimensions in mm

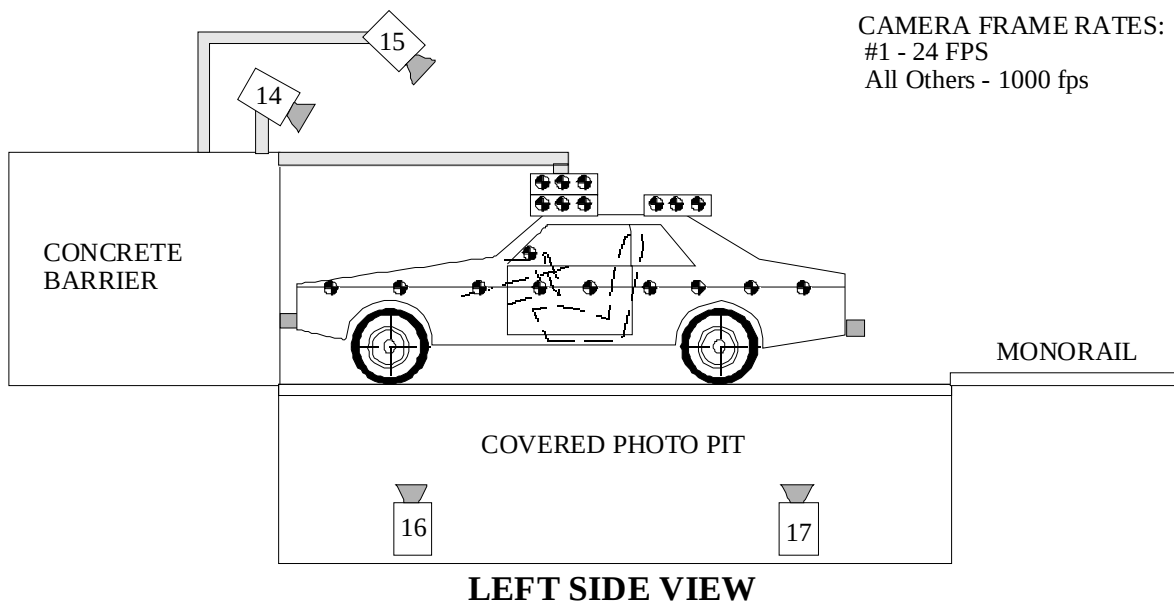
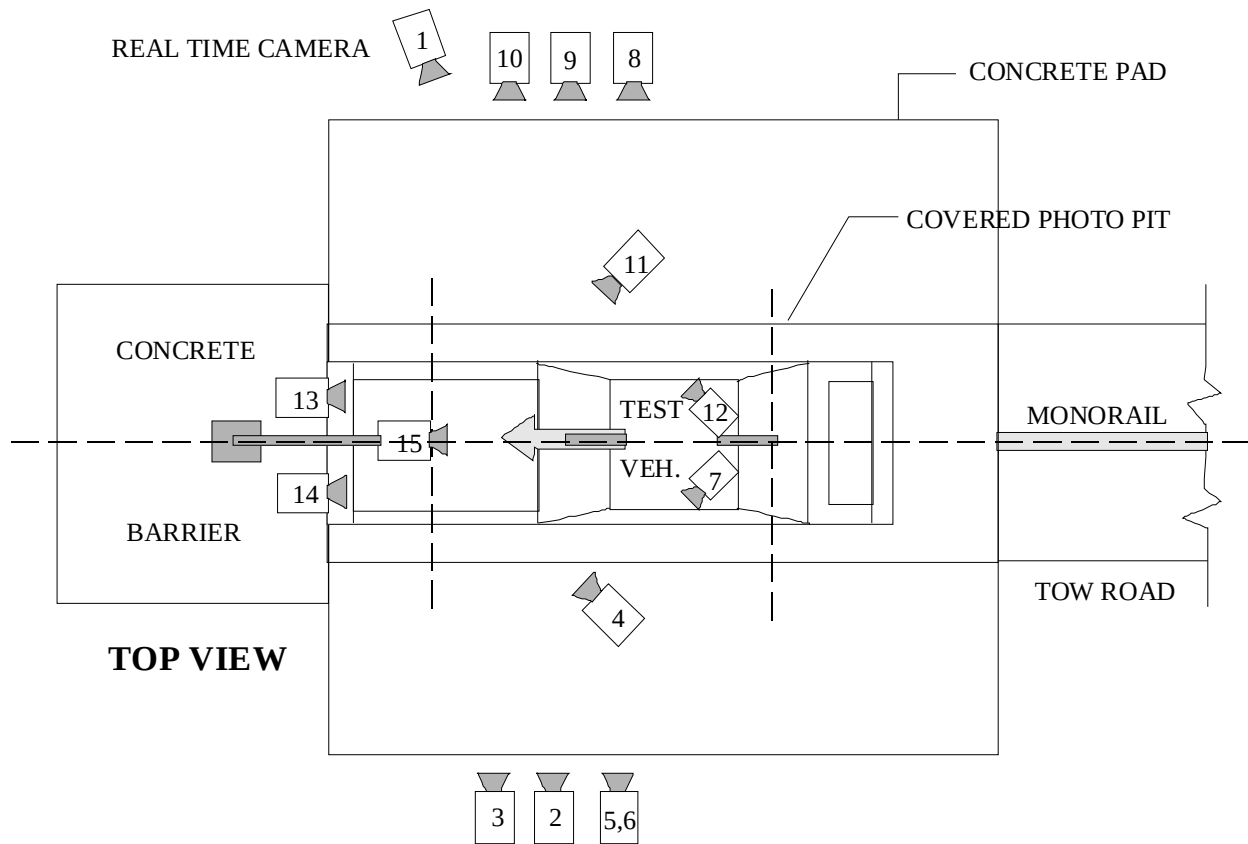
DATA SHEET NO.10
VEHICLE MEASUREMENTS (cont.)

NHTSA TEST No.: M95100 TEST DATE: March 4, 2008
VEHICLE MAKE/MODEL: 2009 Toyota Corolla Four-Door Sedan

TARGET VEHICLE STRUCTURAL MEASUREMENTS

	Elements	Pre-Test (mm)
1	Total length	4529
2	Total Width	1755
3	Bumper Top Height	542
4	Bumper Bottom Height	418
5	Longitudinal Member Top Height	543
6	Distance Between Longitudinal Members	1034
7	Longitudinal Member Width	86
8	Engine top height	882
9	Engine bottom height	328
10	Engine and gearbox width	585
11	Front bumper-engine distance	473
12	Front shock absorber fixing height	874
13	Bonnet leading edge height	797
14	Front shock absorber fixing width	1124
15	Front bumper – front axle distance	926
16	Front axle – A pillar distance	1011
17	A-pillar – B pillar distance	1103
18	B-pillar – rear axle distance	1116
19	B-pillar – C Pillar distance	1034
20	Roof sill bottom height	1380
21	Roof sill top height	1442
22	Floor sill bottom height	204
23	Floor sill top height	343

DATA SHEET NO.11
HIGH-SPEED CAMERA LOCATIONS



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

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	30
2	Overall Left Side	7576	1655	960	-3.2	7136	28	1000
3	Left Side View	9076	905	980	-2.4	8636	50	1000
4	Driver and Interior View	6806	2715	2015	-10.1	-	50	500
5	Steering Column (Bottom)	7856	1845	1200	-4.5	7416	24-70	1000
6	Steering Column (Top)	7856	1845	1810	-9.0	7416	24-70	1000
7	Left CRS Lateral View	-	-	-	-	-	-	-
8	Overall Right Side	7376	1945	1025	0.7	6936	28	500
9	Right Side View	8836	1285	1050	-2.2	8396	50	1000
10	Right Passenger View	8086	1715	1165	-1.0	7646	50	1000
11	Passenger and Interior View	7076	2865	2105	-9.8	-	50	500
12	Right CRS Lateral View	-	-	-	-	-	-	-
13	Passenger Front View	620	-92	1987	-42	-	25	500
14	Driver Front View	620	-92	1987	-41	-	25	500
15	Windshield View	0	-530	3374	-51	-	25	500
16	Pit View of Engine	0	615	-3048	90	-	12	500
17	Pit View of Fuel Tank	0	2640	-3048	90	-	12	500

*X = film plane to monorail centerline ** = referenced to horizontal plane

Y = film plane to impact location N.T. indicates No Timing

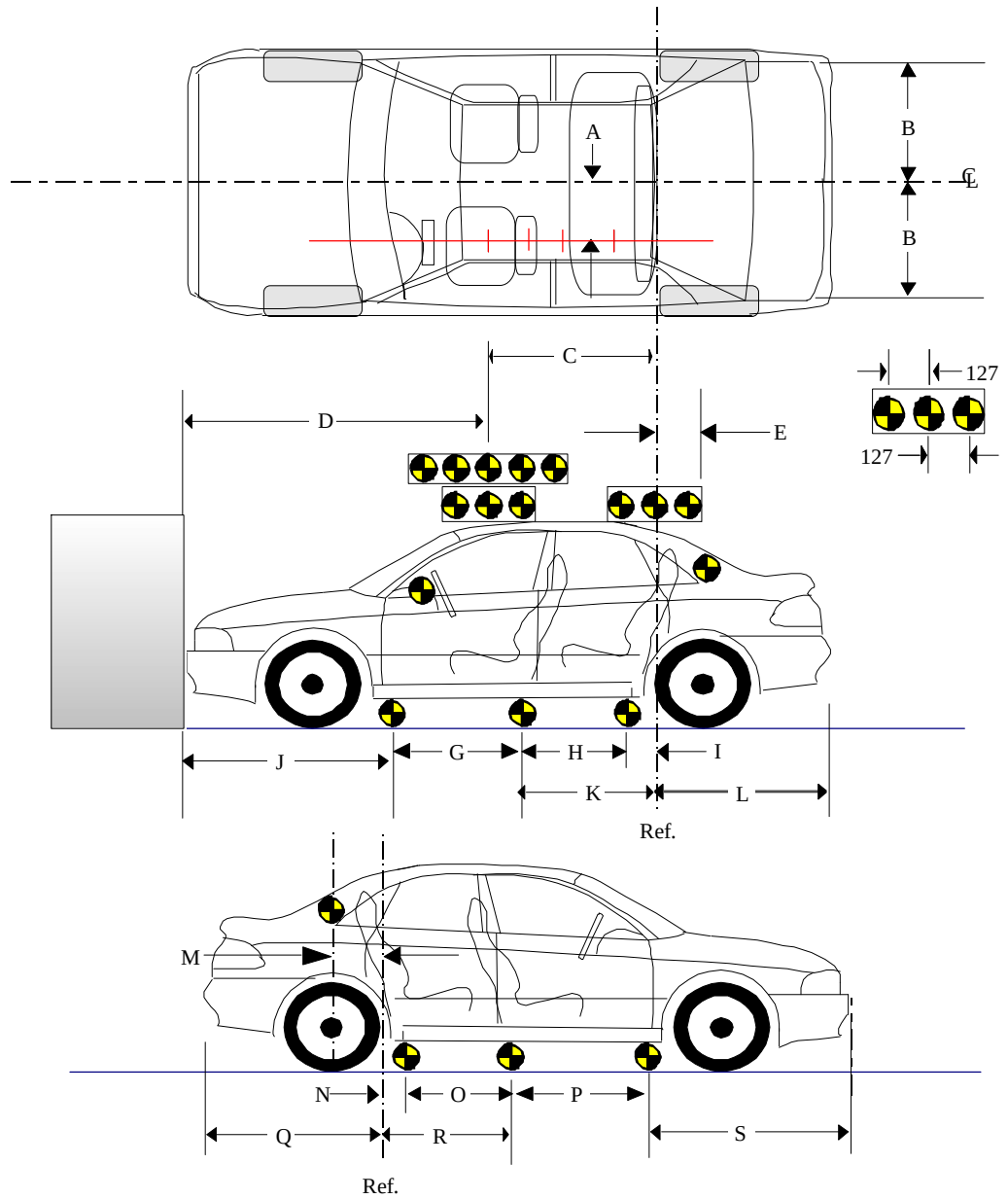
Z = film plane to ground

DATA SHEET NO. 12
VEHICLE REFERENCE PHOTO TARGET LOCATIONS

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan

(Dimensions in millimeters)

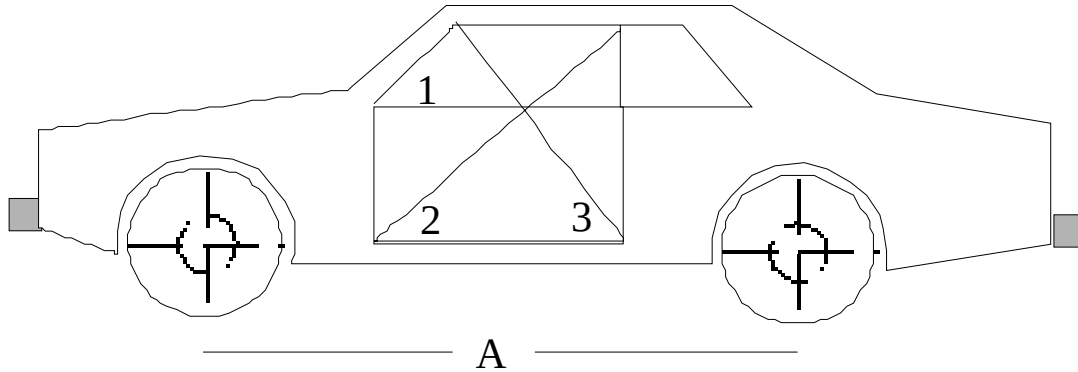
A	364
B	593
C	1220
D	1971
E	237
F	1484
G	882
H	864
I	109
J	1354
K	973
L	1320
M	195
N	111
O	873
P	874
Q	1319
R	984
S	1353



DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan

DOOR OPENING WIDTH AND WHEELBASE MEASUREMENTS



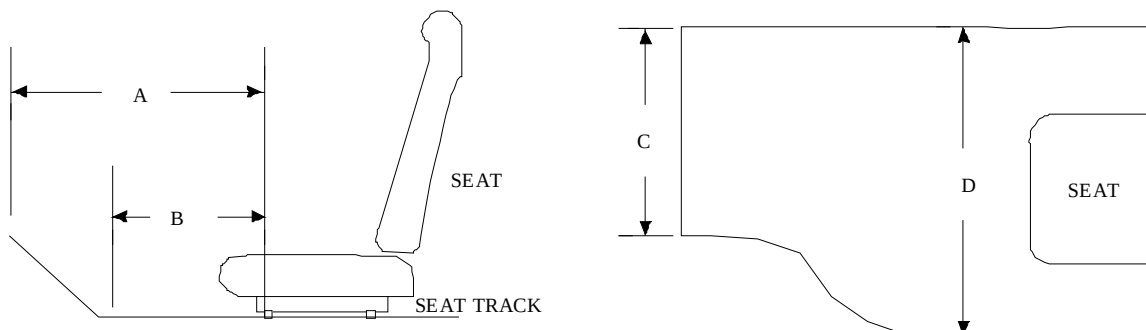
UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	984	1358	991	985	1365	993
AFTER TEST	984	1356	992	983	1363	993
DIFFERENCE	0	2	-1	2	2	0

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2606	2605
AFTER TEST	2520	2529
DIFFERENCE	86	76

DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont)

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan

STATIC FOOTWELL DEFORMATION



DRIVER

Measurement	Pre-Test	Post-Test	Difference
A	697	661	36
B	501	491	10
C	481	476	5
D	486	481	5

PASSENGER

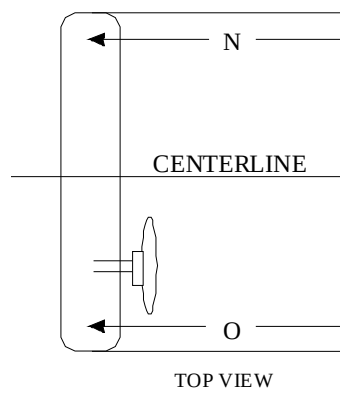
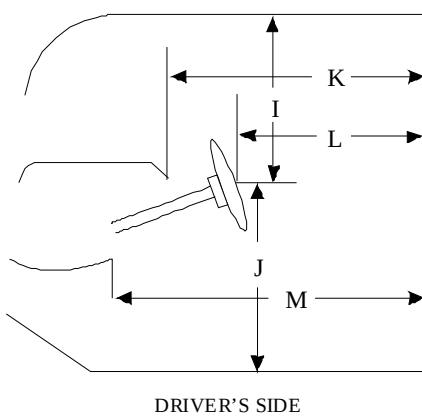
Measurement	Pre-Test	Post-Test	Difference
A	671	646	25
B	483	484	-1
C	469	470	-1
D	480	484	-4

Units = mm

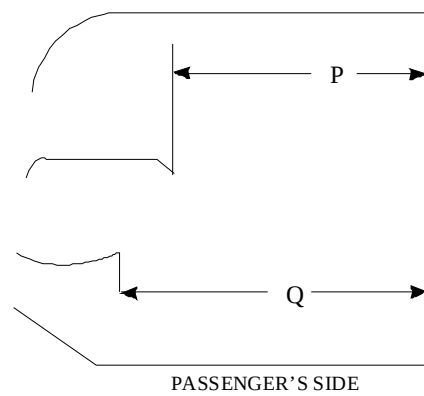
DATA SHEET NO.13
VEHICLE INTRUSION MEASUREMENTS (cont.)

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan

STATIC PASSENGER COMPARTMENT INTRUSION



MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



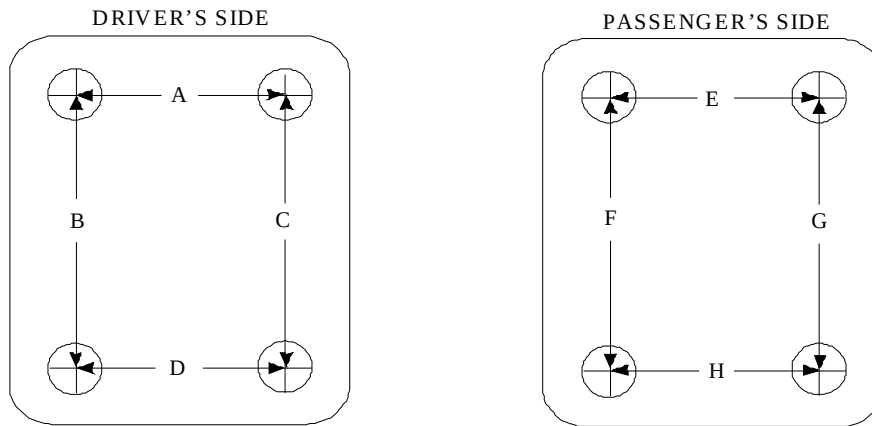
Measurement	Pre-Test	Post-Test	Difference
I	421	449	-28
J	649	617	32
K	730	712	18
L	536	558	-22
M	834	832	2
N	707	705	2
O	707	706	1
P = K (PASS.)	957	946	11
Q = M (PASS.)	818	811	7

Units = mm

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

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan

FLOORBOARD DEFORMATION



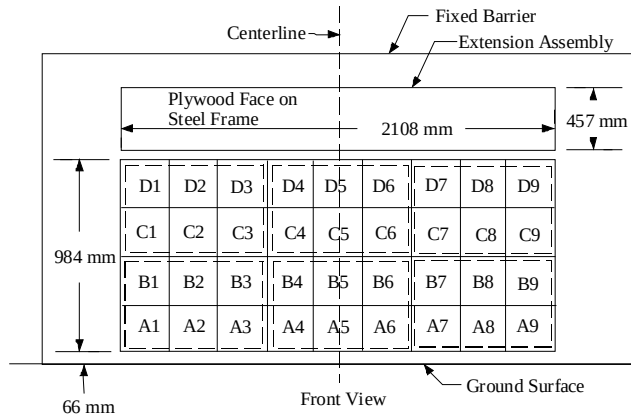
TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	481	476	6
B	299	304	-5
C	346	335	11
D	486	481	6
E	469	470	-2
F	312	309	3
G	274	275	-1
H	480	484	-5

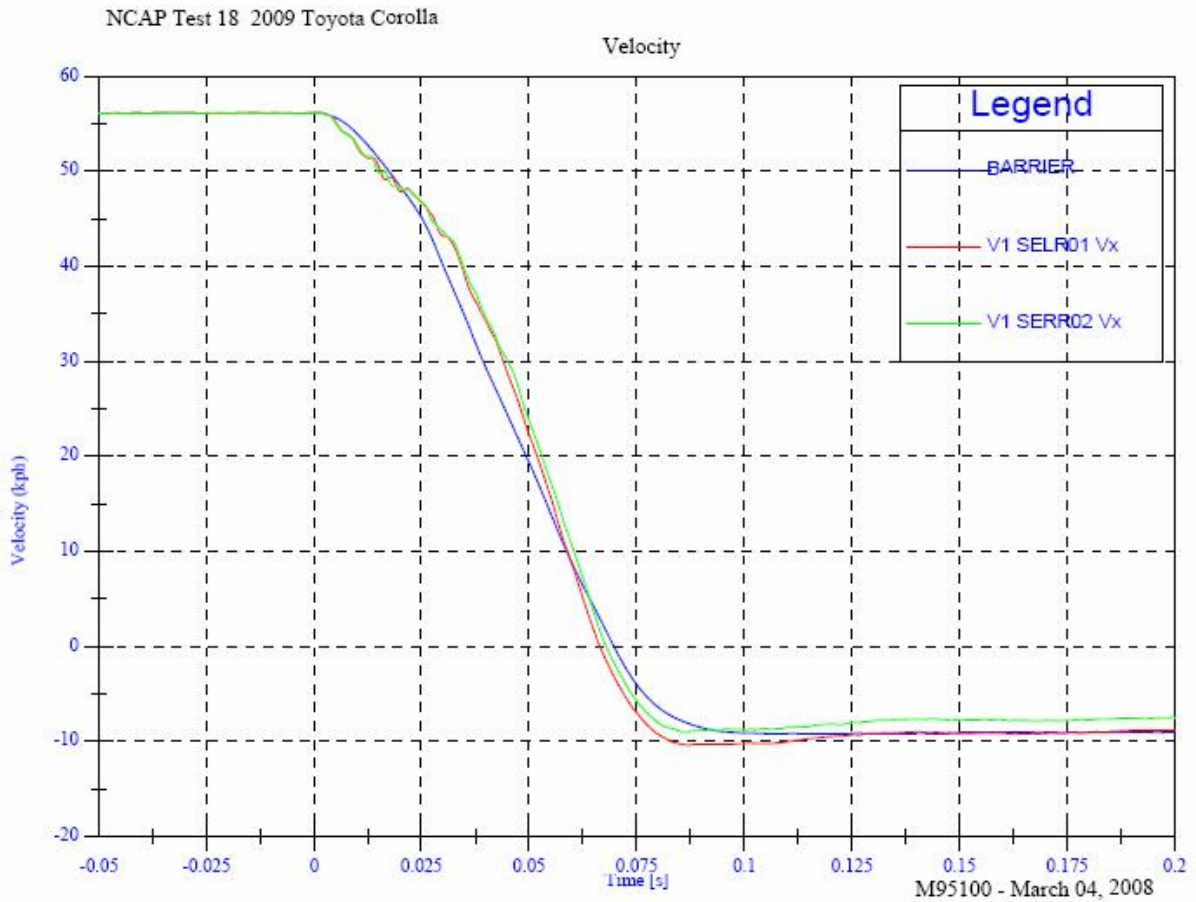
Units = mm

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: Toyota Corolla Four-Door Sedan

NHTSA Test No.: M95100 VIN: 1NXBU40E09Z001571

Model Year: 2009 Build Date: 01/08 Test Date: March 4, 2008

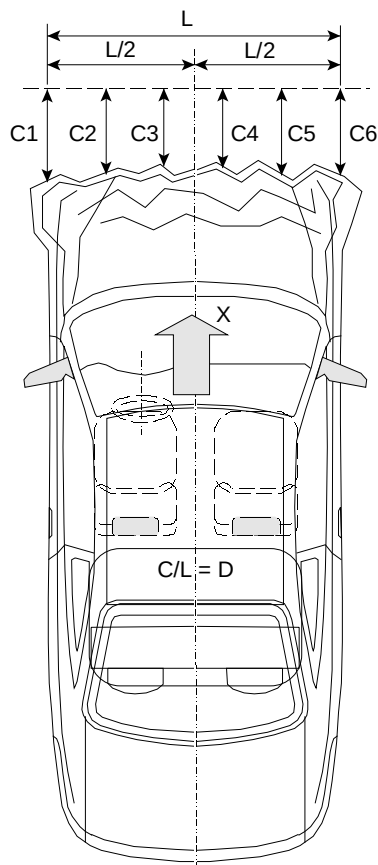
Vehicle Size Category: Compact Test Weight: 1423.5 kg

Vehicle Wheelbase: 2606 mm; Front Overhang: 925 mm; Overall Width: 1755 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4417	4030	387
C2 =	4493	3982	511
C3 =	4524	4008	516
C4 =	4526	4003	523
C5 =	4495	3963	532
C6 =	4420	4021	399



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

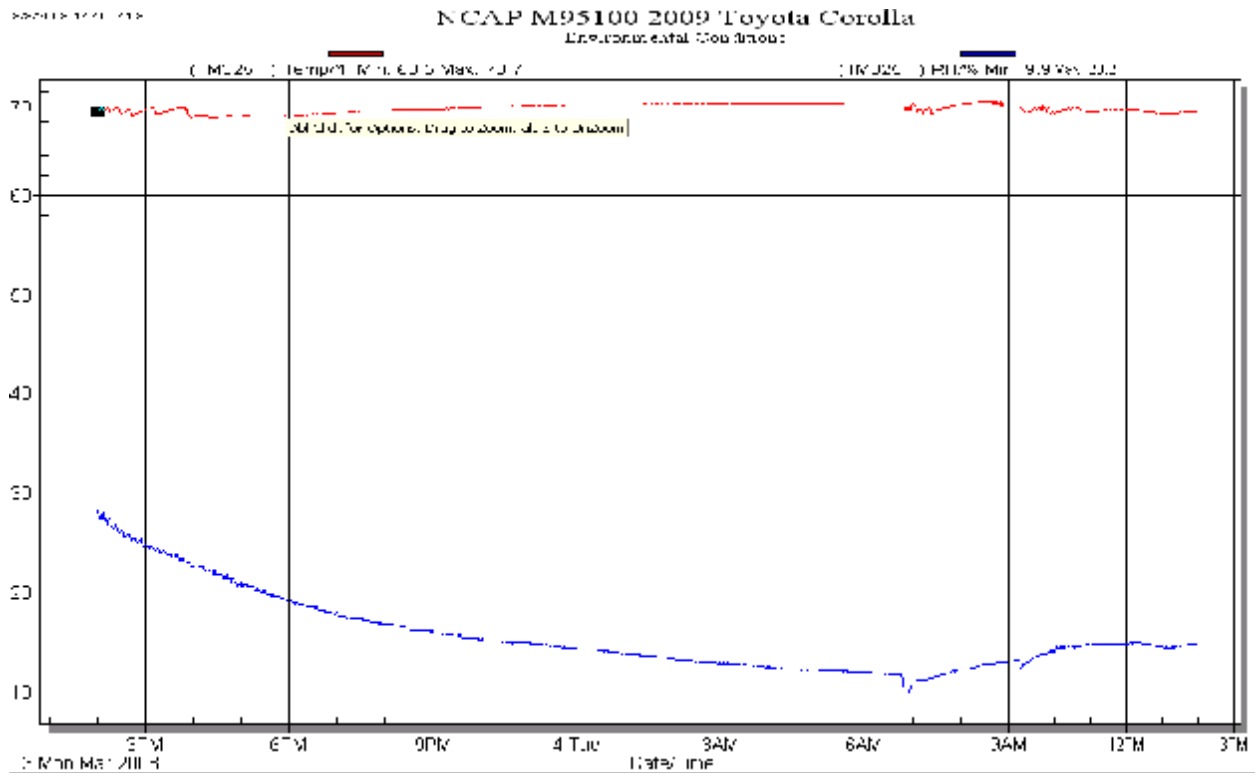
Length of Damaged Region: L1= 1163 mm

L2= 581.5 mm

L5= 232.6 mm

DATA SHEET NO.16
VEHICLE AND DUMMY TEMPERATURE STABILIZATION CHART

NHTSA Test No.: M95100 Vehicle: 2009 Toyota Corolla Four-Door Sedan



APPENDIX A
PHOTOGRAPHS

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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
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A-54	Pre-Test Passenger Floor Pan View	A-31
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Figure A-1: Load Cell Locations

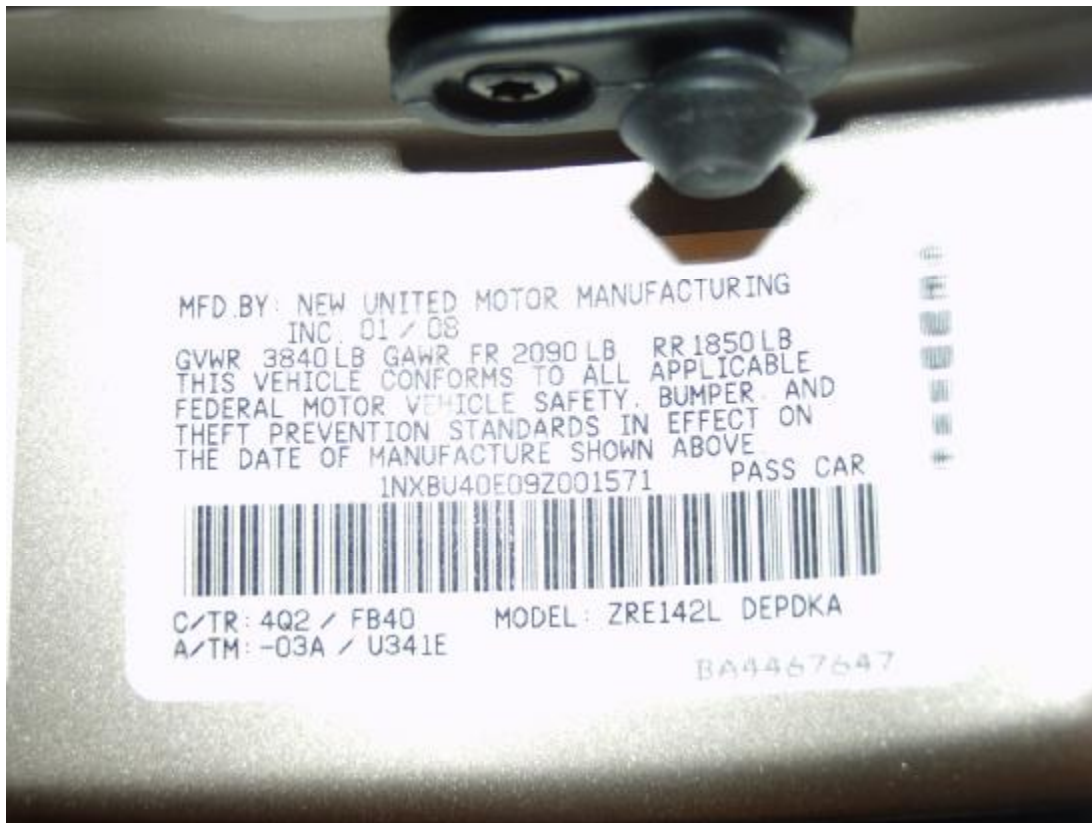


Figure A-2: Vehicle Certification Placard



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

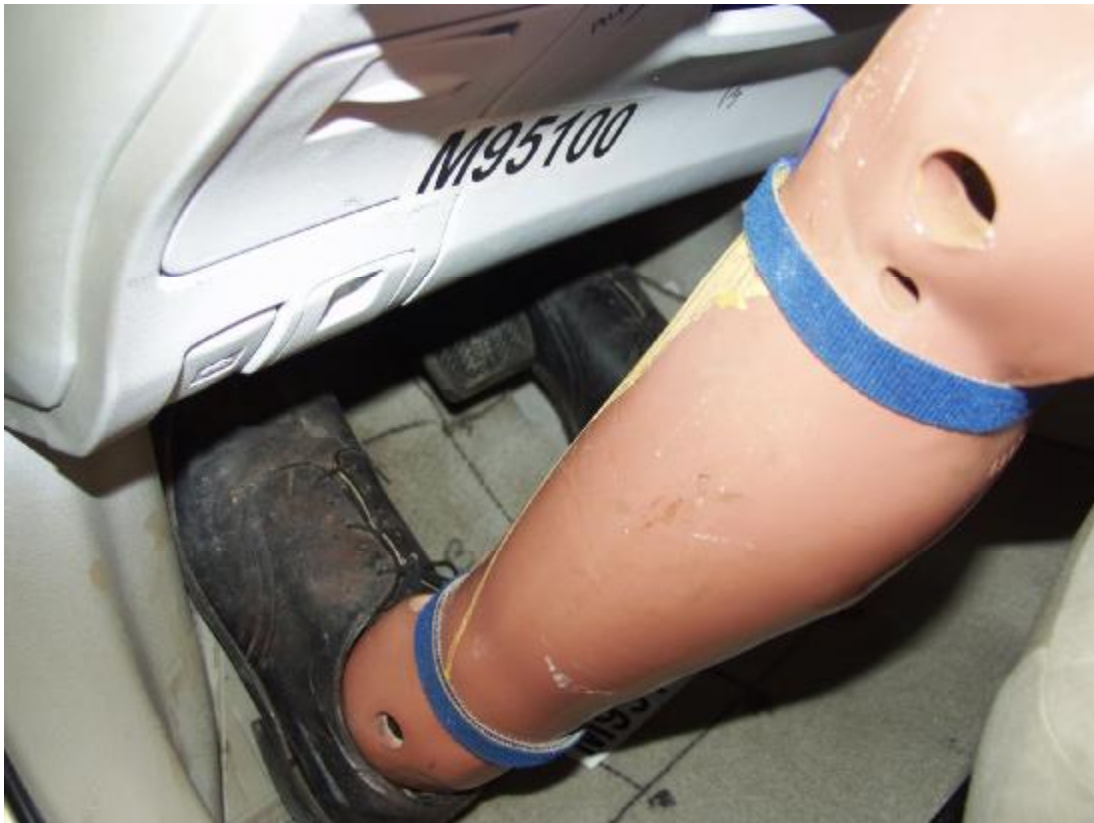


Figure A-36: Pre-Test Driver Feet View



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

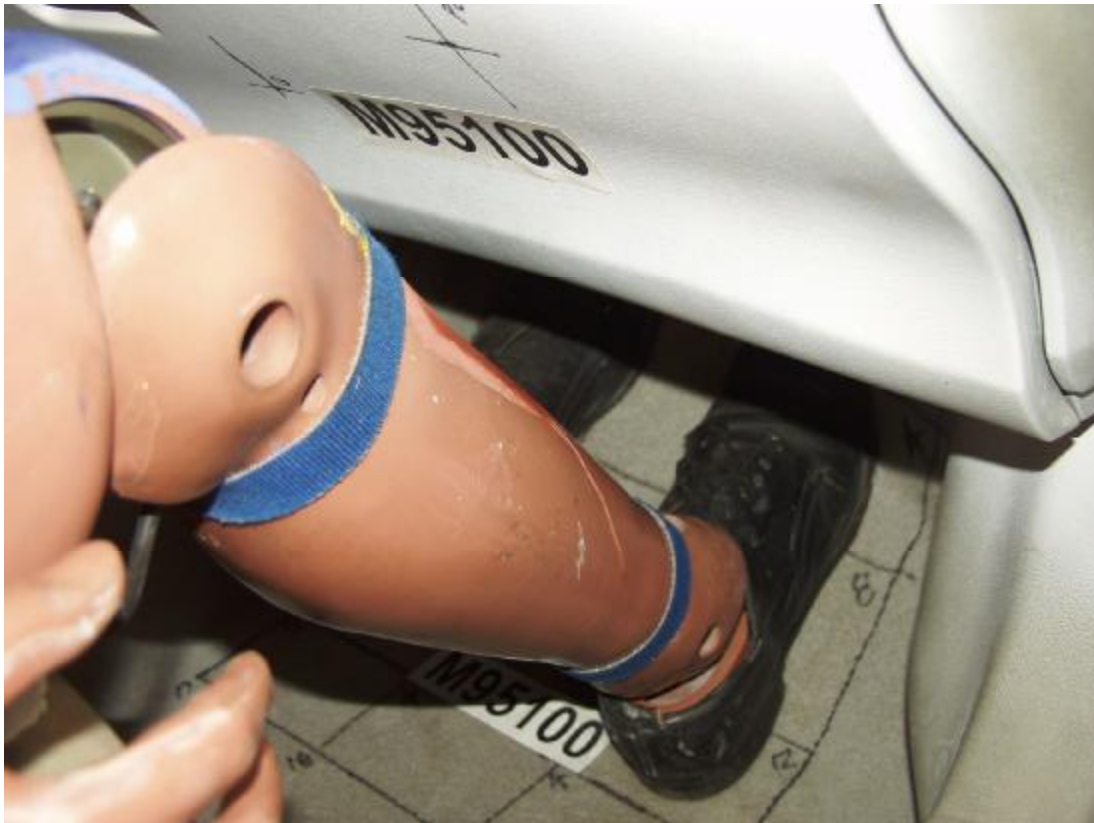


Figure A-50: Pre-Test Passenger Feet View



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.: M95100

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

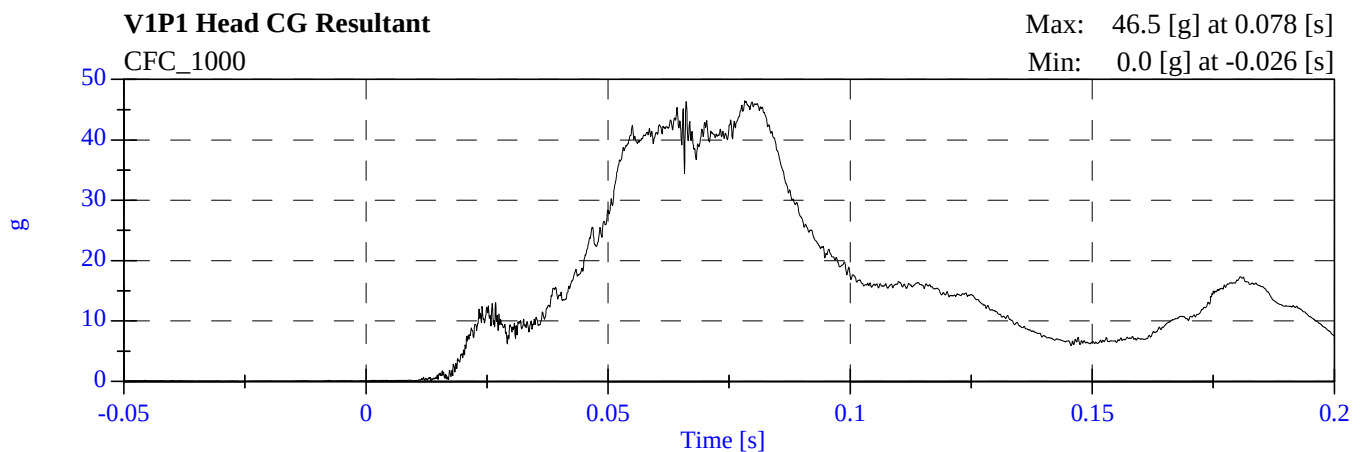
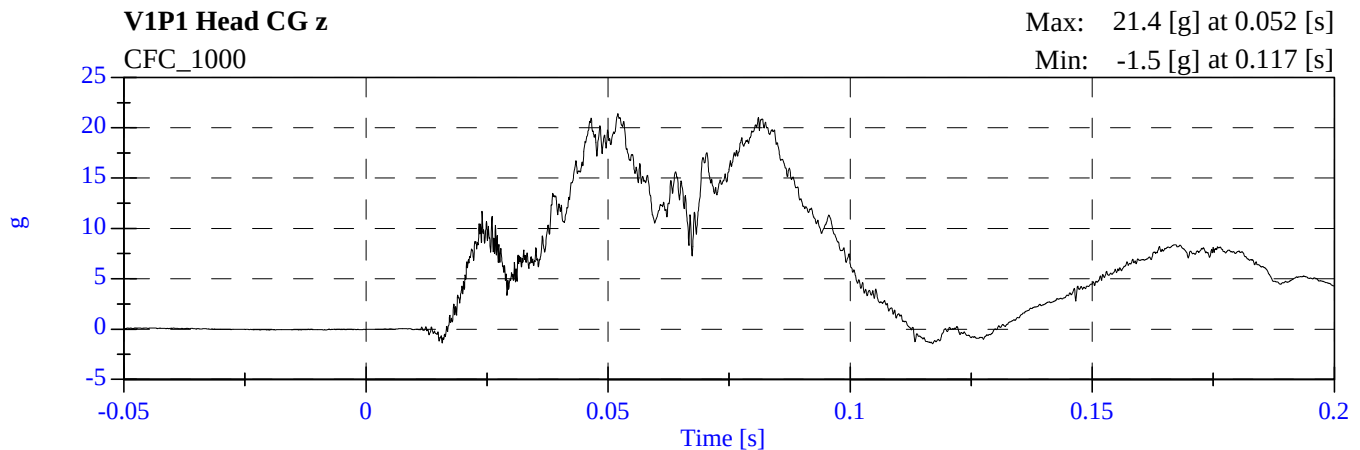
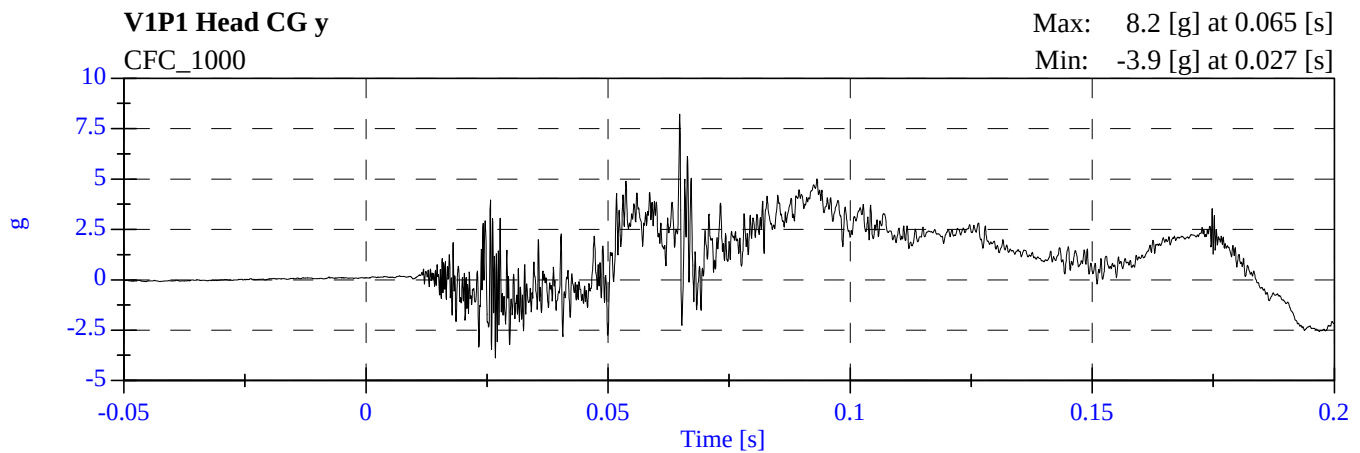
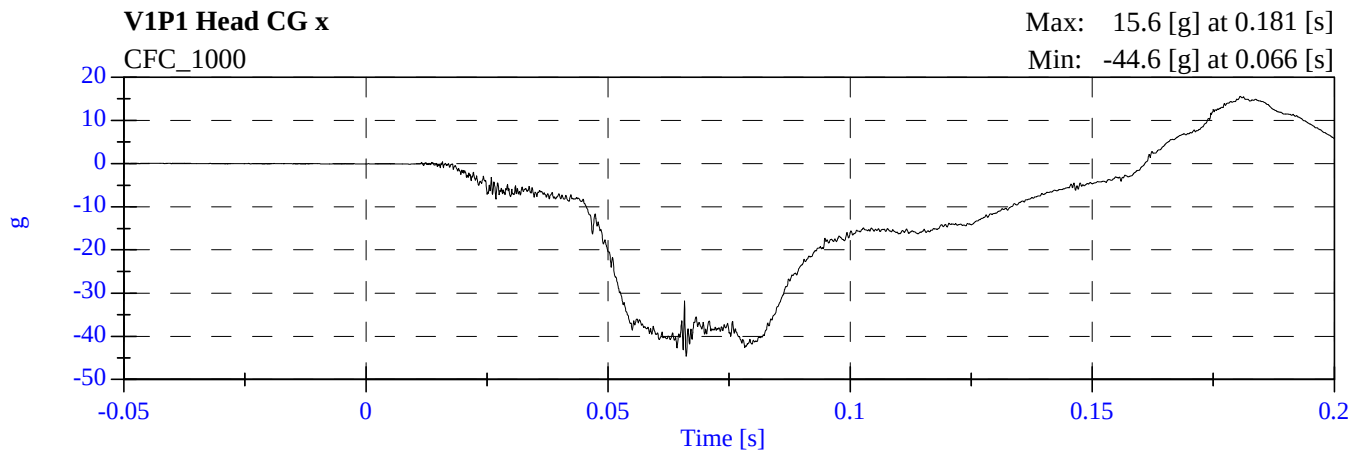
V1P1 Head CG Ax	V1P1 Lap Belt Load
V1P1 Head CG Ay	V1P1 Shoulder Belt Load
V1P1 Head CG Az	V1P2 Lap Belt Load
V1P1 Head CG Red Ax	V1P2 Shoulder Belt Load
V1P1 Head CG Red Ay	V1 Left Rear #1x
V1P1 Head CG Red Az	V1 Right Rear #2x
V1P1 Upper Neck Fx	V1 Engine Top #3x
V1P1 Upper Neck Fy	V1 Engine Bottom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

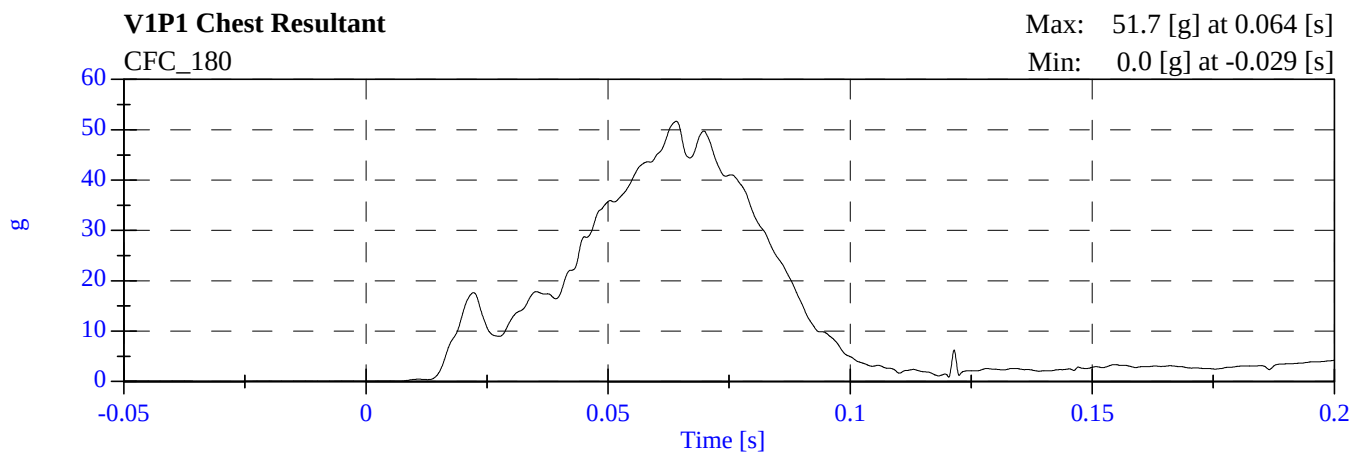
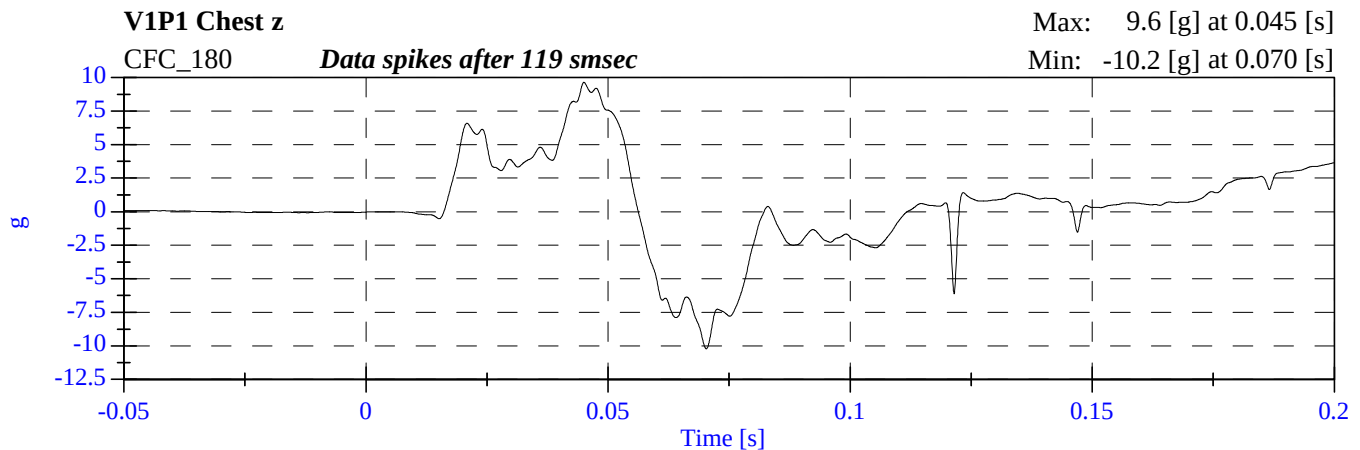
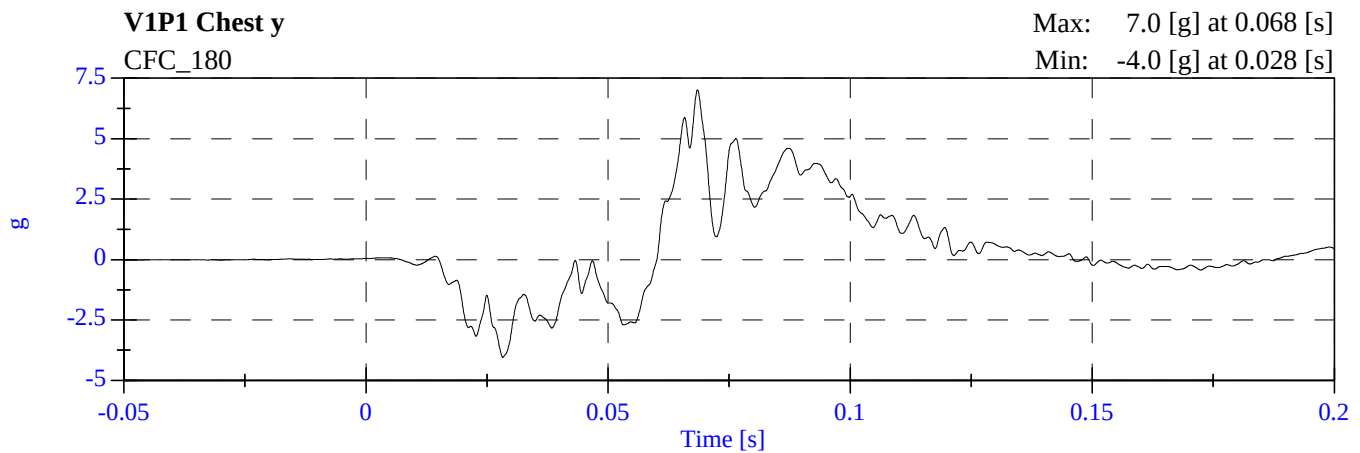
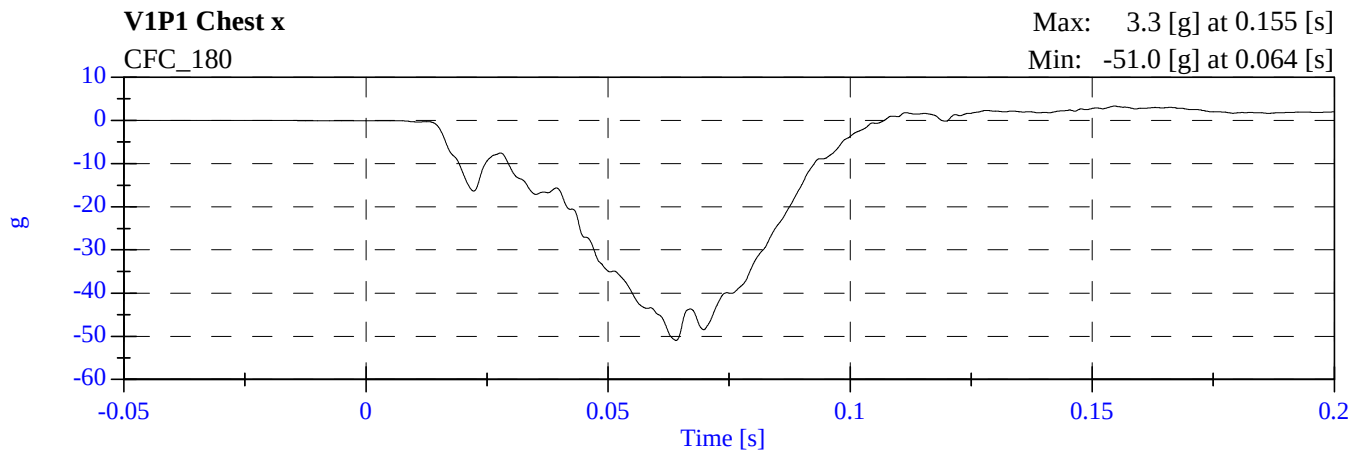
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Barrier Load Cell B7 Fx	
Barrier Load Cell B8 Fx	
Barrier Load Cell B9 Fx	
Barrier Load Cell C1 Fx	
Barrier Load Cell C2 Fx	
Barrier Load Cell C3 Fx	
Barrier Load Cell C4 Fx	
Barrier Load Cell C5 Fx	
Barrier Load Cell C6 Fx	
Barrier Load Cell C7 Fx	
Barrier Load Cell C8 Fx	
Barrier Load Cell C9 Fx	
Barrier Load Cell D1 Fx	
Barrier Load Cell D2 Fx	
Barrier Load Cell D3 Fx	
Barrier Load Cell D4 Fx	
Barrier Load Cell D5 Fx	
Barrier Load Cell D6 Fx	
Barrier Load Cell D7 Fx	
Barrier Load Cell D8 Fx	
Barrier Load Cell D9 Fx	

TEST NOTES	
Data Channel	Anomalies
V1P1 Upper Neck Fx	Channel did not record properly
V1P1 Upper Neck Fy	Data spikes after 119 msec
V1P1 Upper Neck Fz	Data spikes after 119 msec
V1P1 Chest z	Data spikes after 119 msec
V1P1 Pelvic x	Cut wire at 77 ms
V1P2 Left Upper Tibia Mx	Data spikes after 206 ms
V1 Engine Top #3x	Data spikes after 111 ms
V1 Engine Bottom #4x	Cut wire at 58 ms

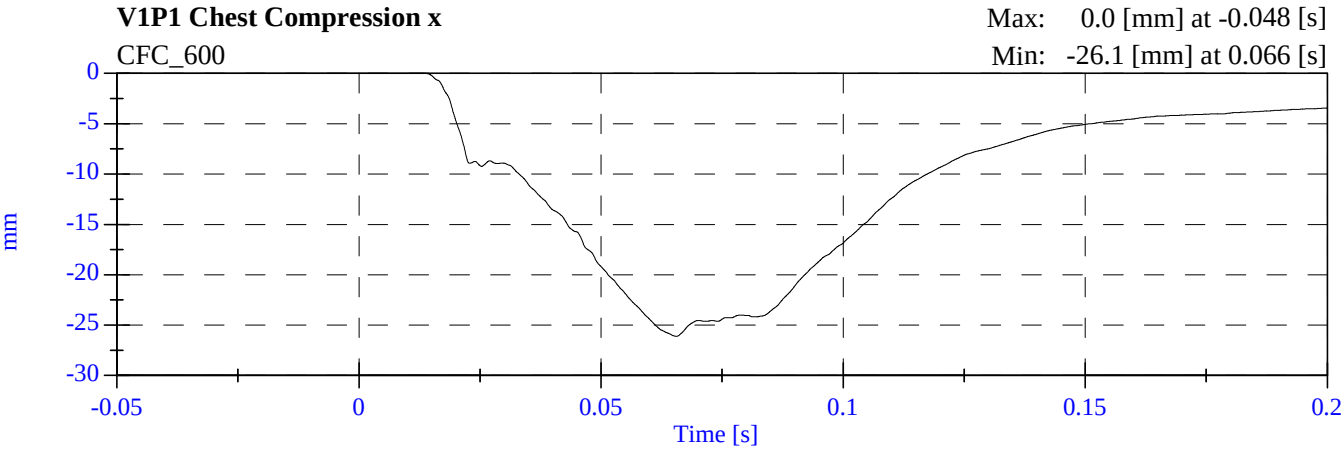
NCAP Test 18 2009 Toyota Corolla M95100 - March 04, 2008



NCAP Test 18 2009 Toyota Corolla M95100 - March 04, 2008

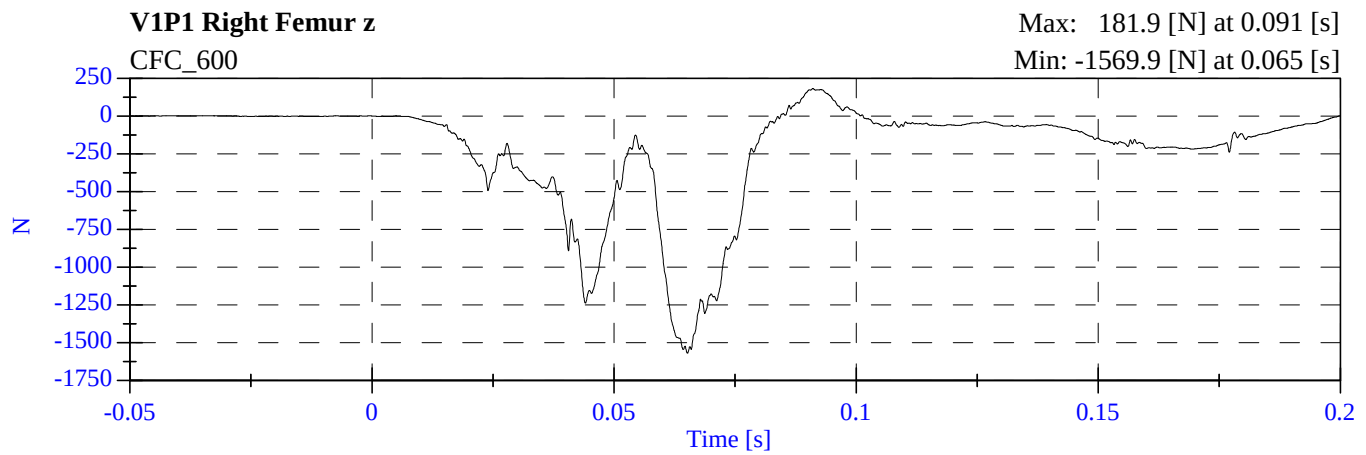
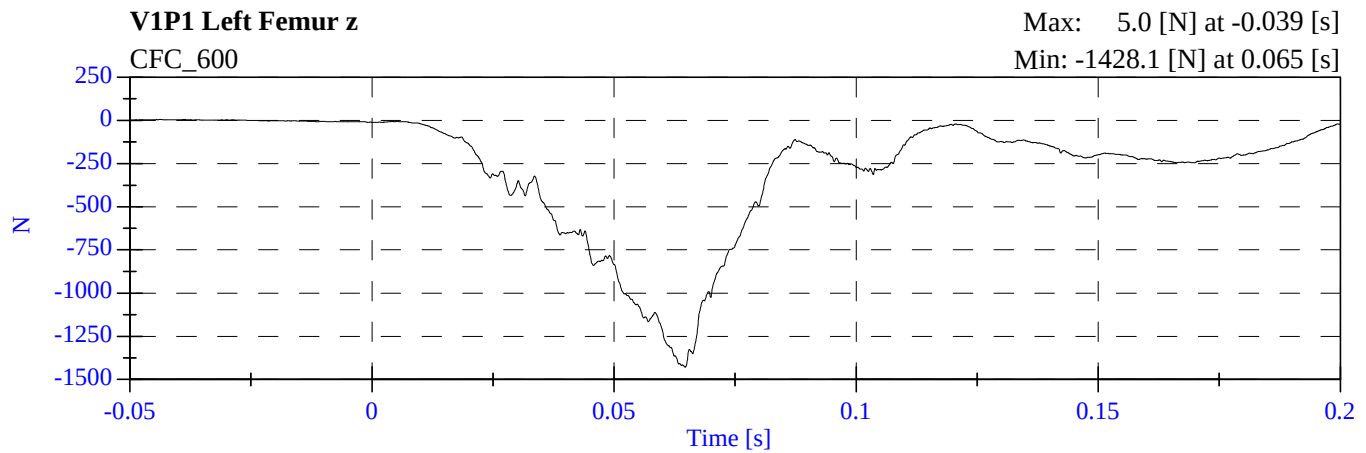


NCAP Test 18 2009 Toyota Corolla
M95100 - March 04, 2008

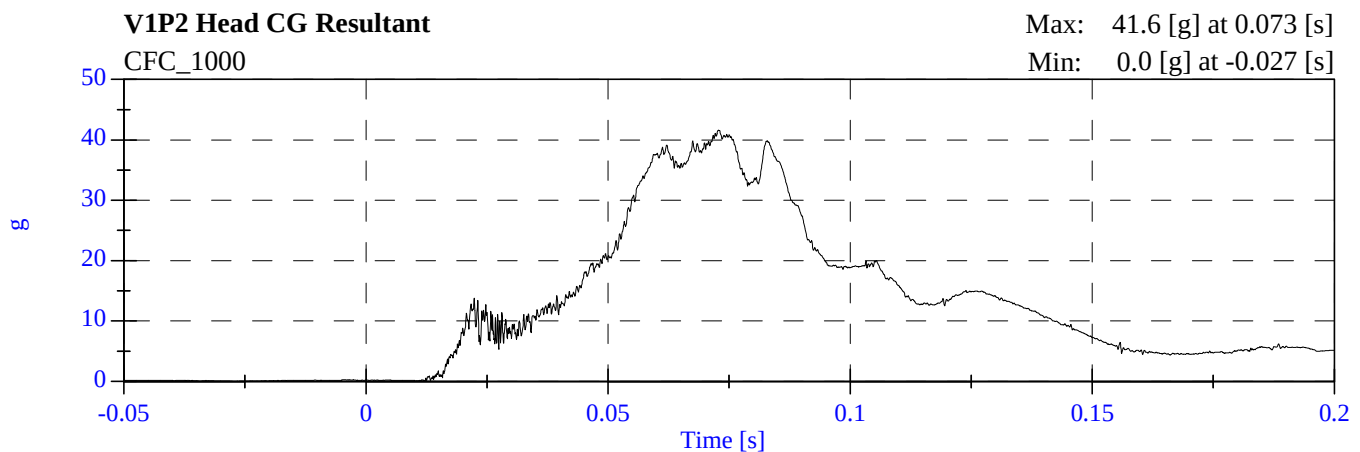
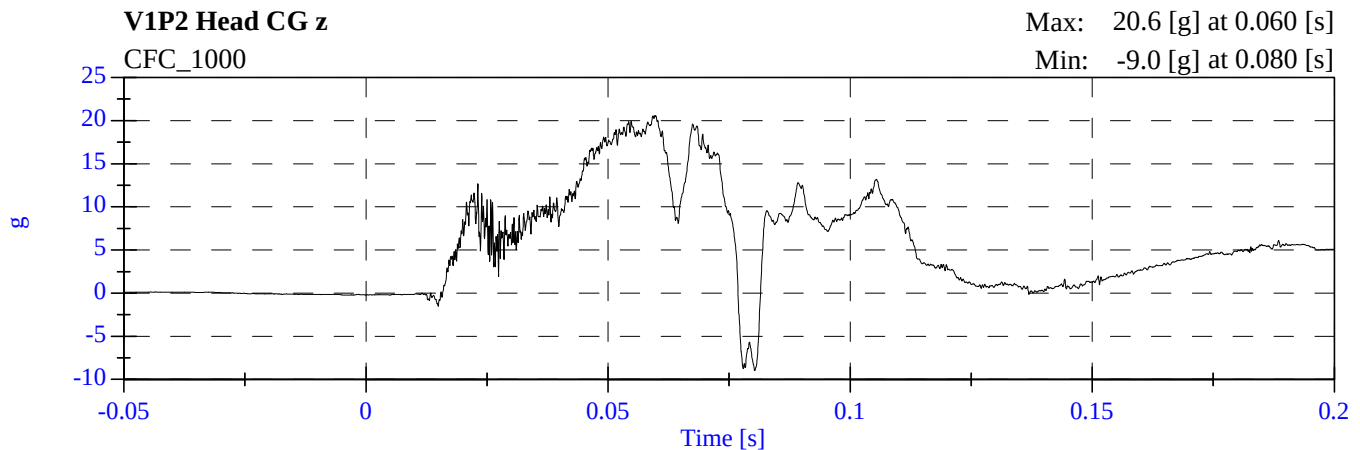
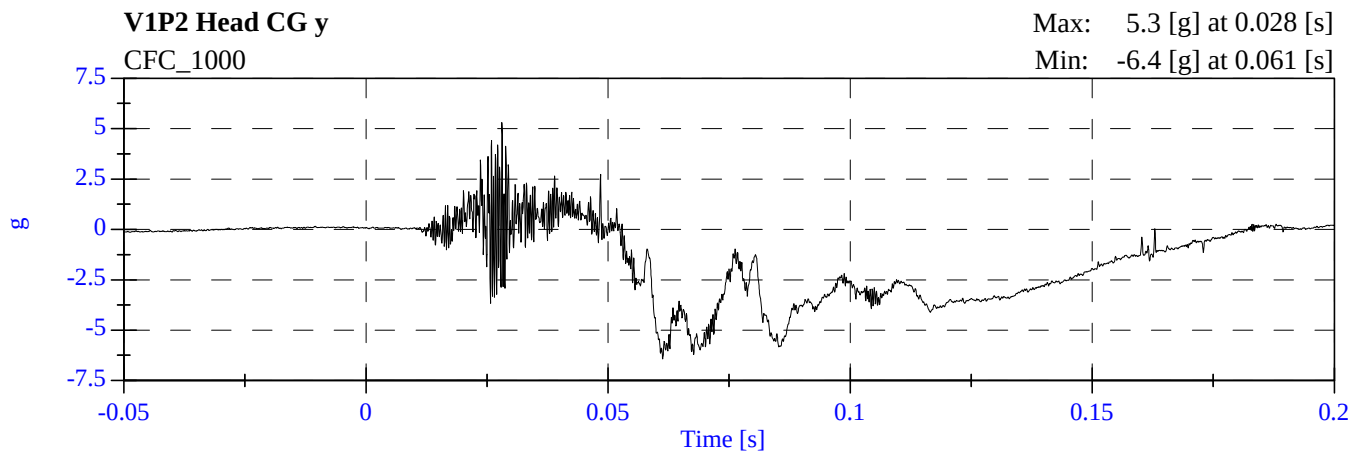
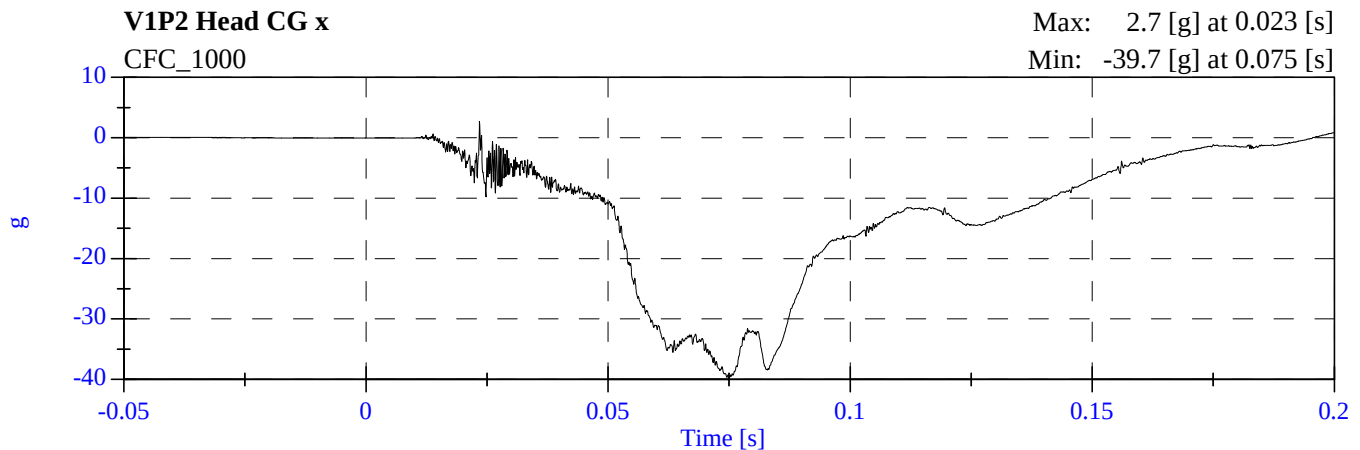


NCAP Test 18 2009 Toyota Corolla

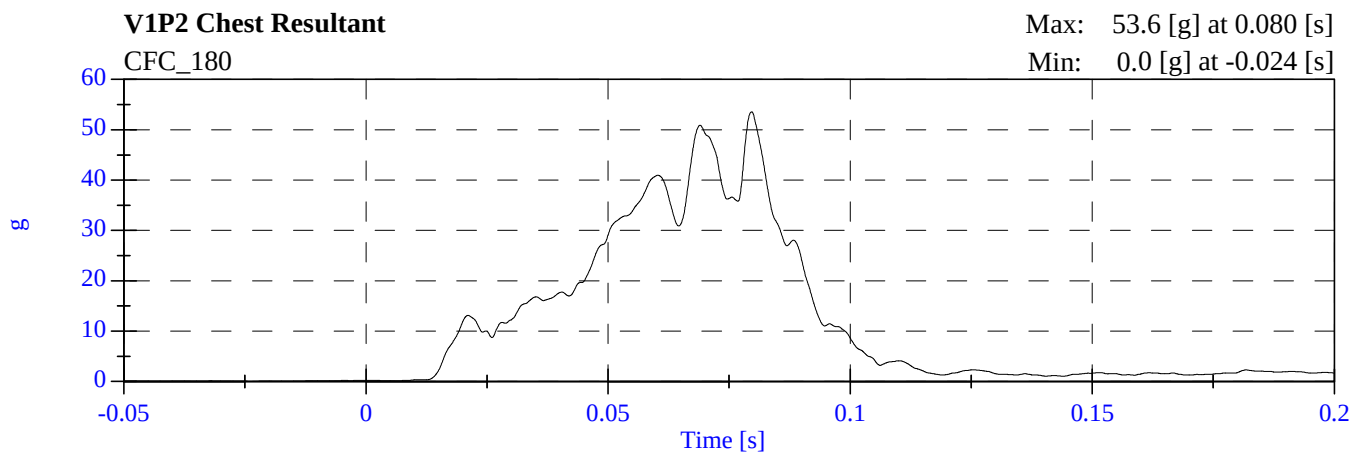
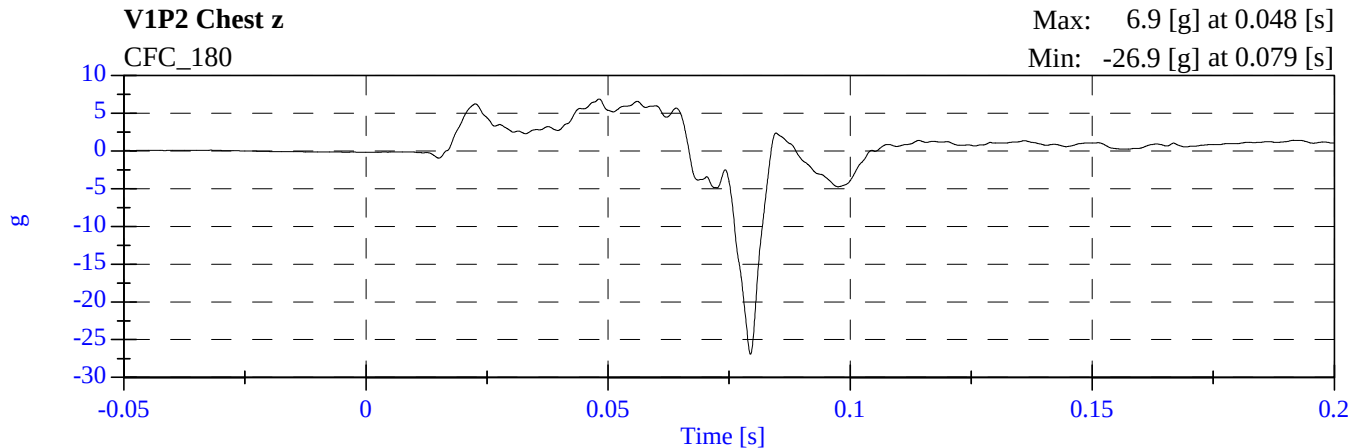
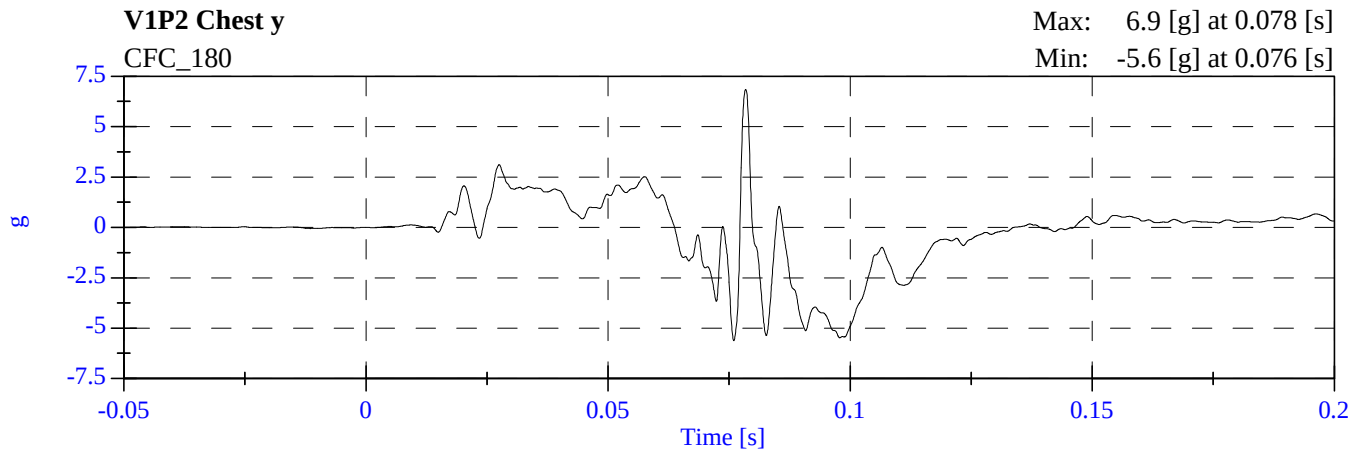
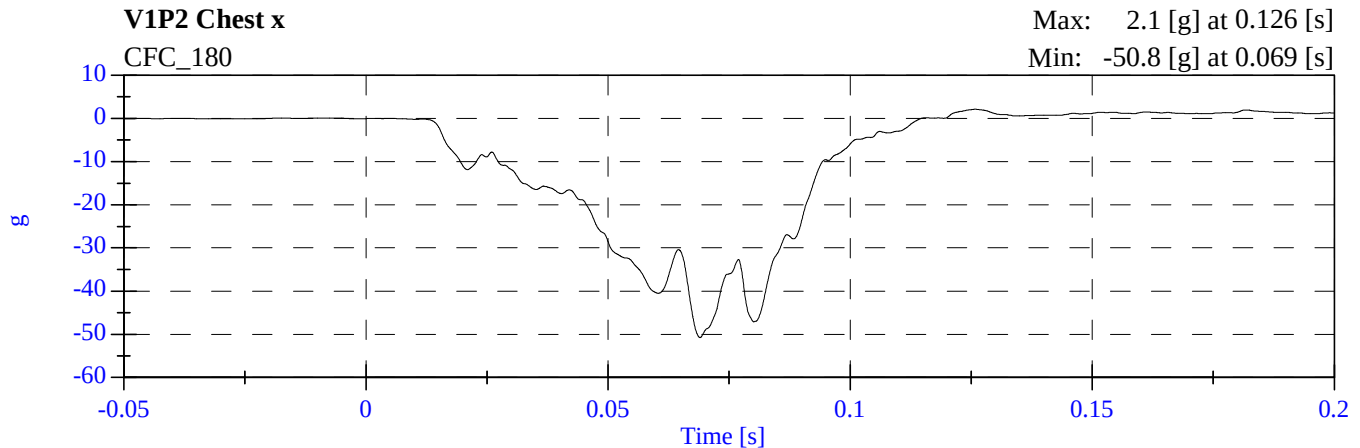
M95100 - March 04, 2008



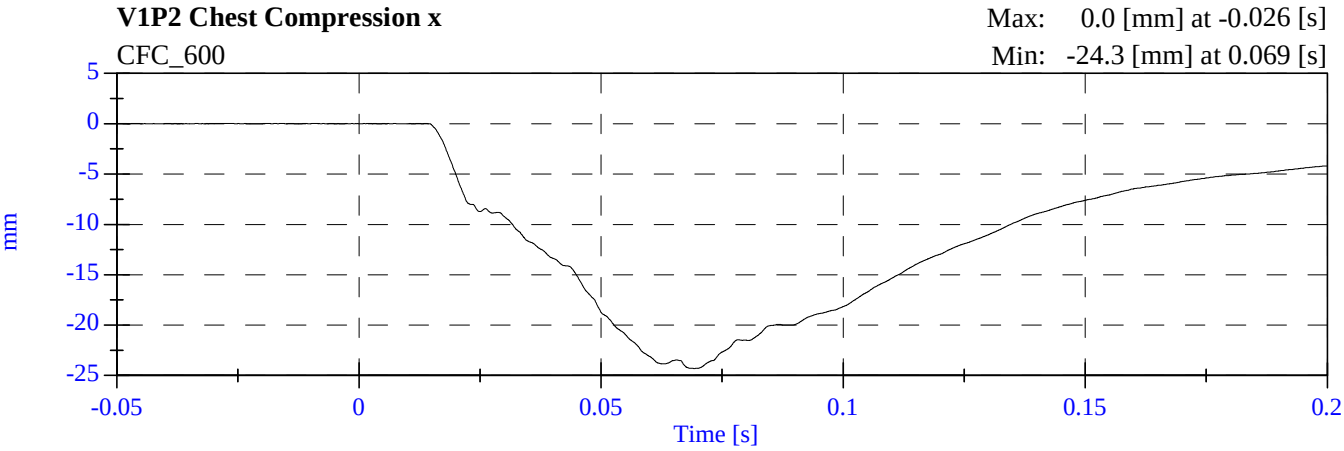
NCAP Test 18 2009 Toyota Corolla M95100 - March 04, 2008



NCAP Test 18 2009 Toyota Corolla M95100 - March 04, 2008

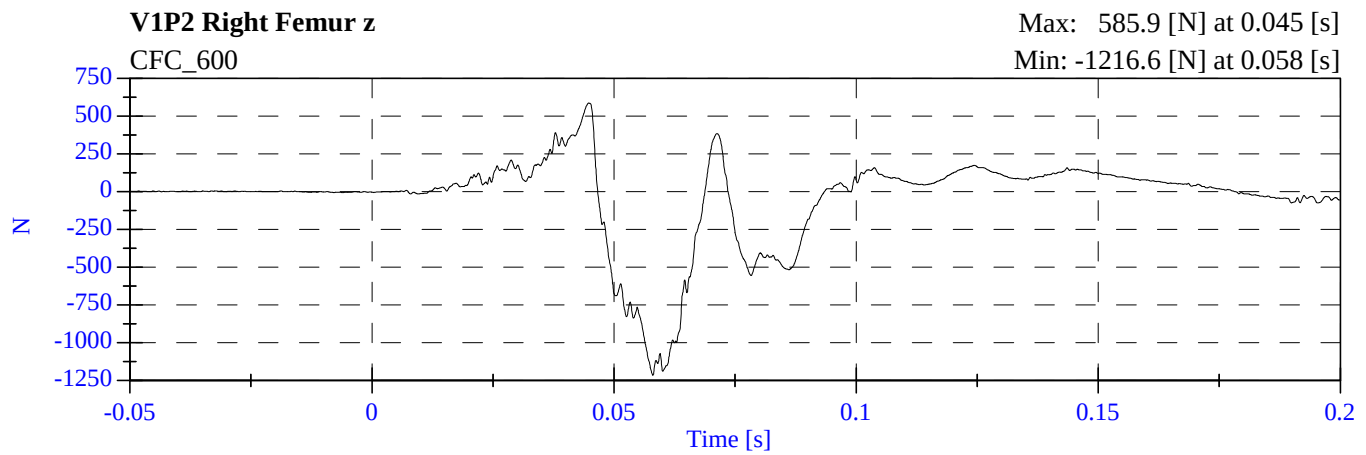
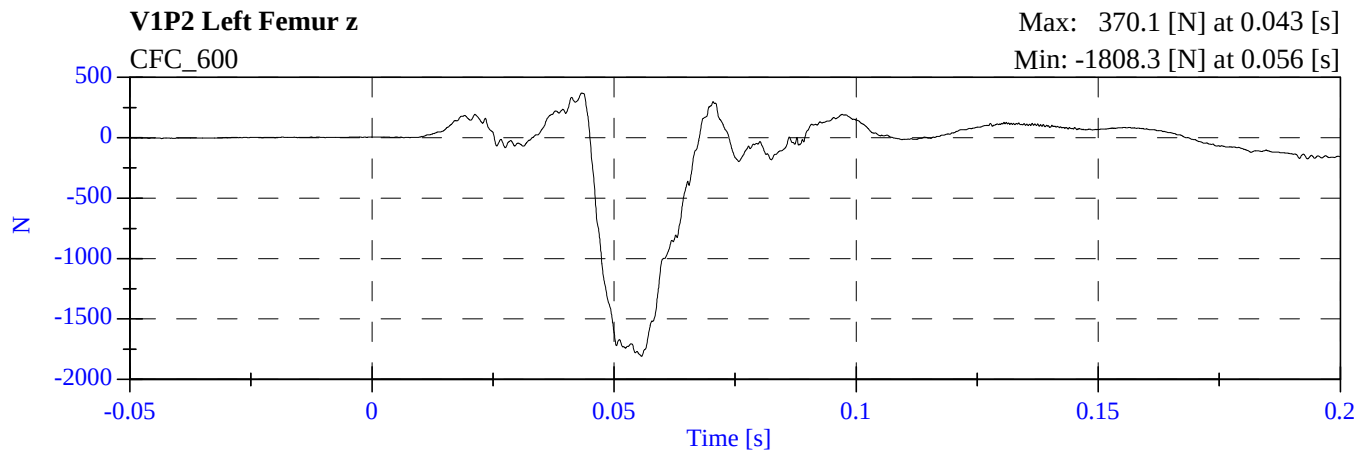


NCAP Test 18 2009 Toyota Corolla
M95100 - March 04, 2008



NCAP Test 18 2009 Toyota Corolla

M95100 - March 04, 2008



APPENDIX C

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

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

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

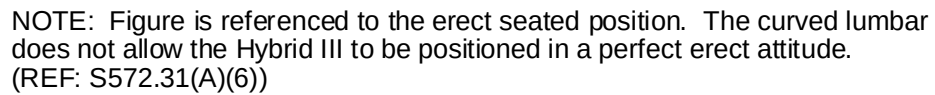
Dummy serial numbers and certification dates are:

<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	064	8/16/07
#2/Right Front Passenger	061	8/16/07

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



PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 8/6/07
Workfile 064H 8/6/07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	39
Peak Resultant Acceleration	225-275 G's	258.34
Peak Lateral Acceleration	15 G's Max	4.63
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	8/7/07	6 Axis Neck Transducer
Workfile	064NF 8/7/07	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	44.0
Impact Velocity		6.89 – 7.13 m/s	7.00
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	24.26
	20 ms	17.60 - 22.60 G's	21.57
	30 ms	12.50 - 18.50 G's	16.93
Max Pendulum G's Above 30 ms		29 G's Max	16.93
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.00
D Plane Rotation	Max	64 - 78 Deg	68.68
	Time	57 - 64 ms	59.60
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	94.31
	Time	47 - 58 ms	52.00
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	115.10
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	99.70

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	8/7/07	6 Axis Neck Transducer
Workfile	064NE 8/7/07	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	44.0
Impact Velocity		5.94 – 6.19 m/s	6.08
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.34
	20 ms	14.00 - 19.00 G's	16.51
	30 ms	11.00 - 16.00 G's	13.99
Max Pendulum G's Above 30 ms		22 G's Max	13.99
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	45.00
D Plane Rotation	Max	81 - 106 Deg	95.06
	Time	72 - 82 ms	78.10
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-67.83
	Time	65 - 79 ms	72.70
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	158.50
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	141.50

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 8/9/07
Workfile 064T 8/9/07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	40.0
Pendulum Velocity	6.58 – 6.83 m/s	6.78
Maximum Deflection	63.50 – 72.64 mm	67.27
Maximum Resistive Force	5159.9 – 5893.9 N	5849.23
Internal Hysteresis	69 - 85 %	73.02

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 8/16/07
Workfile 064LF 064RF 8/16/07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5555.56
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5447.63

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date 8/16/07

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1
Relative Humidity			36.0
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	3.5
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	6.0
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.5
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Elbow Rest Height	J	7.5 - 8.3 in	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

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 8/6/07
Workfile 061H 08/06/07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	39.0
Peak Resultant Acceleration	225-275 G's	270.53
Peak Lateral Acceleration	15 G's Max	14.86
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	8/15/07	6 Axis Neck Transducer
Workfile	061NF1 08/15/07	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	35.0
Impact Velocity		6.89 – 7.13 m/s	6.98
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.77
	20 ms	17.60 - 22.60 G's	22.31
	30 ms	12.50 - 18.50 G's	18.43
Max Pendulum G's Above 30 ms		29 G's Max	18.43
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	36.70
D Plane Rotation	Max	64 - 78 Deg	69.72
	Time	57 - 64 ms	57.30
Moment About Occipital Condyle	Max	88.13 – 108.47 N-m	102.99
	Time	47 - 58 ms	48.60
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	116.20
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.40

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	8/15/07	6 Axis Neck Transducer
Workfile	061NE1 08/15/07	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	35.0
Impact Velocity		5.94 – 6.19 m/s	6.07
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.86
	20 ms	14.00 - 19.00 G's	17.83
	30 ms	11.00 - 16.00 G's	14.67
Max Pendulum G's Above 30 ms		22 G's Max	14.67
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	40.70
D Plane Rotation	Max	81 - 106 Deg	95.39
	Time	72 - 82 ms	76.90
Moment About Occipital Condyle	Max	-79.99 - -52.88 N-m	-66.37
	Time	65 - 79 ms	73.20
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	157.70
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 061
Sequential Test Number 1
Date 08/09/07
Workfile 061T 08/9/07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.6 – 22.2 Deg C	21.1
Relative Humidity	10% - 70%	39.0
Pendulum Velocity	6.58 – 6.83 m/s	6.72
Maximum Deflection	63.50 – 72.64 mm	67.19
Maximum Resistive Force	5159.9 – 5893.9 N	5797.87
Internal Hysteresis	69 - 85 %	73.53

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 8/16/07
Workfile 061LF 061RF 8/16/07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5202.55
RIGHT KNEE		
Temperature	18.9 – 25.6 Deg C	21.1
Relative Humidity	10% - 70%	36.0
Probe Velocity	2.07 – 2.13 m/s	2.13
Peak Knee Impact Force	4715.1 – 5782.7 N	5393.02

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date 8/16/07

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1
Relative Humidity			36.0
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	34.70
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	11.5
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.2
Elbow Rest Height	J	7.5 - 8.3 in	8.0
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	16.8
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

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-J27517	22-Jan-08	22-Jul-08
	Y	ENDEVCO	AC-AAKB1	22-Jan-08	22-Jul-08
	Z	ENDEVCO	AC-AAK48	22-Jan-08	22-Jul-08
Head	X (R)	ENDEVCO	AC-P16194	22-Jan-08	22-Jul-08
	Y (R)	ENDEVCO	AC-J14688	22-Jan-08	22-Jul-08
	Z (R)	ENDEVCO	AC-P21399	22-Jan-08	22-Jul-08
Neck Load Cell	X	DENTON	LC-1912Fx	22-Jun-07	21-Dec-07
	Y	DENTON	LC-1912Fy	22-Jun-07	21-Dec-07
	Z	DENTON	LC-1912Fz	22-Jun-07	21-Dec-07
Neck Moment	X	DENTON	LC-1912Mx	22-Jun-07	21-Dec-07
	Y	DENTON	LC-1912My	22-Jun-07	21-Dec-07
	Z	DENTON	LC-1912Mz	22-Jun-07	21-Dec-07
Chest	X	ENDEVCO	AC-J23946	22-Jan-08	22-Jul-08
	Y	ENDEVCO	AC-AGAC4	22-Jan-08	22-Jul-08
	Z	ENDEVCO	AC-P16225	22-Jan-08	22-Jul-08
Chest	X (R)	ENTRAN	AC-03E03E21-M20	22-Jan-08	22-Jul-08
	Y (R)	ENDEVCO	AC-P15638	22-Jan-08	22-Jul-08
	Z (R)	ENDEVCO	AC-P16517	22-Jan-08	22-Jul-08
Chest Deflection	X	SERVO	DS-064	25-Jun-07	24-Dec-07
Pelvic	X	ENDEVCO	AC-AJ5R0	22-Jan-08	22-Jul-08
	Y	ENDEVCO	AC-J22036	22-Jan-08	22-Jul-08
	Z	ENDEVCO	AC-P32204	22-Jan-08	22-Jul-08

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1525	25-Jun-07	24-Dec-07
Right Femur Load Cell	Fz	DENTON	LC-1526	25-Jun-07	24-Dec-07
Left Upper Tibia	Mx	DENTON	LC-404Mx	19-Jul-07	17-Jan-08
	My	DENTON	LC-404My	19-Jul-07	17-Jan-08
Left Lower Tibia	Fz	DENTON	LC-396Fz	19-Jul-07	17-Jan-08
	Mx	DENTON	LC-396Mx	19-Jul-07	17-Jan-08
	My	DENTON	LC-396My	19-Jul-07	17-Jan-08
Right Upper Tibia	Mx	DENTON	LC-374Mx	20-Jul-07	18-Jan-08
	My	DENTON	LC-374My	20-Jul-07	18-Jan-08
Right Lower Tibia	Fz	DENTON	LC-372Fz	20-Jul-07	18-Jan-08
	Mx	DENTON	LC-372Mx	20-Jul-07	18-Jan-08
	My	DENTON	LC-372My	20-Jul-07	18-Jan-08
Left Foot Rear	X	ENDEVCO	AC-P17912	22-Jan-08	22-Jul-08
	Z	ENDEVCO	AC-J33376	22-Jan-08	22-Jul-08
Left Foot Front	Z	ENDEVCO	AC-P16899	22-Jan-08	22-Jul-08
Right Foot Rear	X	ENDEVCO	AC-J14669	22-Jan-08	22-Jul-08
	Z	ENDEVCO	AC-J20209	22-Jan-08	22-Jul-08
Right Foot Front	Z	ENDEVCO	AC-J14234	22-Jan-08	22-Jul-08
Lap Belt Load Cell		First Technology	LC-156	07-Sep-07	07-Mar-08
Shoulder Belt Load Cell		First Technology	LC-159	07-Sep-07	07-Mar-08

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head	X	ENDEVCO	AC-J20018	23-Jan-08	23-Jul-08
	Y	ENDEVCO	AC-P16755	23-Jan-08	23-Jul-08
	Z	ENDEVCO	AC-J14667	23-Jan-08	23-Jul-08
Head	X (R)	ENDEVCO	AC-J38127	23-Jan-08	23-Jul-08
	Y (R)	ENDEVCO	AC-ACCD0	23-Jan-08	23-Jul-08
	Z (R)	ENDEVCO	AC-CC92H	23-Jan-08	23-Jul-08
Neck Load Cell	X	DENTON	LC-1916Fx	22-Jun-07	21-Dec-07
	Y	DENTON	LC-1916Fy	22-Jun-07	21-Dec-07
	Z	DENTON	LC-1916Fz	22-Jun-07	21-Dec-07
Neck Moment	X	DENTON	LC-1916Mx	22-Jun-07	21-Dec-07
	Y	DENTON	LC-1916My	22-Jun-07	21-Dec-07
	Z	DENTON	LC-1916Mz	22-Jun-07	21-Dec-07
Chest	X	ENDEVCO	AC-AAKC6	23-Jan-08	23-Jul-08
	Y	ENDEVCO	AC-AAKD0	23-Jan-08	23-Jul-08
	Z	ENDEVCO	AC-J27470	23-Jan-08	23-Jul-08
Chest	X (R)	ENDEVCO	AC-J21988	23-Jan-08	23-Jul-08
	Y (R)	ENDEVCO	AC-J20027	23-Jan-08	23-Jul-08
	Z (R)	ENDEVCO	AC-J36741	23-Jan-08	23-Jul-08
Chest Deflection	X	SERVO	DS-061	25-Jun-07	24-Dec-07
Pelvic	X	ENTRAN	AC-99H30-Z13	23-Jan-08	23-Jul-08
	Y	ENTRAN	AC-01G18-F14	23-Jan-08	23-Jul-08
	Z	ENTRAN	AC-02I02I05-F06	23-Jan-08	23-Jul-08

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-1532	25-Jun-07	24-Dec-07
Right Femur Load Cell	Fz	DENTON	LC-1533	25-Jun-07	24-Dec-07
Left Upper Tibia	Mx	DENTON	LC-93Mx	20-Jul-07	18-Jan-08
	My	DENTON	LC-93My	26-Jun-07	25-Dec-07
Left Lower Tibia	Fz	DENTON	LC-093Fz	20-Jul-07	18-Jan-08
	Mx	DENTON	LC-093Mx	20-Jul-07	18-Jan-08
	My	DENTON	LC-093My	20-Jul-07	18-Jan-08
Right Upper Tibia	Mx	DENTON	LC-115Mx	27-Jul-07	25-Jan-08
	My	DENTON	LC-115My	27-Jul-07	25-Jan-08
Right Lower Tibia	Fz	DENTON	LC-116Fz	27-Jul-07	25-Jan-08
	Mx	DENTON	LC-116Mx	27-Jul-07	25-Jan-08
	My	DENTON	LC-116My	27-Jul-07	25-Jan-08
Left Foot Rear	X	ENDEVCO	AC-J20030	23-Jan-08	23-Jul-08
	Z	ENDEVCO	AC-J18662	23-Jan-08	23-Jul-08
Left Foot Front	Z	ENDEVCO	AC-J19927	23-Jan-08	23-Jul-08
Right Foot Rear	X	ENDEVCO	AC-J20382	23-Jan-08	23-Jul-08
	Z	ENDEVCO	AC-J19547	23-Jan-08	23-Jul-08
Right Foot Front	Z	ENDEVCO	AC-J19440	23-Jan-08	23-Jul-08
Lap Belt Load Cell		First Technology	LC-173	07-Sep-07	07-Mar-08
Shoulder Belt Load Cell		First Technology	LC-178	07-Sep-07	07-Mar-08

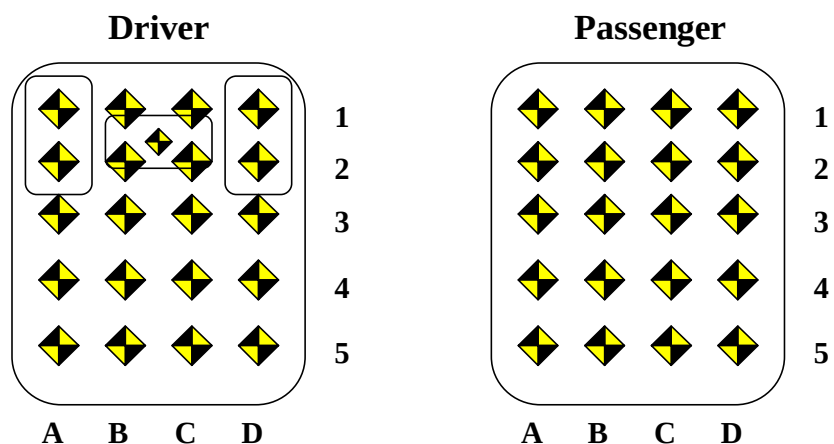
INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	ENDEVCO	AC-J25745	07-Feb-08	07-Aug-08
Right Rear Seat Crossmember X	ENDEVCO	AC-P23957	25-Jan-08	25-Jul-08
Top of Engine	ICS	AC-FA2486	03-Mar-08	01-Sep-08
Bottom of Engine	ICS	AC-FA2480	12-Sep-07	12-Mar-08
Right Disc Brake Caliper	ICS	AC-FA2487	12-Sep-07	12-Mar-08
Left Disc Brake Caliper	ICS	AC-FA2477	08-Sep-07	08-Mar-08
Left Seat Rear Crossmember Z	ENDEVCO	AC-J29805	07-Feb-08	07-Aug-08
Right Seat Rear Crossmember Z	ENDEVCO	AC-P16625	25-Jan-08	25-Jul-08

APPENDIX E

VEHICLE INTERIOR INTRUSION MEASUREMENTS

DRIVER SIDE INTRUSION MEASUREMENTS

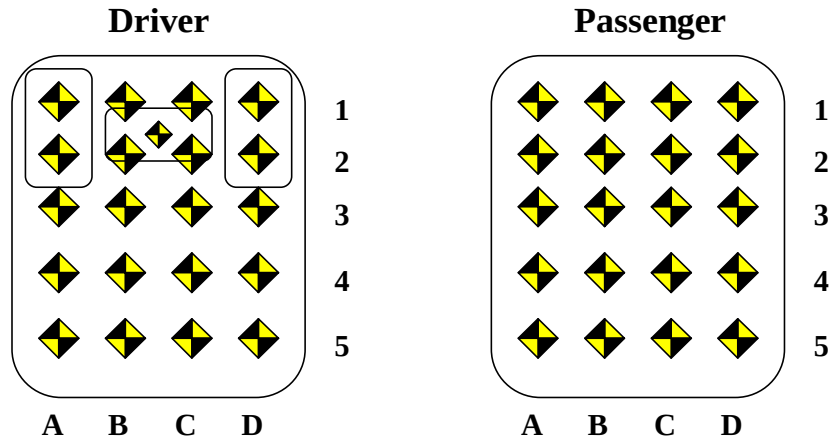


Driver Side Intrusion Measurements

Intrusion Location	PRE-TEST (mm)			POST-TEST (mm)			CHANGE (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3207	-536	-433	3191	-526	-445	16	-10	12
B1	3329	-429	-429	3299	-415	-463	30	-14	34
C1	3327	-306	-425	3267	-294	-472	60	-12	47
D1	3319	-183	-422	3276	-176	-465	43	-7	43
A2	3143	-538	-359	3132	-529	-366	11	-9	7
B2	3246	-427	-355	3227	-420	-381	19	-7	26
C2	3227	-307	-353	3191	-299	-396	36	-8	43
D2	3273	-182	-355	3248	-183	-389	25	1	34
A3	3071	-538	-276	3066	-530	-277	5	-8	1
B3	3129	-424	-278	3123	-414	-287	6	-10	9
C3	3130	-308	-279	3115	-302	-299	15	-6	20
D3	3103	-185	-277	3092	-178	-291	11	-7	14
A4	3035	-537	-272	3031	-527	-269	4	-10	-3
B4	3035	-422	-267	3031	-414	-264	4	-8	-3
C4	3039	-306	-269	3034	-299	-264	5	-7	-5
D4	3036	-186	-274	3025	-179	-278	11	-7	4
A5	2939	-535	-271	2940	-527	-274	-1	-8	3
B5	2943	-420	-270	2942	-412	-270	1	-8	0
C5	2948	-306	-270	2946	-298	-270	2	-8	0
D5	2950	-184	-273	2945	-179	-276	5	-5	3
BP	3174	-317	-446	3168	-313	-455	6	-4	9
G	2920	-491	-718	2921	-485	-723	-1	-6	5
H	2899	-199	-719	2902	-197	-733	-3	-2	14
L	2682	-351	-926	2703	-344	-898	-21	-7	-28
AB	2631	-558	-336	2627	-553	-335	4	-5	-1

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	3301	181	-428	3280	182	-450	21	-1	22
B1	3300	304	-428	3282	315	-453	18	-11	25
C1	3307	433	-430	3269	428	-465	38	5	35
D1	3243	541	-425	3212	539	-443	31	2	18
A2	3201	184	-347	3191	185	-370	10	-1	23
B2	3200	306	-347	3189	304	-371	11	2	24
C2	3202	426	-345	3192	427	-364	10	-1	19
D2	3204	541	-346	3197	536	-358	7	5	12
A3	3120	187	-281	3115	184	-296	5	3	15
B3	3116	305	-278	3115	299	-296	1	6	18
C3	3112	425	-277	3112	414	-288	0	11	11
D3	3112	543	-278	3109	534	-281	3	9	3
A4	3036	190	-270	3035	187	-280	1	3	10
B4	3031	298	-271	3033	295	-277	-2	3	6
C4	3031	420	-270	3029	415	-274	2	5	4
D4	3029	542	-268	3029	536	-269	0	6	1
A5	2951	189	-272	2952	185	-281	-1	4	9
B5	2947	301	-272	2950	296	-275	-3	5	3
C5	2947	417	-271	2946	409	-271	1	8	0
D5	2941	542	-271	2944	542	-273	-3	0	2
R	2888	196	-732	2887	195	-749	1	1	17
S	2918	494	-723	2914	494	-732	4	0	9
AB	2630	558	-338	2629	557	-338	1		0

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

AB = Front outboard seat anchor bolt