

2004 JEEP LIBERTY 4-DOOR MPV FRONTAL VEHICLE CRASH TESTS IN SUPPORT OF FMVSS 208 UPGRADE

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SEPTEMBER 9, 2004

FINAL REPORT

PREPARED FOR:

**U.S. DEPARTMENT OF TRANSPORTATION
VOLPE NATIONAL TRANSPORTATION SYSTEMS CENTER
OFFICE OF SAFETY AND SECURITY
55 BROADWAY
CAMBRIDGE, MA 02142**

IN COOPERATION WITH:

**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF APPLIED VEHICLE SAFETY RESEARCH
400 SEVENTH STREET, SW
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16. Abstract A 30 mph (48.27 km/h) frontal barrier impact test was conducted on a 2004 Jeep Liberty 4-Door MPV at Karco Engineering, LLC on 09/9/04. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity was 48.17 km/h. The ambient temperature at the barrier face at the time of impact was 34.4 degrees Celsius. The vehicle's maximum post-test static crush was 240 mm at the vehicle centerline. The test vehicle was equipped with 3-point continuous loop belt systems and second-generation supplemental airbags in both front outboard seating positions. The front seated dummies were unbelted. The center rear seat was equipped with a 3-point continuous loop belt system. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:																																										
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th rowspan="2">Threshold</th> <th colspan="2">Front ATDs</th> <th colspan="2">Rear ATDs</th> </tr> <tr> <th>Driver (H3 50%)</th> <th>Passenger (H3 50%)</th> <th>Center Rear (H3 50%)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>306.7</td> <td>523.2</td> <td>419.6</td> <td></td> </tr> <tr> <td>Max. Chest Accl. (3 msec Clip)</td> <td>G's</td> <td>60</td> <td>54.9</td> <td>66.6</td> <td>41.2</td> <td></td> </tr> <tr> <td>Left Femur Force</td> <td>Newton</td> <td>50% 10008</td> <td>-7662.0</td> <td>-7646.7</td> <td>-1539.4</td> <td></td> </tr> <tr> <td>Right femur Force</td> <td>Newton</td> <td>50% 10008</td> <td>-6578.2</td> <td>-8065.1</td> <td>-2388.6</td> <td></td> </tr> </tbody> </table>				Measurement Description	Units	Threshold	Front ATDs		Rear ATDs		Driver (H3 50%)	Passenger (H3 50%)	Center Rear (H3 50%)		Head Injury Criteria (HIC ₁₅)	N/A	700	306.7	523.2	419.6		Max. Chest Accl. (3 msec Clip)	G's	60	54.9	66.6	41.2		Left Femur Force	Newton	50% 10008	-7662.0	-7646.7	-1539.4		Right femur Force	Newton	50% 10008	-6578.2	-8065.1	-2388.6	
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SECTION 1

PURPOSE AND SUMMARY OF TEST R40401

1.1 PURPOSE

This 30 mph (48.27 km/h) frontal barrier impact test was conducted as a research study for frontal vehicle crash tests in support of the FMVSS 208 upgrade test program. It was sponsored by the Volpe National Transportation Systems Center (Volpe) in cooperation with the National Highway Traffic Safety Administration (NHTSA) under Contract DTRS57-04-D-30000. The purpose of this test program is to obtain vehicle crashworthiness and occupant restraint system performance data to evaluate and compare occupant responses with standard 50th percentile male dummies (unbelted tested at 30 mph) and the larger 95th percentile male dummies (belted tested at 35 mph) in the front outboard seating positions.

This 30 mph (48.27 km/h) frontal barrier impact test was conducted in accordance with The Laboratory Test Procedures for the Office of Vehicle Safety Compliance FMVSS 208 "Occupant Crash Protection" (TP208-10) and Office of Crashworthiness Standards New Car Assessment Program (NCAP) Frontal Impact testing.

1.2 SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2004 Jeep Liberty 4-Door MPV at a velocity of 48.17 km/h (29.94 mph). The test was performed at KARCO Engineering, LLC on September 9, 2004.

Two Part 572E 50th percentile male anthropomorphic test devices (ATDs or dummies), with THOR-LX legs, were placed in the driver and right-front passenger seating positions. These dummies were unbelted during the crash. A Part 572E 50th percentile male ATD was placed in the center-rear passenger seat and was restrained with the three point shoulder-lap belt harness.

The ATDs were fully instrumented with head (primary and redundant) and chest (primary and redundant) accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right and left femur load cells and THOR-LX legs. Load cells were placed on the ATDs (center-rear passenger) lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (H3 50%) ATD (Serial No. 043), with THOR-LX legs (Serial No. Right: 103 and Left: 104), right-front passenger (H3 50%) ATD (Serial No. 045), with THOR-LX legs (Serial No. Right: G109, Left: G110), and center-rear passenger (H3 50%) ATD (Serial No. 055), were calibrated prior to this test.

One hundred seventy two (172) channels of data were recorded using an on-board data acquisition system. Three (3) real-time, seven (7) high-speed digital video and thirteen (13) high-speed film cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Appendix A contains Pre- and Post-Test Photographs; Appendix B contains the vehicle and dummy response data traces; Appendix C contains the Load Cell Barrier information; Appendix D contains the Instrumentation Data Channel Assignments; and Appendix E contains the Dummy Calibration data.

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

The maximum static crush of the vehicle was 240 mm. All four doors remained closed during impact and opened without the aid of tools. All doors were operable after the impact.

The Driver's (H3 50%) visible contact points were as follows: On impact the head contacted the airbag and sun-visor, the chest contacted the airbag, both knees contacted the knee bolster, both tibias contacted the knee bolster.

The right-front Passenger's (H3 50%) visible contact points were as follows: The head contacted the airbag and sun-visor, the chest contacted the airbag, both knees contacted the glove box and both tibias contacted the glove box.

The center-rear passenger's (H3 50%) visible contact points were as follows: The head (chin) contacted the chest, the chest had no contact. The left knee and tibia contacted the left-front seatback. The right knee and tibia contacted the right-front seatback.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC ₁₅	Chest Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)
Driver (H3 50%)	306.7	54.9	-41.6	-7662.0	-6578.2	N/A
Passenger (H3 50%)	523.2	66.6	-12.0	-7646.7	-8065.1	N/A
Ct. Rear Pass. (H3 50%)	419.6	41.2	-37.8	-1539.4	-2388.6	304.5

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	Nm	1.355

* Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	48.17
Test Weight	kg	2025
Impact Angle	degrees	0
Average Rebound	mm	465
Maximum Static Crush	mm	240

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver (H3 50%) Side	Passenger (H3 50%) Side
Front Door opening	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Rear Door Opening	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Front Seat Track Shift (mm)	0	0
Front Seat Back Failure	No	No
Rear Seat Track Shift (mm)	0	0
Rear Seat Back Failure	No	No

HYBRID III DUMMY CONTACT INFORMATION

Description	Driver (H3 50%)	Passenger (H3 50%)	Center Rear (H3 50%)	
Dummy Type	50% Male	50% Male	50% Male	
Serial No	043	045	055	
Head	Airbag, Sun-Visor	Airbag, Sun-Visor	Chin to Chest	
Chest	Airbag	Airbag	None	
Left Knee	Bolster	Glove Box	Seatback	
Right Knee	Bolster	Glove Box	Seatback	
Left Tibia	Bolster	Glove Box	Seatback	
Right Tibia	Bolster	Glove Box	Seatback	

DATA SHEET NO. 1...(CONTINUED)**CRASH TEST SUMMARY**Test Vehicle: 2004 Jeep Liberty 4-Door MPVNHTSA No.: R40401Test Program: 2004 FMVSS 208 UpgradeTest Date: 9/9/04**FILM & VIDEO COVERAGE**

Real-Time Video	3
High-Speed 16mm Movie	13
High-Speed Video	7
Total	23

DATA CHANNELS

Driver (50%) ATD Sensors	63
Right Front Pass. (50%) ATD Sensors	63
Left Rear Pass. (50%) ATD Sensors	
Right. Rear Pass. (50%) ATD Sensors	
Ct. Rear Pass. (50%) ATD Sensors	26
Belt Assessment Sensors	3
Airbag Timing Sensors	4
Vehicle Structure Accelerometers	13
Rigid Barrier Load Cells	36
Total	208

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	R40401	Anti-Lock Brakes	Yes
Make	Jeep	All Wheel Drive	No
Model	Liberty	Power Steering	Yes
Body Style	4-Door Utility	Driver Front Airbag	Yes
VIN No.	1J4GK48K84W226063	Driver Side Airbag	No
Color	Blue	Driver Head Airbag	No
Delivery Date	5/2604	Driver Curtain Airbag	No
Odometer	24	Passenger Airbag	Yes
Dealer	Victorville-Chrysler-Jeep	Passenger Side Airbag	No
Transmission	4-Speed Automatic	Passenger Head Airbag	No
Final Drive	Rear	Passenger Curtain Airbag	No
Type/No. of Cylinders	V6	Pre-Tensioners	Yes
Engine Displacement (L)	3.7	Load Limiters	Yes
Engine Placement	Longitudinal	Bucket Seats	Yes
Roof Rack	Yes	Air Conditioner	Yes
Sunroof/T-Top	No	AM/FM Cassette	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	No	Automatic Door Locks	Yes
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	Yes
Rear Disc	Yes	Other	N/A
Does Owners Manual provide instructions to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

Manufactured By	Daimler Chrysler Corporation	GVWR (kg)	2427
		GAWR Front (kg)	1248
Date of Manufacture	1/04	GAWR Rear (kg)	1429

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

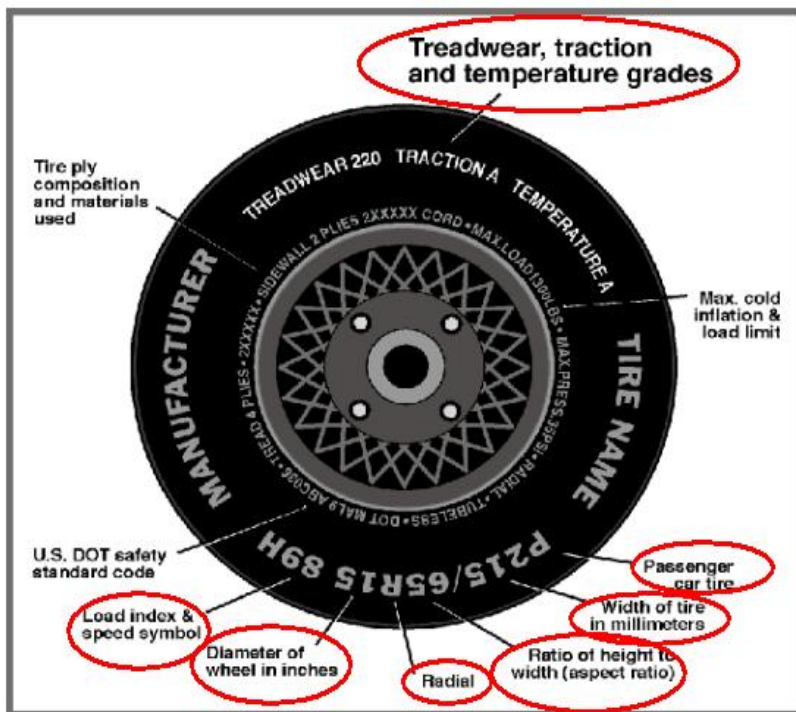
Measured Parameter	Front	Second Row	Third Row	Total
Type of Seats	Bucket	Split Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				522
Cargo Weight (RCLW) (kg)				136

DATA SHEET NO. 2...(CONTINUED)
GENERAL TEST AND VEHICLE DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

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)	308	308
Cold Pressure (kpa)	227	227
Recommended Tire Size	P215/75R16	P215/75R16
Tire Size on Vehicle	P215/75R16	P215/75R16
Tire Manufacturer	Goodyear	Goodyear
Tread wear	340	340
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Plies Polyester Cord	2 Plies Polyester Cord
Tire Plies Body	N/A	N/A
Load Index/Speed Symbol	101S	101S
Tire Material	Polyester & Steel	Polyester & Steel
DOT Safety Code Right	M6Y4-EYER-2203	M6Y4-EYER-2203
DOT Safety Code Left	M6Y4-EYER-2203	M6Y4-EYER-2203

DATA SHEET NO. 2...(CONTINUED)
GENERAL TEST AND VEHICLE DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	450	420		494	534	
Right	kg	448	395		491	506	
Ratio	%	52%	48%		49%	51%	
Totals	kg	898	815	1713	985	1040	2025

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1713
Weight of 2 P572 M ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	136
Calculated Vehicle Target Wt. (TVTW)	kg	2001

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	795	804	825	835	1272
As Tested	mm	885	894	921	942	1352

Vehicle Wheel Base (mm) 2650

Weight of Ballast Secured in cargo area (kg) N/A

Vehicle Components Removed Rear Light, Rear Bumper, Rear Glass, Rear Hatch
Spare Tire and Spare Tire Mount.

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 73.8

Usable Capacity Furnished by COTR (L) 67.9 to 69.4

Actual Test Volume with entire fuel System Filled (L) 68.6

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: Key operated with automatic shut-off when key is in 'OFF' position.

DATA SHEET NO. 3
POST TEST IMPACT DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	48.17
Trap No. 1 Entry Distance	mm	<1524	1524
Trap No.1 Exit Distance	mm	<1524	305
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	48.12
Trap No.2 Entry Distance	mm	<1524	1524
Trap No.2 Exit Distance	mm	<1524	305

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4081	3994	-87
Center	mm	4214	3974	-240
Right Side	mm	4071	3934	-137

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	450
Center	mm	460
Right Side	mm	485
Average	mm	465

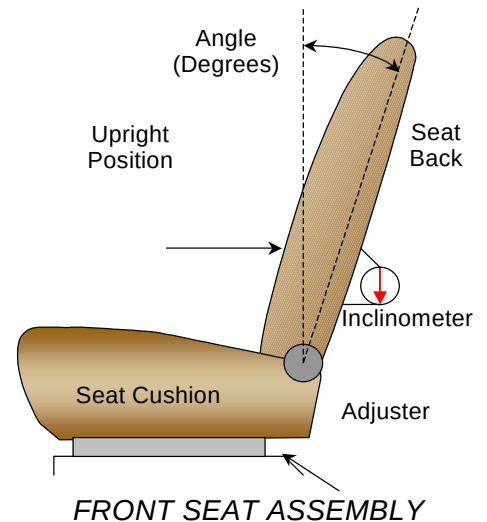
DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturers designated angle. The procedure is as follows:
A digital inclinometer is placed firmly against a flat surface of the seat back. The seat back angle is measured directly from the digital readout.



SEAT BACK ANGLES

	Deg.
Front Driver	23.5
Front Passenger	23.5
Center Rear Passenger	23.0

SEAT FORE/AFT POSITIONS

The first or forward most position is counted as number one (1). The fore/aft position is set aft of the middle position for both the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Front Driver	18 Detents	10 th Detent
Front Passenger	18 Detents	10 th Detent
Ct. Rear Pass. (2 nd Row)	1	1

DATA SHEET NO. 4...(CONTINUED)**TEST VEHICLE INFORMATION**

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

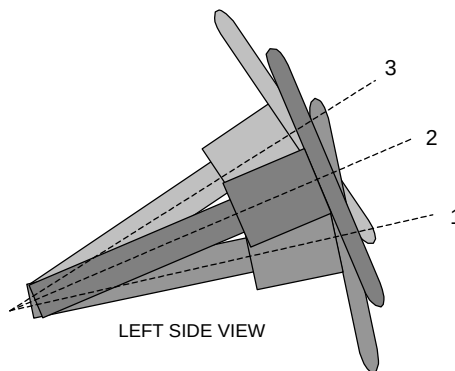
NHTSA No.: R40401
Test Date: 9/9/04

SEAT BELT UPPER ANCHORAGE**SEAT BELT UPPER ANCHORAGE**

	Total # of Positions	Placed in Position #
Front Driver	N/A	N/A
Front Pass.	N/A	N/A
Center Rear Pass.	1	1

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees
Lowermost position No. 1	22.0
Geometric center position No. 2	25.0
Uppermost position No. 3	28.0

Steering column placed in mid position.

DATA SHEET NO. 4...(CONTINUED)
TEST VEHICLE INFORMATION

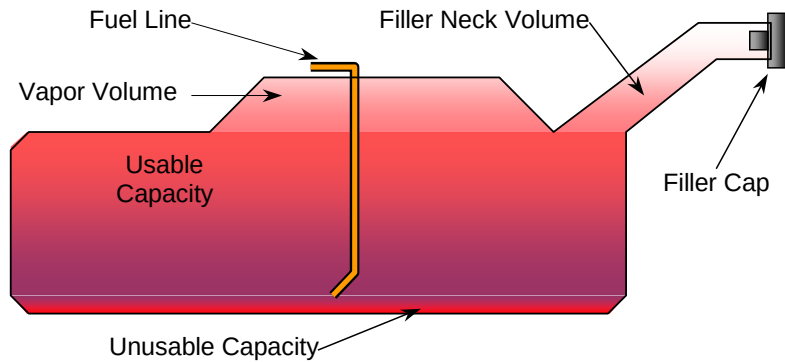
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	73.8
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	67.9 to 69.4
Actual Amount of Solvent used	68.6

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

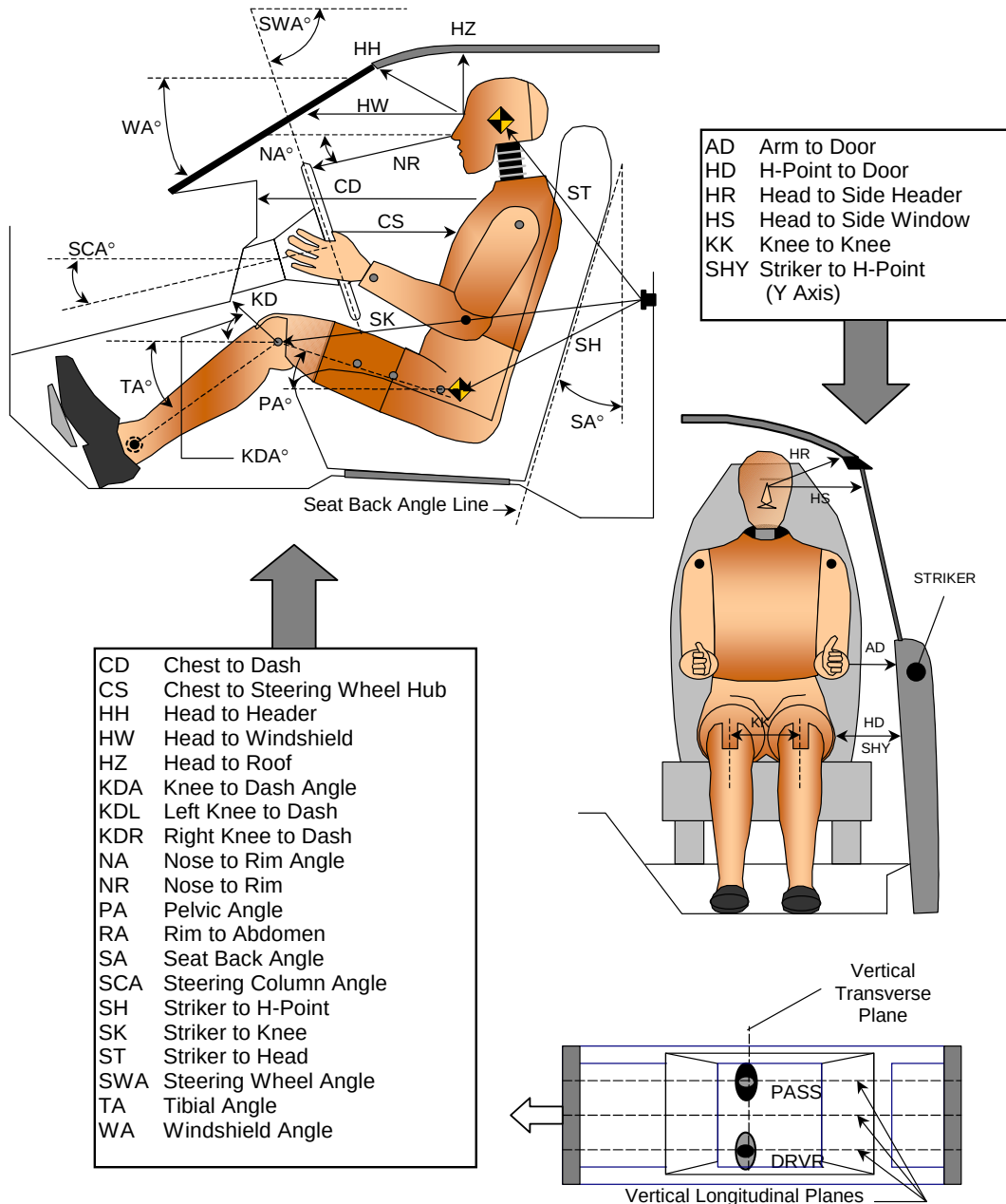


VEHICLE FUEL TANK ASSEMBLY

DATA SHEET NO. 5 **DUMMY POSITIONING IN VEHICLE**

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

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

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

TEST DUMMY POSITION MEASUREMENTS - FRONT SEAT DUMMIES

Code	Measurement Description	Driver (H3 50%)		Passenger (H3 50%)	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		38.0		
SWA	Steering Wheel Angle		65.0		
SCA	Steering Column Angle		25.0		
SA	Seat Back Angle		23.5		23.5
HZ	Head to Roof (Z)	235	90.0	205	90.0
HH	Head to Header	445		395	
HW	Head to Windshield	612		550	
HR	Head to Side Header (Y)	262		245	
NR	Nose to Rim	438	16.0		
CD	Chest to Dash	530		553	
CS	Chest to Steering Hub	298			
RA	Rim to Abdomen	195			
KDL	Left Knee to Dash	122	10.0	133	
KDR	Right Knee to Dash	140		120	2.0
PA	Pelvic Angle		24.8		24.4
TA	Tibia Angle		50.0		47.0
KK	Knee to Knee (Y)	282		278	
SK	Striker to Outboard Knee	610	8.0	615	5.0
ST	Striker to Head	620	84.0	630	81.0
SH	Striker to H-Point	213	13.0	220	13.0
SHY	Striker to H-Point (Y)	185		188	
HS	Head to Side Window	300		287	
HD	H-Point to Door (Y)	178		185	
AD	Arm to Door (Y)	102		25	

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

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

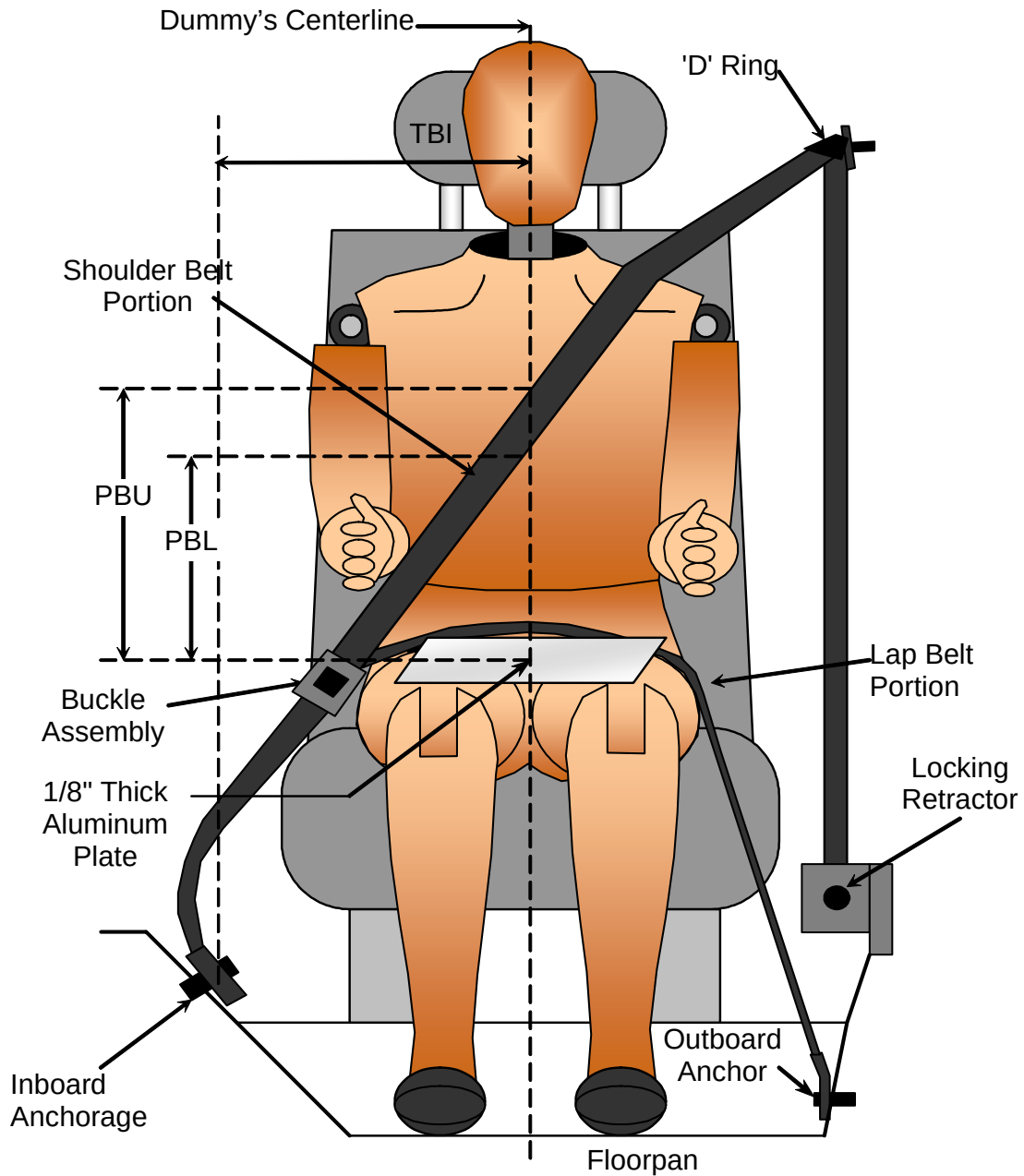
TEST DUMMY POSITION MEASUREMENTS - REAR SEAT DUMMIES

Code	Measurement Description	Center Rear Pass (H3 50%)		Right Rear Pass (H3 50%)	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
HZ	Head to Roof (Z)	300			
HR	Head To Side Header	615			
NR	Nose to Seat Back	595	20.5		
CD	Chest to Seat Back	475			
KDL	Left Knee to Seat Back	140	11.0		
KDR	Right Knee to Seat Back	160			
PA	Pelvic Angle		24.8		
TA	Tibia Angle		89.0		
KK	Knee to Knee (Y)	275			
SK	Striker to Outboard Knee	640	1.5		
ST	Striker to Head	420	78.2		
SH	Striker to H-Point	320	42.8		
SHY	Striker to H-Point (Y)	620			
HS	Head to Side Window	720			
HD	H-Point to Door (Y)	510			
AD	Arm To Door (Y)	410			
SA	Seat Back Angle		20.1		

DATA SHEET NO. 6
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04



DATA SHEET NO. 6...(CONTINUED)
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

SEAT BELT POSITIONING MEASUREMENTS; FRONT DUMMIES

Measurement Description	Units	Driver (H3 50%)	Passenger (H3 50%)
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	N/A	N/A
PBU - Top Surface of reference to belt upper edge	mm	N/A	N/A
PBL - Top Surface of reference to belt lower edge	mm	N/A	N/A
Lap Belt Tension	Newton	N/A	N/A
Shoulder Belt Tension	N/A	N/A	N/A
Retractor Reel to "D" ring	mm	N/A	N/A
Shoulder Belt length as measured on ATD	mm	N/A	N/A
Lap Belt length as measured on ATD	mm	N/A	N/A
Remainder of belt on reel	mm	N/A	N/A
Total belt length for continuous webbing systems	mm	N/A	N/A

SHOULDER BELT SPOOL-OFF; FRONT DUMMIES

Measurement Description	Units	Driver (H3 50%)	Passenger (H3 50%)
As determined mechanically	mm	N/A	N/A
As determined electronically	mm	N/A	N/A

SEAT BELT POSITIONING MEASUREMENTS; REAR DUMMIES

Measurement Description	Units	Center (H3 50%)	Right (H3 50%)
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	200	
PBU - Top Surface of reference to belt upper edge	mm	315	
PBL - Top Surface of reference to belt lower edge	mm	240	
Lap Belt Tension	Newton	10	
Shoulder Belt Tension	N/A	Retractor	
Retractor Reel to "D" ring	mm	N/A	
Shoulder Belt length as measured on ATD	mm	960	
Lap Belt length as measured on ATD	mm	785	
Remainder of belt on reel	mm	650	
Total belt length for continuous webbing systems	mm	2395	

SHOULDER BELT SPOOL-OFF; REAR DUMMIES

Measurement Description	Units	Center	Right
As determined mechanically	mm	160.0	
As determined electronically	mm	304.5	

DATA SHEET NO. 7

VEHICLE ACCELEROMETER AND SQUIB SENSOR LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

VEHICLE ACCELEROMETER PEAK DATA

No.	Accelerometer Location	Peak Values				
		Units	Max	Time	Min	Time
1	Left Rear X	G's	0.9	91.1	-43.1	39.9
2	Right Rear X	G's	1.8	92.6	-46.0	26.0
3	Left Brake Caliper X	G's	21.4	59.7	-68.0	47.6
4	Right Brake Caliper X	G's	18.8	34.7	-62.3	25.4
5	Instrument Panel X	G's	23.7	71.7	-71.7	48.2
6	Engine Top X	G's	19.3	63.5	-53.0	45.1
7	Engine Bottom X	G's	0.0	0.0	0.0	0.0
8	Toe Pan Accelerator X	G's	3.6	12.6	-47.0	40.2
9	Toe Pan Accelerator Z	G's	18.4	41.3	-18.8	59.8
10	Toe Pan Footrest X	G's	2.3	13.0	-42.7	9.0
11	Toe Pan Footrest Z	G's	22.9	43.2	-17.4	66.6
12	Rear Deck Z	G's	17.1	16.9	-16.7	50.4
13	Rear Center Compartment X	G's	4.6	13.6	-44.1	26.8

1.) Channel failed at 63.4 msec.

2.) Channel failed, no data

SQUIB FIRING TIME DATA

Loc. No.	Contact Switch Location	Units	Peak Values			
			Max	Time	Min	Time
1	Driver Squib 1st Stage	On/Off	3.6	20.4	-2.7	20.9
2	Driver Squib 2nd Stage	On/Off	0.1	10.2	0.0	13.1
3	Driver Pretensioner	On/Off	0.0	0.0	0.0	0.0
4	Passenger Squib 1st Stage	On/Off	3.6	10.2	-2.5	11.2
5	Passenger Squib 2nd Stage	On/Off	3.3	30.6	-2.8	32.2
6	Passenger Pretensioner	On/Off	0.0	0.0	0.0	0.0

1.) Seatbelts not used

DATA SHEET NO. 8
VEHICLE ACCELEROMETER PRE AND POST TEST LOCATIONS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

VEHICLE ACCELEROMETER PRE AND POST TEST LOCATIONS

No.	Accelerometer Location	Pre Test (mm)			Post Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
1	Left Rear X	1625	-705	450	1590	-700	515	-35	-5	65
2	Right Rear X	1625	705	450	1590	700	515	-35	-5	65
3	Left Brake Caliper X	3305	-610	304	3360	-630	350	55	20	46
4	Right Brake Caliper X	3305	610	304	3360	630	347	55	20	43
5	Instrument Panel X	2720	0	1145	2740	0	1165	20	0	20
6	Engine Top X	3575	-60	940	3560	-55	990	-15	5	50
7	Engine Bottom X	3485	70	330	3500	80	420	15	10	90
8	Toe Pan Accelerator X	2820	-300	350	2815	-345	370	-5	45	20
9	Toe Pan Accelerator Z	2820	-300	350	2815	-345	370	-5	45	20
10	Toe Pan Footrest X	2744	-660	350	2745	-695	370	1	35	20
11	Toe Pan Footrest Z	2744	-660	350	2745	-695	370	1	35	20
12	Rear Deck Z	220	0	660	200	0	750	-20	0	90
13	Rear Center Comp. X	1675	0	520	1665	0	575	-10	0	55

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

DATA SHEET NO. 9
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	2.3	18.5	-59.6	71.4	18.4	89.7	-79.0	60.9
Head CG	Y	G's	32.2	62.5	-7.0	75.9	7.0	184.6	-50.0	58.7
Head CG	Z	G's	31.8	67.2	-13.6	87.3	29.5	146.6	-41.0	86.5
Head CG Resultant	N/A	G's	65.9	71.4			90.8	60.9		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	1.5	158.7	-54.9	75.9	4.3	199.4	-57.0	71.3
Chest CG	Y	G's	7.6	75.7	-1.8	69.0	4.0	124.5	-10.2	72.1
Chest CG	Z	G's	23.9	71.2	-5.8	45.6	37.2	74.2	-6.5	41.9
Chest CG Resultant	N/A	G's	58.4	75.6			68.4	74.3		

FEMUR PEAK FORCES

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	200.7	158.3	-7662.0	53.2	483.7	102.7	-7646.7	46.9
Right Femur	Z	Newtons	155.6	199.3	-6578.2	62.3	247.5	159.5	-8065.1	50.7

PRIMARY HEAD INJURY CRITERIA (HIC36)

Location	Driver (50th)				Passenger (50th)			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary	329.3	59.2	79.2	48.5	524.3	54.3	69.7	64.8

PRIMARY HEAD INJURY CRITERIA (HIC15)

Location	Driver (50th)				Passenger (50th)			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary	306.7	60.5	75.5	52.9	523.2	54.4	69.4	65.5

PRIMARY CHEST CLIP (3MSEC)

Location	Driver (50th)			Passenger (50th)		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	54.9	74.0	77.0	66.6	72.7	75.7

DATA SHEET NO. 9...(CONTINUED)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	1312.0	81.8	-378.8	152.2	2346.0	85.7	-522.8	175.0
Neck Force	Y	Newtons	26.9	50.0	-243.8	75.0	1434.8	87.3	-110.8	145.5
Neck Force	Z	Newtons	604.5	117.8	-1201.6	70.4	1342.5	68.0	-830.3	58.5
Neck Force Resultant	N/A	Newtons	1688.9	70.4			2739.0	86.0		
Neck Moment	X	Nm	24.4	78.4	-12.3	68.4	24.5	59.5	-62.4	71.0
Neck Moment	Y	Nm	51.7	69.7	-10.7	110.4	48.4	172.7	-34.9	87.4
Neck Moment	Z	Nm	8.5	90.5	-3.7	66.5	52.9	86.4	-4.9	69.8
Neck Moment Resultant	N/A	Nm	52.3	81.8			63.7	70.7		

NINE ACCELEROMETER ARRAY HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
NAAH CG	X	G's	1.6	18.5	-59.0	71.4	18.7	89.7	-78.1	60.9
NAAH CG	Y	G's	33.1	62.5	-6.9	76.4	7.2	184.4	-51.4	58.7
NAAH CG	Z	G's	31.7	67.2	-13.7	87.3	29.2	146.6	-41.5	86.2
NAAH CG Resultant	N/A	G's	65.3	71.5			90.3	60.9		
NAAH X-ARM	Y	G's	41.8	63.5	-9.2	80.0	15.9	86.9	-74.6	57.5
NAAH X-ARM	Z	G's	27.5	75.6	-13.6	61.0	38.7	67.0	-26.8	54.9
NAAH Y-ARM	X	G's	2.1	39.1	-66.1	70.4	33.6	89.0	-70.3	59.0
NAAH Y-ARM	Z	G's	36.4	67.4	-14.8	82.5	42.4	58.5	-50.4	86.5
NAAH Z-ARM	X	G's	7.9	83.8	-79.8	71.5	50.1	87.0	-135.0	60.8
NAAH Z-ARM	Y	G's	60.9	63.3	-18.3	69.1	22.0	79.3	-77.5	58.7

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	0.2	23.8	-41.6	80.9	0.5	52.6	-12.0	87.1

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ¹
Shoulder Belt Force	N/A	Newtons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ¹
Shoulder Belt Pullout	N/A	MM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ¹

1.) Driver and passenger seatbelts were not used

DATA SHEET NO. 9...(CONTINUED)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

KNEE PEAK DISPLACEMENTS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Knee	Z	MM	0.0	0.0	0.0	0.0	0.3	105.5	-4.3	41.3
Right Knee	Z	MM	0.0	0.0	0.0	0.0	0.2	170.6	-12.0	39.4

1.) Driver channels failed, no data

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Upper Force	X	Newtons	480.4	32.1	-1121.1	69.5	106.3	24.8	-1116.9	39.0
Left Upper Force	Z	Newtons	126.8	176.7	-1453.0	75.0	120.2	136.0	-4775.1	73.3
Left Upper Moment	X	Nm	43.0	63.1	-2.1	199.4	14.4	194.5	-75.3	74.0
Left Upper Moment	Y	Nm	161.7	36.8	-1.4	13.1	109.1	38.6	-20.8	53.6
Left Lower Force	X	Newtons	569.6	35.9	-86.3	48.7	631.7	71.2	-195.6	27.5
Left Lower Force	Y	Newtons	154.2	48.9	-243.3	63.2	662.9	74.6	-62.7	192.6
Left Lower Force	Z	Newtons	165.3	25.8	-2820.7	71.8	147.7	142.3	-5600.1	73.4
Left Lower Moment	X	Nm	78.2	75.7	-8.3	29.0	33.2	83.1	-31.0	36.5
Left Lower Moment	Y	Nm	53.9	70.7	-15.2	46.9	76.1	71.3	-40.2	31.6
Right Upper Force	X	Newtons	804.1	59.1	-1117.7	34.9	671.8	58.0	-1963.5	38.8
Right Upper Force	Z	Newtons	388.5	44.6	-1992.8	73.7	200.5	173.2	-3886.1	76.5
Right Upper Moment	X	Nm	22.6	62.2	-16.8	115.7	45.9	56.9	-120.2	76.4
Right Upper Moment	Y	Nm	177.6	35.3	-4.7	14.7	5.1	199.9	-224.2	38.3
Right Lower Force	X	Newtons	608.2	35.1	-73.3	29.2	957.2	37.7	-13.5	6.5
Right Lower Force	Y	Newtons	75.3	53.6	-106.0	31.5	248.1	57.7	-818.9	76.5
Right Lower Force	Z	Newtons	168.9	194.6	-3421.8	72.7	251.3	30.9	-5074.1	74.8
Right Lower Moment	X	Nm	21.8	71.6	-11.2	88.9	62.3	83.7	-6.3	39.4
Right Lower Moment	Y	Nm	44.7	71.7	-31.6	29.5	99.4	72.4	-1.4	15.2

TIBIA AND FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Tibia	X	G's	8.7	70.4	-77.1	48.4	17.6	70.6	-71.9	31.2
Left Tibia	Y	G's	19.1	64.6	-25.7	48.4	25.9	70.6	-16.9	57.4
Left Foot	X	G's	29.5	73.0	-102.2	36.0	30.6	69.1	-76.1	40.4
Left Foot	Y	G's	22.1	26.9	-36.0	75.6	29.2	27.5	-25.7	77.1
Left Foot	Z	G's	19.7	36.3	-57.3	47.9	53.0	23.7	-31.6	32.5
Right Tibia	X	G's	5.4	21.1	-74.4	29.1	19.0	50.2	-79.6	42.8
Right Tibia	Y	G's	14.3	35.3	-17.1	72.3	28.9	82.8	-84.4	42.9
Right Foot	X	G's	21.4	70.4	-120.8	36.4	24.8	75.0	-119.5	39.3
Right Foot	Y	G's	27.5	44.4	-22.5	71.4	31.8	44.5	-25.6	80.5
Right Foot	Z	G's	27.9	29.3	-65.8	34.4	41.2	44.8	-47.6	51.9

DATA SHEET NO. 9...(CONTINUED)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

ANKLE PEAK ROTATIONS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Ankle	X	Degrees	5.7	25.7	-36.5	197.6	37.8	83.2	-1.9	29.1
Left Ankle	Y	Degrees	18.8	74.5	-18.3	26.7	0.9	68.5	-30.1	32.4
Left Ankle	Z	Degrees	2.2	42.5	-8.3	69.0	12.4	128.5	4.7	0.4
Right Ankle	X	Degrees	2.4	8.6	-9.1	91.1	37.1	82.7	-4.4	194.5
Right Ankle	Y	Degrees	24.2	73.9	-17.5	34.2	9.2	77.1	-30.3	34.9
Right Ankle	Z	Degrees	0.0	0.0	0.0	0.0	3.7	38.4	-7.3	196.9

1.) Driver channel questionable data 2.) Driver channel failed, no data

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver (50th)				Passenger (50th)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	1.5	160.0	-54.8	75.9	4.3	198.5	-57.6	71.1
Chest CG	Y	G's	7.8	75.7	-1.7	69.0	4.0	126.2	-9.8	71.9
Chest CG	Z	G's	24.0	71.2	-6.0	45.6	36.8	74.1	-6.1	38.7
Chest CG Resultant	N/A	G's	58.3	75.6			67.9	74.2		

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver (50th)			Passenger (50th)		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	54.9	73.9	76.9	66.3	72.7	75.7

DATA SHEET NO. 9...(CONTINUED)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Head CG	X	G's	1.1	16.4	-50.8	106.7
Head CG	Y	G's	2.0	104.9	-3.5	66.0
Head CG	Z	G's	54.2	85.8	-0.6	11.5
Head CG Resultant	N/A	G's	63.5	88.5		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Chest CG	X	G's	1.5	153.1	-44.7	54.4
Chest CG	Y	G's	8.9	80.3	-3.1	74.3
Chest CG	Z	G's	10.9	79.8	-15.8	46.1
Chest CG Resultant	N/A	G's	45.8	54.4		

FEMUR PEAK FORCES

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Left Femur	Z	Newtons	1616.5	45.2	-1539.4	57.7
Right Femur	Z	Newtons	1787.0	46.3	-2388.6	58.5

PRIMARY HEAD INJURY CRITERIA (HIC36)

Location	Center Rear Pass. (50th)			
	HIC	T ¹	T ²	Avg G
Head CG Primary	851.9	74.0	110.0	56.2

PRIMARY HEAD INJURY CRITERIA (HIC15)

Location	Center Rear Pass. (50th)			
	HIC	T ¹	T ²	Avg G
Head CG Primary	419.6	79.3	94.3	60.0

PRIMARY CHEST CLIP (3MSEC)

Location	Center Rear Pass. (50th)		
	CLIP	T ¹	T ²
Chest CG Primary	41.2	49.3	52.3

CHEST PEAK DISPLACEMENT

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Chest	X	MM	0.0	8.0	-37.8	84.2

DATA SHEET NO. 9...(CONTINUED)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Neck Force	X	Newtons	82.7	28.1	-1678.5	106.0
Neck Force	Y	Newtons	58.3	105.2	-74.9	55.2
Neck Force	Z	Newtons	2352.1	88.2	-52.9	6.2
Neck Force Resultant	N/A	Newtons	2658.4	89.9		
Neck Moment	X	Nm	3.9	97.4	-16.1	115.0
Neck Moment	Y	Nm	83.6	108.7	-63.2	62.6
Neck Moment	Z	Nm	9.1	112.2	-4.4	66.1
Neck Moment Resultant	N/A	Nm	84.8	108.7		

NINE ACCELEROMETER ARRAY HEAD PEAK ACCELERATIONS

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
NAAH CG	X	G's	5.0	14.7	-50.6	106.6
NAAH CG	Y	G's	1.9	105.3	-3.6	66.0
NAAH CG	Z	G's	54.7	85.8	-0.5	11.9
NAAH CG Resultant	N/A	G's	63.7	88.9		
NAAH X-ARM	Y	G's	3.8	93.7	-5.1	65.1
NAAH X-ARM	Z	G's	56.4	85.8	-1.7	15.0
NAAH Y-ARM	X	G's	0.8	26.7	-52.8	106.8
NAAH Y-ARM	Z	G's	57.0	75.8	-1.0	11.9
NAAH Z-ARM	X	G's	11.2	59.3	-78.4	106.1
NAAH Z-ARM	Y	G's	8.5	72.6	-7.9	97.7

KNEE PEAK DISPLACEMENTS

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Left Knee	Z	MM	1.0	96.6	-2.6	58.6
Right Knee	Z	MM	0.0	0.0	0.0	0.0

1.) Channel failed, no data

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Center Rear Pass. (50th)			
			Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	8057.4	49.3	-52.8	135.9
Shoulder Belt Force	N/A	Newtons	5285.0	76.0	-29.5	160.9
Shoulder Belt Pullout	N/A	MM	304.5	86.8	0.0	3.5

DATA SHEET NO. 9...(CONTINUED)Test Vehicle: 2004 Jeep Liberty 4-Door MPVNHTSA No.: R40401Test Program: 2004 FMVSS 208 UpgradeTest Date: 9/9/04**DUMMY INJURY CRITERIA DATA**

Parameter	Driver (50th)	
	Injury Criteria and Performance Limits	
Parameter	H3 50th w/ THOR Limit	Test Value
HIC (15 msec)	700	307
NIJ (Compression Flexion)	1	0.10
NIJ (Compression Extension)	1	0.06
NIJ (Tension Flexion)	1	0.29
NIJ (Tension Extension)	1	0.29
Peak Upper Neck Tension (N)	4170	605
Peak Upper Neck Compression (N)	4000	1202
3 ms Chest Acceleration (G)	60	55
Chest Deflection (MM)	63	42
Left Femur Load (N)	9040	-7662
Right Femur Load (N)	9040	-6578
Left Tibia to Femur Displacement (MM)	15	0.0
Right Tibia to Femur Displacement (MM)	15	0.0
Left Upper Tibia Index	0.91	0.73
Right Upper Tibia Index	0.91	0.81
Left Lower Tibia Index	0.91	0.48
Right Lower Tibia Index	0.91	0.31
Left Upper Tibia Compression FZ (N)	5600	1453
Right Upper Tibia Compression FZ (N)	5600	1993
Left Lower Tibia Compression FZ (N)	5200	2821
Right Lower Tibia Compression FZ (N)	5200	3422
Left Foot XL Rotation (Degrees)	35	-36
Right Foot XL Rotation (Degrees)	35	19
Left Foot YL Rotation (Degrees)	35	-9
Right Foot YL Rotation (Degrees)	35	24

1.) Questionable data

2.) Channel failed, no data

DATA SHEET NO. 9...(CONTINUED)Test Vehicle: 2004 Jeep Liberty 4-Door MPVNHTSA No.: R40401Test Program: 2004 FMVSS 208 UpgradeTest Date: 9/9/04**DUMMY INJURY CRITERIA DATA**

	Right Front Passenger (50th)	
	Injury Criteria and Performance Limits	
Parameter	H3 50th w/ THOR Limit	Test Values
HIC (15 msec)	700	523
NIJ (Compression Flexion)	1	0.06
NIJ (Compression Extension)	1	0.11
NIJ (Tension Flexion)	1	0.38
NIJ (Tension Extension)	1	0.29
Peak Upper Neck Tension (N)	4170	1343
Peak Upper Neck Compression (N)	4000	830
3 ms Chest Acceleration (G)	60	67
Chest Deflection (MM)	63	-12
Left Femur Load (N)	9040	-7647
Right Femur Load (N)	9040	-8065
Left Tibia to Femur Displacement (MM)	15	-4.3
Right Tibia to Femur Displacement (MM)	15	-12.0
Left Upper Tibia Index	0.91	0.65
Right Upper Tibia Index	0.91	1.14
Left Lower Tibia Index	0.91	0.50
Right Lower Tibia Index	0.91	0.58
Left Upper Tibia Compression FZ (N)	5600	4775
Right Upper Tibia Compression FZ (N)	5600	3886
Left Lower Tibia Compression FZ (N)	5200	5600
Right Lower Tibia Compression FZ (N)	5200	5074
Left Foot XL Rotation (Degrees)	35	38
Right Foot XL Rotation (Degrees)	35	-30
Left Foot YL Rotation (Degrees)	35	37
Right Foot YL Rotation (Degrees)	35	-30

DATA SHEET NO. 9...(CONTINUED)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

DUMMY INJURY CRITERIA DATA

	Center Rear Passenger (50th)	
	Injury Criteria and Performance Limits	
Parameter	H3 50th w/ Denton Limit	Test Values
HIC (15 msec)	700	420
NIJ (Compression Flexion)	1	0.20
NIJ (Compression Extension)	1	0.03
NIJ (Tension Flexion)	1	0.65
NIJ (Tension Extension)	1	0.04
Peak Upper Neck Tension (N)	4170	2352
Peak Upper Neck Compression (N)	4000	53
3 ms Chest Acceleration (G)	60	41
Chest Deflection (MM)	63	-38
Left Femur Load (N)	10008	-1539
Right Femur Load (N)	10008	-2389
Left Tibia to Femur Displacement (MM)	15	-2.6
Right Tibia to Femur Displacement (MM)	15	0.0
Left Upper Tibia Index	0.91	N/A
Right Upper Tibia Index	0.91	N/A
Left Lower Tibia Index	0.91	N/A
Right Lower Tibia Index	0.91	N/A
Left Upper Tibia Compression FZ (N)	5600	N/A
Right Upper Tibia Compression FZ (N)	5600	N/A
Left Lower Tibia Compression FZ (N)	5200	N/A
Right Lower Tibia Compression FZ (N)	5200	N/A
Left Foot XL Rotation (Degrees)	N/A	N/A
Right Foot XL Rotation (Degrees)	N/A	N/A
Left Foot YL Rotation (Degrees)	N/A	N/A
Right Foot YL Rotation (Degrees)	N/A	N/A

1.) Channel failed, no data

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

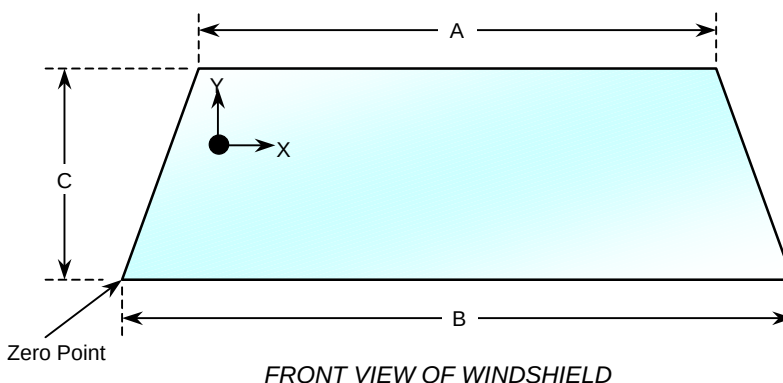
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive and plastic molding covers.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles that are equipped with occupant passive restraints.

Temperature of windshield molding during test: 34.4 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	1962	1962	100%
Right Side	1962	1962	100%
Total	3924	3924	100%



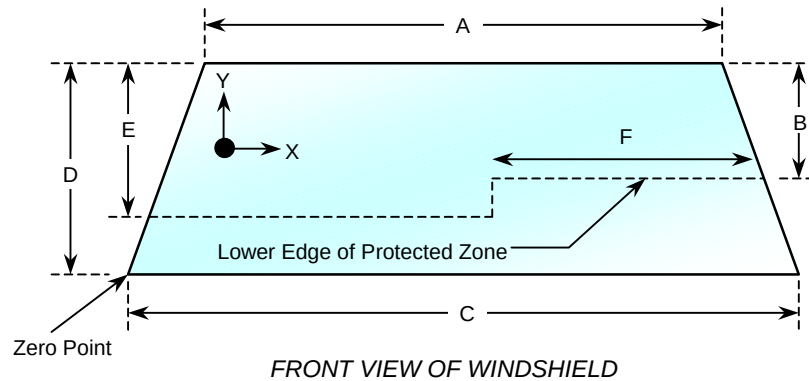
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1200	0
B	mm	1500	14
C-Left	mm	612	20
C-Right	mm	612	20

DATA SHEET NO. 11
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1200
B	mm	420
C	mm	1500
D	mm	612
E	mm	450
F	mm	494

AREA OF PROTECTED ZONE FAILURES

A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one that is normally in contact with the windshield.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

DATA SHEET NO. 12
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV NHTSA No.: R40401
Test Program: 2004 FMVSS 208 Upgrade Test Date: 9/9/04

Test Time: 3:16 PM Temperature: 34.4 Deg. C.

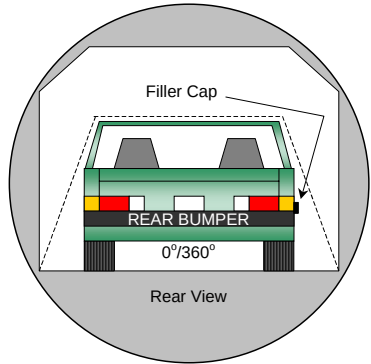
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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

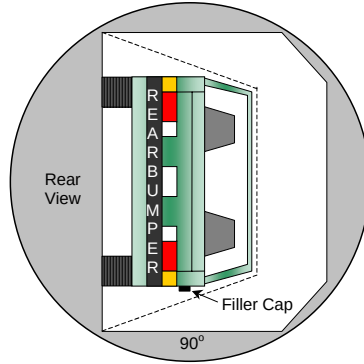
DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

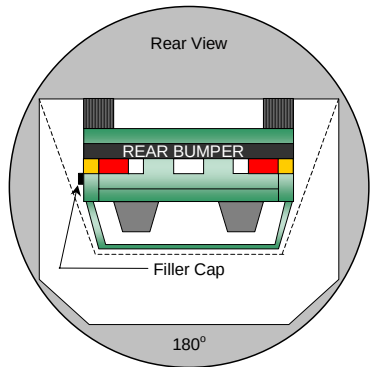
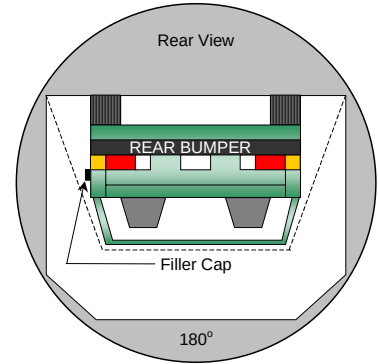
NHTSA No.: R40401
Test Date: 9/9/04



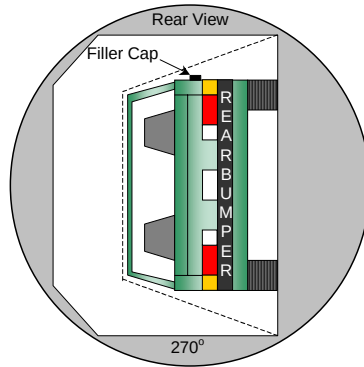
0° to 90°



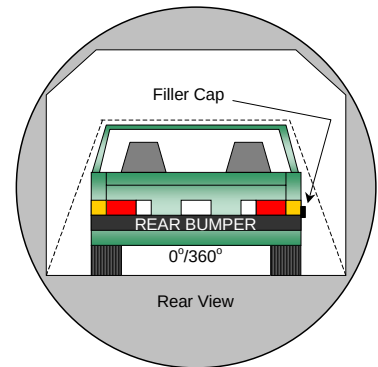
90° to 180°



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. 13...(CONTINUED)
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	82	300	382
90° to 180°	81	300	381
180° to 270°	83	300	383
270° to 360°	77	300	377

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

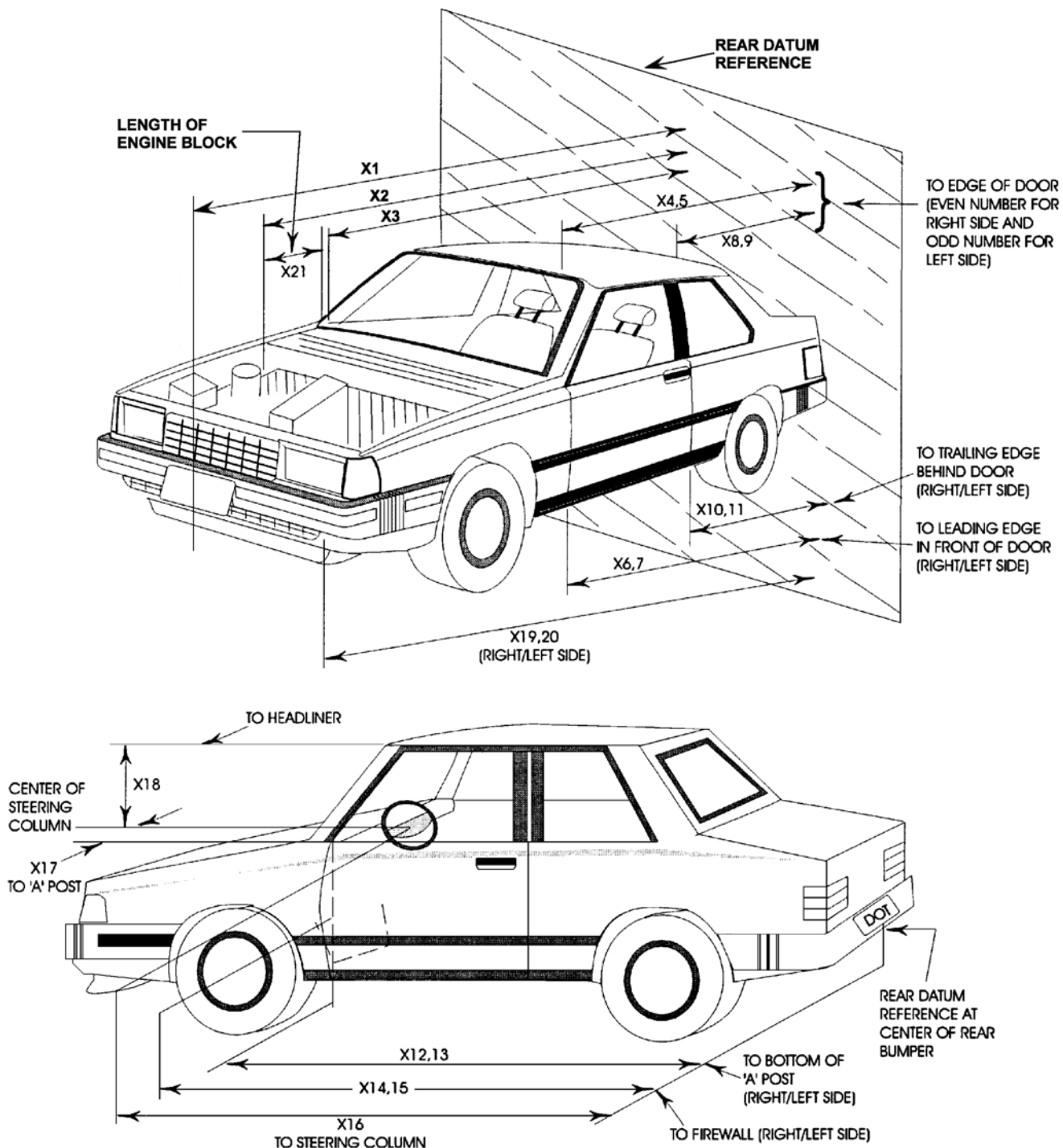
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14 **VEHICLE MEASUREMENTS**

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04



DATA SHEET NO. 14...(CONTINUED)
VEHICLE MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4214	3974	-240
2	RSOV to front of engine	mm	3649	3599	-50
3	RSOV to firewall centerline	mm	3134	3154	20
4	RSOV to leading edge of right door	mm	2826	2827	1
5	RSOV to leading edge of left door	mm	2870	2880	10
6	RSOV to lower leading edge of right door	mm	2826	2827	1
7	RSOV to lower leading edge of left door	mm	2834	2840	6
8	RSOV to upper trailing edge of right door	mm	1833	1833	0
9	RSOV to upper trailing edge of left door	mm	1852	1858	6
10	RSOV to lower trailing edge of right door	mm	1841	1842	1
11	RSOV to lower trailing edge of left door	mm	1852	1858	6
12	RSOV to bottom of right 'A' pillar	mm	2820	2809	-11
13	RSOV to bottom of left 'A' pillar	mm	2822	2831	9
14	RSOV to firewall on right side	mm	3162	3164	2
15	RSOV to firewall on left side	mm	3168	3184	16
16	RSOV to steering column hub	mm	2400	2475	75
17	Center of steering column to left 'A' pillar	mm	340	350	10
18	Center of steering column to headlining	mm	490	500	10
19	RSOV to right side of front bumper	mm	4071	3934	-137
20	RSOV to left side of front bumper	mm	4081	3994	-87
21	Length of engine block	mm	585	585	0
RD	RSOV to right side of dash panel	mm	2636	2644	8
CD	RSOV to center of dash panel	mm	2554	2570	16
LD	RSOV to left side of dash panel	mm	2643	2658	15

All measurements in millimeters

DATA SHEET NO. 14...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

VEHICLE STRUCTURAL MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4214	3974	-240
2	Total width	mm	1765	1765	0
3	Bumper top height	mm	698	760	62
4	Bumper bottom height	mm	330	380	50
5	Longitudinal member top height	mm	730	725	-5
6	Longitudinal member bottom height	mm	340	401	61
7	Distance between longitudinal members	mm	1000	825	-175
8	Longitudinal member width	mm	75	68	0
9	Engine top height	mm	930	960	30
10	Engine bottom height	mm	360	294	-66
11	Engine and gear box width	mm	1000	1000	0
12	Front bumper to engine distance	mm	565	387	-178
13	Front shock absorber fixing width	mm	900	810	-90
14	Bonnet leading edge height	mm	915	1150	235
15	Front shock absorber fixing width	mm	1000	810	-190
16	Front bumper to front axle distance	mm	750	720	-30
17	Front axle to 'A' pillar distance	mm	661	617	-44
18	'A' pillar to 'B' pillar distance	mm	1035	1035	0
19	'B' pillar to rear axle distance	mm	1000	1006	6
20	'B' pillar to 'C' pillar distance	mm	870	870	0
21	Roof sill bottom height	mm	1520	1516	-4
22	Roof sill top height	mm	1690	1690	0
23	Floor sill bottom height	mm	270	300	30
24	Floor sill top height	mm	460	450	-10

All measurements are in millimeters

DATA SHEET NO. 14...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

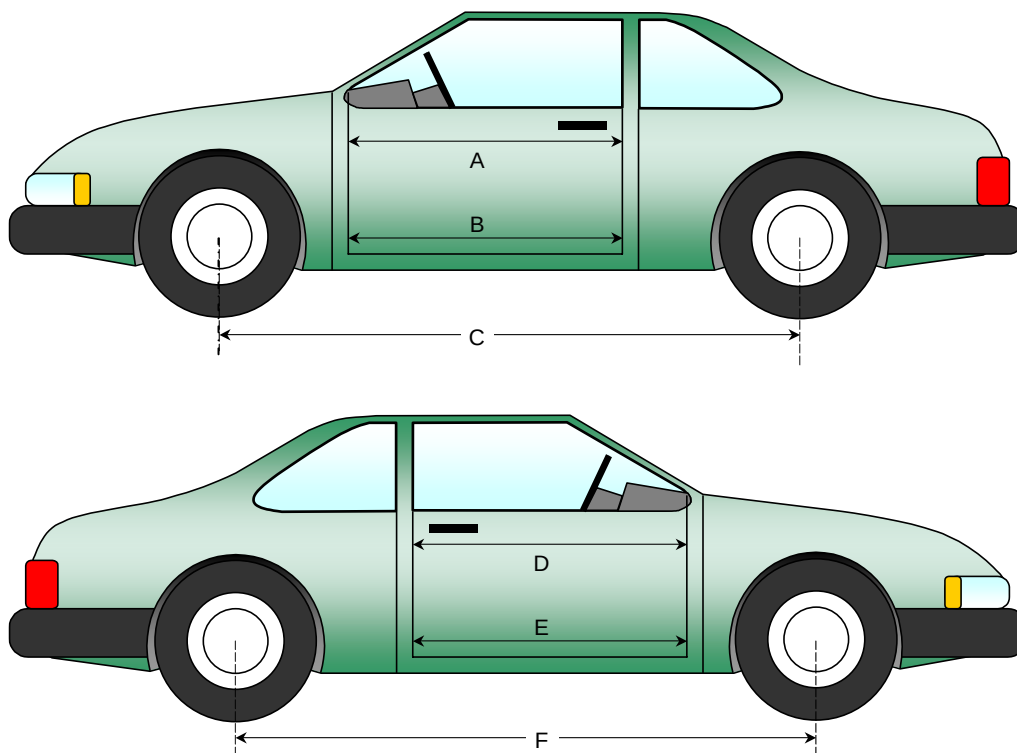
NHTSA No.: R40401
 Test Date: 9/9/04

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	936	932	-4
B	Left Side Lower	mm	896	894	-2
D	Right Side Upper	mm	935	926	-9
E	Right Side Lower	mm	900	893	-7

WHEELBASE MEASUREMENT TABLE

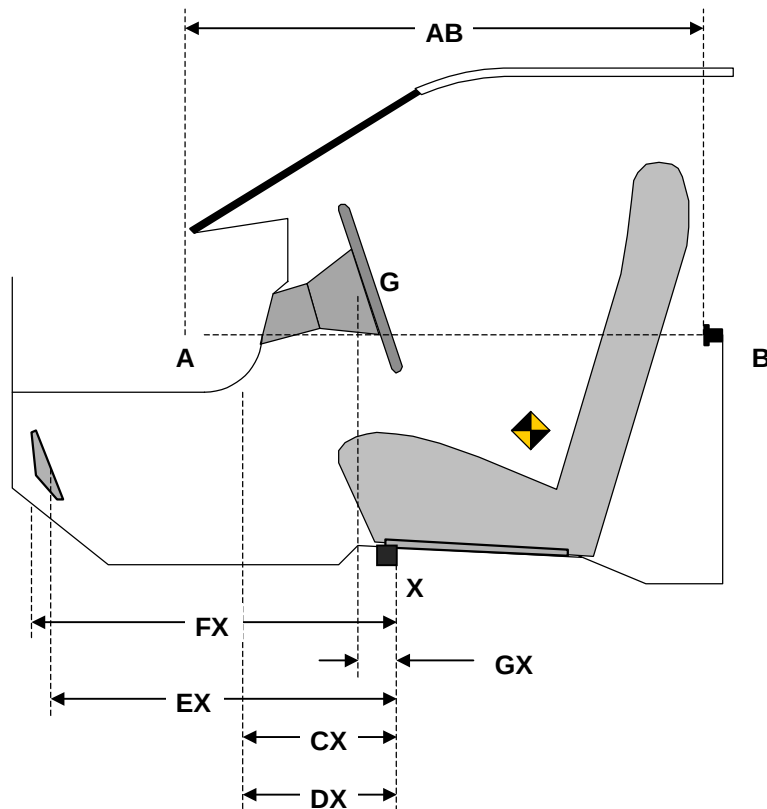
Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2650	2665	15
F	Right Side Wheel Base	mm	2650	2665	15



DATA SHEET NO. 14...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04



DRIVER COMPARTMENT INTRUSION TABLE

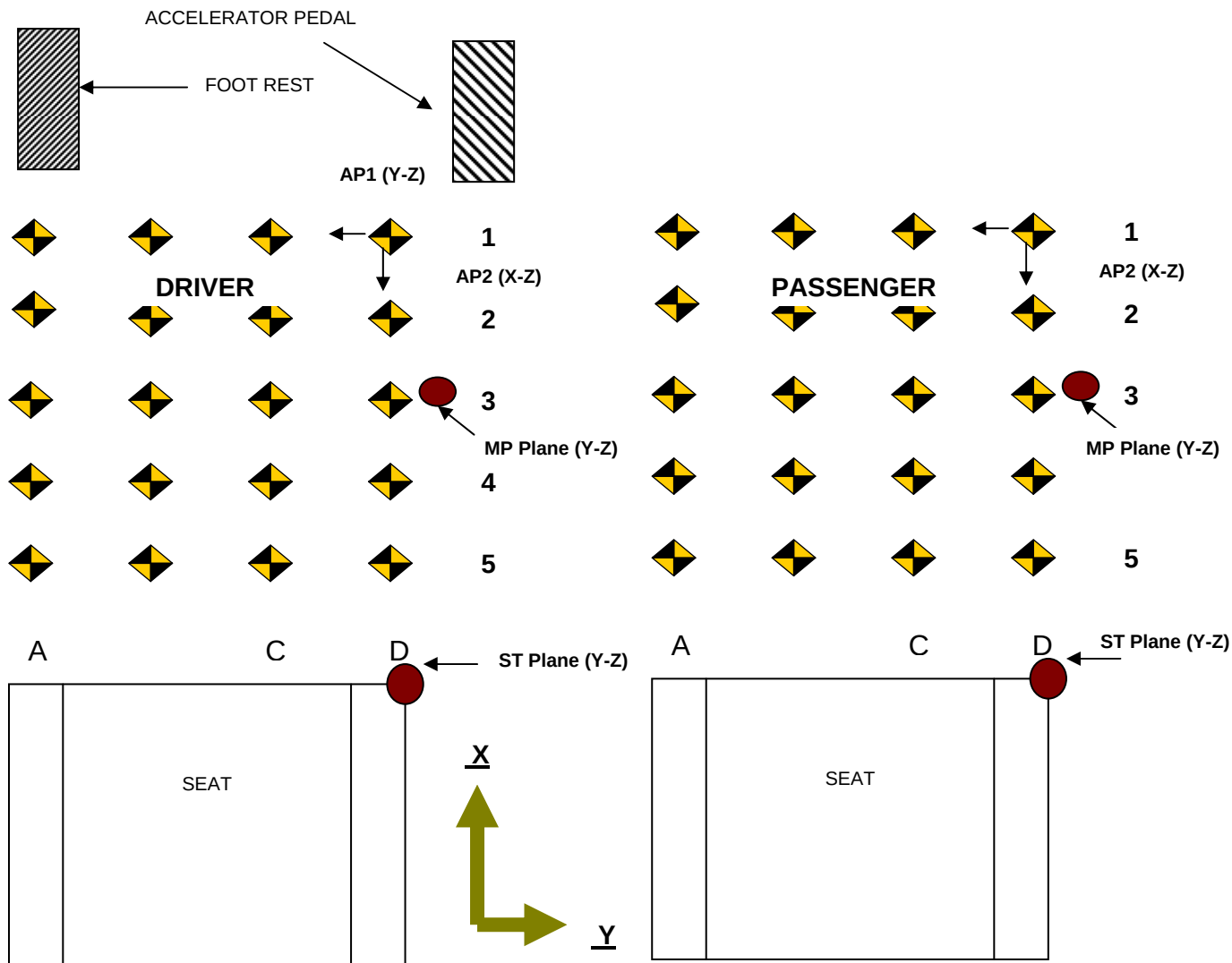
Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	936	932	-4
CX	Left Knee Bolster to X	mm	305	346	41
DX	Right Knee Bolster to X	mm	381	335	-46
EX	Brake Pedal to X	mm	516	535	19
FX	Foot Rest to X	mm	660	525	-135
GX	Center of Steering Wheel Hub to X	mm	110	105	-5

X = Left Front Seat Outboard Anchor Bolt Head

DATA SHEET NO. 14...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

MP: Y-Z plane, halfway between the ST plane and AP1 plane

CF Plane: X-Z plane passes through center of footrest.

BP Plane: X-Z plane passes through center of brake pedal

TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 14...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

All measurements are in mm.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	699	751	740	716	679	749	747	727	-21	-2	7	11
2	633	669	656	647	625	676	662	660	-8	8	8	13
3	557	565	556	550	556	574	566	564	-1	9	11	14
4	499	492	485	475	498	495	492	489	-1	4	7	15
5	416	408	396	388	415	415	408	401	-2	7	12	13

DRIVER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	15	113	224	313	-11	79	180	276	-27	-34	-44	-37
2	2	106	218	314	-11	80	186	285	-12	-26	-32	-29
3	-5	98	211	311	-6	76	187	288	-1	-22	-25	-23
4	-10	91	203	306	-27	77	191	290	-17	-14	-12	-15
5	-20	88	202	304	-33	71	187	290	-13	-18	-15	-13

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-125	-82	-75	-85	-127	-100	-89	-87	-2	-18	-14	-1
2	-60	-10	-14	-14	-64	-21	-27	-24	-4	-11	-13	-10
3	7	50	43	41	6	42	36	31	-2	-8	-7	-10
4	67	65	61	56	55	58	54	44	-12	-7	-6	-12
5	66	66	60	58	55	63	55	49	-10	-3	-5	-9

DATA SHEET NO. 14...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

All measurements in mm

PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	677	709	701	694	681	711	701	694	4	2	0	1
2	607	616	618	620	612	621	620	623	5	5	3	3
3	514	512	508	508	522	521	518	511	8	9	10	4
4	545	440	438	431	451	448	440	439	6	9	2	8
5	355	349	347	340	366	359	353	344	11	10	6	4

PASSENGER FLOOR PAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-265	-181	-72	46.5	-254	-189	-64	52	11	-8	8	5
2	285	-189	-72	50	-279	-181	-66	51	6	8	6	1
3	-288	-193	-78	35	-279	-188	-71	33	8	5	7	-1
4	-295	-195	-78	31	-280	-196	-78	34	15	-2	0	3
5	-303	-200	-82	27.3	-296	-197	-83	28	7	3	-1	0

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-63	-27	-20	-15	-86	-51	-44	-42	-23	-25	-25	-26
2	14	29	33	42	-7	8	14	25	-21	-21	-20	-18
3	45	69	74	68	25	54	57	51	-19	-15	-17	-18
4	53	69	72	66	35	56	58	51	-17	-13	-14	-15
5	63	67	67	34	55	58	57	50	-8	-10	-10	-14

DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

VEHICLE CAMERA MEASUREMENT TABLE

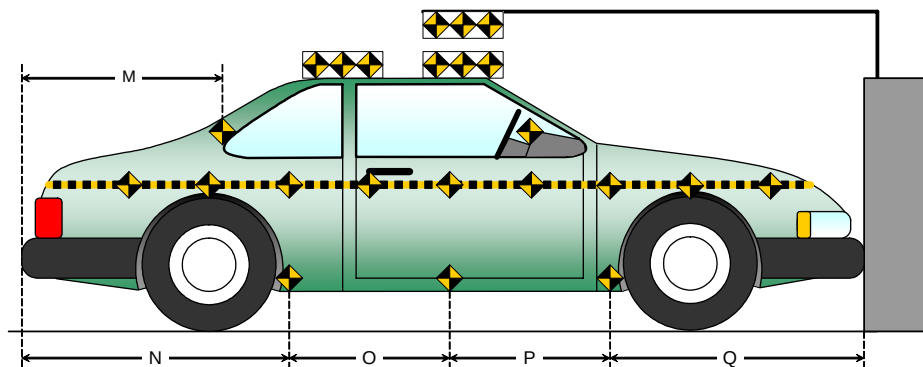
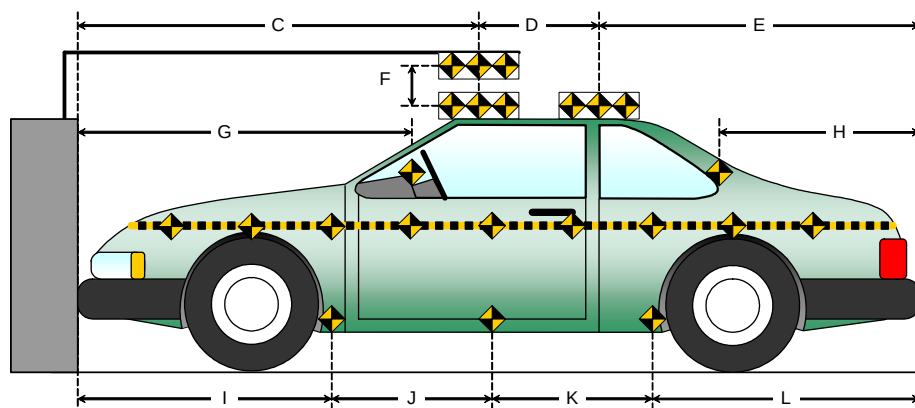
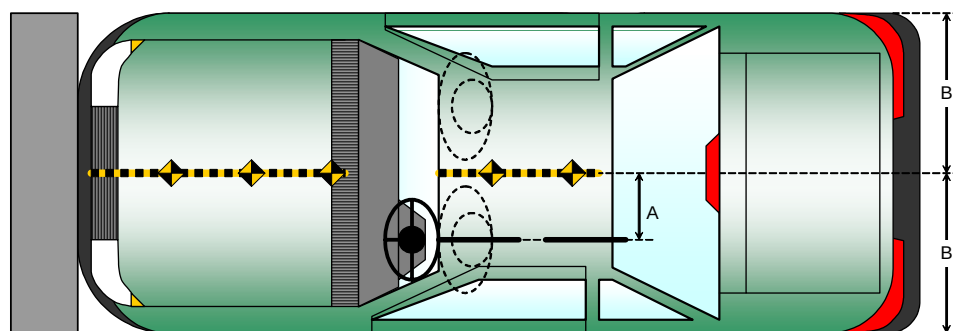
No.	Camera		Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
	View	Type	X	Y	Z				
1	Left Side (Panning)	Real Time	-12192	-6096	-1651	-10	N/A	Zoom	30
1B	Left Side (Still)	Real Time	-1219	-8585	-1372	0	8188	Zoom	30
1C	Right Side (Still)	Real Time	-1067	7976	-991	0	7620	Zoom	30
2	Overall Left Side	16mm	-2489	-8280	-1143	-4	7834	13	1010
2B	Overall Left Side	Video	-1883	-7671	-1143	-2	7228	10	1000
3	Left Side View	Video	-1677	-7773	-1270	-4	7338	50	1000
3B	Left Side View	16mm	-2134	-8230	-1449	-4	7773	35	1040
4B	Driver & Interior	Video	-5360	-10846	-4648	-13	11310	Zoom	1000
5	Steering Column (Bottom)	16mm	-2134	-8230	-2997	-16	7921	19	1020
6	Steering Column (Top)	16mm	-2134	-8230	-3404	-20	8009	19	1010
7	Left Rear Dummy On-Board	Video	-2819	-635	-1626	-25	668	4.2	1000
8	Overall Right Side	16mm	-2083	8230	-1270	-6	7776	13	1010
9	Right Side View	Video	-1577	10871	-1575	-4	10433	105	1000
9B	Right Passenger View	16mm	-1677	10871	-1575	-4	10428	80	965
10	Right Side View	16mm	-2083	8230	-1575	-4	7774	35	965
11	Passenger & Interior View	16mm	-6781	9144	-2997	-9	9933	50	890
11B	Passenger & Interior View	Video	-6477	9068	-2946	-9	9722	Zoom	1000
12	Right Rear Dummy On-Board	Video	-2819	635	-1626	-25	668	5.7	1000
13	Passenger Front View	16mm	610	432	-2667	-40	N/A	13	890
14	Driver Front View	16mm	610	-432	-2667	-40	N/A	13	1155
15	Windshield View	16mm	-610	0	-5944	-90	N/A	13	1005
16	Pit View of Engine	16mm	-914	0	1499	90	N/A	9	890
17	Pit View of Fuel Tank	16mm	-2438	0	1499	90	N/A	6	730

DATA SHEET NO. 16 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

All Dimensions in (mm)	
Item	Value
A	396
B	800
C	2180
D	610
E	1440
F	155
G	1635
H	985
I	1318
J	746
K	706
L	1453
M	972
N	1475
O	714
P	702
Q	1384



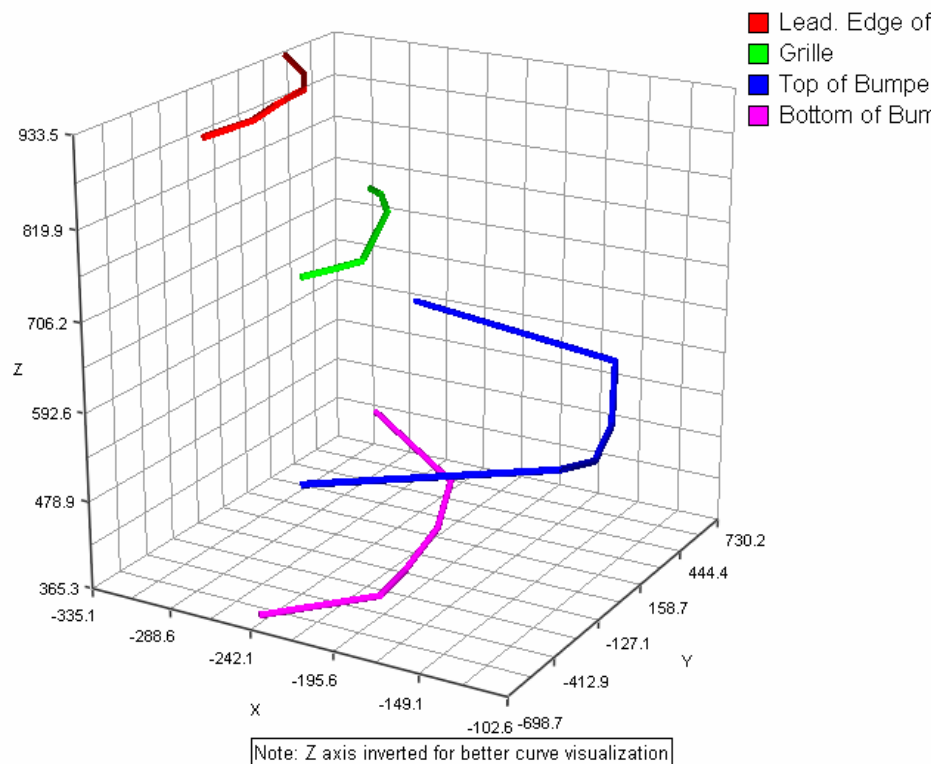
DATA SHEET NO. 17
TEST VEHICLE FRONTAL PROFILE DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

Pre-Test Measurements in mm.							
		Vehicle Left			Vehicle Right		
		C1	C2	C3	C4	C5	C6
Leading edge of Hood							
	X	-293	-283	-284	-289	-306	-335
	Y	-421	-253	-83	91	264	433
	Z	-919	-926	-933	-930	-928	-928
Grille							
	X	-244	-236	-232	-250	-264	-280
	Y	-374	-269	-155	179	288	394
	Z	-762	-764	-762	-780	-785	-776
Top of Bumper							
	X	-213	-103	-108	-120	-141	-285
	Y	-699	-399	-112	152	433	730
	Z	-565	-596	-563	-566	-602	-583
Bottom of Bumper							
	X	-241	-200	-212	-220	-234	-309
	Y	-662	-391	-119	174	419	716
	Z	-379	-384	-365	-374	-396	-415

Test Vehicle Pre-Crash Frontal Profile (Jeep Liberty)



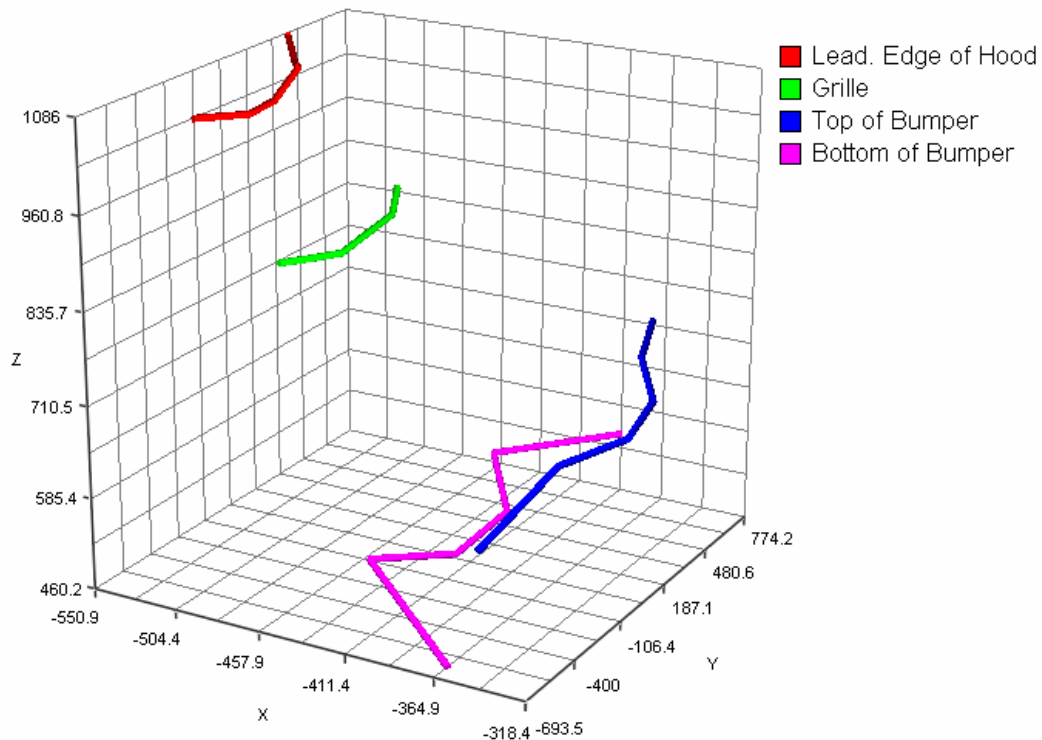
DATA SHEET NO. 17...(CONTINUED)
TEST VEHICLE FRONTAL PROFILE DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

Post Test Measurements in mm.							
		Vehicle Left			Vehicle Right		
		C1	C2	C3	C4	C5	C6
Leading edge of Hood	X	-516	-503	-507	-511	-529	-551
	Y	-429	-261	-90	89	252	423
	Z	-1070	-1063	-1061	-1085	-1069	-1086
Grille	X	-476	-468	-463	-467	-475	-485
	Y	-380	-275	-161	171	285	387
	Z	-895	-892	-887	-897	-916	-900
Top of Bumper	X	-343	-331	-318	-326	-353	-372
	Y	-694	-368	-86	176	450	774
	Z	-639	-704	-703	-710	-718	-716
Bottom of Bumper	X	-364	-431	-408	-406	-434	-386
	Y	-621	-354	-83	211	449	751
	Z	-460	-518	-494	-508	-539	-548

Test Vehicle Post-Crash Frontal Profile (Jeep Liberty)



Note: Z axis was inverted for better curve visualization

DATA SHEET NO. 17...(CONTINUED)
TEST VEHICLE FRONTAL PROFILE DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

Change (Post - Pre) Test Measurements in mm.							
		Vehicle Left			Vehicle Right		
		C1	C2	C3	C4	C5	C6
Leading edge of Hood							
	X	-223	-220	-223	-222	-223	-216
	Y	-9	-9	-7	-2	-12	-10
	Z	-152	-137	-128	-155	-140	-158
Grille							
	X	-231	-232	-231	-217	-211	-204
	Y	-6	-7	-6	-8	-3	-7
	Z	-133	-128	-125	-117	-131	-124
Top of Bumper							
	X	-130	-228	-210	-206	-212	-87
	Y	5	32	27	25	18	44
	Z	-74	-107	-140	-145	-116	-133
Bottom of Bumper							
	X	-123	-231	-196	-186	-200	-77
	Y	41	37	36	37	30	35
	Z	-81	-135	-129	-133	-143	-133

DATA SHEET NO. 18
POST-TEST AIRBAG DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04

POST-TEST AIRBAG DATA

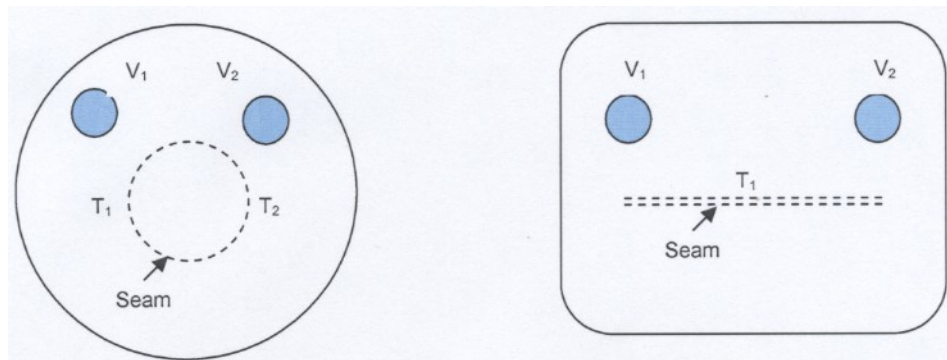
	DRIVER	PASSENGER
No. of vent holes	2	2
Size of vent holes (mm ²)	495	1981
Total vent area (mm ²)	990	3962

Deflated airbag length and width dimensions or, if round, diameter (mm)		
Length	460	550
Width	690	780
Depth or Diameter	360	400

Tethering information		
Is the airbag tethered?	Yes	No
Record length of tether (mm)	370	N/A

Airbag manufacturing information		
Manufacturer	TRW	TRW
Part No.	TCEDT0094K0784	TCOPTOG84721221
Gas Generator	31XK007R12288	V508/30352155A

The following sketch shows the airbag with location of the vent holes (v1 and v2), along with the tethers attachment points (T1 and T2). The tethers are sewed to the both bag and the steering wheel end.

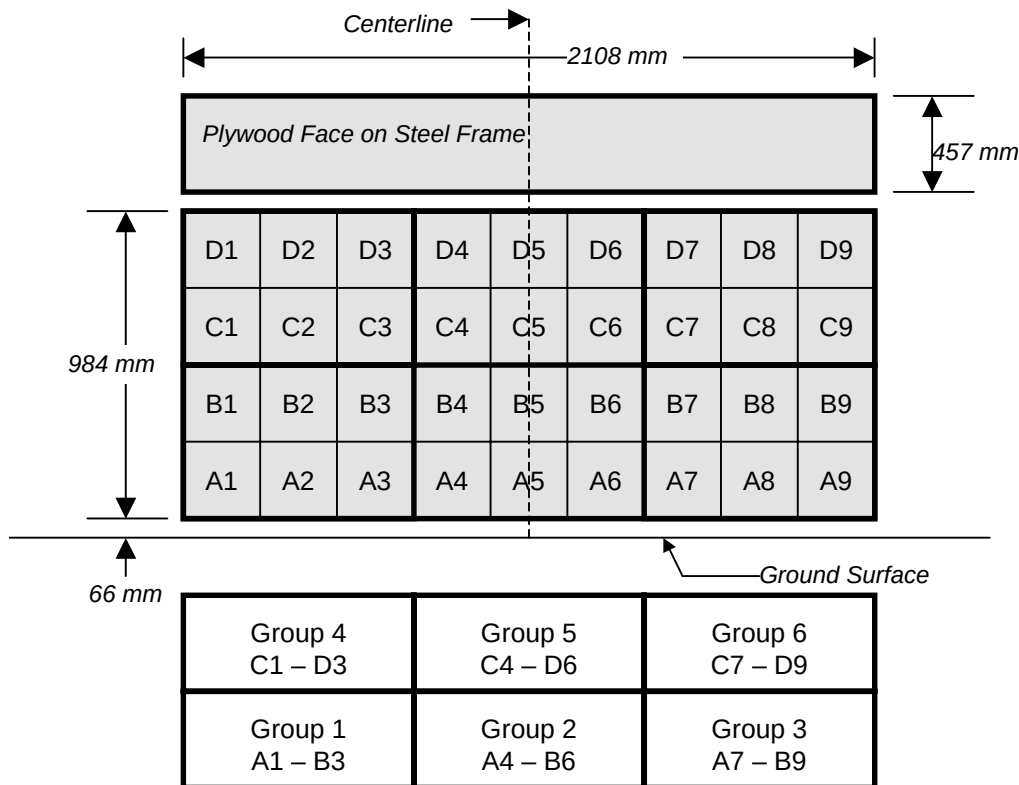


DATA SHEET NO. 19
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
 Test Date: 9/9/04

36 Load Cell Rigid Barrier (NHTSA Standard)
Load Cell Locations on Fixed Barrier



6 Groups of 6 Load Cells Each

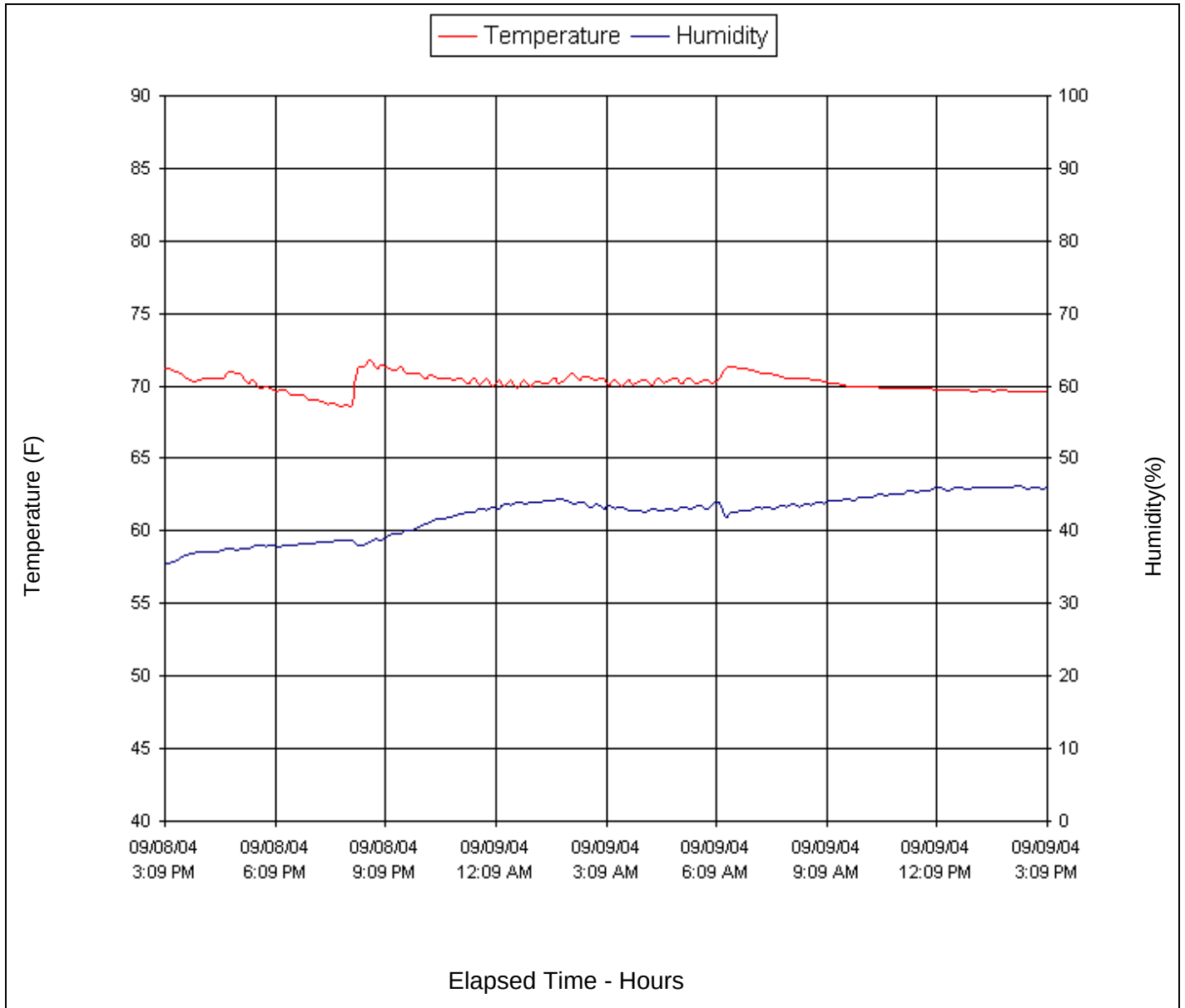
The Data is presented in Appendix C with the following requirements:

- 1.) Data from 36 individual load cells
- 2.) Sum data from 6 groupings shown above (6 cells/group)
- 3.) Total or sum of all 36 individual load cells
- 4.) Sum of all 36 individual load cells vs. vehicle dynamic crush

DATA SHEET NO. 20
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

NHTSA No.: R40401
Test Date: 9/9/04



APPENDIX A
PHOTOGRAPHS

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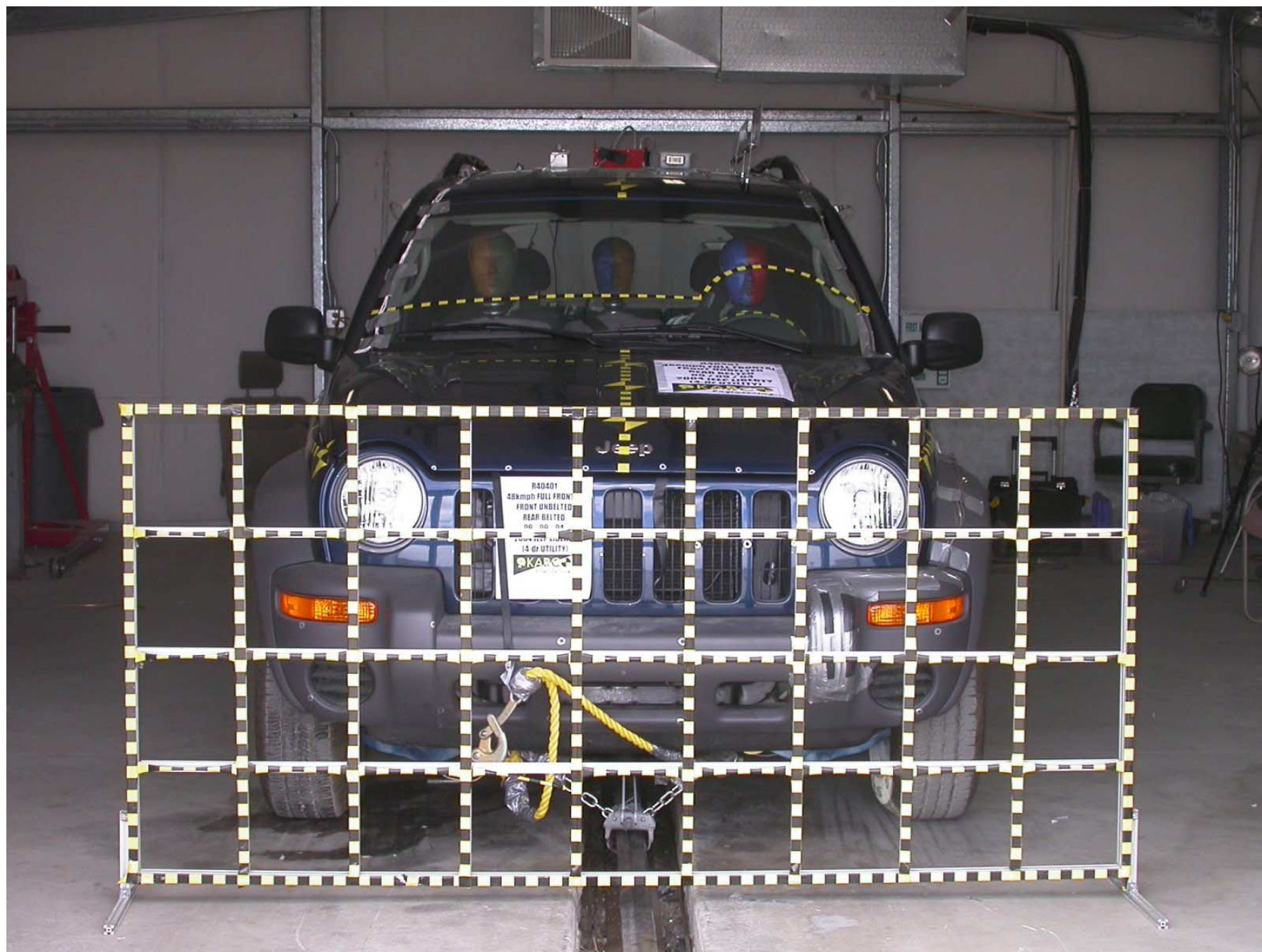


Figure A-1: Load Cell Location

MFD BY DAIMLERCHRYSLER CORPORATION DATE OF MFR 1-04 GWR 2427 KG(05350 LB)

GAWR FRONT	WITH TIRES	RIMS AT	COLD
1248 KG(2750 LB)	P215/75R16	16X7	227 KPA(33 PSI)
GAWR REAR	WITH TIRES	RIMS AT	COLD
1429 KG(3150 LB)	P215/75R16	16X7	227 KPA(33 PSI)

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1J4GK48K84W226063 TYPE: MPV SINGLE X DUAL



MDH: 011601 080AA PNT:PB7 VEHICLE MADE IN U.S.A. TRM:MSDU 4648503

Figure A-2: Vehicle Certification Label

<u>TIRE INFLATION PRESSURE</u> INFLATE TIRES COLD BEFORE RUNNING. DO NOT REDUCE PRESSURE IF TIRES ARE WARM.	 SEE OWNERS MANUAL FOR HIGH SPEED OPERATION AND ADDITIONAL DATA.						
RECOMMENDED INFLATION PRESSURE AND TIRE SIZES <table> <tr> <td>P215/75R16</td> <td>33 psi/227 kPa</td> </tr> <tr> <td>P235/70R16</td> <td>33 psi/227 kPa</td> </tr> <tr> <td>P235/65R17</td> <td>33 psi/227 kPa</td> </tr> </table> (AT FULL LOAD)	P215/75R16	33 psi/227 kPa	P235/70R16	33 psi/227 kPa	P235/65R17	33 psi/227 kPa	MINIMUM TIRE SIZE P215/75R16 (W/3.7L OR 2.4L)
P215/75R16	33 psi/227 kPa						
P235/70R16	33 psi/227 kPa						
P235/65R17	33 psi/227 kPa						
VEHICLE CAPACITY 1150 lb/522 kg	SEATING CAPACITY FRONT 2 REAR 3 52088962AB						

Figure A-3: Vehicle Tire Label



Figure A-4: Right Front $\frac{3}{4}$ View, As Received



Figure A-5: Left Rear $\frac{3}{4}$ View, as Received



Figure A-6: Pre-Test Front View



Figure A-7: Post-Test Front View (Vehicle Moved)



Figure A-8: Pre-Test Left Side View



Figure A-9: Post-Test Left Side View



Figure A-10: Pre-Test Right Side View



Figure A-11: Post-Test Right Side View



Figure A-12: Pre-Test Right Front $\frac{3}{4}$ View



Figure A-13: Post-Test Right Front $\frac{3}{4}$ View



Figure A-14: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-15: Post-Test Left Rear ¾ View



Figure A-16: Post-Test Left Rear ¾ View of Doors After Impact



Figure A-17: Post-Test Driver Side A Pillar



Figure A-18: Post-Test Driver Side B Pillar



Figure A-19: Post-Test Driver Side C Pillar



Figure A-20: Post- Test Driver Side D Pillar



Figure A-21: Post-Test Driver Side Front Door Sill



Figure A-22: Post-Test Driver Side Rear Door Sill



Figure A-23: Post-Test Right Rear $\frac{3}{4}$ View of Doors After Impact



Figure A-24: Post-Test Passenger Side A Pillar



Figure A-25: Post-Test Passenger Side B Pillar



Figure A-26: Post-Test Passenger Side C Pillar



Figure A-27: Post- Test Passenger Side D Pillar



Figure A-28: Post-Test Passenger Side Front Door Sill



Figure A-29: Post-Test Passenger Side Rear Door Sill

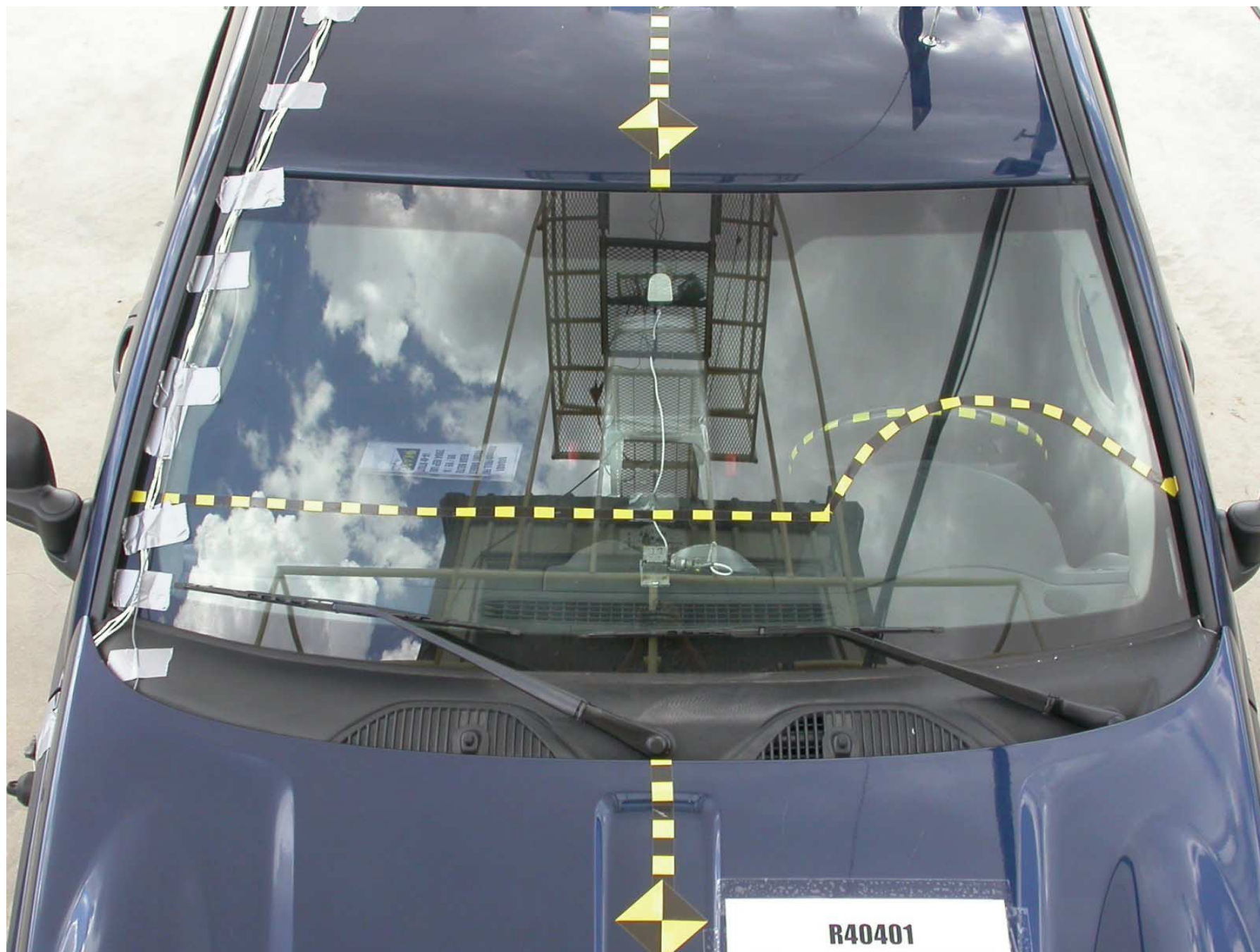


Figure A-30: Pre-Test Windshield View



Figure A-31: Post-Test Windshield View

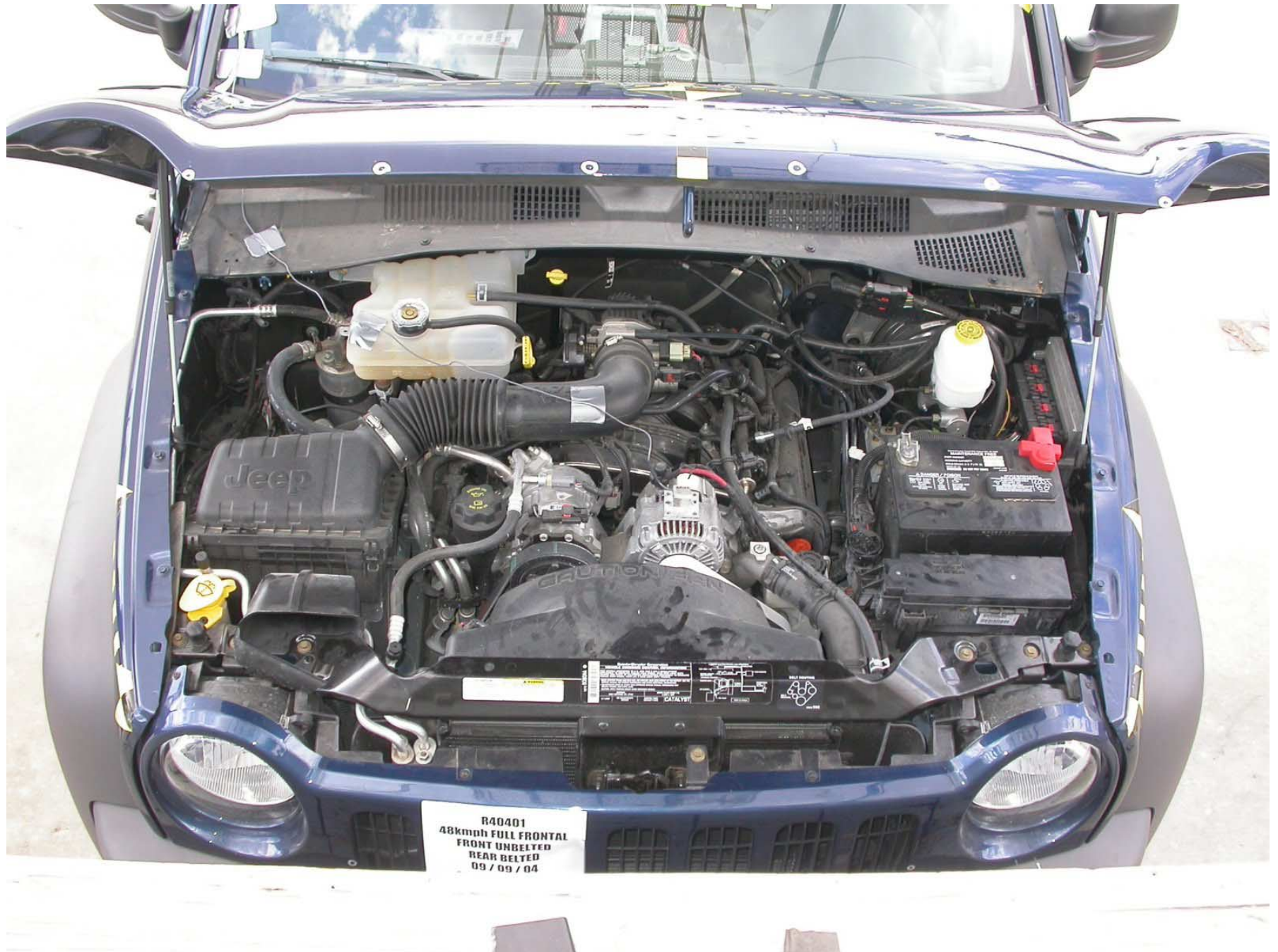


Figure A-32: Pre-Test Engine Compartment

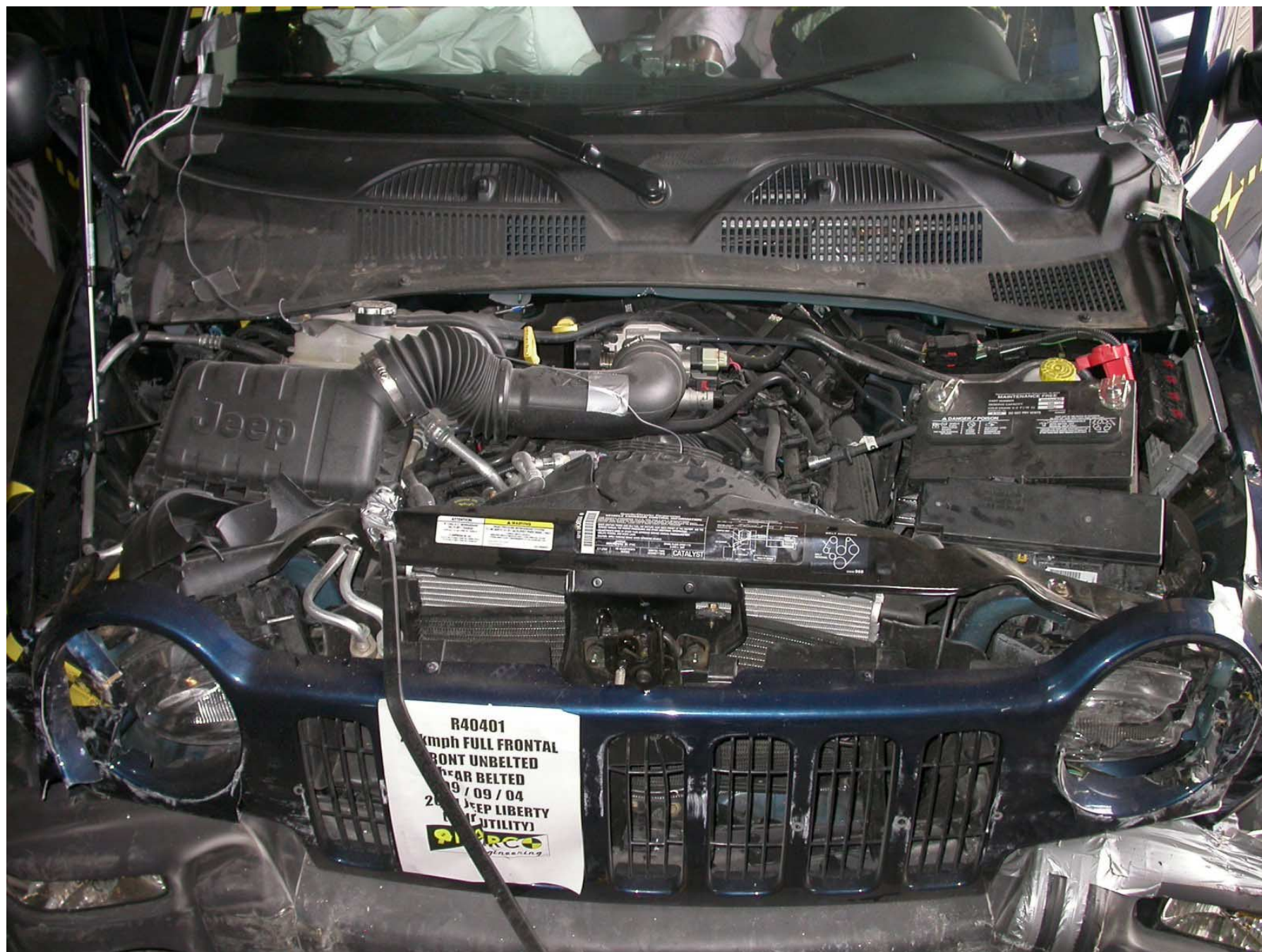


Figure A-33: Post-Test Engine Compartment (Vehicle Moved)

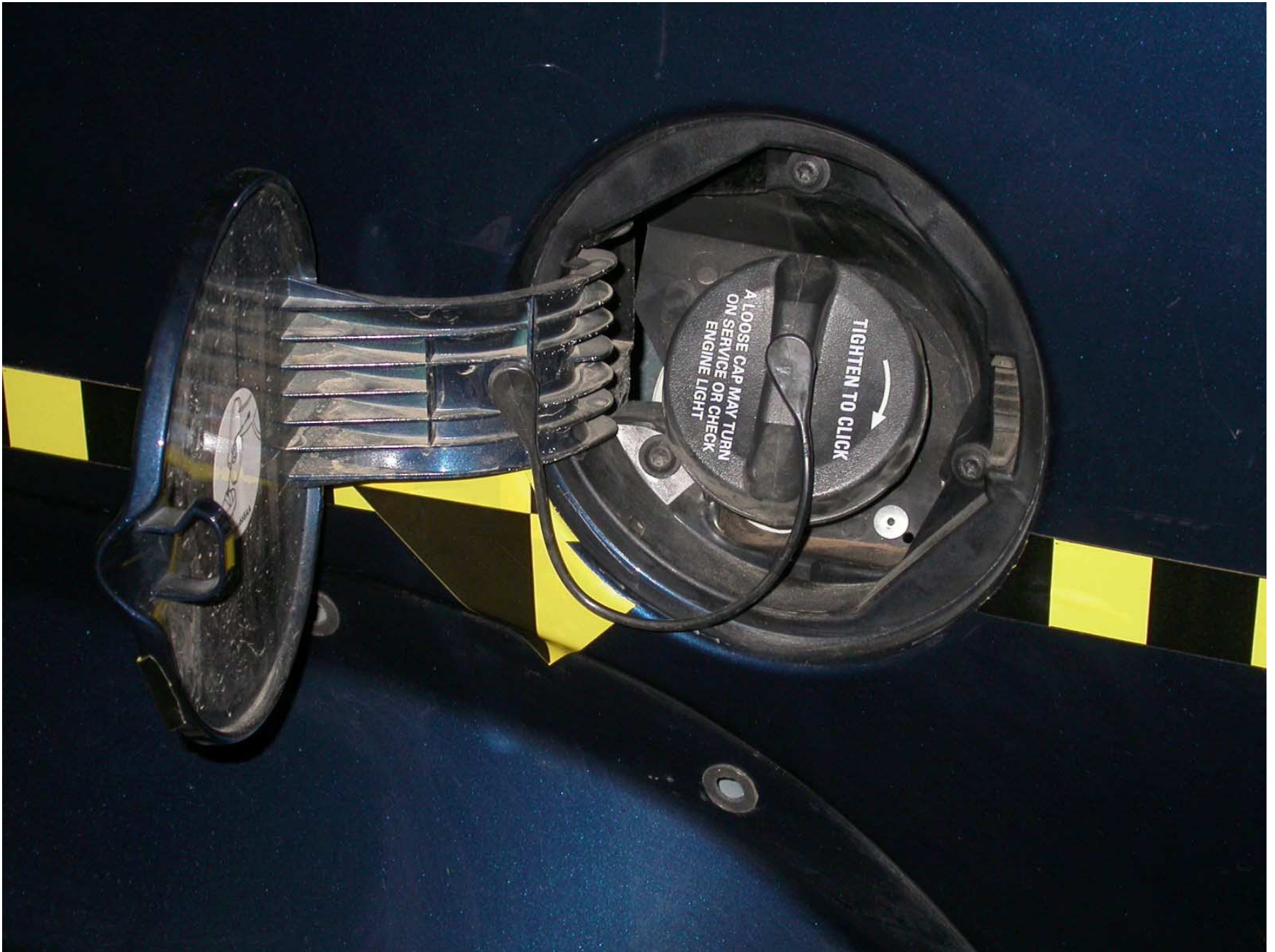


Figure A-34: Pre-Test Fuel Cap



Figure A-35: Post-Test Fuel Cap





Figure A-37: Post-Test Front Underbody View (Front of Test Vehicle is to the Left)

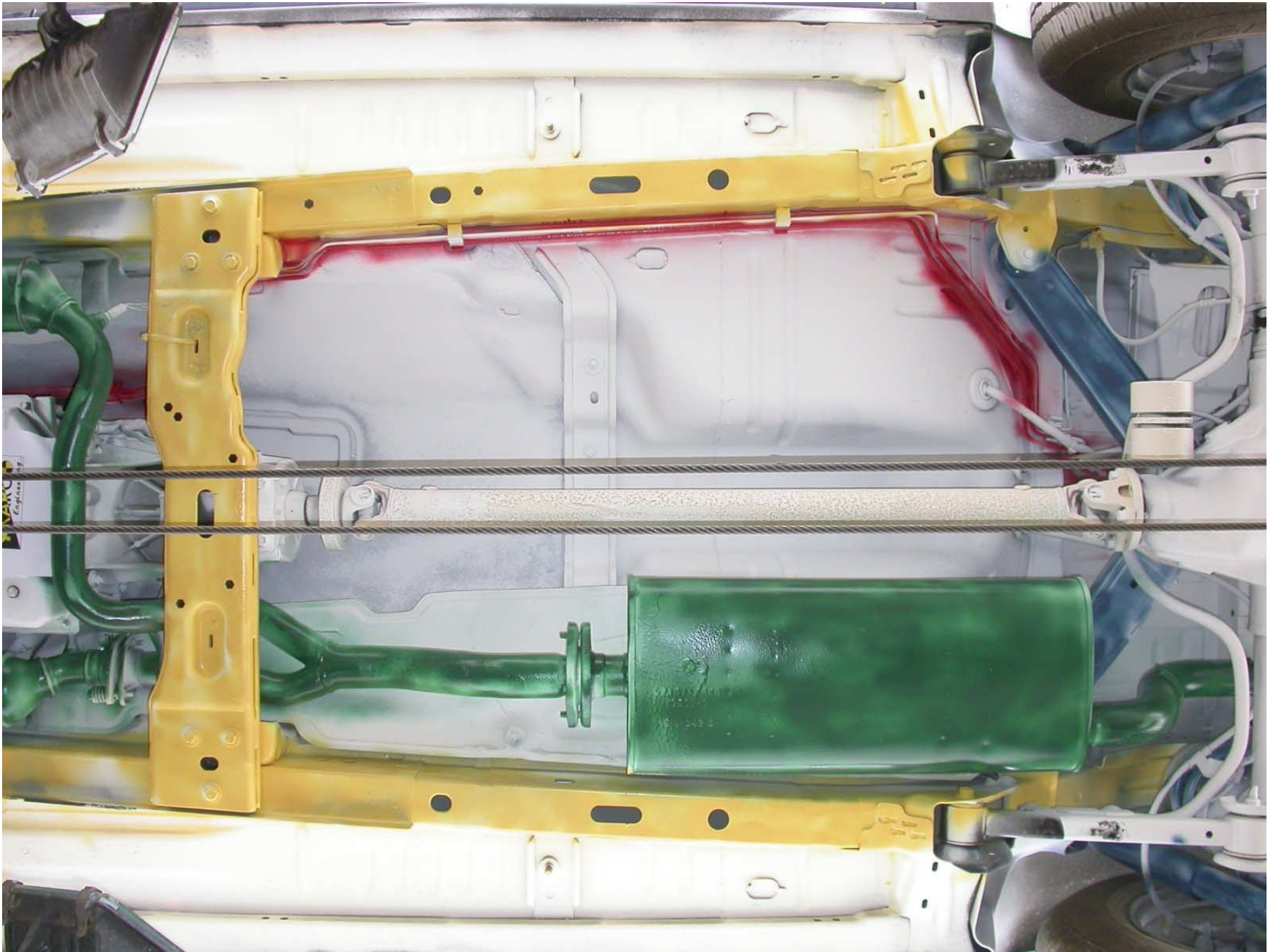


Figure A-38: Pre-Test Mid Underbody View (Front of Test Vehicle is to the Left)



Figure A-39: Post-Test Mid Underbody View (Front of Test Vehicle is to the Left)

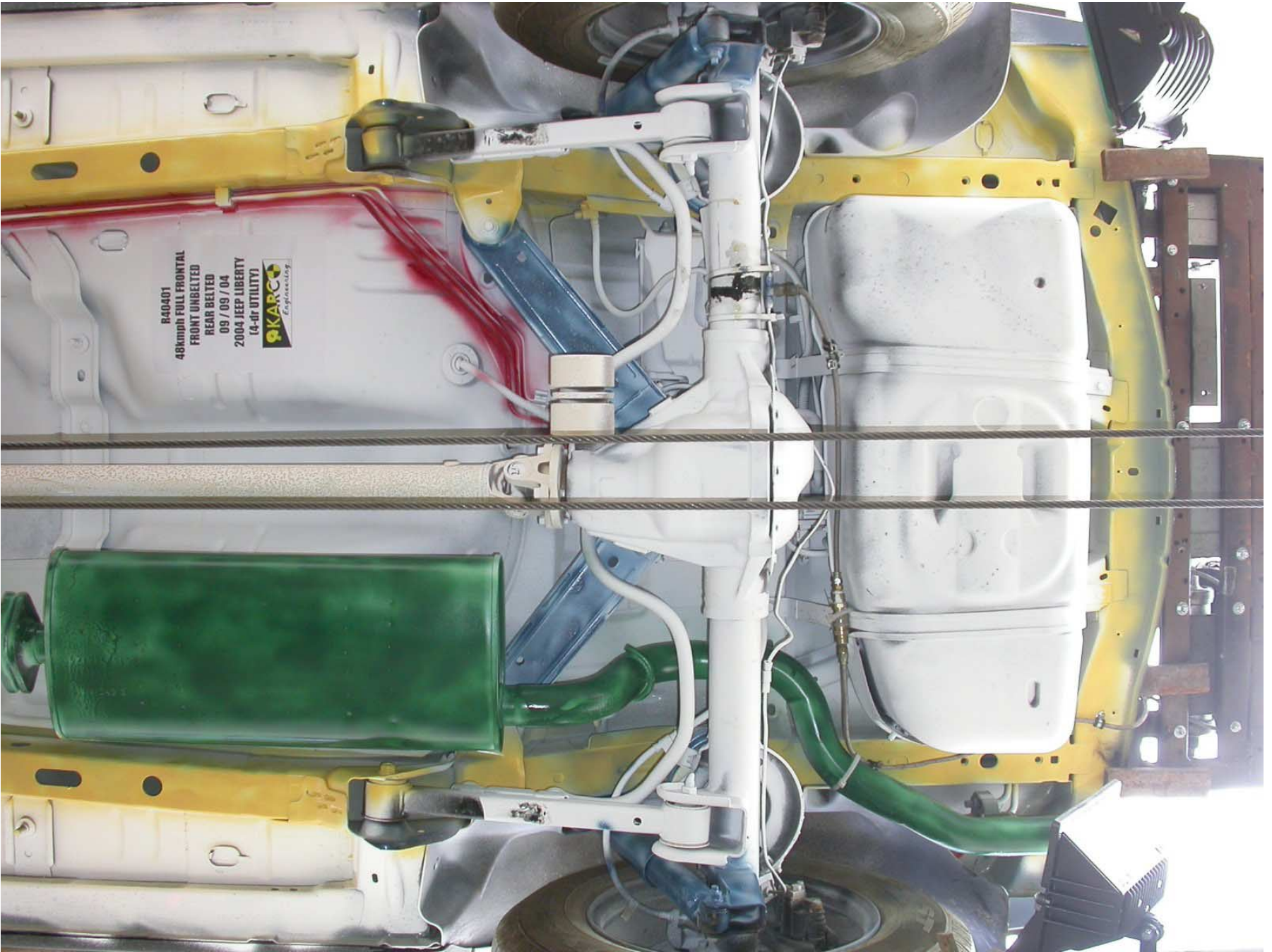


Figure A-40: Pre-Test Rear Underbody View (Front of Test Vehicle is to the Left)

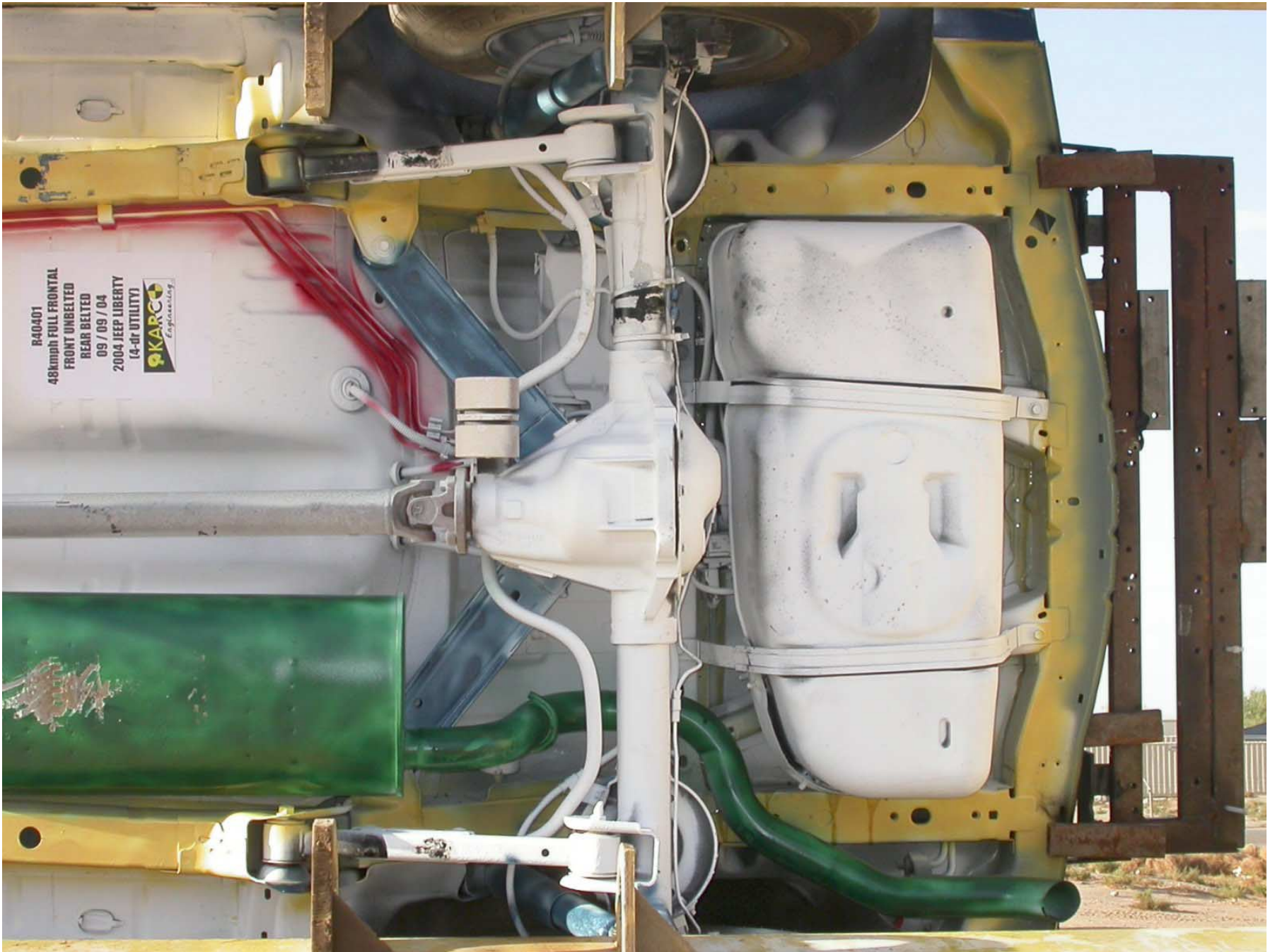


Figure A-41: Post-Test Rear Underbody View (Front of Test Vehicle is to the Left)

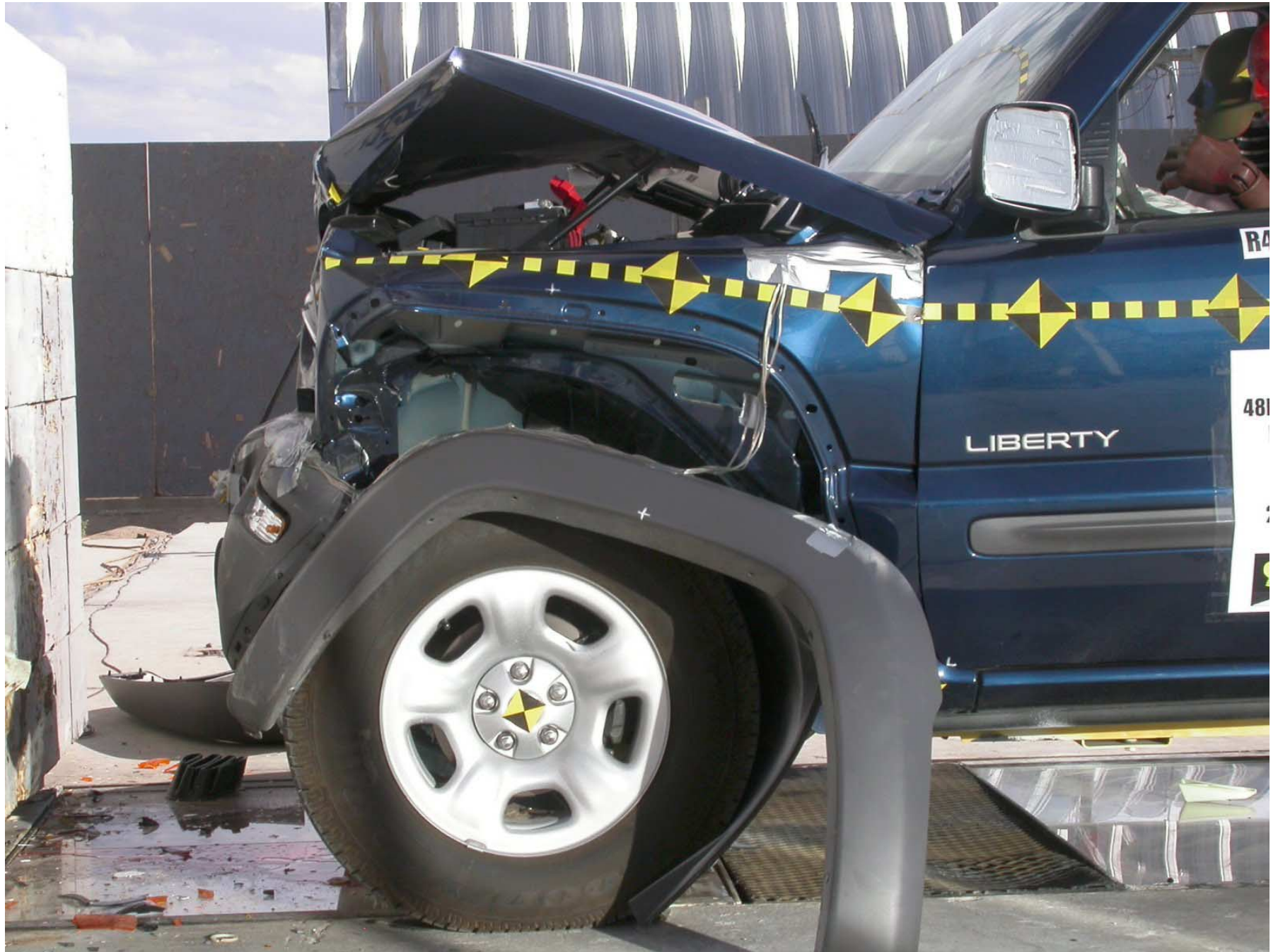


Figure A-42: Post-Test Left Front Wheel Well (Front of Test Vehicle is to the Left)



Figure A-43: Post-Test Left Front Wheel Well with Tire and Wheel Removed (Front of Test Vehicle is to the Left)





Figure A-45: Post-Test Left Front Wheel Well Underside View (Front of Test Vehicle is to the Left)



Figure A-46: Post-Test Left Front Bumper to Rail Attachment (Front of Test Vehicle is to the Left)



Figure A-47: Post-Test Left Front Sub Frame Mount Damage (Front of Test Vehicle is to the Left)

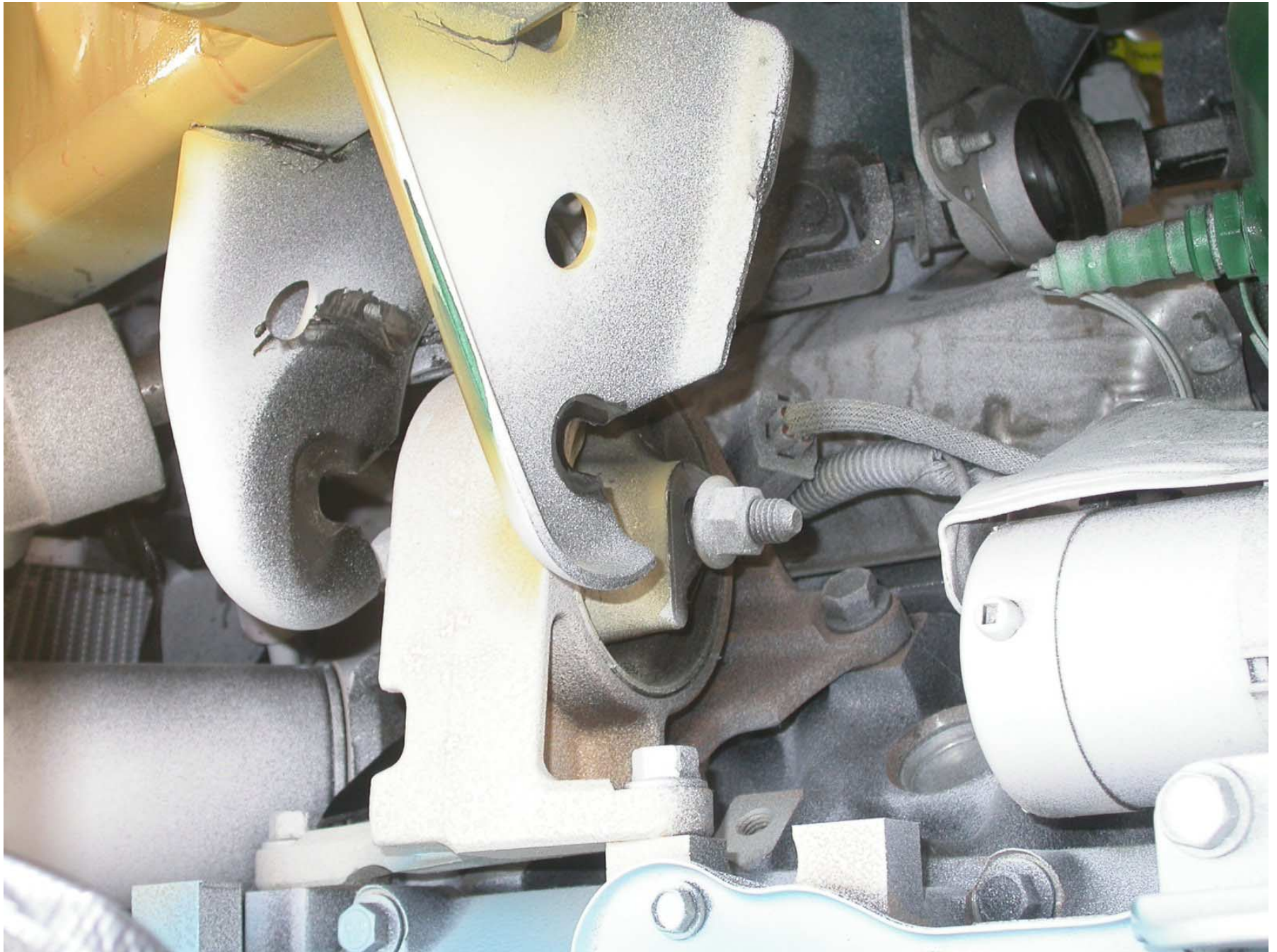


Figure A-48: Post-Test Left Front Sub Frame Mount Damage (Front of Test Vehicle is to the Left)

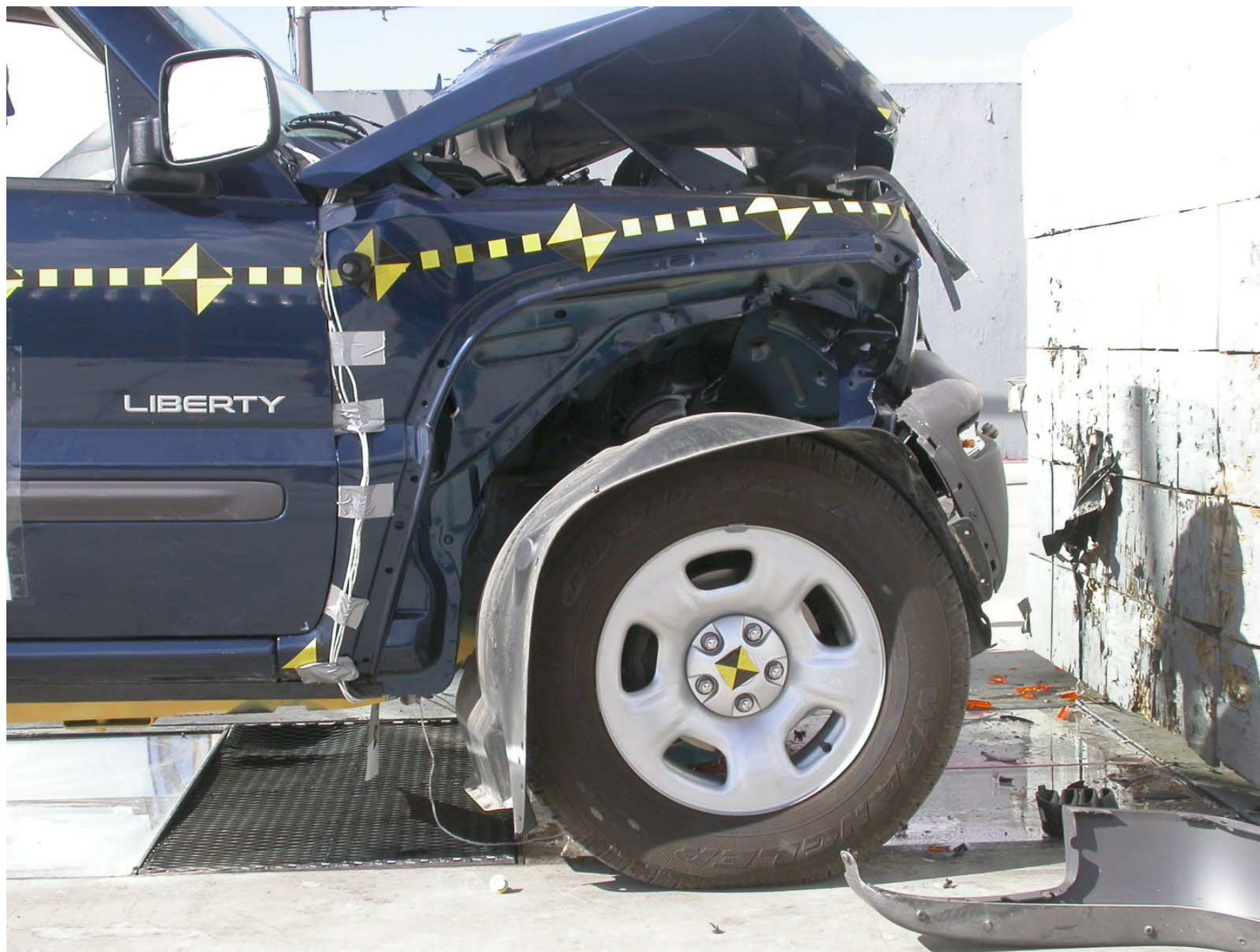


Figure A-49: Post-Test Right Front Wheel Well (Front of Test Vehicle is to the Right)



Figure A-50: Post-Test Right Front Wheel Well with Tire and Wheel Removed (Front of Test Vehicle is to the Right)

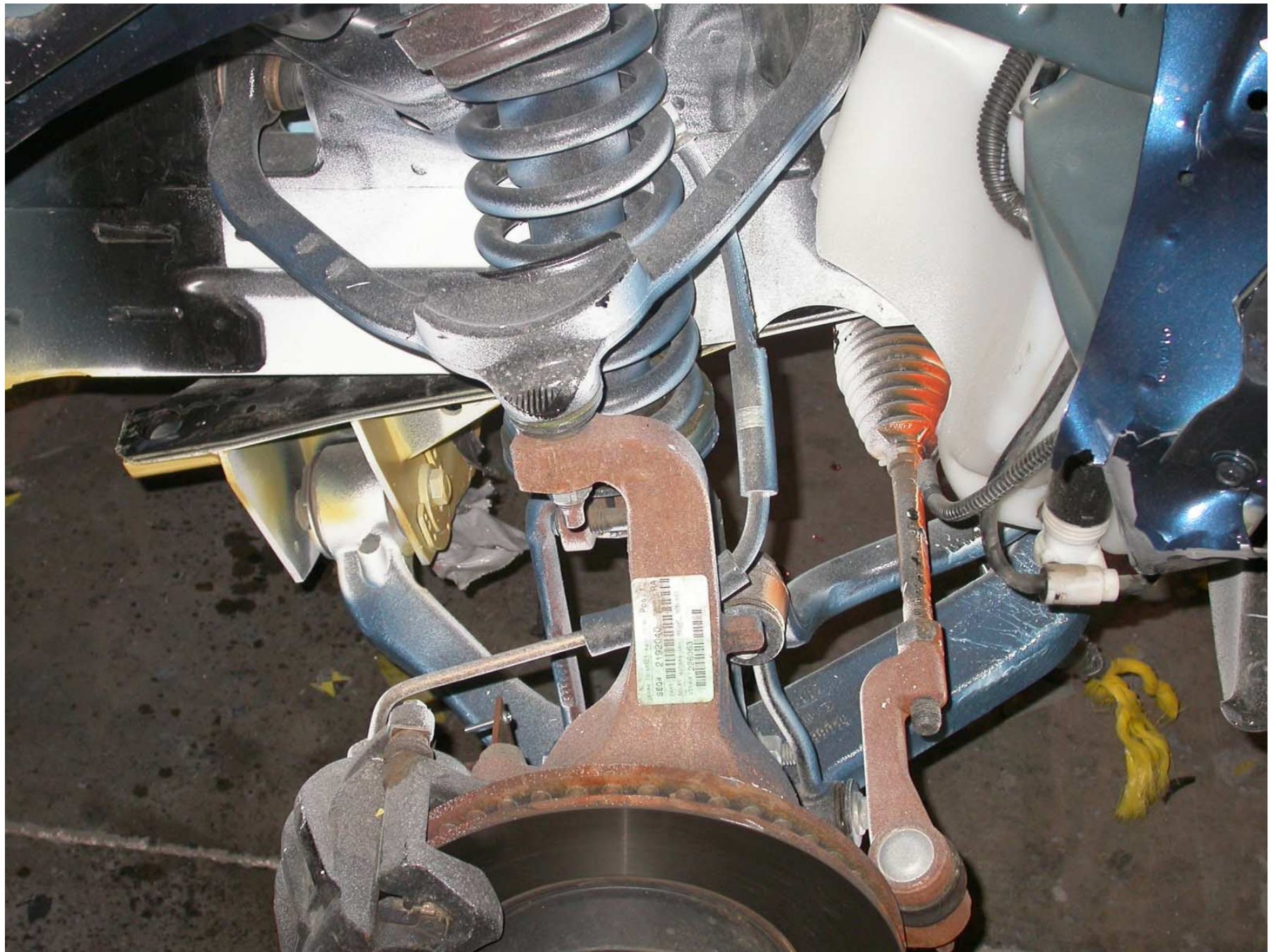


Figure A-51: Post-Test Right Front Wheel Well with Tire and Wheel Removed Close-up (Front of Test Vehicle is to the Right)

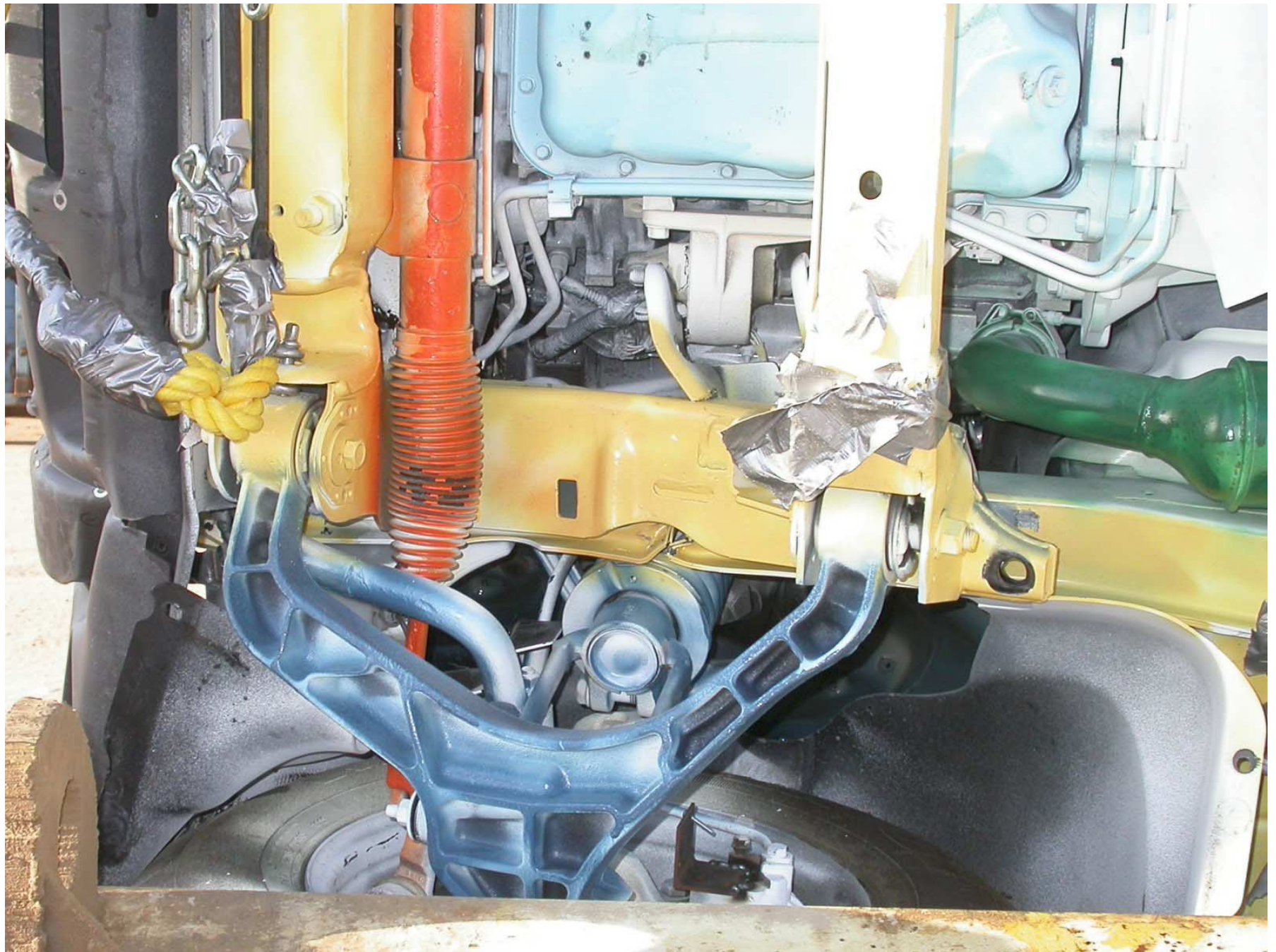


Figure A-52: Post-Test Right Front Wheel Well Underside View (Front of Test Vehicle is to the Left)



Figure A-53: Right Front Bumper to Rail Attachment (Front of Test Vehicle is to the Left)

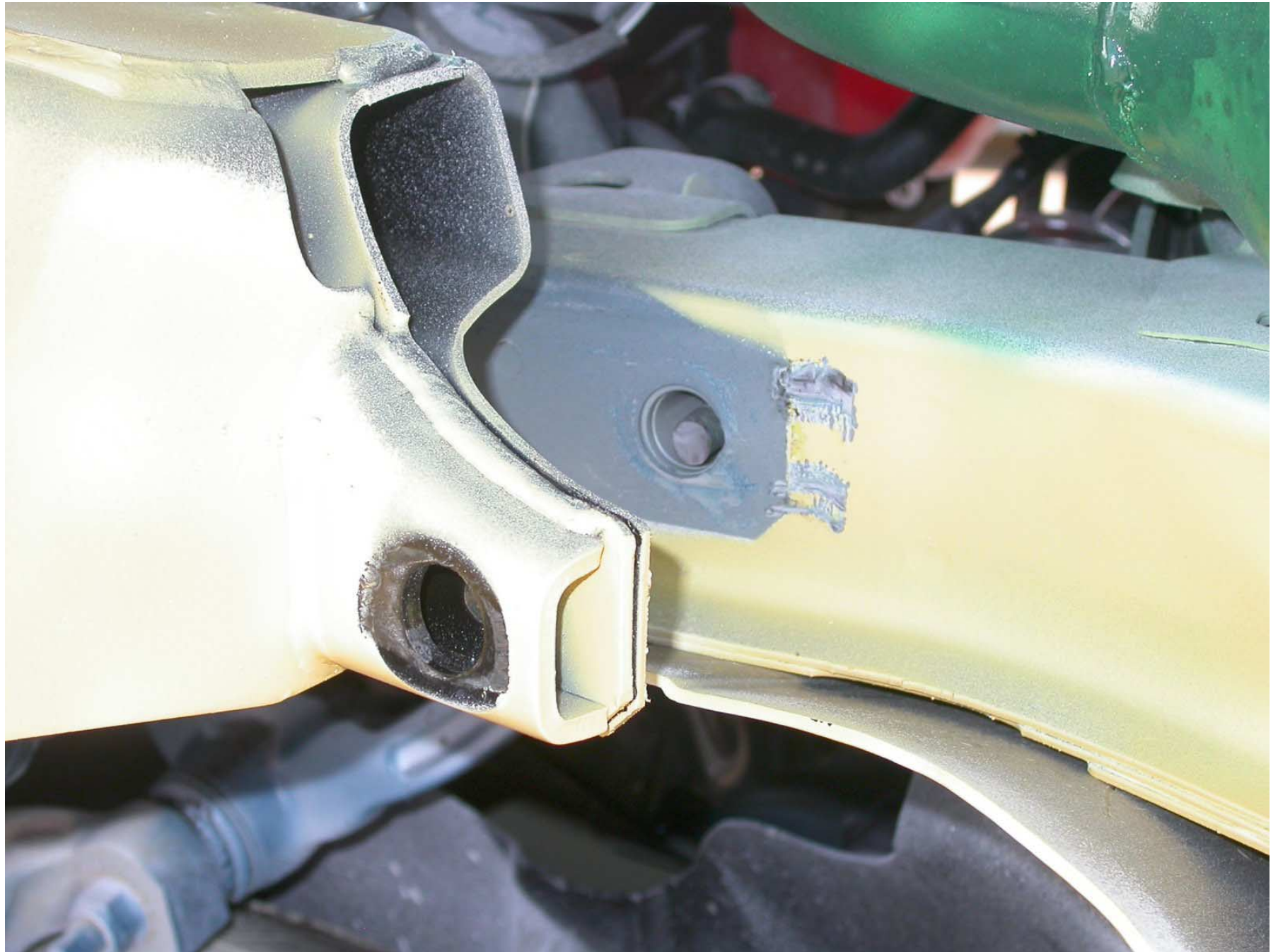


Figure A-54: Post-Test Right Front Right Sub Frame Mount Damage (Front of Test Vehicle is to the Left)



Figure A-55: Post-Test Right Front Right Sub Frame Mount Damage (Front of Test Vehicle is to the Left)



Figure A-56: Pre-Test Driver Dummy Front View (Head Position)



Figure A-57: Post-Test Driver Dummy Front View (Head Position)



Figure A-58: Pre-Test Driver Dummy Through Window



Figure A-59: Post-Test Driver Dummy Through Window



Figure A-60: Pre-Test Driver Dummy (Door Open)



Figure A-61: Post-Test Driver Dummy (Door Open)



Figure A-62: Pre-Test Driver Dummy Abdomen



Figure A-63: Post-Test Driver Dummy Abdomen



Figure A-64: Pre-Test Driver Dummy Feet



Figure A-65: Post-Test Driver Dummy Feet



Figure A-66: Pre-Test Driver Side Knee Bolster



Figure A-67: Post-Test Driver Side Knee Bolster



Figure A-68: Pre-Test Driver Side Floor Pan



Figure A-69: Post-Test Driver Side Floor Pan



Figure A-70: Pre-Test Driver Seat Track



Figure A-71: Post-Test Driver Seat Track



Figure A-72: Post-Test Driver Dummy Head



Figure A-73: Post-Test Driver Dummy Contact to Air Bag



Figure A-74: Post-Test Driver Dummy Contact With Sun-Visor

**Photograph Not
Available**

Figure A-75: Pre-Test Passenger Dummy Front View (Head Position)



Figure A-76: Post-Test Passenger Dummy Front View (Head Position)



Figure A-77: Pre-Test Passenger Dummy Through Window



Figure A-78: Post-Test Passenger Dummy Through Window



Figure A-79: Pre-Test Passenger Dummy (Door Open)



Figure A-80: Post-Test Passenger Dummy (Door Open)



Figure A-81: Pre-Test Passenger Dummy Feet



Figure A-82: Post-Test Passenger Dummy Feet



Figure A-83: Pre-Test Passenger Side Glove Box



Figure A-84: Post-Test Passenger Side Glove Box



Figure A-85: Pre-Test Passenger Side Floor Pan



Figure A-86: Post-Test Passenger Side Floor Pan



Figure A-87: Pre-Test Passenger Seat Track



Figure A-88: Post-Test Passenger Seat Track



Figure A-89: Post-Test Passenger Dummy Head



Figure A-90: Post-Test Passenger Dummy Contact to Air Bag



Figure A-91: Post-Test Passenger Dummy Contact With Sun-Visor



Figure A-92: Pre-Test Center Rear Dummy (Front View)



Figure A-93: Post-Test Center Rear Dummy (Front View)



Figure A-94: Pre-Test Rear Center Dummy Door Open (Left Side View)



Figure A-95: Post-Test Center Rear Dummy Door Open (Left Side View)



Figure A-96: Pre-Test Center Rear Dummy Left Leg



Figure A-97: Post-Test Center Rear Dummy Left Leg



Figure A-98: Pre-Test Center Rear Dummy Door Open (Right Side View)



Figure A-99: Post-Test Center Rear Dummy Door Open (Right Side View)



Figure A-100: Pre-Test Center Rear Dummy Right Leg



Figure A-101: Post-Test Center Rear Dummy Right Leg

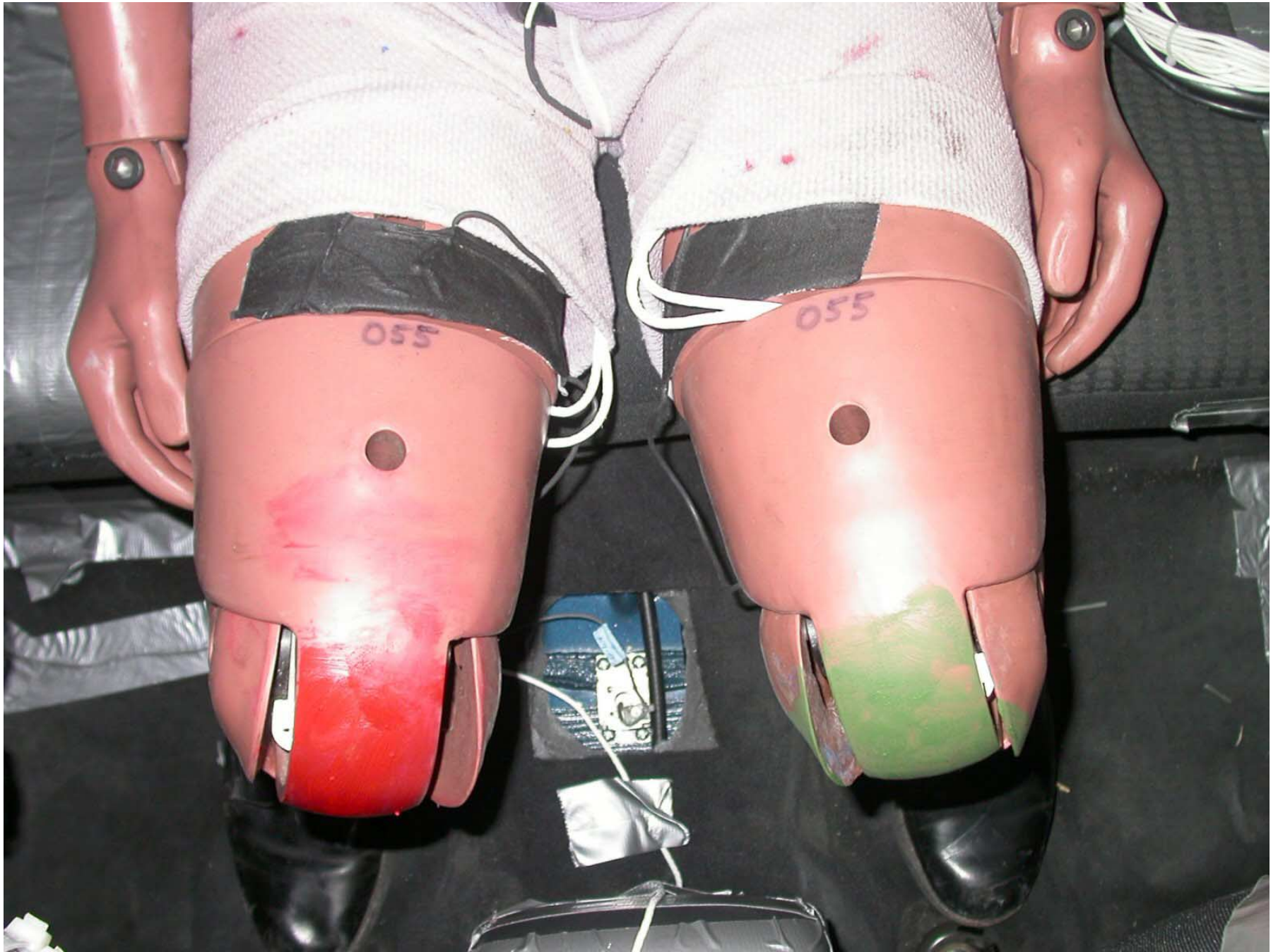


Figure A-102: Pre-Test Center Rear Dummy Knees (Overhead View)



Figure A-103: Post-Test Center Rear Dummy Knees (Overhead View)



Figure A-104: Post-Test Center Rear Dummy Contact Points

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TR-P24104-05-NC



Figure A-105: Vehicle on Rollover Device (0°)



Figure A-106: Vehicle on Rollover Device (90°)



Figure A-107: Vehicle on Rollover Device (180°)

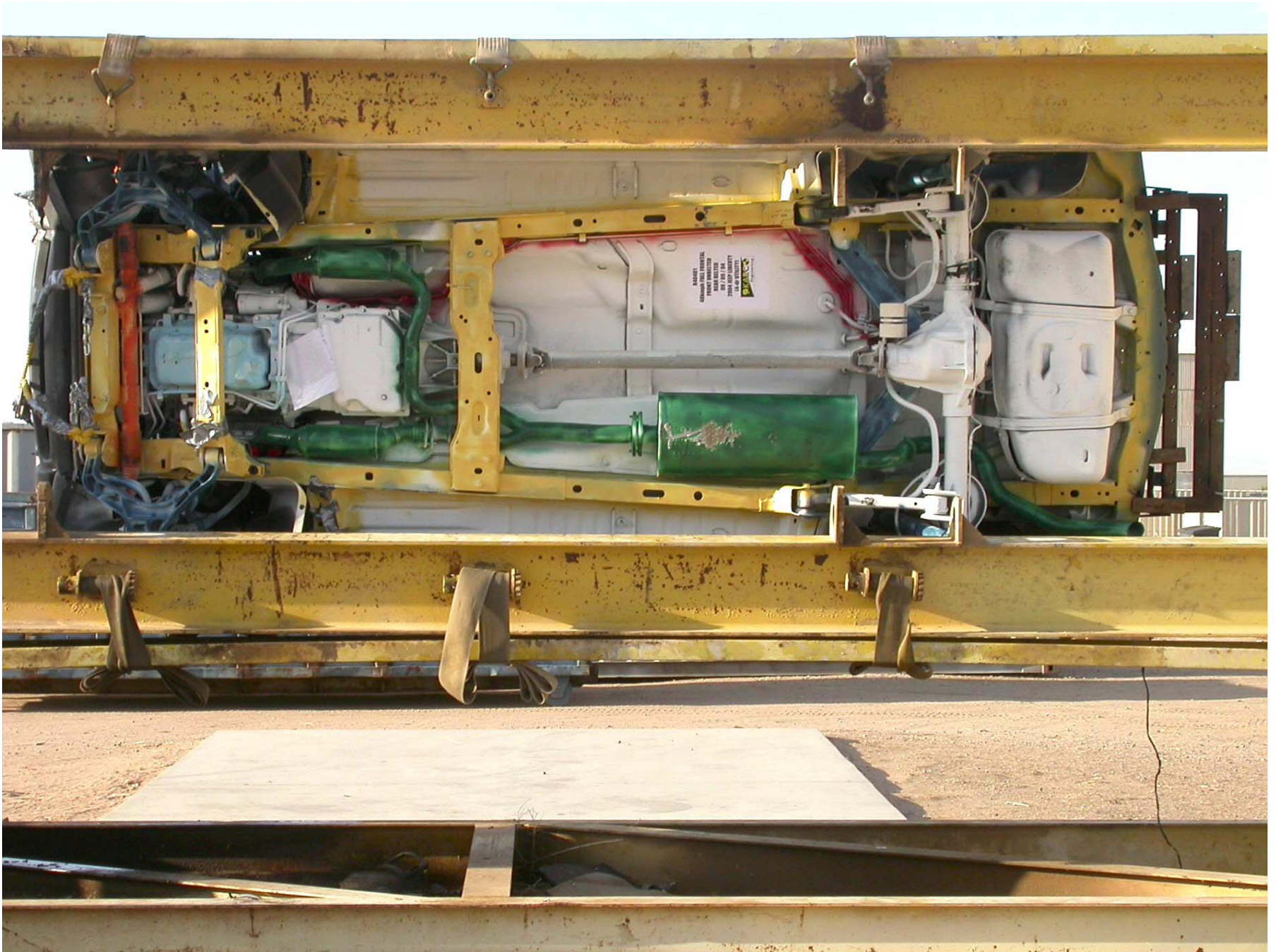


Figure A-108: Vehicle on Rollover Device (270°)

A-108

TR-P24104-05-NC



Figure A-109: Vehicle During Impact



Figure A-110: Driver's Airbag Label



Figure A-111: Driver's Airbag Generator Label

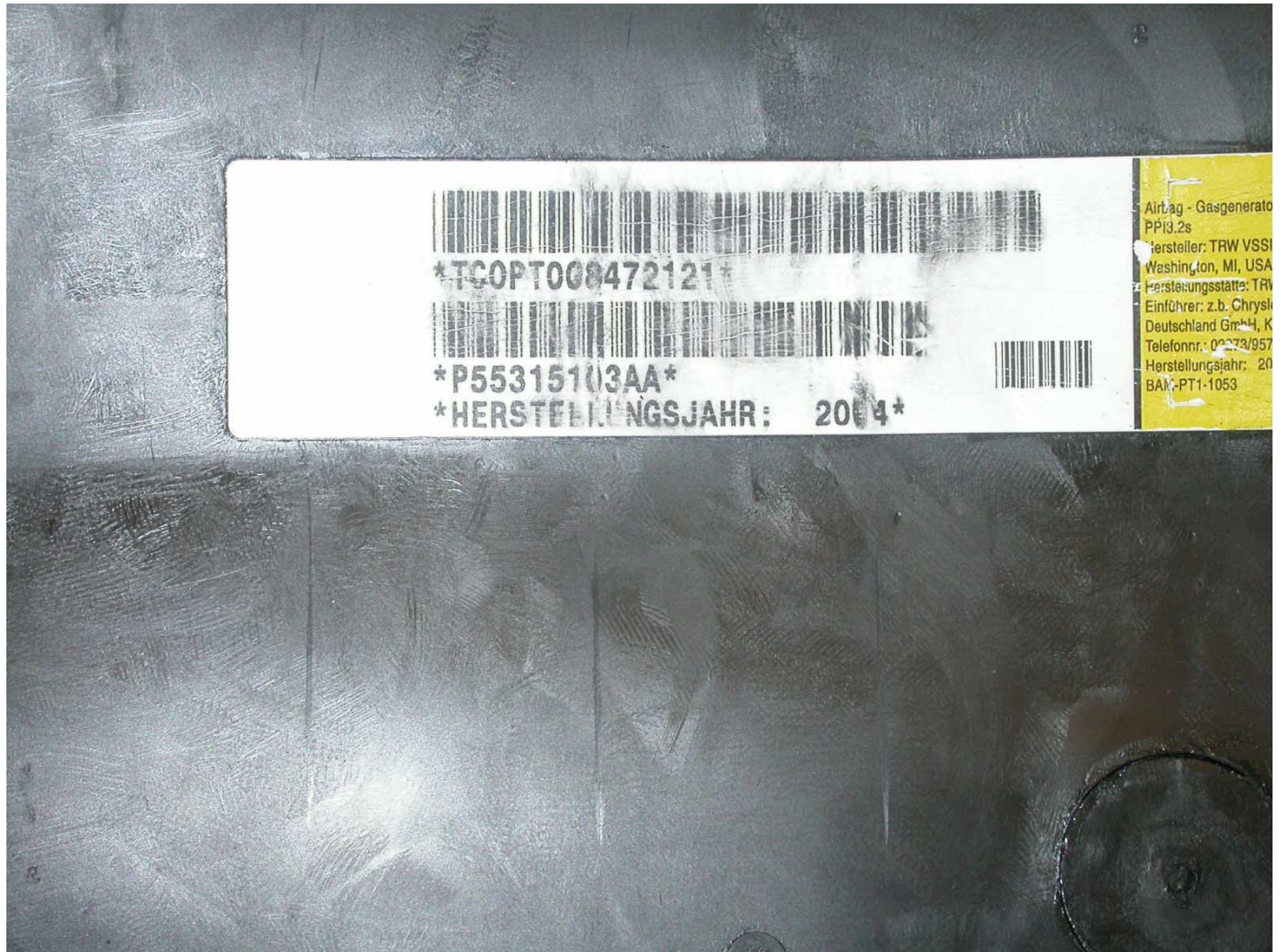


Figure A-112: Passenger's Airbag Label



Figure A-113: Passenger's Airbag Generator Label

APPENDIX B

DUMMY AND VEHICLE RESPONSE DATA TRACES

LIST OF DATA PLOTS

Data Plot	Page
B-1	Driver (H3 50th) Head Primary X
	Driver (H3 50th) Head Primary Y
	Driver (H3 50th) Head Primary Z
	Driver (H3 50th) Head Resultant Primary
B-2	Driver (H3 50th) Head Primary X Velocity
	Driver (H3 50th) Head Primary X Displacement
B-3	Driver (H3 50th) NAAH CG X
	Driver (H3 50th) NAAH CG Y
	Driver (H3 50th) NAAH CG t Z
	Driver (H3 50th) NAAH CG Resultant
B-4	Driver (H3 50th) NAAH CG X Velocity
	Driver (H3 50th) NAAH CG X Displacement
B-5	Driver (H3 50th) NAAH Xarm- Y
	Driver (H3 50th) NAAH Xarm- Z
	Driver (H3 50th) NAAH Yarm- X
B-6	Driver (H3 50th) NAAH Yarm- Z
	Driver (H3 50th) NAAH Zarm- X
	Driver (H3 50th) NAAH Zarm- Y
B-7	Driver (H3 50th) Upper Neck Force X
	Driver (H3 50th) Upper Neck Force Y
	Driver (H3 50th) Upper Neck Force Z
	Driver (H3 50th) Upper Neck Force Resultant
B-8	Driver (H3 50th) Upper Neck Moment X
	Driver (H3 50th) Upper Neck Moment Y
	Driver (H3 50th) Upper Neck Moment Z
	Driver (H3 50th) Upper Neck Moment Resultant
B-9	Driver (H3 50th) Chest Primary X
	Driver (H3 50th) Chest Primary Y
	Driver (H3 50th) Chest Primary Z
	Driver (H3 50th) Chest Resultant Primary
B-10	Driver (H3 50th) Chest Primary X Velocity
	Driver (H3 50th) Chest Primary X Displacement
B-11	Driver (H3 50th) Chest Redundant X
	Driver (H3 50th) Chest Redundant Y
	Driver (H3 50th) Chest Redundant Z

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	Driver (H3 50th) Right Upper Tibia Moment Y B-23

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	Passenger (H3 50th) NAAH CG Resultant	B-30
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	Passenger (H3 50th) NAAH CG X Displacement	B-31
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B-33	Passenger (H3 50th) NAAH Yarm- Z	B-33
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B-40	Passenger (H3 50th) Chest Deflection	B-40
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	Passenger (H3 50th) Left Upper Tibia Moment X	B-44
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B-46	Passenger (H3 50th) Left Lower Tibia Moment X	B-46
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	Passenger (H3 50th) Right Tibia Y	B-48
B-49	Passenger (H3 50th) Right Foot X	B-49
	Passenger (H3 50th) Right Foot Y	B-49
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B-50	Passenger (H3 50th) Right Upper Tibia Force X	B-50
	Passenger (H3 50th) Right Upper Tibia Force Y	B-50
	Passenger (H3 50th) Right Upper Tibia Force Z	B-50
	Passenger (H3 50th) Right Upper Tibia Moment Y	B-50
B-51	Passenger (H3 50th) Right Lower Tibia Force X	B-51
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B-52	Passenger (H3 50th) Right Lower Tibia Moment X	B-52
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B-53	Passenger (H3 50th) Right Ankle Rotation X	B-53
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B-54	Passenger (H3 50th) Lap Belt Force	B-54
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	Passenger (H3 50th) Shoulder Belt Pullout	B-54
B-55	CR Pass (H3 50th) Head Primary X	B-55
	CR Pass (50th) Head Primary Y	B-55
	CR Pass (50th) Head Primary Z	B-55
	CR Pass (50th) Head Resultant Primary	B-55
B-56	CR Pass (50th) Head Primary X Velocity	B-56
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B-57	CR Pass (50th) NAAH CG X	B-57
	CR Pass (50th) NAAH CG Y	B-57
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	CR Pass (50th) NAAH CG Resultant	B-57
B-58	CR Pass (50th) NAAH CG X Velocity	B-58
	CR Pass (50th) NAAH CG X Displacement	B-58
B-59	RR Pass (50th) NAHA Xarm-Y	B-59
	RR Pass (50th) NAHA Xarm-Z	B-59
	RR Pass (50th) NAHA Yarm-X	B-59

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Data Plot		Page
B-60	CR Pass (50th) NAHA Yarm-Z	B-60
	CR Pass (50th) NAHA Zarm-X	B-60
	CR Pass (50th) NAHA Zarm-Y	B-60
B-61	CR Pass (50th) Upper Neck Force X	B-61
	CR Pass (50th) Upper Neck Force Y	B-61
	CR Pass (50th) Upper Neck Force Z	B-61
	CR Pass (50th) Upper Neck Force Resultant	B-61
B-62	CR Pass (50th) Upper Neck Moment X	B-62
	CR Pass (50th) Upper Neck Moment Y	B-62
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	CR Pass (50th) Upper Neck Moment Resultant	B-62
B-63	CR Pass (50th) Chest Primary X	B-63
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B-64	CR Pass (50th) Chest Primary X Velocity	B-64
	CR Pass (50th) Chest Primary X Displacement	B-64
B-65	CR Pass (50th) Chest Displacement	B-65
B-66	CR Pass (50th) Left Femur Force	B-66
	CR Pass (50th) Right Femur Force	B-66
	CR Pass (50th) Left Knee Displacement	B-66
	CR Pass (50th) Right Knee Displacement	B-66
B-67	CR Pass (50th) Lap Belt Force	B-67
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	CR Pass (50th) Shoulder Belt Pullout	B-67
B-68	Vehicle Left Rear X	B-68
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B-69	Vehicle Right Rear X	B-69
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B-70	Vehicle Left Brake Caliper X	B-70
	Vehicle Left Brake Caliper X Velocity	B-70
	Vehicle Left Brake Caliper X Displacement	B-70

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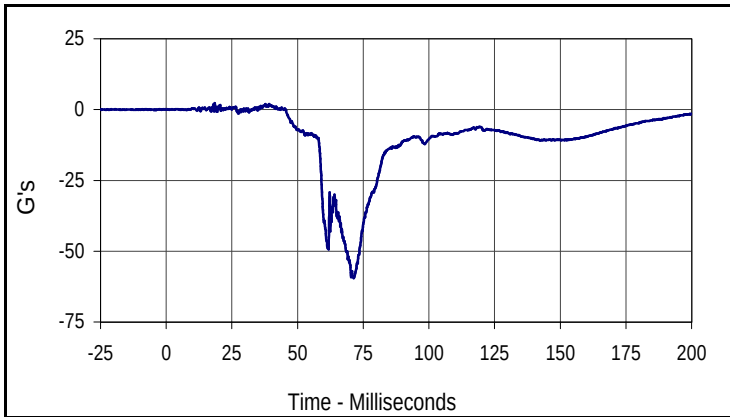
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B-71	Vehicle Right Brake Caliper X
	Vehicle Right Brake Caliper X Velocity
	Vehicle Right Brake Caliper X Displacement
B-72	Vehicle Instrument Panel X
	Vehicle Instrument Panel X Velocity
	Vehicle Instrument Panel X Displacement
B-73	Vehicle Engine Top X
	Vehicle Engine Top X Velocity
	Vehicle Engine Top X Displacement
B-74	Vehicle Engine Bottom X
	Vehicle Engine Bottom X Velocity
	Vehicle Engine Bottom X Displacement
B-75	Vehicle Rear Center Compartment X
	Vehicle Rear Center Compartment X Velocity
	Vehicle Rear Center Compartment X Displacement
B-76	Vehicle Toe Pan Accelerator X
	Vehicle Toe Pan Accelerator X Velocity
	Vehicle Toe Pan Accelerator X Displacement
B-77	Vehicle Toe Pan Accelerator Z
	Vehicle Toe Pan Accelerator Z Velocity
	Vehicle Toe Pan Accelerator Z Displacement
B-78	Vehicle Toe Pan Foot Rest X
	Vehicle Toe Pan Foot Rest X Velocity
	Vehicle Toe Pan Foot Rest X Displacement
B-79	Vehicle Toe Pan Foot Rest Z
	Vehicle Toe Pan Foot Rest Z Velocity
	Vehicle Toe Pan Foot Rest Z Displacement
B-80	Vehicle Rear Deck Z
	Vehicle Rear Deck Z Velocity
	Vehicle Rear Deck Z Displacement
B-81	Driver Airbag Squib Stage 1
	Driver Airbag Squib Stage 2
	Driver Pre-Tensioner Squib

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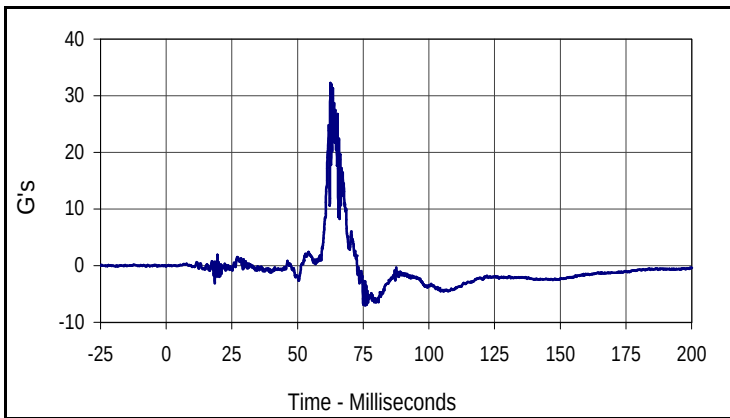
<u>Data Plot</u>	<u>Page</u>
B-82 Passenger Airbag Squib Stage 1	B-82
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Passenger Pretensioner Squib	B-82

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

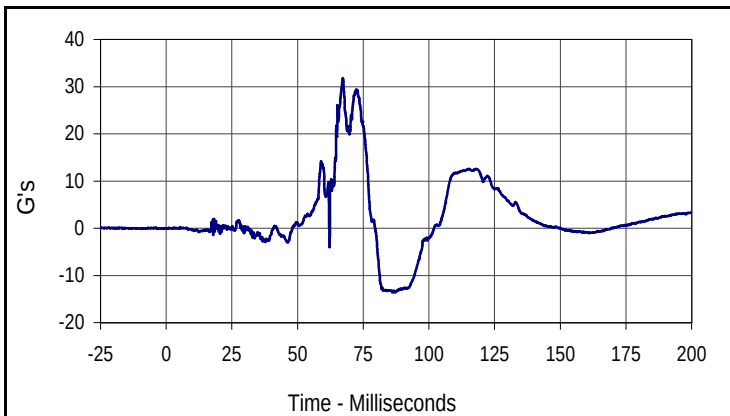
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 NHTSA No.: R40401



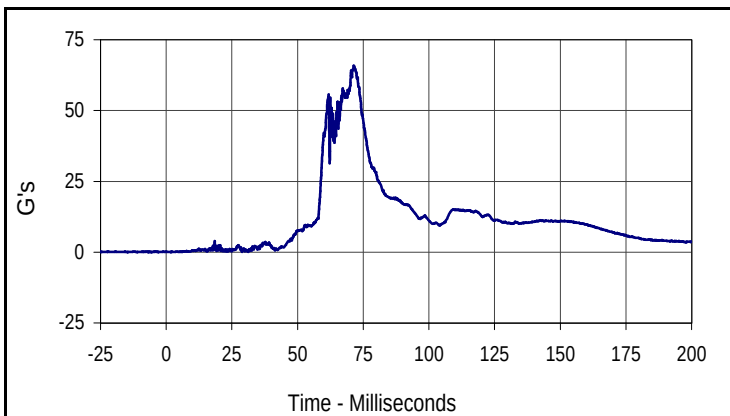
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Max	Time	Min	Time
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Curve Description			
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002	FIL	1000	G's
Max	Time	Min	Time
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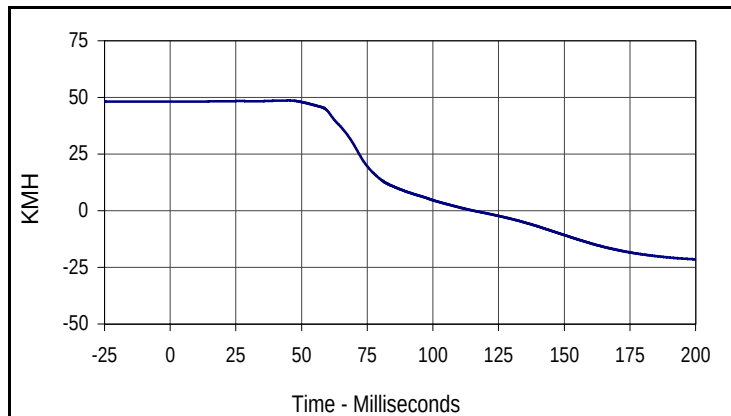
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31.8	67.2	-13.6	87.3



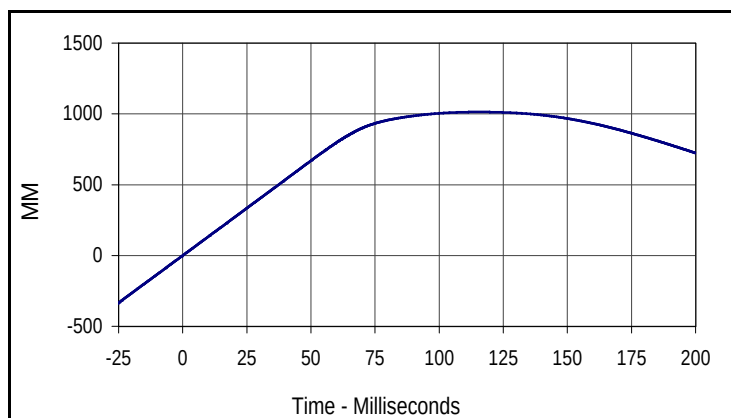
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Driver (50th) Head Resultant Primary			
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001	RES	1000	G's
Max	Time	Min	Time
65.9	71.4	0.0	1.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



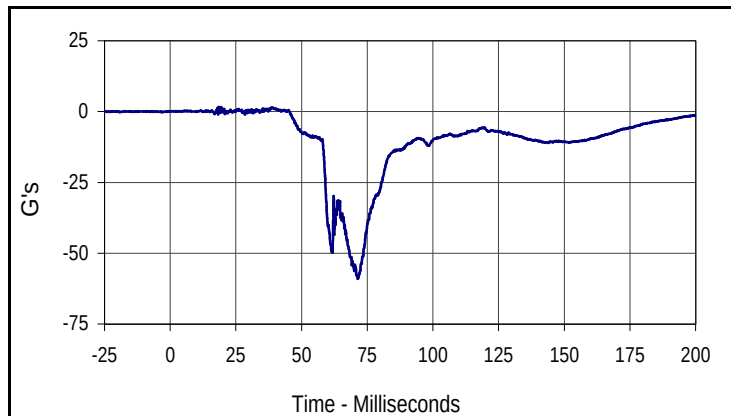
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Driver (50th) Head Primary X Velocity			
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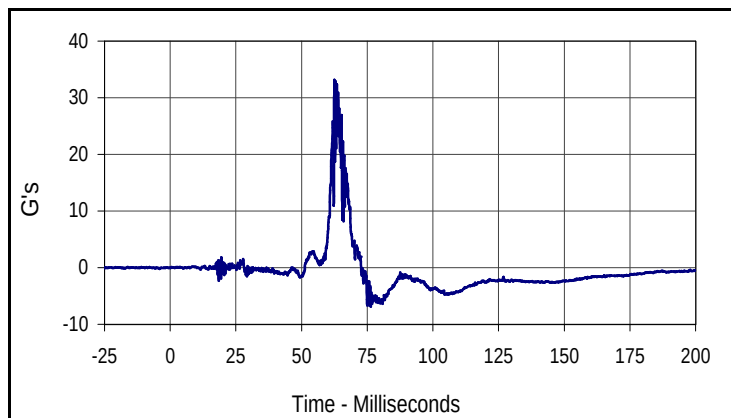
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Driver (50th) Head Primary X Displacement			
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Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

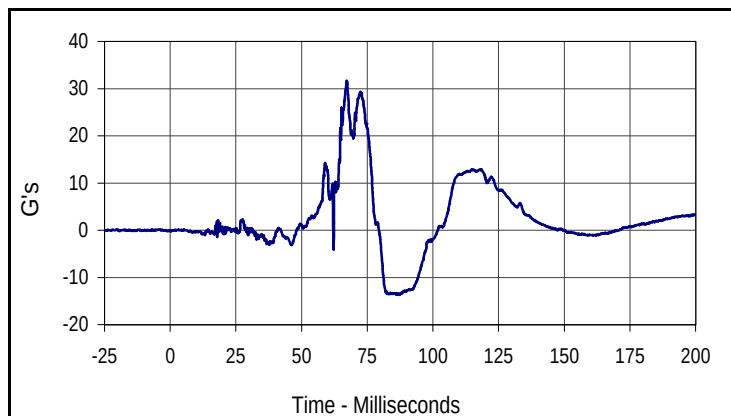
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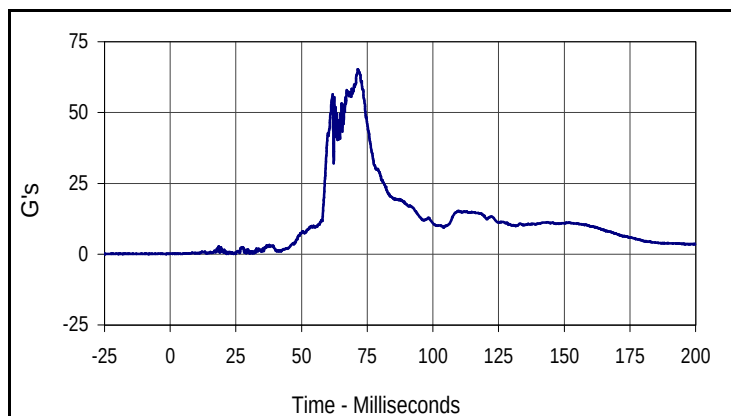
Curve Description			
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004	FIL	1000	G's
Max	Time	Min	Time
1.6	18.5	-59.0	71.4



Curve Description			
Driver (50th) NAAH CG Y			
CURNO	Type	SAE Class	Units
005	FIL	1000	G's
Max	Time	Min	Time
33.1	62.5	-6.9	76.4



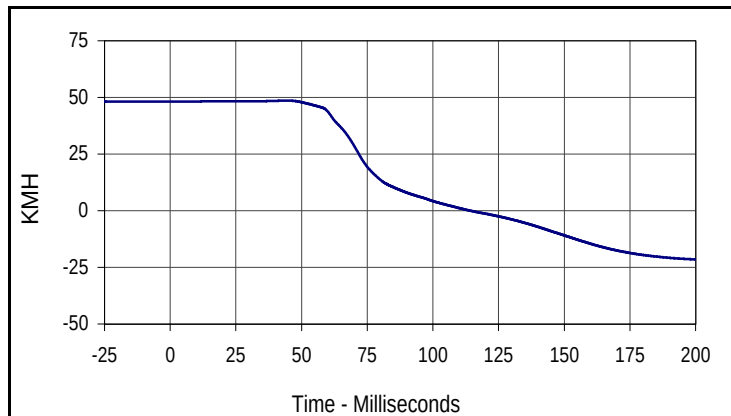
Curve Description			
Driver (50th) NAAH CG Z			
CURNO	Type	SAE Class	Units
006	FIL	1000	G's
Max	Time	Min	Time
31.7	67.2	-13.7	87.3



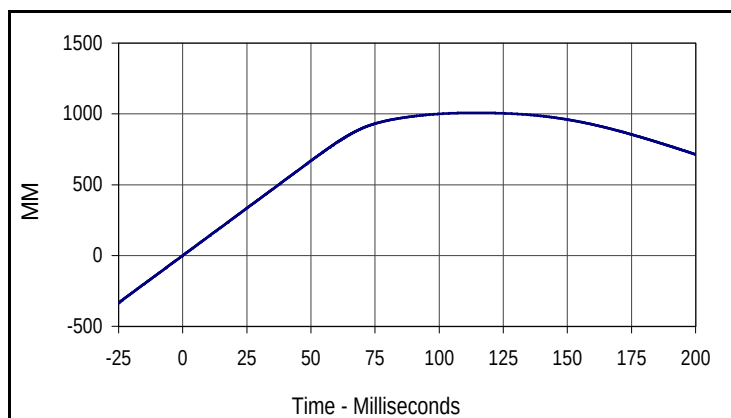
Curve Description			
Driver (50th) NAAH CG Resultant			
CURNO	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
65.3	71.5	0.1	4.3

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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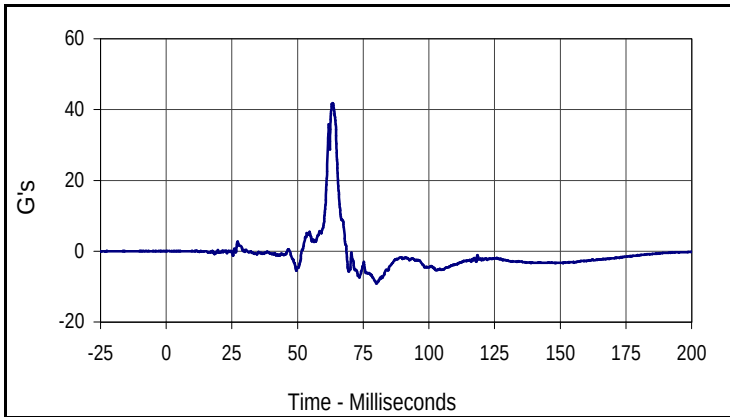
Curve Description			
Driver (50th) NAAH CG X Velocity			
CURNO	Type	SAE Class	Units
004	IN1	180	KMH
Max	Time	Min	Time
48.6	45.3	-21.5	200.0



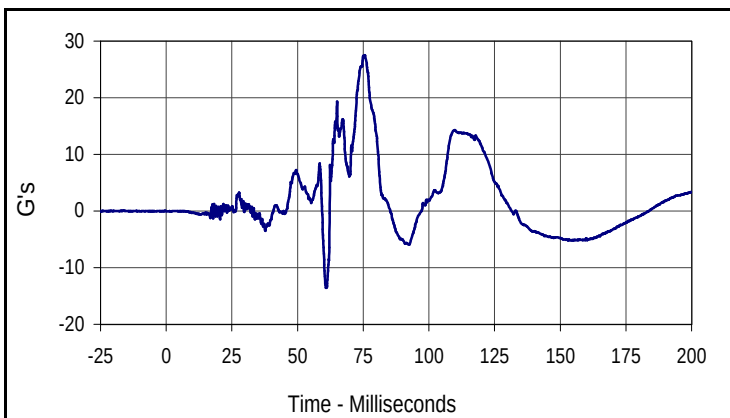
Curve Description			
Driver (50th) NAAH CG X Displacement			
CURNO	Type	SAE Class	Units
004	IN2	180	MM
Max	Time	Min	Time
1008.1	114.3	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

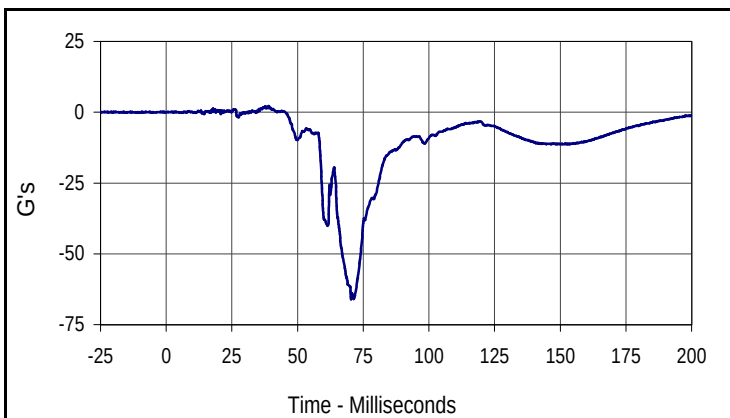
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver (50th) NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
007	FIL	1000	G's
Max	Time	Min	Time
41.8	63.5	-9.2	80.0



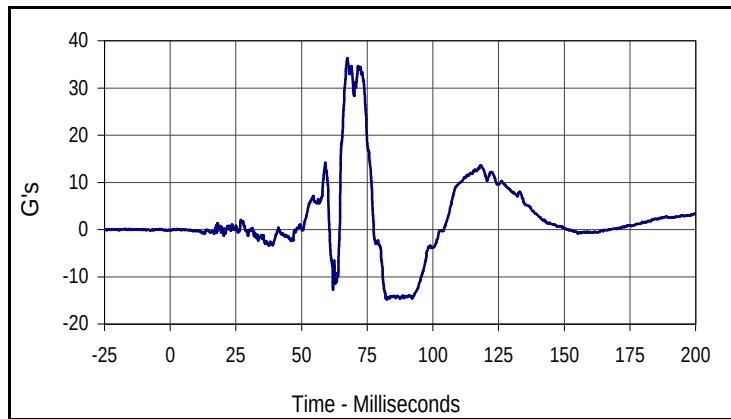
Curve Description			
Driver (50th) NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
008	FIL	1000	G's
Max	Time	Min	Time
27.5	75.6	-13.6	61.0



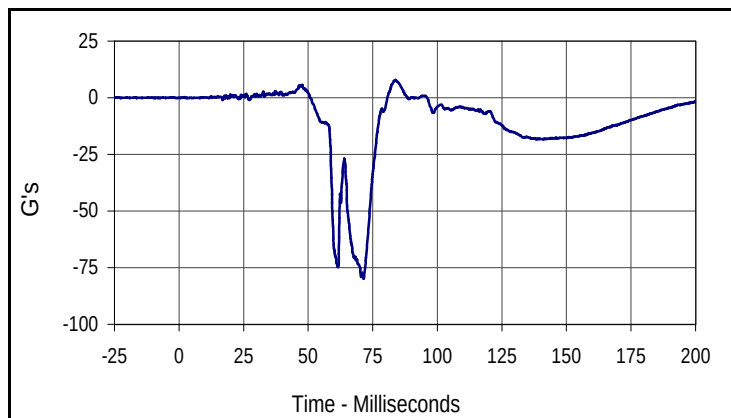
Curve Description			
Driver (50th) NAAH Yarm-X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
2.1	39.1	-66.1	70.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

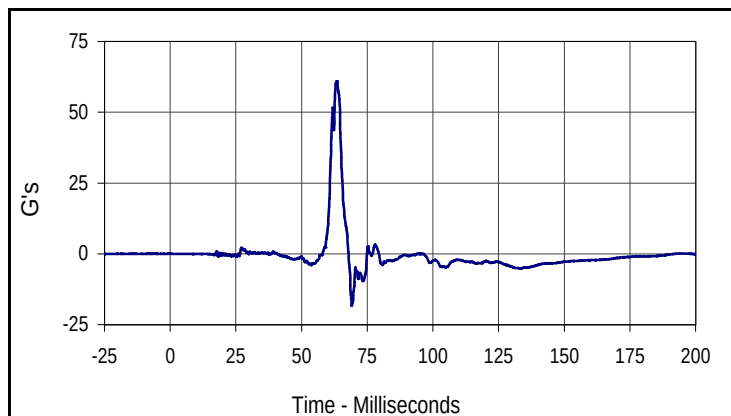
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver (50th) NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
36.4	67.4	-14.8	82.5



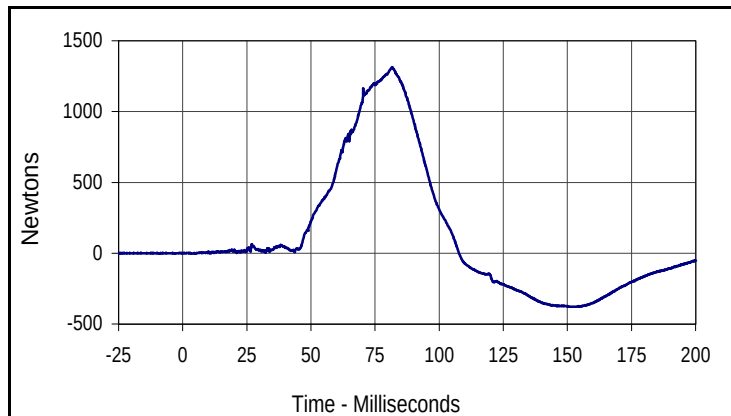
Curve Description			
Driver (50th) NAAH Zarm-X			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
7.9	83.8	-79.8	71.5



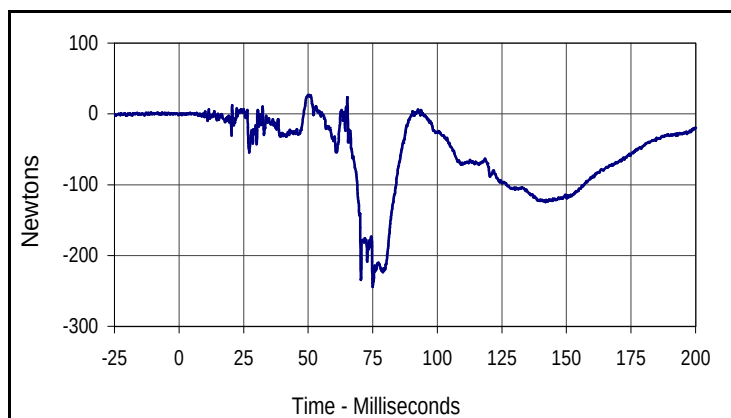
Curve Description			
Driver (50th) NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
012	FIL	1000	G's
Max	Time	Min	Time
60.9	63.3	-18.3	69.1

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

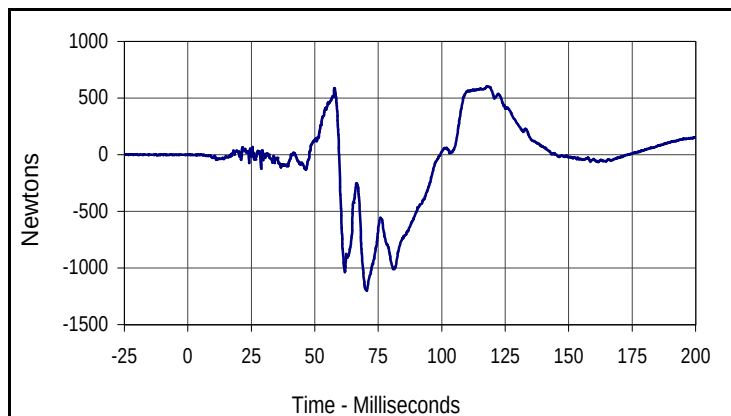
Test Date: 9/9/04
 NHTSA No.: R40401



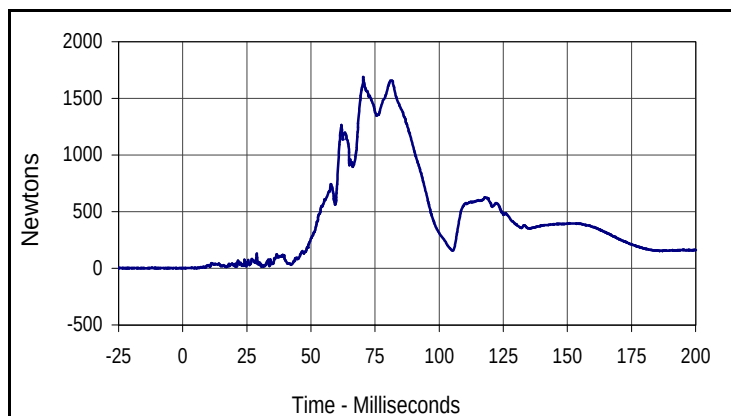
Curve Description			
Driver (50th) Upper Neck Force X			
CURNO	Type	SAE Class	Units
013	FIL	1000	Newton's
Max	Time	Min	Time
1312.0	81.8	-378.8	152.2



Curve Description			
Driver (50th) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
014	FIL	1000	Newton's
Max	Time	Min	Time
26.9	50.0	-243.8	75.0



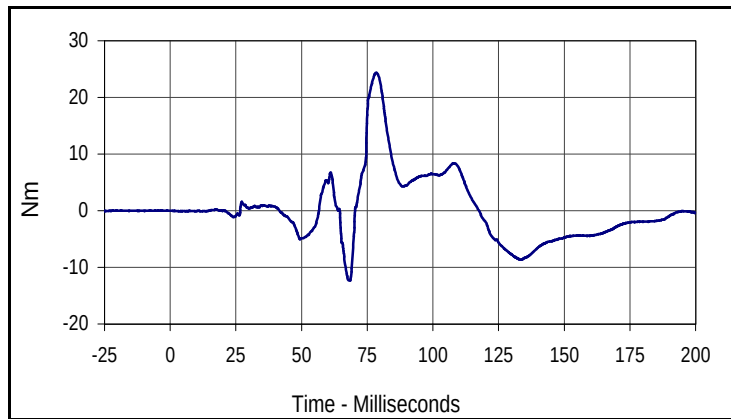
Curve Description			
Driver (50th) Upper Neck Force Z			
CURNO	Type	SAE Class	Units
015	FIL	1000	Newton's
Max	Time	Min	Time
604.5	117.8	-1201.6	70.4



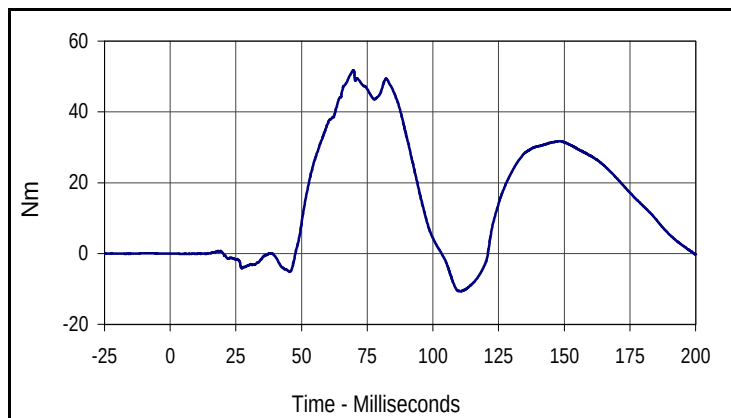
Curve Description			
Driver (50th) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
013	RES	1000	Newton's
Max	Time	Min	Time
1688.9	70.4	0.6	5.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

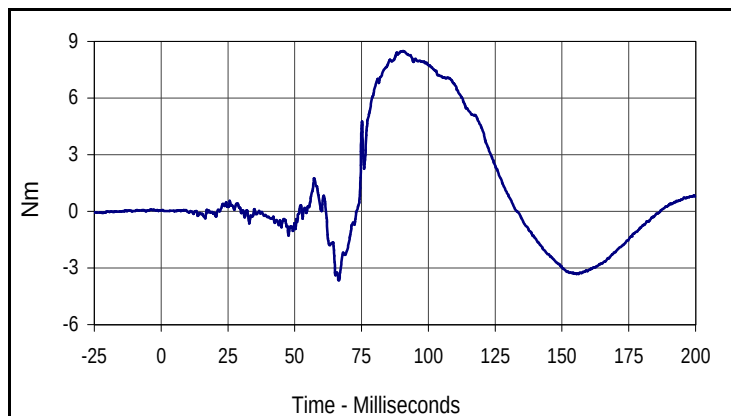
Test Date: 9/9/04
 NHTSA No.: R40401



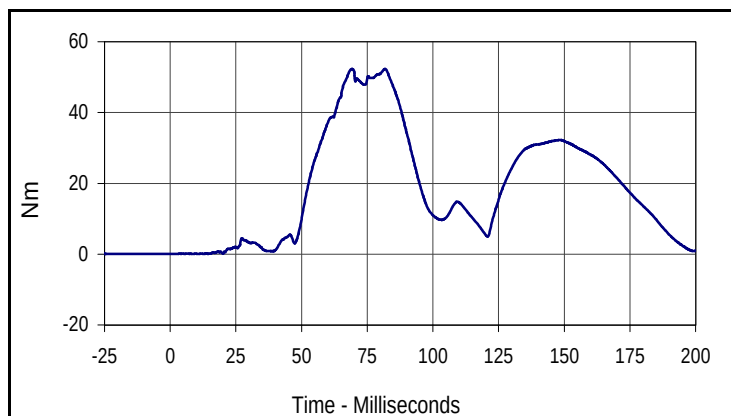
Curve Description			
Driver (50th) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
016	FIL	600	Nm
Max	Time	Min	Time
24.4	78.4	-12.3	68.4



Curve Description			
Driver (50th) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
017	FIL	600	Nm
Max	Time	Min	Time
51.7	69.7	-10.7	110.4



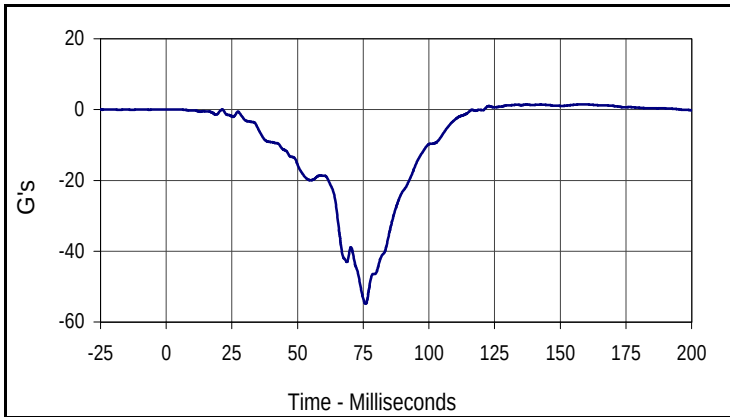
Curve Description			
Driver (50th) Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
018	FIL	600	Nm
Max	Time	Min	Time
8.5	90.5	-3.7	66.5



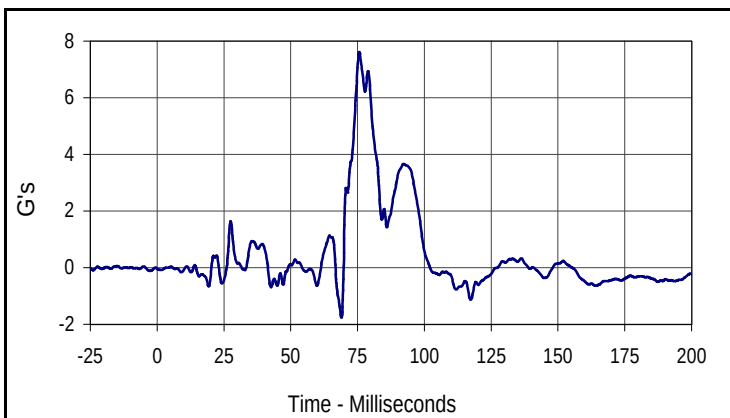
Curve Description			
Driver (50th) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
016	RES	600	Nm
Max	Time	Min	Time
52.3	81.8	0.0	10.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

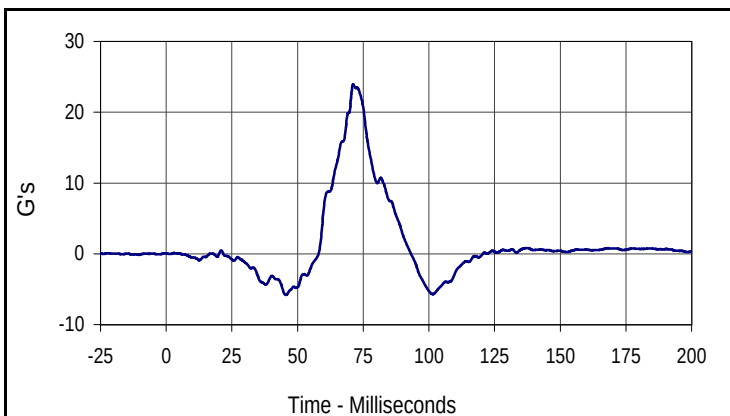
Test Date: 9/9/04
 NHTSA No.: R40401



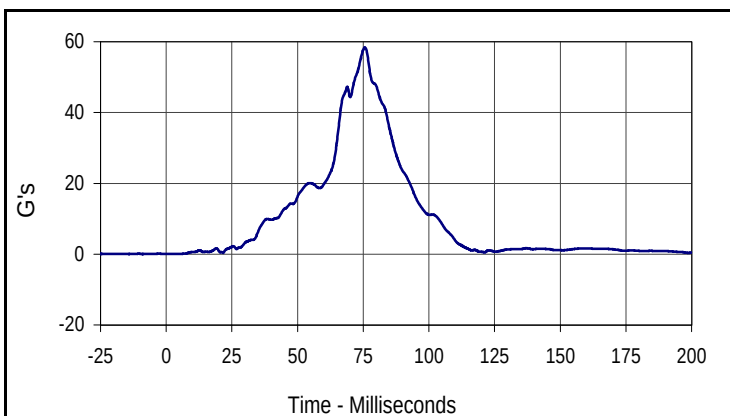
Curve Description			
Driver (50th) Chest Primary X			
CURNO	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
1.5	158.7	-54.9	75.9



Curve Description			
Driver (50th) Chest Primary Y			
CURNO	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
7.6	75.7	-1.8	69.0



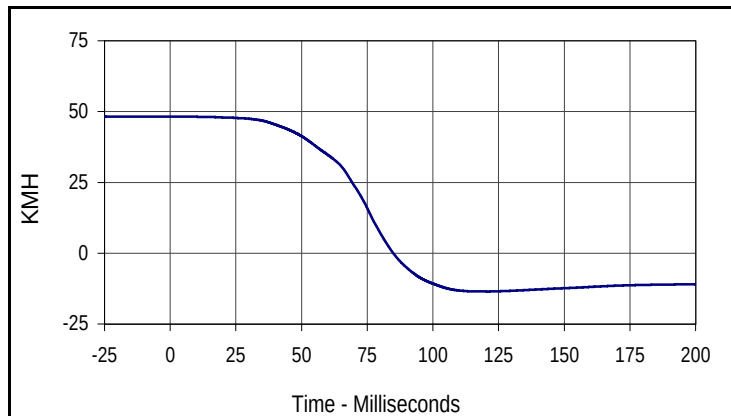
Curve Description			
Driver (50th) Chest Primary Z			
CURNO	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
23.9	71.2	-5.8	45.6



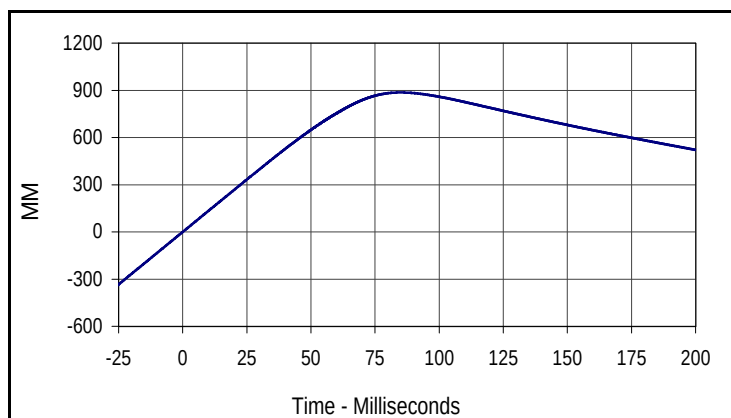
Curve Description			
Driver (50th) Chest Resultant Primary			
CURNO	Type	SAE Class	Units
019	RES	180	G's
Max	Time	Min	Time
58.4	75.6	0.0	5.6

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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Test Date: 9/9/04
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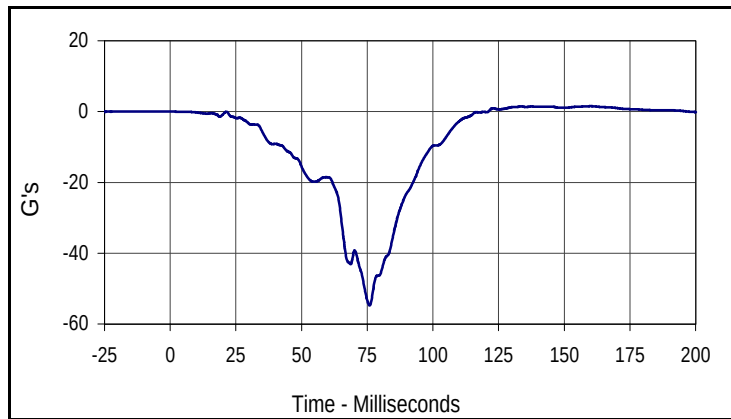
Curve Description			
Driver (50th) Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
019	IN1	180	KMH
Max	Time	Min	Time
48.2	6.1	-13.5	121.1



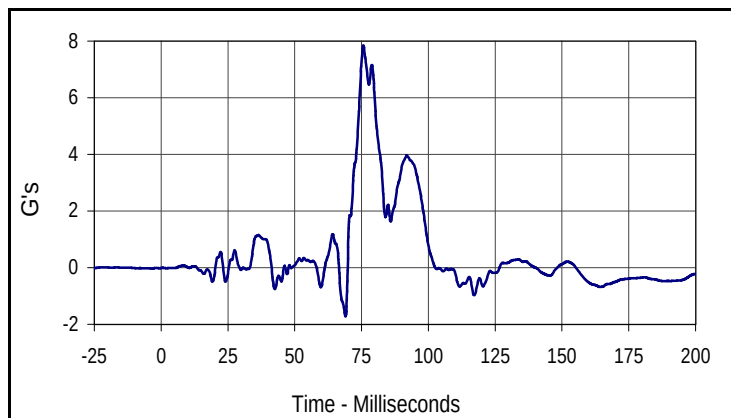
Curve Description			
Driver (50th) Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
019	IN2	180	MM
Max	Time	Min	Time
886.2	84.9	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

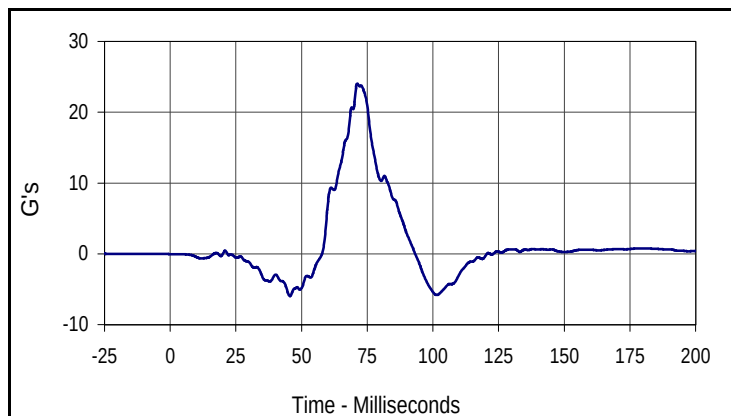
Test Date: 9/9/04
 NHTSA No.: R40401



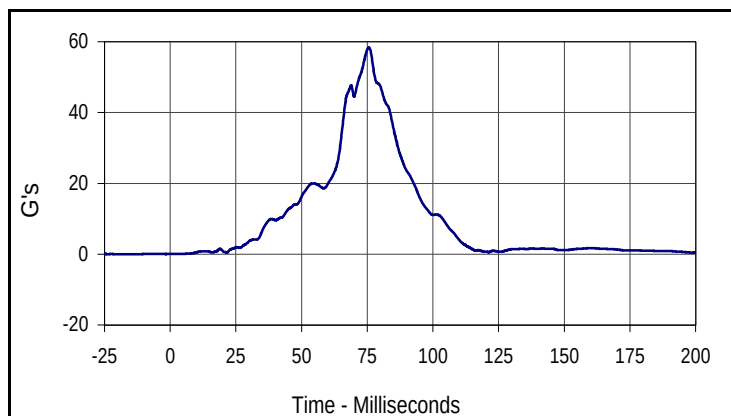
Curve Description			
Driver (50th) Chest Redundant X			
CURNO	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
1.5	160.0	-54.8	75.9



Curve Description			
Driver (50th) Chest Redundant Y			
CURNO	Type	SAE Class	Units
023	FIL	180	G's
Max	Time	Min	Time
7.8	75.7	-1.7	69.0



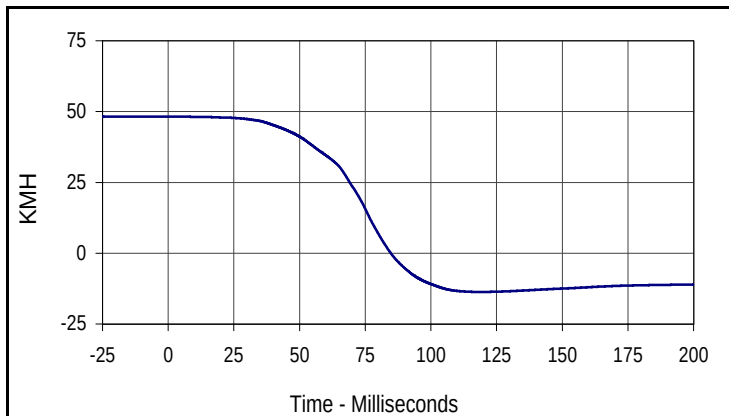
Curve Description			
Driver (50th) Chest Redundant Z			
CURNO	Type	SAE Class	Units
024	FIL	180	G's
Max	Time	Min	Time
24.0	71.2	-6.0	45.6



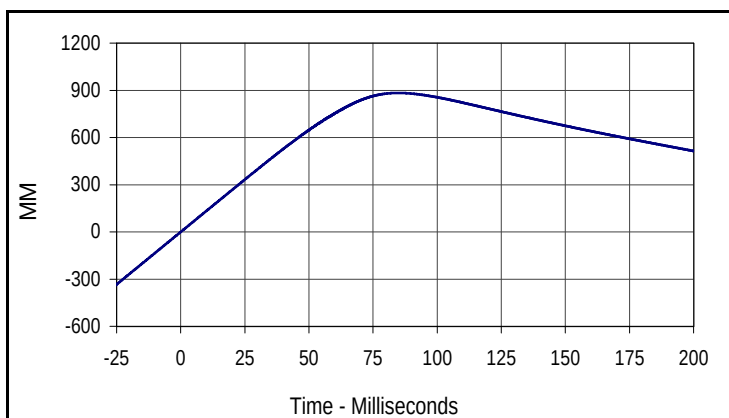
Curve Description			
Driver (50th) Chest Resultant Redundant			
CURNO	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
58.3	75.6	0.0	0.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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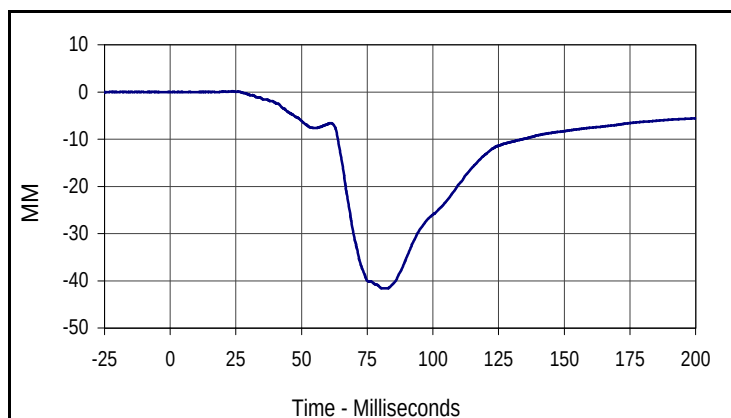
Curve Description			
Driver (50th) Chest Redundant X Velocity			
CURNO	Type	SAE Class	Units
022	IN1	180	KMH
Max	Time	Min	Time
48.2	0.0	-13.7	121.1



Curve Description			
Driver (50th) Chest Redundant X Displacement			
CURNO	Type	SAE Class	Units
022	IN2	180	MM
Max	Time	Min	Time
883.3	84.7	-0.1	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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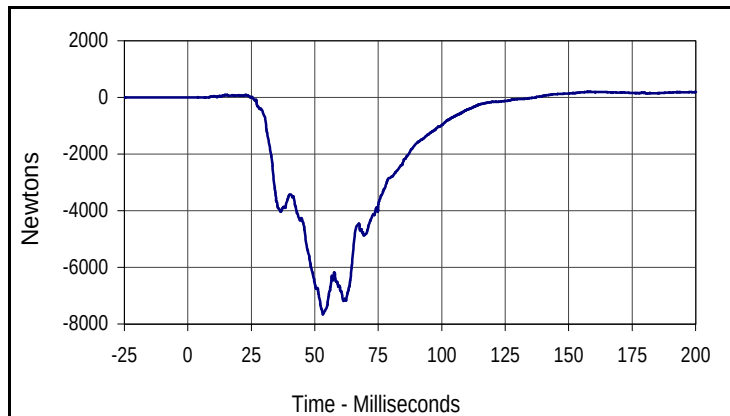
Test Date: 9/9/04
 NHTSA No.: R40401



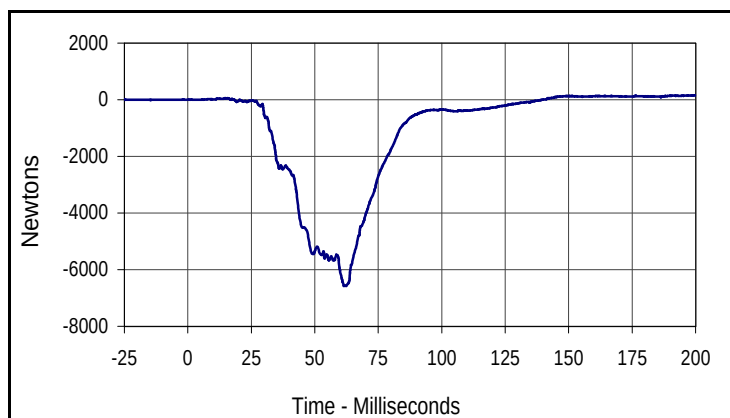
Curve Description			
Driver (50th) Chest Deflection			
CURNO	Type	SAE Class	Units
025	FIL	600	MM
Max	Time	Min	Time
0.2	23.8	-41.6	80.9

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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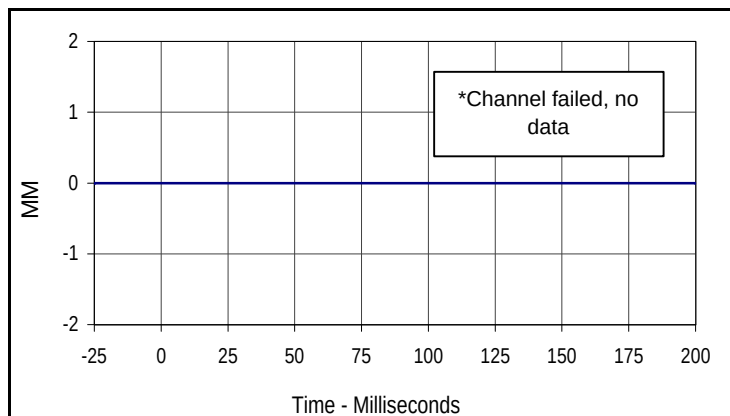
Test Date: 9/9/04
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Curve Description			
Driver (50th) Left Femur Force			
CURNO	Type	SAE Class	Units
026	FIL	600	Newtons
Max	Time	Min	Time
200.7	158.3	-7662.0	53.2

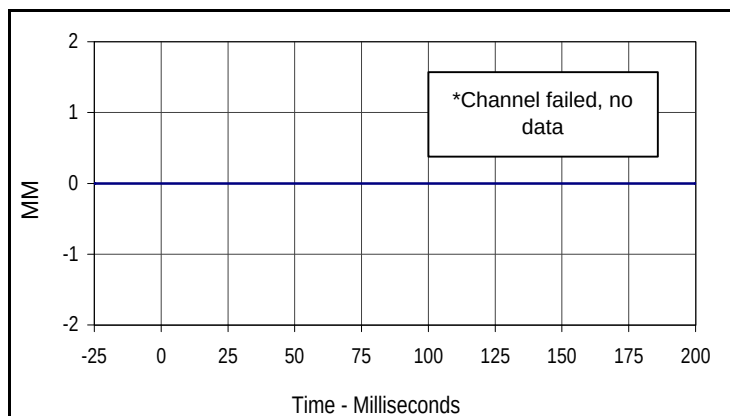


Curve Description			
Driver (50th) Right Femur Force			
CURNO	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
155.6	199.3	-6578.2	62.3



Curve Description			
Driver (50th) Left Knee Displacement			
CURNO	Type	SAE Class	Units
028	FIL	180	MM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

*Channel failed, no data

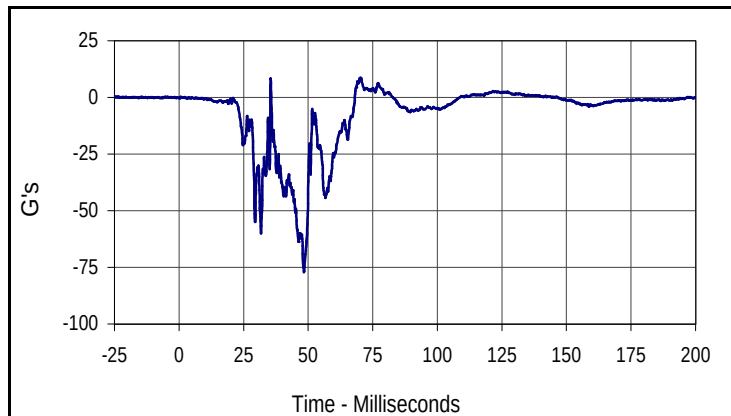


Curve Description			
Driver (50th) Right Knee Displacement			
CURNO	Type	SAE Class	Units
029	FIL	180	MM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

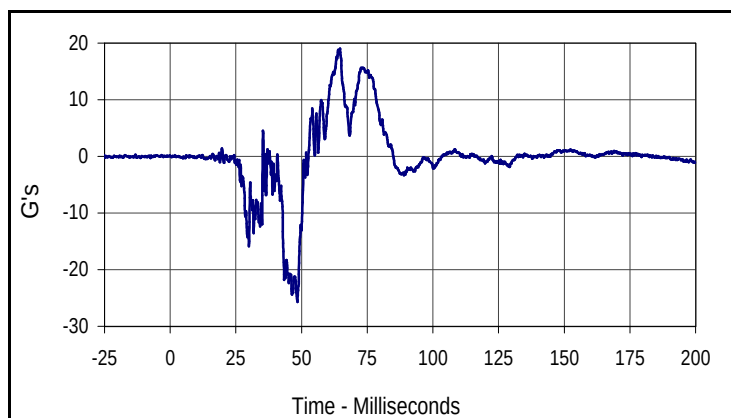
*Channel failed, no data

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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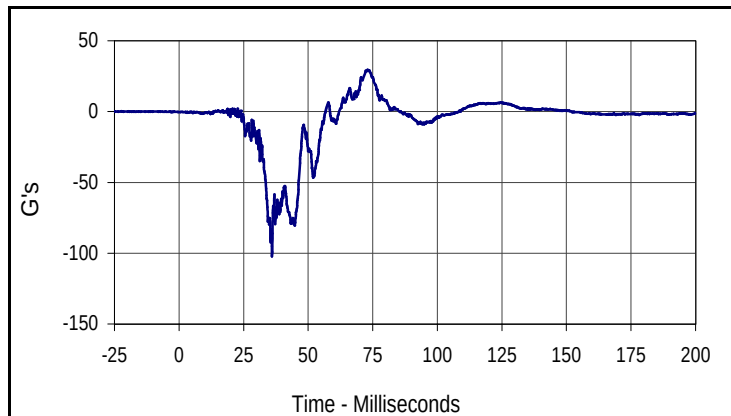
Curve Description			
Driver (50th) Left Tibia X			
CURNO	Type	SAE Class	Units
030	FIL	1000	G's
Max	Time	Min	Time
8.7	70.4	-77.1	48.4



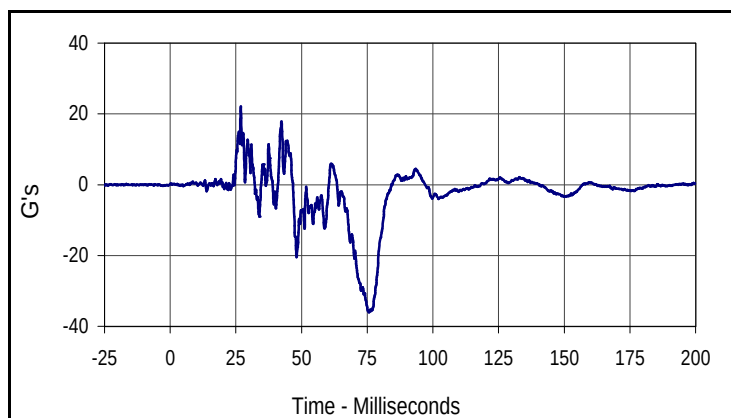
Curve Description			
Driver (50th) Left Tibia Y			
CURNO	Type	SAE Class	Units
031	FIL	1000	G's
Max	Time	Min	Time
19.1	64.6	-25.7	48.4

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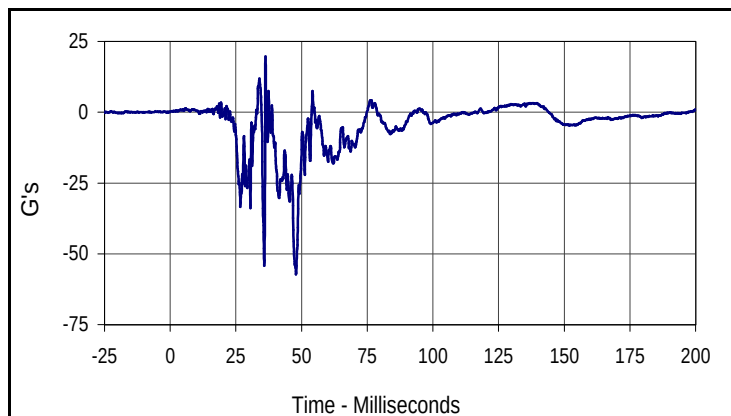
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver (50th) Left Foot X			
CURNO	Type	SAE Class	Units
032	FIL	1000	G's
Max	Time	Min	Time
29.5	73.0	-102.2	36.0



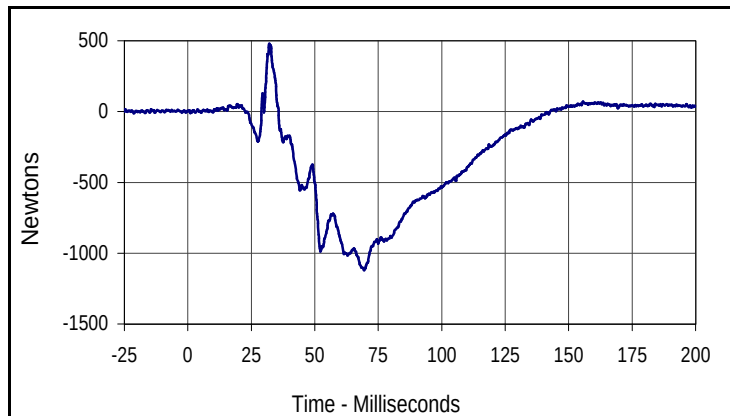
Curve Description			
Driver (50th) Left Foot Y			
CURNO	Type	SAE Class	Units
033	FIL	1000	G's
Max	Time	Min	Time
22.1	26.9	-36.0	75.6



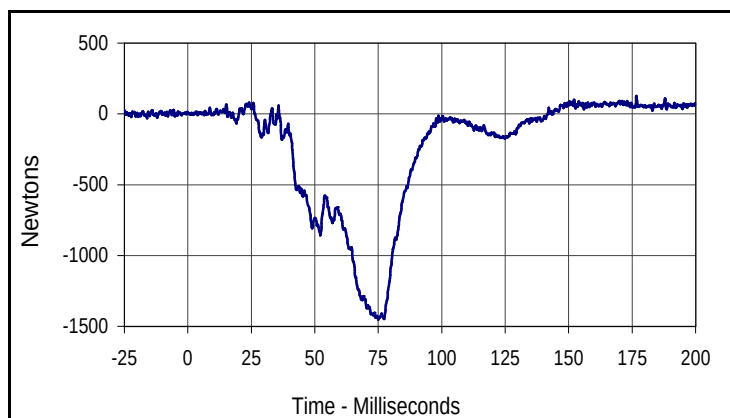
Curve Description			
Driver (50th) Left Foot Z			
CURNO	Type	SAE Class	Units
034	FIL	1000	G's
Max	Time	Min	Time
19.7	36.3	-57.3	47.9

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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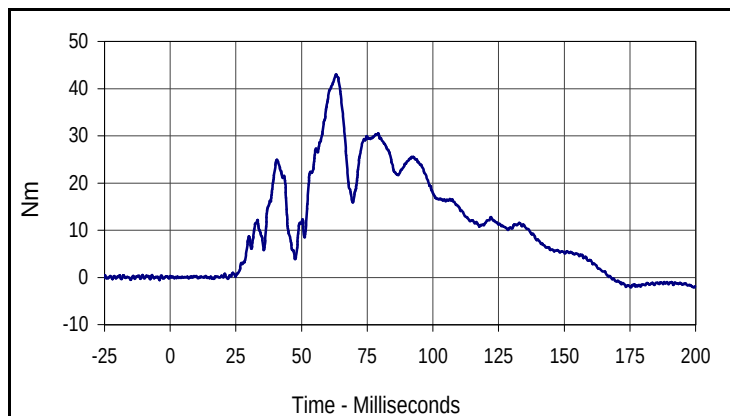
Test Date: 9/9/04
 NHTSA No.: R40401



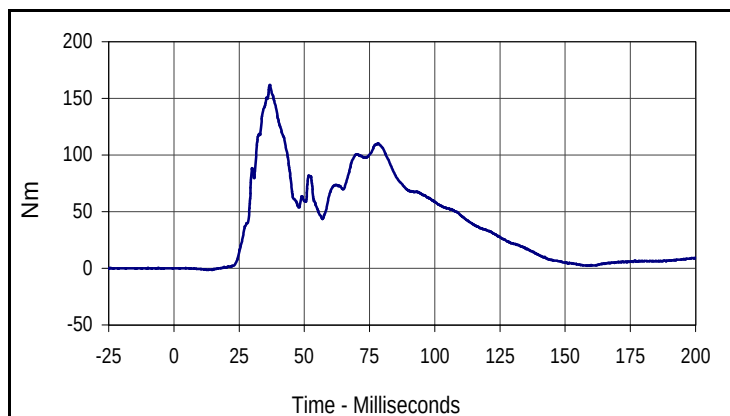
Curve Description			
Driver (50th) Left Upper Tibia Force X			
CURNO	Type	SAE Class	Units
035	FIL	600	Newtons
Max	Time	Min	Time
480.4	32.1	-1121.1	69.5



Curve Description			
Driver (50th) Left Upper Tibia Force Z			
CURNO	Type	SAE Class	Units
036	FIL	600	Newtons
Max	Time	Min	Time
126.8	176.7	-1453.0	75.0



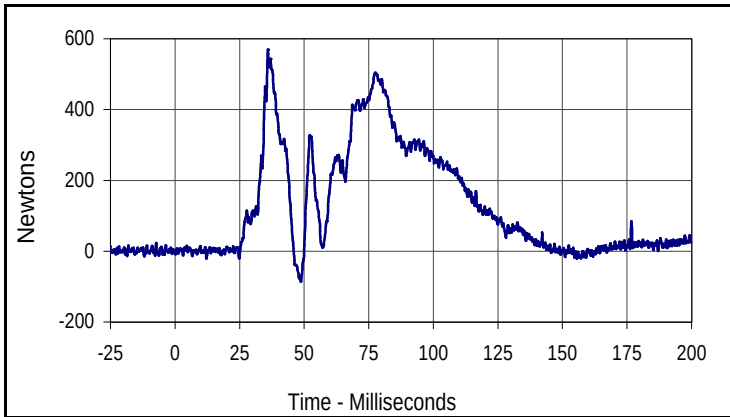
Curve Description			
Driver (50th) Left Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
037	FIL	600	Nm
Max	Time	Min	Time
43.0	63.1	-2.1	199.4



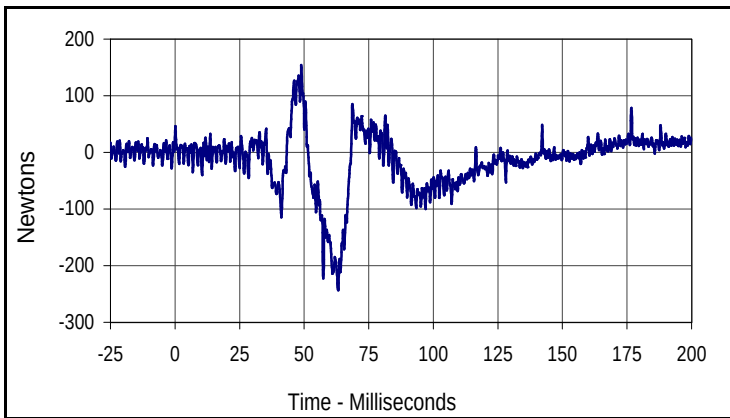
Curve Description			
Driver (50th) Left Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
038	FIL	600	Nm
Max	Time	Min	Time
161.7	36.8	-1.4	13.1

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
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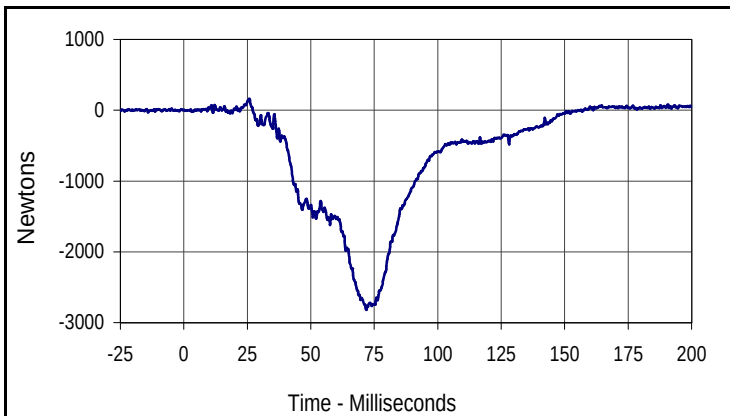
Test Date: 9/9/04
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Curve Description			
Driver (50th) Left Lower Tibia Force X			
CURNO	Type	SAE Class	Units
039	FIL	600	Newtons
Max	Time	Min	Time
569.6	35.9	-86.3	48.7



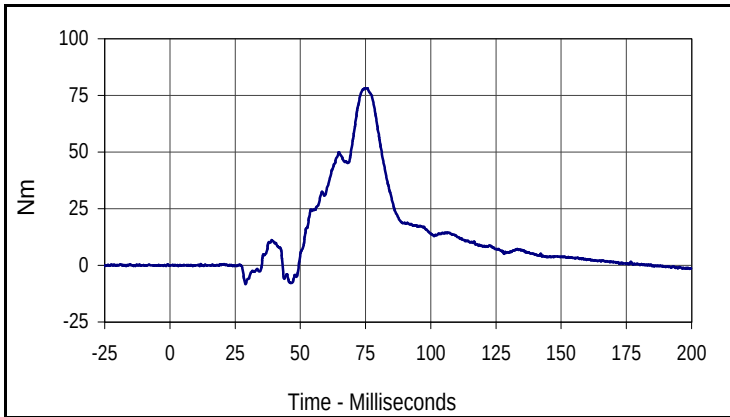
Curve Description			
Driver (50th) Left Lower Tibia Force Y			
CURNO	Type	SAE Class	Units
040	FIL	600	Newtons
Max	Time	Min	Time
154.2	48.9	-243.3	63.2



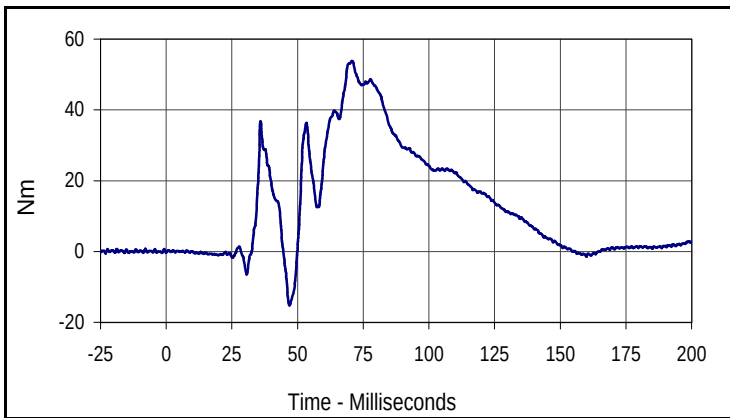
Curve Description			
Driver (50th) Left Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
041	FIL	600	Newtons
Max	Time	Min	Time
165.3	25.8	-2820.7	71.8

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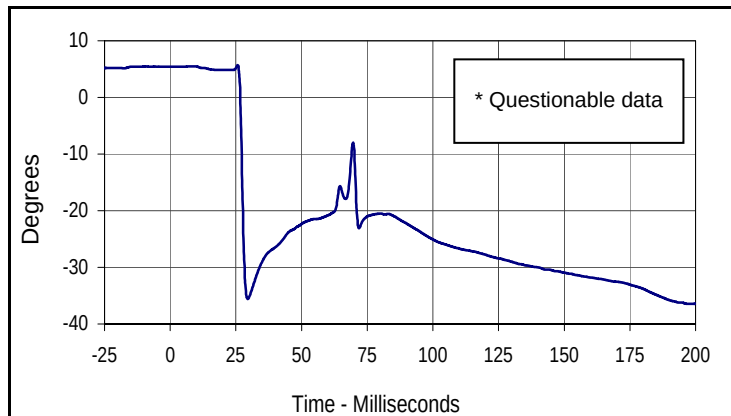
Curve Description			
Driver (50th) Left Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
042	FIL	600	Nm
Max	Time	Min	Time
78.2	75.7	-8.3	29.0



Curve Description			
Driver (50th) Left Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
043	FIL	600	Nm
Max	Time	Min	Time
53.9	70.7	-15.2	46.9

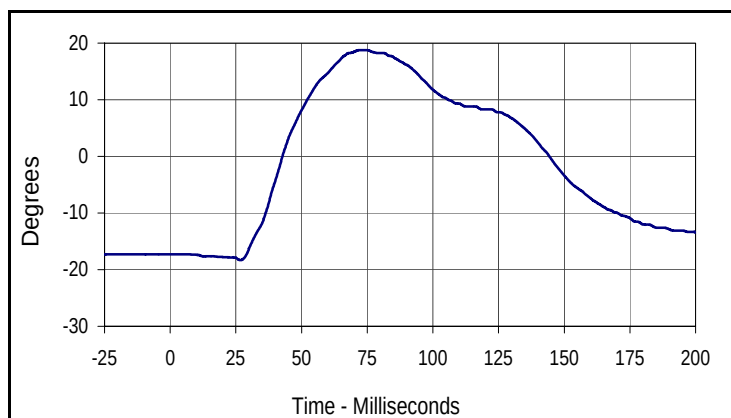
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
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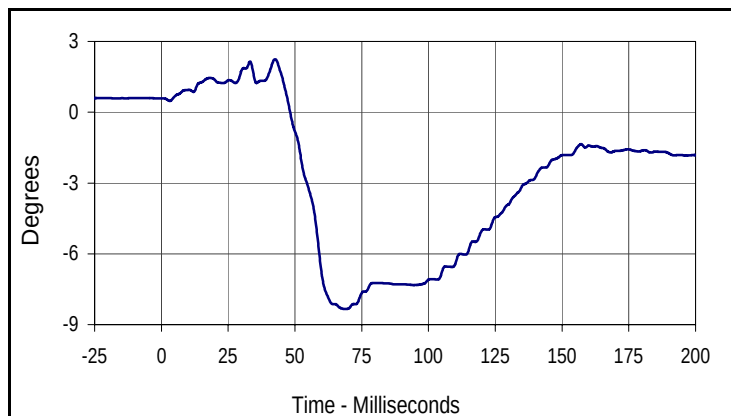


Curve Description			
Driver (50th) Left Ankle Rotation X			
CURNO	Type	SAE Class	Units
044	FIL	180	Degrees
Max	Time	Min	Time
5.7	25.7	-36.5	197.6

* Questionable data



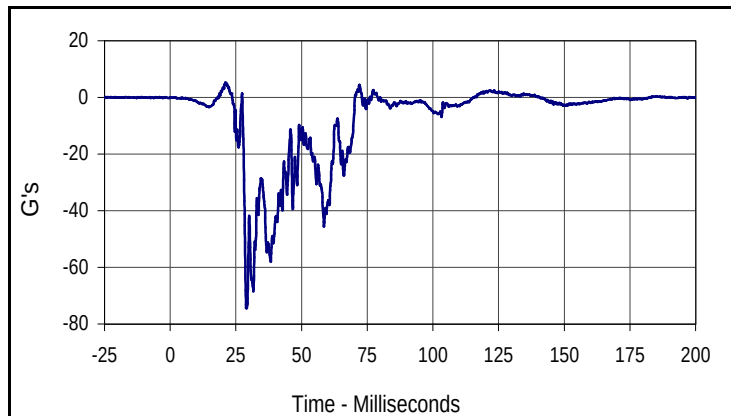
Curve Description			
Driver (50th) Left Ankle Rotation Y			
CURNO	Type	SAE Class	Units
045	FIL	180	Degrees
Max	Time	Min	Time
18.8	74.5	-18.3	26.7



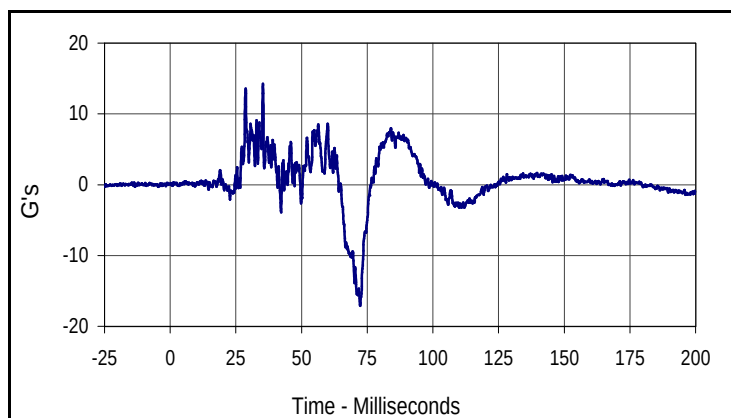
Curve Description			
Driver (50th) Left Ankle Rotation Z			
CURNO	Type	SAE Class	Units
046	FIL	180	Degrees
Max	Time	Min	Time
2.2	42.5	-8.3	69.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



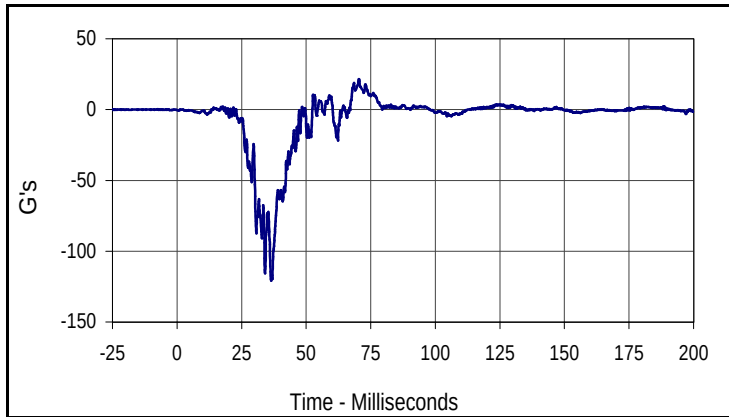
Curve Description			
Driver (50th) Right Tibia X			
CURNO	Type	SAE Class	Units
047	FIL	1000	G's
Max	Time	Min	Time
5.4	21.1	-74.4	29.1



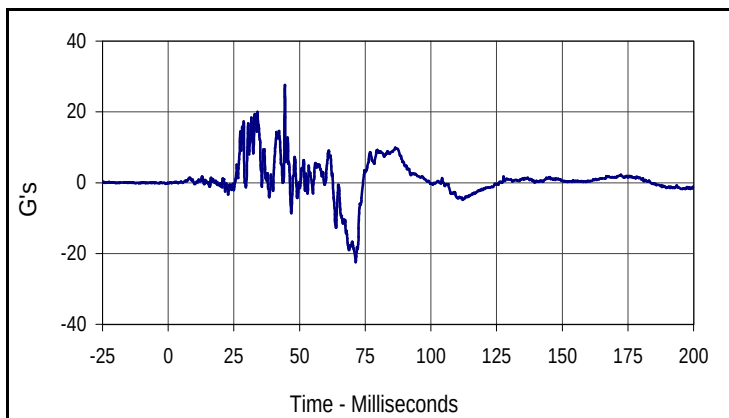
Curve Description			
Driver (50th) Right Tibia Y			
CURNO	Type	SAE Class	Units
048	FIL	1000	G's
Max	Time	Min	Time
14.3	35.3	-17.1	72.3

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

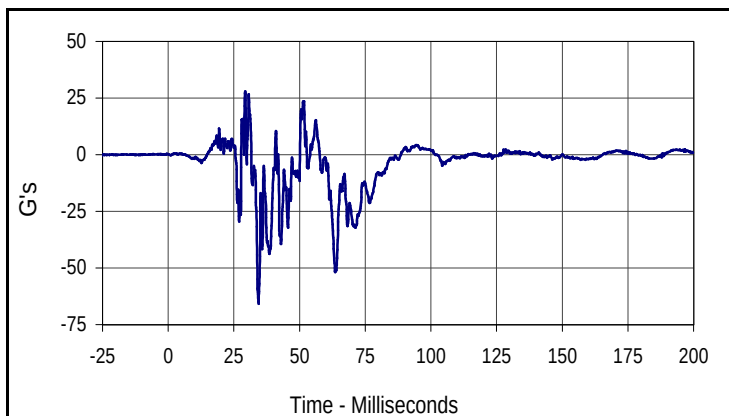
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver (50th) Right Foot X			
CURNO	Type	SAE Class	Units
049	FIL	1000	G's
Max	Time	Min	Time
21.4	70.4	-120.8	36.4



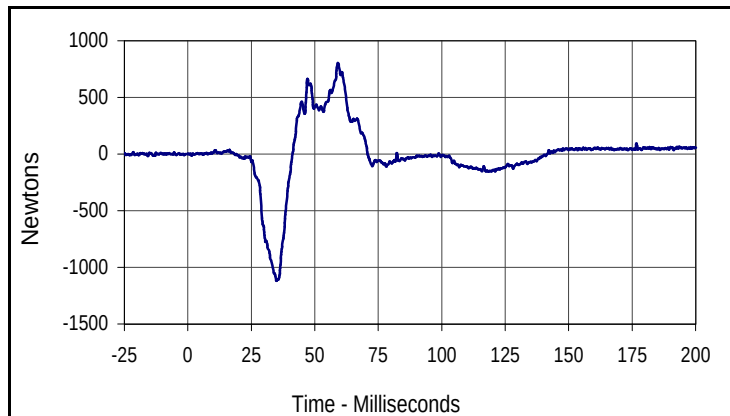
Curve Description			
Driver (50th) Right Foot Y			
CURNO	Type	SAE Class	Units
050	FIL	1000	G's
Max	Time	Min	Time
27.5	44.4	-22.5	71.4



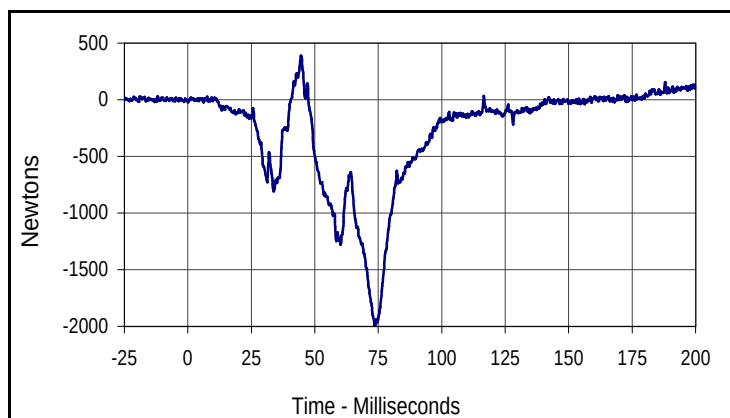
Curve Description			
Driver (50th) Right Foot Z			
CURNO	Type	SAE Class	Units
051	FIL	1000	G's
Max	Time	Min	Time
27.9	29.3	-65.8	34.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

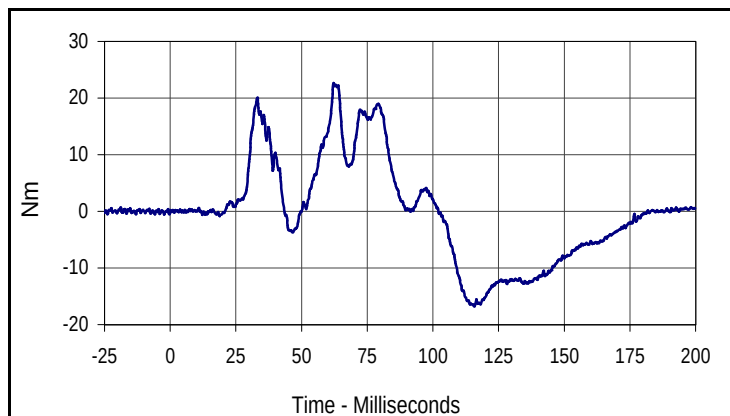
Test Date: 9/9/04
 NHTSA No.: R40401



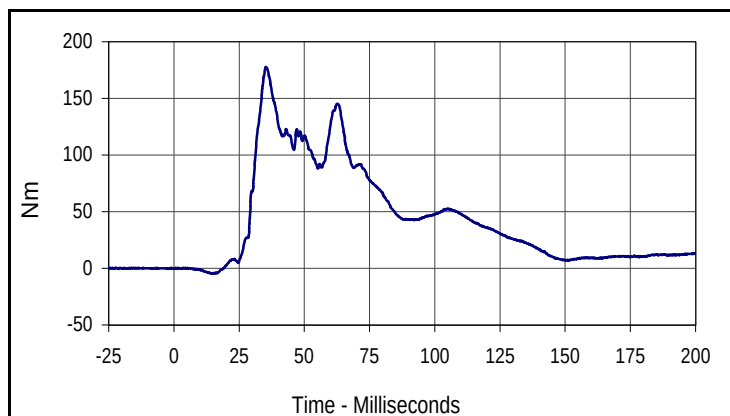
Curve Description			
Driver (50th) Right Upper Tibia Force X			
CURNO	Type	SAE Class	Units
052	FIL	600	Newtons
Max	Time	Min	Time
804.1	59.1	-1117.7	34.9



Curve Description			
Driver (50th) Right Upper Tibia Force Z			
CURNO	Type	SAE Class	Units
053	FIL	600	Newtons
Max	Time	Min	Time
388.5	44.6	-1992.8	73.7



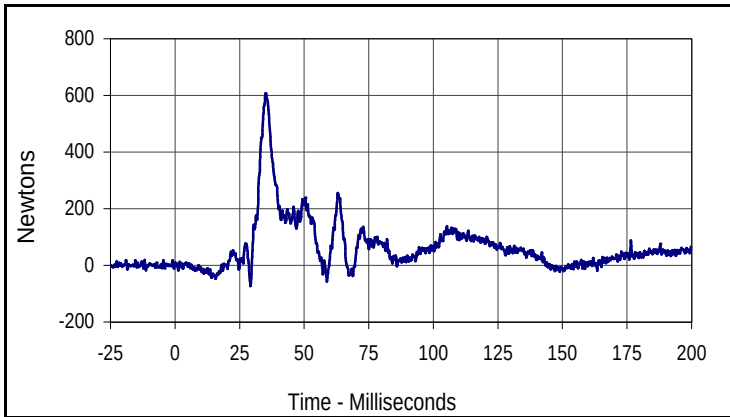
Curve Description			
Driver (50th) Right Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
054	FIL	600	Nm
Max	Time	Min	Time
22.6	62.2	-16.8	115.7



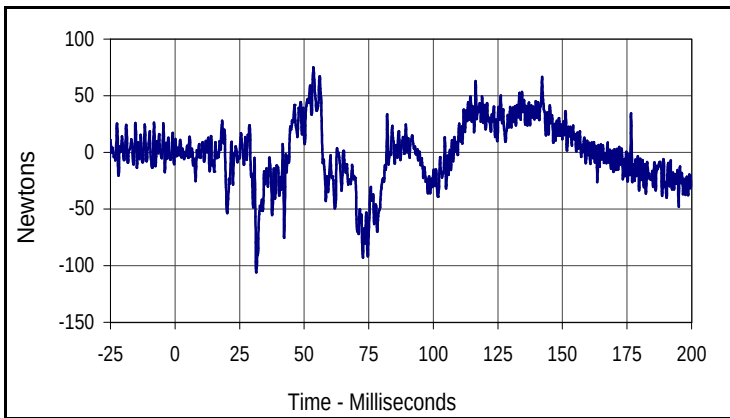
Curve Description			
Driver (50th) Right Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
055	FIL	600	Nm
Max	Time	Min	Time
177.6	35.3	-4.7	14.7

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

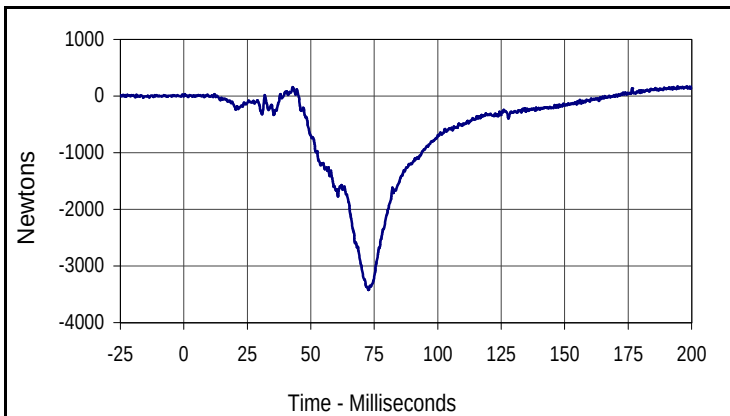
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver (50th) Right Lower Tibia Force X			
CURNO	Type	SAE Class	Units
056	FIL	600	Newtons
Max	Time	Min	Time
608.2	35.1	-73.3	29.2



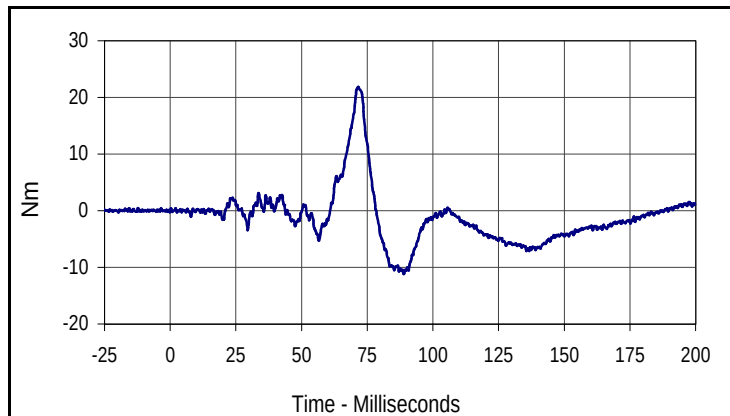
Curve Description			
Driver (50th) Right Lower Tibia Force Y			
CURNO	Type	SAE Class	Units
057	FIL	600	Newtons
Max	Time	Min	Time
75.3	53.6	-106.0	31.5



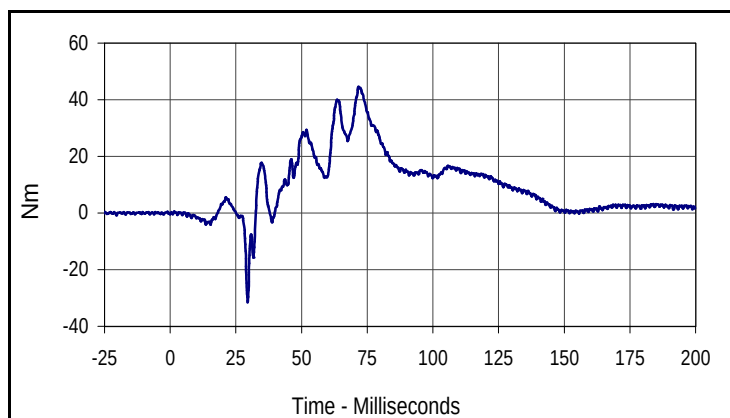
Curve Description			
Driver (50th) Right Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
058	FIL	600	Newtons
Max	Time	Min	Time
168.9	194.6	-3421.8	72.7

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



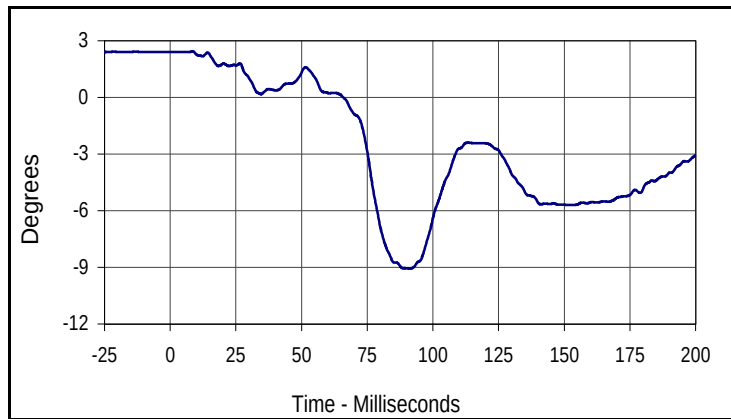
Curve Description			
Driver (50th) Right Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
059	FIL	600	Nm
Max	Time	Min	Time
21.8	71.6	-11.2	88.9



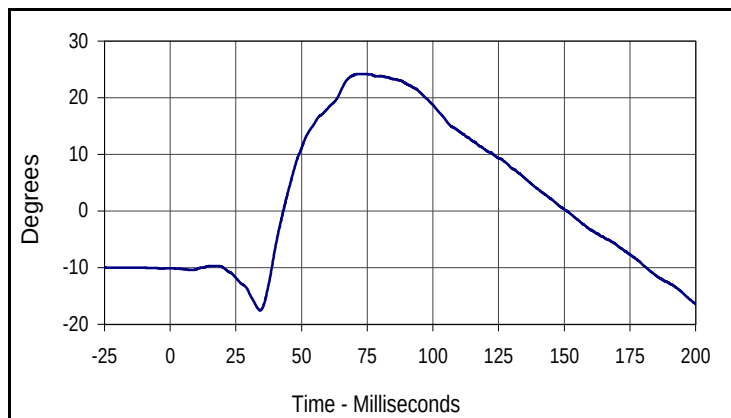
Curve Description			
Driver (50th) Right Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
060	FIL	600	Nm
Max	Time	Min	Time
44.7	71.7	-31.6	29.5

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

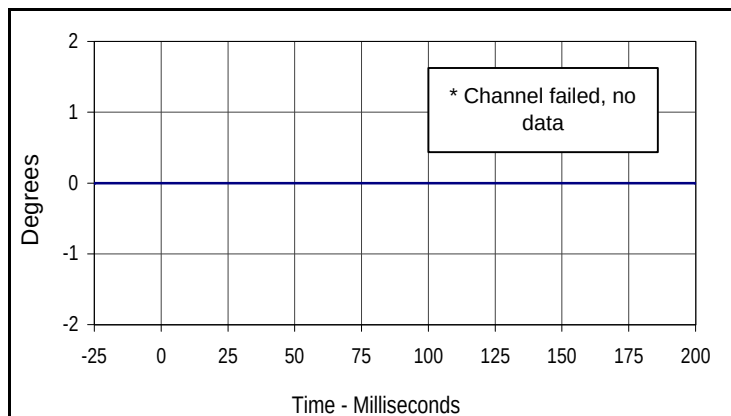
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver (50th) Right Ankle Rotation X			
CURNO	Type	SAE Class	Units
061	FIL	180	Degrees
Max	Time	Min	Time
2.4	8.6	-9.1	91.1



Curve Description			
Driver (50th) Right Ankle Rotation Y			
CURNO	Type	SAE Class	Units
062	FIL	180	Degrees
Max	Time	Min	Time
24.2	73.9	-17.5	34.2

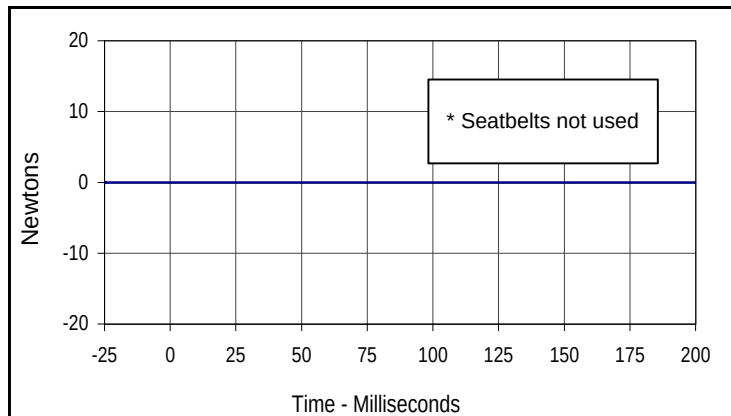


Curve Description			
Driver (50th) Right Ankle Rotation Z			
CURNO	Type	SAE Class	Units
063	FIL	180	Degrees
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Channel failed, no data

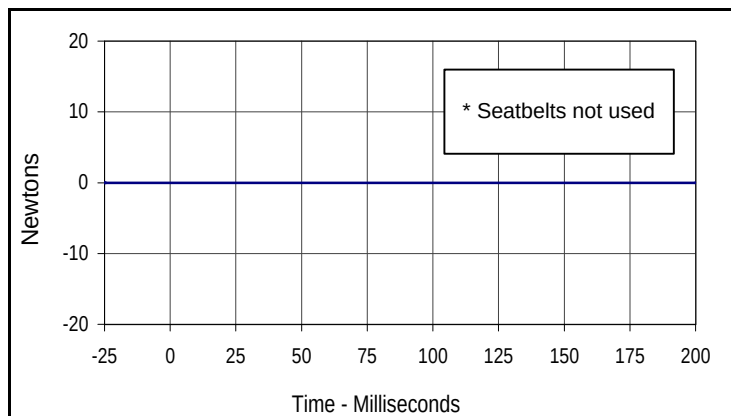
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



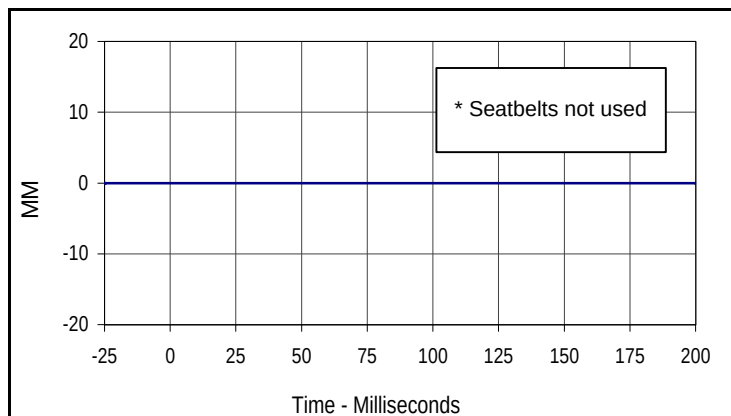
Curve Description			
Driver (50th) Lap Belt Force			
CURNO	Type	SAE Class	Units
064	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Seatbelts not used



Curve Description			
Driver (50th) Shoulder Belt Force			
CURNO	Type	SAE Class	Units
065	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Seatbelts not used

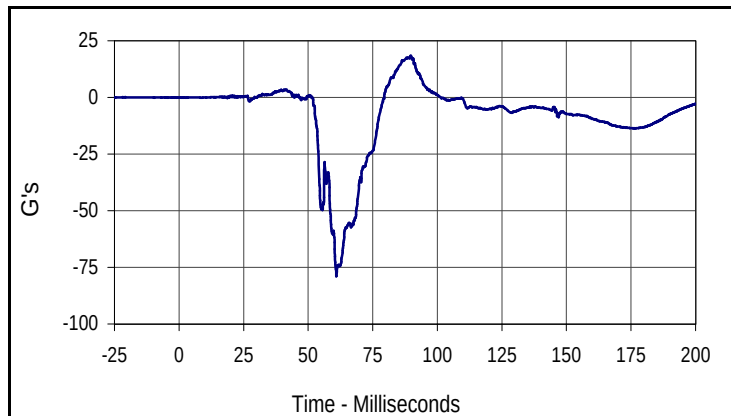


Curve Description			
Driver (50th) Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
066	FIL	60	MM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

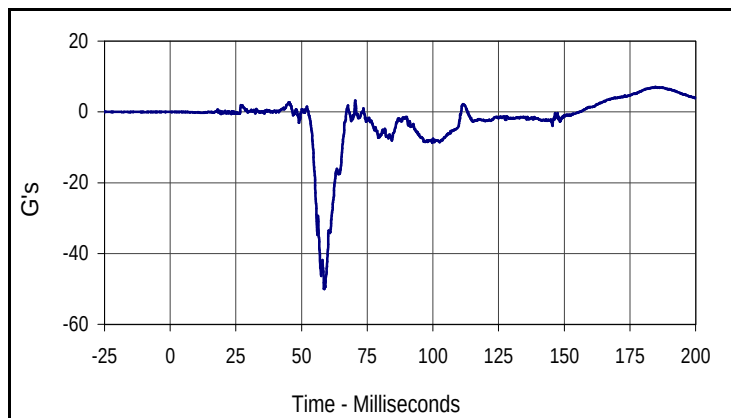
* Seatbelts not used

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

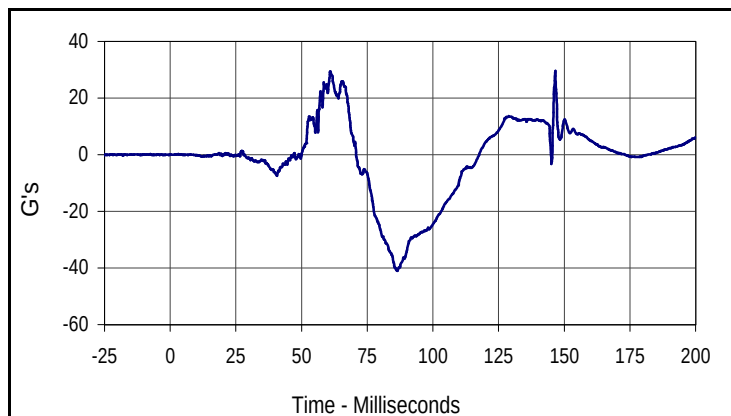
Test Date: 9/9/04
 NHTSA No.: R40401



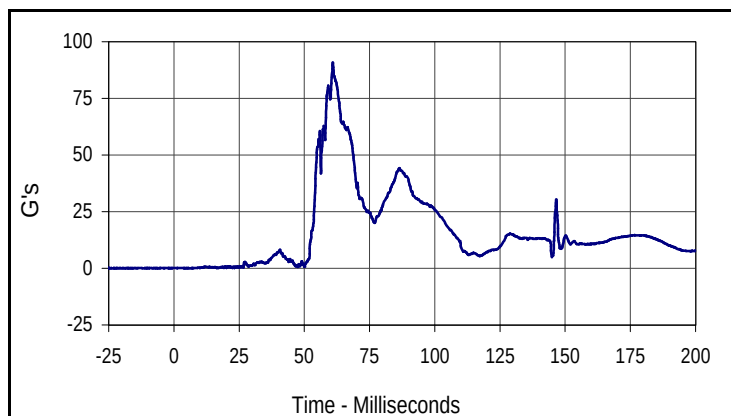
Curve Description			
Passenger (50th) Head Primary X			
CURNO	Type	SAE Class	Units
067	FIL	1000	G's
Max	Time	Min	Time
18.4	89.7	-79.0	60.9



Curve Description			
Passenger (50th) Head Primary Y			
CURNO	Type	SAE Class	Units
068	FIL	1000	G's
Max	Time	Min	Time
7.0	184.6	-50.0	58.7



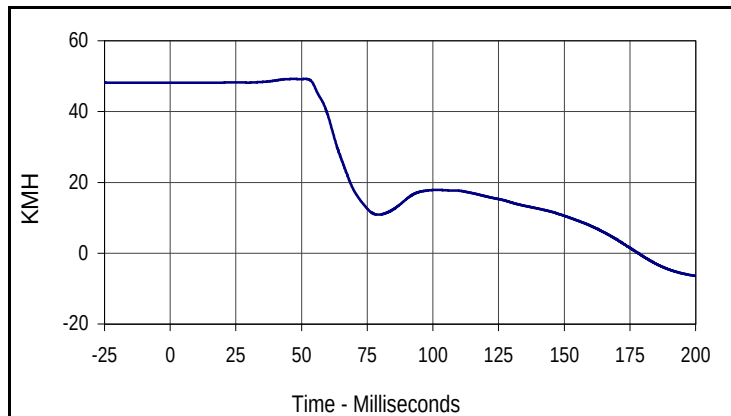
Curve Description			
Passenger (50th) Head Primary Z			
CURNO	Type	SAE Class	Units
069	FIL	1000	G's
Max	Time	Min	Time
29.5	146.6	-41.0	86.5



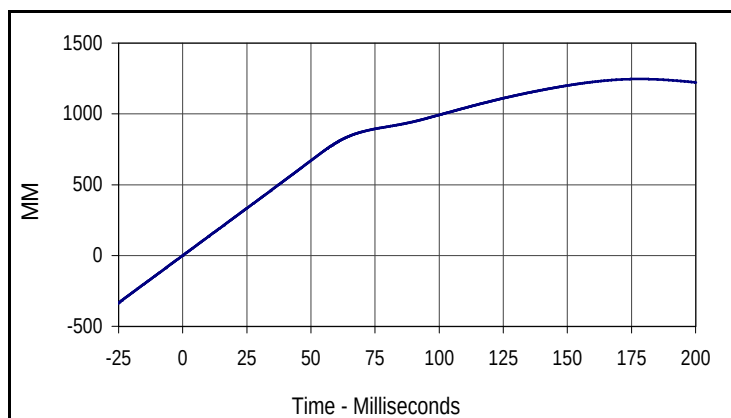
Curve Description			
Passenger (50th) Head Resultant Primary			
CURNO	Type	SAE Class	Units
067	RES	1000	G's
Max	Time	Min	Time
90.8	60.9	0.0	6.5

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



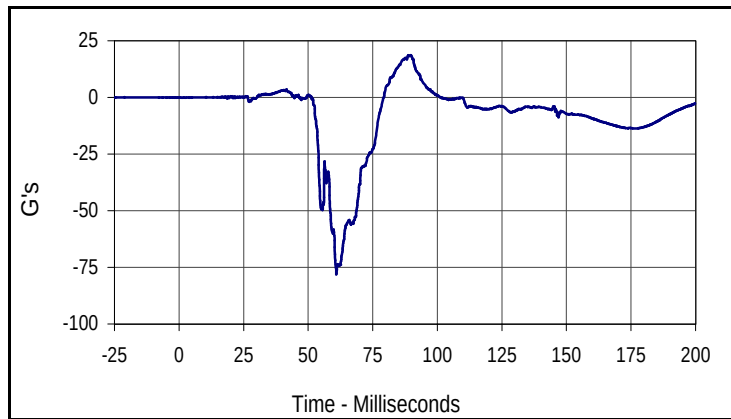
Curve Description			
Passenger (50th) Head Primary X Velocity			
CURNO	Type	SAE Class	Units
067	IN1	180	KMH
Max	Time	Min	Time
49.2	46.8	-6.4	200.0



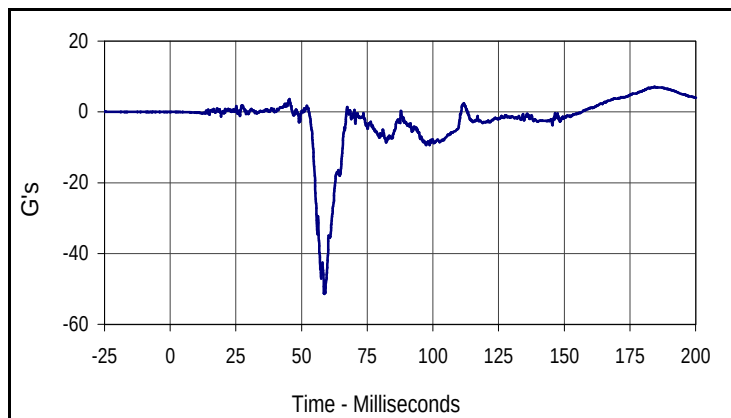
Curve Description			
Passenger (50th) Head Primary X Displacement			
CURNO	Type	SAE Class	Units
067	IN2	180	MM
Max	Time	Min	Time
1246.6	178.1	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

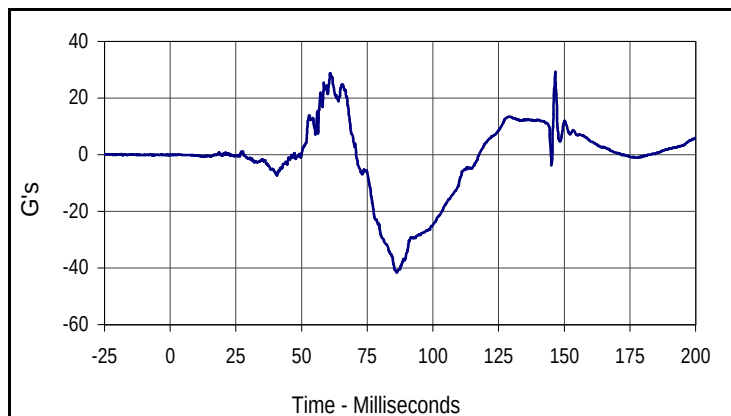
Test Date: 9/9/04
 NHTSA No.: R40401



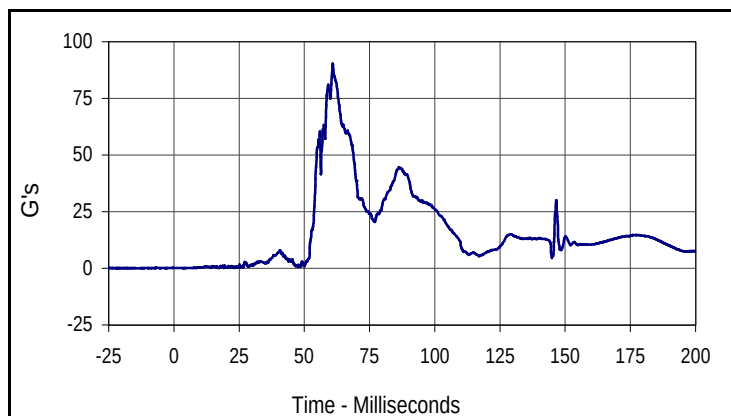
Curve Description			
Passenger (50th) NAAH CG X			
CURNO	Type	SAE Class	Units
070	FIL	1000	G's
Max	Time	Min	Time
18.7	89.7	-78.1	60.9



Curve Description			
Passenger (50th) NAAH CG Y			
CURNO	Type	SAE Class	Units
071	FIL	1000	G's
Max	Time	Min	Time
7.2	184.4	-51.4	58.7



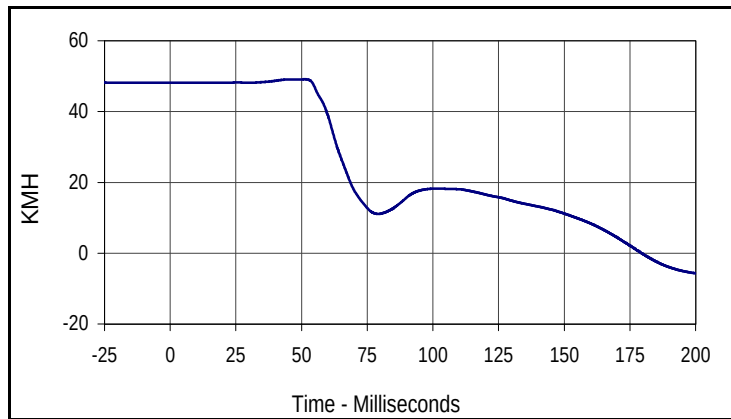
Curve Description			
Passenger (50th) NAAH CG Z			
CURNO	Type	SAE Class	Units
072	FIL	1000	G's
Max	Time	Min	Time
29.2	146.6	-41.5	86.2



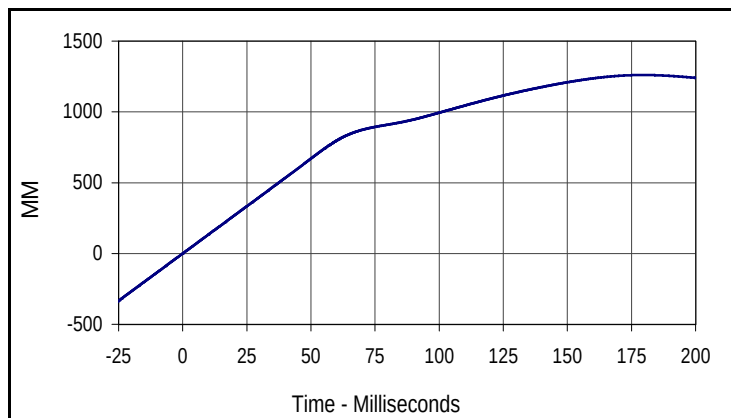
Curve Description			
Passenger (50th) NAAH CG Resultant			
CURNO	Type	SAE Class	Units
070	RES	1000	G's
Max	Time	Min	Time
90.3	60.9	0.0	3.6

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
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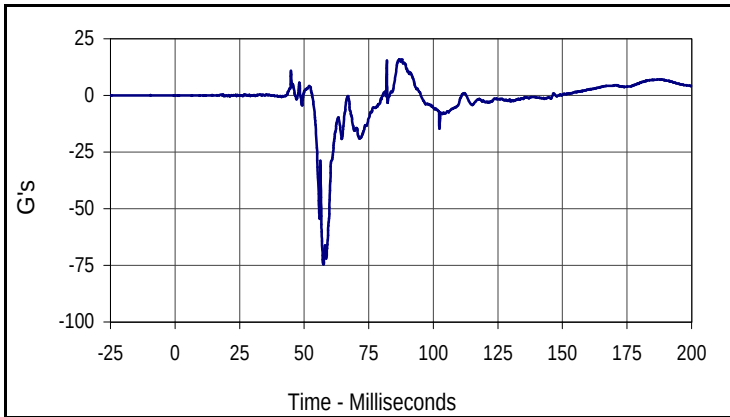
Curve Description			
Passenger (50th) NAAH CG X Velocity			
CURNO	Type	SAE Class	Units
070	IN1	180	KMH
Max	Time	Min	Time
49.1	51.3	-5.7	200.0



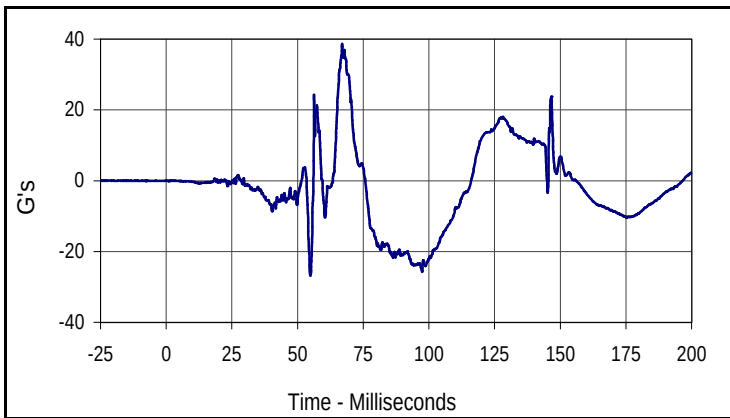
Curve Description			
Passenger (50th) NAAH CG X Displacement			
CURNO	Type	SAE Class	Units
070	IN2	180	MM
Max	Time	Min	Time
1260.7	179.4	0.1	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

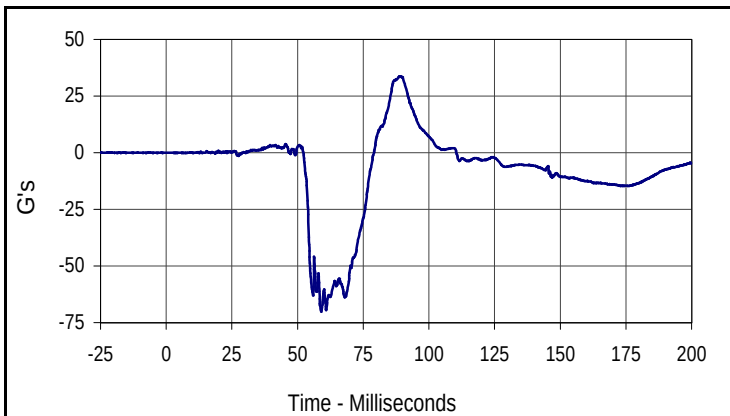
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
073	FIL	1000	G's
Max	Time	Min	Time
15.9	86.9	-74.6	57.5



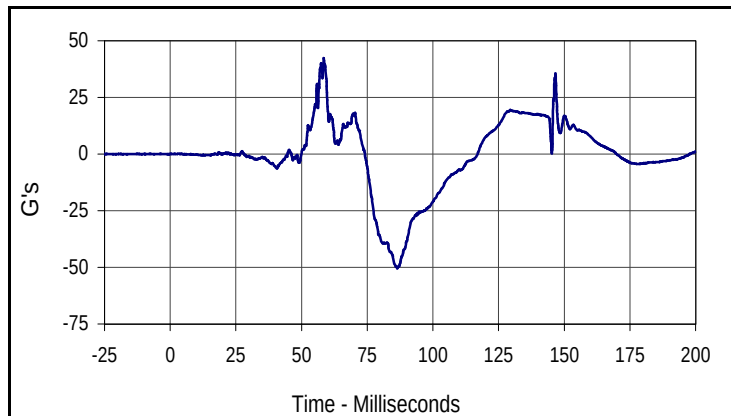
Curve Description			
Passenger (50th) NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
074	FIL	1000	G's
Max	Time	Min	Time
38.7	67.0	-26.8	54.9



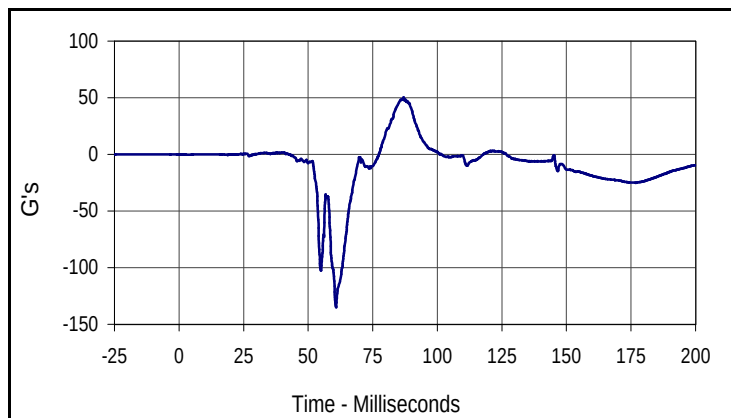
Curve Description			
Passenger (50th) NAAH Yarm-X			
CURNO	Type	SAE Class	Units
075	FIL	1000	G's
Max	Time	Min	Time
33.6	89.0	-70.3	59.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

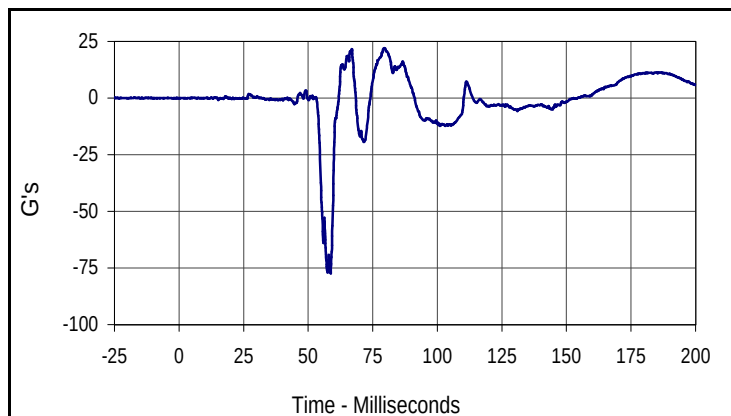
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
076	FIL	1000	G's
Max	Time	Min	Time
42.4	58.5	-50.4	86.5



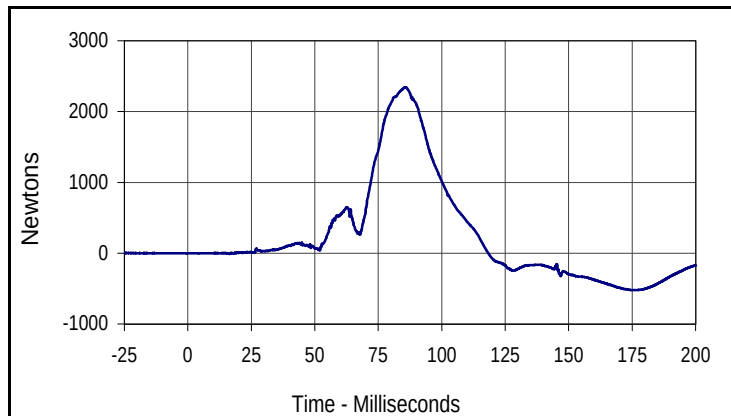
Curve Description			
Passenger (50th) NAAH Zarm-X			
CURNO	Type	SAE Class	Units
077	FIL	1000	G's
Max	Time	Min	Time
50.1	87.0	-135.0	60.8



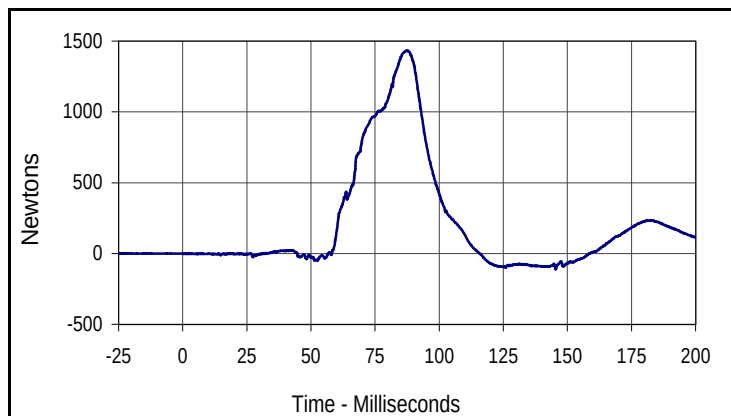
Curve Description			
Passenger (50th) NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
078	FIL	1000	G's
Max	Time	Min	Time
22.0	79.3	-77.5	58.7

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

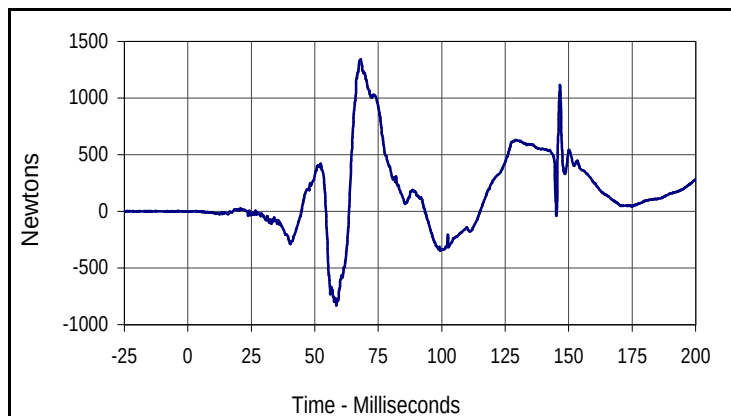
Test Date: 9/9/04
 NHTSA No.: R40401



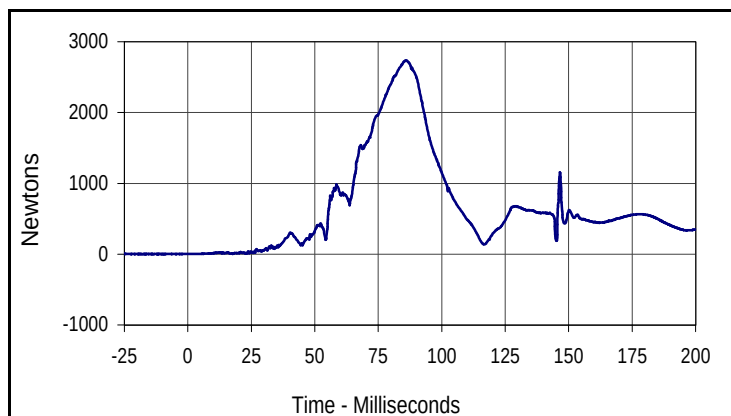
Curve Description			
Passenger (50th) Upper Neck Force X			
CURNO	Type	SAE Class	Units
079	FIL	1000	Newtons
Max	Time	Min	Time
2346.0	85.7	-522.8	175.0



Curve Description			
Passenger (50th) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
080	FIL	1000	Newtons
Max	Time	Min	Time
1434.8	87.3	-110.8	145.5



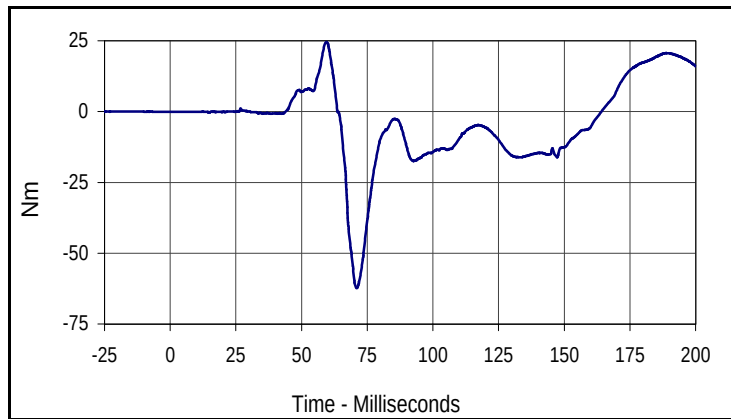
Curve Description			
Passenger (50th) Upper Neck Force Z			
CURNO	Type	SAE Class	Units
081	FIL	1000	Newtons
Max	Time	Min	Time
1342.5	68.0	-830.3	58.5



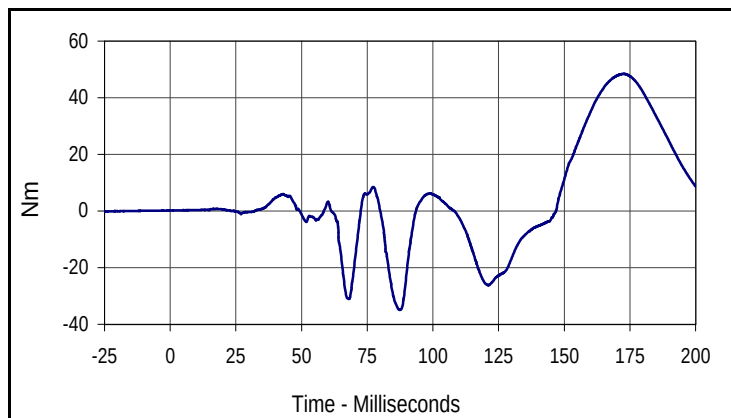
Curve Description			
Passenger (50th) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
079	RES	1000	Newtons
Max	Time	Min	Time
2739.0	86.0	2.2	6.1

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

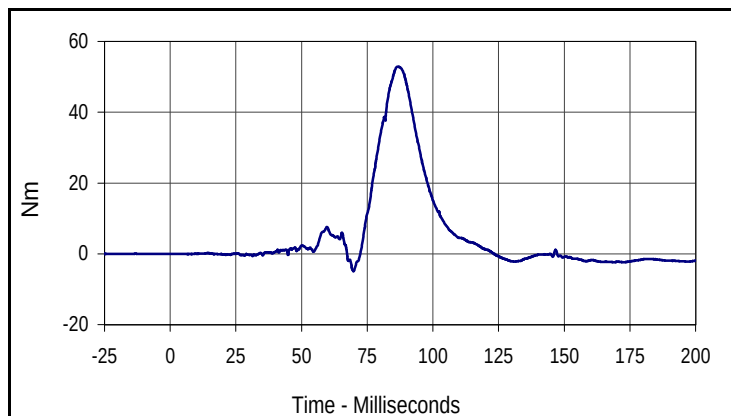
Test Date: 9/9/04
 NHTSA No.: R40401



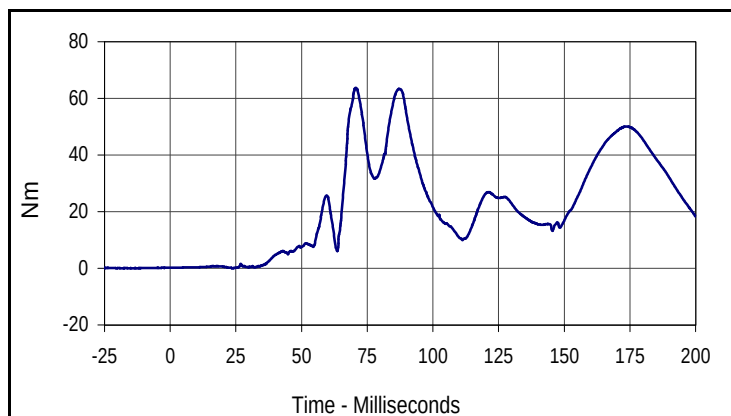
Curve Description			
Passenger (50th) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
082	FIL	600	Nm
Max	Time	Min	Time
24.5	59.5	-62.4	71.0



Curve Description			
Passenger (50th) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
083	FIL	600	Nm
Max	Time	Min	Time
48.4	172.7	-34.9	87.4



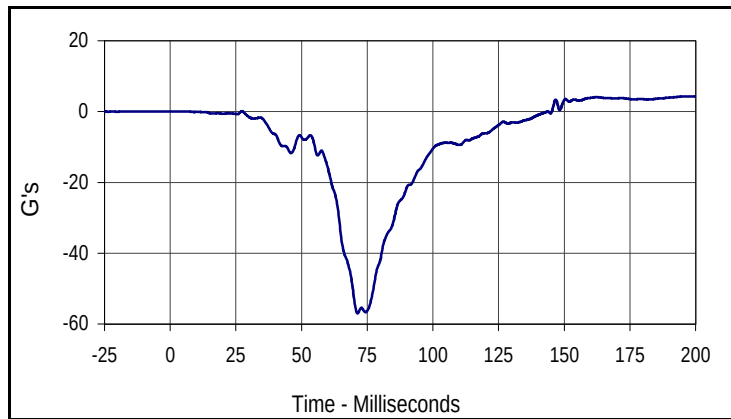
Curve Description			
Passenger (50th) Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
084	FIL	600	Nm
Max	Time	Min	Time
52.9	86.4	-4.9	69.8



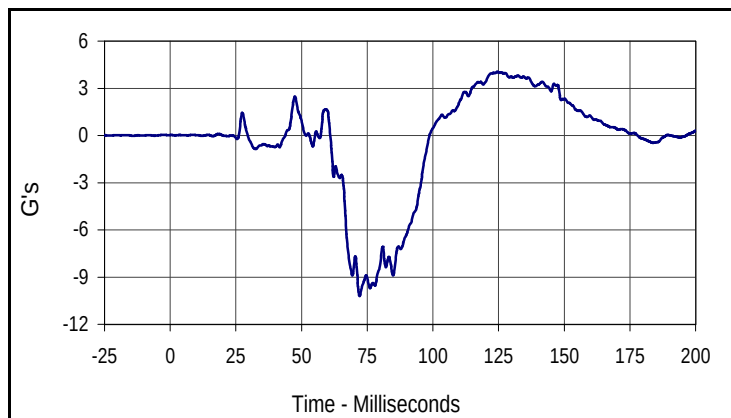
Curve Description			
Passenger (50th) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
082	RES	600	Nm
Max	Time	Min	Time
63.7	70.7	0.0	23.9

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

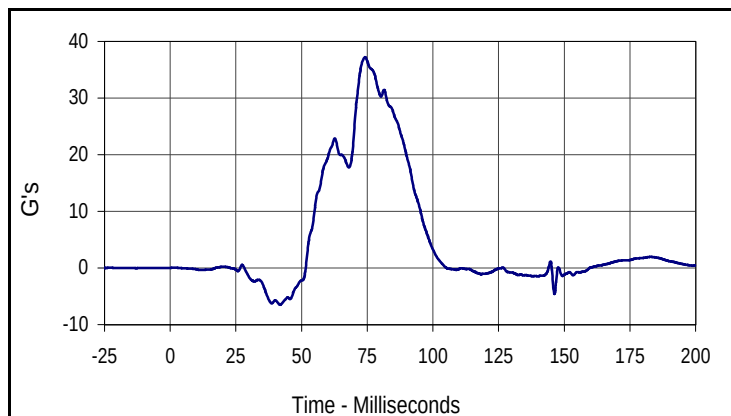
Test Date: 9/9/04
 NHTSA No.: R40401



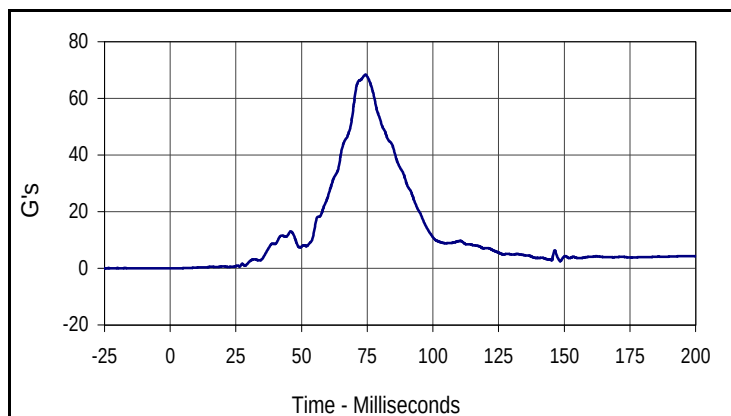
Curve Description			
Passenger (50th) Chest Primary X			
CURNO	Type	SAE Class	Units
085	FIL	180	G's
Max	Time	Min	Time
4.3	199.4	-57.0	71.3



Curve Description			
Passenger (50th) Chest Primary Y			
CURNO	Type	SAE Class	Units
086	FIL	180	G's
Max	Time	Min	Time
4.0	124.5	-10.2	72.1



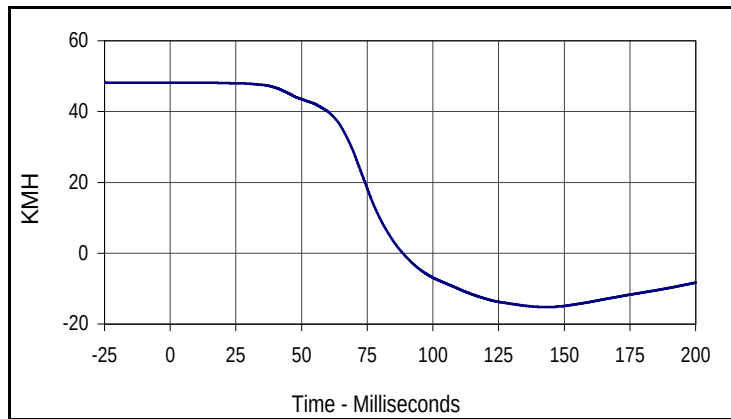
Curve Description			
Passenger (50th) Chest Primary Z			
CURNO	Type	SAE Class	Units
087	FIL	180	G's
Max	Time	Min	Time
37.2	74.2	-6.5	41.9



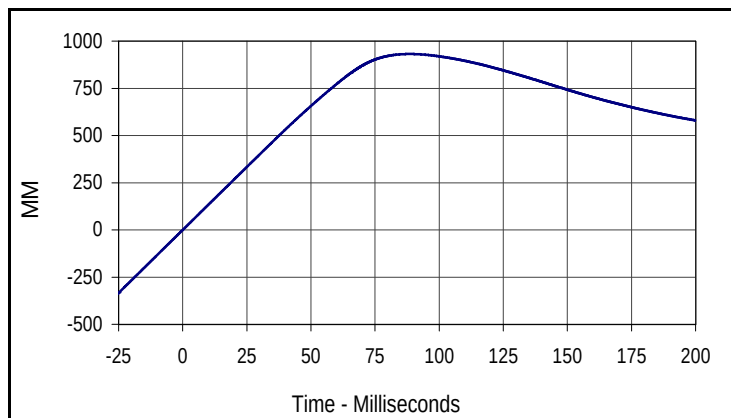
Curve Description			
Passenger (50th) Chest Resultant Primary			
CURNO	Type	SAE Class	Units
085	RES	180	G's
Max	Time	Min	Time
68.4	74.3	0.0	3.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



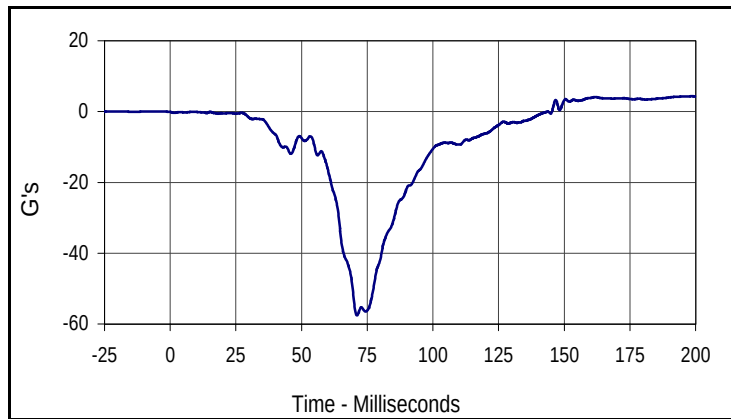
Curve Description			
Passenger (50th) Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
085	IN1	180	KMH
Max	Time	Min	Time
48.2	7.2	-15.2	145.3



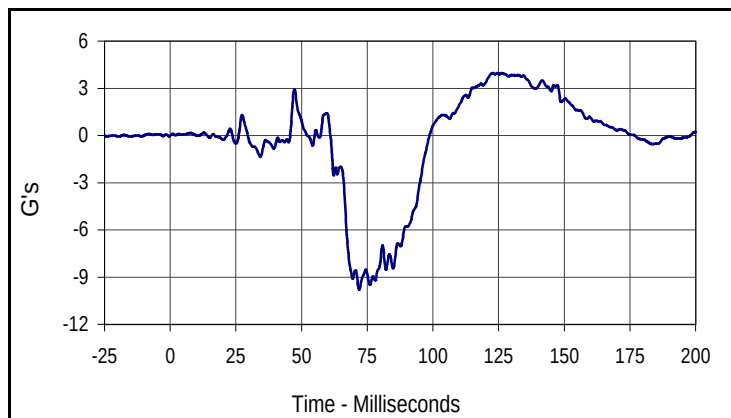
Curve Description			
Passenger (50th) Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
085	IN2	180	MM
Max	Time	Min	Time
931.7	88.5	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

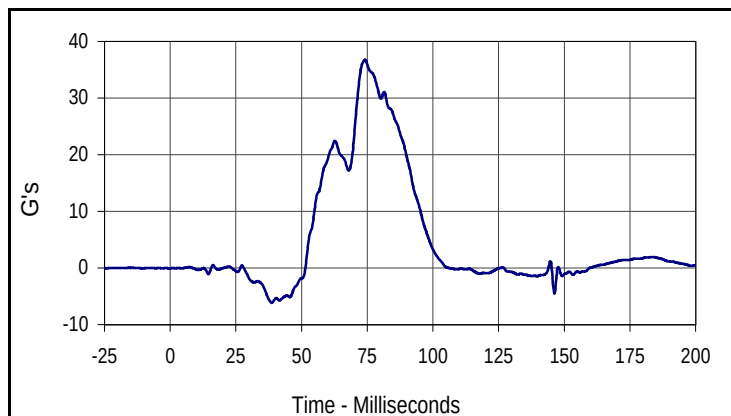
Test Date: 9/9/04
 NHTSA No.: R40401



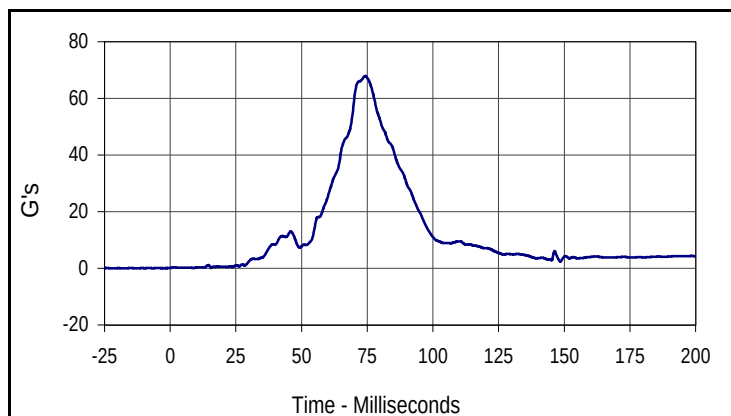
Curve Description			
Passenger (50th) Chest Redundant X			
CURNO	Type	SAE Class	Units
088	FIL	180	G's
Max	Time	Min	Time
4.3	198.5	-57.6	71.1



Curve Description			
Passenger (50th) Chest Redundant Y			
CURNO	Type	SAE Class	Units
089	FIL	180	G's
Max	Time	Min	Time
4.0	126.2	-9.8	71.9



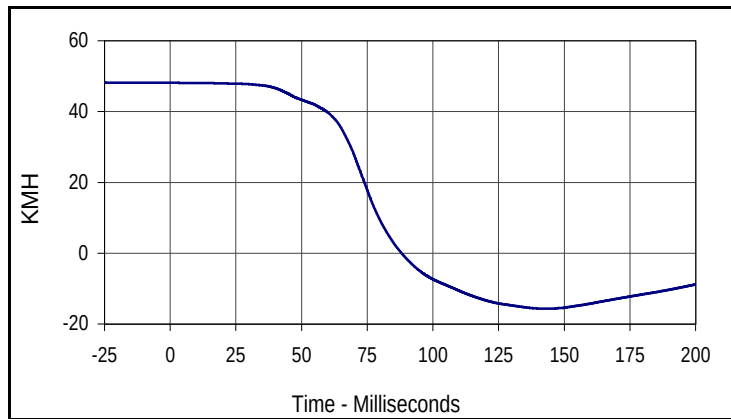
Curve Description			
Passenger (50th) Chest Redundant Z			
CURNO	Type	SAE Class	Units
090	FIL	180	G's
Max	Time	Min	Time
36.8	74.1	-6.1	38.7



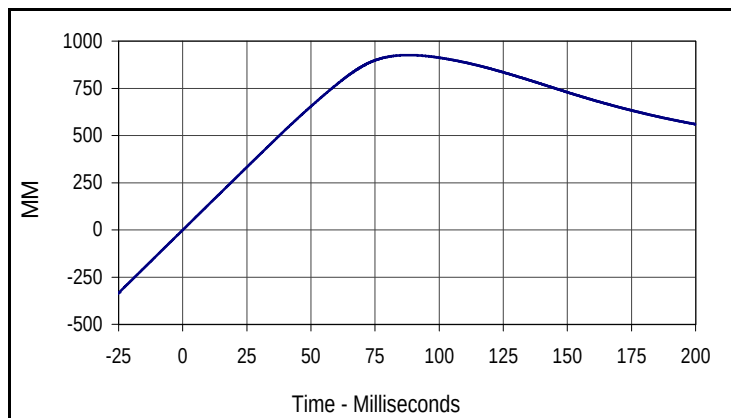
Curve Description			
Passenger (50th) Chest Resultant Redundant			
CURNO	Type	SAE Class	Units
088	RES	180	G's
Max	Time	Min	Time
67.9	74.2	0.1	8.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



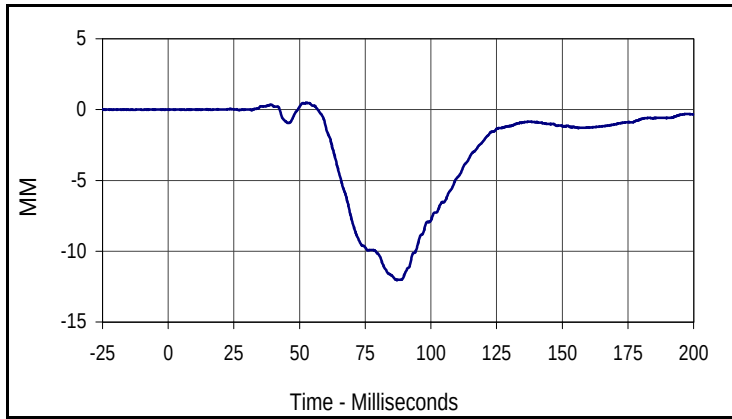
Curve Description			
Passenger (50th) Chest Redundant X Velocity			
CURNO	Type	SAE Class	Units
088	IN1	180	KMH
Max	Time	Min	Time
48.1	0.0	-15.7	145.3



Curve Description			
Passenger (50th) Chest Redundant X Displacement			
CURNO	Type	SAE Class	Units
088	IN2	180	MM
Max	Time	Min	Time
926.0	88.1	-0.3	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

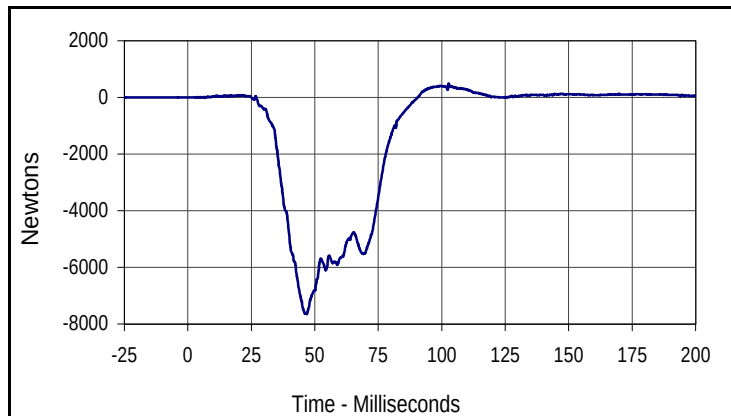
Test Date: 9/9/04
NHTSA No.: R40401



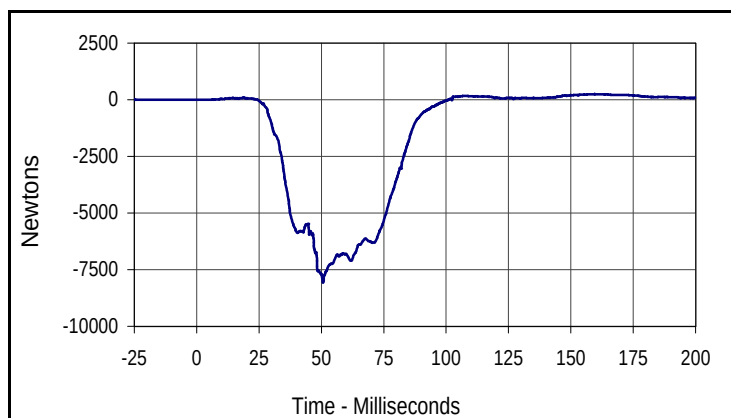
Curve Description			
Passenger (50th) Chest Deflection			
CURNO	Type	SAE Class	Units
091	FIL	600	MM
Max	Time	Min	Time
0.5	52.6	-12.0	87.1

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

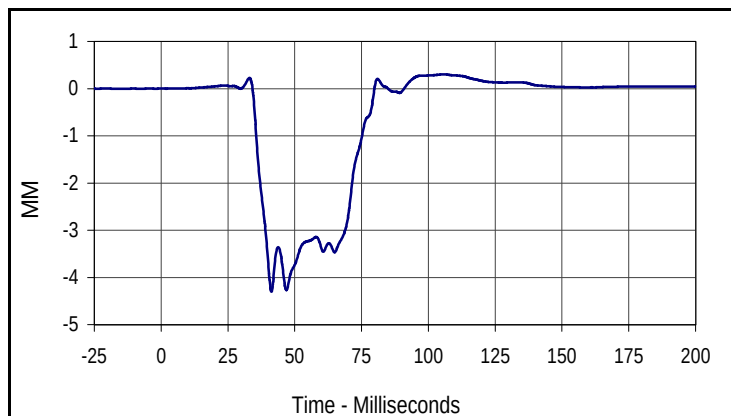
Test Date: 9/9/04
 NHTSA No.: R40401



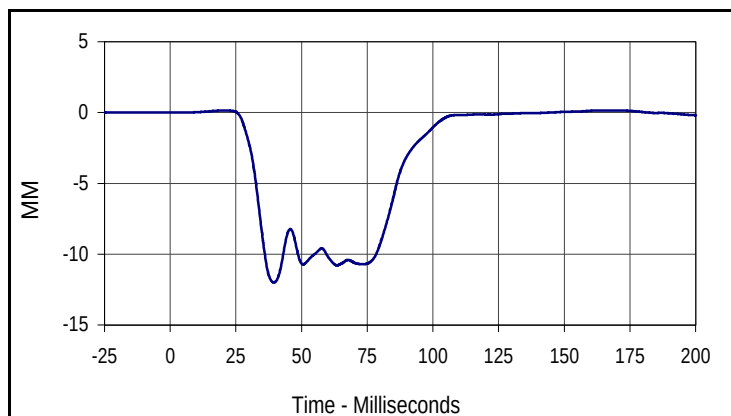
Curve Description			
Passenger (50th) Left Femur Force			
CURNO	Type	SAE Class	Units
092	FIL	600	Newtons
Max	Time	Min	Time
483.7	102.7	-7646.7	46.9



Curve Description			
Passenger (50th) Right Femur Force			
CURNO	Type	SAE Class	Units
093	FIL	600	Newtons
Max	Time	Min	Time
247.5	159.5	-8065.1	50.7



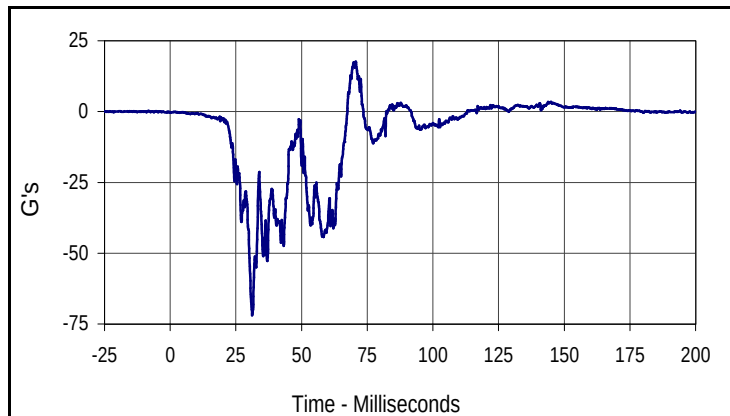
Curve Description			
Passenger (50th) Left Knee Displacement			
CURNO	Type	SAE Class	Units
094	FIL	180	MM
Max	Time	Min	Time
0.3	105.5	-4.3	41.3



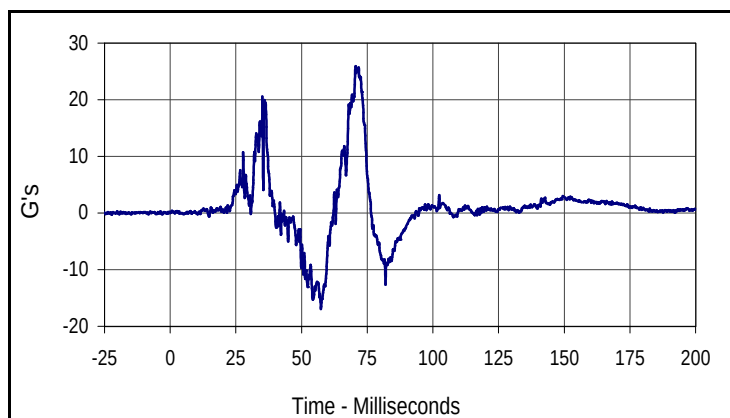
Curve Description			
Passenger (50th) Right Knee Displacement			
CURNO	Type	SAE Class	Units
095	FIL	180	MM
Max	Time	Min	Time
0.2	170.6	-12.0	39.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



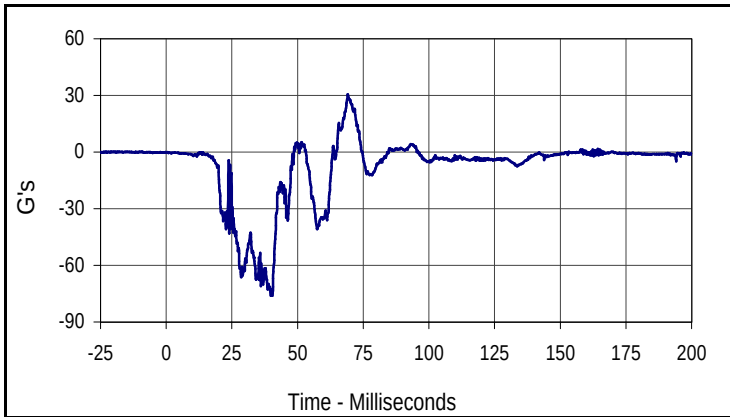
Curve Description			
Passenger (50th) Left Tibia X			
CURNO	Type	SAE Class	Units
096	FIL	1000	G's
Max	Time	Min	Time
17.6	70.6	-71.9	31.2



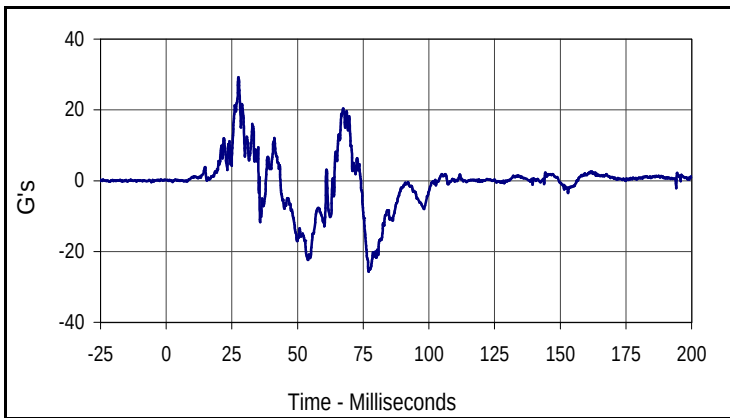
Curve Description			
Passenger (50th) Left Tibia Y			
CURNO	Type	SAE Class	Units
097	FIL	1000	G's
Max	Time	Min	Time
25.9	70.6	-16.9	57.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

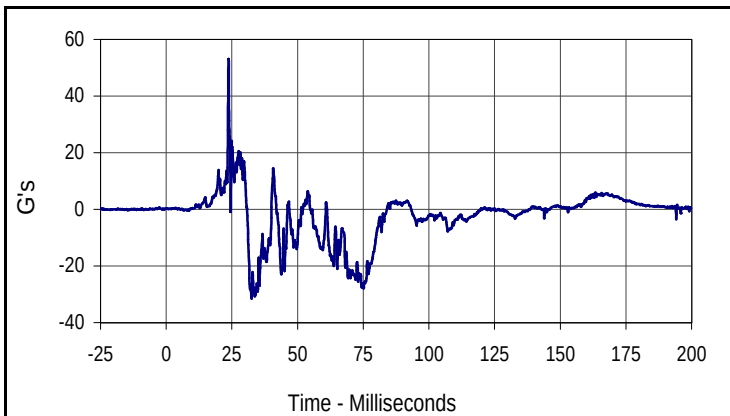
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) Left Foot X			
CURNO	Type	SAE Class	Units
098	FIL	1000	G's
Max	Time	Min	Time
30.6	69.1	-76.1	40.4



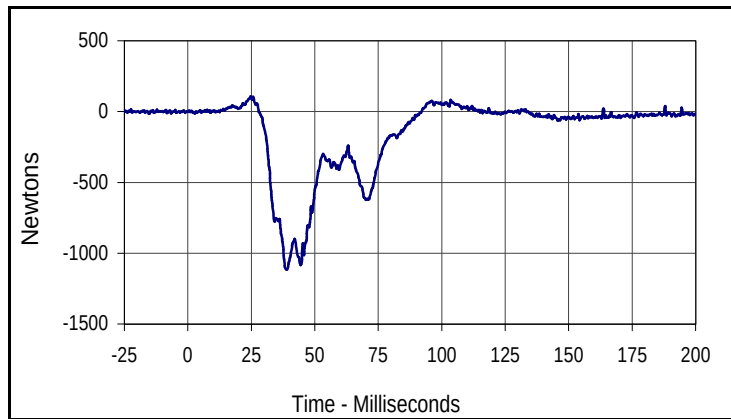
Curve Description			
Passenger (50th) Left Foot Y			
CURNO	Type	SAE Class	Units
099	FIL	1000	G's
Max	Time	Min	Time
29.2	27.5	-25.7	77.1



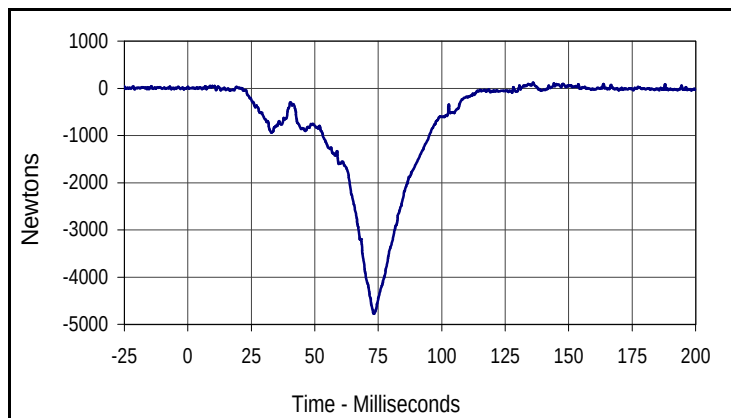
Curve Description			
Passenger (50th) Left Foot Z			
CURNO	Type	SAE Class	Units
100	FIL	1000	G's
Max	Time	Min	Time
53.0	23.7	-31.6	32.5

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

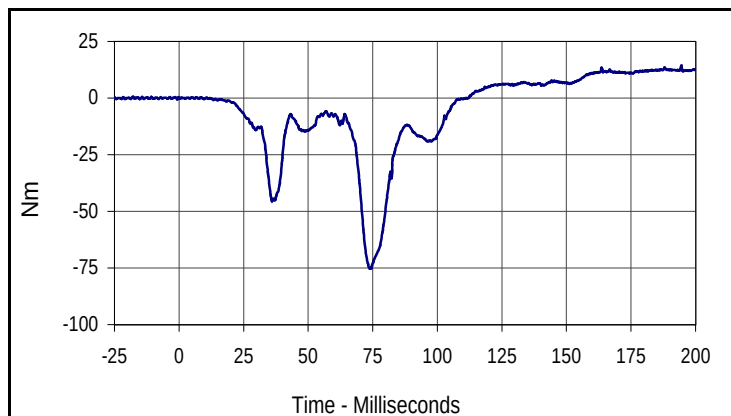
Test Date: 9/9/04
 NHTSA No.: R40401



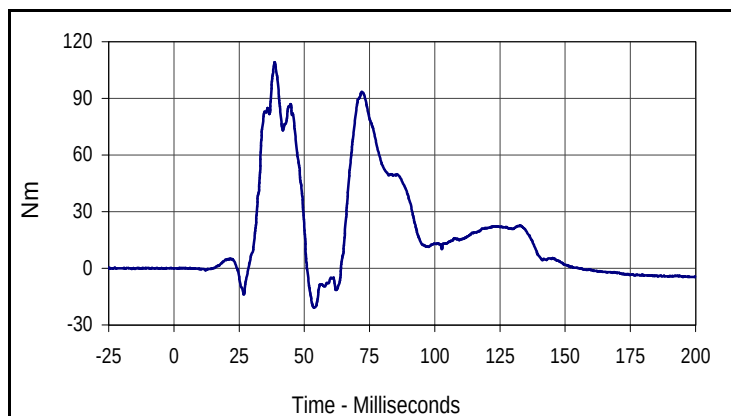
Curve Description			
Passenger (50th) Left Upper Tibia Force X			
CURNO	Type	SAE Class	Units
101	FIL	600	Newtons
Max	Time	Min	Time
106.3	24.8	-1116.9	39.0



Curve Description			
Passenger (50th) Left Upper Tibia Force Z			
CURNO	Type	SAE Class	Units
102	FIL	600	Newtons
Max	Time	Min	Time
120.2	136.0	-4775.1	73.3



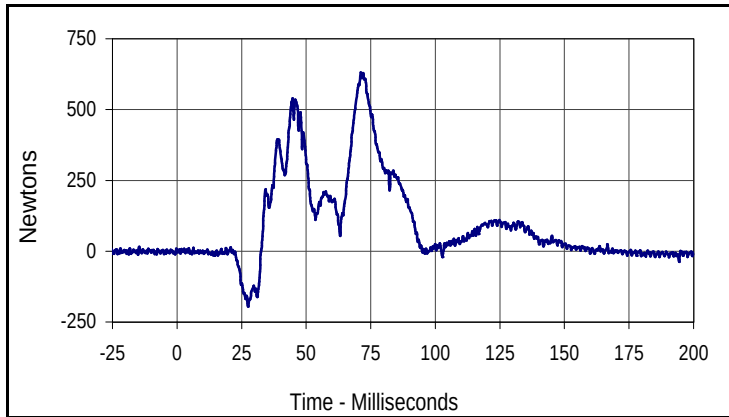
Curve Description			
Passenger (50th) Left Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
103	FIL	600	Nm
Max	Time	Min	Time
14.4	194.5	-75.3	74.0



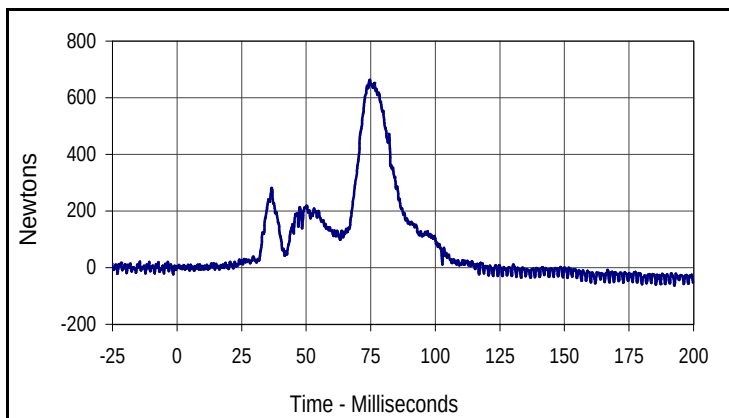
Curve Description			
Passenger (50th) Left Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
104	FIL	600	Nm
Max	Time	Min	Time
109.1	38.6	-20.8	53.6

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

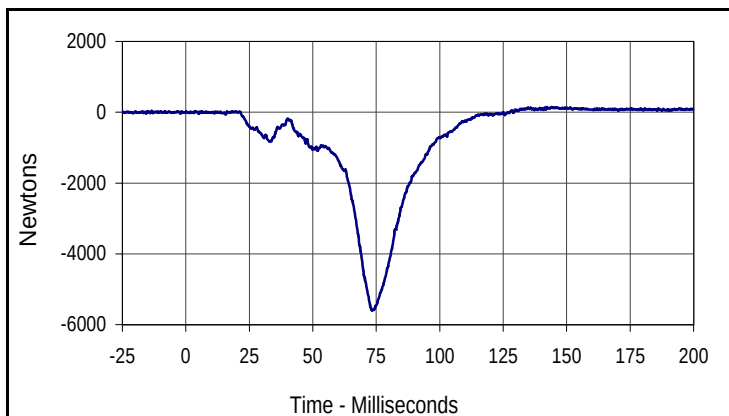
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) Left Lower Tibia Force X			
CURNO	Type	SAE Class	Units
105	FIL	600	Newtons
Max	Time	Min	Time
631.7	71.2	-195.6	27.5



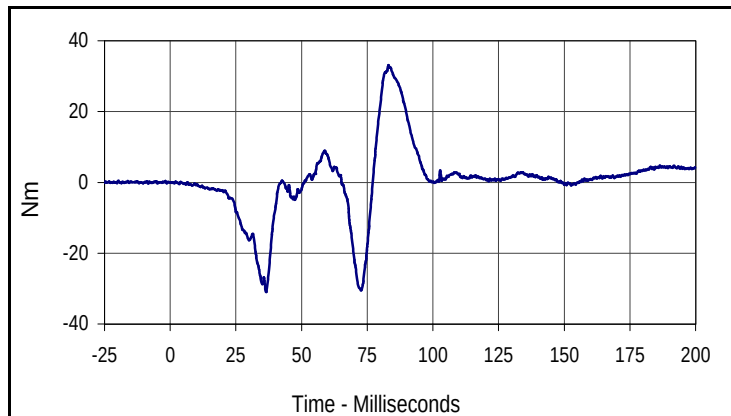
Curve Description			
Passenger (50th) Left Lower Tibia Force Y			
CURNO	Type	SAE Class	Units
106	FIL	600	Newtons
Max	Time	Min	Time
662.9	74.6	-62.7	192.6



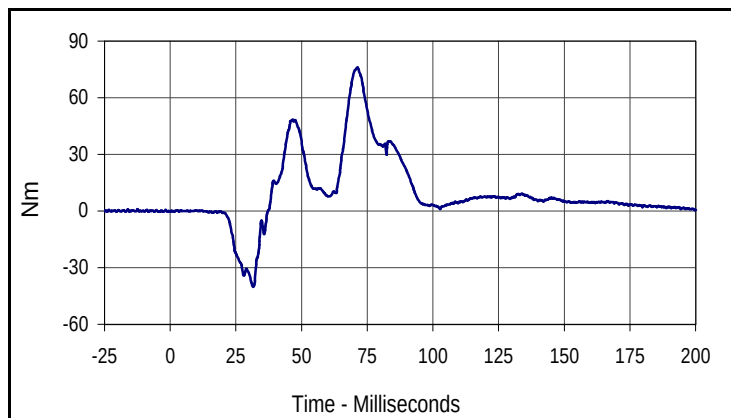
Curve Description			
Passenger (50th) Left Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
107	FIL	600	Newtons
Max	Time	Min	Time
147.7	142.3	-5600.1	73.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



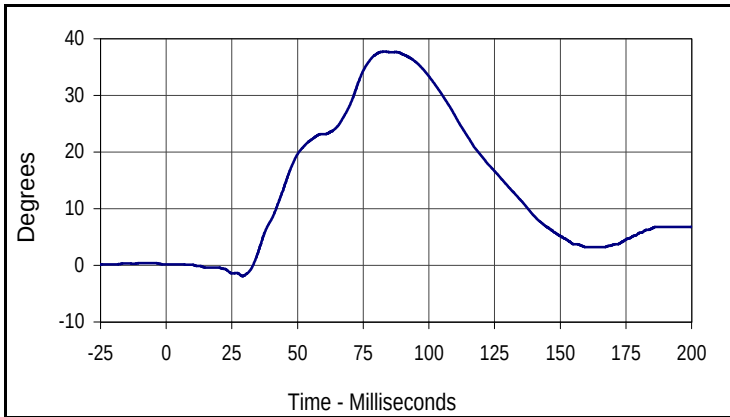
Curve Description			
Passenger (50th) Left Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
108	FIL	600	Nm
Max	Time	Min	Time
33.2	83.1	-31.0	36.5



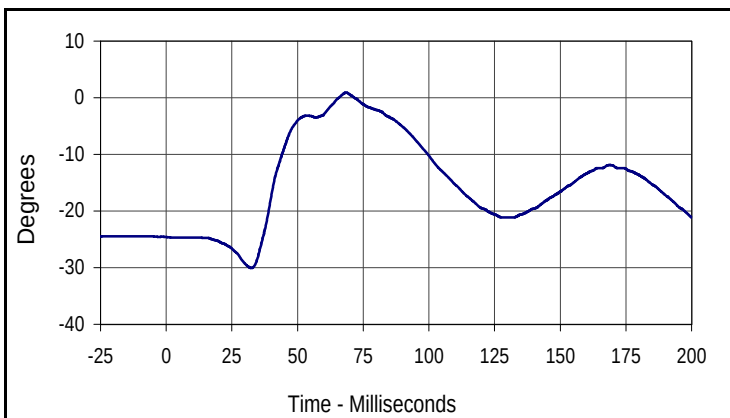
Curve Description			
Passenger (50th) Left Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
109	FIL	600	Nm
Max	Time	Min	Time
76.1	71.3	-40.2	31.6

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

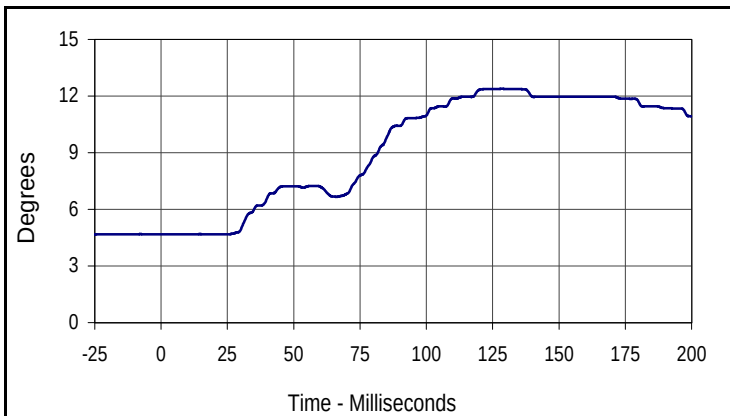
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) Left Ankle Rotation X			
CURNO	Type	SAE Class	Units
110	FIL	180	Degrees
Max	Time	Min	Time
37.8	83.2	-1.9	29.1



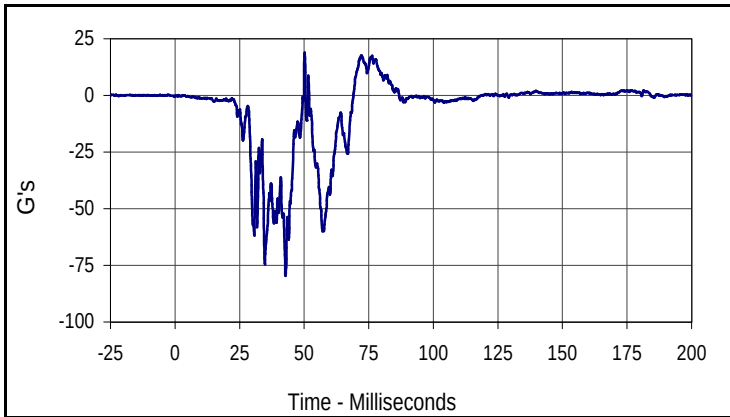
Curve Description			
Passenger (50th) Left Ankle Rotation Y			
CURNO	Type	SAE Class	Units
111	FIL	180	Degrees
Max	Time	Min	Time
0.9	68.5	-30.1	32.4



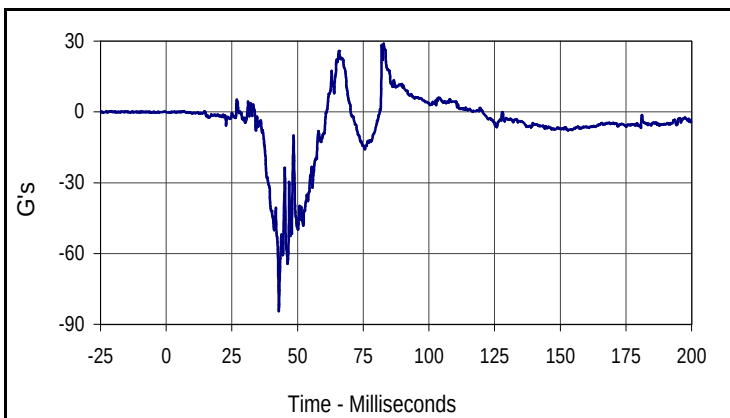
Curve Description			
Passenger (50th) Left Ankle Rotation Z			
CURNO	Type	SAE Class	Units
112	FIL	180	Degrees
Max	Time	Min	Time
12.4	128.5	4.7	0.4

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



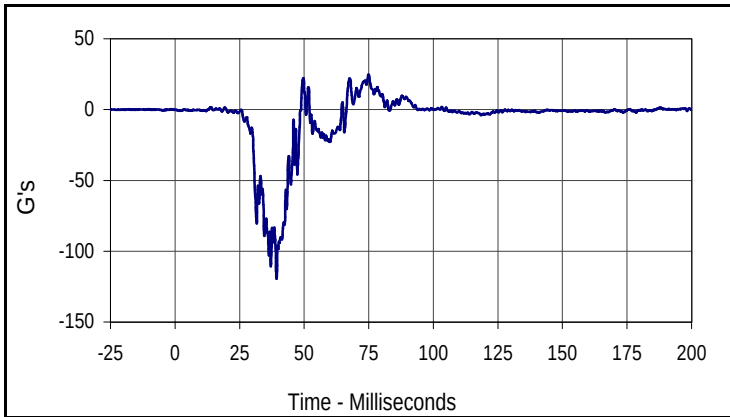
Curve Description			
Passenger (50th) Right Tibia X			
CURNO	Type	SAE Class	Units
113	FIL	1000	G's
Max	Time	Min	Time
19.0	50.2	-79.6	42.8



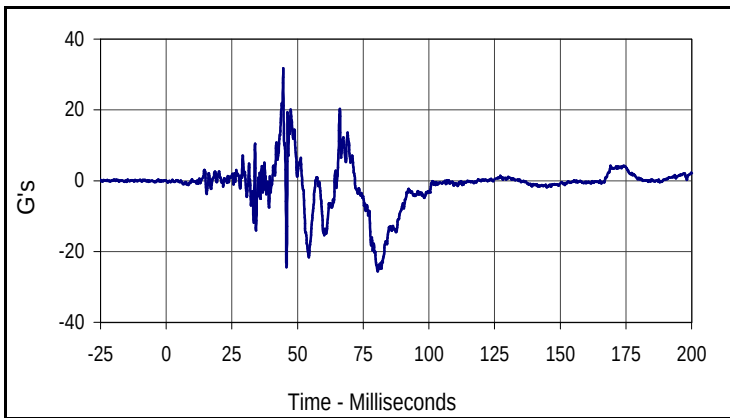
Curve Description			
Passenger (50th) Right Tibia Y			
CURNO	Type	SAE Class	Units
114	FIL	1000	G's
Max	Time	Min	Time
28.9	82.8	-84.4	42.9

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

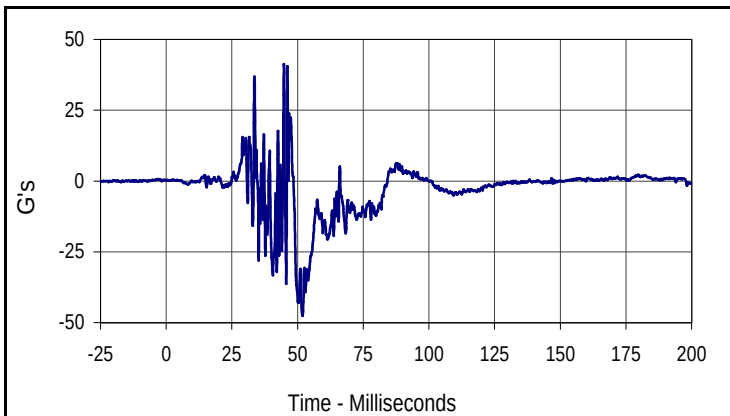
Test Date: 9/9/04
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Curve Description			
Passenger (50th) Right Foot X			
CURNO	Type	SAE Class	Units
115	FIL	1000	G's
Max	Time	Min	Time
24.8	75.0	-119.5	39.3



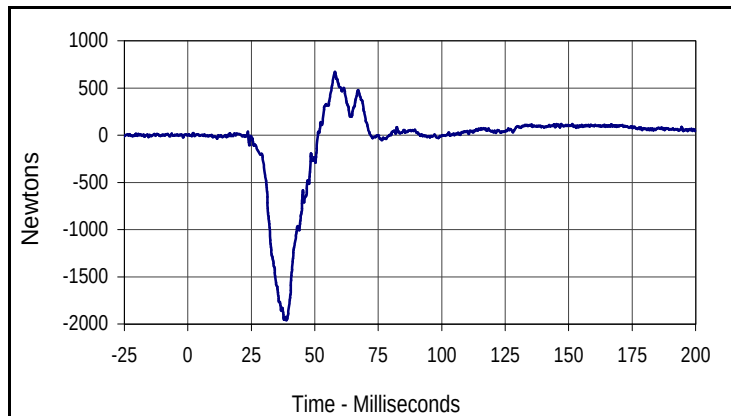
Curve Description			
Passenger (50th) Right Foot Y			
CURNO	Type	SAE Class	Units
116	FIL	1000	G's
Max	Time	Min	Time
31.8	44.5	-25.6	80.5



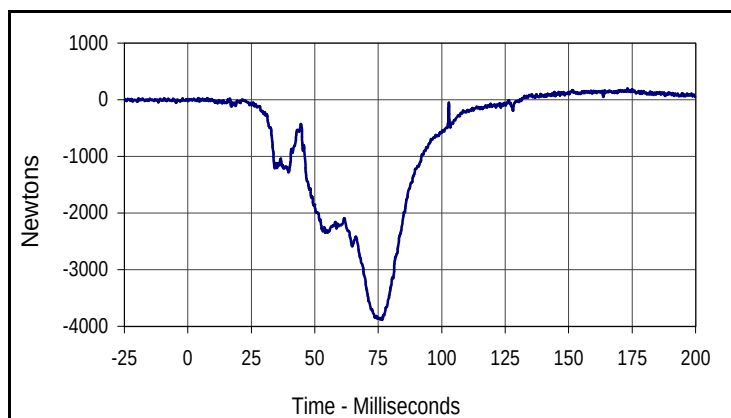
Curve Description			
Passenger (50th) Right Foot Z			
CURNO	Type	SAE Class	Units
117	FIL	1000	G's
Max	Time	Min	Time
41.2	44.8	-47.6	51.9

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

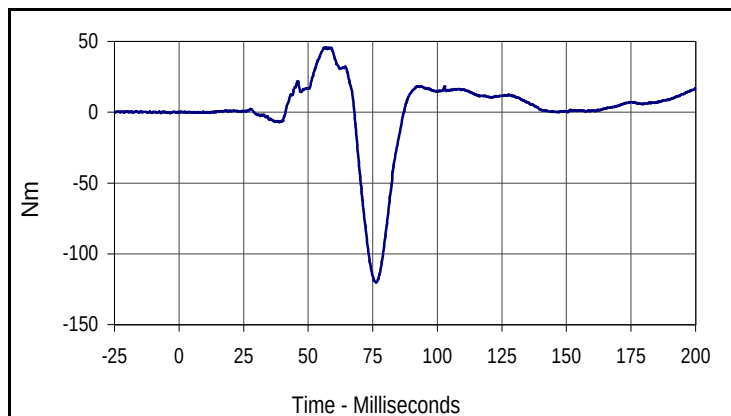
Test Date: 9/9/04
 NHTSA No.: R40401



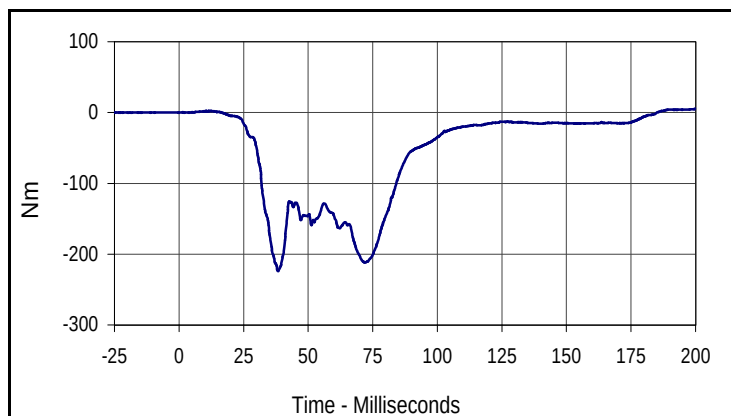
Curve Description			
Passenger (50th) Right Upper Tibia Force X			
CURNO	Type	SAE Class	Units
118	FIL	600	Newtons
Max	Time	Min	Time
671.8	58.0	-1963.5	38.8



Curve Description			
Passenger (50th) Right Upper Tibia Force Z			
CURNO	Type	SAE Class	Units
119	FIL	600	Newtons
Max	Time	Min	Time
200.5	173.2	-3886.1	76.5



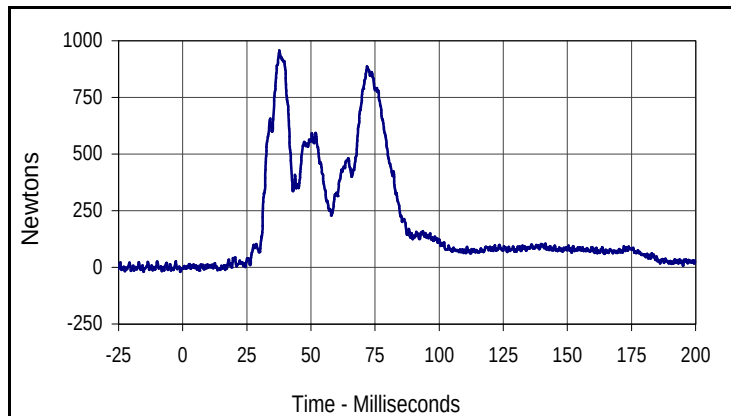
Curve Description			
Passenger (50th) Right Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
120	FIL	600	Nm
Max	Time	Min	Time
45.9	56.9	-120.2	76.4



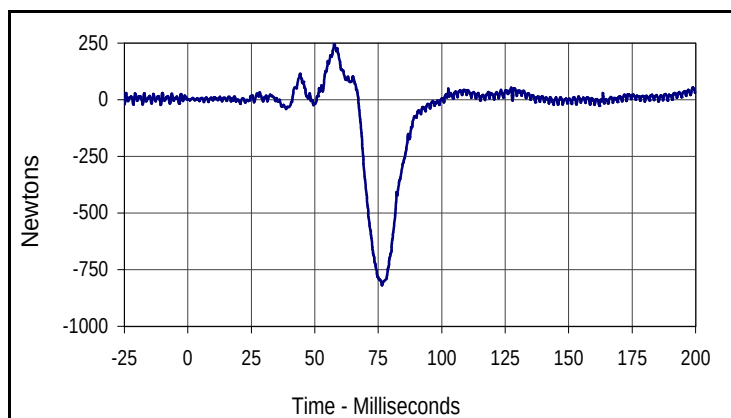
Curve Description			
Passenger (50th) Right Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
121	FIL	600	Nm
Max	Time	Min	Time
5.1	199.9	-224.2	38.3

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

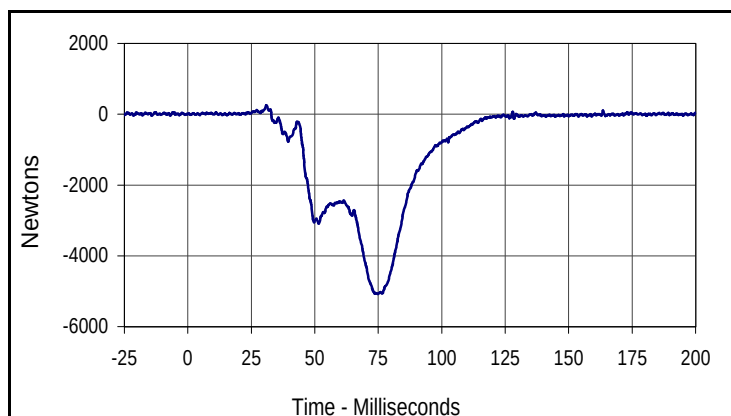
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) Right Lower Tibia Force X			
CURNO	Type	SAE Class	Units
122	FIL	600	Newtons
Max	Time	Min	Time
957.2	37.7	-13.5	6.5



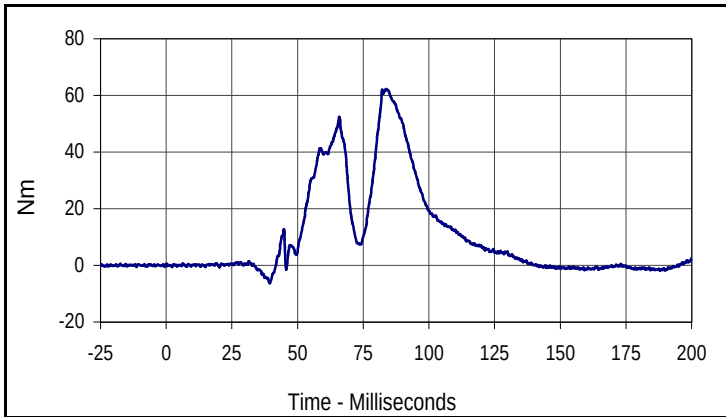
Curve Description			
Passenger (50th) Right Lower Tibia Force Y			
CURNO	Type	SAE Class	Units
123	FIL	600	Newtons
Max	Time	Min	Time
248.1	57.7	-818.9	76.5



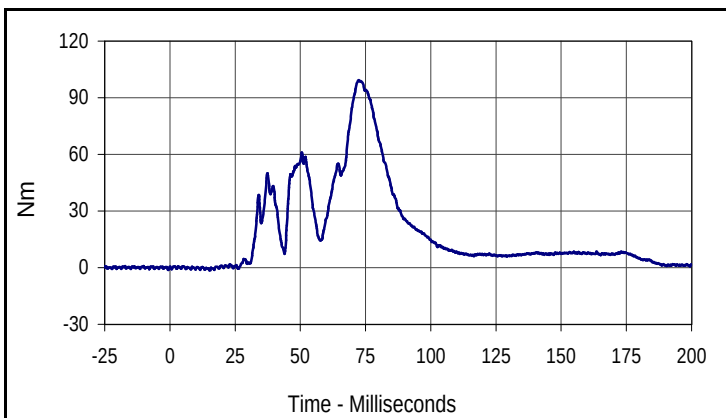
Curve Description			
Passenger (50th) Right Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
124	FIL	600	Newtons
Max	Time	Min	Time
251.3	30.9	-5074.1	74.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



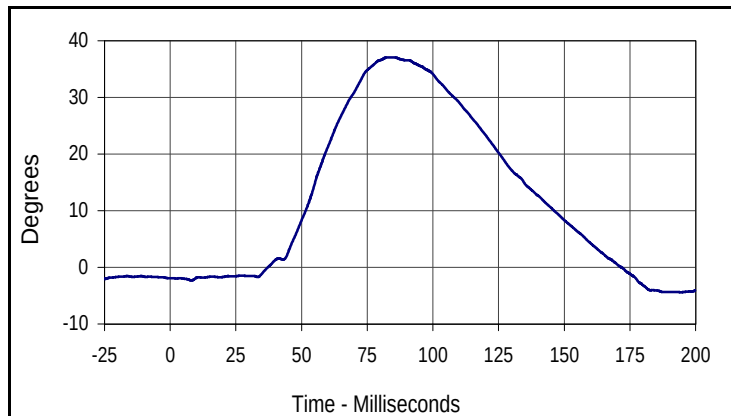
Curve Description			
Passenger (50th) Right Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
125	FIL	600	Nm
Max	Time	Min	Time
62.3	83.7	-6.3	39.4



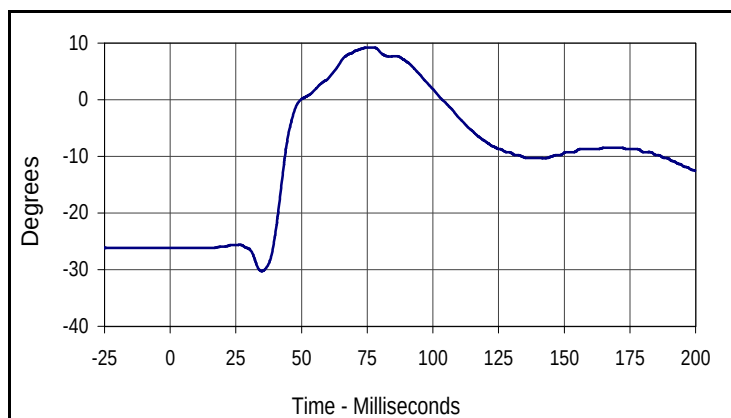
Curve Description			
Passenger (50th) Right Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
126	FIL	600	Nm
Max	Time	Min	Time
99.4	72.4	-1.4	15.2

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

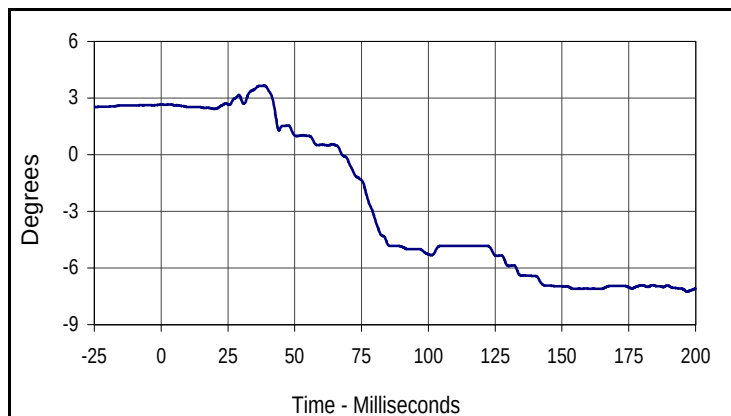
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Passenger (50th) Right Ankle Rotation X			
CURNO	Type	SAE Class	Units
127	FIL	180	Degrees
Max	Time	Min	Time
37.1	82.7	-4.4	194.5



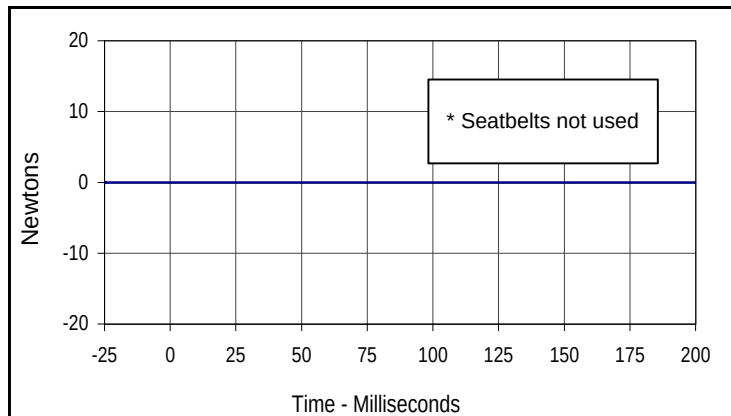
Curve Description			
Passenger (50th) Right Ankle Rotation Y			
CURNO	Type	SAE Class	Units
128	FIL	180	Degrees
Max	Time	Min	Time
9.2	77.1	-30.3	34.9



Curve Description			
Passenger (50th) Right Ankle Rotation Z			
CURNO	Type	SAE Class	Units
129	FIL	180	Degrees
Max	Time	Min	Time
3.7	38.4	-7.3	196.9

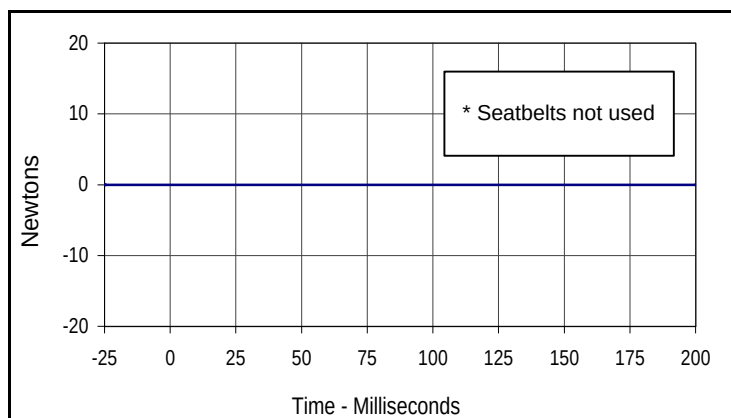
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



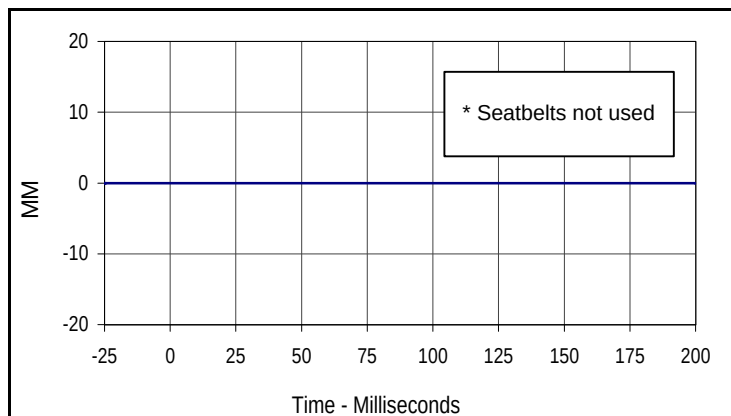
Curve Description			
Passenger (50th) Lap Belt Force			
CURNO	Type	SAE Class	Units
130	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Seatbelts not used



Curve Description			
Passenger (50th) Shoulder Belt Force			
CURNO	Type	SAE Class	Units
131	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Seatbelts not used

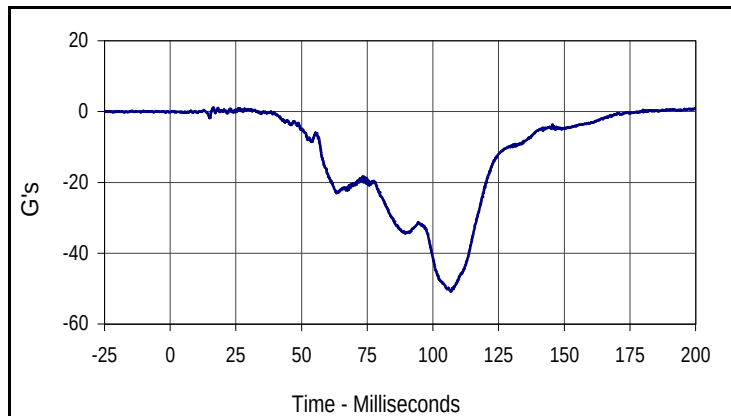


Curve Description			
Passenger (50th) Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
132	FIL	60	MM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

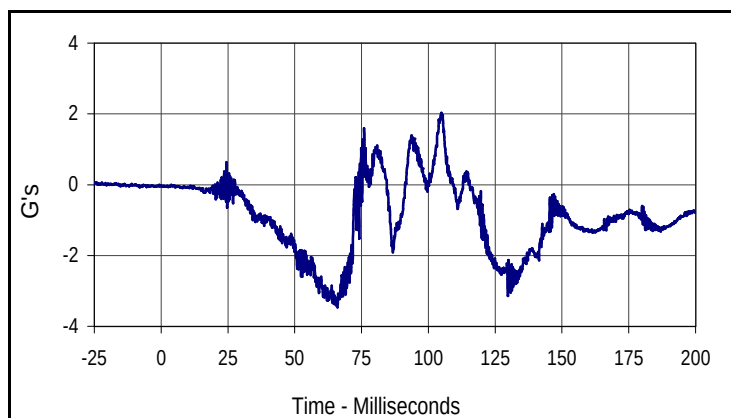
* Seatbelts not used

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

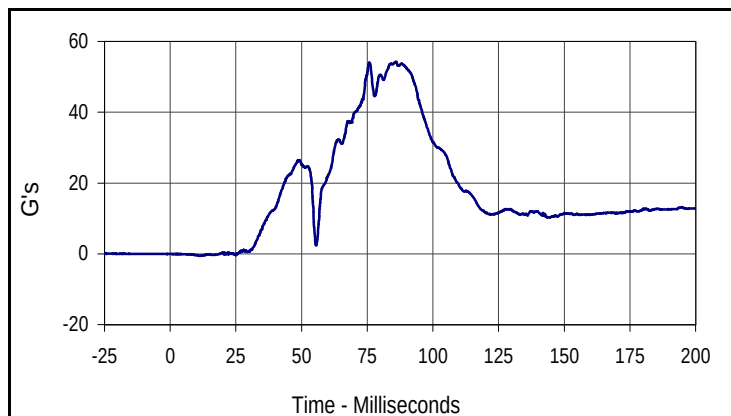
Test Date: 9/9/04
 NHTSA No.: R40401



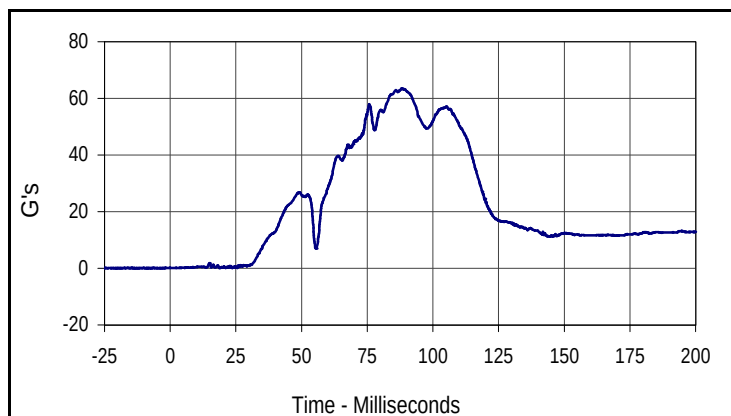
Curve Description			
Center Rear Pass. (50th) Head Primary X			
CURNO	Type	SAE Class	Units
133	FIL	1000	G's
Max	Time	Min	Time
1.1	16.4	-50.8	106.7



Curve Description			
Center Rear Pass. (50th) Head Primary Y			
CURNO	Type	SAE Class	Units
134	FIL	1000	G's
Max	Time	Min	Time
2.0	104.9	-3.5	66.0



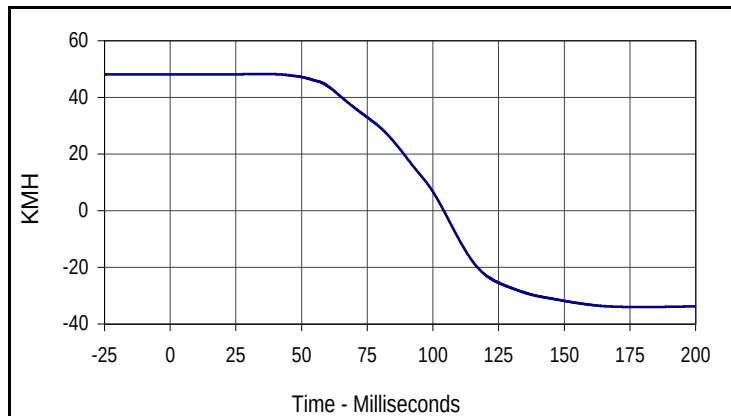
Curve Description			
Center Rear Pass. (50th) Head Primary Z			
CURNO	Type	SAE Class	Units
135	FIL	1000	G's
Max	Time	Min	Time
54.2	85.8	-0.6	11.5



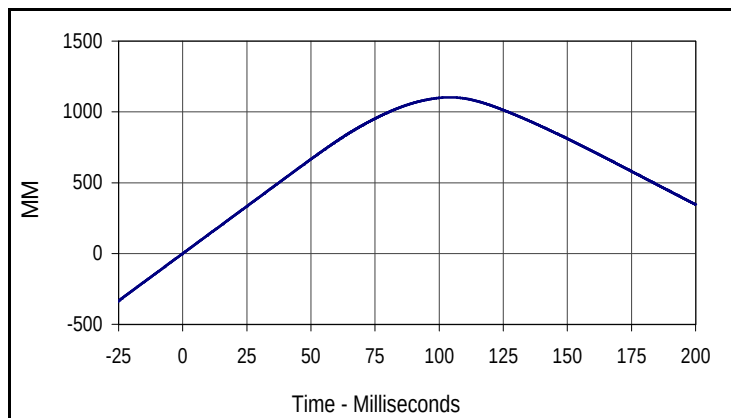
Curve Description			
Center Rear Pass. (50th) Head Resultant Primary			
CURNO	Type	SAE Class	Units
133	RES	1000	G's
Max	Time	Min	Time
63.5	88.5	0.1	3.1

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



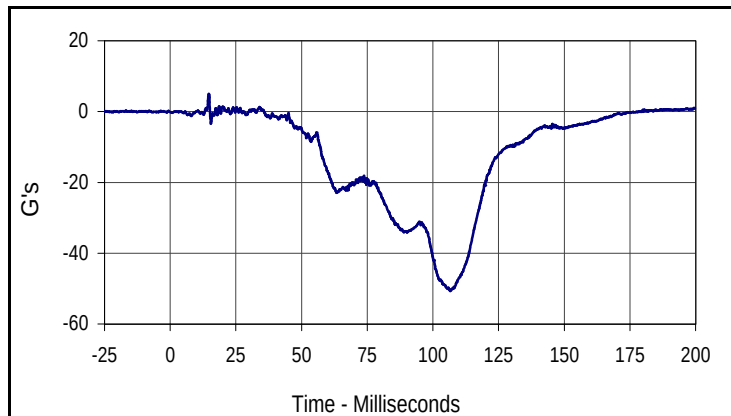
Curve Description			
Center Rear Pass. (50th) Head Primary X Velocity			
CURNO	Type	SAE Class	Units
133	IN1	180	KMH
Max	Time	Min	Time
48.3	33.1	-34.0	179.2



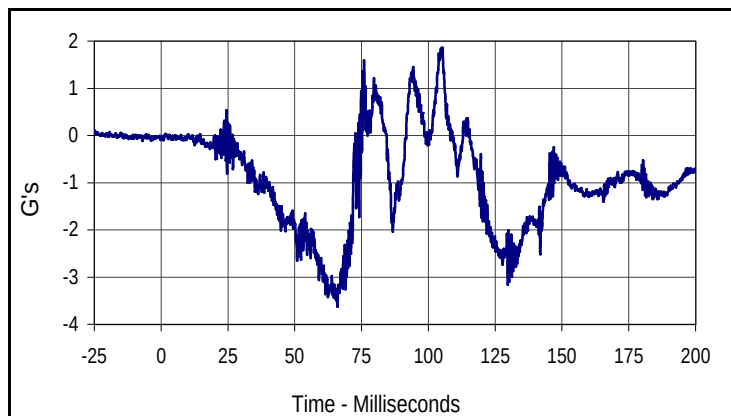
Curve Description			
Center Rear Pass. (50th) Head Primary X Displacement			
CURNO	Type	SAE Class	Units
133	IN2	180	MM
Max	Time	Min	Time
1103.0	104.1	-0.1	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

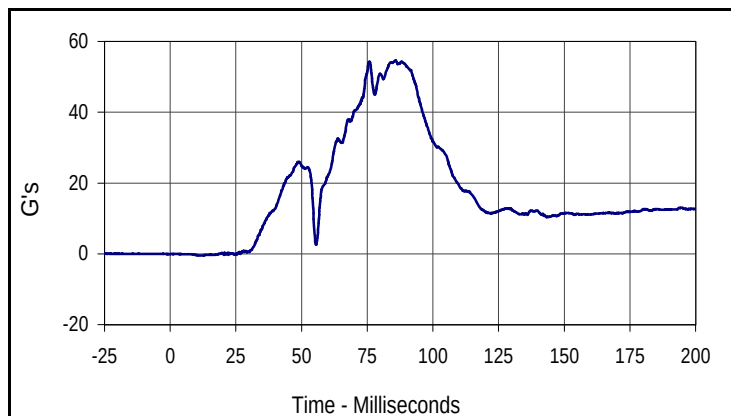
Test Date: 9/9/04
 NHTSA No.: R40401



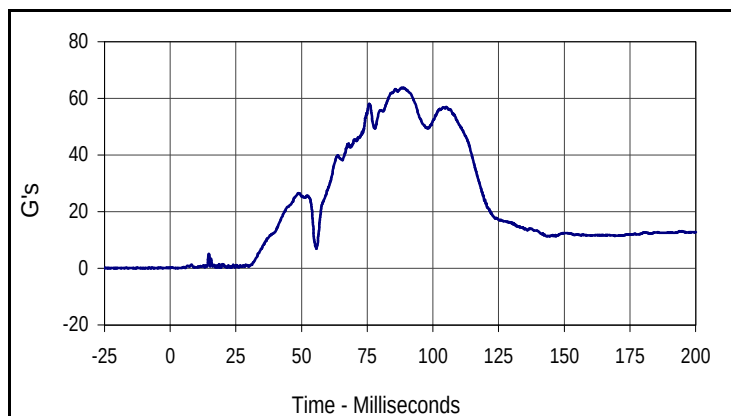
Curve Description			
Center Rear Pass. (50th) NAAH CG X			
CURNO	Type	SAE Class	Units
136	FIL	1000	G's
Max	Time	Min	Time
5.0	14.7	-50.6	106.6



Curve Description			
Center Rear Pass. (50th) NAAH CG Y			
CURNO	Type	SAE Class	Units
137	FIL	1000	G's
Max	Time	Min	Time
1.9	105.3	-3.6	66.0



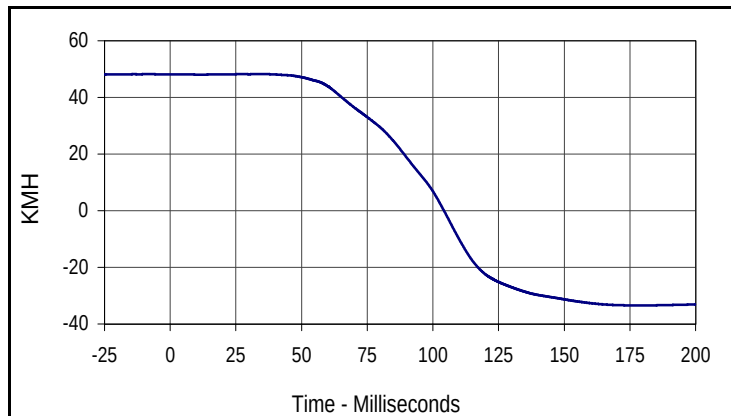
Curve Description			
Center Rear Pass. (50th) NAAH CG Z			
CURNO	Type	SAE Class	Units
138	FIL	1000	G's
Max	Time	Min	Time
54.7	85.8	-0.5	11.9



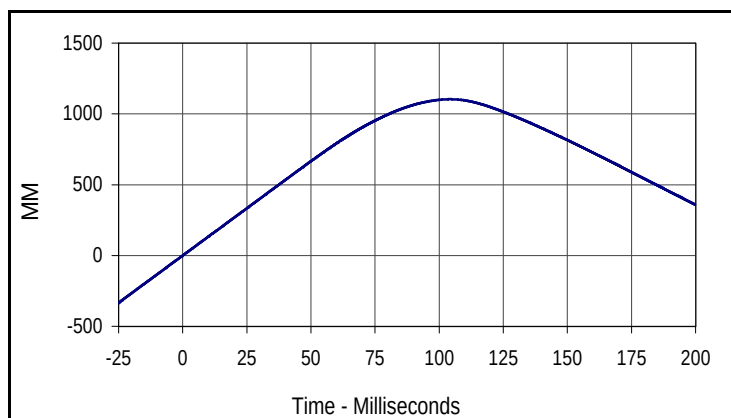
Curve Description			
Center Rear Pass. (50th) NAAH CG Resultant			
CURNO	Type	SAE Class	Units
136	RES	1000	G's
Max	Time	Min	Time
63.7	88.9	0.0	2.1

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



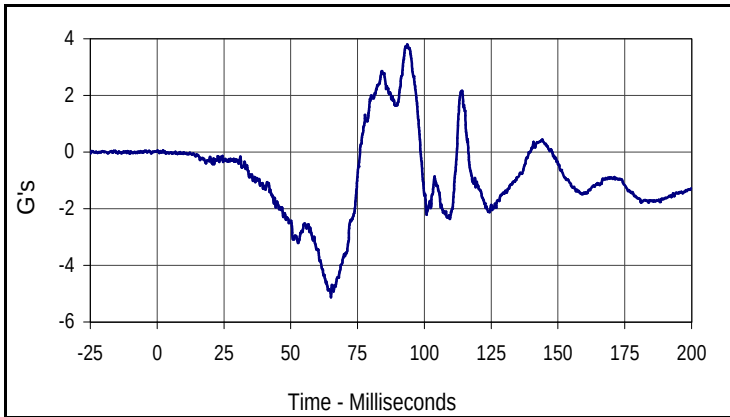
Curve Description			
Center Rear Pass. (50th) NAAH CG X Velocity			
CURNO	Type	SAE Class	Units
136	IN1	180	KMH
Max	Time	Min	Time
48.3	35.6	-33.4	179.1



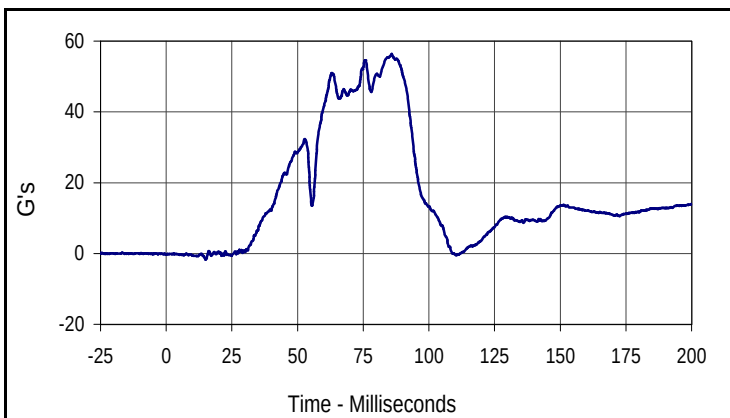
Curve Description			
Center Rear Pass. (50th) NAAH CG X Displacement			
CURNO	Type	SAE Class	Units
136	IN2	180	MM
Max	Time	Min	Time
1103.5	104.2	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

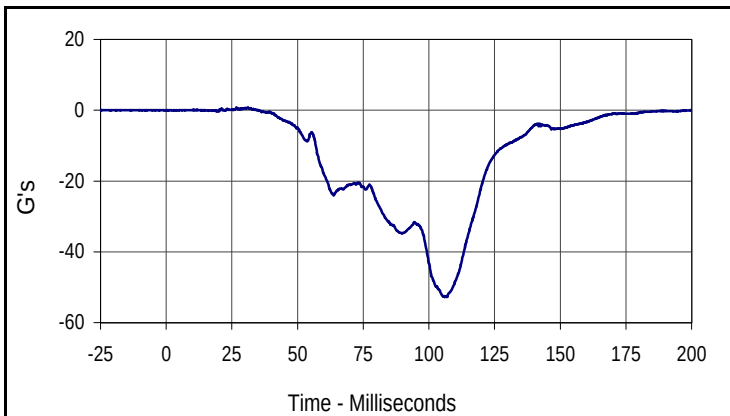
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Center Rear Pass. (50th) NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
139	FIL	1000	G's
Max	Time	Min	Time
3.8	93.7	-5.1	65.1



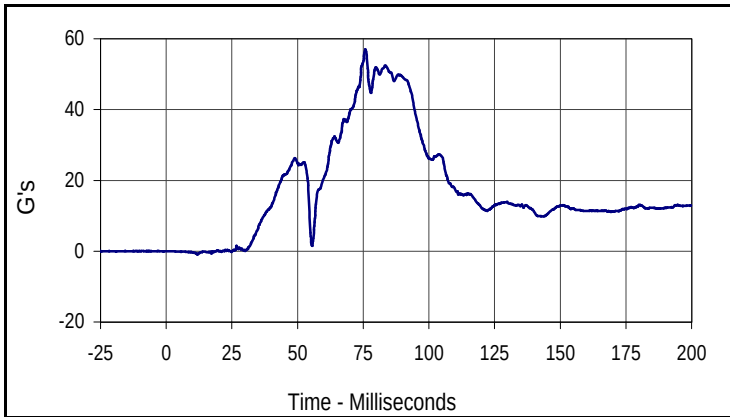
Curve Description			
Center Rear Pass. (50th) NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
140	FIL	1000	G's
Max	Time	Min	Time
56.4	85.8	-1.7	15.0



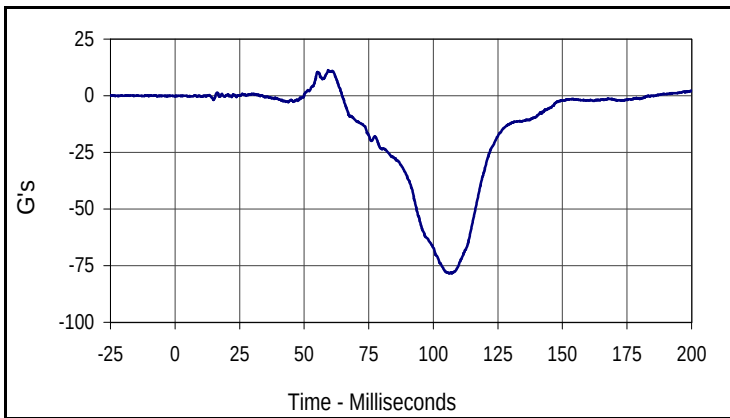
Curve Description			
Center Rear Pass. (50th) NAAH Yarm-X			
CURNO	Type	SAE Class	Units
141	FIL	1000	G's
Max	Time	Min	Time
0.8	26.7	-52.8	106.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

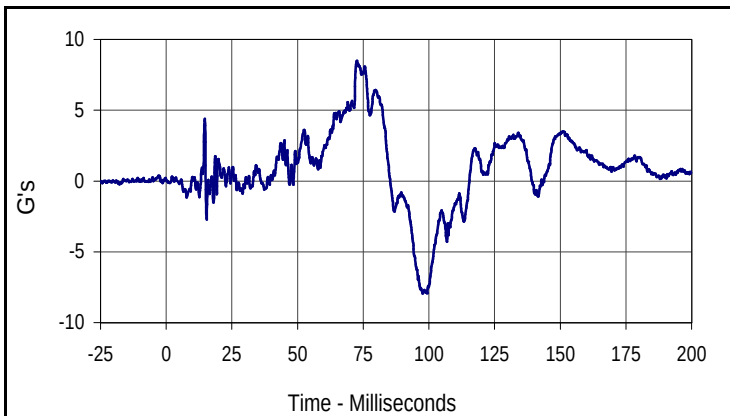
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Center Rear Pass. (50th) NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
142	FIL	1000	G's
Max	Time	Min	Time
57.0	75.8	-1.0	11.9



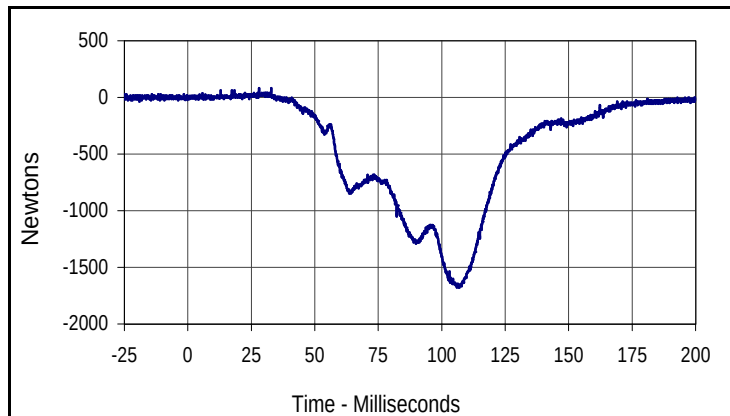
Curve Description			
Center Rear Pass. (50th) NAAH Zarm-X			
CURNO	Type	SAE Class	Units
143	FIL	1000	G's
Max	Time	Min	Time
11.2	59.3	-78.4	106.1



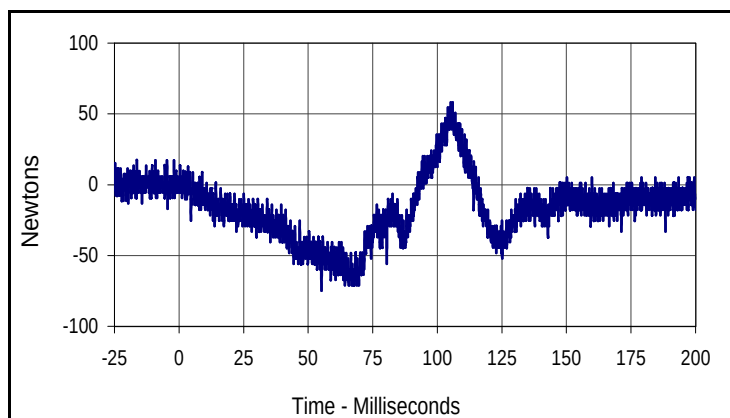
Curve Description			
Center Rear Pass. (50th) NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
144	FIL	1000	G's
Max	Time	Min	Time
8.5	72.6	-7.9	97.7

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

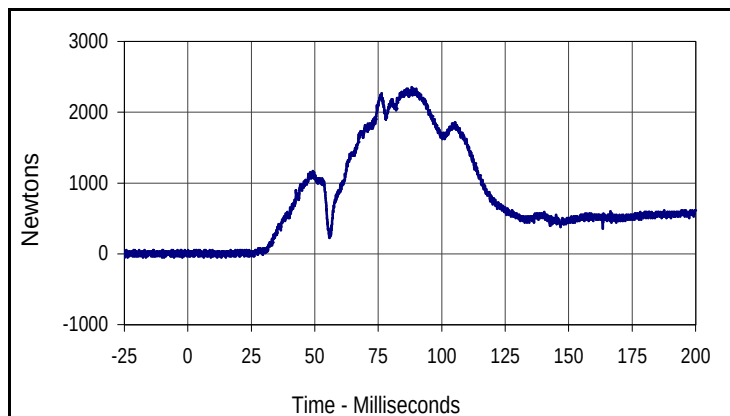
Test Date: 9/9/04
 NHTSA No.: R40401



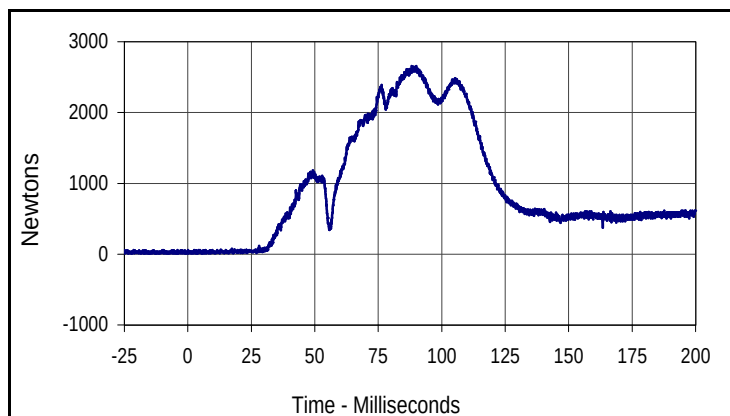
Curve Description			
Center Rear Pass. (50th) Upper Neck Force X			
CURNO	Type	SAE Class	Units
145	FIL	1000	Newtons
Max	Time	Min	Time
82.7	28.1	-1678.5	106.0



Curve Description			
Center Rear Pass. (50th) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
146	FIL	1000	Newtons
Max	Time	Min	Time
58.3	105.2	-74.9	55.2



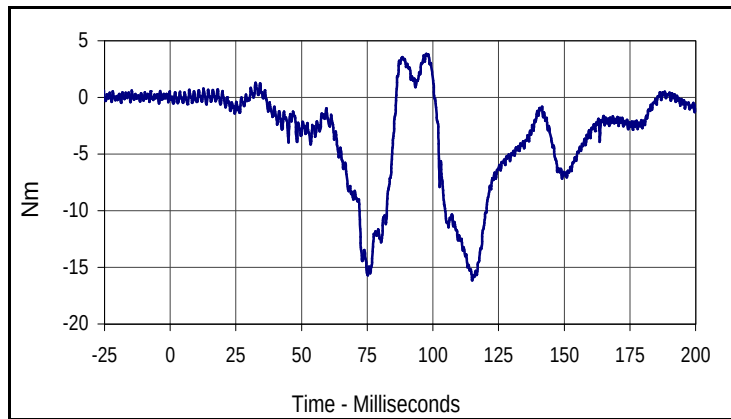
Curve Description			
Center Rear Pass. (50th) Upper Neck Force Z			
CURNO	Type	SAE Class	Units
147	FIL	1000	Newtons
Max	Time	Min	Time
2352.1	88.2	-52.9	6.2



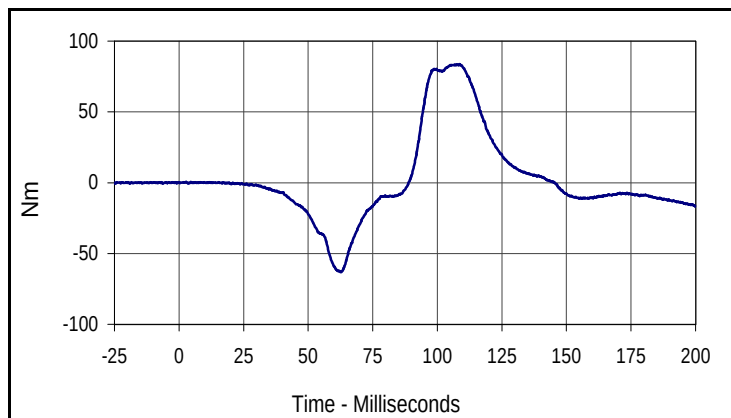
Curve Description			
Center Rear Pass. (50th) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
145	RES	1000	Newtons
Max	Time	Min	Time
2658.4	89.9	10.4	12.5

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

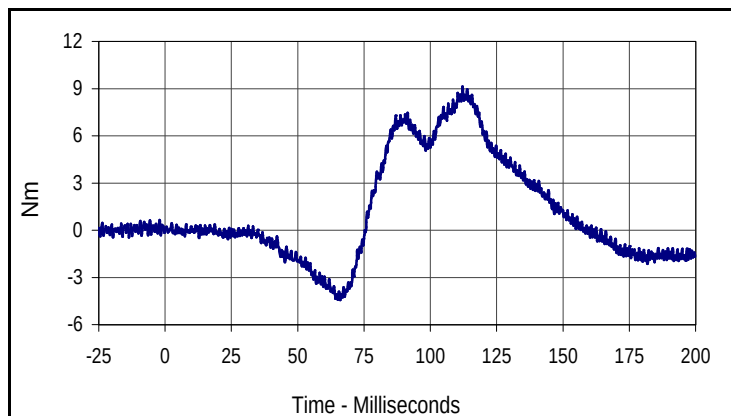
Test Date: 9/9/04
 NHTSA No.: R40401



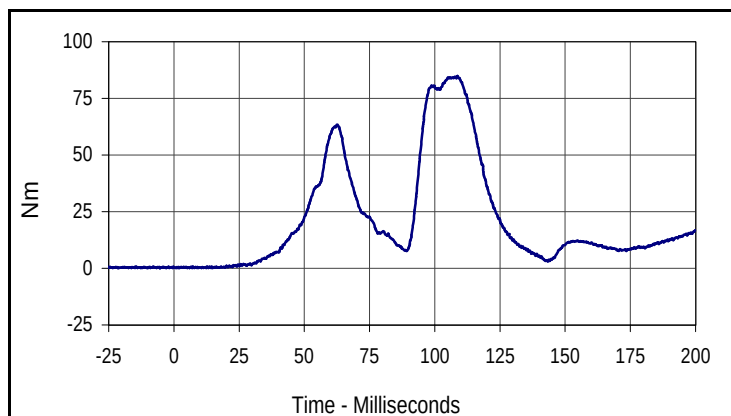
Curve Description			
Center Rear Pass. (50th) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
148	FIL	600	Nm
Max	Time	Min	Time
3.9	97.4	-16.1	115.0



Curve Description			
Center Rear Pass. (50th) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
149	FIL	600	Nm
Max	Time	Min	Time
83.6	108.7	-63.2	62.6



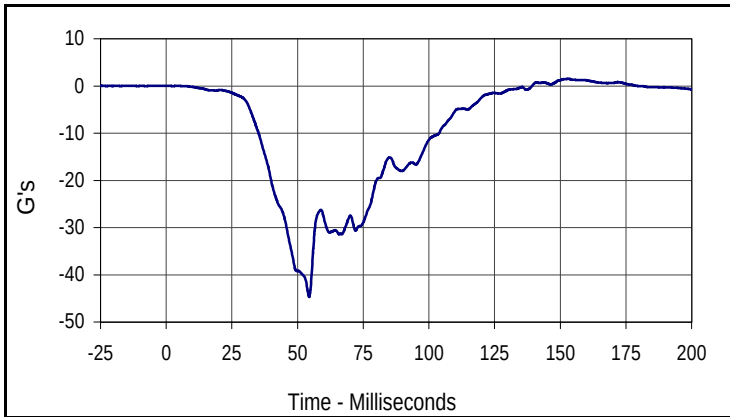
Curve Description			
Center Rear Pass. (50th) Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
150	FIL	600	Nm
Max	Time	Min	Time
9.1	112.2	-4.4	66.1



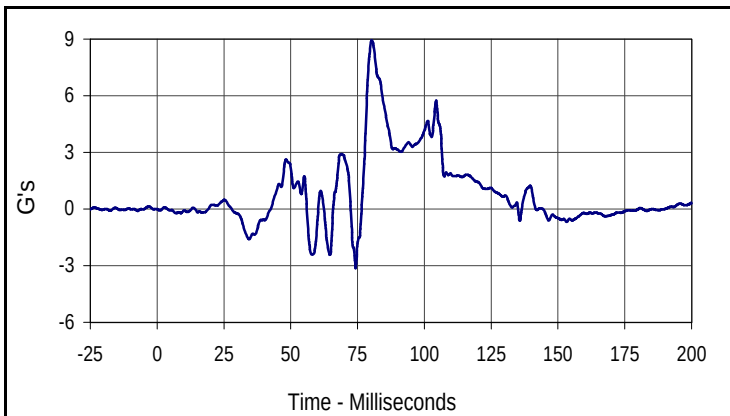
Curve Description			
Center Rear Pass. (50th) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
148	RES	600	Nm
Max	Time	Min	Time
84.8	108.7	0.1	7.7

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

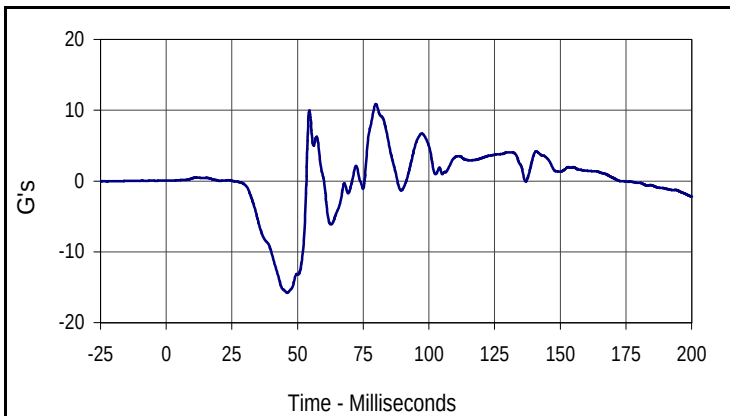
Test Date: 9/9/04
 NHTSA No.: R40401



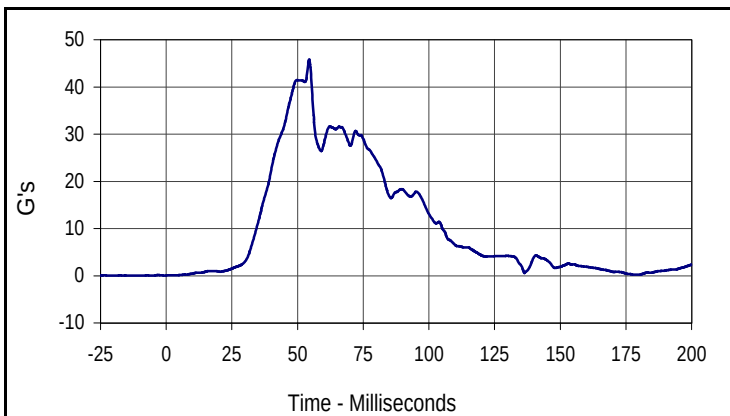
Curve Description			
Center Rear Pass. (50th) Chest Primary X			
CURNO	Type	SAE Class	Units
151	FIL	180	G's
Max	Time	Min	Time
1.5	153.1	-44.7	54.4



Curve Description			
Center Rear Pass. (50th) Chest Primary Y			
CURNO	Type	SAE Class	Units
152	FIL	180	G's
Max	Time	Min	Time
8.9	80.3	-3.1	74.3



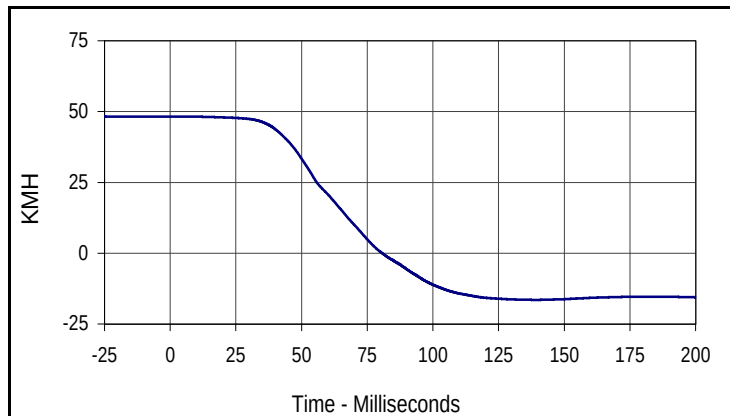
Curve Description			
Center Rear Pass. (50th) Chest Primary Z			
CURNO	Type	SAE Class	Units
153	FIL	180	G's
Max	Time	Min	Time
10.9	79.8	-15.8	46.1



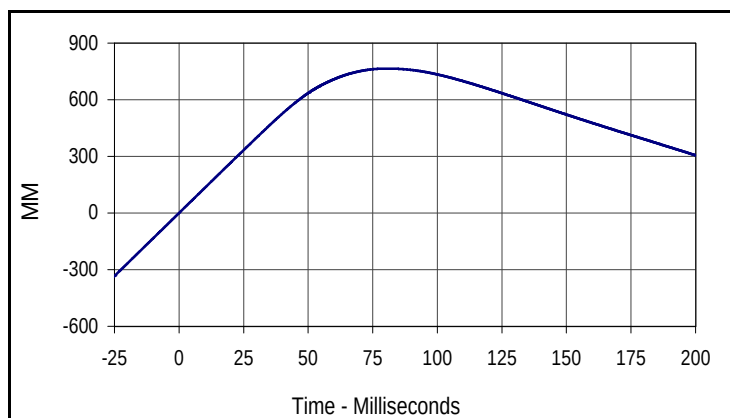
Curve Description			
Center Rear Pass. (50th) Chest Resultant			
CURNO	Type	SAE Class	Units
151	RES	180	G's
Max	Time	Min	Time
45.8	54.4	0.1	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



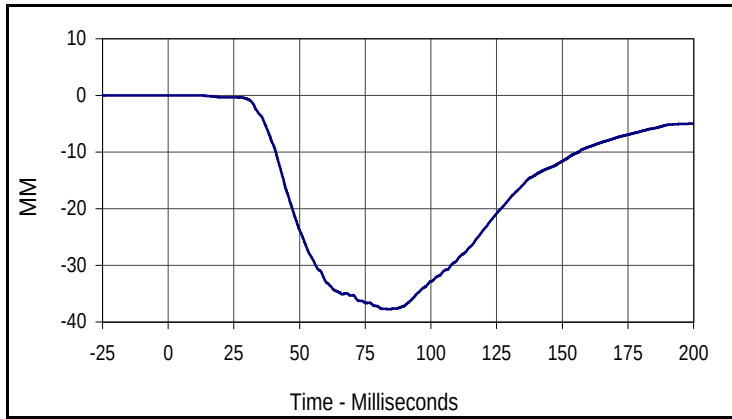
Curve Description			
Center Rear Pass. (50th) Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
151	IN1	180	KMH
Max	Time	Min	Time
48.2	5.5	-16.5	139.3



Curve Description			
Center Rear Pass. (50th) Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
151	IN2	180	MM
Max	Time	Min	Time
765.2	80.7	0.1	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
Test Program: 2004 FMVSS 208 Upgrade

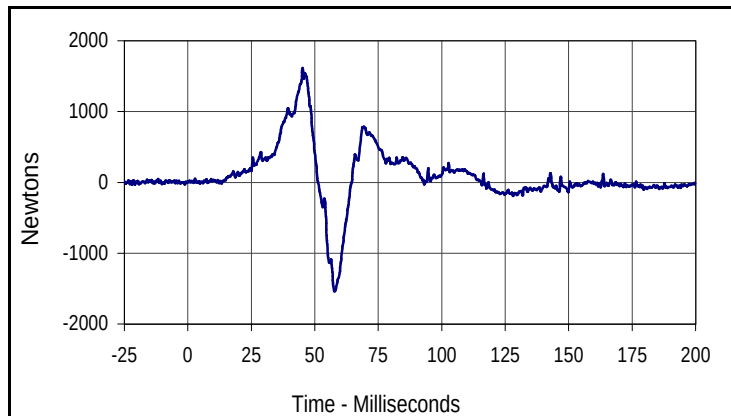
Test Date: 9/9/04
NHTSA No.: R40401



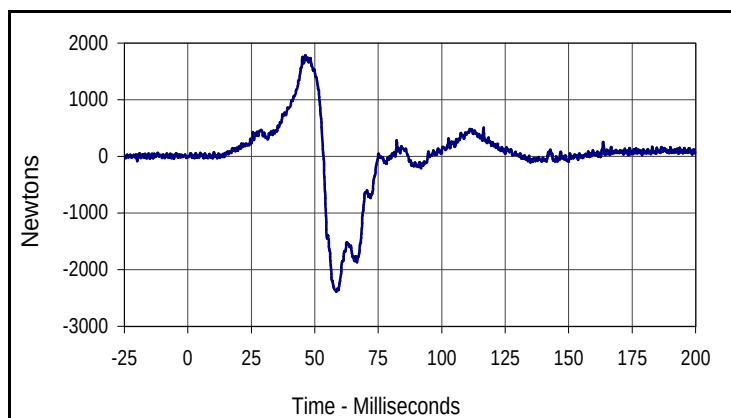
Curve Description			
Center Rear Pass. (50th) Chest Displacement			
CURNO	Type	SAE Class	Units
154	FIL	600	MM
Max	Time	Min	Time
0.0	8.0	-37.8	84.2

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

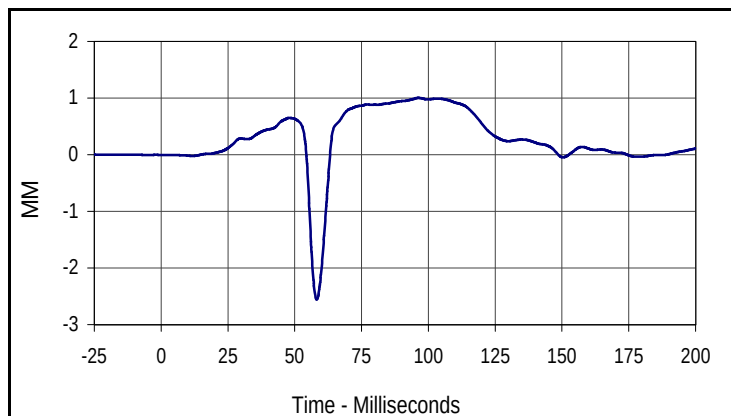
Test Date: 9/9/04
 NHTSA No.: R40401



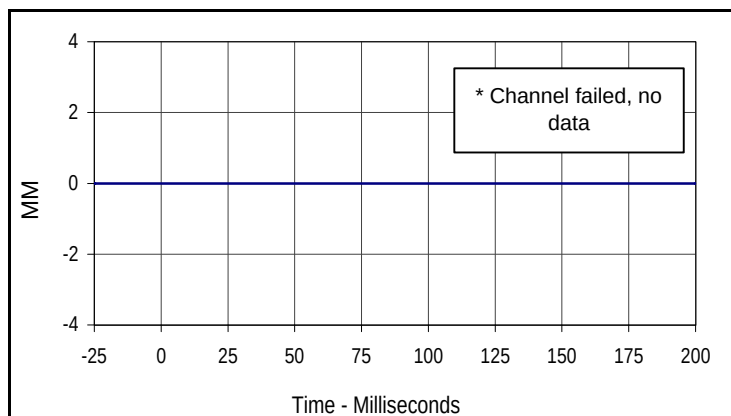
Curve Description			
Center Rear Pass. (50th) Left Femur Force			
CURNO	Type	SAE Class	Units
155	FIL	600	Newtons
Max	Time	Min	Time
1616.5	45.2	-1539.4	57.7



Curve Description			
Center Rear Pass. (50th) Right Femur Force			
CURNO	Type	SAE Class	Units
156	FIL	600	Newtons
Max	Time	Min	Time
1787.0	46.3	-2388.6	58.5



Curve Description			
Center Rear Pass. (50th) Left Knee Displacement			
CURNO	Type	SAE Class	Units
157	FIL	180	MM
Max	Time	Min	Time
1.0	96.6	-2.6	58.6

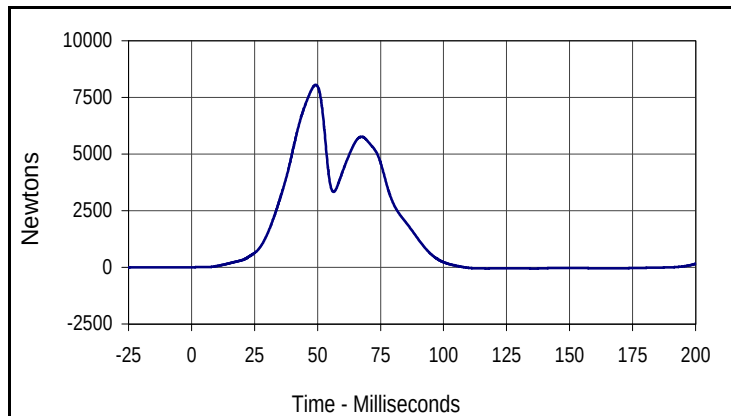


Curve Description			
Center Rear Pass. (50th) Right Knee Displacement			
CURNO	Type	SAE Class	Units
158	FIL	180	MM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

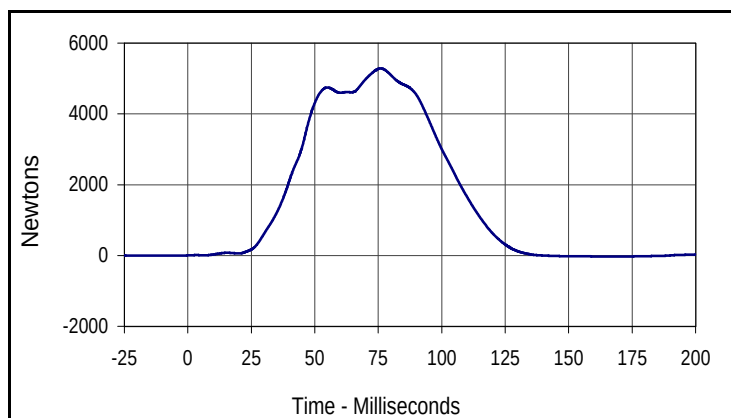
* Channel failed, no data

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

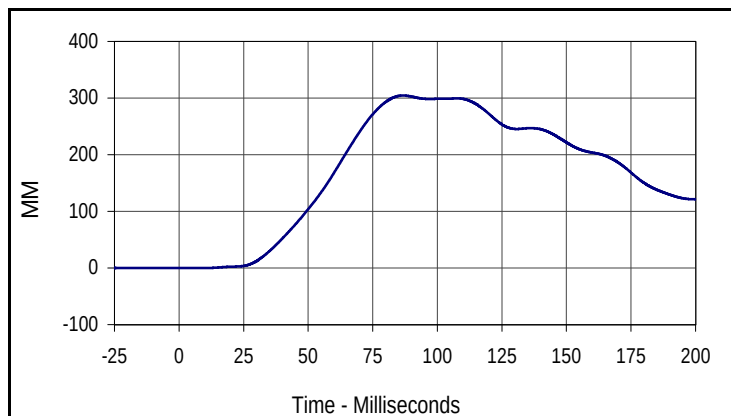
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Center Rear Pass. (50th) Lap Belt Force			
CURNO	Type	SAE Class	Units
159	FIL	60	Newtons
Max	Time	Min	Time
8057.4	49.3	-52.8	135.9



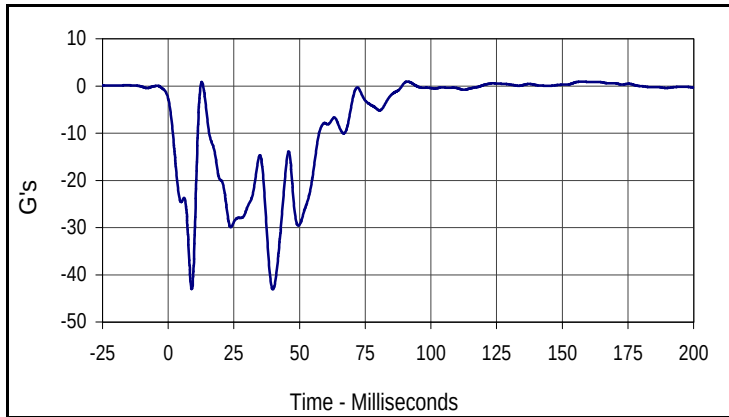
Curve Description			
Center Rear Pass. (50th) Shoulder Belt Force			
CURNO	Type	SAE Class	Units
160	FIL	60	Newtons
Max	Time	Min	Time
5285.0	76.0	-29.5	160.9



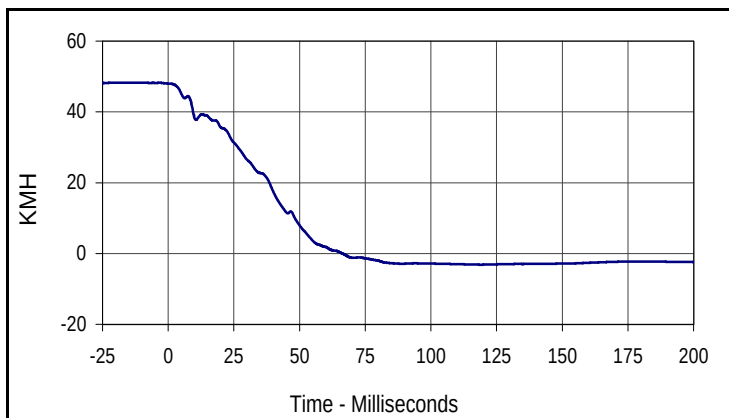
Curve Description			
Center Rear Pass. (50th) Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
161	FIL	60	MM
Max	Time	Min	Time
304.5	86.8	0.0	3.5

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

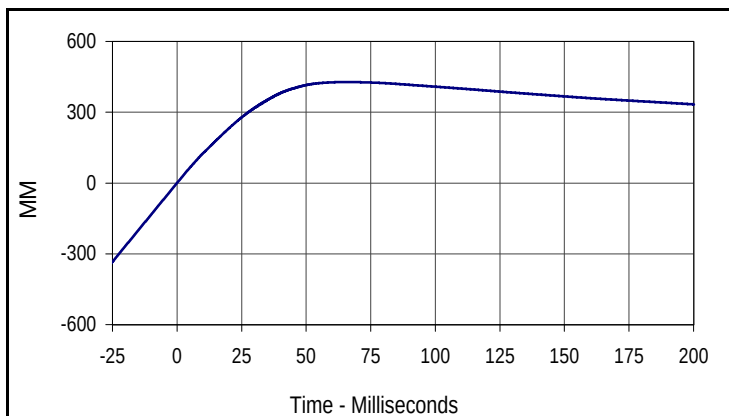
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Left Rear X			
CURNO	Type	SAE Class	Units
162	FIL	60	G's
Max	Time	Min	Time
0.9	91.1	-43.1	39.9



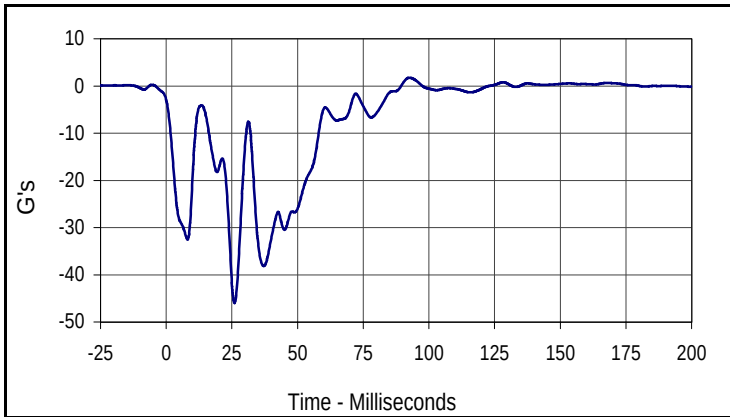
Curve Description			
Vehicle Left Rear X Velocity			
CURNO	Type	SAE Class	Units
162	IN1	180	KMH
Max	Time	Min	Time
48.0	0.0	-3.1	118.9



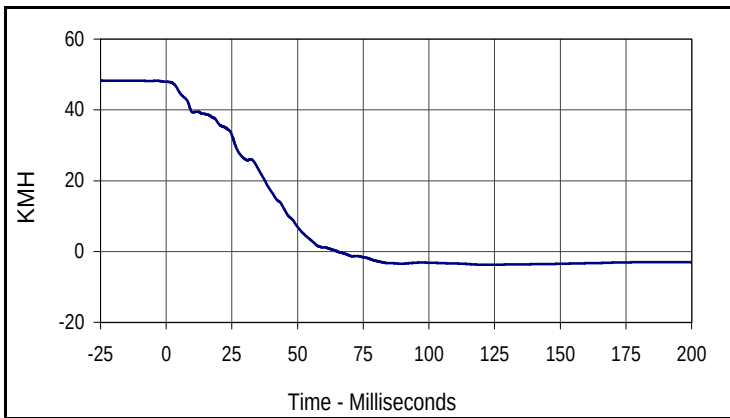
Curve Description			
Vehicle Left Rear X Displacement			
CURNO	Type	SAE Class	Units
162	IN2	180	MM
Max	Time	Min	Time
428.2	66.3	0.2	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

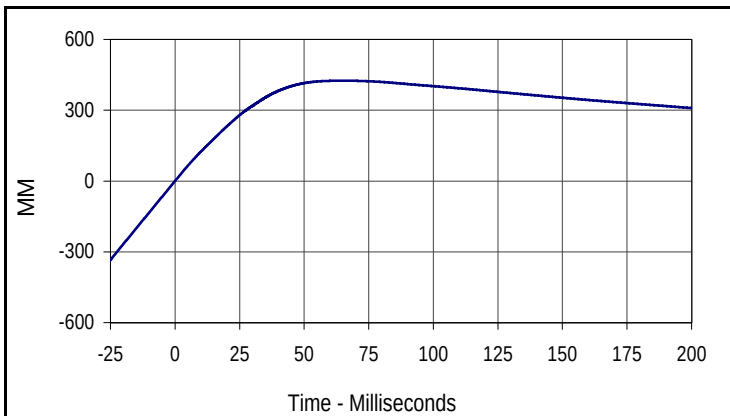
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Right Rear X			
CURNO	Type	SAE Class	Units
163	FIL	60	G's
Max	Time	Min	Time
1.8	92.6	-46.0	26.0



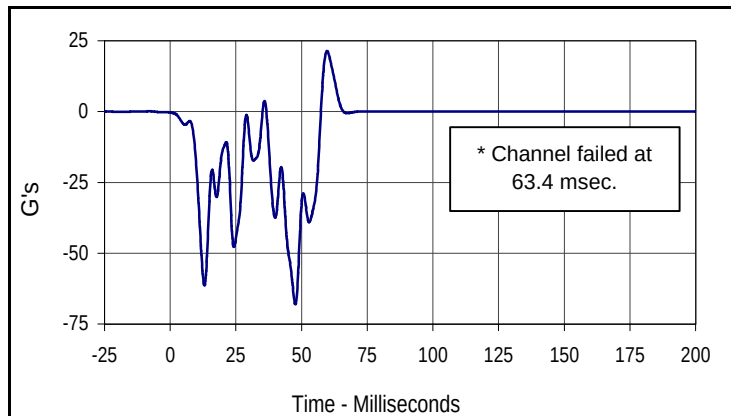
Curve Description			
Vehicle Right Rear X Velocity			
CURNO	Type	SAE Class	Units
163	IN1	180	KMH
Max	Time	Min	Time
48.0	0.0	-3.8	121.9



Curve Description			
Vehicle Right Rear X Displacement			
CURNO	Type	SAE Class	Units
163	IN2	180	MM
Max	Time	Min	Time
425.4	65.1	0.2	0.0

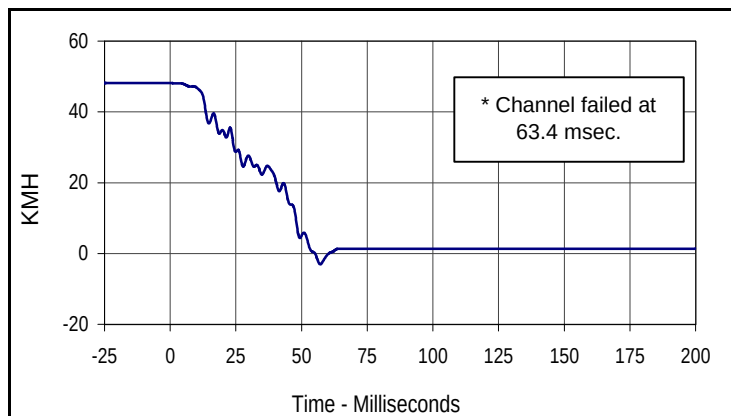
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



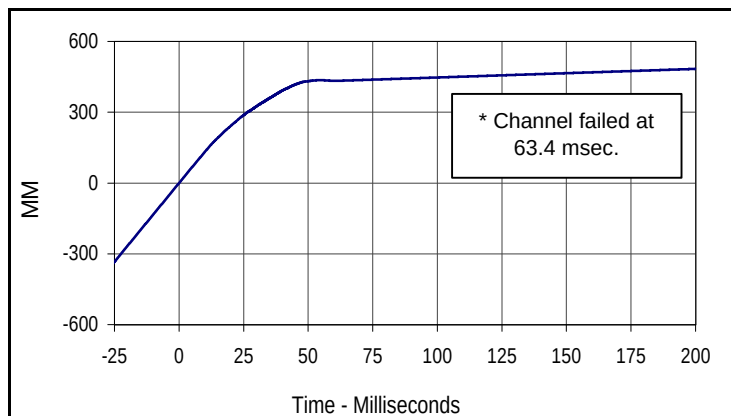
Curve Description			
Vehicle Left Brake Caliper X			
CURNO	Type	SAE Class	Units
164	FIL	60	G's
Max	Time	Min	Time
21.4	59.7	-68.0	47.6

* Channel failed at 63.4 msec.



Curve Description			
Vehicle Left Brake Caliper X Velocity			
CURNO	Type	SAE Class	Units
164	IN1	180	KMH
Max	Time	Min	Time
48.1	0.0	-3.0	57.1

* Channel failed at 63.4 msec.

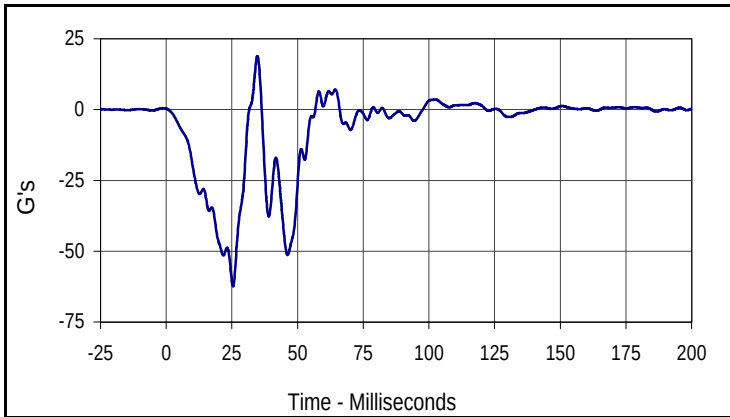


Curve Description			
Vehicle Left Brake Caliper X Displacement			
CURNO	Type	SAE Class	Units
164	IN2	180	MM
Max	Time	Min	Time
483.7	200.0	-0.1	0.0

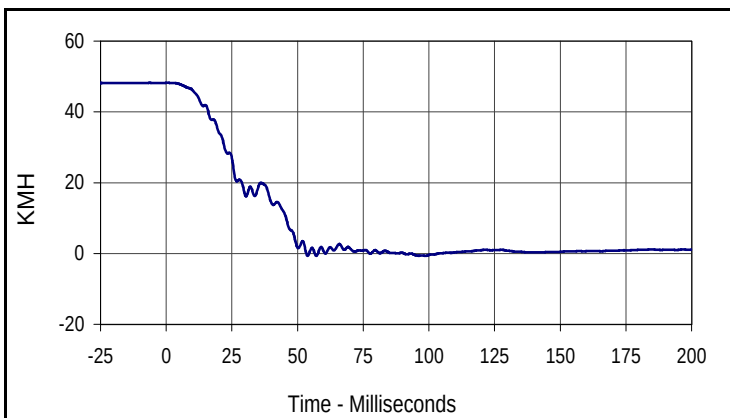
* Channel failed at 63.4 msec.

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

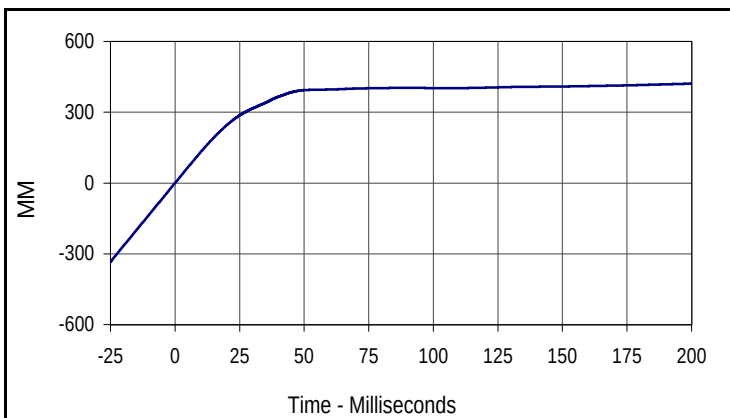
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Right Brake Caliper X			
CURNO	Type	SAE Class	Units
165	FIL	60	G's
Max	Time	Min	Time
18.8	34.7	-62.3	25.4



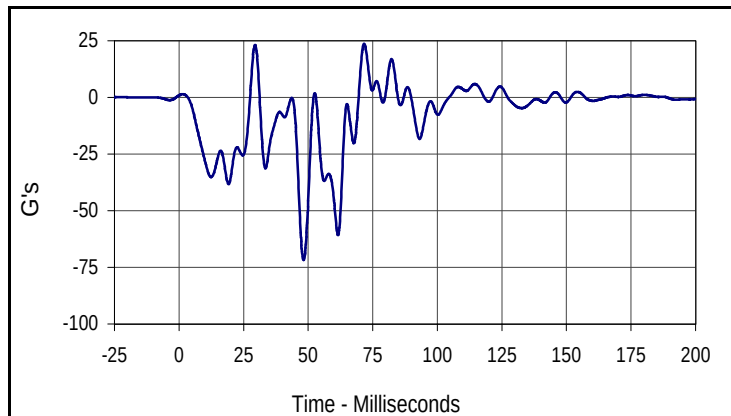
Curve Description			
Vehicle Right Brake Caliper X Velocity			
CURNO	Type	SAE Class	Units
165	IN1	180	KMH
Max	Time	Min	Time
48.2	0.6	-0.7	57.1



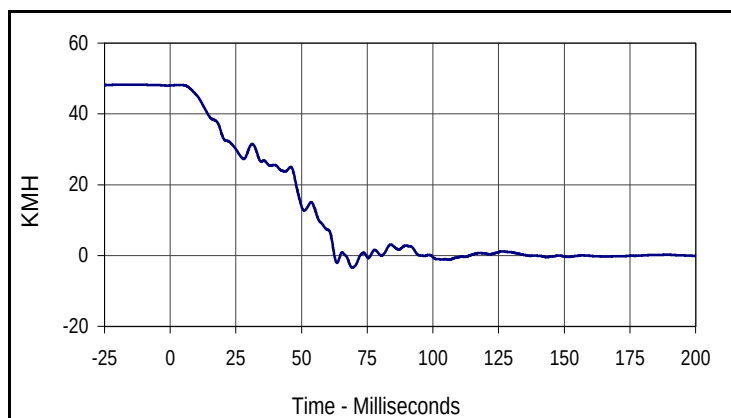
Curve Description			
Vehicle Right Brake Caliper X Displacement			
CURNO	Type	SAE Class	Units
165	IN2	180	MM
Max	Time	Min	Time
421.2	200.0	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

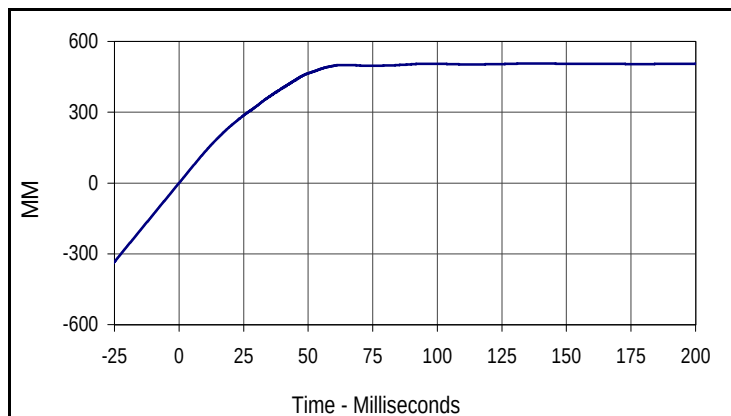
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Instrument Panel X			
CURNO	Type	SAE Class	Units
166	FIL	60	G's
Max	Time	Min	Time
23.7	71.7	-71.7	48.2



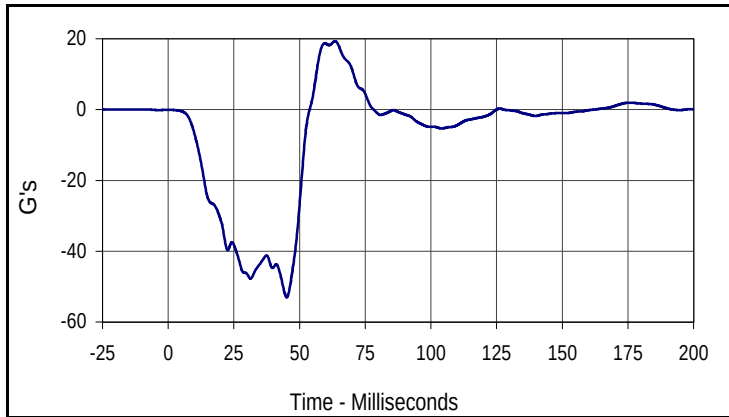
Curve Description			
Vehicle Instrument Panel X Velocity			
CURNO	Type	SAE Class	Units
166	IN1	180	KMH
Max	Time	Min	Time
48.2	3.3	-3.4	69.3



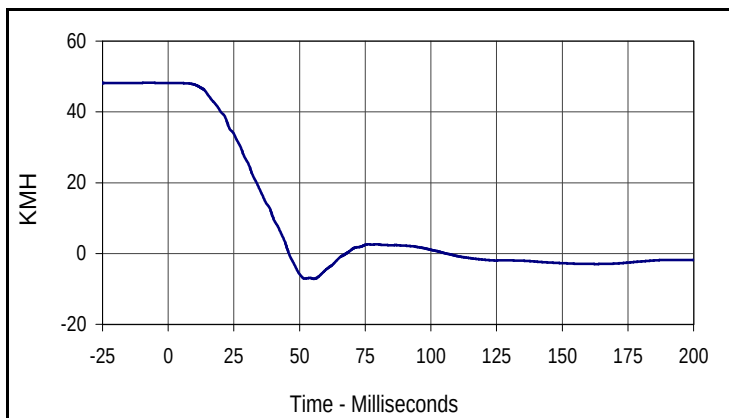
Curve Description			
Vehicle Instrument Panel X Displacement			
CURNO	Type	SAE Class	Units
166	IN2	180	MM
Max	Time	Min	Time
506.3	136.0	0.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

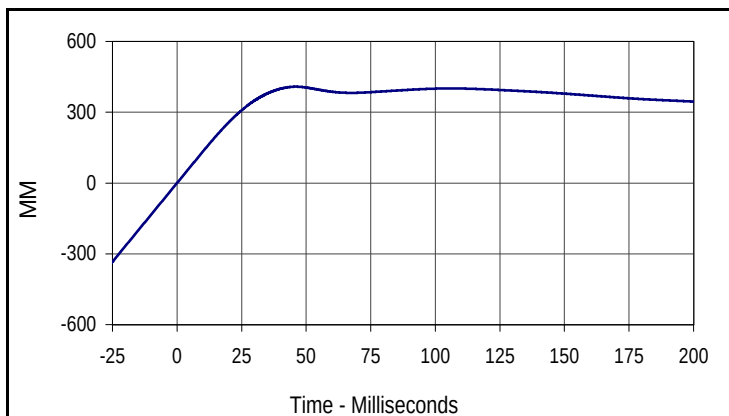
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Engine Top X			
CURNO	Type	SAE Class	Units
167	FIL	60	G's
Max	Time	Min	Time
19.3	63.5	-53.0	45.1



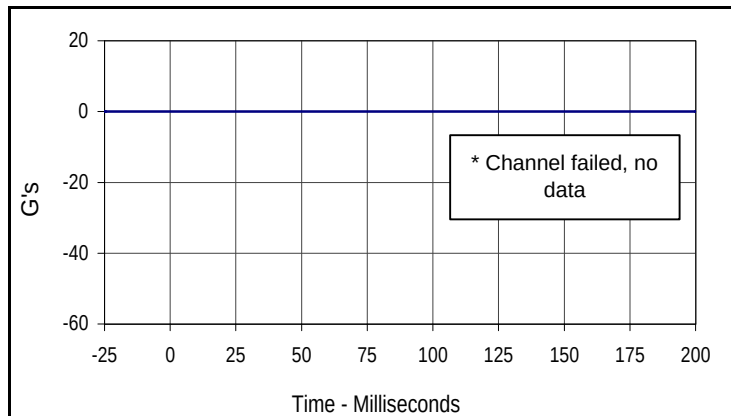
Curve Description			
Vehicle Engine Top X Velocity			
CURNO	Type	SAE Class	Units
167	IN1	180	KMH
Max	Time	Min	Time
48.2	1.4	-7.2	55.4



Curve Description			
Vehicle Engine Top X Displacement			
CURNO	Type	SAE Class	Units
167	IN2	180	MM
Max	Time	Min	Time
408.3	45.9	0.1	0.0

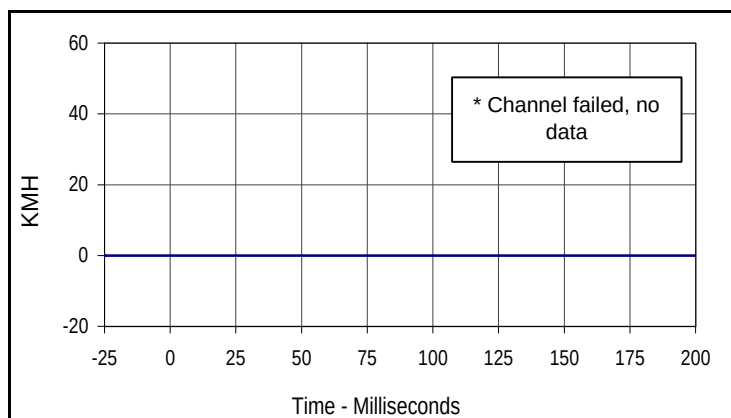
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



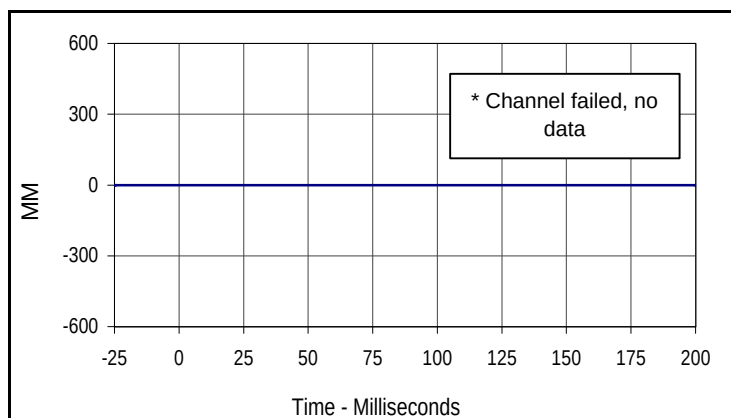
Curve Description			
Vehicle Engine Bottom X			
CURNO	Type	SAE Class	Units
168	FIL	60	G's
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Channel failed, no data



Curve Description			
Vehicle Engine Bottom X Velocity			
CURNO	Type	SAE Class	Units
168	IN1	180	KMH
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Channel failed, no data

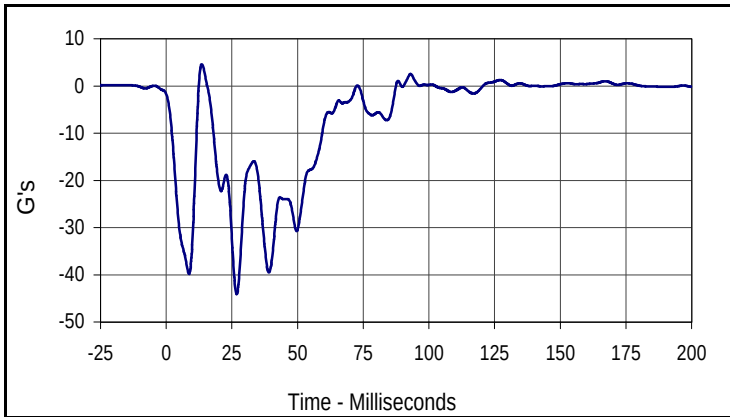


Curve Description			
Vehicle Engine Bottom X Displacement			
CURNO	Type	SAE Class	Units
168	IN2	180	MM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

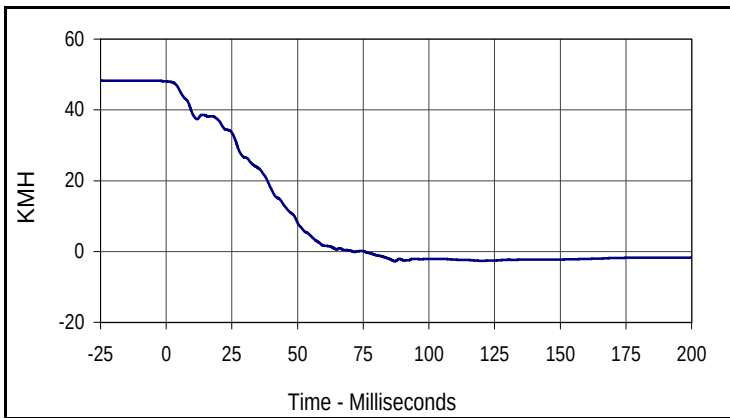
* Channel failed, no data

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

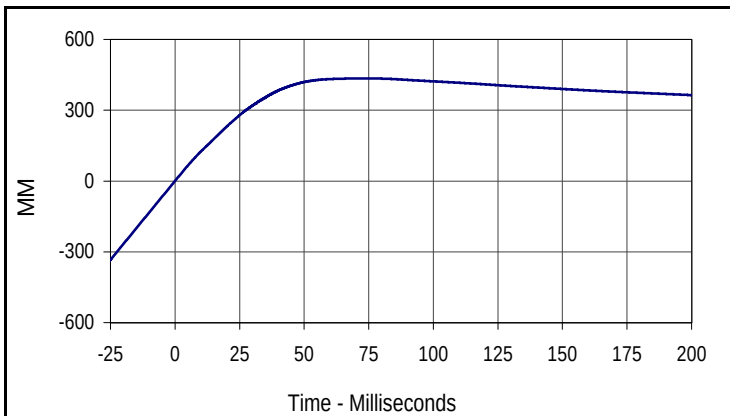
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Rear Center Compartment X			
CURNO	Type	SAE Class	Units
169	FIL	60	G's
Max	Time	Min	Time
4.6	13.6	-44.1	26.8



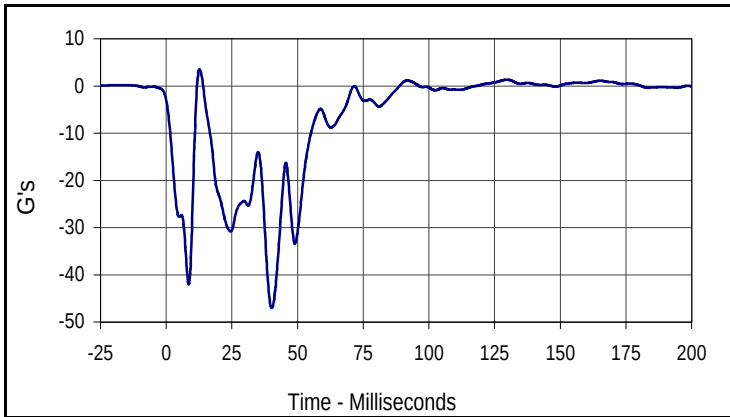
Curve Description			
Vehicle Rear Center Compartment X Velocity			
CURNO	Type	SAE Class	Units
169	IN1	180	KMH
Max	Time	Min	Time
48.0	0.0	-2.7	87.0



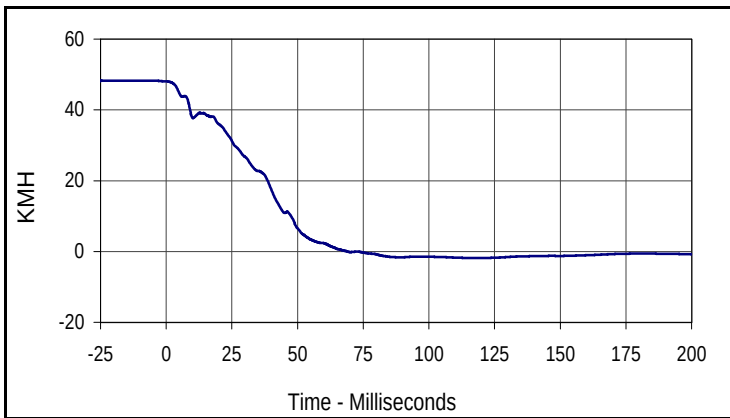
Curve Description			
Vehicle Rear Center Compartment X Displacement			
CURNO	Type	SAE Class	Units
169	IN2	180	MM
Max	Time	Min	Time
434.6	75.5	0.4	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

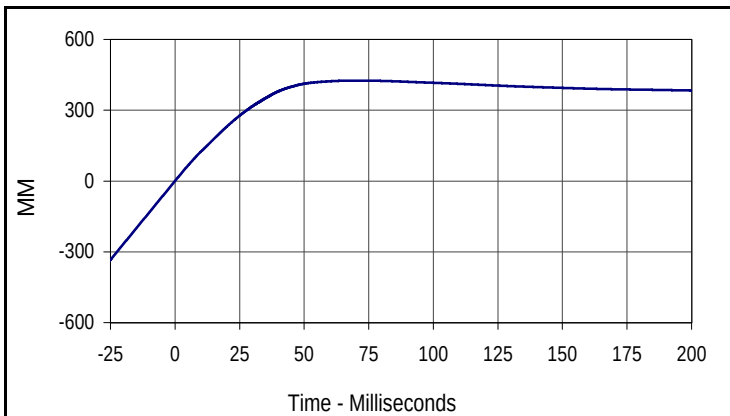
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Toe Pan Accelerator X			
CURNO	Type	SAE Class	Units
170	FIL	60	G's
Max	Time	Min	Time
3.6	12.6	-47.0	40.2



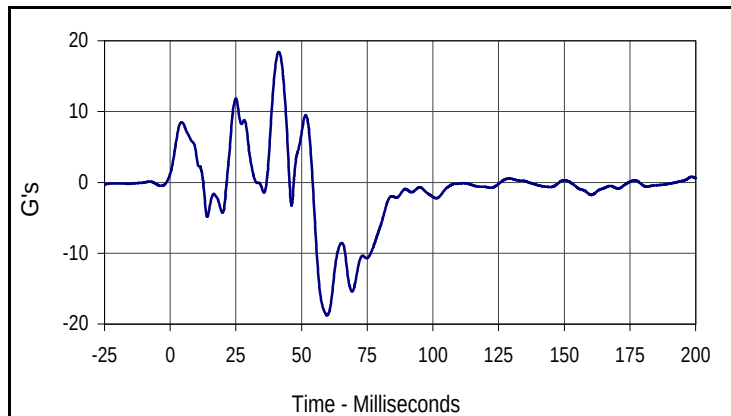
Curve Description			
Vehicle Toe Pan Accelerator X Velocity			
CURNO	Type	SAE Class	Units
170	IN1	180	KMH
Max	Time	Min	Time
48.1	0.0	-1.9	119.5



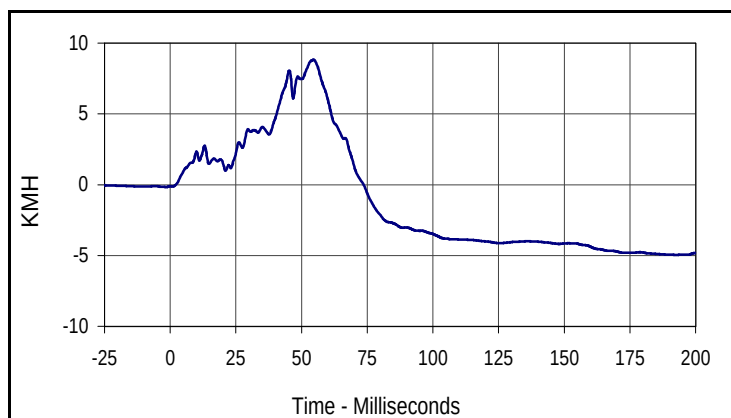
Curve Description			
Vehicle Toe Pan Accelerator X Displacement			
CURNO	Type	SAE Class	Units
170	IN2	180	MM
Max	Time	Min	Time
425.3	68.9	0.3	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

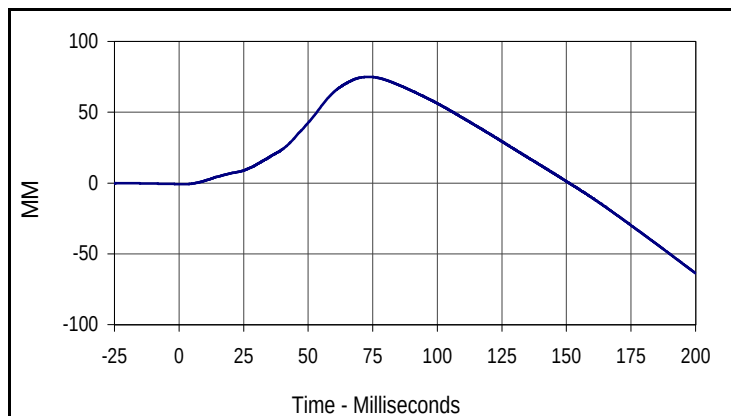
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Toe Pan Accelerator Z			
CURNO	Type	SAE Class	Units
171	FIL	60	G's
Max	Time	Min	Time
18.4	41.3	-18.8	59.8



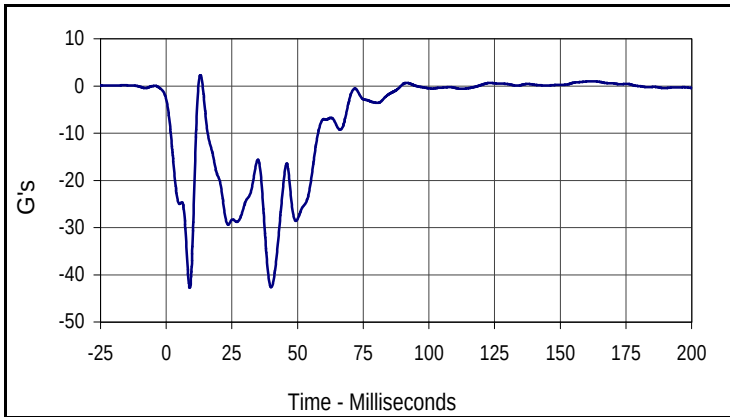
Curve Description			
Vehicle Toe Pan Accelerator Z Velocity			
CURNO	Type	SAE Class	Units
171	IN1	180	KMH
Max	Time	Min	Time
8.8	54.6	-5.0	192.8



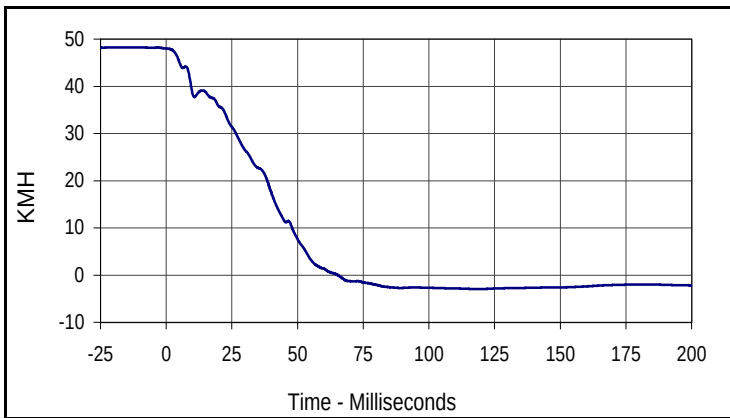
Curve Description			
Vehicle Toe Pan Accelerator Z Displacement			
CURNO	Type	SAE Class	Units
171	IN2	180	MM
Max	Time	Min	Time
75.0	73.6	-63.7	200.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

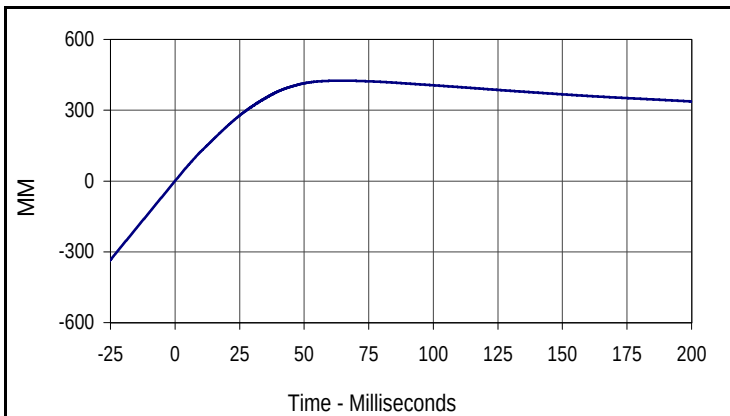
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Toe Pan Foot Rest X			
CURNO	Type	SAE Class	Units
172	FIL	60	G's
Max	Time	Min	Time
2.3	13.0	-42.7	9.0



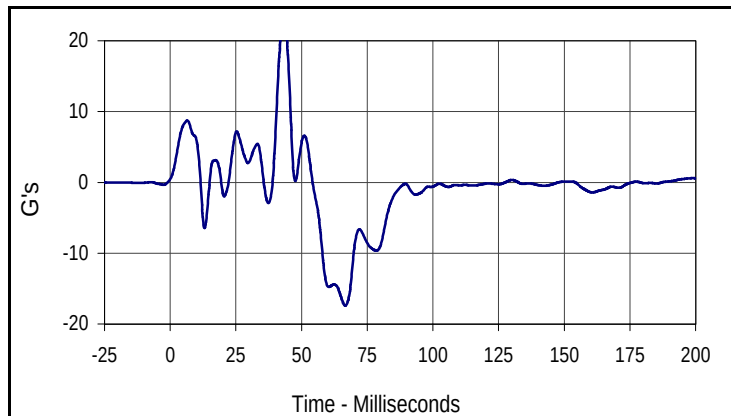
Curve Description			
Vehicle Toe Pan Foot Rest X Velocity			
CURNO	Type	SAE Class	Units
172	IN1	180	KMH
Max	Time	Min	Time
48.0	0.0	-2.9	118.8



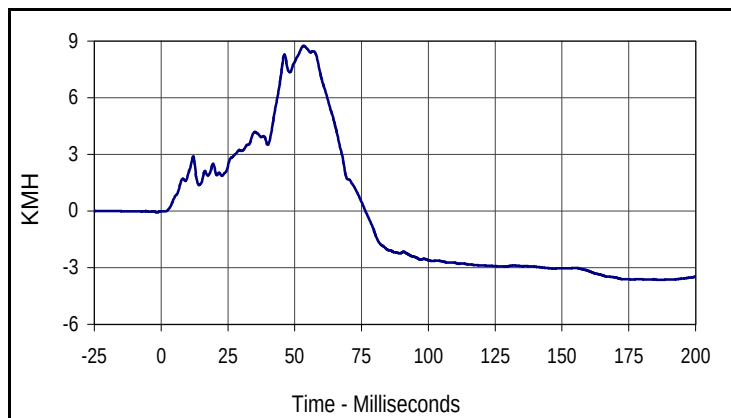
Curve Description			
Vehicle Toe Pan Foot Rest X Displacement			
CURNO	Type	SAE Class	Units
172	IN2	180	MM
Max	Time	Min	Time
425.5	65.2	0.2	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

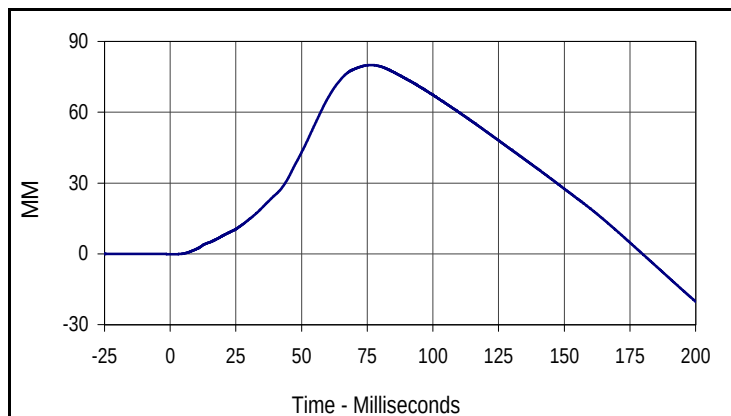
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Toe Pan Foot Rest Z			
CURNO	Type	SAE Class	Units
173	FIL	60	G's
Max	Time	Min	Time
22.9	43.2	-17.4	66.6



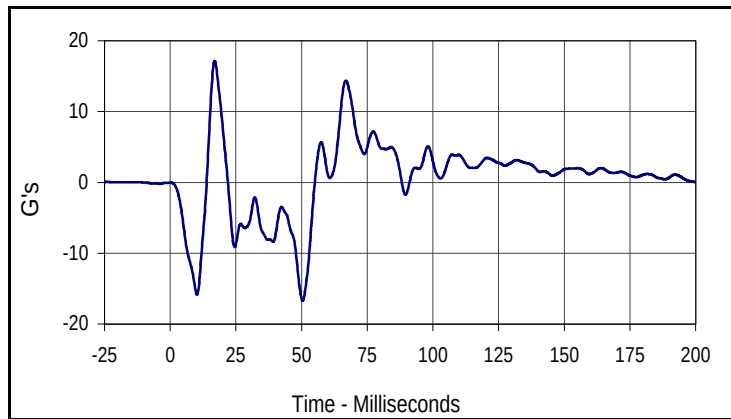
Curve Description			
Vehicle Toe Pan Foot Rest Z Velocity			
CURNO	Type	SAE Class	Units
173	IN1	180	KMH
Max	Time	Min	Time
8.7	53.4	-3.7	186.4



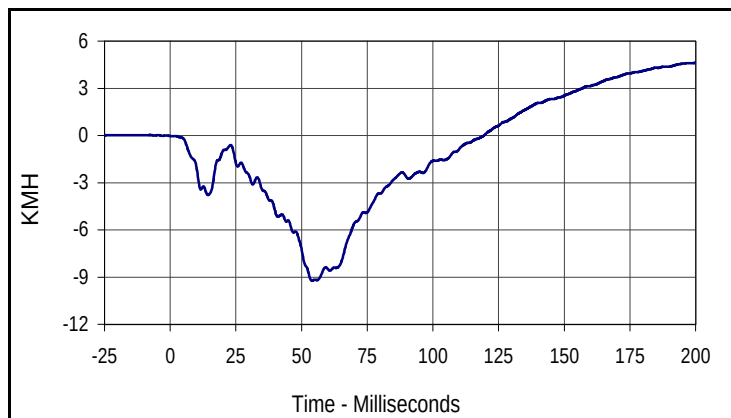
Curve Description			
Vehicle Toe Pan Foot Rest Z Displacement			
CURNO	Type	SAE Class	Units
173	IN2	180	MM
Max	Time	Min	Time
80.0	76.4	-20.2	200.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

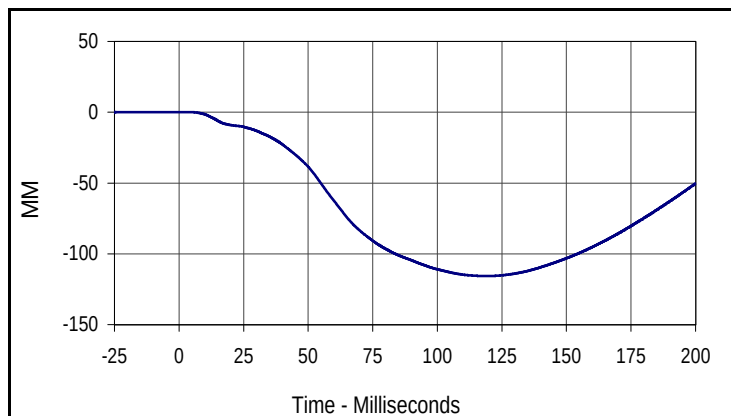
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Vehicle Rear Deck Z			
CURNO	Type	SAE Class	Units
174	FIL	60	G's
Max	Time	Min	Time
17.1	16.9	-16.7	50.4



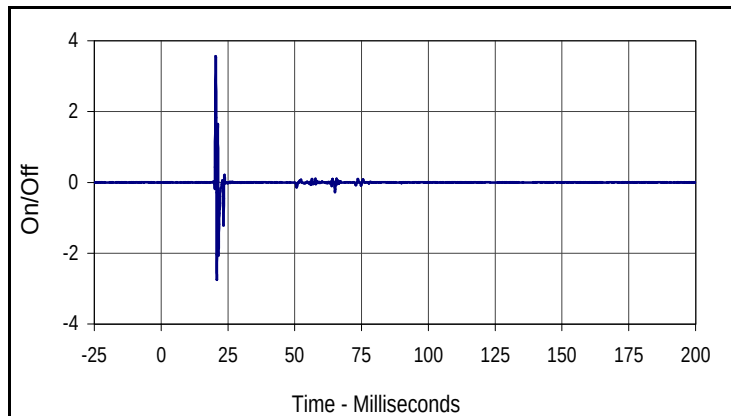
Curve Description			
Vehicle Rear Deck Z Velocity			
CURNO	Type	SAE Class	Units
174	IN1	180	KMH
Max	Time	Min	Time
4.6	200.0	-9.2	53.9



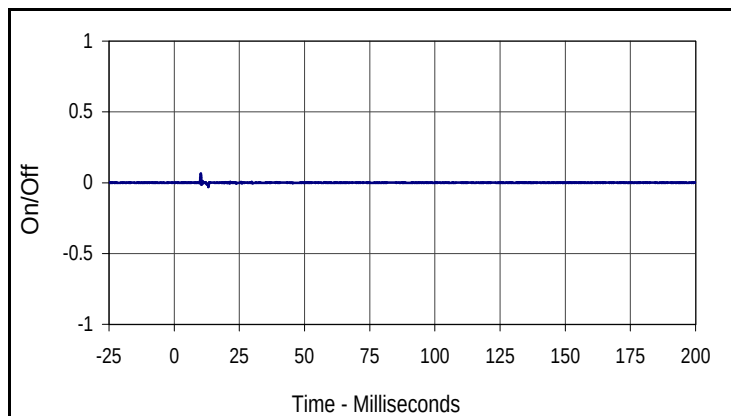
Curve Description			
Vehicle Rear Deck Z Displacement			
CURNO	Type	SAE Class	Units
174	IN2	180	MM
Max	Time	Min	Time
0.1	0.0	-115.7	119.5

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

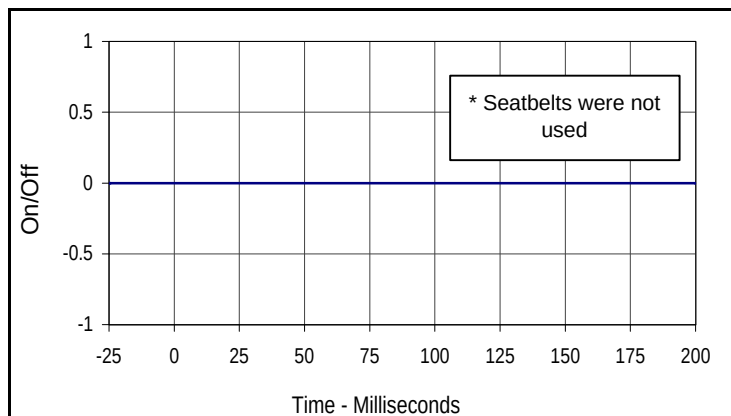
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Driver Airbag Squib Stage 1			
CURNO	Type	SAE Class	Units
175	FIL	1000	On/Off
Max	Time	Min	Time
3.6	20.4	-2.7	20.9



Curve Description			
Driver Airbag Squib Stage 2			
CURNO	Type	SAE Class	Units
176	FIL	1000	On/Off
Max	Time	Min	Time
0.1	10.2	0.0	13.1

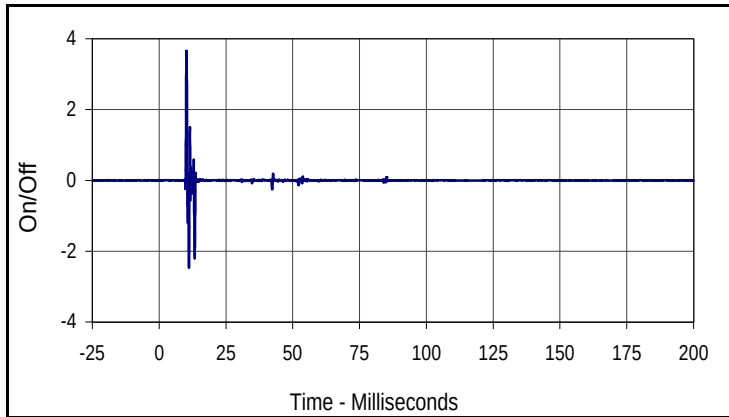


Curve Description			
Driver Pretensioner Squib			
CURNO	Type	SAE Class	Units
177	FIL	1000	On/Off
Max	Time	Min	Time
0.0	0.0	0.0	0.0

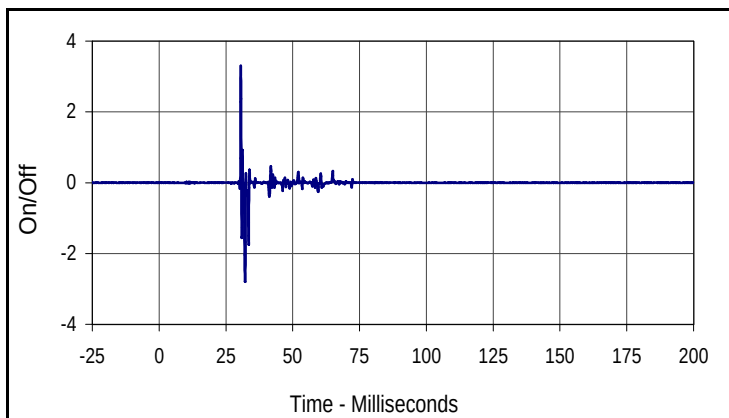
* Seatbelts were not used

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

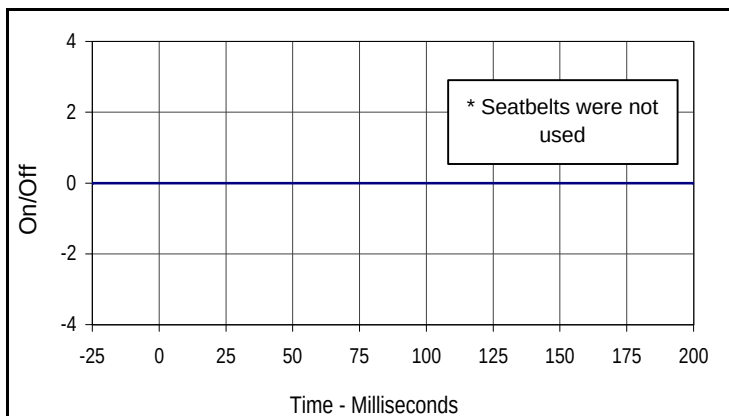
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Pass. Airbag Squib Stage 1			
CURNO	Type	SAE Class	Units
178	FIL	1000	On/Off
Max	Time	Min	Time
3.6	10.2	-2.5	11.2



Curve Description			
Pass. Airbag Squib Stage 2			
CURNO	Type	SAE Class	Units
179	FIL	1000	On/Off
Max	Time	Min	Time
3.3	30.6	-2.8	32.2



Curve Description			
Pass. Pretensioner Squib			
CURNO	Type	SAE Class	Units
180	FIL	1000	On/Off
Max	Time	Min	Time
0.0	0.0	0.0	0.0

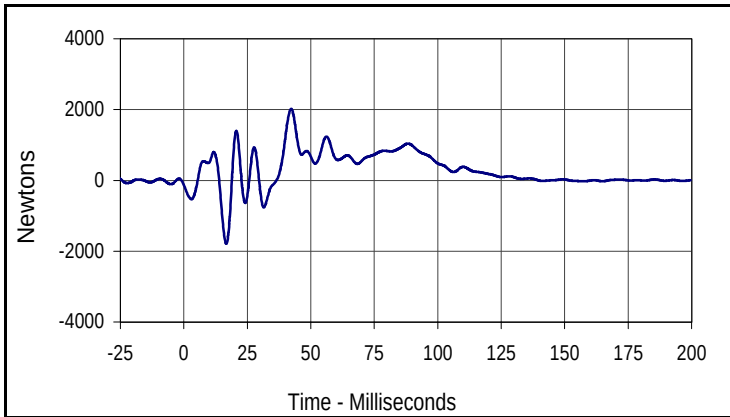
* Seatbelts were not used

APPENDIX C

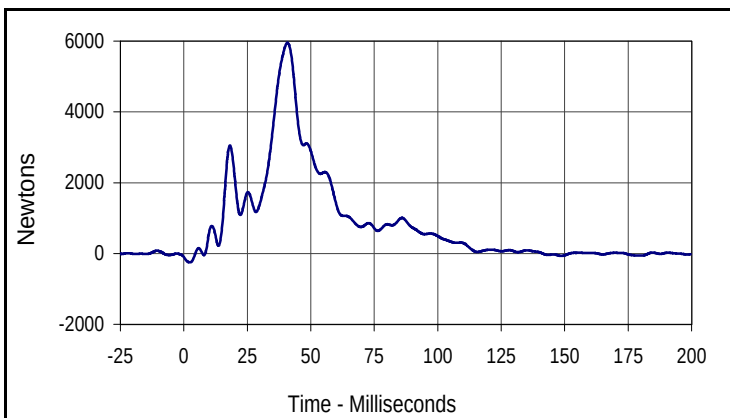
LOAD CELL BARRIER DATA TRACES

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

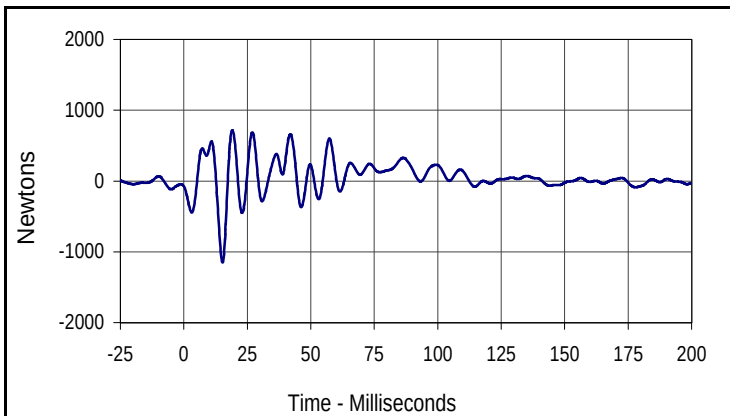
Test Date: 9/9/04
 NHTSA No.: R40401



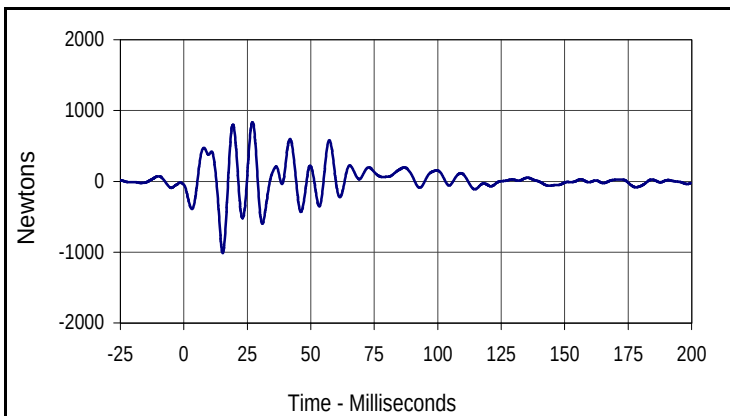
Curve Description			
Barrier Force A1			
CURNO	Type	SAE Class	Units
181	FIL	60	Newtons
Max	Time	Min	Time
2019.4	42.3	-1787.6	16.7



Curve Description			
Barrier Force B1			
CURNO	Type	SAE Class	Units
190	FIL	60	Newtons
Max	Time	Min	Time
5951.7	40.8	-250.8	2.3



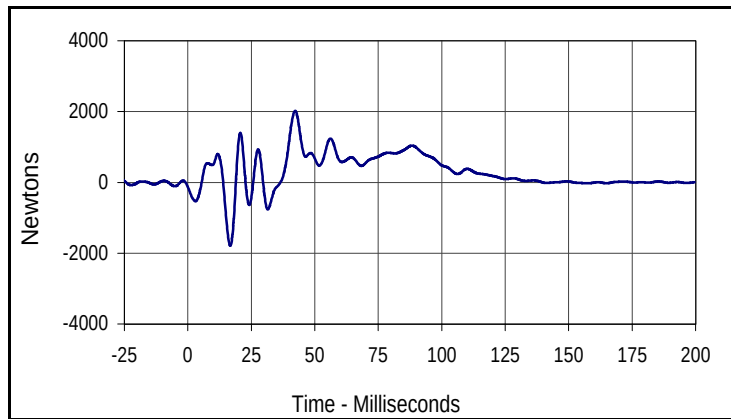
Curve Description			
Barrier Force C1			
CURNO	Type	SAE Class	Units
199	FIL	60	Newtons
Max	Time	Min	Time
717.9	19.1	-1151.9	15.2



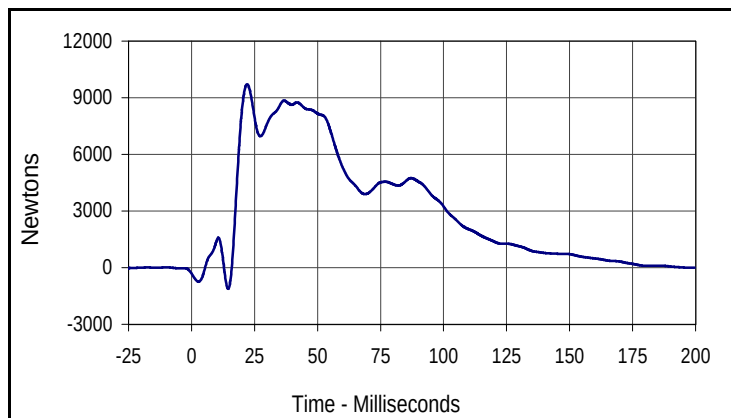
Curve Description			
Barrier Force D1			
CURNO	Type	SAE Class	Units
208	FIL	60	Newtons
Max	Time	Min	Time
835.5	27.0	-1013.7	15.3

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

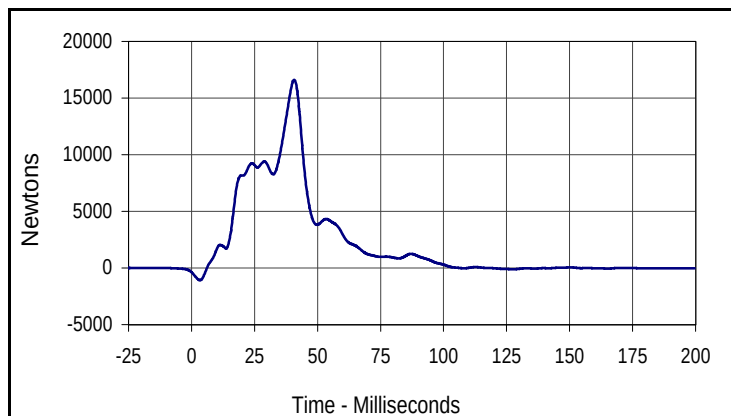
Test Date: 9/9/04
 NHTSA No.: R40401



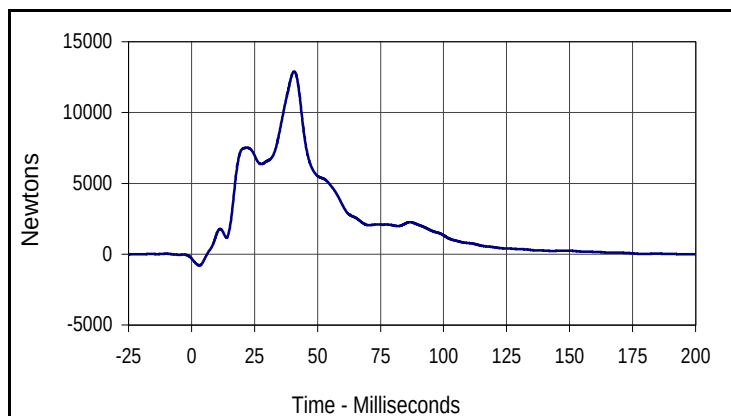
Curve Description			
Barrier Force A2			
CURNO	Type	SAE Class	Units
182	FIL	60	Newtons
Max	Time	Min	Time
2019.4	42.3	-1787.6	16.7



Curve Description			
Barrier Force B2			
CURNO	Type	SAE Class	Units
191	FIL	60	Newtons
Max	Time	Min	Time
9717.1	22.0	-1117.1	14.5



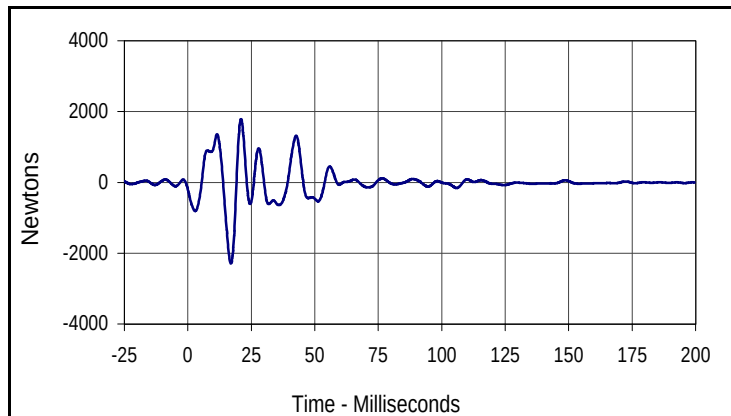
Curve Description			
Barrier Force C2			
CURNO	Type	SAE Class	Units
200	FIL	60	Newtons
Max	Time	Min	Time
16610.3	40.7	-1080.5	3.3



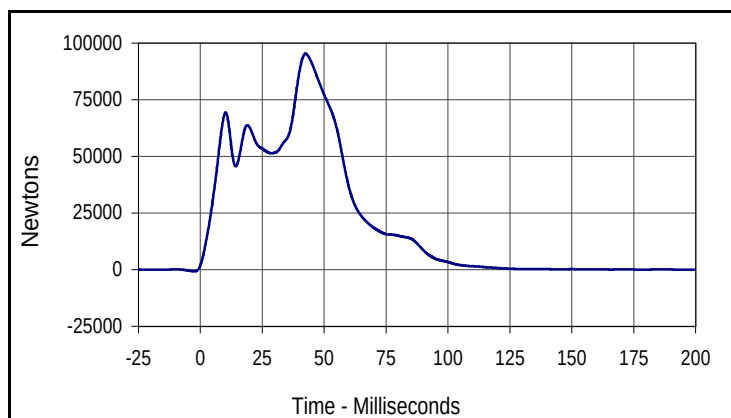
Curve Description			
Barrier Force D2			
CURNO	Type	SAE Class	Units
209	FIL	60	Newtons
Max	Time	Min	Time
12906.9	40.7	-795.0	3.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

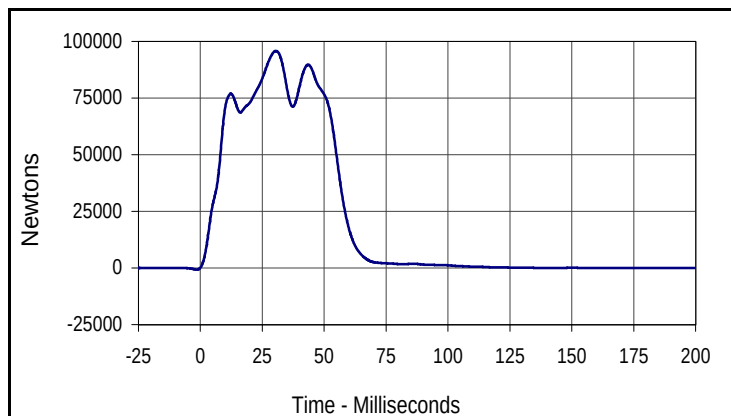
Test Date: 9/9/04
 NHTSA No.: R40401



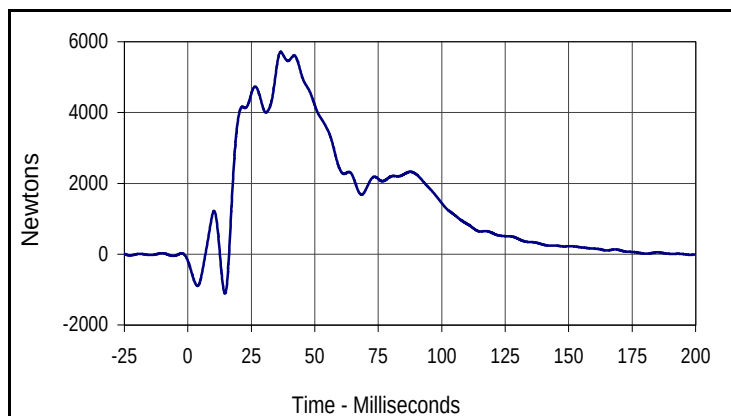
Curve Description			
Barrier Force A3			
CURNO	Type	SAE Class	Units
183	FIL	60	Newtons
Max	Time	Min	Time
1782.8	20.9	-2292.0	16.9



Curve Description			
Barrier Force B3			
CURNO	Type	SAE Class	Units
192	FIL	60	Newtons
Max	Time	Min	Time
95316.7	42.5	19.8	194.2



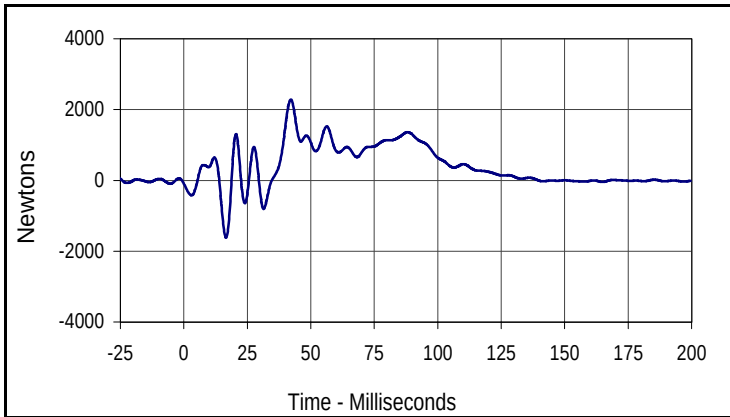
Curve Description			
Barrier Force C3			
CURNO	Type	SAE Class	Units
201	FIL	60	Newtons
Max	Time	Min	Time
95796.8	30.5	-33.1	141.2



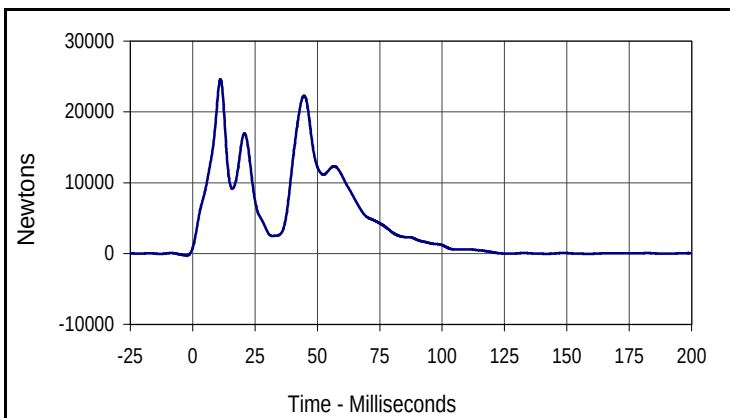
Curve Description			
Barrier Force D3			
CURNO	Type	SAE Class	Units
210	FIL	60	Newtons
Max	Time	Min	Time
5716.3	36.6	-1105.9	14.6

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

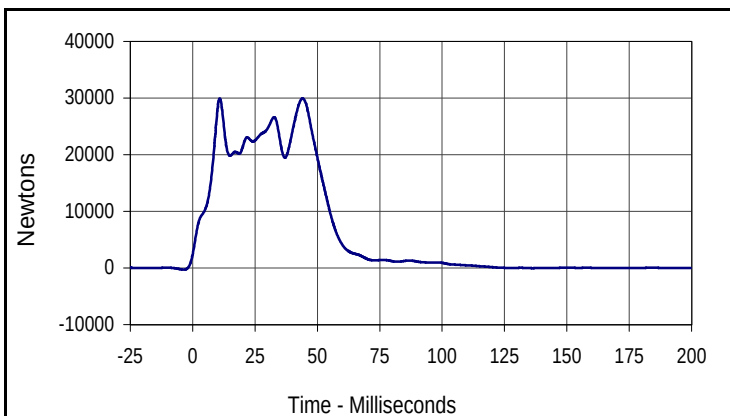
Test Date: 9/9/04
 NHTSA No.: R40401



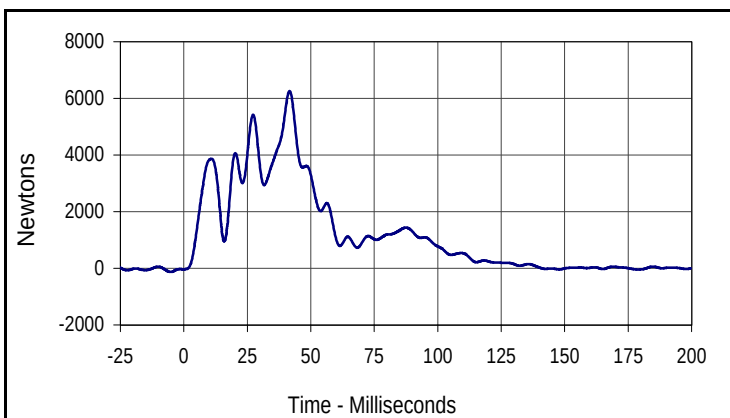
Curve Description			
Barrier Force A4			
CURNO	Type	SAE Class	Units
184	FIL	60	Newtons
Max	Time	Min	Time
2286.0	42.1	-1614.5	16.6



Curve Description			
Barrier Force B4			
CURNO	Type	SAE Class	Units
193	FIL	60	Newtons
Max	Time	Min	Time
24610.8	11.1	-52.9	141.8



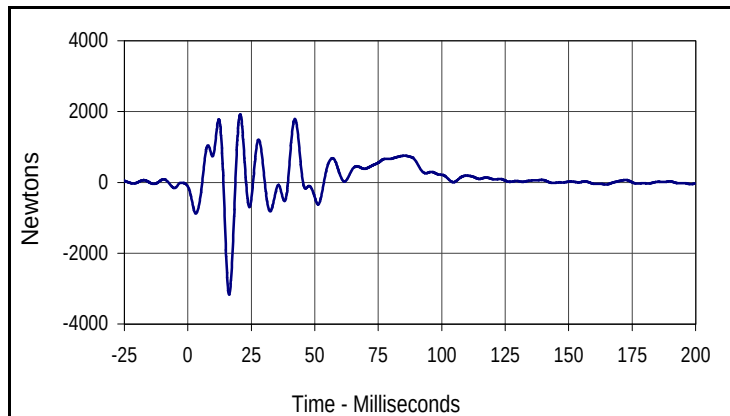
Curve Description			
Barrier Force C4			
CURNO	Type	SAE Class	Units
202	FIL	60	Newtons
Max	Time	Min	Time
29951.9	10.8	-30.4	136.3



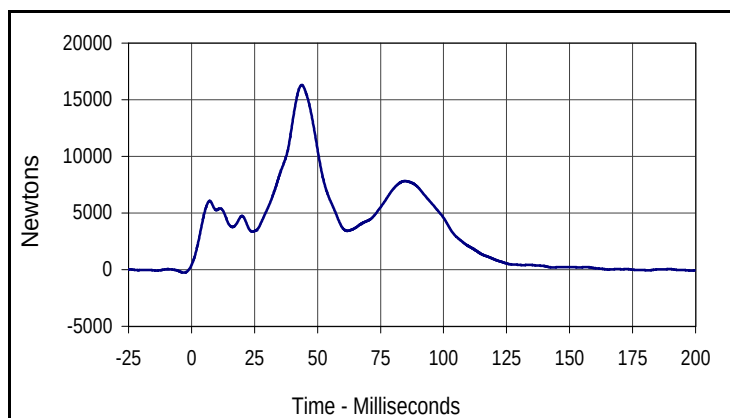
Curve Description			
Barrier Force D4			
CURNO	Type	SAE Class	Units
211	FIL	60	Newtons
Max	Time	Min	Time
6258.1	41.6	-43.0	0.0

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

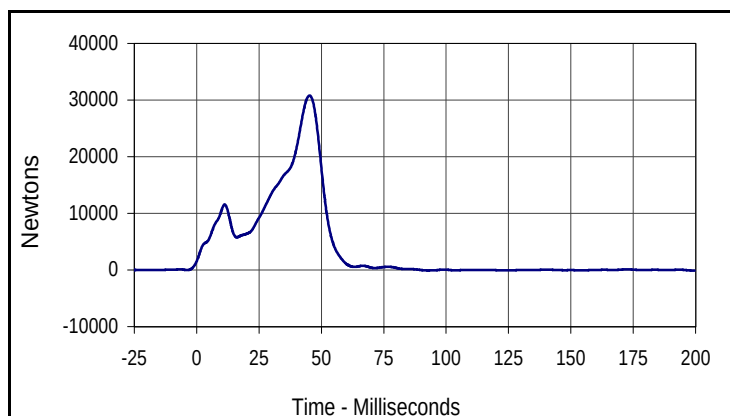
Test Date: 9/9/04
 NHTSA No.: R40401



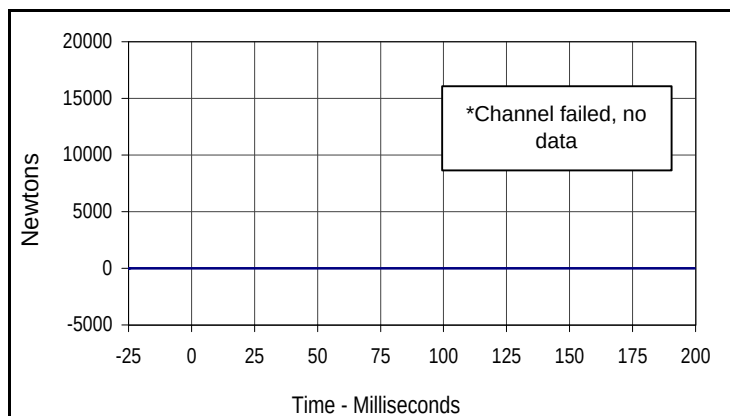
Curve Description			
Barrier Force A5			
CURNO	Type	SAE Class	Units
185	FIL	60	Newtons
Max	Time	Min	Time
1919.8	20.6	-3169.4	16.3



Curve Description			
Barrier Force B5			
CURNO	Type	SAE Class	Units
194	FIL	60	Newtons
Max	Time	Min	Time
16309.3	43.7	-85.7	198.3



Curve Description			
Barrier Force C5			
CURNO	Type	SAE Class	Units
203	FIL	60	Newtons
Max	Time	Min	Time
30802.7	45.2	-110.9	199.7

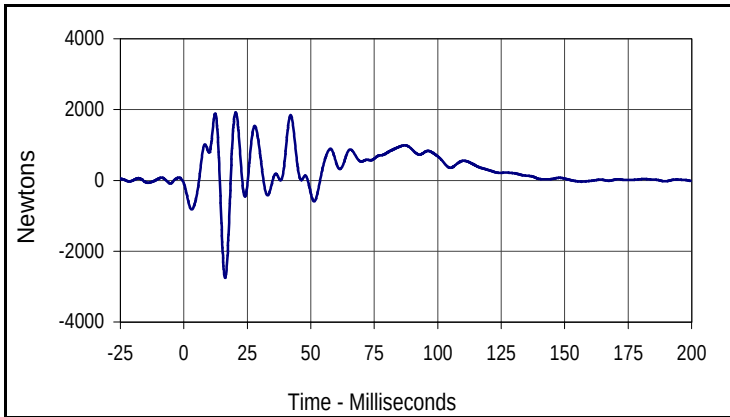


Curve Description			
Barrier Force D5			
CURNO	Type	SAE Class	Units
212	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

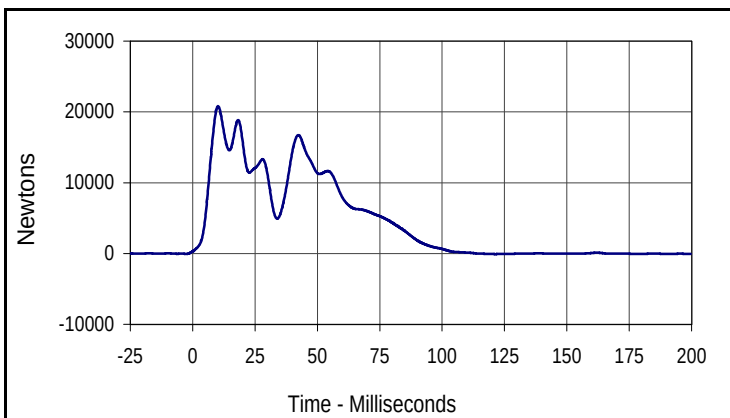
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Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

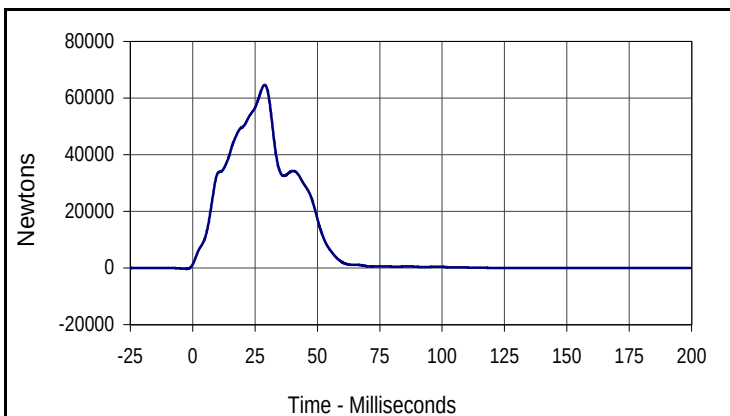
Test Date: 9/9/04
 NHTSA No.: R40401



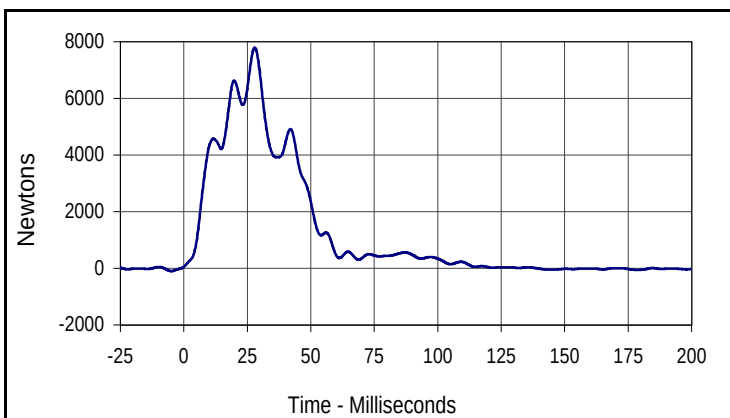
Curve Description			
Barrier Force A6			
CURNO	Type	SAE Class	Units
186	FIL	60	Newtons
Max	Time	Min	Time
1917.8	20.4	-2750.5	16.3



Curve Description			
Barrier Force B6			
CURNO	Type	SAE Class	Units
195	FIL	60	Newtons
Max	Time	Min	Time
20806.1	10.2	-80.6	121.4



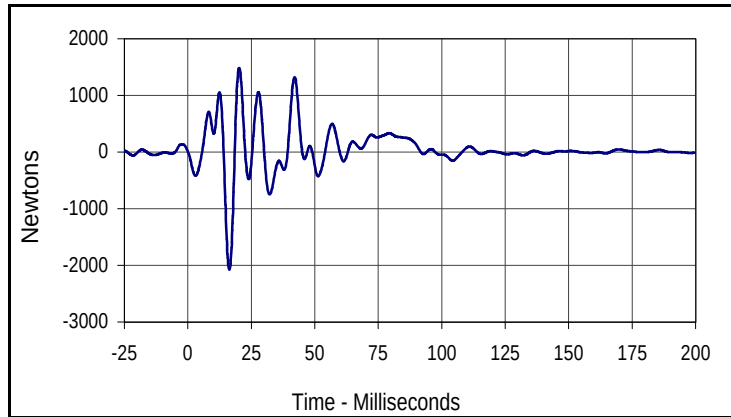
Curve Description			
Barrier Force C6			
CURNO	Type	SAE Class	Units
204	FIL	60	Newtons
Max	Time	Min	Time
64678.7	28.9	-31.5	153.6



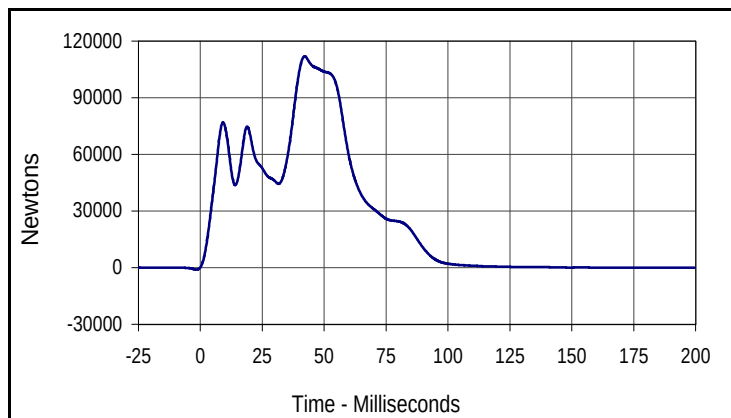
Curve Description			
Barrier Force D6			
CURNO	Type	SAE Class	Units
213	FIL	60	Newtons
Max	Time	Min	Time
7796.8	27.9	-53.7	178.2

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

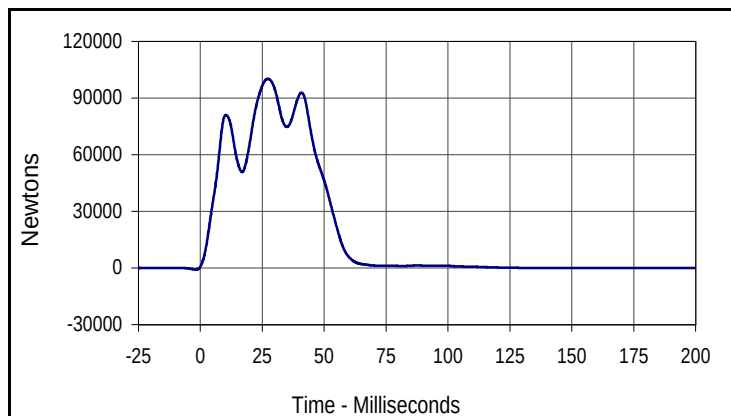
Test Date: 9/9/04
 NHTSA No.: R40401



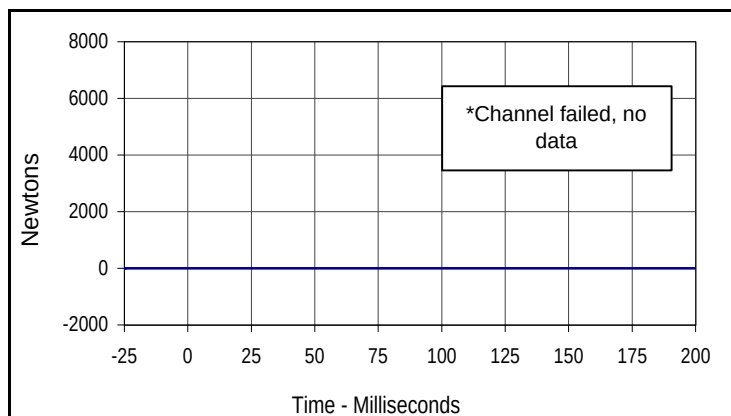
Curve Description			
Barrier Force A7			
CURNO	Type	SAE Class	Units
187	FIL	60	Newtons
Max	Time	Min	Time
1488.0	20.2	-2072.9	16.3



Curve Description			
Barrier Force B7			
CURNO	Type	SAE Class	Units
196	FIL	60	Newtons
Max	Time	Min	Time
111930.6	42.1	-58.3	197.7



Curve Description			
Barrier Force C7			
CURNO	Type	SAE Class	Units
205	FIL	60	Newtons
Max	Time	Min	Time
100216.7	27.3	-41.3	178.3

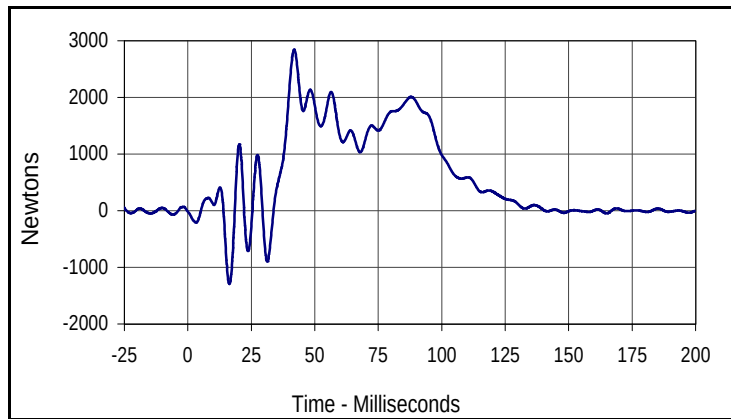


Curve Description			
Barrier Force D7			
CURNO	Type	SAE Class	Units
214	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

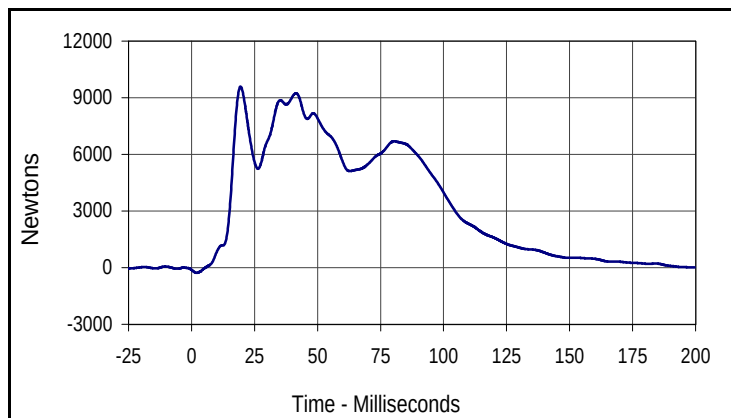
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Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

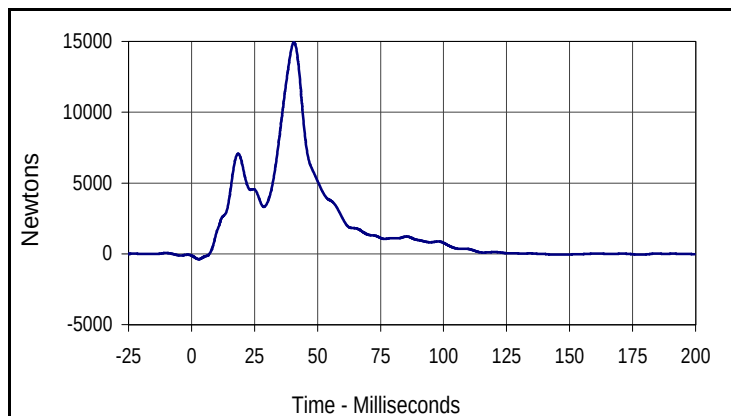
Test Date: 9/9/04
 NHTSA No.: R40401



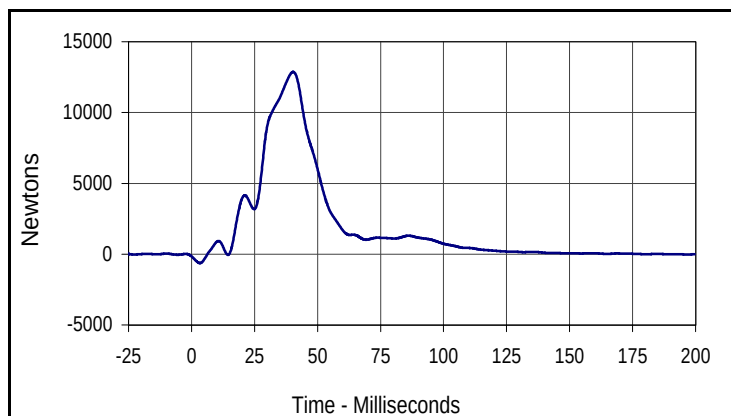
Curve Description			
Barrier Force A8			
CURNO	Type	SAE Class	Units
188	FIL	60	Newtons
Max	Time	Min	Time
2841.9	41.9	-1294.6	16.4



Curve Description			
Barrier Force B8			
CURNO	Type	SAE Class	Units
197	FIL	60	Newtons
Max	Time	Min	Time
9594.3	19.4	-268.9	2.1



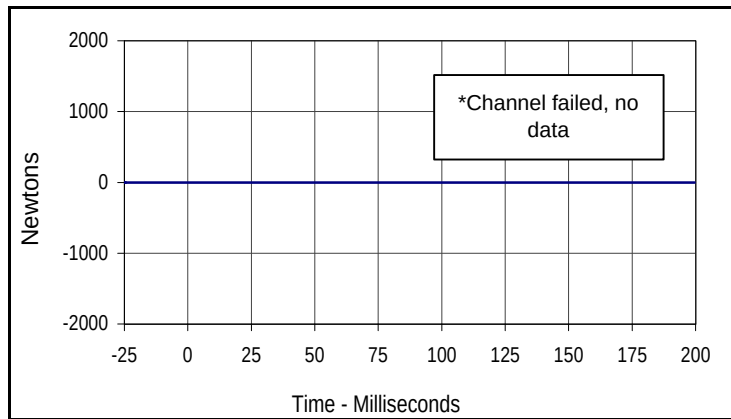
Curve Description			
Barrier Force C8			
CURNO	Type	SAE Class	Units
206	FIL	60	Newtons
Max	Time	Min	Time
14923.1	40.6	-381.8	2.9



Curve Description			
Barrier Force D8			
CURNO	Type	SAE Class	Units
215	FIL	60	Newtons
Max	Time	Min	Time
12868.5	40.3	-628.8	3.3

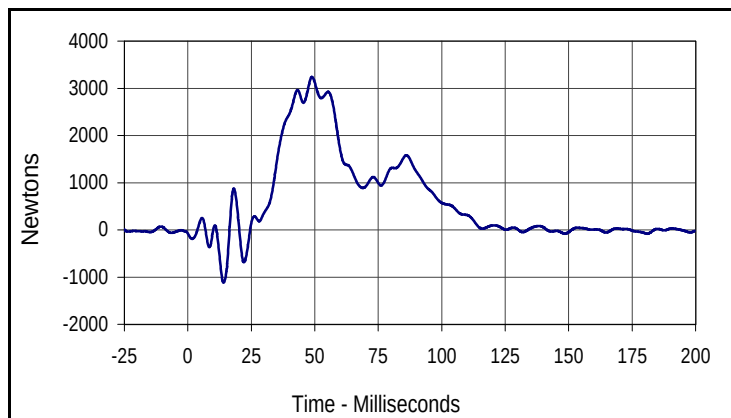
Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401

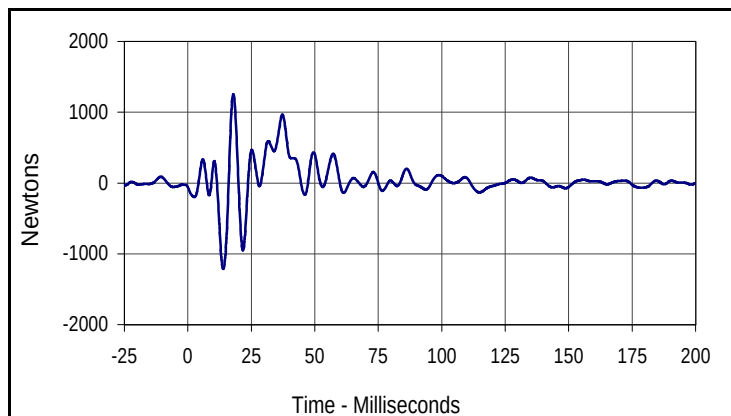


Curve Description			
Barrier Force A9			
CURNO	Type	SAE Class	Units
189	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

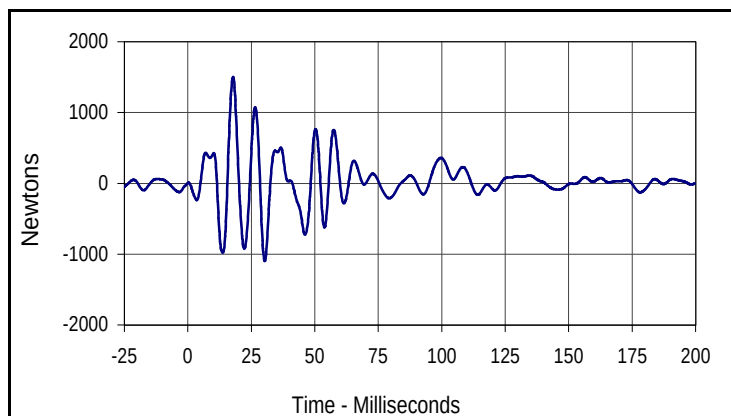
* Channel failed, no data



Curve Description			
Barrier Force B9			
CURNO	Type	SAE Class	Units
198	FIL	60	Newtons
Max	Time	Min	Time
3238.7	48.9	-1116.0	14.1



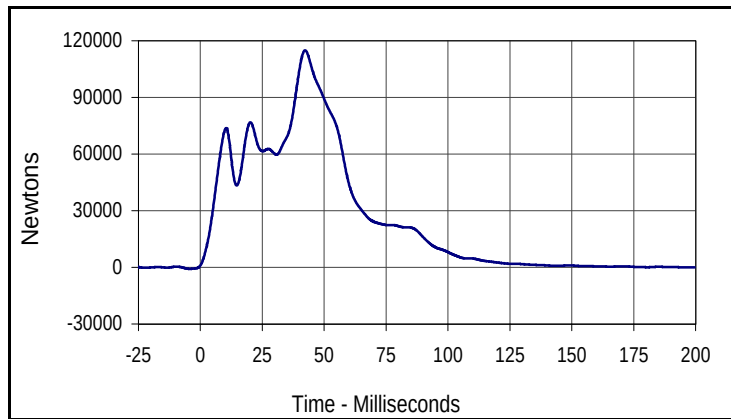
Curve Description			
Barrier Force C9			
CURNO	Type	SAE Class	Units
207	FIL	60	Newtons
Max	Time	Min	Time
1254.4	17.9	-1211.9	13.9



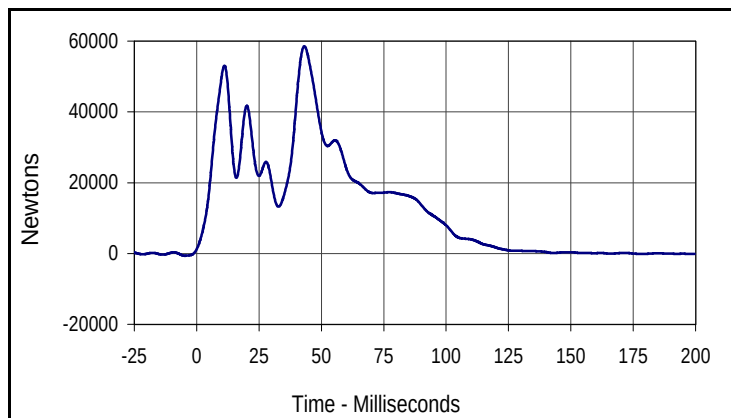
Curve Description			
Barrier Force D9			
CURNO	Type	SAE Class	Units
216	FIL	60	Newtons
Max	Time	Min	Time
1502.9	17.8	-1096.4	30.3

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

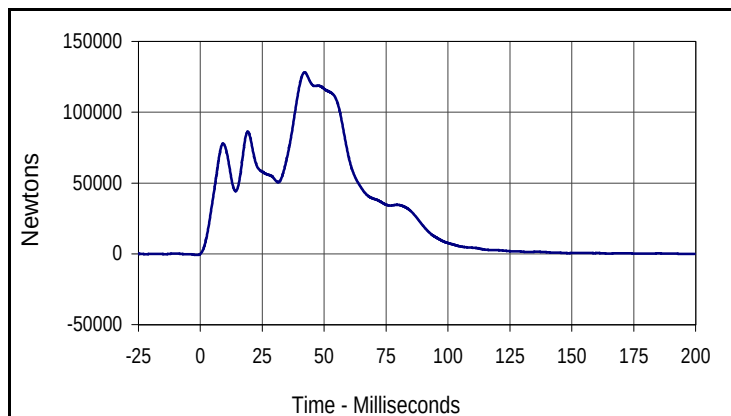
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Barrier Force Sum Group 1			
CURNO	Type	SAE Class	Units
001	SUM	60	Newtons
Max	Time	Min	Time
114943.3	42.3	-29.5	196.9



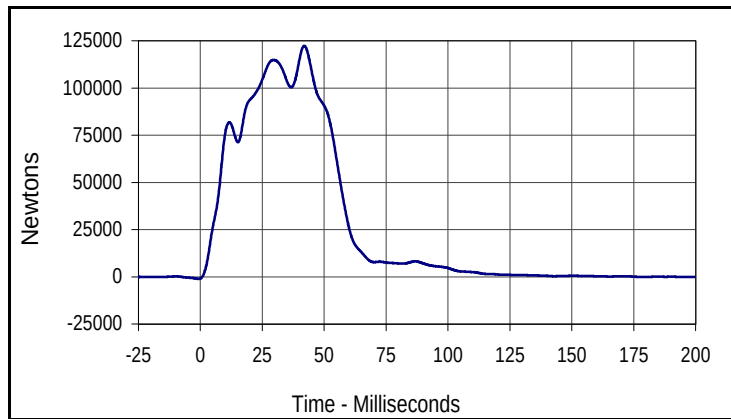
Curve Description			
Barrier Force Sum Group 2			
CURNO	Type	SAE Class	Units
002	SUM	60	Newtons
Max	Time	Min	Time
58560.6	43.2	-148.2	198.1



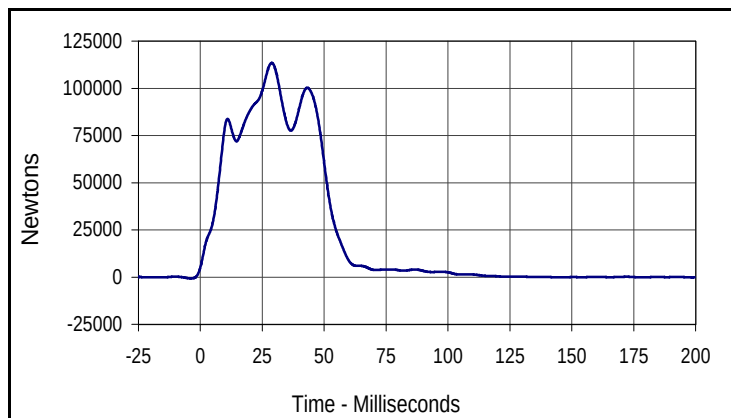
Curve Description			
Barrier Force Sum Group 3			
CURNO	Type	SAE Class	Units
003	SUM	60	Newtons
Max	Time	Min	Time
128105.1	42.1	-142.4	197.8

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

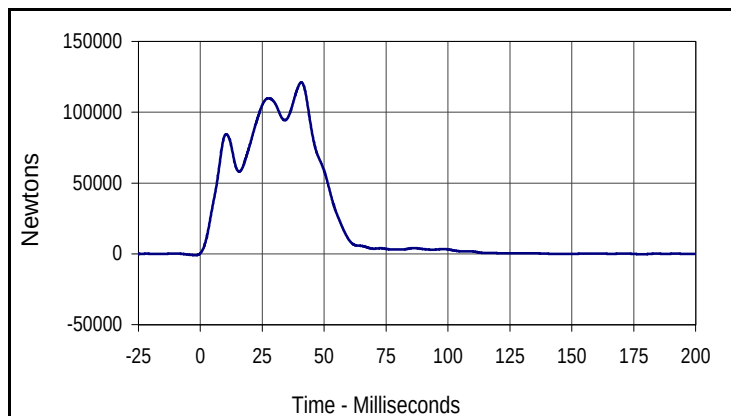
Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Barrier Force Sum Group 4			
CURNO	Type	SAE Class	Units
004	SUM	60	Newtons
Max	Time	Min	Time
122343.0	42.0	-893.0	0.0



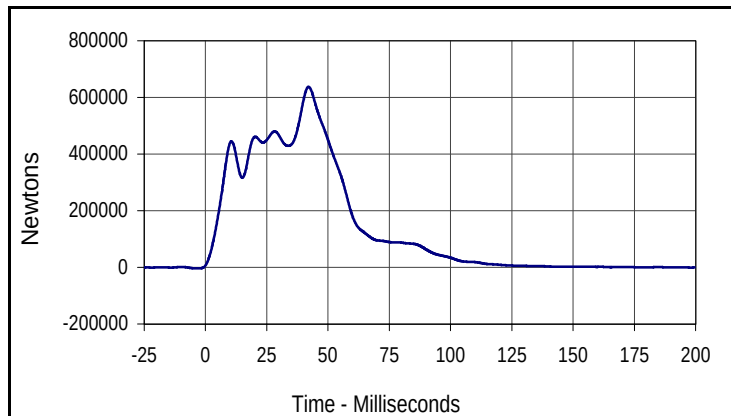
Curve Description			
Barrier Force Sum Group 5			
CURNO	Type	SAE Class	Units
005	SUM	60	Newtons
Max	Time	Min	Time
113427.2	28.8	-173.5	198.6



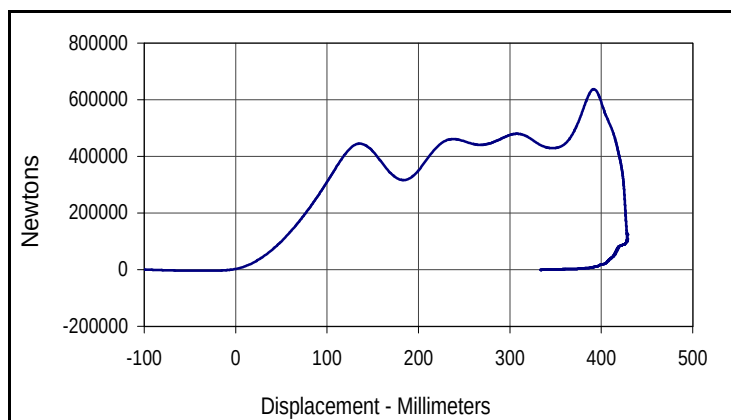
Curve Description			
Barrier Force Sum Group 6			
CURNO	Type	SAE Class	Units
006	SUM	60	Newtons
Max	Time	Min	Time
121051.0	40.8	-283.0	178.2

Test Vehicle: 2004 Jeep Liberty 4-Door MPV
 Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04
 NHTSA No.: R40401



Curve Description			
Barrier Force Total Sum			
CURNO	Type	SAE Class	Units
007	SUM	60	Newtons
Max	Time	Min	Time
637416.3	42.1	-661.3	198.1



Curve Description			
Barrier Force Total Sum vs. Displ.			
CURNO	Type	SAE Class	Units
001	XVY	60	Newtons
Max	MM	Min	MM
637416.3	391.9	-661.3	334.3

BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2004 Jeep Liberty 4-Door MPV

NHTSA No.: R40401

Test Program: 2004 FMVSS 208 Upgrade

Test Date: 9/9/04

Location	Units	Max	Time	Min	Time
Barrier Force A1	Newtons	2019.4	42.3	-1787.6	16.7
Barrier Force A2	Newtons	2019.4	42.3	-1787.6	16.7
Barrier Force A3	Newtons	1782.8	20.9	-2292.0	16.9
Barrier Force A4	Newtons	2286.0	42.1	-1614.5	16.6
Barrier Force A5	Newtons	1919.8	20.6	-3169.4	16.3
Barrier Force A6	Newtons	1917.8	20.4	-2750.5	16.3
Barrier Force A7	Newtons	1488.0	20.2	-2072.9	16.3
Barrier Force A8	Newtons	2841.9	41.9	-1294.6	16.4
Barrier Force A9	Newtons	0.0	0.0	0.0	0.0
Barrier Force B1	Newtons	5951.7	40.8	-250.8	2.3
Barrier Force B2	Newtons	9717.1	22.0	-1117.1	14.5
Barrier Force B3	Newtons	95316.7	42.5	19.8	194.2
Barrier Force B4	Newtons	24610.8	11.1	-52.9	141.8
Barrier Force B5	Newtons	16309.3	43.7	-85.7	198.3
Barrier Force B6	Newtons	20806.1	10.2	-80.6	121.4
Barrier Force B7	Newtons	111930.6	42.1	-58.3	197.7
Barrier Force B8	Newtons	9594.3	19.4	-268.9	2.1
Barrier Force B9	Newtons	3238.7	48.9	-1116.0	14.1
Barrier Force C1	Newtons	717.9	19.1	-1151.9	15.2
Barrier Force C2	Newtons	16610.3	40.7	-1080.5	3.3
Barrier Force C3	Newtons	95796.8	30.5	-33.1	141.2
Barrier Force C4	Newtons	29951.9	10.8	-30.4	136.3
Barrier Force C5	Newtons	30802.7	45.2	-110.9	199.7
Barrier Force C6	Newtons	64678.7	28.9	-31.5	153.6
Barrier Force C7	Newtons	100216.7	27.3	-41.3	178.3
Barrier Force C8	Newtons	14923.1	40.6	-381.8	2.9
Barrier Force C9	Newtons	1254.4	17.9	-1211.9	13.9
Barrier Force D1	Newtons	835.5	27.0	-1013.7	15.3
Barrier Force D2	Newtons	12906.9	40.7	-795.0	3.0
Barrier Force D3	Newtons	5716.3	36.6	-1105.9	14.6
Barrier Force D4	Newtons	6258.1	41.6	-43.0	0.0
Barrier Force D5	Newtons	0.0	0.0	0.0	0.0
Barrier Force D6	Newtons	7796.8	27.9	-53.7	178.2
Barrier Force D7	Newtons	0.0	0.0	0.0	0.0
Barrier Force D8	Newtons	12868.5	40.3	-628.8	3.3
Barrier Force D9	Newtons	1502.9	17.8	-1096.4	30.3
Barrier Force Sum Group 1	Newtons	114943.3	42.3	-29.5	196.9
Barrier Force Sum Group 2	Newtons	58560.6	43.2	-148.2	198.1
Barrier Force Sum Group 3	Newtons	128105.1	42.1	-142.4	197.8
Barrier Force Sum Group 4	Newtons	122343.0	42.0	-893.0	0.0
Barrier Force Sum Group 5	Newtons	113427.2	28.8	-173.5	198.6
Barrier Force Sum Group 6	Newtons	121051.0	40.8	-283.0	178.2
Barrier Force Total Sum	Newtons	637416.3	42.1	-661.3	198.1

1.) Channels failed, no data

APPENDIX D

INSTRUMENTATION AND DATA CHANNEL ASSIGNMENTS

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 043
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC039X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
2	HEAD, PRIMARY	Y	KEAC038Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
3	HEAD, PRIMARY	Z	KEAC027Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
4	NAAH CG	X	GPAC038X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
5	NAAH CG	Y	GPAC039Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
6	NAAH CG	Z	GPAC040Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
7	NAAH X-ARM	Y	GPAC018Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
8	NAAH X-ARM	Z	GPAC004X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
9	NAAH Y-ARM	X	GPAC015X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
10	NAAH Y-ARM	Z	GPAC016Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
11	NAAH Z-ARM	X	GPAC006Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
12	NAAH Z-ARM	Y	GPAC007Z	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
14	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
15	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
16	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
17	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
18	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
19	CHEST, PRIMARY	X	KEAC032X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
20	CHEST, PRIMARY	Y	GPAC017Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
21	CHEST, PRIMARY	Z	KEAC026Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
22	CHEST, REDUNDANT	X	KEAC023X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
23	CHEST, REDUNDANT	Y	KEAC022Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
24	CHEST, REDUNDANT	Z	KEAC024Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 043
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	CHEST DISPLACEMENT	X	V043CD	Rotary Pot Chest	SERVO	84892-A	MM
26	LEFT FEMUR FORCE	Z	V043LF	Load cell, Femur	R.A. Denton	IF625	N
27	RIGHT FEMUR FORCE	Z	V043RF	Load cell, Femur	R.A. Denton	IF625	N
28	LEFT KNEE DISPLACEMENT	Z	VPL043LK	Displacement pot, Knee	Space Age	150-0121	MM
29	RIGHT KNEE DISPLACEMENT	Z	VPL043RK	Displacement pot, Knee	Space Age	150-0121	MM
30	LEFT TIBIA	X	VLTX	Accel., 1/2 bridge	Endevco	7264-2000	G
31	LEFT TIBIA	Y	VLTY	Accel., 1/2 bridge	Endevco	7264-2000	G
32	LEFT FOOT	X	VLFX	Accel., 1/2 bridge	Endevco	7264-2000	G
33	LEFT FOOT	Y	VLFY	Accel., 1/2 bridge	Endevco	7264-200	G
34	LEFT FOOT	Z	VLFZ	Accel., 1/2 bridge	Endevco	7264-200	G
35	LEFT UPPER TIBIA FORCE	X	VLUTFX	Load cell, Tibia	R. A. Denton	4353J	N
36	LEFT UPPER TIBIA FORCE	Z	VLUTFZ	Load cell, Tibia	R. A. Denton	4353J	N
37	LEFT UPPER TIBIA MOMENT	X	VLUTMX	Load cell, Tibia	R. A. Denton	4353J	Nm
38	LEFT UPPER TIBIA MOMENT	Y	VLUTMY	Load cell, Tibia	R. A. Denton	4353J	Nm
39	LEFT LOWER TIBIA FORCE	X	VLLTFX	Load cell, Tibia	R. A. Denton	4929J	N
40	LEFT LOWER TIBIA FORCE	Y	VLLTFY	Load cell, Tibia	R. A. Denton	4929J	N
41	LEFT LOWER TIBIA FORCE	Z	VLLTFZ	Load cell, Tibia	R. A. Denton	4929J	N
42	LEFT LOWER TIBIA MOMENT	X	VLLTMX	Load cell, Tibia	R. A. Denton	4929J	Nm
43	LEFT LOWER TIBIA MOMENT	Y	VLLTMY	Load cell, Tibia	R. A. Denton	4929J	Nm
44	LEFT ANKLE ROTATION	X	VLANKX	Rotary Potentiometer	Contelec	PD210-4B	Deg
45	LEFT ANKLE ROTATION	Y	VLANKY	Rotary Potentiometer	Contelec	PD210-4B	Deg
46	LEFT ANKLE ROTATION	Z	VLANKZ	Rotary Potentiometer	Contelec	PD210-4B	Deg

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 043
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
47	RIGHT TIBIA	X	VRTX	Accel., 1/2 bridge	Endevco	7264-2000	G
48	RIGHT TIBIA	Y	VRTY	Accel., 1/2 bridge	Endevco	7264-2000	G
49	RIGHT FOOT	X	VRFX	Accel., 1/2 bridge	Endevco	7264-2000	G
50	RIGHT FOOT	Y	VRFY	Accel., 1/2 bridge	Endevco	7264-200	G
51	RIGHT FOOT	Z	VRFZ	Accel., 1/2 bridge	Endevco	7264-200	G
52	RIGHT UPPER TIBIA FORCE	X	VRUTFX	Load cell, Tibia	R. A. Denton	4353J	N
53	RIGHT UPPER TIBIA FORCE	Z	VRUTFZ	Load cell, Tibia	R. A. Denton	4353J	N
54	RIGHT UPPER TIBIA MOMENT	X	VRUTMX	Load cell, Tibia	R. A. Denton	4353J	Nm
55	RIGHT UPPER TIBIA MOMENT	Y	VRUTMY	Load cell, Tibia	R. A. Denton	4353J	Nm
56	RIGHT LOWER TIBIA FORCE	X	VRLTFX	Load cell, Tibia	R. A. Denton	4929J	N
57	RIGHT LOWER TIBIA FORCE	Y	VRLTFY	Load cell, Tibia	R. A. Denton	4929J	N
58	RIGHT LOWER TIBIA FORCE	Z	VRLTFZ	Load cell, Tibia	R. A. Denton	4929J	N
59	RIGHT LOWER TIBIA MOMENT	X	VRLTMX	Load cell, Tibia	R. A. Denton	4929J	Nm
60	RIGHT LOWER TIBIA MOMENT	Y	VRLTMY	Load cell, Tibia	R. A. Denton	4929J	Nm
61	RIGHT ANKLE ROTATION	X	VRANKX	Rotary Potentiometer	Contelec	PD210-4B	Deg
62	RIGHT ANKLE ROTATION	Y	VRANKY	Rotary Potentiometer	Contelec	PD210-4B	Deg
63	RIGHT ANKLE ROTATION	Z	VRANKZ	Rotary Potentiometer	Contelec	PD210-4B	Deg
64	LAP BELT FORCE	X	BL134	Load cell, Seat belt	First Tech	IF-964	N
65	SHOULDER BELT FORCE	X	BL135	Load cell, Seat belt	First Tech	IF-964	N
66	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 045
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
67	HEAD, PRIMARY	X	KEAC083X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
68	HEAD, PRIMARY	Y	KEAC084Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
69	HEAD, PRIMARY	Z	KEAC085Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
70	NAAH CG	X	GPAC044X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
71	NAAH CG	Y	GPAC045Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
72	NAAH CG	Z	GPAC046Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
73	NAAH X-ARM	Y	GPAC014Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
74	NAAH X-ARM	Z	GPAC036X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
75	NAAH Y-ARM	X	GPAC001X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
76	NAAH Y-ARM	Z	GPAC012Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
77	NAAH Z-ARM	X	GPAC030Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
78	NAAH Z-ARM	Y	GPAC037Z	Load cell, six axis neck	R. A. Denton	1716A	Nm
79	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
80	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
81	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
82	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
83	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
84	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
85	CHEST, PRIMARY	X	GPAC011Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
86	CHEST, PRIMARY	Y	GPAC010Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
87	CHEST, PRIMARY	Z	GPAC034X	Accel.,Full bridge	Entran	EGEB6Q-2K	G
88	CHEST, REDUNDANT	X	GPAC020Z	Accel.,Full bridge	Entran	EGEB6Q-2K	G
89	CHEST, REDUNDANT	Y	GPAC027Y	Accel.,Full bridge	Entran	EGEB6Q-2K	G
90	CHEST, REDUNDANT	Z	GPAC005X	Accel.,Full bridge	Entran	EGEB6Q-2K	G

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 045
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
91	CHEST DISPLACEMENT	X	V045CD	Rotary Pot Chest	SERVO	84892-A	MM
92	LEFT FEMUR FORCE	Z	V045LF	Load cell, Femur	R.A. Denton	IF625	N
93	RIGHT FEMUR FORCE	Z	V045RF	Load cell, Femur	R.A. Denton	IF625	N
94	LEFT KNEE DISPLACEMENT	Z	VPL045LK	Displacement pot, Knee	Space Age	150-0121	MM
95	RIGHT KNEE DISPLACEMENT	Z	VPL045RK	Displacement pot, Knee	Space Age	150-0121	MM
96	LEFT TIBIA	X	VLTX	Accel., 1/2 bridge	Endevco	7264-2000	G
97	LEFT TIBIA	Y	VLTY	Accel., 1/2 bridge	Endevco	7264-2000	G
98	LEFT FOOT	X	VLFX	Accel., 1/2 bridge	Endevco	7264-2000	G
99	LEFT FOOT	Y	VLFY	Accel., 1/2 bridge	Endevco	7264-200	G
100	LEFT FOOT	Z	VLFZ	Accel., 1/2 bridge	Endevco	7264-200	G
101	LEFT UPPER TIBIA FORCE	X	VLUTFX	Load cell, Tibia	R. A. Denton	4353J	N
102	LEFT UPPER TIBIA FORCE	Z	VLUTFZ	Load cell, Tibia	R. A. Denton	4353J	N
103	LEFT UPPER TIBIA MOMENT	X	VLUTMX	Load cell, Tibia	R. A. Denton	4353J	Nm
104	LEFT UPPER TIBIA MOMENT	Y	VLUTMY	Load cell, Tibia	R. A. Denton	4353J	Nm
105	LEFT LOWER TIBIA FORCE	X	VLLTFX	Load cell, Tibia	R. A. Denton	4929J	N
106	LEFT LOWER TIBIA FORCE	Y	VLLTFY	Load cell, Tibia	R. A. Denton	4929J	N
107	LEFT LOWER TIBIA FORCE	Z	VLLTFZ	Load cell, Tibia	R. A. Denton	4929J	N
108	LEFT LOWER TIBIA MOMENT	X	VLLTMX	Load cell, Tibia	R. A. Denton	4929J	Nm
109	LEFT LOWER TIBIA MOMENT	Y	VLLTMY	Load cell, Tibia	R. A. Denton	4929J	Nm
110	LEFT ANKLE ROTATION	X	VLANKX	Rotary Potentiometer	Contelec	PD210-4B	Deg
111	LEFT ANKLE ROTATION	Y	VLANKY	Rotary Potentiometer	Contelec	PD210-4B	Deg
112	LEFT ANKLE ROTATION	Z	VLANKZ	Rotary Potentiometer	Contelec	PD210-4B	Deg

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 045
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
113	RIGHT TIBIA	X	VRTX	Accel., 1/2 bridge	Endevco	7264-2000	G
114	RIGHT TIBIA	Y	VRTY	Accel., 1/2 bridge	Endevco	7264-2000	G
115	RIGHT FOOT	X	VRFX	Accel., 1/2 bridge	Endevco	7264-2000	G
116	RIGHT FOOT	Y	VRFY	Accel., 1/2 bridge	Endevco	7264-200	G
117	RIGHT FOOT	Z	VRFZ	Accel., 1/2 bridge	Endevco	7264-200	G
118	RIGHT UPPER TIBIA FORCE	X	VRUTFX	Load cell, Tibia	R. A. Denton	4353J	N
119	RIGHT UPPER TIBIA FORCE	Z	VRUTFZ	Load cell, Tibia	R. A. Denton	4353J	N
120	RIGHT UPPER TIBIA MOMENT	X	VRUTMX	Load cell, Tibia	R. A. Denton	4353J	Nm
121	RIGHT UPPER TIBIA MOMENT	Y	VRUTMY	Load cell, Tibia	R. A. Denton	4353J	Nm
122	RIGHT LOWER TIBIA FORCE	X	VRLTFX	Load cell, Tibia	R. A. Denton	4929J	N
123	RIGHT LOWER TIBIA FORCE	Y	VRLTFY	Load cell, Tibia	R. A. Denton	4929J	N
124	RIGHT LOWER TIBIA FORCE	Z	VRLTFZ	Load cell, Tibia	R. A. Denton	4929J	N
125	RIGHT LOWER TIBIA MOMENT	X	VRLTMX	Load cell, Tibia	R. A. Denton	4929J	Nm
126	RIGHT LOWER TIBIA MOMENT	Y	VRLTMY	Load cell, Tibia	R. A. Denton	4929J	Nm
127	RIGHT ANKLE ROTATION	X	VRANKX	Rotary Potentiometer	Contelec	PD210-4B	Deg
128	RIGHT ANKLE ROTATION	Y	VRANKY	Rotary Potentiometer	Contelec	PD210-4B	Deg
129	RIGHT ANKLE ROTATION	Z	VRANKZ	Rotary Potentiometer	Contelec	PD210-4B	Deg
130	LAP BELT FORCE	X	BL136	Load cell, Seat belt	First Tech	IF-964	N
131	SHOULDER BELT FORCE	X	BL137	Load cell, Seat belt	First Tech	IF-964	N
132	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Center Rear Passenger A.T.D. Serial Number 055
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
133	HEAD, PRIMARY	X	V055HX	Accel.,Full bridge	Entran	EGEB6Q-2K	G
134	HEAD, PRIMARY	Y	V055HY	Accel.,Full bridge	Entran	EGEB6Q-2K	G
135	HEAD, PRIMARY	Z	V055HZ	Accel.,Full bridge	Entran	EGEB6Q-2K	G
136	NAAH CG	X	V055NHX	Accel.,Full bridge	Entran	EGEB6Q-2K	G
137	NAAH CG	Y	V055NHY	Accel.,Full bridge	Entran	EGEB6Q-2K	G
138	NAAH CG	Z	V055NHZ	Accel.,Full bridge	Entran	EGEB6Q-2K	G
139	NAAH X-ARM	Y	V055NXY	Accel.,Full bridge	Entran	EGEB6Q-2K	G
140	NAAH X-ARM	Z	V055NXZ	Accel.,Full bridge	Entran	EGEB6Q-2K	G
141	NAAH Y-ARM	X	V055NYX	Accel.,Full bridge	Entran	EGEB6Q-2K	G
142	NAAH Y-ARM	Z	V055NYZ	Accel.,Full bridge	Entran	EGEB6Q-2K	G
143	NAAH Z-ARM	X	V055NZX	Accel.,Full bridge	Entran	EGEB6Q-2K	G
144	NAAH Z-ARM	Y	V055NZY	Load cell, six axis neck	R. A. Denton	1716A	Nm
145	NECK FORCE	X	V055NFX	Load cell, six axis neck	R. A. Denton	1716A	N
146	NECK FORCE	Y	V055NFY	Load cell, six axis neck	R. A. Denton	1716A	N
147	NECK FORCE	Z	V055NFZ	Load cell, six axis neck	R. A. Denton	1716A	N
148	NECK MOMENT	X	V055NMX	Load cell, six axis neck	R. A. Denton	1716A	Nm
149	NECK MOMENT	Y	V055NMY	Load cell, six axis neck	R. A. Denton	1716A	Nm
150	NECK MOMENT	Z	V055NMZ	Load cell, six axis neck	R. A. Denton	1716A	Nm

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Center Rear Passenger A.T.D. Serial Number 055
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
151	CHEST, PRIMARY	X	V055CX	Accel., Full bridge	Entran	EGEB6Q-2K	G
152	CHEST, PRIMARY	Y	V055CY	Accel., Full bridge	Entran	EGEB6Q-2K	G
153	CHEST, PRIMARY	Z	V055CZ	Accel., Full bridge	Entran	EGEB6Q-2K	G
154	CHEST DISPLACEMENT	X	V055CD	Rotary Pot Chest	Maurey	81422	MM
155	LEFT FEMUR FORCE	Z	V055LF	Load cell, Femur	R.A. Denton	2121	N
156	RIGHT FEMUR FORCE	Z	V055RF	Load cell, Femur	R.A. Denton	2121	N
157	LEFT KNEE DISPLACEMENT	Z	VPL055LK	Displacement pot, Knee	Space age	150-0121	MM
158	RIGHT KNEE DISPLACEMENT	Z	VPL055RK	Displacement pot, Knee	Space Age	150-0121	MM
159	LAP BELT FORCE	X	BL172	Load cell, Seat belt	First Tech	IF-964	N
160	SHOULDER BELT FORCE	X	BL173	Load cell, Seat belt	First Tech	IF-964	N
161	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Vehicle Accelerometers and Firing Circuits
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
162	LEFT REAR	X	KEVA002	Accel., Vehicle block	I.C. Sensor	3031-500	G
163	RIGHT REAR	X	KEVA004	Accel., Vehicle block	I.C. Sensor	3031-200	G
164	LEFT BRAKE CALIPER	X	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G
165	RIGHT BRAKE CALIPER	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-500	G
166	INSTRUMENT PANEL	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-500	G
167	ENGINE TOP	X	KEVA018	Accel., Vehicle block	I.C. Sensor	3031-500	G
168	ENGINE BOTTOM	X	KEVA008	Accel., Vehicle block	I.C. Sensor	3031-200	G
174	REAR CENTER COMPARTMENT	X	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G
169	TOE PAN ACCELERATOR	X	KETX006	Accel., Vehicle block	I.C. Sensor	3031-500	G
170	TOE PAN ACCELERATOR	Z	KETX006	Accel., Vehicle block	I.C. Sensor	3031-200	G
171	TOE PAN FOOTREST	X	KETX005	Accel., Vehicle block	I.C. Sensor	3031-500	G
172	TOE PAN FOOTREST	Z	KETX005	Accel., Vehicle block	I.C. Sensor	3031-200	G
173	REAR DECK	Z	KEVA020	Accel., Vehicle block	I.C. Sensor	3031-500	G
175	DRVR ABG SQUIB 1st Stage	N/A	SQUIB1	Squib Firing Sensor	EEURD	CTL-6-S32-8F	On/Off
176	DRVR ABG SQUIB 2nd Stage	N/A	SQUIB2	Squib Firing Sensor	EEURD	CTL-6-S32-8F	On/Off
177	DRVR PRETENSIONER	N/A	SQUIB3	Squib Firing Sensor	EEURD	CTL-6-S32-8F	On/Off
178	PASS ABG SQUIB 1st Stage	N/A	SQUIB4	Squib Firing Sensor	EEURD	CTL-6-S32-8F	On/Off
179	PASS ABG SQUIB 2nd Stage	N/A	SQUIB5	Squib Firing Sensor	EEURD	CTL-6-S32-8F	On/Off
180	PASS PRETENSIONER	N/A	SQUIB6	Squib Firing Sensor	EEURD	CTL-6-S32-8F	On/Off

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
181	BARRIER FORCE A1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
182	BARRIER FORCE A2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
183	BARRIER FORCE A3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
184	BARRIER FORCE A4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
185	BARRIER FORCE A5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
186	BARRIER FORCE A6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
187	BARRIER FORCE A7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
188	BARRIER FORCE A8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
189	BARRIER FORCE A9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
190	BARRIER FORCE B1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
191	BARRIER FORCE B2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
192	BARRIER FORCE B3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
193	BARRIER FORCE B4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
194	BARRIER FORCE B5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
195	BARRIER FORCE B6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
196	BARRIER FORCE B7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
197	BARRIER FORCE B8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
198	BARRIER FORCE B9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N

2004 FMVSS 208 Upgrade
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
9/9/04
2004 Jeep Liberty 4-Door MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
199	BARRIER FORCE C1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
200	BARRIER FORCE C2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
201	BARRIER FORCE C3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
202	BARRIER FORCE C4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
203	BARRIER FORCE C5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
204	BARRIER FORCE C6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
205	BARRIER FORCE C7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
206	BARRIER FORCE C8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
207	BARRIER FORCE C9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
208	BARRIER FORCE D1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
209	BARRIER FORCE D2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
210	BARRIER FORCE D3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
211	BARRIER FORCE D4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
212	BARRIER FORCE D5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
213	BARRIER FORCE D6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
214	BARRIER FORCE D7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
215	BARRIER FORCE D8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
216	BARRIER FORCE D9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N

APPENDIX E

DUMMY CALIBRATION DATA TRACES AND TABLES

Test Program: Hybrid III 50th Percentile Male Head Drop Test

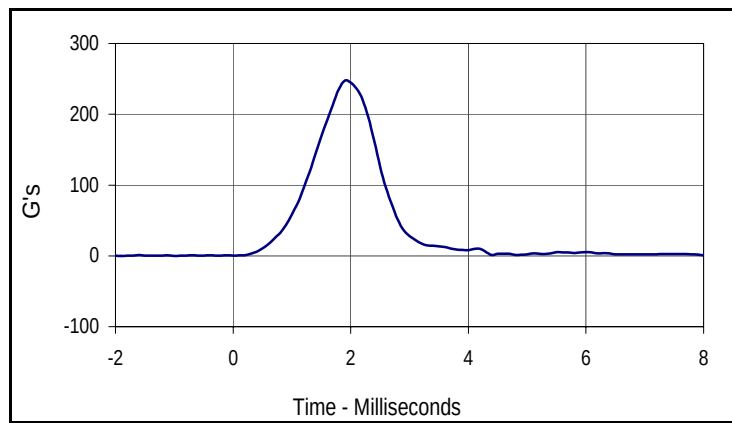
Test Date: 9/3/04

ATD Serial No.: 043

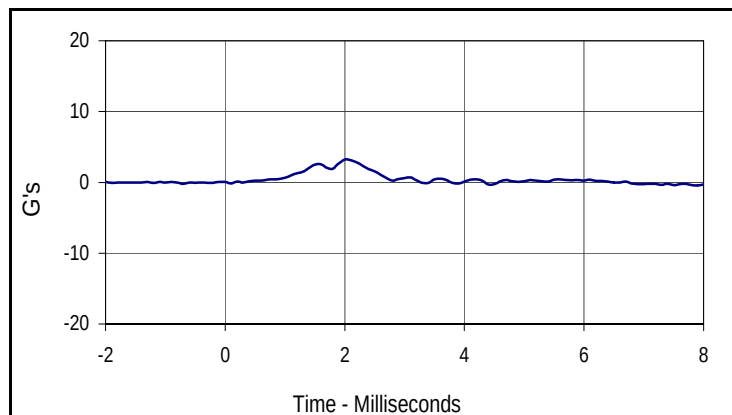
Test I.D.: HD10 F



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	247.4	Pass
Peak Lateral Acceleration	G's	≤15.0	3.2	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
247.4	1.9	0.1	-1.0



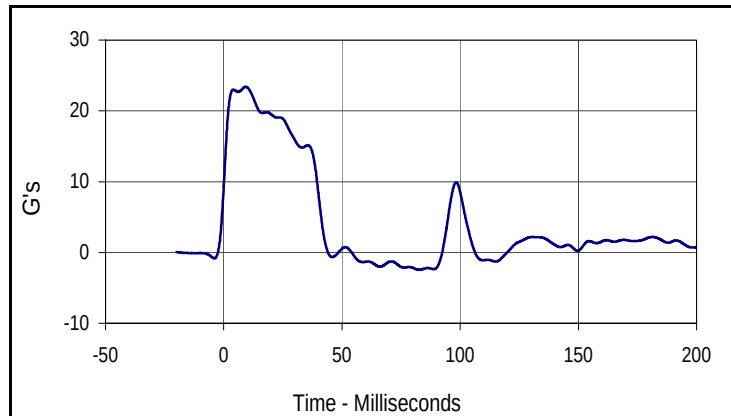
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.2	2.0	-0.3	4.4

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 043

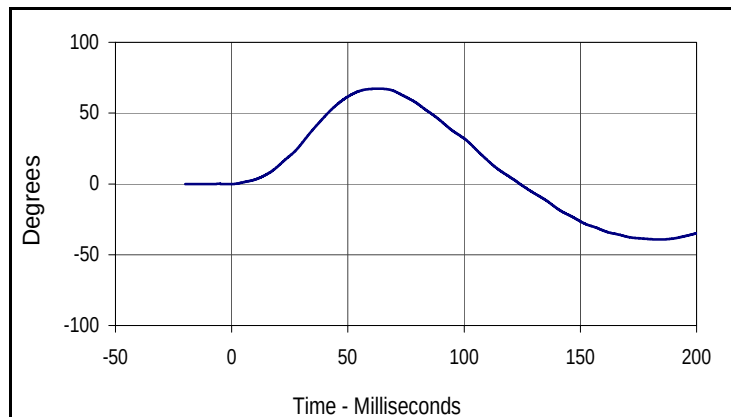
Test Date: 9/5/04
 Test I.D.: NF10J



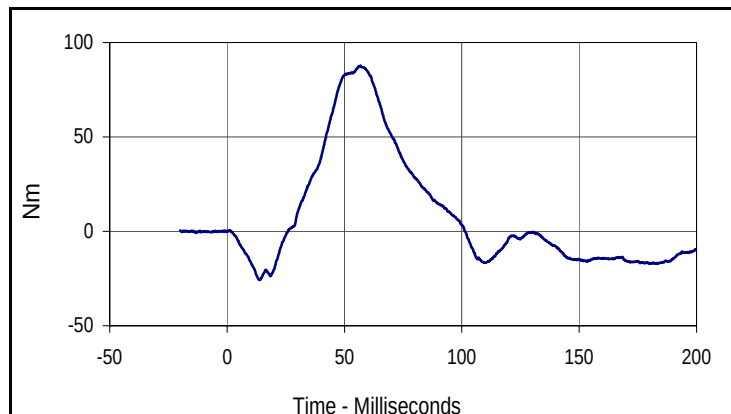
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.3	Pass
	20 Msec.	G's	17.6 to 22.6	19.5	Pass
	30 Msec.	G's	12.5 to 18.5	15.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	41.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	67.2	Pass
	Time	Msec.	57.0 to 64.0	63.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	124	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	87.8	Pass
	Time	Msec.	47.0 to 58.0	56.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	101.4	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.4	9.3	-2.4	82.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
67.2	63.3	-39.2	184.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.8	56.8	-25.7	13.9

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

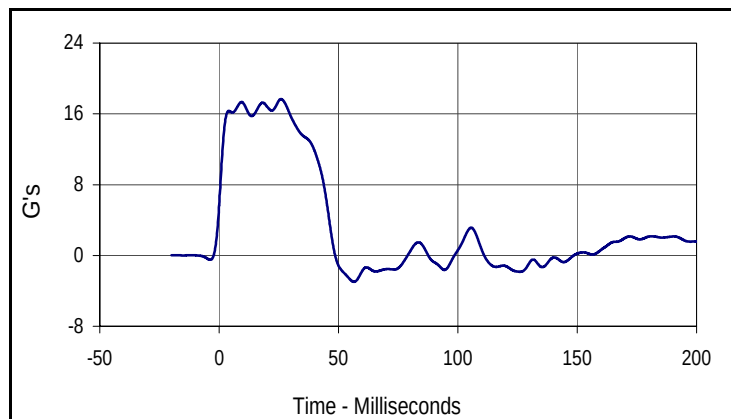
Test Date: 9/5/04

ATD Serial No.: 043

Test I.D.: NE10K



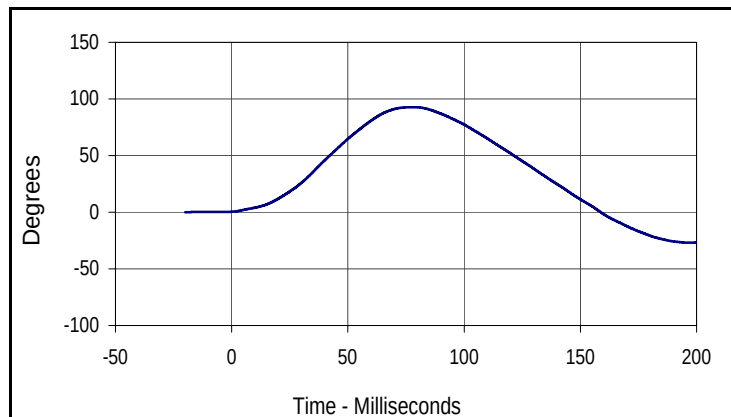
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.16	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.2	Pass
	20 Msec.	G's	14.0 to 19.0	16.9	Pass
	30 Msec.	G's	11.0 to 16.0	15.7	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.7	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	45.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	92.7	Pass
	Time	Msec.	72.0 to 82.0	78.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	158.8	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-71.3	Pass
	Time	Msec.	65.0 to 79.0	69.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	136.0	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

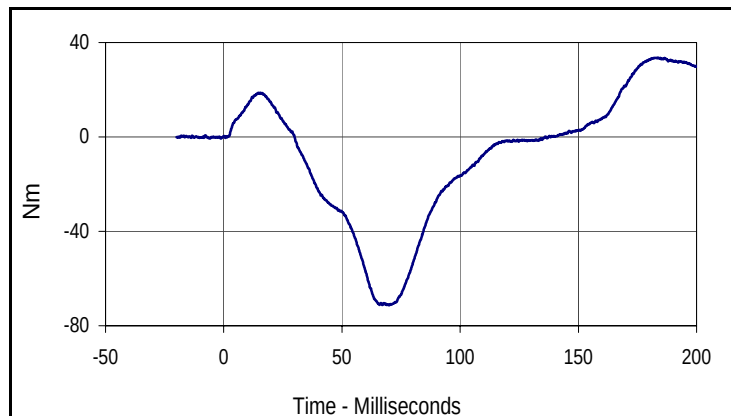
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.7	25.9	-3.0	56.5



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
92.7	78.7	-26.9	198.3



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
33.6	183.8	-71.3	69.9

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

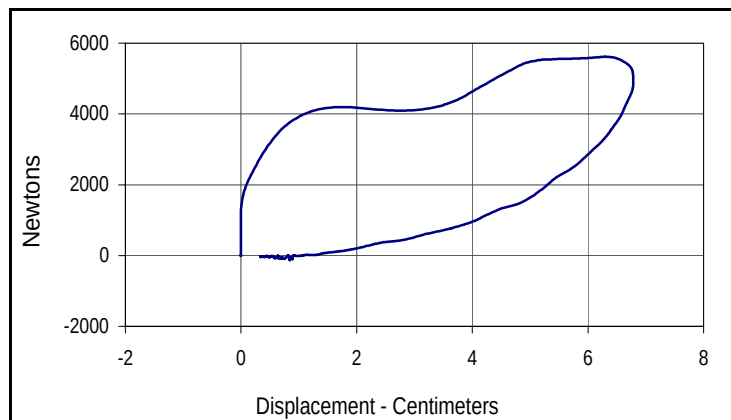
Test Date: 9/4/04

ATD Serial No.: 043

Test I.D.: CH10F



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	6.74	Pass
Peak Probe Force	Newtons	5159 to 5893	5616	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.78	Pass
Internal Hysteresis	%	69 to 85	75.3	Pass
Overall Test Results			Pass	



Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.3
Peak Probe Force		Peak Chest Displ.	
5616		6.78	

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 9/4/04

ATD Serial No.: 043

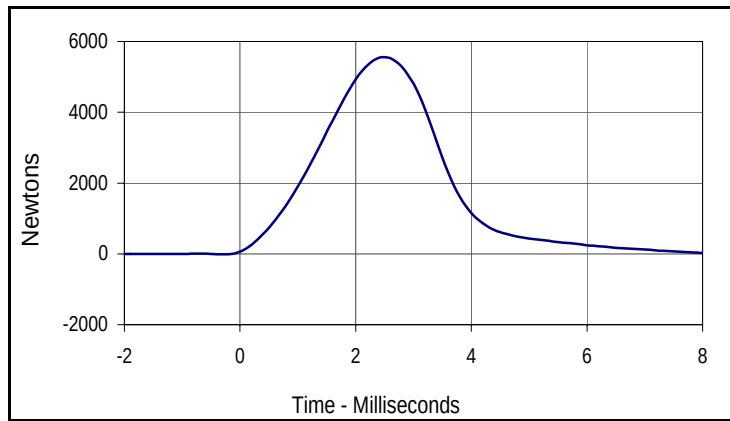
Test I.D.: LK10H , RK10H

**Left Knee**

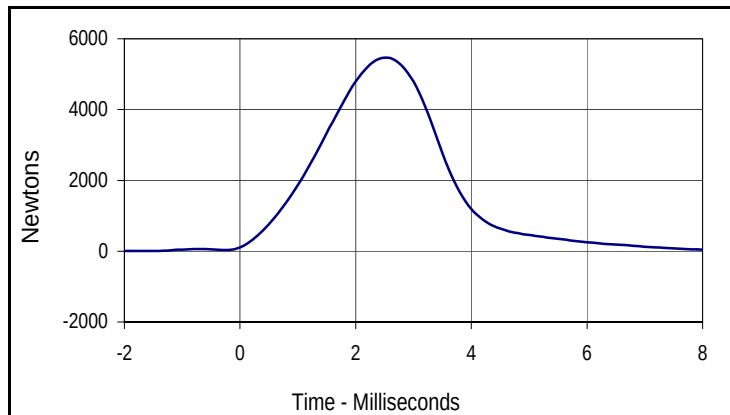
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	Newtons	4715 to 5782	5559	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5470	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5559.2	2.5	-26.4	9.2

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5470.1	2.5	-26.3	9.5

Test Program: Hybrid III Thor-LX Inversion Quasi-Static Test

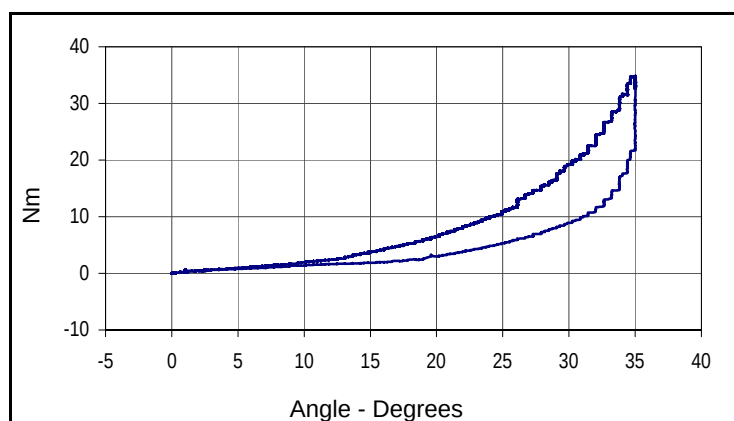
Test Date: 8/25/04

ATD Serial No.: 043

Test I.D.: IN10A



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
Eversion Angle at 6 Nm	Degrees	17.5 to 21.3	19.3	Pass
Eversion Angle at 23 Nm	Degrees	29.3 to 35.9	32.0	Pass
Overall Test Results				Pass



Curve Description			
Ankle Moment Torque vs. Inversion Angle			
CURNO	Type	SAE Class	Units
001	FIL	600	N/A
Torque	Angle	Torque	Angle
6.0	19.3	23.0	32.0

Test Program: Hybrid III Thor-LX Eversion Quasi-Static Test

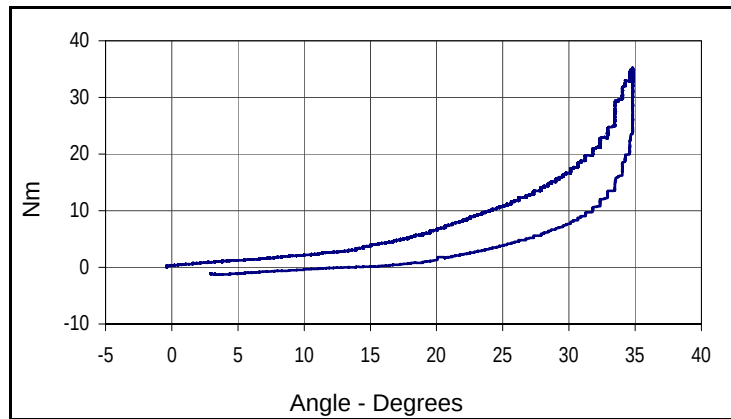
Test Date: 8/25/04

ATD Serial No.: 043

Test I.D.: EV10A



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
Eversion Angle at 6 Nm	Degrees	17.5 to 21.3	19.2	Pass
Eversion Angle at 23 Nm	Degrees	29.3 to 35.9	31.8	Pass
Overall Test Results				Pass



Curve Description			
Ankle Moment Torque vs. Eversion Angle			
CURNO	Type	SAE Class	Units
001	FIL	600	N/A
Torque	Angle	Torque	Angle
6.0	19.2	23.0	31.8

Test Program: Hybrid III Thor-LX Dynamic Ball of Foot Impact Test

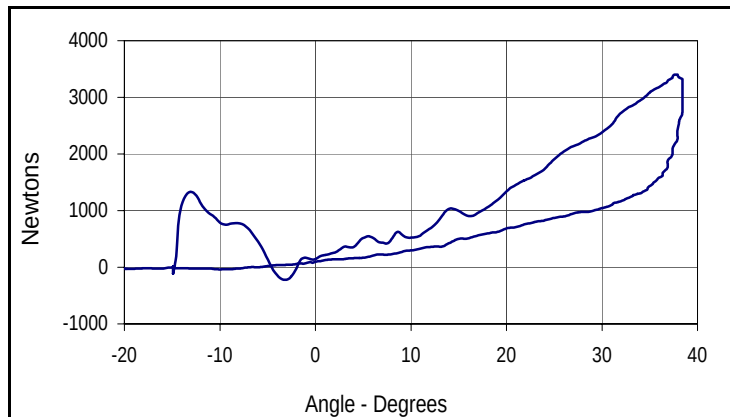
Test Date: 8/24/04

ATD Serial No.: 043

Test I.D.: BI10A



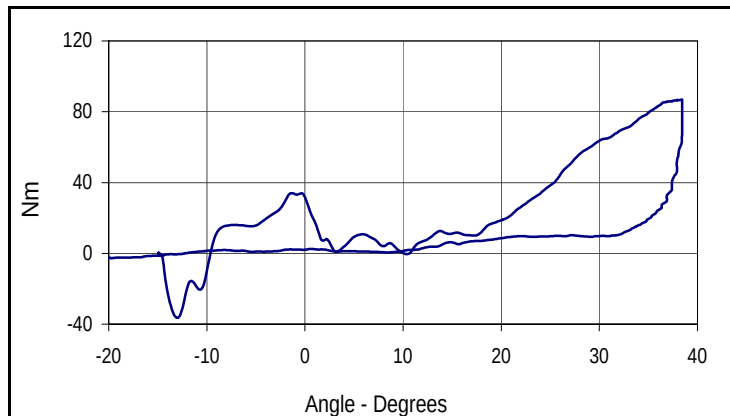
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.9 to 5.1	5.03	Pass
Peak Lower Tibia Compressive Force	Newtons	3058 to 3738	3403	Pass
Peak Ankle Resistive Moment	Nm	76.2 to 93.2	86.9	Pass
Overall Test Results			Pass	



Curve Description

Peak Lower Tibia Compressive Force vs. Angle

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Angle	Min	Angle
3402.8	37.8	-220.2	-3.2



Curve Description

Peak Ankle Resistive Moment vs. Angle

CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Angle	Min	Angle
86.9	38.4	-36.3	-12.9

Test Program: Hybrid III Thor-LX Dynamic Heel of Foot Impact Test

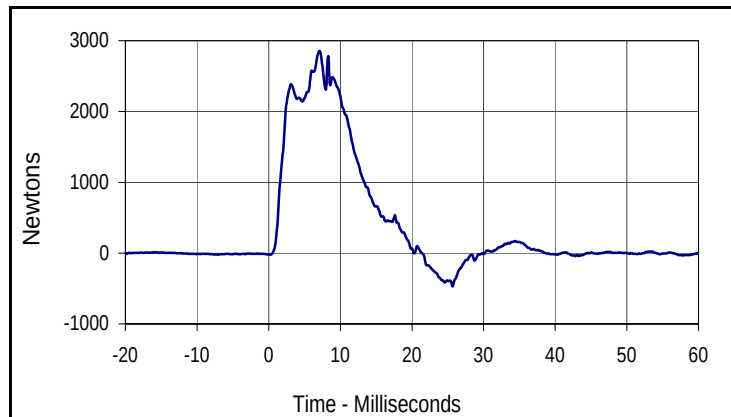
Test Date: 8/24/04

ATD Serial No.: 043

Test I.D.: HI10A



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	3.90 to 4.10	3.96	Pass
Peak Lower Tibia Compressive Force	Newtons	2694 to 3292	2853	Pass
Overall Test Results				Pass



Curve Description			
Peak Lower Tibia Compressive Force			
CURNO	Type	SAE Class	Units
001	FIL	1000	Newtons
Max	Time	Min	Time
2853.3	7.1	-472.4	25.7

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 9/5/04

ATD Serial No.: 043

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	881	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	138	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	144	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	43	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	587	Pass
L - Popliteal length	mm	429 to 455	440	Pass
M - Knee pivot height	mm	485 to 500	496	Pass
N - Buttock popliteal length	mm	452 to 477	470	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	265	Pass
V - Shoulder breadth	mm	422 to 437	427	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	987	Pass
Z - Waist circumference	mm	836 to 866	845	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	229	Pass
Overall Test Results				Pass

Test Program: Hybrid III 50th Percentile Male Head Drop Test

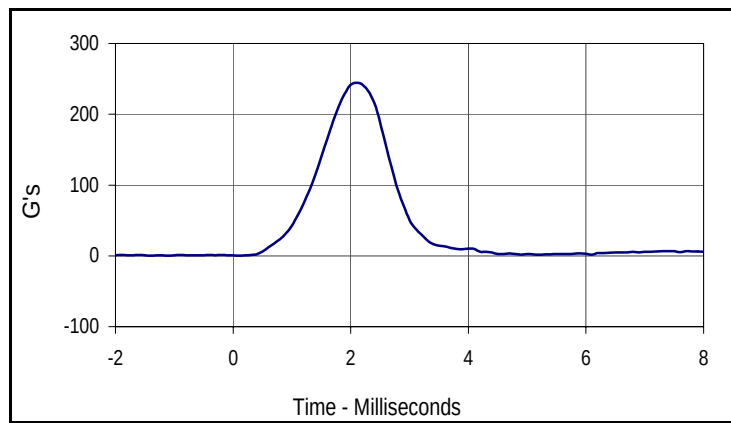
Test Date: 9/3/04

ATD Serial No.: 045

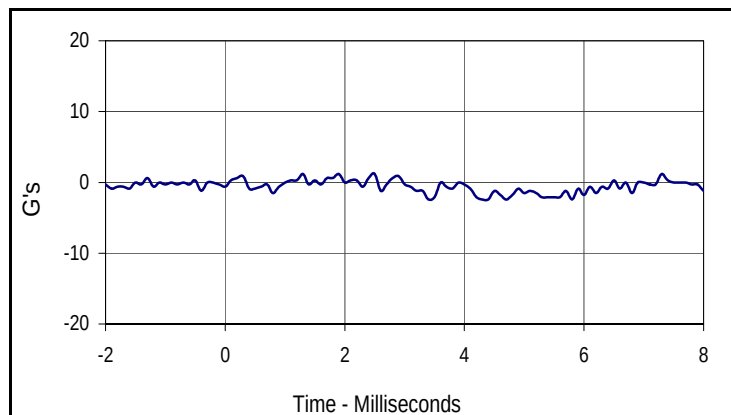
Test I.D.: HD10G



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	244.6	Pass
Peak Lateral Acceleration	G's	≤15.0	2.4	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
244.6	2.1	0.4	-1.1



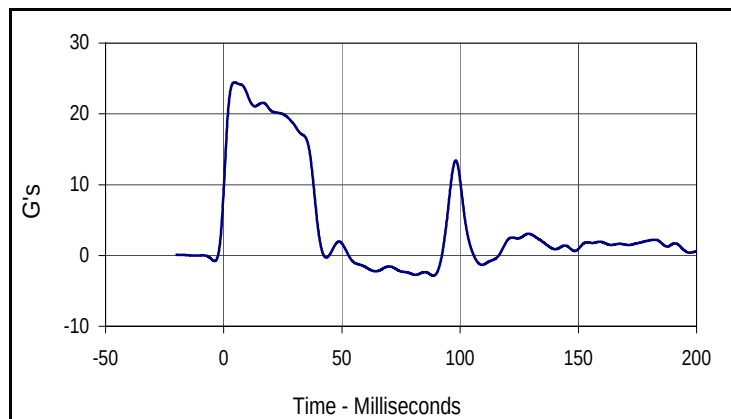
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.2	1.3	-2.4	3.4

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 045

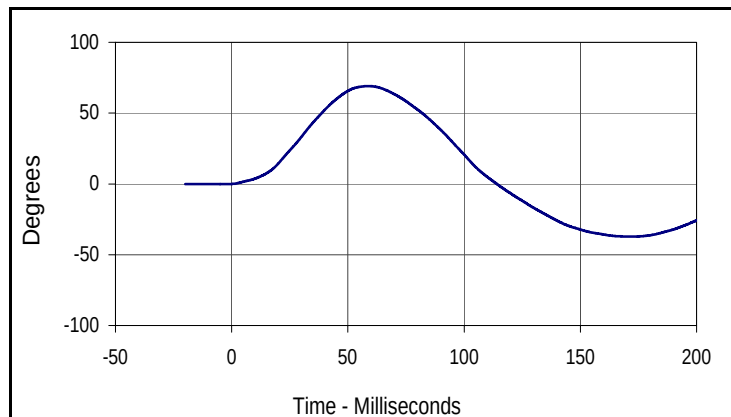
Test Date: 9/5/04
 Test I.D.: NF10J



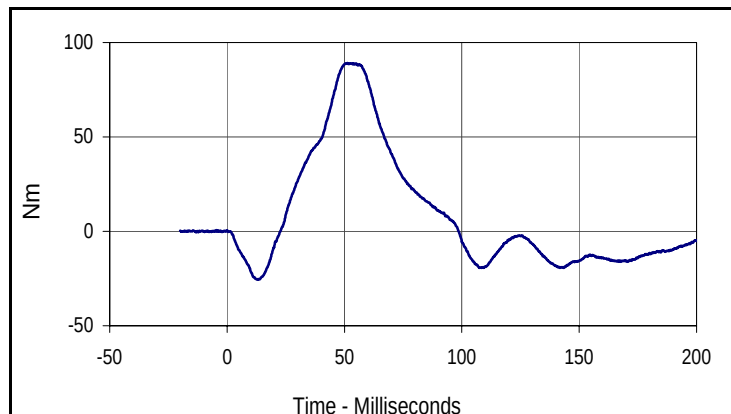
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.7	Pass
	20 Msec.	G's	17.6 to 22.6	20.4	Pass
	30 Msec.	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	39.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	69.1	Pass
	Time	Msec.	57.0 to 64.0	58.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	114.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	89.1	Pass
	Time	Msec.	47.0 to 58.0	51.2	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.6	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.5	4.5	-2.9	88.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
69.1	58.7	-37.2	171.6



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
89.1	51.2	-25.6	13.0

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

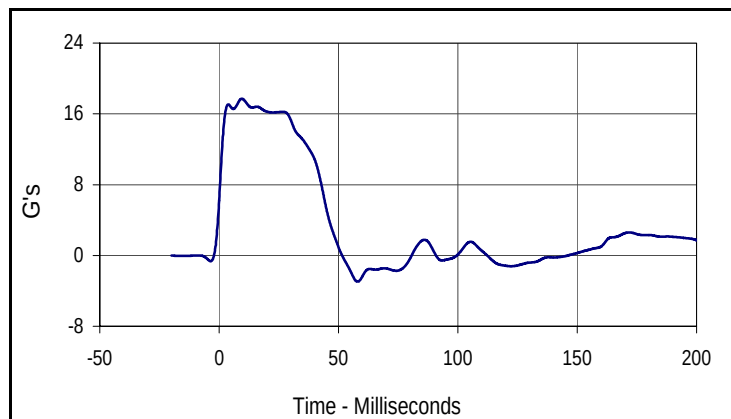
Test Date: 9/5/04

ATD Serial No.: 045

Test I.D.: NE10L



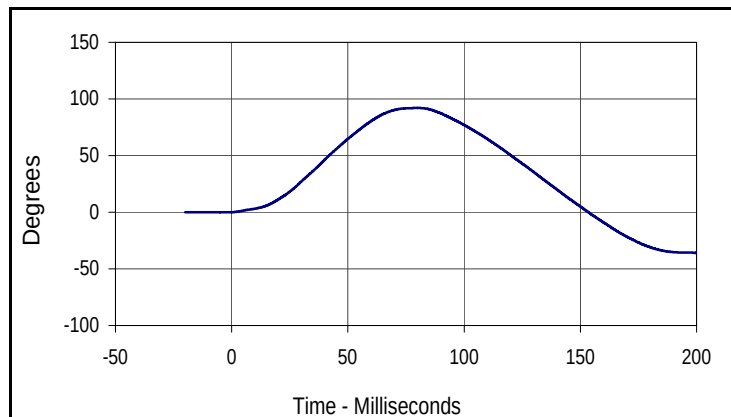
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.00	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.7	Pass
	20 Msec.	G's	14.0 to 19.0	16.3	Pass
	30 Msec.	G's	11.0 to 16.0	15.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	45.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	92.0	Pass
	Time	Msec.	72.0 to 82.0	80.1	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	153.5	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-66.5	Pass
	Time	Msec.	65.0 to 79.0	66.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.2	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

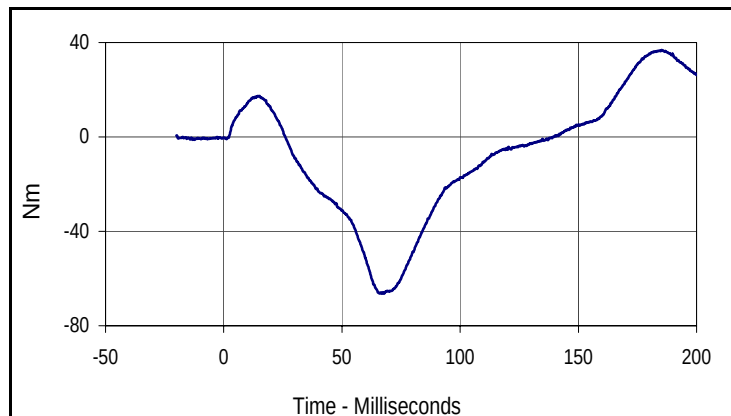
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.7	9.5	-3.0	58.0



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
92.0	80.1	-35.8	200.0



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.8	185.3	-66.5	66.8

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

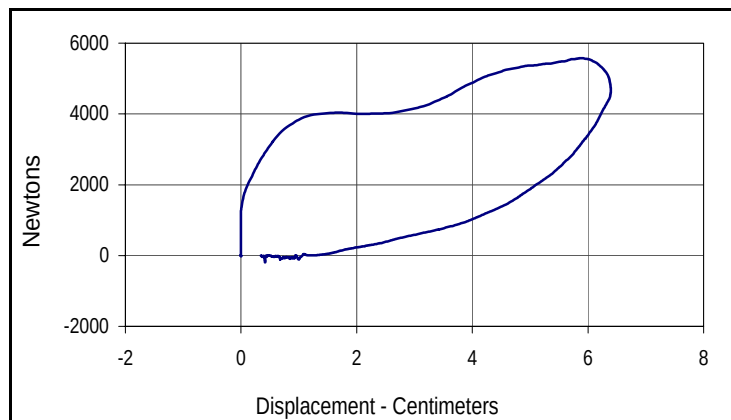
Test Date: 9/4/04

ATD Serial No.: 045

Test I.D.: CH10G



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	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5579	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.40	Pass
Internal Hysteresis	%	69 to 85	76.1	Pass
Overall Test Results				Pass



Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	76.1
Peak Probe Force		Peak Chest Displ.	
5579		6.40	

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 9/4/04

ATD Serial No.: 045

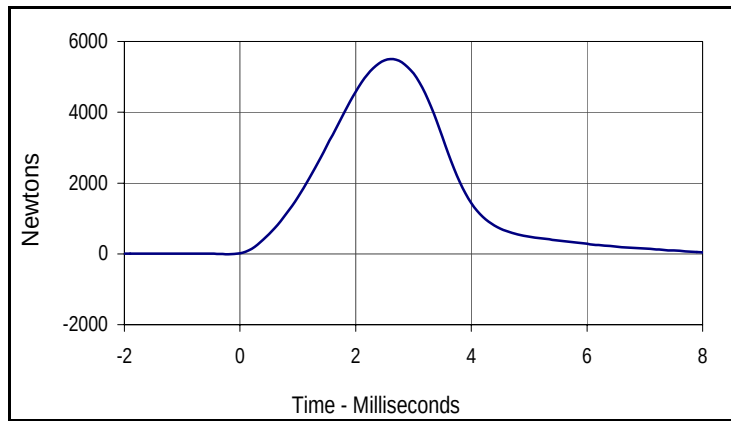
Test I.D.: LK10I , RK10H

**Left Knee**

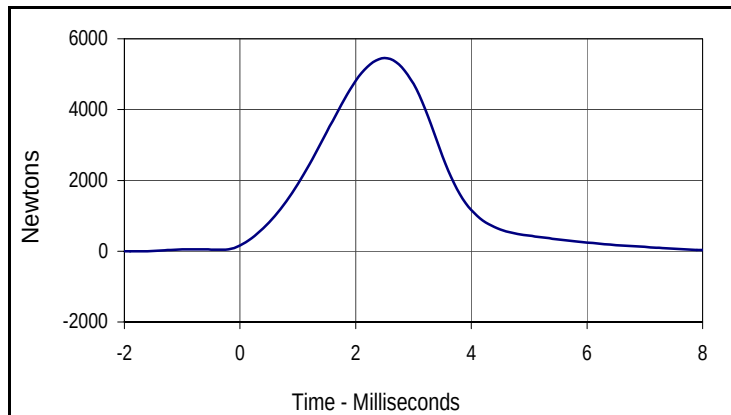
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5503	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5454	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5502.9	2.6	-24.1	9.3

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5454.5	2.5	-32.6	9.5

Test Program: Hybrid III Thor-LX Inversion Quasi-Static Test

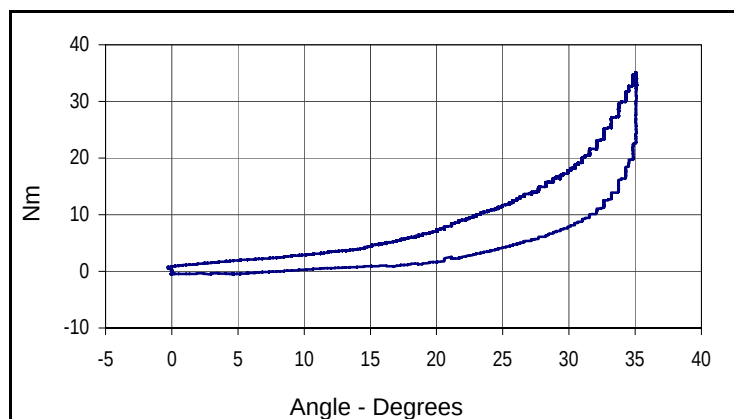
Test Date: 8/25/04

ATD Serial No.: 045

Test I.D.: IN10B



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
Eversion Angle at 6 Nm	Degrees	17.5 to 21.3	18.1	Pass
Eversion Angle at 23 Nm	Degrees	29.3 to 35.9	32.1	Pass
Overall Test Results				Pass



Curve Description			
Ankle Moment Torque vs. Inversion Angle			
CURNO	Type	SAE Class	Units
001	FIL	600	N/A
Torque	Angle	Torque	Angle
6.0	18.1	23.0	32.1

Test Program: Hybrid III Thor-LX Eversion Quasi-Static Test

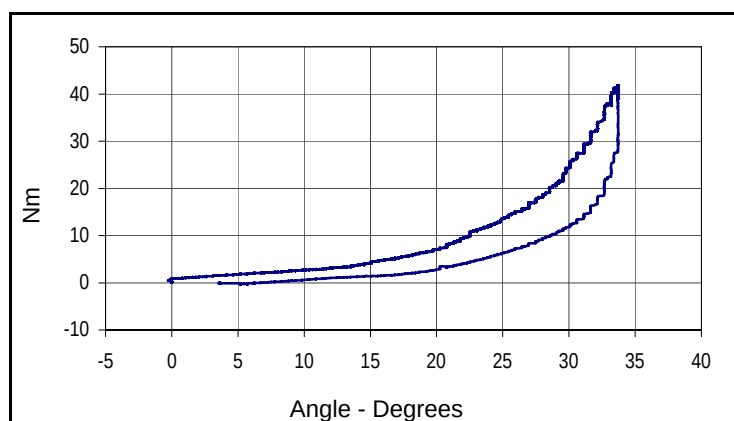
Test Date: 8/25/04

ATD Serial No.: 045

Test I.D.: EV10B



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
Eversion Angle at 6 Nm	Degrees	17.5 to 21.3	18.4	Pass
Eversion Angle at 23 Nm	Degrees	29.3 to 35.9	29.6	Pass
Overall Test Results				Pass



Curve Description			
Ankle Moment Torque vs. Eversion Angle			
CURNO	Type	SAE Class	Units
001	FIL	600	N/A
Torque	Angle	Torque	Angle
6.0	18.4	23.0	29.6

Test Program: Hybrid III Thor-LX Dynamic Ball of Foot Impact Test

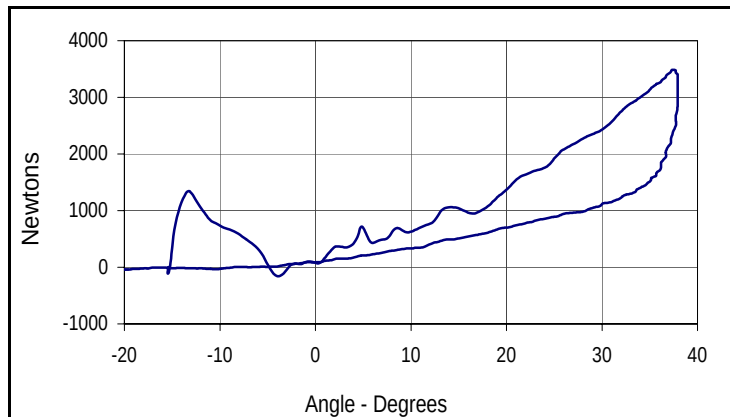
Test Date: 8/24/04

ATD Serial No.: 045

Test I.D.: BI10B



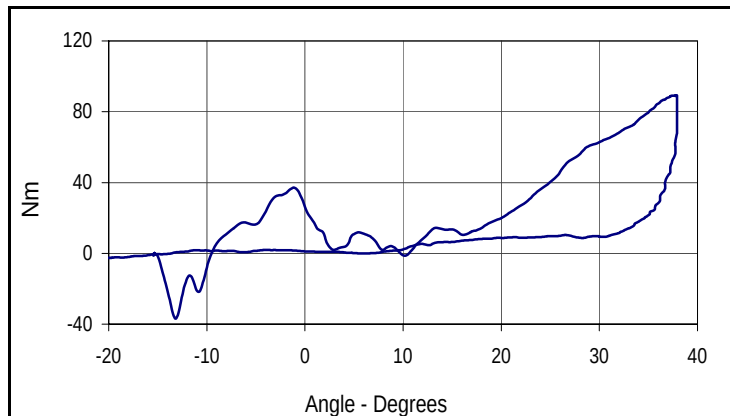
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.9 to 5.1	4.97	Pass
Peak Lower Tibia Compressive Force	Newtons	3058 to 3738	3488	Pass
Peak Ankle Resistive Moment	Nm	76.2 to 93.2	89.3	Pass
Overall Test Results			Pass	



Curve Description

Peak Lower Tibia Compressive Force vs. Angle

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Angle	Min	Angle
3487.8	37.4	-159.2	-3.8



Curve Description

Peak Ankle Resistive Moment vs. Angle

CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Angle	Min	Angle
89.3	37.9	-36.9	-13.2

Test Program: Hybrid III Thor-LX Dynamic Heel of Foot Impact Test

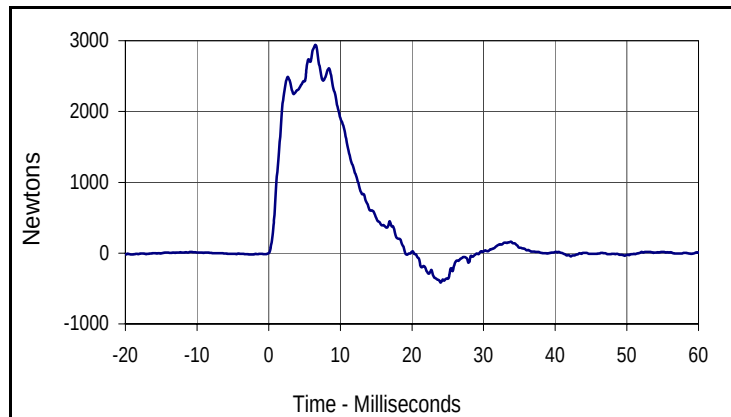
Test Date: 8/24/04

ATD Serial No.: 045

Test I.D.: HI10B



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	3.90 to 4.10	4.02	Pass
Peak Lower Tibia Compressive Force	Newtons	2694 to 3292	2940	Pass
Overall Test Results				Pass



Curve Description			
Peak Lower Tibia Compressive Force			
CURNO	Type	SAE Class	Units
001	FIL	1000	Newtons
Max	Time	Min	Time
2939.9	6.5	-419.2	24.0

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 9/5/04

ATD Serial No.: 045

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	518	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	88	Pass
F - Thigh clearance	mm	140 to 155	146	Pass
G - Elbow back to wrist pivot	mm	290 to 305	301	Pass
H - Skull cap to back line	mm	41 to 46	42	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	197	Pass
K - Buttock to knee length	mm	579 to 604	585	Pass
L - Popliteal length	mm	429 to 455	432	Pass
M - Knee pivot height	mm	485 to 500	497	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	221	Pass
P - Foot length	mm	251 to 267	265	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	985	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

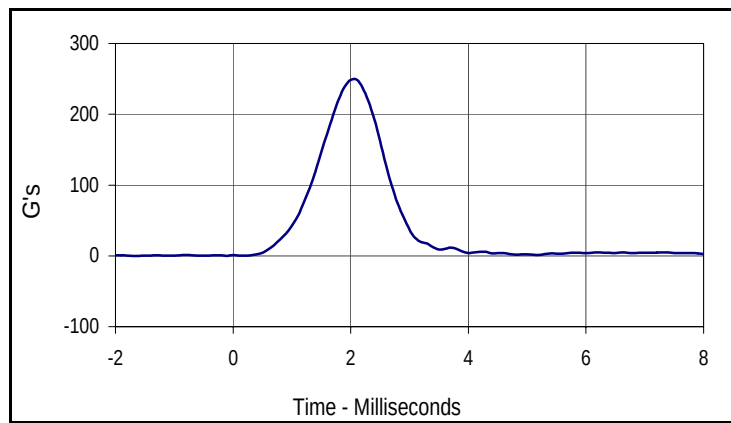
Test Date: 9/3/04

ATD Serial No.: 055

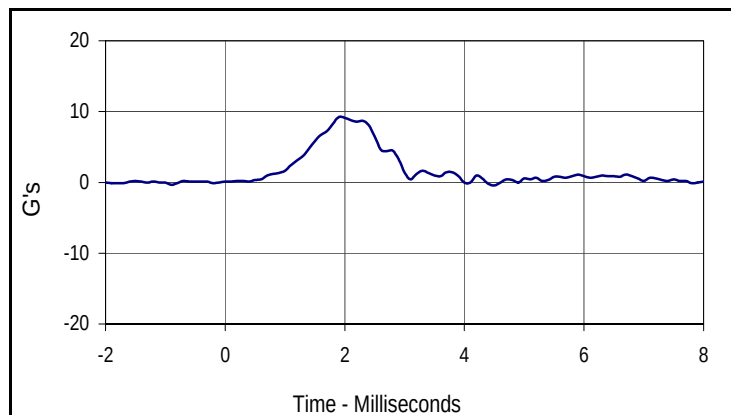
Test I.D.: HD10H



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	248.7	Pass
Peak Lateral Acceleration	G's	≤15.0	9.2	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
248.7	2.1	0.0	-0.1



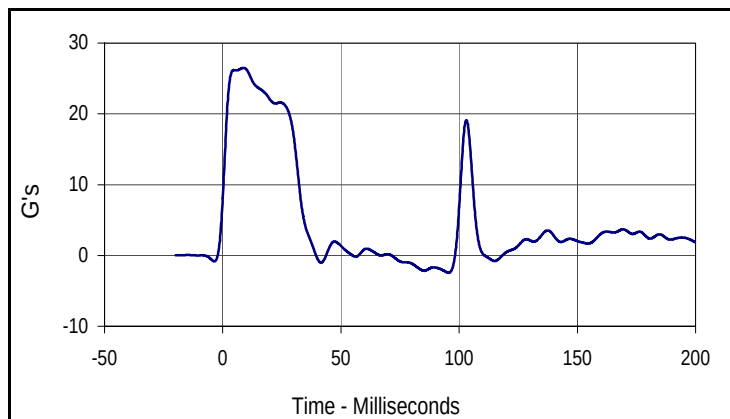
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
9.2	1.9	-0.4	4.5

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 055

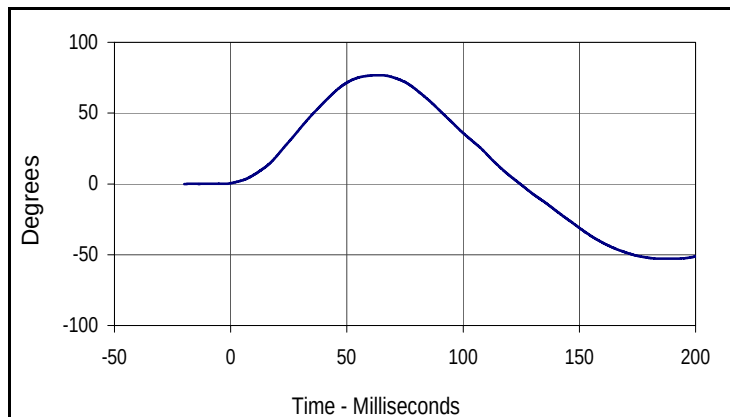
Test Date: 9/5/04
 Test I.D.: NF10L



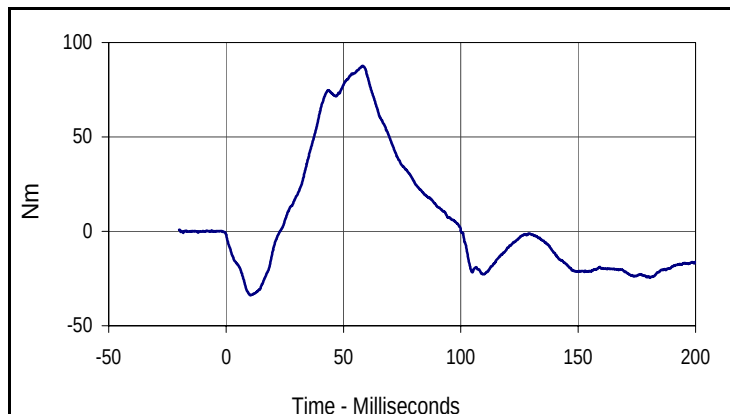
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.98	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	26.3	Pass
	20 Msec.	G's	17.6 to 22.6	22.0	Pass
	30 Msec.	G's	12.5 to 18.5	16.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	19.1	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	34.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	76.8	Pass
	Time	Msec.	57.0 to 64.0	63.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	124.6	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	87.6	Pass
	Time	Msec.	47.0 to 58.0	58.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	100.1	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
26.5	8.8	-2.4	95.5



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.8	63.7	-52.9	185.7



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.6	58.0	-33.9	10.5

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

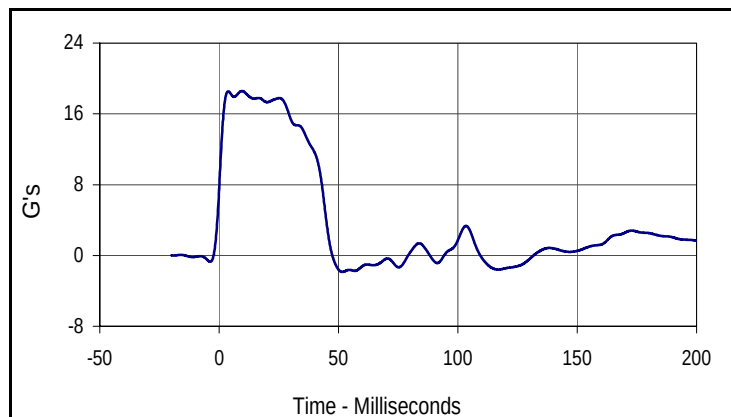
Test Date: 9/5/04

ATD Serial No.: 055

Test I.D.: NE10M



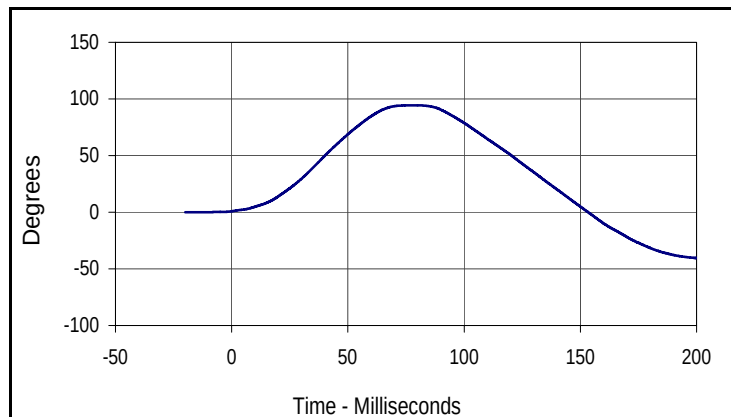
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.08	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.6	Pass
	20 Msec.	G's	14.0 to 19.0	17.3	Pass
	30 Msec.	G's	11.0 to 16.0	15.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	44.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	94.4	Pass
	Time	Msec.	72.0 to 82.0	78.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	153.4	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-77.0	Pass
	Time	Msec.	65.0 to 79.0	70.5	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	141.2	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

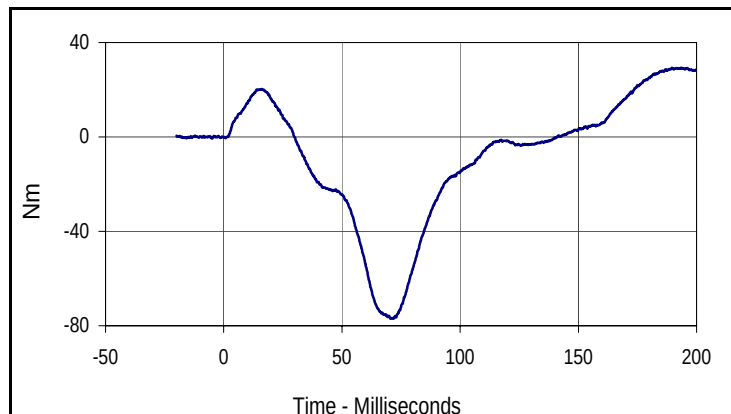
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.6	9.5	-1.9	51.6



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
94.4	78.5	-40.4	200.0



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
29.2	193.5	-77.0	70.5

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

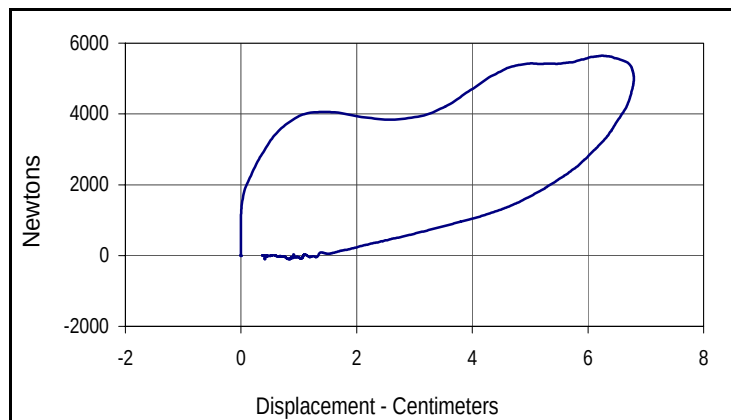
Test Date: 9/4/04

ATD Serial No.: 055

Test I.D.: CH10H



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	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5645	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.79	Pass
Internal Hysteresis	%	69 to 85	74.5	Pass
Overall Test Results				Pass



Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	74.5
Peak Probe Force		Peak Chest Displ.	
5645		6.79	

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 9/4/04

ATD Serial No.: 055

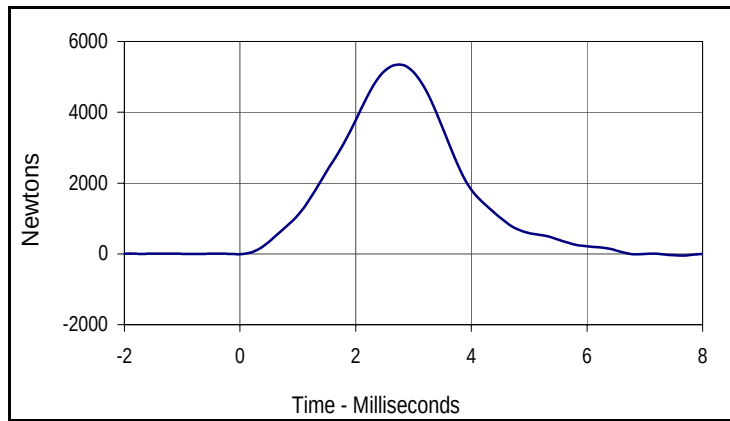
Test I.D.: LK10J , RK10J

**Left Knee**

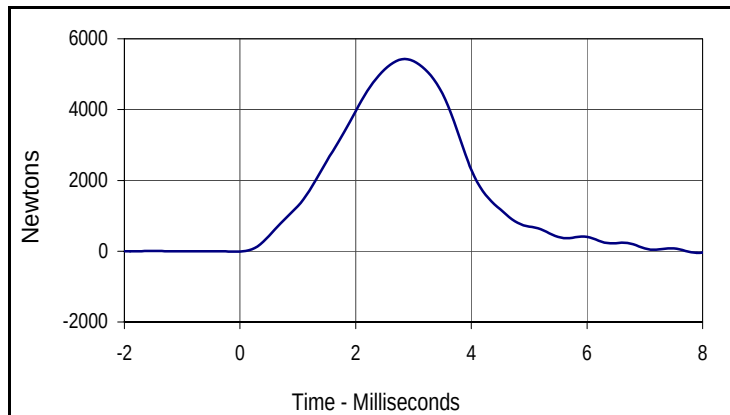
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5343	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	Newtons	4715 to 5782	5422	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5343.1	2.7	-48.5	7.6

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5421.8	2.8	-109.3	9.4

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 9/5/04

ATD Serial No.: 055

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	508	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	136	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	152	Pass
G - Elbow back to wrist pivot	mm	290 to 305	298	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	338	Pass
J - Elbow rest height	mm	190 to 211	203	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	434	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	262	Pass
V - Shoulder breadth	mm	422 to 437	432	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	1000	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	228	Pass
Overall Test Results				Pass