REPORT NUMBER: NCAP-TRC-2009-001

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
2010 FORD MUSTANG 2-DOOR CONVERTIBLE
NHTSA NUMBER: MA0206

PREPARED BY:
TRANSPORTATION RESEARCH CENTER INC.
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Test Date: May 21, 2009

Report Date: October 27, 2009

FINAL REPORT

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

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Approval Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date:_____

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

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15. Supplemental Notes

16. Abstract

This frontal barrier impact was conducted on a 2010 Ford Mustang at Transportation Research Center Inc. in East Liberty, Ohio, on May 21, 2009. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The impact velocity was 56.3 km/h, and the ambient temperature at the barrier face at the time of impact was 22.3° C. The vehicle's post-test maximum static crush was 615 mm. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:

	Driver ATD		Passenger ATD	
	Threshold	Results	Threshold	Results
Head Injury Criteria (HIC_{36}):	700	468.6 g	700	423* g
Max Chest compression:	63	-30.2 mm	52	-26.3 mm
Neck Injury Predictor (NIJ):				
NTE	1	0.22	1	0.19
NTF	1	0.28	1	0.14
NCE	1	0.14	1	0.14
NCF	1	0.09	1	0.13
Neck Tension:	4170	1254 N	2620	842 N
Neck Compression:	4000	-167 N	2520	-358 N
Left Femur Force	10008	-1455 N	6805	-2070 N
Right Femur Force	10008	-2920 N	6805	-697 N

Primary Head Y channel for passenger was lost; redundant Head Y channel was used for passenger HIC calculation.

17. Key Words	18. Distribution Statement
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SECTION 1
PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-R-00007. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.3 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure for new car assessment program frontal impact testing, dated May 2006.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2010 Ford Mustang at a velocity of 56.3 kph. The test was performed at Transporation Research Center, Inc. on May 21, 2009 at 21:02. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

One (1) real-time camera and sixteen (16) high-speed digital cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Two (2) Part 572E 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head (primary and redundant), chest (primary and redundant), and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, lower leg instrumentation, and right and left foot

and toe accelerometers. Seat belt load cells were also on the driver's and passenger's lap belts to measure dummy pelvic section loading. The driver and passenger seat belts were also instrumented to measure belt spool and elongation. The driver (position 1) ATD (Serial No. 037) and the right front passenger (position 2) ATD (Serial No. 352) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 149 channels of data were recorded with a fully self-contained onboard Kayser Threde Data Acquisition System. Appendix B contains the vehicle, load cell barrier, and dummy response data traces.

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

The maximum static crush of the vehicle was 615 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: airbag, head restraint, and knee bolster. The passenger's visible contact points were as follows: airbag, head restraint, and glove box.

The occupant data is summarized below.

ATD Position	HIC (15)	T_1 (ms)	T_2 (ms)	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)	Belt Stretch (mm/m)
Driver	468.6	55.6	70.6	37.5	-30.2	-1455	-2920	16	< 1
Passenger	423[1]	68.7	83.7	37.1	-26.3	-2070	-697	84	< 1

[1] Primary Head Y channel for passenger was lost; redundant Head Y channel was used for passenger HIC calculation.

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

TEST NOTES

The passenger dummy's primary Head Y-axis acceleration channel collected no valid data during the event. This affected the primary HIC calculation.

The passenger dummy's lap belt load cell collected no valid data during the event.

204 indicant steering column rearward motion could not be determined. The tracking target was obscured by the dummy's hand and the camera views were underexposed.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

TEST VEHICLE INFORMATION AND OPTIONS

Make	Ford	Driver Front Airbag	Yes
Model Year	2010	Driver Side Airbag	Yes
Model	Mustang	Driver Head Airbag	No
Body Style	2-door convertible	Driver Curtain Airbag	No
NHTSA No.	MA0206	Driver Knee Airbag	No
VIN	1ZVBP8EN1A5105025	Pass. Front Airbag	Yes
Color	Blue	Pass. Side Airbag	Yes
Delivery Date	5/11/2009	Pass. Head Airbag	No
Odometer Reading	146.7 miles	Pass. Curtain Airbag	No
Dealer	Brondes Ford Inc.	Pass. Knee Airbag	No
Transmission	Automatic	Load Limiters	Yes
Final Drive	Rear wheel drive	Anti-lock Brakes	Yes
Type /No. of Cylinders	V6	All-Wheel Drive	No
Engine Displacement	4.0L	Pretensioners	Yes
Engine Placement	Longitudinal	Air Conditioning	Yes
Roof Rack	No	Tilt Wheel	Yes
Sunroof / T-Top	No	Power Seats	No
Tinted Glass	Yes	Power Windows	Yes
Traction Control	No	Power Steering	Yes
Power Brakes	Yes	AM/FM CD	Yes
Front Disc	Yes	Automatic Door Locks	Yes
Rear Disc	Yes	Other	
Does owner's manual provide instructions to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2400
Date of Manufacture	4/09	GAWR Front (kg)	1007
		GAWR Rear (kg)	1089

TEST VEHICLE SEAT TYPE AND CAPACITY

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

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

TEST VEHICLE AXLE WEIGHTS

		As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
	Units	Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	432.0	390.2		460.5	437.5		469.2	453.8	
Right	kg	420.4	383.2		458.0	446.0		455.2	446.8	
Ratio	%	52.4	47.6		51.0	49.0		50.7	49.3	
Totals	kg	852.4	773.4	1625.8	918.5	883.5	1802.0	924.4	900.6	1825.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
(A) Total Delivered Weight (UVW)	kg	1625.8
(B) Weight of 2 572E ATDs	kg	152.0
(C) Rated Cargo/Luggage Weight (RCLW)	kg	29.0
(A+B+C) Vehicle Target Weight (TVTW)	kg	1806.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	727	723	744	743	1294
As Tested	mm	714	707	726	718	1334
Fully Loaded	mm	715	712	720	720	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	2720
Total Vehicle Length at Left Side	mm	4945
Total Vehicle Length at Centerline	mm	5190
Total Vehicle Length at Right Side	mm	4955
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	Not Recorded
*Amount of Stoddard Solvent in Fuel Tank	liters	56.4

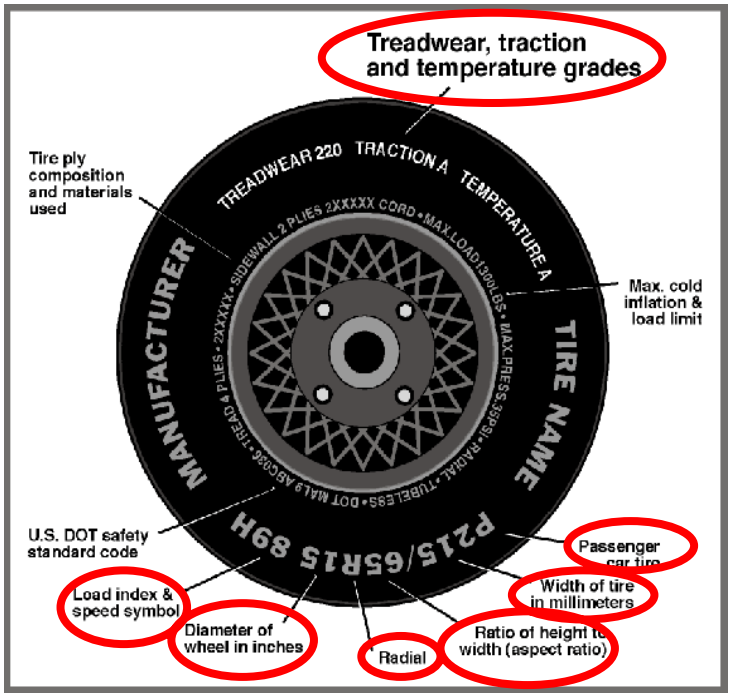
*The fuel system is discussed in detail in this report on Data Sheet 4.

Vehicle parts removed to make Target Vehicle Test Weight: Rear bumper fascia, side mirrors, rear deck lid, muffler, rear seatbelts, convertible top motor, and rear window glass

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	220	220
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P215/60R17	P215/60R17
Tire Size on Vehicle	P215/60R17	P215/60R17
Tire Manufacturer	BF Goodrich	BF Goodrich
Tire Model	Traction T/A	Traction T/A
Load Index & Speed Symbol	95T	95T
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	B	B
Tire Plies Sidewall	1 polyester	1 polyester
Tire Plies Tread	1 Polyester, 2 steel, 1 nylon	1 Polyester, 2 steel, 1 nylon
Tire Material	Steel, nylon, and polyester	Steel, nylon, and polyester
DOT Safety Code Right	APNV H111	APNV H111
DOT Safety Code Left	APNV H111	APNV H111

DATA SHEET NO. 2

SEAT ADJUSTMENT, SEAT BELTS, FUEL SYSTEMS, AND STEERING WHEEL

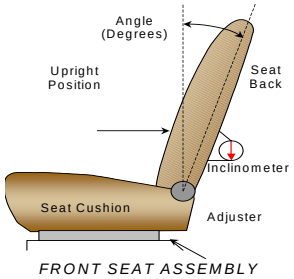
Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

SEAT BACK ANGLE POSITION

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

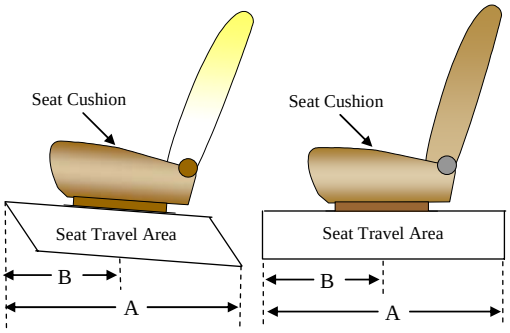
SEAT BACK ANGLE

	Degrees	Detent
Driver Seat	12.9°	N/A
Front Passenger Seat	12.0°	N/A
Left Rear Seat	Fixed	N/A
Right Rear Seat	Fixed	N/A



SEAT FORE/AFT POSITIONS

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



SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel (mm)	Placed in Detent # or Position (mm)
Driver Seat with Seated Dummy	260	130
Front Passenger Seat	230	115

SEAT BELT UPPER ANCHORAGE

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

DATA SHEET NO. 2 (CONTINUED)

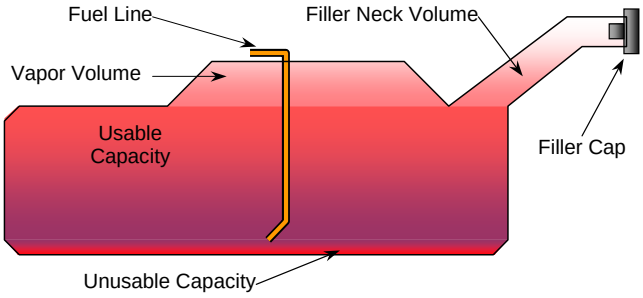
SEAT ADJUSTMENT, SEAT BELTS, FUEL SYSTEMS, AND STEERING WHEEL

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

FUEL TANK CAPACITY

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

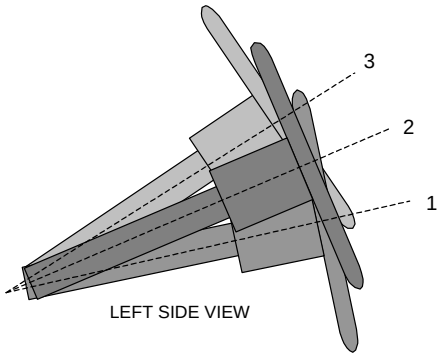
The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running.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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

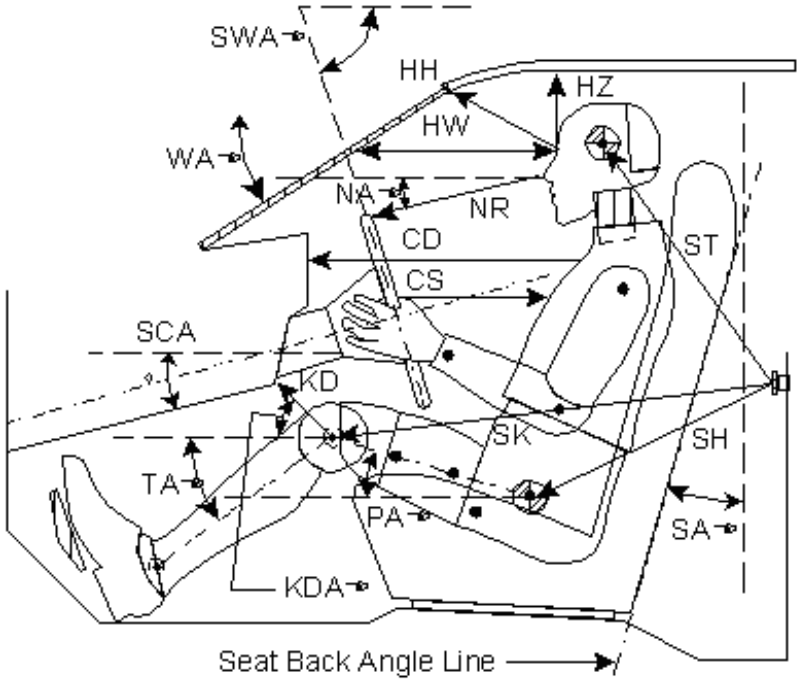
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	10.8°	N/A
Geometric Center, Position No. 2	21.7°	N/A
Uppermost, Position No. 3	32.5°	N/A
Telescoping Steering Wheel Travel	No Feature	N/A
Test Position	21.7°	N/A

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

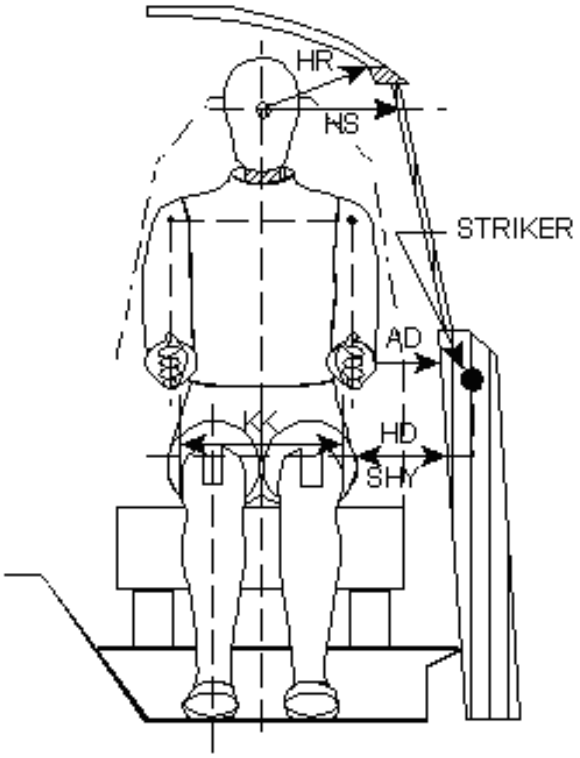


Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		61.2		
SWA°	Steering Wheel Angle		21.7		
SCA°	Steering Column Angle		68.3		
SA°	Seat Back Angle (on headrest post)		12.9		12
HZ	Head to Roof (Z)	230		209	
HH	Head to Header	325		351	
HW	Head to Windshield	580		570	
HR	Head to Side Header (Y)	261		240	
NR	Nose to Rim	360	10		
CD	Chest to Dash	530		540	
KDL	Left Knee to Dash	130	26.1	135	
KDR	Right Knee to Dash	100		143	29.3
PA°	Pelvic Angle		23.8		23.1
TA°	Tibia Angle		43.5		39.2
SK	Striker to Knee	885	9.2	890	5.6
ST	Striker to Head	532	-49.7	545	-47.1
SH	Striker to H-Point	540	24.5	535	24.9

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

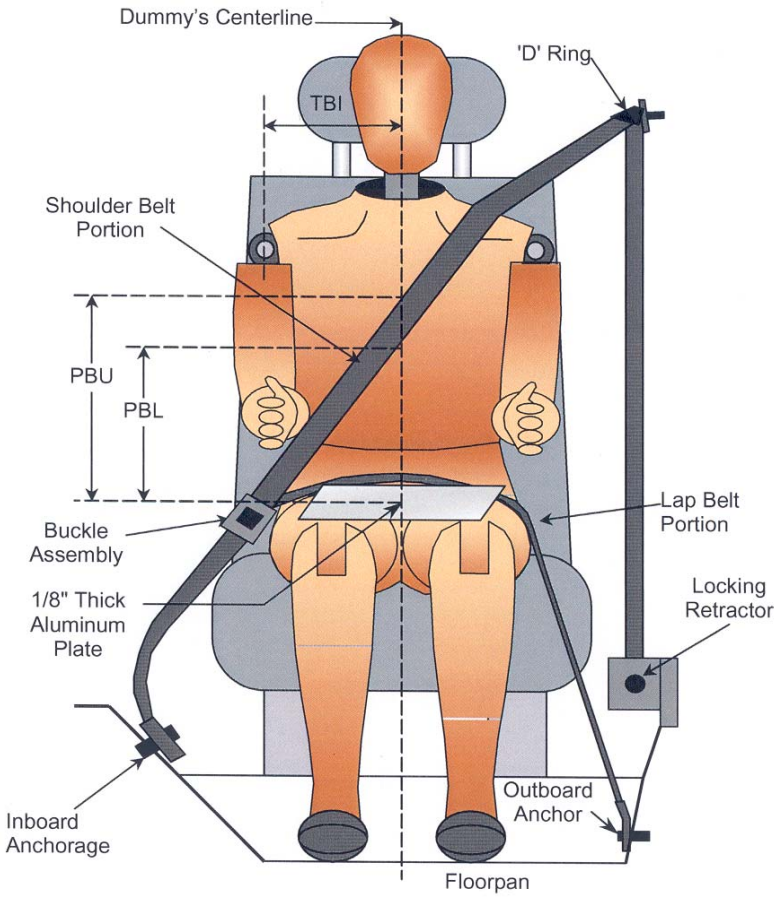


Code	Description	Driver	Passenger
AD	Arm to Door	120	30
HD	H-Point to Door	140	130
HR	Head to Side Header	261	240
HS	Head to Side Window	295	278
KK	Knee to Knee	325	270
SHY	Striker to H-Point (Y Direction)	120	223

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



Measurement Parameter	Units	Driver S/N 352	Passenger S/N 037
PBU - Top surface of aluminum plate to belt upper edge	mm	330	320
PBL - Top surface of aluminum plate to belt lower edge	mm	270	250

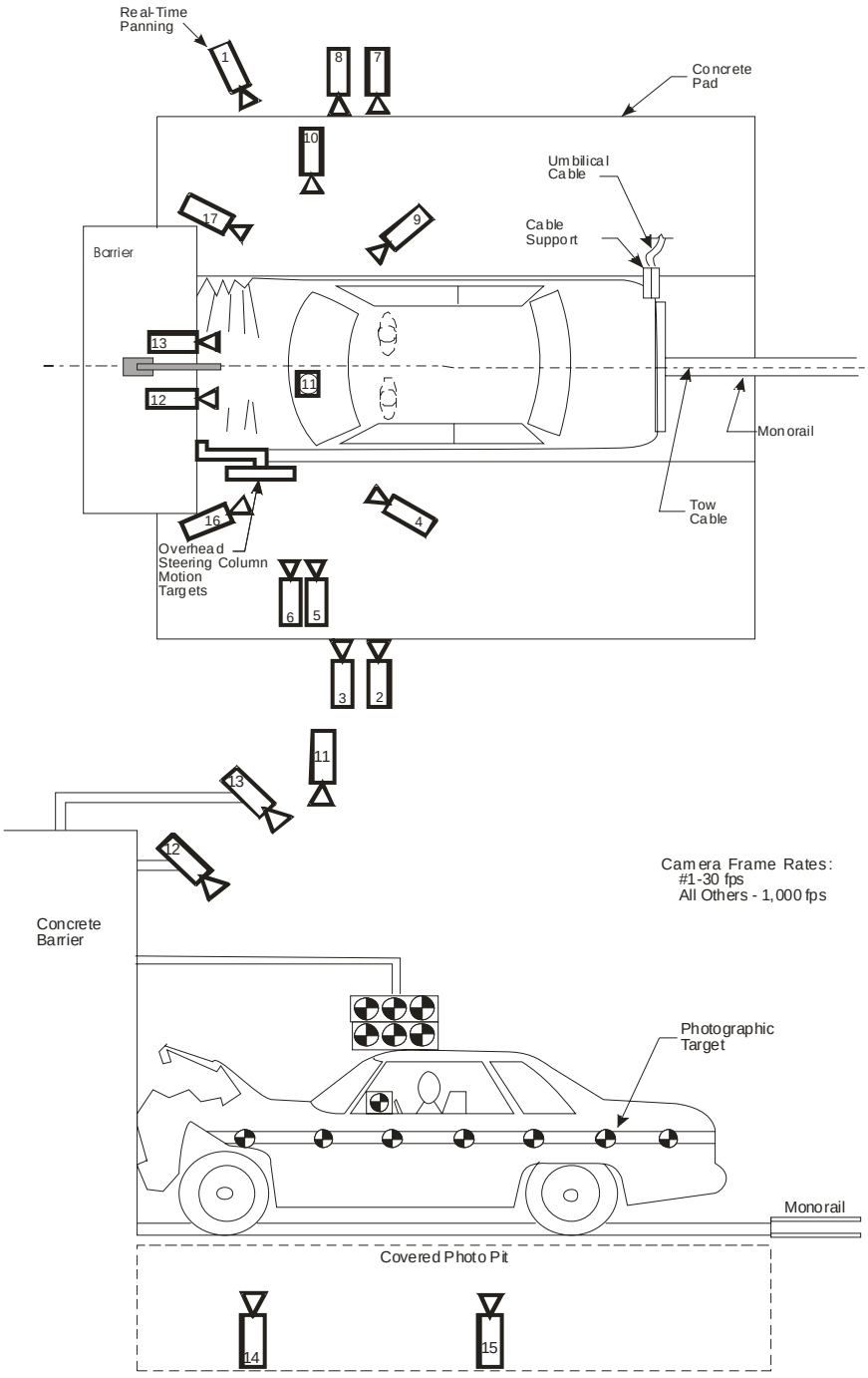
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	1020	1048
Lap Belt Length as measured on ATD	mm	895	835
Remainder of belt on reel	mm	818	850
Total belt length for continuous webbing systems	mm	2733	2733

DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



DATA SHEET NO. 6 (CONTINUED)

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

VEHICLE CAMERA MEASUREMENT TABLE

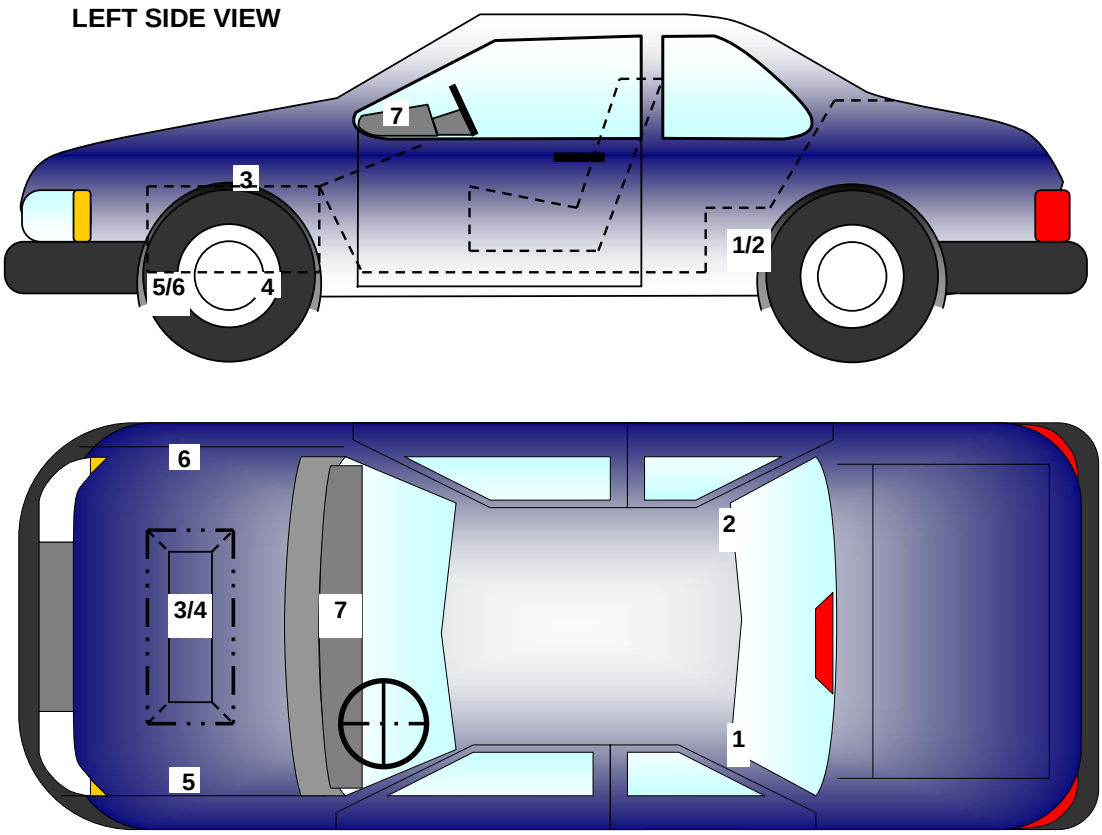
No.	Camera View	Location (mm)			Angle (deg)	Film Plane to Head	Lens (mm)	Speed (fsp)
		X	Y	Z				
1	Real-time (Panning)						Zoom	30
2	Left Overall	2150	-4250	1160	-4.2	3800	12.5	1000
3	Left Side Dummy Kinematics	1370	-4690	960	-4.1	4250	25	1000
4	Left Oblique Dummy Kinematics	4000	-2650	1680	-19.3	2690	25	1000
5	Left Side tight 204i high	1750	-4410	2170	-14.9	4000	50	1000
6	Left Side Tight 204i low	1750	-4480	1470	-5.4	4050	50	1000
7	Right Overall	2020	5700	880	-5.1	5500	12.5	1000
8	Right Side Dummy Kinematics	1080	5210	950	-1.6	5050	25	1000
9	Right Oblique Dummy Kinematics	3740	2660	1680	-18	2900	25	1000
10	Right Side Mid Dummy Kinematics	1650	5570	990	-2.4	5450	25	1000
11	Overhead windshield area during event	300	0	5650	-83.5	n/a	16	1000
12	Barrier Driver through windshield	0	-420	2530	-44	n/a	25	1000
13	Barrier Passenger through windshield	0	420	2530	-44	n/a	25	1000
14	Pit Front Vehicle Crush	670	0	280	90	n/a	25	1000
15	Pit Fuel Tank	2100	0	460	90	n/a	12.5	1000
16	Driver Retractor Medium Tight Off board	0	2650	1280	-6.6	3360	25	1000
17	Passenger Retractor Medium Tight Off board	0	2560	1180	-8.4	3150	25	1000

Reference Points: X – Barrier Impact Surface
Y – Monorail Center
Z – Ground Plane

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Seat Cross member X	2255	-410	-425
2	Right Rear Seat Cross member X	2255	415	-414
3	Top of Engine Block X	4840	0	-946
4	Engine Bottom X	4090	30	-187
5	Right Front Brake Caliper X	4115	690	-279
6	Left Front Brake Caliper X	4115	-690	-278
7	Center of Instrument Panel Top X	3345	0	-989

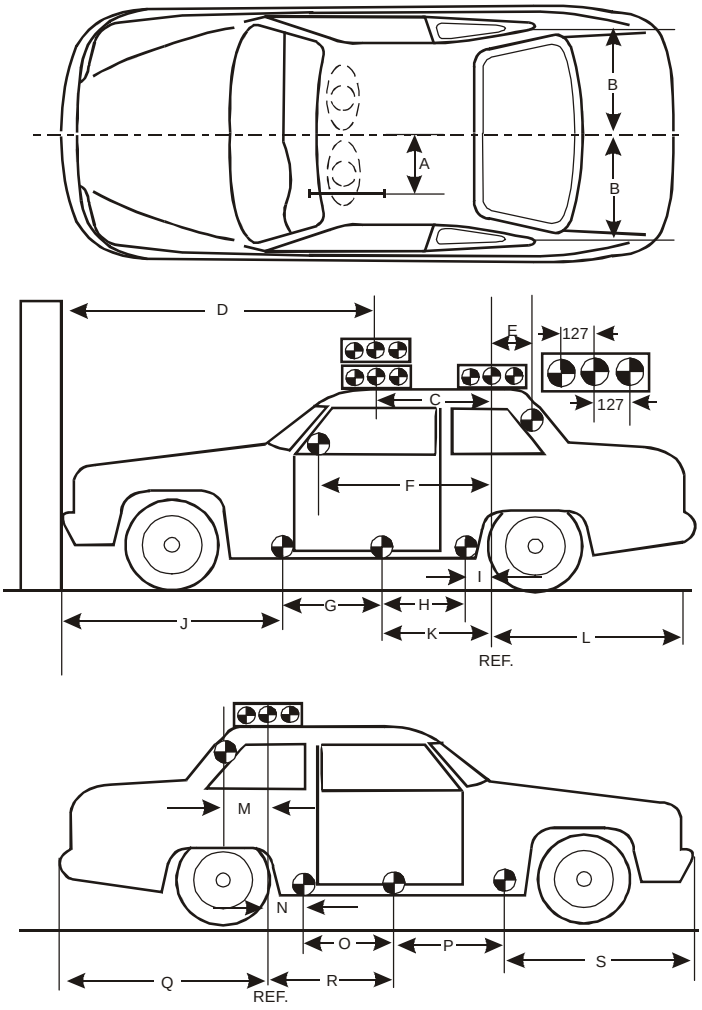
Reference Points: X - Test Vehicle Rear Bumper (+ forward)
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8

VEHICLE REFERENCE PHOTO TARGET LOCATIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

All Units in (mm)	
Item	Value
A	362
B	670
C	588
D	2344
E	1940
F	3235
G	885
H	912
I	1982
J	4945
K	2890
L	2180
M	1940
N	1982
O	912
P	890
Q	2180
R	2890
S	4955



DATA SHEET NO. 9

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0206
Test Program:	NCAP Frontal Impact	Test Date:	05/21/09

DATA CHANNELS

Driver Dummy Accelerometers	50
Passenger Dummy Accelerometers	50
Belt Assessment Sensors	6
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	36
Total	151

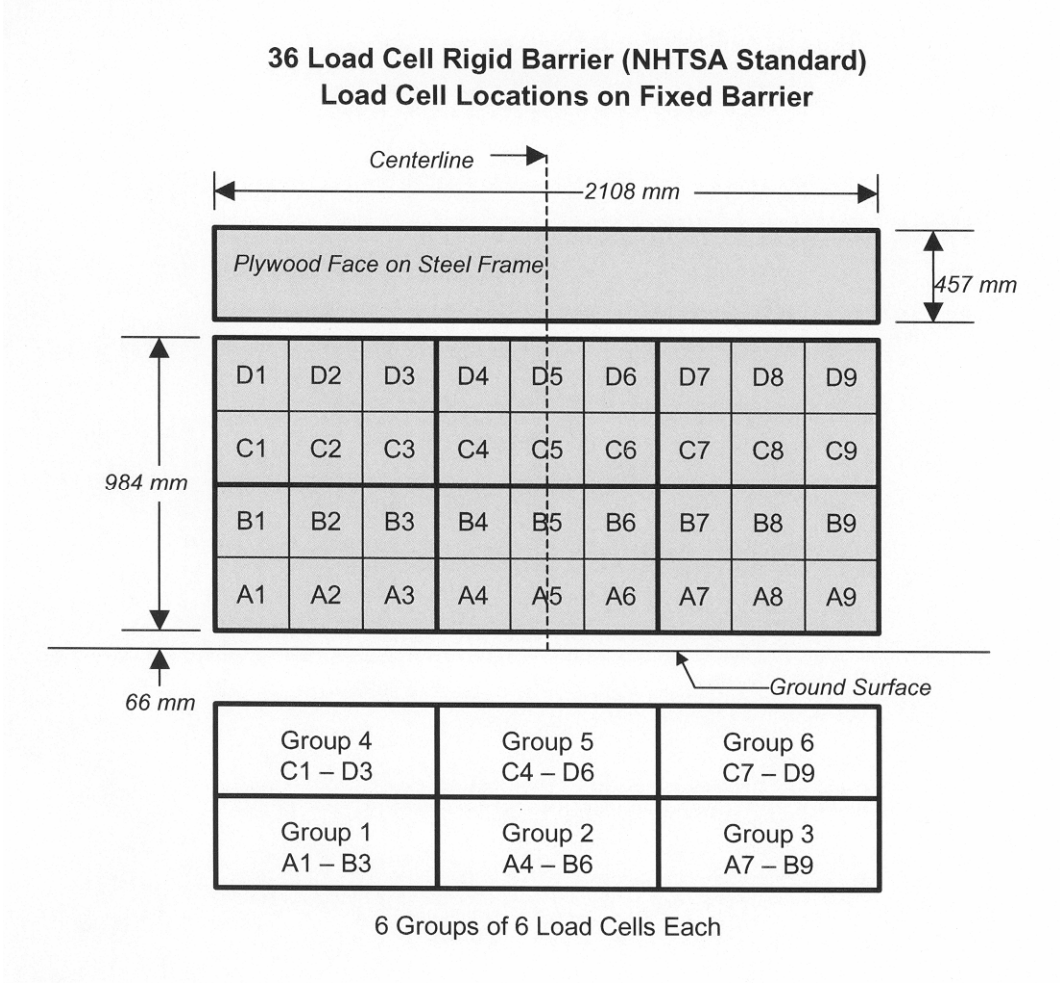
CAMERA COVERAGE

Cameras	
High-Speed Vehicle Onboard	0
High-Speed Offboard	16
Real-Time	1
Total	17

DATA SHEET NO. 10

FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0206
Test Program:	NCAP Frontal Impact	Test Date:	05/21/09



The following data is presented in Appendix B:

(1) Data from 36 individual load cells
(2) Total or Sum of 36 individual load cells
(3) Data from 6 Groupings shown above (6 cells/group)

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

SPEED TRAP DATA

Measured Parameter	Units	Requirements	Value
Trap No. 1 Velocity (Primary)	km/h	55.5 to 57.1	56.3
Trap No. 2 Velocity (Redundant)	km/h	55.5 to 57.1	56.3

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/Serial No.	50% Male Hybrid III No. 037	50% Male Hybrid III No. 352
Head Contact	Airbag & headrest	Airbag & headrest
Upper Torso Contact	None	None
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove box
Right Knee Contact	Knee Bolster	Glove box

DOORING OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Closed and Latched	Closed and Latched
Rear Door Opening	Closed and Latched	Closed and Latched
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None
Glazing Damage	Left Lower Damage	None

POST TEST STRUCTURAL OBSERBATIONS

Critical Areas of Performance	**Observations and Conclusions**
Windshield Damage	Left Lower Glazing Damage
Window Damage	None
Other Notable Effects	None

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4945	4540	405
Center	mm	5190	4575	615
Right Side	mm	4955	4550	405

DATA SHEET NO. 11 (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	---[1]
Center	mm	---[1]
Right Side	mm	---[1]
Average	mm	---[1]

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

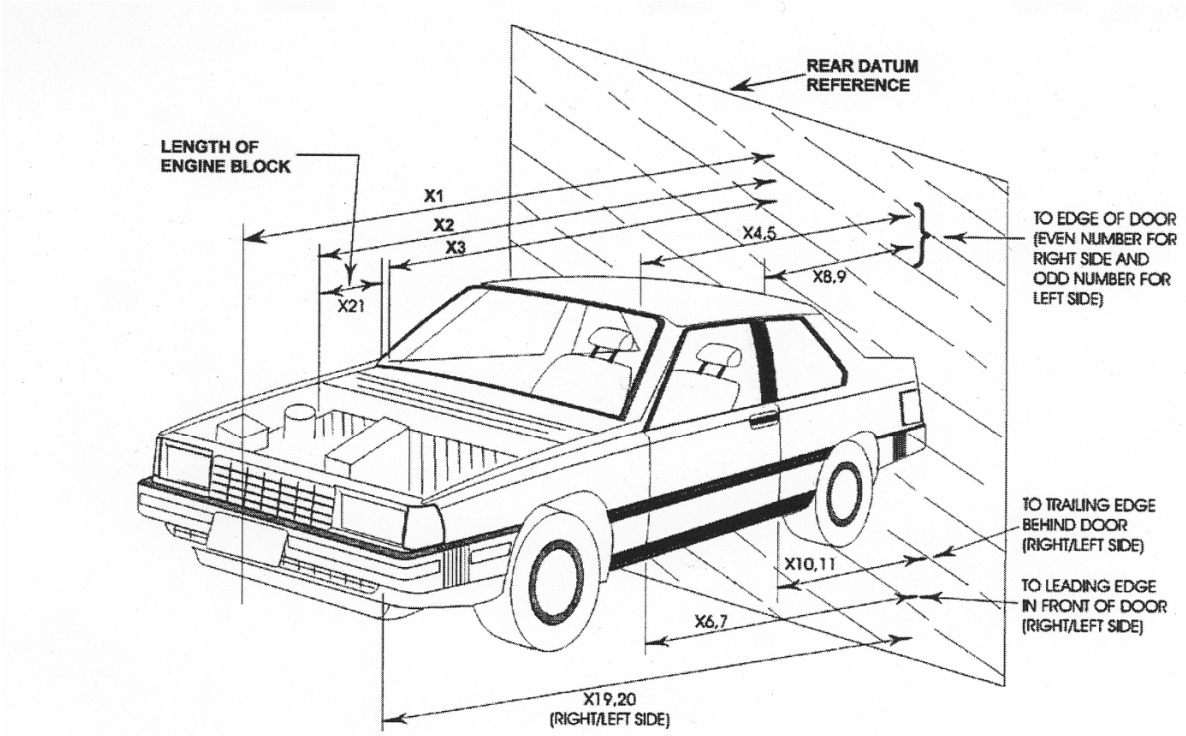
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Operated	Installed	Operated
Frontal Airbag	Yes	Yes	Yes	Yes
Knee Airbag	No	N/A	No	N/A
Side Torso Airbag	Yes	No	Yes	No
Head/Torso Side Airbag	No	N/A	No	N/A
Curtain Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Unknown	Yes	Unknown
Seat Belt Load Limiter	Yes	Unknown	Yes	Unknown

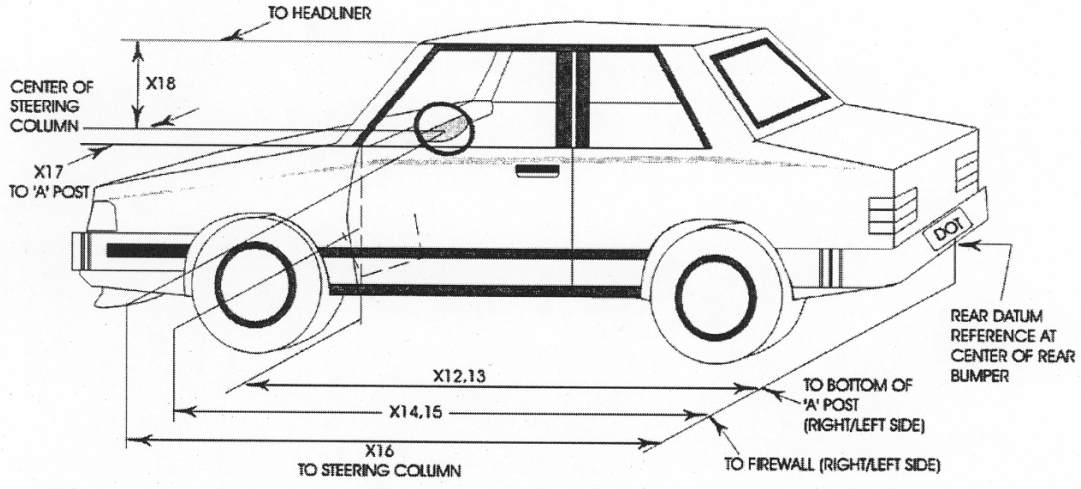
[1]Measurement not recorded.

DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0206
Test Program:	NCAP Frontal Impact	Test Date:	05/21/09





DATA SHEET NO. 12 (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Pre-Test	Post-Test	Difference
X1	Total length of vehicle at centerline	5190	4575	615
X2	RSOV to front of engine block	4280	4100	180
X3	RSOV to firewall	2890	3725	-835
X4	RSOV to upper leading edge of right door	4450	3443	1007
X5	RSOV to upper leading edge of left door	3430	3430	0
X6	RSOV to lower leading edge of right door	3435	4114	-679
X7	RSOV to lower leading edge of left door	3430	3425	5
X8	RSOV to upper trailing edge of right door	2200	2195	5
X9	RSOV to upper trailing edge of left door	2190	2188	2
X10	RSOV to lower trailing edge of right door	2320	2296	24
X11	RSOV to lower trailing edge of left door	2310	2300	10
X12	RSOV to bottom a “A” post on right side	3440	3410	30
X13	RSOV to bottom a “A” post on left side	3410	3405	5
X14	RSOV to firewall on right side	3790	3765	25
X15	RSOV to firewall on left side	3775	3760	15
X16	RSOV to steering wheel center	3060	3040	20
X17	Center of steering column to “A” post	310	340	-30
X18	Center of steering column to headliner	400	390	10
X19	RSOV to right side of front bumper	4955	4550	405
X20	RSOV to left side of front bumper	4945	4540	405
X21	Length of engine block	500	500	0
RD	RSOV to right side of dash panel	3235	3210	25
CD	RSOV to center of dash panel	3255	3255	0
LD	RSOV to left side of dash panel	3210	3215	-5

All measurements are in millimeters.

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

FOR 56.3 KPH FRONTAL BARRIER IMPACT

VIN: 1ZVBP8EN1A5105025 Build Date: 4/09

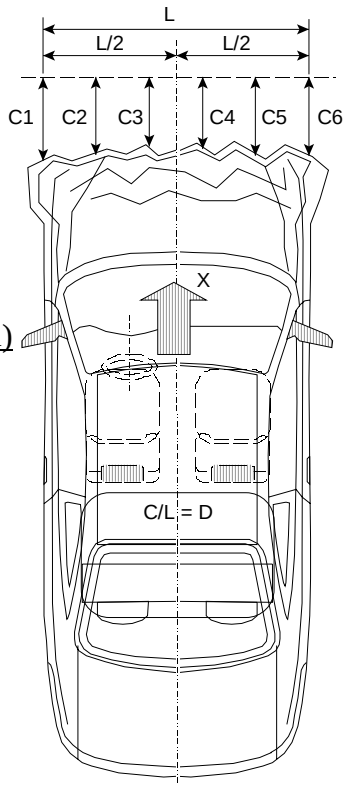
Vehicle Size Category: Passenger Car Test Weight: 1802.0 kg

Vehicle Wheelbase: 2720 mm Front Overhang: 930 mm Overall Width: 1524 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions with Bumper

	PRE-TEST	POST-TEST	DIFFERENCE	
C1 =	4945	4540	405	**mm**
C2 =	5095	4565	530	**mm**
C3 =	5165	4580	585	**mm**
C4 =	5165	4580	585	**mm**
C5 =	5095	4552	543	**mm**
C6 =	4955	4550	405	**mm**



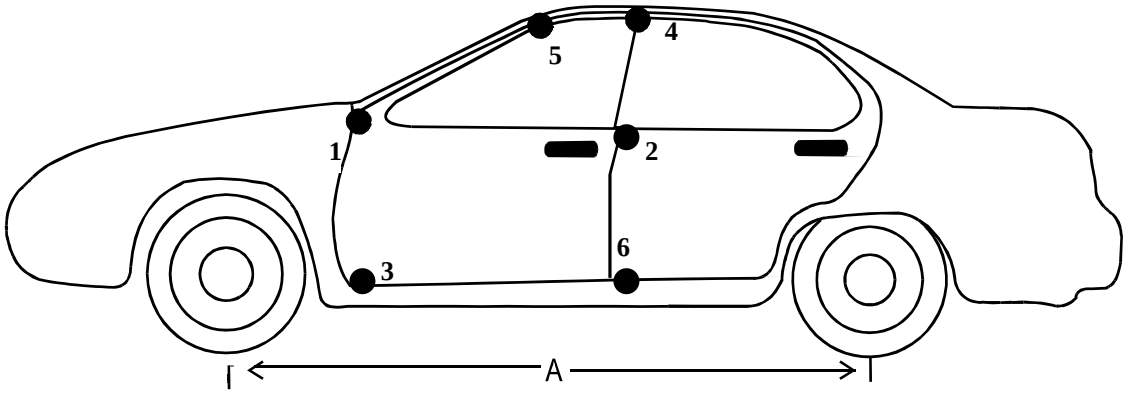
Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region **L1=** 1524 **mm**
L2= 762 **mm**
L3= 762 **mm**

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



Door Opening Width

Driver Side

Point Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3000.8	-763.1	-4.2	2981.4	-758.0	-38.9	19.4	-5.1	34.7
2	1812.7	-813.9	12.5	1806.1	-815.6	12.6	6.6	1.7	-0.1
3	2912.0	-772.9	380.4	2908.1	-757.8	349.7	3.9	-15.1	30.7
4	1762.9	-805.1	-268.7	1761.3	-801.6	-264.3	1.5	-3.5	-4.4
5	2008.8	-779.6	342.1	2005.0	-782.3	339.6	3.8	2.7	2.5
6	2477.9	-656.6	-558.7	2442.6	-652.1	-580.5	35.3	-4.5	21.8

Passenger Side

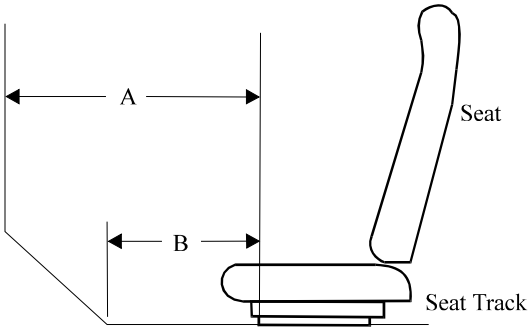
Point Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3000.5	780.4	4.6	2989.1	773.4	-14.1	11.5	6.9	18.8
2	1813.3	827.2	11.7	1810.5	827.8	11.4	2.8	-0.7	0.3
3	2912.8	783.6	380.9	2910.6	771.4	365.2	2.2	12.2	15.8
4	1764.7	823.3	-263.7	1763.9	812.9	-253.7	0.8	10.4	-10.1
5	1984.4	803.8	329.2	1982.6	805.9	328.1	1.8	-2.1	1.1
6	2478.4	673.1	-561.3	2455.7	678.0	-573.1	22.7	-4.9	11.9

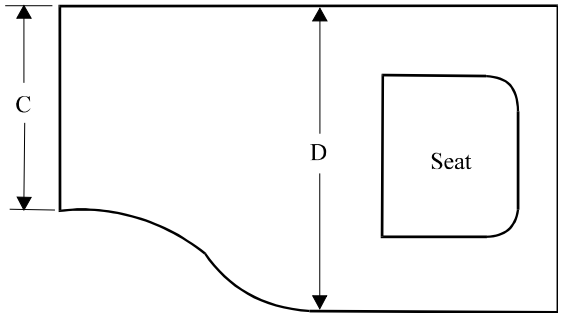
Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	2720 mm	2720 mm
Post-Test	2640 mm	2640 mm
Difference	80 mm	80 mm

DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09





Driver's Side Static Footwell Deformation

Measurement	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
A	626	605	-21
B	528	524	-4
C	383	326	-57
D	422	417	-5

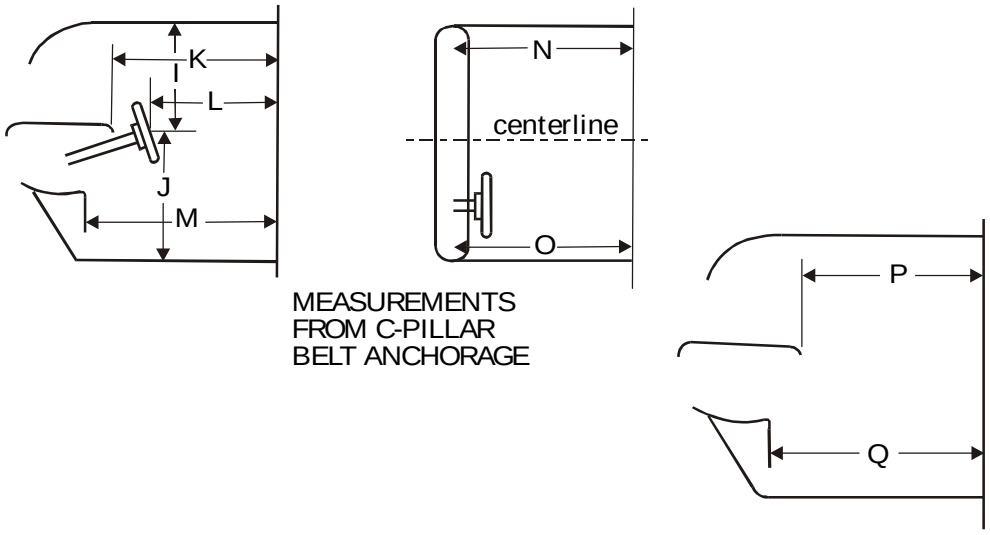
Passenger's Side Static Footwell Deformation

Measurement	Pre-Test (mm)	Post-Test (mm)	Difference (mm)
A	584	539	-45
B	484	461	-23
C	-380	-343	37
D	-403	-400	3

DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



STATIC PASSENGER COMPARTMENT INTRUSION

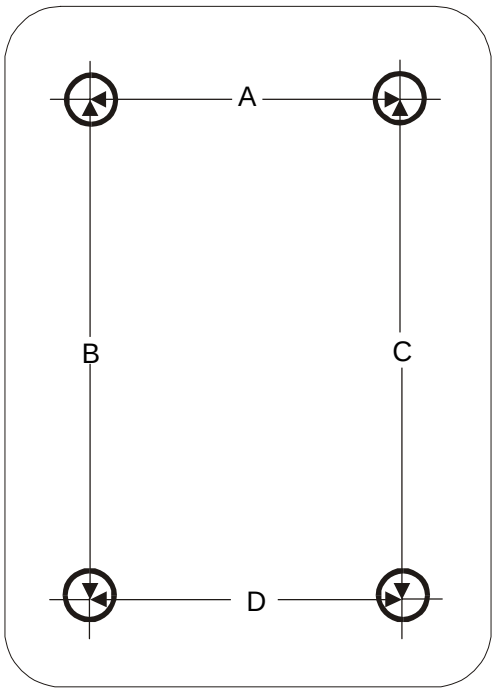
Measurement	Pre-Test	Post-Test	Difference
I	395	390	5
J	583	630	-47
K	1705	1693	12
L	1475	1470	5
M	1790	1780	10
N	1685	1675	10
O	1673	1665	8
P = K (Pass.)	1715	1710	5
Q = M (Pass.)	1785	1780	5

DATA SHEET NO. 14 (CONTINUED)

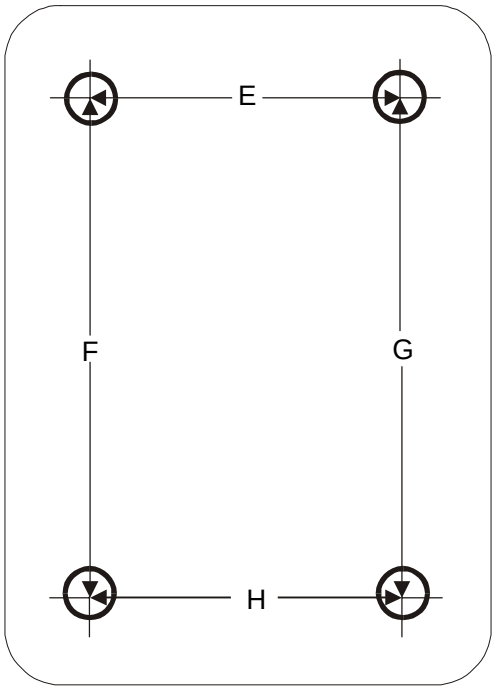
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09

DRIVERS SIDE



PASSENGERS SIDE



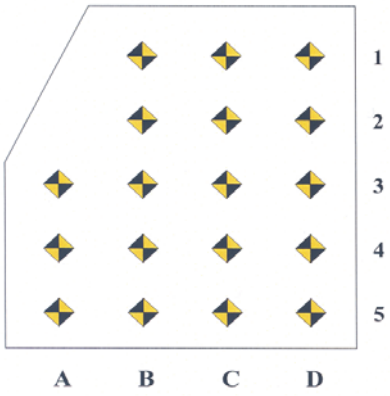
FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	403	355	-48
B	528	524	-4
C	501	490	-11
D	422	417	-5
E	395	368	-27
F	484	461	-23
G	508	505	-3
H	403	400	-3

DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



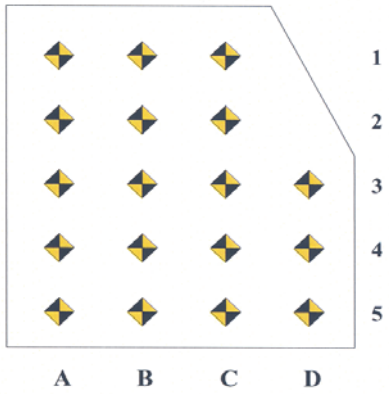
Driver's Side Toeboard Measurements in Millimeters

Intrusion Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3250	-618	402	3227	-590	364	-23	28	-38
B1	3259	-484	397	3176	-497	355	-83	-13	-42
C1	3254	-369	401	3144	-386	358	-110	-17	-43
D1	3253	-235	401	3169	-264	353	-84	-29	-48
A2	3206	-623	434	3192	-588	400	-14	35	-34
B2	3212	-485	430	3149	-498	409	-63	-13	-21
C2	3199	-365	440	3129	-383	423	-70	-18	-17
D2	3205	-231	436	3176	-266	406	-29	-35	-30
A3	3152	-626	469	3146	-599	441	-6	27	-28
B3	3150	-491	469	3109	-499	452	-41	-8	-17
C3	3139	-358	471	3123	-373	487	-16	-15	16
D3	3139	-223	466	3123	-244	453	-16	-21	-13
A4	2895	-623	482	2892	-606	461	-3	17	-21
B4	2893	-472	480	2889	-471	534	-4	1	54
C4	2892	-322	480	2888	-327	518	-4	-5	38
D4	2894	-214	467	2888	-223	483	-6	-9	16
A5	2624	-629	494	2622	-622	479	-2	7	-15
B5	2627	-472	493	2623	-471	527	-4	1	34
C5	2632	-347	494	2627	-349	524	-5	-2	30
D5	2638	-207	455	2633	-205	486	-5	2	31
BP	3151	-372	252	3081	-411	201	-70	-39	-51
LB	2785	-535	-13	2767	-532	-49	-18	3	-36
RB	2771	-198	-12	2758	-196	-37	-13	2	-25
SW	2615	-364	-146	2599	-352	-184	-16	12	-38
AB	2572	-577	431	2565	-569	429	-7	8	-2

DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



Passenger's Side Toeboard Measurements in Millimeters

Intrusion Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3260	250	392	3213	265	364	-47	15	-28
B1	3271	376	387	3187	387	351	-84	11	-36
C1	3272	504	386	3198	515	366	-74	11	-20
D1	3257	630	391	3233	608	361	-24	-22	-30
A2	3208	247	430	3175	254	411	-33	7	-19
B2	3215	382	427	3162	387	413	-53	5	-14
C2	3220	530	425	3180	518	373	-40	-12	-52
D2	3208	638	429	3202	610	407	-6	-28	-22
A3	3160	251	460	3135	253	452	-25	2	-8
B3	3147	391	460	3129	388	480	-18	-3	20
C3	3154	520	460	3138	502	446	-16	-18	-14
D3	3162	646	467	3157	621	447	-5	-25	-20
A4	2900	255	468	2897	257	498	-3	2	30
B4	2911	391	480	2909	387	535	-2	-4	55
C4	2904	516	480	2901	508	514	-3	-8	34
D4	2902	644	484	2902	630	473	0	-14	-11
A5	2676	240	453	2674	237	493	-2	-3	40
B5	2675	371	487	2672	368	525	-3	-3	38
C5	2667	512	493	2664	507	517	-3	-5	24
D5	2654	643	496	2652	637	490	-2	-6	-6

DATA SHEET NO. 15

SUMMARY OF FMVSS 212 DATA AND 219 PARTIAL

Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0206
Test Program:	NCAP Frontal Impact	Test Date:	05/21/09

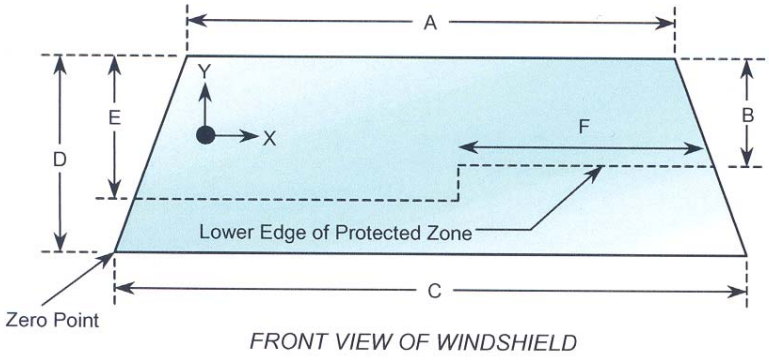
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants.

Temperature of windshield molding during test:

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2129	2129	100.0
Right Side	2129	2129	100.0
Total	4258	4258	100.5



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1253
B	mm	345
C[1]	mm	1565
D	mm	720
E	mm	335
F	mm	560

Details of Windshield Glass Penetration Greater Than 6 mm: None

[1] Cowl trim panel used in place of molding at this location.

DATA SHEET NO. 16
FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0206
Test Program:	NCAP Frontal Impact	Test Date:	05/21/09

Test Conditions:

Temperature: 22.3° C Time: 14:05

The test vehicle was filled with 93% of the manufacturer's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 ATDs were located at each of the front designated seating positions.

Test Vehicle Impact Type:

1. ☒ Frontal (56 km/h)
2. ☐ Oblique 301 Optional Rear MDB (48 km/h)
3. ☐ Flat 301 Rear MB (48 km/h)
4. ☐ Side MDB Impact (32 km/h)

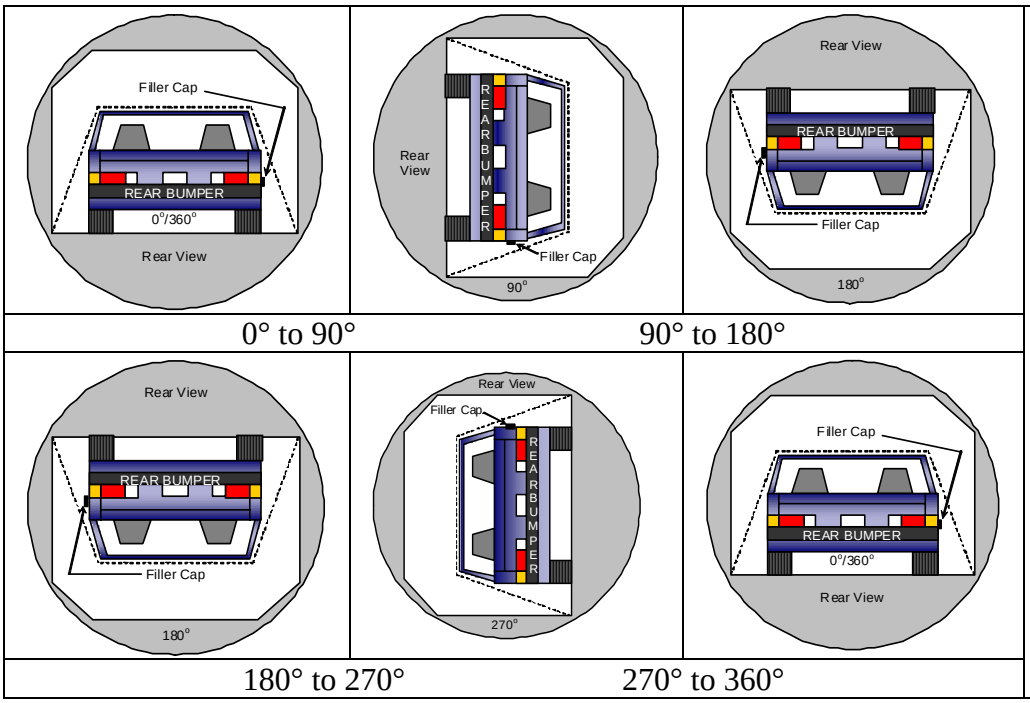
Stoddard Solvent Spillage Measurements

	Actual	Max Allowed
A. From impact until vehicle motion ceases:	0	28 g
B. For the 5 minute period after vehicle motion ceases:	0	141 g
C. For the following 25 minutes:	0	28 g/min
D. Spillage Details: None		

DATA SHEET NO. 17

FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



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

DETAILS OF STODDARD SOLVENT SPILLAGE LOCATIONS

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°	60	300	First 5	0	Sixth	0	Seventh	0
90° to 180°	60	300	First 5	0	Sixth	0	Seventh	0
180° to 270°	60	300	First 5	0	Sixth	0	Seventh	0
270° to 360°	60	300	First 5	0	Sixth	0	Seventh	0

DATA SHEET NO. 18

POST-TEST AIR BAG DATA

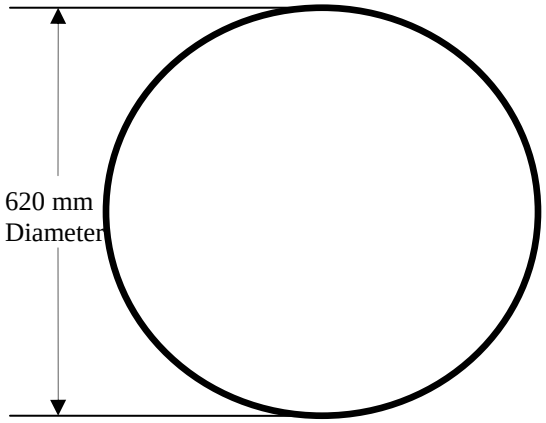
Test Vehicle:	2010 Ford Mustang	NHTSA No.:	MA0206
Test Program:	NCAP Frontal Impact	Test Date:	05/21/09

		Driver	Passenger
A.	Number of airbag vent holes:	2	2
B.	Size of airbag vent holes:	31 x 37mm	63 x 63 mm
C.	Total airbag vent area:	1922 mm^2	7958 mm^2

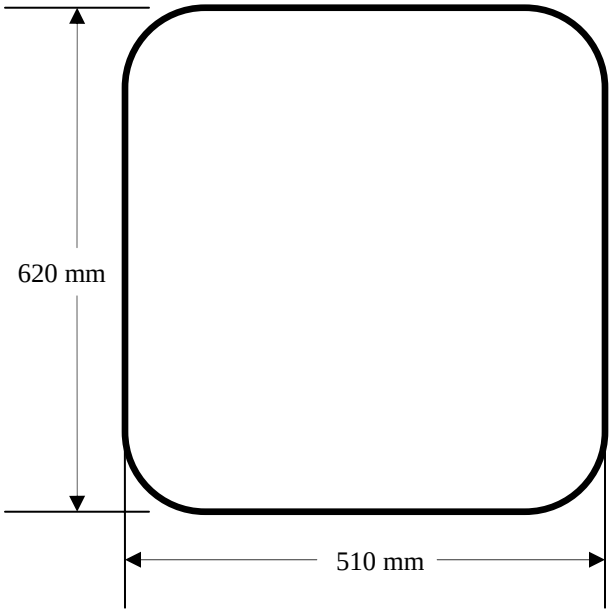
D. Deflated airbag length and width dimensions or, if round, diameter
Driver: Diameter: 626 mm
Passenger: Length: 620 mm Width: 510 mm

E. Is the airbag tethered?
Driver: No
Passenger: Yes If yes, record length of tether: Unknown

Driver's airbag:



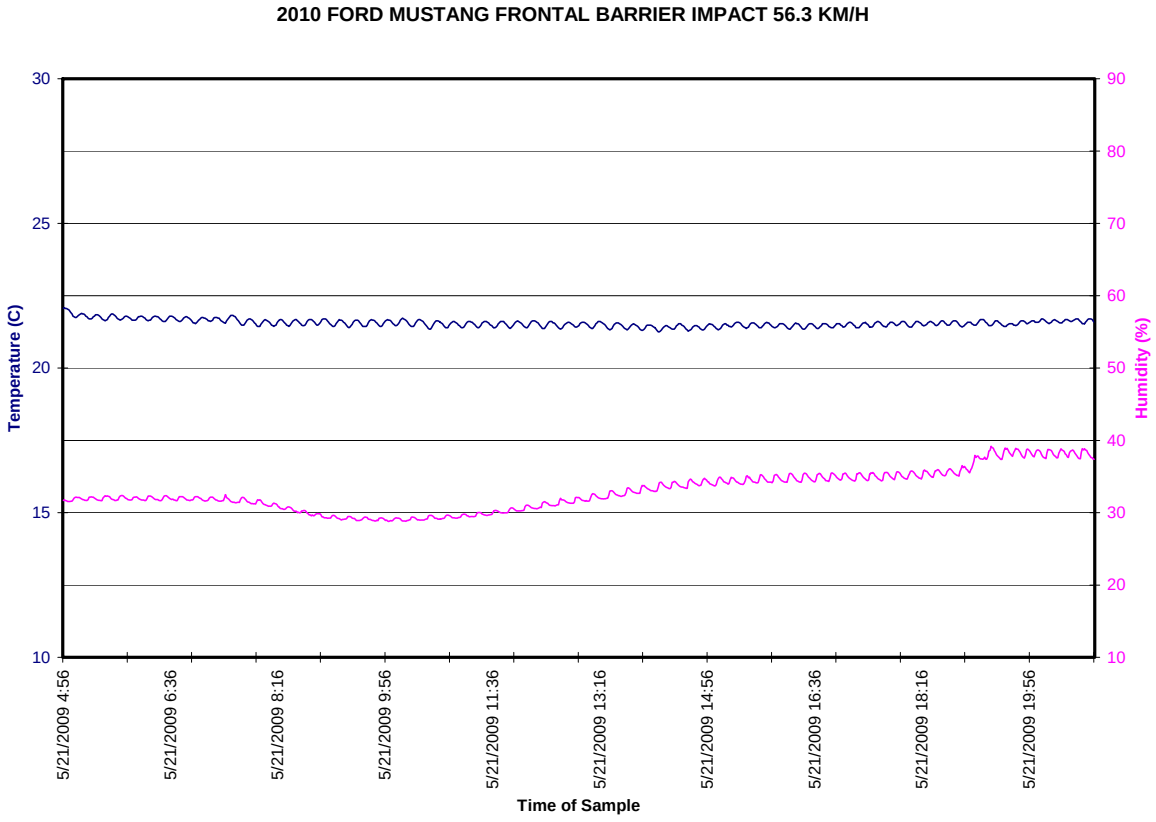
Passenger's airbag:



F. Airbag and gas generator part numbers and manufacturer's names.
Driver: Unknown
Passenger: Unknown

DATA SHEET NO. 19
DUMMY / VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2010 Ford Mustang NHTSA No.: MA0206
Test Program: NCAP Frontal Impact Test Date: 05/21/09



APPENDIX A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS, CONT'D.

LIST OF PHOTOGRAPHS, CONT'D.

Figure A-1 Pre-Test Front View

Figure A-2 Post-Test Front View

Figure A-3 Pre-Test Left Front View

Figure A-4 Post-Test Left Front View

Figure A-5 Pre-Test Left Side View

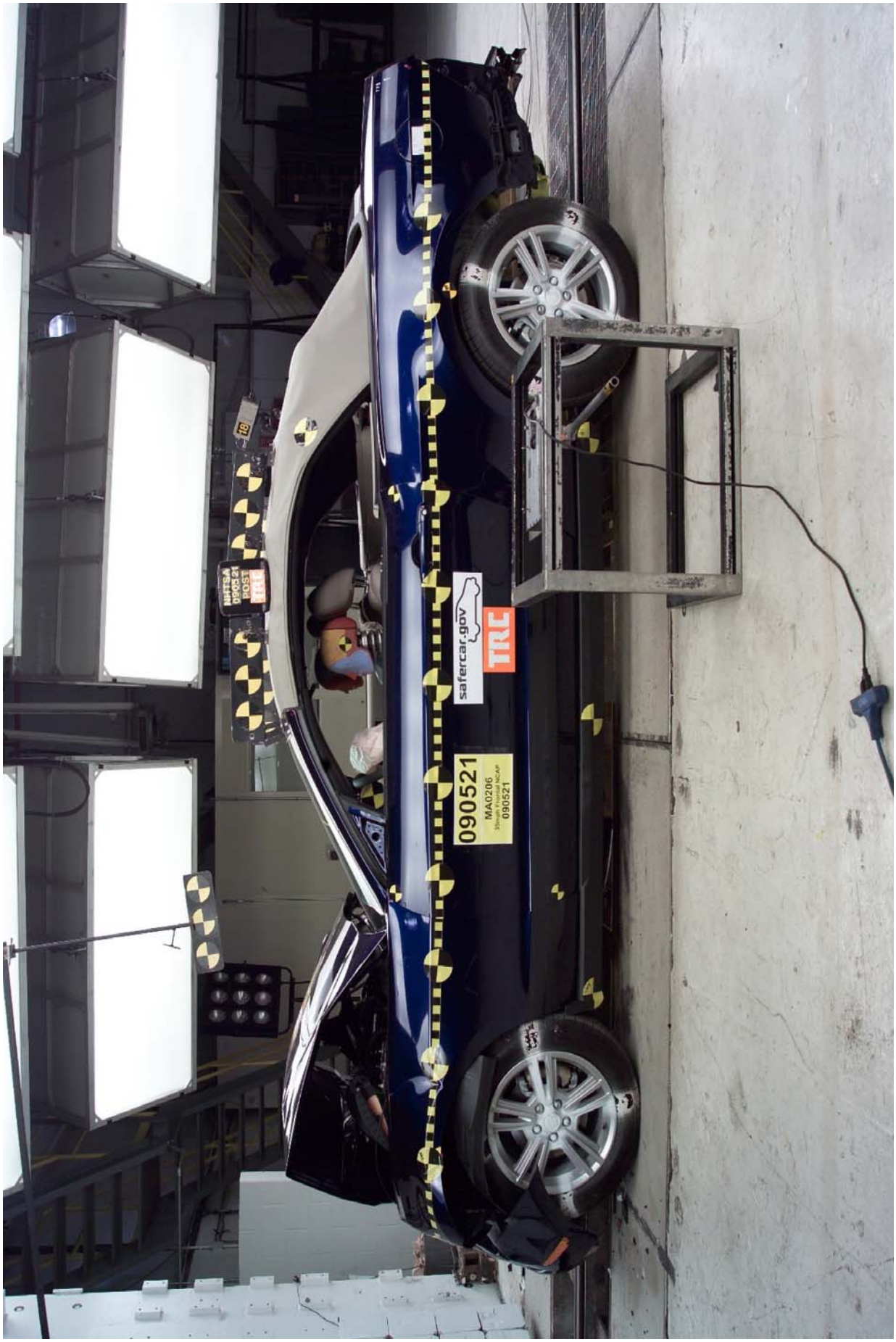


Figure A-6 Post-Test Left Side View

Figure A-7 Pre-Test Left Rear View

Figure A-8 Post-Test Left Rear View

Figure A-9 Pre-Test Rear View

Figure A-10 Post-Test Rear View

Figure A-11 Pre-Test Right Rear View

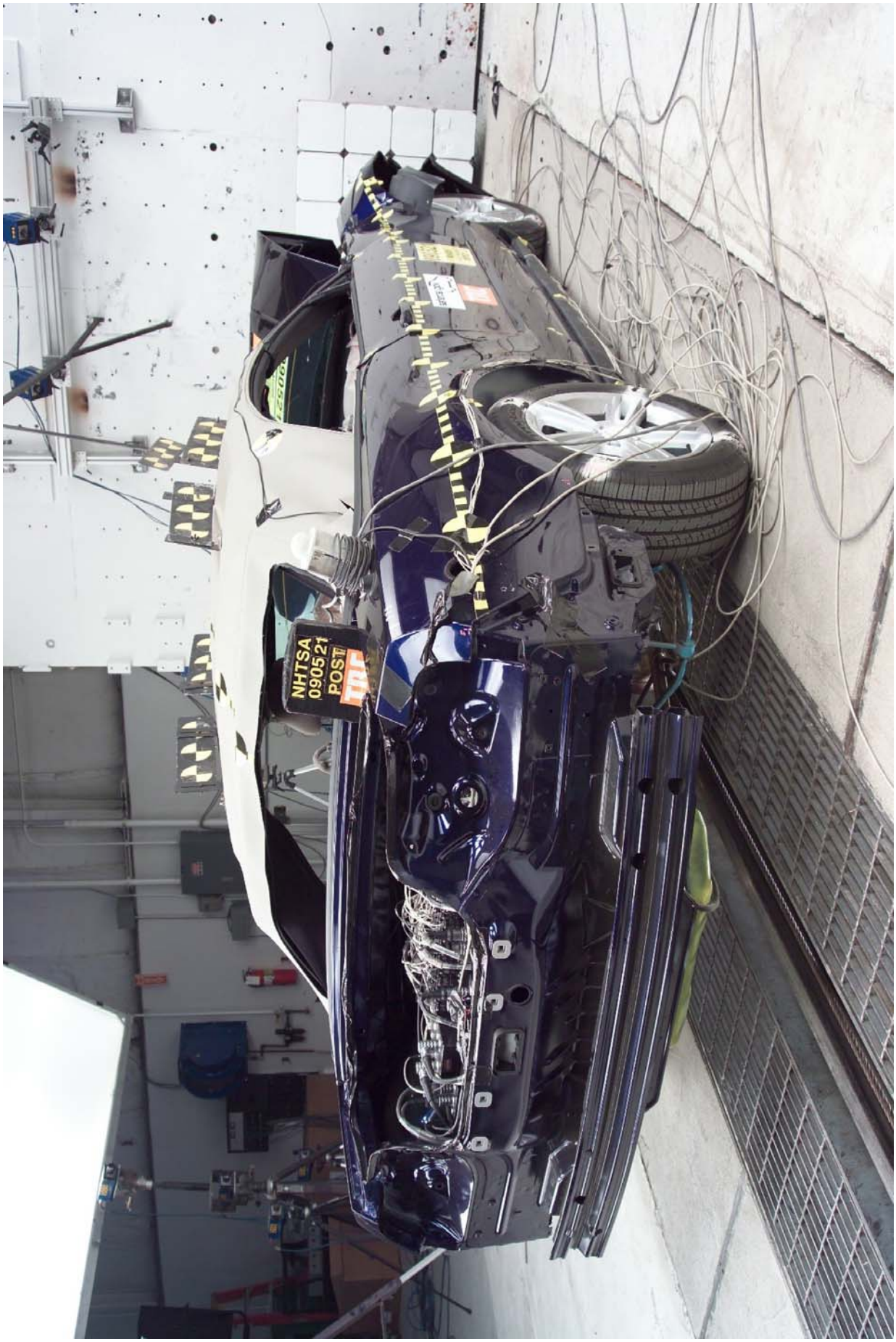


Figure A-12 Post-Test Right Rear View

Figure A-13 Pre-Test Right Side View

Figure A-14 Post-Test Right Side View

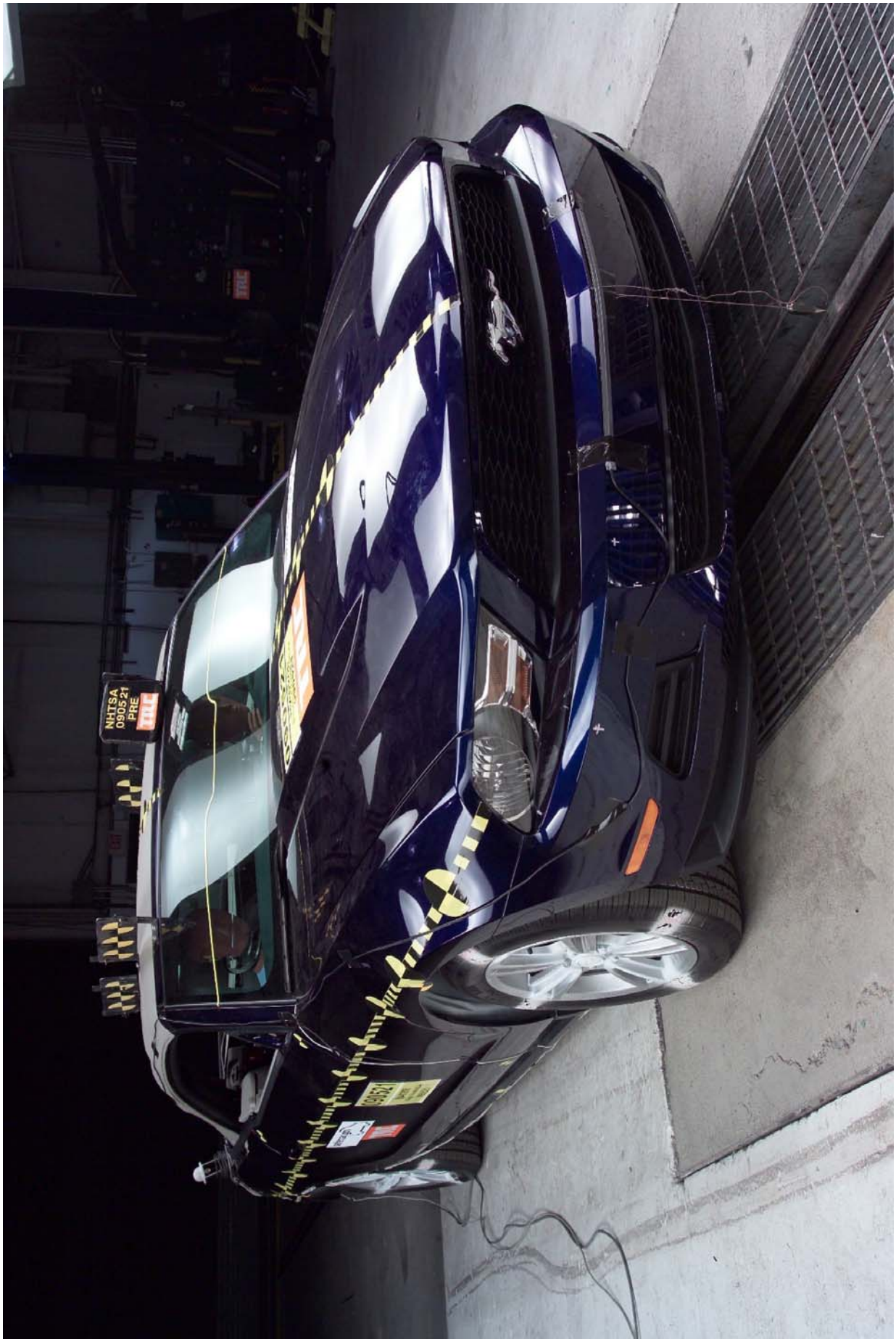


Figure A-15 Pre-Test Right Front View

Figure A-16 Post-Test Right Front View

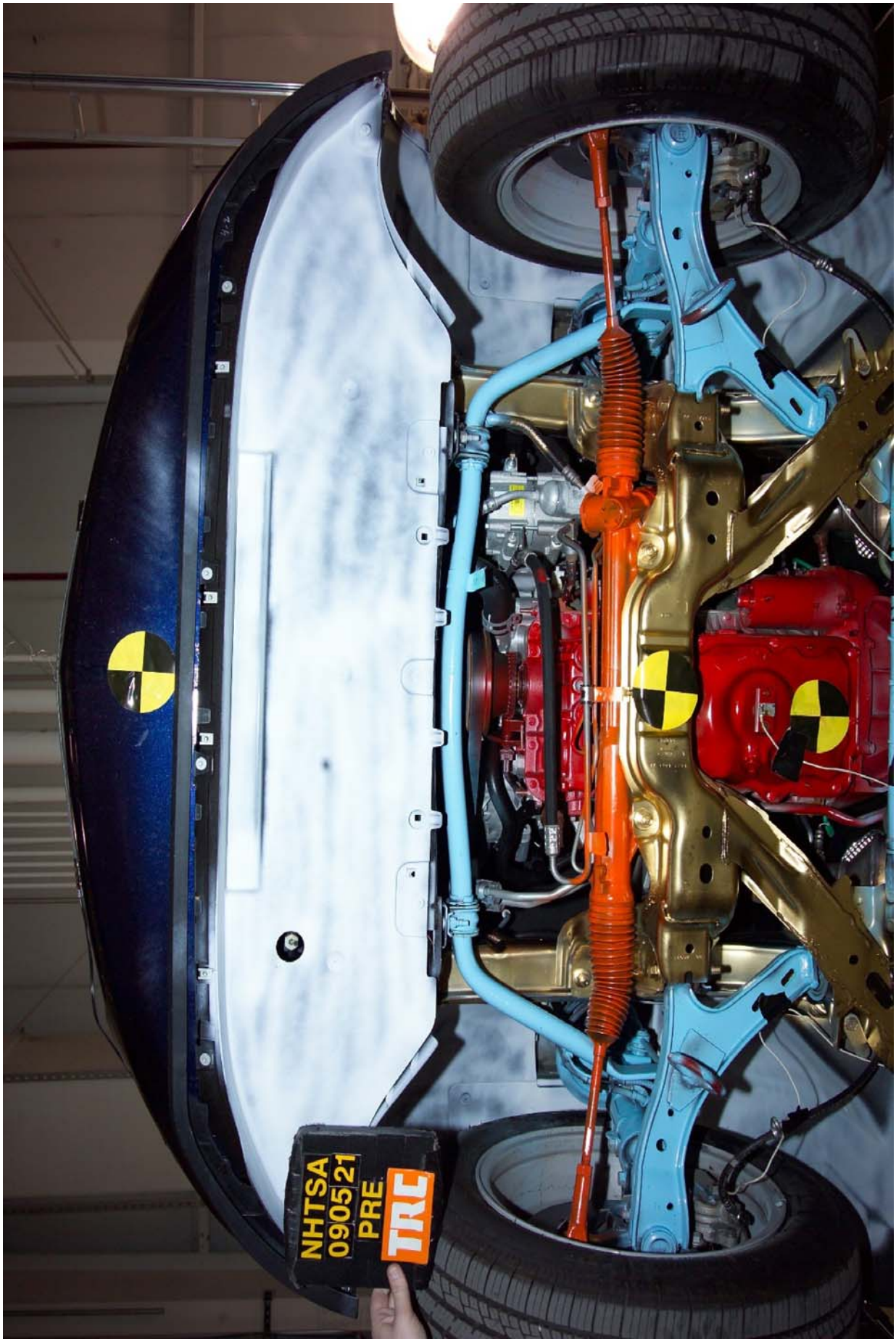


Figure A-17 Pre-Test Front Underbody View

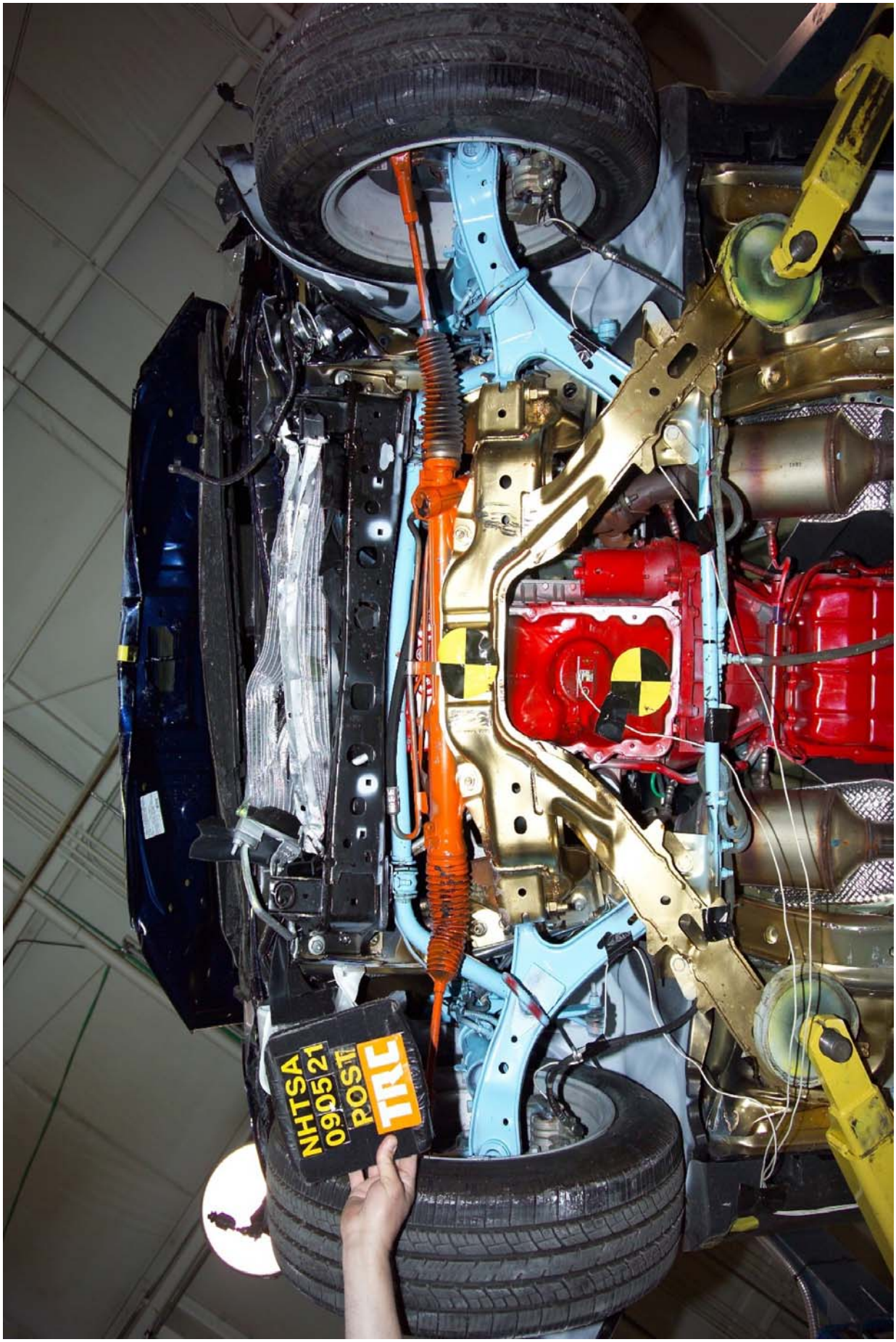


Figure A-18 Post-Test Front Underbody View

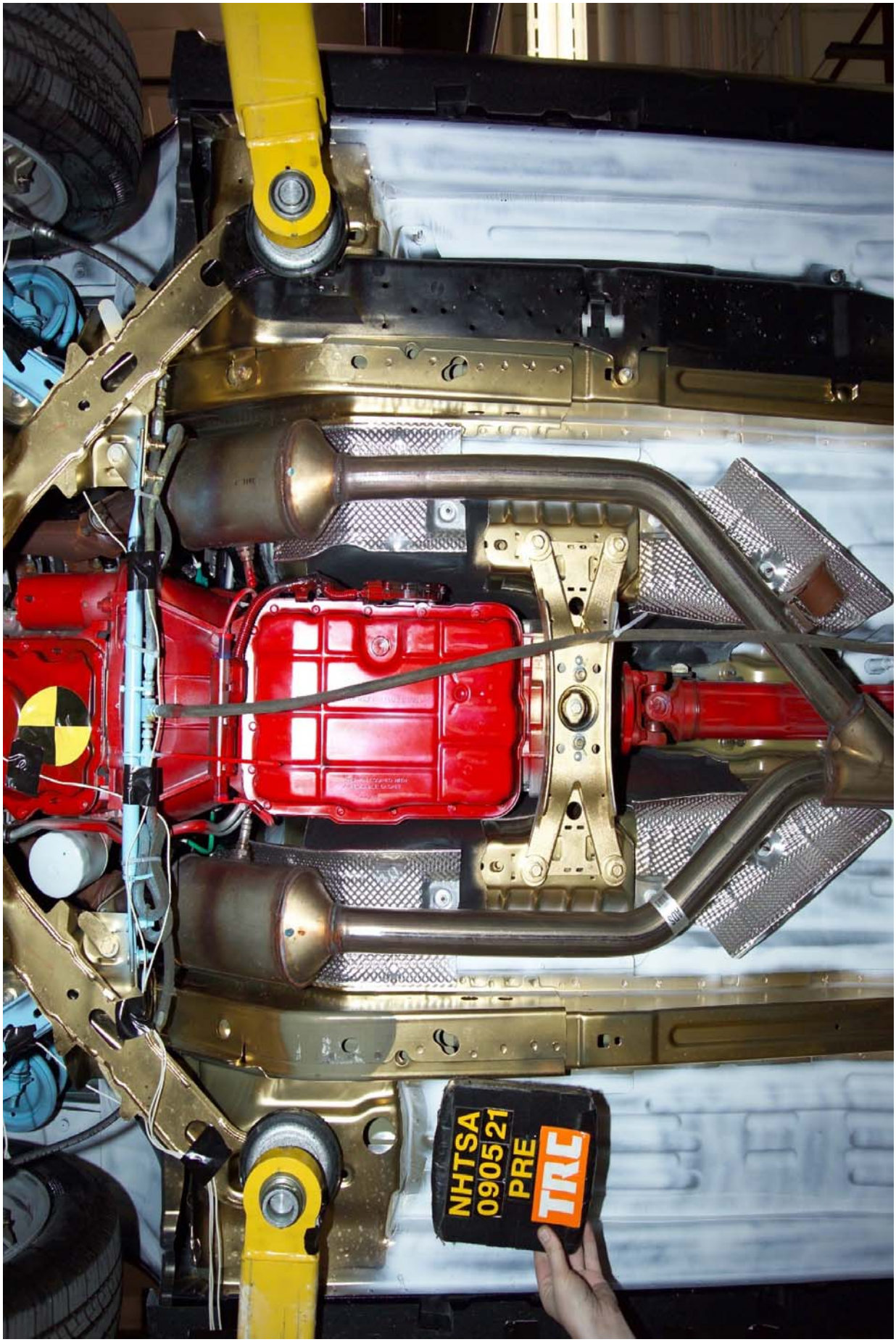


Figure A-19 Pre-Test Mid Front Underbody View

Figure A-20 Post-Test Mid Front Underbody View

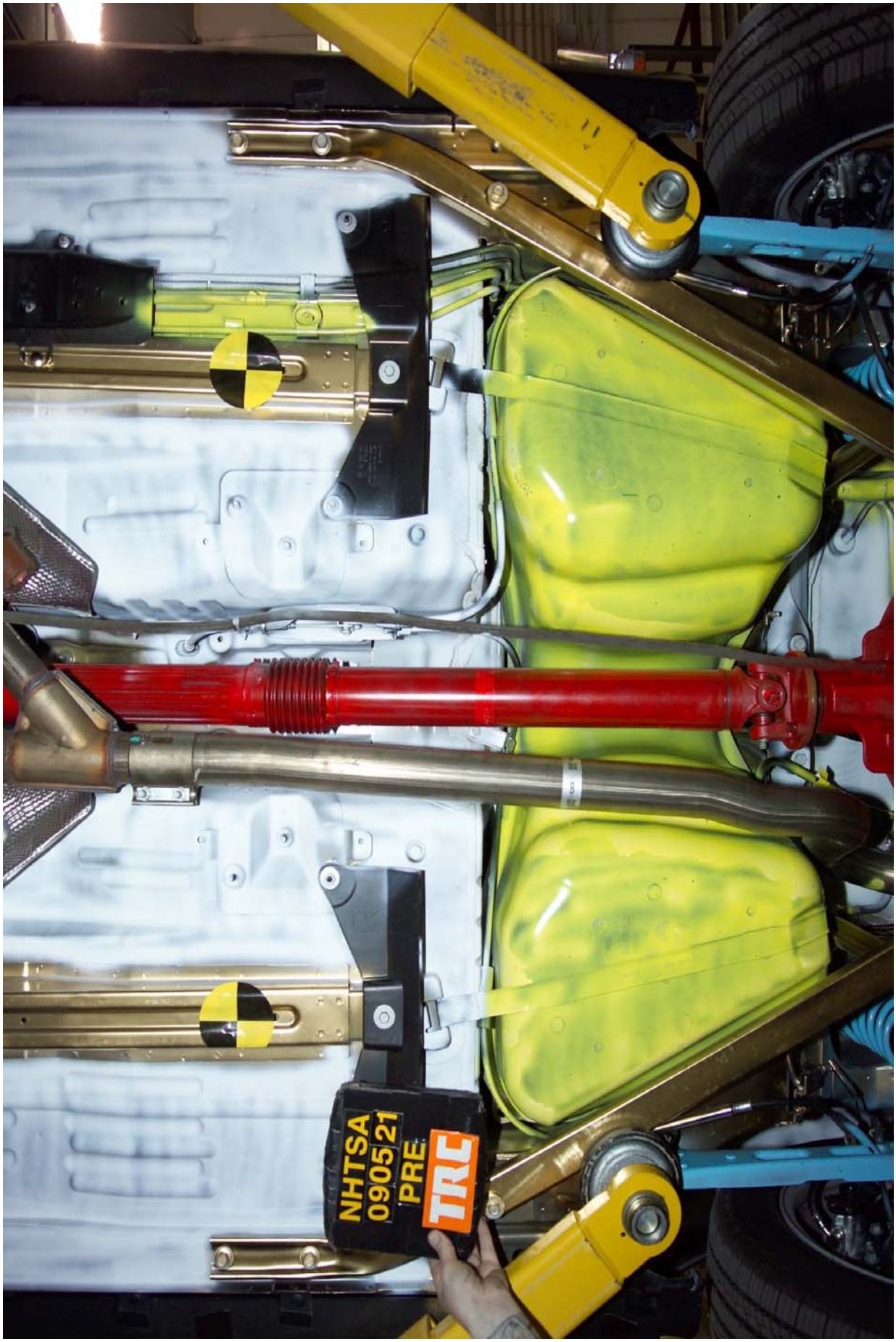


Figure A-21 Pre-Test Mid Underbody View

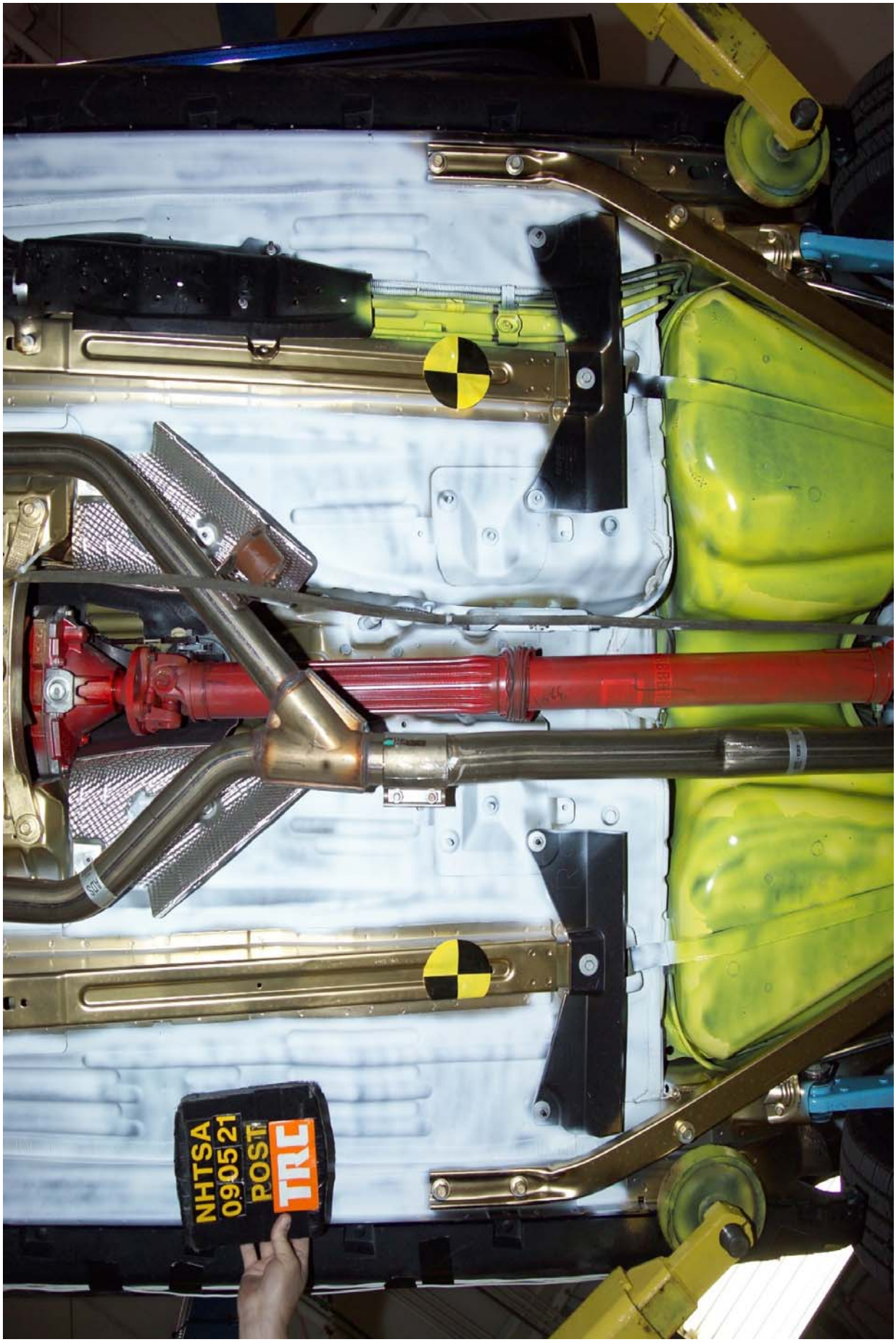


Figure A-22 Post-Test Mid Underbody View

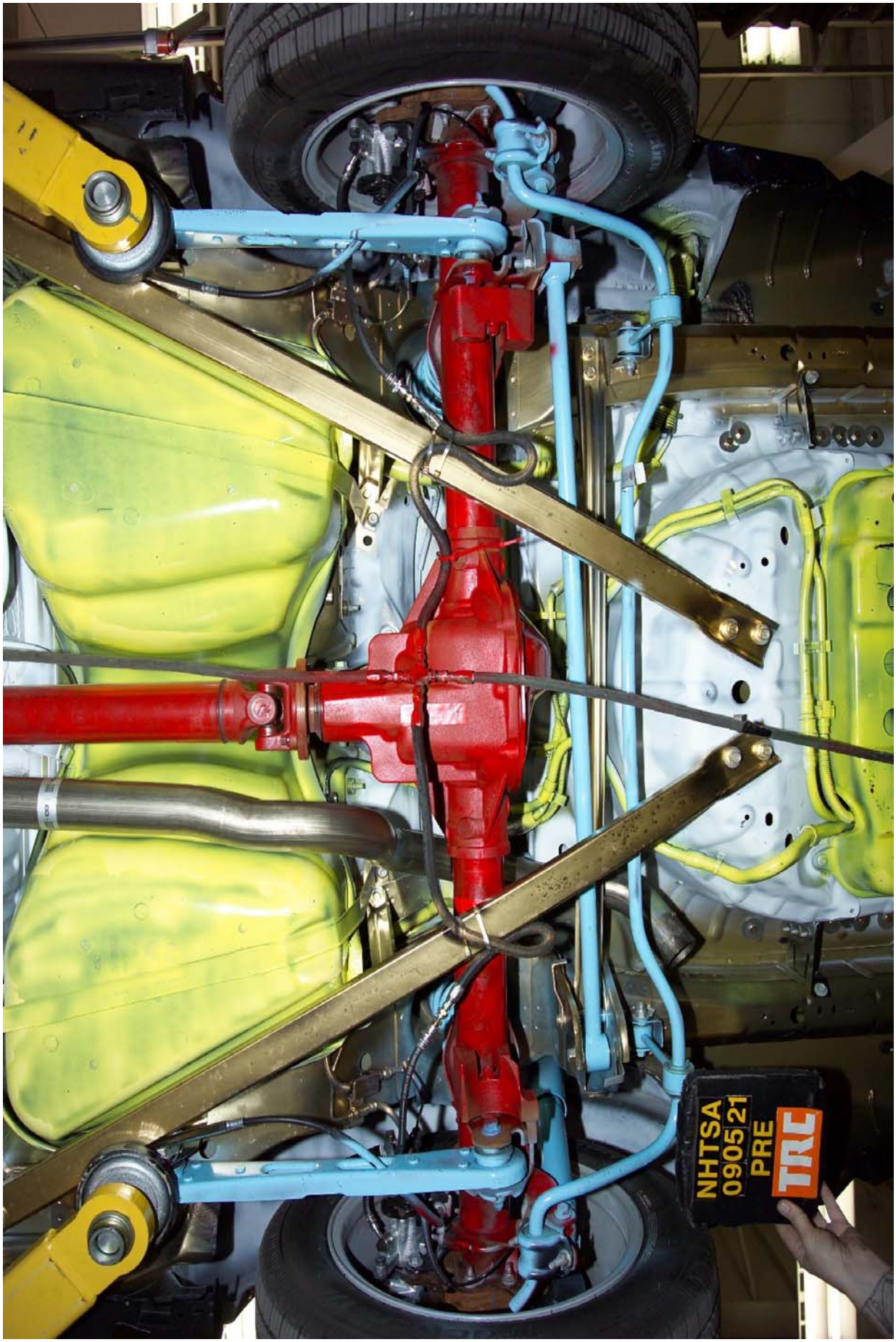


Figure A-23 Pre-Test Mid Rear Underbody View

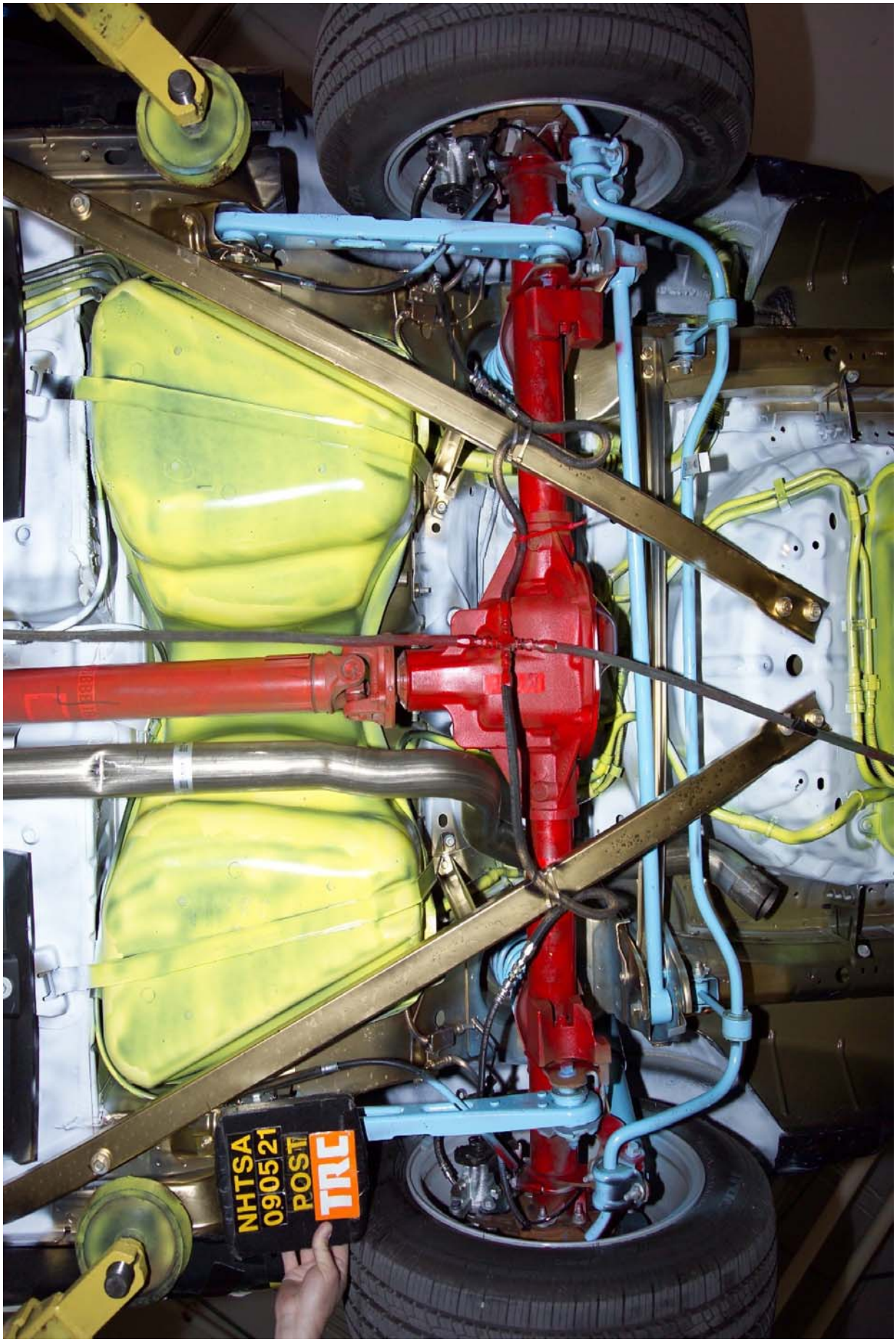


Figure A-24 Post-Test Mid Rear Underbody View

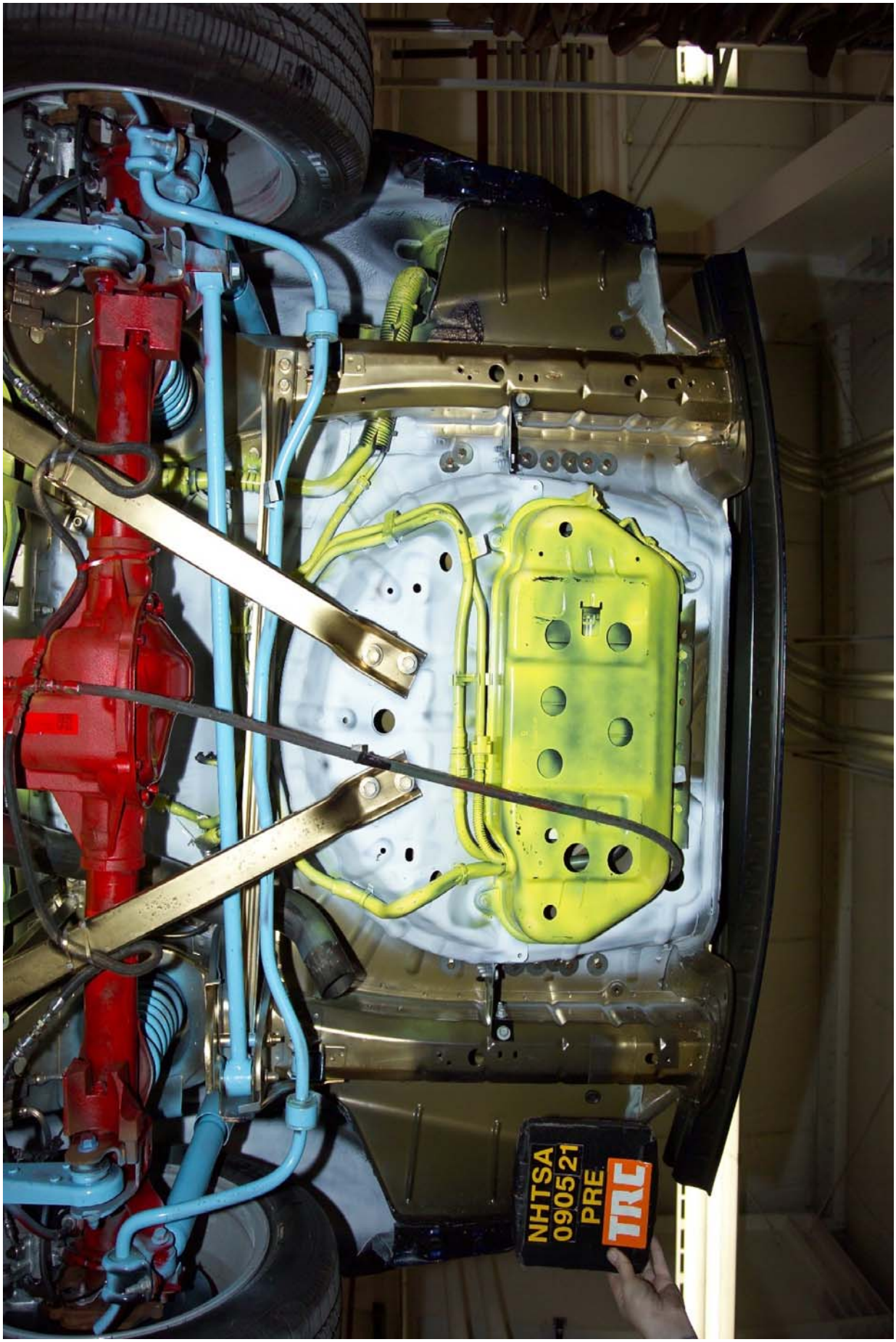


Figure A-25 Pre-Test Rear Underbody View

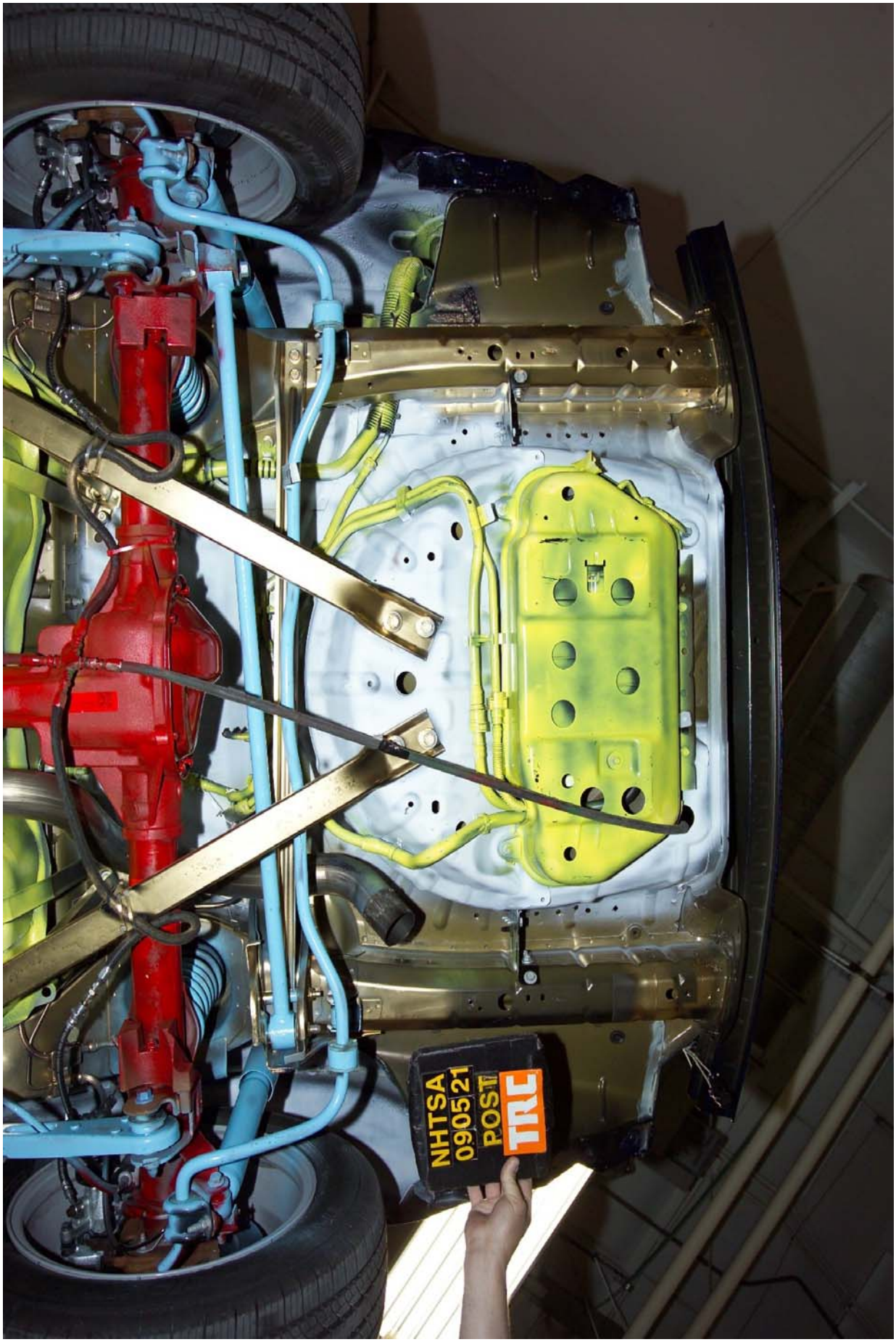


Figure A-26 Post-Test Rear Underbody View

Figure A-27 Pre-Test Fuel Tank View

Figure A-28 Post-Test Fuel Tank View

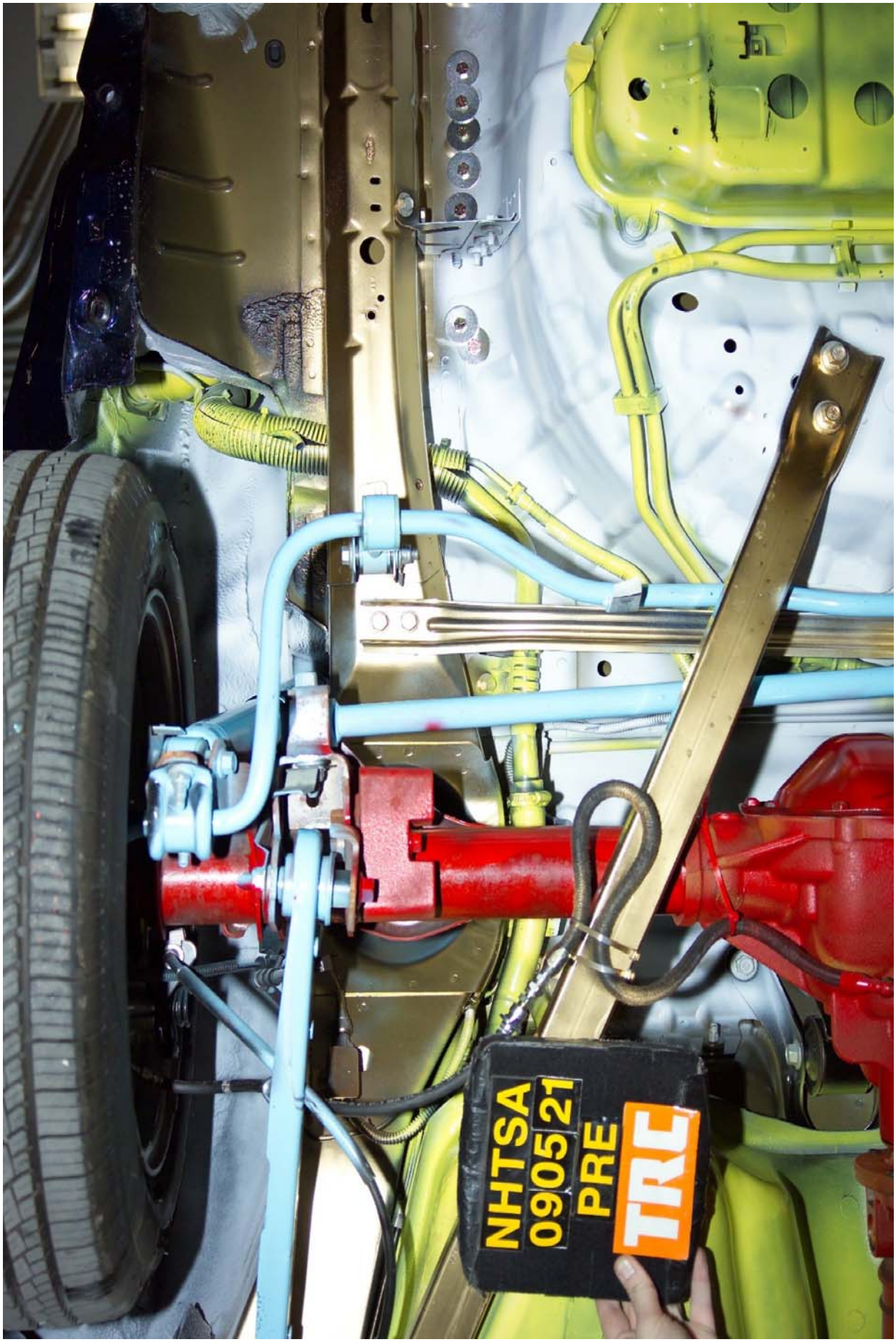


Figure A-29 Pre-Test Fuel Filler Neck View

Figure A-30 Post-Test Fuel Filler Neck View

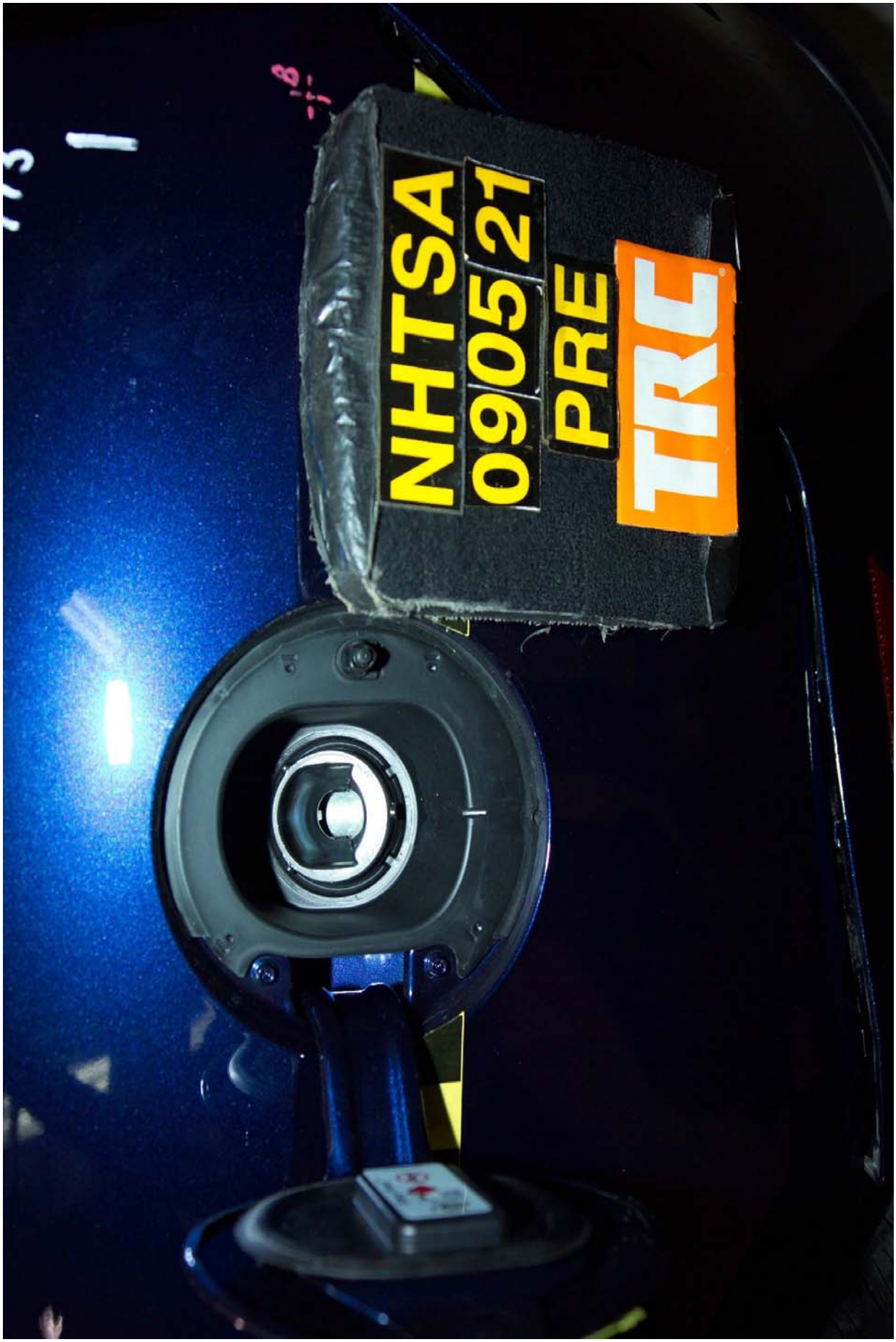


Figure A-31 Pre-Test Fuel Filler Cap View

Figure A-32 Post-Test Fuel Filler Cap View

Figure A-33 Pre-Test Engine Compartment View

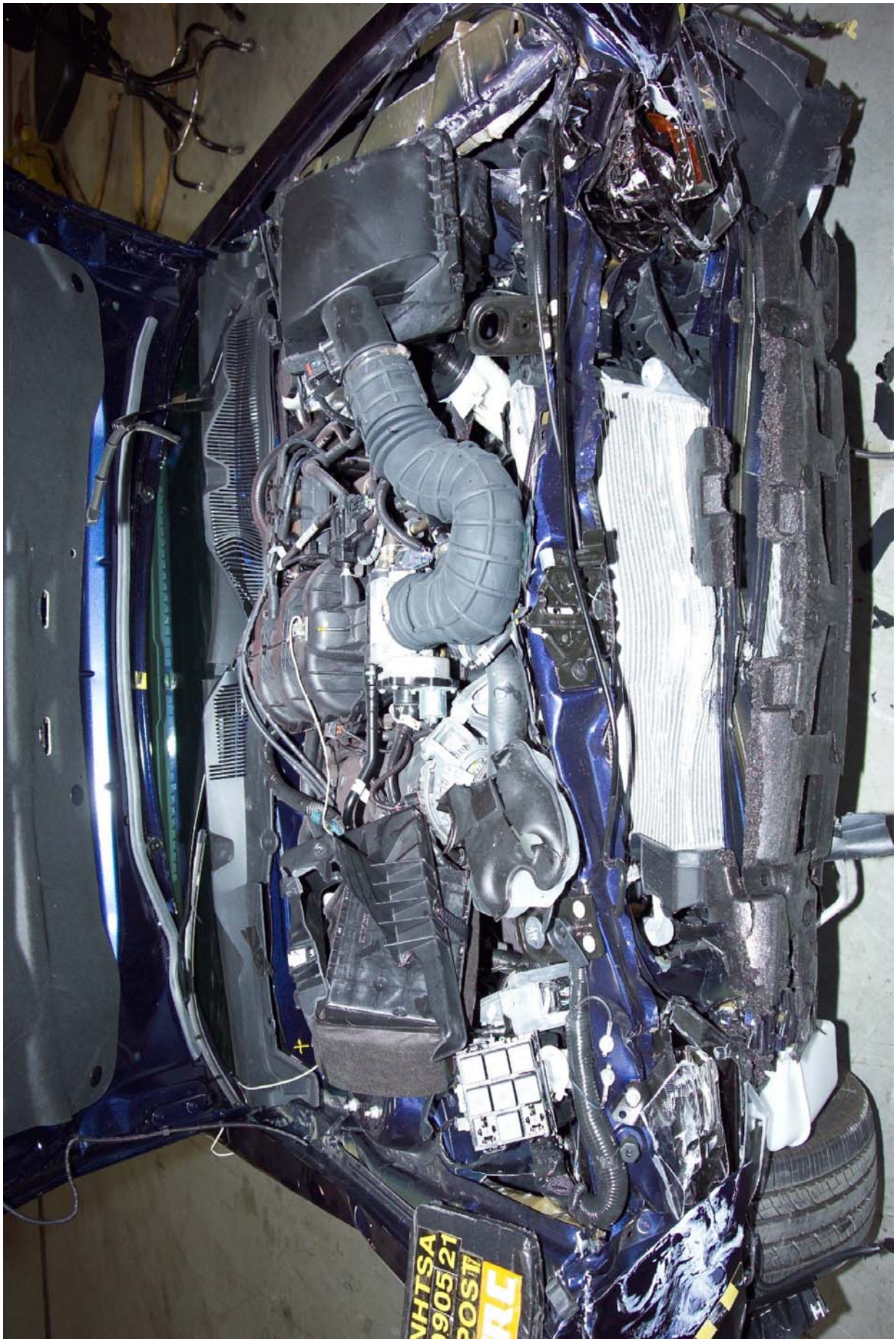


Figure A-34 Post-Test Engine Compartment View

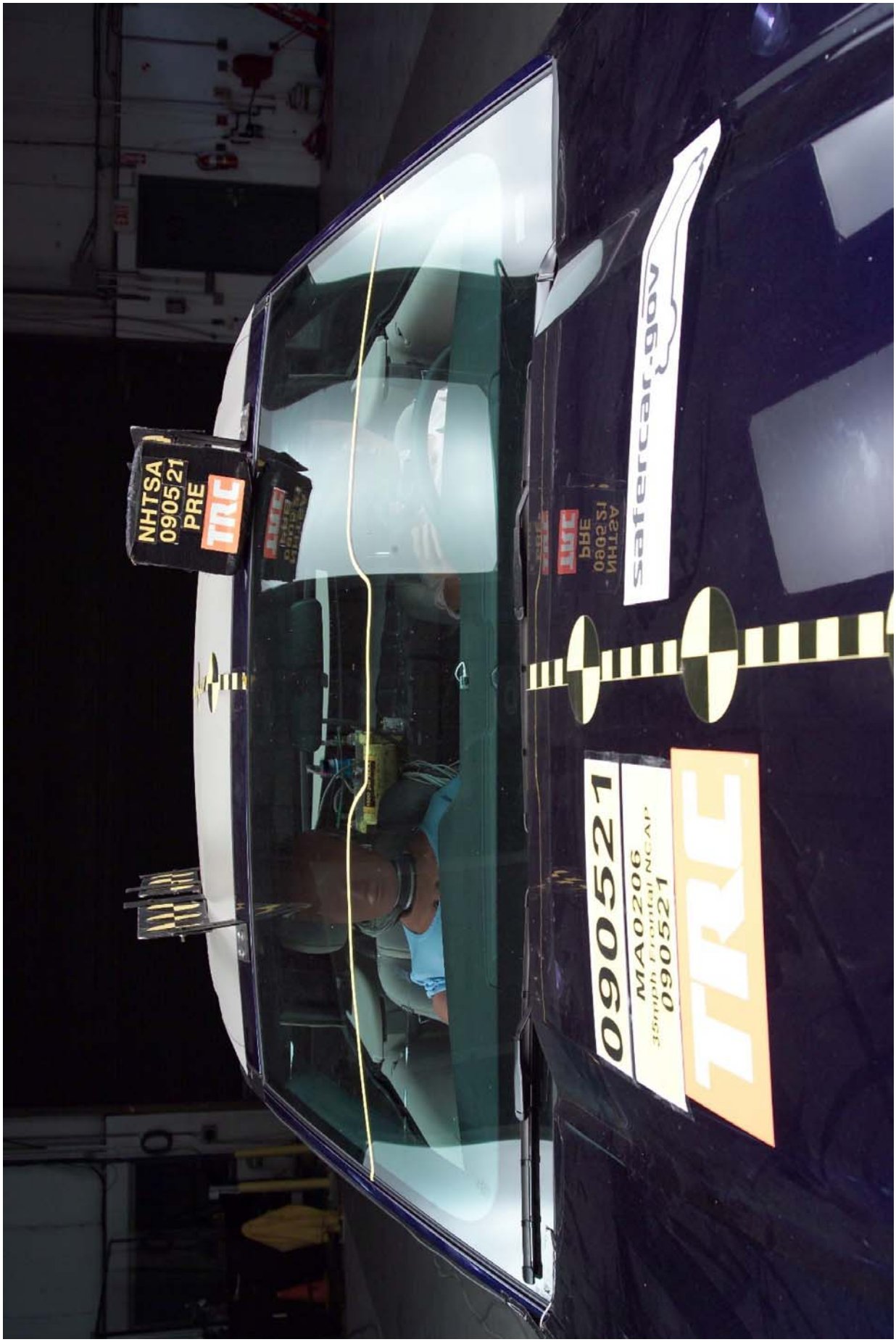


Figure A-35 Pre-Test Windshield View

Figure A-36 Post-Test Windshield View

Figure A-37 Pre-Test Driver Dummy - View 1

Figure A-38 Post-Test Driver Dummy - View 1

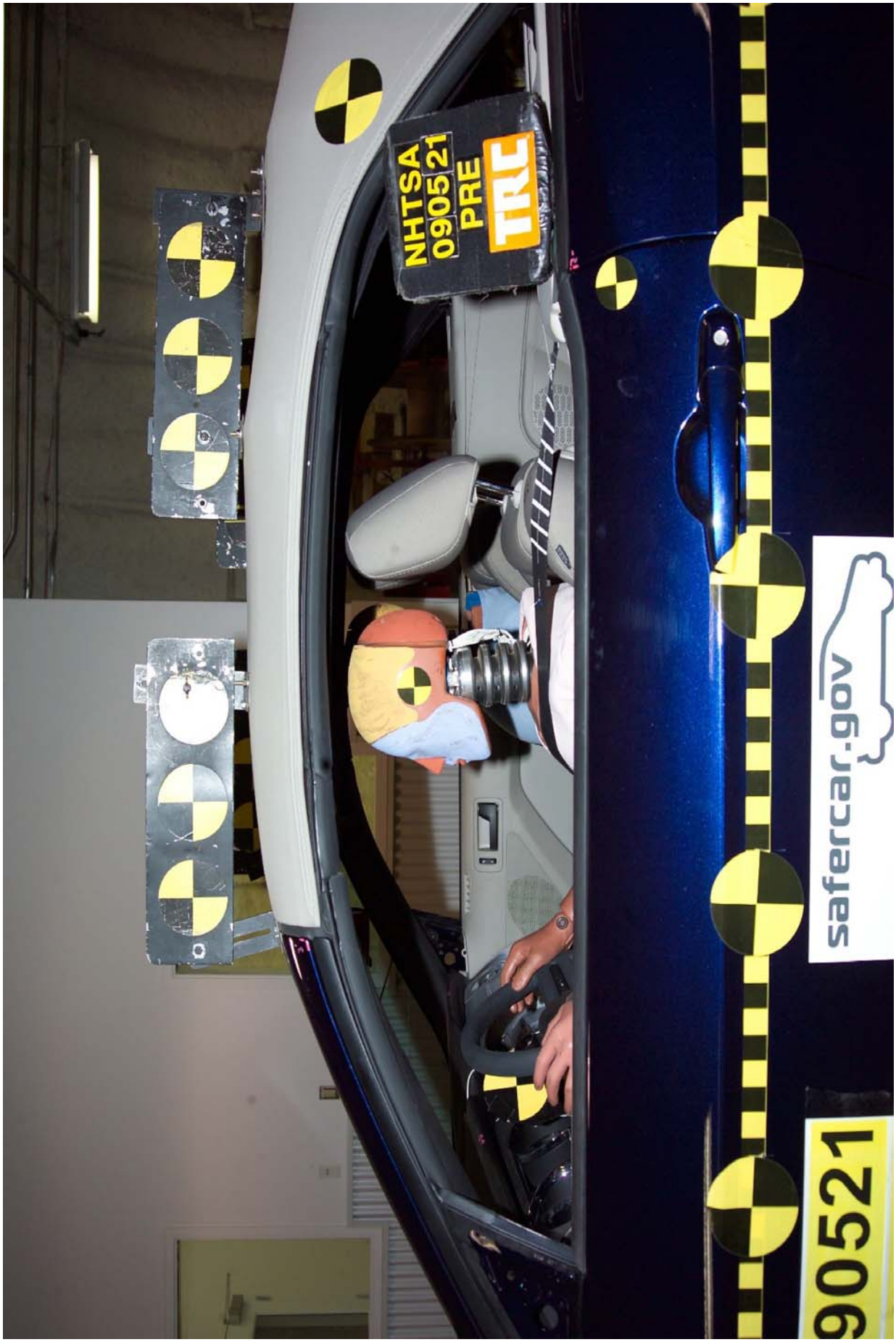


Figure A-39 Pre-Test Driver Dummy - View 2

Figure A-40 Post-Test Driver Dummy - View 2

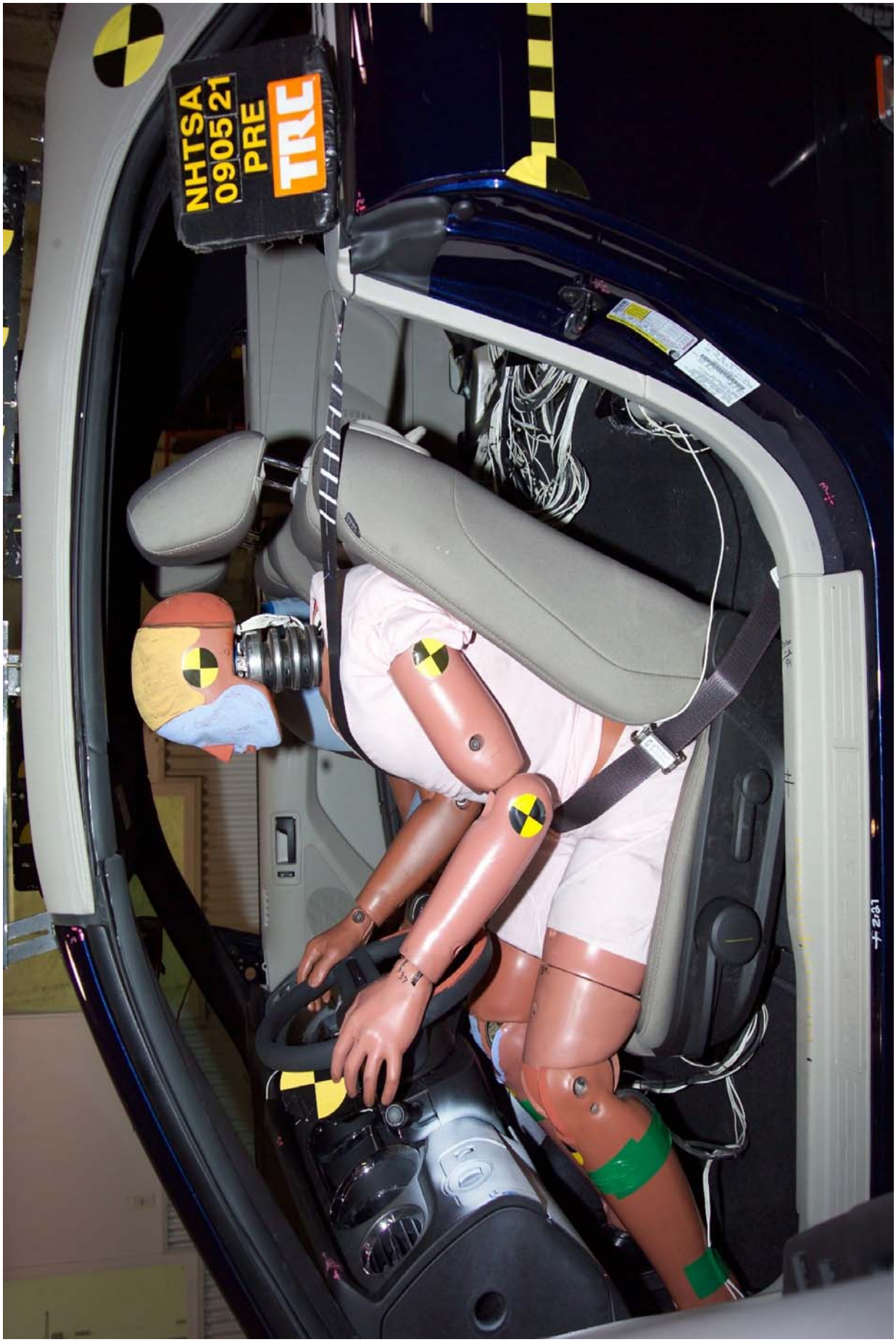


Figure A-41 Pre-Test Driver Dummy - View 3

Figure A-42 Post-Test Driver Dummy - View 3

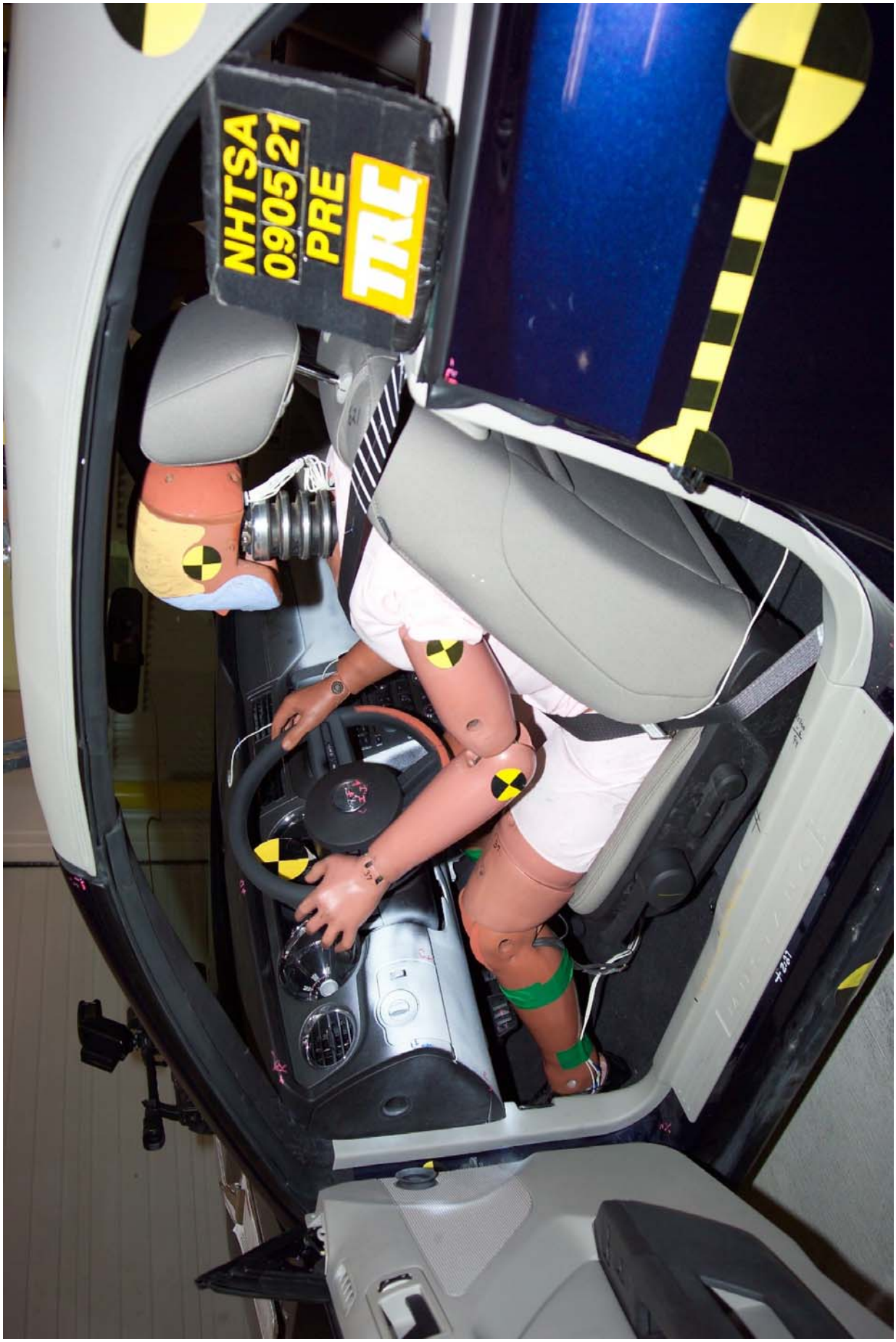


Figure A-43 Pre-Test Driver Dummy - View 4

Figure A-44 Post-Test Driver Dummy - View 4

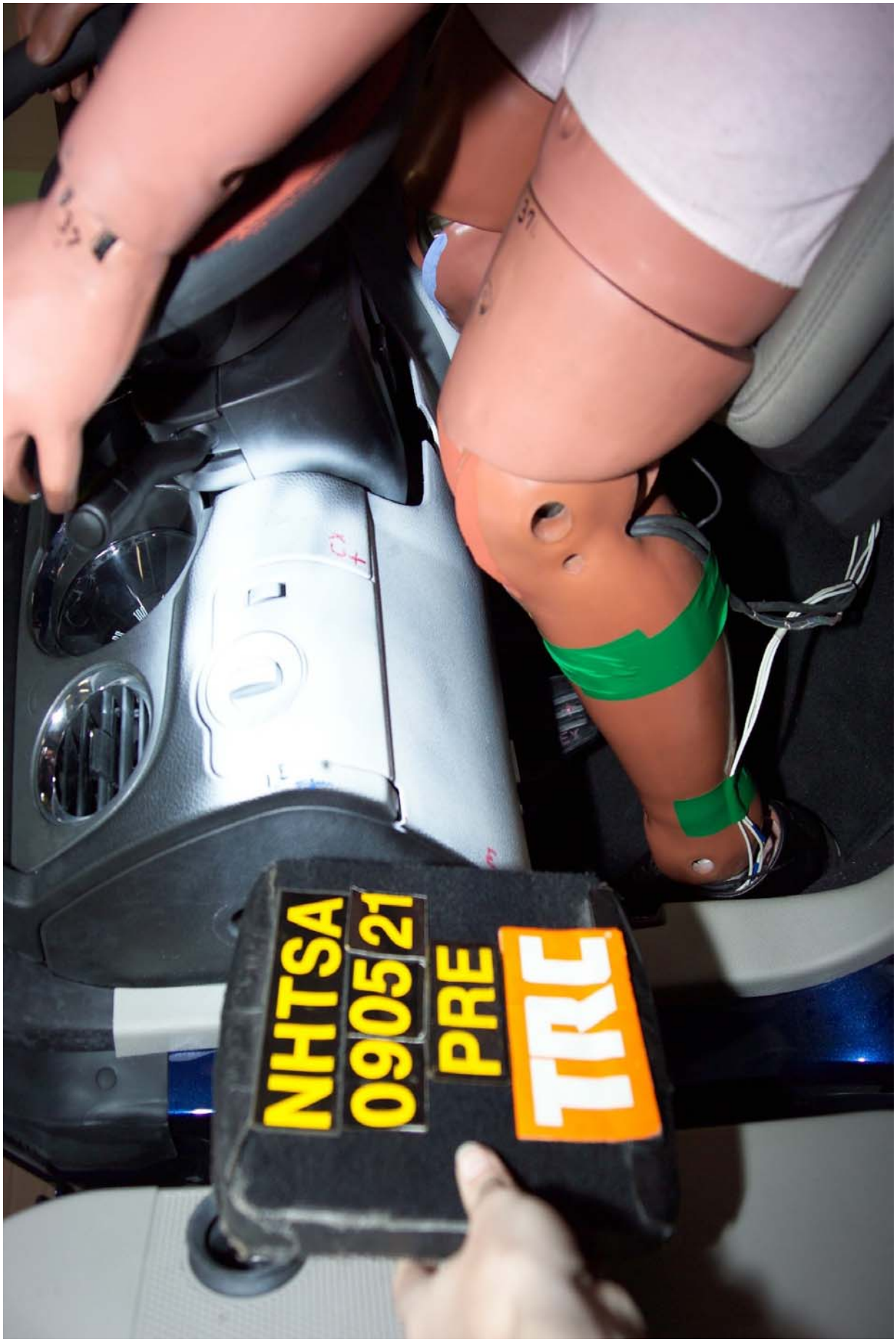


Figure A-45 Pre-Test Driver Dummy Knee Bolster View

Figure A-46 Post-Test Driver Dummy Knee Bolster View

Figure A-47 Pre-Test Driver Dummy Feet View

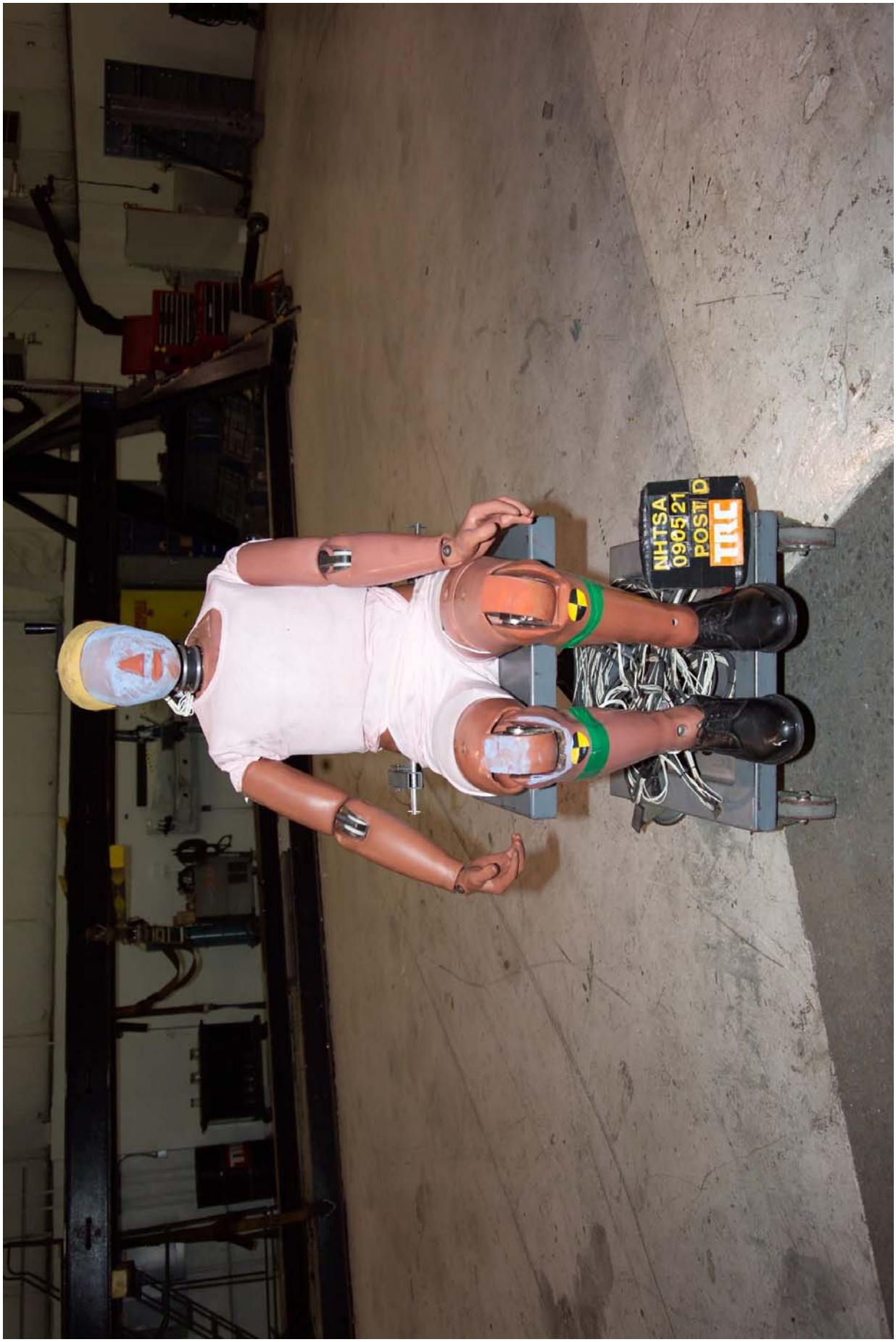


Figure A-48 Post-Test Driver Dummy Overall View

Figure A-49 Post-Test Driver Dummy Head Contact - View 1

Figure A-50 Post-Test Driver Dummy Head Contact - View 2

Figure A-51 Post-Test Driver Dummy Knee Contact View

Figure A-52 Post-Test Driver Toeboard Deformation View

Figure A-53 Pre-Test Right Front Passenger Dummy - View 1

Figure A-54 Post-Test Right Front Passenger Dummy - View 1

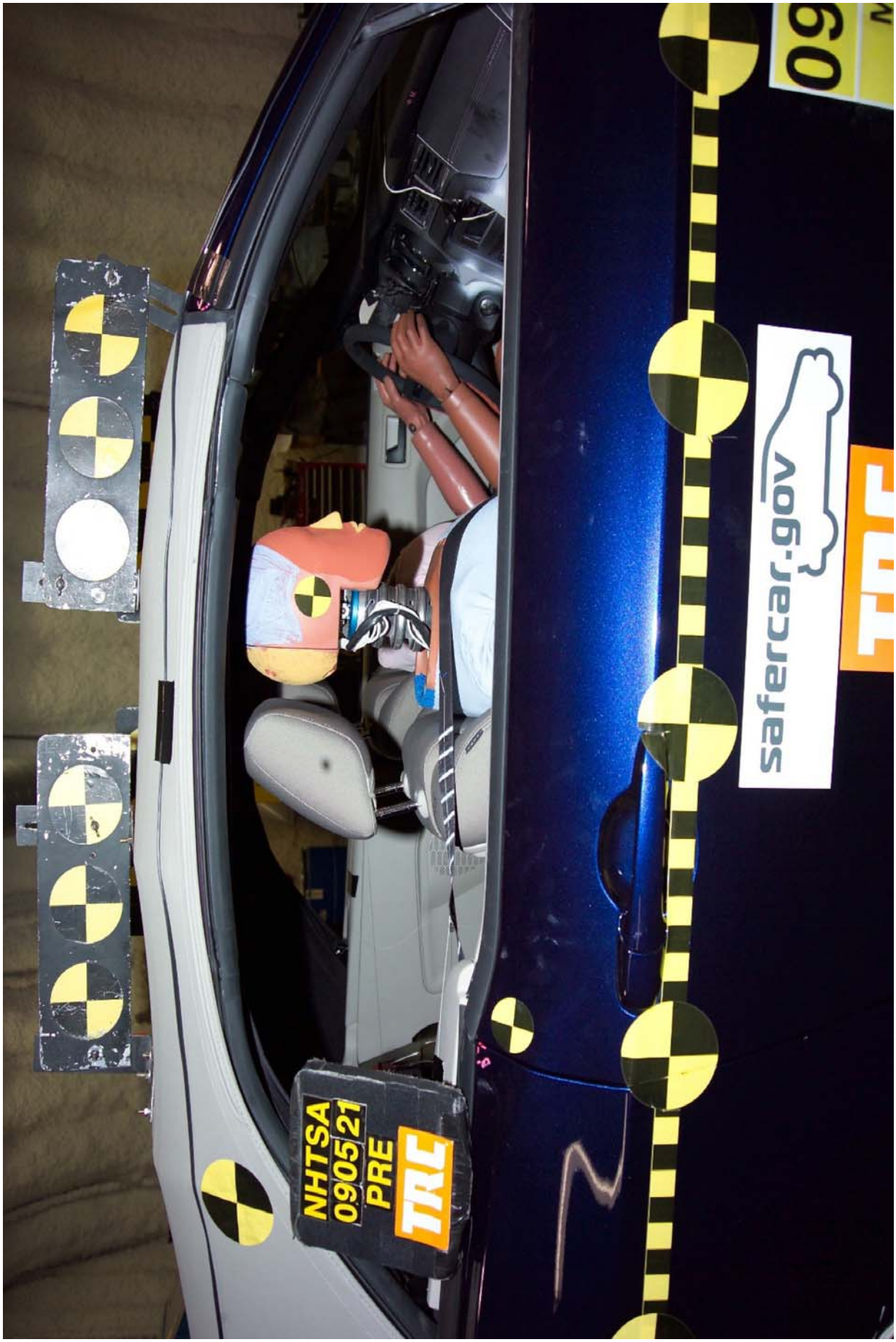


Figure A-55 Pre-Test Right Front Passenger Dummy - View 2

Figure A-56 Post-Test Right Front Passenger Dummy - View 2

Figure A-57 Pre-Test Right Front Passenger Dummy - View 3

Figure A-58 Post-Test Right Front Passenger Dummy - View 3

Figure A-59 Pre-Test Right Front Passenger Dummy - View 4

Figure A-60 Post-Test Right Front Passenger Dummy - View 4

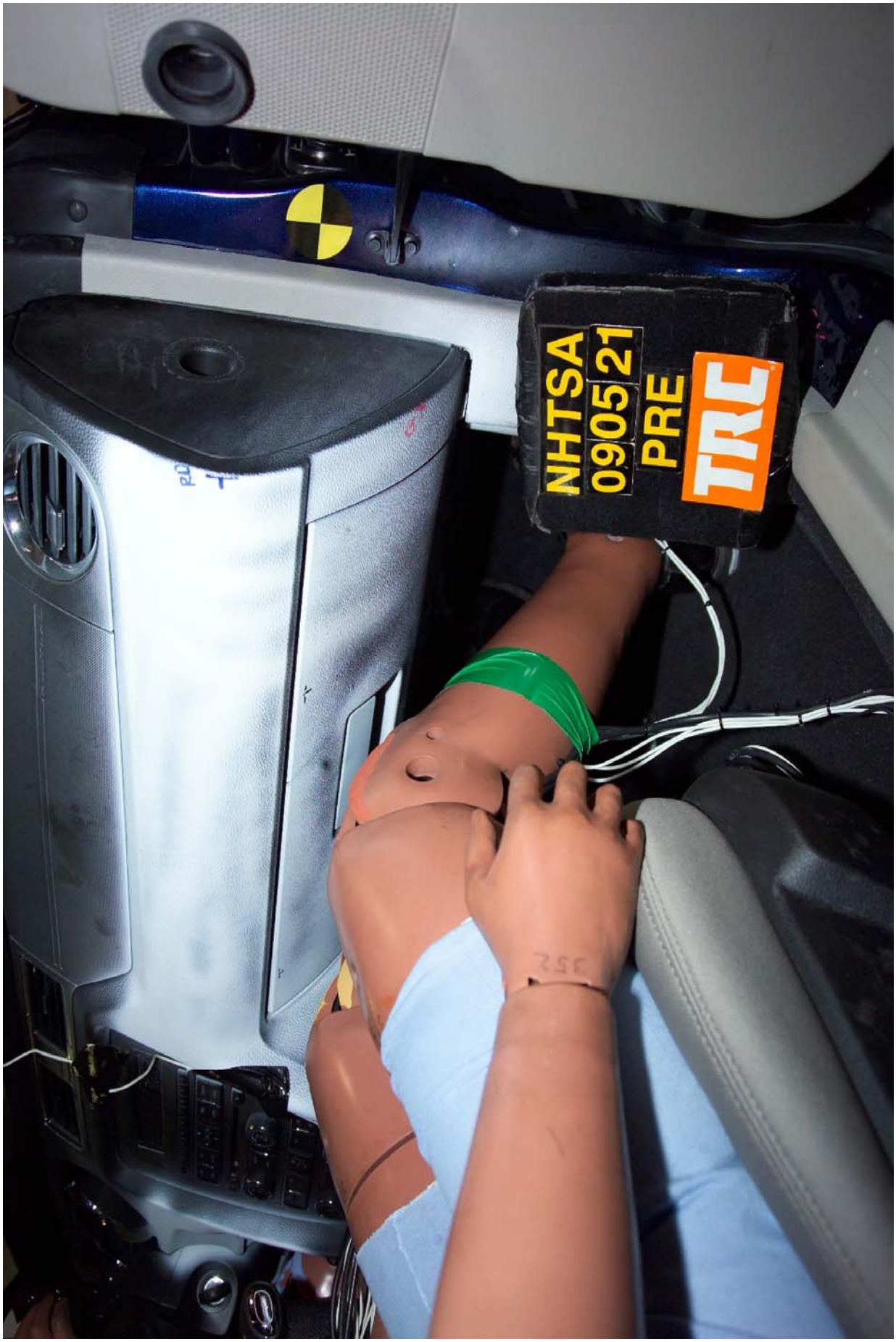


Figure A-61 Pre-Test Right Front Passenger Dummy Knee Bolster View

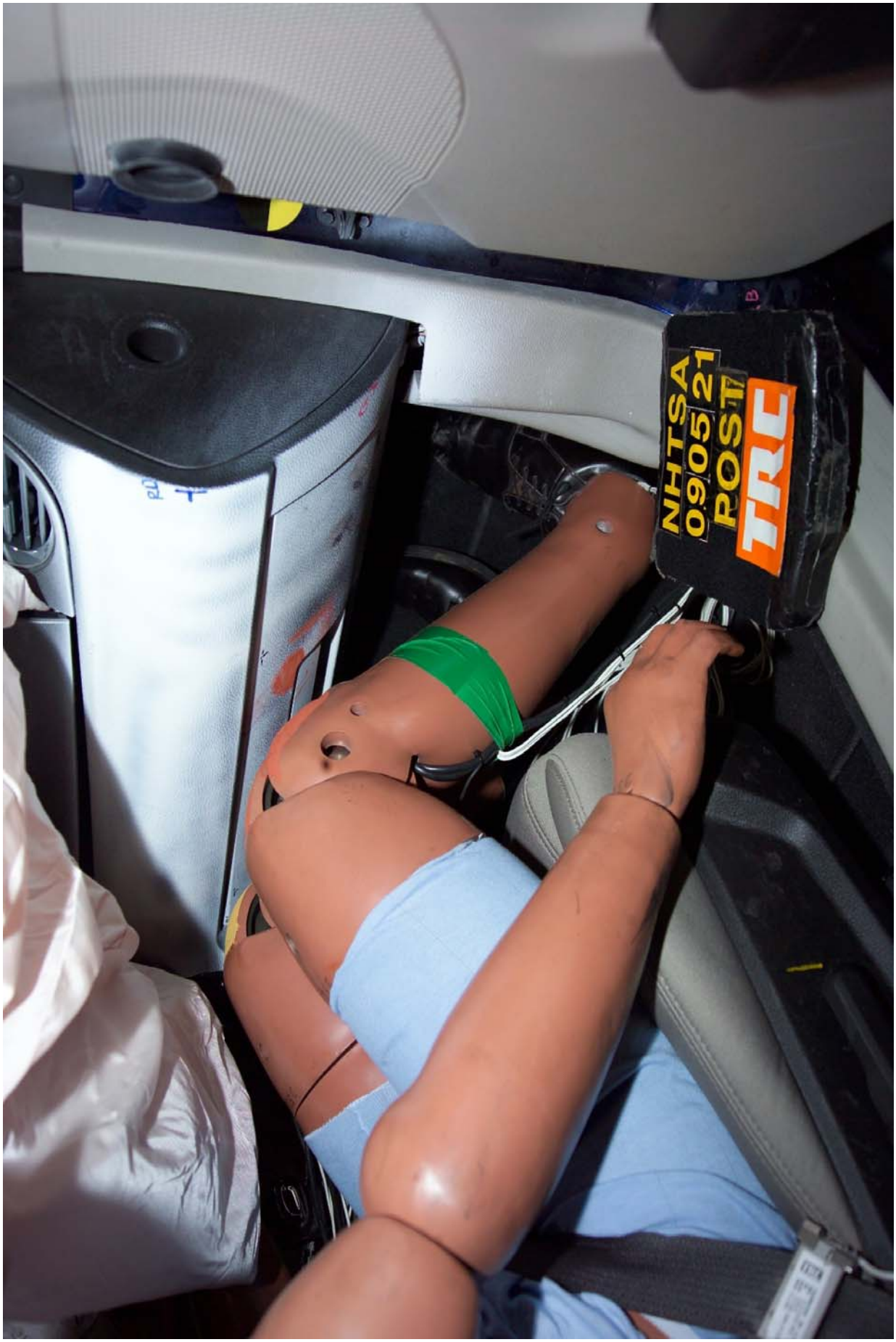


Figure A-62 Post-Test Right Front Passenger Dummy Knee Bolster View

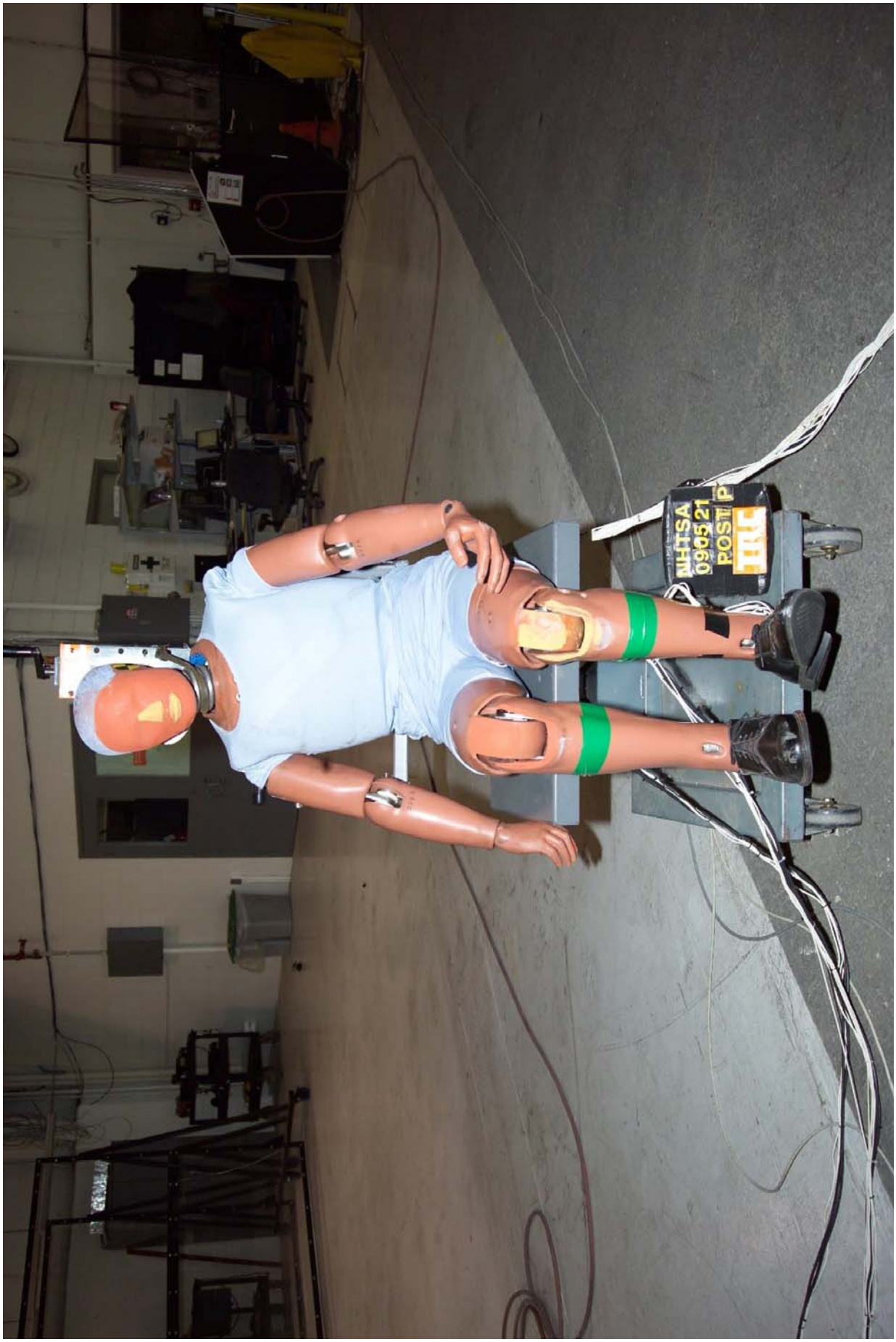


Figure A-63 Post-Test Right Front Passenger Dummy Overall View

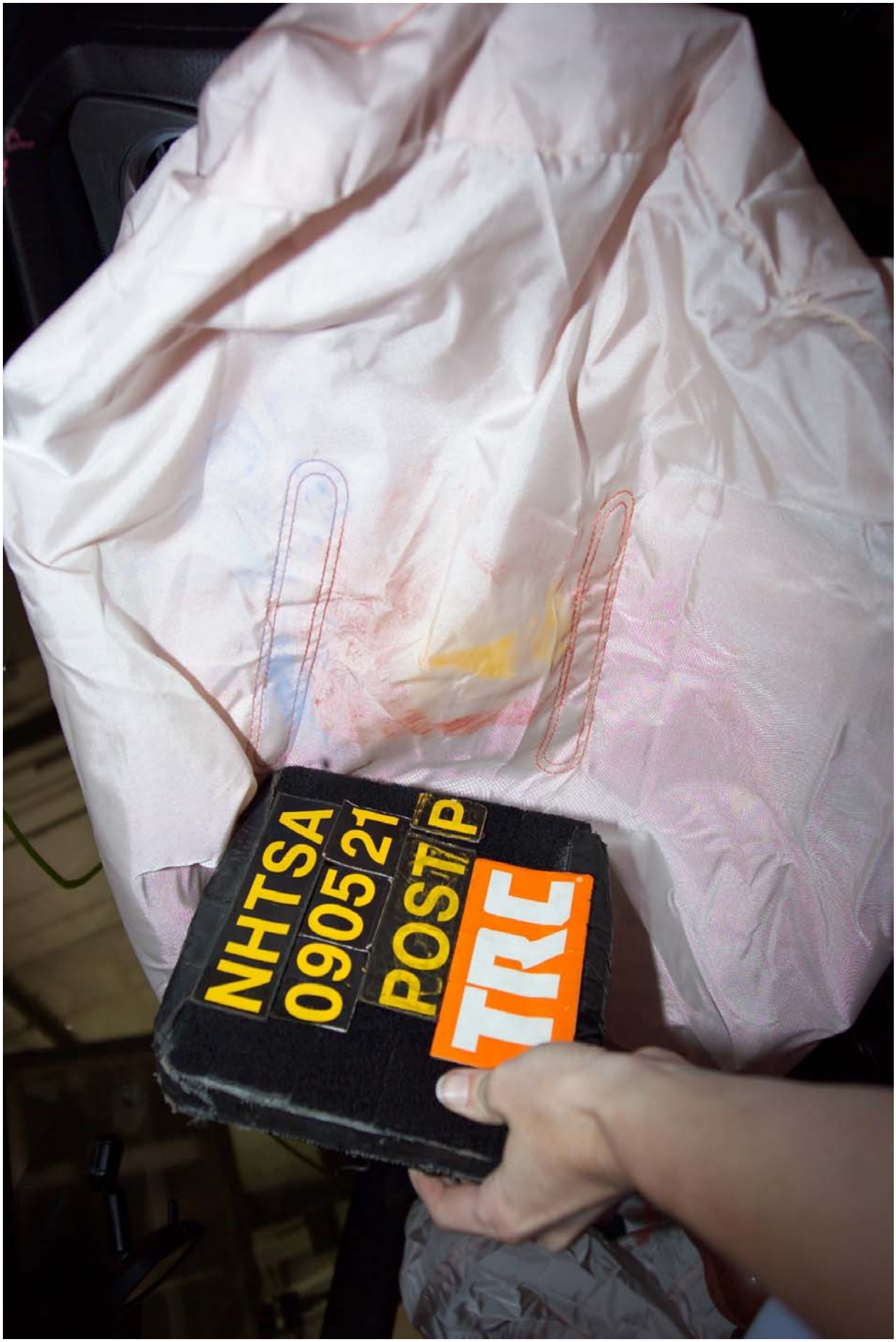


Figure A-64 Post-Test Right Front Passenger Dummy Head Contact - View 1

Figure A-65 Post-Test Right Front Passenger Dummy Head Contact - View 2

Figure A-66 Post-Test Right Front Passenger Dummy Knee Contact View

Figure A-67 Post-Test Light Trap Digital Read-Out - View 1

Figure A-68 Post-Test Light Trap Digital Read-Out - View 2

Figure A-69 Post-Test Light Trap Digital Read-Out - View 3

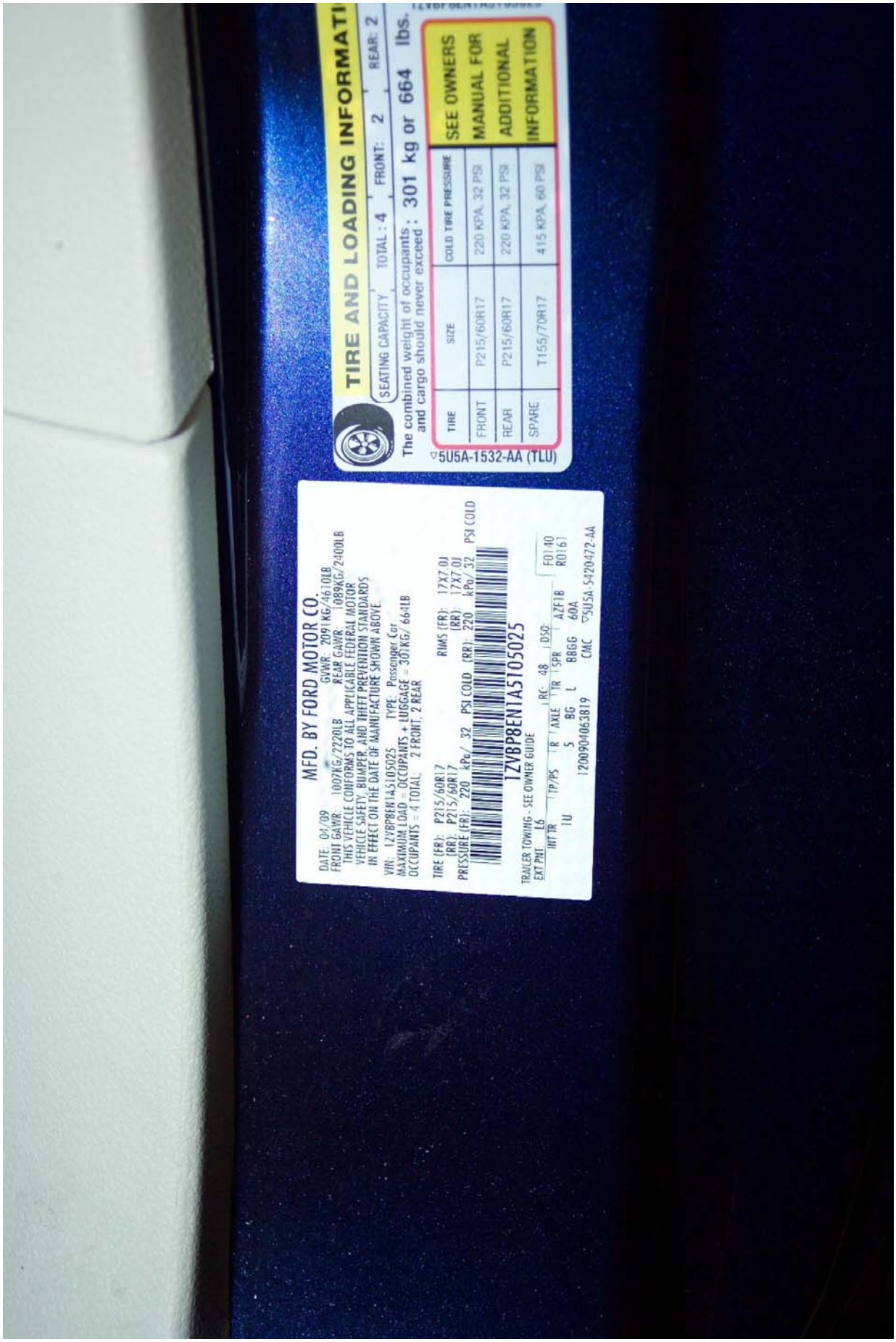


Figure A-70 Vehicle Certification Label View

Figure A-71 Vehicle Tire Load Label View

Figure A-72 FMVSS 301 Rollover View at 90°

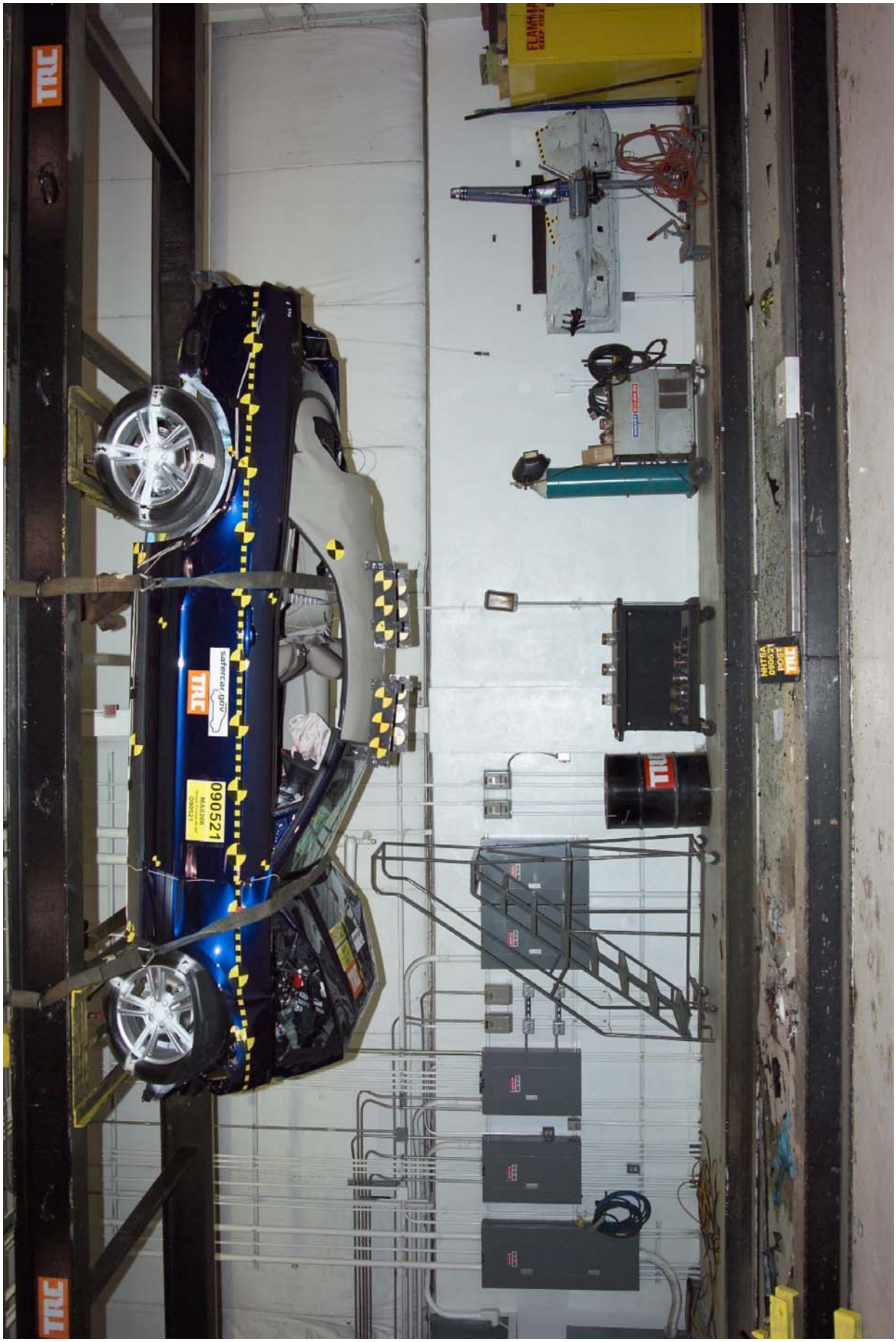


Figure A-73 FMVSS 301 Rollover View at 180°

Figure A-74 FMVSS 301 Rollover View at 270°

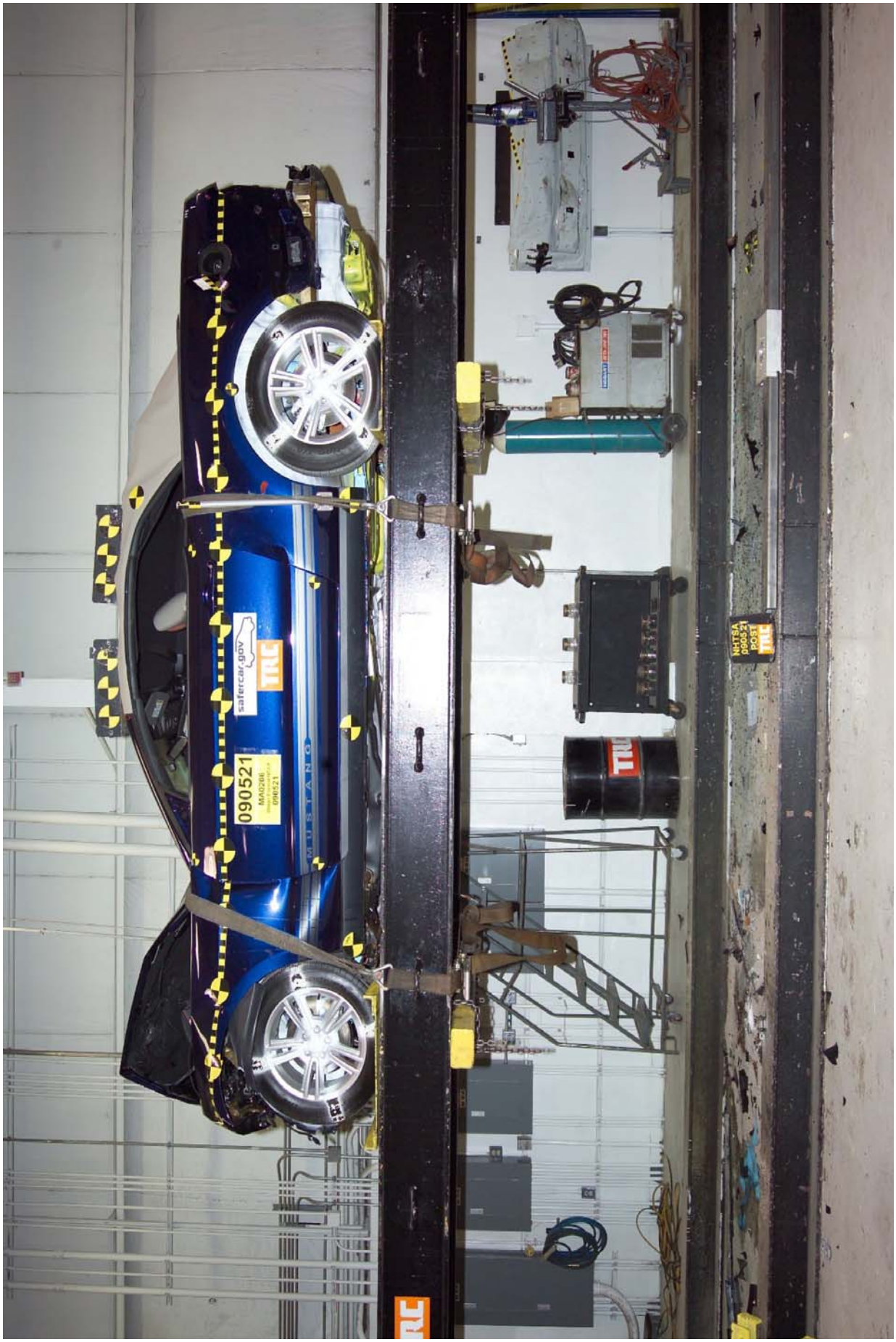


Figure A-75 FMVSS 301 Rollover View at 360°

Figure A-76 Impact Event

APPENDIX B

HIII 50TH, VEHICLE, AND BARRIER RESPONSE DATA PLOTS

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 Redundant
	Driver Head Y Redundant
	Driver Head Z Redundant
	Driver Head Resultant 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 Chest X Redundant
	Driver Chest Y Redundant
	Driver Chest Z Redundant
	Driver Chest Resultant Redundant
	Driver Chest Displacement
	Driver Pelvis X
	Driver Pelvis Y
	Driver Pelvis Z
	Driver Pelvis Resultant
	Driver Left Femur Z Force
	Driver Right Femur Z Force
	Driver Left Upper Tibia Moment X
	Driver Left Upper Tibia Moment Y
	Driver Left Lower Tibia Force Z
	Driver Left Lower Tibia Moment X
	Driver Left Lower Tibia Moment Y
	Driver Left Foot X
	Driver Left Foot Z
	Driver Left Toe Z
	Driver Right Upper Tibia Moment X
	Driver Right Upper Tibia Moment Y
	Driver Right Lower Tibia Force Z
	Driver Right Lower Tibia Moment X

Driver Right Lower Tibia Moment Y
Driver Right Foot X
Driver Right Foot Z
Driver Right Toe Z
Passenger Head X Redundant
Passenger Head Y Redundant
Passenger Head Z Redundant
Passenger Head Resultant Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Chest X Redundant
Passenger Chest Y Redundant
Passenger Chest Z Redundant
Passenger Chest Resultant Redundant
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Left Femur Z Force
Passenger Right Femur Z Force
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Foot X
Passenger Left Foot Z
Passenger Left Toe Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Lower Tibia Force Z

Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Foot X
Passenger Right Foot Z
Passenger Right Toe Z
Vehicle Left Rear Crossmember X
Vehicle Right Rear Crossmember X
Vehicle Left Rear Crossmember Z
Vehicle Right Rear Crossmember Z
Vehicle Top of Engine Block X
Vehicle Bottom of Engine Block X
Vehicle Right Brake Caliper X
Vehicle Left Brake Caliper X
Vehicle Instrument Panel X
Vehicle Instrument Panel Velocity
Vehicle Instrument Panel Displacement
Driver Lap Belt Force
Driver Shoulder Belt Force
Passenger Lap Belt Force
Passenger Shoulder Belt Force
Driver Belt Elongation
Passenger Belt Elongation
Barrier Load Cell A1
Barrier Load Cell A2
Barrier Load Cell A3
Barrier Load Cell A4
Barrier Load Cell A5
Barrier Load Cell A6
Barrier Load Cell A7
Barrier Load Cell A8
Barrier Load Cell A9
Barrier Load Cell B1
Barrier Load Cell B2
Barrier Load Cell B3
Barrier Load Cell B4
Barrier Load Cell B5

NHTSA

Test Date: 05/21/2009

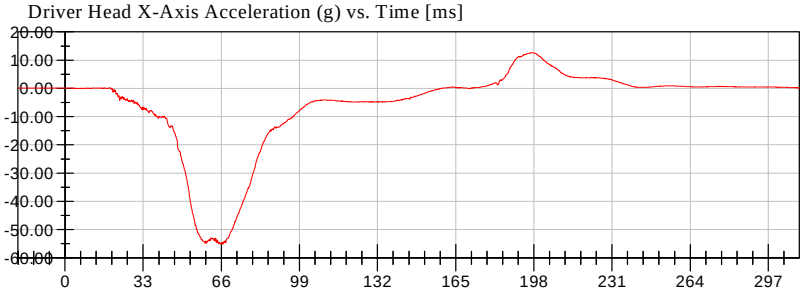
Test Lab: CTF

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Test Number: 090521-1 (MA0206)

Position #2 Hybrid III Mid-Sized Adult Male Dummy (352)

Driver Head X-Axis Acceleration (g) vs. Time [ms]



<Max>

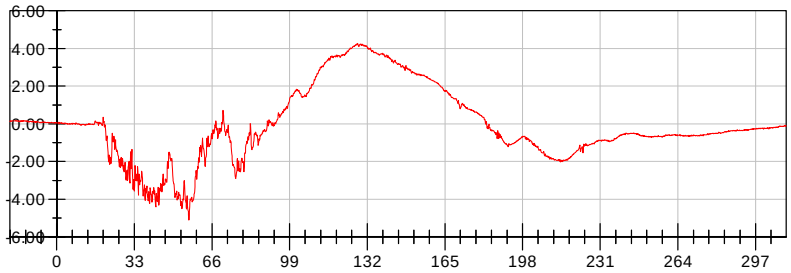
12.63 g at 197.50 ms

<Min>

-55.16 g at 66.40 ms

CFC_1000

Driver Head Y-Axis Acceleration (g) vs. Time [ms]



<Max>

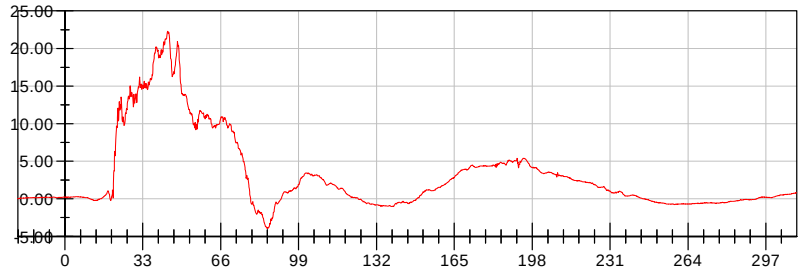
4.25 g at 127.60 ms

<Min>

-5.12 g at 56.10 ms

CFC_1000

Driver Head Z-Axis Acceleration (g) vs. Time [ms]



<Max>

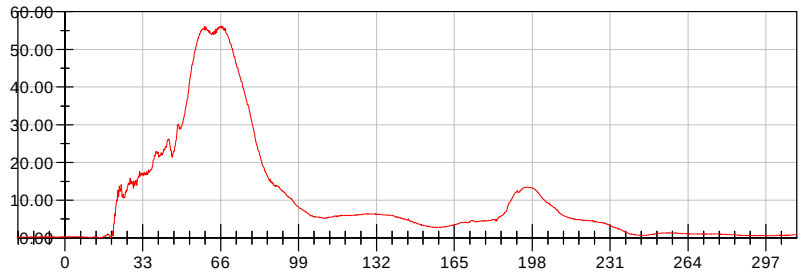
22.31 g at 43.50 ms

<Min>

-3.91 g at 85.60 ms

CFC_1000

Driver Head Resultant Acceleration (g) vs. Time [ms]



<Max>

56.22 g at 66.40 ms

<Min>

0.06 g at 10.80 ms

CFC_1000

NHTSA

Test Date: 05/21/2009

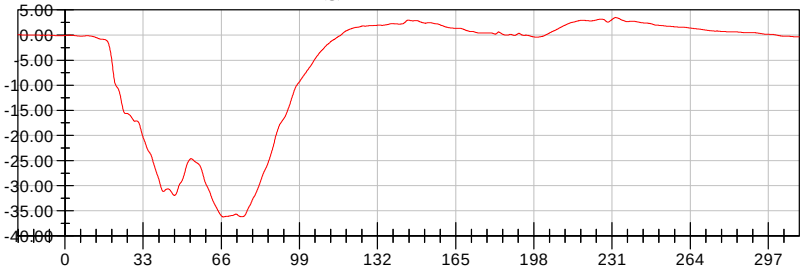
Test Lab: CTF

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Test Number: 090521-1 (MA0206)

Position #2 Hybrid III Mid-Sized Adult Male Dummy (352)

Driver Chest X-Axis Acceleration (g) vs. Time [ms]



<Max>

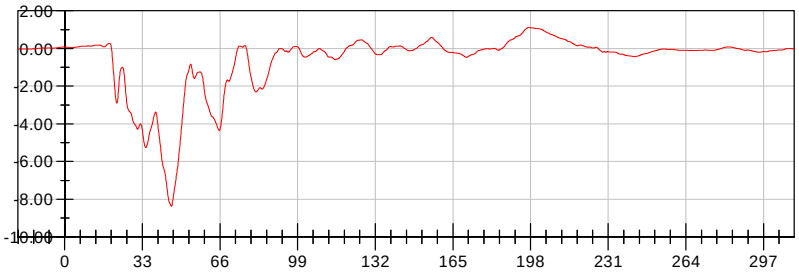
3.48 g at 232.60 ms

<Min>

-36.22 g at 66.80 ms

CFC_180

Driver Chest Y-Axis Acceleration (g) vs. Time [ms]



<Max>

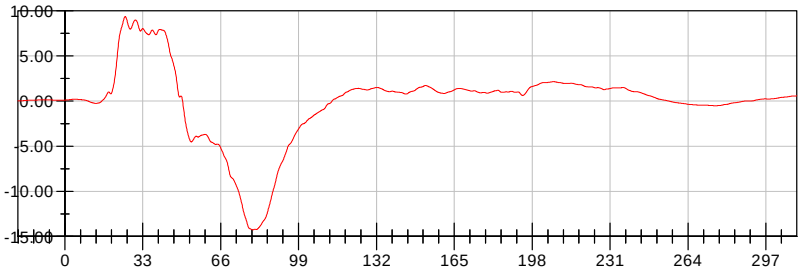
1.10 g at 197.30 ms

<Min>

-8.38 g at 45.40 ms

CFC_180

Driver Chest Z-Axis Acceleration (g) vs. Time [ms]



<Max>

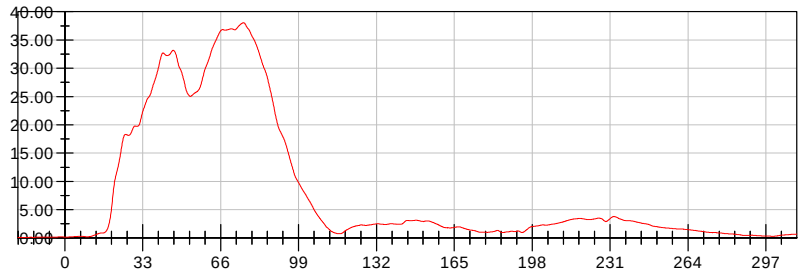
9.35 g at 25.50 ms

<Min>

-14.28 g at 79.60 ms

CFC_180

Driver Chest Resultant Acceleration (g) vs. Time [ms]



<Max>

38.07 g at 75.60 ms

<Min>

0.06 g at -18.50 ms

CFC_180

NHTSA

Test Date: 05/21/2009

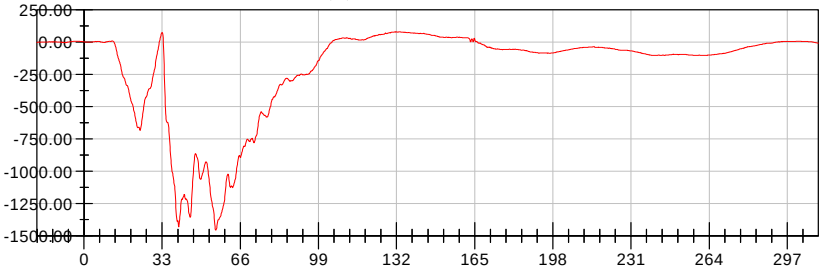
Test Lab: CTF

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Test Number: 090521-1 (MA0206)

Position #2 Hybrid III Mid-Sized Adult Male Dummy (352)

Driver Left Femur Z-Axis Force (N) vs. Time [ms]



<Max>

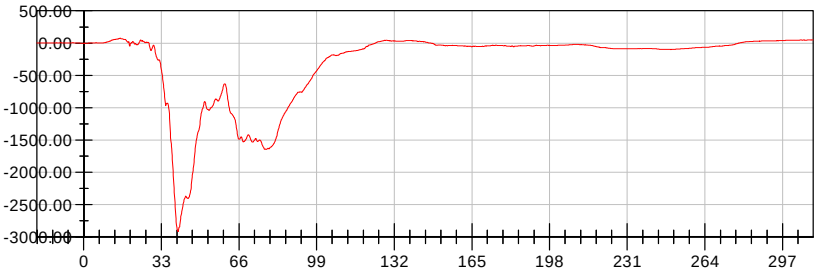
80.84 N at 133.40 ms

<Min>

-1,454.58 N at 55.60 ms

CFC_600

Driver Right Femur Z-Axis Force (N) vs. Time [ms]



<Max>

73.87 N at 15.50 ms

<Min>

-2,920.23 N at 40.10 ms

CFC_600

NHTSA

Test Date: 05/21/2009

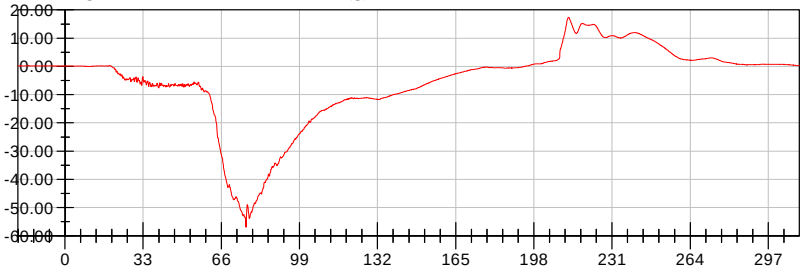
Test Lab: CTF

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Test Number: 090521-1 (MA0206)

Position #2 Hybrid III Mid-Sized Adult Male Dummy (352)

Passenger Head X-Axis Acceleration (g) vs. Time [ms]



<Max>

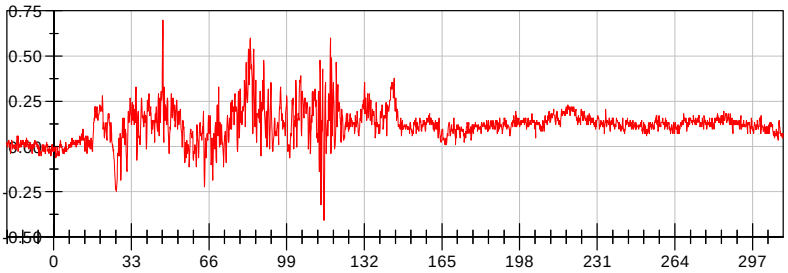
17.36 g at 212.60 ms

<Min>

-56.98 g at 76.50 ms

CFC_1000

Passenger Head Y-Axis Acceleration (g) vs. Time [ms]



<Max>

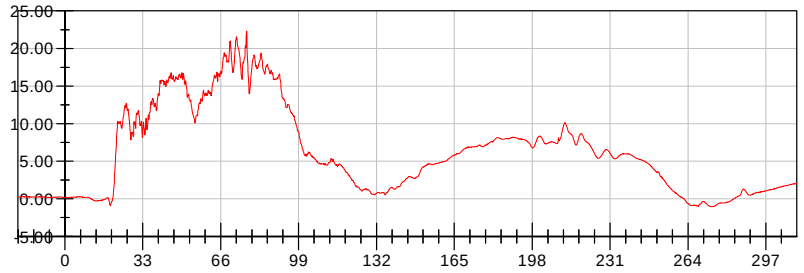
0.70 g at 46.40 ms

<Min>

-0.41 g at 114.90 ms

CFC_1000

Passenger Head Z-Axis Acceleration (g) vs. Time [ms]



<Max>

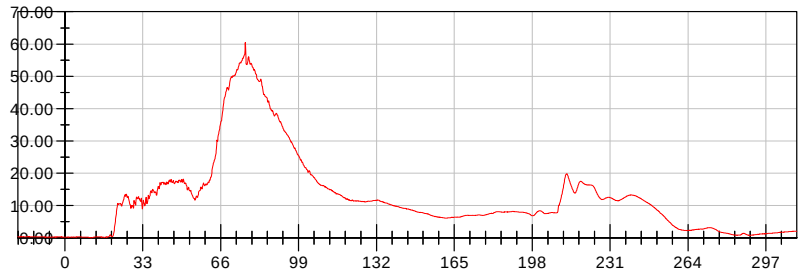
22.32 g at 77.00 ms

<Min>

-1.05 g at 274.40 ms

CFC_1000

Passenger Head Resultant Acceleration (g) vs. Time [ms]



<Max>

60.51 g at 76.50 ms

<Min>

0.02 g at 11.00 ms

CFC_1000

NHTSA

Test Date: 05/21/2009

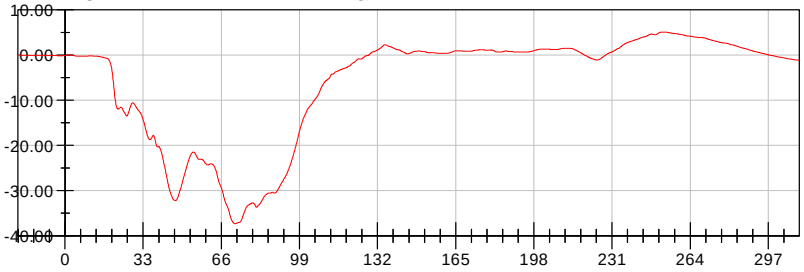
Test Lab: CTF

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Test Number: 090521-1 (MA0206)

Position #2 Hybrid III Mid-Sized Adult Male Dummy (352)

Passenger Chest X-Axis Acceleration (g) vs. Time [ms]



<Max>

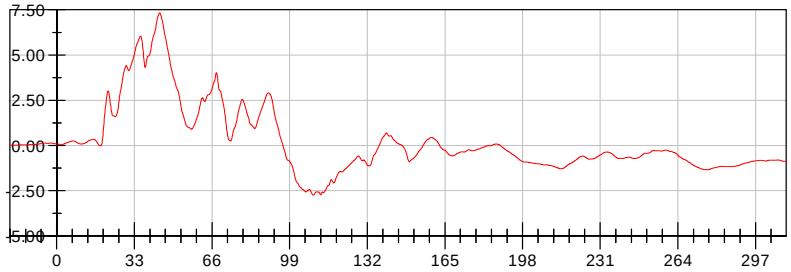
5.11 g at 251.90 ms

<Min>

-37.32 g at 72.00 ms

CFC_180

Passenger Chest Y-Axis Acceleration (g) vs. Time [ms]



<Max>

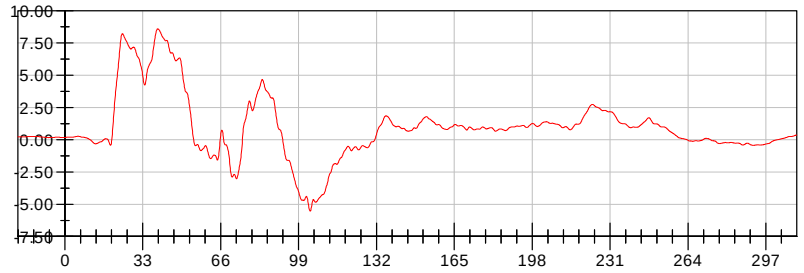
7.32 g at 43.80 ms

<Min>

-2.76 g at 109.10 ms

CFC_180

Passenger Chest Z-Axis Acceleration (g) vs. Time [ms]



<Max>

8.60 g at 39.30 ms

<Min>

-5.54 g at 103.90 ms

CFC_180

Passenger Chest Resultant Acceleration (g) vs. Time [ms]

<Max>

37.44 g at 71.90 ms

<Min>

0.16 g at 10.80 ms

CFC_180

NHTSA

Test Date: 05/21/2009

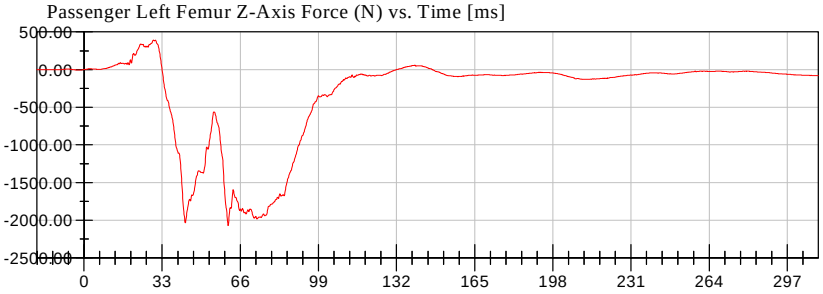
Test Lab: CTF

Position #1 Hybrid III Mid-Sized Adult Male Dummy (37)

Test Number: 090521-1 (MA0206)

Position #2 Hybrid III Mid-Sized Adult Male Dummy (352)

Passenger Left Femur Z-Axis Force (N) vs. Time [ms]



<Max>

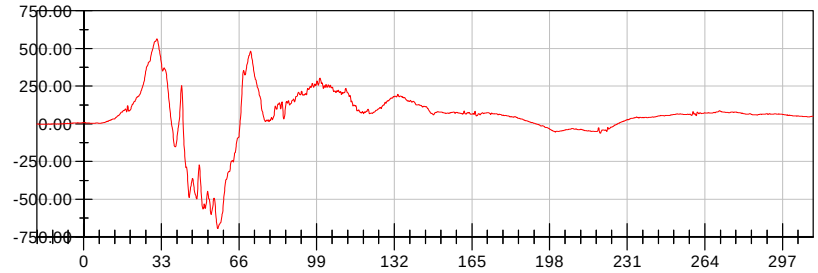
391.92 N at 30.20 ms

<Min>

-2,069.86 N at 60.80 ms

CFC_600

Passenger Right Femur Z-Axis Force (N) vs. Time [ms]



<Max>

563.63 N at 31.10 ms

<Min>

-696.79 N at 57.00 ms

CFC_600

APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HIII 50th Male: 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 04

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	883	Yes
B	Shoulder Pivot Height	505.5 - 520.7	519	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	93	Yes
F	Thigh Clearance	139.7 - 154.9	150	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	292	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	340	Yes
J	Elbow Rest Height	190.5 - 210.8	196	Yes
K	Buttock Knee Length	579.1 - 604.5	601	Yes
L	Popliteal Height	429.3 - 454.7	435	Yes
M	Knee Pivot Height	485.1 - 500.4	497	Yes
N	Buttock Popliteal Length	452.1 - 477.5	469	Yes
O	Chest Depth	213.4 - 228.6	221	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	435	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	988	Yes
Z	Waist Circumference	835.7 - 866.1	860	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Technician

Approved

Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	248.4 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	13.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

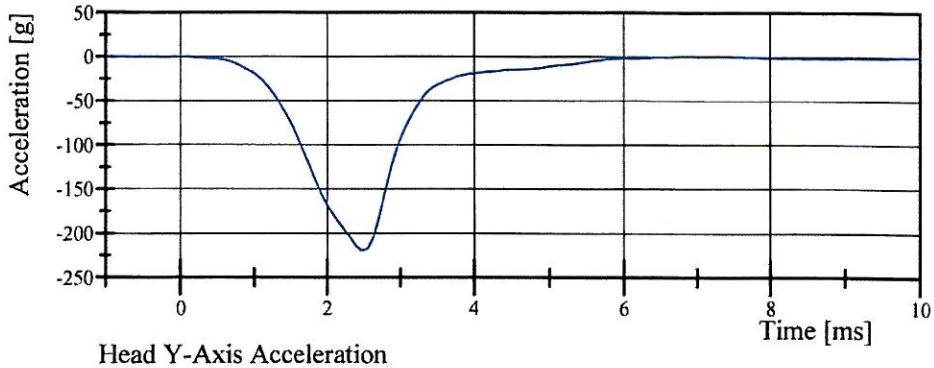
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.20.2009 07:52:08 609

Transportation Research Center Inc.

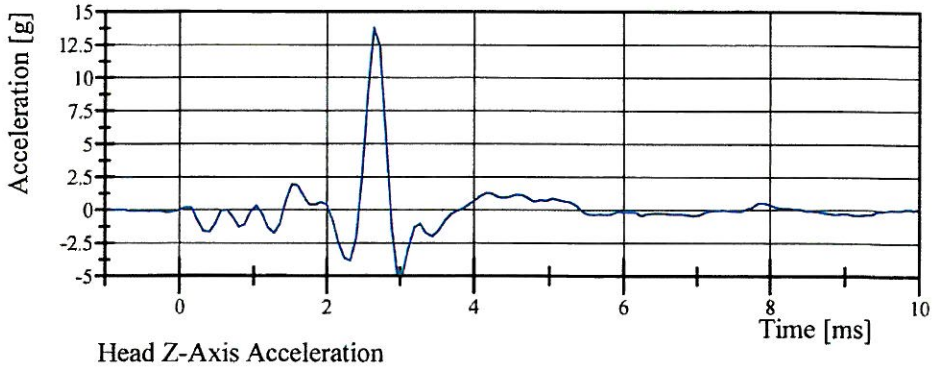
Front Head Drop
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/20/2009

Head X-Axis Acceleration



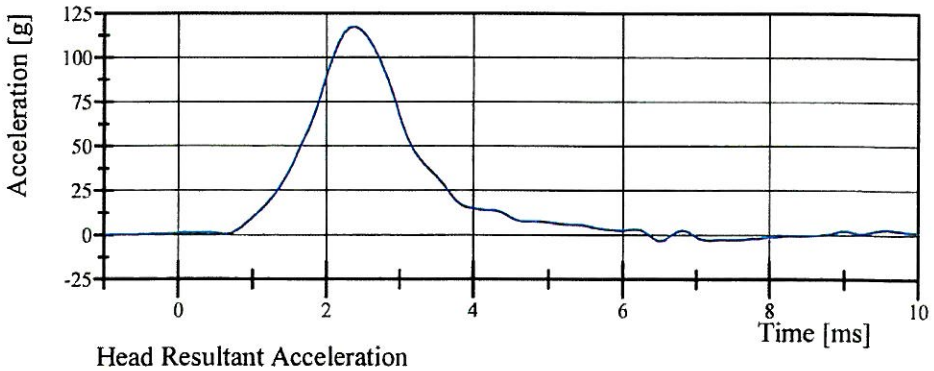
Filter Class: CFC_1000
Max: 0.9 g at 6.9 ms
Min: -219.8 g at 2.5 ms

Head Y-Axis Acceleration



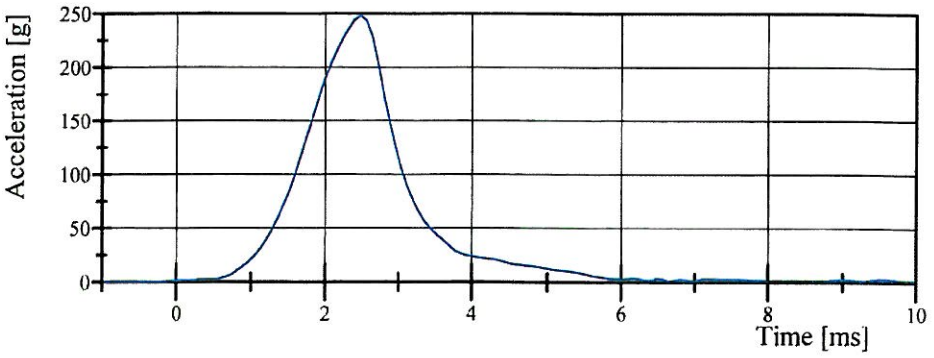
Filter Class: CFC_1000
Max: 13.8 g at 2.6 ms
Min: -4.8 g at 3.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 117.4 g at 2.4 ms
Min: -3.5 g at 6.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 248.4 g at 2.5 ms
Min: 0.1 g at -0.9 ms

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

05.20.2009 07:52:14 609

Transportation Research Center Inc.

Neck Flexion
HIII 50th Serial No. 037 Certification No. 4-2
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.956 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.2 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-27.32 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.58 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-16.65 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-16.65 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-73.6 °	Yes
Time of Peak	57 - 64 ms	59.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	116.4 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	107.4 N·m	Yes
Time of Peak	47 - 58 ms	50.4 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	97.1 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

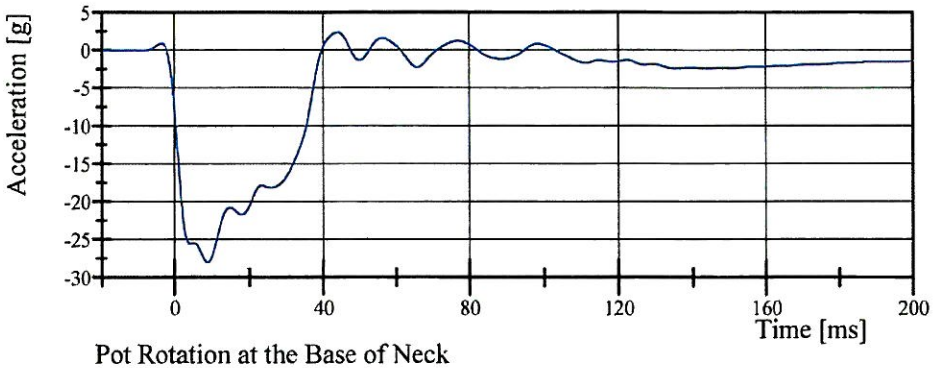
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.20.2009 10:05:36 2969

Transportation Research Center Inc.

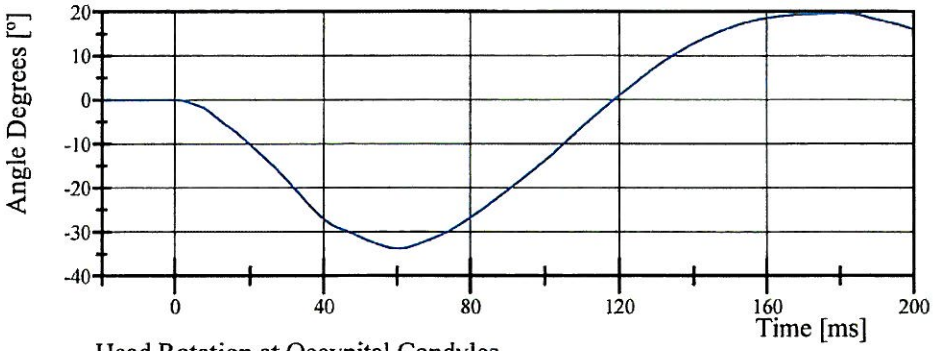
Neck Flexion
HIII 50th Serial No. 037 Certification No. 4-2
Test Date: 5/20/2009

Pendulum Acceleration



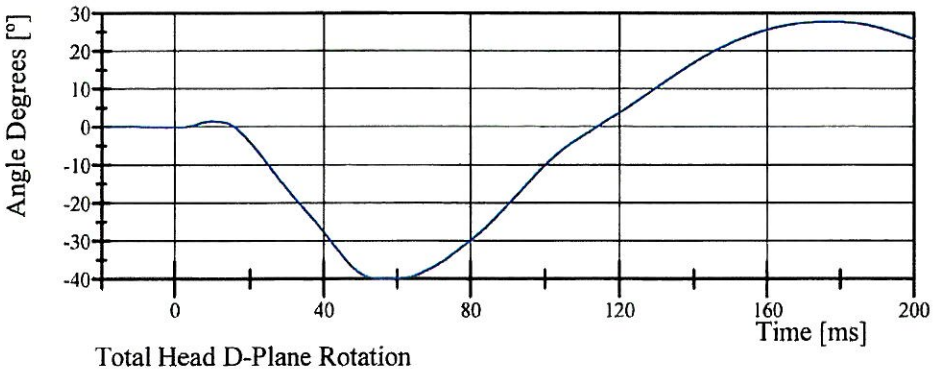
Filter Class: CFC_60
Max: 2.4 g at 43.8 ms
Min: -28.0 g at 8.9 ms

Pot Rotation at the Base of Neck



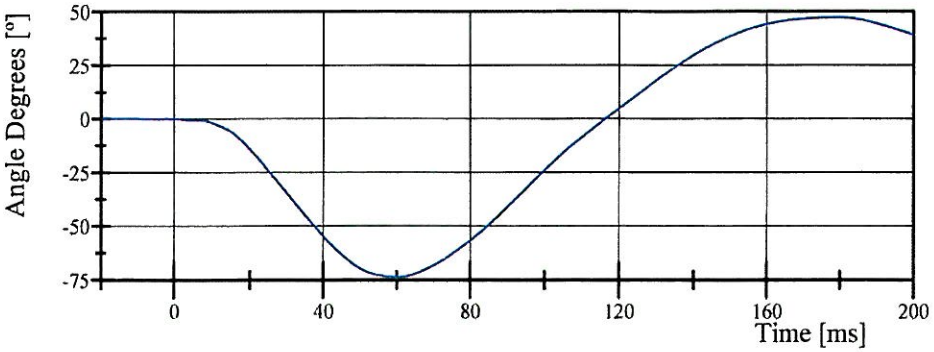
Filter Class: CFC_60
Max: 19.7 ° at 180.9 ms
Min: -33.8 ° at 60.5 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 27.7 ° at 177.2 ms
Min: -40.0 ° at 56.5 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 47.4 ° at 179.8 ms
Min: -73.6 ° at 59.9 ms

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

05.20.2009 10:05:46 2969

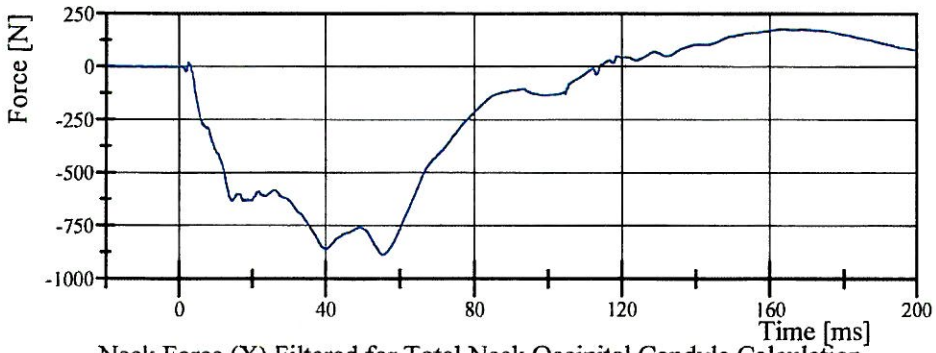
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 4-2

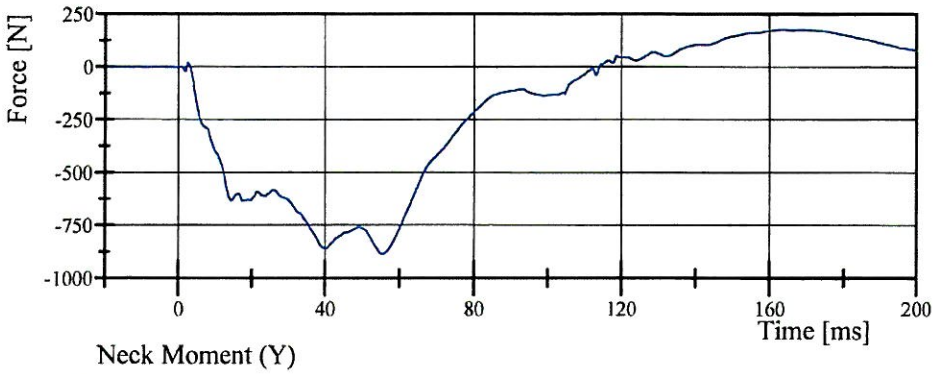
Test Date: 5/20/2009

Neck Force (X)



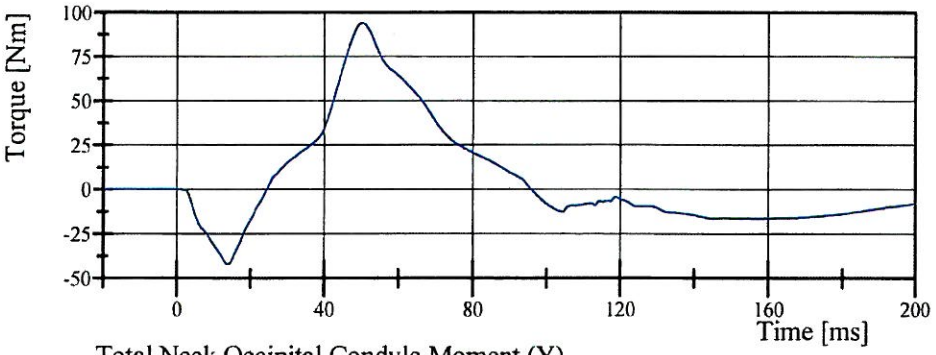
Filter Class: CFC_1000
Max: 178.5 N at 163.9 ms
Min: -886.7 N at 55.4 ms

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



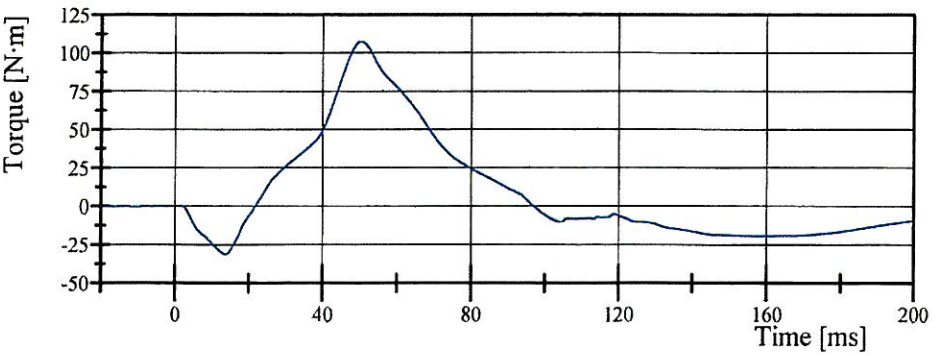
Filter Class: CFC_600
Max: 178.1 N at 163.3 ms
Min: -886.2 N at 55.4 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 93.9 Nm at 50.2 ms
Min: -42.2 Nm at 13.9 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 107.4 N·m at 50.4 ms
Min: -31.3 N·m at 13.8 ms

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

05.20.2009 10:05:47 2969

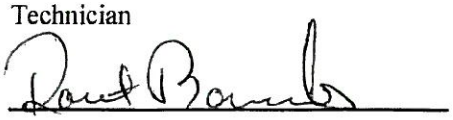
Transportation Research Center Inc.

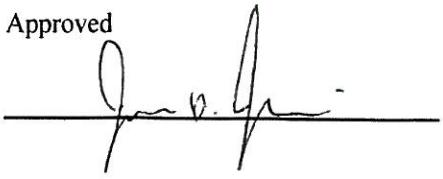
Neck Extension
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.969 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	42.3 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.11 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.04 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.90 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.90 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	95.5 °	Yes
Time of Peak	72 - 82 ms	77.8 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	159.9 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-65.9 N·m	Yes
Time of Peak	65 - 79 ms	72.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	143.1 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

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

05.20.2009 10:36:01 3049

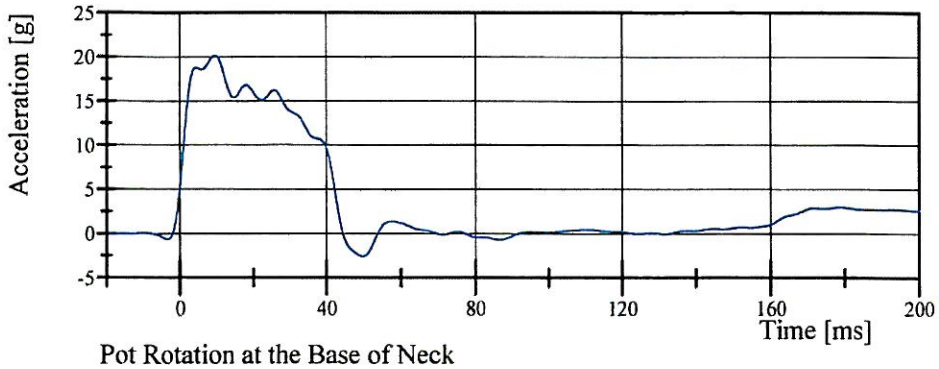
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 4-1

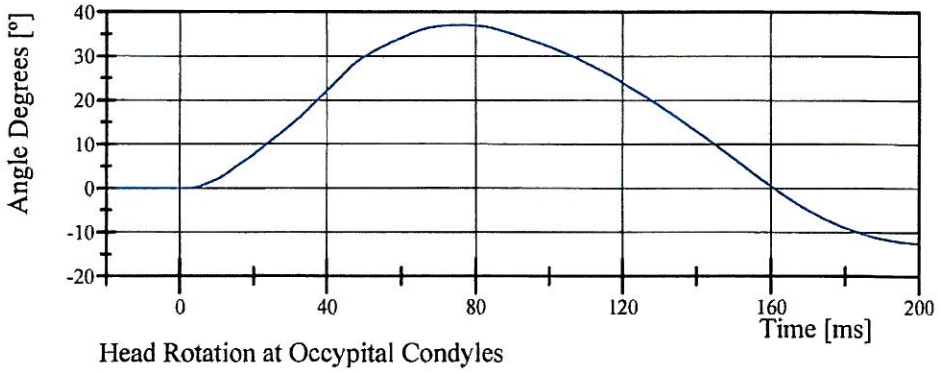
Test Date: 5/20/2009

Pendulum Acceleration



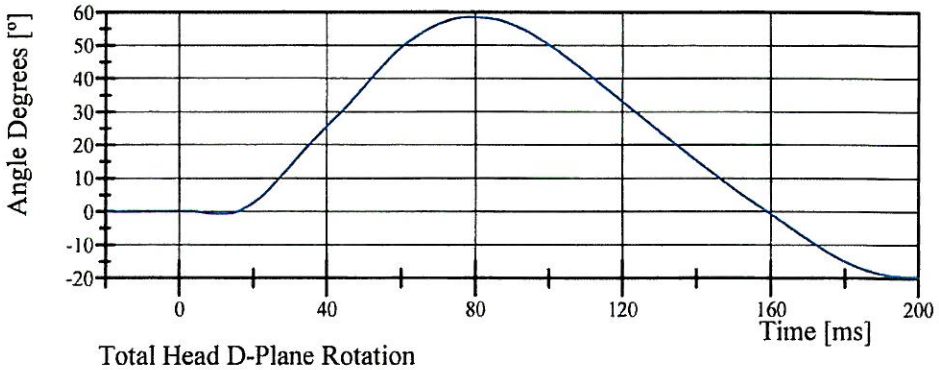
Filter Class: CFC_60
Max: 20.2 g at 9.5 ms
Min: -2.6 g at 49.8 ms

Pot Rotation at the Base of Neck



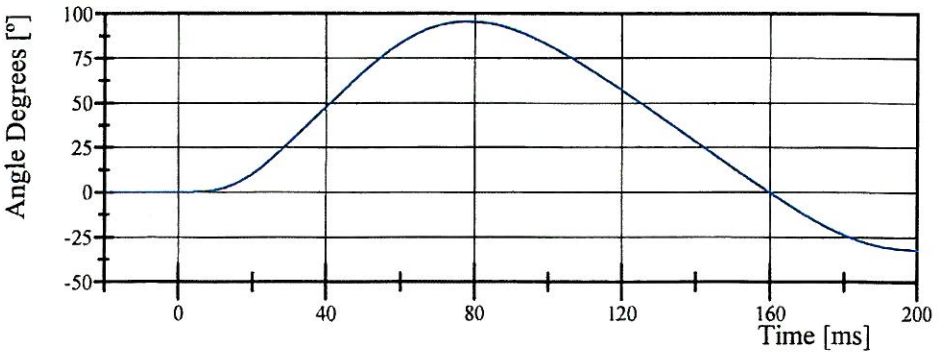
Filter Class: CFC_60
Max: 37.1 ° at 75.5 ms
Min: -12.5 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 58.5 ° at 78.6 ms
Min: -19.6 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 95.5 ° at 77.8 ms
Min: -32.1 ° at 200.0 ms

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

05.20.2009 10:36:10 3049

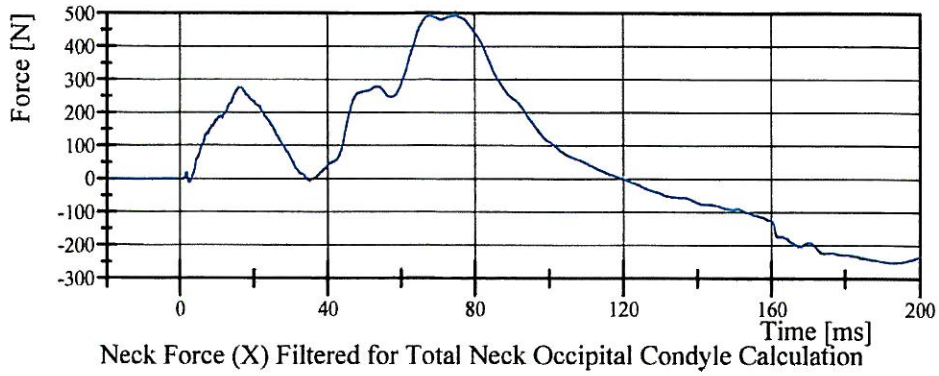
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 4-1

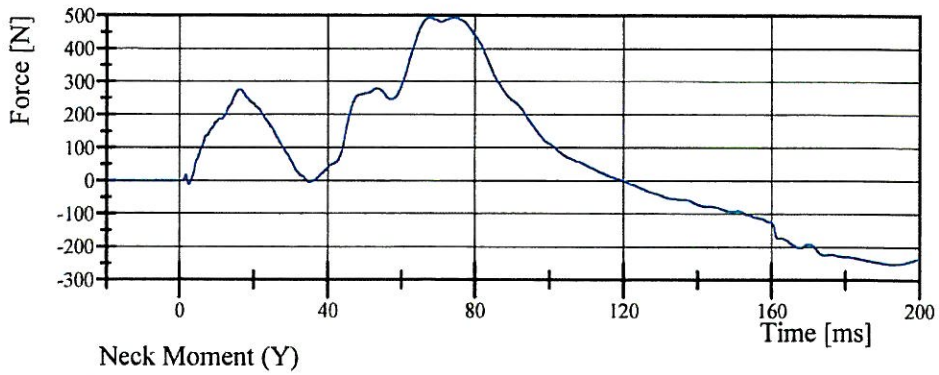
Test Date: 5/20/2009

Neck Force (X)



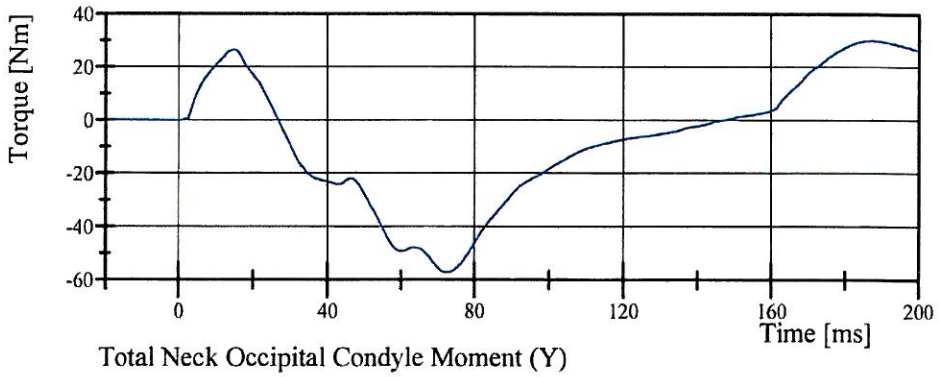
Filter Class: CFC_1000
Max: 494.8 N at 74.7 ms
Min: -252.2 N at 193.4 ms

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



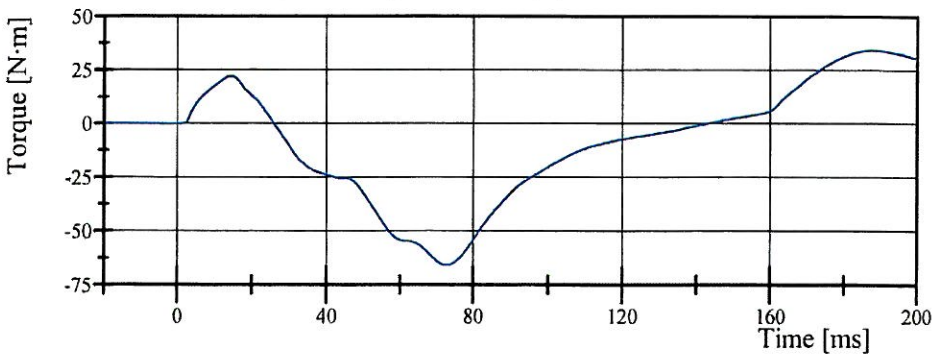
Filter Class: CFC_600
Max: 494.3 N at 74.7 ms
Min: -251.8 N at 193.3 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 30.0 Nm at 187.1 ms
Min: -57.2 Nm at 72.3 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 34.3 N·m at 187.3 ms
Min: -65.9 N·m at 72.8 ms

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

05.20.2009 10:36:11 3049

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.778 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,875.1 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-66.44 mm	Yes
Internal Hysteresis	65 - 85 %	76.9 %	Yes

Test meets specifications.

Comments:

Technician

Approved

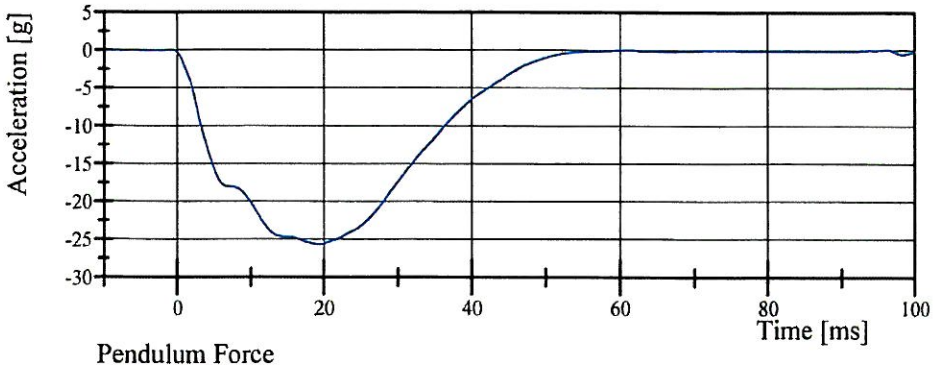
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

05.20.2009 13:16:53 370

Transportation Research Center Inc.

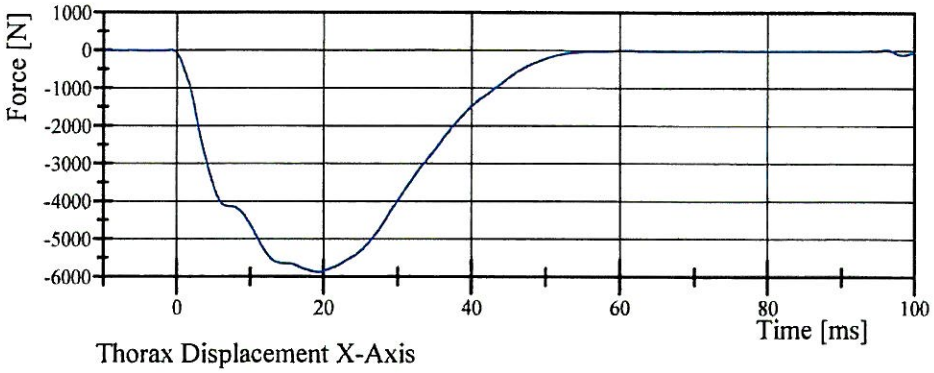
Front Thorax
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/20/2009

Pendulum Acceleration



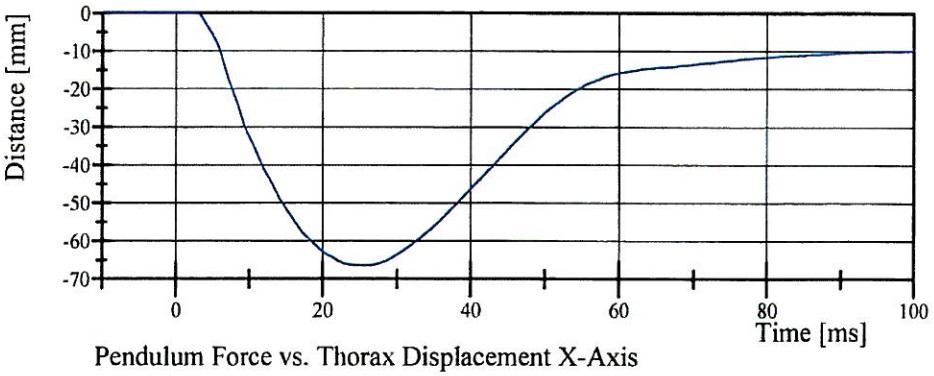
Filter Class: CFC_180
Max: 0.1 g at 96.2 ms
Min: -25.6 g at 19.4 ms

Pendulum Force



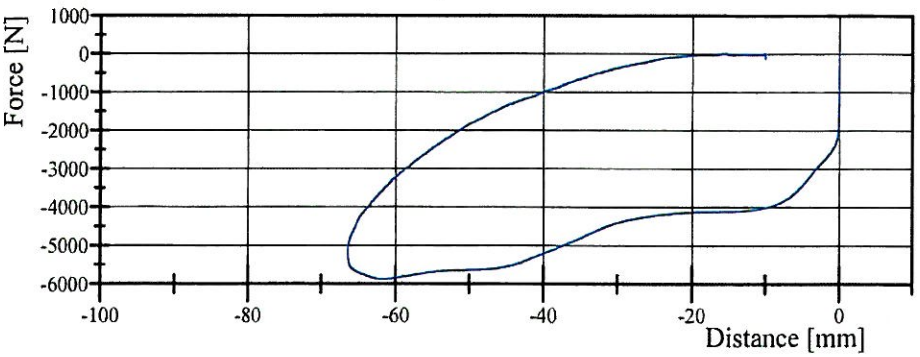
Filter Class: CFC_180
Max: 22.0 N at 96.2 ms
Min: -5,875.1 N at 19.4 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -1.8 ms
Min: -66.4 mm at 25.9 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 22.0 N at -10.1 mm
Min: -5,875.1 N at -61.8 mm

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

05.20.2009 13:17:00 370

Transportation Research Center Inc

Hybrid III Hip Range of Motion

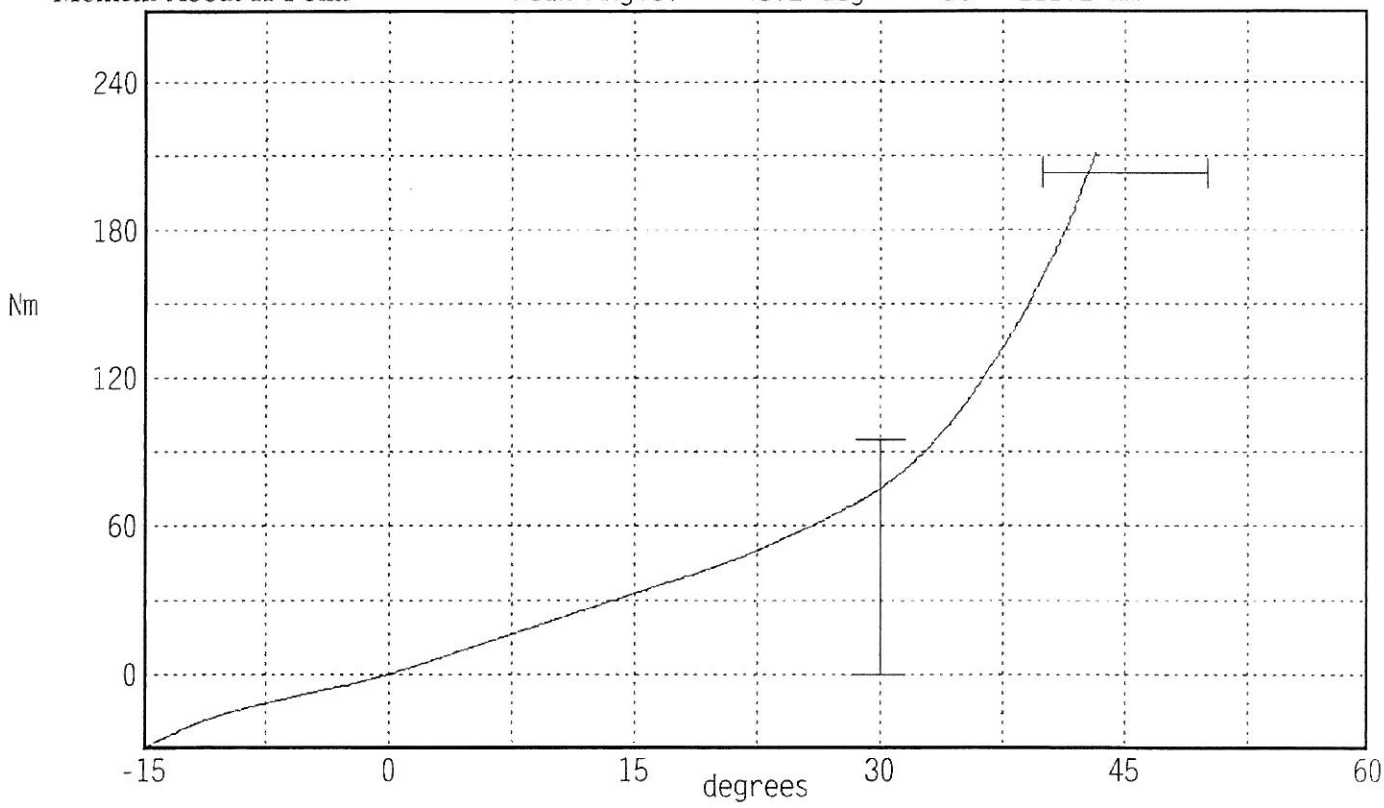
Serial Number: 037L
Test Number: 037C04
Comments:

Date: 05/19/2009
Time: 15:31

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	27	%	Pass
Moment at 30 deg	<= 94.9	75.2	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	42.8	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

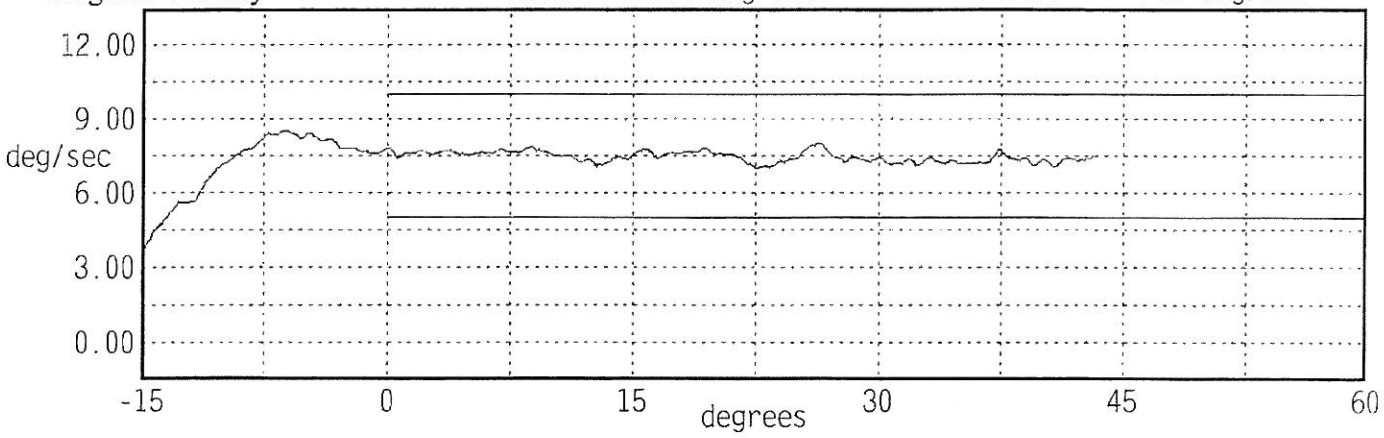
Moment About H-Point

Peak Moment: 211.2 Nm at 43.2 deg
Peak Angle: 43.2 deg at 211.2 Nm



Angular Velocity

Max: 8.0 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

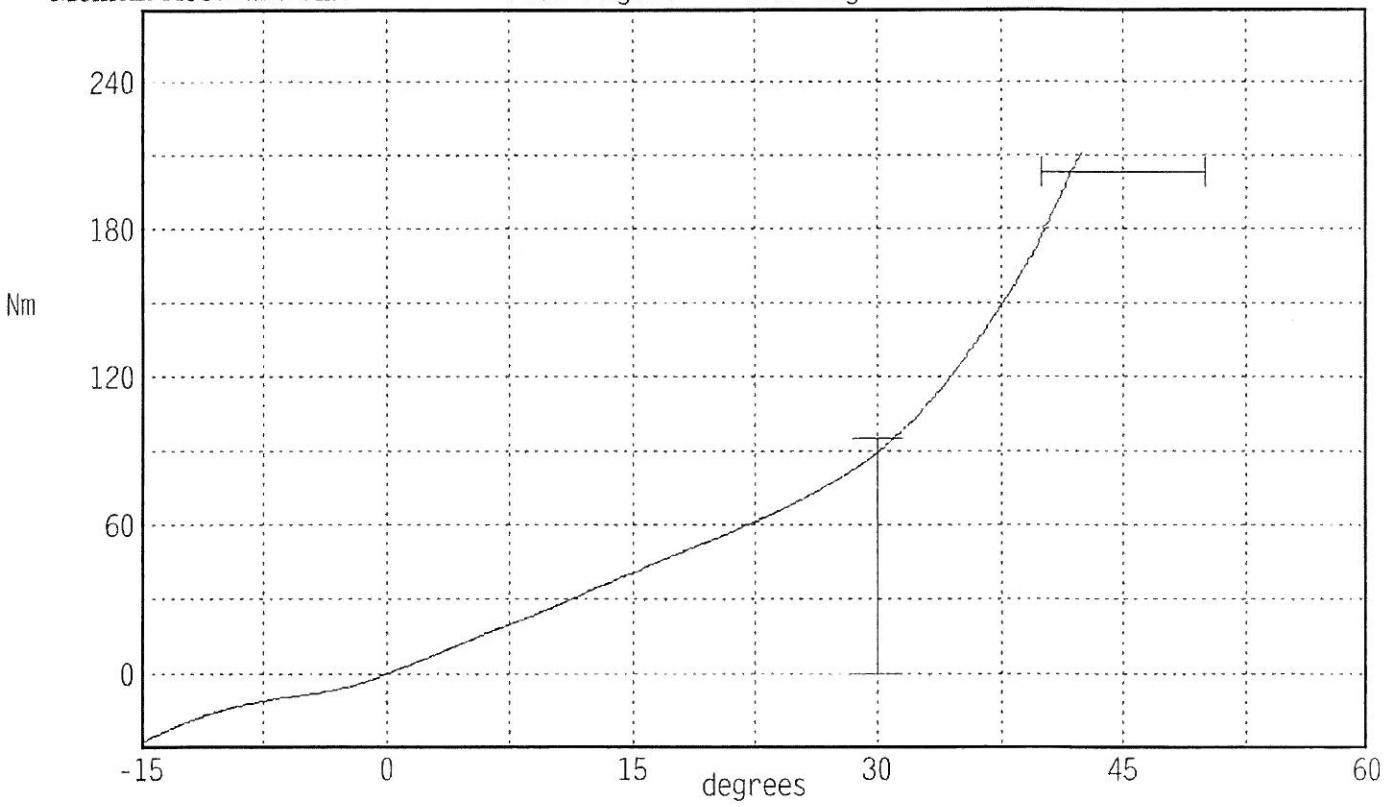
Serial Number: 037R
Test Number: 037C04
Comments:

Date: 05/19/2009
Time: 15:52

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	27	%	Pass
Moment at 30 deg	<= 94.9	89.3	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	41.9	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

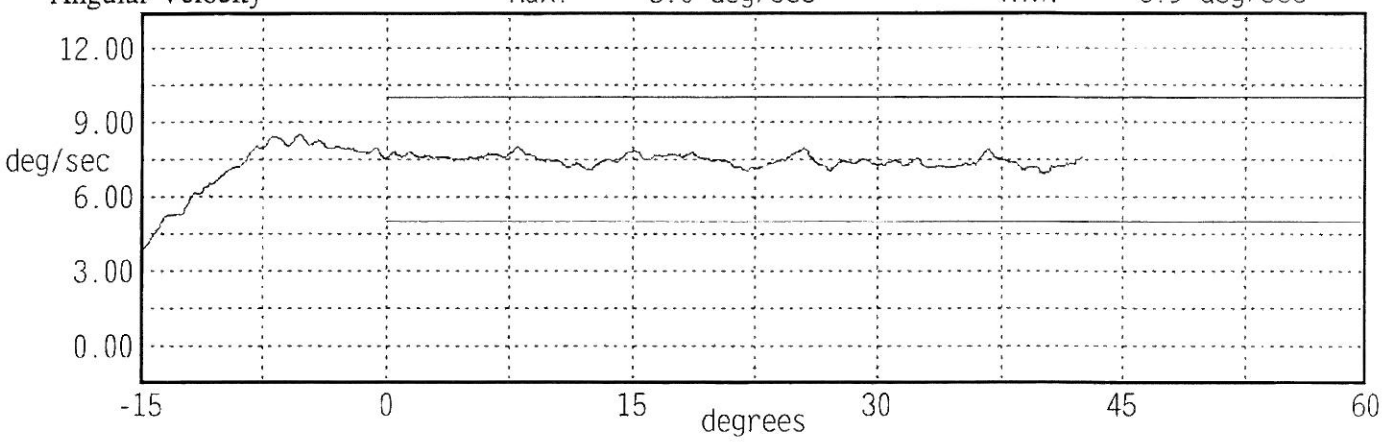
Moment About H-Point

Peak Moment: 211.0 Nm at 42.5 deg
Peak Angle: 42.5 deg at 211.0 Nm



Angular Velocity

Max: 8.0 deg/sec Min: 6.9 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 4-2
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.089 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,769.73 N	Yes

Test meets specifications.

Comments:

Technician

Approved

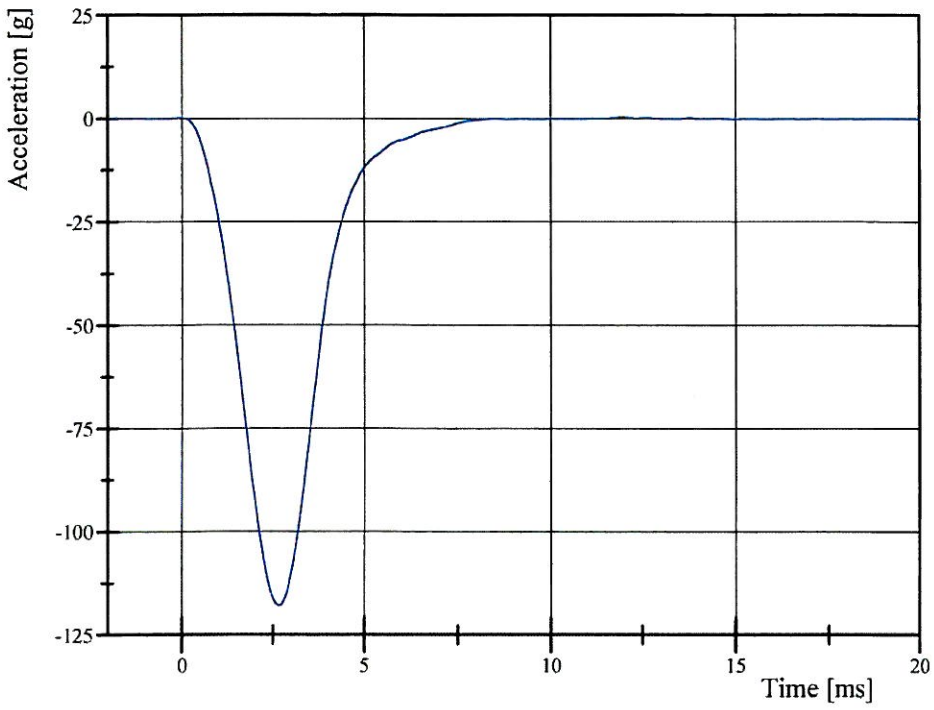
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.19.2009 17:03:22 1868

Transportation Research Center Inc.

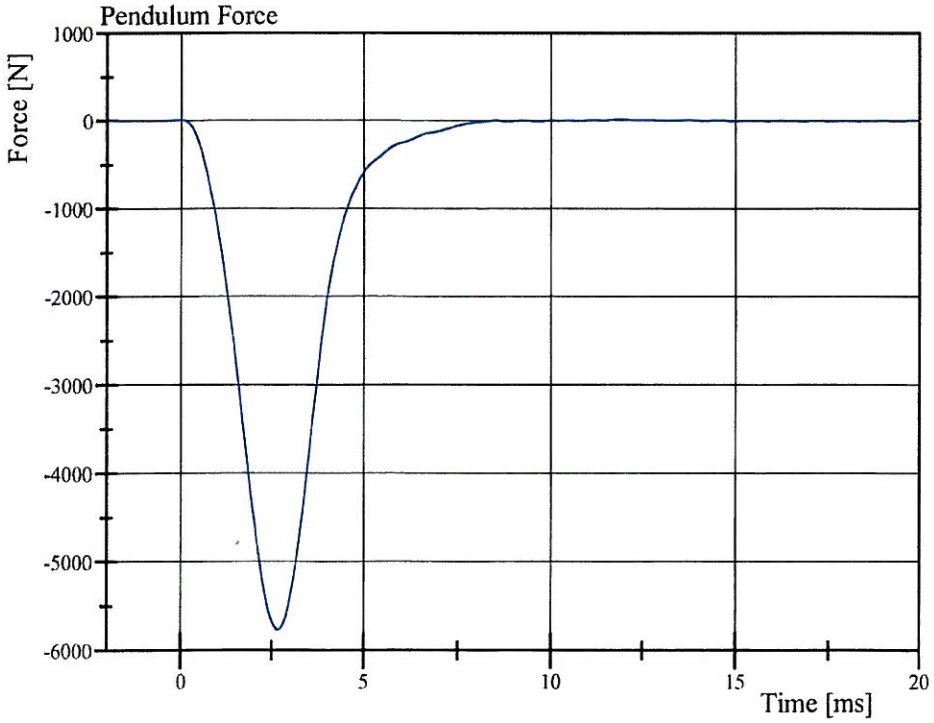
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 4-2
Test Date: 5/19/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.4 g at 11.9 ms
Min: -117.9 g at 2.6 ms

Pendulum Force



Filter Class: CFC_600
Max: 20.9 N at 11.9 ms
Min: -5,769.7 N at 2.6 ms

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

05.19.2009 17:03:38 1868

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	27 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.097 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,150.01 N	Yes

Test meets specifications.

Comments:

Technician

Approved

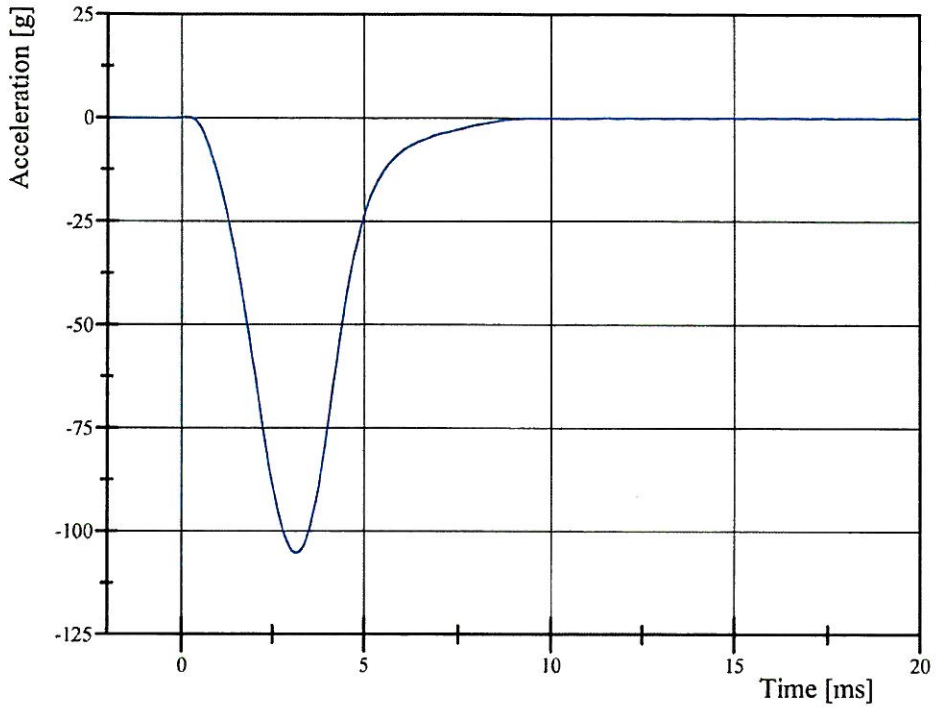
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.19.2009 16:50:36 1865

Transportation Research Center Inc.

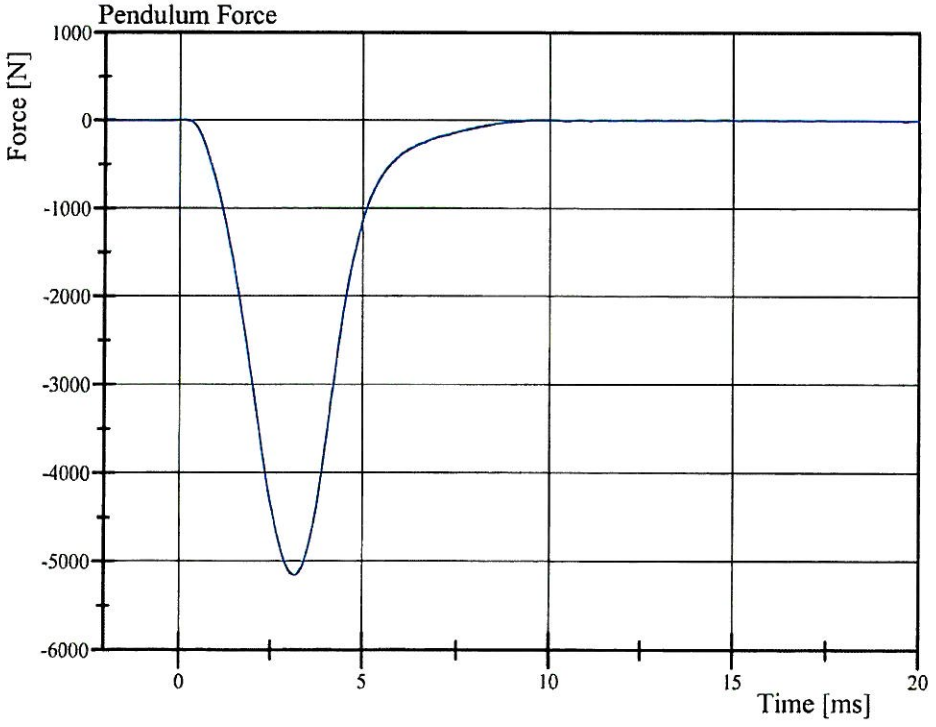
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 4-1
Test Date: 5/19/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.1 g at 0.2 ms
Min: -105.3 g at 3.1 ms

Pendulum Force



Filter Class: CFC_600
Max: 6.6 N at 0.2 ms
Min: -5,150.0 N at 3.1 ms

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

05.19.2009 16:50:50 1865

CALIBRATION TEST RESULTS

POST-TEST

HIII 50th Male: 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 05

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	883	Yes
B	Shoulder Pivot Height	505.5 - 520.7	518	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	136	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	93	Yes
F	Thigh Clearance	139.7 - 154.9	150	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	291	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	339	Yes
J	Elbow Rest Height	190.5 - 210.8	198	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	435	Yes
M	Knee Pivot Height	485.1 - 500.4	497	Yes
N	Buttock Popliteal Length	452.1 - 477.5	468	Yes
O	Chest Depth	213.4 - 228.6	220	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	435	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	986	Yes
Z	Waist Circumference	835.7 - 866.1	861	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Technician

Approved

Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 037 Certification No. 5-2
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	230.7 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-2.2 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

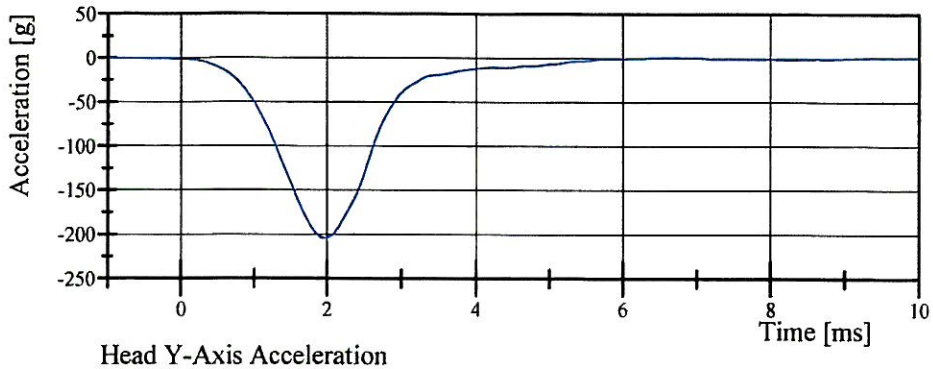
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.29.2009 14:25:09 613

Transportation Research Center Inc.

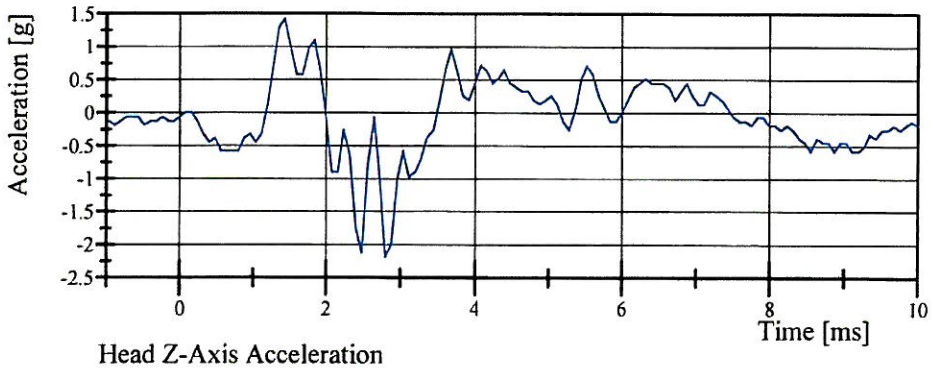
Front Head Drop
HIII 50th Serial No. 037 Certification No. 5-2
Test Date: 5/29/2009

Head X-Axis Acceleration



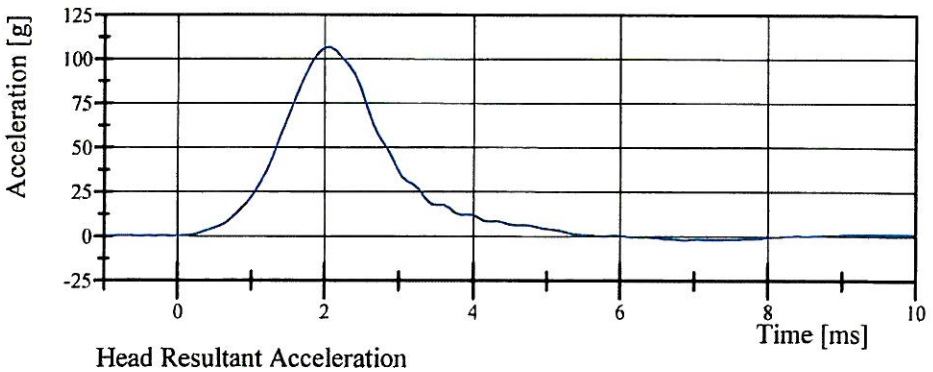
Filter Class: CFC_1000
Max: 1.1 g at 9.5 ms
Min: -204.8 g at 2.0 ms

Head Y-Axis Acceleration



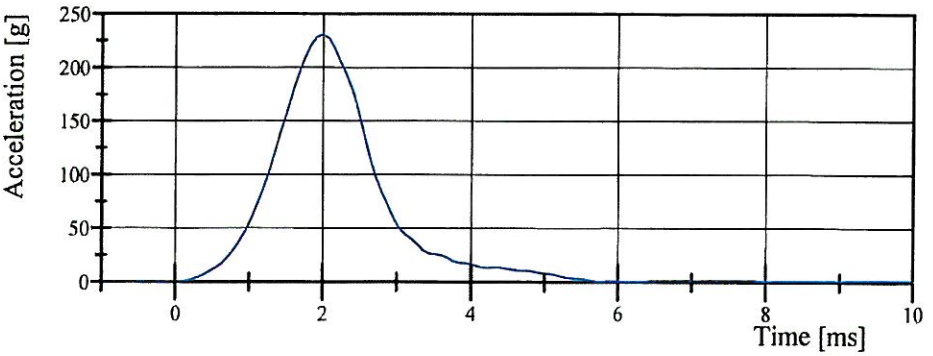
Filter Class: CFC_1000
Max: 1.4 g at 1.4 ms
Min: -2.2 g at 2.8 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 106.6 g at 2.1 ms
Min: -2.0 g at 6.9 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 230.7 g at 2.0 ms
Min: 0.4 g at -1.0 ms

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

05.29.2009 14:25:16 613

Transportation Research Center Inc.

Neck Flexion
HIII 50th Serial No. 037 Certification No. 5-3
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.962 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	41.8 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-23.28 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.08 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-13.95 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-13.95 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-71.7 °	Yes
Total Head D-Plane Rotation Time of Peak	57 - 64 ms	59.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	117.8 ms	Yes
Total Neck Occipital Condyles Moment Peak	88 - 108 N·m	105.3 N·m	Yes
Total Neck Occipital Condyles Moment Time of Peak	47 - 58 ms	53.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.8 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

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

05.29.2009 12:49:35 2973

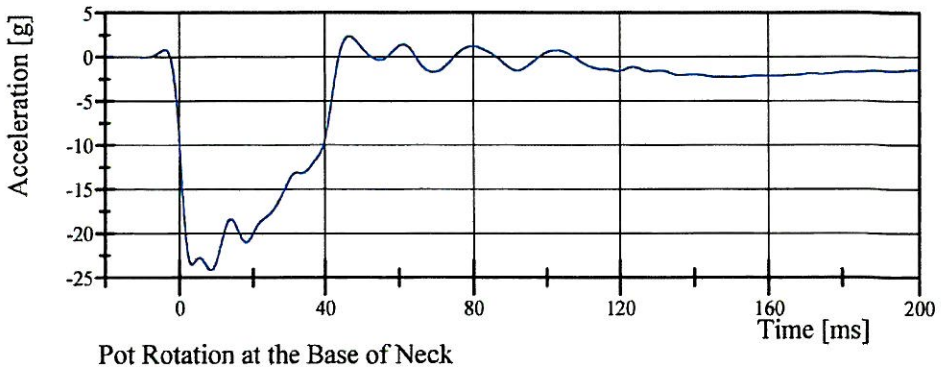
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 5-3

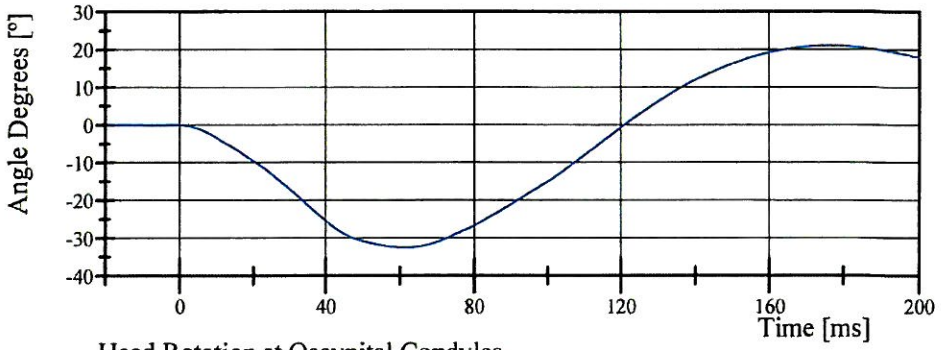
Test Date: 5/29/2009

Pendulum Acceleration



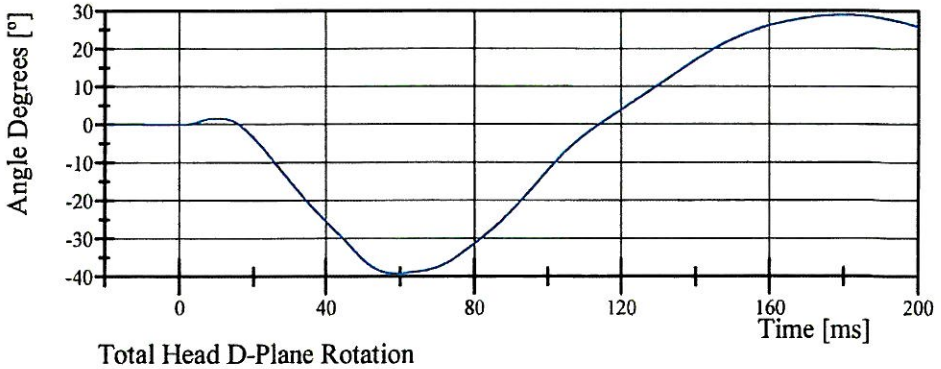
Filter Class: CFC_60
Max: 2.3 g at 46.6 ms
Min: -24.2 g at 8.6 ms

Pot Rotation at the Base of Neck



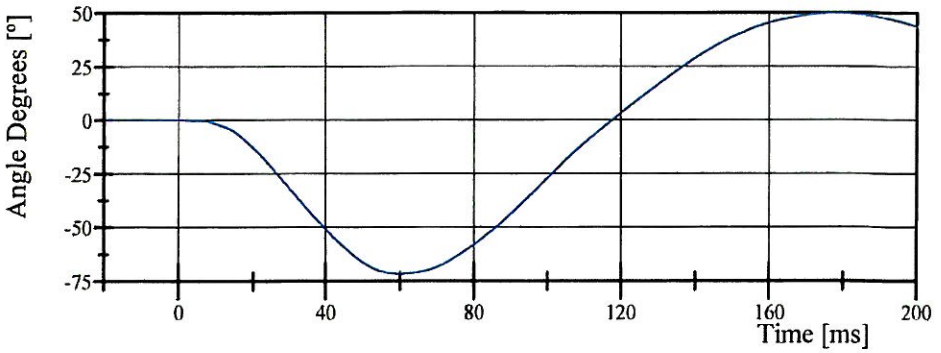
Filter Class: CFC_60
Max: 21.1 ° at 177.0 ms
Min: -32.5 ° at 61.5 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 29.0 ° at 180.6 ms
Min: -39.2 ° at 59.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 50.0 ° at 178.7 ms
Min: -71.7 ° at 59.9 ms

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

05.29.2009 12:49:41 2973

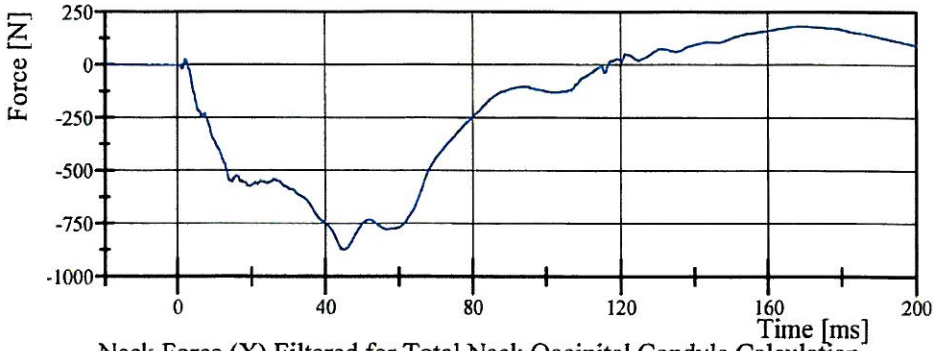
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 5-3

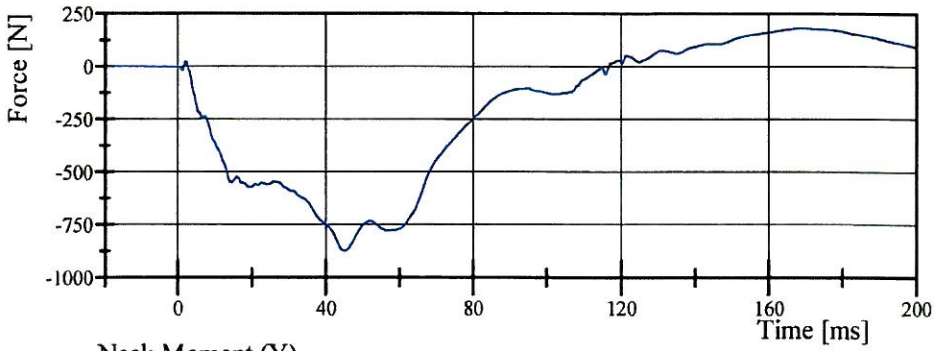
Test Date: 5/29/2009

Neck Force (X)



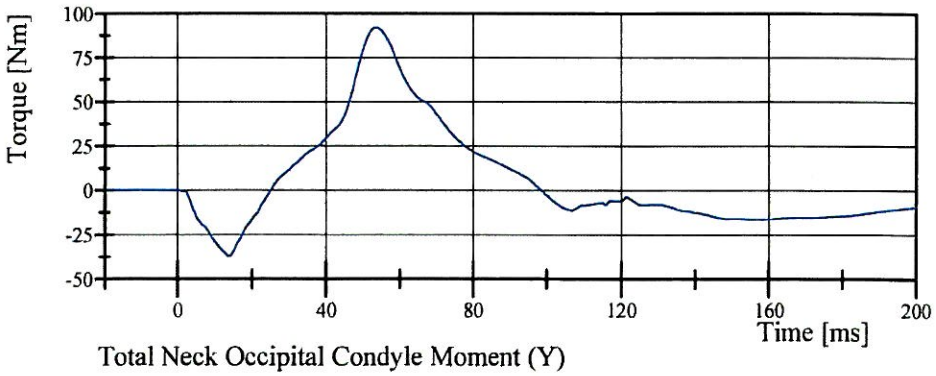
Filter Class: CFC_1000
Max: 183.5 N at 169.0 ms
Min: -876.2 N at 45.3 ms

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



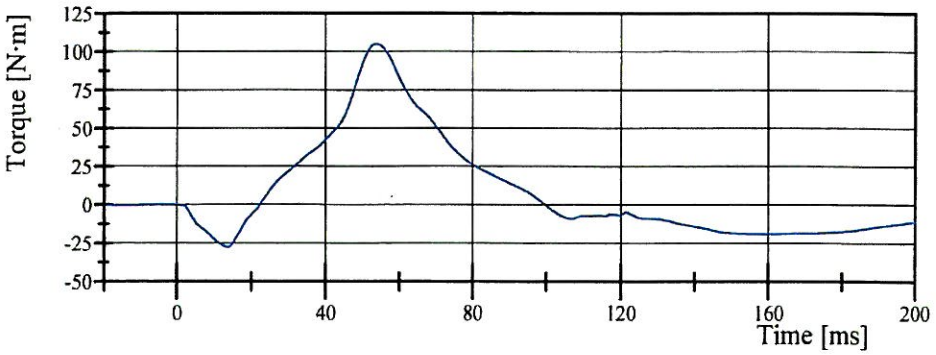
Filter Class: CFC_600
Max: 183.3 N at 169.0 ms
Min: -874.9 N at 45.1 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 92.1 Nm at 53.6 ms
Min: -37.1 Nm at 13.9 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 105.3 N·m at 53.8 ms
Min: -27.6 N·m at 13.8 ms

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

05.29.2009 12:49:42 2973

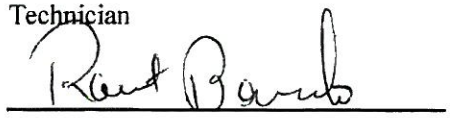
Transportation Research Center Inc.

Neck Extension
HIII 50th Serial No. 037 Certification No. 5-1
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.958 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	39.4 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.50 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	17.84 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.54 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.81 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	97.8 °	Yes
Time of Peak	72 - 82 ms	77.7 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	157.9 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-70.5 N·m	Yes
Time of Peak	65 - 79 ms	70.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	141.9 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

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

05.29.2009 13:21:29 3055

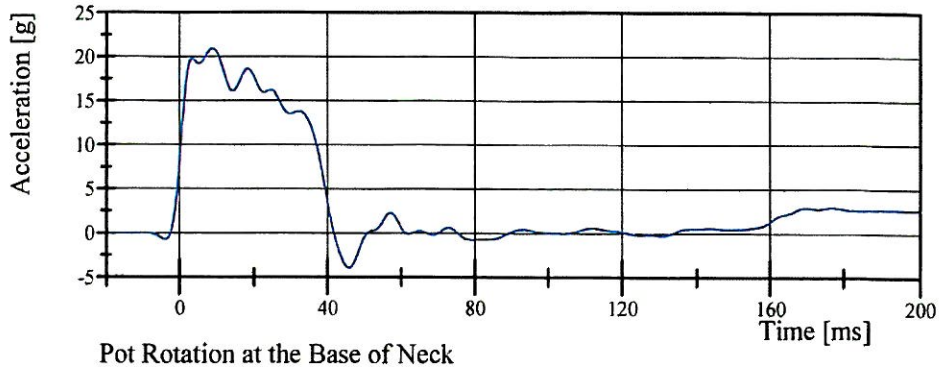
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 5-1

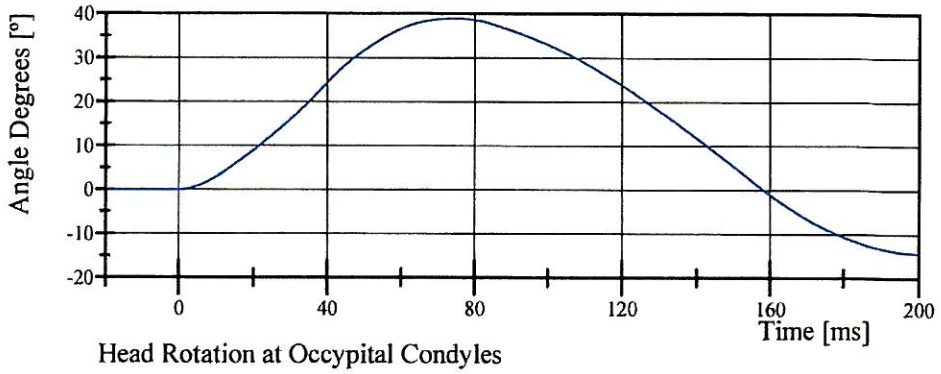
Test Date: 5/29/2009

Pendulum Acceleration



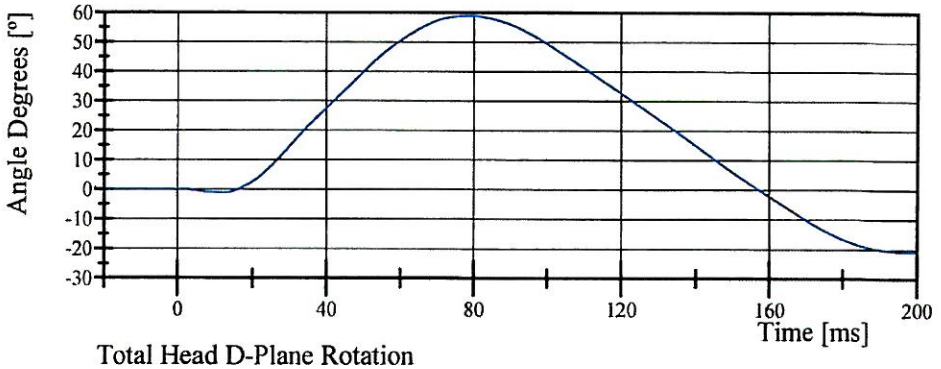
Filter Class: CFC_60
Max: 20.9 g at 8.9 ms
Min: -3.9 g at 45.8 ms

Pot Rotation at the Base of Neck



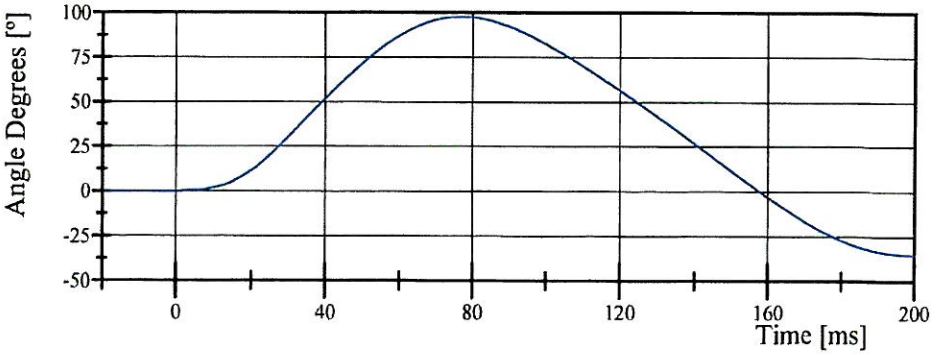
Filter Class: CFC_60
Max: 38.9 ° at 75.0 ms
Min: -14.3 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 59.0 ° at 79.0 ms
Min: -20.9 ° at 199.1 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 97.8 ° at 77.7 ms
Min: -35.1 ° at 200.0 ms

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

05.29.2009 13:21:36 3055

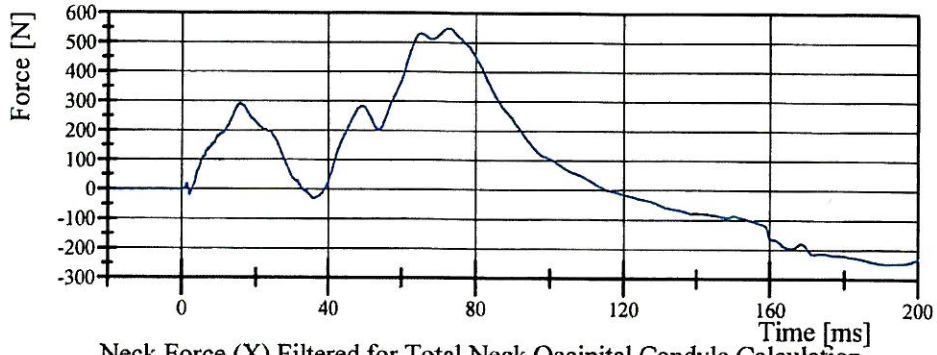
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 5-1

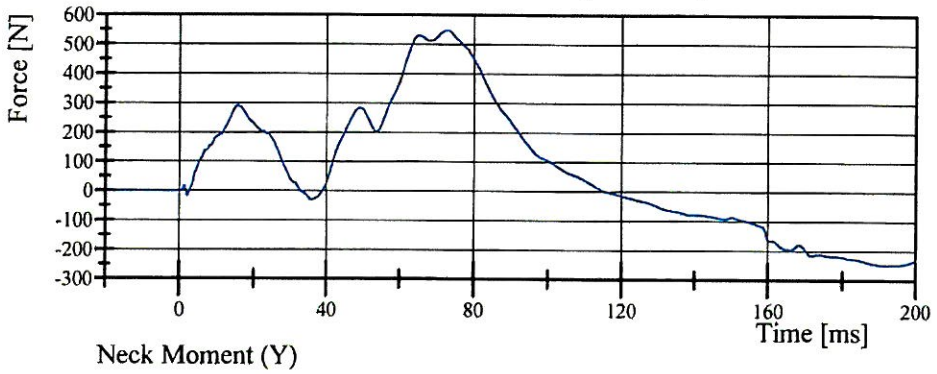
Test Date: 5/29/2009

Neck Force (X)



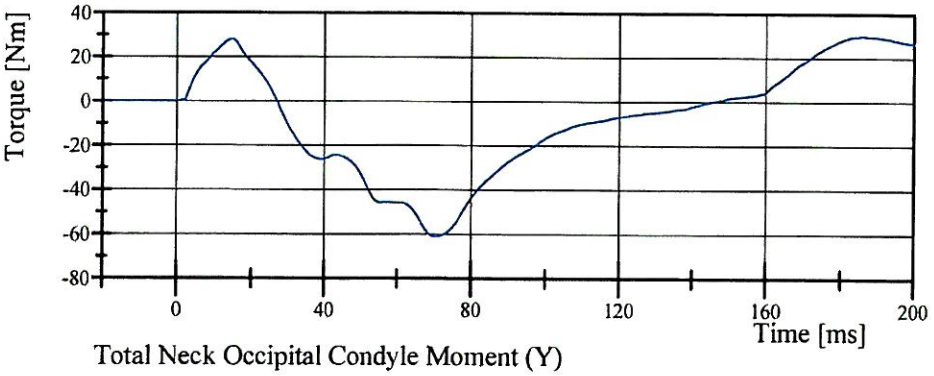
Filter Class: CFC_1000
Max: 548.2 N at 72.3 ms
Min: -248.1 N at 191.2 ms

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



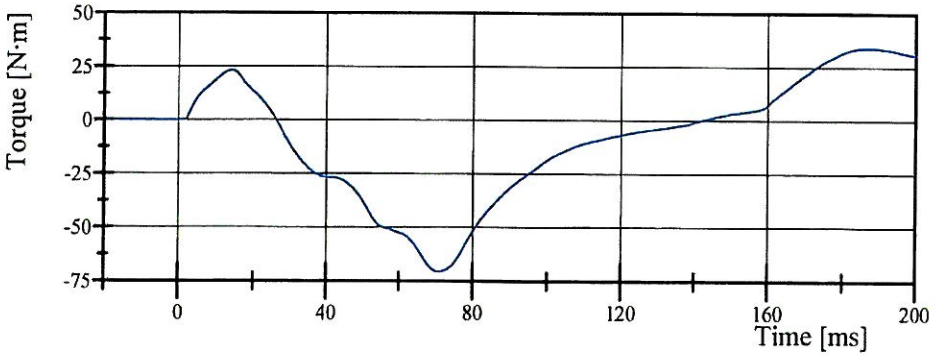
Filter Class: CFC_600
Max: 548.1 N at 72.5 ms
Min: -247.6 N at 192.2 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 29.9 Nm at 186.1 ms
Min: -61.1 Nm at 70.4 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 34.1 N·m at 187.0 ms
Min: -70.5 N·m at 70.8 ms

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

05.29.2009 13:21:37 3055

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 037 Certification No. 5-2
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.696 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,879.7 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-67.22 mm	Yes
Internal Hysteresis	65 - 85 %	75.3 %	Yes

Test meets specifications.

Comments:

Technician 

Approved 

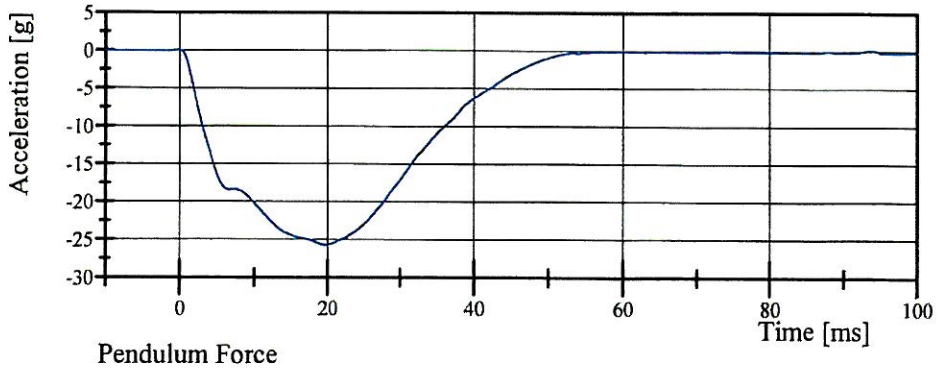
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

05.29.2009 15:50:25 378

Transportation Research Center Inc.

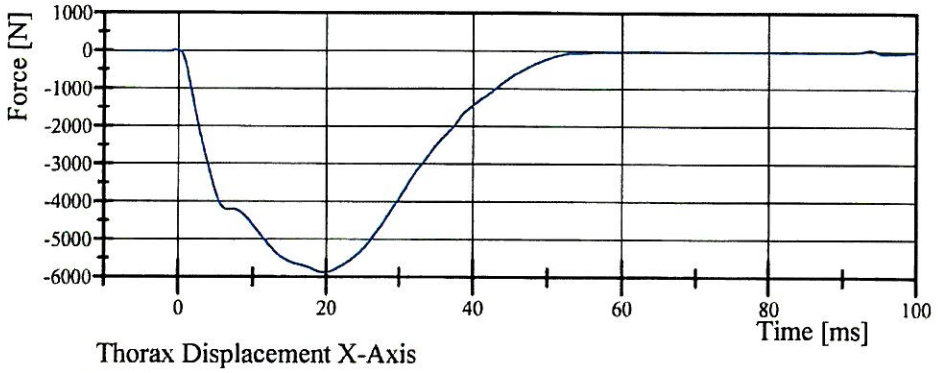
Front Thorax
HIII 50th Serial No. 037 Certification No. 5-2
Test Date: 5/29/2009

Pendulum Acceleration



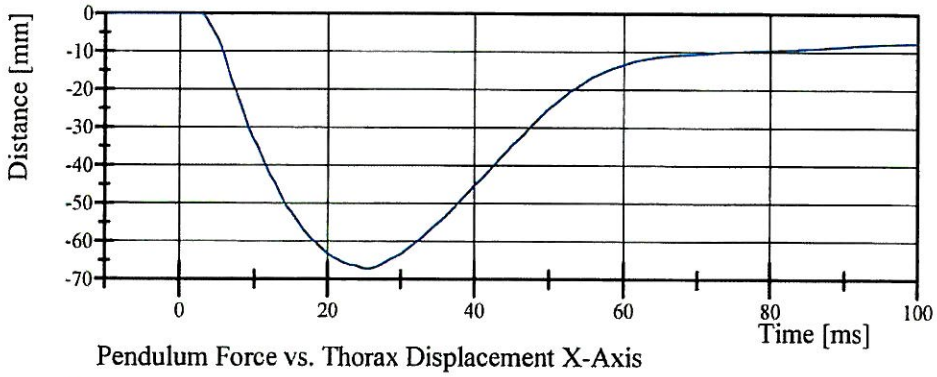
Filter Class: CFC_180
Max: 0.2 g at 93.8 ms
Min: -25.7 g at 19.8 ms

Pendulum Force



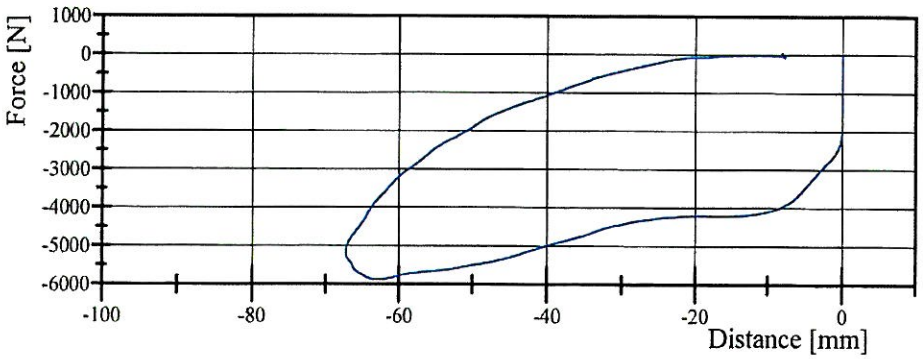
Filter Class: CFC_180
Max: 54.4 N at 93.8 ms
Min: -5,879.7 N at 19.8 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -4.2 ms
Min: -67.2 mm at 25.4 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 54.4 N at -8.1 mm
Min: -5,879.7 N at -62.9 mm

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

05.29.2009 15:50:41 378

Transportation Research Center Inc

Hybrid III Hip Range of Motion

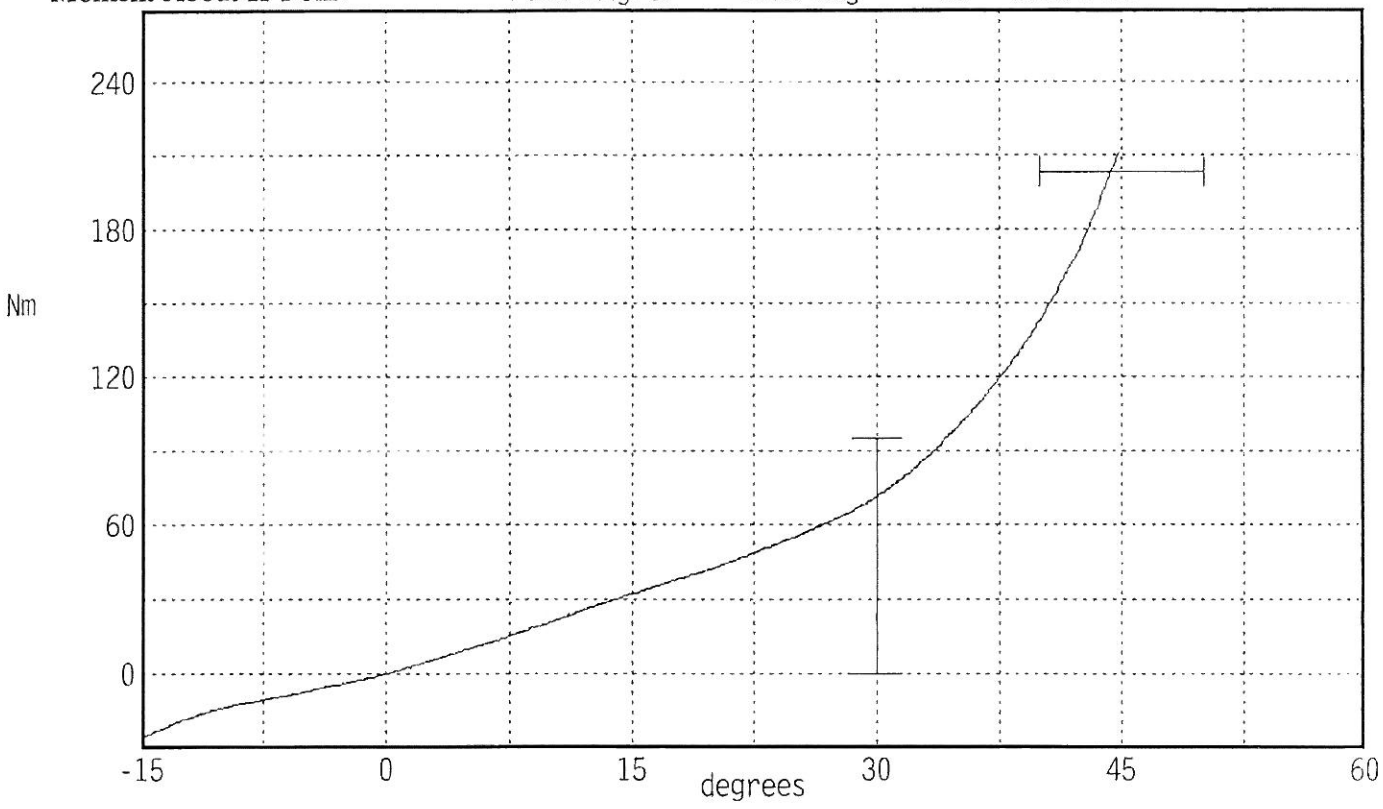
Serial Number: 037L
Test Number: 037C05
Comments:

Date: 05/29/2009
Time: 13:53

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.8	°C	Pass
Humidity	10 - 70	52	%	Pass
Moment at 30 deg	<= 94.9	71.5	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	44.3	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

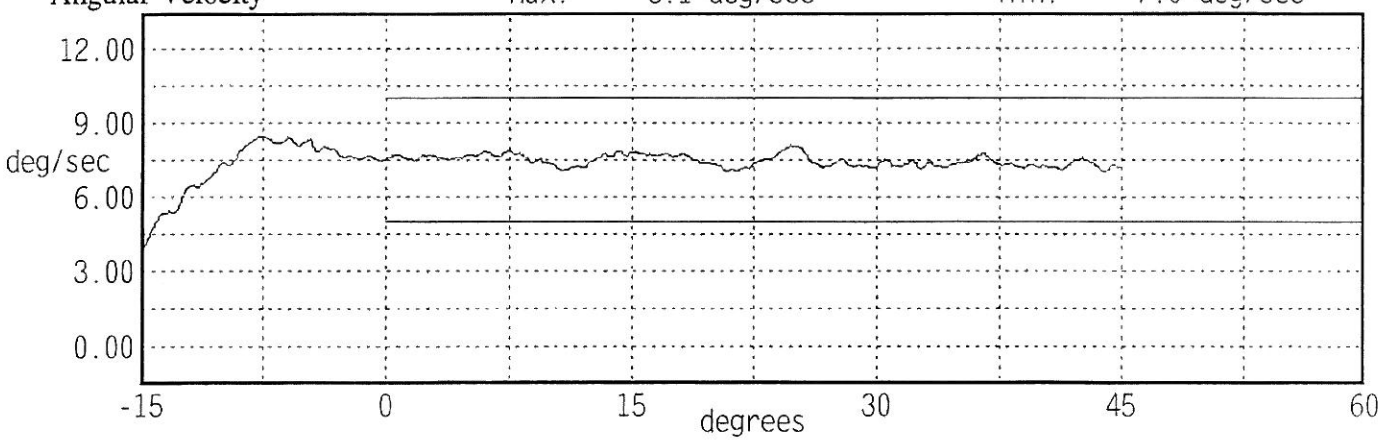
Moment About H-Point

Peak Moment: 211.0 Nm at 44.8 deg
Peak Angle: 44.8 deg at 211.0 Nm



Angular Velocity

Max: 8.1 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

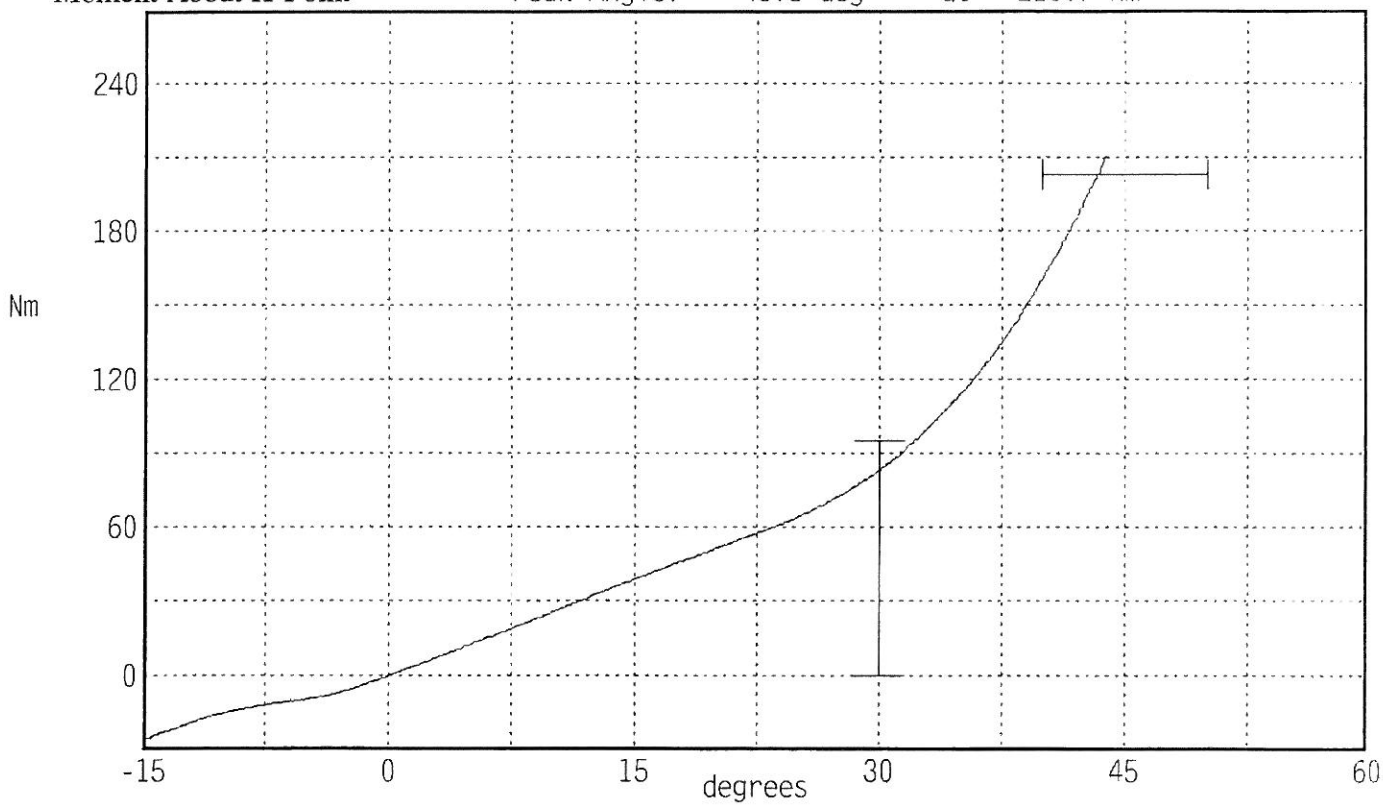
Serial Number: 037R
Test Number: 037C05
Comments:

Date: 05/29/2009
Time: 14:21

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.8	°C	Pass
Humidity	10 - 70	52	%	Pass
Moment at 30 deg	<= 94.9	83.2	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	43.4	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

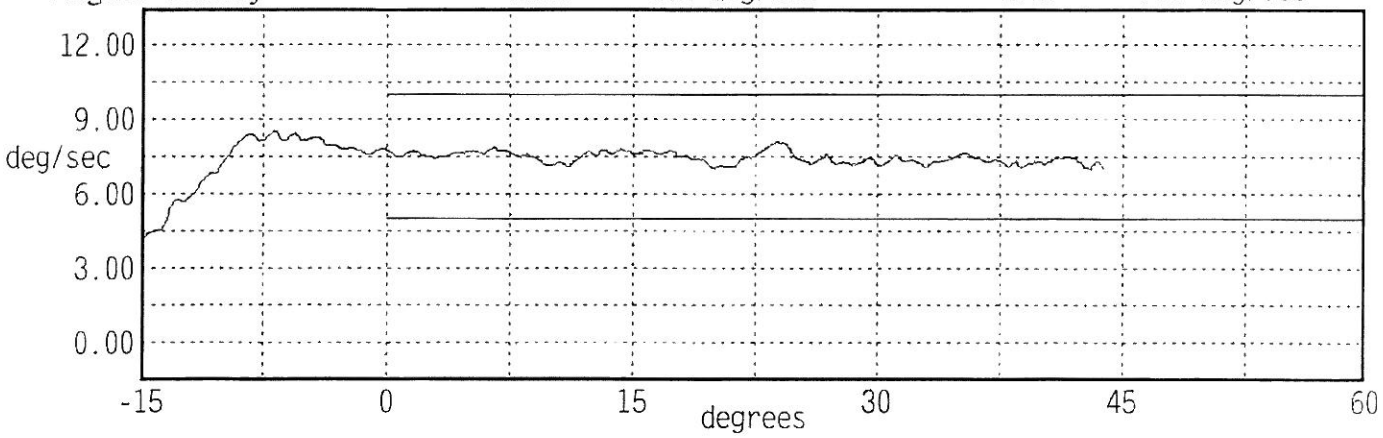
Moment About H-Point

Peak Moment: 210.7 Nm at 43.8 deg
Peak Angle: 43.8 deg at 210.7 Nm



Angular Velocity

Max: 8.1 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 5-1
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.115 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,335.46 N	Yes

Test meets specifications.

Comments:

Technician

Approved

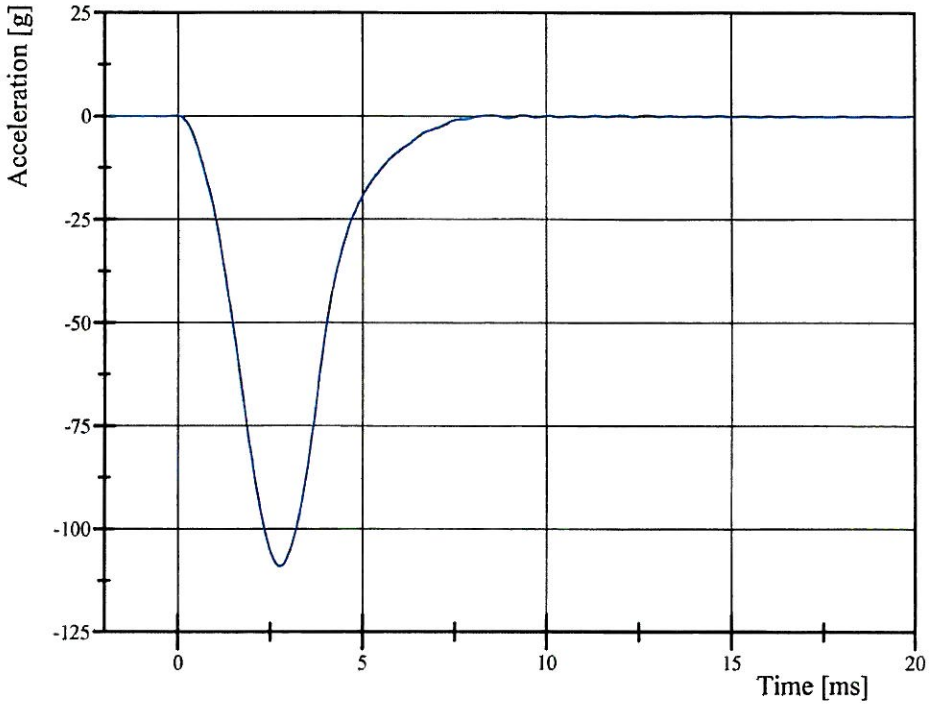
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.29.2009 13:39:52 1726

Transportation Research Center Inc.

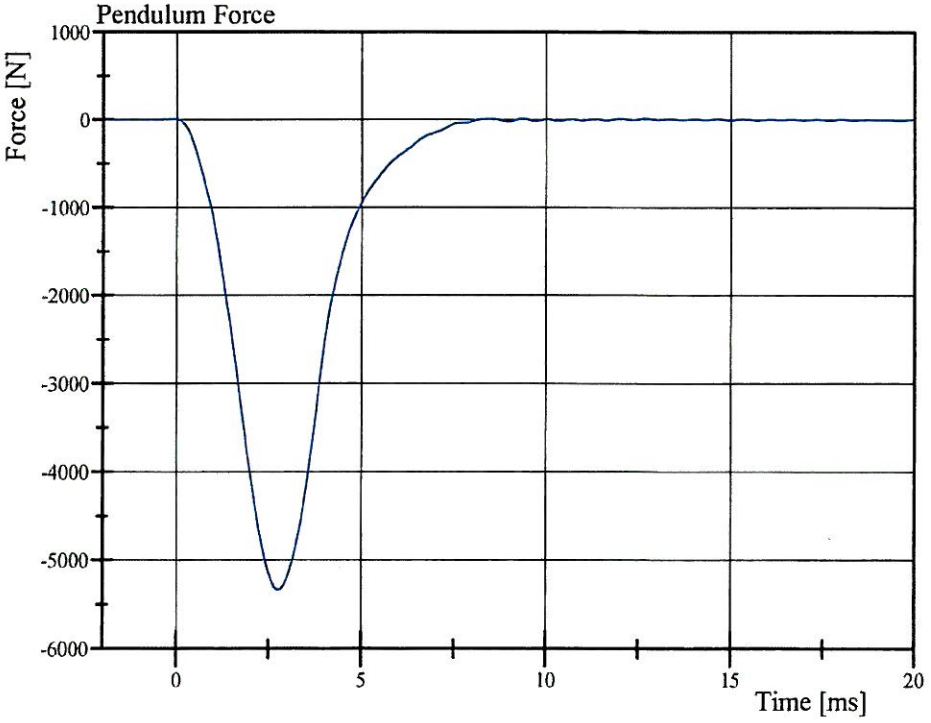
Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 5-1
Test Date: 5/29/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.3 g at 12.7 ms
Min: -109.0 g at 2.7 ms

Pendulum Force



Filter Class: CFC_600
Max: 15.6 N at 12.7 ms
Min: -5,335.5 N at 2.7 ms

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

05.29.2009 13:39:58 1726

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 5-1
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.121 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-4,741.28 N	Yes

Test meets specifications.

Comments:

Technician

Approved

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

05.29.2009 13:45:45 1724

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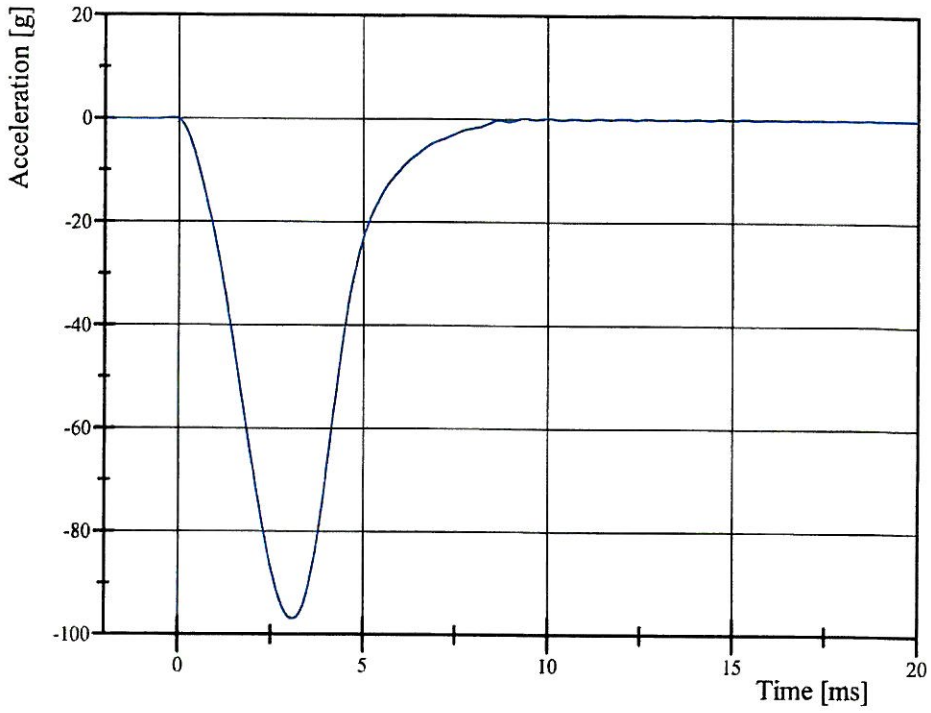
Transportation Research Center Inc.

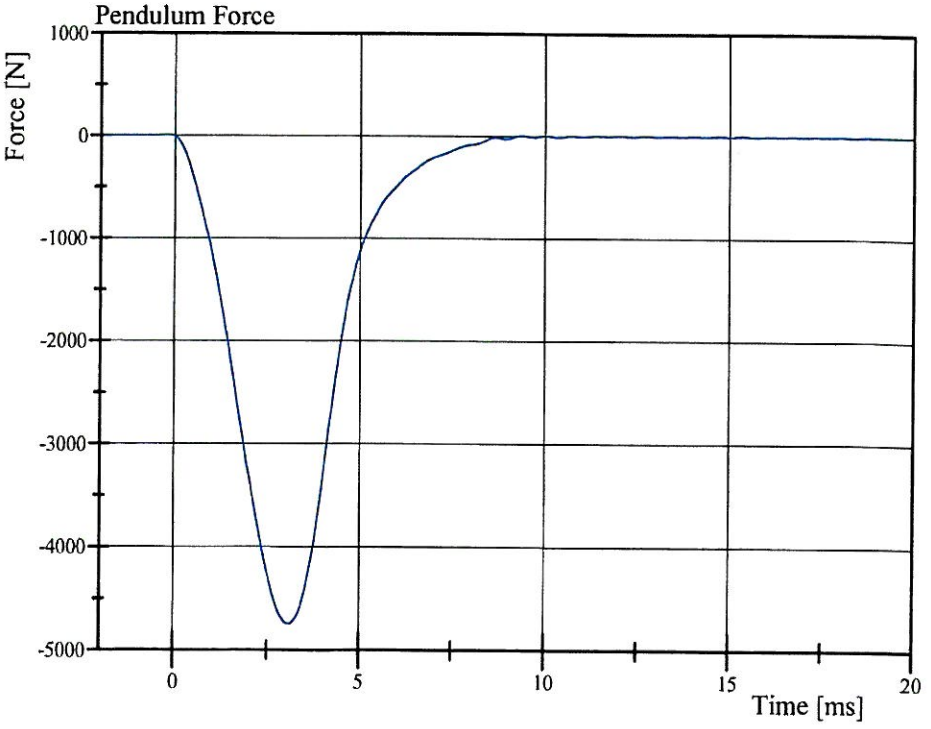
Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 5-1
Test Date: 5/29/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at -0.2 ms
Min: -96.9 g at 3.1 ms

Pendulum Force



Filter Class: CFC_600
Max: 8.6 N at -0.2 ms
Min: -4,741.3 N at 3.1 ms

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

05.29.2009 13:45:51 1724

CALIBRATION TEST RESULTS

PRE-TEST

HIII 50th Male: 352

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 352
Calibration No. 04

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	886	Yes
B	Shoulder Pivot Height	505.5 - 520.7	517	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	136	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	94	Yes
F	Thigh Clearance	139.7 - 154.9	153	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	335	Yes
J	Elbow Rest Height	190.5 - 210.8	195	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	434	Yes
M	Knee Pivot Height	485.1 - 500.4	498	Yes
N	Buttock Popliteal Length	452.1 - 477.5	471	Yes
O	Chest Depth	213.4 - 228.6	224	Yes
P	Foot Length	251.5 - 266.7	260	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	98	Yes
Y	Chest Circumference	970.3 - 1000.8	999	Yes
Z	Waist Circumference	835.7 - 866.1	860	Yes
AA	Location For Chest Circumference	429.3 - 434.3	433	Yes
BB	Location For Waist Circumference	226.1 - 231.1	231	Yes

Comments: Partial Set

Technician

Approved

Revised 3/13/3003

Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	261.4 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-4.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

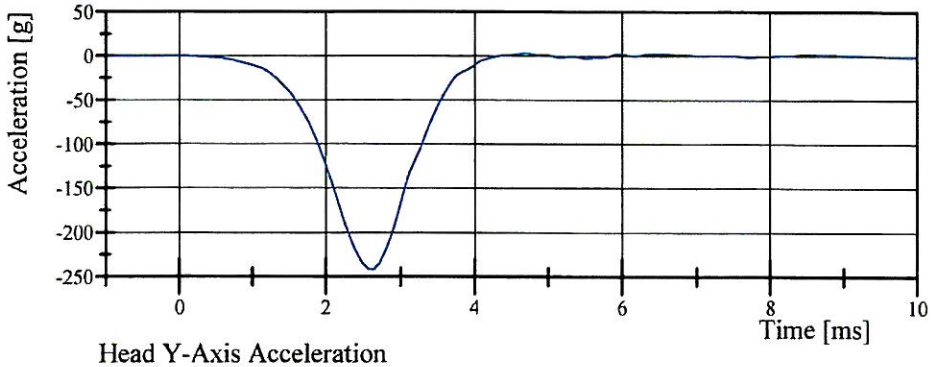
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.20.2009 10:22:55 607

Transportation Research Center Inc.

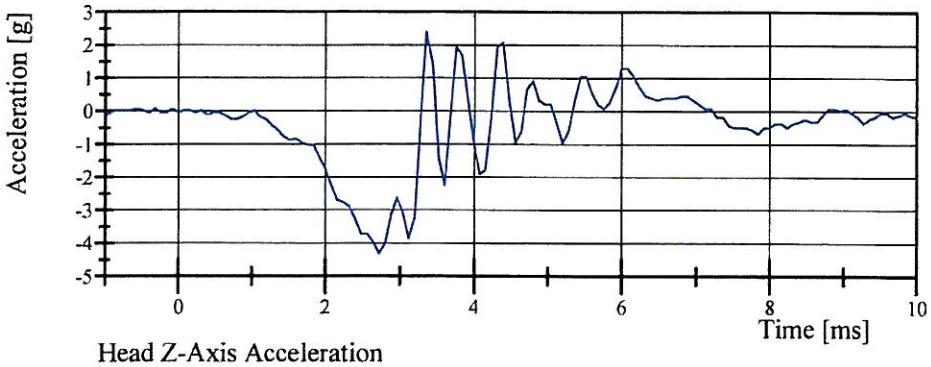
Front Head Drop
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Head X-Axis Acceleration



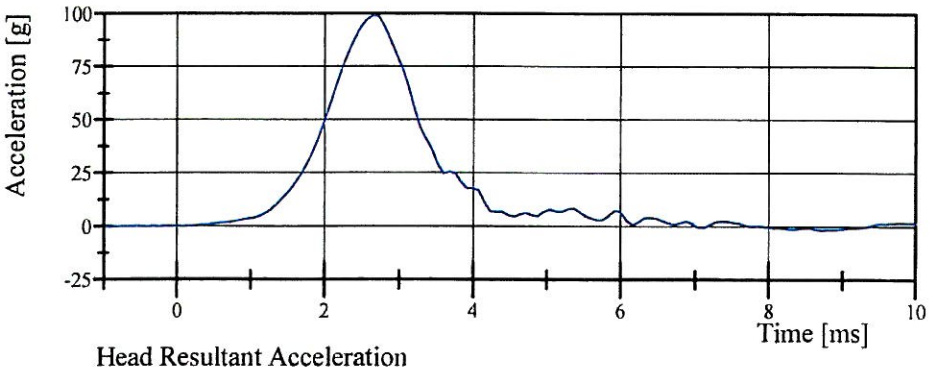
Filter Class: CFC_1000
Max: 3.3 g at 4.7 ms
Min: -241.9 g at 2.6 ms

Head Y-Axis Acceleration



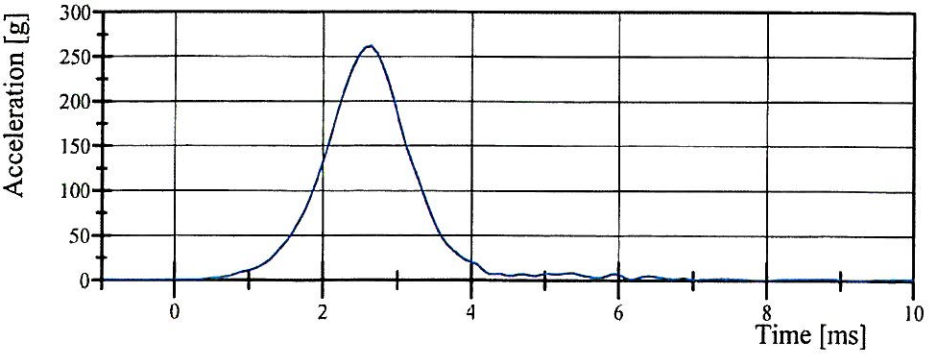
Filter Class: CFC_1000
Max: 2.4 g at 3.4 ms
Min: -4.3 g at 2.7 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 99.1 g at 2.6 ms
Min: -1.7 g at 8.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 261.4 g at 2.6 ms
Min: 0.0 g at -0.9 ms

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

05.20.2009 10:23:05 607

Transportation Research Center Inc.

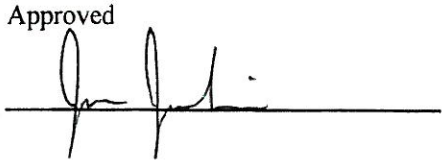
Neck Flexion
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.977 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	41.1 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-24.76 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.52 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-13.38 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-13.51 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-69.2 °	Yes
Total Head D-Plane Rotation Time of Peak	57 - 64 ms	59.3 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	116.6 ms	Yes
Total Neck Occipital Condyles Moment Peak	88 - 108 N·m	97.0 N·m	Yes
Total Neck Occipital Condyles Moment Time of Peak	47 - 58 ms	52.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.4 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

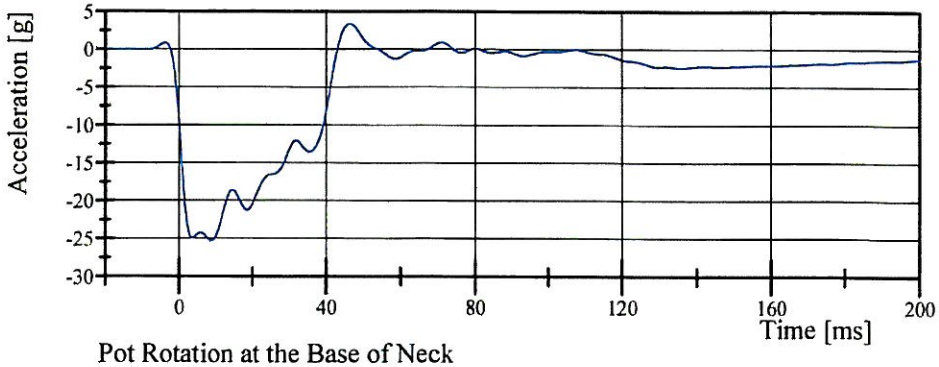
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.20.2009 13:28:21 2972

Transportation Research Center Inc.

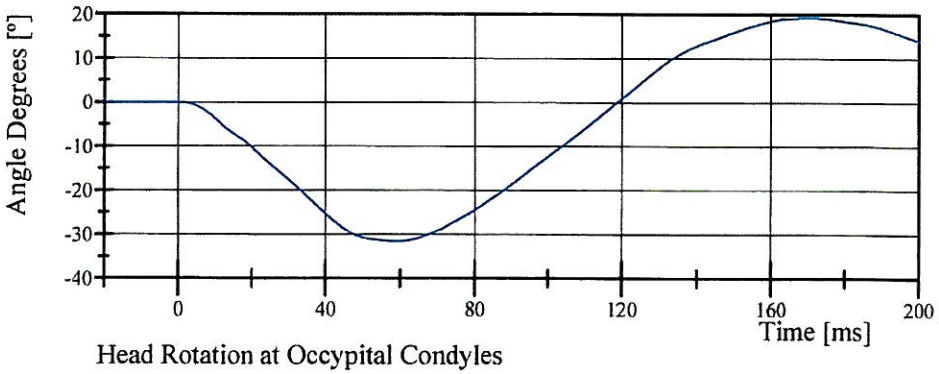
Neck Flexion
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Pendulum Acceleration



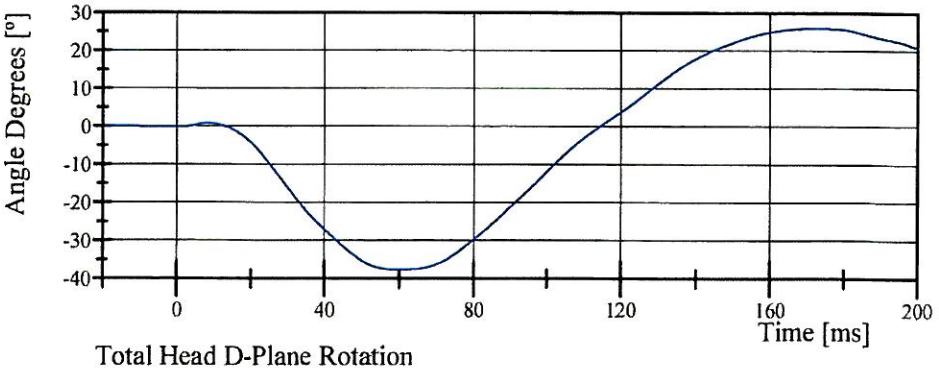
Filter Class: CFC_60
Max: 3.4 g at 46.3 ms
Min: -25.3 g at 8.9 ms

Pot Rotation at the Base of Neck



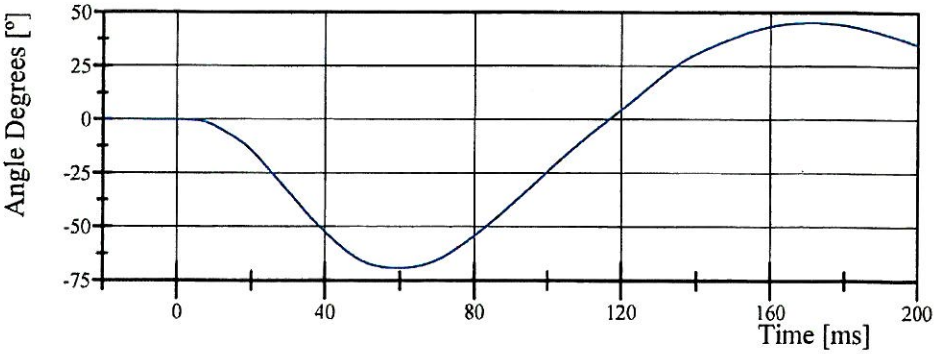
Filter Class: CFC_60
Max: 19.3 ° at 170.6 ms
Min: -31.6 ° at 59.2 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 26.0 ° at 172.2 ms
Min: -37.7 ° at 59.5 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 45.2 ° at 171.5 ms
Min: -69.2 ° at 59.3 ms

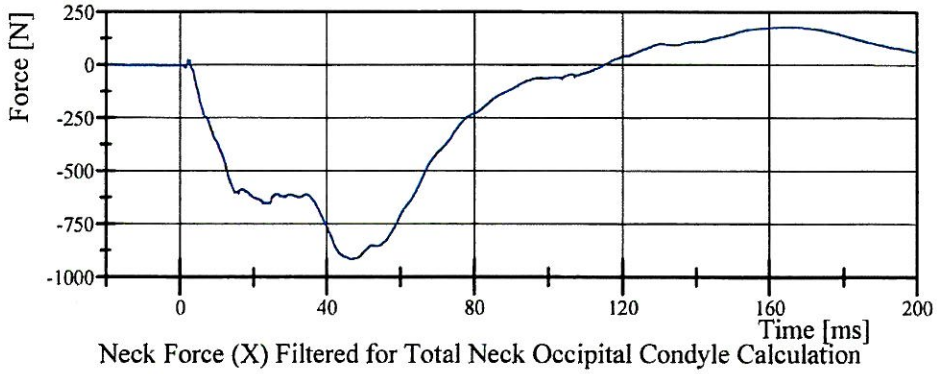
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.20.2009 13:28:31 2972

Transportation Research Center Inc.

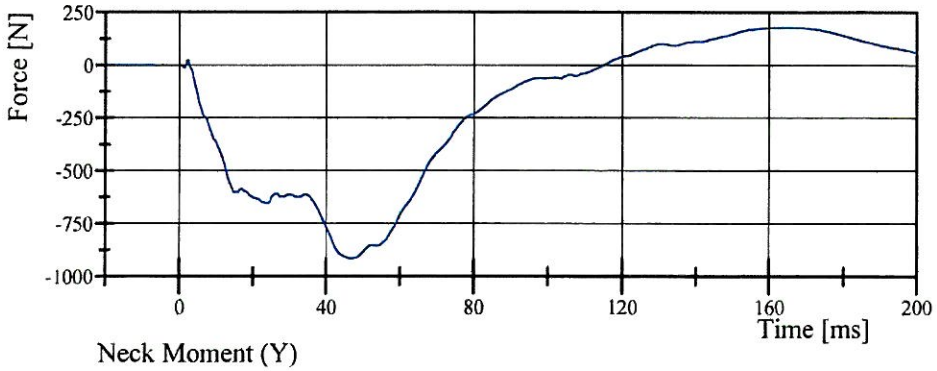
Neck Flexion
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Neck Force (X)



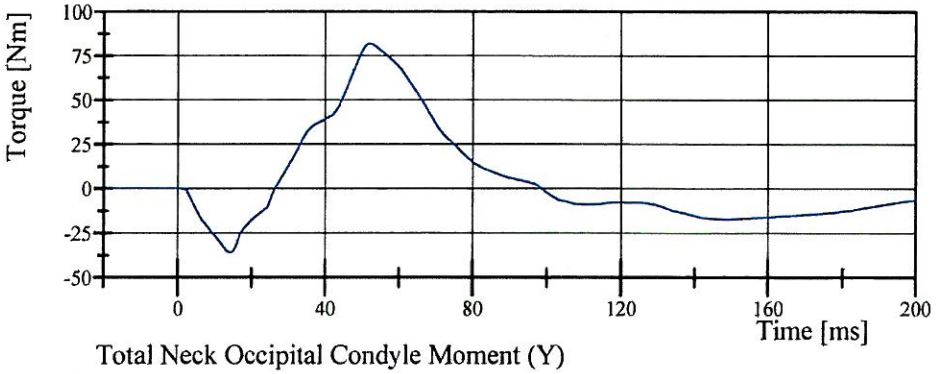
Filter Class: CFC_1000
Max: 179.9 N at 164.5 ms
Min: -916.4 N at 46.7 ms

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



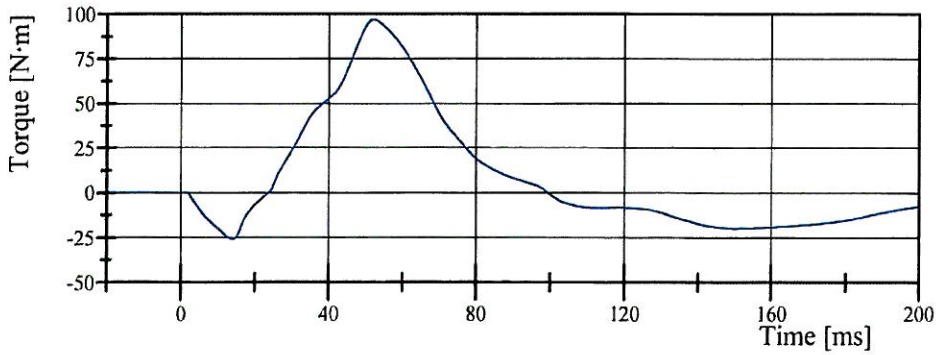
Filter Class: CFC_600
Max: 179.5 N at 165.8 ms
Min: -916.1 N at 46.6 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 81.9 Nm at 52.2 ms
Min: -36.0 Nm at 14.4 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 97.0 N·m at 52.2 ms
Min: -25.8 N·m at 13.8 ms

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

05.20.2009 13:28:32 2972

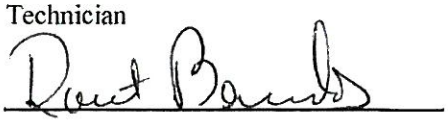
Transportation Research Center Inc.

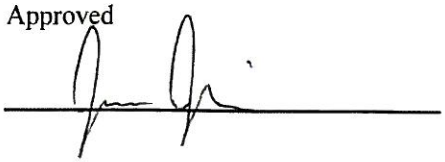
Neck Extension
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.963 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	42.9 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.30 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	15.71 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	12.32 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	12.38 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	91.9 °	Yes
Time of Peak	72 - 82 ms	78.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	156.2 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-60.5 N·m	Yes
Time of Peak	65 - 79 ms	73.3 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	143.7 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

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

05.20.2009 14:36:42 3055

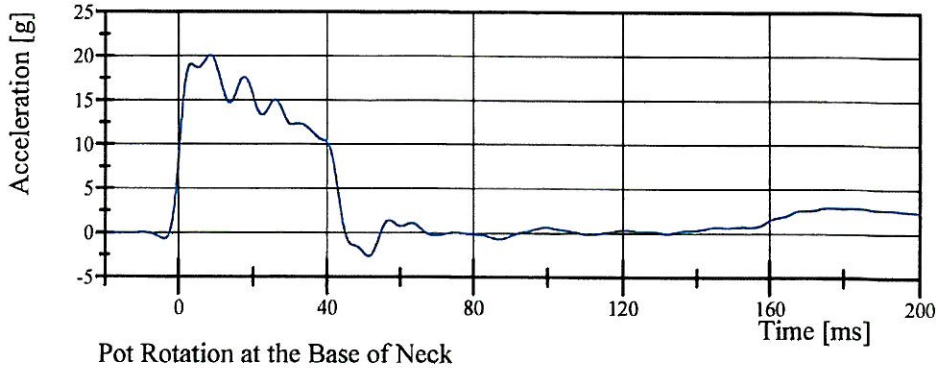
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 352 Certification No. 4-2

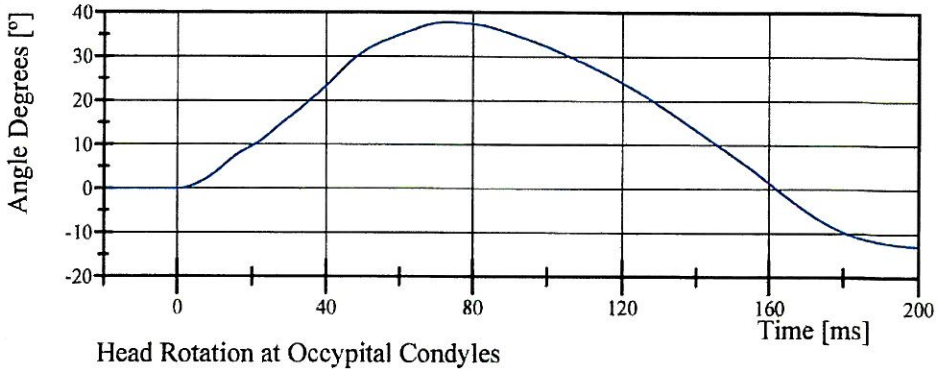
Test Date: 5/20/2009

Pendulum Acceleration



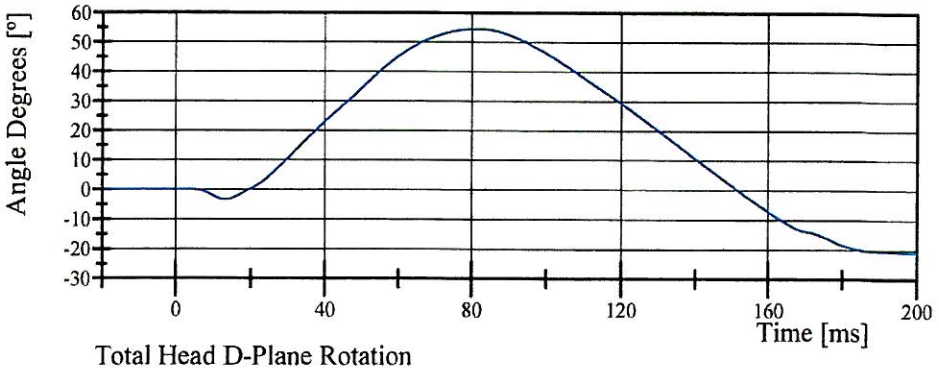
Filter Class: CFC_60
Max: 20.1 g at 8.6 ms
Min: -2.6 g at 51.4 ms

Pot Rotation at the Base of Neck



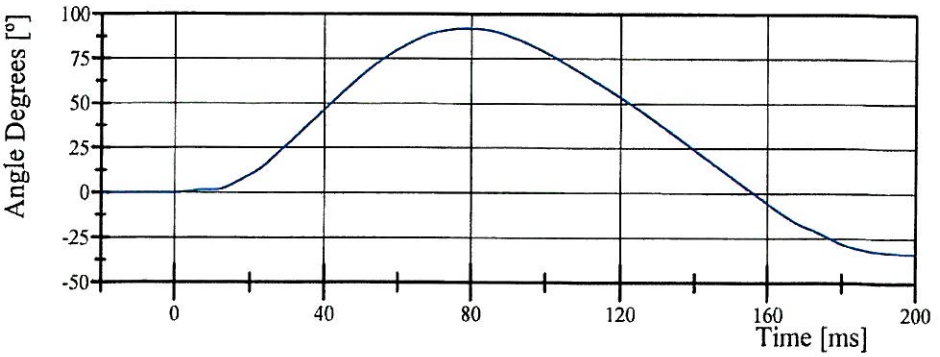
Filter Class: CFC_60
Max: 37.8 ° at 73.0 ms
Min: -12.8 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 54.4 ° at 81.7 ms
Min: -21.1 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 91.9 ° at 78.9 ms
Min: -34.0 ° at 200.0 ms

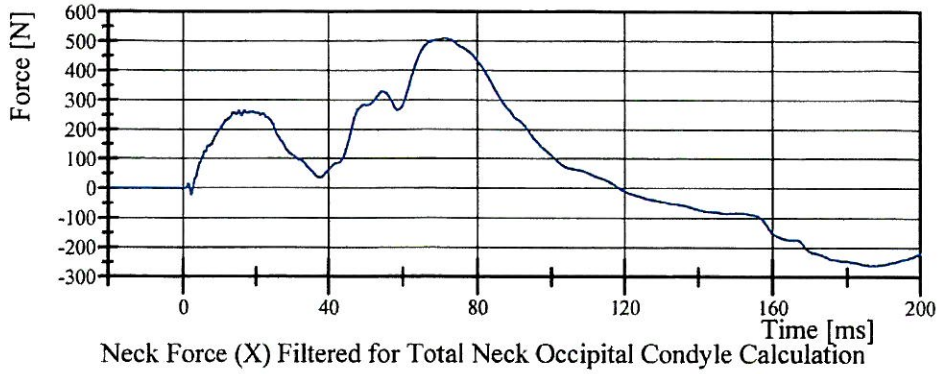
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.20.2009 14:37:10 3055

Transportation Research Center Inc.

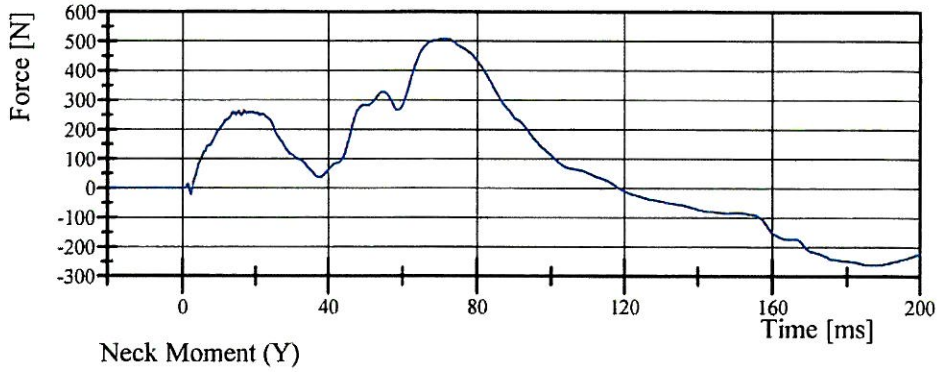
Neck Extension
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/20/2009

Neck Force (X)



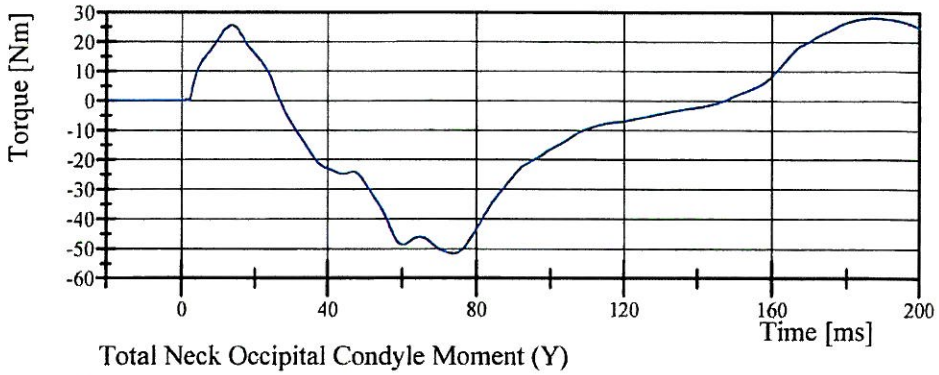
Filter Class: CFC_1000
Max: 509.6 N at 70.8 ms
Min: -261.5 N at 187.0 ms

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



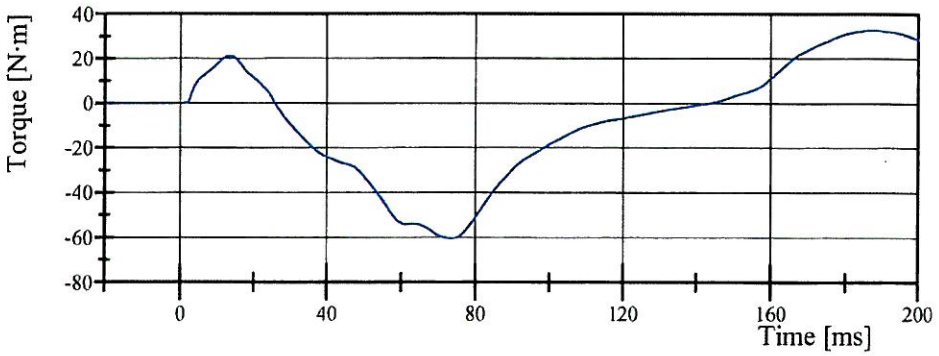
Filter Class: CFC_600
Max: 509.4 N at 71.0 ms
Min: -261.1 N at 186.9 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 28.1 Nm at 187.5 ms
Min: -51.7 Nm at 73.9 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 32.7 N·m at 187.5 ms
Min: -60.5 N·m at 73.3 ms

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

05.20.2009 14.37.11 3055

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 352 Certification No. 4-3
Test Date: 5/21/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.718 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,643.1 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-64.44 mm	Yes
Internal Hysteresis	65 - 85 %	74.5 %	Yes

Test meets specifications.

Comments:

Technician

Approved

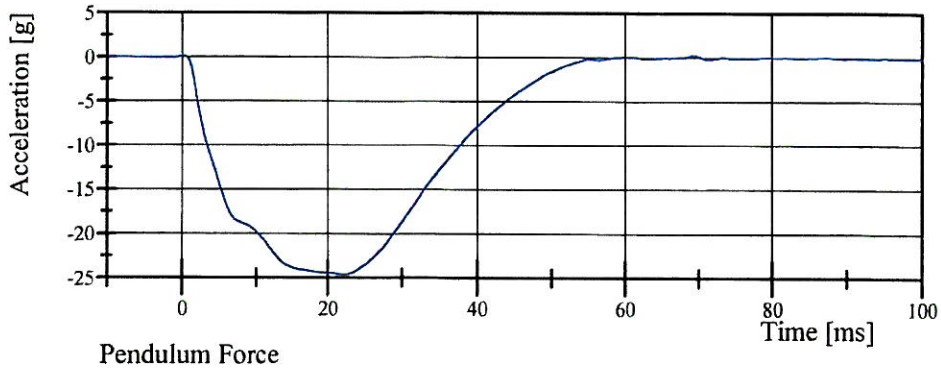
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

05.21.2009 07:00:50 365

Transportation Research Center Inc.

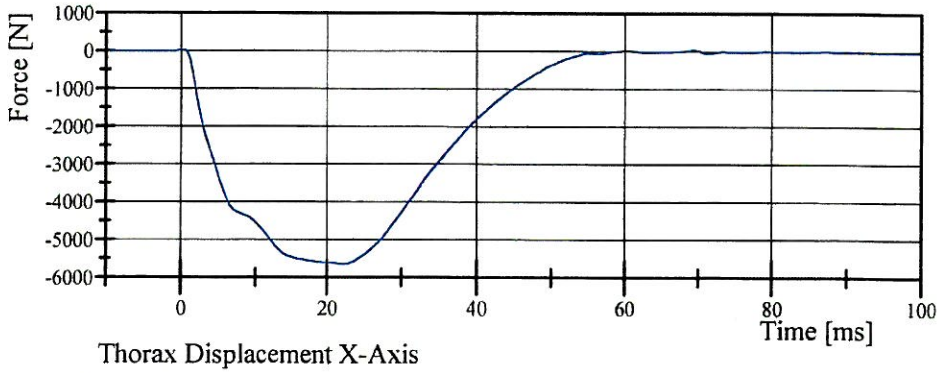
Front Thorax
HIII 50th Serial No. 352 Certification No. 4-3
Test Date: 5/21/2009

Pendulum Acceleration



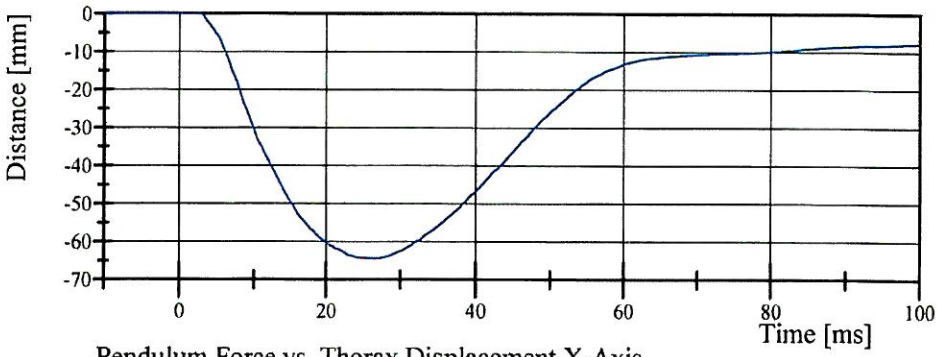
Filter Class: CFC_180
Max: 0.2 g at 69.4 ms
Min: -24.6 g at 22.4 ms

Pendulum Force



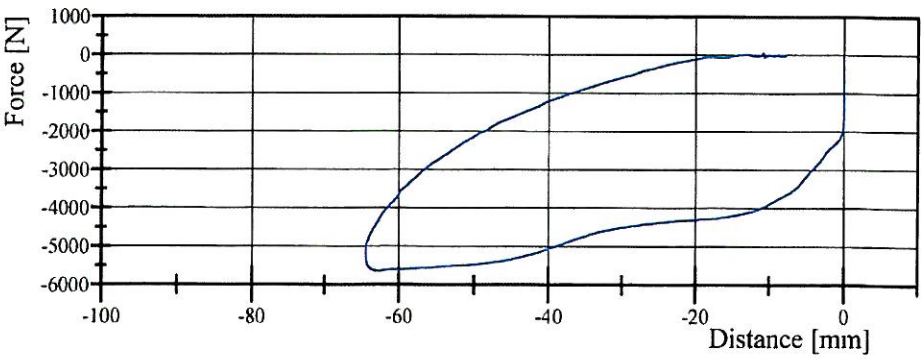
Filter Class: CFC_180
Max: 53.8 N at 69.4 ms
Min: -5,643.1 N at 22.4 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -3.7 ms
Min: -64.4 mm at 27.1 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 53.8 N at -10.8 mm
Min: -5,643.1 N at -62.7 mm

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

05.21.2009 07:00:57 365

Transportation Research Center Inc

Hybrid III Hip Range of Motion

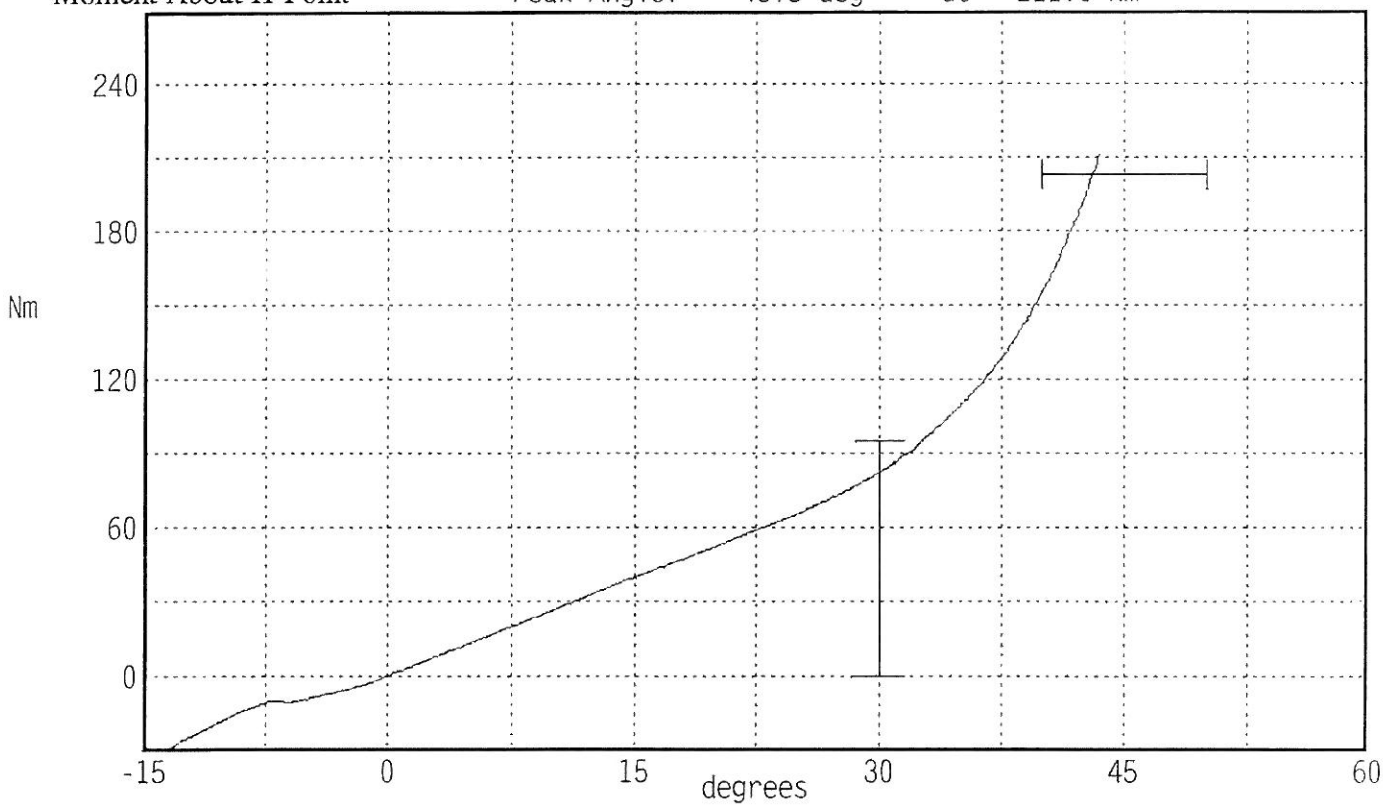
Serial Number: 352L
Test Number: 352C04
Comments:

Date: 05/20/2009
Time: 07:21

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.8	°C	Pass
Humidity	10 - 70	34	%	Pass
Moment at 30 deg	<= 94.9	82.5	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	43.0	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

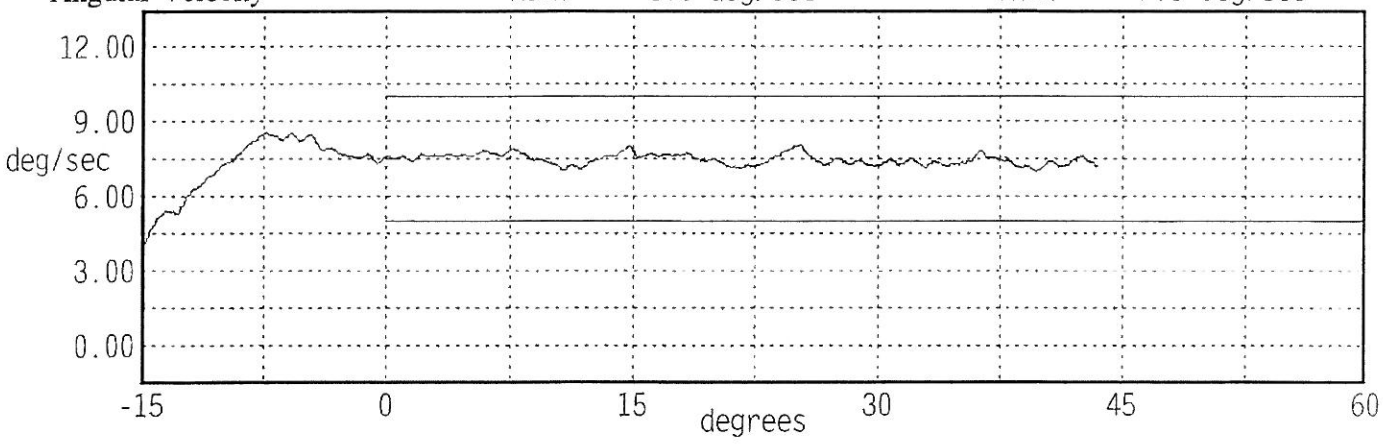
Moment About H-Point

Peak Moment: 211.0 Nm at 43.5 deg
Peak Angle: 43.5 deg at 211.0 Nm



Angular Velocity

Max: 8.0 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

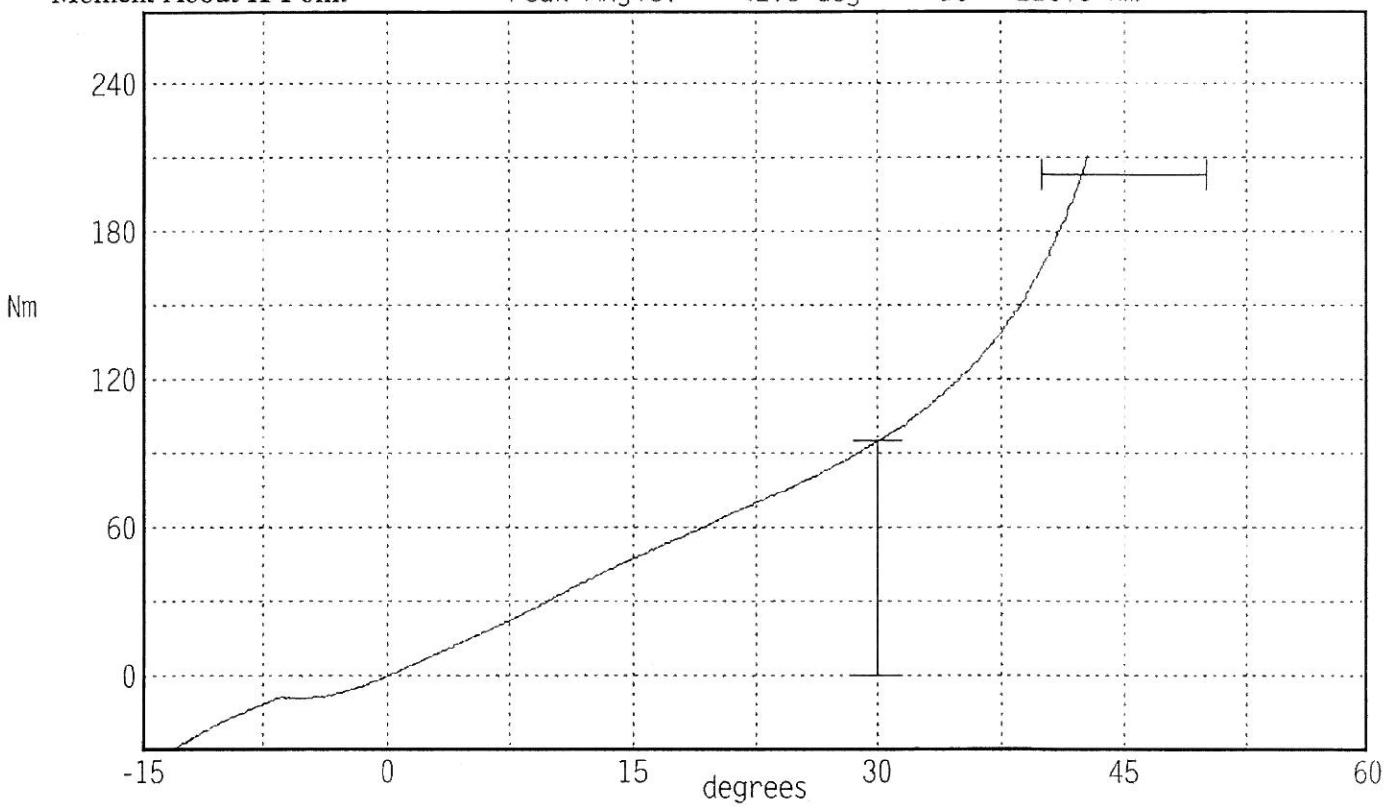
Serial Number: 352R
Test Number: 352C04
Comments:

Date: 05/19/2009
Time: 18:08

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	27	%	Pass
Moment at 30 deg	<= 94.9	94.5	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	42.4	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

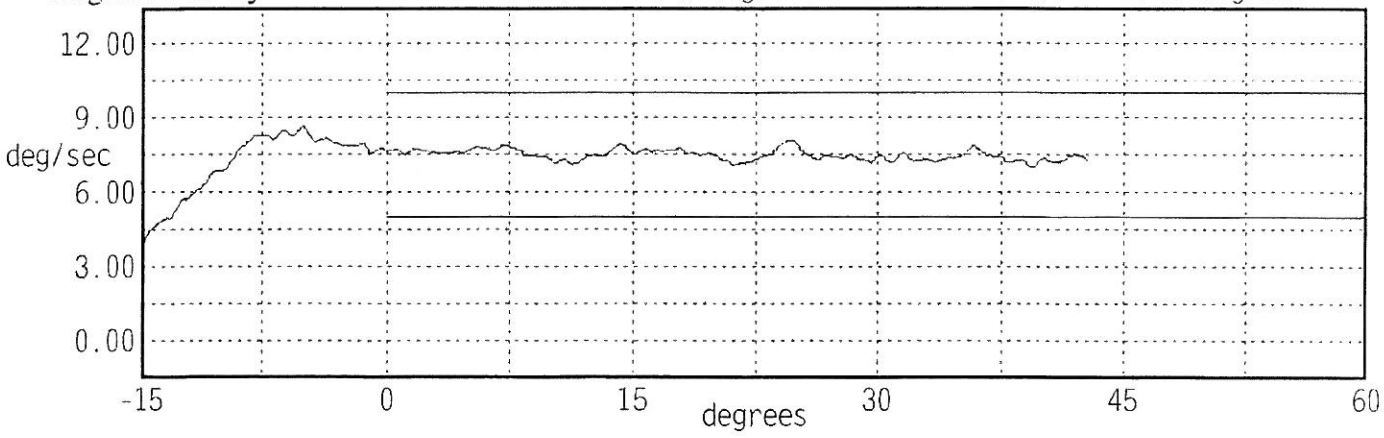
Moment About H-Point

Peak Moment: 210.5 Nm at 42.8 deg
Peak Angle: 42.8 deg at 210.5 Nm



Angular Velocity

Max: 8.1 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 4-4
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.115 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,597.59 N	Yes

Test meets specifications.

Comments:

Technician

Approved

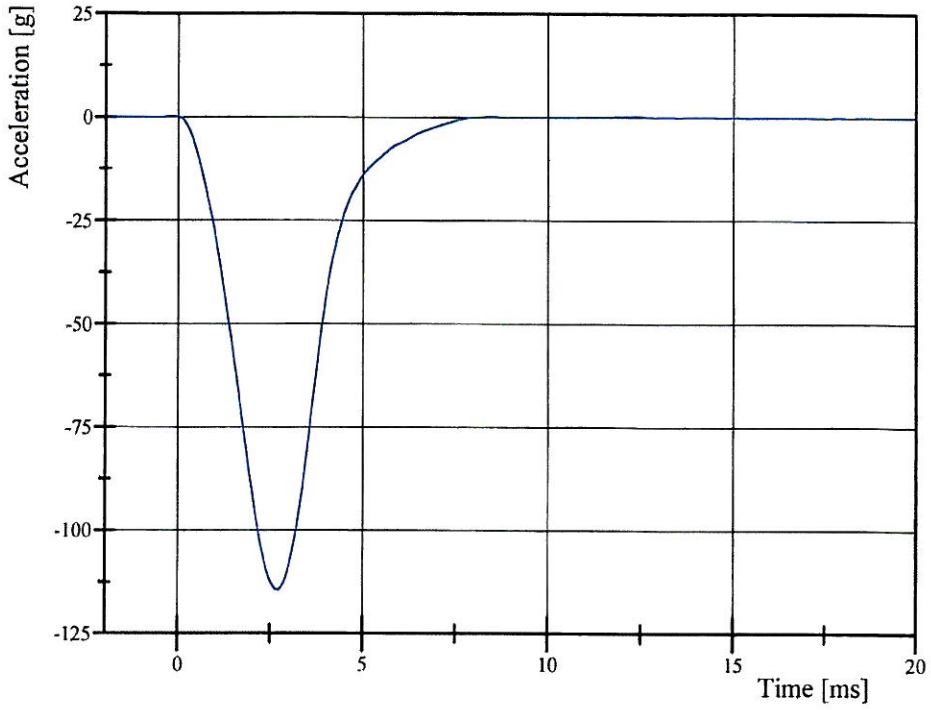
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.19.2009 19:05:39 1861

Transportation Research Center Inc.

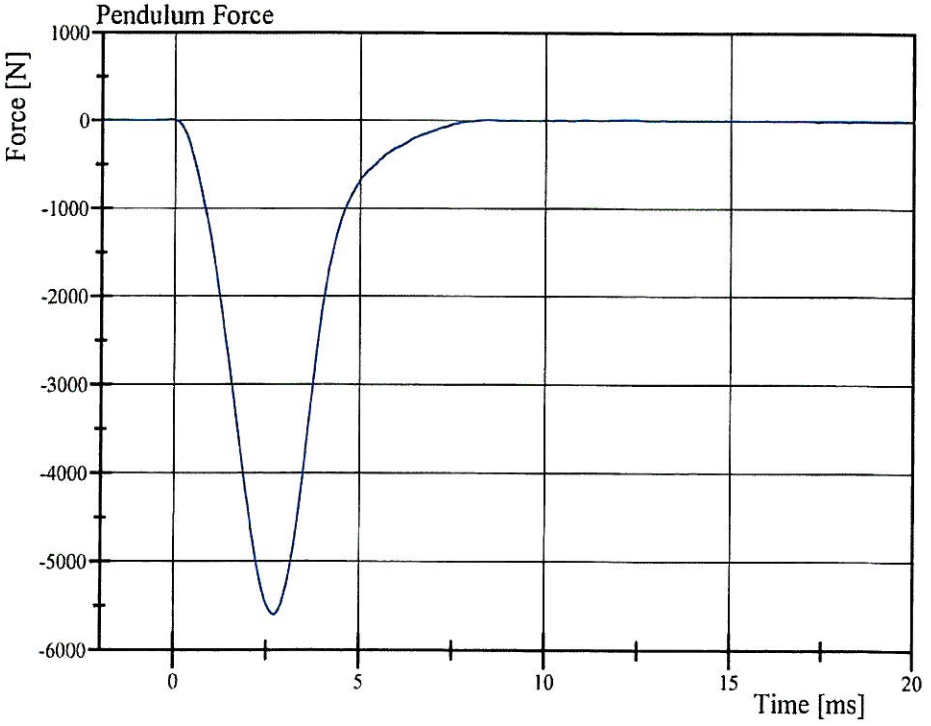
Left Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 4-4
Test Date: 5/19/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at 12.3 ms
Min: -114.4 g at 2.7 ms

Pendulum Force



Filter Class: CFC_600
Max: 12.1 N at 12.3 ms
Min: -5,597.6 N at 2.7 ms

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

05.19.2009 19:05:48 1861

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/19/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.111 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,271.74 N	Yes

Test meets specifications.

Comments:

Technician

Approved

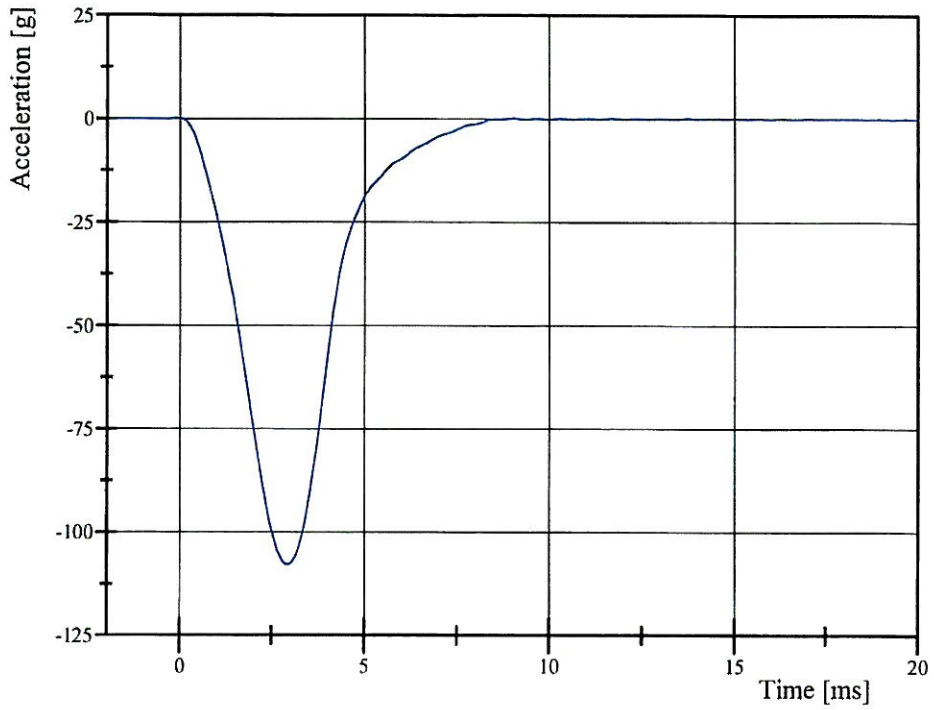
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.19.2009 18:01:46 1849

Transportation Research Center Inc.

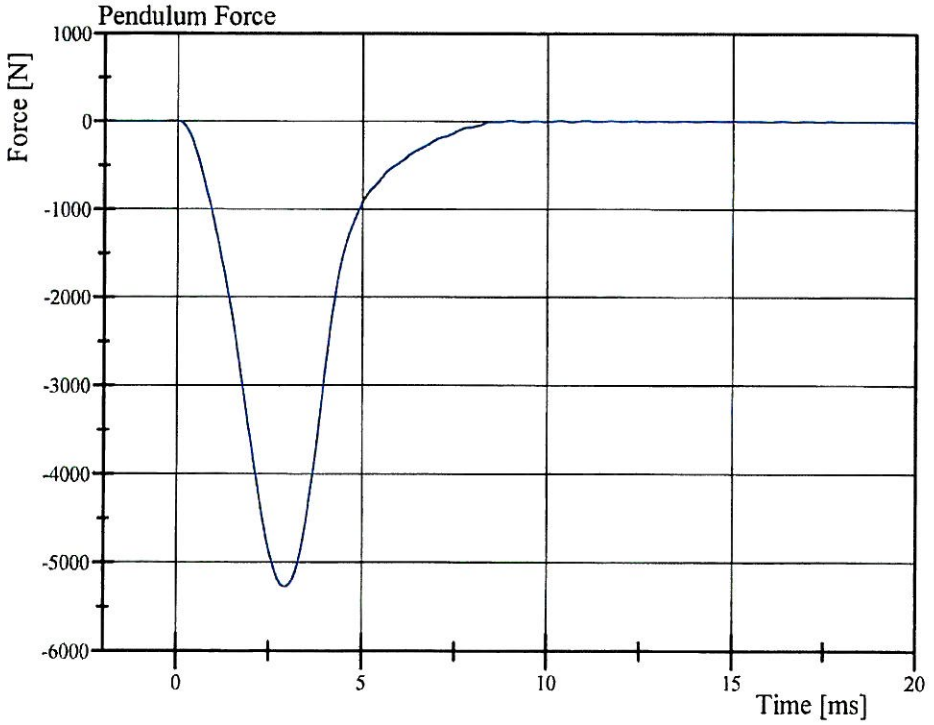
Right Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 4-2
Test Date: 5/19/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -107.7 g at 2.9 ms

Pendulum Force



Filter Class: CFC_600
Max: 8.6 N at -0.1 ms
Min: -5,271.7 N at 2.9 ms

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

05.19.2009 18:02:29 1849

CALIBRATION TEST RESULTS

POST-TEST

HIII 50th Male: 352

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 352
Calibration No. 05

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	886	Yes
B	Shoulder Pivot Height	505.5 - 520.7	515	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	136	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	93	Yes
F	Thigh Clearance	139.7 - 154.9	151	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	335	Yes
J	Elbow Rest Height	190.5 - 210.8	196	Yes
K	Buttock Knee Length	579.1 - 604.5	601	Yes
L	Popliteal Height	429.3 - 454.7	435	Yes
M	Knee Pivot Height	485.1 - 500.4	498	Yes
N	Buttock Popliteal Length	452.1 - 477.5	471	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	260	Yes
V	Shoulder Breadth	421.6 - 436.9	431	Yes
W	Foot Breadth	91.4 - 106.7	98	Yes
Y	Chest Circumference	970.3 - 1000.8	998	Yes
Z	Waist Circumference	835.7 - 866.1	861	Yes
AA	Location For Chest Circumference	429.3 - 434.3	433	Yes
BB	Location For Waist Circumference	226.1 - 231.1	231	Yes

Comments:

Technician

Approved

Transportation Research Center Inc.

Front Head Drop
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	260.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	5.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

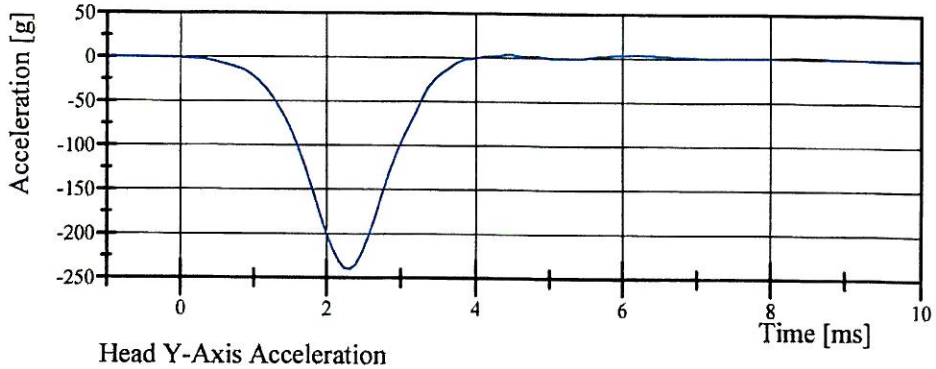
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.29.2009 07:39:17 610

Transportation Research Center Inc.

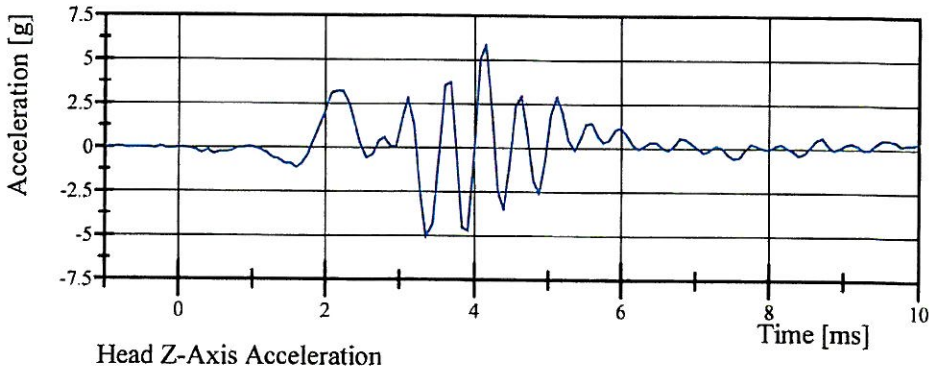
Front Head Drop
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/29/2009

Head X-Axis Acceleration



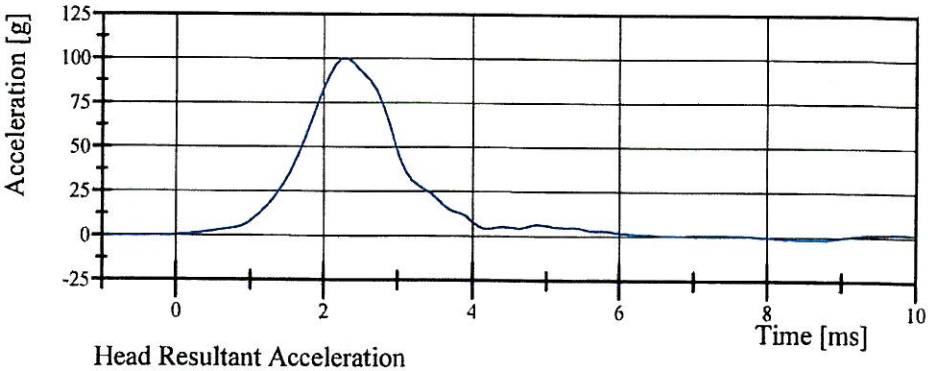
Filter Class: CFC_1000
Max: 3.8 g at 6.2 ms
Min: -240.1 g at 2.3 ms

Head Y-Axis Acceleration



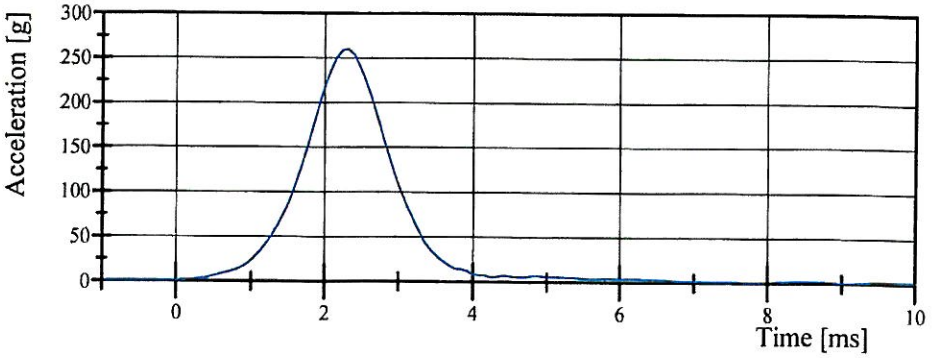
Filter Class: CFC_1000
Max: 5.9 g at 4.2 ms
Min: -5.1 g at 3.4 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 100.1 g at 2.3 ms
Min: -1.4 g at 8.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 260.1 g at 2.3 ms
Min: 0.0 g at -0.5 ms

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

05.29.2009 07:39:25 610

Transportation Research Center Inc.

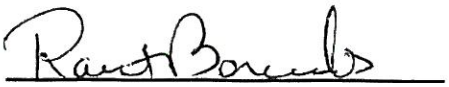
Neck Flexion
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.984 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	39.3 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-25.13 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.80 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-14.64 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-14.69 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-69.3 °	Yes
Time of Peak	57 - 64 ms	58.6 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	113.0 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	100.2 N·m	Yes
Time of Peak	47 - 58 ms	51.4 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.0 ms	Yes

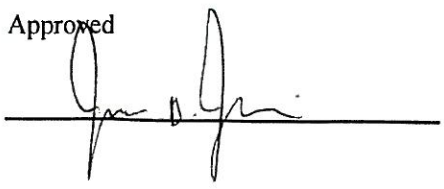
Test meets specifications.

Comments:

Technician



Approved



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

05.29.2009 08:28:53 2968

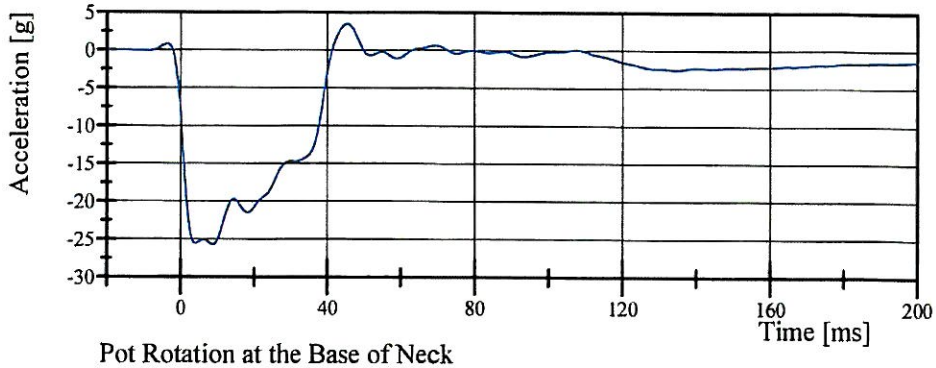
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 352 Certification No. 5-1

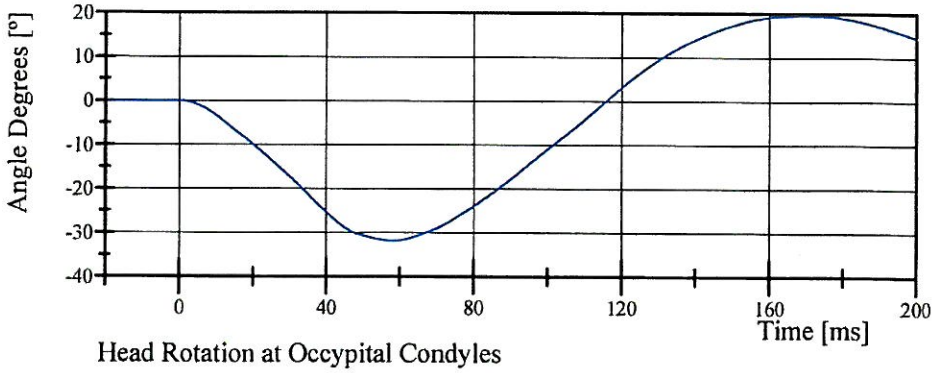
Test Date: 5/29/2009

Pendulum Acceleration



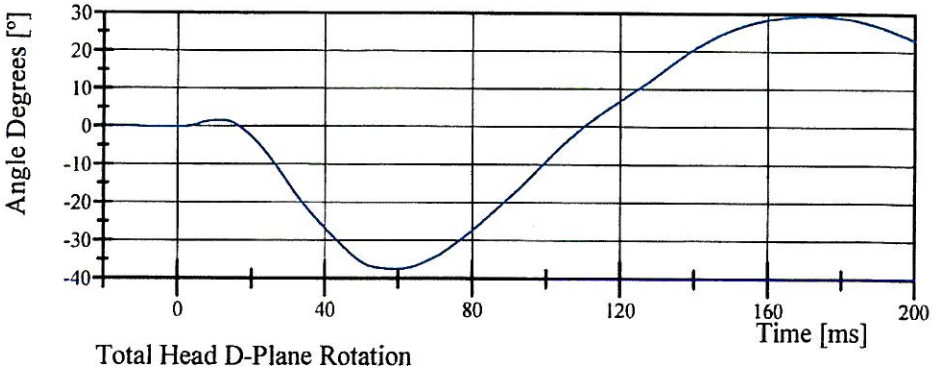
Filter Class: CFC_60
Max: 3.5 g at 45.5 ms
Min: -25.7 g at 8.8 ms

Pot Rotation at the Base of Neck



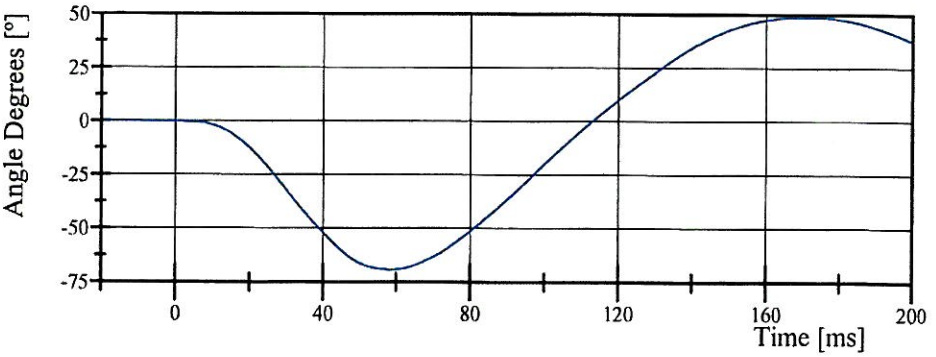
Filter Class: CFC_60
Max: 19.7 ° at 169.3 ms
Min: -31.8 ° at 58.2 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 29.4 ° at 172.4 ms
Min: -37.5 ° at 59.6 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 49.1 ° at 171.4 ms
Min: -69.3 ° at 58.6 ms

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

05.29.2009 08:29:01 2968

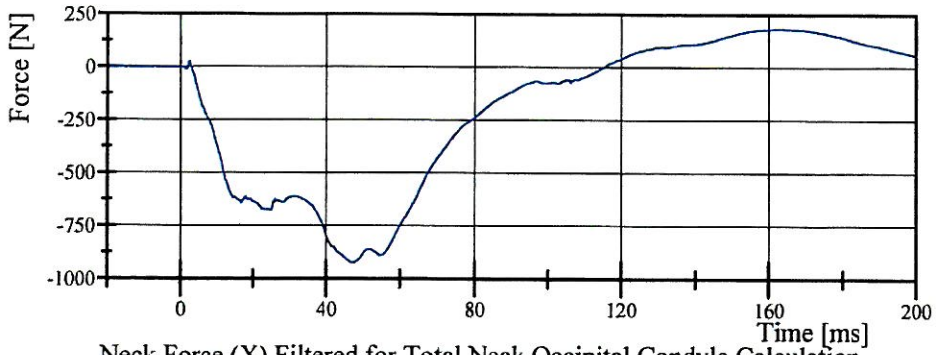
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 352 Certification No. 5-1

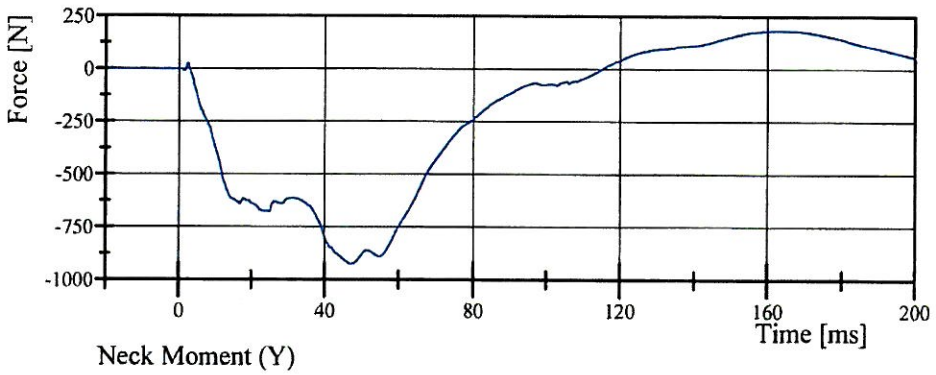
Test Date: 5/29/2009

Neck Force (X)



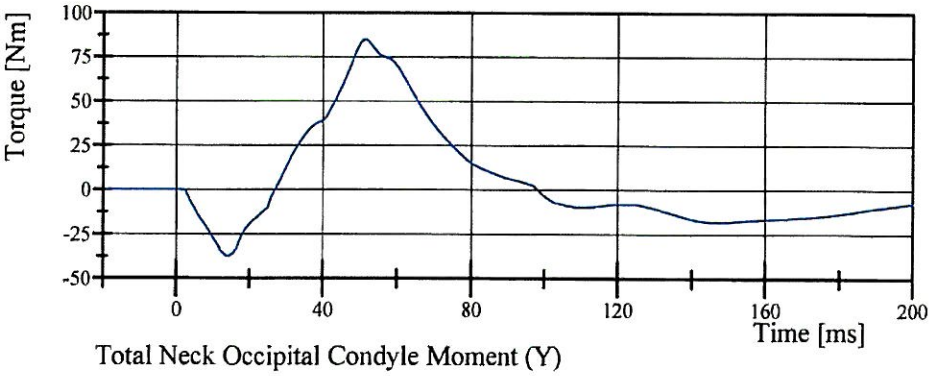
Filter Class: CFC_1000
Max: 185.1 N at 164.2 ms
Min: -924.9 N at 47.0 ms

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



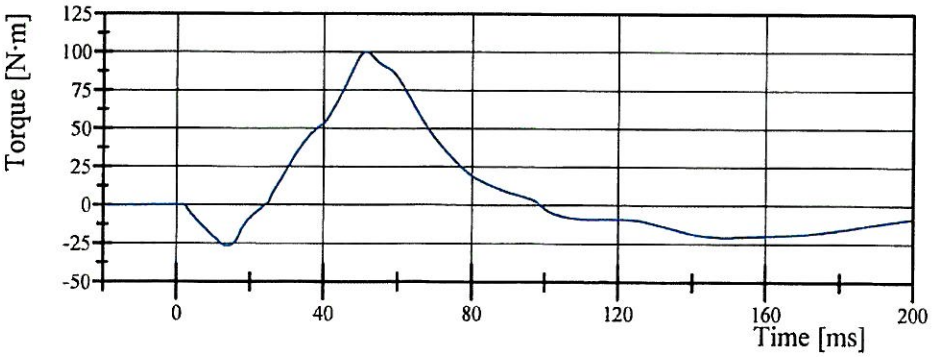
Filter Class: CFC_600
Max: 184.7 N at 163.4 ms
Min: -924.1 N at 47.0 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 85.0 Nm at 51.4 ms
Min: -37.4 Nm at 14.3 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 100.2 N·m at 51.4 ms
Min: -26.7 N·m at 13.9 ms

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

05.29.2009 08:29:02 2968

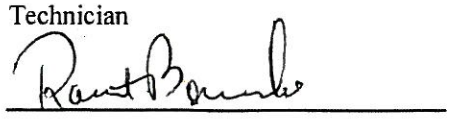
Transportation Research Center Inc.

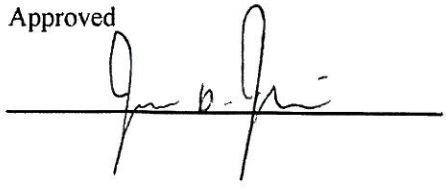
Neck Extension
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/29/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.979 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.9 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.23 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.31 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.35 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.36 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	94.6 °	Yes
Time of Peak	72 - 82 ms	77.9 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	155.4 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-61.7 N·m	Yes
Time of Peak	65 - 79 ms	72.9 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	141.8 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

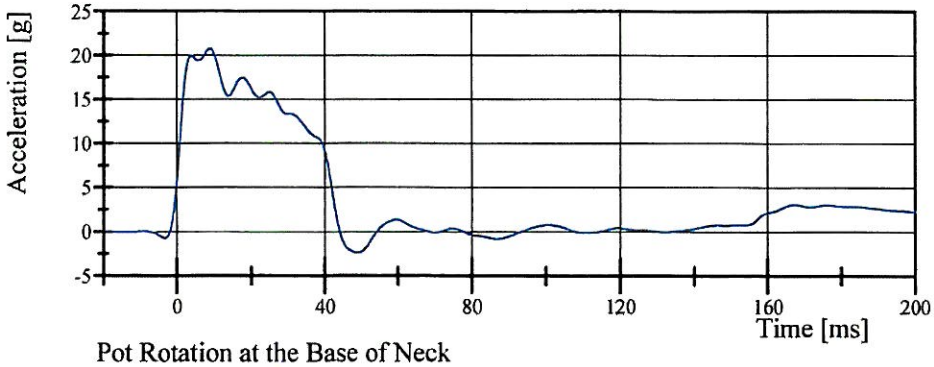
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.29.2009 09:11:13 3047

Transportation Research Center Inc.

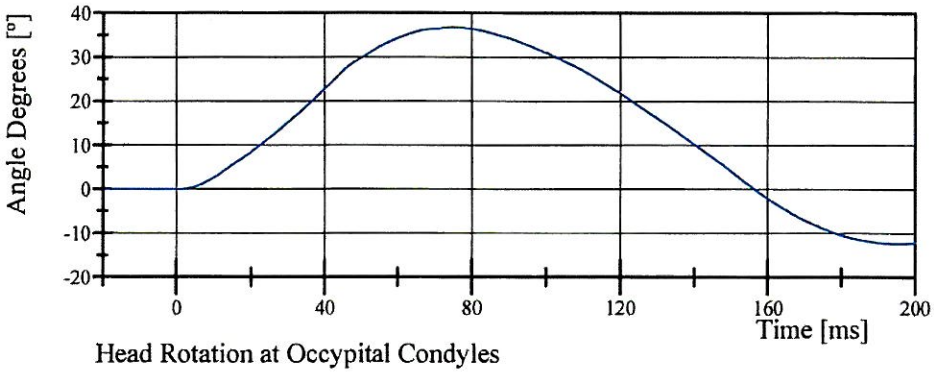
Neck Extension
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/29/2009

Pendulum Acceleration



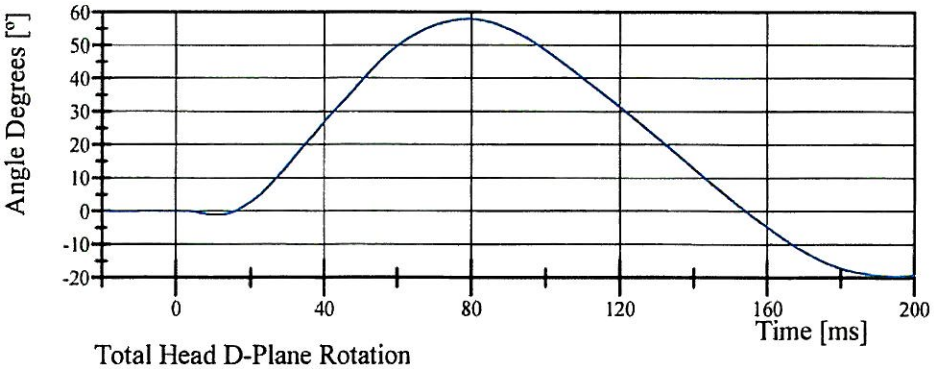
Filter Class: CFC_60
Max: 20.8 g at 9.0 ms
Min: -2.4 g at 49.0 ms

Pot Rotation at the Base of Neck



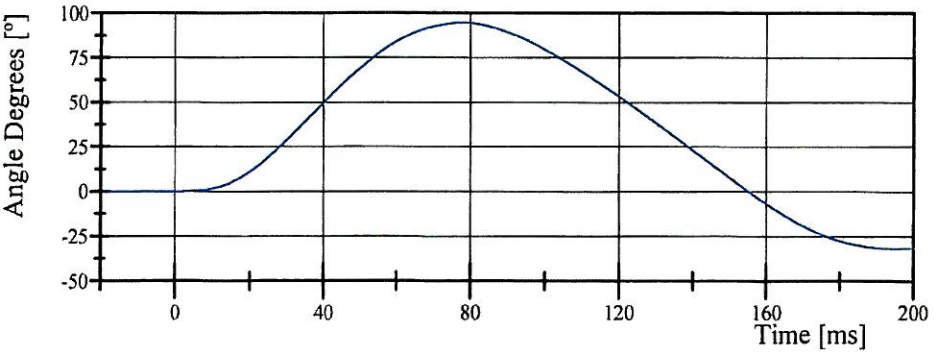
Filter Class: CFC_60
Max: 36.8 ° at 75.3 ms
Min: -12.3 ° at 195.6 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 58.0 ° at 79.4 ms
Min: -19.5 ° at 195.1 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 94.6 ° at 77.9 ms
Min: -31.8 ° at 195.3 ms

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

05.29.2009 09:11:21 3047

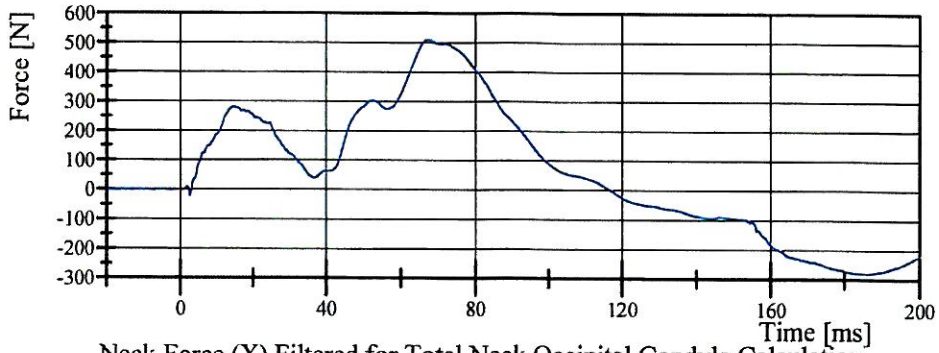
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 352 Certification No. 5-1

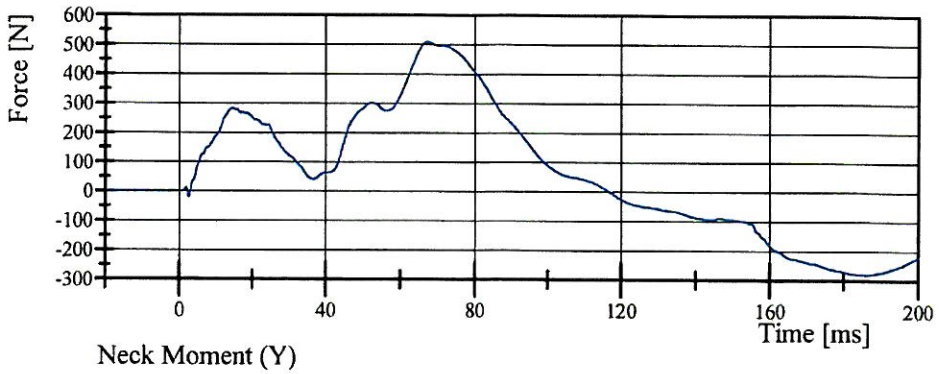
Test Date: 5/29/2009

Neck Force (X)



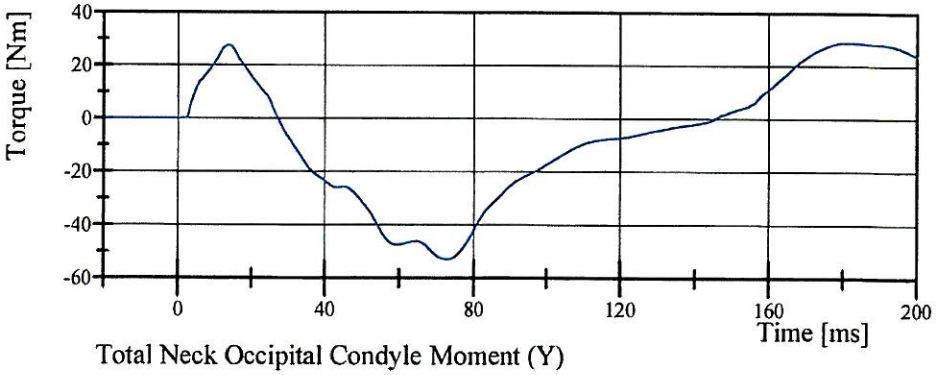
Filter Class: CFC_1000
Max: 510.0 N at 67.3 ms
Min: -280.4 N at 186.5 ms

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



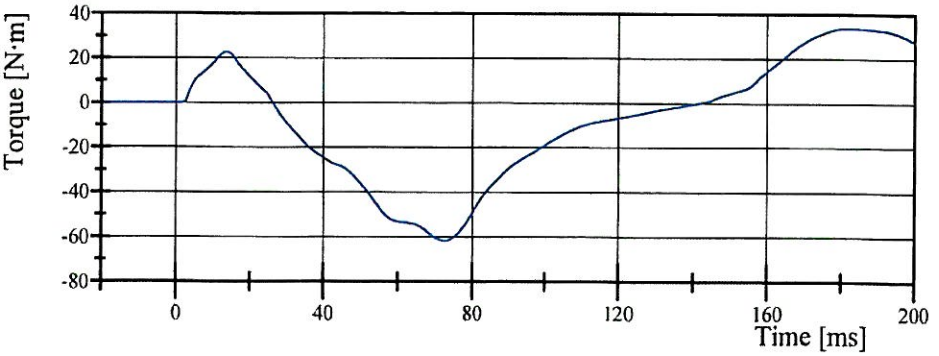
Filter Class: CFC_600
Max: 510.0 N at 67.5 ms
Min: -280.2 N at 186.5 ms

Neck Moment (Y)



Filter Class: CFC_600
Max: 29.0 Nm at 181.1 ms
Min: -53.0 Nm at 73.0 ms

Total Neck Occipital Condyle Moment (Y)



Filter Class: CFC_600
Max: 33.8 N·m at 181.3 ms
Min: -61.7 N·m at 72.9 ms

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

05.29.2009 09:11:21 3047

Transportation Research Center Inc.

Front Thorax
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/28/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.731 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,685.8 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-67.19 mm	Yes
Internal Hysteresis	65 - 85 %	72.4 %	Yes

Test meets specifications.

Comments:

Technician

Approved

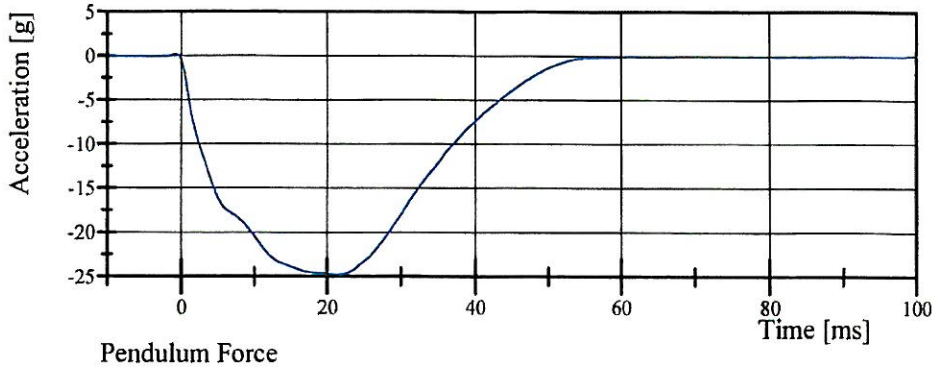
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

05.28.2009 13:42:26 373

Transportation Research Center Inc.

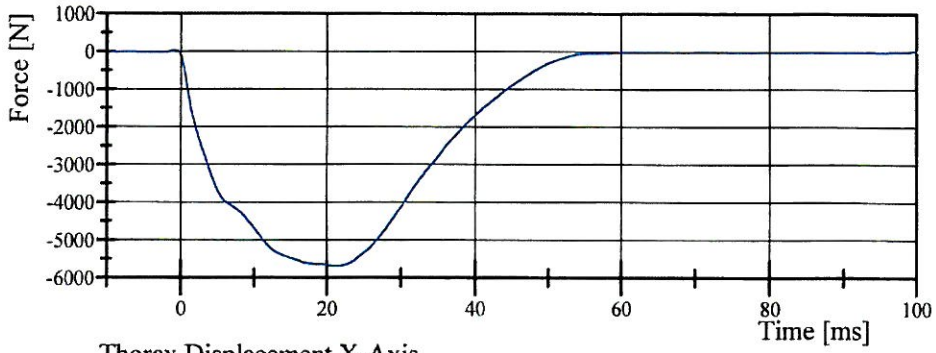
Front Thorax
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/28/2009

Pendulum Acceleration



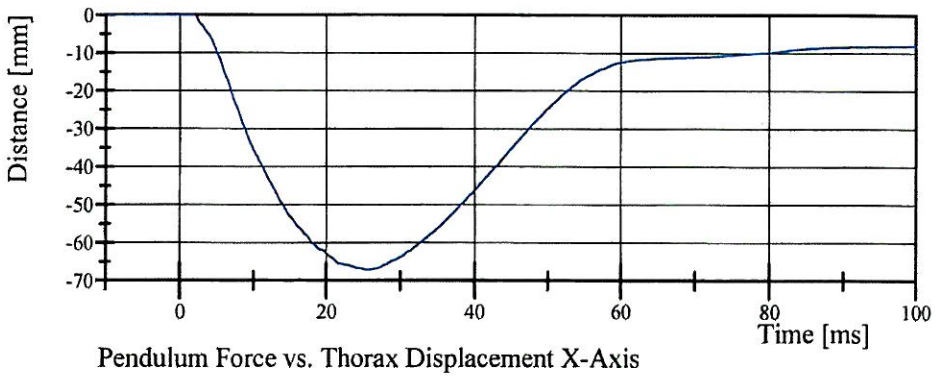
Filter Class: CFC_180
Max: 0.2 g at -0.6 ms
Min: -24.8 g at 21.3 ms

Pendulum Force



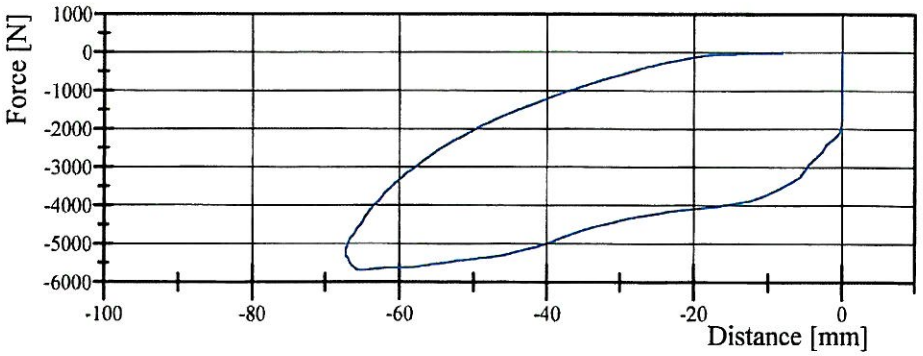
Filter Class: CFC_180
Max: 38.5 N at -0.6 ms
Min: -5,685.8 N at 21.3 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -9.4 ms
Min: -67.2 mm at 25.9 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 38.5 N at -0.0 mm
Min: -5,685.8 N at -64.8 mm

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

05.28.2009 13:42:32 373

Transportation Research Center Inc

Hybrid III Hip Range of Motion

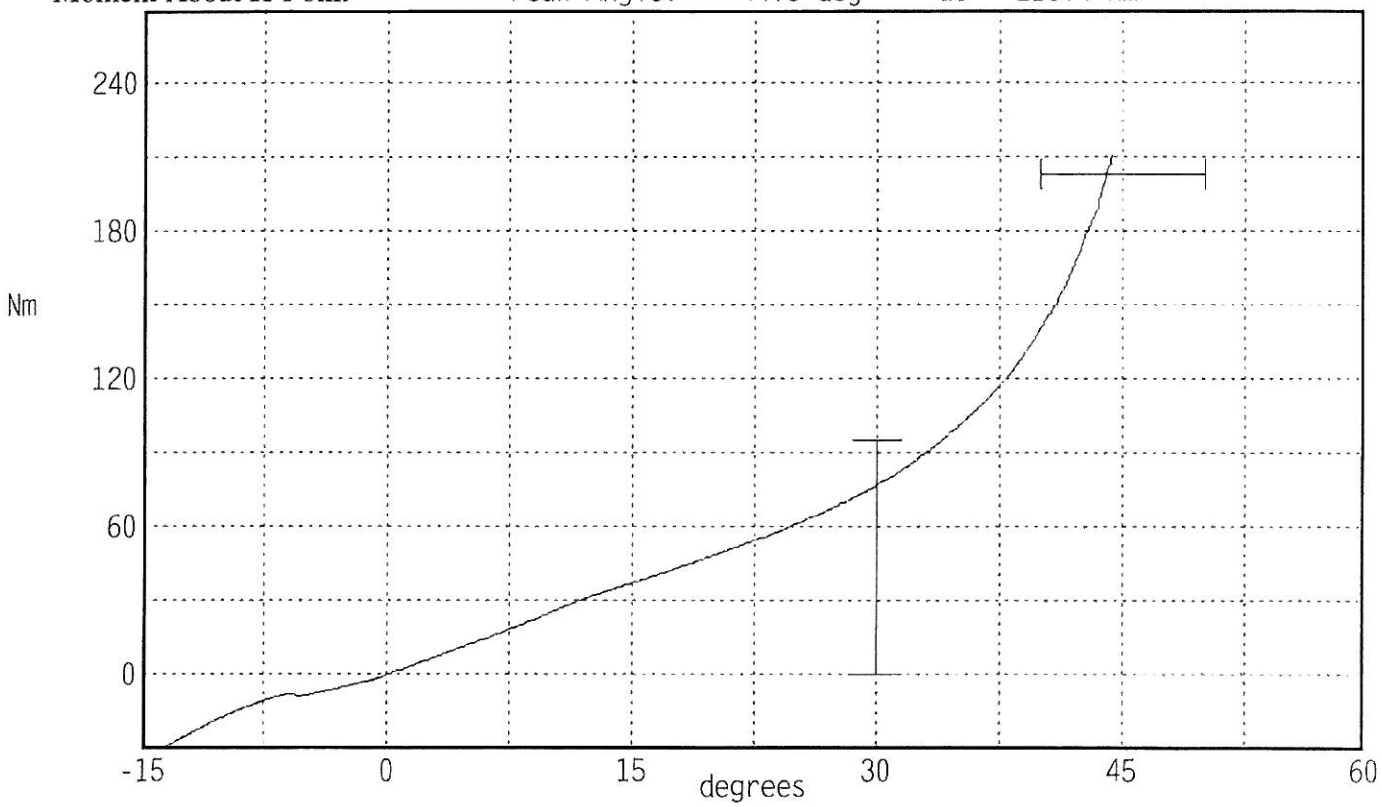
Serial Number: 352L
Test Number: 352C05
Comments:

Date: 05/29/2009
Time: 10:17

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.6	°C	Pass
Humidity	10 - 70	50	%	Pass
Moment at 30 deg	<= 94.9	76.9	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	44.1	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

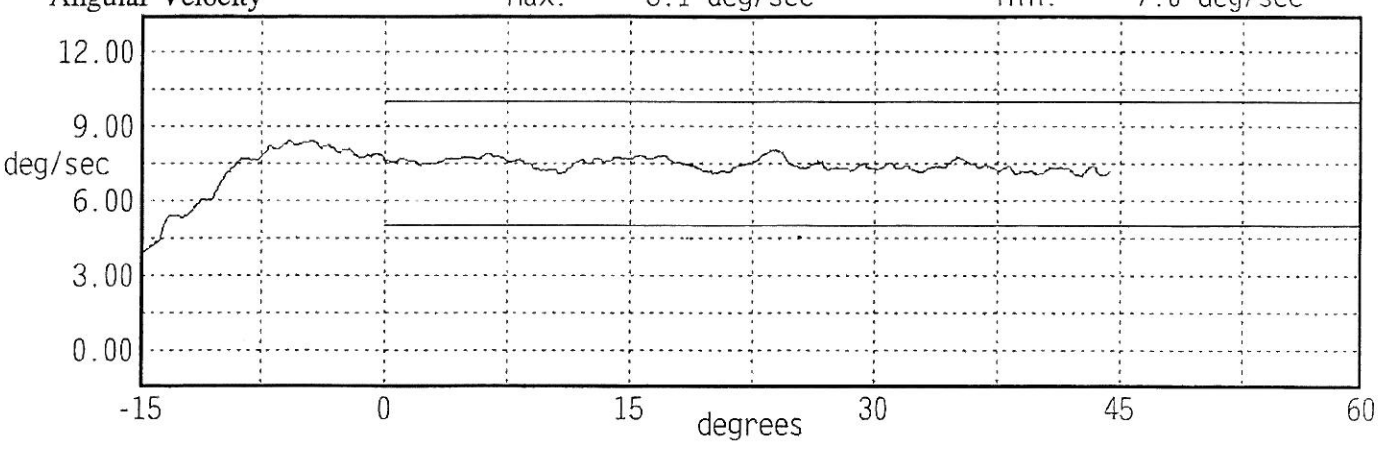
Moment About H-Point

Peak Moment: 210.4 Nm at 44.3 deg
Peak Angle: 44.3 deg at 210.4 Nm



Angular Velocity

Max: 8.1 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

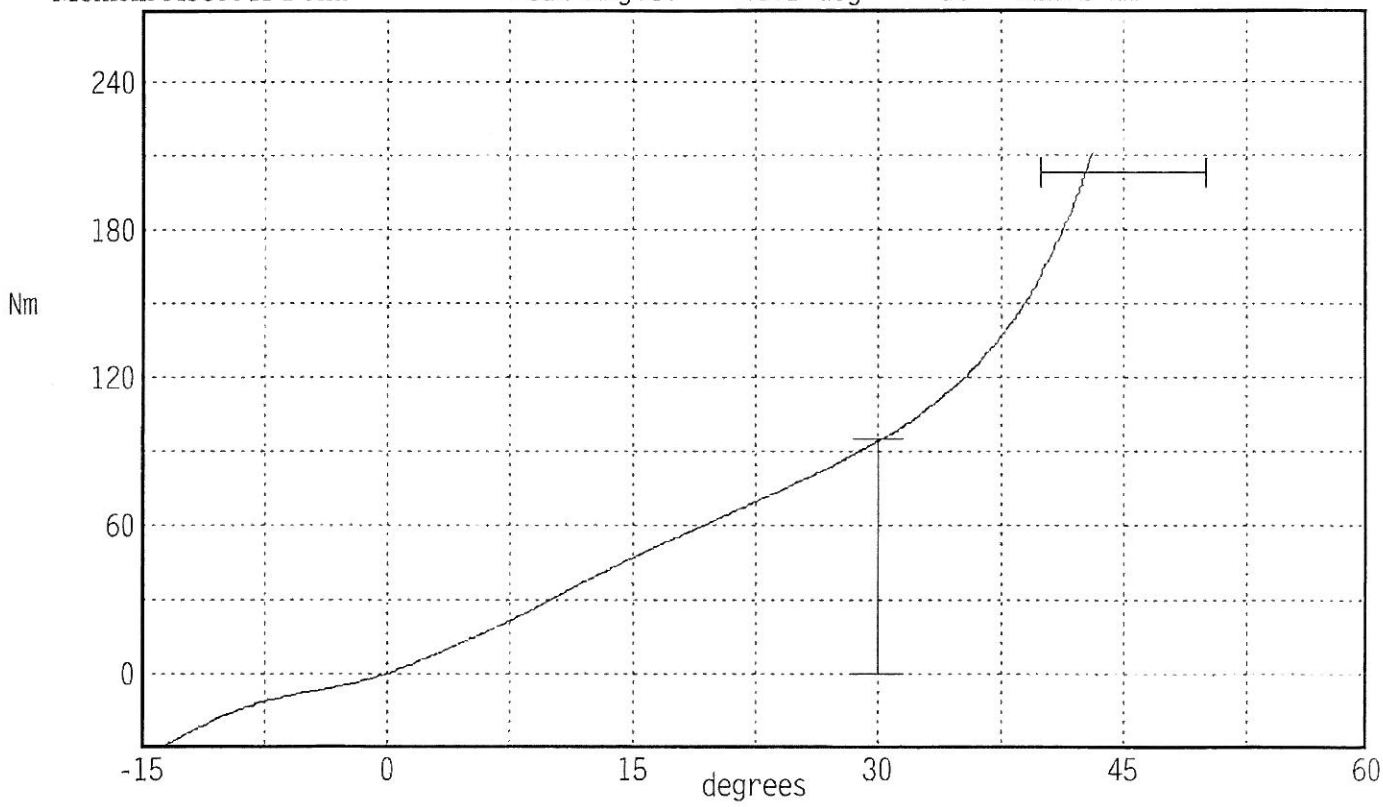
Serial Number: 352R
Test Number: 352C05
Comments:

Date: 05/29/2009
Time: 10:47

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.8	°C	Pass
Humidity	10 - 70	51	%	Pass
Moment at 30 deg	<= 94.9	94.1	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	42.6	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

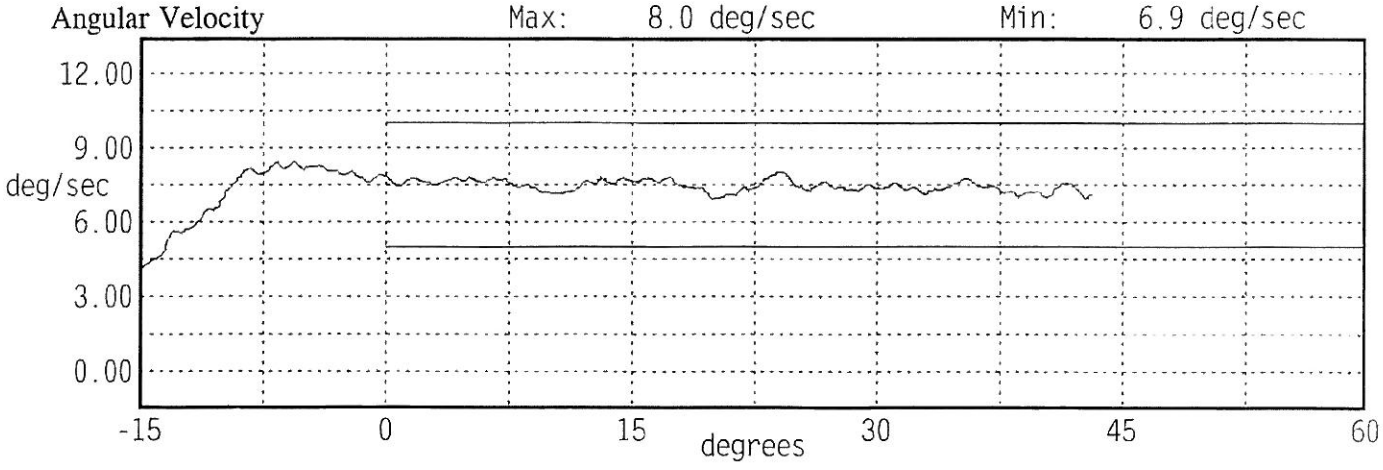
Moment About H-Point

Peak Moment: 211.1 Nm at 43.1 deg
Peak Angle: 43.1 deg at 211.1 Nm



Angular Velocity

Max: 8.0 deg/sec Min: 6.9 deg/sec



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/28/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.120 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,131.73 N	Yes

Test meets specifications.

Comments:

Technician

Approved

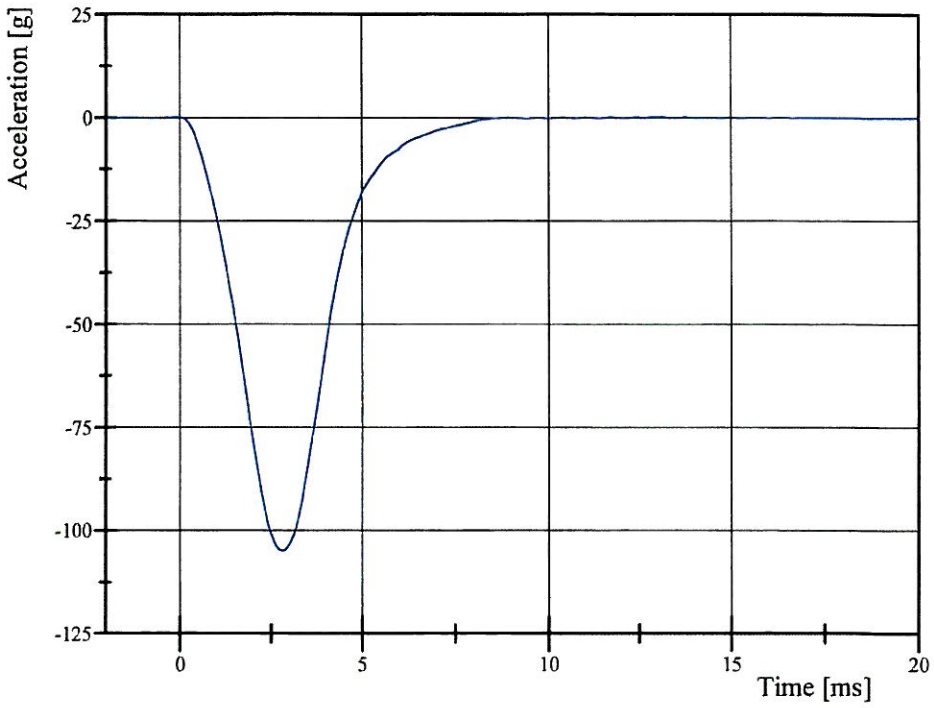
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.28.2009 15:12:13 1720

Transportation Research Center Inc.

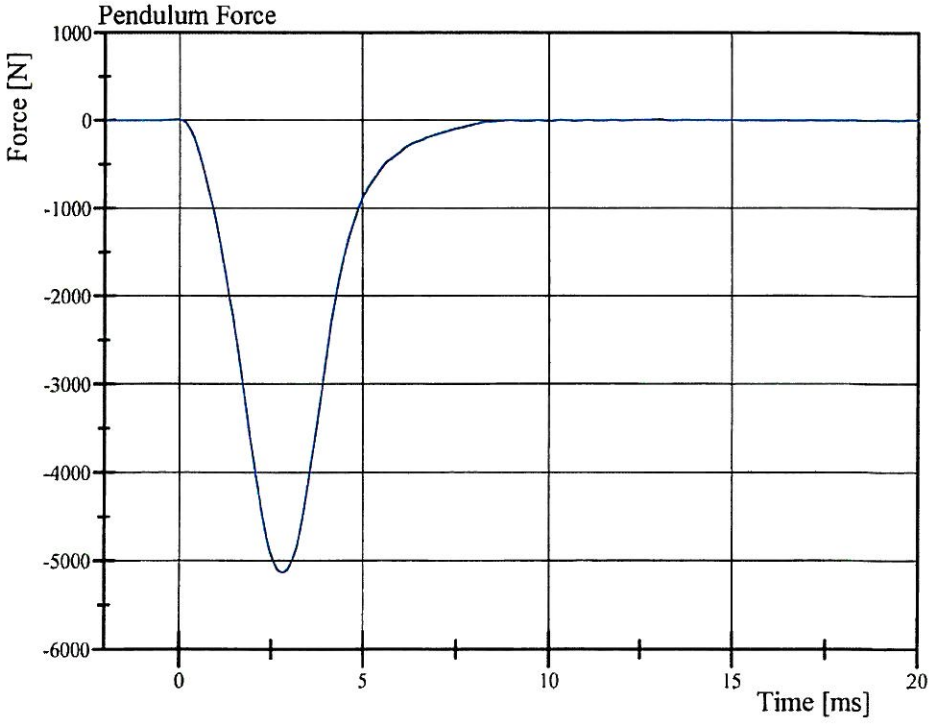
Left Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/28/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.3 g at 13.0 ms
Min: -104.9 g at 2.8 ms

Pendulum Force



Filter Class: CFC_600
Max: 13.1 N at 13.0 ms
Min: -5,131.7 N at 2.8 ms

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

05.28.2009 15:12:20 1720

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/28/2009

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.113 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-4,963.60 N	Yes

Test meets specifications.

Comments:

Technician

Approved

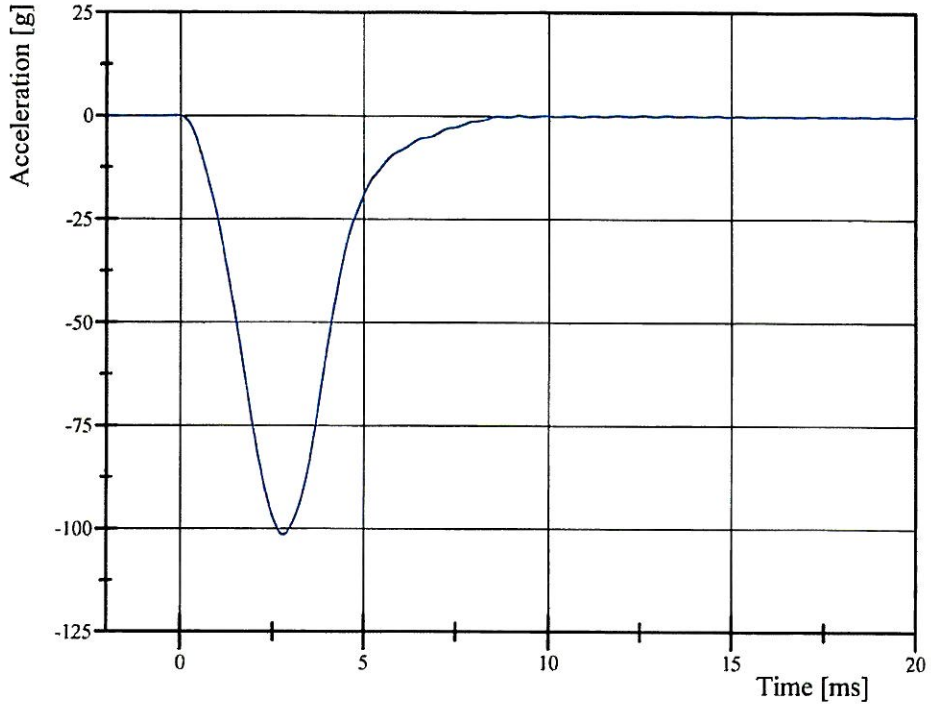
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

05.28.2009 14:52:20 1723

Transportation Research Center Inc.

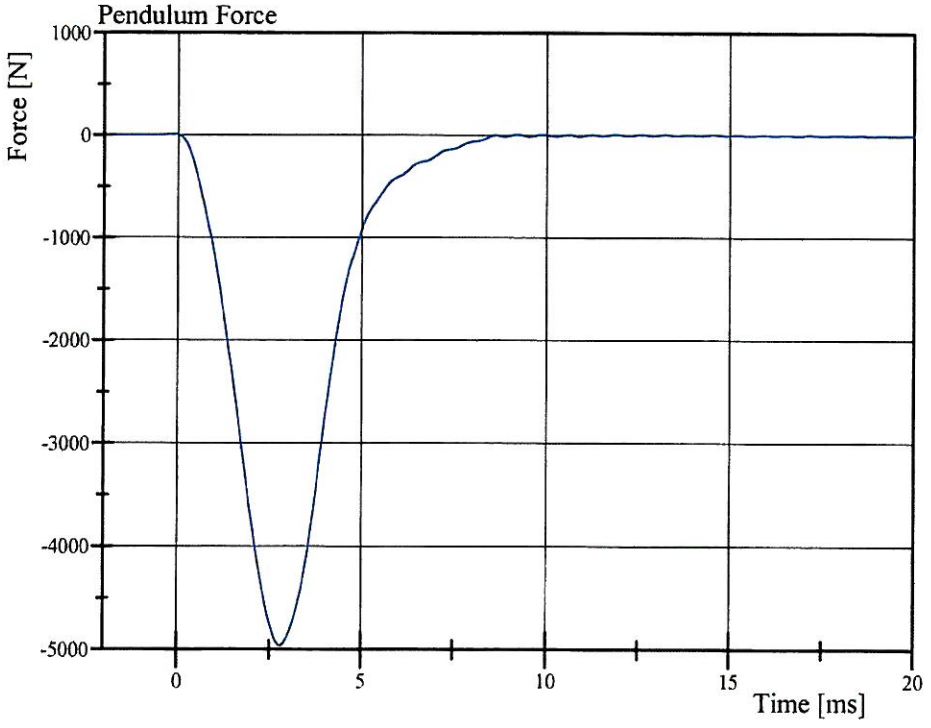
Right Knee Femur Response Test
HIII 50th Serial No. 352 Certification No. 5-1
Test Date: 5/28/2009

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -101.4 g at 2.8 ms

Pendulum Force



Filter Class: CFC_600
Max: 9.5 N at -0.1 ms
Min: -4,963.6 N at 2.8 ms

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

05.28.2009 14:52:28 1723