REPORT NUMBER: SNCAPP-TRC-2009-001

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT TEST

FORD MOTOR COMPANY
2010 FORD MUSTANG 2-DOOR CONVERTIBLE
NHTSA NUMBER: MA0208

PREPARED BY:
TRANSPORTATION RESEARCH CENTER INC.
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EAST LIBERTY, OH 43319

Test Date: May 19, 2009

Report Date: July 23, 2009

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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Test Performed By: John Shultz, Supervisor

Report Approved By: Mike Tonneman

Mike Tonneman, Project Manager

Transportation Research Center Inc.

Approval Date: 7/23/09

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

FINAL REPORT ACCEPTANCE BY OCWS:

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

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15. Supplemental Notes

16. Abstract

This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject vehicle, a 2010 Ford Mustang 2-door Convertible in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on May 19, 2009.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck (Driver's) side of the target vehicle at the time of impact was 21°. The target vehicle's post-test maximum crush was 89 mm at Level 3.

The test or target vehicle's performance is given below (with FIR filter):

	Front SID HIII		Rear SID HIII	
Left Upper Rib Acceleration:	42.2	g's	55.7	g's
Left Lower Rib Acceleration:	36.8	g's	48.4	g's
Lower Spine Acceleration:	43.2	g's	63.5	g's
Thoracic Trauma Index, (TTI):	42.7	g's	59.5	g's
Pelvis Acceleration (PEV):	40.1	g's	48.0	g's

The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Side Impact Hybrid III Dummy (SID HIII) Occupant Side Impact Protection	Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave, SE Washington, DC 20590

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Unclassified	Unclassified	165	

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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY 2010 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-02005. The purpose of this test was to generate comparative side impact performance in a 2010 Ford Mustang 2-door Convertible. The side impact test was conducted in accordance with the Office Crashworthiness Standard's Laboratory Test Procedure dated January 2002.

TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated January 2002 and the corresponding Transportation Research Center Inc. (TRC Inc.) procedures. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

TRC Inc. does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2

SUMMARY OF TEST RESULTS

A 2010 Ford Mustang 2-door Convertible was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.0 km/h (38.5 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on May 19, 2009. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SID HIIIs) are included in Appendix A.

One (1) real-time motion picture camera and nine (9) high-speed digital motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre-test and post-test photographs of the vehicle and Side Impact Dummy (SID/HIII) can be found in Appendix A. Two 50th percentile adult male SID/HIIIs were placed in the driver and left rear passenger designated seating positions according to instructions specified in the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated January 2002. The SID/HIIIs were instrumented in the following locations:

- Left Upper Rib (LUR) uniaxial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uniaxial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uniaxial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uniaxial accelerometer (Y-axis)
- Head Center of Gravity (CG) triaxial accelerometers (X, Y and Z axes)
- Upper Neck (NEK) triaxial force and moment load cell (Fx, Fy, Fz, Mx, My, Mz)

The test vehicle was instrumented with twenty-one (21) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self-contained onboard Kayser Threde Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

The driver SID/HIII, Serial No. 001, and left rear passenger SID/HIII, Serial No. 002, were calibrated prior to this test.

Appendix A contains the still photograph prints. Appendix B contains the SID/HIII, vehicle, and MDB response data traces. Appendix C contains the SID/HIII configuration and performance verification data.

The occupant data is summarized below:

ATD position	HIC	T^1	T^2	TTI (G's)	Peak Pelvis (G's)
Driver	Lost Data*	43.3	66.9	42.7	40.1
Passenger	1,181.8	63.2	71.2	59.5	48.0

*Please refer to the succeeding test notes.

Supplemental Restraint Information

Restraint Type	Left Front (Driver)		Left Rear Passenger	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	N/A
Side Torso Airbag	Yes	Yes	No	N/A
Side Torso/Head Airbag	No	N/A	No	N/A
Side Head Curtain Airbag	No	N/A	No	N/A

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

TEST NOTES

The driver ATD Head CG X-axis acceleration data channel did not record valid data. This affected the velocity and HIC calculations.

The driver ATD lower spine (T12) Y-axis redundant data channel recorded no valid data.

The passenger ATD upper spine (T01) Y-axis acceleration data channel did not record valid data.

The left lower B-pillar post Y-axis acceleration data channel exceeded full scale of the instrument at 7.3 milliseconds and recorded no valid data thereafter.

The left mid B-pillar post Y-axis acceleration data channel recorded questionable data after 4.2 milliseconds.

The left lower A-pillar post Y-axis acceleration data channel recorded questionable data after approximately 9 milliseconds.

The left mid A-pillar post Y-axis acceleration data channel recorded questionable data after approximately 15.5 milliseconds.

The left rear outboard seat track data channel recorded questionable data after approximately 18 milliseconds.

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

TEST VEHICLE INFORMATION AND OPTIONS

Make	Ford	Driver Front Airbag	Yes
Model Year	2010	Driver Side Airbag	Yes
Model	Mustang	Driver Head Airbag	No
Body Style	2-door convertible	Driver Curtain Airbag	No
NHTSA No.	MA0208	Driver Knee Airbag	No
VIN	1ZVBP8EN3A5101297	Rear Pass. Front Airbag	No
Color	Red	Rear Pass. Side Airbag	No
Delivery Date	5/11/2009	Rear Pass. Head Airbag	No
Odometer Reading	17.6 miles	Rear Pass. Curtain Airbag	No
Dealer	Brondes Ford Inc.	Rear Pass. Knee Airbag	No
Transmission	Automatic	Load Limiters	No
Final Drive	Rear wheel drive	Anti-lock Brakes	Yes
Type /No. of Cylinders	V6	All-Wheel Drive	No
Engine Displacement	4.0L	Pretensioners	Yes
Engine Placement	Longitudinal	Air Conditioning	Yes
Roof Rack	No	Tilt Wheel	Yes
Sunroof / T-Top	No	Power Seats	Yes
Tinted Glass	Yes	Power Windows	Yes
Traction Control	No	Power Steering	Yes
Power Brakes	Yes	AM/FM CD	Yes
Front Disc	Yes	Automatic Door Locks	Yes
Rear Disc	Yes	Other – Leather Seats	Yes
Does owner's manual provide instructions to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	3/09

GVWR (kg)	2091
GAWR Front (kg)	1007
GAWR Rear (kg)	1089

TEST VEHICLE SEAT TYPE AND CAPACITY

Measured Parameter	Front	Mid	Rear	Total
Type of Seats	Bucket	N/A	Bench	
Designated Seating Capacity (DSC)	2	0	2	4
Type of Seat Back	Adjustable	N/A	Fixed	
(A) Capacity Wt. (VCW) (kg)				301
(B) DSC x 68.08 kg				272
(A-B) Cargo Wt. (RCLW) (kg)				29

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

TEST VEHICLE AXLE WEIGHTS

		As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
	Units	Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	433.0	393.4		478.0	461.0		489.4	481.8	
Right	kg	442.6	387.6		451.6	454.2		435.4	456.8	
Ratio	%	52.9	47.1		50.4	49.6		49.6	50.4	
Totals	kg	875.6	781.0	1656.6	929.6	915.2	1844.8	924.8	938.6	1863.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
(A) Total Delivered Weight (UVW)	kg	1656.6
(B) Weight of 2 P572M ATDs	kg	164.2
(C) Rated Cargo/Luggage Weight (RCLW)	kg	29.0
(A+B+C) Vehicle Target Weight (TVTW)	kg	1849.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	732	732	758	760	1282
As Tested	mm	713	719	731	735	1349
Fully Loaded	mm	719	733	725	738	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Length at Left Side	mm	4395
Total Vehicle Length at Centerline	mm	4760
Total Vehicle Length at Right Side	mm	4395
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	Not Recorded
Amount of Stoddard Solvent in Fuel Tank	liters	56.4

Vehicle parts removed to make Target Vehicle Test Weight: Tail lights, rear deck liner, rear spoiler, rear bumper fascia and trim, rear bumper foam

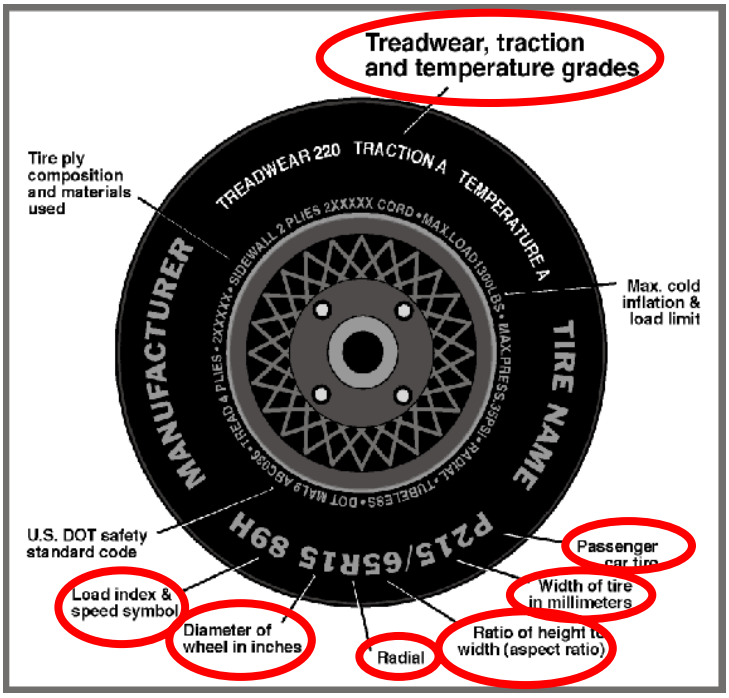
TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2720
Vertical Impact Reference Line Aft of Front Axle	mm	419.5
Actual Impact Point Aft of Front Axle	mm	412.5
Impact Point Difference	mm	7.0

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	220	220
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P235/50ZR18	P235/50ZR18
Tire Size on Vehicle	P235/50ZR18	P235/50ZR18
Tire Manufacturer	Pirelli	Pirelli
Tire Model	P Zero Nero	P Zero Nero
Load Index & Speed Symbol	97W	97W
Treadwear	400	400
Traction Grade	AA	AA
Temperature Grade	A	A
Tire Plies Sidewall	2 polyester	2 polyester
Tire Plies Tread	2 Polyester, 2 steel, 1 nylon	2 Polyester, 2 steel, 1 nylon
Tire Material	Steel, nylon, and polyester	Steel, nylon, and polyester
DOT Safety Code Right	N9 4W H367	N9 4W H367
DOT Safety Code Left	N9 4W H367	N9 4W H367

DATA SHEET NO. 2

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

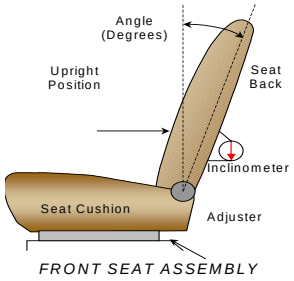
Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0208
Test Program:	NCAP Side Impact	Test Date:	05/19/09

SEAT BACK ANGLE POSITION

The seat back angle was measured relative to the rocker sill. The headrest was in the full up position and an inclinometer was placed on the outboard headrest post.

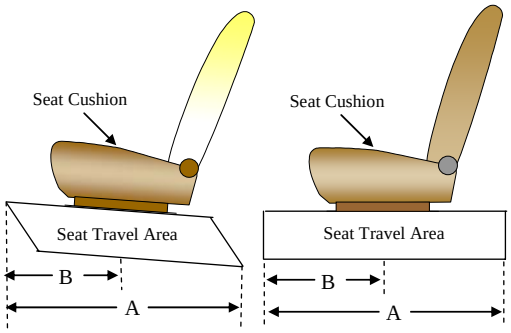
SEAT BACK ANGLE`

	Degrees	Detent
Driver Seat with Seated Dummy	13.1°	N/A
Front Passenger Seat	13.1°	N/A
Rear Seat – Struck Side	Fixed	N/A
Rear Seat – Non-Struck Side	Fixed	N/A



SEAT FORE/AFT POSITIONS

For all seats (driver & passenger, power & manual seat tracks): Position the seat in the mechanical mid-position. Reference points are to be scribed on the seat and the seat track. The total seat travel is measured and the seat is then positioned in place.



SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel (mm)	Placed in Detent # or Position (mm)
Driver Seat with Seated Dummy	238	119
Front Passenger Seat	N/A	N/A
Rear Seat – Struck Side	Fixed	N/A
Rear Seat – Non-Struck Side	Fixed	N/A

SEAT BELT UPPER ANCHORAGE

	Total No. of Positions	Placed in Position No.
Driver Seat	Fixed	N/A
Rear Seat	Fixed	N/A

Position number one is the uppermost adjustment position.

DATA SHEET NO. 2 (CONTINUED)

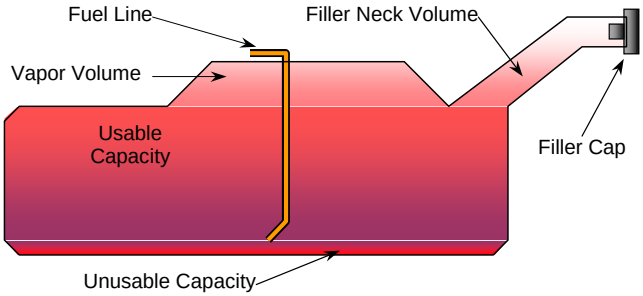
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	60.6
Usable Capacity of "Optional" Tank	N/A
92-94% of Usable Capacity	55.8 - 57.0
Actual Amount of Solvent used	56.4
1/3 of Usable Capacity	20.2

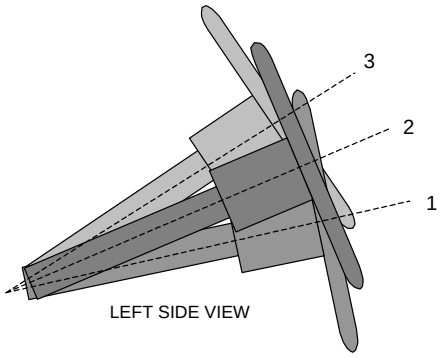
The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

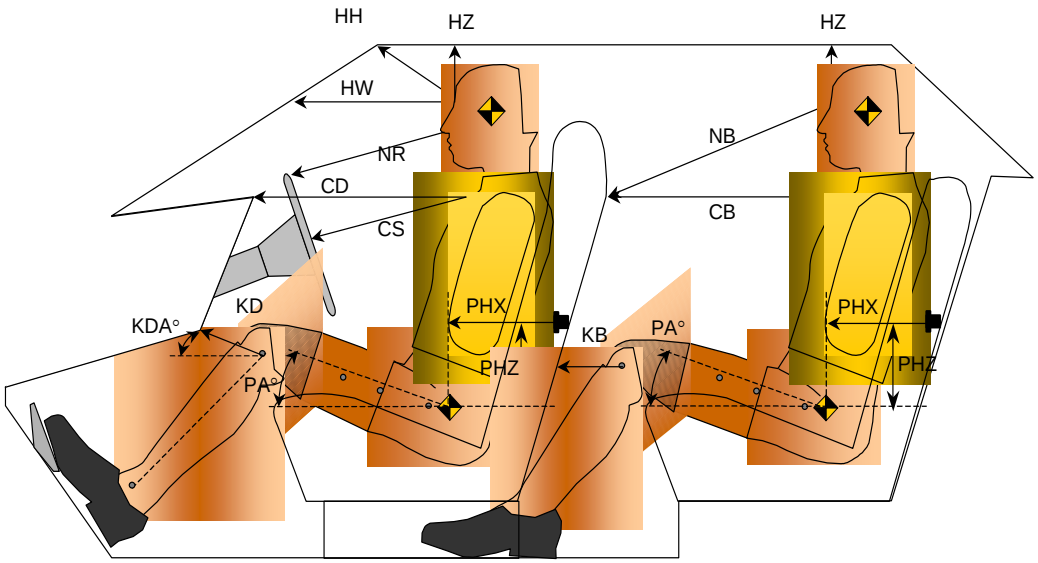
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	N/A	N/A
Geometric Center, Position No. 2	21.9°	N/A
Uppermost, Position No. 3	N/A	N/A
Telescoping Steering Wheel Travel	No Feature	N/A
Test Position	21.9°	N/A

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

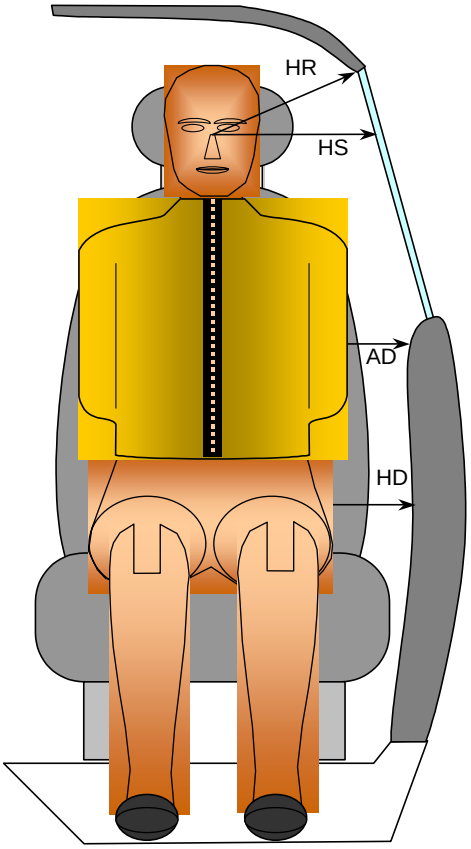


Code	Measurement Description	Driver S/N 001		Passenger S/N 002	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH	Head to Header	387			
HW	Head to Windshield	565			
HZ	Head to Roof	175		140	
NR/NB	Nose to Rim or Seatback	440		465	
CD/CB	Chest to Dash or Seatback	546		402	
CS	Chest to Steering Wheel	343			
KDL/KDAL KBL/KBAL	Left Knee to Dash or Seatback	53	26.3	30	0
KDR/KDAR KBR/KBAR	Right Knee to Dash or Seatback	57	22.5	15	0
PA	Pelvic Angle		23.7		29.6
PHX	H-Point to Striker (X-Axis)	487		331	
PHZ	H-Point to Striker (Z-Axis)	230		194	
SA	Seat Back Angle		13.1		16.6

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



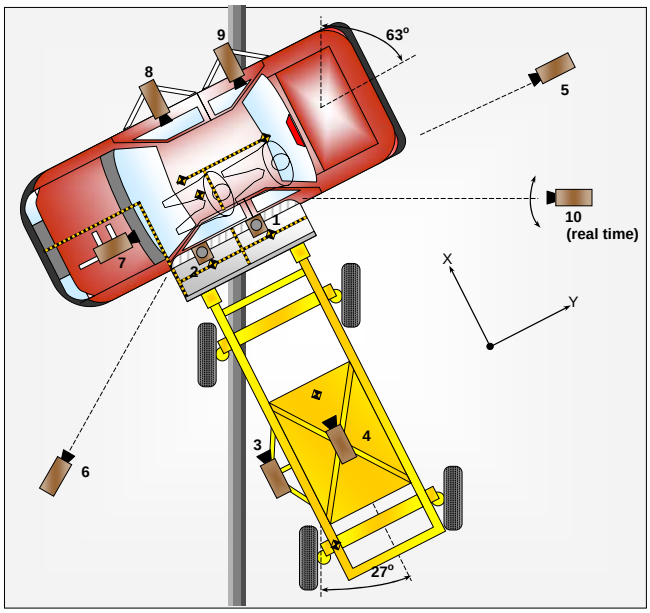
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 001	Passenger S/N 002
HR	Head to Side Header	mm	198	170
HS	Head to Side Window	mm	305	190
AD	Arm to Door (L: lower U: upper)	mm	L: 134 U: 124	L: 33 U: 45
HD	H-Point to Door	mm	145	110

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



REFERENCE: (from Point of Impact for X and Y; from Ground for Z):
+X= Forward of MDB, +Y= Rear of vehicle, +Z= Down

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Overhead Wide	250	2150	-5750	8.5	1000
2	Overhead Tight	370	1800	-5750	16	1000
3	Onboard Cart at MDB left edge	0	8300	-1100	12.5	1000
4	Onboard cart centerline at struck side	-2400	-4500	-1110	16	1000
5	Vehicle Rear at contact plane	0	10400	-980	12.5	1000
6	Left Side Oblique	2000	5500	-960	16	1000
7	Onboard vehicle hood at Driver Dummy	520	-380	-1200	12.5	1000
8	Onboard vehicle door at Driver Dummy	1740	1065	-1130	16	1000
9	Onboard vehicle door at Rear Passenger Dummy	1740	1050	-1130	16	1000
10	Panning/ Documentary				Zoom	30

*All measurements accurate to ± 6 mm

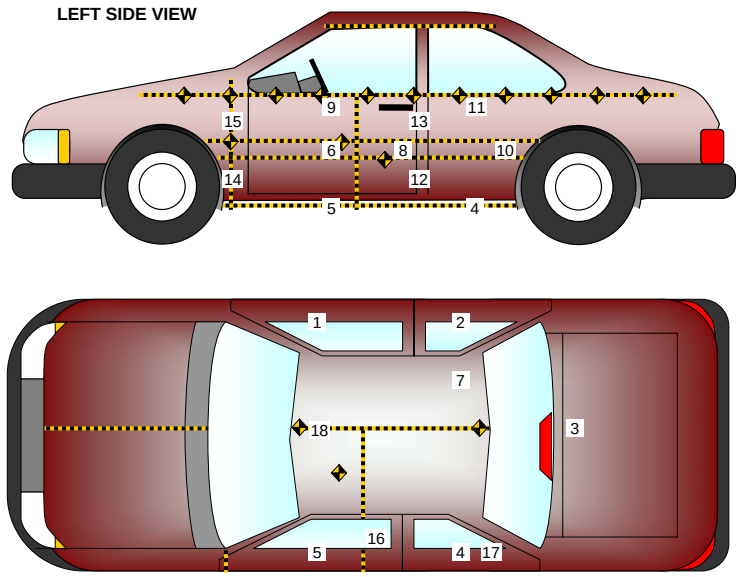
INSTRUMENTATION

	Number of Channels
Driver and Rear Pass. Dummies	35
Vehicle Structure	21
Moving Deformable Barrier	5
Contact Switches	2
Total No. of Data Channels	**63**

DATA SHEET NO. 6

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



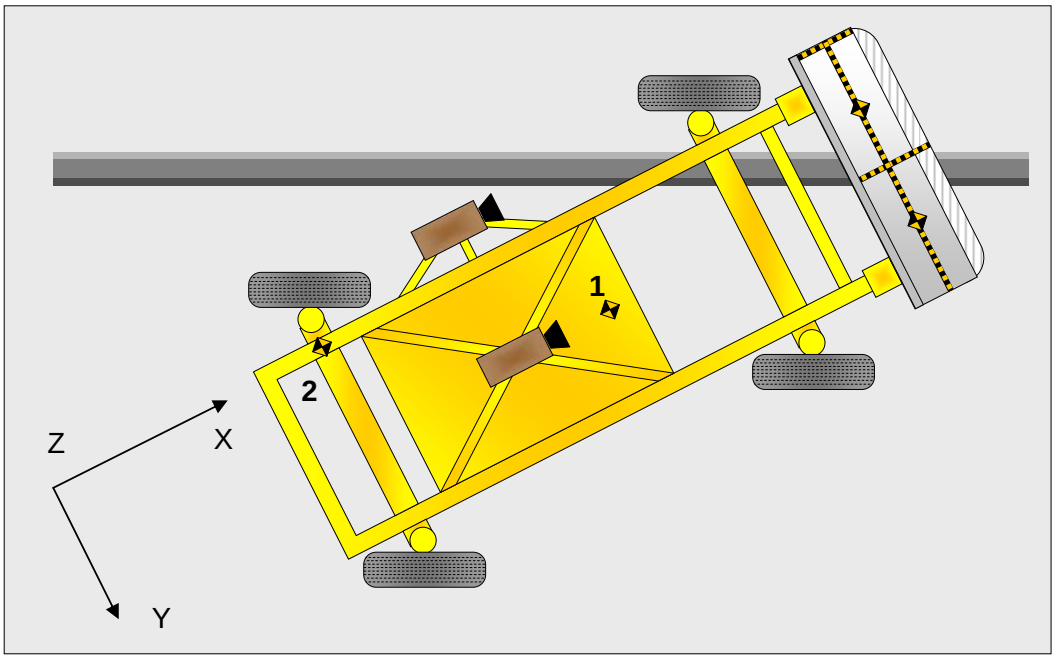
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2664	665	272
2	Right Sill at Rear Seat	1869	665	290
3	Rear Floorpan Above Axle	1000	6	280
4	Left Sill at Rear Seat	1944	665	260
5	Left Sill at Front Seat	2674	665	268
6	Left Front Door C/L[1]	N/A	----	----
7	Rear Occupant Compartment	1789	560	495
8	Left Front Door Mid-Rear[1]	N/A	----	----
9	Left Front Door Upper C/L[1]	N/A	----	----
10	Left Rear Door Mid-Rear[1]	N/A	----	----
11	Left Rear Door Upper C/L[1]	N/A	----	----
12	Left Lower B-Post	1864	750	572
13	Left Middle B-Post	1799	750	850
14	Left Lower A-Post	3037	790	448
15	Left Middle A-Post	3029	790	835
16	Front Seat Track	2214	500	295
17	Rear Seat Track or Structure	1644	570	260
18	Vehicle CG	Not Recorded	Not Recorded	Not Recorded

[1]Door Accelerometers were not required.

DATA SHEET NO. 7

MDB DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	1855	0	-520
2	MDB Rear	412	-677	-625

Reference Points: X - Test Vehicle Rear Bumper (+ forward)
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2591
C.G. Location aft of Front Axle	1104

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	342.8	328.2	
Right	kg	430.8	253.6	
Ratio	%	57.4	42.6	
Totals	kg	783.6	581.8	1365.4

DATA SHEET NO. 8

POST TEST OBSERVATIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID/HIII / 001	SID/HIII / 002
Head Contact	Head rest	Side header
Upper Torso Contact	Side seat airbag	Interior side panel
Lower Torso Contact	Side seat airbag	Interior side panel
Left Knee Contact	Door panel	Interior side panel
Right Knee Contact	None	None

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Left Front (Driver)	Left Rear Passenger
Locked/Unlocked Doors	Unlocked	Not Applicable
Left Side Door Opening	Jammed shut	Not Applicable
Right Side Door Opening	Remained closed and operational	Not Applicable
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Did not separate from vehicle
Sill Separation	Did not separate from vehicle
Windshield Damage	None
Window Damage	Left front and left rear shattered
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 01		Left Rear (Passenger) Occupant Location 04	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	No	No	N/A
Side Torso Airbag	Yes	Yes	No	N/A
Head Airbag	No	N/A	No	N/A
Head/Torso Side Airbag	No	N/A	No	N/A
Curtain Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Unknown	No	N/A
Seat Belt Load Limiter	No	N/A	No	N/A

DATA SHEET NO. 8 (Continued)

POST TEST OBSERVATIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.0
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.1
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0

IMPACT TARGET DATA

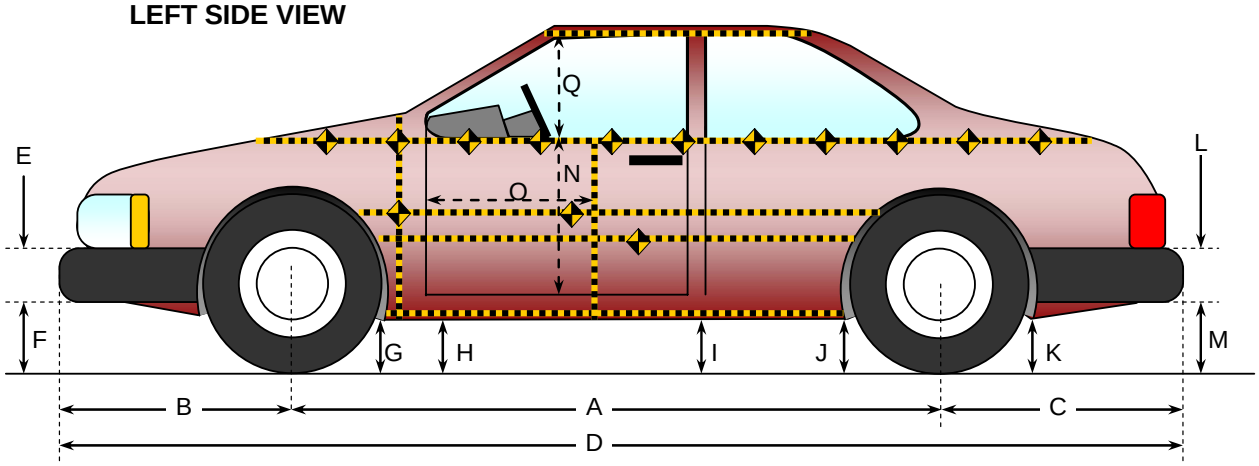
Measured Parameter	Units	Requirement	Primary Value	Redundant
Horizontal Offset	mm	+/- 50	7 mm left	14 mm left
Vertical Offset	mm	+/- 20	7 mm up	4 mm up

DATA SHEET NO. 9

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

LEFT SIDE VIEW



All Measurements in mm

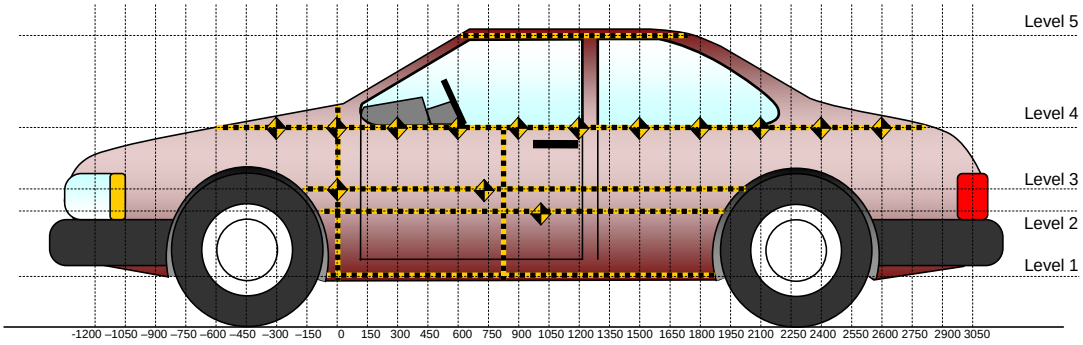
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2720	2710	10
B	Front Axle to Front Surface of Vehicle	945	945	0
C	Rear Axle to Rear Surface of Vehicle[1]	1095	--	--
D	Total Length at Centerline[1]	4760	--	--
E	Front Bumper Thickness	125	125	0
F	Front Bumper Bottom to Ground	390	405	-15
G	Sill Height at Front Wheel Well	340	340	0
H	Sill Height at Front Door Leading Edge	230	261	-31
I	Sill Height at "B" Pillar	260	305	-45
J1	Sill Height at Rear Wheel Well	153	193	-40
J2	Pinch Weld Height at Rear Wheel Well	235	291	-56
K	Sill Height Aft of Rear Wheel Well[1]	366	--	--
L	Rear Bumper Thickness[1]	180	--	--
M	Rear Bumper Bottom to Ground[1]	564	--	--
N	Sill Height to Window Bottom Sill	707	676	31
O	Front Door Leading Edge to Impact CL	527	527	0
P	Rear Door Trailing Edge to Impact CL[2]	--	--	--
Q	Front Window Opening	345	345	0
R	Right Side Length	4395	4395	0
S	Left Side Length	4395	4395	0
T	Vehicle Width at "B" Post	1485	1299	186

[1]Rear bumper was removed to achieve test weight.
[2]Test vehicle was a 2-door.

DATA SHEET NO. 10

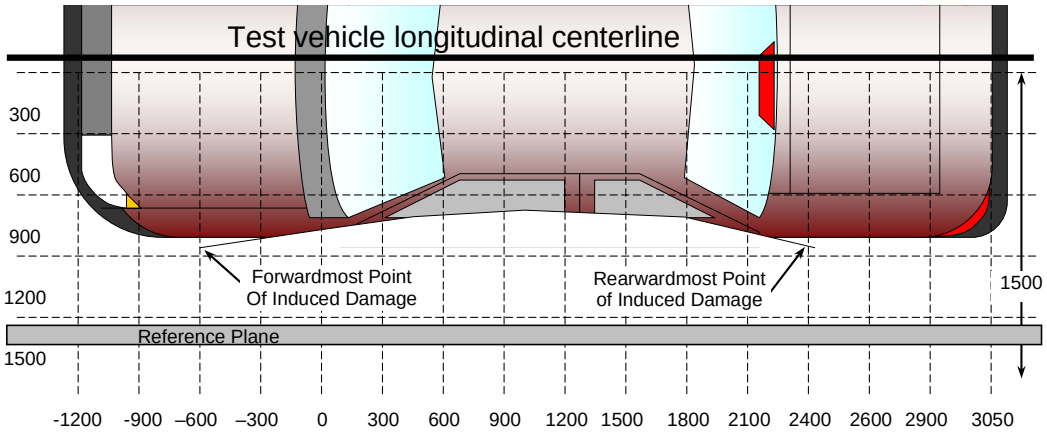
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



All Measurements Shown in mm

LEFT SIDE VIEW



All Dimensions Shown in millimeters

TOP VIEW

Measurements are taken with vehicle in the as tested condition.
All measurements below in mm.

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measurement Description	Maximum Exterior Static Crush	Distance From Impact	Height Above Ground
5	Window Top	71	300	1240
4	Window Sill	76	450	955
3	Mid Door	89	1650	680
2	Occupant H-Point	87	1650	508
1	Sill Top	59	450	270
	Maximum Penetration	89		

DATA SHEET NO. 10 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			-3565					-3499					66		
0	-3403	-3413	-3416	-3416		-3345	-3342	-3354	-3348		58	71	62	68	
150	-3253	-3261	-3266	-3266		-3194	-3218	-3206	-3202		59	43	60	64	
300	-3100	-3112	-3117	-3116	-3116	-3043	-3073	-3061	-3053	-3045	57	39	56	63	71
450	-2949	-2962	-2966	-2966	-2967	-2890	-2893	-2891	-2890	-2897	59	69	75	76	70
600	-2796	-2814	-2816	-2816	-2818	-2738	-2747	-2746	-2740	-2750	58	67	70	76	68
750	-2648	-2662	-2668	-2667	-2664	-2590	-2594	-2599	-2593	-2599	58	68	69	74	65
900	-2501	-2513	-2517	-2518	-2497	-2442	-2446	-2447	-2443	-2433	59	67	70	75	64
1050	-2349	-2365	-2365	-2367	-2345	-2292	-2297	-2296	-2292	-2288	57	68	69	75	57
1200	-2198	-2215	-2216	-2218	-2194	-2140	-2149	-2148	-2143	-2138	57	62	68	75	56
1350	-2053	-2064	-2065	-2068	-2045	-1996	-2002	-1998	-1993	-1991	57	62	67	73	54
1500	-1901	-1916	-1914	-1916	-1894	-1842	-1854	-1854	-1843	-1840	59	62	60	73	54
1650	-1747	-1763	-1764	-1766	-1746	-1690	-1676	-1675	-1720	-1694	57	87	89	46	52
1800	-1599	-1612	-1613	-1615	-1595	-1541	-1550	-1532	-1568	-1544	58	62	81	47	51
1950			-1464	-1467	-1447			-1423	-1423	-1398			41	44	49
2100				-1316	-1298				-1274	-1251				42	47
2250				-1166					-1124					42	
2400				-1016					-974					42	
2550				-866					-824					42	
2700				-716					-674					42	

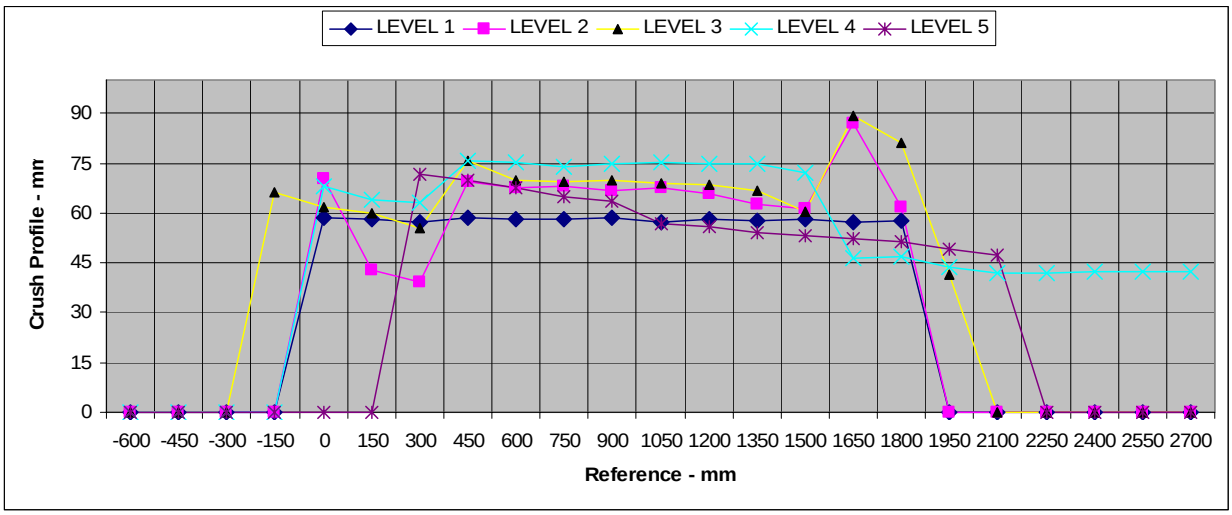
Reference plane is parallel to test vehicle longitudinal centerline.

Given measurements = Reference plane to car body

DATA SHEET NO. 10 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

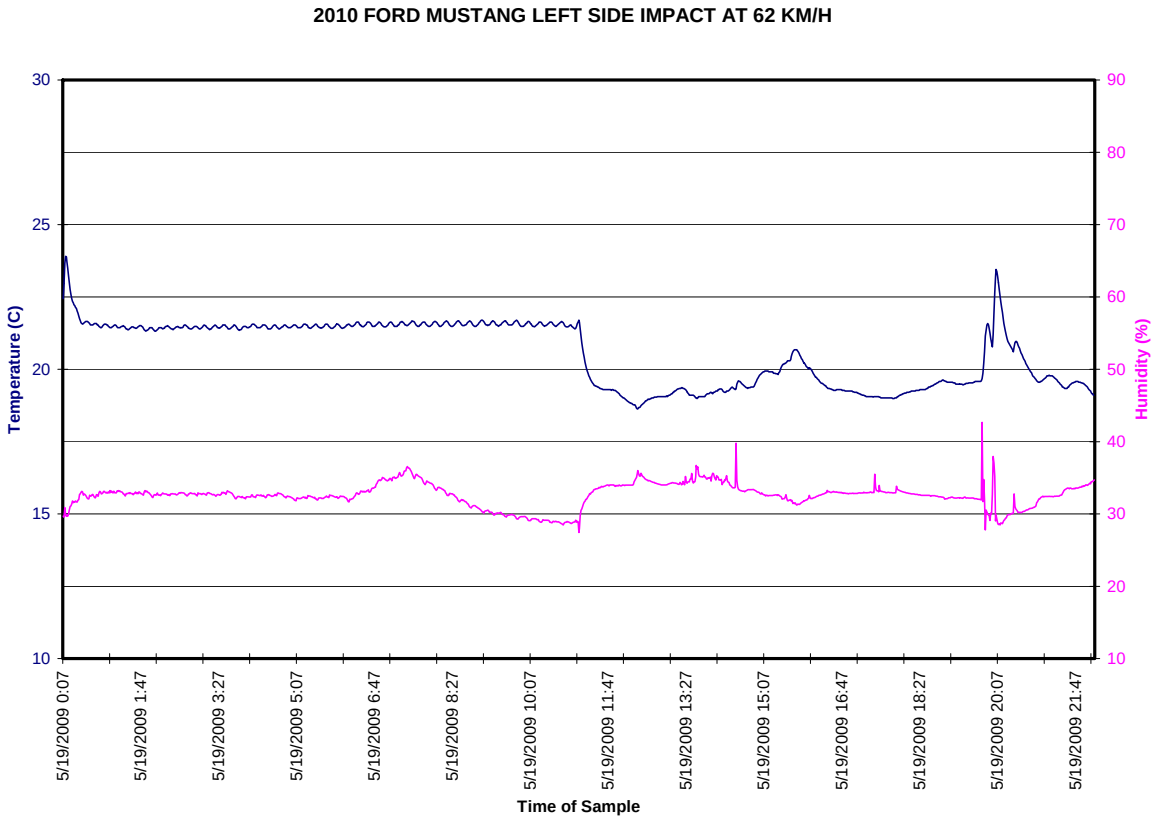
Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



DATA SHEET NO. 11

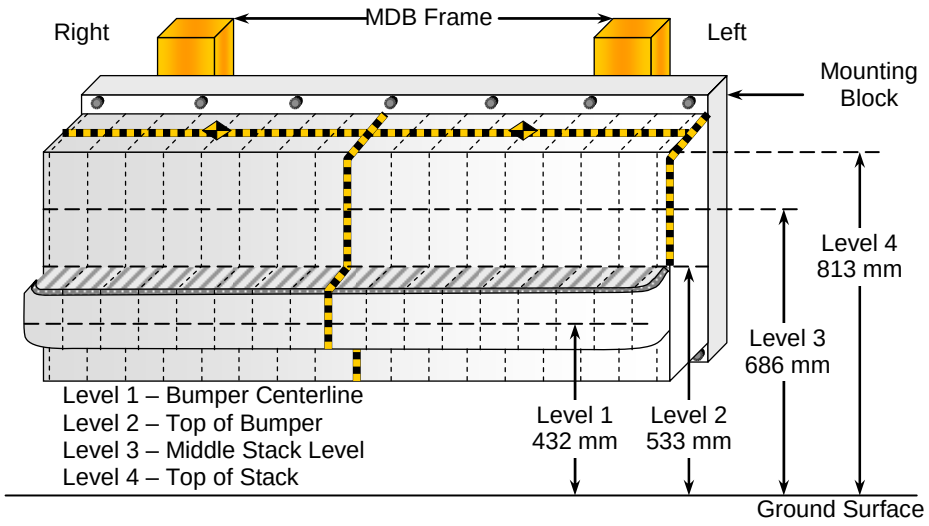
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	-273	-272	-270	-252	-233	-205	-181	-173	-169	-166	-162	-159	-163	-186	-180	-173	-167
2[1]	-206	-201	-191	-171	-152	-123	-110	-103	-100	-97	-93	-89	-91	-98	-113	-108	-109
3	-139	-144	-146	-94	-69	-52	-42	-39	-38	-38	-44	-55	-74	-112	-136	-132	-140
4	-149	-148	-119	-95	-66	-42	-39	-45	-56	-70	-80	-95	-111	-140	-165	-163	-177

All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of + 0.1 mm.

[1] Top Bumper measurements are collected at 560 mm to eliminate post-test measurement point obstruction by the bumper element.

SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0208
Test Program: NCAP Side Impact Test Date: 05/19/09

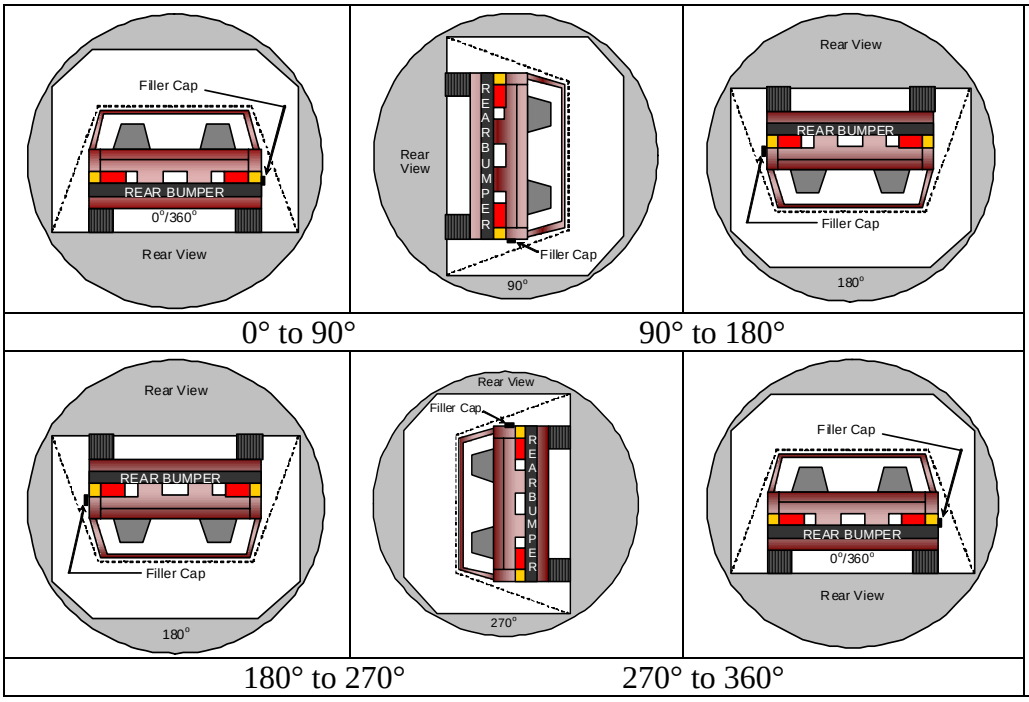
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 20.6 Test Time: 20:03

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 ounce)
B. For the 5 minute period after motion ceases: 0
(Maximum allowable = 5 ounces)
C. For the following 25 minutes: 0
(Maximum allowable = 1 oz./minute)
D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage locations: None

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage Collection Time (min)	Spillage (oz.)	Spillage Collection Time (min)	Spillage (oz.)	Spillage Collection Time (min)	Spillage (oz.)
0° to 90°	120	300	First 5	0	Sixth	0	Seventh	0
90° to 180°	120	300	First 5	0	Sixth	0	Seventh	0
180° to 270°	120	300	First 5	0	Sixth	0	Seventh	0
270° to 360°	120	300	First 5	0	Sixth	0	Seventh	0

APPENDIX A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS (CONTINUED)

LIST OF PHOTOGRAPHS (CONTINUED)

Figure A-1 Pre-Test Front View of Test Vehicle

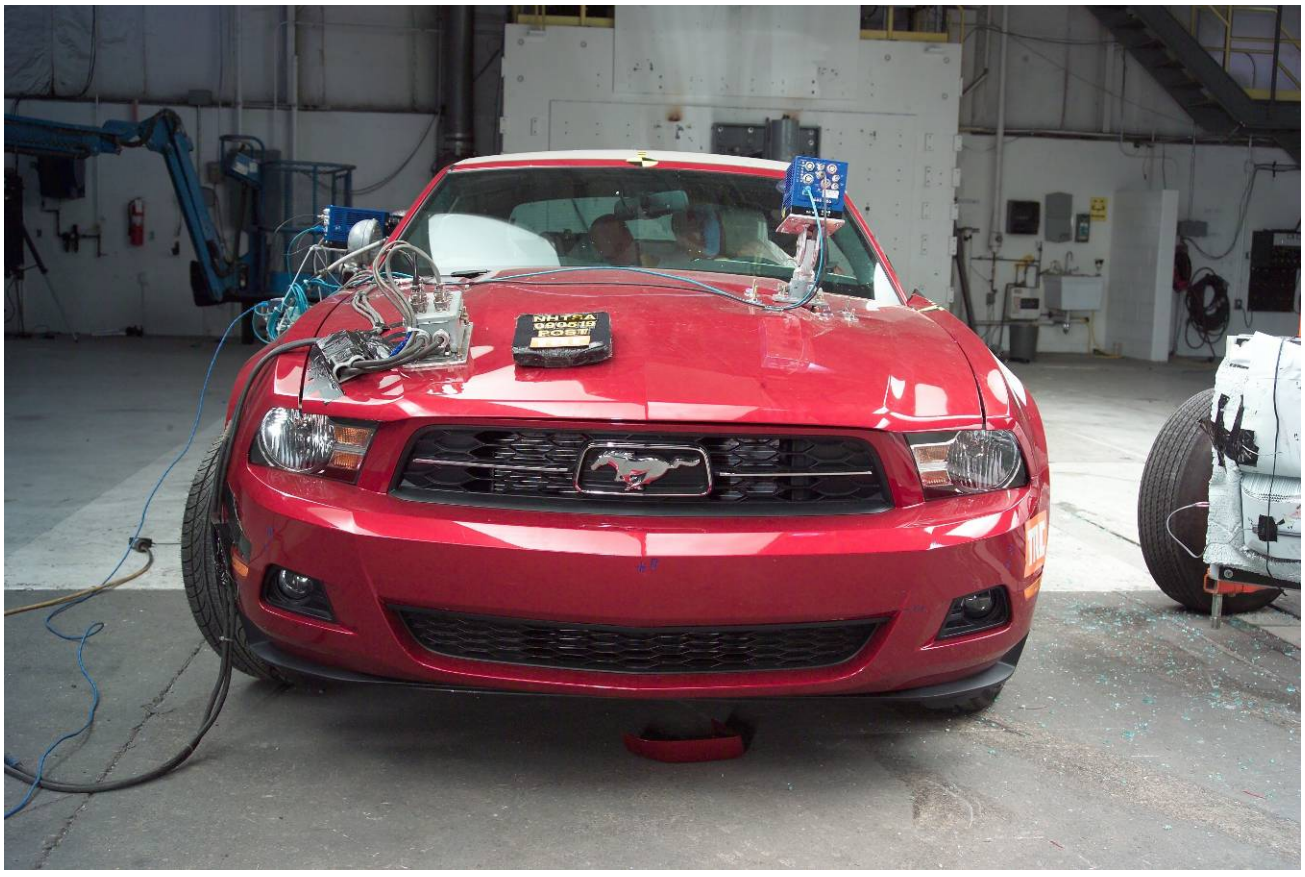


Figure A-2 Post-Test Front View of Test Vehicle

Figure A-3 Pre-Test Left Front View of Test Vehicle

Figure A-4 Post-Test Left Front View of Test Vehicle

Figure A-5 Pre-Test Impacted Side View of Test Vehicle

Figure A-6 Post-Test Impacted Side View of Test Vehicle

Figure A-7 Pre-Test Left Rear View of Test Vehicle

Figure A-8 Post-Test Left Rear View of Test Vehicle

Figure A-9 Pre-Test Rear View of Test Vehicle

Figure A-10 Post-Test Rear View of Test Vehicle

Figure A-11 Pre-Test Right Rear View of Test Vehicle

Figure A-12 Post-Test Right Rear View of Test Vehicle

Figure A-13 Pre-Test Right Side View of Test Vehicle

Figure A-14 Post-Test Right Side View of Test Vehicle

Figure A-15 Pre-Test Right Front View of Test Vehicle

Figure A-16 Post-Test Right Front View of Test Vehicle

Figure A-17 Pre-Test Frontal View of Impactor Face

Figure A-18 Post-Test Frontal View of Impactor Face

Figure A-19 Pre-Test Left Side View of Impactor Face

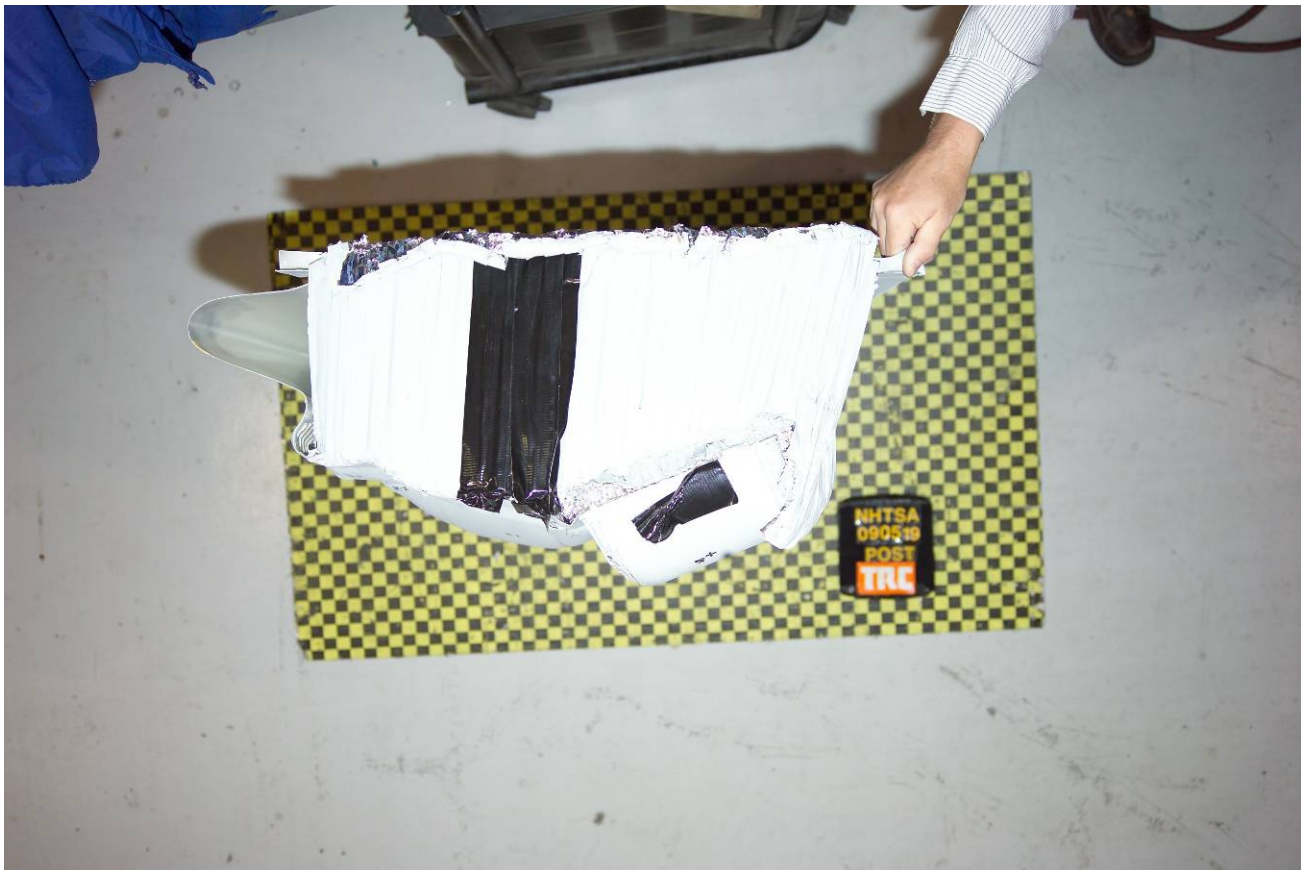


Figure A-20 Post-Test Left Side View of Impactor Face

Figure A-21 Pre-Test Right Side View of Impactor Face

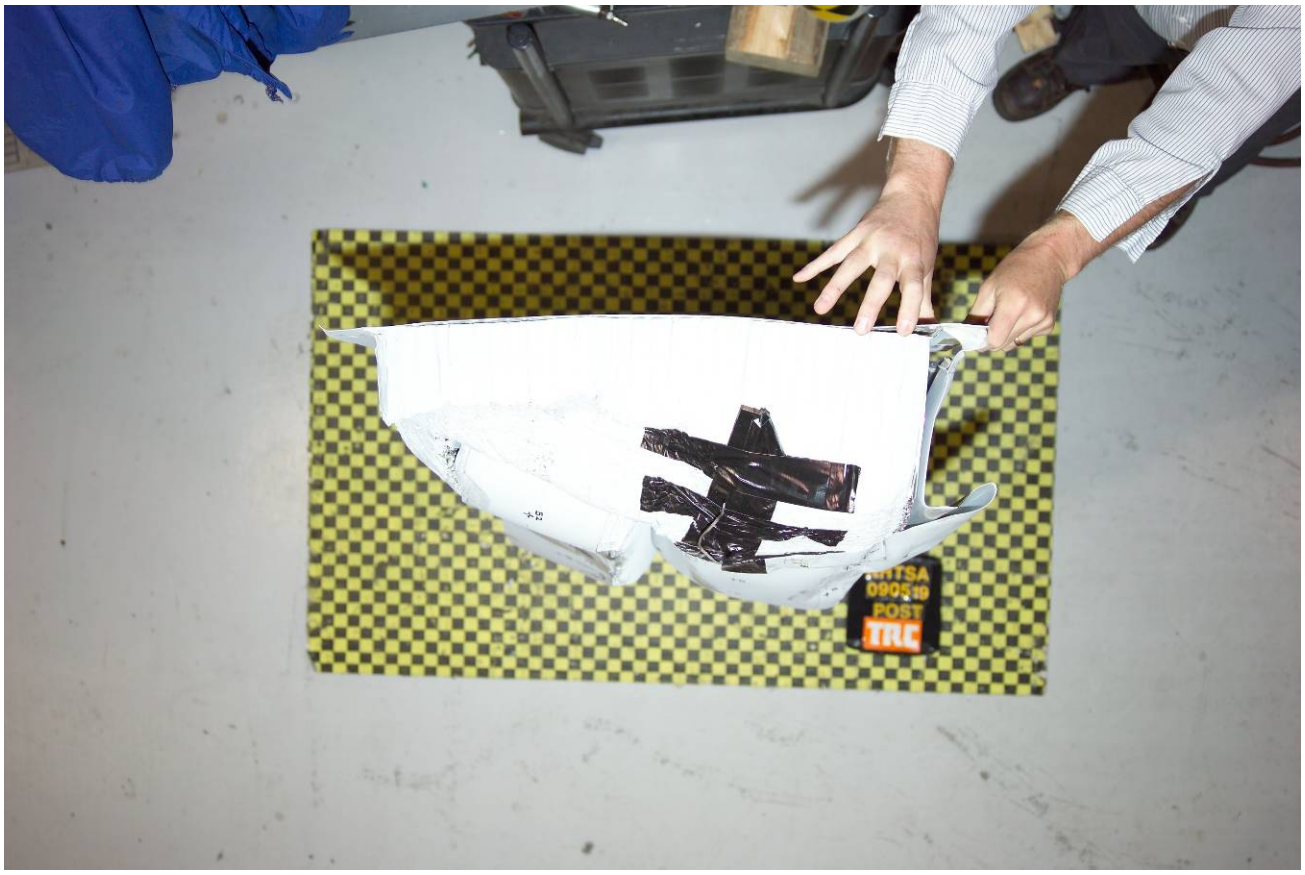


Figure A-22 Post-Test Right Side View of Impactor Face

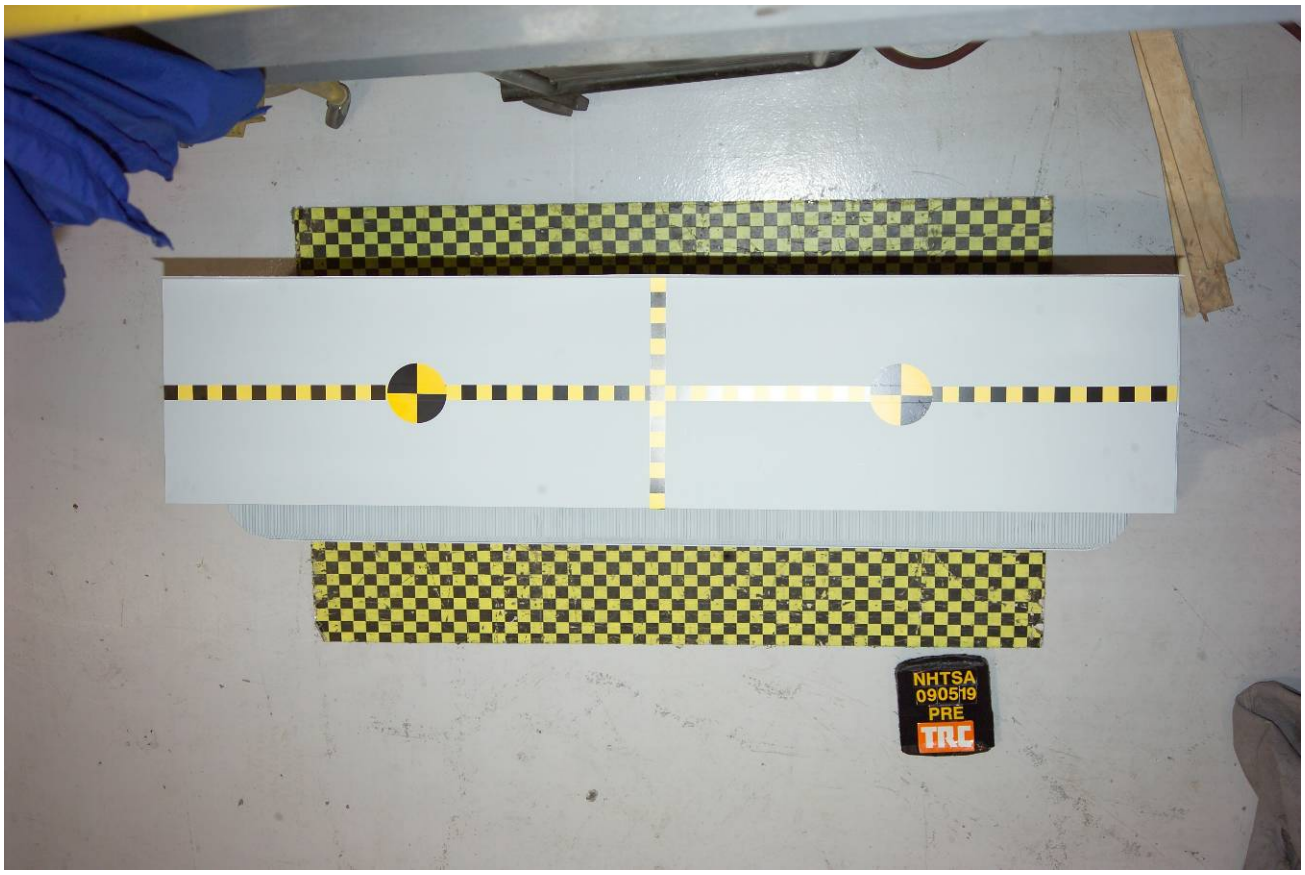


Figure A-23 Pre-Test Top View of Impactor Face

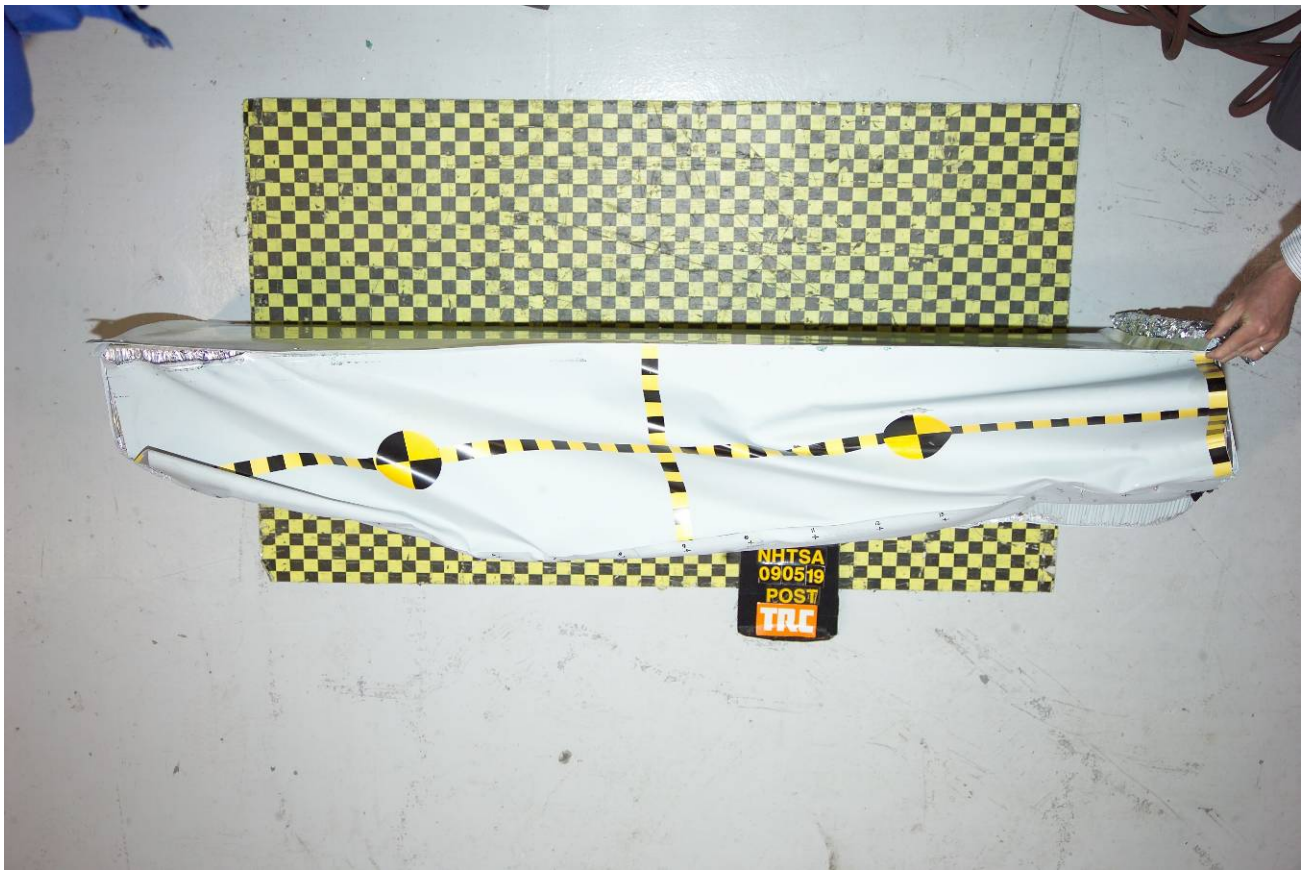


Figure A-24 Post-Test Top View of Impactor Face

Figure A-25 Pre-Test Left Side View of Impactor

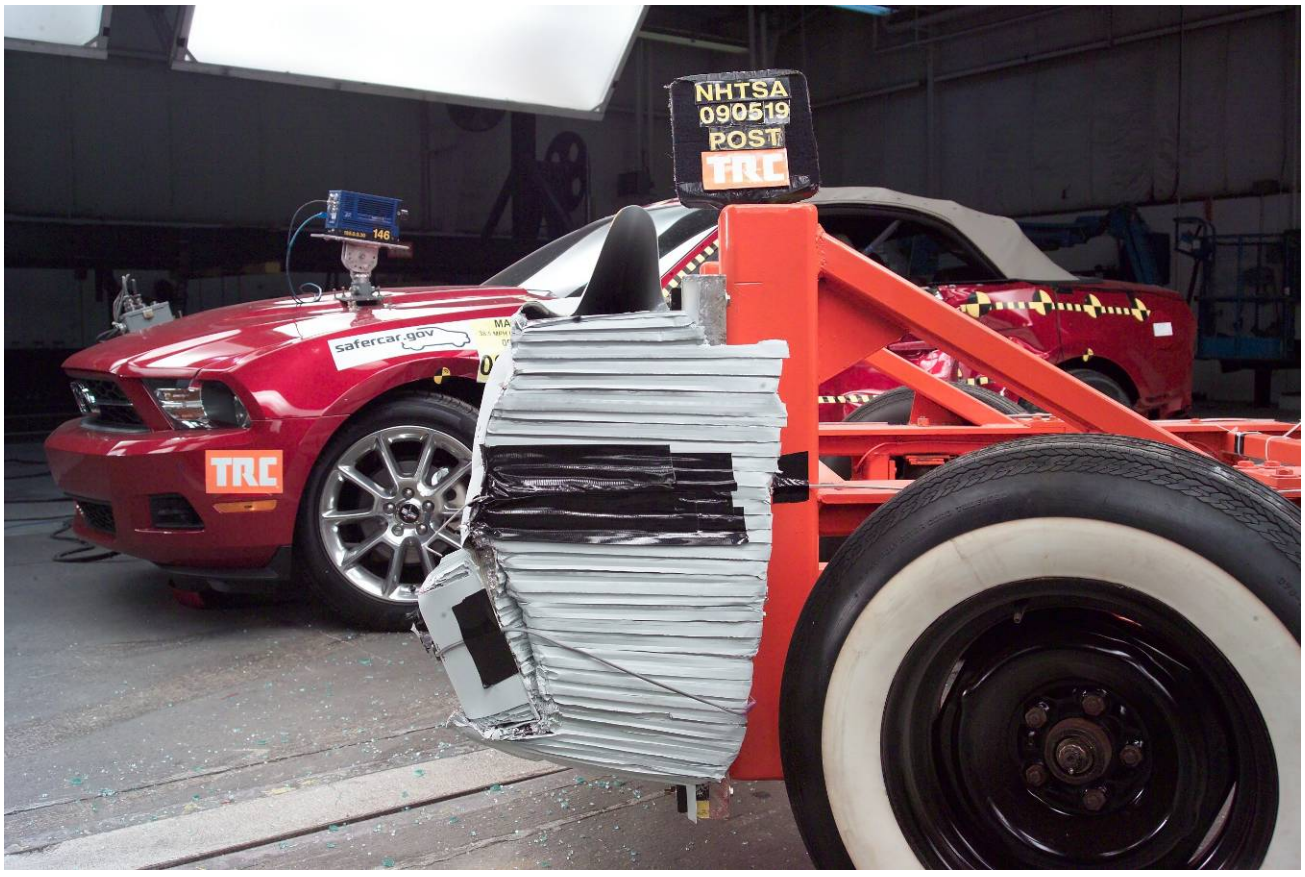


Figure A-26 Post-Test Left Side View of Impactor

Figure A-27 Pre-Test Right Side View of Impactor

Figure A-28 Post-Test Right Side View of Impactor

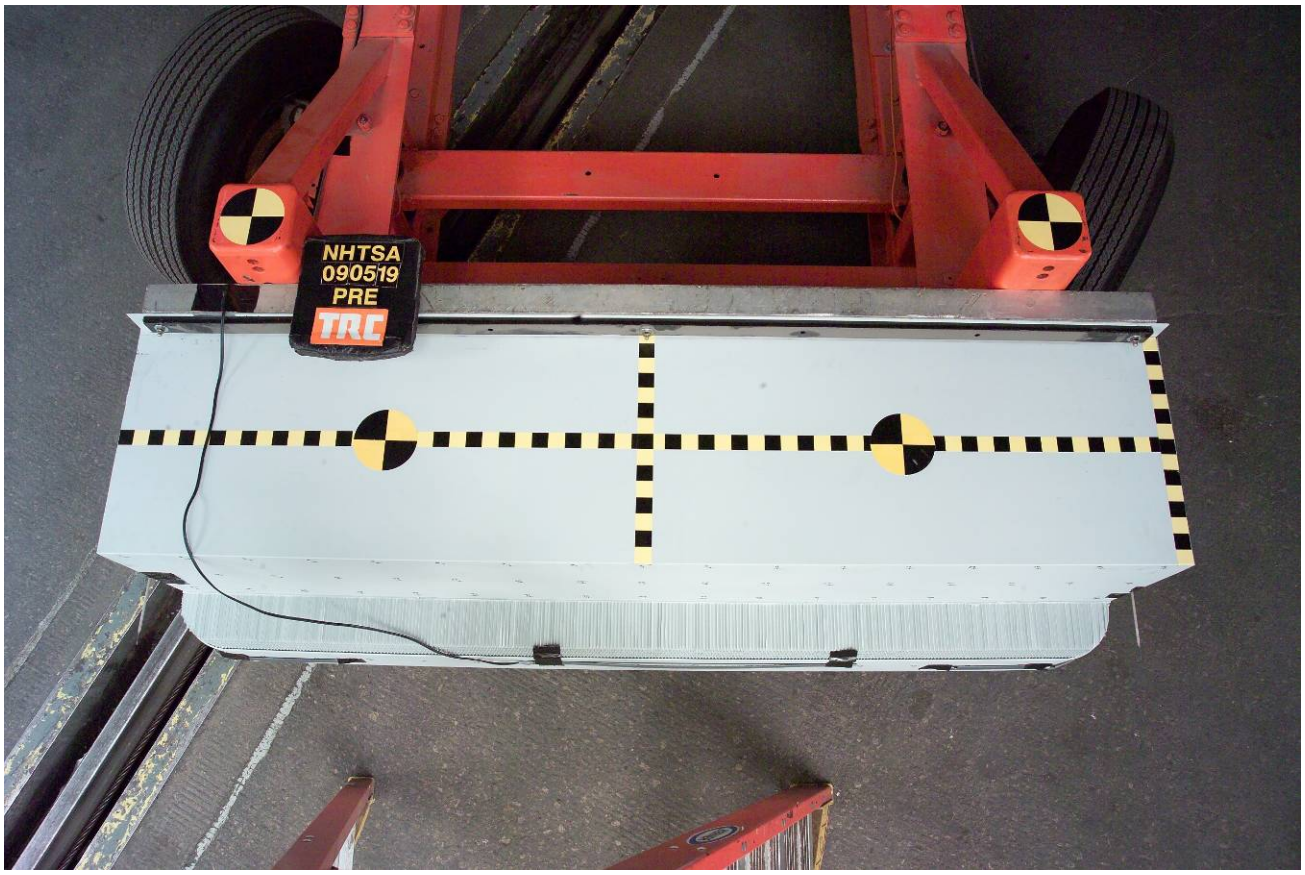


Figure A-29 Pre-Test Top View of Impactor

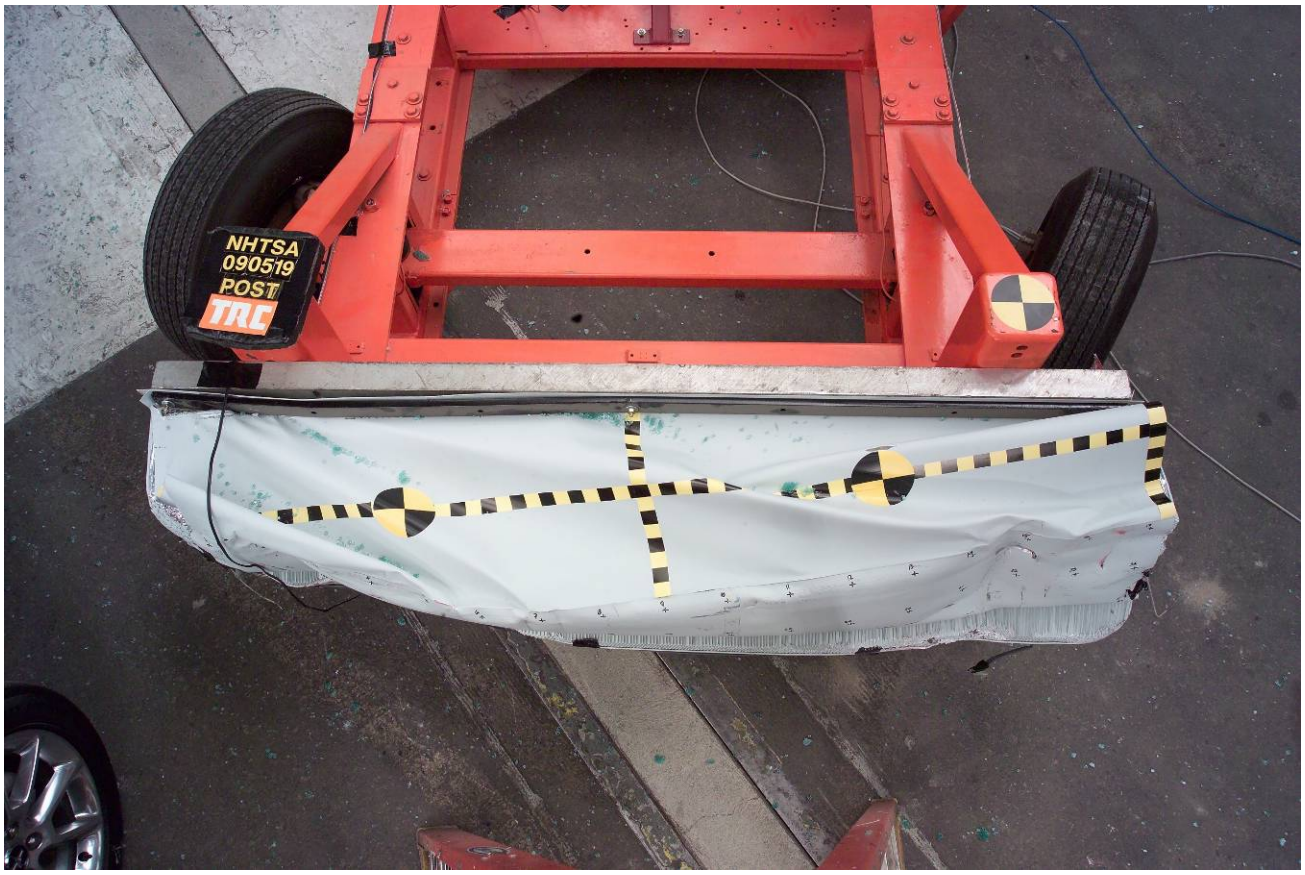


Figure A-30 Post-Test Top View of Impactor

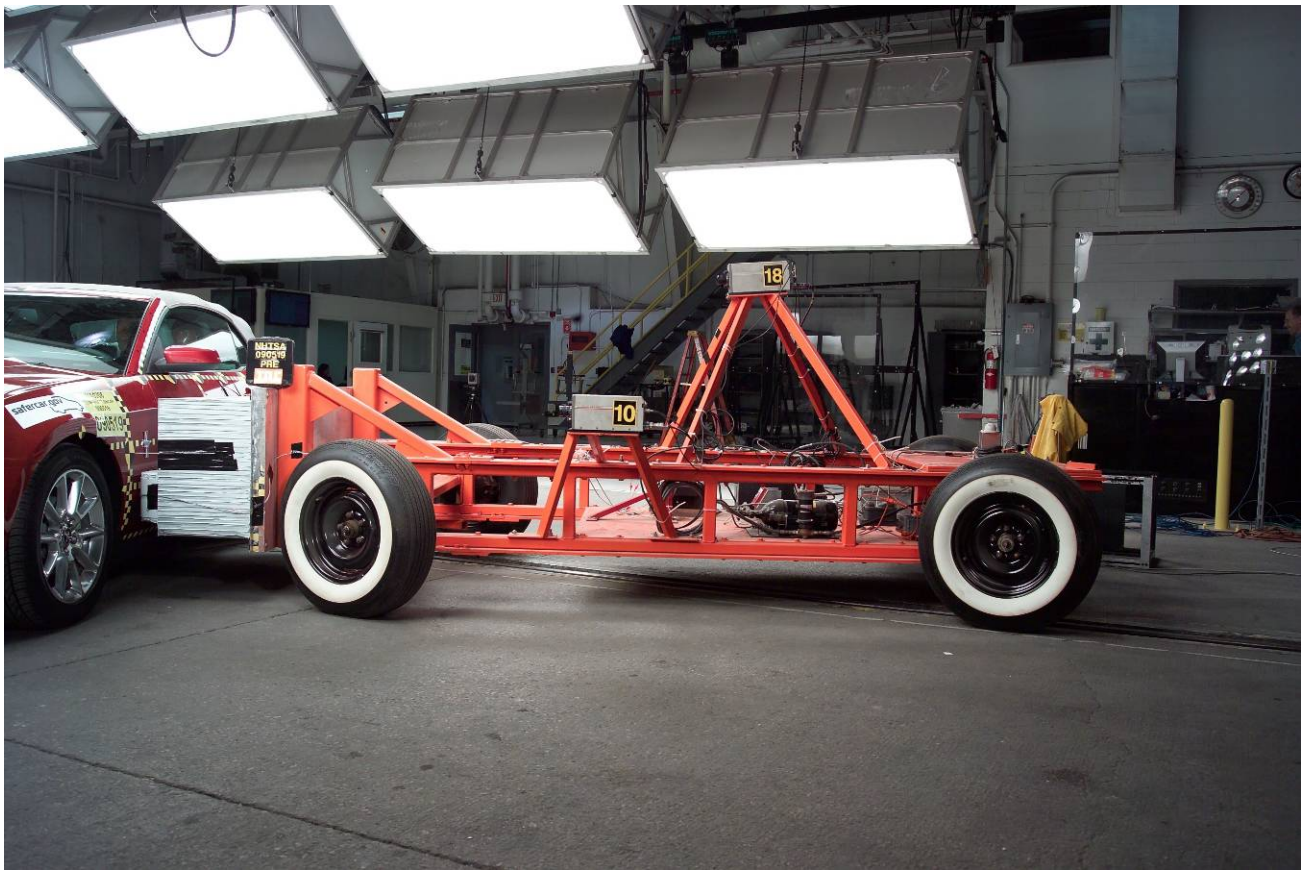


Figure A-31 Pre-Test Left Side Overall View of Impactor

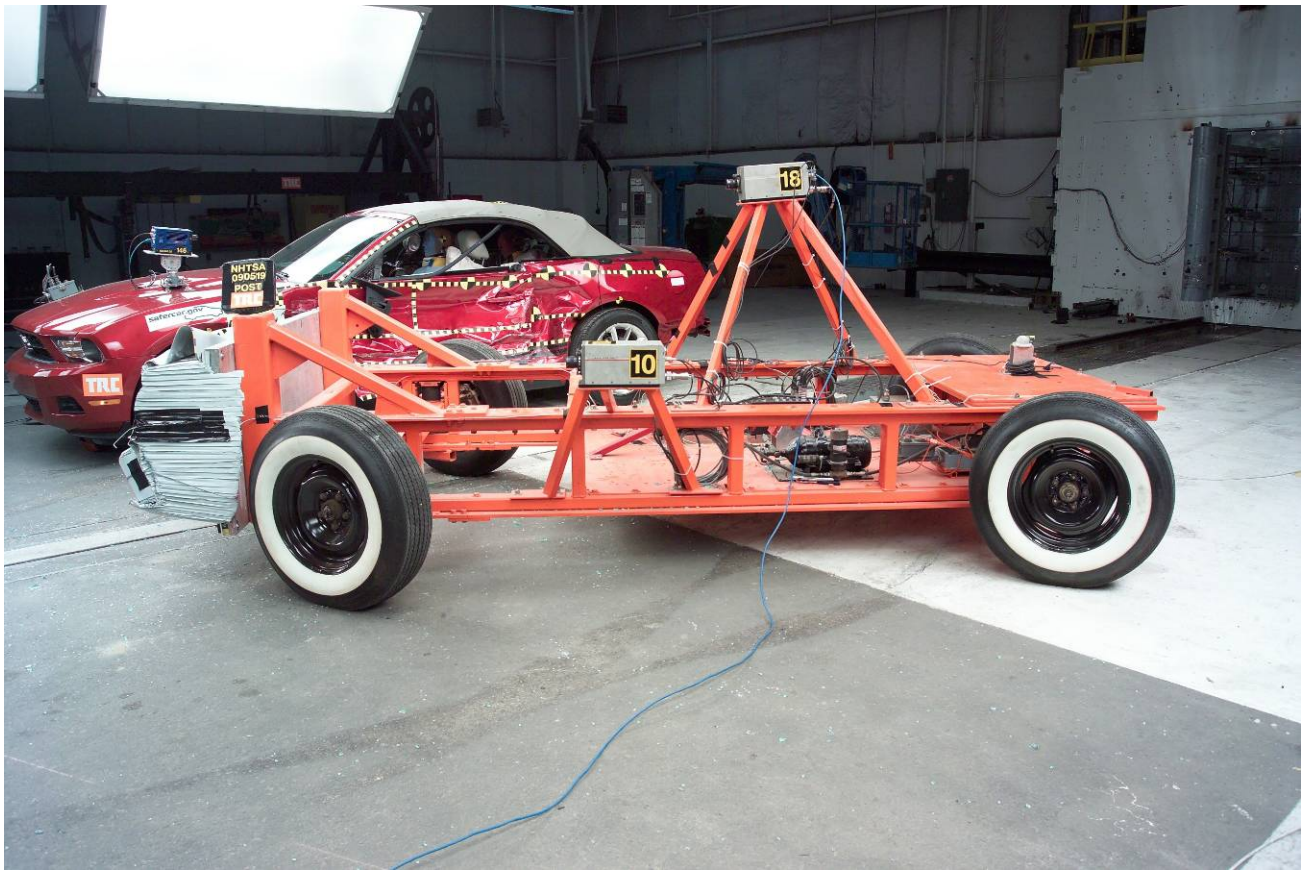


Figure A-32 Post-Test Left Side Overall View of Impactor

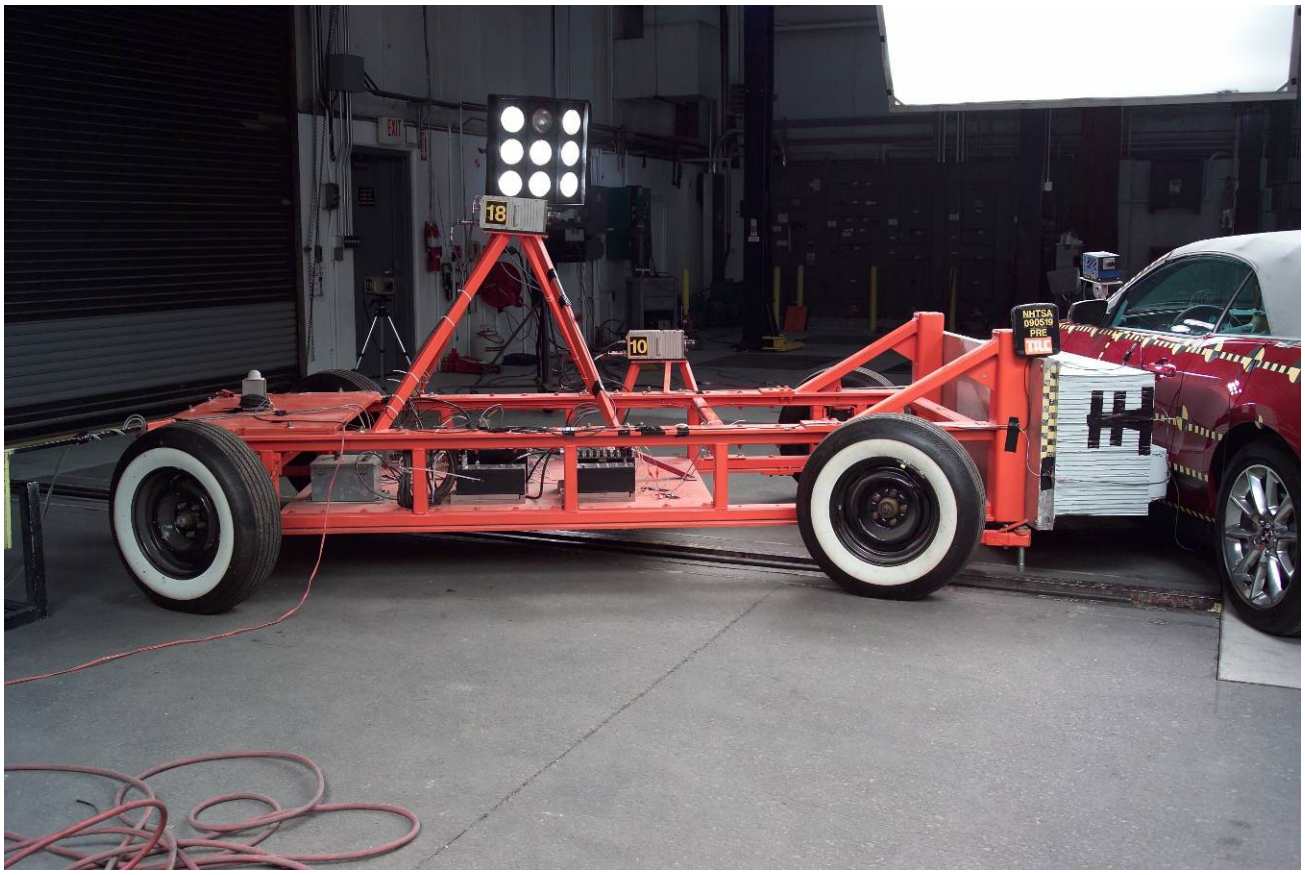


Figure A-33 Pre-Test Right Side Overall View of Impactor

Figure A-34 Post-Test Right Side Overall View of Impactor

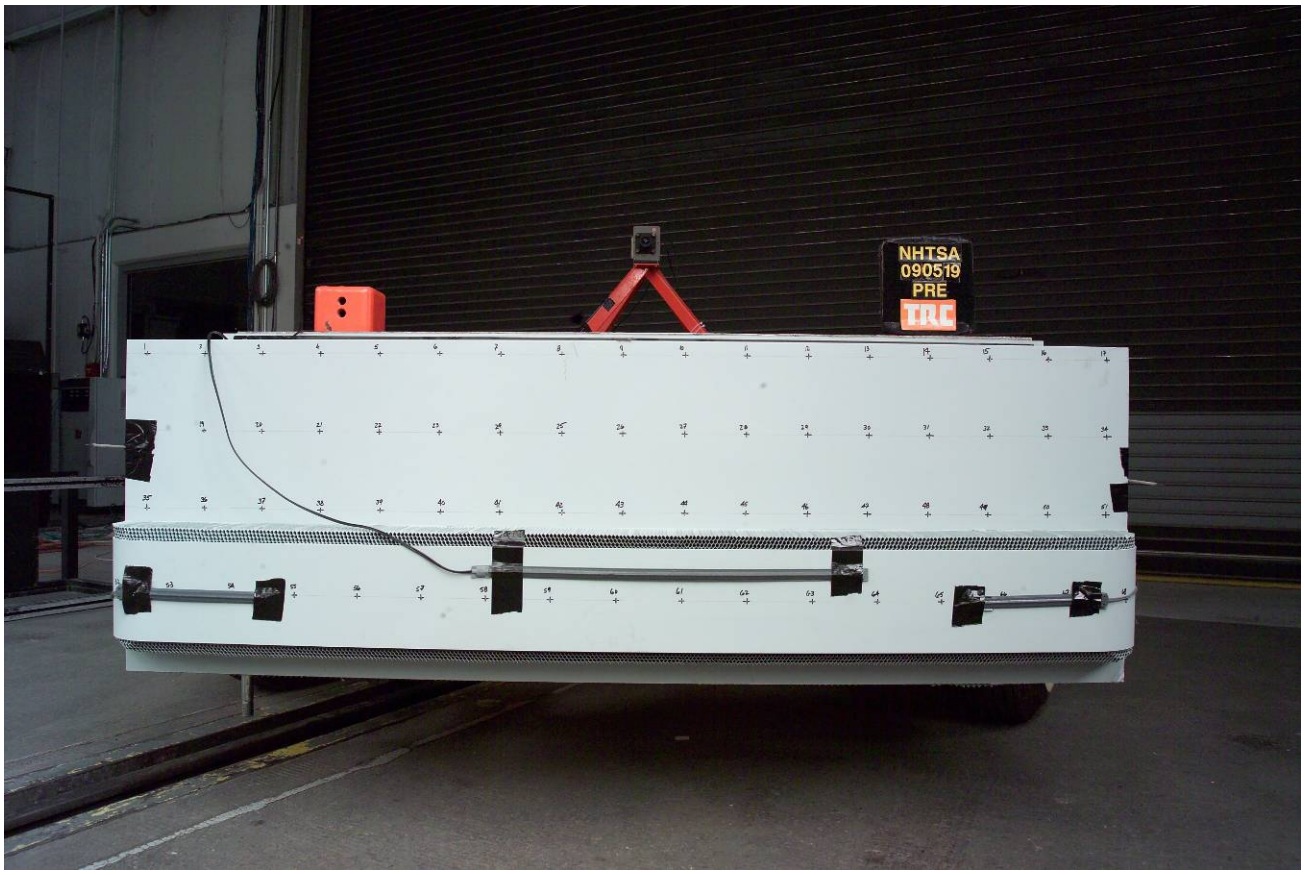


Figure A-35 Pre-Test View of MDB Showing Contact Switches in Place

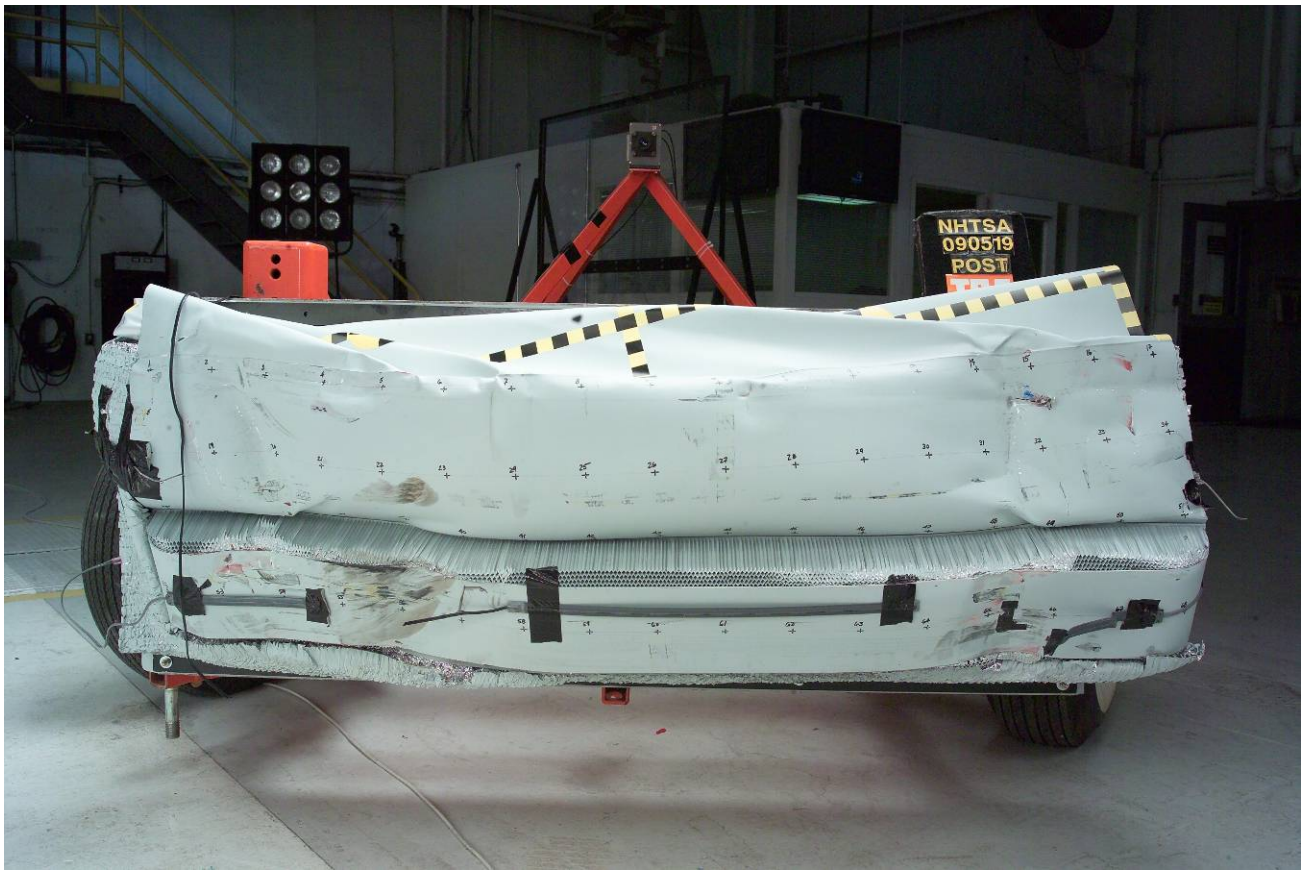


Figure A-36 Post-Test View of MDB Showing Contact Switches in Place

Figure A-37 Pre-Test Overhead View of MDB Aligned with Vehicle

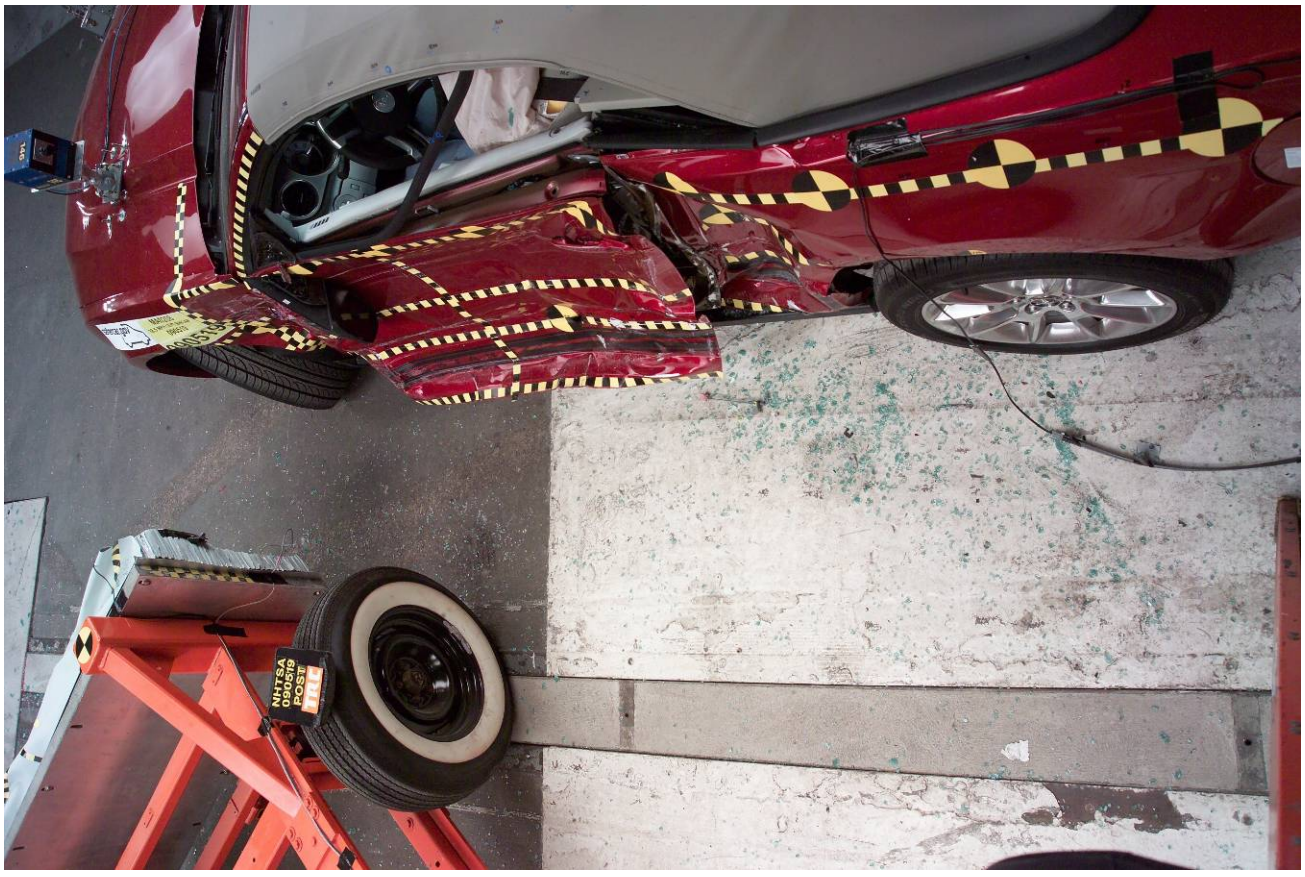


Figure A-38 Post-Test Overhead View of MDB and Vehicle

Figure A-39 Pre-Test Right Occupant Compartment View of Front SID HIII

Figure A-40 Post-Test Right Occupant Compartment View of Front SID HIII

Figure A-41 Pre-Test Right Occupant Compartment View of Rear SID HIII

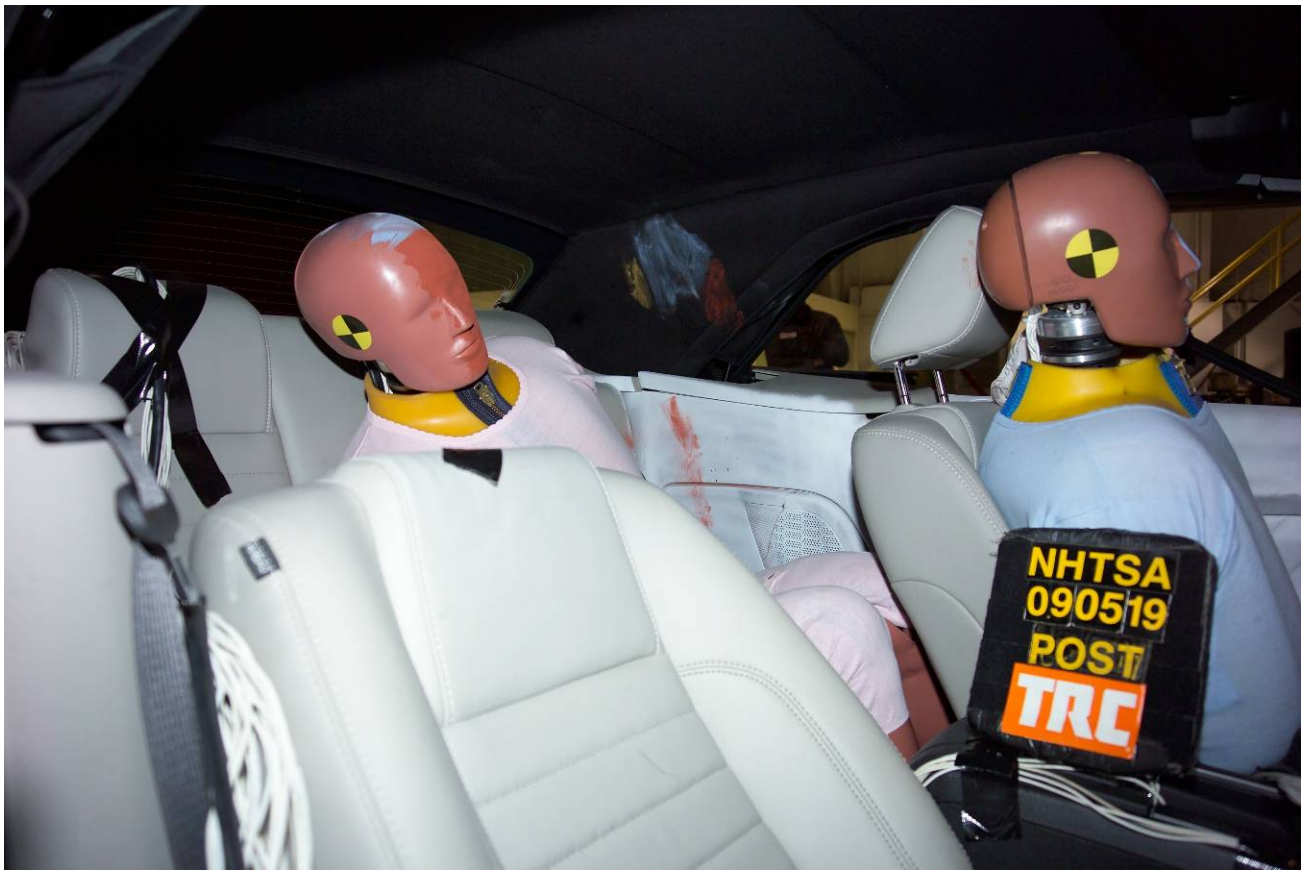


Figure A-42 Post-Test Right Occupant Compartment View of Rear SID HIII

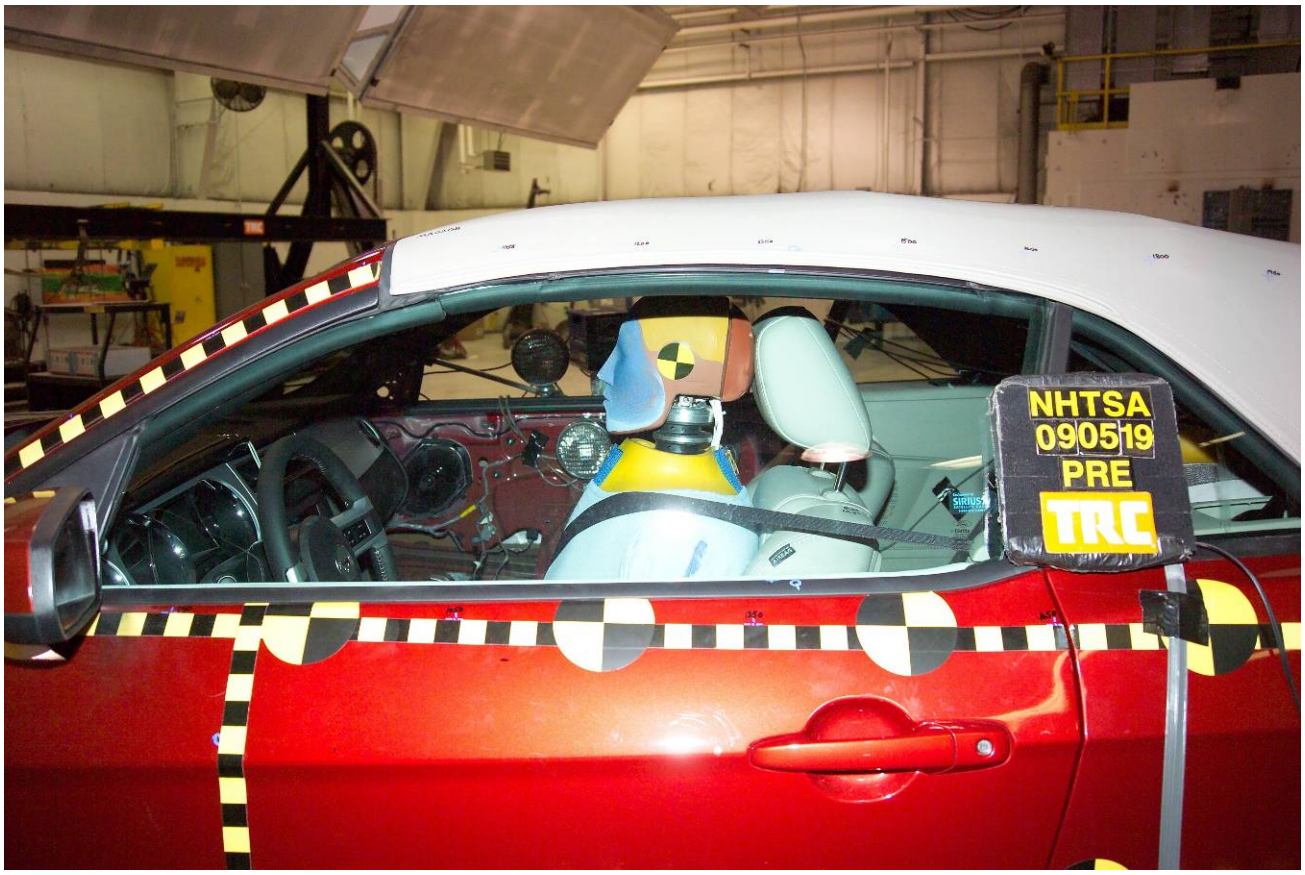


Figure A-43 Pre-Test Left View of Front SID HIII

Figure A-44 Post-Test Left View of Front SID HIII

Figure A-45 Pre-Test Left View of Front SID HIII and Belt Position

Intentionally Left Blank

Figure A-46 Pre-Test Left View of Front SID HIII and Door Clearance

Figure A-47 Post-Test Left View of Front SID HIII and Door Clearance

Figure A-48 Pre-Test Left View of Rear SID HIII

Figure A-49 Post-Test Left View of Rear SID HIII

Figure A-50 Pre-Test Left View of Rear SID HIII and Belt Position

Figure A-51 Post-Test Left View of Rear SID HIII and Door Clearance

Figure A-52 Pre-Test Interior of Front Door

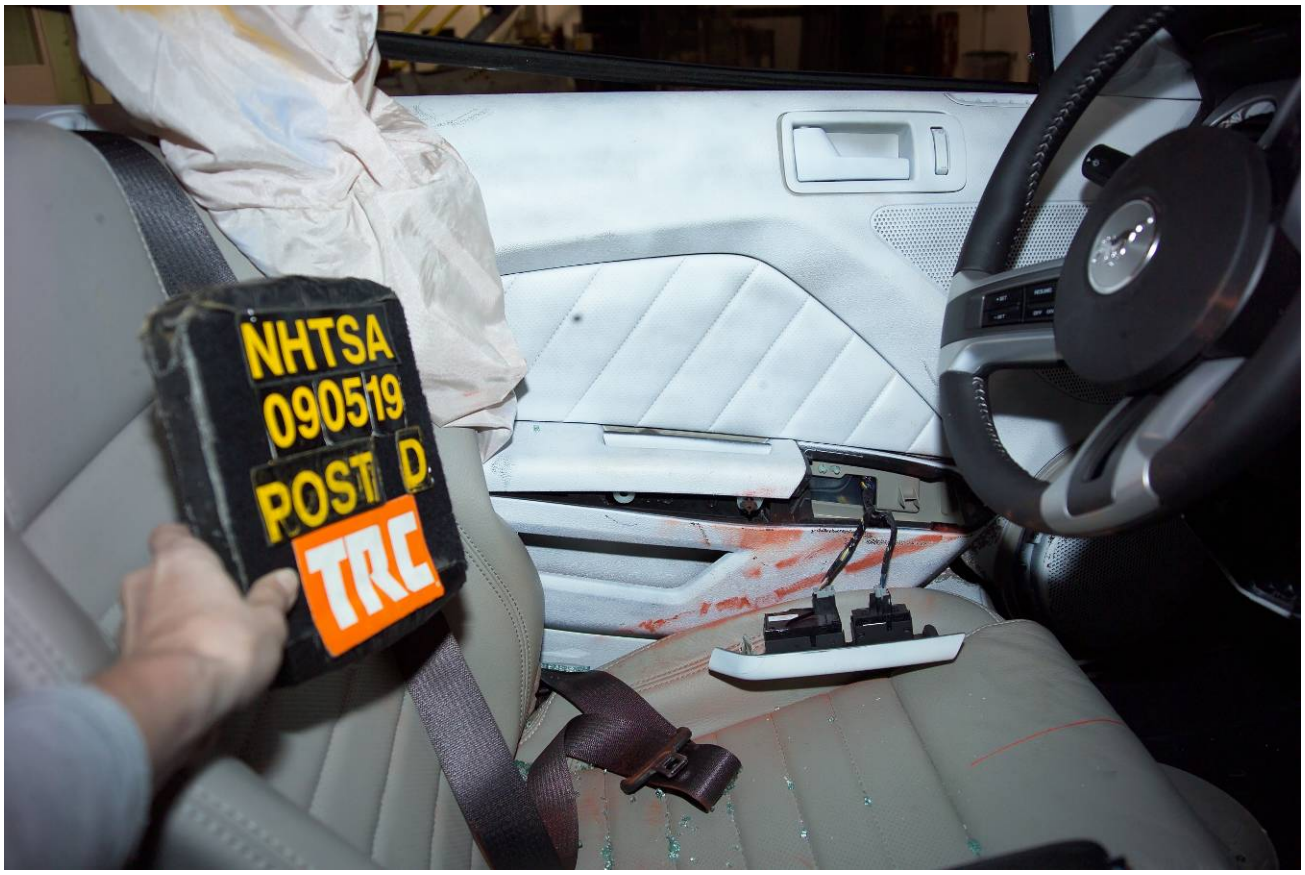


Figure A-53 Post-Test Interior of Front Door Showing SID HIII Impact Locations

Figure A-54 Post-Test Front SID HIII Contact – View 1

Figure A-55 Post-Test Front SID HIII Contact – View 2

Figure A-56 Post-Test Front SID HIII Contact – View 3

Figure A-57 Pre-Test Interior of Rear Side Panel

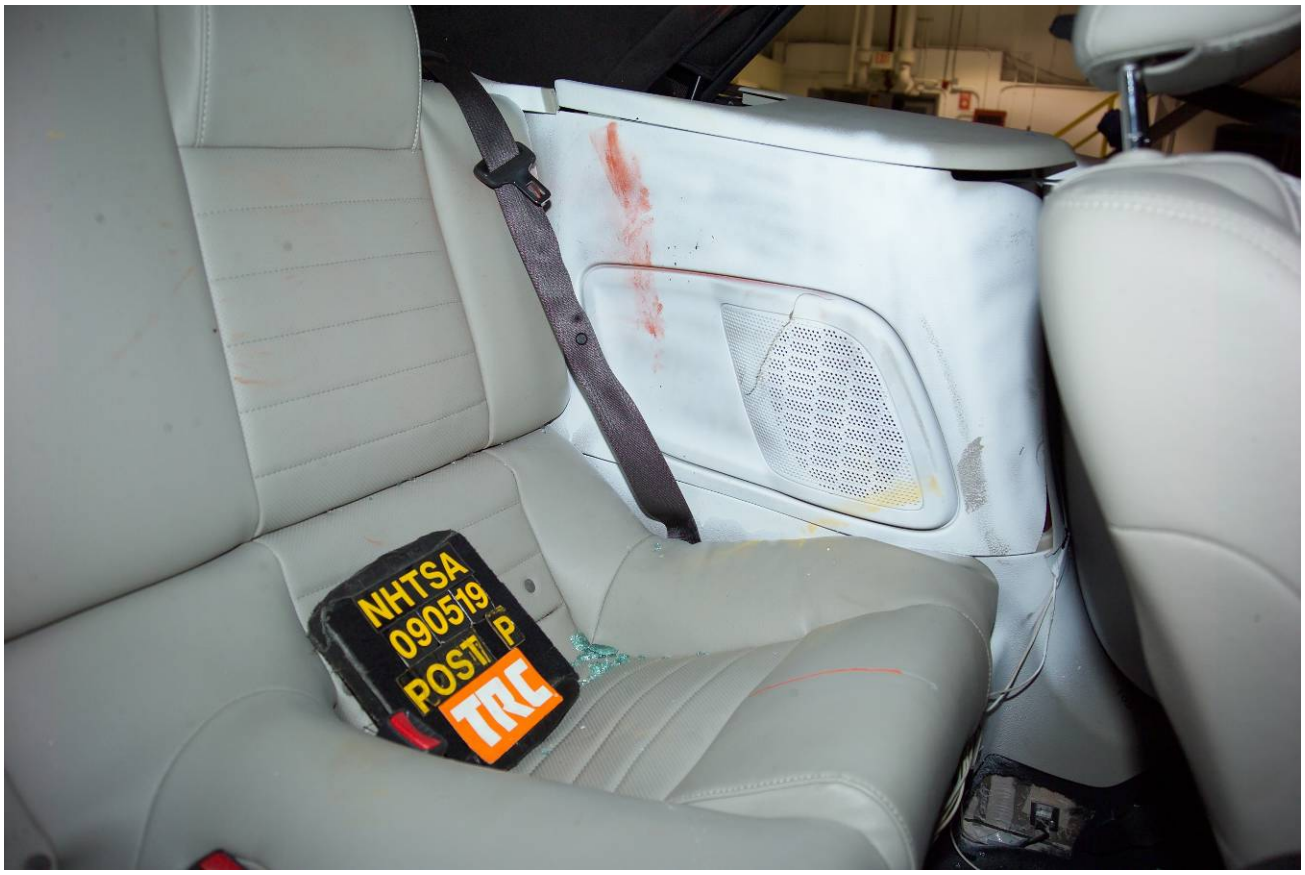


Figure A-58 Post-Test Rear SID HIII Contact – View 1

Figure A-59 Post-Test Rear SID Contact – View 2

Figure A-60 Post-Test Rear SID HIII Contact – View 3

Intentionally Left Blank

Figure A-61 Pre-Test Left Side View of MDB with Impactor Face in Position

Intentionally Left Blank

Figure A-62 Pre-Test Primary Impact Point View

Figure A-63 Post-Test Primary Impact Point View

Figure A-64 Pre-Test Right Side View of MDB with Impactor Face in Position

Intentionally Left Blank

Figure A-65 Pre-Test Secondary Impact Point View

Figure A-66 Post-Test Secondary Impact Point View

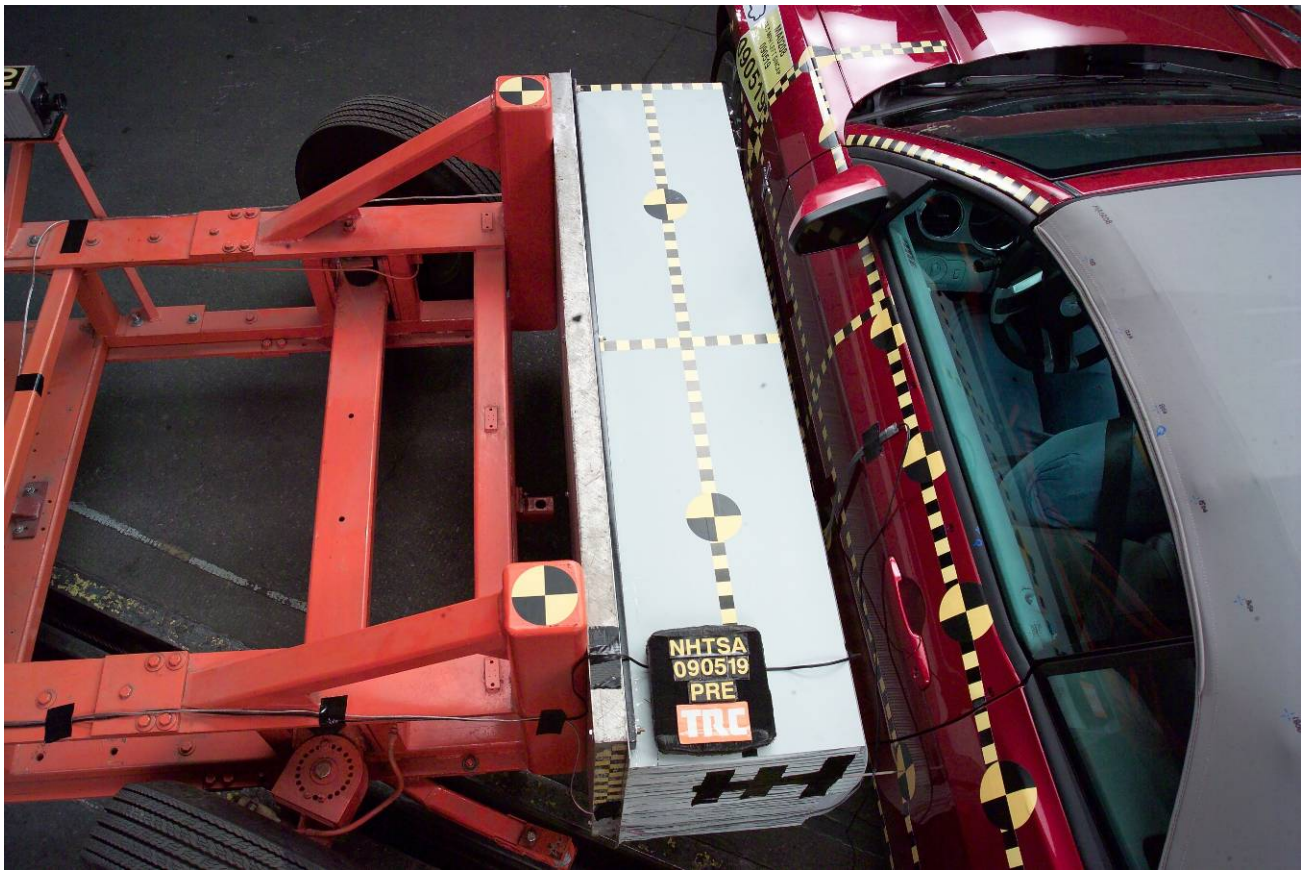


Figure A-67 Pre-Test Overhead View of MDB with Impactor Face in Position

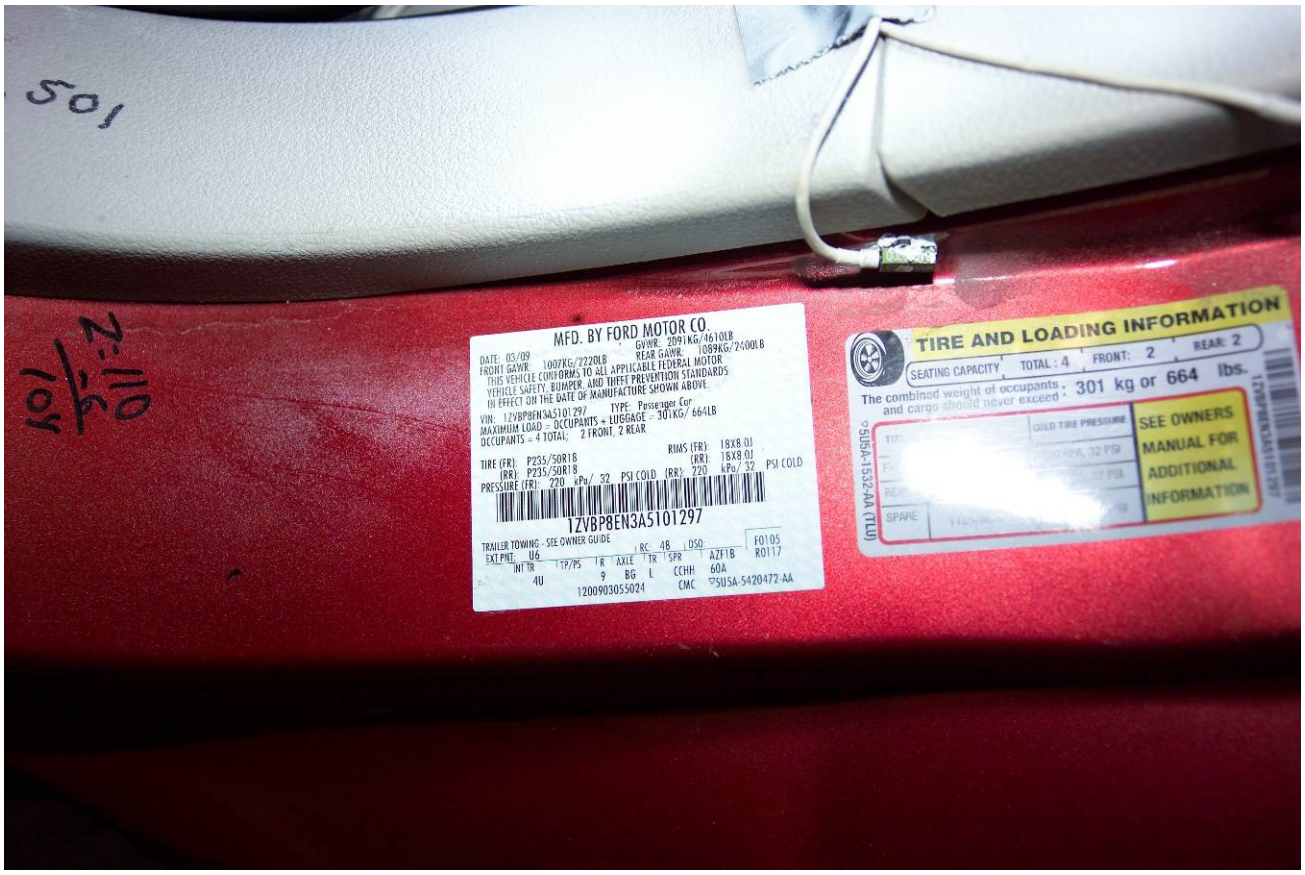


Figure A-68 Pre-Test Vehicle Certification Label View

Figure A-69 Pre-Test Vehicle Recommended Tire Pressure Label View

Figure A-70 Post-Test Light Trap Digital Readout – View 1

Figure A-71 Post-Test Light Trap Digital Readout – View 2

Figure A-72 Post-Test Light Trap Digital Readout – View 3

Figure A-73 Impact Event

Intentionally Left Blank

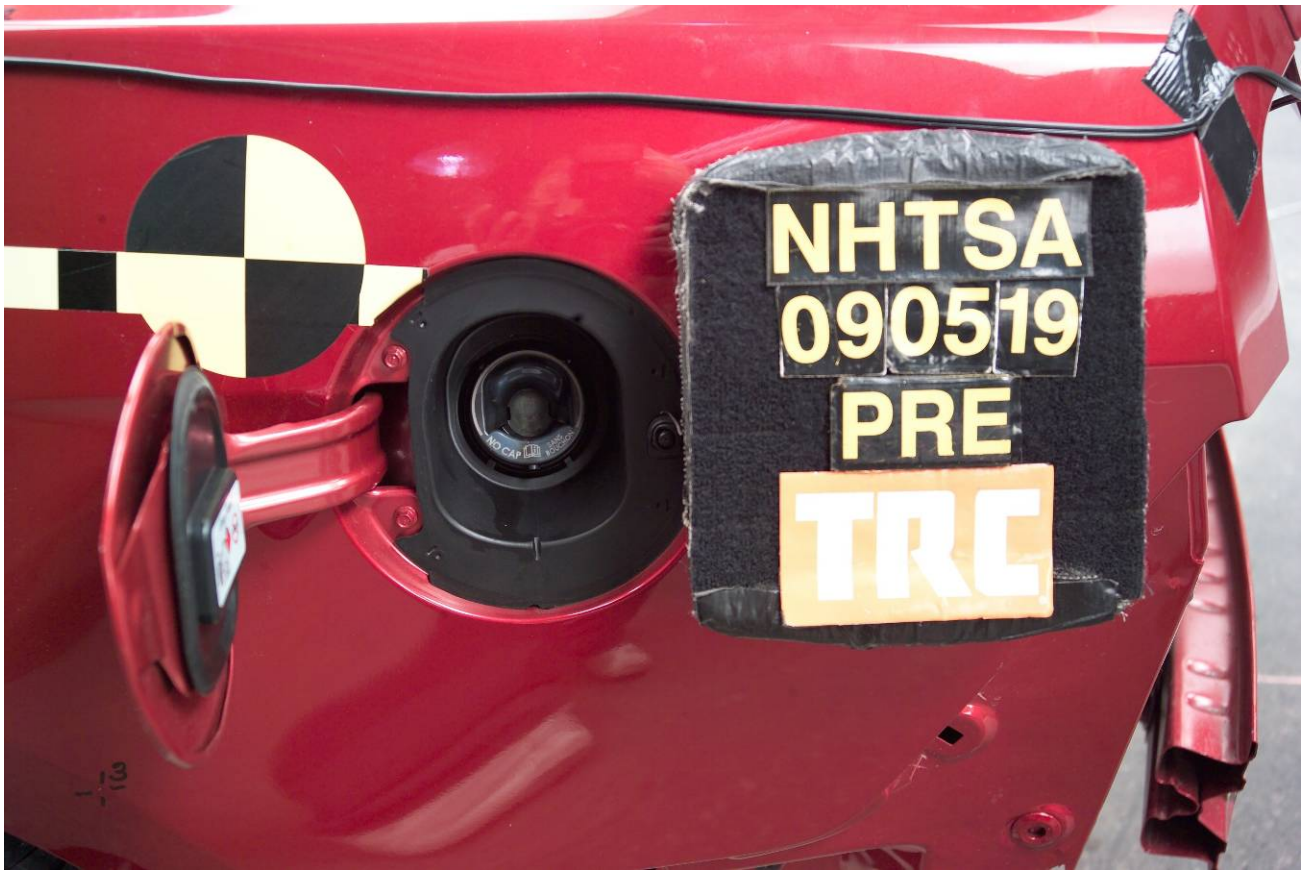


Figure A-74 Pre-Test Fuel Cap

Figure A-75 Post-Test Fuel Cap

Figure A-76 FMVSS 301 Rollover View at 90°

Figure A-77 FMVSS 301 Rollover View at 180°

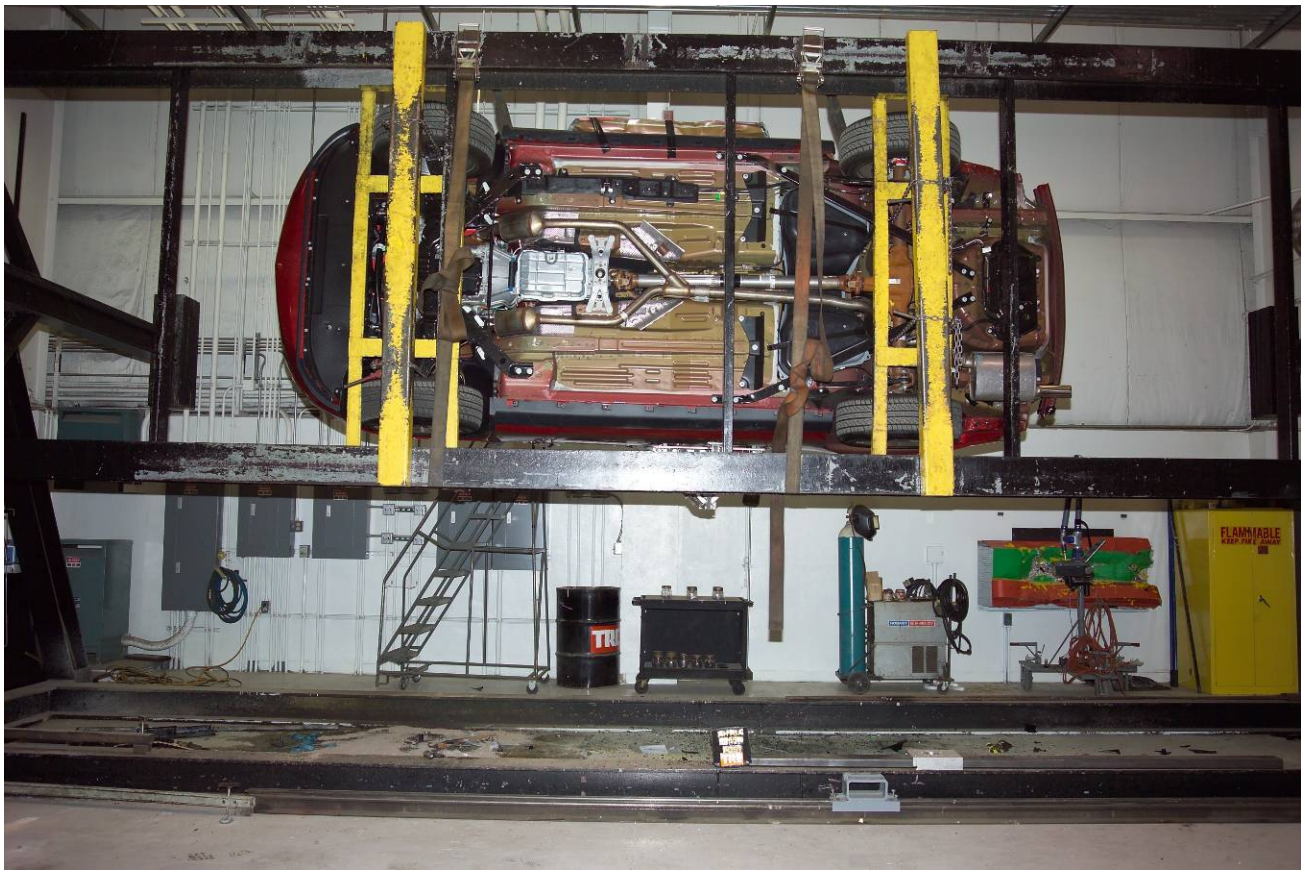


Figure A-78 FMVSS 301 Rollover View at 270°

Figure A-79 FMVSS 301 Rollover View at 360°

APPENDIX B

SID/HIII, VEHICLE AND MDB RESPONSE DATA

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

Data Plot	LIST OF DATA PLOTS (CONTINUED)
	Driver Head X Primary
	Driver Head Y Primary
	Driver Head Z Primary
	Driver Upper Neck Force X
	Driver Upper Neck Force Y
	Driver Upper Neck Force Z
	Driver Upper Neck Moment X
	Driver Upper Neck Moment Y
	Driver Upper Neck Moment Z
	Driver Upper Rib Primary Y
	Driver Upper Rib Redundant Y
	Driver Lower Rib Primary Y
	Driver Lower Rib Redundant Y
	Driver Lower Spine Y
	Driver Lower Spine Redundant Y
	Driver Pelvis Y
	Left Rear Passenger Head X Primary
	Left Rear Passenger Head Y Primary
	Left Rear Passenger Head Z Primary
	Left Rear Passenger Upper Neck Force X
	Left Rear Passenger Upper Neck Force Y
	Left Rear Passenger Upper Neck Force Z
	Left Rear Passenger Upper Neck Moment X
	Left Rear Passenger Upper Neck Moment Y
	Left Rear Passenger Upper Neck Moment Z
	Left Rear Passenger Upper Rib Primary Y
	Left Rear Passenger Upper Rib Redundant Y
	Left Rear Passenger Lower Rib Primary Y
	Left Rear Passenger Lower Rib Redundant Y
	Left Rear Passenger Lower Spine Primary Y
	Left Rear Passenger Lower Spine Redundant Y
	Left Rear Passenger Pelvis Y

Data Plot	LIST OF DATA PLOTS (CONTINUED)
	Vehicle Right Sill at Front Seat X
	Vehicle Right Sill at Front Seat Y
	Vehicle Right Sill at Front Seat Z
	Vehicle Right Sill at Rear Seat X
	Vehicle Right Sill at Rear Seat Y
	Vehicle Right Sill at Rear Seat Z
	Vehicle Rear Floor Above Axle X
	Vehicle Rear Floor Above Axle Y
	Vehicle Rear Floor Above Axle Z
	Vehicle Left Sill at Front Seat Y
	Vehicle Left Sill at Rear Seat Y
	Vehicle Right Rear Occupant Compartment Y
	Vehicle Left A-Post Lower Y
	Vehicle Left A-Post Middle Y
	Vehicle Left B-Post Lower Y
	Vehicle Left B-Post Middle Y
	Vehicle Left Front Seat Track Y
	Vehicle Left Rear Seat Track Y
	Vehicle CG X
	Vehicle CG Y
	Vehicle CG Z
	MDB CG X
	MDB CG Y
	MDB CG Z
	MDB Rear X
	MDB Rear Y
	MDB Right Bumper Contact
	MDB Left Bumper Contact

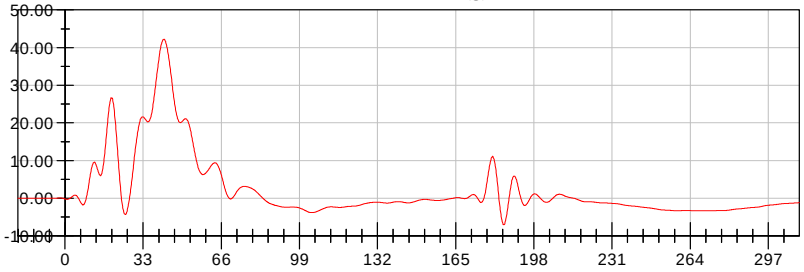
NHTSA

Test Lab: CTF
Test Number: 090519-1 (MA0208)

Position #1 SID H3 Dummy (M001)
Position #4 SID H3 Dummy (002)

Test Date: 05/19/2009

DRIVER UPPER RIB Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

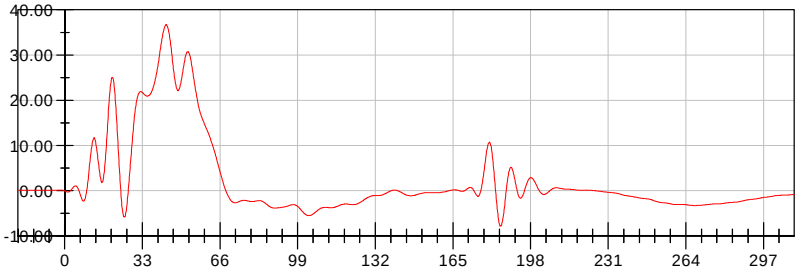
42.24 g at 41.90 ms

<Min>

-7.02 g at 185.00 ms

FIR_100

DRIVER LOWER RIB Y-AXIS ACCELERATION (g) vs. Time [ms]



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36.77 g at 43.10 ms

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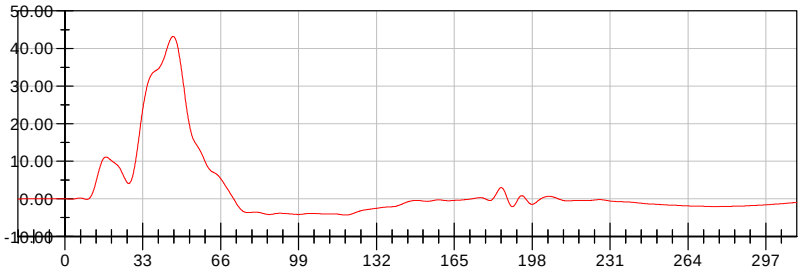
-7.92 g at 185.00 ms

FIR_100

DRIVER LOWER SPINE Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

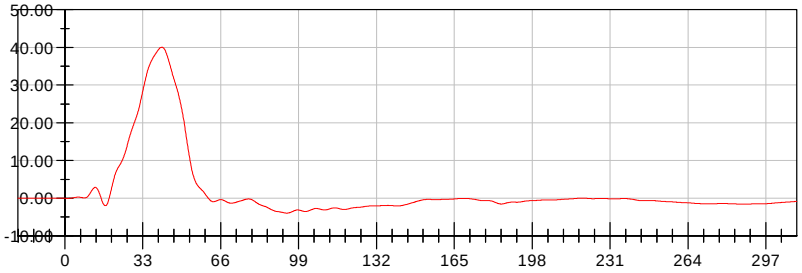
43.20 g at 45.70 ms

<Min>

-4.30 g at 118.80 ms

FIR_100

DRIVER PELVIS Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

40.06 g at 41.20 ms

<Min>

-3.94 g at 94.30 ms

FIR_100

NHTSA

Test Date: 05/19/2009

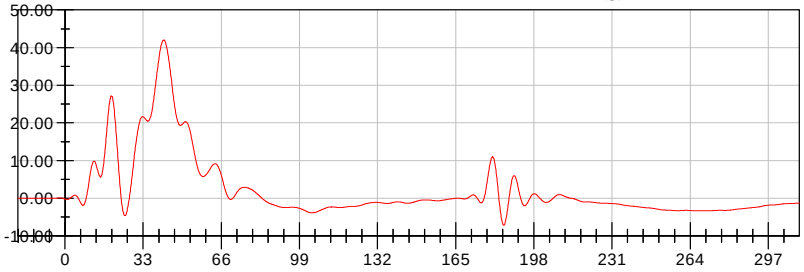
Test Lab: CTF

Position #1 SID H3 Dummy (M001)

Test Number: 090519-1 (MA0208)

Position #4 SID H3 Dummy (002)

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



<Max>

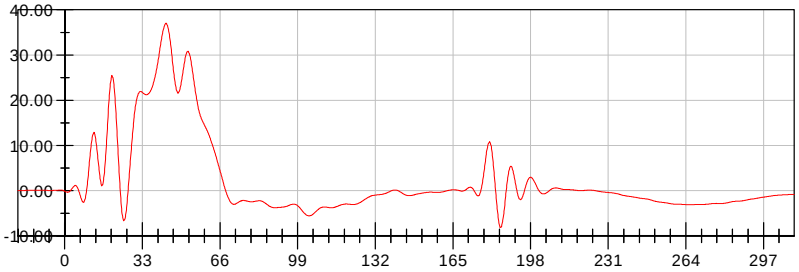
42.04 g at 41.80 ms

<Min>

-7.19 g at 185.00 ms

FIR_100

DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



<Max>

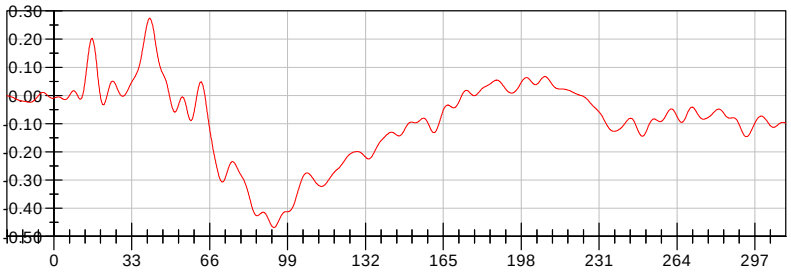
37.05 g at 43.10 ms

<Min>

-8.16 g at 185.00 ms

FIR_100

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



<Max>

0.27 g at 40.60 ms

<Min>

-0.47 g at 93.10 ms

FIR_100

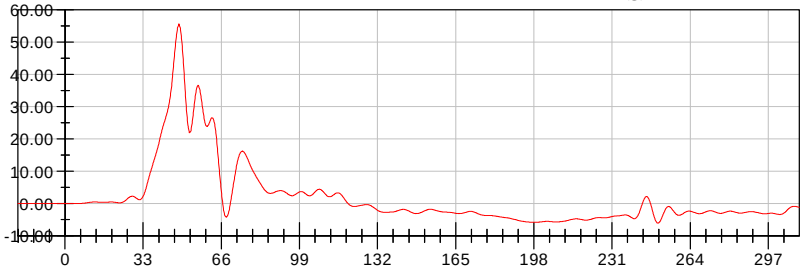
NHTSA

Test Lab: CTF
Test Number: 090519-1 (MA0208)

Position #1 SID H3 Dummy (M001)
Position #4 SID H3 Dummy (002)

Test Date: 05/19/2009

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

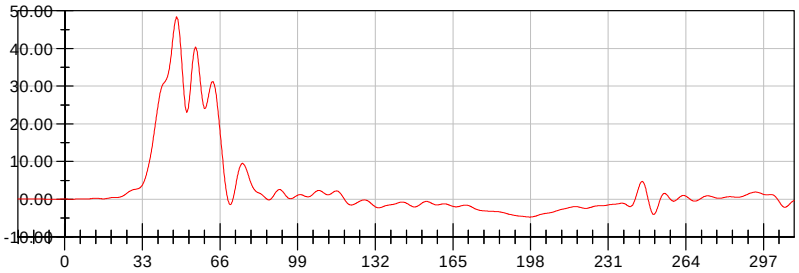
55.67 g at 48.10 ms

<Min>

-6.09 g at 250.60 ms

FIR_100

LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

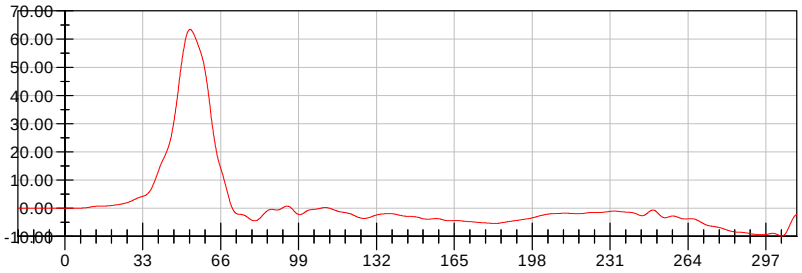
48.40 g at 47.50 ms

<Min>

-4.78 g at 197.50 ms

FIR_100

LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

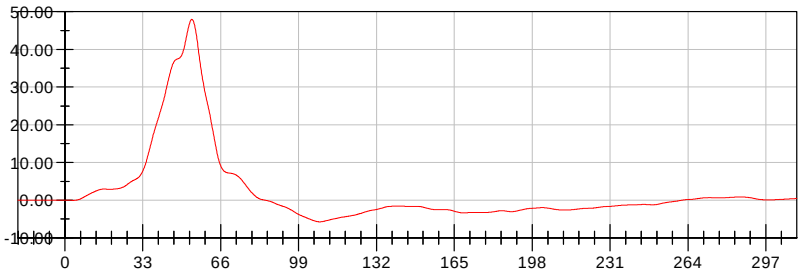
63.47 g at 53.10 ms

<Min>

-9.90 g at 303.70 ms

FIR_100

LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

48.03 g at 53.80 ms

<Min>

-5.73 g at 108.10 ms

FIR_100

NHTSA

Test Date: 05/19/2009

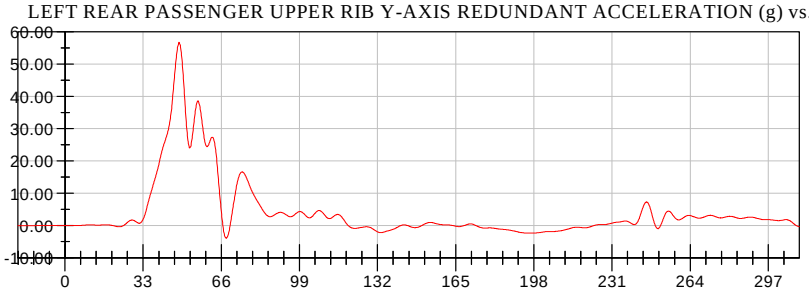
Test Lab: CTF

Position #1 SID H3 Dummy (M001)

Position #4 SID H3 Dummy (002)

Test Number: 090519-1 (MA0208)

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



<Max>

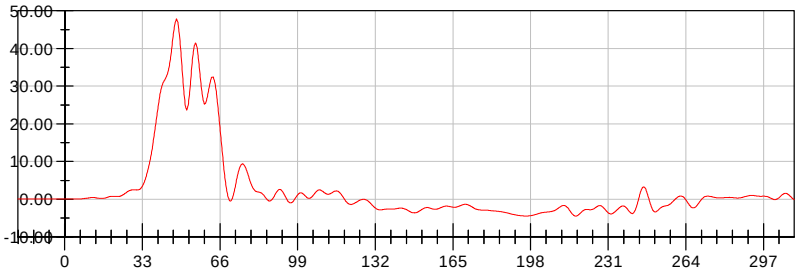
56.80 g at 48.10 ms

<Min>

-3.94 g at 68.10 ms

FIR_100

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



<Max>

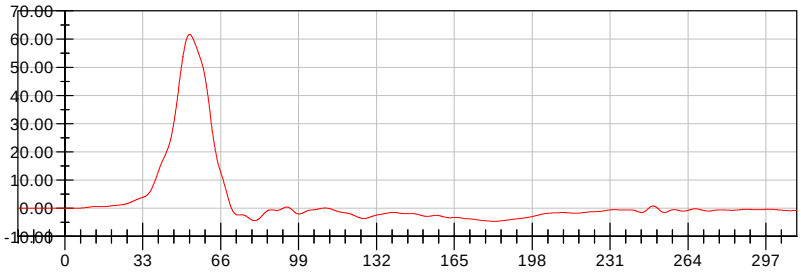
47.83 g at 47.50 ms

<Min>

-4.52 g at 217.50 ms

FIR_100

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION (g) vs. Time [ms]



<Max>

61.64 g at 53.10 ms

<Min>

-4.64 g at 181.90 ms

FIR_100

APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII: 001

Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 001 Calibration No. 01

Test Parameter	Dimension	Specification			Results		Pass
Seated Height	SH	889.0	- 909.3	mm	900	mm	Yes
Rib Height	RH	501.7	- 520.7	mm	515	mm	Yes
Hip Pivot Height	HP	99.1 REF		mm	99.1	mm	
Knee Pivot From Backline	KH	510.5	- 525.8	mm	516	mm	Yes
Knee Pivot From Floor	KV	490.2	- 505.5	mm	495	mm	Yes
Hip Width	HW	355.6	- 391.2	mm	380	mm	Yes
Top Rib Width From C\L	RW-1	165.1	- 180.3	mm	175	mm	Yes
Bottom Rib Width From C\L	RW-2	165.1	- 180.3	mm	175	mm	Yes
Difference Between Top & Bottom Rib Width from C\L			<= 2.5	mm	0.0	mm	Yes

Technician

Approved

Transportation Research Center Inc.

Left Lateral Head Drop
SID-HIII Serial No. 001 Certification No. 1-1
Test Date: 5/18/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	139.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

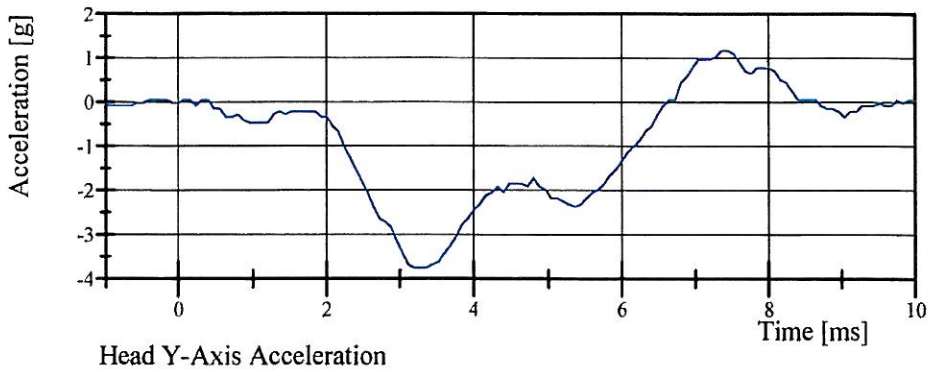
05.18.2009 11:18:06 608

090519

Transportation Research Center Inc.

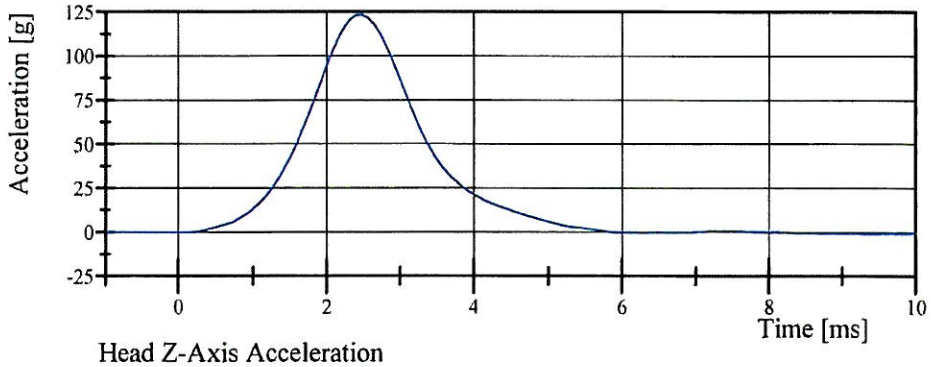
Left Lateral Head Drop
SID-HIII Serial No. 001 Certification No. 1-1
Test Date: 5/18/2009

Head X-Axis Acceleration



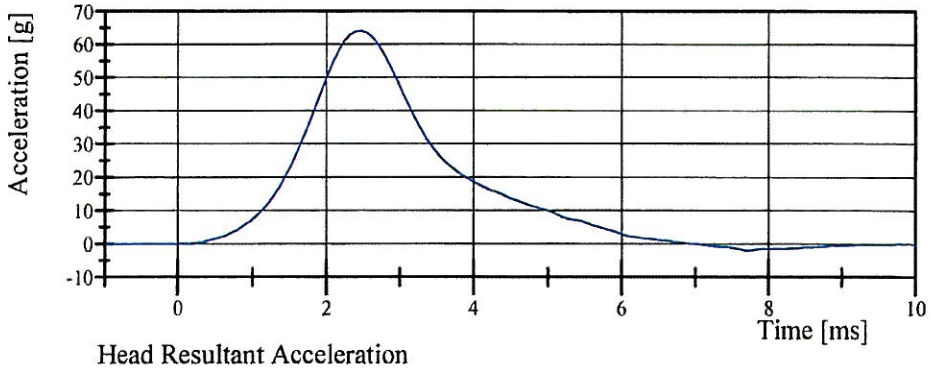
Filter Class: CFC_1000
Max: 1.2 g at 7.4 ms
Min: -3.7 g at 3.2 ms

Head Y-Axis Acceleration



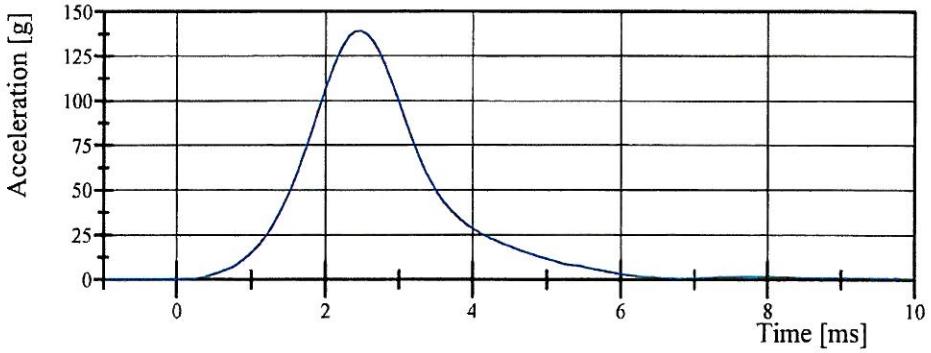
Filter Class: CFC_1000
Max: 123.5 g at 2.5 ms
Min: -0.8 g at 9.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 64.1 g at 2.5 ms
Min: -1.9 g at 7.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 139.2 g at 2.5 ms
Min: 0.0 g at -0.1 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.18.2009 11:18:12 608

090519

Transportation Research Center Inc.

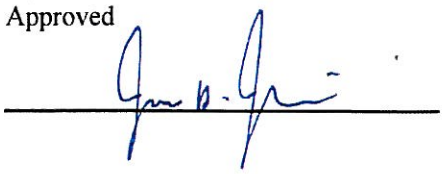
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 1-5
Test Date: 5/18/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.941 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.187 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.785 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.837 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.250 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-75.6 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	60.2 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	86.7 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	59.4 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	12.6 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

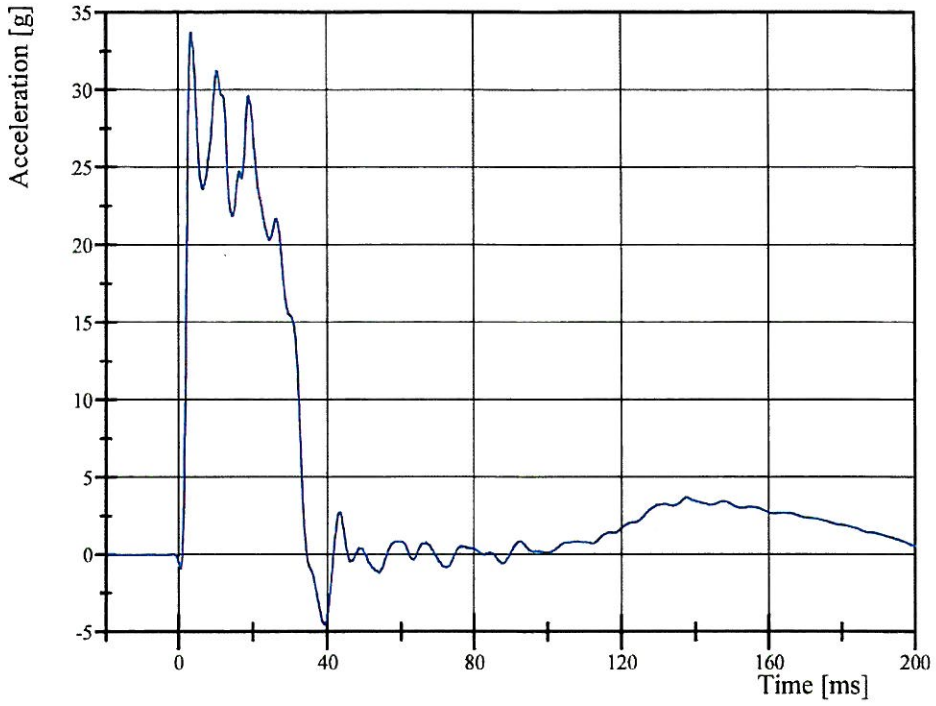
05.18.2009 22:35:02 2957

090519

Transportation Research Center Inc.

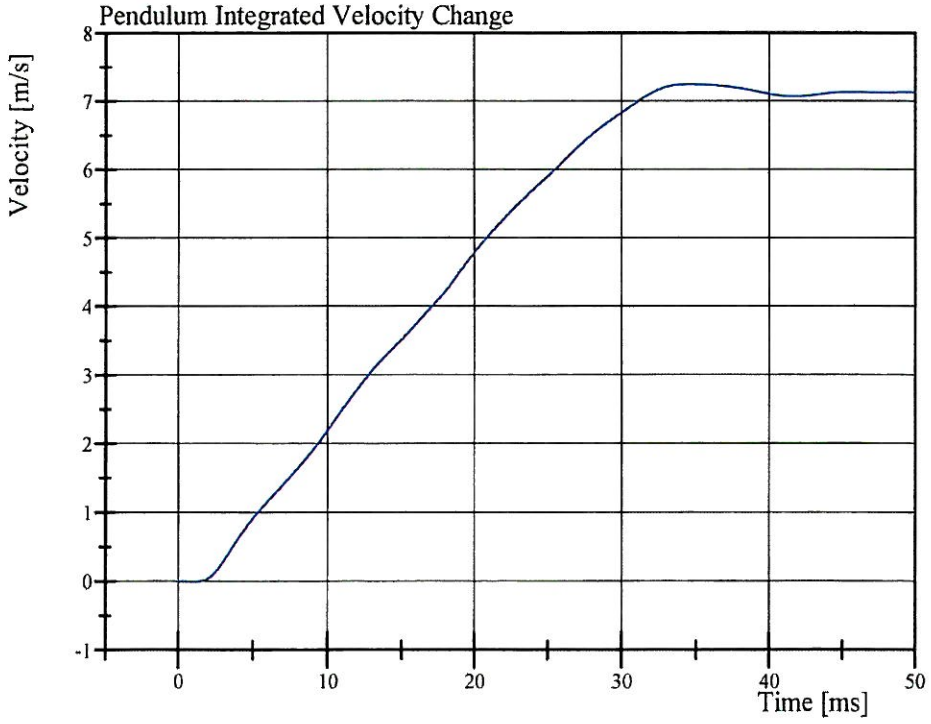
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 1-5
Test Date: 5/18/2009

Pendulum Acceleration



Filter Class: CFC_180
Max: 33.7 g at 3.4 ms
Min: -4.5 g at 39.3 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.2 m/s at 34.5 ms
Min: -0.0 m/s at 1.0 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

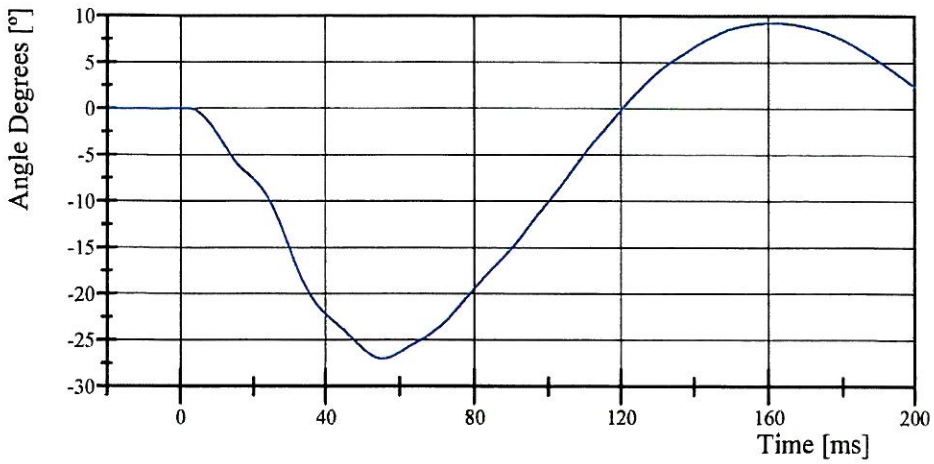
05.18.2009 22:35:21 2957

090519

Transportation Research Center Inc.

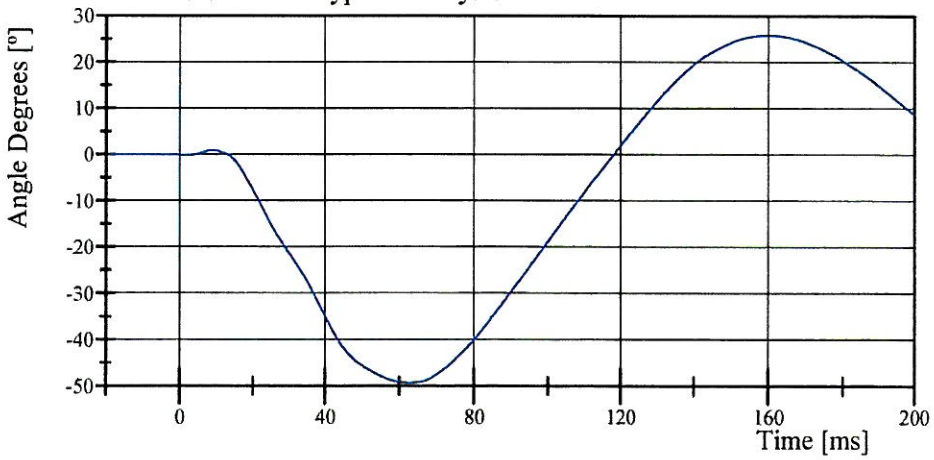
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 1-5
Test Date: 5/18/2009

Pot Rotation at the Base of Neck



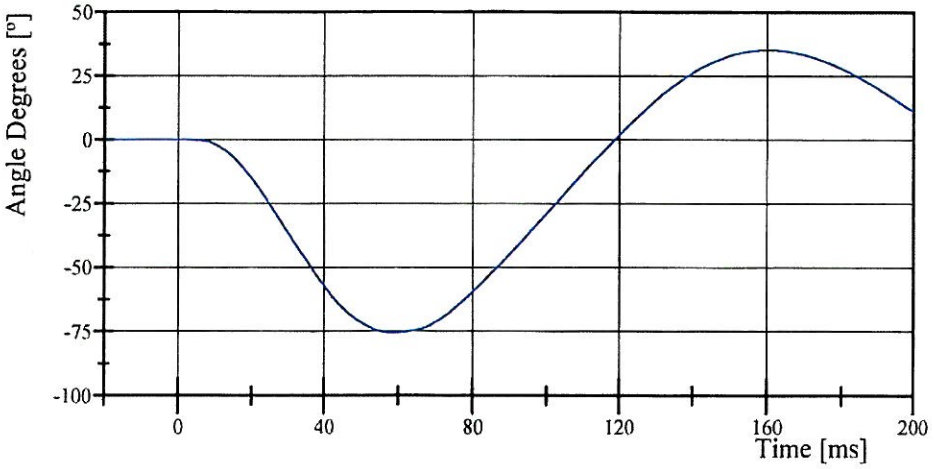
Filter Class: CFC_60
Max: 9.3 ° at 161.2 ms
Min: -27.0 ° at 55.5 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 25.9 ° at 160.0 ms
Min: -49.3 ° at 62.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 35.2 ° at 160.2 ms
Min: -75.6 ° at 58.6 ms

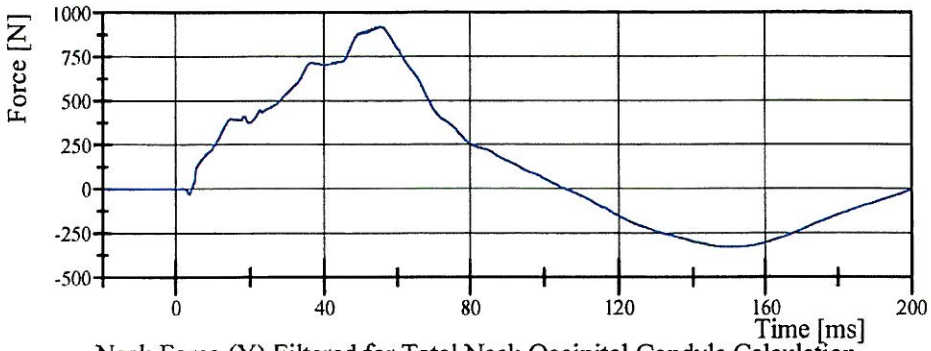
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.18.2009 22:35:22 2957

Transportation Research Center Inc.

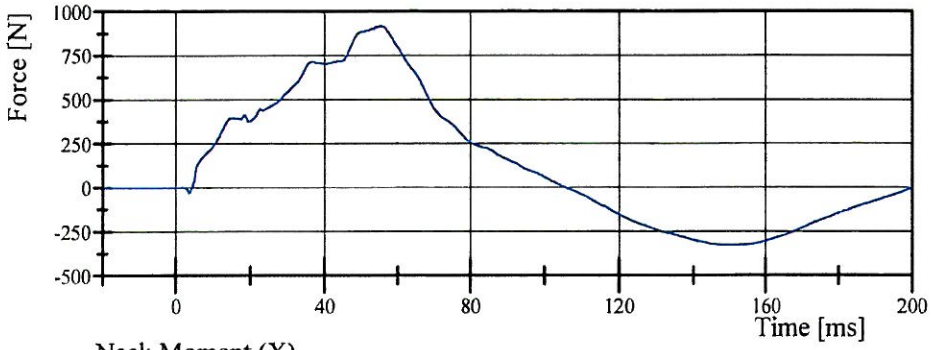
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 1-5
Test Date: 5/18/2009

Neck Force (Y)



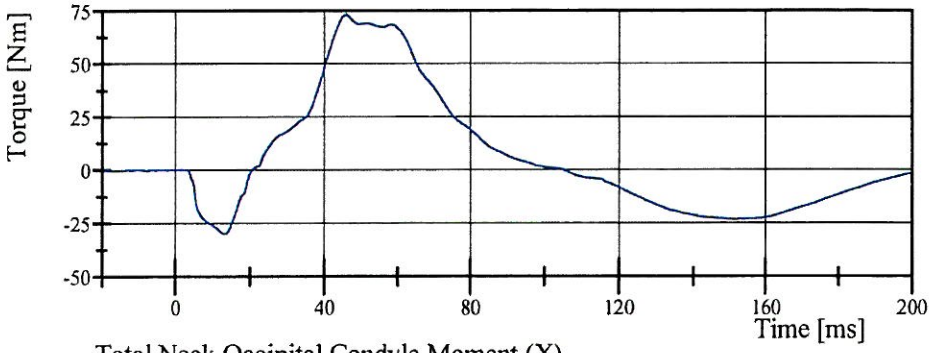
Filter Class: CFC_1000
Max: 918.9 N at 55.1 ms
Min: -328.0 N at 149.2 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyle Calculation



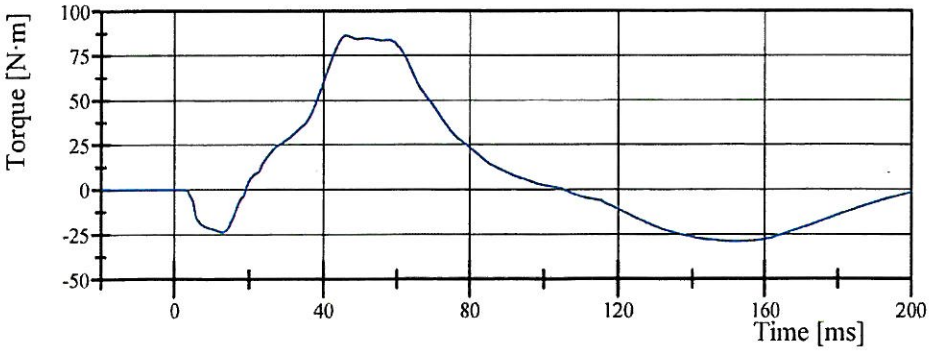
Filter Class: CFC_600
Max: 918.7 N at 55.4 ms
Min: -327.5 N at 149.3 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 73.4 Nm at 45.9 ms
Min: -29.9 Nm at 13.3 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 86.7 N·m at 46.0 ms
Min: -28.9 N·m at 151.2 ms

Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 1-8
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Maximum Force at Test Velocity	3,738 - 4,432 N	3,937.2 N	Yes
Maximum Displacement at Test Velocity	33.36 - 39.56 mm	37.158 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 6.091

Damper Setting: 7.5

Technician Robert Boucher

Approved

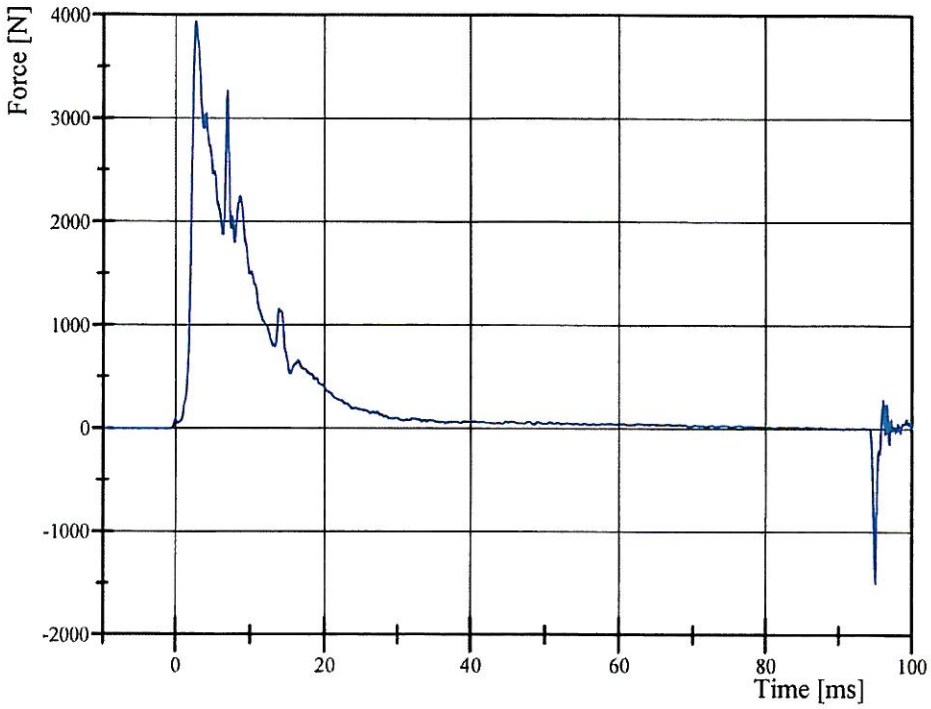
Specification Source: TP214D-07 Appendix A

05.19.2009 10:29:32 1637

Transportation Research Center Inc.

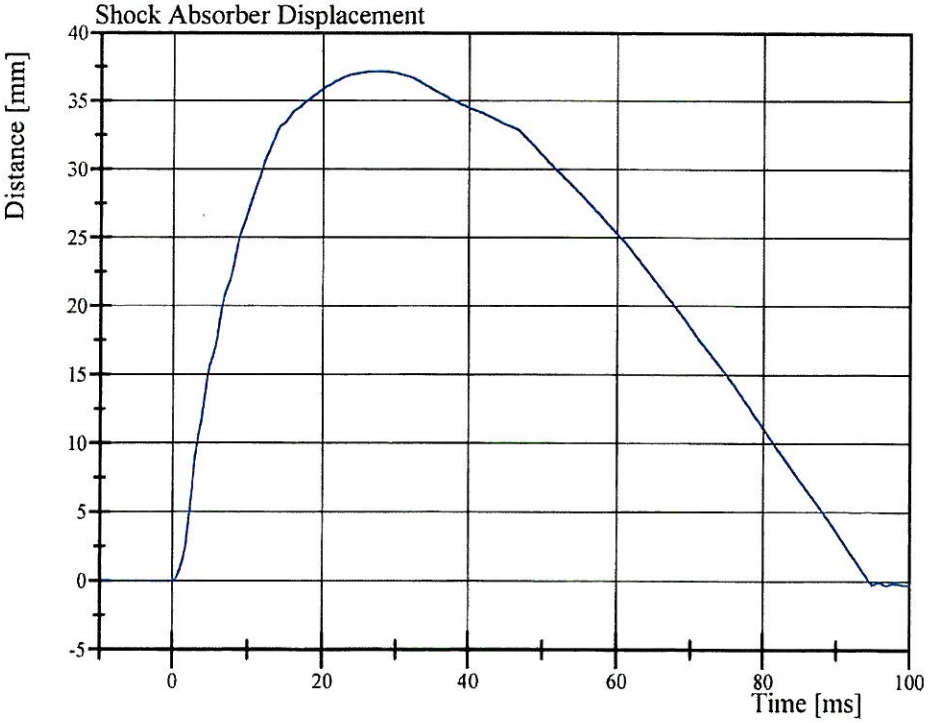
6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 1-8
Test Date: 5/19/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 3,937.2 N at 2.6 ms
Min: -1,497.9 N at 95.1 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 37.2 mm at 26.6 ms
Min: -0.3 mm at 100.0 ms

Specification Source: TP214D-07 Appendix A

05.19.2009 10:29:43 1637

Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 1-2
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Maximum Force at Test Velocity	1,726 - 2,088 N	1,750.2 N	Yes
Maximum Displacement at Test Velocity	31.67 - 37.21 mm	35.777 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 4.257

Damper Setting: 7.5

Technician

Approved

Specification Source: TP214D-07 Appendix A

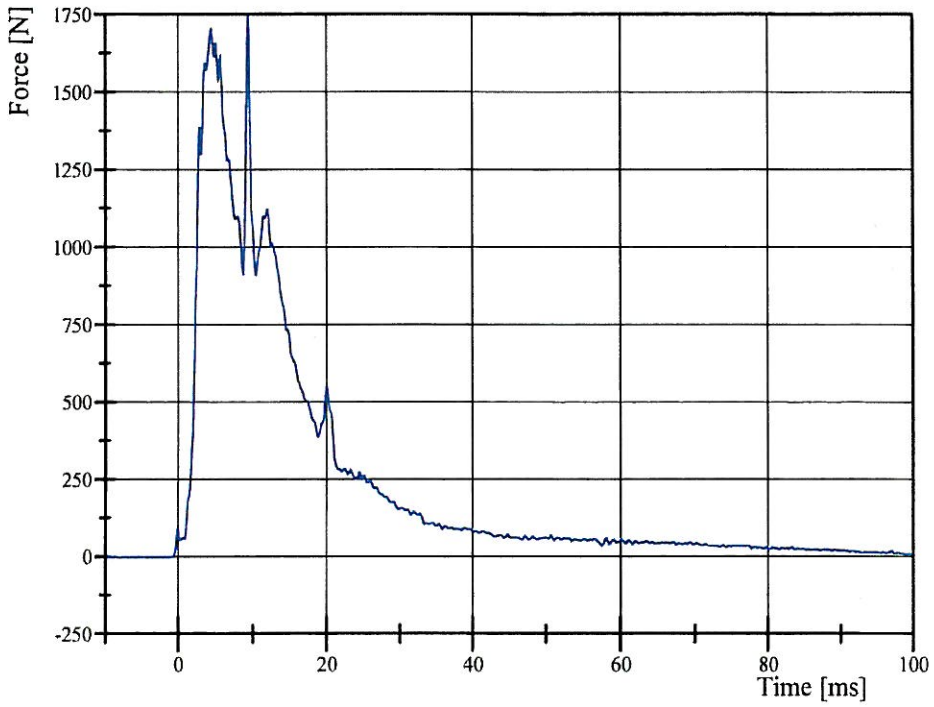
05.19.2009 10:10:45 1812

090519

Transportation Research Center Inc.

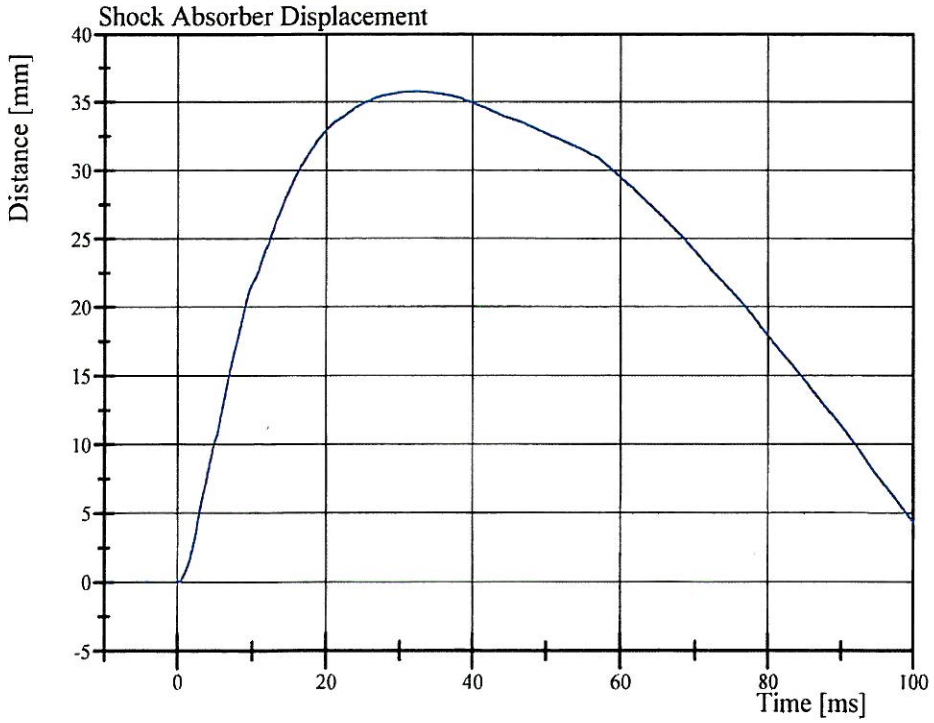
4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 1-2
Test Date: 5/19/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 1,750.2 N at 9.4 ms
Min: -4.1 N at -9.8 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 35.8 mm at 31.9 ms
Min: -0.0 mm at -9.7 ms

Specification Source: TP214D-07 Appendix A

05.19.2009 10:10:55 1812

Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 1-1
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Maximum Force at Test Velocity	834 - 1,120 N	874.5 N	Yes
Maximum Displacement at Test Velocity	30.15 - 35.12 mm	33.986 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 3.039

Damper Setting: 7.5

Technician

Approved

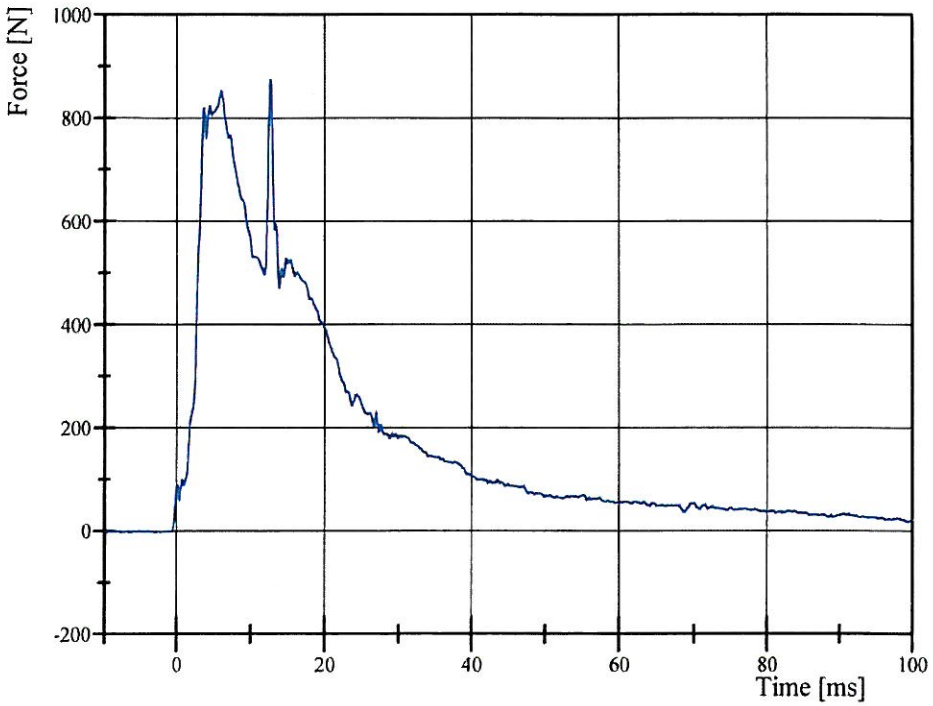
Specification Source: TP214D-07 Appendix A

05.19.2009 10:02:08 2046

Transportation Research Center Inc.

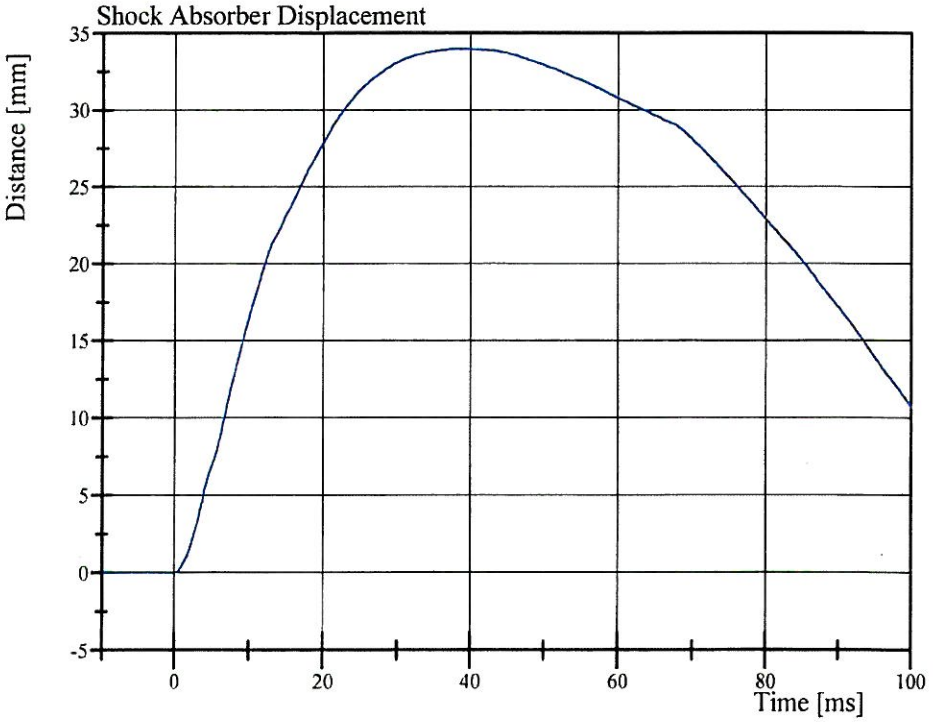
3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 1-1
Test Date: 5/19/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 874.5 N at 12.7 ms
Min: -3.6 N at -6.5 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 34.0 mm at 38.5 ms
Min: -0.0 mm at -2.0 ms

Specification Source: TP214D-07 Appendix A

05.19.2009 10:02:23 2046

Transportation Research Center Inc.

Left Lateral Thorax
SID-HIII Serial No. 001 Certification No. 1-2
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.328 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	40.2 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	39.9 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	19.6 g	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

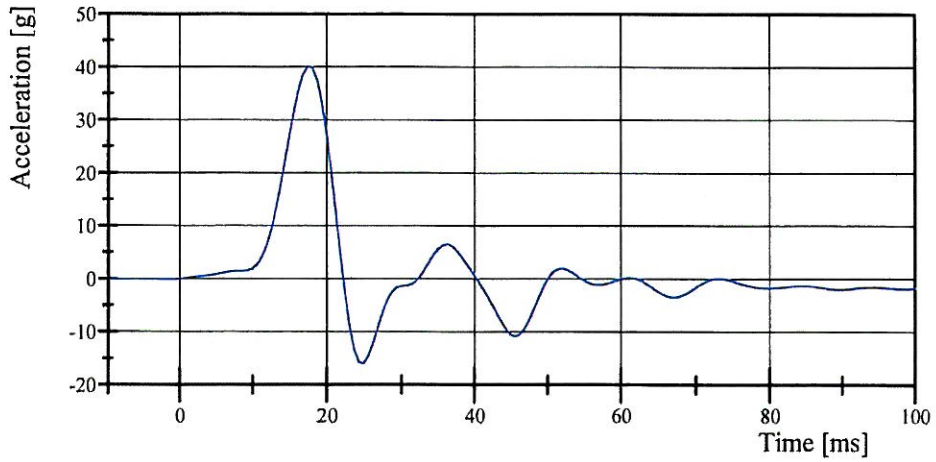
05.19.2009 10:58:48 556

090519

Transportation Research Center Inc.

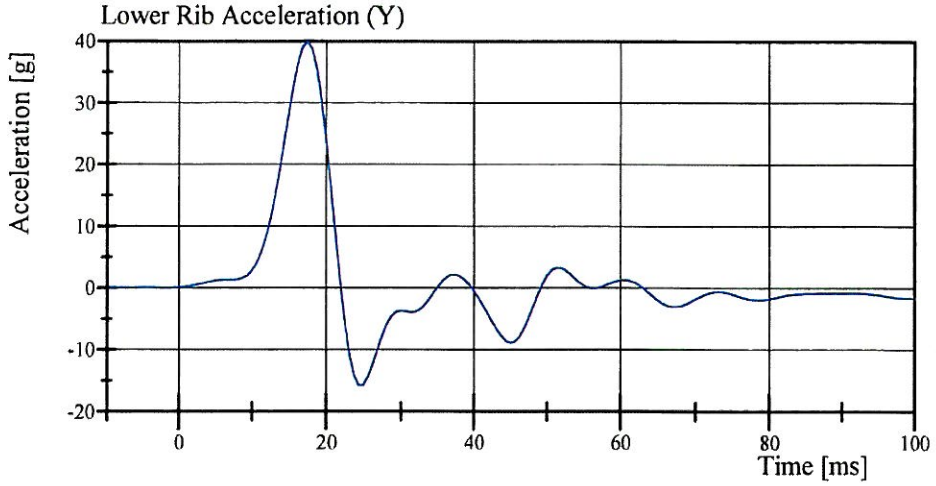
Left Lateral Thorax
SID-HIII Serial No. 001 Certification No. 1-2
Test Date: 5/19/2009

Upper Rib Acceleration (Y)



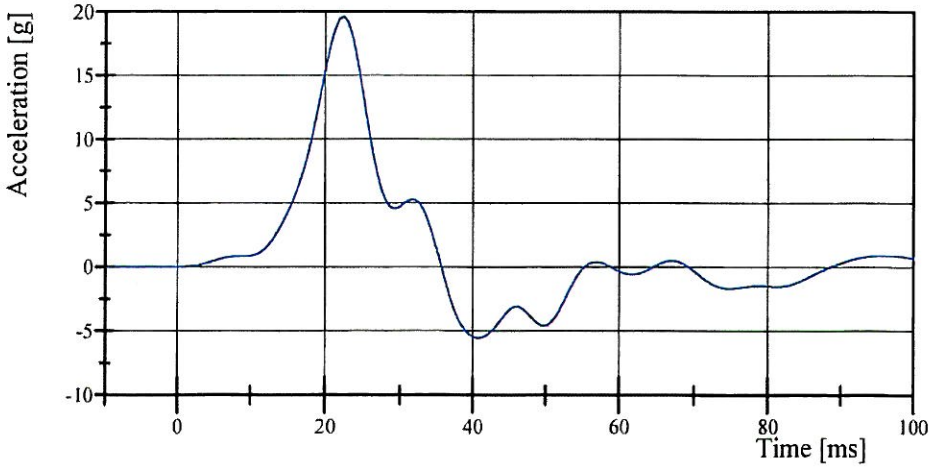
Filter Class: FIR_100
Max: 40.2 g at 17.5 ms
Min: -16.0 g at 25.0 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 39.9 g at 17.4 ms
Min: -15.7 g at 24.4 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 19.6 g at 22.5 ms
Min: -5.5 g at 40.6 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.19.2009 10:59:28 556

090519

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 001 Certification No. 1-18
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.633 mm/s	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

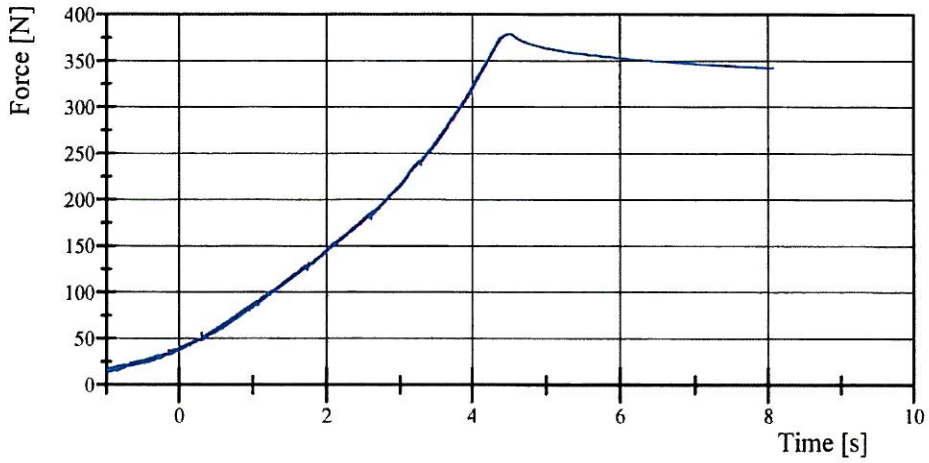
05.19.2009 09:44:25 24843

090519

Transportation Research Center Inc.

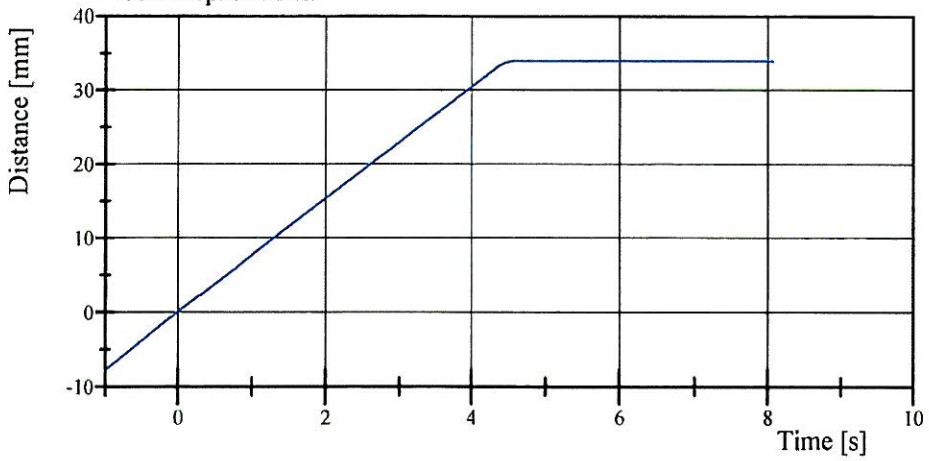
Abdomen Compression
SID-HIII Serial No. 001 Certification No. 1-18
Test Date: 5/19/2009

Probe Force



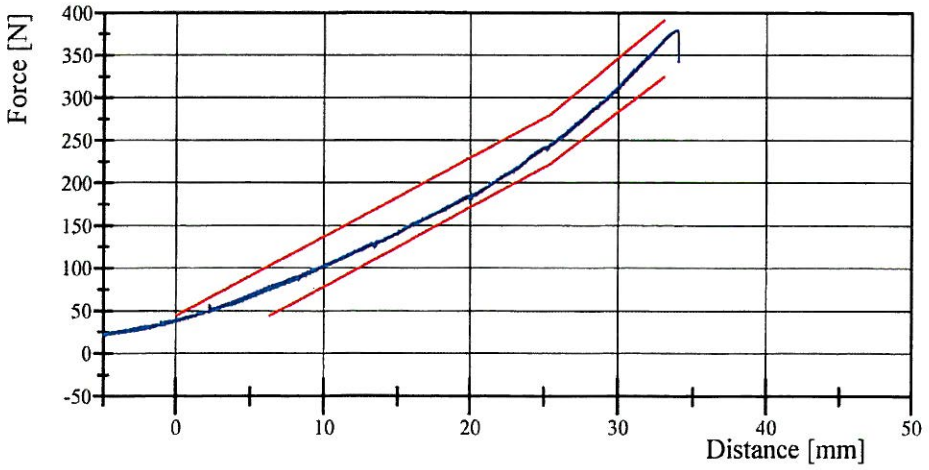
Filter Class: CFC_600
Max: 379.4 N at 4.5 s
Min: 13.8 N at -1.0 s

Probe Displacement



Filter Class: CFC_180
Max: 34.0 mm at 8.1 s
Min: -7.8 mm at -1.0 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 379.4 N at 33.9 mm
Min: -1.5 N at -15.6 mm

Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

05.19.2009 09.45:30 24843

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 18-May-09

TRC, INC. **TEST NO: TOFL-01** **572B SN 001 TORSO FLEX CAL 01**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.4 °C
RELATIVE HUMIDITY	10 – 70 %	22 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	130 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	196 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	228 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6.5 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Paul Berendo

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 001 Certification No. 1-1
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.33 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.6 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	41.8 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test does not meet specifications.

Comments:

Technician Robert Boucek

Approved

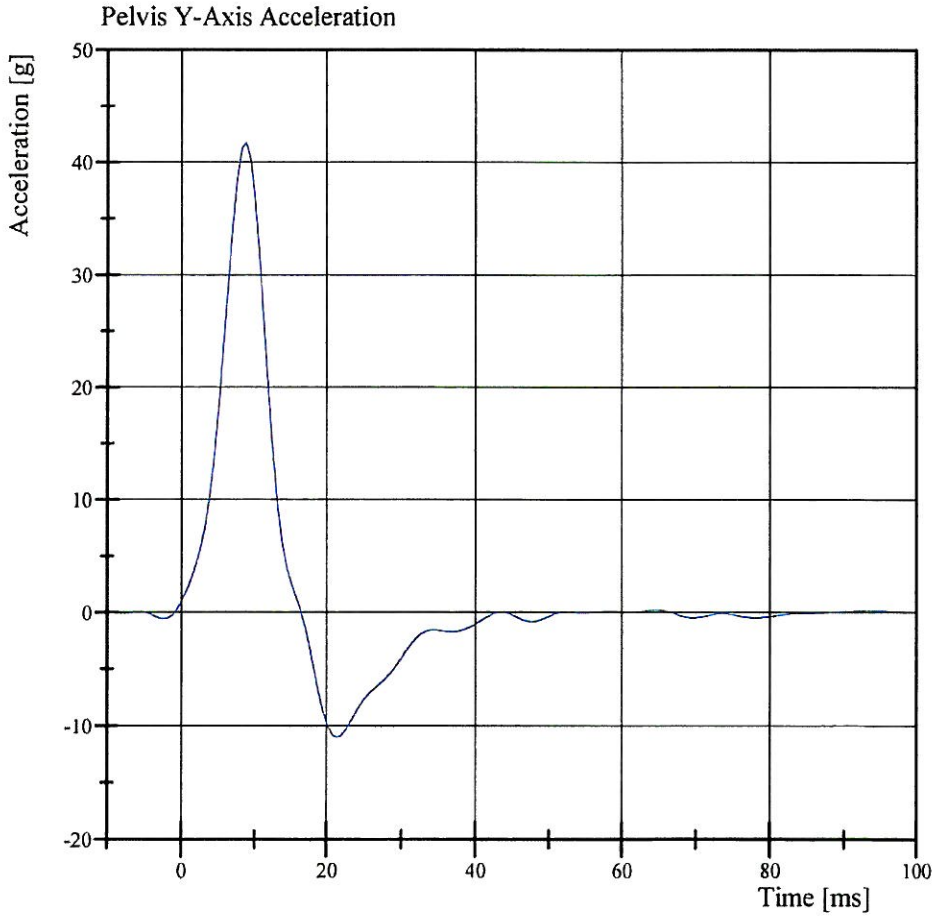
Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

05.19.2009 00:27:45 562

090519

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 001 Certification No. 1-1
Test Date: 5/19/2009



Filter Class: FIR_100
Max: 41.8 g at 8.9 ms
Min: -11.0 g at 21.4 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.19.2009 00:28:29 562

090519

CALIBRATION TEST RESULTS

POST-TEST

SID/HIII: 001

Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 001 Calibration No. 02

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	901 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	515 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	518 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	496 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	382 mm	Yes
Top Rib Width From C\L	RW-1	165.1 - 180.3 mm	176 mm	Yes
Bottom Rib Width From C\L	RW-2	165.1 - 180.3 mm	176 mm	Yes
Difference Between Top & Bottom Rib Width from C\L		<= 2.5 mm	0.0 mm	Yes

Technician

Approved

Transportation Research Center Inc.

Left Lateral Head Drop
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	143.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-3.8 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

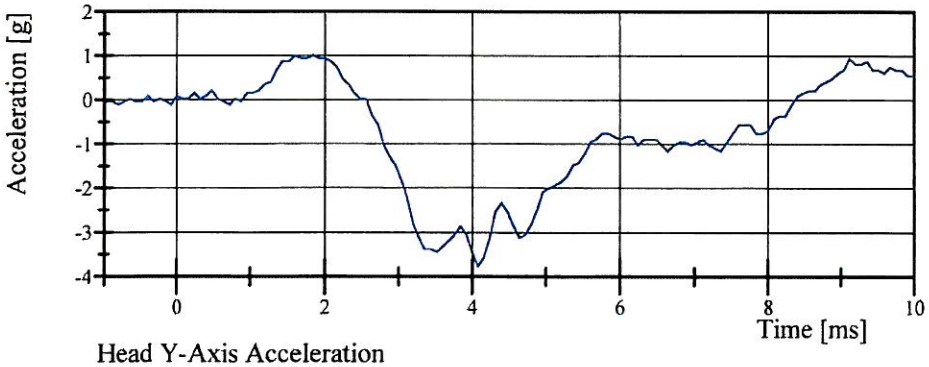
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.02.2009 08:53:20 607

Transportation Research Center Inc.

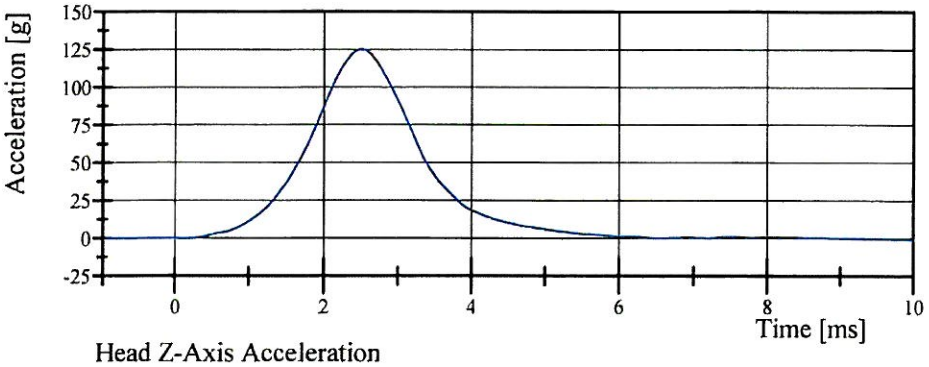
Left Lateral Head Drop
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Head X-Axis Acceleration



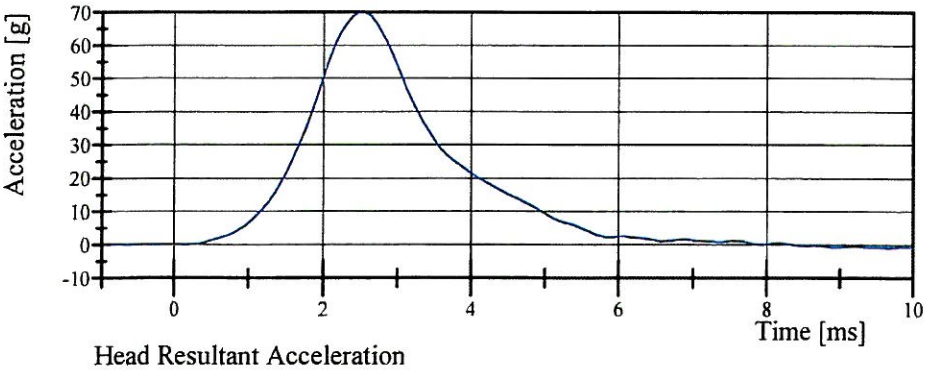
Filter Class: CFC_1000
Max: 1.0 g at 1.6 ms
Min: -3.8 g at 4.1 ms

Head Y-Axis Acceleration



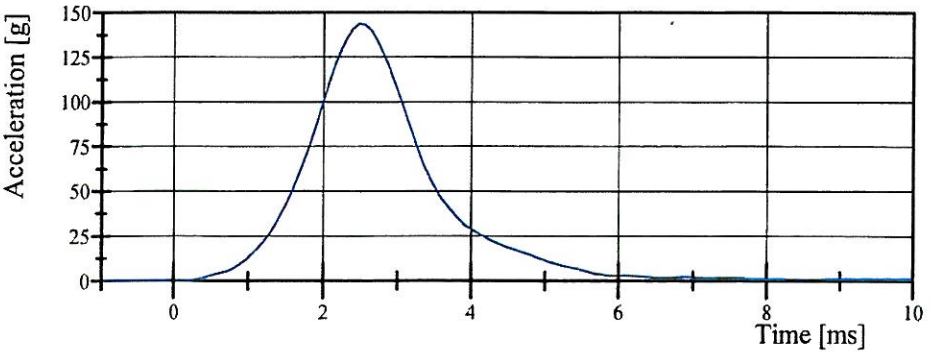
Filter Class: CFC_1000
Max: 125.2 g at 2.5 ms
Min: -0.8 g at 10.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 69.8 g at 2.5 ms
Min: -0.9 g at 9.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 143.4 g at 2.5 ms
Min: 0.0 g at 0.1 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.02.2009 08:53:26 607

Transportation Research Center Inc.

Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.941 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.396 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.752 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.585 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.229 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-74.4 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	61.3 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	84.4 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	56.0 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	10.6 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

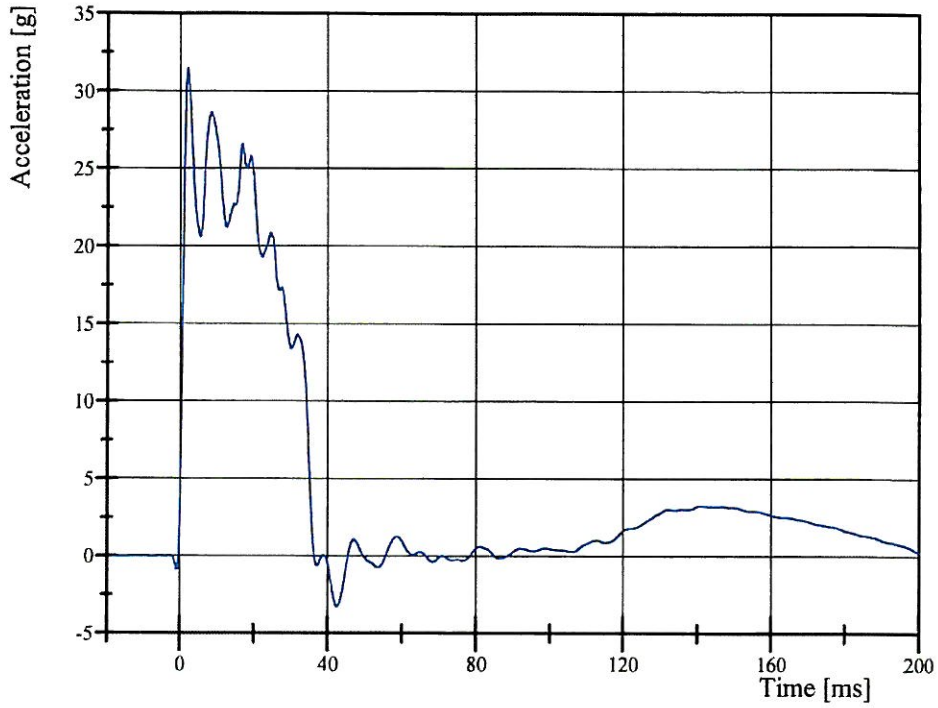
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.02.2009 13:18:55 2973

Transportation Research Center Inc.

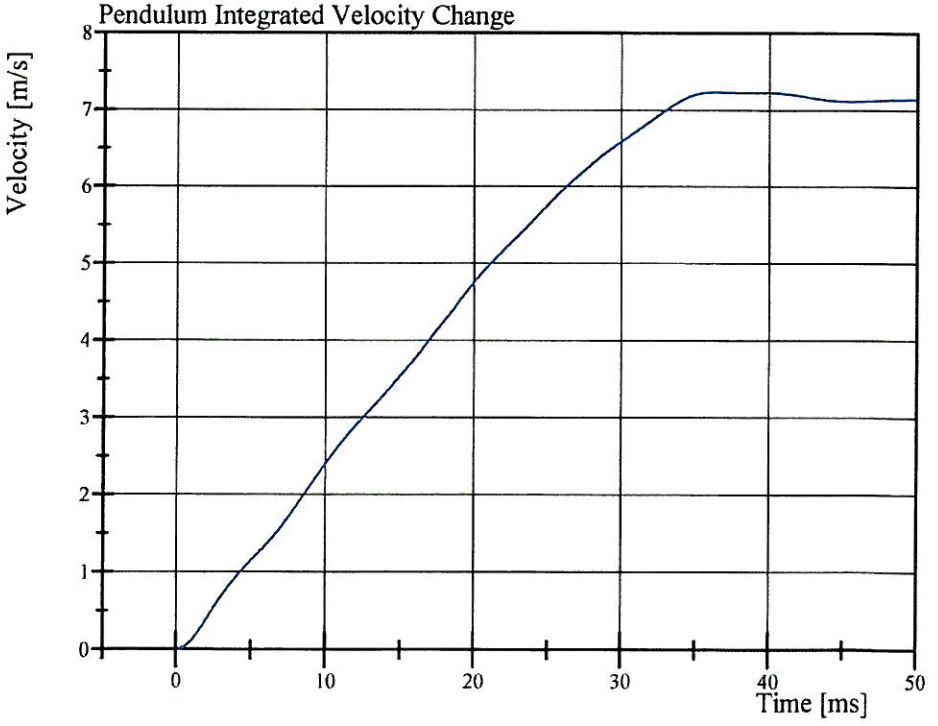
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Pendulum Acceleration



Filter Class: CFC_180
Max: 31.4 g at 2.1 ms
Min: -3.3 g at 42.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.2 m/s at 36.3 ms
Min: 0.0 m/s at 0.0 ms

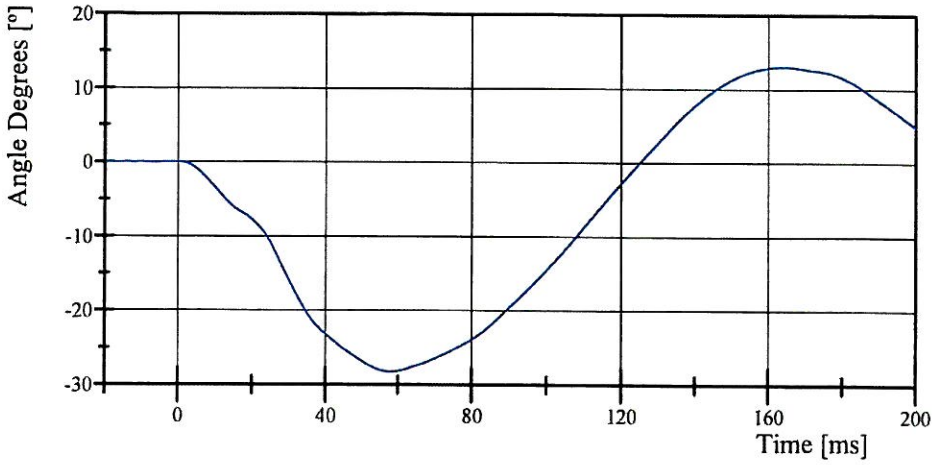
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.02.2009 13:19:02 2973

Transportation Research Center Inc.

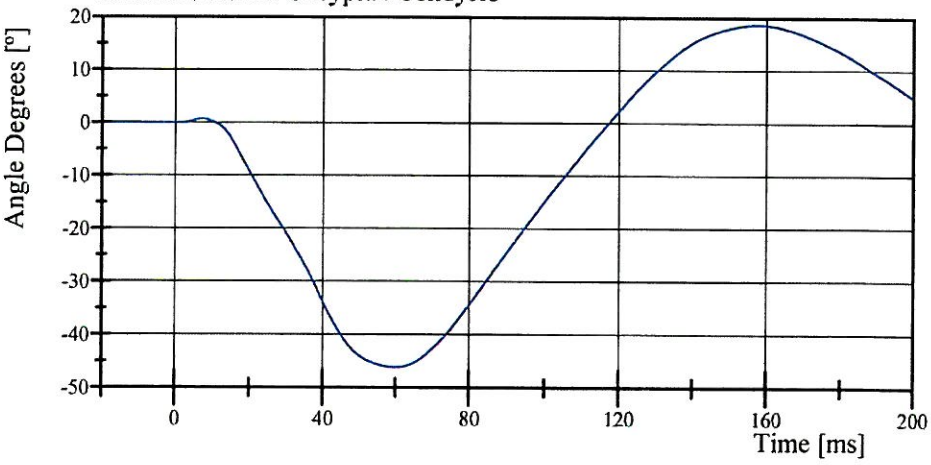
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Pot Rotation at the Base of Neck



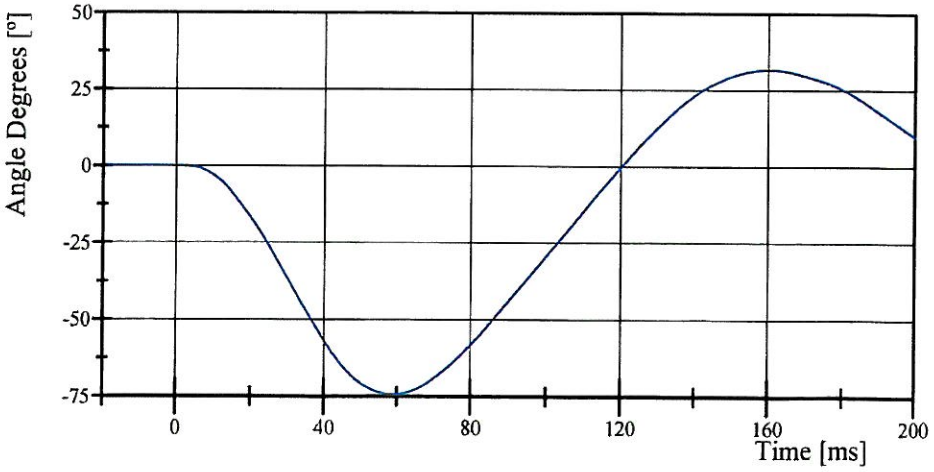
Filter Class: CFC_60
Max: 13.0 ° at 164.0 ms
Min: -28.2 ° at 58.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 18.7 ° at 157.7 ms
Min: -46.2 ° at 60.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 31.5 ° at 160.6 ms
Min: -74.4 ° at 59.0 ms

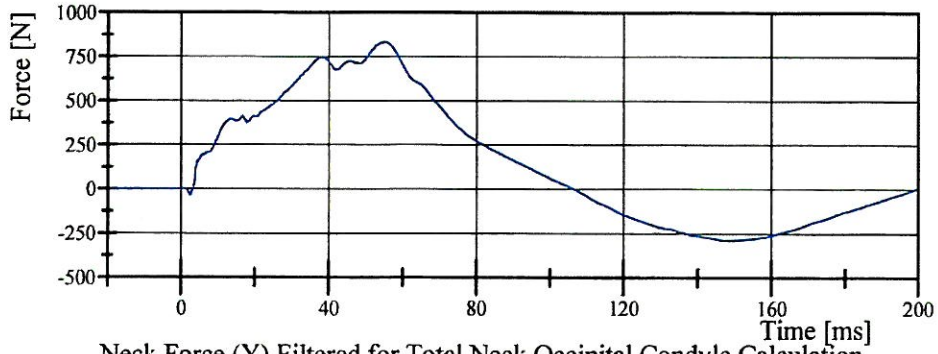
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.02.2009 13:19:03 2973

Transportation Research Center Inc.

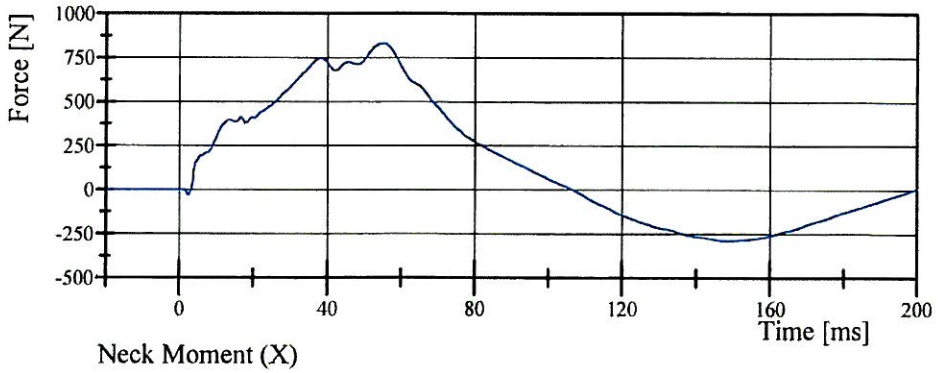
Left Lateral Neck
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Neck Force (Y)



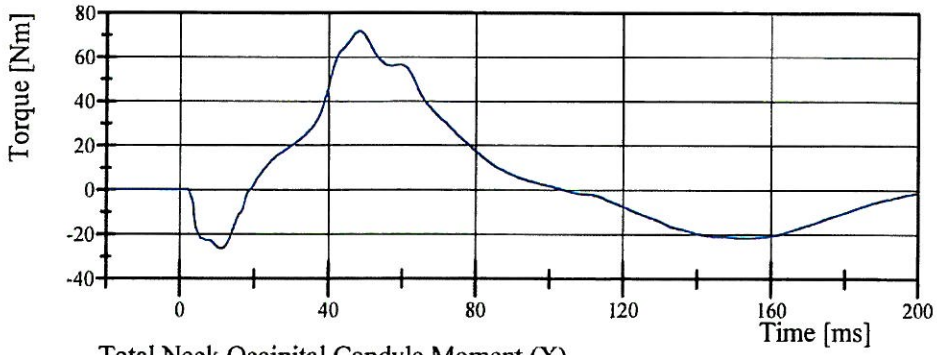
Filter Class: CFC_1000
Max: 832.7 N at 55.0 ms
Min: -289.6 N at 147.8 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyle Calculation



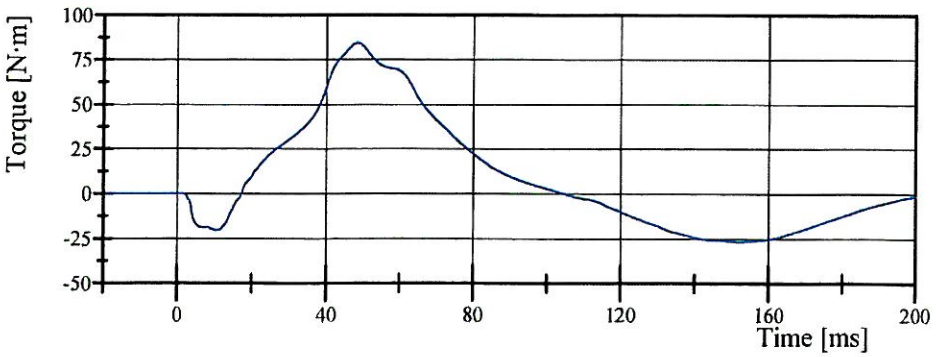
Filter Class: CFC_600
Max: 832.0 N at 55.1 ms
Min: -289.4 N at 147.8 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 71.8 Nm at 48.4 ms
Min: -26.6 Nm at 11.3 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 84.4 N·m at 48.4 ms
Min: -26.7 N·m at 152.2 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.02.2009 13:19:04 2973

Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 2-2
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Maximum Force at Test Velocity	3,745 - 4,439 N	4,378.4 N	Yes
Maximum Displacement at Test Velocity	33.36 - 39.57 mm	39.008 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 6.096

Damper Setting: 7.5

Technician

Approved

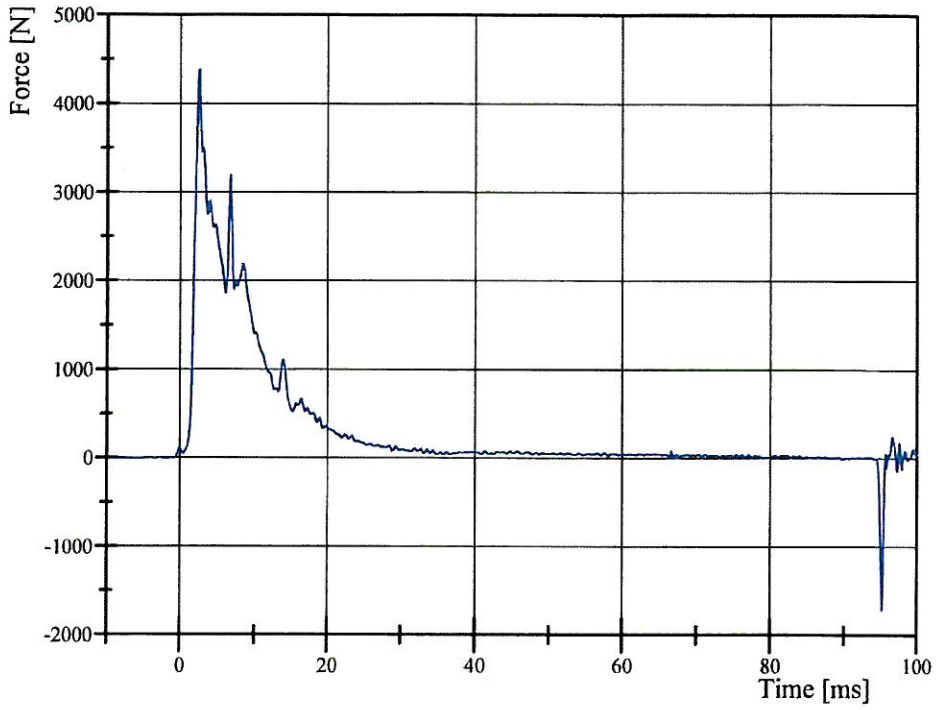
Specification Source: TP214D-07 Appendix A

06.04.2009 08:09:39 1616

Transportation Research Center Inc.

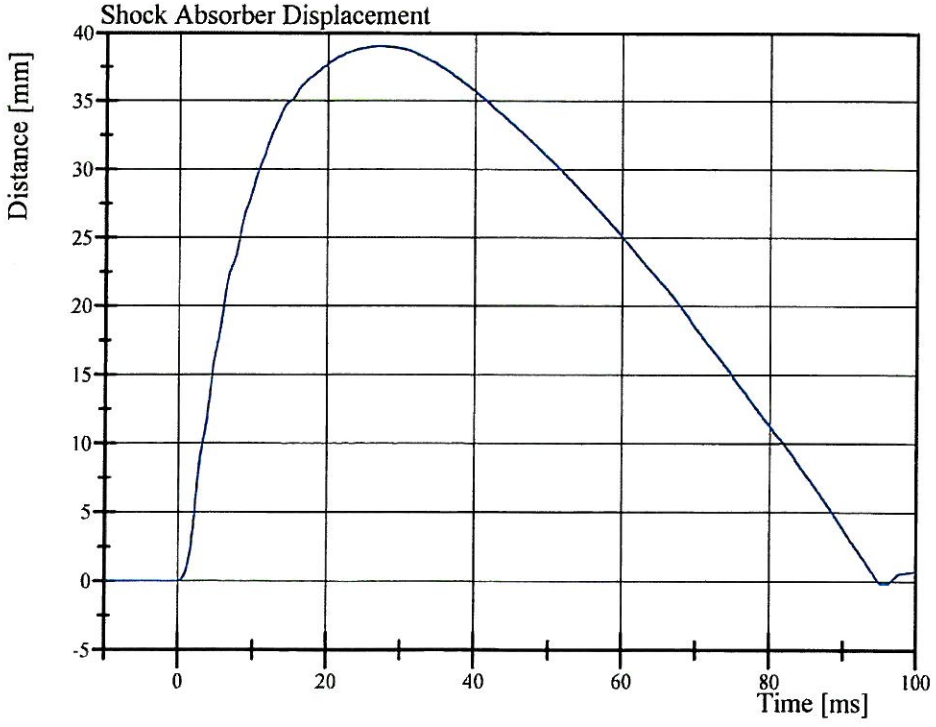
6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 2-2
Test Date: 6/4/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 4,378.4 N at 2.5 ms
Min: -1,713.7 N at 95.3 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 39.0 mm at 27.0 ms
Min: -0.2 mm at 95.3 ms

Specification Source: TP214D-07 Appendix A

06.04.2009 08:09:46 1616

Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 2-6
Test Date: 6/4/2009

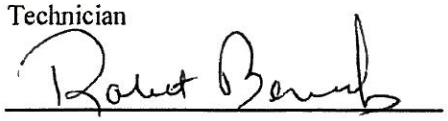
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Maximum Force at Test Velocity	1,742 - 2,106 N	1,780.4 N	Yes
Maximum Displacement at Test Velocity	31.69 - 37.24 mm	37.066 mm	Yes

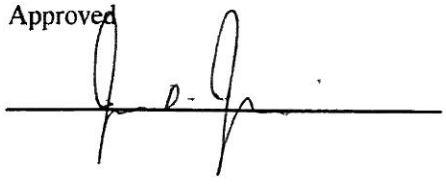
Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 4.276

Damper Setting: 7.5

Technician 

Approved 

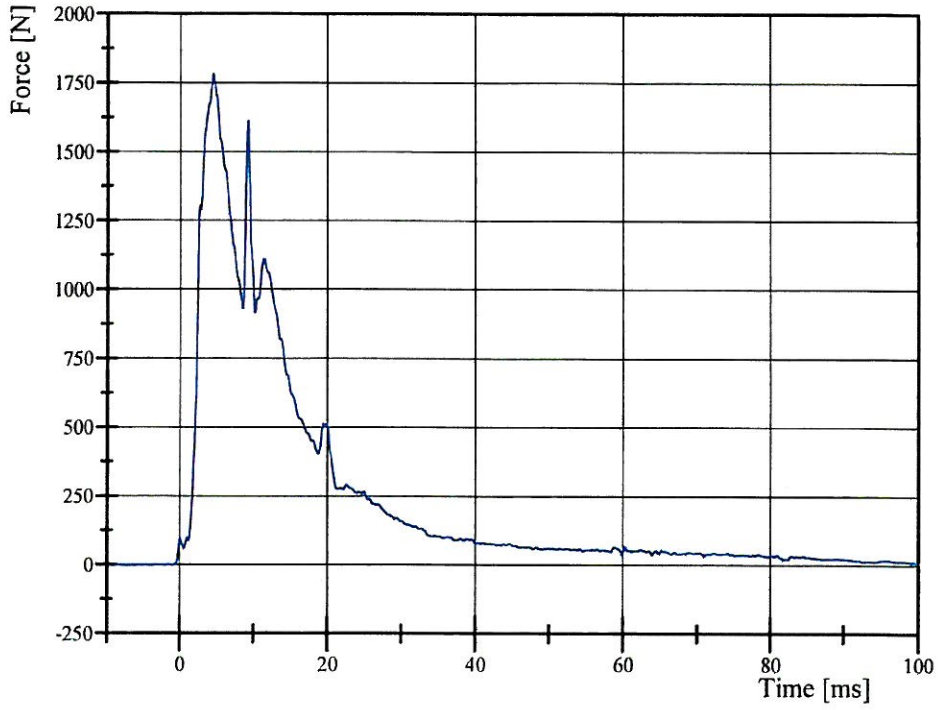
Specification Source: TP214D-07 Appendix A

06.04.2009 07:57:16 1778

Transportation Research Center Inc.

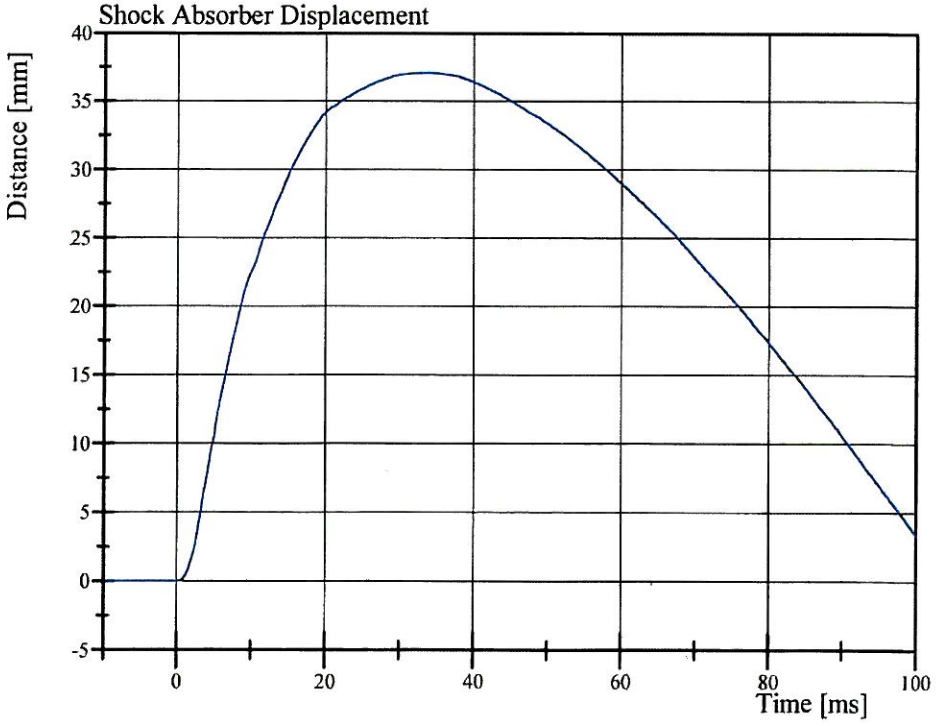
4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 2-6
Test Date: 6/4/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 1,780.4 N at 4.6 ms
Min: -3.6 N at -9.0 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 37.1 mm at 33.8 ms
Min: -0.0 mm at -6.5 ms

Specification Source: TP214D-07 Appendix A

06.04.2009 07:57:31 1778

Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Maximum Force at Test Velocity	834 - 1,120 N	874.8 N	Yes
Maximum Displacement at Test Velocity	30.15 - 35.12 mm	34.856 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 3.038

Damper Setting: 7.5

Technician

Approved

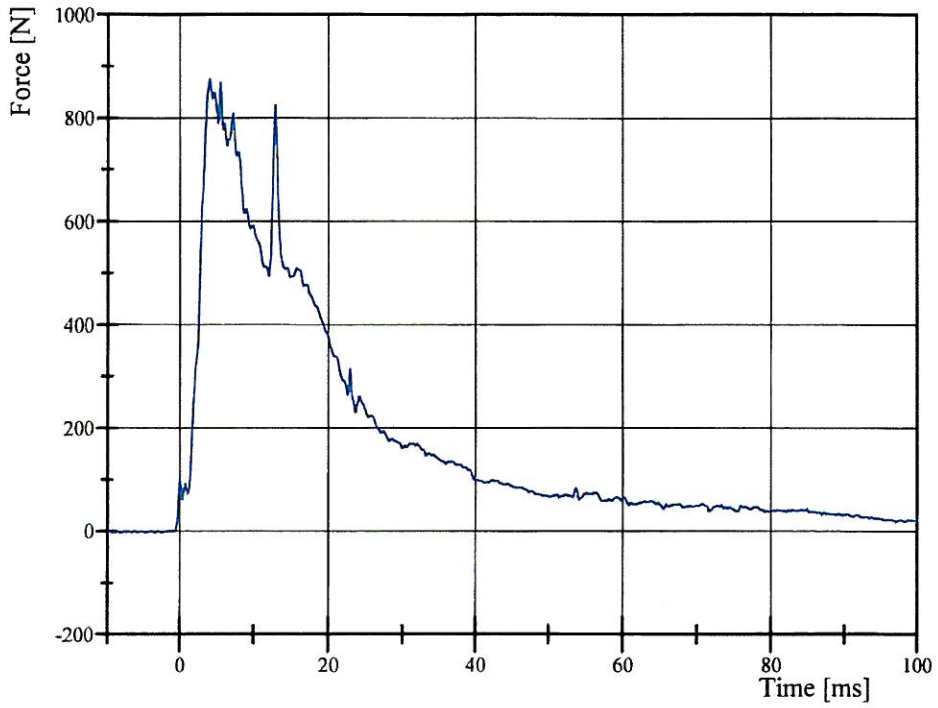
Specification Source: TP214D-07 Appendix A

06.02.2009 14:28:44 2036

Transportation Research Center Inc.

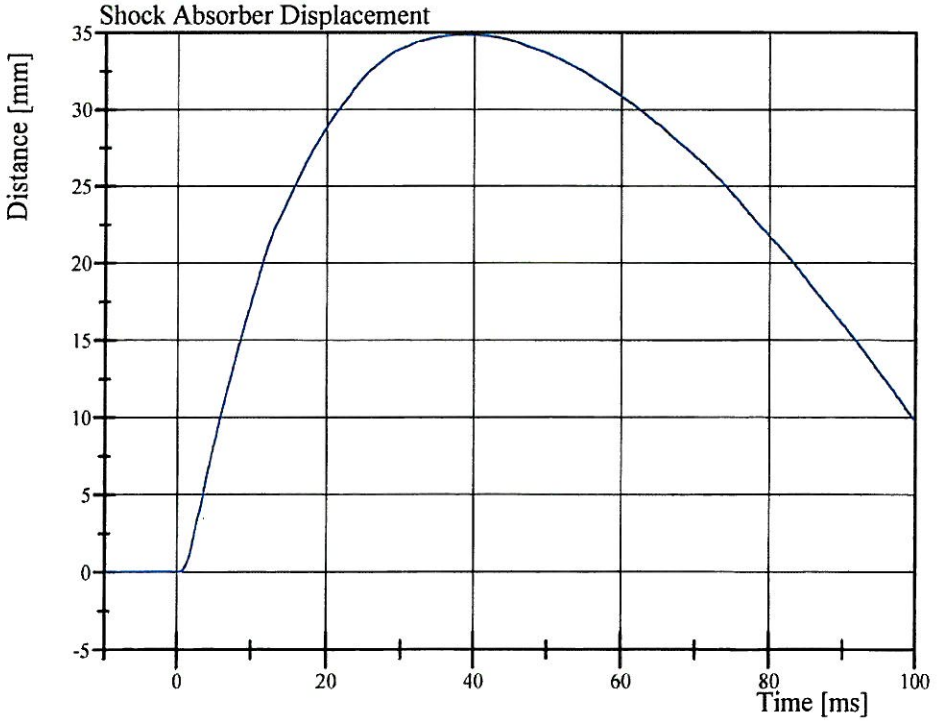
3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 6/2/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 874.8 N at 4.0 ms
Min: -3.7 N at -8.2 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 34.9 mm at 38.5 ms
Min: -0.0 mm at -9.9 ms

Specification Source: TP214D-07 Appendix A

06.02.2009 14:28:55 2036

Transportation Research Center Inc.

Left Lateral Thorax
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 5/28/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.325 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	40.2 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	38.2 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	18.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

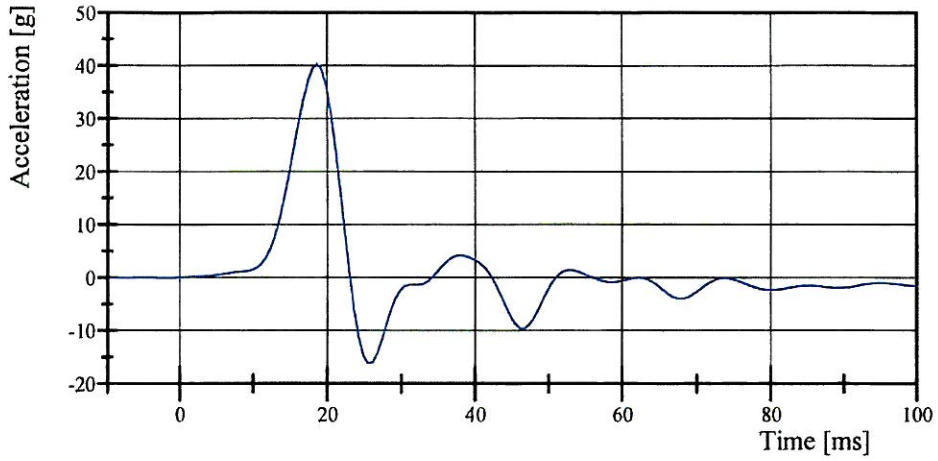
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.28.2009 12:51:54 542

Transportation Research Center Inc.

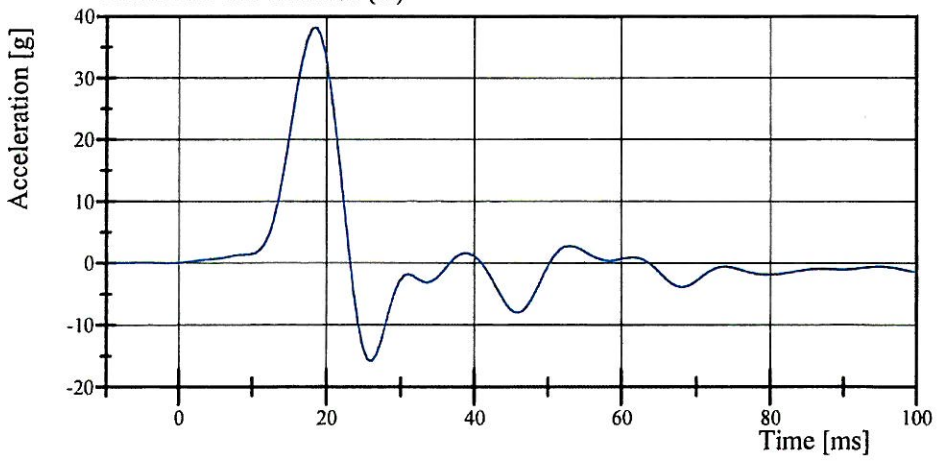
Left Lateral Thorax
SID-HIII Serial No. 001 Certification No. 2-1
Test Date: 5/28/2009

Upper Rib Acceleration (Y)



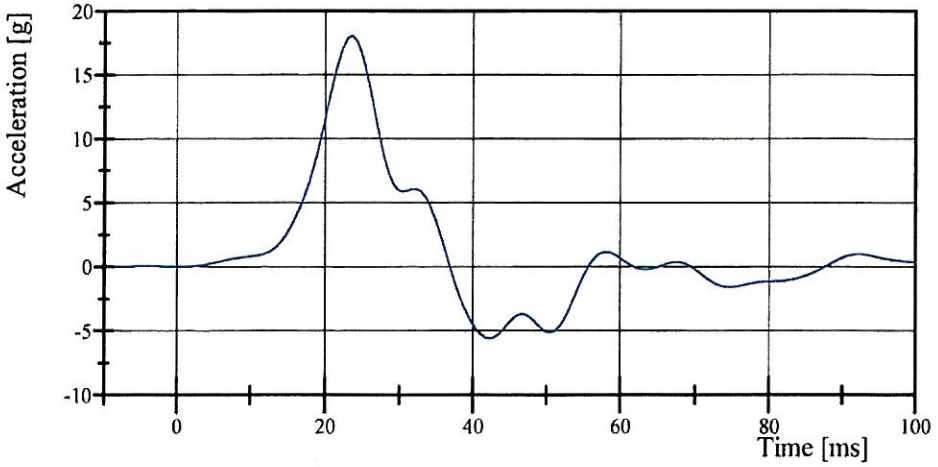
Filter Class: FIR_100
Max: 40.2 g at 18.6 ms
Min: -16.2 g at 25.5 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 38.2 g at 18.6 ms
Min: -15.9 g at 26.1 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 18.0 g at 23.6 ms
Min: -5.6 g at 42.3 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.28.2009 12:52:03 542

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 001 Certification No. 2-2
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.827 mm/s	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

06.04.2009 09:25:04 7090

090519

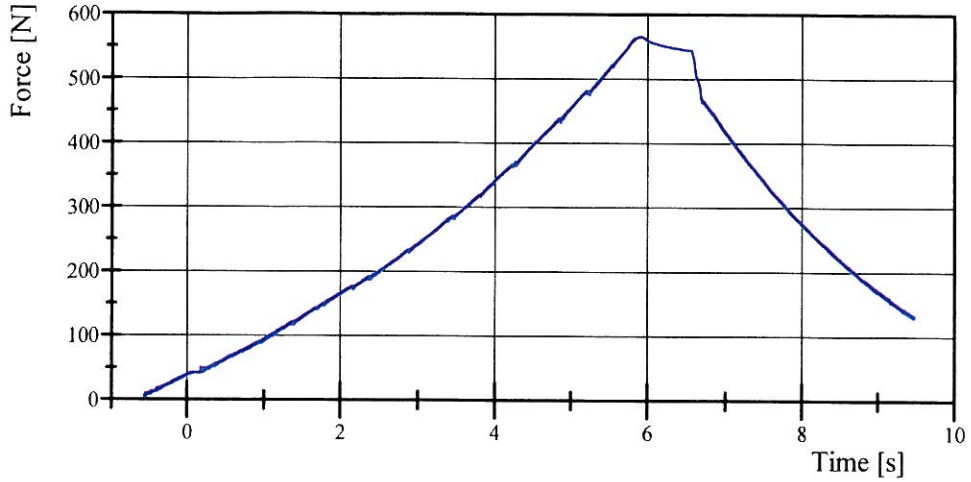
Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 001 Certification No. 2-2

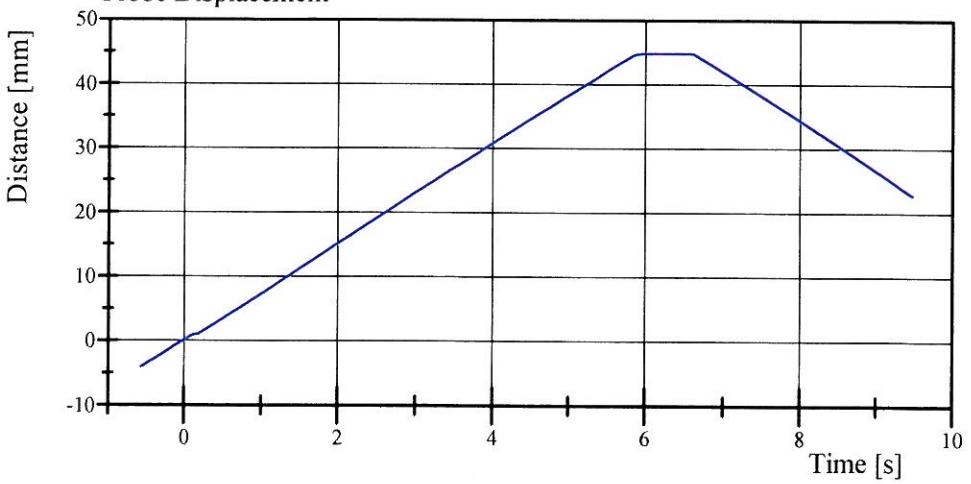
Test Date: 6/4/2009

Probe Force



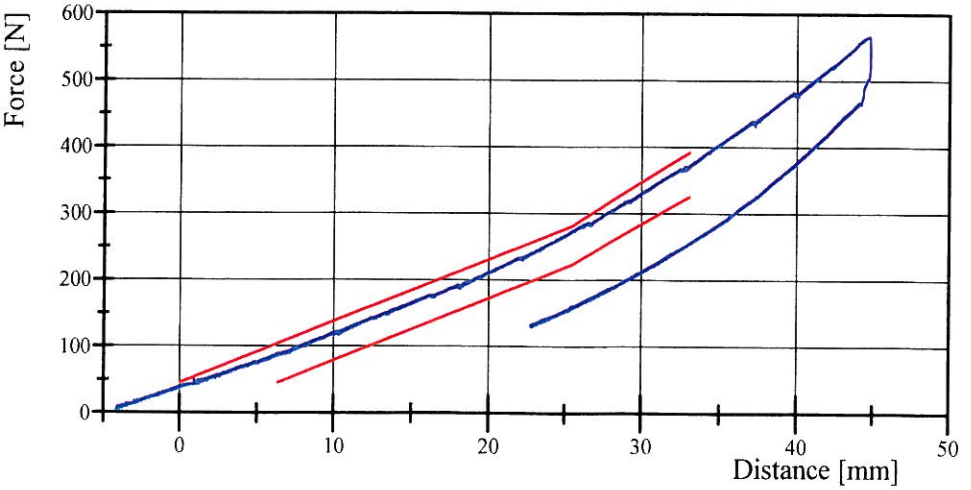
Filter Class: CFC_600
Max: 566.4 N at 5.9 s
Min: 3.5 N at -0.6 s

Probe Displacement



Filter Class: CFC_180
Max: 44.8 mm at 6.3 s
Min: -4.2 mm at -0.6 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 566.4 N at 44.7 mm
Min: 3.5 N at -4.2 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 04-Jun-09

TRC, INC. **TEST NO: TOFL-01** **572B SN 001 TORSO FLEX CAL 02**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	22.0 °C
RELATIVE HUMIDITY	10 – 70 %	43 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	127.5 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	185.0 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	221.5 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5.5 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Robert Bruce

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 001 Certification No. 2-6
Test Date: 6/5/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.330 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.2 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	50.5 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

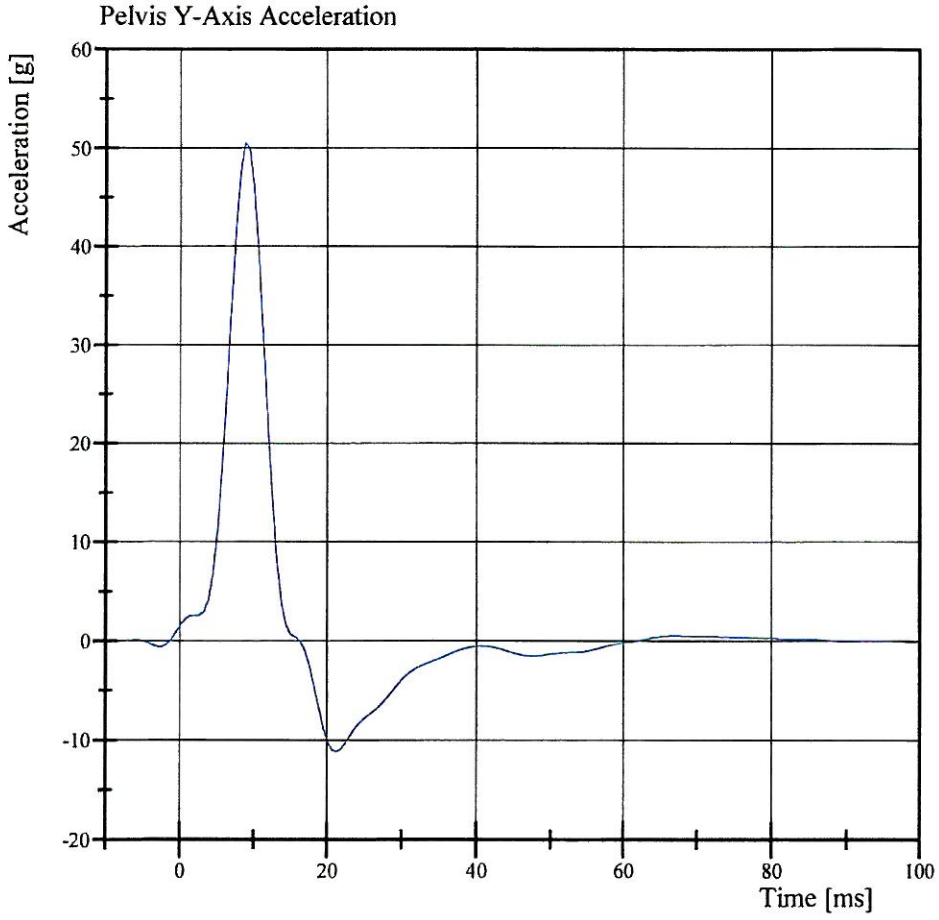
Approved

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.05.2009 09:58:41 555

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 001 Certification No. 2-6
Test Date: 6/5/2009



Filter Class: FIR_100
Max: 50.5 g at 8.8 ms
Min: -11.2 g at 21.3 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.05.2009 09:59:29 555

CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII: 002

Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 002 Calibration No. 02

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	905 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	510 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	520 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	500 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	375 mm	Yes
Top Rib Width From C\L	RW-1	165.1 - 180.3 mm	175 mm	Yes
Bottom Rib Width From C\L	RW-2	165.1 - 180.3 mm	175 mm	Yes
Difference Between Top & Bottom Rib Width from C\L		<= 2.5 mm	0.0 mm	Yes

Technician

Approved

Transportation Research Center Inc.

Left Lateral Head Drop
SID-HIII Serial No. 002 Certification No. 2-1
Test Date: 5/18/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	124.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	6.9 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

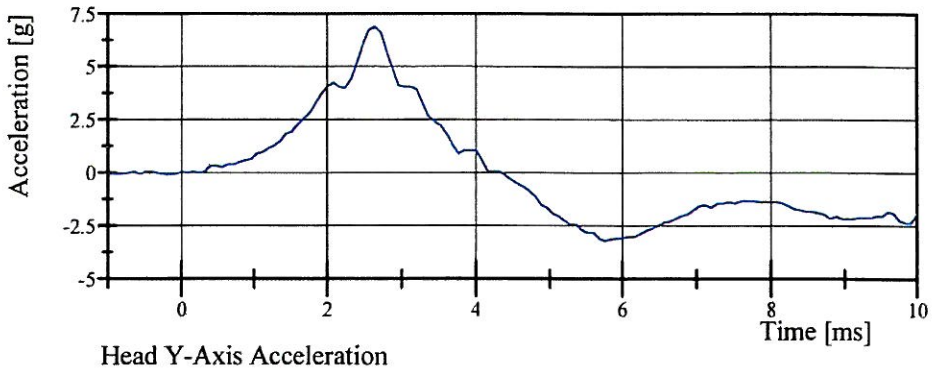
05.18.2009 08:05:18 606

090519

Transportation Research Center Inc.

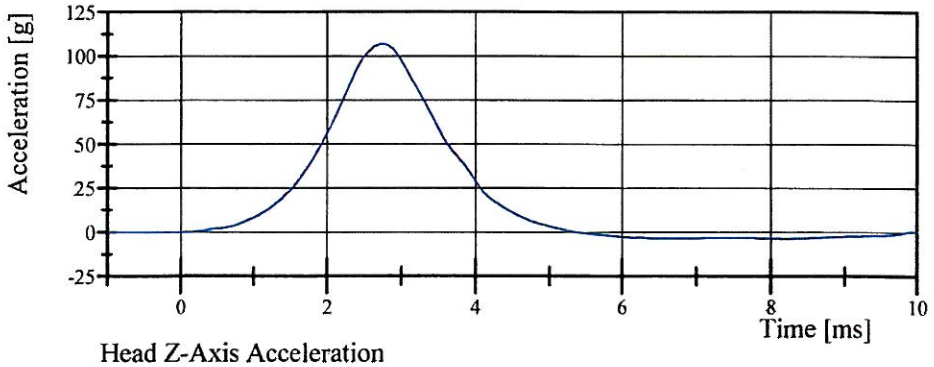
Left Lateral Head Drop
SID-HIII Serial No. 002 Certification No. 2-1
Test Date: 5/18/2009

Head X-Axis Acceleration



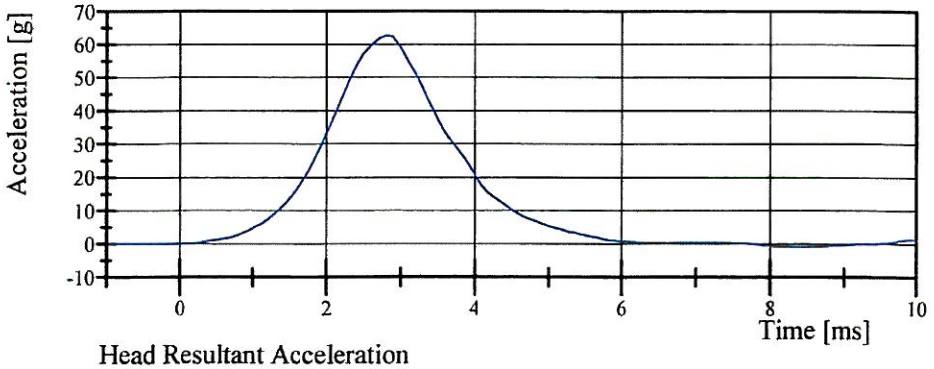
Filter Class: CFC_1000
Max: 6.9 g at 2.6 ms
Min: -3.2 g at 5.8 ms

Head Y-Axis Acceleration



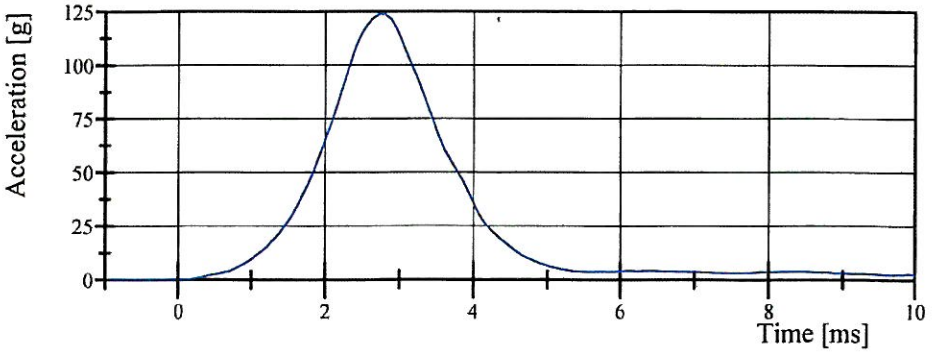
Filter Class: CFC_1000
Max: 107.0 g at 2.7 ms
Min: -3.5 g at 8.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 62.8 g at 2.8 ms
Min: -0.8 g at 8.3 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 124.0 g at 2.8 ms
Min: 0.0 g at -0.3 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.18.2009 08:05:24 606

090519

Transportation Research Center Inc.

Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 2-10
Test Date: 5/18/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	22 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-7.020 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.446 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.897 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.735 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.338 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-73.1 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	59.6 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	84.0 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	53.3 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	10.3 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

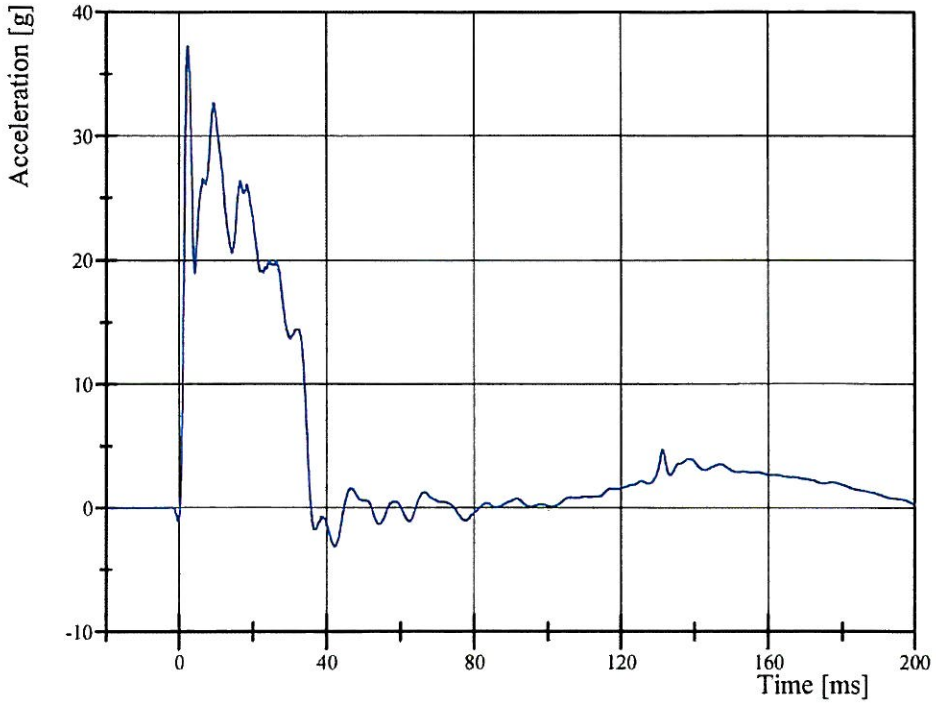
05.18.2009 16:22:13 2962

090519

Transportation Research Center Inc.

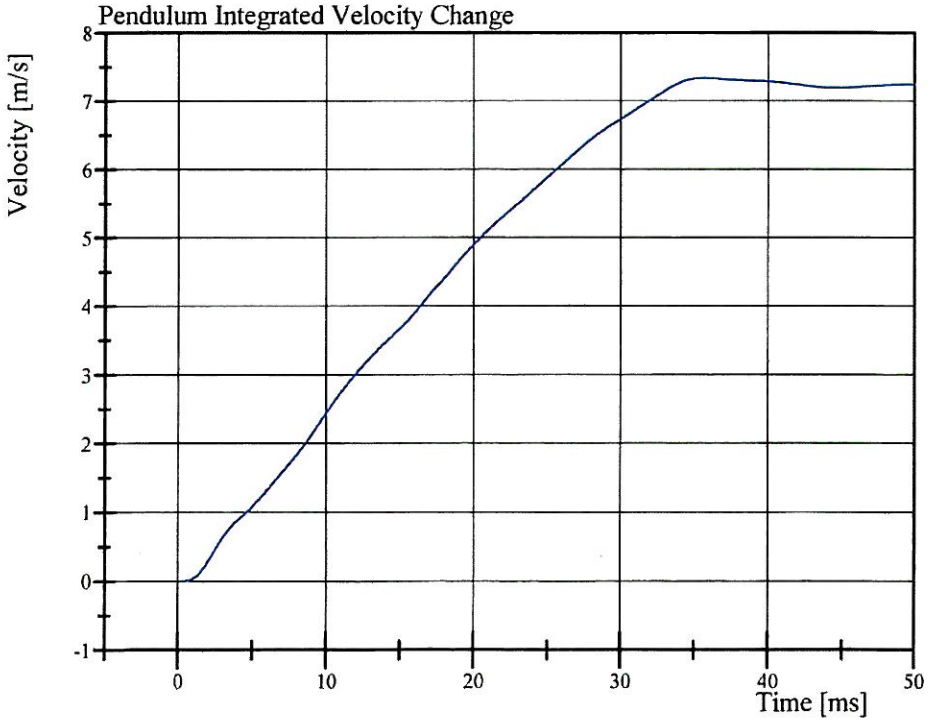
Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 2-10
Test Date: 5/18/2009

Pendulum Acceleration



Filter Class: CFC_180
Max: 37.3 g at 2.3 ms
Min: -3.1 g at 42.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.3 m/s at 35.7 ms
Min: -0.0 m/s at 0.2 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

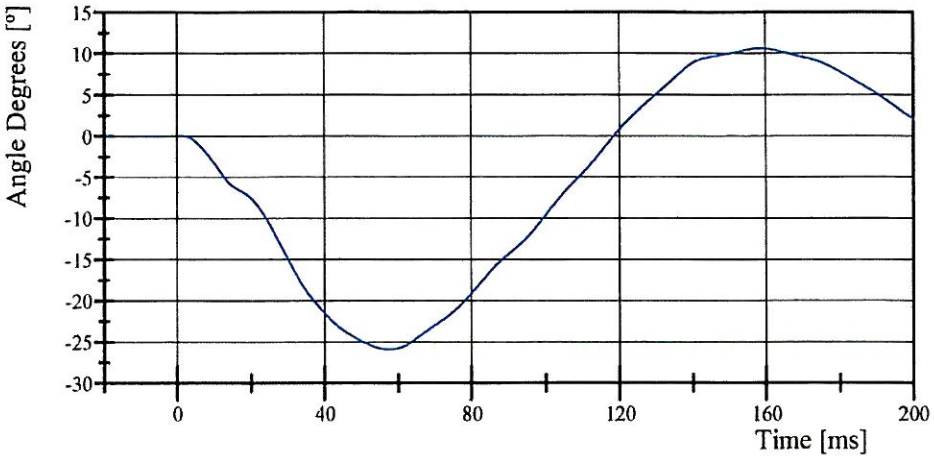
05.18.2009 16:22:20 2962

090519

Transportation Research Center Inc.

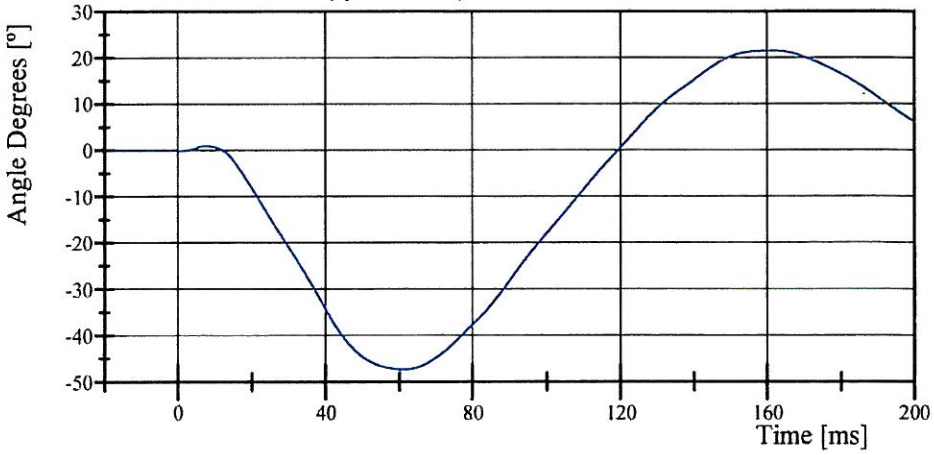
Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 2-10
Test Date: 5/18/2009

Pot Rotation at the Base of Neck



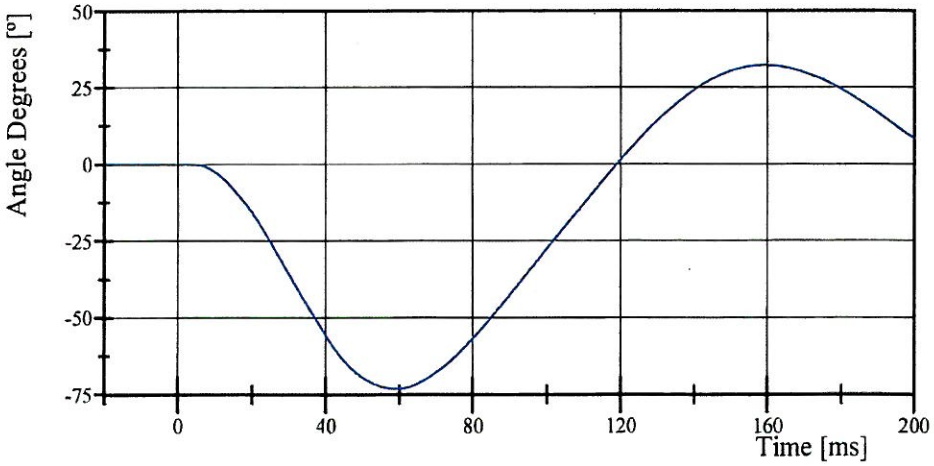
Filter Class: CFC_60
Max: 10.7 ° at 158.5 ms
Min: -25.9 ° at 57.6 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 21.6 ° at 161.0 ms
Min: -47.4 ° at 61.1 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 32.2 ° at 159.3 ms
Min: -73.1 ° at 59.4 ms

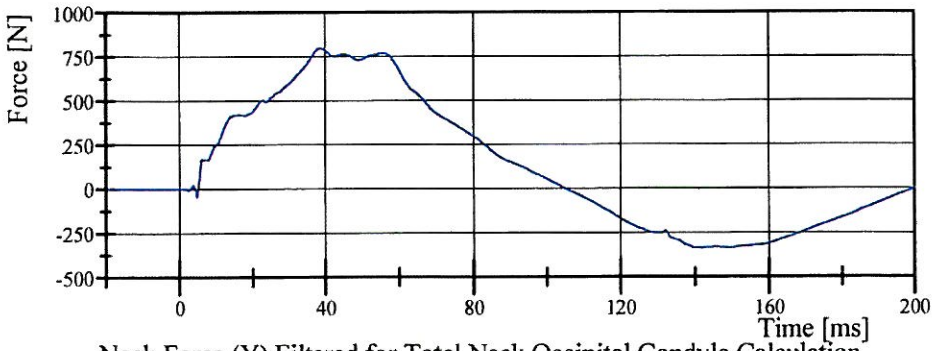
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.18.2009 16:22:20 2962

Transportation Research Center Inc.

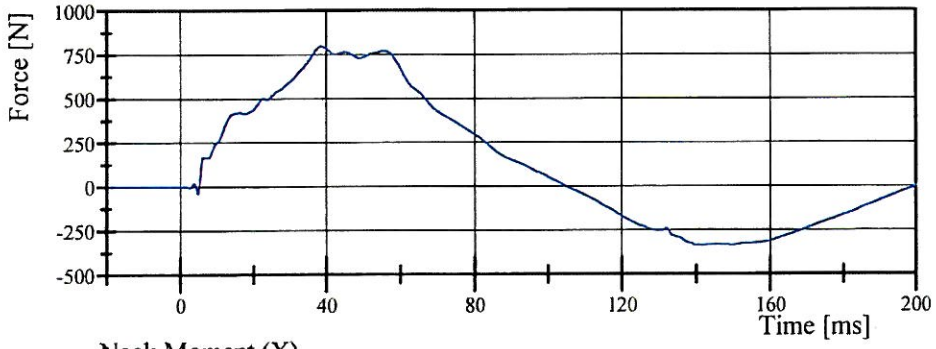
Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 2-10
Test Date: 5/18/2009

Neck Force (Y)



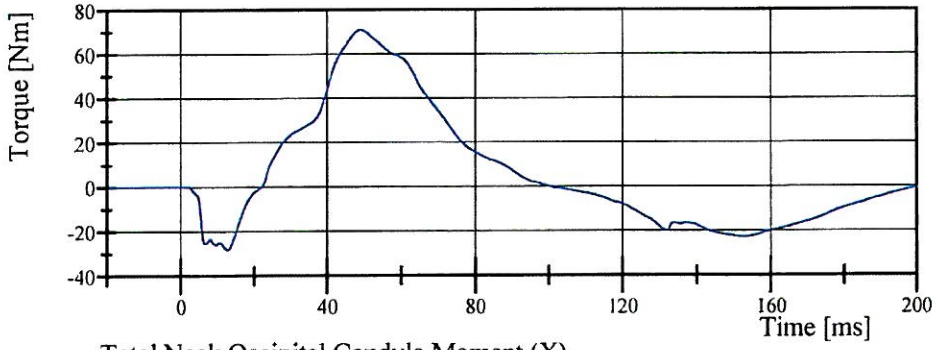
Filter Class: CFC_1000
Max: 799.8 N at 38.6 ms
Min: -335.4 N at 142.0 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyle Calculation



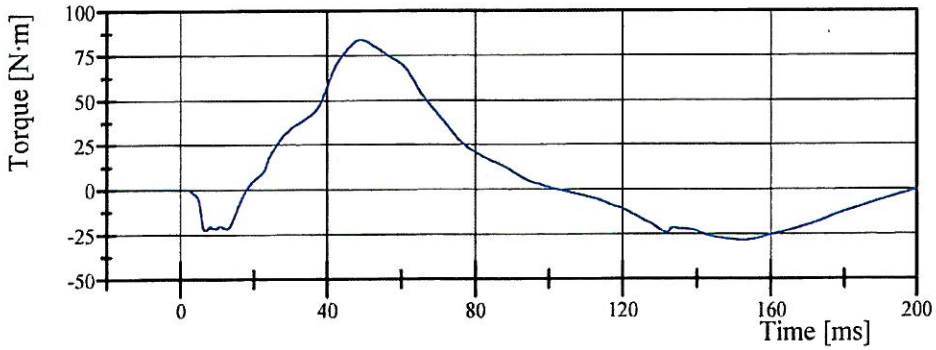
Filter Class: CFC_600
Max: 799.1 N at 38.6 ms
Min: -335.0 N at 141.8 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 71.0 Nm at 49.0 ms
Min: -28.3 Nm at 12.7 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 84.0 N·m at 49.0 ms
Min: -28.6 N·m at 152.1 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.18.2009 16:22:21 2962

090519

Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 2-6
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Maximum Force at Test Velocity	3,706 - 4,395 N	4,362.2 N	Yes
Maximum Displacement at Test Velocity	33.34 - 39.54 mm	38.568 mm	Yes

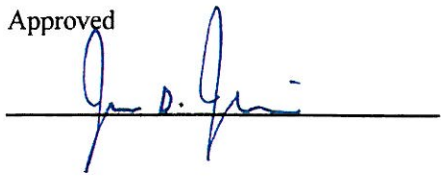
Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 6.067

Damper Setting: 7.5

Technician 

Approved 

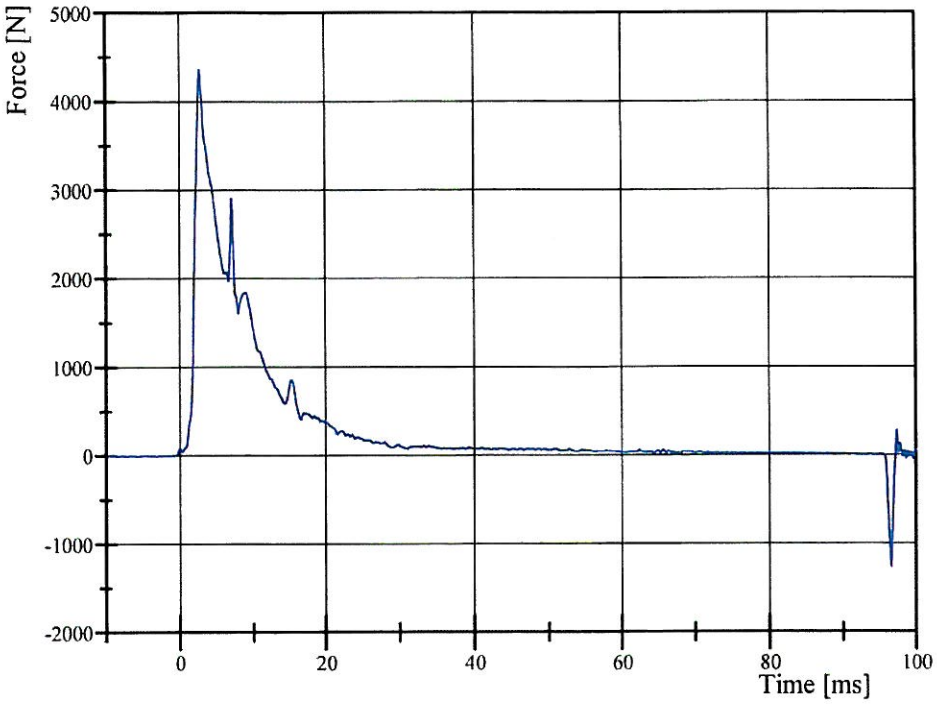
Specification Source: TP214D-07 Appendix A

05.19.2009 10:42:13 1634

Transportation Research Center Inc.

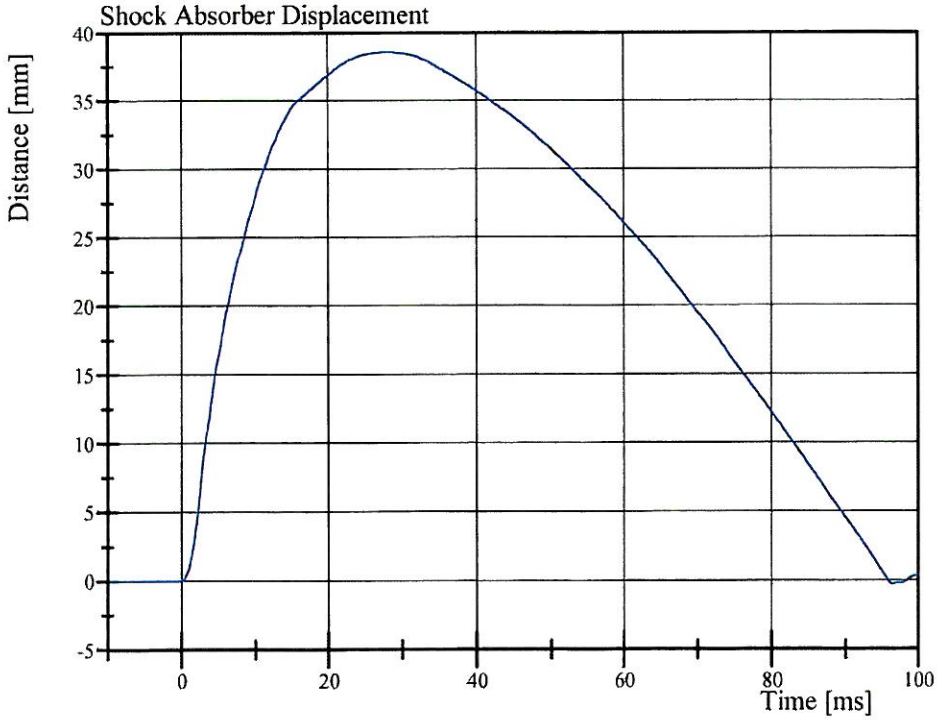
6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 2-6
Test Date: 5/19/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 4,362.2 N at 2.7 ms
Min: -1,258.2 N at 96.6 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 38.6 mm at 27.6 ms
Min: -0.3 mm at 96.5 ms

Specification Source: TP214D-07 Appendix A

05.19.2009 10:42:26 1634

Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 2-3
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Maximum Force at Test Velocity	1,734 - 2,097 N	1,837.5 N	Yes
Maximum Displacement at Test Velocity	31.68 - 37.22 mm	36.862 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 4.267

Damper Setting: 7.5

Technician

Approved

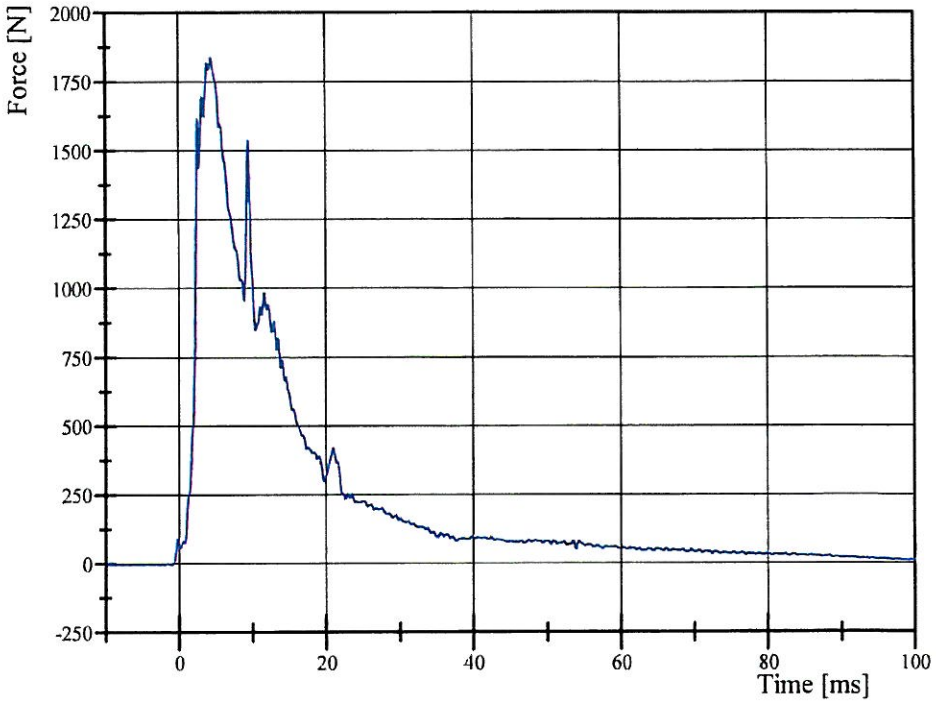
Specification Source: TP214D-07 Appendix A

05.19.2009 10:33:55 1807

Transportation Research Center Inc.

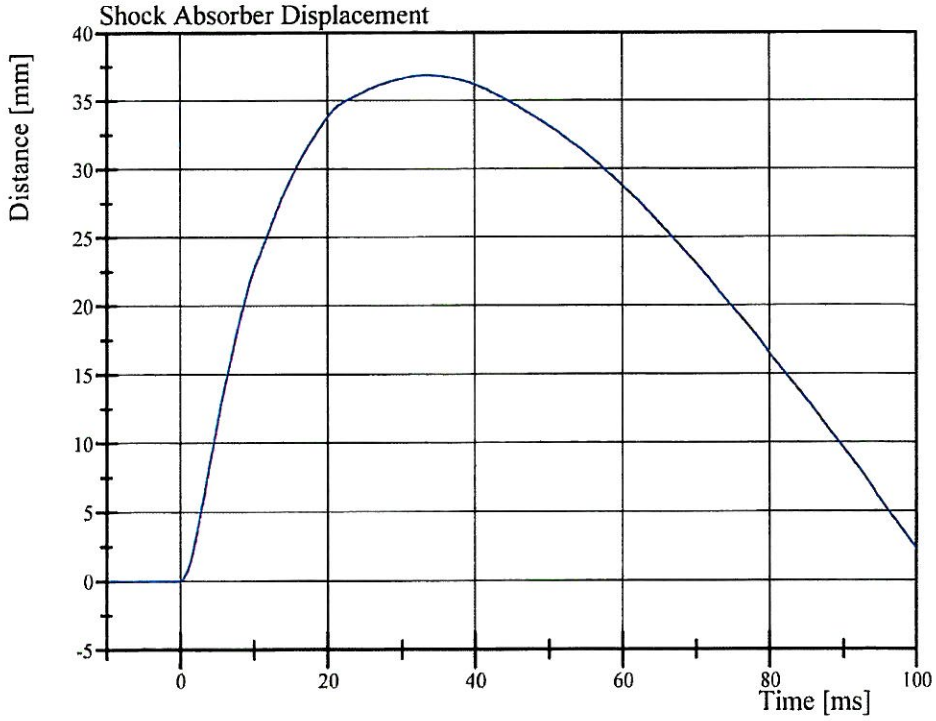
4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 2-3
Test Date: 5/19/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 1,837.5 N at 4.5 ms
Min: -4.0 N at -6.7 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 36.9 mm at 33.1 ms
Min: -0.0 mm at -8.2 ms

Specification Source: TP214D-07 Appendix A

05.19.2009 10:34:07 1807

Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 2-5
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Maximum Force at Test Velocity	833 - 1,119 N	923.2 N	Yes
Maximum Displacement at Test Velocity	30.15 - 35.11 mm	34.416 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 3.037

Damper Setting: 7.5

Technician

Approved

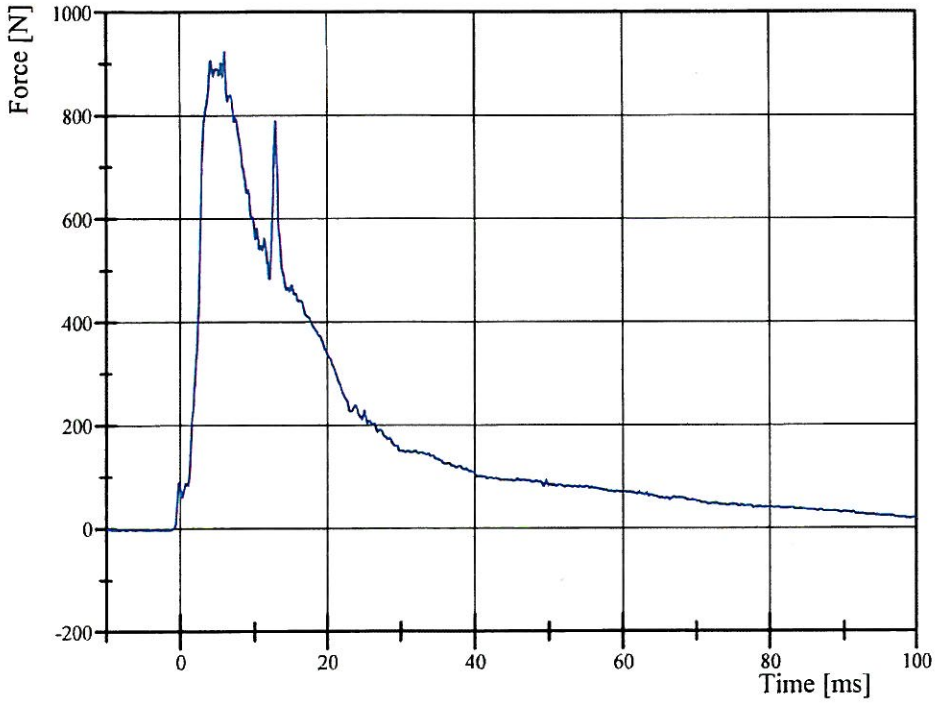
Specification Source: TP214D-07 Appendix A

05.19.2009 10:27:50 2040

Transportation Research Center Inc.

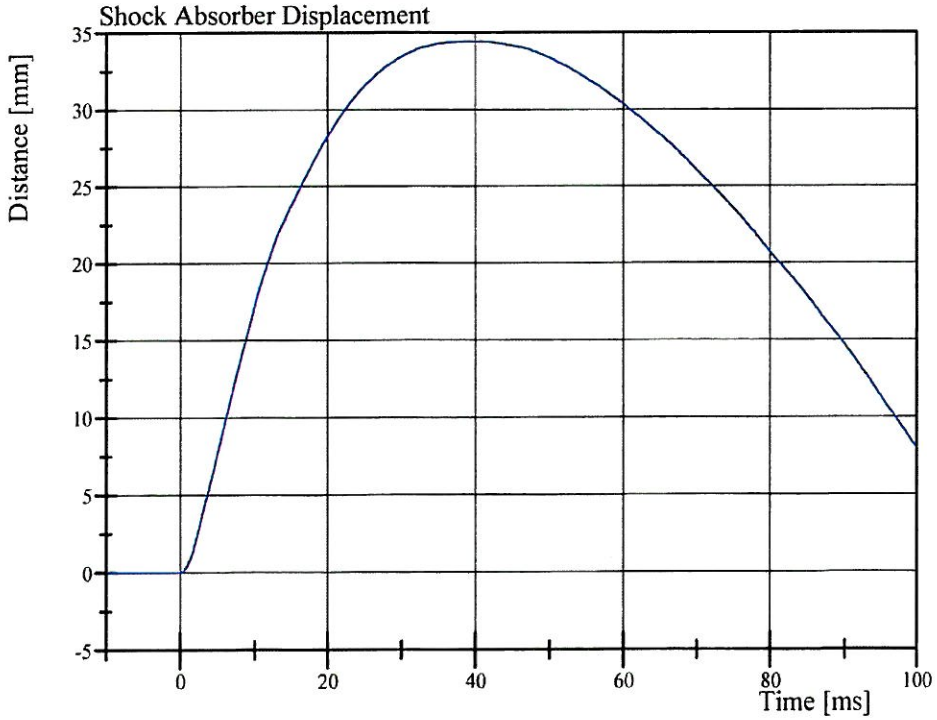
3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 2-5
Test Date: 5/19/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 923.2 N at 6.0 ms
Min: -4.6 N at -7.4 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 34.4 mm at 39.4 ms
Min: -0.0 mm at -9.8 ms

Specification Source: TP214D-07 Appendix A

05.19.2009 10:28:07 2040

Transportation Research Center Inc.

Left Lateral Thorax
SID-HIII Serial No. 002 Certification No. 2-4
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.291 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	45.5 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	41.9 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	21.8 g	Yes

Test meets specifications.

Comments:

Technician

Approved

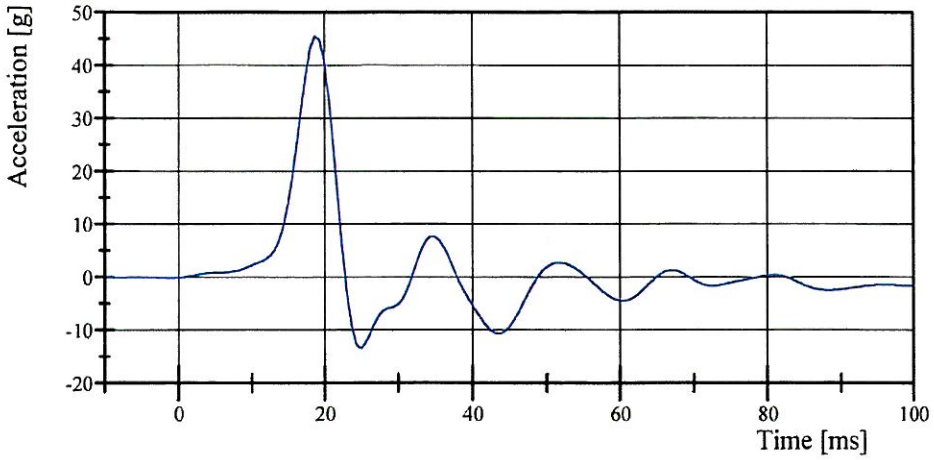
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.19.2009 12:03:51 541

Transportation Research Center Inc.

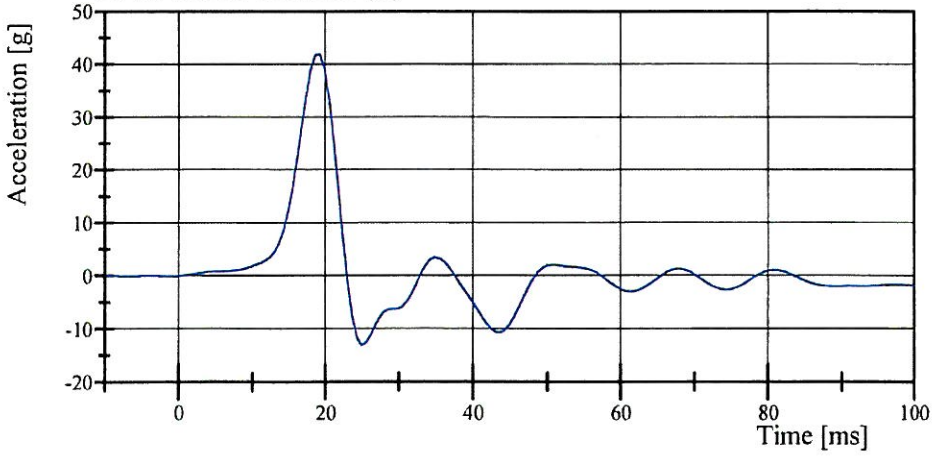
Left Lateral Thorax
SID-HIII Serial No. 002 Certification No. 2-4
Test Date: 5/19/2009

Upper Rib Acceleration (Y)



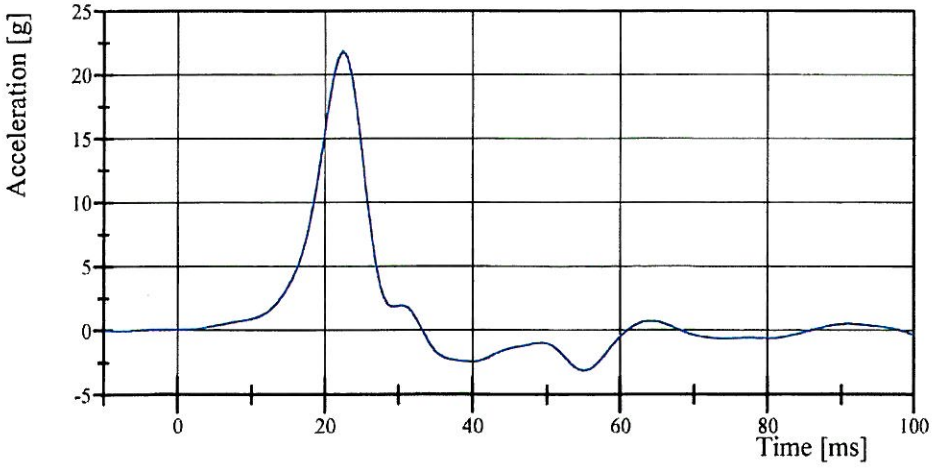
Filter Class: FIR_100
Max: 45.5 g at 18.7 ms
Min: -13.4 g at 25.0 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 41.9 g at 19.3 ms
Min: -13.1 g at 25.0 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 21.8 g at 22.4 ms
Min: -3.1 g at 55.0 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.19.2009 12:03:59 541

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 002 Certification No. 2-1
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.868 mm/s	Yes

Test meets specifications.

Comments:

Technician

Approved

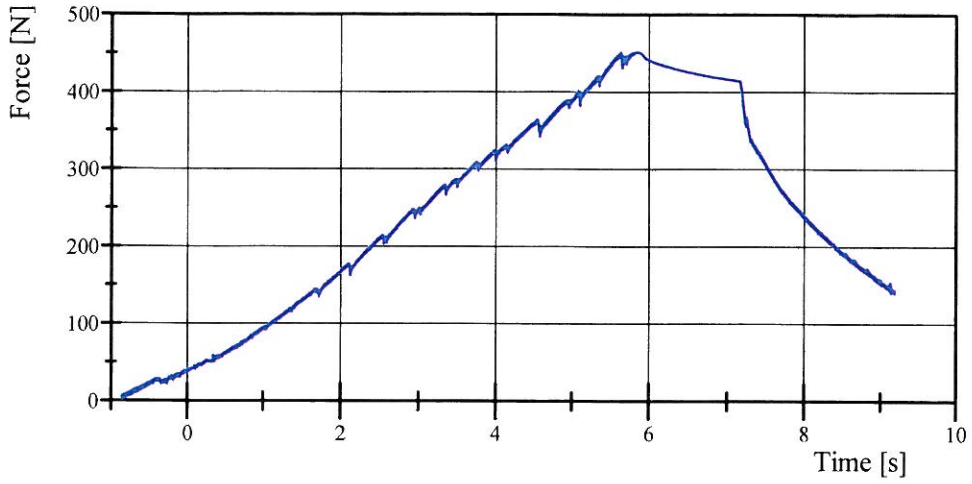
Specification Source: CFR49 Part 572 Subpart B with Polarity in accordance with J211

05.19.2009 07:38:45 10764 090519

Transportation Research Center Inc.

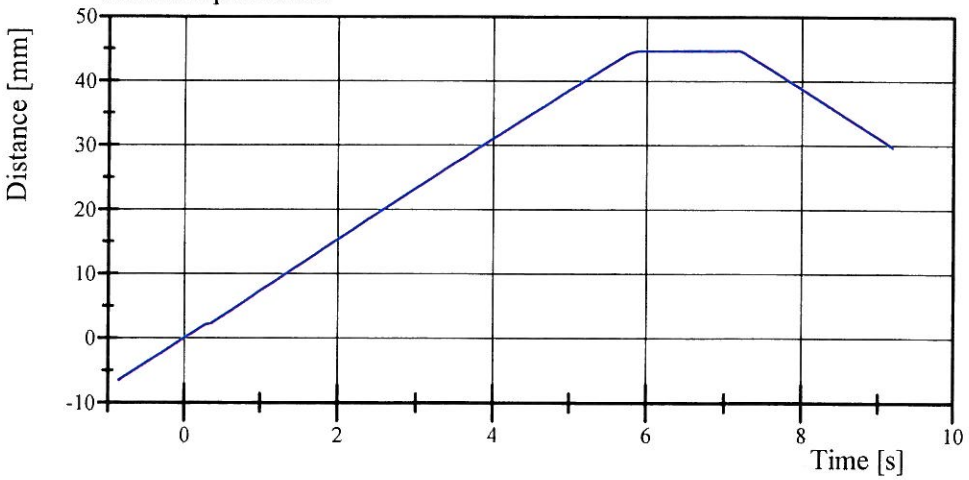
Abdomen Compression
SID-HIII Serial No. 002 Certification No. 2-1
Test Date: 5/19/2009

Probe Force



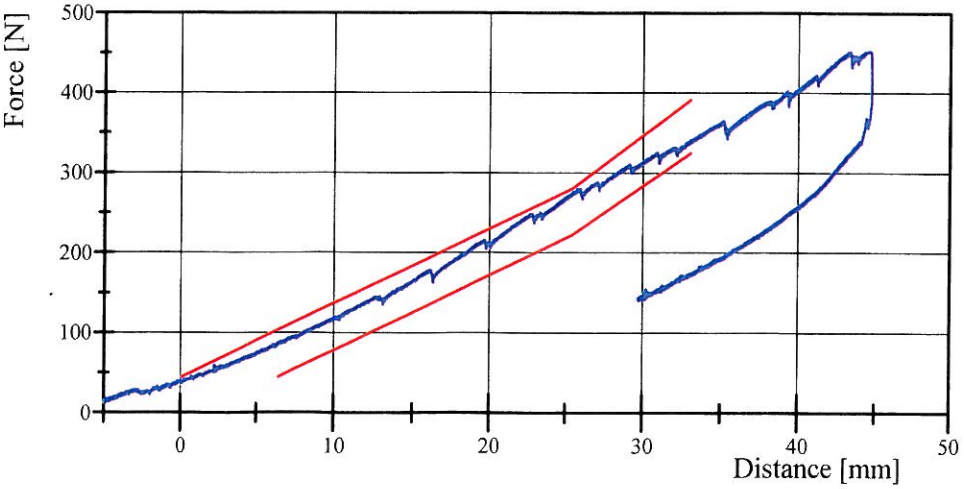
Filter Class: CFC_600
Max: 452.6 N at 5.8 s
Min: 0.7 N at -0.9 s

Probe Displacement



Filter Class: CFC_180
Max: 44.8 mm at 7.1 s
Min: -6.5 mm at -0.9 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 452.6 N at 44.6 mm
Min: 0.7 N at -6.5 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 18-May-09

TRC, INC. **TEST NO: TOFL-01** **572B SN 002 TORSO FLEX CAL 02**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.4 °C
RELATIVE HUMIDITY	10 – 70 %	35 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	135 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	198 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	226 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6.7 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Rand Burnett

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 002 Certification No. 2-3
Test Date: 5/18/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	22 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.33 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	5.8 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	42.0 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test does not meet specifications.

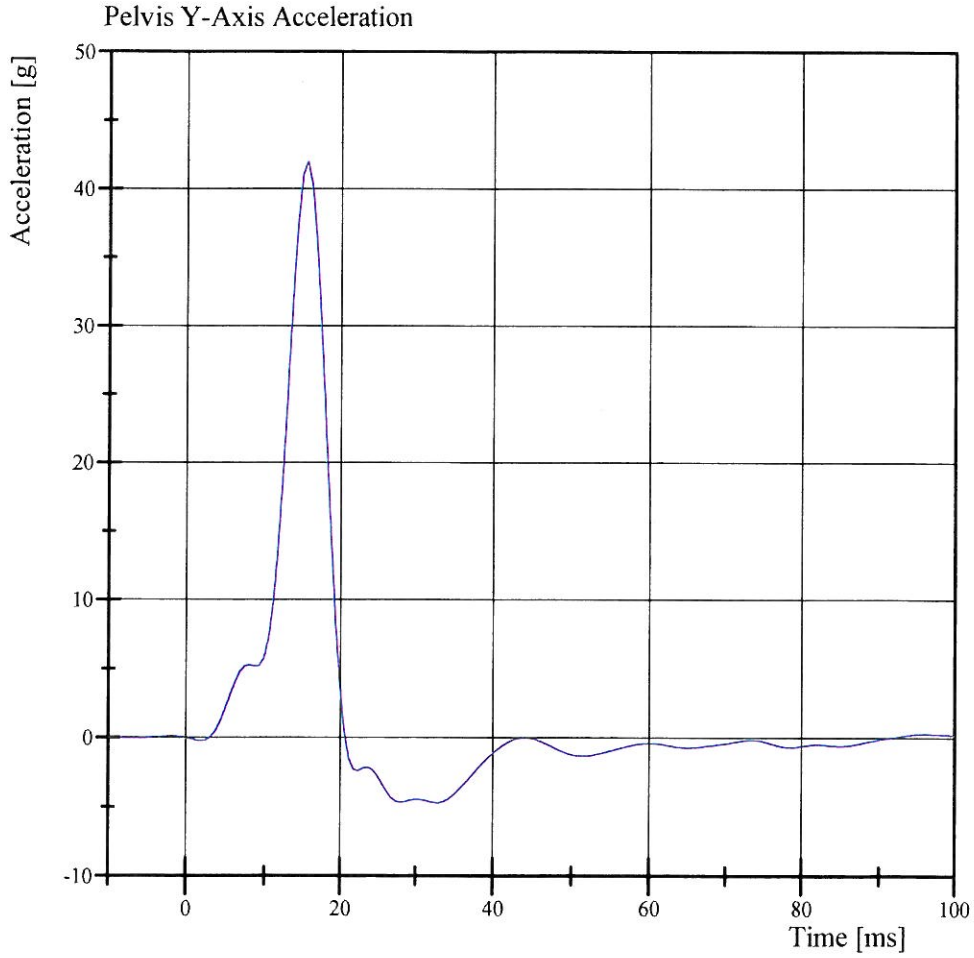
Comments:

Technician

Approved

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 002 Certification No. 2-3
Test Date: 5/18/2009



Filter Class: FIR_100
Max: 42.0 g at 15.4 ms
Min: -4.7 g at 33.0 ms

CALIBRATION TEST RESULTS

POST-TEST

SID/HIII: 002

Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 002 Calibration No. 03

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	906 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	510 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	518 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	499 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	377 mm	Yes
Top Rib Width From C\L	RW-1	165.1 - 180.3 mm	176 mm	Yes
Bottom Rib Width From C\L	RW-2	165.1 - 180.3 mm	175 mm	Yes
Difference Between Top & Bottom Rib Width from C\L		<= 2.5 mm	1.0 mm	Yes

Technician

Approved

Transportation Research Center Inc.

Left Lateral Head Drop
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	131.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-14.6 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician John K Chmiel

Approved

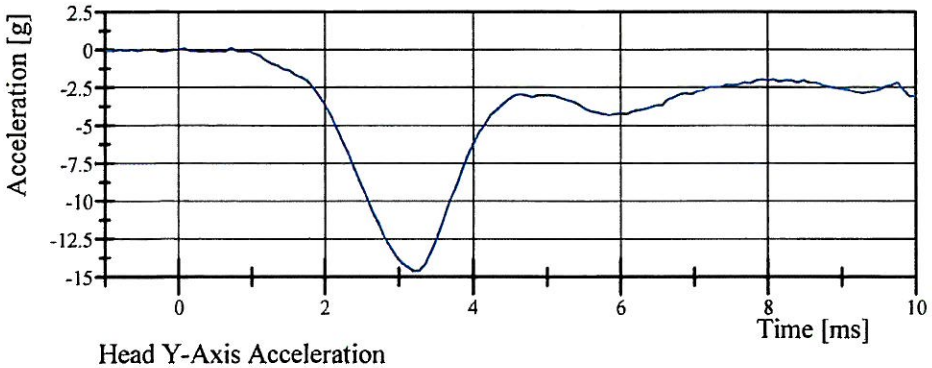
Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

06.04.2009 09:19:46 601

Transportation Research Center Inc.

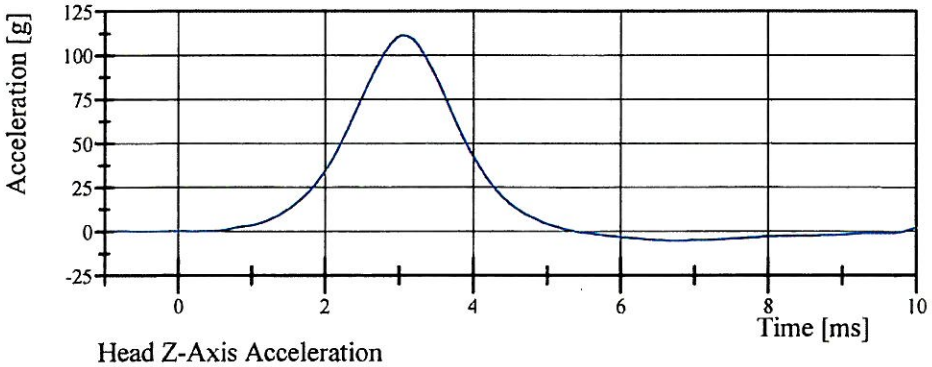
Left Lateral Head Drop
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Head X-Axis Acceleration



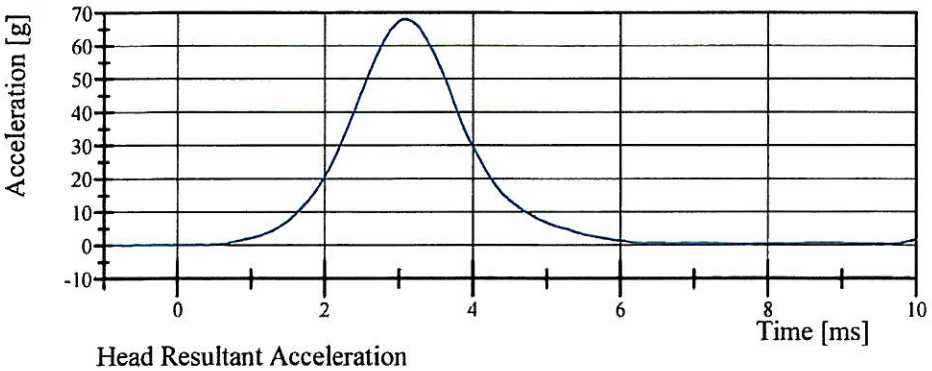
Filter Class: CFC_1000
Max: 0.1 g at 0.7 ms
Min: -14.6 g at 3.2 ms

Head Y-Axis Acceleration



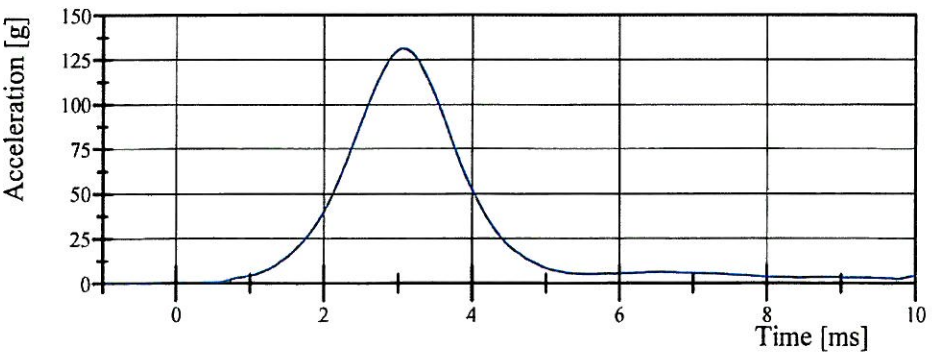
Filter Class: CFC_1000
Max: 111.5 g at 3.0 ms
Min: -5.2 g at 6.9 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 68.0 g at 3.1 ms
Min: -0.1 g at -0.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 131.2 g at 3.0 ms
Min: 0.0 g at -0.4 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.04.2009 09:19:51 601

Transportation Research Center Inc.

Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-7.020 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.328 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.586 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.502 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.310 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-75.1 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	63.0 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	84.0 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	53.0 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	9.0 ms	Yes

Test meets specifications.

Comments:

Technician John K. Chung

Approved

Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

06.04.2009 11:30:55 2963

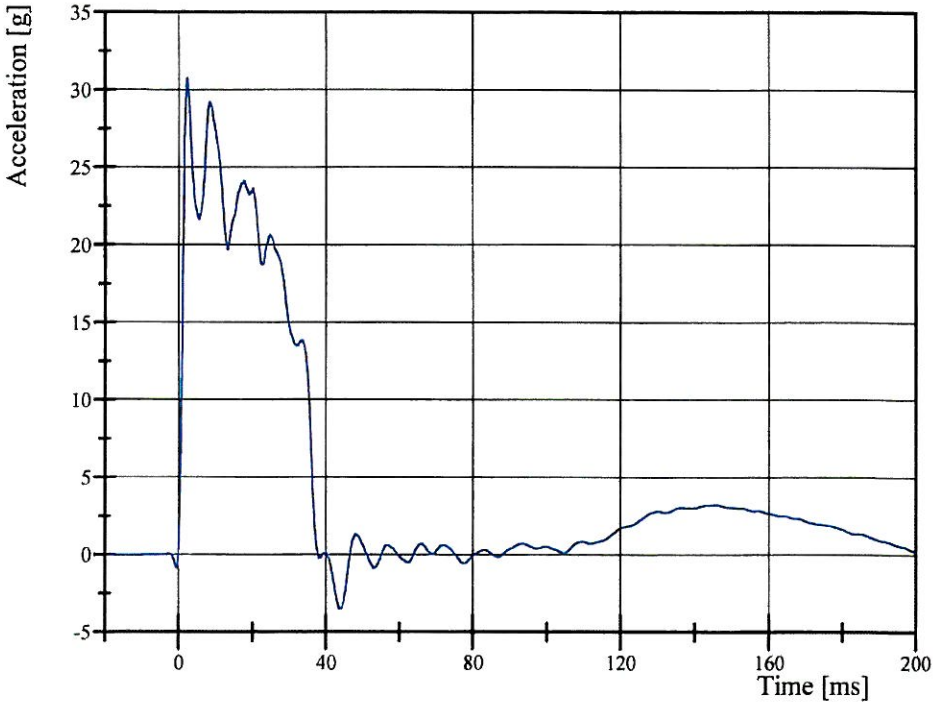
Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 002 Certification No. 3-1

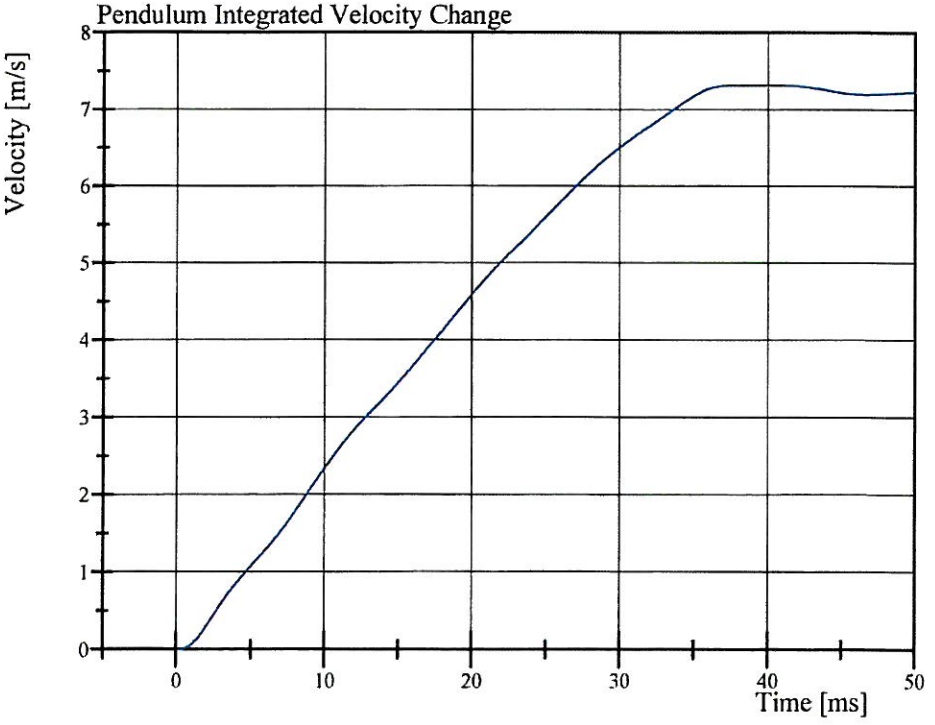
Test Date: 6/4/2009

Pendulum Acceleration



Filter Class: CFC_180
Max: 30.7 g at 2.3 ms
Min: -3.5 g at 44.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.3 m/s at 37.8 ms
Min: 0.0 m/s at 0.0 ms

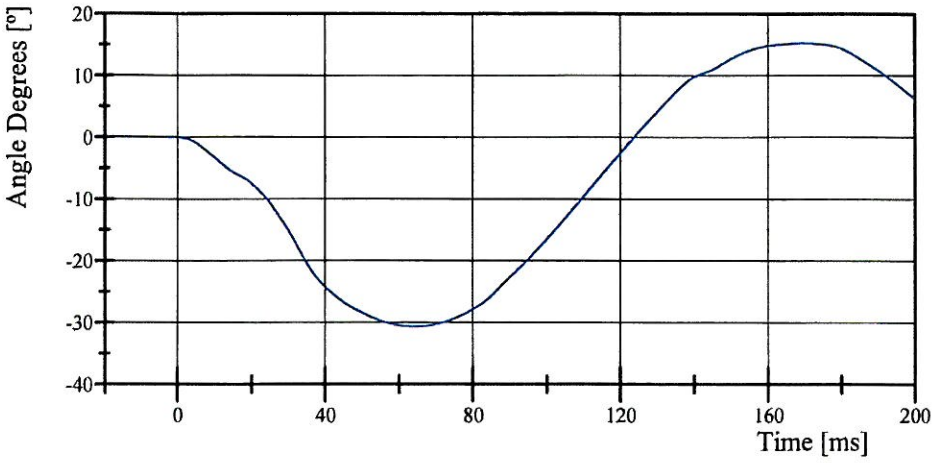
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.04.2009 11:31:11 2963

Transportation Research Center Inc.

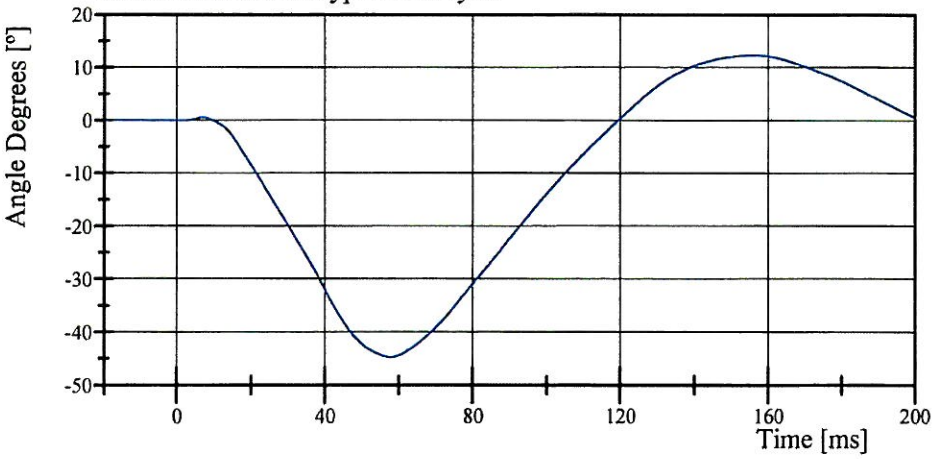
Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Pot Rotation at the Base of Neck



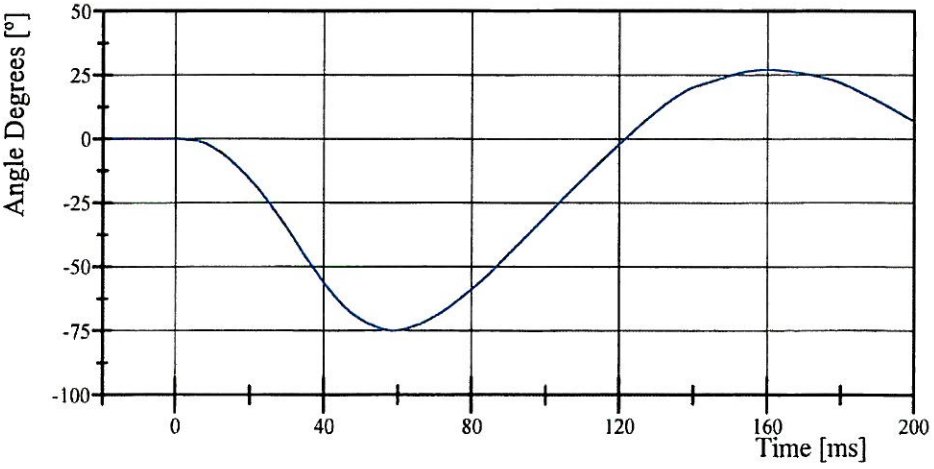
Filter Class: CFC_60
Max: 15.2 ° at 169.2 ms
Min: -30.7 ° at 64.8 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 12.3 ° at 155.8 ms
Min: -44.8 ° at 57.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 26.9 ° at 160.0 ms
Min: -75.1 ° at 58.8 ms

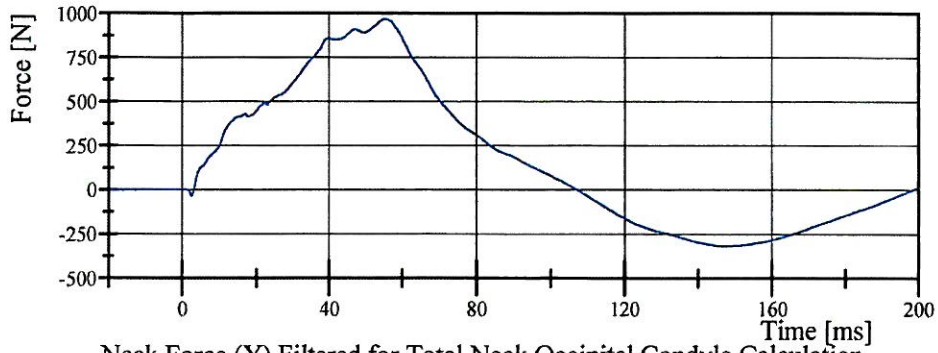
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.04.2009 11:31:11 2963

Transportation Research Center Inc.

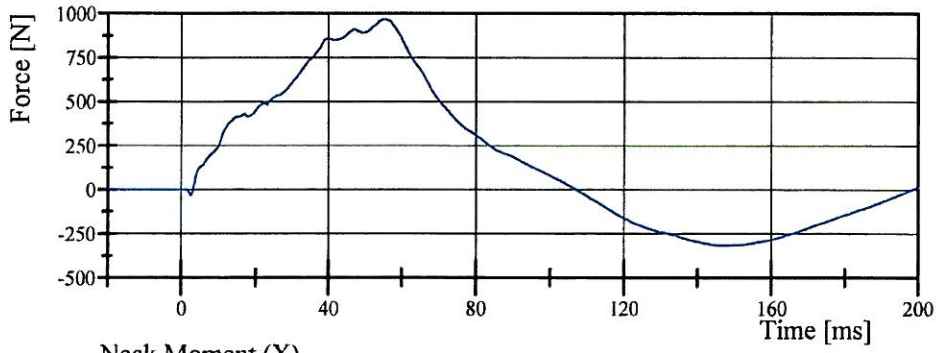
Left Lateral Neck
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Neck Force (Y)



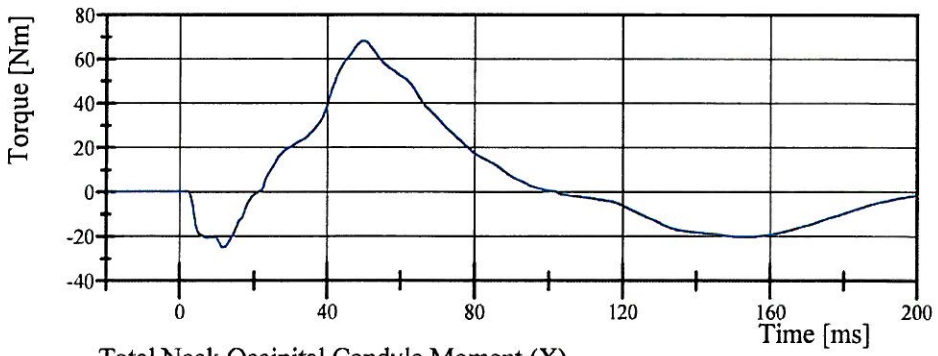
Filter Class: CFC_1000
Max: 968.1 N at 55.0 ms
Min: -318.0 N at 146.3 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyle Calculation



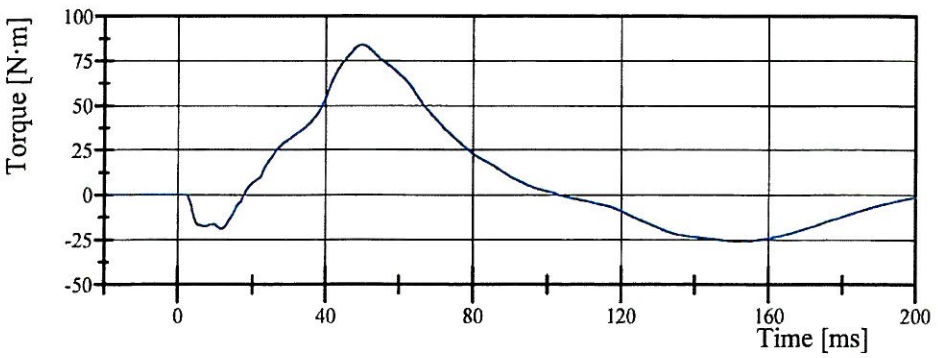
Filter Class: CFC_600
Max: 967.8 N at 55.0 ms
Min: -317.5 N at 146.9 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 68.1 Nm at 49.8 ms
Min: -25.2 Nm at 11.8 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 84.0 N·m at 49.8 ms
Min: -25.8 N·m at 151.9 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.04.2009 11:31:12 2963

Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Maximum Force at Test Velocity	3,745 - 4,439 N	4,144.2 N	Yes
Maximum Displacement at Test Velocity	33.36 - 39.57 mm	38.096 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 6.096

Damper Setting: 7.5

Technician John K. Chmiel

Approved

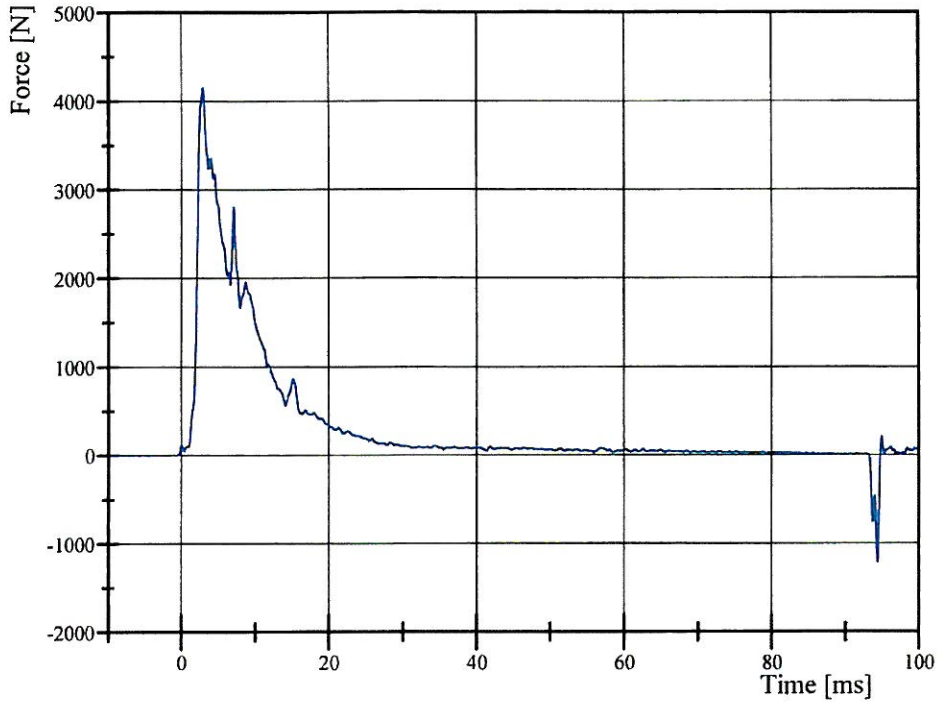
Specification Source: TP214D-07 Appendix A

06.04.2009 13:28:45 1621

Transportation Research Center Inc.

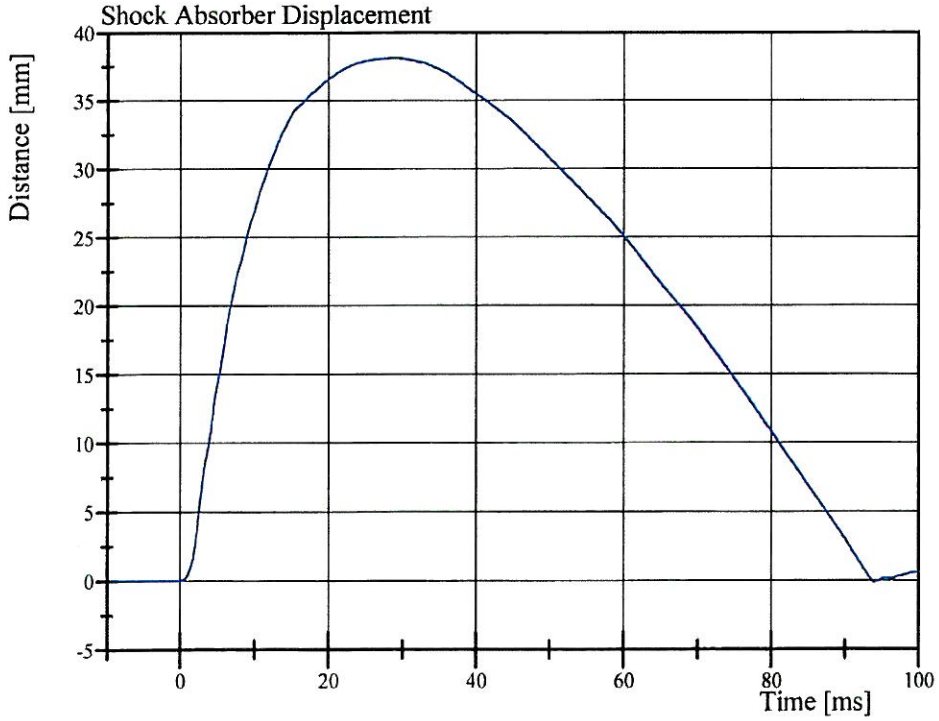
6.10 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 4,144.2 N at 3.0 ms
Min: -1,210.6 N at 94.5 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 38.1 mm at 28.9 ms
Min: -0.1 mm at 94.0 ms

Specification Source: TP214D-07 Appendix A

06.04.2009 13:29:01 1621

Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Maximum Force at Test Velocity	1,747 - 2,111 N	1,880.0 N	Yes
Maximum Displacement at Test Velocity	31.69 - 37.24 mm	36.192 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 4.281

Damper Setting: 7.5

Technician

Approved

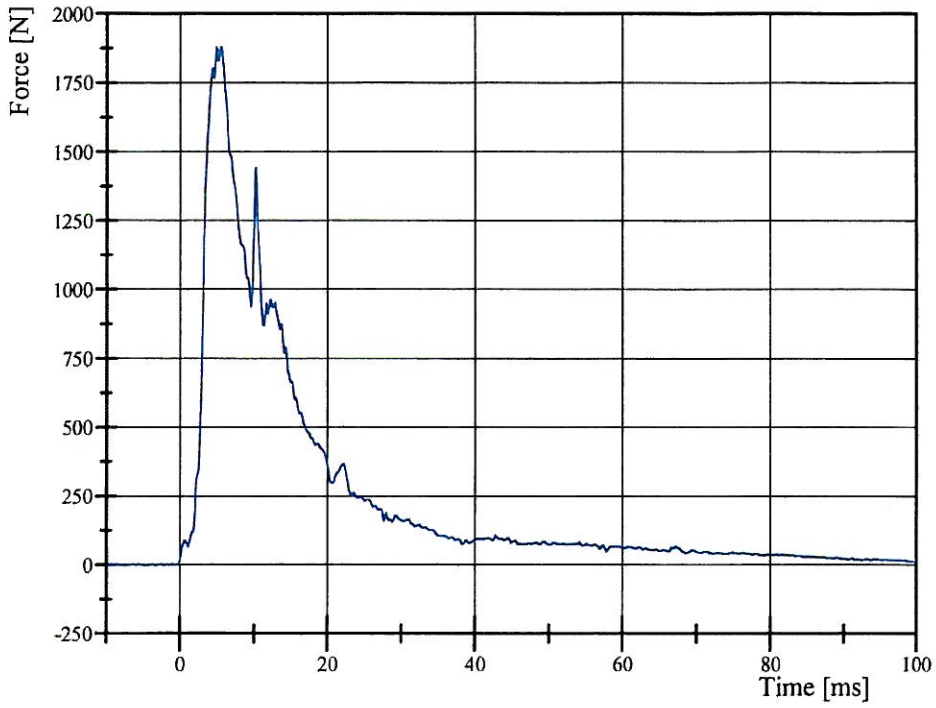
Specification Source: TP214D-07 Appendix A

06.04.2009 13:34:56 1783

Transportation Research Center Inc.

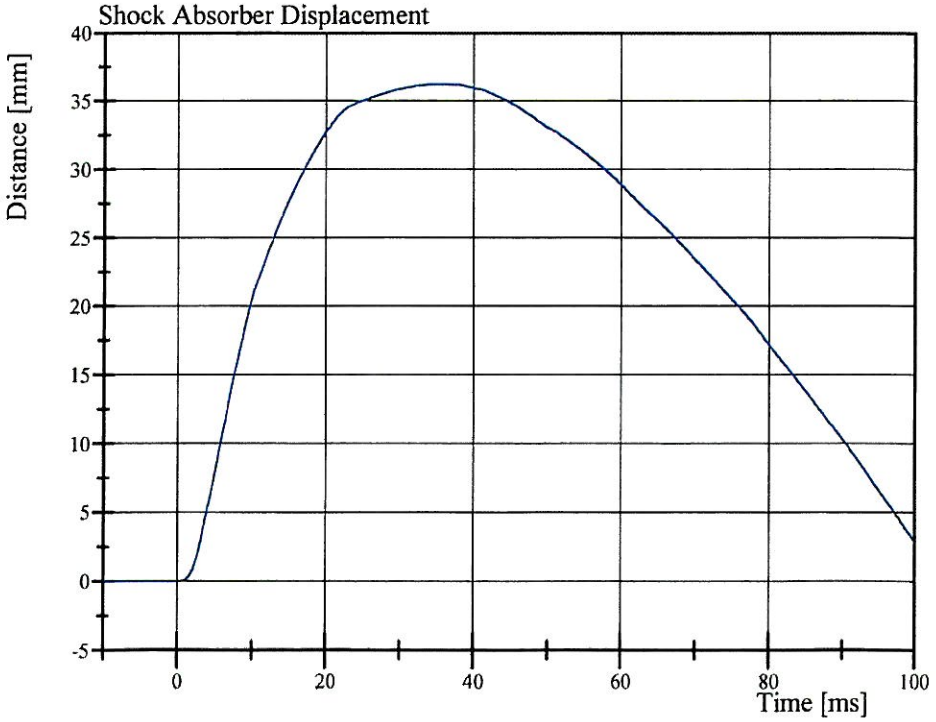
4.27 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 1,880.0 N at 5.5 ms
Min: -2.5 N at -3.3 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 36.2 mm at 35.1 ms
Min: -0.0 mm at -9.8 ms

Specification Source: TP214D-07 Appendix A

06.04.2009 13:35:16 1783

Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Maximum Force at Test Velocity	855 - 1,144 N	971.4 N	Yes
Maximum Displacement at Test Velocity	30.2 - 35.19 mm	34.210 mm	Yes

Test meets specifications.

Comments:

Actual Impactor Velocity (m/s): 3.074

Damper Setting: 7.5

Technician

Approved

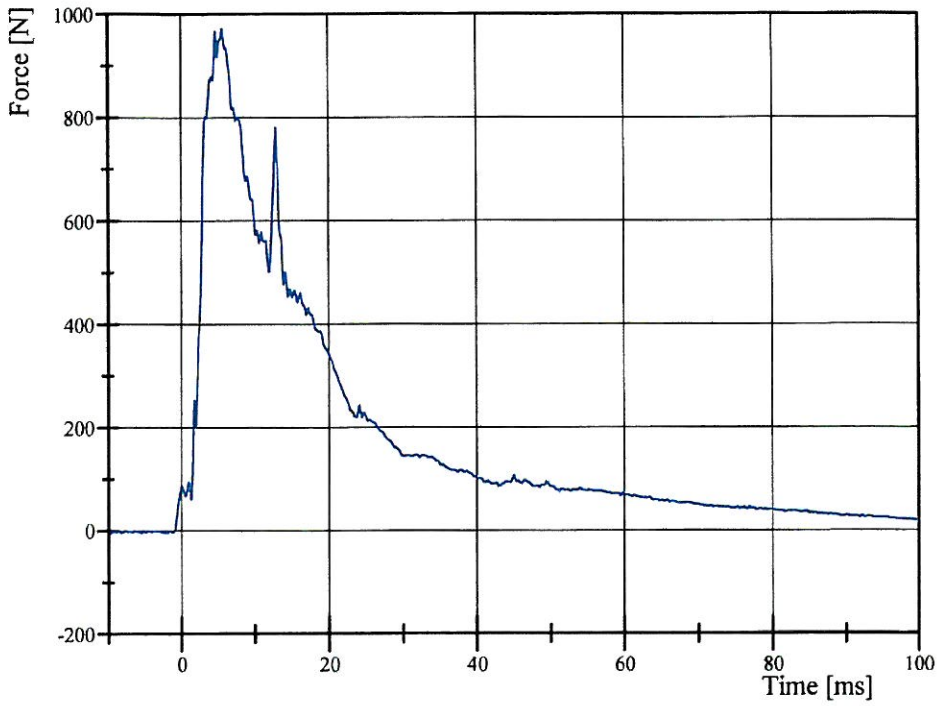
Specification Source: TP214D-07 Appendix A

06.04.2009 13:44:27 2013

Transportation Research Center Inc.

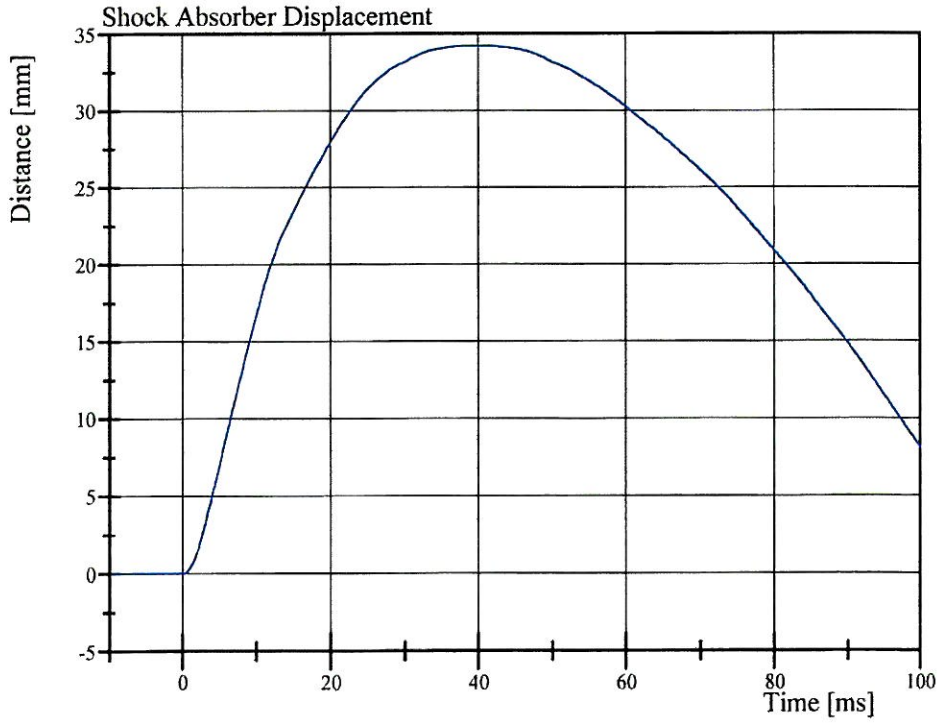
3.05 m/s Thoracic Shock Absorber Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Shock Absorber Resistive Force



Filter Class: CFC_1000
Max: 971.4 N at 5.6 ms
Min: -4.5 N at -9.5 ms

Shock Absorber Displacement



Filter Class: CFC_1000
Max: 34.2 mm at 39.4 ms
Min: -0.0 mm at -8.8 ms

Specification Source: TP214D-07 Appendix A

06.04.2009 13:44:40 2013

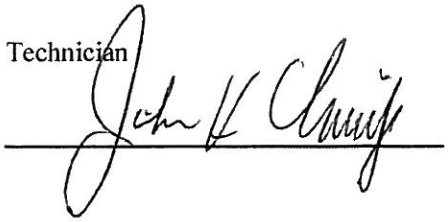
Transportation Research Center Inc.

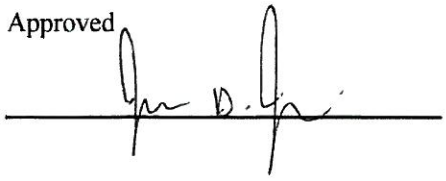
Left Lateral Thorax
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 5/28/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.300 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	42.8 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	39.4 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	21.2 g	Yes

Test meets specifications.

Comments:

Technician 

Approved 

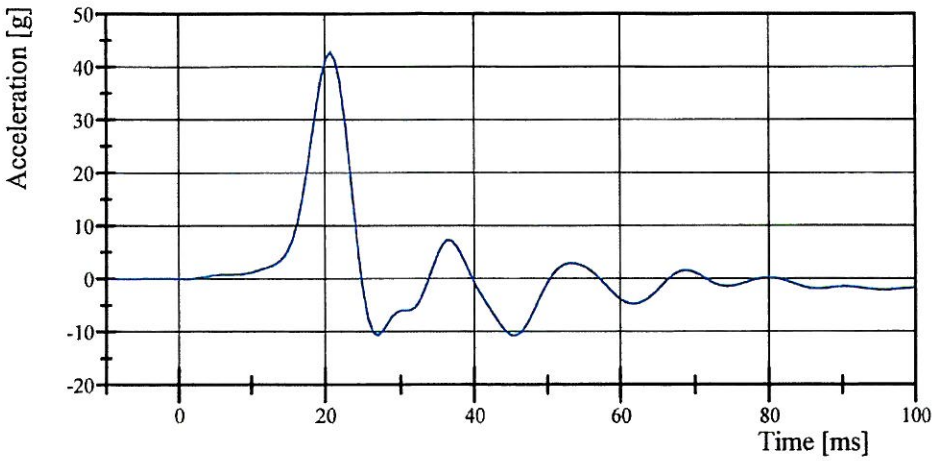
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.28.2009 11:02:44 578

Transportation Research Center Inc.

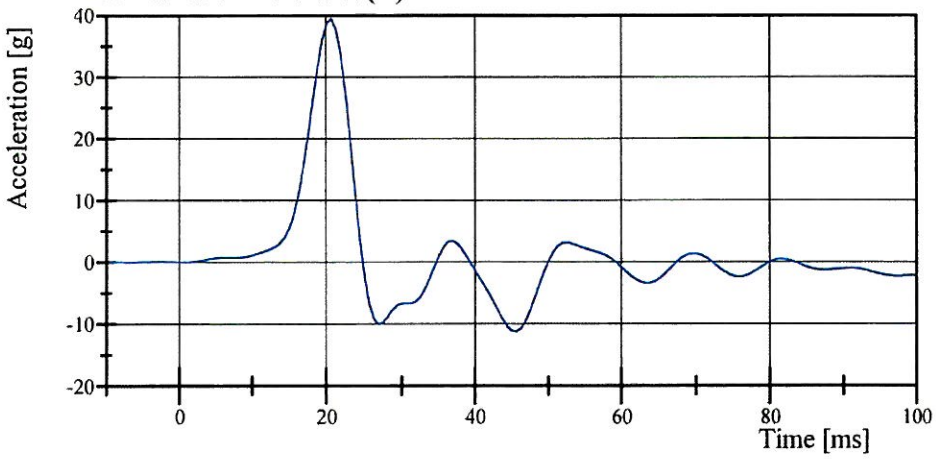
Left Lateral Thorax
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 5/28/2009

Upper Rib Acceleration (Y)



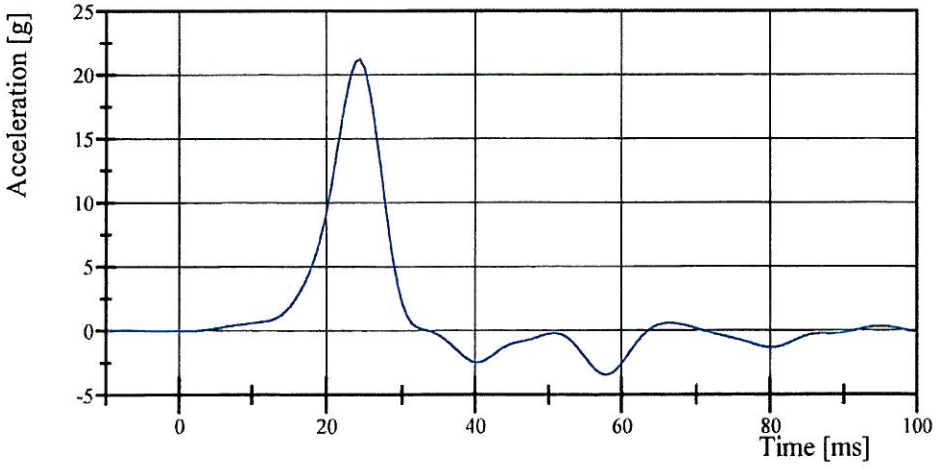
Filter Class: FIR_100
Max: 42.8 g at 20.7 ms
Min: -10.7 g at 45.7 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 39.4 g at 20.7 ms
Min: -11.3 g at 45.7 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 21.2 g at 24.5 ms
Min: -3.5 g at 57.6 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

05.28.2009 11:02:52 578

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.803 mm/s	Yes

Test meets specifications.

Comments:

Technician

Approved

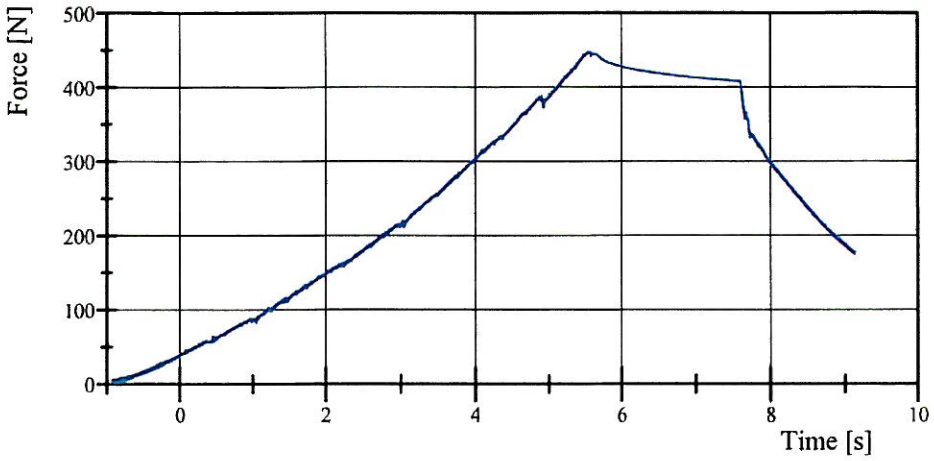
Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

06.04.2009 15:04:17 11553

Transportation Research Center Inc.

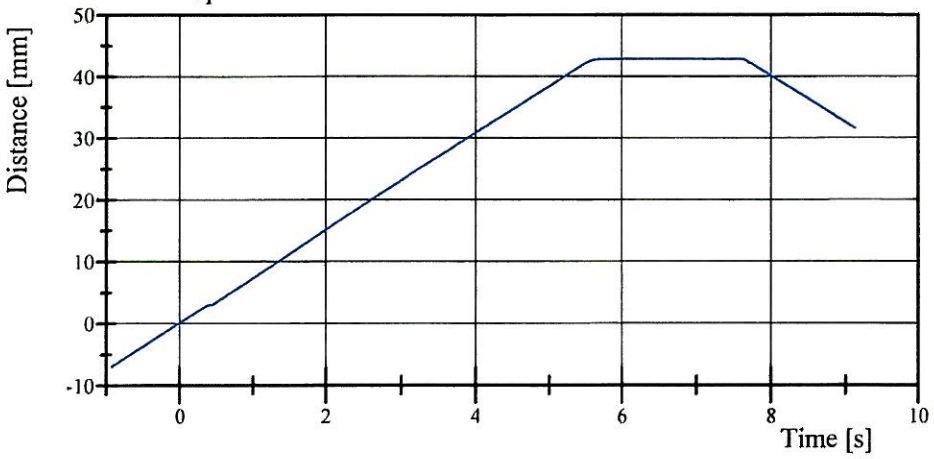
Abdomen Compression
SID-HIII Serial No. 002 Certification No. 3-1
Test Date: 6/4/2009

Probe Force



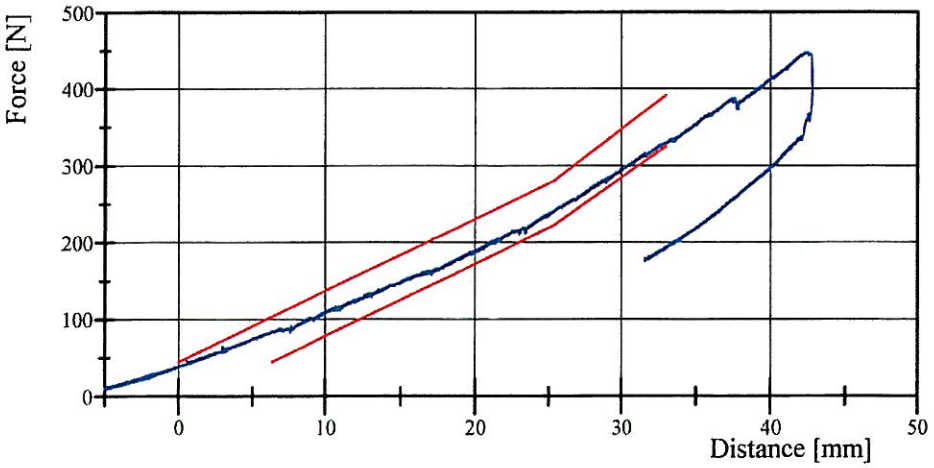
Filter Class: CFC_600
Max: 447.6 N at 5.6 s
Min: 0.1 N at -0.9 s

Probe Displacement



Filter Class: CFC_180
Max: 42.8 mm at 7.1 s
Min: -7.0 mm at -0.9 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 447.6 N at 42.4 mm
Min: 0.1 N at -7.0 mm

Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

06.04.2009 15:05:19 11553

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 28-May-09

TRC, INC. **TEST NO: TOFL-01** **572B SN 002 TORSO FLEX CAL 03**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 – 70 %	40 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	138 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	198 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	226 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	7.1 °

TEST MEETS SPECIFICATIONS

TECHNICIAN John K Clancy

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 002 Certification No. 3-2
Test Date: 6/5/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.323 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	5.7 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	45.5 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

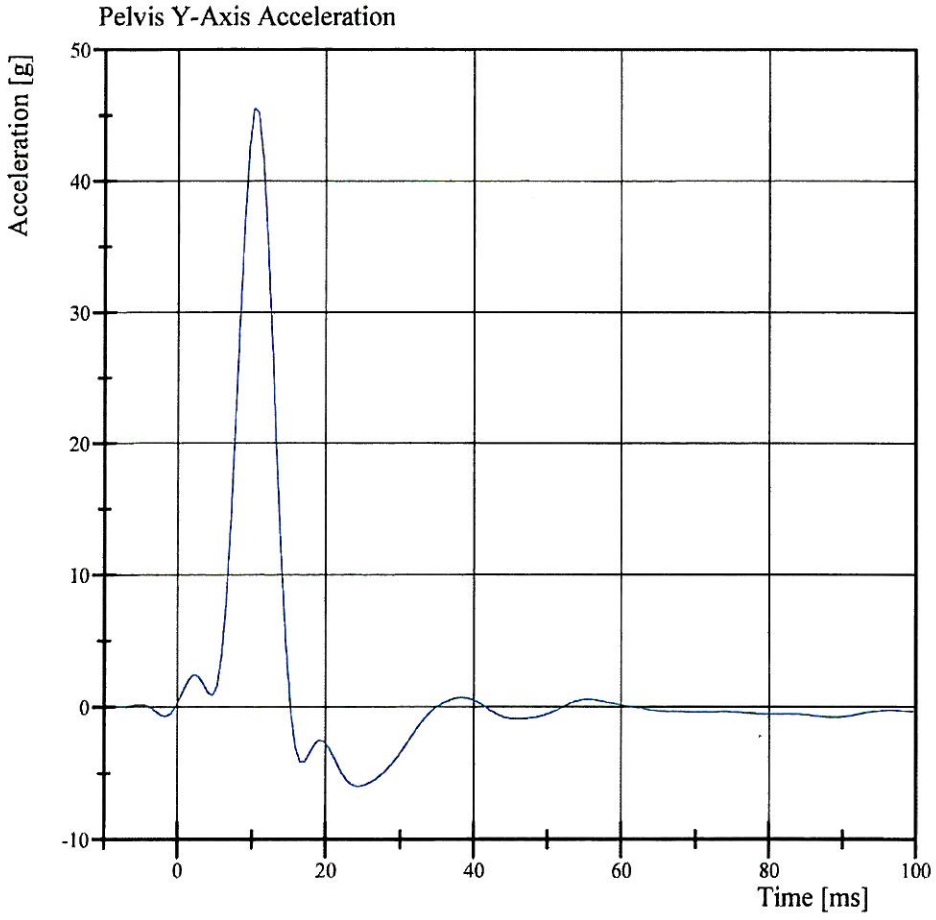
Approved

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.05.2009 08:51:47 568

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 002 Certification No. 3-2
Test Date: 6/5/2009



Filter Class: FIR_100
Max: 45.5 g at 10.3 ms
Min: -6.0 g at 24.6 ms

Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

06.05.2009 08:52:21 568