REPORT NUMBER TR-P25007-04-NC

REAR IMPACT DYNAMIC SEAT TEST

VOLKSWAGEN DO BRAZIL LTDA
2005 VOLKSWAGEN GOLF
4-DOOR HATCHBACK

NHTSA NUMBER: C55801

PREPARED BY:
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10/20/05

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
ROOM 6115 (NVS-221)
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WASHINGTON, D.C. 20590

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15. Supplementary Notes

16. Abstract

A rear impact dynamic seat test was conducted on a 2005 Volkswagen Golf 4-Door Hatchback at Karco Engineering, LLC on 8/26/05. This test was conducted to obtain data indicant of NHTSA-STD-1207. The impact velocity was 47.71 Km/h. The ambient temperature at the time of impact was 37.8 degrees Celsius. The vehicle's maximum post-test static crush was 211 mm left of the vehicle's centerline.

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SECTION 1

PURPOSE OF TEST

1. PURPOSE

This 30 mph rear impact dynamic seat test was performed on a 2005 Volkswagen Golf 4-Door Hatchback. The purpose of this test is to evaluate the seat and occupant performance in moderate-to-high speed rear impacts.

SECTION 2

SUMMARY OF TEST

2. SUMMARY

A 1493 kg 2005 Volkswagen Golf 4-Door Hatchback was impacted from the rear by a 1799 kg moving barrier at a velocity of 47.71 Km/h (29.65 mph). The test was performed by KARCO Engineering, LLC on August 26, 2005.

The vehicle was prepared and tested following the Office of Vehicle Safety Compliance Test Procedure for Federal Motor Vehicle Safety Standard (FMVSS) 301R (OVSC TP-301-03, dated February 28., 2003). For the purpose of acquiring information for Office of Vehicle Safety Research, the test was modified as follows:

- Two (2) instrumented 50th percentile male Part 572E Hybrid III ATD's were positioned in the left front driver seat (P1) and the right rear passenger seat (P3) in the place of ballast ATD's.
- Two (2) high speed cameras were installed on the vehicle's right front and left rear doors.
- Two (2) front seat back frame MHD's, one (1) left front sill and one (1) right rear sill were installed to measure rotation about the Y-axis.
- Four (4) vehicle accels were installed to measure acceleration along the X-axis.

The crash event was recorded by ten (10) high speed and two (2) real time cameras. Camera locations and other pertinent camera information are found in the data sheets. Appendix A contains Pre- and Post-Test Photographs, Appendix B contains the Dummy and Vehicle Response Data Traces. Appendix C contains the Instrumentation Data Channel assignments. Appendix D contains the Dummy Calibration Data Traces and Tables.

The occupant and seat data is summarized below.

	Seat Back Rotation		HIC 36	NIJ				3 msec.Clip (g's)	Chest Deflection (mm)	Femur	
	Left (deg.)	Right (deg.)		Ntf	Nte	Ncf	Nce			Left	Right
Driver (P1)	-29.6	-27.7	291	0.16	0.29	0.00	0.18	17.1	-2.8	-890.0	-1114.2
Pass. (P3)			97	0.18	0.18	0.13	0.00	30.0	-5.0	-2951.1	-3269.2

	Head to Torso Rotation
	Degrees
Driver (P1)	-52.4
Pass. (P3)	-23.4

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	C55801	Anti-Lock Brakes	Yes
Make	Volkswagen	All Wheel Drive	No
Model	Golf	Power Steering	Yes
Body Style	4-Door Hatchback	Driver Front Airbag	Yes
Vin No.	9BWFL61J354013682	Driver Side Airbag	Yes
Color	White	Driver Head Airbag	Yes
Delivery Date	6/7/05	Driver Curtain Airbag	No
Odometer	235	Pass. Airbag	Yes
Dealer	Bozzani Volkswagen	Pass. Side Airbag	Yes
Transmission	5 Speed Manual	Pass. Head Airbag	Yes
Final Drive	Front	Pass. Curtain Airbag	No
Type/No. Cyl.	4	Pre-Tensioners	
Engine Disp. (L)	2.0	Load Limiters	
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air. Cond.	Yes
Sunroof/T-Top	No	AM/FM Cassette	Yes
Tinted Glass	No	Tilt Steering	Yes
Traction Control	Yes	Automatic Door Locks	No
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	No
Rear Disc	Yes	Other	

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen Do Brazil LTDA	GVWR (kg)	1760
		GAWR Front (kg)	930
Date of Manufacture	Nov-04	GAWR Rear (kg)	840

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	None	
Number of Occupants	2	3	0	5
Capacity Weight (VCW) (kg)				405
Cargo Weight (RCLW) (kg)				65

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

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801

Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	384	258		415	324	
Right	kg	386	256		431	323	
Ratio	%	60.0%	40.0%		56.7%	43.3%	
Totals	kg	770	513	1284	846	647	1493

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1284
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	65
Calculated Vehicle Target Wt. (TVTW)	kg	1501

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	684	684	703	711	1010
As Tested	mm	663	655	677	670	1094

Vehicle Wheel Base (mm) 2525

Weight of Ballast Secured in cargo area (kg) 13.6

Vehicle Components Removed None

* Ballast weight does not include cameras, instrumentation and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 55.00

Usable Capacity Furnished by COTR (L) 52.01

Actual Test Volume with entire fuel System Filled (L) 51.14

1/3 of Usable Capacity (L) N/A

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Purple

Is Vehicle Fuel Pump Electric or Mechanical? Electric

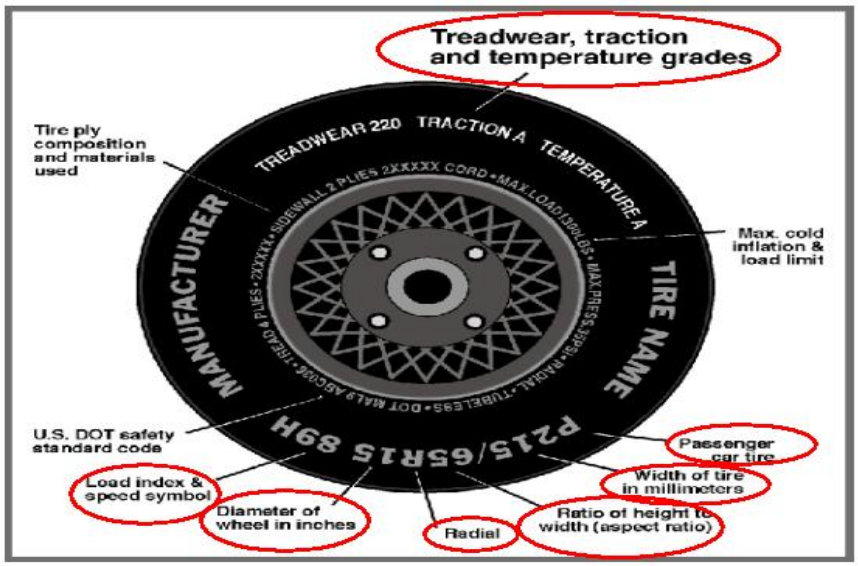
If electric, does pump operate with ignition switch "On" & engine "OFF" Yes

Fuel System Particulars: The fuel filler door is located on the right rear fender.
The standard fuel tank occupies the area under the rear seat.

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

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	310	310
Cold Pressure (kpa)	210	180
Recommended Tire Size	P195/65R15	P195/65R15
Tire Size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Goodyear	Goodyear
Treadwear	360	360
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester Cord	1 Polyester Cord
Tire Plies Body	1 Polyester, 2 Steel Cord, 2 Nylon Cord	1 Polyester, 2 Steel Cord, 2 Nylon Cord
Load Index/Speed Symbol	91H	91H
Tire Material	Polyester, Steel Cord, Nylon Cord	Polyester, Steel Cord, Nylon Cord
DOT Safety Code Right	Y1AE HTDR 3704	Y1AE HTDR 3704
DOT Safety Code Left	Y1AE HTDR 3704	Y1AE HTDR 3704

DATA SHEET NO. 2
MOVING BARRIER DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

BARRIER SPECIFICATIONS

Measurement Description	mm
Barrier Face Height	1525
Barrier Face Width	1980
Barrier Face Ground Clearance	115
Tread Width	200
Wheelbase	3045
Tread Width	1530

LOCATION OF BARRIER CG

Measurement Description	mm
X-distance rearward of front wheel center	1372
Y-distance from longitudinal-vertical plane of symmetry	1523

BARRIER WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	494	405	
Right	kg	494	406	
Ratio	%	54.9%	45.1%	
Totals	kg	988	811	1799

BARRIER TIRES

Manufacturer	Maximum II
Model	Remington
Size	205-75-R15
Pressure (kPa)	241

BARRIER IMPACT VELOCITY

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	46.51 to 48.12	47.71
Trap No. 2 Velocity (Redundant)	km/h	46.51 to 48.12	47.67

DATA SHEET NO. 3
SEAT DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

HEAD RESTRAINT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X		X
Vertical Adjustment	X		X	
Fore-Aft Adjustment	X		X	
Fore-Aft Locks		X		X

SEAT BACK RECLINE TYPE

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Power		X		X
Lever (with detents)		X		X
Lever (ratchet)		X		X
Rotary Knob	X			X
Pivot Locks on both sides	X			X

LUMBAR ADJUSTMENT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed	X		X	
Adjustable		X		X

BOLSTER ADJUSTMENT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed	X		X	
Adjustable		X		X

SEAT CUSHION TYPE

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Cushion moves vertically	X			X
Independently of seat back		X		X

DATA SHEET NO. 3…(CONTINUED)
SEAT DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

SEAT CUSHION FORE-AFT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Power		X		X
Manual-Detents	X			X
Manual-Infinite		X		X

SEAT CUSHION FORE-AFT

	Driver (P1)		Passenger (P3)	
	Detents first/last	Travel (mm)	Detents first/last	Travel (mm)
Power				
Manual-Detents	1,14	240		
Manual-Infinite				

SEAT CUSHION VERTICAL

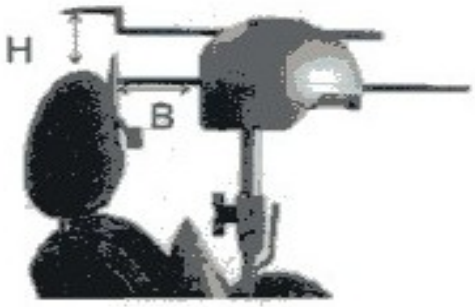
	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Power		X		X
Manual-Detents		X		X
Manual-Infinite	X			X

SEAT TEST POSITIONS

	Driver (P1)	Passenger (P3)
Seat Cushion Fore-Aft (mm)	240	
Seat Cushion Vertical (mm)	0	
Seat Back (Degrees)	19.0	16.0
Head Restraint to H-Point (mm)	865	826
Seatback MHD Angle (Pre/Post-Test)	23.5 Deg. / 49.0 Deg.	

DATA SHEET NO. 4
ICBC MEASUREMENTS

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05



HEAD RESTRAINT POSITION (vertical fore-aft)

	Driver (P1)				
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	Height along torso line from pivot
Full Up / Fixed	mm	110	10	25.0	865
Full Down / Fixed	mm	110	-95	25.0	757

HEAD RESTRAINT POSITION-CONFIGURED FOR TEST (vertical fore-aft)

	Driver (P1)				
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	Height along torso line from pivot
Full Up / Fixed	mm	110	10	25.0	865

HEAD RESTRAINT POSITION (vertical fore-aft)

	Passenger (P3)				
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	Height along torso line from pivot
Full Up / Fixed	mm	104	-40	24.0	826
Full Down / Fixed	mm	104	-127	24.0	739

HEAD RESTRAINT POSITION-CONFIGURED FOR TEST (vertical fore-aft)

	Passenger (P3)				
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	Height along torso line from pivot
Full Up / Fixed	mm	104	-40	24.0	826

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

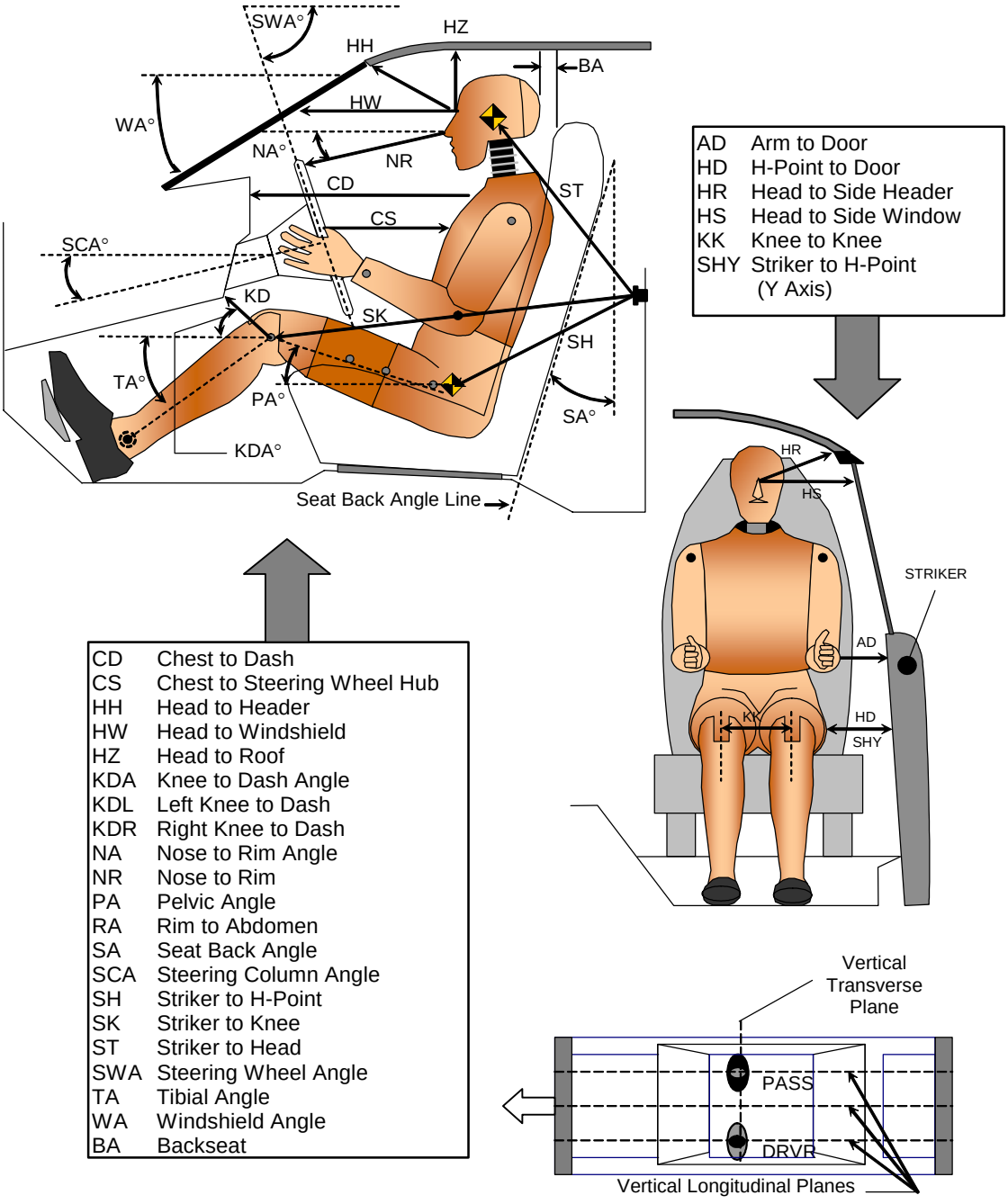
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		29.0		
SWA	Steering Wheel Angle		67.0		
SCA	Steering Column Angle		23.0		
SA	Seat Back Angle		19.0		16.0
HZ	Head to Roof (Z)	202	90.0	200	90.0
HH	Head to Header	345		1165	
HW	Head to Windshield	588		1430	
HR	Head to Side Header (Y)	275		214	
NR	Nose to Rim	385	14.0		
CD	Chest to Dash	510		1365	
CS	Chest to Steering Hub	295			
RA	Rim to Abdomen	220			
KDL	Left Knee to Dash	188	30.0	905	
KDR	Right Knee to Dash	180		943	4.0
PA	Pelvic Angle		20.0		23.0
TA	Tibia Angle		40.0		*
KK	Knee to Knee (Y)	286		68	
SK	Striker to Knee	560	11.4	570	12.0
ST	Striker to Head	465	80.5	430	81.4
SH	Striker to H-Point	255	50.0	250	46.0
SHY	Striker to H-Point (Y)	250		220	
HS	Head to Side Window	300		268	
HD	H-Point to Door (Y)	135		125	
AD	Arm to Door (Y)	45		60	
BS	Head to Back Seat	145		155	

* Not measured

DATA SHEET NO. 5…(CONTINUED)
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6
VEHICLE AND SEAT INSTRUMENTATION DATA SUMMARY

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801

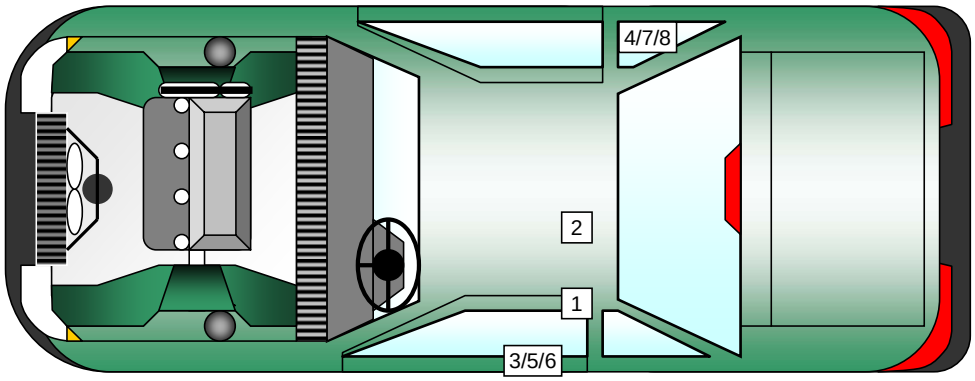
Test Program: FMVSS 301R Test Date: 8/26/05

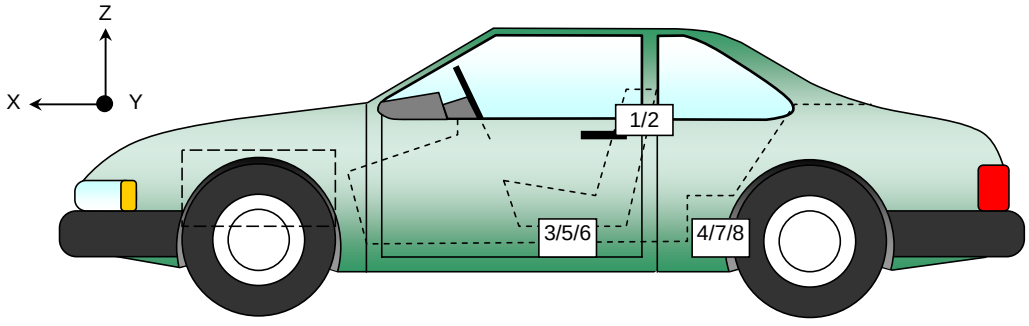
VEHICLE INSTRUMENTATION AND SEAT BACK PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Driver Seat Back Left Side	1680	-525	835	Deg/Sec	243.7	170.2	-581.3	62.3 [1]
2	Driver Seat Back Right Side	1680	-130	835	Deg/Sec	239.0	168.7	-516.5	76.9 [1]
3	Left Front Sill Angular Velocity	2375	-665	260	Deg/Sec	33.4	30.5	-62.5	18.7 [1]
4	Right Rear Sill Angular Velocity	1550	675	255	Deg/Sec	61.2	58.4	-89.1	32.0 [1]
5	Left Front Cross Member Primary	2330	-615	230	G's	27.0	5.4	-2.6	85.6
6	Left Front Cross Member Red.	2390	-615	230	G's	27.2	5.5	-2.6	85.5
7	Right Rear Cross Member Primary	1690	620	240	G's	28.9	5.0	-1.9	118.5
8	Right Rear Cross Member Red.	1640	620	240	G's	30.3	5.1	-1.9	118.4

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

1.) Digitally filtered values





DATA SHEET NO. 7
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801

Test Program: FMVSS 301R Test Date: 8/26/05

HEAD PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	39.1	125.2	-4.5	349.9	29.3	67.1	-4.6	248.0
Head CG	Y	G's	1.7	137.7	-4.1	107.8	4.1	125.6	-3.9	55.6
Head CG	Z	G's	30.8	109.1	-0.5	10.5	19.2	60.4	-14.4	32.6
Head CG Resultant	N/A	G's	45.4	122.1			34.7	67.1		

CHEST PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	17.3	94.0	-2.3	329.3	30.5	32.7	-1.8	100.4
Chest CG	Y	G's	1.3	50.5	-2.8	74.4	4.2	50.1	-3.9	30.6
Chest CG	Z	G's	7.5	69.7	-4.7	108.6	5.6	76.3	-8.2	31.5
Chest CG Resultant	N/A	G's	17.3	94.0			31.4	32.5		

HEAD AND CHEST PEAK ANGULAR VELOCITY

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Head CG	Y	Deg/Sec	1083.6	210.0	-2442.8	106.7	512.8	194.4	-1954.4	59.3 [1]
Chest CG	Y	Deg/Sec	326.4	264.0	-754.6	84.5	177.1	156.9	-690.2	43.8 [1]

1.) Digitally Filtered Values

LOWER NECK PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Lower Neck	X	G's	22.9	94.7	-2.6	335.2	29.3	46.0	-1.3	264.7

HEAD INJURY CRITERIA (HIC36)

	Driver				Passenger			
Location	HIC	T^1	T^2	Avg G	HIC	T^1	T^2	Avg G
Head CG	290.9	104.6	140.6	36.5	97.4	53.3	76.5	28.1

CHEST CLIP (3MSEC)

	Driver			Passenger		
Location	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG	17.1	92.0	95.0	30.0	31.7	34.7

DATA SHEET NO. 7…(CONTINUED)
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801

Test Program: FMVSS 301R Test Date: 8/26/05

UPPER NECK PEAK FORCES AND MOMENTS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	486.0	129.3	-174.2	349.6	259.5	55.5	-155.9	247.0
Neck Force	Y	Newtons	44.6	151.1	-76.7	250.5	99.0	112.3	-81.7	53.5
Neck Force	Z	Newtons	1584.8	109.3	-6.7	155.1	1050.1	61.3	-619.8	32.6
Neck Force Resultant	N/A	Newtons	1585.0	109.3			1070.3	61.3		
Neck Moment	X	Nm	2.3	111.5	-5.6	93.7	5.6	101.1	-8.7	61.2
Neck Moment	Y	Nm	17.4	129.7	-28.3	151.3	27.6	43.4	-16.3	84.0
Neck Moment	Z	Nm	3.9	263.0	-2.9	317.5	6.3	132.3	-5.1	58.4
Neck Moment Resultant	N/A	Nm	28.6	151.3			27.8	43.4		

LOWER NECK PEAK FORCES AND MOMENTS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	797.0	109.8	-269.5	349.6	461.4	52.9	-90.5	246.9
Neck Force	Y	Newtons	76.2	133.3	-935.5	85.7	61.0	86.1	-92.8	50.3
Neck Force	Z	Newtons	0.0	0.0	0.0	0.0	1282.6	60.1	-887.5	32.5 [1]
Neck Force Resultant	N/A	Newtons	983.8	86.0			1334.7	57.3		
Neck Moment	X	Nm	4.4	190.0	-25.3	84.8	8.1	115.3	-10.5	50.7
Neck Moment	Y	Nm	18.4	349.7	-93.4	111.3	27.5	32.7	-67.2	58.2
Neck Moment	Z	Nm	6.2	157.3	-9.0	111.4	2.6	110.2	-6.9	50.6
Neck Moment Resultant	N/A	Nm	94.0	111.2			67.6	58.2		

1.) Driver channel failed, no data

FEMUR PEAK FORCES

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	1008.5	70.4	-890.0	57.7	453.6	103.6	-2951.1	45.5
Right Femur	Z	Newtons	2747.9	69.7	-1114.2	211.2	576.9	59.4	-3269.2	44.7

CHEST PEAK DEFLECTIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	0.8	60.9	-2.8	349.4	0.0	1.4	-5.0	38.6

DATA SHEET NO. 7…(CONTINUED)
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801

Test Program: FMVSS 301R Test Date: 8/26/05

PELVIC PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	31.6	69.3	-2.7	233.6	47.2	41.5	-6.0	102.0
Pelvis	Y	G's	3.2	69.6	-3.0	85.5	2.5	58.4	-4.0	32.0
Pelvis	Z	G's	11.3	56.6	-3.6	108.1	9.9	31.5	-6.2	48.7
Pelvis Resultant	N/A	G's	33.4	69.3			47.5	41.4		

SEAT BELT SENSOR PEAK VALUES

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Load	N/A	Newtons	365.9	276.4	-18.3	151.3	1241.7	102.6	-35.8	34.7
Belt Pullout	N/A	MM	31.2	349.9	-31.8	64.3	20.4	304.3	-57.1	55.8[1]

1.) Passenger channel - Questionable data

DATA SHEET NO. 8
FUEL SYSTEM INTEGRITY POST- IMPACT DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

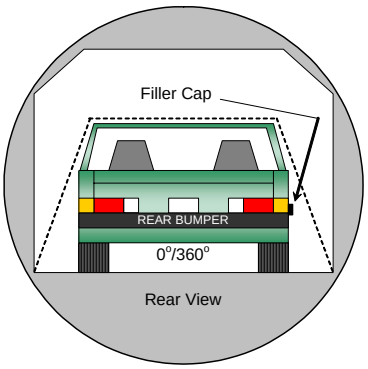
Test Time: 2:27 PM Temperature: 37.8 Deg. C.

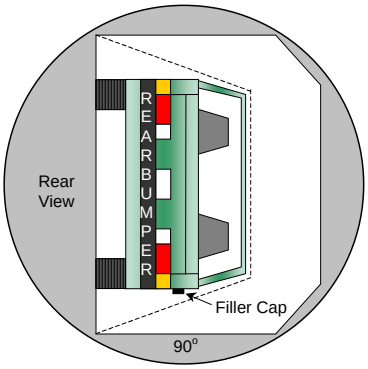
STODDARD SOLVENT SPILLAGE MEASUREMENTS

A. From impact until vehicle motion ceases: 0.0 oz.
(Maximum Allowable = 1 ounce)
B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)
D. Spillage Location Details: No leakage occurred

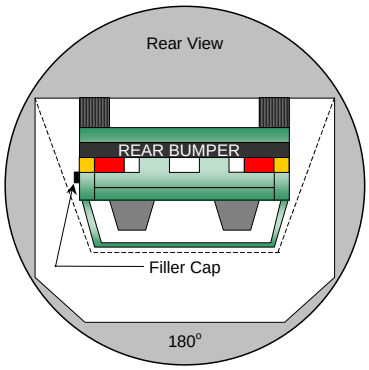
DATA SHEET NO. 9
STATIC ROLLOVER DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

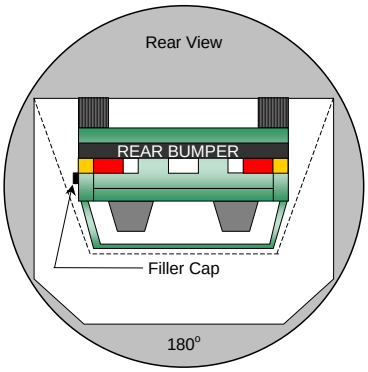




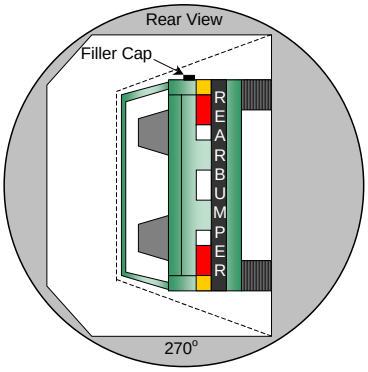
0° to 90°



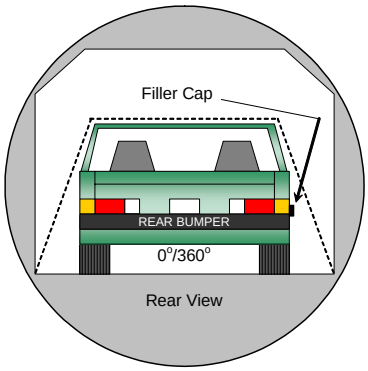
90° to 180°



180° to 270°



270° to 360°



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. No solvent leakage occurred during rollover.

DATA SHEET NO. 9…(CONTINUED)
STATIC ROLLOVER DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	83	300	383
90° to 180°	83	300	383
180° to 270°	80	300	380
270° to 360°	83	300	383

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

First 5 Minutes	5.0
Sixth Minute	1.0
Seventh Minute	1.0
Eighth Minute	1.0

ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)

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

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. 10
CAMERA LOCATIONS

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

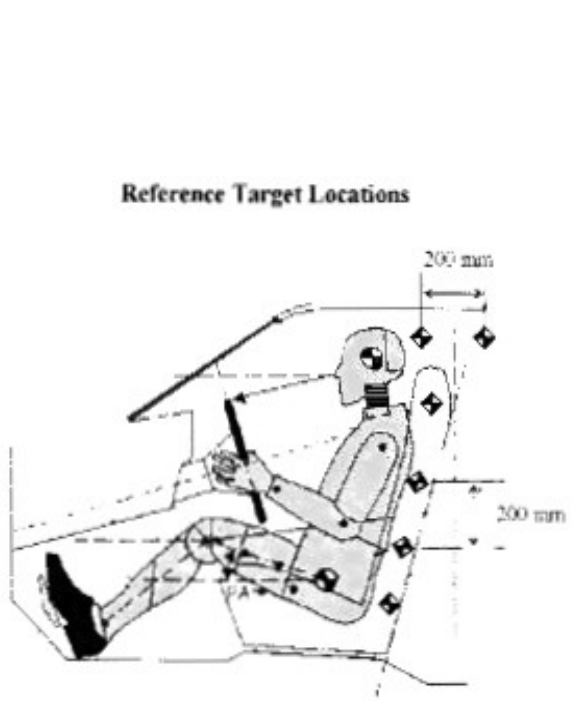
VEHICLE CAMERA MEASUREMENT TABLE

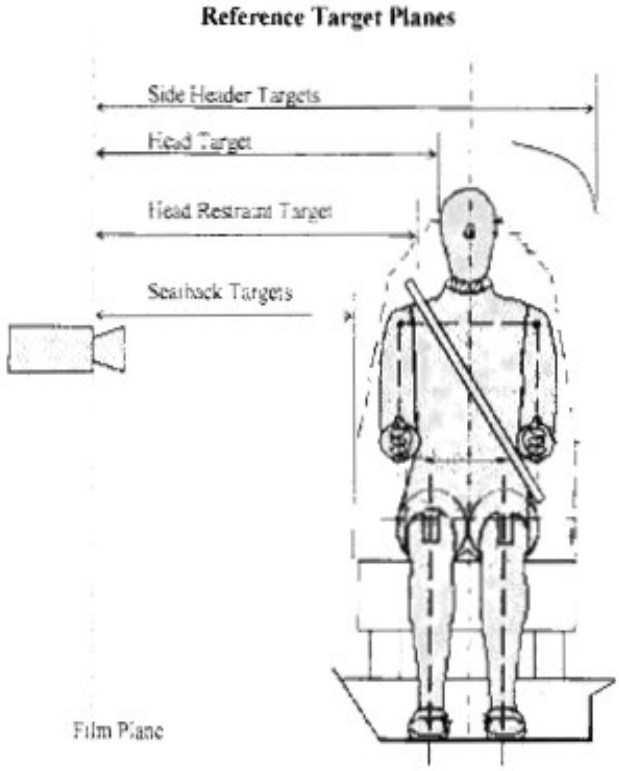
No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Real Time, Documentary	2040	1480	-1835	-7.0	Zoom	30
2	Left Side	560	-12155	1700	0.0	35mm	1000
3	Right Side	2265	-11860	1708	0.0	35mm	1000
4	Overhead	1230	2869	-5488	-90.0	20mm	1000
5	Moving Barrier	0	0	-2332	64.0	7mm	879
6	Rear Underside	635	0	1820	90.0	13mm	1000
7	Mid Underside	1845	0	1870	90.0	12mm	1000
8	Front Underside	3025	0	1865	90.0	12mm	1000
9	Underside Close-Up	760	268	1870	84.0	25mm	1000
10	Driver Side On-Board	-1630	70	-1130	-2.0	14mm	1000
11	Passenger On-Board	-1646	-74	-1130	-2.0	8mm	1000
12	Real Time Left Side	710	-12005	1542	-2.0	Zoom	30

X = Monorail Centerline Y = Impact Location Z = Ground DNR = Did Not Run NTM = No Timing Marks

DATA SHEET NO. 11
REFERENCE TARGET MEASUREMENTS

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05





Film Plane to Reference Distance		
Plane	Driver (P1)	Passenger (P3)
Seat Back	617	
Head Restraint	947	1095
Head Target	1089	1084
Side Header	1061	885

* All measurements in mm

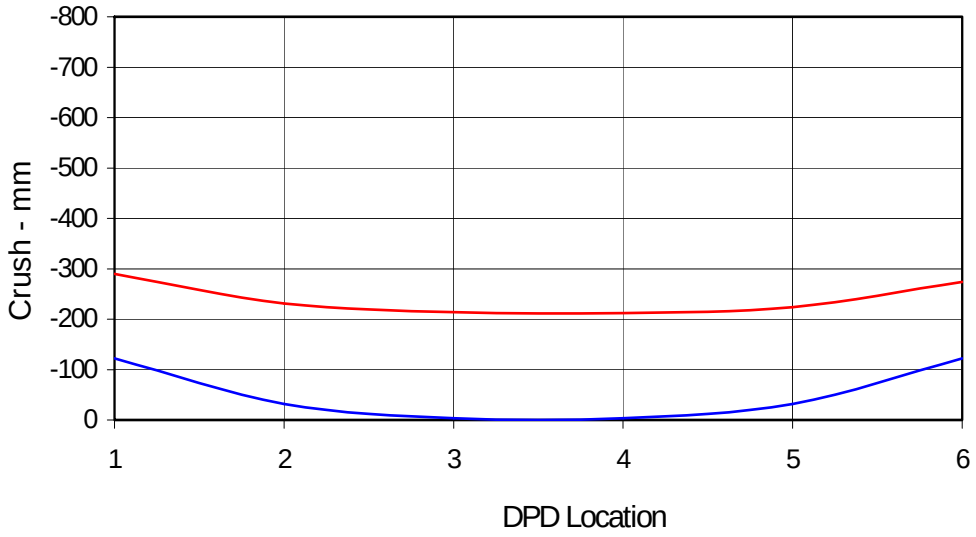
DATA SHEET NO. 12
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2005 Volkswagen Golf 4-Door Hatchback NHTSA No.: C55801
Test Program: Rear Impact Dynamic Seat Test Test Date: 8/26/05

CRUSH PROFILE

Damage Region Length (mm): 1371 Midpoint of Damage: Centerline
Impact Mode: Rear Impact (0 Deg.)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	-122	-290	168
C2	Crush zone 2 on left side	mm	-32	-231	199
C3	Crush zone 3 on left side	mm	-3	-214	211
C4	Crush zone 4 on right side	mm	-3	-212	209
C5	Crush zone 5 on right side	mm	-32	-224	192
C6	Crush zone 6 at right side	mm	-122	-274	152



APPENDIX A

PHOTOGRAPHS

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Figure A-1: Left Front ¾ View, As Received

Figure A-2: Right Rear ¾ View, As Received

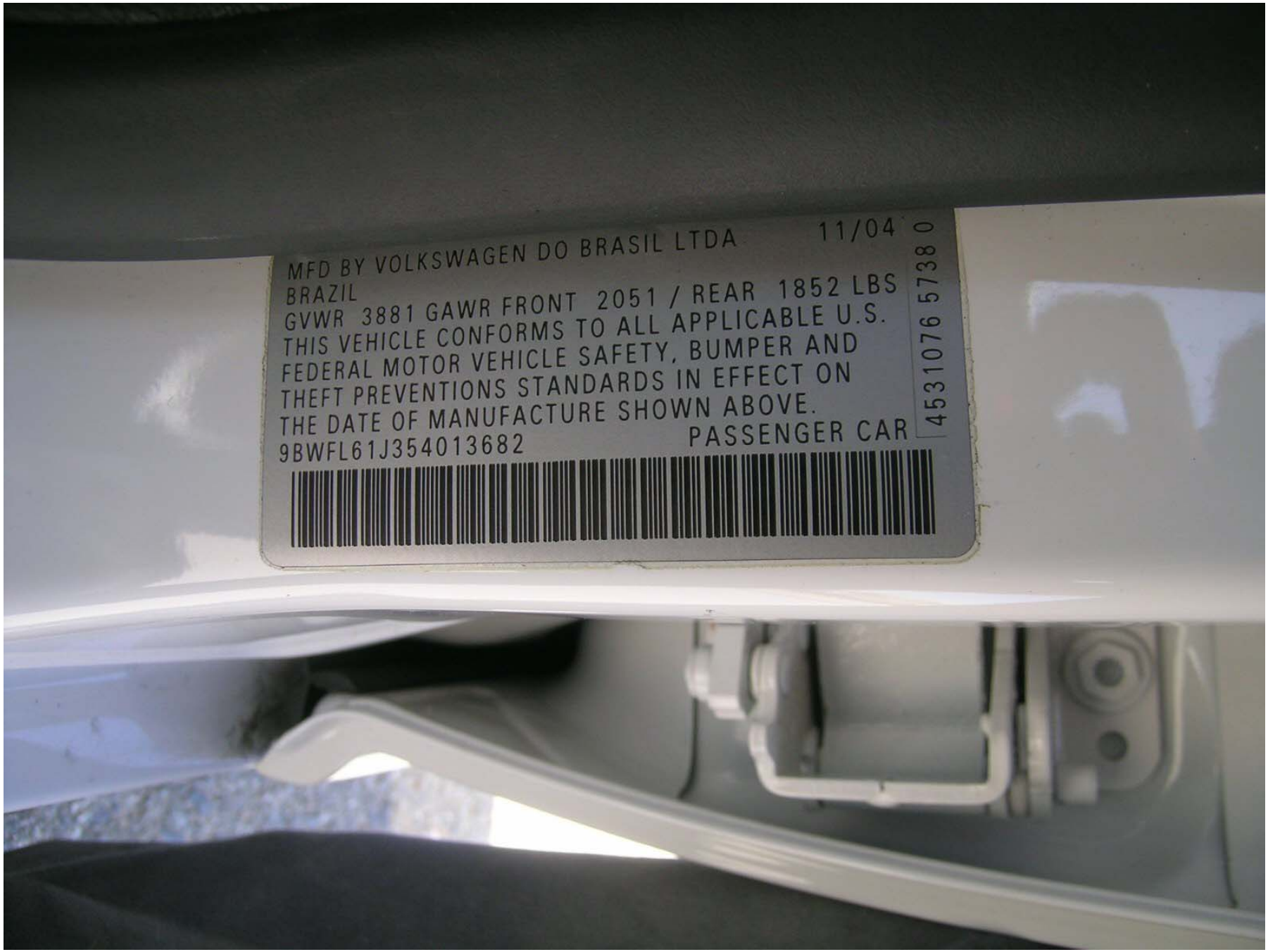

Figure A-3: Vehicle Certification Label

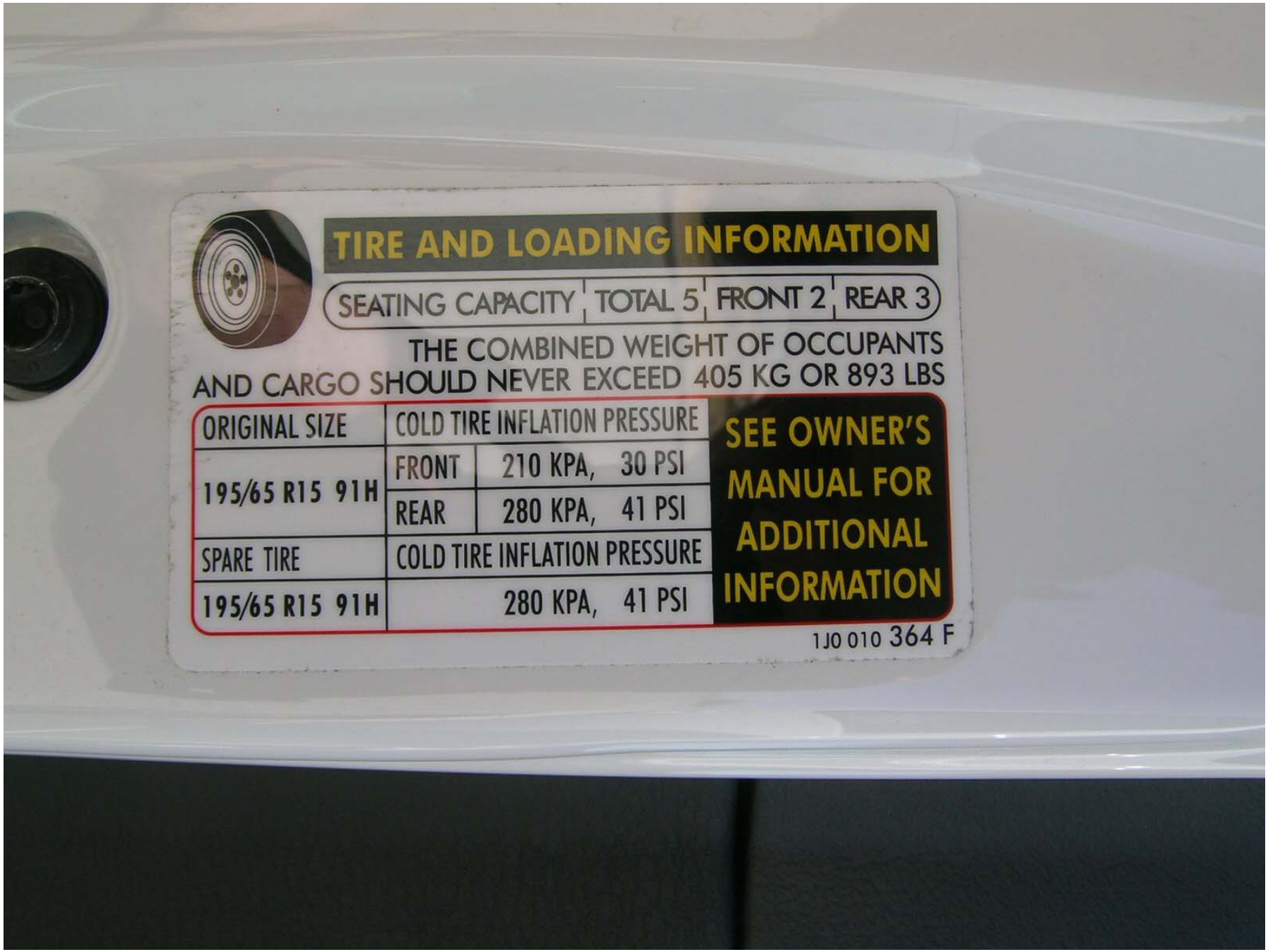

Figure A-4: Vehicle Tire Label

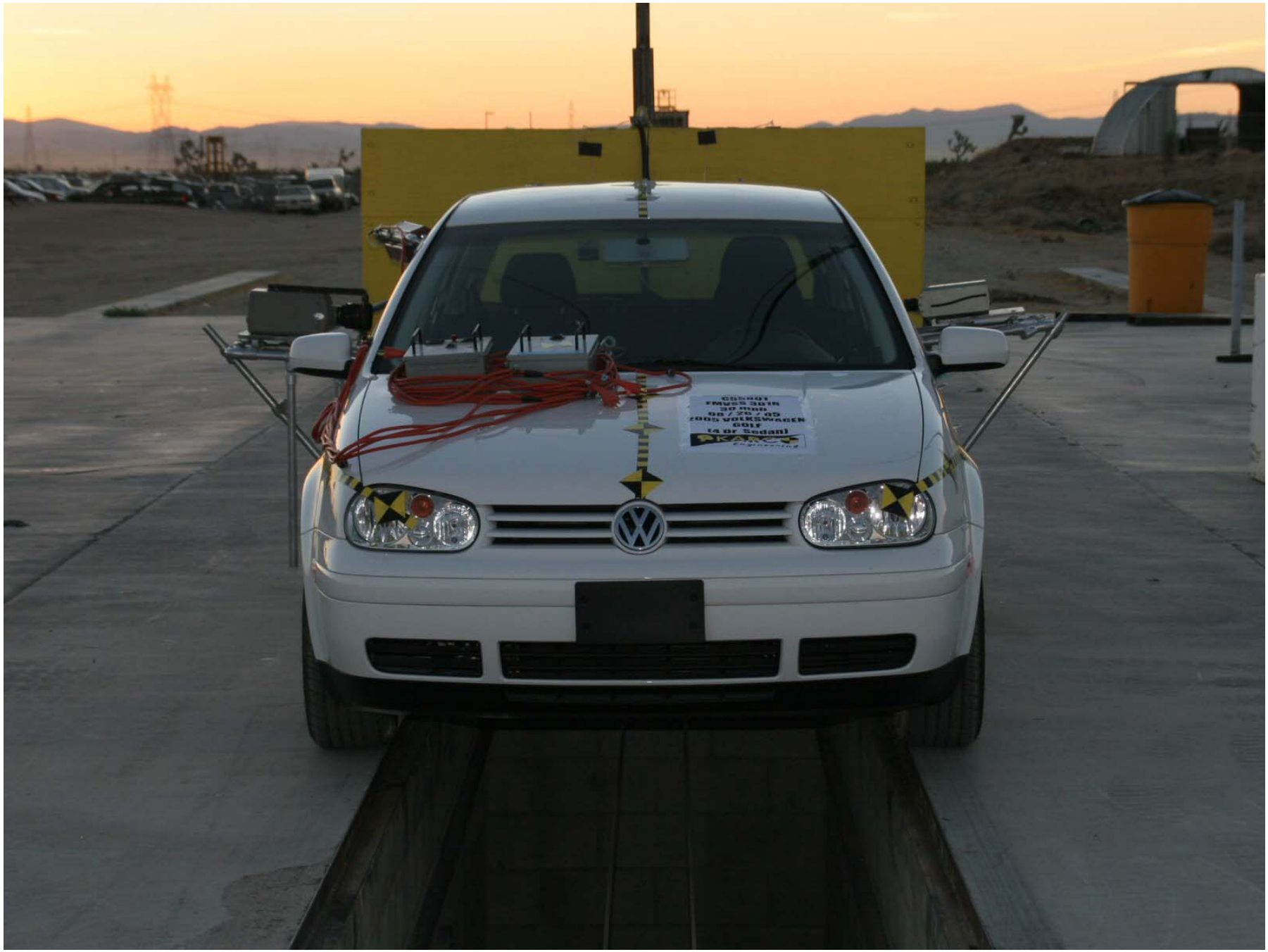

Figure A-5: Pre-Test Front View

Figure A-6: Post-Test Front View

Figure A-7: Pre-Test Left Side View

Figure A-8: Post-Test Left Side View

Figure A-9: Pre-Test Right Side View

Figure A-10: Post-Test Right Side View

Figure A-11: Pre-Test Left Front ¾ View

Figure A-12: Post-Test Left Front ¾ View

Figure A-13: Pre-Test Right Rear ¾ View

Figure A-14: Post-Test Right Rear ¾ View

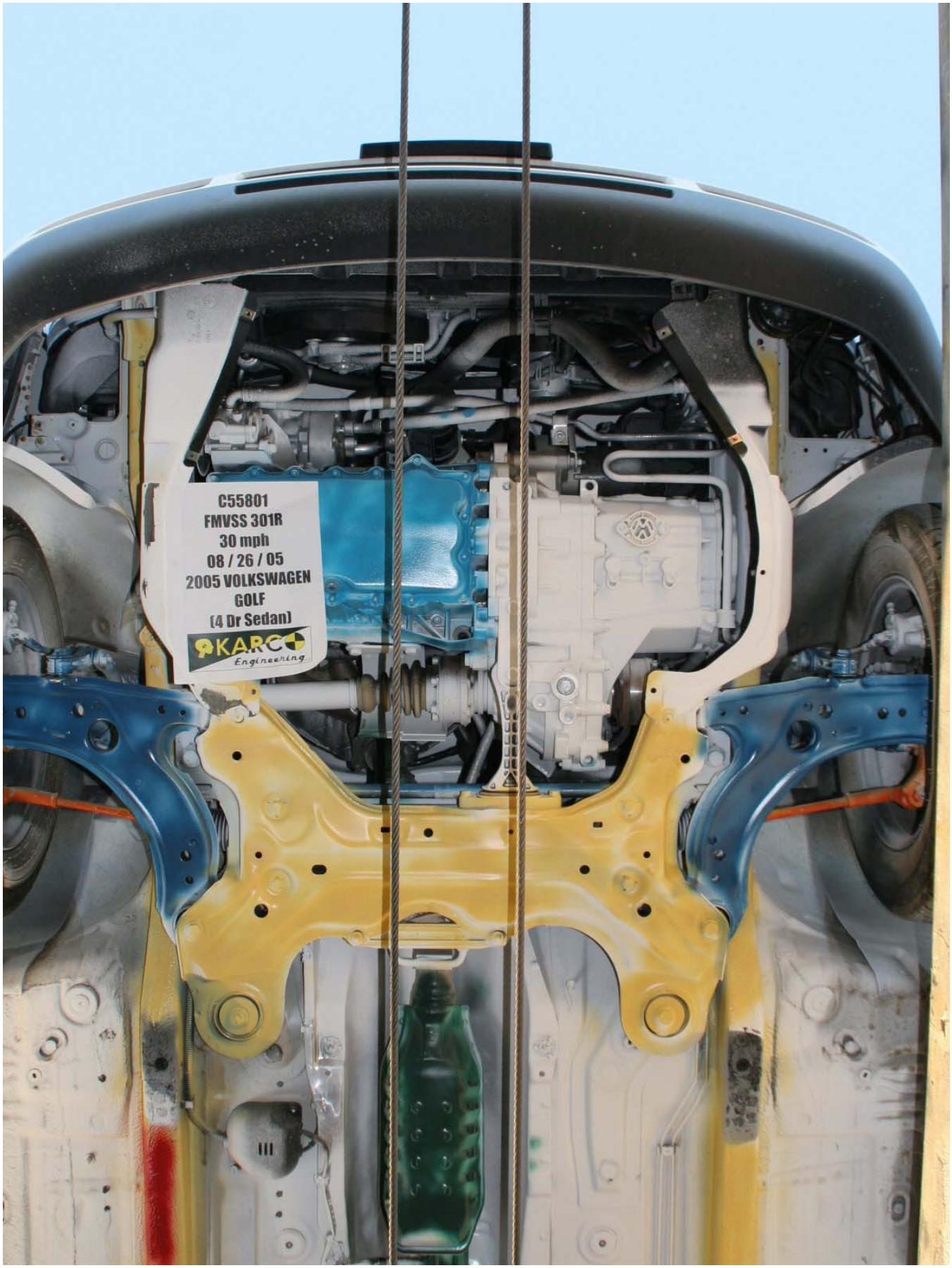

Figure A-15: Pre-Test Front Underbody View

Figure A-16: Post-Test Front Underbody View

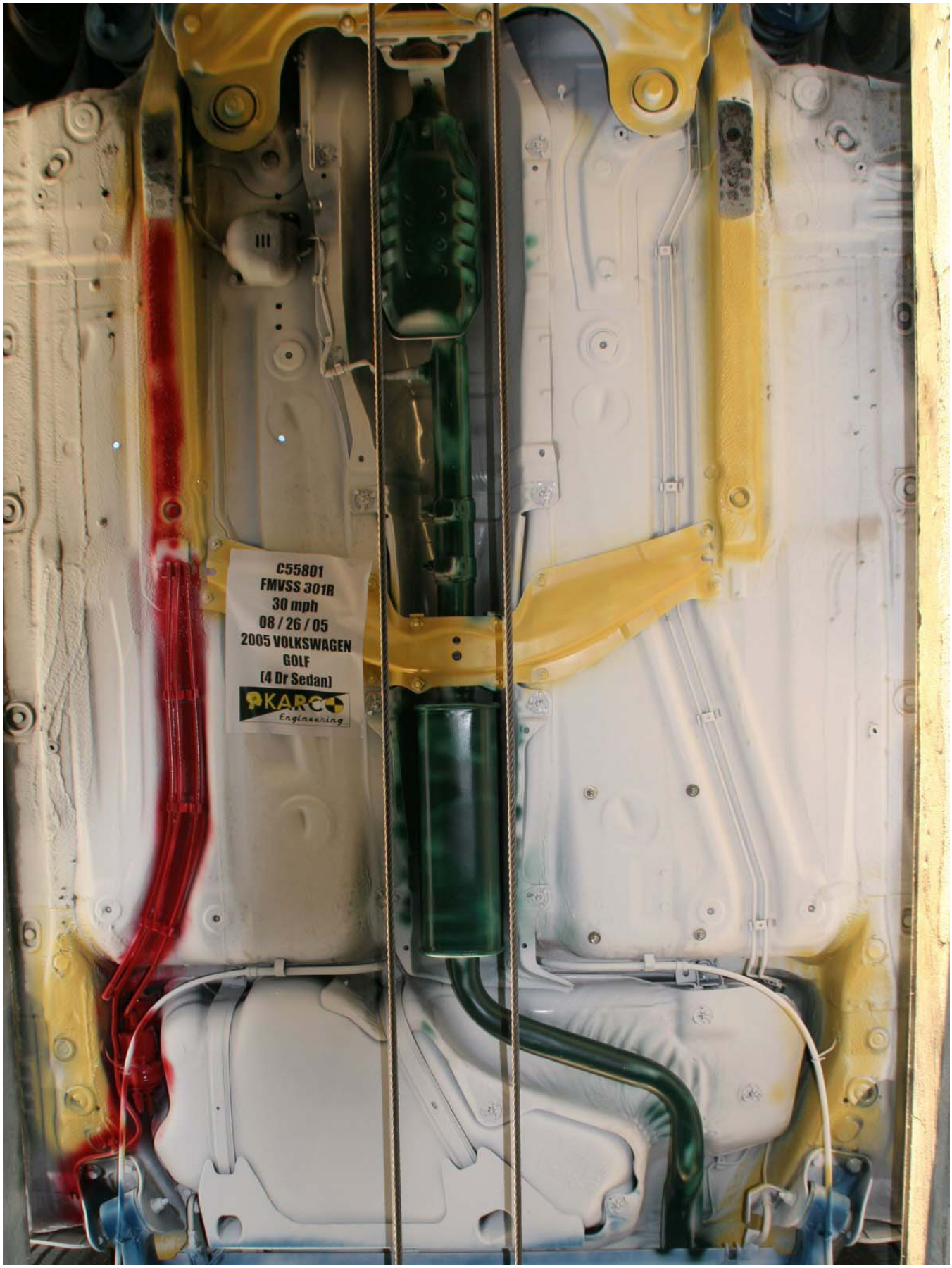

Figure A-17: Pre-Test Mid Underbody View

Figure A-18: Post-Test Mid Underbody View

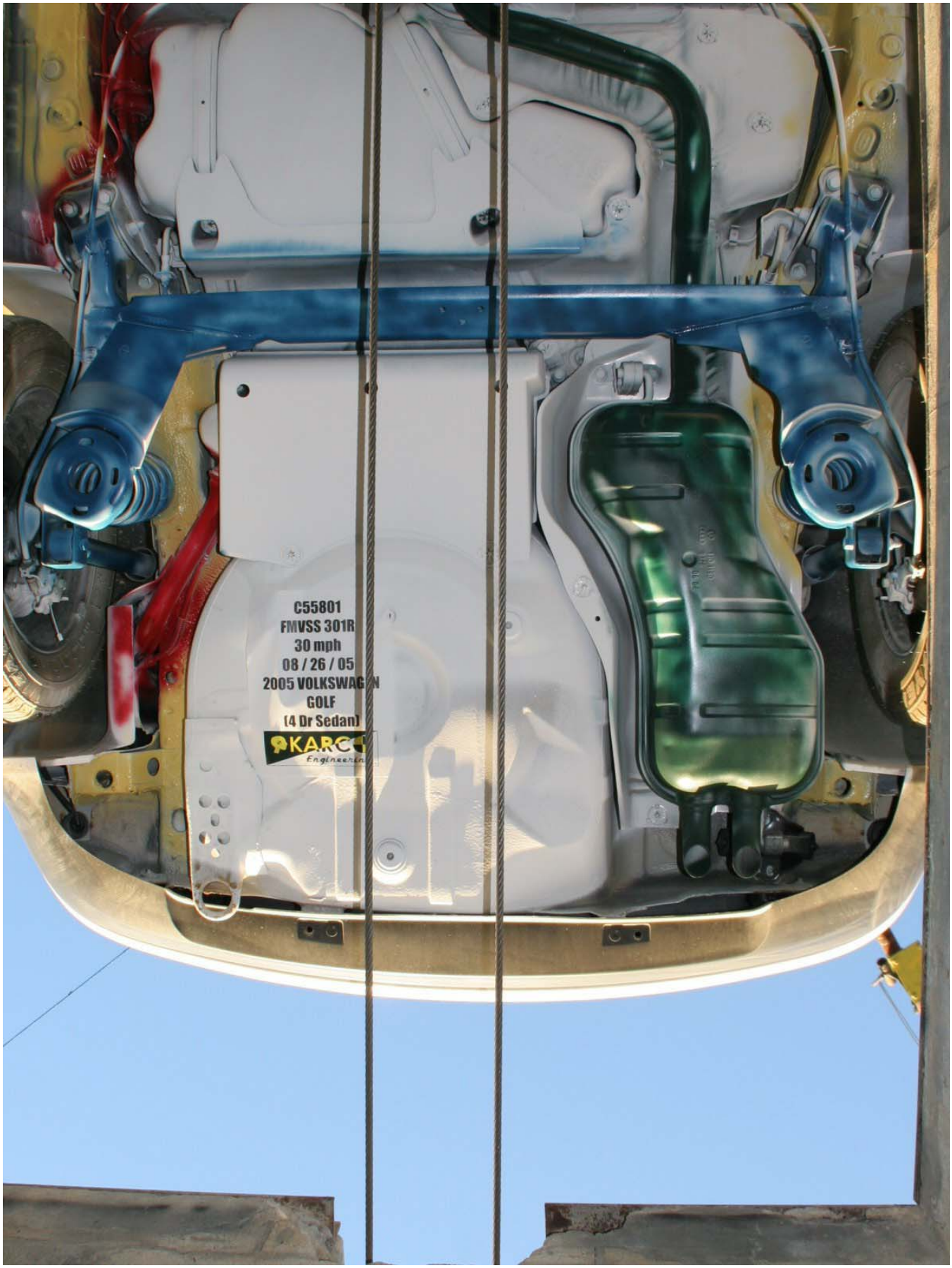

Figure A-19: Pre-Test Rear Underbody View

Figure A-20: Post-Test Rear Underbody View

Figure A-21: Pre-Test Driver Seat Right Side View

Figure A-22: Post-Test Driver Seat Right Side View

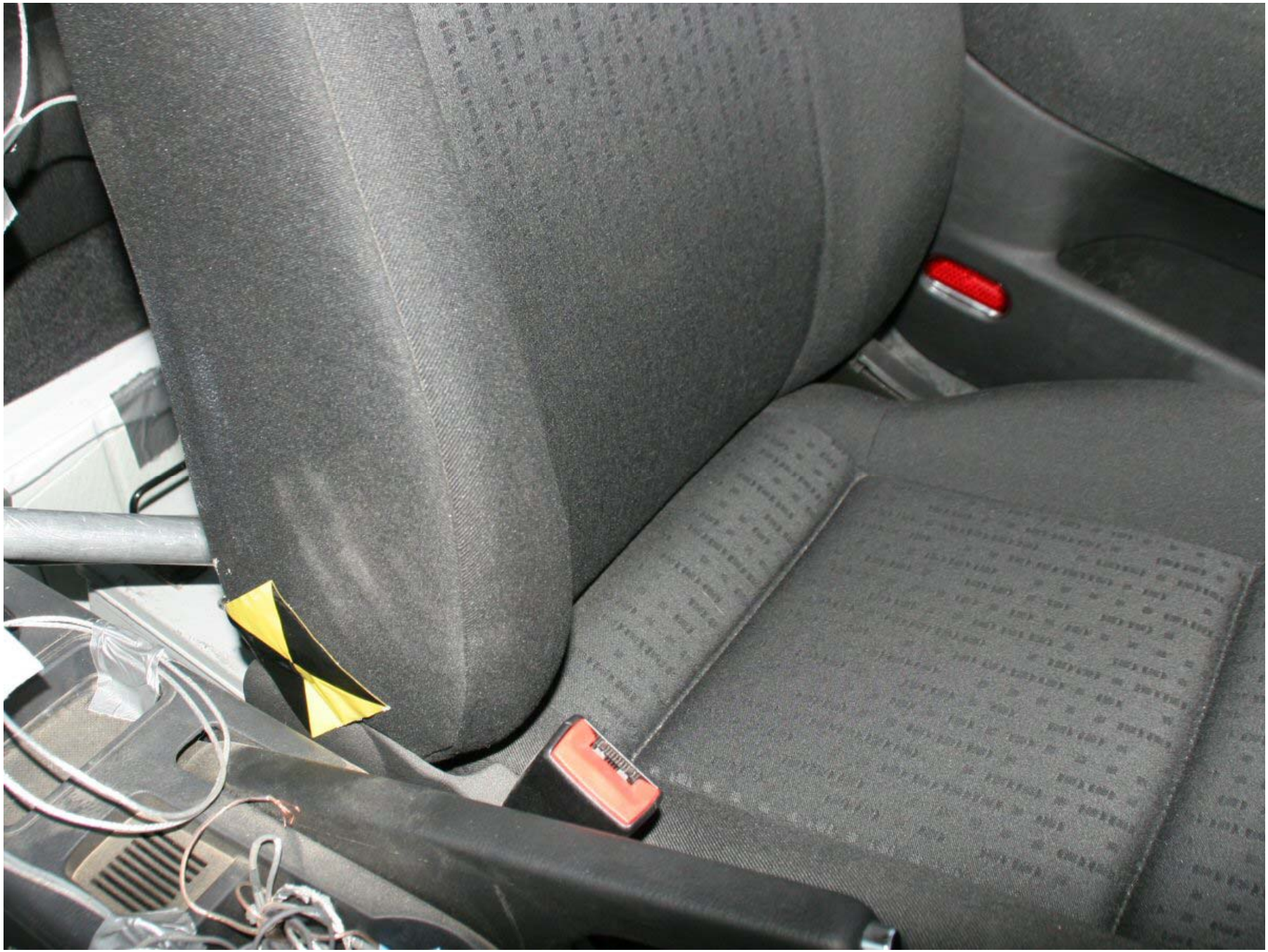

Figure A-23: Pre-Test Driver Seat Close-Up View

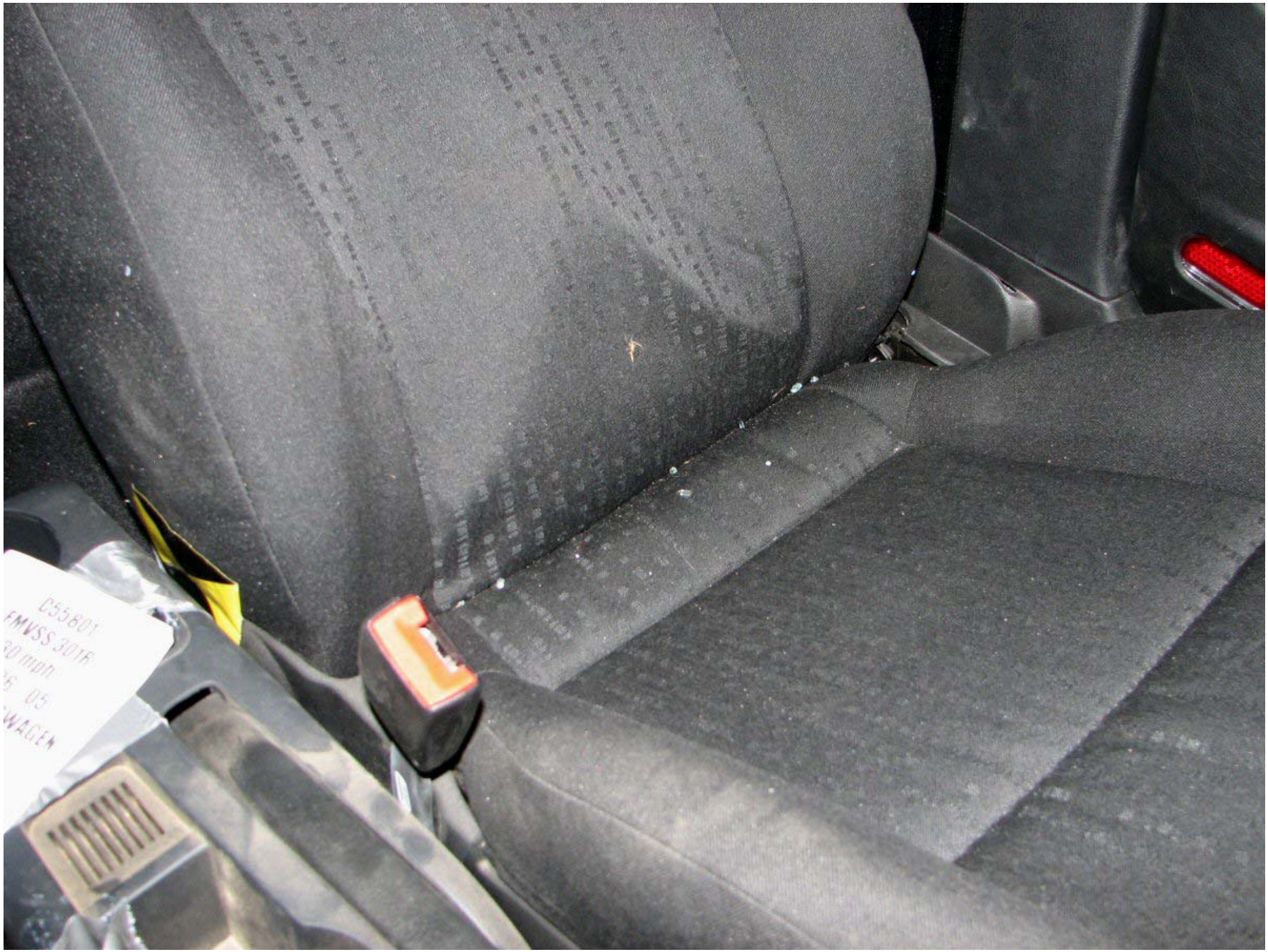

Figure A-24: Post-Test Driver Seat Close-Up View

Figure A-25: Pre-Test Passenger Seat Right Side View

Figure A-26: Post-Test Passenger Seat Right Side View

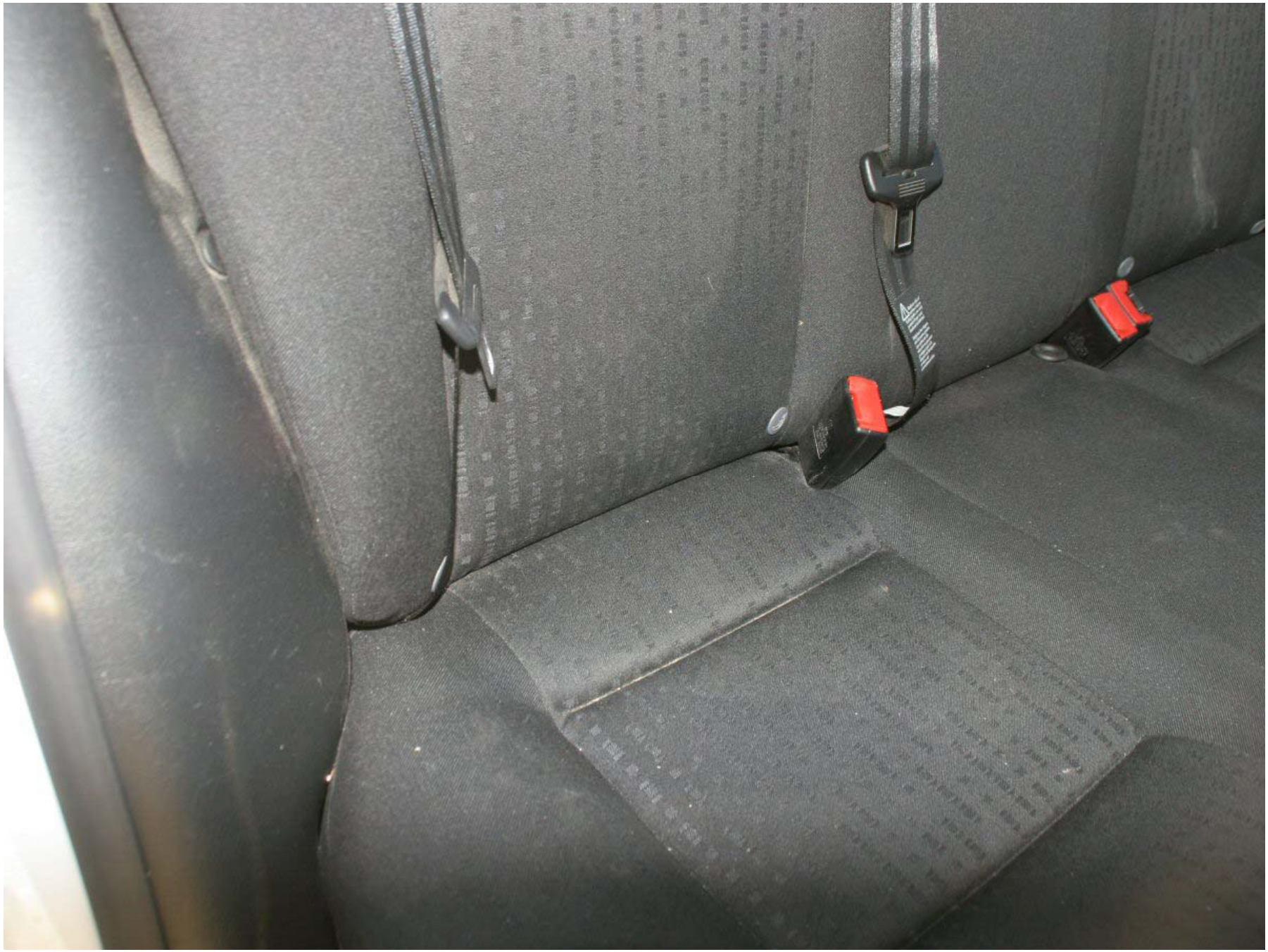

Figure A-27: Pre-Test Passenger Seat Close-Up View

Figure A-28: Post-Test Passenger Seat Close-Up View

Figure A-29: Pre-Test Driver Seat ICBC Machine

Figure A-30: Pre-Test Passenger Seat ICBC Machine

Figure A-31: Pre-Test Driver Dummy Left Side View

Figure A-32: Post-Test Driver Dummy Left Side View

Figure A-33: Pre-Test Driver Dummy Right Side View

Figure A-34: Post-Test Driver Dummy Right Side View

Figure A-35: Pre-Test Driver Dummy ¾ View

Figure A-36: Post-Test Driver Dummy ¾ View

Figure A-37: Pre-Test Passenger Dummy Left Side View

Figure A-38: Post-Test Passenger Dummy Left Side View

Figure A-39: Pre-Test Passenger Dummy Right Side View

Figure A-40: Post-Test Passenger Dummy Right Side View

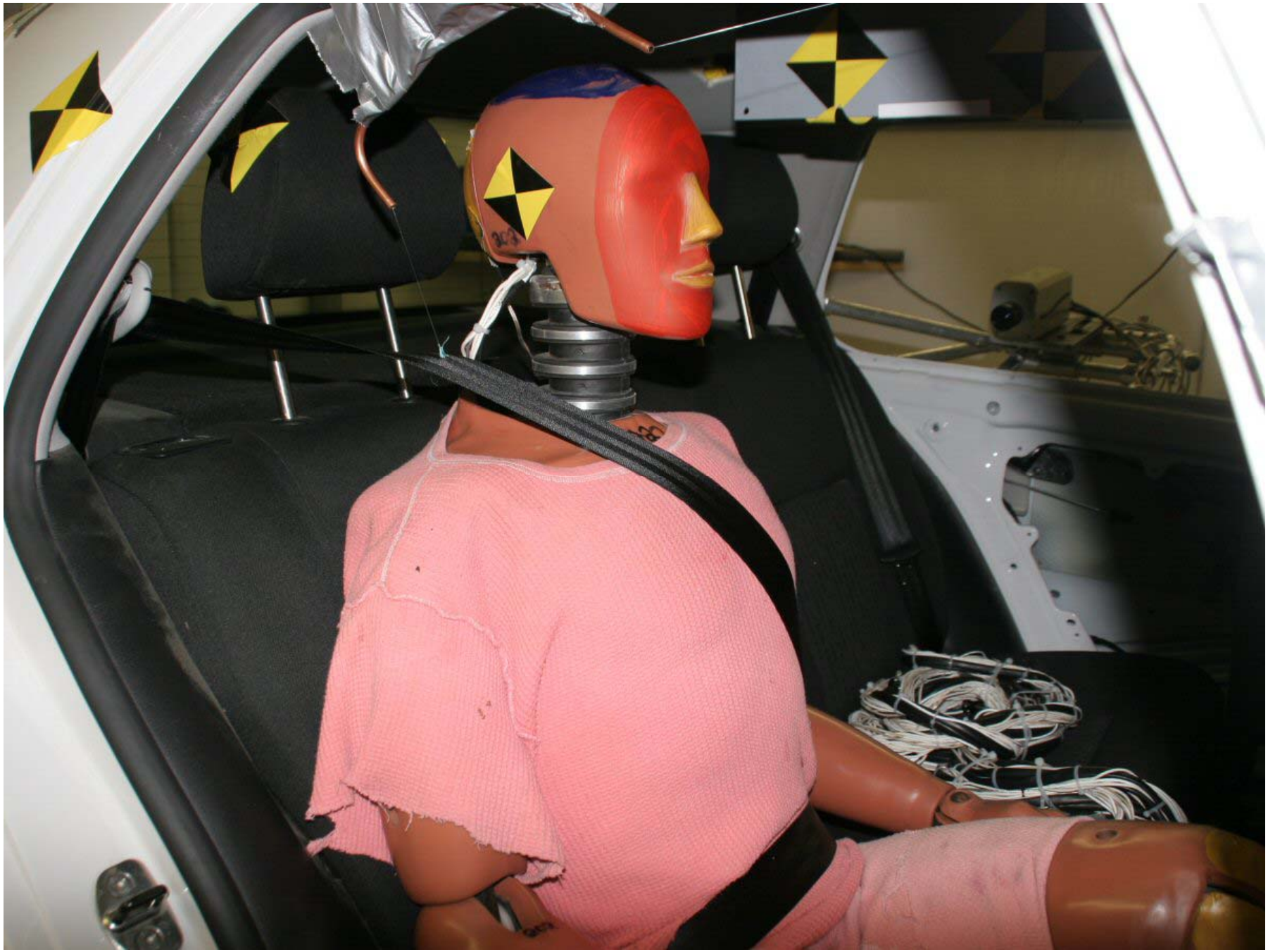

Figure A-41: Pre-Test Passenger Dummy ¾ View

Figure A-42: Post-Test Passenger Dummy ¾ View

Figure A-43: Vehicle on Rollover Device 0°

Figure A-44: Vehicle on Rollover Device 90°

Figure A-45: Vehicle on Rollover Device 180°

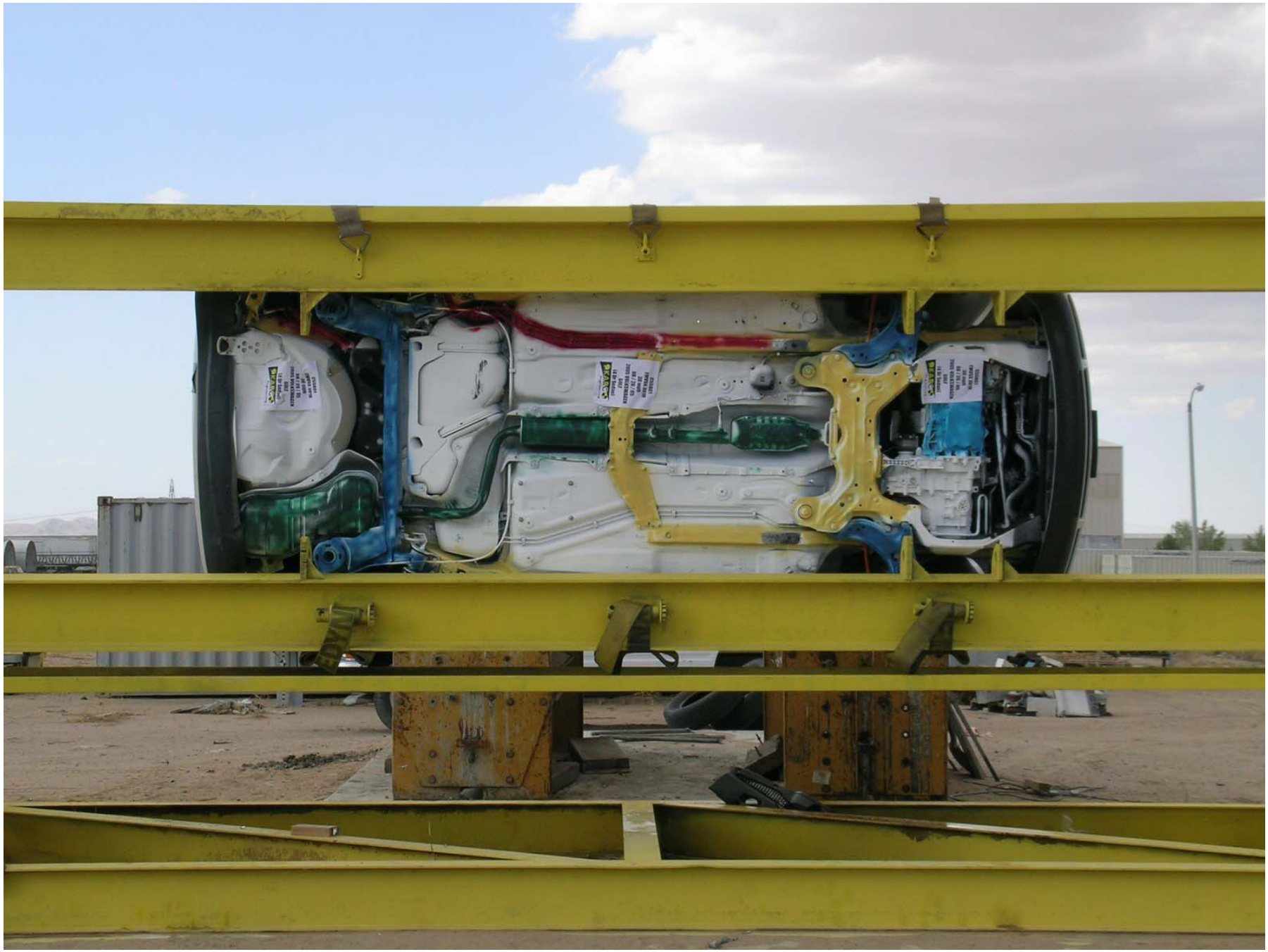

Figure A-46: Vehicle on Rollover Device 270°

Figure A-47: Vehicle During Impact

Figure A-48: Post-Test Driver Seat Left Side Reclining Mechanism

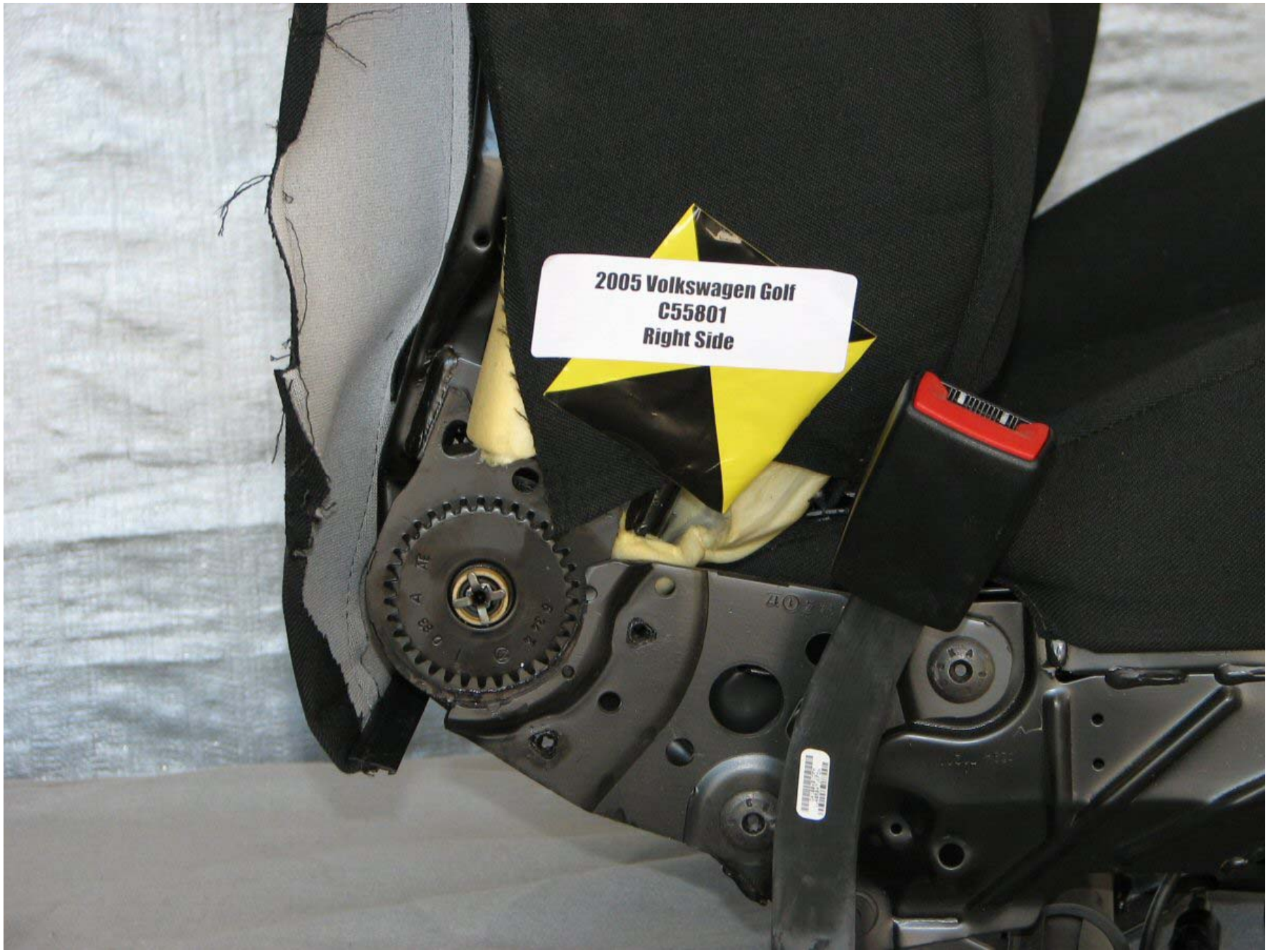

Figure A-49: Post-Test Driver Seat Right Side Reclining Mechanism

Figure A-50: Post-Test Driver Seatbelt

Figure A-50: Post-Test Driver Seat Belt

APPENDIX B

DATA PLOTS

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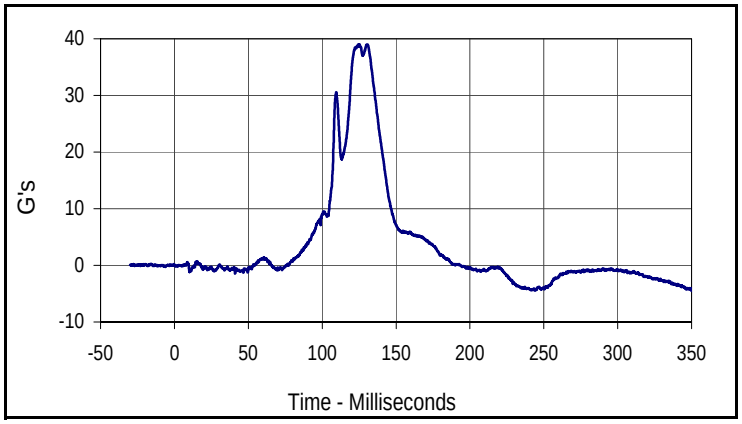
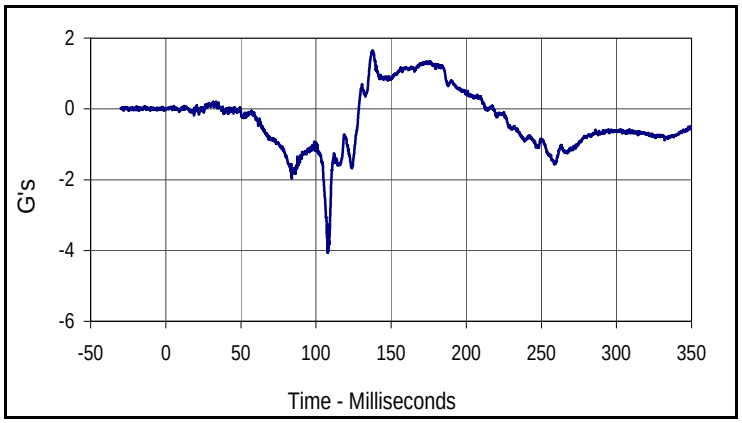
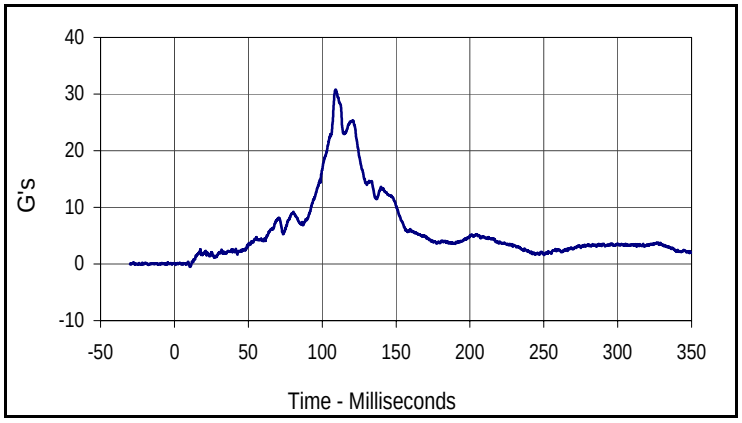
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



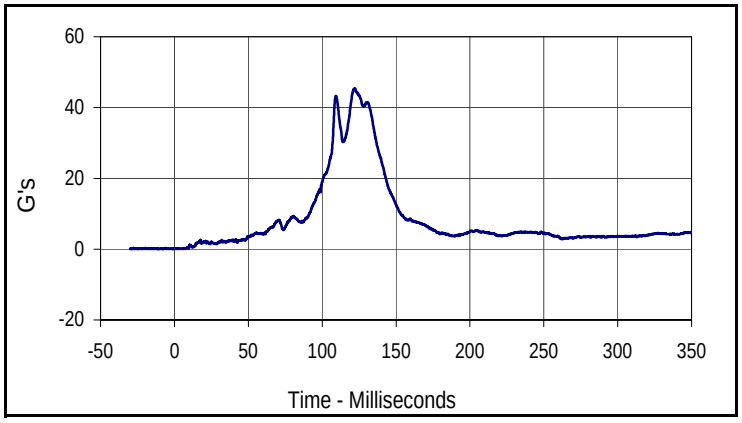
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
39.1	125.2	-4.5	349.9



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.7	137.7	-4.1	107.8

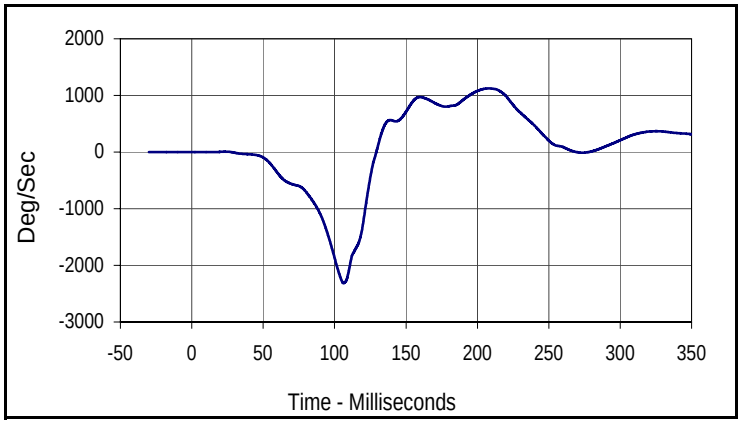


Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
30.8	109.1	-0.5	10.5

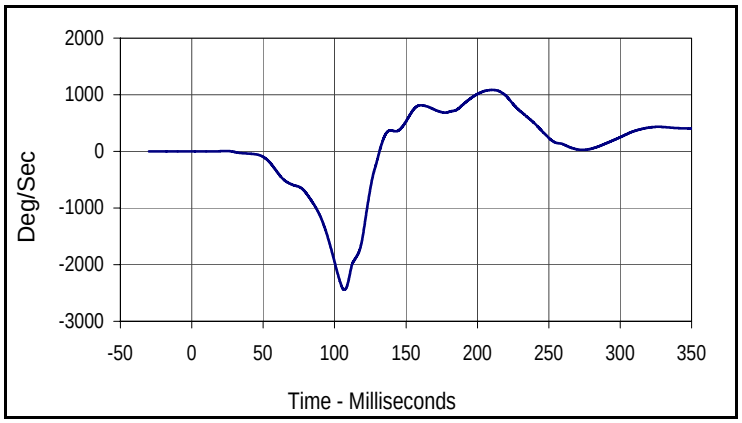


Curve Description			
Driver Head X Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
45.4	122.1	0.0	1.0

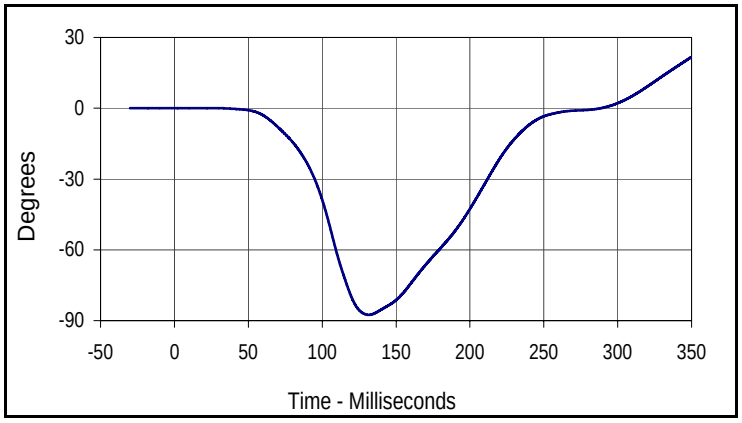
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



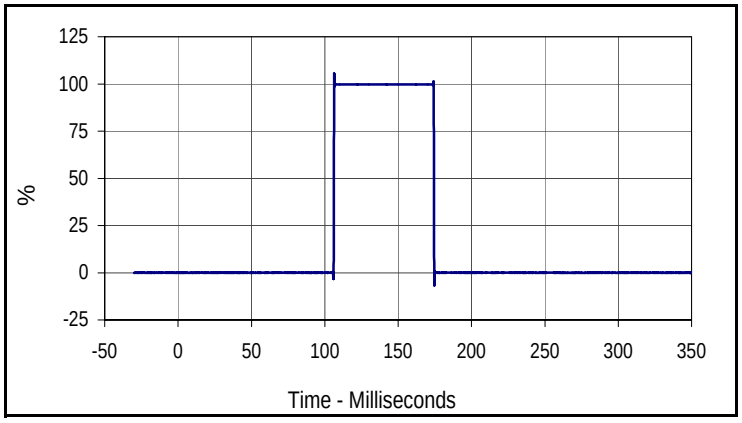
Curve Description			
Driver Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
004	FIL	1000	Deg/Sec
Max	Time	Min	Time
1125.4	207.7	-2315.6	106.3



Curve Description			
Driver Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
004	COMP	NA	Deg/Sec
Max	Time	Min	Time
1083.6	210.0	-2442.8	106.7

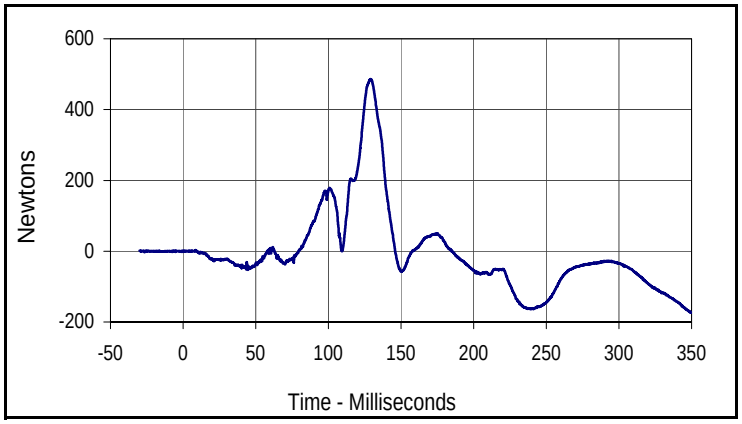


Curve Description			
Driver Head Y Rotation			
CURNO	Type	SAE Class	Units
004	COMP-IN1	NA	Degrees
Max	Time	Min	Time
21.7	349.9	-87.6	131.5

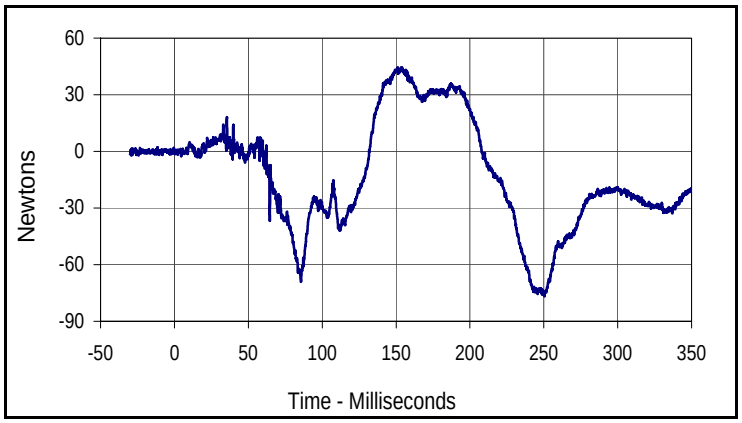


Curve Description			
Driver Headrest Contact			
CURNO	Type	SAE Class	Units
005	FIL	1000	%
Max	Time	Min	Time
105.5	106.4	-6.7	174.7

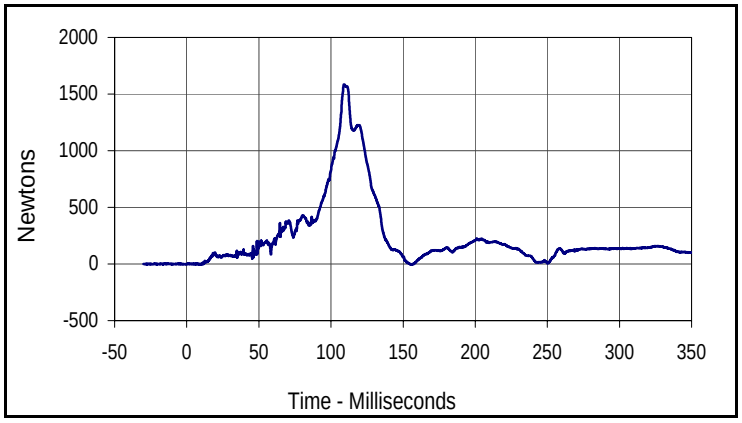
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



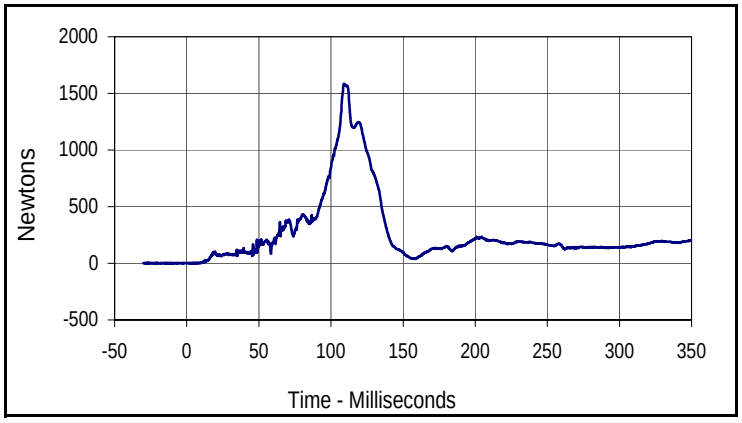
Curve Description			
Driver Upper Neck Force X			
CURNO	Type	SAE Class	Units
006	FIL	1000	Newtons
Max	Time	Min	Time
486.0	129.3	-174.2	349.6



Curve Description			
Driver Upper Neck Force Y			
CURNO	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
44.6	151.1	-76.7	250.5

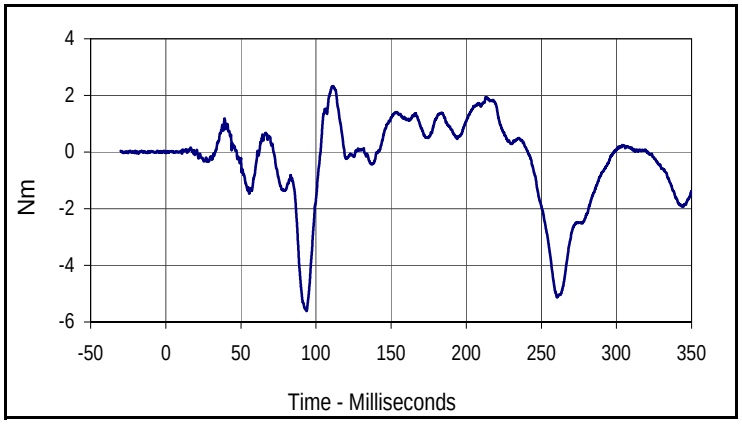


Curve Description			
Driver Upper Neck Force Z			
CURNO	Type	SAE Class	Units
008	FIL	1000	Newtons
Max	Time	Min	Time
1584.8	109.3	-6.7	155.1

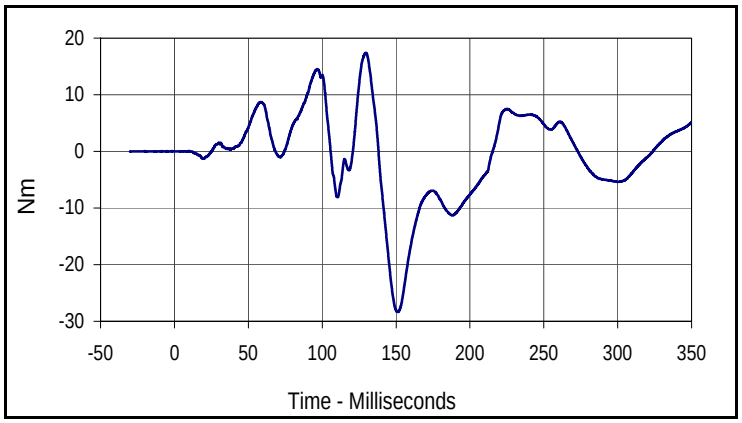


Curve Description			
Driver Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
006	RES	1000	Newtons
Max	Time	Min	Time
1585.0	109.3	0.5	1.3

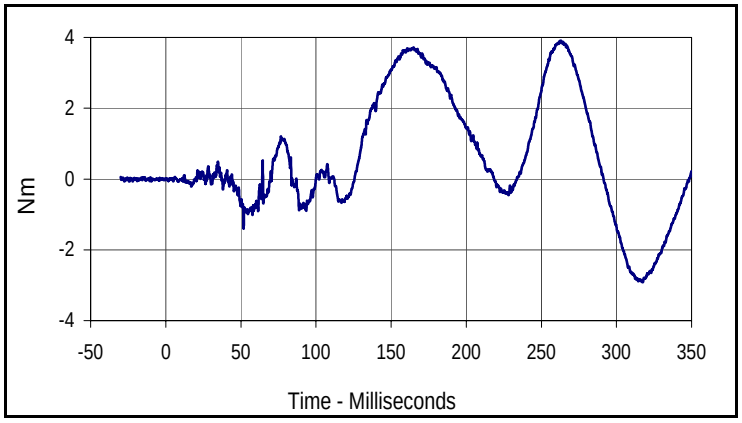
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



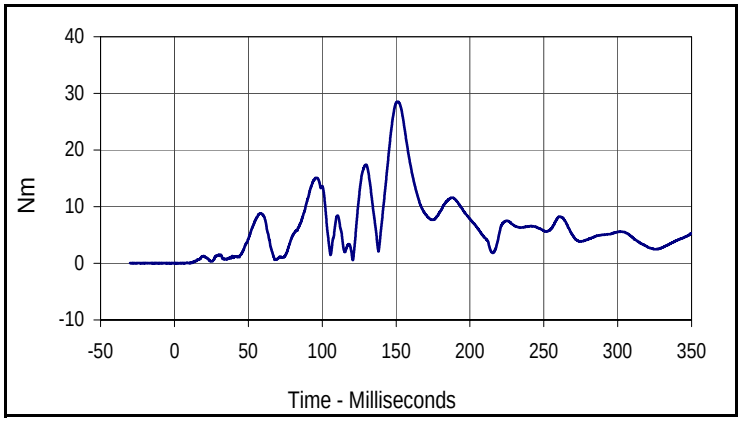
Curve Description			
Driver Upper Neck Moment X			
CURNO	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
2.3	111.5	-5.6	93.7



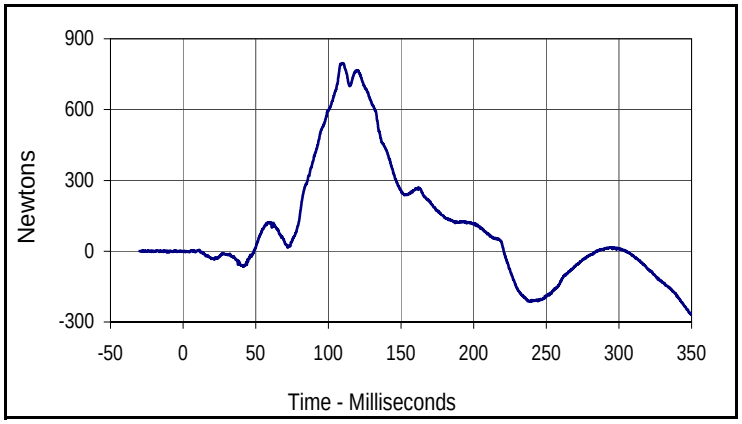
Curve Description			
Driver Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
17.4	129.7	-28.3	151.3



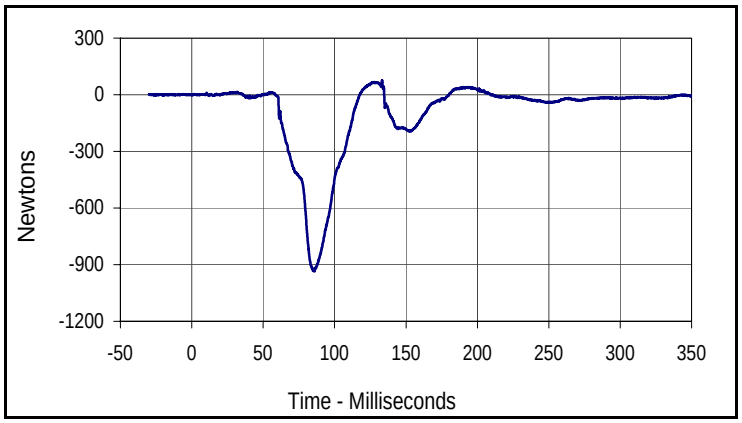
Curve Description			
Driver Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
3.9	263.0	-2.9	317.5



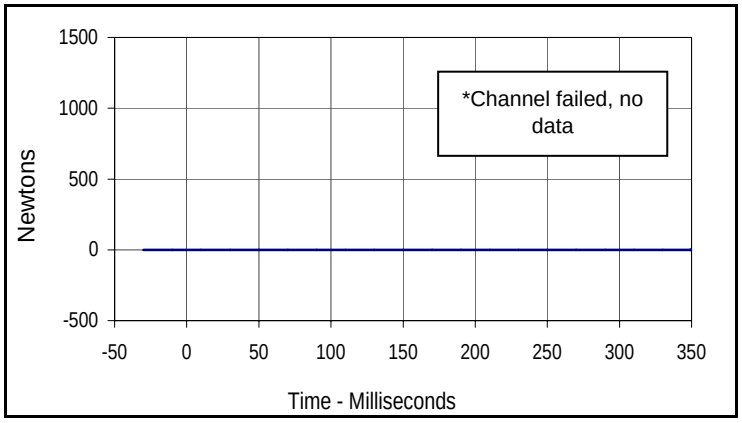
Curve Description			
Driver Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
009	RES	600	Nm
Max	Time	Min	Time
28.6	151.3	0.0	1.4



Curve Description			
Driver Lower Neck Force X			
CURNO	Type	SAE Class	Units
012	FIL	1000	Newtons
Max	Time	Min	Time
797.0	109.8	-269.5	349.6

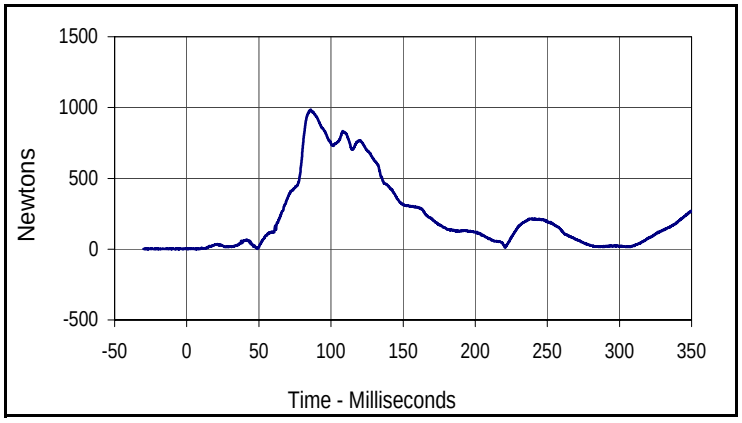


Curve Description			
Driver Lower Neck Force Y			
CURNO	Type	SAE Class	Units
013	FIL	1000	Newtons
Max	Time	Min	Time
76.2	133.3	-935.5	85.7

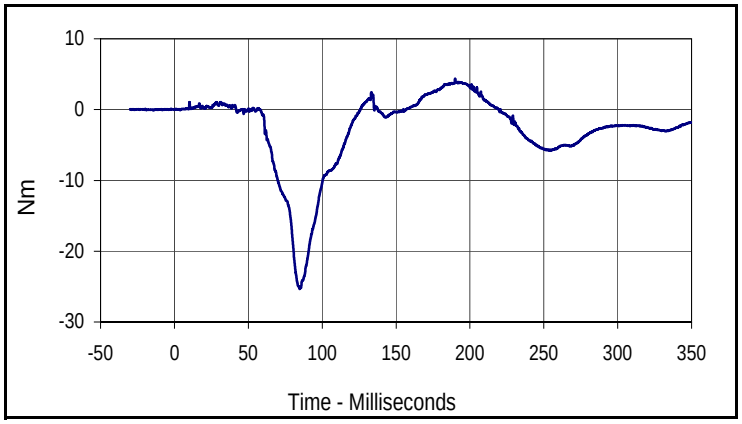


Curve Description			
Driver Lower Neck Force Z			
CURNO	Type	SAE Class	Units
014	FIL	1000	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

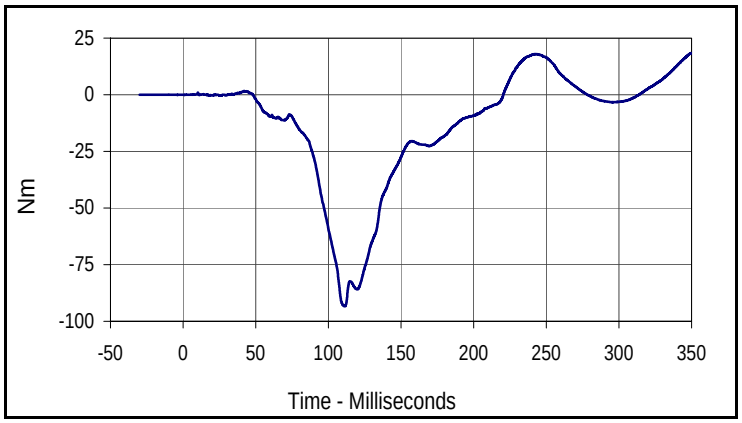
* Channel failed, no data



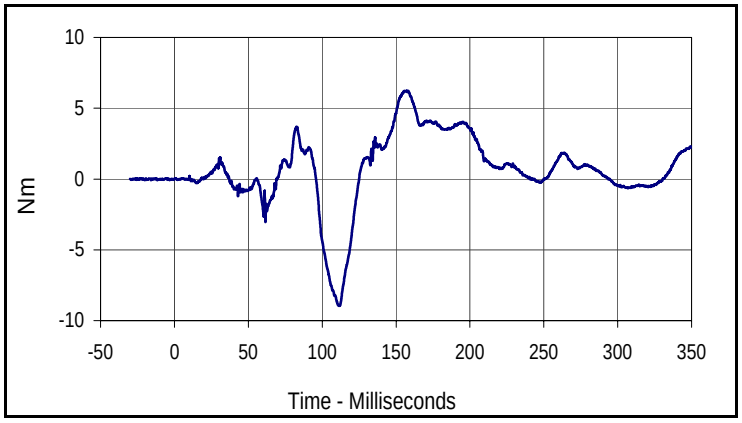
Curve Description			
Driver Lower Neck Force Resultant			
CURNO	Type	SAE Class	Units
012	RES	1000	Newtons
Max	Time	Min	Time
983.8	86.0	0.1	8.3



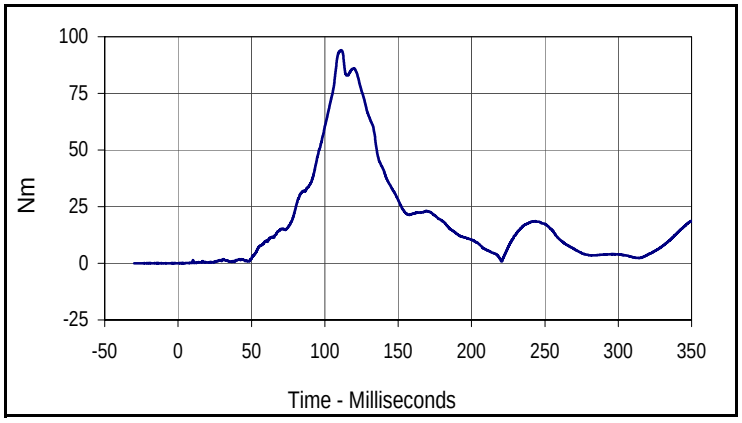
Curve Description			
Driver Lower Neck Moment X			
CURNO	Type	SAE Class	Units
015	FIL	600	Nm
Max	Time	Min	Time
4.4	190.0	-25.3	84.8



Curve Description			
Driver Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
016	FIL	600	Nm
Max	Time	Min	Time
18.4	349.7	-93.4	111.3

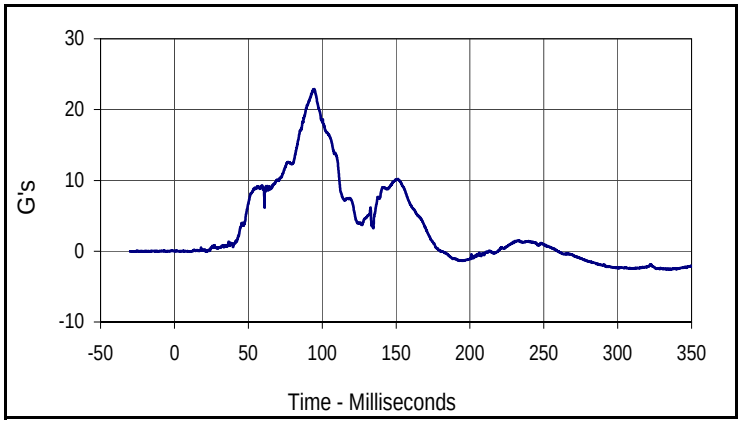


Curve Description			
Driver Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
017	FIL	600	Nm
Max	Time	Min	Time
6.2	157.3	-9.0	111.4



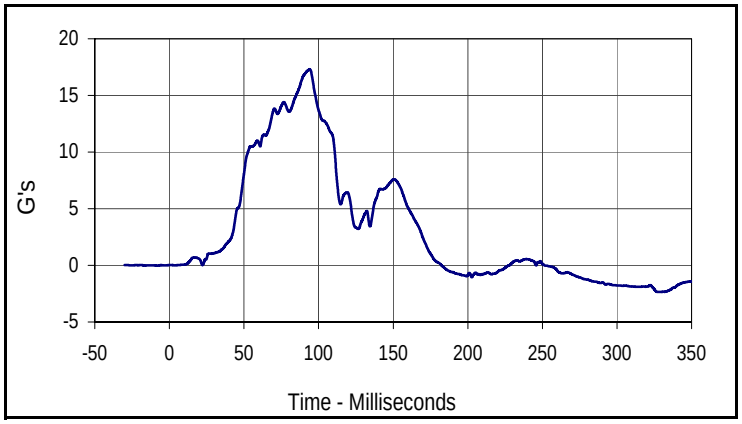
Curve Description			
Driver Lower Neck Moment Resultant			
CURNO	Type	SAE Class	Units
015	RES	600	Nm
Max	Time	Min	Time
94.0	111.2	0.0	0.0

Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801

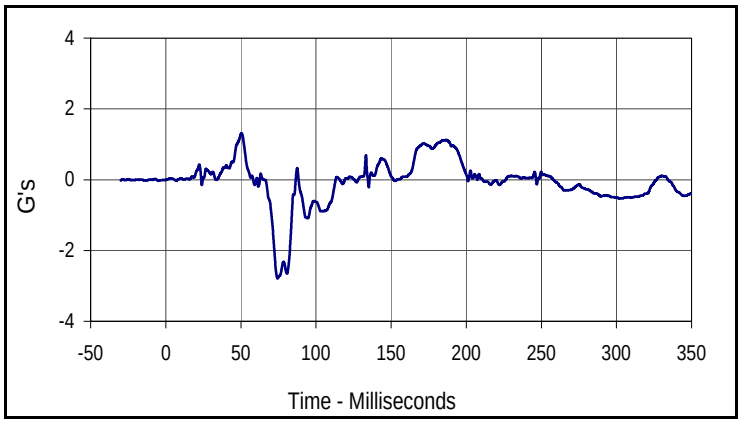


Curve Description			
Driver Lower Neck X			
CURNO	Type	SAE Class	Units
018	FIL	1000	G's
Max	Time	Min	Time
22.9	94.7	-2.6	335.2

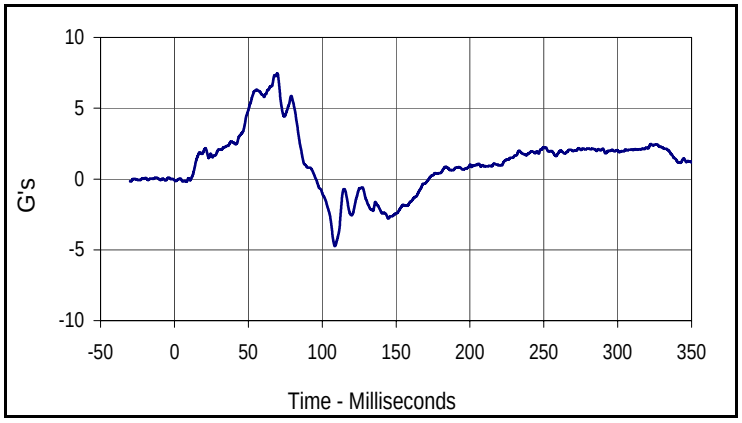
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



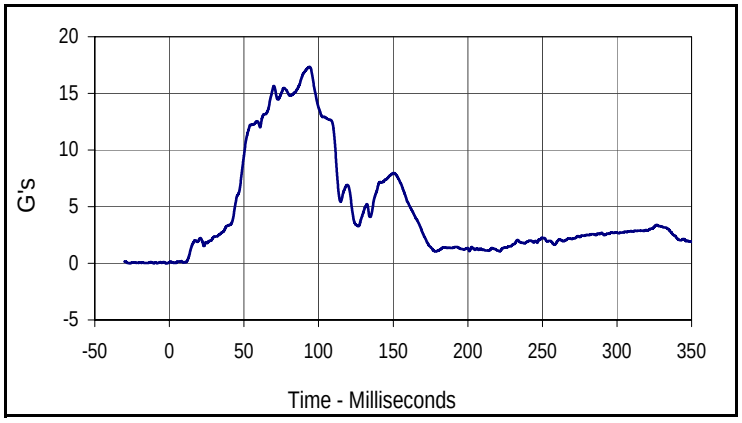
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
17.3	94.0	-2.3	329.3



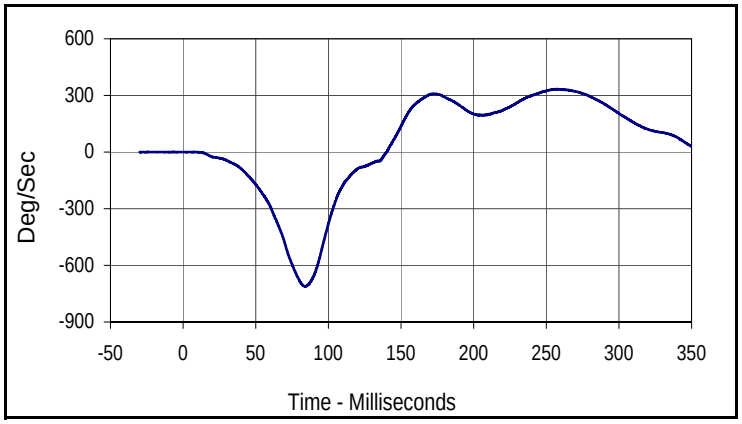
Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
1.3	50.5	-2.8	74.4



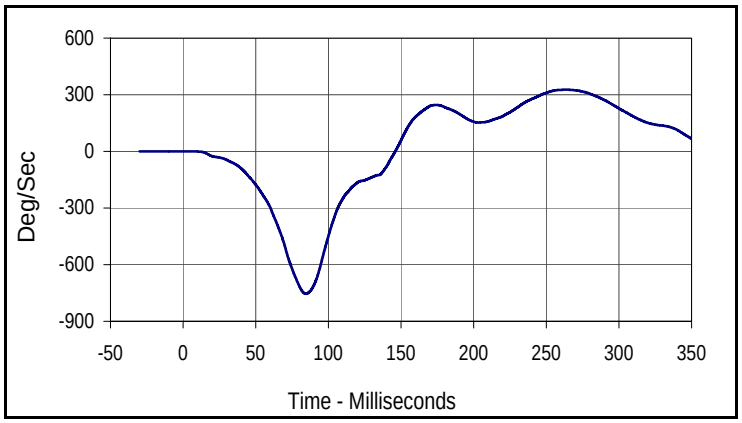
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
7.5	69.7	-4.7	108.6



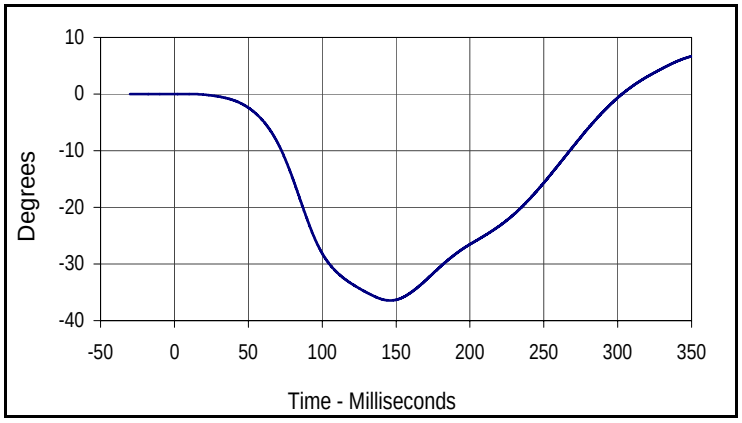
Curve Description			
Driver Chest Resultant			
CURNO	Type	SAE Class	Units
019	RES	180	G's
Max	Time	Min	Time
17.3	94.0	0.0	4.4



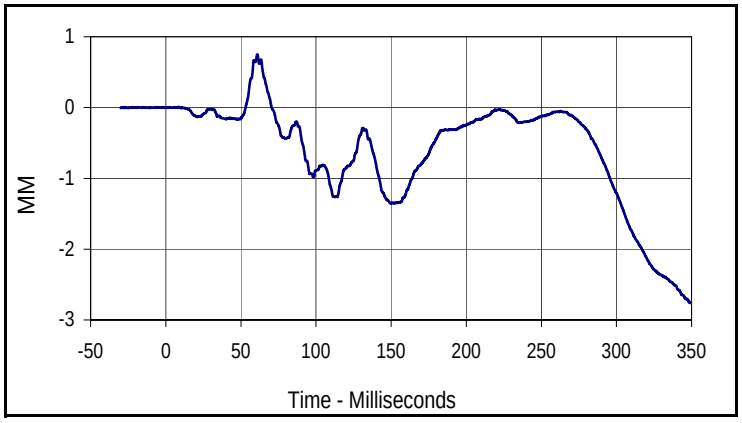
Curve Description			
Driver Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
022	FIL	1000	Deg/Sec
Max	Time	Min	Time
333.5	258.0	-712.7	84.2



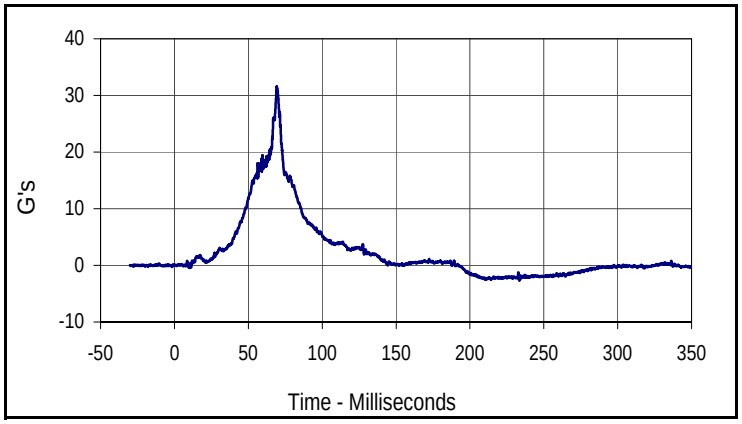
Curve Description			
Driver Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
022	COMP	NA	Deg/Sec
Max	Time	Min	Time
326.4	264.0	-754.6	84.5



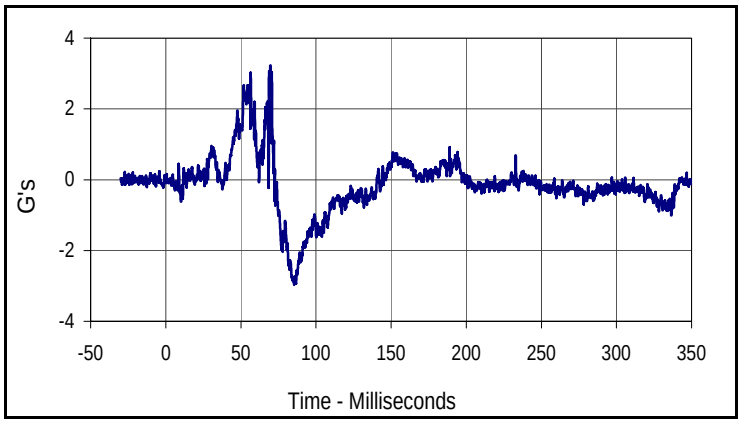
Curve Description			
Driver Chest Y Rotation			
CURNO	Type	SAE Class	Units
022	COMP-IN1	NA	Degrees
Max	Time	Min	Time
6.7	349.9	-36.4	146.1



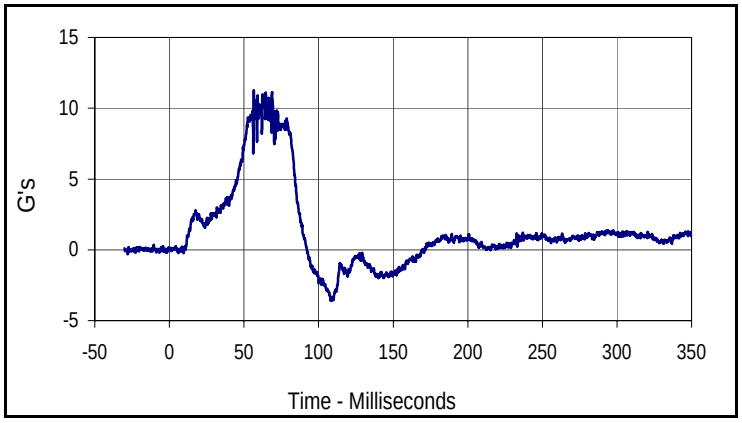
Curve Description			
Driver Chest Deflection			
CURNO	Type	SAE Class	Units
023	FIL	600	MM
Max	Time	Min	Time
0.8	60.9	-2.8	349.4



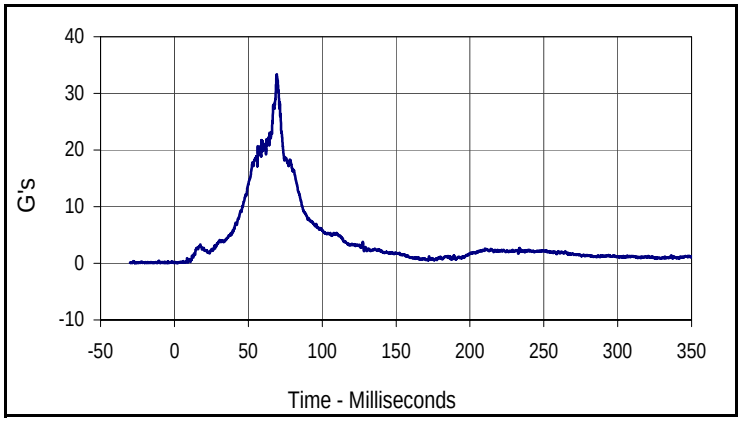
Curve Description			
Driver Pelvis X			
CURNO	Type	SAE Class	Units
024	FIL	1000	G's
Max	Time	Min	Time
31.6	69.3	-2.7	233.6



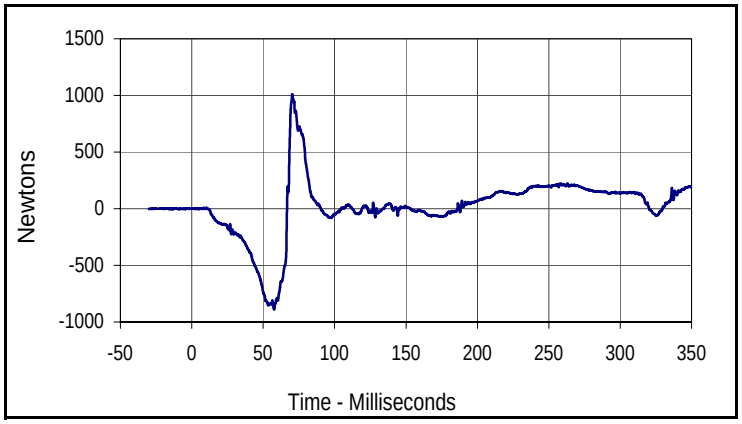
Curve Description			
Driver Pelvis Y			
CURNO	Type	SAE Class	Units
025	FIL	1000	G's
Max	Time	Min	Time
3.2	69.6	-3.0	85.5



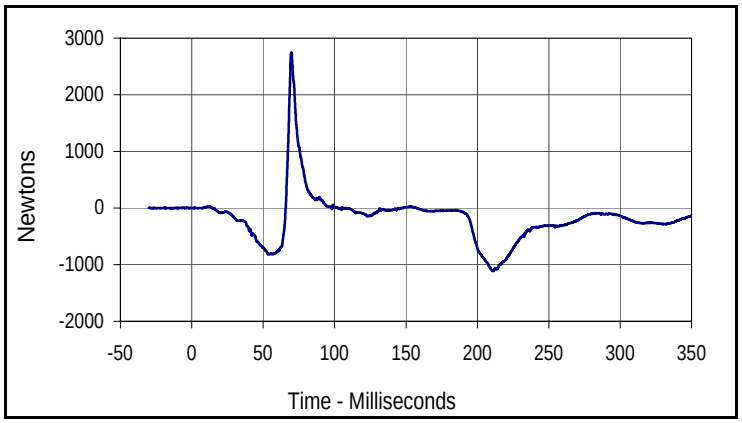
Curve Description			
Driver Pelvis Z			
CURNO	Type	SAE Class	Units
026	FIL	1000	G's
Max	Time	Min	Time
11.3	56.6	-3.6	108.1



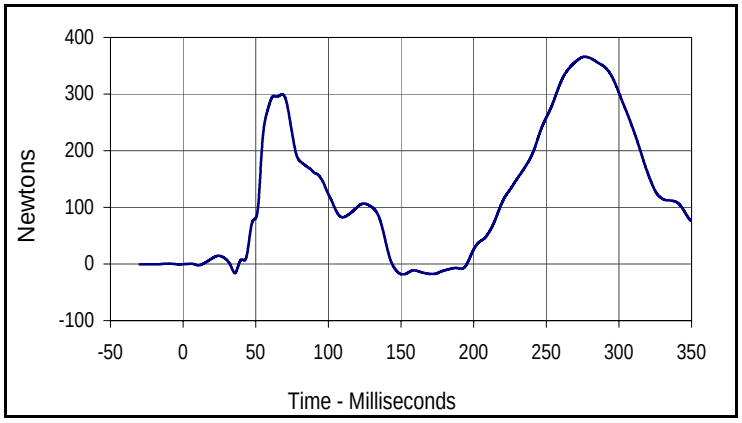
Curve Description			
Driver Pelvis Resultant			
CURNO	Type	SAE Class	Units
024	RES	1000	G's
Max	Time	Min	Time
33.4	69.3	0.0	2.3



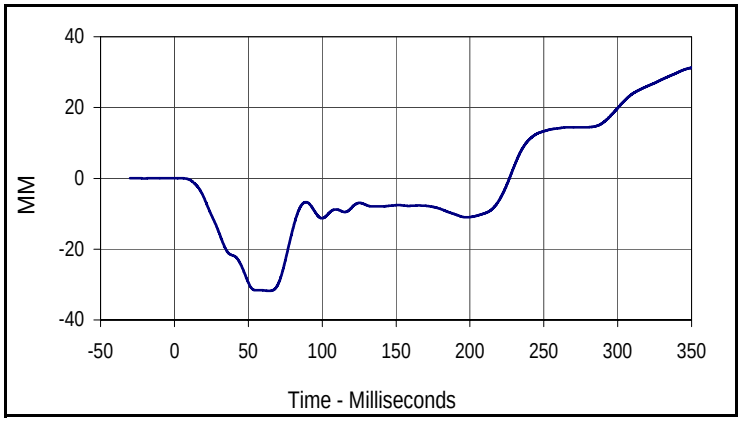
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
1008.5	70.4	-890.0	57.7



Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
2747.9	69.7	-1114.2	211.2

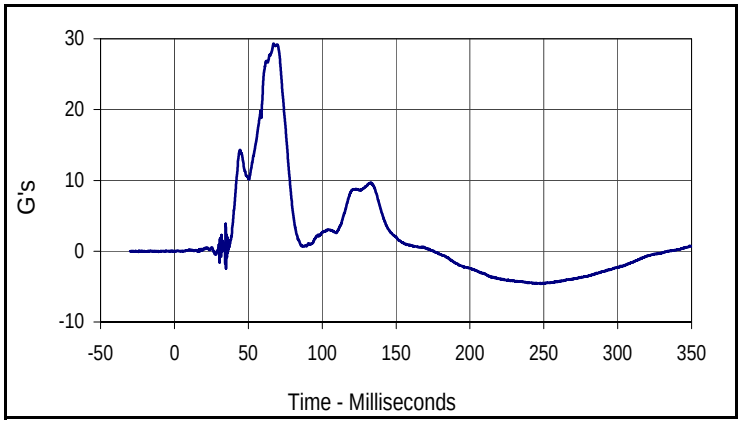


Curve Description			
Driver Lap Belt Force			
CURNO	Type	SAE Class	Units
029	FIL	60	Newtons
Max	Time	Min	Time
365.9	276.4	-18.3	151.3

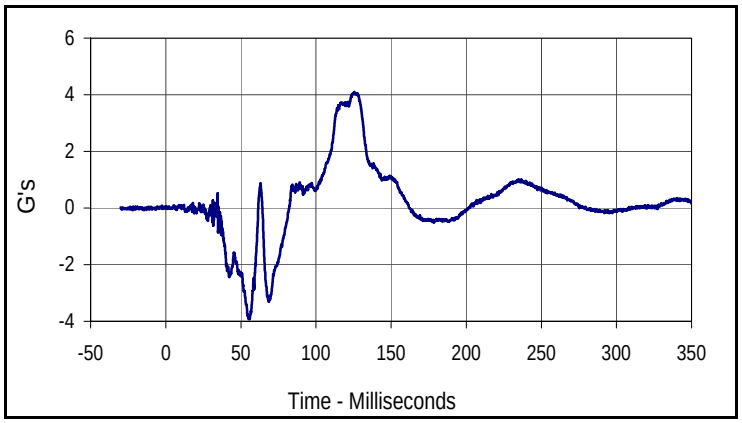


Curve Description			
Driver Lap Belt Pullout			
CURNO	Type	SAE Class	Units
030	FIL	60	MM
Max	Time	Min	Time
31.2	349.9	-31.8	64.3

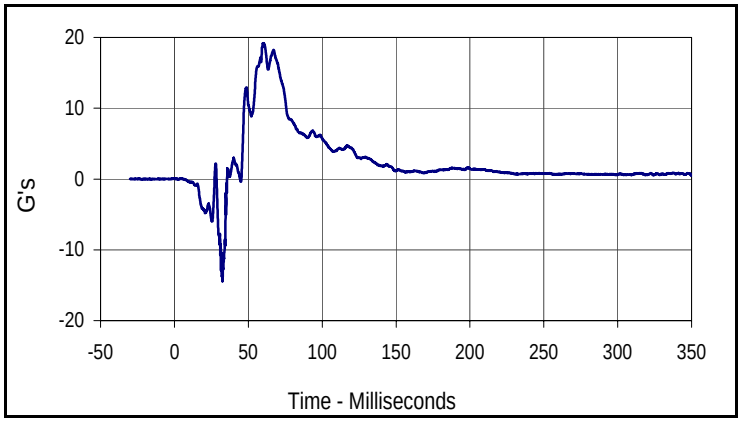
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



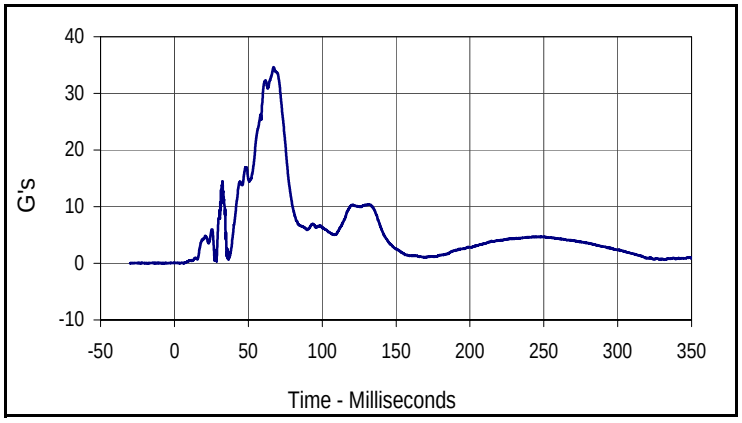
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
031	FIL	1000	G's
Max	Time	Min	Time
29.3	67.1	-4.6	248.0



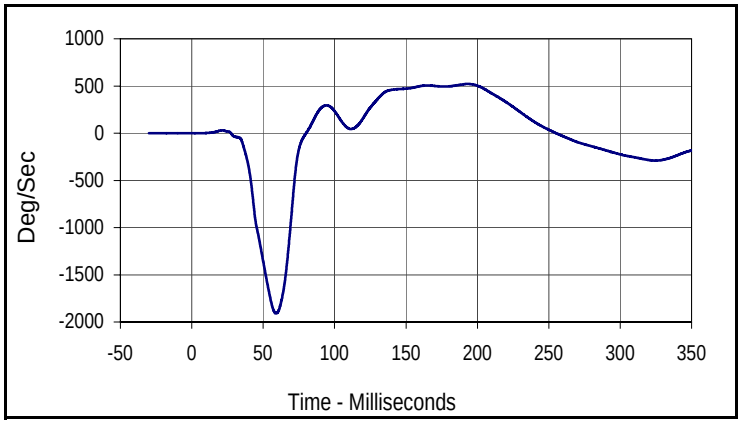
Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
032	FIL	1000	G's
Max	Time	Min	Time
4.1	125.6	-3.9	55.6



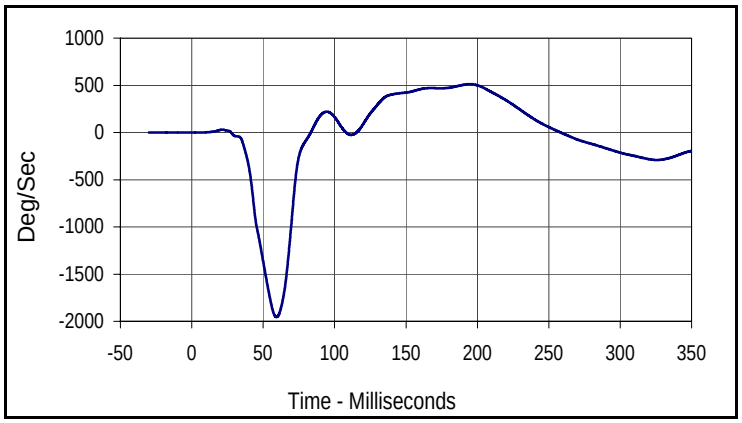
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
033	FIL	1000	G's
Max	Time	Min	Time
19.2	60.4	-14.4	32.6



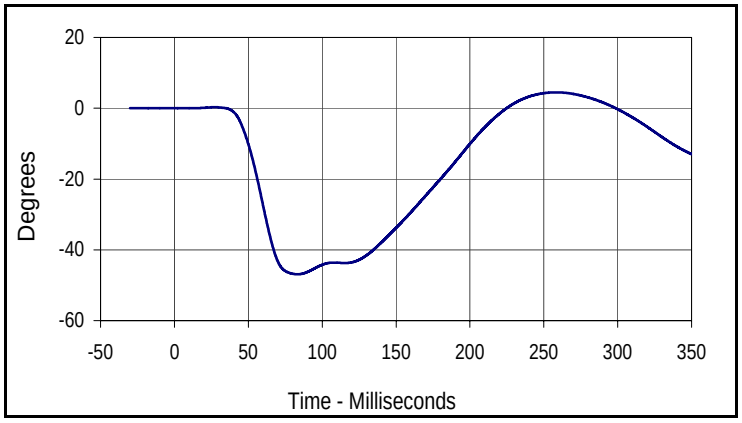
Curve Description			
Passenger Head Resultant			
CURNO	Type	SAE Class	Units
031	RES	1000	G's
Max	Time	Min	Time
34.7	67.1	0.0	3.7



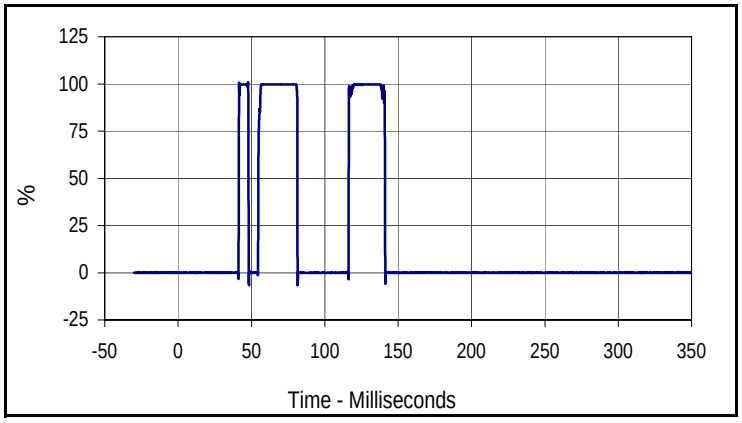
Curve Description			
Passenger Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
034	FIL	1000	Deg/Sec
Max	Time	Min	Time
522.9	193.5	-1909.6	59.0



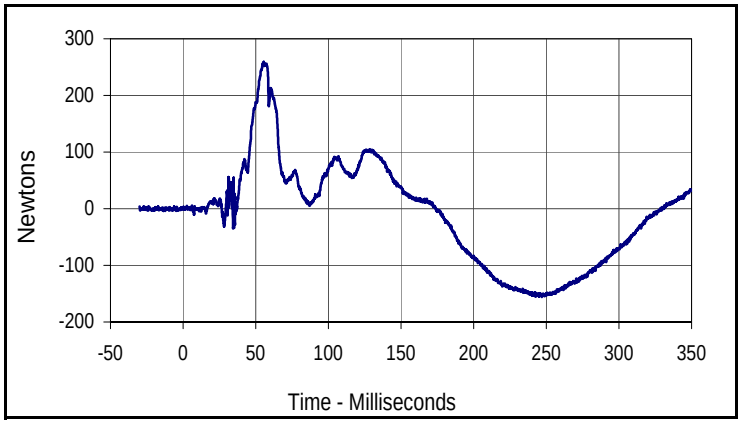
Curve Description			
Passenger Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
034	COMP	NA	Deg/Sec
Max	Time	Min	Time
512.8	194.4	-1954.4	59.3



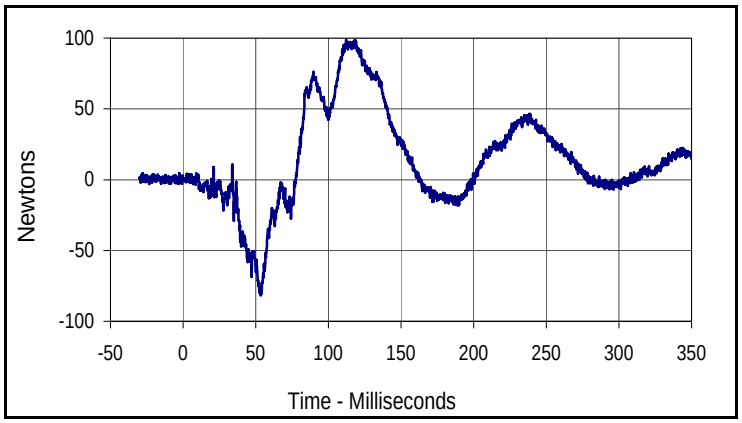
Curve Description			
Passenger Head Y Rotation			
CURNO	Type	SAE Class	Units
034	COMP-IN1	NA	Degrees
Max	Time	Min	Time
4.5	258.4	-46.9	83.4



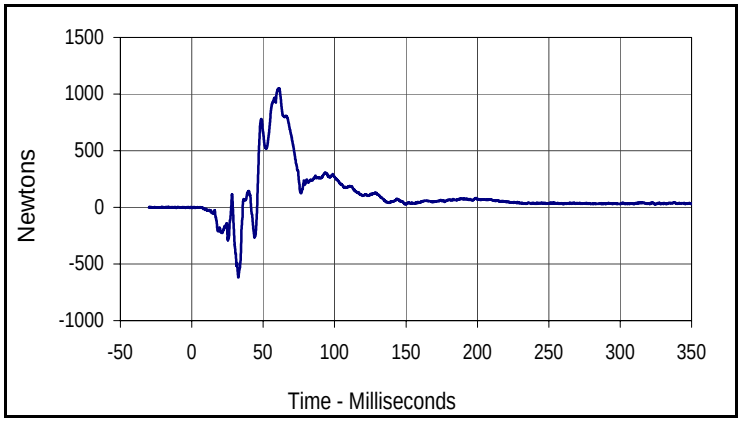
Curve Description			
Passenger Headrest Contact			
CURNO	Type	SAE Class	Units
035	FIL	1000	%
Max	Time	Min	Time
100.8	47.8	-6.5	81.6



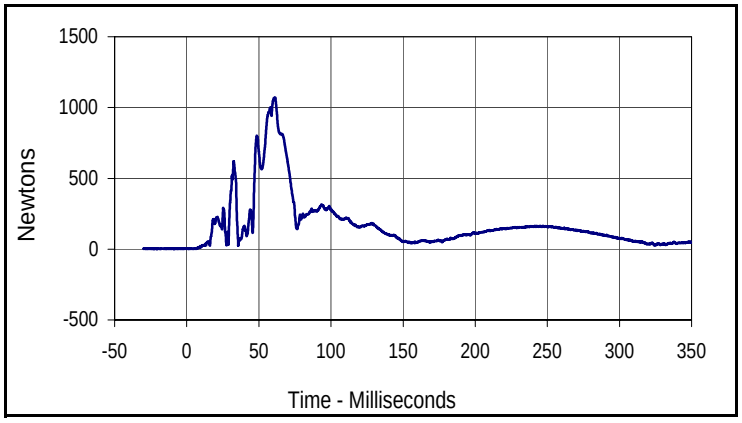
Curve Description			
Passenger Upper Neck Force X			
CURNO	Type	SAE Class	Units
036	FIL	1000	Newtons
Max	Time	Min	Time
259.5	55.5	-155.9	247.0



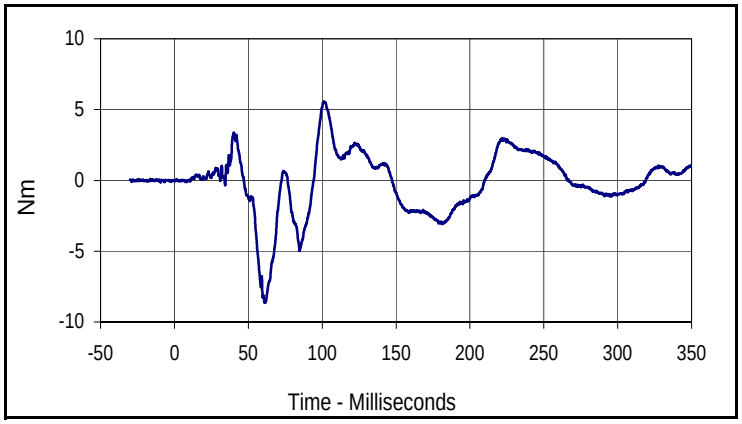
Curve Description			
Passenger Upper Neck Force Y			
CURNO	Type	SAE Class	Units
037	FIL	1000	Newtons
Max	Time	Min	Time
99.0	112.3	-81.7	53.5



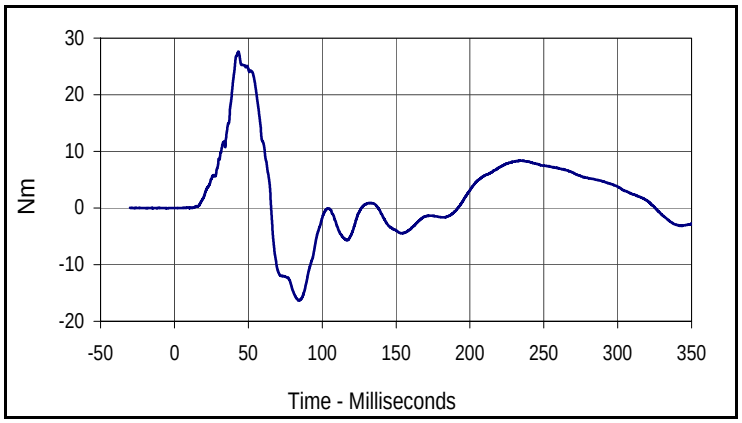
Curve Description			
Passenger Upper Neck Force Z			
CURNO	Type	SAE Class	Units
038	FIL	1000	Newtons
Max	Time	Min	Time
1050.1	61.3	-619.8	32.6



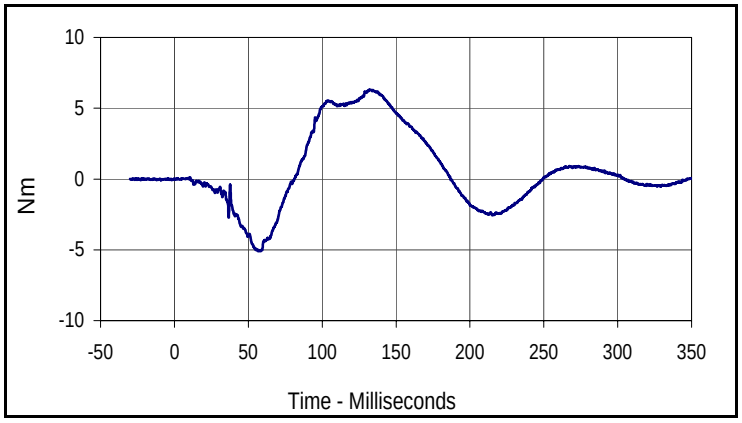
Curve Description			
Passenger Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
036	RES	1000	Newtons
Max	Time	Min	Time
1070.3	61.3	0.7	2.9



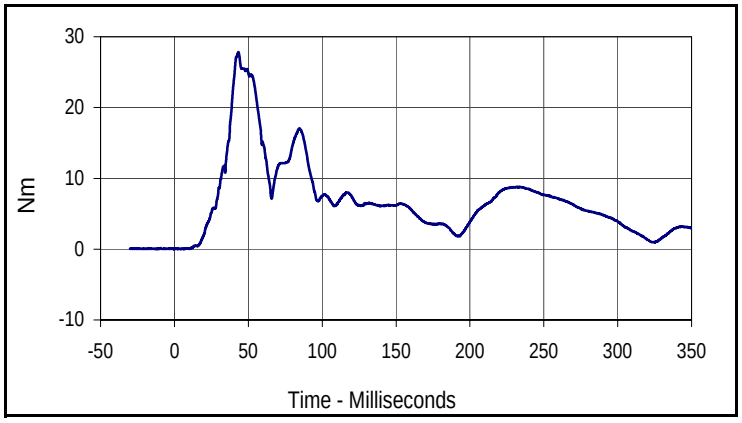
Curve Description			
Passenger Upper Neck Moment X			
CURNO	Type	SAE Class	Units
039	FIL	600	Nm
Max	Time	Min	Time
5.6	101.1	-8.7	61.2



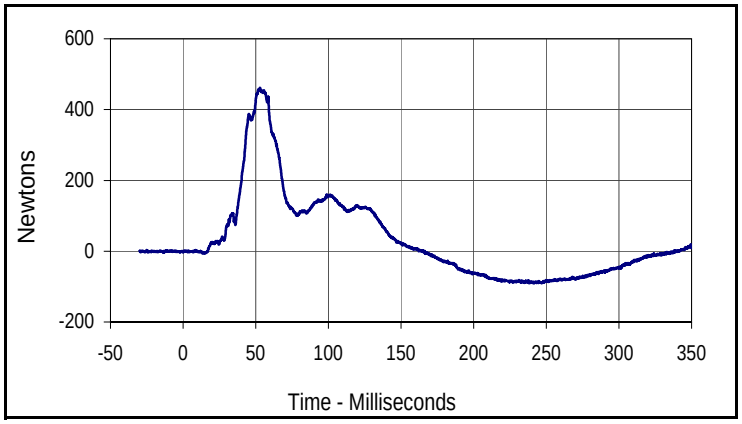
Curve Description			
Passenger Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
040	FIL	600	Nm
Max	Time	Min	Time
27.6	43.4	-16.3	84.0



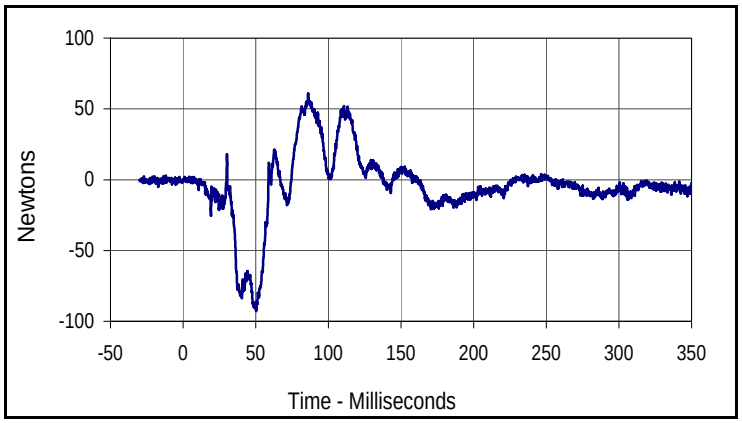
Curve Description			
Passenger Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
041	FIL	600	Nm
Max	Time	Min	Time
6.3	132.3	-5.1	58.4



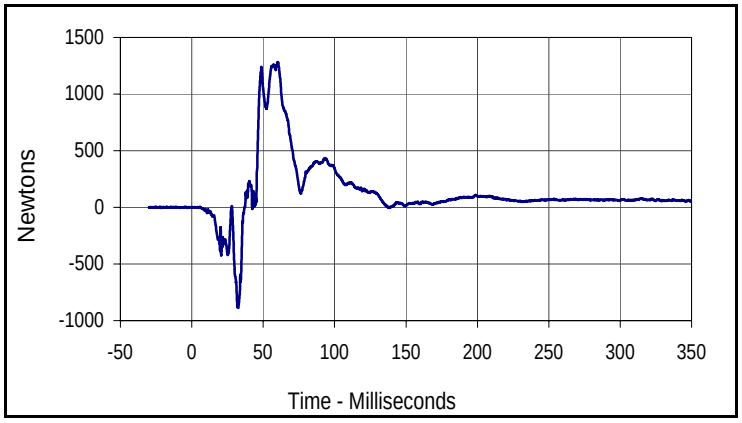
Curve Description			
Passenger Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
039	RES	600	Nm
Max	Time	Min	Time
27.8	43.4	0.0	4.4



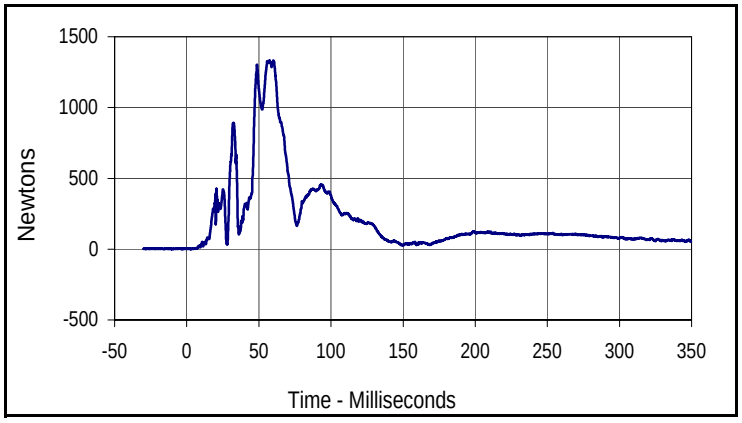
Curve Description			
Passenger Lower Neck Force X			
CURNO	Type	SAE Class	Units
042	FIL	1000	Newtons
Max	Time	Min	Time
461.4	52.9	-90.5	246.9



Curve Description			
Passenger Lower Neck Force Y			
CURNO	Type	SAE Class	Units
043	FIL	1000	Newtons
Max	Time	Min	Time
61.0	86.1	-92.8	50.3

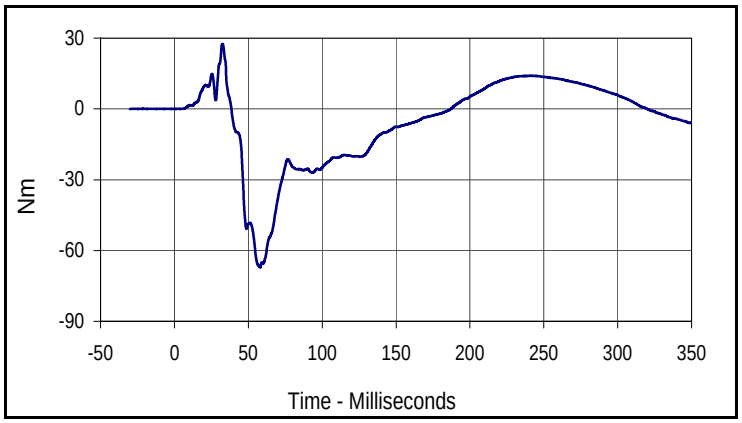


Curve Description			
Passenger Lower Neck Force Z			
CURNO	Type	SAE Class	Units
044	FIL	1000	Newtons
Max	Time	Min	Time
1282.6	60.1	-887.5	32.5

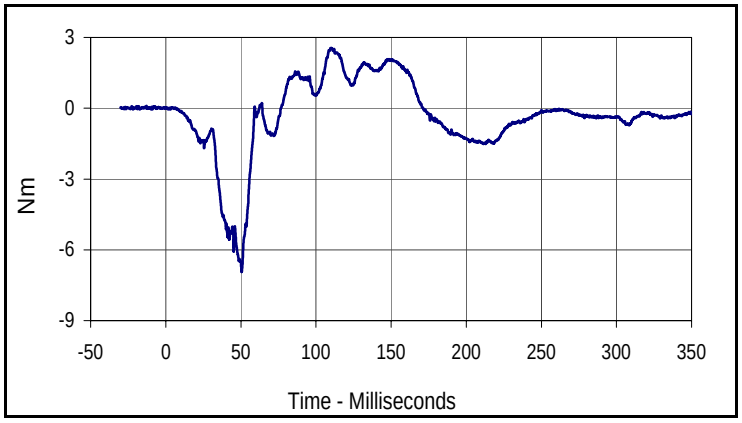


Curve Description			
Passenger Lower Neck Force Resultant			
CURNO	Type	SAE Class	Units
042	RES	1000	Newtons
Max	Time	Min	Time
1334.7	57.3	0.5	2.8

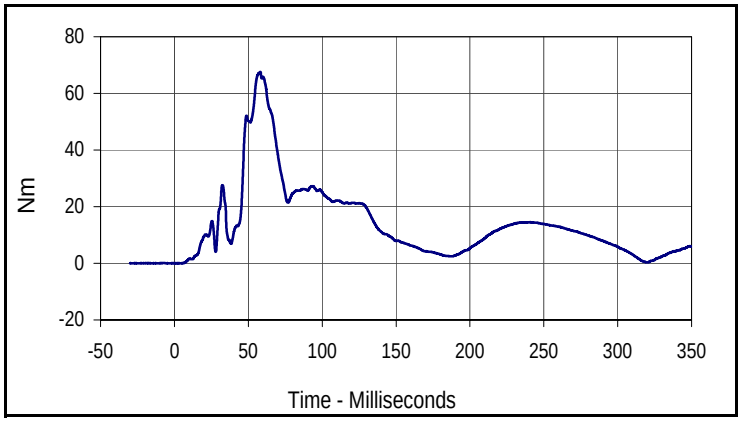
Curve Description			
Passenger Lower Neck Moment X			
CURNO	Type	SAE Class	Units
045	FIL	600	Nm
Max	Time	Min	Time
8.1	115.3	-10.5	50.7



Curve Description			
Passenger Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
046	FIL	600	Nm
Max	Time	Min	Time
27.5	32.7	-67.2	58.2

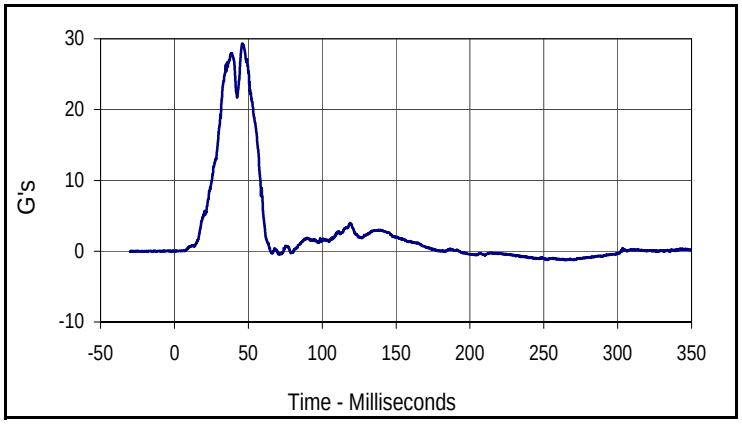


Curve Description			
Passenger Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
047	FIL	600	Nm
Max	Time	Min	Time
2.6	110.2	-6.9	50.6



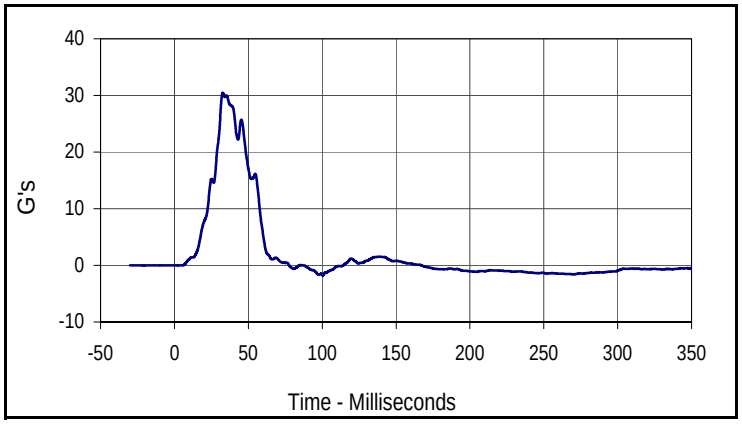
Curve Description			
Passenger Lower Neck Moment Resultant			
CURNO	Type	SAE Class	Units
045	RES	600	Nm
Max	Time	Min	Time
67.6	58.2	0.0	1.5

Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801

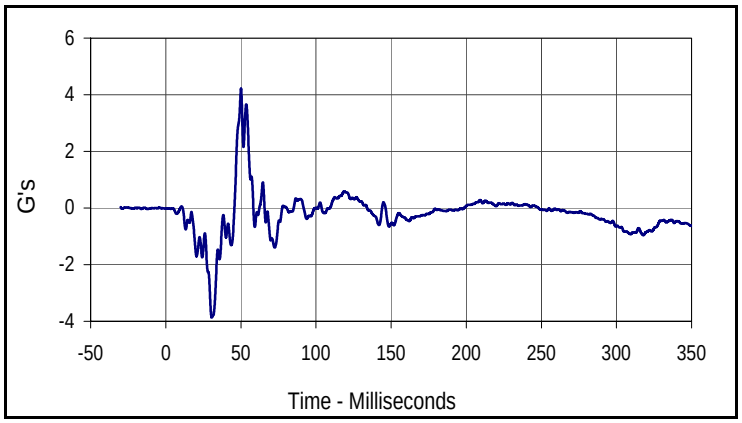


Curve Description			
Passenger Lower Neck X			
CURNO	Type	SAE Class	Units
048	FIL	1000	G's
Max	Time	Min	Time
29.3	46.0	-1.3	264.7

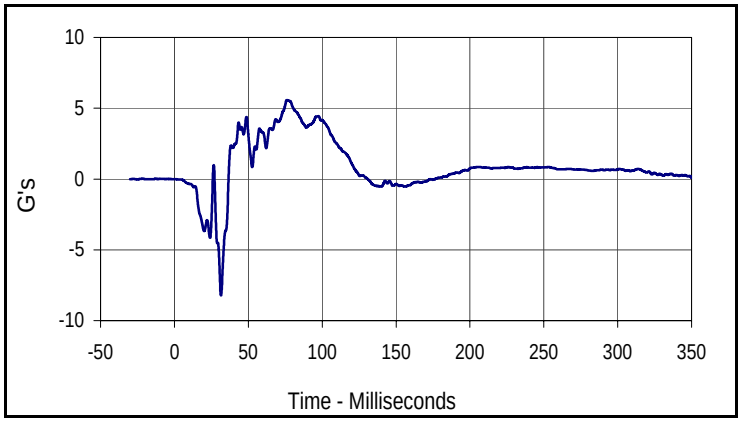
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



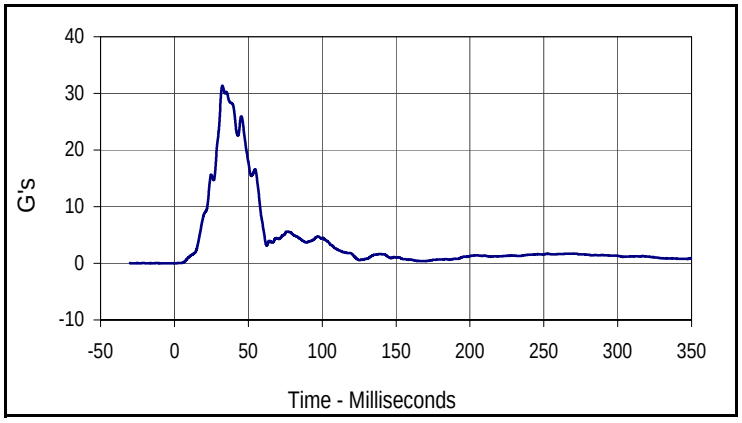
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
049	FIL	180	G's
Max	Time	Min	Time
30.5	32.7	-1.8	100.4



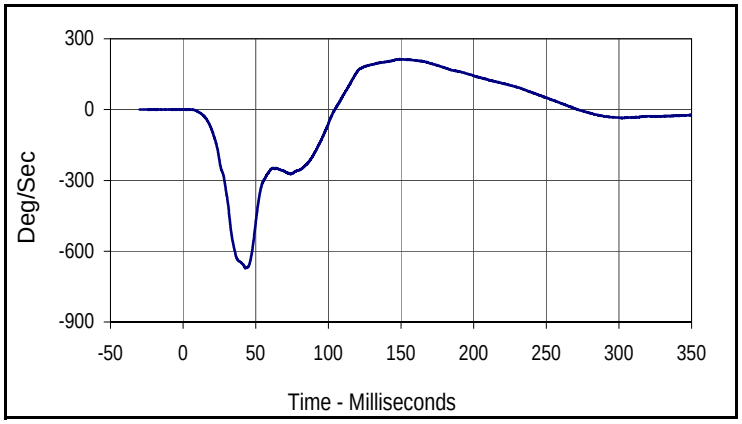
Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
050	FIL	180	G's
Max	Time	Min	Time
4.2	50.1	-3.9	30.6



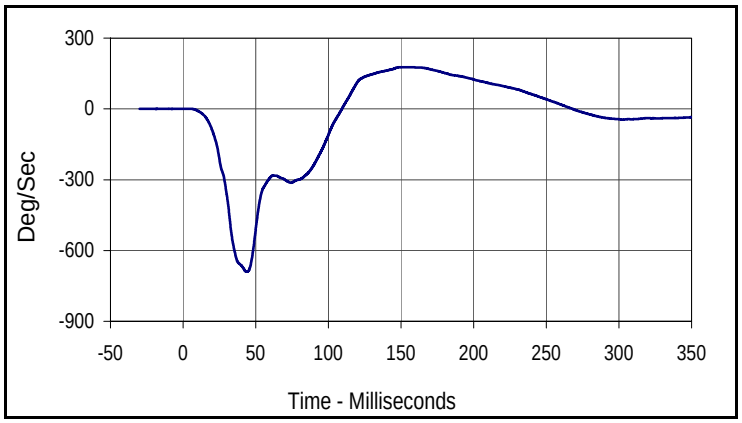
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
051	FIL	180	G's
Max	Time	Min	Time
5.6	76.3	-8.2	31.5



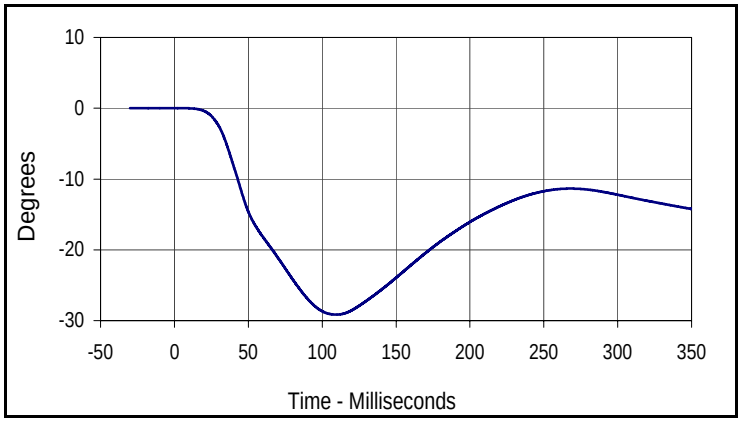
Curve Description			
Passenger Chest Resultant			
CURNO	Type	SAE Class	Units
049	RES	180	G's
Max	Time	Min	Time
31.4	32.5	0.0	1.4



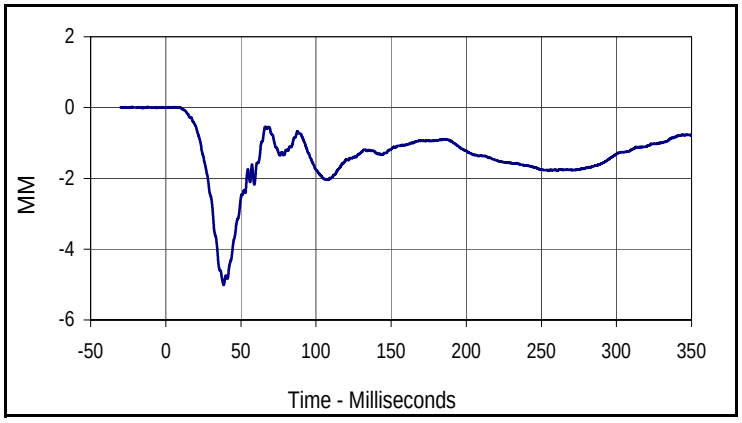
Curve Description			
Passenger Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
052	FIL	1000	Deg/Sec
Max	Time	Min	Time
214.8	149.1	-672.3	42.8



Curve Description			
Passenger Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
052	COMP	NA	Deg/Sec
Max	Time	Min	Time
177.1	156.9	-690.2	43.8

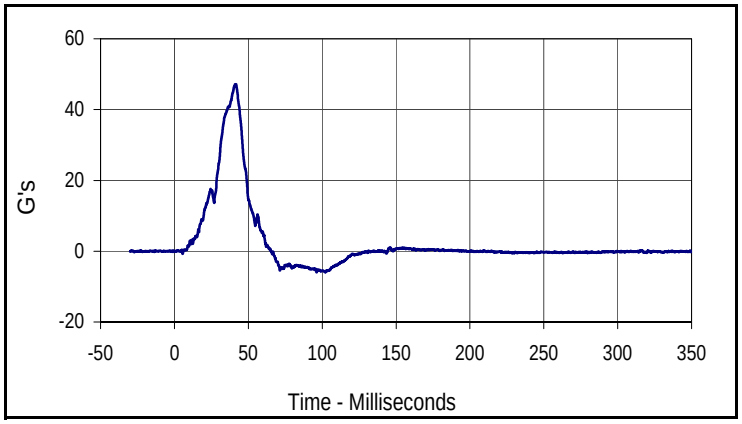


Curve Description			
Passenger Chest Y Rotation			
CURNO	Type	SAE Class	Units
052	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.0	1.5	-29.2	109.3

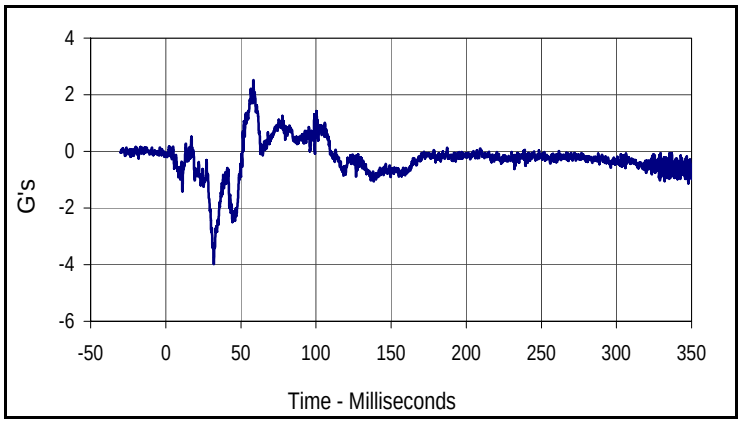


Curve Description			
Passenger Chest Deflection			
CURNO	Type	SAE Class	Units
053	FIL	600	MM
Max	Time	Min	Time
0.0	1.4	-5.0	38.6

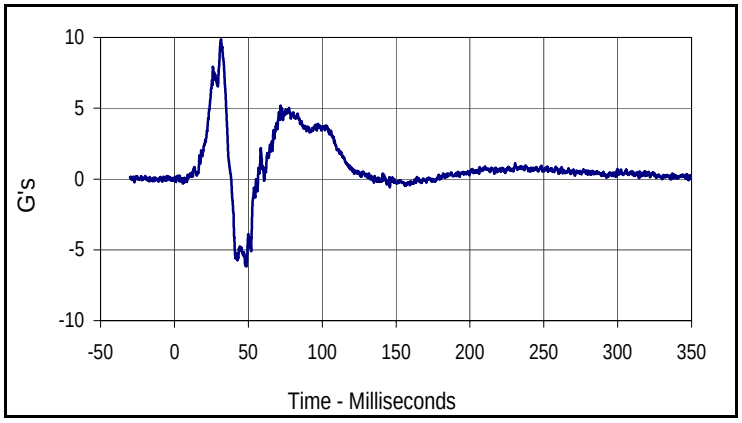
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



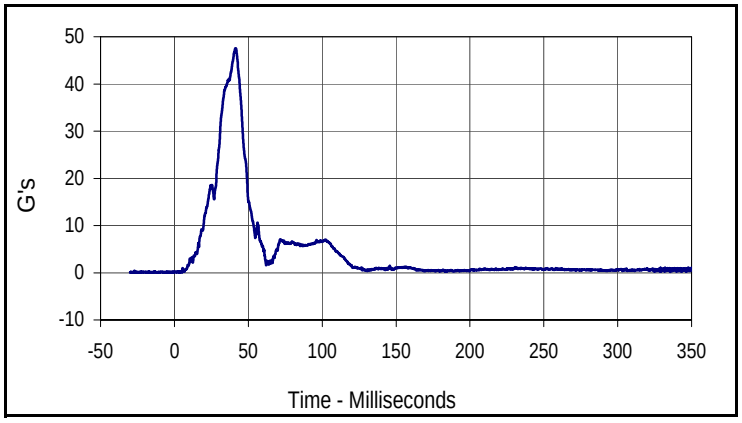
Curve Description			
Passenger Pelvis X			
CURNO	Type	SAE Class	Units
054	FIL	1000	G's
Max	Time	Min	Time
47.2	41.5	-6.0	102.0



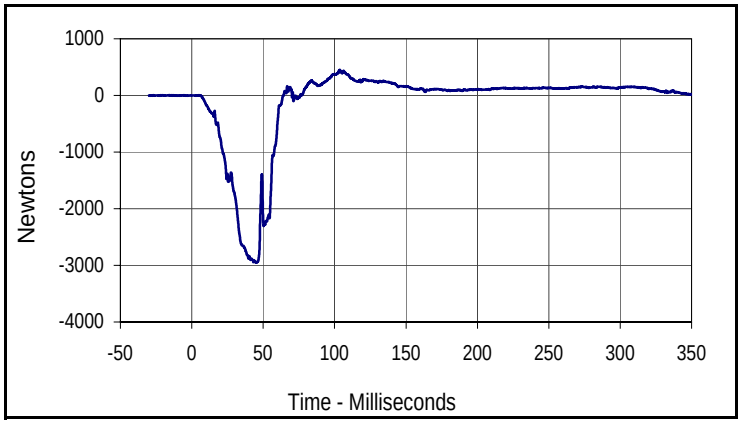
Curve Description			
Passenger Pelvis Y			
CURNO	Type	SAE Class	Units
055	FIL	1000	G's
Max	Time	Min	Time
2.5	58.4	-4.0	32.0



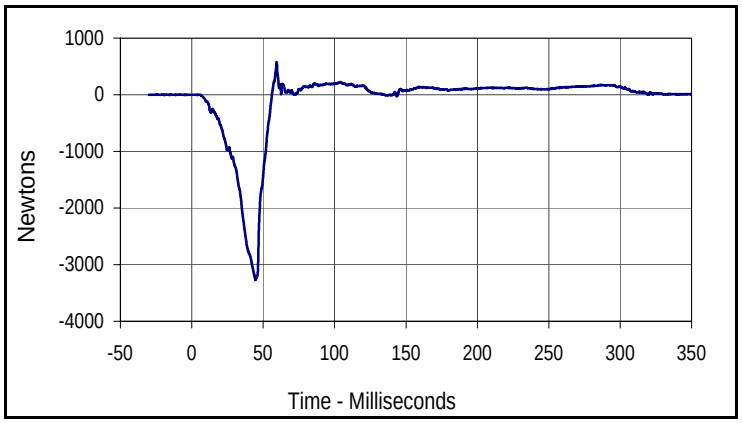
Curve Description			
Passenger Pelvis Z			
CURNO	Type	SAE Class	Units
056	FIL	1000	G's
Max	Time	Min	Time
9.9	31.5	-6.2	48.7



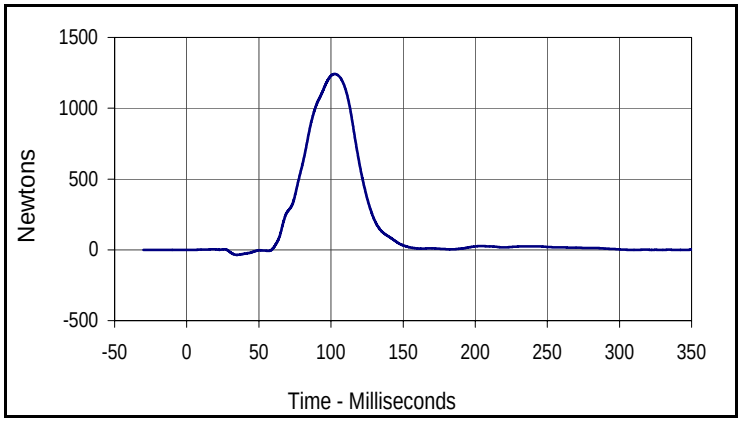
Curve Description			
Passenger Pelvis Resultant			
CURNO	Type	SAE Class	Units
054	RES	1000	G's
Max	Time	Min	Time
47.5	41.4	0.0	3.5



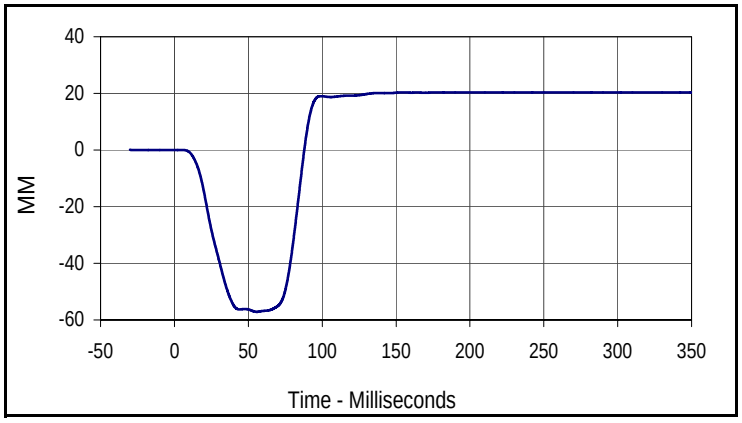
Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
057	FIL	600	Newtons
Max	Time	Min	Time
453.6	103.6	-2951.1	45.5



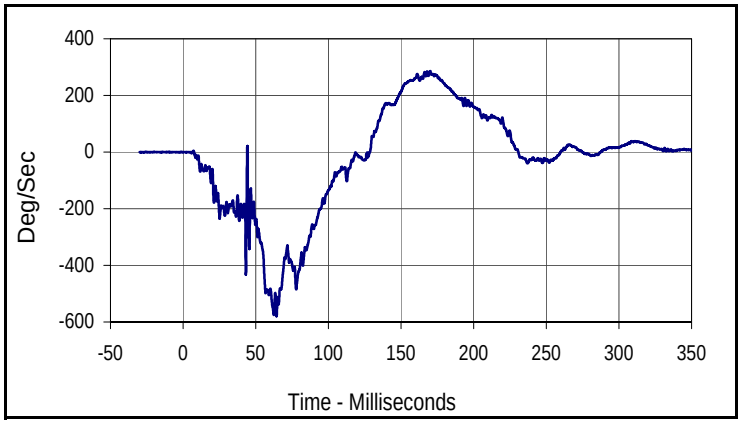
Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
058	FIL	600	Newtons
Max	Time	Min	Time
576.9	59.4	-3269.2	44.7



Curve Description			
Passenger Lap Belt Force			
CURNO	Type	SAE Class	Units
059	FIL	60	Newtons
Max	Time	Min	Time
1241.7	102.6	-35.8	34.7

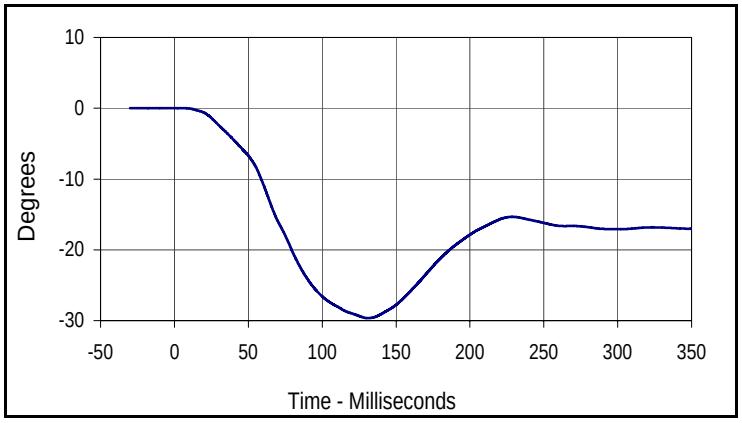


Curve Description			
Passenger Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
060	FIL	60	MM
Max	Time	Min	Time
20.4	304.3	-57.1	55.8

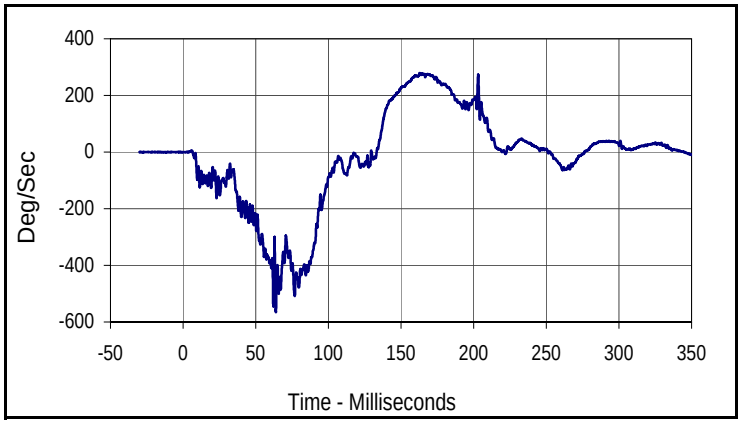


Curve Description			
Driver Seat Back Left Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
061	FIL	1000	Deg/Sec
Max	Time	Min	Time
286.1	170.1	-579.2	64.4

Curve Description			
Driver Seat Back Left Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
061	COMP	NA	Deg/Sec
Max	Time	Min	Time
243.7	170.2	-581.3	62.3

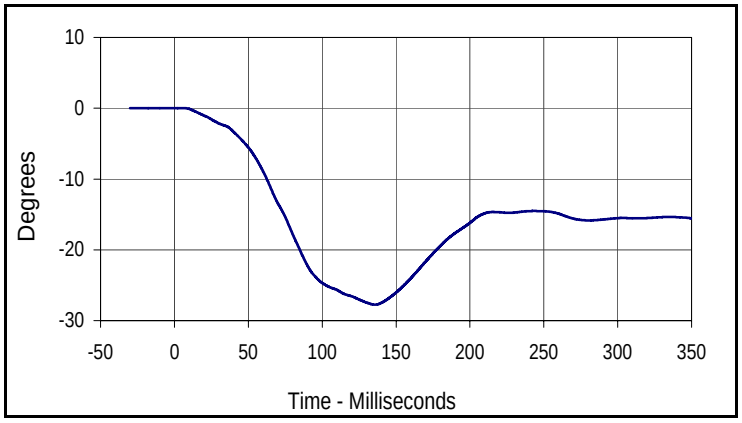


Curve Description			
Driver Seat Back Left Side Y Rotation			
CURNO	Type	SAE Class	Units
061	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.0	1.3	-29.6	130.5

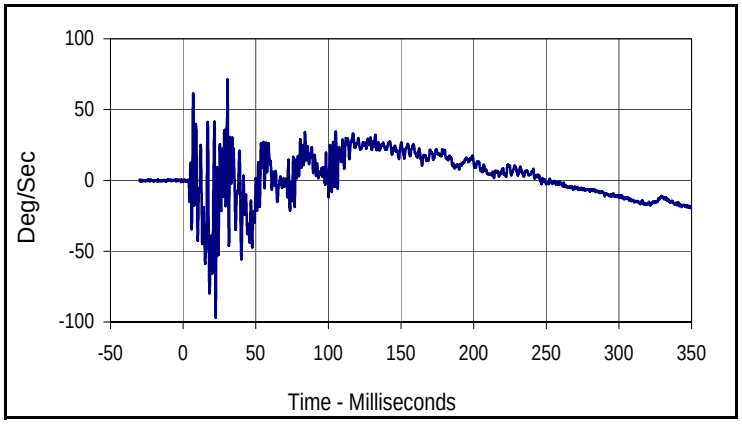


Curve Description			
Driver Seat Back Right Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
062	FIL	1000	Deg/Sec
Max	Time	Min	Time
279.1	163.0	-564.8	63.8

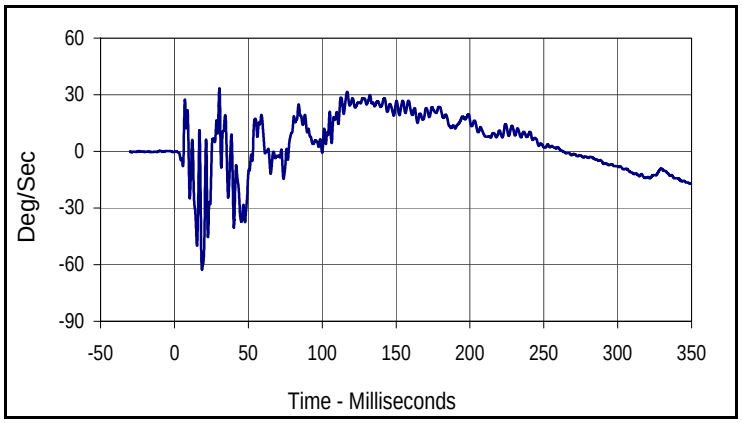
Curve Description			
Driver Seat Back Right Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
062	COMP	NA	Deg/Sec
Max	Time	Min	Time
239.0	168.7	-516.5	76.9



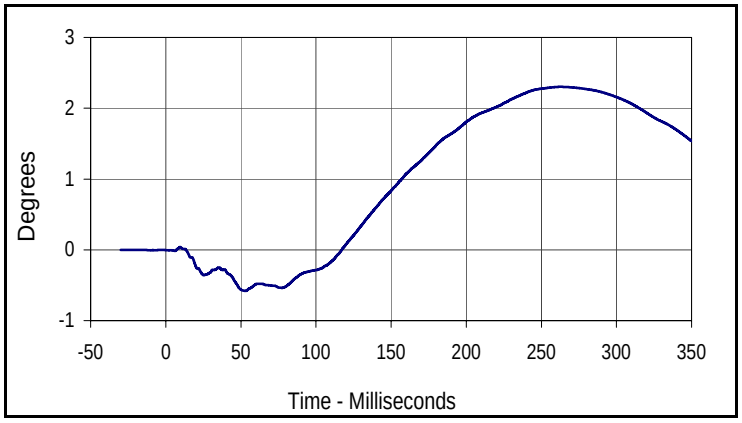
Curve Description			
Driver Seat Back Right Side Y Rotation			
CURNO	Type	SAE Class	Units
062	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.0	6.5	-27.7	135.8



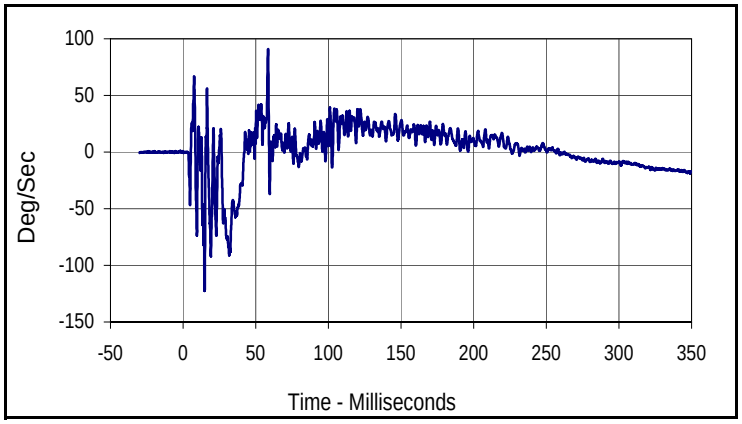
Curve Description			
Vehicle Left Front Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
063	FIL	1000	Deg/Sec
Max	Time	Min	Time
71.6	30.6	-96.6	22.4



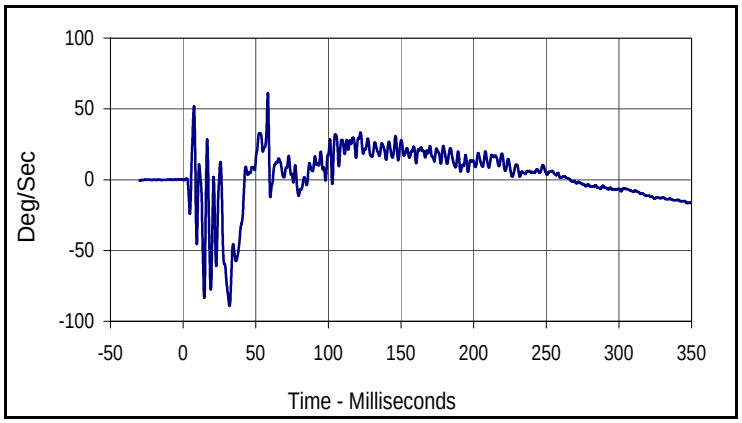
Curve Description			
Vehicle Left Front Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
063	COMP	NA	Deg/Sec
Max	Time	Min	Time
33.4	30.5	-62.5	18.7



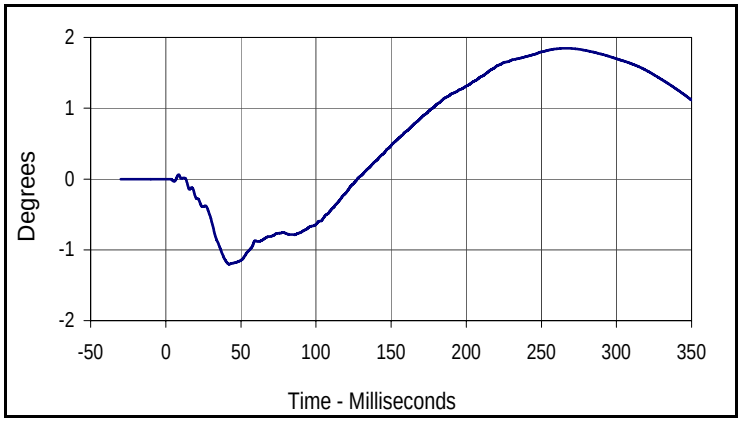
Curve Description			
Vehicle Left Front Sill Y Rotation			
CURNO	Type	SAE Class	Units
063	COMP-IN1	NA	Degrees
Max	Time	Min	Time
2.3	262.9	-0.6	53.1



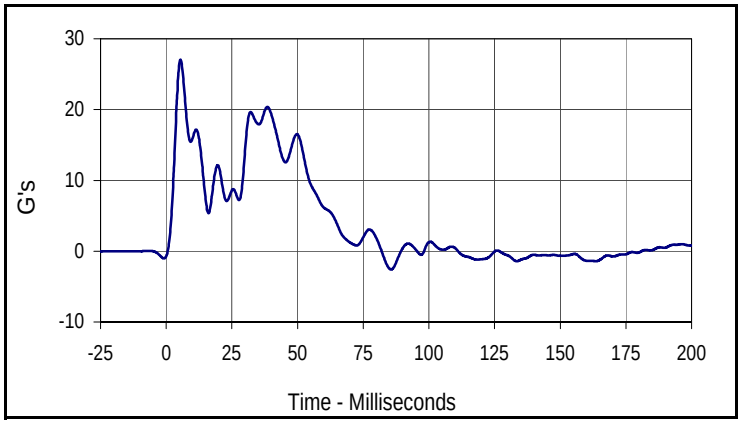
Curve Description			
Vehicle Right Rear Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
064	FIL	1000	Deg/Sec
Max	Time	Min	Time
91.0	58.5	-122.6	14.8



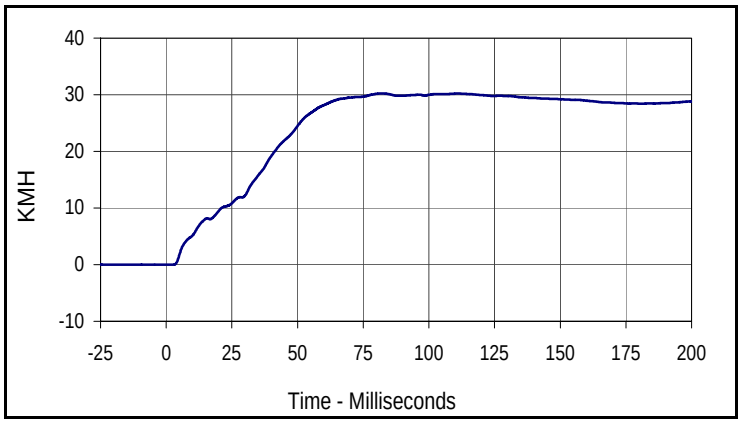
Curve Description			
Vehicle Right Rear Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
064	COMP	NA	Deg/Sec
Max	Time	Min	Time
61.2	58.4	-89.1	32.0



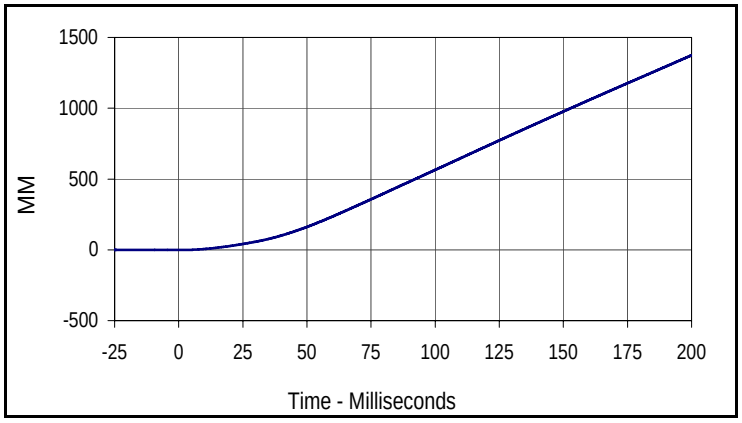
Curve Description			
Vehicle Right Rear Sill Y Rotation			
CURNO	Type	SAE Class	Units
064	COMP-IN1	NA	Degrees
Max	Time	Min	Time
1.8	266.4	-1.2	42.3



Curve Description			
Vehicle Left Front X-Member Primary X			
CURNO	Type	SAE Class	Units
065	FIL	60	G's
Max	Time	Min	Time
27.0	5.4	-2.6	85.6

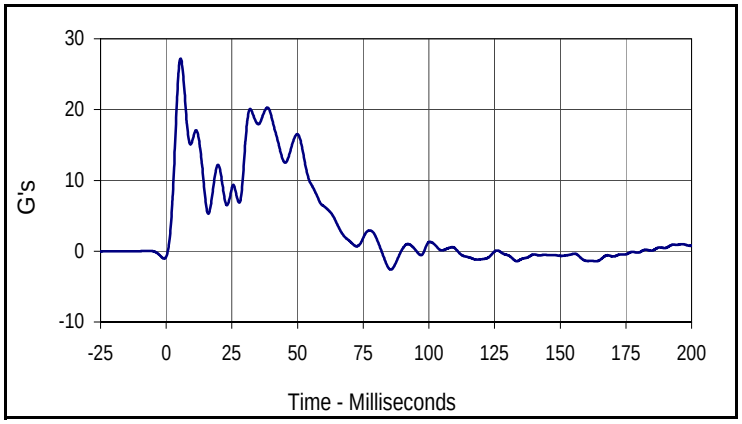


Curve Description			
Vehicle LF X-Member Primary X Velocity			
CURNO	Type	SAE Class	Units
065	IN1	180	KMH
Max	Time	Min	Time
30.2	82.4	0.0	2.6

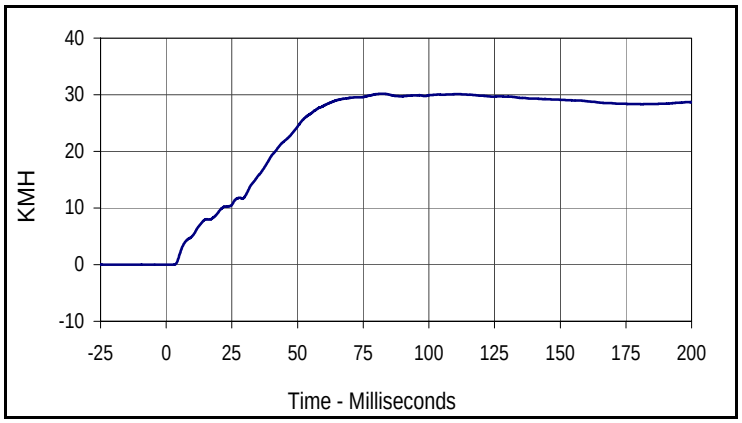


Curve Description			
Vehicle LF X-Member Primary X Displacement			
CURNO	Type	SAE Class	Units
065	IN2	180	MM
Max	Time	Min	Time
1374.1	200.0	0.0	0.0

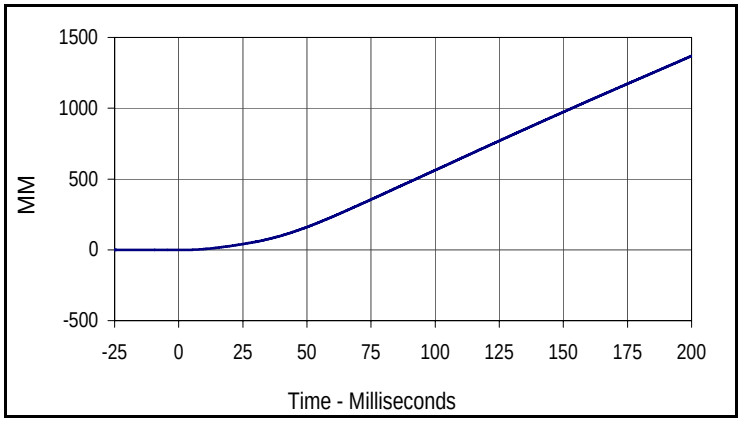
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



Curve Description			
Vehicle Left Front X-Member Red. X			
CURNO	Type	SAE Class	Units
066	FIL	60	G's
Max	Time	Min	Time
27.2	5.5	-2.6	85.5

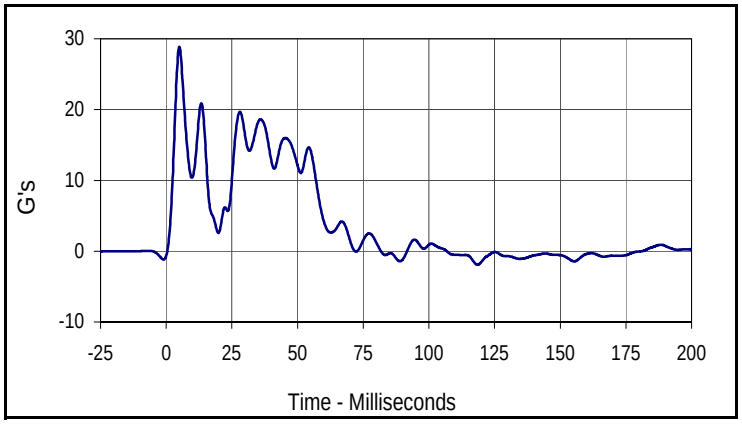


Curve Description			
Vehicle LF X-Member Red. X Velocity			
CURNO	Type	SAE Class	Units
066	IN1	180	KMH
Max	Time	Min	Time
30.2	82.6	0.0	2.7

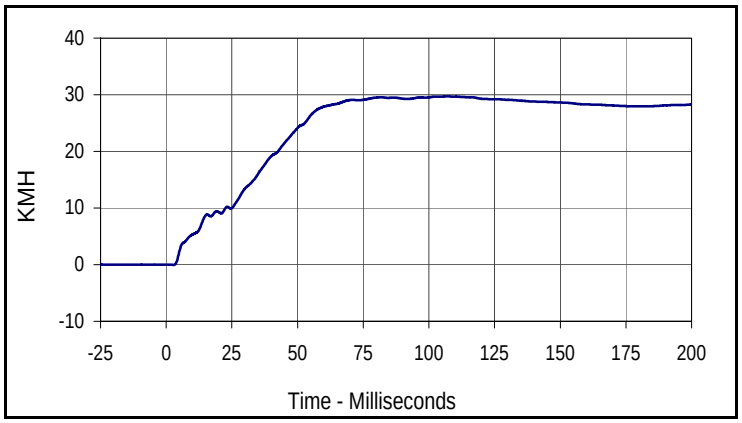


Curve Description			
Vehicle LF X-Member Red. X Displacement			
CURNO	Type	SAE Class	Units
066	IN2	180	MM
Max	Time	Min	Time
1369.3	200.0	0.0	3.1

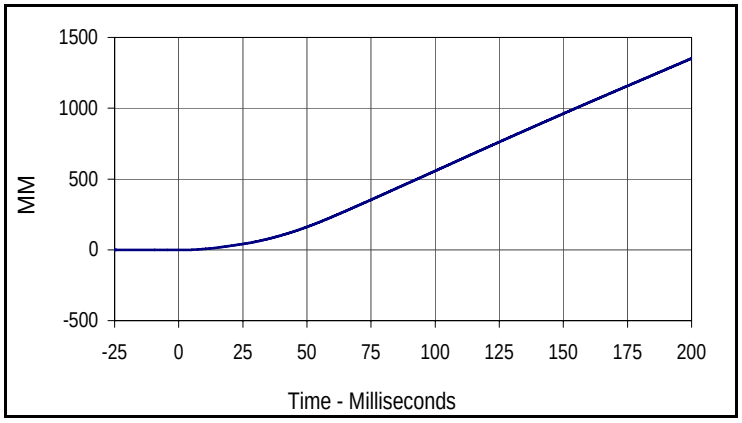
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



Curve Description			
Vehicle Right Rear X-Member Primary X			
CURNO	Type	SAE Class	Units
067	FIL	60	G's
Max	Time	Min	Time
28.9	5.0	-1.9	118.5

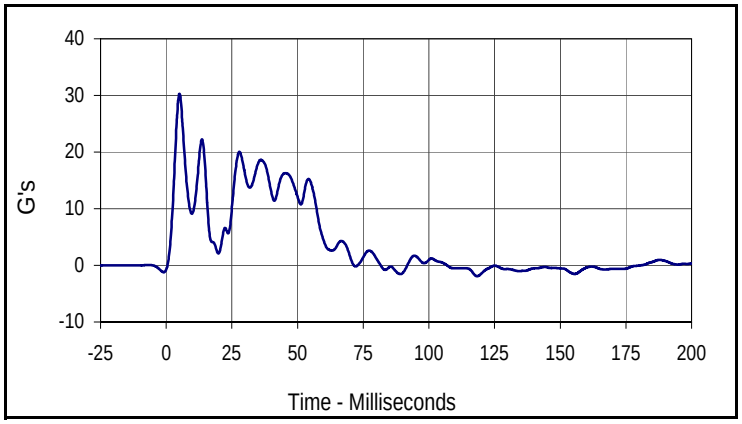


Curve Description			
Vehicle RR X-Member Primary Velocity			
CURNO	Type	SAE Class	Units
067	IN1	180	KMH
Max	Time	Min	Time
29.7	107.1	0.0	2.8

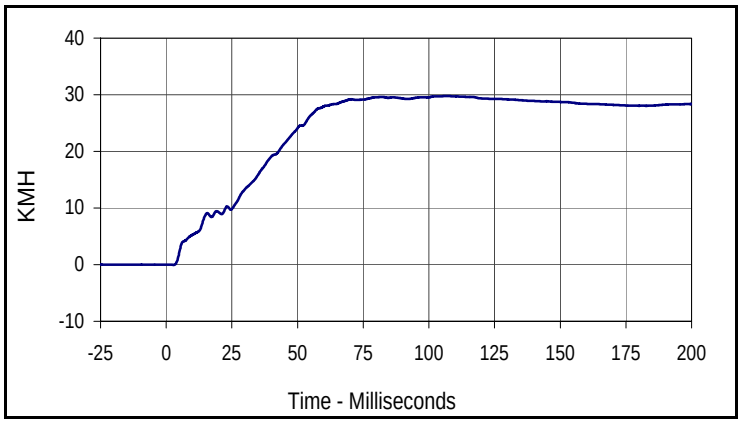


Curve Description			
Vehicle RR X-Member Primary Displacement			
CURNO	Type	SAE Class	Units
067	IN2	180	MM
Max	Time	Min	Time
1351.7	200.0	0.0	3.2

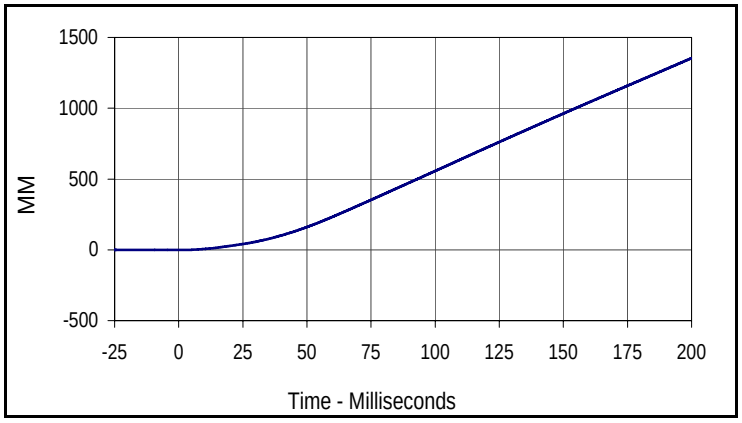
Test Vehicle:	2005 Volkswagen Golf 4-Door Hatchback	Test Date:	8/26/05
Test Program:	FMVSS 301R	NHTSA No.:	C55801



Curve Description			
Vehicle Right Rear X-Member Red. X			
CURNO	Type	SAE Class	Units
068	FIL	60	G's
Max	Time	Min	Time
30.3	5.1	-1.9	118.4



Curve Description			
Vehicle RR X-Member Red. X Velocity			
CURNO	Type	SAE Class	Units
068	IN1	180	KMH
Max	Time	Min	Time
29.8	107.4	0.0	2.8



Curve Description			
Vehicle RR X-Member Red. X Displacement			
CURNO	Type	SAE Class	Units
068	IN2	180	MM
Max	Time	Min	Time
1353.8	200.0	0.0	3.2

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

FMVSS 301R
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 206
8/26/05
2005 Volkswagen Golf 4-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD CG	X	206HEADX	Accelerometer	Entran	EGEB6Q-2K	G
2	HEAD CG	Y	206HEADY	Accelerometer	Entran	EGEB6Q-2K	G
3	HEAD CG	Z	206HEADZ	Accelerometer	Entran	EGEB6Q-2K	G
4	HEAD CG	Y	206HEAD_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
5	VEHICLE HEADREST	NA	CONT01	Contact Sensor	Tapeswitch	8 oz. tapeswitch	On/Off
6	UPPER NECK FORCE	X	206UNFX	Neck Load Cell - Force	Denton	1716A	Newtons
7	UPPER NECK FORCE	Y	206UNFY	Neck Load Cell - Force	Denton	1716A	Newtons
8	UPPER NECK FORCE	Z	206UNFZ	Neck Load Cell - Force	Denton	1716A	Newtons
9	UPPER NECK MOMENT	X	206UNMX	Neck Load Cell - Moment	Denton	1716A	Nm
10	UPPER NECK MOMENT	Y	206UNMY	Neck Load Cell - Moment	Denton	1716A	Nm
11	UPPER NECK MOMENT	Z	206UNMZ	Neck Load Cell - Moment	Denton	1716A	Nm
12	LOWER NECK FORCE	X	206LNFX	Neck Load Cell - Force	Denton	5832J	Newtons
13	LOWER NECK FORCE	Y	206LNFY	Neck Load Cell - Force	Denton	5832J	Newtons
14	LOWER NECK FORCE	Z	206LNFZ	Neck Load Cell - Force	Denton	5832J	Newtons
15	LOWER NECK MOMENT	X	206LNMX	Neck Load Cell - Moment	Denton	5832J	Nm
16	LOWER NECK MOMENT	Y	206LNMY	Neck Load Cell - Moment	Denton	5832J	Nm
17	LOWER NECK MOMENT	Z	206LNMZ	Neck Load Cell - Moment	Denton	5832J	Nm
18	LOWER NECK	X	206LNX	Accelerometer	Entran	EGEB6Q-2K	G

FMVSS 301R
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 206
8/26/05
2005 Volkswagen Golf 4-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
19	CHEST CG	X	206CHESTX	Accelerometer	Entran	EGEB6Q-2K	G
20	CHEST CG	Y	206CHESTY	Accelerometer	Entran	EGEB6Q-2K	G
21	CHEST CG	Z	206CHESTZ	Accelerometer	Entran	EGEB6Q-2K	G
22	CHEST CG	X	206CH_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
23	CHEST	X	206CHPOT	Potentiometer	Servo	2897	MM
24	PELVIS	X	206PELX	Accelerometer	Entran	EGEB6Q-2K	G
25	PELVIS	Y	206PELY	Accelerometer	Entran	EGEB6Q-2K	G
26	PELVIS	Z	206PELZ	Accelerometer	Entran	EGEB6Q-2K	G
27	LEFT FEMUR	Z	206FEM_L	Load Cell, Femur	Denton	2121A	Newtons
28	RIGHT FEMUR	Z	206FEM_R	Load Cell, Femur	Denton	2121A	Newtons
29	LAP BELT	NA	BL112	Lap Belt Load Cell	FGP	FN4060	Newtons
30	SHOULDER BELT	NA	POT01	Shoulder Belt Spoolout Pot	Celesco	PTX101-0030	MM

FMVSS 301R
Instrumentation Data Channel Assignments
Right Rear A.T.D. Serial Number 202
8/26/05
2005 Volkswagen Golf 4-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
31	HEAD CG	X	202HEADX	Accelerometer	Entran	EGEB6Q-2K	G
32	HEAD CG	Y	202HEADY	Accelerometer	Entran	EGEB6Q-2K	G
33	HEAD CG	Z	202HEADZ	Accelerometer	Entran	EGEB6Q-2K	G
34	HEAD CG	Y	202HEAD_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
35	VEHICLE HEADREST	NA	CONT01	Contact Sensor	Tapeswitch	8 oz. tapeswitch	On/Off
36	UPPER NECK FORCE	X	202UNFX	Neck Load Cell - Force	Denton	1716A	Newtons
37	UPPER NECK FORCE	Y	202UNFY	Neck Load Cell - Force	Denton	1716A	Newtons
38	UPPER NECK FORCE	Z	202UNFZ	Neck Load Cell - Force	Denton	1716A	Newtons
39	UPPER NECK MOMENT	X	202UNMX	Neck Load Cell - Moment	Denton	1716A	Nm
40	UPPER NECK MOMENT	Y	202UNMY	Neck Load Cell - Moment	Denton	1716A	Nm
41	UPPER NECK MOMENT	Z	202UNMZ	Neck Load Cell - Moment	Denton	1716A	Nm
42	LOWER NECK FORCE	X	202LNFX	Neck Load Cell - Force	Denton	5832J	Newtons
43	LOWER NECK FORCE	Y	202LNFY	Neck Load Cell - Force	Denton	5832J	Newtons
44	LOWER NECK FORCE	Z	202LNFZ	Neck Load Cell - Force	Denton	5832J	Newtons
45	LOWER NECK MOMENT	X	202LNMX	Neck Load Cell - Moment	Denton	5832J	Nm
46	LOWER NECK MOMENT	Y	202LNMY	Neck Load Cell - Moment	Denton	5832J	Nm
47	LOWER NECK MOMENT	Z	202LNMZ	Neck Load Cell - Moment	Denton	5832J	Nm
48	LOWER NECK	X	202LNX	Accelerometer	Entran	EGEB6Q-2K	G

FMVSS 301R
Instrumentation Data Channel Assignments
Right Rear A.T.D. Serial Number 202
8/26/05
2005 Volkswagen Golf 4-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
49	CHEST CG	X	202CHESTX	Accelerometer	Entran	EGEB6Q-2K	G
50	CHEST CG	Y	202CHESTY	Accelerometer	Entran	EGEB6Q-2K	G
51	CHEST CG	Z	202CHESTZ	Accelerometer	Entran	EGEB6Q-2K	G
52	CHEST CG	Y	202CH_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
53	CHEST	X	202CHPOT	Potentiometer	Servo	2897	MM
54	PELVIS	X	202PELX	Accelerometer	Entran	EGEB6Q-2K	G
55	PELVIS	Y	202PELY	Accelerometer	Entran	EGEB6Q-2K	G
56	PELVIS	Z	202PELZ	Accelerometer	Entran	EGEB6Q-2K	G
57	LEFT FEMUR	Z	202FEM_L	Load Cell, Femur	Denton	2121A	Newtons
58	RIGHT FEMUR	Z	202FEM_R	Load Cell, Femur	Denton	2121A	Newtons
59	LAP BELT	NA	BL113	Lap Belt Load Cell	FGP	FN4060	Newtons
60	SHOULDER BELT	NA	POT02	Shoulder Belt Spoolout Pot	Celesco	PTX101-0030	MM

FMVSS 301R
Instrumentation Data Channel Assignments
Vehicle
8/26/05
2005 Volkswagen Golf 4-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
61	DRIVER SEAT BACK LEFT	Y	MHD028	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
62	DRIVER SEAT BACK RIGHT	Y	MHD031	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
63	LEFT FRONT SILL	Y	MHD036	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
64	RIGHT REAR SILL	Y	MHD030	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
65	LEFT FRONT X-MEMBER	X	KEVA003	Accelerometer	ICS	3031-500	G's
66	LEFT FRONT X-MEMBER	X	KEVA013	Accelerometer	ICS	3031-500	G's
67	RIGHT REAR X-MEMBER	X	KEVA004	Accelerometer	ICS	3031-500	G's
68	RIGHT REAR X-MEMBER	X	KEVA012	Accelerometer	ICS	3031-500	G's

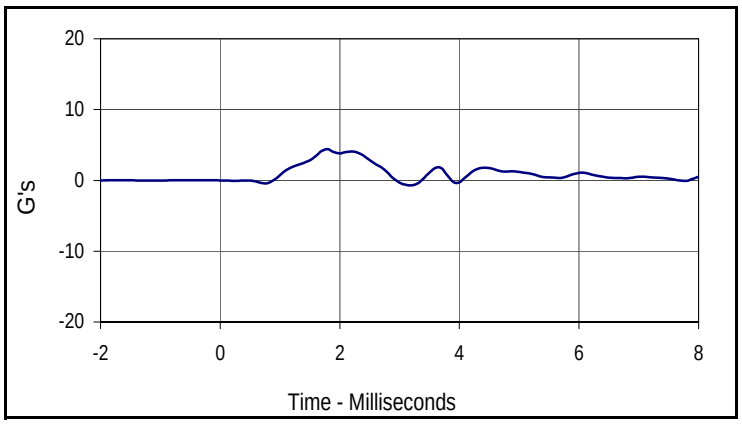
APPENDIX D

DUMMY CALIBRATION DATA

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	7/27/05
ATD Serial No.:	034	Test I.D.:	HD07A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	268.9	Pass
Peak Lateral Acceleration	G's	≤15.0	4.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

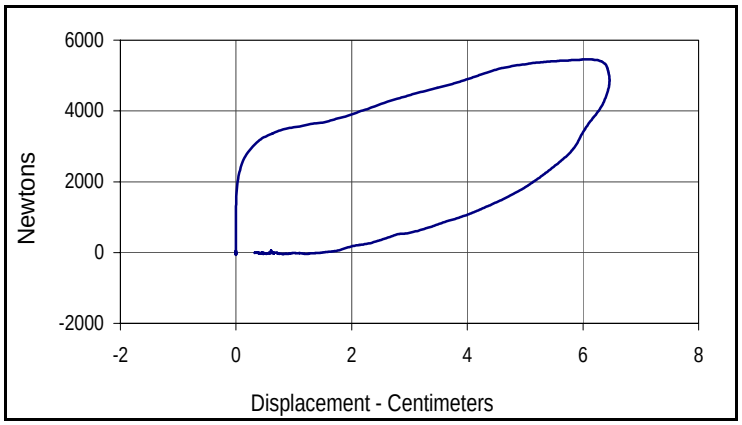
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
268.9	2.0	0.0	-0.1



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.4	1.8	-0.7	3.2

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	7/29/05
ATD Serial No.:	034	Test I.D.:	CH07A

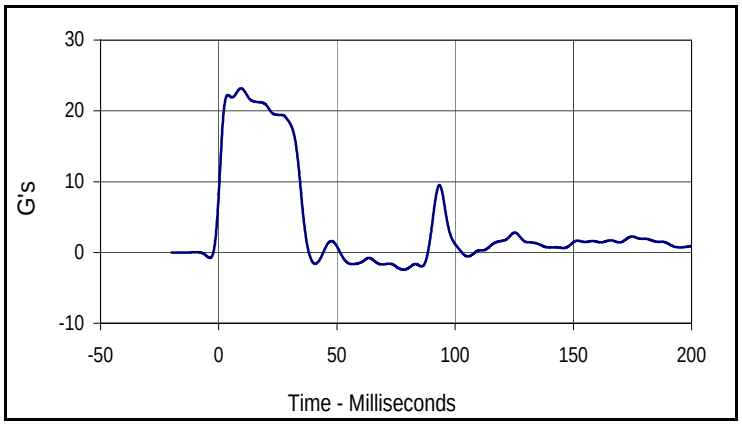
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.75	Pass
Peak Probe Force	Newtons	5159 to 5893	5459	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.46	Pass
Internal Hysterysis	%	69 to 85	75.9	Pass
		Overall Test Results		Pass



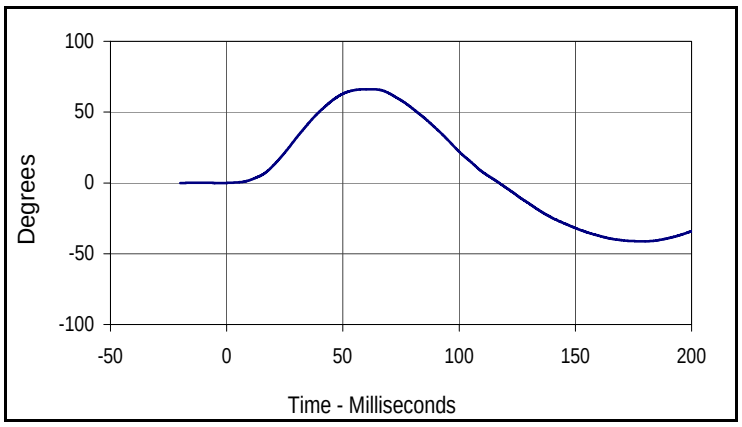
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	75.9
Peak Probe Force		Peak Chest Deflection	
5459		6.46	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	7/28/05
ATD Serial No.:	034	Test I.D.:	NF07A

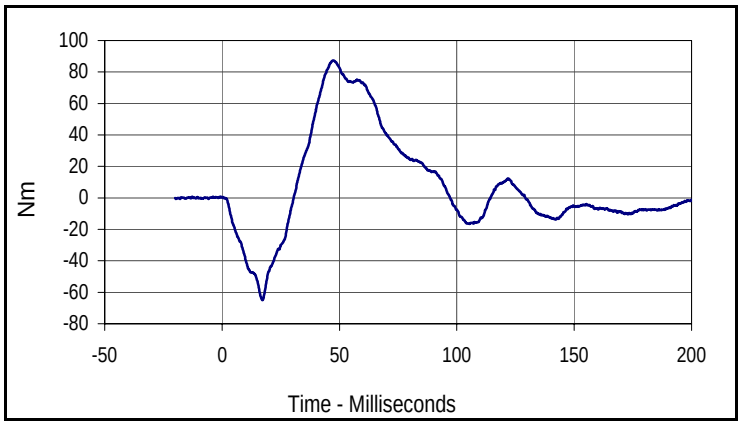
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.94	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.1	Pass
	20 Msec.	G's	17.6 to 22.6	20.8	Pass
	30 Msec.	G's	12.5 to 18.5	18.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	66.2	Pass
	Time	Msec.	57.0 to 64.0	61.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	117.2	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	87.3	Pass
	Time	Msec.	47.0 to 58.0	47.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.2	9.4	-2.4	78.2



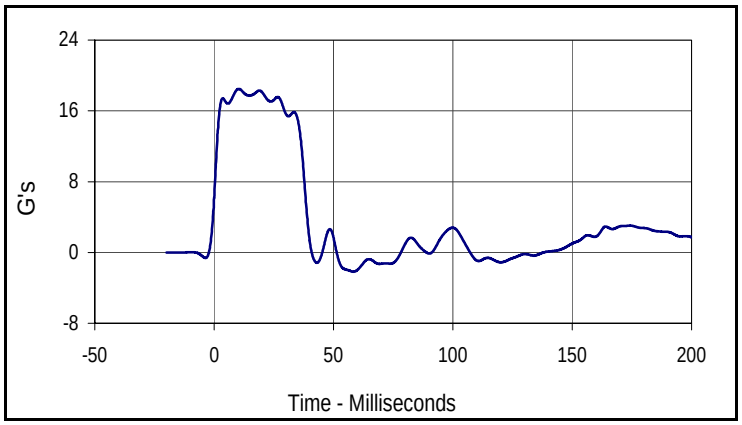
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
66.2	61.2	-41.2	180.1



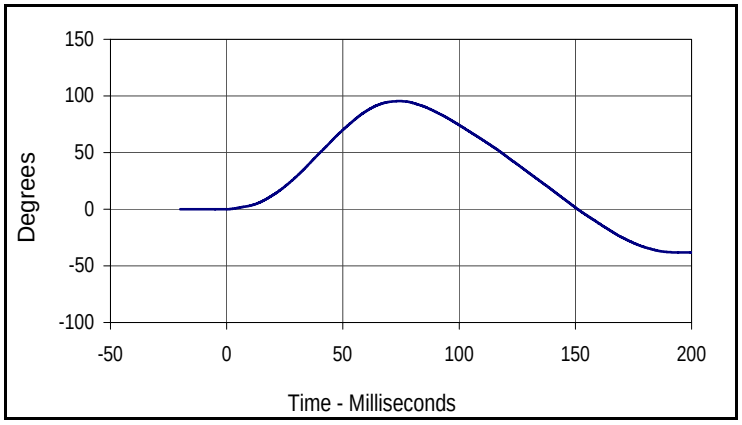
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.3	47.4	-65.0	17.2

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	9/21/05
ATD Serial No.:	034	Test I.D.:	NE09A

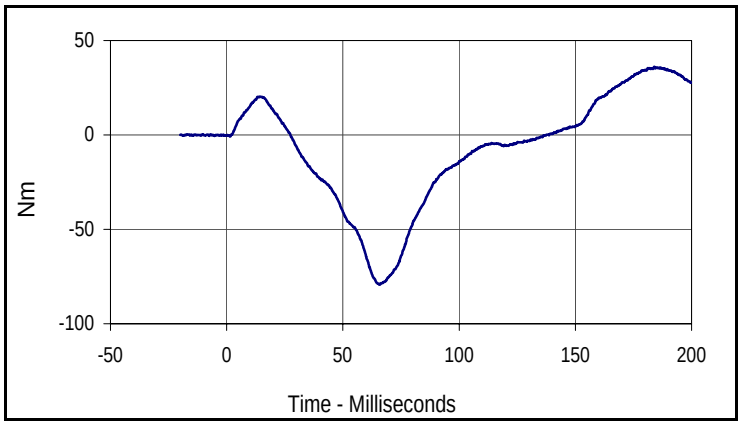
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.00	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.5	Pass
	20 Msec.	G's	14.0 to 19.0	18.1	Pass
	30 Msec.	G's	11.0 to 16.0	15.7	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.4	Pass
	Time	Msec.	72.0 to 82.0	74.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-79.3	Pass
	Time	Msec.	65.0 to 79.0	65.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	137.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.5	10.3	-2.2	58.4



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.4	74.4	-38.2	196.2



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.1	183.9	-79.3	65.9

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	7/27/05
ATD Serial No.:	034	Test I.D.:	LK07A , RK07A

Left Knee

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5582	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5671	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5582.1	2.6	-24.8	7.8

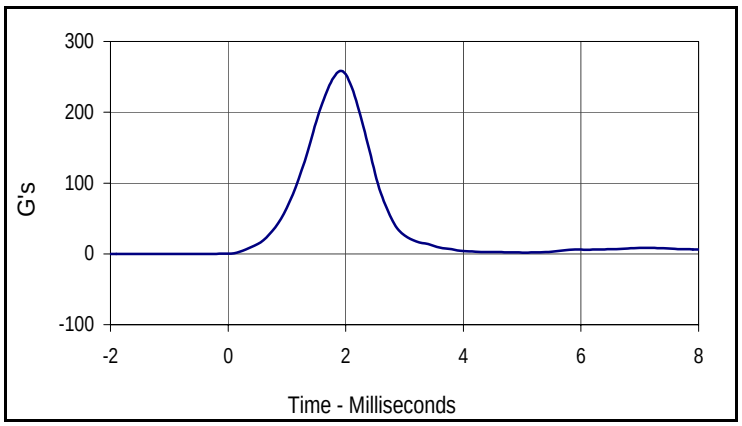
Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5671.0	2.4	-72.7	7.0

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	7/29/05
ATD Serial No.:	034	Test I.D.:	N/A

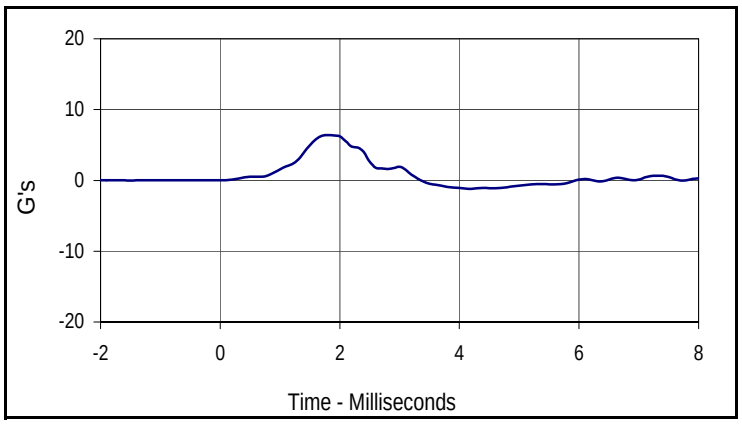
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	148	Pass
G - Elbow back to wrist pivot	mm	290 to 305	295	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	201	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Poplipteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock poplipteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	425	Pass
W - Foot breadth	mm	91 to 107	103	Pass
Y - Chest circumference	mm	970 to 1001	998	Pass
Z - Waist circumference	mm	836 to 866	860	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	7/27/05
ATD Serial No.:	035	Test I.D.:	HD07B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	258.3	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



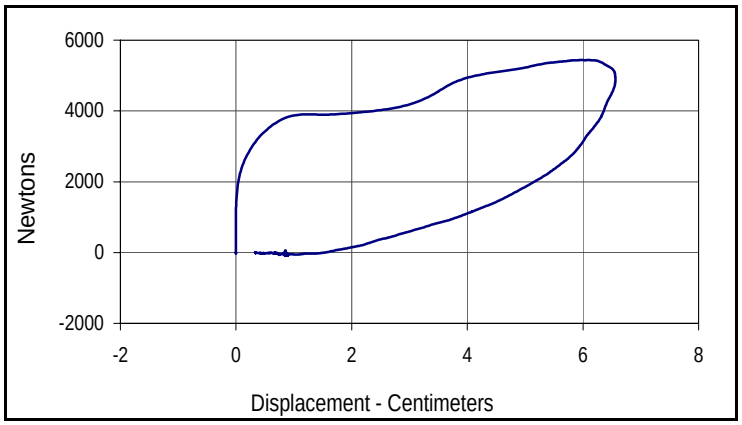
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
258.3	1.9	0.0	-0.6



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.4	1.8	-1.2	4.2

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	7/29/05
ATD Serial No.:	035	Test I.D.:	CH07B

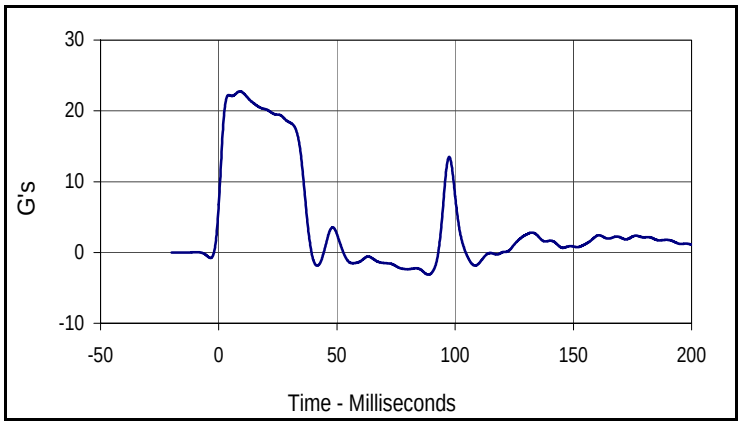
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5438	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.56	Pass
Internal Hysterysis	%	69 to 85	75.2	Pass
		Overall Test Results		Pass



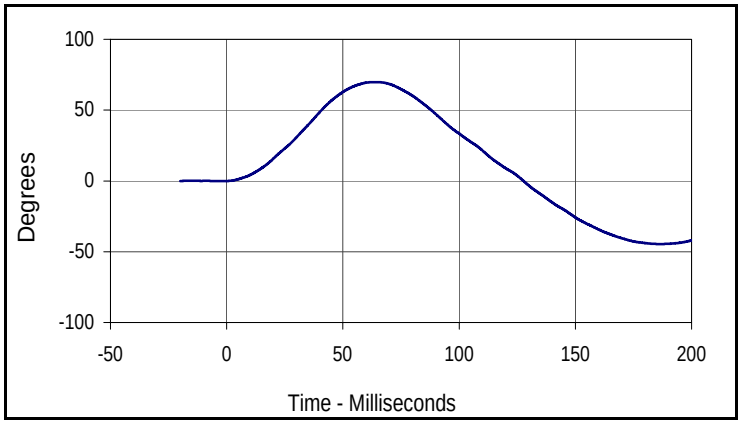
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	75.2
Peak Probe Force		Peak Chest Deflection	
5438		6.56	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	7/28/05
ATD Serial No.:	035	Test I.D.:	NF07B

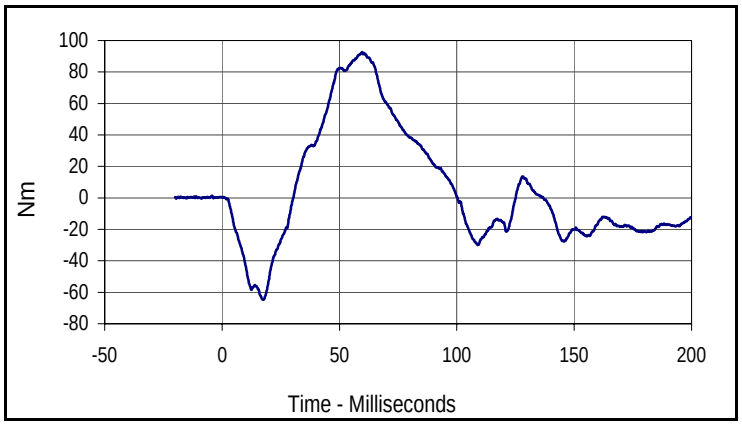
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	20.2	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	37.3	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	69.8	Pass
	Time	Msec.	57.0 to 64.0	64.0	Fail
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	127.7	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	92.7	Pass
	Time	Msec.	47.0 to 58.0	59.6	Fail
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	100.3	Pass
			Overall Test Results		Fail



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
22.8	8.9	-3.1	88.7



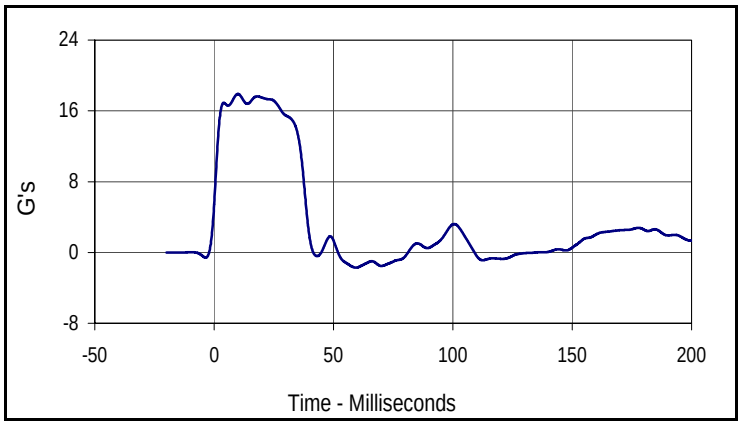
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
69.8	64.0	-44.6	186.6



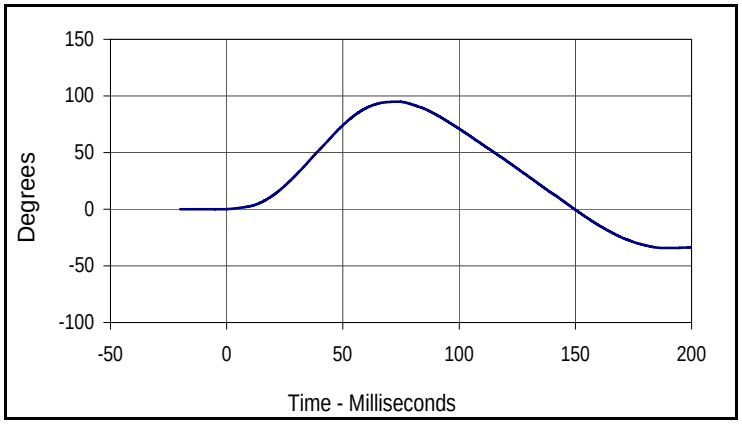
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
92.7	59.6	-64.7	17.6

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	7/28/05
ATD Serial No.:	035	Test I.D.:	NE07B

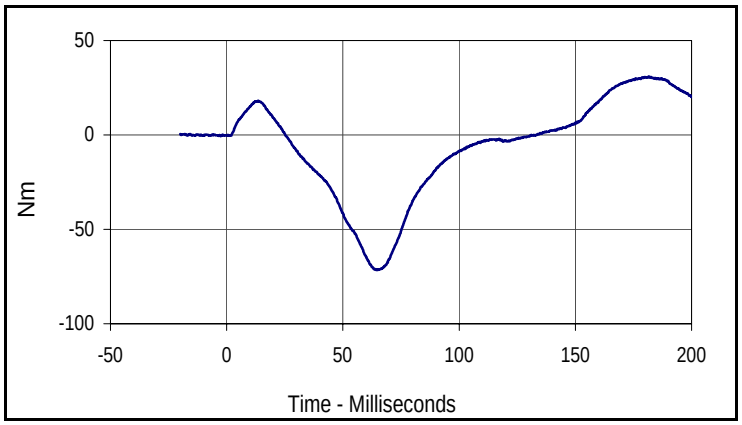
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.9	Pass
	20 Msec.	G's	14.0 to 19.0	17.5	Pass
	30 Msec.	G's	11.0 to 16.0	15.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.0	Pass
	Time	Msec.	72.0 to 82.0	73.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.7	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-71.6	Pass
	Time	Msec.	65.0 to 79.0	65.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	133.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.9	10.0	-1.7	59.3



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.0	73.5	-34.2	189.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
31.0	181.6	-71.6	65.0

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	7/27/05
ATD Serial No.:	034	Test I.D.:	LK07B , RK07B

Left Knee

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5553	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5538	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5553.5	2.7	-28.9	9.7

Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5538.5	2.4	-58.0	6.9

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	7/29/05
ATD Serial No.:	035	Test I.D.:	N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	882	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Poplipteal length	mm	429 to 455	435	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock poplipteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	995	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	432	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass