

REPORT NUMBER: SPNCAP-KAR-13-006

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

**FORD MOTOR CO.
2013 FORD ESCAPE 5-DOOR MPV**

NHTSA No: MD0202

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



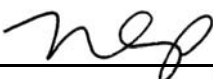
JULY 30, 2012


FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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Approval Date: July 30, 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

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		15. Supplementary Notes																												
16. Abstract A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2013 Ford Escape 5-door MPV in accordance with the specifications of the Office of Crash Worthiness 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 July 16th, 2012. The impact velocity was 32.54 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 29.3 deg. C. The target vehicle's maximum post-test static crush was 446 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Measurement Description</th> <th colspan="3" style="text-align: center;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">g</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">356.5</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">g</td> <td style="text-align: center;">82</td> <td style="text-align: center;">44.1</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">3144</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38</td> <td style="text-align: center;">22</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45</td> <td style="text-align: center;">13</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)	g	1000	356.5	Resultant Lower Spine Acceleration	g	82	44.1	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3144	Maximum Thoracic Rib Deflection	mm	38	22	Maximum Abdominal Rib Deflection	mm	45	13
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		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																												
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SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2013 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 2013 Ford Escape 5-Door MPV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated May 2012.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2013 Ford Escape 5-Door MPV. The subject vehicle was towed into the rigid pole at an angle of 74.6° and a velocity of 32.54 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on July 16, 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 May 2012. 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	356.5
Lower Spine (T12) Resultant Acceleration	g	82	44
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3145
Maximum Thoracic Rib Deflection	mm	38*	22
Maximum Abdominal Rib Deflection	mm	45*	13

*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				

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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MD0202
Model Year	2013
Make	Ford
Model	Escape
Body Style	5-Door MPV
VIN	1FMCU0F73DUA20310
Body Color	Sterling Grey Metallic
Odometer Reading (km / mi)	55 / 34
Engine Displacement (L)	2.5
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6
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	Yes
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	Yes
Driver Load Limiter	Yes
Rear Pass. Load Limiter	Yes
Other Safety Restraint	Yes

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	May-12
Vehicle Type	MPV

GVWR (kg)	2096
GAWR Front (kg)	1098
GAWR Rear (kg)	1006

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	2	3		5
Capacity Weight (VCW) (kg)				375.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				34.8

A
B
A-B

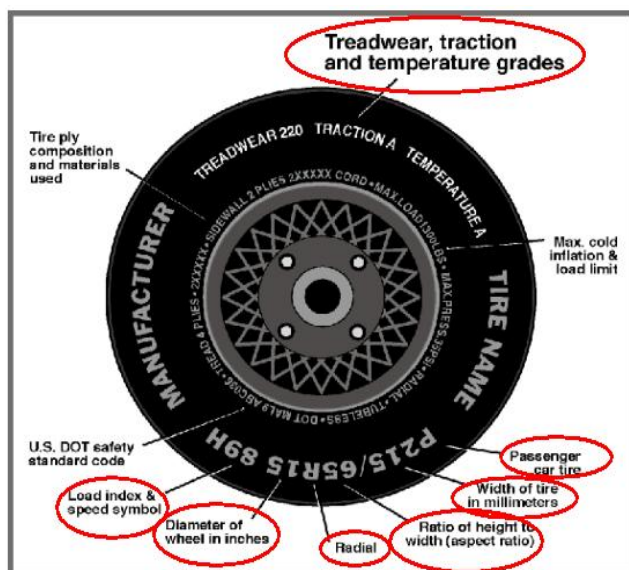
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	240	240
Recommended Tire Size	235/55R17 99H	P255/70R18

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Tire Size on Vehicle	235/55R17	235/55R17
Tire Manufacturer	Continental	Continental
Tire Name	Conti Pro Contact	Conti Pro Contact
Tire Type	Passenger	Passenger
Tire Width	235	235
Aspect Ratio	55	55
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	99H	99H
Treadware	500	500
Traction Grade	AA	AA
Temperature Grade	A	A
Tire Material	2 Polyester, 2 Steel, 2 Polyamide	2 Polyester, 2 Steel, 2 Polyamide

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	265	268	266	270
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	467.5	334.5		481.5	355.5		485.5	369.0	
Right	kg	466.5	320.5		486.0	344.0		470.5	347.0	
Ratio	%	58.8%	41.2%	100.0%	58.0%	42.0%	100.0%	57.2%	42.8%	100.0%
Total	kg	934.0	655.0	1589.0	967.5	699.5	1667.0	956.0	716.0	1672.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1589.0	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	34.8	C
Calculated Vehicle Target Wt (TVT _W)	kg	1672.8	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)
Non-Struck Side Door Panels	6.0
Non-Struck Side Outboard Mirror	1.5
Non-Struck Side Windows	11.0
Spare Tire and Tools	19.0
Trunk Soft Trim	7.5
Speakers	1.5
Tail Lights	2.0
Bumper Cover	5.5
Ballast / Equipment Added	71.3

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-1.2	-1.2	-0.7	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-1.1	-1.0	-0.8	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.0	0.0	0.0	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.2	-0.1	-0.1	Yes
Vehicle CG (Aft of Front Axle)	mm	1109	1129	1152	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	7	3	17	

*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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

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	15.8	10.6	13.2
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 to LR	Fixed to LR	Fixed to LR

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP	SCRP Height	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	10.6	673	Max	667	670	673
			Mid	667	670	673
			Min	667	670	673
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Front Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
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 to LR	Fixed to LR	Max	Fixed to LR	Fixed to LR	Fixed to LR
			Mid	Fixed to LR	Fixed to LR	Fixed to LR
			Min	Fixed to LR	Fixed to LR	Fixed to LR

DATA SHEET NO. 2 ... (CONTINUED)

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

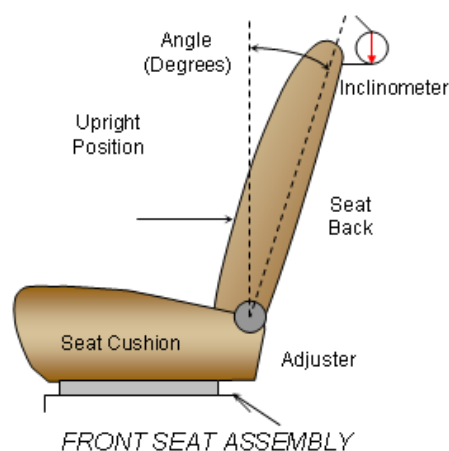
Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	255	38	0	0
Front Passenger Seat	268	38	134	18
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed to LR	Fixed to LR	Fixed to LR	Fixed to LR

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	50.4	27	4.6	0
Front Passenger Seat	50.3	27	4.3	0
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	11.0	7	1.7	0
Non-Struck Side Rear Seat	11.6	7	1.7	0
Rear Center Seat	Fixed to LR	Fixed to LR	Fixed to LR	Fixed to LR

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	4	H

DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

HEAD RESTRAINT ADJUSTMENT

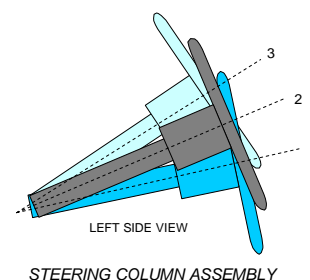
The driver's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	3 Vertical; 11 Horizontal	Full Down; Full Forward

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	24.2	102
Geometric Center - Position 2	27.1	127
Uppermost - Position 3	30.0	152
Telescoping Steering Wheel Travel		50
Test Position	27.1	127



DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

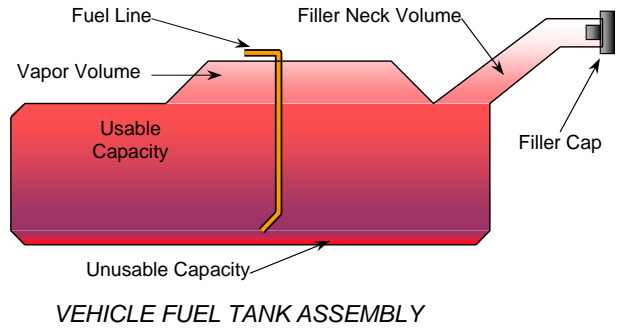
FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	57.00
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	53.01
Actual amount of Solvent Used in Test	53.01
1/3 of Usable Capacity	19.00

Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? **Yes** **No**

FUEL PUMP

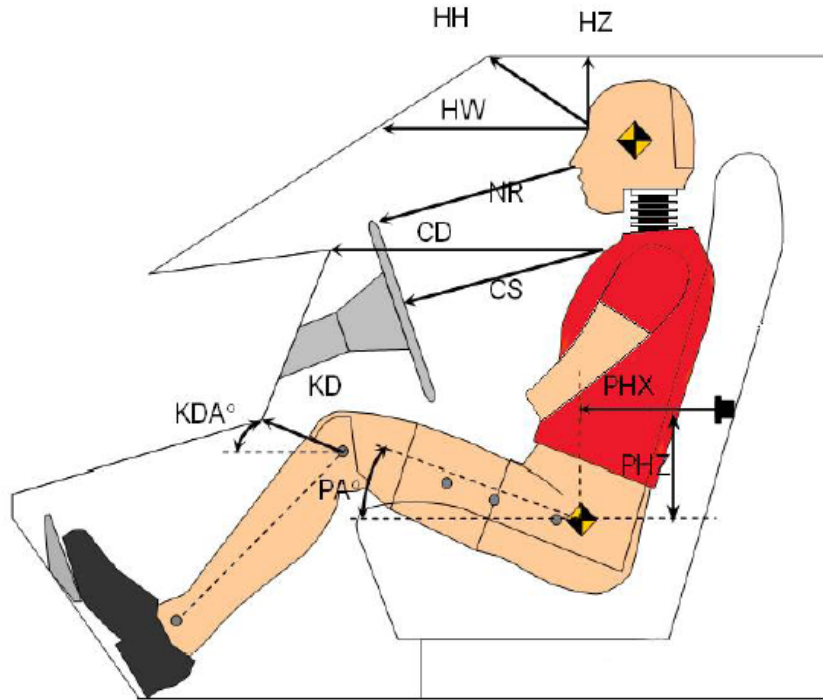
The vehicle is equipped with an electric fuel pump. The electronic fuel pump operates for a prescribed amount of time to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 450 ms following ignition operation, the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is deactivated. Also, fuel pump shut-off is provided, which is designed to stop the fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



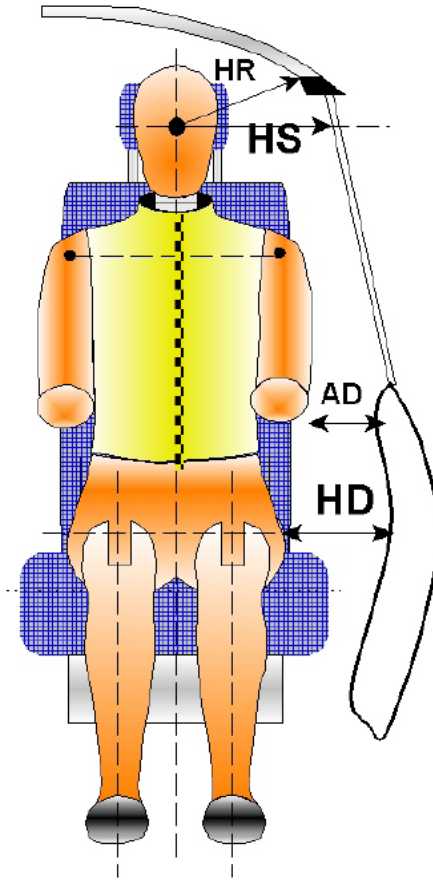
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	336	
HW	Head to Windshield	789	
HZ	Head to Roof	258	
NR	Nose to Rim	296	
CD	Chest to Dash	445	
CS	Chest to Steering Wheel	240	
KD(L)/KDA(L)°	Left Knee to Dash	125	52.1
KD(R)/KDA(R)°	Right Knee to Dash	122	25.9
PAX°	Pelvic Tilt Angle (x-axis)		21.1
PAY°	Pelvic Tilt Angle (y-axis)		0.4
PHX	Hip Point to Striker (x-axis)	329	
PHZ	Hip Point to Striker (z-axis)	108	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



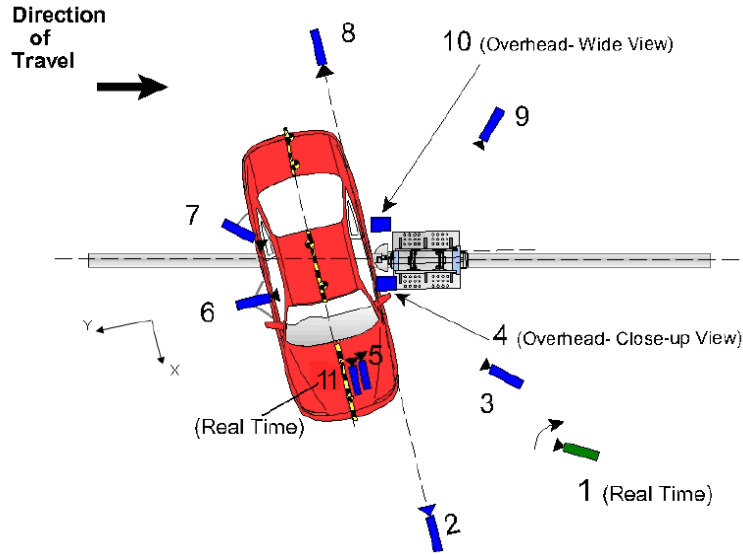
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	311
HS	Head to Side Window	mm	396
AD	Arm to Door	mm	175
HD	H-Point to Door	mm	168

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



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	-0.30	0.03	-1.05	24	1000
6	On-Board - Dummy Side View	-0.45	0.03	-1.05	14	1000
7	On-Board - Dummy Rear Oblique View	-0.60	0.03	-1.05	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	-1.20	0.05	-1.06		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

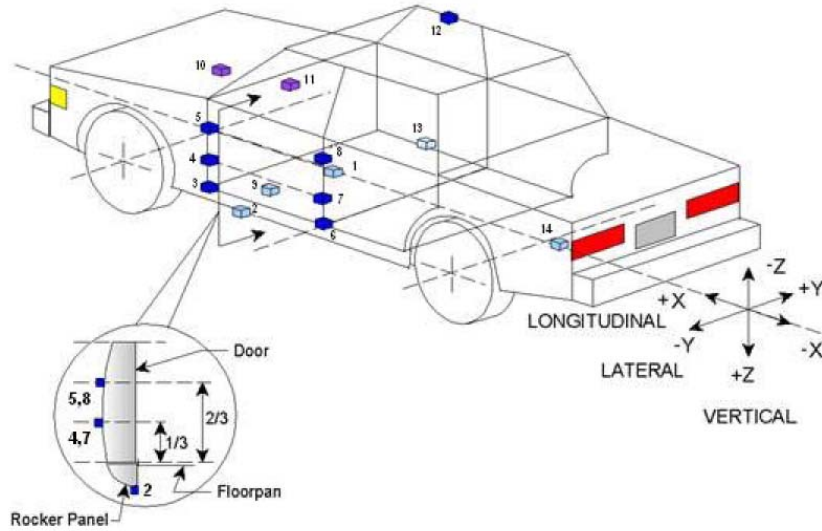
INSTRUMENTATION

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

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



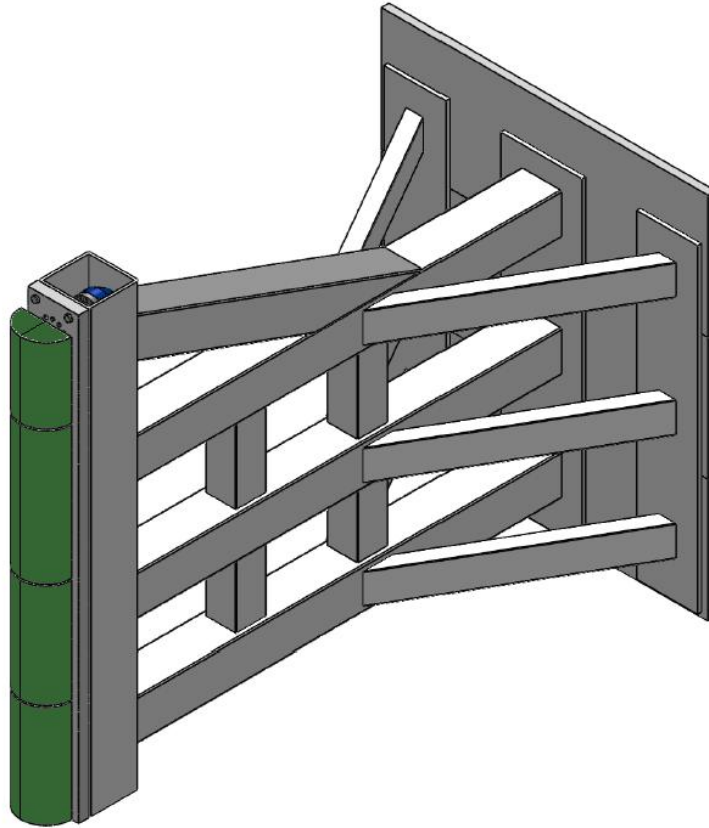
VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1870	0	-405
2	Left Floor Sill	2875	-691	-255
3	A-Pillar Sill	3075	-792	-460
4	A-Pillar Low	3075	-792	-675
5	A-Pillar Mid	3075	-792	-945
6	B-Pillar Sill	1984	-718	-470
7	B-Pillar Low	1984	-718	-695
8	B-Pillar Mid	1984	-718	-950
9	Driver Seat Track	2313	-556	-417
10	Engine Top	3799	196	-870
11	Firewall	3485	42	-865
12	Right Roof	2037	465	-1617
13	Right Floor Sill	1935	714	-414
14	Rear Floorpan	865	12	-825

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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag, Headrest, Front Passenger Seat Back
Left Side of Head	Curtain Airbag
Back of Head	Headrest, Seat Back
Left Shoulder	Door Panel, Torso/Pelvis Airbag, Seat
Upper Torso	Seat, Torso/Pelvis Airbag
Lower Torso	Seat, Torso/Pelvis Airbag
Left Hip	Seat, Torso/Pelvis Airbag, Door Panel
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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

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				

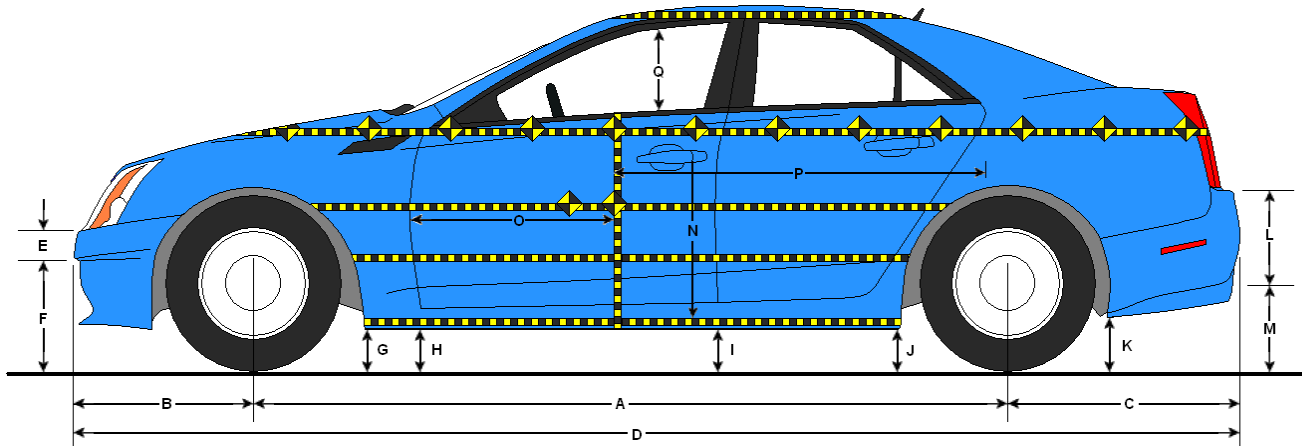
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1118
Actual Impact Point (Aft of Front Axle)	mm		1108
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	10
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.6
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.54
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.58

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2691	2601	-90
B	Front Axle to FSOV	924	921	-3
C	Rear Axle to RSOV	880	925	45
D	Total Length at Centerline	4493	4447	-46
E	Front Bumper Thickness	438	437	-1
F	Front Bumper Bottom to Ground	341	372	31
G	Sill Height at Front Wheel Well	301	300	-1
H	Sill Height at Front Door Leading Edge	292	367	75
I	Sill Height at B-Pillar	293	313	20
J1	Sill Height at Rear Wheel Well	314	312	-2
J2	Pinch Weld Height at Rear Wheel Well	281	271	-10
K	Sill Height Aft of Rear Wheel Well	662	646	-16
L	Rear Bumper Thickness	98	99	1
M	Rear Bumper Bottom to Ground	528	496	-32
N	Sill Height to Bottom of Front Window Sill	660	778	118
O	Front Door Leading Edge to Impact CL	664	545	-119
P	Rear Door Trailing Edge to Impact CL	1426	1320	-106
Q	Front Window Opening	476	478	2
R	Right Side Length	3244	3264	20
S	Left Side Length	3244	3106	-138
T	Vehicle Width at B-Pillar	1797	1686	-111

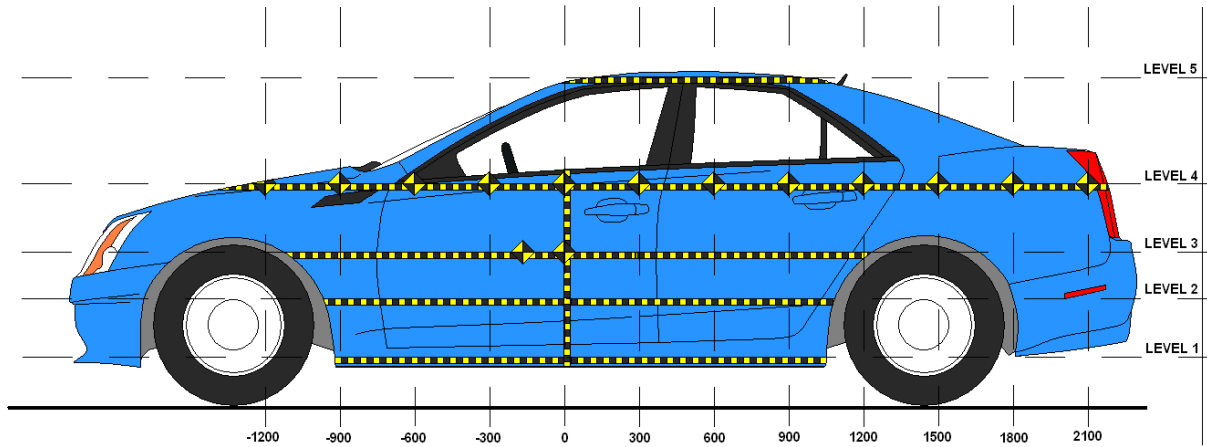
All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 10

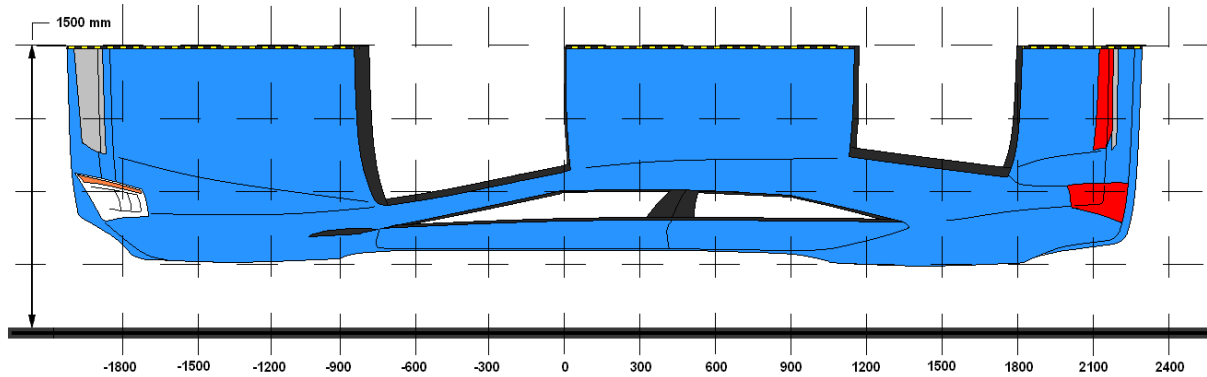
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202

Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



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	358	357	0
2	Occupant H-Point	688	443	0
3	Mid-Door	737	446	0
4	Window Sill	1047	426	0
5	Window Top	1589	301	0

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202

Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12

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			584	697				648	758				64	61	
-750		591	595	678			666	672	760			75	77	82	
-600	629	607	608	666		594	681	685	766		-35	74	77	100	
-450	632	609	608	656		694	769	771	816		62	160	163	160	
-300	635	610	608	648		794	853	855	891		159	243	247	243	
-150	638	611	609	641		895	944	946	968		257	333	337	327	
0	643	611	609	636	836	1000	1054	1055	1062	1137	357	443	446	426	301
150	648	613	610	631	832	994	1031	1038	1057	1075	346	418	428	426	243
300	651	614	612	628	834	902	907	910	933	1041	251	293	298	305	207
450	654	616	614	626	837	819	804	802	824	1007	165	188	188	198	170
600	657	618	616	624	840	791	776	776	795	980	134	158	160	171	140
750	659	620	618	621	846	762	749	750	767	958	103	129	132	146	112
900	641	622	621	625	853	714	720	722	743	939	73	98	101	118	86
1050	633	620	622	629	859	678	689	693	720	923	45	69	71	91	64
1200		599	601	647	866		646	650	709	922		47	49	62	56
1350			588	640	872			636	676	922			48	36	50
1500				646	878				690	924				44	46
1650				652	885				690	926				38	41
1800				660	892				691	939				31	47
1950				672					696					24	
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

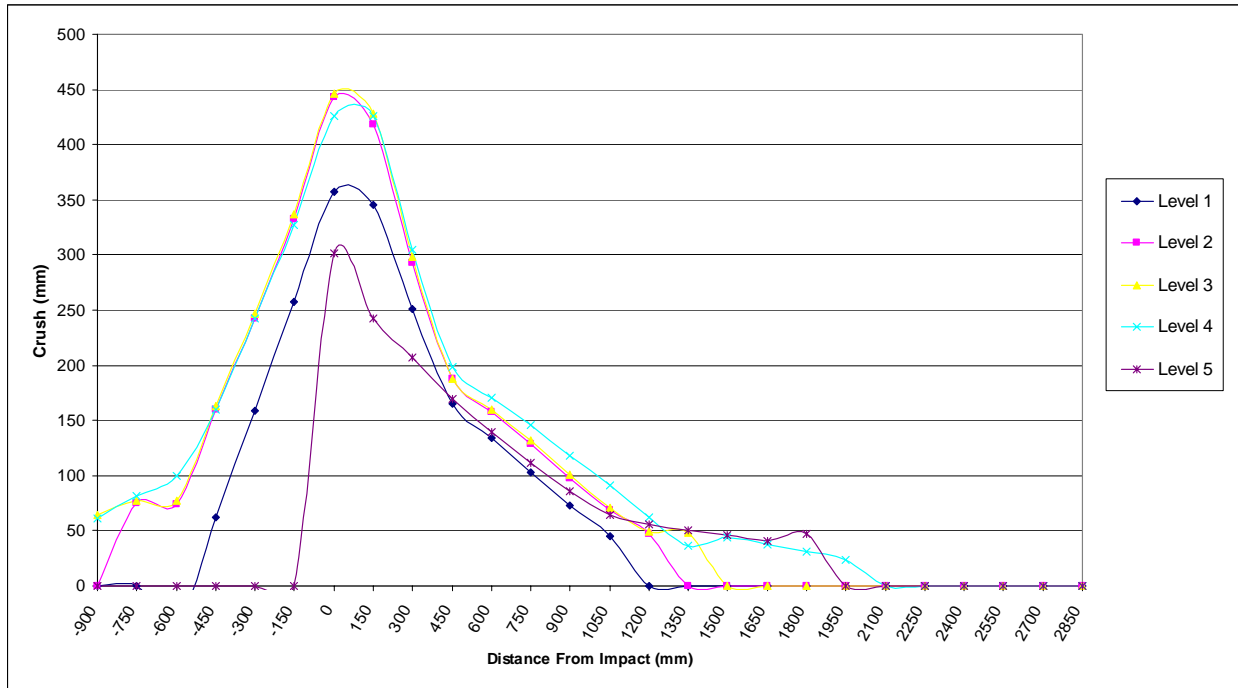
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Ford Escape 5-Door MPV

NHTSA No. MD0202

Test Program: NCAP Side Pole Impact Test

Test Date: 07/16/12

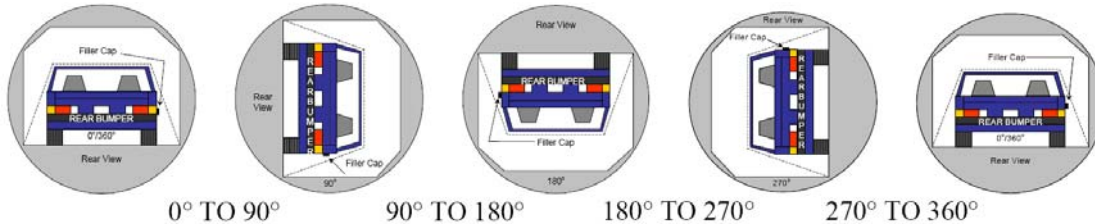


DATA SHEET NO. 11

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
 Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12
 Temperature at Time of Impact: 29.3° C Test Time: 12:35 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°	81	300	381
90° To 180°	80	300	380
180° To 270°	79	300	379
270° To 360°	80	300	380

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			

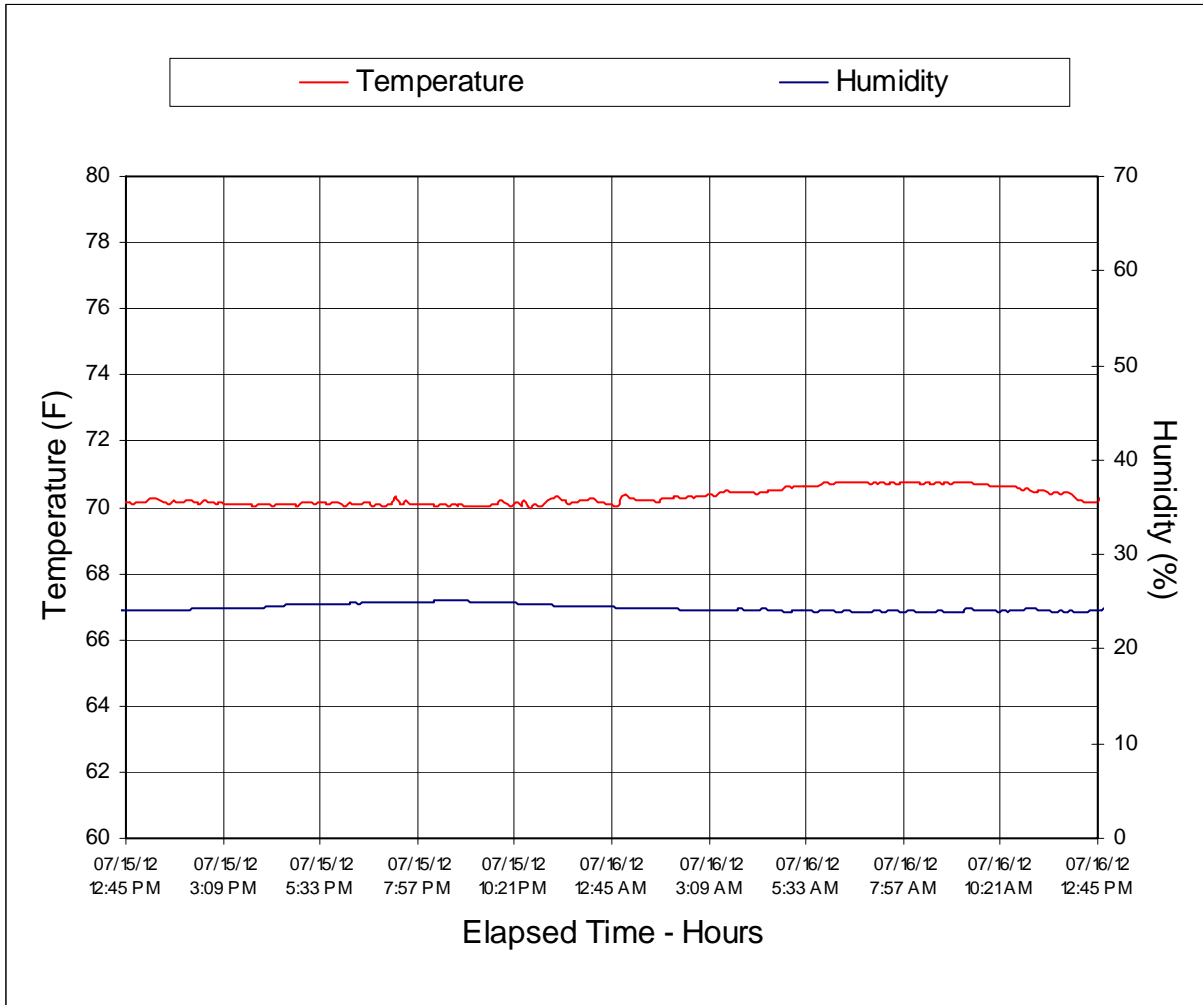
SOLVENT SPILLAGE LOCATION TABLE

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: 2013 Ford Escape 5-Door MPV NHTSA No. MD0202
Test Program: NCAP Side Pole Impact Test Test Date: 07/16/12



**APPENDIX A
PHOTOGRAPHS**

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FIGURE 1. As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 2. As-Delivered Left Rear $\frac{3}{4}$ 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 $\frac{3}{4}$ View of Test Vehicle



FIGURE 6. Post-Test Left Front $\frac{3}{4}$ 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 $\frac{3}{4}$ View of Test Vehicle



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ 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

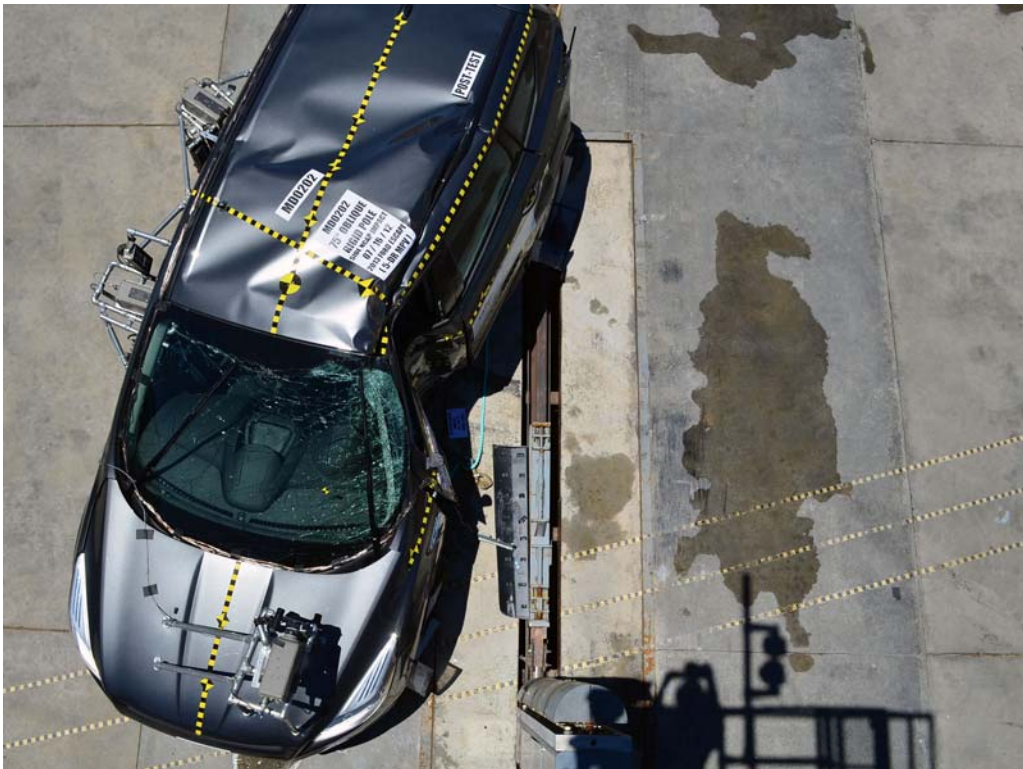


FIGURE 16. Post-Test Overhead View of Test Vehicle and Pole



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

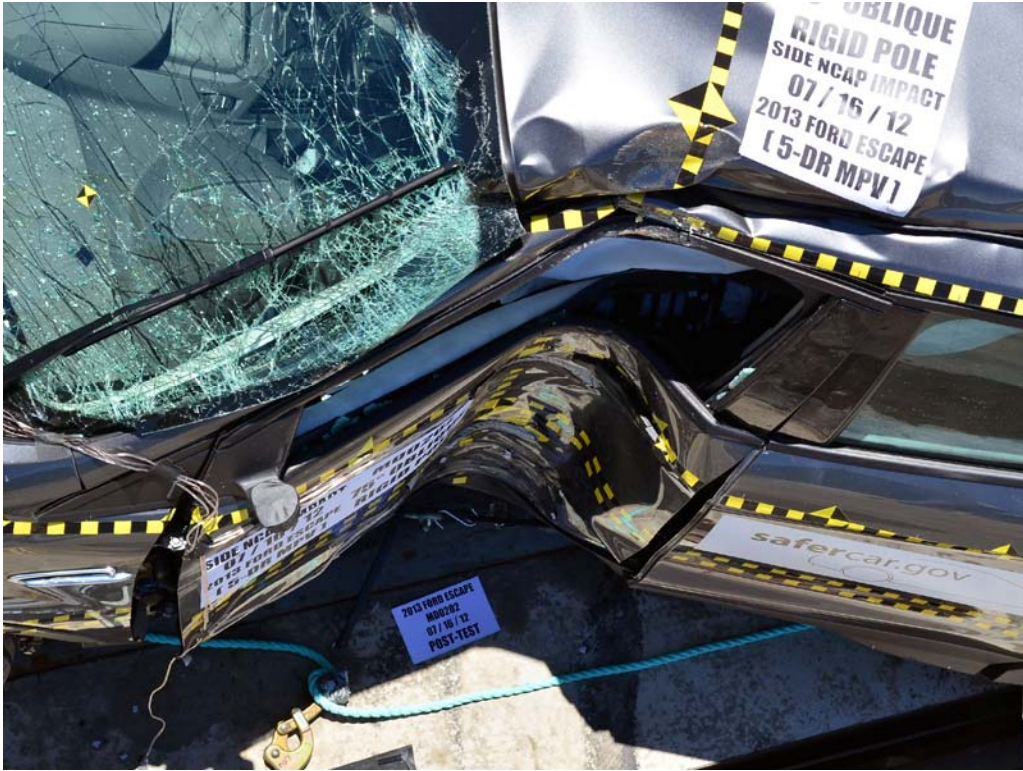


FIGURE 41. Post-Test Driver Dummy and Door Clearance



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



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. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



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



FIGURE 54. Post-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 55. Close-Up View of Vehicle's Certification Label



FIGURE 56. Close-Up View of Vehicle's Tire Information Placard



FIGURE 57. Pre-Test Pole Barrier Front View



FIGURE 58. Post-Test Pole Barrier Front View



FIGURE 59. Pre-Test Pole Barrier Side View



FIGURE 60. Post-Test Pole Barrier Side View



FIGURE 61. Pre-Test Ballast View



FIGURE 62. Post-Test Primary and Redundant Speed Trap Read-Out

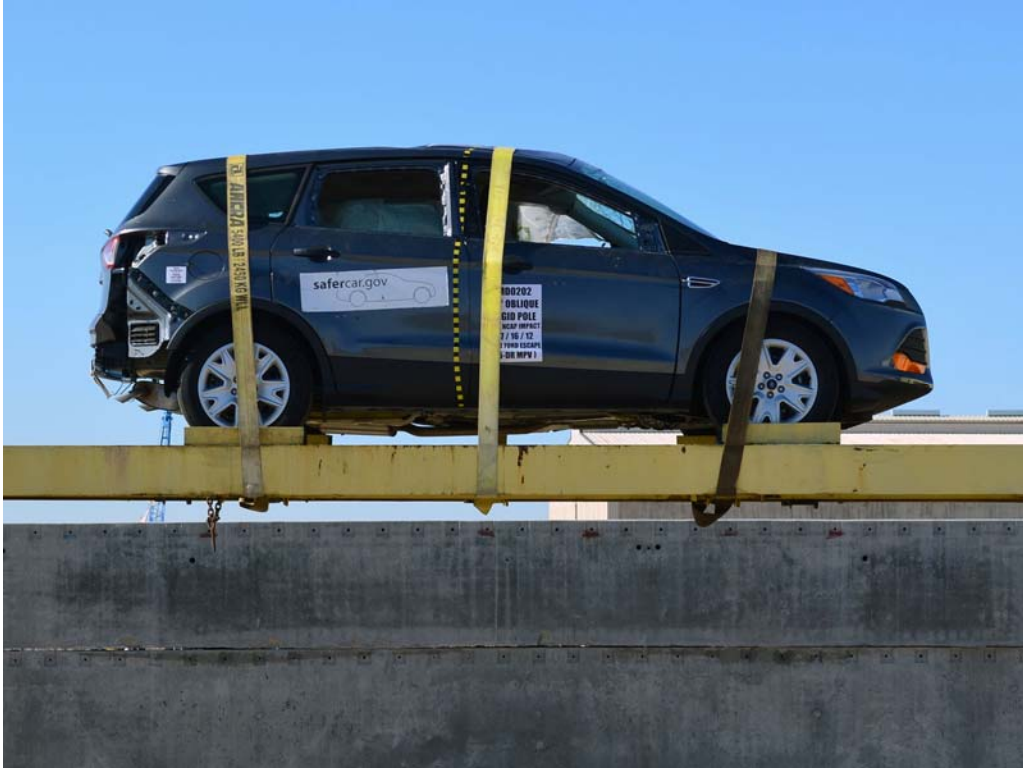


FIGURE 63. FMVSS No. 301-305 Rollover 0 Degrees



FIGURE 64. FMVSS No. 301-305 Rollover 90 Degrees



FIGURE 67. FMVSS No. 301-305 Rollover 360 Degrees



FIGURE 68. Impact Event

VEHICLE DESCRIPTION		DU A20310		EPA DOT Fuel Economy and Environment		Gasoline Vehicle	
ESCAPE 2013 ESCAPE S FWD 124.91 WHITE BASE 2.5L I4 IVC7 ENGINE 5-SPEED SELECTSHIFT AUTO TR		EXTERIOR: STEELINO GRAY METALLIC INTERIOR: CHARCOAL BLACK CLOTH SEATS		Fuel Economy 25 MPG (combined city/hwy) city highway 4.0 gallons per 100 miles		You Save \$950 in fuel costs over 5 years compared to the average new vehicle.	
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE				Annual fuel cost \$2,150			
EXTERIOR • BLIND SPOT MIRRORS • GRILLE - BLACK • HALOGEN HEADLAMPS • REAR SPOILER, BODY COLOR				Fuel Economy & Greenhouse Gas Rating (passenger only) Smog Rating (passenger only) 1 6 10 1 5 10 Best			
INTERIOR • COAR FLOCKS, 2 • CUPHOLDERS - 4 • REAR SEAT FOLD REAR SEAT • 8 AUDIO CONTROLS • ICE BLUE LIGHTING • LOCAL VARIETY SERVICES • FRONT FLOOR MATS • ILLUMINATED ENTRY				Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 city and 32 hwy and 27.0 combined mpg. Good estimates are based on 36,000 miles per year at 37.5¢ per gallon. MSRP is miles per gallon equivalent. Vehicle emissions and a maximum range of 400 miles and more.			
FUNCTIONAL • X-DRIVE SELECT CONTROL • AMP/FM COMPACT CAPSULE/JBL JCD • BATTERY SAVING FEATURE • MONKEY • POWERPOINTS (2) • POWER LOCKS • REMOTE KEYLESS ENTRY				WARRANTY • 5-YEAR/60,000 MILE BUMPER TO BUMPER • 5-YEAR/100,000 MILE POWERTRAIN • 5-YEAR/100,000 MILE ROADSIDE ASSIST			
SAFETY/SECURITY • ADMINLOCK WITH ESC • AIRBAG - DRIVER KNEE • AIRBAG - DUAL STAGE FRONT • AIRBAGS - SAFETY CANOPY • AIRBAGS - SIDE AIR CURTAIN • LATCH CHILD SAFETY SYSTEM • PERSONAL SAFETY SYSTEM • SECURELOCK PASS-ANTI THEFT				Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 city and 32 hwy and 27.0 combined mpg. Good estimates are based on 36,000 miles per year at 37.5¢ per gallon. MSRP is miles per gallon equivalent. Vehicle emissions and a maximum range of 400 miles and more.			
INCLUDED ON THIS VEHICLE		PRICE INFORMATION		fuel economy.gov Calculate personalized estimates and compare vehicles.			
EQUIPMENT GROUP 100A		MSRP		GOVERNMENT 5-STAR SAFETY RATINGS			
OPTIONAL EQUIPMENT		MSRP		Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.			
CALIFORNIA EMISSIONS SYSTEM SINGLE CD W/S SPEAKERS/SYNC SYNC VOICE ACTIVATED SYSTEM		NO CHARGE 209.90		Frontal Crash Not Rated Driver Passenger Not Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.			
MSRP TO YOU		MSRP TO YOU		Side Crash Not Rated Front seat Rear seat Not Rated Based on the risk of injury in a side impact.			
You World Ford, Inc. 71 Main Rd. East Rochester NY 14445		44F 070		Rollover Not Rated Based on the risk of rollover in a single-vehicle crash.			
44F 070		CS18		Star ratings range from 1 to 5 stars (*****), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4238			
44F 070		44F 070		FINANCING FROM FORD			
44-0208 OPT 2		44-0208 OPT 2		Choose the vehicle you want, whether you decide to lease or finance, and let us take care of the rest. See your dealer for details.			

FIGURE 69. Monroney Label

Seats

SITTING IN THE CORRECT POSITION

WARNINGS

- Sitting improperly, out of position or with the seatback reclined too far can take weight off the seat cushion and affect the decision of the passenger sensing system, resulting in serious injury or death in the event of a collision. Always sit upright against your seatback, with your feet on the floor.
- Do not recline the seatback as this can cause the occupant to slide under the safety belt, resulting in serious injury in the event of a collision.
- Do not place objects higher than the seatback to reduce the risk of serious injury in the event of a collision or during heavy braking.

Max. 30°

When you use them properly, the seat, head restraint, safety belt and air bags will provide optimum protection in the event of a collision.

We recommend that you follow these guidelines:

- Sit in an upright position with the base of your spine as far back as possible.
- Do not recline the seatback more than 30 degrees.
- Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable.
- Keep sufficient distance between yourself and the steering wheel. We recommend a minimum of 10 inches (25 centimeters) between your breastbone and the air bag cover.
- Hold the steering wheel with your arms slightly bent.
- Bend your legs slightly so that you can press the pedals fully.
- Position the shoulder strap of the safety belt over the center of your shoulder and position the lap strap tightly across your hips.

Make sure that your driving position is comfortable and that you can maintain full control of your vehicle.

HEAD RESTRAINTS

WARNINGS

- Fully adjust the head restraint before you sit in or operate your vehicle. This will help minimize the risk of neck injury in the event of a collision. Do not adjust the head restraint when your vehicle is moving.
- The head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied.

Seats

WARNINGS

- Install the head restraint properly to help minimize the risk of neck injury in the event of a collision.

Front seat head restraint

Rear seat outboard head restraints

Rear center head restraint

The head restraints consist of:

- An energy absorbing head restraint
- Two steel stems
- Guide sleeve adjust and unlock button
- Guide sleeve unlock and remove button
- Fold button

Note: Adjust the seatback to an upright driving position before adjusting the head restraint. Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable. If you are extremely tall, adjust the head restraint to its highest position.

Adjusting the Head Restraint

Raising the Head Restraint

Pull the head restraint up.

Lowering the Head Restraint

- Press and hold button C.
- Push the head restraint down.

Removing the Head Restraint

- Pull the head restraint up until it reaches its highest position.
- Press and hold buttons C and D.
- Pull the head restraint up.

Installing the Head Restraint

Align the steel stems into the guide sleeves and push the head restraint down until it locks.

Folding the Head Restraint

- Press and hold button E.
- Pull it back up to reset.

FIGURE 70. 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
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
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)

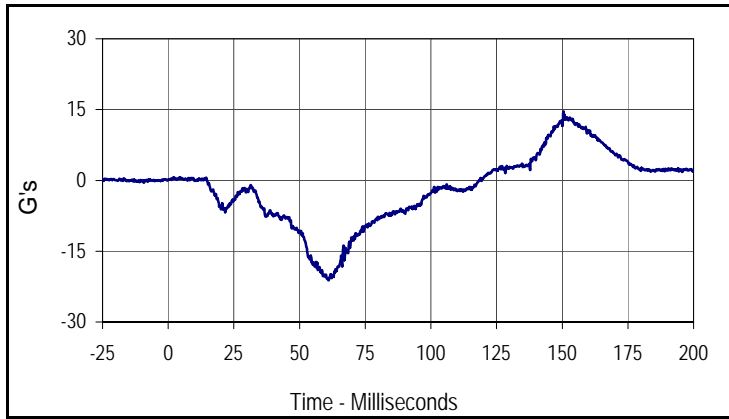
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration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

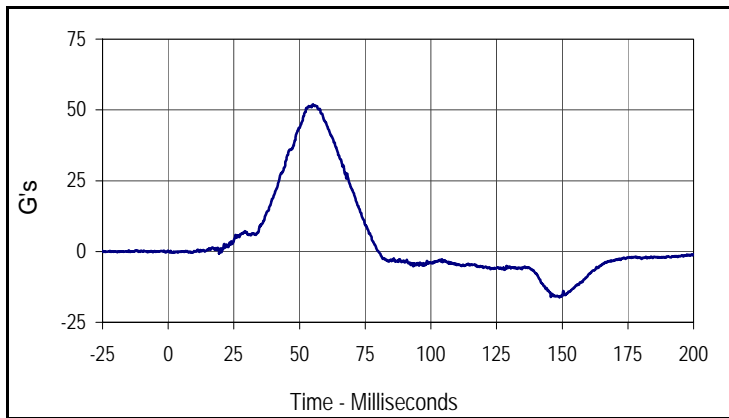
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2013 Ford Escape 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

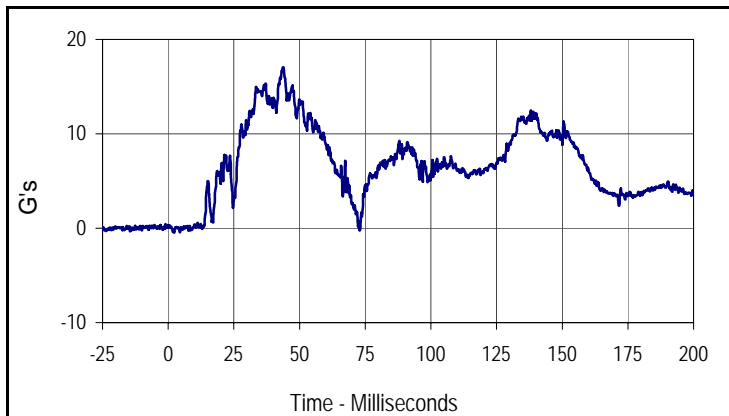
Test Date: 7/16/12
 NHTSA No.: MD0202



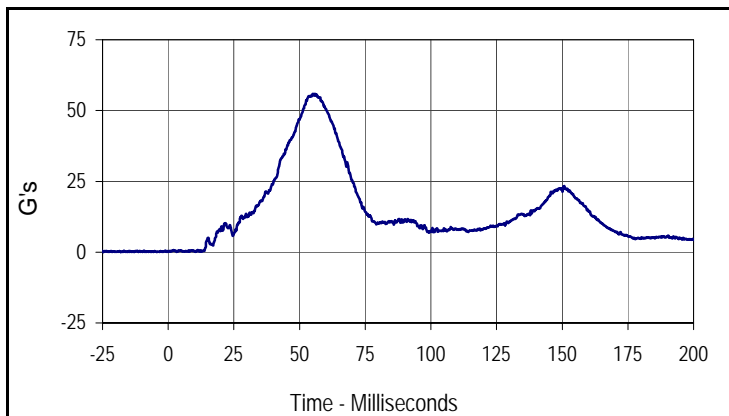
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
14.6	150.4	-21.2	61.0



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
51.9	55.0	-16.2	149.0



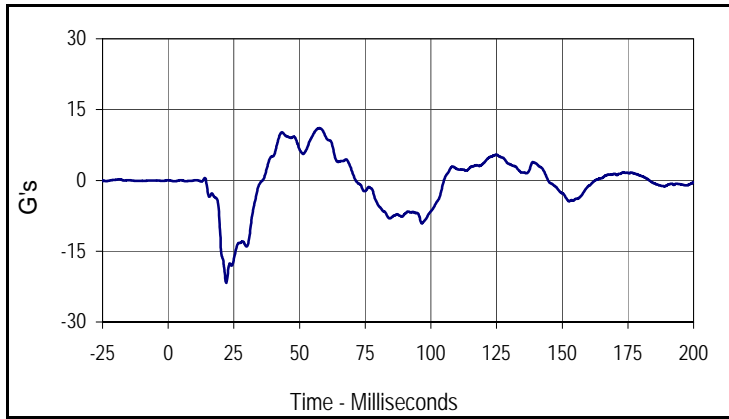
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
17.1	43.8	-0.5	2.3



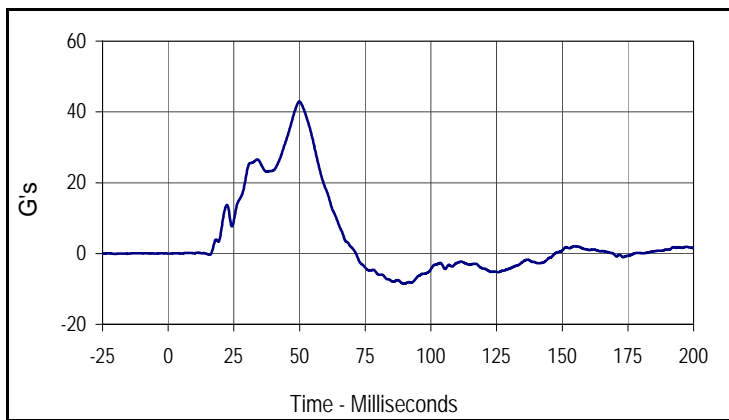
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
55.9	55.9	0.1	10.4

Test Vehicle: 2013 Ford Escape 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

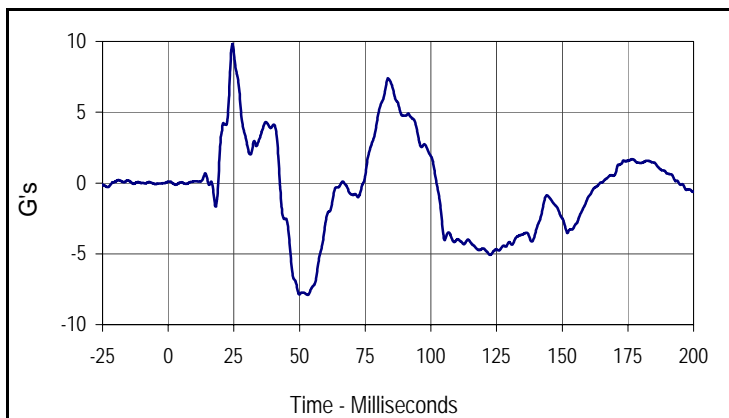
Test Date: 7/16/12
 NHTSA No.: MD0202



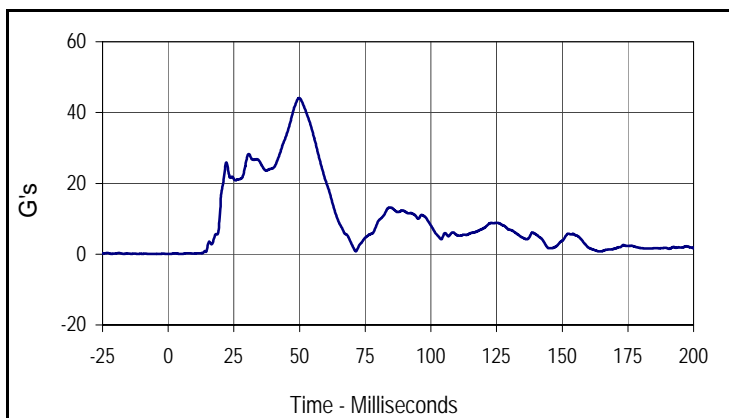
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
11.1	57.6	-21.8	22.1



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
42.9	49.9	-8.5	89.7



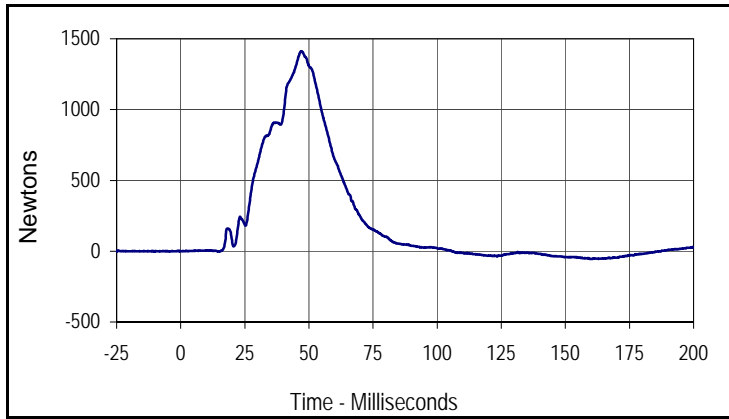
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
9.8	24.4	-7.9	53.2



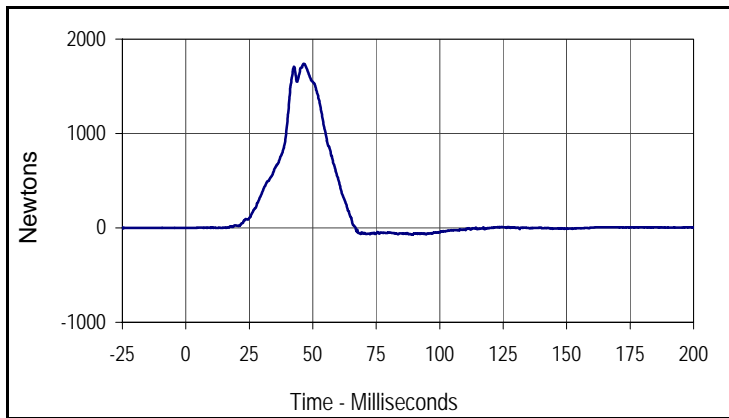
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
44.1	49.9	0.0	4.3

Test Vehicle: 2013 Ford Escape 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

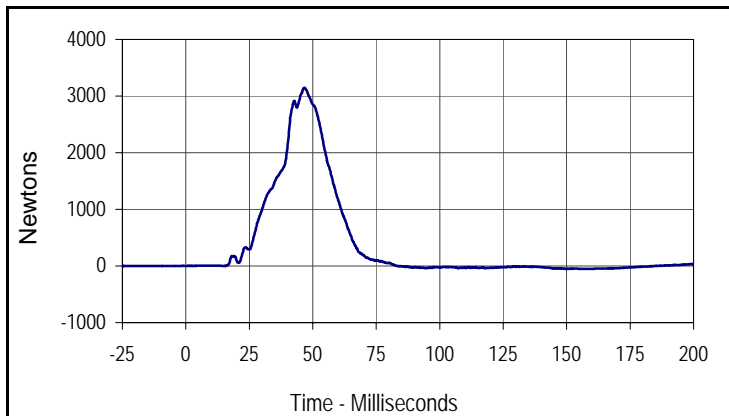
Test Date: 7/16/12
 NHTSA No.: MD0202



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
1411.7	47.1	-55.3	159.9



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
1739.8	46.3	-72.0	89.2



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
3144.5	46.8	-53.3	158.7

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Test Program: SID IIs External Measurements

Test Date: 6/18/12

ATD Serial No.: 307

Test I.D.: N/A



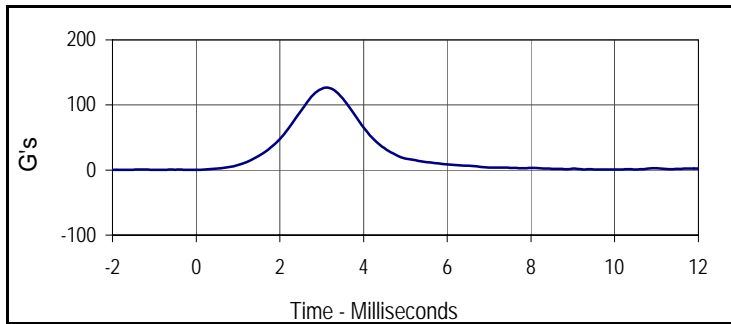
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A Sitting Height	mm	772 - 788	779	Pass
B Shoulder Pivot Height	mm	437 - 453	445	Pass
C H-Point Height	mm	79 - 89	84	Pass
D H-Point from Seatback	mm	141 - 151	145	Pass
E Shoulder Pivot from Backline	mm	97 - 107	102	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	43	Pass
I Head Depth	mm	178 - 188	183	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	350	Pass
M Knee Pivot to Floor Height	mm	392 - 409	402	Pass
N Buttock Popliteal Length	mm	416 - 442	430	Pass
O Chest Depth w/o Jacket	mm	195 - 211	204	Pass
P Foot Length	mm	216 - 232	221	Pass
Q Hip Breadth with Pelvic Plug	mm	313 - 323	318	Pass
R Arm Length	mm	249 - 259	252	Pass
S Knee Joint to Seatback	mm	477 - 493	484	Pass
V Shoulder Width	mm	341 - 357	351	Pass
W Foot Width	mm	78 - 94	89	Pass
Y Chest Circumference with Jacket	mm	851 - 881	873	Pass
Z Waist Circumference	mm	760 - 791	775	Pass
Overall Test Results				Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 307

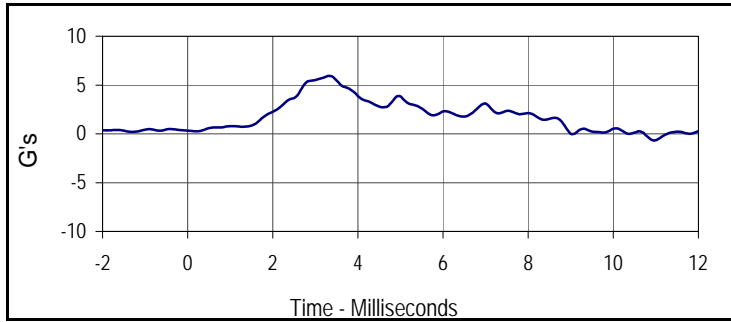
Test Date: 6/18/12
 Test I.D.: 307HD039



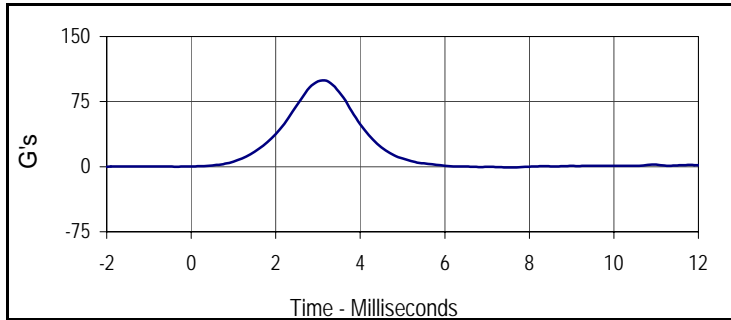
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	240	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.9	Pass
Peak Head Resultant Acceleration	G's	115 to 137	126.6	Pass
Peak Head X Acceleration	G's	<15	5.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.0	Pass
Overall Test Results				Pass



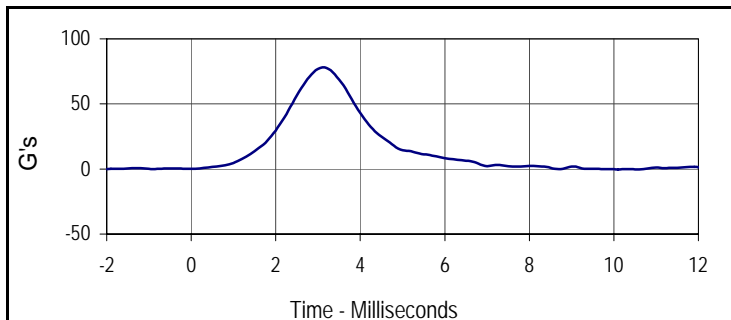
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
126.6	3.1	0.4	-2.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.9	3.3	0.2	-1.3



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
99.5	3.1	-1.0	7.6



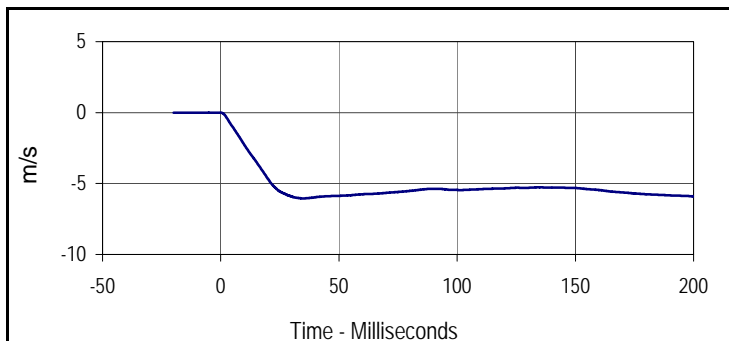
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
78.0	3.1	-0.2	10.0

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 307

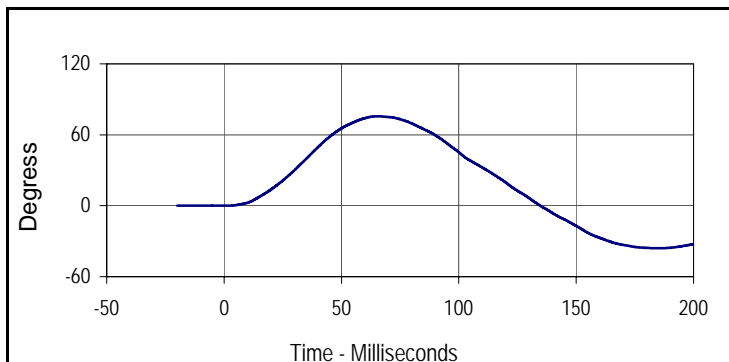
Test Date: 6/18/12
 Test I.D.: 307NB039



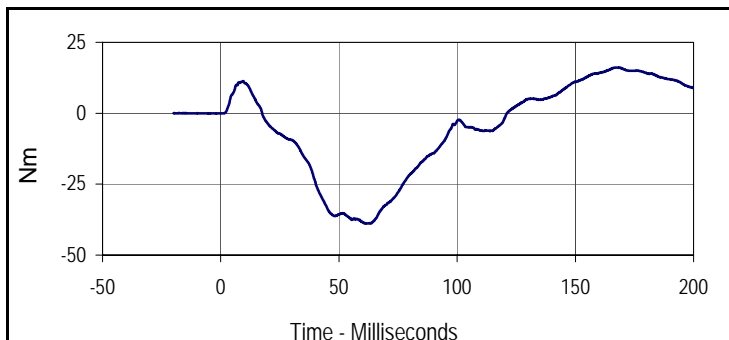
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	265	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass	
	Min		20.7	Pass	
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass	
	Min		29.0	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	30.0	Pass	
Pendulum Velocity	m/s	5.51 to 5.63	5.61	Pass	
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.28	Pass
	15 msec	m/s	-3.30 to -4.10	-3.47	Pass
	20 msec	m/s	-4.40 to -5.40	-4.68	Pass
	25 msec	m/s	-5.40 to -6.10	-5.56	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.05	Pass
D-Plane Rotation	Max	Degrees	71 to 81	75.7	Pass
	Time	msec	50 to 70	65.4	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-38.9	Pass	
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	121.1	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	-20.0	-6.0	34.7



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degree
Max	Time	Min	Time
75.7	65.4	-35.9	184.9



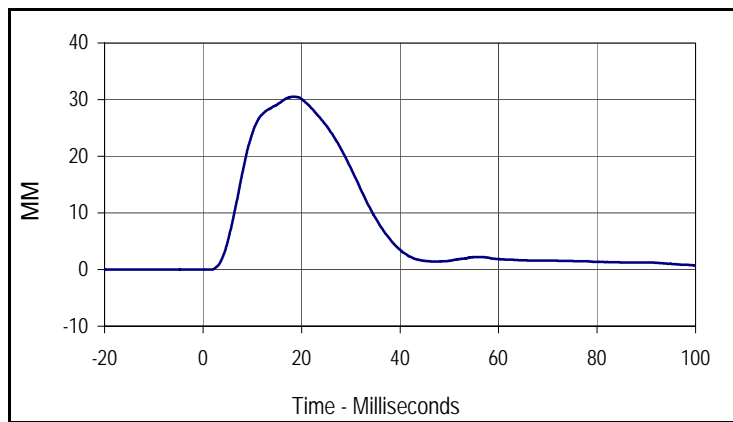
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
16.1	167.2	-38.9	62.5

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 307

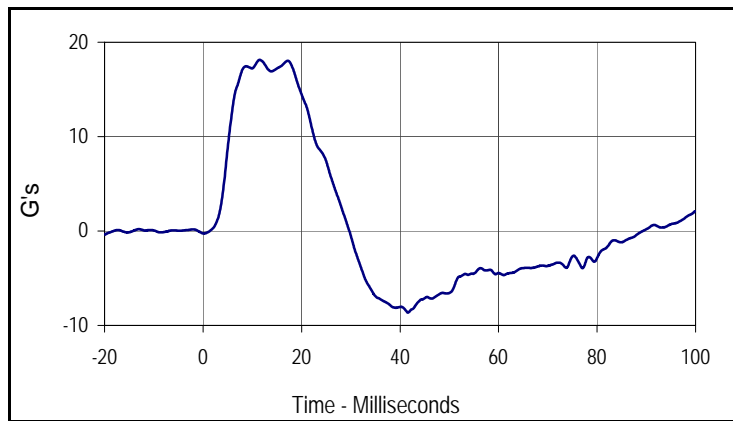
Test Date: 6/18/12
 Test I.D.: 307SH039



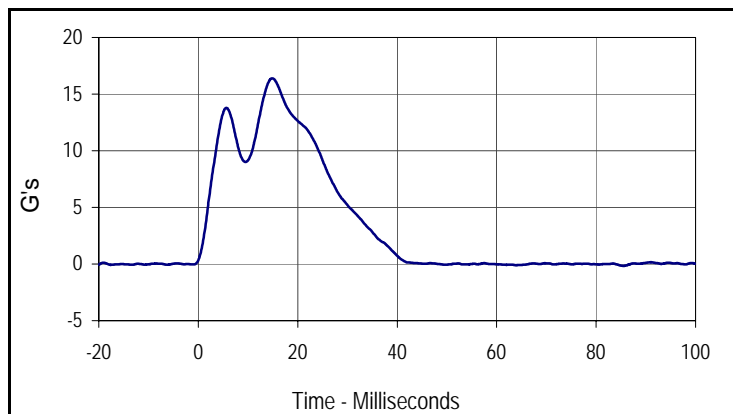
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	290	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.1	Pass
Impactor Velocity	m/s	4.20 to 4.40	4.24	Pass
Peak Shoulder Deflection	mm	28 to 37	30.5	Pass
Peak Lateral Spine Acceleration Y	G's	17 to 22	18.1	Pass
Peak Impactor Acceleration	G's	13 to 18	16.4	Pass
Overall Test Results				Pass



Curve Description			
Shoulder Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.5	18.3	0.0	-9.6



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.1	11.5	-8.6	41.6



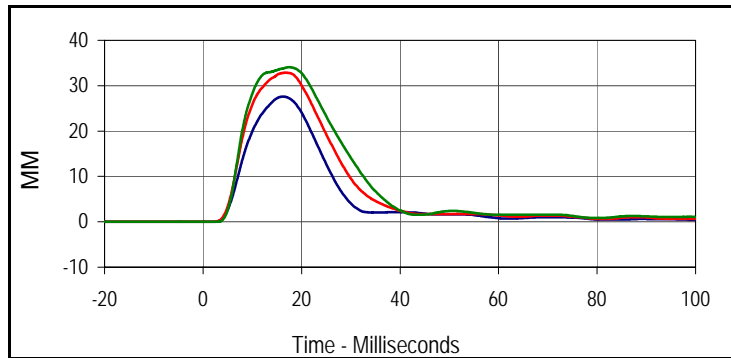
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.4	14.8	-0.2	85.5

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

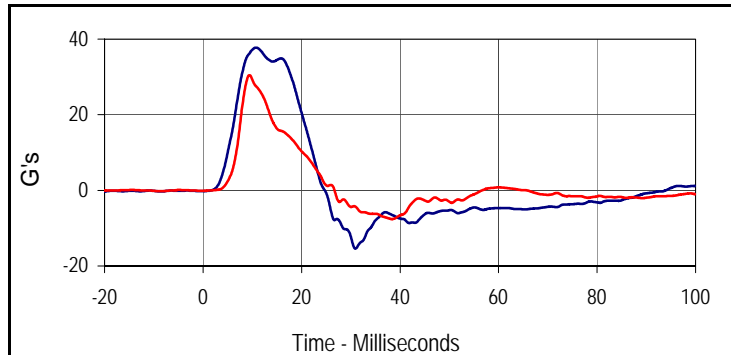
Test Date: 6/18/12
 Test I.D.: 307TWA039



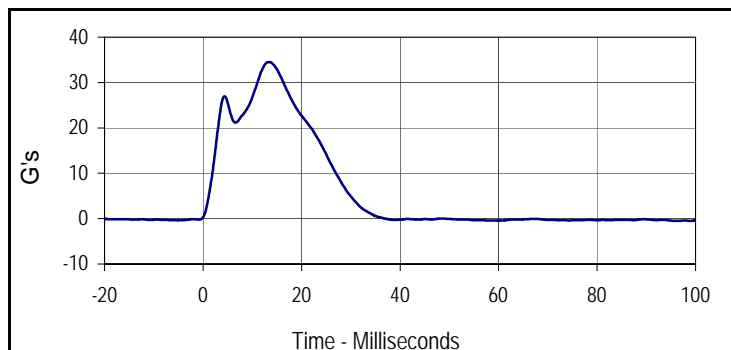
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	310	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.5	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	34.9	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.6	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	32.8	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.1	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.7	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	30.5	Pass
Peak Impactor Acceleration	G's	30 to 36	34.5	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.6	16.2	0.0	-13.0
Middle Thorax Deflection			
Max	Time	Min	Time
32.8	16.8	0.0	-5.9
Lower Thorax Deflection			
Max	Time	Min	Time
34.1	17.6	0.0	-6.1



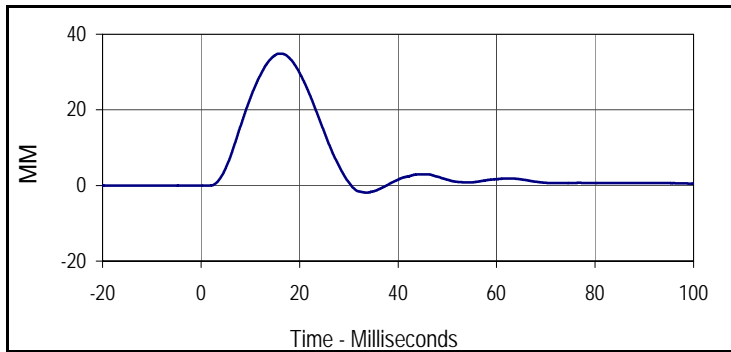
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.7	10.7	-15.4	30.9
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
30.5	9.4	-7.6	38.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.5	13.4	-0.5	96.1

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

Test Date: 6/18/12
 Test I.D.: 307TWA039



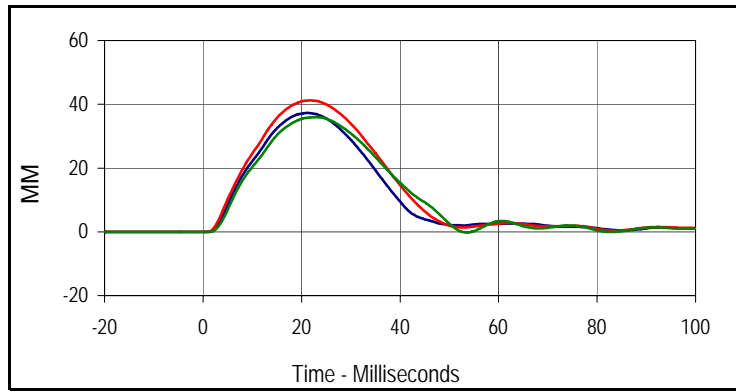
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
34.9	15.9	-1.9	33.6

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 307

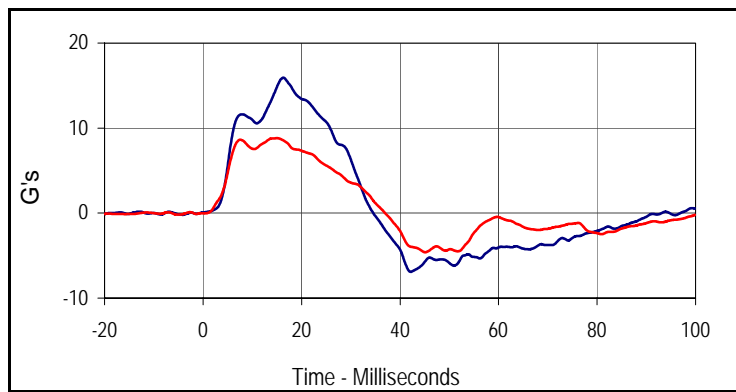
Test Date: 6/18/12
 Test I.D.: 307TWOA039



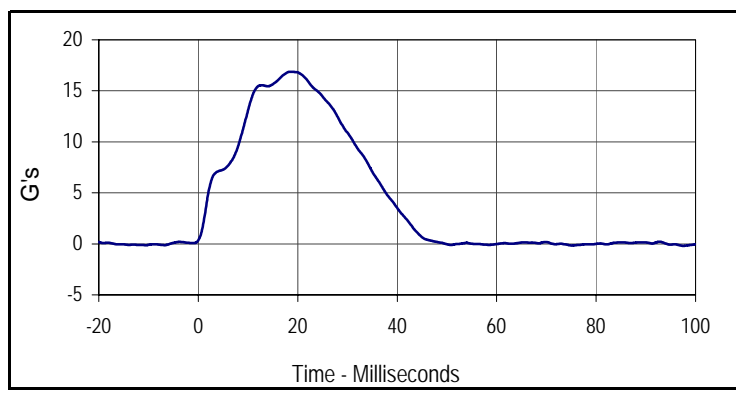
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	315	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	37.3	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	41.2	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	36.0	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	15.9	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	8.8	Pass
Peak Impactor Acceleration	G's	14 to 18	16.9	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
37.3	21.0	0.0	-7.1
Middle Thorax Deflection			
Max	Time	Min	Time
41.2	21.7	0.0	-8.4
Lower Thorax Deflection			
Max	Time	Min	Time
36.0	23.0	-0.2	53.6



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.9	16.3	-6.9	42.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.8	15.0	-4.6	45.1



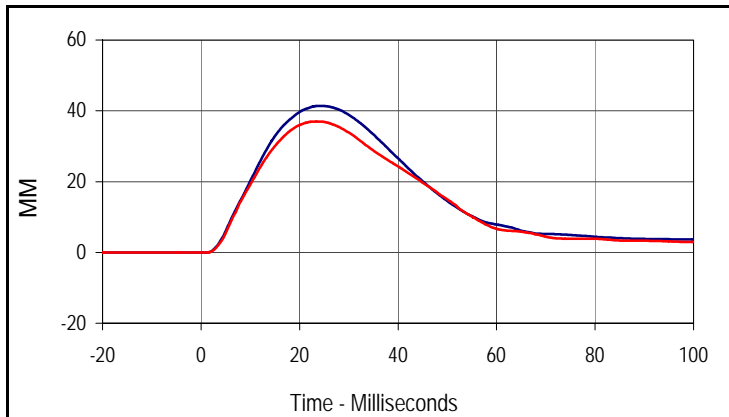
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.9	18.7	-0.2	97.5

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 307

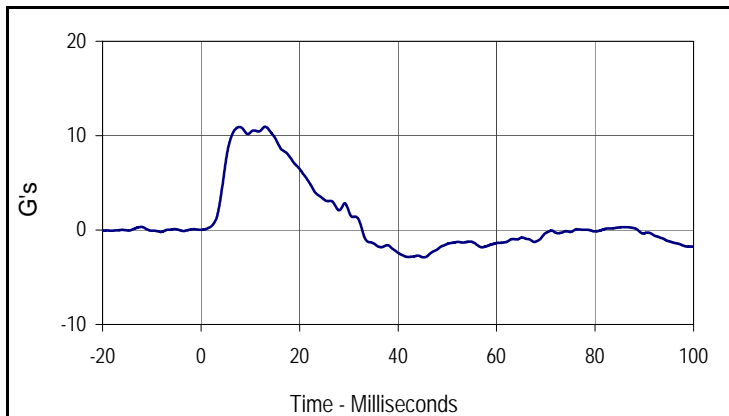
Test Date: 6/18/12
 Test I.D.: 307ABD039



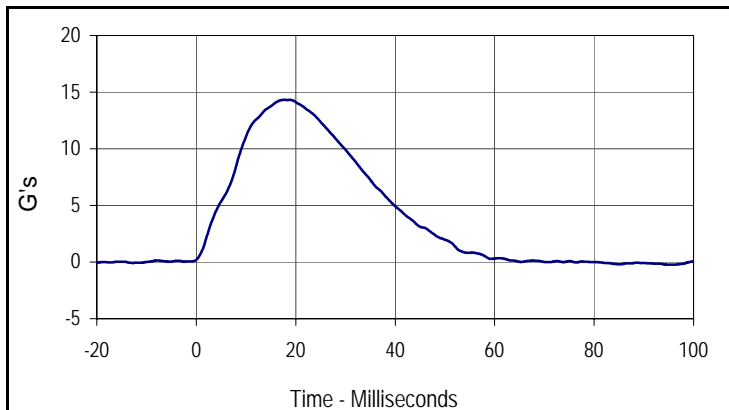
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	330	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	41.4	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	37.0	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.9	Pass
Peak Impactor Acceleration	G's	12 to 16	14.3	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
41.4	24.5	0.0	-20.0
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.0	23.4	0.0	-0.2



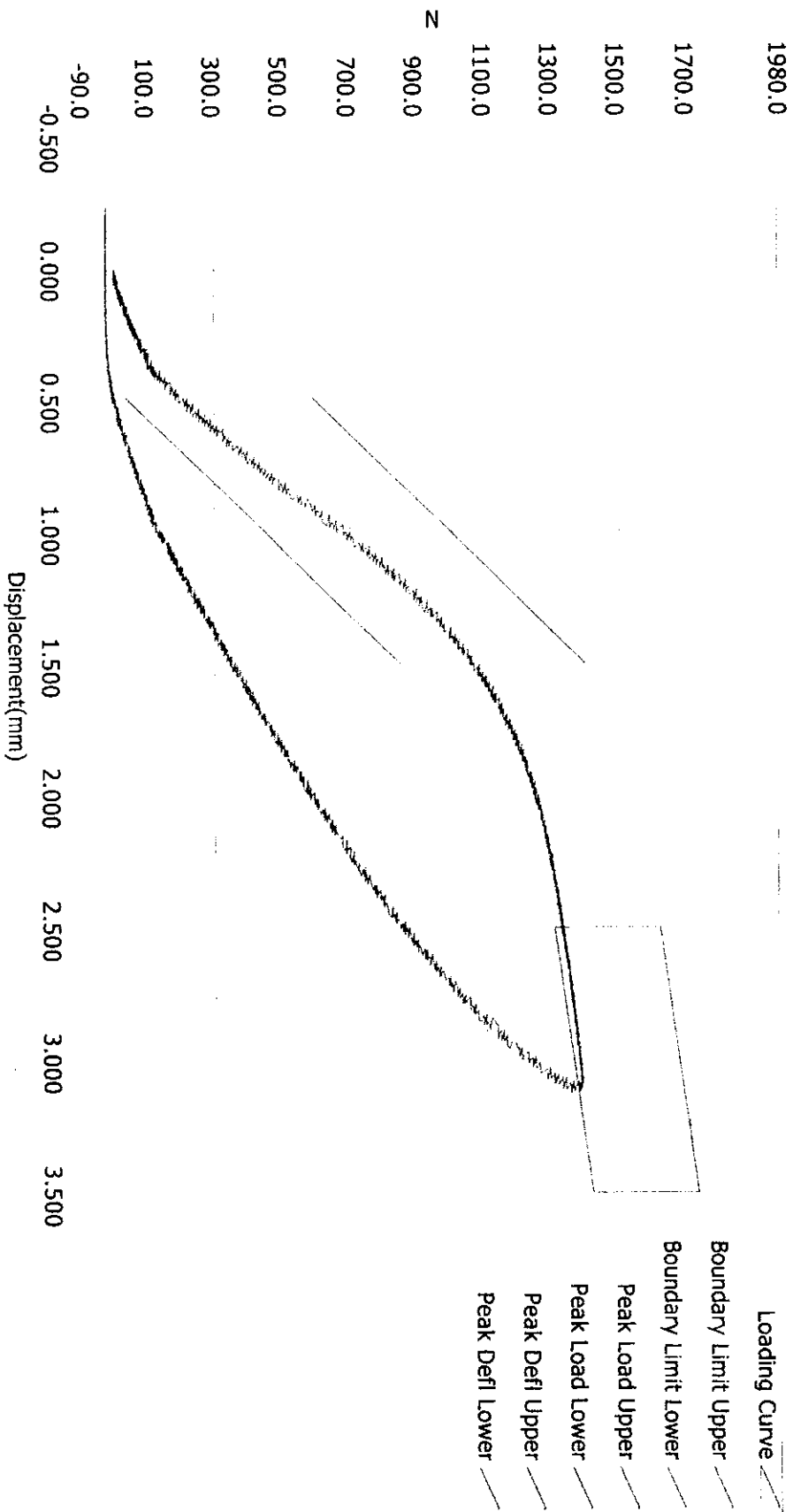
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.9	13.0	-2.9	45.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.3	17.7	-0.2	96.1

MD0202 PRE TEST

Resultant Data - SIDIIS Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
N/A	SIDIIS		

Current Date : 10/4/2011

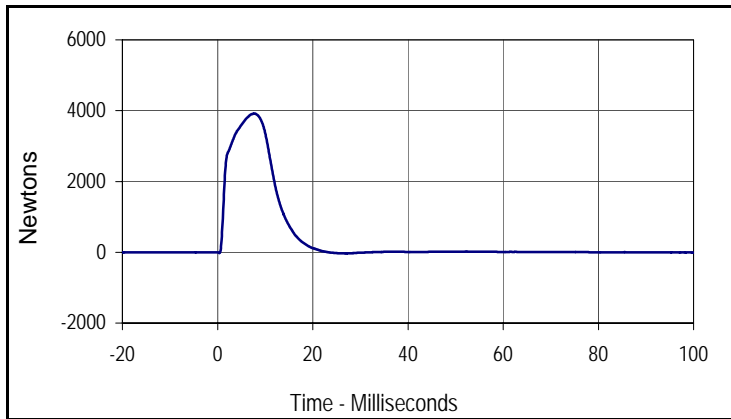
Current Time : 18:12:33

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 307

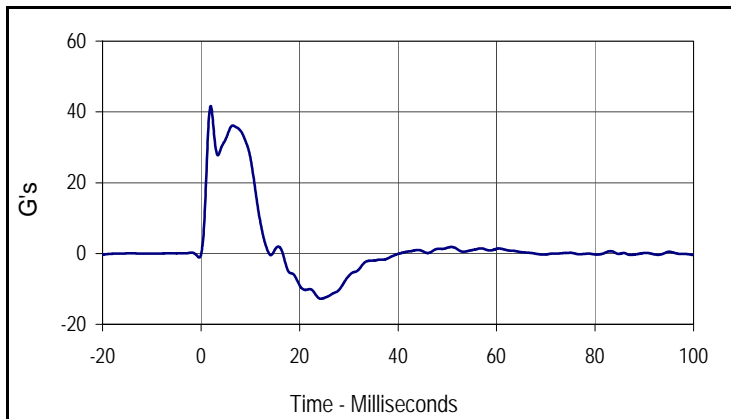
Test Date: 6/18/12
 Test I.D.: 307ACET039



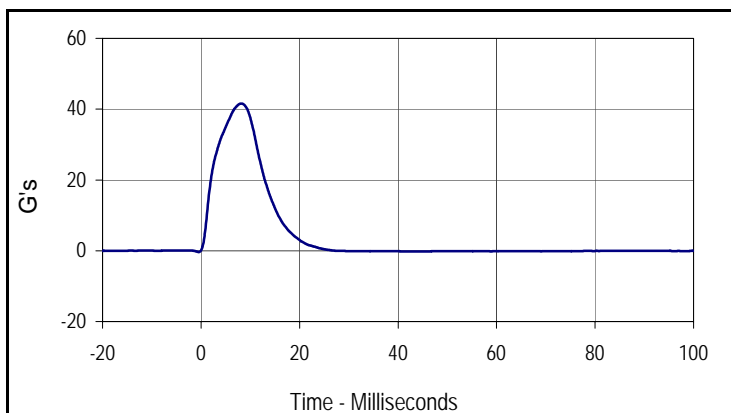
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	355	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.6	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3917.1	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	36.2	Pass
Peak Impactor Acceleration	G's	38 to 47	41.6	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3917.1	7.7	-34.5	27.0



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
41.6	2.0	-12.8	24.3



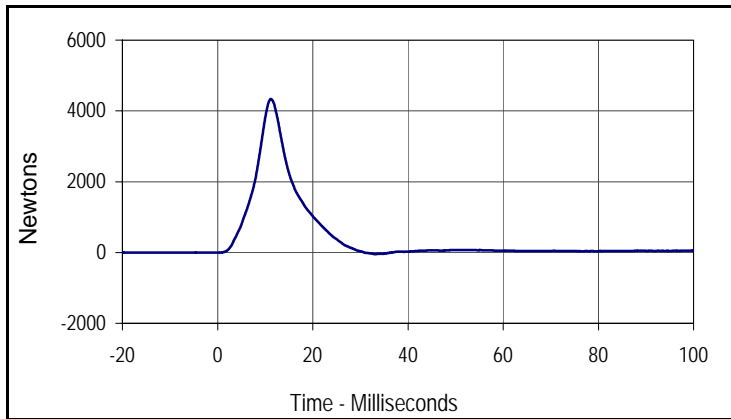
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
41.6	8.2	-0.4	-0.5

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 307

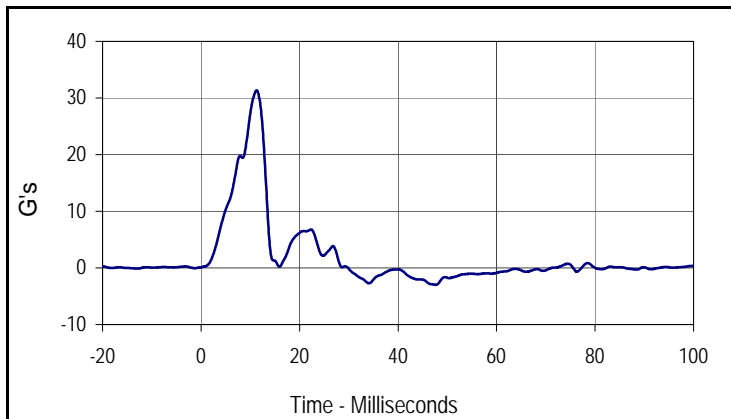
Test Date: 6/18/12
 Test I.D.: 307PL039



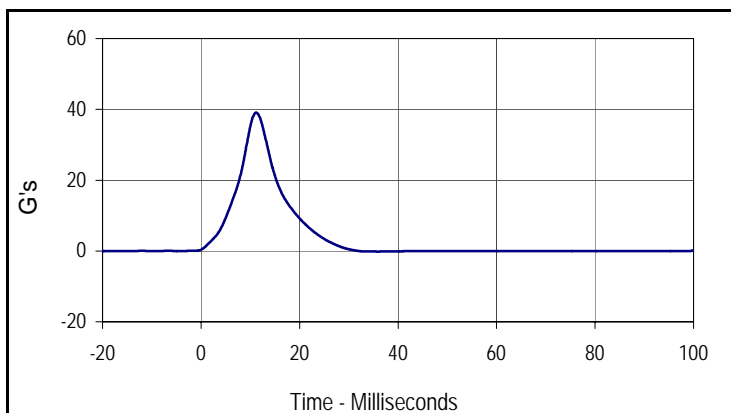
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	395	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.4	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4333.6	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.3	Pass
Peak Impactor Acceleration	G's	36 to 45	39.1	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4333.6	11.2	-48.6	33.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.3	11.3	-3.0	47.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.1	11.2	-0.2	35.9

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

Test Program: SID IIs External Measurements

Test Date: 7/19/12

ATD Serial No.: 307

Test I.D.: N/A



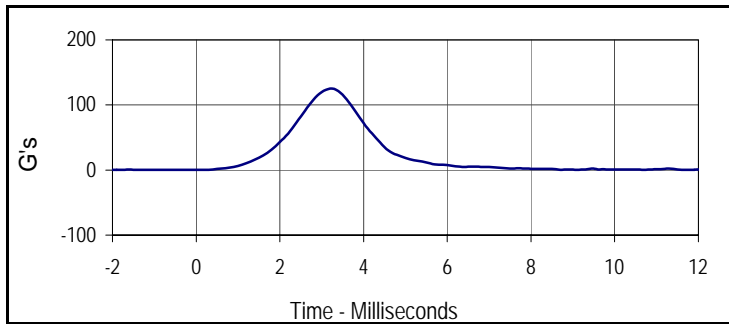
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
A Sitting Height	mm	772 - 788	780	Pass
B Shoulder Pivot Height	mm	437 - 453	444	Pass
C H-Point Height	mm	79 - 89	83	Pass
D H-Point from Seatback	mm	141 - 151	145	Pass
E Shoulder Pivot from Backline	mm	97 - 107	102	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	43	Pass
I Head Depth	mm	178 - 188	183	Pass
J Head Circumference	mm	541 - 551	546	Pass
K Buttock to Knee Length	mm	514 - 540	527	Pass
L Popliteal Height	mm	343 - 369	350	Pass
M Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N Buttock Popliteal Length	mm	416 - 442	430	Pass
O Chest Depth w/o Jacket	mm	195 - 211	204	Pass
P Foot Length	mm	216 - 232	221	Pass
Q Hip Breadth with Pelvic Plug	mm	313 - 323	318	Pass
R Arm Length	mm	249 - 259	252	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	89	Pass
Y Chest Circumference with Jacket	mm	851 - 881	873	Pass
Z Waist Circumference	mm	760 - 791	775	Pass
Overall Test Results				Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 307

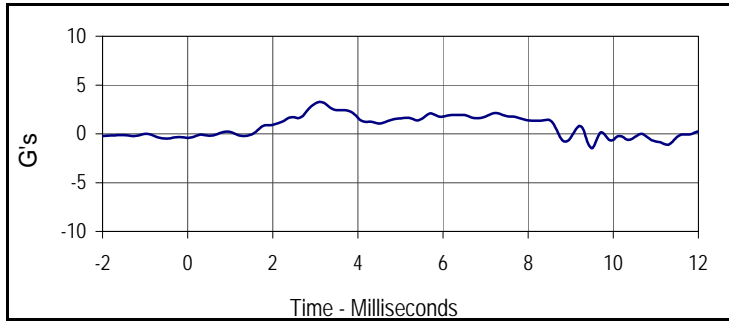
Test Date: 7/19/12
 Test I.D.: 307HD040



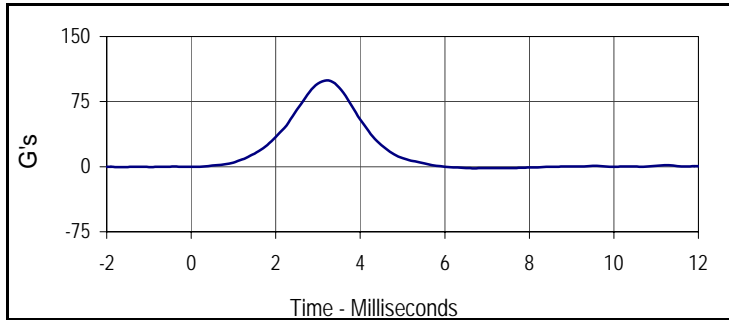
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	250	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.5	Pass
Peak Head Resultant Acceleration	G's	115 to 137	125.1	Pass
Peak Head X Acceleration	G's	<15	3.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.6	Pass
Overall Test Results				Pass



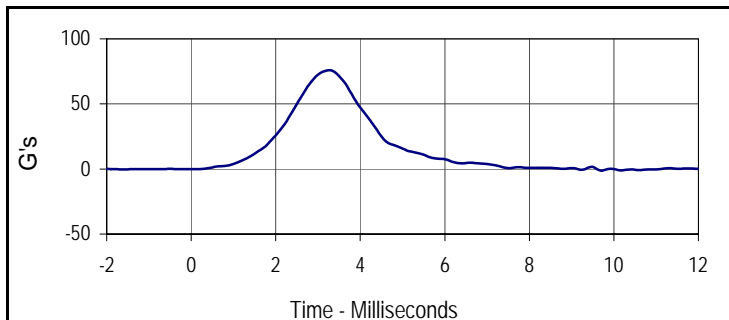
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.1	3.2	0.2	0.3



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.3	3.1	-0.5	-0.5



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
99.5	3.2	-1.8	6.7



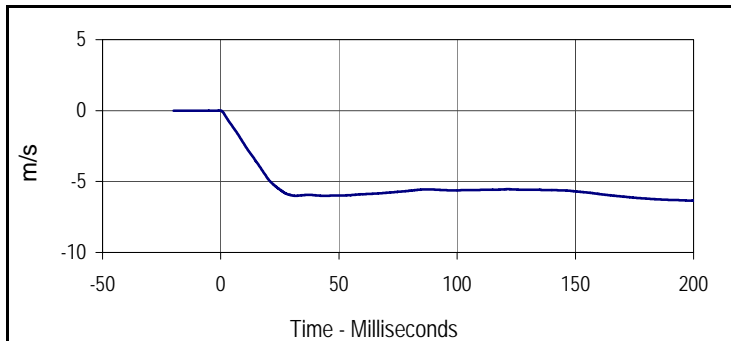
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
75.8	3.3	-1.2	9.7

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 307

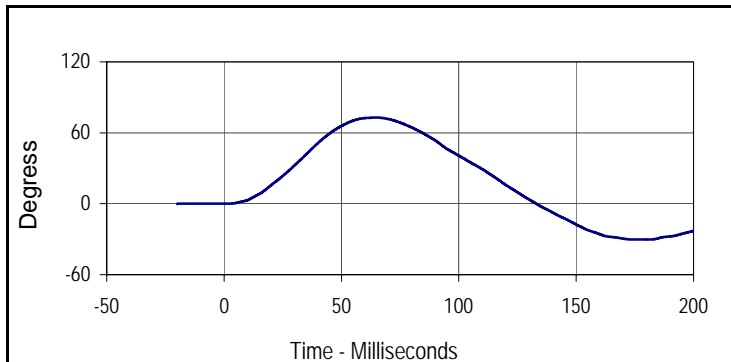
Test Date: 7/19/12
 Test I.D.: 307NB040



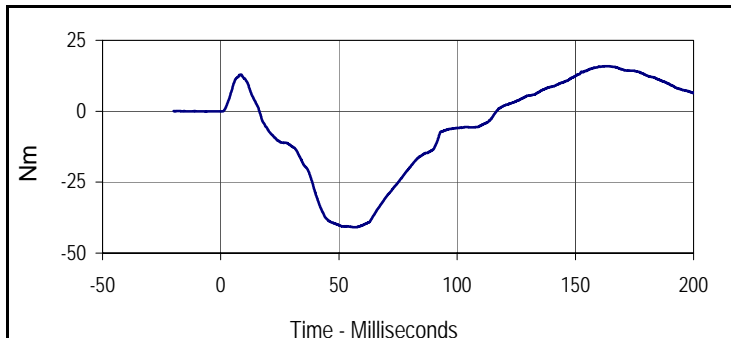
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	285	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass	
	Min		20.7	Pass	
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass	
	Min		29.0	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	29.4	Pass	
Pendulum Velocity	m/s	5.51 to 5.63	5.56	Pass	
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.39	Pass
	15 msec	m/s	-3.30 to -4.10	-3.59	Pass
	20 msec	m/s	-4.40 to -5.40	-4.81	Pass
	25 msec	m/s	-5.40 to -6.10	-5.57	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.01	Pass
D-Plane Rotation	Max	Degrees	71 to 81	72.9	Pass
	Time	msec	50 to 70	64.8	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-40.9	Pass	
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	116.7	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	-0.6	-6.3	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
72.9	64.8	-30.3	180.8



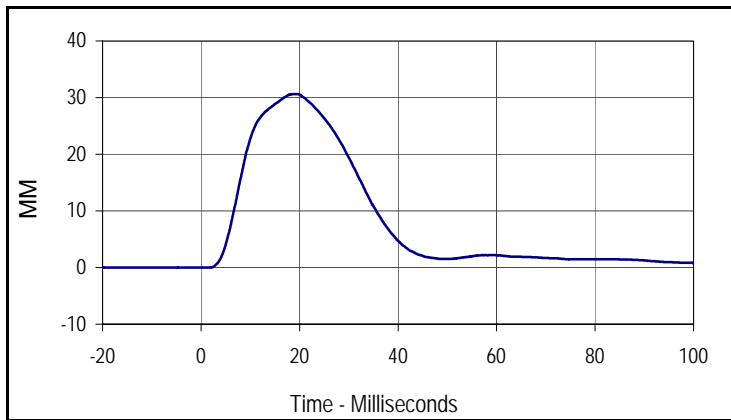
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.9	162.4	-40.9	56.8

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 307

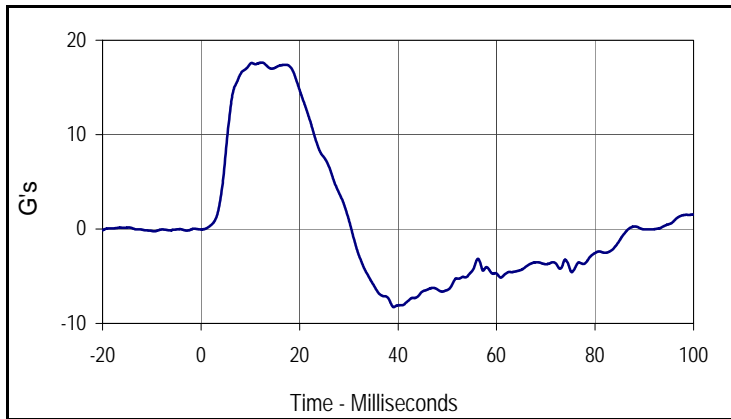
Test Date: 7/19/12
 Test I.D.: 307SH040



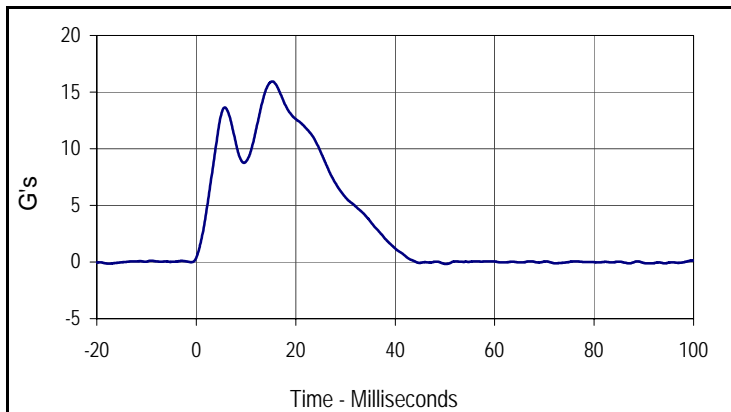
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	310	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.5	Pass
Impactor Velocity	m/s	4.20 to 4.40	4.25	Pass
Peak Shoulder Deflection	mm	28 to 37	30.6	Pass
Peak Lateral Spine Acceleration Y	G's	17 to 22	17.6	Pass
Peak Impactor Acceleration	G's	13 to 18	15.9	Pass
Overall Test Results				Pass



Curve Description			
Shoulder Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.6	19.0	0.0	-18.7



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
17.6	12.3	-8.3	39.1



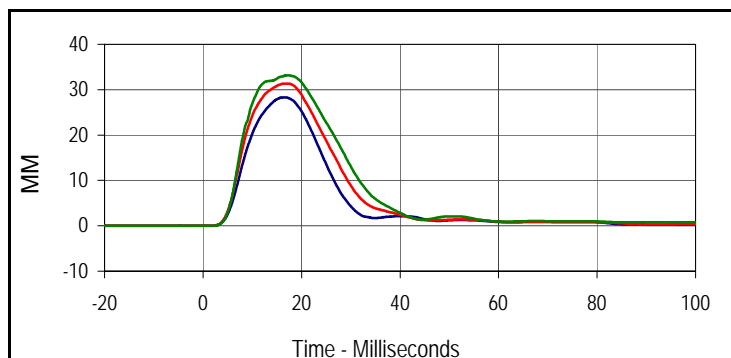
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.9	15.3	-0.2	50.2

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

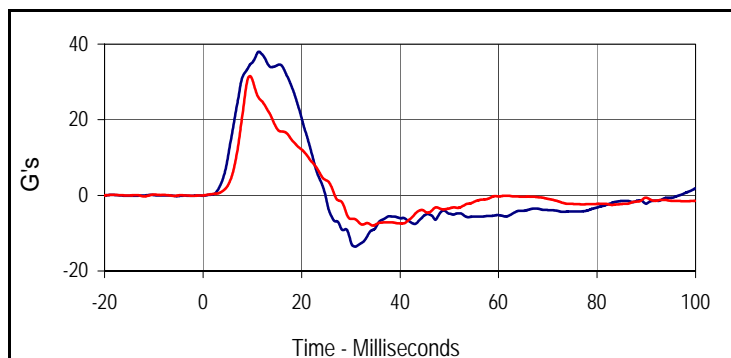
Test Date: 7/19/12
 Test I.D.: 307TWA040



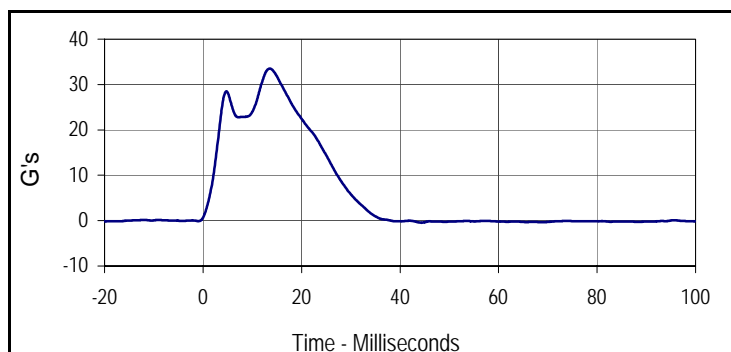
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	330	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.0	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.2	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	36.1	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	28.3	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.4	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	33.2	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	38.0	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	31.6	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
28.3	16.4	0.0	-0.9
Middle Thorax Deflection			
Max	Time	Min	Time
31.4	17.0	0.0	0.4
Lower Thorax Deflection			
Max	Time	Min	Time
33.2	17.0	0.0	-19.7



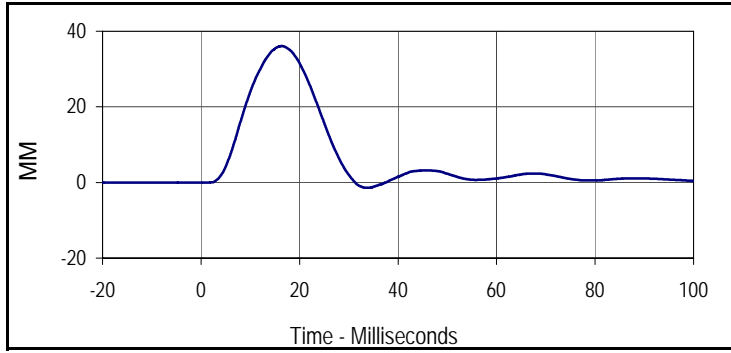
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
38.0	11.3	-13.6	30.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.6	9.5	-8.0	34.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.5	13.5	-0.4	44.3

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

Test Date: 7/19/12
 Test I.D.: 307TWA040



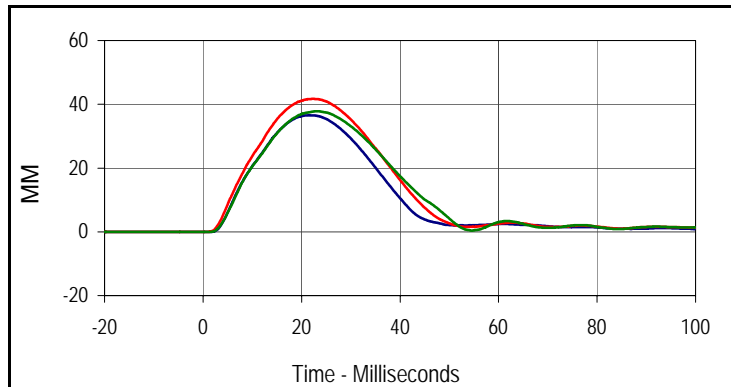
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.1	16.4	-1.4	34.0

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 307

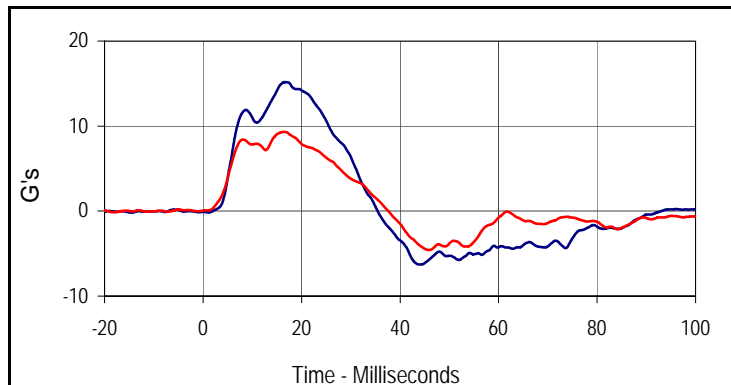
Test Date: 7/19/12
 Test I.D.: 307TWOA040



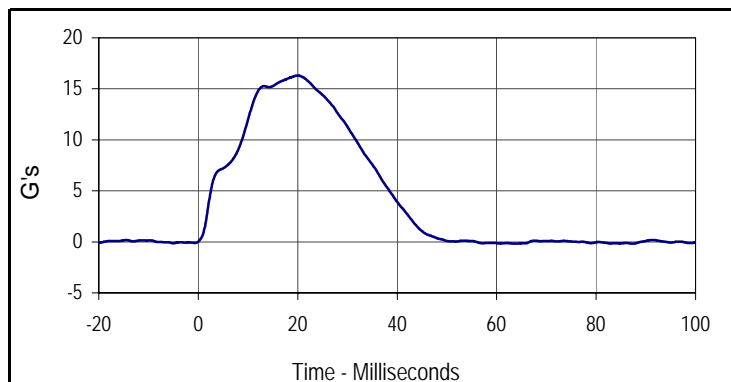
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	360	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	20.8	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.0	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	36.6	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	41.7	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	37.9	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.3	Pass
Peak Impactor Acceleration	G's	14 to 18	16.3	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
36.6	21.5	0.0	1.5
Middle Thorax Deflection			
Max	Time	Min	Time
41.7	22.4	0.0	-0.9
Lower Thorax Deflection			
Max	Time	Min	Time
37.9	23.1	0.0	-8.9



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	16.7	-6.3	44.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.3	16.5	-4.6	45.9



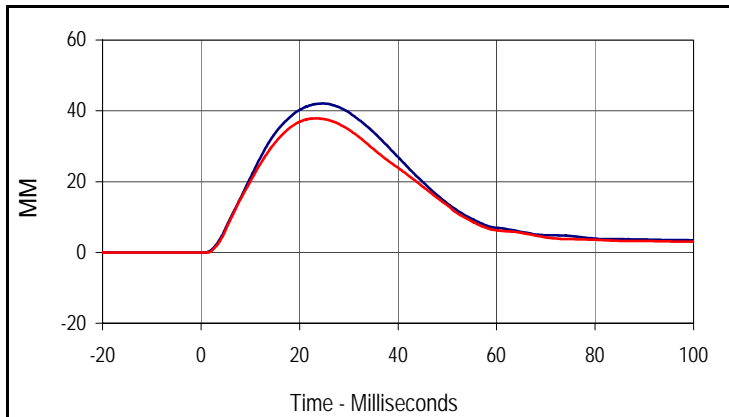
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.3	20.0	-0.2	87.4

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 307

Test Date: 7/19/12
 Test I.D.: 307ABD040

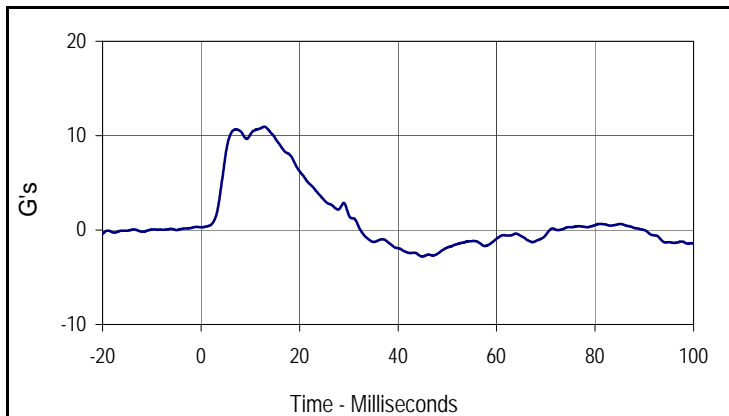


Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	380	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	42.1	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	37.9	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.9	Pass
Peak Impactor Acceleration	G's	12 to 16	14.3	Pass
Overall Test Results				Pass

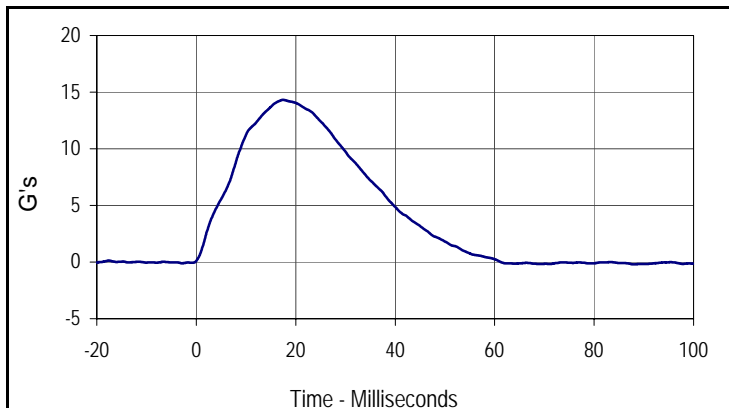


Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
42.1	24.7	0.0	0.8

Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.9	23.0	0.0	-1.7



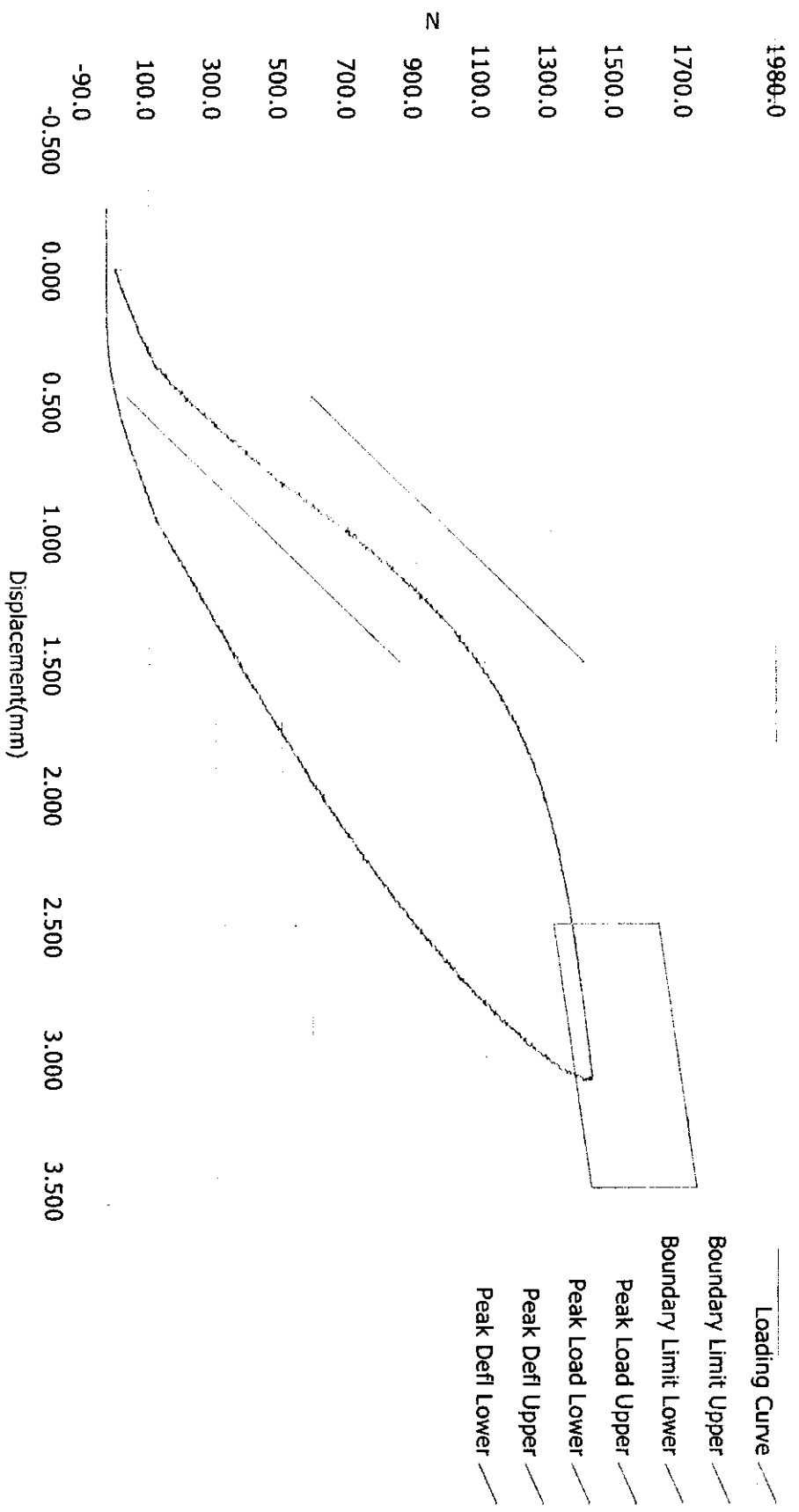
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.9	12.9	-2.8	44.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.3	17.5	-0.2	87.9

MD0202 POST TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	46905	10/6/2011	12:54 AM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 10/6/2011

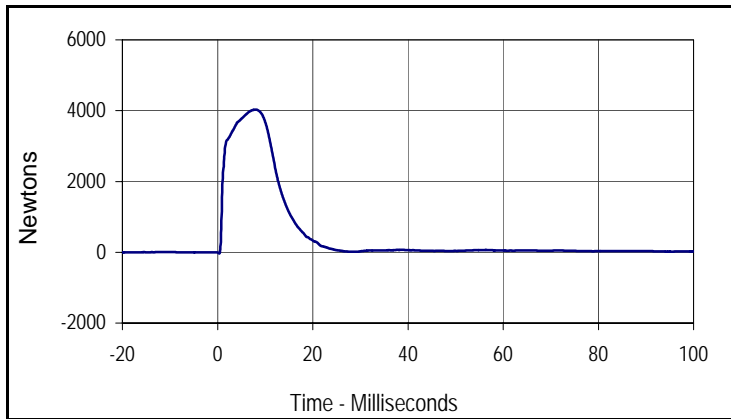
Current Time : 00:55:21

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 307

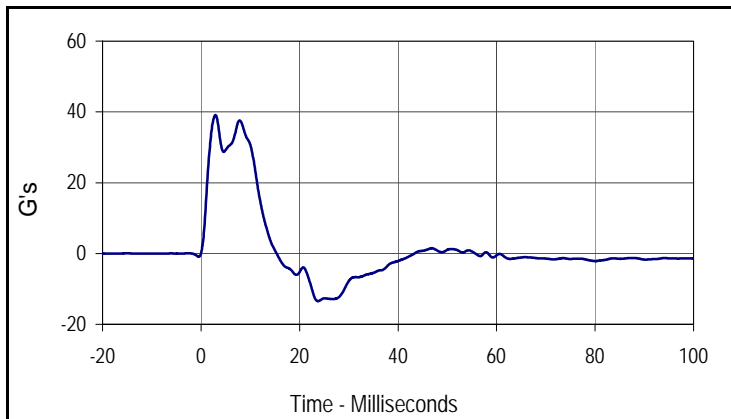
Test Date: 7/19/12
 Test I.D.: 307ACET040



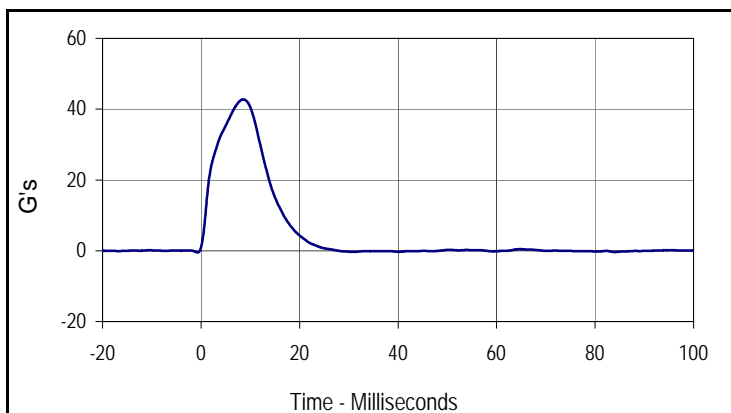
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	400	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.4	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	4032.7	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	37.6	Pass
Peak Impactor Acceleration	G's	38 to 47	42.7	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4032.7	8.0	-33.7	0.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.1	2.9	-13.5	23.7



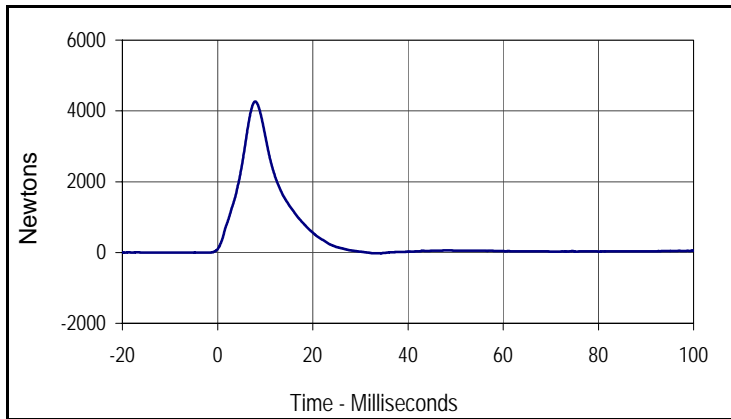
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.7	8.6	-0.5	-0.7

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 307

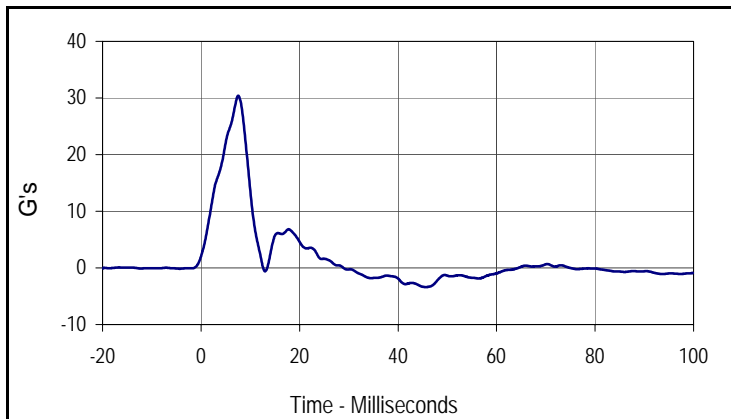
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 Test I.D.: 307PL040



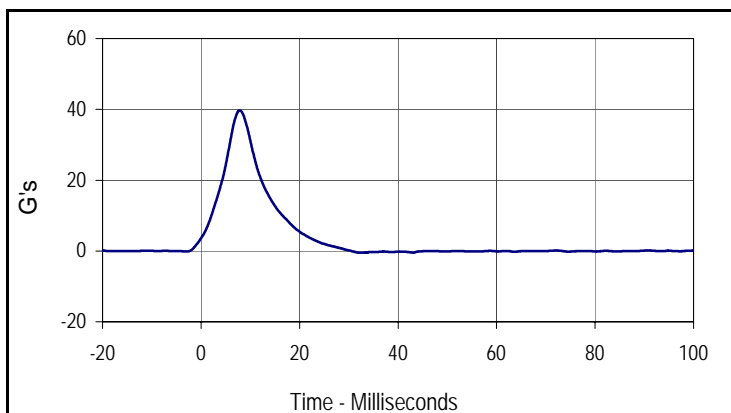
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	415	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.5	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4266.8	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	30.4	Pass
Peak Impactor Acceleration	G's	36 to 45	39.7	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4266.8	7.9	-24.1	33.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.4	7.6	-3.4	45.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.7	7.9	-0.5	32.6

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 307			
			Serial Number	Manufacturer	Calibration	
Head Accelerometers			X	P58900	Endevco	7/9/12
			Y	P58902	Endevco	7/9/12
			Z	P58983	Endevco	7/9/12
Displacement Potentiometers	Shoulder		Y	1244	FTSS	7/10/12
	Thoracic Rib	Upper	Y	1249	FTSS	7/10/12
		Middle	Y	1265	FTSS	7/10/12
		Lower	Y	1277	FTSS	7/10/12
	Abdominal Rib	Upper	Y	1286	FTSS	7/10/12
		Lower	Y	1290	FTSS	7/10/12
Lower Spine Accelerometers (T12)			X	P59007	Endevco	7/9/12
			Y	P59015	Endevco	7/9/12
			Z	P59016	Endevco	7/9/12
Acetabulum Load Cell			Y	277	Denton	5/24/12
Iliac Wing Load Cell			Y	289	Denton	5/24/12
Pelvis Plug (Struck Side)				46806	FTSS	10/4/11
Pelvis Plug (Non-Struck Side)				46797	FTSS	10/4/11

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	12913	Endevco	2/29/12
Vehicle Center of Gravity	Y	12862	Endevco	1/11/12
Vehicle Center of Gravity	Z	12906	Endevco	1/11/12
Left Floor Sill	Y	13000	Endevco	12/17/11
A-Pillar Sill	Y	12911	Endevco	1/11/12
A-Pillar Low	Y	12865	Endevco	1/11/12
A-Pillar Mid	Y	12884	Endevco	1/11/12
B-Pillar Sill	Y	12876	Endevco	1/11/12
B-Pillar Low	Y	12887	Endevco	12/17/11
B-Pillar Mid	Y	12892	Endevco	1/11/12
Driver Seat	Y	J21730	Endevco	4/13/12
Engine Top	X	12886	Endevco	1/11/12
Engine Top	Y	12919	Endevco	12/17/11
Firewall	Y	12872	Endevco	1/11/12
Right Roof	Y	13001	Endevco	1/11/12
Right Floor Sill	Y	12885	Endevco	1/11/12
Rear Floorpan	X	BJ15H	Endevco	4/18/12
Rear Floorpan	Y	12997	Endevco	12/17/11

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