

REPORT NUMBER: SPNCAP-KAR-12-030

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**TOYOTA MOTOR CORPORATION
2012 TOYOTA YARIS LE 5-DOOR HATCHBACK**

NHTSA No: MC5108

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



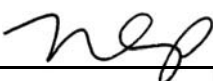
JANUARY 13, 2012

FINAL REPORT

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

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Approval Date: January 13, 2012

FINAL REPORT ACCEPTANCE BY OCWS:


Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: 


COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: 

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. SPNCAP-KAR-12-030	2. Government Accession No.	3. Recipient's Catalog No.																												
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108		5. Report Date January 13, 2012																												
		6. Performing Organization Code KAR																												
7. Authors Mr. Kelsey A. Chiu, Engineering Department Supervisor, KARCO Mr. Frank Richardson, Program Manager, KARCO		8. Performing Organization Report No. TR-P31007-10-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. DTNH22-09-D-00122																												
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		13. Type of Report and Period Covered Final Test Report, Jan. 3 - 13, 2012																												
		14. Sponsoring Agency Code NVS-111																												
15. Supplementary Notes																														
16. Abstract A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2012 Toyota Yaris LE 5-door hatchback in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on January 3, 2012. The impact velocity was 32.8 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 18.7 deg. C. The target vehicle's maximum post-test static crush was 349 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>352.8</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>46.0</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td>N</td> <td>5525</td> <td>4194</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>18</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45</td> <td>24</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches. The opposite doors did not open during the side impact event.				Measurement Description	Driver ATD (ES-2re)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	352.8	Resultant Lower Spine Acceleration	g	82	46.0	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	4194	Maximum Thoracic Rib Deflection	mm	38	18	Maximum Abdominal Rib Deflection	mm	45	24
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 1200 New Jersey Ave., SE Room W43-410 Washington, DC 20590																												
19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 101	22. Price																											

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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2012 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00122. The purpose of this test is to generate comparative side impact performance in a 2012 Toyota Yaris LE 5-door hatchback. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated August 2011.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2012 Toyota Yaris LE 5-door hatchback. The subject vehicle was towed into the rigid pole at an angle of 75.2° and a velocity of 32.8 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on January 3, 2012. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated August 2011. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) was instrumented accordingly:

- Head CG tri-axial accelerometers
- Thorax upper, middle and lower rib displacement potentiometers
- Abdomen upper and lower rib displacement potentiometers
- Lower spine (12) tri-axial accelerometers
- Iliac load cell
- Acetabulum load cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	352.8
Lower Spine (T12) Resultant Acceleration	g	82	46
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4194
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	24

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	Yes	No	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other (Seat Cushion Airbag	Yes	No	Yes	No

GENERAL COMMENTS

Both the front and rear doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. Both doors on the non-struck side remained closed and latched. There were no ATD values that exceeded limits.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.574
Pressure	Tire Pressures	lbf/in ²	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC5108
Model Year	2012
Make	Toyota
Model	Yaris LE
Body Style	5-Door Hatchback
VIN	JTDKTUD35CD503712
Body Color	Blazing Blue Pearl
Odometer Reading (km / mi)	93 / 58
Engine Displacement (L)	1.5
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	4
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	No

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	No
Power Window Auto-Reverse	Yes
Other Optional Feature	None
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	Seat Cushion Airbag

Does Owner's Manual provide instructions to turn off automatic door locks?

☐

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Corporation
Date of Manufacture	Sep-11
Vehicle Type	Passenger

GVWR (kg)	1510
GAWR Front (kg)	830
GAWR Rear (kg)	830

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	A
Capacity Weight (VCW) (kg)				376.0	B
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				35.8	A-B

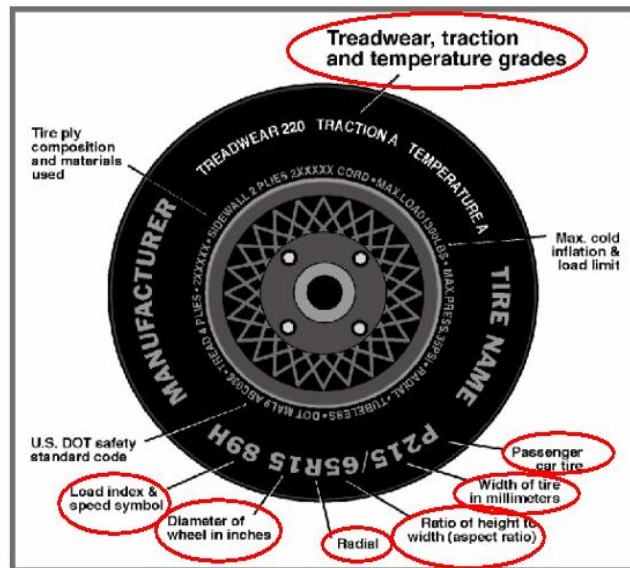
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	230	230
Recommended Tire Size	P175/65R15	P175/65R15

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Tire Size on Vehicle	75/65R15	75/65R15
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Assurance	Assurance
Tire Type	Passenger	Passenger
Tire Width	175	175
Aspect Ratio	65	65
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index/Speed Symbol	84H	84H
Treadware	580	580
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	220	220	220	225
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	230	230

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	350.5	210.0		368.0	229.5		369.5	247.5	
Right	kg	324.0	209.0		343.0	229.0		326.5	233.5	
Ratio	%	61.7%	38.3%	100.0%	60.8%	39.2%	100.0%	59.1%	40.9%	100.0%
Total	kg	674.5	419.0	1093.5	711.0	458.5	1169.5	696.0	481.0	1177.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1093.5
Actual Weight of 1 P572 O ATD Used	kg	49.0
Rated Cargo/Luggage Wt (RCLW)	kg	35.8
Calculated Vehicle Target Wt (TVTW)	kg	1178.3

A
B
C
A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e.

Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)? ☒ Yes ☐ No

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Rear Bumper Cover	2.5
Rear Taillights	3.0
Non-Struck Side Windows	5.0
Speakers	1.0
Outboard Mirror	1.0
Non-Struck Side Door Panels	5.0
Spare Tire	11.0
Spare Tire Tools	4.0
Headlights	5.0
4 Headrests	6.0
Windshield Wipers and Rear Motor	3.0
Non-Structural Plastic Trim	0.5
Washer Fluid Reservoir	1.0
Air Filter	1.5
Ballast / Equipment Added	68.8

DATA SHEET NO. 1 ... (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12**TEST VEHICLE ATTITUDE AND CG**

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.1	-0.3	-0.3	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.1	0.0	0.2	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.3	0.2	0.3	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.0	0.1	0.1	Yes
Vehicle CG (Aft of Front Axle)	mm	963	985	1027	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	19	16	36	

*ND=Nose Down (-), NU=Nose Up (+)

**LD=Left Down (-), LU=Left Up (+)

***The "As Tested" vehicle attitude angle measurements must be within "As Delivered" and the "Fully Loaded" vehicle attitude measurements at each location. Indicate "Yes" or "No" for "Meets Requirement"

DATA SHEET NO. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12**SEAT POSITIONING**

The driver's seat is set to the forward most position where the ATD will not contact any interior panels at the mid-height and mid-angle position. The front center seat (if applicable) and right front passenger's seat should be set in a similar manner as the driver's seat. The struck side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rearmost, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	7.2	0.0	3.6
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	3.6	568	Max	550	559	568
			Mid	550	559	568
			Min	550	559	568
Front Passenger Seat	Fixed	563	Max	545	554	563
			Mid	545	554	563
			Min	545	554	563
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

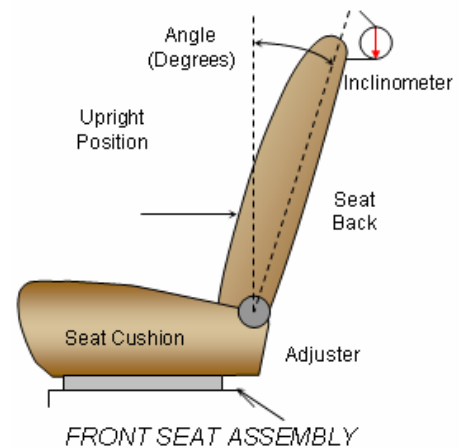
Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents	mm	Detent
Driver Seat	220	23	0	0
Front Passenger Seat	220	23	0	0
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The right front passenger seat back is set to the same angle as the driver's seat.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents	Degree	Detent
Driver Seat w/Seated Dummy	52.3	27	-3.6	1
Front Passenger Seat	47.9	27	-3.6	1
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. The positions are marked H, M1, ... , L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12**HEAD RESTRAINT ADJUSTMENT**

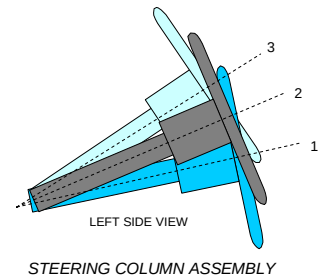
The driver's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	4	Full Down

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	23.6	
Geometric Center - Position 2	25.0	
Uppermost - Position 3	26.5	
Telescoping Steering Wheel Travel		
Test Position	25.0	



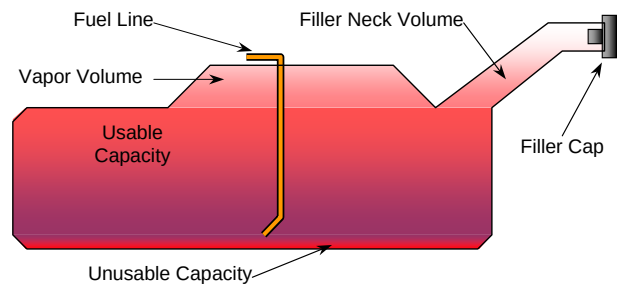
DATA SHEET NO. 2 ... (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12**FUEL TANK CAPACITY**

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	42.01
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	39.07
Actual amount of Solvent Used in Test	39.07
1/3 of Usable Capacity	14.00

Is the Actual Amount of Solvent Used in the test equal to $93\% \pm 1\%$ of the Usable Capacity stated in the Form No. 1? ☒ Yes ☐ No

FUEL PUMP

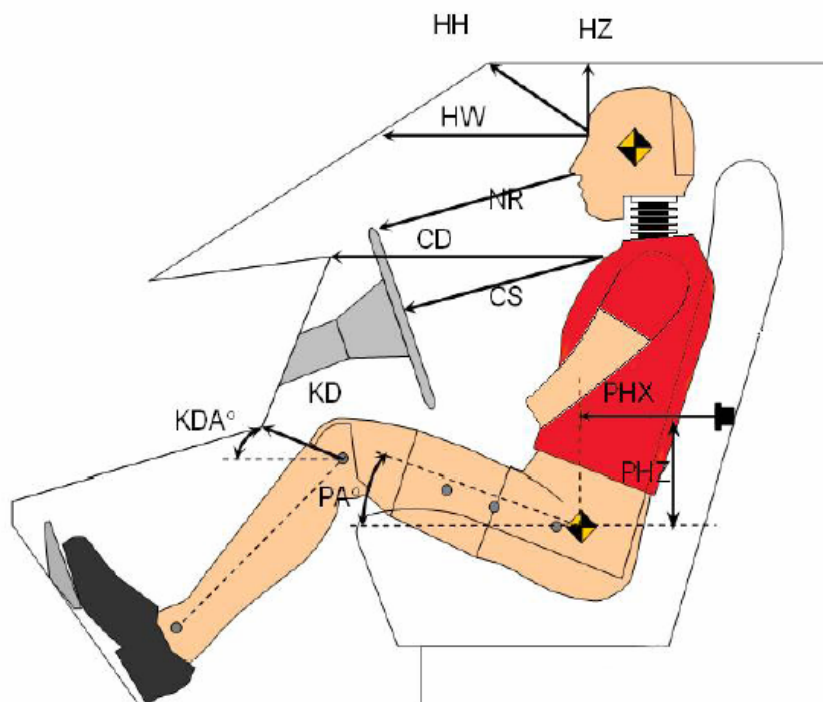
The vehicle is equipped with an electric fuel pump.
The fuel pump is activated when the ignition is turned on.

**VEHICLE FUEL TANK ASSEMBLY**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



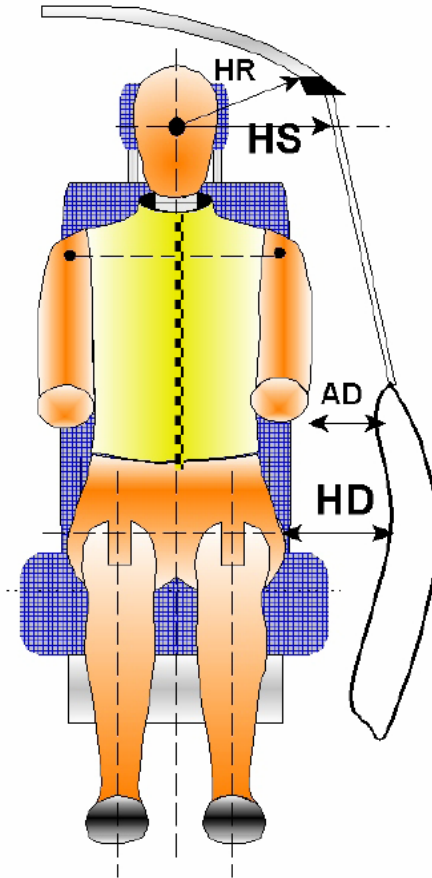
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	260	
HW	Head to Windshield	654	
HZ	Head to Roof	204	
NR	Nose to Rim	286	
CD	Chest to Dash	421	
CS	Chest to Steering Wheel	194	
KD(L)/KDA(L)°	Left Knee to Dash	126	60.5
KD(R)/KDA(R)°	Right Knee to Dash	109	66.4
PAX°	Pelvic Tilt Angle (x-axis)		19.7
PAY°	Pelvic Tilt Angle (y-axis)		0.0
PHX	Hip Point to Striker (x-axis)	326	
PHZ	Hip Point to Striker (z-axis)	182	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



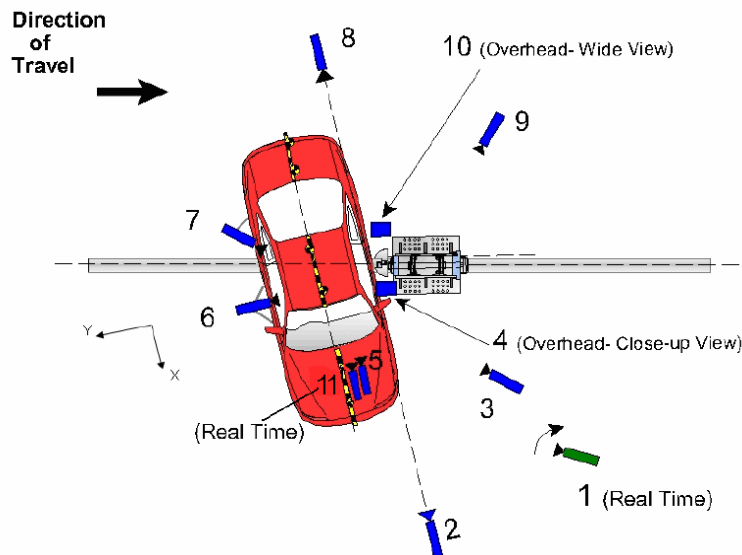
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	254
HS	Head to Side Window	mm	331
AD	Arm to Door	mm	129
HD	H-Point to Door	mm	163

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



CAMERA LOCATIONS AND DATA

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.48	0.44	-1.30	35	1000
6	On-Board - Dummy Side View	0.04	1.53	-1.13	14	1000
7	On-Board - Dummy Rear Oblique View	-0.92	1.48	-1.22	20	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.59	0.51	-1.29		30

Reference from Point of Impact for X and Y; from Ground for Z):

+X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down

*All measurements accurate to ± 6 mm

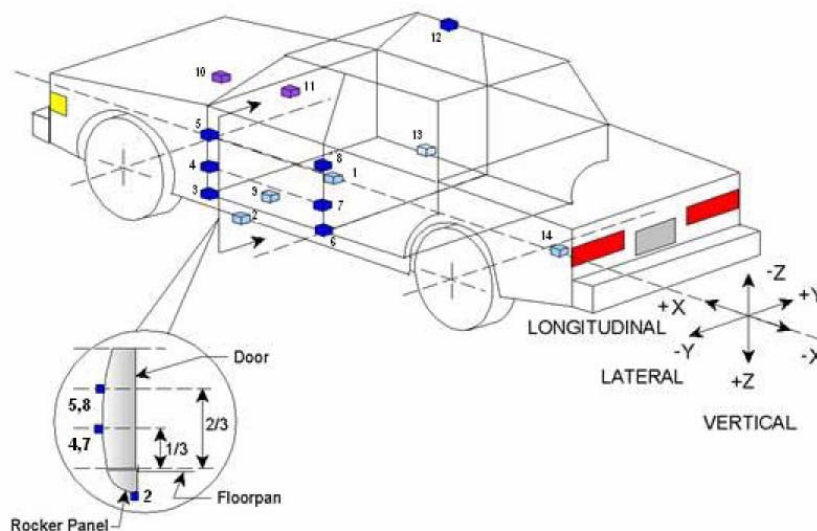
INSTRUMENTATION

Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

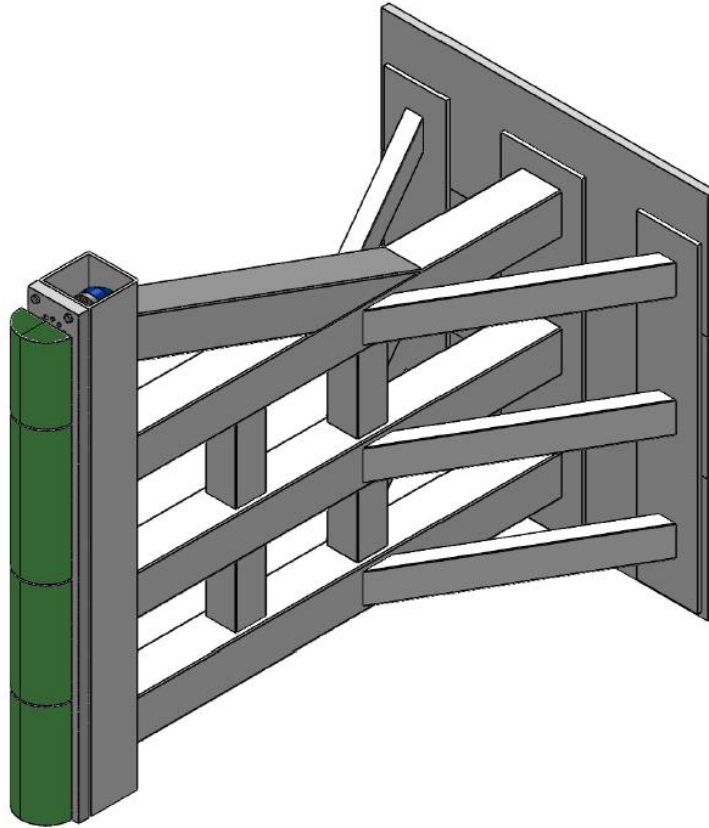
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1569	0	-248
2	Left Floor Sill	2402	-420	-140
3	A-Pillar Sill	2695	-745	-365
4	A-Pillar Low	2695	-745	-524
5	A-Pillar Mid	2695	-745	-768
6	B-Pillar Sill	1648	-690	-370
7	B-Pillar Low	1648	-690	-565
8	B-Pillar Mid	1648	-690	-770
9	Driver Seat Track	2025	-558	-275
10	Engine Top	3267	341	-765
11	Firewall	3075	-44	-722
12	Right Roof	1790	468	-1453
13	Right Floor Sill	1535	675	-260
14	Rear Floorpan	394	405	-490

Reference: X – Rear surface of vehicle (+ forward)
 Y – Vehicle centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	87
2	mm	468
3	mm	648
4	mm	978
5	mm	1168
6	mm	1651
7	mm	1816
8	mm	2057

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Head Restraint, Seat Back, RF Seat
Left Shoulder	Seat, Torso/Pelvis Airbag
Upper Torso	Seat
Lower Torso	Seat
Left Hip	Seat, Torso/Pelvis Airbag
Left Knee	Door Panel, Right Knee

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	n/a	n/a	n/a	n/a	n/a

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	No Separation
Windshield Damage	Broken
Side Window Damage	Left Front Window Broken
Other Notable Effects	None

DATA SHEET NO. 8 ... (CONTINUED)**POST-TEST OBSERVATIONS**

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	Yes	No	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other (Seat Cushion Airbag)	Yes	No	Yes	No

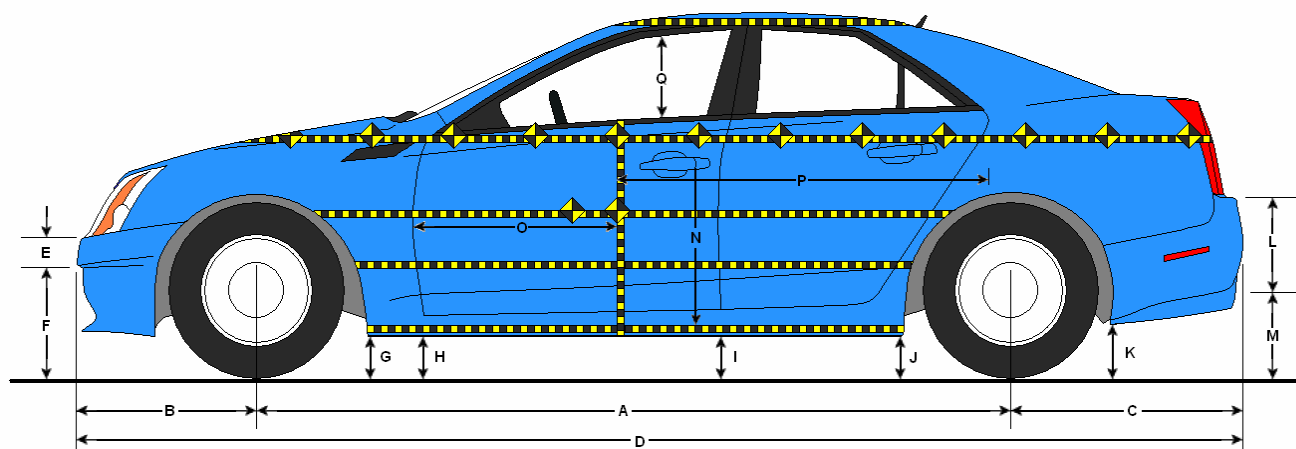
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1035
Actual Impact Point (Aft of Front Axle)	mm		1025
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	10
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.2
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.8
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.8

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

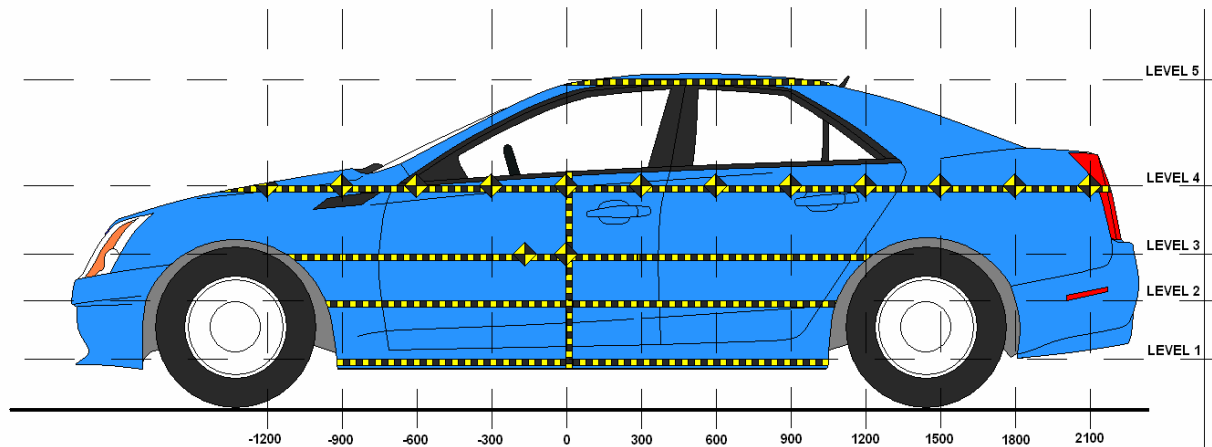
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2512	2476	-36
B	Front Axle to FSOV	793	804	11
C	Rear Axle to RSOV	528	539	11
D	Total Length at Centerline	3739	3819	80
E	Front Bumper Thickness	155	155	0
F	Front Bumper Bottom to Ground	364	391	27
G	Sill Height at Front Wheel Well	192	213	21
H	Sill Height at Front Door Leading Edge	193	216	23
I	Sill Height at B-Pillar	208	221	13
J1	Sill Height at Rear Wheel Well	211	237	26
J2	Pinch Weld Height at Rear Wheel Well	189	209	20
K	Sill Height Aft of Rear Wheel Well	429	459	30
L	Rear Bumper Thickness	285	286	1
M	Rear Bumper Bottom to Ground	326	336	10
N	Sill Height to Bottom of Front Window Sill	580	649	69
O	Front Door Leading Edge to Impact CL	672	562	-110
P	Rear Door Trailing Edge to Impact CL	1394	1316	-78
Q	Front Window Opening	504	517	13
R	Right Side Length	2837	2845	8
S	Left Side Length	2835	2784	-51
T	Vehicle Width at B-Pillar	1693	1601	-92

All measurements in mm with tolerance of $\pm 3\text{mm}$

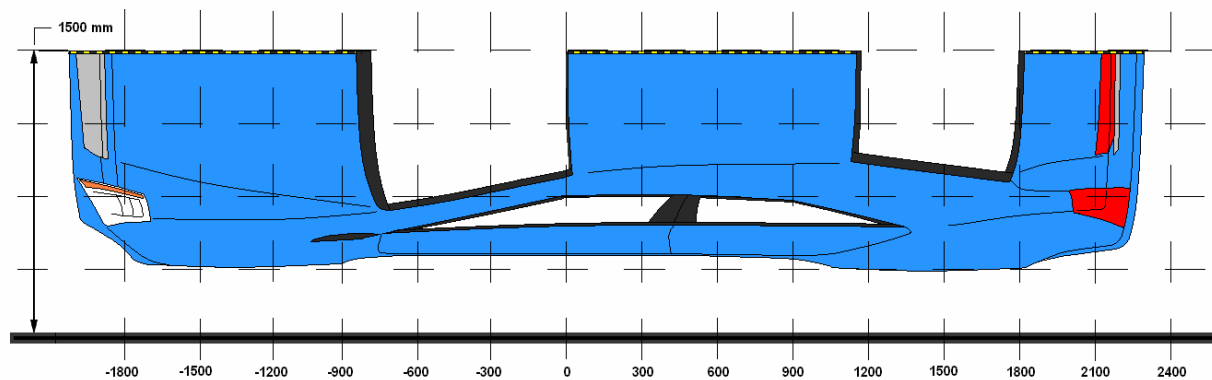
DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12



LEFT SIDE VIEW



OVERHEAD VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	249	286	0
2	Occupant H-Point	568	343	0
3	Mid-Door	626	349	0
4	Window Sill	871	334	0
5	Window Top	1448	124	0

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900			653	731				685	759				32	28	
-750		656	659	724			696	700	761			40	41	37	
-600	694	663	661	714		737	692	689	753		43	29	28	39	
-450	693	662	659	707		786	772	777	808		93	110	118	101	
-300	692	661	658	699		837	848	858	871		145	187	200	172	
-150	692	661	657	693		896	927	937	945		204	266	280	252	
0	692	660	657	687	966	978	1003	1006	1021	1090	286	343	349	334	124
150	694	660	656	683	972	947	959	965	981	1095	253	299	309	298	123
300	695	661	656	663	973	863	864	865	844	1070	168	203	209	181	97
450	698	662	657	676	974	818	776	770	785	1047	120	114	113	109	73
600	700	665	659	679	971	783	753	749	769	1029	83	88	90	90	58
750	703	667	662	682	972	752	732	730	754	1019	49	65	68	72	47
900	704	670	665	686	973	725	715	713	740	1014	21	45	48	54	41
1050	702	668	666	691	978	703	692	694	726	1012	1	24	28	35	34
1200		656	659	698	981		665	665	713	1010		9	6	15	29
1350			653	705	989			665	702	1012			12	-3	23
1500				717					726					9	
1650															
1800															
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

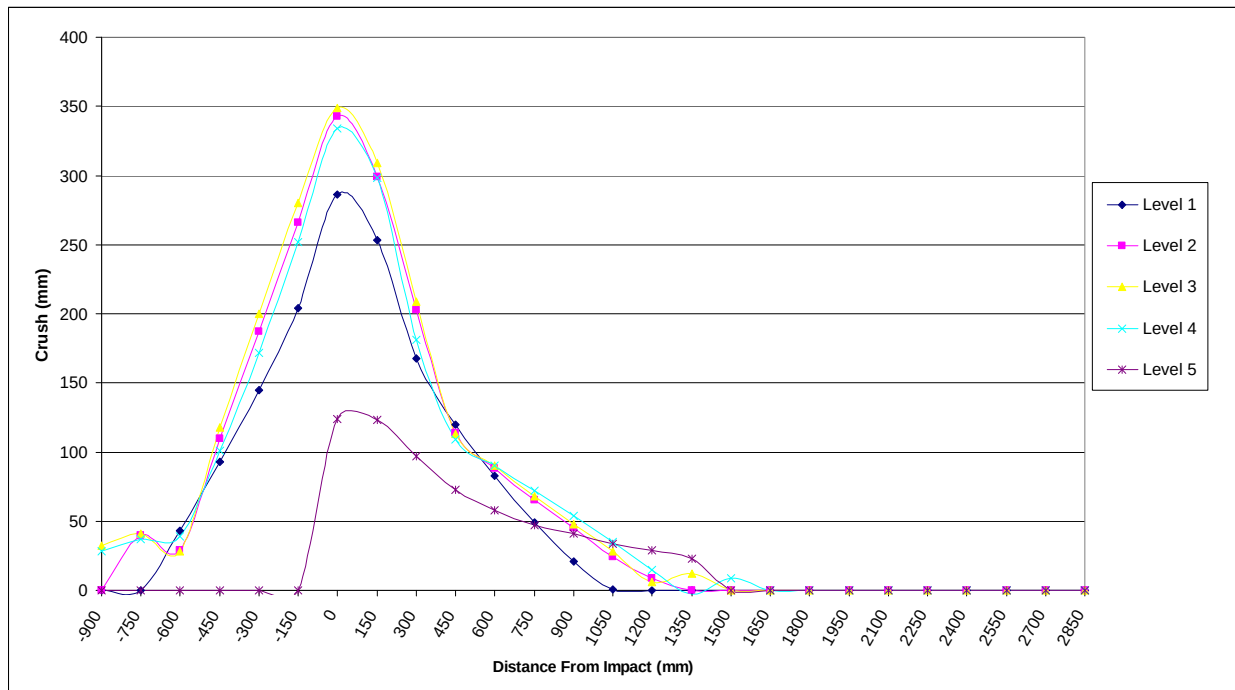
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback

NHTSA No. MC5108

Test Program: NCAP Side Pole Impact Test

Test Date: 1/3/12

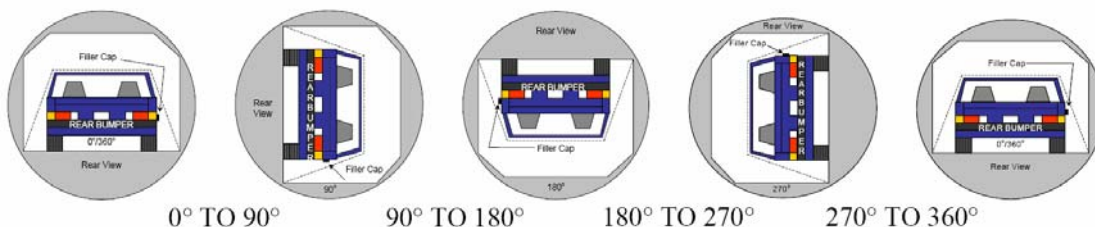


DATA SHEET NO. 11

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback NHTSA No. MC5108
 Test Program: NCAP Side Pole Impact Test Test Date: 1/3/12
 Temperature at Time of Impact: 18.7° C Test Time: 12:30 PM

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
 (Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
 (Maximum allowable = 1 oz./minute)
- D. Spillage Details: No spillage occurred



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	85	300	385
90° To 180°	78	300	378
180° To 270°	75	300	375
270° To 360°	77	300	377

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 14

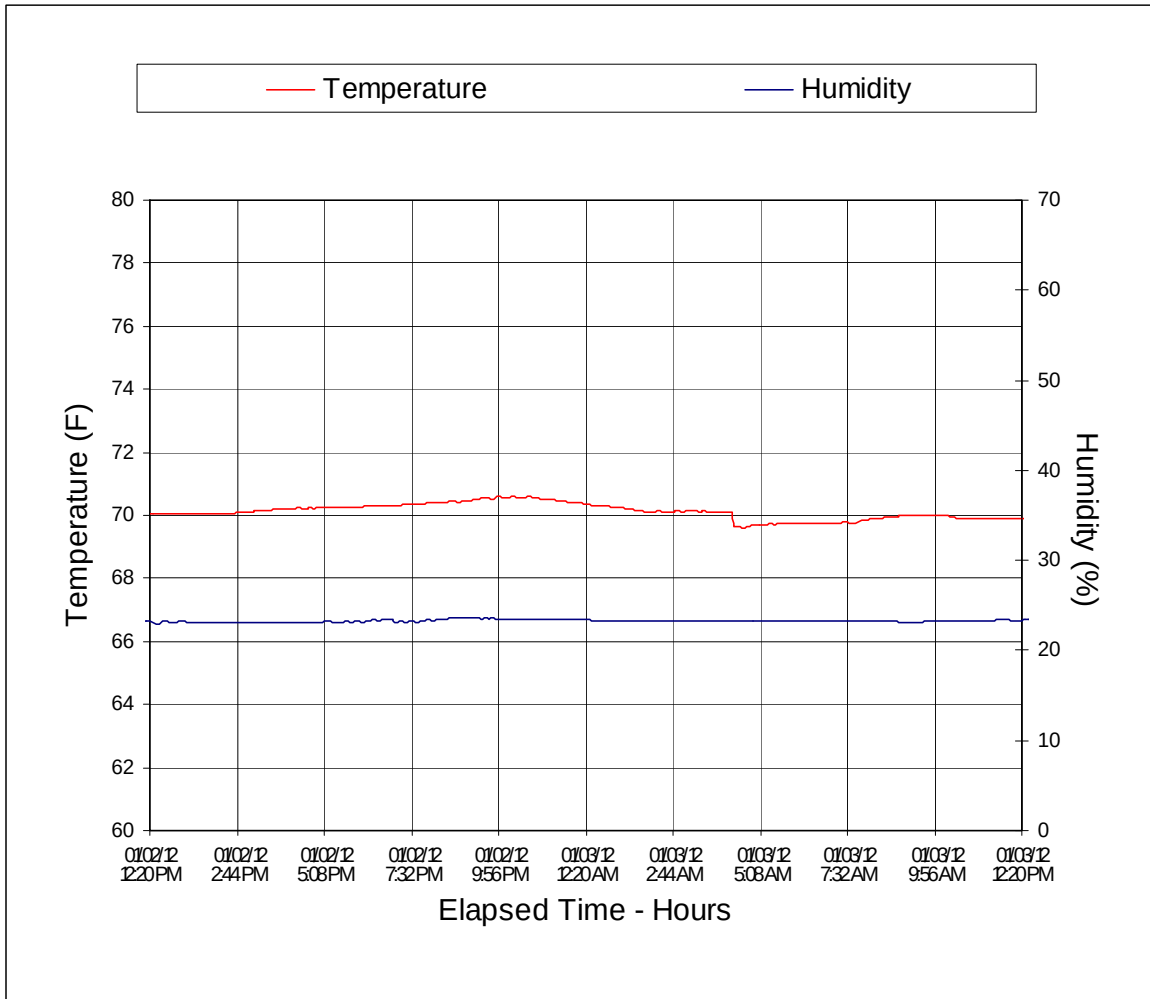
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback

NHTSA No. MC5108

Test Program: NCAP Side Pole Impact Test

Test Date: 1/3/12



APPENDIX A
PHOTOGRAPHS

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FIGURE 1. As-Delivered Right Front Three-Quarter View of Test Vehicle



FIGURE 2. As-Delivered Left Rear Three-Quarter View of Test Vehicle



FIGURE 3. Pre-Test Frontal View of Test Vehicle

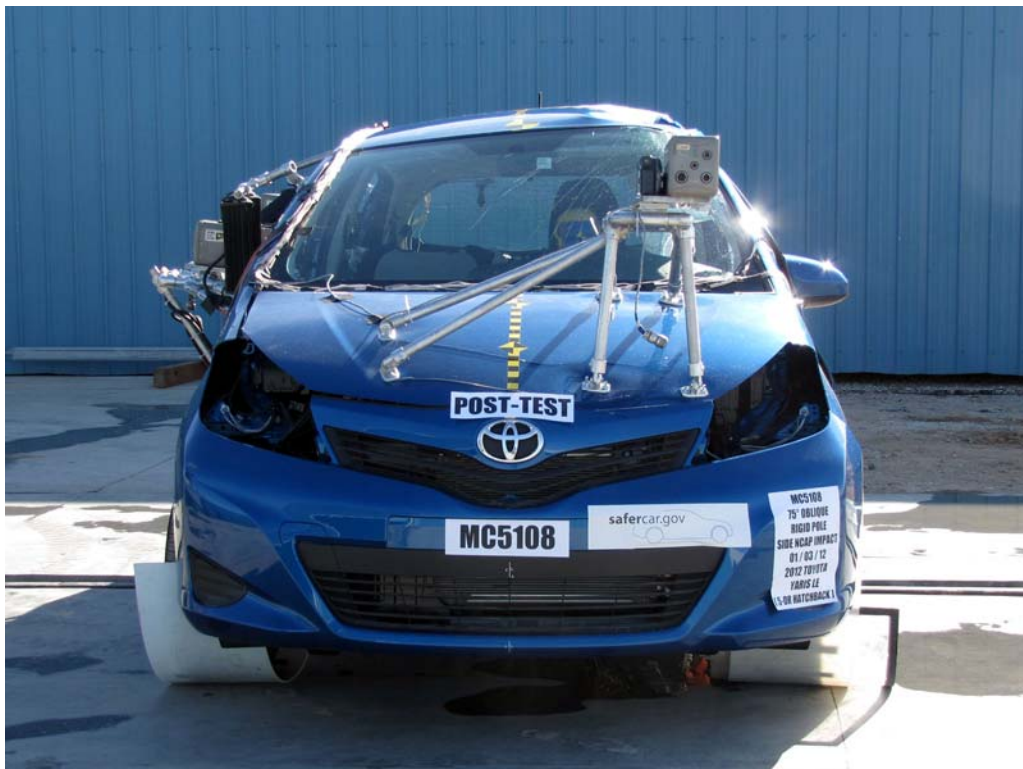


FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front Three-Quarter View of Test Vehicle



FIGURE 6. Post-Test Left Front Three-Quarter View of Test Vehicle



FIGURE 7. Pre-Test Left Side View of Test Vehicle



FIGURE 8. Post-Test Left Side View of Test Vehicle



FIGURE 9. Pre-Test Left Rear Three-Quarter View of Test Vehicle



FIGURE 10. Post-Test Left Rear Three-Quarter View of Test Vehicle



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



FIGURE 13. Pre-Test Right Side View of Test Vehicle



FIGURE 14. Post-Test Right Side View of Test Vehicle

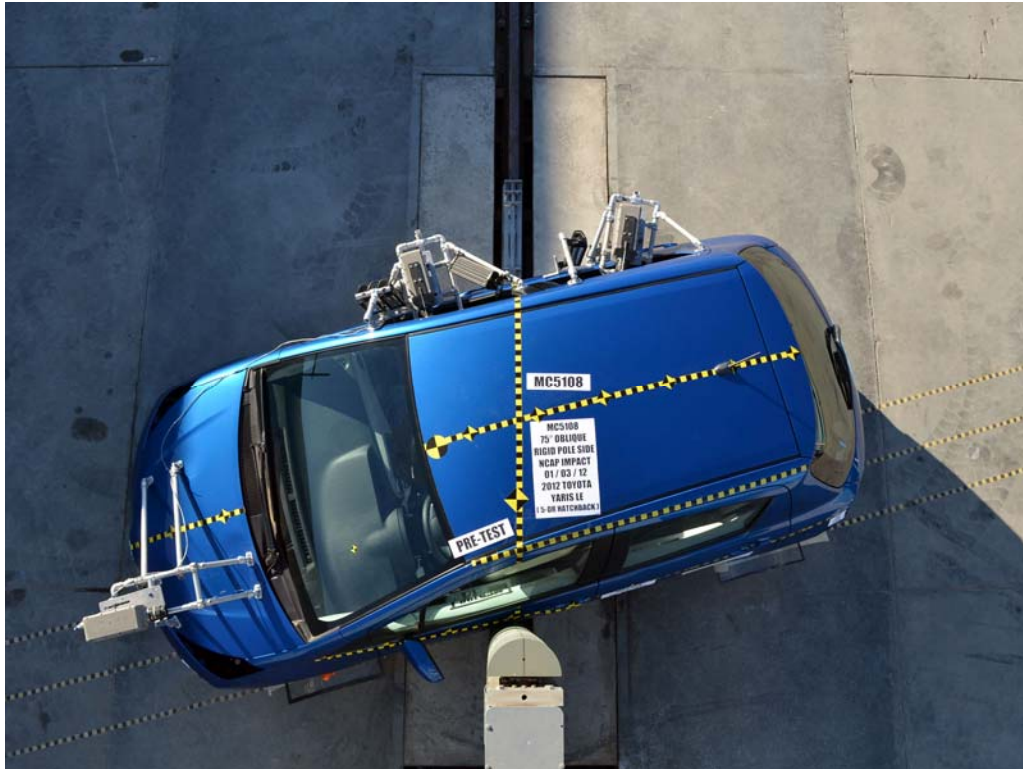


FIGURE 15. Pre-Test Overhead View of Test Vehicle and Pole

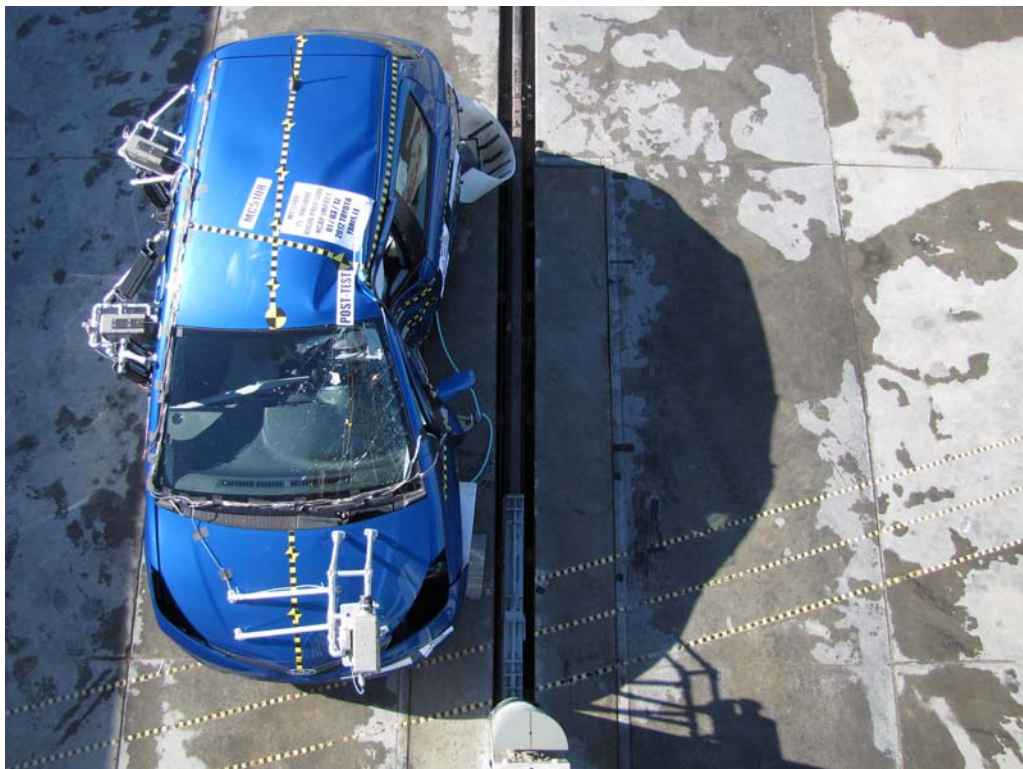


FIGURE 16. Post-Test Overhead View of Test Vehicle and Pole



FIGURE 17. Pre-Test Left Side View of Pole
Positioned Against Side of Vehicle at Impact Point



FIGURE 18. Pre-Test Right Side View of Pole
Positioned Against Side of Vehicle at Impact Point



FIGURE 19. Pre-Test Close-Up View of Impact Point Target



FIGURE 20. Post-Test Close-Up View of Impact Point Target Showing Impact Location



FIGURE 21. Pre-Test Front Close-Up View of Dummy



FIGURE 22. Post-Test Front Close-Up View of Dummy



FIGURE 23. Pre-Test Left Side View of Dummy Showing Belt, Chalking, and Contact Switches



FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Door Top View



FIGURE 25. Post-Test Left Side View of Dummy Shoulder and Door Top View



FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



FIGURE 27. Pre-Test Frontal View of Dummy Head and Shoulders
in Relation to Head Restraint



FIGURE 28. Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



FIGURE 29. Pre-Test Overhead View of Dummy Thighs on Seat Pan



FIGURE 30. Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket



FIGURE 31. Pre-Test View of Dummy's Head Showing Dummy's Head Is Level



FIGURE 32. Pre-Test Placement of Dummy's Feet



FIGURE 33. Pre-Test View of Belt Anchorage for Dummy



FIGURE 34. Pre-Test Left Side View of Steering Wheel



FIGURE 35. View of Disengaged Parking Brake



FIGURE 36. Pre-Test View of Parking Brake



FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Track



FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Back



FIGURE 39. Pre-Test Close-Up View of Driver Seat Back or Head Restraint



FIGURE 40. Pre-Test Driver Dummy and Door Clearance



FIGURE 41. Post-Test Driver Dummy and Door Clearance



FIGURE 42. Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment



FIGURE 43. Post-Test Right Side View of Dummy and Front Seat Occupant Compartment

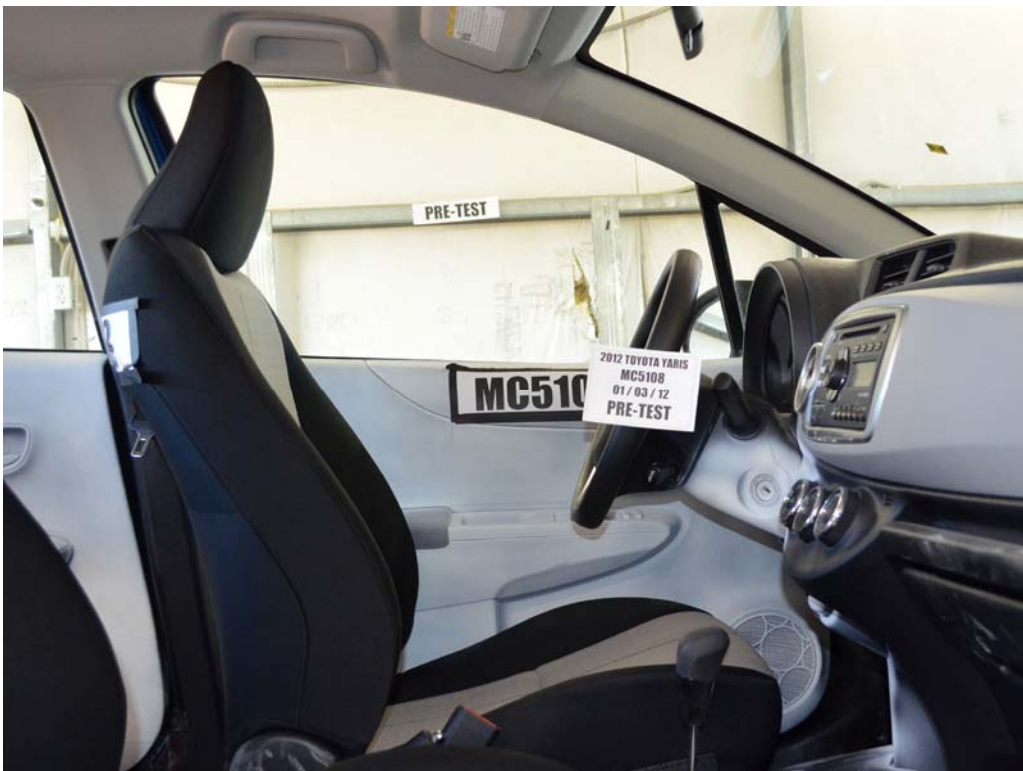


FIGURE 44. Pre-Test Inner Driver Door Panel View



FIGURE 45. Post-Test Inner Driver Door Panel View
Showing Dummy Contact Locations



FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



FIGURE 47. Post-Test Dummy Close-Up Head Contact with Side Airbag View



FIGURE 48. Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View

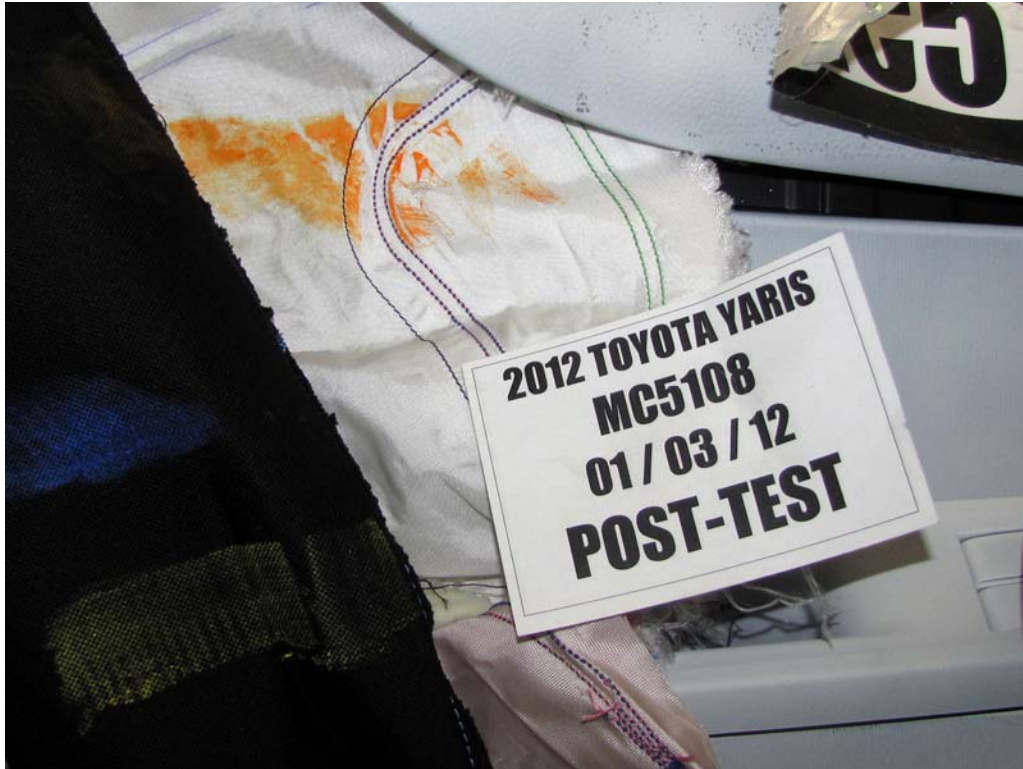


FIGURE 49. Post-Test Dummy Close-Up Torso Contact with Side Airbag View

Photograph Not Applicable

No Driver Dummy Pelvis
Contact With Vehicle Interior

FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



FIGURE 51. Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



FIGURE 52. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 53. Post-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 54. Close-Up View of Vehicle's Certification Label

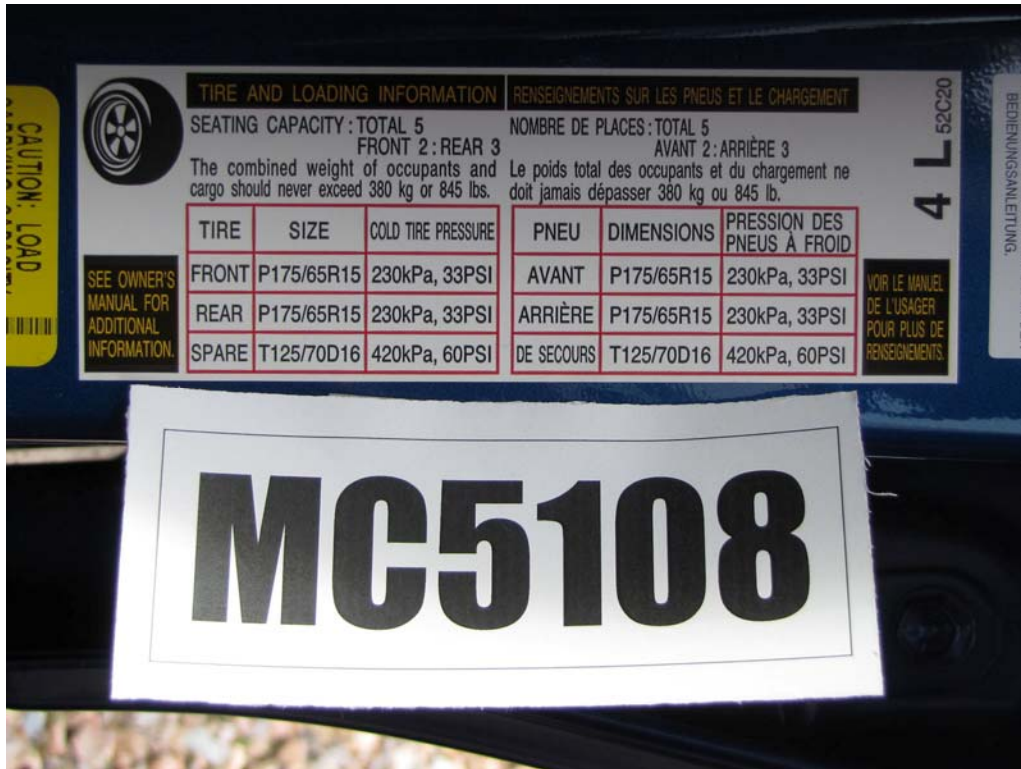


FIGURE 55. Close-Up View of Vehicle's Tire Information Placard



FIGURE 56. Pre-Test Pole Barrier Front View



FIGURE 57. Post-Test Pole Barrier Front View



FIGURE 58. Pre-Test Pole Barrier Side View



FIGURE 59. Post-Test Pole Barrier Side View

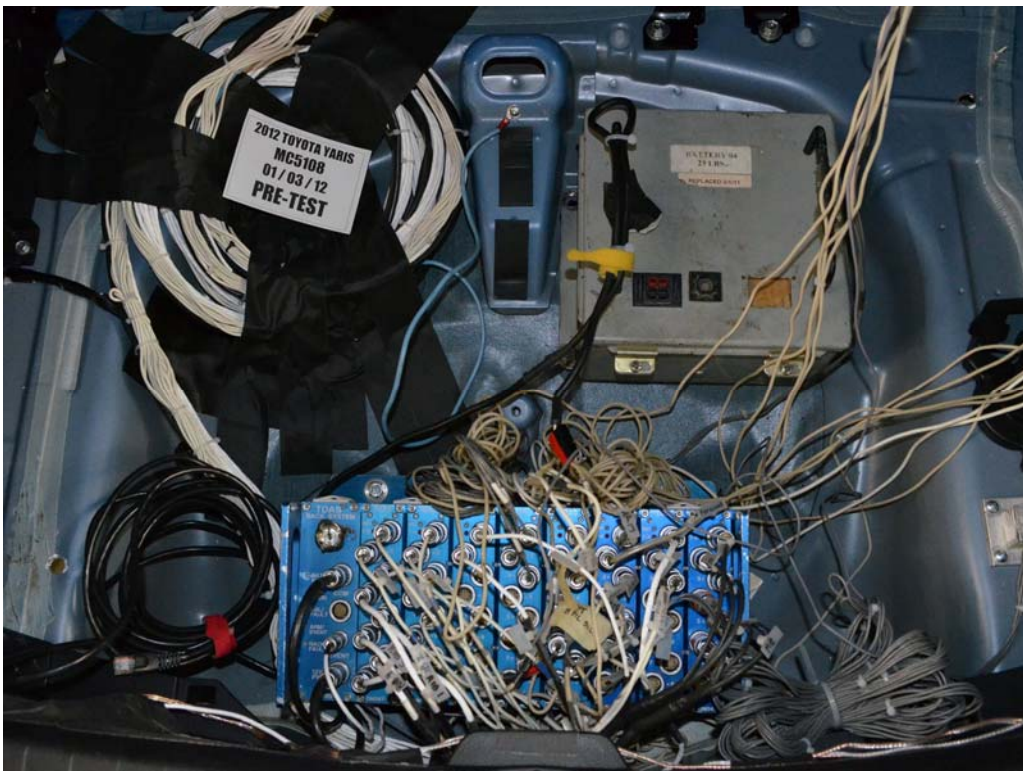


FIGURE 60. Pre-Test Ballast View



FIGURE 61. Post-Test Primary and Redundant Speed Trap Read-Out

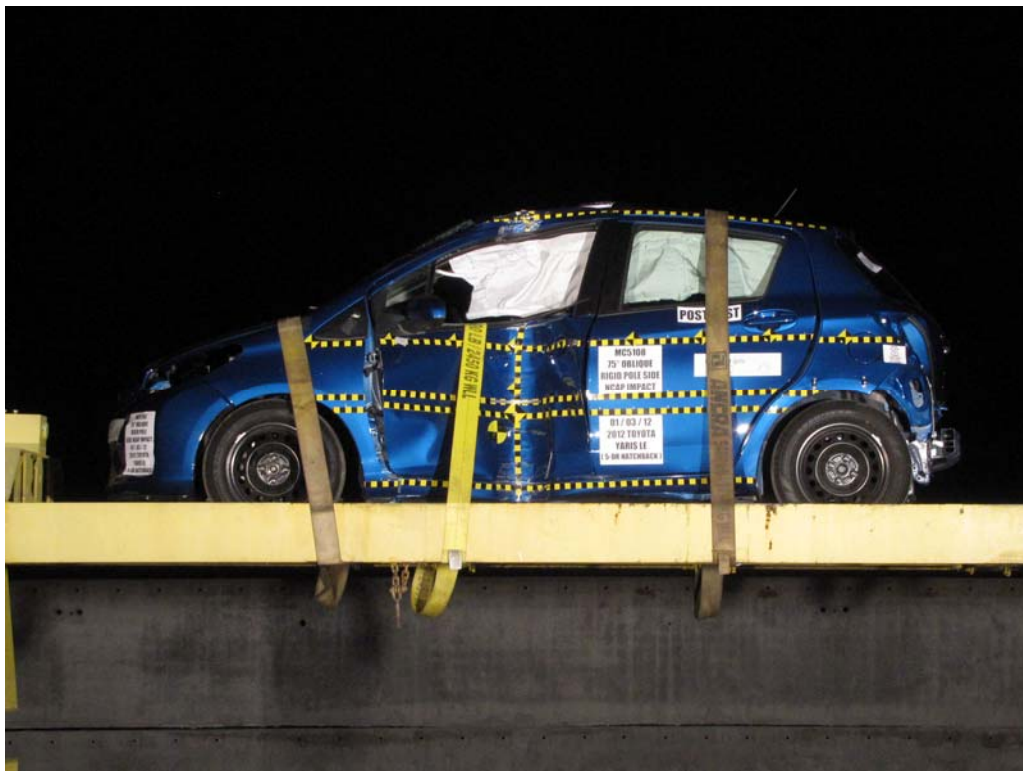


FIGURE 62. FMVSS No. 301-305 Rollover 0 Degrees



FIGURE 63. FMVSS No. 301-305 Rollover 90 Degrees

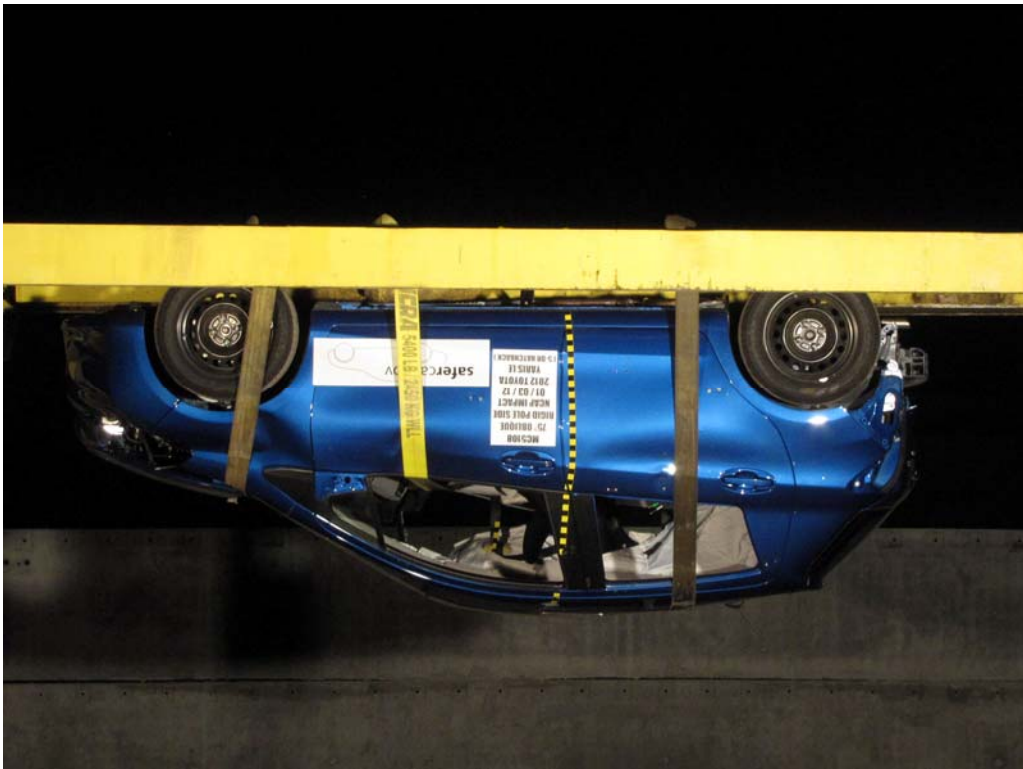


FIGURE 64. FMVSS No. 301-305 Rollover 180 Degrees

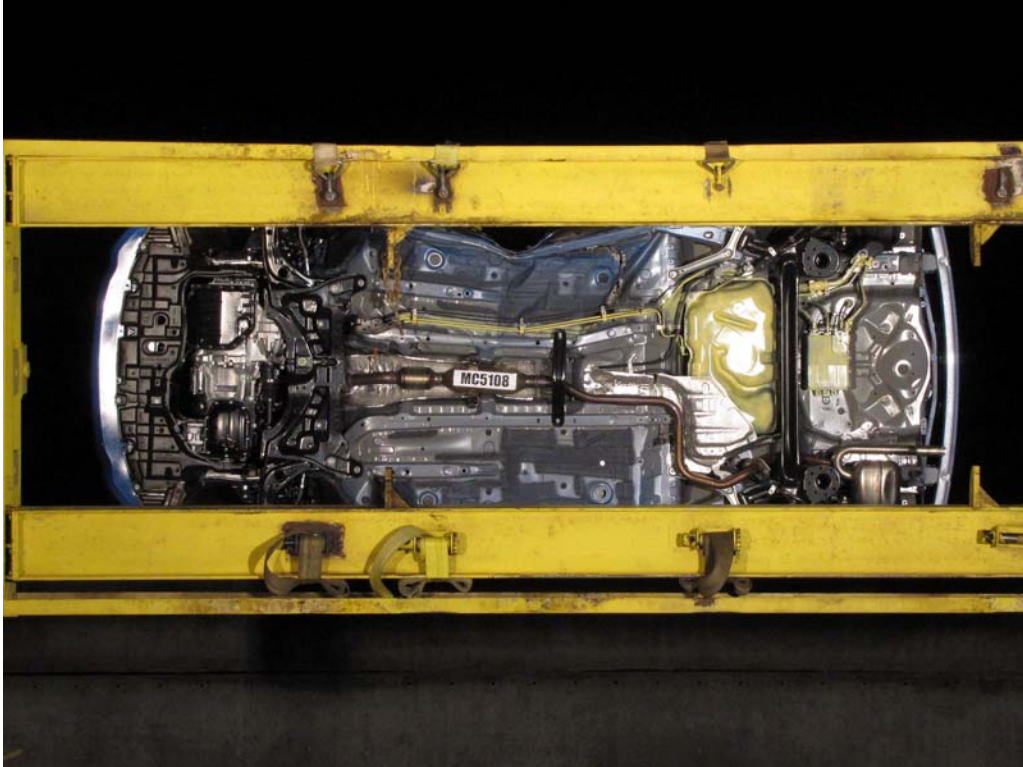


FIGURE 65. FMVSS No. 301-305 Rollover 270 Degrees

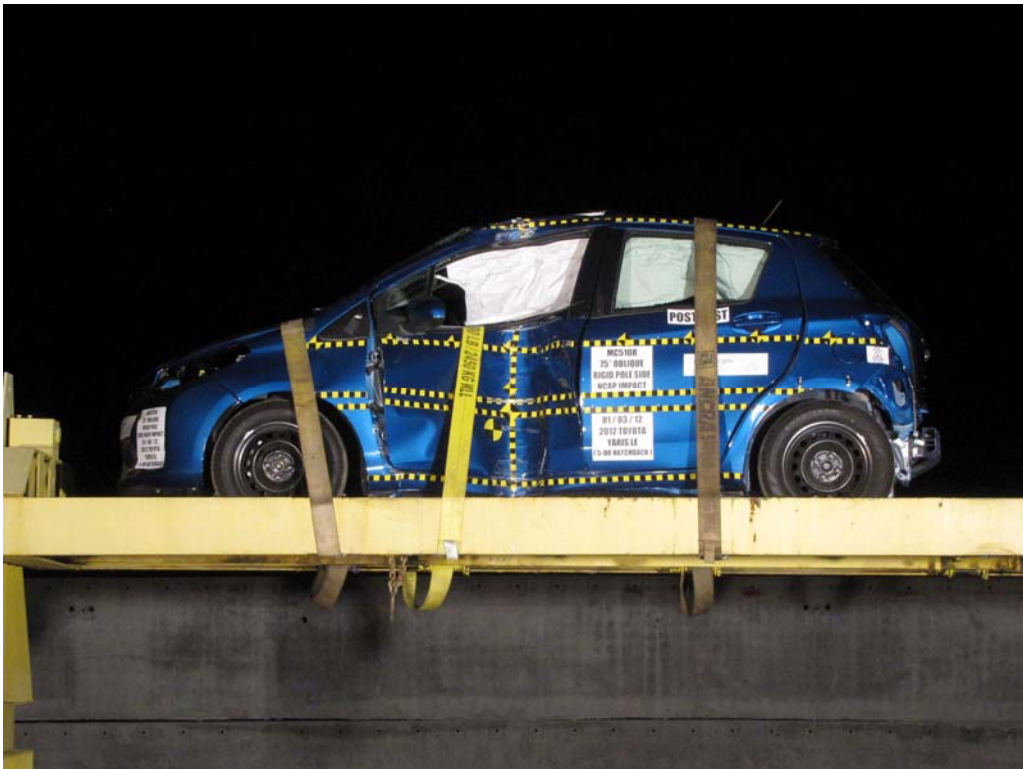
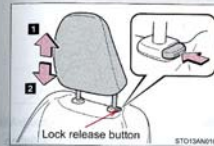


FIGURE 66. FMVSS No. 301-305 Rollover 360 Degrees

1-3. Adjustable components (seats, mirrors, steering wheel)
Head restraints

Head restraints are provided for all seats.



- 1 Up
Pull the head restraint up.
- 2 Down
Push the head restraint down while pushing the lock release button.

■ Removing the head restraints

Front and rear center head restraints



Pull the head restraint up while pressing the lock release button.

Rear outside head restraints



Pull the lock release knob and fold down the seatback until it reaches the position where the head restraints can be removed.

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1-3. Adjustable components (seats, mirrors, steering wheel)

■ Adjusting the height of the head restraints



Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

■ Adjusting the rear center seat head restraint

Always raise the head restraint one level from the stowed position when using.

⚠ CAUTION

■ Head restraint precautions

Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

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FIGURE 69. Head Restraint Use and Adjustment
 Information from Vehicle Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
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5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-2
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-2
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-2
8	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-2
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-3
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-3
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-3

The following additional data 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

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection (Y)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)

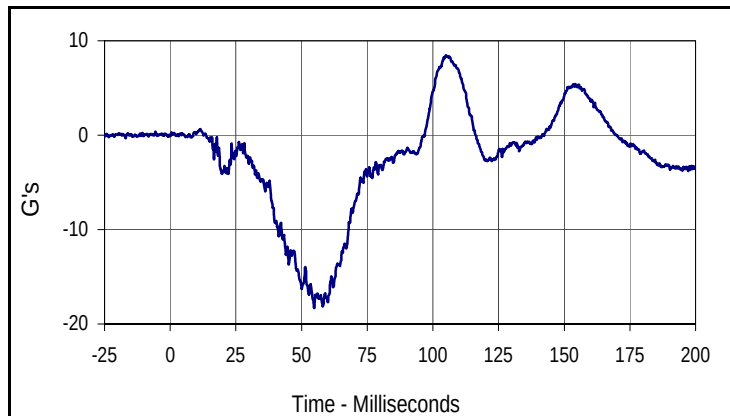
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

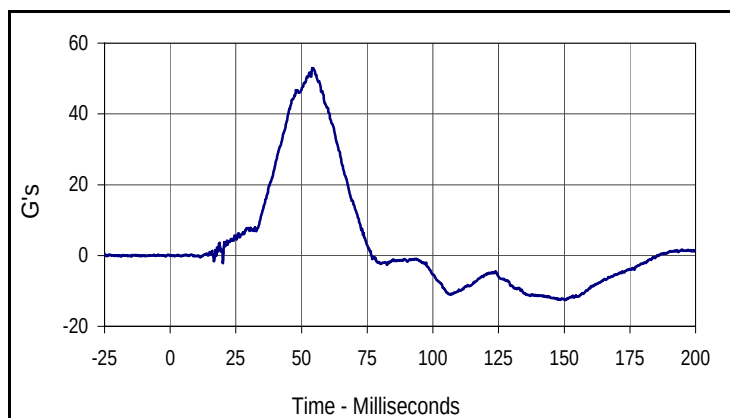
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

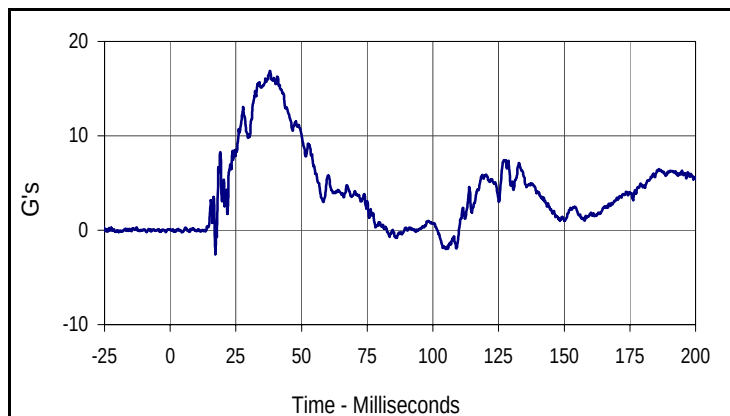
Test Date: 1/3/12
 NHTSA No.: MC5108



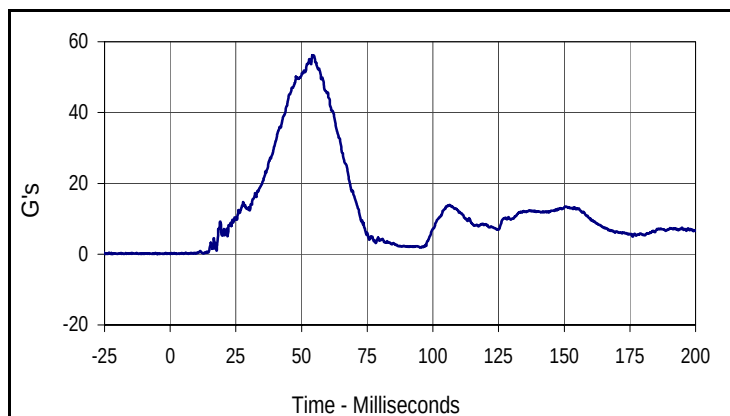
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
8.5	105.0	-18.3	54.8



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
53.0	54.0	-12.6	150.4



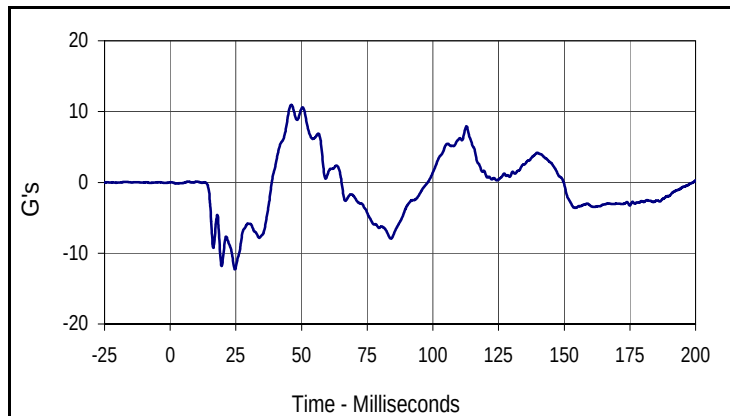
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
16.9	38.0	-2.5	17.2



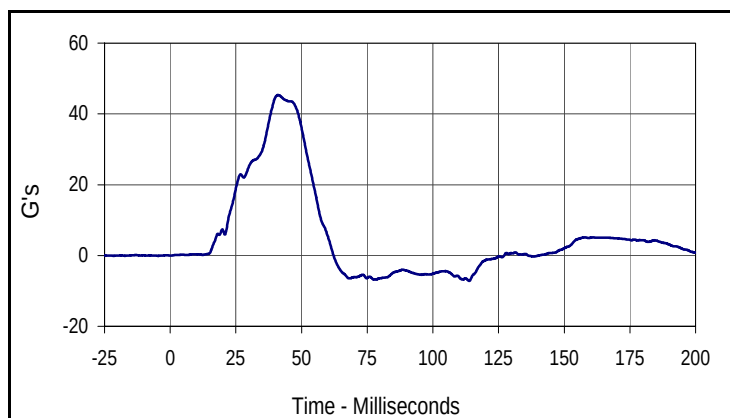
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
56.2	54.0	0.0	6.8

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

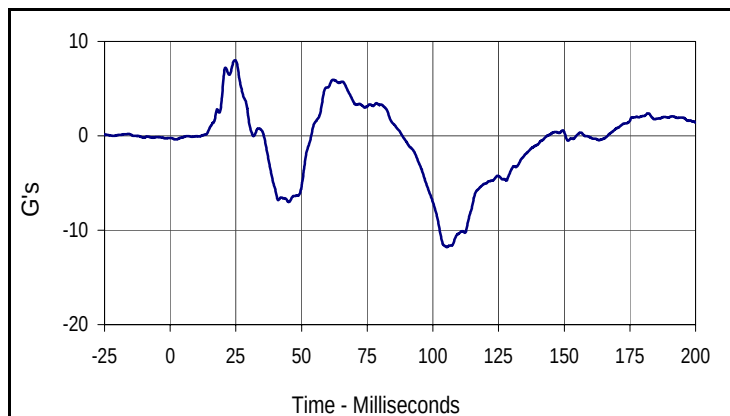
Test Date: 1/3/12
 NHTSA No.: MC5108



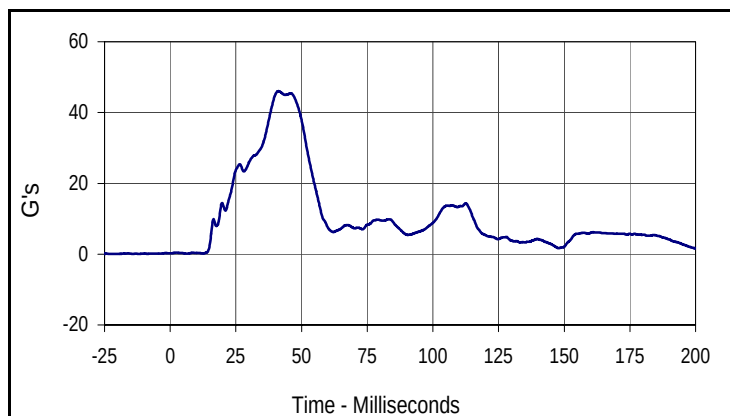
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.9	46.1	-12.3	24.6



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
45.3	41.1	-7.2	113.8



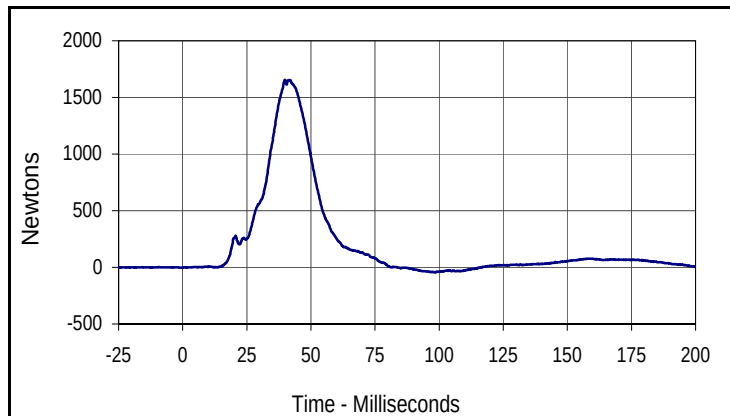
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
8.0	24.7	-11.8	105.3



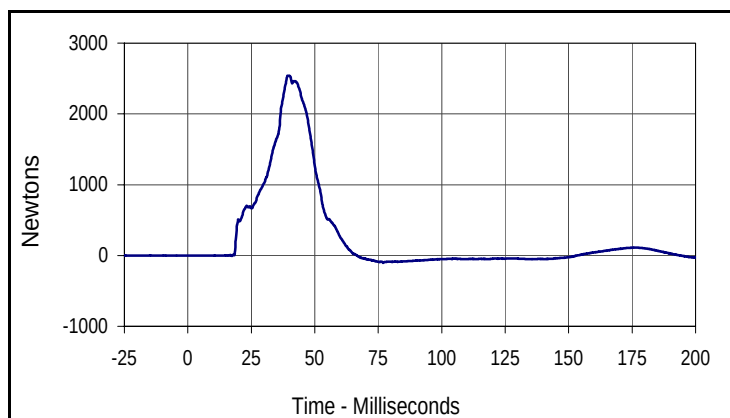
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
46.0	41.2	0.1	6.1

Test Vehicle: 2012 Toyota Yaris LE 5-Door Hatchback
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

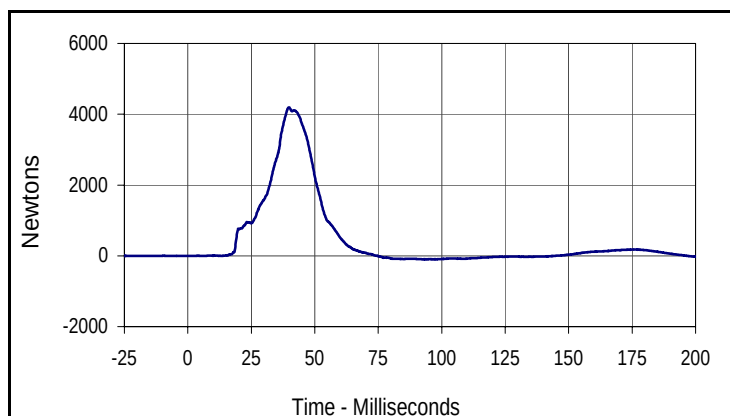
Test Date: 1/3/12
 NHTSA No.: MC5108



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
1654.3	39.9	-43.8	98.6



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
2539.9	39.9	-104.2	76.9



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
4194.2	39.9	-101.5	96.6

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST / ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID IIs External Measurements
 ATD Serial No.: 299

Test Date: 12/26/11
 Test I.D.: N/A



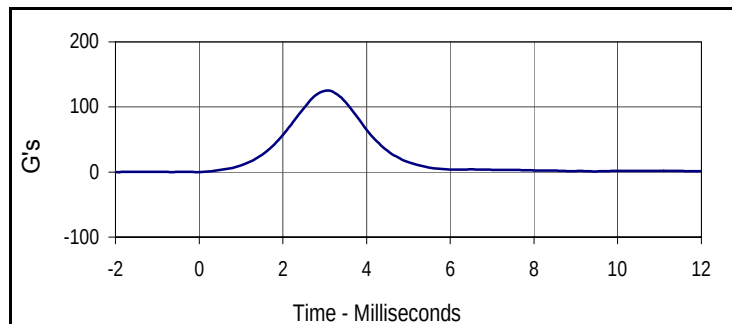
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	775	Pass
B	Shoulder Pivot Height	mm	437 - 453	442	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	147	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	101	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	146	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	185	Pass
J	Head Circumference	mm	541 - 551	546	Pass
K	Buttock to Knee Length	mm	514 - 540	528	Pass
L	Popliteal Height	mm	343 - 369	354	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	429	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	200	Pass
P	Foot Length	mm	216 - 232	220	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 - 323	318	Pass
R	Arm Length	mm	249 - 259	256	Pass
S	Knee Joint to Seatback	mm	477 - 493	485	Pass
V	Shoulder Width	mm	341 - 357	351	Pass
W	Foot Width	mm	78 - 94	92	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	877	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
Overall Test Results					Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 299

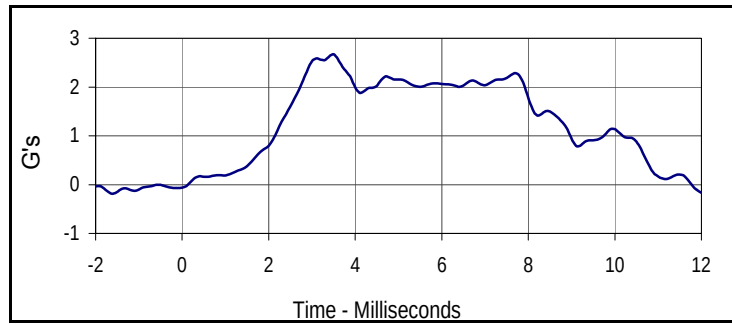
Test Date: 12/26/11
 Test I.D.: 299HD028



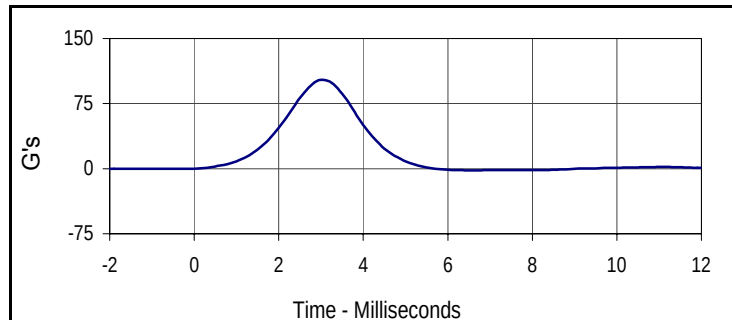
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	270	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	40.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Head Resultant Acceleration	G's	115 to 137	125.0	Pass
Peak Head X Acceleration	G's	<15	2.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	12.1	Pass
Overall Test Results				Pass



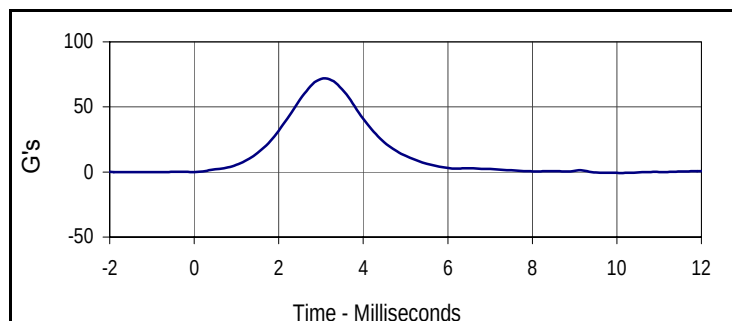
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.0	3.1	0.0	-1.9



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.7	3.5	-0.2	-1.6



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
102.3	3.0	-2.0	6.6



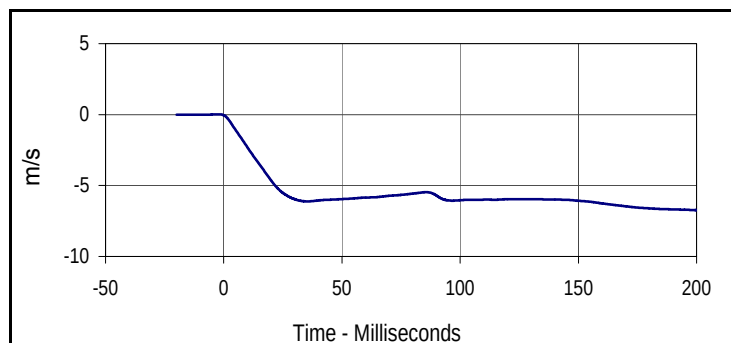
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
72.0	3.1	-0.7	10.0

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 299

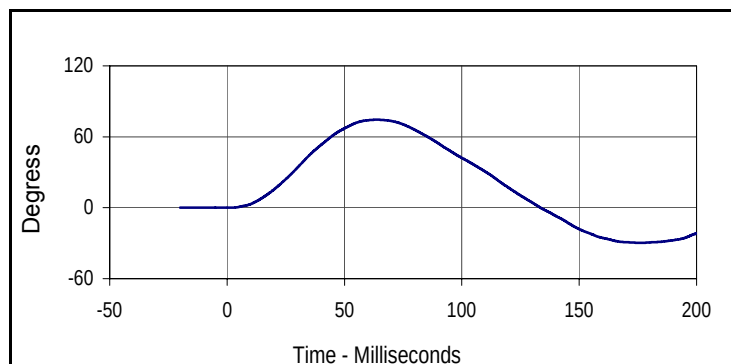
Test Date: 12/26/11
 Test I.D.: 299NB028



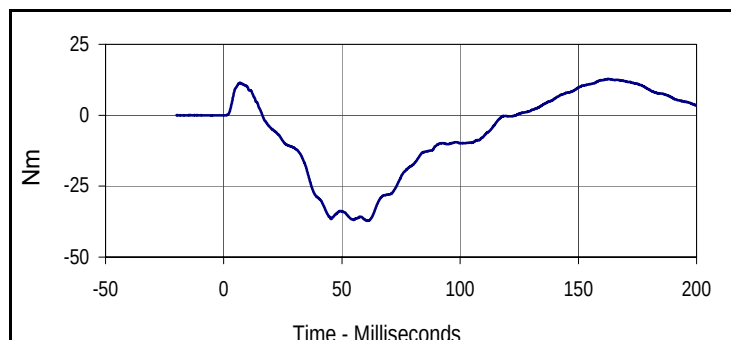
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	300	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	30.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.59	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.30	Pass
	15 msec	-3.30 to -4.10	-3.48	Pass
	20 msec	-4.40 to -5.40	-4.64	Pass
	25 msec	-5.40 to -6.10	-5.52	Pass
	25-100 msec	-5.50 to -6.20	-6.12	Pass
D-Plane Rotation	Max	71 to 81	74.5	Pass
	Time	50 to 70	63.8	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-37.2	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	123.6	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-2.2	-6.7	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
74.5	63.8	-29.7	176.1



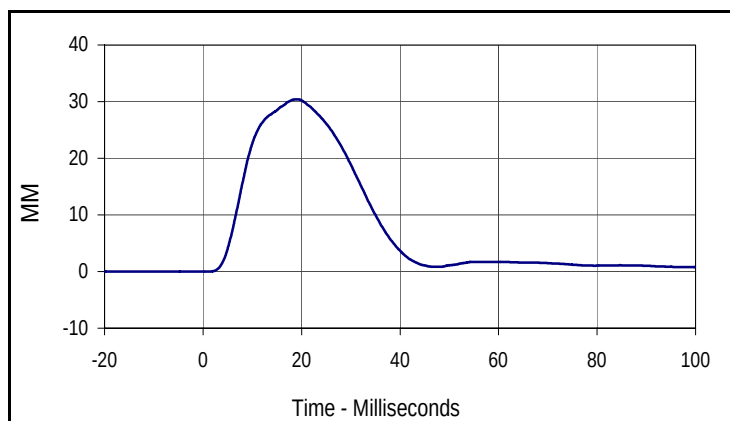
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
12.8	162.7	-37.2	60.8

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 299

Test Date: 12/26/11
 Test I.D.: 299SH028



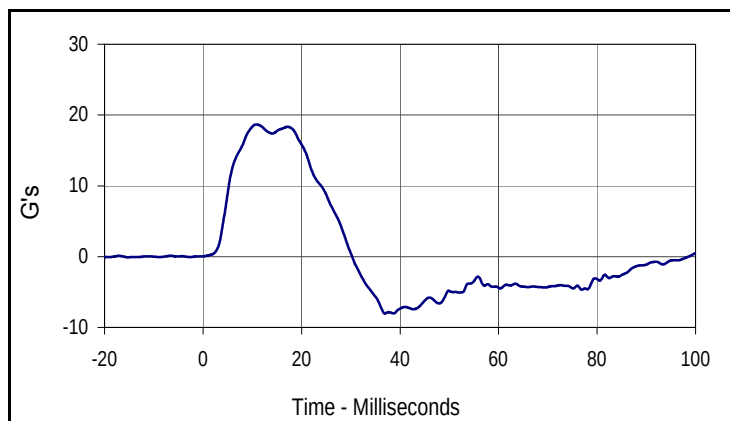
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	350	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.1	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.29	Pass
Peak Shoulder Deflection		mm	28 to 37	30.4	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	18.7	Pass
Peak Impactor Acceleration		G's	13 to 18	15.8	Pass
Overall Test Results				Pass	



Curve Description

Shoulder Deflection

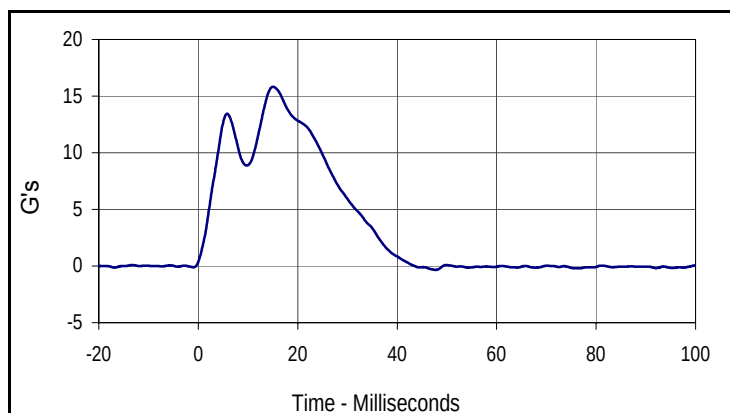
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.4	19.0	0.0	-1.8



Curve Description

Upper Spine Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.7	10.8	-8.0	36.9



Curve Description

Impactor Acceleration

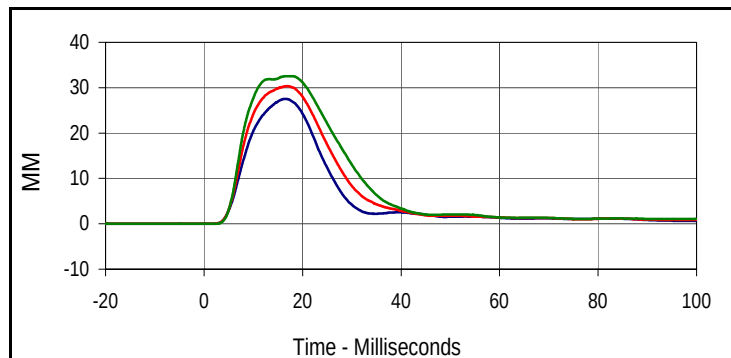
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.8	15.0	-0.3	47.8

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

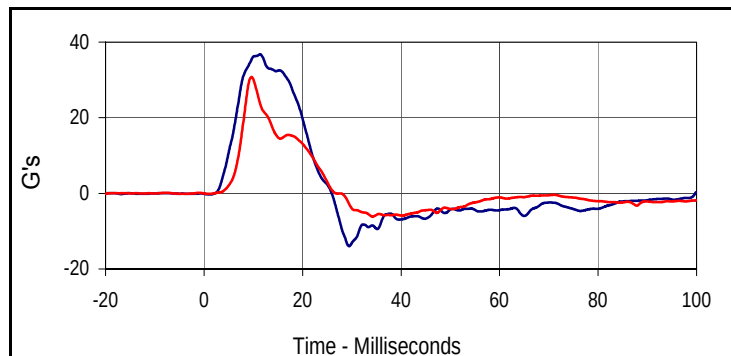
Test Date: 12/26/11
 Test I.D.: 299TWA028



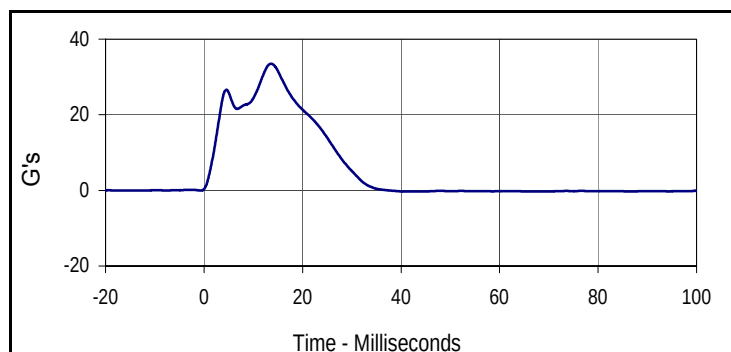
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	375	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	40.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.9	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	35.8	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.5	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	30.4	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	32.6	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	36.8	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	30.8	Pass
Peak Impactor Acceleration	G's	30 to 36	33.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.5	16.5	0.0	-8.8
Middle Thorax Deflection			
Max	Time	Min	Time
30.4	16.9	0.0	-15.7
Lower Thorax Deflection			
Max	Time	Min	Time
32.6	17.2	0.0	-10.7



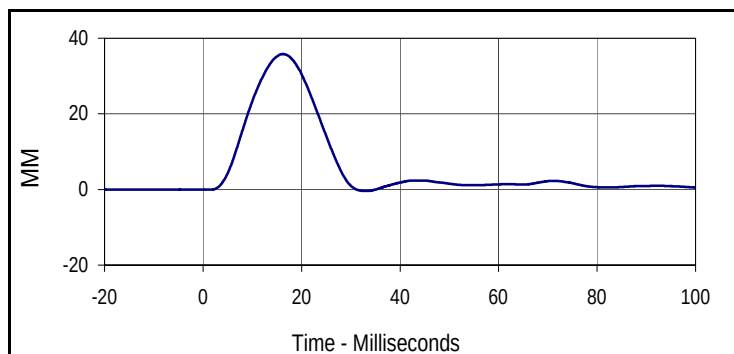
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.8	11.4	-14.0	29.5
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
30.8	9.6	-6.1	34.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.5	13.6	-0.3	40.8

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

Test Date: 12/26/11
 Test I.D.: 299TWA028



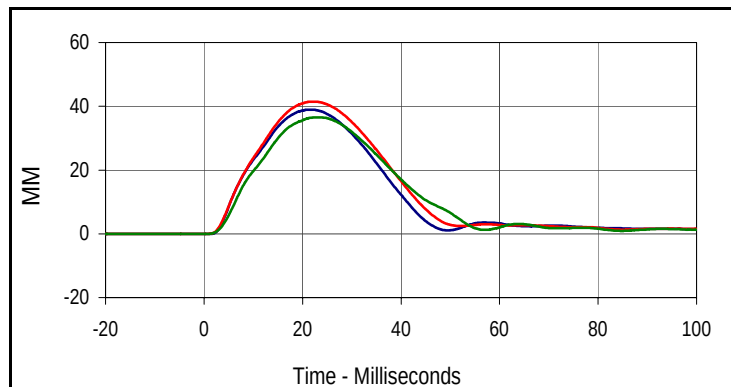
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
35.8	16.3	-0.4	33.1

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 299

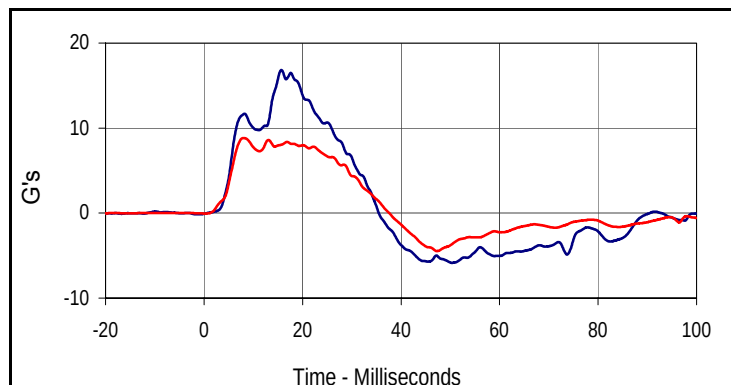
Test Date: 12/26/11
 Test I.D.: 299TWOA028



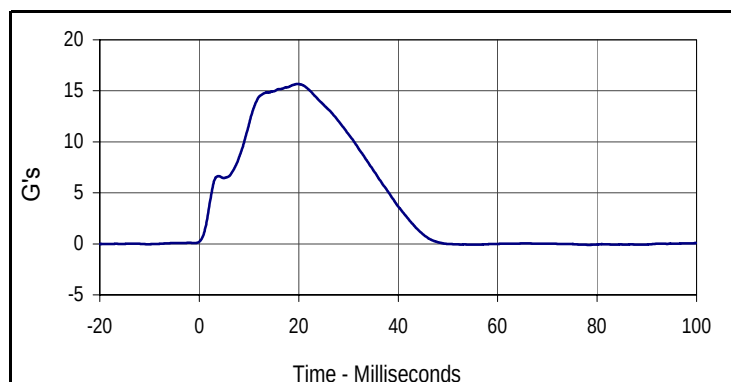
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	398	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	28.7	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	39.0	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	41.5	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	36.5	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	16.8	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	8.8	Pass
Peak Impactor Acceleration		G's	14 to 18	15.7	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.0	21.5	0.0	-19.5
Middle Thorax Deflection			
Max	Time	Min	Time
41.5	22.1	0.0	-10.0
Lower Thorax Deflection			
Max	Time	Min	Time
36.5	22.6	0.0	-9.3



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
16.8	15.7	-5.9	50.3
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.8	8.0	-4.5	47.3



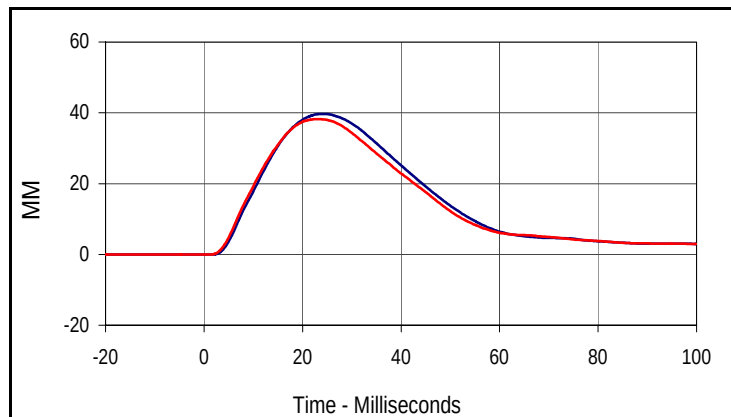
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.7	19.8	-0.1	78.3

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 299

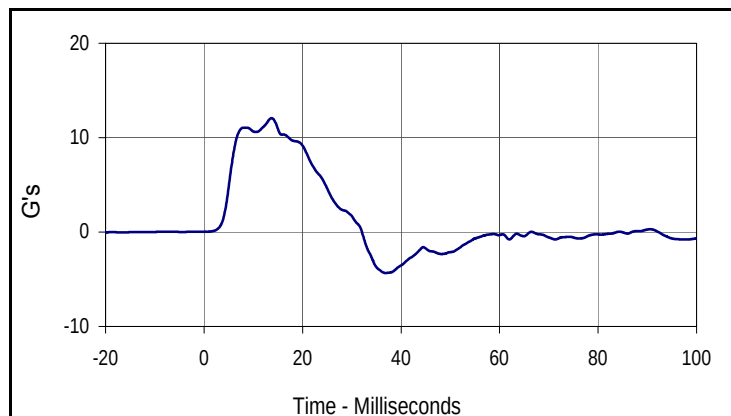
Test Date: 12/26/11
 Test I.D.: 299ABD028



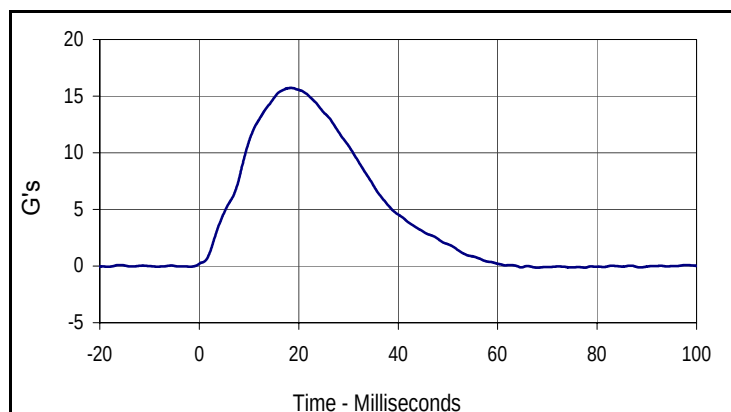
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	420	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.7	Pass
	Min °C		20.7	Pass
Humidity During Soak	Max %	10.0 to 70.0	40.0	Pass
	Min %		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.1	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	39.7	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	38.2	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.1	Pass
Peak Impactor Acceleration	G's	12 to 16	15.7	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.7	23.9	0.0	0.6
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.2	22.8	0.0	-3.5

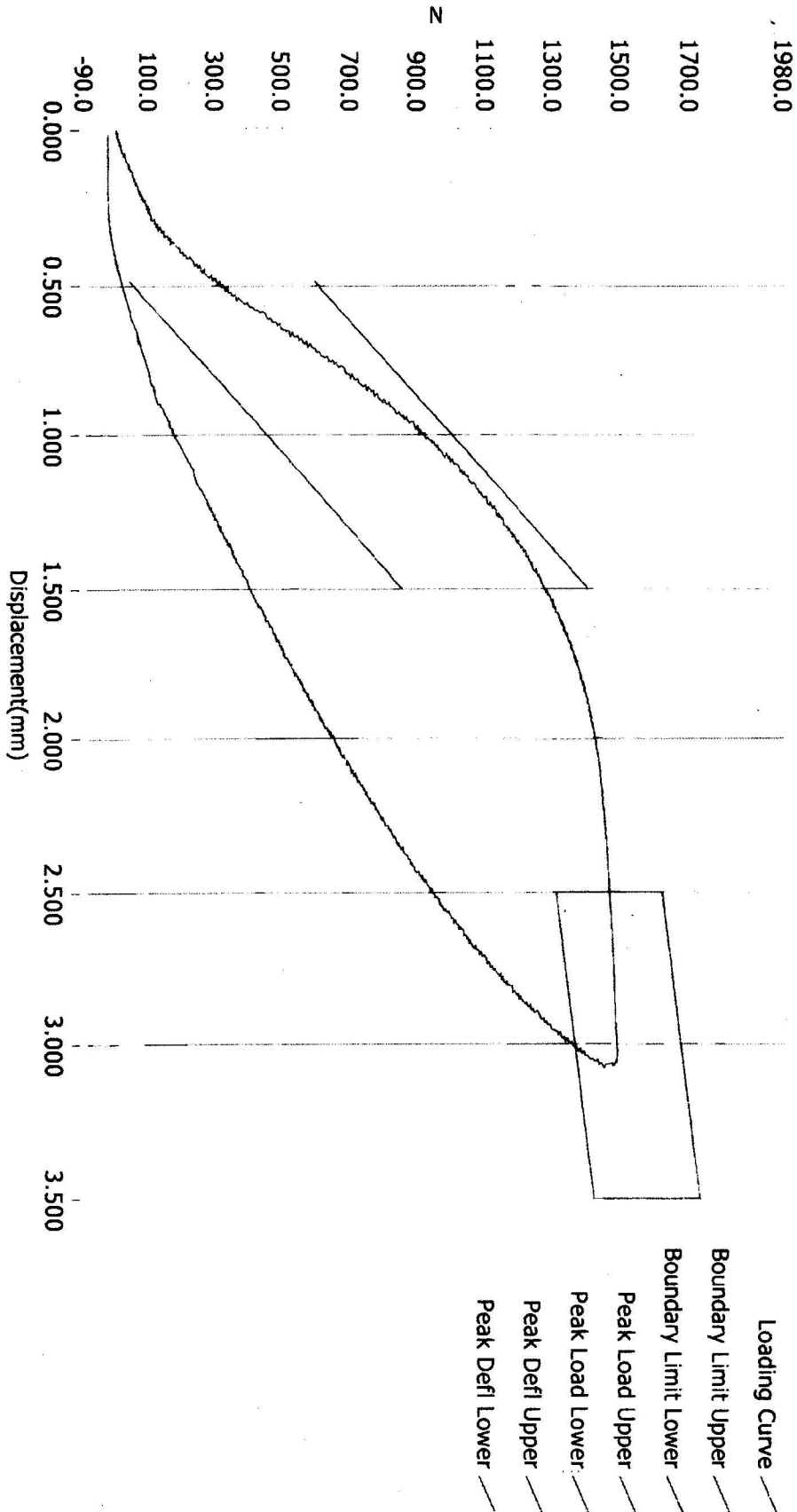


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.1	13.7	-4.3	36.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.7	18.5	-0.1	68.0

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	36308	SIDIIs	

Current Date : 9/22/2010

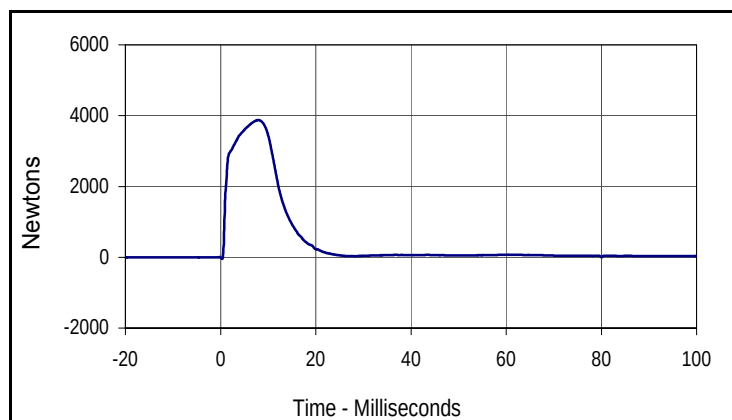
Current Time : 12:42:13

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 299

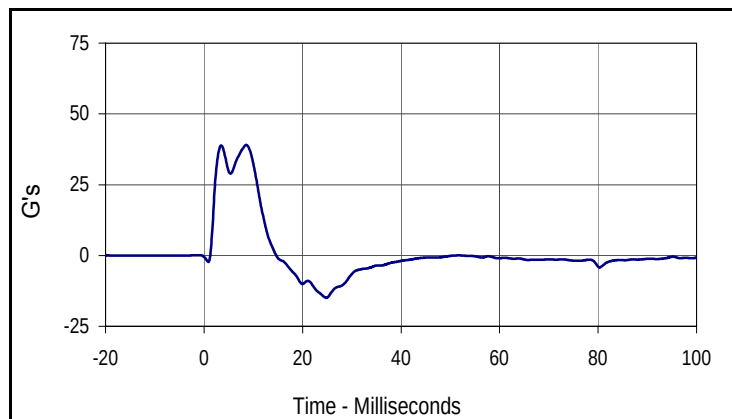
Test Date: 12/26/11
 Test I.D.: 299ACET028



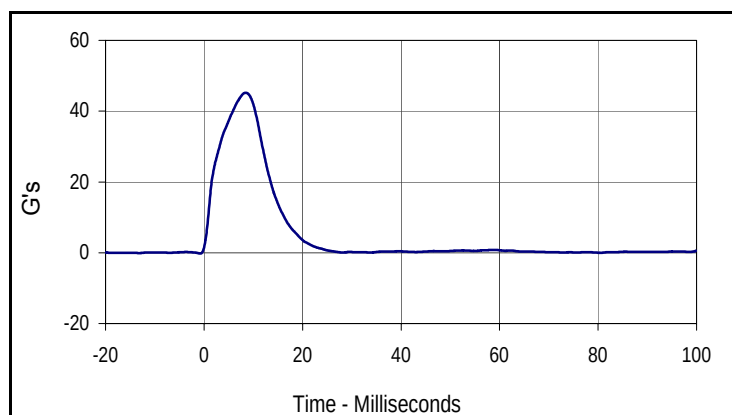
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	435	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	40.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3877.6	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	39.1	Pass
Peak Impactor Acceleration	G's	38 to 47	45.2	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3877.6	7.8	-43.3	0.3



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.1	8.6	-14.9	24.8



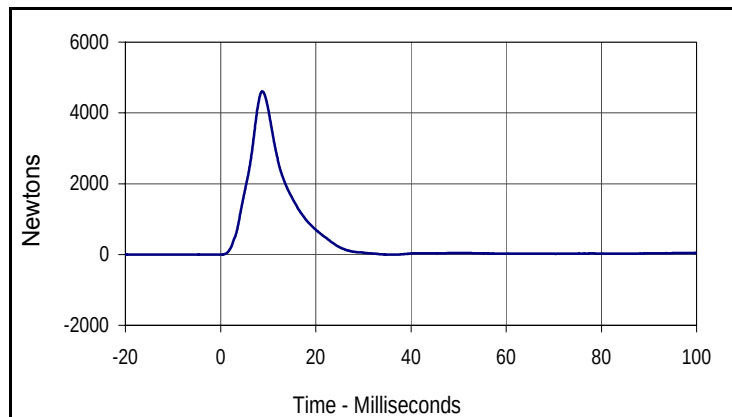
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.2	8.5	-0.2	-0.8

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 299

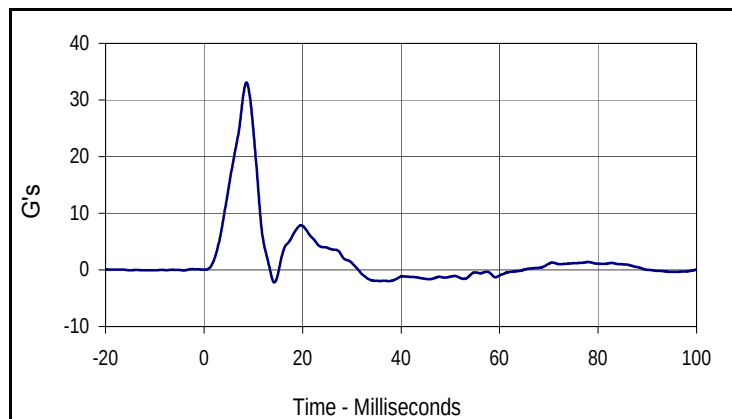
Test Date: 12/26/11
 Test I.D.: 299PL028



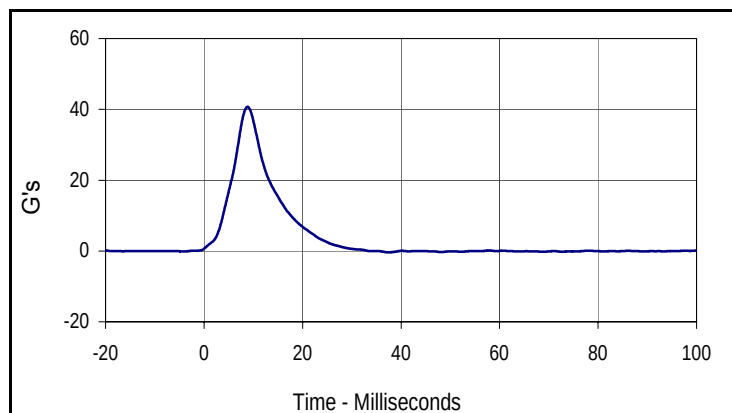
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	454	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	40.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.5	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4603.5	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	33.1	Pass
Peak Impactor Acceleration	G's	36 to 45	40.7	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4603.5	8.8	-3.4	36.1



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
33.1	8.6	-2.2	14.3



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.7	8.8	-0.4	37.4

APPENDIX C
POST-TEST / ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID IIs External Measurements
 ATD Serial No.: 299

Test Date: 1/5/12
 Test I.D.: N/A



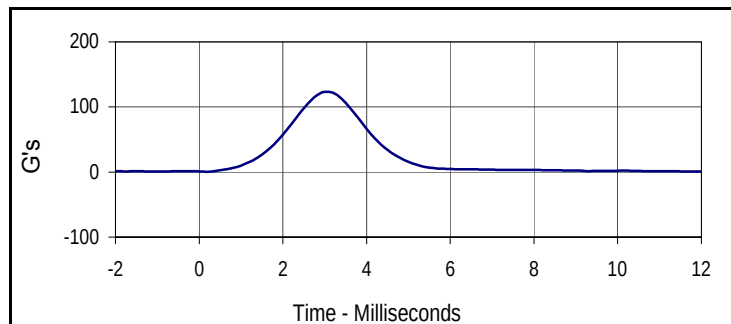
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	31	Pass
A	Sitting Height	mm	772 - 788	777	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	146	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	101	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	185	Pass
J	Head Circumference	mm	541 - 551	546	Pass
K	Buttock to Knee Length	mm	514 - 540	528	Pass
L	Popliteal Height	mm	343 - 369	354	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	402	Pass
N	Buttock Popliteal Length	mm	416 - 442	429	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	200	Pass
P	Foot Length	mm	216 - 232	220	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 - 323	318	Pass
R	Arm Length	mm	249 - 259	256	Pass
S	Knee Joint to Seatback	mm	477 - 493	485	Pass
V	Shoulder Width	mm	341 - 357	351	Pass
W	Foot Width	mm	78 - 94	92	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	877	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
Overall Test Results					Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 299

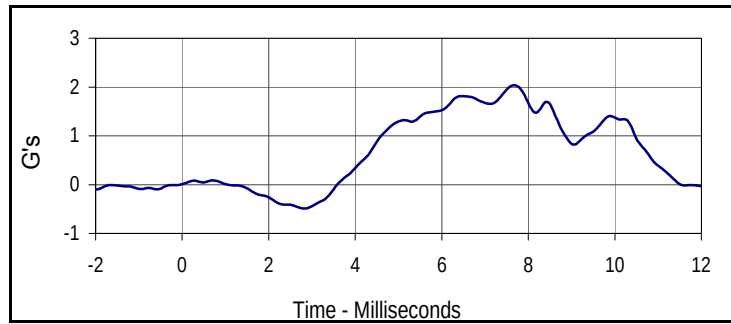
Test Date: 1/5/12
 Test I.D.: 299HD029



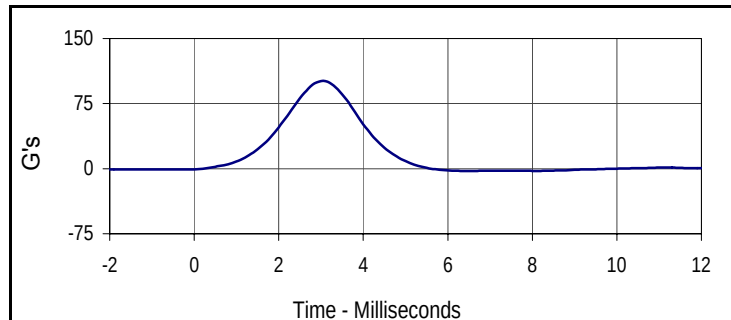
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	280	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	35.7	Pass
Peak Head Resultant Acceleration	G's	115 to 137	123.4	Pass
Peak Head X Acceleration	G's	<15	1.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	12.6	Pass
Overall Test Results				Pass



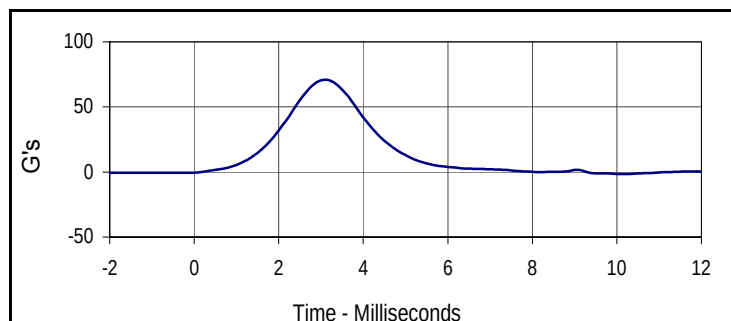
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
123.4	3.1	0.1	0.2



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.5	6.0	-0.5	2.8



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
101.0	3.0	-2.7	6.5



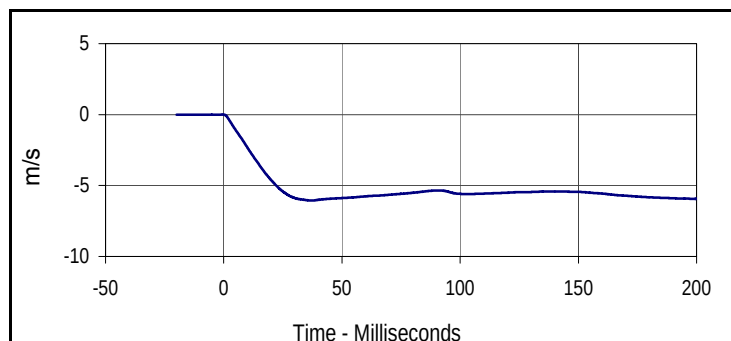
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.0	3.1	-1.5	10.0

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 299

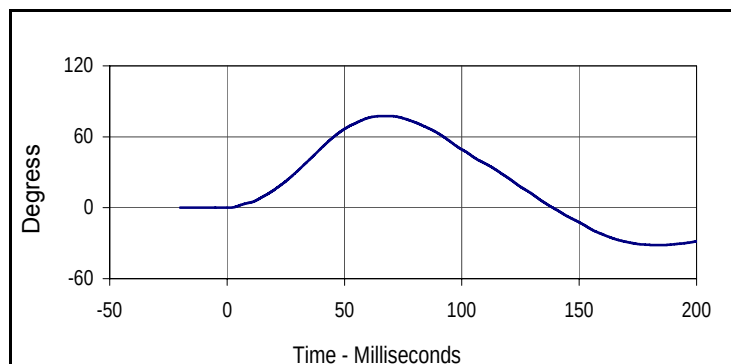
Test Date: 1/5/12
 Test I.D.: 299NB029



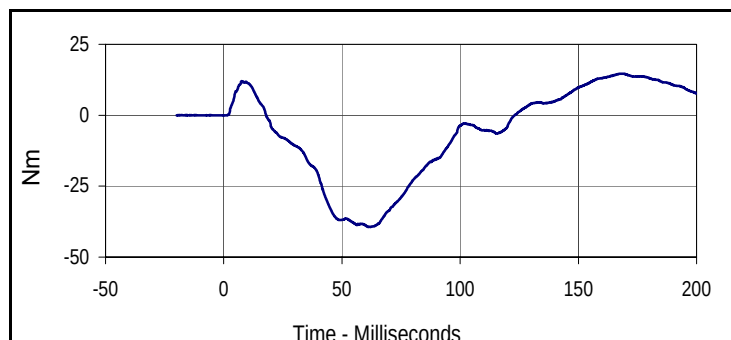
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.8	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.57	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.32	Pass
	15 msec	m/s	-3.30 to -4.10	-3.54	Pass
	20 msec	m/s	-4.40 to -5.40	-4.61	Pass
	25 msec	m/s	-5.40 to -6.10	-5.42	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.05	Pass
D-Plane Rotation	Max	Degrees	71 to 81	77.6	Pass
	Time	msec	50 to 70	66.3	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-39.4	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	123.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.5	-6.1	36.7



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
77.6	66.3	-31.7	183.4



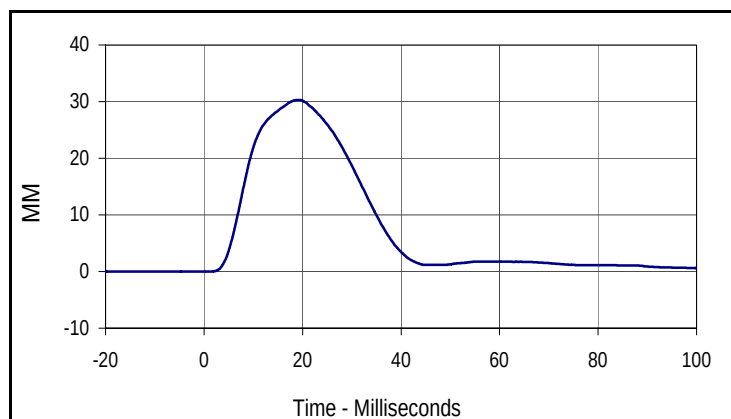
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.7	168.5	-39.4	62.0

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 299

Test Date: 1/5/12
 Test I.D.: 299SH029



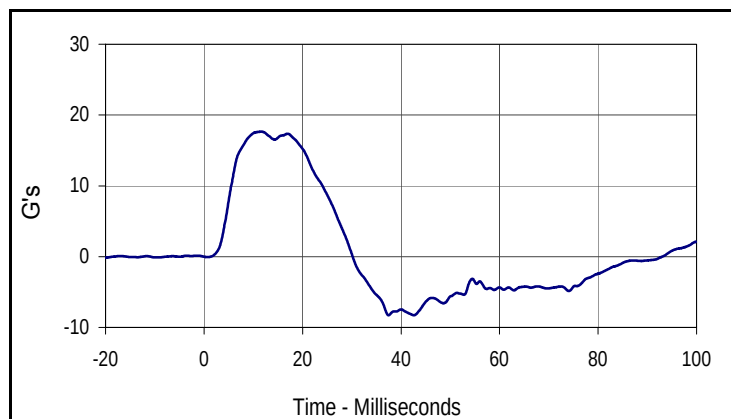
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	340	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.8	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.36	Pass
Peak Shoulder Deflection		mm	28 to 37	30.3	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	17.7	Pass
Peak Impactor Acceleration		G's	13 to 18	15.5	Pass
Overall Test Results				Pass	



Curve Description

Shoulder Deflection

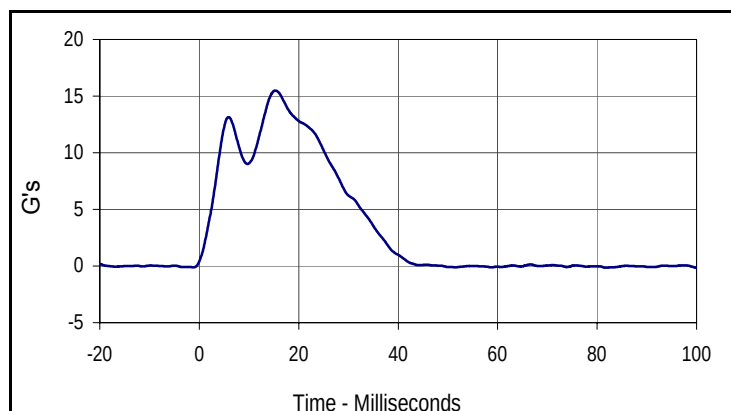
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.3	19.4	0.0	-7.1



Curve Description

Upper Spine Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
17.7	11.6	-8.3	37.5



Curve Description

Impactor Acceleration

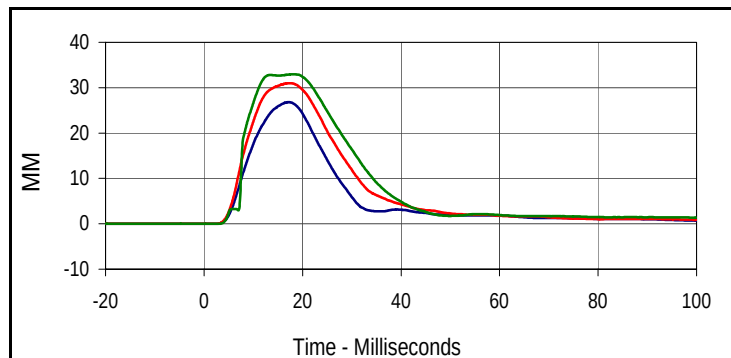
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.5	15.3	-0.2	81.8

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

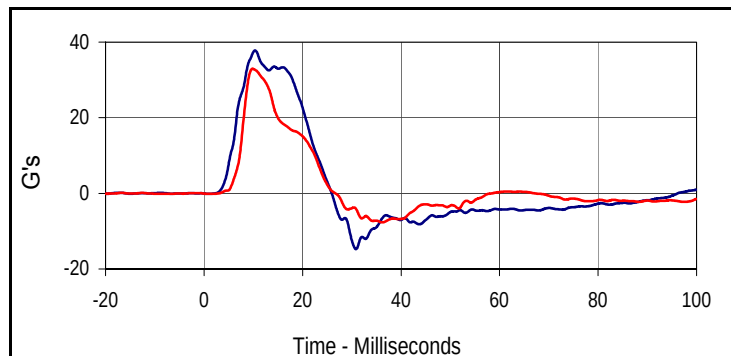
Test Date: 1/5/12
 Test I.D.: 299TWA029



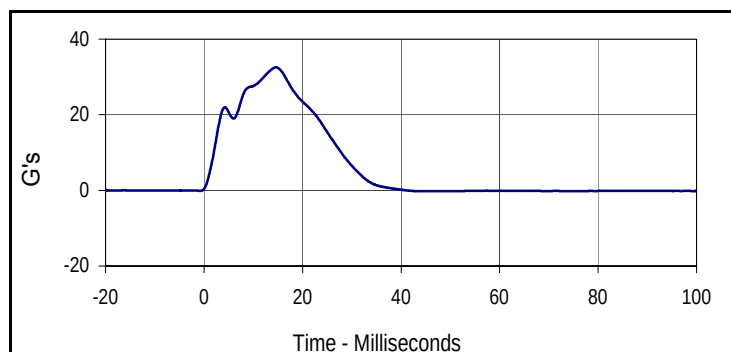
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	360	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	34.2	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	36.4	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	26.8	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.0	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	32.9	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.8	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.9	Pass
Peak Impactor Acceleration	G's	30 to 36	32.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.8	17.2	0.0	-12.8
Middle Thorax Deflection			
Max	Time	Min	Time
31.0	17.4	0.0	-3.0
Lower Thorax Deflection			
Max	Time	Min	Time
32.9	18.4	0.0	-17.7



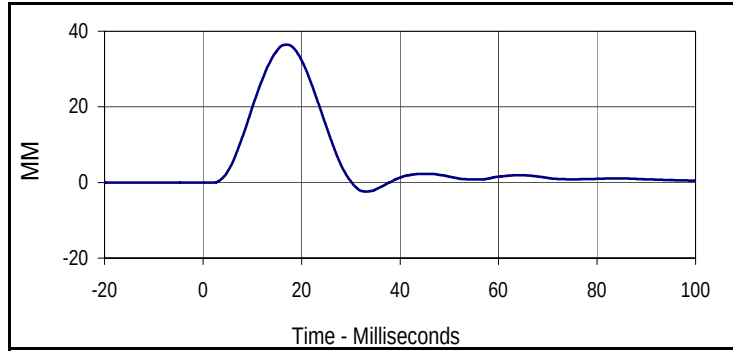
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.8	10.4	-14.8	30.8
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.9	9.9	-7.7	36.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.5	14.6	-0.2	50.4

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 299

Test Date: 1/5/12
 Test I.D.: 299TWA029



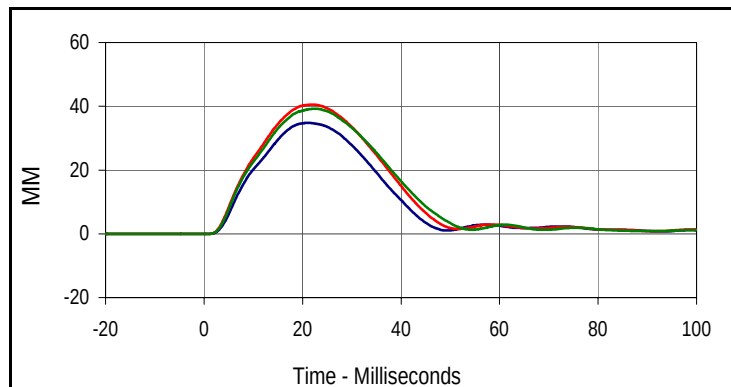
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.4	16.9	-2.4	33.2

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 299

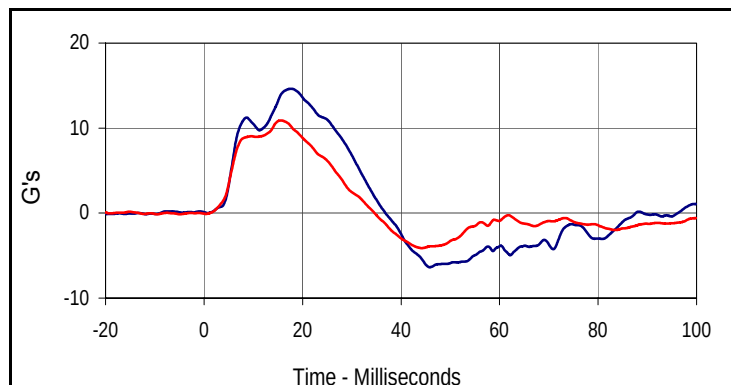
Test Date: 1/5/12
 Test I.D.: 299TWOA029



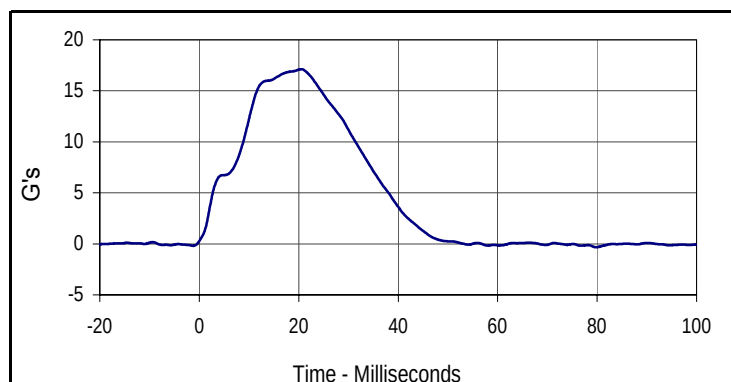
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	400	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	36.8	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.4	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	34.8	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.5	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	39.2	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.6	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	10.9	Pass
Peak Impactor Acceleration		G's	14 to 18	17.1	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.8	21.2	0.0	-2.4
Middle Thorax Deflection			
Max	Time	Min	Time
40.5	21.9	0.0	-6.2
Lower Thorax Deflection			
Max	Time	Min	Time
39.2	22.5	0.0	-18.7



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.6	17.7	-6.4	45.8
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.9	15.6	-4.1	44.2



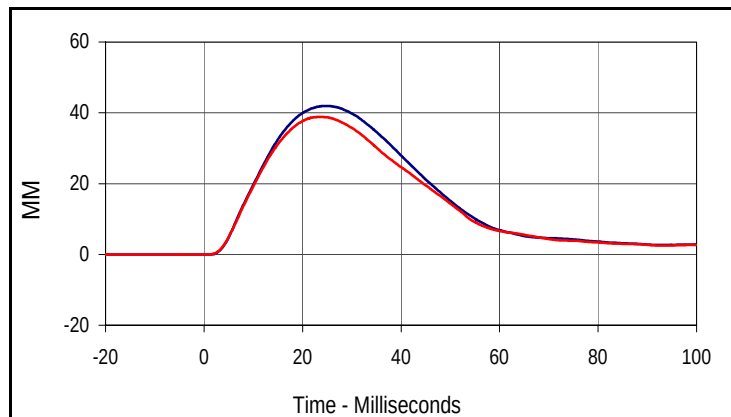
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
17.1	20.5	-0.3	79.8

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 299

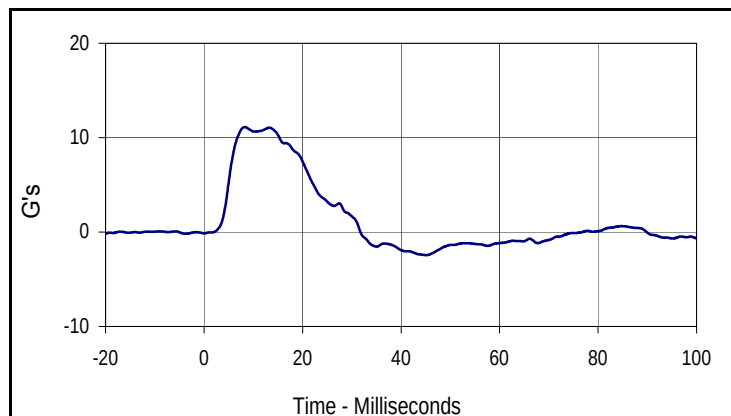
Test Date: 1/5/12
 Test I.D.: 299ABD029



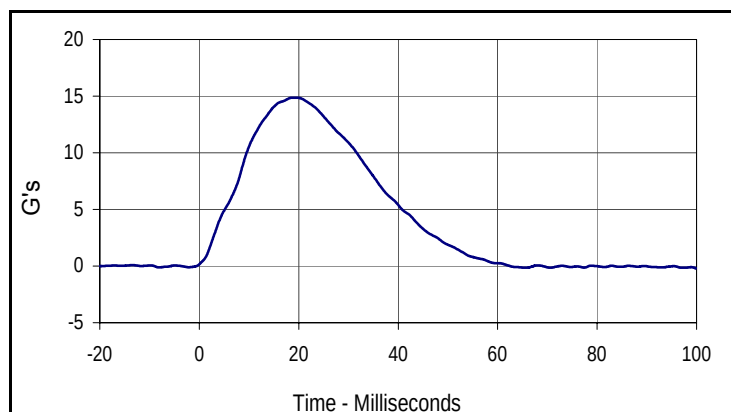
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	410	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.8	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	42.0	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	38.8	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	11.1	Pass
Peak Impactor Acceleration	G's	12 to 16	14.9	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
42.0	24.5	0.0	-8.4
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.8	23.6	0.0	-10.0



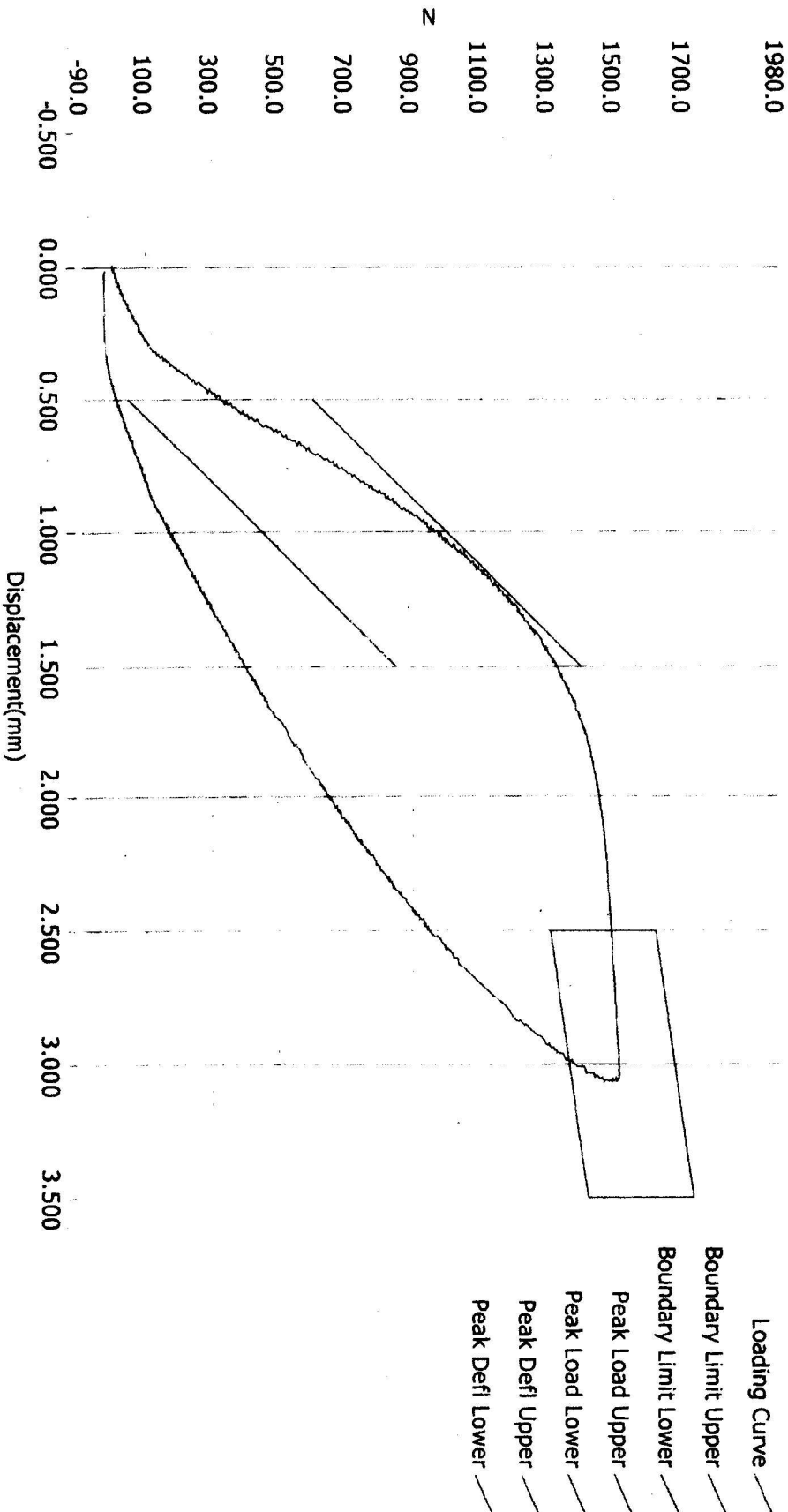
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.1	8.2	-2.4	45.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.9	19.5	-0.2	99.9

MC5108 POST TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

36266

SIDIIs

9/22/2010

10:21 AM

Current Date : 9/22/2010

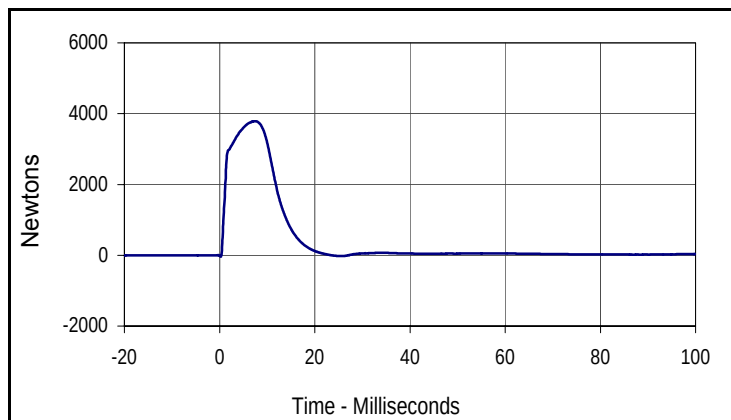
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Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 299

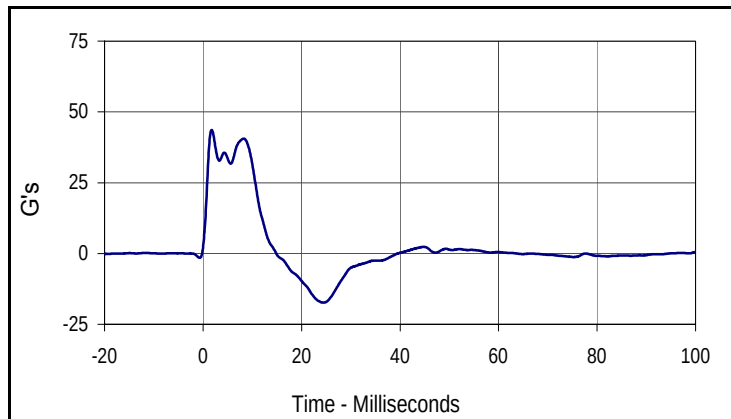
Test Date: 1/5/12
 Test I.D.: 299ACET029



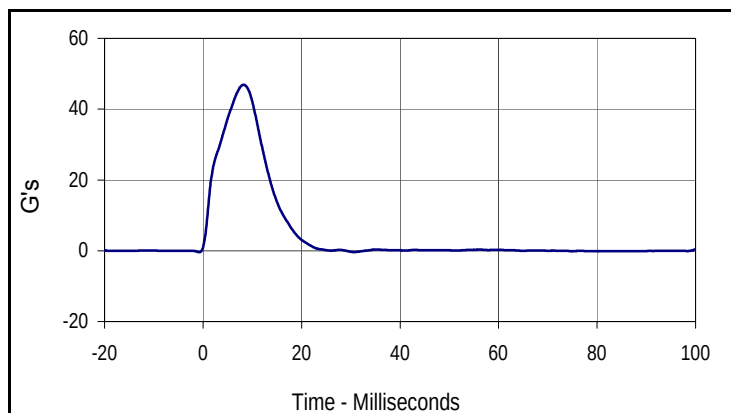
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	440	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.4	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3786.5	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	40.6	Pass
Peak Impactor Acceleration	G's	38 to 47	46.9	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3786.5	7.4	-36.8	0.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
43.6	1.8	-17.4	24.4



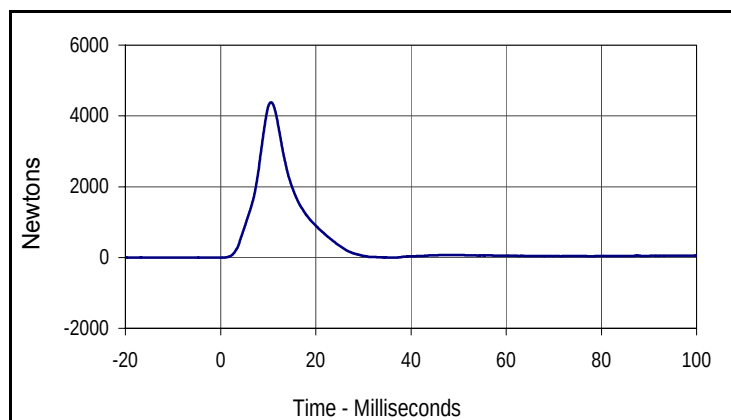
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.9	8.2	-0.4	-0.7

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 299

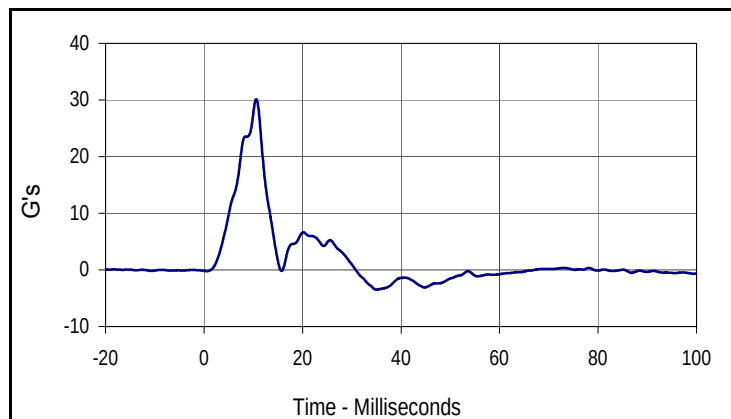
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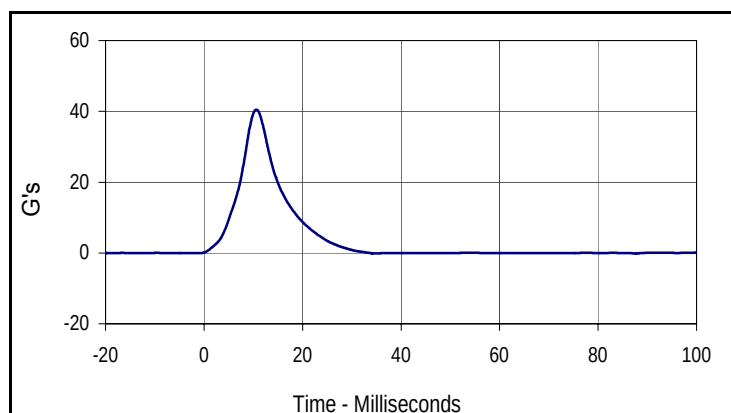
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	450	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	33.9	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4384.7	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	30.1	Pass
Peak Impactor Acceleration	G's	36 to 45	40.5	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4384.7	10.6	-4.8	36.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.1	10.6	-3.5	35.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.5	10.6	-0.2	87.6

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 299			
				Serial Number	Manufacturer	Calibration	
Head Accelerometers				X	P51926	Endevco	8/8/11
				Y	P51929	Endevco	8/8/11
				Z	P51934	Endevco	8/8/11
Displacement Potentiometers	Shoulder		Y	1074	FTSS	8/8/11	
	Thoracic Rib	Upper	Y	1143	FTSS	8/8/11	
		Middle	Y	1160	FTSS	8/8/11	
		Lower	Y	1213	FTSS	8/8/11	
	Abdominal Rib	Upper	Y	1218	FTSS	8/8/11	
		Lower	Y	1234	FTSS	8/8/11	
Lower Spine Accelerometers (T12)				X	P63999	Endevco	8/5/11
				Y	P58872	Endevco	8/4/11
				Z	P58795	Endevco	8/4/11
Acetabulum Load Cell				Y	272	Denton	7/22/11
Iliac Wing Load Cell				Y	284	Denton	7/22/11
Pelvis Plug (Struck Side)					36384	FTSS	9/23/10
Pelvis Plug (Non-Struck Side)					36411	FTSS	9/22/10

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	Ketx5a	ICSensor	6/20/11
Vehicle Center of Gravity	Y	Ketx5b	ICSensor	6/20/11
Vehicle Center of Gravity	Z	Ketx5c	ICSensor	6/20/11
Left Floor Sill	Y	Keva508	Endevco	8/2/11
A-Pillar Sill	Y	J36724	Endevco	3/30/11
A-Pillar Low	Y	00L20-A20	Endevco	10/28/11
A-Pillar Mid	Y	BY98H	Endevco	3/15/11
B-Pillar Sill	Y	J21907	Endevco	3/30/11
B-Pillar Low	Y	J36641	Endevco	4/4/11
B-Pillar Mid	Y	BF59J	Endevco	4/29/11
Driver Seat	Y	AJ7Y4	Endevco	3/30/11
Engine Top	X	BI60H	Endevco	7/22/11
Engine Top	Y	AR17	Endevco	7/22/11
Firewall	Y	BJ54H	Endevco	3/31/11
Right Roof	Y	EK16J	Endevco	2/3/11
Right Floor Sill	Y	BF83H	Endevco	3/31/11
Rear Floorpan	X	Keva201X	Endevco	11/28/11
Rear Floorpan	Y	Keva201Y	Endevco	11/28/11

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	8/8/11
Load Cell 2	132304A	Interface	8/8/11
Load Cell 3	19477	Interface	8/8/11
Load Cell 4	19325	Interface	8/8/11
Load Cell 5	131827A	Interface	8/8/11
Load Cell 6	132302A	Interface	8/8/11
Load Cell 7	19267	Interface	8/8/11
Load Cell 8	19321	Interface	8/8/11