

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**TOYOTA MOTOR CORPORATION
2008 TOYOTA SCION XB
5-DOOR MPV**

NHTSA NUMBER: M85100

**PREPARED BY:
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JUNE 13, 2007

FINAL REPORT

**PREPARED FOR:
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Technical Report Documentation Page

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2008 Toyota Scion xB 5-Door MPV at Karco Engineering, LLC on 6/13/07. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.44 km/h. The ambient temperature at the barrier face at the time of impact is 37.2 degrees Celcius. The vehicle's maximum post-test static crush is 349 mm at the vehicle's centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:					
Measurement Description		Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)		N/A	1000	417.7	479.0
Max. Chest Accel. (3 msec Clip)		G's	60	47.3	48.4
Left Femur Force		Newtons	10008	-5798.6	-3334.1
Right Femur Force		Newtons	10008	-4279.9	-3942.2
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SECTION 1

PURPOSE AND SUMMARY OF TEST M85100

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-D-00027. 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 30 mph (48.3 km/h) requirements.

The 35 mph (56.3 km/h) frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated July 2005. 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.

1.2 SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2008 Toyota Scion xB 5-Door MPV at a velocity of 56.44 km/h. The test was performed at Karco Engineering, LLC on June 13, 2007.

Three (3) real-time and fourteen (14) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet number 14 (page number 24) of this report.

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

Both ATDs were fully instrumented with head (primary and redundant), chest (primary and redundant) and pelvis triaxial accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were placed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. Shoulder belt spool-off was measured for the driver and passenger dummies. The driver (position 1) ATD (Serial No. 035) and the right-front passenger (position 2) ATD (Serial No. 034) were calibrated one test prior to this test.

One hundred and thirty two (132) channels of data were recorded using a TDAS data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the Dummy Response data traces, Appendix C contains the Dummy Calibration data, and Appendix D contains the Child Restraint System Report.

There was 100 percent windshield retention and there was no intrusion into the protected zone of the windshield during the impact event. There was no stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 349 mm at the vehicle's centerline and both the driver and the passenger side doors remained closed and latched during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver ATD's head and chest contacted the airbag and the abdomen had no contact. Both knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD's head and chest contacted the airbag. Both knees contacted the glove box.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY					
ATD Position	HIC	3 msec Clip (g)	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	417.7	47.3	-20.6	-5798.6	-4279.9
Passenger	479.0	48.4	-24.2	-3334.1	-3942.2

Additional data plots for this test are available in the research and development section of the NHTSA website. The website can be found at: www.NHTSA.Dot.Gov

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(\text{tf} - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

* Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
Test Program: 2007 NHTSA 35mph NCAP

NHTSA No.: M85100
Test Date: 6/13/07

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.44
Test Weight	kg	1601
Impact Angle	degrees	0
Average Rebound	mm	2014
Maximum Static Crush	mm	349

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door opening	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools
Rear Door Opening	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools
Seat Track Shift (mm)	None	None
Seat Back Failure	No	No

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/ Serial No.	50% Male Hybrid III No. 035	50% Male Hybrid III No. 034
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	None	Airbag
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

MOVIE COVERAGE

Cameras	Standard	Additional
High Speed	14	0
Real Time	1	2
Total	15	2

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	8
Rigid Barrier Load Cells	36
Total	132

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M85100	Anti-Lock Brakes	Yes
Make	Toyota	All Wheel Drive	No
Model	Scion xB	Power Steering	Yes
Body Style	5-Door MPV	Driver Front Airbag	Yes
Vin No.	JTLKE50EX81004277	Driver Side Airbag	Yes
Color	Silver	Driver Head Airbag	No
Delivery Date	5/21/2007	Driver Curtain Airbag	Yes
Odometer (Miles)	14.0	Pass. Airbag	Yes
Dealer	Valley Hi-Toyota	Pass. Side Airbag	No
Transmission	4-Speed Automatic	Pass. Head Airbag	No
Final Drive	Front	Pass. Curtain Airbag	Yes
Type/No. Cyl.	In-line 4 Cylinder	Pre-Tensioners	Yes
Engine Disp. (L)	2.4	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air. Cond.	Yes
Sunroof/T-Top	No	AM/FM CD	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	Yes	Automatic Door Locks	Yes
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	No
Rear Disc	Yes	Other	None

Does Owners Manual provide instructions to turn off automatic door locks.

Yes

DATA FROM MANUFACTURER

Manufactured By	Toyota Motor Corp.	GVWR (kg)	1860
Date of Manufacture	Apr-07	GAWR Front (kg)	1030
		GAWR Rear (kg)	855

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

DATA SHEET NO. 2...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

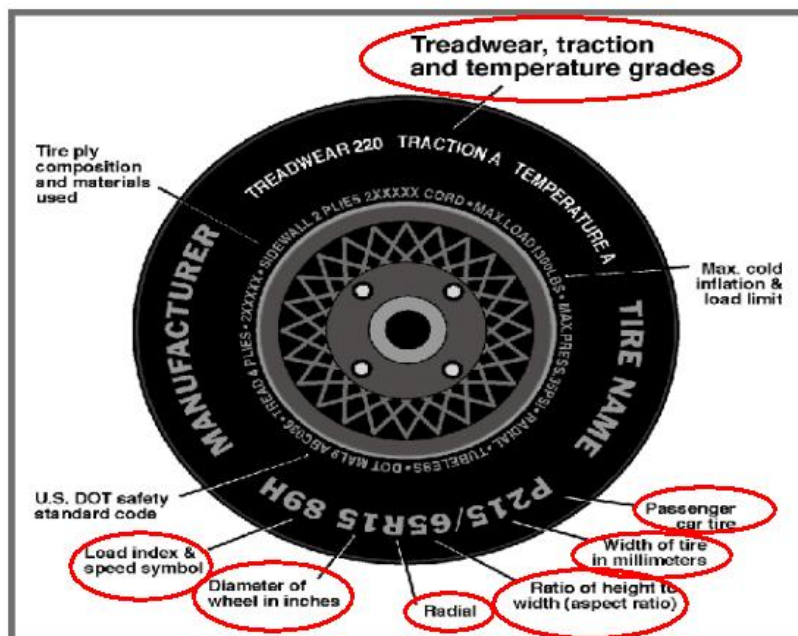
Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	308	308
Cold Pressure (kpa)	240	220
Recommended Tire Size	P205/55R16	P205/55R16
Tire Size on Vehicle	P205/55R16	P205/55R16
Tire Manufacturer	Bridgestone	Bridgestone
Treadwear	300	300
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	89H	89H
Tire Material	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
DOT Safety Code Right	EL8K-JAE1407	EL8K-JAE1307
DOT Safety Code Left	EL8K-JAE1407	EL8K-JAE1407

DATA SHEET NO. 2...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	450	272	722	469	347	816
Right	kg	438	249	687	462	323	785
Ratio	%	63.0	37.0	100.0	58.1	41.9	100.0
Totals	kg	888	521	1409	931	670	1601

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1409
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	45
Calculated Vehicle Target Wt. (TVTW)	kg	1606

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	690	695	737	741	968
As Tested	mm	672	668	678	685	1096

Vehicle Wheel Base (mm) 2619

Weight of Ballast Secured in cargo area (kg) 0

Weight of Items Removed (kg) 98

Vehicle Components Removed Rear Hatch, Rear Side Panels, Taillights, Exhaust
Removed 2/3 of Solvent to Reach TVTW

* Ballast weight does not include cameras, instrumentation and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 52.99

Actual Test Volume with entire fuel System Filled (L) 19.00

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Red

Is Vehicle Fuel Pump Electric or Mechanical? Electric

If electric, does pump operate with ignition switch "On" & engine "OFF" Yes

Fuel System Particulars: Electric fuel pump. Activated when electrical system is activated.
Fuel pump will run during the operation of the engine.

DATA SHEET NO. 3**POST-TEST IMPACT DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**SPEED TRAP DATA**

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	56.44
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	56.42

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4067	3858	-209
Center	mm	4240	3891	-349
Right Side	mm	4070	3799	-271

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	2025
Center	mm	1970
Right Side	mm	2047
Average	mm	2014

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

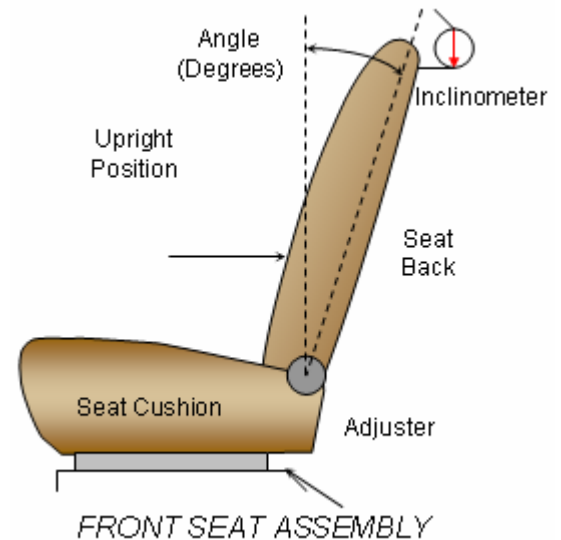
Test Date: 6/13/07

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturer's designated angle. The procedure is as follows: Seat back angle was measured at the headrest of the seat using a digital inclinometer.

SEAT BACK ANGLES

	Deg.
Driver w/seated Dummy	2.0 @ Headrest
Passenger w/seated Dummy	1.0 @ Headrest

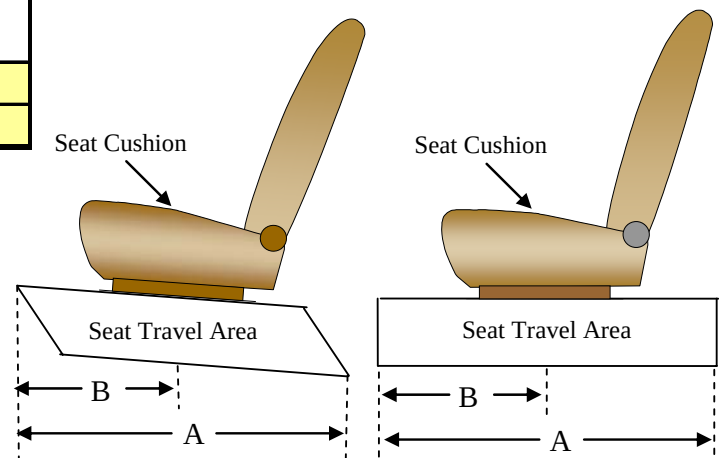


SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position. There were vertical adjustments on the seats that were equipped with the vehicle. They were placed at the lowermost position.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position
Driver Seat	274 mm	139 mm
Passenger Seat	240 mm	120 mm



SEAT BELT UPPER ANCHORAGE

Position number two (2) from the uppermost position.

SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	4	2
Passenger Seat	4	2

DATA SHEET NO. 4...(CONTINUED)

TEST VEHICLE INFORMATION

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

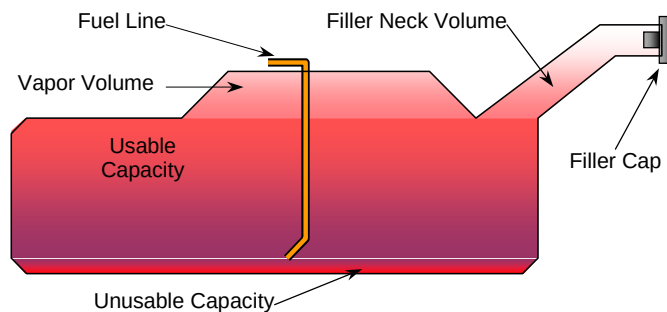
Test Date: 6/13/07

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	52.99
Usable Capacity of "Optional" Tank	
Usable Capacity used for FMVSS 301	48.75 to 49.81
Actual Amount of Solvent used	19.00*

* Approved by NHTSA

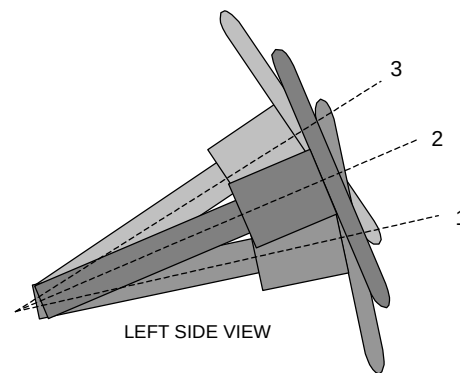
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	26.5	
Geometric center position No. 2	28.2	
Uppermost position No. 3	29.8	

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		37.6		
SWA	Steering Wheel Angle		62.0		
SCA	Steering Column Angle		28.2		
SA	Seat Back Angle		2.0 @ Headrest		1.0 @ Headrest
HZ	Head to Roof (Z)	280		250	
HH	Head to Header	592		510	
HW	Head to Windshield	775		648	
HR	Head to Side Header (Y)	360		345	
NR	Nose to Rim	409	11.5		
CD	Chest to Dash	540		530	
CS	Chest to Steering Hub	300			
RA	Rim to Abdomen	192			
KDL	Left Knee to Dash	130	1.5	115	
KDR	Right Knee to Dash	120		118	19.6
PA	Pelvic Angle		22.8		21.1
TA	Tibia Angle		50.9		59.6
KK	Knee to Knee (Y)	345		270	
SK	Striker to Knee	640	15.0	650	13.5
ST	Striker to Head	427	73.7	454	75.4
SH	Striker to H-Point	347	45.0	345	45.0
SHY	Striker to H-Point (Y)	258		245	
HS	Head to Side Window	370		370	
HD	H-Point to Door (Y)	145		140	
AD	Arm to Door (Y)	142		132	

DATA SHEET NO. 5...(CONTINUED)

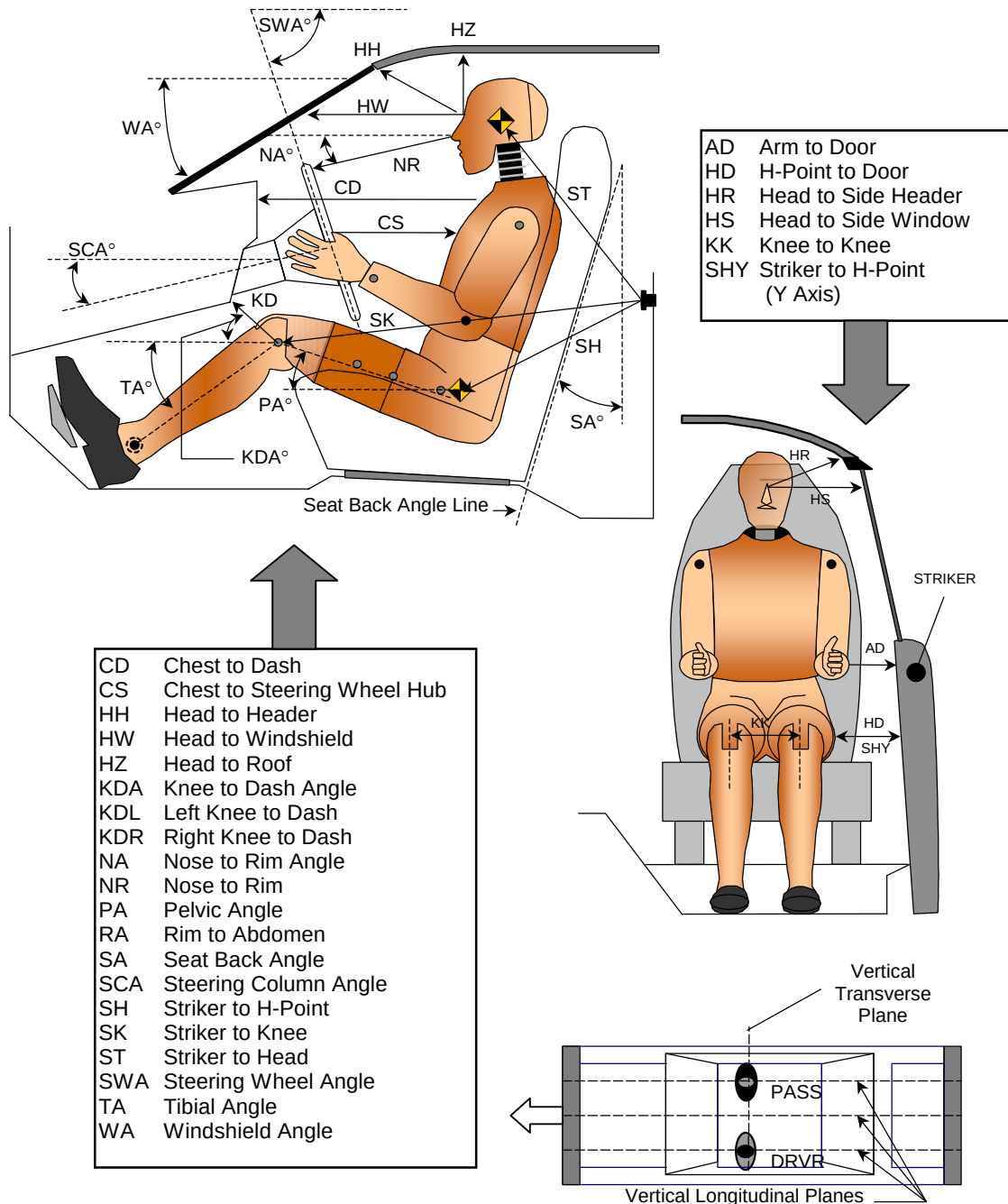
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6

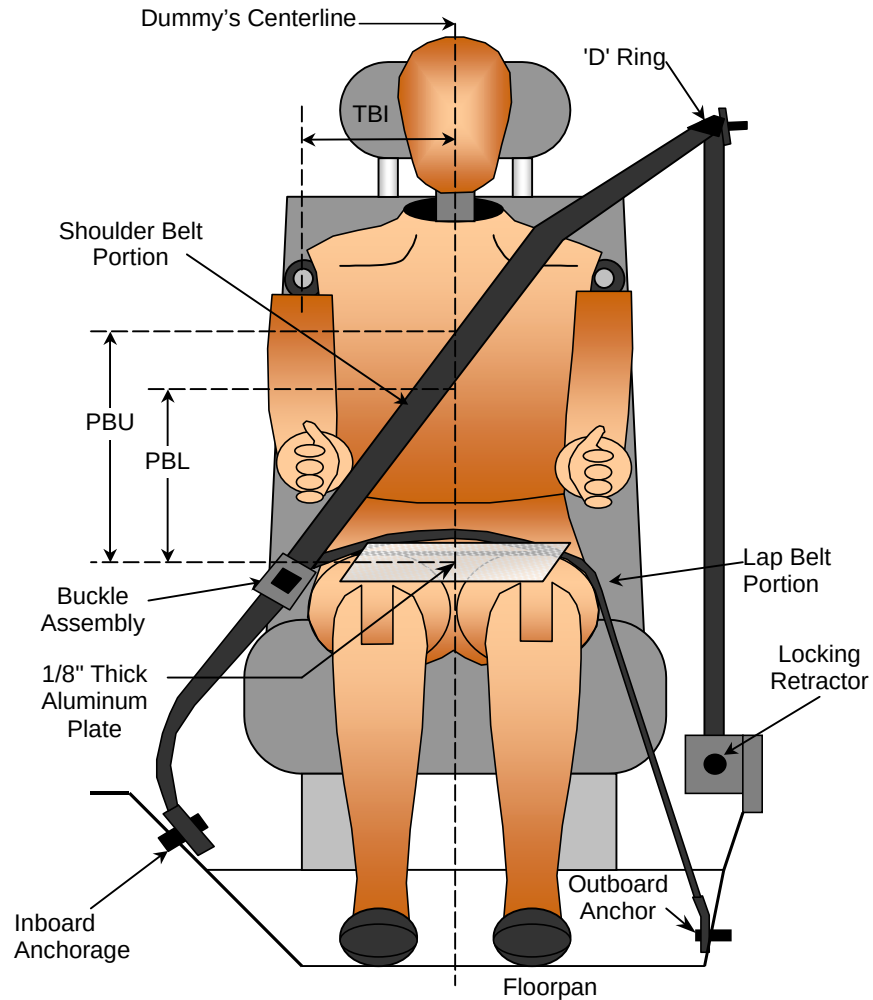
SEAT BELT POSITIONING DATA

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	221	220
PBU - Top Surface of reference to belt upper edge	mm	360	340
PBL - Top Surface of reference to belt lower edge	mm	280	270
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

Test Date: 6/13/07

Test Program: 2007 NHTSA 35mph NCAP

NHTSA No.: M85100

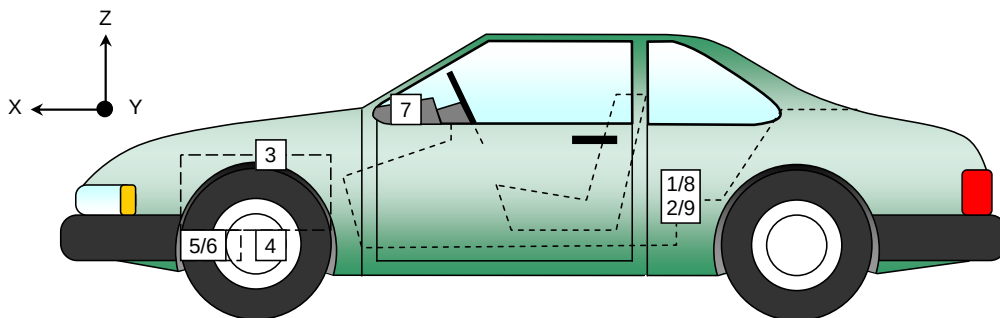
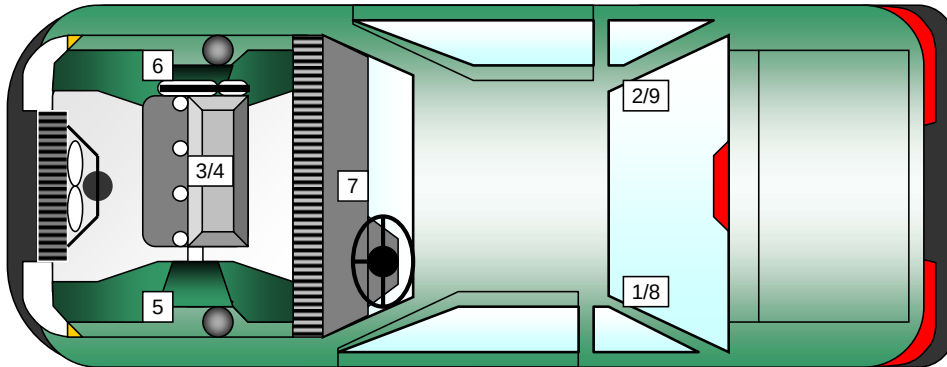
VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	1564	-739	349
2	Right Rear X-Member	1559	739	349
3	Engine Top	3560	190	905
4	Engine Bottom	2605	197	120
5	Left Brake Caliper	3515	-682	359
6	Right Brake Caliper	3515	682	359
7	Instrument Panel			
8	Left Rear X-Member (Z-Axis)	1564	-739	349
9	Right Rear X-Member (Z-Axis)	1559	739	349

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

1.) Instrument Panel no longer used by NHTSA

2.) Insufficient room for installation



DATA SHEET NO. 8**SEAT BELT ASSESSMENT TEST DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	800	800
Shoulder Belt length as measured on ATD	mm	930	954
Lap Belt length as measured on ATD	mm	942	965
Remainder of belt on reel	mm	780	695
Total belt length for continuous webbing systems	mm	3452	3414

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	150	218
As determined electronically	mm	235	335

** Channel Failed, No Data

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically between belt load cell and "D" ring	mm/cm	*	*
Mechanically	mm/cm		

* Not used with shoulder belt pre-tensioner systems

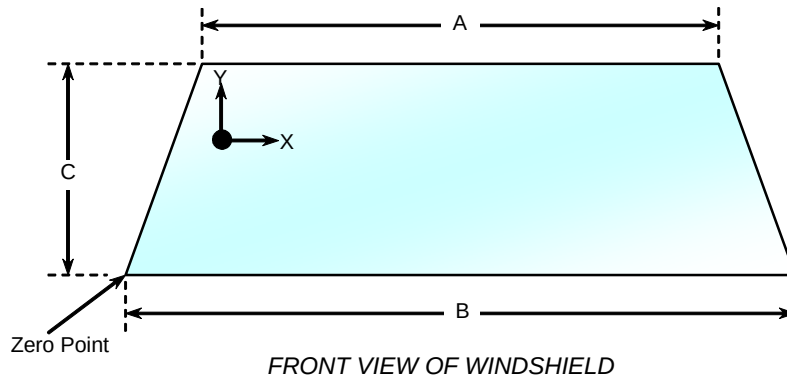
DATA SHEET NO. 9**SUMMARY OF FMVSS 212 DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07

Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles that are equipped with occupant passive restraints.

Temperature of windshield molding during test: 28.0 °C**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	2045	2045	100
Right Side	2045	2045	100
Total	4090	5148	100

**WINDSHIELD DIMENSIONS**

Item	Units	Segment Length	Molding Width
A	mm	1285	15
B	mm	1535	35
C-Left	mm	635	15
C-Right	mm	635	15

DATA SHEET NO. 10

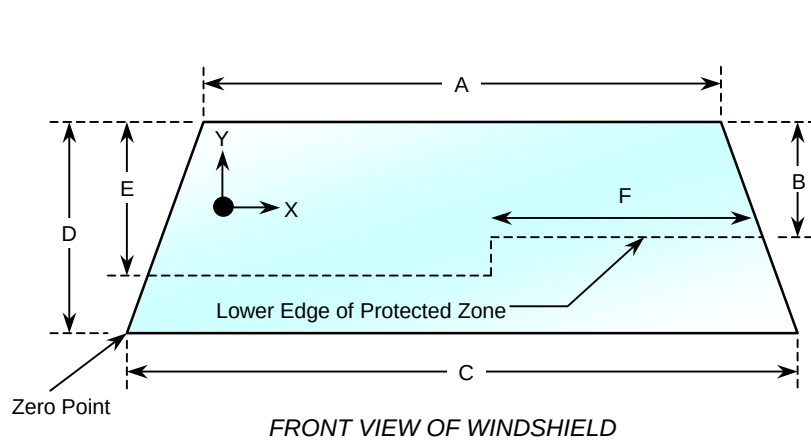
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1285
B	mm	350
C	mm	1535
D	mm	635
E	mm	416
F	mm	950

AREA OF PROTECTED ZONE FAILURES

- A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one that is normally in contact with the windshield.

X	Y

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y

DATA SHEET NO. 11

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV NHTSA No.: M85100
Test Program: 2007 NHTSA 35mph NCAP Test Date: 6/13/07

Test Time: 5:17 PM

Temperature: 37.2 ° C

STODDARD SOLVENT SPILLAGE MEASUREMENTS

- A. From impact until vehicle motion ceases: 0.0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)
- C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)
- D. Spillage Location Details: No leakage occurred

DATA SHEET NO. 12

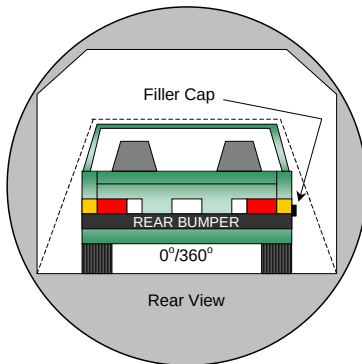
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

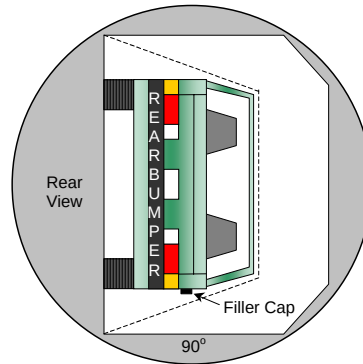
NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

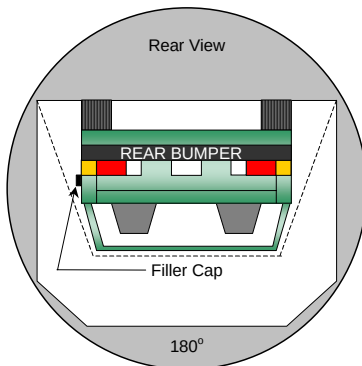
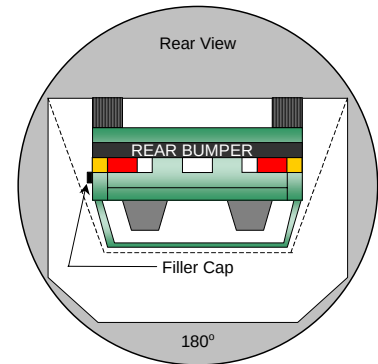
Test Date: 6/13/07



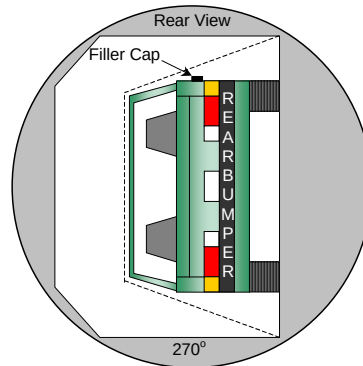
0° to 90°



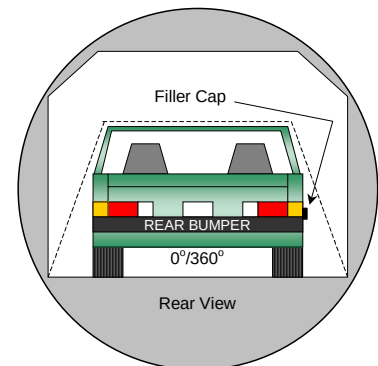
90° to 180°



180° to 270°



270° to 360°



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. No solvent leakage occurred during rollover.

DATA SHEET NO. 12...(CONTINUED)**FMVSS 301 STATIC ROLLOVER DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	84	303	387
90° to 180°	85	305	390
180° to 270°	89	306	395
270° to 360°	82	309	391

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

First 5 Minutes	5.0
Sixth Minute	1.0
Seventh Minute	1.0
Eighth Minute	1.0

ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 13**VEHICLE MEASUREMENTS**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**VEHICLE MEASUREMENT TABLE**

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4240	3891	-349
2	RSOV to front of engine	mm	3604	3439	-165
3	RSOV to firewall centerline	mm	3229	3190	-39
4	RSOV to leading edge of right door	mm	2945	2900	-45
5	RSOV to leading edge of left door	mm	2961	2967	6
6	RSOV to lower leading edge of right door	mm	2886	2899	13
7	RSOV to lower leading edge of left door	mm	2904	2920	16
8	RSOV to upper trailing edge of right door	mm	1863	1893	30
9	RSOV to upper trailing edge of left door	mm	1874	1887	13
10	RSOV to lower trailing edge of right door	mm	1851	1862	11
11	RSOV to lower trailing edge of left door	mm	1860	1863	3
12	RSOV to bottom of right 'A' pillar	mm	2916	2903	-13
13	RSOV to bottom of left 'A' pillar	mm	2882	2858	-24
14	RSOV to firewall on right side	mm	3341	3099	-242
15	RSOV to firewall on left side	mm	3337	3104	-233
16	RSOV to steering column	mm	2500	2595	95
17	Center of steering column to left 'A' pillar	mm	390	356	-34
18	Center of steering column to headlining	mm	488	545	57
19	RSOV to right side of front bumper	mm	4070	3799	-271
20	RSOV to left side of front bumper	mm	4067	3858	-209
21	Length of engine block	mm	520	520	0
RD	RSOV to right side of dash panel	mm	2690	2706	16
CD	RSOV to center of dash panel	mm	2661	2717	56
LD	RSOV to left side of dash panel	mm	2716	2720	4

DATA SHEET NO. 13...(CONTINUED)**VEHICLE STRUCTURAL MEASUREMENTS**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**VEHICLE STRUCTURAL MEASUREMENT TABLE**

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4240	3891	-349
2	Total width	mm	1727	1720	-7
3	Bumper top height	mm	642	640	-2
4	Bumper bottom height	mm	172	203	31
5	Longitudinal member top height	mm	540	575	35
6	Longitudinal member bottom height	mm	438	465	27
7	Distance between longitudinal members	mm	930	1020	90
8	Longitudinal member width	mm	60	60	0
9	Engine top height	mm	828	825	-3
10	Engine bottom height	mm	173	175	2
11	Engine and gear box width	mm	795	795	0
12	Front bumper to engine distance	mm	642	475	-167
13	Front shock absorber fixing width	mm	864	855	-9
14	Bonnet leading edge height	mm	760	845	85
15	Front shock absorber fixing width	mm	1200	1180	-20
16	Front bumper to front axle distance	mm	865	523	-342
17	Front axle to 'A' pillar distance	mm	460	400	-60
18	'A' pillar to 'B' pillar distance	mm	1091	1089	-2
19	'B' pillar to rear axle distance	mm	1082	1082	0
20	'B' pillar to 'C' pillar distance	mm	1020	1020	0
21	Roof sill bottom height	mm	1380	1415	35
22	Roof sill top height	mm	1552	1488	-64
23	Floor sill bottom height	mm	280	266	-14
24	Floor sill top height	mm	330	321	-9

DATA SHEET NO. 13...(CONTINUED)

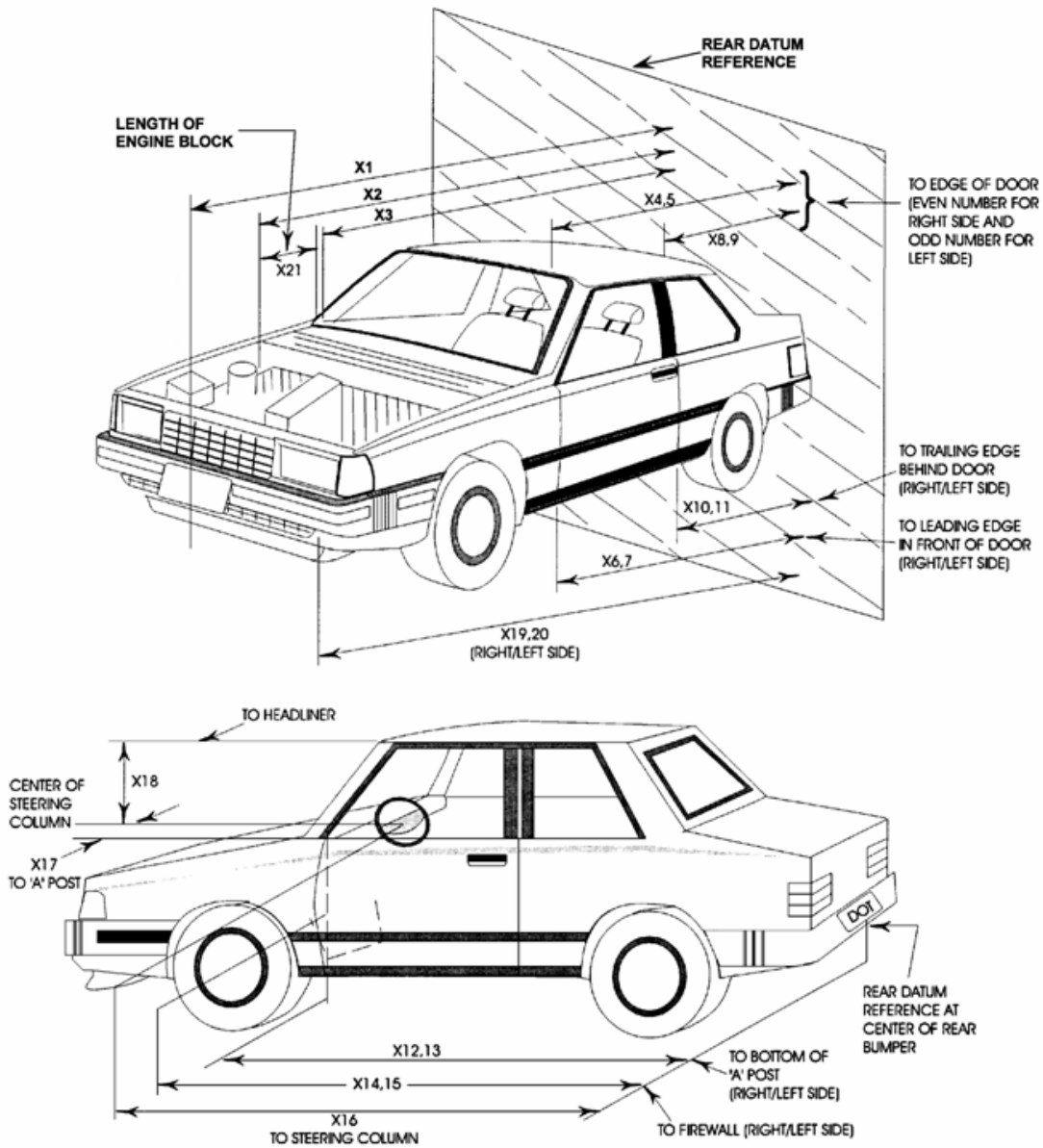
VEHICLE MEASUREMENTS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



DATA SHEET NO. 14**CAMERA LOCATIONS**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**VEHICLE CAMERA MEASUREMENT TABLE**

No.	Camera View	Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time Camera (Panning)	-16589	-7485	-1475	0			30
2	Overall Left Side	-2798	-7397	-1048	0	8105	20mm	1000
3	Closeup Left Side	-2584	-7124	-1095	0	7844	50mm	1000
4	Driver and Interior View	-8696	-12562	-4511	-17	15570	ZOOM	1000
5	Steering Column (Bottom)	-1631	-8234	-2682	-13	9453	35mm	1000
6	Steering Column (Top)	-1663	-8153	-3078	-13	9549	35mm	1000
7	Overall Right Side	-2798	7384	-1048	0	7409	20mm	1000
8	Closeup Right Side	-2584	7052	-1048	0	7079	50mm	1000
9	Passenger and Interior View	-5330	9365	-2407	-10	10211	ZOOM	1000
10	Right Side View	-2006	6967	-1463	-6	7134	ZOOM	1000
11	Windshield View	-589	0	-5556	-90		24mm	1000
12	Driver Front View	378	-286	-2438	-34		25mm	1000
13	Passenger Front View	375	413	-2439	-34		25mm	1000
14	Pit View of Engine	-756	0	1495	90		12mm	1000
15	Pit View of Fuel Tank	-3398	0	1495	90		8mm	1000
16	Real Time Driver	-2458	-7598	1301	-1			30
17	Real Time Passenger	-2985	3981	-1284	-1			30

All measurements are made relative to the point of impact.

DATA SHEET NO. 15

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

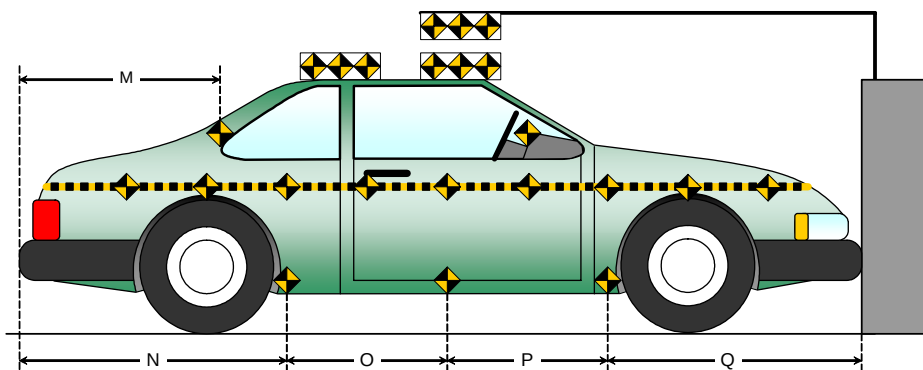
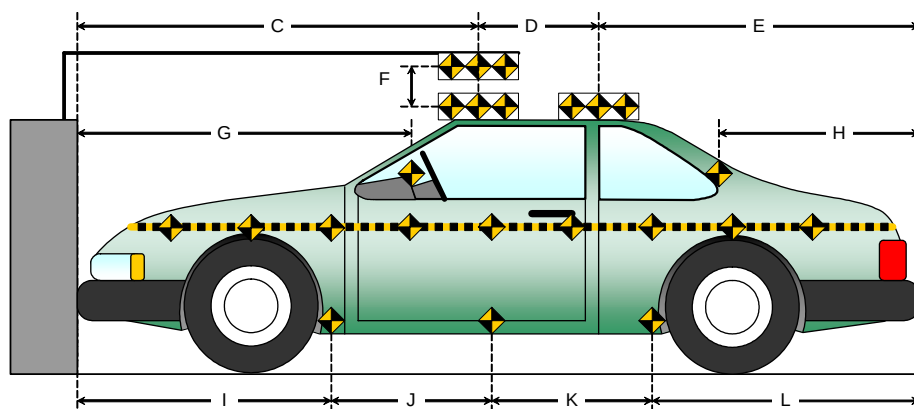
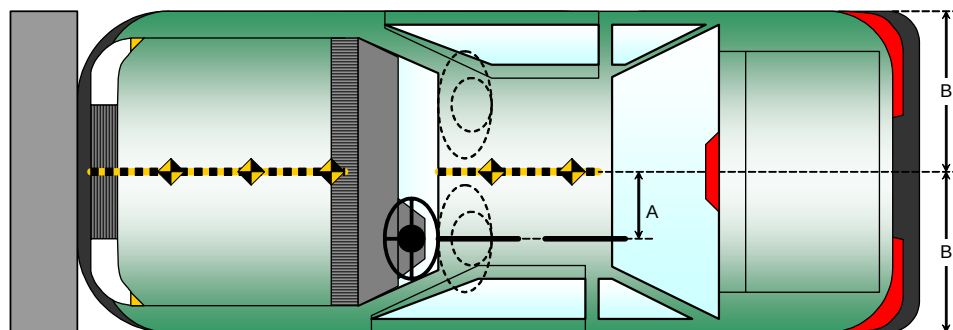
Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

All Dimensions in (mm)	
Item	Value
A	397
B	864
C	2074
D	615
E	1577
F	
G	1595
H	788
I	1314
J	867
K	867
L	1203
M	790
N	1215
O	867
P	867
Q	1310



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

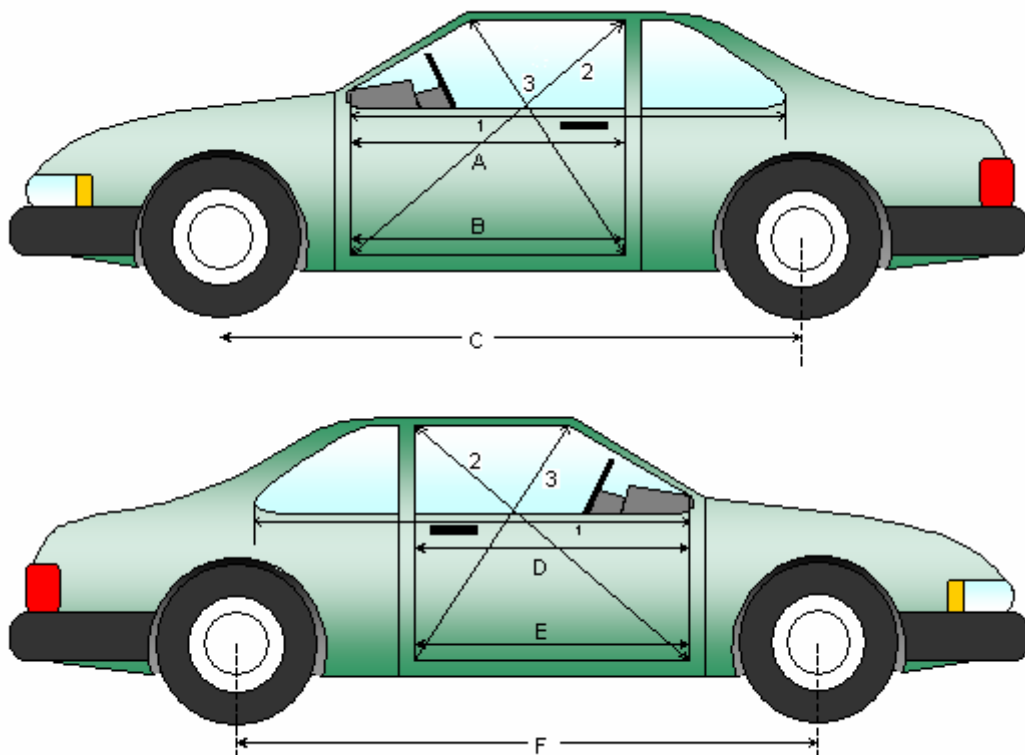
Test Date: 6/13/07

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
1L	Left Side	mm	985	986	1
2L	Left Side (Diagonally)	mm	1480	1480	0
3L	Left Side (Diagonally)	mm	1165	1171	6
1R	Right Side	mm	982	975	-7
2R	Right Side (Diagonally)	mm	1490	1484	-6
3R	Right Side (Diagonally)	mm	1150	1150	0

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2619	2564	-55
F	Right Side Wheel Base	mm	2619	2564	-55



DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

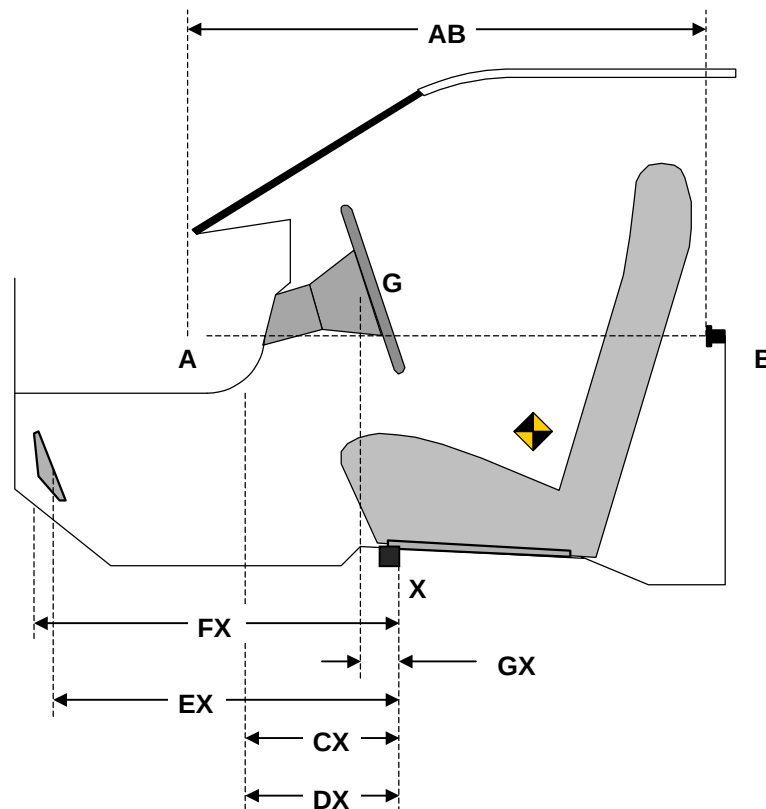
NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	921	930	9
CX	Left Knee Bolster to X	mm	288	252	-36
DX	Right Knee Bolster to X	mm	290	248	-42
EX	Brake Pedal to X	mm	560	570	10
FX	Foot Rest to X	mm	574	580	6
GX	Center of Steering Wheel Hub to X	mm	136	50	-86



DATA SHEET NO. 16...(CONTINUED)

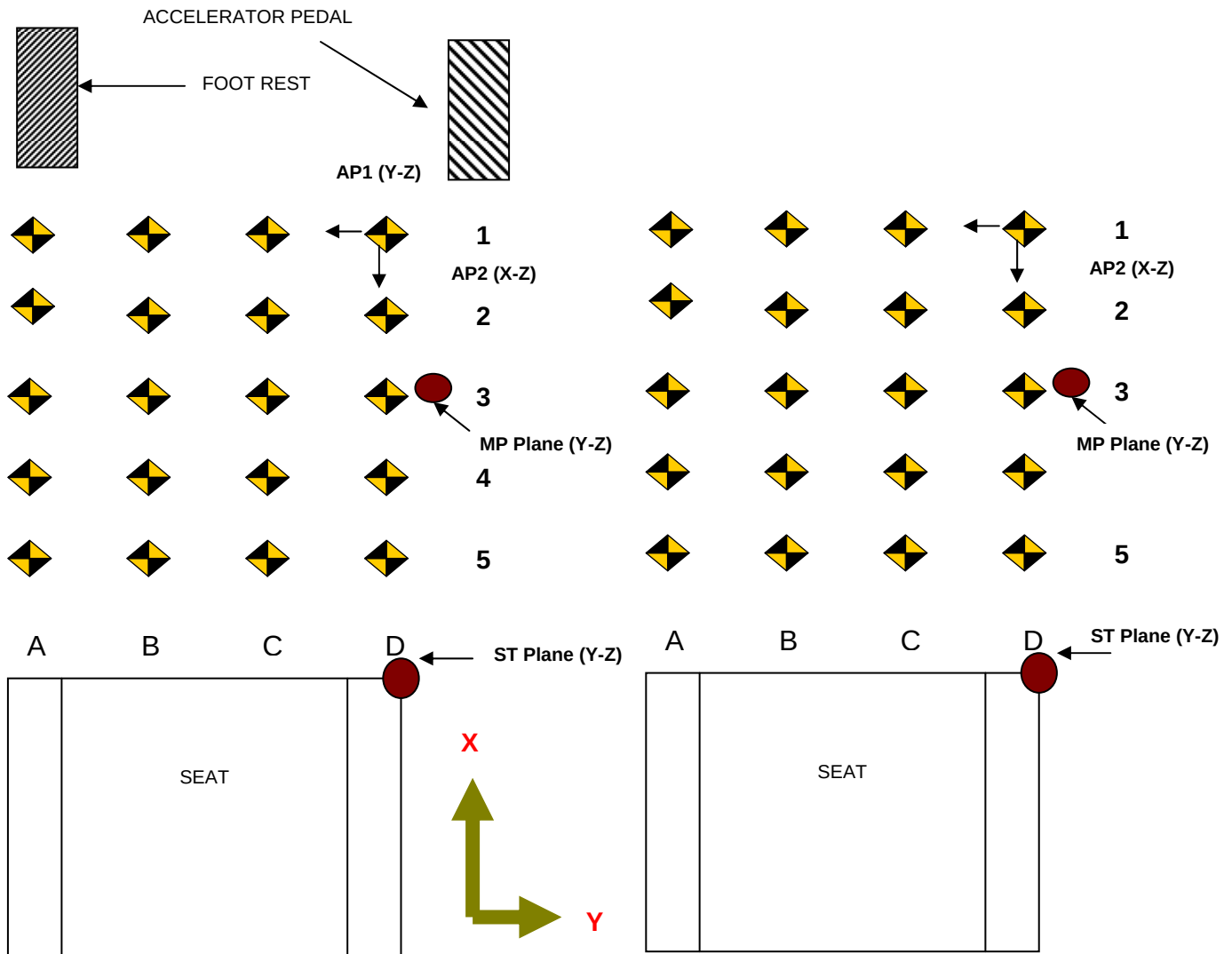
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

MP: Y-Z plane, halfway between the ST plane and AP1 plane

CF Plane: X-Z plane passes through center of footrest.

BP Plane: X-Z plane passes through center of brake pedal

TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

All measurements in mm

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	629	666	665	666	624	637	640	671	5	29	25	-5
2	610	586	589	590	596	574	588	611	14	12	1	-21
3	516	496	494	487	504	491	504	510	12	5	-10	-23
4	408	398	395	387	399	401	405	407	9	-3	-10	-20
5	306	298	292	285	294	295	301	311	12	3	-9	-26

DRIVER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	42	163	281	397	-9	113	236	354	51	50	45	43
2	30	158	283	415	-15	114	239	371	45	44	44	44
3	24	152	279	420	-16	112	238	377	40	40	41	43
4	19	147	276	411	-14	115	245	376	33	32	31	35
5	13	143	267	408	-13	120	244	382	26	23	23	26

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-59	-39	-20	-81	-61	-52	-24	-15	2	13	4	-66
2	35	22	37	22	35	24	46	62	0	-2	-9	-40
3	95	66	93	96	90	80	110	117	5	-14	-17	-21
4	102	73	89	100	103	86	105	113	-1	-13	-16	-13
5	99	72	87	97	102	82	101	113	3	10	14	16

DATA SHEET NO. 16...(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

All measurements in mm

PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	677	687	672	640	653	660	634	625	24	27	38	15
2	604	607	593	603	593	582	569	590	11	25	24	13
3	517	518	503	512	507	502	489	503	10	16	14	9
4	411	412	403	398	399	400	392	391	12	12	11	7
5	315	307	300	299	299	295	290	290	16	12	10	9

PASSENGER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-379	-232	-104	2	-360	-243	-119	-4	-19	11	15	6
2	-382	-236	-105	16	-384	-246	-116	4	2	10	11	12
3	-382	-241	-106	19	-382	-246	-112	13	0	5	6	6
4	-385	-241	-108	14	-383	-243	-113	9	-2	2	5	5
5	-386	-238	-108	11	-387	-240	-113	8	1	2	5	3

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-31	-22	-44	-72	-79	-4	-47	-71	48	-18	3	-1
2	32	34	18	32	65	48	32	42	-33	-14	-14	-10
3	79	88	64	88	109	115	88	95	-30	-27	-24	-7
4	94	87	72	103	119	109	92	116	-25	-22	-20	-13
5	97	86	71	99	118	104	88	111	-21	-18	-17	-12

DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

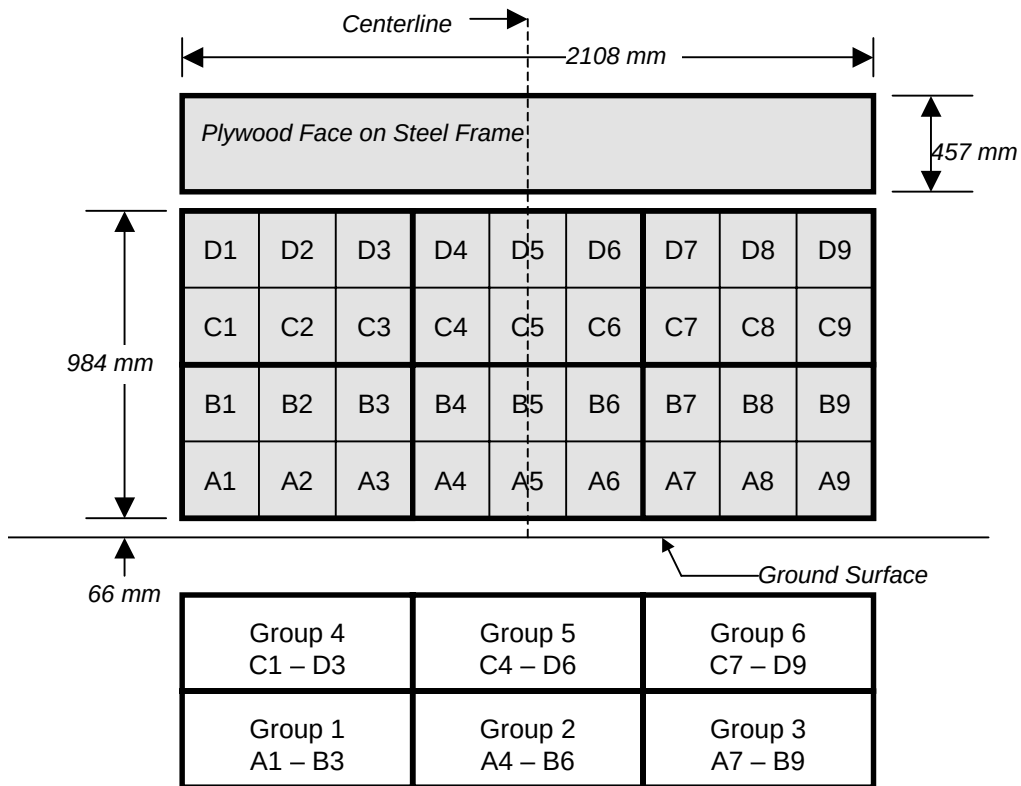
Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

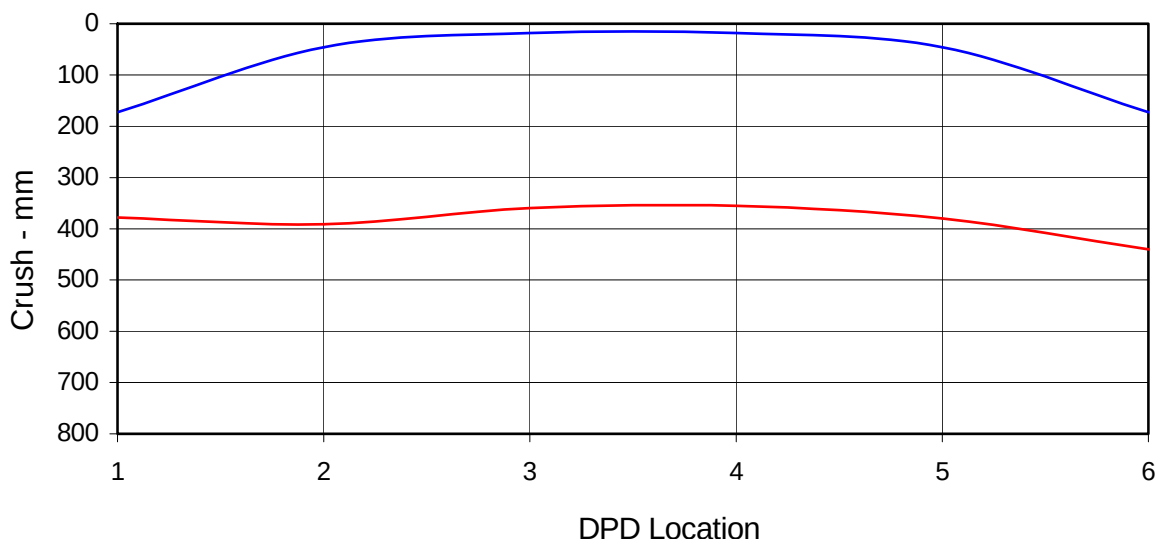
36 Load Cell Rigid Barrier (NHTSA Standard) Load Cell Locations on Fixed Barrier



6 Groups of 6 Load Cells Each

DATA SHEET NO. 18**ACCIDENT INVESTIGATION DIVISION DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**VEHICLE INFORMATION**VIN: JTLKE50EX81004277Wheel base (mm): 2619Vehicle Size Category: 5-Door MPVTest Weight (kg): 1601**ACCELEROMETER DATA**Accelerometer Location: Left rear cross memberCal. Procedure/Interval: 6 months / drop testIntegration Algorithm: NHTSA StandardLinearity: GoodImpact Velocity (km/h): 56.44Velocity Change (km/h): 64.3Time of Separation (msec): 58.2**CRUSH PROFILE**Collision Deformation Classification: 12FDEW6Midpoint of Damage: Vehicle CenterlineDamage Region Length (mm): 1370Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	173	378	-205
C2	Crush zone 2 on left side	mm	46	391	-345
C3	Crush zone 3 on left side	mm	18	360	-342
C4	Crush zone 4 on right side	mm	18	355	-337
C5	Crush zone 5 on right side	mm	46	380	-334
C6	Crush zone 6 at right side	mm	173	440	-267



DATA SHEET NO. 19

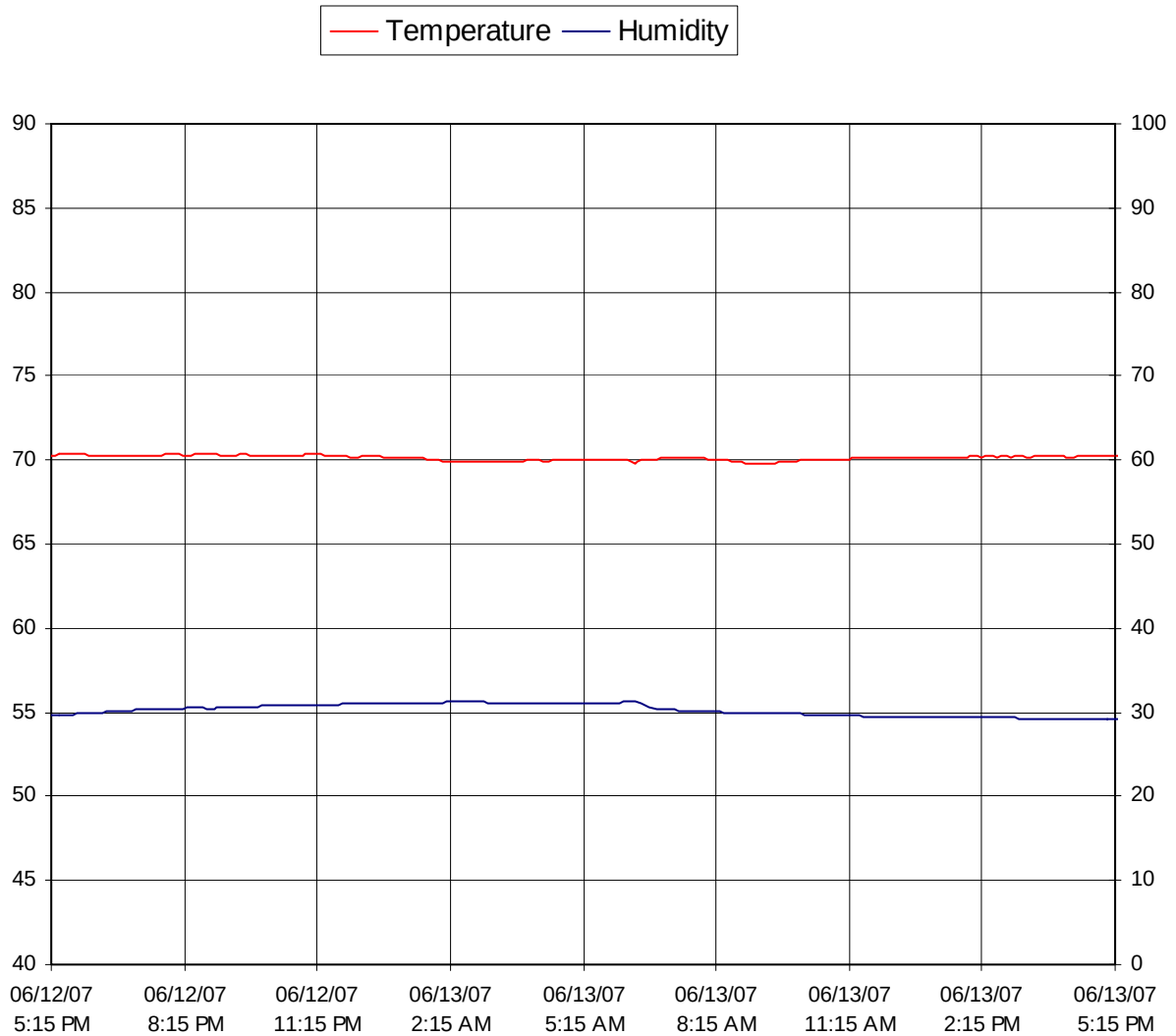
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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A-7	Post-Test Front View	A-7
A-8	Pre-Test Left Side View	A-8
A-9	Post-Test Left Side View	A-9
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A-11	Post-Test Right Side View	A-11
A-12	Pre-Test Right Front $\frac{3}{4}$ View	A-12
A-13	Post-Test Right Front $\frac{3}{4}$ View	A-13
A-14	Pre-Test Left Rear $\frac{3}{4}$ View	A-14
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A-21	Post-Test Engine Compartment (Vehicle Moved)	A-21
A-22	Pre-Test Fuel Cap	A-22
A-23	Post-Test Fuel Cap	A-23
A-24	Pre-Test Front Underbody	A-24
A-25	Post-Test Front Underbody	A-25
A-26	Pre-Test Mid Underbody	A-26
A-27	Post-Test Mid Underbody	A-27
A-28	Pre-Test Rear Underbody	A-28
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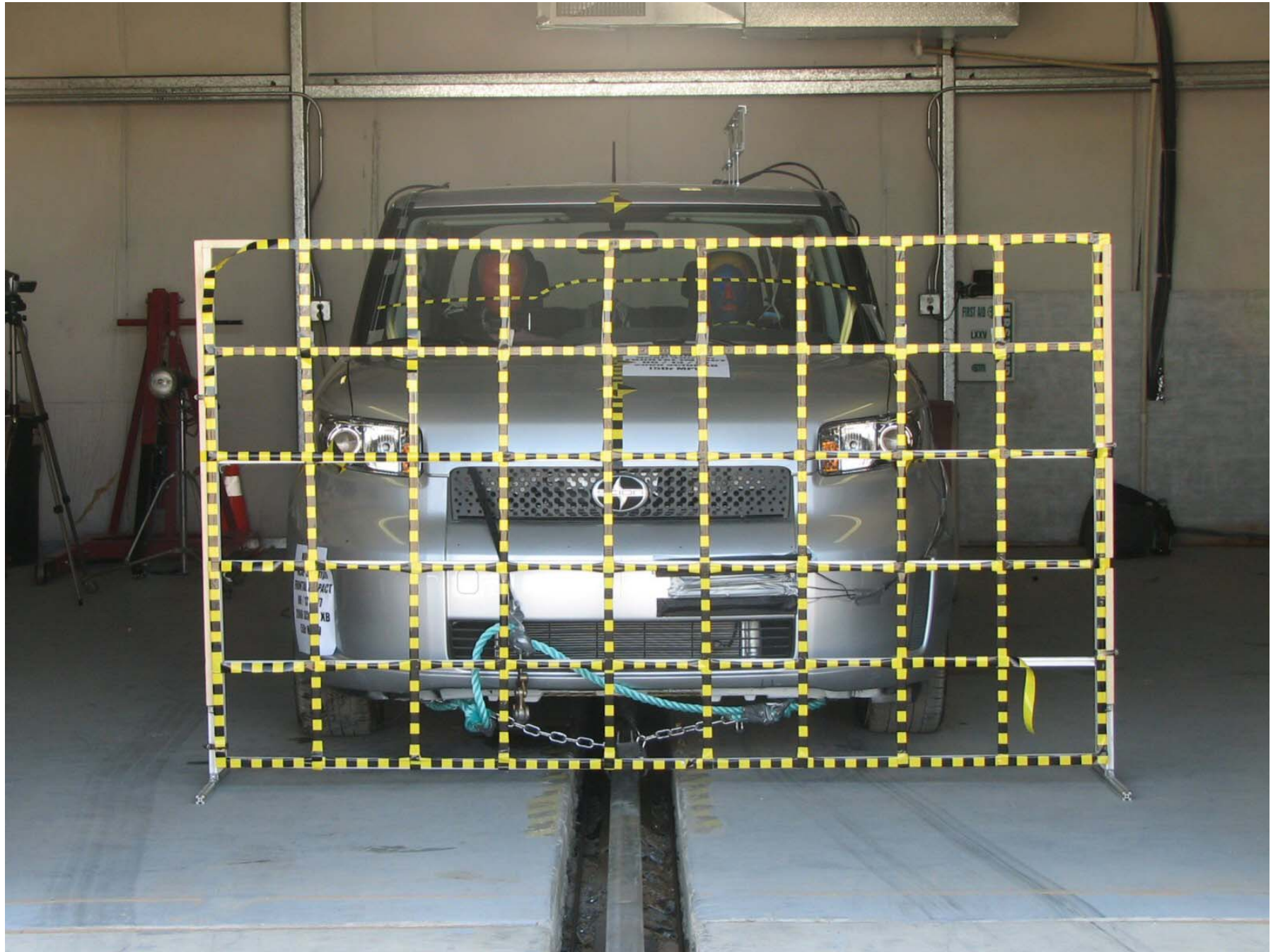


Figure A-1: Load Cell Location

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MFD. BY: TOYOTA MOTOR CORPORATION

04/07

GVWR: 1860KG (4105LB)

GAWR: FRT. 1030KG (2270LB) WITH P205/55R16 TIRES,

16X6 1/2J RIMS, AT 240KPA (35PSI) COLD.

RR. 855KG (1880LB) WITH P205/55R16 TIRES,

16X6 1/2J RIMS, AT 220KPA (32PSI) COLD.

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.

JTLKE50EX81004277 MPV



C/TR: 1F7/FA10

AZE151L-FHPNKA

A/TM: -02A/U241E

MADE IN JAPAN

935

J

Figure A-2: Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY: TOTAL 5
FRONT 2: REAR 3

The combined weight of occupants and cargo should never exceed 385 kg or 850 lbs.

SEE OWNER'S
MANUAL FOR
ADDITIONAL
INFORMATION.

TIRE	SIZE	COLD TIRE PRESSURE
FRONT	P205/55R16	240kPa, 35PSI
REAR	P205/55R16	220kPa, 32PSI
SPARE	T135/70D17	420kPa, 60PSI

INFORMATION SUR LES PNEUS ET LE CHARGEMENT

NOMBRE DE PLACES ASSISES: TOTAL 5
AVANT 2: ARRIÈRE 3

Le poids total des occupants et du chargement ne doit jamais être supérieur à 385 kg ou 850 lb.

PNEUS	DIMENSION	PRESSION DE GONFLAGE À FROID
AVANT	P205/55R16	240kPa, 35PSI
ARRIÈRE	P205/55R16	220kPa, 32PSI
SECOURS	T135/70D17	420kPa, 60PSI

POUR DE PLUS
AMPLES INFOR-
MATIONS, VOIR
LE MANUEL DU
PROPRIÉTAIRE.

C 3^{12E50}

Figure A-3: Tire Placard



Figure A-4: Right Front $\frac{3}{4}$ View, As Received



Figure A-5: Left Rear $\frac{3}{4}$ View, as Received



Figure A-6: Pre-Test Front View



Figure A-7: Post-Test Front View (Vehicle Moved)



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 3/4 View



Figure A-13: Post-Test Right Front ¾ View (Vehicle Moved)



Figure A-14: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-15: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-16: Post-Test Left Side 3/4 View of Doors After Impact



Figure A-17: Post-Test Right Side $\frac{3}{4}$ View of Doors After Impact



Figure A-18: Pre-Test Windshield





Figure A-20: Pre-Test Engine Compartment



Figure A-21: Post-Test Engine Compartment (Vehicle Moved)



Figure A-22: Pre-Test Fuel Cap

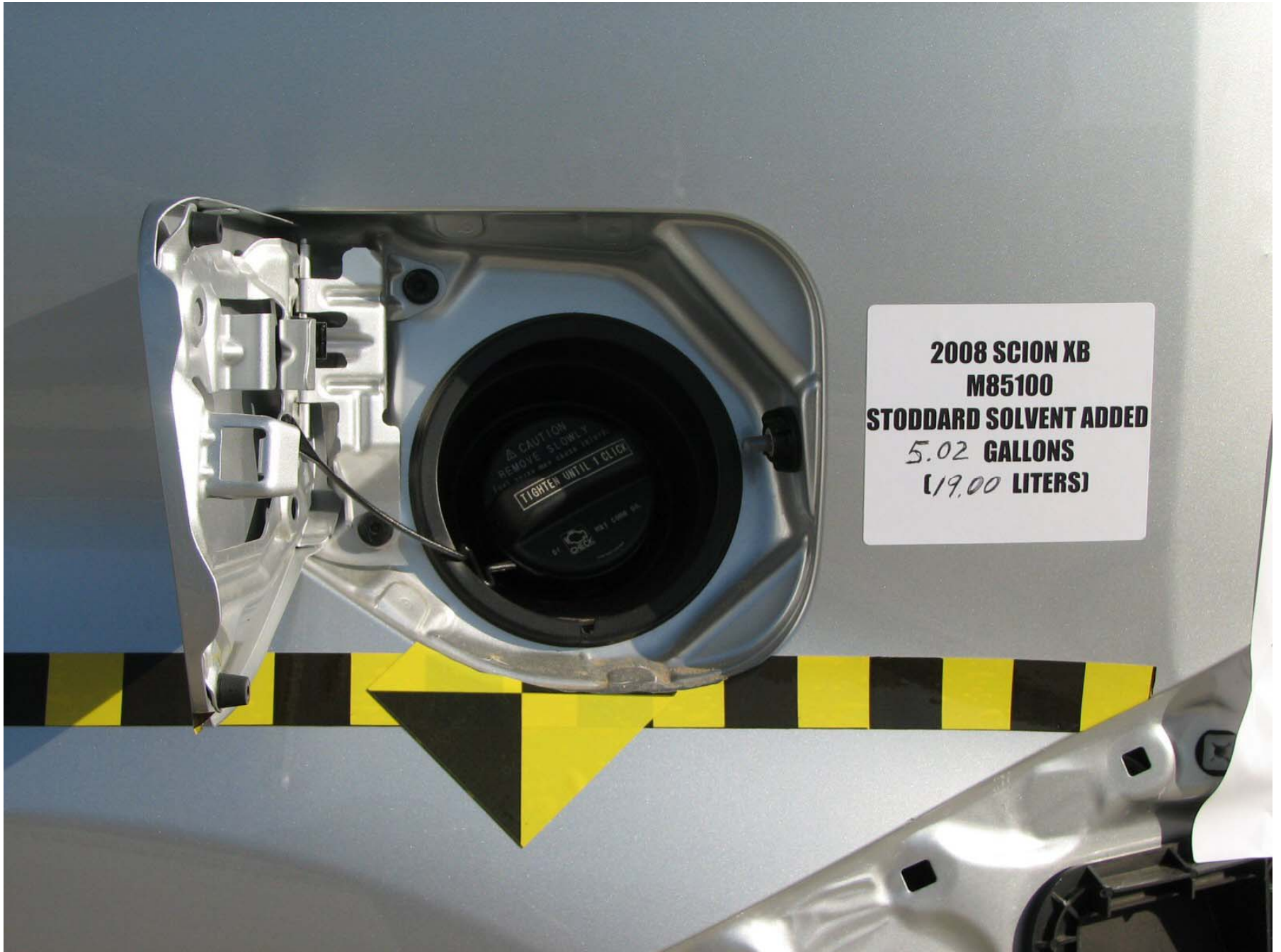


Figure A-23: Post-Test Fuel Cap



Figure A-24: Pre-Test Front Underbody

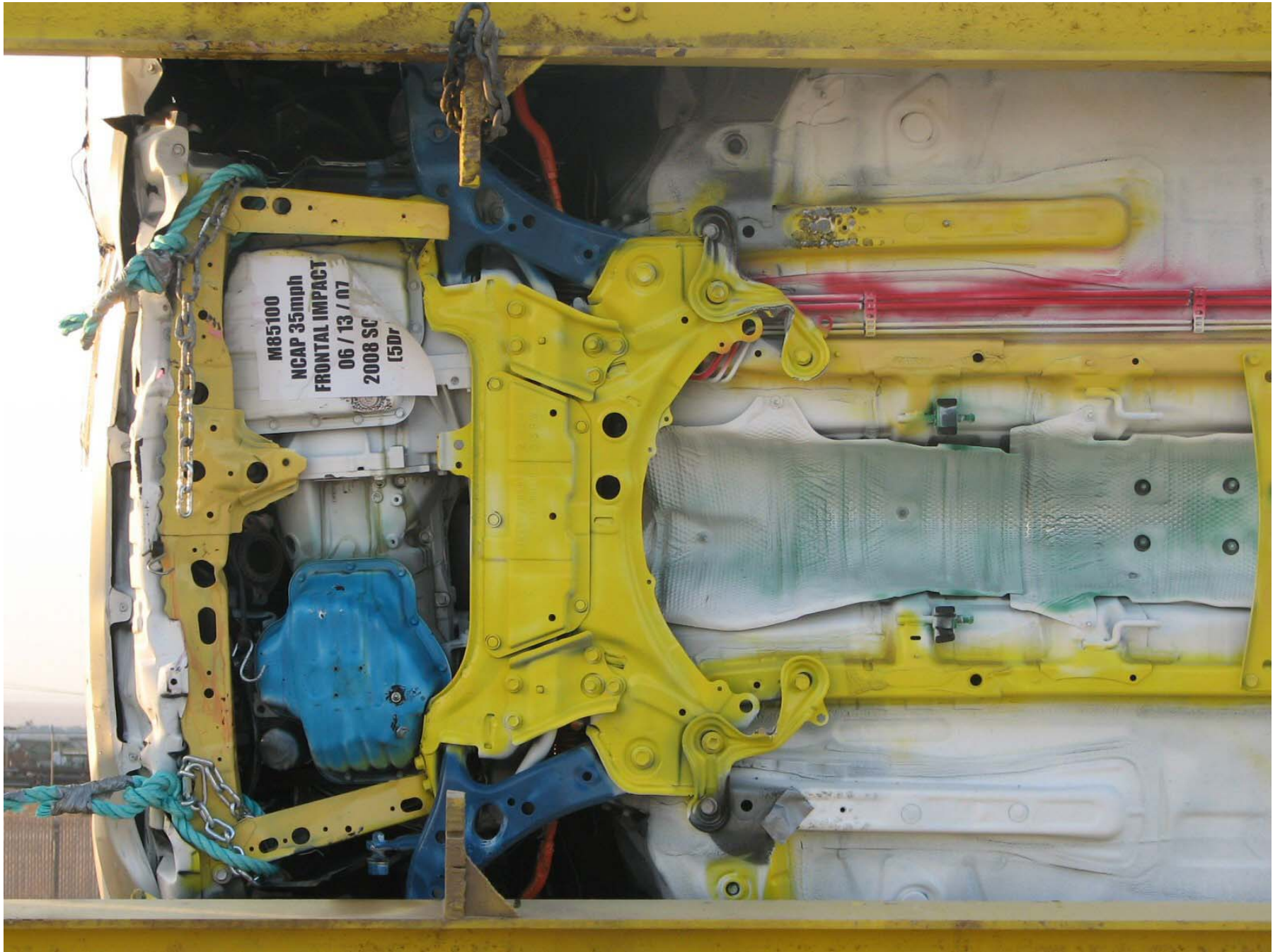


Figure A-25: Post-Test Front Underbody

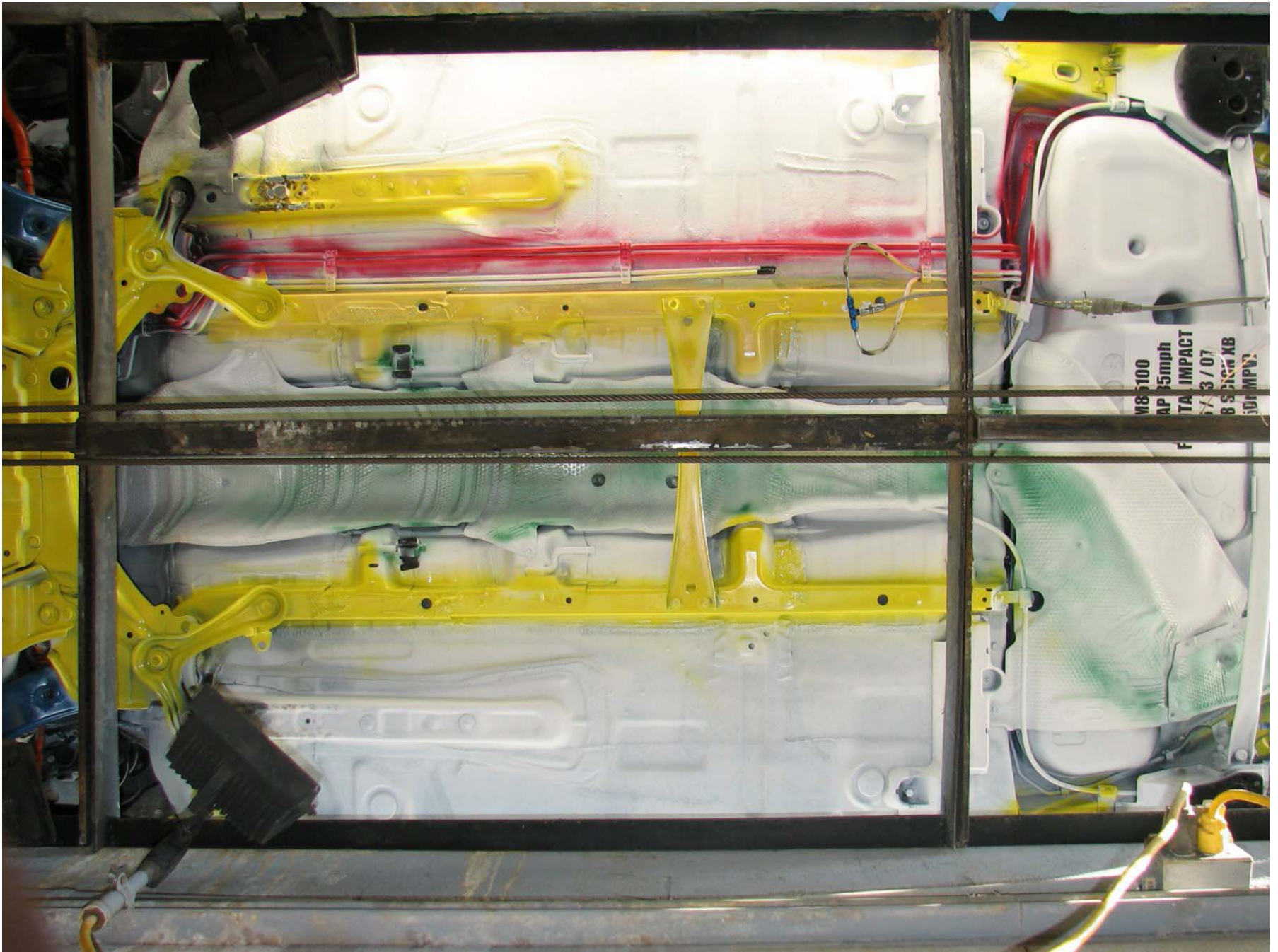


Figure A-26: Pre-Test Mid Underbody

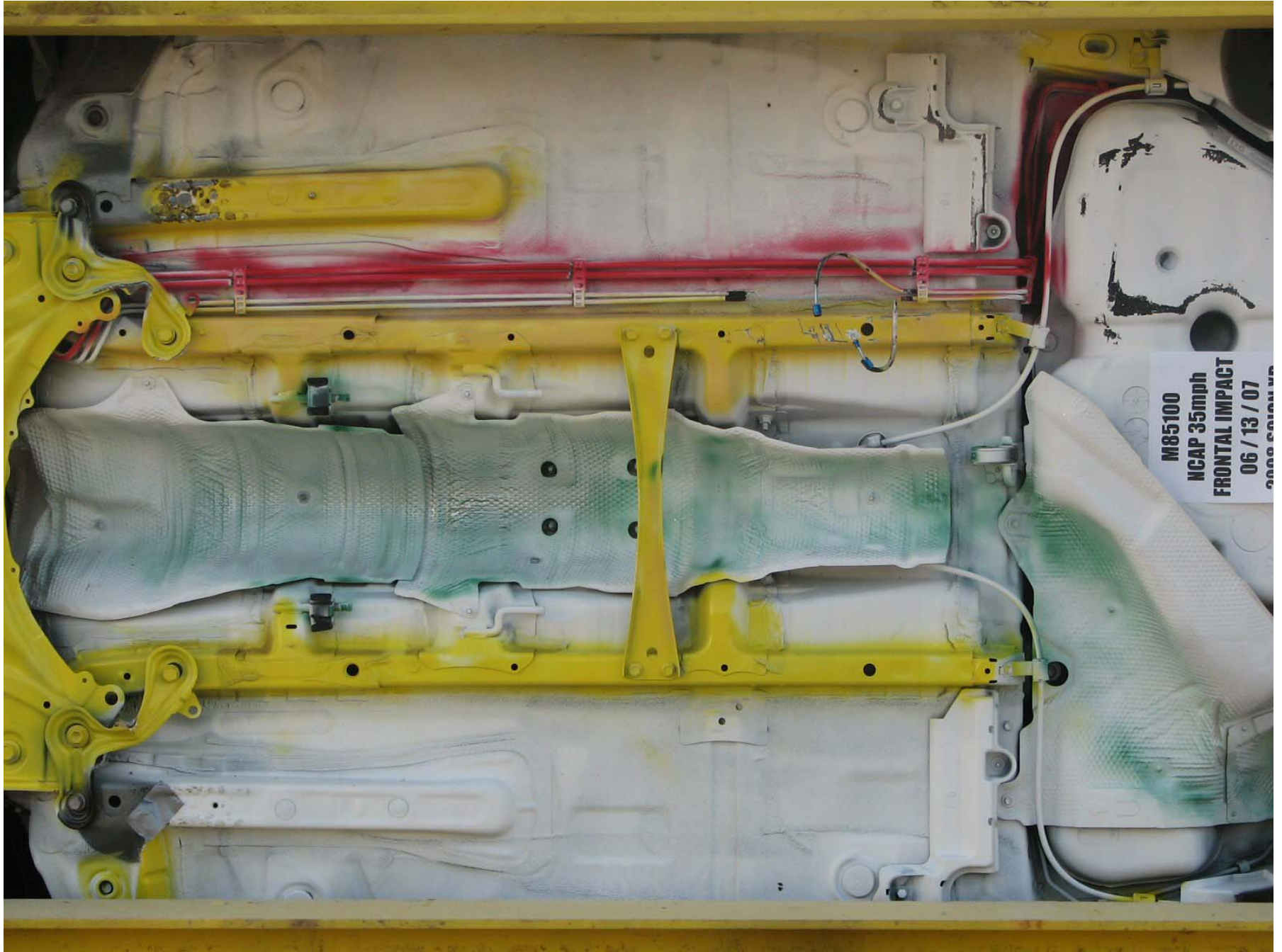


Figure A-27: Post-Test Mid Underbody

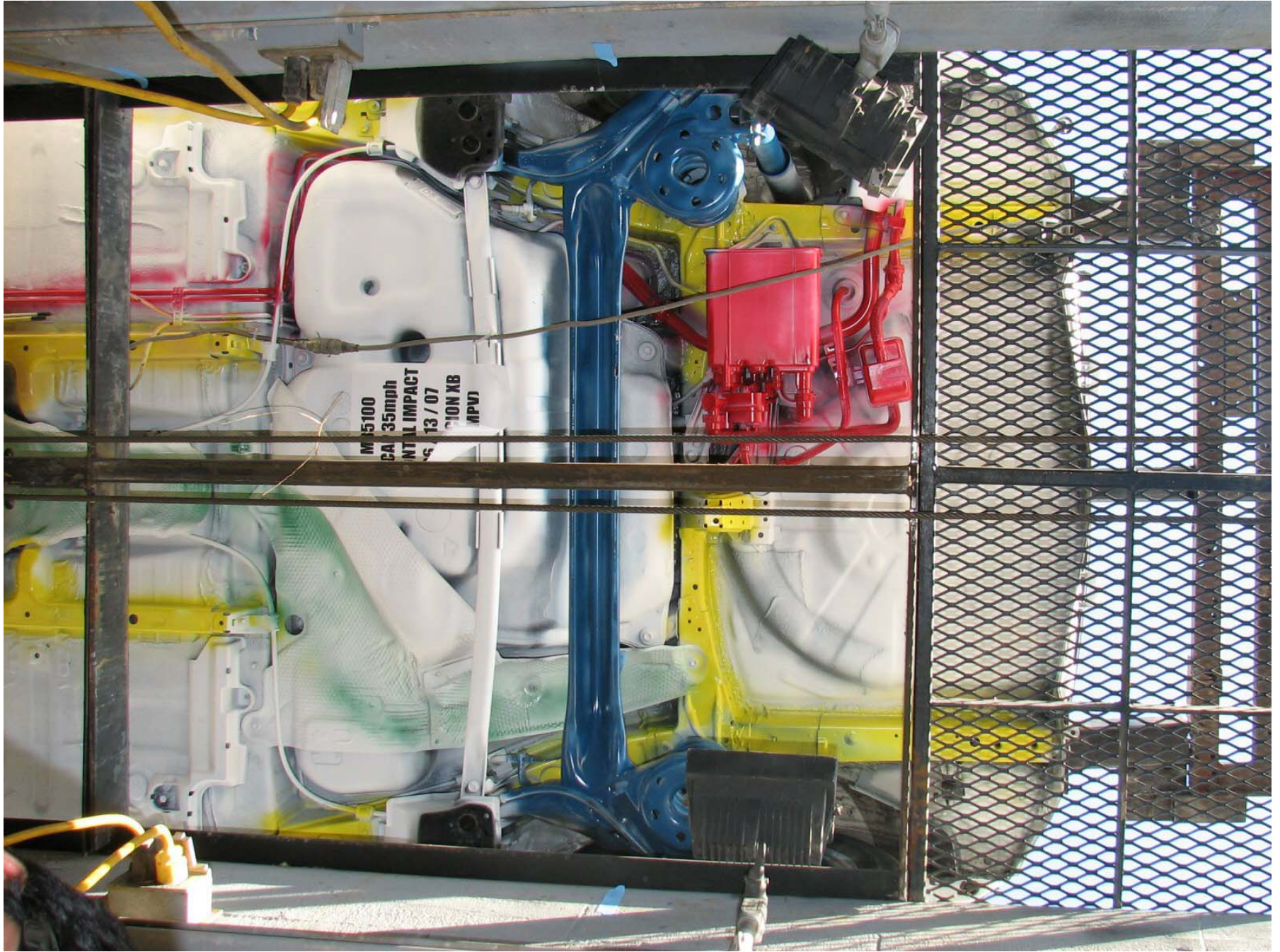


Figure A-28: Pre-Test Rear Underbody



Figure A-29: Post-Test Rear Underbody



Figure A-30: Pre-Test Driver Dummy Front View (Head Position)



Figure A-31: Post-Test Driver Dummy Front View (Head Position)



Figure A-32: Pre-Test Driver Dummy (Through Window)



Figure A-33: Post-Test Driver Dummy (Through Window)



Figure A-34: Pre-Test Driver Dummy (Door Open)



Figure A-35: Post-Test Driver Dummy (Door Open)

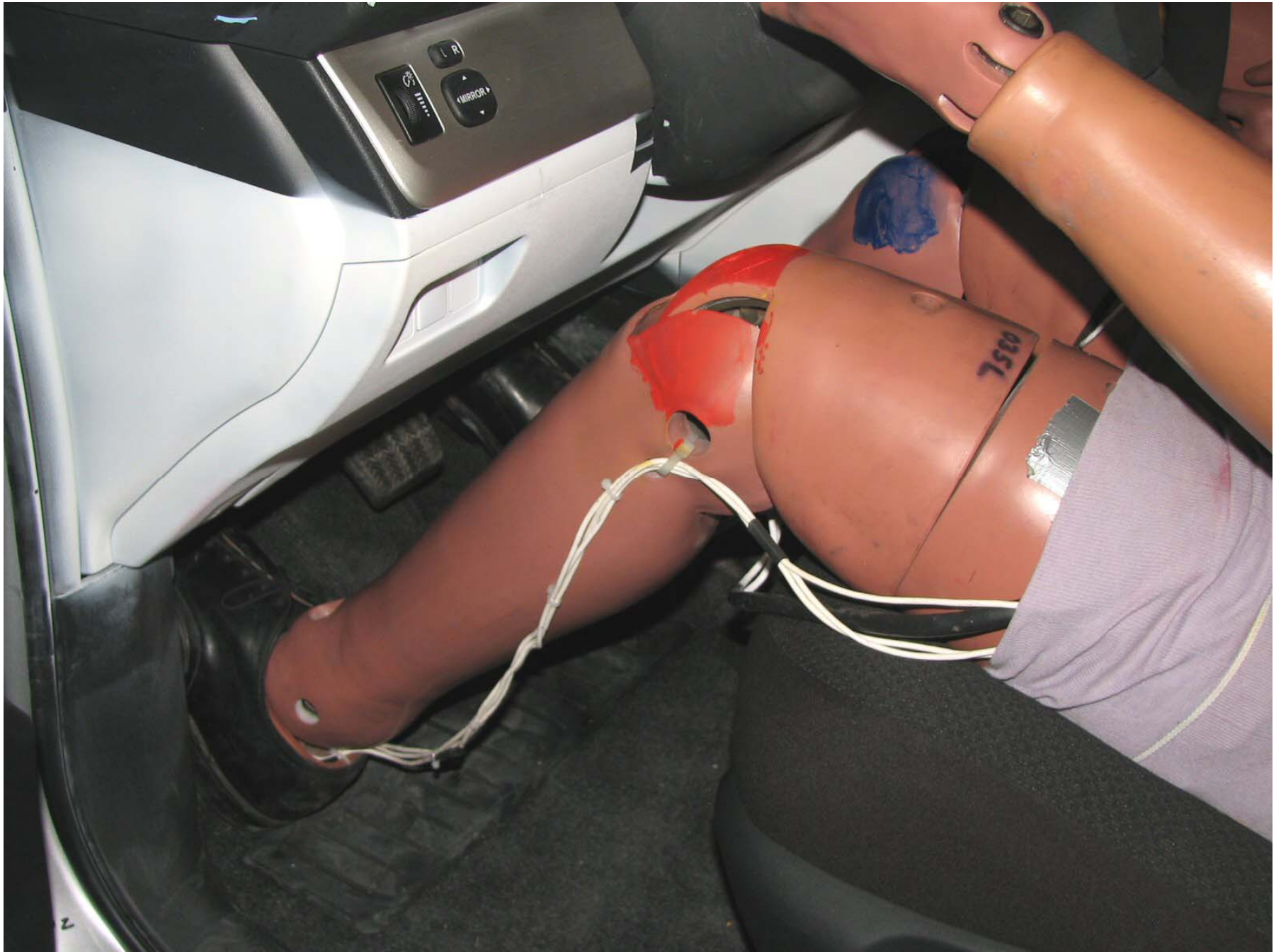


Figure A-36: Pre-Test Driver Dummy Feet



Figure A-37: Post-Test Driver Dummy Feet



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



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

**Photograph Not
Available**

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



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



Figure A-42: Post-Test Driver Dummy Head



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



Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)



Figure A-45: Post-Test Passenger Dummy Front View (Head Position)



Figure A-46: Pre-Test Passenger Dummy (Through Window)



Figure A-47: Post-Test Passenger Dummy (Through Window)



Figure A-48: Pre-Test Passenger Dummy (Door Open)



Figure A-49: Post-Test Passenger Dummy (Door Open)



Figure A-50: Pre-Test Passenger Dummy Feet



Figure A-51: Post-Test Passenger Dummy Feet



Figure A-52: Pre-Test Passenger Side Glove Box



Figure A-53: Post-Test Passenger Side Glove Box

**Photograph Not
Available**

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

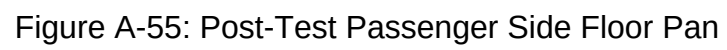




Figure A-56: Post-Test Passenger Dummy Head



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



Figure A-58: Vehicle on Rollover Device (0°)



Figure A-59: Vehicle on Rollover Device (90°)



Figure A-60: Vehicle on Rollover Device (180°)

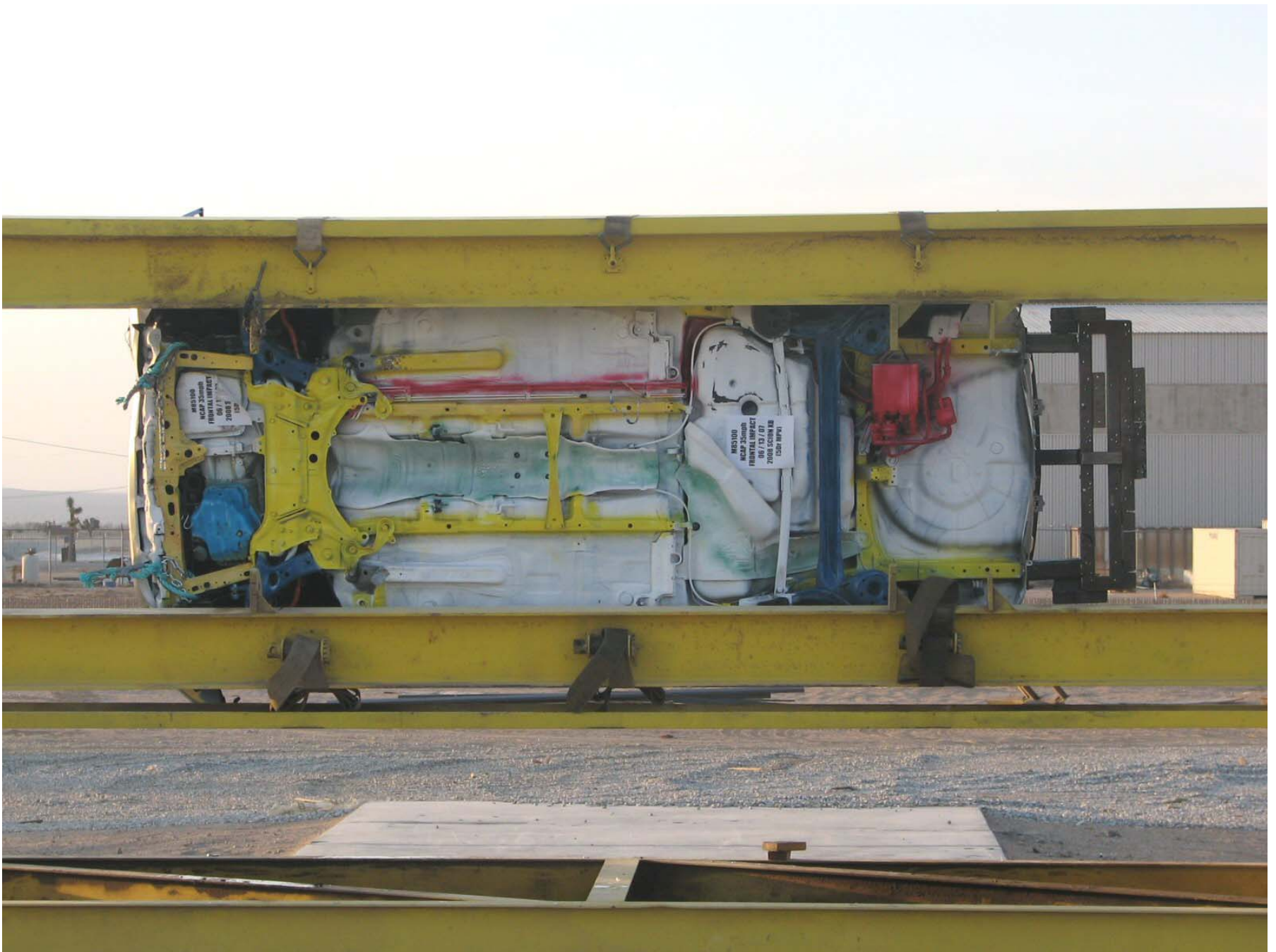


Figure A-61: Vehicle on Rollover Device (270°)



Figure A-62: Vehicle Impact

APPENDIX B
DATA PLOTS

LIST OF DATA PLOTS

Data Plot	Page
B-1	Driver Head Primary X
	Driver Head Primary Y
	Driver Head Primary Z
	Driver Head Resultant Primary
B-2	Driver Chest Primary X
	Driver Chest Primary Y
	Driver Chest Primary Z
	Driver Chest Resultant Primary
B-3	Driver Left Femur Force Z
	Driver Right Femur Force Z
B-4	Passenger Head Primary X
	Passenger Head Primary Y
	Passenger Head Primary Z
	Passenger Head Resultant Primary
B-5	Passenger Chest Primary X
	Passenger Chest Primary Y
	Passenger Chest Primary Z
	Passenger Chest Resultant Primary
B-6	Passenger Left Femur Force Z
	Passenger Right Femur Force Z

LIST OF DATA PLOTS...(CONTINUED)

The following additional data plots for this test can be obtained from the research and development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

- Driver Head Primary X Velocity
- Driver Head Primary X Displacement
- Driver Head Redundant X
- Driver Head Redundant Y
- Driver Head Redundant Z
- Driver Head Resultant Redundant
- Driver Head Redundant X Velocity
- Driver Head Redundant X Displacement
- Driver Upper Neck Force X
- Driver Upper Neck Force Y
- Driver Upper Neck Force Z
- Driver Upper Neck Force Resultant
- Driver Upper Neck Moment X
- Driver Upper Neck Moment Y
- Driver Upper Neck Moment Z
- Driver Upper Neck Moment Resultant
- Driver Chest Primary X Velocity
- Driver Chest Primary X Displacement
- Driver Chest Redundant X
- Driver Chest Redundant Y
- Driver Chest Redundant Z
- Driver Chest Resultant Redundant
- Driver Chest Redundant X Velocity
- Driver Chest Redundant X Displacement
- Driver Chest Displacement
- Driver Pelvis X
- Driver Pelvis Y
- Driver Pelvis Z
- Driver Pelvis Resultant
- Driver Pelvis X Velocity
- Driver Pelvis X Displacement
- Driver Left Upper Tibia Moment X
- Driver Left Upper Tibia Moment Y
- Driver Right Upper Tibia Moment X

LIST OF DATA PLOTS...(CONTINUED)

Driver Right Upper Tibia Moment Y
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Left Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Right Foot Fore Z
Driver Lap Belt Force
Driver Shoulder Belt Force
Driver Shoulder Belt Pullout
Driver Shoulder Belt Elongation
Passenger Head Primary X Velocity
Passenger Head Primary X Displacement
Passenger Head Redundant X
Passenger Head Redundant Y
Passenger Head Redundant Z
Passenger Head Resultant Redundant
Passenger Head Redundant X Velocity
Passenger Head Redundant X Displacement
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Force Resultant
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Upper Neck Moment Resultant
Passenger Chest Primary X Velocity
Passenger Chest Primary X Displacement
Passenger Chest Redundant X

LIST OF DATA PLOTS...(CONTINUED)

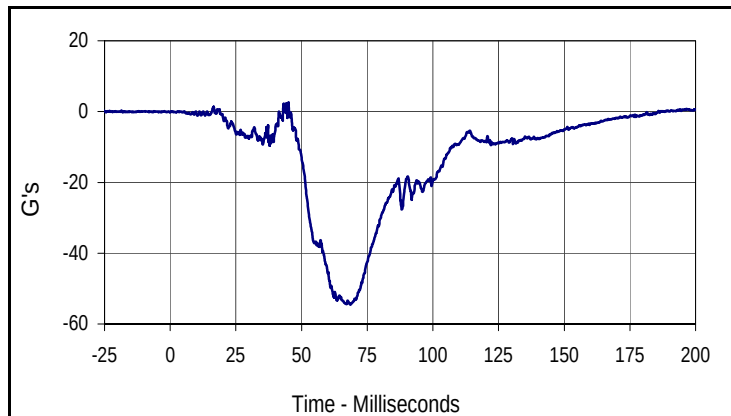
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X Velocity
Passenger Pelvis X Displacement
Passenger Left Femur Force
Passenger Right Femur Force
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Left Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Right Foot Fore Z
Passenger Lap Belt Force
Passenger Shoulder Belt Force
Passenger Shoulder Belt Pullout
Passenger Shoulder Belt Elongation
Vehicle Left Rear X
Vehicle Left Rear X Velocity

LIST OF DATA PLOTS...(CONTINUED)

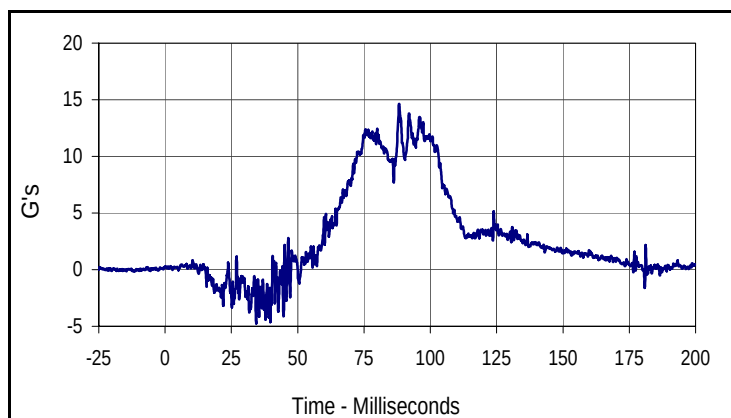
Vehicle Left Rear X Displacement
Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
Vehicle Left Brake Caliper
Vehicle Left Brake Caliper Velocity
Vehicle Left Brake Caliper Displacement
Vehicle Right Brake Caliper
Vehicle Right Brake Caliper Velocity
Vehicle Right Brake Caliper Displacement
Vehicle Instrument Panel
Vehicle Instrument Panel Velocity
Vehicle Instrument Panel Displacement
Vehicle Left Rear Z
Vehicle Left Rear Z Velocity
Vehicle Left Rear Z Displacement
Vehicle Right Rear Z
Vehicle Right Rear Z Velocity
Vehicle Right Rear Z Displacement

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

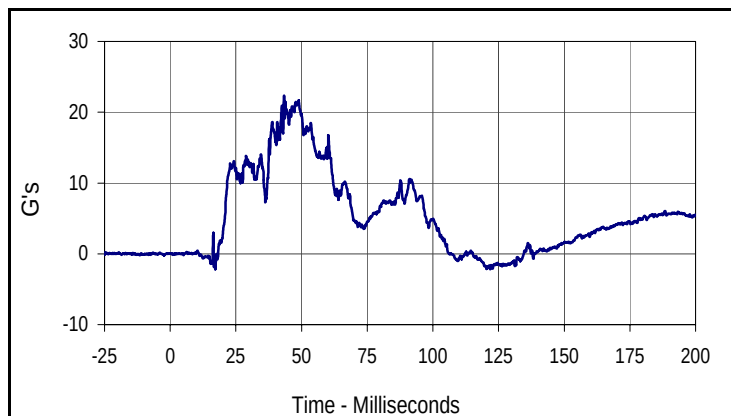
Test Date: 6/13/07
 NHTSA No.: M85100



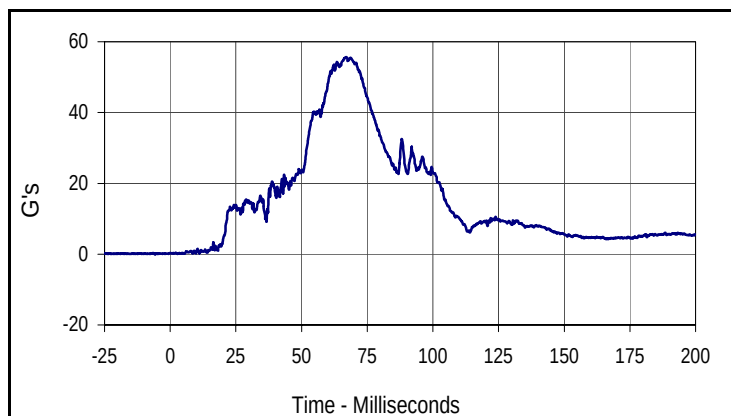
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Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.6	45.0	-54.5	68.6



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
14.6	88.3	-4.7	34.3



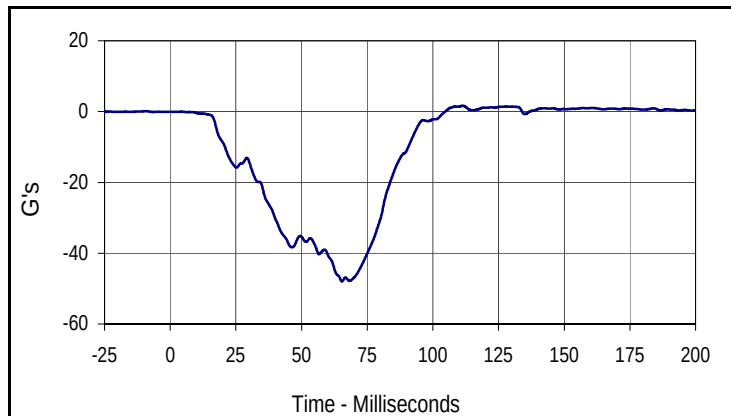
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Driver Head Primary Z			
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Max	Time	Min	Time
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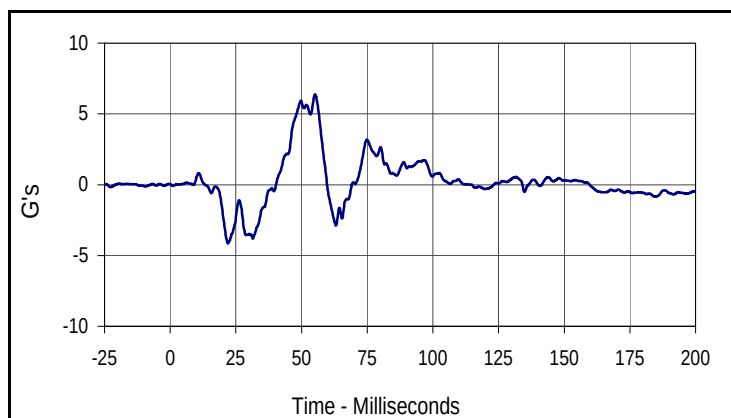
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
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Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

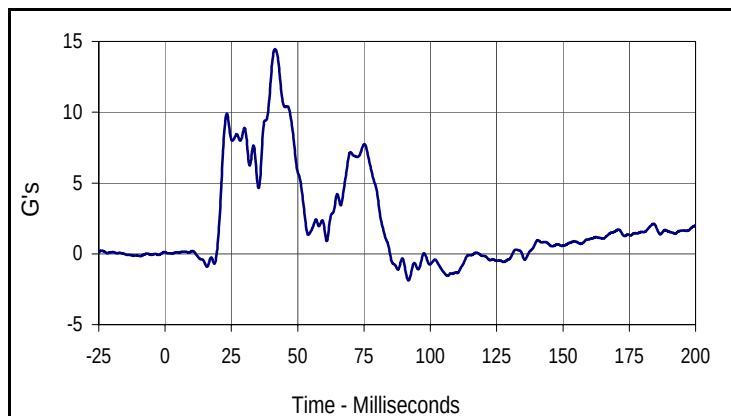
Test Date: 6/13/07
 NHTSA No.: M85100



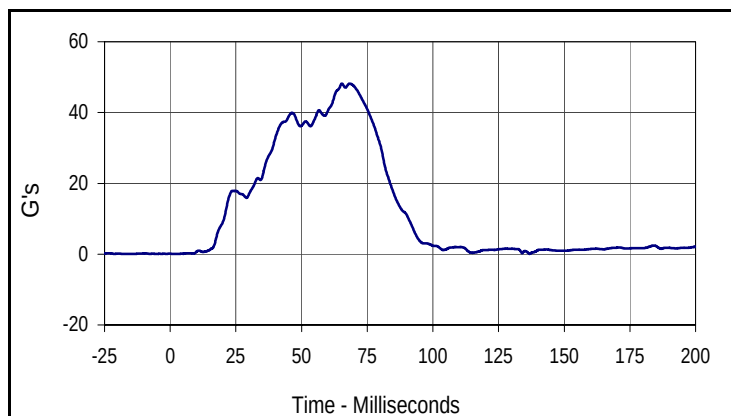
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Driver Chest Primary X			
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Max	Time	Min	Time
1.6	111.5	-47.9	65.4



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
6.4	55.1	-4.1	22.0



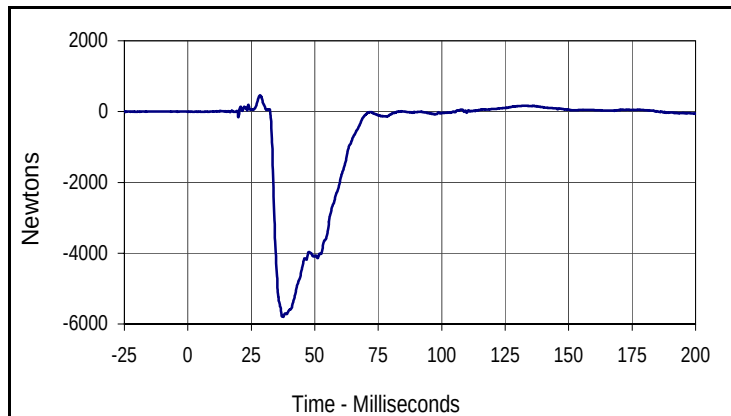
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Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
14.4	41.5	-1.9	91.8



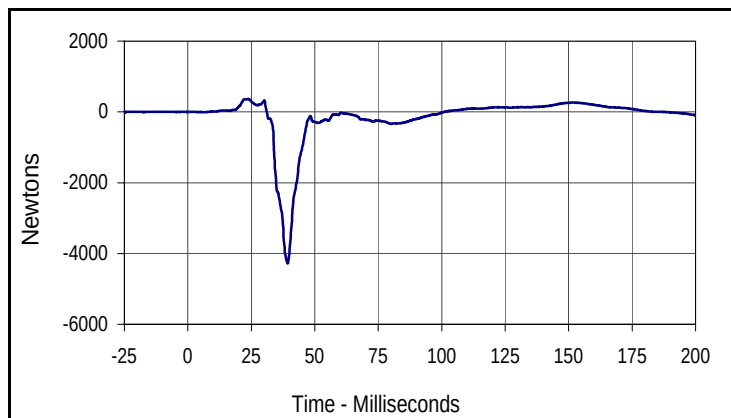
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Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
48.2	65.4	0.0	2.9

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07
 NHTSA No.: M85100



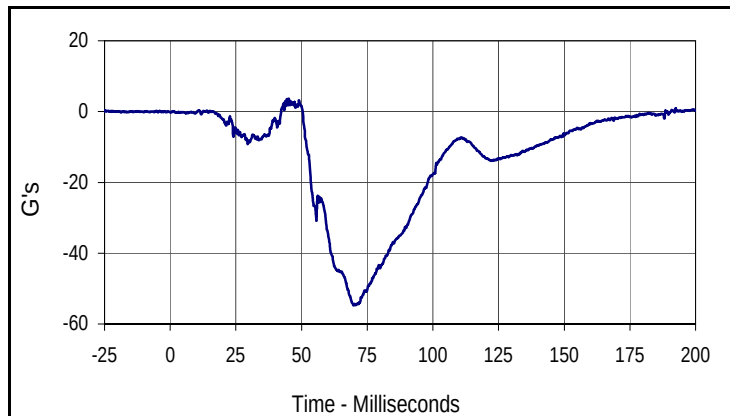
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Driver Left Femur Force Z			
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007	FIL	600	Newtons
Max	Time	Min	Time
461.9	28.4	-5798.6	37.6



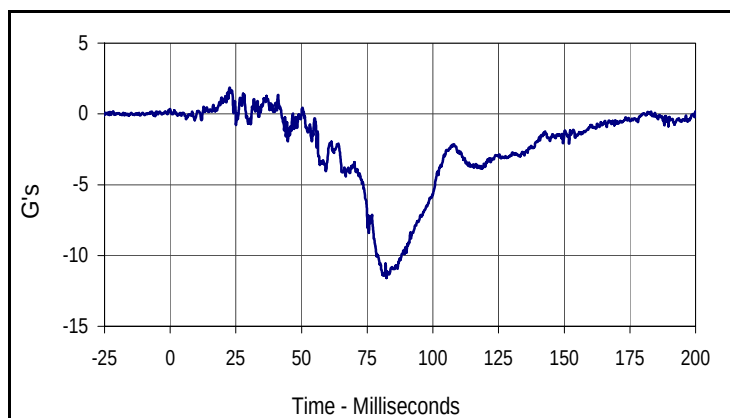
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
364.6	23.9	-4279.9	39.3

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

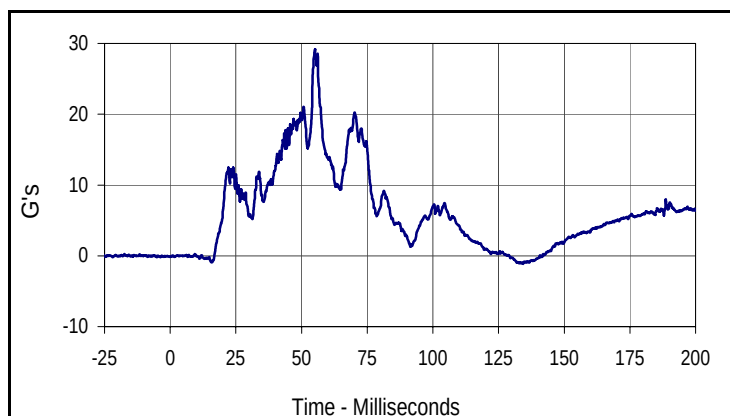
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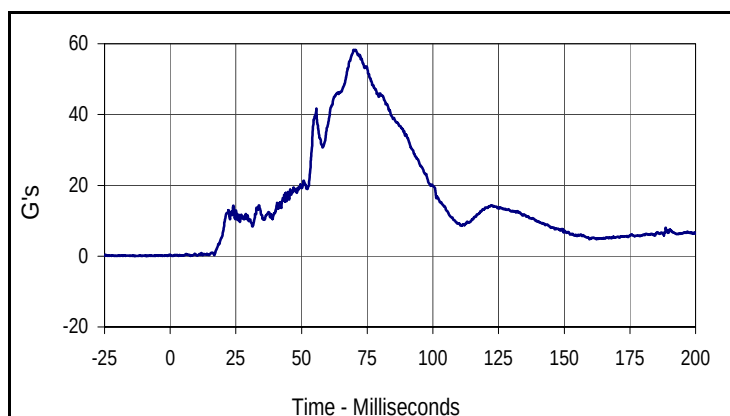
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Max	Time	Min	Time
3.6	45.2	-54.8	69.8



Curve Description			
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010	FIL	1000	G's
Max	Time	Min	Time
1.9	22.6	-11.6	82.3



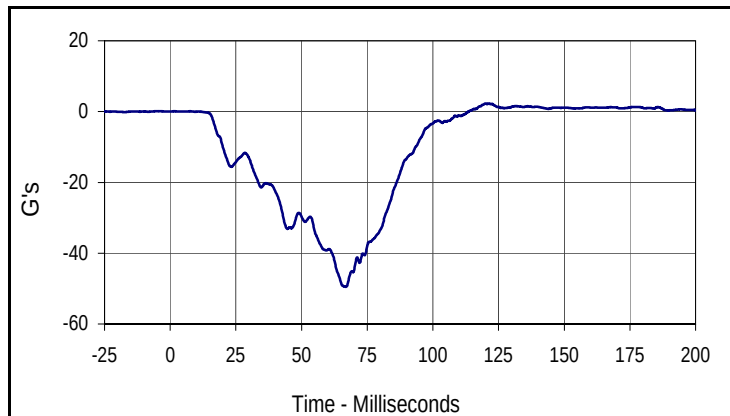
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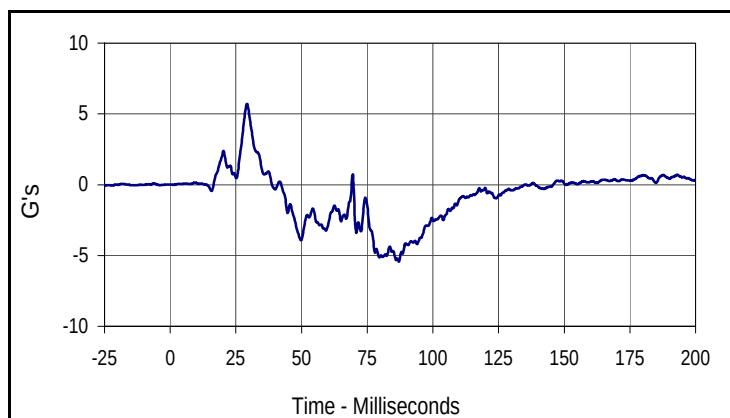
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Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
58.3	69.9	0.0	1.2

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

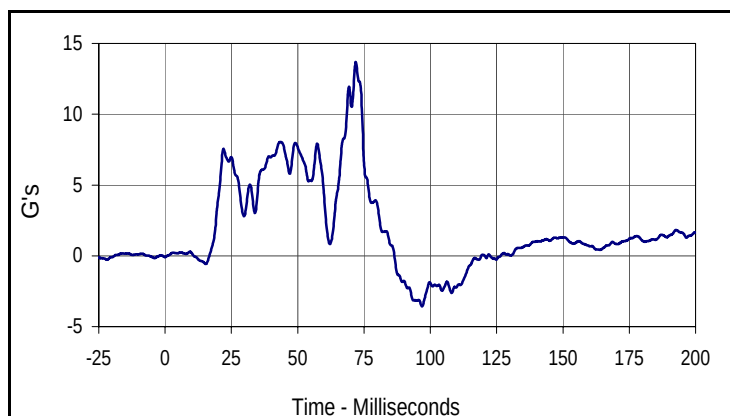
Test Date: 6/13/07
 NHTSA No.: M85100



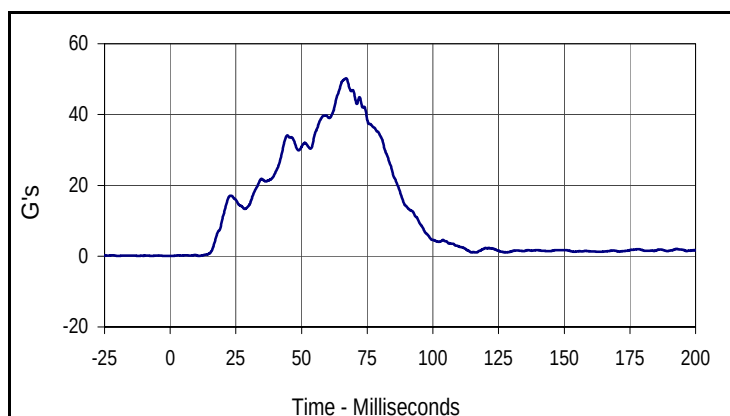
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
2.3	120.0	-49.5	66.9



Curve Description			
Passenger Chest Primary Y			
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013	FIL	180	G's
Max	Time	Min	Time
5.7	29.2	-5.4	87.0



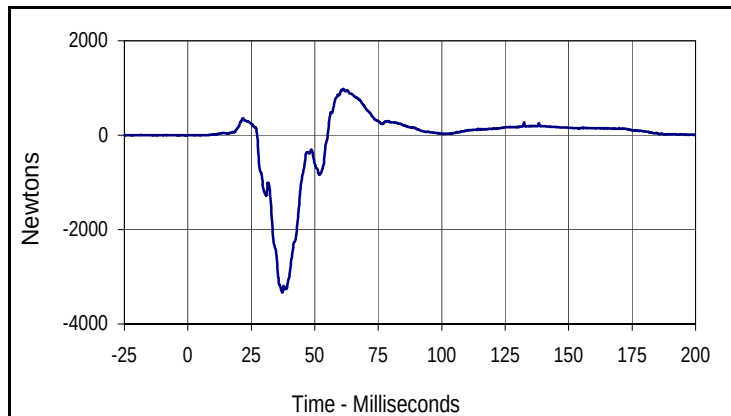
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
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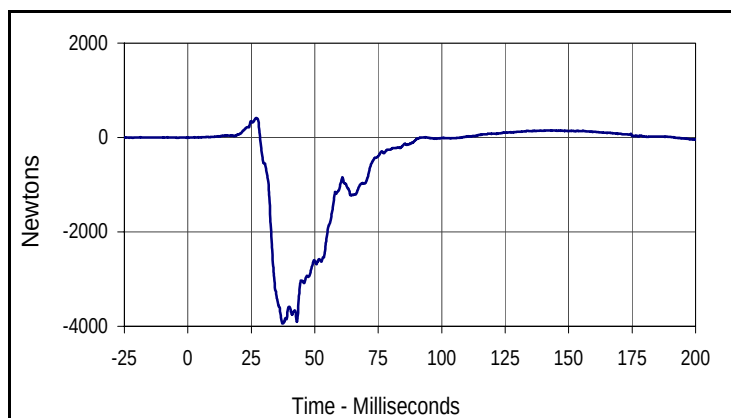
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Passenger Chest Resultant Primary			
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012	RES	180	G's
Max	Time	Min	Time
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Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07
 NHTSA No.: M85100



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
980.9	61.3	-3334.1	37.2

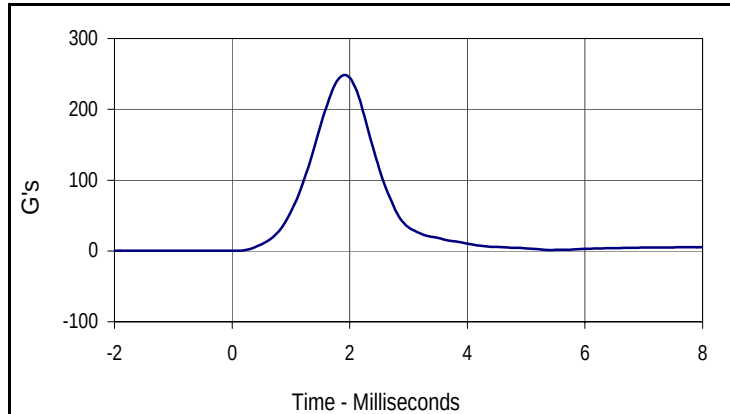


Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
415.7	26.9	-3942.2	37.4

APPENDIX C
DUMMY CALIBRATION DATA

Test Program: Hybrid III 50th Percentile Male Head Drop TestTest Date: 6/1/07ATD Serial No.: 035Test I.D.: HD06B

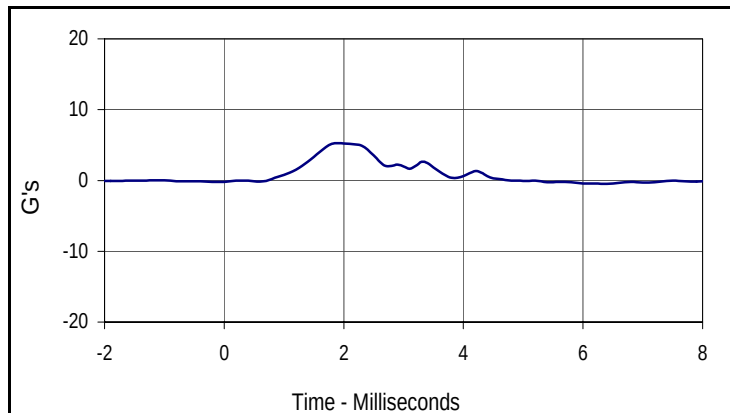
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	248.7	Pass
Peak Lateral Acceleration	G's	≤15.0	5.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description

Head Resultant

CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
248.7	1.9	0.1	-1.4



Curve Description

Head Y

CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.3	1.9	-0.4	6.0

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

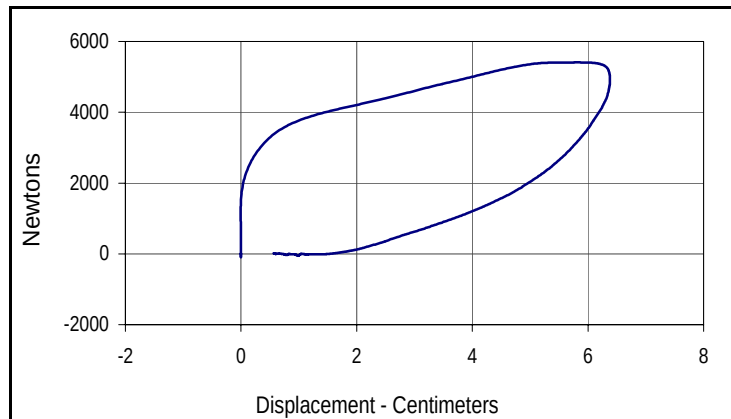
Test Date: 6/1/07

ATD Serial No.: 035

Test I.D.: CH06B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5408	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.38	Pass
Internal Hysteresis	%	69 to 85	75.4	Pass
Overall Test Results				Pass



Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.4
Peak Probe Force		Peak Chest Deflection	
5408		6.38	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

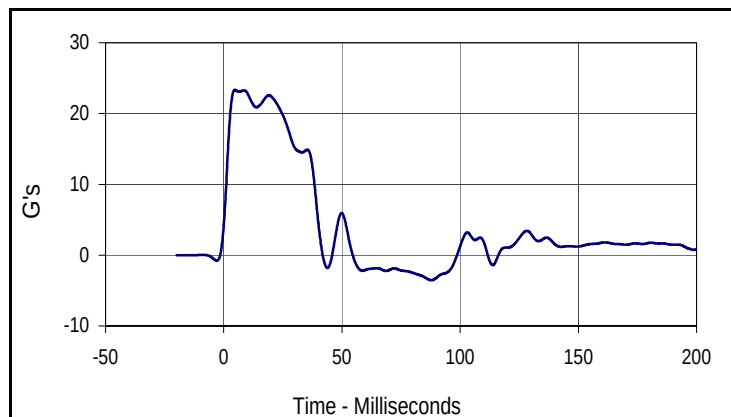
Test Date: 6/4/07

ATD Serial No.: 035

Test I.D.: NF06B



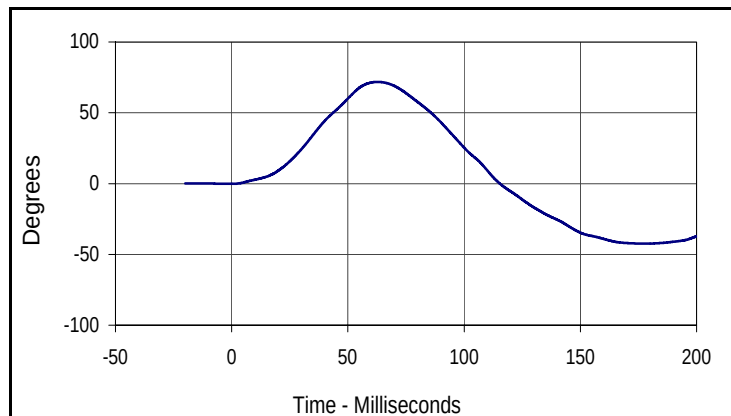
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.9	Pass
	20 Msec.	G's	17.6 to 22.6	22.5	Pass
	30 Msec.	G's	12.5 to 18.5	15.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	71.9	Pass
	Time	Msec.	57.0 to 64.0	62.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.4	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	97.0	Pass
	Time	Msec.	47.0 to 58.0	52.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

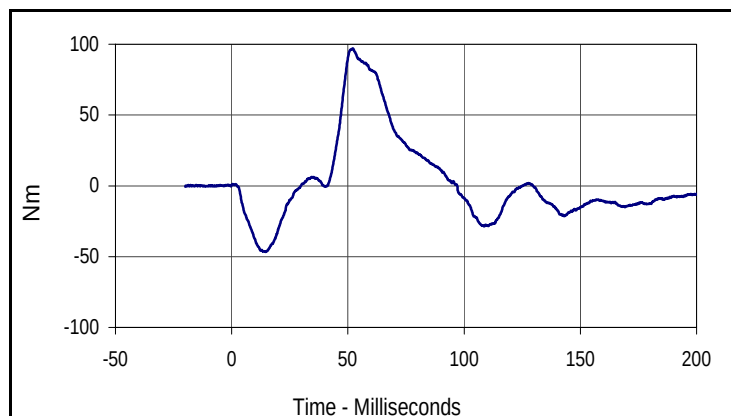
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.3	4.7	-3.5	87.8



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
71.9	62.7	-42.4	178.6



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
97.0	52.1	-46.6	14.7

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

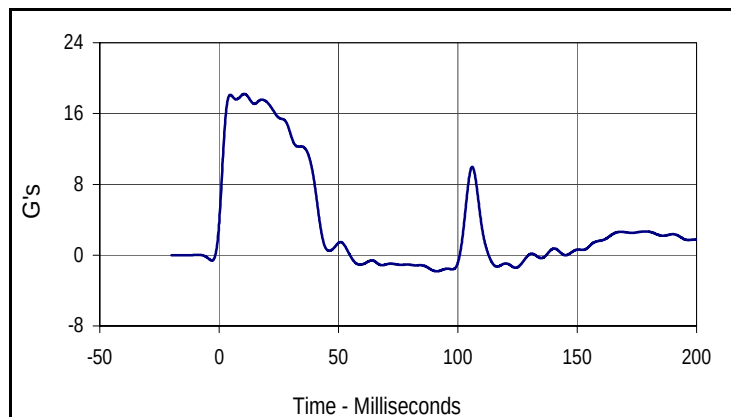
Test Date: 6/4/07

ATD Serial No.: 035

Test I.D.: NE06B



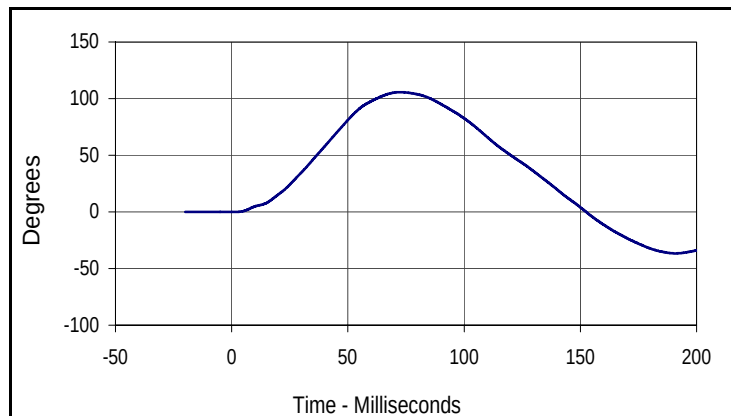
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.03	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.2	Pass
	20 Msec.	G's	14.0 to 19.0	17.3	Pass
	30 Msec.	G's	11.0 to 16.0	13.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	13.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	41.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	105.7	Pass
	Time	Msec.	72.0 to 82.0	72.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152.5	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-78.7	Pass
	Time	Msec.	65.0 to 79.0	67.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.9	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

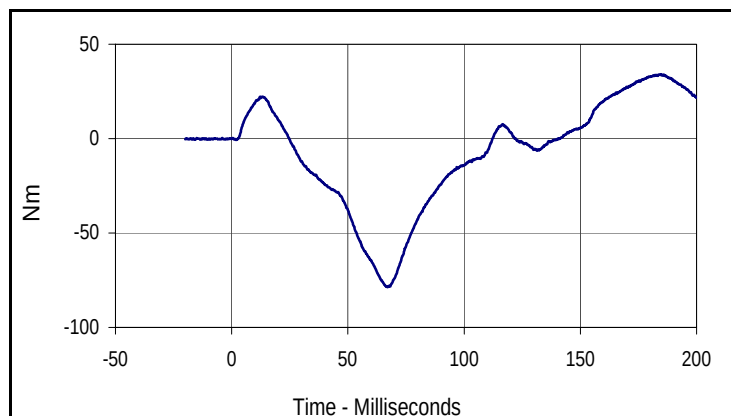
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.2	10.5	-1.8	91.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
105.7	72.4	-36.6	190.9



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
34.0	184.8	-78.7	67.0

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 6/4/07

ATD Serial No.: 035

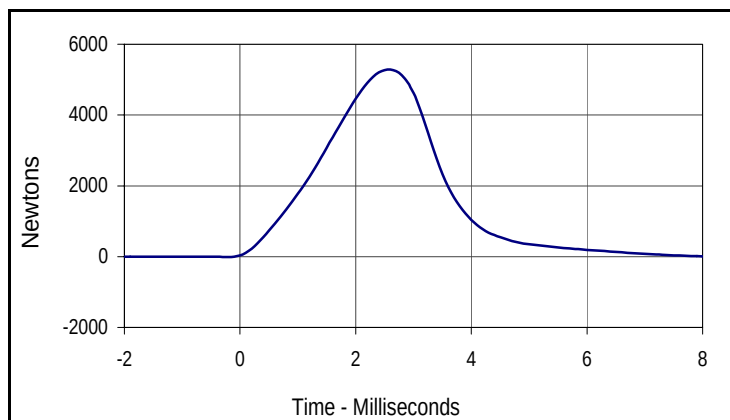
Test I.D.: LK06B , RK06B

**Left Knee**

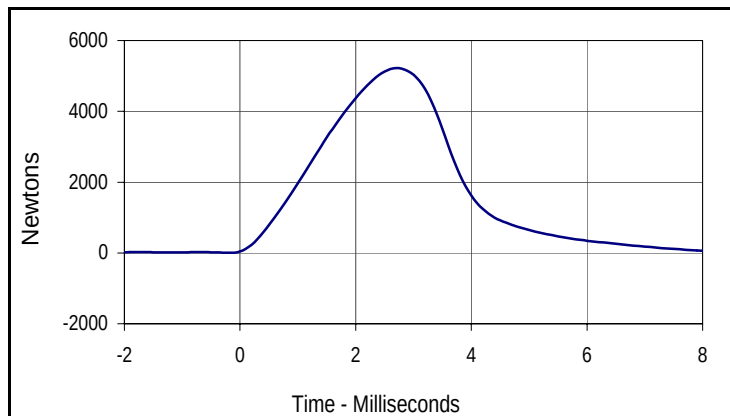
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5284	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5223	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5284.0	2.6	-14.2	-0.2

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5223.3	2.7	-2.6	9.8

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 6/1/07

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	882	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	137	Pass
E - Shoulder pivot from back	mm	84 to 94	88	Pass
F - Thigh clearance	mm	140 to 155	147	Pass
G - Elbow back to wrist pivot	mm	290 to 305	298	Pass
H - Skull cap to back line	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	208	Pass
K - Buttock to knee length	mm	579 to 604	602	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	492	Pass
N - Buttock popliteal length	mm	452 to 477	462	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	253	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	102	Pass
Y - Chest circumference	mm	970 to 1001	982	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	432	Pass
BB - Location for waist circumference	mm	226 to 231	228	Pass
Overall Test Results				Pass

Test Program: Hybrid III 50th Percentile Male Head Drop Test

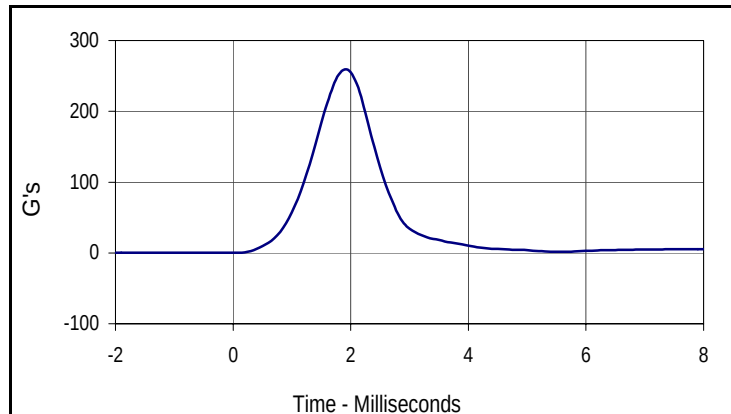
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ATD Serial No.: 034

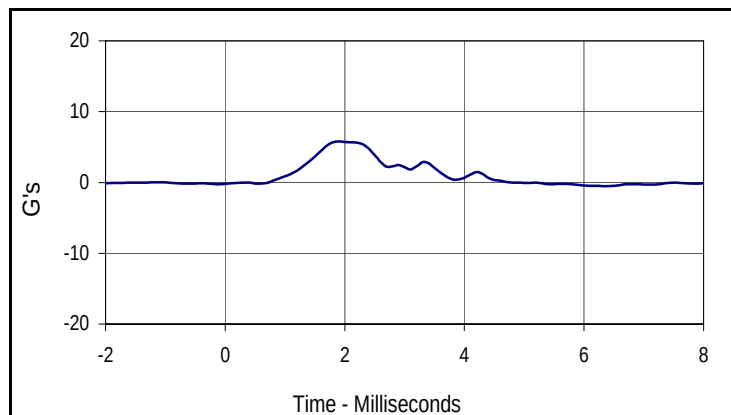
Test I.D.: HD06A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	259.2	Pass
Peak Lateral Acceleration	G's	≤15.0	5.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
259.2	1.9	0.1	-1.4



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.8	1.9	-0.4	6.0

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

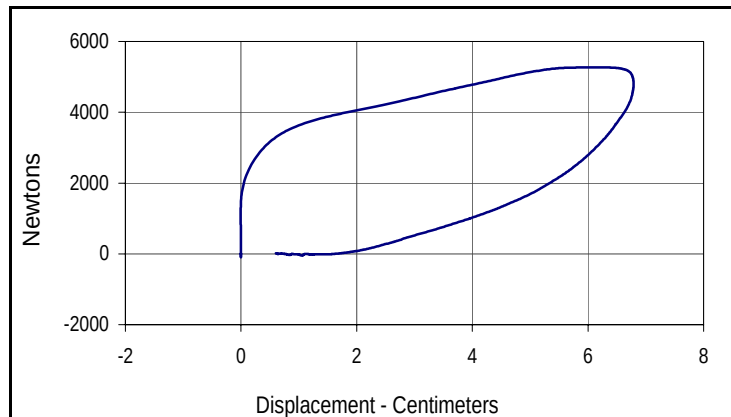
Test Date: 6/1/07

ATD Serial No.: 034

Test I.D.: CH06A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.63	Pass
Peak Probe Force	Newtons	5159 to 5893	5266	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.79	Pass
Internal Hysteresis	%	69 to 85	75.4	Pass
Overall Test Results				Pass



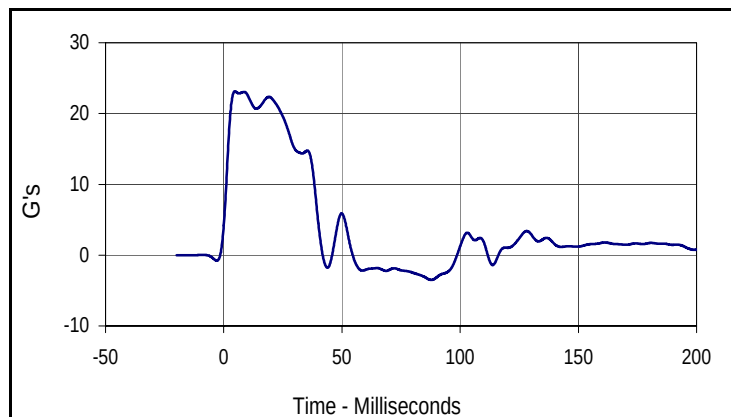
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.4
Peak Probe Force		Peak Chest Deflection	
5266		6.79	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 034

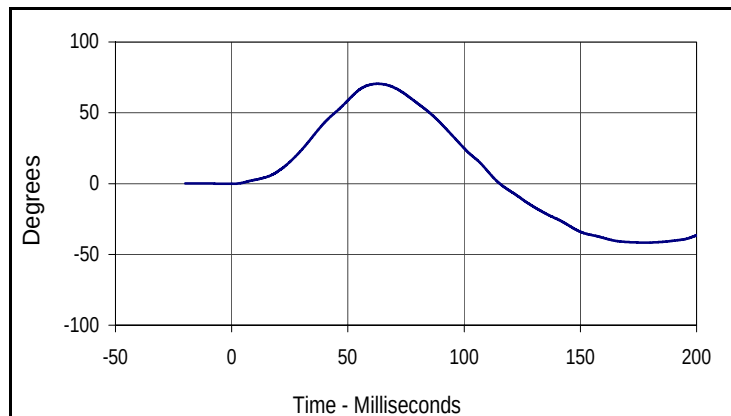
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 Test I.D.: NF06A



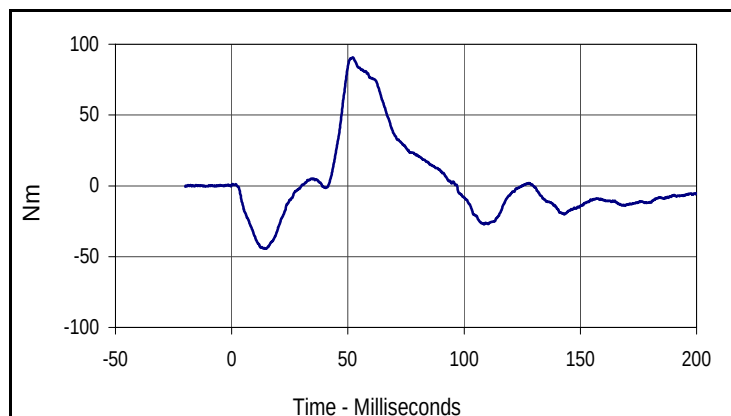
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	22.2	Pass
	30 Msec.	G's	12.5 to 18.5	15.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	70.5	Pass
	Time	Msec.	57.0 to 64.0	62.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.4	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	90.7	Pass
	Time	Msec.	47.0 to 58.0	52.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.1	4.7	-3.5	87.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
70.5	62.7	-41.6	178.6



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
90.7	52.1	-44.4	14.7

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

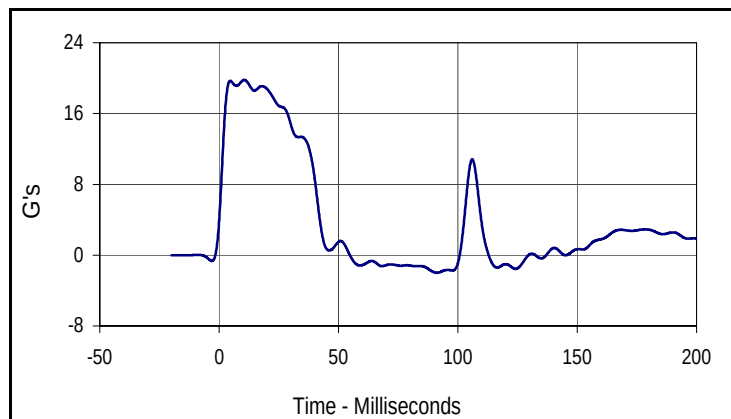
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Test I.D.: NE06A



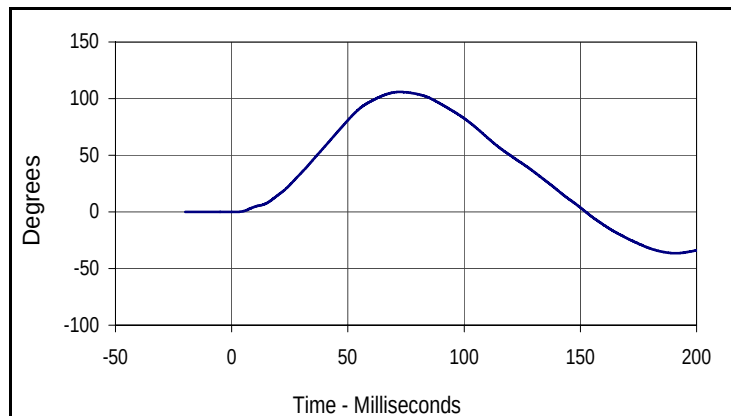
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.16	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.8	Pass
	20 Msec.	G's	14.0 to 19.0	18.8	Pass
	30 Msec.	G's	11.0 to 16.0	14.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	41.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	105.9	Pass
	Time	Msec.	72.0 to 82.0	72.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152.4	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-78.7	Pass
	Time	Msec.	65.0 to 79.0	67.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.9	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

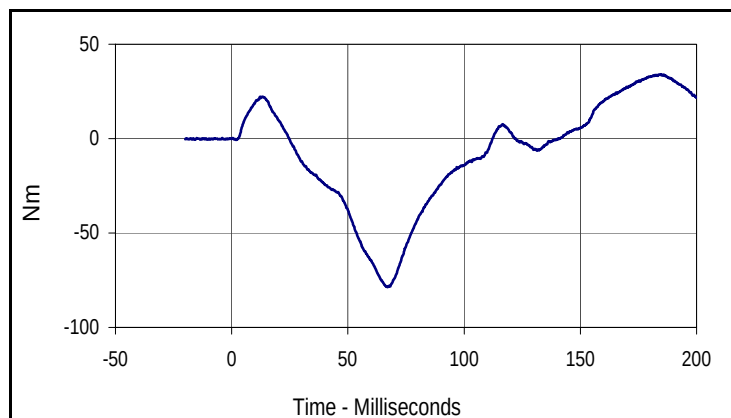
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.8	10.5	-2.0	91.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
105.9	72.3	-36.5	190.9



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
34.0	184.8	-78.7	67.0

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 6/4/07

ATD Serial No.: 034

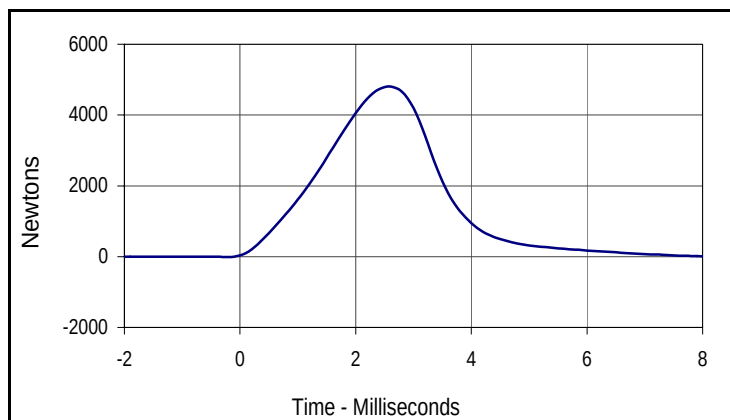
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**Left Knee**

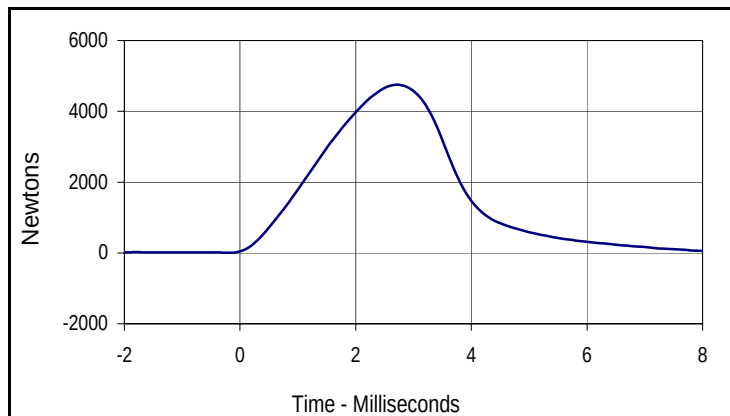
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	4804	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	4749	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4803.5	2.6	-12.8	-0.2

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
4748.6	2.7	-2.3	9.7

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 6/1/07

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	509	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	138	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	299	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	206	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	227	Pass
P - Foot length	mm	251 to 267	256	Pass
V - Shoulder breadth	mm	422 to 437	434	Pass
W - Foot breadth	mm	91 to 107	101	Pass
Y - Chest circumference	mm	970 to 1001	987	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

Test Program: Dummy Damage Checklist
 ATD Serial No.: 035

Test Date: 6/4/07
 Test I.D.: N/A



GENERAL	DAMAGED	OK
Outer skin on entire dummy		X
Head ballast secure		X
Gashes, rips, general appearance, etc.		X
Neck-Broken or cracks in rubber		X
Check that upper neck bracket is firmly attached to lwr neck bracket		X
Three rubber bumpers in place		X
Spine- Broken or cracks in rubber		X
Check for looseness at the condyle joint		X
Nodding blocks- cracked or out of position		X
Ribs- Check all ribs and rib supports for damage (bent or broken)		X
Check damping material or separation or cracks		X
OTHER		
CHEST DISPLACEMENT ASSEMBLY		
Bent shaft		X
Slider arm riding correctly, in track		X
TRANSDUCER LEADS		
Torn cables		X
ACCELEROMETER MOUNTINGS		
Check for secure mounting		X
KNEES		
Check outer skin, insert and casting (without removing insert)		X
Knee sliders - Wires intact		X
Knee sliders- Rubber returned to "at rest position"		X
LIMBS		
Check for normal movement and adjustment		X
PELVIS		
Inspect for breakage, especially at iliac crest		X

Comments on repair or replacement parts:

Test Program: Dummy Damage Checklist
 ATD Serial No.: 034

Test Date: 6/4/07
 Test I.D.: N/A



GENERAL	DAMAGED	OK
Outer skin on entire dummy		X
Head ballast secure		X
Gashes, rips, general appearance, etc.		X
Neck-Broken or cracks in rubber		X
Check that upper neck bracket is firmly attached to lwr neck bracket		X
Three rubber bumpers in place		X
Spine- Broken or cracks in rubber		X
Check for looseness at the condyle joint		X
Nodding blocks- cracked or out of position		X
Ribs- Check all ribs and rib supports for damage (bent or broken)		X
Check damping material or separation or cracks		X
OTHER		
CHEST DISPLACEMENT ASSEMBLY		
Bent shaft		X
Slider arm riding correctly, in track		X
TRANSDUCER LEADS		
Torn cables		X
ACCELEROMETER MOUNTINGS		
Check for secure mounting		X
KNEES		
Check outer skin, insert and casting (without removing insert)		X
Knee sliders - Wires intact		X
Knee sliders- Rubber returned to "at rest position"		X
LIMBS		
Check for normal movement and adjustment		X
PELVIS		
Inspect for breakage, especially at iliac crest		X

Comments on repair or replacement parts:

APPENDIX D
CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27001-10-NC

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**TOYOTA MOTOR CORPORATION
2008 TOYOTA SCION XB
5-DOOR MPV**

NHTSA NUMBER: M85100

**PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



JUNE 13, 2007

FINAL REPORT

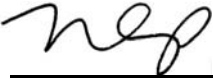
**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
1200 NEW JERSEY AVE, SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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KARCO Engineering, LLC

Date: June 13, 2007

Reviewed by: 
Mr. Michael L. Dunlap, Director of Operations
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Date: June 13, 2007

Approved by: 
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: June 13, 2007

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

1. Report No. TR-P27001-10-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of one (1) Graco Snugride CRS Final Report of one (1) Compass I-410 CRS NHTSA NO. M85100				5. Report Date 6/13/2007	
				6. Performing Organization Code KAR	
7. Authors Mr. Johnny H. Dutto, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco				8. Performing Organization Report No. TR-P27001-10-NC	
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-06-D-00027	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C 20590				13. Type of Report and Period Covered Final Test Report Base Year	
				14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS	
15. Supplementary Notes					
16. Abstract A frontal impact test was conducted on one (1) Graco Snugride CRS and one (1) Compass I-410 CRS in conjunction with frontal barrier impact NCAP testing on a 2008 Toyota Scion xB 5-Door MPV and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on June 13, 2007.					
Measurement Description		Units	Threshold	Left Rear (P4)	Right Rear (P3)
Head Injury Criteria (HIC15)		N/A	390	681.9	691.2
3 msec. Chest Clip		G's	50	59.8	57.4
17. Key Words New Car Assessment Program (Frontal NCAP) Frontal Barrier Impact Test Final Report of a Graco Snugride CRS Final Report of a Compass I-410 CRS				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified		20. Security Classification (this page) Unclassified		21. No. of Pages 72	22. Price

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SECTION D1

PURPOSE AND SUMMARY OF TEST M85100

The purpose of this test is to obtain CRS performance data during 35 mph (56.3 km/h) frontal barrier impact NCAP test.

The frontal barrier impact NCAP test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

Two 12-month old CRABI's (P3 & P4) was instrumented with head, chest, and six-axis upper neck load cells. A tri-axial accelerometer was installed on the CRS and the CRS base.

The left rear (Serial No. 022) and rear rear (Serial No. 017) CRABI's were calibrated prior to this test. CRABI calibration information is found in Section D-4.

CHILD DUMMY VALUES		
Location	HIC15 Values	3 Msec. Chest Clip
CRABI (P3)	691.2	57.4
CRABI (P4)	681.9	59.8

DATA SHEET NO.1
CRASH TEST SUMMARY

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS	Position #4 CRS
Manufacturer	Graco	Compass
Model Name	Snugride	I-410
Serial No.	8645MRG3	BS-00003959
Type	Infant	Infant
Forward/Rearward	Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS	Position #4 CRS
Head Contact	Passenger Seatback / Rear Headrest	Driver Seatback / Rear Headrest
Chest Contact	None	None
Abdomen Contact	None	None
Left Knee Contact	None	None
Right Knee Contact	None	None
Left Toe Contact	Seatback	Seatback
Right Toe Contact	Seatback	Seatback

POST-TEST DOOR OPENINGS

Description	Position #3 CRS	Position #4 CRS
Right Rear Door	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools

CAMERA COVERAGE

Description	Standard
High Speed	4
Real Time	0
Total	4

DATA CHANNELS

CRABI (P3 & P4) Sensors	26
Belt Sensors	4
CRS Sensors	12
Total	42

DATA SHEET NO.2**VEHICLE PARAMETER DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	450	272	722	469	347	816
Right	kg	438	249	687	462	323	785
Ratio	%	63.0	37.0	100.0	58.1	41.9	100.0
Totals	kg	888	521	1409	931	670	1601

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1409
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	45
Calculated Vehicle Target Wt. (TVTW)	kg	1606

DATA SHEET NO.3

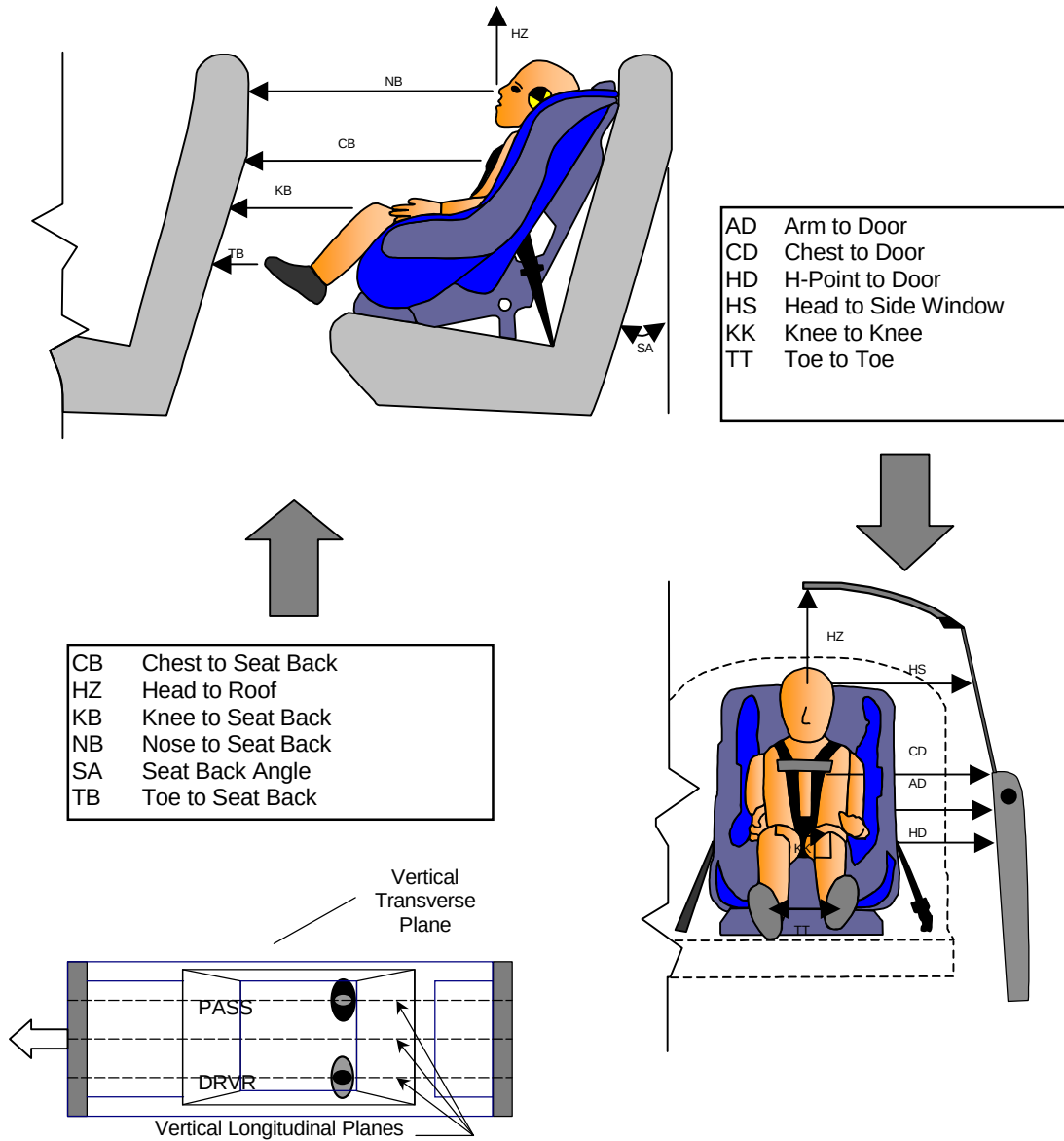
CRABI POSITIONING IN VEHICLE

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO.3

CRABI POSITIONING IN VEHICLE...(CONTINUED)

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

CRABI POSITION MEASUREMENTS

Code	Measurement	P3 (Passenger's Side)		P4 (Driver's Side)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
SA	Seat Back Angle		20.0		20.0
HZ	Head to Roof (Z)	500		462	
CD	Chest to Door	420		380	
KK	Knee to Knee (Y)	130		115	
HS	Head to Side Window	425		395	
HD	H-Point to Door (Y)	350		310	
AD	Arm to Door	292		270	
NB	Nose to Seat Back	515		525	
CB	Chest to Seat Back	436		474	
FF	Foot to Foot	140		80	
KB-Left	Knee to Seat Back	180		160	
KB-Right	Knee to Seat Back	185		158	
TB-Left	Toe to Seat Back	50		40	
TB-Right	Toe to Seat Back	48		48	

DATA SHEET NO.4**CRS PERFORMANCE DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**CRS PERFORMANCE DATA**

Location	CRS (P4)		CRS (P3)	
	Damage	Post-Test	Damage	Post-Test
Upper Tether Strap				
Upper Tether Buckle				
Upper Tether Hook				
Veh. Upper Tether Anchor				
Lower Anchor Strap				
Lower Anchor Buckle				
Lower Anchor Hooks	No	None	No	None
Veh. Lower CRS Anchors	No	None	No	None
5-Point Harness Connections	No	None	No	None
Cracks on CRS	No	None	No	None
Fabric Tears on CRS	No	None	No	None
Vehicle Seat Structure	No	None	No	None
Vehicle Seat Fabric Tears	No	None	No	None

DATA SHEET NO. 5
CRS ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV

NHTSA No.: M85100

Test Program: 2007 NHTSA 35mph NCAP

Test Date: 6/13/07

CRS ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS (P4)	1210	-470	898
2	CRS Base (P4)	1245	-470	840
3	CRS (P3)	1555	-480	840
4	CRS Base (P3)	1560	-480	680

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

DATA SHEET NO.6**CRS CAMERA LOCATIONS AND DATA**Test Vehicle: 2008 Toyota Scion xB 5-Door MPVNHTSA No.: M85100Test Program: 2007 NHTSA 35mph NCAPTest Date: 6/13/07**CAMERA LOCATIONS**

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Driver Side Upper CRS View	-1880	737	-1473	-2		12	1000
2	Passenger Side Upper CRS View	-1880	-737	-1473	2		12	1000
3	Driver Side Lower CRS View	-1346	635	-535	-2		10	1000
4	Passenger Side Lower CRS View	-1346	-635	-1187	2		12	1000

SECTION D2

PHOTOGRAPHS

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7	Post-Test Left Side View of Position 3 CRS	D2-7
8	Pre-Test Right Side View of Position 3 CRS	D2-8
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15	Post-Test Position 3 Right Side View	D2-15
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18	Post-Test Position 3 Dummy Legs	D2-18
19	Position 4 CRS Label	D2-1
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36	Post-Test Position 4 Dummy Legs	D2-18

MODEL **8645MRG3**

NAME **SNUGRIDE**

Manufactured in 041007 10

GRACO CHILDREN'S PRODUCTS, INC.

EXTON, PA 19341 1-888-224-6549

Made in U.S.A.

PB-25777

Figure D2-1: Position 3 CRS Label

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Figure D2-2: Pre-Test Frontal View of Position 3 CRS



Figure D2-3: Post-Test Frontal View of Position 3 CRS



Figure D2-4: Pre-Test Rear View of Position 3 CRS



Figure D2-5: Post-Test Rear View of Position 3 CRS



Figure D2-6: Pre-Test Right Side View of Position 3 CRS



Figure D2-7: Post-Test Right Side View of Position 3 CRS



Figure D2-8: Pre-Test Left Side View of Position 3 CRS



Figure D2-9: Post-Test Left Side View of Position 3 CRS



Figure D2-10: Pre-Test Position 3 Front View (Head and Seat Belt Position)



Figure D2-11: Post-Test Position 3 Front View (Head and Seat Belt Position)



Figure D2-12: Pre-Test Position 3 Front View (Seat Belt Position)



Figure D2-13: Post-Test Position 3 Front View (Seat Belt Position)



Figure D2-14: Pre-Test Position 3 Right Side View



Figure D2-15: Post-Test Position 3 Right Side View



Figure D2-16: Pre-Test Position 3 Right Side View (Through Window)



Figure D2-17: Post-Test Position 3 Right Side View (Through Window)



Figure D2-18: Post-Test Position 3 Dummy Legs

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Figure D2-19: Position 4 CRS Label

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Figure D2-20: Pre-Test Frontal View of Position 4 CRS



Figure D2-21: Post-Test Frontal View of Position 4 CRS



Figure D2-22: Pre-Test Rear View of Position 4 CRS



Figure D2-23: Post-Test Rear View of Position 4 CRS



Figure D2-24: Pre-Test Right Side View of Position 4 CRS



Figure D2-25: Post-Test Right Side View of Position 4 CRS



Figure D2-26: Pre-Test Left Side View of Position 4 CRS



Figure D2-27: Post-Test Left Side View of Position 4 CRS



Figure D2-28: Pre-Test Position 4 Front View (Head & Seat Belt Position)



Figure D2-29: Post-Test Position 4 Front View (Head & Seat Belt Position)



Figure D2-30: Pre-Test Position 4 Front View (Seat Belt Position)

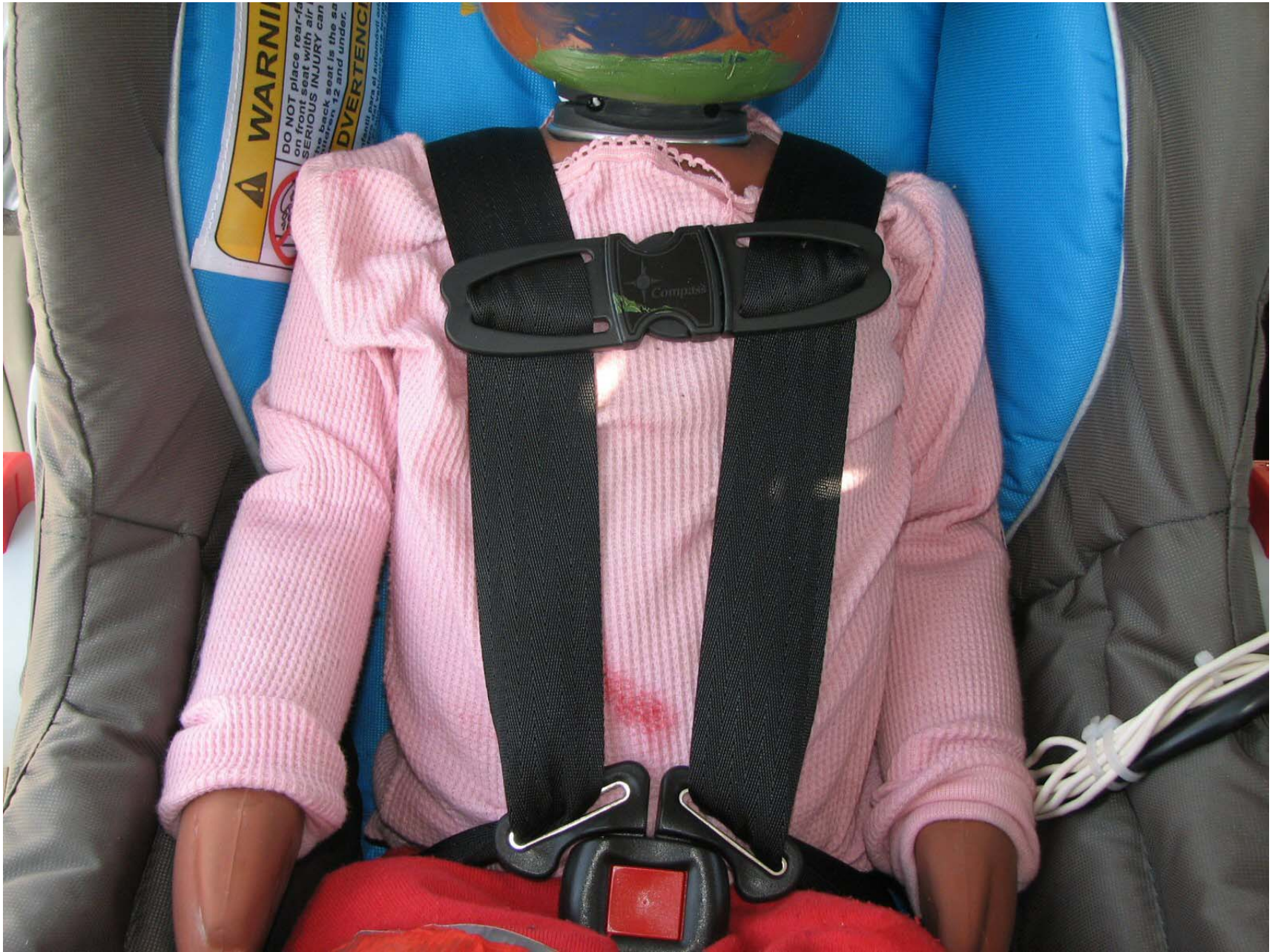


Figure D2-31: Post-Test Position 4 Front View (Seat Belt Position)



Figure D2-32: Pre-Test Position 4 Left Side View



Figure D2-33: Post-Test Position 4 Left Side View



Figure D2-34: Pre-Test Position 4 Left Side View



Figure D2-35: Post-Test Position 4 Left Side View



Figure D2-36: Post-Test Position 4 Dummy Legs

SECTION D3

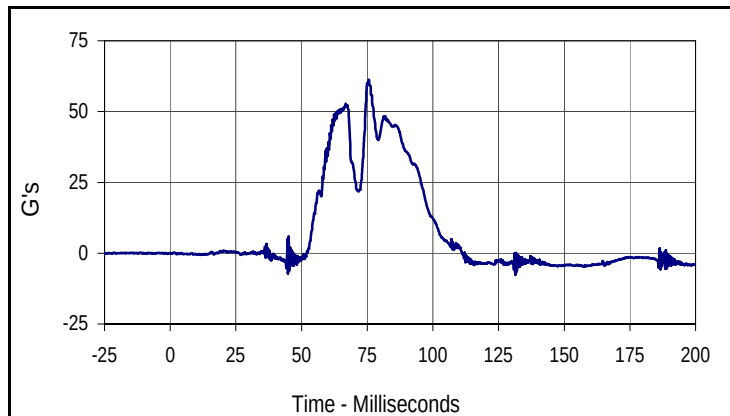
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

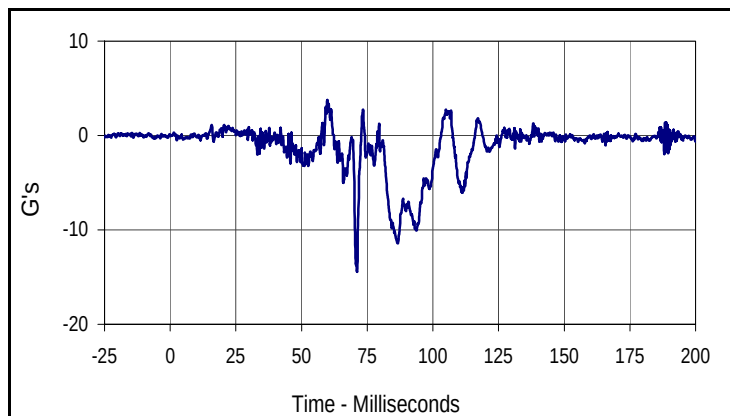
<u>Data Plot</u>		<u>Page</u>
D3-1	Right Rear CRABI (P4) Head X	D3-1
	Right Rear CRABI (P4) Head Y	D3-1
	Right Rear CRABI (P4) Head Z	D3-1
	Right Rear CRABI (P4) Head Resultant	D3-1
D3-2	Right Rear CRABI (P4) Chest X	D3-2
	Right Rear CRABI (P4) Chest Y	D3-2
	Right Rear CRABI (P4) Chest Z	D3-2
	Right Rear CRABI (P4) Chest Resultant	D3-2
D3-3	Right Rear CRABI (P3) Head X	D3-3
	Right Rear CRABI (P3) Head Y	D3-3
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	Right Rear CRABI (P3) Head Resultant	D3-3
D3-4	Right Rear CRABI (P3) Chest X	D3-4
	Right Rear CRABI (P3) Chest Y	D3-4
	Right Rear CRABI (P3) Chest Z	D3-4
	Right Rear CRABI (P3) Chest Resultant	D3-4

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

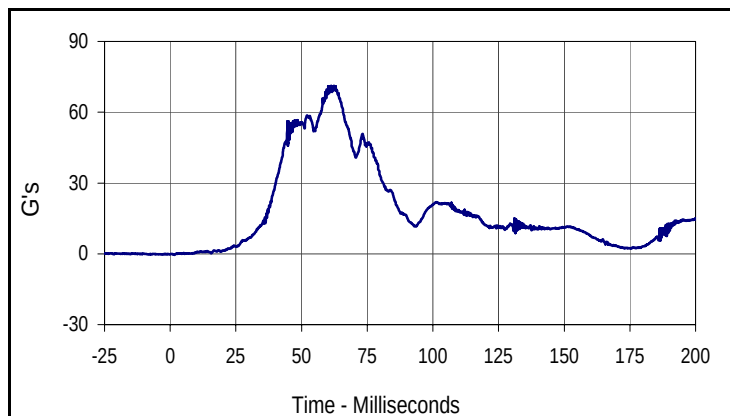
Test Date: 6/13/07
 NHTSA No.: M85100



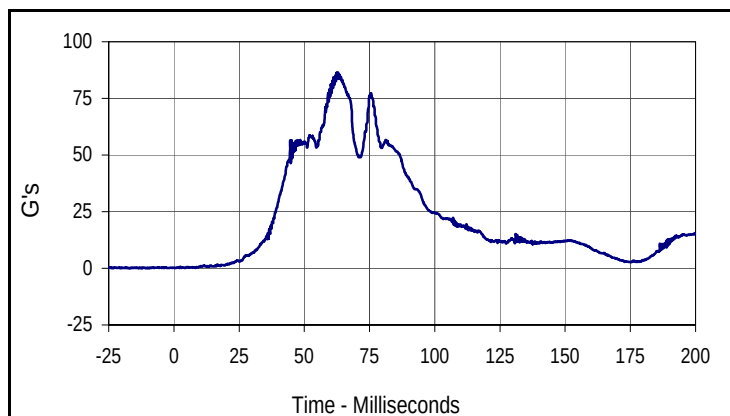
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CRABI Head X (P4)			
CURNO	Type	SAE Class	Units
142	FIL	1000	G's
Max	Time	Min	Time
61.2	75.6	-7.6	131.4



Curve Description			
CRABI Head Y (P4)			
CURNO	Type	SAE Class	Units
143	FIL	1000	G's
Max	Time	Min	Time
3.8	59.8	-14.4	71.1



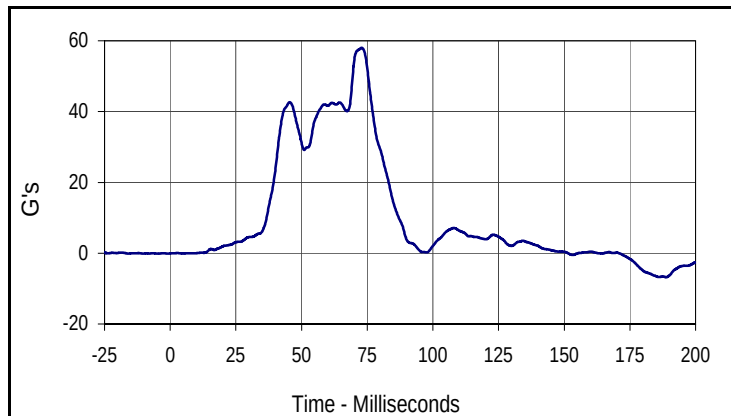
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71.2	61.3	-0.4	1.7



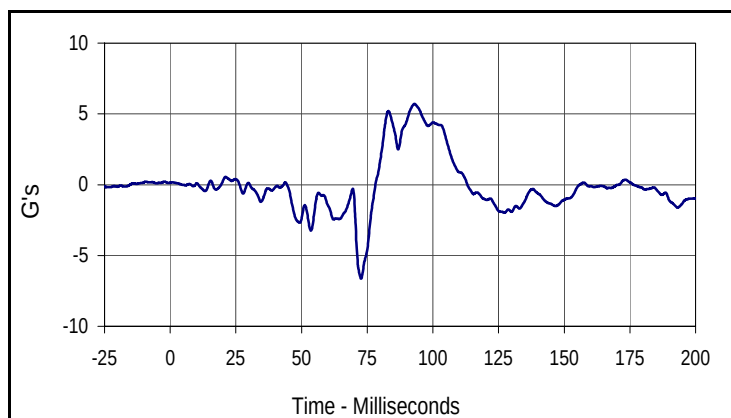
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CRABI Head Resultant (P4)			
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142	RES	1000	G's
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86.4	63.0	0.1	0.2

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

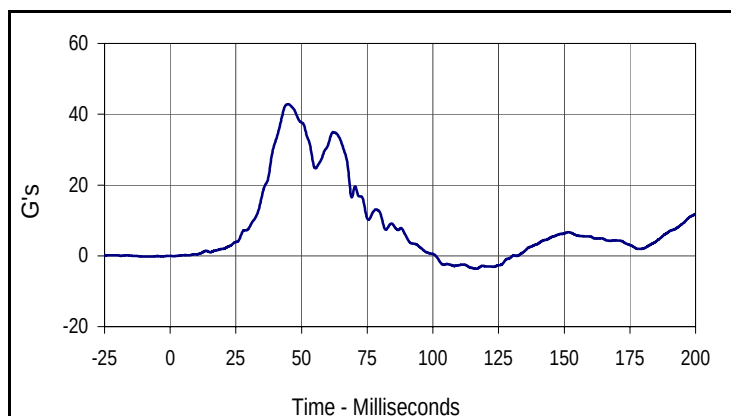
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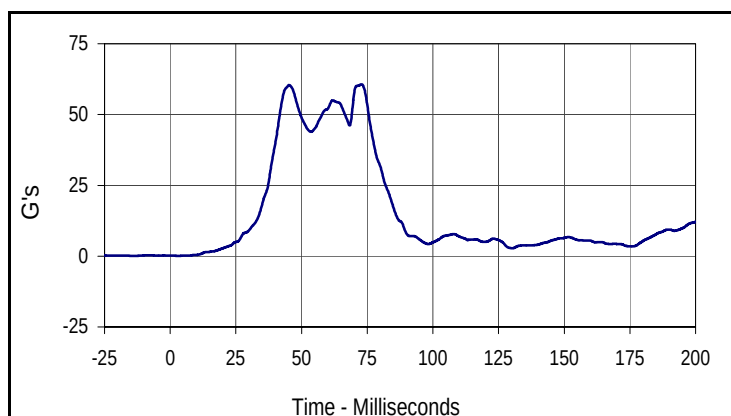
Curve Description			
CRABI Chest X (P4)			
CURNO	Type	SAE Class	Units
145	FIL	180	G's
Max	Time	Min	Time
58.0	73.0	-6.8	188.8



Curve Description			
CRABI Chest Y (P4)			
CURNO	Type	SAE Class	Units
146	FIL	180	G's
Max	Time	Min	Time
5.7	93.0	-6.6	72.7



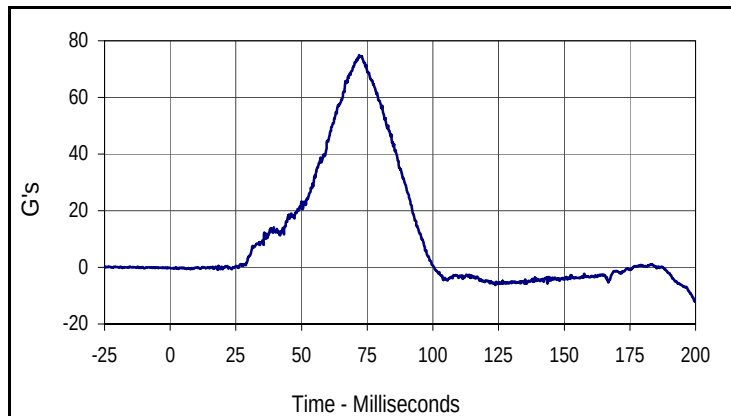
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CRABI Chest Z (P4)			
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147	FIL	180	G's
Max	Time	Min	Time
42.9	44.9	-3.6	116.6



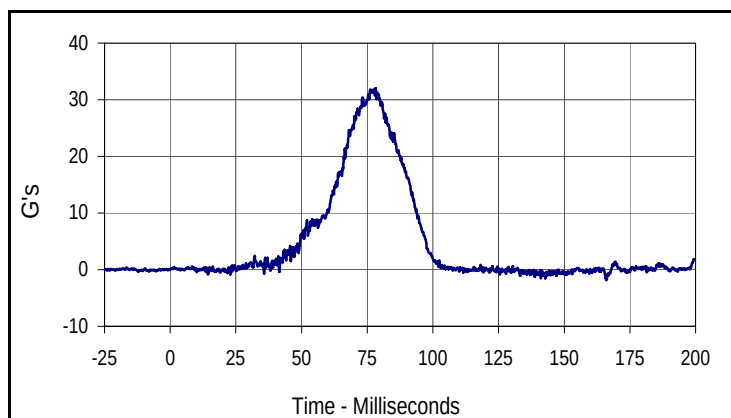
Curve Description			
CRABI Chest Resultant (P4)			
CURNO	Type	SAE Class	Units
145	RES	180	G's
Max	Time	Min	Time
60.7	72.9	0.1	3.5

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

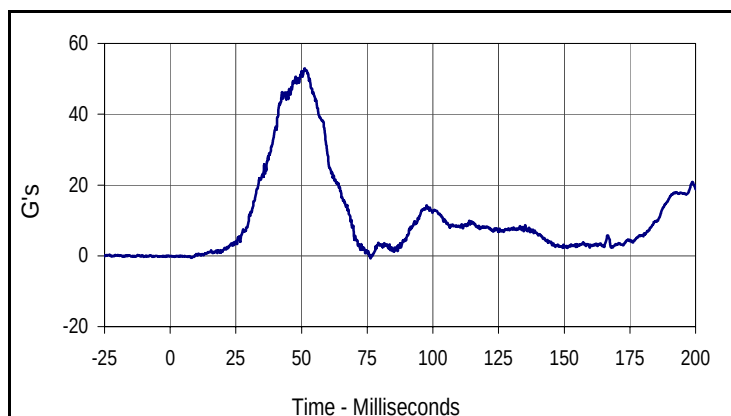
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 NHTSA No.: M85100



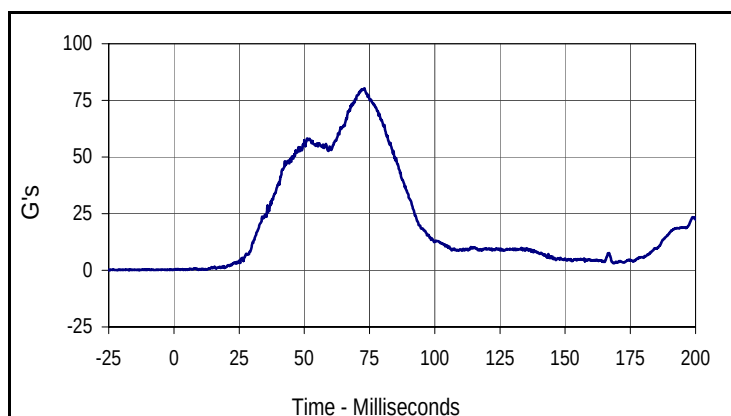
Curve Description			
CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
163	FIL	1000	G's
Max	Time	Min	Time
74.9	72.0	-12.1	199.8



Curve Description			
CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
164	FIL	1000	G's
Max	Time	Min	Time
32.0	78.2	-1.9	166.0



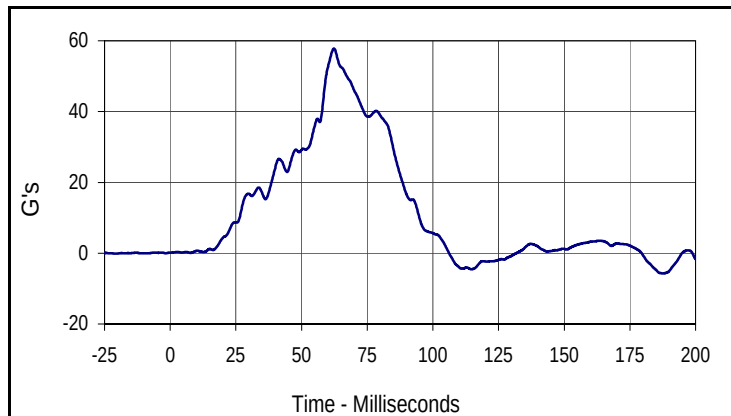
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CRABI Head Z (P3)			
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165	FIL	1000	G's
Max	Time	Min	Time
53.0	51.1	-0.8	76.2



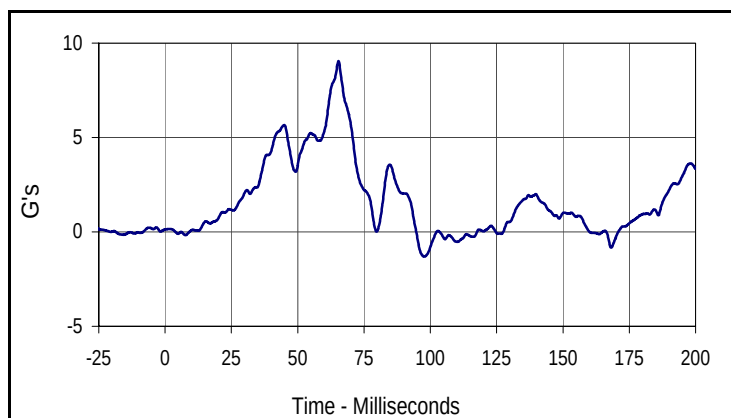
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CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
163	RES	1000	G's
Max	Time	Min	Time
80.3	73.0	0.1	9.3

Test Vehicle: 2008 Toyota Scion xB 5-Door MPV
 Test Program: 2007 NHTSA 35mph NCAP

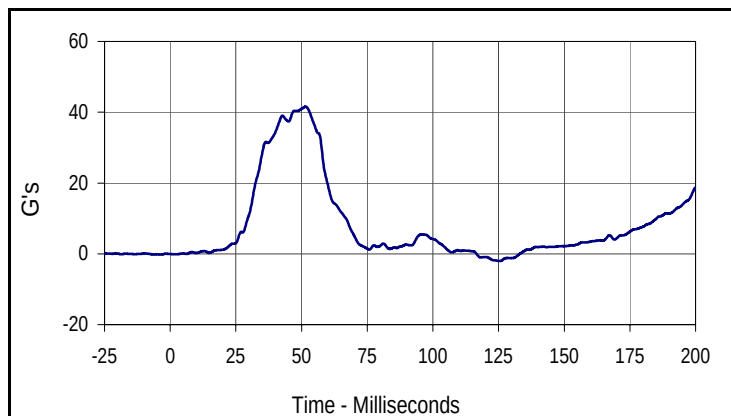
Test Date: 6/13/07
 NHTSA No.: M85100



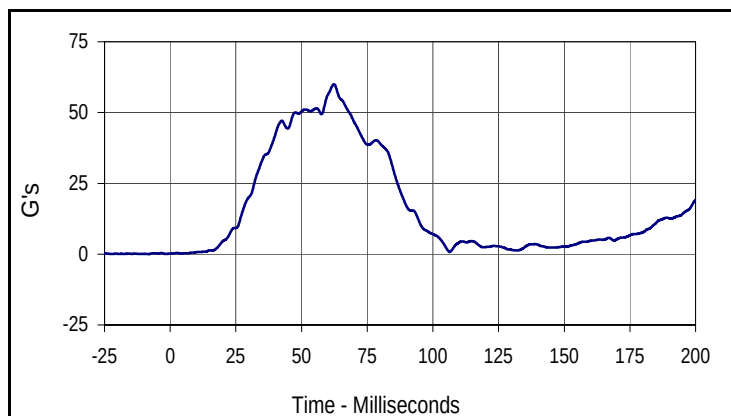
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CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
166	FIL	180	G's
Max	Time	Min	Time
57.8	62.3	-5.7	187.7



Curve Description			
CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
167	FIL	180	G's
Max	Time	Min	Time
9.0	65.4	-1.3	97.7



Curve Description			
CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
168	FIL	180	G's
Max	Time	Min	Time
41.6	51.5	-2.0	125.5



Curve Description			
CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
166	RES	180	G's
Max	Time	Min	Time
60.0	62.3	0.2	4.2

SECTION D4

CRABI CALIBRATION INFORMATION

Test Program: CRABI 12 Month Old Frontal Head Drop Test

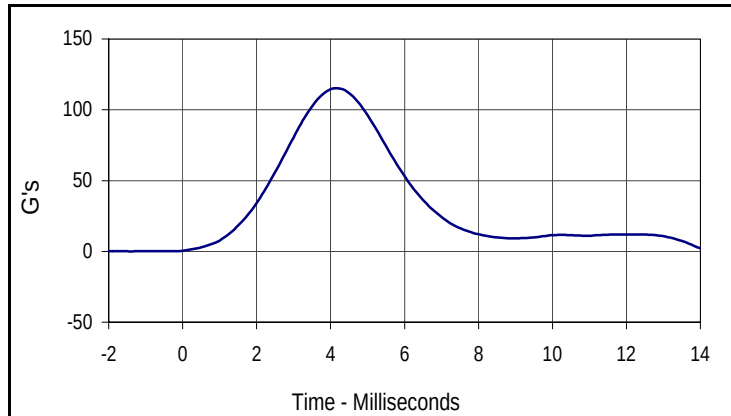
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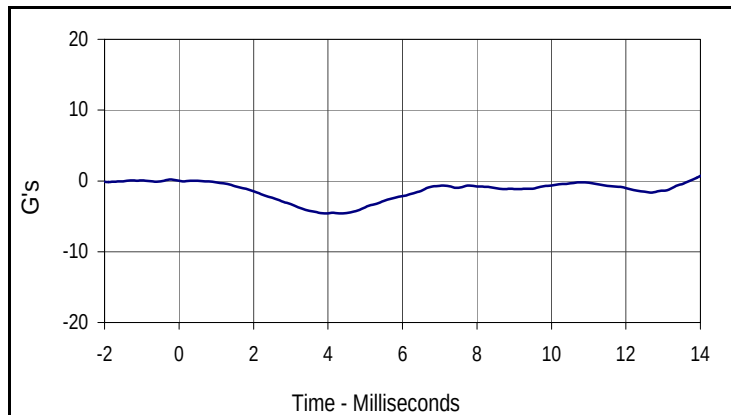
Test I.D.: FHD06J



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	100.0 to 120.0	115.2	Pass
Peak Lateral Acceleration	G's	≤15.0	4.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
115.2	4.2	0.0	-1.4



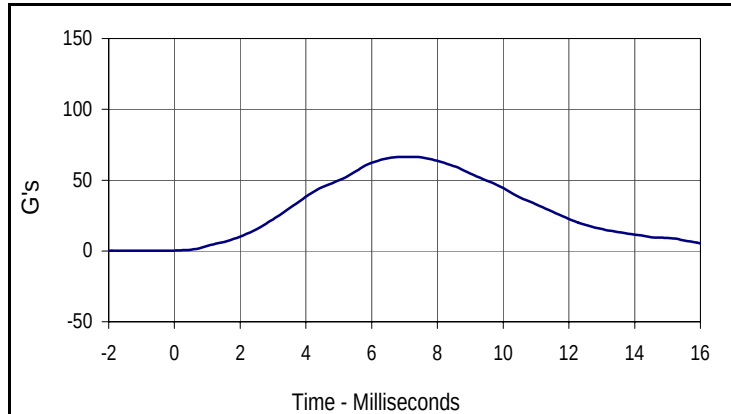
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.2	-0.2	-4.6	3.9

Test Program: CRABI 12 Month Old Rear Head Drop Test
 ATD Serial No.: 017

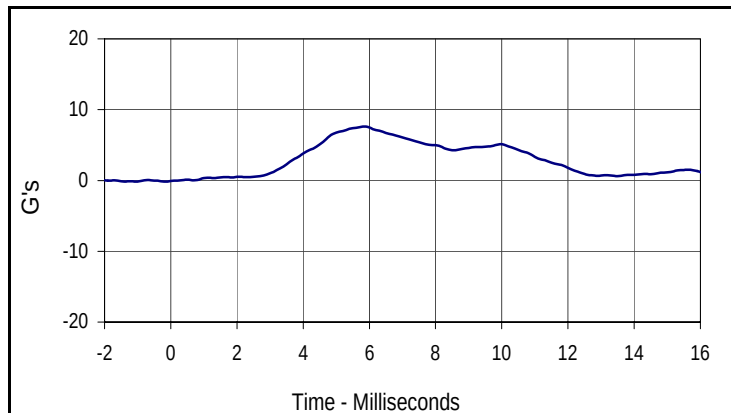
Test Date: 6/12/07
 Test I.D.: RHD06J



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	55.0 to 71.0	62.2	Pass
Peak Lateral Acceleration	G's	≤15.0	7.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
62.2	6.0	0.1	-0.9



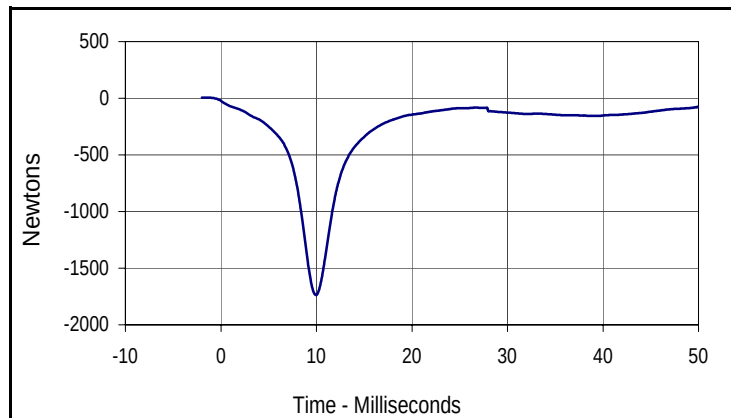
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.8	-0.2	-1.4

Test Program: CRABI 12 Month Old Thorax Impact Test
 ATD Serial No.: 017

Test Date: 6/12/07
 Test I.D.: CH06J



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	5.05	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1736	Pass
Overall Test Results				Pass



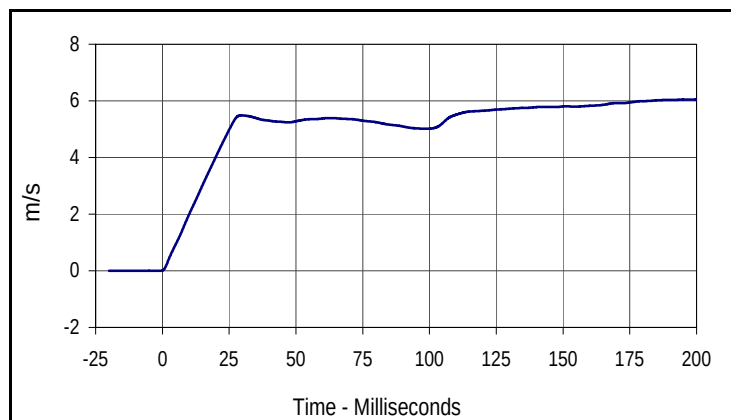
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6.2	-1.6	-1736.1	10.0

Test Program: CRABI 12 Month Old Neck Flexion Test
 ATD Serial No.: 017

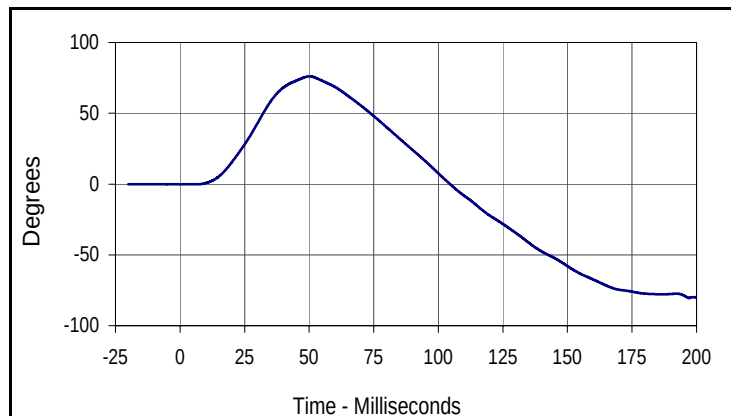
Test Date: 6/12/07
 Test I.D.: NF06J



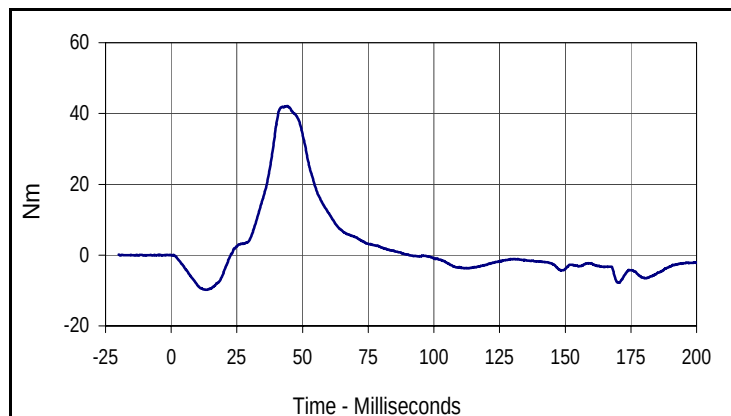
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.11	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.0	Pass
	25 Msec.	m/s	4.3 to 5.2	5.0	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	39.4	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	70.6	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.0	199.3	0.0	-0.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.1	50.1	-80.5	197.1



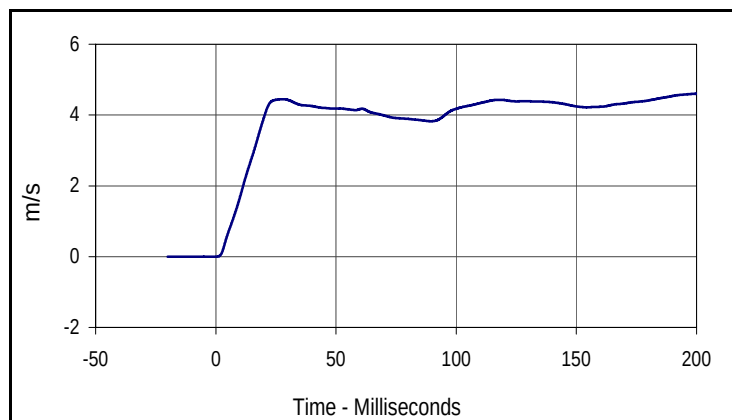
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
42.1	44.3	-9.8	13.5

Test Program: CRABI 12 Month Old Neck Extension Test
 ATD Serial No.: 017

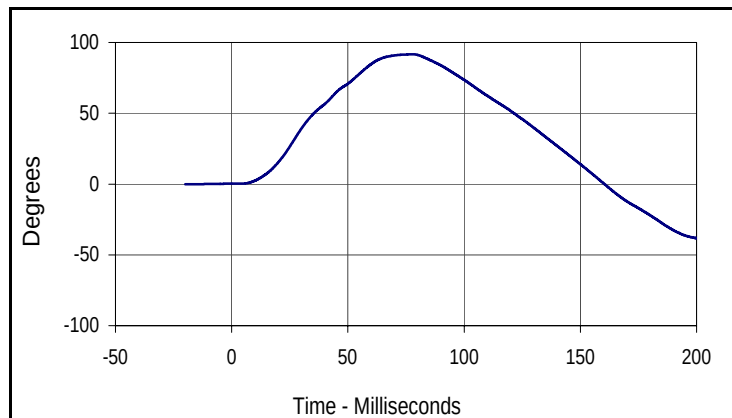
Test Date: 6/12/07
 Test I.D.: NE06J



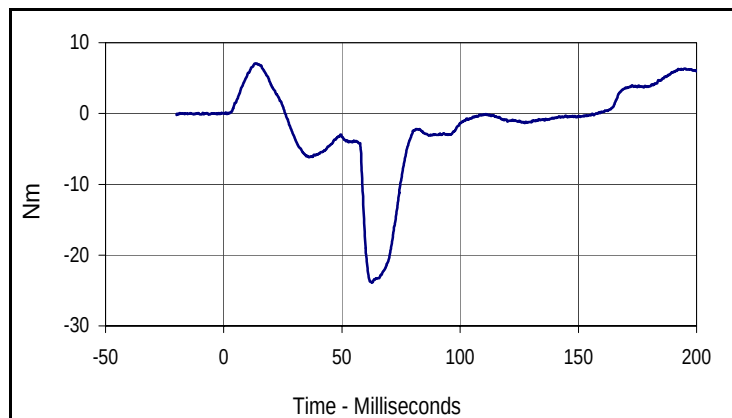
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.40	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.8	Pass
	10 Msec.	m/s	1.5 to 2.1	1.7	Pass
	14 Msec.	m/s	2.2 to 2.9	2.6	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	91.7	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-19.1	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	77.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.6	200.0	0.0	0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
91.7	77.7	-38.2	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
7.1	13.2	-23.9	62.8

Test Program: CRABI 12 Month Old External Dimensions
 ATD Serial No.: 017

Test Date: 6/12/07
 Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	456.0 to 471.2	459	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	287	Pass
C - "H" point height	mm	27.9 to 38.1	30	Pass
D - "H" point from backline	mm	40.1 to 50.3	47	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	55	Pass
F - Thigh clearance	mm	63.0 to 73.2	64	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	182	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	110	Pass
J - Elbow rest height	mm	150.1 to 165.3	159	Pass
K - Buttock to knee length	mm	202.7 to 217.9	214	Pass
L - Popliteal length	mm	138.7 to 153.9	148	Pass
M - Knee pivot height	mm	165.1 to 180.3	171	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	152	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	111	Pass
P - Foot length	mm	92.4 to 102.6	100	Pass
Q- Stature	mm	727.7 to 753.1	N/A	N/A
R - Buttock to knee pivot length	mm	178.5 to 188.7	184	Pass
S - Head Breadth	mm	124.4 to 134.6	126	Pass
T - Head Depth	mm	149.9 to 165.1	154	Pass
U - Hip breadth	mm	158.5 to 173.7	165	Pass
V - Shoulder breadth	mm	200.7 to 215.9	210	Pass
W - Foot breadth	mm	39.1 to 49.3	40	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	464	Pass
Z - Waist circumference	mm	447.0 to 472.4	451	Pass
AA - Reference location for dimension Y & O	mm	256.5 to 266.7	260	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	110	Pass
CC - Shoulder Height	mm	299.7 to 314.9	309	Pass
DD - Chin Height	mm	289.6 to 304.8	296	Pass
Overall Test Results				Pass

Test Program: CRABI 12 Month Old Frontal Head Drop Test

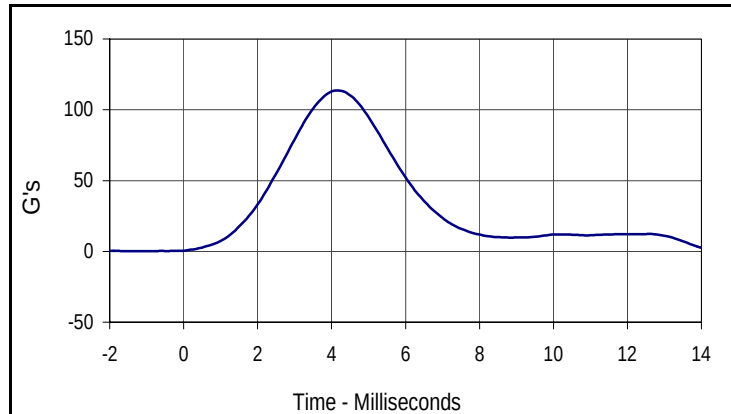
Test Date: 6/12/07

ATD Serial No.: 022

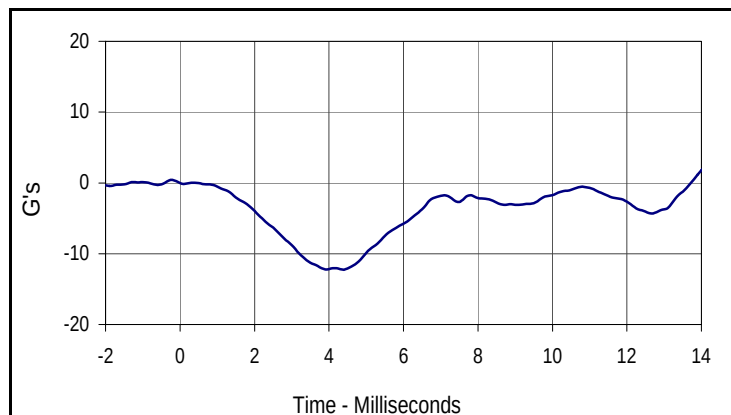
Test I.D.: FHD06K



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	100.0 to 120.0	113.6	Pass
Peak Lateral Acceleration	G's	≤15.0	12.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
113.6	4.2	0.1	-1.4



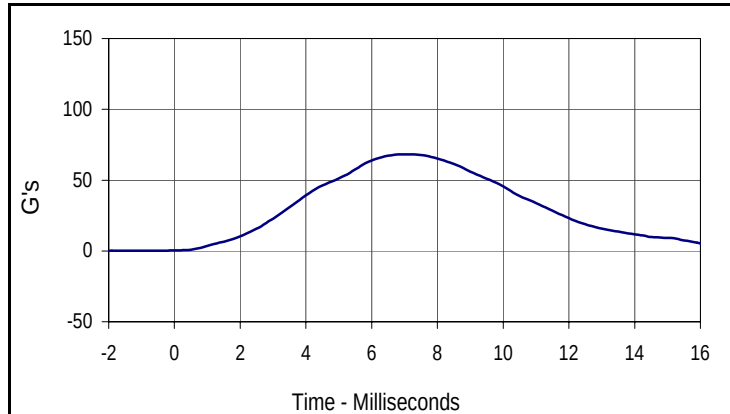
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.4	-0.2	-12.3	4.4

Test Program: CRABI 12 Month Old Rear Head Drop Test
 ATD Serial No.: 022

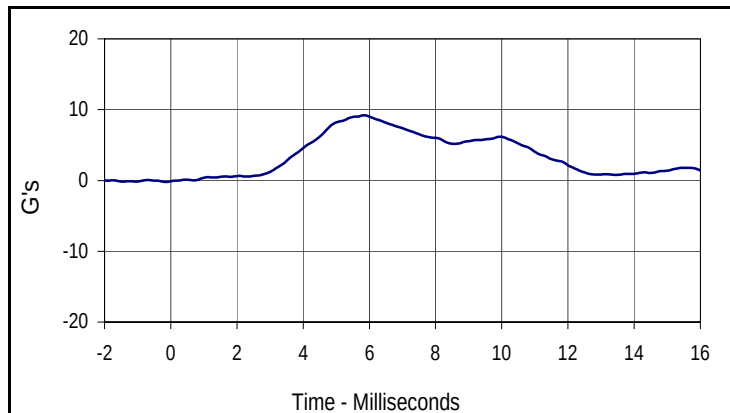
Test Date: 6/12/07
 Test I.D.: RHD06K



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	55.0 to 71.0	63.9	Pass
Peak Lateral Acceleration	G's	≤15.0	9.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
63.9	6.0	0.1	-0.9



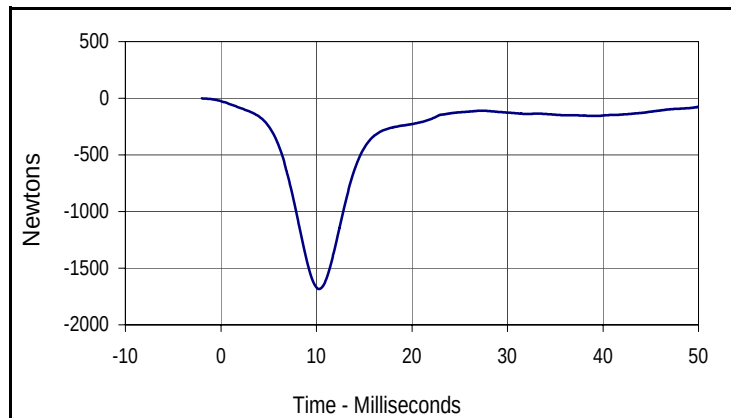
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
9.2	5.9	-0.2	-0.2

Test Program: CRABI 12 Month Old Thorax Impact Test
 ATD Serial No.: 022

Test Date: 6/12/07
 Test I.D.: CH06K



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	5.08	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1670	Pass
Overall Test Results				Pass



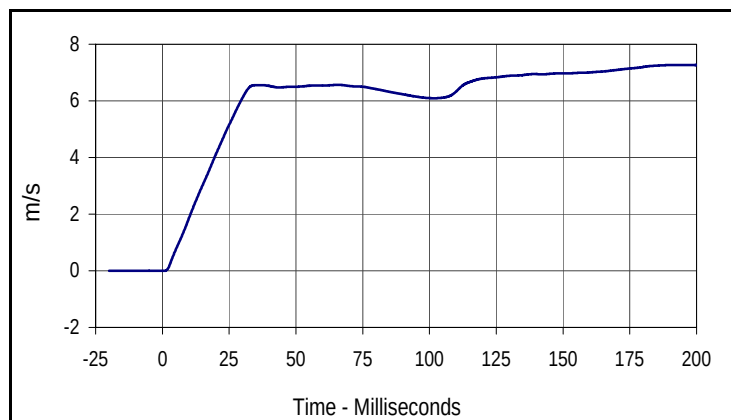
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	60	Newtons
Max	Time	Min	Time
-1.2	-2.0	-1670.1	10.0

Test Program: CRABI 12 Month Old Neck Flexion Test
 ATD Serial No.: 022

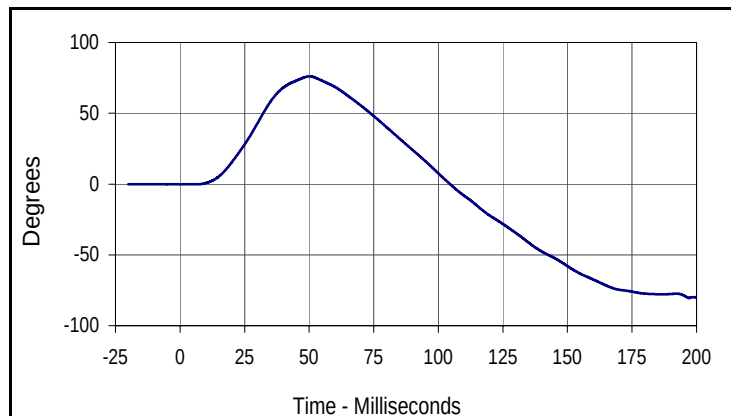
Test Date: 6/12/07
 Test I.D.: NF06K



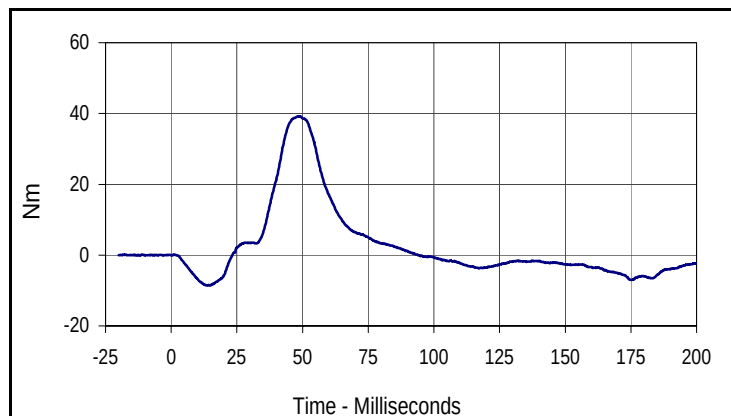
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.20	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	1.9	Pass
	20 Msec.	m/s	3.4 to 4.2	4.1	Pass
	25 Msec.	m/s	4.3 to 5.2	5.2	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	39.2	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	75.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.3	197.7	0.0	0.6



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.1	50.1	-80.5	197.1



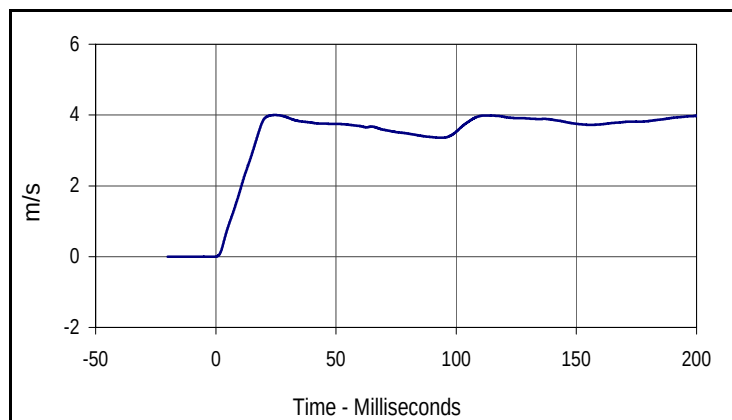
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
39.2	48.7	-8.6	13.7

Test Program: CRABI 12 Month Old Neck Extension Test
 ATD Serial No.: 022

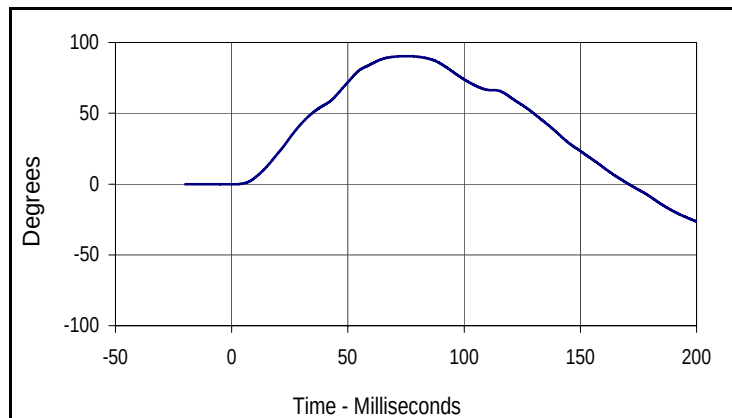
Test Date: 6/12/07
 Test I.D.: NE06K



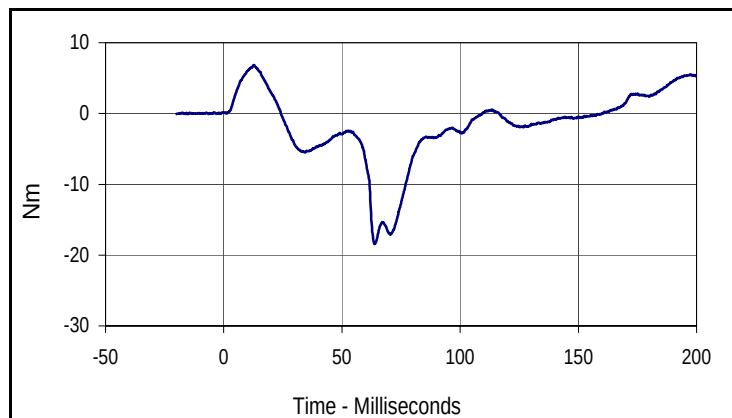
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.46	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	1.0	Pass
	10 Msec.	m/s	1.5 to 2.1	1.8	Pass
	14 Msec.	m/s	2.2 to 2.9	2.7	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	90.4	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-12.5	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	80.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.0	24.6	0.0	-0.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
90.4	75.0	-26.4	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
6.8	12.8	-18.4	63.8

Test Program: CRABI 12 Month Old External Dimensions
 ATD Serial No.: 022

Test Date: 6/12/07
 Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	456.0 to 471.2	460	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	285	Pass
C - "H" point height	mm	27.9 to 38.1	34	Pass
D - "H" point from backline	mm	40.1 to 50.3	44	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	52	Pass
F - Thigh clearance	mm	63.0 to 73.2	68	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	186	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	110	Pass
J - Elbow rest height	mm	150.1 to 165.3	158	Pass
K - Buttock to knee length	mm	202.7 to 217.9	213	Pass
L - Popliteal length	mm	138.7 to 153.9	142	Pass
M - Knee pivot height	mm	165.1 to 180.3	171	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	149	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	110	Pass
P - Foot length	mm	92.4 to 102.6	97	Pass
Q- Stature	mm	727.7 to 753.1	N/A	N/A
R - Buttock to knee pivot length	mm	178.5 to 188.7	180	Pass
S - Head Breadth	mm	124.4 to 134.6	126	Pass
T - Head Depth	mm	149.9 to 165.1	154	Pass
U - Hip breadth	mm	158.5 to 173.7	163	Pass
V - Shoulder breadth	mm	200.7 to 215.9	210	Pass
W - Foot breadth	mm	39.1 to 49.3	45	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	460	Pass
Z - Waist circumference	mm	447.0 to 472.4	451	Pass
AA - Reference location for dimension Y & O	mm	256.5 to 266.7	263	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	108	Pass
CC - Shoulder Height	mm	299.7 to 314.9	307	Pass
DD - Chin Height	mm	289.6 to 304.8	295	Pass
Overall Test Results				Pass