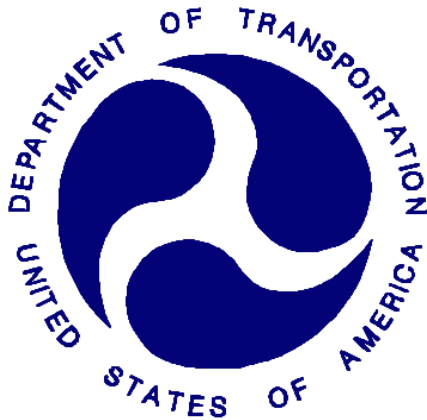


**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**SATURN CORPORATION
2004 SATURN VUE
MPV**

NHTSA NUMBER: M40111

**PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



2/19/04

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590**

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Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2004 Saturn Vue AWD 4 Door MPV at Karco Engineering, LLC on 2/19/04. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 55.89 km/h. The ambient temperature at the barrier face at the time of impact is 12.8 degrees Celcius. The vehicle's maximum post test static crush is 532 mm at the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:					
Measurement Description		Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)		N/A	1000	232.7	284.3
Max. Chest Accel. (3 msec Clip)		G's	60	36.1	39.7
Left Femur Force		Newtons	10008	-936.1	-2598.4
Right Femur Force		Newtons	10008	-1573.4	-3023.7
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2004 Saturn Vue AWD 4 Door MPV NHTSA No. M40111				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M40111

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-02005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48.3 km/h) requirements.

The 35 mph (56.3 km/h) frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Test Procedure.

1.2 SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2004 Saturn Vue MPV at a velocity of 55.89 km/h. The test was performed at Karco Engineering, LLC on February 19, 2004.

One real-time and 17 (seventeen) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

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

Both ATDs were fully instrumented with nine accelerometer array head, chest and pelvis triaxial accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also placed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 34) and the right-front passenger (position 2) ATD (Serial No. 35) were calibrated two tests prior to this test.

One Hundred and Nine (109) channels of data were recorded using an on-board data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the vehicle and dummy response data traces. Appendix C contains Load Cell Barrier information. Appendix D contains the Instrumentation Data Channel assignments. Appendix E contains the Dummy Calibration data and Appendix F contains the Child Restraint System (CRS). Appendix G contains the Nine Accelerometer Array Head 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 532 mm and both the driver and the passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver ATD head and chest contacted the airbag. The abdomen had no contact. Both knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD head and chest contacted the airbag. The abdomen had no contact. Both knees contacted the glove box.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)
Driver	232.7	36.1	-27.0	-936.1	-1573.4	119.8
Passenger	284.3	39.7	-23.7	-2598.4	-3023.7	150.4

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

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 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.89
Test Weight	kg	1839
Impact Angle	degrees	0
Average Rebound	mm	975
Maximum Static Crush	mm	532

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
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
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/ Serial No.	50% Male Hybrid III No. 34	50% Male Hybrid III No. 35
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Steering Column/Bolster	Glovebox
Right Knee Contact	Steering Column/Bolster	Glovebox

16mm MOVIE COVERAGE

High Speed	17
Real Time	1
Total	18

DATA CHANNELS

Driver ATD Sensors	46
Passenger ATD Sensors	46
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	36
Total	145

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M40111	Anti-Lock Brakes	No
Make	Saturn	All Wheel Drive	Yes
Model	Vue	Power Steering	Yes
Body Style	4 Door MPV	Driver Front Airbag	Yes
Vin No.	5GZCZ43D24S817875	Driver Side Airbag	No
Color	White	Driver Head Airbag	No
Delivery Date	2/17/2004	Driver Curtain Airbag	No
Odometer	78 mi.	Pass. Front Airbag	Yes
Dealer	Saturn of Loma Linda	Pass. Side Airbag	No
Transmission	3 Speed Automatic	Pass. Head Airbag	No
Final Drive	AWD	Pass. Curtain Airbag	No
Type/No. Cyl.	4 Cylinder	Pre-Tensioners	Yes
Engine Disp. (L)	2.2	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air. Cond.	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	Dr. Yes
Rear Disc	No	Other	None

Does Owners Manual provide instructions to turn off automatic door locks.

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Saturn Corporation	GVWR (kg)	2140
Date of Manufacture	Oct-03	GAWR Front (kg)	1035
		GAWR Rear (kg)	1105

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

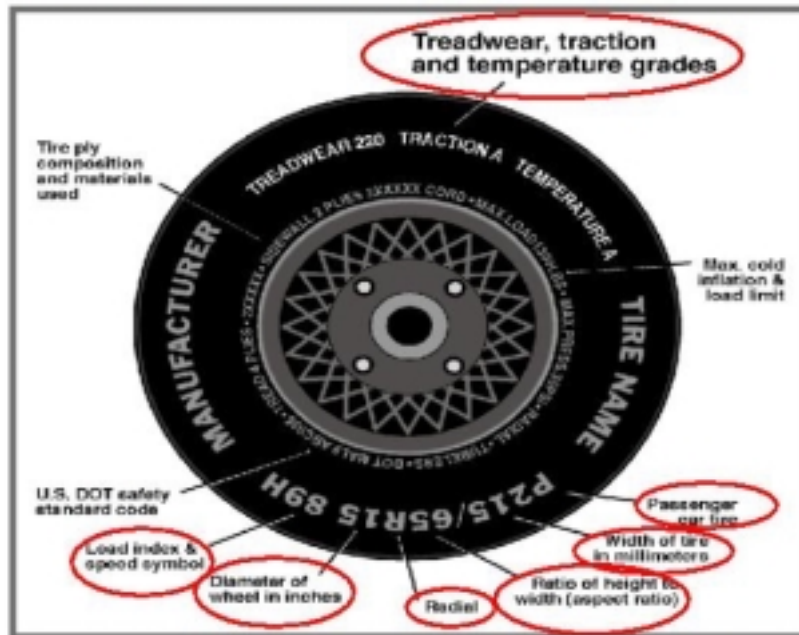
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	None	
Number of Occupants	2	3	0	5
Capacity Weight (VCW) (kg)				476
Cargo Weight (RCLW) (kg)				136

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

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

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)	210	210
Cold Pressure (kpa)	210	210
Recommended Tire Size	P235/65R16	P235/65R16
Tire Size on Vehicle	P235/65R16	P235/65R16
Tire Manufacturer	Bridgestone	Bridgestone
Treadwear	300	300
Traction	B	B
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	101 S	101 S
Tire Material	Polyester/Steel/Nylon	Polyester/Steel/Nylon
DOT Safety Code Right	OB74BD23603	OB74BD23603
DOT Safety Code Left	OB74BD23603	OB74BD23603

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

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	445	357		495	447	
Right	kg	430	327		479	418	
Ratio	%	56.1	43.9		53.0	47.0	
Totals	kg	875	684	1559	974	865	1839

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1559
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	136
Calculated Vehicle Target Wt. (TVTW)	kg	1847

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	810	815	842	842	1187
As Tested	mm	789	792	797	806	1272

Vehicle Wheel Base (mm) 2705

Weight of Ballast Secured in cargo area (kg) 0

Vehicle Components Removed Rear windows, door panels and bumper, hatch lid, tail lights, muffler and spare tire.

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 62.46

Usable Capacity Furnished by COTR (L) 62.08

Actual Test Volume with entire fuel System Filled (L) 58.07

1/3 of Usable Capacity (L) 20.69

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.

DATA SHEET NO. 3
POST TEST IMPACT DATA

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	55.89
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	55.91
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	4419	4030	-389
Center	mm	4599	4067	-532
Right Side	mm	4419	4084	-335

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1005
Center	mm	965
Right Side	mm	955
Average	mm	975

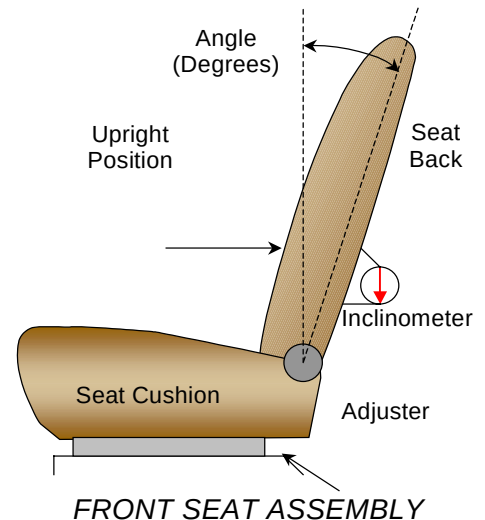
DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturers designated angle. The procedure is as follows: A special application tool with pointed probes is inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly, approximately 13 inches above the pivot point of the seat back. An inclinometer is placed against the flat surface of the tool and the seat back angle is measured directly from the dial face.



SEAT BACK ANGLES

	Deg.
Driver w/seated dummy	4.4
Passenger w/seated dummy	4.4

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 #
Driver Seat	240 mm	120 mm
Passenger Seat	25	13

SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position.

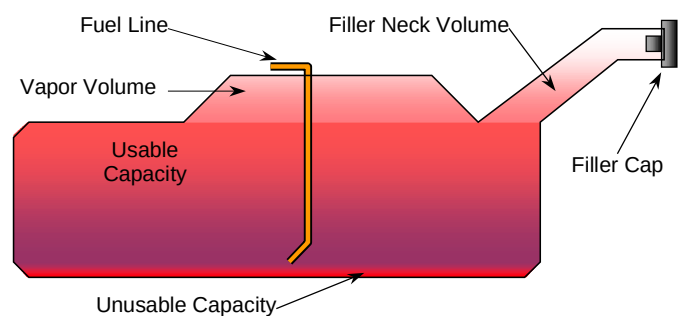
SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	2
Passenger Seat	5	2

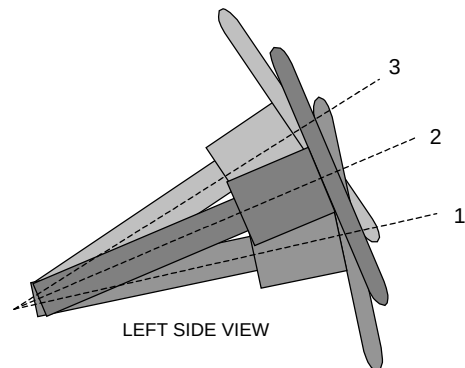
DATA SHEET NO. 4...(CONTINUED)**TEST VEHICLE INFORMATION**Test Vehicle: 2004 Saturn Vue MPVNHTSA No.: M40111Test Program: 2004 NHTSA 35mph NCAPTest Date: 2/19/04**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank"	62.08
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	57.11 to 58.35
Actual Amount of Solvent used	58.07
1/3 of Usable Capacity	20.69

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 right rear fender. The standard fuel tank occupies the area under the rear seat.

**VEHICLE FUEL TANK ASSEMBLY****STEERING COLUMN ADJUSTMENT**

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

**STEERING COLUMN ASSEMBLY****STEERING COLUMN POSITIONS**

	Degrees
Lowermost positon No. 1	22.8
Geometric center position No. 2	24.7
Uppermost position No. 3	26.5

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

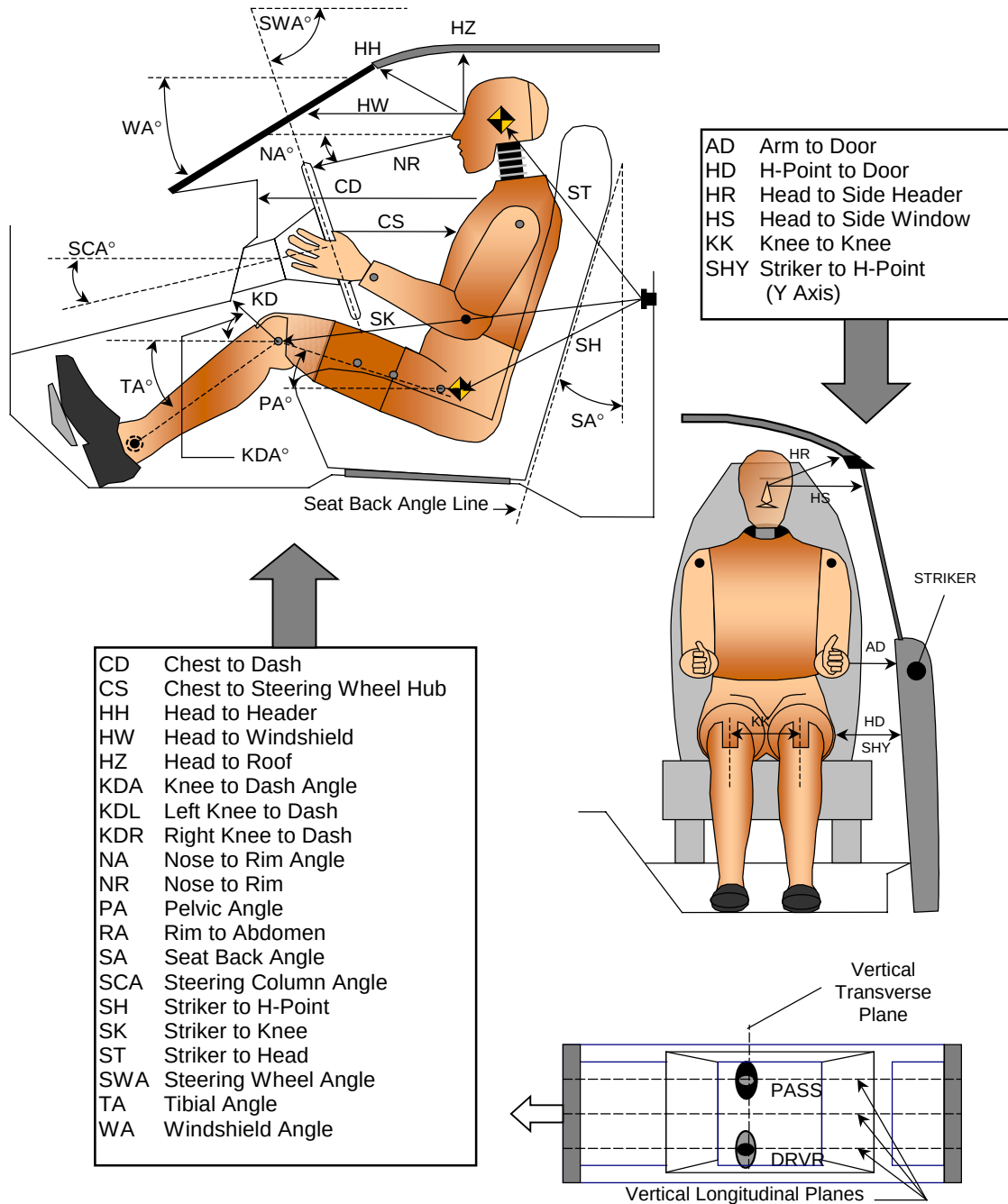
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		58		
SWA	Steering Wheel Angle		65.3		
SCA	Steering Column Angle		24.7		
SA	Seat Back Angle		4.4		4.4
HZ	Head to Roof (Z)	238	90	195	90
HH	Head to Header	440		413	
HW	Head to Windshield	732		715	
HR	Head to Side Header (Y)	303		315	
NR	Nose to Rim	410	12		
CD	Chest to Dash	555		585	
CS	Chest to Steering Hub	310			
RA	Rim to Abdomen	200			
KDL	Left Knee to Dash	145	10	183	
KDR	Right Knee to Dash	142		190	19
PA	Pelvic Angle		22.5		22
TA	Tibia Angle		44		43
KK	Knee to Knee (Y)	285		270	
SK	Striker to Knee	600	2	610	5
ST	Striker to Head	575	80	585	77
SH	Striker to H-Point	210	23	182	22
SHY	Striker to H-Point (Y)	220		220	
HS	Head to Side Window	310		330	
HD	H-Point to Door (Y)	147		125	
AD	Arm to Door (Y)	65		80	

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

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

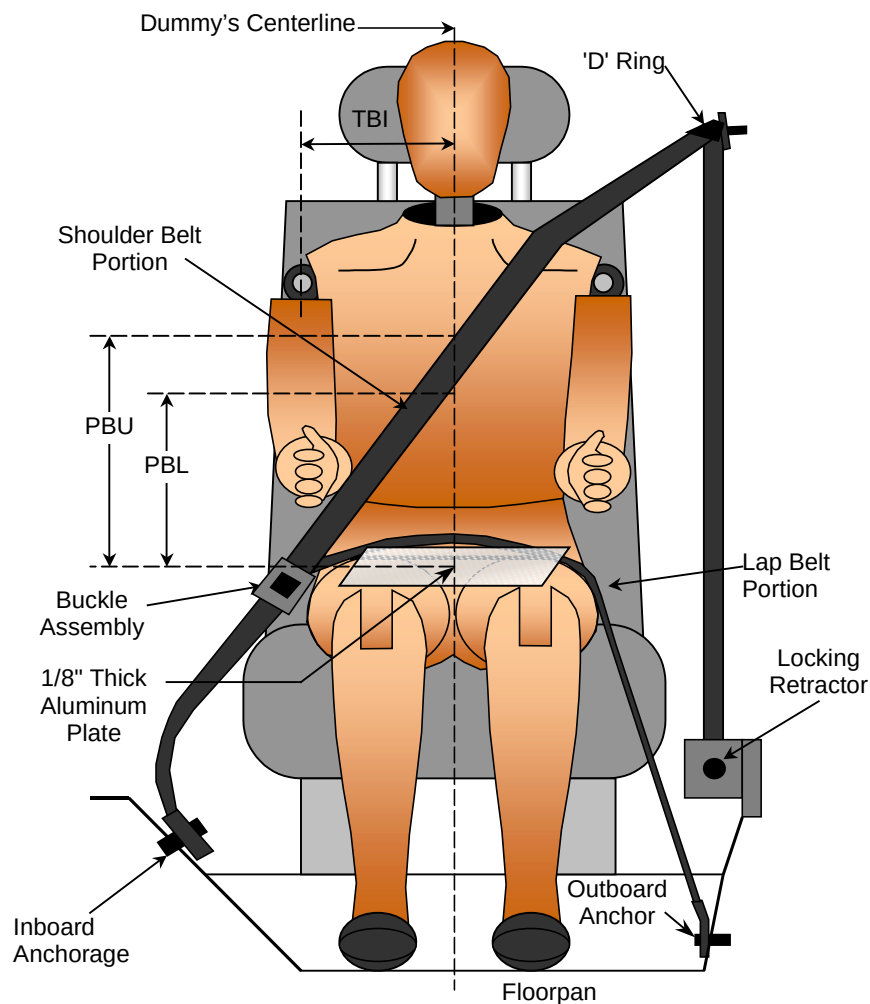


DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6 **SEAT BELT POSITIONING DATA**

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	205	220
PBU - Top Surface of reference to belt upper edge	mm	350	310
PBL - Top Surface of reference to belt lower edge	mm	275	225
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7 - VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

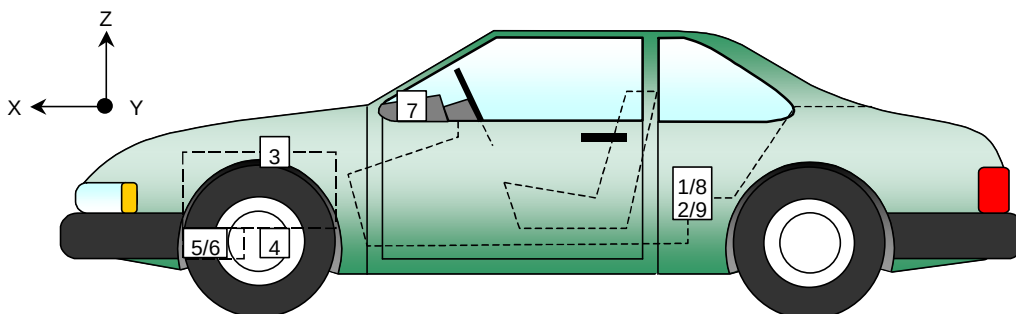
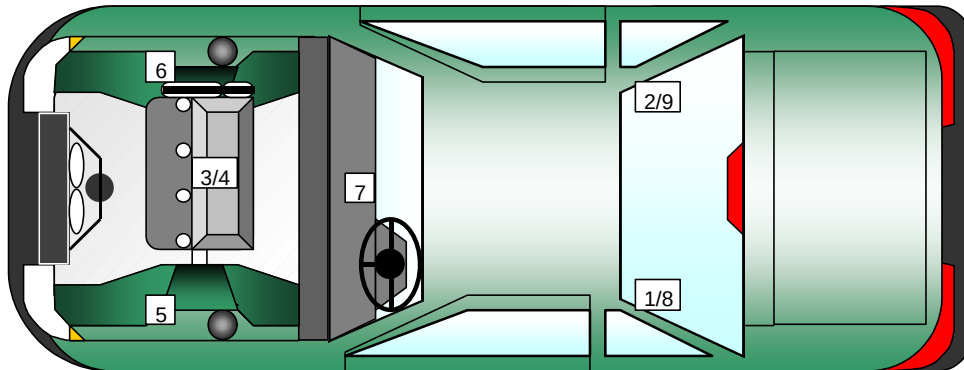
Test Date: 2/19/04

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member	1850	-720	410	G's	1.7	128.6	-43.4	53.7
2	Right Rear X-Member	1850	720	410	G's	1.6	123.2	-41.2	56.1
3	Engine Top	3870	0	850	G's	68.5	49.4	-164.2	35.3
4	Engine Bottom	3810	180	170	G's	0.1	1.3	-145.6	31.2
5	Left Brake Caliper	3820	-730	290	G's	9.2	76.4	-75.1	48.3
6	Right Brake Caliper	3820	730	290	G's	27.3	73.6	-66.6	60.1
7	Instrument Panel	2970	0	1060	G's	21.6	93.5	-75.6	53.9
8	Left Rear X-Member (Z-Axis)	1800	-720	410	G's	6.1	52.4	-7.6	48.1
9	Right Rear X-Member (Z-Axis)	1800	720	410	G's	4.1	93.5	-7.2	47.9

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

1.) Channel failed at 43.6 msec.



DATA SHEET NO. 8 - HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	0.7	16.5	-36.4	81.8	0.2	15.8	-41.1	85.7
Head CG	Y	G's	1.2	58.7	-2.6	35.1	1.7	58.4	-5.5	90.6
Head CG	Z	G's	17.2	62.2	-1.1	16.4	25.2	85.6	-1.6	16.6
Head CG Resultant	N/A	G's	39.4	83.2			48.3	85.7		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.2	150.4	-36.5	89.3	2.1	169.5	-40.6	84.2
Chest CG	Y	G's	4.0	59.6	-3.6	70.4	3.4	49.1	-3.4	80.0
Chest CG	Z	G's	3.3	38.4	-10.9	78.1	7.2	90.4	-8.6	108.9
Chest CG Resultant	N/A	G's	36.9	89.3			40.7	84.3		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	573.7	50.7	-936.1	87.0	918.9	60.0	-2598.4	83.4
Right Femur	Z	Newtons	1335.5	57.9	-1573.4	71.3	926.6	57.0	-3023.7	75.1

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Shoulder Belt Pullout	N/A	MM	119.8	108.1	-50.9	50.9	150.4	101.8	-61.1	37.6
Shoulder Belt Stretch	N/A	MM/CM	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
Lap Belt Force	N/A	Newtons	5130.8	68.2	-19.4	161.2	7002.7	67.7	-4.2	1.8
Shoulder Belt Force	N/A	Newtons	4308.2	94.5	-42.7	9.4	4793.1	90.6	-34.3	167.7

1.) Not used with pre-tensioners

PRIMARY HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary	232.7	61.6	97.6	33.4	284.3	71.0	107.0	36.2

PRIMARY CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	36.1	87.5	90.5	39.7	83.0	86.0

DATA SHEET NO. 8...(continued)

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	3.2	104.1	-41.0	71.4	4.1	101.6	-54.2	68.4
Pelvis	Y	G's	6.1	101.6	-3.5	20.5	4.3	58.4	-5.2	75.0
Pelvis	Z	G's	1.9	153.1	-27.6	84.3	1.3	163.4	-29.9	82.7
Pelvis Resultant	N/A	G's	47.7	71.4			57.6	68.4		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	397.6	89.5	-472.9	117.2	40.9	95.8	-405.3	139.0
Neck Force	Y	Newtons	52.1	144.0	-62.6	41.6	43.5	37.9	-126.5	139.5
Neck Force	Z	Newtons	1025.5	62.4	-49.4	16.9	1267.4	85.6	-60.2	16.4
Neck Force Resultant	N/A	Newtons	1029.1	62.4			1282.8	85.6		
Neck Moment	X	N•m	5.0	77.8	-5.9	113.7	10.1	87.7	-5.3	146.6
Neck Moment	Y	N•m	47.1	68.4	-13.4	52.0	33.4	142.8	-12.3	110.9
Neck Moment	Z	N•m	4.2	125.5	-2.1	82.3	1.1	36.9	-3.5	142.0
Neck Moment Resultant	N/A	N•m	47.1	68.4			33.9	142.8		

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	17.5	85.8	-90.3	65.4	23.7	80.8	-60.9	65.7
Left Foot Aft	Z	G's	2.8	81.4	-43.9	66.6	3.7	78.5	-24.5	58.1
Left Foot Fore	Z	G's	16.2	79.1	-58.4	66.7	24.0	74.6	-67.3	51.9
Right Foot Aft	X	G's	12.4	102.9	-114.9	56.6	35.3	90.9	-65.8	69.3
Right Foot Aft	Z	G's	5.4	72.0	-115.6	55.5	6.1	81.1	-42.9	44.4
Right Foot Fore	Z	G's	40.5	49.2	-221.9	55.1	26.5	76.0	-86.9	68.6

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Upper Moment	X	N•m	24.8	48.0	-8.7	55.7	12.7	92.3	-37.9	67.3
Left Upper Moment	Y	N•m	18.1	122.5	-106.2	66.9	16.0	148.0	-78.9	72.3
Right Upper Moment	X	N•m	17.4	162.9	-46.1	59.6	16.5	180.2	-41.1	68.2
Right Upper Moment	Y	N•m	21.2	111.0	-118.5	58.7	41.0	65.6	-78.4	45.1
Left Lower Moment	X	N•m	72.3	73.5	-5.4	31.9	6.4	75.8	-9.4	55.7
Left Lower Moment	Y	N•m	62.7	77.3	-54.9	66.1	14.8	90.7	-30.6	60.9
Left Lower Force	Z	Newtons	185.1	150.1	-1727.3	45.7	120.9	161.6	-2590.9	90.1
Right Lower Moment	X	N•m	59.5	62.4	-22.5	58.7	22.5	99.1	-16.2	68.9
Right Lower Moment	Y	N•m	122.8	73.2	-70.5	56.1	44.0	92.2	-36.4	69.1
Right Lower Force	Z	Newtons	152.3	33.5	-3619.4	60.2	104.7	129.7	-3338.3	44.9

DATA SHEET NO. 8...(continued)

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	0.0	7.6	-27.0	66.0	0.0	7.1	-23.7	87.4

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	0.7	200.0	-36.4	83.6	0.1	15.8	-40.8	85.7
Head CG	Y	G's	1.3	66.9	-2.4	82.3	1.9	29.3	-5.2	89.3
Head CG	Z	G's	17.2	62.2	-1.0	16.4	24.6	86.1	-1.4	16.3
Head CG Resultant	N/A	G's	39.6	83.6			47.8	85.7		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.2	150.6	-36.8	89.2	2.2	168.5	-40.9	84.1
Chest CG	Y	G's	4.2	59.7	-3.2	70.3	3.4	49.0	-3.3	81.3
Chest CG	Z	G's	3.4	38.4	-11.0	78.2	7.0	90.5	-8.5	109.2
Chest CG Resultant	N/A	G's	37.3	89.2			40.9	84.2		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Redundant	233.9	62.3	98.3	33.5	283.8	70.8	106.8	36.2

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	36.4	87.5	90.5	39.9	82.9	85.9

DATA SHEET NO. 9
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	205	220
PBU - Top Surface of reference to belt upper edge	mm	350	310
PBL - Top Surface of reference to belt lower edge	mm	275	225
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	720	720
Shoulder Belt length as measured on ATD	mm	820	850
Lap Belt length as measured on ATD	mm	610	625
Remainder of belt on reel	mm	1110	1070
Total belt length for continuous webbing systems	mm	3260	3265

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	130.0	65.0
As determined electronically	mm	119.8	150.4

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically between belt load cell and "D" ring	mm/cm	*	*
Mechanically	mm/cm	N/A	N/A

* Not used with shoulder belt pre-tensioner systems

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

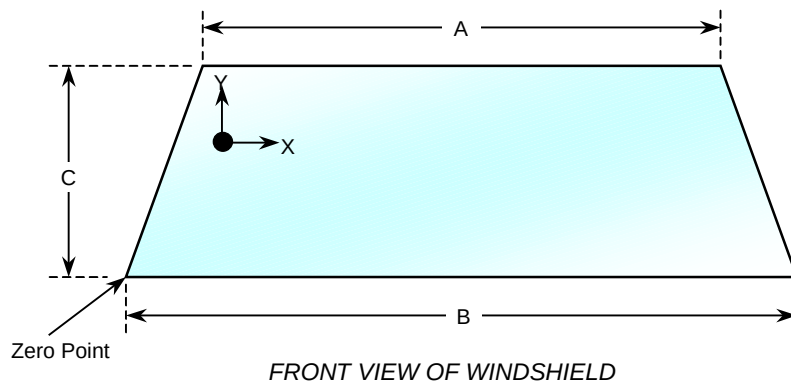
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the posttest 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: 21.1 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	2209.0	2209.0	100.0
Right Side	2209.0	2209.0	100.0
Total	4418.0	4418.0	100.0



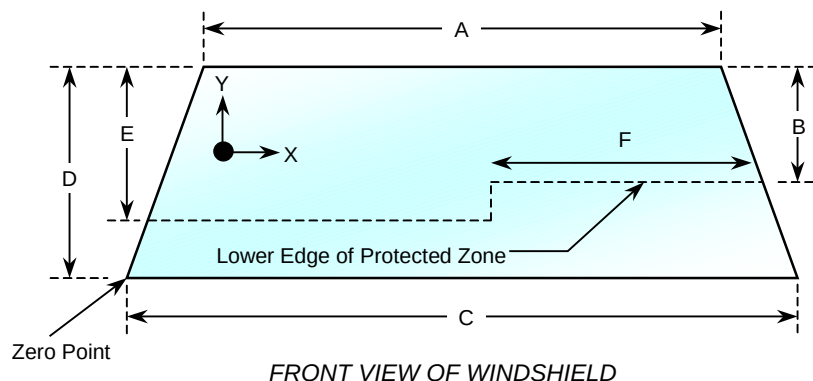
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1218.0	20.0
B	mm	1440.0	20.0
C-Left	mm	880.0	20.0
C-Right	mm	880.0	20.0

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

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1218
B	mm	600
C	mm	1440
D	mm	880
E	mm	605
F	mm	450

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 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

Test Time: 3:17 PM

Temperature: 12.8 Deg. C.

STODDARD SOLVENT SPILLAGE MEASUREMENTS

A. From impact until vehicle motion ceases: 0.0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)

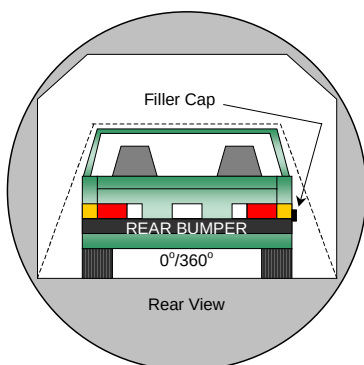
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)

D. Spillage Location Details: No leakage occurred

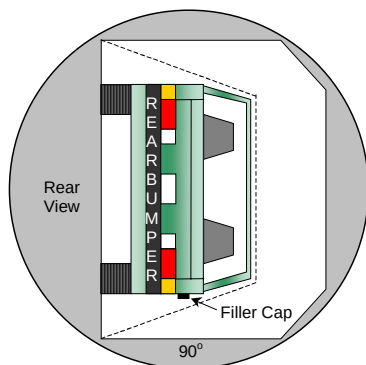
DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

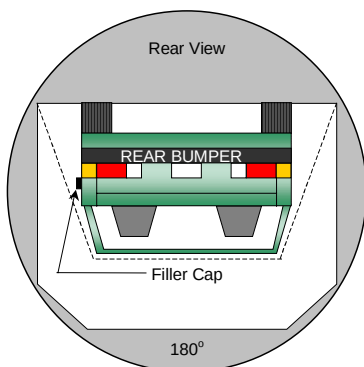
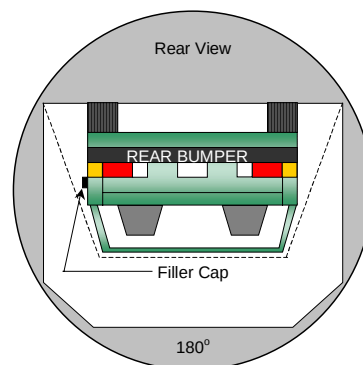
NHTSA No.: M40111
Test Date: 2/19/04



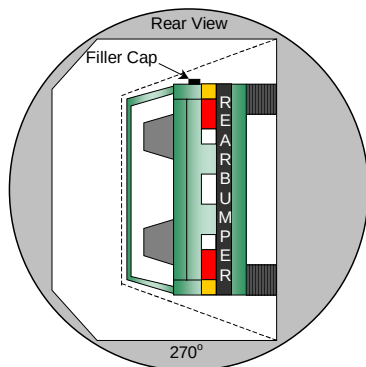
0° to 90°



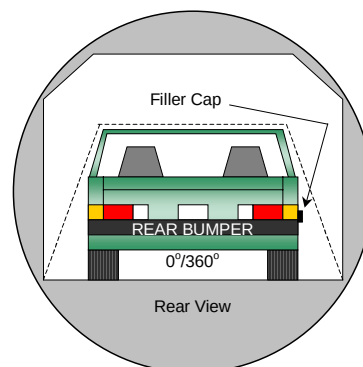
90° to 180°



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 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	81	300	381
90° to 180°	81	300	381
180° to 270°	79	300	379
270° to 360°	80	300	380

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 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4599	4067	-532
2	RSOV to front of engine	mm	3879	3604	-275
3	RSOV to firewall centerline	mm	3609	3579	-30
4	RSOV to leading edge of right door	mm	3073	3084	11
5	RSOV to leading edge of left door	mm	3072	3074	2
6	RSOV to lower leading edge of right door	mm	3056	3060	4
7	RSOV to lower leading edge of left door	mm	3050	3050	0
8	RSOV to upper trailing edge of right door	mm	2046	2060	14
9	RSOV to upper trailing edge of left door	mm	2046	2046	0
10	RSOV to lower trailing edge of right door	mm	2066	2070	4
11	RSOV to lower trailing edge of left door	mm	2062	2062	0
12	RSOV to bottom of right 'A' pillar	mm	3060	3054	-6
13	RSOV to bottom of left 'A' pillar	mm	3055	3047	-8
14	RSOV to firewall on right side	mm	3524	3509	-15
15	RSOV to firewall on left side	mm	3528	3499	-29
16	RSOV to steering column	mm	2656	2665	9
17	Center of steering column to left 'A' pillar	mm	309	330	21
18	Center of steering column to headlining	mm	500	520	20
19	RSOV to right side of front bumper	mm	4419	4084	-335
20	RSOV to left side of front bumper	mm	4419	4030	-389
21	Length of engine block	mm	220	220	0
RD	RSOV to right side of dash panel	mm	2880	2884	4
CD	RSOV to center of dash panel	mm	2825	2884	59
LD	RSOV to left side of dash panel	mm	2848	2843	-5

All measurements in millimeters

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

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

VEHICLE STRUCTURAL MEASUREMENT TABLE

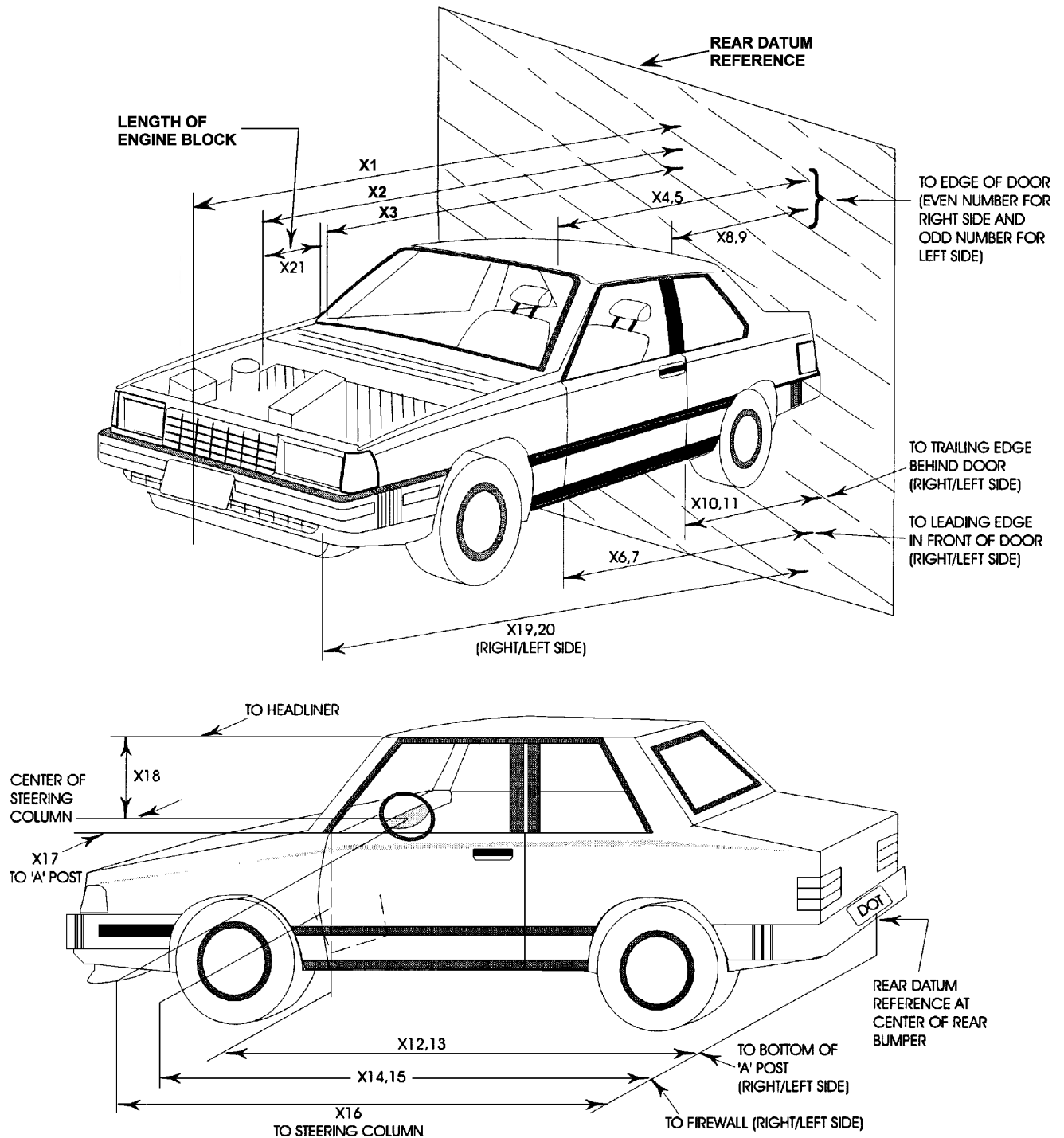
No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4599	4067	-532
2	Total width	mm	1760	1770	10
3	Bumper top height	mm	803	875	72
4	Bumper bottom height	mm	240	420	180
5	Longitudinal member top height	mm	592	743	151
6	Longitudinal member bottom height	mm	489	459	-30
7	Distance between longitudinal members	mm	880	872	-8
8	Longitudinal member width	mm	65	62	-3
9	Engine top height	mm	810	864	54
10	Engine bottom height	mm	209	223	14
11	Engine and gear box width	mm	455	455	0
12	Front bumper to engine distance	mm	740	535	-205
13	Front shock absorber fixing width	mm	980	1030	50
14	Bonnet leading edge height	mm	930	1000	70
15	Front shock absorber fixing width	mm	1165	1120	-45
16	Front bumper to front axle distance	mm	955	545	-410
17	Front axle to 'A' pillar distance	mm	540	500	-40
18	'A' pillar to 'B' pillar distance	mm	1040	1037	-3
19	'B' pillar to rear axle distance	mm	1110	1116	6
20	'B' pillar to 'C' pillar distance	mm	960	960	0
21	Roof sill bottom height	mm	1545	1540	-5
22	Roof sill top height	mm	1638	1650	12
23	Floor sill bottom height	mm	275	295	20
24	Floor sill top height	mm	455	470	15

All measurements in millimeters

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

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04



DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04

VEHICLE CAMERA MEASUREMENT TABLE

No.	Camera View	Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time	18288	-22860	2540	10	N/A	17-70	DNR
2	Driver Overall	1930	8357	1321	4	7783	13	1020
2B	Driver Overall	1626	8230	1092	4	7684	17	NTM
3	Driver Close-Up	1626	8230	1600	4	7682	35	1010
3B	Driver Close-Up	1930	8230	1600	4	7660	35	1000
4	3/4 Driver	6477	10185	4648	13	10956	105	1030
5	Steering Column	1524	8230	2997	16	7858	19	920
6	Steering Column	1524	8230	3404	20	7953	19	1000
7	Driver Side Child	2946	-737	1549	20	1257	8.5	1000
8	Passenger Overall	2286	-8230	1524	6	7647	13	1000
9	Passenger Close-Up	1219	-6096	1524	4	5626	35	1000
10	3/4 Passenger	8026	-8941	2997	9	10239	80	920
11	Passenger Door	1626	-8836	1702	4	8289	50	NTM
12	Passenger Side Child	2946	737	1549	20	1257	8.5	1000
13	Overhead	610	0	6172	90	N/A	13	1010
14	Driver Front	-610	406	2743	40	N/A	13	NTM
15	Passenger Front	-610	406	2743	40	N/A	13	NTM
16	Pit Engine	762	0	-1499	90	N/A	9	DNR
17	Pit Fuel Tank	3658	0	-1499	90	N/A	6	950

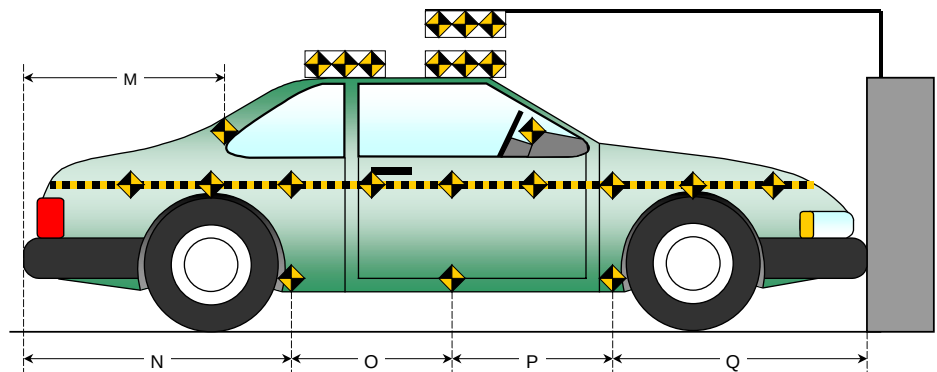
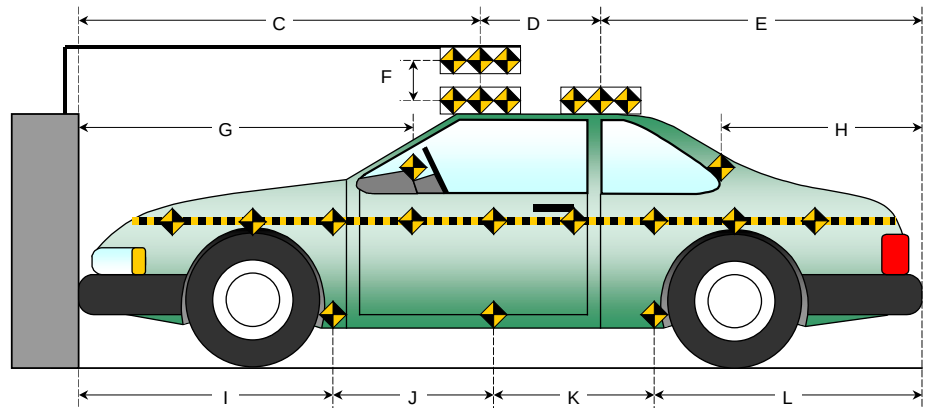
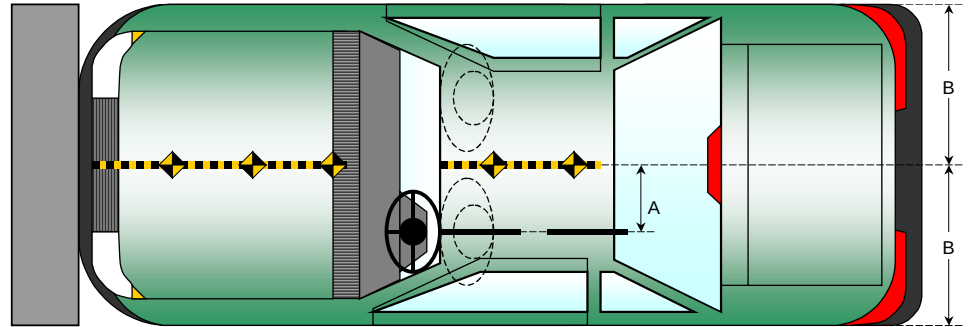
X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Timing Marks

DATA SHEET NO. 16
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

All Dimensions in (mm)	
Item	Value
A	360
B	880
C	2329
D	610
E	1665
F	150
G	1765
H	1118
I	1449
J	862
K	862
L	1430
M	1132
N	1442
O	862
P	862
Q	1448



DATA SHEET NO. 17
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

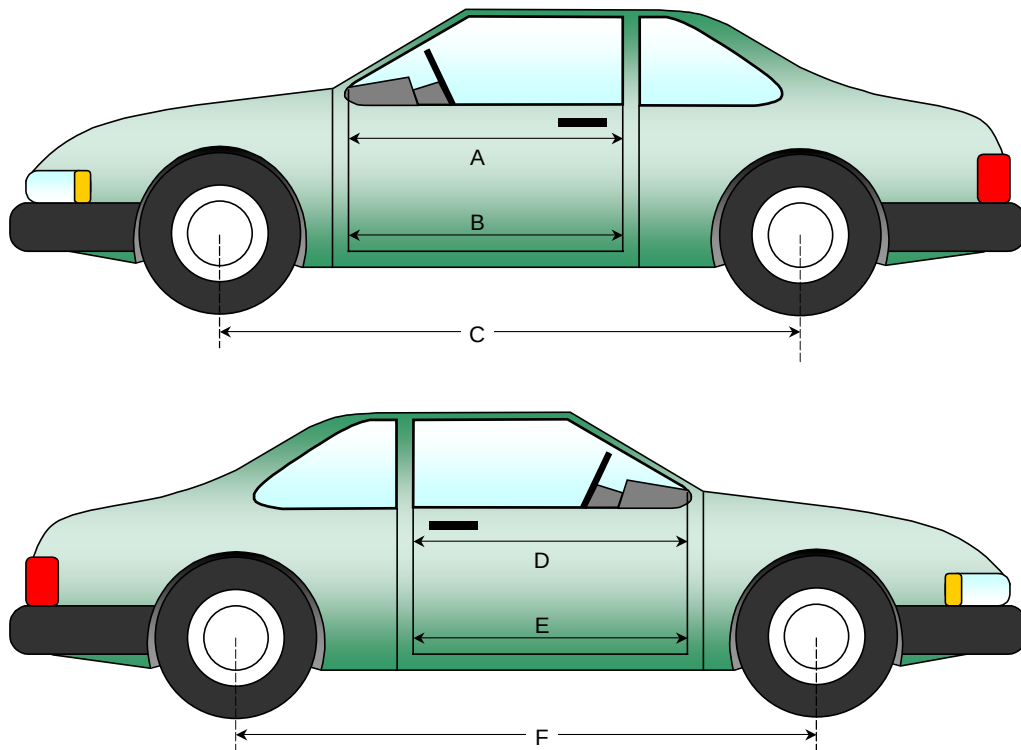
NHTSA No.: M40111
 Test Date: 2/19/04

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	934	924	-10
B	Left Side Lower	mm	950	934	-16
D	Right Side Upper	mm	935	931	-4
E	Right Side Lower	mm	943	936	-7

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2705	2605	-100
F	Right Side Wheel Base	mm	2705	2595	-110



DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

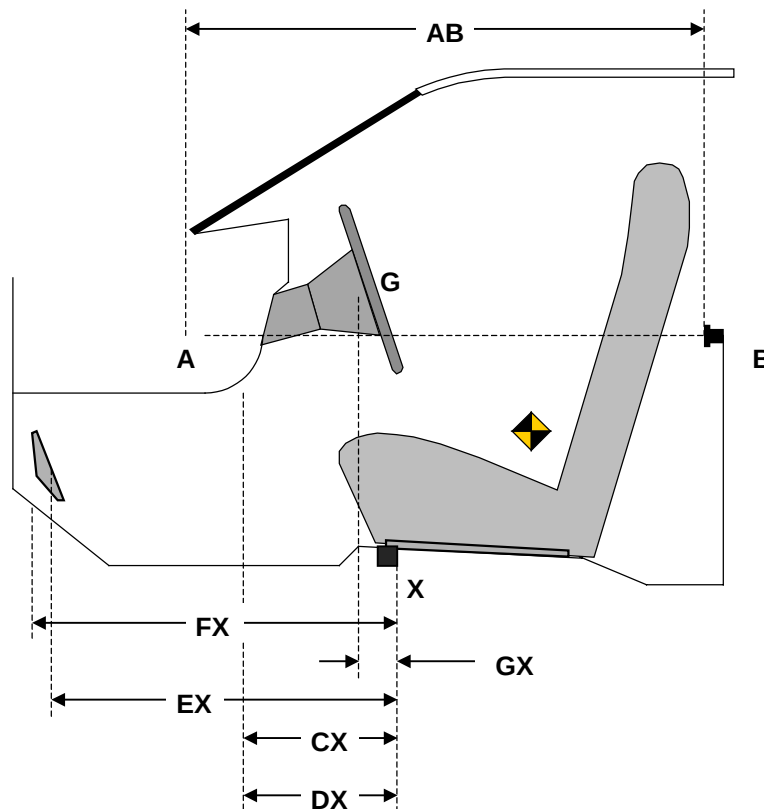
Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	927	924	-3
CX	Left Knee Bolster to X	mm	300	275	-25
DX	Right Knee Bolster to X	mm	290	315	25
EX	Brake Pedal to X	mm	585	455	-130
FX	Foot Rest to X	mm	643	487	-156
GX	Center of Steering Wheel Hub to X	mm	110	150	40

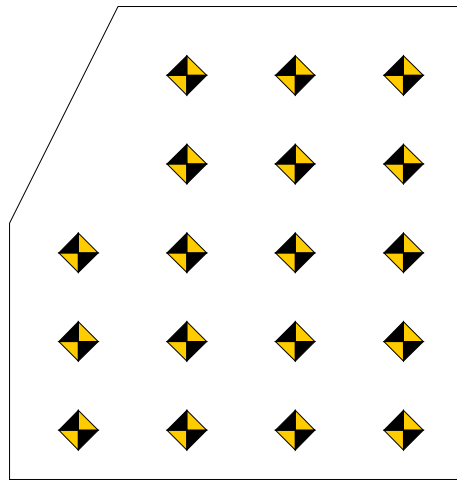
X = Left Front Seat Outboard Anchor Bolt Head



DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04



A B C D

1 Measurement reference point for X and Z-axis is the forward outboard seat mounting bolt.

2 Columns A through D are evenly spaced.

3 Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4 and 5 are located on the most level portion of the floor pan.

5

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		701	696	703		639	639	647		-62	-57	-56
2		654	622	621		579	576	591		-75	-46	-30
3	559	560	558	559	497	497	498	501	-62	-63	-60	-58
4	463	463	465	462	402	402	405	402	-61	-61	-60	-60
5	369	363	364	360	308	303	301	301	-61	-60	-63	-59

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		71	71	97		56	60	81		-15	-11	-16
2		-131	-131	-155		-135	-133	-160		-4	-2	-5
3	-156	-167	-168	-169	-167	-189	-193	-181	-11	-22	-25	-12
4	-167	-168	-167	-167	-162	-176	-179	-175	5	-8	-12	-8
5	-164	-167	-170	-172	-154	-166	-178	-177	10	1	-8	-5

DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

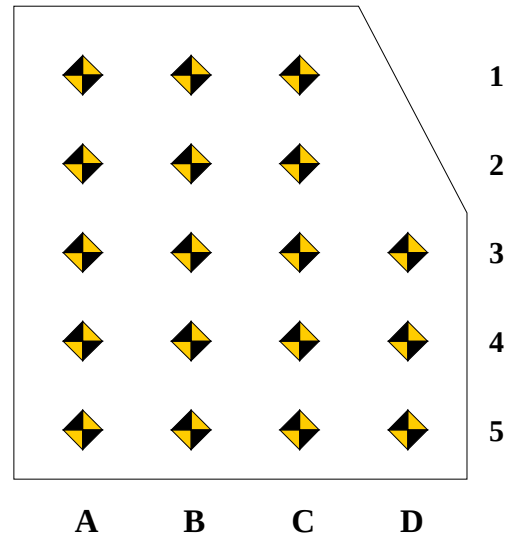
NHTSA No.: M40111
 Test Date: 2/19/04

Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4 and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	706	708	710		681	676	677		-25	-32	-33	
2	635	633	634		617	614	614		-18	-19	-20	
3	543	543	545	544	540	535	536	534	-3	-8	-9	-10
4	441	443	443	446	444	440	438	439	3	-3	-5	-7
5	340	340	343	342	342	338	337	336	2	-2	-6	-6

PASSENGER FLOOR PAN Z-AXIS

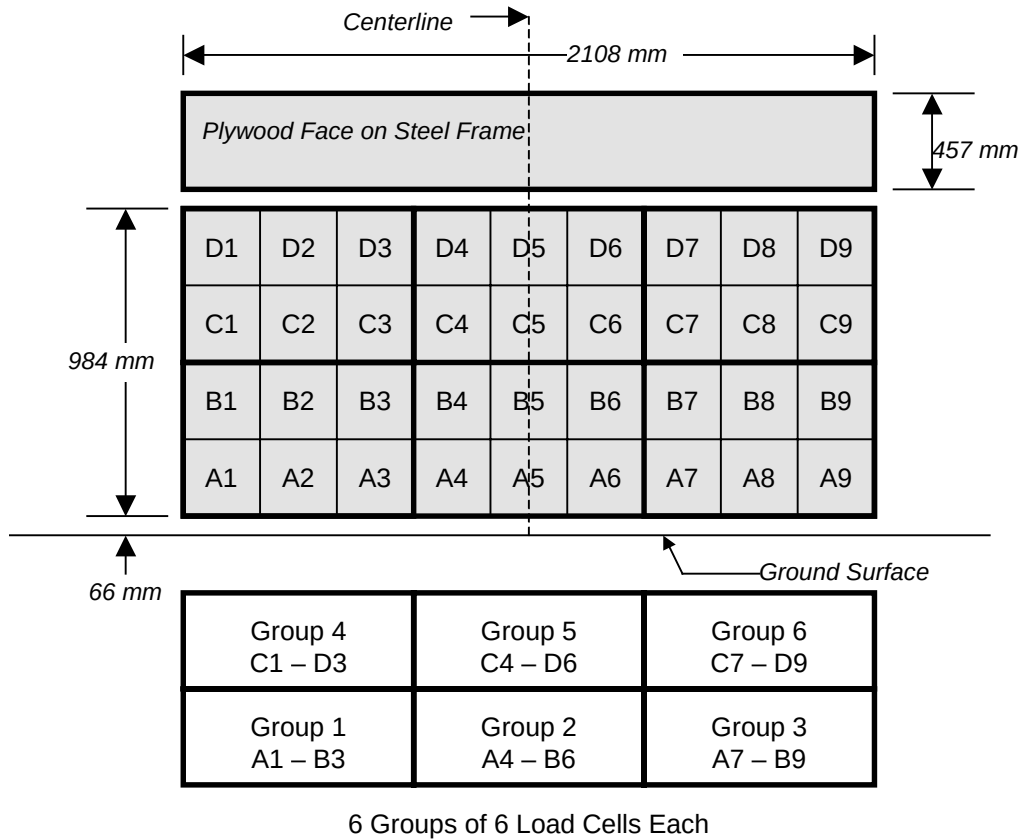
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	64	61	59		38	30	31		-26	-31	-28	
2	-124	-123	-122		-107	-107	-104		17	16	18	
3	-159	-168	-167	-167	-168	-169	-169	-151	-9	-1	-2	16
4	-173	-175	-174	-167	-176	-168	-165	-144	-3	7	9	23
5	-171	-168	-173	-161	-167	-160	-161	-140	4	8	12	21

DATA SHEET NO. 18
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

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



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. 19
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

VEHICLE INFORMATION

VIN: 5GZC2A3D245817875
 Vehicle Size Category: 4 Door MPV

Wheel base (mm): 2705
 Test Weight (kg): 1839

ACCELEROMETER DATA

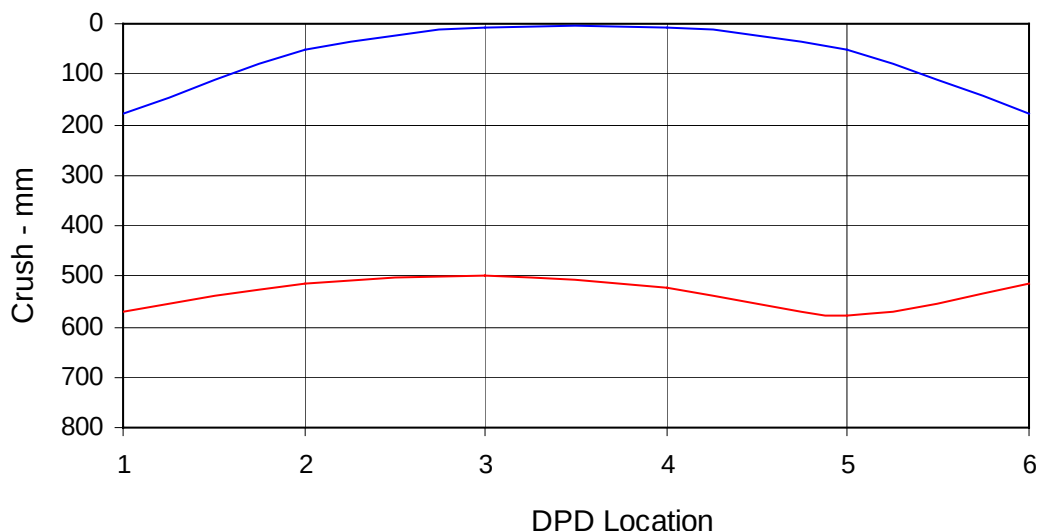
Accelerometer Location: Left rear floor pan
 Cal. Procedure/Interval: 6 months / drop test
 Integration Algorithm: NHTSA Standard
 Impact Velocity (km/h): 55.89
 Velocity Change (km/h): 64.97

Linearity: Good
 Time of Separation (msec): 79.1

CRUSH PROFILE

Collision Deformation Classification 12FDEW6 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1350 Impact Mode: Full Frontal

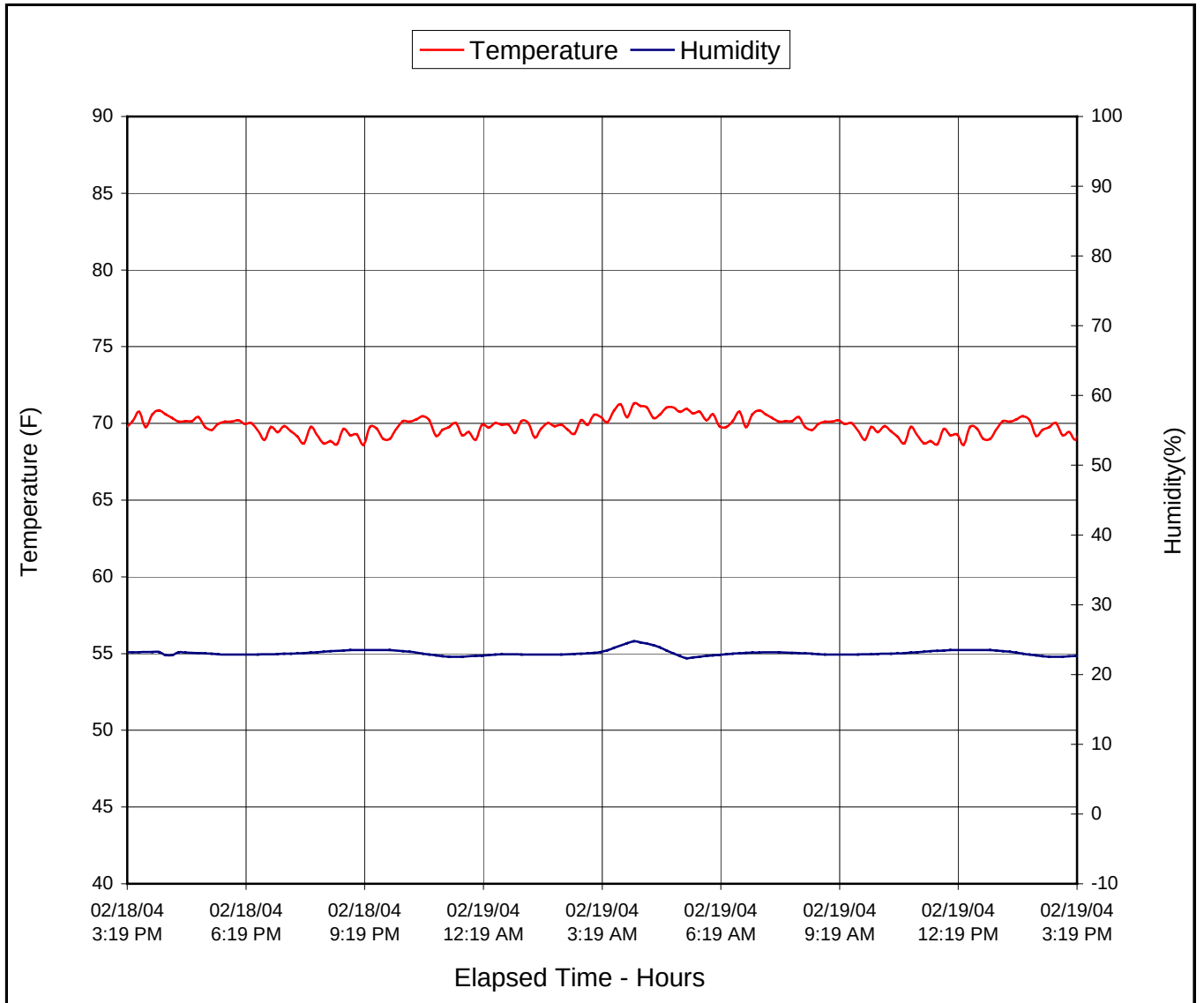
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	180	569	-389
C2	Crush zone 2 on left side	mm	50	514	-464
C3	Crush zone 3 on left side	mm	8	498	-490
C4	Crush zone 4 on right side	mm	8	524	-516
C5	Crush zone 5 on right side	mm	50	580	-530
C6	Crush zone 6 at right side	mm	180	515	-335



DATA SHEET NO. 20
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
Test Date: 2/19/04



APPENDIX A
PHOTOGRAPHS

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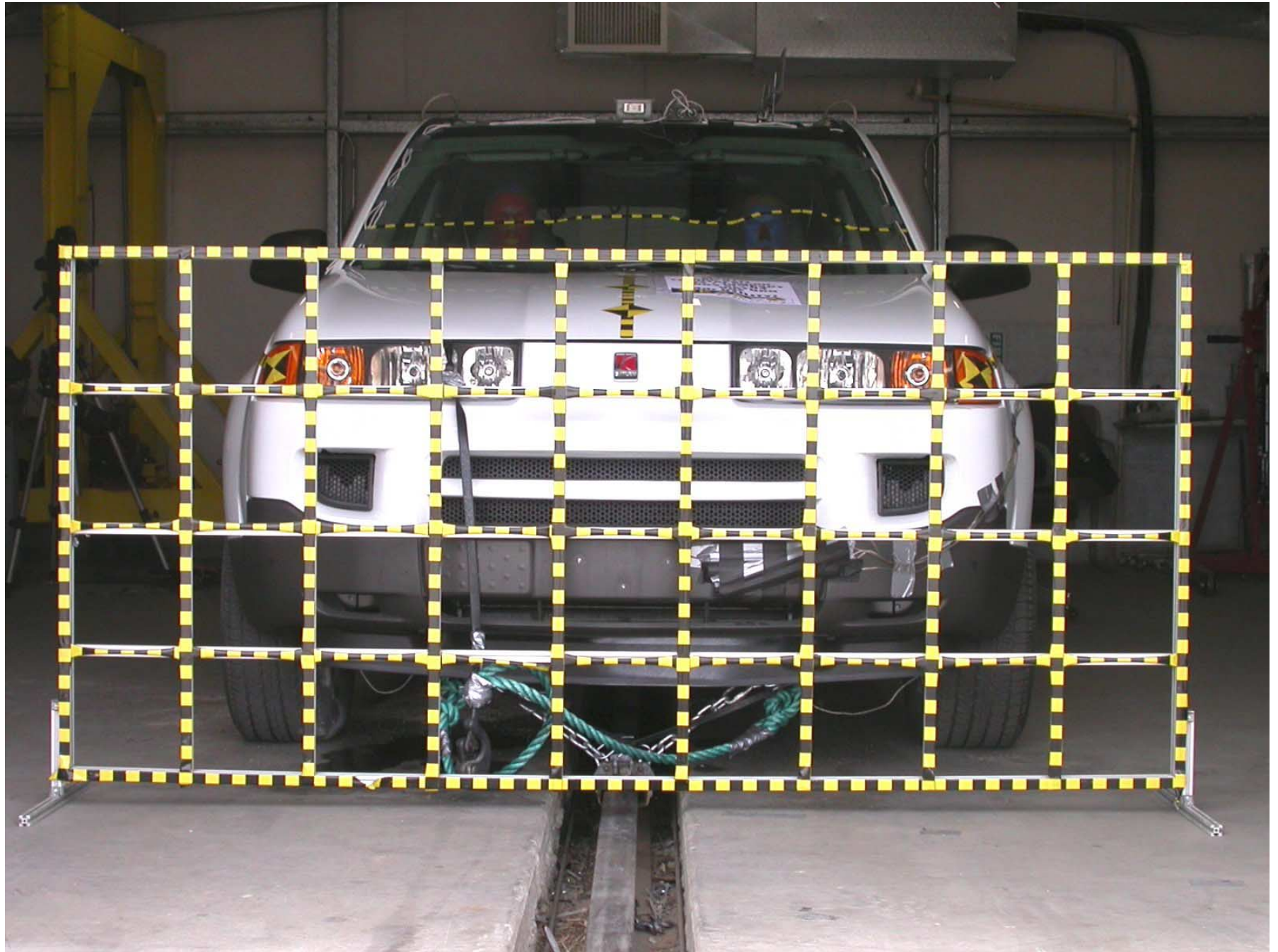


Figure A-1: Load Cell Location



MFD BY SATURN CORPORATION

10/03

GVWR GAWR FRT GAWR RR
2140KG(4718LB) 1035KG(2282LB) 1105KG(2436LB)

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

5GZCZ43D24S817875

TYPE: M.P.V.

MODEL: ZLD26

LPTH	TIRE SIZE	SPEED RTG	RIM	COLD TIRE PRESSURE
FRT	P235/65R16	S	16X6.5J	210KPA(30PSI)
RR	P235/65R16	S	16X6.5J	210KPA(30PSI)
SPA	T155/90D16	M	16X4T	420KPA(60PSI)

SEE OWNER'S MANUAL



FOR MORE INFORMATION.

Figure A-2: Vehicle Certification Label



MFD BY SATURN CORPORATION

10/03

GVWR 2140KG(4718LB) GAWR FRT 1035KG(2282LB) GAWR RR 1105KG(2436LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR
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SPA	T155/90D16	M	16X4T	420KPA(60PSI)

SEE OWNER'S MANUAL



FOR MORE INFORMATION.

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 ¾ 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 $\frac{3}{4}$ View



Figure A-16: Left Rear $\frac{3}{4}$ View of Doors After Impact



Figure A-17: Right Rear 3/4 View of Doors After Impact



Figure A-18: Pre-Test Windshield View



Figure A-19: Post-Test Windshield View



Figure A-20: Pre-Test Engine Compartment



Figure A-21: Post-Test Engine Compartment (Vehicle Moved)



Figure A-22: Pre-Test Fuel Cap



Figure A-23: Post-Test Fuel Cap

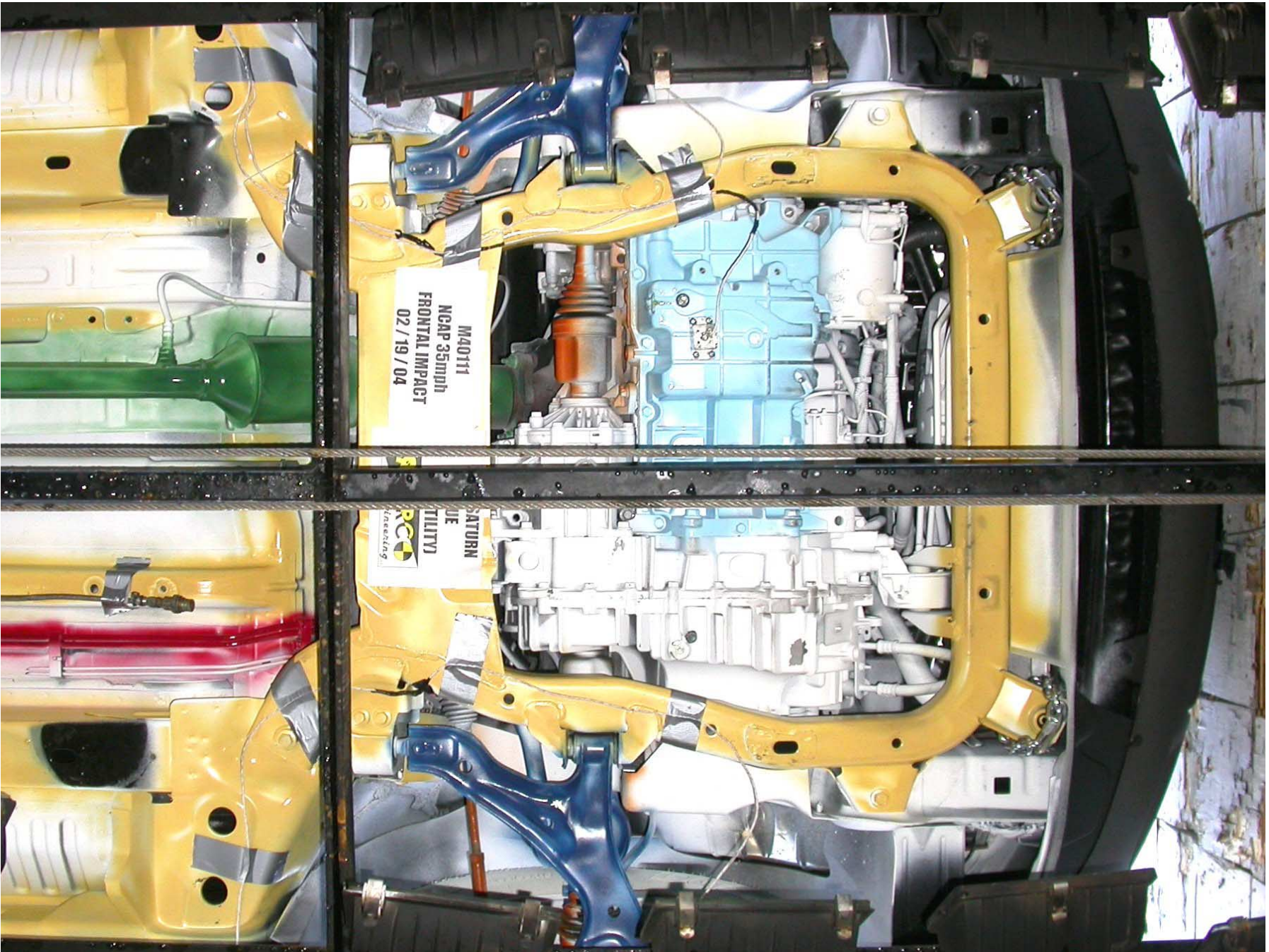


Figure A-24: Pre-Test Front Underbody View

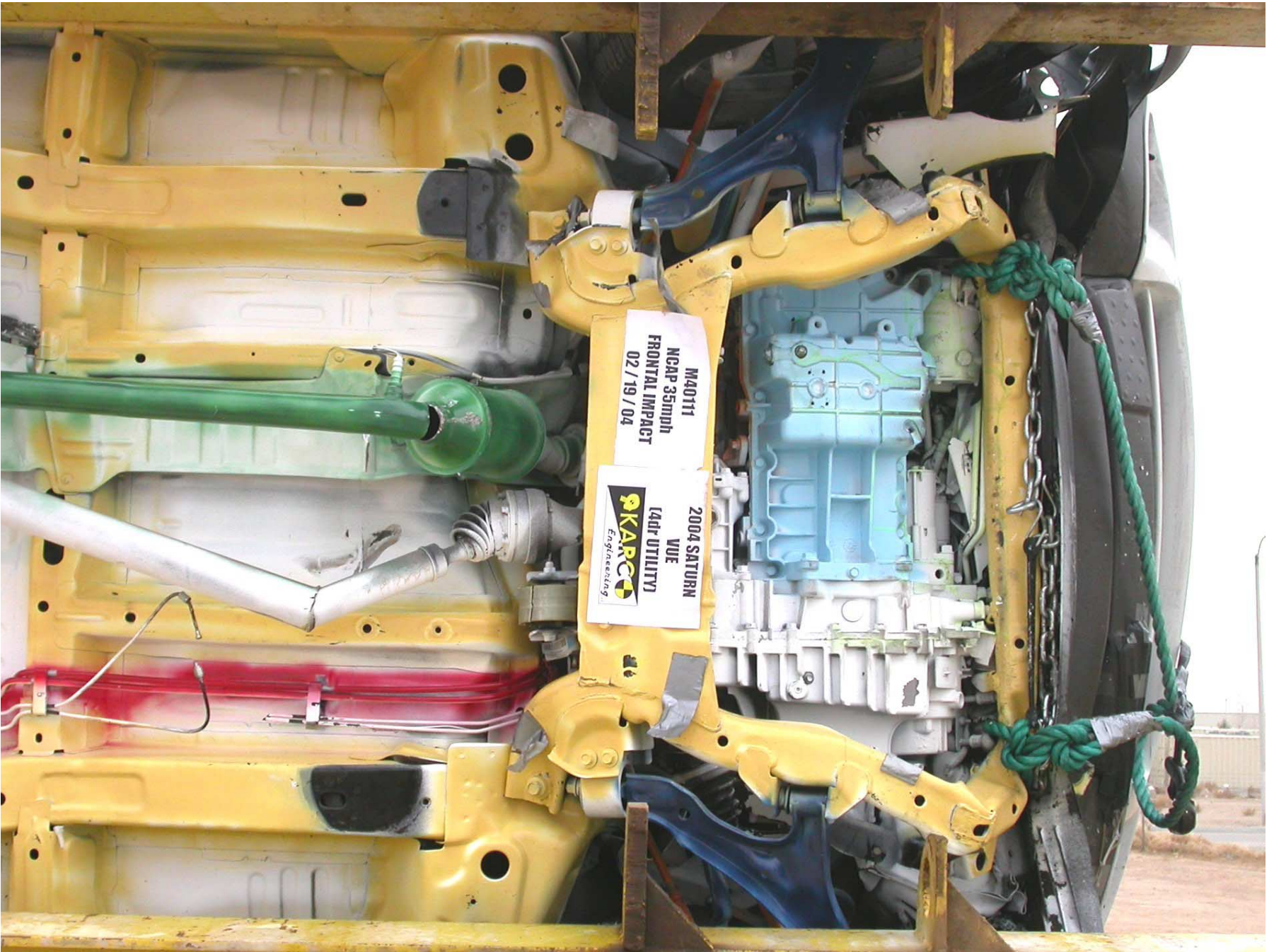


Figure A-25: Post-Test Front Underbody View

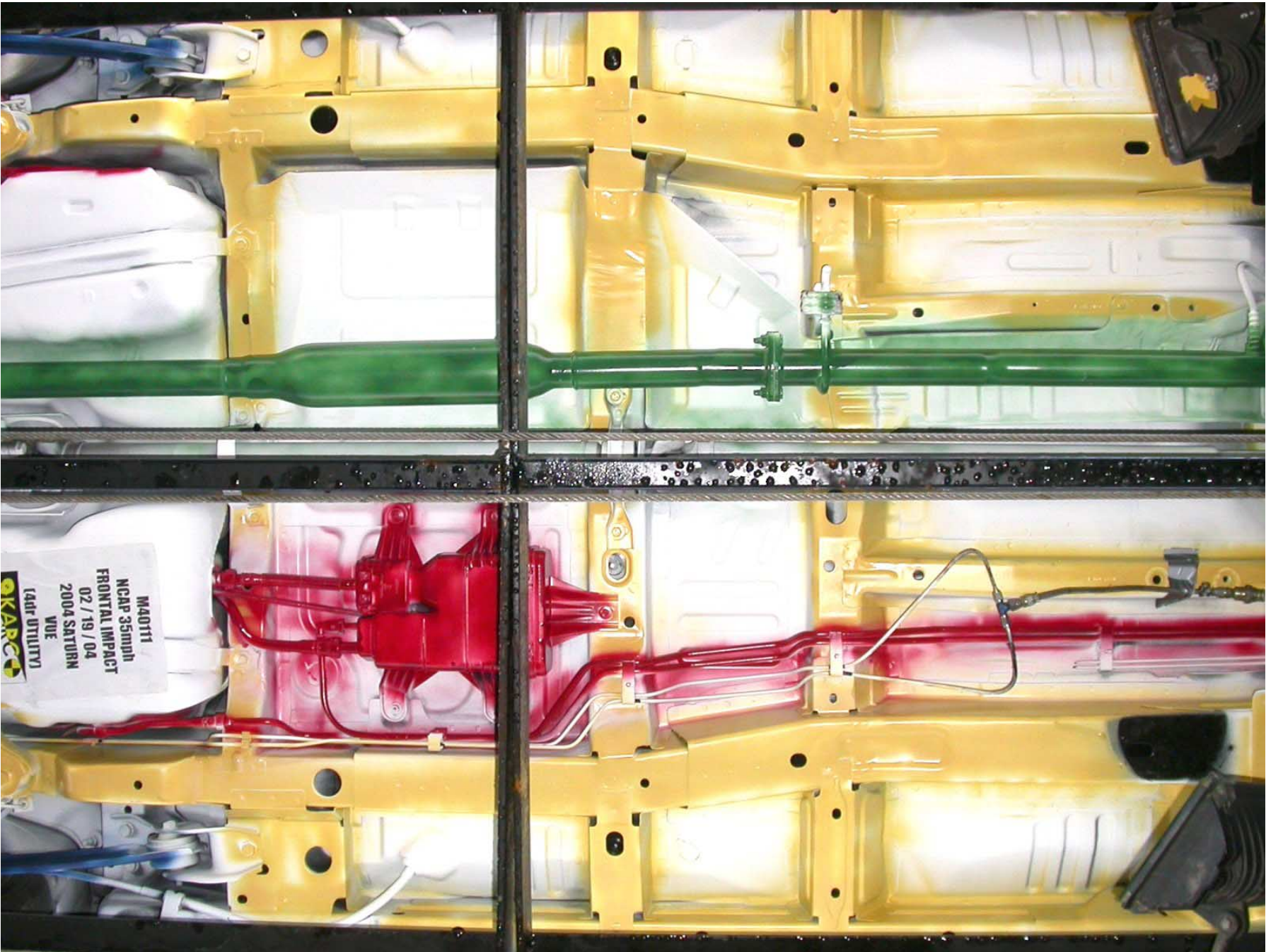


Figure A-26: Pre-Test Mid Underbody View

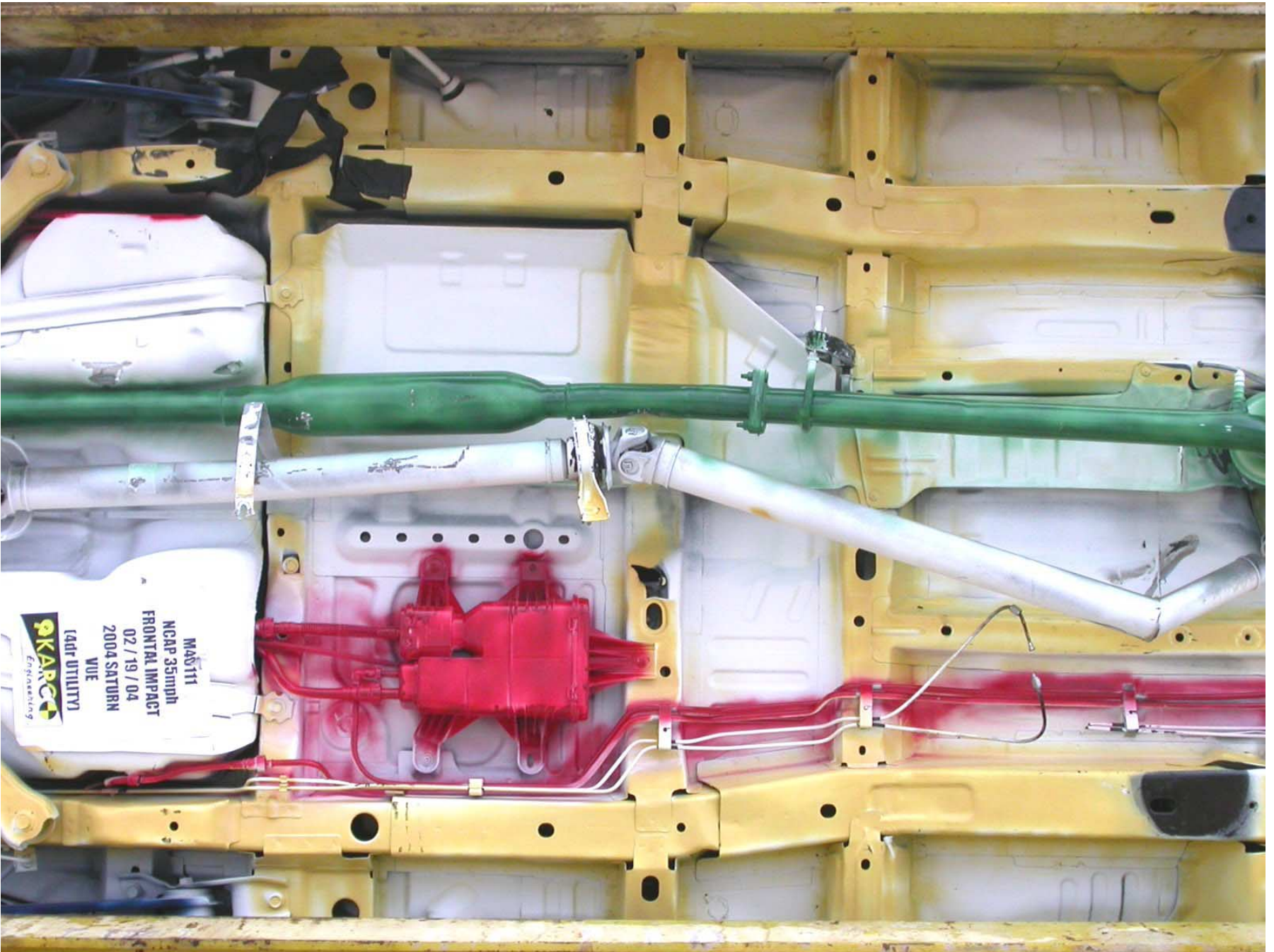


Figure A-27: Post-Test Mid Underbody View

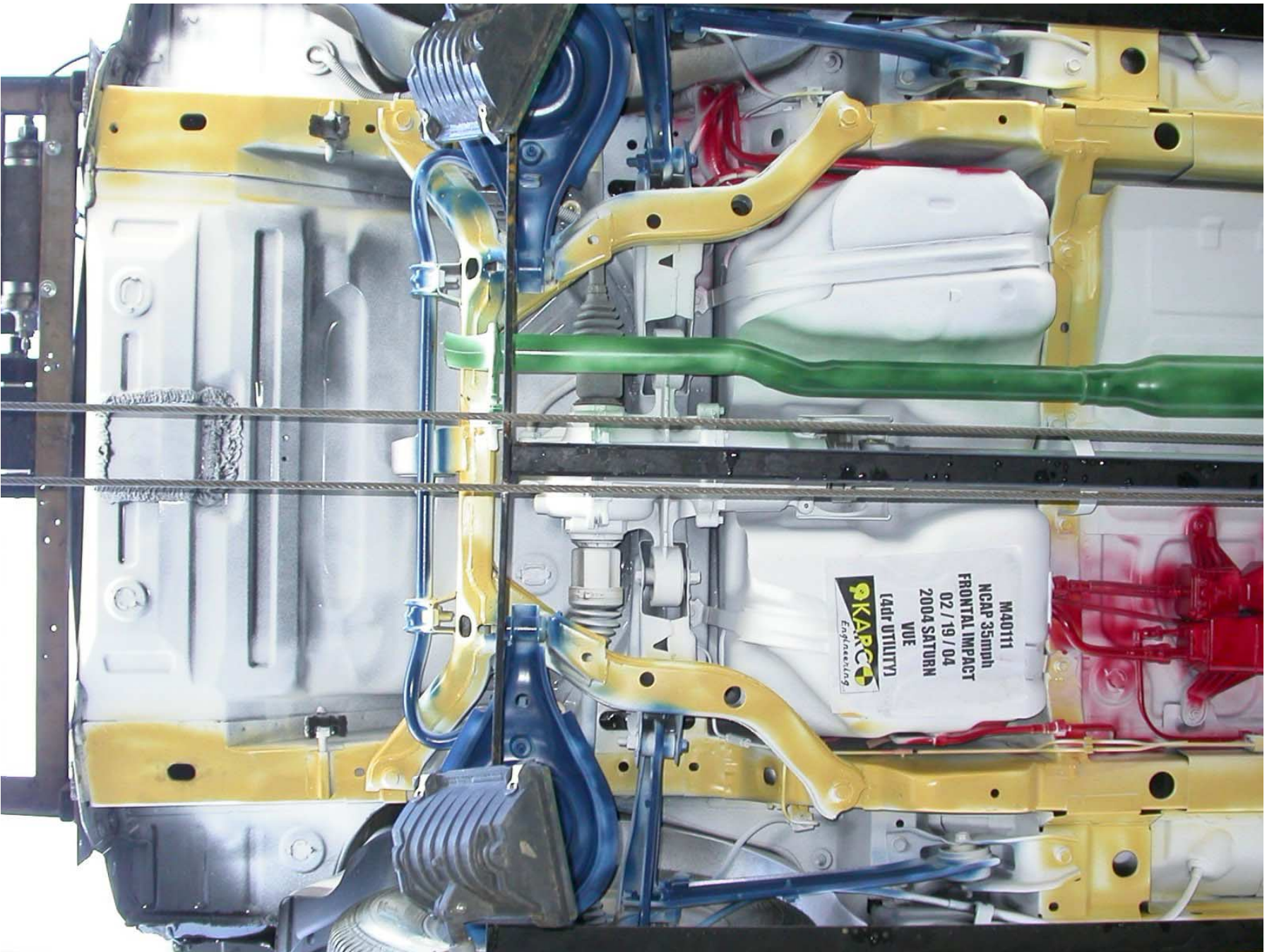


Figure A-28: Pre-Test Rear Underbody View

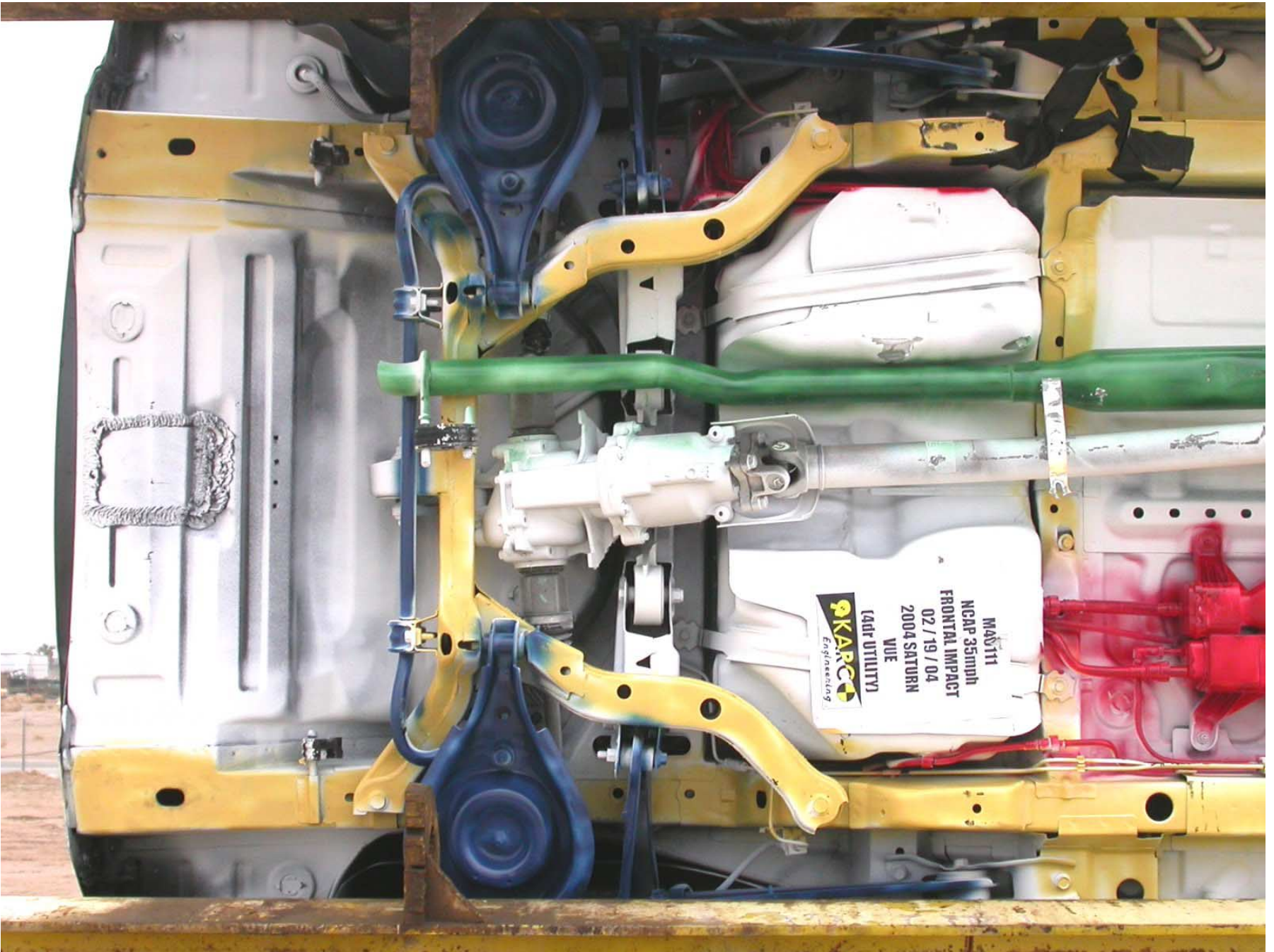


Figure A-29: Post-Test Rear Underbody View

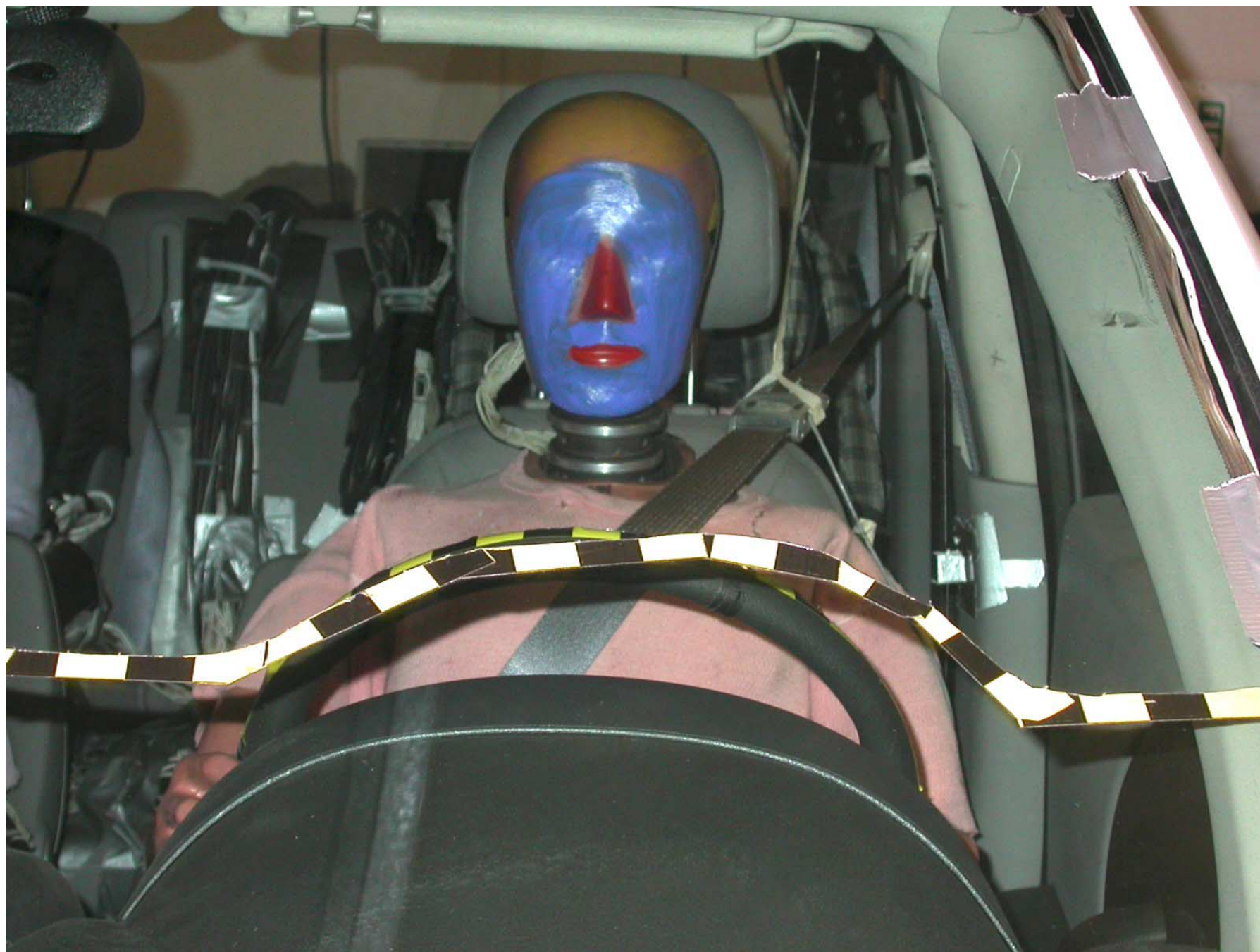


Figure A-30: Pre-Test Driver Dummy Front View (Head Position)



Figure A-31: Post-Test Driver Dummy Front View (Head Position)



Figure A-32: Pre-Test Driver Dummy Front Through Window



Figure A-33: Post-Test Driver Dummy Front Through Window



Figure A-34: Pre-Test Driver Dummy Door Open



Figure A-35: Post-Test Driver Dummy Door Open



Figure A-36: Pre-Test Driver Dummy Feet



Figure A-37: Post-Test Driver Dummy Feet



Figure A-38: Pre-Test Driver Side Knee Bolster



Figure A-39: Post-Test Driver Side Knee Bolster



Figure A-40: Pre-Test Driver Side Floor Pan



Figure A-41: Post-Test Driver Side Floor Pan



Figure A-42: Post-Test Driver Dummy Head



Figure A-43: Post-Test Driver Dummy Contact to Air Bag



Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)



Figure A-45: Post-Test Passenger Dummy Front View (Head Position)



KARCO **M40111**
Engineering

Figure A-46: Pre-Test Passenger Dummy Front Through Window



Figure A-47: Post-Test Passenger Dummy Front Through Window



Figure A-48: Pre-Test Passenger Dummy Door Open



Figure A-49: Post-Test Passenger Dummy Door Open



Figure A-50: Pre-Test Passenger Dummy Feet



Figure A-51: Post-Test Passenger Dummy Feet



Figure A-52: Pre-Test Passenger Side Knee Bolster



Figure A-53: Post-Test Passenger Side Knee Bolster



Figure A-54: Pre-Test Passenger Side Floor Pan



Figure A-55: Post-Test Passenger Side Floor Pan



Figure A-56: Post-Test Passenger Dummy Head



Figure A-57: Post-Test Passenger Dummy Contact to Air Bag



Figure A-58: Vehicle on Rollover Device



Figure A-59: Vehicle on Rollover Device

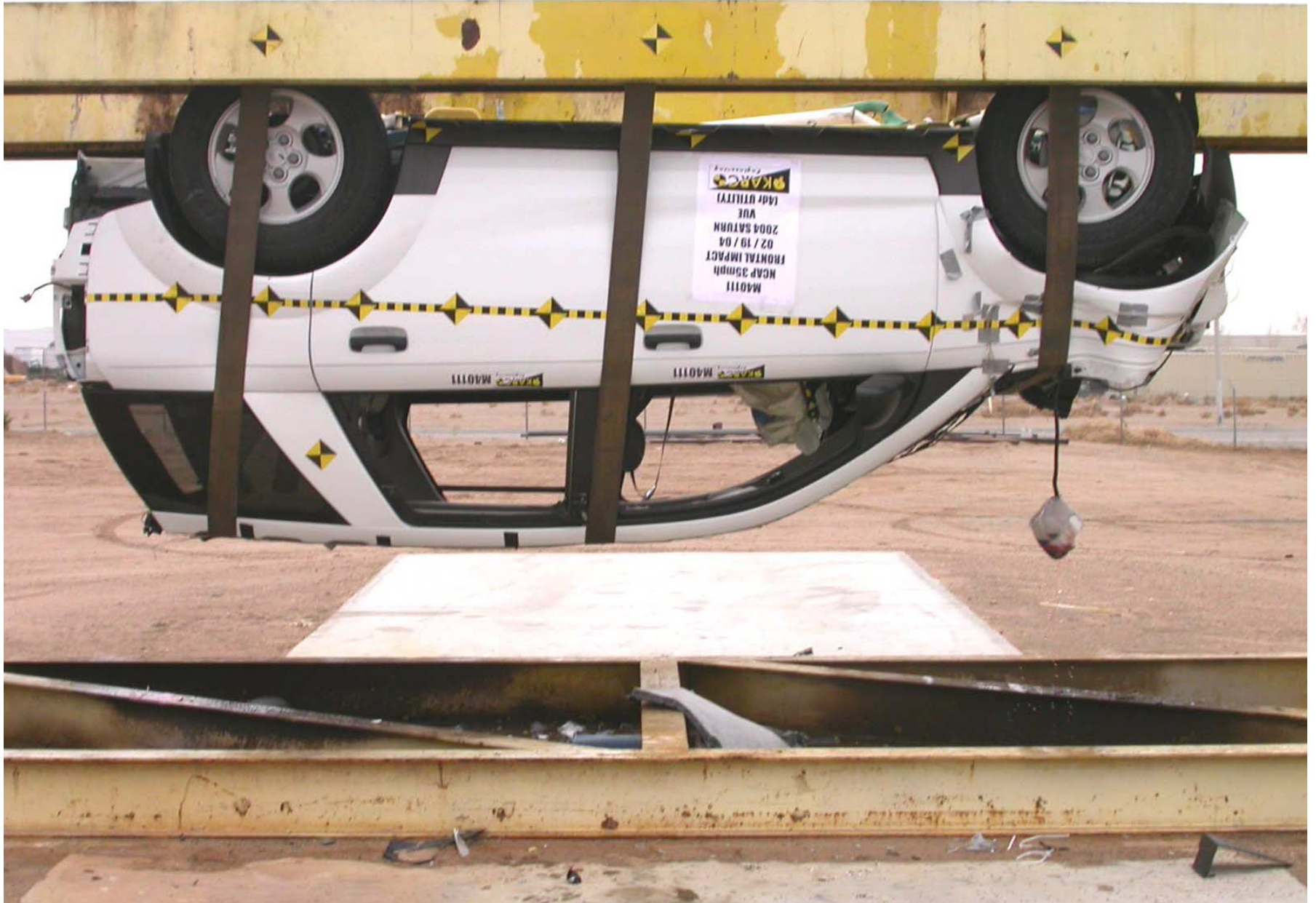


Figure A-60: Vehicle on Rollover Device

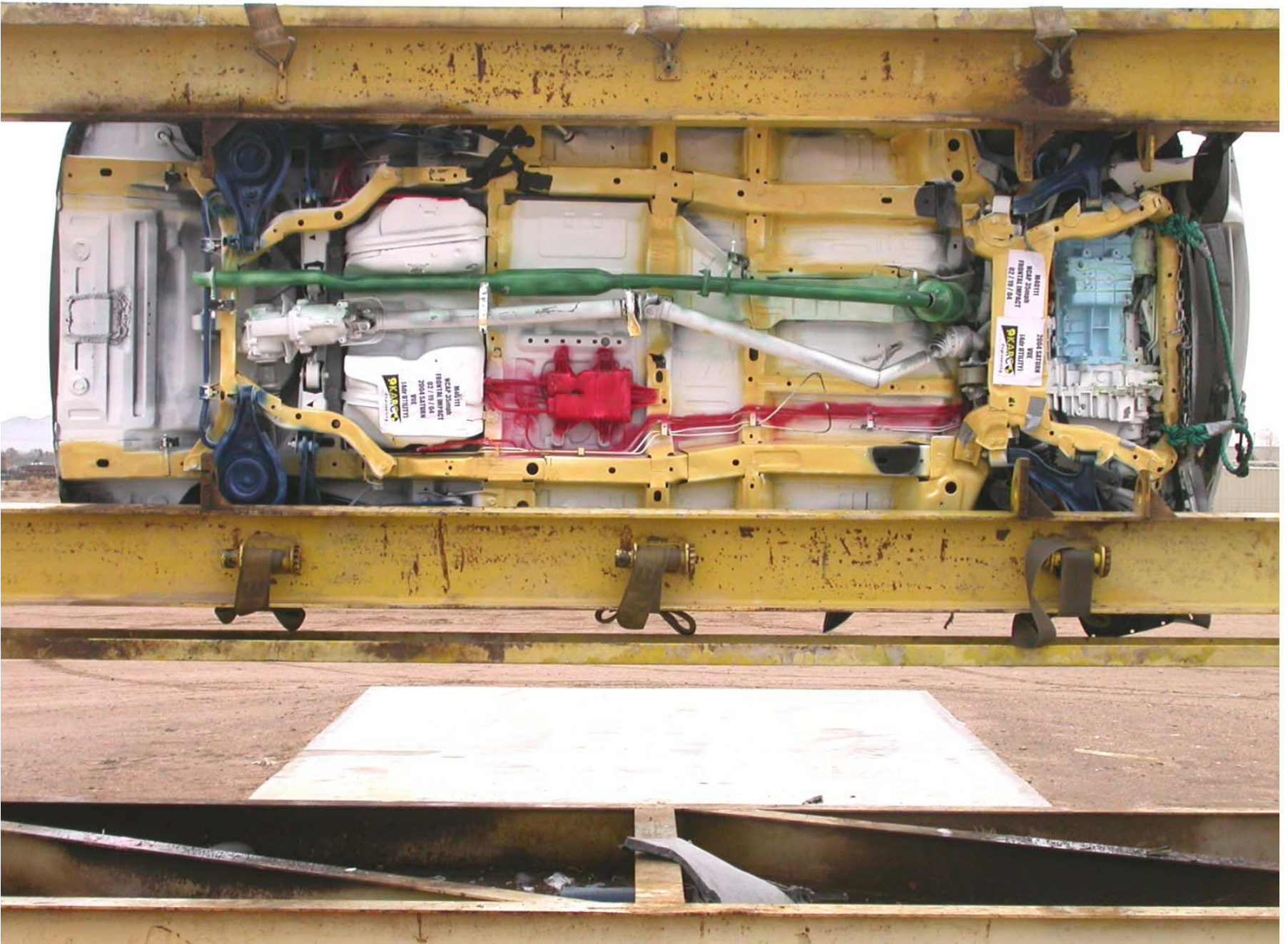


Figure A-61: Vehicle on Rollover Device



Figure A-62: Vehicle During Impact

APPENDIX B

DATA PLOTS

LIST OF DATA PLOTS

Data Plot	Page
B-1	Driver Head Primary X
	Driver Head Primary Y
	Driver Head Primary Z
	Driver Head Resultant Primary
B-2	Driver Head Primary X Velocity
	Driver Head Primary X Displacement
B-3	Driver Head Redundant X
	Driver Head Redundant Y
	Driver Head Redundant Z
	Driver Head Resultant Redundant
B-4	Driver Head Redundant X Velocity
	Driver Head Redundant X Displacement
B-5	Driver Upper Neck Force X
	Driver Upper Neck Force Y
	Driver Upper Neck Force Z
	Driver Upper Neck Force Resultant
B-6	Driver Upper Neck Moment X
	Driver Upper Neck Moment Y
	Driver Upper Neck Moment Z
	Driver Upper Neck Moment Resultant
B-7	Driver Chest Primary X
	Driver Chest Primary Y
	Driver Chest Primary Z
	Driver Chest Resultant Primary
B-8	Driver Chest Primary X Velocity
	Driver Chest Primary X Displacement
B-9	Driver Chest Redundant X
	Driver Chest Redundant Y
	Driver Chest Redundant Z
	Driver Chest Resultant Redundant
B-10	Driver Chest Redundant X Velocity
	Driver Chest Redundant X Displacement
B-11	Driver Chest Displacement

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	Driver Pelvis Y
	Driver Pelvis Z
	Driver Pelvis Resultant
B-13	Driver Pelvis X Velocity
	Driver Pelvis X Displacement
B-14	Driver Left Femur Force
	Driver Right Femur Force
B-15	Driver Left Upper Tibia Moment X
	Driver Left Upper Tibia Moment Y
	Driver Right Upper Tibia Moment X
	Driver Right Upper Tibia Moment Y
B-16	Driver Left Lower Tibia Moment X
	Driver Left Lower Tibia Moment Y
	Driver Left Lower Tibia Force Z
B-17	Driver Right Lower Tibia Moment X
	Driver Right Lower Tibia Moment Y
	Driver Right Lower Tibia Force Z
B-18	Driver Left Foot Aft X
	Driver Left Foot Aft Z
	Driver Left Foot Fore Z
B-19	Driver Right Foot Aft X
	Driver Right Foot Aft Z
	Driver Right Foot Fore Z
B-20	Driver Lap Belt Force
	Driver Shoulder Belt Force
	Driver Shoulder Belt Pullout
	Driver Shoulder Belt Elongation
B-21	Passenger Head Primary X
	Passenger Head Primary Y
	Passenger Head Primary Z
	Passenger Head Resultant Primary
B-22	Passenger Head Primary X Velocity
	Passenger Head Primary X Displacement

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B-30	Passenger Chest Redundant X Velocity	B-30
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B-33	Passenger Pelvis X Velocity	B-33
	Passenger Pelvis X Displacement	B-33

LIST OF DATA PLOTS...(Continued)

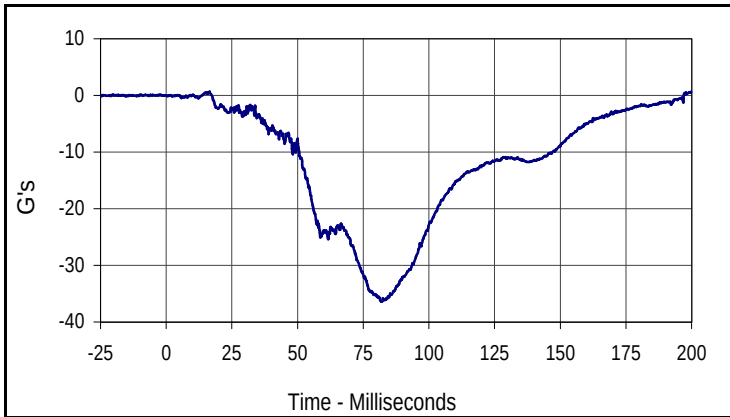
Data Plot		Page
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	Passenger Left Upper Tibia Moment Y	B-35
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LIST OF DATA PLOTS...(Continued)

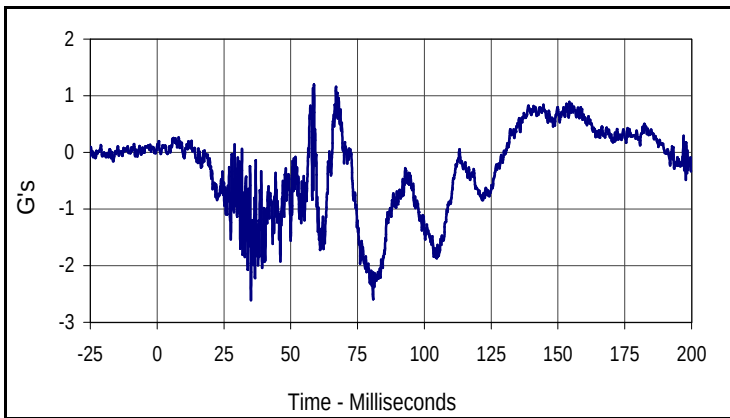
<u>Data Plot</u>	<u>Page</u>
B-45	Vehicle Left Brake Caliper
	Vehicle Left Brake Caliper Velocity
	Vehicle Left Brake Caliper Displacement
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	Vehicle Right Brake Caliper Velocity
	Vehicle Right Brake Caliper Displacement
B-47	Vehicle Instrument Panel
	Vehicle Instrument Panel Velocity
	Vehicle Instrument Panel Displacement
B-48	Vehicle Left Rear Z
	Vehicle Left Rear Z Velocity
	Vehicle Left Rear Z Displacement
B-49	Vehicle Right Rear Z
	Vehicle Right Rear Z Velocity
	Vehicle Right Rear Z Displacement

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

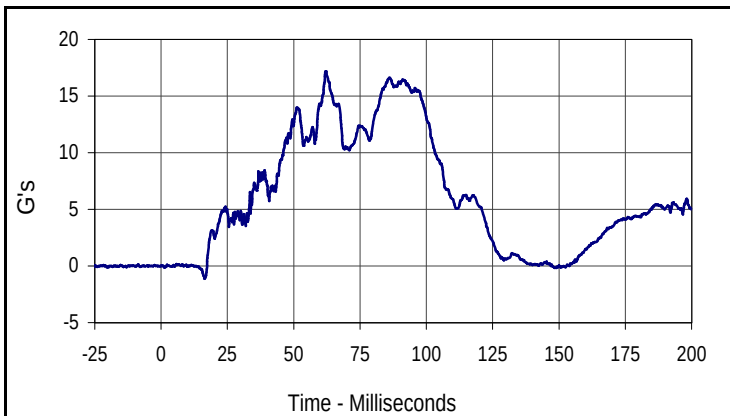
Test Date: 2/19/04
 NHTSA No.: M40111



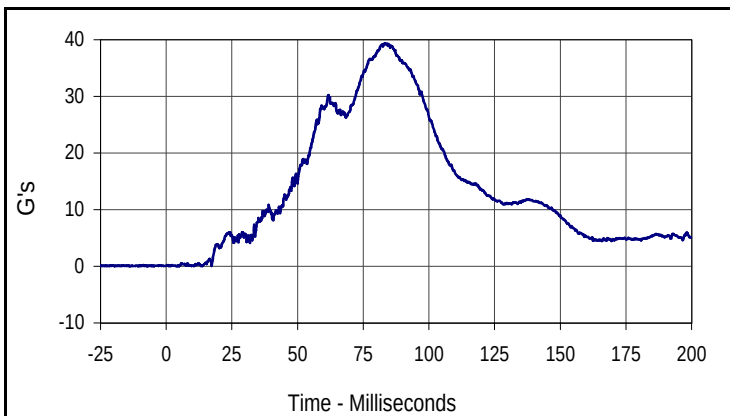
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.7	16.5	-36.4	81.8



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.2	58.7	-2.6	35.1



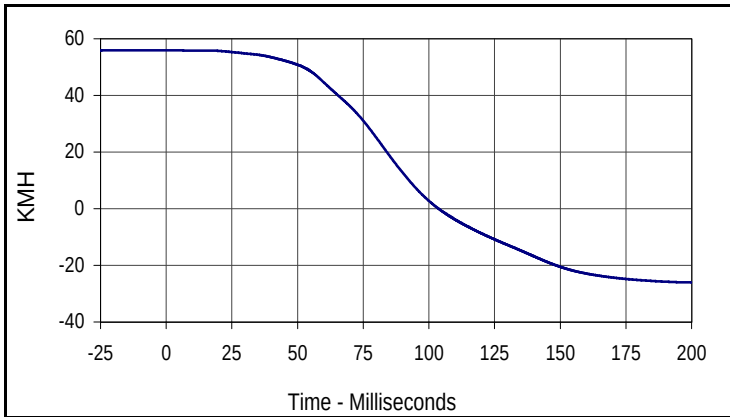
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
17.2	62.2	-1.1	16.4



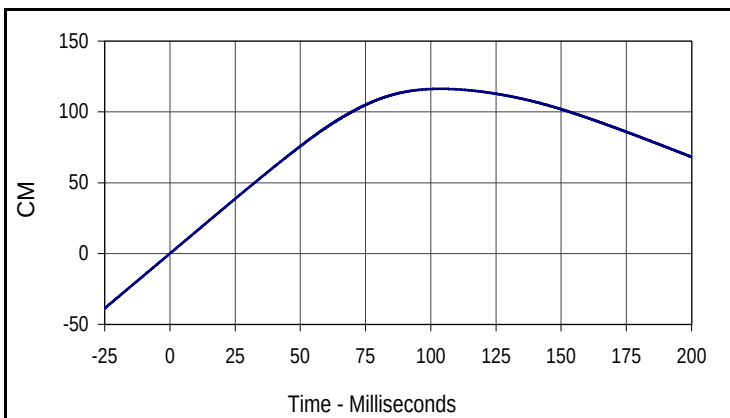
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
39.4	83.2	0.0	4.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



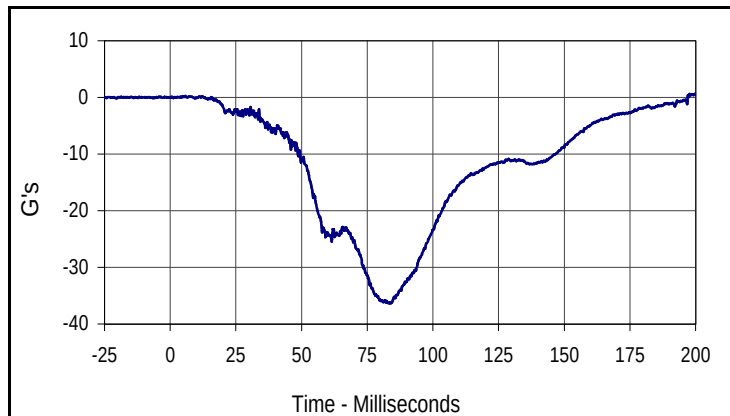
Curve Description			
Driver Head Primary X Velocity			
CURNO	Type	SAE Class	Units
001	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-26.0	197.4



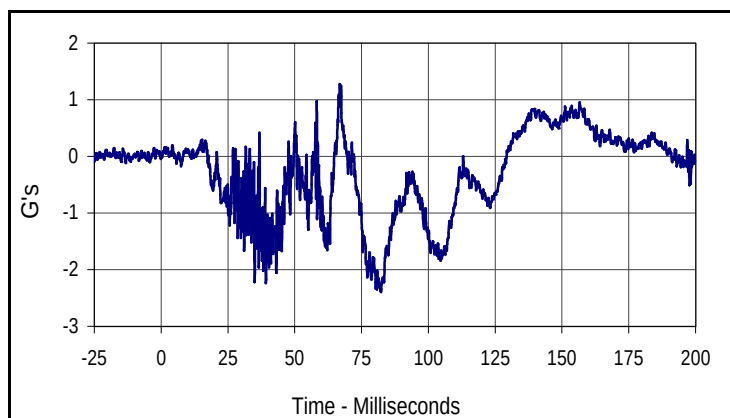
Curve Description			
Driver Head Primary X Displacement			
CURNO	Type	SAE Class	Units
001	IN2	180	CM
Max	Time	Min	Time
116.3	103.7	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

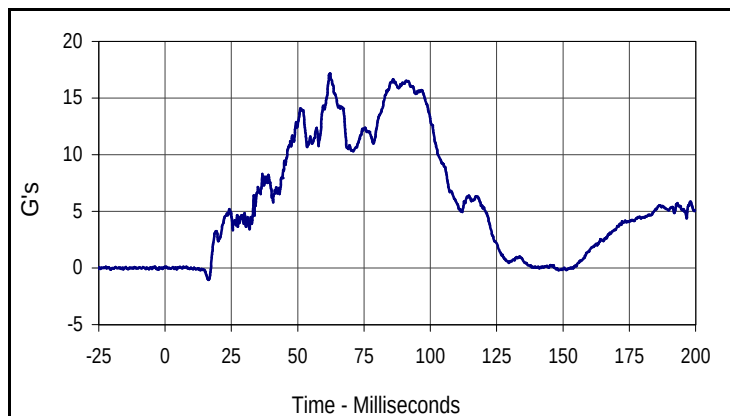
Test Date: 2/19/04
 NHTSA No.: M40111



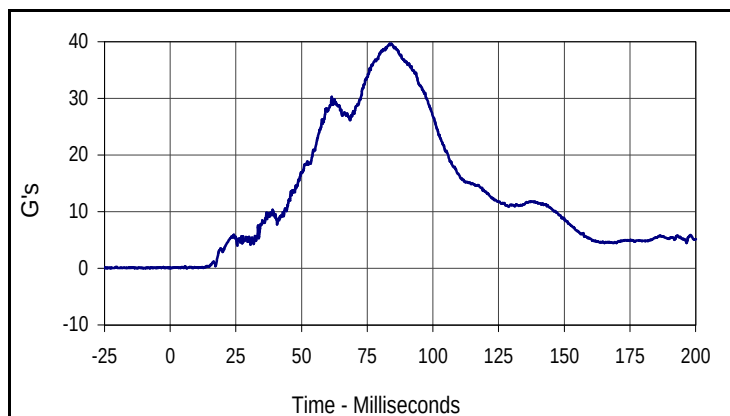
Curve Description			
Driver Head Redundant X			
CURNO	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
0.7	200.0	-36.4	83.6



Curve Description			
Driver Head Redundant Y			
CURNO	Type	SAE Class	Units
005	FIL	1000	G's
Max	Time	Min	Time
1.3	66.9	-2.4	82.3



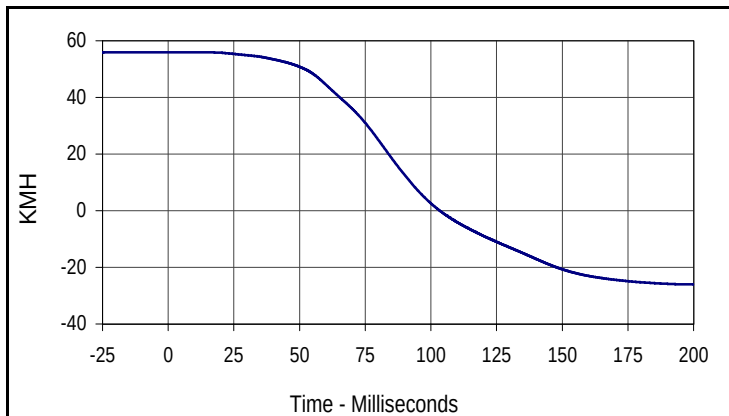
Curve Description			
Driver Head Redundant Z			
CURNO	Type	SAE Class	Units
006	FIL	1000	G's
Max	Time	Min	Time
17.2	62.2	-1.0	16.4



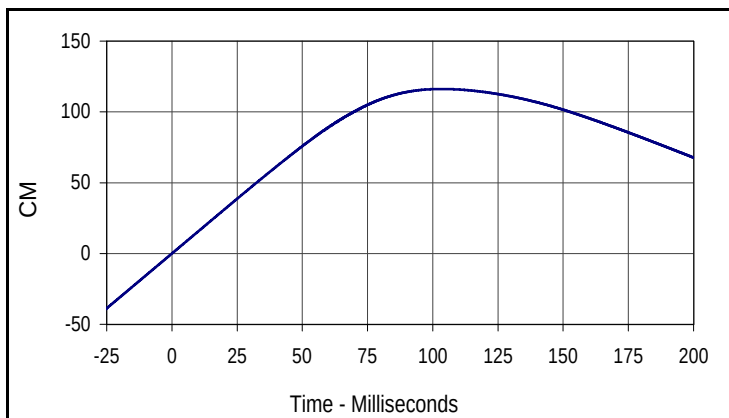
Curve Description			
Driver Head Resultant Redundant			
CURNO	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
39.6	83.6	0.0	6.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



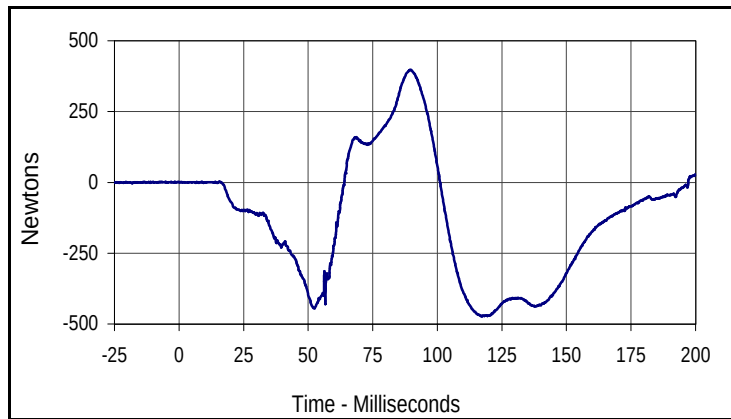
Curve Description			
Driver Head Redundant X Velocity			
CURNO	Type	SAE Class	Units
004	IN1	180	KMH
Max	Time	Min	Time
55.9	12.9	-26.0	197.2



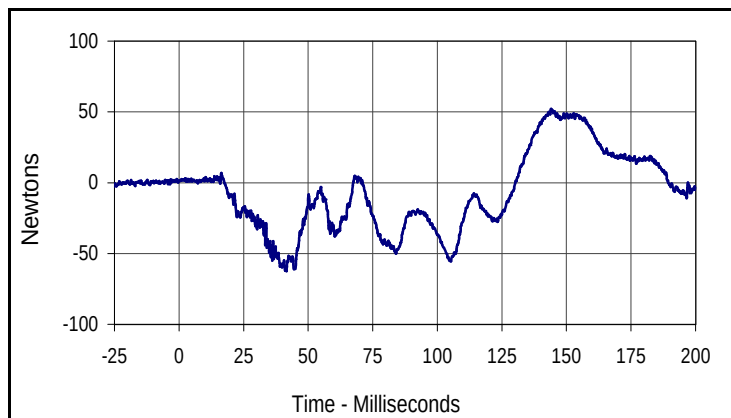
Curve Description			
Driver Head Redundant X Displacement			
CURNO	Type	SAE Class	Units
004	IN2	180	CM
Max	Time	Min	Time
116.2	103.4	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

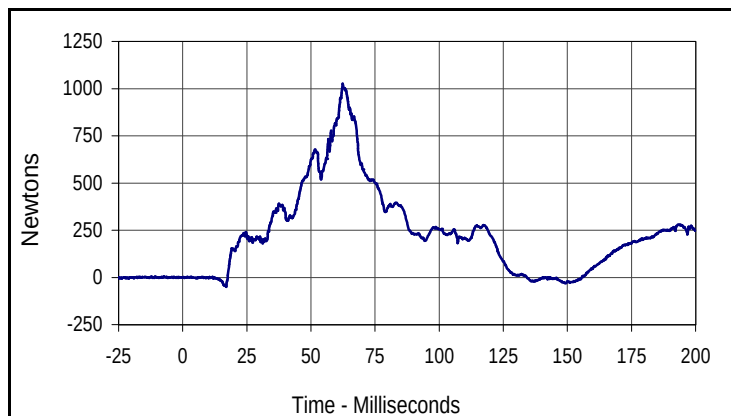
Test Date: 2/19/04
 NHTSA No.: M40111



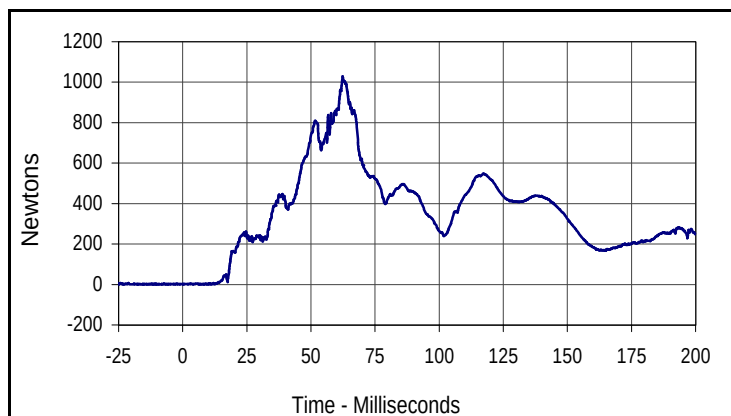
Curve Description			
Driver Upper Neck Force X			
CURNO	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
397.6	89.5	-472.9	117.2



Curve Description			
Driver Upper Neck Force Y			
CURNO	Type	SAE Class	Units
008	FIL	1000	Newtons
Max	Time	Min	Time
52.1	144.0	-62.6	41.6



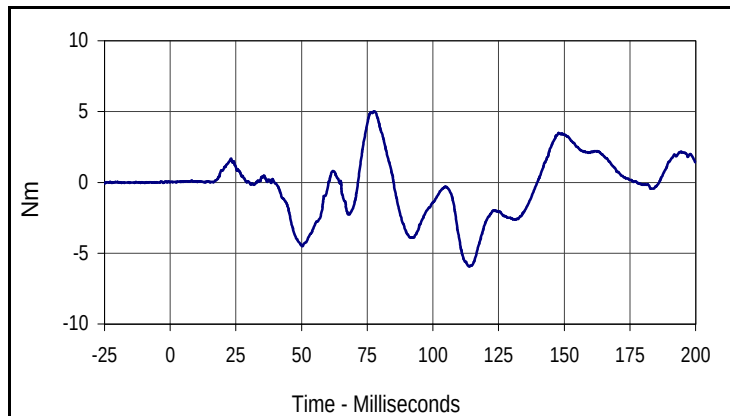
Curve Description			
Driver Upper Neck Force Z			
CURNO	Type	SAE Class	Units
009	FIL	1000	Newtons
Max	Time	Min	Time
1025.5	62.4	-49.4	16.9



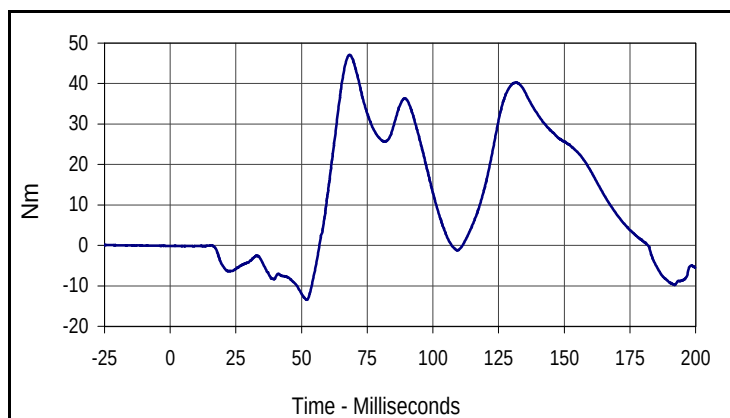
Curve Description			
Driver Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
007	RES	1000	Newtons
Max	Time	Min	Time
1029.1	62.4	0.8	7.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

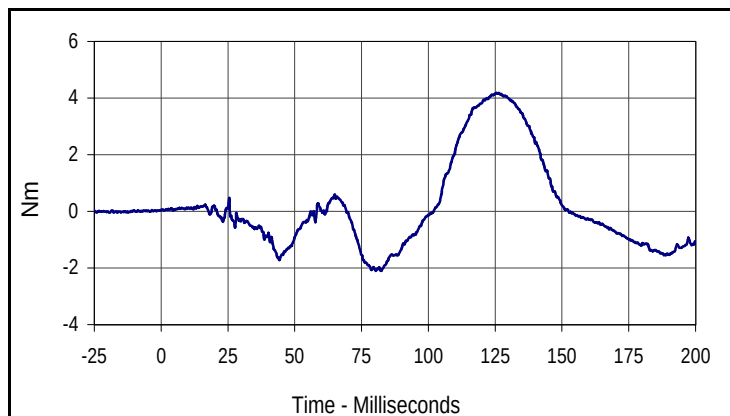
Test Date: 2/19/04
 NHTSA No.: M40111



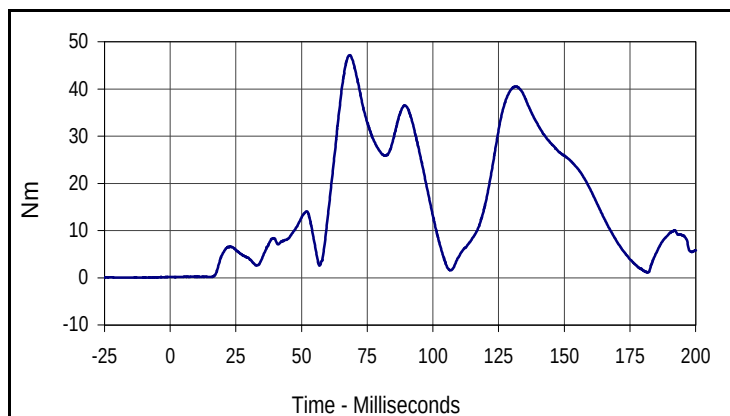
Curve Description			
Driver Upper Neck Moment X			
CURNO	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
5.0	77.8	-5.9	113.7



Curve Description			
Driver Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
47.1	68.4	-13.4	52.0



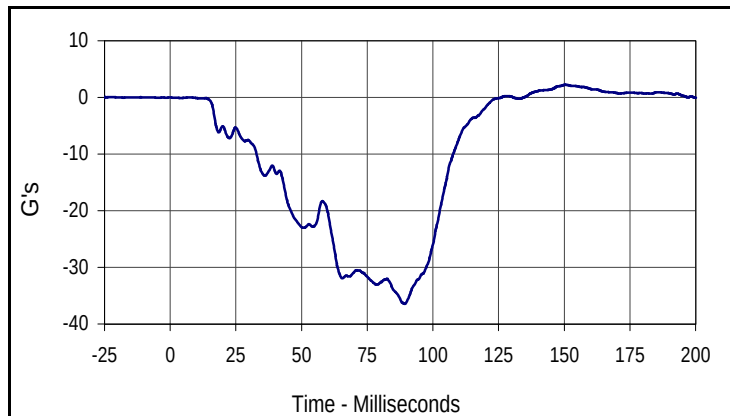
Curve Description			
Driver Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
4.2	125.5	-2.1	82.3



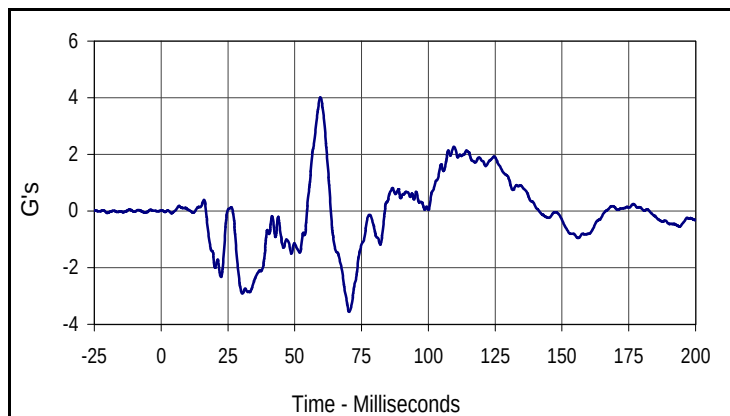
Curve Description			
Driver Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
010	RES	600	Nm
Max	Time	Min	Time
47.1	68.4	0.1	1.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

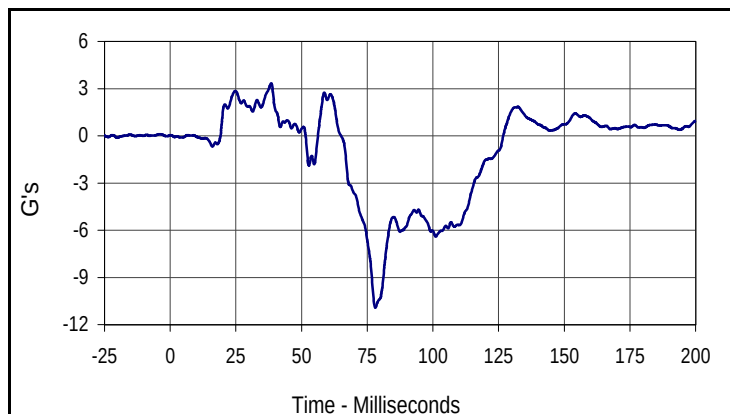
Test Date: 2/19/04
 NHTSA No.: M40111



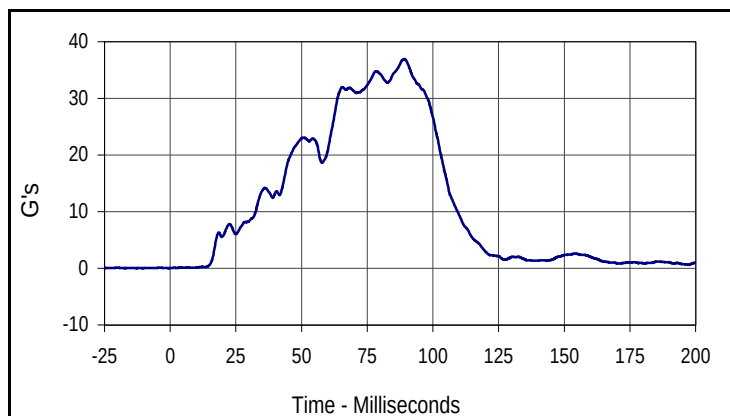
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
2.2	150.4	-36.5	89.3



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
4.0	59.6	-3.6	70.4



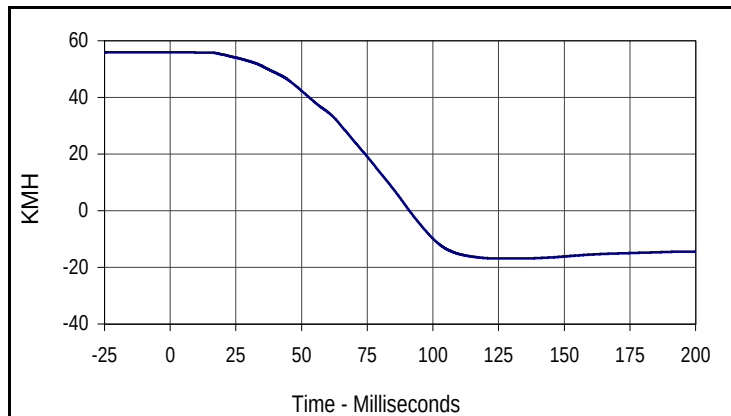
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
015	FIL	180	G's
Max	Time	Min	Time
3.3	38.4	-10.9	78.1



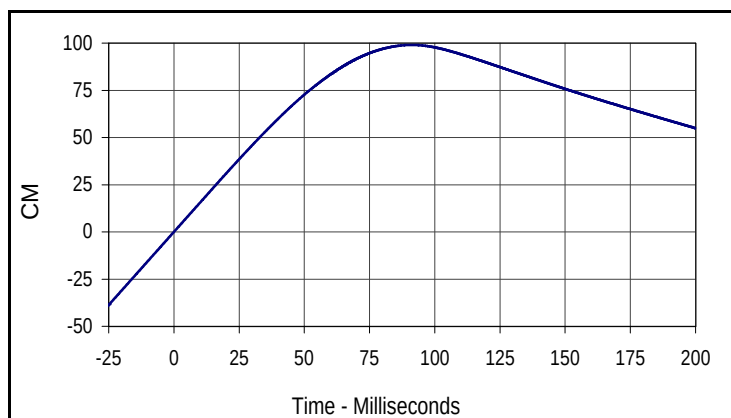
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
013	RES	180	G's
Max	Time	Min	Time
36.9	89.3	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



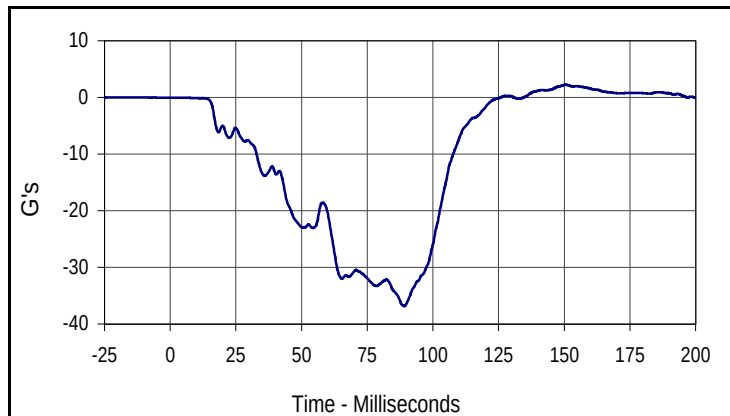
Curve Description			
Driver Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
013	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-16.9	126.1



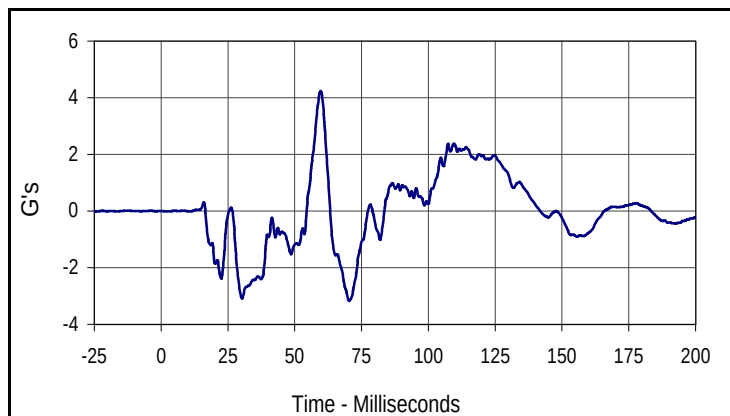
Curve Description			
Driver Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
013	IN2	180	CM
Max	Time	Min	Time
99.0	91.0	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

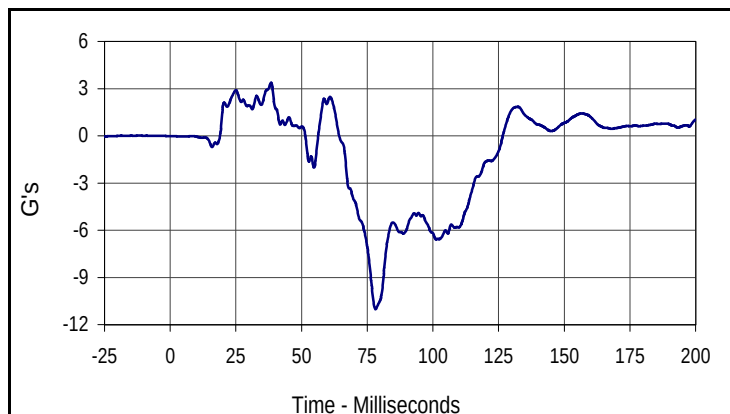
Test Date: 2/19/04
 NHTSA No.: M40111



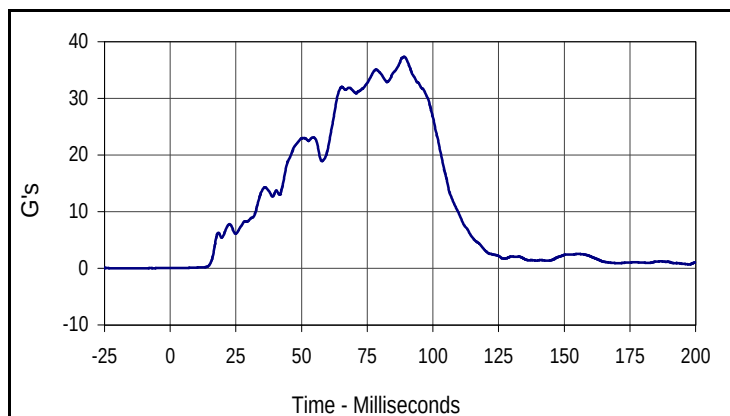
Curve Description			
Driver Chest Redundant X			
CURNO	Type	SAE Class	Units
016	FIL	180	G's
Max	Time	Min	Time
2.2	150.6	-36.8	89.2



Curve Description			
Driver Chest Redundant Y			
CURNO	Type	SAE Class	Units
017	FIL	180	G's
Max	Time	Min	Time
4.2	59.7	-3.2	70.3



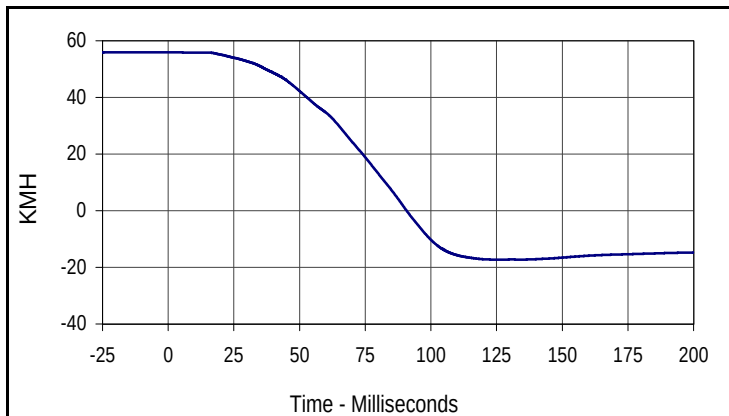
Curve Description			
Driver Chest Redundant Z			
CURNO	Type	SAE Class	Units
018	FIL	180	G's
Max	Time	Min	Time
3.4	38.4	-11.0	78.2



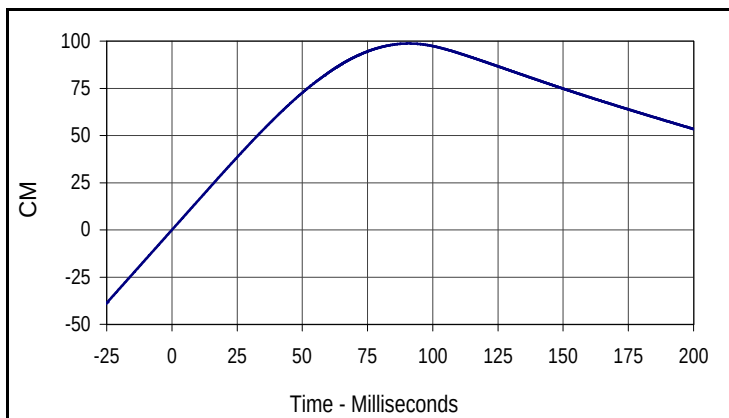
Curve Description			
Driver Chest Resultant Redundant			
CURNO	Type	SAE Class	Units
016	RES	180	G's
Max	Time	Min	Time
37.3	89.2	0.1	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



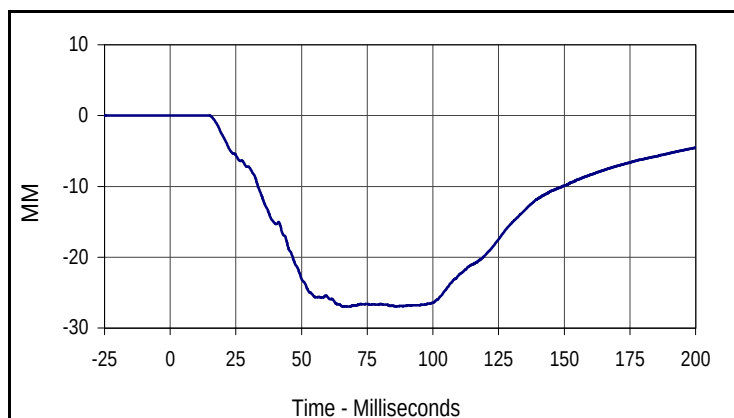
Curve Description			
Driver Chest Redundant X Velocity			
CURNO	Type	SAE Class	Units
016	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-17.3	125.9



Curve Description			
Driver Chest Redundant X Displacement			
CURNO	Type	SAE Class	Units
016	IN2	180	CM
Max	Time	Min	Time
98.7	90.8	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

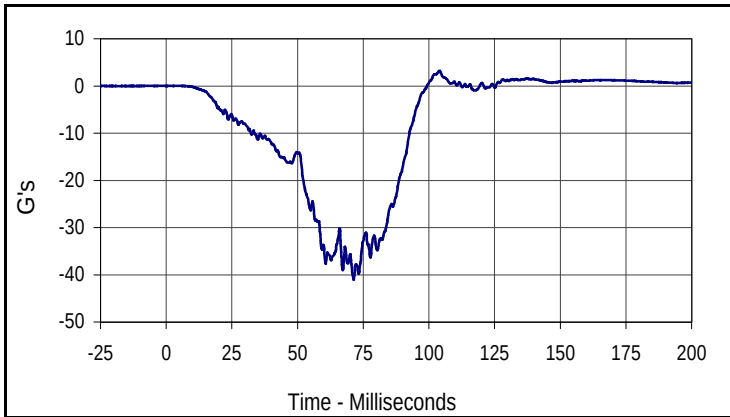
Test Date: 2/19/04
 NHTSA No.: M40111



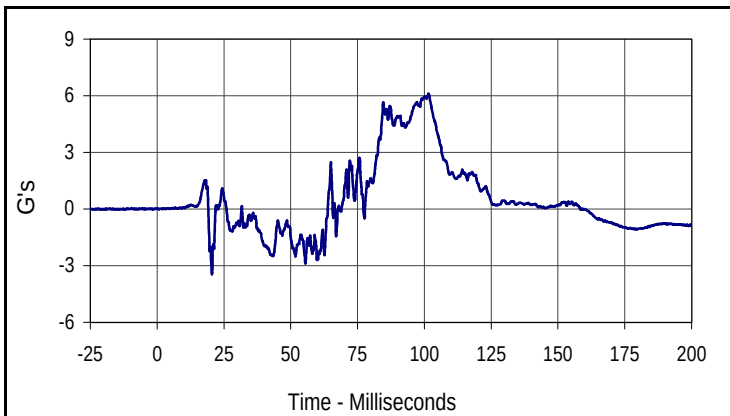
Curve Description			
Driver Chest Displacement			
CURNO	Type	SAE Class	Units
019	FIL	600	MM
Max	Time	Min	Time
0.0	7.6	-27.0	66.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

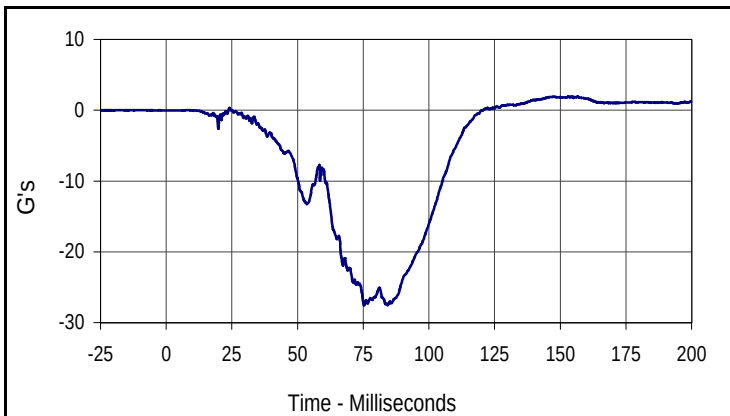
Test Date: 2/19/04
 NHTSA No.: M40111



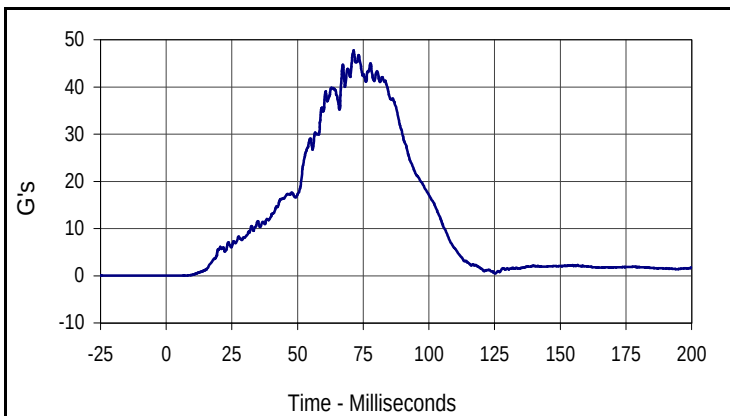
Curve Description			
Driver Pelvis X			
CURNO	Type	SAE Class	Units
020	FIL	1000	G's
Max	Time	Min	Time
3.2	104.1	-41.0	71.4



Curve Description			
Driver Pelvis Y			
CURNO	Type	SAE Class	Units
021	FIL	1000	G's
Max	Time	Min	Time
6.1	101.6	-3.5	20.5



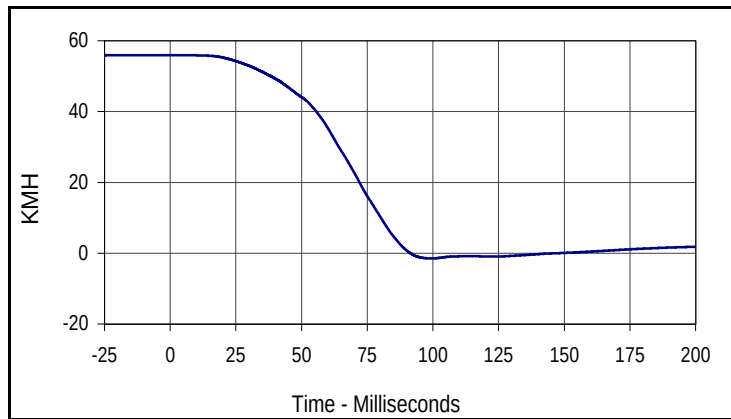
Curve Description			
Driver Pelvis Z			
CURNO	Type	SAE Class	Units
022	FIL	1000	G's
Max	Time	Min	Time
1.9	153.1	-27.6	84.3



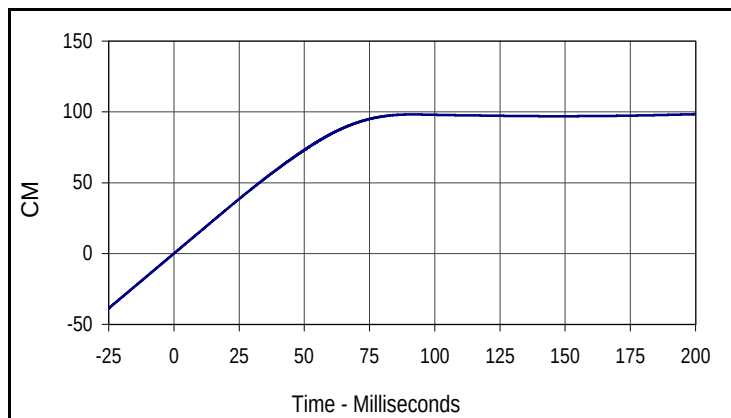
Curve Description			
Driver Pelvis Resultant			
CURNO	Type	SAE Class	Units
020	RES	1000	G's
Max	Time	Min	Time
47.7	71.4	0.0	7.8

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



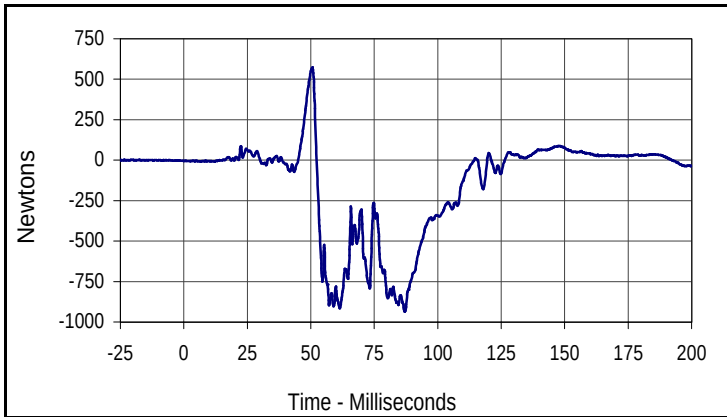
Curve Description			
Driver Pelvis X Velocity			
CURNO	Type	SAE Class	Units
020	IN1	180	KMH
Max	Time	Min	Time
55.9	7.0	-1.5	99.3



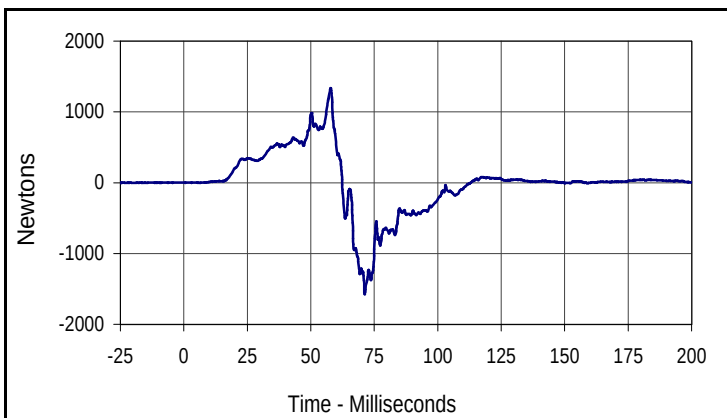
Curve Description			
Driver Pelvis X Displacement			
CURNO	Type	SAE Class	Units
020	IN2	180	CM
Max	Time	Min	Time
98.4	200.0	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



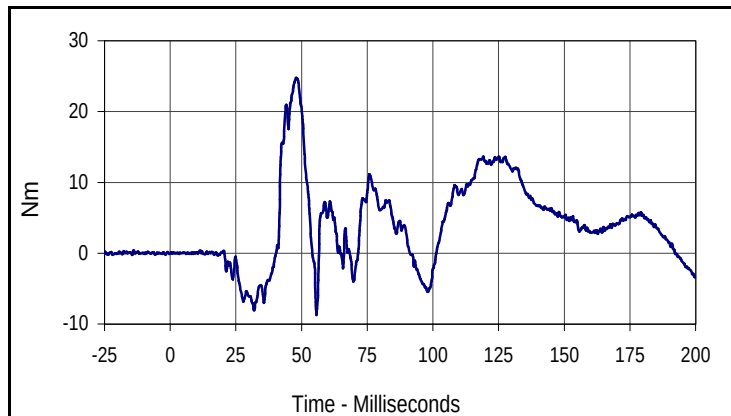
Curve Description			
Driver Left Femur Force			
CURNO	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
573.7	50.7	-936.1	87.0



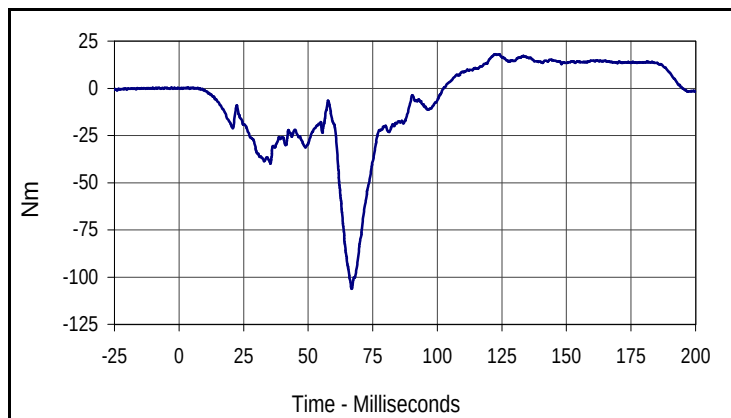
Curve Description			
Driver Right Femur Force			
CURNO	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
1335.5	57.9	-1573.4	71.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

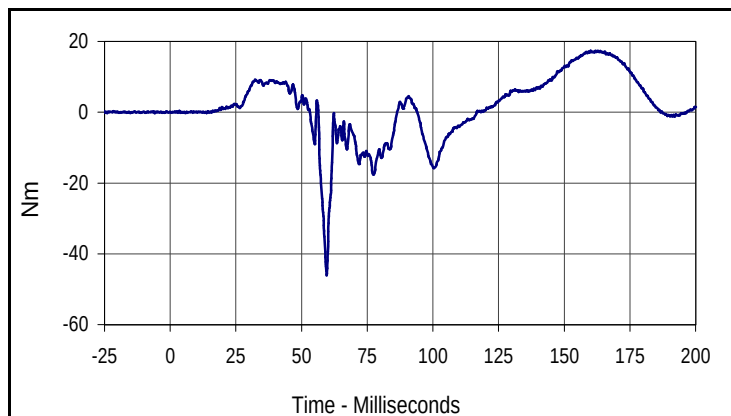
Test Date: 2/19/04
 NHTSA No.: M40111



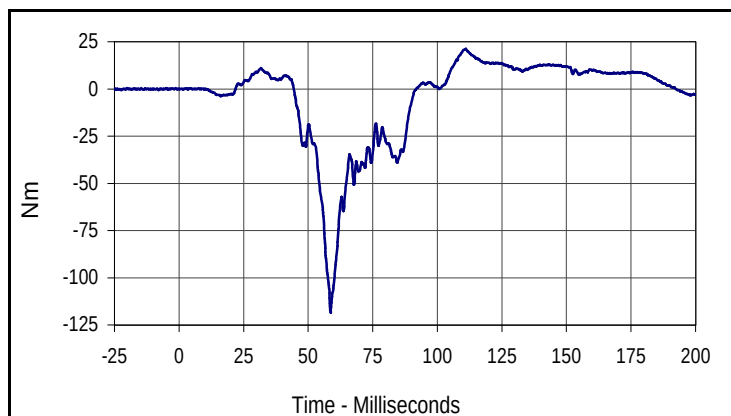
Curve Description			
Driver Left Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
025	FIL	600	Nm
Max	Time	Min	Time
24.8	48.0	-8.7	55.7



Curve Description			
Driver Left Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
18.1	122.5	-106.2	66.9



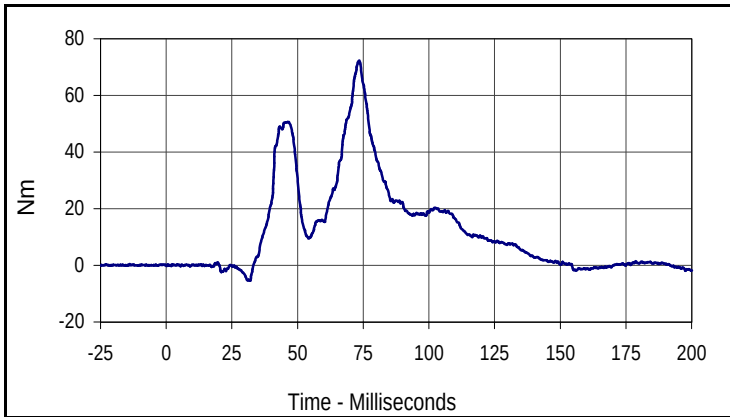
Curve Description			
Driver Right Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
027	FIL	600	Nm
Max	Time	Min	Time
17.4	162.9	-46.1	59.6



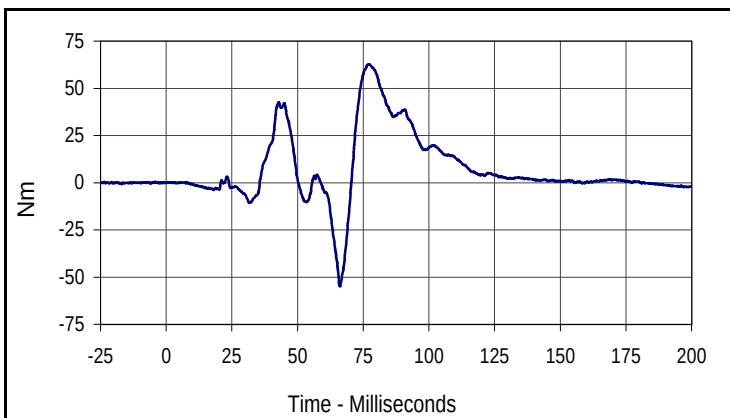
Curve Description			
Driver Right Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
028	FIL	600	Nm
Max	Time	Min	Time
21.2	111.0	-118.5	58.7

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

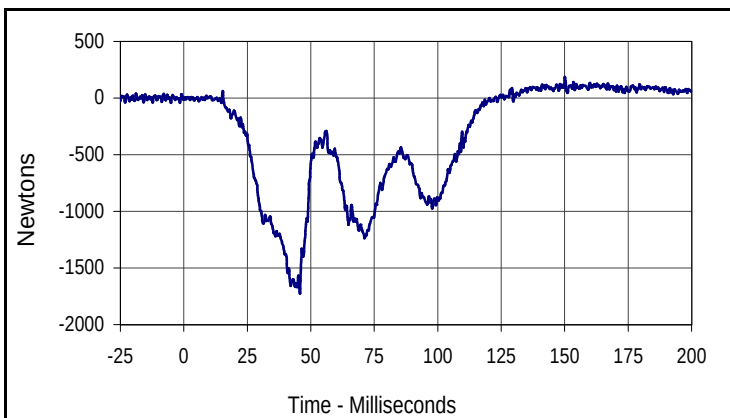
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Left Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
029	FIL	600	Nm
Max	Time	Min	Time
72.3	73.5	-5.4	31.9



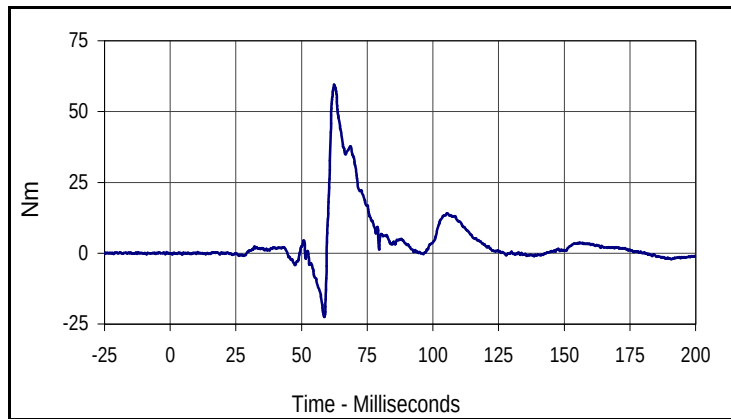
Curve Description			
Driver Left Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
030	FIL	600	Nm
Max	Time	Min	Time
62.7	77.3	-54.9	66.1



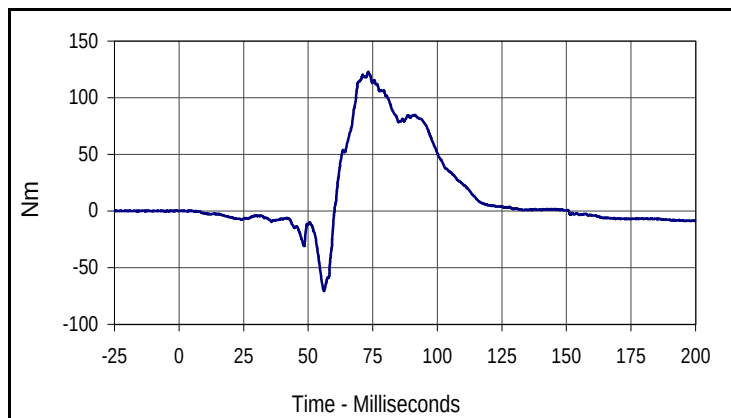
Curve Description			
Driver Left Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
031	FIL	600	Newtons
Max	Time	Min	Time
185.1	150.1	-1727.3	45.7

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

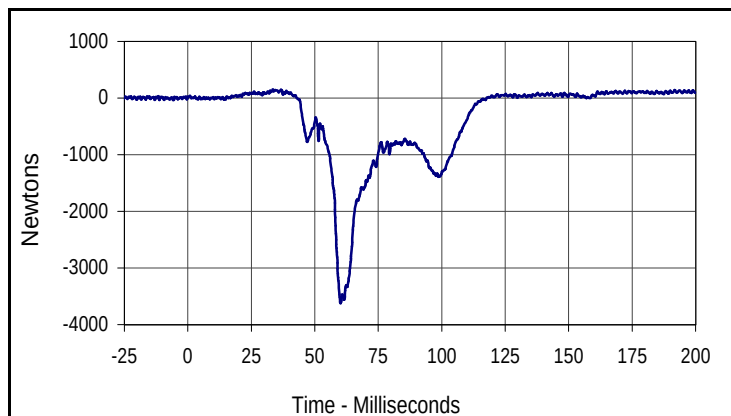
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Right Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
032	FIL	600	Nm
Max	Time	Min	Time
59.5	62.4	-22.5	58.7



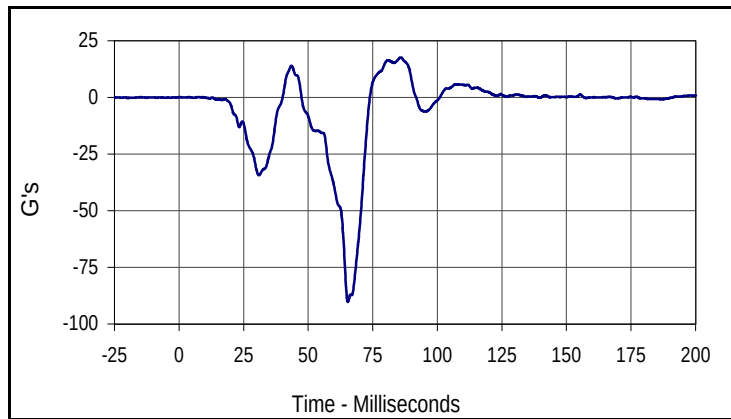
Curve Description			
Driver Right Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
033	FIL	600	Nm
Max	Time	Min	Time
122.8	73.2	-70.5	56.1



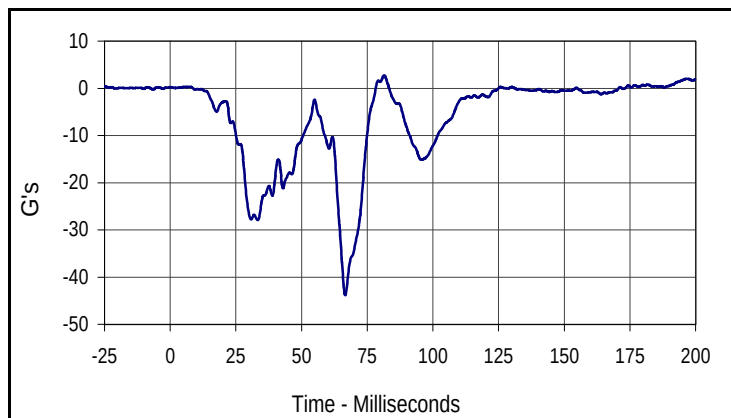
Curve Description			
Driver Right Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
034	FIL	600	Newtons
Max	Time	Min	Time
152.3	33.5	-3619.4	60.2

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

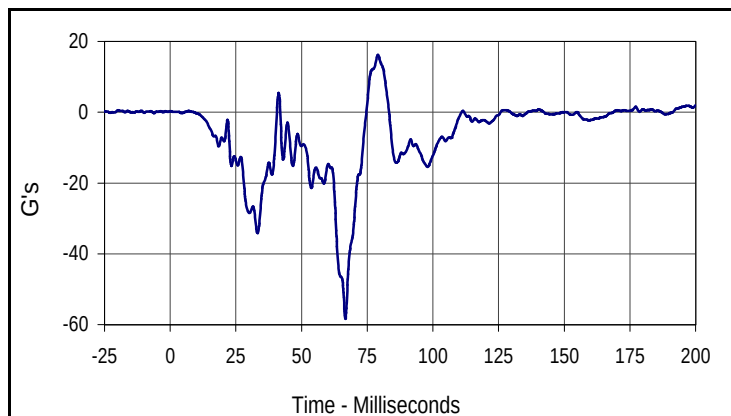
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Left Foot Aft X			
CURNO	Type	SAE Class	Units
035	FIL	180	G's
Max	Time	Min	Time
17.5	85.8	-90.3	65.4



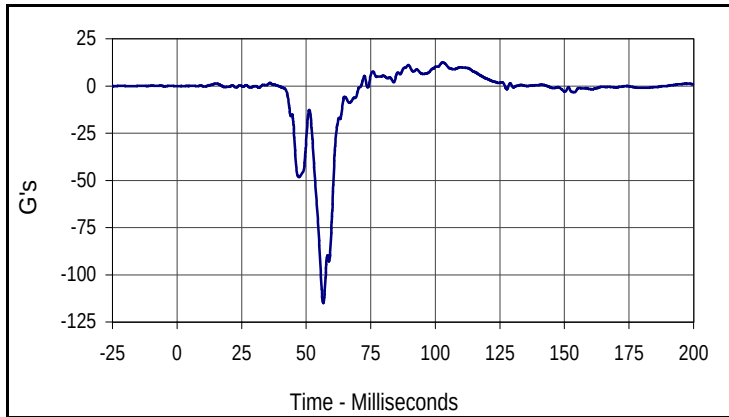
Curve Description			
Driver Left Foot Aft Z			
CURNO	Type	SAE Class	Units
036	FIL	180	G's
Max	Time	Min	Time
2.8	81.4	-43.9	66.6



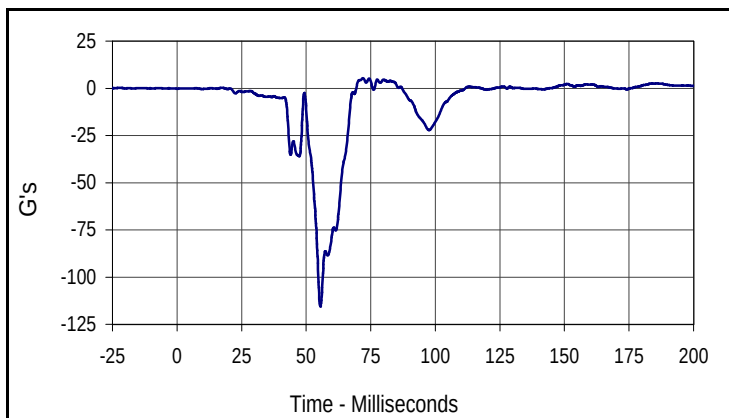
Curve Description			
Driver Left Foot Fore Z			
CURNO	Type	SAE Class	Units
037	FIL	180	G's
Max	Time	Min	Time
16.2	79.1	-58.4	66.7

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

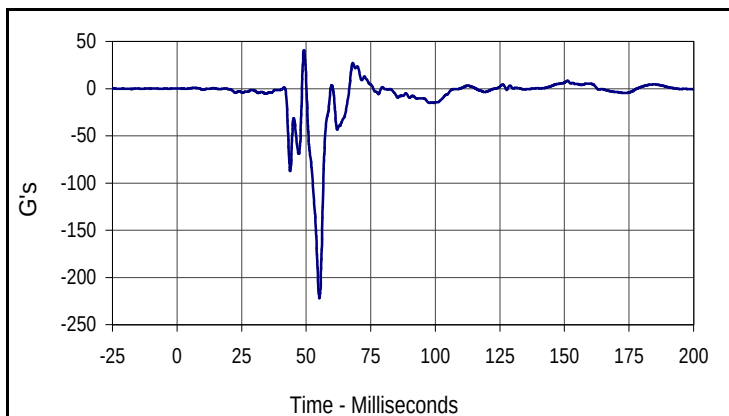
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Right Foot Aft X			
CURNO	Type	SAE Class	Units
038	FIL	180	G's
Max	Time	Min	Time
12.4	102.9	-114.9	56.6



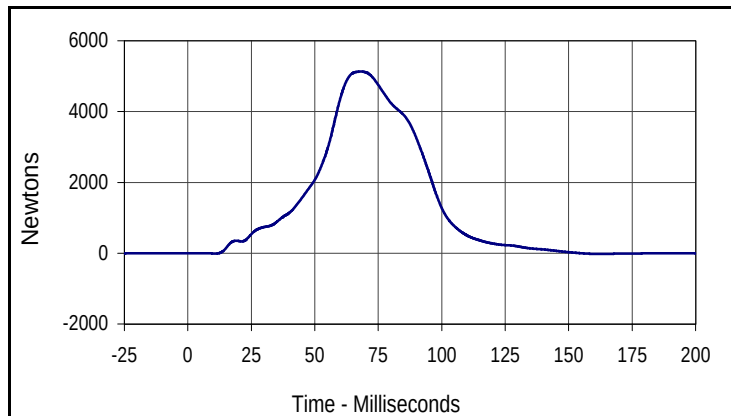
Curve Description			
Driver Right Foot Aft Z			
CURNO	Type	SAE Class	Units
039	FIL	180	G's
Max	Time	Min	Time
5.4	72.0	-115.6	55.5



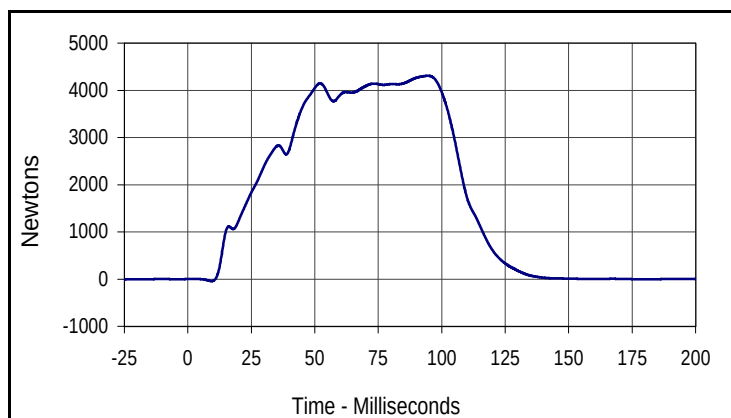
Curve Description			
Driver Right Foot Fore Z			
CURNO	Type	SAE Class	Units
040	FIL	180	G's
Max	Time	Min	Time
40.5	49.2	-221.9	55.1

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

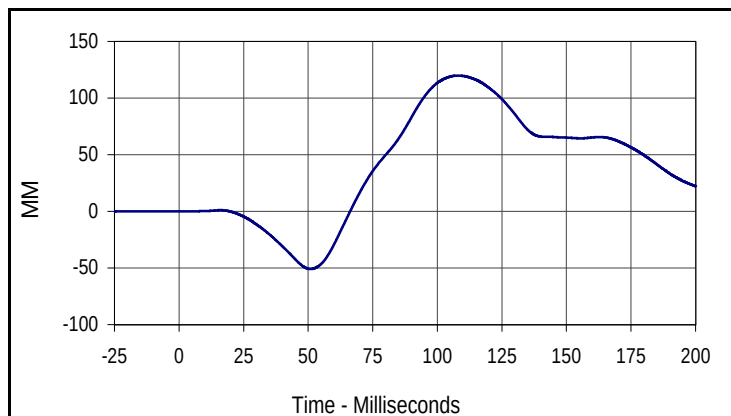
Test Date: 2/19/04
 NHTSA No.: M40111



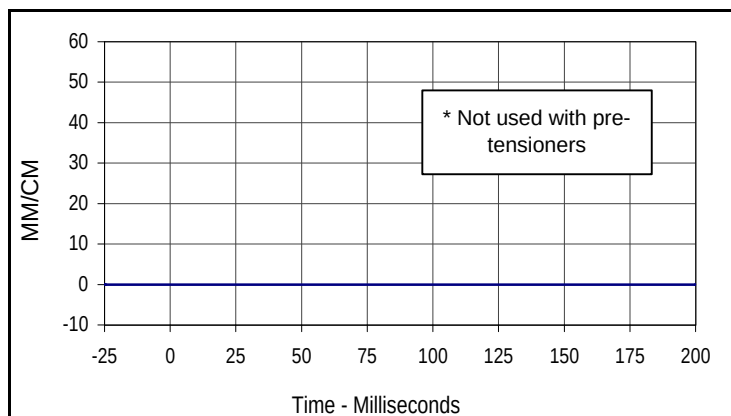
Curve Description			
Driver Lap Belt Force			
CURNO	Type	SAE Class	Units
041	FIL	60	Newtons
Max	Time	Min	Time
5130.8	68.2	-19.4	161.2



Curve Description			
Driver Shoulder Belt Force			
CURNO	Type	SAE Class	Units
042	FIL	60	Newtons
Max	Time	Min	Time
4308.2	94.5	-42.7	9.4



Curve Description			
Driver Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
043	FIL	60	MM
Max	Time	Min	Time
119.8	108.1	-50.9	50.9

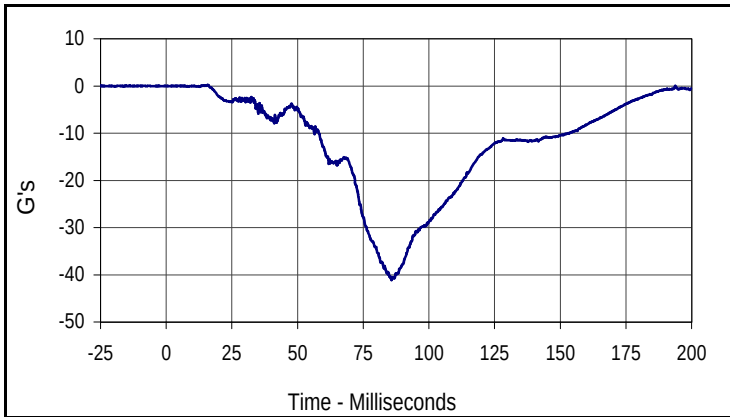


Curve Description			
Driver Shoulder Belt Elongation			
CURNO	Type	SAE Class	Units
044	FIL	60	MM/CM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

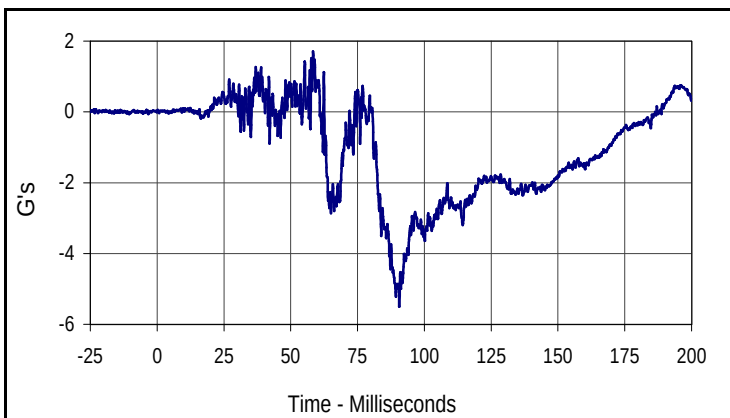
* Not used with pre-tensioners

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

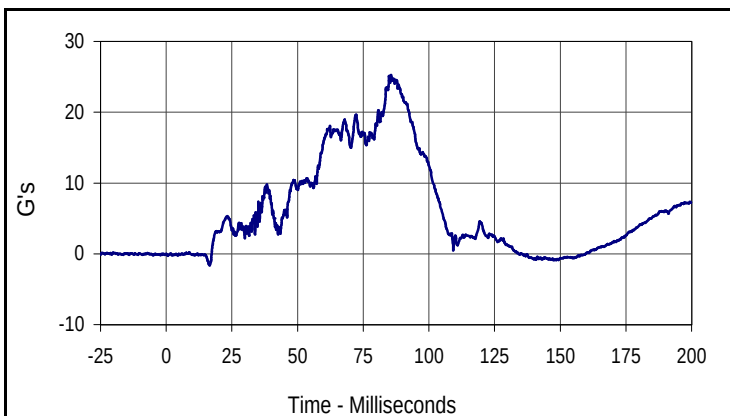
Test Date: 2/19/04
 NHTSA No.: M40111



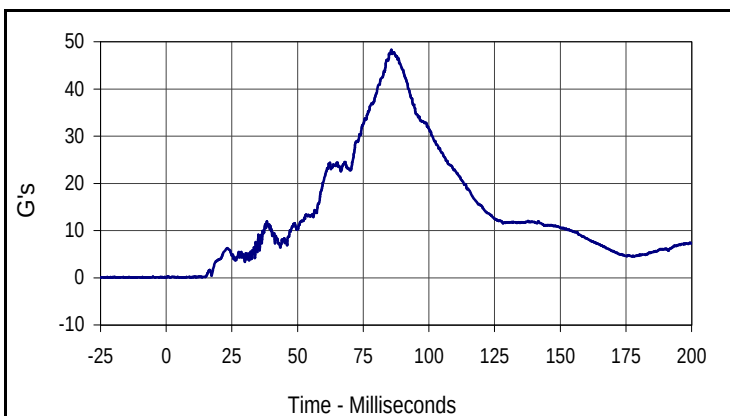
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
045	FIL	1000	G's
Max	Time	Min	Time
0.2	15.8	-41.1	85.7



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
046	FIL	1000	G's
Max	Time	Min	Time
1.7	58.4	-5.5	90.6



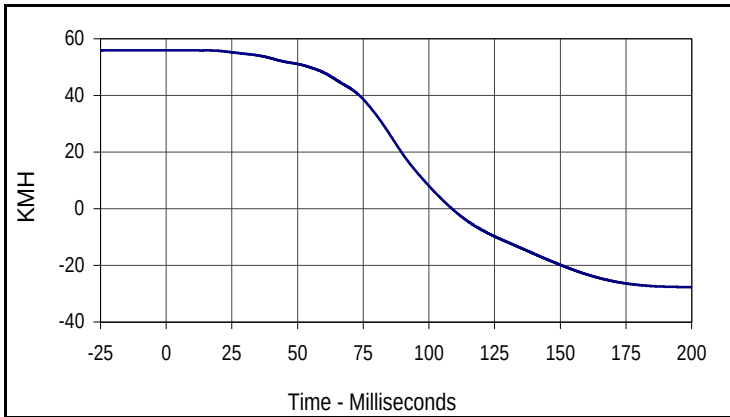
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
047	FIL	1000	G's
Max	Time	Min	Time
25.2	85.6	-1.6	16.6



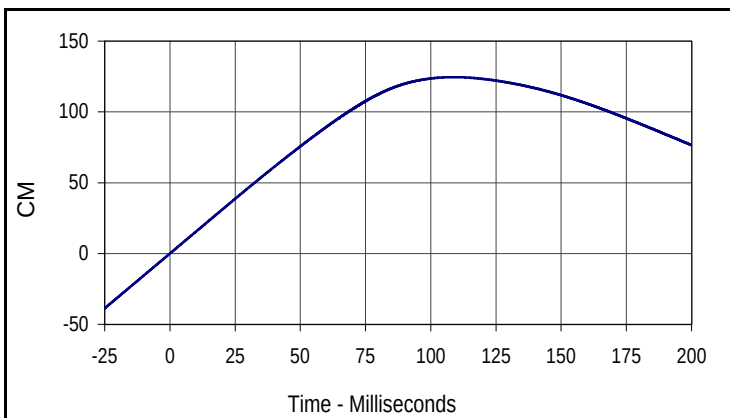
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
045	RES	1000	G's
Max	Time	Min	Time
48.3	85.7	0.0	4.8

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



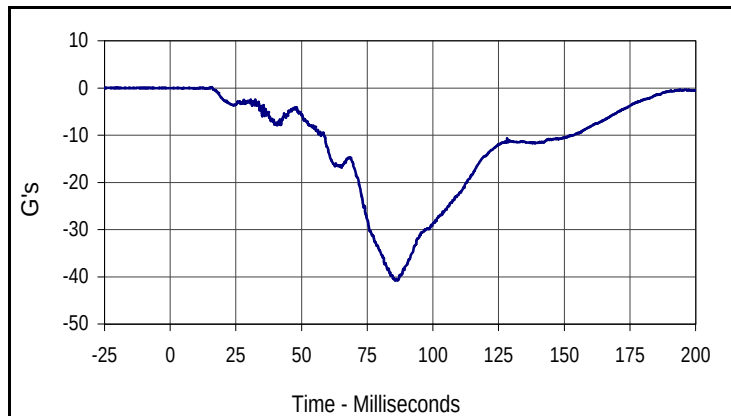
Curve Description			
Passenger Head Primary X Velocity			
CURNO	Type	SAE Class	Units
045	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-27.7	200.0



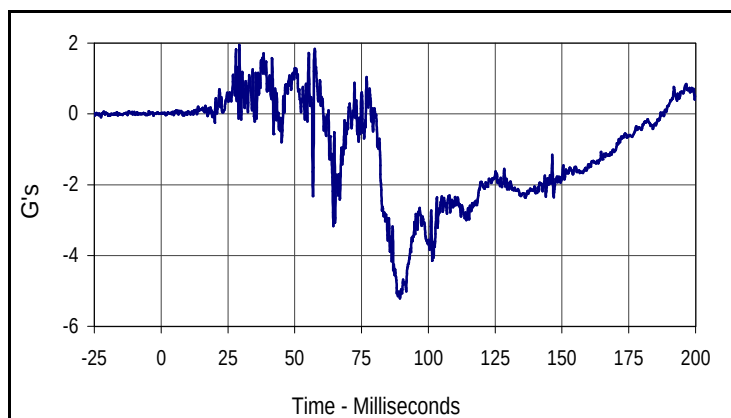
Curve Description			
Passenger Head Primary X Displacement			
CURNO	Type	SAE Class	Units
045	IN2	180	CM
Max	Time	Min	Time
124.6	108.8	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

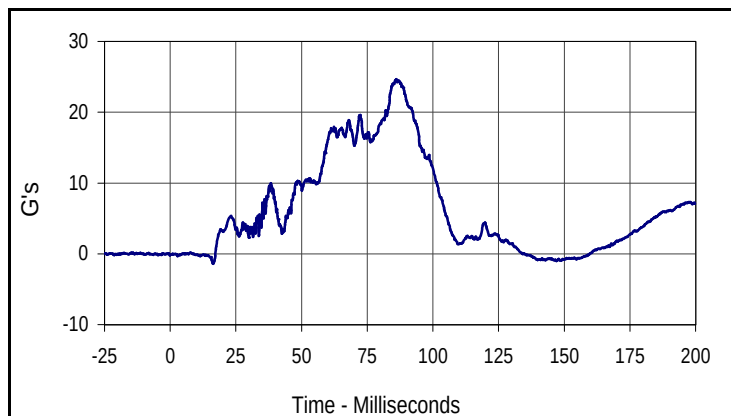
Test Date: 2/19/04
 NHTSA No.: M40111



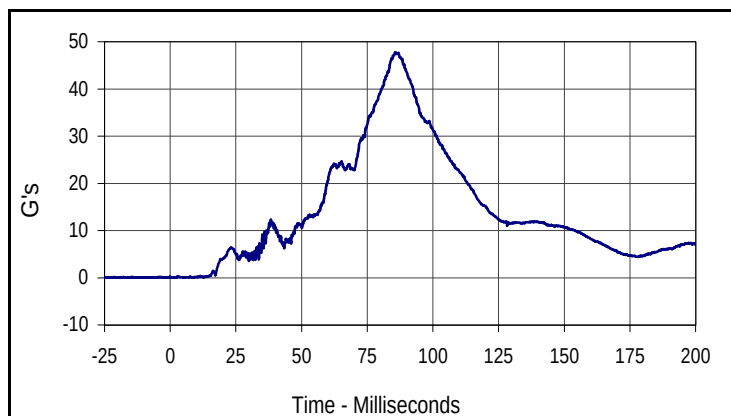
Curve Description			
Passenger Head Redundant X			
CURNO	Type	SAE Class	Units
048	FIL	1000	G's
Max	Time	Min	Time
0.1	15.8	-40.8	85.7



Curve Description			
Passenger Head Redundant Y			
CURNO	Type	SAE Class	Units
049	FIL	1000	G's
Max	Time	Min	Time
1.9	29.3	-5.2	89.3



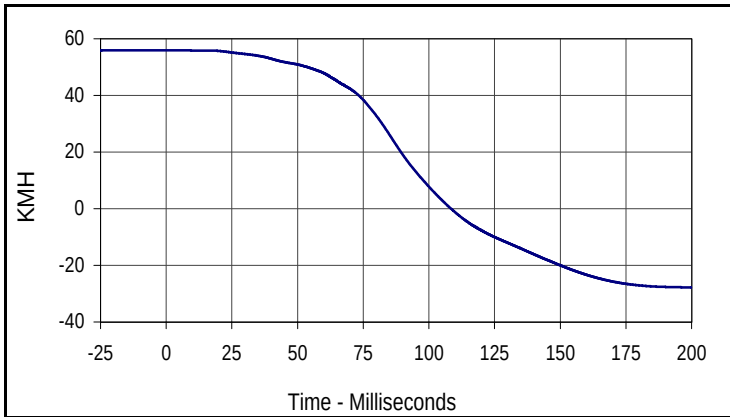
Curve Description			
Passenger Head Redundant Z			
CURNO	Type	SAE Class	Units
050	FIL	1000	G's
Max	Time	Min	Time
24.6	86.1	-1.4	16.3



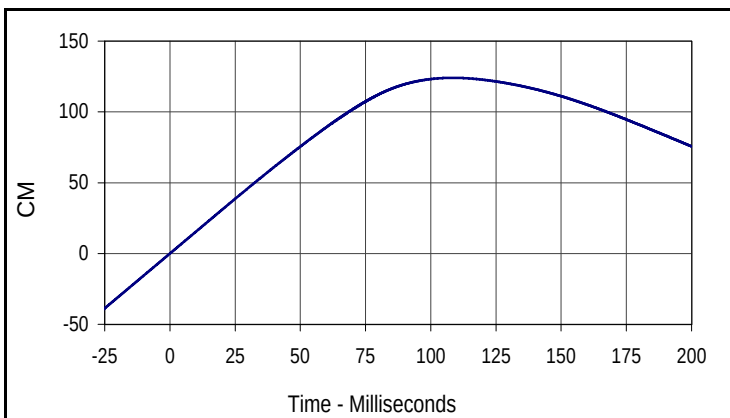
Curve Description			
Passenger Head Resultant Redundant			
CURNO	Type	SAE Class	Units
048	RES	1000	G's
Max	Time	Min	Time
47.8	85.7	0.0	1.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



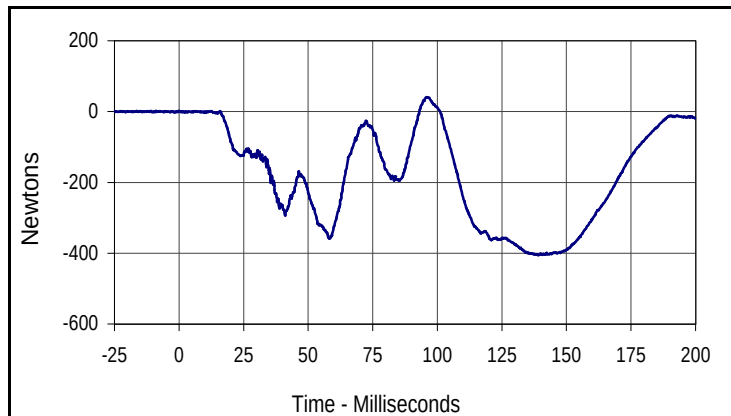
Curve Description			
Passenger Head Redundant X Velocity			
CURNO	Type	SAE Class	Units
048	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-27.8	200.0



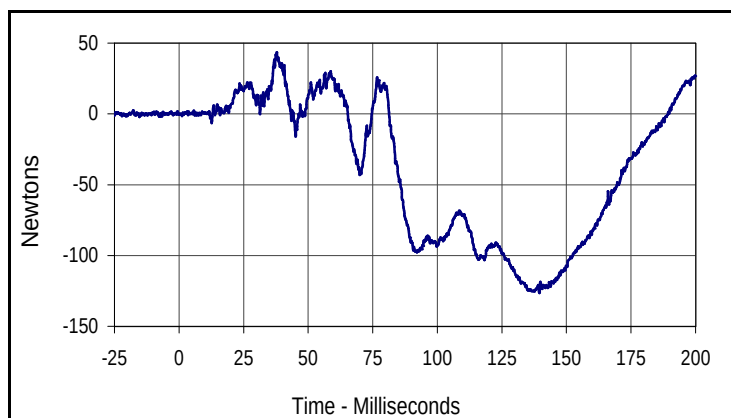
Curve Description			
Passenger Head Redundant X Displacement			
CURNO	Type	SAE Class	Units
048	IN2	180	CM
Max	Time	Min	Time
124.1	108.4	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

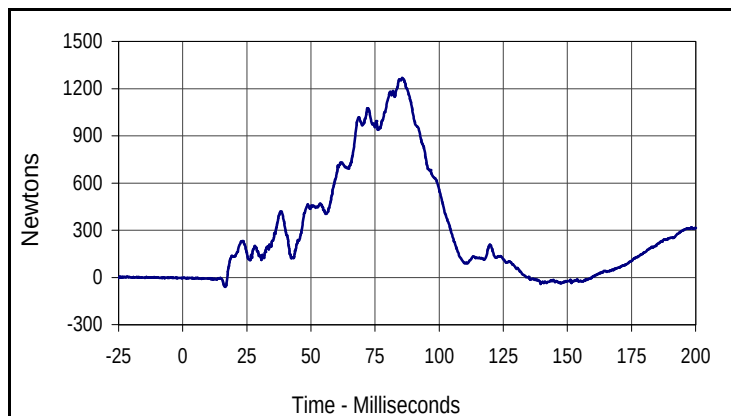
Test Date: 2/19/04
 NHTSA No.: M40111



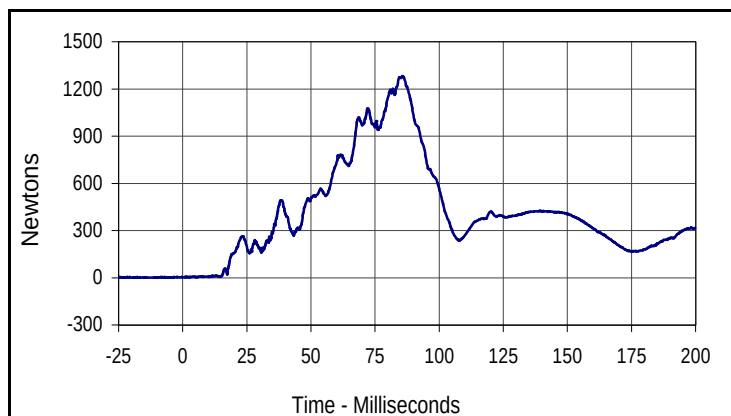
Curve Description			
Passenger Upper Neck Force X			
CURNO	Type	SAE Class	Units
051	FIL	1000	Newtons
Max	Time	Min	Time
40.9	95.8	-405.3	139.0



Curve Description			
Passenger Upper Neck Force Y			
CURNO	Type	SAE Class	Units
052	FIL	1000	Newtons
Max	Time	Min	Time
43.5	37.9	-126.5	139.5



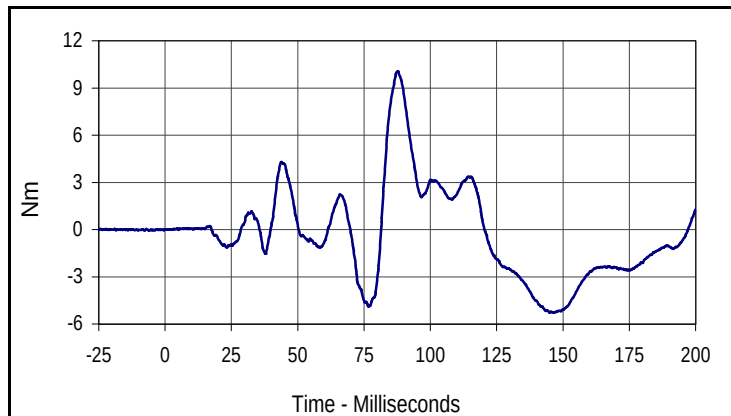
Curve Description			
Passenger Upper Neck Force Z			
CURNO	Type	SAE Class	Units
053	FIL	1000	Newtons
Max	Time	Min	Time
1267.4	85.6	-60.2	16.4



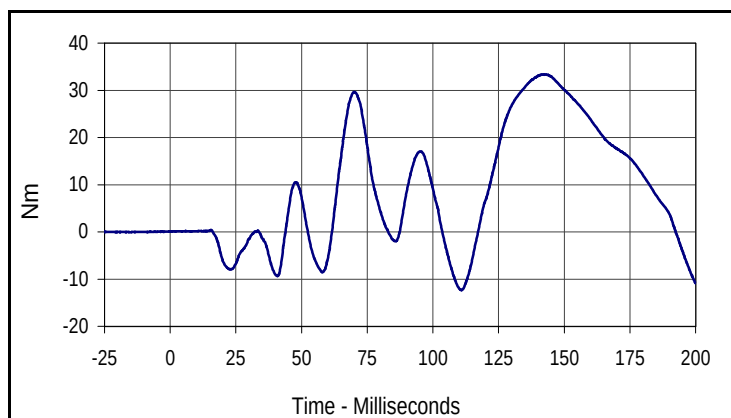
Curve Description			
Passenger Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
051	RES	1000	Newtons
Max	Time	Min	Time
1282.8	85.6	2.3	0.5

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

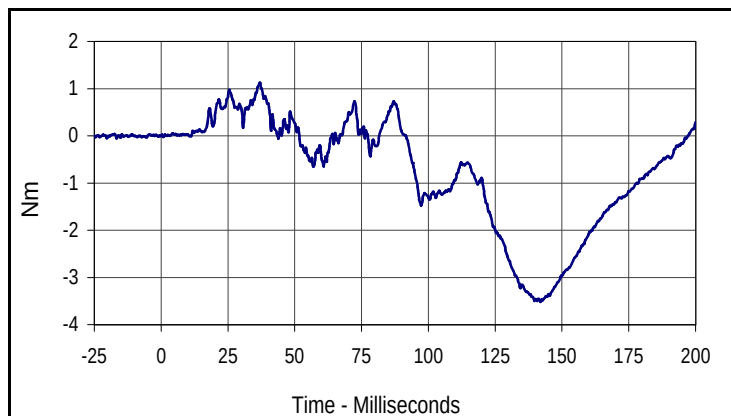
Test Date: 2/19/04
 NHTSA No.: M40111



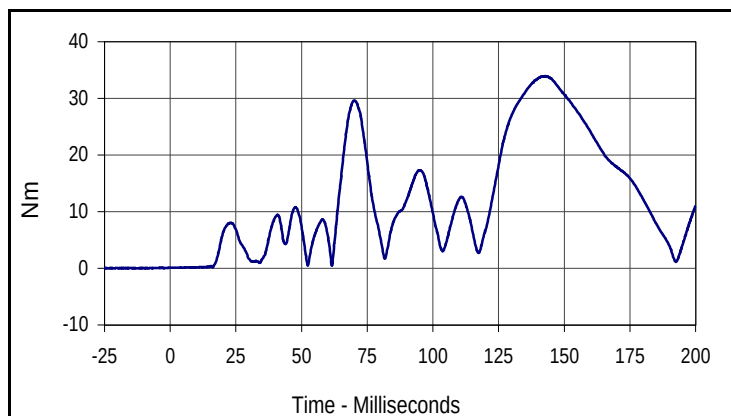
Curve Description			
Passenger Upper Neck Moment X			
CURNO	Type	SAE Class	Units
054	FIL	600	Nm
Max	Time	Min	Time
10.1	87.7	-5.3	146.6



Curve Description			
Passenger Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
055	FIL	600	Nm
Max	Time	Min	Time
33.4	142.8	-12.3	110.9



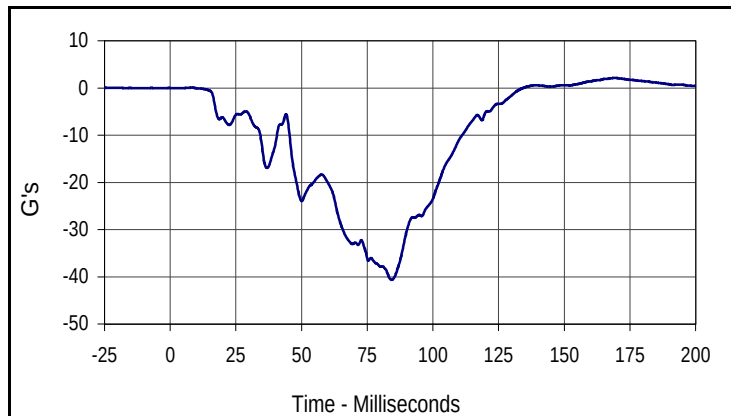
Curve Description			
Passenger Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
056	FIL	600	Nm
Max	Time	Min	Time
1.1	36.9	-3.5	142.0



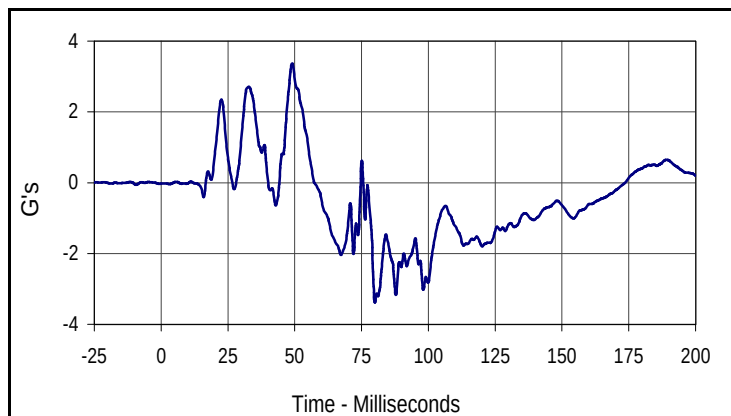
Curve Description			
Passenger Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
054	RES	600	Nm
Max	Time	Min	Time
33.9	142.8	0.1	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

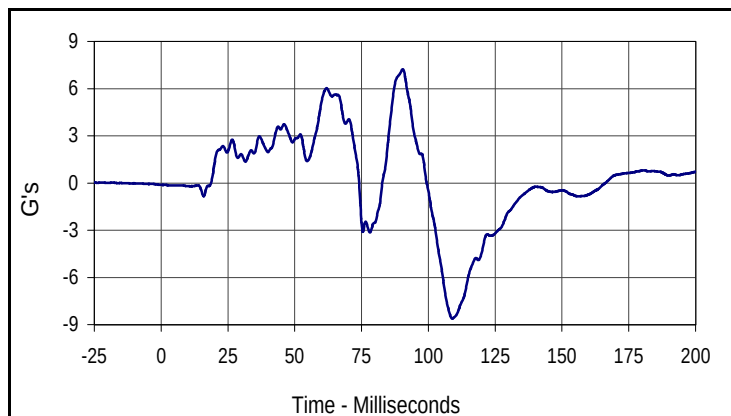
Test Date: 2/19/04
 NHTSA No.: M40111



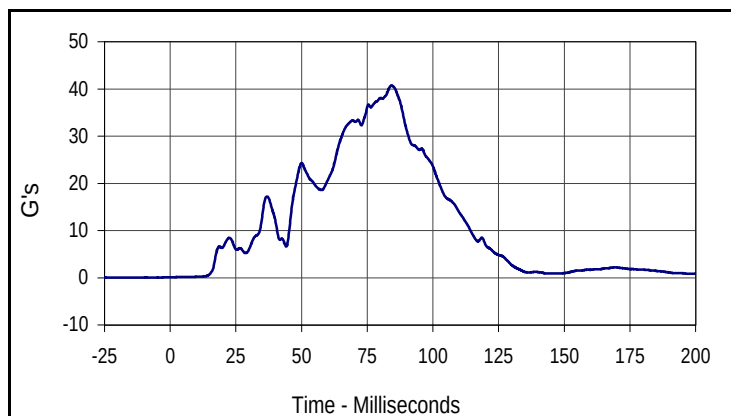
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
057	FIL	180	G's
Max	Time	Min	Time
2.1	169.5	-40.6	84.2



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
058	FIL	180	G's
Max	Time	Min	Time
3.4	49.1	-3.4	80.0



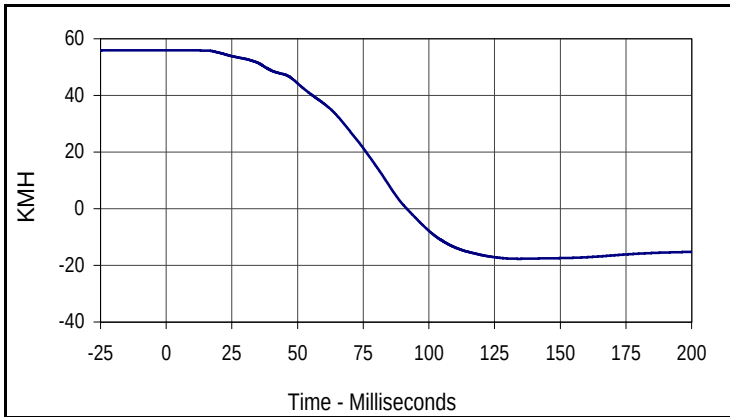
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
059	FIL	180	G's
Max	Time	Min	Time
7.2	90.4	-8.6	108.9



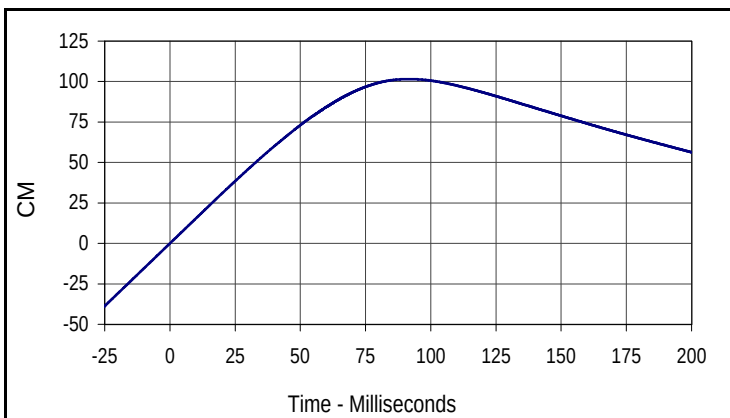
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
057	RES	180	G's
Max	Time	Min	Time
40.7	84.3	0.1	1.6

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



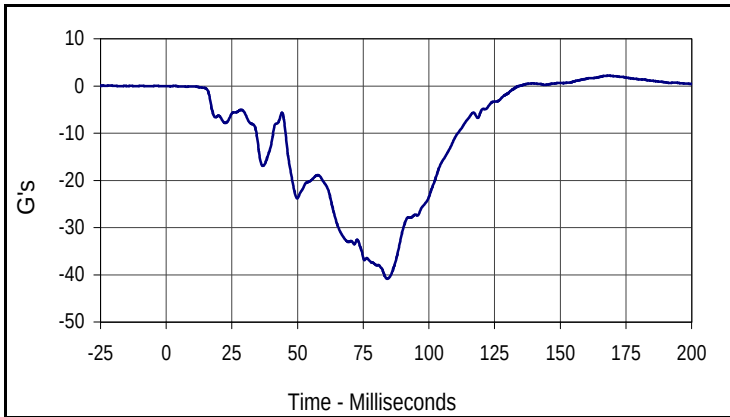
Curve Description			
Passenger Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
057	IN1	180	KMH
Max	Time	Min	Time
55.9	9.4	-17.7	134.4



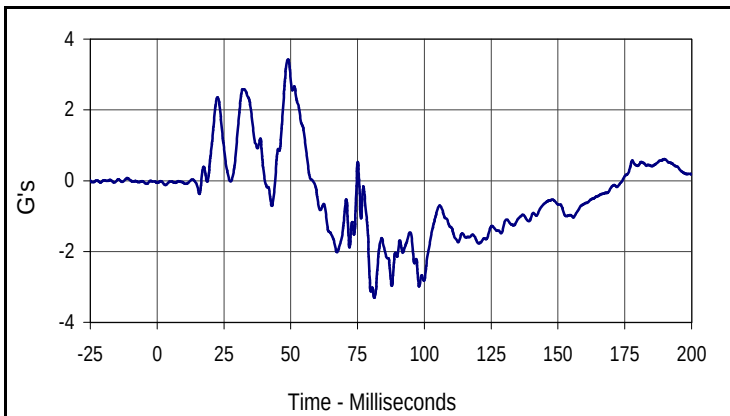
Curve Description			
Passenger Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
057	IN2	180	CM
Max	Time	Min	Time
101.5	91.6	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

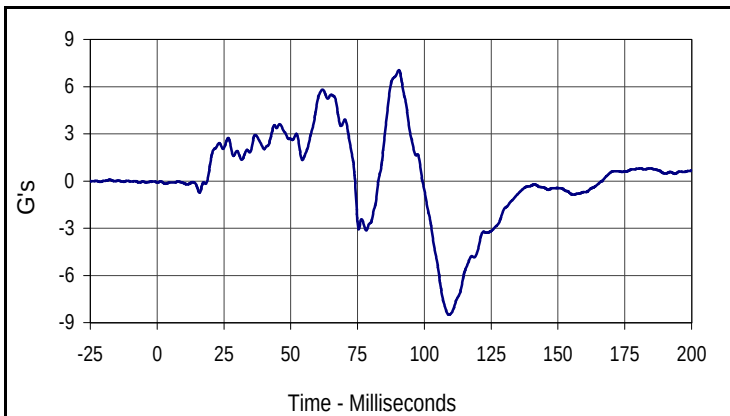
Test Date: 2/19/04
 NHTSA No.: M40111



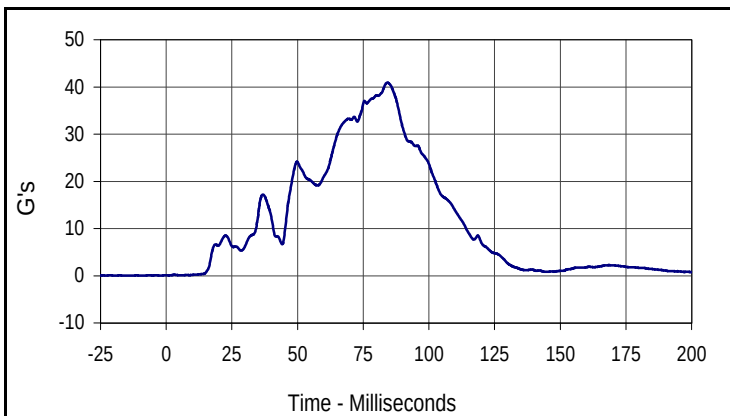
Curve Description			
Passenger Chest Redundant X			
CURNO	Type	SAE Class	Units
060	FIL	180	G's
Max	Time	Min	Time
2.2	168.5	-40.9	84.1



Curve Description			
Passenger Chest Redundant Y			
CURNO	Type	SAE Class	Units
061	FIL	180	G's
Max	Time	Min	Time
3.4	49.0	-3.3	81.3



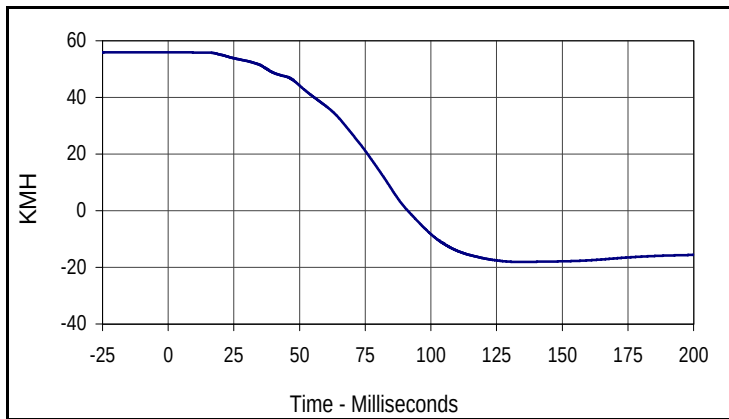
Curve Description			
Passenger Chest Redundant Z			
CURNO	Type	SAE Class	Units
062	FIL	180	G's
Max	Time	Min	Time
7.0	90.5	-8.5	109.2



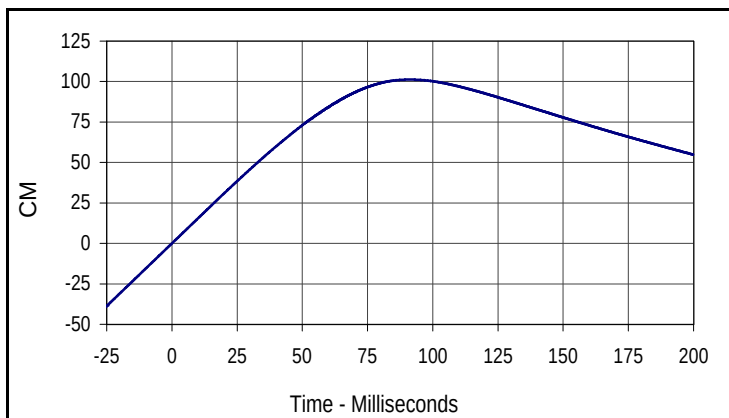
Curve Description			
Passenger Chest Resultant Redundant			
CURNO	Type	SAE Class	Units
060	RES	180	G's
Max	Time	Min	Time
40.9	84.2	0.1	1.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



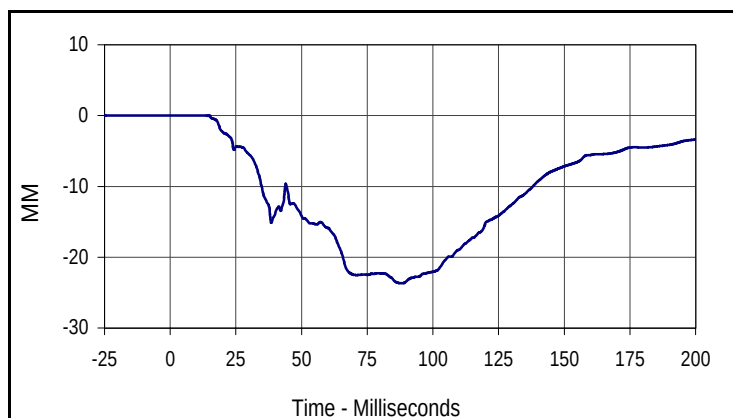
Curve Description			
Passenger Chest Redundant X Velocity			
CURNO	Type	SAE Class	Units
060	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-18.1	134.4



Curve Description			
Passenger Chest Redundant X Displacement			
CURNO	Type	SAE Class	Units
060	IN2	180	CM
Max	Time	Min	Time
101.2	91.2	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

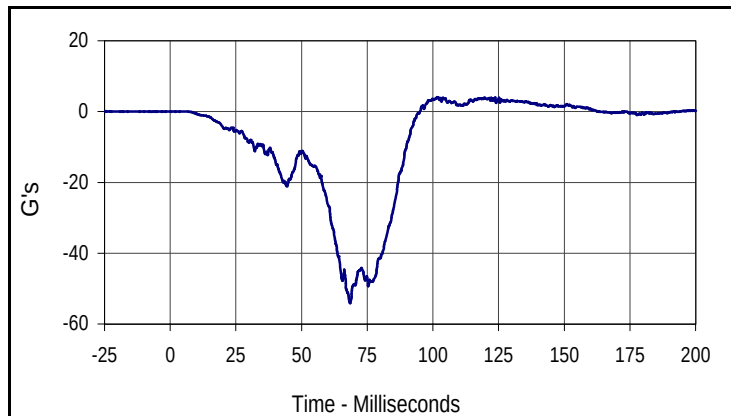
Test Date: 2/19/04
 NHTSA No.: M40111



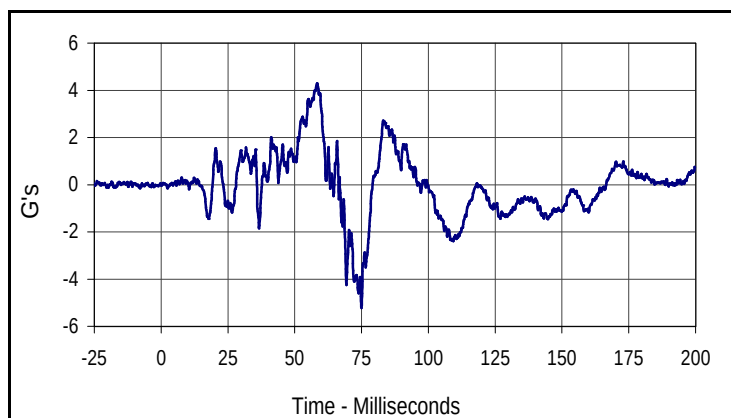
Curve Description			
Passenger Chest Displacement			
CURNO	Type	SAE Class	Units
063	FIL	600	MM
Max	Time	Min	Time
0.0	7.1	-23.7	87.4

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

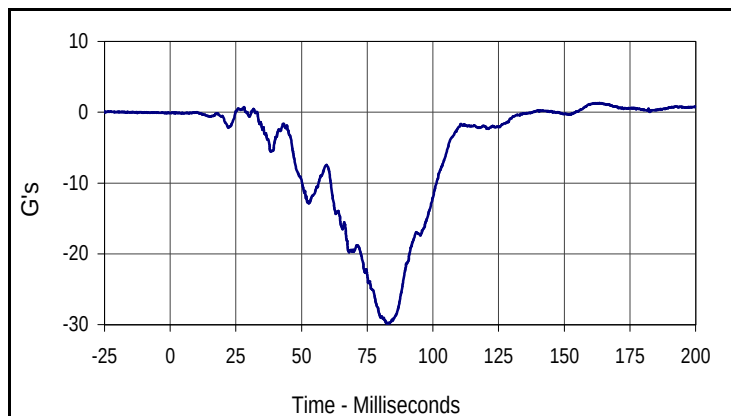
Test Date: 2/19/04
 NHTSA No.: M40111



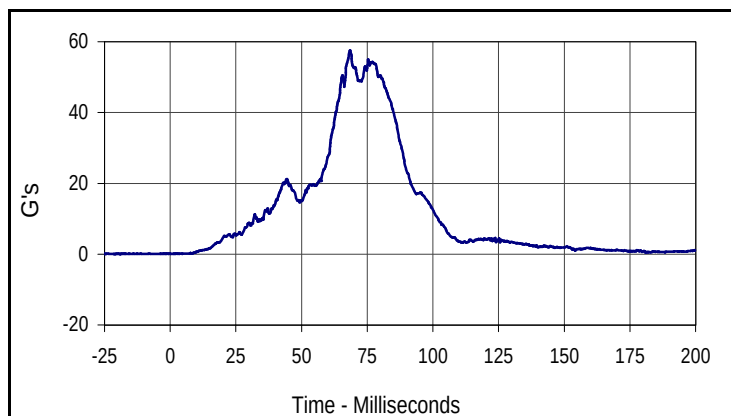
Curve Description			
Passenger Pelvis X			
CURNO	Type	SAE Class	Units
064	FIL	1000	G's
Max	Time	Min	Time
4.1	101.6	-54.2	68.4



Curve Description			
Passenger Pelvis Y			
CURNO	Type	SAE Class	Units
065	FIL	1000	G's
Max	Time	Min	Time
4.3	58.4	-5.2	75.0



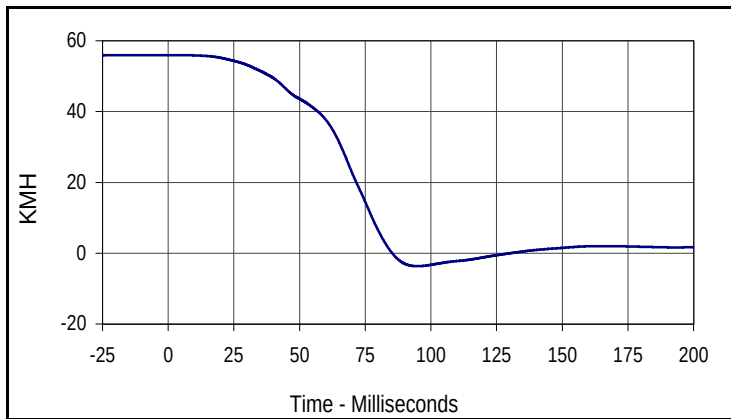
Curve Description			
Passenger Pelvis Z			
CURNO	Type	SAE Class	Units
066	FIL	1000	G's
Max	Time	Min	Time
1.3	163.4	-29.9	82.7



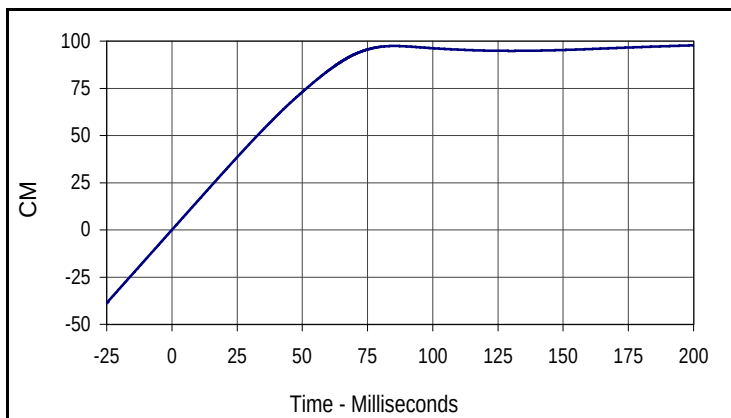
Curve Description			
Passenger Pelvis Resultant			
CURNO	Type	SAE Class	Units
064	RES	1000	G's
Max	Time	Min	Time
57.6	68.4	0.0	0.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



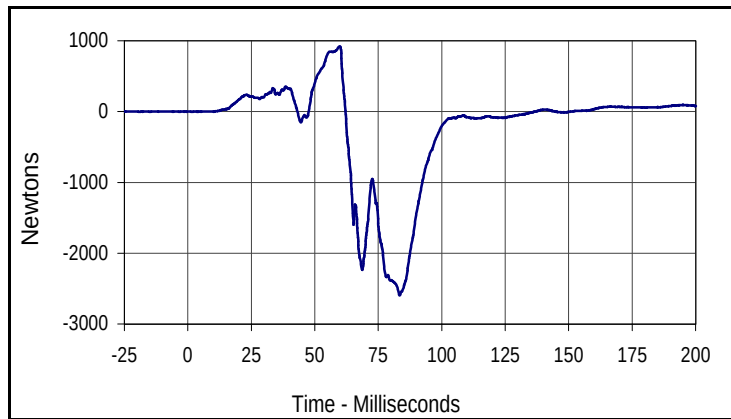
Curve Description			
Passenger Pelvis X Velocity			
CURNO	Type	SAE Class	Units
064	IN1	180	KMH
Max	Time	Min	Time
55.9	6.6	-3.7	94.9



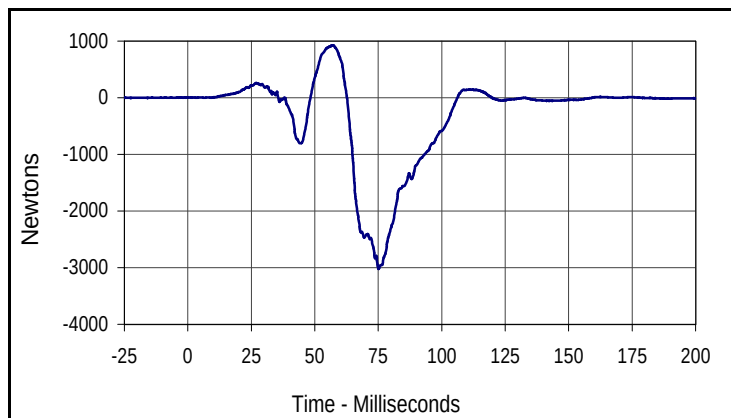
Curve Description			
Passenger Pelvis X Displacement			
CURNO	Type	SAE Class	Units
064	IN2	180	CM
Max	Time	Min	Time
97.8	200.0	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



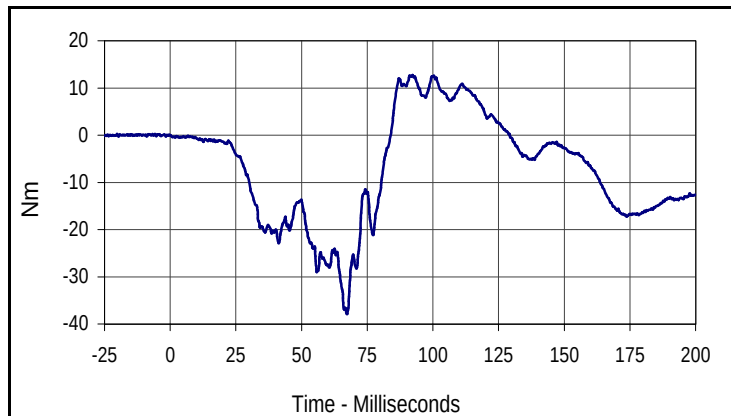
Curve Description			
Passenger Left Femur Force			
CURNO	Type	SAE Class	Units
067	FIL	600	Newtons
Max	Time	Min	Time
918.9	60.0	-2598.4	83.4



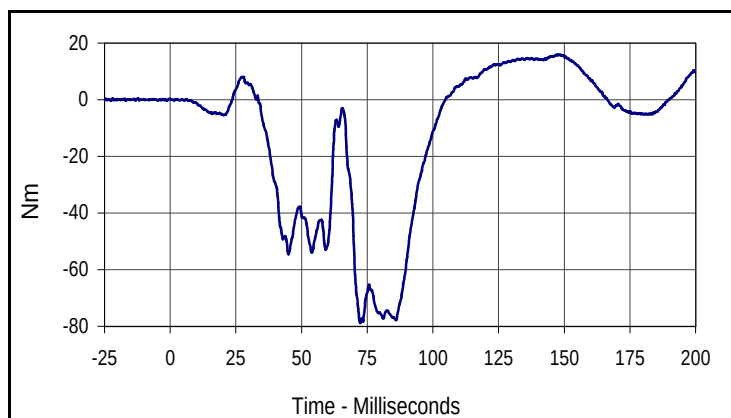
Curve Description			
Passenger Right Femur Force			
CURNO	Type	SAE Class	Units
068	FIL	600	Newtons
Max	Time	Min	Time
926.6	57.0	-3023.7	75.1

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

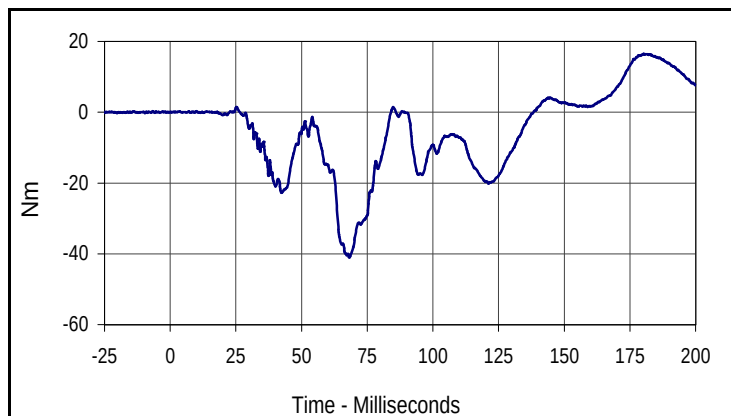
Test Date: 2/19/04
 NHTSA No.: M40111



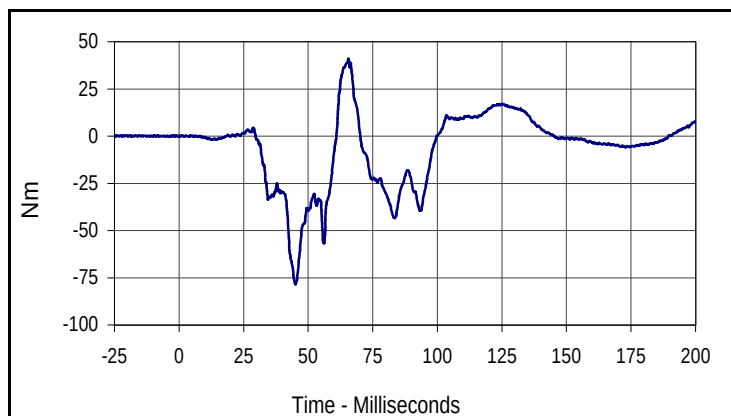
Curve Description			
Passenger Left Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
069	FIL	600	Nm
Max	Time	Min	Time
12.7	92.3	-37.9	67.3



Curve Description			
Passenger Left Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
070	FIL	600	Nm
Max	Time	Min	Time
16.0	148.0	-78.9	72.3



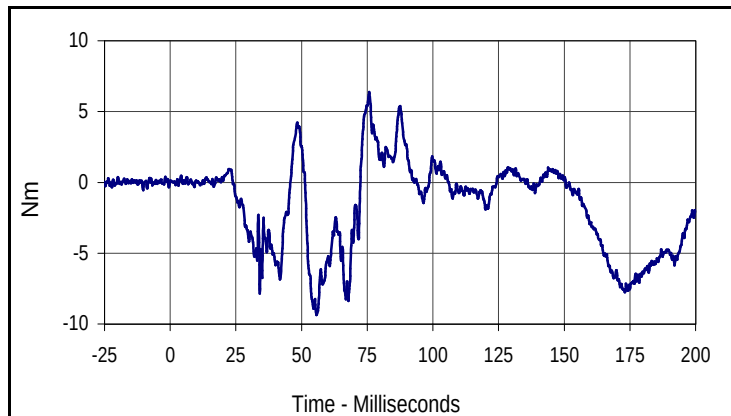
Curve Description			
Passenger Right Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
071	FIL	600	Nm
Max	Time	Min	Time
16.5	180.2	-41.1	68.2



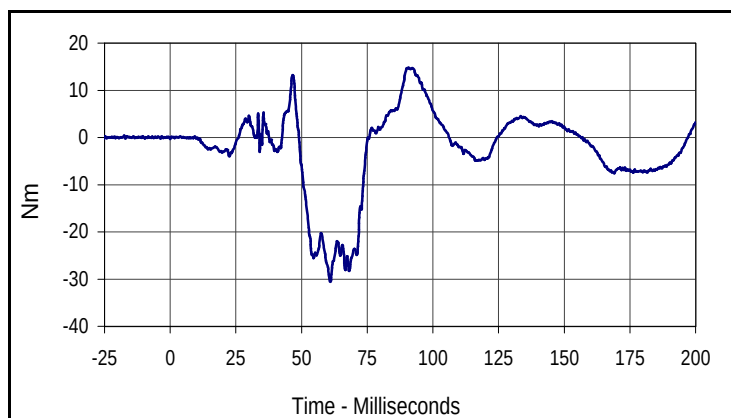
Curve Description			
Passenger Right Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
072	FIL	600	Nm
Max	Time	Min	Time
41.0	65.6	-78.4	45.1

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

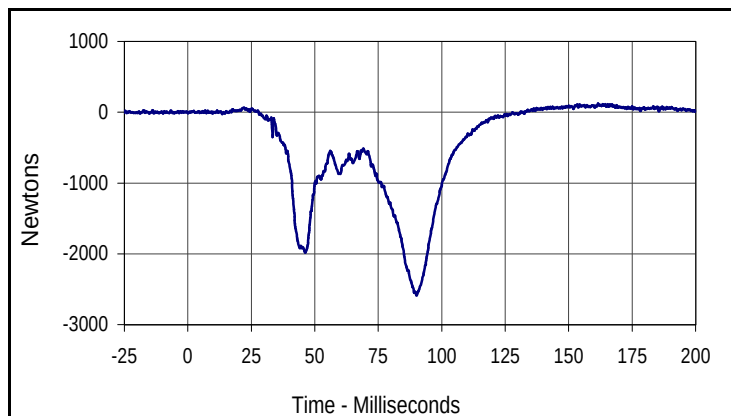
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Left Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
073	FIL	600	Nm
Max	Time	Min	Time
6.4	75.8	-9.4	55.7



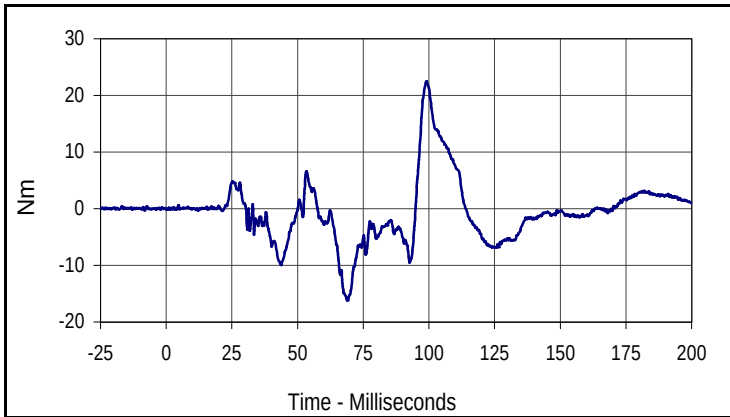
Curve Description			
Passenger Left Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
074	FIL	600	Nm
Max	Time	Min	Time
14.8	90.7	-30.6	60.9



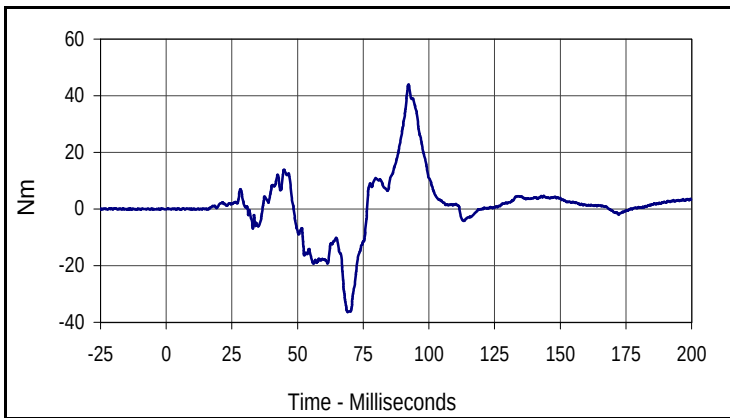
Curve Description			
Passenger Left Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
075	FIL	600	Newtons
Max	Time	Min	Time
120.9	161.6	-2590.9	90.1

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

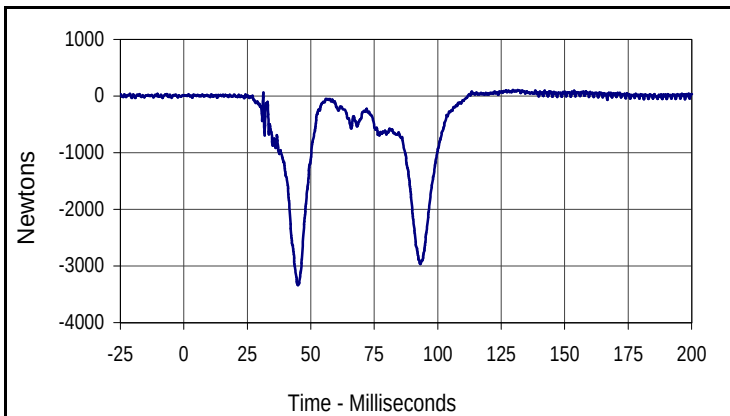
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Right Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
076	FIL	600	Nm
Max	Time	Min	Time
22.5	99.1	-16.2	68.9



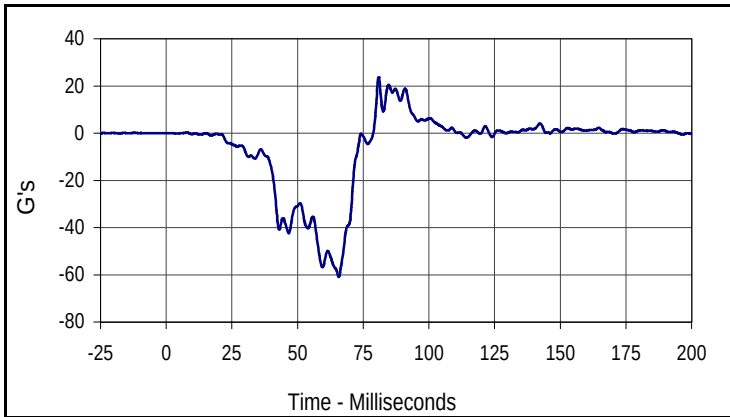
Curve Description			
Passenger Right Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
077	FIL	600	Nm
Max	Time	Min	Time
44.0	92.2	-36.4	69.1



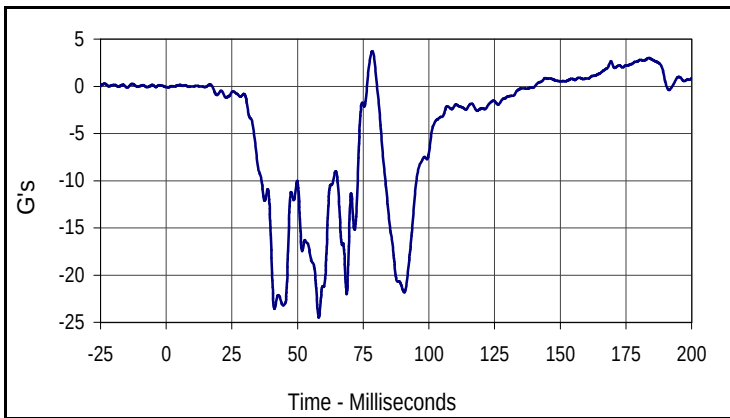
Curve Description			
Passenger Right lower Tibia Force Z			
CURNO	Type	SAE Class	Units
078	FIL	600	Newtons
Max	Time	Min	Time
104.7	129.7	-3338.3	44.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

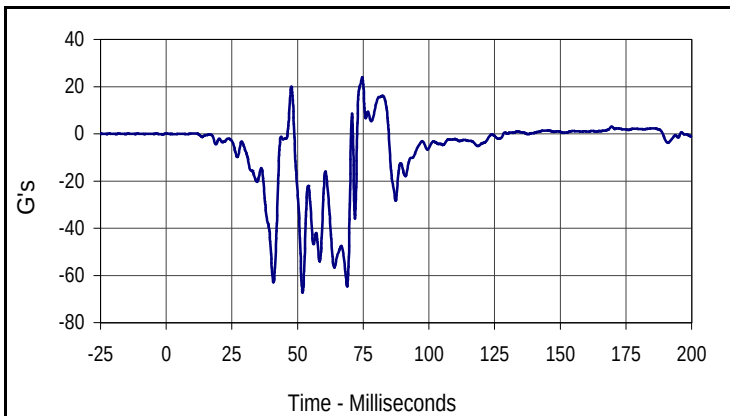
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Left Foot Aft X			
CURNO	Type	SAE Class	Units
079	FIL	180	G's
Max	Time	Min	Time
23.7	80.8	-60.9	65.7



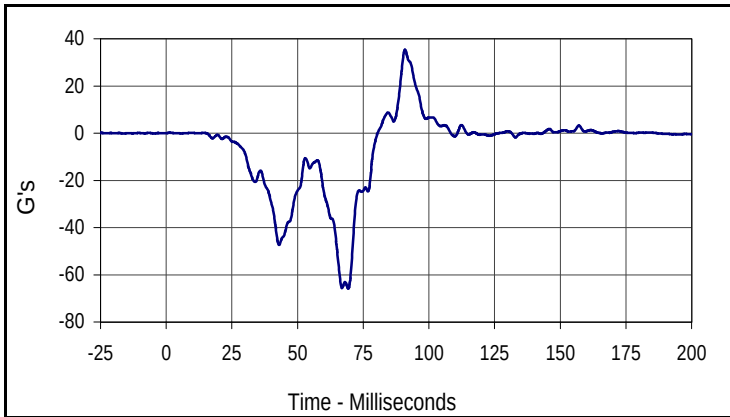
Curve Description			
Passenger Left Foot Aft Z			
CURNO	Type	SAE Class	Units
080	FIL	180	G's
Max	Time	Min	Time
3.7	78.5	-24.5	58.1



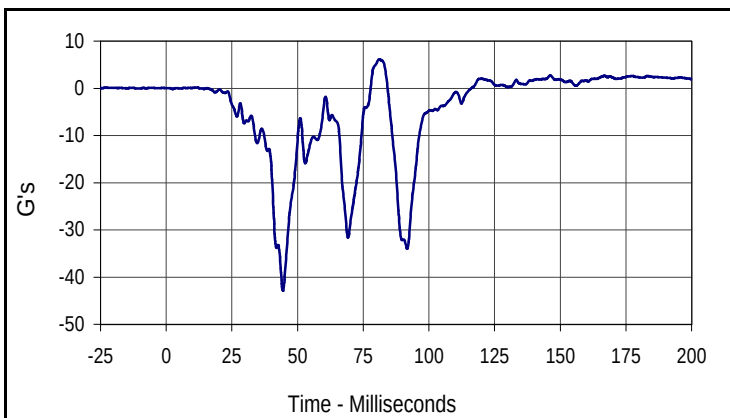
Curve Description			
Passenger Left Foot Fore Z			
CURNO	Type	SAE Class	Units
081	FIL	180	G's
Max	Time	Min	Time
24.0	74.6	-67.3	51.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

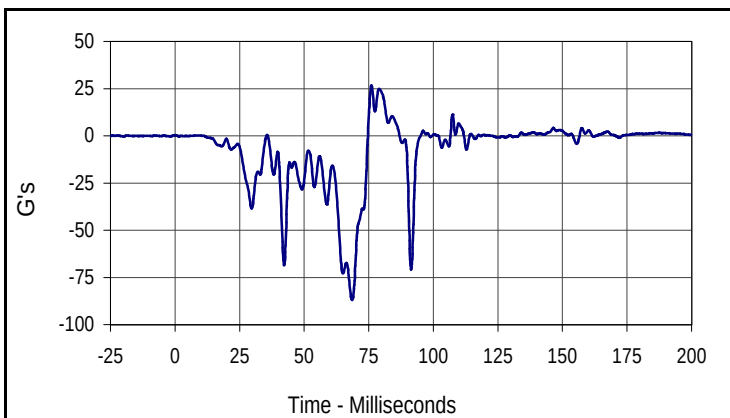
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Right Foot Aft X			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
35.3	90.9	-65.8	69.3



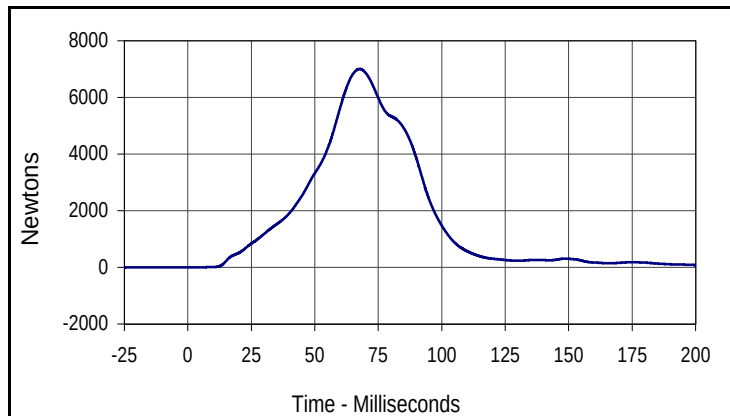
Curve Description			
Passenger Right Foot Aft Z			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
6.1	81.1	-42.9	44.4



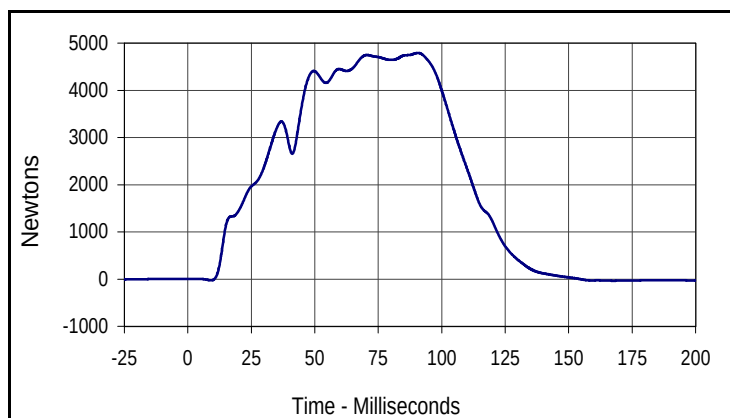
Curve Description			
Passenger Right Foot Fore Z			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
26.5	76.0	-86.9	68.6

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

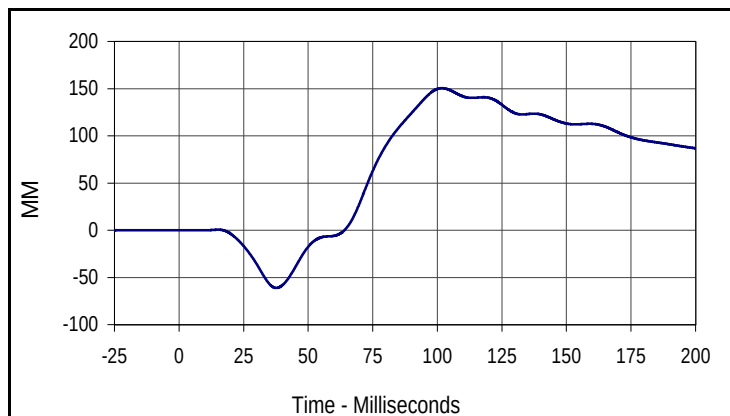
Test Date: 2/19/04
 NHTSA No.: M40111



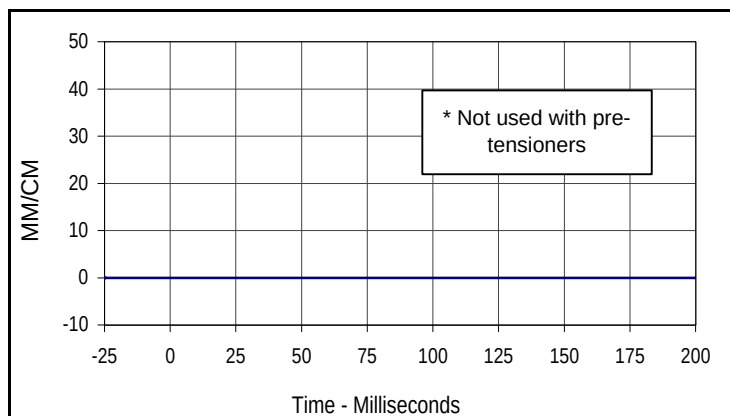
Curve Description			
Passenger Lap Belt Force			
CURNO	Type	SAE Class	Units
085	FIL	60	Newtons
Max	Time	Min	Time
7002.7	67.7	-4.2	1.8



Curve Description			
Passenger Shoulder Belt Force			
CURNO	Type	SAE Class	Units
086	FIL	60	Newtons
Max	Time	Min	Time
4793.1	90.6	-34.3	167.7



Curve Description			
Passenger Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
087	FIL	60	MM
Max	Time	Min	Time
150.4	101.8	-61.1	37.6

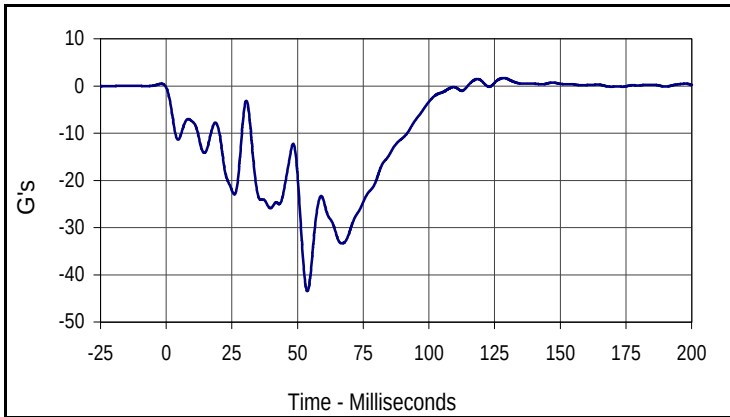


Curve Description			
Passenger Shoulder Belt Elongation			
CURNO	Type	SAE Class	Units
088	FIL	60	MM/CM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

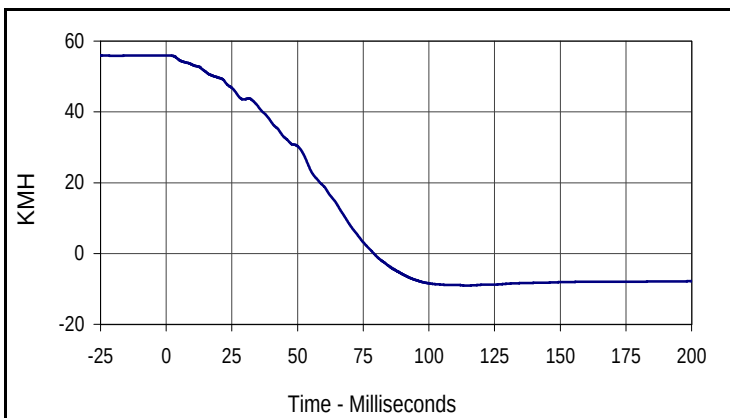
* Not used with pre-tensioners

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

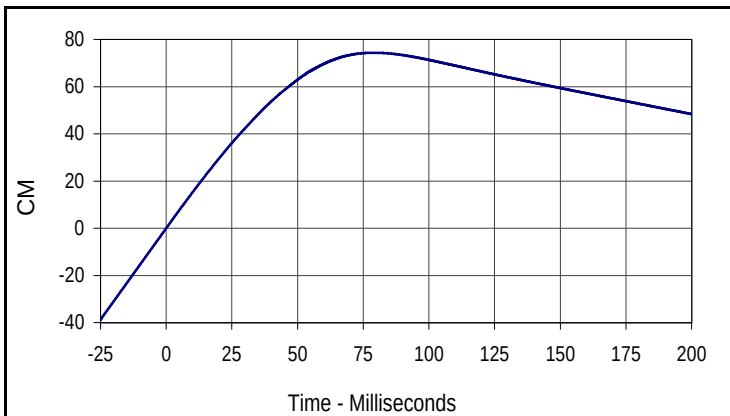
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Left Rear X			
CURNO	Type	SAE Class	Units
089	FIL	60	G's
Max	Time	Min	Time
1.7	128.6	-43.4	53.7



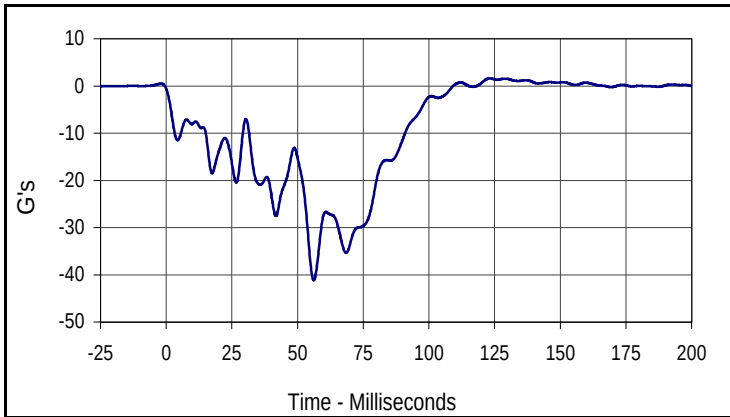
Curve Description			
Vehicle Left Rear X Velocity			
CURNO	Type	SAE Class	Units
089	IN1	180	KMH
Max	Time	Min	Time
55.9	1.5	-9.1	114.1



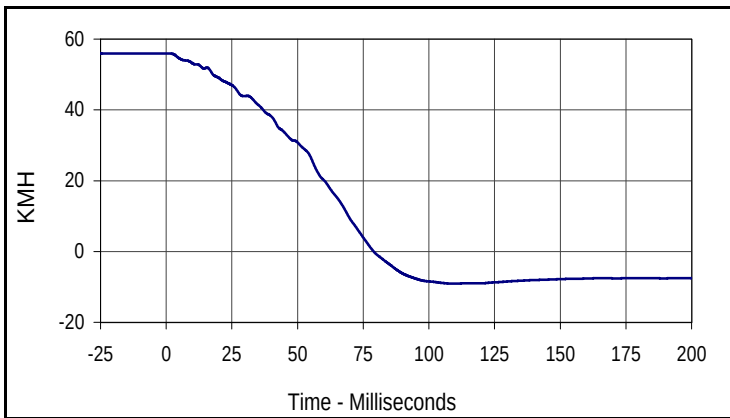
Curve Description			
Vehicle Left Rear X Displacement			
CURNO	Type	SAE Class	Units
089	IN2	180	CM
Max	Time	Min	Time
74.4	79.0	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

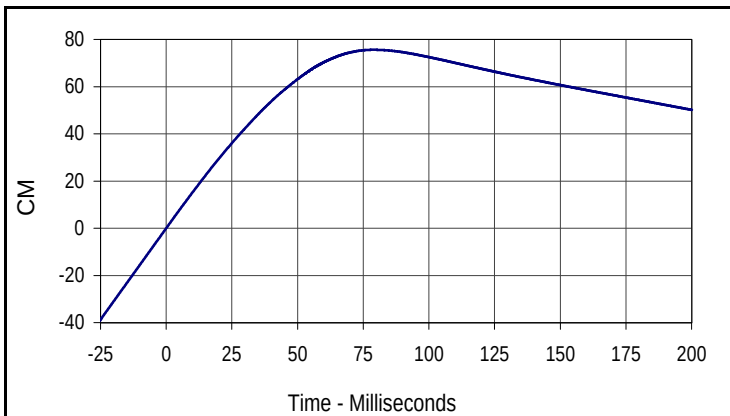
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Right Rear X			
CURNO	Type	SAE Class	Units
090	FIL	60	G's
Max	Time	Min	Time
1.6	123.2	-41.2	56.1



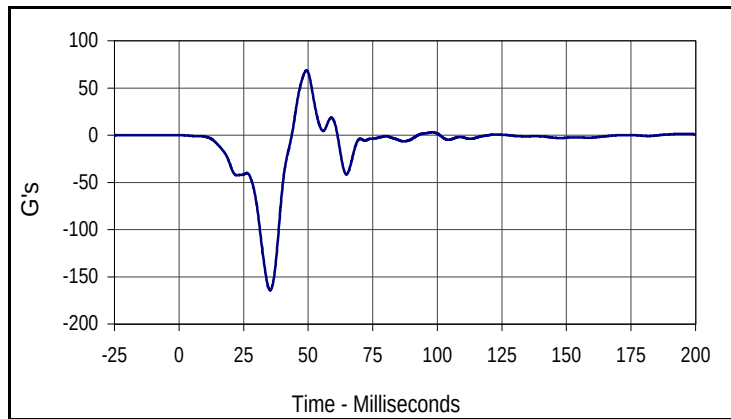
Curve Description			
Vehicle Right Rear X Velocity			
CURNO	Type	SAE Class	Units
090	IN1	180	KMH
Max	Time	Min	Time
55.9	1.3	-9.1	108.4



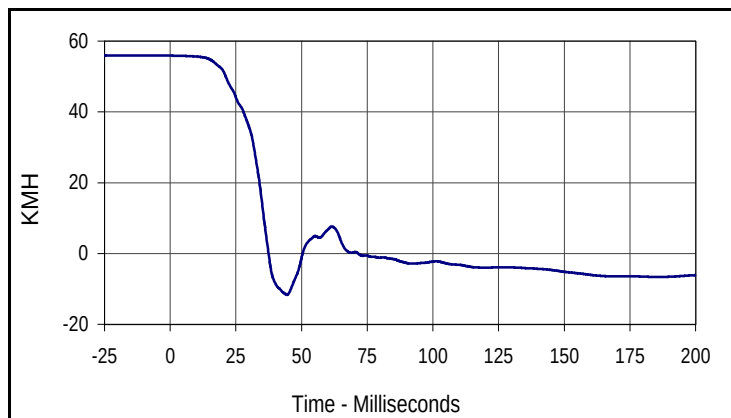
Curve Description			
Vehicle Right Rear X Displacement			
CURNO	Type	SAE Class	Units
090	IN2	180	CM
Max	Time	Min	Time
75.6	79.0	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

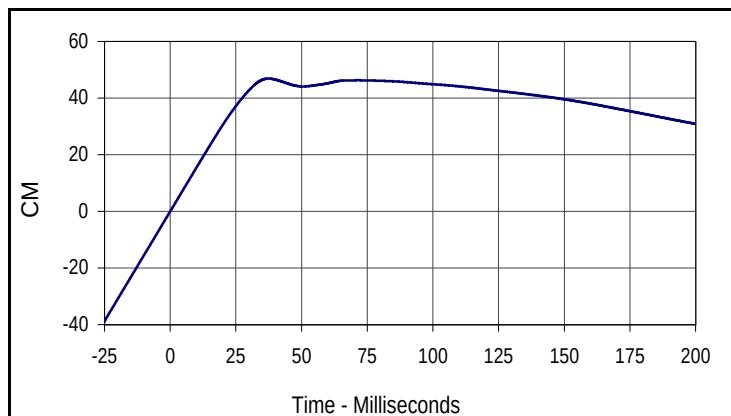
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Engine Top			
CURNO	Type	SAE Class	Units
091	FIL	60	G's
Max	Time	Min	Time
68.5	49.4	-164.2	35.3



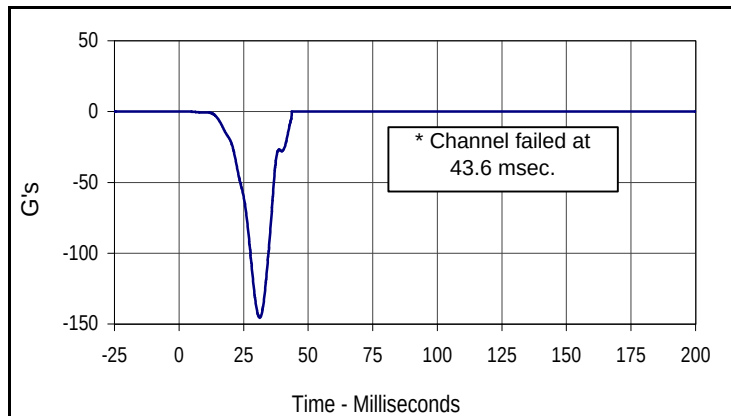
Curve Description			
Vehicle Engine Top Velocity			
CURNO	Type	SAE Class	Units
091	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-11.7	44.5



Curve Description			
Vehicle Engine Top Displacement			
CURNO	Type	SAE Class	Units
091	IN2	180	CM
Max	Time	Min	Time
46.9	37.4	0.0	0.0

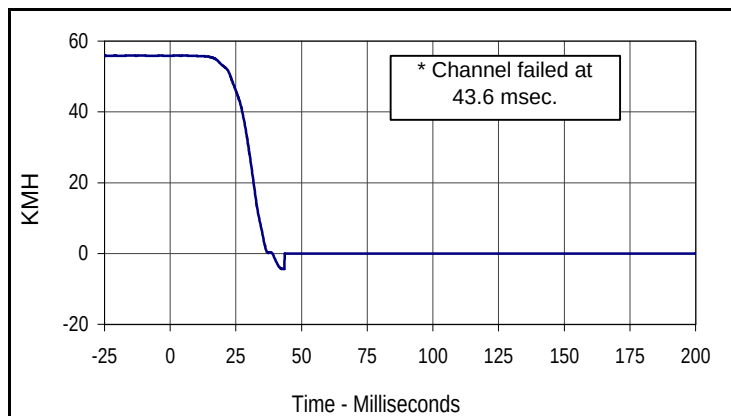
Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



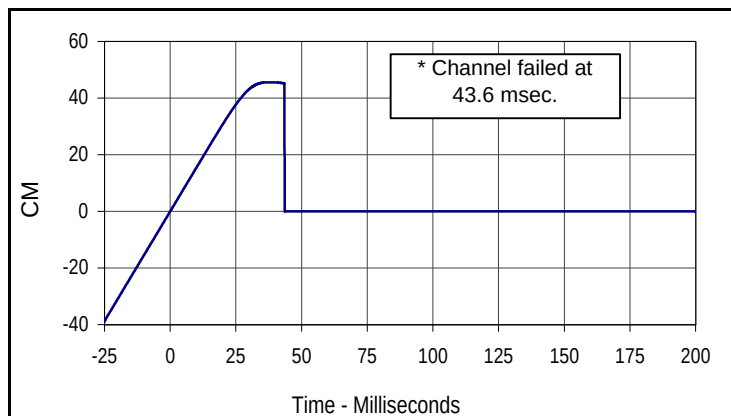
Curve Description			
Vehicle Engine Bottom			
CURNO	Type	SAE Class	Units
092	FIL	60	G's
Max	Time	Min	Time
0.1	1.3	-145.6	31.2

* Channel failed at 43.6 msec.



Curve Description			
Vehicle Engine Bottom Velocity			
CURNO	Type	SAE Class	Units
092	IN1	180	KMH
Max	Time	Min	Time
55.9	2.2	-4.4	42.9

* Channel failed at 43.6 msec.

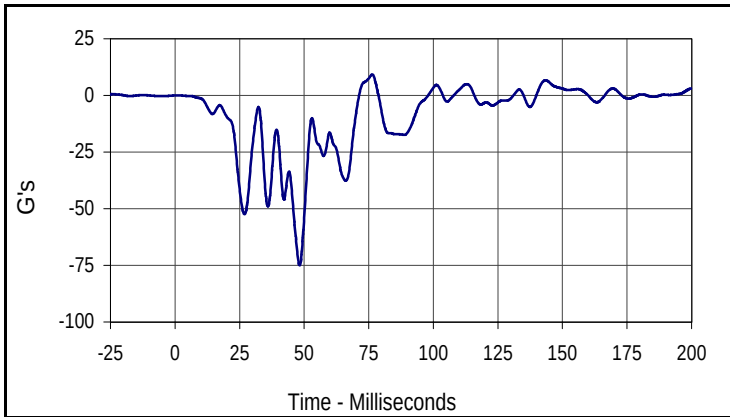


Curve Description			
Vehicle Engine Bottom Displacement			
CURNO	Type	SAE Class	Units
092	IN2	180	CM
Max	Time	Min	Time
45.6	38.9	0.0	43.6

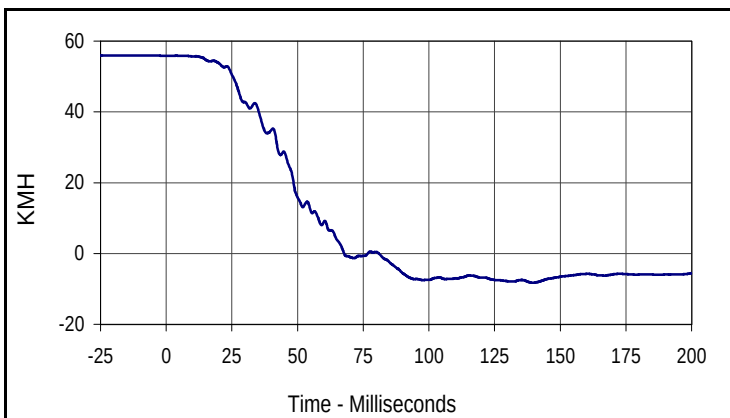
* Channel failed at 43.6 msec.

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

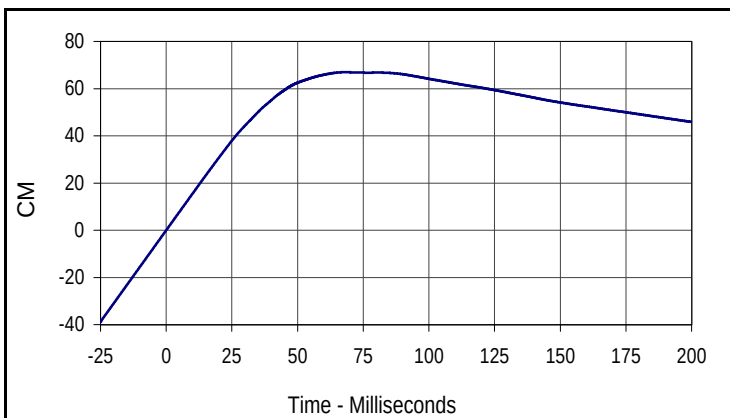
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Left Brake Caliper			
CURNO	Type	SAE Class	Units
093	FIL	60	G's
Max	Time	Min	Time
9.2	76.4	-75.1	48.3



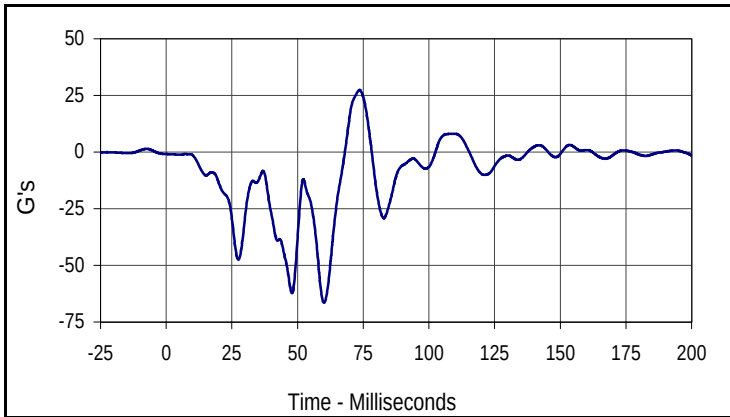
Curve Description			
Vehicle Left Brake Caliper Velocity			
CURNO	Type	SAE Class	Units
093	IN1	180	KMH
Max	Time	Min	Time
55.9	3.9	-8.2	139.6



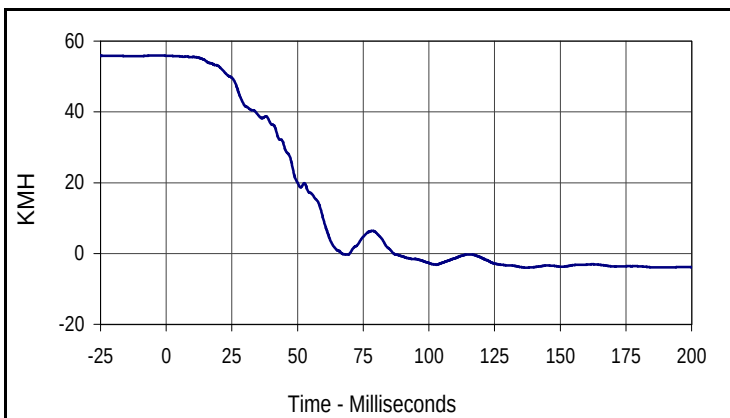
Curve Description			
Vehicle Left Brake Caliper Displacement			
CURNO	Type	SAE Class	Units
093	IN2	180	CM
Max	Time	Min	Time
67.0	67.7	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

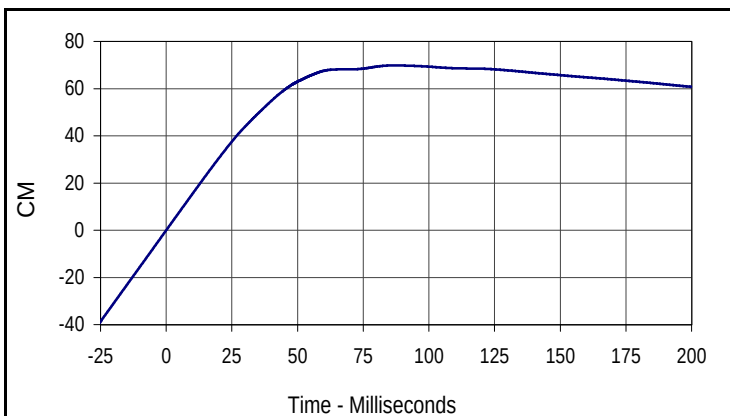
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Right Brake Caliper			
CURNO	Type	SAE Class	Units
094	FIL	60	G's
Max	Time	Min	Time
27.3	73.6	-66.6	60.1



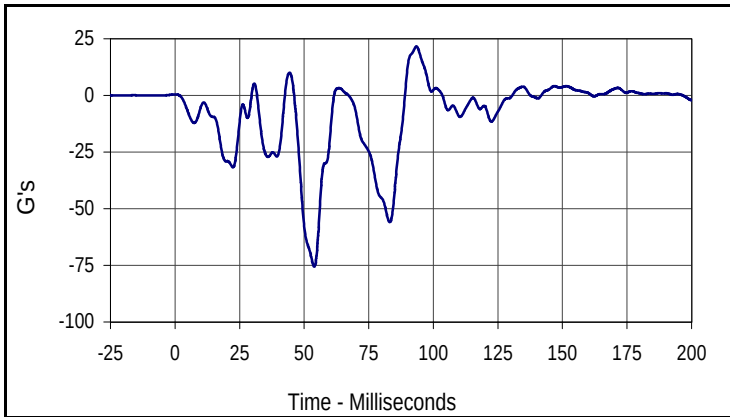
Curve Description			
Vehicle Right Brake Caliper Velocity			
CURNO	Type	SAE Class	Units
094	IN1	180	KMH
Max	Time	Min	Time
55.9	0.0	-4.0	137.2



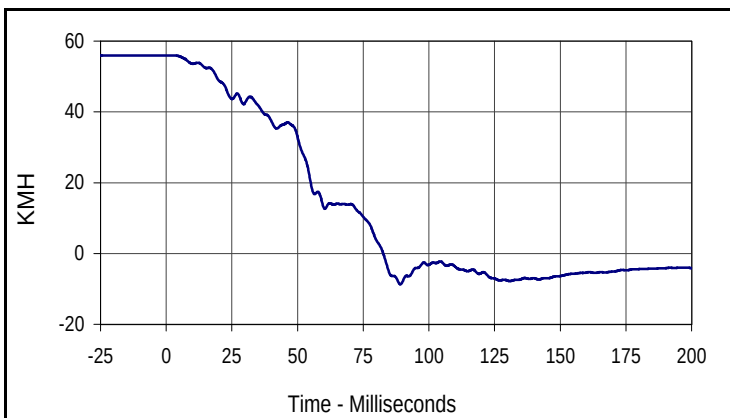
Curve Description			
Vehicle Right Brake Caliper Displacement			
CURNO	Type	SAE Class	Units
094	IN2	180	CM
Max	Time	Min	Time
69.8	86.5	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

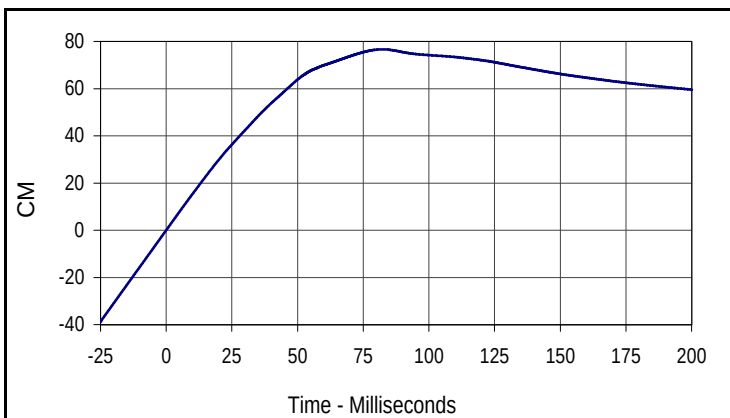
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Instrument Panel			
CURNO	Type	SAE Class	Units
095	FIL	60	G's
Max	Time	Min	Time
21.6	93.5	-75.6	53.9



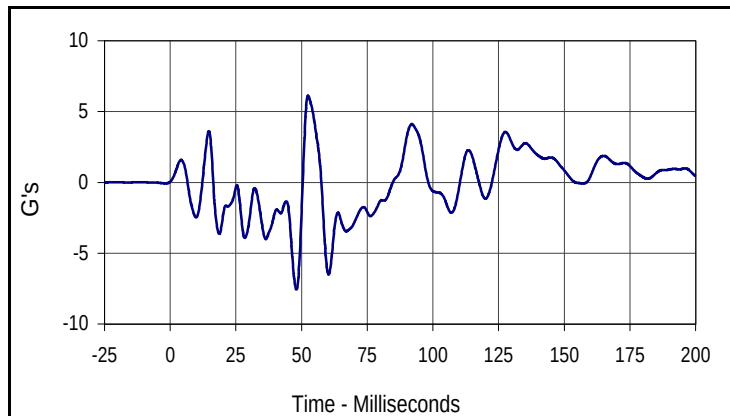
Curve Description			
Vehicle Instrument Panel Velocity			
CURNO	Type	SAE Class	Units
095	IN1	180	KMH
Max	Time	Min	Time
55.9	2.8	-8.7	89.1



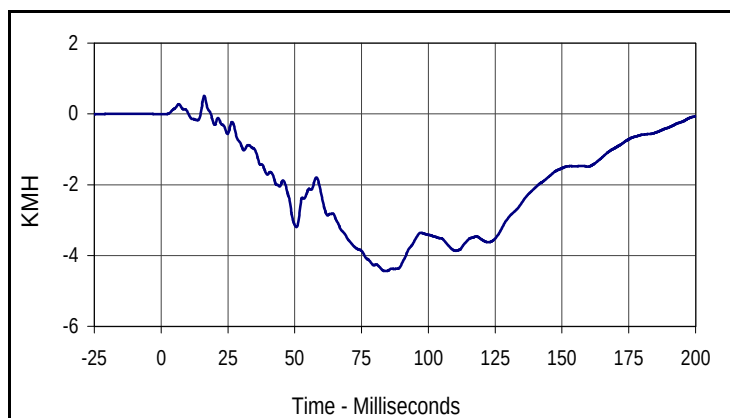
Curve Description			
Vehicle Instrument Panel Displacement			
CURNO	Type	SAE Class	Units
095	IN2	180	CM
Max	Time	Min	Time
76.7	82.6	0.0	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

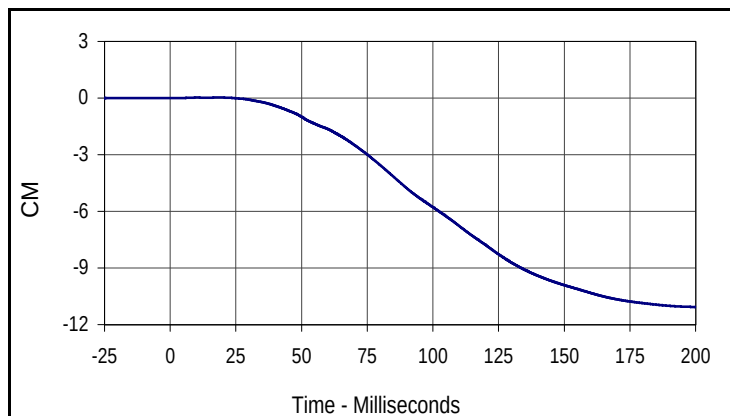
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Left Rear Z			
CURNO	Type	SAE Class	Units
096	FIL	60	G's
Max	Time	Min	Time
6.1	52.4	-7.6	48.1



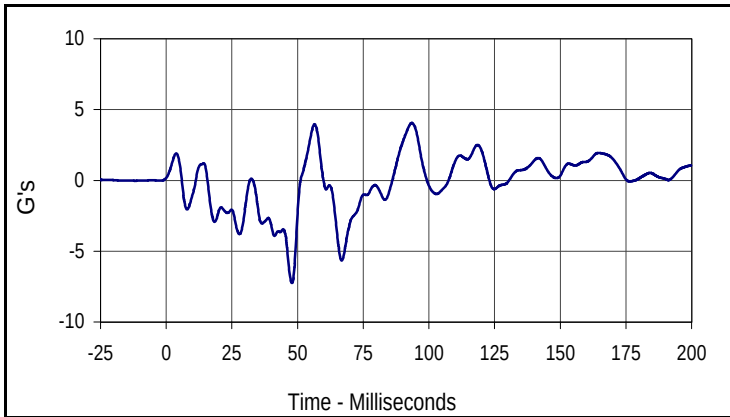
Curve Description			
Vehicle Left Rear Z Velocity			
CURNO	Type	SAE Class	Units
096	IN1	180	KMH
Max	Time	Min	Time
0.5	16.1	-4.4	84.0



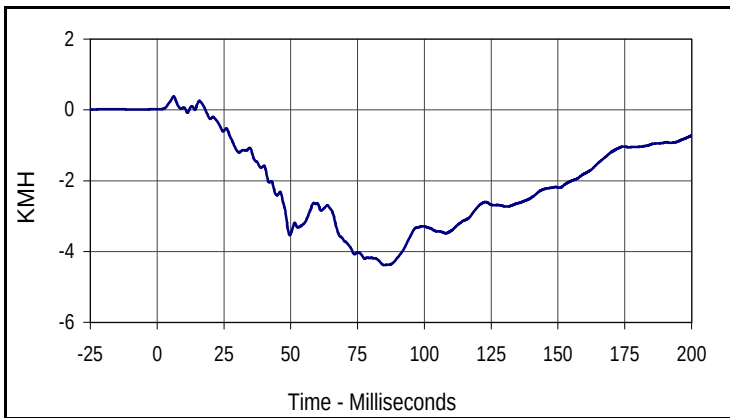
Curve Description			
Vehicle Left Rear Z Displacement			
CURNO	Type	SAE Class	Units
096	IN2	180	CM
Max	Time	Min	Time
0.0	18.6	-11.1	200.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

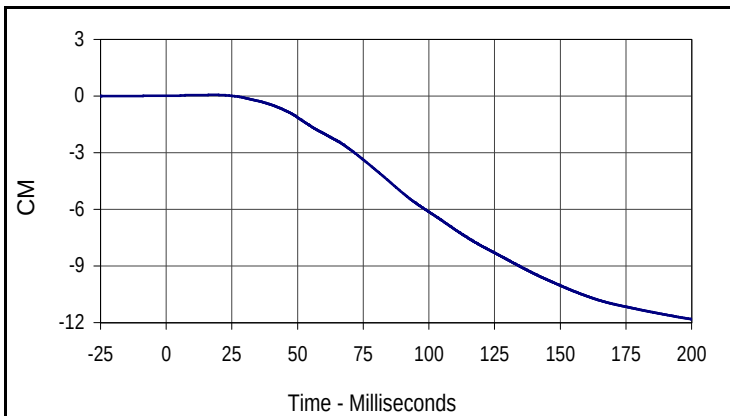
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Vehicle Right Rear Z			
CURNO	Type	SAE Class	Units
097	FIL	60	G's
Max	Time	Min	Time
4.1	93.5	-7.2	47.9



Curve Description			
Vehicle Right Rear Z Velocity			
CURNO	Type	SAE Class	Units
097	IN1	180	KMH
Max	Time	Min	Time
0.4	6.2	-4.4	84.9



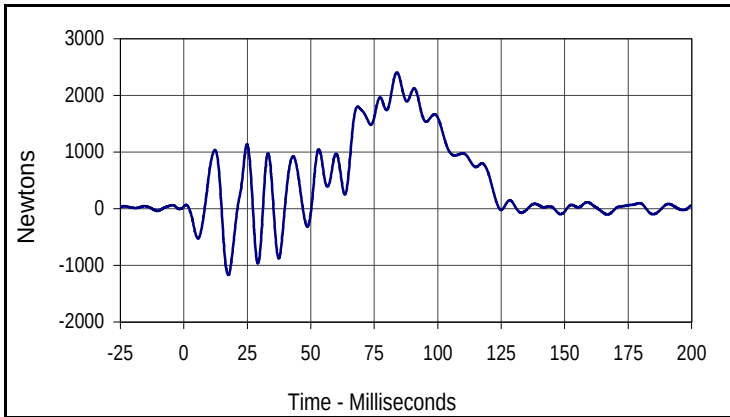
Curve Description			
Vehicle Right Rear Z Displacement			
CURNO	Type	SAE Class	Units
097	IN2	180	CM
Max	Time	Min	Time
0.1	18.1	-11.8	200.0

APPENDIX C

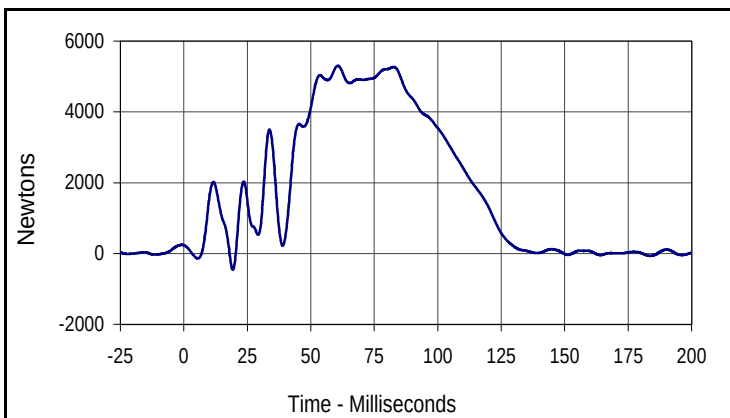
LOAD CELL BARRIER DATA PLOTS

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

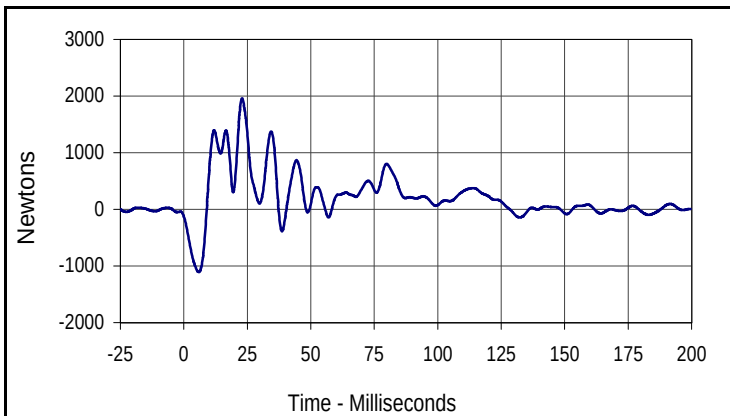
Test Date: 2/19/04
 NHTSA No.: M40111



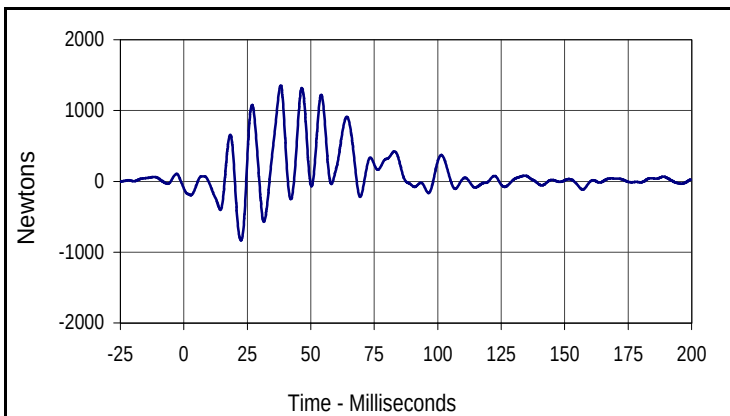
Curve Description			
Barrier Force A1			
CURNO	Type	SAE Class	Units
098	FIL	60	Newtons
Max	Time	Min	Time
2406.7	83.9	-1171.7	17.5



Curve Description			
Barrier Force B1			
CURNO	Type	SAE Class	Units
107	FIL	60	Newtons
Max	Time	Min	Time
5304.2	60.7	-461.3	19.3



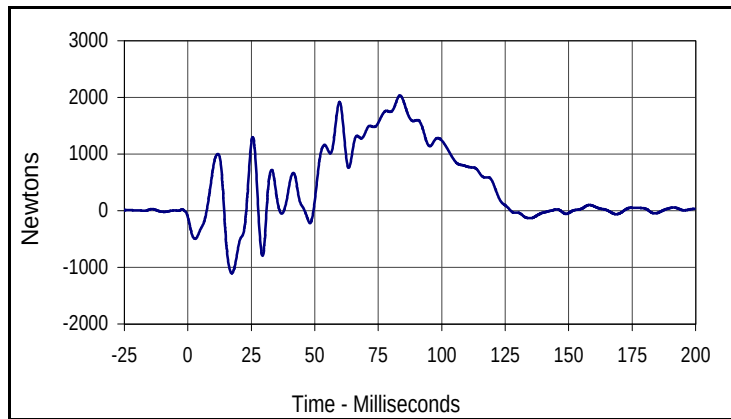
Curve Description			
Barrier Force C1			
CURNO	Type	SAE Class	Units
116	FIL	60	Newtons
Max	Time	Min	Time
1959.5	22.9	-1109.4	5.9



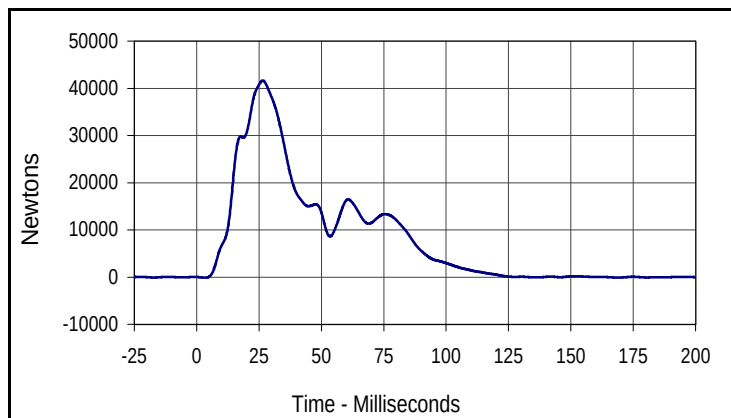
Curve Description			
Barrier Force D1			
CURNO	Type	SAE Class	Units
125	FIL	60	Newtons
Max	Time	Min	Time
1351.2	38.1	-831.8	22.5

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

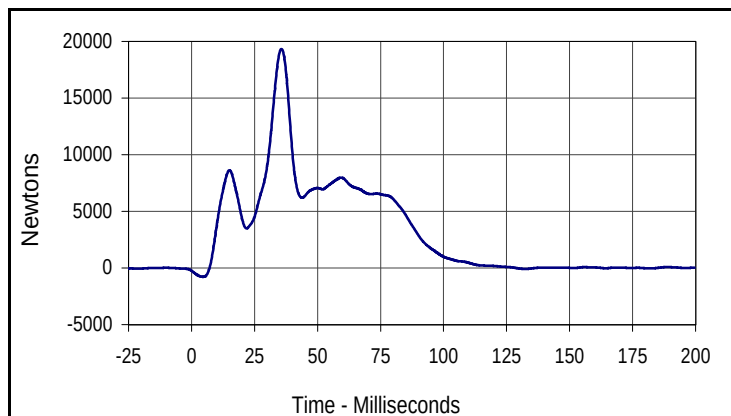
Test Date: 2/19/04
 NHTSA No.: M40111



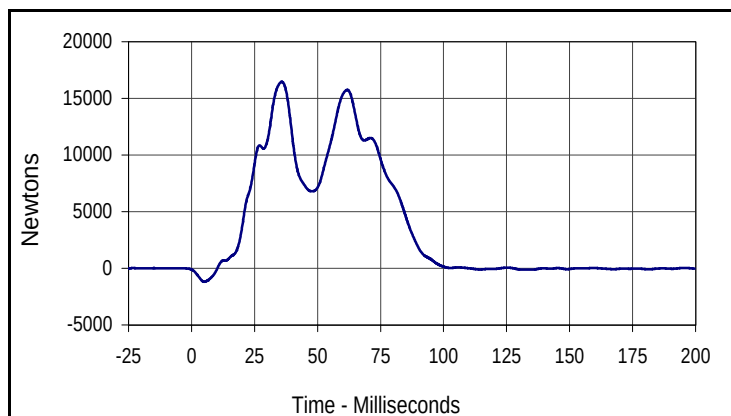
Curve Description			
Barrier Force A2			
CURNO	Type	SAE Class	Units
099	FIL	60	Newtons
Max	Time	Min	Time
2034.9	83.6	-1104.9	17.3



Curve Description			
Barrier Force B2			
CURNO	Type	SAE Class	Units
108	FIL	60	Newtons
Max	Time	Min	Time
41623.5	26.5	-127.4	3.4



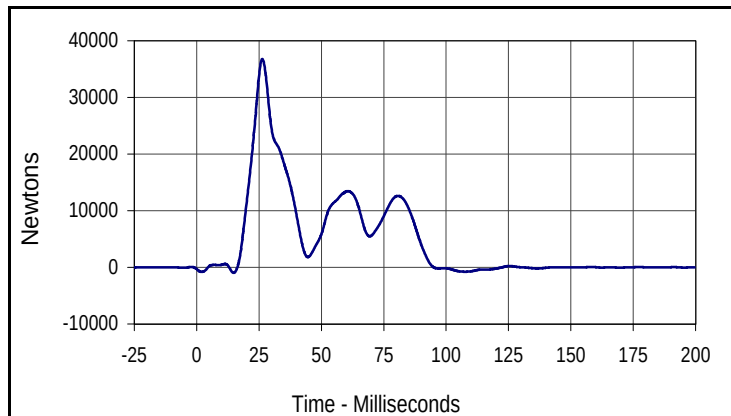
Curve Description			
Barrier Force C2			
CURNO	Type	SAE Class	Units
117	FIL	60	Newtons
Max	Time	Min	Time
19335.3	35.6	-777.4	4.5



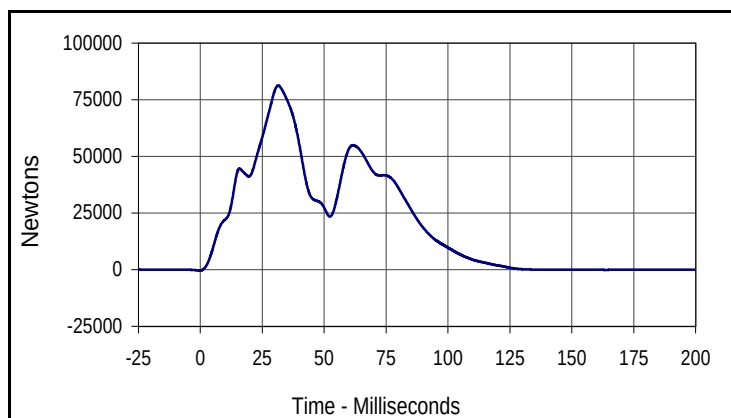
Curve Description			
Barrier Force D2			
CURNO	Type	SAE Class	Units
126	FIL	60	Newtons
Max	Time	Min	Time
16459.1	35.8	-1183.5	5.0

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

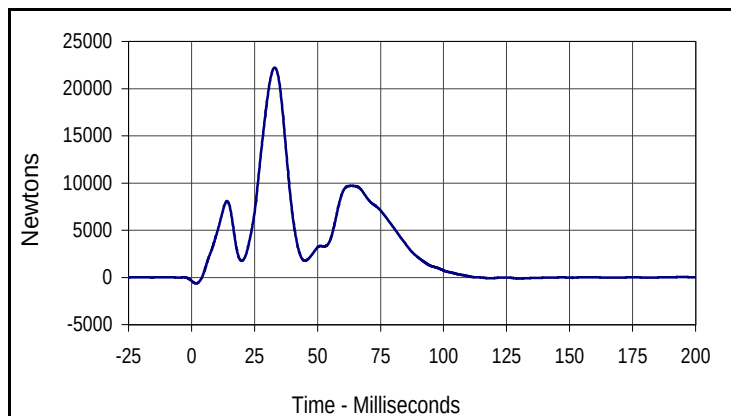
Test Date: 2/19/04
 NHTSA No.: M40111



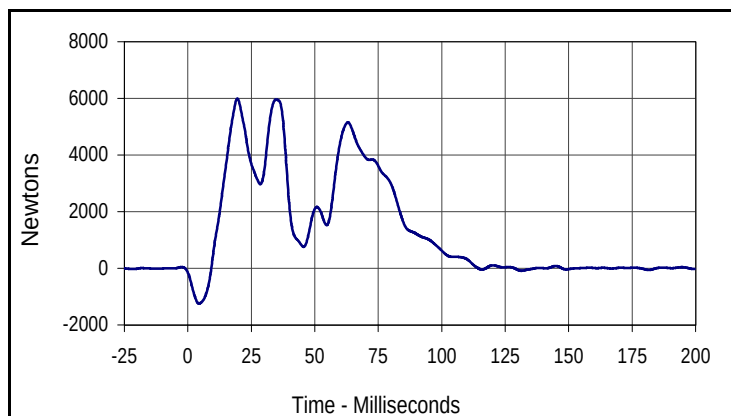
Curve Description			
Barrier Force A3			
CURNO	Type	SAE Class	Units
100	FIL	60	Newtons
Max	Time	Min	Time
36780.9	26.3	-985.2	14.8



Curve Description			
Barrier Force B3			
CURNO	Type	SAE Class	Units
109	FIL	60	Newtons
Max	Time	Min	Time
81229.0	31.4	-372.4	0.0



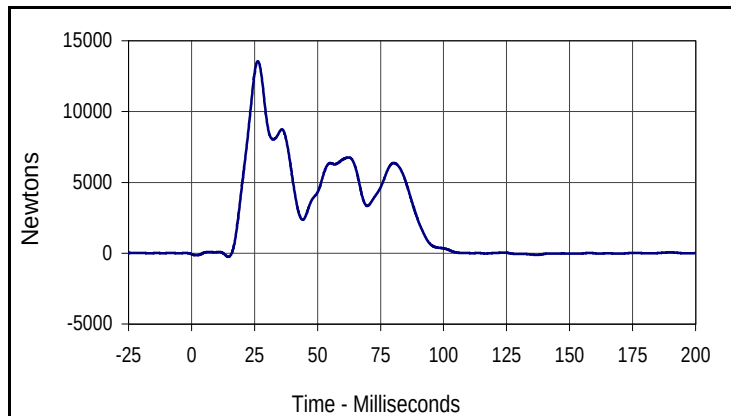
Curve Description			
Barrier Force C3			
CURNO	Type	SAE Class	Units
118	FIL	60	Newtons
Max	Time	Min	Time
22229.7	33.0	-624.7	1.8



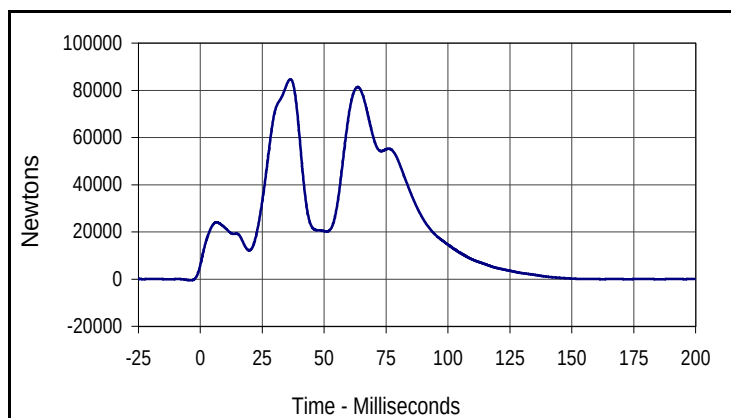
Curve Description			
Barrier Force D3			
CURNO	Type	SAE Class	Units
127	FIL	60	Newtons
Max	Time	Min	Time
5986.8	19.5	-1243.4	4.4

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

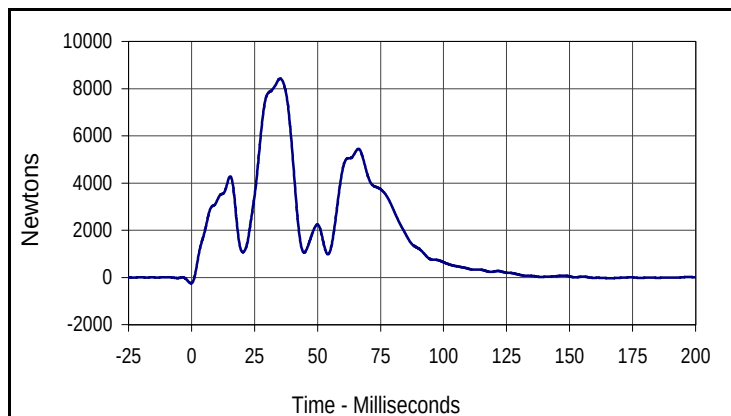
Test Date: 2/19/04
 NHTSA No.: M40111



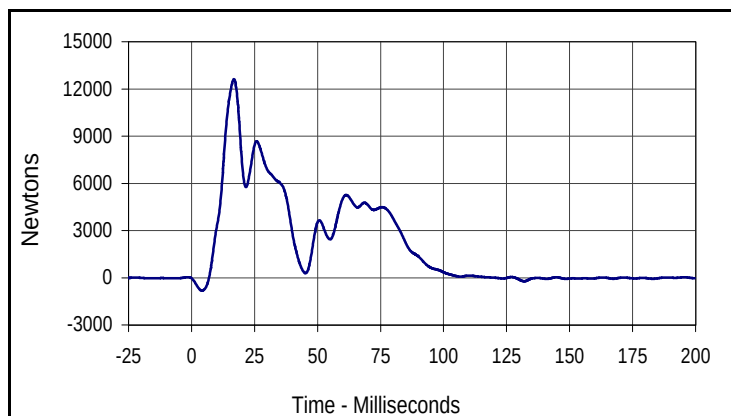
Curve Description			
Barrier Force A4			
CURNO	Type	SAE Class	Units
101	FIL	60	Newtons
Max	Time	Min	Time
13558.5	26.3	-261.7	14.6



Curve Description			
Barrier Force B4			
CURNO	Type	SAE Class	Units
110	FIL	60	Newtons
Max	Time	Min	Time
84712.6	36.4	-34.6	172.7



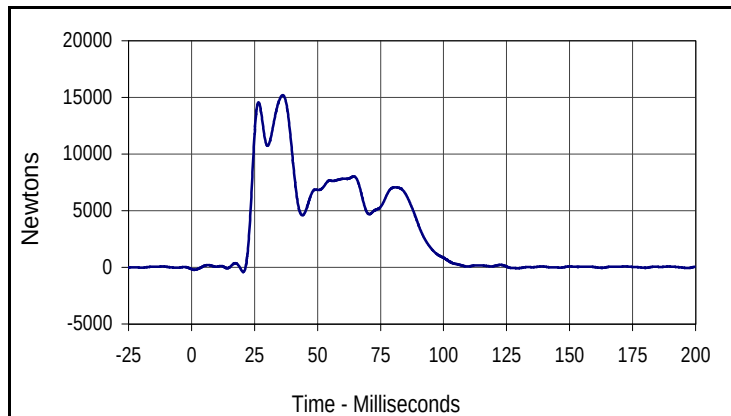
Curve Description			
Barrier Force C4			
CURNO	Type	SAE Class	Units
119	FIL	60	Newtons
Max	Time	Min	Time
8427.0	35.1	-242.6	0.0



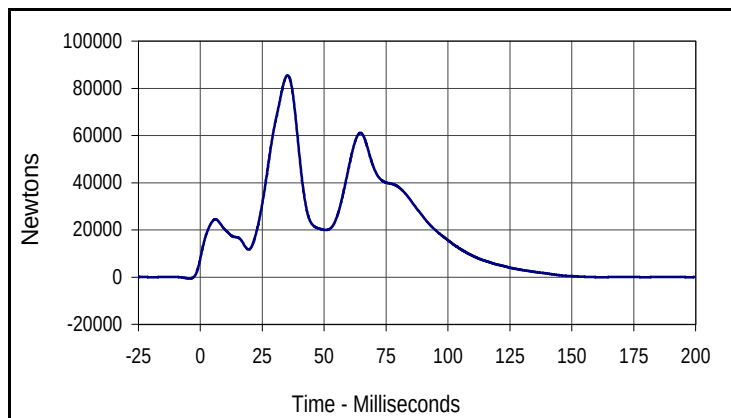
Curve Description			
Barrier Force D4			
CURNO	Type	SAE Class	Units
128	FIL	60	Newtons
Max	Time	Min	Time
12623.1	16.8	-817.2	4.1

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

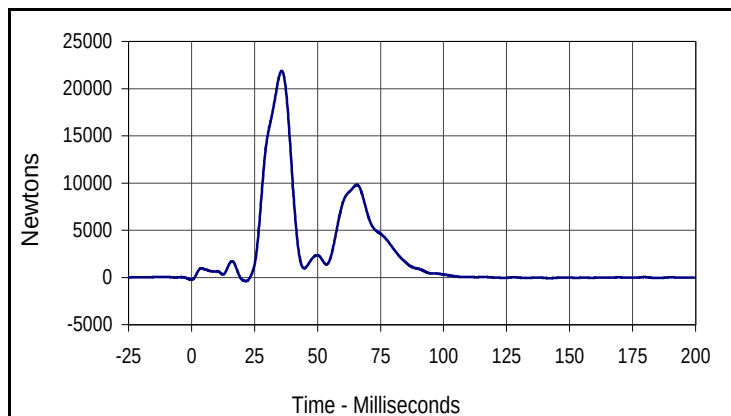
Test Date: 2/19/04
 NHTSA No.: M40111



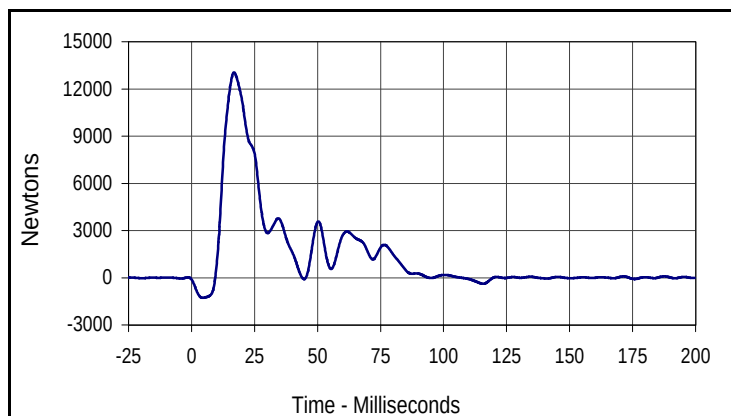
Curve Description			
Barrier Force A5			
CURNO	Type	SAE Class	Units
102	FIL	60	Newtons
Max	Time	Min	Time
15208.4	36.2	-409.8	20.5



Curve Description			
Barrier Force B5			
CURNO	Type	SAE Class	Units
111	FIL	60	Newtons
Max	Time	Min	Time
85517.3	35.2	-57.6	179.8



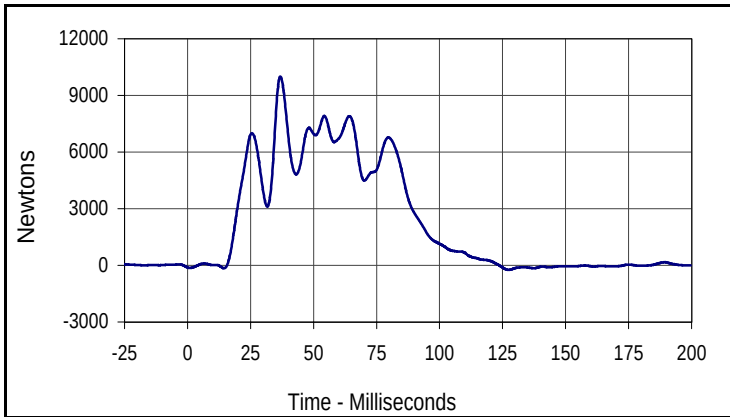
Curve Description			
Barrier Force C5			
CURNO	Type	SAE Class	Units
120	FIL	60	Newtons
Max	Time	Min	Time
21887.4	35.8	-386.0	21.6



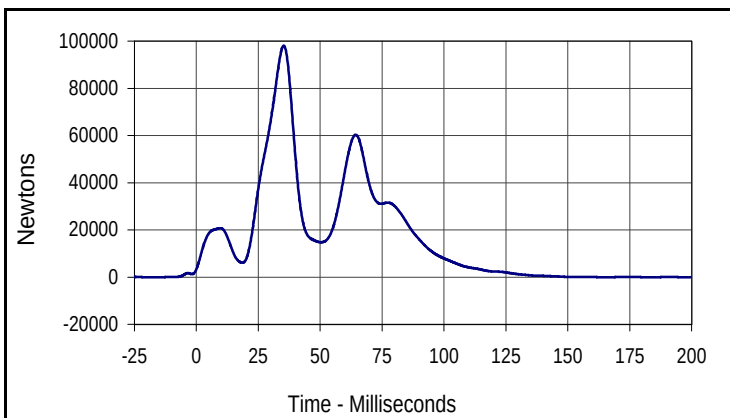
Curve Description			
Barrier Force D5			
CURNO	Type	SAE Class	Units
129	FIL	60	Newtons
Max	Time	Min	Time
13047.0	16.9	-1273.2	4.5

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

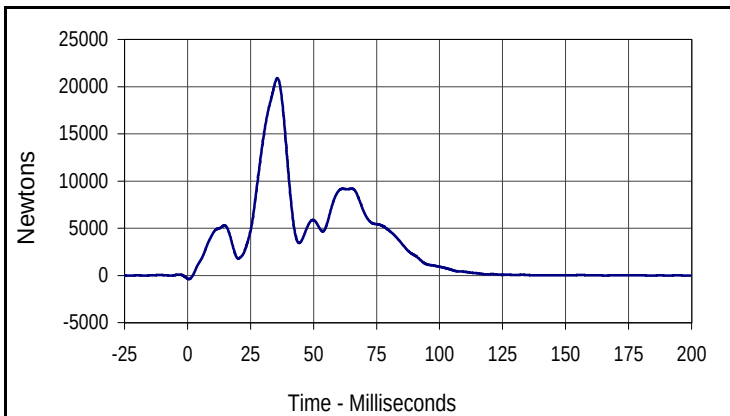
Test Date: 2/19/04
 NHTSA No.: M40111



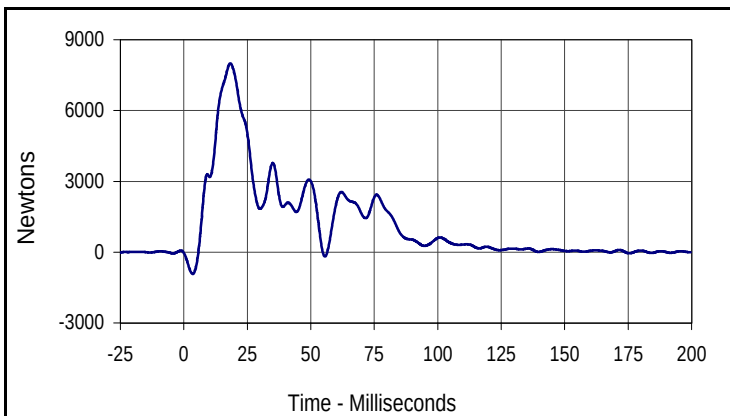
Curve Description			
Barrier Force A6			
CURNO	Type	SAE Class	Units
103	FIL	60	Newtons
Max	Time	Min	Time
10008.4	36.8	-233.9	127.4



Curve Description			
Barrier Force B6			
CURNO	Type	SAE Class	Units
112	FIL	60	Newtons
Max	Time	Min	Time
98085.4	35.3	-126.2	182.7



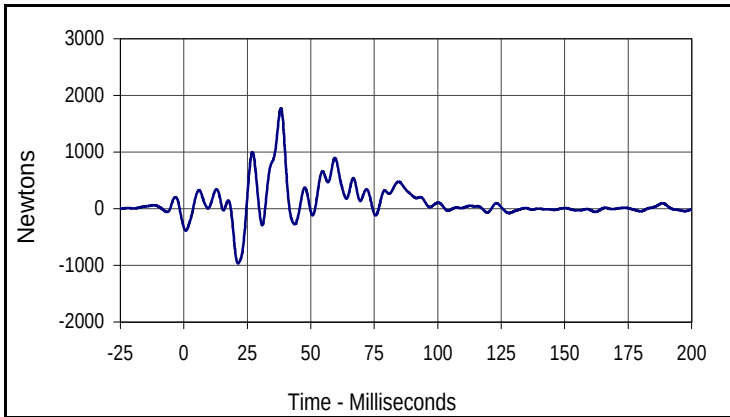
Curve Description			
Barrier Force C6			
CURNO	Type	SAE Class	Units
121	FIL	60	Newtons
Max	Time	Min	Time
20889.5	35.6	-386.1	0.6



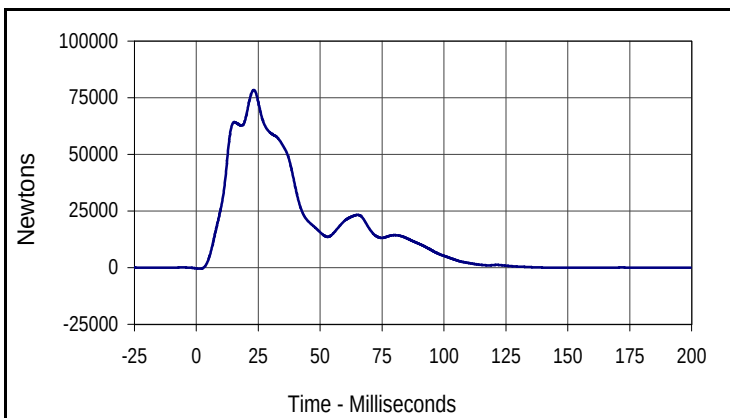
Curve Description			
Barrier Force D6			
CURNO	Type	SAE Class	Units
130	FIL	60	Newtons
Max	Time	Min	Time
8002.7	18.3	-927.8	3.5

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

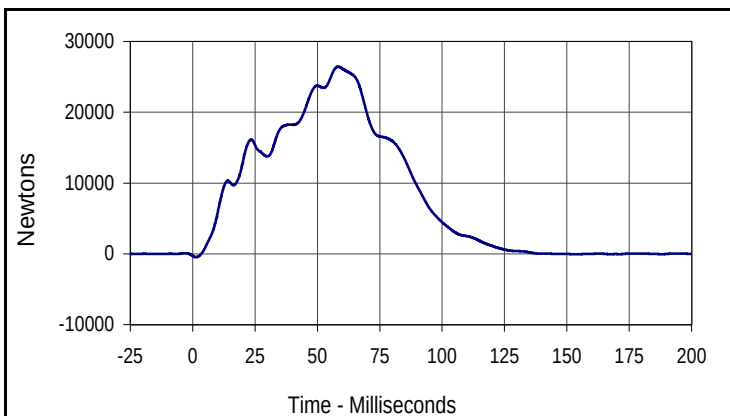
Test Date: 2/19/04
 NHTSA No.: M40111



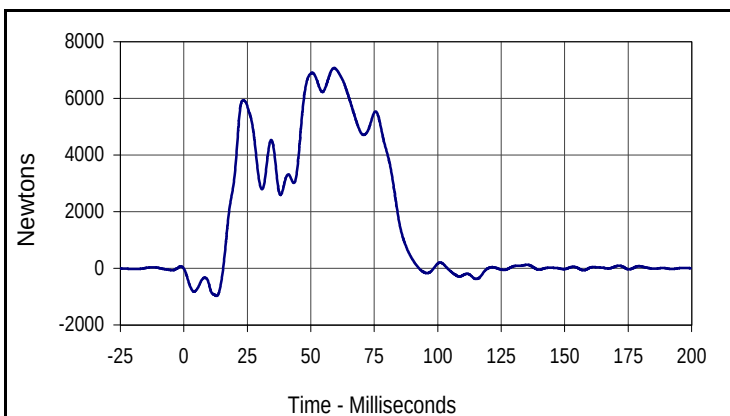
Curve Description			
Barrier Force A7			
CURNO	Type	SAE Class	Units
104	FIL	60	Newtons
Max	Time	Min	Time
1770.1	38.2	-966.6	21.3



Curve Description			
Barrier Force B7			
CURNO	Type	SAE Class	Units
113	FIL	60	Newtons
Max	Time	Min	Time
78451.4	23.2	-490.0	1.4



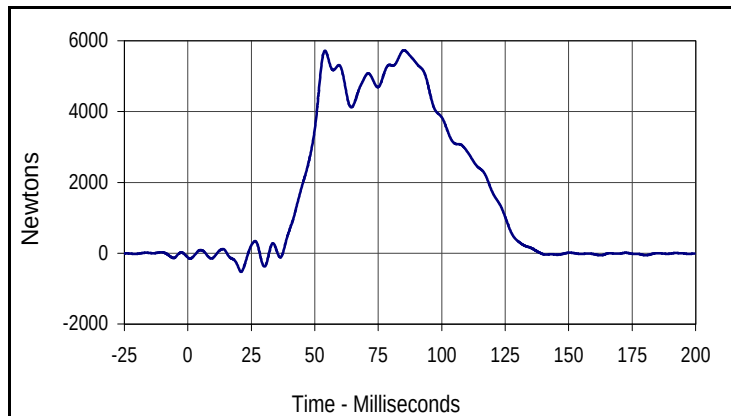
Curve Description			
Barrier Force C7			
CURNO	Type	SAE Class	Units
122	FIL	60	Newtons
Max	Time	Min	Time
26426.7	58.3	-480.4	1.3



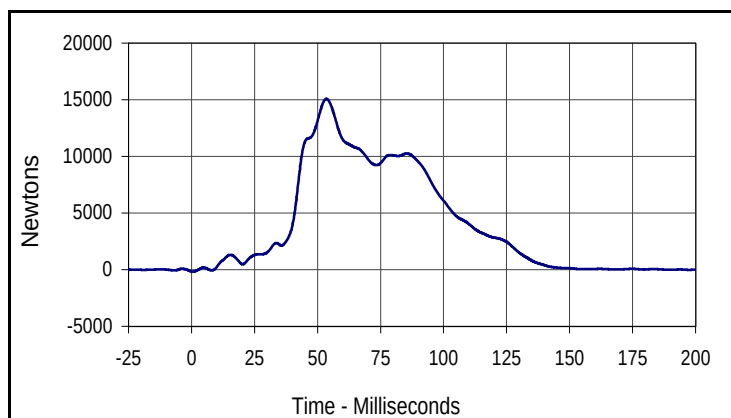
Curve Description			
Barrier Force D7			
CURNO	Type	SAE Class	Units
131	FIL	60	Newtons
Max	Time	Min	Time
7073.0	59.1	-976.7	12.9

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

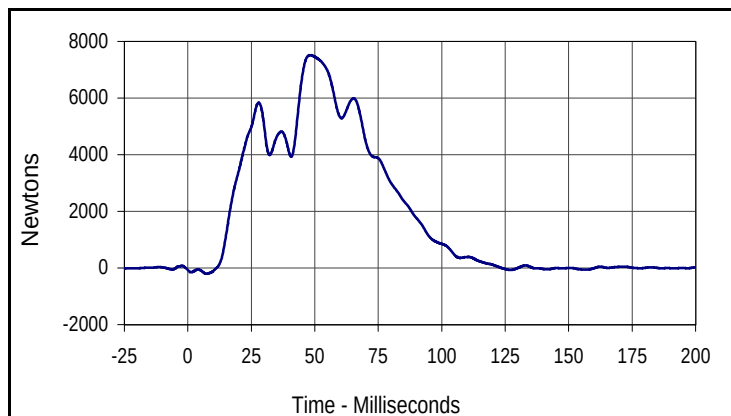
Test Date: 2/19/04
 NHTSA No.: M40111



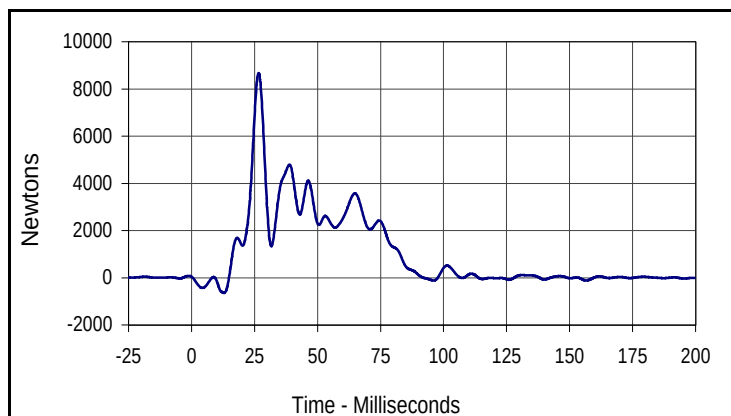
Curve Description			
Barrier Force A8			
CURNO	Type	SAE Class	Units
105	FIL	60	Newtons
Max	Time	Min	Time
5732.0	85.1	-523.7	21.0



Curve Description			
Barrier Force B8			
CURNO	Type	SAE Class	Units
114	FIL	60	Newtons
Max	Time	Min	Time
15074.4	53.5	-171.7	0.6



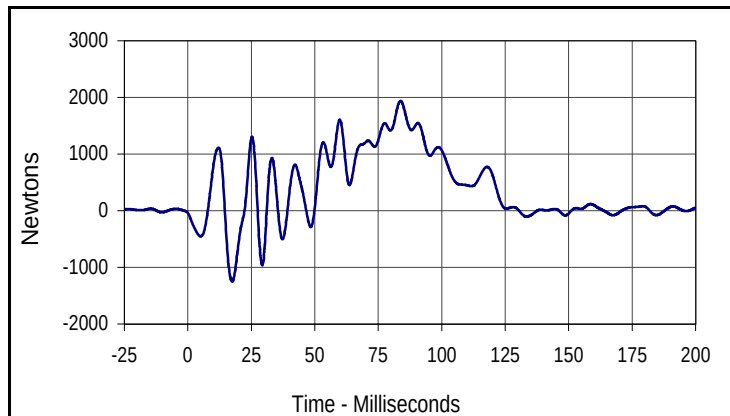
Curve Description			
Barrier Force C8			
CURNO	Type	SAE Class	Units
123	FIL	60	Newtons
Max	Time	Min	Time
7512.3	48.2	-204.7	7.4



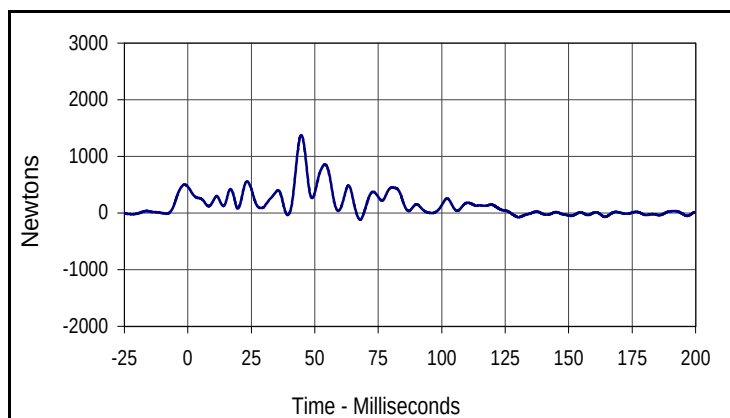
Curve Description			
Barrier Force D8			
CURNO	Type	SAE Class	Units
132	FIL	60	Newtons
Max	Time	Min	Time
8673.6	26.6	-640.8	12.9

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

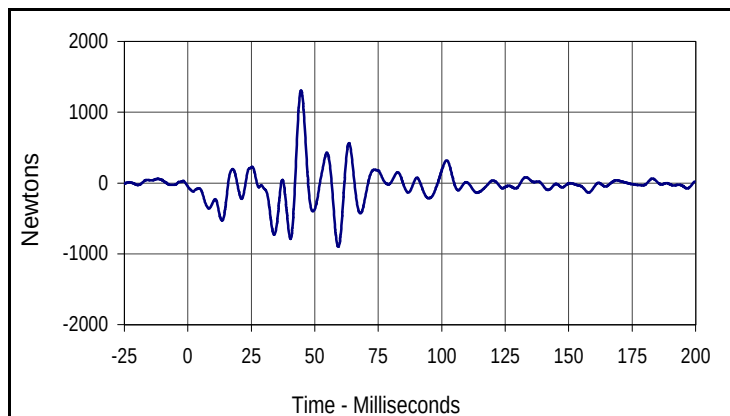
Test Date: 2/19/04
 NHTSA No.: M40111



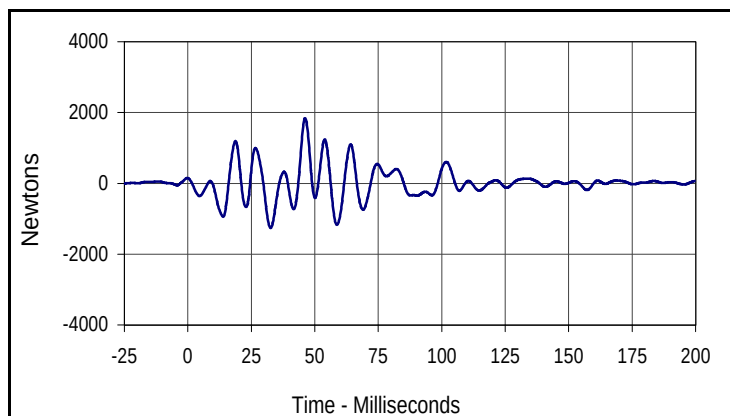
Curve Description			
Barrier Force A9			
CURNO	Type	SAE Class	Units
106	FIL	60	Newtons
Max	Time	Min	Time
1940.3	83.8	-1250.1	17.4



Curve Description			
Barrier Force B9			
CURNO	Type	SAE Class	Units
115	FIL	60	Newtons
Max	Time	Min	Time
1375.1	44.7	-117.3	67.9



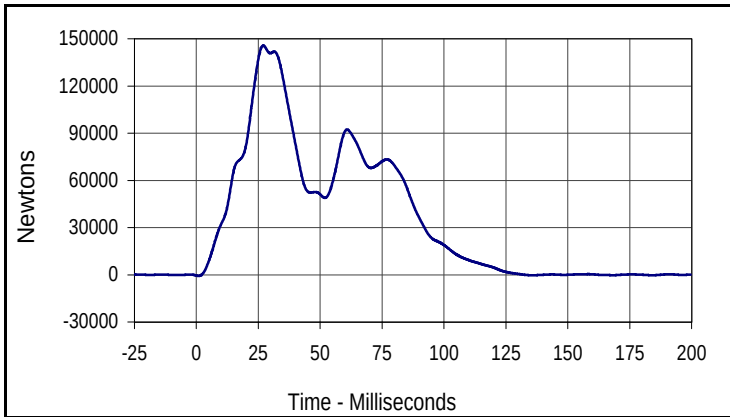
Curve Description			
Barrier Force C9			
CURNO	Type	SAE Class	Units
124	FIL	60	Newtons
Max	Time	Min	Time
1305.8	44.6	-898.8	59.3



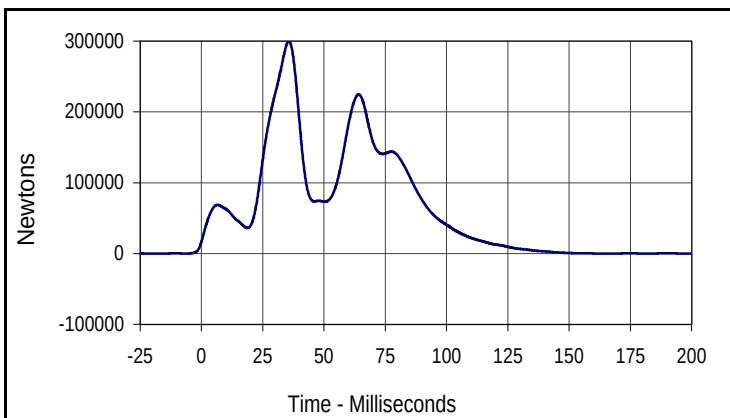
Curve Description			
Barrier Force D9			
CURNO	Type	SAE Class	Units
133	FIL	60	Newtons
Max	Time	Min	Time
1839.2	46.2	-1259.1	32.6

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

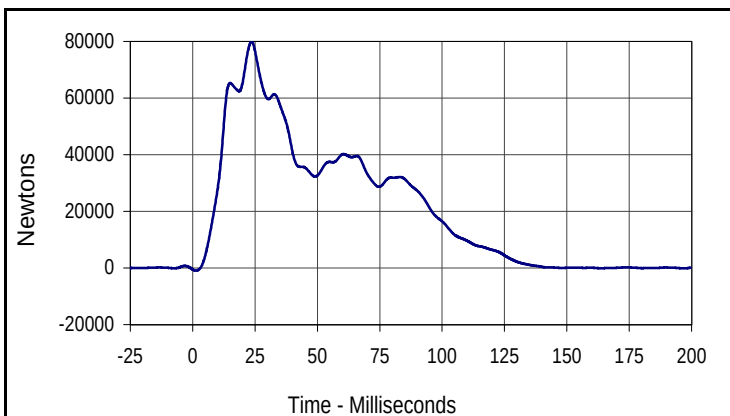
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Barrier Force Sum Group 1			
CURNO	Type	SAE Class	Units
001	SUM	60	Newtons
Max	Time	Min	Time
145681.1	27.0	-715.7	0.9



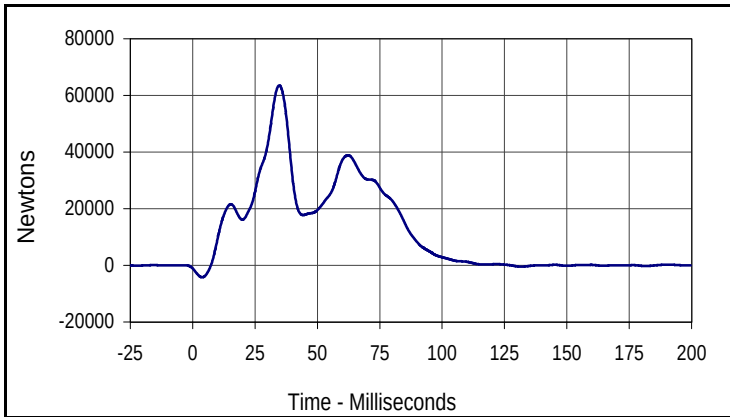
Curve Description			
Barrier Force Sum Group 2			
CURNO	Type	SAE Class	Units
002	SUM	60	Newtons
Max	Time	Min	Time
299970.7	35.6	-183.2	162.9



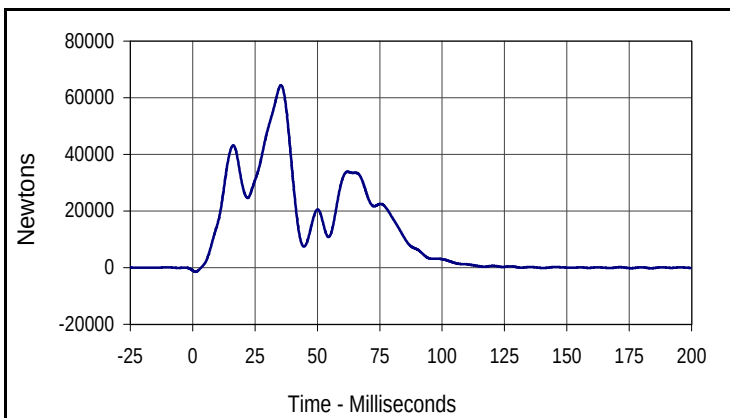
Curve Description			
Barrier Force Sum Group 3			
CURNO	Type	SAE Class	Units
003	SUM	60	Newtons
Max	Time	Min	Time
79884.6	23.6	-931.9	1.3

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

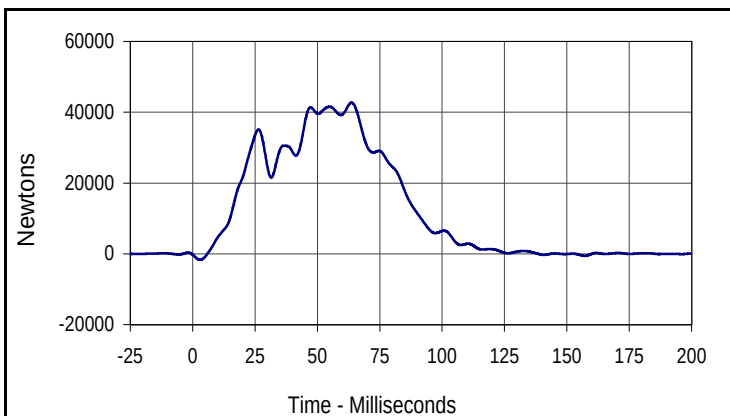
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Barrier Force Sum Group 4			
CURNO	Type	SAE Class	Units
004	SUM	60	Newtons
Max	Time	Min	Time
63559.3	34.7	-4223.1	3.8



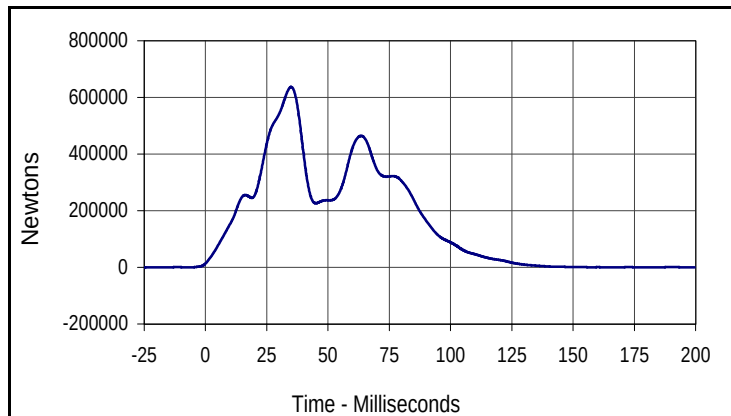
Curve Description			
Barrier Force Sum Group 5			
CURNO	Type	SAE Class	Units
005	SUM	60	Newtons
Max	Time	Min	Time
64388.1	35.4	-1419.8	1.1



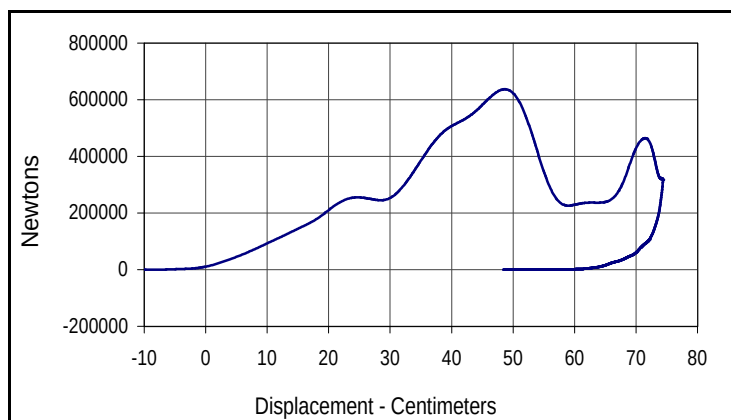
Curve Description			
Barrier Force Sum Group 6			
CURNO	Type	SAE Class	Units
006	SUM	60	Newtons
Max	Time	Min	Time
42711.5	63.7	-1660.7	3.0

Test Vehicle: 2004 Saturn Vue
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Barrier Force Total Sum			
CURNO	Type	SAE Class	Units
007	SUM	60	Newtons
Max	Time	Min	Time
636913.4	34.9	-489.7	164.6



Curve Description			
Barrier Force Total Sum vs. Displ.			
CURNO	Type	SAE Class	Units
001	XVY	60	Newtons
Max	CM	Min	CM
636913.4	48.6	-489.7	56.1

BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

Location	Units	Max	Time	Min	Time
Barrier Force A1	Newtons	2406.7	83.9	-1171.7	17.5
Barrier Force A2	Newtons	2034.9	83.6	-1104.9	17.3
Barrier Force A3	Newtons	36780.9	26.3	-985.2	14.8
Barrier Force A4	Newtons	13558.5	26.3	-261.7	14.6
Barrier Force A5	Newtons	15208.4	36.2	-409.8	20.5
Barrier Force A6	Newtons	10008.4	36.8	-233.9	127.4
Barrier Force A7	Newtons	1770.1	38.2	-966.6	21.3
Barrier Force A8	Newtons	5732.0	85.1	-523.7	21.0
Barrier Force A9	Newtons	1940.3	83.8	-1250.1	17.4
Barrier Force B1	Newtons	5304.2	60.7	-461.3	19.3
Barrier Force B2	Newtons	41623.5	26.5	-127.4	3.4
Barrier Force B3	Newtons	81229.0	31.4	-372.4	0.0
Barrier Force B4	Newtons	84712.6	36.4	-34.6	172.7
Barrier Force B5	Newtons	85517.3	35.2	-57.6	179.8
Barrier Force B6	Newtons	98085.4	35.3	-126.2	182.7
Barrier Force B7	Newtons	78451.4	23.2	-490.0	1.4
Barrier Force B8	Newtons	15074.4	53.5	-171.7	0.6
Barrier Force B9	Newtons	1375.1	44.7	-117.3	67.9
Barrier Force C1	Newtons	1959.5	22.9	-1109.4	5.9
Barrier Force C2	Newtons	19335.3	35.6	-777.4	4.5
Barrier Force C3	Newtons	22229.7	33.0	-624.7	1.8
Barrier Force C4	Newtons	8427.0	35.1	-242.6	0.0
Barrier Force C5	Newtons	21887.4	35.8	-386.0	21.6
Barrier Force C6	Newtons	20889.5	35.6	-386.1	0.6
Barrier Force C7	Newtons	26426.7	58.3	-480.4	1.3
Barrier Force C8	Newtons	7512.3	48.2	-204.7	7.4
Barrier Force C9	Newtons	1305.8	44.6	-898.8	59.3
Barrier Force D1	Newtons	1351.2	38.1	-831.8	22.5
Barrier Force D2	Newtons	16459.1	35.8	-1183.5	5.0
Barrier Force D3	Newtons	5986.8	19.5	-1243.4	4.4
Barrier Force D4	Newtons	12623.1	16.8	-817.2	4.1
Barrier Force D5	Newtons	13047.0	16.9	-1273.2	4.5
Barrier Force D6	Newtons	8002.7	18.3	-927.8	3.5
Barrier Force D7	Newtons	7073.0	59.1	-976.7	12.9
Barrier Force D8	Newtons	8673.6	26.6	-640.8	12.9
Barrier Force D9	Newtons	1839.2	46.2	-1259.1	32.6
Barrier Force Sum Group 1	Newtons	145681.1	27.0	-715.7	0.9
Barrier Force Sum Group 2	Newtons	299970.7	35.6	-183.2	162.9
Barrier Force Sum Group 3	Newtons	79884.6	23.6	-931.9	1.3
Barrier Force Sum Group 4	Newtons	63559.3	34.7	-4223.1	3.8
Barrier Force Sum Group 5	Newtons	64388.1	35.4	-1419.8	1.1
Barrier Force Sum Group 6	Newtons	42711.5	63.7	-1660.7	3.0
Barrier Force Total Sum	Newtons	636913.4	34.9	-489.7	164.6

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
2/19/04
2004 Saturn Vue MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC039	Accel.,1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	KEAC038	Accel.,1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	KEAC027	Accel.,1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	KEAC031	Accel.,1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	KEAC032	Accel.,1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	KEAC026	Accel.,1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
8	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
9	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
11	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
12	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST , REDUNDANT	X	KEAC023	Accel.,1/2 bridge	Endevco	7264-200	G
17	CHEST , REDUNDANT	Y	KEAC022	Accel.,1/2 bridge	Endevco	7264-200	G
18	CHEST , REDUNDANT	Z	KEAC024	Accel.,1/2 bridge	Endevco	7264-200	G
19	CHEST DISPLACEMENT	X	GPCP001	Rotary Pot Chest	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	KEAC019	Accel.,1/2 bridge	Endevco	7264-200	G
21	PELVIS, PRIMARY	Y	KEAC020	Accel.,1/2 bridge	Endevco	7264-200	G
22	PELVIS, PRIMARY	Z	KEAC021	Accel.,1/2 bridge	Endevco	7264-200	G
23	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
2/19/04
2004 Saturn Vue MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPOT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
26	UP. TIBIA LEFT MOM.	Y	GPOT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
27	UP. TIBIA RIGHT MOM.	X	GPOT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
28	UP. TIBIA RIGHT MOM.	Y	GPOT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
29	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
30	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
31	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
32	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
33	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
34	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
35	FOOT LEFT, AFT	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT, AFT	Z	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT, FORE	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT, AFT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT, AFT	Z	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT, FORE	Z	KEIC004Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
41	LAP BELT FORCE	X	BL134	Load cell, Seat belt	FGP	FN4060	N
42	SHOULDER BELT FORCE	X	BL135	Load cell, Seat belt	FGP	FN4060	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
2/19/04
2004 Saturn Vue MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
52	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
53	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
54	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
55	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
56	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
57	CHEST , PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
61	CHEST , REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
62	CHEST , REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
63	CHEST DISPLACEMENT	X	GPCP002	Rotary Pot Chest	Servo	14CBI	MM
64	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	KEFF004	Load cell, Femur	R.A. Denton	2121	N

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
2/19/04
2004 Saturn Vue MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
70	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
71	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
72	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
73	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
74	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
75	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
76	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
77	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
78	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
79	FOOT LEFT, AFT	X	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT, AFT	Z	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT, FORE	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT, AFT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT, AFT	Z	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT, FORE	Z	KEIC001Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
85	LAP BELT FORCE	X	BL168	Load cell, Seat belt	First Tech	IF-964	N
86	SHOULDER BELT FORCE	X	BL169	Load cell, Seat belt	First Tech	IF-964	N
87	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
88	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
2/19/04
2004 Saturn Vue MPV**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	LEFT REAR	X	KEVA002	Accel., Pre-Amp	I.C.S/Karco	3031-500	G
90	RIGHT REAR	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
91	ENGINE TOP	X	KEVA009	Accel., Vehicle block	I.C. Sensor	3031-500	G
92	ENGINE BOTTOM	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-500	G
93	LEFT BRAKE CALIPER	X	KEVA008	Accel., Vehicle block	I.C. Sensor	3031-500	G
94	RIGHT BRAKE CALIPER	X	KEVA012	Accel., Vehicle block	I.C. Sensor	3031-500	G
95	INSTRUMENT PANEL	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G
96	LEFT REAR	Z	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G
97	RIGHT REAR	Z	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-200	G

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
2/19/04
2004 Saturn Vue MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
98	BARRIER FORCE A1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
99	BARRIER FORCE A2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
100	BARRIER FORCE A3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
101	BARRIER FORCE A4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
102	BARRIER FORCE A5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
103	BARRIER FORCE A6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
104	BARRIER FORCE A7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
105	BARRIER FORCE A8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
106	BARRIER FORCE A9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
107	BARRIER FORCE B1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
108	BARRIER FORCE B2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
109	BARRIER FORCE B3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
110	BARRIER FORCE B4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
111	BARRIER FORCE B5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
112	BARRIER FORCE B6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
113	BARRIER FORCE B7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
114	BARRIER FORCE B8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
115	BARRIER FORCE B9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
2/19/04
2004 Saturn Vue MPV**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
116	BARRIER FORCE C1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
117	BARRIER FORCE C2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
118	BARRIER FORCE C3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
119	BARRIER FORCE C4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
120	BARRIER FORCE C5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
121	BARRIER FORCE C6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
122	BARRIER FORCE C7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
123	BARRIER FORCE C8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
124	BARRIER FORCE C9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
125	BARRIER FORCE D1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
126	BARRIER FORCE D2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
127	BARRIER FORCE D3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
128	BARRIER FORCE D4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
129	BARRIER FORCE D5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
130	BARRIER FORCE D6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
131	BARRIER FORCE D7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
132	BARRIER FORCE D8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
133	BARRIER FORCE D9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Nine Accelerometer Array Head
2/19/04
2004 Saturn Vue MPV**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
186	DRIVER X-ARM	Y	GPAC016	Accel., 1/2 bridge	Endevco	7264-2000	G
187	DRIVER X-ARM	Z	GPAC015	Accel., 1/2 bridge	Endevco	7264-2000	G
188	DRIVER Y-ARM	X	GPAC004	Accel., 1/2 bridge	Endevco	7264-2000	G
189	DRIVER Y-ARM	Z	GPAC018	Accel., 1/2 bridge	Endevco	7264-2000	G
190	DRIVER Z-ARM	X	GPAC006	Accel., 1/2 bridge	Endevco	7264-2000	G
191	DRIVER Z-ARM	Y	GPAC007	Accel., 1/2 bridge	Endevco	7264-2000	G
192	PASS. X-ARM	Y	GPAC012	Accel., 1/2 bridge	Endevco	7264-2000	G
193	PASS. X-ARM	Z	GPAC001	Accel., 1/2 bridge	Endevco	7264-2000	G
194	PASS. Y-ARM	X	GPAC036	Accel., 1/2 bridge	Endevco	7264-2000	G
195	PASS. Y-ARM	Z	GPAC014	Accel., 1/2 bridge	Endevco	7264-2000	G
196	PASS. Z-ARM	X	GPAC030	Accel., 1/2 bridge	Endevco	7264-2000	G
197	PASS. Z-ARM	Y	GPAC037	Accel., 1/2 bridge	Endevco	7264-2000	G

APPENDIX E

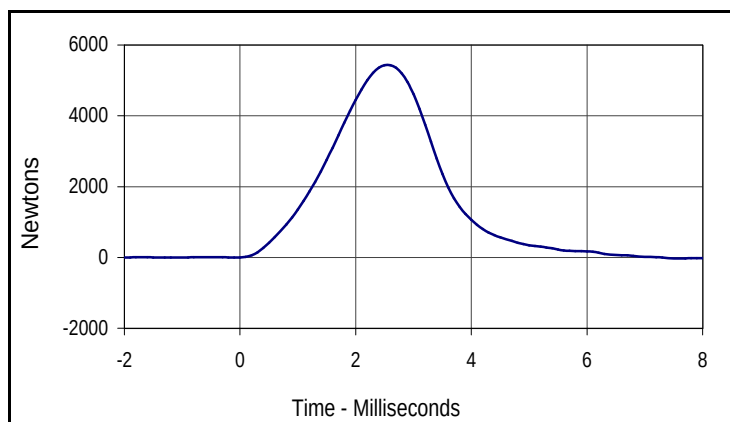
DUMMY CALIBRATION DATA

Test Program: Hybrid III 50th Percentile Male Knee Impact TestTest Date: 2/7/04ATD Serial No.: 034Test I.D.: LK04A , RK04a**Left Knee**

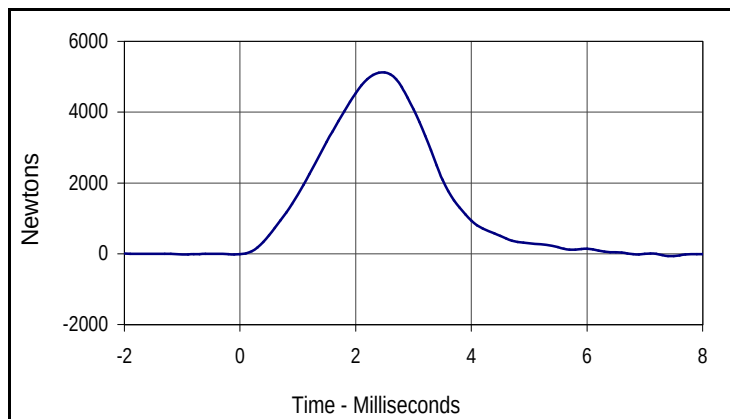
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5431	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	Newtons	4715 to 5782	5125	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5431.0	2.6	-39.2	8.3

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5125.2	2.5	-65.5	7.5

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

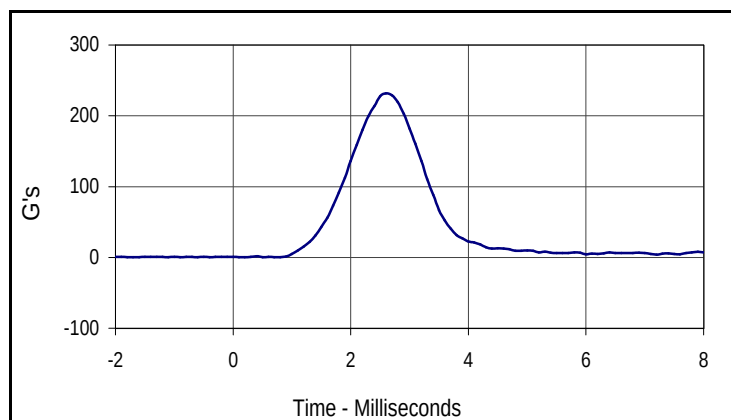
Test Date: 2/7/04

ATD Serial No.: 034

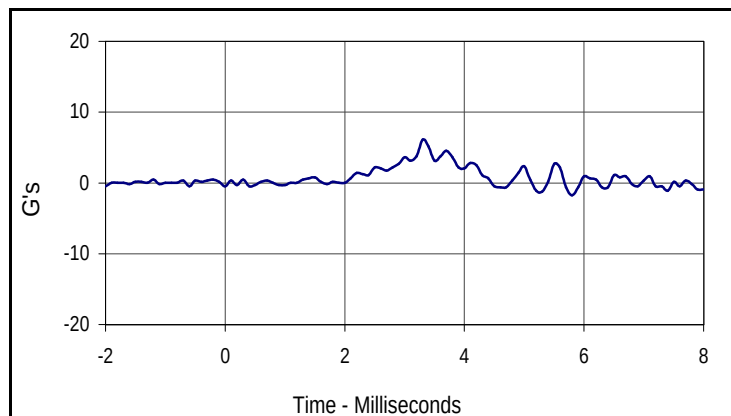
Test I.D.: HD04A



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	231.8	Pass
Peak Lateral Acceleration	G's	≤15.0	6.1	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
231.8	2.6	0.3	-0.4



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.1	3.3	-1.7	5.8

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

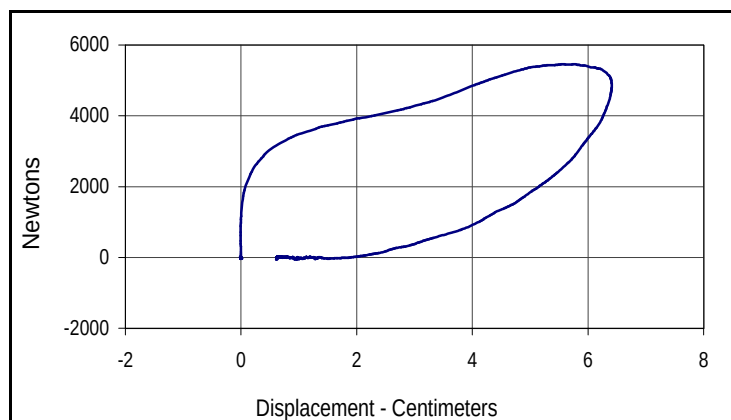
Test Date: 2/8/04

ATD Serial No.: 034

Test I.D.: CH04A



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	6.61	Pass
Peak Probe Force	Newtons	5159 to 5893	5455	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.41	Pass
Internal Hysteresis	%	69 to 85	77.6	Pass
Overall Test Results				Pass



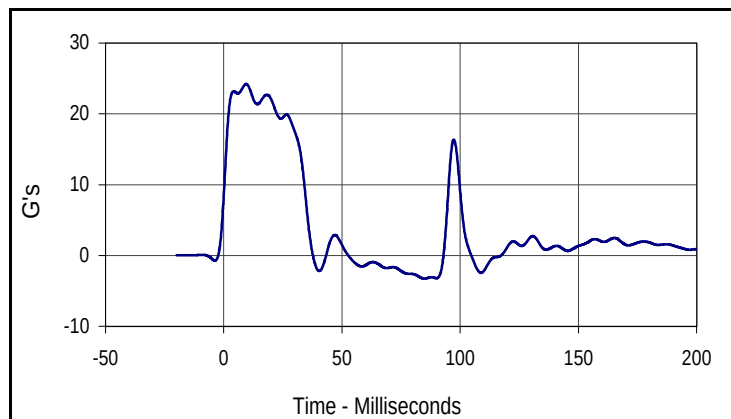
Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	77.6
Peak Probe Force		Peak Chest Displ.	
5455.4		6.41	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 034

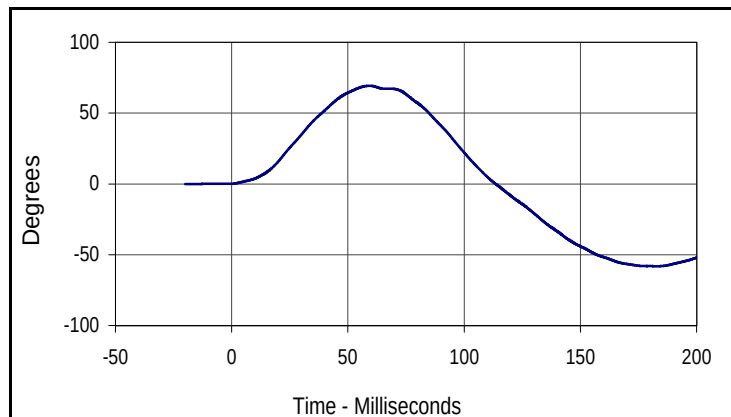
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 Test I.D.: NF04A



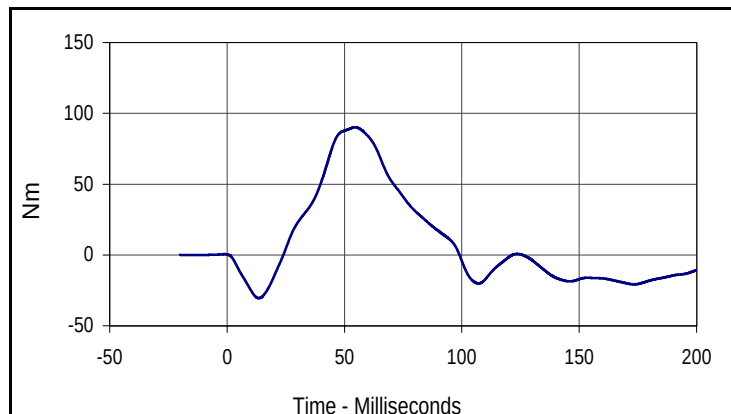
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.1	Pass
	20 Msec.	G's	17.6 to 22.6	22.1	Pass
	30 Msec.	G's	12.5 to 18.5	17.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	69.3	Pass
	Time	Msec.	57.0 to 64.0	59.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	113.6	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	90.2	Pass
	Time	Msec.	47.0 to 58.0	54.6	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.2	9.5	-3.3	84.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
69.3	59.4	-58.1	183.0



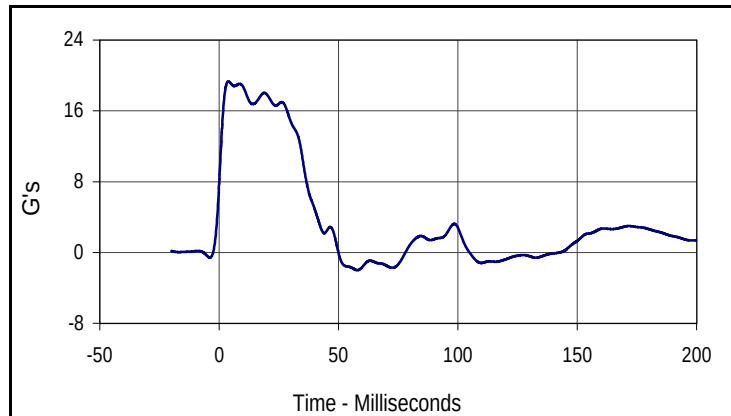
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
90.2	54.6	-30.5	13.5

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 ATD Serial No.: 034

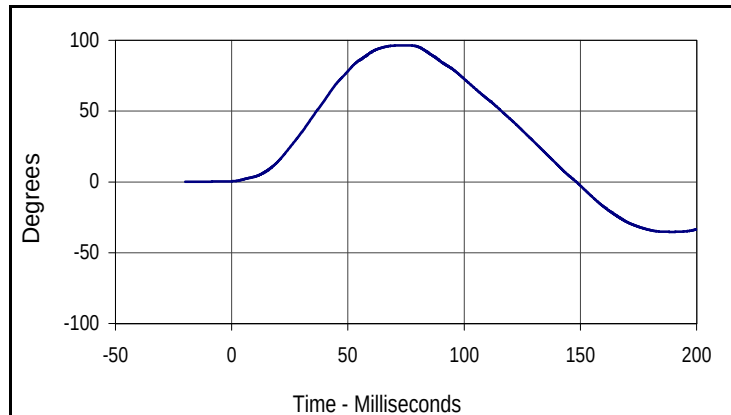
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 Test I.D.: NE04A



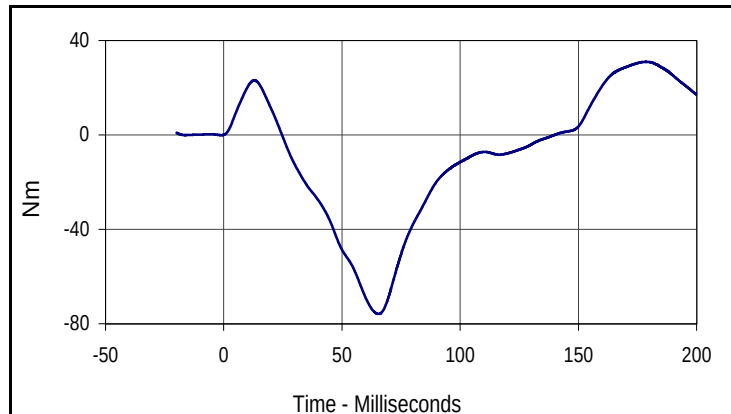
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.08	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.7	Pass
	20 Msec.	G's	14.0 to 19.0	17.9	Pass
	30 Msec.	G's	11.0 to 16.0	14.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	96.4	Pass
	Time	Msec.	72.0 to 82.0	75.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	148.3	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-75.8	Pass
	Time	Msec.	65.0 to 79.0	65.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.9	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.3	3.8	-2.0	57.9



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
96.4	75.2	-35.3	189.8



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
31.0	178.6	-75.8	65.4

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 2/8/04

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	520	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	154	Pass
G - Elbow back to wrist pivot	mm	290 to 305	295	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	340	Pass
J - Elbow rest height	mm	190 to 211	200	Pass
K - Buttock to knee length	mm	579 to 604	585	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	990	Pass
Z - Waist circumference	mm	836 to 866	860	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 2/7/04

ATD Serial No.: 035

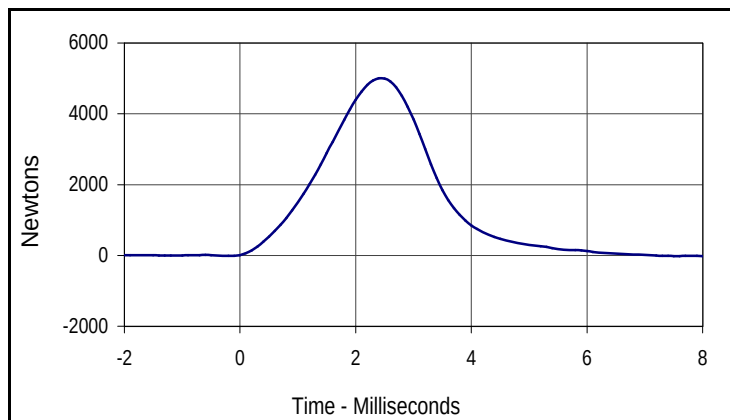
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**Left Knee**

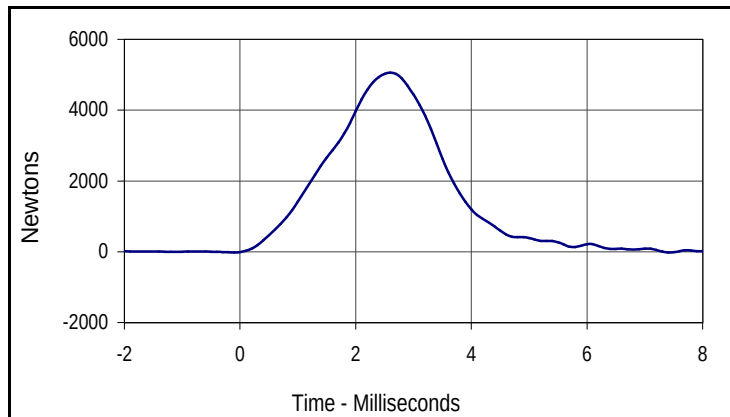
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5005	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5061	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5004.6	2.4	-43.4	8.3

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5061.2	2.6	-62.6	8.5

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

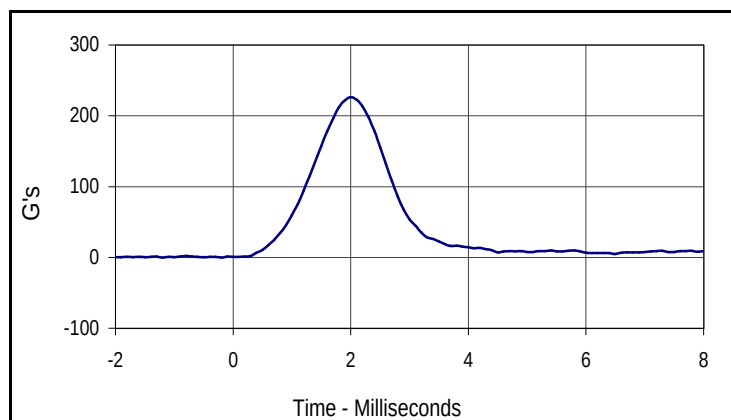
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ATD Serial No.: 035

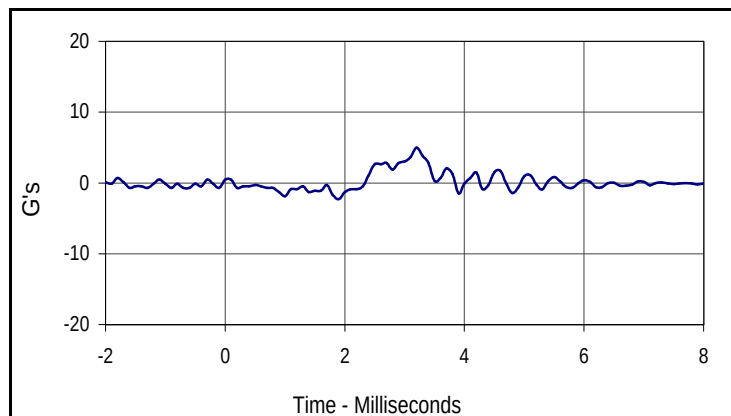
Test I.D.: HD04B



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	226.1	Pass
Peak Lateral Acceleration	G's	≤15.0	5.0	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
226.1	2.0	0.1	-1.2



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.0	3.2	-2.3	1.9

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

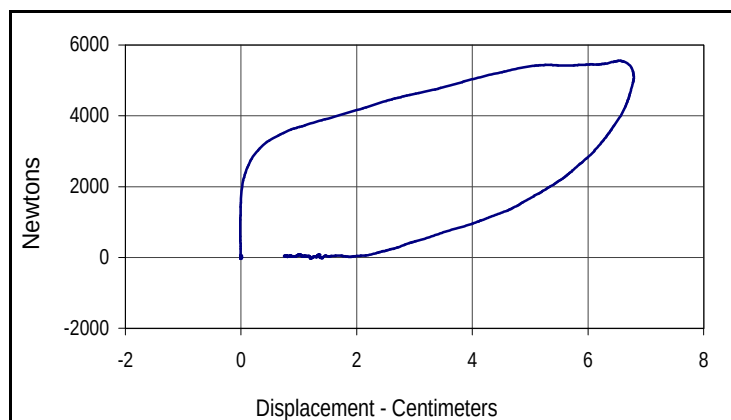
Test Date: 2/8/04

ATD Serial No.: 035

Test I.D.: CH04B



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	5557	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.79	Pass
Internal Hysteresis	%	69 to 85	76.6	Pass
Overall Test Results				Pass



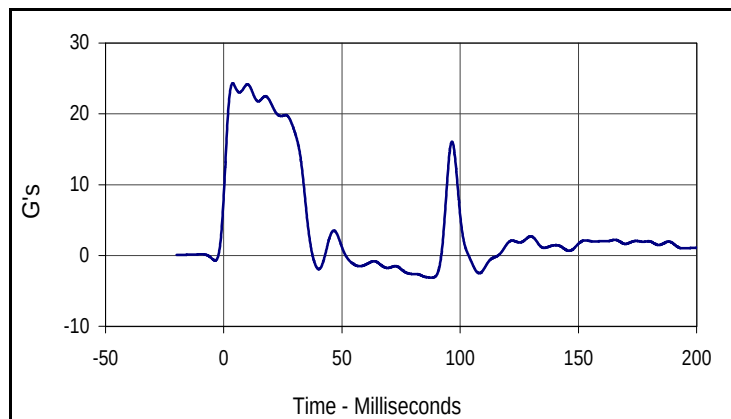
Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	76.6
Peak Probe Force		Peak Chest Displ.	
5556.6		6.79	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

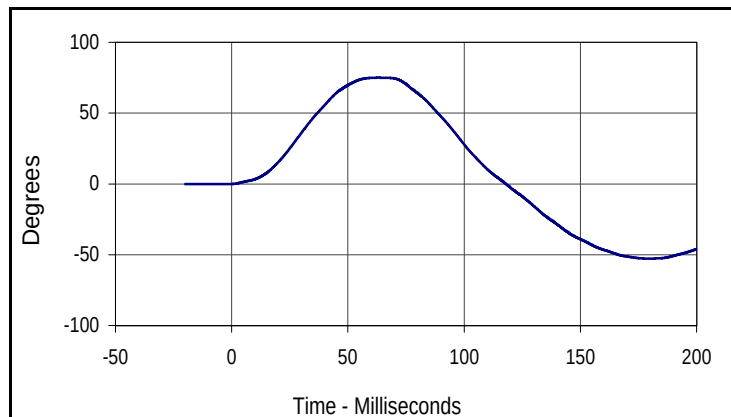
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 Test I.D.: NF04B



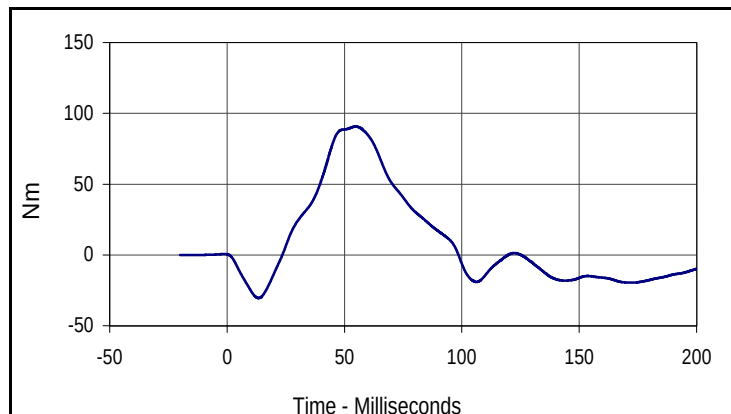
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.2	Pass
	20 Msec.	G's	17.6 to 22.6	21.5	Pass
	30 Msec.	G's	12.5 to 18.5	17.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	75.0	Pass
	Time	Msec.	57.0 to 64.0	63.1	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	118	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	90.7	Pass
	Time	Msec.	47.0 to 58.0	54.8	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
24.3	3.8	-3.1	87.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.0	63.1	-52.7	178.7



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
90.7	54.8	-30.5	13.4

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

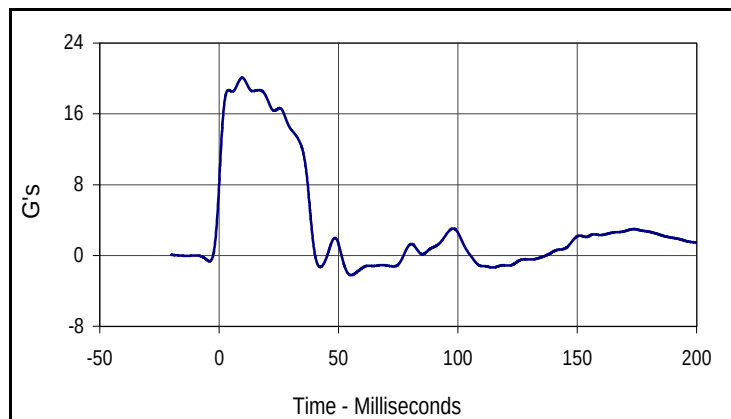
Test Date: 2/7/04

ATD Serial No.: 035

Test I.D.: NE04B



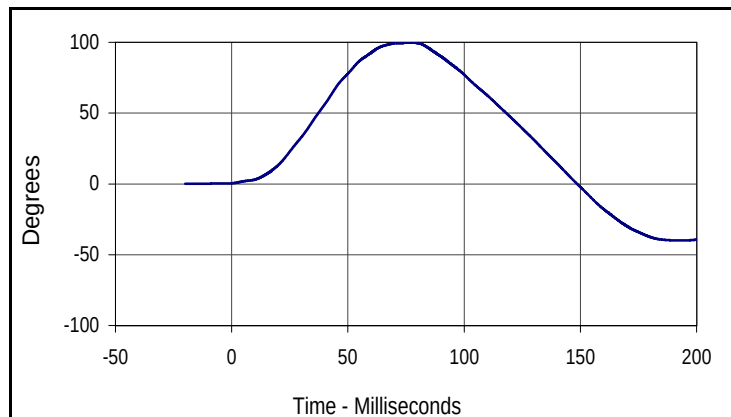
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.01	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	20.1	Pass
	20 Msec.	G's	14.0 to 19.0	17.8	Pass
	30 Msec.	G's	11.0 to 16.0	14.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	99.8	Pass
	Time	Msec.	72.0 to 82.0	77.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	148.7	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-77.1	Pass
	Time	Msec.	65.0 to 79.0	65.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	134.9	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

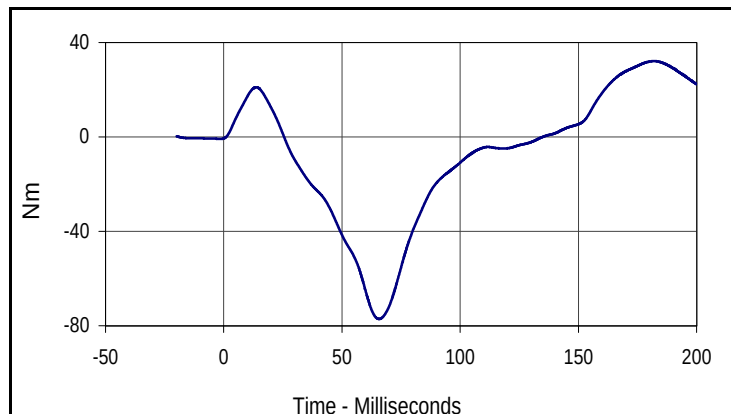
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
20.1	9.6	-2.2	55.2



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
99.8	77.2	-40.0	192.6



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
32.1	182.0	-77.1	65.7

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 2/8/04

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	195	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	435	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	455	Pass
O - Chest depth	mm	213 to 229	228	Pass
P - Foot length	mm	251 to 267	265	Pass
V - Shoulder breadth	mm	422 to 437	425	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	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

APPENDIX F

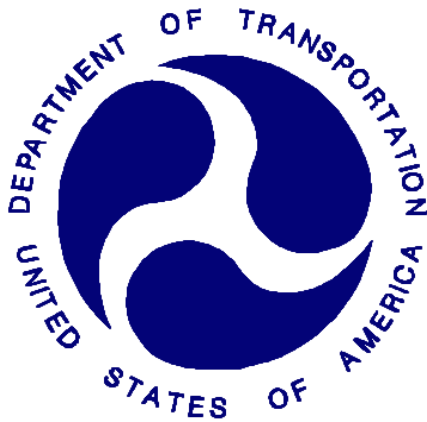
CHILD RESTRAINT SYSTEM

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**SATURN CORPORATION
2004 SATURN VUE
MPV**

NHTSA NUMBER: M40111

**PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



2/19/04

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-01-D-02005.

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Date: February 24, 2004

Approved by: _____
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: February 24, 2004

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

1. Report No. TR-P24001-15-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of a Evenflo Vanguard 5 Convertible Final Report of a Cosco Alpha Omega Convertible NHTSA No. M40111			5. Report Date February 24, 2004		
			6. Performing Organization Code		
7. Authors Mr. James E. Gorth, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco			8. Performing Organization Report No. TR-P24001-15-NC		
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301			10. Work Unit No.		
			11. Contract or Grant No. DTNH22-01-D-02005		
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NPS-111 400 Seventh Street, SW, Room 5311 Washington, D.C 20590			13. Type of Report and Period Covered Final Test Report Option Year 3		
			14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS		
15. Supplementary Notes					
16. Abstract A frontal test was conducted on the subject CRS's Evenflo Vanguard 5 Convertible and a Cosco Alpha Omega Convertible in conjunction with frontal NCAP testing on a 2004 Saturn Vue AWD 4 Door MPV and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on February 19, 2004.					
Measurement Description		Units		Left Rear	Right Rear
Head Injury Criteria (HIC) 36		N/A		660.6	734.8
Head Injury Criteria (HIC) 15		N/A		421.3	433.1
3 msec. Chest Clip		G's		49.5	43.6
Peak Chest Displacement		mm		-13.2	-12.7
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) Final Report of a Evenflo Vanguard 5 Convertible Final Report of a Cosco Alpha Omega Convertible NHTSA No. M40111				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified		20. Security Classification (this page) Unclassified		21. No. of Pages 148	22. Price

Form DOT F1700.7 (8-72)

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SECTION F-1

PURPOSE AND SUMMARY OF TEST M40111

The purpose of this test is to obtain CRS performance data during an NCAP (35mph) frontal impact test.

The 56.31 km/h NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

Two three-year-old child dummies were instrumented with head, chest, and pelvic triaxial accelerometers. In addition chest displacement and upper and lower six axial neck force and moment load cell sensors were utilized. Triaxial accelerometers were installed on the CRS.

The right rear (Position 3) child dummy (Serial No. 139) and the left rear (Position 4) child dummy (Serial No. 082) were calibrated prior to this test. Child dummy certification information is found in Section F-5.

CHILD DUMMY VALUES

Location	HIC 36 Values	HIC 15 Values	3 Msec. Chest Clip	Peak Chest Disp.
Right Rear Child	734.8	433.1	43.6	-12.7
Left Rear Child	660.6	421.3	49.5	-13.2

SECTION F-1**DATA SHEET NO.1...CRASH TEST SUMMARY**Test Vehicle: 2004 Saturn Vue AWD 4 Door MPVNHTSA No.: M40111Test Program 2004 NHTSA 35mph NCAPTest Date: 2/19/04**CHILD RESTRAINT SYSTEM INFORMATION**

Description	Position # 3 CRS	Position #4 CRS
Manufacturer	Evenflo	Cosco
Model Name	Vanguard 5	Alpha Omega
Serial No.	3691261P1	22150GRH A02B
Type	Convertible	Convertible
Forward/Rearward	Forward	Forward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS	Position #4 CRS
Head Contact	Chin to Retaining Clip	Chin to Retaining Clip
Chest Contact	Chin	Chin
Abdomen Contact	None	None
Left Knee Contact	None	None
Right Knee Contact	None	None
Left Toe Contact	Seatback	Seatback
Right Toe Contact	Seatback	Seatback
Ret. Clip Movement	75 mm	80 mm
Harness Stretch	None	None
Movement Amount	None	None

POST TEST DOOR OPENINGS

Description	Position #3 CRS	Position #4 CRS
Left Side Doors	Remained closed/latched, opened w/o aid of tools	Remained closed/latched, opened w/o aid of tools
Right Side Doors	Remained closed/latched, opened w/o aid of tools	Remained closed/latched, opened w/o aid of tools
Hatch/Other Door	None	None

POST TEST SEAT DATA

Location	Seat Movement (mm)	Seat Back Failure
Left Front	None	None
Right Front	None	None
Left Rear	None	None
Right Rear	None	None

CAMERA COVERAGE

High Speed	2
Real Time	1
Total	3

SECTION F-1

DATA SHEET NO.2...CRS PARAMETER DATA

Test Vehicle: 2004 Saturn Vue AWD 4 Door MPV
 Test Program 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	445	357		495	447	
Right	kg	430	327		479	418	
Ratio	%	56.1	43.9		53.0	47.0	
Totals	kg	875	684	1559	974	865	1839

TARGET TEST WEIGHT CALCULATION

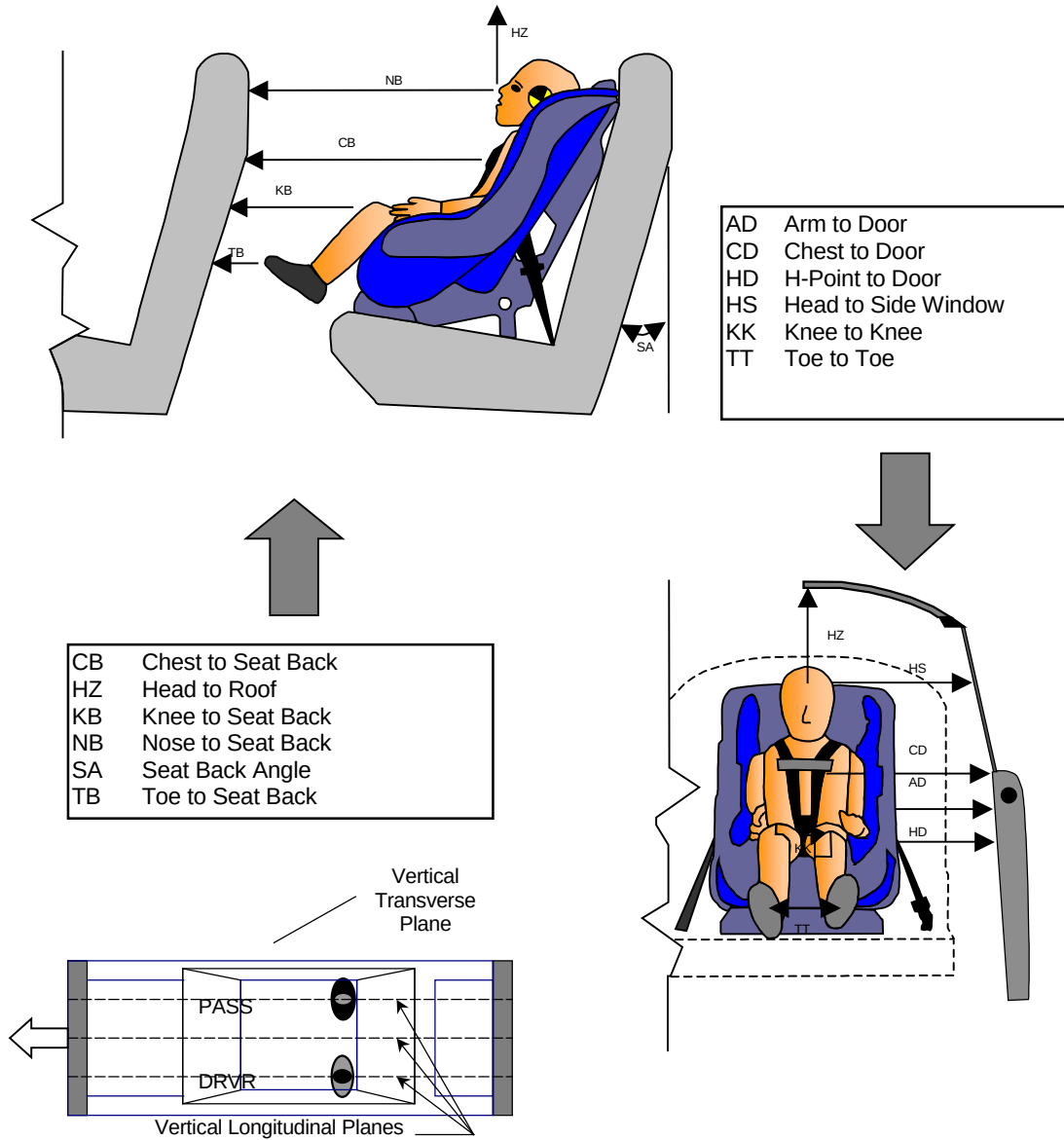
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1559
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	136
Calculated Vehicle Target Wt. (TVTW)	kg	1847

SECTION F-1

DATA SHEET NO.3...CHILD DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Saturn Vue AWD 4 Door MPV
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

SECTION F-1

DATA SHEET NO.3...CHILD DUMMY POSITIONING IN VEHICLE...(continued)

Test Vehicle: 2004 Saturn Vue AWD 4 Door MPV
 Test Program 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

CHILD DUMMY POSITION MEASUREMENTS

Code	Measurement	Units	P3 CRS Serial No. 139			P4 CRS Serial No. 082			
			Pre-Test	Post-Test	Diff.	Pre-Test	Post-Test	Diff.	
SA	Seat Back Angle	deg.	22	22		22	22		
HZ	Head to Roof (Z)	mm	428	405	-23	430	440	10	
CD	Chest to Door	mm	385	395	10	360	380	20	
KK	Knee to Knee (Y)	mm	210	194	-16	200	215	15	
HS	Head to Side Window	mm	392	395	3	365	405	40	
HD	H-Point to Door (Y)	mm	290	295	5	250	295	45	
AD	Arm to Door	mm	235	240	5	190	235	45	
NB	Nose to Seat Back	mm	545	625	80	497	544	47	
CB	Chest to Seat Back	mm	540	627	87	490	520	30	
FF	Foot to Foot	mm	200	190	-10	245	290	45	
KB-Left	Knee to Seat Back	mm	332	420	88	305	320	15	
KB-Right	Knee to Seat Back	mm	330	412	82	300	320	20	
TB-Left	Toe to Seat Back	mm	55	145	90	50	30	-20	
TB-Right	Toe to Seat Back	mm	63	130	67	48	30	-18	
CCA	Car Cushion Angle	deg.	77				77		
BA	Back Angle	deg.	22				23		
SCA	Seat Cushion Angle	deg.	21				70		

DATA SHEET NO. 4 - 3 YEAR OLD HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	11.2	199.7	-26.9	108.9	0.1	2.5	-35.5	109.8
Head CG	Y	G's	7.7	109.3	-13.8	117.5	5.1	110.4	-6.7	107.8
Head CG	Z	G's	60.4	86.7	-10.1	57.1	61.3	85.8	-6.1	50.4
Head CG Resultant	N/A	G's	64.4	86.7			63.9	85.8		

PRIMARY HEAD INJURY CRITERIAS (HIC)

Location	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary (HIC36)	660.6	74.6	110.6	50.7	734.8	74.3	110.3	52.9
Head CG Primary (HIC15)	421.3	80.2	95.2	60.1	433.1	78.8	93.8	60.8

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	6.9	192.2	-34.5	92.0	4.2	148.3	-38.9	85.5
Chest CG	Y	G's	1.7	193.7	-8.0	109.3	5.5	85.0	-3.9	115.0
Chest CG	Z	G's	21.3	93.5	-41.2	65.6	20.4	93.6	-33.6	64.1
Chest CG Resultant	N/A	G's	51.1	65.8			45.2	63.7		

PRIMARY CHEST CLIP (3MSEC)

Location	Left Rear (3 Yr.)			Right Rear (3 Yr.)		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	49.5	64.6	67.6	43.6	62.2	65.2

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	0.0	9.2	-13.2	106.6	0.0	6.2	-12.7	104.3

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	14.4	146.3	-43.6	85.9	3.6	146.7	-37.4	65.6
Pelvis	Y	G's	5.5	81.1	-8.8	65.3	6.8	80.7	-3.4	53.7
Pelvis	Z	G's	10.2	98.3	-41.9	64.3	12.0	98.0	-33.9	63.3
Pelvis Resultant	N/A	G's	54.9	64.9			48.9	63.8		

DATA SHEET NO. 4...(continued)

Test Vehicle: 2004 Saturn Vue MPV

NHTSA No.: M40111

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	82.8	199.0	-575.3	121.7	3.5	5.3	-702.2	114.1
Neck Force	Y	Newtons	3.2	71.0	-177.3	119.4	24.8	109.0	-42.0	87.4
Neck Force	Z	Newtons	1597.8	86.6	-285.3	57.0	1688.0	89.8	-147.0	49.8
Neck Force Resultant	N/A	Newtons	1656.6	86.6			1748.6	89.8		
Neck Moment	X	Nm	7.8	199.9	-3.5	123.2	5.6	118.0	-3.7	90.2
Neck Moment	Y	Nm	7.6	165.2	-7.2	63.0	5.2	88.1	-8.9	200.0
Neck Moment	Z	Nm	9.4	151.2	-0.7	57.4	1.1	124.3	-1.1	170.5
Neck Moment Resultant	N/A	Nm	10.8	152.5			9.0	200.0		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	139.7	66.5	-570.6	87.0	142.6	200.0	-512.3	91.9
Neck Force	Y	Newtons	27.7	109.3	-188.7	119.9	29.8	52.2	-278.8	86.2
Neck Force	Z	Newtons	1253.8	83.7	-442.0	57.7	1343.2	88.4	-355.2	61.6
Neck Force Resultant	N/A	Newtons	1351.0	83.8			1442.8	89.8		
Neck Moment	X	Nm	8.1	200.0	-22.0	119.1	3.7	60.8	-8.2	88.9
Neck Moment	Y	Nm	75.6	120.1	-10.5	200.0	84.3	108.9	-11.8	200.0
Neck Moment	Z	Nm	7.2	146.3	-8.1	86.4	3.2	66.8	-5.4	88.9
Neck Moment Resultant	N/A	Nm	78.9	119.8			84.3	108.9		

CHILD SEAT TETHER BELT SENSOR PEAK VALUES

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Car Seat Upper Tether Force	N/A	Newtons	113.7	129.5	-5.1	196.7	527.2	80.9	-36.7	190.1 ¹

1.) Left rear channel, data questionable

CHILD SEAT ACCELEROMETER PEAK VALUES

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Child Seat	X	G's	4.4	185.1	-53.5	79.6	3.3	175.1	-39.8	61.7
Child Seat	Y	G's	19.9	83.0	-15.2	76.8	5.8	75.7	-1.4	120.4
Child Seat	Z	G's	8.6	58.4	-4.5	74.4	9.6	65.3	-15.4	55.4
Child Seat Resultant	N/A	G's	53.5	79.8			40.3	62.2		

SECTION F-1

DATA SHEET NO.5...CRS PERFORMANCE DATA

Test Vehicle: 2004 Saturn Vue AWD 4 Door MPV
 Test Program 2004 NHTSA 35mph NCAP

NHTSA No.: M40111
 Test Date: 2/19/04

CRS PERFORMANCE DATA

Location	P3 CRS Serial No. 139		P4 CRS Serial No. 082	
	Damage	Post-Test	Damage	Post-Test
Upper Tether Strap	No	None	No	None
Upper Tether Buckle	No	None	No	None
Upper Tether Hook	No	None	No	None
Veh. Upper Tether Anchor	No	None	No	None
Lower Anchor Strap	No	None	No	None
Lower Anchor Buckle	No	None	No	None
Lower Anchor Hooks	No	None	No	None
Veh. Lower CRS Anchors	No	None	No	None
5 Point Harness Connections	No	None	No	None
Cracks on CRS	No	None	No	None
Fabric Tears on CRS	No	None	No	None
Vehicle Seat Structure	Yes	Seat Rotated	Yes	Seat Rotated
Vehicle Seat Fabric Tears	No	None	Yes	Head Skin Slipped Off

SECTION F-1**DATA SHEET NO.6...CRS CAMERA DATA**Test Vehicle: 2004 Saturn Vue AWD 4 Door MPVNHTSA No.: M40111Test Program 2004 NHTSA 35mph NCAPTest Date: 2/19/04**CAMERA LOCATIONS**

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Driver Side Child Dummy	2946	-737	1549	20	1257	20	1000
2	Passenger Side Child Dummy	2946	737	1549	20	1257	20	1000
3								
4								

X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Time Marks

SECTION F-2

PHOTOGRAPHS

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2	Pre-Test Frontal View of Position 3 CRS	F2-2
3	Post-Test Frontal View of Position 3 CRS	F2-3
4	Pre-Test Rear View of Position 3 CRS	F2-4
5	Post-Test Rear View of Position 3 CRS	F2-5
6	Pre-Test Left Side View of Position 3 CRS	F2-6
7	Post-Test Left Side View of Position 3 CRS	F2-7
8	Pre-Test Right Side View of Position 3 CRS	F2-8
9	Post-Test Right Side View of Position 3 CRS	F2-9
10	Pre-Test Position 3 Front View	F2-10
11	Post-Test Position 3 Front View	F2-11
12	Pre-Test Position 3 Left Side View	F2-12
13	Post-Test Position 3 Left Side View	F2-13
14	Pre-Test Position 3 Right Side View	F2-14
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16	Post-Test Position 3 Contact Point (Back of Right Front Seat)	F2-16

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19	Post-Test Frontal View of Position 4 CRS	F2-19
20	Pre-Test Rear View of Position 4 CRS	F2-20
21	Post-Test Rear View of Position 4 CRS	F2-21
22	Pre-Test Left Side View of Position 4 CRS	F2-22
23	Post-Test Left Side View of Position 4 CRS	F2-23
24	Pre-Test Right Side View of Position 4 CRS	F2-24
25	Post-Test Right Side View of Position 4 CRS	F2-25
26	Pre-Test position 4 Front View	F2-26
27	Post-Test Position 4 Front View	F2-27
28	Pre-Test Position 4 Left Side View	F2-28
29	Post-Test Position 4 Left Side View	F2-29
30	Pre-Test Position 4 Right Side View	F2-30
31	Post-Test Position 4 Right Side View	F2-31
32	Post-Test Position 4 Contact Point (Back of Left Front Seat)	F2-32

Manufactured in 13AUG03

Model # 3691261 P1



Figure F2-1: Close-up View Position 3 CRS Label



Figure F2-2: Pre-Test Frontal View of Position 3 CRS



Figure F2-3: Post-Test Frontal View of Position 3 CRS



Figure F2-4: Pre-Test Rear View of Position 3 CRS



Figure F2-5: Post-Test Rear View of Position 3 CRS



Figure F2-6: Pre-Test Left Side View of Position 3 CRS



Figure F2-7: Post-Test Left Side View of Position 3 CRS



Figure F2-8: Pre-Test Right Side View of Position 3 CRS



Figure F2-9: Post-Test Right Side View of Position 3 CRS



Figure F2-10: Pre-Test Position 3 Front View



Figure F2-11: Post-Test Position 3 Front View



Figure F2-12: Pre-Test Position 3 Left Side View



Figure F2-13: Post-Test Position 3 Left Side View



Figure F2-14: Pre-Test Position 3 Right Side View



Figure F2-15: Post-Test Position 3 Right Side View



Figure F2-16: Post-Test Position 3 Contact Point (Back of Right Front Seat)

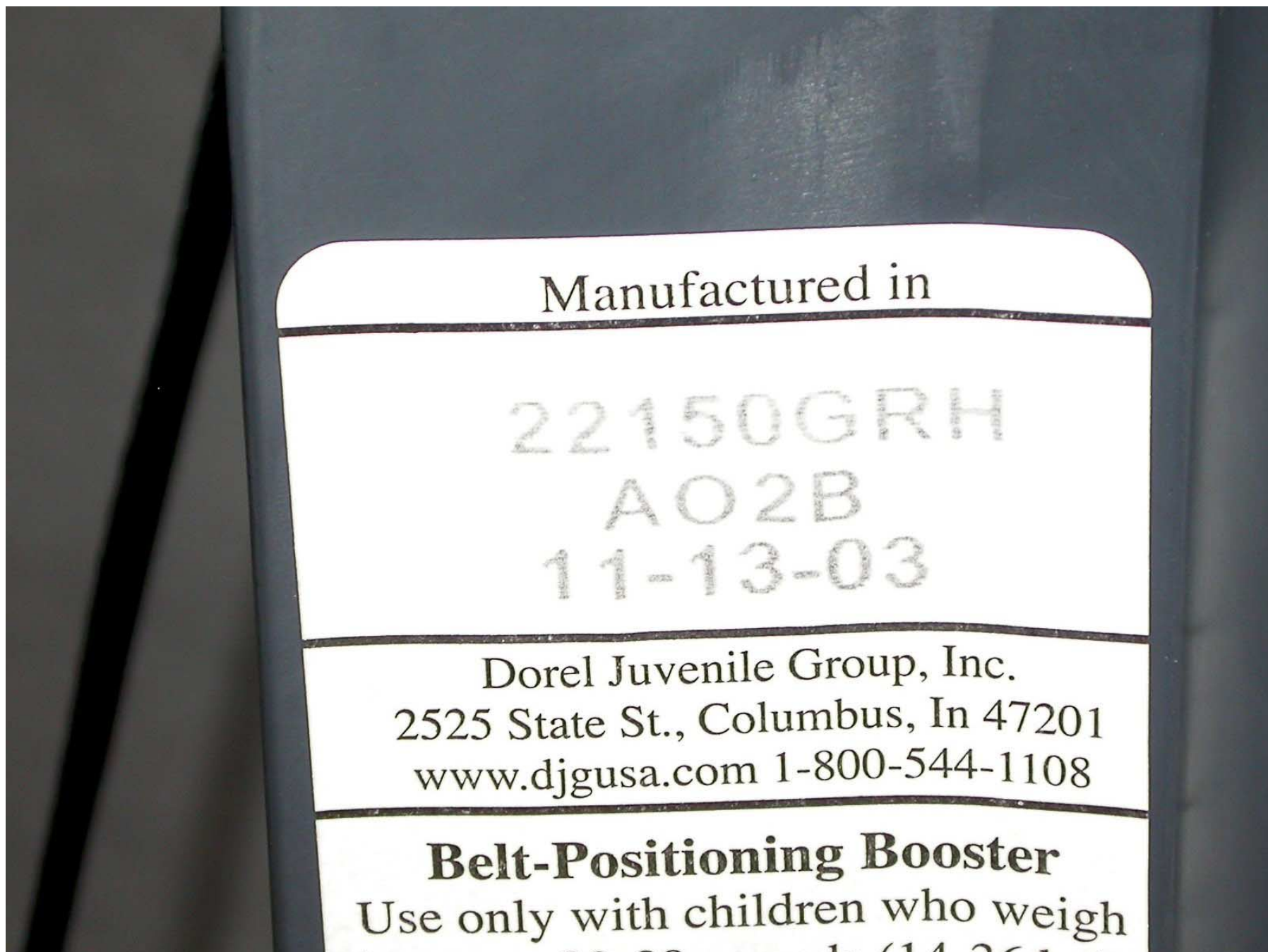


Figure F2-17: Close-up View Position 4 CRS Label



Figure F2-18: Pre-Test Frontal View of Position 4 CRS



Figure F2-19: Post-Test Front View of Position 4 CRS



Figure F2-20: Pre-Test Rear View of Position 4 CRS



Figure F2-21: Post-Test Rear View of Position 4 CRS



Figure F2-22: Pre-Test Left Side View of Position 4 CRS



Figure F2-23: Post-Test Left Side View of Position 4 CRS



Figure F2-24: Pre-Test Right Side View of Position 4 CRS



Figure F2-25: Post-Test Right Side View of Position 4 CRS



Figure F2-26: Pre-Test Position 4 Front View



Figure F2-27: Post-Test Position 4 Front View



Figure F2-28: Pre-Test Position 4 Left Side View



Figure F2-29: Post-Test Position 4 Left Side View



Figure F2-30: Pre-Test Position 4 Right Side View



Figure F2-31: Post-Test Position 4 Right Side View



Figure F2-32: Post-Test Position 4 Contact Point (Back of Left Front Seat)

SECTION F-3

CHILD DUMMY RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS #4

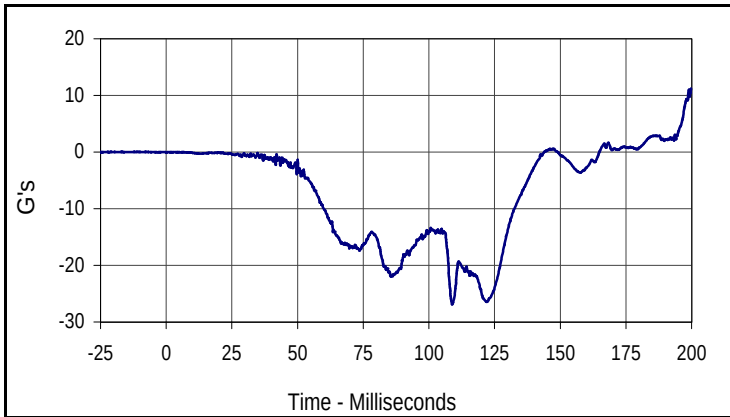
Data Plot	Page
F3-1	Left Rear (3yr. old) Head X
	F3-1
	Left Rear (3yr. old) Head Y
	F3-1
	Left Rear (3yr. old) Head Z
	F3-1
	Left Rear (3yr. old) Head Resultant
	F3-1
F3-2	Left Rear (3yr. old) Upper Neck Force X
	F3-2
	Left Rear (3yr. old) Upper Neck Force Y
	F3-2
	Left Rear (3yr. old) Upper Neck Force Z
	F3-2
	Left Rear (3yr. old) Upper Neck Force Resultant
	F3-2
F3-3	Left Rear (3yr. old) Upper Neck Moment X
	F3-3
	Left Rear (3yr. old) Upper Neck Moment Y
	F3-3
	Left Rear (3yr. old) Upper Neck Moment Z
	F3-3
	Left Rear (3yr. old) Upper Neck Moment Resultant
	F3-3
F3-4	Left Rear (3yr. old) Lower Neck Force X
	F3-4
	Left Rear (3yr. old) Lower Neck Force Y
	F3-4
	Left Rear (3yr. old) Lower Neck Force Z
	F3-4
	Left Rear (3yr. old) Lower Neck Force Resultant
	F3-4
F3-5	Left Rear (3yr. old) Lower Neck Moment X
	F3-5
	Left Rear (3yr. old) Lower Neck Moment Y
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	Left Rear (3yr. old) Lower Neck Moment Z
	F3-5
	Left Rear (3yr. old) Lower Neck Moment Resultant
	F3-5
F3-6	Left Rear (3yr. old) Chest X
	F3-6
	Left Rear (3yr. old) Chest Y
	F3-6
	Left Rear (3yr. old) Chest Z
	F3-6
	Left Rear (3yr. old) Chest Resultant
	F3-6
F3-7	Left Rear (3yr. old) Chest Displacement
	F3-7
F3-8	Left Rear (3yr. old) Pelvis X
	F3-8
	Left Rear (3yr. old) Pelvis Y
	F3-8
	Left Rear (3yr. old) Pelvis Z
	F3-8
	Left Rear (3yr. old) Pelvis Resultant
	F3-8
F3-9	Left Rear (3yr. old) Car Seat Upper Tether Force
	F3-9
F3-10	Left Rear (3yr. old) Car Seat X
	F3-10
	Left Rear Car Seat Y
	F3-10
	Left Rear Car Seat Z
	F3-10
	Left Rear Car Seat Resultant
	F3-10

LIST OF DATA PLOTS #3

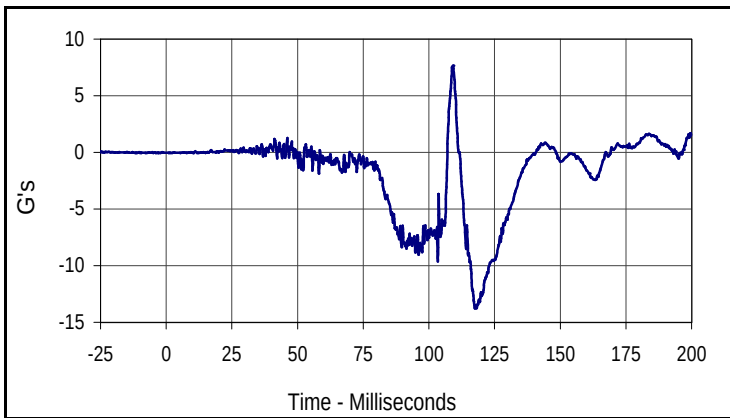
Data Plot		Page
F3-11	Right Rear Child (3 yr. old) Head X	F3-11
	Right Rear Child (3 yr. old) Head Y	F3-11
	Right Rear Child (3 yr. old) Head Z	F3-11
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	Right Rear Child (3 yr. old) Upper Neck Force Y	F3-12
	Right Rear Child (3 yr. old) Upper Neck Force Z	F3-12
	Right Rear Child (3 yr. old) Upper Neck Force Resultant	F3-12
F3-13	Right Rear Child (3 yr. old) Upper Neck Moment X	F3-13
	Right Rear Child (3 yr. old) Upper Neck Moment Y	F3-13
	Right Rear Child (3 yr. old) Upper Neck Moment Z	F3-13
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	Right Rear Child (3 yr. old) Lower Neck Moment Y	F3-15
	Right Rear Child (3 yr. old) Lower Neck Moment Z	F3-15
	Right Rear Child (3 yr. old) Lower Neck Moment Resultant	F3-15
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	Right Rear Child (3 yr. old) Car Seat Resultant	F3-20

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

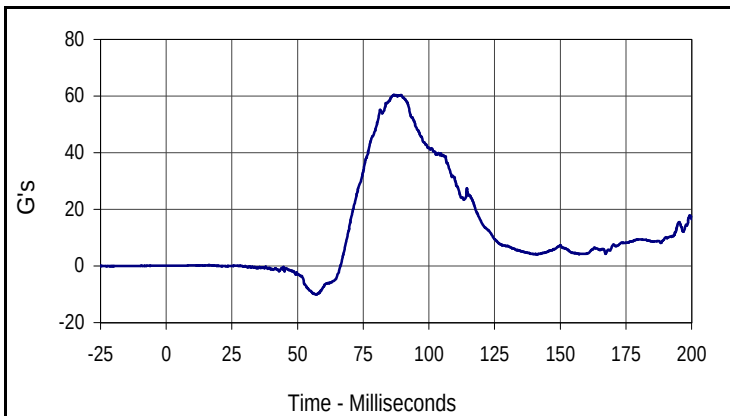
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 NHTSA No.: M40111



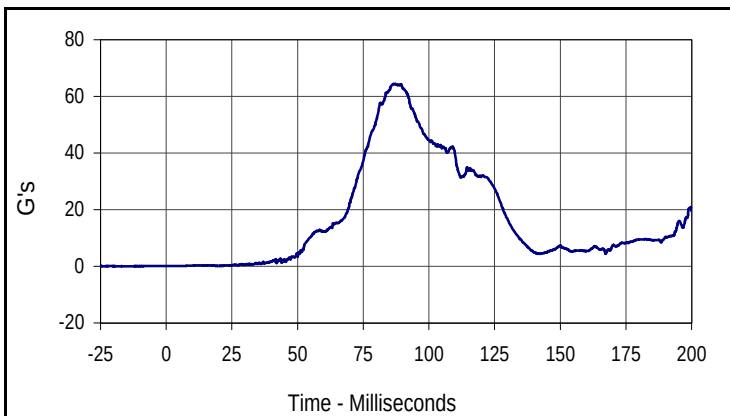
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Left Rear (3 Yr.) Head X			
CURNO	Type	SAE Class	Units
134	FIL	1000	G's
Max	Time	Min	Time
11.2	199.7	-26.9	108.9



Curve Description			
Left Rear (3 Yr.) Head Y			
CURNO	Type	SAE Class	Units
135	FIL	1000	G's
Max	Time	Min	Time
7.7	109.3	-13.8	117.5



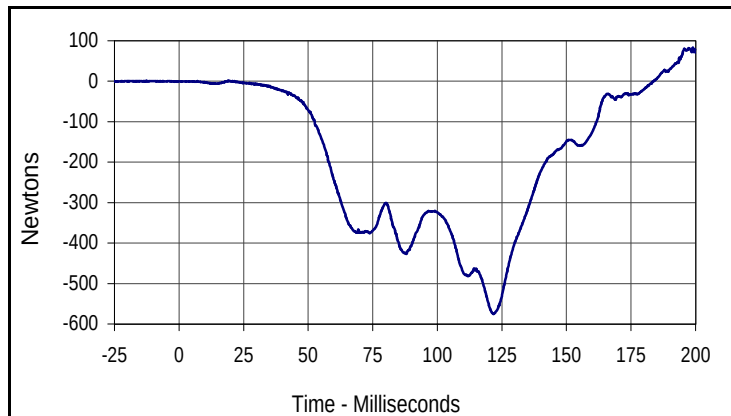
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Max	Time	Min	Time
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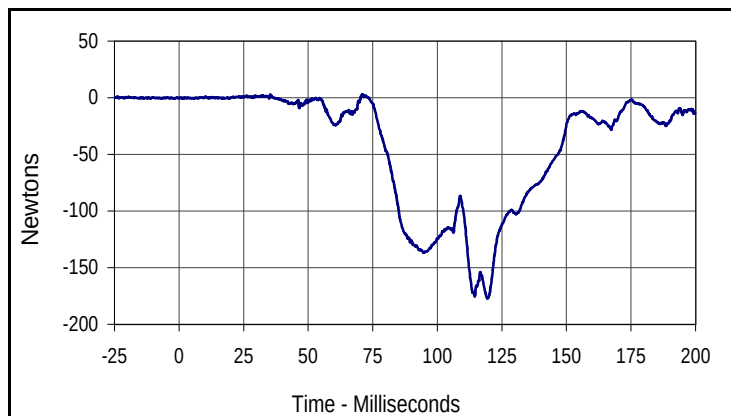
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Left Rear (3 Yr.) Head Resultant			
CURNO	Type	SAE Class	Units
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Max	Time	Min	Time
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Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

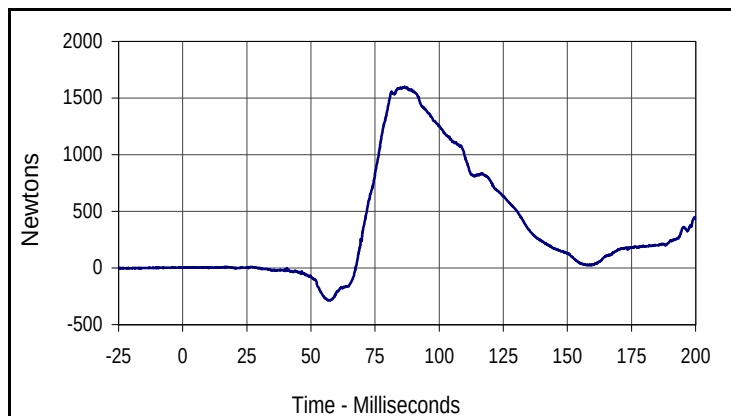
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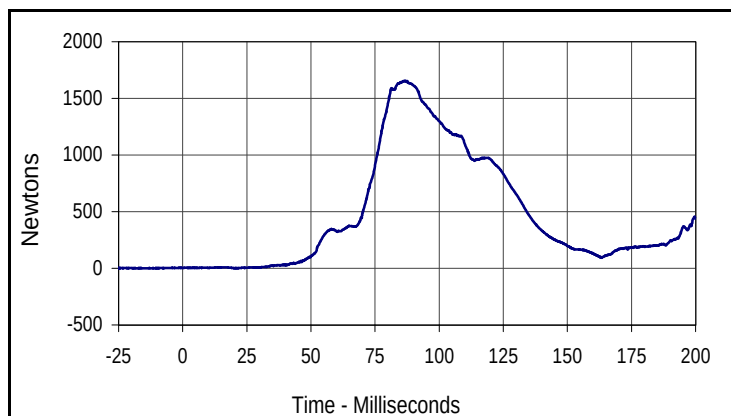
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CURNO	Type	SAE Class	Units
137	FIL	1000	Newtons
Max	Time	Min	Time
82.8	199.0	-575.3	121.7



Curve Description			
Left Rear (3 Yr.) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
138	FIL	1000	Newtons
Max	Time	Min	Time
3.2	71.0	-177.3	119.4



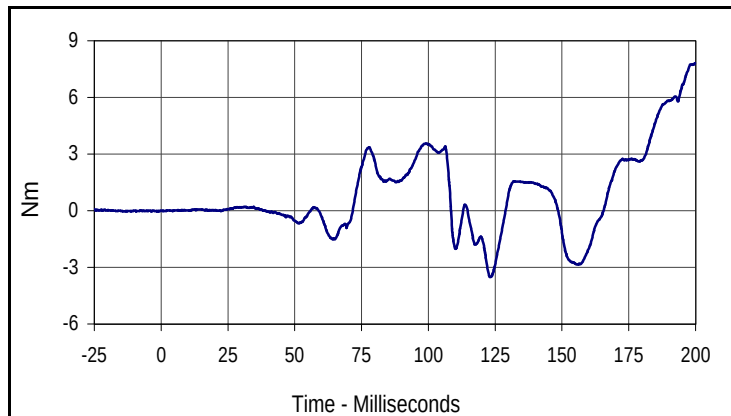
Curve Description			
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CURNO	Type	SAE Class	Units
139	FIL	1000	Newtons
Max	Time	Min	Time
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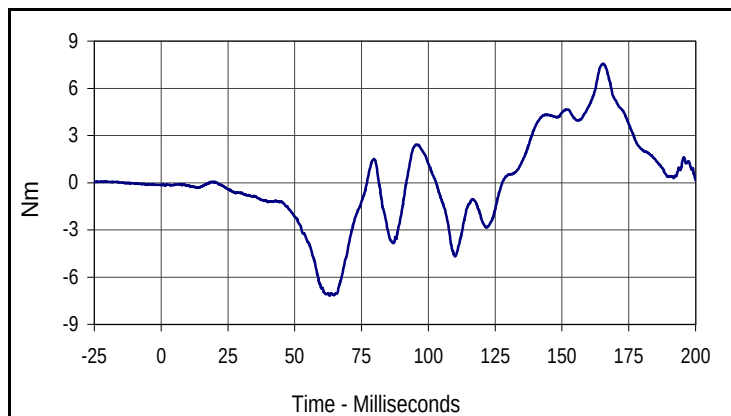
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Left Rear (3 Yr.) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
137	RES	1000	Newtons
Max	Time	Min	Time
1656.6	86.6	0.2	21.5

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

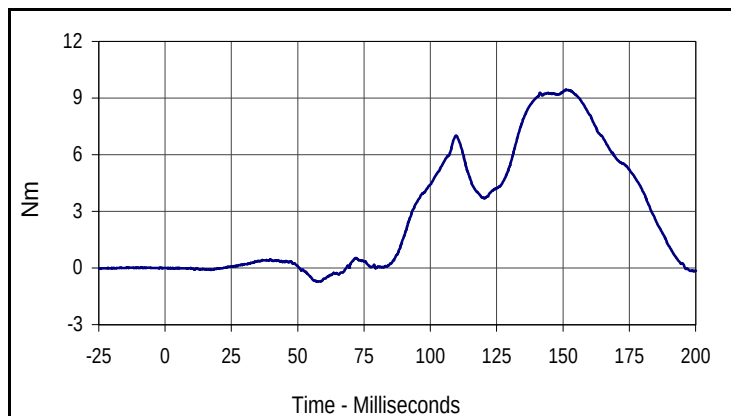
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 NHTSA No.: M40111



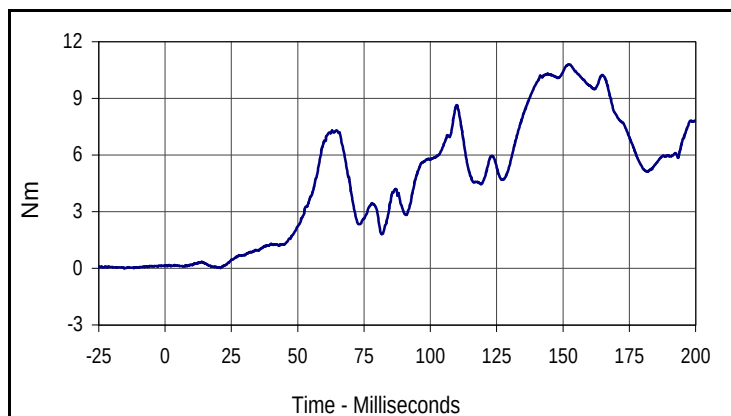
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Left Rear (3 Yr.) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
140	FIL	600	Nm
Max	Time	Min	Time
7.8	199.9	-3.5	123.2



Curve Description			
Left Rear (3 Yr.) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
141	FIL	600	Nm
Max	Time	Min	Time
7.6	165.2	-7.2	63.0



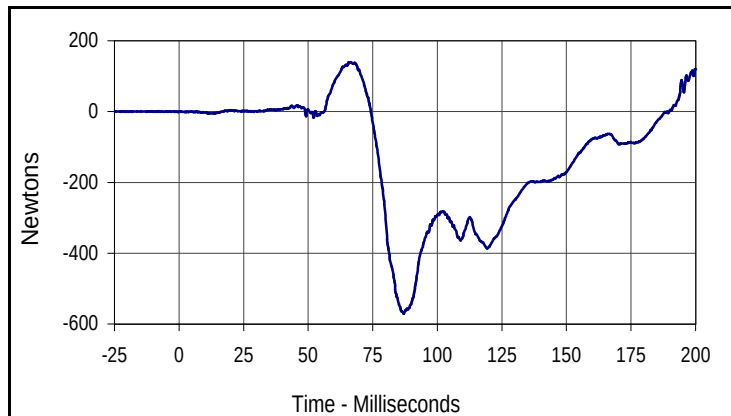
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Left Rear (3 Yr.) Upper Neck Moment Z			
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142	FIL	600	Nm
Max	Time	Min	Time
9.4	151.2	-0.7	57.4



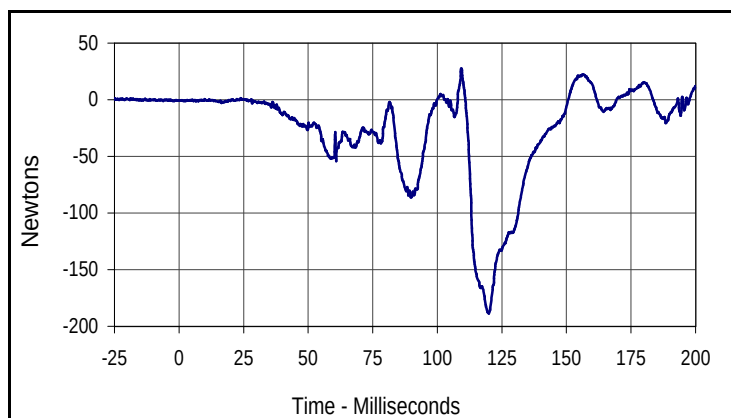
Curve Description			
Left Rear (3 Yr.) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
140	RES	600	Nm
Max	Time	Min	Time
10.8	152.5	0.0	20.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

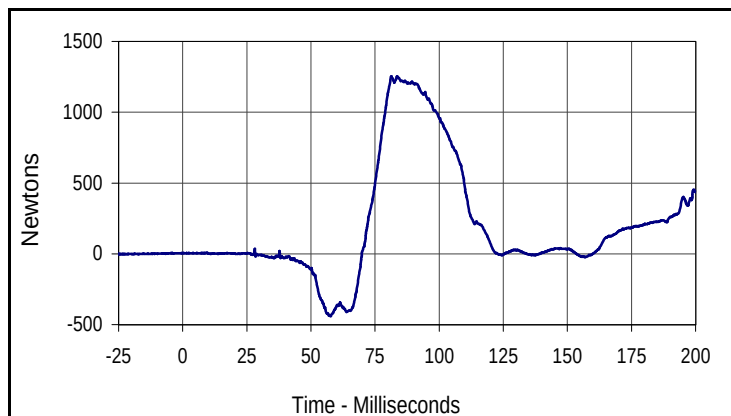
Test Date: 2/19/04
 NHTSA No.: M40111



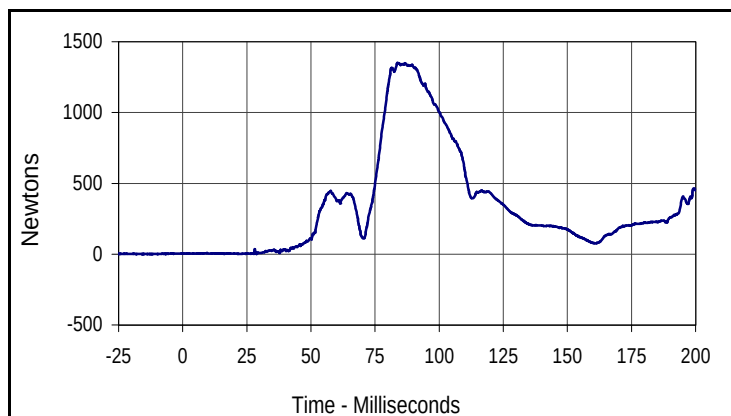
Curve Description			
Left Rear (3 Yr.) Lower Neck Force X			
CURNO	Type	SAE Class	Units
143	FIL	1000	Newtons
Max	Time	Min	Time
139.7	66.5	-570.6	87.0



Curve Description			
Left Rear (3 Yr.) Lower Neck Force Y			
CURNO	Type	SAE Class	Units
144	FIL	1000	Newtons
Max	Time	Min	Time
27.7	109.3	-188.7	119.9



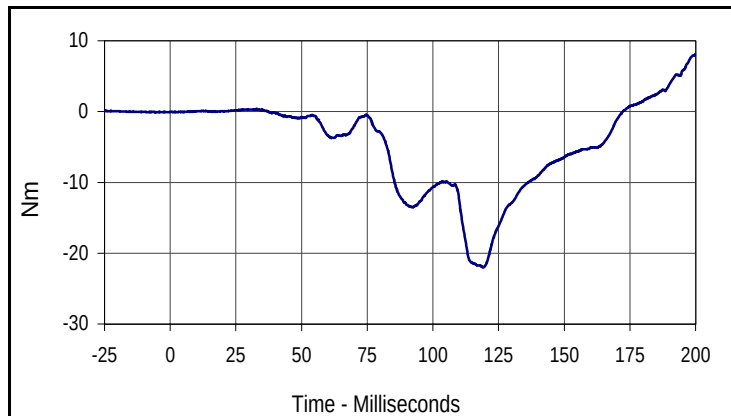
Curve Description			
Left Rear (3 Yr.) Lower Neck Force Z			
CURNO	Type	SAE Class	Units
145	FIL	1000	Newtons
Max	Time	Min	Time
1253.8	83.7	-442.0	57.7



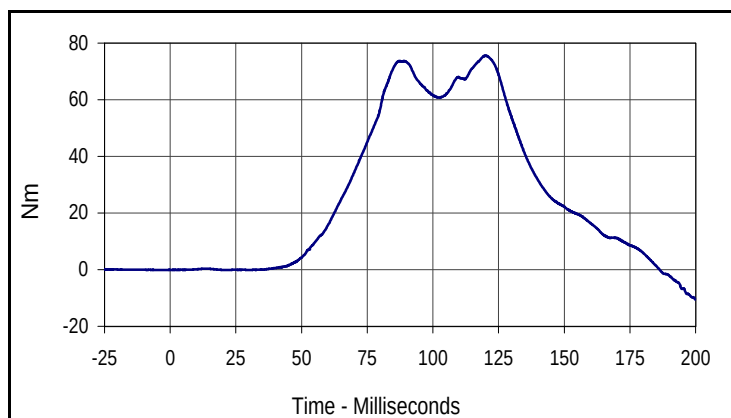
Curve Description			
Left Rear (3 Yr.) Lower Neck Force Res.			
CURNO	Type	SAE Class	Units
143	RES	1000	Newtons
Max	Time	Min	Time
1351.0	83.8	0.8	27.8

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

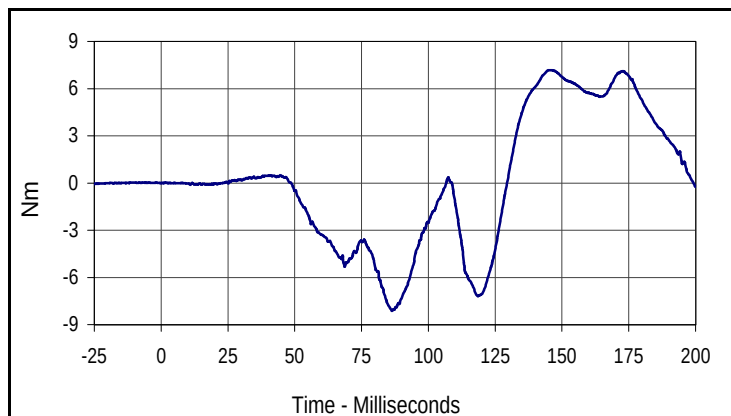
Test Date: 2/19/04
 NHTSA No.: M40111



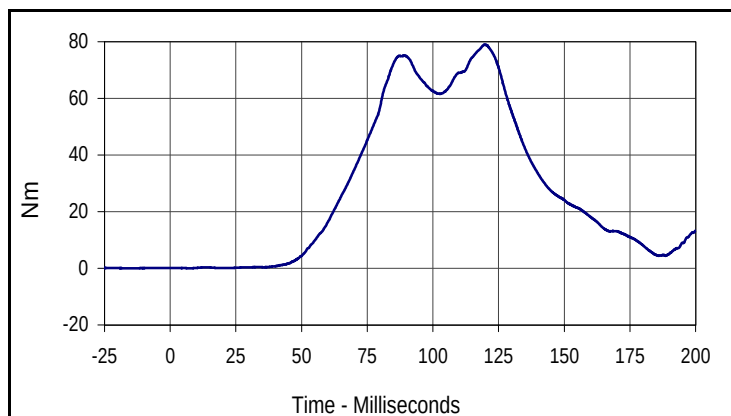
Curve Description			
Left Rear (3 Yr.) Lower Neck Moment X			
CURNO	Type	SAE Class	Units
146	FIL	600	Nm
Max	Time	Min	Time
8.1	200.0	-22.0	119.1



Curve Description			
Left Rear (3 Yr.) Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
147	FIL	600	Nm
Max	Time	Min	Time
75.6	120.1	-10.5	200.0



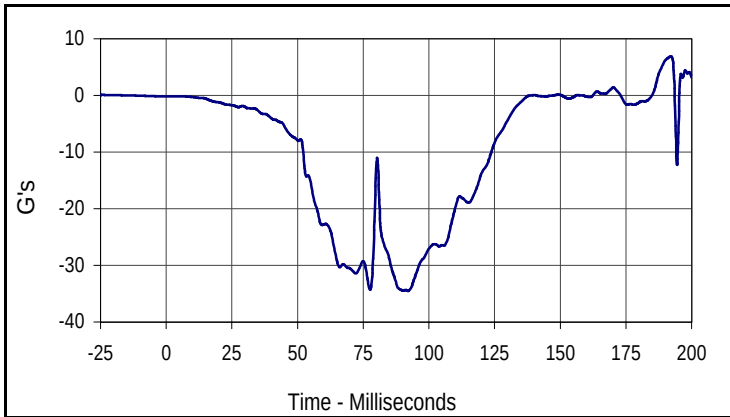
Curve Description			
Left Rear (3 Yr.) Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
148	FIL	600	Nm
Max	Time	Min	Time
7.2	146.3	-8.1	86.4



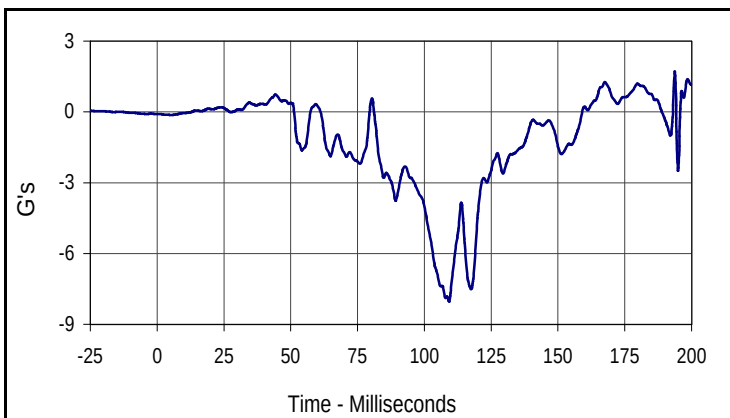
Curve Description			
Left Rear (3 Yr.) Lower Neck Moment Res.			
CURNO	Type	SAE Class	Units
146	RES	600	Nm
Max	Time	Min	Time
78.9	119.8	0.0	6.8

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

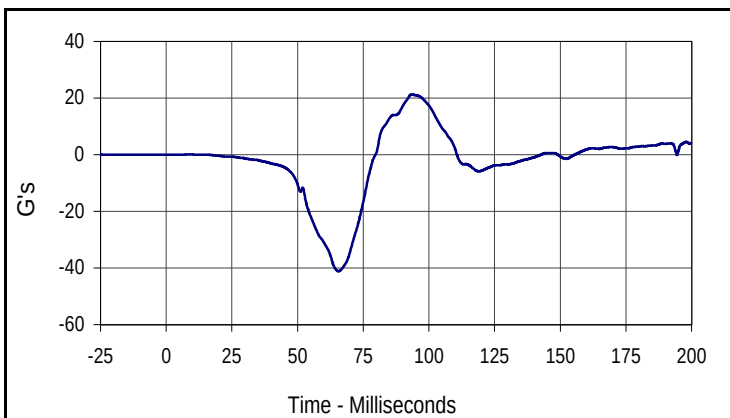
Test Date: 2/19/04
 NHTSA No.: M40111



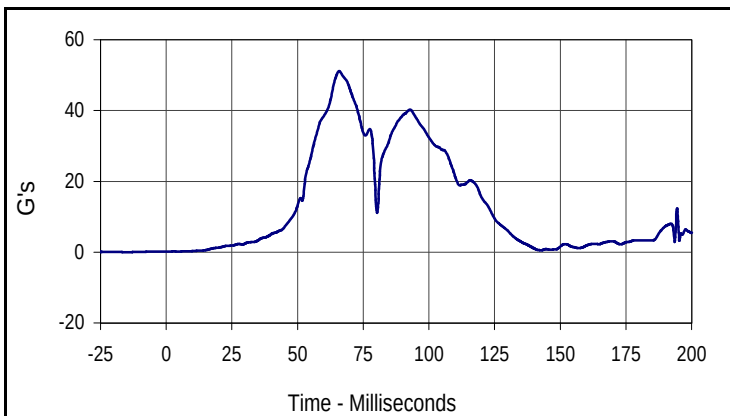
Curve Description			
Left Rear (3 Yr.) Chest X			
CURNO	Type	SAE Class	Units
149	FIL	180	G's
Max	Time	Min	Time
6.9	192.2	-34.5	92.0



Curve Description			
Left Rear (3 Yr.) Chest Y			
CURNO	Type	SAE Class	Units
150	FIL	180	G's
Max	Time	Min	Time
1.7	193.7	-8.0	109.3



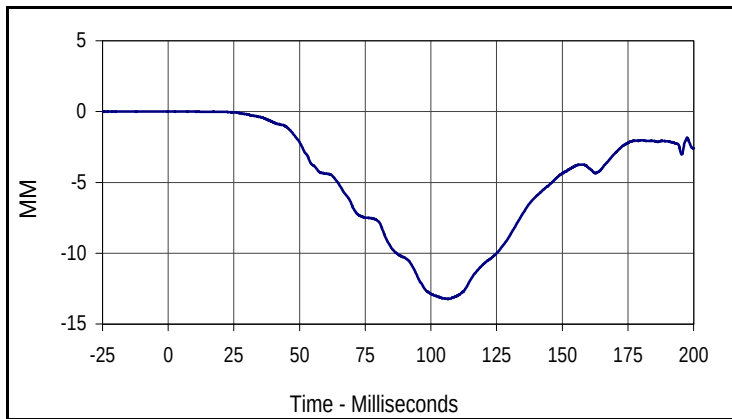
Curve Description			
Left Rear (3 Yr.) Chest Z			
CURNO	Type	SAE Class	Units
151	FIL	180	G's
Max	Time	Min	Time
21.3	93.5	-41.2	65.6



Curve Description			
Left Rear (3 Yr.) Chest Resultant			
CURNO	Type	SAE Class	Units
149	RES	180	G's
Max	Time	Min	Time
51.1	65.8	0.2	0.0

Test Vehicle: 2004 Saturn Vue MPV
Test Program: 2004 NHTSA 35mph NCAP

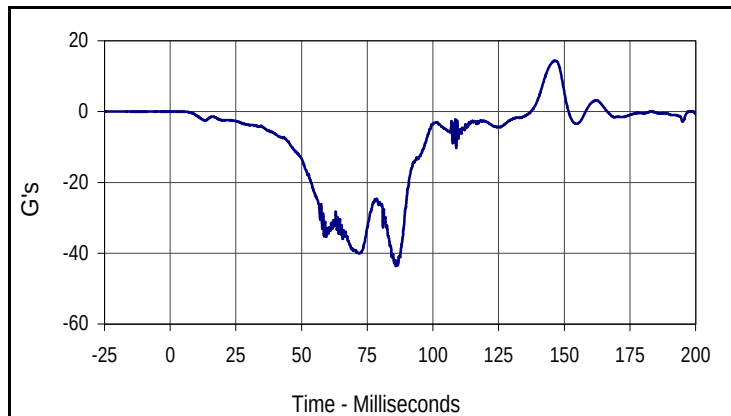
Test Date: 2/19/04
NHTSA No.: M40111



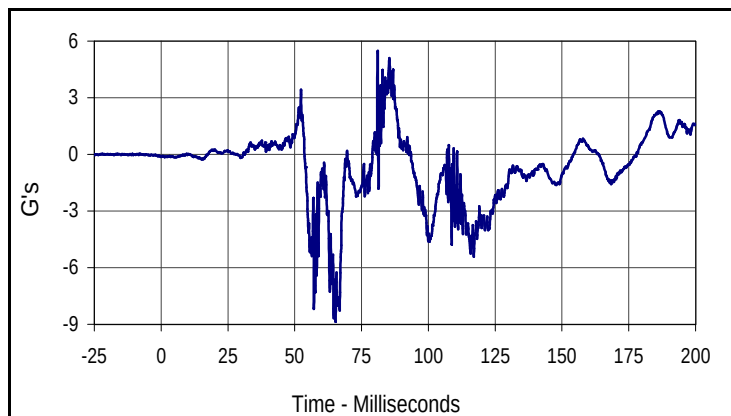
Curve Description			
Left Rear (3 Yr.) Chest Displacement			
CURNO	Type	SAE Class	Units
152	FIL	600	MM
Max	Time	Min	Time
0.0	9.2	-13.2	106.6

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

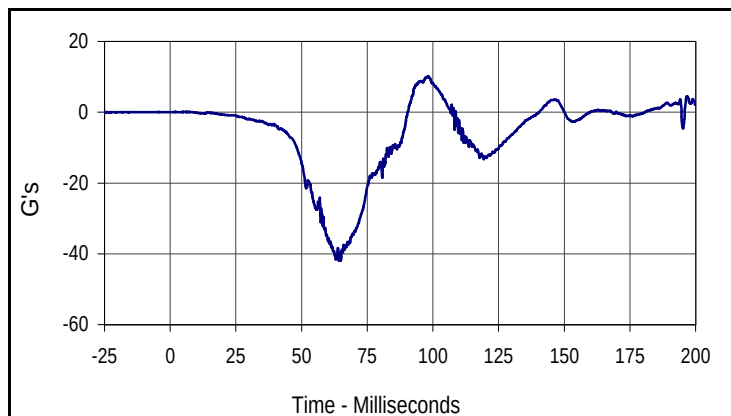
Test Date: 2/19/04
 NHTSA No.: M40111



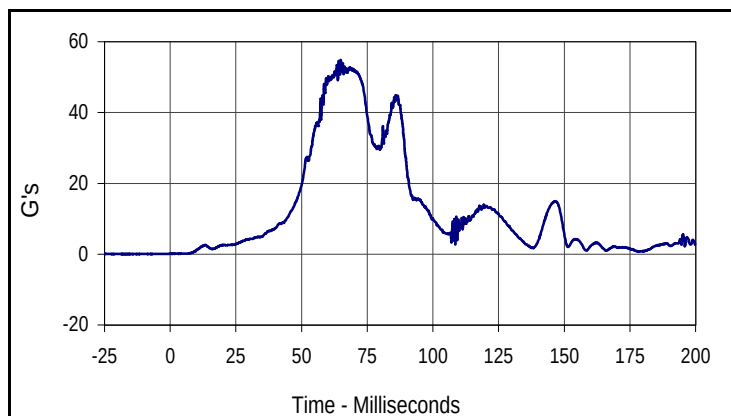
Curve Description			
Left Rear (3 Yr.) Pelvis X			
CURNO	Type	SAE Class	Units
153	FIL	1000	G's
Max	Time	Min	Time
14.4	146.3	-43.6	85.9



Curve Description			
Left Rear (3 Yr.) Pelvis Y			
CURNO	Type	SAE Class	Units
154	FIL	1000	G's
Max	Time	Min	Time
5.5	81.1	-8.8	65.3



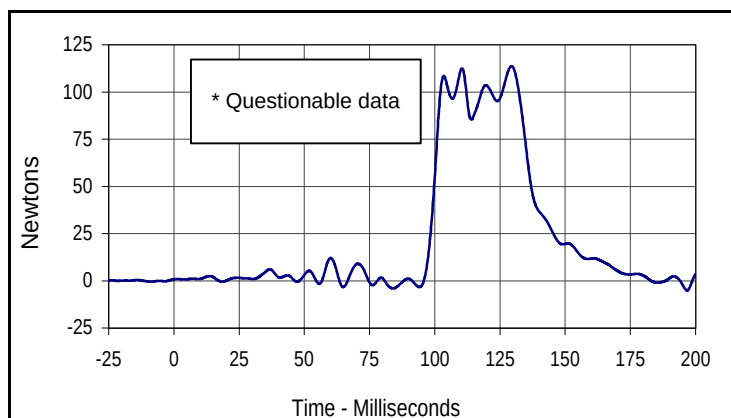
Curve Description			
Left Rear (3 Yr.) Pelvis Z			
CURNO	Type	SAE Class	Units
155	FIL	1000	G's
Max	Time	Min	Time
10.2	98.3	-41.9	64.3



Curve Description			
Left Rear (3 Yr.) Pelvis Resultant			
CURNO	Type	SAE Class	Units
153	RES	1000	G's
Max	Time	Min	Time
54.9	64.9	0.1	0.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 2/19/04
 NHTSA No.: M40111

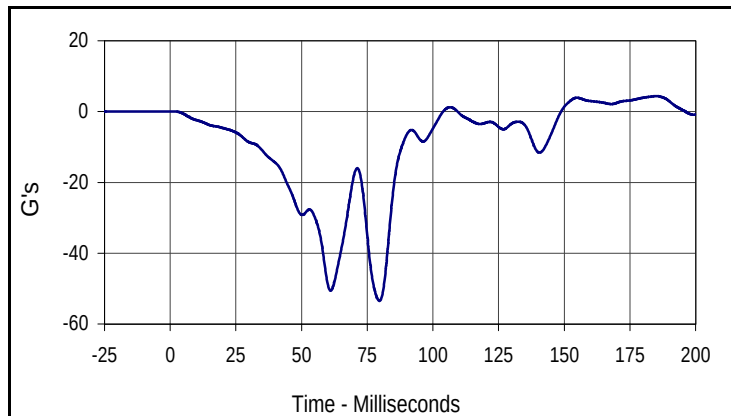


Curve Description			
Left Rear (3 Yr.) Child Seat Tether Load			
CURNO	Type	SAE Class	Units
156	FIL	60	Newtons
Max	Time	Min	Time
113.7	129.5	-5.1	196.7

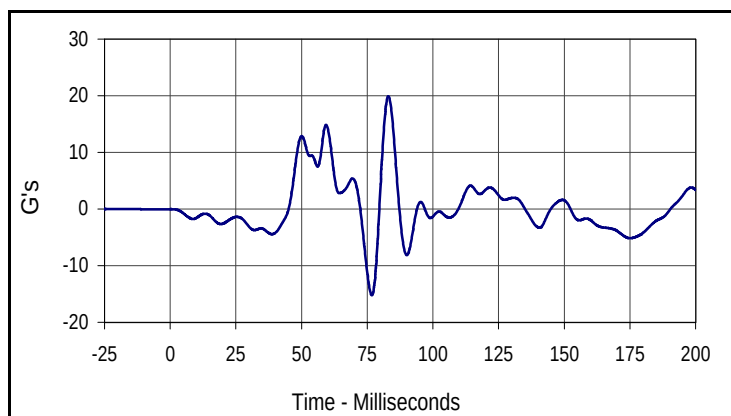
* Questionable data

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

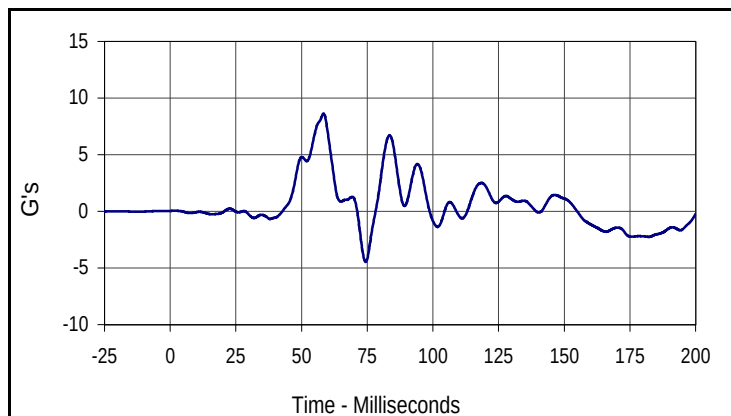
Test Date: 2/19/04
 NHTSA No.: M40111



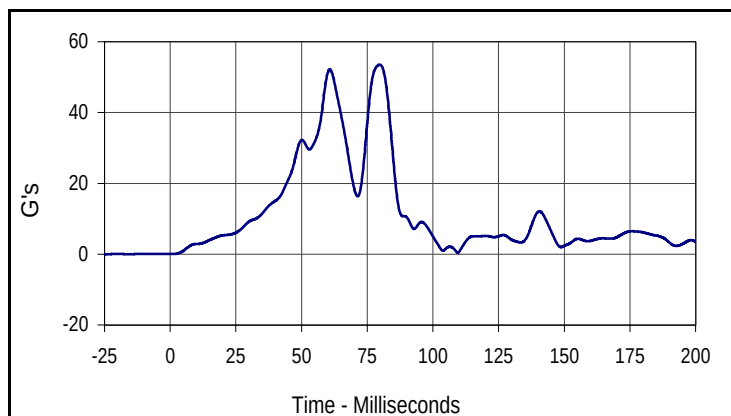
Curve Description			
Left Rear (3 Yr.) Car Seat X			
CURNO	Type	SAE Class	Units
157	FIL	60	G's
Max	Time	Min	Time
4.4	185.1	-53.5	79.6



Curve Description			
Left Rear (3 Yr.) Car Seat Y			
CURNO	Type	SAE Class	Units
158	FIL	60	G's
Max	Time	Min	Time
19.9	83.0	-15.2	76.8



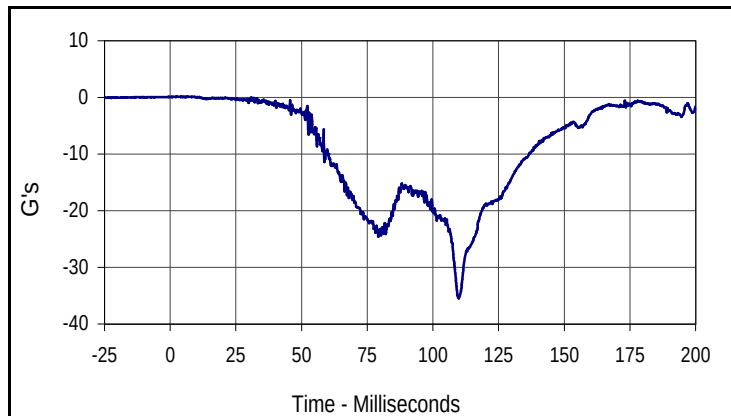
Curve Description			
Left Rear (3 Yr.) Car Seat Z			
CURNO	Type	SAE Class	Units
159	FIL	60	G's
Max	Time	Min	Time
8.6	58.4	-4.5	74.4



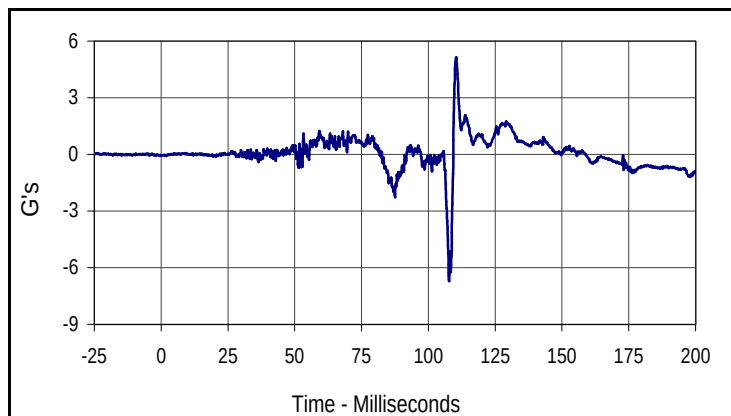
Curve Description			
Left Rear (3 Yr.) Car Seat Resultant			
CURNO	Type	SAE Class	Units
157	RES	60	G's
Max	Time	Min	Time
53.5	79.8	0.1	0.0

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

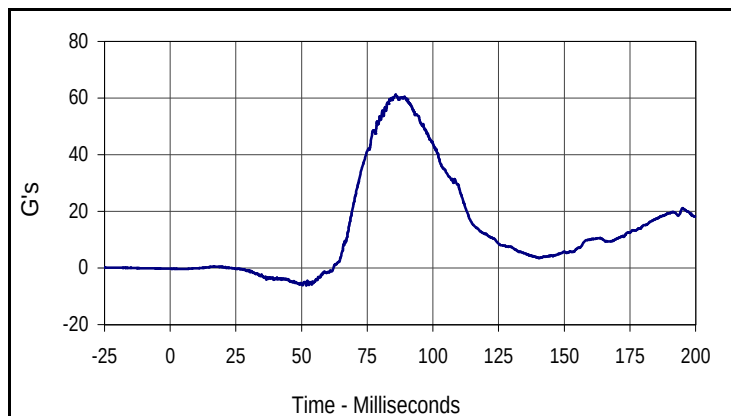
Test Date: 2/19/04
 NHTSA No.: M40111



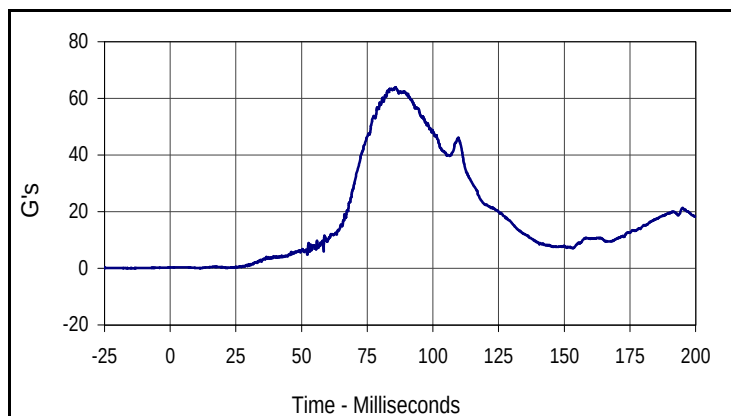
Curve Description			
Right Rear (3 Yr.) Head X			
CURNO	Type	SAE Class	Units
160	FIL	1000	G's
Max	Time	Min	Time
0.1	2.5	-35.5	109.8



Curve Description			
Right Rear (3 Yr.) Head Y			
CURNO	Type	SAE Class	Units
161	FIL	1000	G's
Max	Time	Min	Time
5.1	110.4	-6.7	107.8



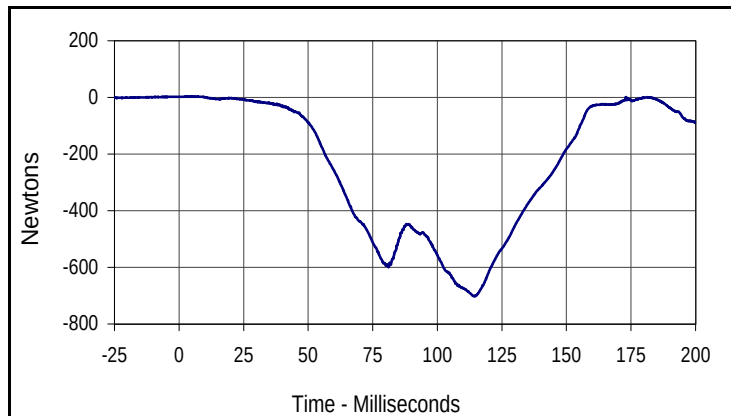
Curve Description			
Right Rear (3 Yr.) Head Z			
CURNO	Type	SAE Class	Units
162	FIL	1000	G's
Max	Time	Min	Time
61.3	85.8	-6.1	50.4



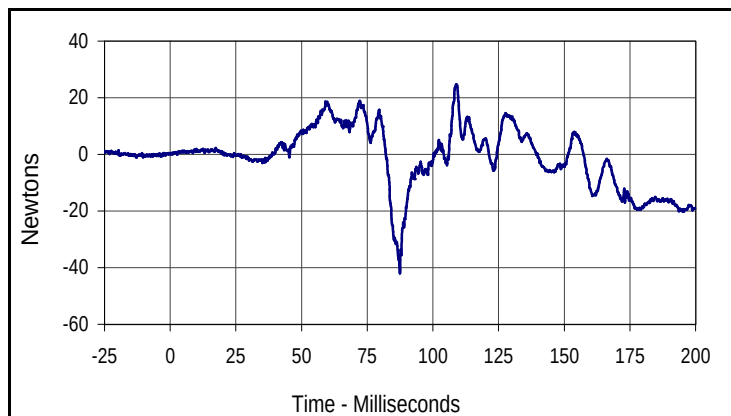
Curve Description			
Right Rear (3 Yr.) Head Resultant			
CURNO	Type	SAE Class	Units
160	RES	1000	G's
Max	Time	Min	Time
63.9	85.8	0.0	11.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

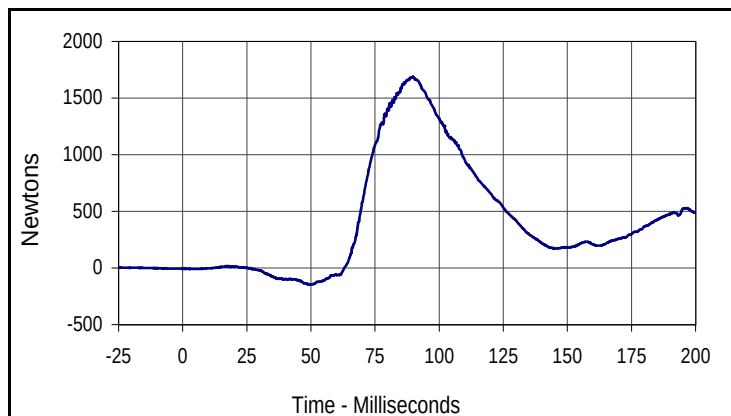
Test Date: 2/19/04
 NHTSA No.: M40111



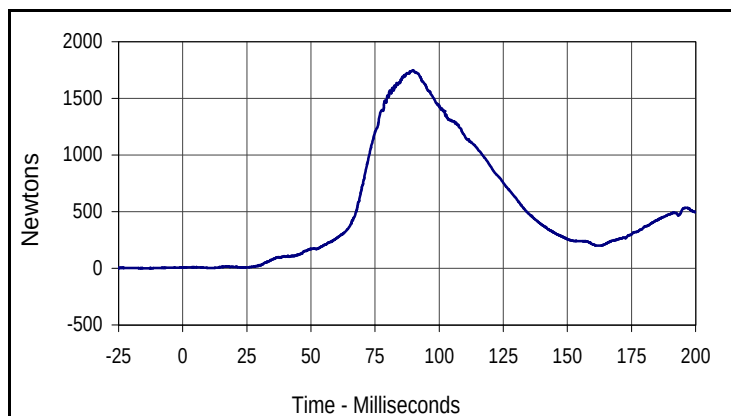
Curve Description			
Right Rear (3 Yr.) Upper Neck Force X			
CURNO	Type	SAE Class	Units
163	FIL	1000	Newtons
Max	Time	Min	Time
3.5	5.3	-702.2	114.1



Curve Description			
Right Rear (3 Yr.) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
164	FIL	1000	Newtons
Max	Time	Min	Time
24.8	109.0	-42.0	87.4



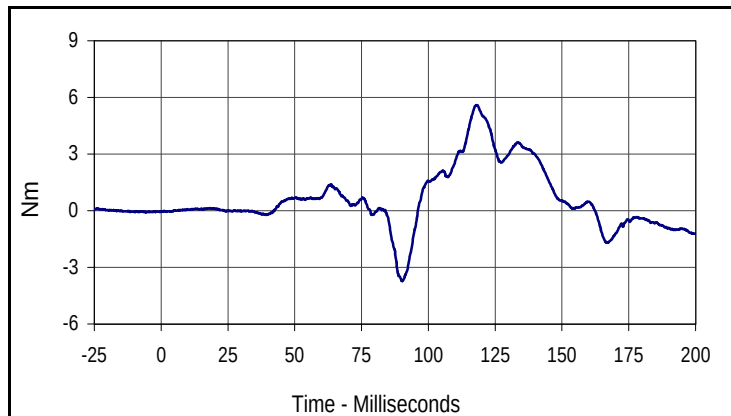
Curve Description			
Right Rear (3 Yr.) Upper Neck Force Z			
CURNO	Type	SAE Class	Units
165	FIL	1000	Newtons
Max	Time	Min	Time
1688.0	89.8	-147.0	49.8



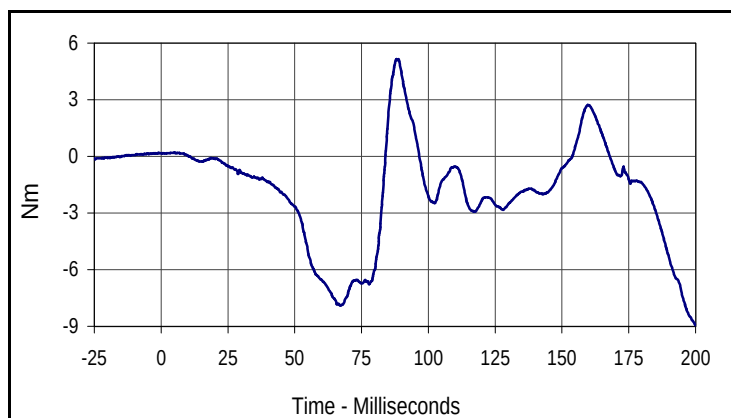
Curve Description			
Right Rear (3 Yr.) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
163	RES	1000	Newtons
Max	Time	Min	Time
1748.6	89.8	2.4	11.5

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

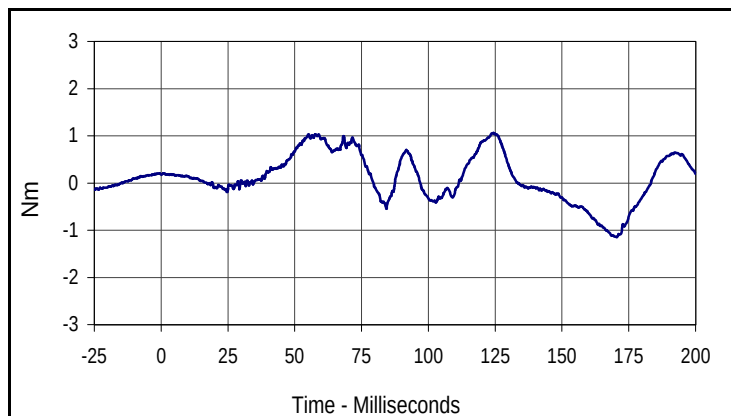
Test Date: 2/19/04
 NHTSA No.: M40111



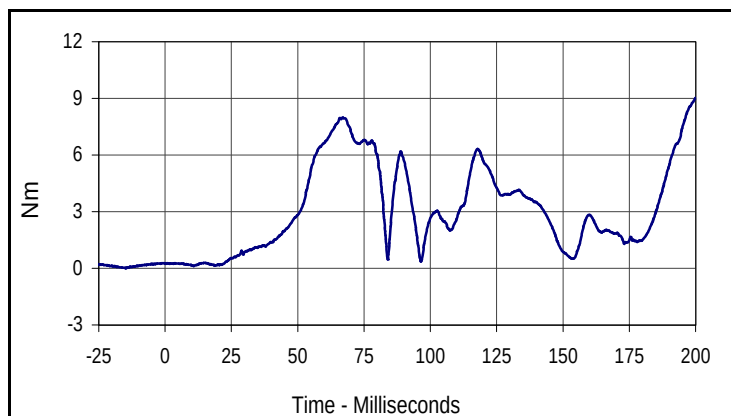
Curve Description			
Right Rear (3 Yr.) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
166	FIL	600	Nm
Max	Time	Min	Time
5.6	118.0	-3.7	90.2



Curve Description			
Right Rear (3 Yr.) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
167	FIL	600	Nm
Max	Time	Min	Time
5.2	88.1	-8.9	200.0



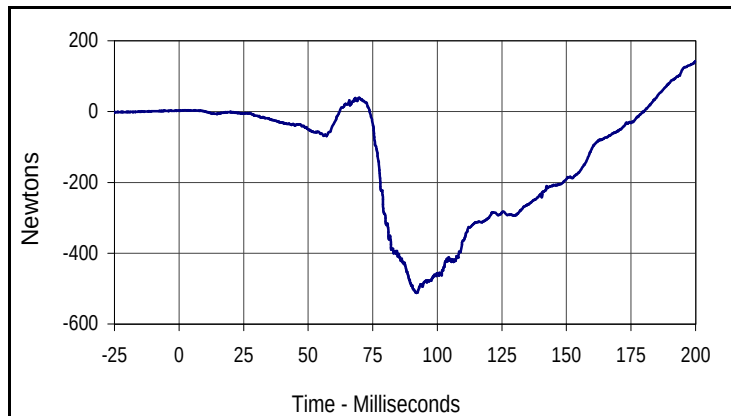
Curve Description			
Right Rear (3 Yr.) Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
168	FIL	600	Nm
Max	Time	Min	Time
1.1	124.3	-1.1	170.5



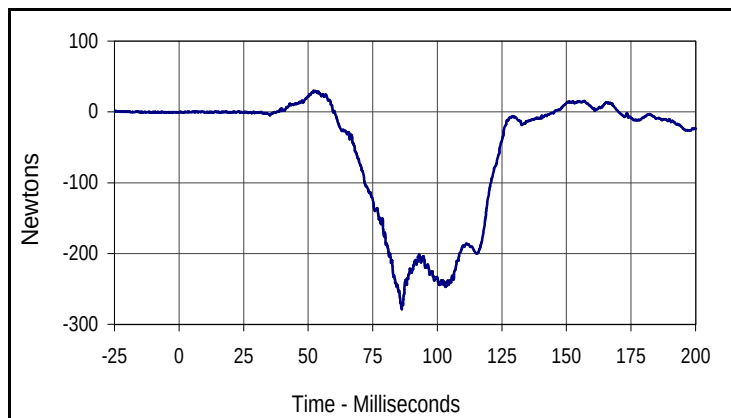
Curve Description			
Right Rear (3 Yr.) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
166	RES	600	Nm
Max	Time	Min	Time
9.0	200.0	0.1	10.8

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

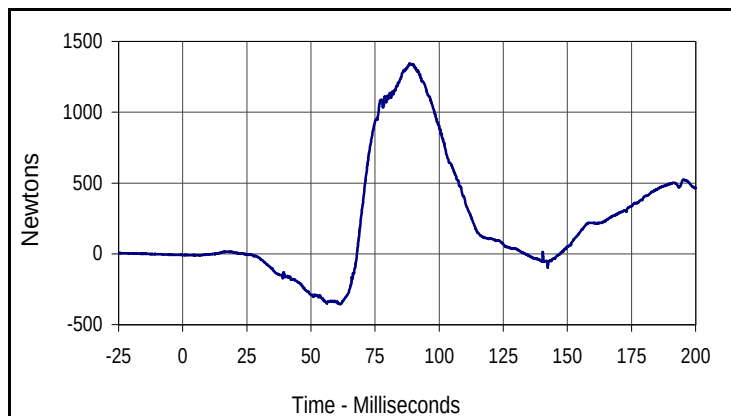
Test Date: 2/19/04
 NHTSA No.: M40111



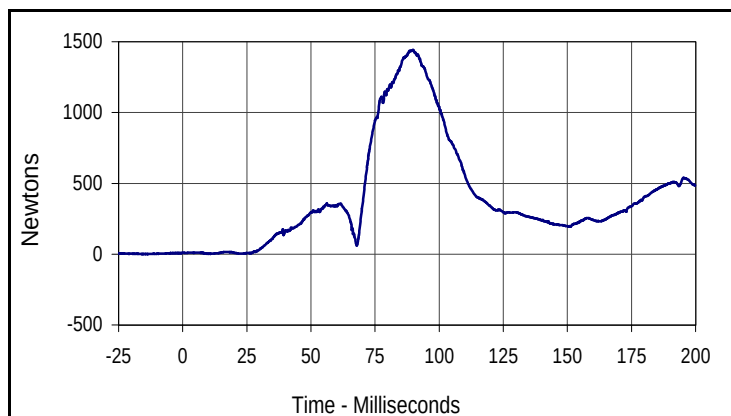
Curve Description			
Right Rear (3 Yr.) Lower Neck Force X			
CURNO	Type	SAE Class	Units
169	FIL	1000	Newtons
Max	Time	Min	Time
142.6	200.0	-512.3	91.9



Curve Description			
Right Rear (3 Yr.) Lower Neck Force Y			
CURNO	Type	SAE Class	Units
170	FIL	1000	Newtons
Max	Time	Min	Time
29.8	52.2	-278.8	86.2



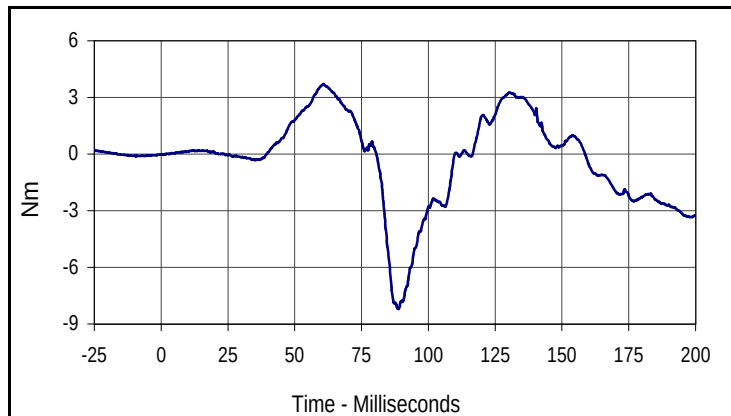
Curve Description			
Right Rear (3 Yr.) Lower Neck Force Z			
CURNO	Type	SAE Class	Units
171	FIL	1000	Newtons
Max	Time	Min	Time
1343.2	88.4	-355.2	61.6



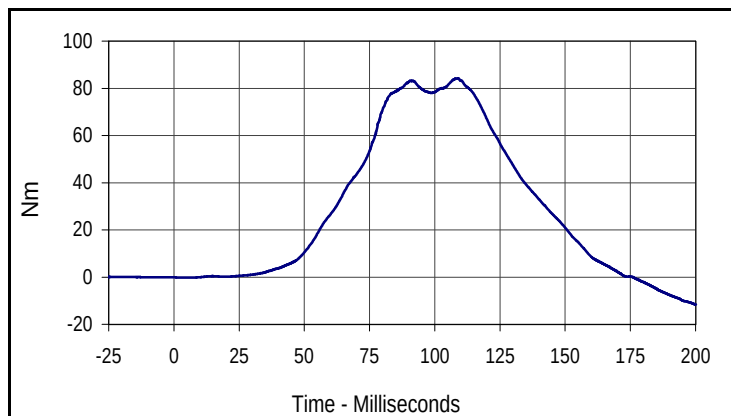
Curve Description			
Right Rear (3 Yr.) Lower Neck Force Res.			
CURNO	Type	SAE Class	Units
169	RES	1000	Newtons
Max	Time	Min	Time
1442.8	89.8	2.6	10.2

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

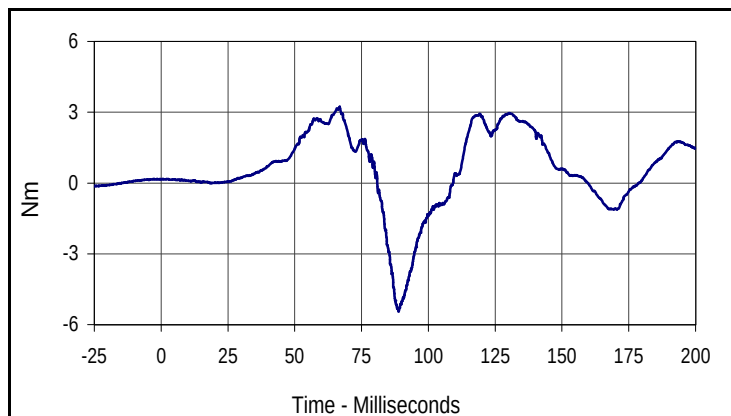
Test Date: 2/19/04
 NHTSA No.: M40111



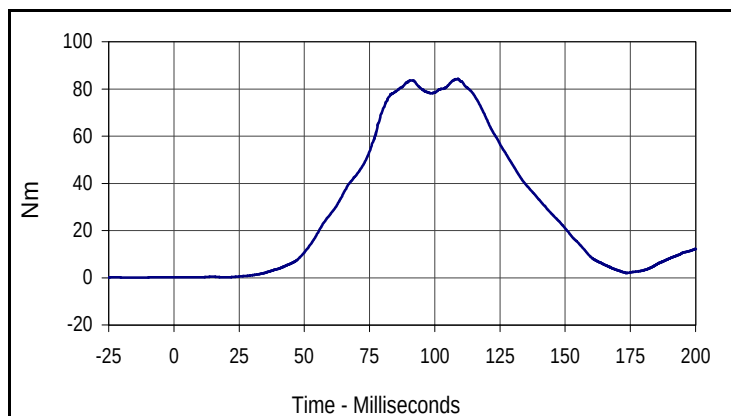
Curve Description			
Right Rear (3 Yr.) Lower Neck Moment X			
CURNO	Type	SAE Class	Units
172	FIL	600	Nm
Max	Time	Min	Time
3.7	60.8	-8.2	88.9



Curve Description			
Right Rear (3 Yr.) Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
173	FIL	600	Nm
Max	Time	Min	Time
84.3	108.9	-11.8	200.0



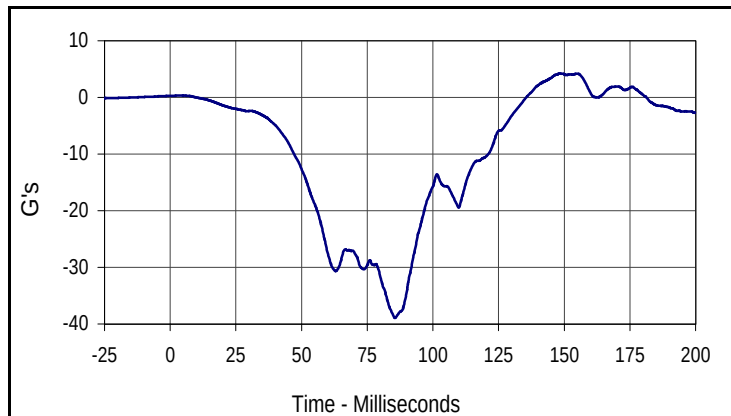
Curve Description			
Right Rear (3 Yr.) Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
174	FIL	600	Nm
Max	Time	Min	Time
3.2	66.8	-5.4	88.9



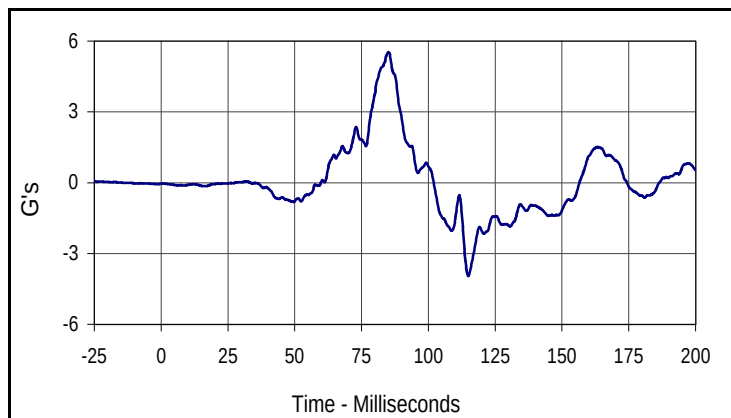
Curve Description			
Right Rear (3 Yr.) Lower Neck Moment Res.			
CURNO	Type	SAE Class	Units
172	RES	600	Nm
Max	Time	Min	Time
84.3	108.9	0.2	20.5

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

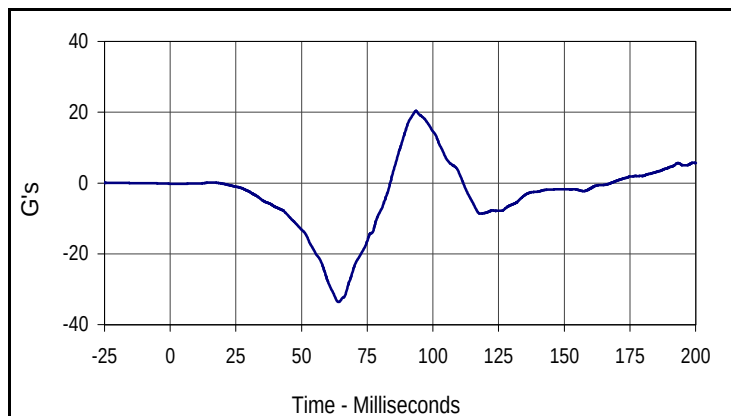
Test Date: 2/19/04
 NHTSA No.: M40111



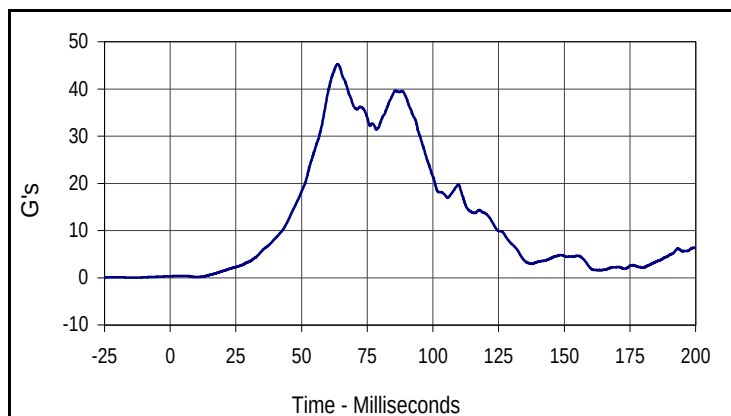
Curve Description			
Right Rear (3 Yr.) Chest X			
CURNO	Type	SAE Class	Units
175	FIL	180	G's
Max	Time	Min	Time
4.2	148.3	-38.9	85.5



Curve Description			
Right Rear (3 Yr.) Chest Y			
CURNO	Type	SAE Class	Units
176	FIL	180	G's
Max	Time	Min	Time
5.5	85.0	-3.9	115.0



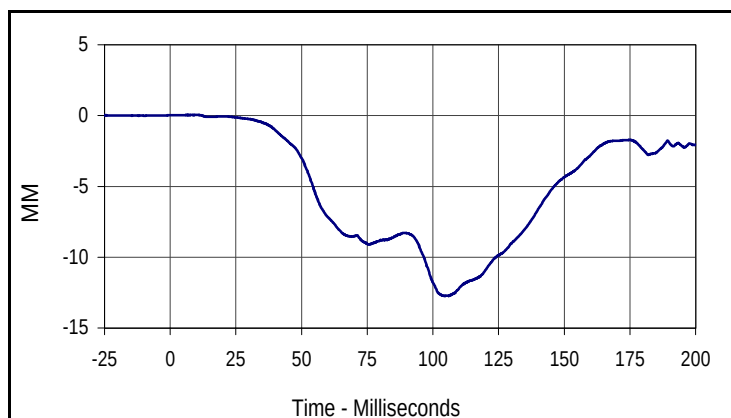
Curve Description			
Right Rear (3 Yr.) Chest Z			
CURNO	Type	SAE Class	Units
177	FIL	180	G's
Max	Time	Min	Time
20.4	93.6	-33.6	64.1



Curve Description			
Right Rear (3 Yr.) Chest Resultant			
CURNO	Type	SAE Class	Units
177	RES	180	G's
Max	Time	Min	Time
45.2	63.7	0.1	9.8

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

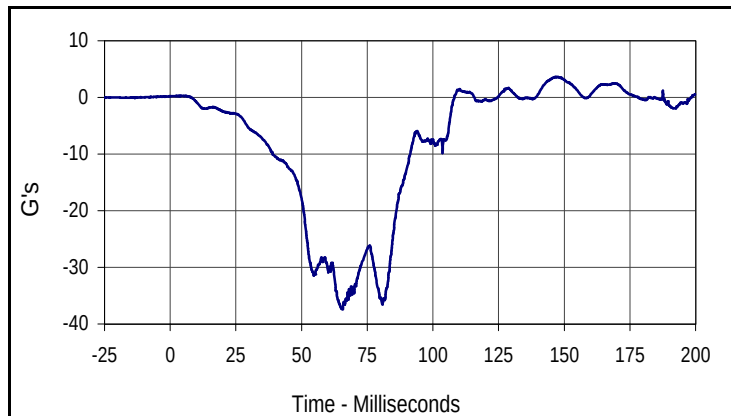
Test Date: 2/19/04
 NHTSA No.: M40111



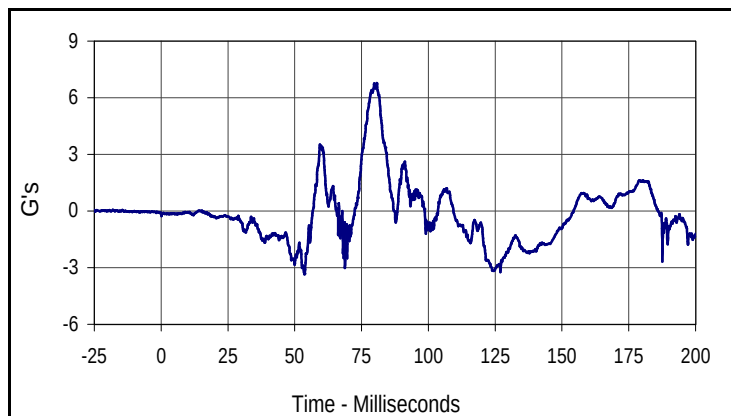
Curve Description			
Right Rear (3 Yr.) Chest Displacement			
CURNO	Type	SAE Class	Units
178	FIL	600	MM
Max	Time	Min	Time
0.0	6.2	-12.7	104.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

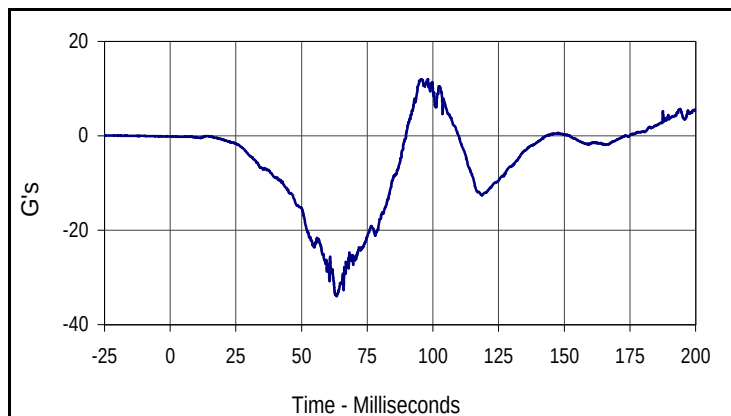
Test Date: 2/19/04
 NHTSA No.: M40111



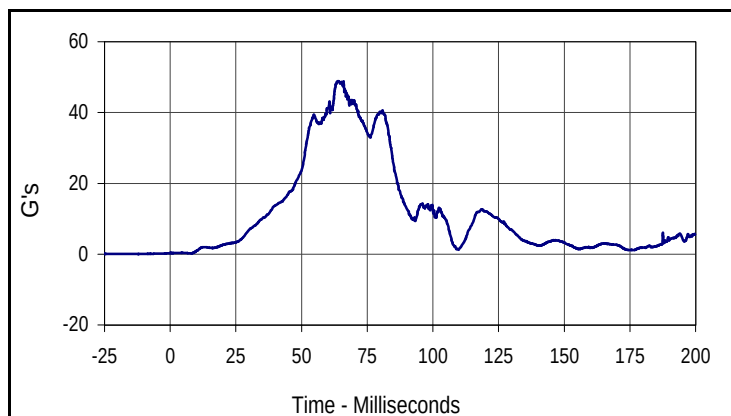
Curve Description			
Right Rear (3 Yr.) Pelvis X			
CURNO	Type	SAE Class	Units
179	FIL	1000	G's
Max	Time	Min	Time
3.6	146.7	-37.4	65.6



Curve Description			
Right Rear (3 Yr.) Pelvis Y			
CURNO	Type	SAE Class	Units
180	FIL	1000	G's
Max	Time	Min	Time
6.8	80.7	-3.4	53.7



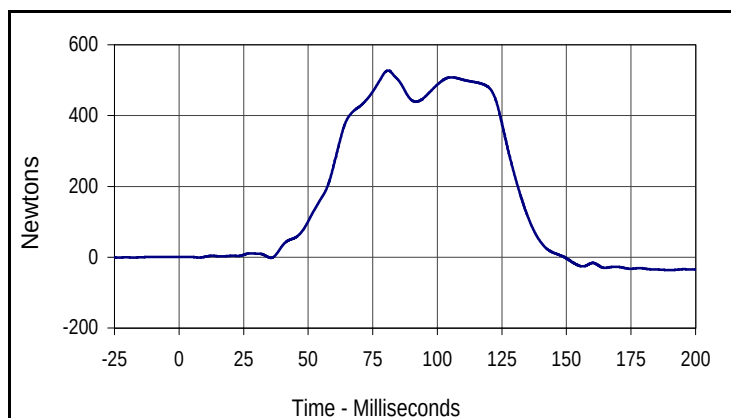
Curve Description			
Right Rear (3 Yr.) Pelvis Z			
CURNO	Type	SAE Class	Units
181	FIL	1000	G's
Max	Time	Min	Time
12.0	98.0	-33.9	63.3



Curve Description			
Right Rear (3 Yr.) Pelvis Resultant			
CURNO	Type	SAE Class	Units
179	RES	1000	G's
Max	Time	Min	Time
48.9	63.8	0.2	8.1

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

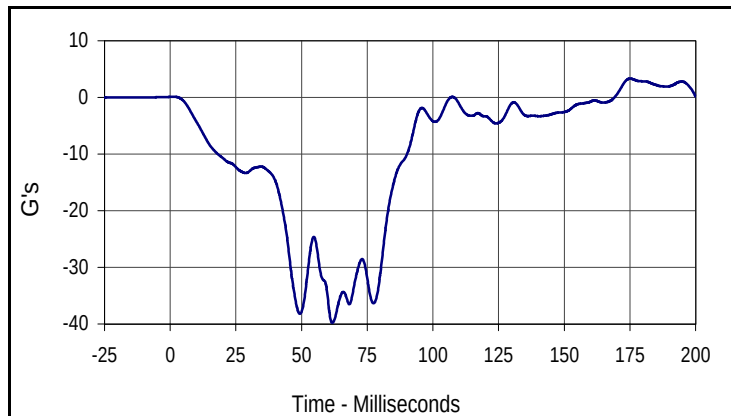
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 NHTSA No.: M40111



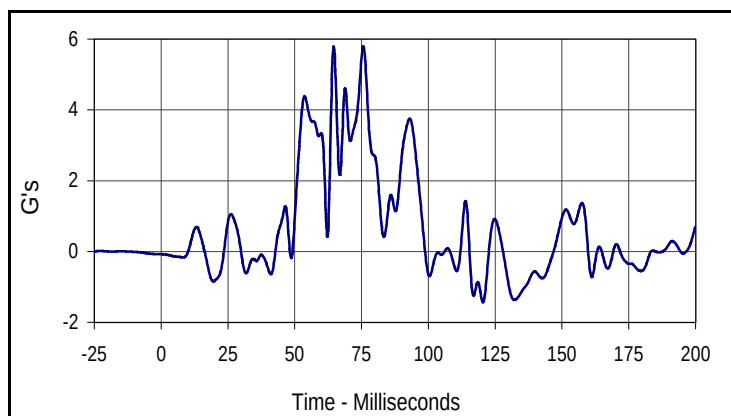
Curve Description			
Right Rear (3 Yr.) Car Seat Upper Tether Force			
CURNO	Type	SAE Class	Units
182	FIL	60	Newtons
Max	Time	Min	Time
527.2	80.9	-36.7	190.1

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

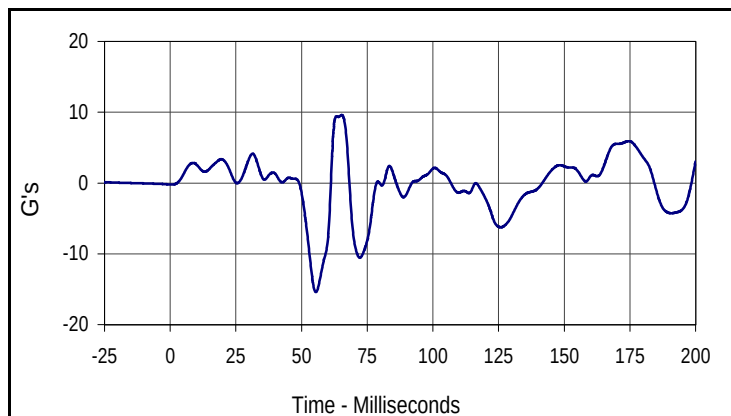
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 NHTSA No.: M40111



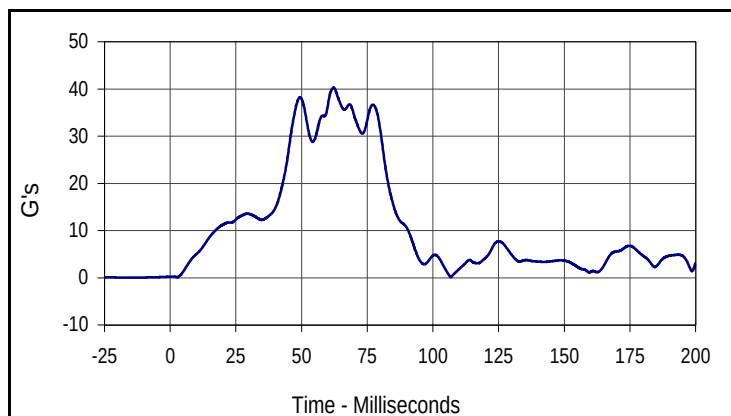
Curve Description			
Right Rear (3 Yr.) Car Seat X			
CURNO	Type	SAE Class	Units
183	FIL	60	G's
Max	Time	Min	Time
3.3	175.1	-39.8	61.7



Curve Description			
Right Rear (3 Yr.) Car Seat Y			
CURNO	Type	SAE Class	Units
184	FIL	60	G's
Max	Time	Min	Time
5.8	75.7	-1.4	120.4



Curve Description			
Right Rear (3 Yr.) Car Seat Z			
CURNO	Type	SAE Class	Units
185	FIL	60	G's
Max	Time	Min	Time
9.6	65.3	-15.4	55.4



Curve Description			
Right Rear (3 Yr.) Car Seat Resultant			
CURNO	Type	SAE Class	Units
183	RES	60	G's
Max	Time	Min	Time
40.3	62.2	0.1	106.8

SECTION F-4

CHILD DUMMY INSTRUMENTATION INFORMATION

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Left Rear Child A.T.D. Serial Number 082
2/19/04
2004 Saturn Vue MPV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
134	HEAD CG	X	GPAC050	Accel.,1/2 bridge	Endevco	7264-2000	G
135	HEAD CG	Y	GPAC051	Accel.,1/2 bridge	Endevco	7264-2000	G
136	HEAD CG	Z	GPAC052	Accel.,1/2 bridge	Endevco	7264-2000	G
137	UPPER NECK FORCE	X	082UNFX	Load cell, six axis neck	R. A. Denton	IF-234	N
138	UPPER NECK FORCE	Y	082UNFY	Load cell, six axis neck	R. A. Denton	IF-234	N
139	UPPER NECK FORCE	Z	082UNFZ	Load cell, six axis neck	R. A. Denton	IF-234	N
140	UPPER NECK MOMENT	X	082UNMX	Load cell, six axis neck	R. A. Denton	IF-234	Nm
141	UPPER NECK MOMENT	Y	082UNMY	Load cell, six axis neck	R. A. Denton	IF-234	Nm
142	UPPER NECK MOMENT	Z	082UNMZ	Load cell, six axis neck	R. A. Denton	IF-234	Nm
143	LOWER NECK FORCE	X	082LNFX	Load cell, six axis neck	R. A. Denton	3303	N
144	LOWER NECK FORCE	Y	082LNFY	Load cell, six axis neck	R. A. Denton	3303	N
145	LOWER NECK FORCE	Z	082LNFZ	Load cell, six axis neck	R. A. Denton	3303	N
146	LOWER NECK MOMENT	X	082LNMX	Load cell, six axis neck	R. A. Denton	3303	Nm
147	LOWER NECK MOMENT	Y	082LNMY	Load cell, six axis neck	R. A. Denton	3303	Nm
148	LOWER NECK MOMENT	Z	082LNMZ	Load cell, six axis neck	R. A. Denton	3303	Nm
149	CHEST CG	X	2116-A11	Accel., Full Bridge	Entran	2000JF	G
150	CHEST CG	Y	2116-A14	Accel., Full Bridge	Entran	2000JF	G
151	CHEST CG	Z	2116-A23	Accel., Full Bridge	Entran	2000JF	G
152	CHEST DISPLACEMENT	X	082CP	Rotary Pot Chest	Servo	14CBI	MM
153	PELVIS	X	2116-A12	Accel., Full Bridge	Entran	2000JF	G
154	PELVIS	Y	2116-A19	Accel., Full Bridge	Entran	2000JF	G
155	PELVIS	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G
156	CAR SEAT UPPER TETHER FORCE	X	BL112	Load cell, Seat belt	FGP	FN4060	N
157	CAR SEAT	X	KETX1A	Accel.,1/2 bridge	Endevco	7264-200	G
158	CAR SEAT	Y	KETX1B	Accel.,1/2 bridge	Endevco	7264-200	G
159	CAR SEAT	Z	KETX1C	Accel.,1/2 bridge	Endevco	7264-200	G

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Right Rear Child A.T.D. Serial Number 139
2/19/04
2004 Saturn Vue MPV**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
160	HEAD CG	X	GPAC047	Accel.,1/2 bridge	Endevco	7264-2000	G
161	HEAD CG	Y	GPAC048	Accel.,1/2 bridge	Endevco	7264-2000	G
162	HEAD CG	Z	GPAC049	Accel.,1/2 bridge	Endevco	7264-2000	G
163	UPPER NECK FORCE	X	139UNFX	Load cell, six axis neck	R. A. Denton	IF-234	N
164	UPPER NECK FORCE	Y	139UNFY	Load cell, six axis neck	R. A. Denton	IF-234	N
165	UPPER NECK FORCE	Z	139UNFZ	Load cell, six axis neck	R. A. Denton	IF-234	N
166	UPPER NECK MOMENT	X	139UNMX	Load cell, six axis neck	R. A. Denton	IF-234	Nm
167	UPPER NECK MOMENT	Y	139UNMY	Load cell, six axis neck	R. A. Denton	IF-234	Nm
168	UPPER NECK MOMENT	Z	139UNMZ	Load cell, six axis neck	R. A. Denton	IF-234	Nm
169	LOWER NECK FORCE	X	139LNFX	Load cell, six axis neck	R. A. Denton	3303	N
170	LOWER NECK FORCE	Y	139LNFY	Load cell, six axis neck	R. A. Denton	3303	N
171	LOWER NECK FORCE	Z	139LNFZ	Load cell, six axis neck	R. A. Denton	3303	N
172	LOWER NECK MOMENT	X	139LNMX	Load cell, six axis neck	R. A. Denton	3303	Nm
173	LOWER NECK MOMENT	Y	139LNMY	Load cell, six axis neck	R. A. Denton	3303	Nm
174	LOWER NECK MOMENT	Z	139LNMZ	Load cell, six axis neck	R. A. Denton	3303	Nm
175	CHEST CG	X	2116-A01	Accel., Full Bridge	Entran	2000JF	G
176	CHEST CG	Y	2116-A06	Accel., Full Bridge	Entran	2000JF	G
177	CHEST CG	Z	2116-A07	Accel., Full Bridge	Entran	2000JF	G
178	CHEST DISPLACEMENT	X	139CP	Rotary Pot Chest	Servo	14CBI	MM
179	PELVIS	X	2116-N07	Accel., Full Bridge	Entran	2000JF	G
180	PELVIS	Y	2116-A03	Accel., Full Bridge	Entran	2000JF	G
181	PELVIS	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G
182	CAR SEAT UPPER TETHER FORCE	X	BL113	Load cell, Seat belt	FGP	FN4060	N
183	CAR SEAT	X	KETX4A	Accel.,1/2 bridge	Endevco	7264-200	G
184	CAR SEAT	Y	KETX4B	Accel.,1/2 bridge	Endevco	7264-200	G
185	CAR SEAT	Z	KETX4C	Accel.,1/2 bridge	Endevco	7264-200	G

SECTION F-5

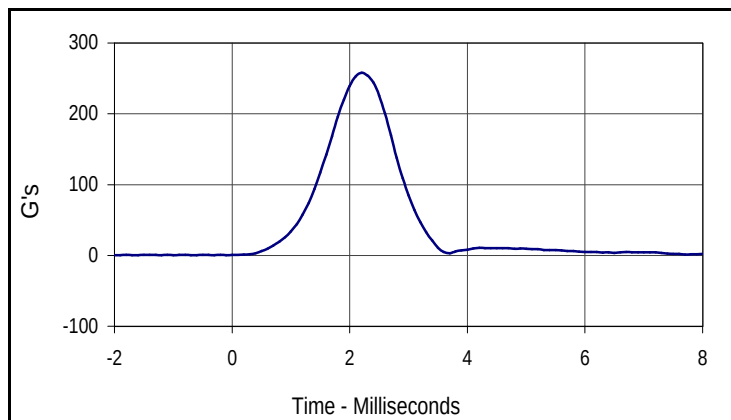
CHILD DUMMY CALIBRATION INFORMATION

Test Program: Hybrid III 3 Year Old Head Drop Test
 ATD Serial No.: 082

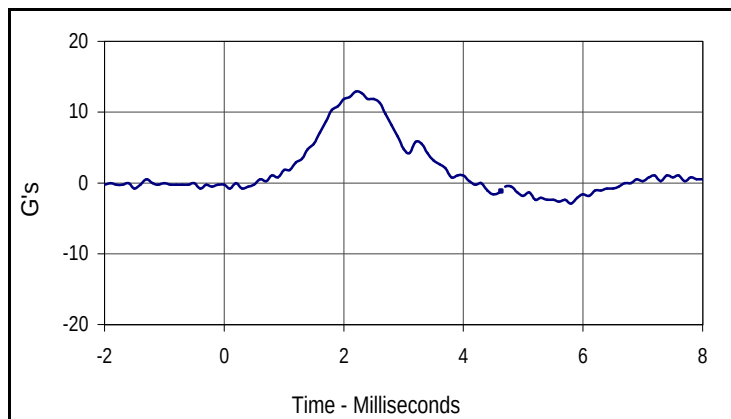
Test Date: 2/11/04
 Test I.D.: HD04H



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	250.0 to 280.0	257.8	Pass
Peak Lateral Acceleration	G's	≤15.0	12.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	4.1	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
257.8	2.2	0.3	-1.9



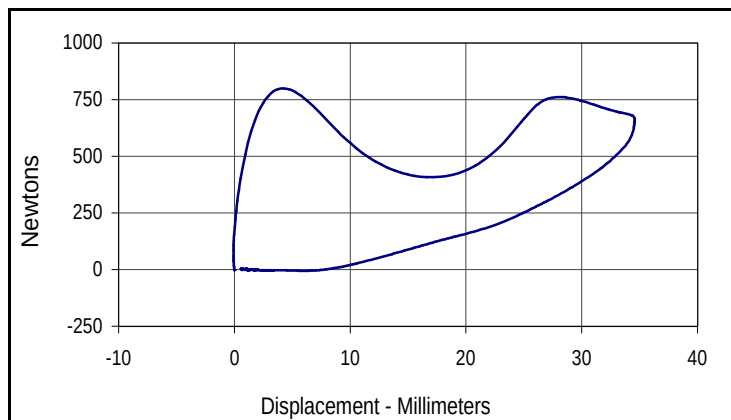
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
12.9	2.2	-2.9	5.8

Test Program: Hybrid III 3 Year Old Thorax Impact Test
 ATD Serial No.: 082

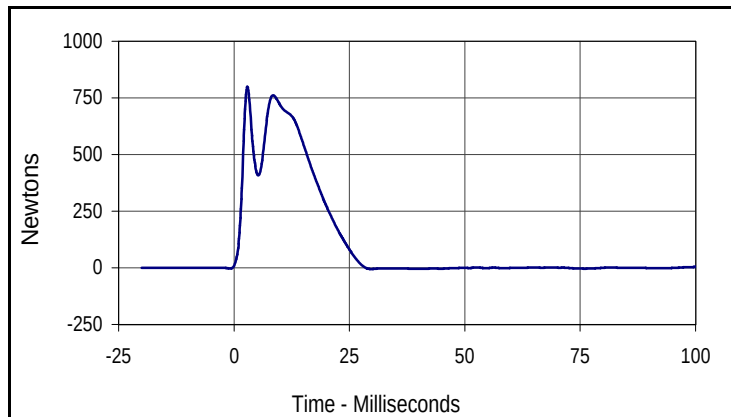
Test Date: 2/12/04
 Test I.D.: CH12D



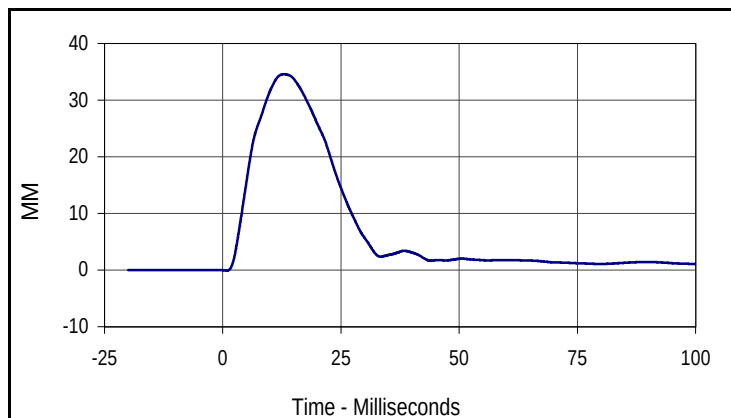
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	6.10	Pass
Peak Chest Compression	MM	32 to 38	34.6	Pass
Peak Force Between 32 and 38 MM	Newtons	680 to 810	693.6	Pass
Peak Force Between 12.5 and 32 MM	Newtons	≤860	761.4	Pass
Internal Hysteresis	%	65 to 85	72.6	Pass
Overall Test Results			Pass	



Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
004	FIL	180/600	72.6
Peak Probe Force		Peak Chest Displ.	
799.5		34.6	



Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
003	FIL	180	Newtons
Max	Time	Min	Time
799.5	2.9	-5.4	29.7



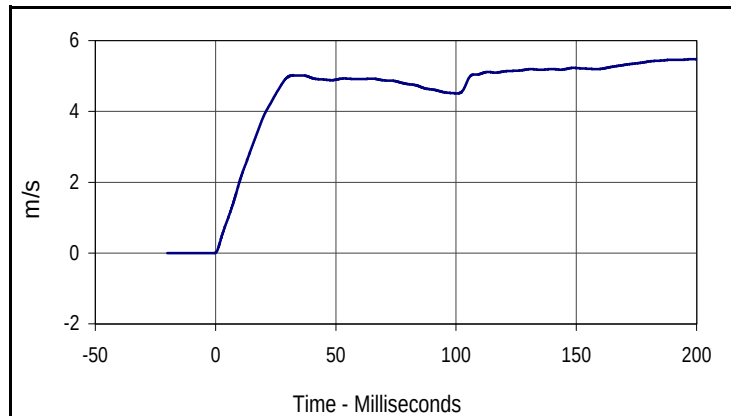
Curve Description			
Chest Compression			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.6	12.9	-0.1	0.8

Test Program: 3 Year Old Hybrid III Neck Flexion Test
 ATD Serial No.: 082

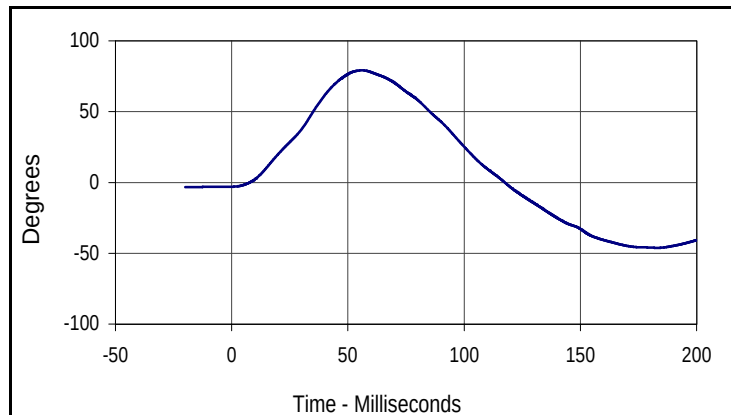
Test Date: 2/11/04
 Test I.D.: NF04J



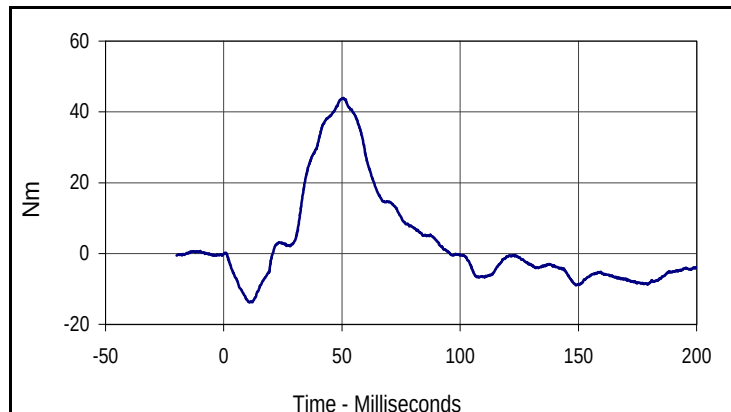
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.43	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.9	Pass
	30 Msec.	m/s	4.0 to 5.1	5.0	Pass
"D" Plane Rotation	Max	Degrees	70.0 to 82.0	79.2	Pass
Peak Moment in Rotation	Max	Nm	42.0 to 53.0	43.9	Pass
Positive Moment Decay, Time To 10Nm		Msec.	60.0 to 80.0	75.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.5	198.6	0.0	-0.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
79.2	56.0	-46.2	183.1



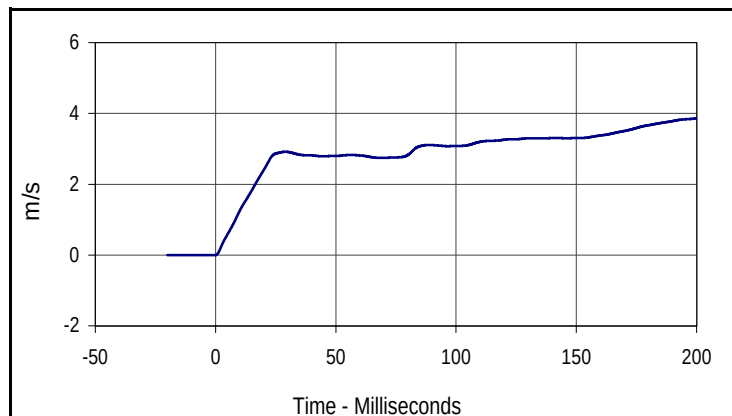
Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
43.9	50.7	-13.8	12.0

Test Program: 3 Year Old Hybrid III Neck Extension Test
 ATD Serial No.: 082

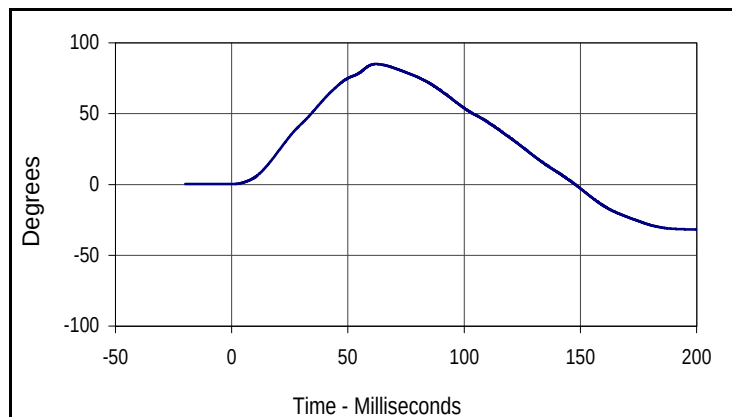
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 Test I.D.: NE04J



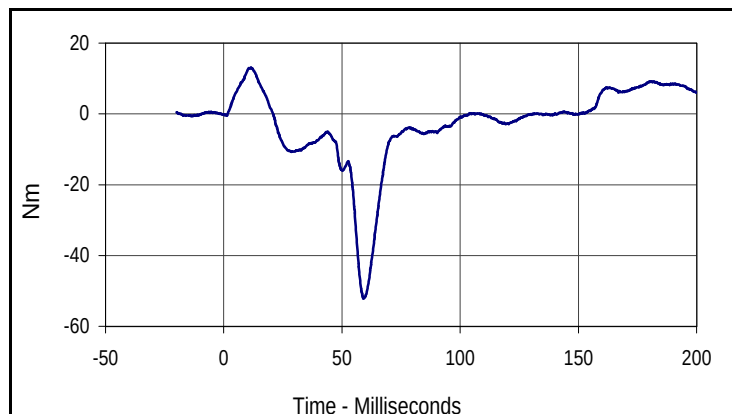
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	3.55 to 3.75	3.60	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.2	Pass
	20 Msec.	m/s	1.9 to 2.5	2.4	Pass
	30 Msec.	m/s	2.8 to 3.5	2.9	Pass
"D" Plane Rotation	Max	Degrees	83.0 to 93.0	85.0	Pass
Peak Moment in Rotation	Max	Nm	-43.7 to -53.3	-52.1	Pass
Positive Moment Decay, Time To 10Nm		Msec.	60.0 to 80.0	69.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.0	220.0	0.0	-0.3



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
85.0	62.1	-32.2	205.7



Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
13.0	11.5	-52.1	59.1

Test Program: Hybrid III 3 Year Old Torso Flexion Test
ATD Serial No.: 082

Test Date: 2/12/04
Test I.D.: TF04G



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
Initial reference plane angle	Degrees	≤15.0	3.2	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	167.9	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	1.1	Pass
Final reference plane angle	Degrees	+/-10	3.2	Pass
Overall Test Results				Pass

Test Program: Hybrid III 3 Year Old External Measurements

Test Date: 2/12/04

ATD Serial No.: 082

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	539 to 554	545	Pass
B - Shoulder pivot height	mm	307 to 323	310	Pass
C - "H" point height	mm	34 to 45	35	Pass
D - "H" point from backline	mm	57 to 67	65	Pass
E - Shoulder pivot from back	mm	61 to 71	65	Pass
F - Thigh clearance	mm	81 to 91	84	Pass
G - Elbow back to wrist pivot	mm	247 to 263	255	Pass
H - Skull cap to back line	mm	48 to 58	55	Pass
I - Shoulder to elbow length	mm	185 to 201	200	Pass
J - Elbow rest height	mm	134 to 149	145	Pass
K - Buttock to knee length	mm	285 to 300	295	Pass
L - Popliteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	255	Pass
N - Buttock popliteal length	mm	218 to 233	225	Pass
O - Chest depth with jacket	mm	139 to 154	150	Pass
P - Foot length	mm	138 to 148	145	Pass
R - Buttock to knee pivot length	mm	251 to 262	260	Pass
S - Head Breadth	mm	128 to 144	135	Pass
T - Head Depth	mm	167 to 183	180	Pass
U - Hip breadth	mm	201 to 216	215	Pass
V - Shoulder breadth	mm	237 to 252	245	Pass
W - Foot breadth	mm	54 to 64	60	Pass
X - Head circumference	mm	500 to 516	515	Pass
Y - Chest circumference with jacket	mm	527 to 553	529	Pass
Z - Waist circumference	mm	527 to 553	546	Pass
AA - Location for chest circumference	mm	249 to 259	253	Pass
BB - Location for waist circumference	mm	160 to 170	166	Pass
Overall Test Results				Pass



Calibration Data Sheet Hybrid III 3 Year Old Head Drop Test

ATD Serial No.: 139

Test I.D.: HD02B

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	250.0 to 280.0	279.3	Pass
Peak Lateral Acceleration	G's	≤15.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	2.8	Pass
Overall Test Results				Pass

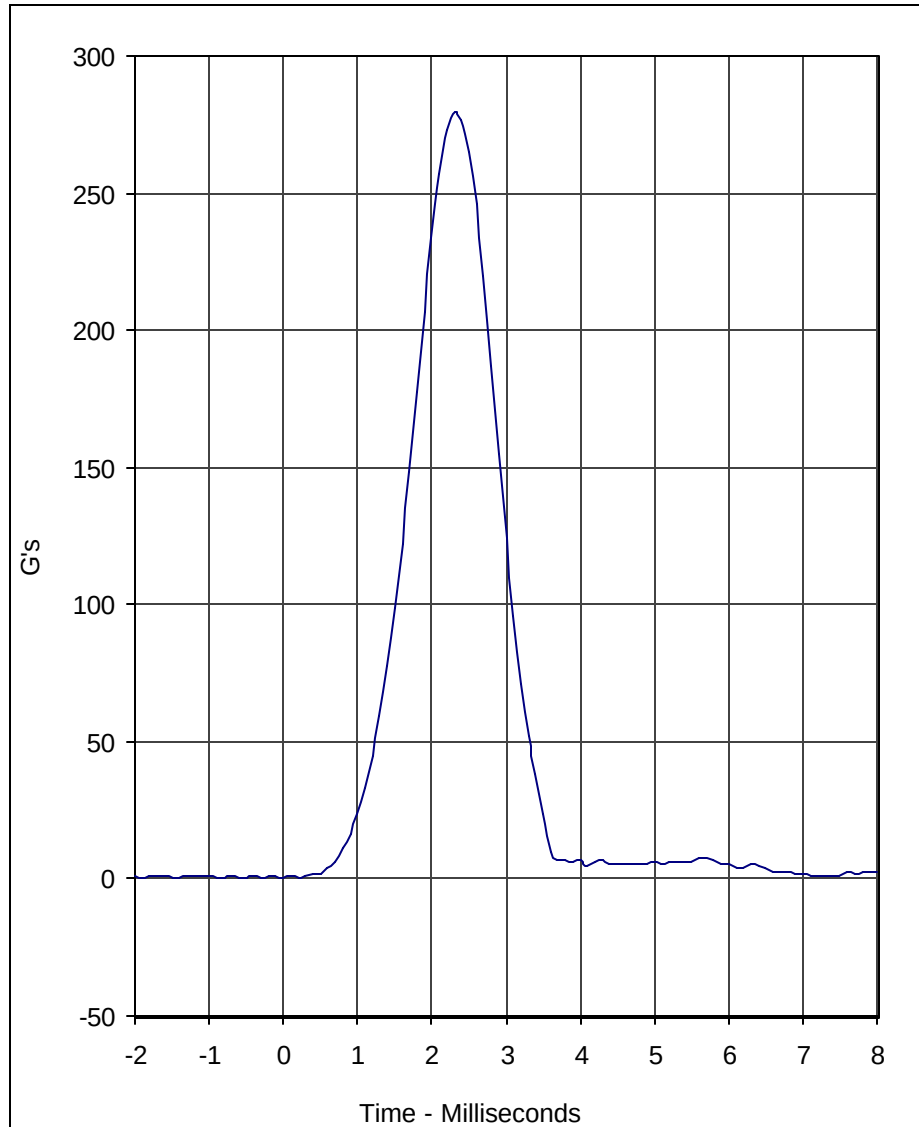
F5-7

TR-P24001-15-NC

Laboratory Technician

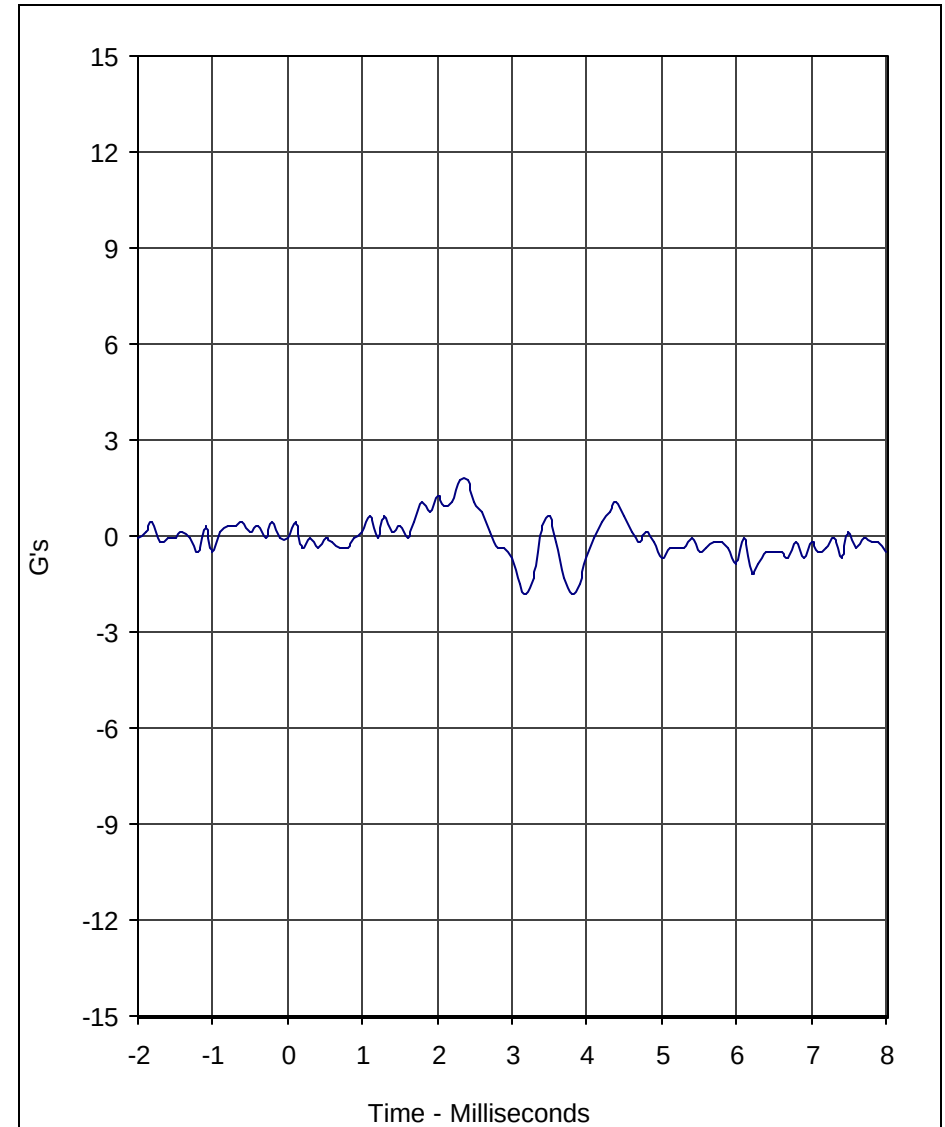
January 7, 2004

Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES
Units	Max	Time	Min	Time	SAE Class
G's	279.3	2.3	0.2	-1.4	1000

Test Program: Hybrid III 3 Year Old Head Drop Test
 Test Date: 1/7/04



Curve Description				CURNO	Type
Head Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	1.7	2.3	-1.8	3.2	1000

A.T.D. Serial No.: 139
 Test I.D.: HD02B





Calibration Data Sheet

Hybrid III 3 Year Old

Thorax Impact Test

ATD Serial No.: 139

Test I.D.: CH02B

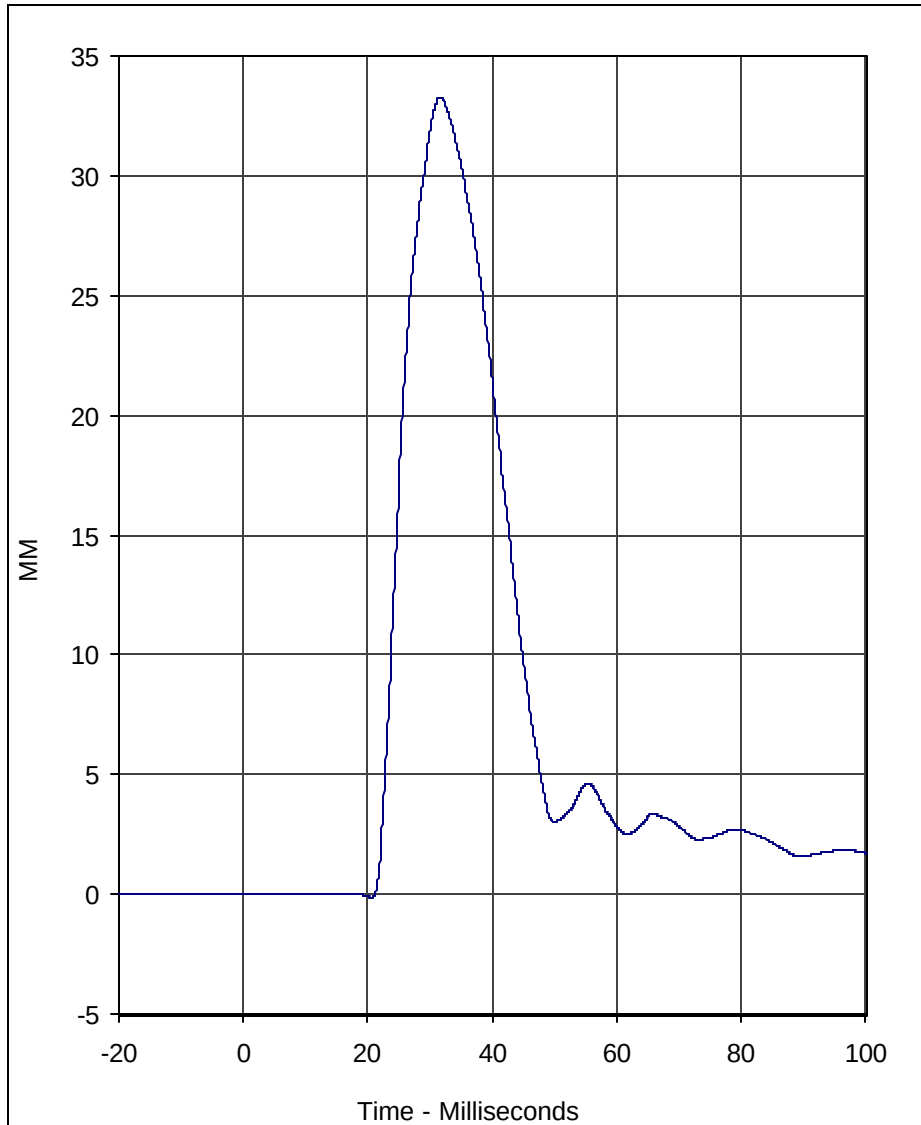
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	5.96	Pass
Peak Chest Compression	MM	32 to 38	33.3	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	742.3	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	750.3	Pass
Internal Hysteresis	%	65 to 85	75.9	Pass
Overall Test Results				Pass

F5-9

TR-P24001-15-NC

Laboratory Technician

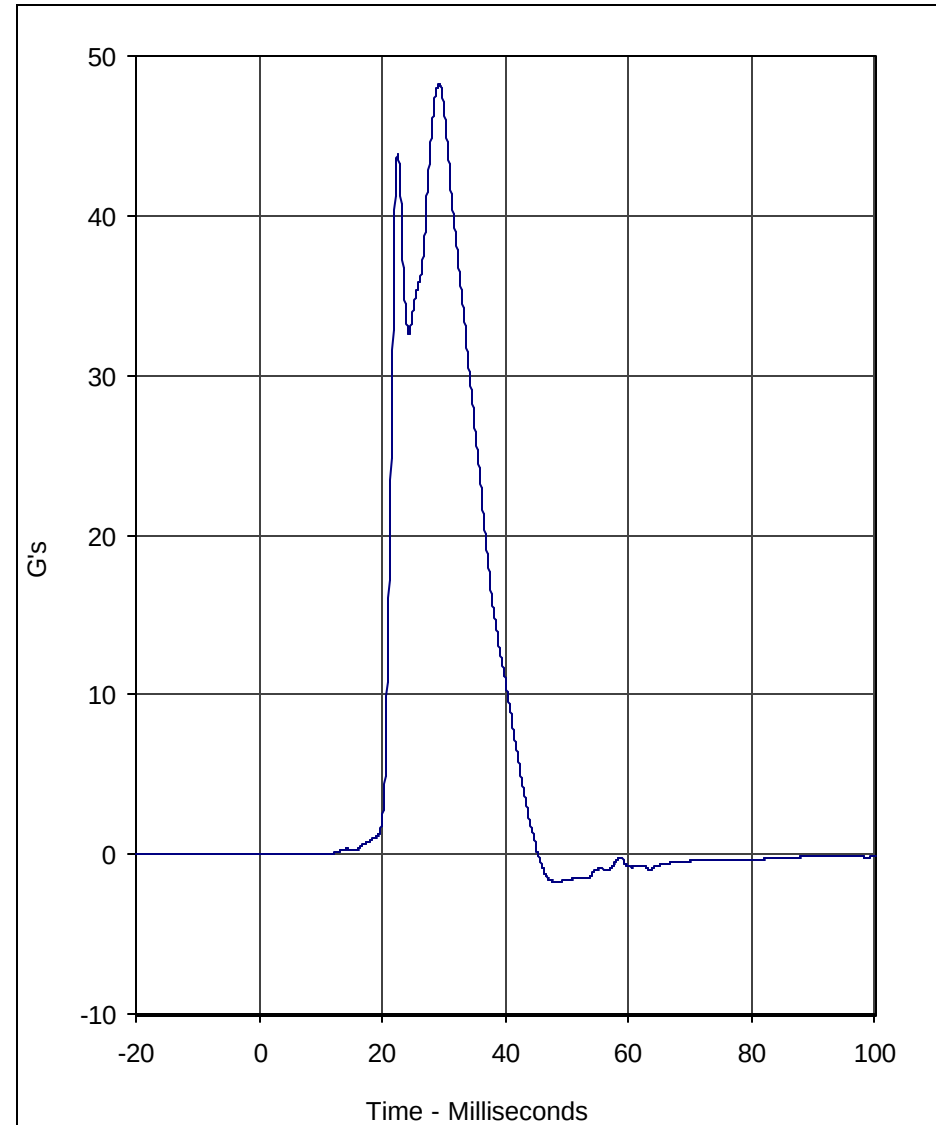
January 7, 2004
Test Date



Curve Description				CURNO	Type
Chest Compression				001	FIL
Units	Max	Time	Min	Time	SAE Class
MM	33.3	32.2	-0.1	21.1	600

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 1/7/04

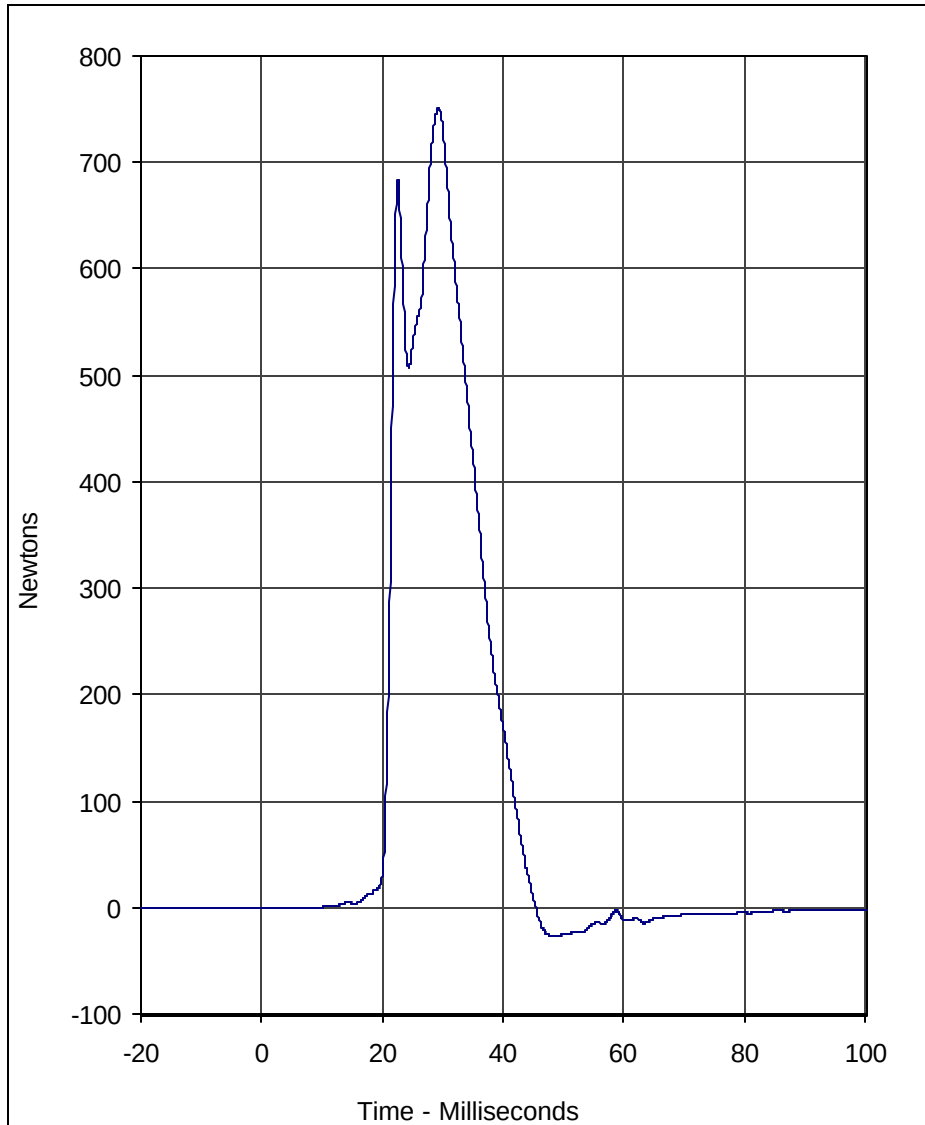


Curve Description				CURNO	Type
Probe Acceleration				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	48.2	29.8	-1.7	48.8	180

A.T.D. Serial No.: 139

Test I.D.: CH02B

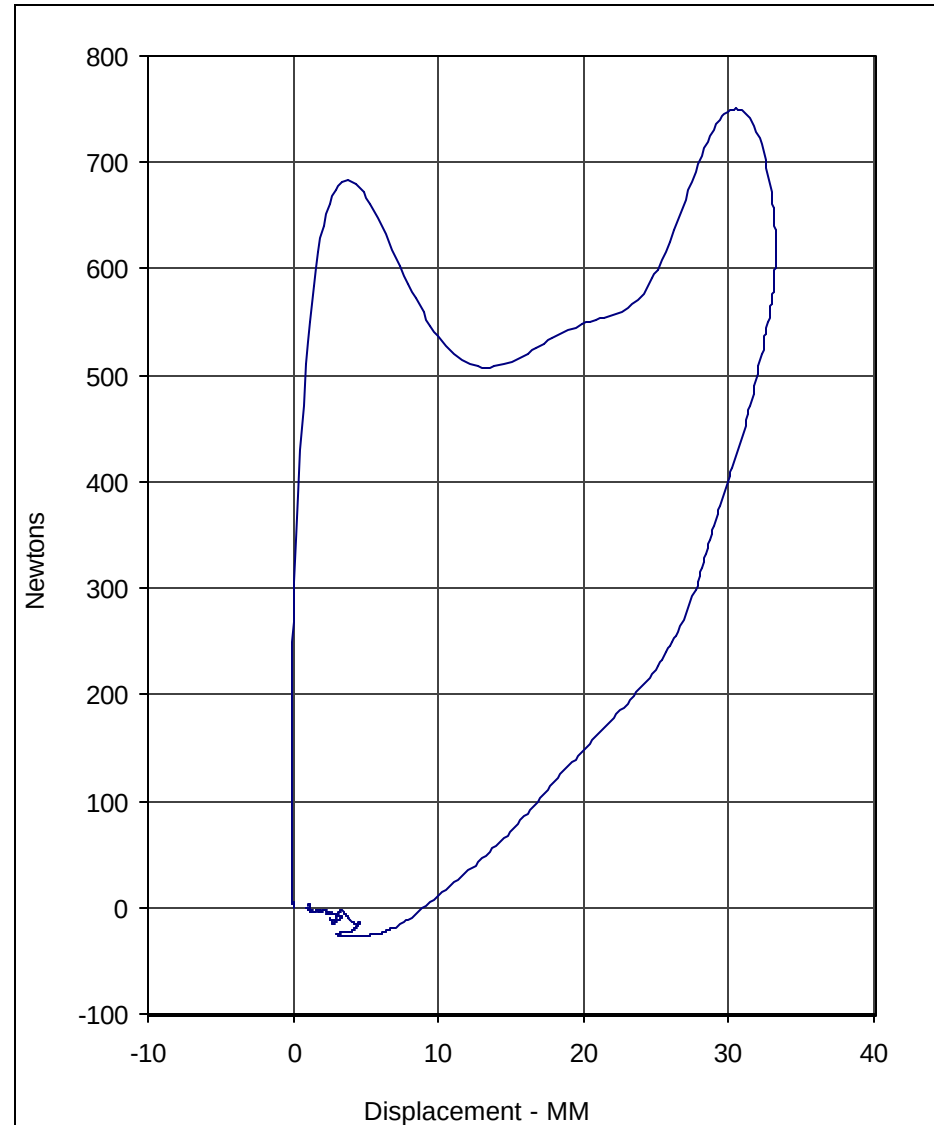




Curve Description				CURNO	Type
Probe Force				003	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	750.3	29.3	-26.5	48.3	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 1/7/04



Curve Description			CURNO	Type
Probe Force vs. Chest Compression			004	FIL
Units	Hysteresis	SAE Class		
%	75.9	180/600		

A.T.D. Serial No.: 139

Test I.D.: CH02B





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

ATD Serial No.: 139

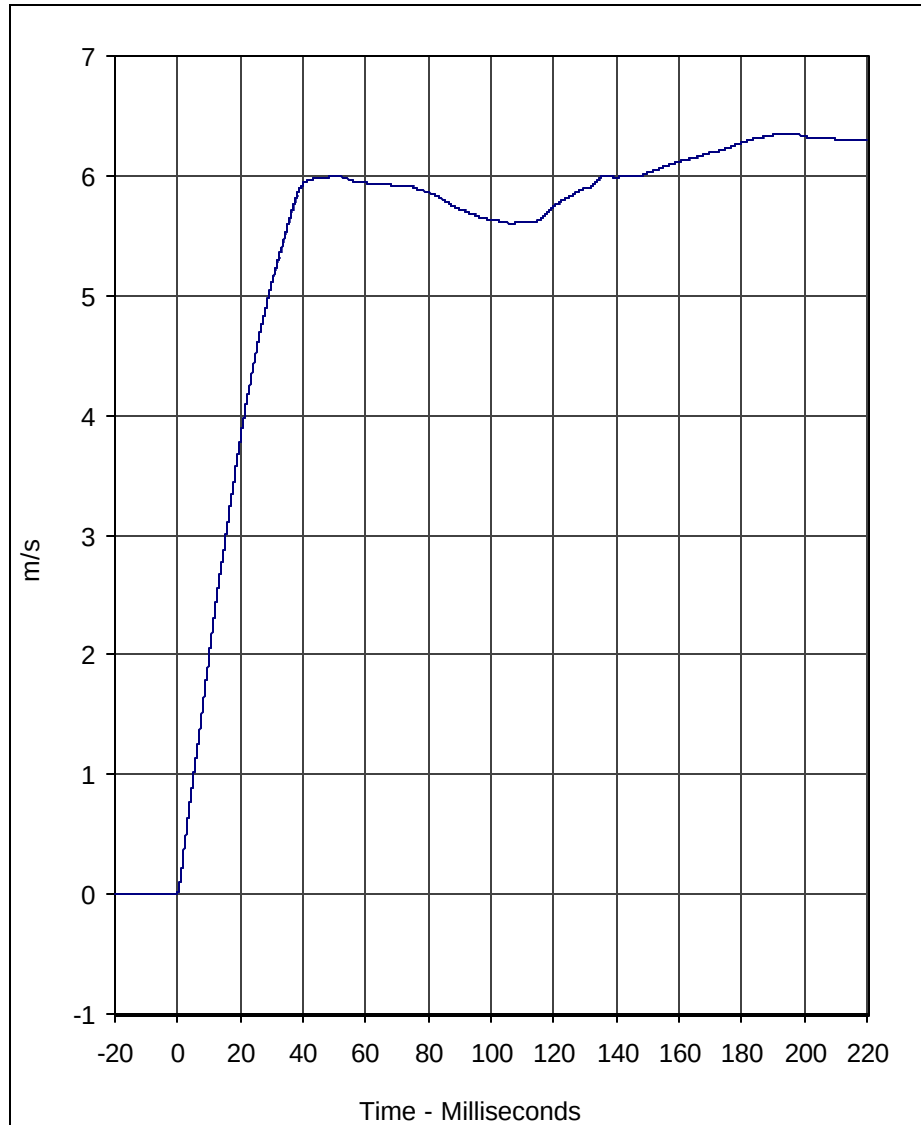
Test I.D.: NF02B

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	5.40 to 5.60	5.47	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.8	Pass
	30 Msec.	m/s	4.0 to 5.1	5.1	Pass
"D" Plane Rotation	Maximum	Degrees	70.0 to 82.0	76.9	Pass
Peak Moment in Rotation	Maximum	Nm	42.0 to 53.0	48.9	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	78.8	Pass
Overall Test Results					Pass

Laboratory Technician

January 7, 2004

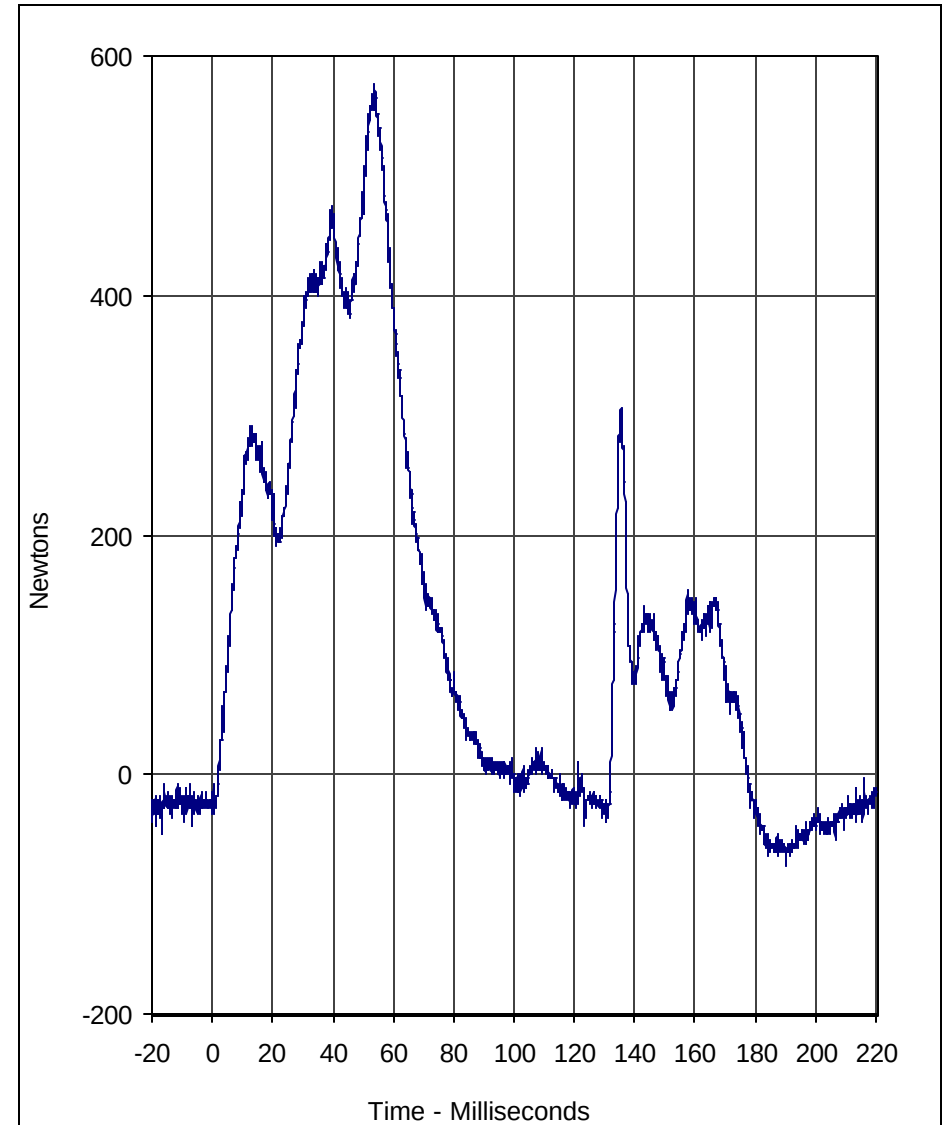
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	6.4	196.2	0.0	-0.7	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 1/7/04

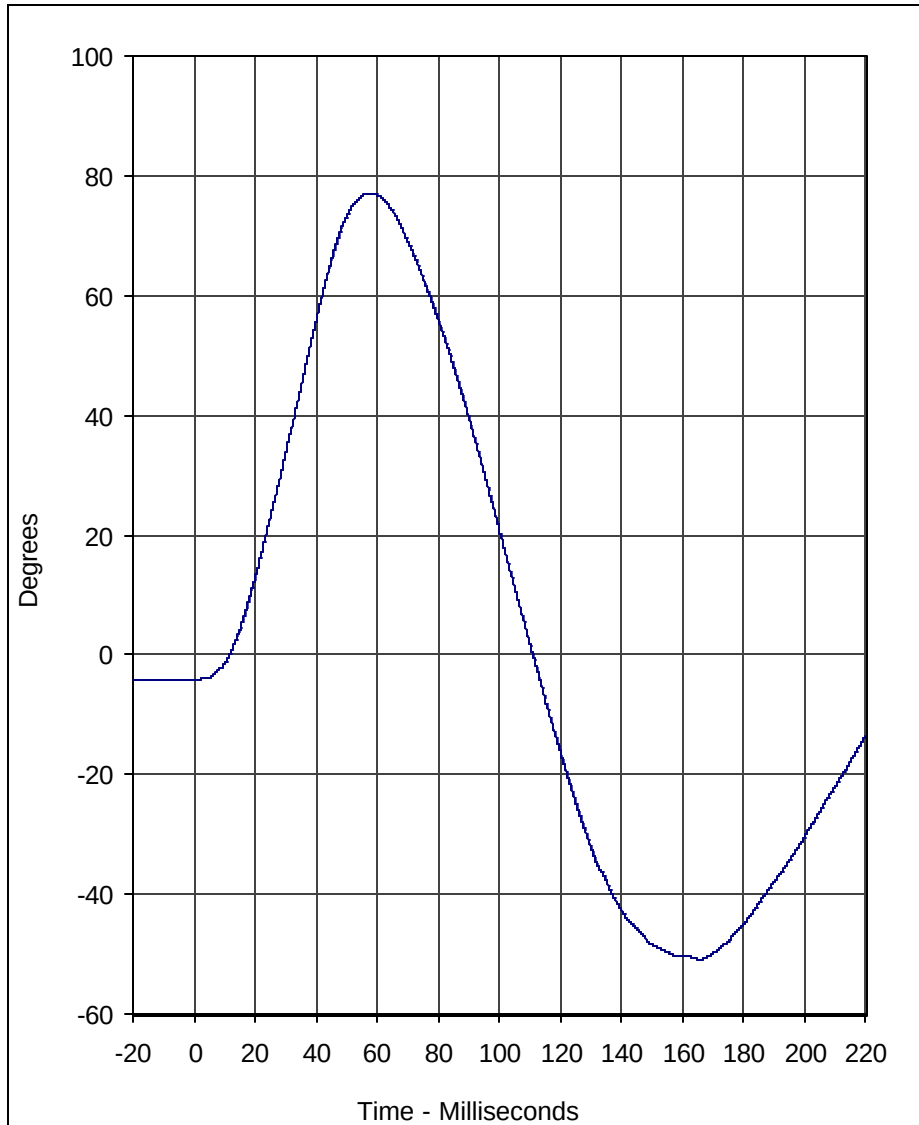


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	576.0	53.4	-75.6	190.3	1000

A.T.D. Serial No.: 139

Test I.D.: NF02B

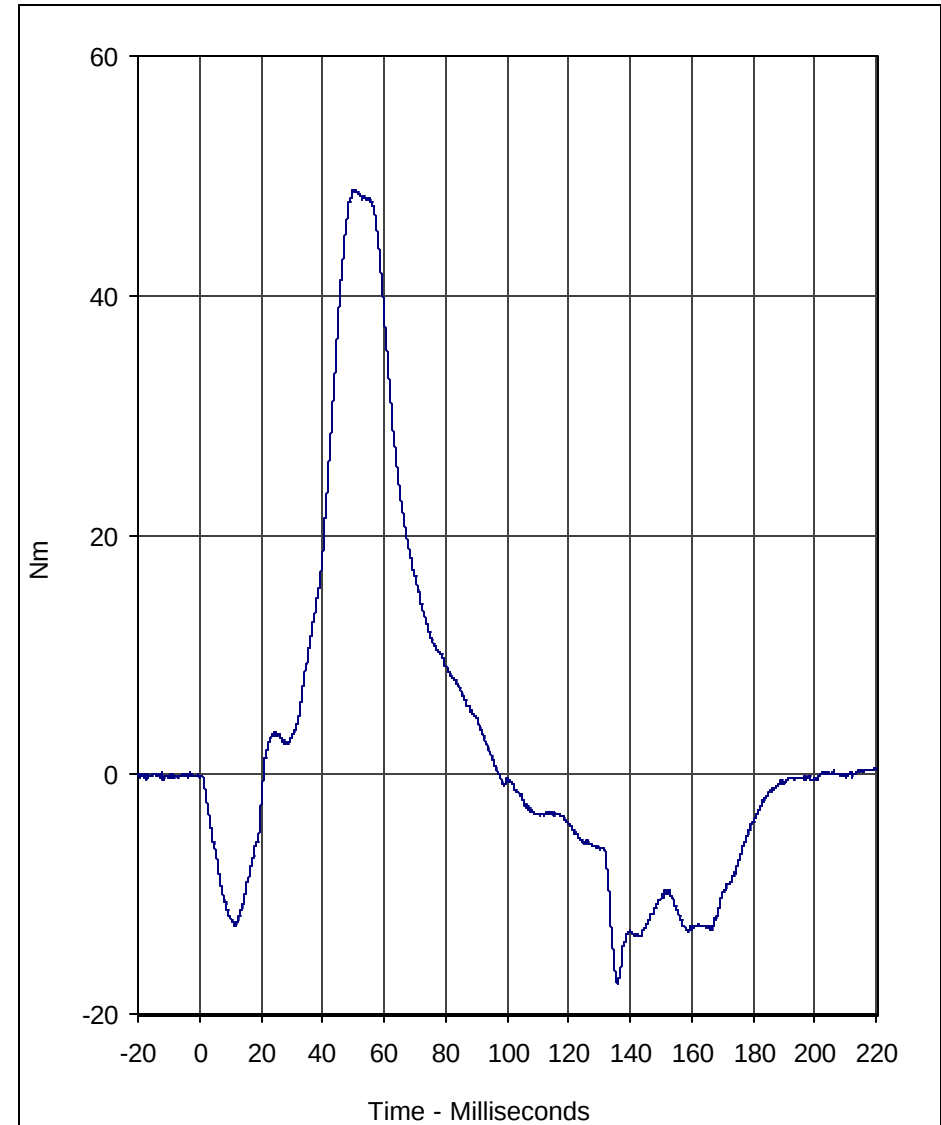




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	76.9	56.8	-51.0	166.0	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 1/7/04



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	48.9	50.0	-17.4	136.0	600

A.T.D. Serial No.: 139

Test I.D.: NF02B





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Extension Test

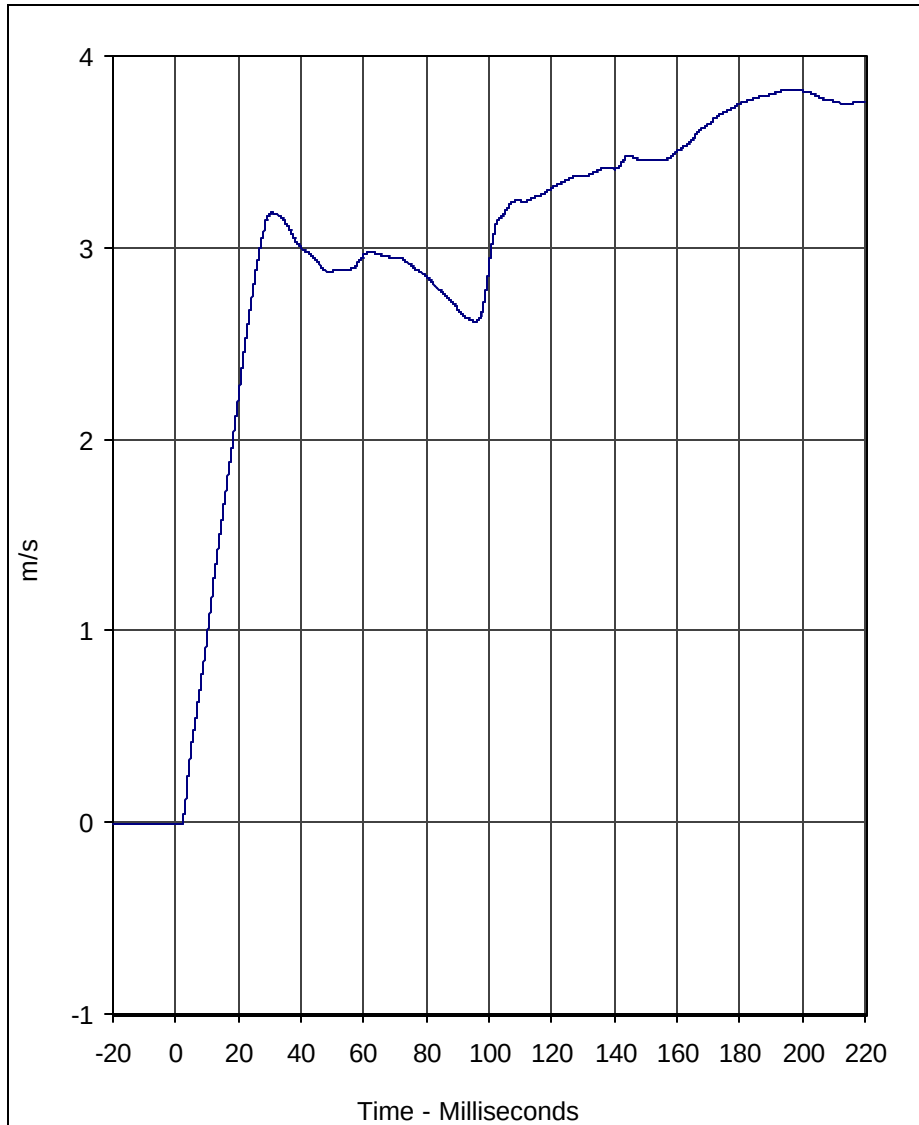
ATD Serial No.: 139

Test I.D.: NE02B

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	3.55 to 3.75	3.63	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.1	Pass
	20 Msec.	m/s	1.9 to 2.5	2.2	Pass
	30 Msec.	m/s	2.8 to 3.5	3.2	Pass
"D" Plane Rotation	Maximum	Degrees	83.0 to 93.0	84.2	Pass
Peak Moment in Rotation	Maximum	Nm	-43.7 to -53.3	-47.0	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	79.9	Pass
Overall Test Results					Pass

Laboratory Technician

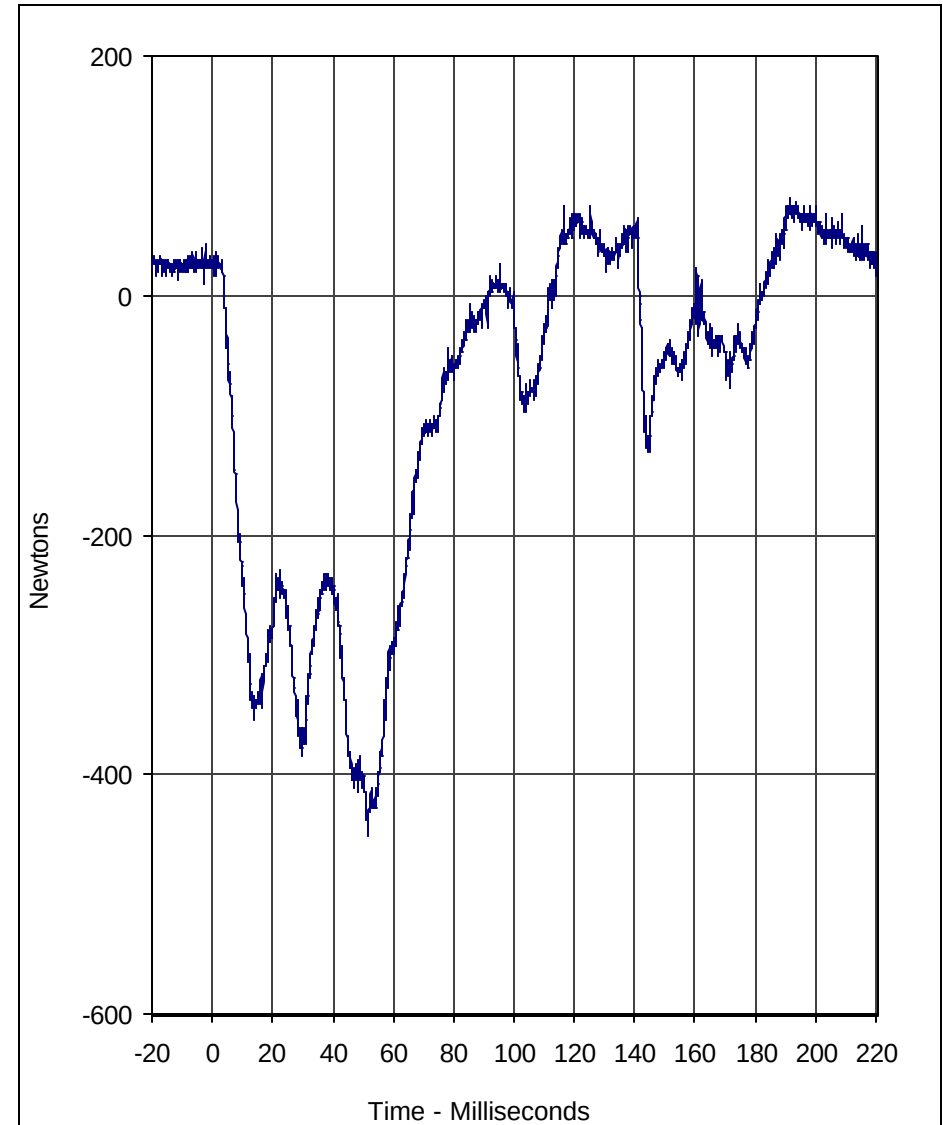
January 7, 2004
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	3.8	196.2	0.0	1.6	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 1/7/04

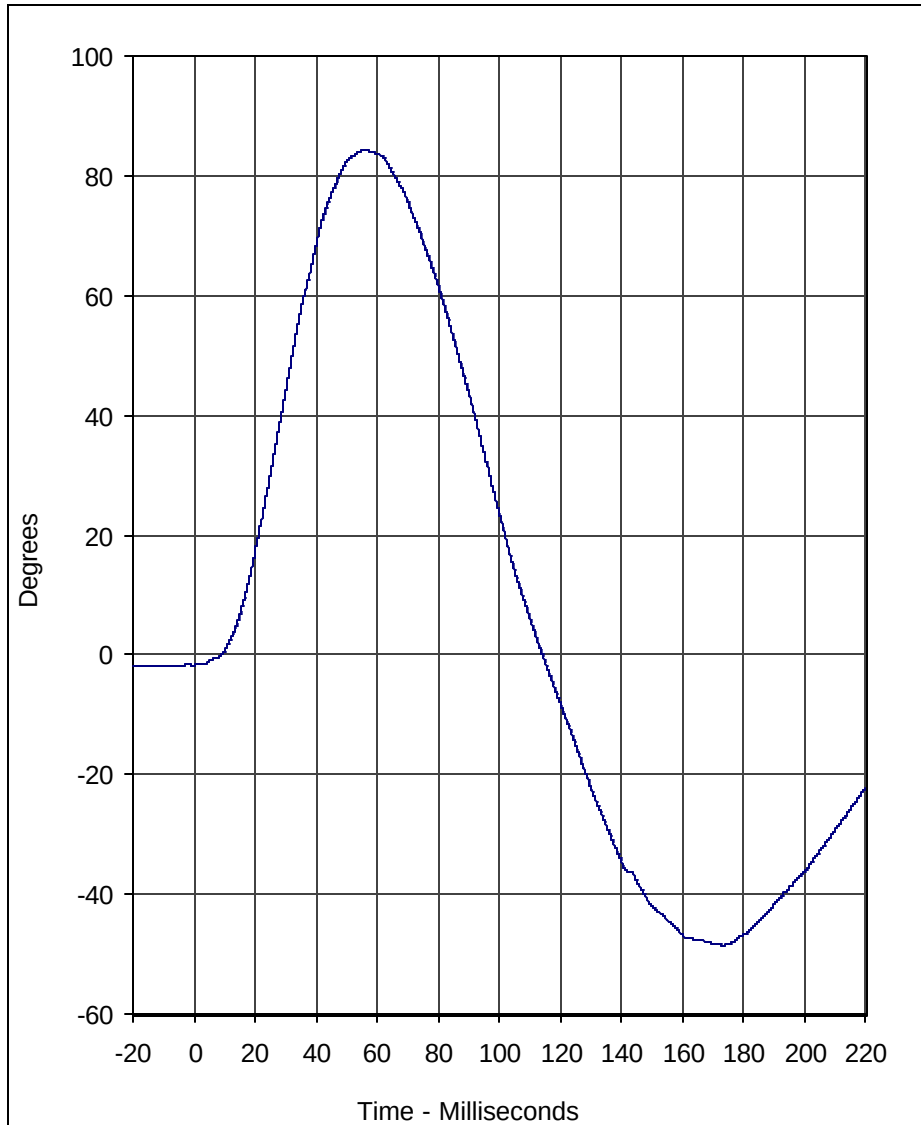


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	80.9	191.6	-451.7	51.5	1000

A.T.D. Serial No.: 139

Test I.D.: NE02B

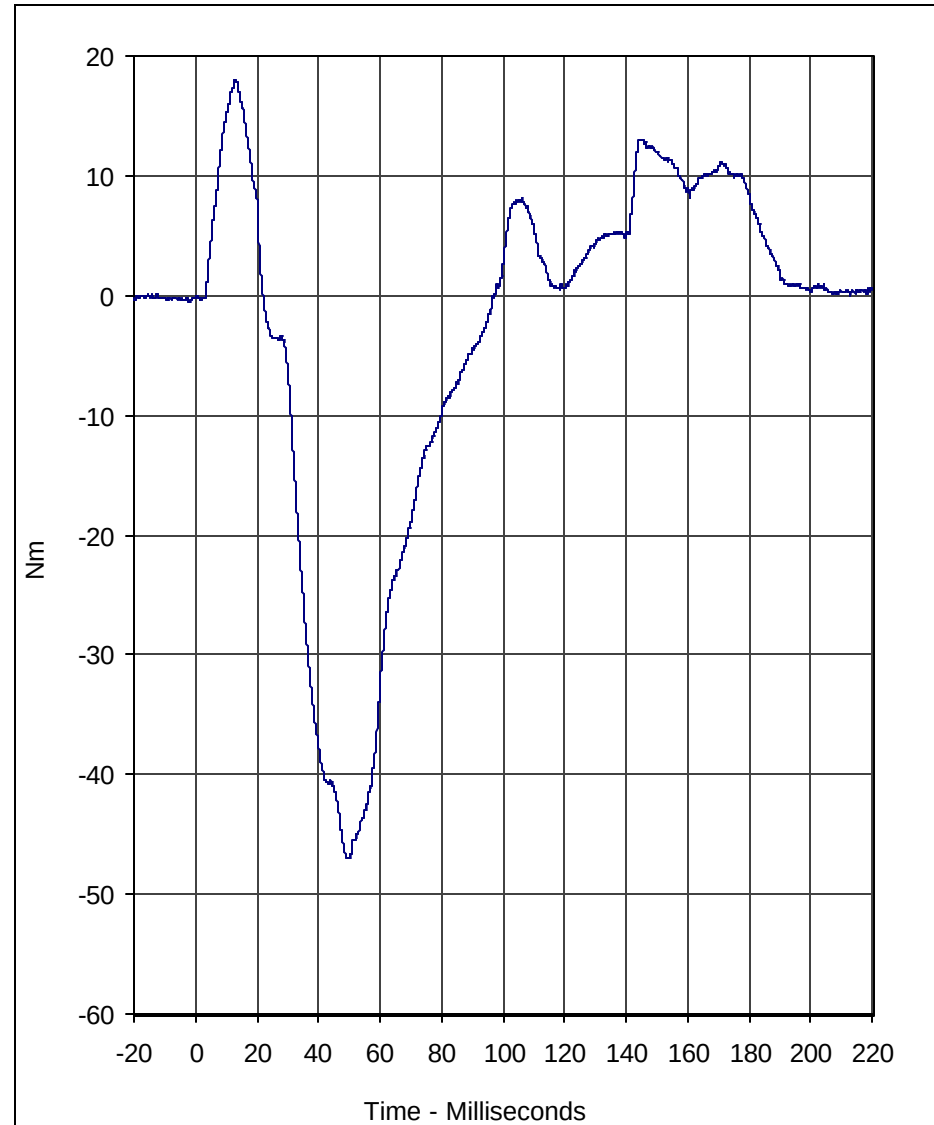




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	84.2	55.9	-48.6	173.5	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 1/7/04



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	18.0	12.8	-47.0	49.3	600

A.T.D. Serial No.: 139

Test I.D.: NE02B





Calibration Data Sheet

Hybrid III 3 Year Old

Torso Flexion Test

ATD Serial No.: 139

Test I.D.: TF02B

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
Initial reference plane angle	Degrees	≤15.0	3.8	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	178.5	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	0.7	Pass
Final reference plane angle	Degrees	+/-10	2.6	Pass
Overall Test Results				Pass

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TR-P24001-15-NC

Laboratory Technician

January 7, 2004

Test Date



Calibration Data Sheet Hybrid III 3 Year Old External Measurements

ATD Serial No.: 139

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	539 to 554	545	Pass
B - Shoulder pivot height	mm	307 to 323	320	Pass
C - "H" point height	mm	34 to 45	35	Pass
D - "H" point from backline	mm	57 to 67	65	Pass
E - Shoulder pivot from back	mm	61 to 71	67	Pass
F - Thigh clearance	mm	81 to 91	84	Pass
G - Elbow back to wrist pivot	mm	247 to 263	252	Pass
H - Skull cap to back line	mm	48 to 58	50	Pass
I - Shoulder to elbow length	mm	185 to 201	194	Pass
J - Elbow rest height	mm	134 to 149	140	Pass
K - Buttock to knee length	mm	285 to 300	296	Pass
L - Popliteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	245	Pass
N - Buttock popliteal length	mm	218 to 233	223	Pass
O - Chest depth with jacket	mm	139 to 154	150	Pass
P - Foot length	mm	138 to 148	145	Pass
R - Buttock to knee pivot length	mm	251 to 262	260	Pass
S - Head Breadth	mm	128 to 144	140	Pass
T - Head Depth	mm	167 to 183	175	Pass
U - Hip breadth	mm	201 to 216	212	Pass
V - Shoulder breadth	mm	237 to 252	243	Pass
W - Foot breadth	mm	54 to 64	56	Pass
X - Head circumference	mm	500 to 516	512	Pass
Y - Chest circumference with jacket	mm	527 to 553	535	Pass
Z - Waist circumference	mm	527 to 553	542	Pass
AA - Location for chest circumference	mm	249 to 259	254	Pass
BB - Location for waist circumference	mm	160 to 170	164	Pass
Overall Test Results				Pass

Laboratory Technician

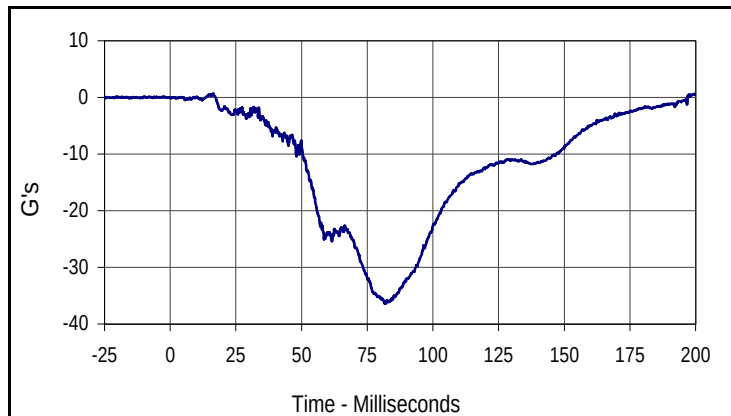
January 7, 2004
Test Date

APPENDIX G

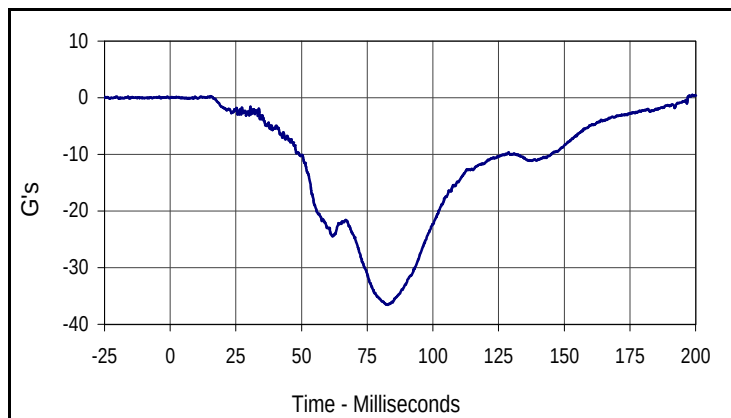
NINE ACCELEROMETER ARRAY HEAD

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

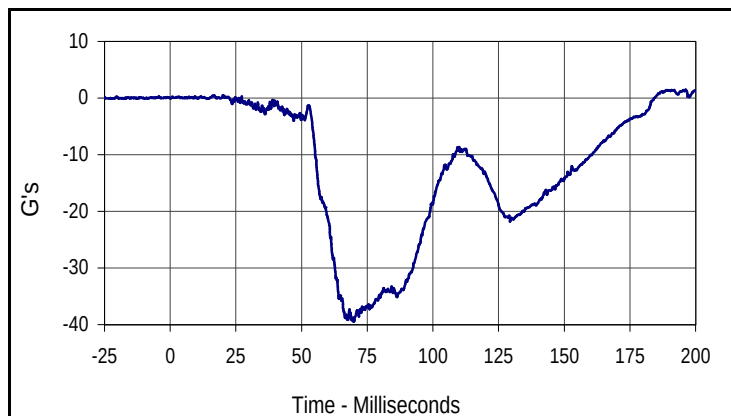
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.7	16.4	-36.4	81.7



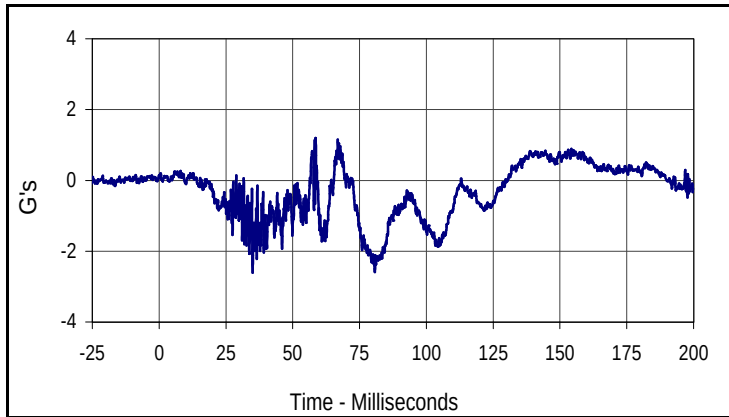
Curve Description			
Driver NAAH Yarm-X			
CURNO	Type	SAE Class	Units
188	FIL	1000	G's
Max	Time	Min	Time
0.5	198.7	-36.6	82.7



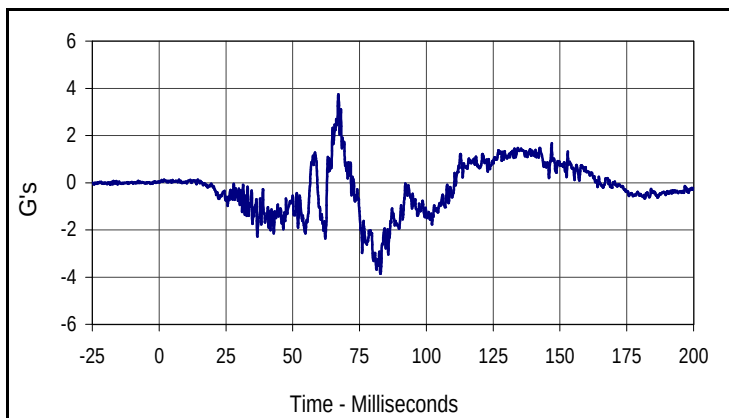
Curve Description			
Driver NAAH Zarm-X			
CURNO	Type	SAE Class	Units
190	FIL	1000	G's
Max	Time	Min	Time
1.4	196.2	-39.5	69.9

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

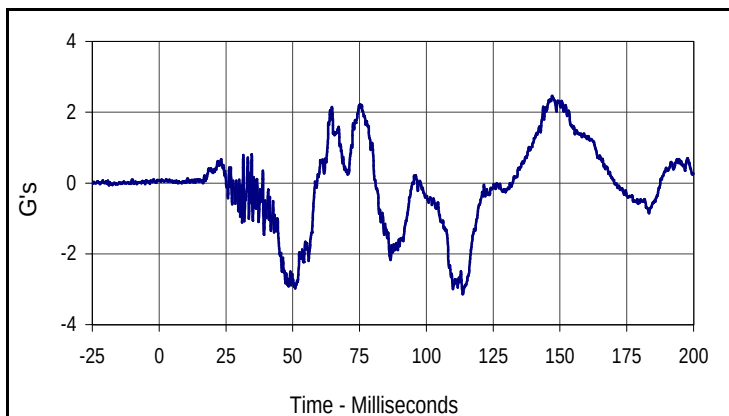
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.2	58.6	-2.6	35.0



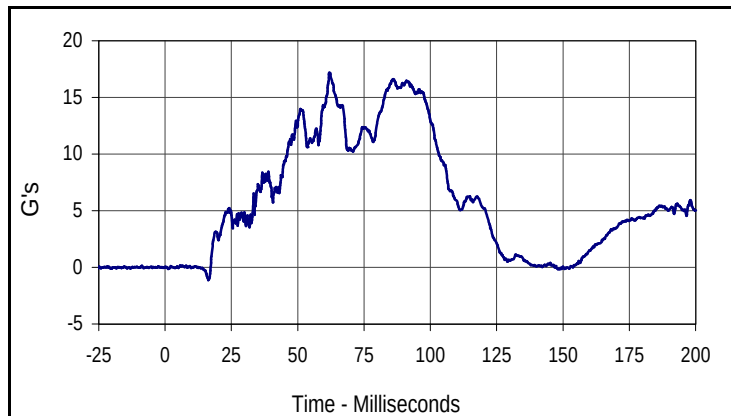
Curve Description			
Driver NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
186	FIL	1000	G's
Max	Time	Min	Time
3.7	67.1	-3.9	82.8



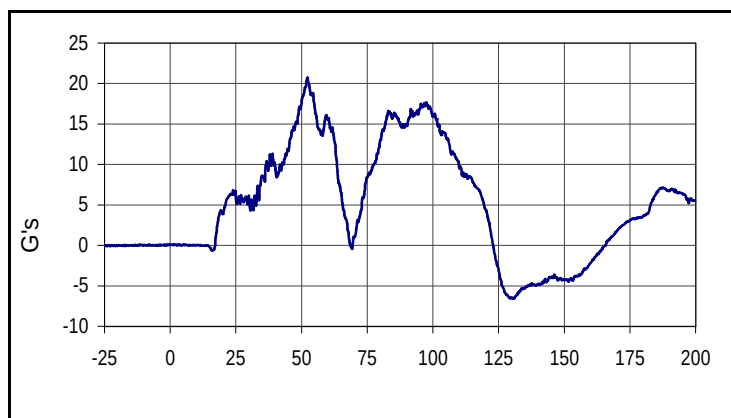
Curve Description			
Driver NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
191	FIL	1000	G's
Max	Time	Min	Time
2.5	147.1	-3.1	113.7

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

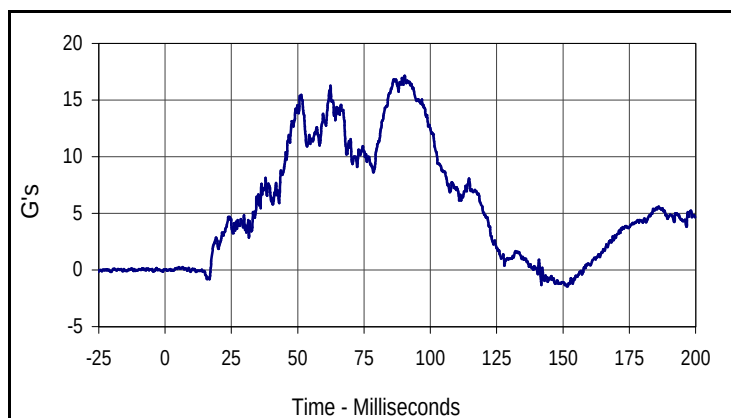
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
17.2	62.1	-1.1	16.3



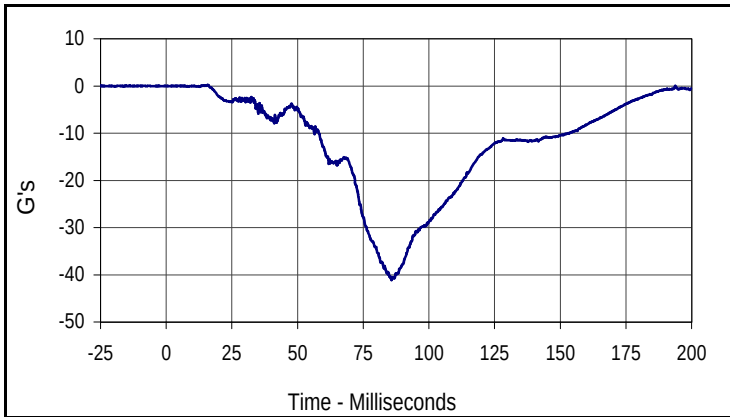
Curve Description			
Driver NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
187	FIL	1000	G's
Max	Time	Min	Time
20.7	52.2	-6.6	130.5



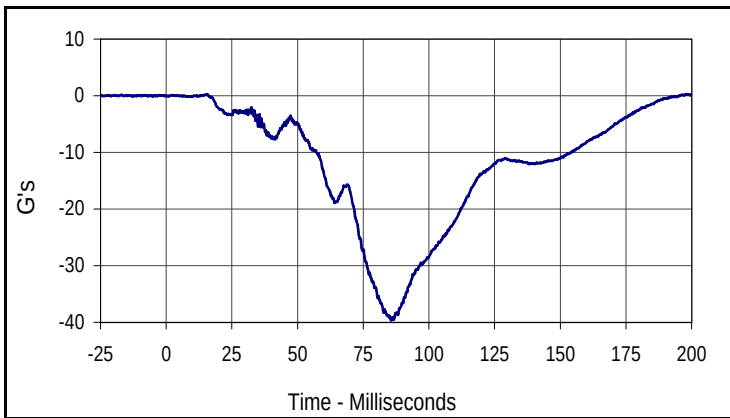
Curve Description			
Driver NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
189	FIL	1000	G's
Max	Time	Min	Time
17.2	90.3	-1.5	151.7

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

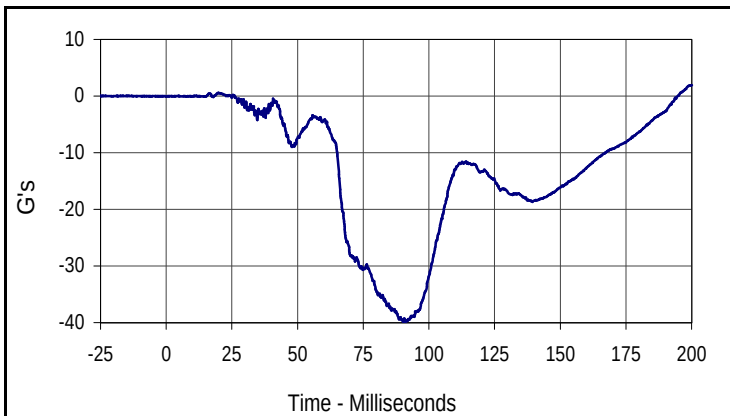
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
045	FIL	1000	G's
Max	Time	Min	Time
0.2	15.8	-41.1	85.7



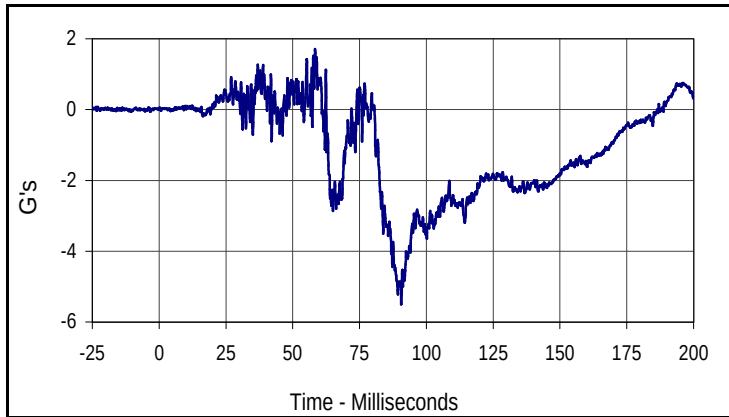
Curve Description			
Passenger NAAH Yarm-X			
CURNO	Type	SAE Class	Units
194	FIL	1000	G's
Max	Time	Min	Time
0.3	198.3	-39.6	85.6



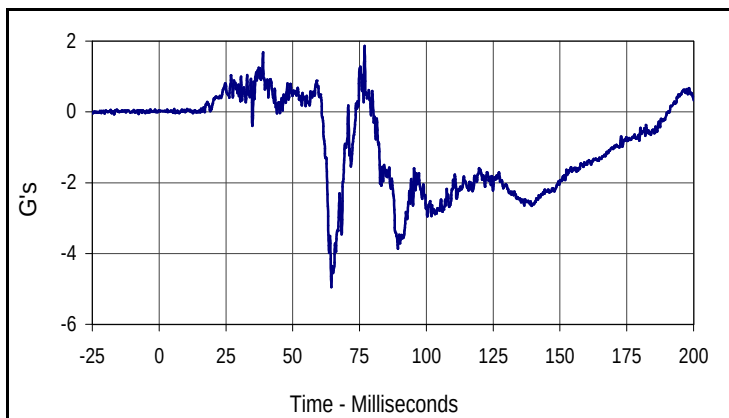
Curve Description			
Passenger NAAH Zarm-X			
CURNO	Type	SAE Class	Units
196	FIL	1000	G's
Max	Time	Min	Time
1.9	199.8	-39.9	90.3

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

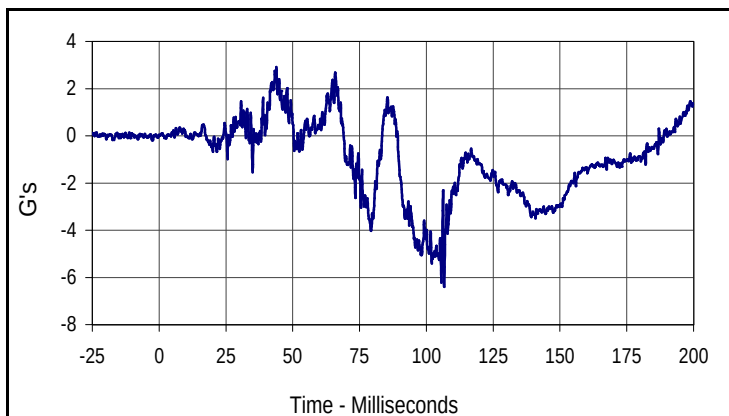
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
046	FIL	1000	G's
Max	Time	Min	Time
1.7	58.4	-5.5	90.6



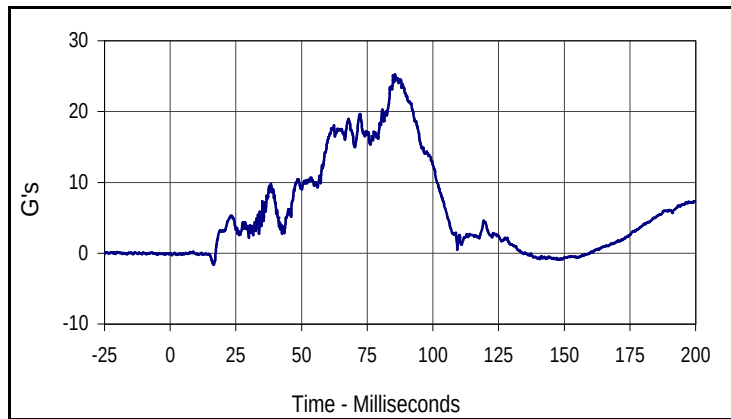
Curve Description			
Passenger NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
192	FIL	1000	G's
Max	Time	Min	Time
1.9	76.9	-5.0	64.5



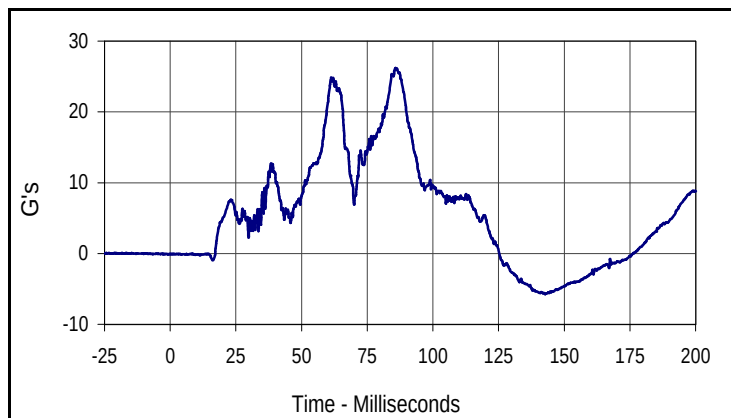
Curve Description			
Passenger NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
197	FIL	1000	G's
Max	Time	Min	Time
2.9	43.9	-6.4	106.7

Test Vehicle: 2004 Saturn Vue MPV
 Test Program: 2004 NHTSA 35mph NCAP

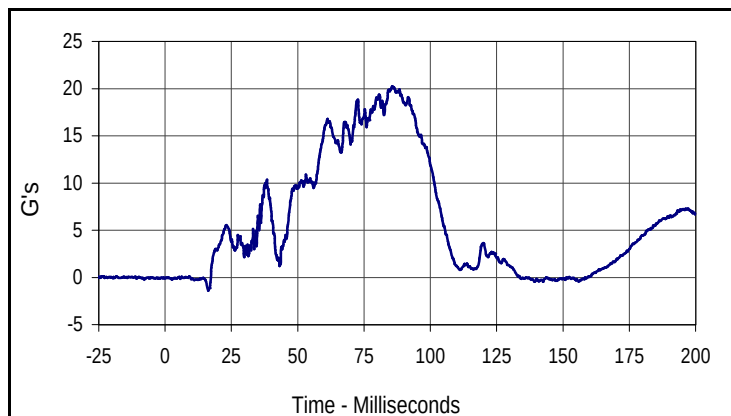
Test Date: 2/19/04
 NHTSA No.: M40111



Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
047	FIL	1000	G's
Max	Time	Min	Time
25.2	85.6	-1.6	16.6



Curve Description			
Passenger NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
193	FIL	1000	G's
Max	Time	Min	Time
26.2	85.7	-5.7	142.7



Curve Description			
Passenger NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
195	FIL	1000	G's
Max	Time	Min	Time
20.3	85.6	-1.4	16.3