

Final Report Number: NCAP-TRC-18-003

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

VOLSKWAGEN DE MEXICO S.A. DE C.V. MEXICO

2018 Volkswagen Tiguan

NHTSA Number: M20185803

PREPARED BY:

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Report Date: March 14, 2023

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

Office of Crashworthiness Standards

1200 New Jersey Ave, SE

Washington, DC 20590

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Approved By: John Shultz

Approval Date: March 14, 2023

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date _____

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

Date _____

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16. Abstract A 56.0 km/h NCAP Frontal Impact Test was conducted on a 2018 Volkswagen Tiguan, in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. The test was conducted at the Transportation Research Center Inc. in East Liberty, Ohio on December 13, 2017. The impact velocity was 56.64 km/h, and the ambient temperature at the barrier face at the time of impact was 18.8° C. The target vehicle post-test maximum crush was 395 millimeters at crush zone 3. The driver seat belt completely separated at the buckle latch plate during the event. The test vehicle's performance is as follows: <table border="1" data-bbox="230 1094 1409 1545"> <thead> <tr> <th></th> <th colspan="3">Driver ATD</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>NA</td> <td>700</td> <td>166</td> <td>NA</td> <td>700</td> <td>238</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-27.7</td> <td>mm</td> <td>52</td> <td>-21.6</td> </tr> <tr> <td>3ms Chest Clip</td> <td>Gs</td> <td>60</td> <td>67.0</td> <td>Gs</td> <td>60</td> <td>42.7</td> </tr> <tr> <td>Nij</td> <td>NA</td> <td>1</td> <td>0.52</td> <td>NA</td> <td>1</td> <td>0.45</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1400.4</td> <td>Newtons</td> <td>2620</td> <td>881.5</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-89.8</td> <td>Newtons</td> <td>2520</td> <td>-470.0</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-2308.6</td> <td>Newtons</td> <td>6805</td> <td>-2319.6</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-3623.5</td> <td>Newtons</td> <td>6805</td> <td>-2009.5</td> </tr> </tbody> </table>								Driver ATD			Passenger ATD			Measurement Description	Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	NA	700	166	NA	700	238	Maximum Chest Compression	mm	63	-27.7	mm	52	-21.6	3ms Chest Clip	Gs	60	67.0	Gs	60	42.7	Nij	NA	1	0.52	NA	1	0.45	Neck Tension	Newtons	4170	1400.4	Newtons	2620	881.5	Neck Compression	Newtons	4000	-89.8	Newtons	2520	-470.0	Left Femur Force	Newtons	10008	-2308.6	Newtons	6805	-2319.6	Right Femur Force	Newtons	10008	-3623.5	Newtons	6805	-2009.5
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1: PURPOSE AND SUMMARY OF THE TEST

PURPOSE

This 56 km/h 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. DTNH22-12-D-00257. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

This 56 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Front NCAP Laboratory Test Procedure dated October 2015.

SUMMARY

A 2018 Volkswagen Tiguan impacted the barrier wall at a velocity of 56.64 km/h. The test was performed at Transportation Research Center, Inc. on December 13, 2017. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

One Part 572E 50th percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck load cells, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and the passenger's shoulder belts to measure dummy pelvic section loading.

The driver (position 1) ATD (Serial No. 037), and the right-front passenger (position 2) ATD (Serial No. 070) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 98 channels of data were recorded on an on-board data acquisition system. The 288 barrier channels of data were recorded on an off-board high resolution barrier data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100.0 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 395 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: front airbag, a-pillar and knee bolster. The passenger's visible contact points were as follows: front airbag, head restraint and glove box.

The driver seat belt completely separated at the buckle latch plate during the event.

The occupant data is summarized below:

ATD Position	HIC ₁₅	Nij	Neck Tension (N)	Neck Compression (N)	3 ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th Male)	166	0.52	1400.4	-89.8	67.0	-27.7	-2308.6	-3623.5
Passenger (5 th Female)	238	0.45	881.5	-470.0	42.7	-21.6	-2319.6	-2009.5

2: OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

TEST VEHICLE INFORMATION

NHTSA No.	M20185803
Model Year	2018
Make	Volkswagen
Model	Tiguan
Body Style	MPV
VIN	3VV0B7AX7JM015996
Body Color	Cardinal Red Metallic
Odometer Reading (km/mi)	27 mi
Engine Displacement (L)	2.0
Type/No. Cylinders	Straight/4
Engine Placement	Frontal/Transverse
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	AWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

TEST VEHICLE OPTIONS

Traction Control System (TCS)	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other	No

Does owner's manual provide instructions to turn off automatic door locks?

Yes

DATA FROM CERTIFICATION LABEL

Manufactured by	VOLSKWAGEN DE MEXICO S.A. DE C.V. MEXICO	GVWR (kg)	2310 (5093 lbs)
Date of Manufacture	07/17	GAWR Front (kg)	1190 (2624 lbs)
		GAWR Rear (kg)	1170 (2579 lbs)

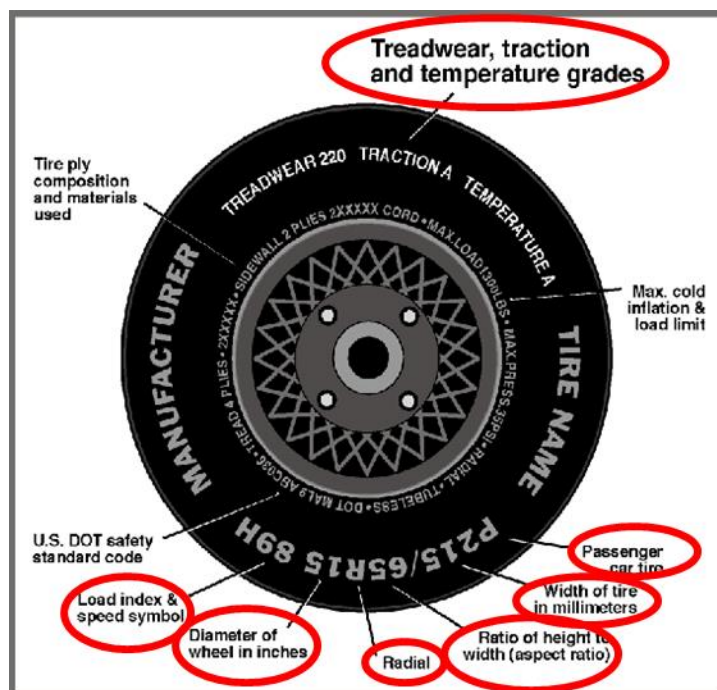
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				440
Cargo Wt. (RCLW) (kg)				99.8

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	280	280
Recommended Tire Size	215/65 R17	215/65 R17
Tire Size on Vehicle	215/65 R17	215/65 R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia H/L 422 Plus	Ecopia H/L 422 Plus
Treadwear	600	600
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	99	99
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Right	V6E3 EC1 2517	V6E3 EC1 2517
DOT Safety Code Left	V6E3 EC1 2517	V6E3 EC1 2517

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2018 Volkswagen TiguanNHTSA No.: M20185803Test Program: NCAP Frontal ImpactTest Date: 12/13/2017**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	491.4	372.2		536.2	464.8	
Right	kg	491.4	389.2		518.4	456.6	
Ratio	%	56.3	43.7		53.4	46.6	
Totals	kg	982.8	761.4	1744.0	1054.6	921.4	1976.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1744.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	139.3
Rated Cargo/Luggage Weight (RCLW)	kg	99.8
Vehicle Target Weight (TVTW)	kg	1983.1

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front)
As Delivered	mm	795	796	817	823	1218
As Tested	mm	786	788	793	795	1301
Post Test	mm	732	644	830	745	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2790
Total Vehicle Length at Left Side	mm	4500
Total Vehicle Length at Centerline	mm	4695
Total Vehicle Length at Right Side	mm	4500
Weight of Ballast in Cargo Area	kg	24.95
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	liters	56.0

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: None

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4695
2	Total Width	1840
3	Bumper Top Height	563
4	Bumper Bottom Height	513
5	Longitudinal Member Top Height	610
6	Distance Between Longitudinal Members	885
7	Longitudinal Member Width	80
8	Engine Top Height	895
9	Engine Bottom Height	220
10	Engine and Gearbox Width	720
11	Front Bumper-Engine Distance	435
12	Front Shock Absorber Fixing Height	895
13	Bonnet Leading Edge Height	845
14	Front Shock Absorber Fixing Width	1140
15	Front Bumper – Front Axle Distance	900
16	Front Axle – A-Pillar Distance	580
17	A-Pillar – B-Pillar Distance	995
18	B-Pillar – Rear Axle Distance	1220
19	B-Pillar – C-Pillar Distance	1030
20	Roof Sill Bottom Height	1454
21	Roof Sill Top Height	1520
22	Floor Sill Bottom Height	390
23	Floor Sill Top Height	430

DATA SHEET NO. 2

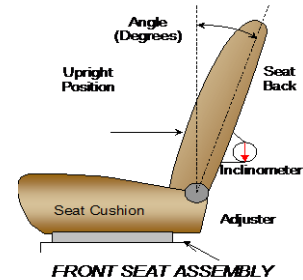
SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat back. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable. Inclinometer measurement at the top of the backrest at the seat centerline, according to Form 1 attachment.



	Degree
Driver Seat back angle:	-17.6
Passenger Seat back angle:	-16.9

SEAT FORE/AFT POSITIONS

Describe the method used of determining seat for/aft positions.

Driver: Mid position, Positioned according to Form 1

Passenger: Full forward, Positioned according to Form 1

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	296 (39 detents)	148 (detent 17)
Passenger Seat	250 (39 detents)	0 (detent 1)

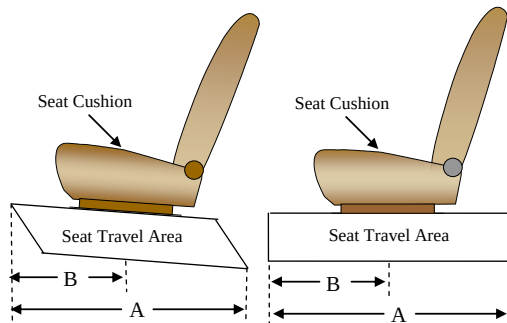
SEAT BELT UPPER ANCHORAGE

Describe the method of positioning seat belt upper anchorages.

Driver: Uppermost, Positioned according to Form 1

Passenger: Uppermost, Positioned according to Form 1.

	Total No. of Positions	Placed in Position No.
Driver Seat	4	1 uppermost
Passenger Seat	4	1 uppermost



DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM AND STEERING WHEEL DATA

Test Vehicle: 2018 Volkswagen Tiguan

NHTSA No.: M20185803

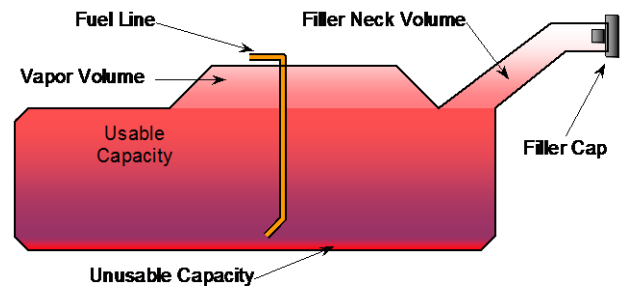
Test Program: NCAP Frontal Impact

Test Date: 12/13/2017

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	60.2
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	56.0
Actual Amount of Solvent Used	56.0
1/3 of Usable Capacity	18.7

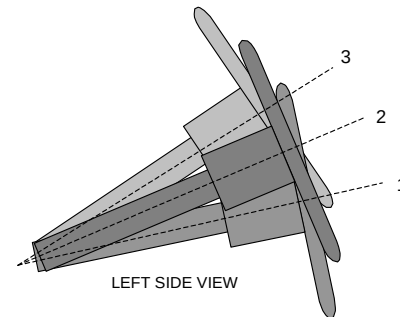
The fuel pump runs for 2 seconds after ignition is switched on. If the engine doesn't run, the fuel pump stops running. If there is a crash signal, it will also stop running.



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. Steel square was placed across the rim of the steering wheel, an inclinometer was placed on the plate and the angle was measured. Telescope travel was measured full in and full out and set at the midpoint.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

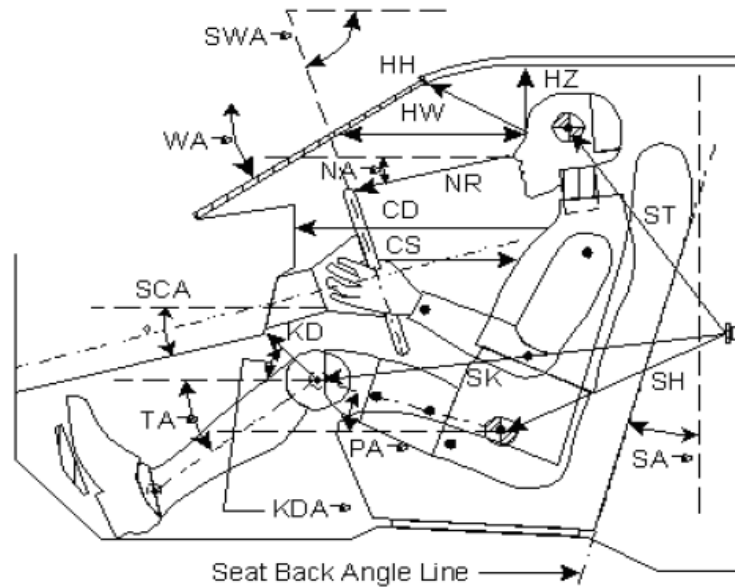
	Degrees	Fore/Aft Position (mm)
Lowermost Position No. 1	28.3	0
Geometric Center Position No. 2	31.0	27
Uppermost Position No. 3	33.8	55
Telescoping Steering Wheel Travel		55
Test Position	31.0	27

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017



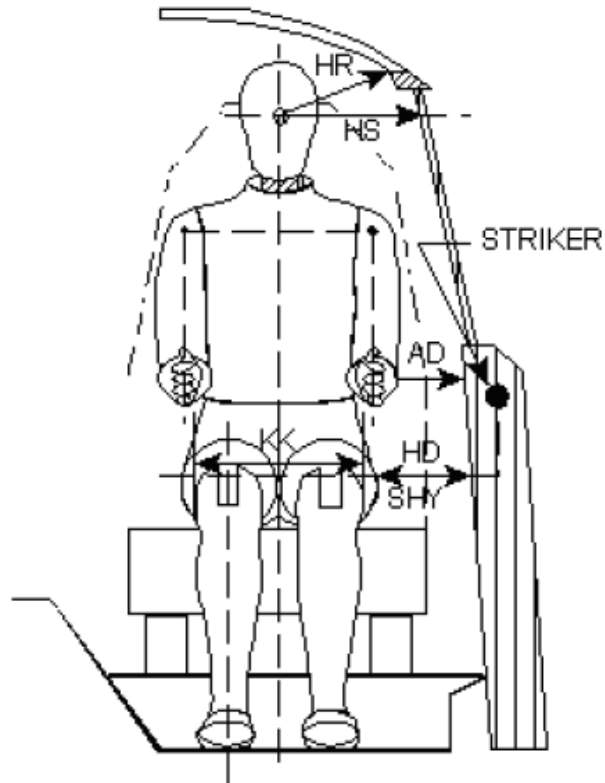
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		30.4		
SWA°	Steering Wheel Angle		26.4		
SCA°	Steering Column Angle		63.6		
SA°	Seat Back Angle (on headrest post)		17.6		16.9
HZ	Head to Roof (Z)	248		253	
HH	Head to Header	413		354	
HW	Head to Windshield	682		671	
NR	Nose to Rim	424	6.8		
CD	Chest to Dash	568		387	
CS	Chest to Steering Hub	360			
RA	Rim to Abdomen	236			
KDL	Left Knee to Dash	206	23.0	106	36.3
KDR	Right Knee to Dash	204	23.4	114	36.3
PA°	Pelvic Angle		24.4		20.6
TA°	Tibia Angle		49.1		57.6
SK	Striker to Knee	600	12.5	715	13.0
ST	Striker to Head	396	-75.8	390	-58.3
SH	Striker to H-Point	342	50.4	420	32.4

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017



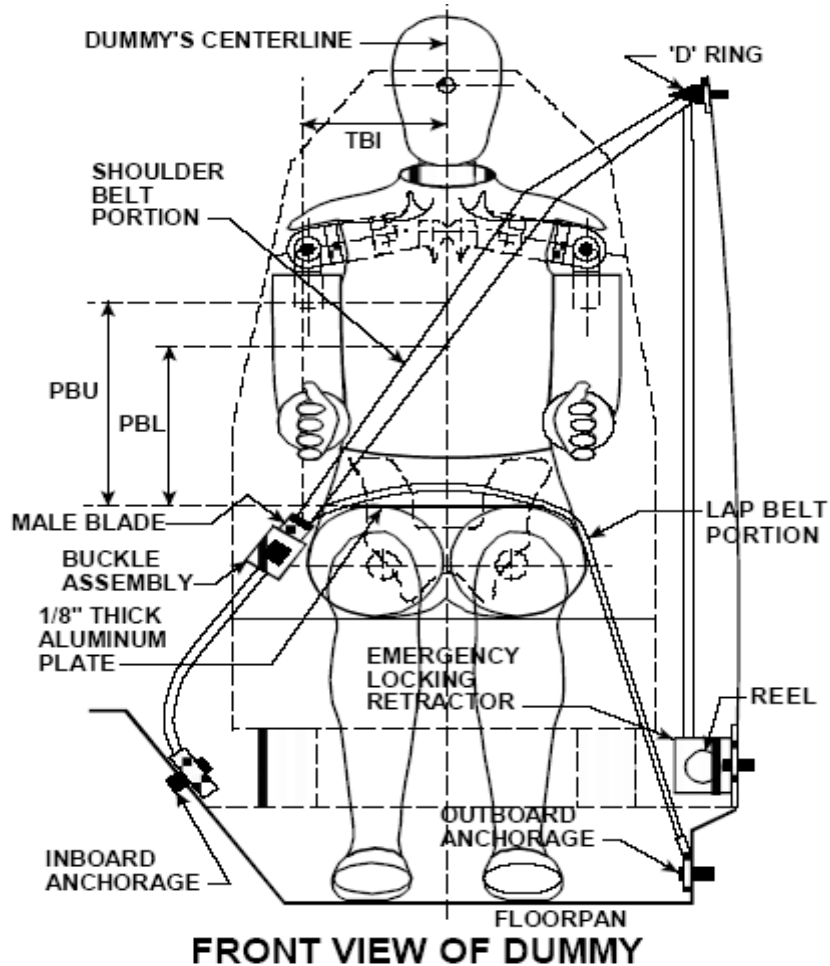
Code	Measurement Description	Driver	Passenger
AD	Arm to Door	135	113
HD	H-Point to Door	146	191
HR	Head to Side Header	247	285
HS	Head to Side Window	364	395
KK	Knee to Knee	327	165
SHY	Striker to H-Point (Y Direction)	245	280
AA	Ankle to Ankle	342	170

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	349	315
PBL – Top surface of reference to belt lower edge	mm	261	220

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	878	955
Lap belt length as measured on ATD	mm	690	760
Remainder of belt on reel	mm	1132	924
Total belt length for continuous webbing systems	mm	2700	2654

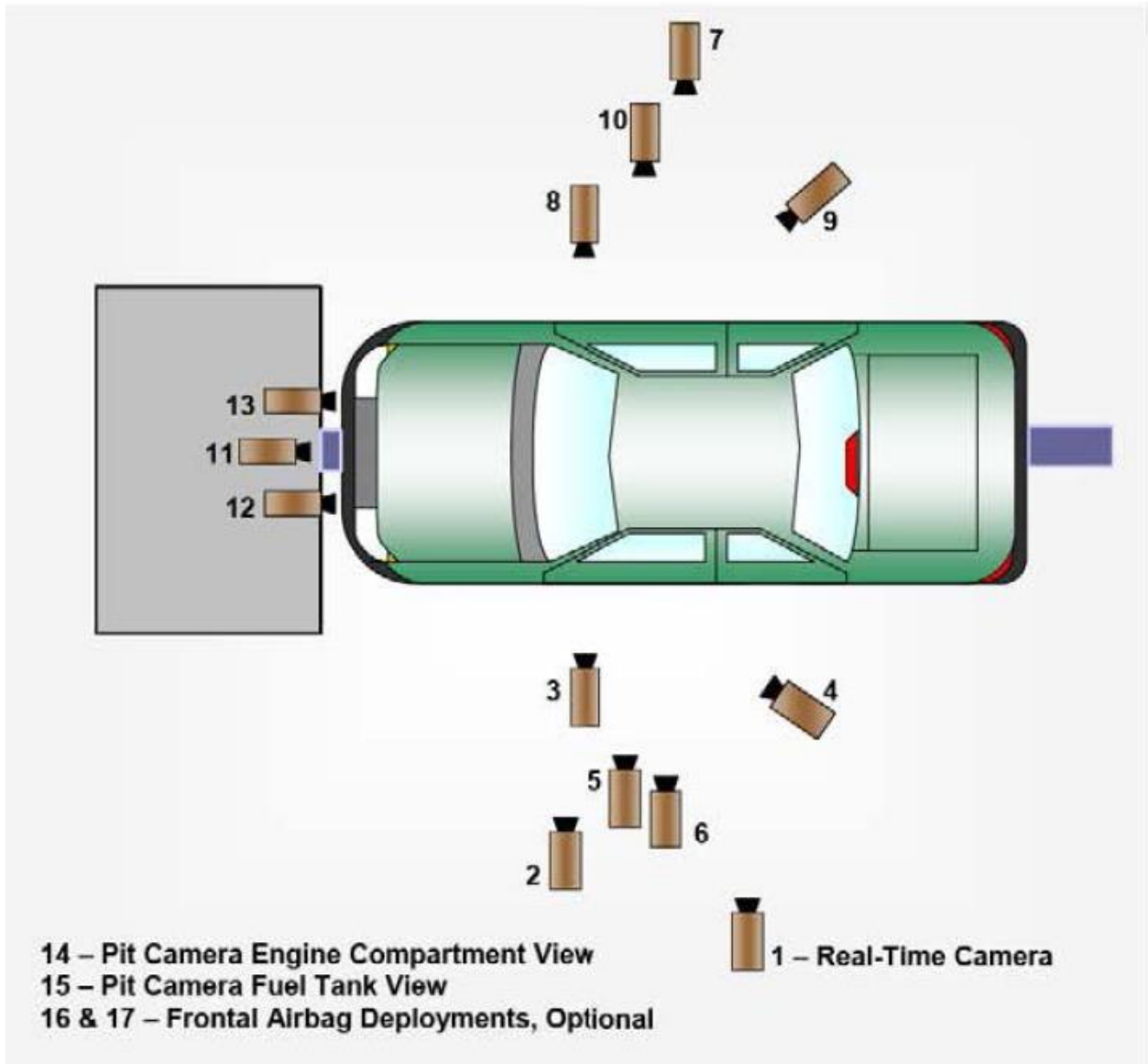
DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 (CONTINUED)**HIGH SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Frame Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	986	-5878	-1273	Zoom	30
2	Driver Close-Up	1840	-5677	-1522	50	1000
3	Left Front Half	1552	-5320	-1443	28	1000
4	Left Angle	4063	-2858	-2117	25	1000
5	Steering Column - Top	2440	-6216	-2213	50	1000
6	Steering Column – Bottom	2180	-5742	-1521	50	1000
7	Right Overall	2587	6591	-1456	20	1000
8	Passenger Close-Up	1545	5893	-1314	50	1000
9	Right Front Half	3918	2898	-2010	25	1000
10	Right Angle	1068	5280	-1370	28	1000
11	Windshield	0	0	-2602	12.5	1000
12	Driver Windshield	0	-442	-2602	25	1000
13	Passenger Windshield	0	483	-2602	20	1000
14	Pit Front	1040	0	3259	25	1000
15	Pit Rear	3316	0	3259	25	1000
16	Onboard Driver Airbag (Optional)				12.5	1000
17	Onboard Passenger Airbag (Optional)				12.5	1000

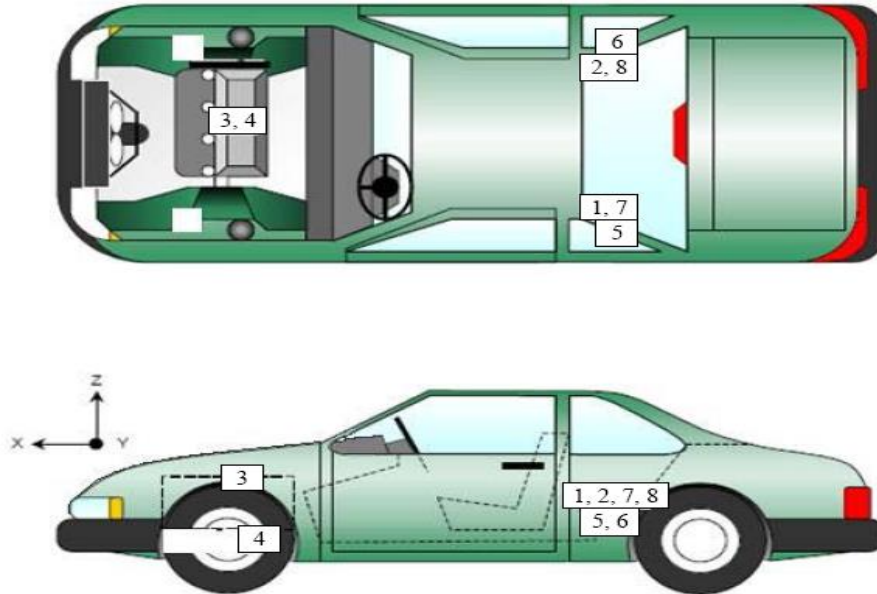
Reference Points: +X – forward of impact plane
+Y – right of monorail center
+Z – into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Location (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1810	-390	-507
2	Right Rear Accelerometer – X Direction	1810	370	-507
3	Engine Top X	4020	220	-811
4	Engine Bottom X	3910	25	-221
5	Left Rear Accelerometer – Z Direction	1810	-390	-507
6	Right Rear Accelerometer – Z Direction	1810	370	-507
7	Left Rear Accelerometer – X Direction Redundant	1809	-350	-507
8	Right Rear Accelerometer- X Direction Redundant	1812	335	-507

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

DATA SHEET NO. 8

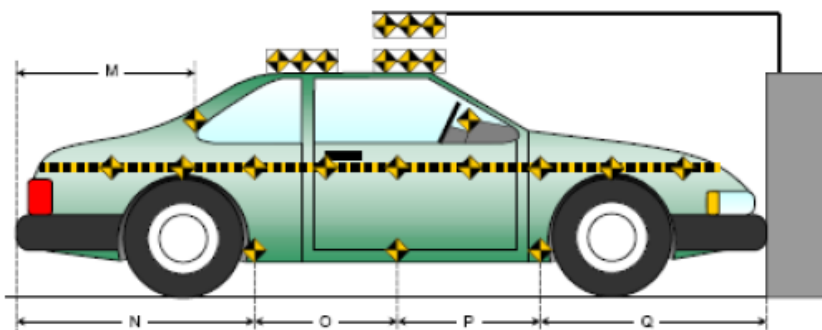
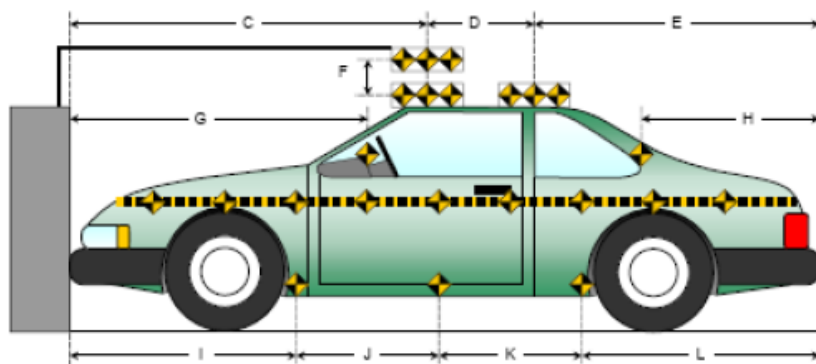
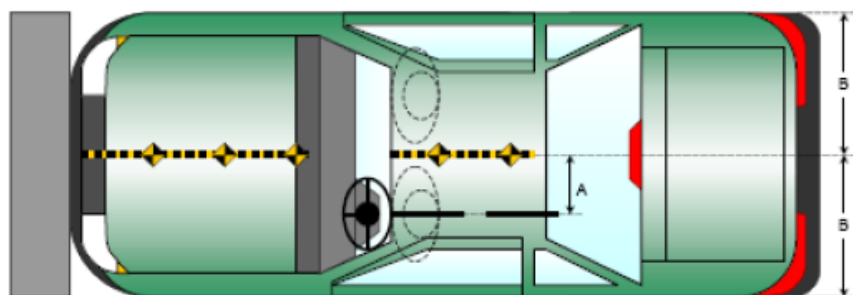
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

Item	Value
A	385
B	920
C	2228
D	600
E	1867
F	256
G	1619
H	1220
I	1365
J	930
K	915
L	1485
M	1223
N	1488
O	917
P	930
Q	1360

All units in millimeters



DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

								Centerline							
A-16	A-15	A-14	A-13	A-12	A-11	A-10	A-09	A-08	A-07	A-06	A-05	A-04	A-03	A-02	A-01
B-16	B-15	B-14	B-13	B-12	B-11	B-10	B-09	B-08	B-07	B-06	B-05	B-04	B-03	B-02	B-01
C-16	C-15	C-14	C-13	C-12	C-11	C-10	C-09	C-08	C-07	C-06	C-05	C-04	C-03	C-02	C-01
D-16	D-15	D-14	D-13	D-12	D-11	D-10	D-09	D-08	D-07	D-06	D-05	D-04	D-03	D-02	D-01
E-16	E-15	E-14	E-13	E-12	E-11	E-10	E-09	E-08	E-07	E-06	E-05	E-04	E-03	E-02	E-01
F-16	F-15	F-14	F-13	F-12	F-11	F-10	F-09	F-08	F-07	F-06	F-05	F-04	F-03	F-02	F-01
G-16	G-15	G-14	G-13	G-12	G-11	G-10	G-09	G-08	G-07	G-06	G-05	G-04	G-03	G-02	G-01
H-16	H-15	H-14	H-13	H-12	H-11	H-10	H-09	H-08	H-07	H-06	H-05	H-04	H-03	H-02	H-01
I-16	I-15	I-14	I-13	I-12	I-11	I-10	I-09	I-08	I-07	I-06	I-05	I-04	I-03	I-02	I-01
J-16	J-15	J-14	J-13	J-12	J-11	J-10	J-09	J-08	J-07	J-06	J-05	J-04	J-03	J-02	J-01
K-16	K-15	K-14	K-13	K-12	K-11	K-10	K-09	K-08	K-07	K-06	K-05	K-04	K-03	K-02	K-01

DATA SHEET NO. 10

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	44
Passenger Dummy Accelerometers	44
Vehicle Structure Accelerometers	8
Total	96

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Real-Time Panning	1
Total	17

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th/ 037	Hybrid III 5th/ 070
Head Contact	Frontal Airbag, A-Pillar	Frontal Airbag, Head Restraint
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Locked	Locked
Front Door Opening	Remained closed & latched, operational	Remained closed & latched, operational
Rear Door Opening	Remained closed & latched, operational	Remained closed & latched, operational
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Slight cracking along bottom edge and at bottom of A pillars from hood
Window Damage	None
Other Notable Effects	Driver seat belt broke at buckle

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	996
Center	mm	819
Right Side	mm	905
Average	mm	907

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

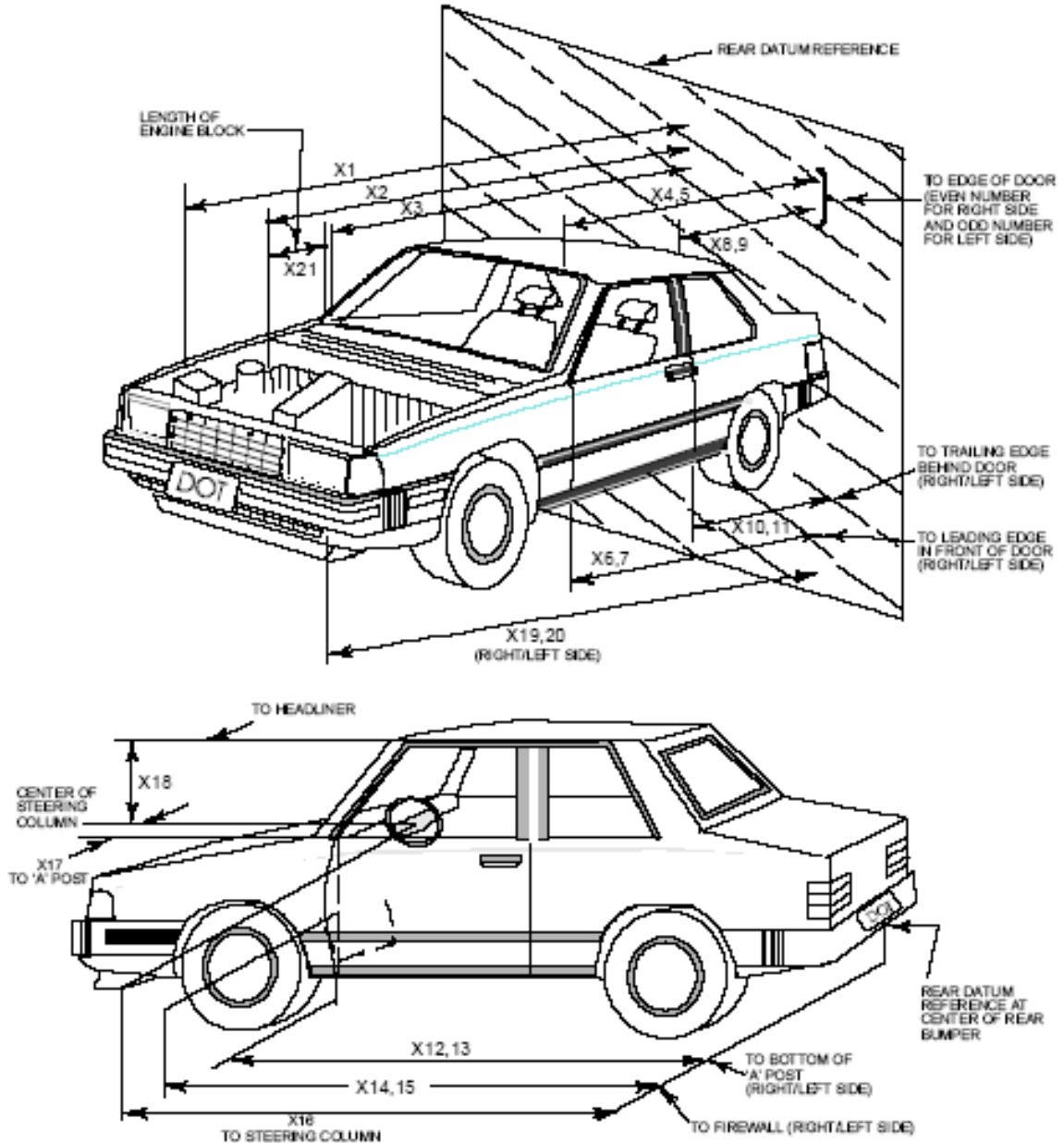
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Curtain Airbag	Yes	Yes	Yes	Yes
Torso/Pelvis Airbag	Yes	No	Yes	No
Pelvis Airbag	No	N/A	No	N/A
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt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

DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017



DATA SHEET NO. 12 (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**Test Vehicle: 2018 Volkswagen TiguanNHTSA No.: M20185803Test Program: NCAP Frontal ImpactTest Date: 12/13/2017

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4695	4315	380
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4260	4130	130
3	RSOV to Firewall	3685	3700	-15
4	RSOV to Upper Leading Edge of Right Door	3273	3297	-24
5	RSOV to Upper Leading Edge of Left Door	3273	3285	-12
6	RSOV to Lower Leading Edge of Right Door	3268	3285	-17
7	RSOV to Lower Leading Edge of Left Door	3264	3290	-26
8	RSOV to Upper Trailing Edge of Right Door	2229	2250	-21
9	RSOV to Upper Trailing Edge of Left Door	2234	2245	-11
10	RSOV to Lower Trailing Edge of Right Door	2285	2294	-9
11	RSOV to Lower Trailing Edge of Left Door	2284	2282	2
12	RSOV to Bottom of "A" Post-of Right Side	3231	3250	-19
13	RSOV to Bottom of "A" Post-of Left Side	3231	3240	-9
14	RSOV to Firewall, Right Side	3455	3474	-19
15	RSOV to Firewall, Left Side	3455	3474	-19
16	RSOV to Steering Column	2886	2926	-40
17	Center of Steering Column to "A" Post	353	355	-2
18	Center of Steering Column to Headliner	442	438	4
19	RSOV to Right Side of Front Bumper	4500	4360	140
20	RSOV to Left Side of Front Bumper	4500	4220	280
21	Length of Engine Block	500	500	0
RD	RSOV to Right Side of Dash Panel	3069	3090	-21
CD	RSOV to Center of Dash Panel	3098	3103	-5
LD	RSOV to Left Side of Dash Panel	3076	3084	-8

All Dimensions in mm

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017

VEHICLE INFORMATION

VIN: 3VV0B7AX7JM015996
Vehicle Size Category: MPV

Wheelbase: 2790
Test Weight (kg): 1976.0

ACCELEROMETER DATA

Accelerometer Locations: As listed on Page 15 of this report.

Cal. Procedure/Interval: TRC procedure / 6 month interval

Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.64

Velocity Change (km/h): 65.32

Time of Separation (ms): 132

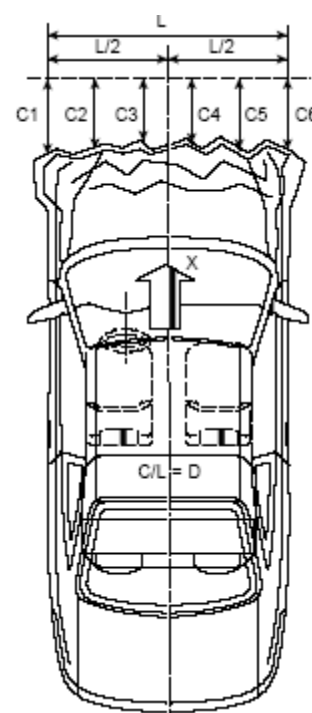
CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Centerline

Damage Region Length (mm): 1524

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4500	4220	280
C2	Crush zone 2 at left side	mm	4650	4280	370
C3	Crush zone 3 at left side	mm	4695	4300	395
C4	Crush zone 4 at right side	mm	4697	4330	367
C5	Crush zone 5 at right side	mm	4650	4370	280
C6	Crush zone 6 at right side	mm	4500	4360	140
L	C1 to C6	mm	1524	1488	36

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2018 Volkswagen Tiguan

NHTSA No.: M20185803

Test Program: NCAP Frontal Impact

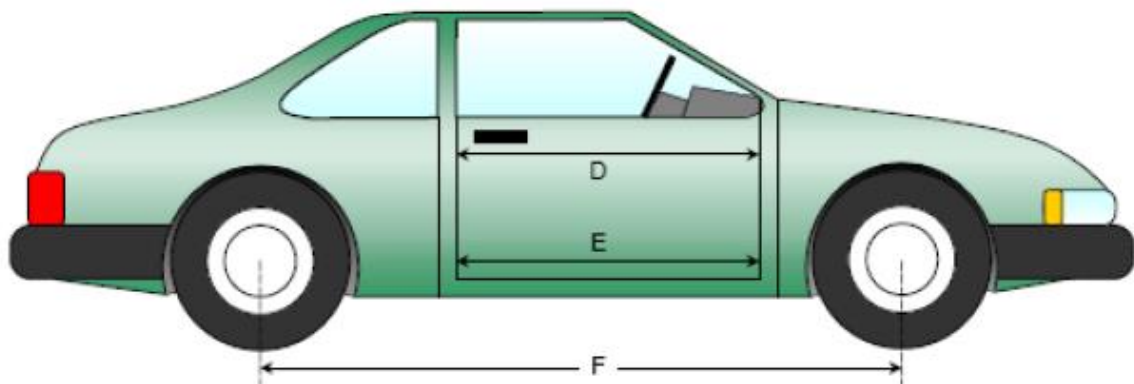
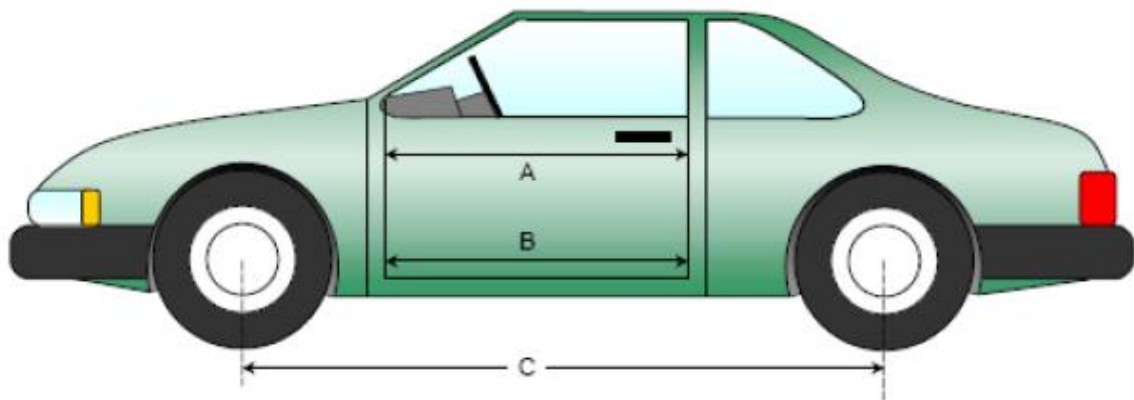
Test Date: 12/13/2017

DOOR OPENING WIDTH

No.	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	965	958	7
B	Left Side Lower	mm	870	866	4
C	Right Side Upper	mm	955	957	-2
D	Right Side Lower	mm	865	865	0

WHEELBASE MEASUREMENTS

No.	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2790	2710	80
F	Right Side Wheelbase	mm	2790	2810	-20



DATA SHEET NO. 14 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

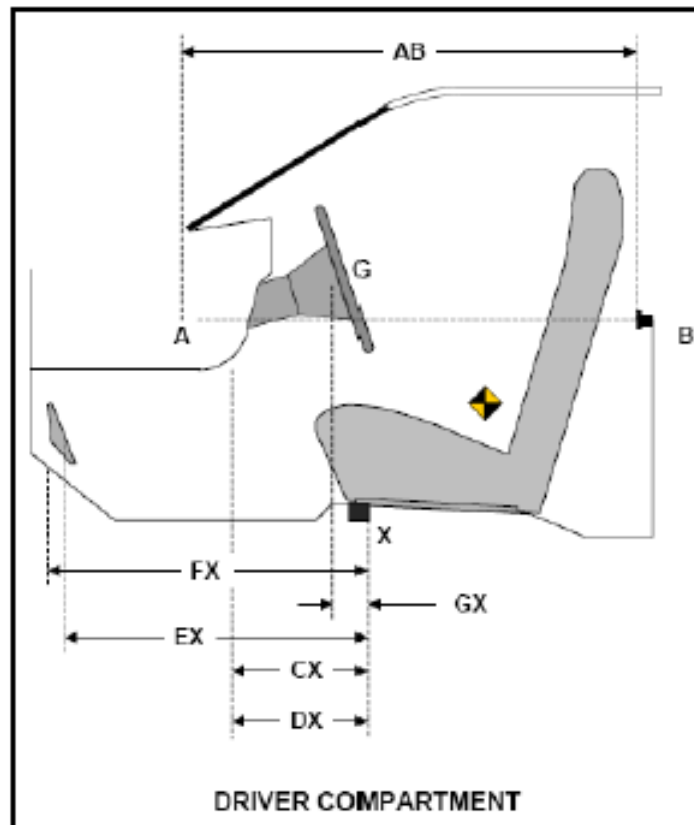
Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	955	954	1
CX	Left Knee Bolster to X	mm	263	284	-21
DX	Right Knee Bolster to X	mm	290	315	-25
EX	Brake Pedal to X	mm	540	586	-46
FX	Foot Rest to X	mm	580	552	28
GX	Center of Steering Column Wheel Hub to X	mm	85	163	-78

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

Please provide windshield mounting details.

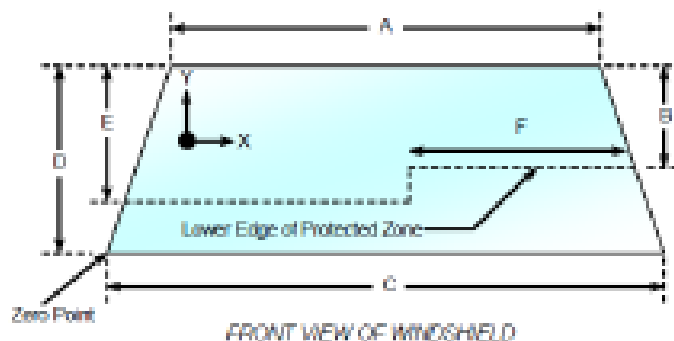
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicle not equipped with occupant passive restraint and 50% for each side of the windshield for vehicle which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.3° C

WINDSHIELD PERIPHERY MEASUREMENTS¹

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2214.0	2214.0	100.0
Right Side	2214.0	2214.0	100.0
Total	4428.0	4428.0	100.0

Item	Units	Value
A	mm	1270
B	mm	418
C	mm	1605
D	mm	777
E	mm	440
F	mm	580



AREAS OF PROTECTED ZONE FAILURES

A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.

X	Y
NA	NA
NA	NA
NA	NA
NA	NA

B. The inner surface of the windshield was penetrated by the hood support beneath the protected zone.

X	Y
NA	NA
NA	NA
NA	NA
NA	NA

DATA SHEET NO. 15 (CONTINUED)

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2018 Volkswagen Tiguan

NHTSA No.: M20185803

Test Program: NCAP Frontal Impact

Test Date: 12/13/2017

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.3°C

Test Time: 18:24

Stoddard Solvent Spillage Measurements

- A From impact until vehicle motion ceases: 0 oz.
(maximum allowable – 1 oz.)
- B For the 5-minute period after motion ceases: 0 oz.
(maximum allowable – 5 oz.)
- C For the following 25 minutes: 0 oz.
(maximum allowable – 1 oz./minutes)
- D Spillage: None

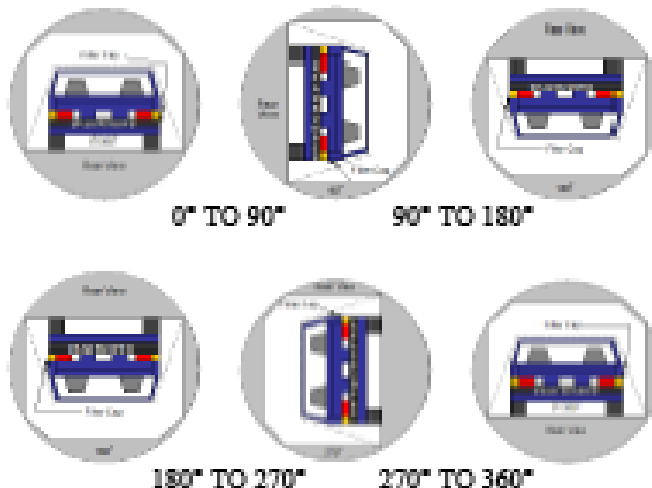
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2018 Volkswagen Tiguan
 Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
 Test Date: 12/13/2017

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:
None



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	90	330	420
90° to 180°	90	330	840
180° to 270°	90	330	1260
270° to 360°	90	330	1480

FMVSS 301 SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	N/A
90° to 180°	0	0	0	N/A
180° to 270°	0	0	0	N/A
270° to 360°	0	0	0	N/A

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

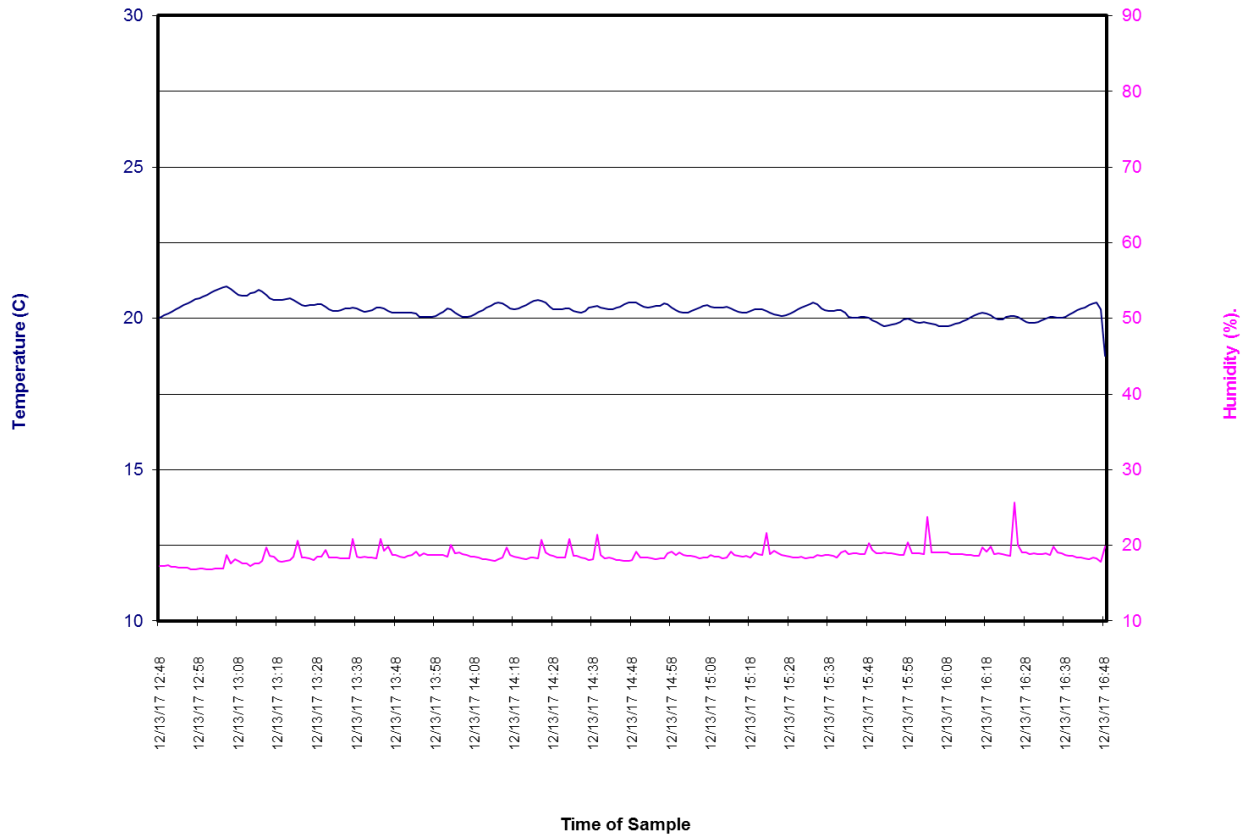
DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2018 Volkswagen Tiguan
Test Program: NCAP Frontal Impact

NHTSA No.: M20185803
Test Date: 12/13/2017

Frontal NCAP 171213 Test Time 16:48



APPENDIX A
PHOTOGRAPHS

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8	Pre-Test Front View of Test Vehicle	A-9
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10	Pre-Test Left View of Test Vehicle	A-10
11	Post-Test Left View of Test Vehicle	A-10
12	Pre-Test Right View of Test Vehicle	A-11
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16	Pre-Test Left Rear 3-4 View	A-13
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41	Post-Test Driver Dummy Feet	A-27
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65	Pre-Test Passenger Side Floorpan	A-40
66	Post-Test Passenger Side Floorpan	A-40

TABLE OF PHOTOGRAPHS (CONTINUED)

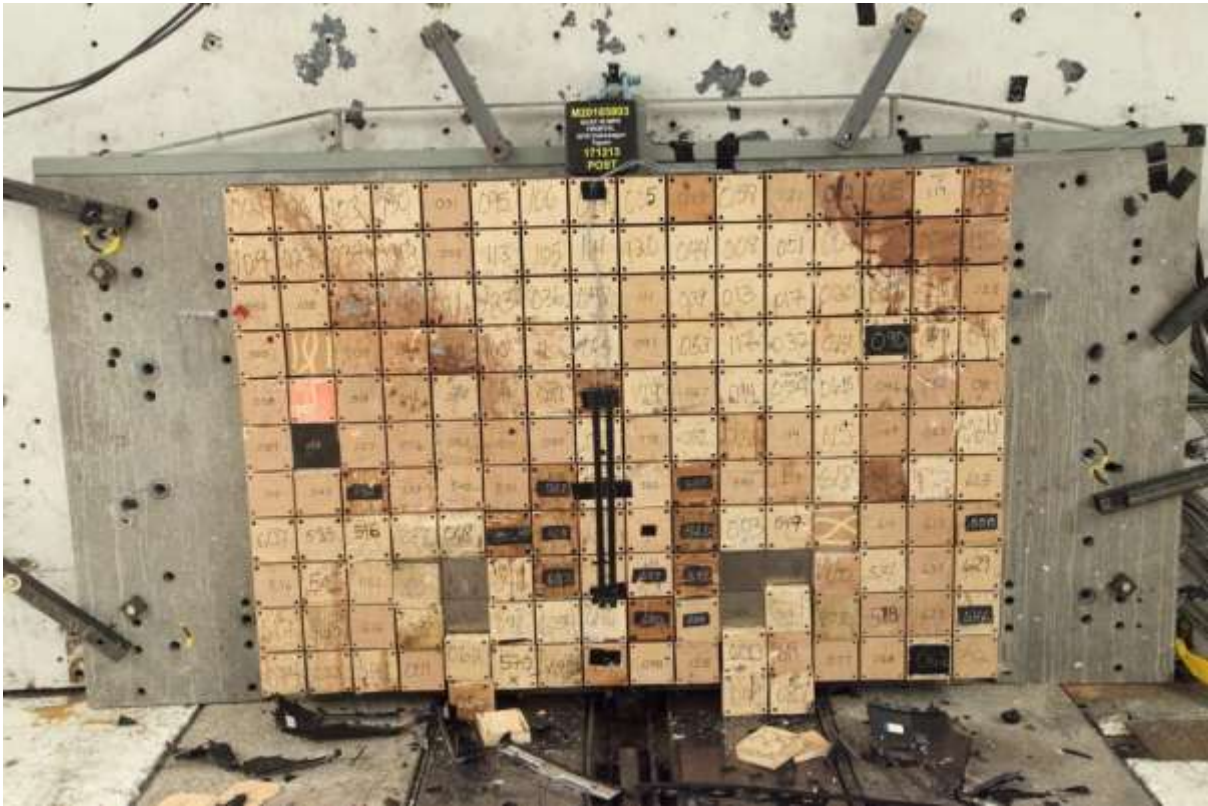
No.	Description	Page
67	Post-Test Passenger Dummy Face	A-41
68	Post-Test Passenger Dummy Contact with Airbag	A-41
69	Post-Test Passenger Dummy Contact with Headrest	A-42
70	Photograph of Ballast Installed in Vehicle View	A-42
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75	Vehicle at 180° on Static Rollover Device	A-45
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77	Vehicle at 360° on Static Rollover Device	A-46
78	2018 Volkswagen Tiguan Frontal Impact Event	A-46
79	Monroney Label Photograph	A-47



001 Load Cell Location



002 Pre-Test Load Cell Wall



003 Post-Test Load Cell Wall



004 Manufacturer's Label



005 Tire Placard

Intentionally Left Blank



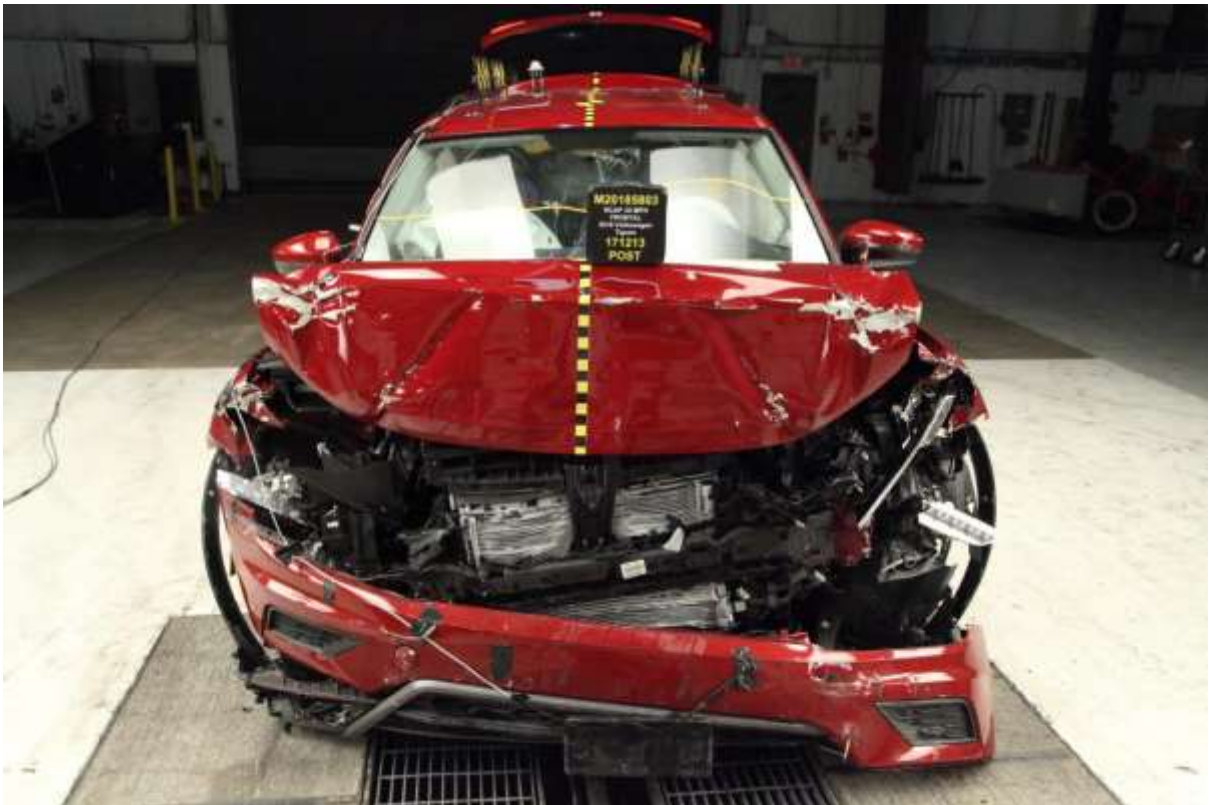
006 2018 Volkswagen Tiguan Frontal As Delivered



007 Left Rear 3-4 View, as Received



008 Pre-Test Front View of Test Vehicle



009 Post-Test Front View of Test Vehicle



010 Pre-Test Left View of Test Vehicle



011 Post-Test Left View of Test Vehicle



012 Pre-Test Right View of Test Vehicle



013 Post-Test Right View of Test Vehicle



014 Pre-Test Right Front 3-4 View



015 Post-Test Right Front 3-4 View



016 Pre-Test Left Rear 3-4 View



017 Post-Test Left Rear 3-4 View



018 Pre-Test Windshield View



019 Post-Test Windshield View



020 Pre-Test Engine Compartment View



021 Post-Test Engine Compartment View



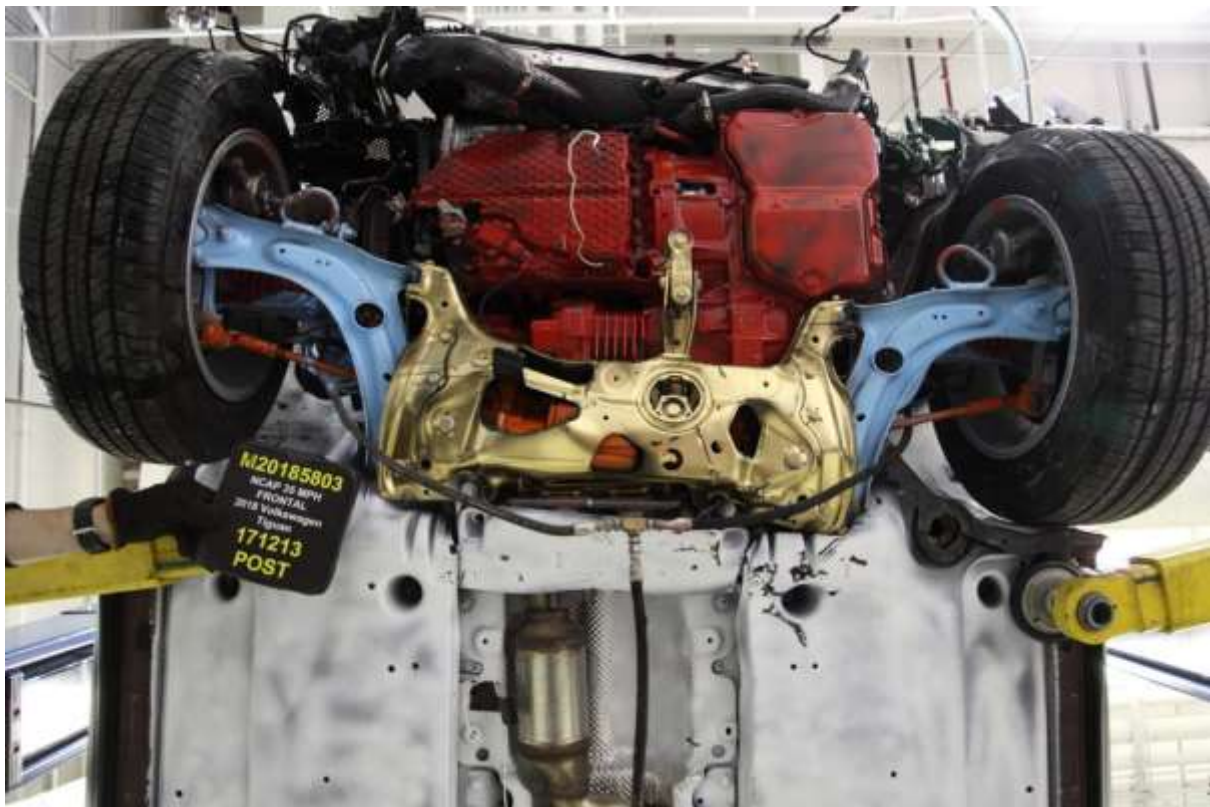
022 Pre-Test Fuel Filler Cap View



023 Post-Test Fuel Filler Cap View



024 Pre-Test Front Underbody View



025 Post-Test Front Underbody View



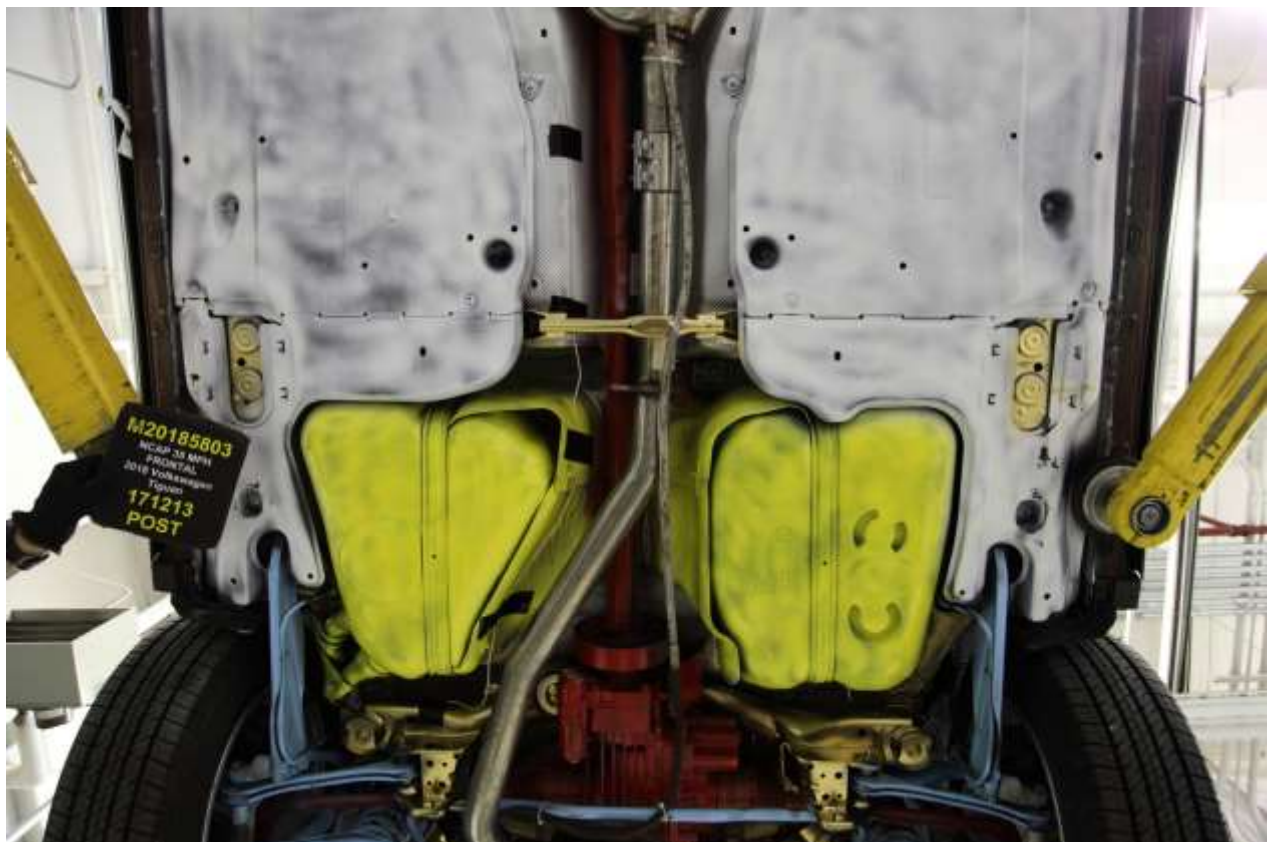
025a Pre-Test Mid Front Underbody View



025b Post-Test Mid Front Underbody View



025c Pre-Test Mid Rear Underbody View



025d Post-Test Mid Rear Underbody View



026 Pre-Test Rear Underbody View



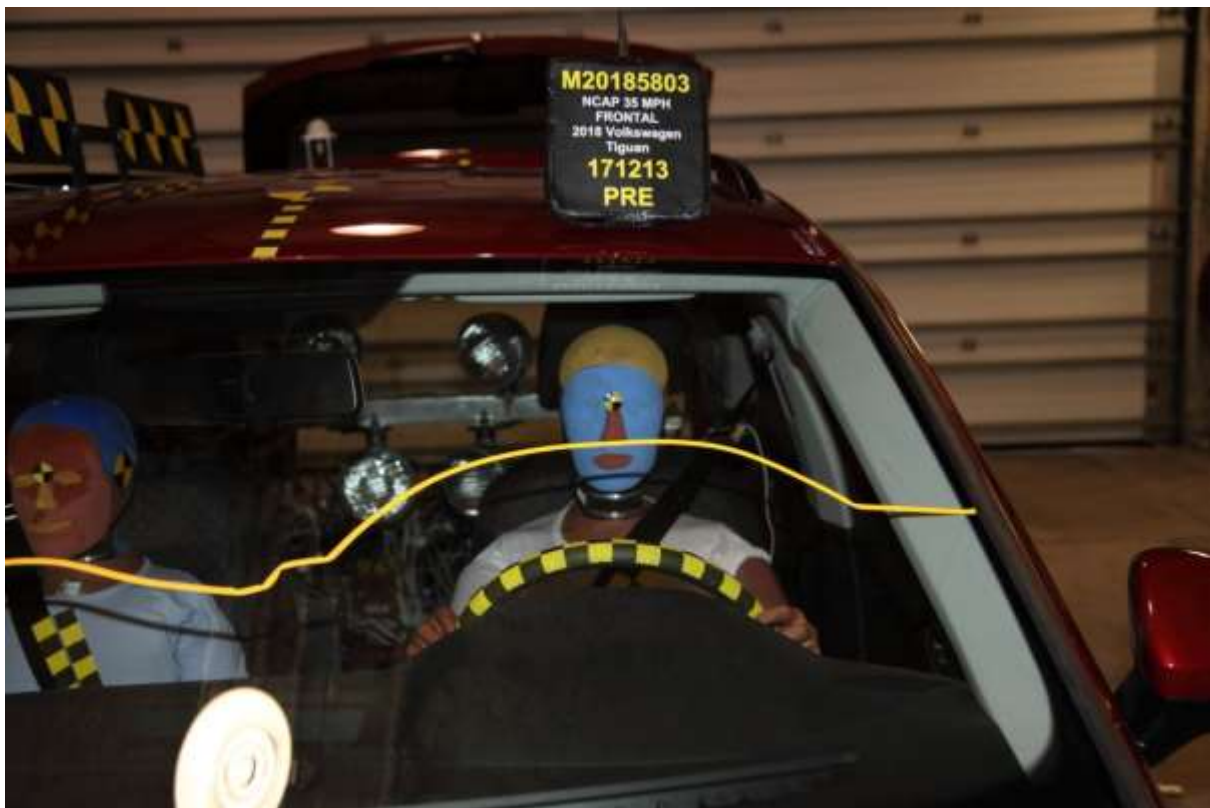
027 Post-Test Rear Underbody View



028 Pre-Test Dummy Cable Routing



029 Post-Test Dummy Cable Routing



030 Pre-Test Driver Dummy Front View



031 Post-Test Driver Dummy Front View



032 Pre-Test Driver Dummy Window View



033 Post-Test Driver Dummy Window View



034 Pre-Test Driver Dummy and Vehicle Interior View



035 Post-Test Driver Dummy and Vehicle Interior View



036 Pre-Test Driver's Seat Fore-Aft Markings



037 Post-Test Driver's Seat Fore-Aft Markings



038 Pre-Test View of Belt Anchorage for Driver Dummy



039 Post-Test View of Belt Anchorage for Driver Dummy



040 Pre-Test Driver Dummy Feet



041 Post-Test Driver Dummy Feet



042 Pre-Test Driver's Side Knee Bolster



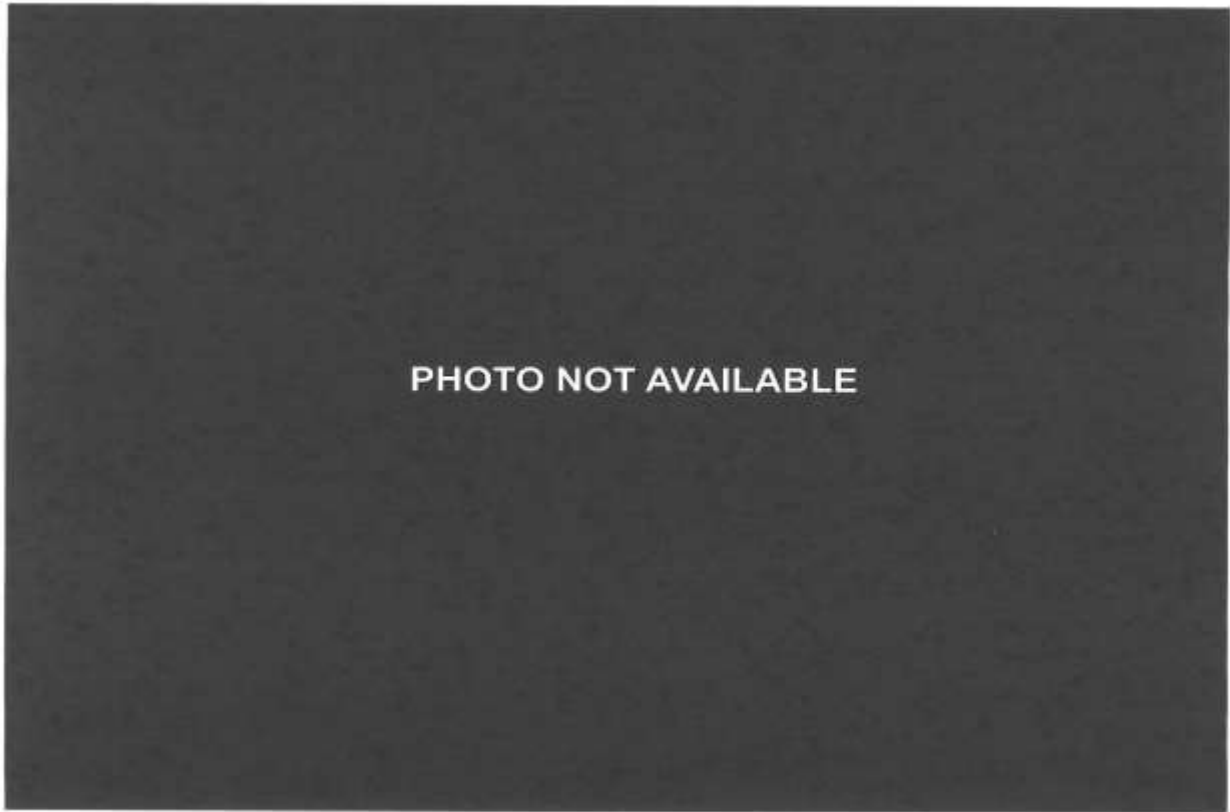
043 Post-Test Driver's Side Knee Bolster



044 Pre-Test Driver's Side Floorpan



045 Post-Test Driver's Side Floorpan



046 Post-Test Driver Dummy Face



047 Post-Test Driver Dummy Contact With Airbag

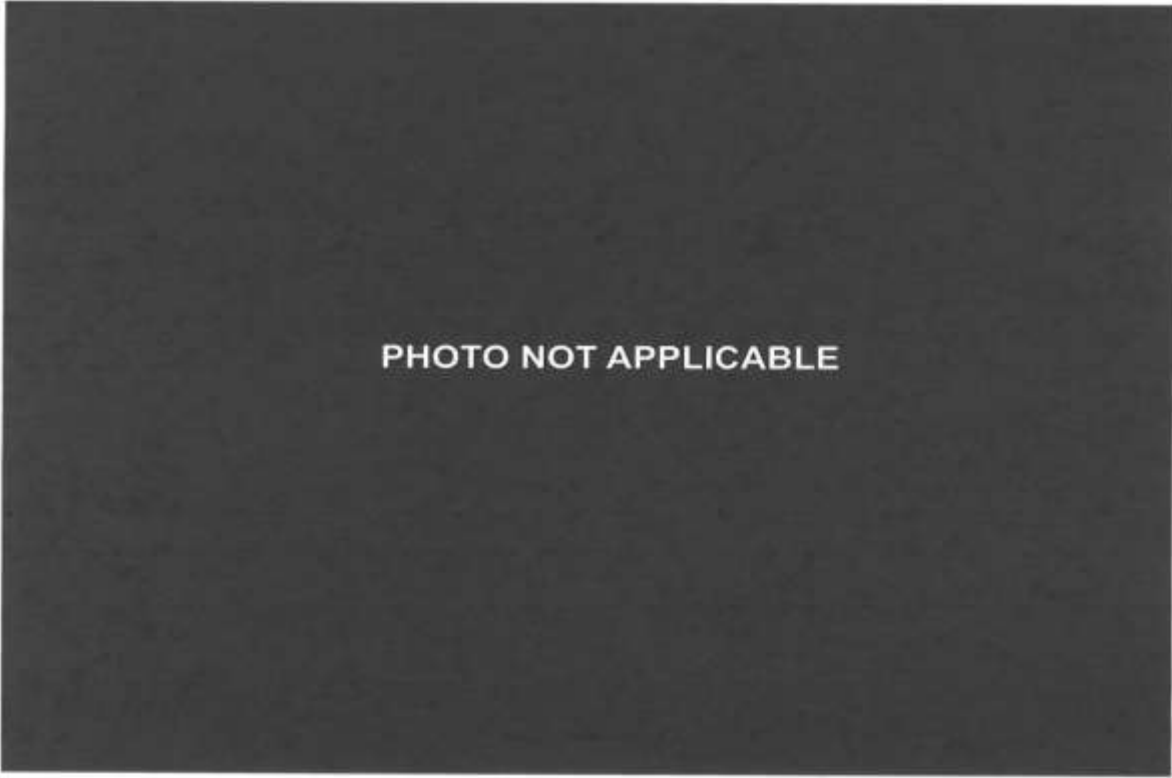


PHOTO NOT APPLICABLE

048 Post-Test Driver Dummy Contact With Headrest

Intentionally Left Blank



049 Pre-Test View of the Steering Wheel



050 Post-Test View of the Steering Wheel



051 Pre-Test Passenger Dummy Front View



052 Post-Test Passenger Dummy Front View



053 Pre-Test Passenger Dummy Window View



054 Post-Test Passenger Dummy Window View



055 Pre-Test Passenger Dummy and Vehicle Interior View



056 Post-Test Passenger Dummy and Vehicle Interior View



057 Pre-Test Passenger's Seat Fore-Aft Markings



058 Post-Test Passenger's Seat Fore-Aft Markings



059 Pre-Test View of Belt Anchorage for Passenger Dummy



060 Post-Test View of Belt Anchorage for Passenger Dummy



061 Pre-Test Passenger Dummy Feet



062 Post-Test Passenger Dummy Feet



063 Pre-Test Passenger's Side Knee Bolster



064 Post-Test Passenger's Side Knee Bolster



065 Pre-Test Passenger's Side Floorpan



066 Post-Test Passenger's Side Floorpan



067 Post-Test Passenger Dummy Face



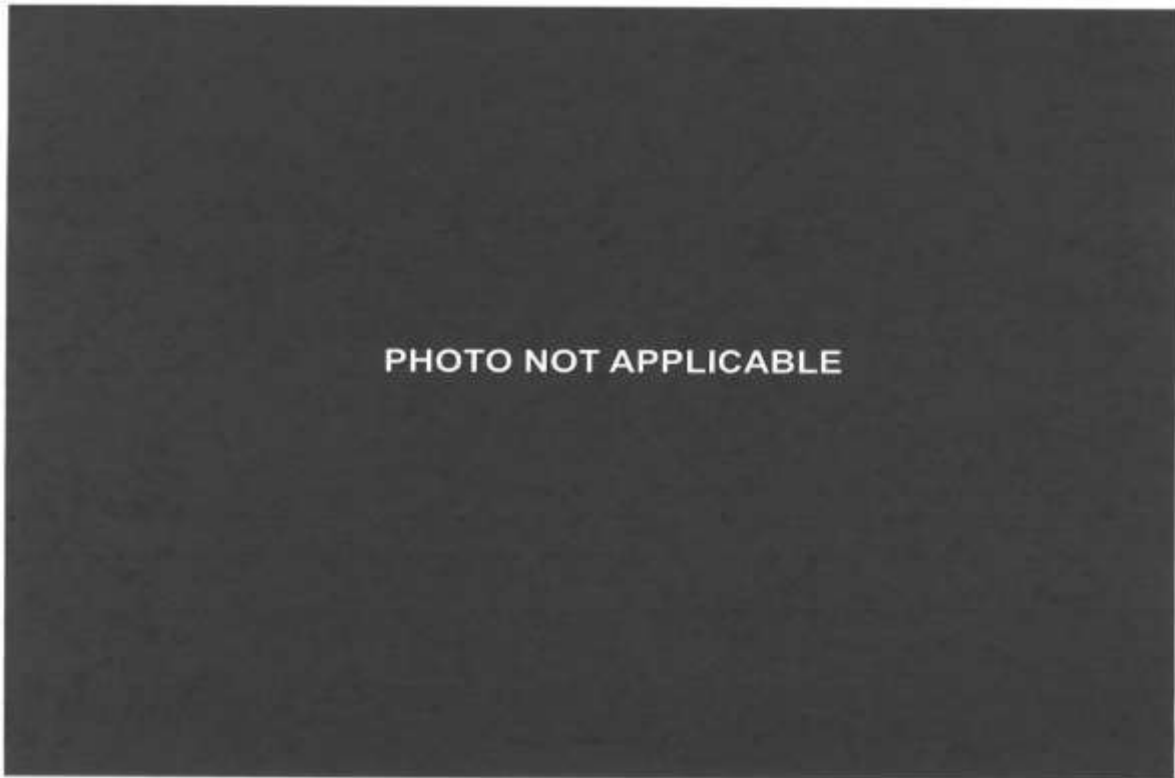
068 Post-Test Passenger Dummy Contact With Airbag



069 Post Test Passenger Dummy Contact With Headrest



070 Photograph of Ballast Installed in Vehicle



071 Post-Test Stoddard Spillage Location View



072 Post-Test Speed Trap Readout



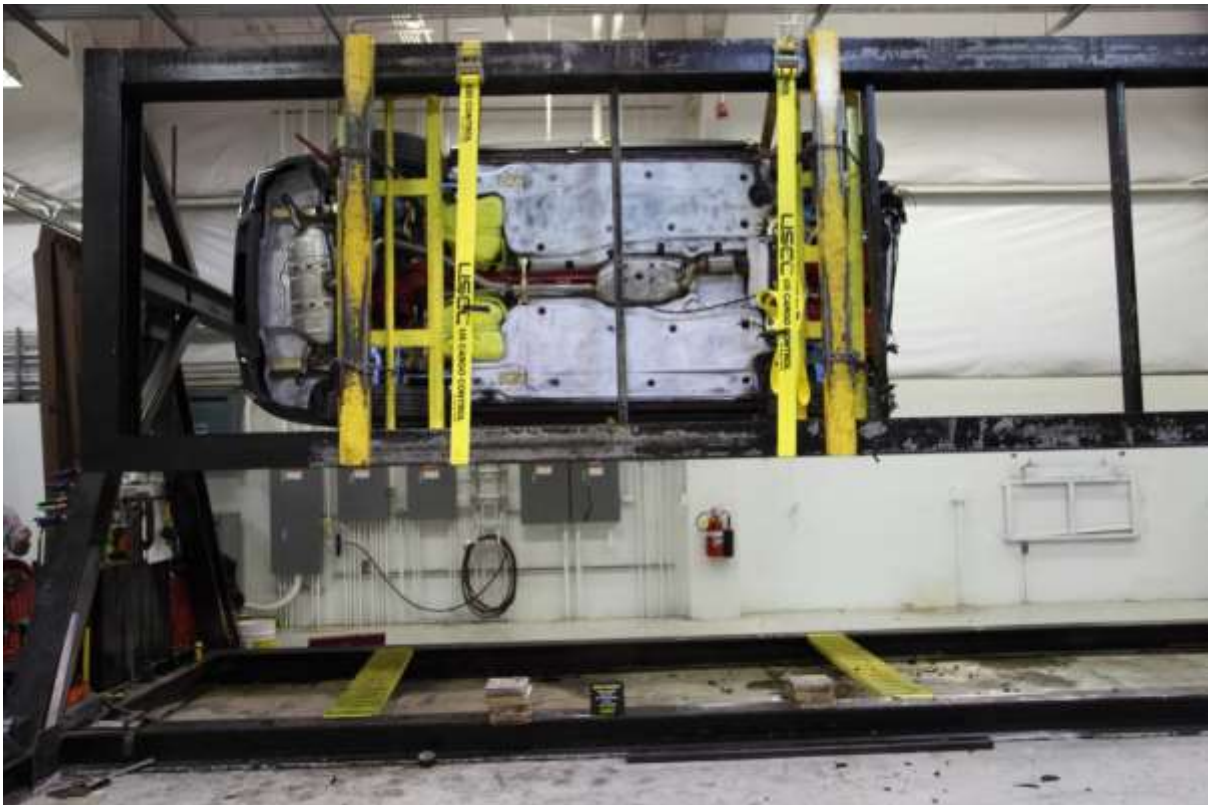
073 Vehicle at 0° on Static Rollover Device



074 Vehicle at 90° on Static Rollover Device



075 Vehicle at 180° on Static Rollover Device



076 Vehicle at 270° on Static Rollover Device



077 Vehicle at 360° on Static Rollover Device



078 2018 Volkswagen Tiguan Frontal Impact Event



079 Monroney Label Photograph



080 Post-Test Driver Seat Belt Separation



080a Post-Test Driver Seat Belt Buckle (left)



080b Post-Test Driver Seatbelt Buckle (right)



080c Post-Test Driver Dummy Clothing (at seatbelt buckle)

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

No.	List of Data Plots Provided in the Test Report	Page
1	Driver Head X Acceleration vs. Time Primary	B-5
2	Driver Head Y Acceleration vs. Time Primary	B-5
3	Driver Head Z Acceleration vs. Time Primary	B-5
4	Driver Head Resultant Acceleration vs. Time Primary	B-5
5	Driver Chest X Deflection vs. Time	B-6
6	Driver Chest X Acceleration vs. Time Primary	B-7
7	Driver Chest Y Acceleration vs. Time Primary	B-7
8	Driver Chest Z Acceleration vs. Time Primary	B-7
9	Driver Chest Resultant Acceleration vs. Time Primary	B-7
10	Driver Upper Neck Force X vs. Time	B-8
11	Driver Upper Neck Force Z vs. Time	B-8
12	Driver Upper Neck Moment Y vs. Time	B-8
13	Driver Nij vs. Time	B-9
14	Driver Left Femur Force vs. Time	B-10
15	Driver Right Femur Force vs. Time	B-10
16	Passenger Head X Acceleration vs. Time Primary	B-11
17	Passenger Head Y Acceleration vs. Time Primary	B-11
18	Passenger Head Z Acceleration vs. Time Primary	B-11
19	Passenger Head Resultant Acceleration vs. Time Primary	B-11
20	Passenger Chest X Deflection vs. Time	B-12
21	Passenger Chest X Acceleration vs. Time Primary	B-13
22	Passenger Chest Y Acceleration vs. Time Primary	B-13
23	Passenger Chest Z Acceleration vs. Time Primary	B-13
24	Passenger Chest Resultant Acceleration vs. Time Primary	B-13
25	Passenger Upper Neck Force X vs. Time	B-14
26	Passenger Upper Neck Force Z vs. Time	B-14
27	Passenger Upper Neck Moment Y vs. Time	B-14
28	Passenger Nij vs. Time	B-15
29	Passenger Left Femur Force vs. Time	B-16
30	Passenger Right Femur Force vs. Time	B-16

The following additional dummy and vehicle response data can be found in the R & D section of the NHTSA website at: www.nhtsa.dot.gov.

Driver Head Acceleration X Redundant
Driver Head Acceleration Y Redundant
Driver Head Acceleration Z Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant
Driver Pelvis X Acceleration
Driver Pelvis Y Acceleration
Driver Pelvis Z Acceleration
Driver Left Femur Force Redundant
Driver Right Femur Force Redundant
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Shoulder Belt Force
Driver Lap Belt Force
Passenger Head Acceleration X Redundant
Passenger Head Acceleration Y Redundant
Passenger Head Acceleration Z Redundant
Passenger Upper Neck Force Y

Passenger Upper Neck Moment X
Passenger Upper Neck Moment Z
Passenger Chest X Acceleration Redundant
Passenger Chest Y Acceleration Redundant
Passenger Chest Z Acceleration Redundant
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Force Redundant
Passenger Right Femur Force Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
Load Cell Barrier Forces and Moments

NHTSA

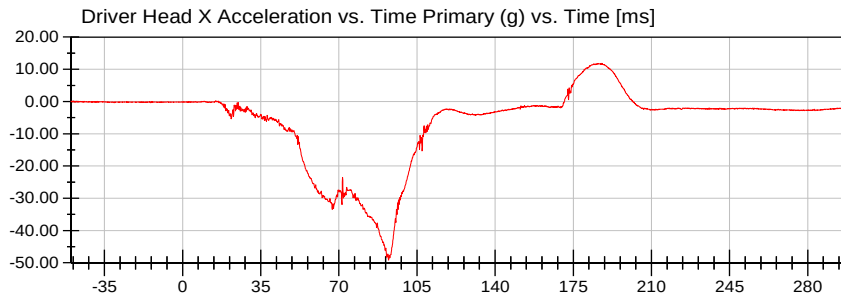
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



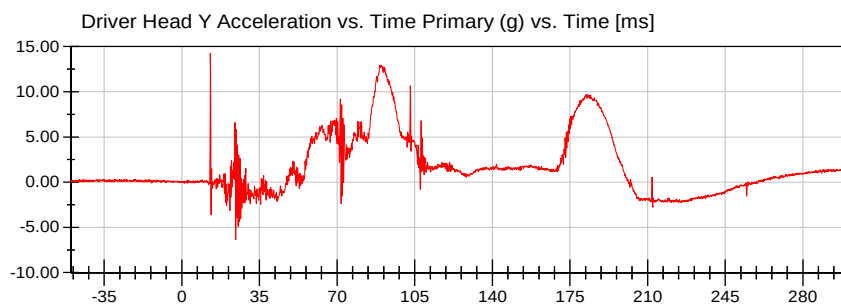
<Max>

11.83 g at 187.44 ms

<Min>

-49.19 g at 92.24 ms

CFC_1000



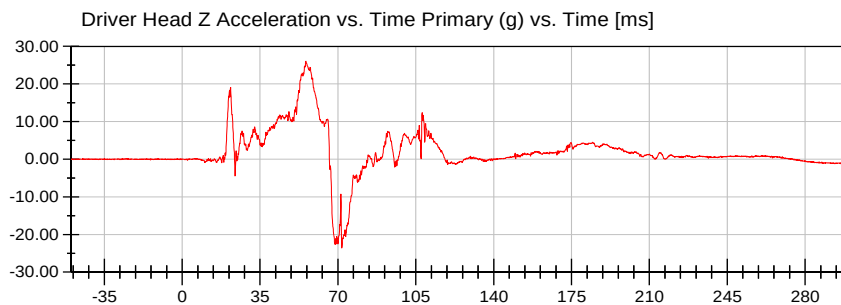
<Max>

14.29 g at 12.88 ms

<Min>

-6.35 g at 24.32 ms

CFC_1000



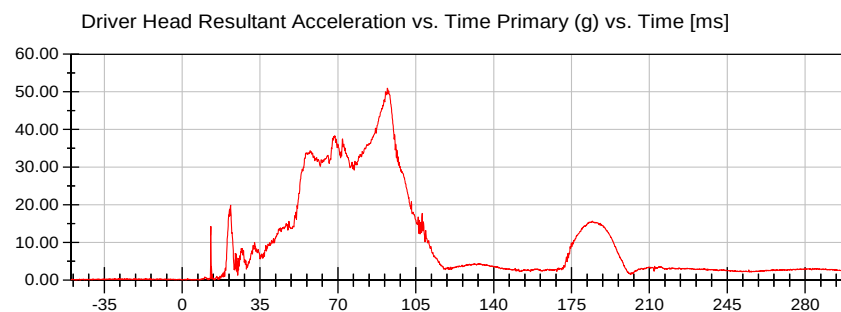
<Max>

26.03 g at 55.60 ms

<Min>

-23.60 g at 71.76 ms

CFC_1000



<Max>

51.00 g at 92.24 ms

<Min>

0.04 g at -48.00 ms

CFC_1000



NHTSA

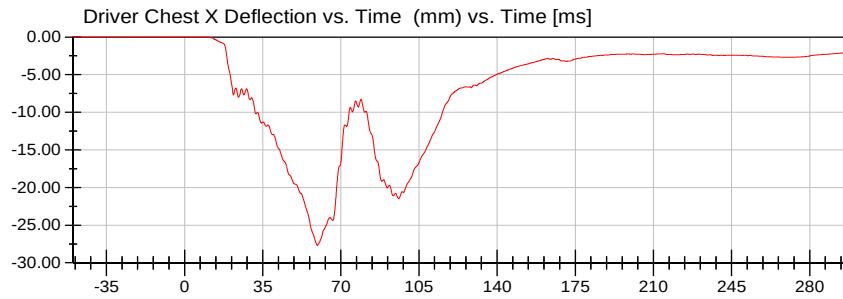
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



<Max>

0.00 mm at -34.48 ms

<Min>

-27.67 mm at 59.44 ms

CFC_600



NHTSA

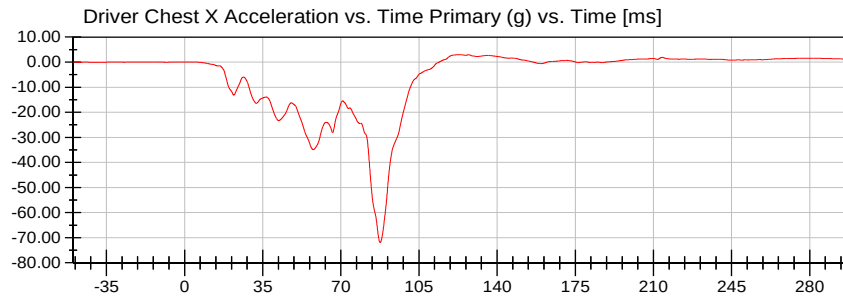
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



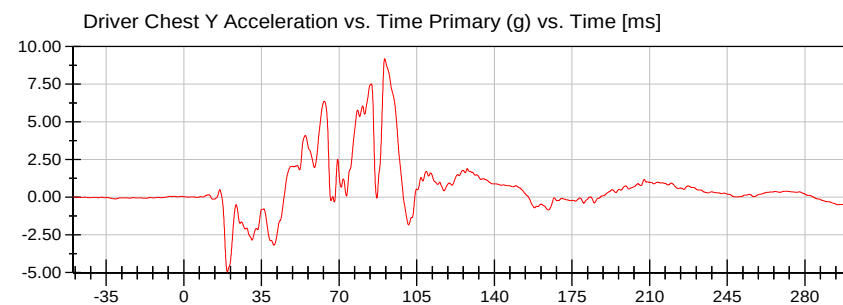
<Max>

2.95 g at 127.20 ms

<Min>

-71.92 g at 87.60 ms

CFC_180



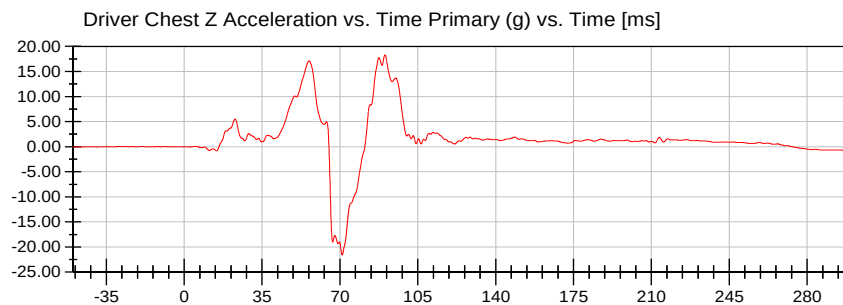
<Max>

9.19 g at 90.56 ms

<Min>

-4.96 g at 19.60 ms

CFC_180



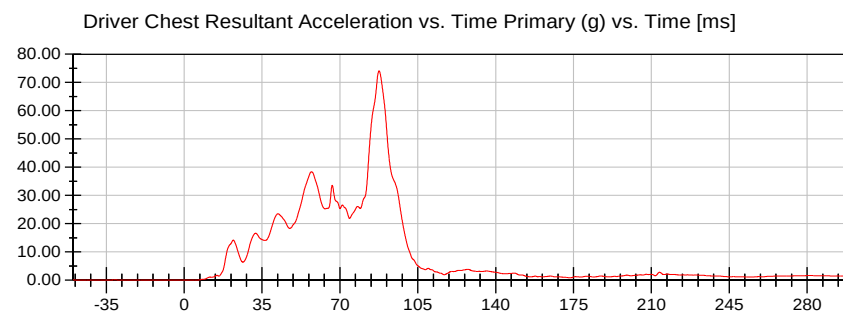
<Max>

18.32 g at 90.24 ms

<Min>

-21.57 g at 71.04 ms

CFC_180



<Max>

74.08 g at 87.60 ms

<Min>

0.02 g at -10.96 ms

CFC_180



NHTSA

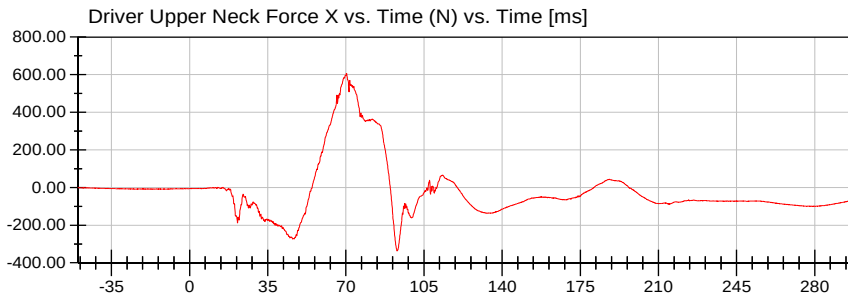
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



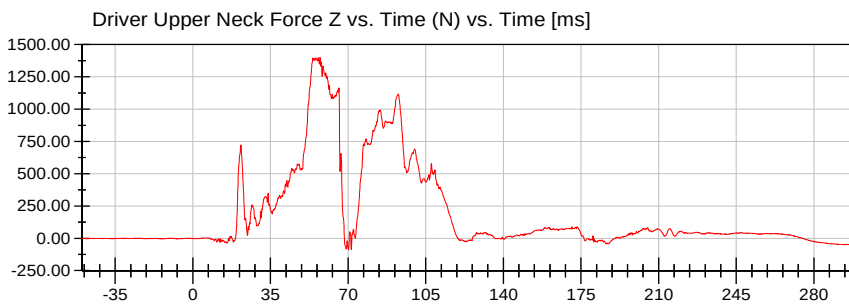
<Max>

606.14 N at 70.32 ms

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-336.58 N at 92.96 ms

CFC_1000



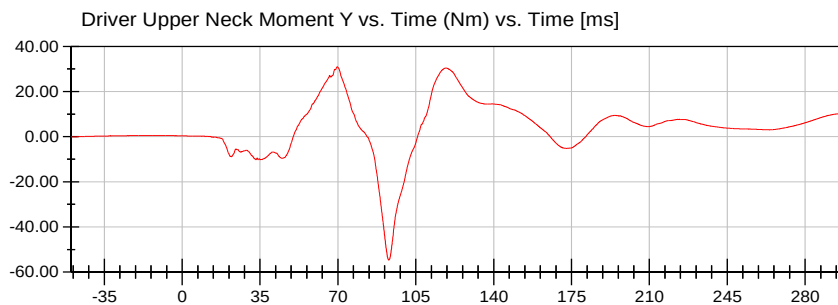
<Max>

1,400.41 N at 57.36 ms

<Min>

-89.75 N at 70.24 ms

CFC_1000



<Max>

30.89 Nm at 69.68 ms

<Min>

-54.65 Nm at 92.88 ms

CFC_600





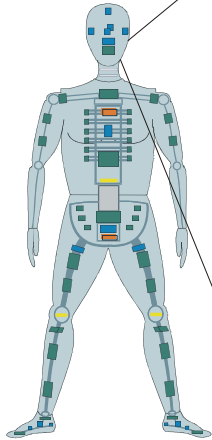
2018 Volkswagen Tiguan NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 12/13/2017
Time: 16:48

Customer: NHTSA

Test Number: M20185803

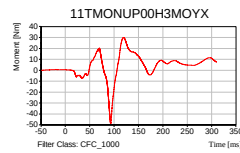
Test Orientation = Frontal
Fzc(Tension) = 6806
Fzc(Compression) = 6160
Myc(Extension) = 135
Myc(Flexion) = 310



Dummy: HIII 50th Male
Seating Position:

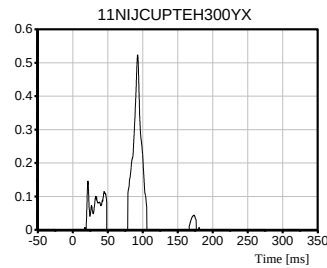
Driver

NIJ Source Code: (Fz/Fzc)+(Myl/Myc)

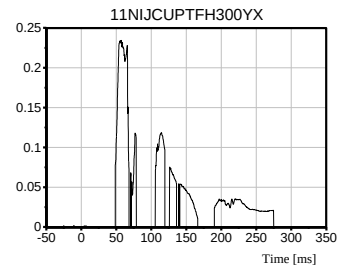


TRC Inc. Test Lab: CTF

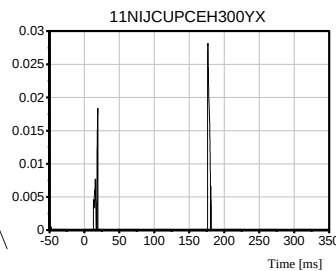
Test Number: 171213



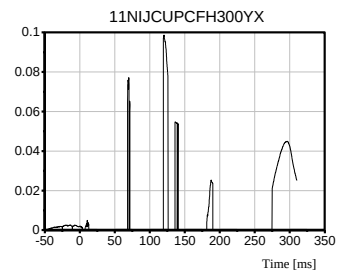
Max [NTE] 0.5240 at 92.72 ms



Max [NTF] 0.2345 at 57.36 ms



Max [NCE] 0.0282 at 176.72 ms



Max [NCF] 0.0986 at 120.40 ms

NHTSA

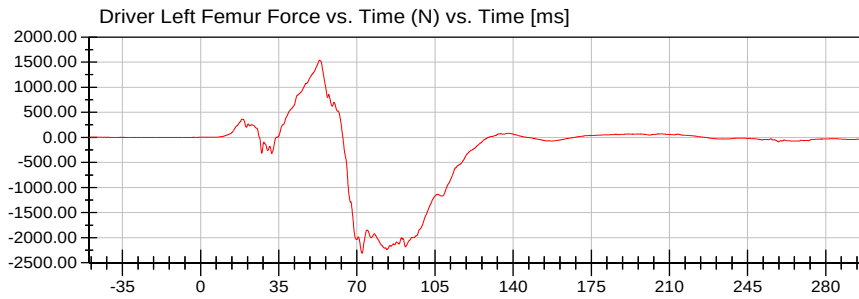
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



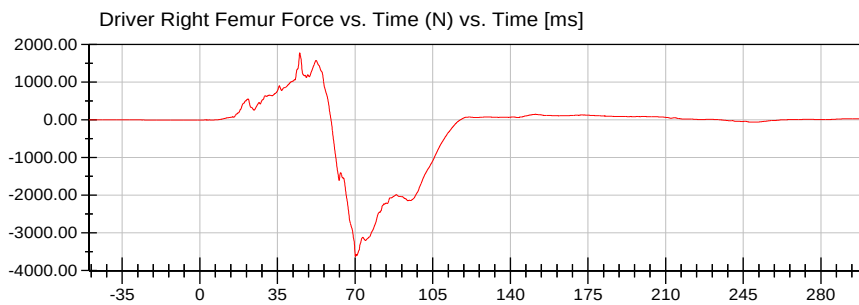
<Max>

1,538.57 N at 53.28 ms

<Min>

-2,308.59 N at 72.32 ms

CFC_600



<Max>

1,783.24 N at 45.04 ms

<Min>

-3,623.50 N at 70.16 ms

CFC_600



NHTSA

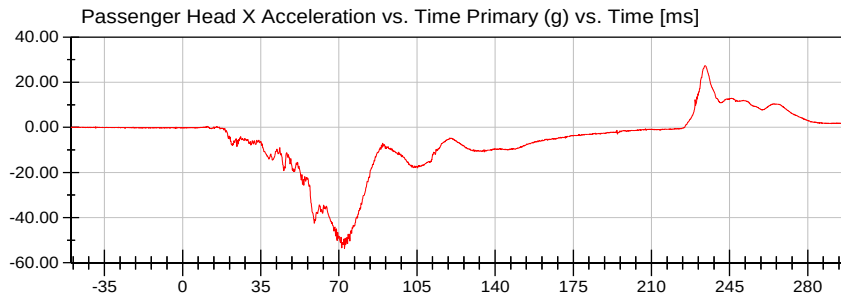
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



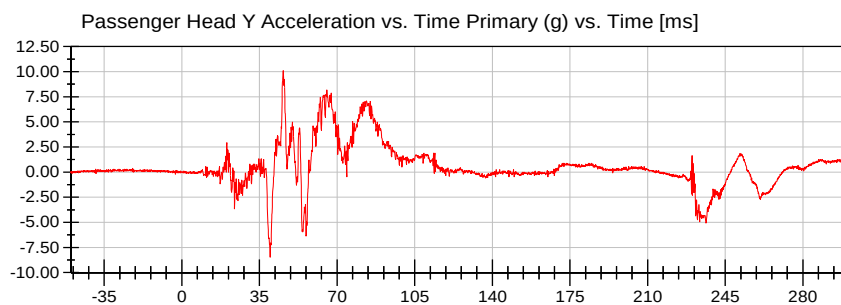
<Max>

27.33 g at 234.00 ms

<Min>

-53.67 g at 72.56 ms

CFC_1000



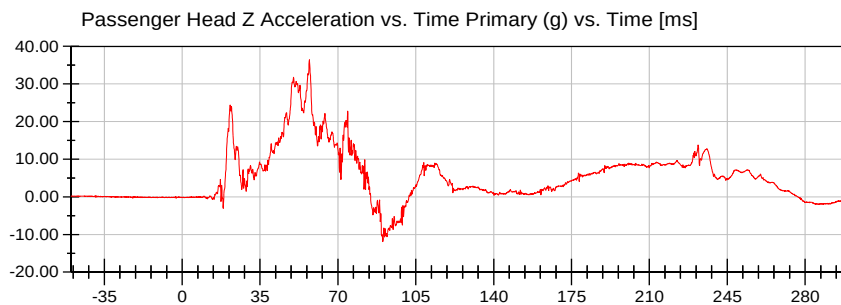
<Max>

10.11 g at 45.68 ms

<Min>

-8.47 g at 39.84 ms

CFC_1000



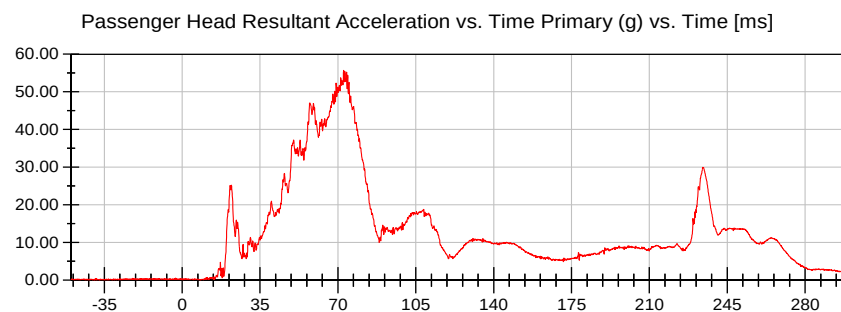
<Max>

36.46 g at 57.20 ms

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-11.92 g at 90.16 ms

CFC_1000



<Max>

55.73 g at 72.56 ms

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0.08 g at -42.48 ms

CFC_1000



NHTSA

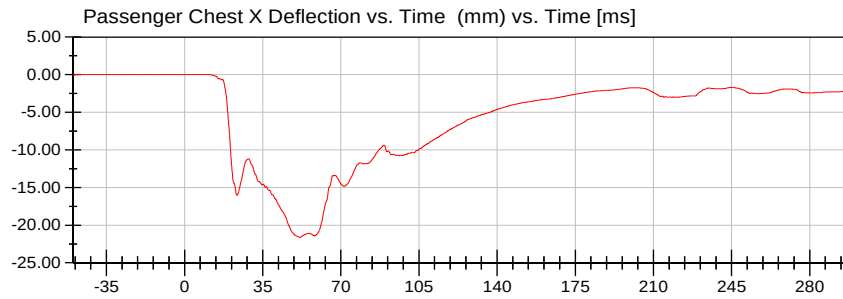
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



<Max>

0.02 mm at -36.00 ms

<Min>

-21.63 mm at 51.68 ms

CFC_600



NHTSA

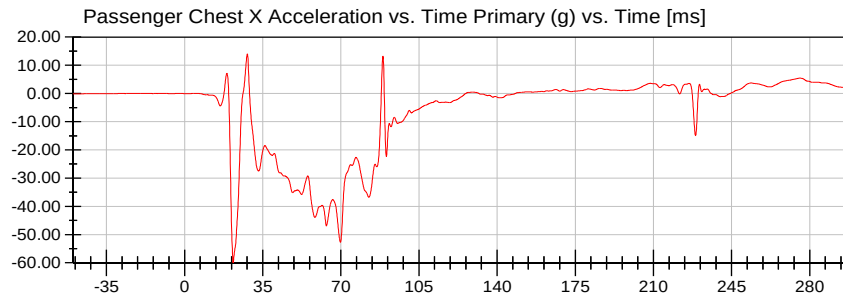
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



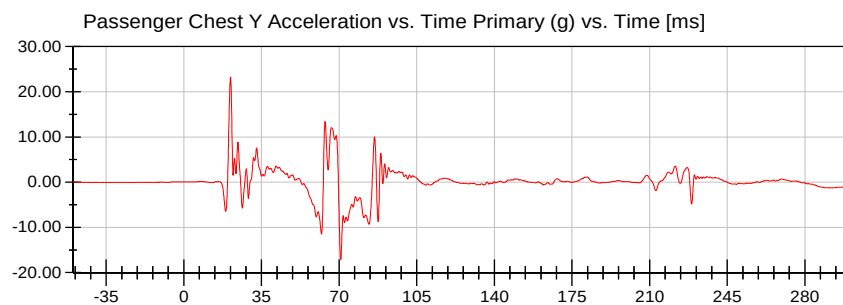
<Max>

13.97 g at 28.08 ms

<Min>

-59.99 g at 21.76 ms

CFC_180



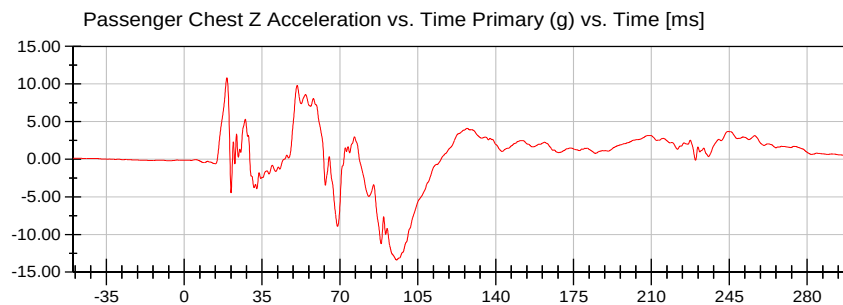
<Max>

23.24 g at 21.04 ms

<Min>

-17.22 g at 70.72 ms

CFC_180



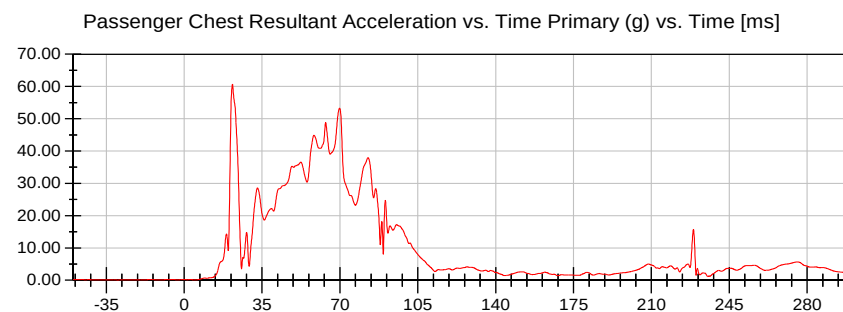
<Max>

10.82 g at 19.20 ms

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-13.39 g at 95.52 ms

CFC_180



<Max>

60.68 g at 21.68 ms

<Min>

0.07 g at -29.84 ms

CFC_180



NHTSA

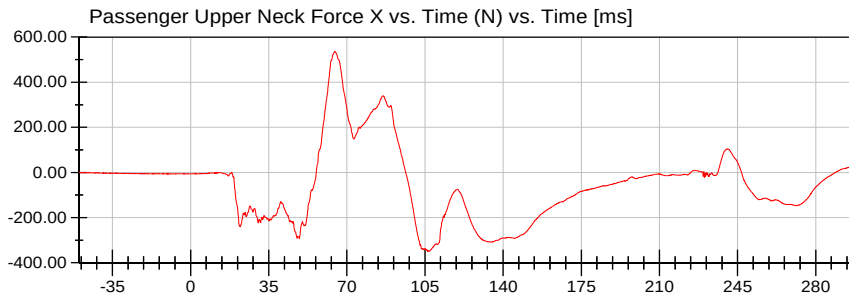
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



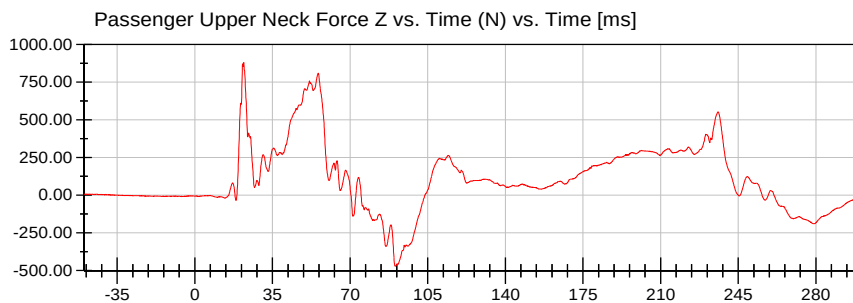
<Max>

535.78 N at 64.64 ms

<Min>

-350.69 N at 106.24 ms

CFC_1000



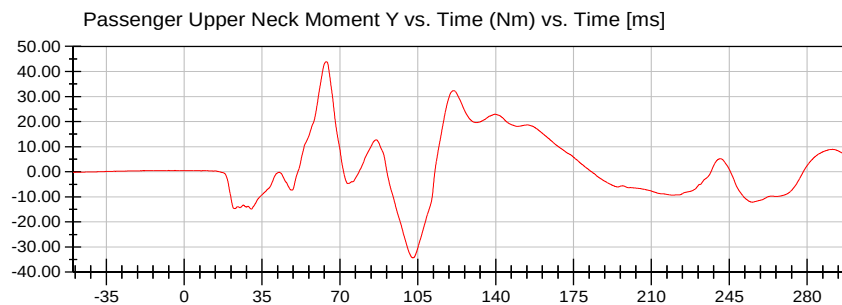
<Max>

881.49 N at 22.08 ms

<Min>

-470.02 N at 90.32 ms

CFC_1000



<Max>

43.90 Nm at 63.92 ms

<Min>

-34.30 Nm at 102.80 ms

CFC_600





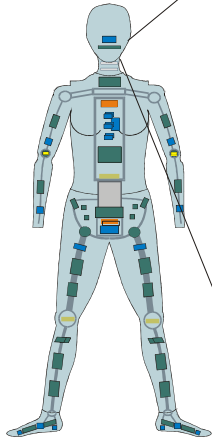
2018 Volkswagen Tiguan NCAP 35 mph Frontal Impact Neck Injury Predictor (NIJ)

Date: 12/13/2017
Time: 16:48

Customer: NHTSA

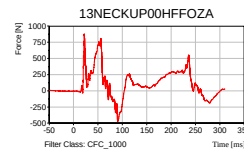
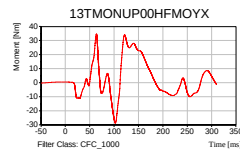
Test Number: M20185803

Test Orientation = Frontal
Fzc(Tension) = 4287
Fzc(Compression) = 3880
Myc(Extension) = 67
Myc(Flexion) = 155



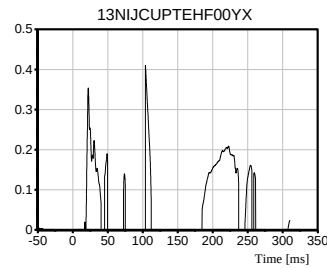
Dummy: HIII 5th Female
Seating Position:
Right Front Passenger

NIJ Source Code: (Fz/Fzc)+(Myl/Myc)

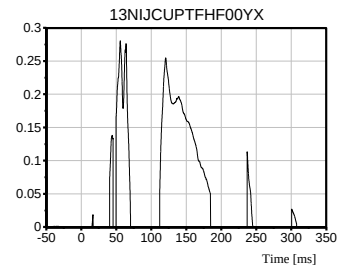


TRC Inc. Test Lab: CTF

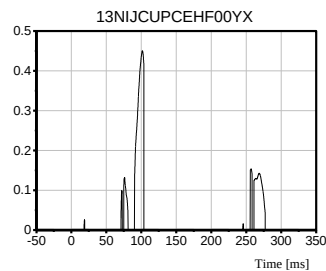
Test Number: 171213



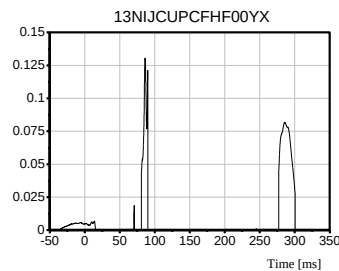
Max [NTE] 0.4104 at 103.76 ms



Max [NTF] 0.2806 at 55.68 ms



Max [NCE] 0.4511 at 101.60 ms



Max [NCF] 0.1306 at 86.24 ms

NHTSA

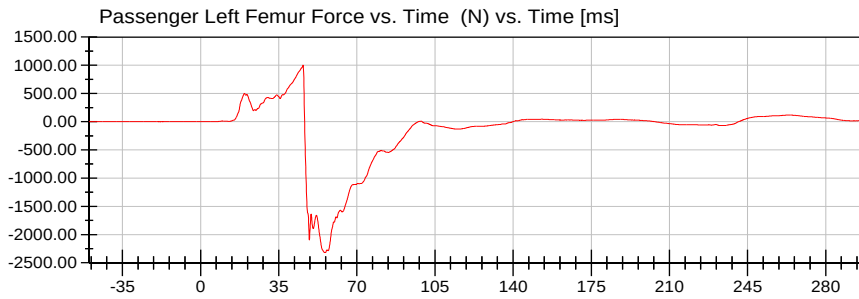
Test Lab: CTF

Test Number: 171213 (M20185803)

Test Date: 12/13/2017

Position #1 Hybrid III Mid-Sized Adult Male Dummy (037)

Position #2 Hybrid III Small Adult Female (070)



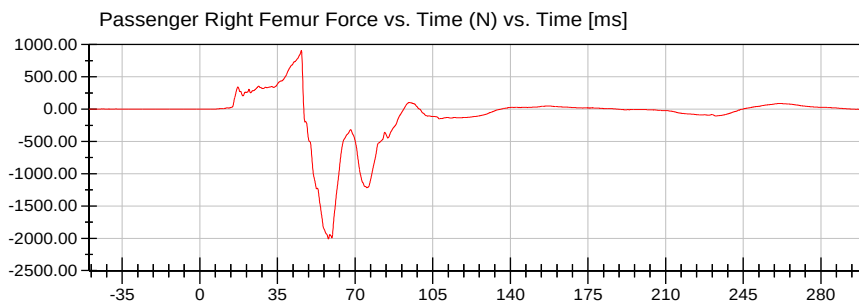
<Max>

1,003.71 N at 45.92 ms

<Min>

-2,319.57 N at 55.84 ms

CFC_600



<Max>

907.88 N at 45.76 ms

<Min>

-2,009.53 N at 58.00 ms

CFC_600



APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION

Pre-Test Calibration Sheets

Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 46

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	514	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	91	Yes
F	Thigh Clearance	139.7 - 154.9	150	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	340	Yes
J	Elbow Rest Height	190.5 - 210.8	201	Yes
K	Buttock Knee Length	579.1 - 604.5	599	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	495	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	226	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	864	Yes
AA	Location For Chest Circumference	429.3 - 434.3	430	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Comments:

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 46-1

Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	268.0 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-5.7 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: N/A

Skull S/N: N/A

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

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12.03.2017 11:56:39 579

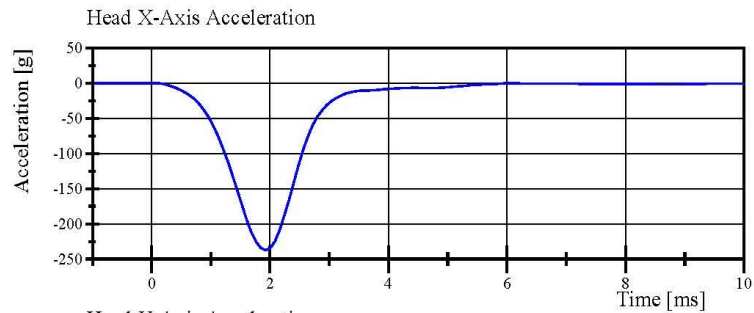


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 46-1

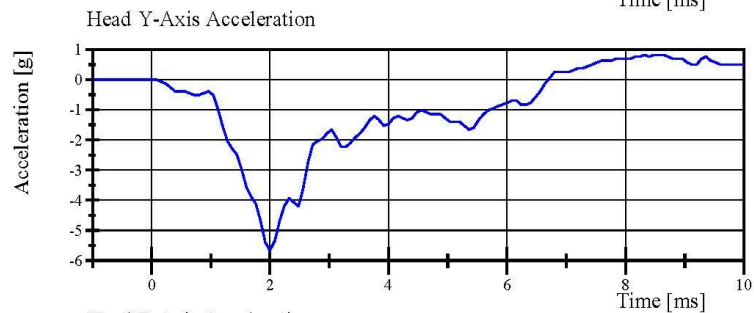
Test Date: 12/3/2017



Filter Class: CFC_1000

Max: 0.1 g at 6.0 ms

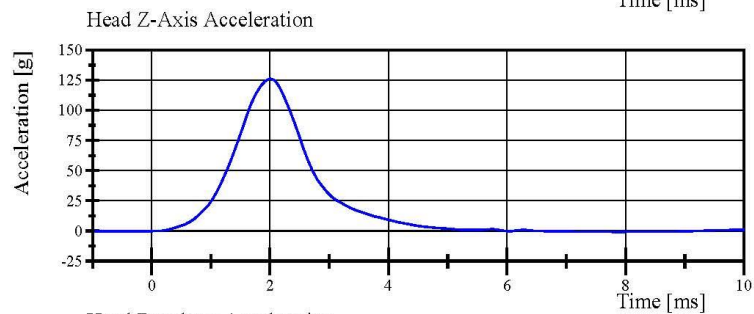
Min: -237.4 g at 1.9 ms



Filter Class: CFC_1000

Max: 0.8 g at 8.3 ms

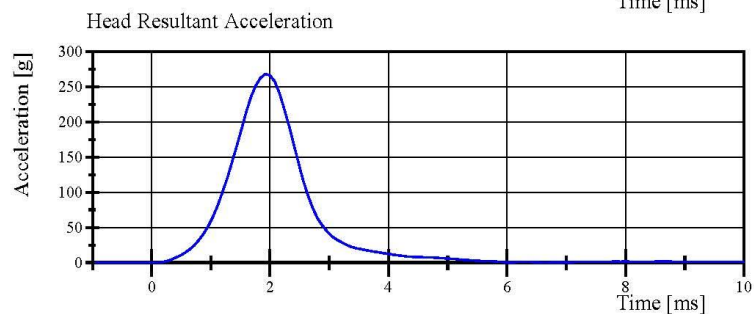
Min: -5.7 g at 2.0 ms



Filter Class: CFC_1000

Max: 126.3 g at 2.0 ms

Min: -0.8 g at 7.8 ms



Filter Class: CFC_1000

Max: 268.0 g at 1.9 ms

Min: 0.0 g at -1.0 ms

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

12.03.2017 11:57:55 579



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 46-1

Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.927 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	34.9 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-25.81 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-21.41 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-17.15 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-17.15 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-73.2 °	Yes
Time of Peak	57 - 64 ms	58.2 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	120.6 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	97.2 N·m	Yes
Time of Peak	47 - 58 ms	48.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	99.4 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 78051-336 #4727

Neck Cable S/N: N/A

Nodding Blocks:

Front S/N: N/A

Rear S/N: N/A

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

12.03.2017 08:59:48 3006



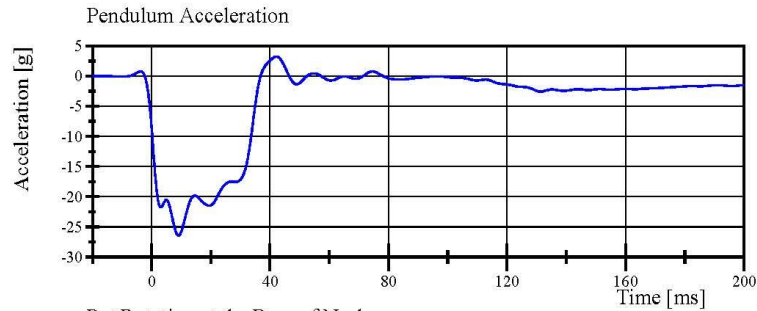
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Transportation Research Center Inc.

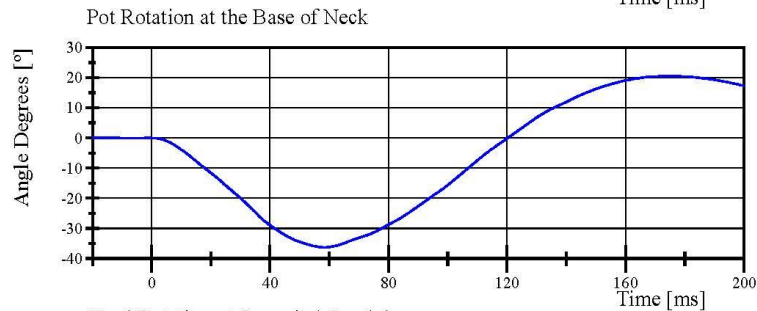
Neck Flexion

HIII 50th Serial No. 037 Certification No. 46-1

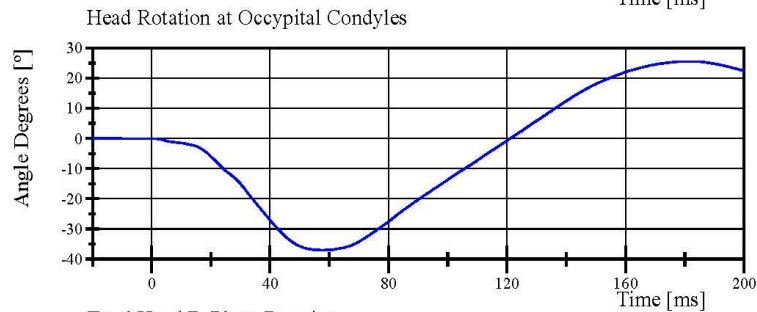
Test Date: 12/3/2017



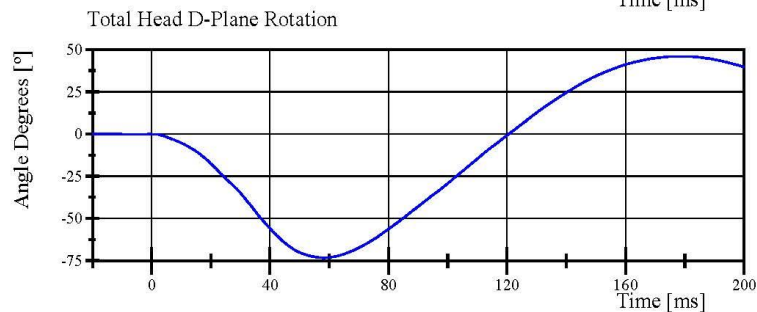
Filter Class: CFC_60
Max: 3.3 g at 42.2 ms
Min: -26.4 g at 9.1 ms



Filter Class: CFC_60
Max: 20.6 ° at 175.0 ms
Min: -36.2 ° at 58.3 ms



Filter Class: CFC_60
Max: 25.5 ° at 181.9 ms
Min: -37.0 ° at 57.7 ms



Filter Class: CFC_60
Max: 46.0 ° at 178.5 ms
Min: -73.2 ° at 58.2 ms

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

12.03.2017 09:01:16 3006

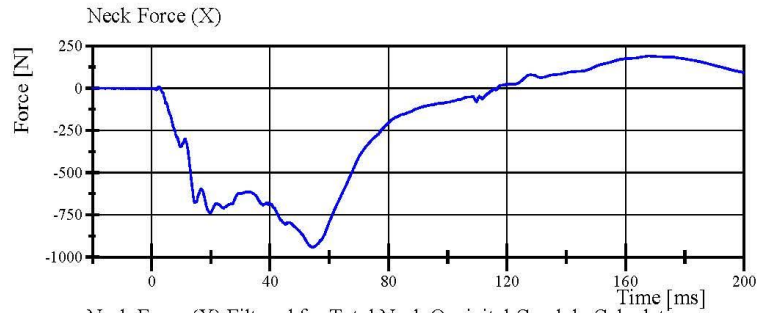


Transportation Research Center Inc.

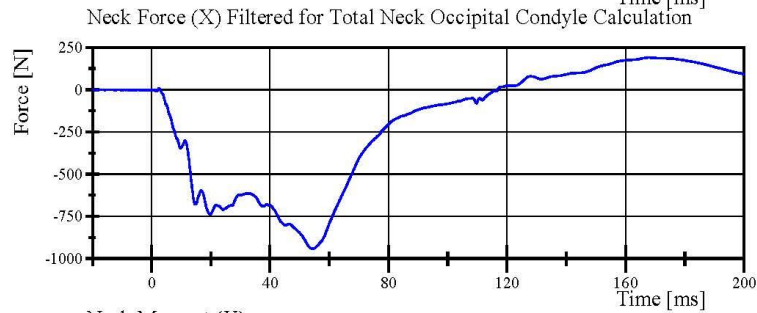
Neck Flexion

HIII 50th Serial No. 037 Certification No. 46-1

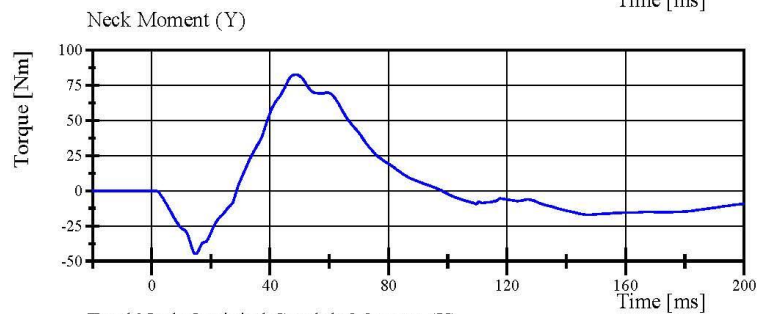
Test Date: 12/3/2017



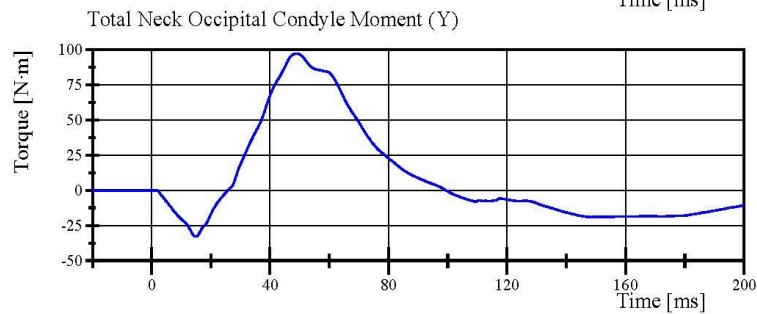
Filter Class: CFC_1000
Max: 191.7 N at 168.2 ms
Min: -940.7 N at 54.4 ms



Filter Class: CFC_600
Max: 191.4 N at 168.2 ms
Min: -940.8 N at 54.5 ms



Filter Class: CFC_600
Max: 82.6 Nm at 48.6 ms
Min: -44.8 Nm at 14.8 ms



Filter Class: Without_(Consta
Max: 97.2 N·m at 48.8 ms
Min: -32.8 N·m at 14.9 ms

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

12.03.2017 09:01:17 3006



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 46-3

Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.974 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.1 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.30 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	15.91 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	13.60 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	13.68 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	94.9 °	Yes
Time of Peak	72 - 82 ms	76.8 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	160.1 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-70.7 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	147.5 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 78051-336 #4727

Neck Cable S/N: N/A

Nodding Block S/N's:

Front : N/A

Rear: N/A

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

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12.03.2017 10:56:44 3099

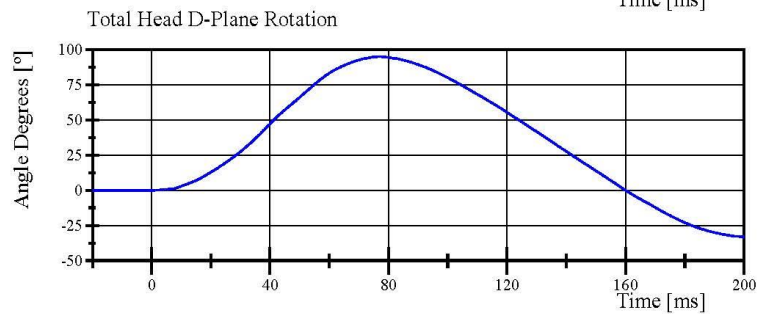
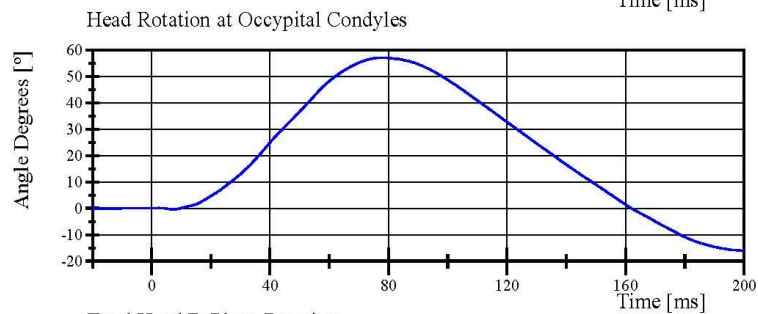
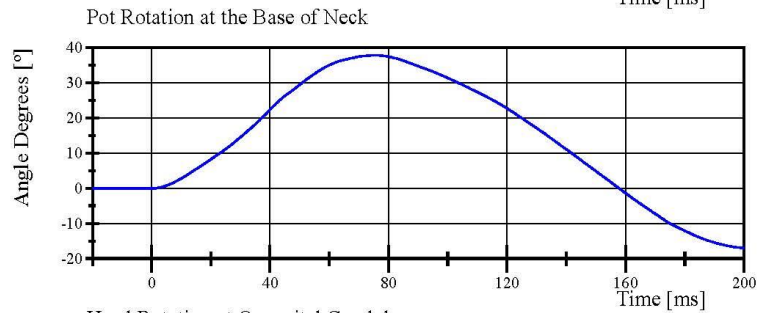
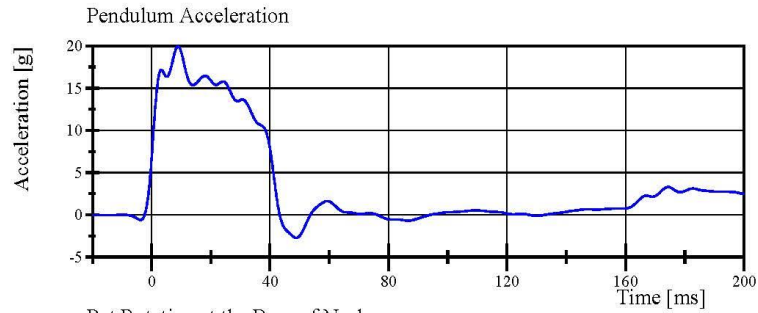


Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 46-3

Test Date: 12/3/2017



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

12.03.2017 10:58:44 3099

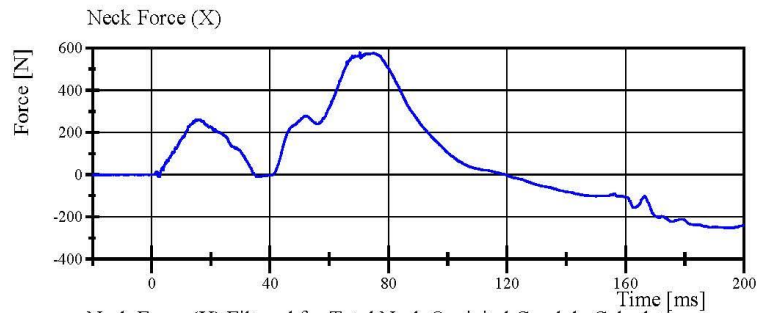


Transportation Research Center Inc.

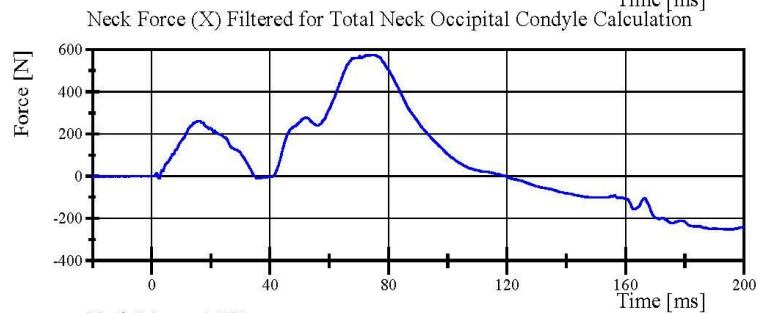
Neck Extension

HIII 50th Serial No. 037 Certification No. 46-3

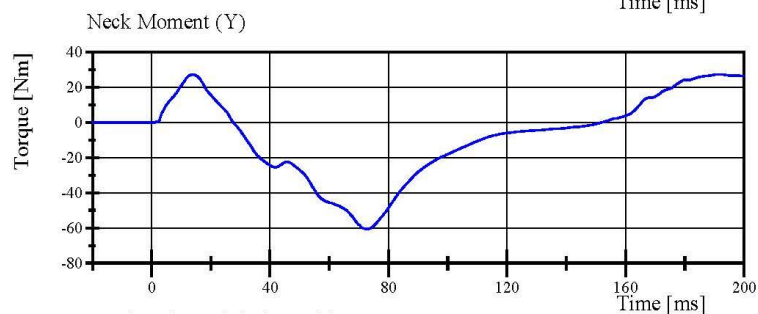
Test Date: 12/3/2017



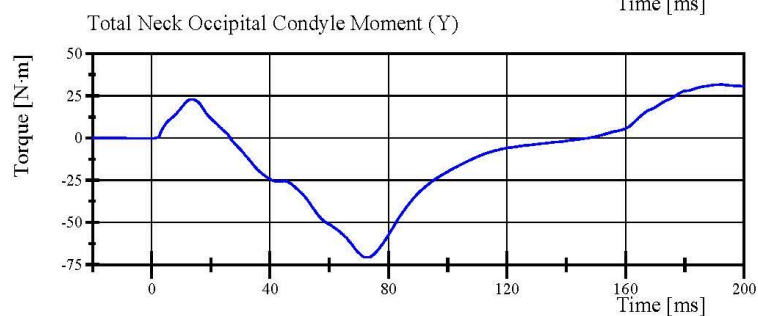
Filter Class: CFC_1000
Max: 579.0 N at 70.3 ms
Min: -252.7 N at 195.8 ms



Filter Class: CFC_600
Max: 575.5 N at 74.8 ms
Min: -252.3 N at 195.8 ms



Filter Class: CFC_600
Max: 27.3 Nm at 14.1 ms
Min: -60.5 Nm at 72.9 ms



Filter Class: Without_(Constai
Max: 31.6 N·m at 192.5 ms
Min: -70.7 N·m at 72.9 ms

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

12.03.2017 10:58:45 3099



Transportation Research Center Inc.

Front Thorax

HIH 50th Serial No. 037 Certification No. 46-1

Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.669 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,577.0 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-64.92 mm	Yes
Internal Hysteresis	69 - 85 %	74.0 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: 2565

Rib Module #1 S/N: 178051-35 H16550

Rib Module #2 S/N: 36 16526

Rib Module #3 S/N: 37 16543

Rib Module #4 S/N: 38 16538

Rib Module #5 S/N: 39 H16530

Rib Module #6 S/N: 40 16548

Rear Support S/N: N/A

Bib S/N: N/A

Sternum Plate S/N: N/A

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

12.03.2017 07:29:27 358



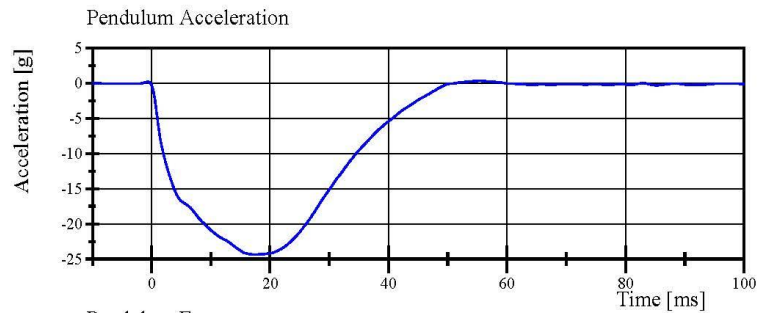
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Transportation Research Center Inc.

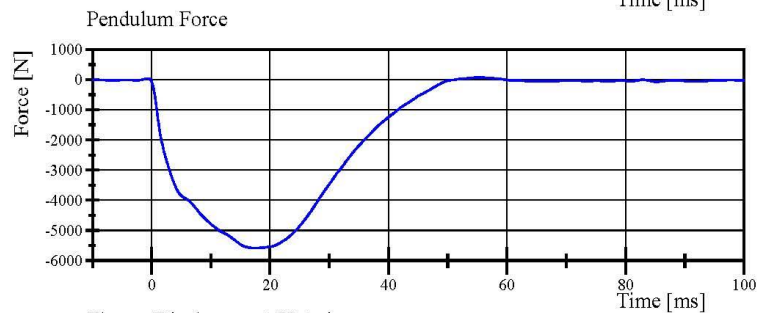
Front Thorax

HIII 50th Serial No. 037 Certification No. 46-1

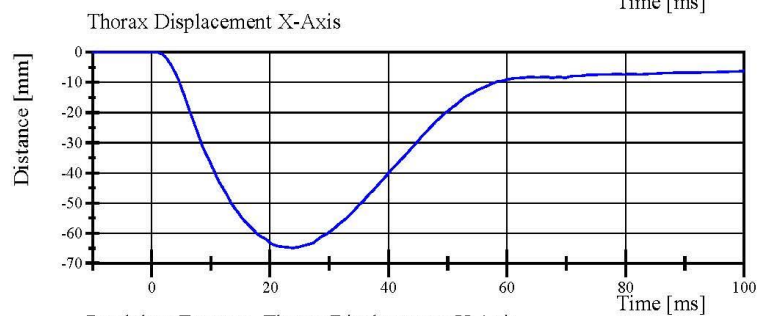
Test Date: 12/3/2017



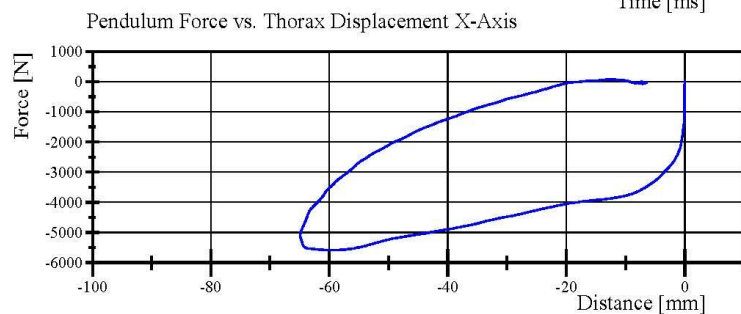
Filter Class: CFC_180
Max: 0.3 g at 55.4 ms
Min: -24.3 g at 17.4 ms



Filter Class: CFC_180
Max: 76.7 N at 55.4 ms
Min: -5,577.0 N at 17.4 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.0 ms
Min: -64.9 mm at 23.8 ms



Filter Class: CFC_180
Max: 76.7 N at -12.3 mm
Min: -5,577.0 N at -59.3 mm

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

12.03.2017 07:39:07 358



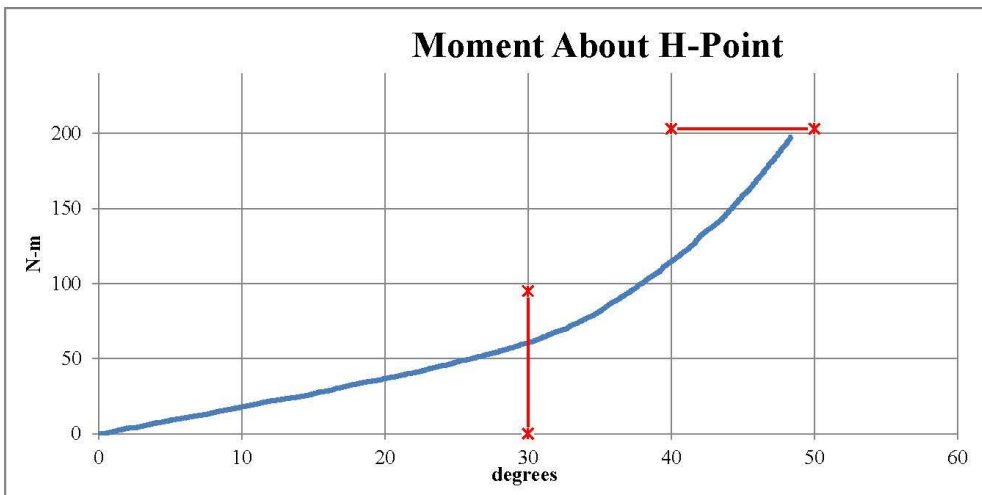
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

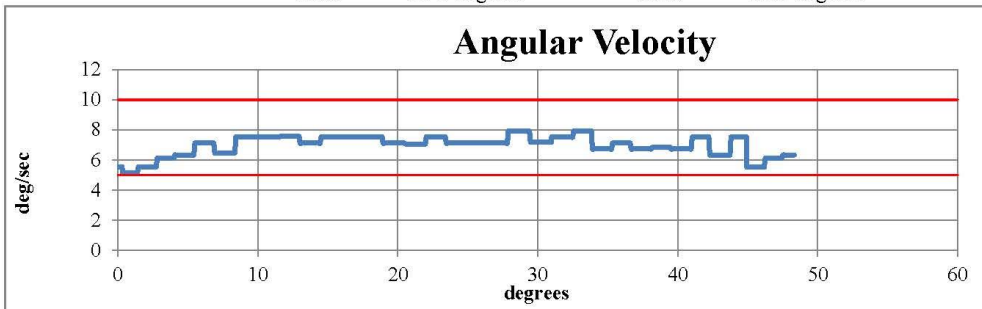


Serial Number: 037 Date: 03-Dec-2017
Side Tested: Left Hip Time: 3:06
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.6 °C	Pass	
Humidity	10	- 70	35 %	Pass	
Moment at 30°	0	≤ 94.9	60.67 N-m	Pass	
Angle at 203 Nm	40	- 50	48.87 deg	Pass	
Average Velocity	5	- 10	6.93 deg/sec	Pass	



Max: 7.91 deg/sec Min: 5.14 deg/sec



Comments:
Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

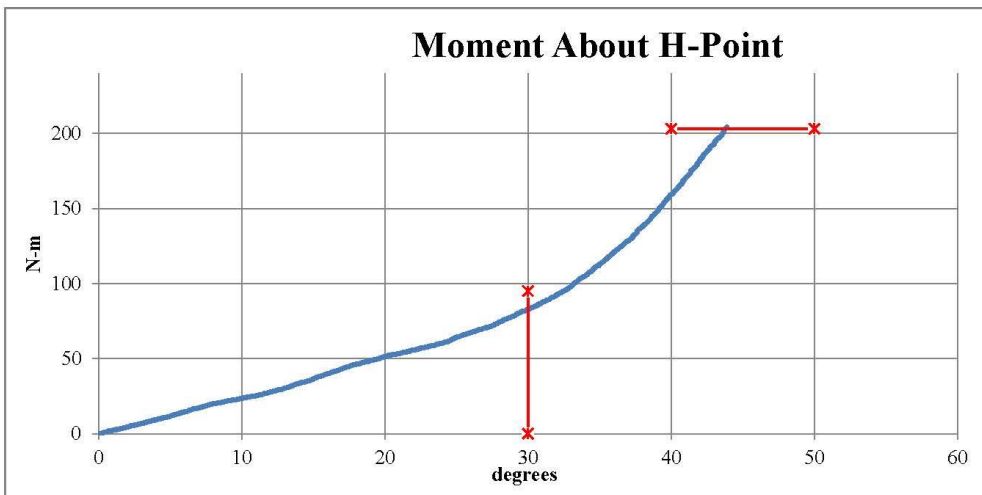
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

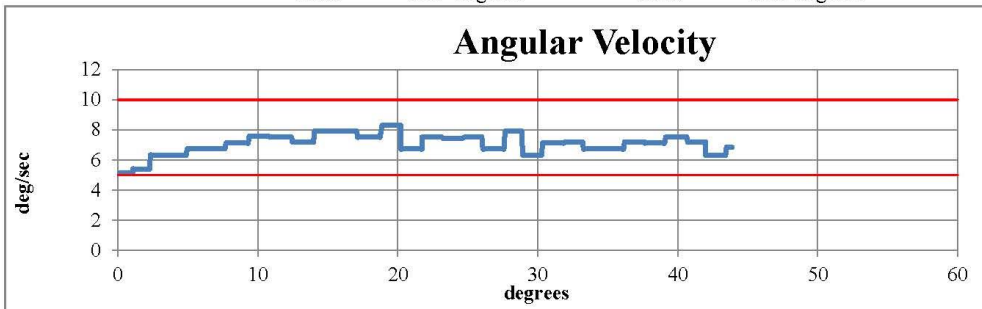


Serial Number: 037 Date: 04-Dec-2017
Side Tested: Right Hip Time: 9:31
Test Number: 1 Comments:

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.8 °C	Pass	
Humidity	10	- 70	33 %	Pass	
Moment at 30°	0	≤ 94.9	82.87 N-m	Pass	
Angle at 203 Nm	40	- 50	43.89 deg	Pass	
Average Velocity	5	- 10	7.04 deg/sec	Pass	



Max: 8.29 deg/sec Min: 5.14 deg/sec



Comments:
Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 46-2
Test Date: 12/4/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.086 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,451.91 N	Yes

Test meets specifications.

Condition: Used

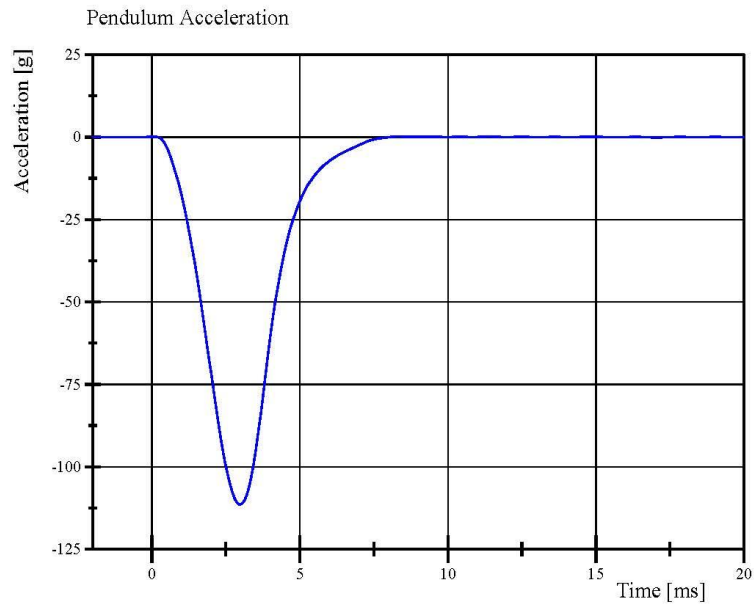
Comments:

Knee Skin S/N: 2672

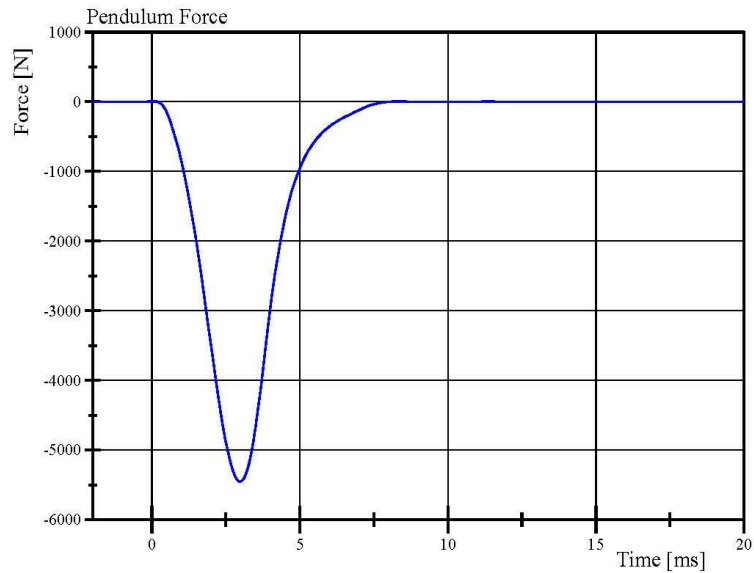
Knee Insert S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 46-2
Test Date: 12/4/2017



Filter Class: CFC_600
Max: 0.2 g at 0.1 ms
Min: -111.4 g at 3.0 ms



Filter Class: CFC_600
Max: 8.2 N at 0.1 ms
Min: -5,451.9 N at 3.0 ms

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

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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 46-1
Test Date: 12/4/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.091 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,507.89 N	Yes

Test meets specifications.

Condition: Used

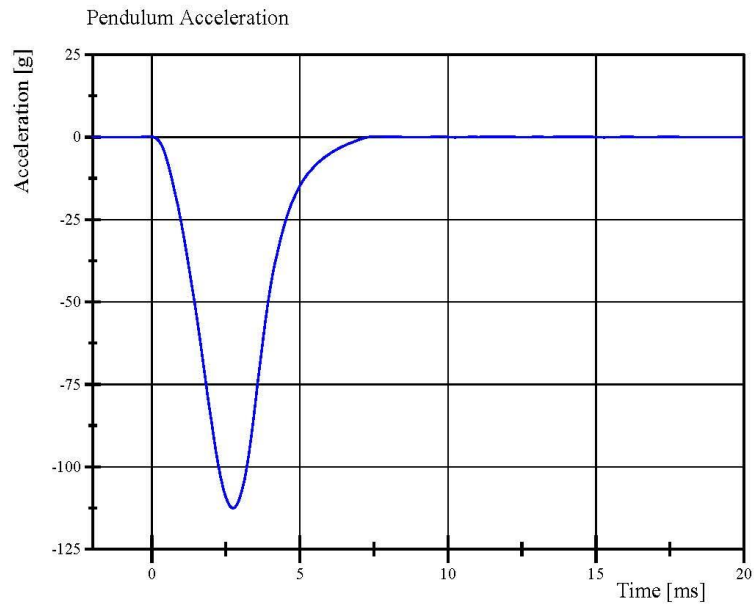
Comments:

Knee skin S/N: 3131

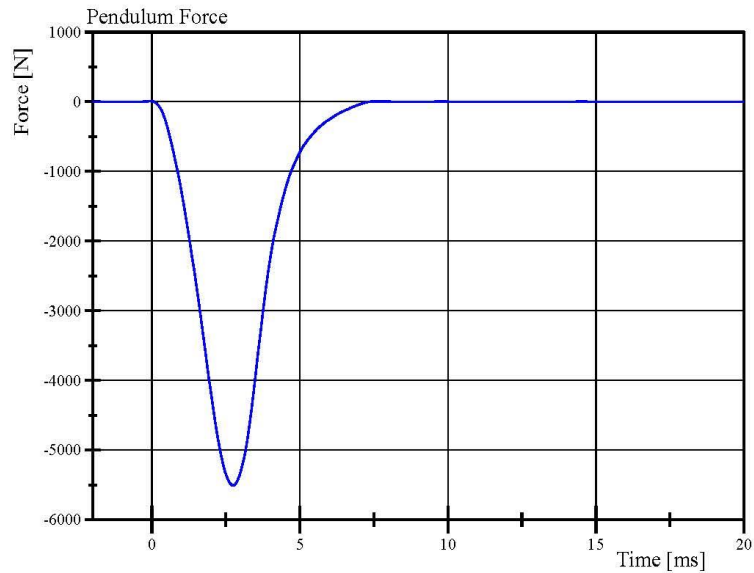
Knee Insert S/N: N/A

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 46-1
Test Date: 12/4/2017



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -112.6 g at 2.7 ms



Filter Class: CFC_600
Max: 9.7 N at -0.1 ms
Min: -5,507.9 N at 2.7 ms

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

12.04.2017 08:35:51 1726



Post-Test Calibration Sheets

Driver S/N 037

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 037
Calibration No. 47

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	513	Yes
C	H-Point Height	83.8 - 88.9	85	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	91	Yes
F	Thigh Clearance	139.7 - 154.9	147	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	337	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	602	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	494	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	227	Yes
P	Foot Length	251.5 - 266.7	264	Yes
V	Shoulder Breadth	421.6 - 436.9	425	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	992	Yes
Z	Waist Circumference	835.7 - 866.1	864	Yes
AA	Location For Chest Circumference	429.3 - 434.3	431	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Comments:



Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 47-1

Test Date: 12/14/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	254.8 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-6.5 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: N/A

Skull S/N: N/A

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

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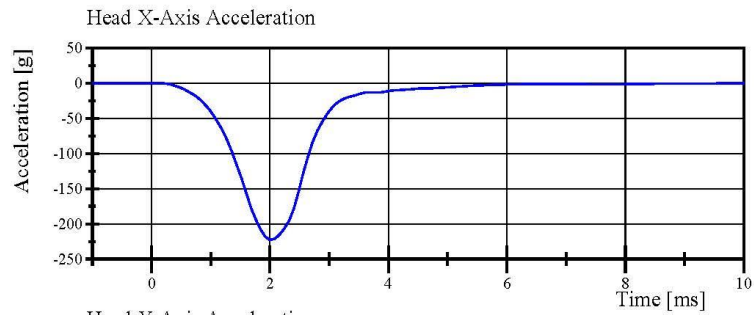


Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 037 Certification No. 47-1

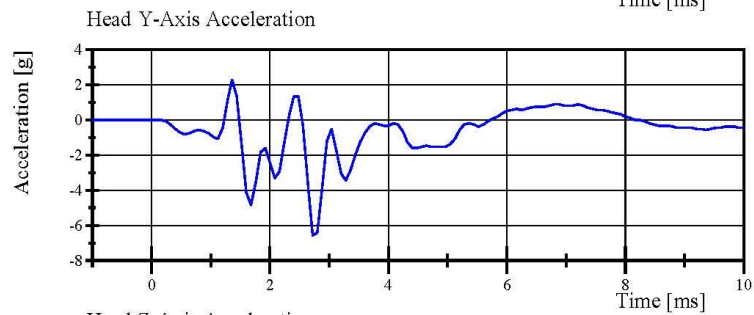
Test Date: 12/14/2017



Filter Class: CFC_1000

Max: 0.1 g at 9.8 ms

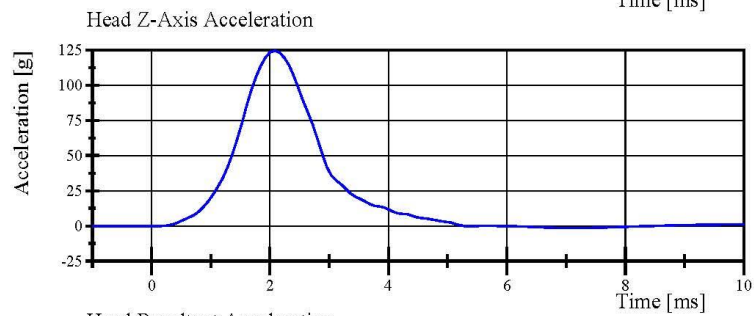
Min: -222.9 g at 2.0 ms



Filter Class: CFC_1000

Max: 2.3 g at 1.4 ms

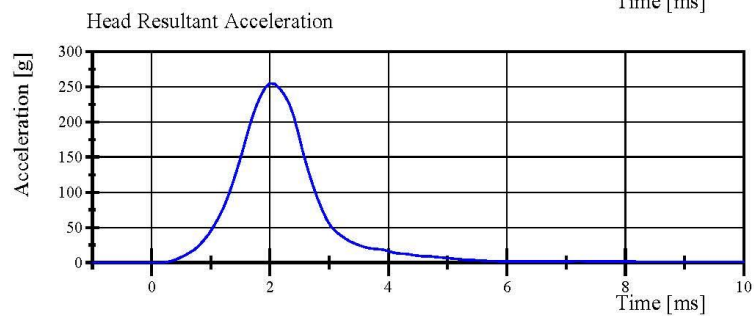
Min: -6.5 g at 2.7 ms



Filter Class: CFC_1000

Max: 124.6 g at 2.1 ms

Min: -1.5 g at 7.2 ms



Filter Class: CFC_1000

Max: 254.8 g at 2.0 ms

Min: 0.0 g at -1.0 ms

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

12.14.2017 13:25:29 578



Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 037 Certification No. 47-1

Test Date: 12/14/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.934 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	40.8 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-24.50 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-19.66 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-15.57 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-15.57 g	Yes
Total Head D-Plane Rotation			
Peak	(-64) - (-78) °	-66.0 °	Yes
Time of Peak	57 - 64 ms	61.0 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	121.7 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	88 - 108 N·m	99.5 N·m	Yes
Time of Peak	47 - 58 ms	53.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	103.0 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 78051-336 #4727

Neck Cable S/N: N/A

Nodding Blocks:

Front S/N: N/A

Rear S/N: N/A

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

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12.14.2017 13:40:53 3005

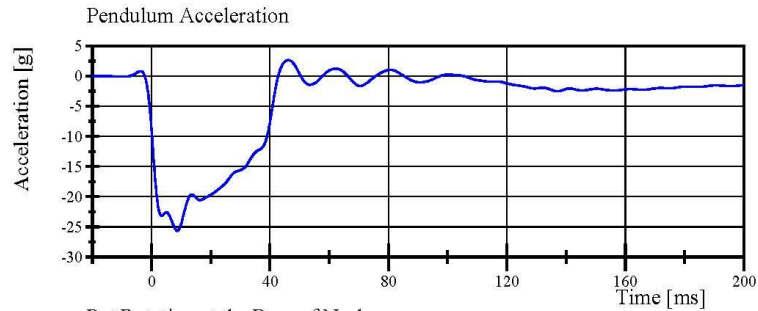


Transportation Research Center Inc.

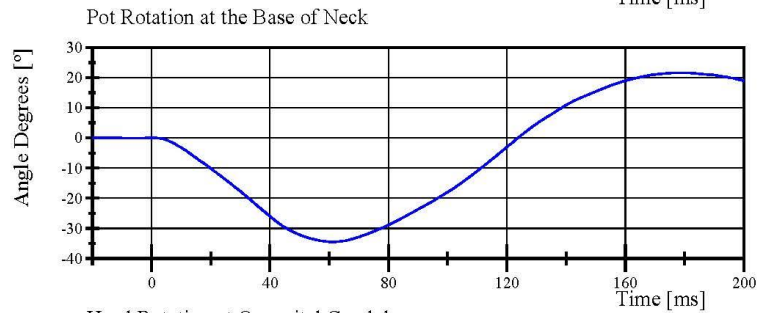
Neck Flexion

HIII 50th Serial No. 037 Certification No. 47-1

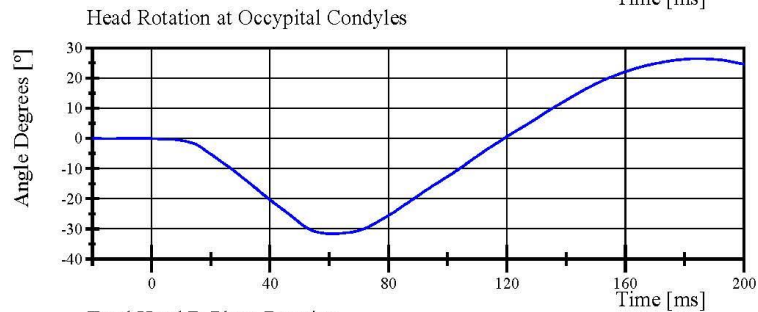
Test Date: 12/14/2017



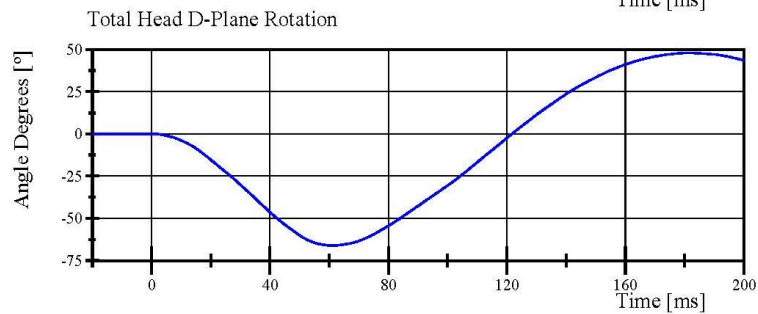
Filter Class: CFC_60
Max: 2.7 g at 46.2 ms
Min: -25.6 g at 8.7 ms



Filter Class: CFC_60
Max: 21.6 ° at 179.0 ms
Min: -34.4 ° at 61.0 ms



Filter Class: CFC_60
Max: 26.4 ° at 184.2 ms
Min: -31.6 ° at 61.0 ms



Filter Class: CFC_60
Max: 47.9 ° at 181.1 ms
Min: -66.0 ° at 61.0 ms

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

12.14.2017 13:42:25 3005

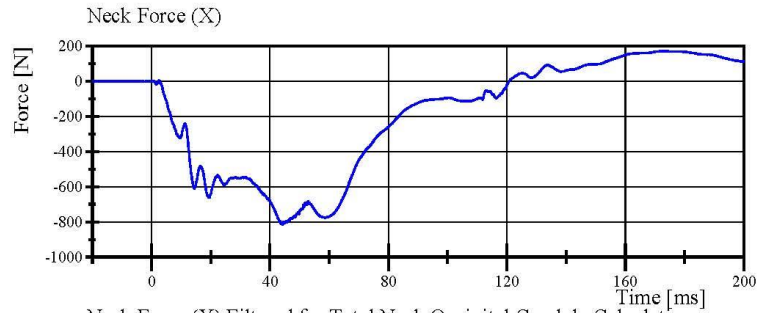


Transportation Research Center Inc.

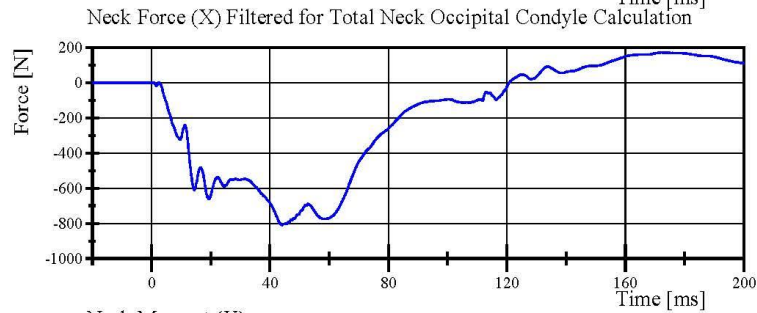
Neck Flexion

HIII 50th Serial No. 037 Certification No. 47-1

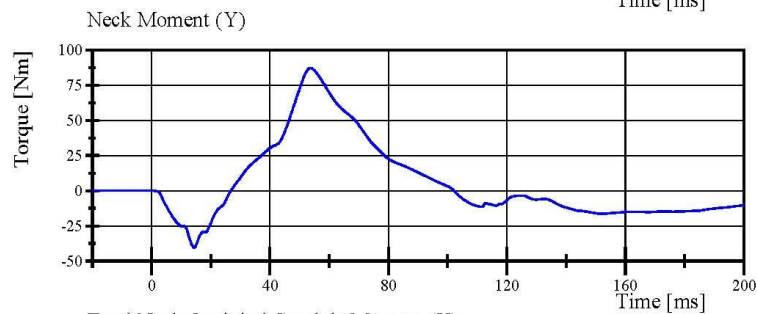
Test Date: 12/14/2017



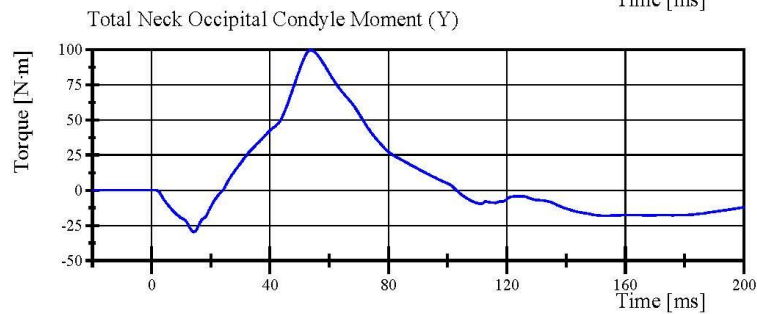
Filter Class: CFC_1000
Max: 173.3 N at 172.2 ms
Min: -813.8 N at 44.2 ms



Filter Class: CFC_600
Max: 172.9 N at 172.2 ms
Min: -808.5 N at 44.2 ms



Filter Class: CFC_600
Max: 87.2 Nm at 53.6 ms
Min: -40.4 Nm at 14.4 ms



Filter Class: Without_(Constai
Max: 99.5 N·m at 53.8 ms
Min: -29.6 N·m at 14.3 ms

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

12.14.2017 13:42:26 3005



Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 47-3

Test Date: 12/14/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.984 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	41.8 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	19.96 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.96 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	12.57 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	12.81 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	92.3 °	Yes
Time of Peak	72 - 82 ms	77.5 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	158.5 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-71.1 N·m	Yes
Time of Peak	65 - 79 ms	71.4 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	144.9 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: 78051-336 #4727

Neck Cable S/N: N/A

Nodding Blocks:

Front S/N: N/A

Rear S/N: N/A

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

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12.14.2017 15:29:14 3097

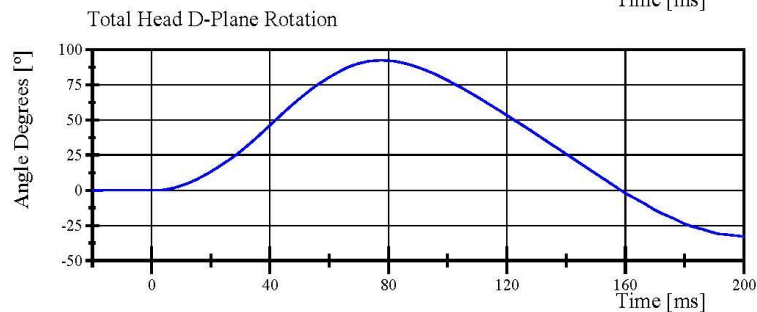
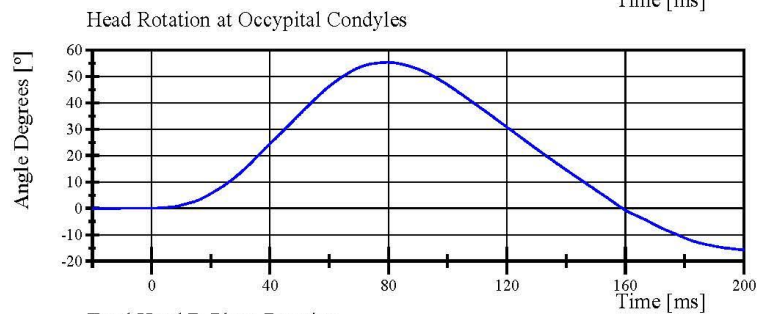
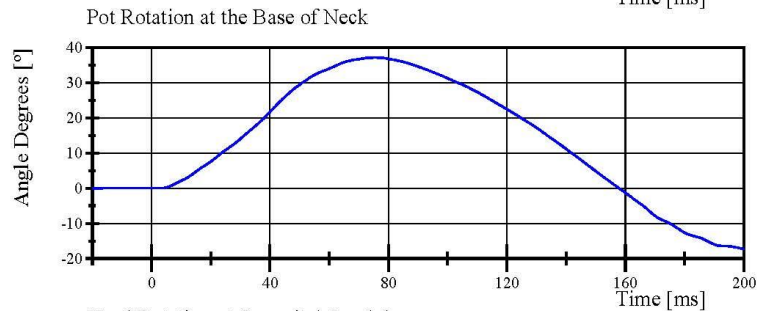
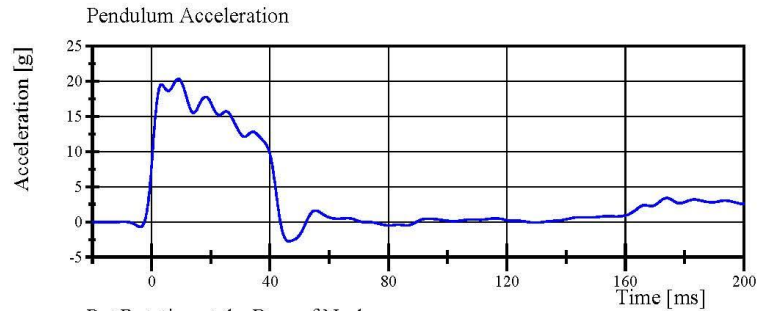


Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 037 Certification No. 47-3

Test Date: 12/14/2017



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

12.14.2017 15:31:07 3097

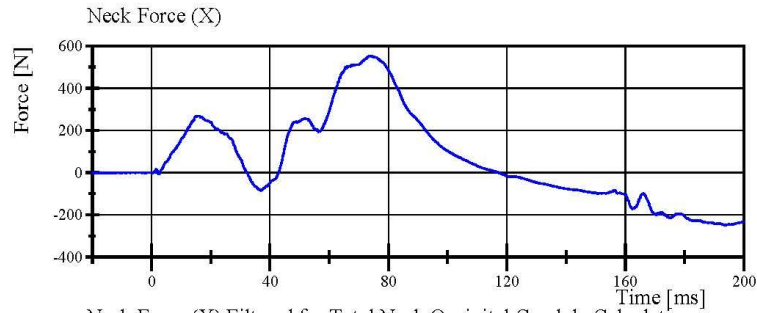


Transportation Research Center Inc.

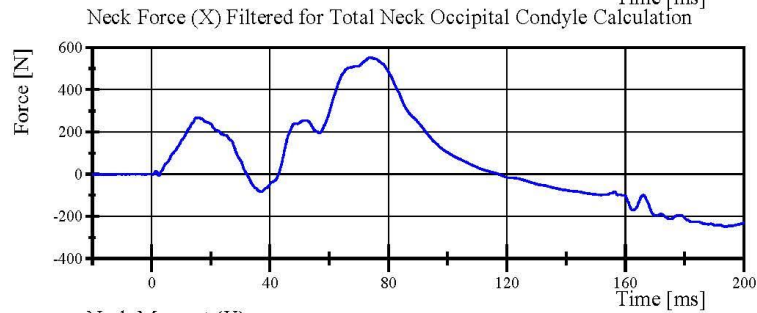
Neck Extension

HIII 50th Serial No. 037 Certification No. 47-3

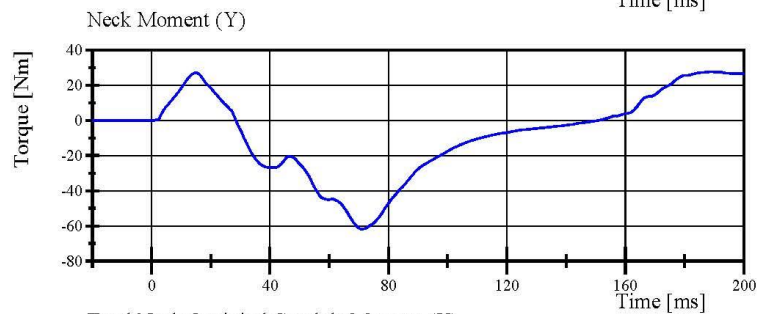
Test Date: 12/14/2017



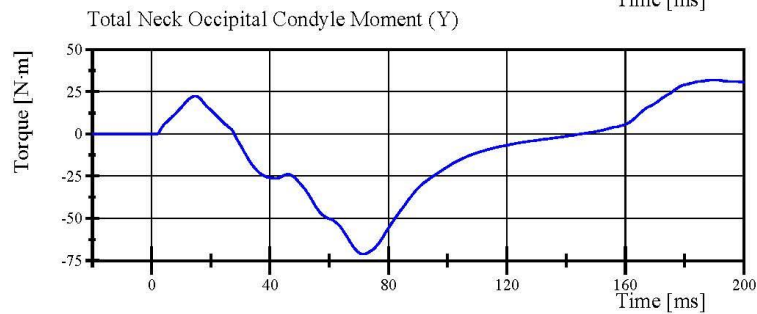
Filter Class: CFC_1000
Max: 554.2 N at 73.8 ms
Min: -248.1 N at 193.4 ms



Filter Class: CFC_600
Max: 553.7 N at 73.8 ms
Min: -247.7 N at 193.6 ms



Filter Class: CFC_600
Max: 27.7 Nm at 189.1 ms
Min: -61.7 Nm at 71.1 ms



Filter Class: Without_(Consta
Max: 31.9 N·m at 189.3 ms
Min: -71.1 N·m at 71.4 ms

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

12.14.2017 15:31:08 3097



Transportation Research Center Inc.

Front Thorax

HIH 50th Serial No. 037 Certification No. 47-1

Test Date: 12/16/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.641 m/s	Yes
Probe Force Peak	(-5,160) - (-5,894) N	-5,531.6 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-68.10 mm	Yes
Internal Hysteresis	69 - 85 %	73.4 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: 2565

Rib Module #1 S/N: 178051-35 HI6550

Rib Module #2 S/N: 36 16526

Rib Module #3 S/N: 37 16543

Rib Module #4 S/N: 38 16538

Rib Module #5 S/N: 39 HI6530

Rib Module #6 S/N: 40 16548

Rear Rib Support S/N: N/A

Bib S/N: N/A

Sternum Plate S/N: N/A

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

12.16.2017 13:39:06 369



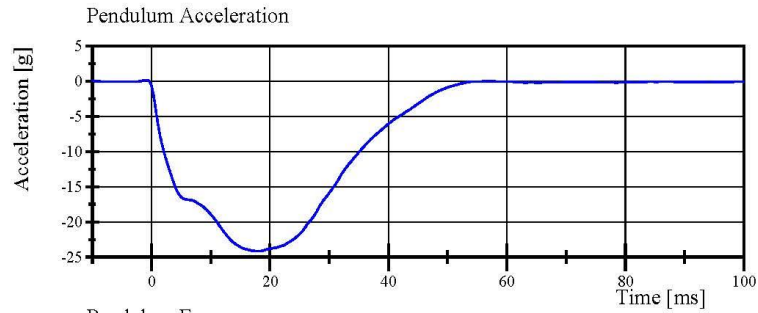
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Transportation Research Center Inc.

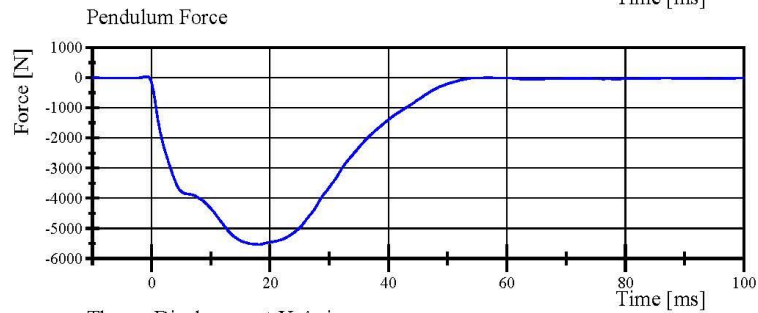
Front Thorax

HIII 50th Serial No. 037 Certification No. 47-1

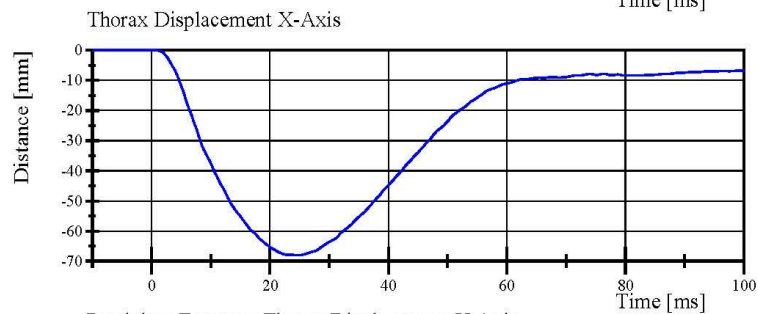
Test Date: 12/16/2017



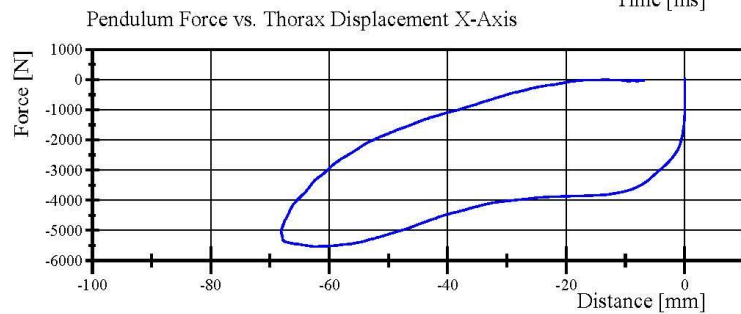
Filter Class: CFC_180
Max: 0.2 g at -0.8 ms
Min: -24.1 g at 18.2 ms



Filter Class: CFC_180
Max: 41.8 N at -0.8 ms
Min: -5,531.6 N at 18.2 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.0 ms
Min: -68.1 mm at 24.8 ms



Filter Class: CFC_180
Max: 41.8 N at -0.0 mm
Min: -5,531.6 N at -62.5 mm

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

12.16.2017 13:40:56 369



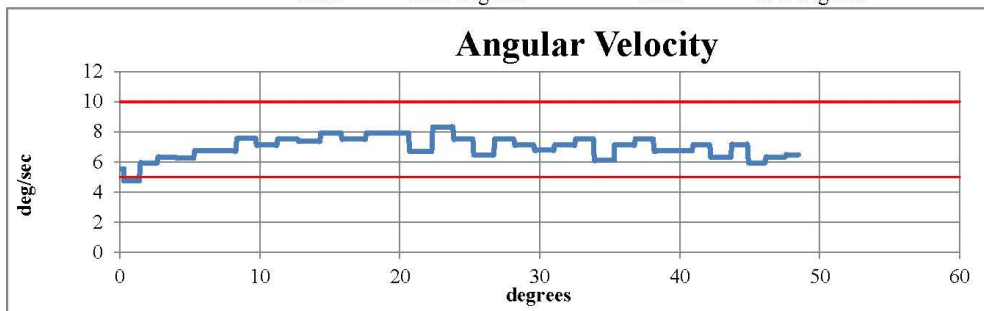
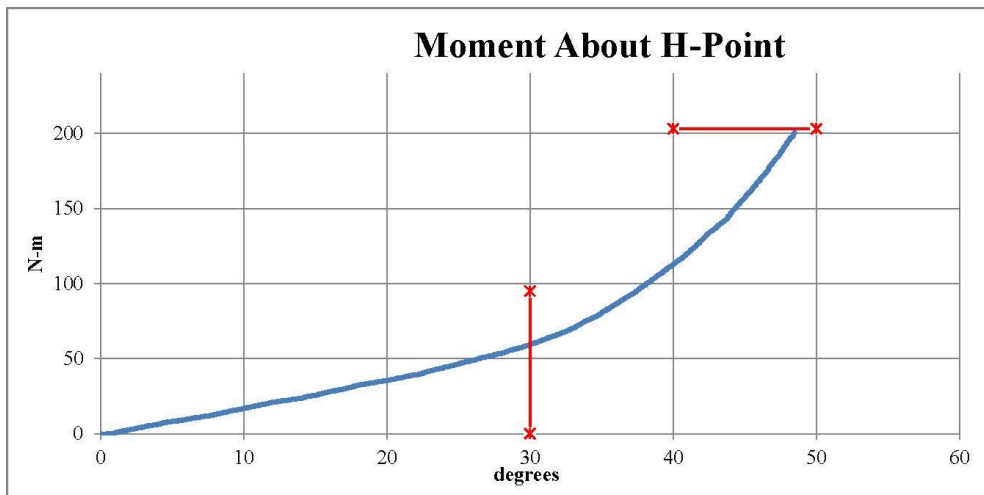
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Transportation Research Center Inc.
Hybrid III 50th Male Hip Range of Motion



Serial Number: 037 Date: 12/14/2017
Side Tested: Left Hip Time: 1:12
Test Number: 01

TEST PARAMETER	SPECIFICATION		TEST RESULTS		
Temperature	18.9	- 25.6	21.6 °C	Pass	
Humidity	10	- 70	35 %	Pass	
Moment at 30°	0	≤ 94.9	59.49 N-m	Pass	
Angle at 203 Nm	40	- 50	48.79 deg	Pass	
Average Velocity	5	- 10	6.94 deg/sec	Pass	



Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551
Lumbar Cable S/N: N/A

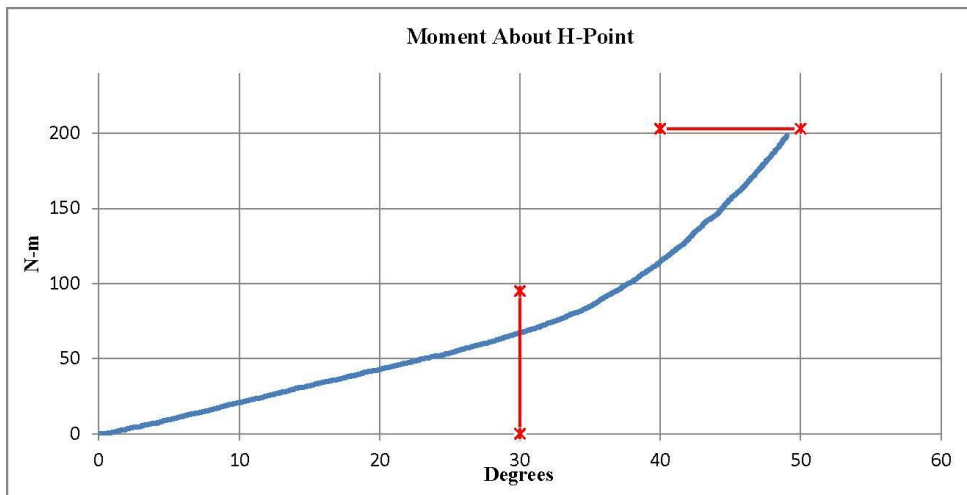
Transportation Research Center Inc.

Hybrid III 50th Male Hip Range of Motion

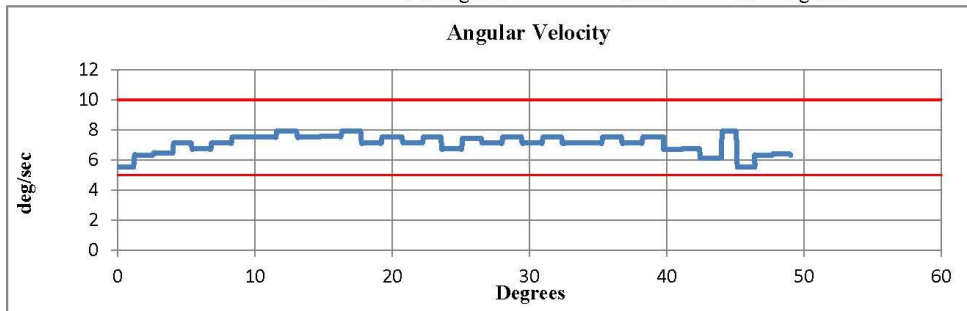


Serial Number: 037 Date: 12/14/2017
Side Tested: Right Hip Time: 13:25
Test Number: 01 Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.4 °C Pass
Humidity	10 - 70	33 % Pass
Moment at 30°	0 ≤ 94.9	67.18 N-m Pass
Angle at 203 Nm	40 - 50	49.43 deg Pass
Average Velocity	5 - 10	7.06 deg/sec Pass



Max: 7.91 deg/sec Min: 5.54 deg/sec



Pelvis Skin S/N: N/A
Lumbar Spine S/N: 0551

Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 50th Serial No. 037 Certification No. 47-1

Test Date: 12/14/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.089 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,424.73 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 2672

Knee Insert S/N: N/A

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

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12.14.2017 12:43:27 1740

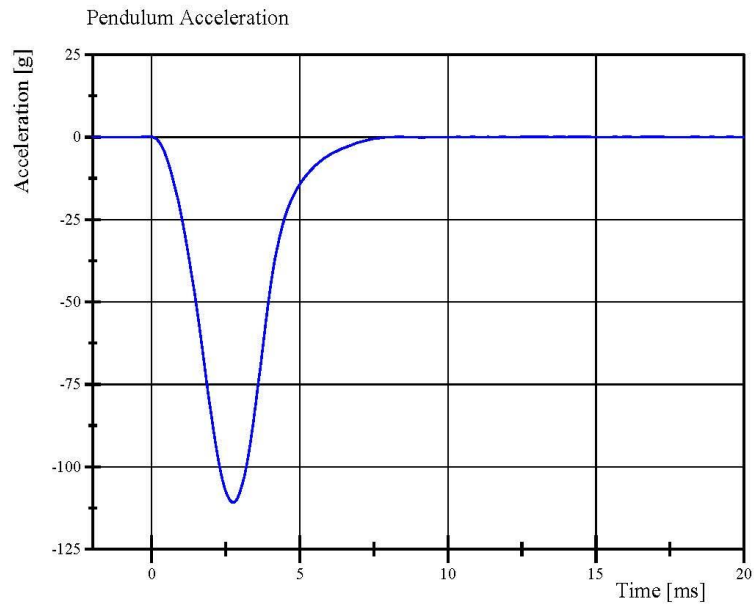


Transportation Research Center Inc.

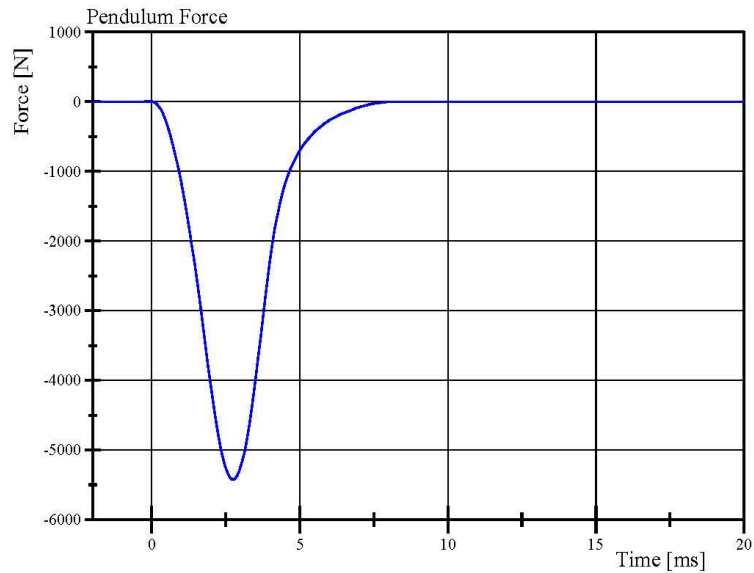
Left Knee Femur Response Test

HIH 50th Serial No. 037 Certification No. 47-1

Test Date: 12/14/2017



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -110.9 g at 2.7 ms



Filter Class: CFC_600
Max: 7.4 N at -0.1 ms
Min: -5,424.7 N at 2.7 ms

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

12.14.2017 12:44:38 1740



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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 47-1
Test Date: 12/14/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.092 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,314.60 N	Yes

Test meets specifications.

Condition: Used

Comments:

Knee Skin S/N: 3131

Knee Insert S/N: N/A

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

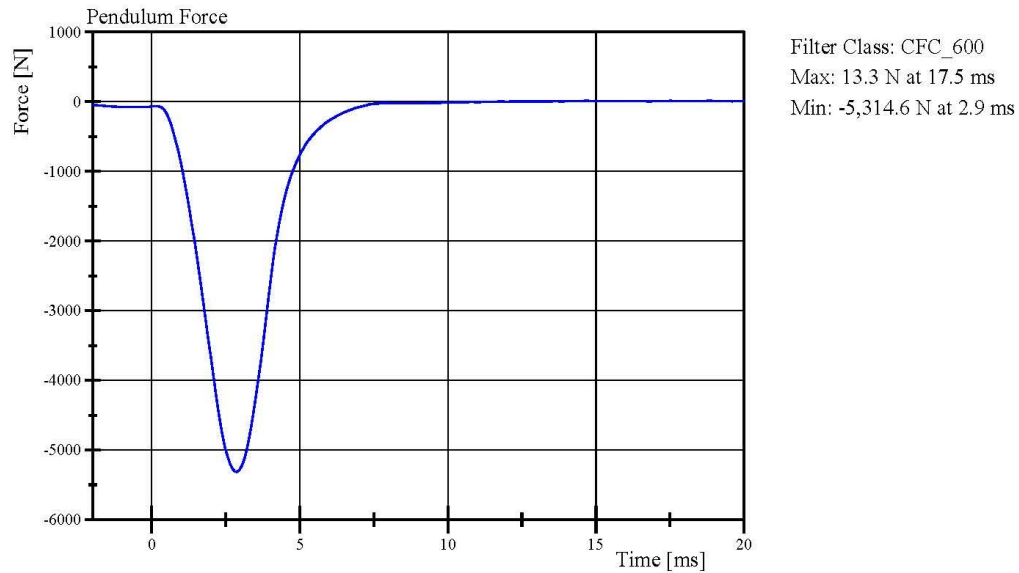
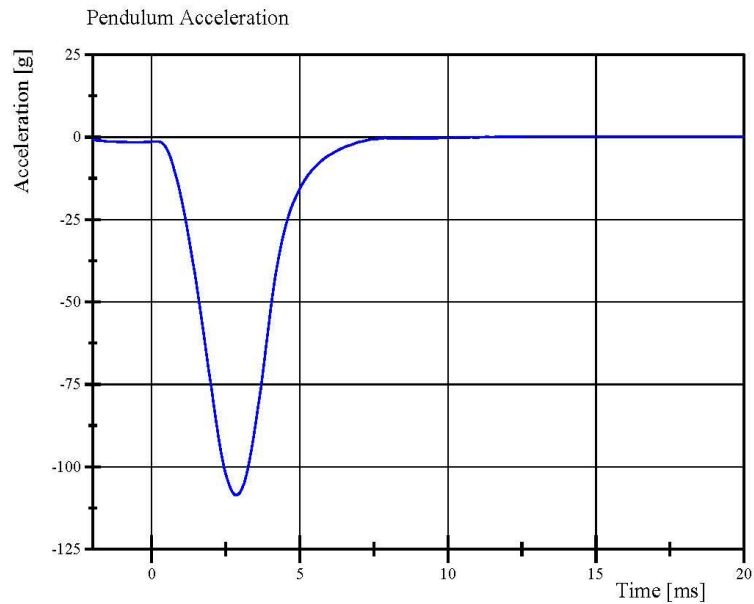
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12.14.2017 12:47:48 1737



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 037 Certification No. 47-1
Test Date: 12/14/2017



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

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Pre-Test Calibration Sheets

Front Passenger S/N 070

Transportation Research Center Inc.
5720 HHH 5th Female Dummy
External Dimensions
Serial No. 070 Calibration No. 32

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	781	Yes
B	Shoulder Pivot Height	431.8 - 457.2	444	Yes
C	Hip Pivot Height	81.3 - 86.3	82	Yes
D	Hip Pivot from Backline	144.8 - 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	81	Yes
F	Thigh Clearance	119.4 - 134.6	126	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	251	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	282	Yes
J	Elbow Rest Height	182.8 - 203.2	185	Yes
K	Buttock Knee Length	520.7 - 546.1	537	Yes
L	Popliteal Height	355.6 - 376.0	364	Yes
M	Knee Pivot Height	393.7 - 419.1	403	Yes
N	Buttock Popliteal Length	414.0 - 439.4	430	Yes
O	Chest Depth without Jacket	175.3 - 190.5	181	Yes
P	Foot Length	218.5 - 233.7	225	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	139	Yes
T	Head Depth	177.8 - 188.0	180	Yes
U	Hip Breadth	299.7 - 314.9	305	Yes
V	Shoulder Breadth	350.5 - 365.7	361	Yes
W	Foot Breadth	78.8 - 94.0	85	Yes
X	Head Circumference	528.3 - 548.7	538	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	871	Yes
Z	Waist Circumference	759.5 - 789.9	778	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	355	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	163	Yes

Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 070 Certification No. 32-1

Test Date: 12/2/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	269.3 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	8.2 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head skin S/N: 06211

Skull S/N: 88105/101C 05 010218

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

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12.02.2017 12:44:27 580

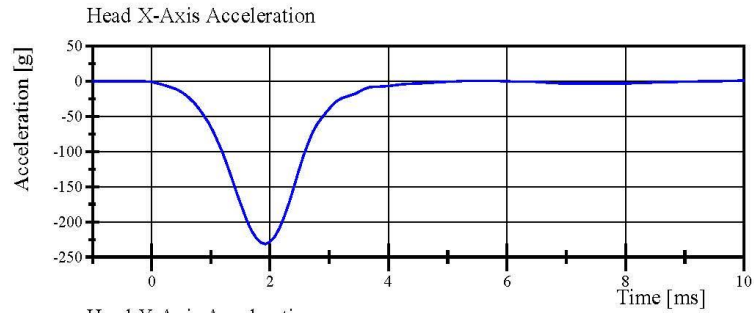


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 070 Certification No. 32-1

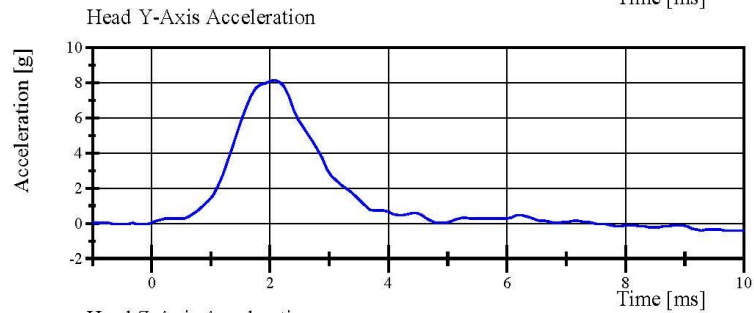
Test Date: 12/2/2017



Filter Class: CFC_1000

Max: 1.0 g at 10.0 ms

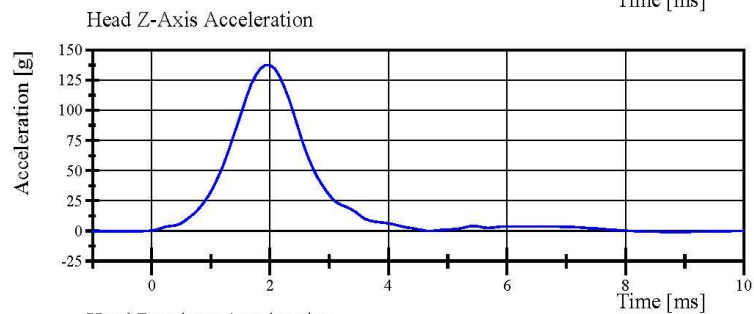
Min: -231.4 g at 1.9 ms



Filter Class: CFC_1000

Max: 8.2 g at 2.1 ms

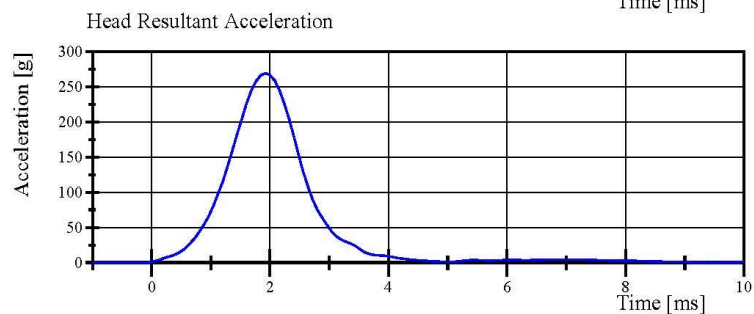
Min: -0.4 g at 9.3 ms



Filter Class: CFC_1000

Max: 137.6 g at 2.0 ms

Min: -0.8 g at 8.7 ms



Filter Class: CFC_1000

Max: 269.3 g at 1.9 ms

Min: 0.0 g at -1.0 ms

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

12.02.2017 12:45:02 580



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 070 Certification No. 32-1

Test Date: 12/2/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.025 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.32 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.44 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.35 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-82.9 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	72.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.1 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: DJ2788

Neck Cable: S/N: N/A

Nodding Blocks:

Front S/N: 85-DI7305

Rear S/N: 85-DI7105

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

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12.02.2017 14:33:43 1828

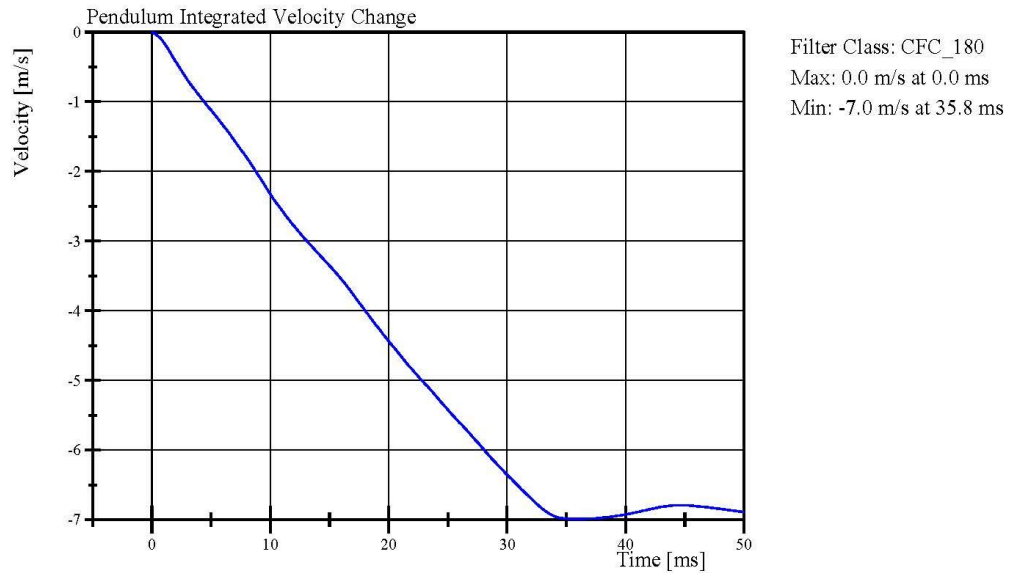
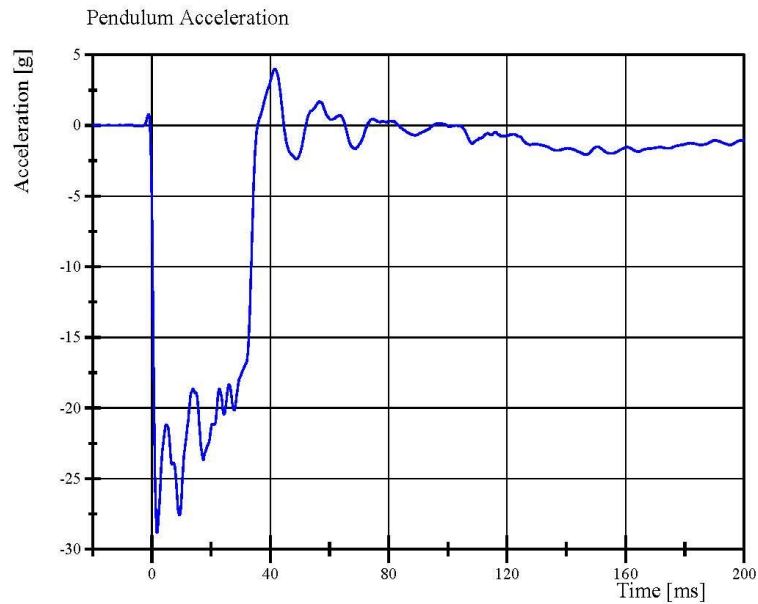


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 070 Certification No. 32-1

Test Date: 12/2/2017



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

12.02.2017 14:34:49 1828



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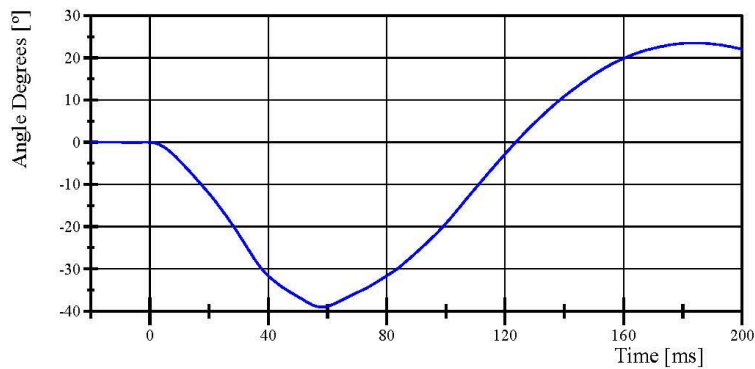
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 070 Certification No. 32-1

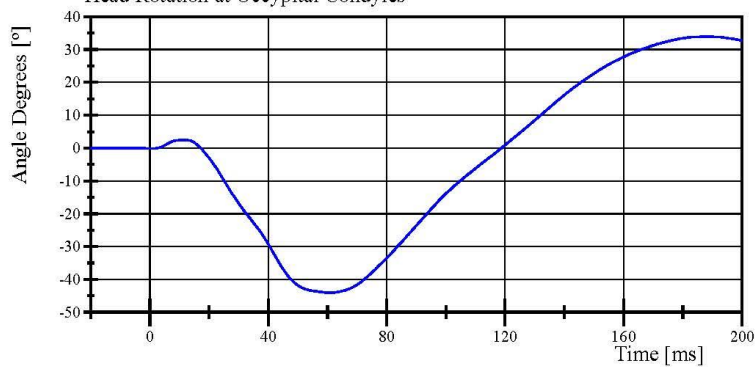
Test Date: 12/2/2017

Pot Rotation at the Base of Neck



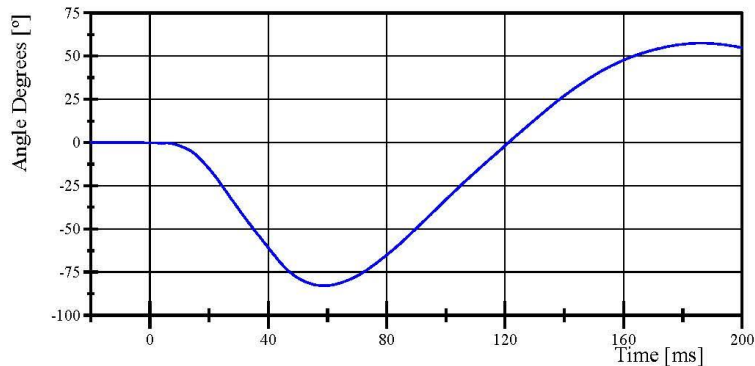
Filter Class: CFC_60
Max: 23.5 ° at 183.8 ms
Min: -39.0 ° at 58.1 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 34.0 ° at 187.9 ms
Min: -44.0 ° at 60.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 57.4 ° at 186.2 ms
Min: -82.9 ° at 59.0 ms

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

12.02.2017 14:34:49 1828

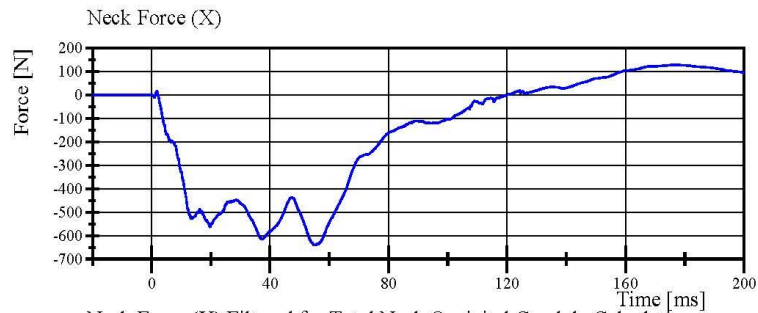


Transportation Research Center Inc.

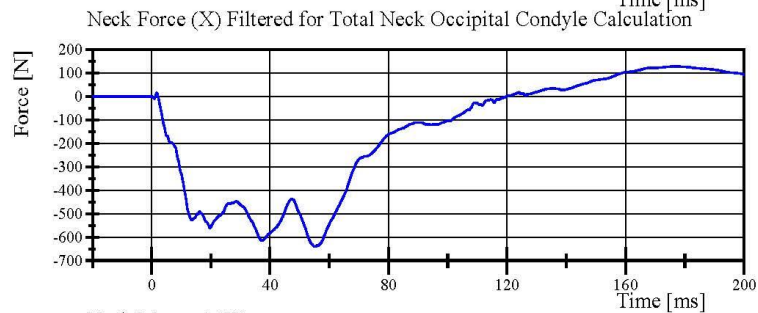
Neck Flexion

HIII 5th Serial No. 070 Certification No. 32-1

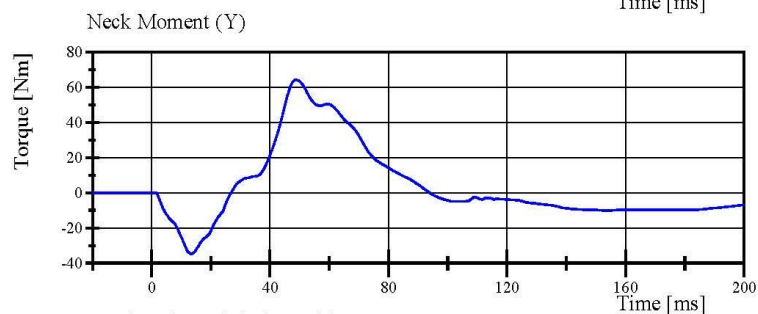
Test Date: 12/2/2017



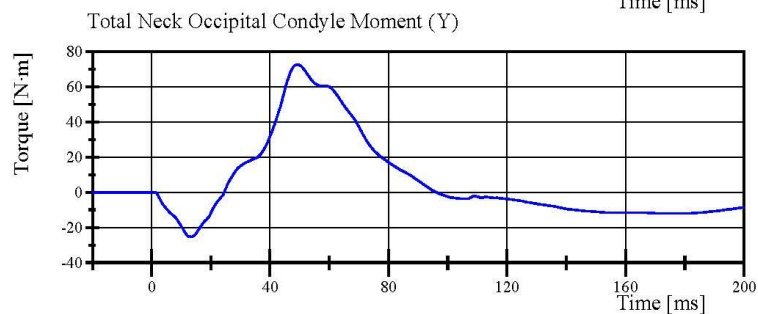
Filter Class: CFC_1000
Max: 128.9 N at 176.1 ms
Min: -640.4 N at 55.3 ms



Filter Class: CFC_600
Max: 128.8 N at 176.2 ms
Min: -640.0 N at 55.4 ms



Filter Class: CFC_600
Max: 64.2 Nm at 48.7 ms
Min: -34.7 Nm at 13.4 ms



Filter Class: Without_(Consta
Max: 72.5 N·m at 49.3 ms
Min: -25.4 N·m at 13.4 ms

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

12.02.2017 14:34:50 1828



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 070 Certification No. 32-1

Test Date: 12/2/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.105 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.74 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.65 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.37 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	109.8 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-58.0 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	101.4 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: DJ2788

Neck Cable: S/N: N/A

Nodding Blocks:

Front S/N: 85-DI7305

Rear S/N: 85-DI7105

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

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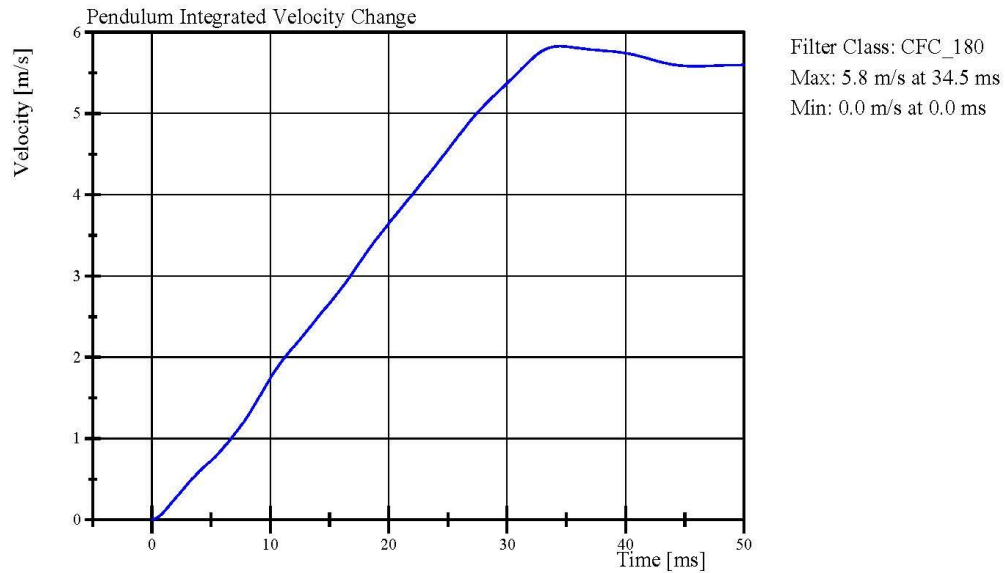
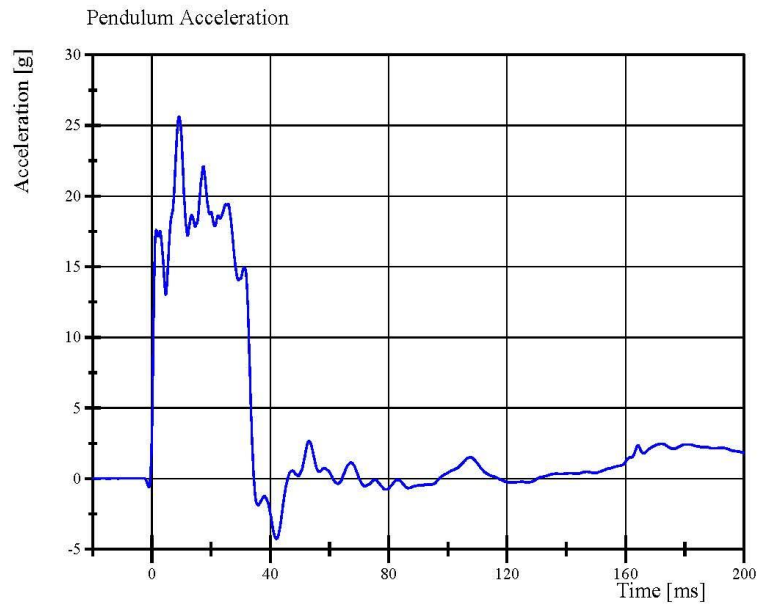


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 070 Certification No. 32-1

Test Date: 12/2/2017



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

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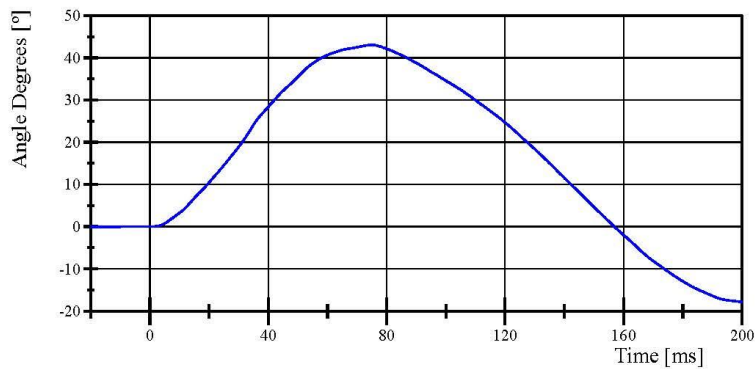
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 070 Certification No. 32-1

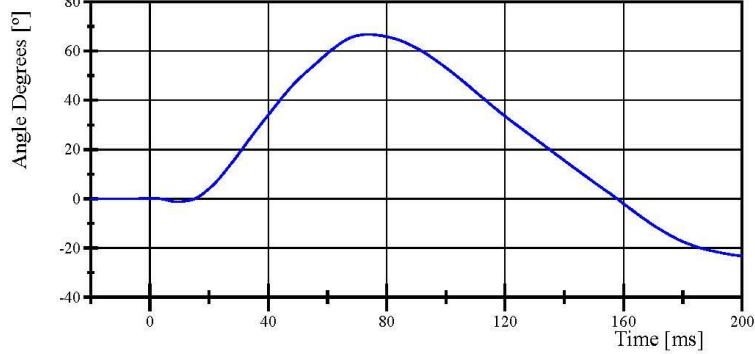
Test Date: 12/2/2017

Pot Rotation at the Base of Neck



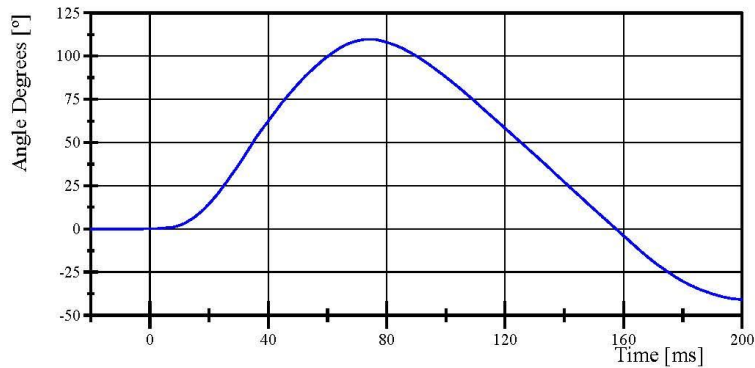
Filter Class: CFC_60
Max: 43.1 ° at 75.0 ms
Min: -17.8 ° at 200.0 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 66.7 ° at 73.8 ms
Min: -23.1 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 109.8 ° at 74.5 ms
Min: -40.8 ° at 200.0 ms

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

12.02.2017 15:21:26 1961

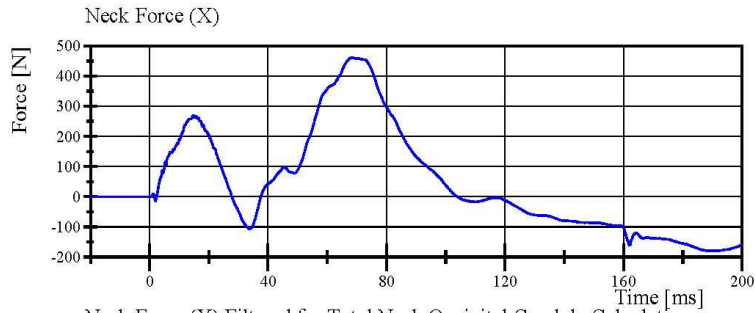


Transportation Research Center Inc.

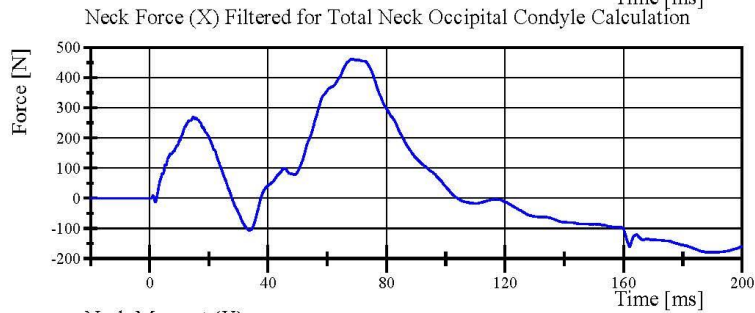
Neck Extension

HIII 5th Serial No. 070 Certification No. 32-1

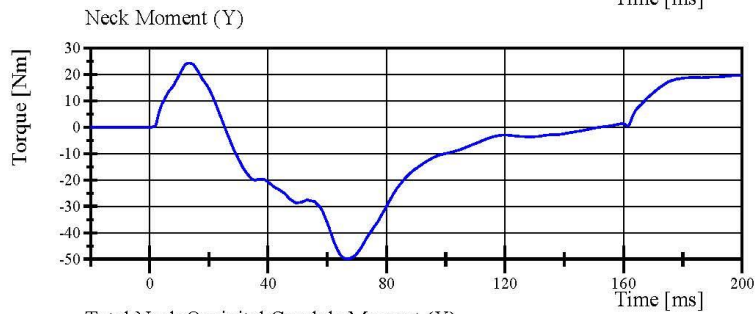
Test Date: 12/2/2017



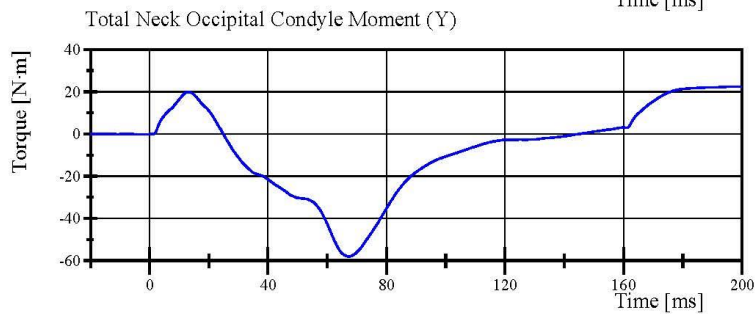
Filter Class: CFC_1000
Max: 462.6 N at 68.2 ms
Min: -179.5 N at 189.3 ms



Filter Class: CFC_600
Max: 462.3 N at 68.3 ms
Min: -179.4 N at 189.5 ms



Filter Class: CFC_600
Max: 24.4 Nm at 13.3 ms
Min: -49.9 Nm at 67.0 ms



Filter Class: Without_(Constai
Max: 22.6 N·m at 197.1 ms
Min: -58.0 N·m at 67.3 ms

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

12.02.2017 15:21:27 1961



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 070 Certification No. 32-1

Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.721 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,118.3 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,123.7 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-51.9 mm	Yes
Internal Hysteresis	69 - 85 %	72.7 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: N/A

Rib 1 S/N: N/A

Rib 2 S/N: N/A

Rib 3 S/N: N/A

Rib 4 S/N: N/A

Rib 5 S/N: N/A

Rib 6 S/N: N/A

Stiffeners S/N: N/A

Bib S/N: N/A

Sternum Plate S/N: N/A

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

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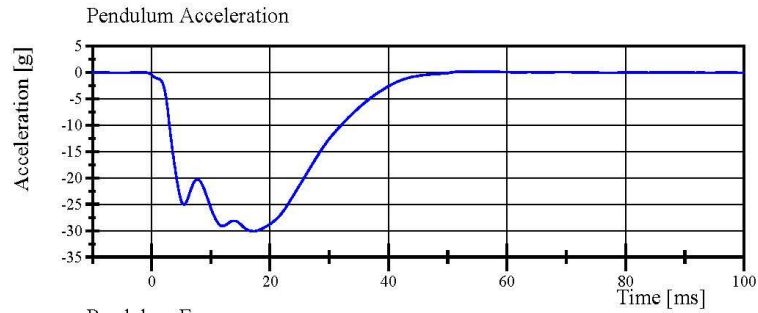
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Transportation Research Center Inc.

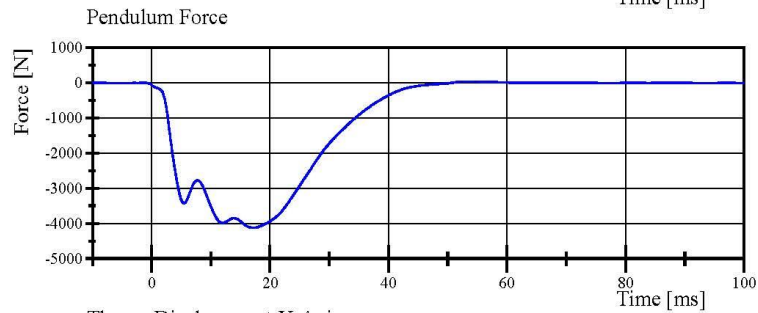
Front Thorax

HIII 5th Serial No. 070 Certification No. 32-1

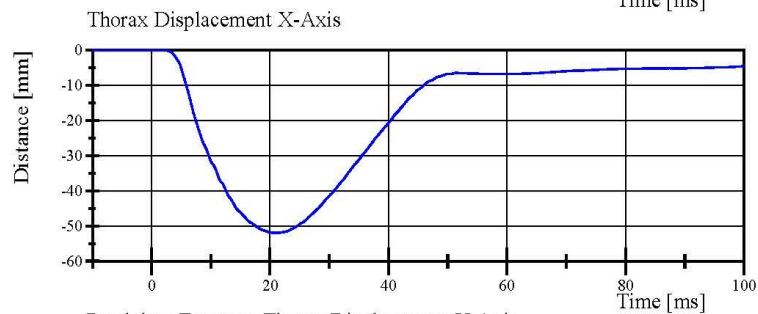
Test Date: 12/3/2017



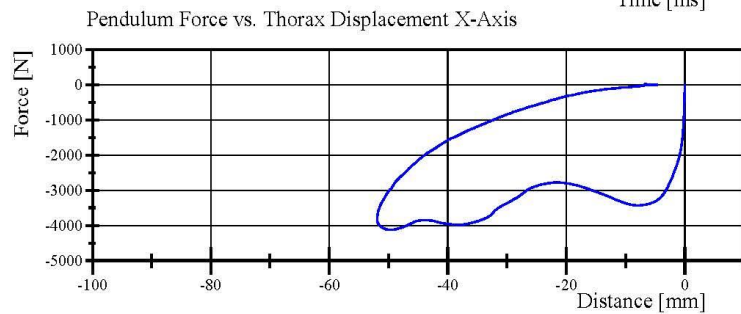
Filter Class: CFC_180
Max: 0.2 g at 53.5 ms
Min: -30.1 g at 17.2 ms



Filter Class: CFC_180
Max: 29.2 N at 53.5 ms
Min: -4,123.7 N at 17.2 ms



Filter Class: CFC_600
Max: 0.0 mm at -9.7 ms
Min: -51.9 mm at 21.1 ms



Filter Class: CFC_180
Max: 29.2 N at -6.6 mm
Min: -4,123.7 N at -49.5 mm

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

12.03.2017 14:28:00 398



Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 32-1
Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.097 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,633.7 N	Yes

Test meets specifications.

Condition: Used

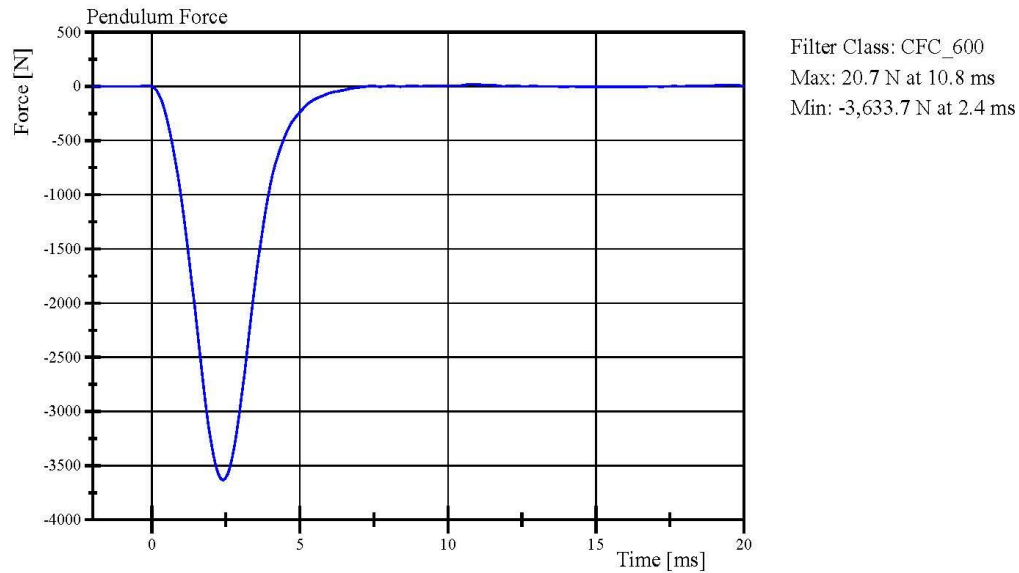
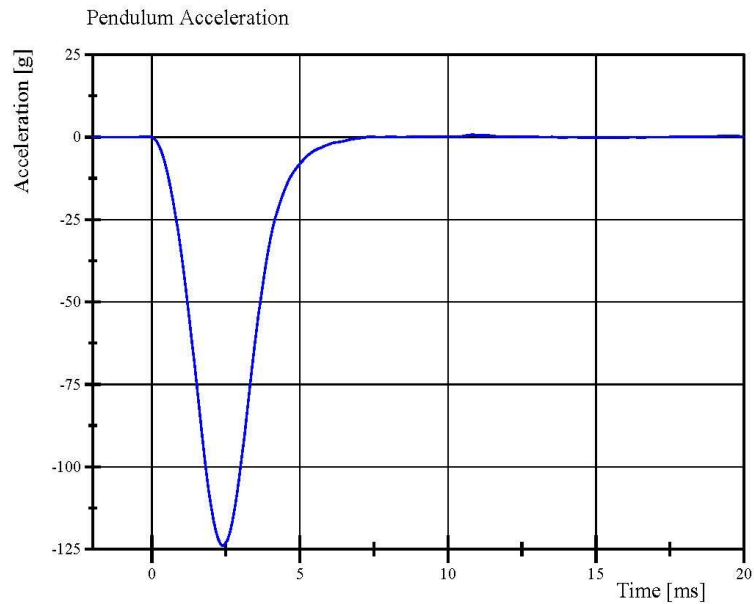
Comments:

Knee Skin S/N: 05856

Knee Insert S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 32-1
Test Date: 12/3/2017



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

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Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 32-1
Test Date: 12/3/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.096 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,750.8 N	Yes

Test meets specifications.

Condition: Used

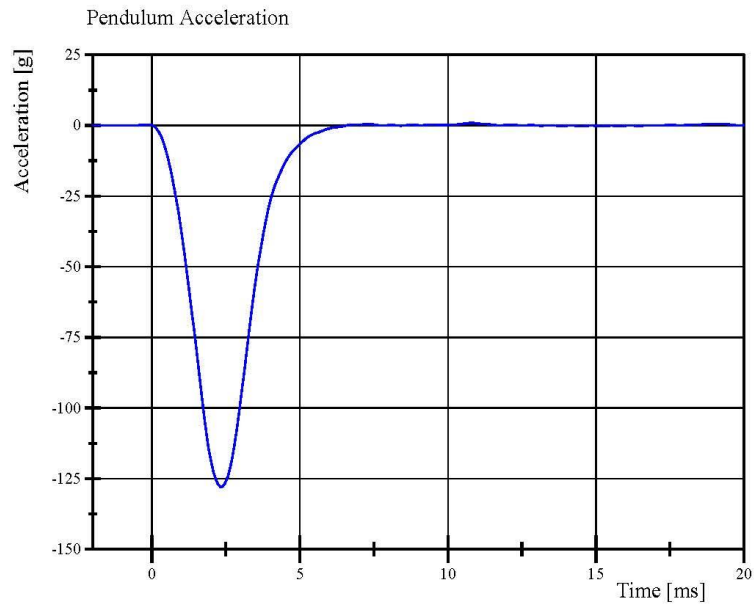
Comments:

Knee Skin S/N: 05269

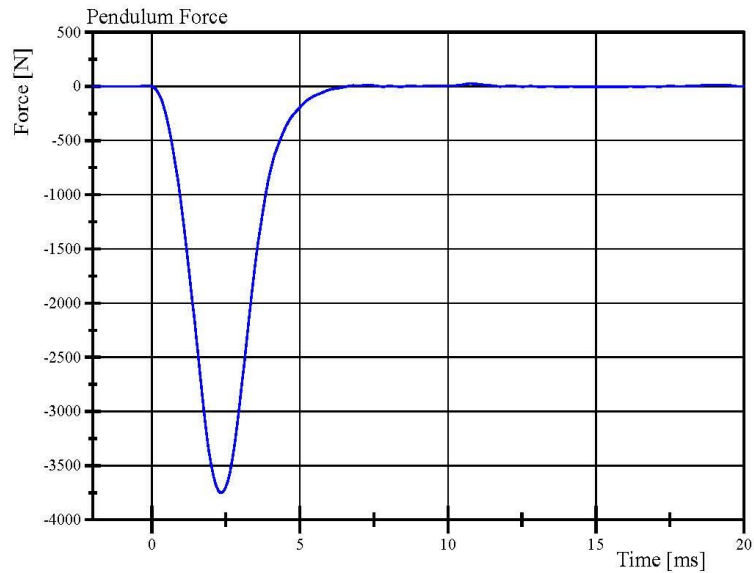
Knee Insert S/N: N/A

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 32-1
Test Date: 12/3/2017



Filter Class: CFC_600
Max: 0.9 g at 10.8 ms
Min: -127.9 g at 2.3 ms



Filter Class: CFC_600
Max: 25.4 N at 10.8 ms
Min: -3,750.8 N at 2.3 ms

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

12.03.2017 10:45:57 1744



Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA

Serial Number: 070

Date: 12/3/2017

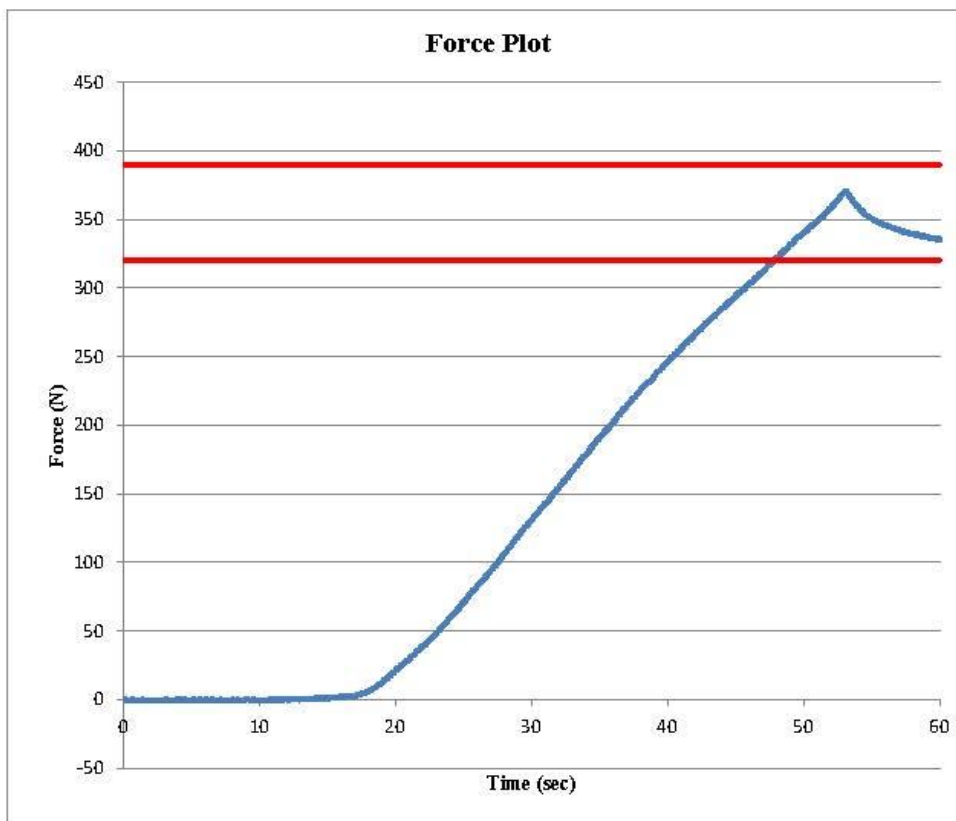
Test Number: 2

Time: 7:55

Comments:



TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.8 °C Pass
Humidity	10 - 70	34 % Pass
Average Angular Velocity	0.5 - 1.5	0.92 deg/sec Pass
Initial Angle	0 - 20	12.49 deg Pass
Peak Force at 45.12°	320 - 390	370.42 N Pass
Final Angle	-8 - 8	2.37 deg Pass



Comments:

Jacket S/N: N/A

Abdomen S/N: N/A

Pelvis Skin S/N: N/A

Lumbar Spine S/N: N/A

Lumbar Cable S/N: N/A

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Post-Test Calibration Sheets

Front Passenger S/N 070

Transportation Research Center Inc.
5720 HIII 5th Female Dummy
External Dimensions
Serial No. 070 Calibration No. 33

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	780	Yes
B	Shoulder Pivot Height	431.8 - 457.2	444	Yes
C	Hip Pivot Height	81.3 - 86.3	82	Yes
D	Hip Pivot from Backline	144.8 - 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	81	Yes
F	Thigh Clearance	119.4 - 134.6	126	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	249	Yes
H	Head Back to Backline	43.2 - 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	282	Yes
J	Elbow Rest Height	182.8 - 203.2	184	Yes
K	Buttock Knee Length	520.7 - 546.1	537	Yes
L	Popliteal Height	355.6 - 376.0	364	Yes
M	Knee Pivot Height	393.7 - 419.1	403	Yes
N	Buttock Popliteal Length	414.0 - 439.4	430	Yes
O	Chest Depth without Jacket	175.3 - 190.5	180	Yes
P	Foot Length	218.5 - 233.7	225	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	473	Yes
S	Head Breadth	137.1 - 147.3	138	Yes
T	Head Depth	177.8 - 188.0	180	Yes
U	Hip Breadth	299.7 - 314.9	306	Yes
V	Shoulder Breadth	350.5 - 365.7	360	Yes
W	Foot Breadth	78.8 - 94.0	88	Yes
X	Head Circumference	528.3 - 548.7	538	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	871	Yes
Z	Waist Circumference	759.5 - 789.9	777	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	355	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	163	Yes

Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 070 Certification No. 33-1

Test Date: 12/15/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Head Resultant Acceleration	250 - 300 g	274.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Condition: Used

Comments:

Head Skin S/N: 06211

Skull S/N: 88105/101C 05 010218

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

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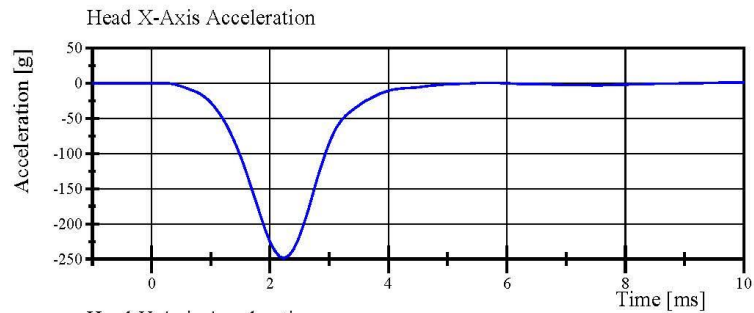


Transportation Research Center Inc.

Front Head Drop

HIII 5th Serial No. 070 Certification No. 33-1

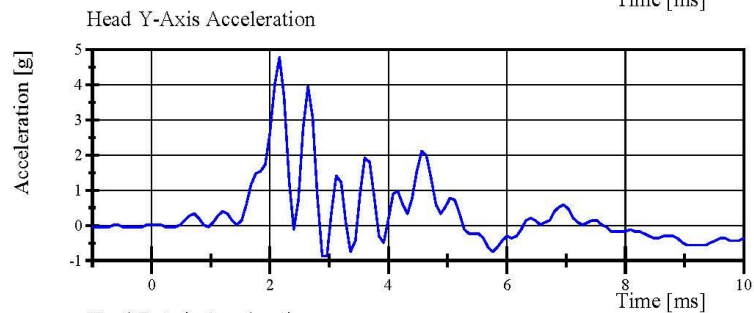
Test Date: 12/15/2017



Filter Class: CFC_1000

Max: 1.2 g at 10.0 ms

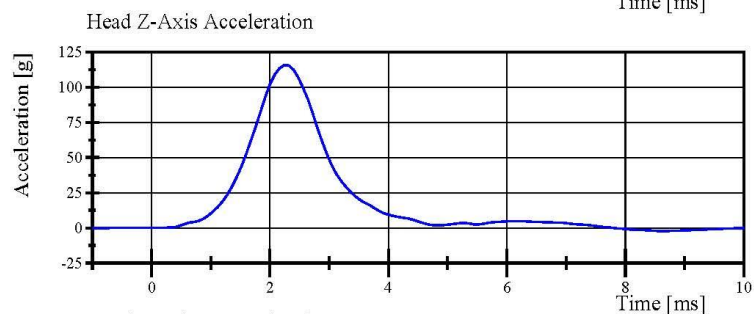
Min: -248.4 g at 2.2 ms



Filter Class: CFC_1000

Max: 4.8 g at 2.2 ms

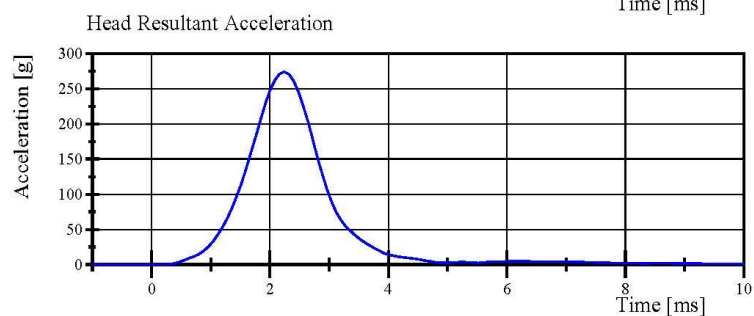
Min: -0.9 g at 2.9 ms



Filter Class: CFC_1000

Max: 115.7 g at 2.2 ms

Min: -2.1 g at 8.6 ms



Filter Class: CFC_1000

Max: 274.1 g at 2.2 ms

Min: 0.1 g at -1.0 ms

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

12.15.2017 11:20:46 576



Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 070 Certification No. 33-1

Test Date: 12/15/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	7.027 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	(-2.1) - (-2.5) m/s	-2.38 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	(-4.0) - (-5.0) m/s	-4.71 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	(-5.8) - (-7.0) m/s	-6.59 m/s	Yes
Total Head D-Plane Rotation	(-77) - (-91) °	-79.1 °	Yes
Total Neck Occipital Condyles Moment Between -77° and -91° Rotation	69 - 83 N·m	72.2 N·m	Yes
Total Neck Occipital Condyles Moment Decay to 10 N·m	80 - 100 ms	87.1 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: DJ2788

Neck Cable S/N: N/A

Nodding Blocks:

Front S/N: 85-DI7305

Rear S/N: 85-DI7105

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

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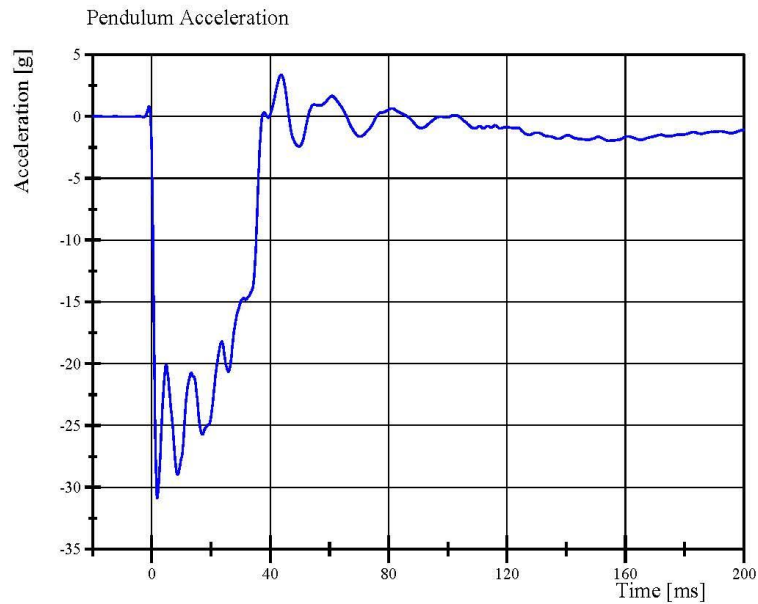


Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 070 Certification No. 33-1

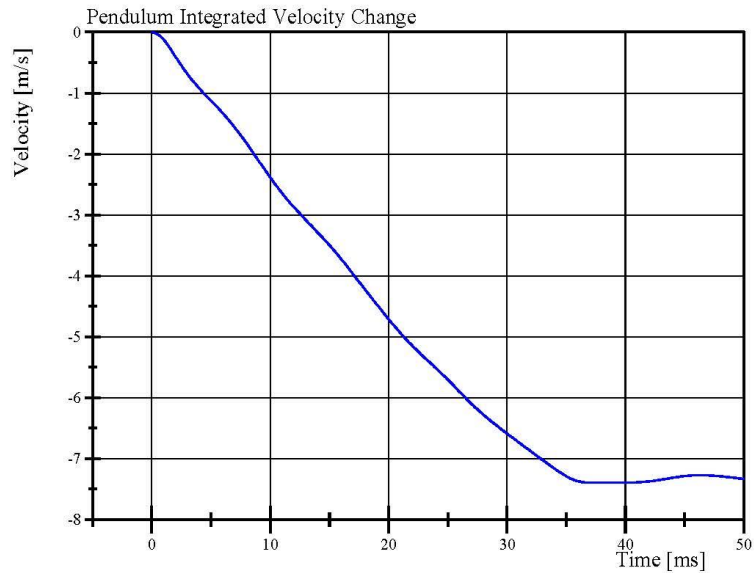
Test Date: 12/15/2017



Filter Class: CFC_180

Max: 3.4 g at 43.7 ms

Min: -30.9 g at 1.9 ms



Filter Class: CFC_180

Max: 0.0 m/s at 0.0 ms

Min: -7.4 m/s at 37.3 ms

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

12.16.2017 12:27:33 1823



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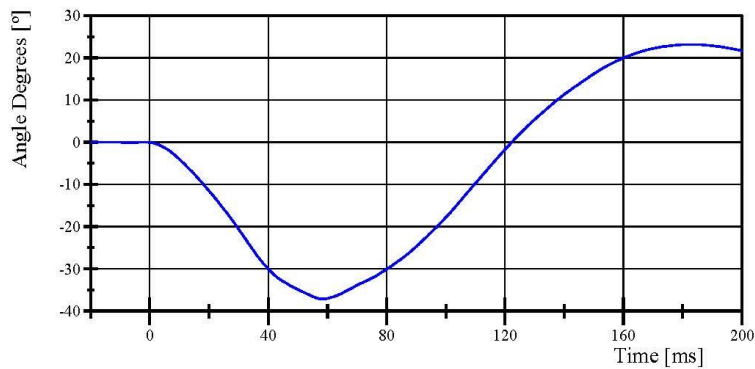
Transportation Research Center Inc.

Neck Flexion

HIII 5th Serial No. 070 Certification No. 33-1

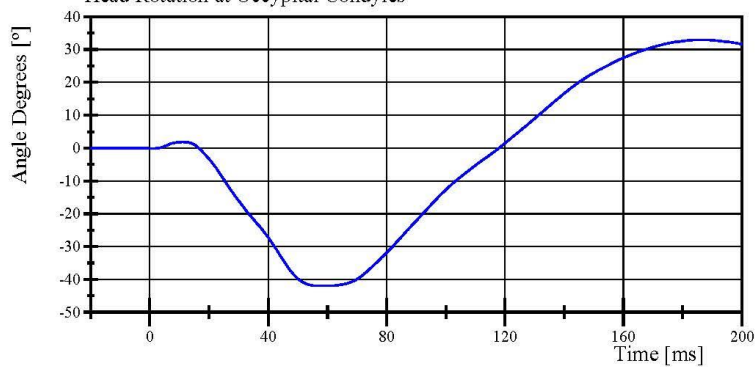
Test Date: 12/15/2017

Pot Rotation at the Base of Neck



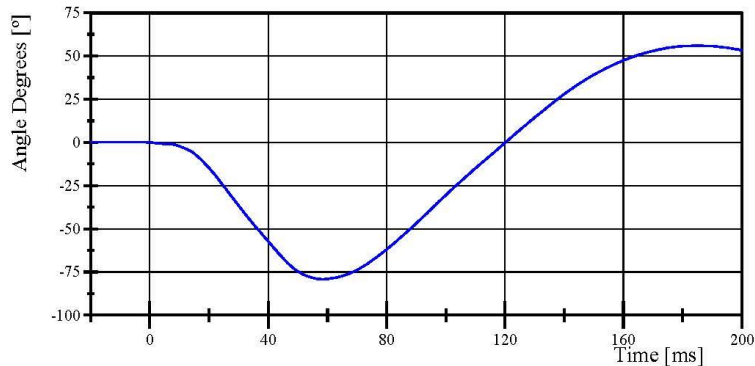
Filter Class: CFC_60
Max: 23.1 ° at 182.9 ms
Min: -37.1 ° at 58.5 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 32.9 ° at 186.1 ms
Min: -42.0 ° at 57.4 ms

Total Head D-Plane Rotation



Filter Class: CFC_60
Max: 56.0 ° at 184.9 ms
Min: -79.1 ° at 58.4 ms

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

12.16.2017 12:27:34 1823

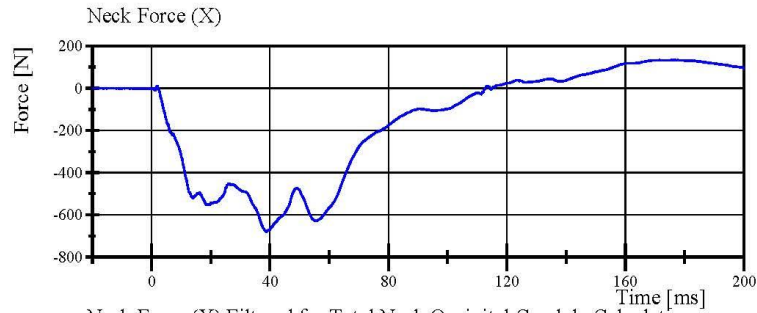


Transportation Research Center Inc.

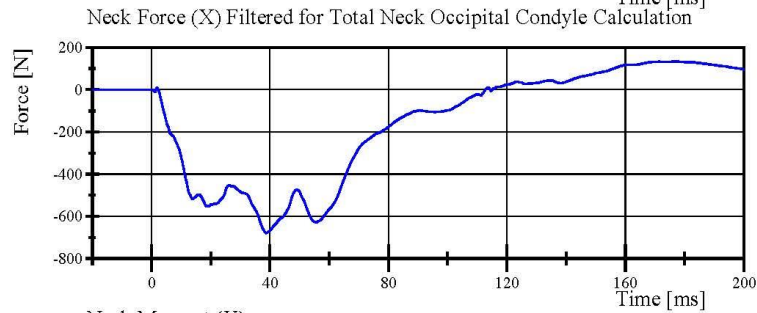
Neck Flexion

HIII 5th Serial No. 070 Certification No. 33-1

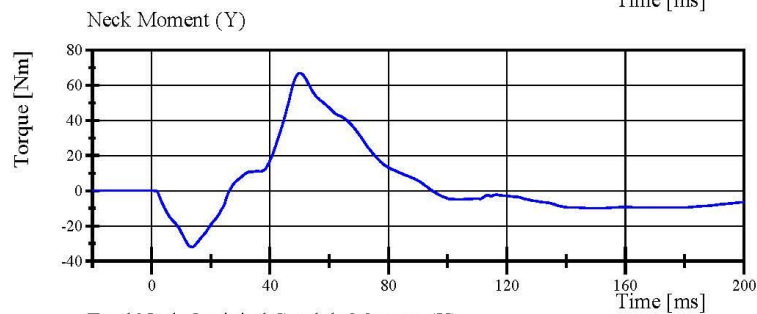
Test Date: 12/15/2017



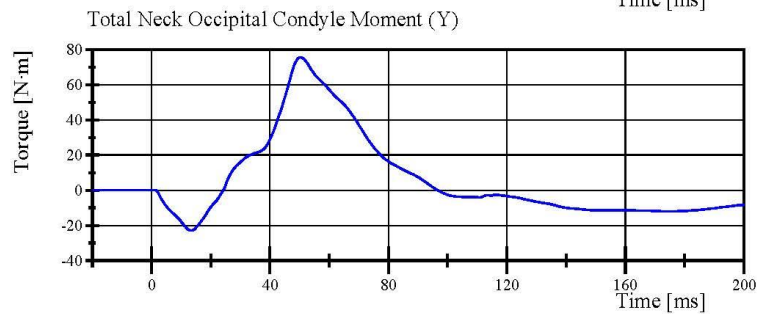
Filter Class: CFC_1000
Max: 133.6 N at 176.0 ms
Min: -679.5 N at 38.7 ms



Filter Class: CFC_600
Max: 133.5 N at 176.1 ms
Min: -678.9 N at 38.8 ms



Filter Class: CFC_600
Max: 66.9 Nm at 50.0 ms
Min: -32.1 Nm at 13.7 ms



Filter Class: Without_(Consta
Max: 75.6 N·m at 50.3 ms
Min: -22.9 N·m at 13.5 ms

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

12.16.2017 12:27:35 1823



Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 070 Certification No. 33-1

Test Date: 12/16/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	(-5.95) - (-6.19) m/s	-6.090 m/s	Yes
Pendulum Integrated Velocity Change at 10ms	1.5 - 1.9 m/s	1.88 m/s	Yes
Pendulum Integrated Velocity Change at 20ms	3.1 - 3.9 m/s	3.70 m/s	Yes
Pendulum Integrated Velocity Change at 30ms	4.6 - 5.6 m/s	5.32 m/s	Yes
Total Head D-Plane Rotation	99 - 114 °	108.5 °	Yes
Total Neck Occipital Condyles Moment Between 99° and 114° Rotation	(-53) - (-65) N·m	-55.5 N·m	Yes
Total Neck Occipital Condyles Moment Decay to -10 N·m	94 - 114 ms	103.0 ms	Yes

Test meets specifications.

Condition: Used

Comments:

Neck S/N: DJ2788

Neck Cable S/N: N/A

Nodding Blocks:

Front S/N: 85-DI7305

Rear S/N: 85-DI7105

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

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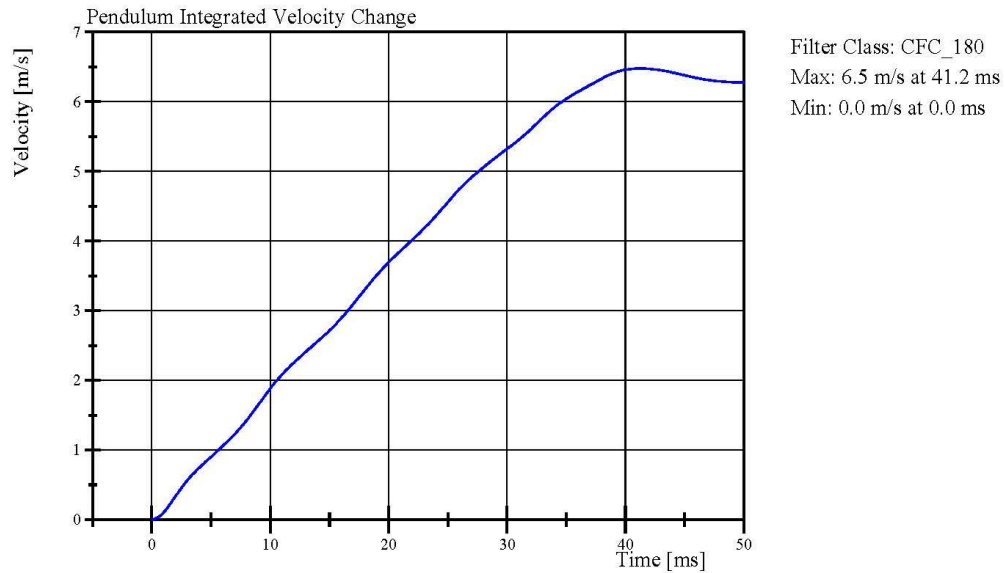
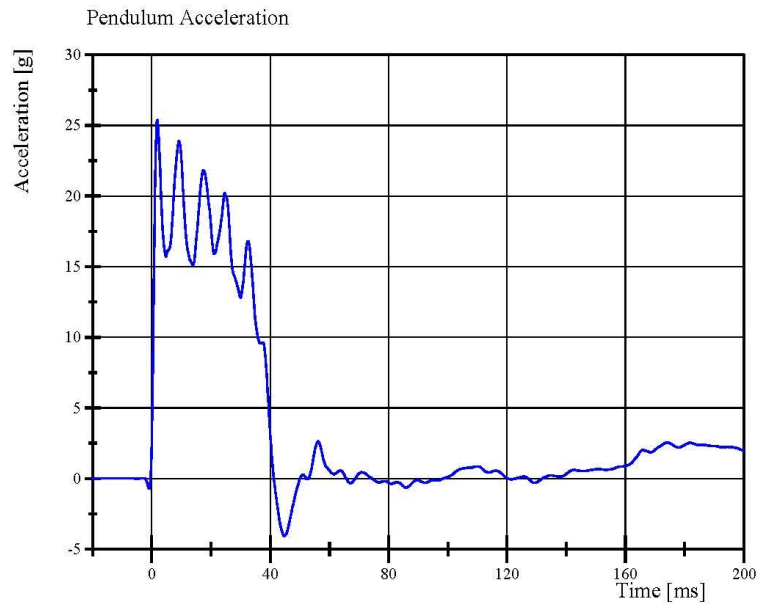


Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 070 Certification No. 33-1

Test Date: 12/16/2017



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

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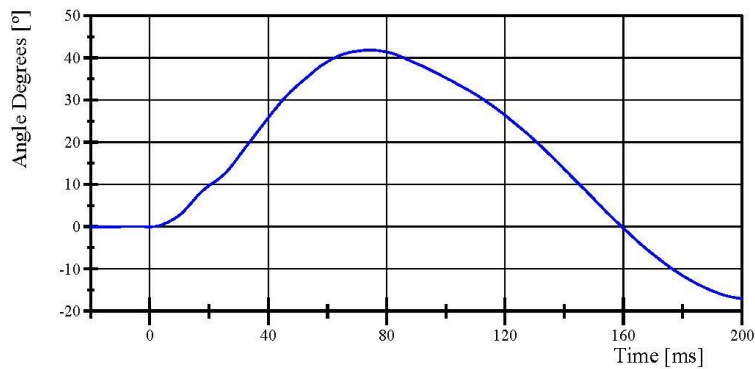
Transportation Research Center Inc.

Neck Extension

HIII 5th Serial No. 070 Certification No. 33-1

Test Date: 12/16/2017

Pot Rotation at the Base of Neck

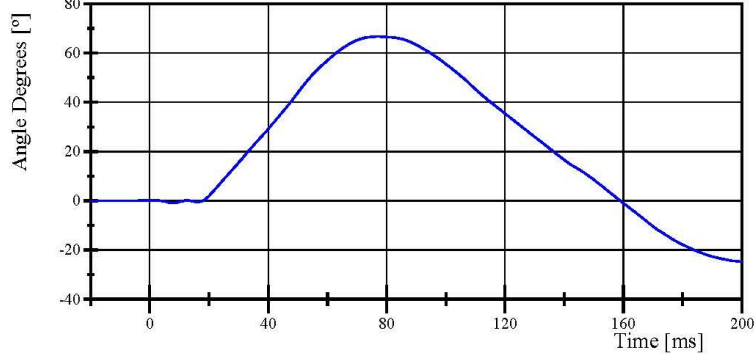


Filter Class: CFC_60

Max: 41.8 ° at 74.2 ms

Min: -17.0 ° at 200.0 ms

Head Rotation at Occypital Condyles

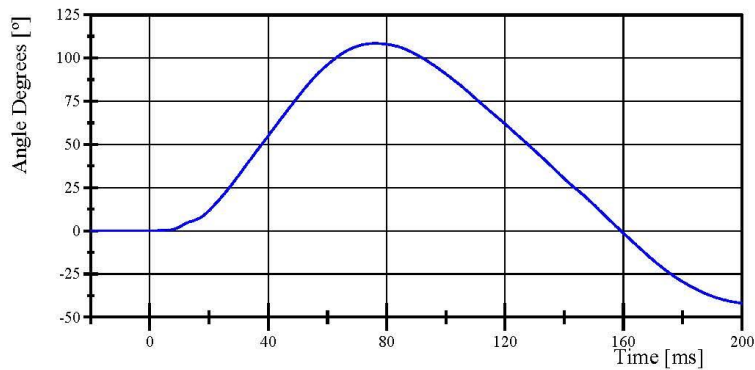


Filter Class: CFC_60

Max: 66.7 ° at 77.0 ms

Min: -24.8 ° at 200.0 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 108.5 ° at 76.1 ms

Min: -41.9 ° at 200.0 ms

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

12.16.2017 13:28:02 1966

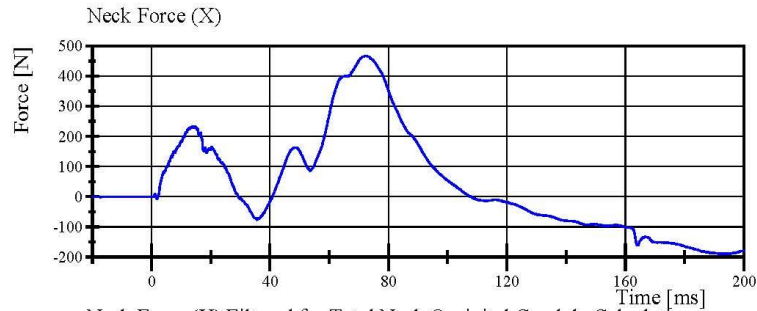


Transportation Research Center Inc.

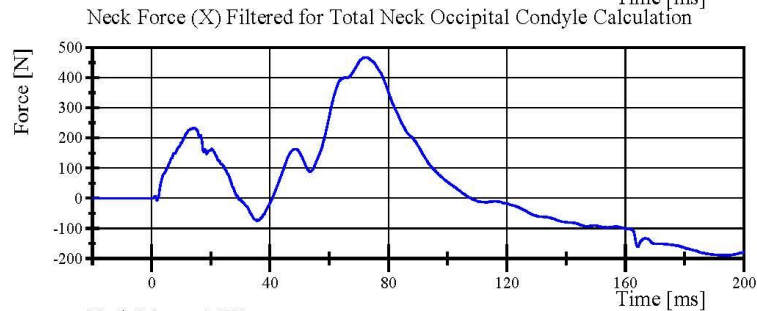
Neck Extension

HIII 5th Serial No. 070 Certification No. 33-1

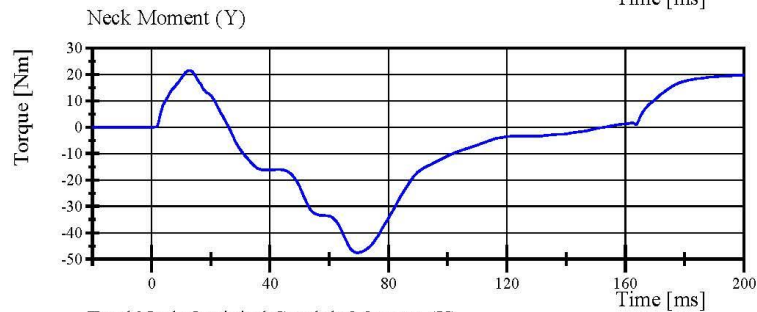
Test Date: 12/16/2017



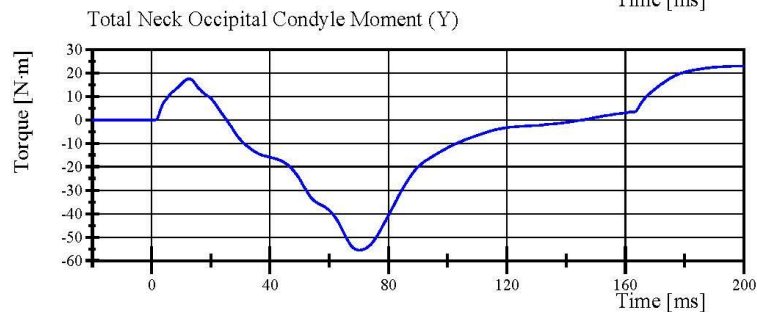
Filter Class: CFC_1000
Max: 467.9 N at 72.3 ms
Min: -189.4 N at 193.2 ms



Filter Class: CFC_600
Max: 468.0 N at 72.4 ms
Min: -189.3 N at 193.4 ms



Filter Class: CFC_600
Max: 21.5 Nm at 12.7 ms
Min: -47.6 Nm at 69.5 ms



Filter Class: Without_(Consta
Max: 22.9 N·m at 198.7 ms
Min: -55.5 N·m at 69.9 ms

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

12.16.2017 13:28:03 1966



Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 070 Certification No. 33-2

Test Date: 12/16/2017

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.715 m/s	Yes
Probe Force Peak Between 50.0 mm and 58.0 mm Chest Deflection	(-3,900) - (-4,400) N	-4,213.5 N	Yes
Probe Force Peak Between 18.0 mm and 50.0 mm Chest Deflection	>= (-4,600) N	-4,210.9 N	Yes
Maximum Chest Compression	(-50) - (-58) mm	-53.1 mm	Yes
Internal Hysteresis	69 - 85 %	72.1 %	Yes

Test meets specifications.

Condition: Used

Comments:

Jacket S/N: N/A

Rib #1 S/N: N/A

Rib #2 S/N: N/A

Rib #3 S/N: N/A

Rib #4 S/N: N/A

Rib #5 S/N: N/A

Rib #6 S/N: N/A

Rib Stiffeners S/N: N/A

Bib S/N: N/A

Sternum Plate S/N: N/A

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

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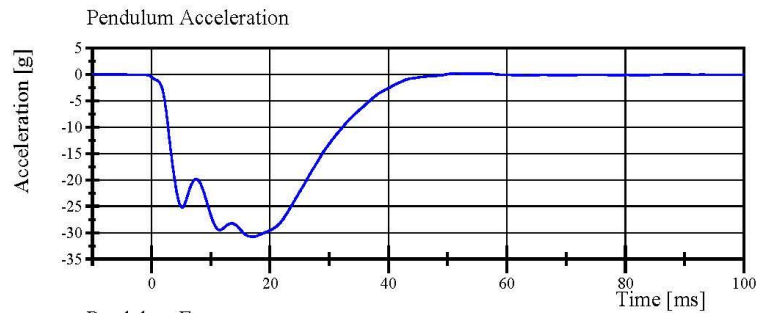


Transportation Research Center Inc.

Front Thorax

HIII 5th Serial No. 070 Certification No. 33-2

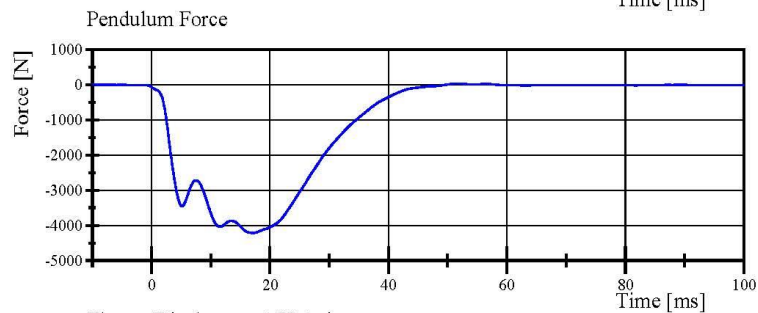
Test Date: 12/16/2017



Filter Class: CFC_180

Max: 0.2 g at 51.7 ms

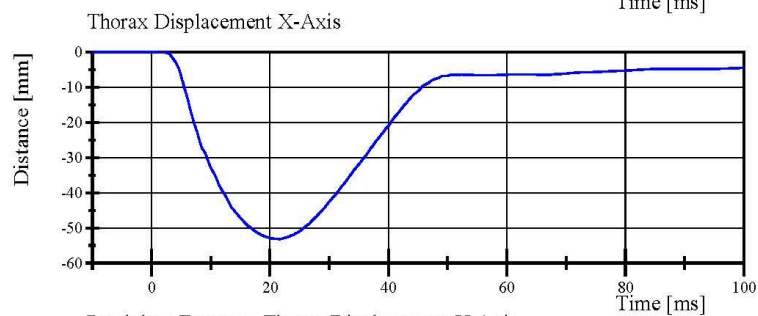
Min: -30.8 g at 17.0 ms



Filter Class: CFC_180

Max: 29.5 N at 51.7 ms

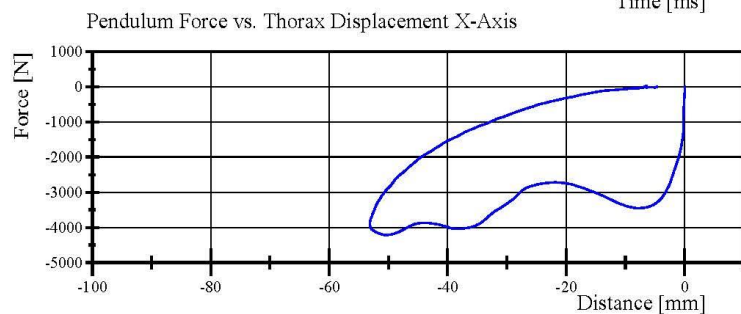
Min: -4,213.5 N at 17.0 ms



Filter Class: CFC_600

Max: 0.0 mm at -5.8 ms

Min: -53.1 mm at 21.6 ms



Filter Class: CFC_180

Max: 29.5 N at -6.5 mm

Min: -4,213.5 N at -50.4 mm

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

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Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 33-2
Test Date: 12/15/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.102 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,745.8 N	Yes

Test meets specifications.

Condition: Used

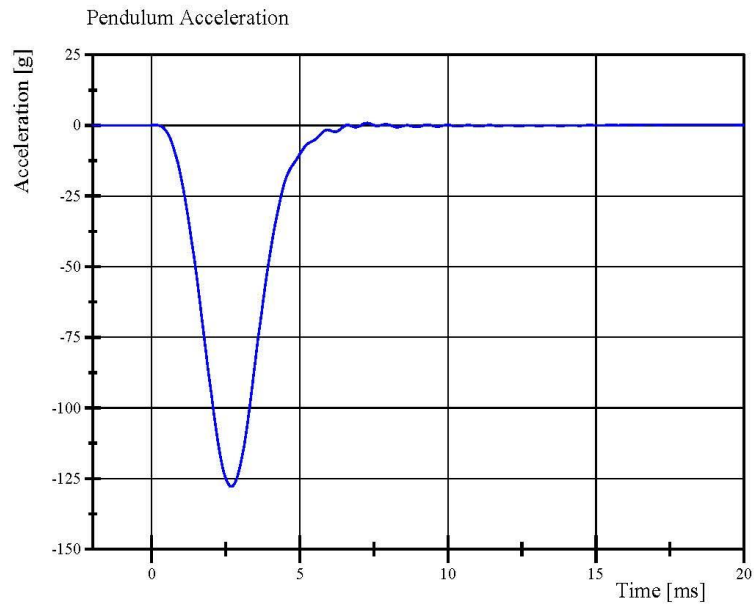
Comments:

Knee Skin S/N: 05856

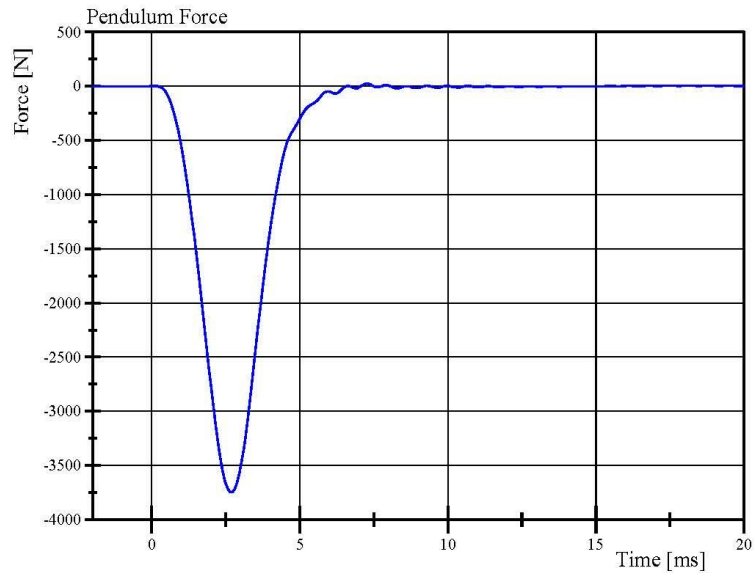
Knee Insert S/N: N/A

Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 33-2
Test Date: 12/15/2017



Filter Class: CFC_600
Max: 0.9 g at 7.3 ms
Min: -127.7 g at 2.7 ms



Filter Class: CFC_600
Max: 25.4 N at 7.3 ms
Min: -3,745.8 N at 2.7 ms

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

12.15.2017 09:28:18 1313



Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 33-8
Test Date: 12/16/2017

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Probe Velocity	2.07 - 2.13 m/s	2.107 m/s	Yes
Peak Femur Force	(-3,450) - (-4,060) N	-3,891.1 N	Yes

Test meets specifications.

Condition: Used

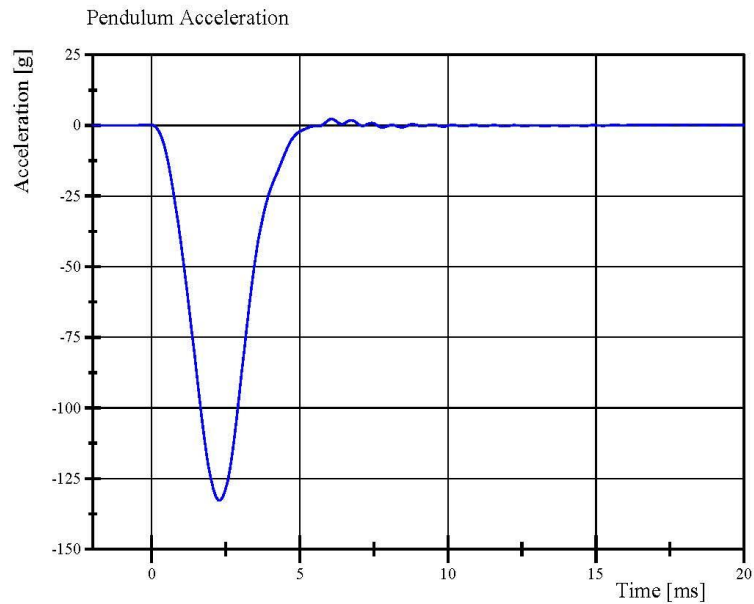
Comments:

Knee Skin S/N: 05269

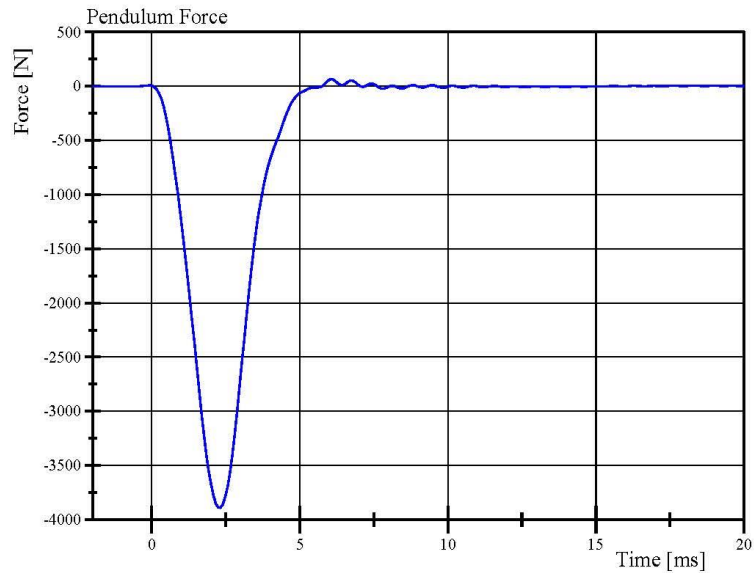
Knee Insert S/N: N/A

Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 5th Serial No. 070 Certification No. 33-8
Test Date: 12/16/2017



Filter Class: CFC_600
Max: 2.3 g at 6.1 ms
Min: -132.7 g at 2.3 ms



Filter Class: CFC_600
Max: 66.7 N at 6.1 ms
Min: -3,891.1 N at 2.3 ms

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

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Transportation Research Center Inc.

Hybrid III Small Female Torso Flexion

NHTSA

Serial Number: 070

Date: 12/16/2017

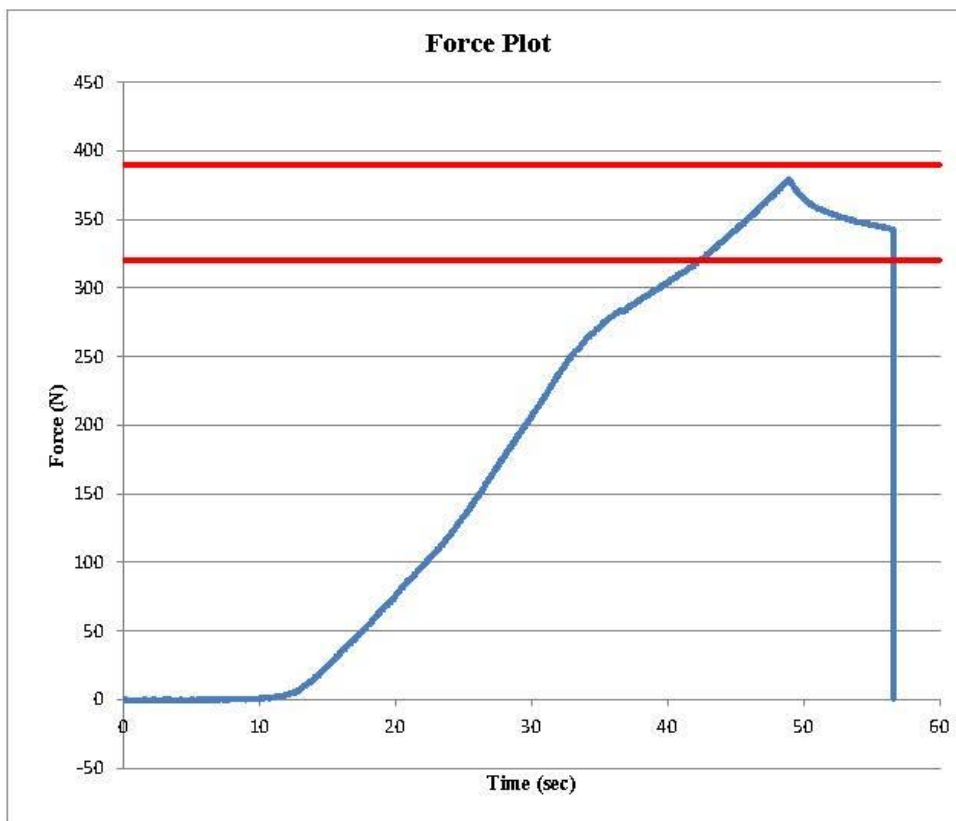
Test Number: 01

Time: 14:13

Comments:



TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.3 °C Pass
Humidity	10 - 70	35 % Pass
Average Angular Velocity	0.5 - 1.5	0.83 deg/sec Pass
Initial Angle	0 - 20	14.87 deg Pass
Peak Force at 45.12°	320 - 390	379 N Pass
Final Angle	-8 - 8	3.51 deg Pass



Comments:

Jacket S/N: N/A

Abdomen S/N: 05 06531

Pelvis Skin S/N: N/A