REPORT NUMBER: NCAPSIDE-TRC-2007-003

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

NISSAN MOTOR CO., LTD.
2008 NISSAN ROGUE S 2WD MPV
NHTSA NUMBER: M85209

PREPARED BY:
TRANSPORTATION RESEARCH CENTER INC.
10820 STATE ROUTE 347
P. O. BOX B-67
EAST LIBERTY, OH 43319

Test Date: November 13, 2007

Report Date: November 27, 2007

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVENUE, S.E., ROOM W43-410
WASHINGTON, D.C. 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-03-D-02005. This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Test Performed By: Duey Thomas, Test Technician II

Report Approved By: 

Christopher Krouskop, Project Manager

Transportation Research Center Inc.

Approval Date: 11-27-07

FINAL REPORT ACCEPTANCE BY OCWS:

Accepted By: _____

Acceptance Date: _____

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NCAPSIDE-TRC-2007-003		

4. Title and Subtitle	5. Report Date
Final Report New Car Assessment Program Side Impact Testing of a 2008 Nissan Rogue S 2WD MPV, NHTSA No.: M85209	November 27, 2007
	6. Performing Organization Code TRC Inc.
7. Author(s) Christopher Krouskop, Project Manager Transportation Research Center Inc.	8. Performing Organization Report No. 071113
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319	10. Work Unit No. (TRAIS)
	11. Contract or Grant No. DTNH22-03-D-02005
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards 1200 New Jersey Avenue, S.E., Room W43-410 Washington, DC 20590	13. Type of Report and Period Covered Final Report November 2007
	14. Sponsoring Agency Code NVS-111

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 2008 Nissan Rogue MPV, to obtain new car assessment and research data indicant of FMVSS 214D performance. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on November 13, 2007.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.8 km/h, and the ambient temperature at the struck (driver's side) side of the target vehicle at the time of impact was 22.5° C. The target vehicle's post-test maximum crush was 259 mm at Level 3.

The test or target vehicle's performance is given below:

	Front SID HIII		Rear SID HIII	
Left Upper Rib Acceleration:	51.1	g's	35.0	g's
Left Lower Rib Acceleration:	40.9	g's	35.3	g's
Lower Spine Acceleration:	29.7	g's	34.4	g's
Thoracic Trauma Index, (TTI):	40.4	g's	34.8	g's
Pelvis Acceleration (PEV):	48.9	g's	57.1	g's
Head Injury Criteria (HIC):	128	g's	431	g's

The doors 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: NHTSA Technical Information Services (TIS) 1200 New Jersey Avenue, S.E., Room W43-410 Washington, DC 20590 Telephone No. (202) 366-4946 Attn: Robert Hornicle

19. Security Classification (of this report)	20. Security Classification (of this page)	21. Number of Pages	22. Price
Unclassified	Unclassified	224	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

TABLE OF CONTENTS

SECTION 1
PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2007 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 evaluate side impact protection in a 2008 Nissan Rogue S 2WD manufactured by Nissan Motor Co., LTD.

TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 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 NCAP SIDE IMPACT TEST

A model year 2008 Nissan Rogue S 2WD was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.8 km/h. The specified impact velocity range is from 61.2 to 62.8 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1721.0 kg and the test weight of the MDB was 1365.4 kg. The test was conducted at TRC Inc. in East Liberty, OH, on November 13, 2007.

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 November 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 primary and redundant)
- Head Center of Gravity (CG) triaxial accelerometers (X, Y and Z axes primary and redundant)
- Upper Neck 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 12,500 samples per second and processed per Appendix V of the Test Procedure.

GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 259 mm at level 3, 1500 mm rearward of the left impact point. The driver SID/HIII, Serial No. 059, and left rear passenger SID/HIII, Serial No. 066, were calibrated prior to this test.

Appendix A contains the still photograph prints. Appendix B contains the driver 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 (36)	T^1	T^2	TTI (G's)	Peak Pelvis (G's)
Driver	128	47.2	72.4	40.4	48.9
Passenger	431	55.0	63.5	34.8	57.1

Supplemental Restraint Information

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

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

TEST NOTES

The following channels did not collect valid data:

Left Lower B-Post Y

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

TEST VEHICLE INFORMATION

Make	Nissan
Model	Rogue
Body Style	MPV
NHTSA No.	M85209
VIN	JN8AS58T98W000375
Color	Gotham Gray
Delivery Date	10/11/2007
Odometer Reading	162 miles
Dealer	Taylor Buick-Nissan
Transmission	Automatic
Final Drive	2WD
Number of Cylinders	4
Engine Displacement	2.5 L
Engine Placement	Transverse
Air Conditioning	Yes
Power Windows	Yes
Power Seats	No
Power Door Locks	Yes

TEST VEHICLE OPTIONS

Sun Roof/T-Top	No
Roof Rack	No
Cruise Control	Yes
Tilt Steering	Yes
Power Steering	Yes
Rear Defroster	Yes
Anti-Lock Brakes	Yes
AM/FM CD	Yes
Keyless Entry	Yes
Tinted Glass	Yes
Driver Front Airbag	Yes
Driver Side Head Airbag	No
Driver Side Torso Airbag	Yes
Rear Passenger Head Airbag	No
Rear Passenger Curtain Airbag	Yes
Pretensioner	Yes
Load Limiters	No
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., LTD.
Date of Manufacture	8/07

GVWR (kg)	1920.0
GAWR Front (kg)	1016.5
GAWR Rear (kg)	910.8

Measured Parameter	Front	Mid	Rear	Total
Type of Seats	Bucket	N/A	Split Bench	
Number Of Occupants	2	N/A	3	5
Capacity Wt. (VCW)				408
Cargo Wt. (RCLW) (kg)				68

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	447.6	300.2		494.6	395.8	
Right	kg	448.4	294.0		456.0	374.6	
Ratio	%	60.1	39.9		55.2	44.8	
Totals	kg	896.0	594.2	1490.2	950.6	770.4	1721.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1490.2
Weight of 2 P572M ATDs	kg	162.0
Rated Cargo/Luggage Weight (RCLW)	kg	68.0
Calculated Vehicle Target Weight (TVTW)	kg	1720.2

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	790	789	818	819	1073
As Tested	mm	775	781	780	790	1170
Fully Loaded	mm	778	788	778	788	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	2690
Total Vehicle Length at Left Side	mm	4262
Total Vehicle Length at Centerline	mm	4615
Total Vehicle Length at Right Side	mm	4262
Weight of Ballast in Cargo Area	kg	0
Amount of Stoddard Solvent in Fuel Tank	liters	55.8

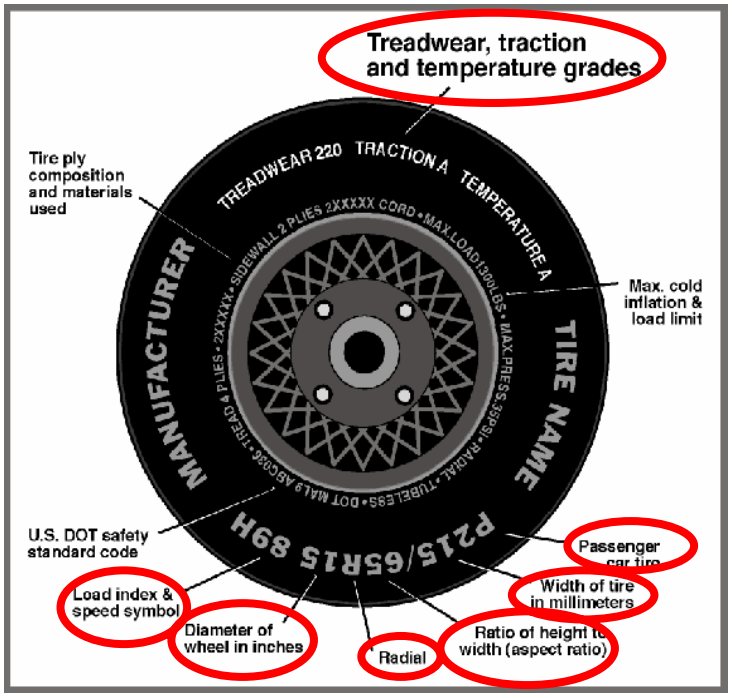
TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2690
Target Impact Point Aft of Front Axle	mm	406
Actual Impact Point Aft of Front Axle	mm	414

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle:	2008 Nissan Rogue S 2WD	NHTSA No.:	M85209
Test Program:	NCAP Side Impact	Test Date:	11/13/07



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	230	230
Recommended Tire Size	P215/70R16	P215/70R16
Tire Size on Vehicle	P215/70R16	P215/70R16
Tire Manufacturer	Continental	Continental
Tire Name	4X$ Contact	4X4 Contact
Tire Type	P	P
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	70	70
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	99H	99H
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle:	2008 Nissan Rogue S 2WD	NHTSA No.:	M85209
Test Program:	NCAP Side Impact	Test Date:	11/13/07

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle.

Driver: Total Number of detents: 25

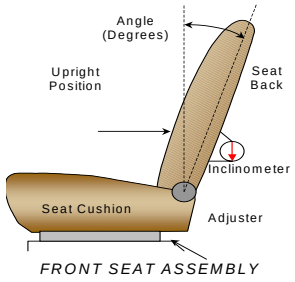
Test detent (with the forward-most detent defined as 0): 13

Passenger: Total Number of detents: Fixed

Test detent (with the forward-most detent defined as 0): N/A

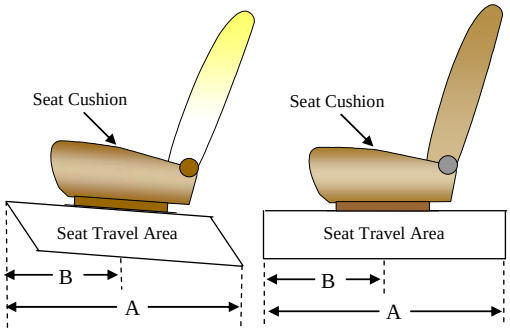
Driver seat back angle: _____

Passenger seat back angle: 23.8° measured at left side of rear seat



SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.



SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	25	13
Rear Seat	Fixed	Fixed

SEAT BELT UPPER ANCHORAGE

	Total No. of Positions	Placed in Position No.
Driver Seat	4	1
Rear Seat	3	1

Position number one is the uppermost adjustment position.

DATA SHEET NO. 3 (CONTINUED)

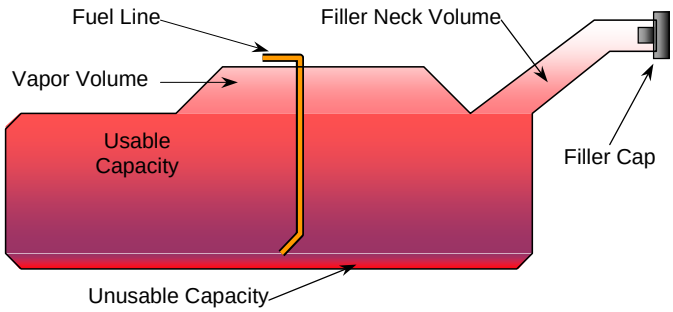
TEST VEHICLE INFORMATION

Test Vehicle:	2008 Nissan Rogue S 2WD	NHTSA No.:	M85209
Test Program:	NCAP Side Impact	Test Date:	11/13/07

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	60.0
Usable Capacity used for FMVSS301	60.0
Actual Amount of Solvent used	55.8

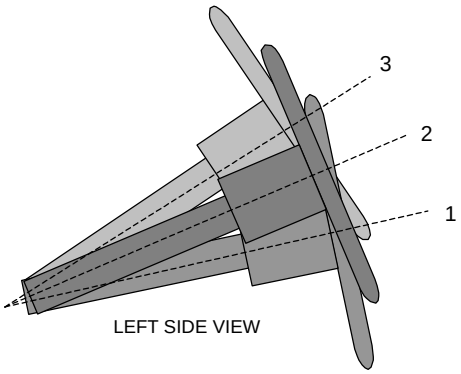
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost Position	24.7°	Fixed
Geometric Center Position	26.8°	Fixed
Uppermost Position	29.3°	Fixed

DATA SHEET NO. 4

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

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	1112

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	390.8	292.4	
Right	kg	383.8	298.4	
Ratio	%	56.7	43.3	
Totals	kg	774.6	590.8	1365.4

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.8
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.9
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0

POST TEST OBSERVATIONS

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	8 mm right
Vertical Offset	mm	+/- 20	5 mm up

DATA SHEET NO. 5

POST TEST OBSERVATIONS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID/HIII / 059	SID/HIII / 066
Head Contact	Side header, airbag	Airbag, side header
Upper Torso Contact	None	None
Lower Torso Contact	None	None
Left Knee Contact	None	None
Right Knee Contact	None	None

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Left Side Door Opening	Jammed & Latched	Jammed & Latched
Right Side Door Opening	Closed & Latched	Closed & Latched
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	Post impact, the Rogue struck laboratory equipment in close proximity.

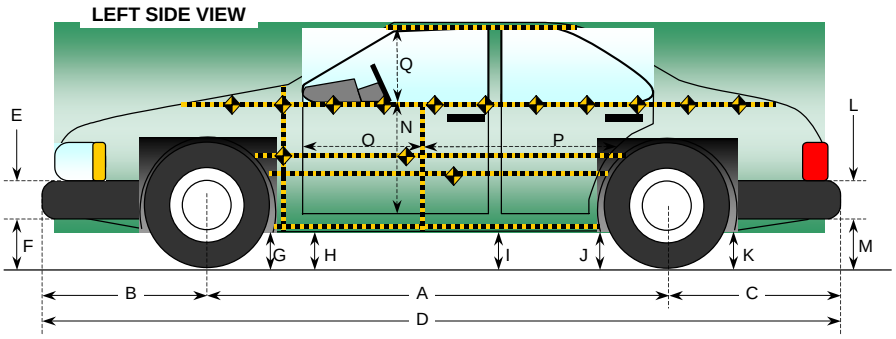
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



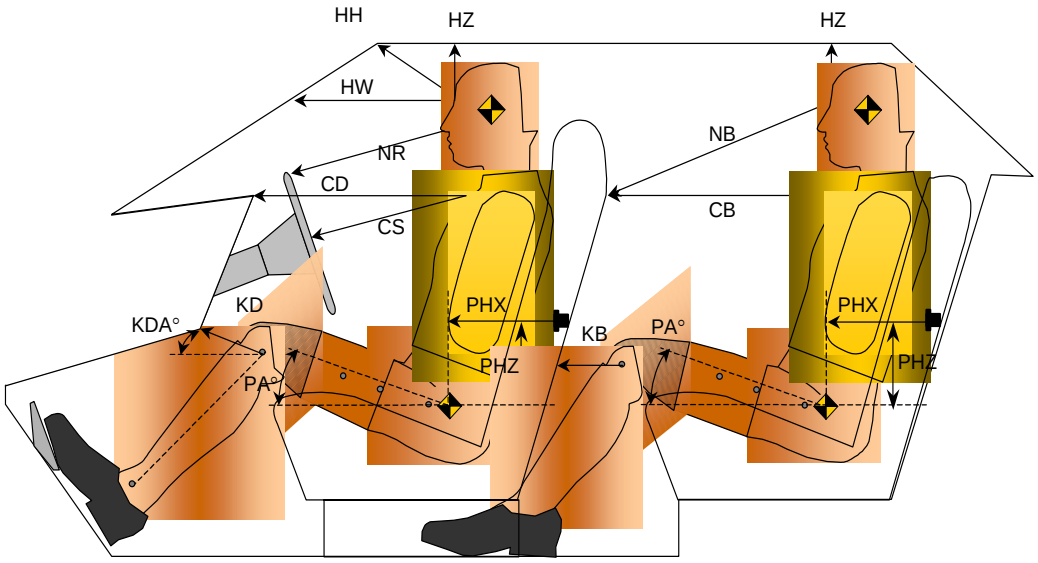
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2690	2692	-2
B	Front Axle to Front Surface of Vehicle	950	952	-2
C	Rear Axle to Rear Surface of Vehicle	975	982	-7
D	Total Length at Centerline	4615	4631	-16
E	Front Bumper Thickness	165	165	0
F	Front Bumper Bottom to Ground	553	566	-13
G	Height to Front Axle	335	312	23
G1	Sill Height at Front Wheel Well	358	367	-9
H	Sill Height at Front Door Leading Edge	370	480	-110
I	Sill Height at "B" Pillar	335	405	-70
J1	Sill Height at Rear Wheel Well	275	429	-154
J2	Pinch Weld Height at Rear Wheel Well	338	305	33
K	Sill Height Aft of Rear Wheel Well	369	379	-10
L	Rear Bumper Thickness	177	177	0
M	Rear Bumper Bottom to Ground	375	475	-100
N	Sill Height to Window Bottom Sill	895	773	122
O	Front Door Leading Edge to Impact CL	803	672	131
P	Rear Door Trailing Edge to Impact CL	1307	1273	34
Q	Front Window Opening	440	429	11
R	Right Side Length	4262	4301	-39
S	Left Side Length	4262	4236	26
T	Vehicle Width at "B" Post	1285	1252	33

DATA SHEET NO. 7

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

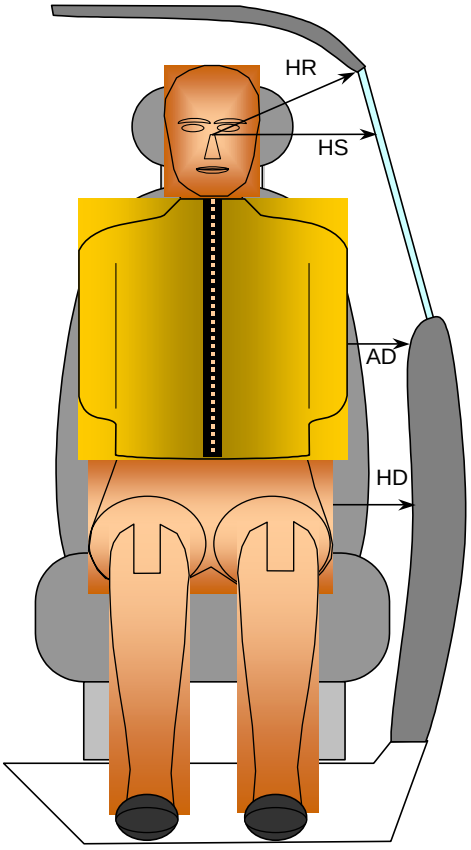


Driver Code	Pass. Code	Measurement Description	Driver S/N 059		Passenger S/N 066	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	370			
HW		Head to Windshield	575			
HZ	HZ	Head to Roof	172		177	
NR	NB	Nose to Rim/Nose to Seatback	480		653	
CD	CB	Chest to Dash or Seatback	548		585	
CS		Chest to Steering Wheel	328			
KDL	KBL	Left Knee to Dash or Seatback	113	8.1	190	13.3
KDR	KBR	Right Knee to Dash or Seatback	113	8.3	190	13.3
PA	PA	Pelvic Angle		24.7		24.6
PHX	PHX	H-Point to Striker (X-Axis)	257		291	
PHZ	PHZ	H-Point to Striker (Z-Axis)	129		285	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



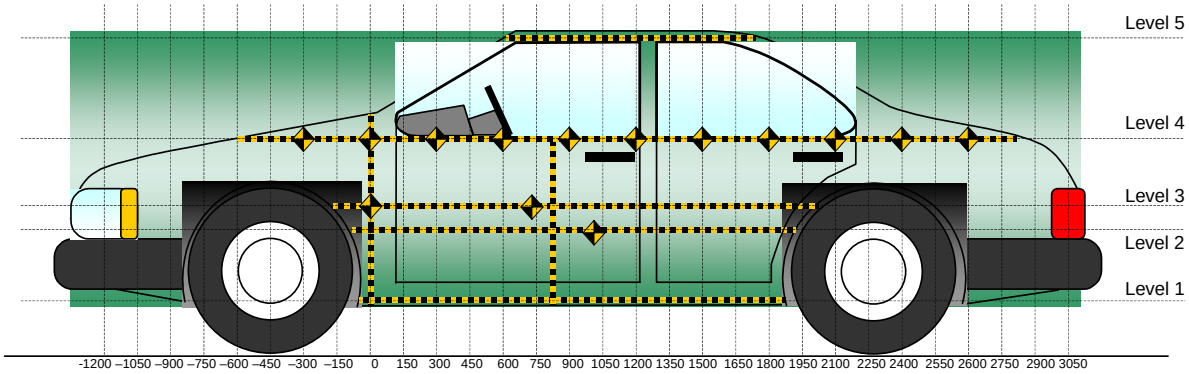
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 059	Passenger S/N 066
HR	Head to Side Header	mm	205	188
HS	Head to Side Window	mm	260	336
AD	Arm to Door - Lower	mm	110	103
AD	Arm to Door - Upper	mm	115	83
HD	H-Point to Door	mm	157	141

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.

All measurements below in mm.

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measurement Description	Height Above Ground
5	Window Top	1570
4	Window Sill	1040
3	Mid Door	730
2	Occupant H-Point	695
1	Sill Top	385

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200															
-1050															
-900															
-750		887	886				904	903				-17	-17		
-600				772					787					-15	
-450				792					802					-10	
-300				805					809					-4	
-150			900	810				901	810				-1	0	
0	879	894	894	815	760	876	890	890	811	756	3	4	4	4	4
150	856	886	885	821	741	748	725	731	835	745	108	161	154	-14	-4
300	858	887	887	827	714	721	683	679	806	718	137	204	208	21	-4
450	858	889	890	834	688	721	667	663	797	691	137	222	227	37	-3
600	859	891	892	838	661	720	658	657	784	664	139	233	235	54	-3
750	860	892	893	844	638	720	664	658	807	640	140	228	235	37	-2
900	860	893	894	849	623	721	652	648	777	623	139	241	246	72	0
1050	860	893	894	854	611	715	645	649	791	611	145	248	245	63	0
1200	860	894	895	858	606	724	668	666	744	605	136	226	229	114	1
1350	861	895	896	864	603	725	642	638	764	602	136	253	258	100	1
1500	861	895	896	868	598	730	639	637	784	596	131	256	259	84	2
1650	861	894	895	873	595	728	650	662	799	593	133	244	233	74	2
1800	861	894	895	875	593	755	691	710	825	592	106	203	185	50	1
1950		897	898	891	591		778	792	873	590		119	106	18	1
2100				880	590				875	588				5	2
2250				868	589				824	587				44	2
2400				861	589				832	587				29	2
2550			900	851	584			905	836	582			-5	15	2
2700		885	884	837			900	900	833			-15	-16	4	

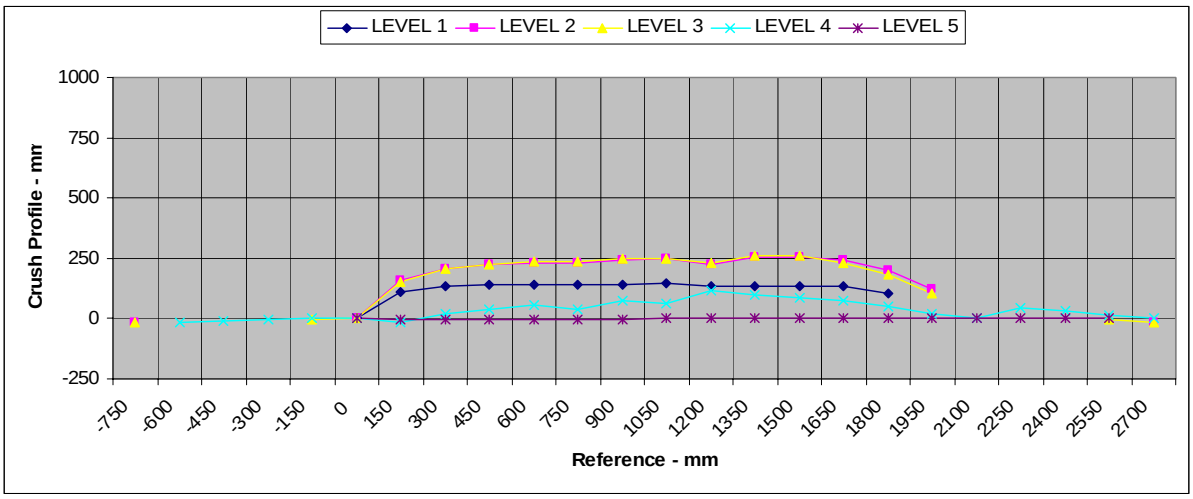
Reference plane is parallel to test vehicle longitudinal centerline.

Given measurements = Reference plane to car body

DATA SHEET NO. 10 (CONTINUED)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

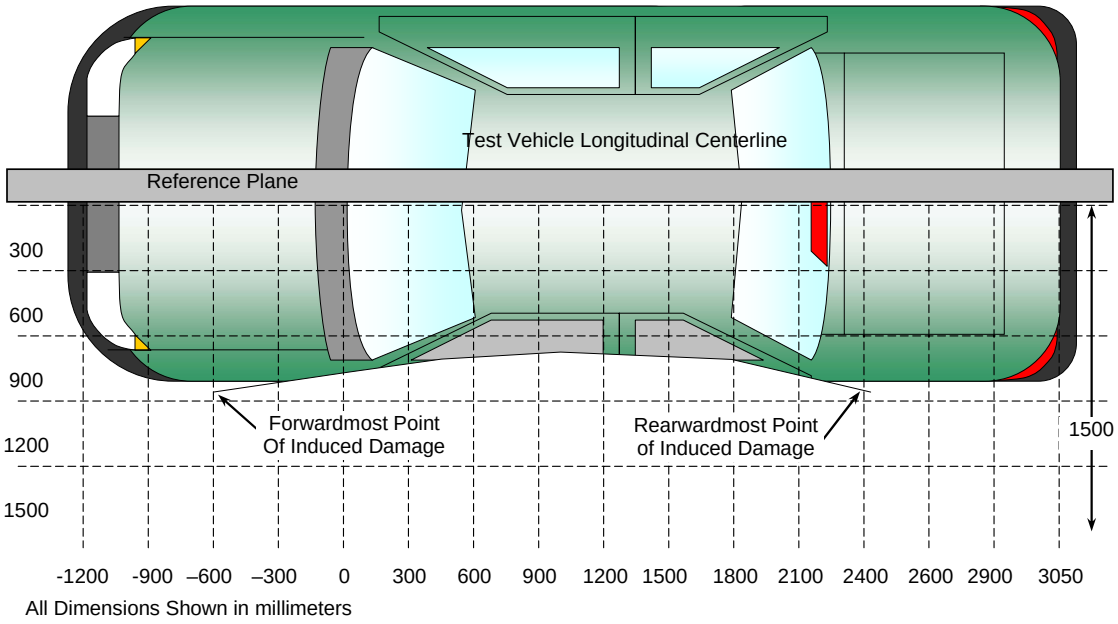


	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	145	256	259	114	4
Distance from Impact	mm	1050	1500	1500	1200	0

DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle:	2008 Nissan Rogue S 2WD	NHTSA No.:	M85209
Test Program:	NCAP Side Impact	Test Date:	11/13/07



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	0 mm	5	760	756	4
2	45 mm	3	890	663	227
3	900 mm	3	894	648	246
4	1200 mm	3	895	666	229
5	1500 mm	3	896	637	259
6	1950 mm	2	897	778	119

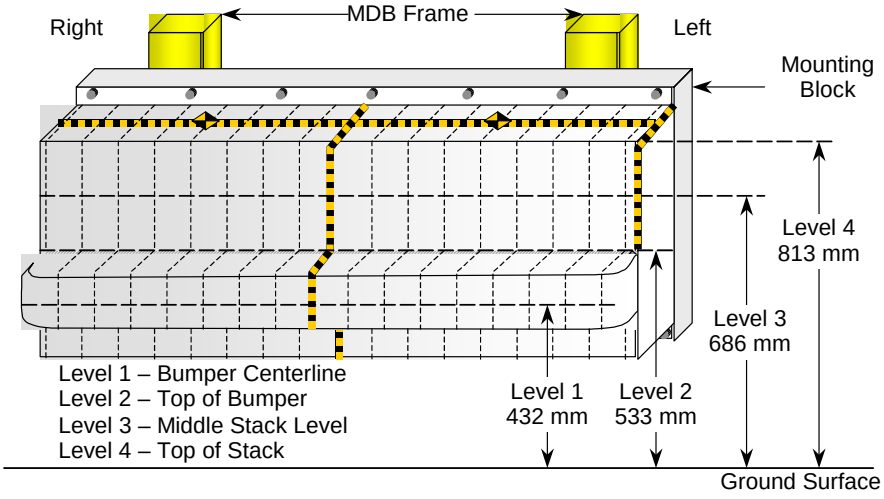
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



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	-188	-188	-184	-182	-179	-180	-174	-170	-168	-163	-160	-157	-155	-152	-150	-148	-144
2	-78	-76	-73	-71	-70	-70	-75	-67	-60	-54	-50	-47	-44	-42	-42	-45	-53
3	-68	-43	-26	-25	-24	-26	-33	-30	-19	-18	-20	-18	-19	-24	-34	-49	-75
4	-148	-122	-90	-61	-48	-78	-92	-69	-43	-36	-35	-36	-41	-50	-62	-84	-119

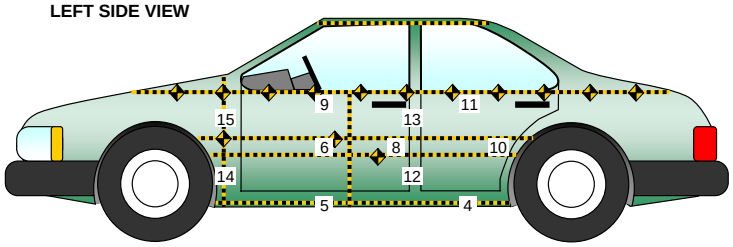
All measurements are in mm

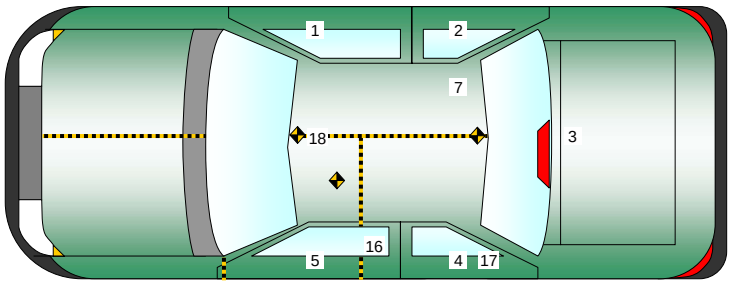
DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

LEFT SIDE VIEW





Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3188	695	---[2]
2	Right Sill at Rear Seat	2290	695	---[2]
3	Rear Floorpan Above Axle	1439	0	---[2]
4	Left Sill at Rear Seat	2772	690	360
5	Left Sill at Front Seat	3175	690	385
6	Left Front Door C/L[1]			
7	Rear Occupant Compartment	2180	540	480
8	Left Front Door Mid-Rear[1]			
9	Left Front Door Upper C/L[1]			
10	Left Rear Door Mid-Rear[1]			
11	Left Rear Door Upper C/L[1]			
12	Left Lower B-Post	2490	620	655
13	Left Upper B-Post	2470	800	991
14	Left Lower A-Post	3600	800	612
15	Left Upper A-Post	3595	775	951
16	Front Seat Track	3442	550	385
17	Rear Seat Track or Structure	2372	490	475
18	Vehicle CG	3440	0	610

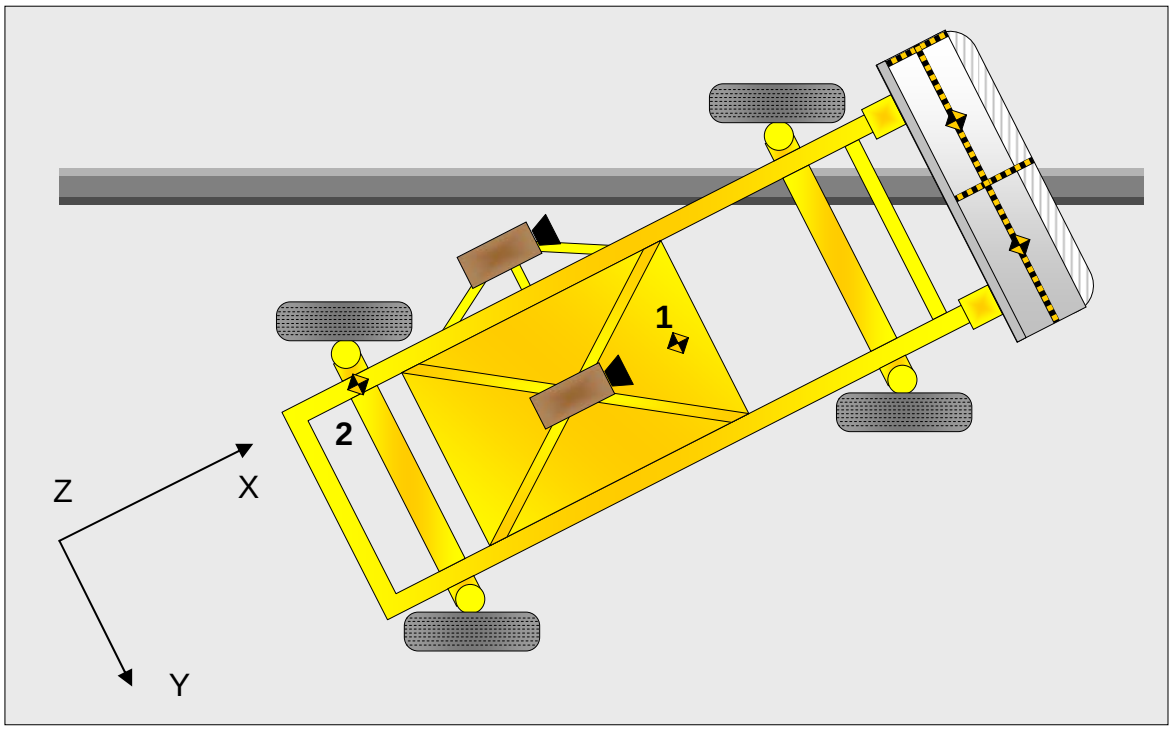
Reference Points: X - Test Vehicle Rear Bumper (+ forward)
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

[1] Accelerometer not applicable to test mode.
[2] Measurement not recorded.

DATA SHEET NO. 14

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



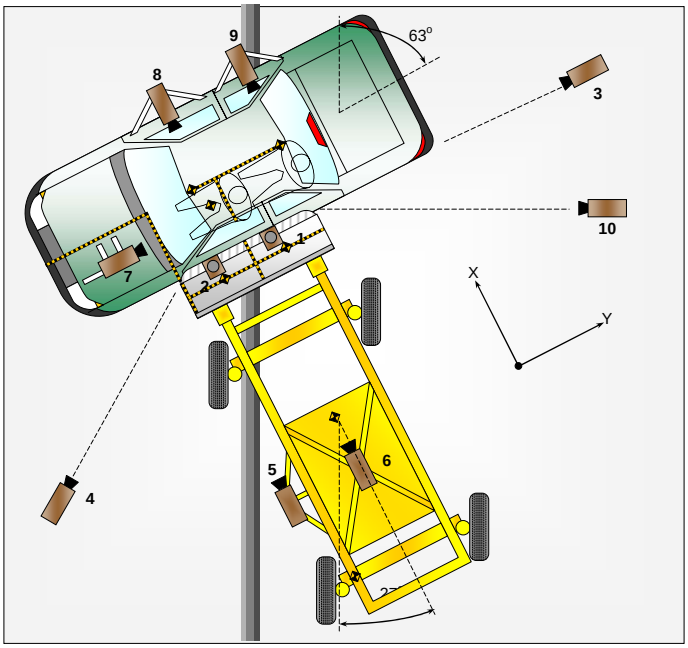
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	1855	0	-520
2	MDB Rear	412	-677	-625

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

DATA SHEET NO. 15

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Overhead Overall	0	350	-7000	12.5	1000
2	Overhead Close-up	0	600	-7000	25	1000
3	Right Side, Ground Level, Overall	0	9370	-1300	12.5	1000
4	Left Side, Ground Level, Overall	2180	6770	-1330	12.5	1000
5	MDB Onboard, Impact Point Close-up	1720	890	-850	12.5	1000
6	MDB Onboard, Centerline of Impact	2590	0	-1400	12.5	1000
7	Vehicle Onboard Front SID/HIII, Front	4304	1390	-1300	12.5	1000
8	Vehicle Onboard Front SID/HIII, Side	1890	150	-1410	6.5	1000
9	Vehicle Onboard Rear SID/HIII, Side	1590	870	-1430	6.5	1000
10	Real Time Coverage				Zoom	30

Reference Points: X - Impact Line
Y - MDB Left Edge Impact Point
Z - Ground Plane

DATA SHEET NO. 16

SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 22.5° C Test Time: 14:40

Stoddard Solvent Spillage Measurements

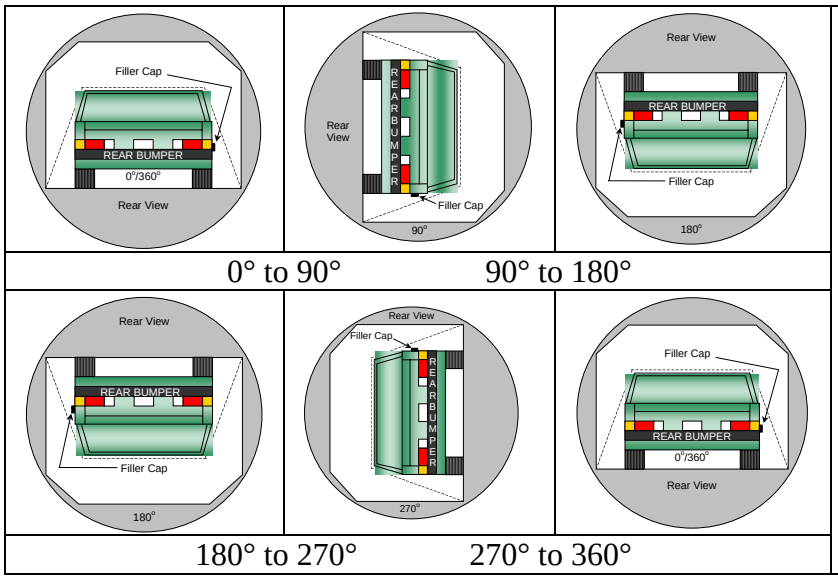
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 ounce)

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).

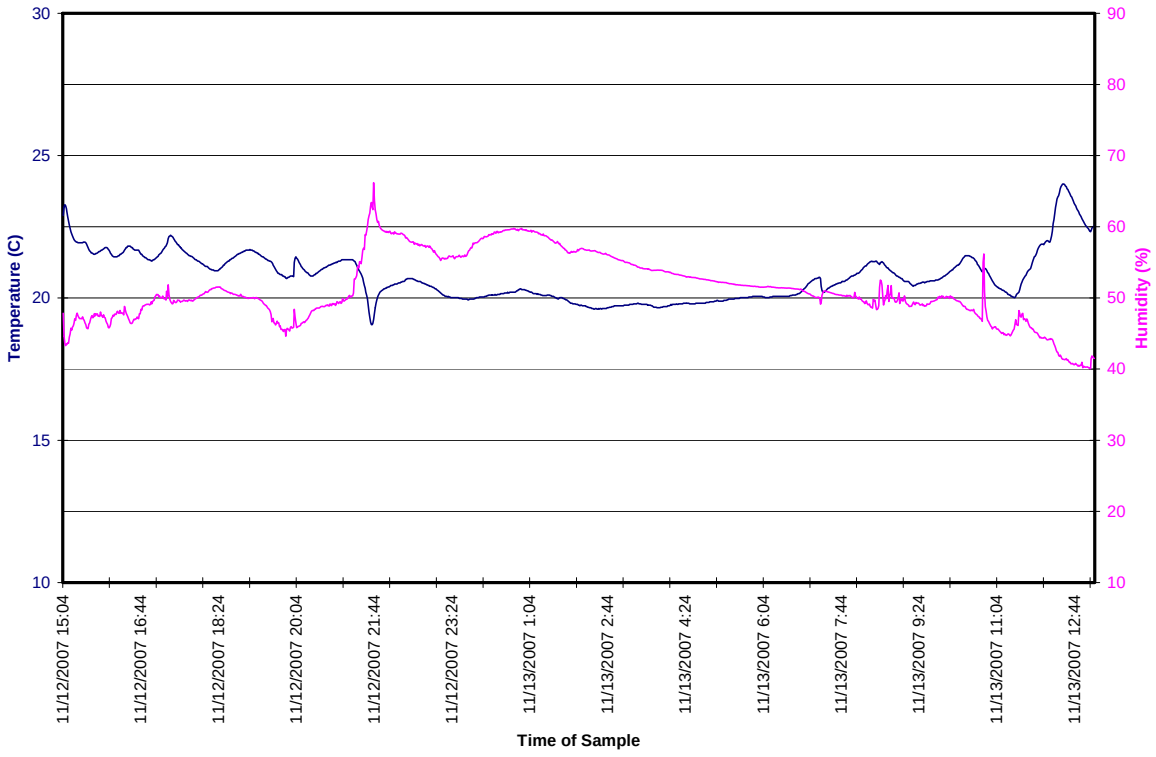
3. Details of Stoddard Solvent spillage locations: None

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

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07



APPENDIX A

PHOTOGRAPHS

List of Photographs

List of Photographs (Continued)

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 with Barrier

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

Figure A-5 Pre-Test Left Front View of Test Vehicle

Figure A-6 Post-Test Left Front View of Test Vehicle

Figure A-7 Pre-Test Impacted Side View of Test Vehicle with Barrier

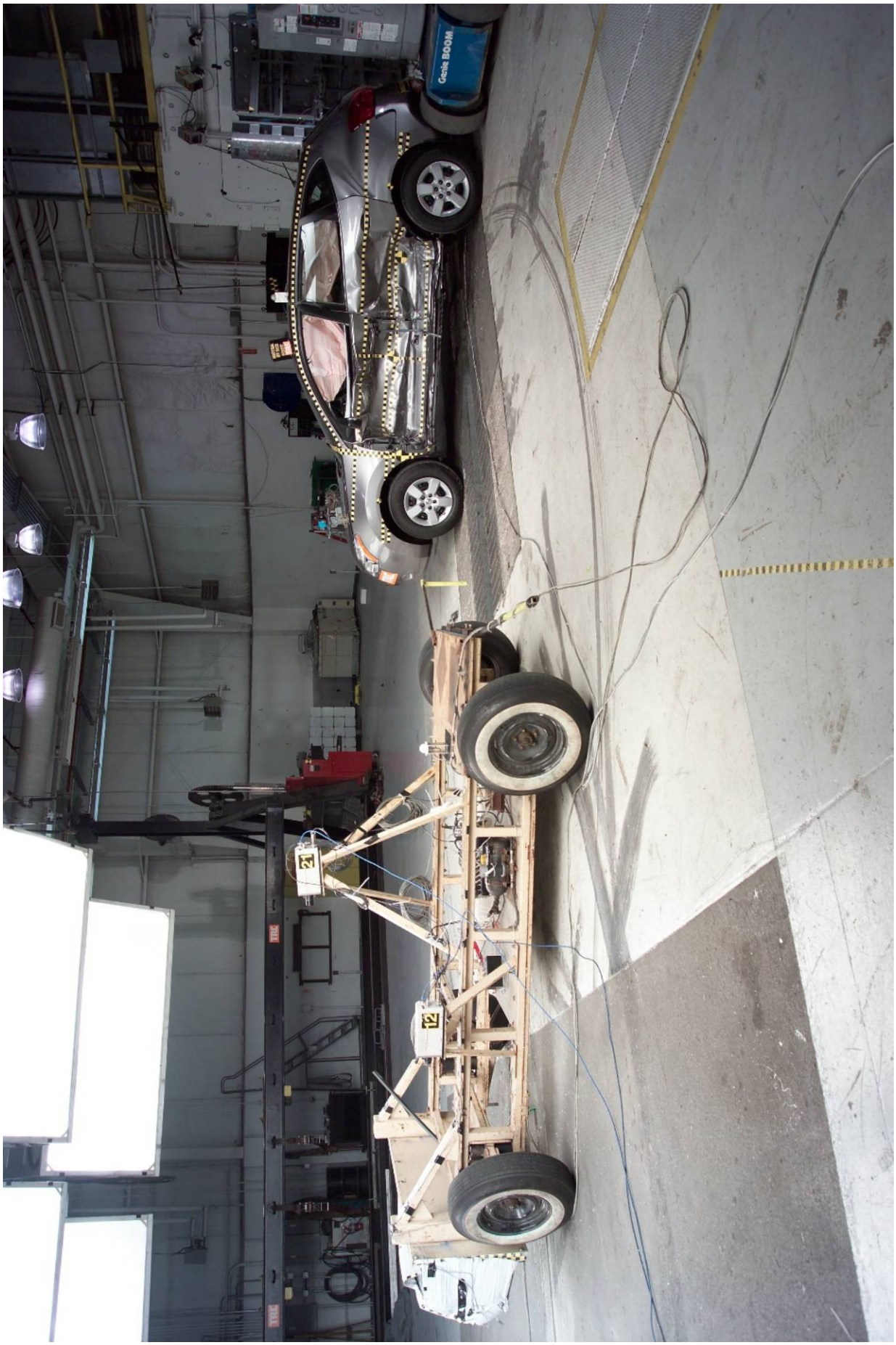


Figure A-8 Post-Test Impacted Side View of Test Vehicle with Barrier

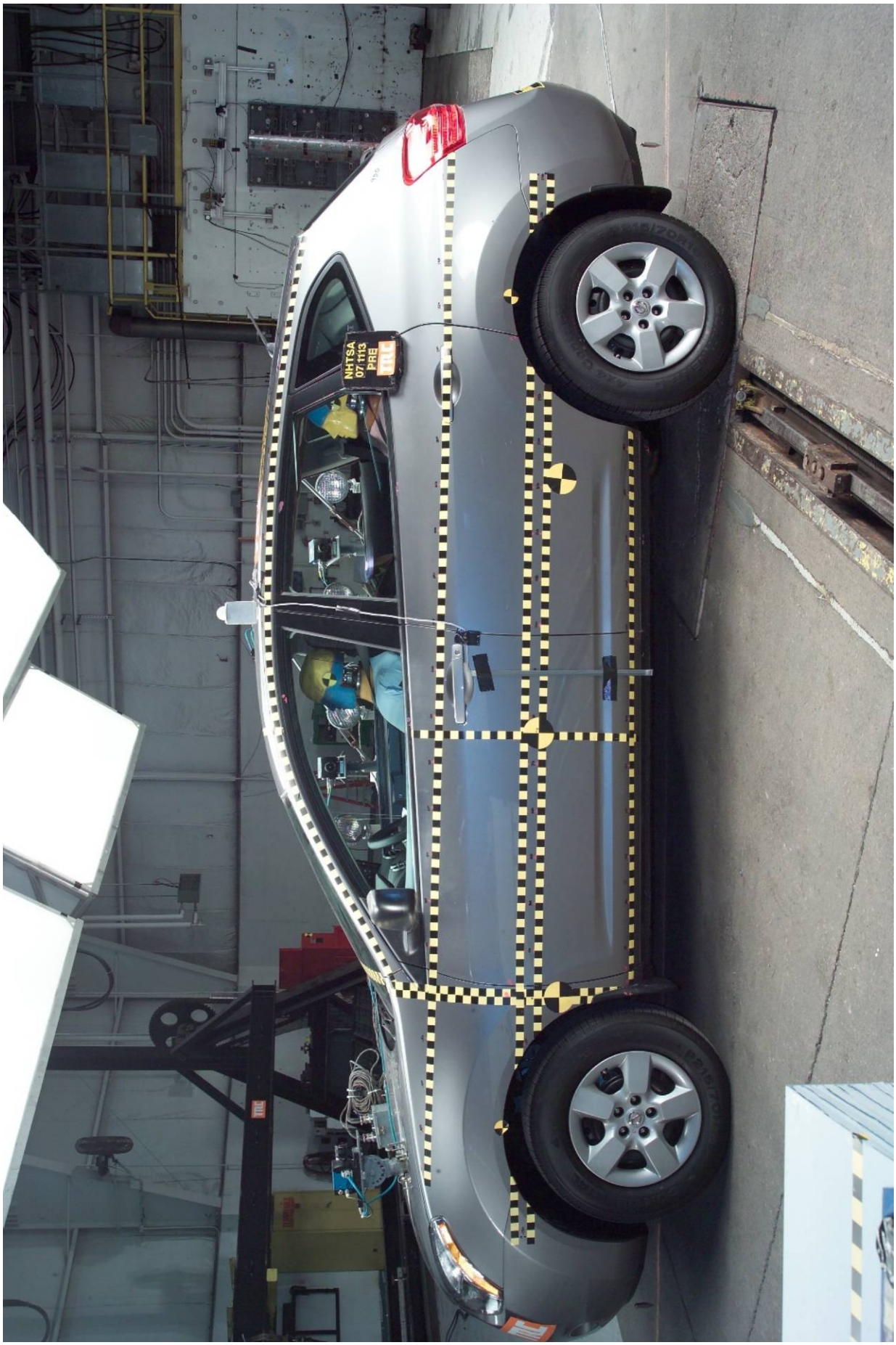


Figure A-9 Pre-Test Impacted Side View of Test Vehicle

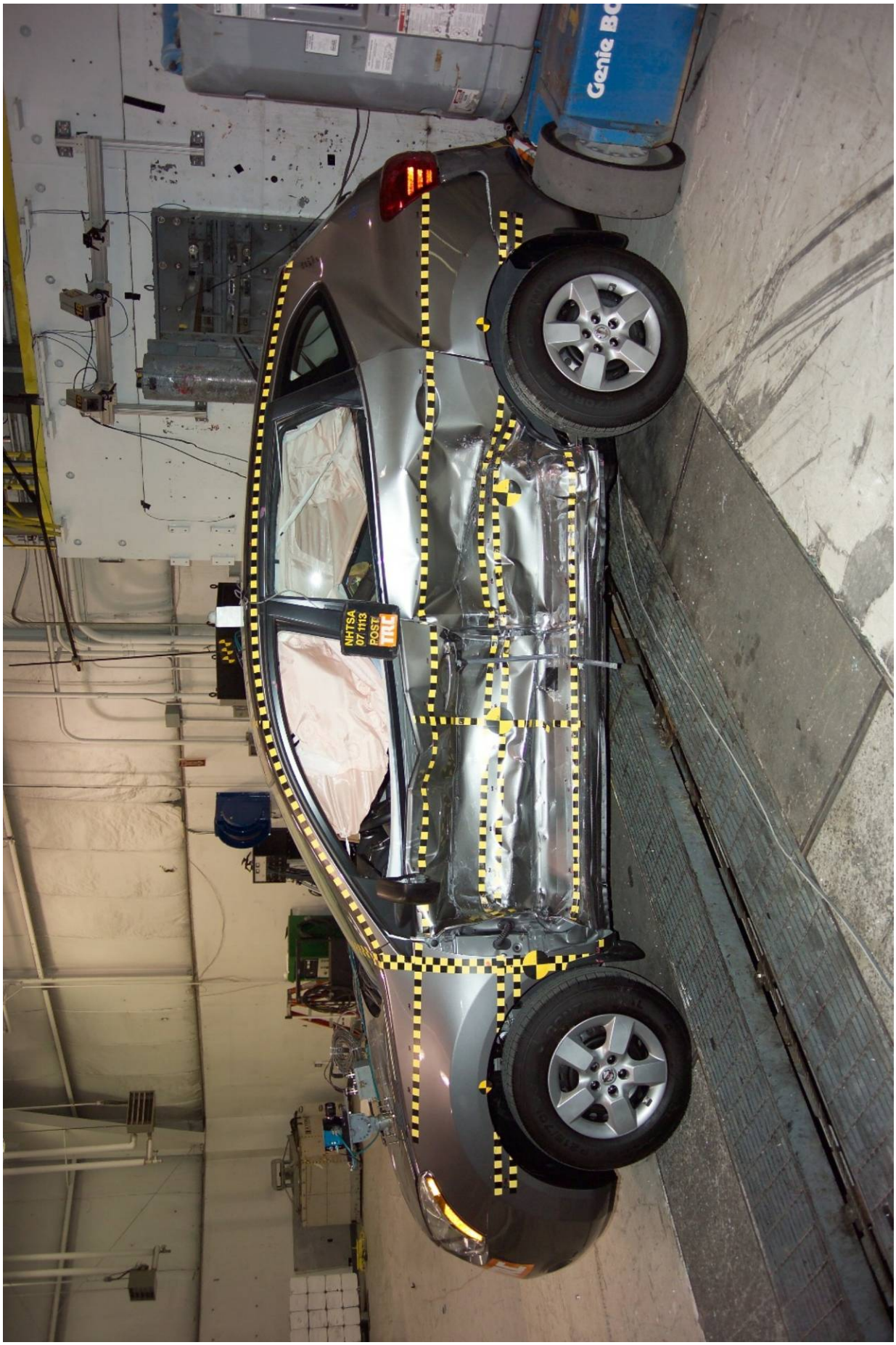


Figure A-10 Post-Test Impacted Side View of Test Vehicle

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

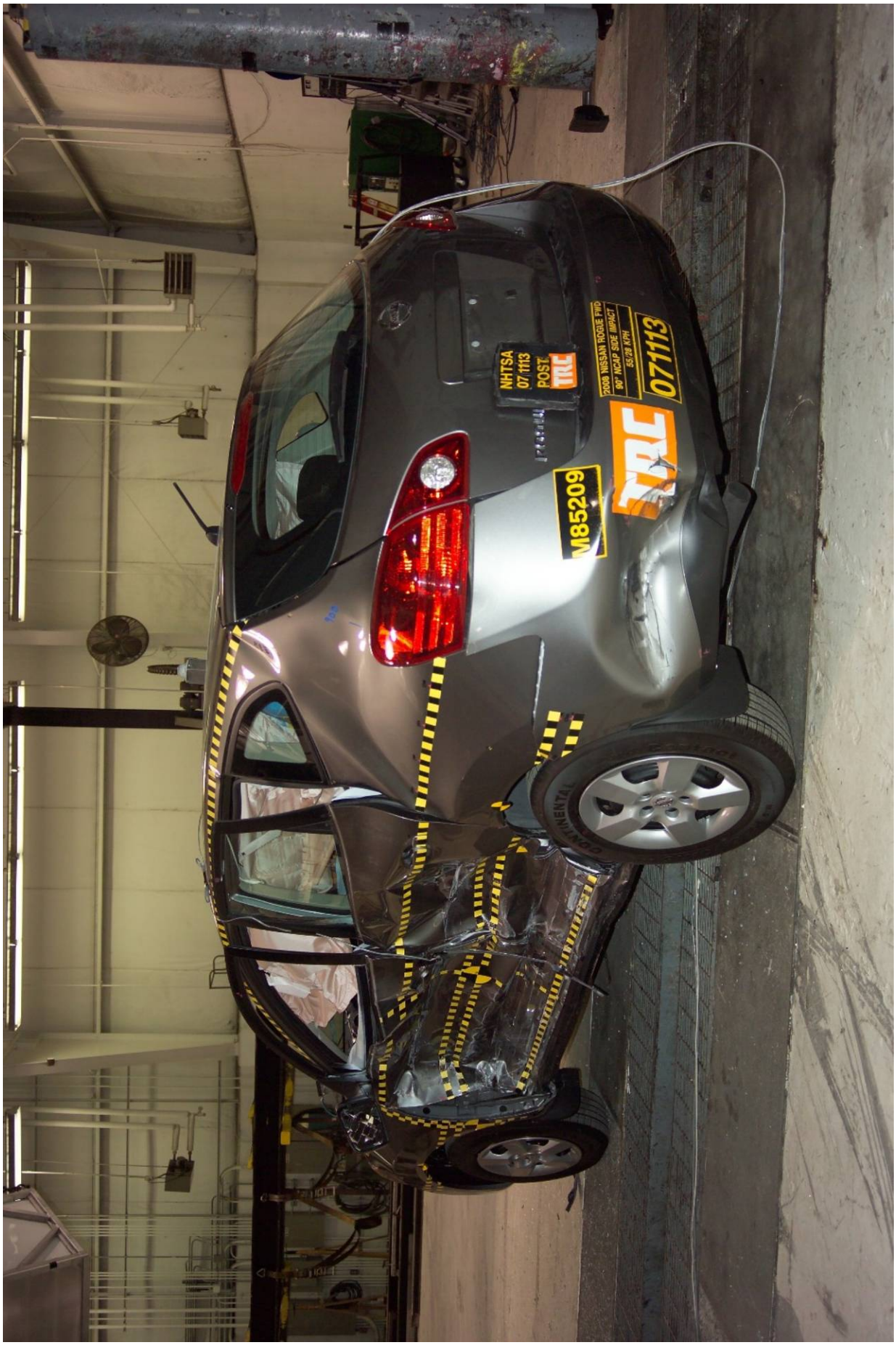


Figure A-12 Post-Test Left Rear View of Test Vehicle

Figure A-13 Pre-Test Rear View of Test Vehicle

Figure A-14 Post-Test Rear View of Test Vehicle

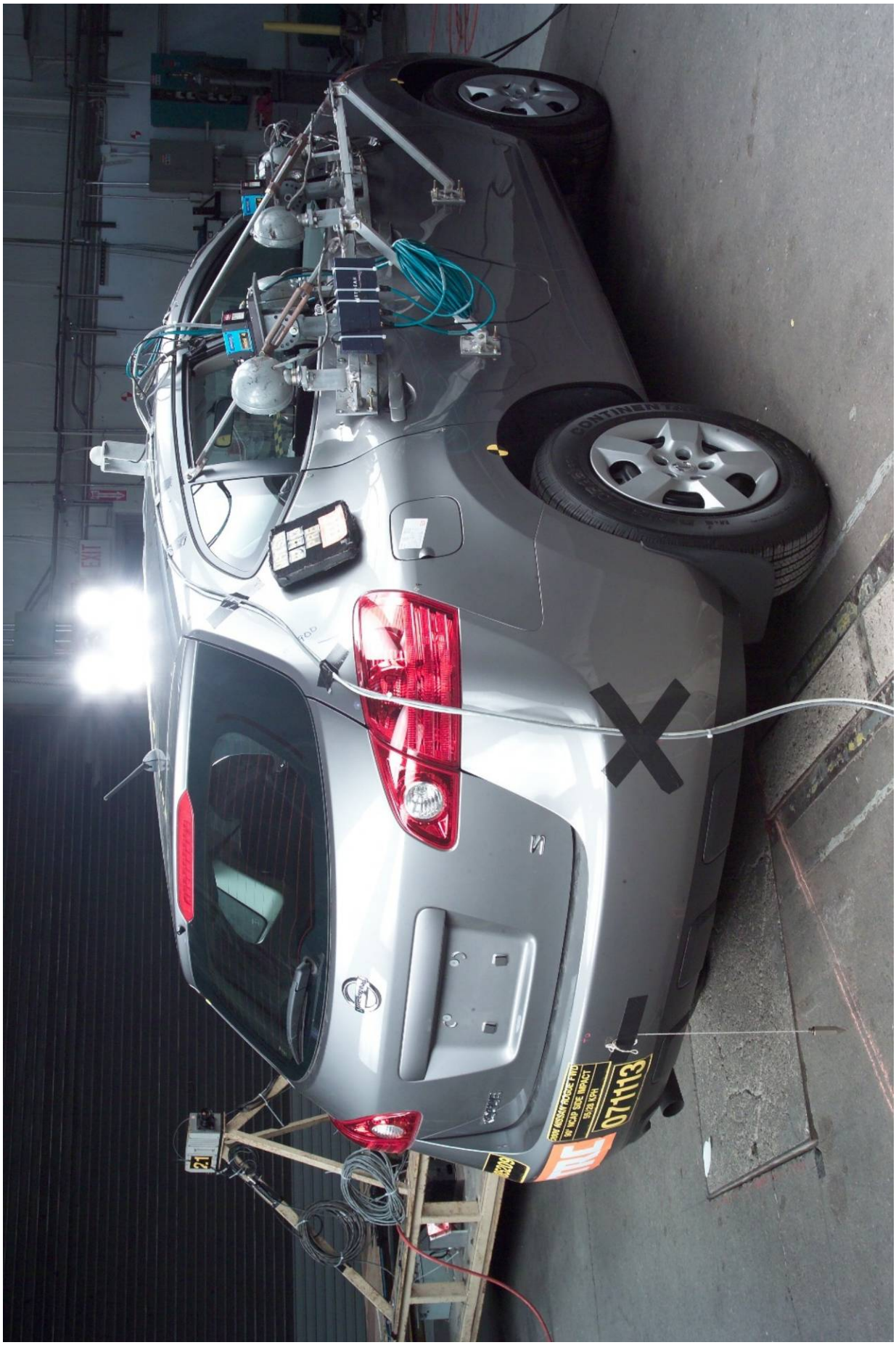


Figure A-15 Pre-Test Right Rear View of Test Vehicle

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

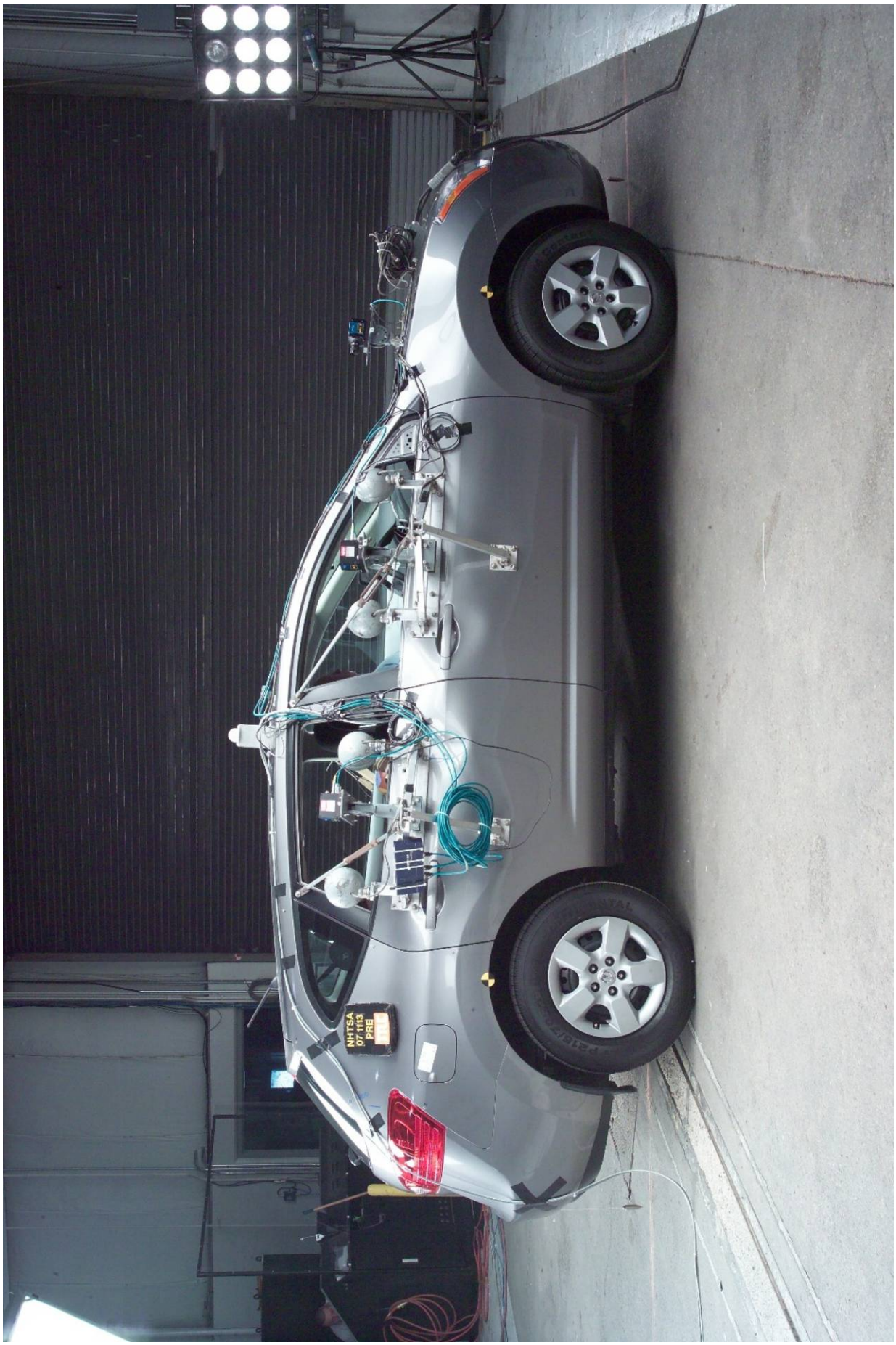


Figure A-17 Pre-Test Right Side View of Test Vehicle

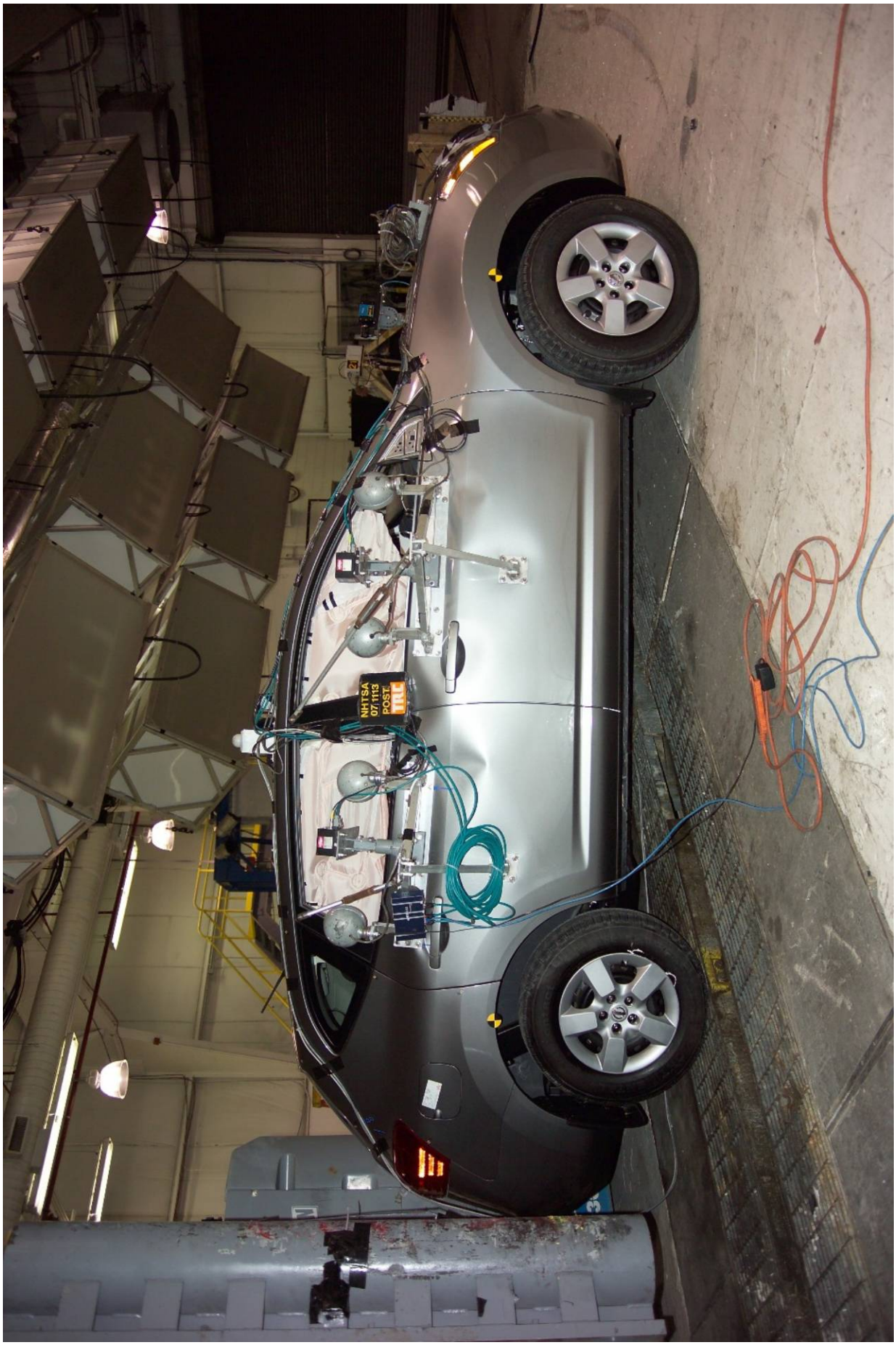


Figure A-18 Post-Test Right Side View of Test Vehicle

Figure A-19 Pre-Test Right Front View of Test Vehicle

Figure A-20 Post-Test Right Front View of Test Vehicle

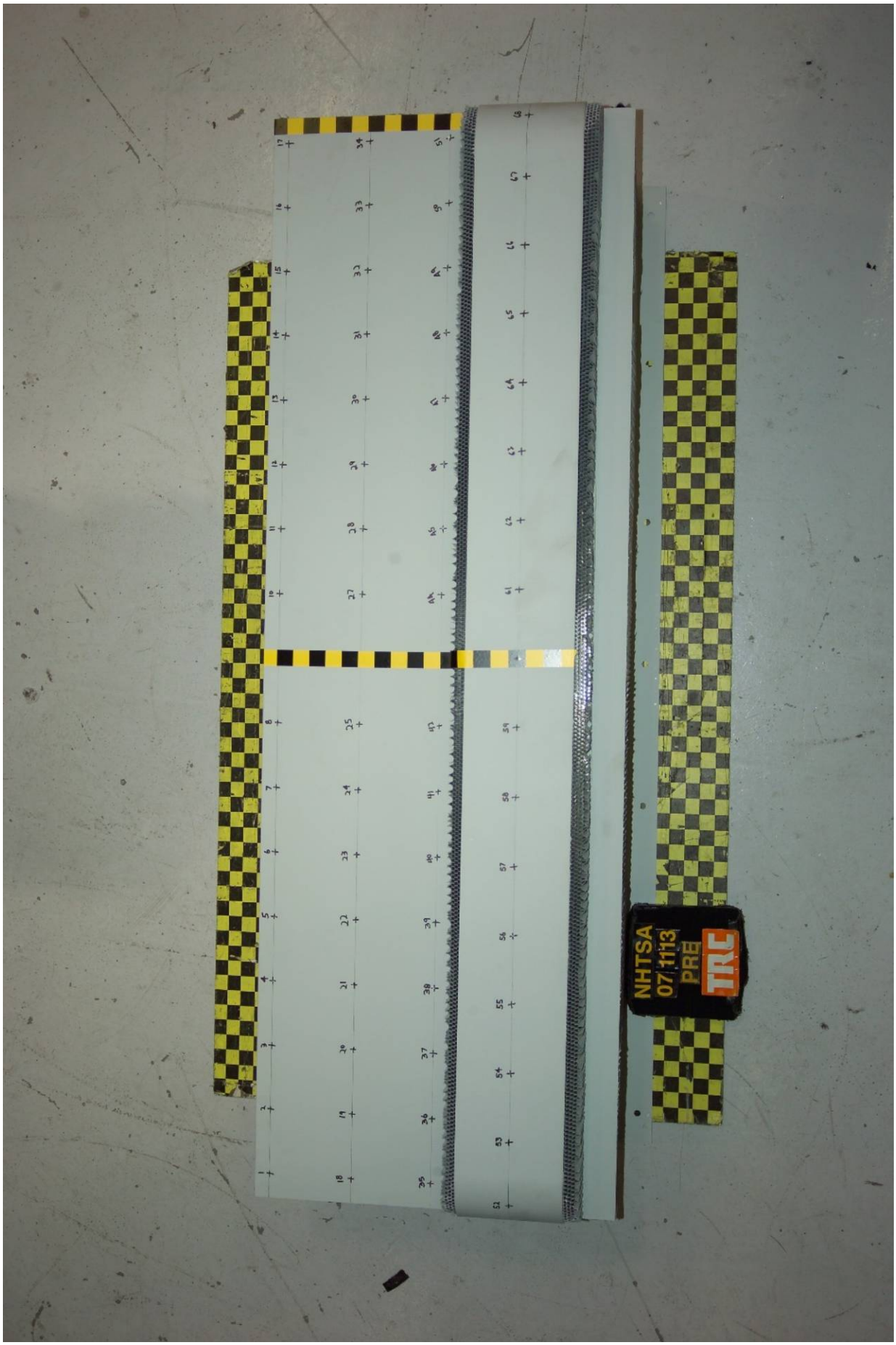


Figure A-21 Pre-Test Frontal View of Impactor Face

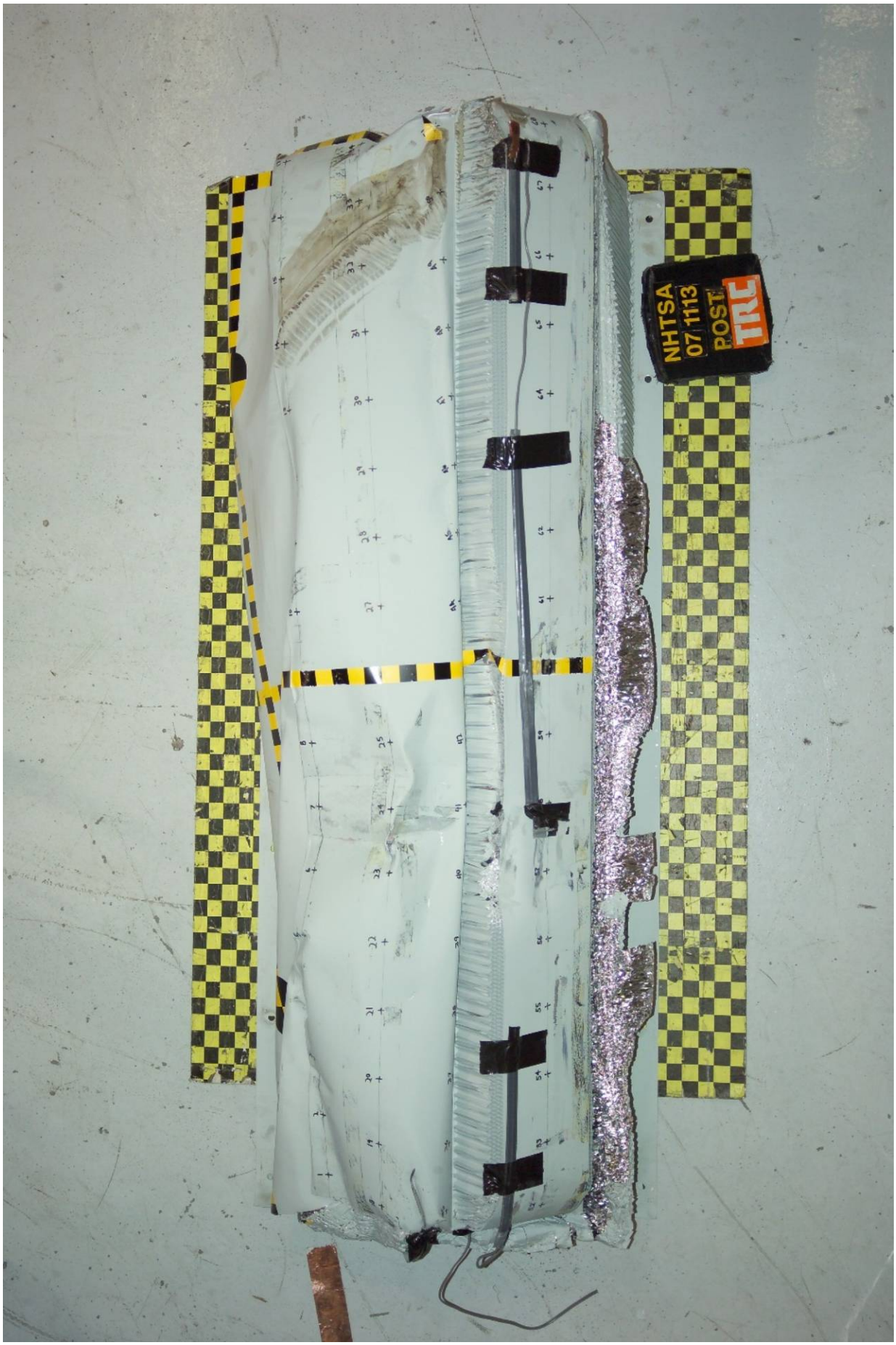


Figure A-22 Post-Test Frontal View of Impactor Face

Figure A-23 Pre-Test Left Side View of Impactor Face

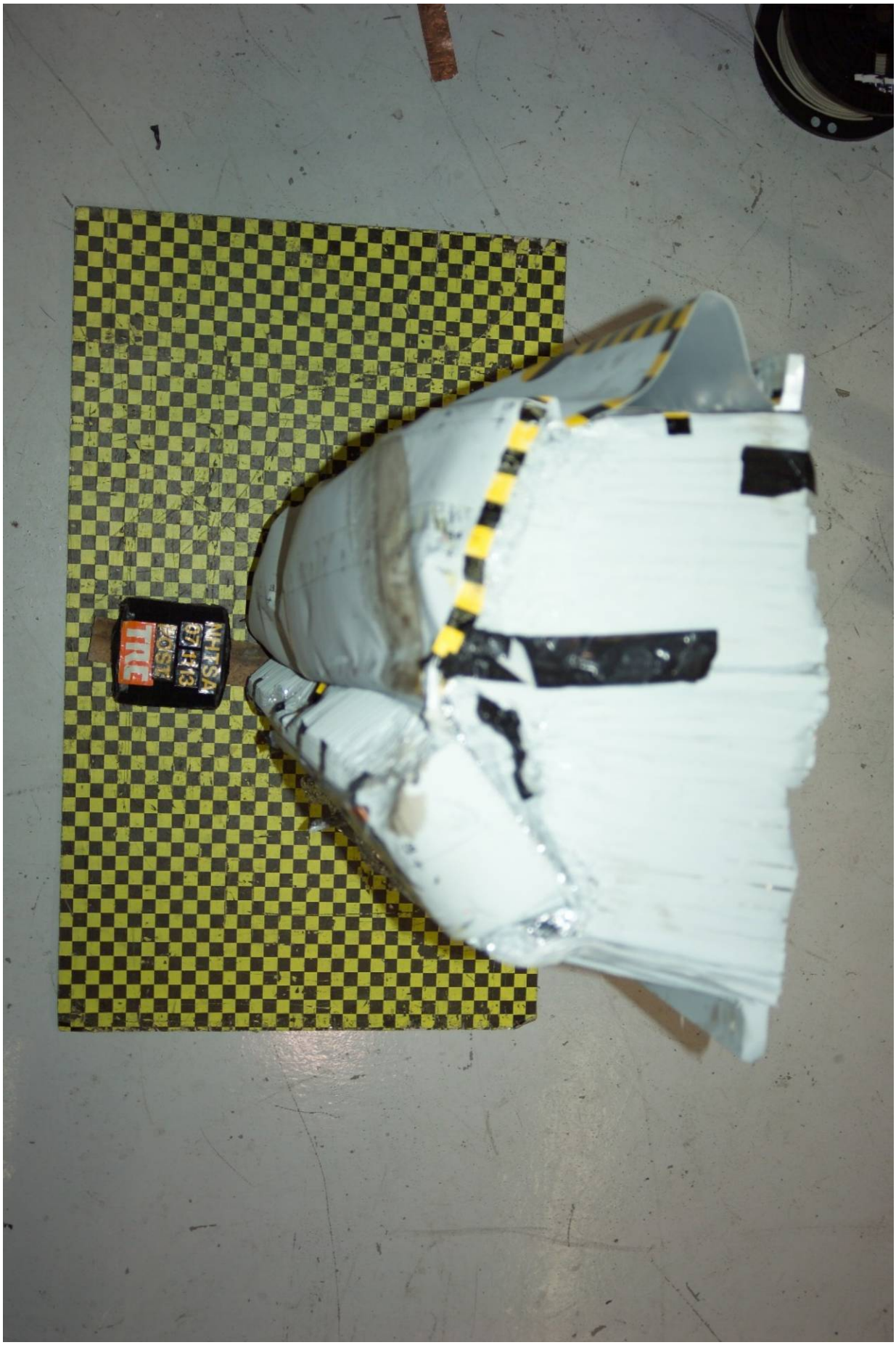


Figure A-24 Post-Test Left Side View of Impactor Face

Figure A-25 Pre-Test Right Side View of Impactor Face

Figure A-26 Post-Test Right Side View of Impactor Face

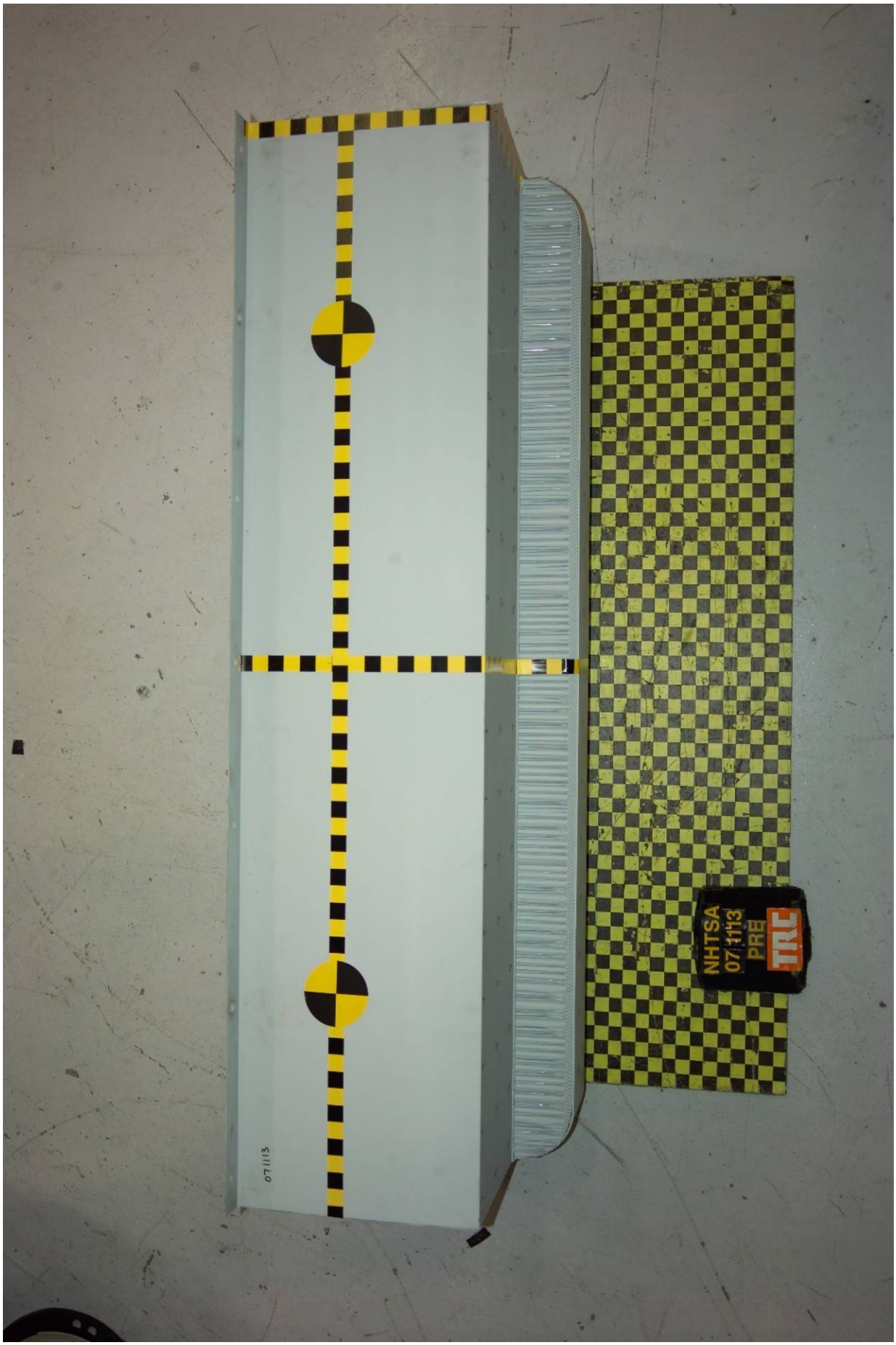


Figure A-27 Pre-Test Top View of Impactor Face

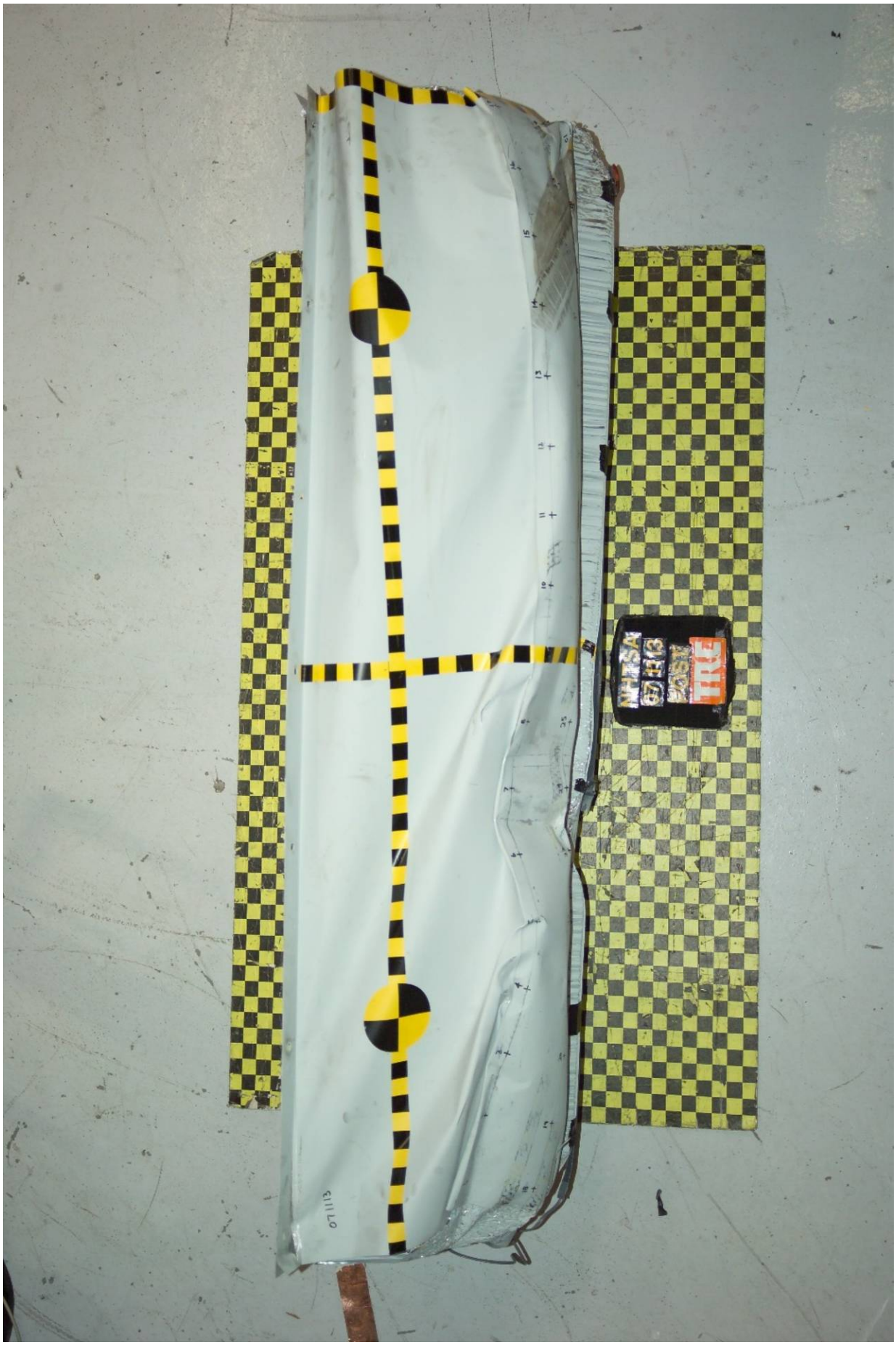


Figure A-28 Post-Test Top View of Impactor Face

Figure A-29 Pre-Test Left Side View of Impactor

Figure A-30 Post-Test Left Side View of Impactor

Figure A-31 Pre-Test Right Side View of Impactor

Figure A-32 Post-Test Right Side View of Impactor

Figure A-33 Pre-Test Top View of Impactor

Figure A-34 Post-Test Top View of Impactor

Figure A-35 Pre-Test Left Side Overall View of Impactor

Figure A-36 Post-Test Left Side Overall View of Impactor

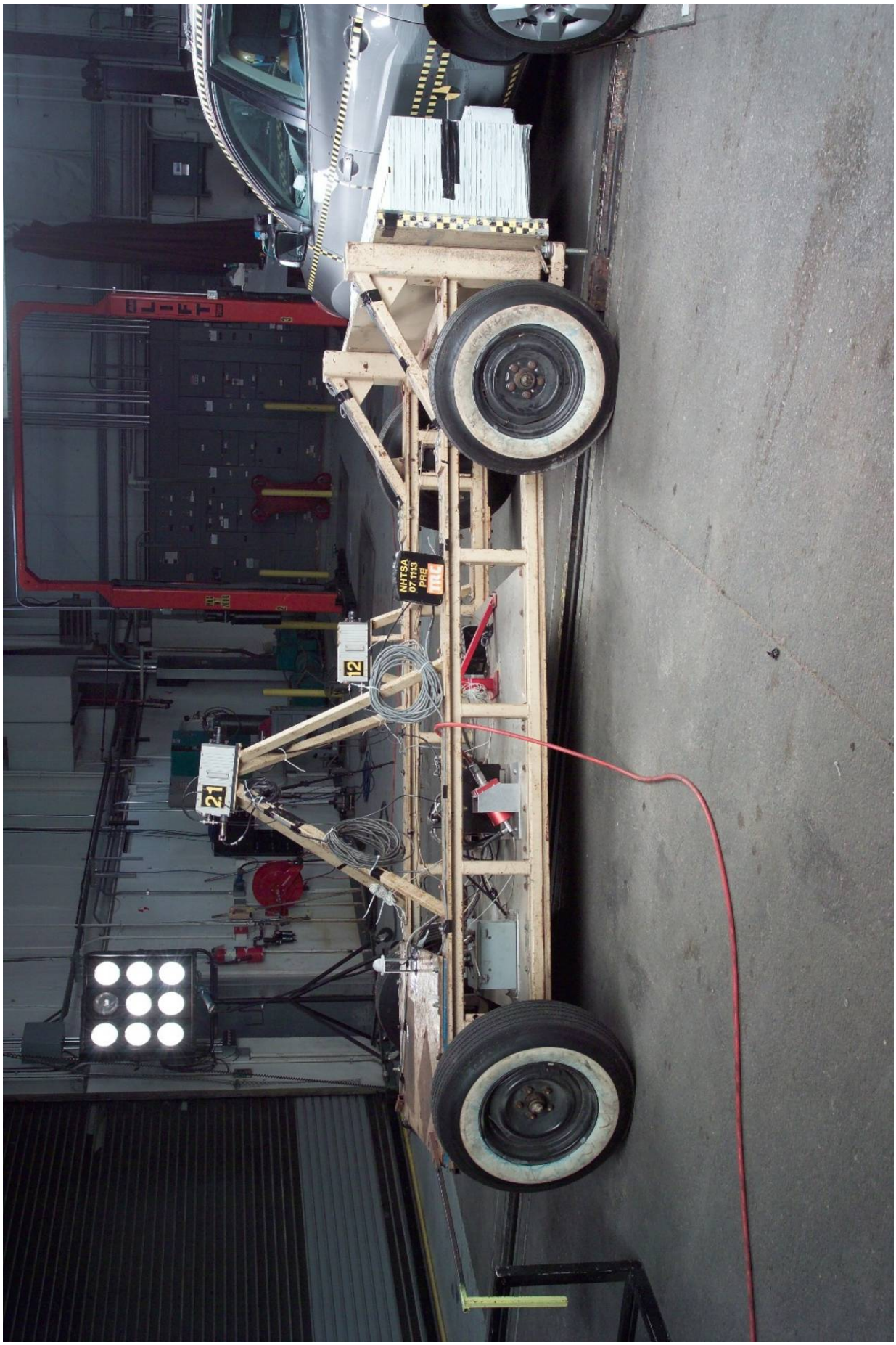


Figure A-37 Pre-Test Right Side Overall View of Impactor

Figure A-38 Post-Test Right Side Overall View of Impactor

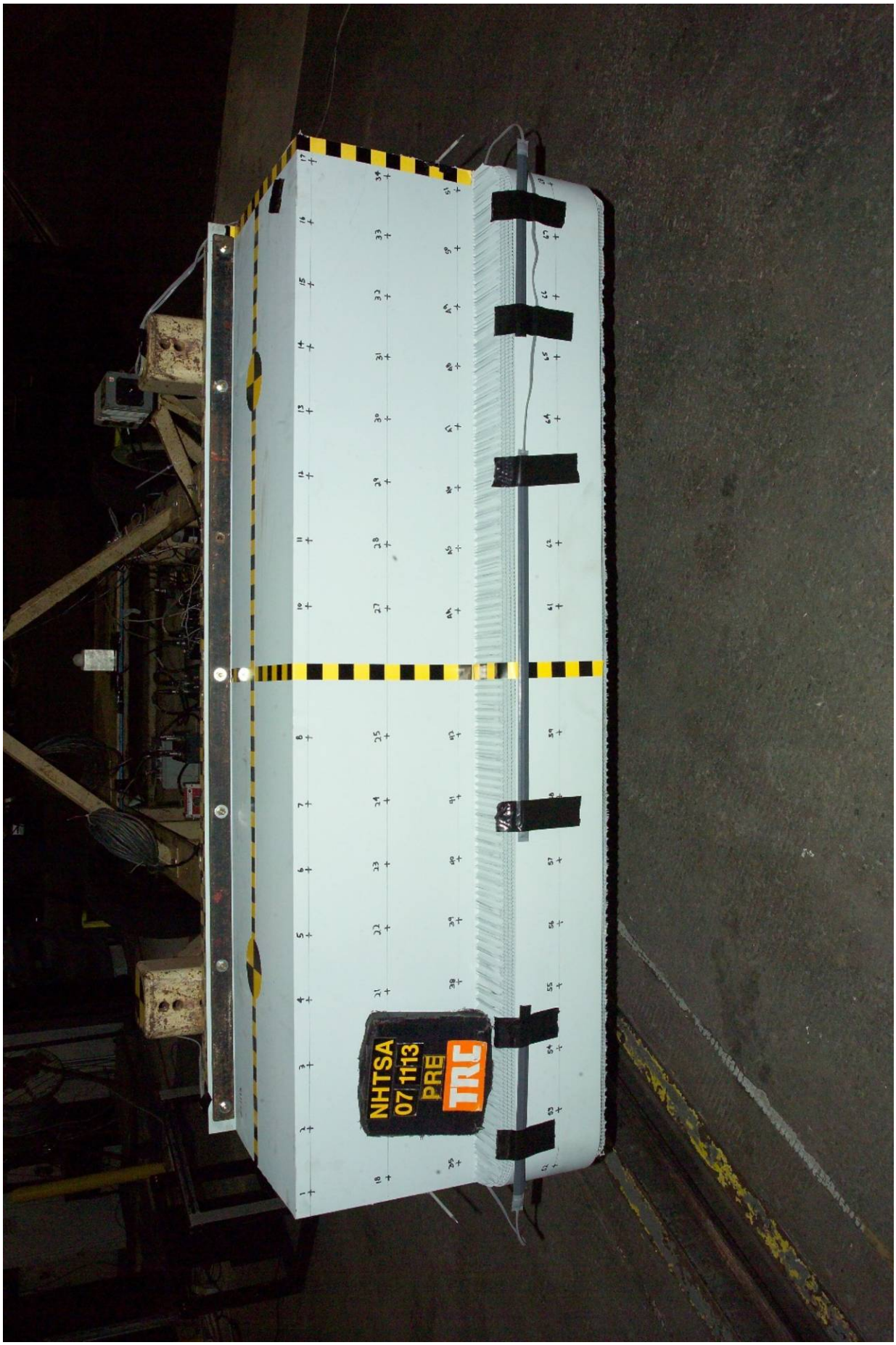


Figure A-39 Pre-Test View of MDB Showing Contact Switches in Place

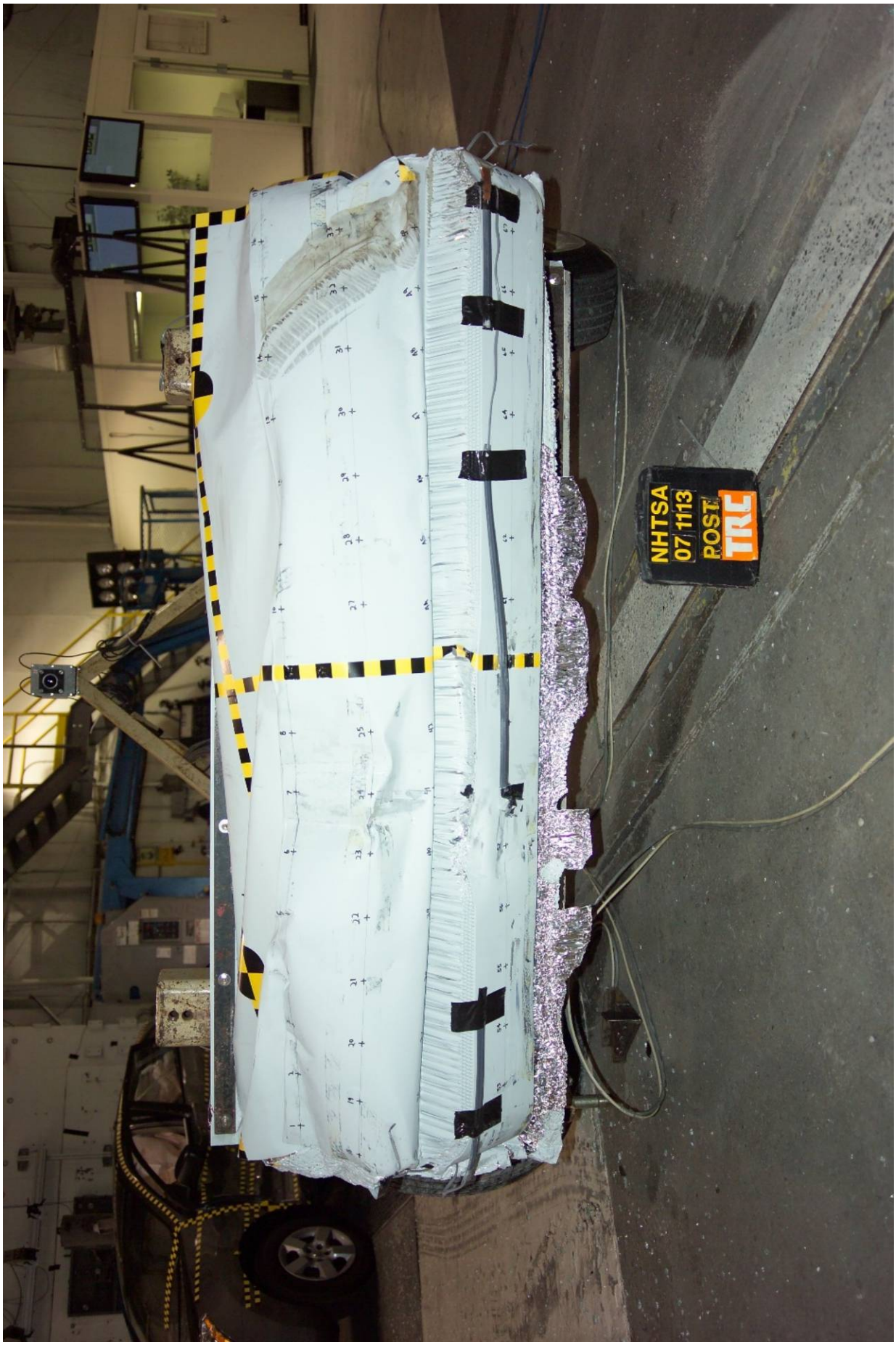


Figure A-40 Post-Test View of MDB Showing Contact Switches in Place

Figure A-41 Pre-Test Overhead View of MDB Aligned with Vehicle

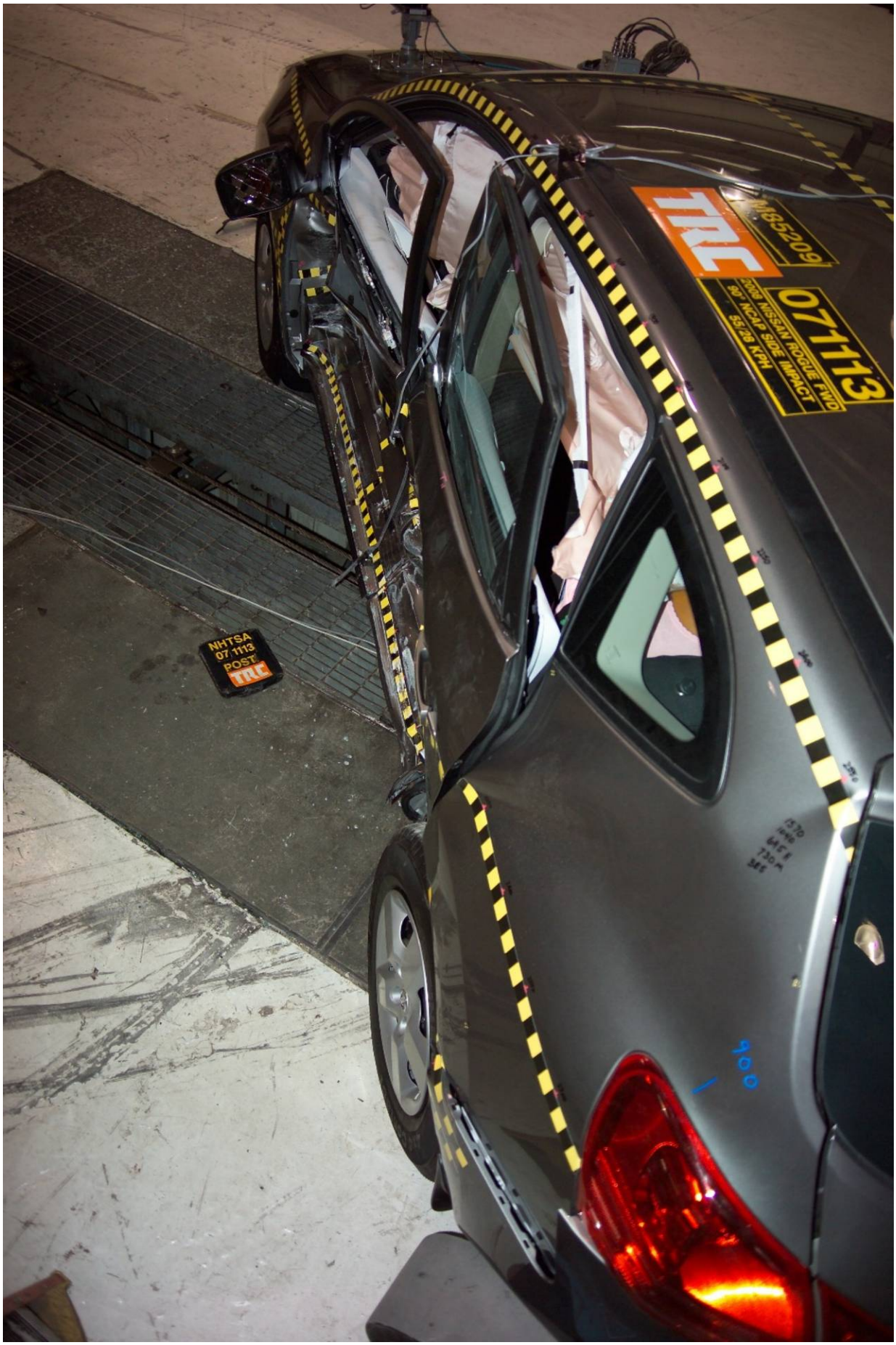


Figure A-42 Post-Test Overhead View of MDB with Vehicle

Figure A-43 Pre-Test Left Occupant Compartment View of Front SID

Figure A-44 Post-Test Left Occupant Compartment View of Front SID

Figure A-45 Pre-Test Left Occupant Compartment View of Rear SID

Figure A-46 Post-Test Left Occupant Compartment View of Rear SID

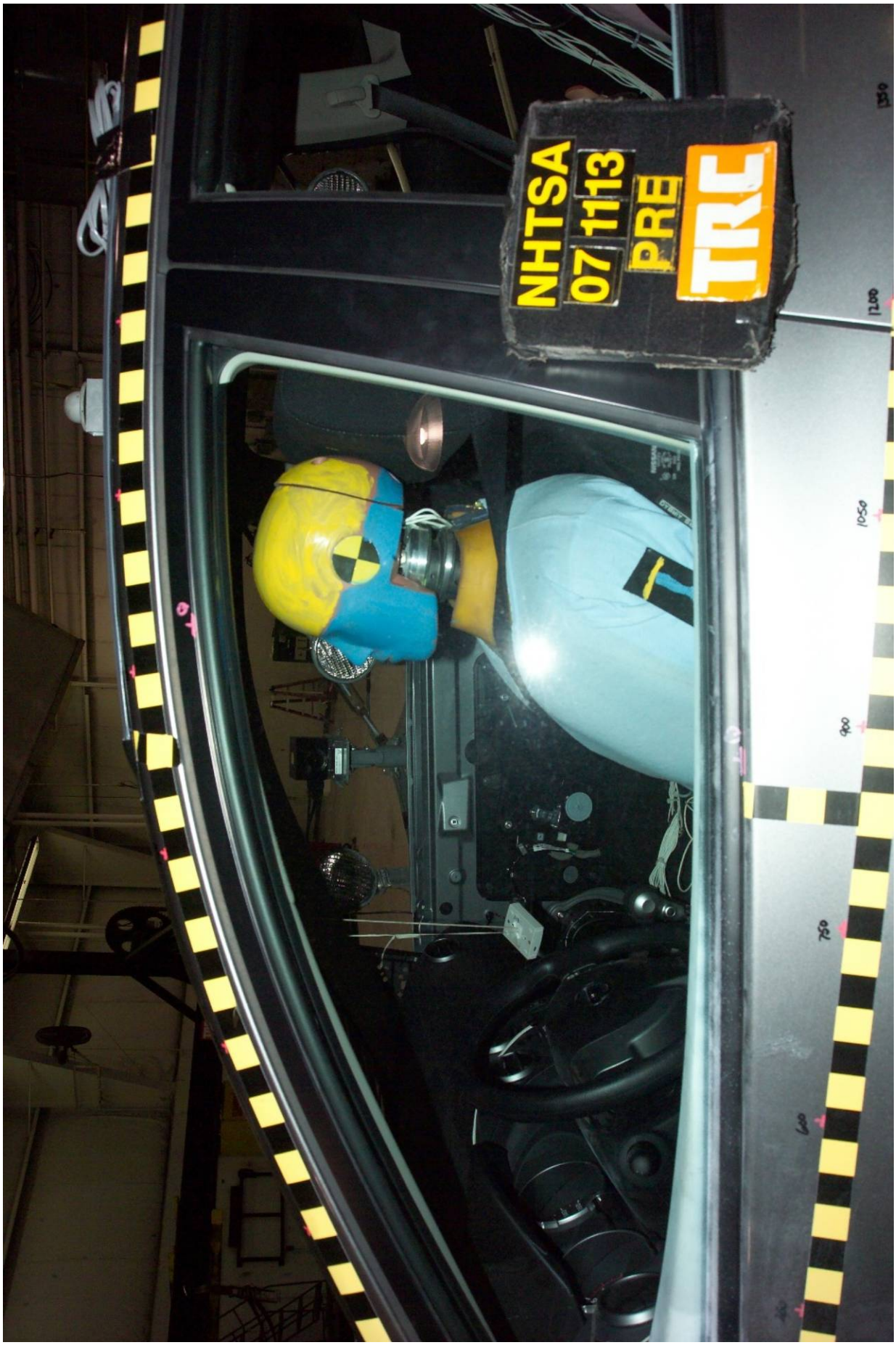


Figure A-47 Pre-Test Left View of Front SID

Figure A-48 Post-Test Left View of Front SID

Figure A-49 Pre-Test Left View of Front SID and Belt Position

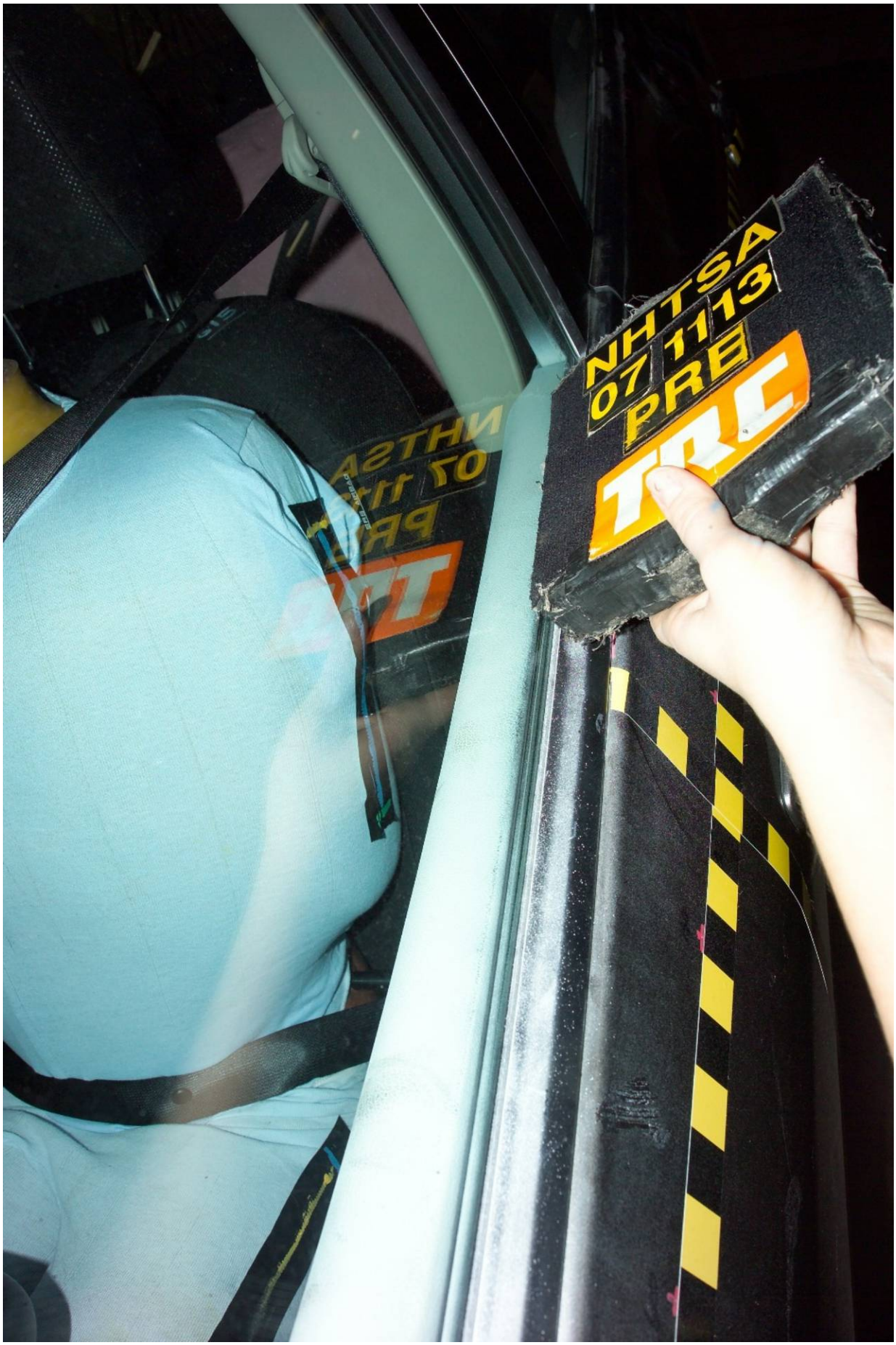


Figure A-50 Pre-Test Left View of Front SID and Door Clearance

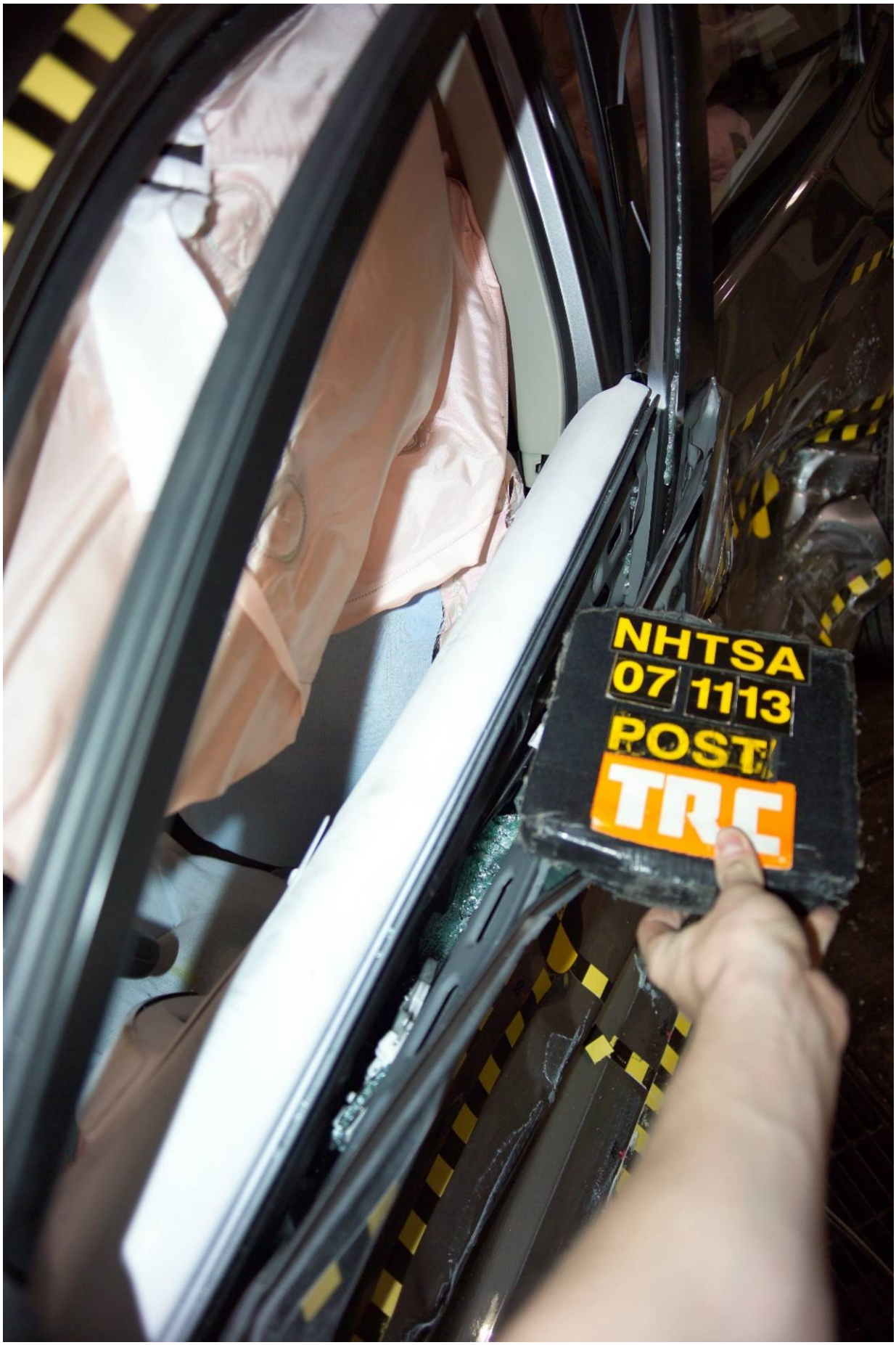


Figure A-51 Post-Test Left View of Front SID and Door Clearance

Figure A-52 Pre-Test Left View of Rear SID

Figure A-53 Post-Test Left View of Rear SID

Figure A-54 Pre-Test Left View of Rear SID and Belt Position

Figure A-55 Pre-Test Left View of Rear SID and Door Clearance

Figure A-56 Post-Test Left View of Rear SID and Door Clearance

Figure A-57 Pre-Test Interior of Front Door

Figure A-58 Post-Test Interior of Front Door Showing SID Impact Locations

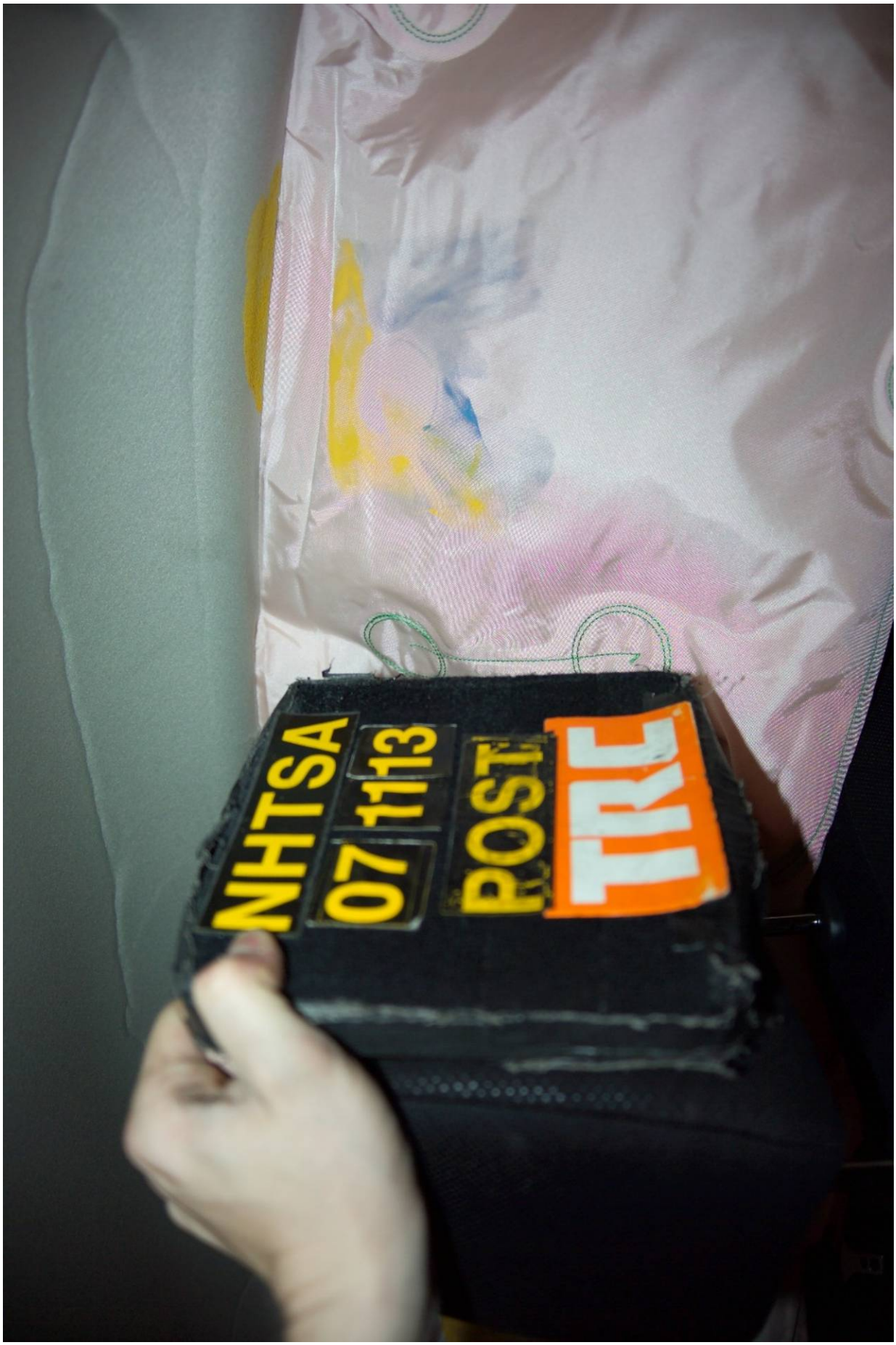


Figure A-59 Post-Test Front SID Contact - View 1

Figure A-60 Post-Test Front SID Contact - View 2

Figure A-61 Pre-Test Interior of Rear Door

Figure A-62 Post-Test Interior of Rear Door Showing SID Impact Locations

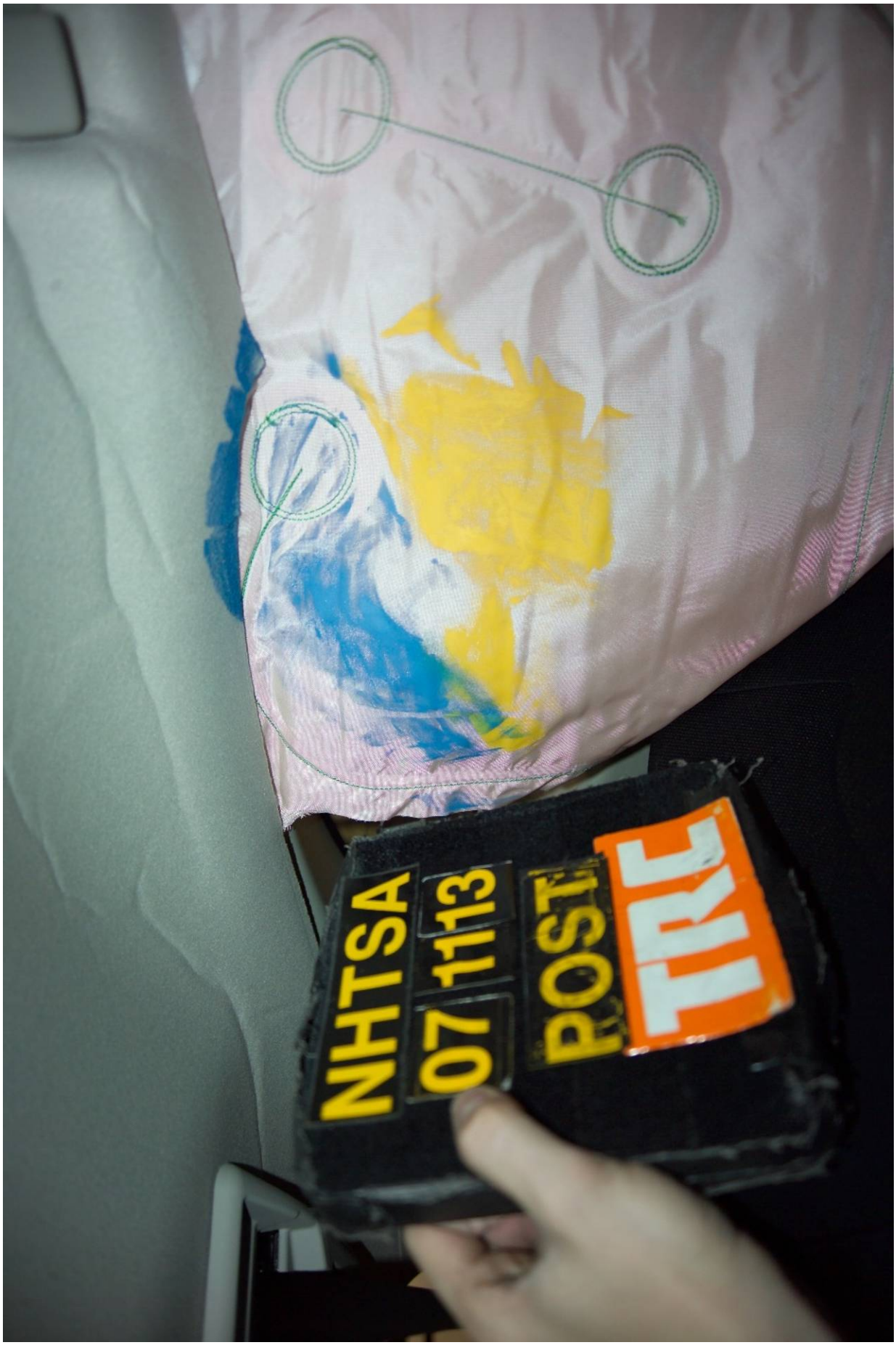


Figure A-63 Post-Test Rear SID Contact - View 1

Figure A-64 Post-Test Rear SID Contact - View 2

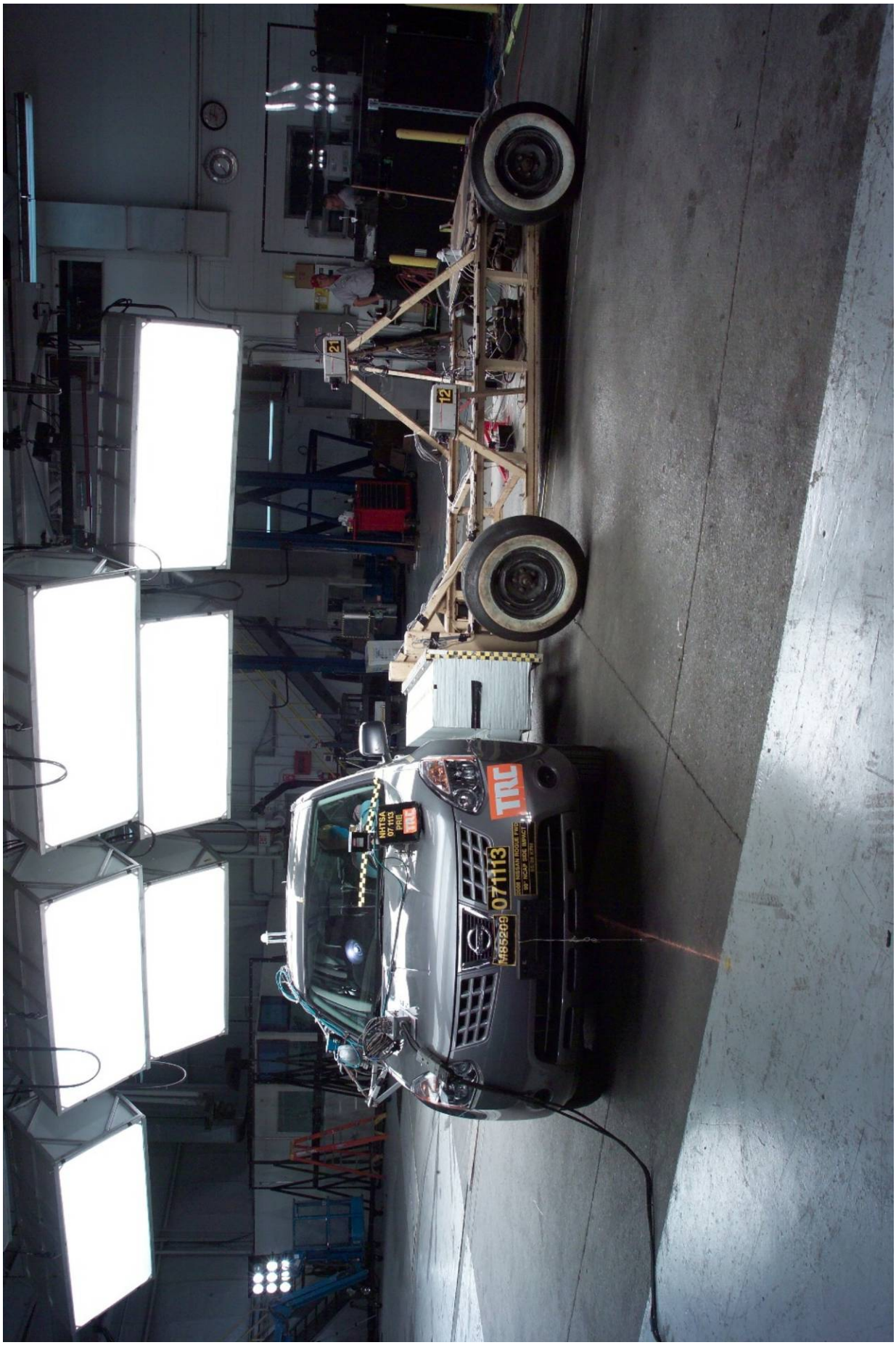


Figure A-65 Pre-Test Left Side View of MDB with Impactor Face in Position

Figure A-66 Pre-Test Primary Impact Point View

Figure A-67 Post-Test Primary Impact Point View

Figure A-68 Pre-Test Right Side View of MDB with Impactor Face in Position

Figure A-69 Pre-Test Secondary Impact Point View

Figure A-70 Post-Test Secondary Impact Point View

Figure A-71 Pre-Test Overhead View of MDB with Impactor Face in Position

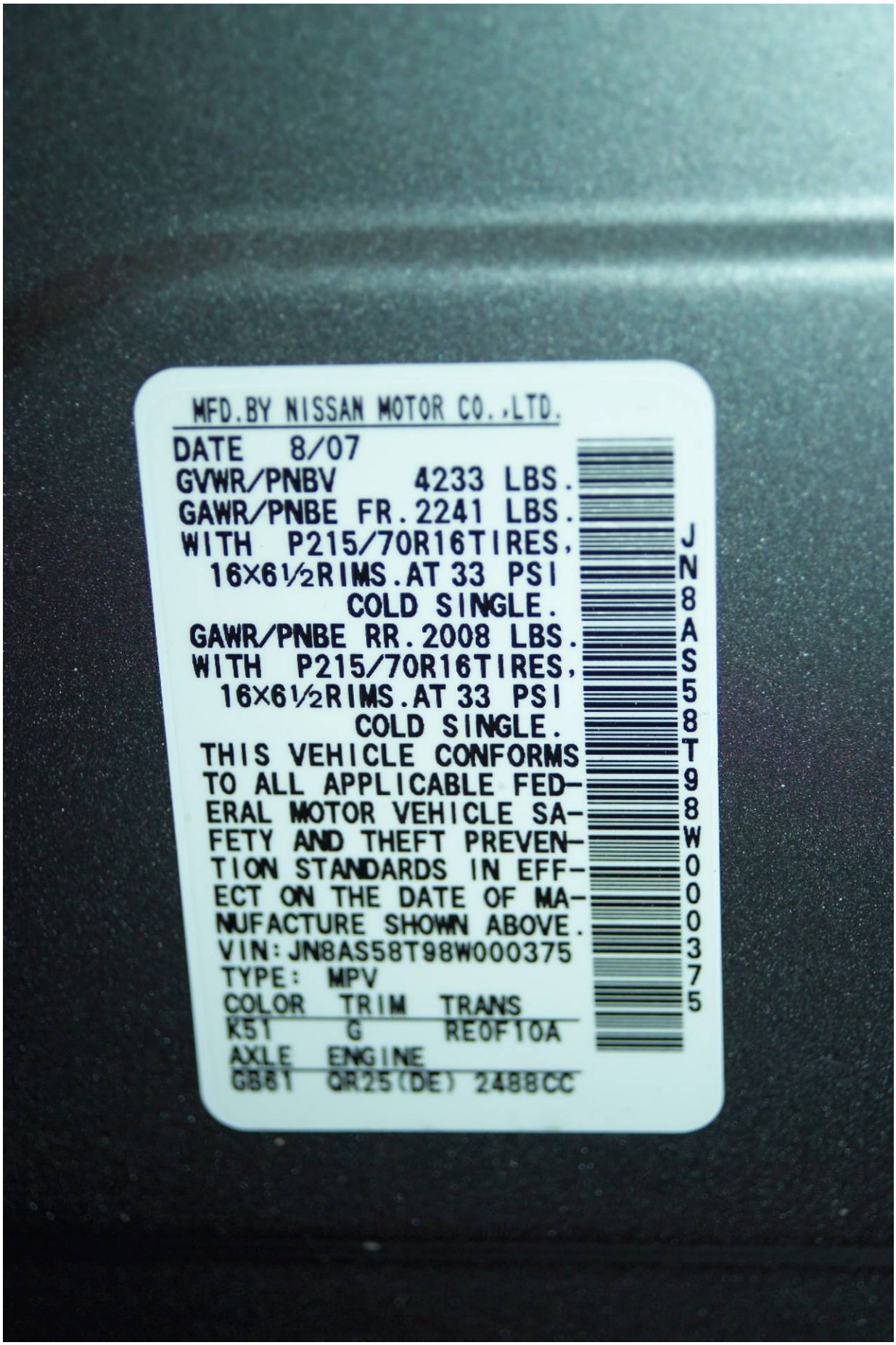


Figure A-72 Pre-Test Vehicle Certification Label View

Figure A-73 Pre-Test Vehicle Recommended Tire Pressure Label View

Figure A-74 Post-Test Light Trap Digital Readout - View 1

Figure A-75 Post-Test Light Trap Digital Readout - View 2

Figure A-76 Impact Event

Figure A-77 Pre-Test Fuel Cap

Figure A-78 Post-Test Fuel Cap

Figure A-79 FMVSS 301 Rollover View at 90°

Figure A-80 FMVSS 301 Rollover View at 180°

Figure A-81 FMVSS 301 Rollover View at 270°

Figure A-82 FMVSS 301 Rollover View at 360°

Figure A-83 Post-Test Vehicle Damage - View 1

Figure A-84 Post-Test Vehicle Damage - View 2

Figure A-85 Post-Test Vehicle Damage - View 3

Figure A-86 Post-Test Vehicle Damage - View 4

APPENDIX B

SID/HIII, VEHICLE AND MDB RESPONSE DATA

The following dummy and vehicle response data can be found in the R&D section of the NHTSA website 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 Head X Redundant
	Driver Head Y Redundant
	Driver Head Z Redundant
	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 Redundant Y
	Driver Lower Rib Redundant Y
	Driver Lower Spine Redundant Y
	Driver Pelvis Redundant Y
	Left Rear Passenger Head X Primary
	Left Rear Passenger Head Y Primary
	Left Rear Passenger Head Z Primary
	Left Rear Passenger Head X Redundant
	Left Rear Passenger Head Y Redundant
	Left Rear Passenger Head Z Redundant
	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 Redundant Y
	Left Rear Passenger Lower Rib Redundant Y
	Left Rear Passenger Lower Spine Redundant Y
	Left Rear Passenger Pelvis Redundant 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 A-Post Lower Y
	Vehicle A-Post Upper Y
	Vehicle B-Post Lower Y
	Vehicle B-Post Upper 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 Date: 11/13/2007

Test Lab: CTF

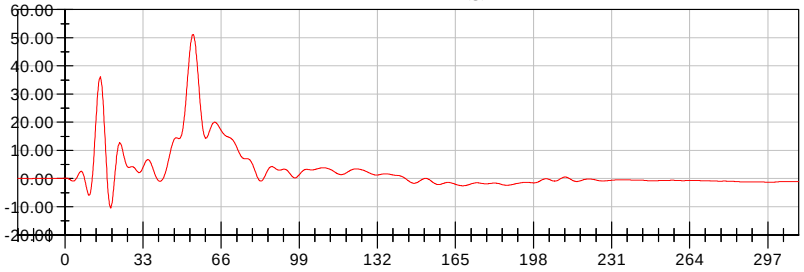
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

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



<Max>

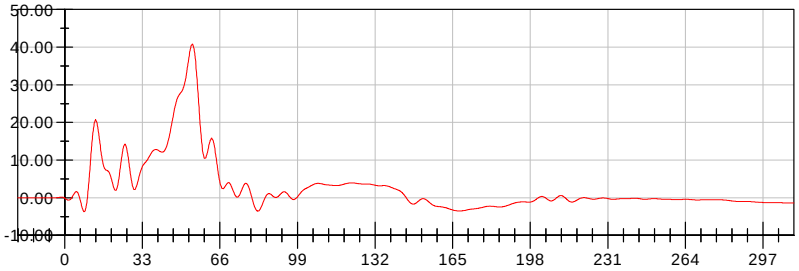
51.13 g at 54.32 ms

<Min>

-10.52 g at 19.36 ms

FIR_100

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



<Max>

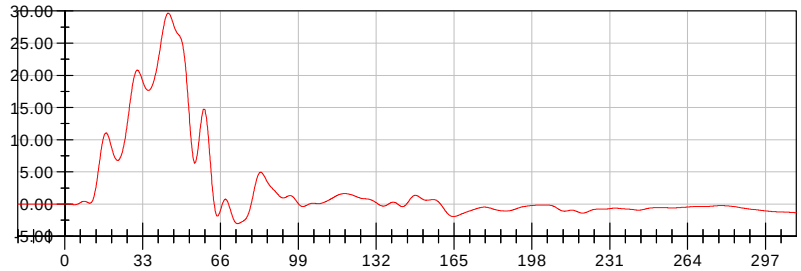
40.87 g at 54.40 ms

<Min>

-3.74 g at 8.16 ms

FIR_100

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



<Max>

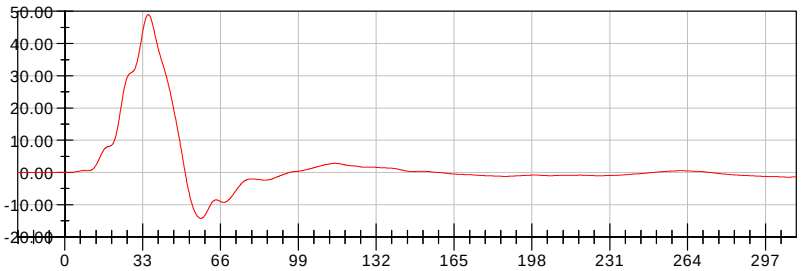
29.69 g at 43.76 ms

<Min>

-3.03 g at 73.12 ms

FIR_100

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



<Max>

48.94 g at 35.60 ms

<Min>

-14.26 g at 57.52 ms

FIR_100

NHTSA

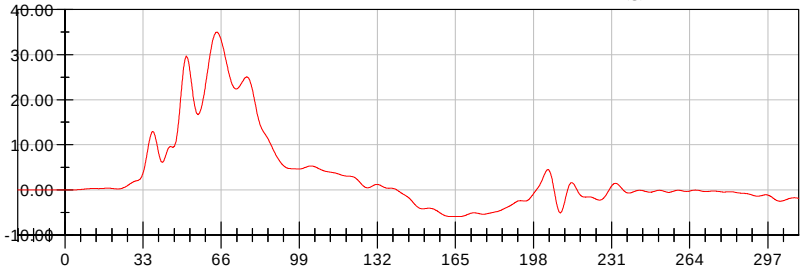
Test Date: 11/13/2007

Test Lab: CTF

Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)
Position #4 SID H3 Dummy (066)
Position #3 Crabi 12 month old Dummy (094)

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



<Max>

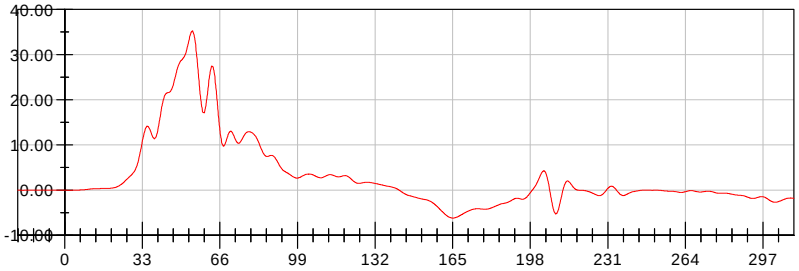
34.99 g at 64.32 ms

<Min>

-5.92 g at 166.32 ms

FIR_100

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



<Max>

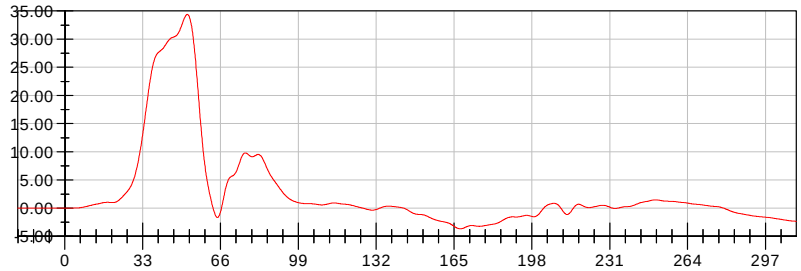
35.26 g at 54.32 ms

<Min>

-6.16 g at 165.04 ms

FIR_100

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



<Max>

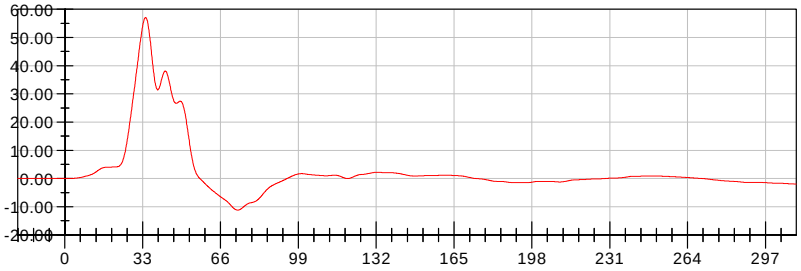
34.42 g at 51.84 ms

<Min>

-3.67 g at 167.52 ms

FIR_100

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



<Max>

57.14 g at 34.32 ms

<Min>

-11.25 g at 73.12 ms

FIR_100

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

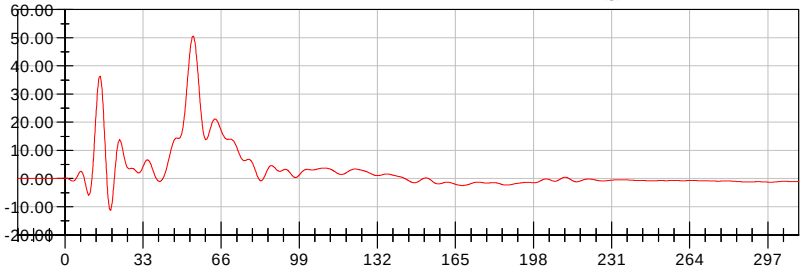
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

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



<Max>

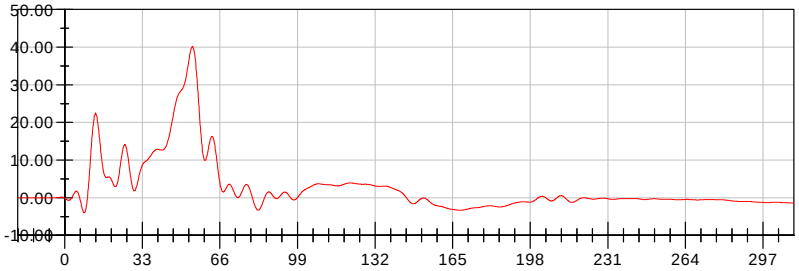
50.58 g at 54.32 ms

<Min>

-11.35 g at 19.36 ms

FIR_100

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



<Max>

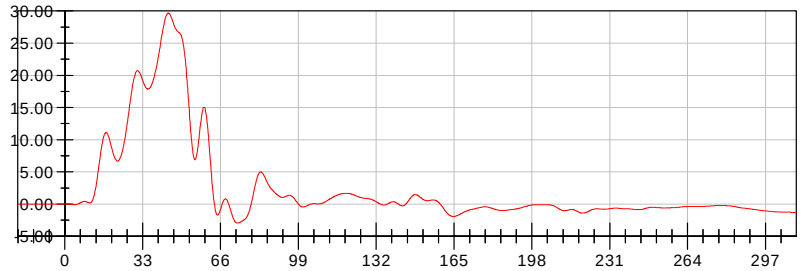
40.25 g at 54.40 ms

<Min>

-4.04 g at 8.16 ms

FIR_100

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



<Max>

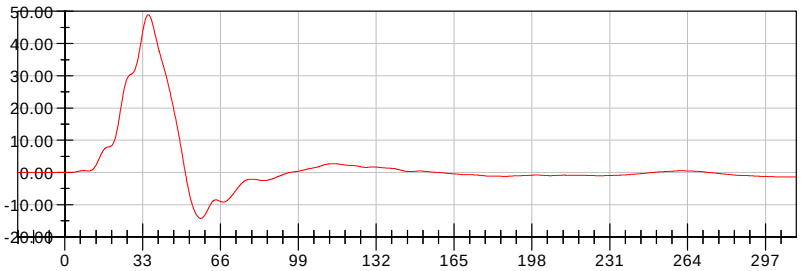
29.71 g at 43.76 ms

<Min>

-2.96 g at 73.12 ms

FIR_100

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



<Max>

48.93 g at 35.60 ms

<Min>

-14.28 g at 57.52 ms

FIR_100

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

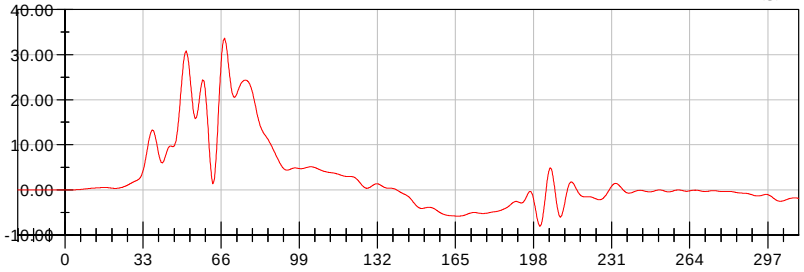
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

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



<Max>

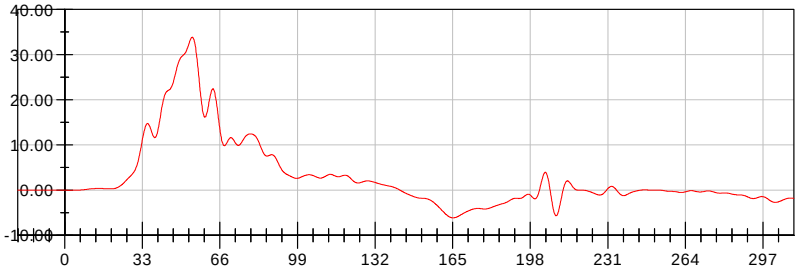
33.67 g at 67.52 ms

<Min>

-8.10 g at 200.64 ms

FIR_100

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



<Max>

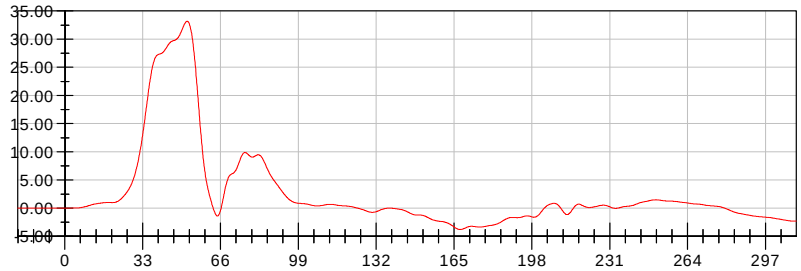
33.90 g at 54.32 ms

<Min>

-6.12 g at 165.04 ms

FIR_100

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



<Max>

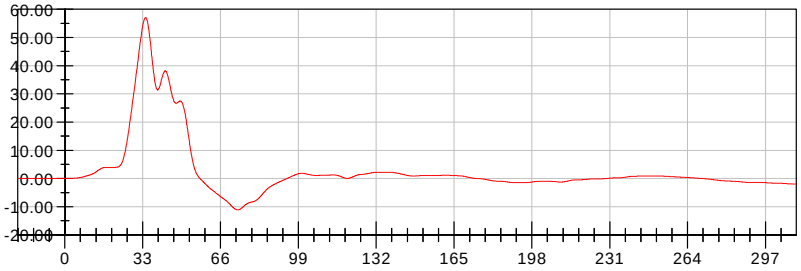
33.21 g at 51.84 ms

<Min>

-3.78 g at 167.52 ms

FIR_100

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



<Max>

57.07 g at 34.32 ms

<Min>

-11.15 g at 73.12 ms

FIR_100

APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII: 059

1

Transportation Research Center Inc.
SID/HIII Dummy Post-Test
External Dimensions
Serial No. 059 Calibration No. 25

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	515 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	523 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	500 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	369 mm	Yes
Top Rib Width From C\L	RW-1	165.1 - 180.3 mm	173 mm	Yes
Bottom Rib Width From C\L	RW-2	165.1 - 180.3 mm	173 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. 059 Certification No. 25-2
Test Date: 11/5/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	146.1 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-5.1 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

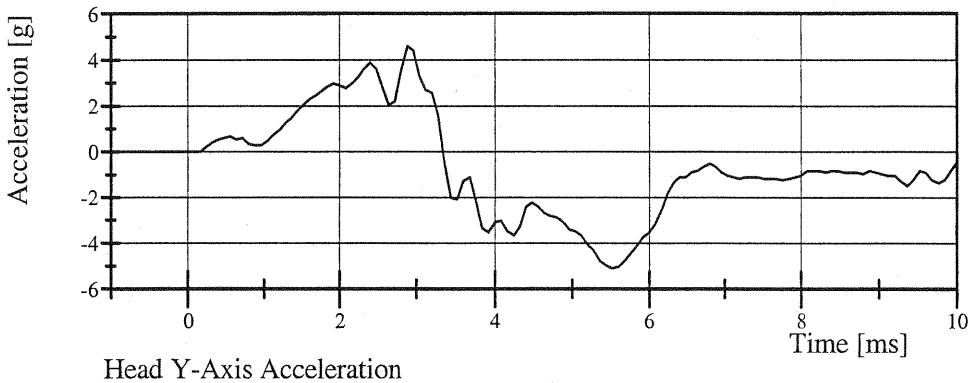
11.05.2007 07:49:55 609

071113

Transportation Research Center Inc.

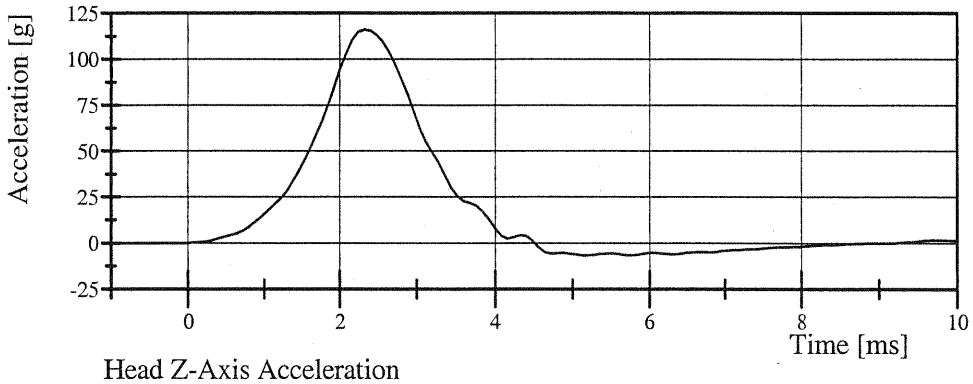
Left Lateral Head Drop
SID-HIII Serial No. 059 Certification No. 25-2
Test Date: 11/5/2007

Head X-Axis Acceleration



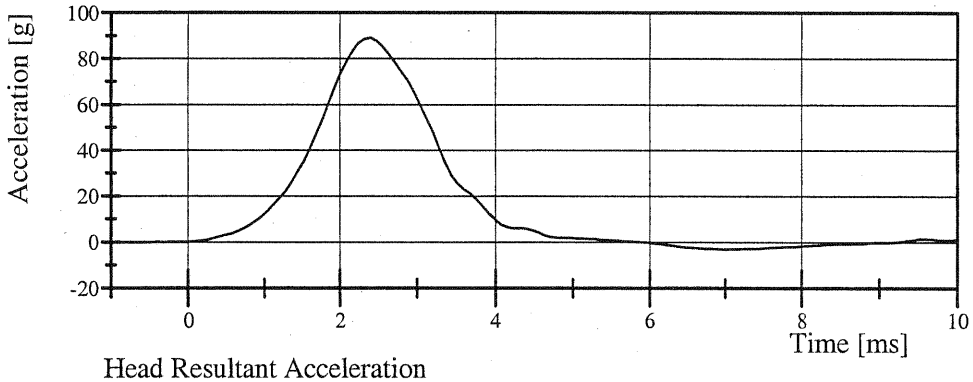
Filter Class: CFC_1000
Max: 4.6 g at 2.9 ms
Min: -5.1 g at 5.5 ms

Head Y-Axis Acceleration



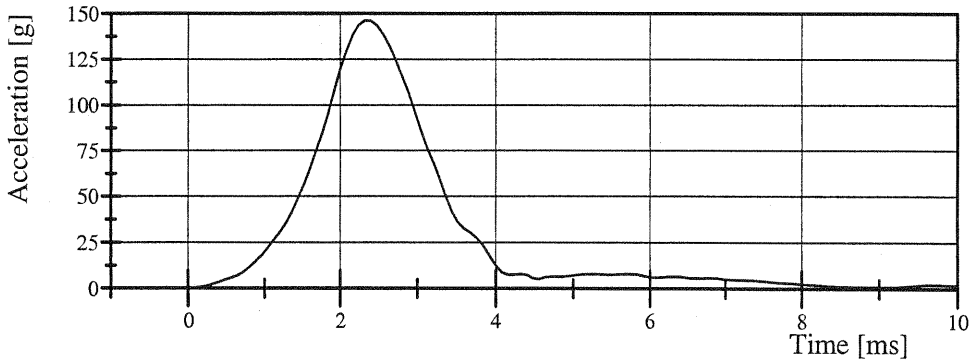
Filter Class: CFC_1000
Max: 116.2 g at 2.3 ms
Min: -6.8 g at 5.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 89.1 g at 2.4 ms
Min: -3.0 g at 7.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 146.1 g at 2.3 ms
Min: 0.0 g at -1.0 ms

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

11.05.2007 07:50:03 609

Transportation Research Center Inc.

Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	39 %	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	2.430 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.844 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.806 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.220 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-72.5 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	60.6 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	85.5 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	55.0 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	10.6 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

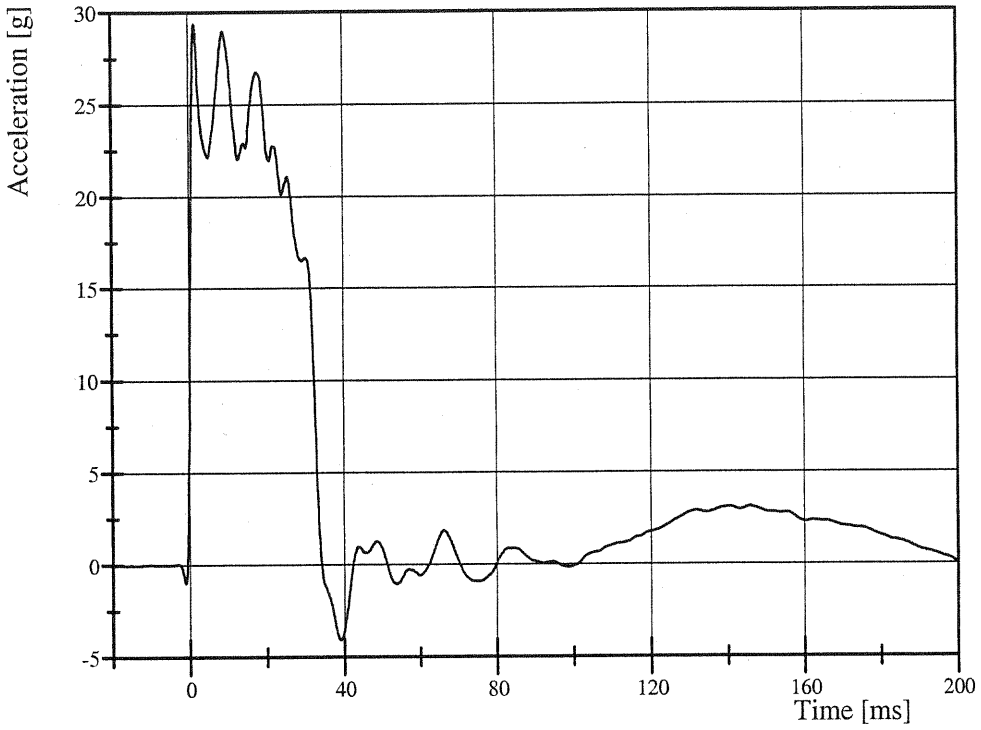
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

11.02.2007 10:25:39 2984

Transportation Research Center Inc.

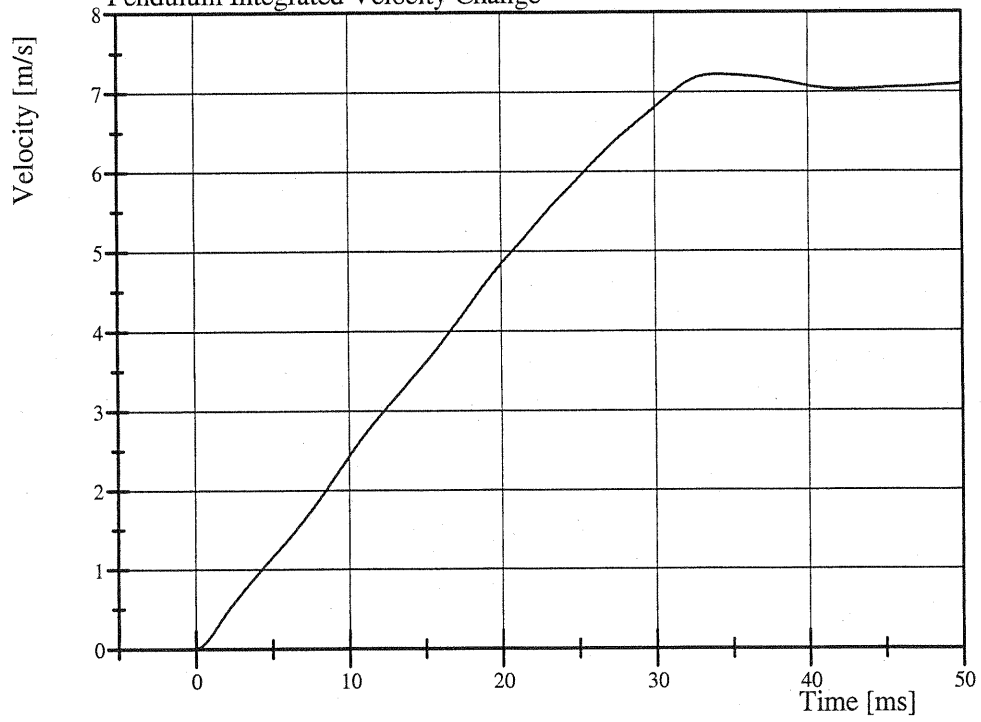
Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/2/2007

Pendulum Acceleration



Filter Class: CFC_180
Max: 29.4 g at 1.6 ms
Min: -4.1 g at 39.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.2 m/s at 34.1 ms
Min: 0.0 m/s at 0.0 ms

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

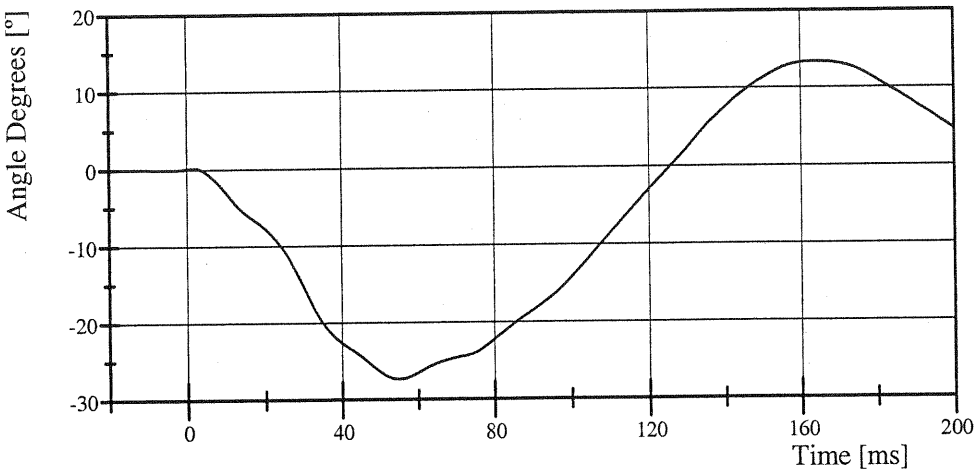
11.02.2007 10:25:48 2984

071113

Transportation Research Center Inc.

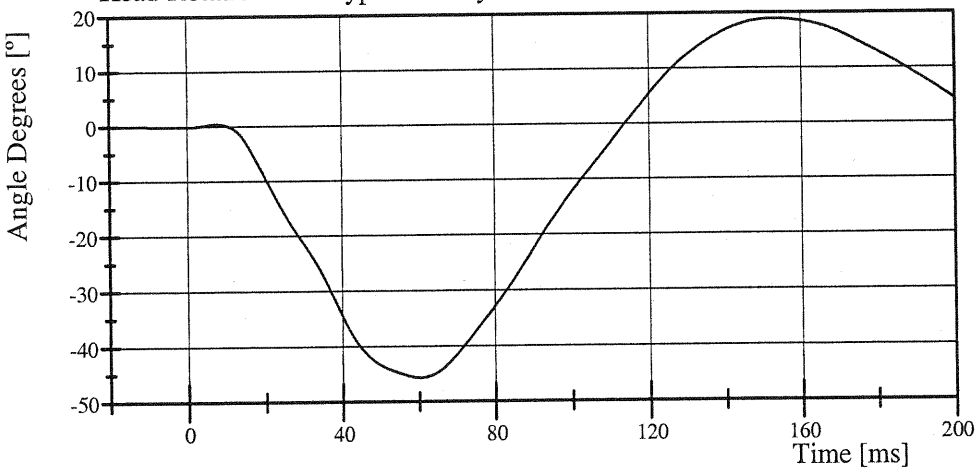
Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/2/2007

Pot Rotation at the Base of Neck



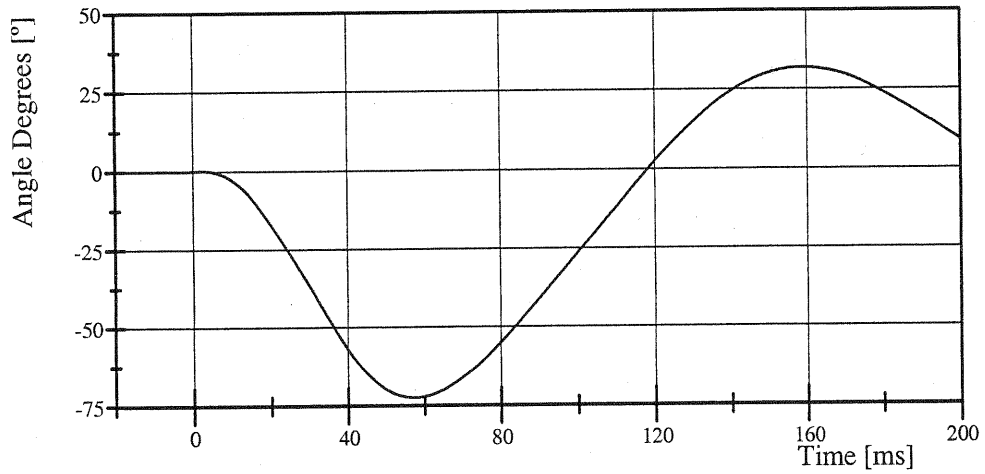
Filter Class: CFC_60
Max: 13.3 ° at 164.2 ms
Min: -27.3 ° at 55.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 18.9 ° at 153.0 ms
Min: -45.7 ° at 60.3 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 31.8 ° at 159.0 ms
Min: -72.5 ° at 57.6 ms

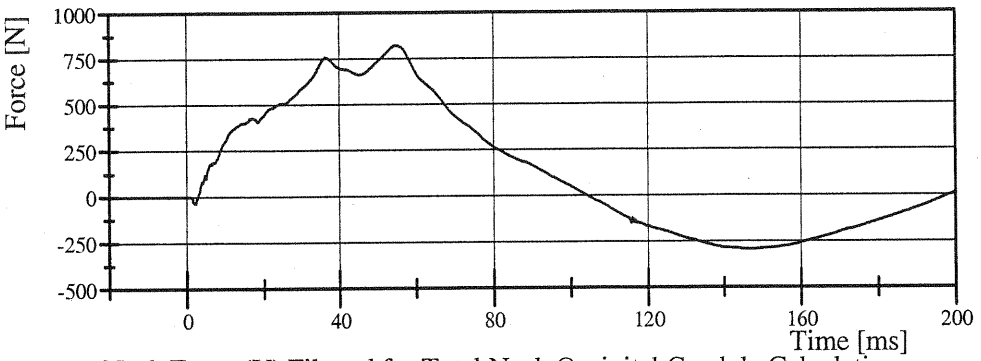
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

11.02.2007 10:25:49 2984

Transportation Research Center Inc.

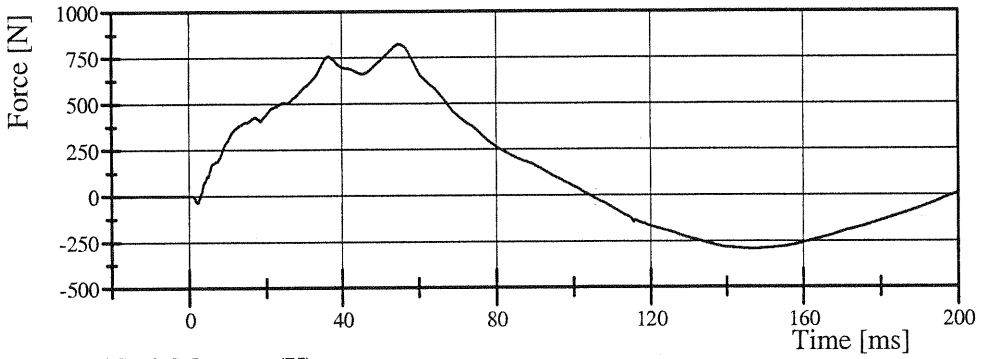
Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/2/2007

Neck Force (Y)



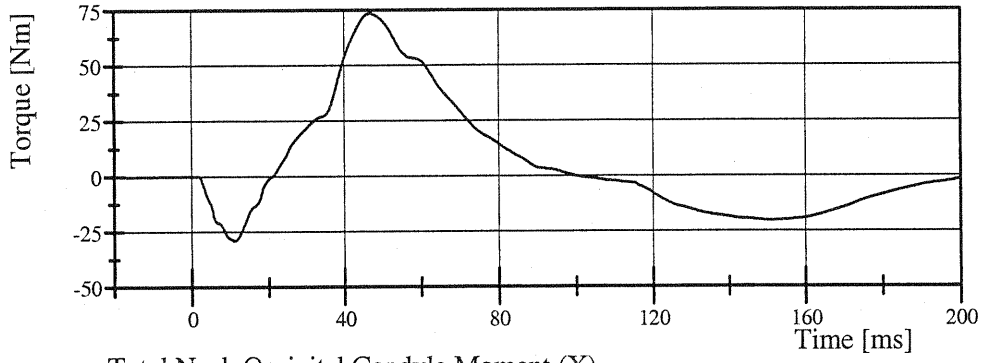
Filter Class: CFC_1000
Max: 822.8 N at 54.6 ms
Min: -294.2 N at 146.8 ms

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



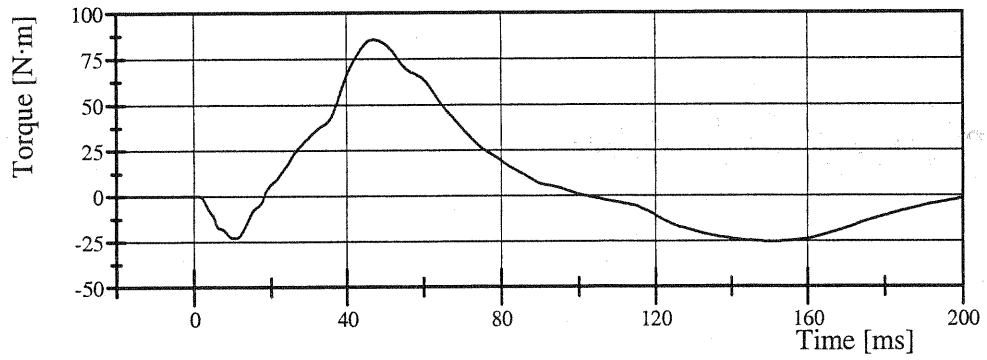
Filter Class: CFC_600
Max: 822.2 N at 54.7 ms
Min: -293.9 N at 146.9 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 73.5 Nm at 46.6 ms
Min: -28.9 Nm at 11.0 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 85.5 N·m at 47.0 ms
Min: -25.3 N·m at 150.2 ms

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

11.02.2007 10:25:50 2984

071113

Transportation Research Center Inc.

Left Lateral Thorax
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.282 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	39.3 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	38.7 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	19.5 g	Yes

Test meets specifications.

Comments:

Technician

Approved

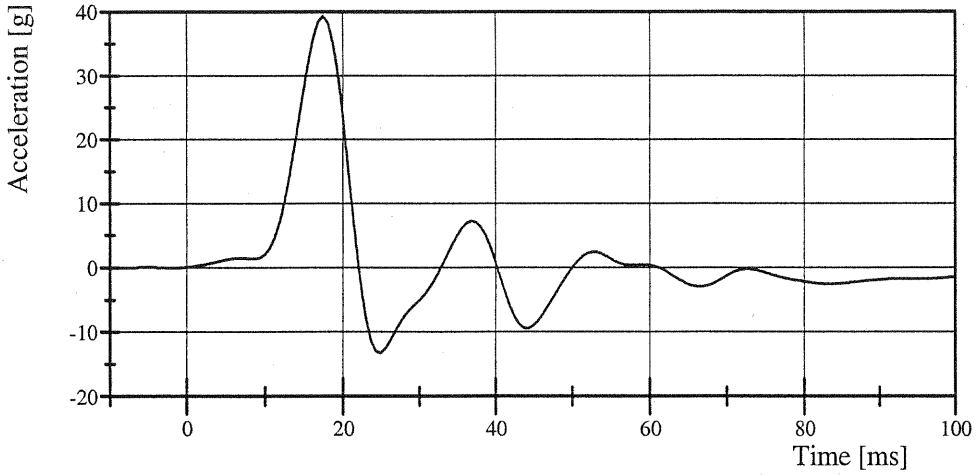
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

11.01.2007 14:01:42 603

Transportation Research Center Inc.

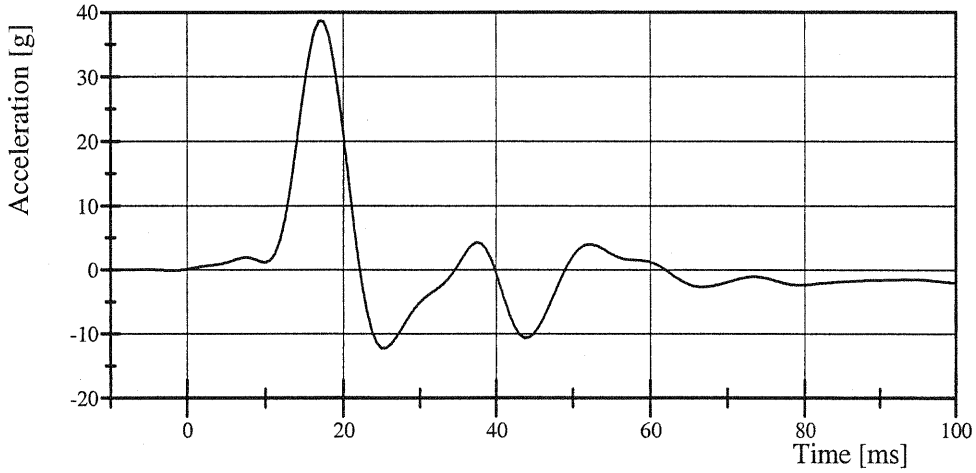
Left Lateral Thorax
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/1/2007

Upper Rib Acceleration (Y)



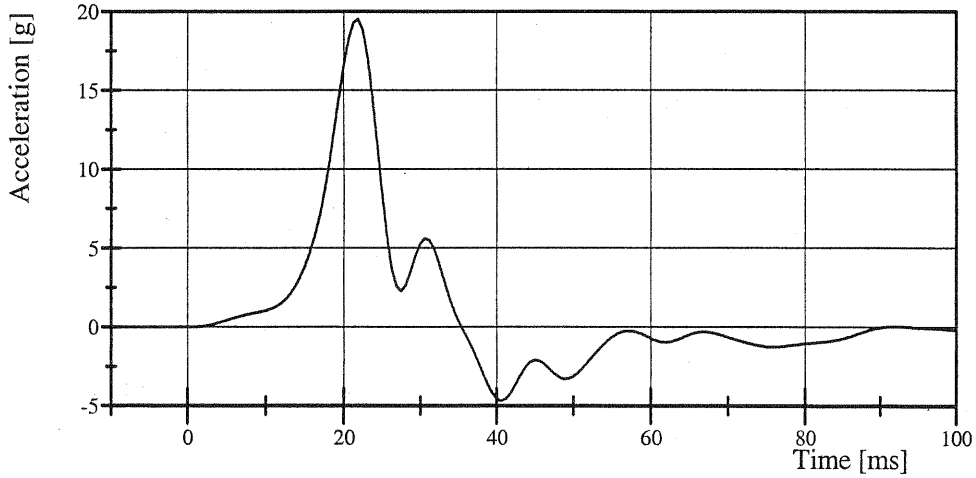
Filter Class: FIR_100
Max: 39.3 g at 17.4 ms
Min: -13.3 g at 25.0 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 38.7 g at 16.9 ms
Min: -12.2 g at 25.5 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 19.5 g at 21.8 ms
Min: -4.7 g at 40.6 ms

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 059 Certification No. 25-18
Test Date: 11/6/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.873 mm/s	Yes

Test meets specifications.

Comments:

Technician

Approved

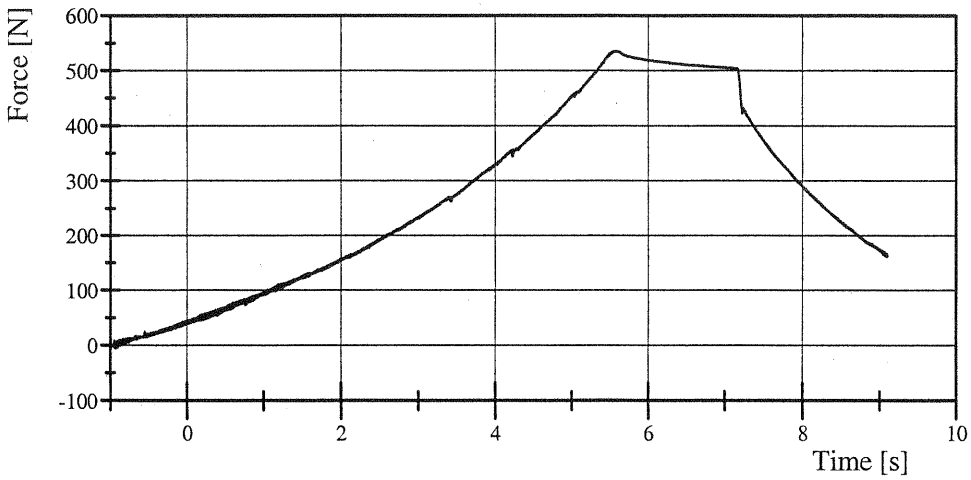
Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

11.06.2007 12:07:36 11834

Transportation Research Center Inc.

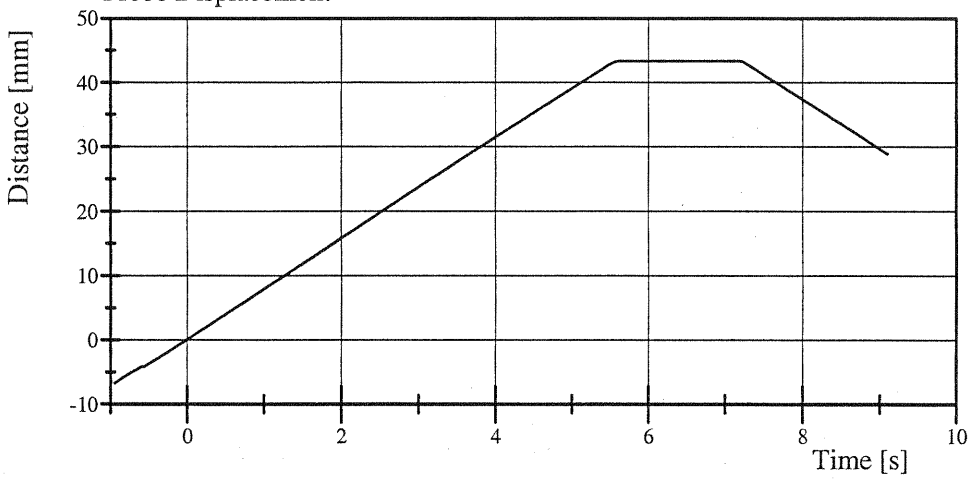
Abdomen Compression
SID-HIII Serial No. 059 Certification No. 25-18
Test Date: 11/6/2007

Probe Force



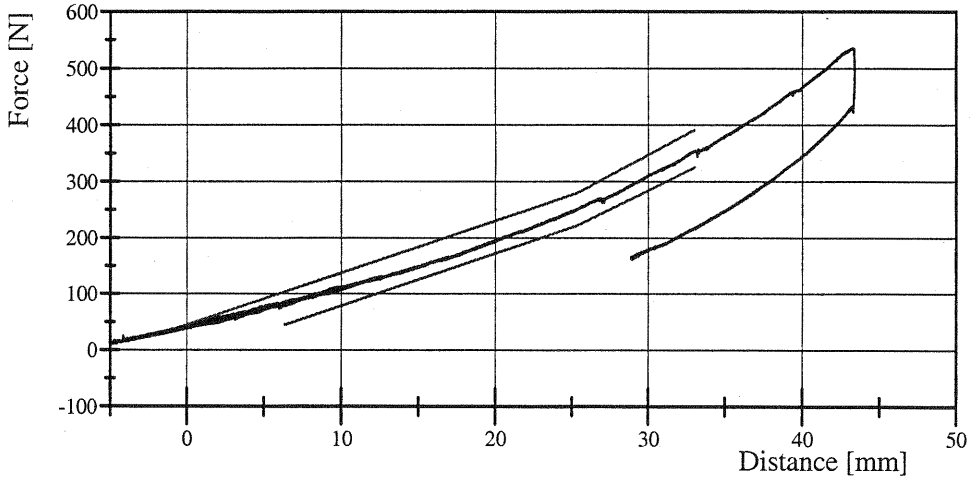
Filter Class: CFC_600
Max: 535.3 N at 5.6 s
Min: -5.2 N at -0.9 s

Probe Displacement



Filter Class: CFC_180
Max: 43.4 mm at 6.9 s
Min: -6.7 mm at -0.9 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 535.3 N at 43.3 mm
Min: -5.2 N at -6.6 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 06-Nov-07

TRC, INC. **TEST NO: LUFL-01** **572B SN 059 TORSO FLEX CAL 25**

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TIME	NA	1230	
TEMPERATURE	18.9 – 25.6° C	20.9 C	P
RELATIVE HUMIDITY	10 – 70 %	37 %	P
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N	P
FORCE AT 20 DEG OF FLEXION	98 – 151 N	102.30 N	P
FORCE AT 30 DEG OF FLEXION	151 – 205 N	155.69 N	P
FORCE AT 40 DEG OF FLEXION	205 – 258 N	231.30 N	P
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6 °	P

TEST MEETS SPECIFICATIONS

TECHNICIAN Robert Barnard

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.283 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.3 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	49.7 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

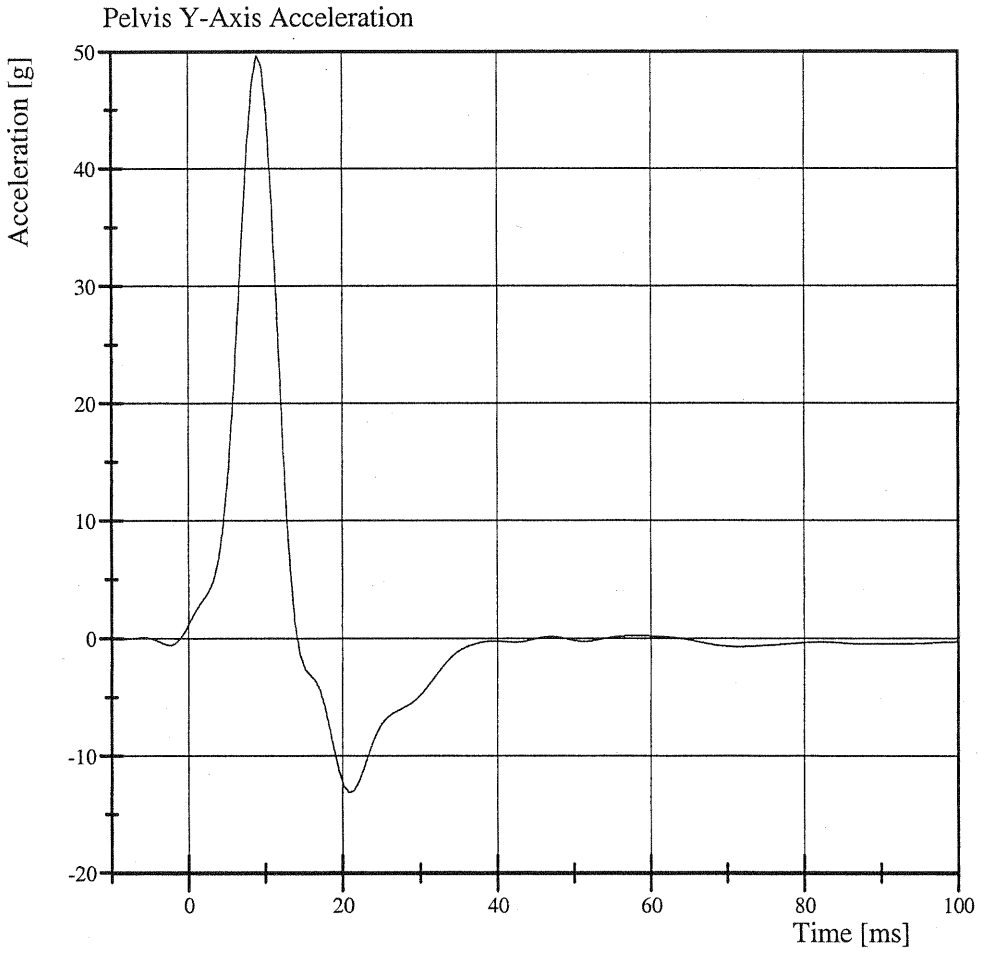
Approved

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

11.01.2007 14:37:29 608

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 059 Certification No. 25-1
Test Date: 11/1/2007



Filter Class: FIR_100
Max: 49.7 g at 9.0 ms
Min: -13.1 g at 20.8 ms

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

11.01.2007 14:37:36 608

CALIBRATION TEST RESULTS

POST-TEST

SID/HIII: 059

1

Transportation Research Center Inc.
SID/HIII Dummy Post-Test
External Dimensions
Serial No. 059 Calibration No. 26

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	516 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	523 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	500 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	370 mm	Yes
Top Rib Width From C\L	RW-1	165.1 - 180.3 mm	174 mm	Yes
Bottom Rib Width From C\L	RW-2	165.1 - 180.3 mm	174 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. 059 Certification No. 26-1
Test Date: 11/19/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	149.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-5.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

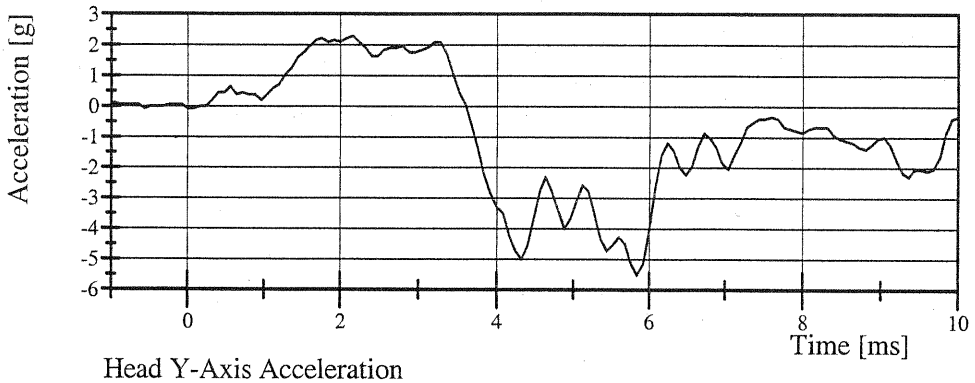
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

11.19.2007 09:15:48 609

Transportation Research Center Inc.

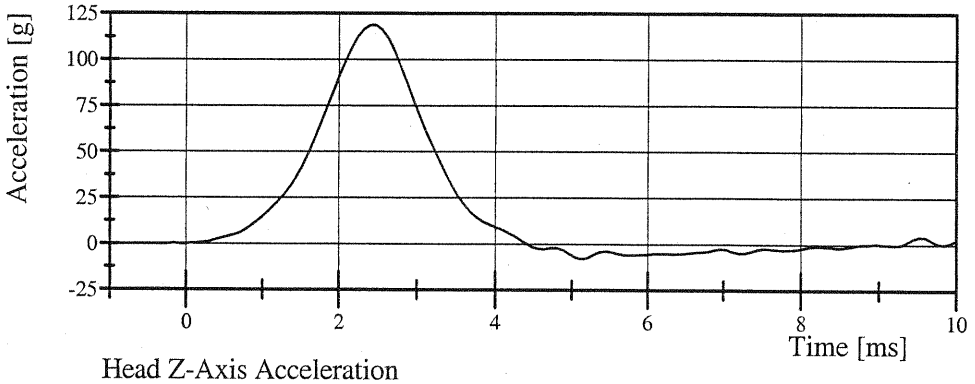
Left Lateral Head Drop
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/19/2007

Head X-Axis Acceleration



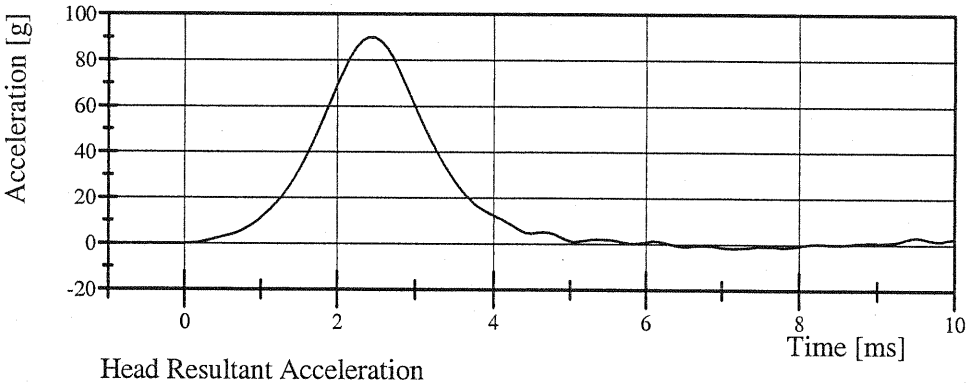
Filter Class: CFC_1000
Max: 2.3 g at 2.2 ms
Min: -5.5 g at 5.8 ms

Head Y-Axis Acceleration



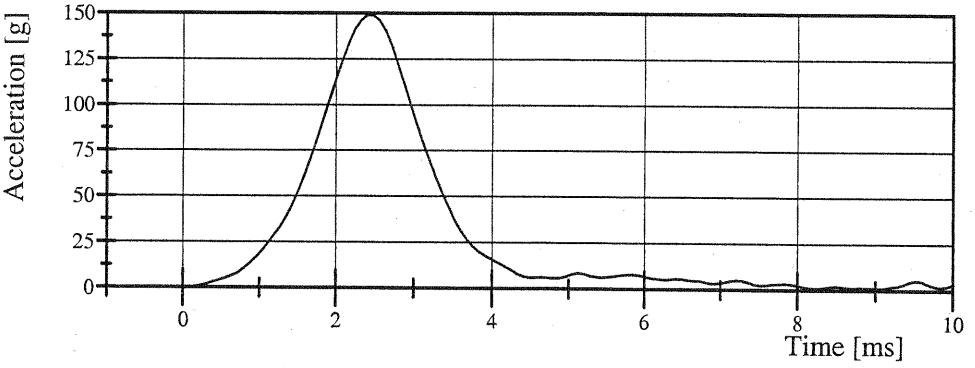
Filter Class: CFC_1000
Max: 118.7 g at 2.4 ms
Min: -8.2 g at 5.1 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 90.0 g at 2.4 ms
Min: -1.7 g at 7.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 149.0 g at 2.4 ms
Min: 0.0 g at -0.3 ms

Transportation Research Center Inc.

Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/19/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.948 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.231 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.455 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.196 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.186 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-71.7 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	63.3 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	82.0 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	50.9 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	7.6 ms	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Stoney

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

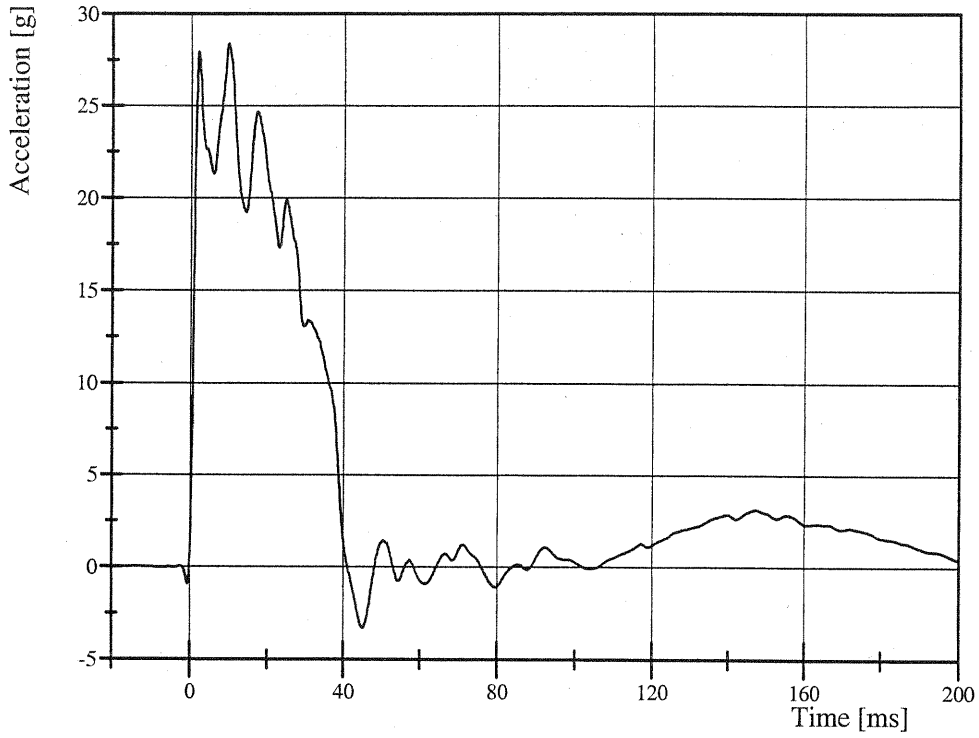
11.19.2007 11:01:46 2977

071113

Transportation Research Center Inc.

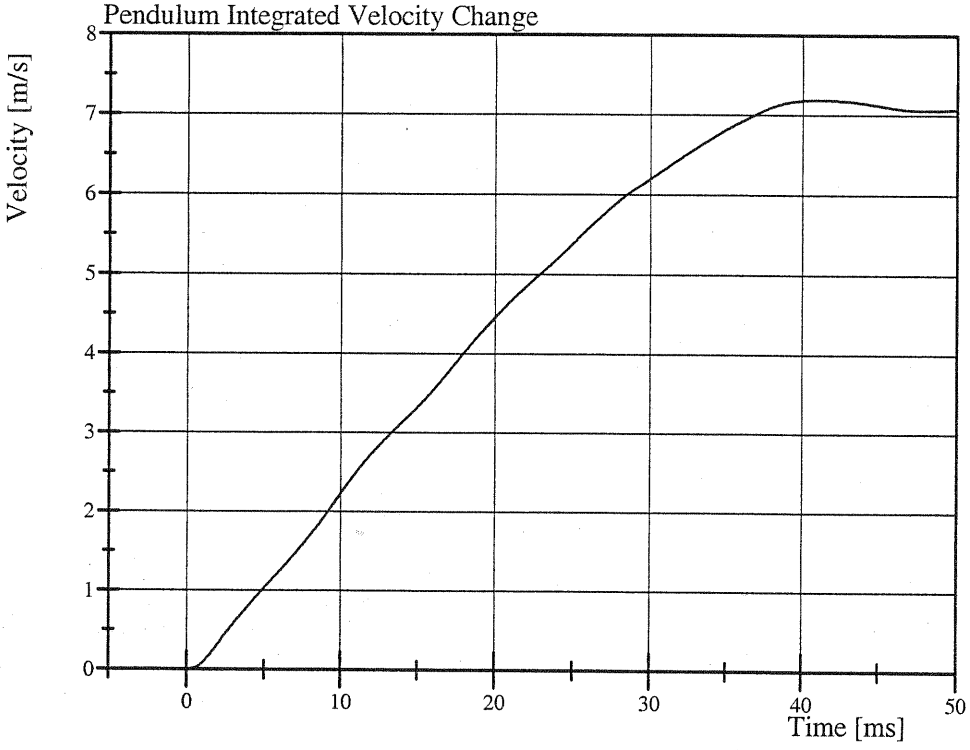
Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/19/2007

Pendulum Acceleration



Filter Class: CFC_180
Max: 28.4 g at 9.6 ms
Min: -3.3 g at 45.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 7.2 m/s at 41.1 ms
Min: 0.0 m/s at 0.0 ms

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

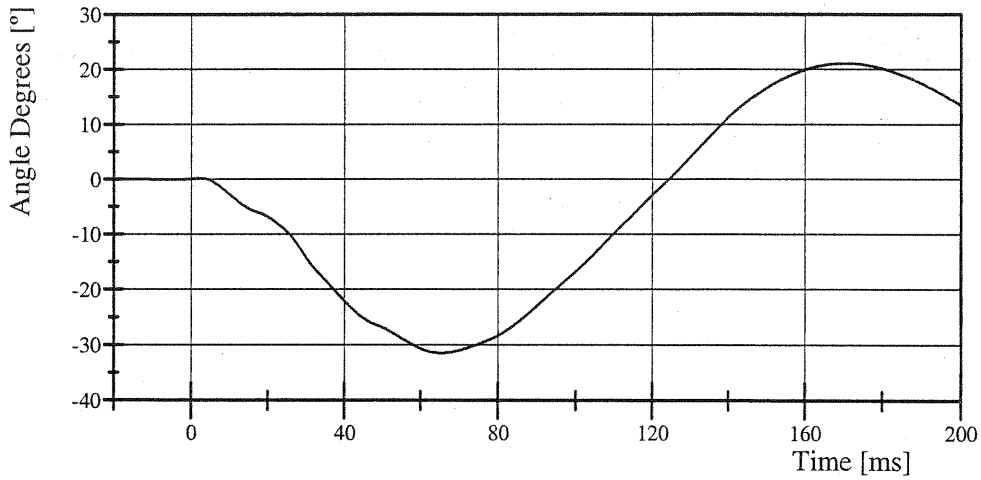
11.19.2007 11:01:57 2977

071113

Transportation Research Center Inc.

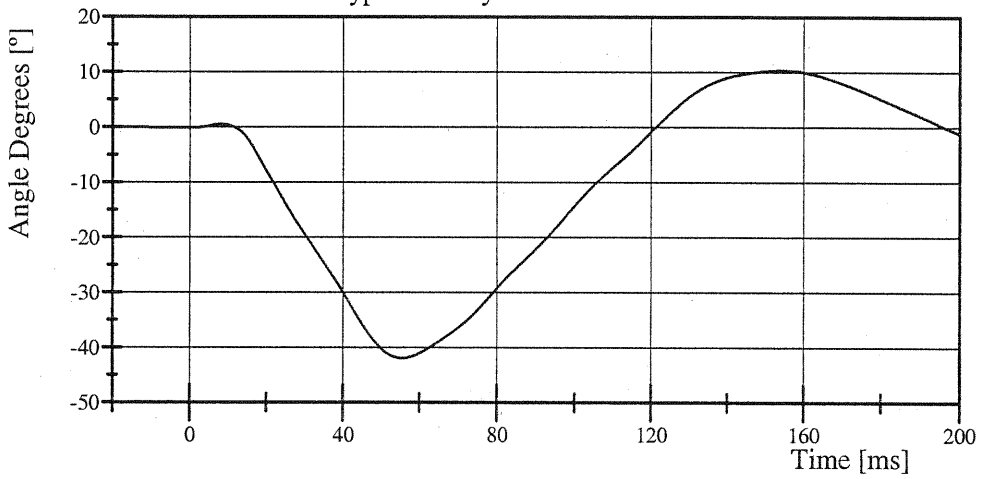
Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/19/2007

Pot Rotation at the Base of Neck



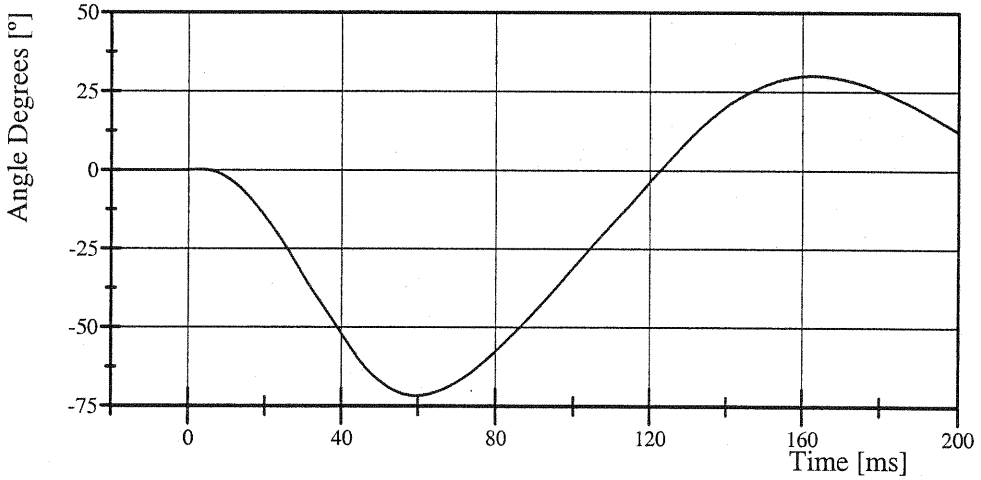
Filter Class: CFC_60
Max: 21.1 ° at 170.6 ms
Min: -31.5 ° at 65.4 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 10.4 ° at 154.2 ms
Min: -41.9 ° at 55.7 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 30.1 ° at 162.6 ms
Min: -71.7 ° at 59.4 ms

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

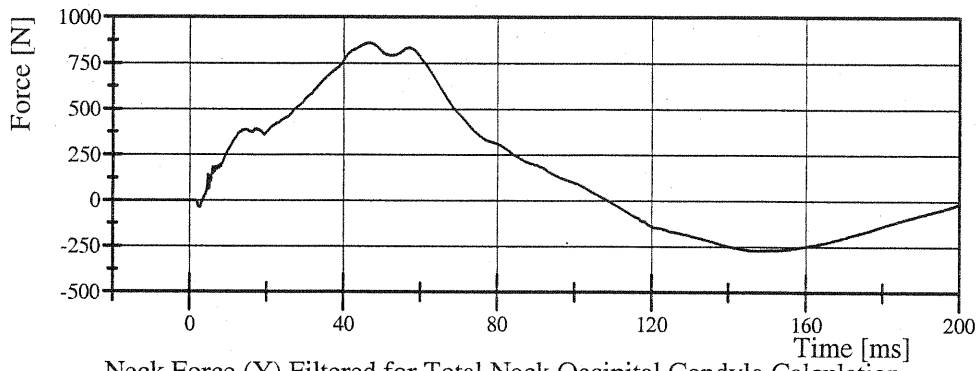
11.19.2007 11:01:58 2977

071113

Transportation Research Center Inc.

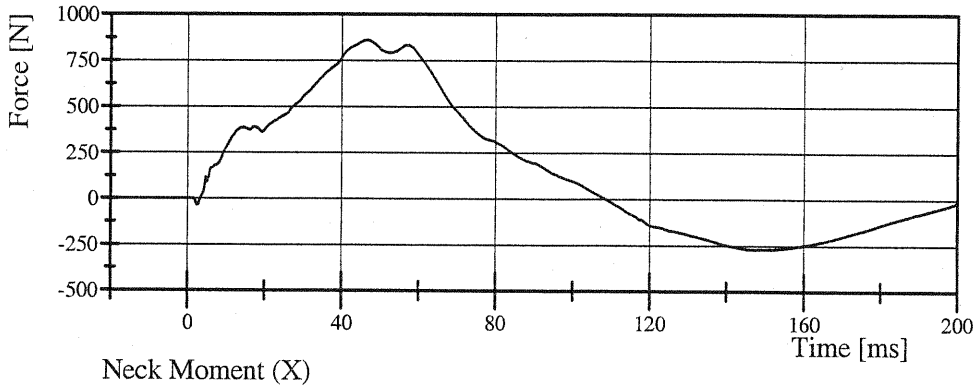
Left Lateral Neck
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/19/2007

Neck Force (Y)



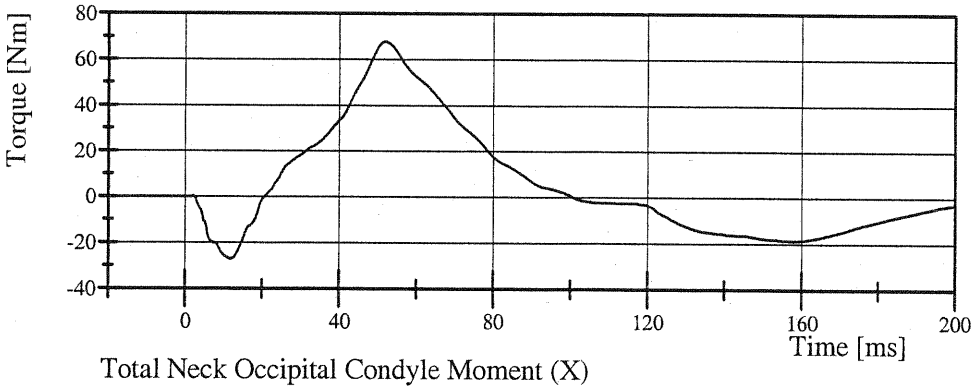
Filter Class: CFC_1000
Max: 862.2 N at 46.7 ms
Min: -271.5 N at 147.4 ms

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



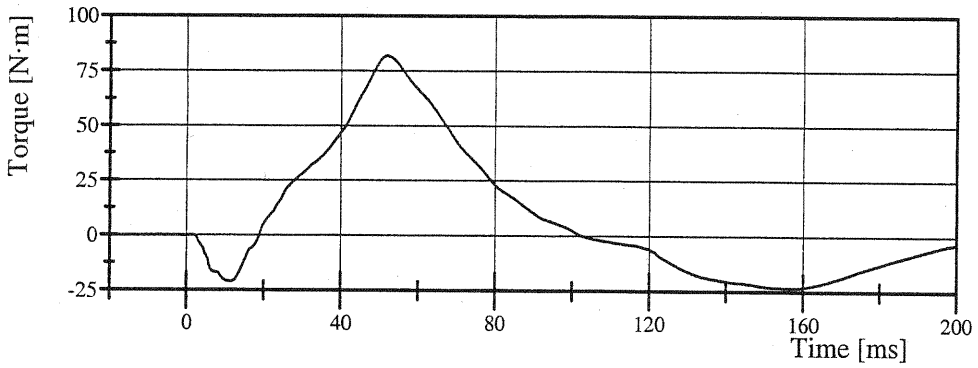
Filter Class: CFC_600
Max: 861.2 N at 46.6 ms
Min: -271.4 N at 147.4 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 67.9 Nm at 51.9 ms
Min: -27.1 Nm at 11.7 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 82.0 N·m at 51.8 ms
Min: -23.2 N·m at 157.6 ms

Transportation Research Center Inc.

Left Lateral Thorax
SID-HIII Serial No. 059 Certification No. 26-2
Test Date: 11/16/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.286 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	42.4 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	40.9 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	20.2 g	Yes

Test meets specifications.

Comments:

Technician

Approved

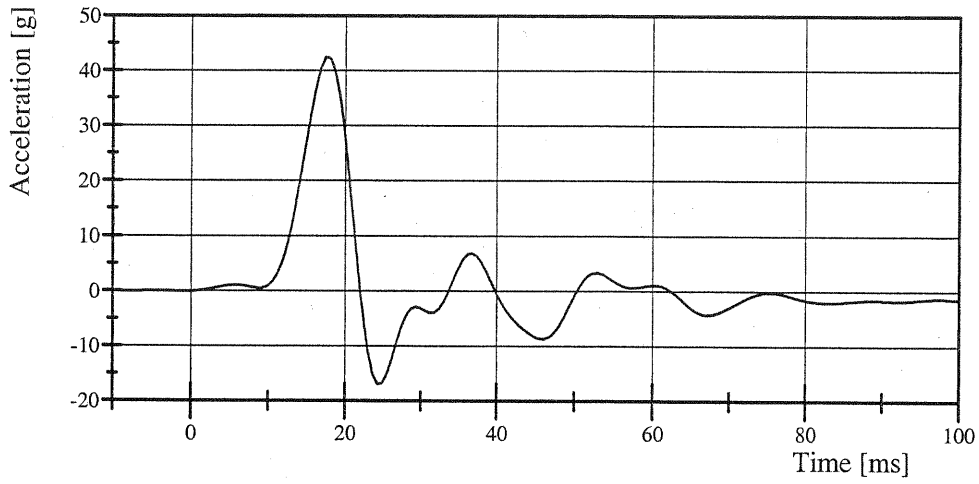
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

11.16.2007 11:29:22 588

Transportation Research Center Inc.

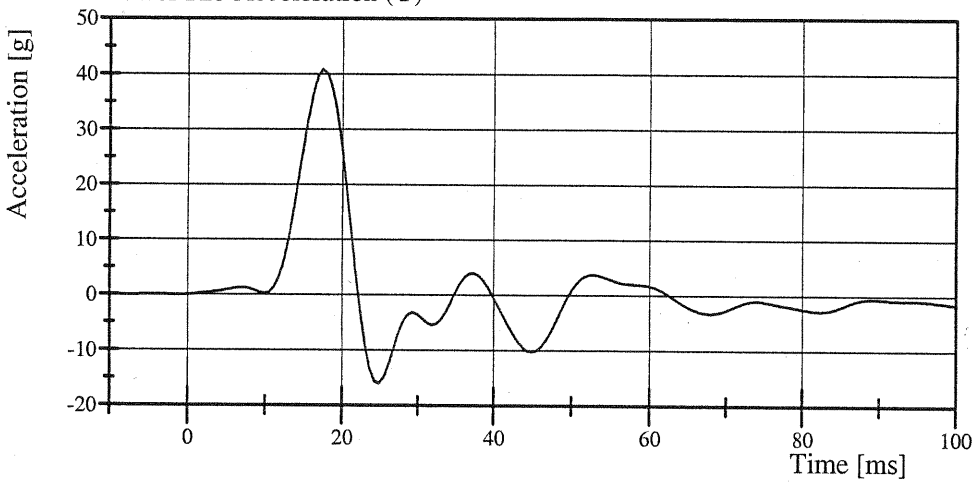
Left Lateral Thorax
SID-HIII Serial No. 059 Certification No. 26-2
Test Date: 11/16/2007

Upper Rib Acceleration (Y)



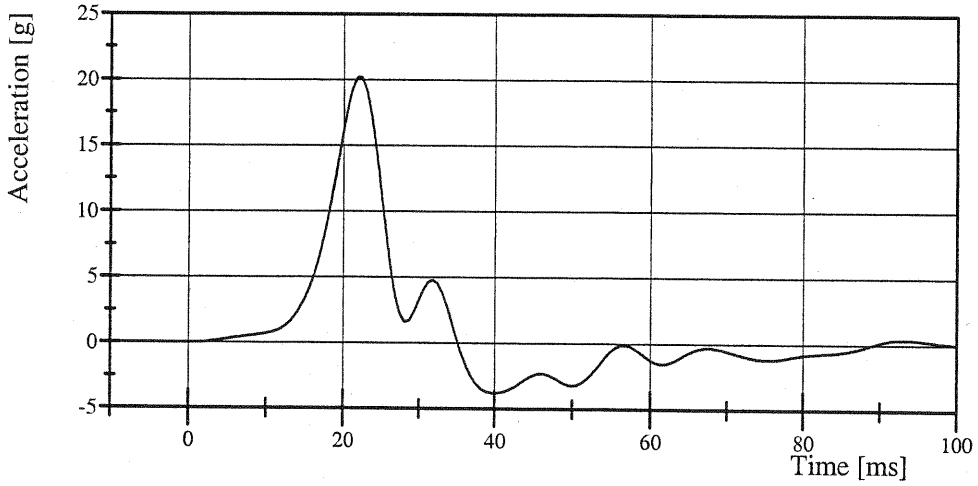
Filter Class: FIR_100
Max: 42.4 g at 17.4 ms
Min: -16.9 g at 24.3 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 40.9 g at 17.4 ms
Min: -16.0 g at 24.9 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 20.2 g at 22.4 ms
Min: -3.8 g at 39.9 ms

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 059 Certification No. 26-4
Test Date: 11/19/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	38 %	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

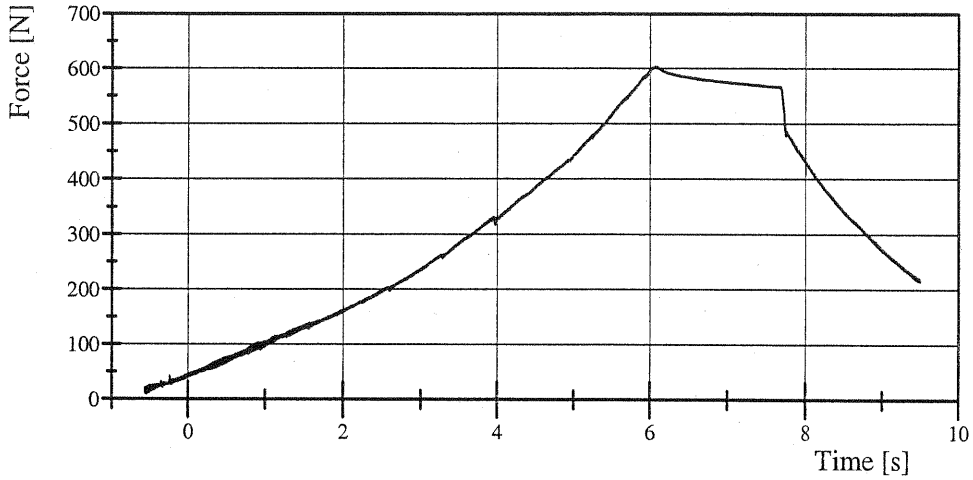
Specification Source: CFR49 Part 572 Subpart B
with Polarity in accordance with J211

11.19.2007 10:10:18 6973

Transportation Research Center Inc.

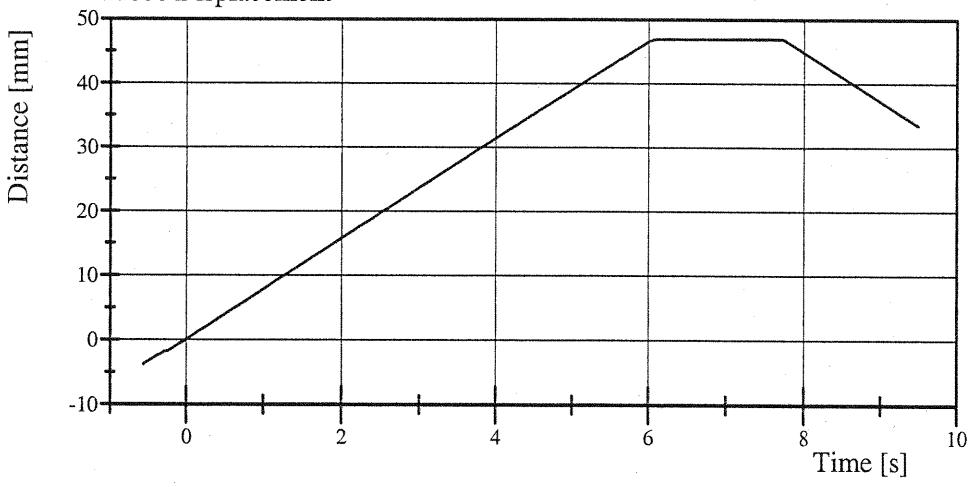
Abdomen Compression
SID-HIII Serial No. 059 Certification No. 26-4
Test Date: 11/19/2007

Probe Force



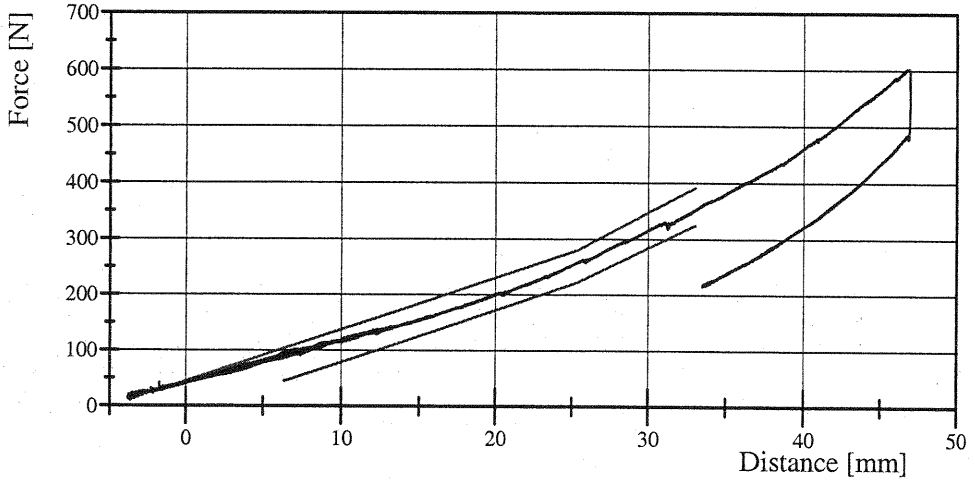
Filter Class: CFC_600
Max: 602.6 N at 6.1 s
Min: 9.8 N at -0.5 s

Probe Displacement



Filter Class: CFC_180
Max: 46.9 mm at 7.4 s
Min: -3.8 mm at -0.6 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 602.6 N at 46.9 mm
Min: 9.8 N at -3.6 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 19-Nov-07

TRC, INC. **TEST NO: LUFL-01** **572B SN 059 TORSO FLEX CAL 26**

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TIME	NA	1309	
TEMPERATURE	18.9 – 25.6° C	21.4 C	P
RELATIVE HUMIDITY	10 – 70 %	42 %	P
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N	P
FORCE AT 20 DEG OF FLEXION	98 – 151 N	102.3 N	P
FORCE AT 30 DEG OF FLEXION	151 – 205 N	160.14 N	P
FORCE AT 40 DEG OF FLEXION	205 – 258 N	213.51 N	P
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5 °	P

TEST MEETS SPECIFICATIONS

TECHNICIAN Robert Bonaventura

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/16/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.281 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.5 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	44.0 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Hall

Approved

Ron Storm

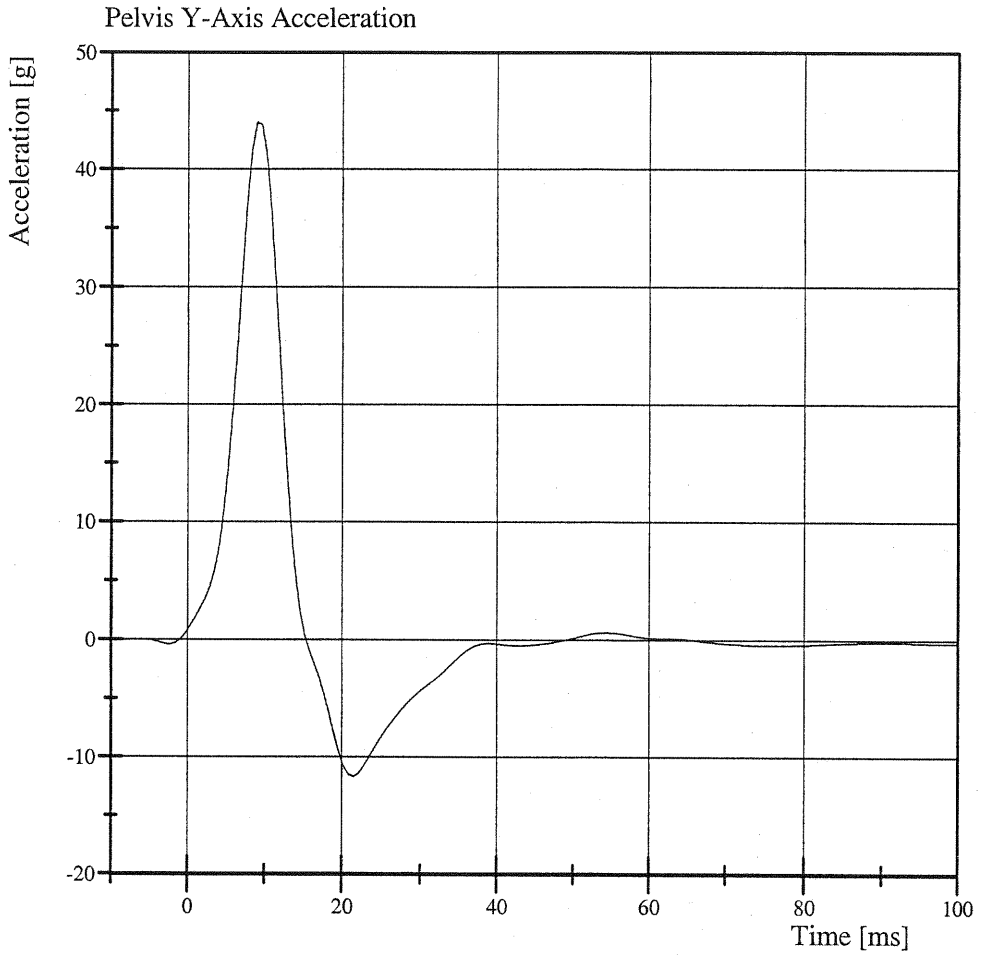
Specification Source: CFR49 Part 572 Subpart M
with Polarity in accordance with J211

11.16.2007 12:51:34 607

071113

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 059 Certification No. 26-1
Test Date: 11/16/2007



Filter Class: FIR_100
Max: 44.0 g at 9.0 ms
Min: -11.7 g at 21.5 ms

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

11.16.2007 12:51:43 607

071113

CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII: 066

Transportation Research Center Inc.
572M SID/HIII Dummy
External Dimensions
Serial No. 066 Calibration No. 25

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	515 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	525 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	371 mm	Yes
Top Rib Width From C\L	RW-1	165.1 - 180.3 mm	174 mm	Yes
Bottom Rib Width From C\L	RW-2	165.1 - 180.3 mm	174 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. 066 Certification No. 25-3
Test Date: 11/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	137.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-5.2 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

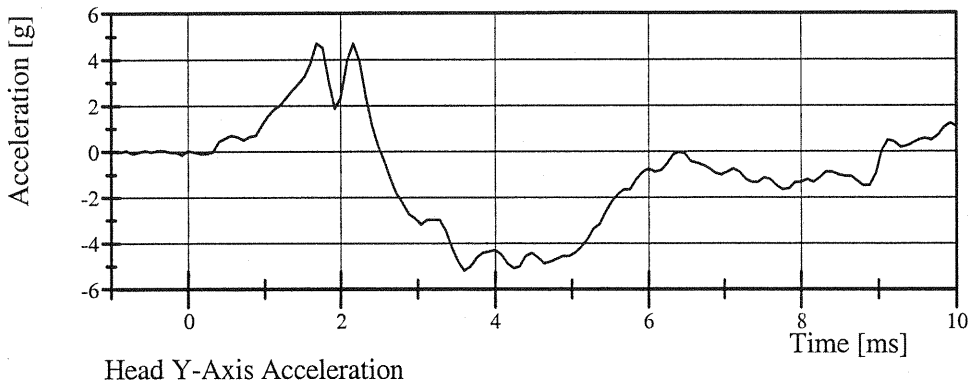
11.02.2007 11:14:35 611

071113

Transportation Research Center Inc.

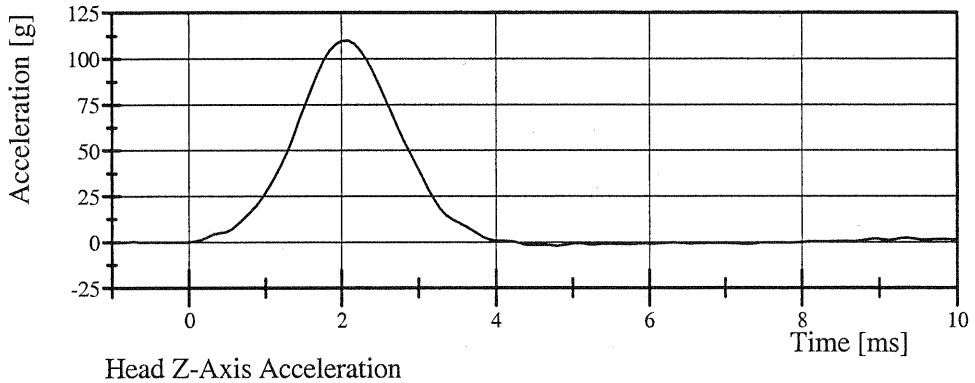
Left Lateral Head Drop
SID-HIII Serial No. 066 Certification No. 25-3
Test Date: 11/2/2007

Head X-Axis Acceleration



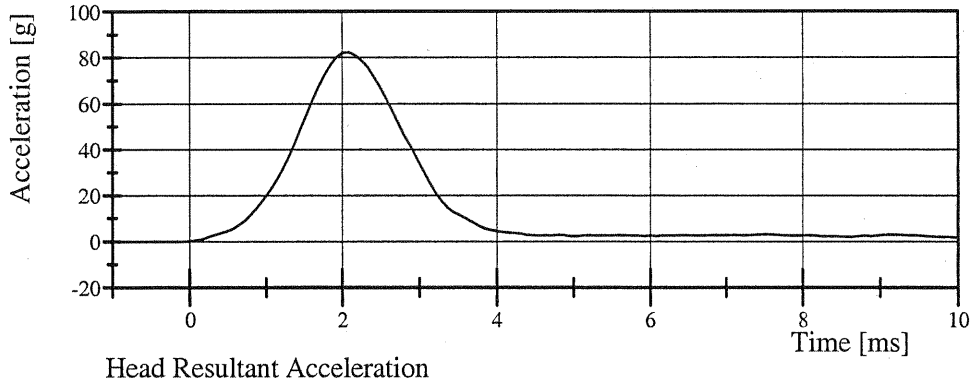
Filter Class: CFC_1000
Max: 4.7 g at 1.7 ms
Min: -5.2 g at 3.6 ms

Head Y-Axis Acceleration



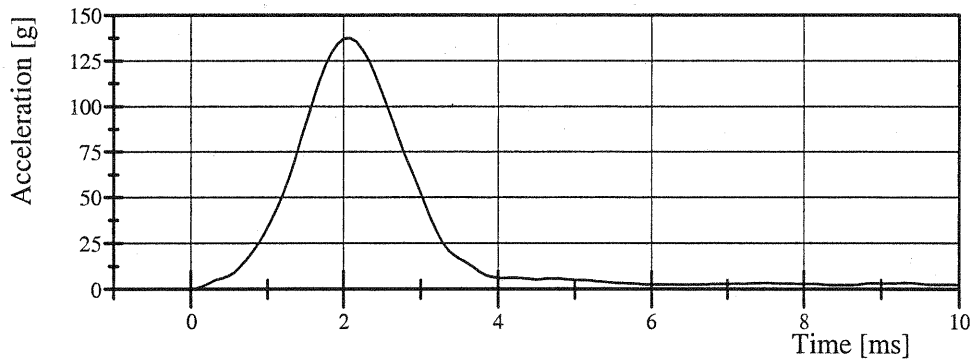
Filter Class: CFC_1000
Max: 110.0 g at 2.1 ms
Min: -2.1 g at 4.8 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 82.2 g at 2.1 ms
Min: -0.1 g at -0.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 137.4 g at 2.1 ms
Min: 0.0 g at -0.9 ms

Transportation Research Center Inc.

Left Lateral Neck
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	35 %	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	2.341 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.728 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.781 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.197 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-71.7 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	58.1 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	87.7 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	54.5 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	10.7 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

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

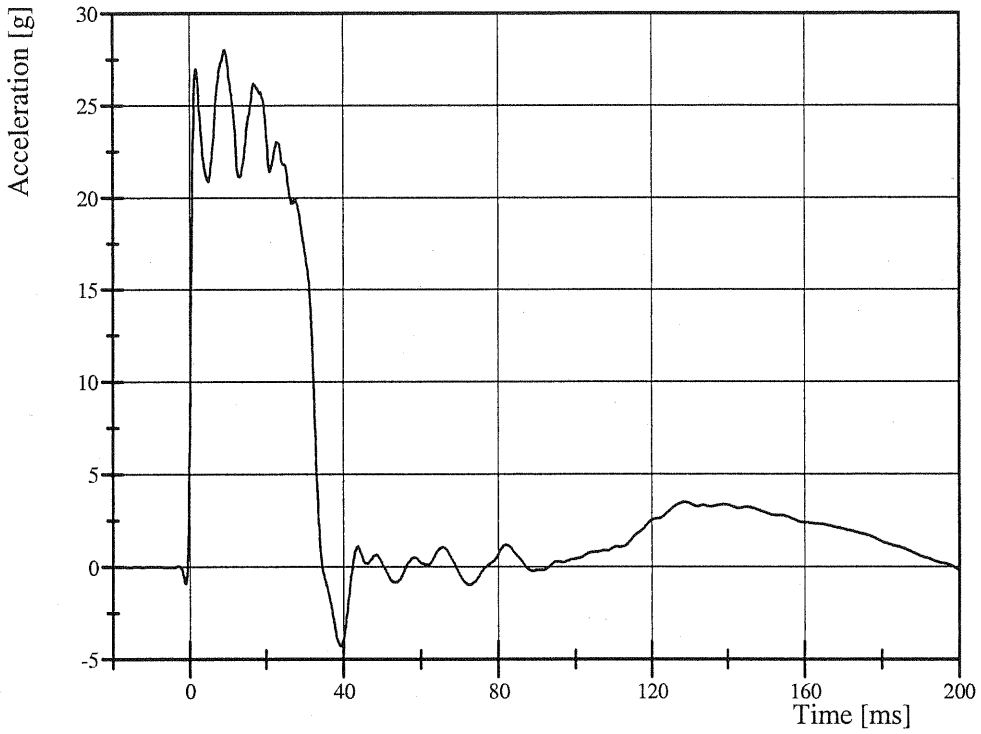
11.02.2007 08:31:35 2982

071113

Transportation Research Center Inc.

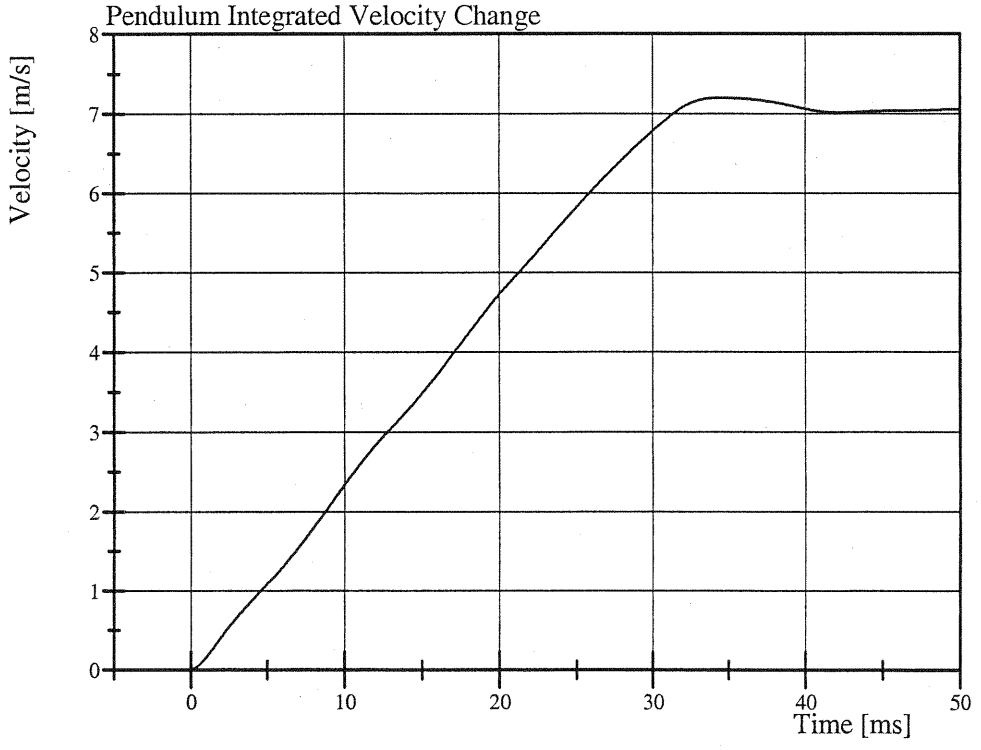
Left Lateral Neck
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/2/2007

Pendulum Acceleration



Filter Class: CFC_180
Max: 28.0 g at 9.1 ms
Min: -4.3 g at 39.4 ms

Pendulum Integrated Velocity Change



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

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

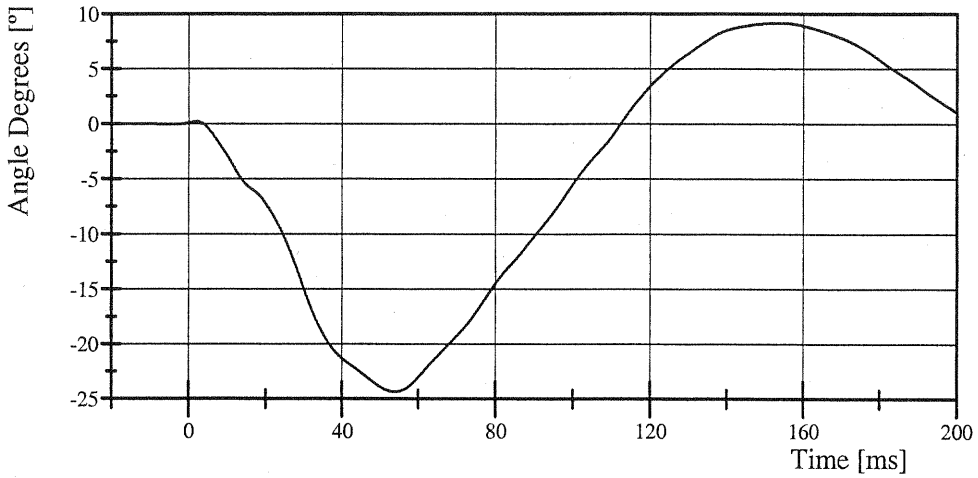
11.02.2007 08:31:43 2982

071113

Transportation Research Center Inc.

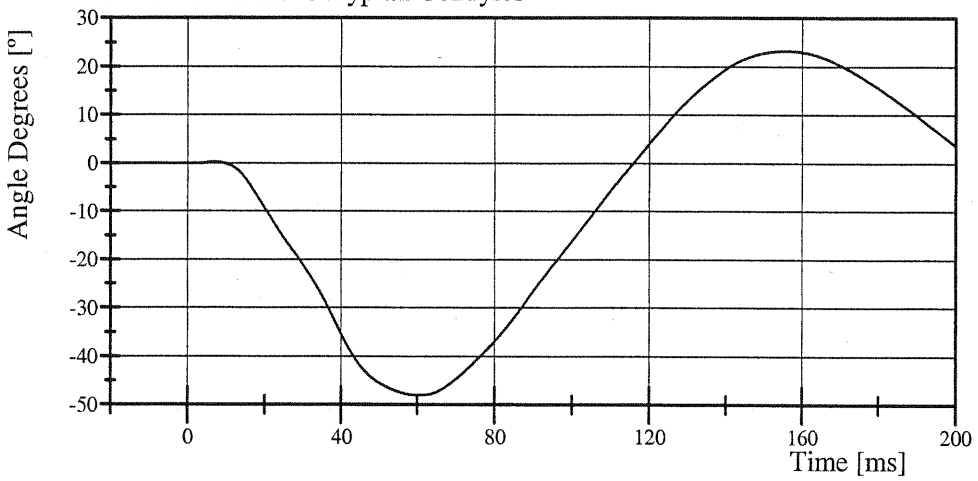
Left Lateral Neck
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/2/2007

Pot Rotation at the Base of Neck



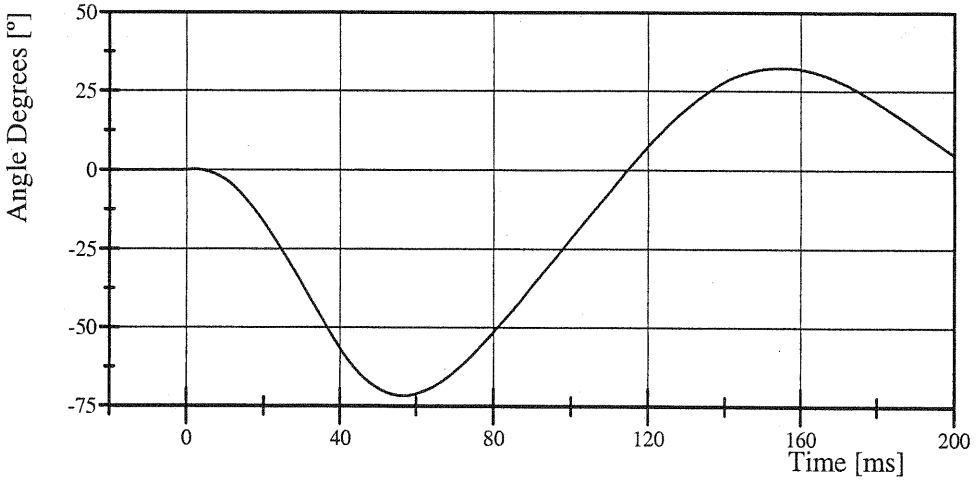
Filter Class: CFC_60
Max: 9.2 ° at 153.9 ms
Min: -24.3 ° at 54.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 23.3 ° at 155.7 ms
Min: -48.0 ° at 60.6 ms

Total Head D-Plane Rotation

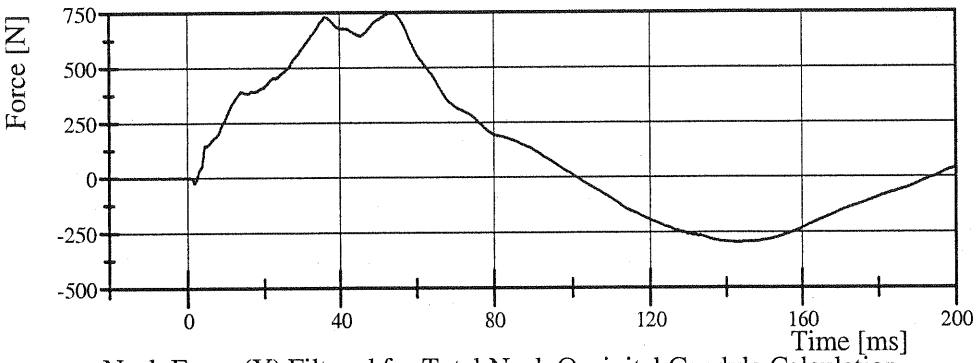


Filter Class: CFC_60
Max: 32.4 ° at 155.1 ms
Min: -71.7 ° at 56.7 ms

Transportation Research Center Inc.

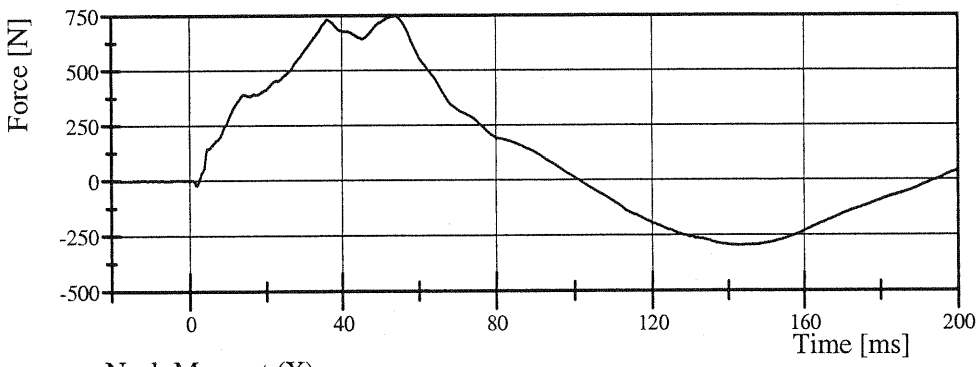
Left Lateral Neck
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/2/2007

Neck Force (Y)



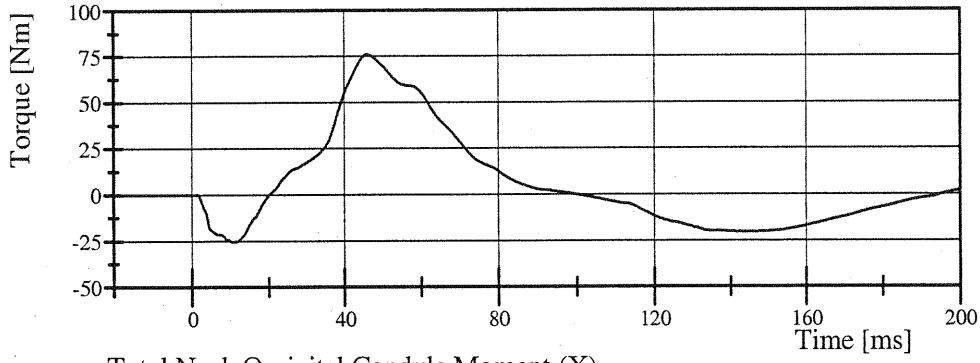
Filter Class: CFC_1000
Max: 749.9 N at 53.9 ms
Min: -295.7 N at 142.6 ms

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



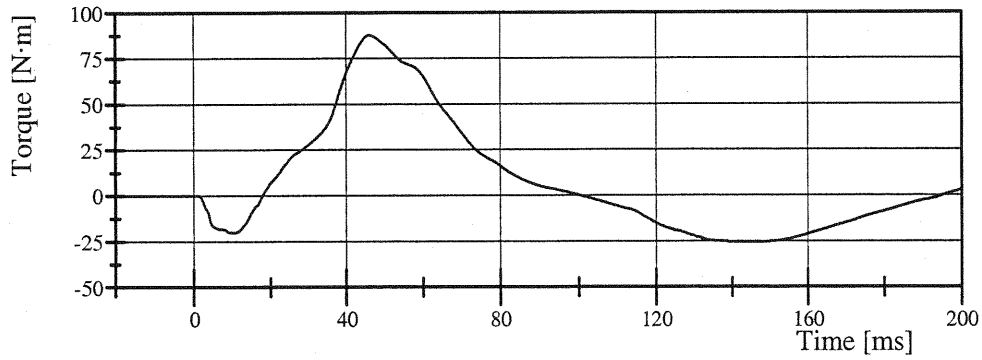
Filter Class: CFC_600
Max: 749.7 N at 54.0 ms
Min: -295.4 N at 142.7 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 76.1 Nm at 45.8 ms
Min: -25.6 Nm at 11.2 ms

Total Neck Occipital Condyle Moment (X)



Filter Class: CFC_600
Max: 87.7 N·m at 46.0 ms
Min: -25.6 N·m at 144.4 ms

Transportation Research Center Inc.

Left Lateral Thorax
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.270 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	43.9 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	41.7 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	21.5 g	Yes

Test meets specifications.

Comments:

Technician

Approved

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

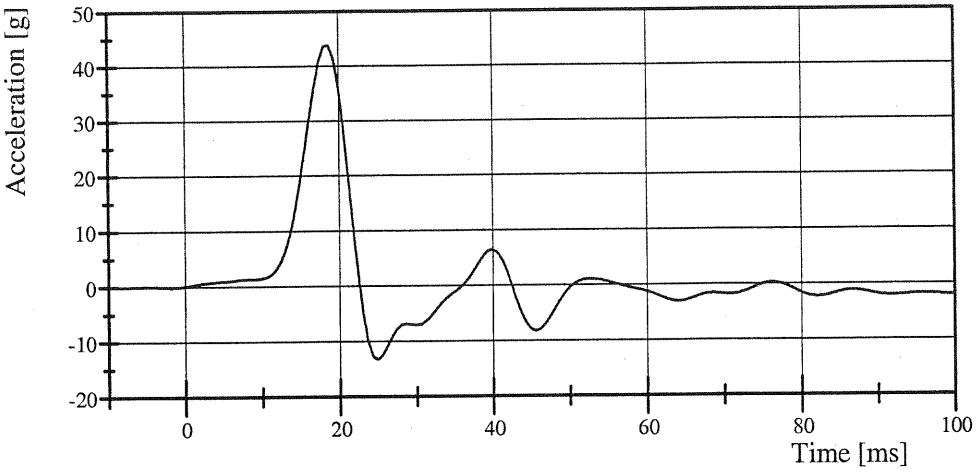
11.01.2007 12:44:54 619

071113

Transportation Research Center Inc.

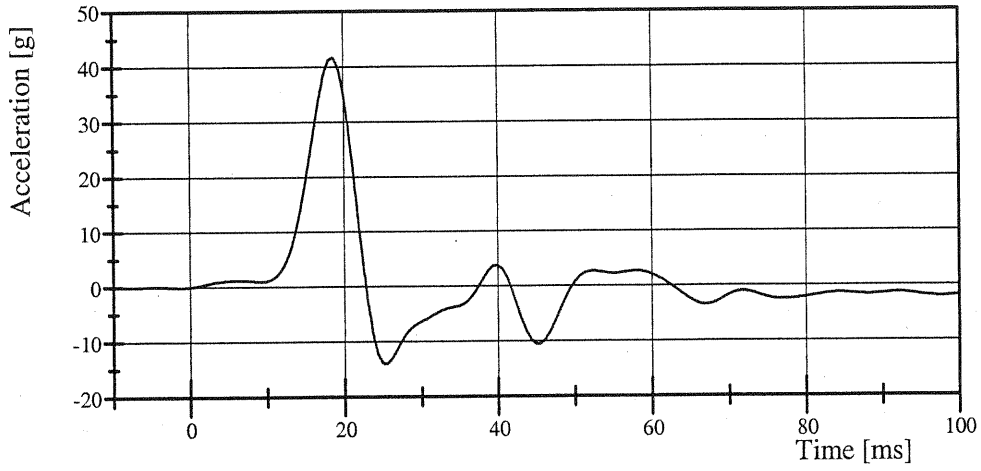
Left Lateral Thorax
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/1/2007

Upper Rib Acceleration (Y)



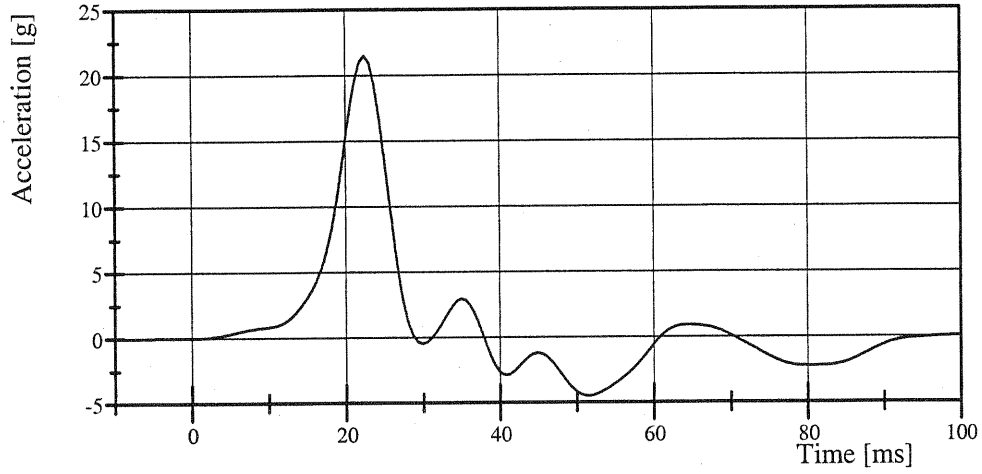
Filter Class: FIR_100
Max: 43.9 g at 18.6 ms
Min: -13.3 g at 25.0 ms

Lower Rib Acceleration (Y)



Filter Class: FIR_100
Max: 41.7 g at 18.6 ms
Min: -14.0 g at 25.5 ms

Lower Spine Acceleration (Y)



Filter Class: FIR_100
Max: 21.5 g at 22.4 ms
Min: -4.5 g at 51.8 ms

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

11.01.2007 12:45:03 619

071113

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.281 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.3 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	45.7 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

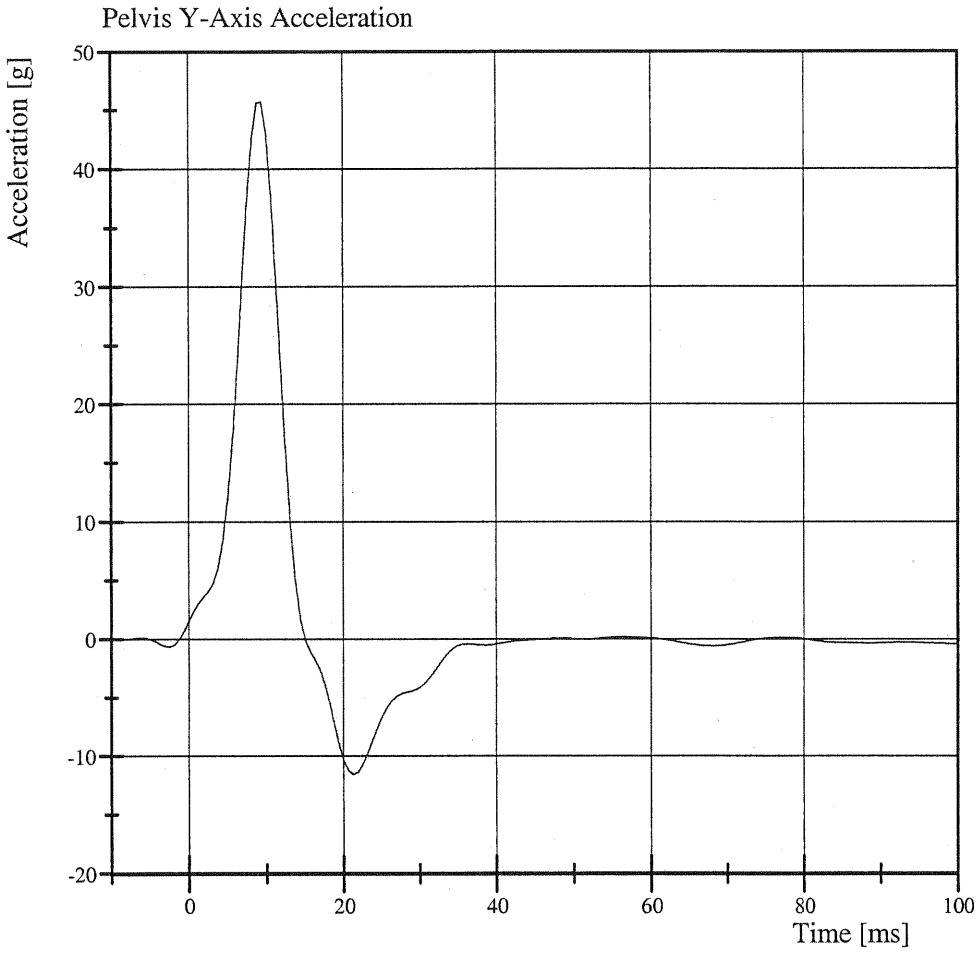
Specification Source: CFR49 Part 572 Subpart M with Polarity in accordance with J211

11.01.2007 12:56:06 610

071113

Transportation Research Center Inc.

Left Lateral Pelvis
SID-HIII Serial No. 066 Certification No. 25-1
Test Date: 11/1/2007



Filter Class: FIR_100
Max: 45.7 g at 9.4 ms
Min: -11.6 g at 21.3 ms

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

11.01.2007 12:56:18 610

071113

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 02-Nov-07

TRC, INC. **TEST NO: LUFL-01** **572B SN 066 TORSO FLEX CAL 25**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME	NA	1030
TEMPERATURE	18.9 – 25.6° C	21.4 C
RELATIVE HUMIDITY	10 – 70 %	39 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	124.55 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	177.92 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	235.75 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	7 °

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

Abdomen Compression
SID-HIII Serial No. 066 Certification No. 25-2
Test Date: 11/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.732 mm/s	Yes

Test meets specifications.

Comments:

Technician

Approved

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

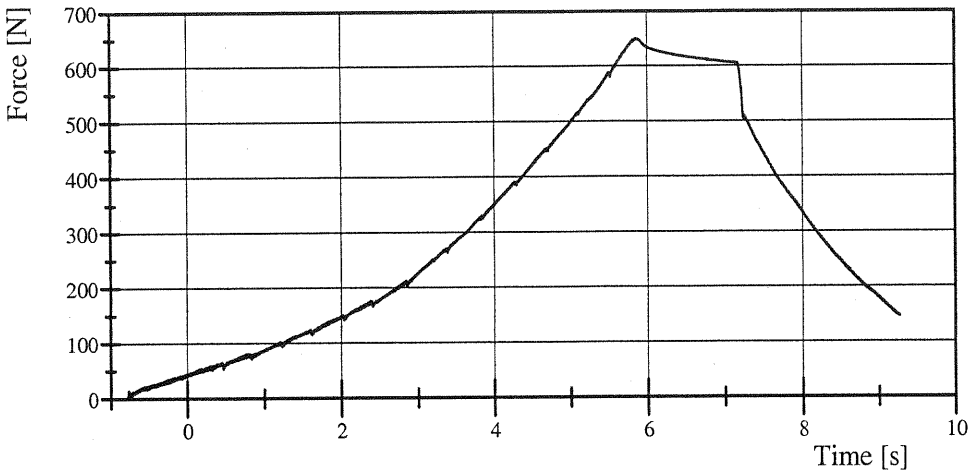
11.02.2007 10:02:51 9749

071113

Transportation Research Center Inc.

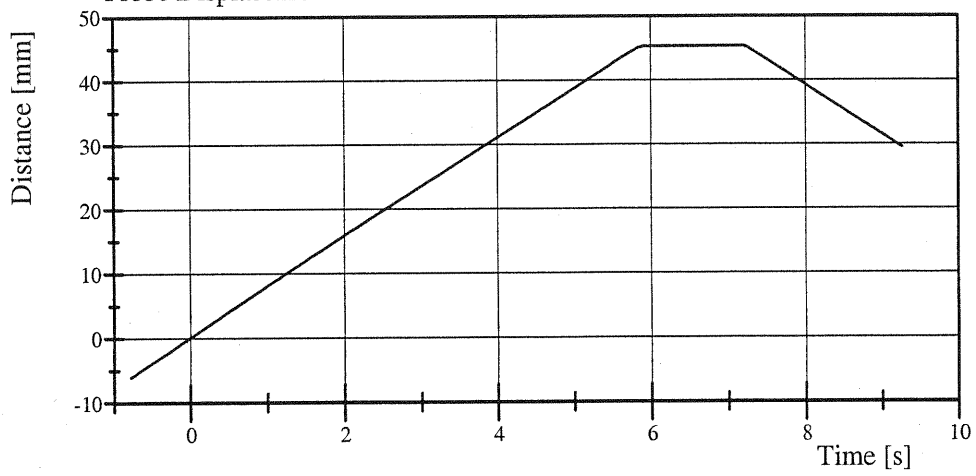
Abdomen Compression
SID-HIII Serial No. 066 Certification No. 25-2
Test Date: 11/2/2007

Probe Force



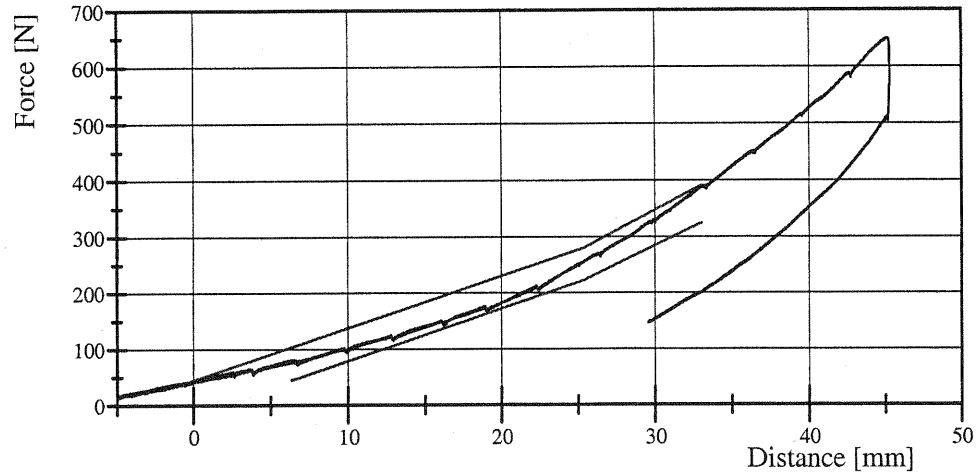
Filter Class: CFC_600
Max: 649.4 N at 5.9 s
Min: 3.2 N at -0.8 s

Probe Displacement



Filter Class: CFC_180
Max: 45.3 mm at 7.2 s
Min: -6.0 mm at -0.8 s

Probe Force vs Displacement



Filter Class: CFC_600
Max: 649.4 N at 45.1 mm
Min: 3.2 N at -6.0 mm

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

11.02.2007 10:04:20 9749

071113

APPENDIX D
CHILD RESTRAINT SYSTEM

REPORT NUMBER: NCAPSIDE-TRC-2007-003

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

NISSAN MOTOR CO., LTD.
2008 NISSAN ROGUE S 2WD MPV
NHTSA NUMBER: M85209

PREPARED BY:
TRANSPORTATION RESEARCH CENTER INC.
10820 STATE ROUTE 347
P. O. BOX B-67
EAST LIBERTY, OH 43319

Test Date: November 13, 2007

Report Date: November 27, 2007

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVENUE, S.E., ROOM W43-410
WASHINGTON, D.C. 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-03-D-02005. This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Test Performed By: Duey Thomas, Test Technician II

Report Approved By: 

Christopher Krouskop, Project Manager

Transportation Research Center Inc.

Approval Date: 11-27-07

FINAL REPORT ACCEPTANCE BY OCWS:

Accepted By: _____

Acceptance Date: _____

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NCAPSIDE-TRC-2007-003		

4. Title and Subtitle	5. Report Date
Final Report of a Graco Snugride CRS NHTSA No.: M85209	November 27, 2007
	6. Performing Organization Code TRC Inc.
7. Author(s) Christopher Krouskop, Project Manager Transportation Research Center Inc.	8. Performing Organization Report No. 071113
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319	10. Work Unit No. (TRAIS)
	11. Contract or Grant No. DTNH22-03-D-02005
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards 1200 New Jersey Avenue, S.E., Room W43-410 Washington, DC 20590	13. Type of Report and Period Covered Final Report November 2007
	14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS

15. Supplemental Notes

16. Abstract

A side impact test was conducted on the subject CRS Graco Snugride in conjunction with side impact NCAP testing on a 2008 Nissan Rogue S 2WD MPV and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on November 13, 2007.

	Right Rear	
Head Injury Criteria (HIC36):	129.8	g's
3 ms Chest Clip:	19.4	g's

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: NHTSA Technical Information Services (TIS) 1200 New Jersey Avenue, S.E., Room W43-410 Washington, DC 20590 Telephone No. (202) 366-4946 Attn: Robert Hornicle

19. Security Classification (of this report)	20. Security Classification (of this page)	21. Number of Pages	22. Price
Unclassified	Unclassified	51	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

TABLE OF CONTENTS

SECTION D1
PURPOSE AND SUMMARY OF TEST M85209

PURPOSE

The purpose of this test is to obtain CRS performance data during a 55/28 km/h 90 degree Moving Deformable Barrier Side Impact NCAP Test.

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

SUMMARY

One 12-month old CRABI (P3) was instrumented with head, chest, pelvis, and six-axis upper neck load cells. A tri-axial accelerometer was installed on the CRS base. Seat belt load cells were placed on the inboard and outboard lower tethers.

The right rear (Serial No. 094) CRABI was calibrated prior to this test. CRABI calibration information is found in Section D-4.

CHILD DUMMY VALUES		
Location	HIC36 Value	3 ms Chest Clip
CRABI (P3)	129.8	19.4

DATA SHEET NO. 1

CRASH TEST SUMMARY

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position #3 CRS
Manufacturer	Graco Children's Products, Inc.
Model Name	Snugride
Model No.	8465DAI3
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS
Head Contact	Right of CRS
Chest Contact	None
Abdomen Contact	None
Left Knee Contact	None
Right Knee Contact	None
Left Toe Contact	None
Right To Contact	None

POST-TEST DOOR OPENINGS

Description	Position #3 CRS
Right Rear Door	Opened without tools. Remained closed during test.

CAMERAS

Description	Standard
High Speed	1
Real Time	0
Total	1

DATA CHANNELS

CRABI (P3) Sensors	15
CRS Sensors	3
Total	18

DATA SHEET NO. 2

VEHICLE PARAMETER DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	447.6	300.2		494.6	395.8	
Right	kg	448.4	294.0		456.0	374.6	
Ratio	%	60.1	39.9		55.2	44.8	
Totals	kg	896.0	594.2	1490.2	950.6	770.4	1721.0

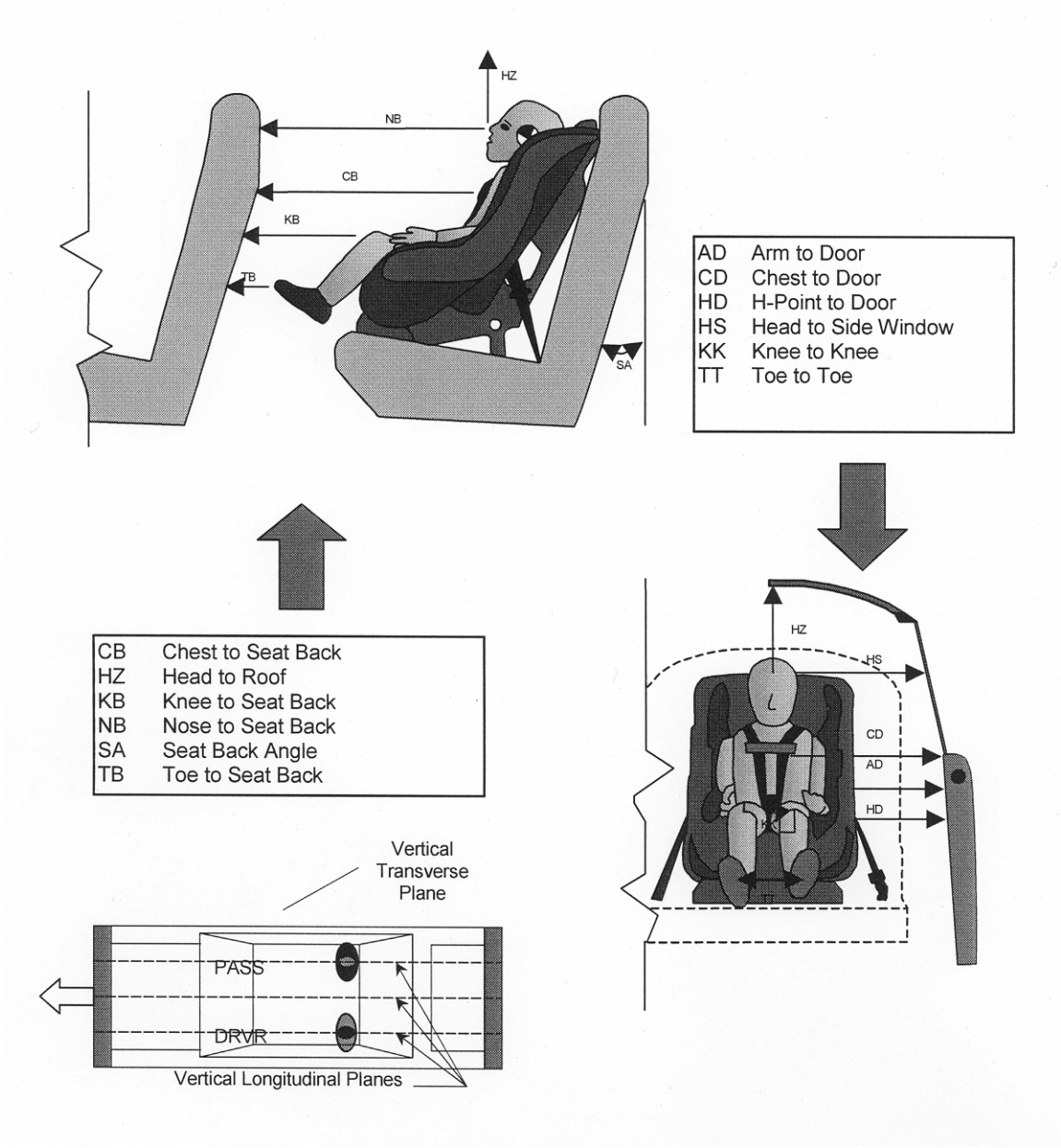
TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1490.2
Weight of 2 P572M ATDs	kg	162.0
Rated Cargo/Luggage Weight (RCLW)	kg	68.0
Calculated Vehicle Target Weight (TVTW)	kg	1720.2

DATA SHEET NO. 3

CRABI POSITIONING IN VEHICLE

Test Vehicle:	2008 Nissan Rogue S 2WD	NHTSA No.:	M85209
Test Program:	NCAP Side Impact	Test Date:	11/13/07



Note: Child seat was rearward facing.

DATA SHEET NO. 3

CRABI POSITIONING IN VEHICLE, (Continued)

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

Code	Measurement Description	P3 (Passenger's Side)	
		Length (mm)	Angle (°)
SA	Seat Back Angle		37.2
HZ	Head to Roof	383	
CB	Chest to Seatback	440	
KB	Left Knee to Seatback	190	
NB	Nose to Seatback	507	
TB	Toe to Seatback	40	

DATA SHEET NO. 4

CRS PERFORMANCE DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

CRS PERFORMANCE DATA

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

DATA SHEET NO. 5

CRS ACCELEROMETER LOCATIONS

Test Vehicle:	2008 Nissan Rogue S 2WD	NHTSA No.:	M85209
Test Program:	NCAP Side Impact	Test Date:	11/13/07

CRS ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	CRS CG	---[1]	---[1]	---[1]

Reference Points: X - From Rear Surface of Vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

[1] Measurements not taken.

DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Nissan Rogue S 2WD NHTSA No.: M85209
Test Program: NCAP Side Impact Test Date: 11/13/07

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Vehicle Onboard Rear SID/HIII, Side	1590	870	-1430	6.5	1000

Reference Points: X - Impact Line
Y - MDB Left Edge Impact Point
Z - Ground Plane

APPENDIX D2

PHOTOGRAPHS

List of Photographs

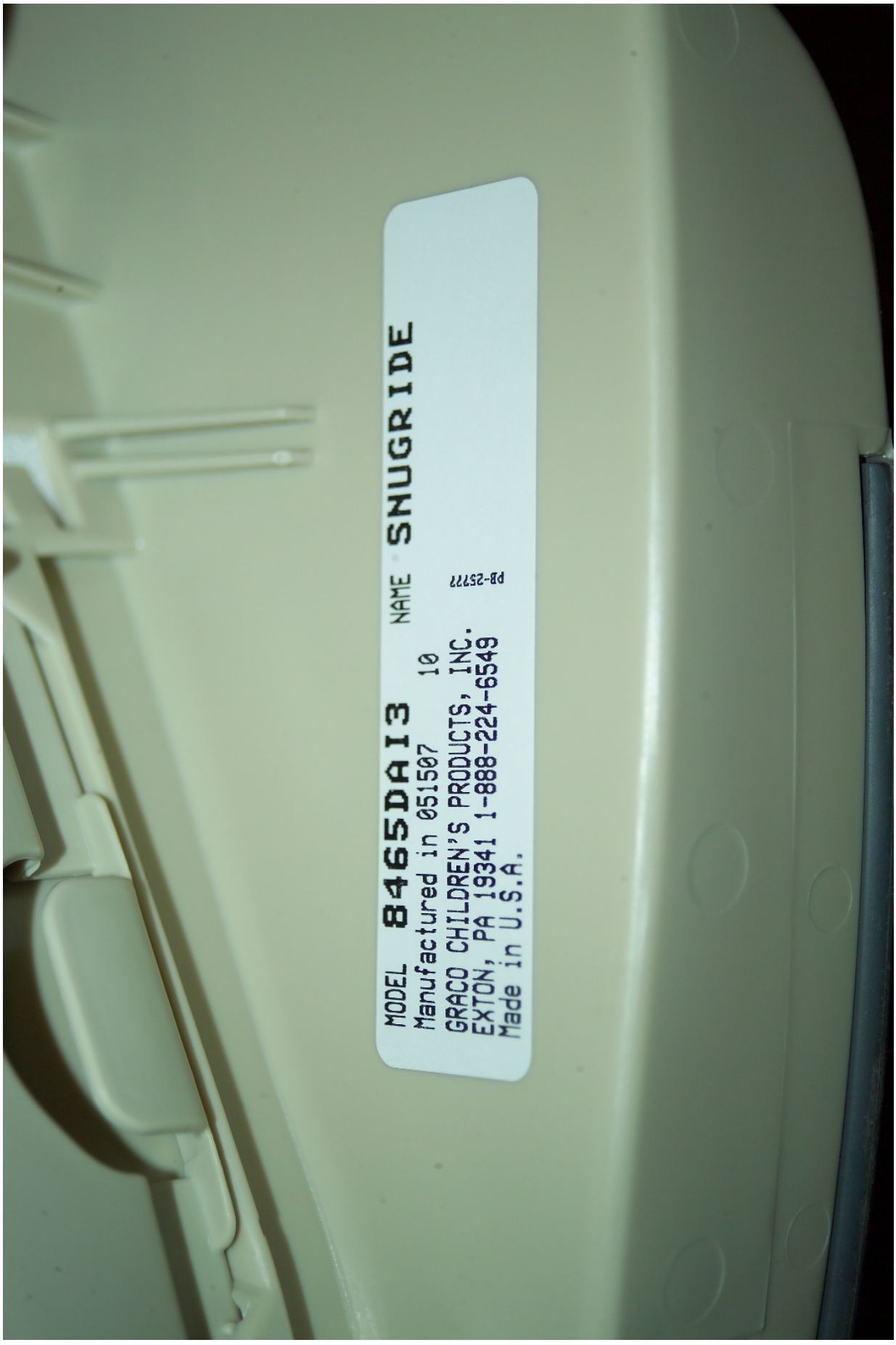


Figure D2-1 Pre-Test Child Restraint Certification Label View

Figure D2-2 Pre-Test Front View of Right Rear CRS

Figure D2-3 Post-Test Front View of Right Rear CRS

Figure D2-4 Pre-Test Left Side View of Right Rear CRS

Figure D2-5 Post-Test Left Side View of Right Rear CRS

Figure D2-6 Pre-Test Right Side View of Right Rear CRS

Figure D2-7 Post-Test Right Side View of Right Rear CRS

Figure D2-8 Pre-Test Front View of Right Rear Dummy

Figure D2-9 Post-Test Front View of Right Rear Dummy

Figure D2-10 Pre-Test Left Side View of Right Rear Dummy

Figure D2-11 Pre-Test Right Side View of Right Rear Dummy

Figure D2-12 Post-Test Right Side View of Right Rear Dummy

APPENDIX D3

CRABI RESPONSE AND CRS DATA

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

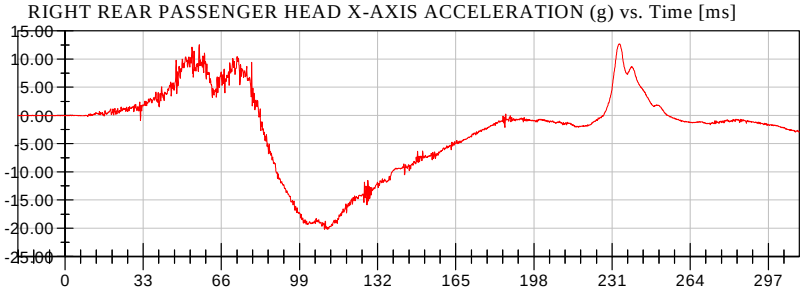
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

RIGHT REAR PASSENGER HEAD X-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

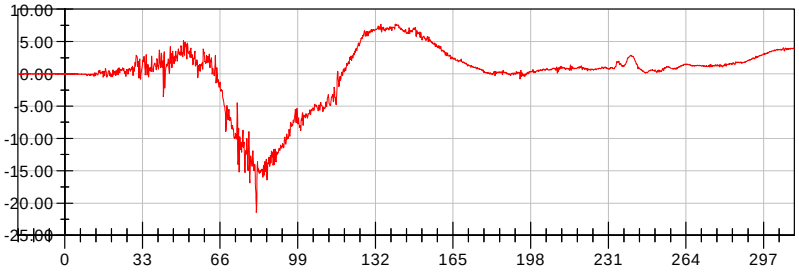
12.71 g at 234.00 ms

<Min>

-20.22 g at 109.60 ms

CFC_1000

RIGHT REAR PASSENGER HEAD Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

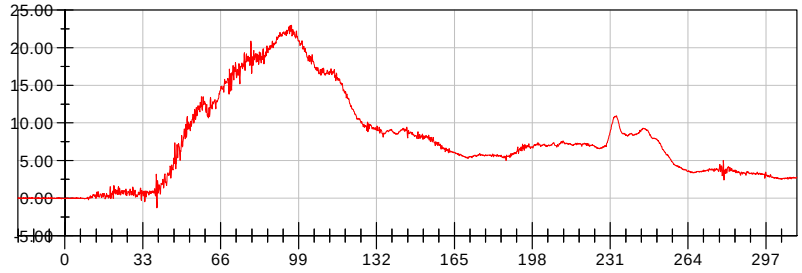
7.71 g at 140.56 ms

<Min>

-21.43 g at 81.44 ms

CFC_1000

RIGHT REAR PASSENGER HEAD Z-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

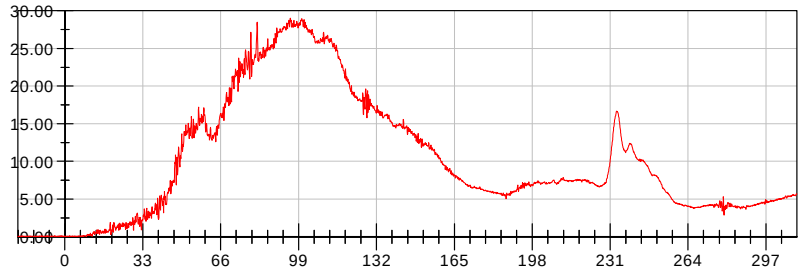
23.01 g at 95.92 ms

<Min>

-1.29 g at 38.96 ms

CFC_1000

RIGHT REAR PASSENGER HEAD RESULTANT ACCELERATION (g) vs. Time [ms]



<Max>

29.03 g at 95.52 ms

<Min>

0.01 g at -18.08 ms

CFC_1000

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

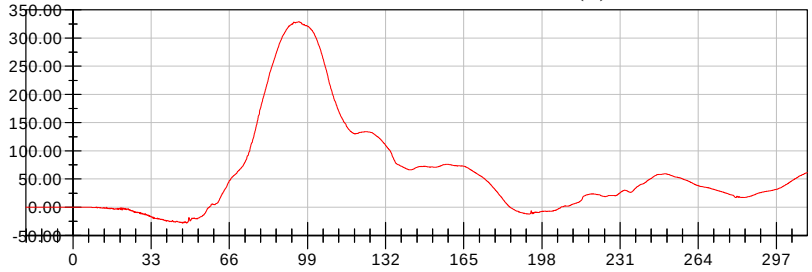
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

RIGHT REAR PASSENGER NECK X-AXIS SHEAR FORCE (N) vs. Time [ms]



<Max>

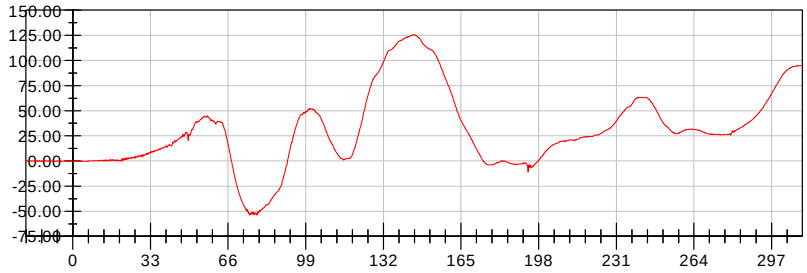
328.77 N at 95.44 ms

<Min>

-28.30 N at 46.32 ms

CFC_1000

RIGHT REAR PASSENGER NECK Y-AXIS SHEAR FORCE (N) vs. Time [ms]



<Max>

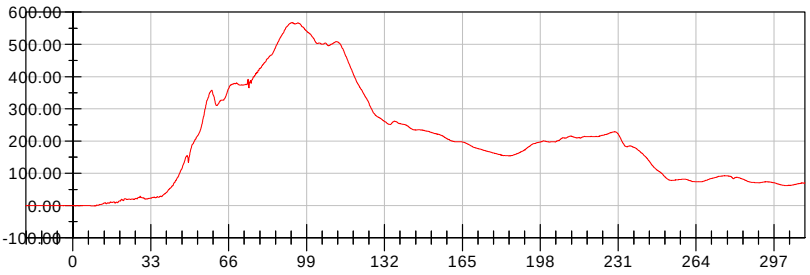
125.59 N at 144.88 ms

<Min>

-53.82 N at 78.32 ms

CFC_1000

RIGHT REAR PASSENGER NECK Z-AXIS AXIAL FORCE (N) vs. Time [ms]



<Max>

567.76 N at 92.80 ms

<Min>

-1.19 N at 8.72 ms

CFC_1000

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

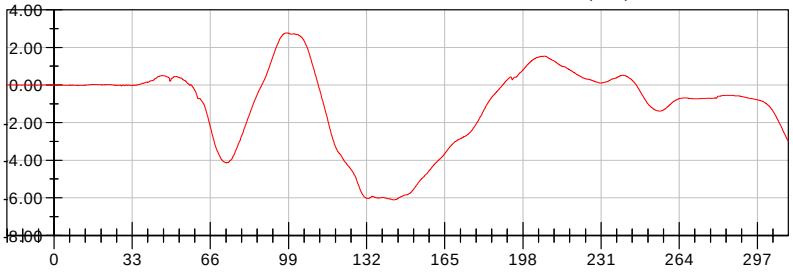
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

RIGHT REAR PASSENGER NECK MOMENT ABOUT X AXIS (Nm) vs. Time [ms]



<Max>

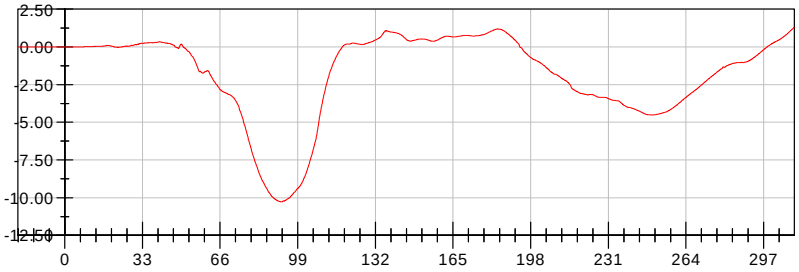
2.78 Nm at 98.48 ms

<Min>

-6.10 Nm at 143.36 ms

CFC_600

RIGHT REAR PASSENGER NECK MOMENT ABOUT Y AXIS (Nm) vs. Time [ms]



<Max>

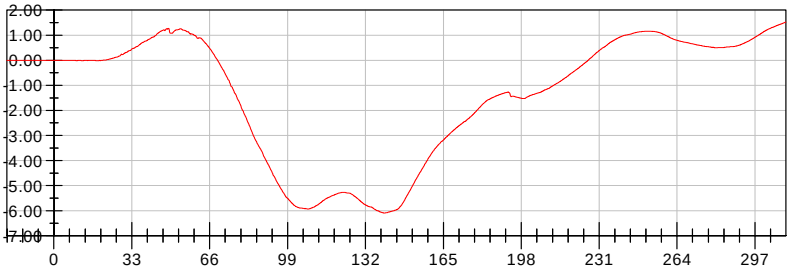
1.30 Nm at 310.00 ms

<Min>

-10.27 Nm at 92.16 ms

CFC_600

RIGHT REAR PASSENGER NECK MOMENT ABOUT Z AXIS (Nm) vs. Time [ms]



<Max>

1.52 Nm at 310.00 ms

<Min>

-6.09 Nm at 139.76 ms

CFC_600

NHTSA

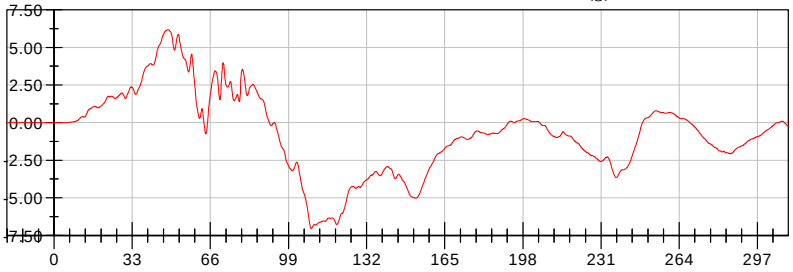
Test Date: 11/13/2007

Test Lab: CTF

Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)
Position #4 SID H3 Dummy (066)
Position #3 Crabi 12 month old Dummy (094)

RIGHT REAR PASSENGER CHEST X-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

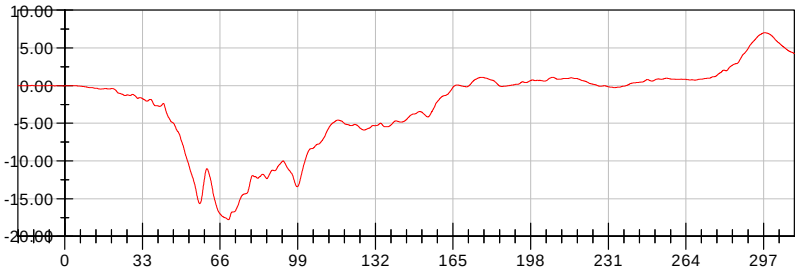
6.18 g at 48.16 ms

<Min>

-7.05 g at 108.64 ms

CFC_180

RIGHT REAR PASSENGER CHEST Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

7.03 g at 297.52 ms

<Min>

-17.79 g at 69.52 ms

CFC_180

RIGHT REAR PASSENGER CHEST Z-AXIS ACCELERATION (g) vs. Time [ms]

<Max>

10.94 g at 54.08 ms

<Min>

-0.87 g at 303.76 ms

CFC_180

RIGHT REAR PASSENGER CHEST RESULTANT ACCELERATION (g) vs. Time [ms]

<Max>

19.91 g at 68.80 ms

<Min>

0.00 g at -7.36 ms

CFC_180

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

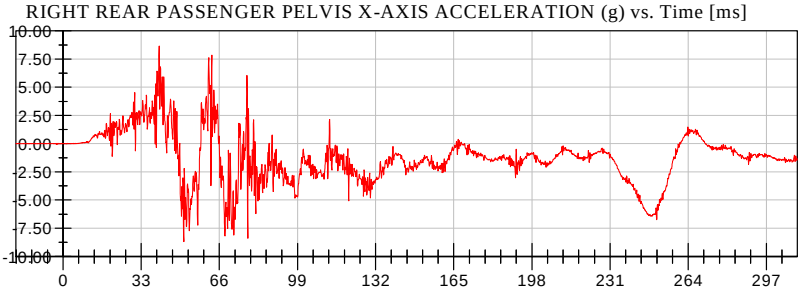
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

RIGHT REAR PASSENGER PELVIS X-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

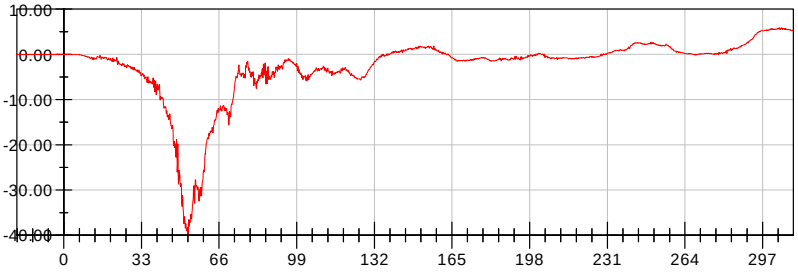
8.67 g at 40.56 ms

<Min>

-8.69 g at 50.96 ms

CFC_1000

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



<Max>

5.95 g at 305.04 ms

<Min>

-39.69 g at 52.88 ms

CFC_1000

RIGHT REAR PASSENGER PELVIS Z-AXIS ACCELERATION (g) vs. Time [ms]

<Max>

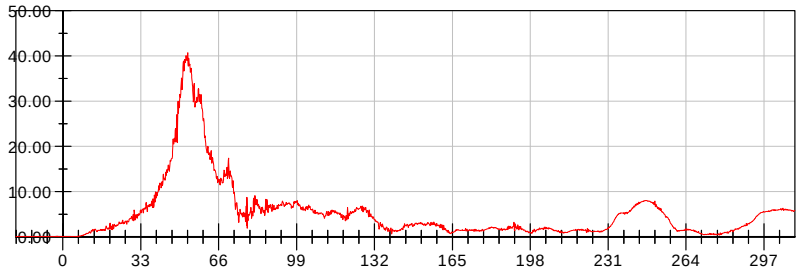
11.93 g at 50.00 ms

<Min>

-3.04 g at 70.48 ms

CFC_1000

RIGHT REAR PASSENGER PELVIS RESULTANT ACCELERATION (g) vs. Time [ms]



<Max>

40.72 g at 52.88 ms

<Min>

0.01 g at -12.56 ms

CFC_1000

NHTSA

Test Date: 11/13/2007

Test Lab: CTF

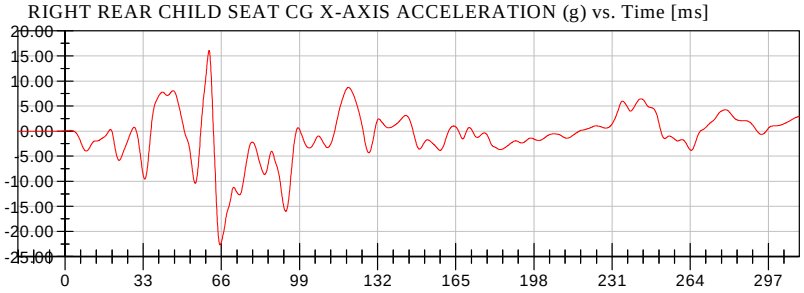
Test Number: 071113 (M85209)

Position #1 SID H3 Dummy (059)

Position #4 SID H3 Dummy (066)

Position #3 Crabi 12 month old Dummy (094)

RIGHT REAR CHILD SEAT CG X-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

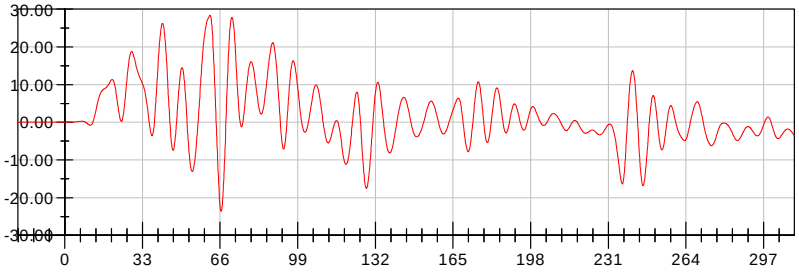
16.11 g at 60.80 ms

<Min>

-22.70 g at 65.44 ms

CFC_60

RIGHT REAR CHILD SEAT CG Y-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

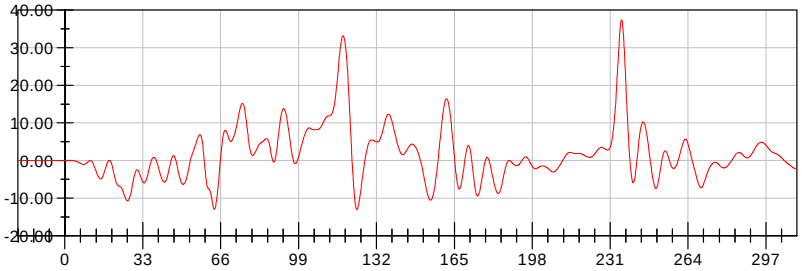
28.40 g at 61.76 ms

<Min>

-23.59 g at 66.40 ms

CFC_60

RIGHT REAR CHILD SEAT CG Z-AXIS ACCELERATION (g) vs. Time [ms]



<Max>

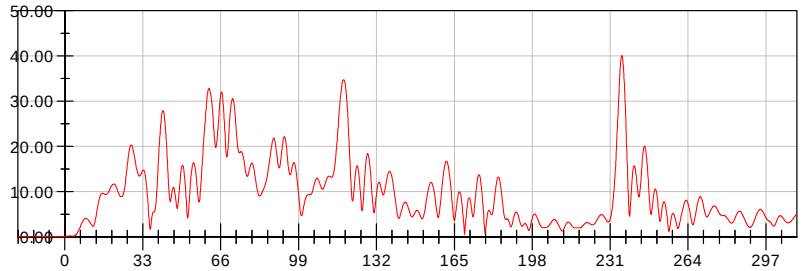
37.38 g at 235.84 ms

<Min>

-13.00 g at 123.68 ms

CFC_60

RIGHT REAR CHILD SEAT CG RESULTANT ACCELERATION (g) vs. Time [ms]



<Max>

40.09 g at 235.92 ms

<Min>

0.00 g at -18.72 ms

CFC_60

APPENDIX D4

DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

CRABI: 094

Transportation Research Center Inc.
572R CRABI 12-Month-Old Dummy
External Dimensions
Serial No. 094 Calibration No. 11
Date: 12-Nov-07

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	456.0 - 471.2 mm	469 mm	Yes
Shoulder Pivot Height	B	276.6 - 291.8 mm	285 mm	Yes
Hip Pivot Height	C	27.9 - 38.1 mm	33 mm	Yes
Hip Pivot from Backline	D	40.1 - 50.3 mm	48 mm	Yes
Shoulder Pivot from Backline	E	50.3 - 60.5 mm	54 mm	Yes
Thigh Clearance	F	63.0 - 73.2 mm	72 mm	Yes
Elbow Pivot to Fingertip	G	176.6 - 191.8 mm	180 mm	Yes
Shoulder to Elbow Pivot	I	99.1 - 114.3 mm	103 mm	Yes
Elbow Rest Height	J	150.1 - 165.3 mm	157 mm	Yes
Buttock to Knee Length	K	202.7 - 217.9 mm	206 mm	Yes
Popliteal Height (Reference to Seat)	L	138.7 - 153.9 mm	150 mm	Yes
Knee Pivot Height	M	165.1 - 180.3 mm	170 mm	Yes
Buttock Popliteal Length	N	144.8 - 160.0 mm	148 mm	Yes
Chest Depth with Jacket	O	107.5 - 122.7 mm	120 mm	Yes
Foot Length	P	92.4 - 102.6 mm	99 mm	Yes
Stature	Q	727.7 - 753.1 mm	750 mm	Yes
Buttock to Knee Pivot Length	R	178.5 - 188.7 mm	182 mm	Yes
Head Breadth	S	124.4 - 134.6 mm	126 mm	Yes
Head Depth (REF)	T	149.9 - 165.1 mm	159 mm	Yes
Hip Breadth	U	158.5 - 173.7 mm	171 mm	Yes
Shoulder Breadth	V	200.7 - 215.9 mm	211 mm	Yes
Foot Breadth	W	39.1 - 49.3 mm	44 mm	Yes
Chest Circumference with Jacket	Y	452.4 - 477.8 mm	465 mm	Yes
Waist Circumference	Z	447.0 - 472.4 mm	454 mm	Yes
Reference Location for Chest Circumference	AA	256.5 - 266.7 mm	263 mm	Yes
Reference Location for Waist Circumference	BB	106.7 - 116.9 mm	112 mm	Yes
Shoulder Height	CC	299.7 - 314.9 mm	310 mm	Yes
Chin Height	DD	289.6 - 304.8 mm	313 mm	No

Comments:

Chin height (DD) measured 302 mm with the head unsupported, and the buttocks and upper torso against the seat back.

Technician

Approved

Transportation Research Center Inc.

Front Head Drop
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Peak Head Resultant Acceleration	100 - 120 g	105.2 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	2.9 g	Yes
Is Acceleration Curve Unimodal within 17% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

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

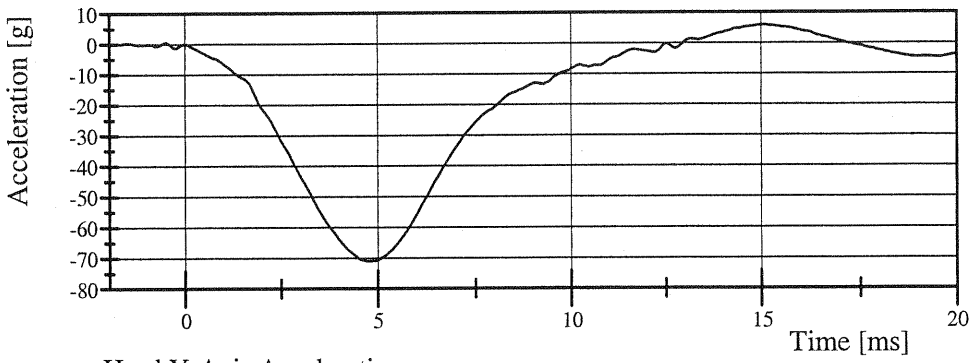
11.12.2007 14:47:59 602

071113

Transportation Research Center Inc.

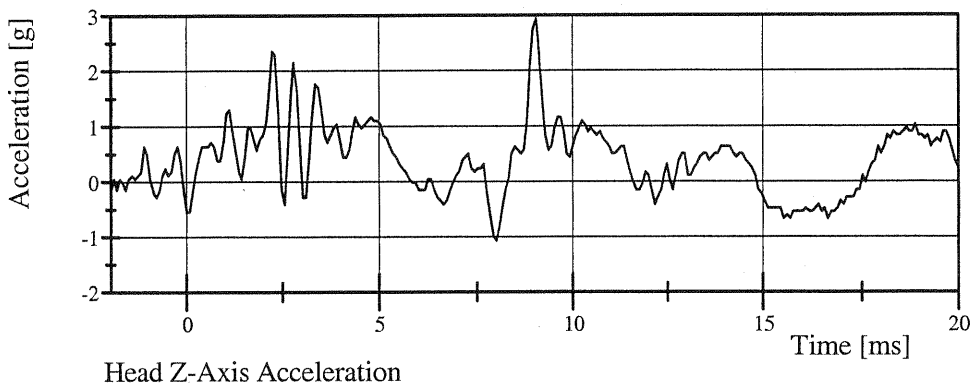
Front Head Drop
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Head X-Axis Acceleration



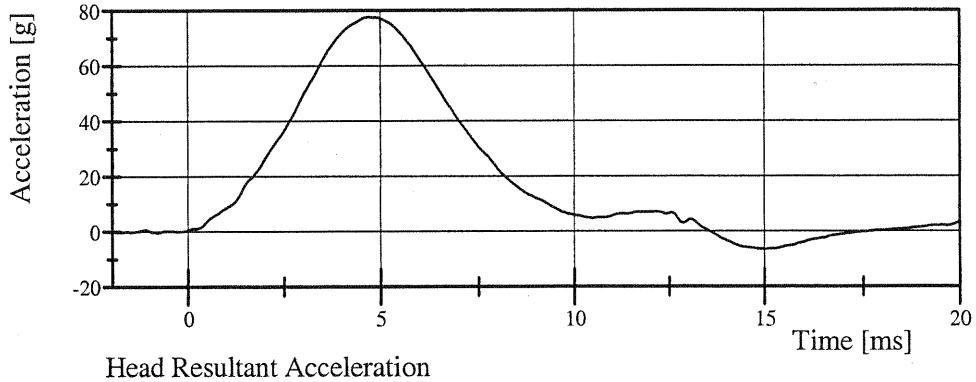
Filter Class: CFC_1000
Max: 6.0 g at 15.0 ms
Min: -71.0 g at 4.8 ms

Head Y-Axis Acceleration



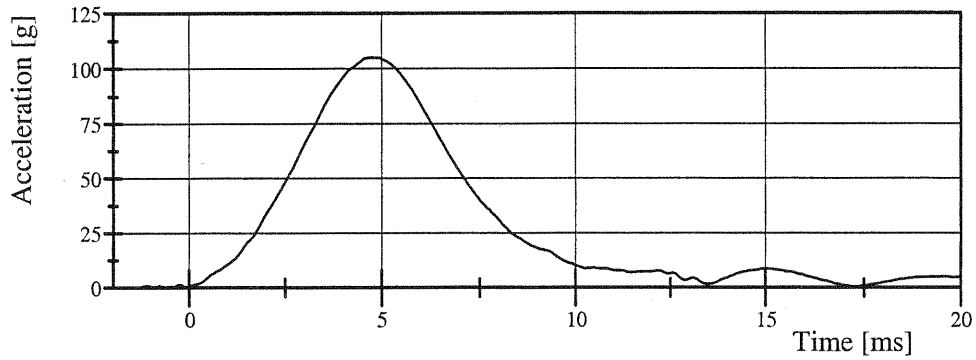
Filter Class: CFC_1000
Max: 2.9 g at 9.0 ms
Min: -1.1 g at 8.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 77.7 g at 4.7 ms
Min: -6.5 g at 15.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 105.2 g at 4.7 ms
Min: 0.1 g at -1.7 ms

Transportation Research Center Inc.

Rear Head Drop
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Peak Head Resultant Acceleration	55 - 71 g	64.9 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-3.4 g	Yes
Is Acceleration Curve Unimodal within 17% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

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

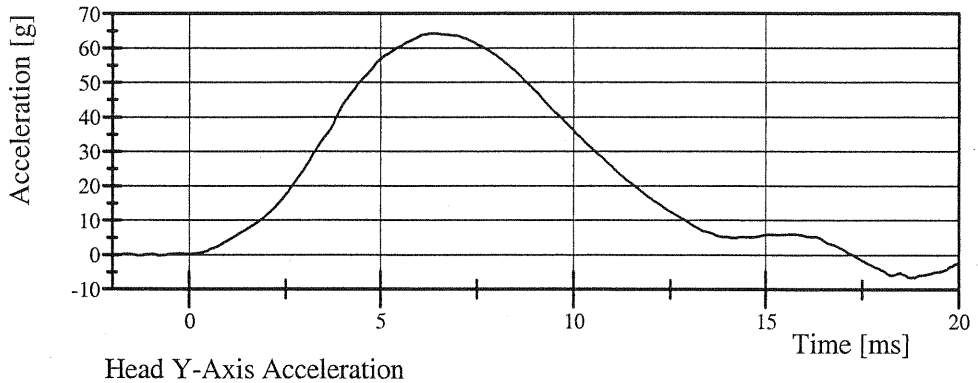
11.12.2007 14:09:49 595

071113

Transportation Research Center Inc.

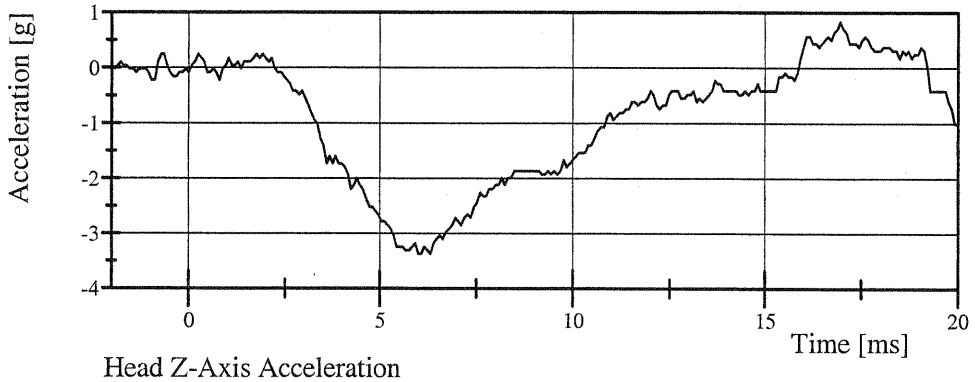
Rear Head Drop
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Head X-Axis Acceleration



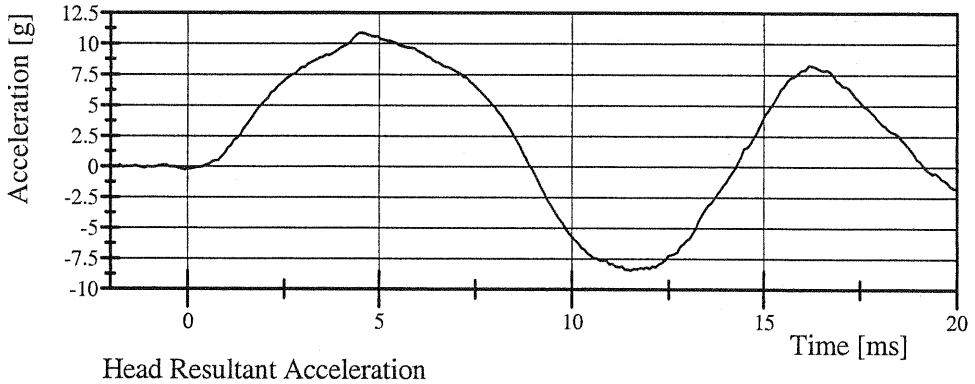
Filter Class: CFC_1000
Max: 64.2 g at 6.3 ms
Min: -6.5 g at 18.8 ms

Head Y-Axis Acceleration



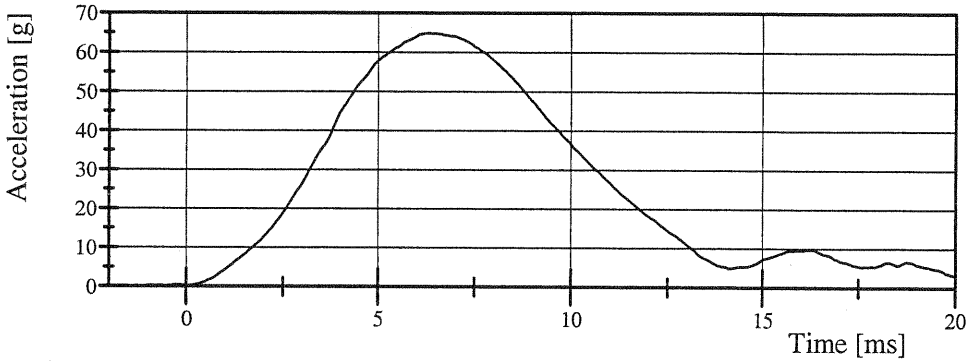
Filter Class: CFC_1000
Max: 0.8 g at 17.0 ms
Min: -3.4 g at 6.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 10.9 g at 4.5 ms
Min: -8.4 g at 11.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 64.9 g at 6.3 ms
Min: 0.0 g at -1.9 ms

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

11.12.2007 14:09:55 595

071113

Transportation Research Center Inc.

Neck Flexion
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	5.1 - 5.3 m/s	5.18 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-1.6) - (-2.3) m/s	-1.99 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-3.4) - (-4.2) m/s	-3.85 m/s	Yes
Pendulum Integrated Velocity Change at 25ms	(-4.3) - (-5.2) m/s	-4.68 m/s	Yes
Total Head D-Plane Rotation	(-75) - (-86) °	-84.1 °	Yes
Total Neck Occipital Condyles Moment	36 - 45 N·m	38.3 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 5 Nm	60 - 80 ms	75.8 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

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

11.12.2007 14:11:00 730

071113

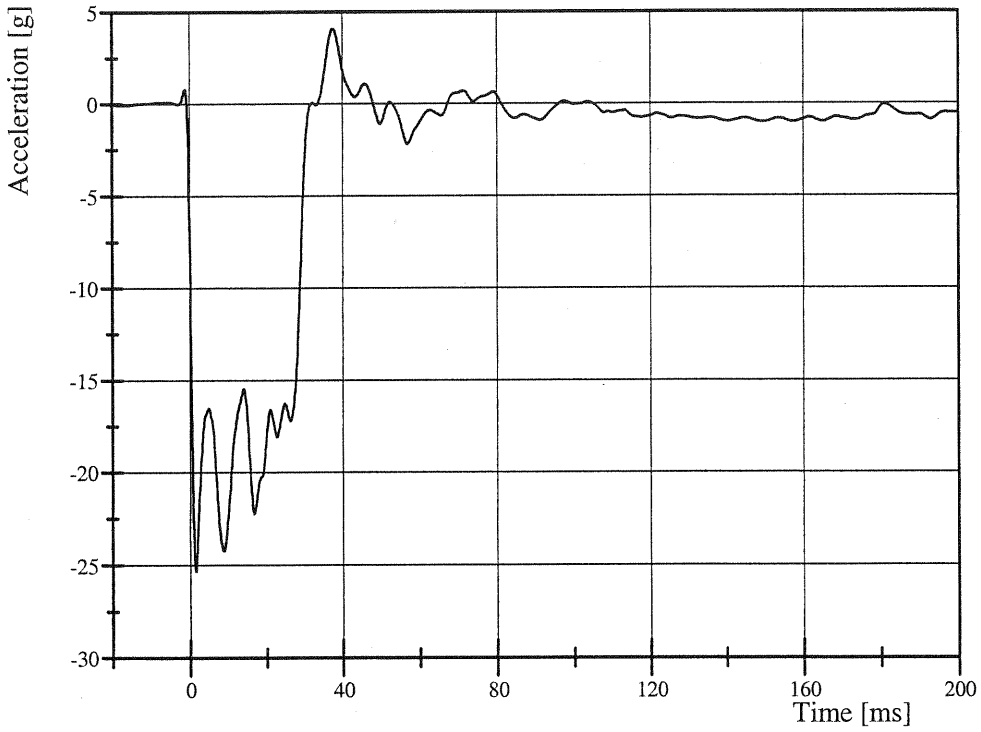
Transportation Research Center Inc.

Neck Flexion

CRABI 12 MO Serial No. 094 Certification No. 11-1

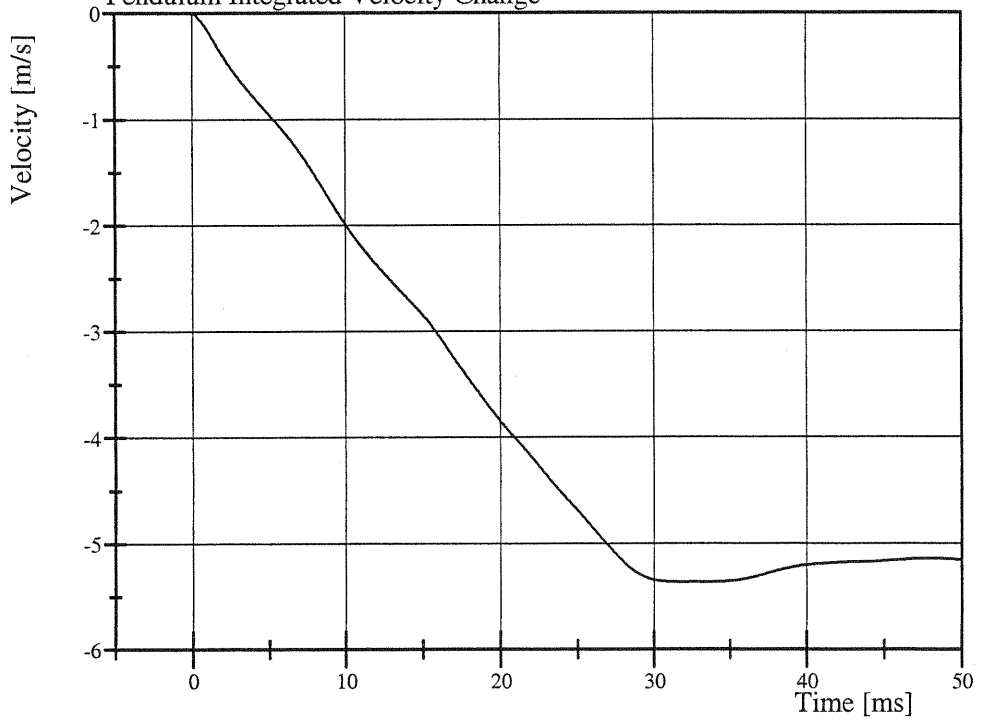
Test Date: 11/12/2007

Pendulum Acceleration



Filter Class: CFC_180
Max: 4.1 g at 37.5 ms
Min: -25.3 g at 1.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -5.4 m/s at 33.5 ms

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

11.12.2007 14:11:07 730

071113

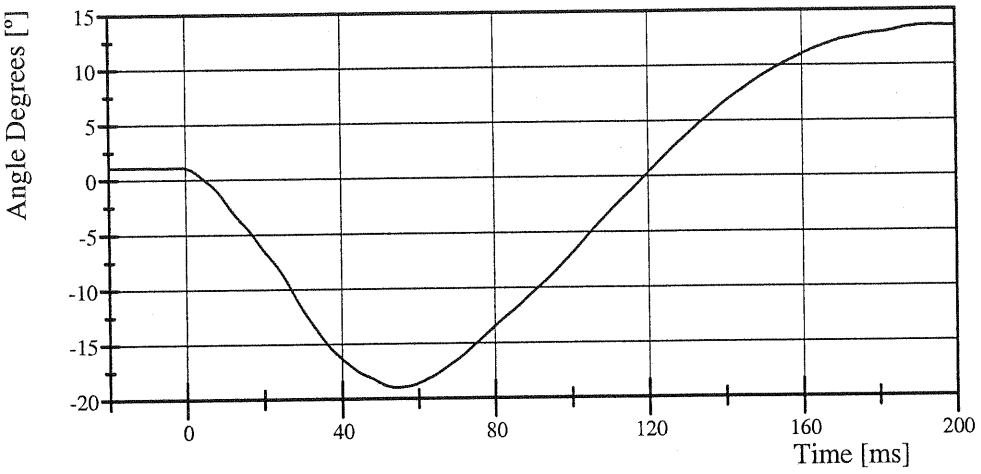
Transportation Research Center Inc.

Neck Flexion

CRABI 12 MO Serial No. 094 Certification No. 11-1

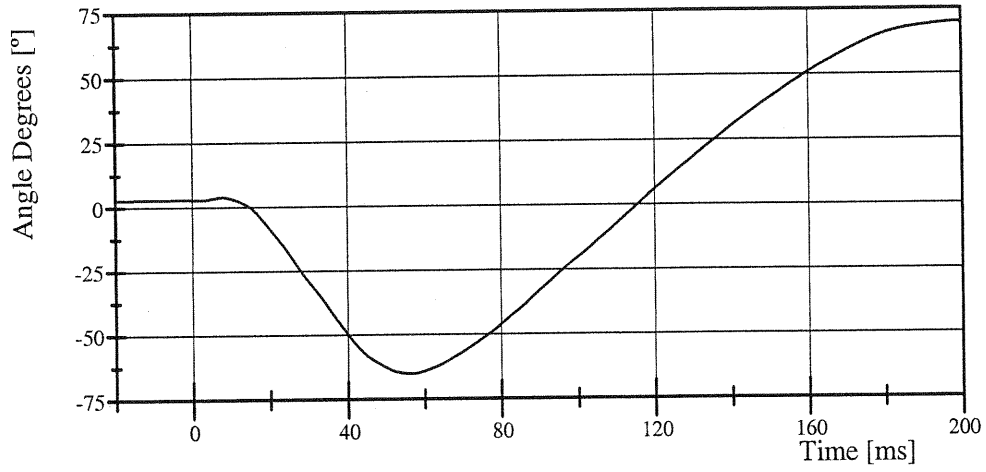
Test Date: 11/12/2007

Forward Pot Rotation at Base of Pendulum



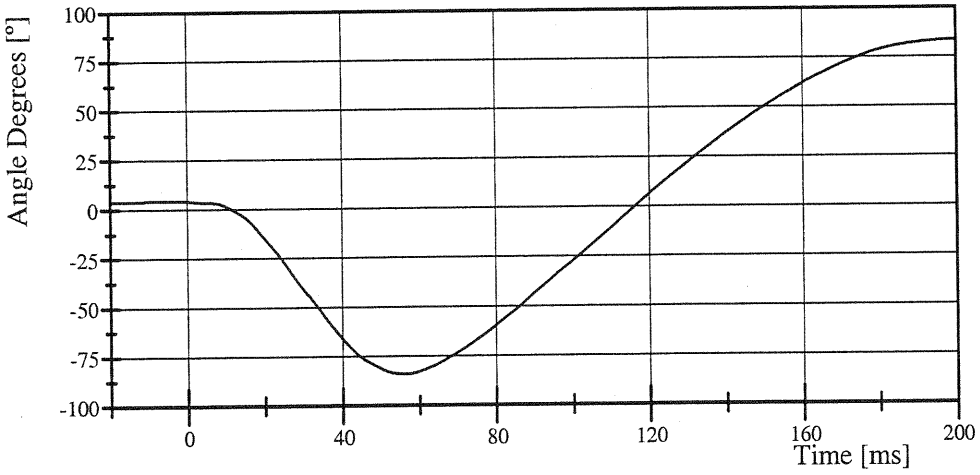
Filter Class: CFC_60
Max: 13.6 ° at 193.8 ms
Min: -18.9 ° at 54.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 69.9 ° at 200.0 ms
Min: -65.2 ° at 56.5 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 83.4 ° at 200.0 ms
Min: -84.1 ° at 56.3 ms

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

11.12.2007 14:11:07 730

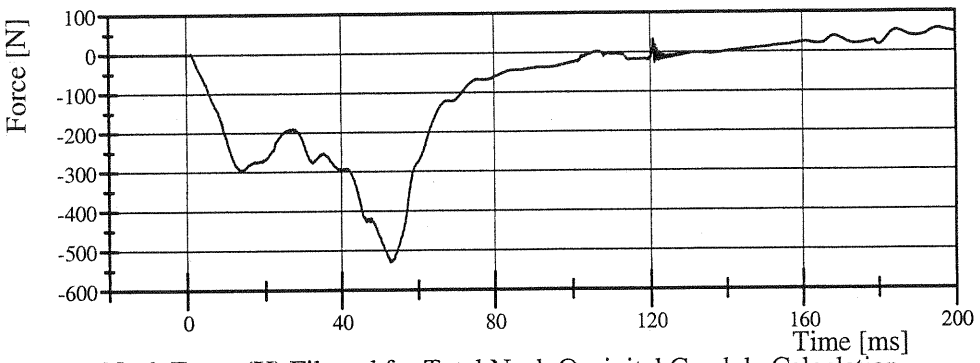
Transportation Research Center Inc.

Neck Flexion

CRABI 12 MO Serial No. 094 Certification No. 11-1

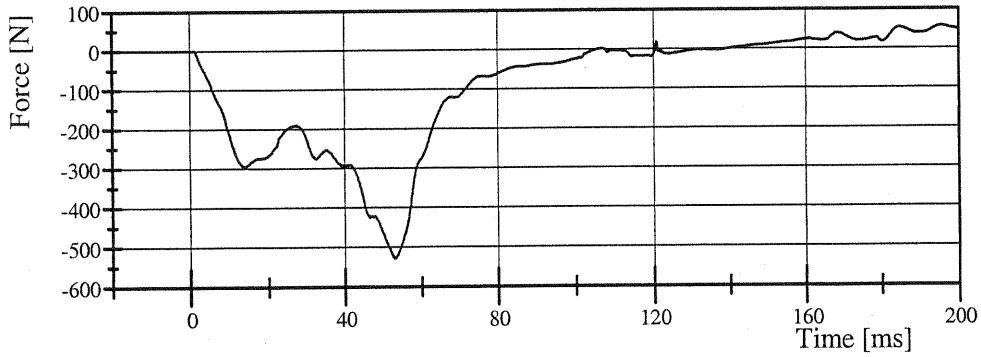
Test Date: 11/12/2007

Neck Force (X)



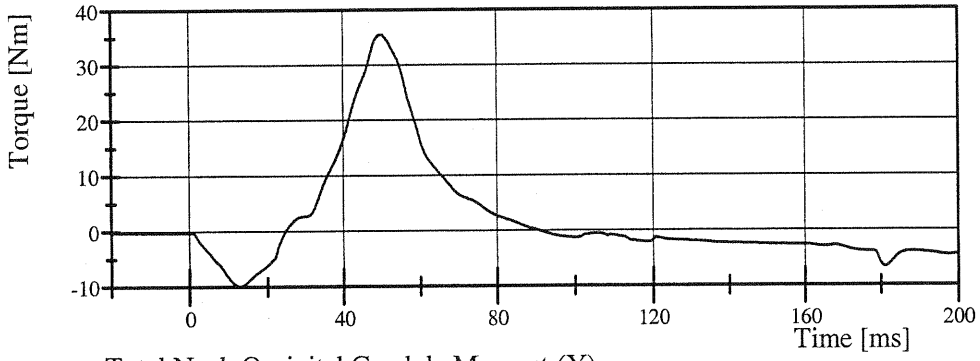
Filter Class: CFC_1000
Max: 57.4 N at 195.4 ms
Min: -528.1 N at 52.7 ms

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



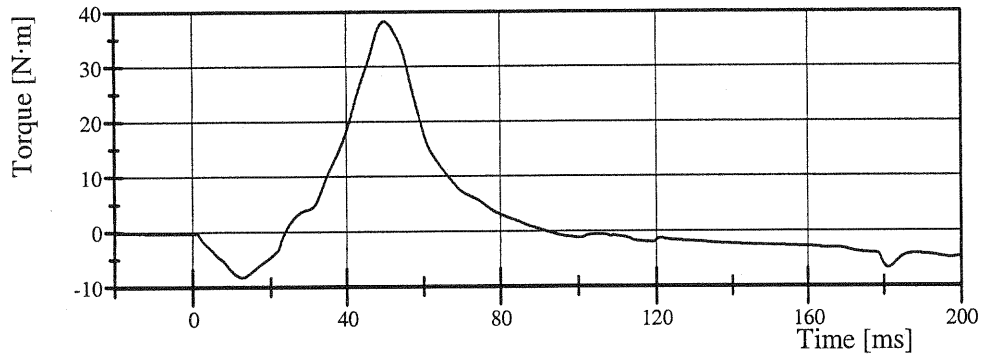
Filter Class: CFC_600
Max: 57.4 N at 195.6 ms
Min: -527.9 N at 52.9 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 35.5 Nm at 50.1 ms
Min: -9.9 Nm at 12.8 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 38.3 N·m at 50.1 ms
Min: -8.2 N·m at 12.5 ms

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

11.12.2007 14:11:08 730

Transportation Research Center Inc.

Neck Extension
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	(-2.4) - (-2.6) m/s	-2.52 m/s	Yes
Pendulum Integrated Velocity Change at 6ms	0.8 - 1.2 m/s	1.00 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 2.1 m/s	1.77 m/s	Yes
Pendulum Integrated Velocity Change at 14ms	2.2 - 2.9 m/s	2.35 m/s	Yes
Total Head D-Plane Rotation	80 - 92 °	88.7 °	Yes
Total Neck Occipital Condyles Moment	(-12) - (-23) N·m	-14.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -5 Nm	76 - 90 ms	83.0 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

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

11.12.2007 14:56:26 1455

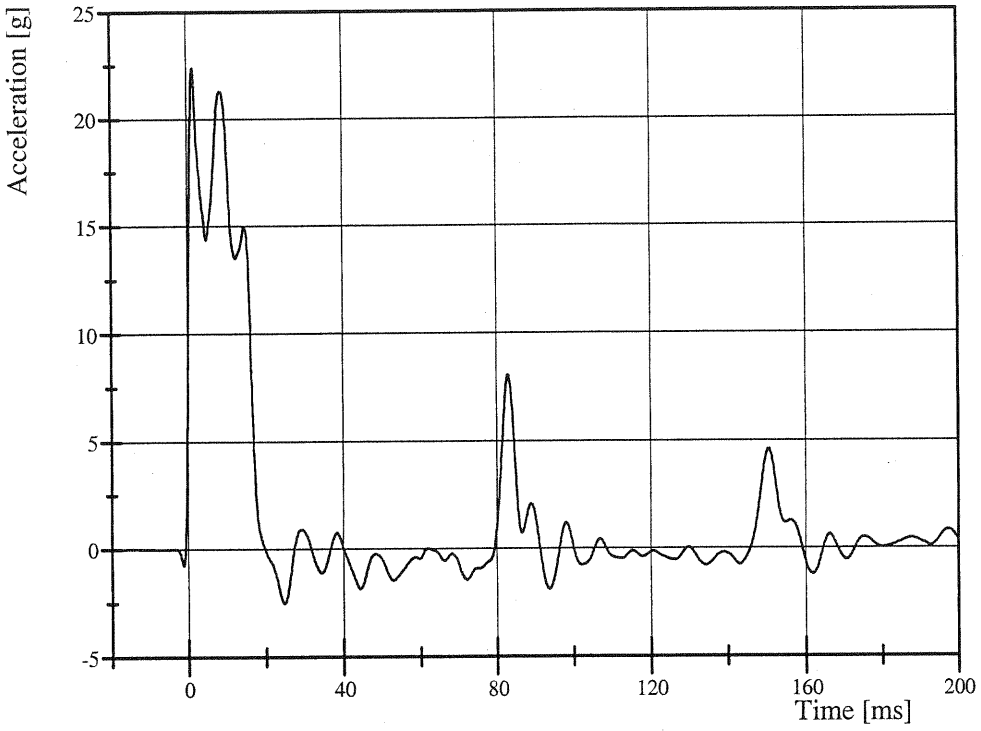
Transportation Research Center Inc.

Neck Extension

CRABI 12 MO Serial No. 094 Certification No. 11-1

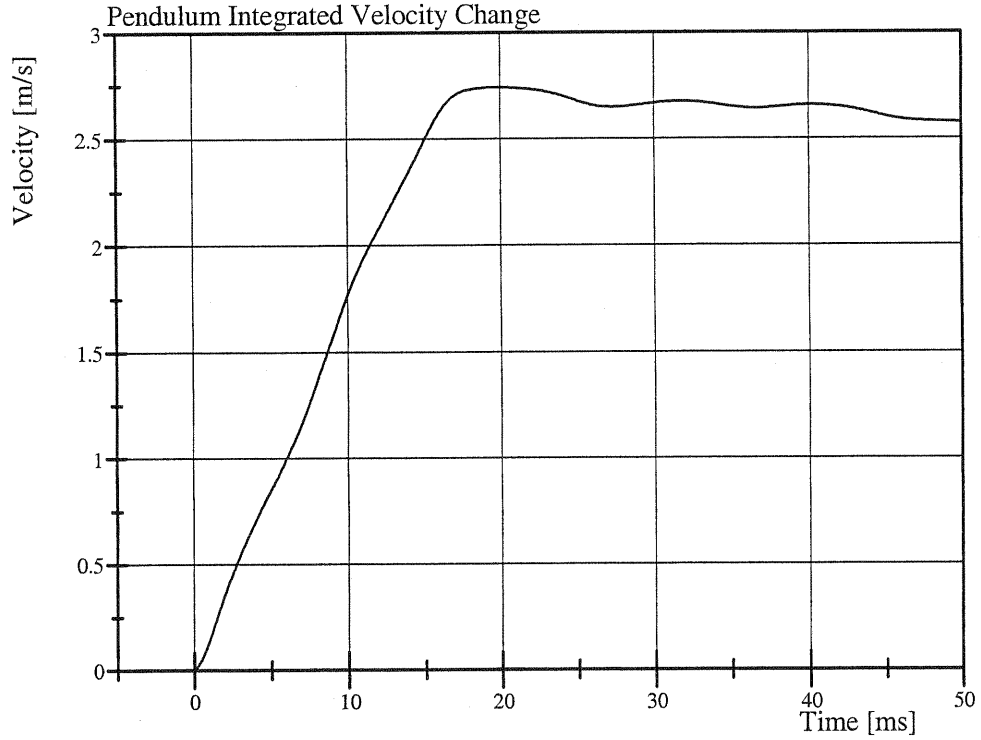
Test Date: 11/12/2007

Pendulum Acceleration



Filter Class: CFC_180
Max: 22.4 g at 1.5 ms
Min: -2.5 g at 24.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 2.7 m/s at 19.8 ms
Min: 0.0 m/s at 0.0 ms

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

11.12.2007 14:56:41 1455

071113

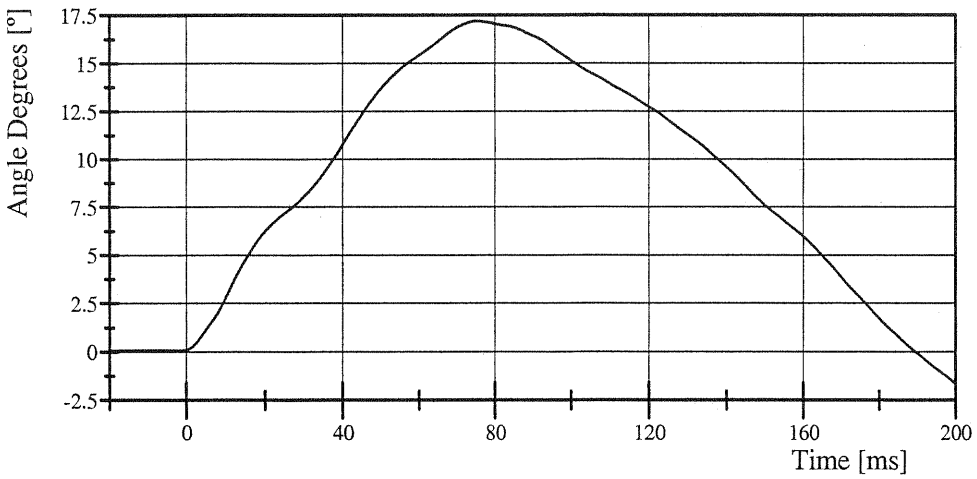
Transportation Research Center Inc.

Neck Extension

CRABI 12 MO Serial No. 094 Certification No. 11-1

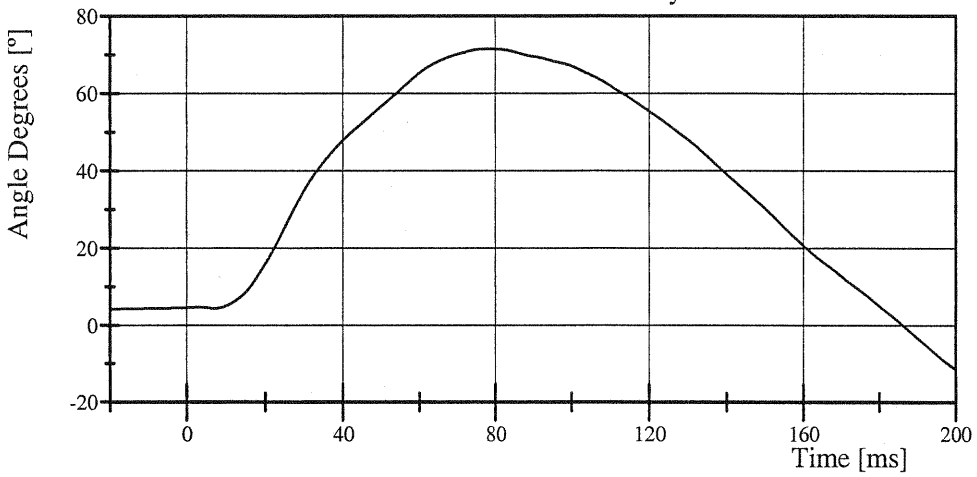
Test Date: 11/12/2007

Forward Pot Rotation at Base of Pendulum



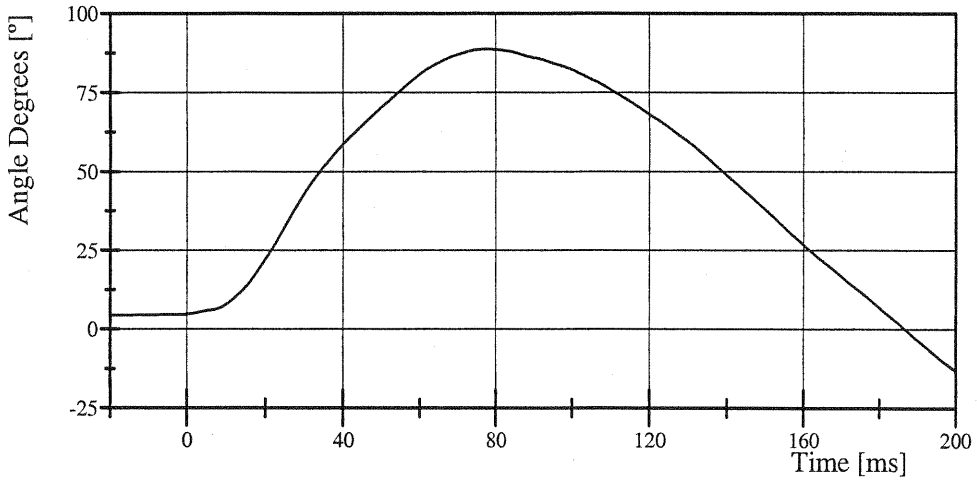
Filter Class: CFC_60
Max: 17.2 ° at 75.4 ms
Min: -1.7 ° at 200.0 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 71.6 ° at 78.9 ms
Min: -11.4 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 88.7 ° at 77.7 ms
Min: -13.1 ° at 200.0 ms

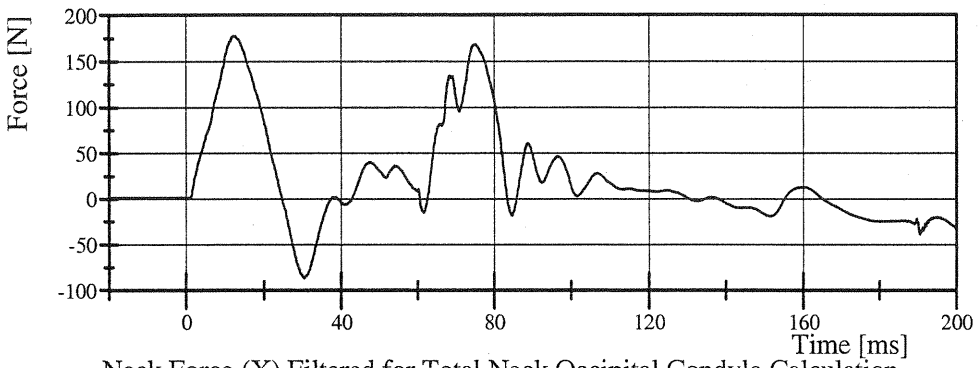
Transportation Research Center Inc.

Neck Extension

CRABI 12 MO Serial No. 094 Certification No. 11-1

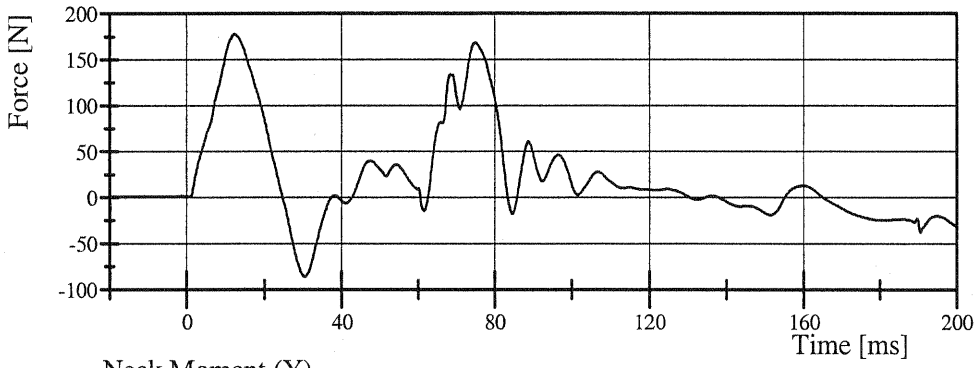
Test Date: 11/12/2007

Neck Force (X)



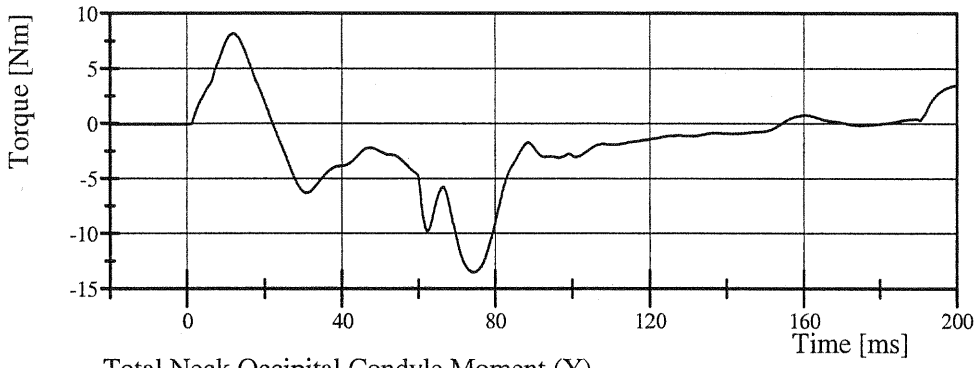
Filter Class: CFC_1000
Max: 177.9 N at 12.3 ms
Min: -86.5 N at 30.4 ms

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



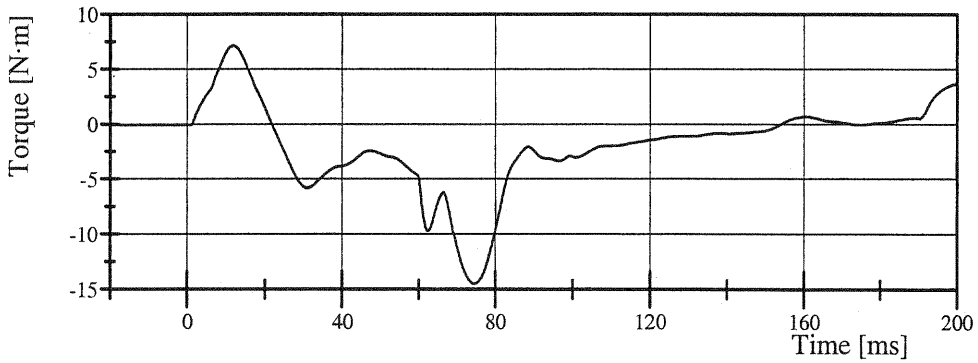
Filter Class: CFC_600
Max: 177.8 N at 12.3 ms
Min: -86.2 N at 30.4 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 8.2 Nm at 11.9 ms
Min: -13.5 Nm at 74.5 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 7.2 N·m at 11.9 ms
Min: -14.5 N·m at 74.6 ms

Transportation Research Center Inc.

Front Thorax
CRABI 12 MO Serial No. 094 Certification No. 11-1
Test Date: 11/12/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impactor Velocity	4.9 - 5.1 m/s	5.07 m/s	Yes
Impactor Force	(-1,514) - (-1,796) N	-1,753.5 N	Yes

Test meets specifications.

Comments:

Technician

Approved

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

11.12.2007 15:20:01 530

071113

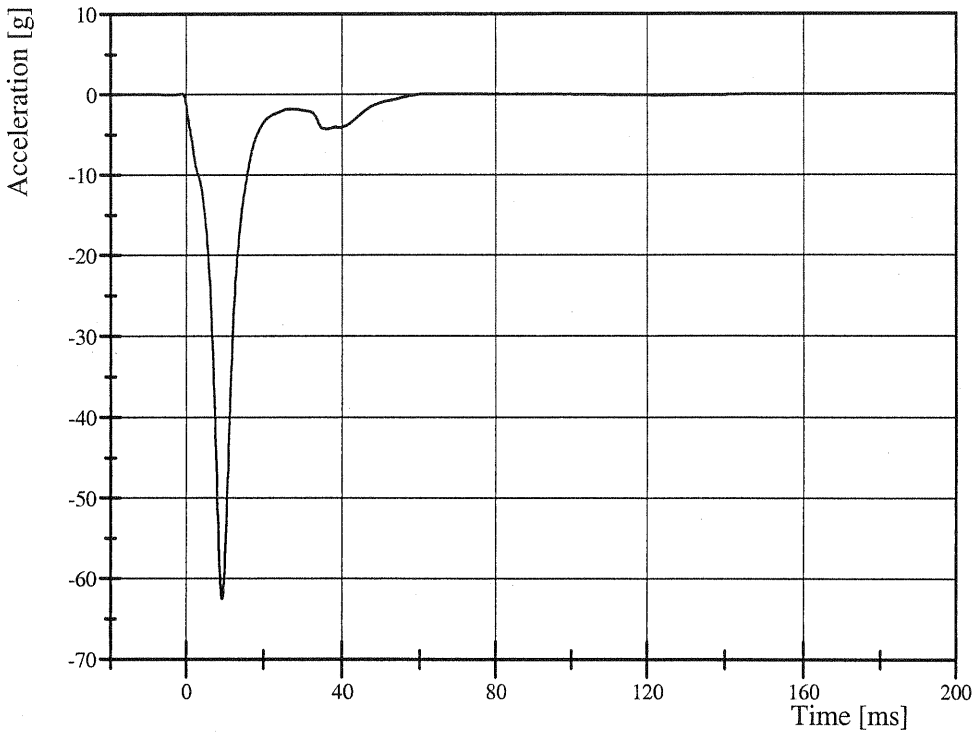
Transportation Research Center Inc.

Front Thorax

CRABI 12 MO Serial No. 094 Certification No. 11-1

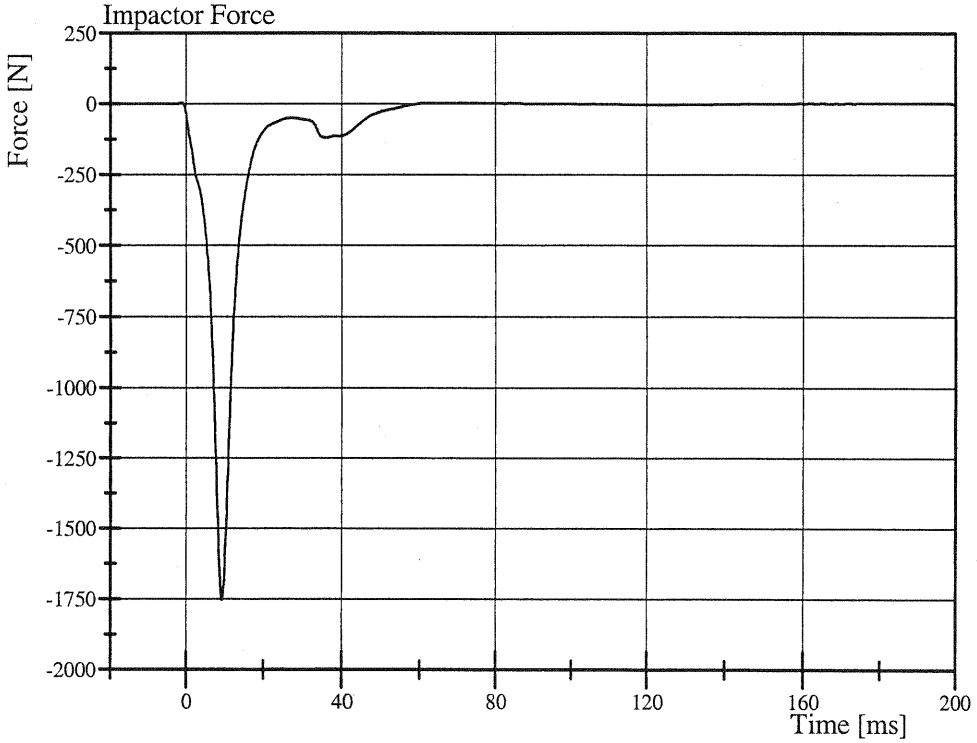
Test Date: 11/12/2007

Impactor Acceleration



Filter Class: CFC_180
Max: 0.1 g at -1.1 ms
Min: -62.5 g at 9.4 ms

Impactor Force



Filter Class: CFC_180
Max: 3.1 N at -1.1 ms
Min: -1,753.5 N at 9.4 ms

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

11.12.2007 15:20:07 530

071113