

REPORT NUMBER TR-P23001-17-NC

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

**BAYERISCHE MOTORENWERKE AG
2003 BMW X5 3.0i
SUV**

NHTSA NUMBER: M30501

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



MARCH 18, 2003

FINAL REPORT

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U.S. DEPARTMENT OF TRANSPORTATION
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Date of Acceptance

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Date of Acceptance

Technical Report Documentation Page

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16. Abstract A 35mph (56.3 km/h) frontal barrier impact was conducted on a 2003 BMW X5 3.0i SUV at KARCO Engineering, LLC on 3/18/03. This test was conducted to obtain data indicant of FVMSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 55.82 km/h. The ambient temperature at the barrier face at the time of impact is 13.3 degrees Celcius. The test vehicle sustained post-impact maximum static crush of 540 mm to the left of 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:																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;">Measurement Description</th> <th style="width: 10%;">Units</th> <th style="width: 10%;">Threshold</th> <th style="width: 15%;">Driver ATD</th> <th style="width: 15%;">Pass. ATD</th> <th style="width: 15%;"></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>N/A</td> <td>1000</td> <td style="background-color: yellow;">496.5</td> <td style="background-color: yellow;">437.3</td> <td rowspan="4" style="background-color: #cccccc;"></td> </tr> <tr> <td>Max. Thorax Accel. (3 msec clip)</td> <td>G's</td> <td>60</td> <td style="background-color: yellow;">42.7</td> <td style="background-color: yellow;">44.3</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10000</td> <td style="background-color: yellow;">-721.7</td> <td style="background-color: yellow;">-520.7</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10000</td> <td style="background-color: yellow;">-774.3</td> <td style="background-color: yellow;">-486.9</td> </tr> </tbody> </table>		Measurement Description	Units	Threshold	Driver ATD	Pass. ATD		Head Injury Criteria (HIC)	N/A	1000	496.5	437.3		Max. Thorax Accel. (3 msec clip)	G's	60	42.7	44.3	Left Femur Force	Newtons	10000	-721.7	-520.7	Right Femur Force	Newtons	10000	-774.3	-486.9	17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2003 BMW X5 3.0i SUV NHTSA No. M30501			
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SECTION 1

PURPOSE AND SUMMARY OF TEST M30501

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-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 2003 BMW X5 3.0i SUV at a velocity of 55.82 km/h. The test was performed at Karco Engineering, LLC on March 18, 2003.

One real-time and 21 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 head (primary and redundant), chest (primary and redundant) 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 one test prior to this test.

Ninety Seven (97) 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).

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 540 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 and the abdomen had no contact. Both knees contacted the steering column/knee bolster.

The passenger's visible contact points were as follows: The passenger ATD head, chest and abdomen contacted the airbag. Both knees contacted the glove box/airbag.

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	496.5	42.7	-30.7	-721.7	-774.3	296.1
Passenger	437.3	44.3	-29.6	-520.7	-486.9	274.4

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

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	$=(t_f - 32)/1.8$
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: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.82
Test Weight	kg	2400
Impact Angle	degrees	0
Average Rebound	mm	630
Maximum Static Crush	mm	540

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	Airbag
Left Knee Contact	Knee Bolster/Steering Column	Glovebox/Airbag
Right Knee Contact	Knee Bolster/Steering Column	Glovebox/Airbag

16mm MOVIE COVERAGE

High Speed	21
Real Time	1
Total	22

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	6
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	36
Total	131

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

TEST VEHICLE INFORMATION

Make	BMW
Model	X5 3.0i
Body Style	4 Door Suv
NHTSA No.	M30501
VIN	5UXFA53553LV85638
Color	White
Delivery Date	3/12/2003
Odometer Reading (mi.)	11
Dealer	BMW of Palm Springs
Transmission	4 Speed Automatic
Final Drive	Rear
Type/No. Cylinders	In-line 6
Engine Displacement (L)	3.0
Engine Placement	Longitudinal
Roof Rack	Yes
Sunroof/T-Top	Yes
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

TEST VEHICLE OPTIONS

Anti-Lock Brakes (ABS)	Yes
All Wheel Drive	No
Power Steering	Yes
Driver Airbag	Yes
Driver Side Bag	Yes
Driver Head Bag	Yes
Pass. Airbag	Yes
Pass. Side Bag	No
Pass. Head Bag	Yes
Pre-tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Center Console	Yes
Air Cond.	Yes
AM/FM Cassette	No
Tilt Steering	Yes
Power Door Locks	Yes
Power Windows	Yes
Power Seats	Driver Only
Other	

DATA FROM CERTIFICATION LABEL

Manufactured By	Bayerische Motorenwerke	GVWR (kg)	2724
Date of Manufacture	February-03	GAWR Front (kg)	1264
		GAWR Rear (kg)	1500

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	None	
Number of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				589
Cargo Weight (RCLW) (kg)				136

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

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	357	357
Cold Pressure (kPa)	220	270
Recommend Tire Size	P235/65R17	P235/65R17
Tire Size on Vehicle	P235/65R17	P235/65R17
Tire Manufacturer	Michelin	Michelin
Treadwear	400	400
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	2	2
Load Index/Speed Symbol	104 HM+S	104 HM+S
Tire Material	Polyester/Steel/Polyamid	Polyester/Steel/Polyamid
DOT Safety Code Right	HNH2-D38X-5002	HNH2-D38X-5002
DOT Safety Code Left	HNH2-D38X-5002	HNH2-D38X-5002

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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	518	550		553	666	
Right	kg	516	533		543	638	
Ratio	%	48.8	51.2		45.7	54.3	
Totals	kg	1034	1083	2117	1096	1304	2400

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2117
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Vehicle Target Weight (TVTW)	kg	2405

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	819	825	837	841	1444
As Tested	mm	813	823	818	822	1531

Vehicle Wheel base (mm): 2820

Weight of Ballast secured in cargo area (kg): 74

Vehicle Components Removed: Bumper cover

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

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 93.1

Usable Capacity Figure Furnished by COTR (L): 93.1

Actual Test Volume with entire fuel System Filled (L): 30.6*

Test Fluid Type: Stoddard Solvent ; Specific Gravity: 0.764

Kinematic Viscosity: as per ASTM Standard D484-71 ; Color: Purple

Is Vehicle Fuel Pump Electric or Mechanical?: Electric

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

Fuel System Particulars: * Note: solvent level decreased to make target test weight

**DATA SHEET NO. 3
POST IMPACT DATA**

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.51 to 57.12	55.82
Trap No. 1 Entry Distance	mm	< 1524	1524
Trap No. 1 Exit Distance	mm	< 1524	305
Trap No. 2 Velocity (Redundant)	km/h	55.51 to 57.12	55.84
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	4406	4035	-371
Center	mm	4655	4144	-511
Right Side	mm	4406	4045	-361

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	675
Center	mm	560
Right Side	mm	655
Average	mm	630

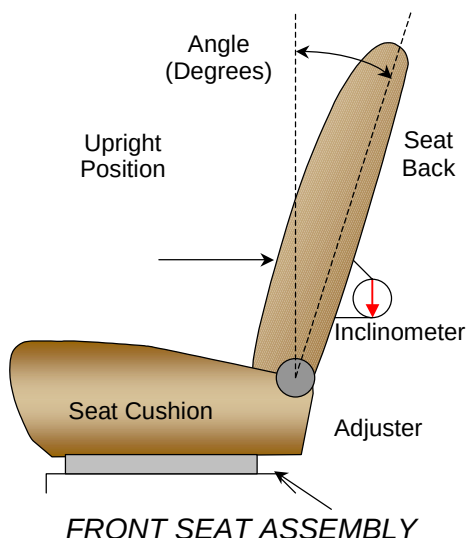
DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

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	18
Passenger w/seated Dummy	18

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	203mm	101.5mm
Passenger Seat	35	18

SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position.

SEAT BELT UPPER ANCHORAGE

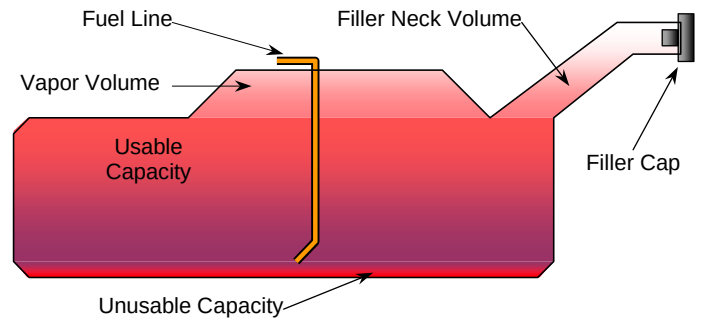
	Total # of Positions	Placed in Position #
Driver Seat	4	2
Passenger Seat	4	2

DATA SHEET NO. 4...(CONTINUED)**TEST VEHICLE INFORMATION**Test Vehicle: 2003 BMW X5 3.0i SUVNHTSA No.: M30501Test Program: 2003 NHTSA 35mph NCAPTest Date: 03/18/03**FUEL TANK CAPACITY DATA**

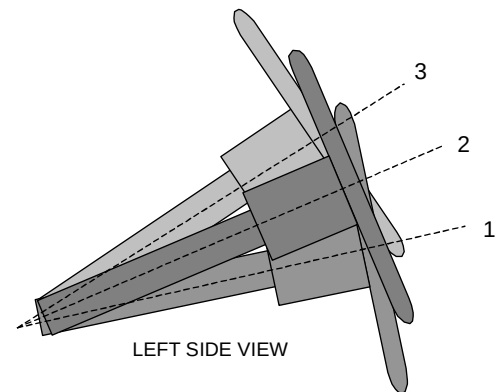
	Liters
Usable Capacity of "Standard Tank"	93.1
Usable Capacity of "Optional Tank"	N/A
Usable Capacity used for FMVSS 301	85.66 to 87.52
Actual Amount of Solvent Used	30.6*

* Note: Solvent level decreased to make target test weight

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; position No. 1	69
Geometric center; position No. 2	67
Uppermost; position No. 3	65

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

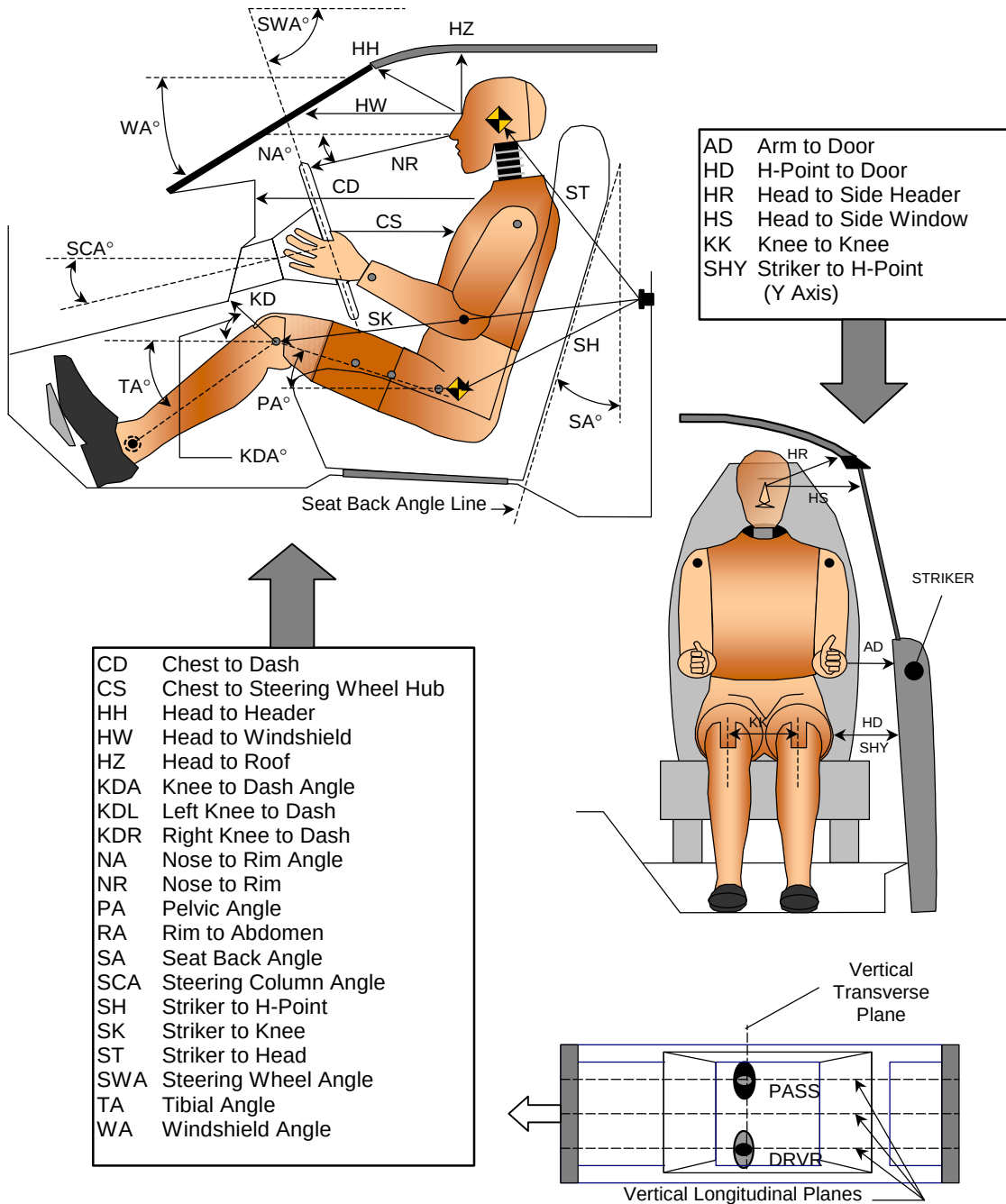
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		68		
SWA	Steering Wheel Angle		67.0		
SCA	Steering Column Angle		23.0		
SA	Seat Back Angle		18.0		18.0
HZ	Head to Roof (Z)	240	90	245	90
HH	Head to Header	495		465	
HW	Head to Windshield	780		785	
HR	Head to Side Header (Y)	290		290	
NR	Nose to Rim	490	6		
CD	Chest to Dash	625		595	
CS	Chest to Steering Hub	380			
RA	Rim to Abdomen	275			
KDL	Left Knee to Dash	205	12	155	
KDR	Right Knee to Dash	160		205	21
PA	Pelvic Angle		25		25
TA	Tibia Angle		43		39
KK	Knee to Knee (Y)	315		315	
ST	Striker to Head	525	11	540	10
SK	Striker to Knee	450	87	464	86
SH	Striker to H-Point	130		135	
SHY	Striker to H-Point (Y)	235		240	
HS	Head to Side Window	365		355	
HD	H-Point to Door (Y)	168		165	
AD	Arm to Door (Y)	110		50	

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

Test Vehicle: 2003 BMW X5 3.0i SUV
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NHTSA No.: M30501
 Test Date: 03/18/03

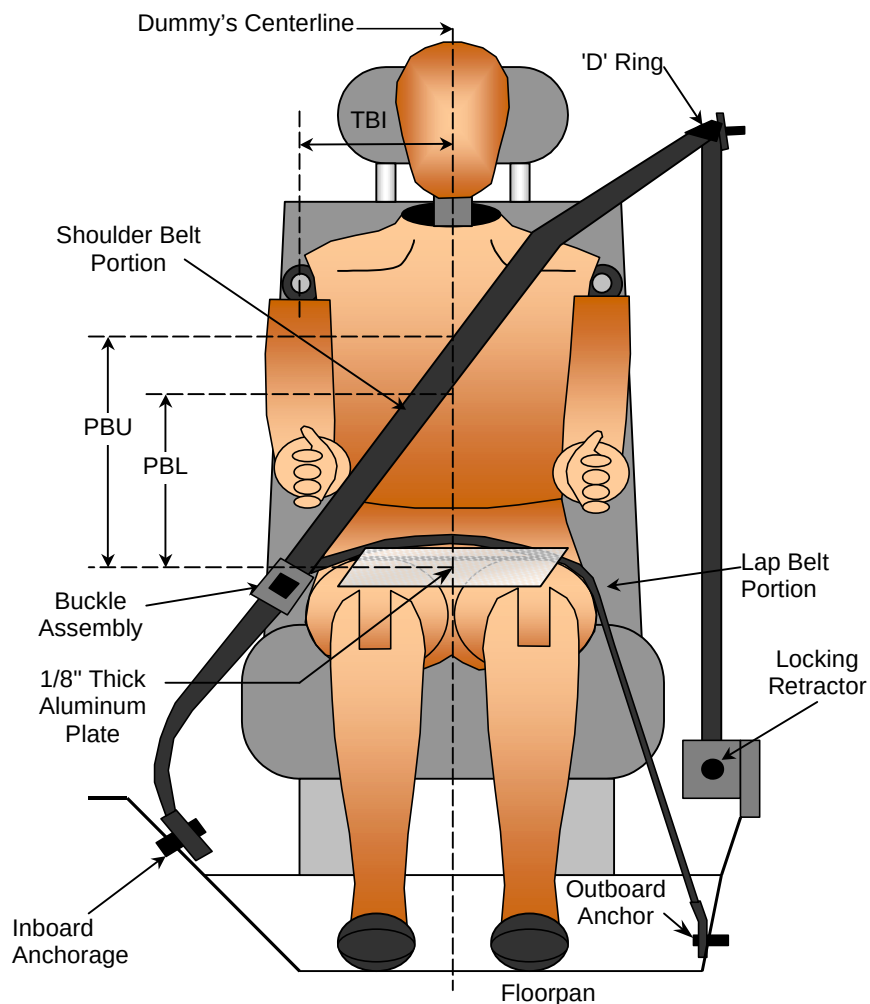


DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6 SEATBELT POSITIONING DATA

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	185	190
PBU - Top surface of reference to belt upper edge	mm	310	280
PBL - Top surface of reference to belt lower edge	mm	230	200
Lap Belt tension	Newton's	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

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

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

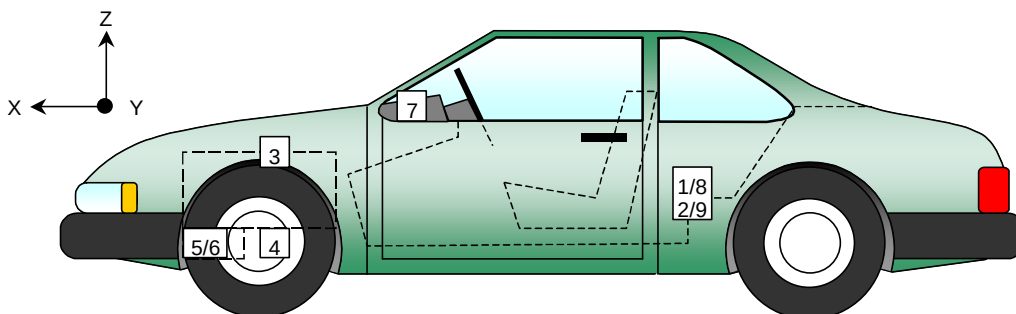
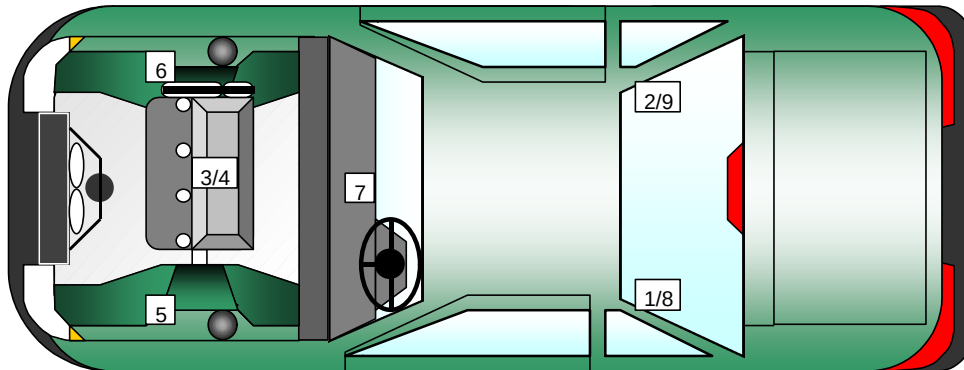
Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

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	-735	490	G's	2.2	121.0	-35.0	32.0
2	Right Rear X-Member	1850	735	490	G's	2.1	121.4	-41.7	38.0
3	Engine Top	3960	-220	930	G's	32.8	44.3	-155.9	33.5
4	Engine Bottom	3150	0	210	G's	28.0	43.6	-98.5	32.7
5	Left Brake Caliper	3650	-710	295	G's	108.1	61.0	-121.1	37.6
6	Right Brake Caliper	3650	710	295	G's	82.2	61.9	-107.6	37.4
7	Instrument Panel	3020	0	1190	G's	7.3	89.7	-55.9	72.2
8	Left Rear X-Member (Z-Axis)	1780	-735	490	G's	6.9	73.6	-5.1	45.1
9	Right Rear X-Member (Z-Axis)	1780	735	490	G's	7.5	49.4	-8.0	29.2

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



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

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	10.9	253.5	-58.6	82.5	9.8	262.4	-49.2	83.5
Head CG	Y	G's	3.0	134.9	-5.0	74.3	5.2	64.9	-11.5	96.9
Head CG	Z	G's	17.3	72.5	-2.6	98.3	28.0	76.6	-3.1	121.3
Head CG Resultant	N/A	G's	59.4	82.5			55.8	83.5		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.6	280.3	-43.3	64.4	1.8	299.9	-45.5	67.6
Chest CG	Y	G's	5.5	69.9	-6.6	47.7	2.8	45.8	-8.4	82.4
Chest CG	Z	G's	7.3	81.9	-6.0	61.6	8.8	52.1	-6.5	113.7
Chest CG Resultant	N/A	G's	43.4	64.5			45.5	67.6		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	1266.5	53.2	-721.7	65.4	803.7	70.2	-520.7	80.0
Right Femur	Z	Newtons	809.1	47.1	-774.3	63.7	1375.6	54.3	-486.9	90.7

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Shoulder Belt Pullout	N/A	MM	296.1	90.4	-0.3	10.6	274.4	86.4	-0.2	10.5
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	6088.3	56.6	-4.8	6.7	7721.6	62.5	-1.2	0.0
Shoulder Belt Force	N/A	Newtons	6838.8	81.6	-20.6	7.0	10150.7	80.9	-16.0	176.7

1.) Not used with pre-tensioner

2.) Passenger channel failed at 159.6 msec.

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary	496.5	65.9	99.6	46.4	437.3	63.1	99.0	43.0

PRIMARY CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	42.7	63.2	66.2	44.3	64.4	67.4

DATA SHEET NO. 8...(continued)

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	5.4	97.3	-60.1	65.7	4.4	99.2	-59.2	62.4
Pelvis	Y	G's	11.8	69.9	-5.0	44.9	4.0	45.7	-8.2	69.6
Pelvis	Z	G's	3.3	276.1	-32.7	61.2	3.4	280.3	-27.7	62.4
Pelvis Resultant	N/A	G's	68.1	63.6			65.7	62.4		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	838.7	78.5	-318.1	142.3	438.3	65.6	-376.7	119.9
Neck Force	Y	Newtons	119.4	136.8	-156.6	93.0	91.6	46.2	-281.6	94.7
Neck Force	Z	Newtons	782.2	72.2	-217.1	14.8	1127.5	76.5	-116.6	113.2
Neck Force Resultant	N/A	Newtons	1045.0	73.1			1133.9	76.5		
Neck Moment	X	N•m	9.1	73.7	-9.8	101.1	20.3	95.1	-4.5	66.7
Neck Moment	Y	N•m	36.4	66.0	-12.2	231.3	36.3	66.8	-15.2	231.3
Neck Moment	Z	N•m	4.3	75.7	-5.4	106.9	9.8	96.1	-7.9	73.2
Neck Moment Resultant	N/A	N•m	36.4	66.0			36.7	66.8		

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	14.0	93.9	-64.2	44.2	26.2	81.6	-137.0	50.1
Left Foot Aft	Z	G's	5.6	299.9	-57.3	45.6	21.9	70.8	-76.6	50.2
Left Foot Fore	Z	G's	0.0	0.0	0.0	0.0	29.3	71.0	-127.0	49.6
Right Foot Aft	X	G's	24.0	72.4	-191.7	53.3	12.6	95.7	-109.5	51.0
Right Foot Aft	Z	G's	8.8	65.5	-77.1	50.5	10.1	70.8	-58.0	49.5
Right Foot Fore	Z	G's	39.5	48.3	-151.3	50.4	20.8	39.5	-123.3	49.7

1.) Driver channel failed, no data

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	105.7	46.9	-25.9	66.2	8.1	243.3	-48.2	63.6
Left Upper Moment	Y	N•m	11.9	291.4	-31.5	89.1	26.0	60.0	-149.9	47.7
Right Upper Moment	X	N•m	21.5	149.8	-20.8	52.9	54.9	48.9	-9.6	142.1
Right Upper Moment	Y	N•m	12.2	118.8	-129.8	53.1	15.4	107.8	-117.9	50.5
Left Lower Moment	X	N•m	15.2	40.6	-8.0	99.6	18.8	94.5	-14.1	56.3
Left Lower Moment	Y	N•m	35.4	95.9	-29.4	45.4	36.9	93.3	-54.4	51.0
Left Lower Force	Z	Newtons	78.7	121.0	-2560.8	47.0	71.5	134.3	-4470.2	49.0
Right Lower Moment	X	N•m	7.6	150.5	-32.6	52.7	41.9	91.2	-28.3	47.5
Right Lower Moment	Y	N•m	26.8	83.8	-53.4	54.1	31.0	90.8	-60.8	50.8
Right Lower Force	Z	Newtons	130.6	34.1	-3997.3	52.9	103.8	196.6	-2907.0	49.5

DATA SHEET NO. 8...(continued)Test Vehicle: 2003 BMW X5 3.0i SUVNHTSA No.: M30501Test Program: 2003 NHTSA 35mph NCAPTest Date: 3/18/03**CHEST PEAK DISPLACEMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.2	0.3	-30.7	76.2	0.4	0.4	-29.6	84.2

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	11.0	251.6	-58.7	82.7	10.1	261.9	-49.2	83.5
Head CG	Y	G's	3.2	140.9	-4.9	72.5	5.3	64.5	-12.4	95.5
Head CG	Z	G's	17.2	72.9	-2.7	98.9	28.1	76.6	-3.2	127.1
Head CG Resultant	N/A	G's	59.3	82.7			55.8	83.5		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.6	281.8	-43.6	64.1	1.8	266.1	-45.5	67.5
Chest CG	Y	G's	5.5	85.4	-6.5	47.6	2.7	44.6	-8.6	82.3
Chest CG	Z	G's	7.1	81.7	-6.3	61.4	9.0	52.1	-6.7	112.6
Chest CG Resultant	N/A	G's	43.8	64.1			45.5	67.5		

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	497.3	65.6	99.3	46.5	435.1	63.2	99.1	43.0

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	43.0	63.1	66.1	44.3	64.6	67.6

DATA SHEET NO. 9
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

SEAT BELT PLACEMENT MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	185	190
PBU -Top surface of reference to belt upper edge	mm	310	280
PBL - Top surface of reference to belt lower edge	mm	230	200
Lap Belt tension	Newton's	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to 'D' ring	mm	790	790
Shoulder belt length as measured on ATD	mm	770	815
Lap belt length as measured on ATD	mm	620	630
Remainder of belt on reel	mm	920	840
Total belt length for continuous webbing systems	mm	3100	3075

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	65.0	103.0
As determined electronically	mm	296.1	274.4

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically between shoulder 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: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

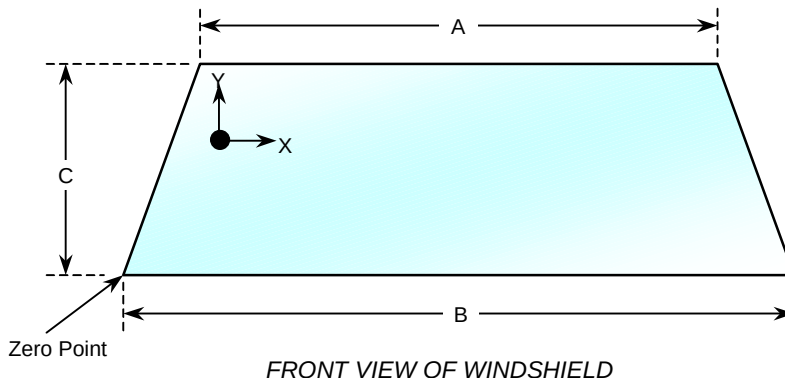
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

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	2231.0	2231.0	100
Right Side	2231.0	2231.0	100
Total	4462.0	4462.0	100



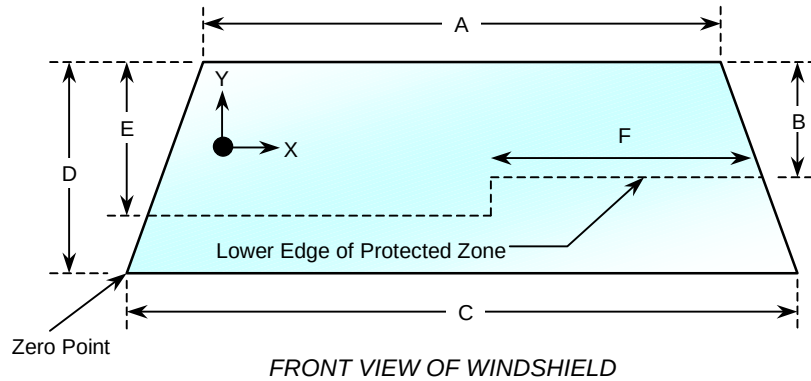
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1262	10
B	mm	1550	0
C	mm	825	21
C	mm	825	21

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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1262
B	mm	496
C	mm	1550
D	mm	825
E	mm	515
F	mm	561

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: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

Test Time: 1:22 PM

Temperature at Test Time: 13.3 Deg. C

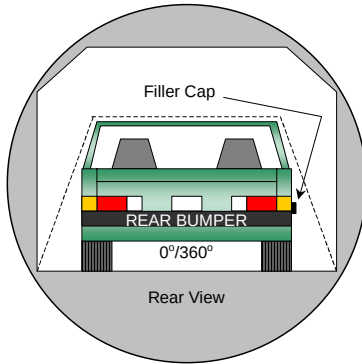
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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

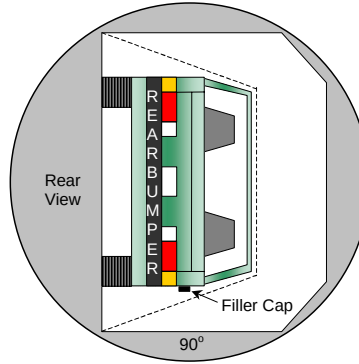
DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

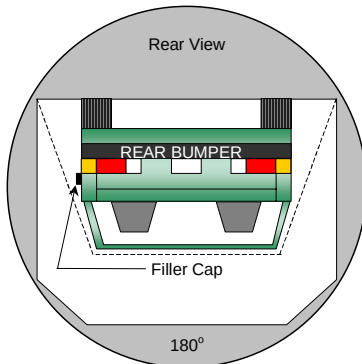
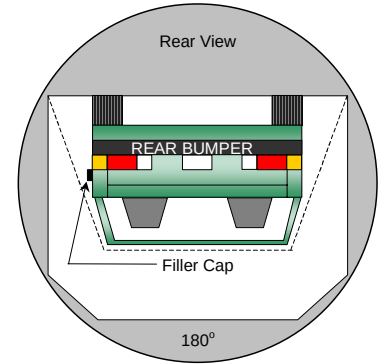
NHTSA No.: M30501
Test Date: 03/18/03



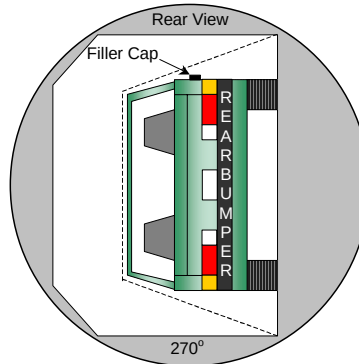
0° to 90°



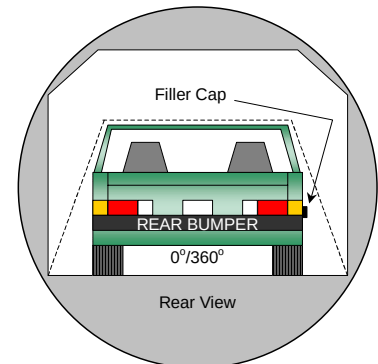
90° to 180°



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: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	84	300	384
90° to 180°	77	300	377
180° to 270°	78	300	378
270° to 360°	79	300	379

FMVSS 301 SPILLAGE REQUIREMENT TABLE (oz.)

First 5 minutes	5.0
Sixth Minute	1.0
Seventh minute	1.0
Eighth Minute	1.0

ACTUAL TEST VEHICLE SOLVENT SPILLAGE (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: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4655	4144	-511
2	RSOV to front of engine	mm	4196	3903	-293
3	RSOV to firewall centerline	mm	3704	3560	-144
4	RSOV to leading edge of right door	mm	3240	3250	10
5	RSOV to leading edge of left door	mm	3242	3245	3
6	RSOV to lower leading edge of right door	mm	3205	3200	-5
7	RSOV to lower leading edge of left door	mm	3205	3200	-5
8	RSOV to upper trailing edge of right door	mm	2055	2060	5
9	RSOV to upper trailing edge of left door	mm	2055	2060	5
10	RSOV to lower trailing edge of right door	mm	2091	2286	195
11	RSOV to lower trailing edge of left door	mm	2090	2084	-6
12	RSOV to bottom of right 'A' pillar	mm	3166	3168	2
13	RSOV to bottom of left 'A' pillar	mm	3166	3175	9
14	RSOV to firewall on right side	mm	3662	3480	-182
15	RSOV to firewall of left side	mm	3665	3495	-170
16	RSOV to steering column	mm	2600	2630	30
17	Center of steering column to left 'A' pillar	mm	430	420	-10
18	Center of steering column to headlining	mm	440	410	-30
19	RSOV to right side of front bumper	mm	4406	4045	-361
20	RSOV to left side of front bumper	mm	4406	4035	-371
21	Length of engine block	mm	700	700	0
RD	RSOV to right side of dash panel	mm	2815	2828	13
CD	RSOV to center of dash panel	mm	2770	2765	-5
LD	RSOV to left side of dash panel	mm	2815	2820	5

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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

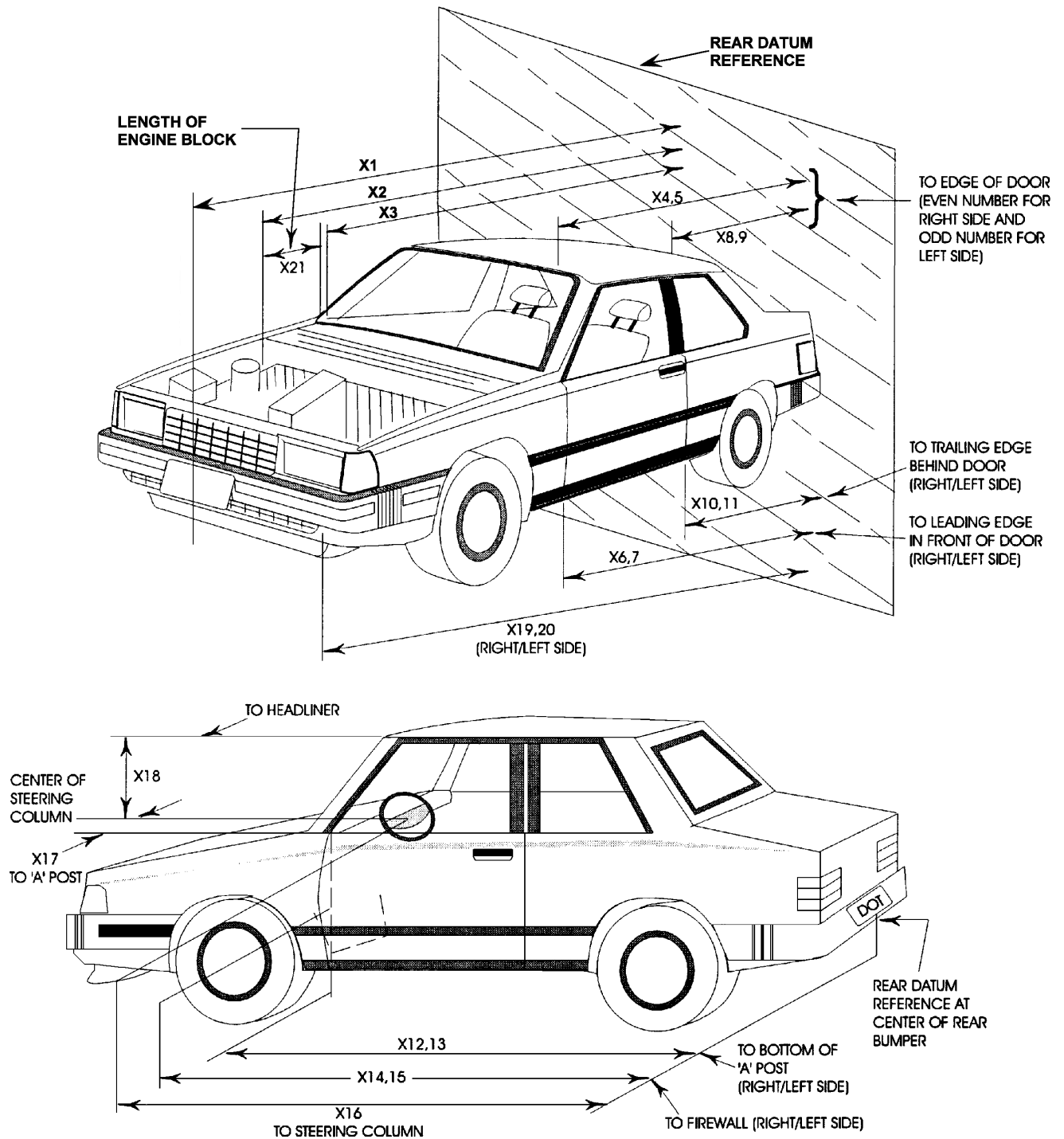
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length	mm	4655	4144	-511
2	Total Width	mm	1877	1877	0
3	Bumper Top Height	mm	720	860	140
4	Bumper Bottom Height	mm	285	350	65
5	Longitudinal Member Top Height	mm	600	620	20
6	Longitudinal Member Bottom Height	mm	455	675	220
7	Distance Between Longitudinal Members	mm	747	822	75
8	Longitudinal Member Width	mm	90	90	0
9	Engine Top Height	mm	915	950	35
10	Engine Bottom Height	mm	273	310	37
11	Engine and Gear Box Width	mm	550	550	0
12	Front Bumper to Engine Distance	mm	459	280	-179
13	Front Shock Absorber Fixing Width	mm	415	426	11
14	Bonnet Leading Edge Height	mm	712	1050	338
15	Front Schock Absorber Fixing Width	mm	1155	1225	70
16	Front Bumper to Front Axle Distance	mm	838	440	-398
17	Front Axle to A-Pillar Distance	mm	580	480	-100
18	A-Pillar to B-Pillar Distance	mm	1154	1150	-4
19	B-Pillar to Rear Axla Distance	mm	1100	1100	0
20	B-Pillar to C-Pillar Distance	mm	835	835	0
21	Roof Sill Bottom Height	mm	1555	1550	-5
22	Roof Sill Top Heigth	mm	1668	1660	-8
23	Floor Sill Bottom Height	mm	273	270	-3
24	Floor Sill Top Height	mm	492	490	-2

All Measurements in millimeters

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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03



DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03

No.	Camera View	Location (mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Right Side, Real Time	18288	-22860	2540	10	N/A	17-70	24
2	Driver Overall	1930	8357	1321	4	7787	13	DNR
2B	Driver Overall	1626	8230	1092	4	7689	17	No Time
3	Driver Close-up	1727	8230	1600	4	7678	35	990
4	3/4 Driver	6477	10185	4648	13	10938	35-85	1000
5	Steering Column	1524	8230	3404	20	7958	19	1000
6	Steering Column	1524	8230	2997	16	7864	19	1030
7	Passenger Overall	2057	-8306	1219	6	7731	14	1000
8	Passenger Close-up	1676	-8052	1219	4	7503	35	1030
9	3/4 Passenger	8026	-8941	2997	9	10212	80	920
10	Passenger Door	2438	-13106	1524	4	12523	50	950
11	Overhead	610	0	6172	90	N/A	13	1050
12	Driver Front	-610	406	2743	40	N/A	12	950
13	Passenger Front	-610	406	2743	40	N/A	13	950
14	Pit Engine	762	0	-1499	90	N/A	10	No Time
15	Pit Gas Tank	3658	0	-1499	90	N/A	6	No Time
16	Driver Side Child	2997	-584	1219	10	1100	6	950
16B	Driver Side Child	2642	8230	2286	15	7878	35	No Time
16C	Driver Side Child	2642	6096	1524	1	5692	25	500
17	Passenger Side Child	2997	584	1219	10	1100	6	720
17B	Passenger Side Child	2438	-9144	2032	10	8773	25	DNR
17C	Passenger Side Child	2743	-8331	1524	1	7903	25	500

X - Barrier Face Y - Monorail Centerline Z - Ground DNR =Did Not Run

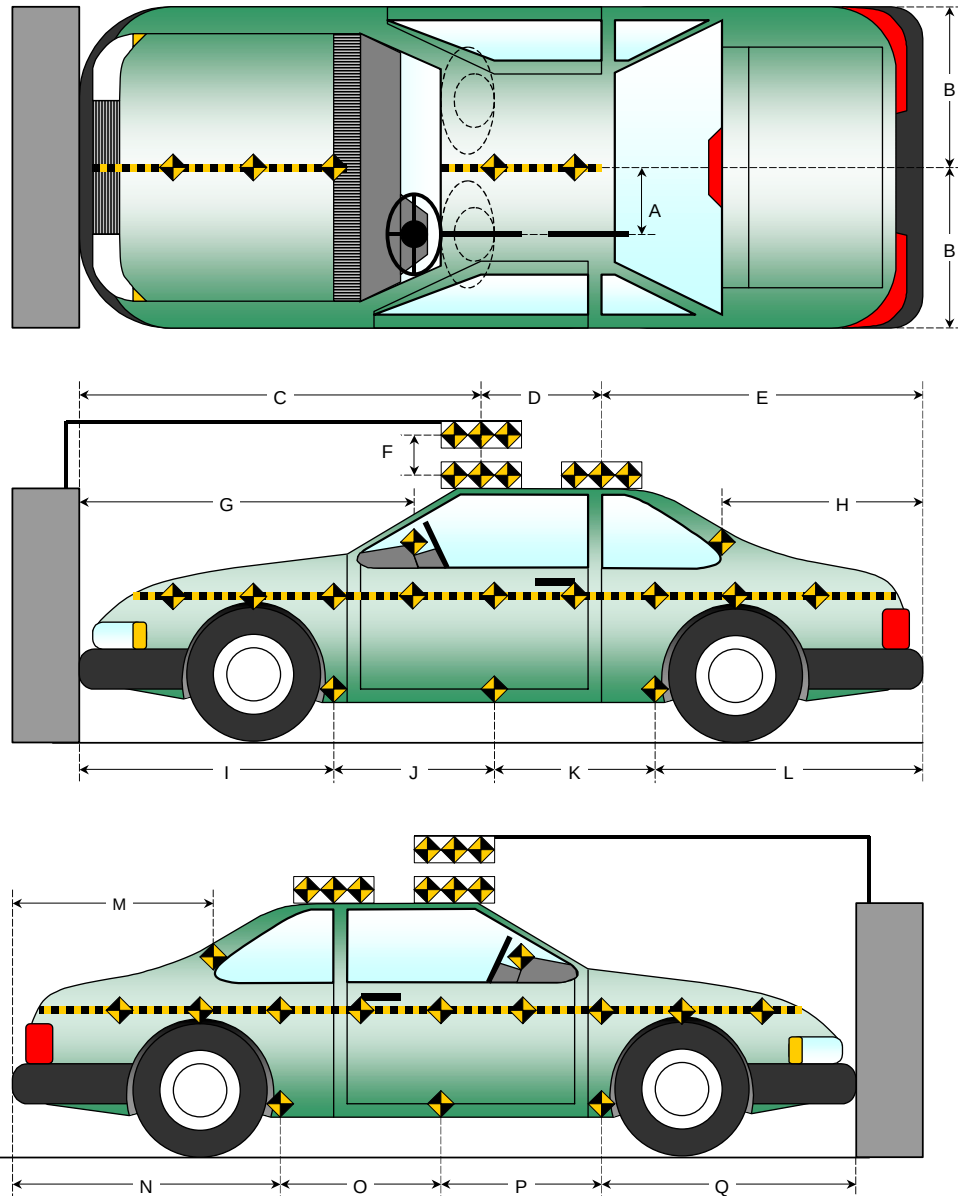
DATA SHEET NO. 16 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

All Dimensions
 in mm

Item	Value
A	495
B	936
C	2377
D	610
E	1698
F	155
G	1836
H	1152
I	1442
J	825
K	825
L	1564
M	1152
N	1564
O	825
P	825
Q	1442



DATA SHEET NO. 17
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

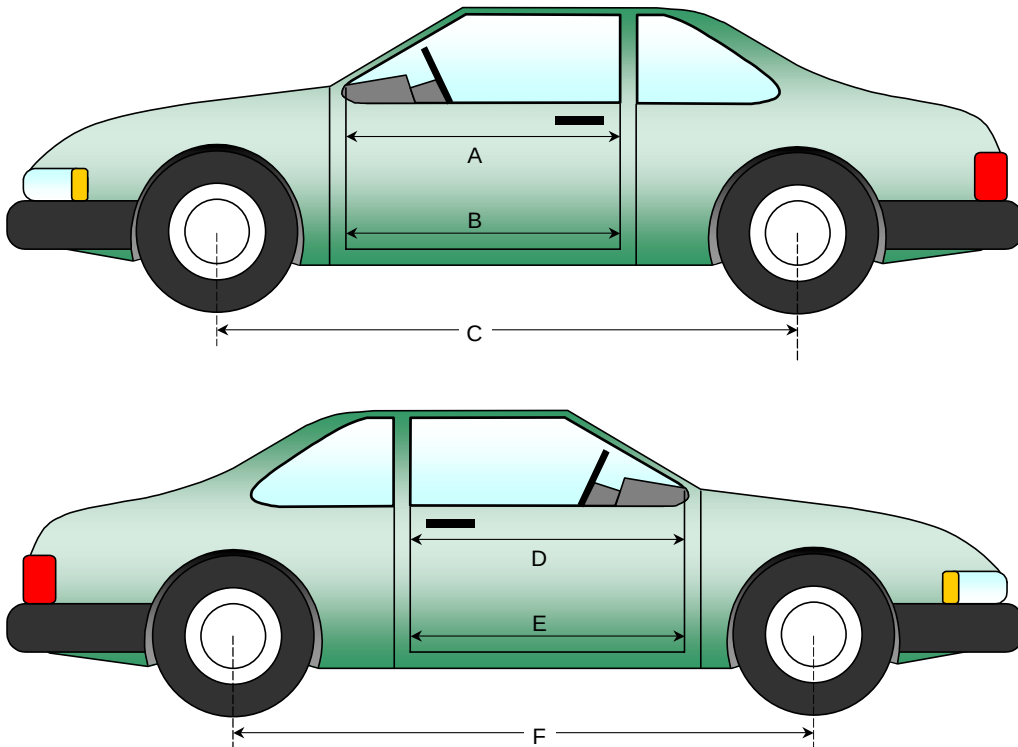
NHTSA No.: M30501
 Test Date: 03/18/03

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1068	1062	-6
B	Left Side Lower	mm	997	993	-4
D	Right Side Upper	mm	1068	1062	-6
E	Right Side Lower	mm	997	995	-2

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheel base	mm	2820	2720	-100
F	Right Side Wheel base	mm	2820	2710	-110



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

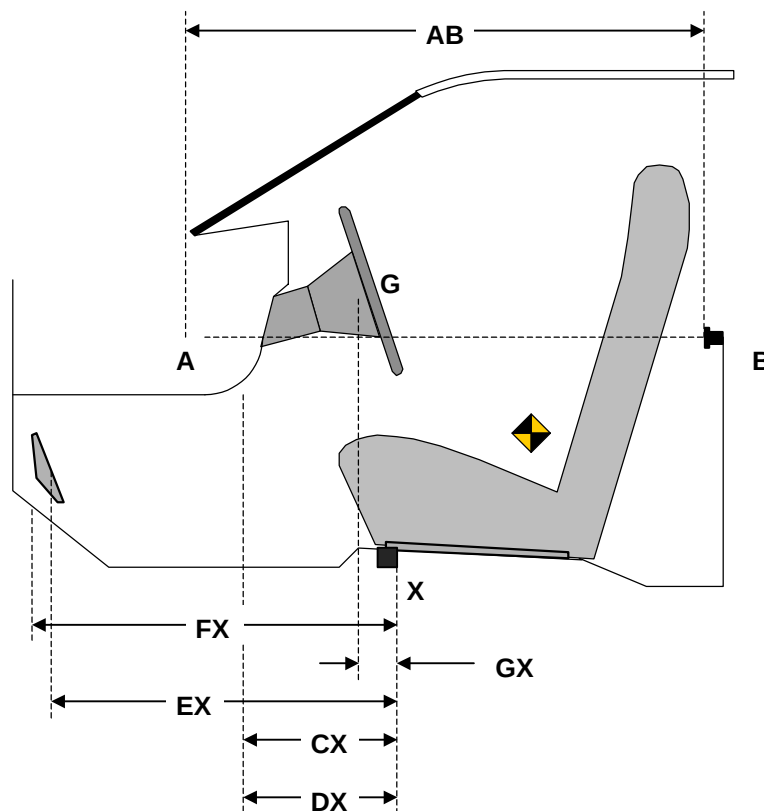
Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1068	1062	-6
CX	Left Knee Bolster to X	mm	295	285	-10
DX	Right Knee Bolster to X	mm	252	210	-42
EX	Brake Pedal to X	mm	537	550	13
FX	Foot Rest to X	mm	605	590	-15
GX	Center of Steering Wheel Hub to X	mm	60	50	-10

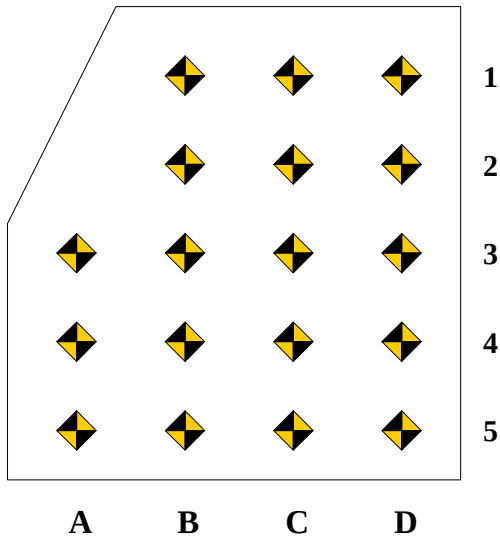
X = Left Front Seat Outboard Anchor Bolt Head



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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03



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.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		662	665	663		670	675	670		8	10	7
2		563	565	564		570	578	569		7	13	5
3	463	462	465	463	470	470	478	469	7	8	13	6
4	363	362	362	361	370	370	373	369	7	8	11	8
5	263	260	260	261	270	270	270	269	7	10	10	8

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-138	-130	-137		-168	-170	-162		-30	-40	-25
2		-137	-127	-135		-155	-160	-160		-18	-33	-25
3	-145	-140	-126	-134	-146	-148	-150	-147	-1	-8	-24	-13
4	-158	-144	-117	-119	-145	-150	-130	-130	13	-6	-13	-11
5	-150	-151	-115	-109	-145	-158	-125	-115	5	-7	-10	-6

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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

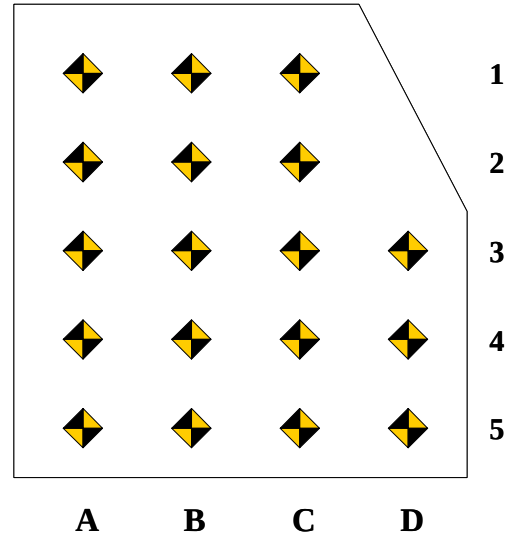
NHTSA No.: M30501
 Test Date: 03/18/03

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	791	786	785		721	712	705		-70	-74	-80	
2	691	686	686		688	682	685		-3	-4	-1	
3	587	582	584	586	590	582	585	590	3	0	1	4
4	486	480	484	483	490	482	485	485	4	2	1	2
5	382	380	384	383	390	387	385	385	8	7	1	2

PASSENGER FLOOR PAN Z-AXIS

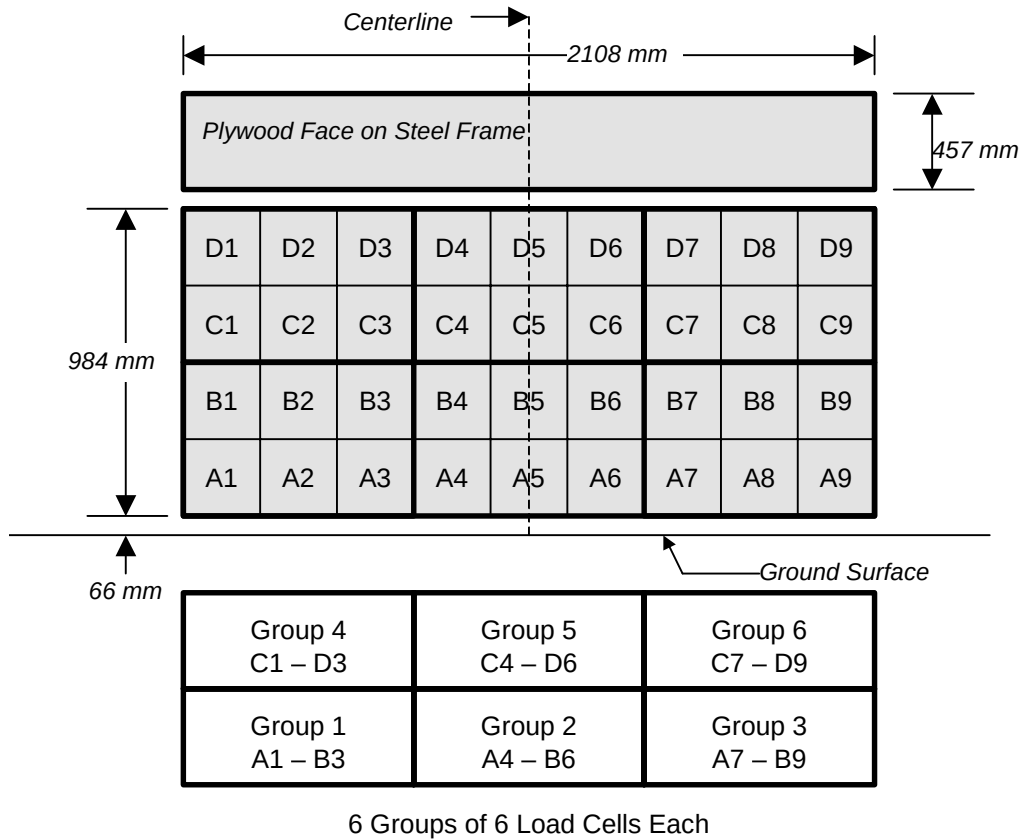
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-77	-68	-73		-75	-65	-65		2	3	8	
2	-134	-135	-130		-168	-170	-163		-34	-35	-33	
3	-136	-135	-134	-139	-159	-160	-151	-160	-23	-25	-17	-21
4	-139	-137	-133	-133	-140	-153	-142	-140	-1	-16	-9	-7
5	-125	-125	-134	-137	-135	-130	-135	-138	-10	-5	-1	-1

DATA SHEET NO. 18
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

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: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 03/18/03

VEHICLE INFORMATION

VIN: 5UXFA53553LV85638
 Vehicle Size Category: 4 Door Suv

Wheel base (mm): 2820
 Test Weight (kg): 2400

ACCELEROMETER DATA

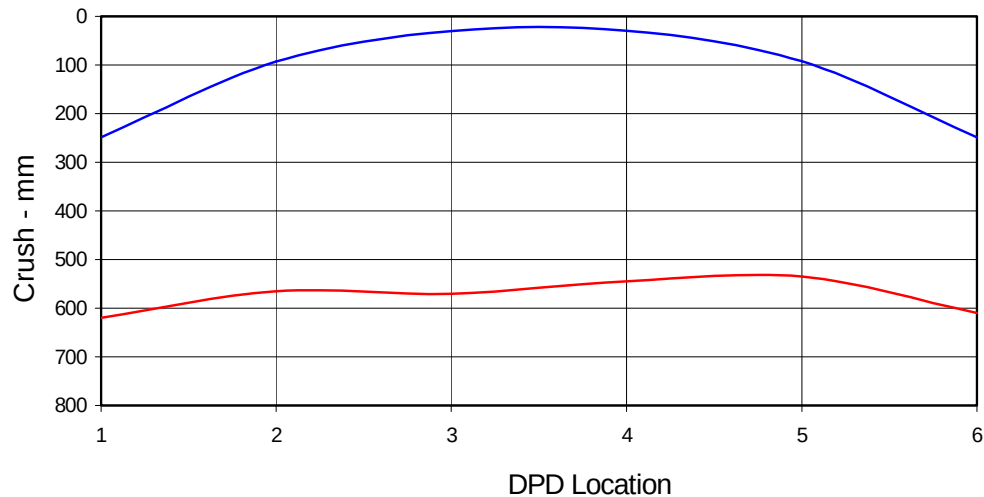
Accelerometer Location: Left rear floor pan
 Cal. Procedure/Interval: 6 months / drop test
 Integration Algorithm: NHTSA Standard
 Impact Velocity (km/h): 55.82
 Velocity Change (km/h): 74.9

Linearity: Good
 Time of Separation (msec): 63.2

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1630 Impact Mode: Full Frontal

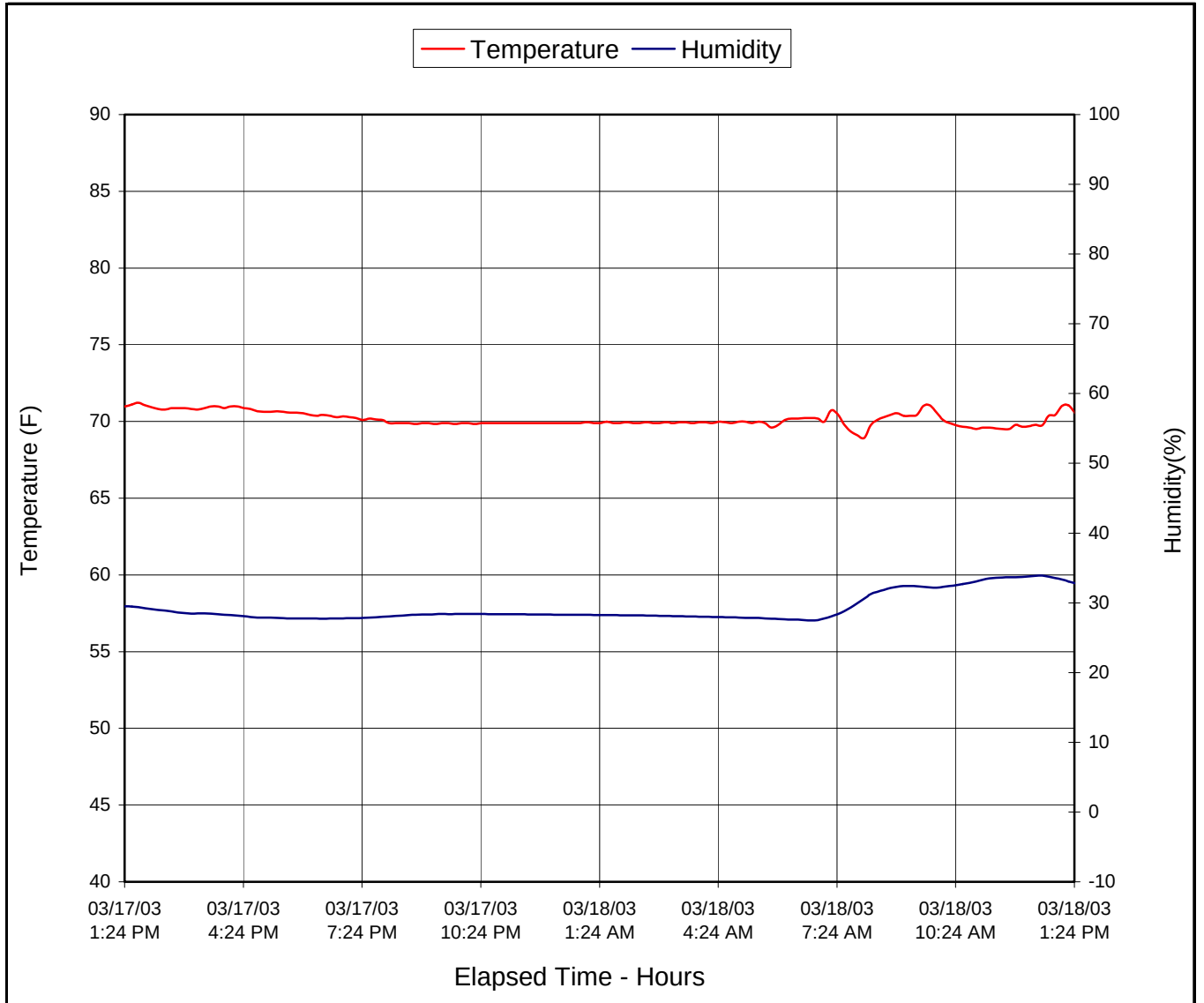
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	249	620	-371
C2	Crush zone 2 on left side	mm	93	565	-472
C3	Crush zone 3 on left side	mm	30	570	-540
C4	Crush zone 4 on right side	mm	29	545	-516
C5	Crush zone 5 on right side	mm	92	535	-443
C6	Crush zone 6 at right side	mm	249	610	-361



DATA SHEET NO. 20
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 03/18/03



APPENDIX A

PHOTOGRAPHS

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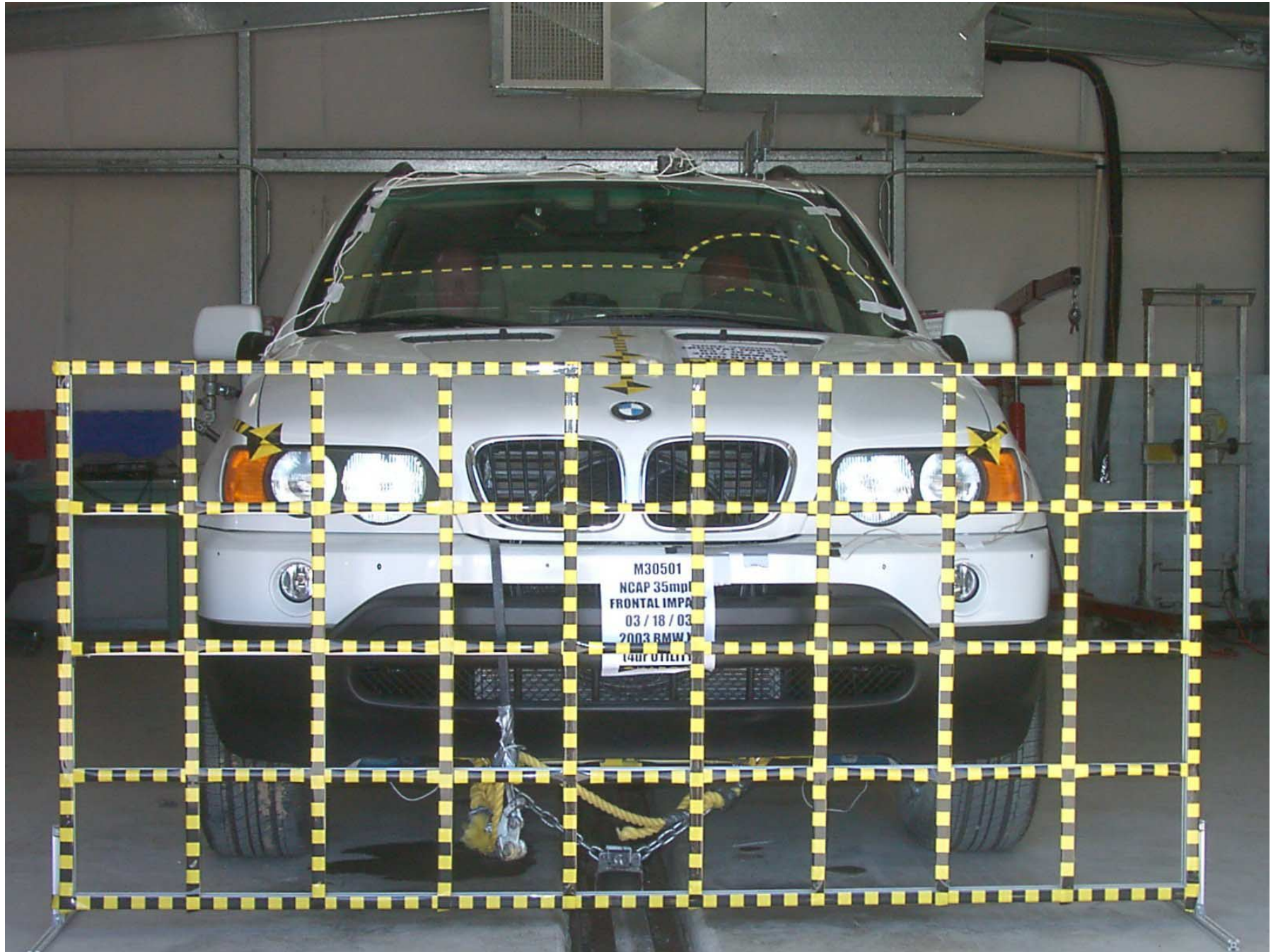


Figure A-1: Load Cell Location



X5 3.0i VEHICLE TYPE: MULTIPURPOSE PASSENGER VEHICLE
MFD BY BAYERISCHE MOTORENWERKE AG 02/03

GVWR 6005 lbs 2724 kg

GAWR FRONT 2787 lbs 1264 kg REAR 3307 lbs 1500 kg

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.

5UXFA53553LV85638



7 012 956

Figure A-2: Vehicle Certification Label

CORRECT TIRE PRESSURE IS ESSENTIAL FOR YOUR AND EVERYBODY'S SAFETY. INCORRECT TIRE PRESSURE CAN LEAD TO A SERIOUS CRASH (NO VEHICLE STABILITY, TIRE DESTRUCTION).
 LA CORRECTE PRESSION DE GONFLAGE DE PNEUS EST ESSENTIELLE POUR VOTRE SECURITE ET CELLE DES AUTRES. UNE PRESSION INCORRECTE DE GONFLAGE PEUT MENER A DES COLLISIONS GRAVES (PAS DE STABILITE DU VEHICULE, DESTRUCTION DE PNEU).

GROSS VEHICLE WEIGHT RATING 2724 KG (6005 LBS) POIDS BRUT NOMINAL D'UN VEHICULE 2724 KG (6005 LBS)		DESIGNATED SEATING CAPACITY 5 NOMBRE DE PLACES DESIGNÉ	FRONT/AVANT 2		REAR/ARRIERE 3	
RECOMMENDED TIRE SIZE AND RIM DIMENSION RECOMMANDEE DES PNEU ET DE JANTE		COLD TIRE INFLATION PRESSURE/ PRESSION DE GONFLAGE A FROID	KPA	PSI	KPA	PSI
235/65 R 17 104 H M+S	7 1/2 J x 17	GROSS AXLE WEIGHT RATING 1264 KG (2787 LBS) FRONT AND 1500 KG (3307 LBS) REAR LIMITE DE CHARGE D'ESSIEU AVANT 1264 KG (2787 LBS) ET D'ESSIEU ARRIERE 1500 KG (3307 LBS)	220	32	270	39
255/55 R 18 105 H M+S	8 1/2 J x 18		▲ 220	▲ 32	● 270	● 39
255/55 R 18 105 V	8 1/2 J x 18		■ 420	■ 61	■ 420	■ 61
235/65 R 17 104 Q M+S	7 1/2 J x 17					
255/55 R 18 105 Q M+S	8 J x 18 OR 8 1/2 J x 18					
▲ 255/50 R 19 103 V	9 J x 19	AXLE WEIGHT RATING UP TO 1205 KG (2657 LBS) FRONT AND UP TO 1285 KG (2833 LBS) REAR CHARGE SUR L'ESSIEU AVANT JUSQU'A 1205 KG (2657 LBS) ET SUR L'ESSIEU ARRIERE JUSQU'A 1285 KG (2833 LBS)	220	32	220	32
▲ 275/40 R 20 102 W	9 1/2 J x 20		▲ 220	▲ 32	● 220	● 32
● 285/45 R 19 107 V	10 J x 19		■ 420	■ 61	■ 420	■ 61
● 315/35 R 20 106 W	10 1/2 J x 20					
■ T 155/90 D 18 113 M	5 J x 18					

BMW

6 757 855 b

Figure A-3: Vehicle Tire Label



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



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

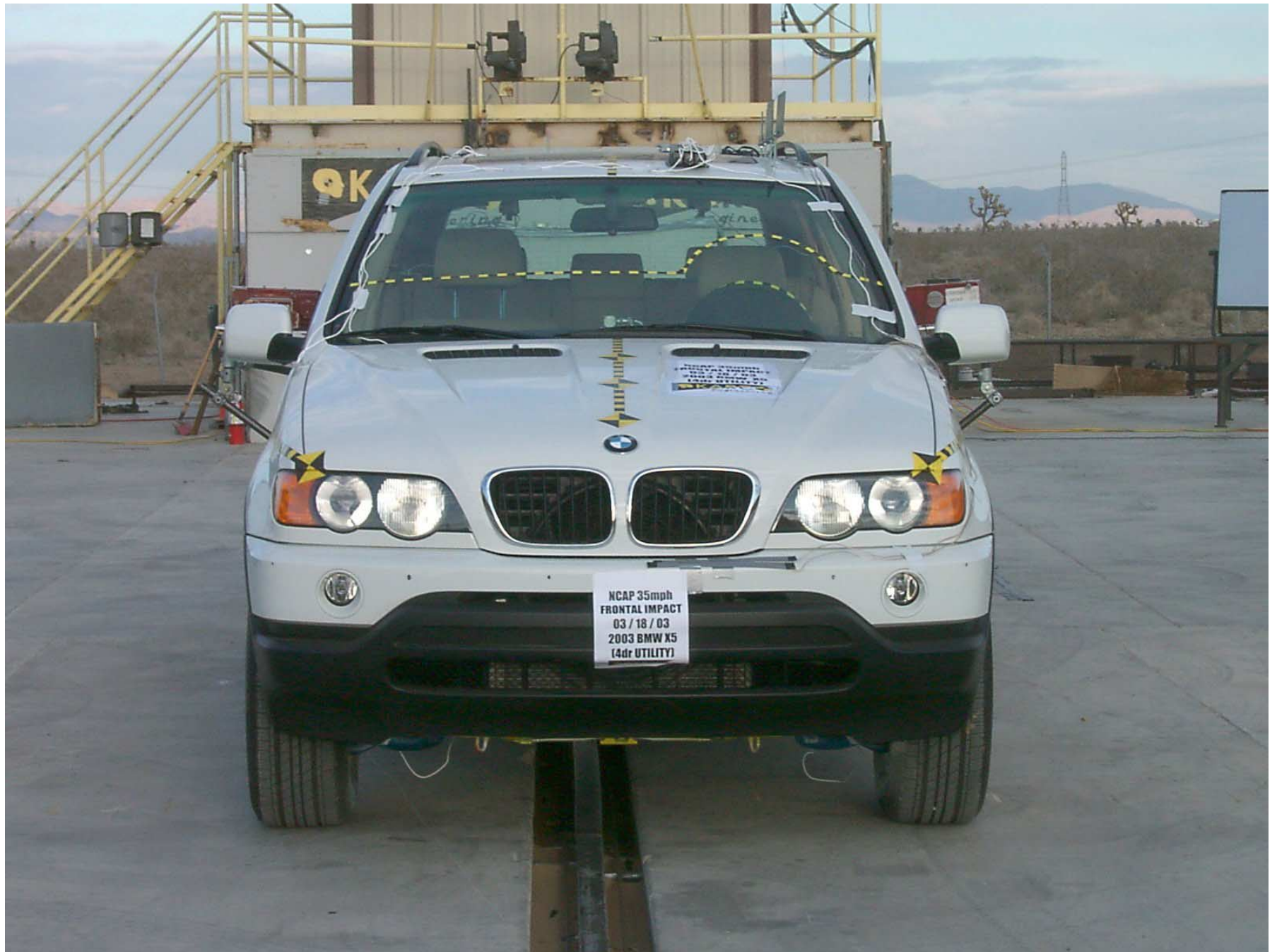


Figure A-6: Pre-Test Front View



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



Figure A-8: Pre-Test Left Side View



Figure A-9: Post-Test Left Side View



Figure A-10: Pre-Test Right Side View



Figure A-11: Post-Test Right Side View



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



Figure A-13: Post-Test Right Front ¾ View (Vehicle Moved)



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 ¾ View of Doors After Impact



Figure A-18: Pre-Test Windshield View



Figure A-19: Post-Test Windshield View

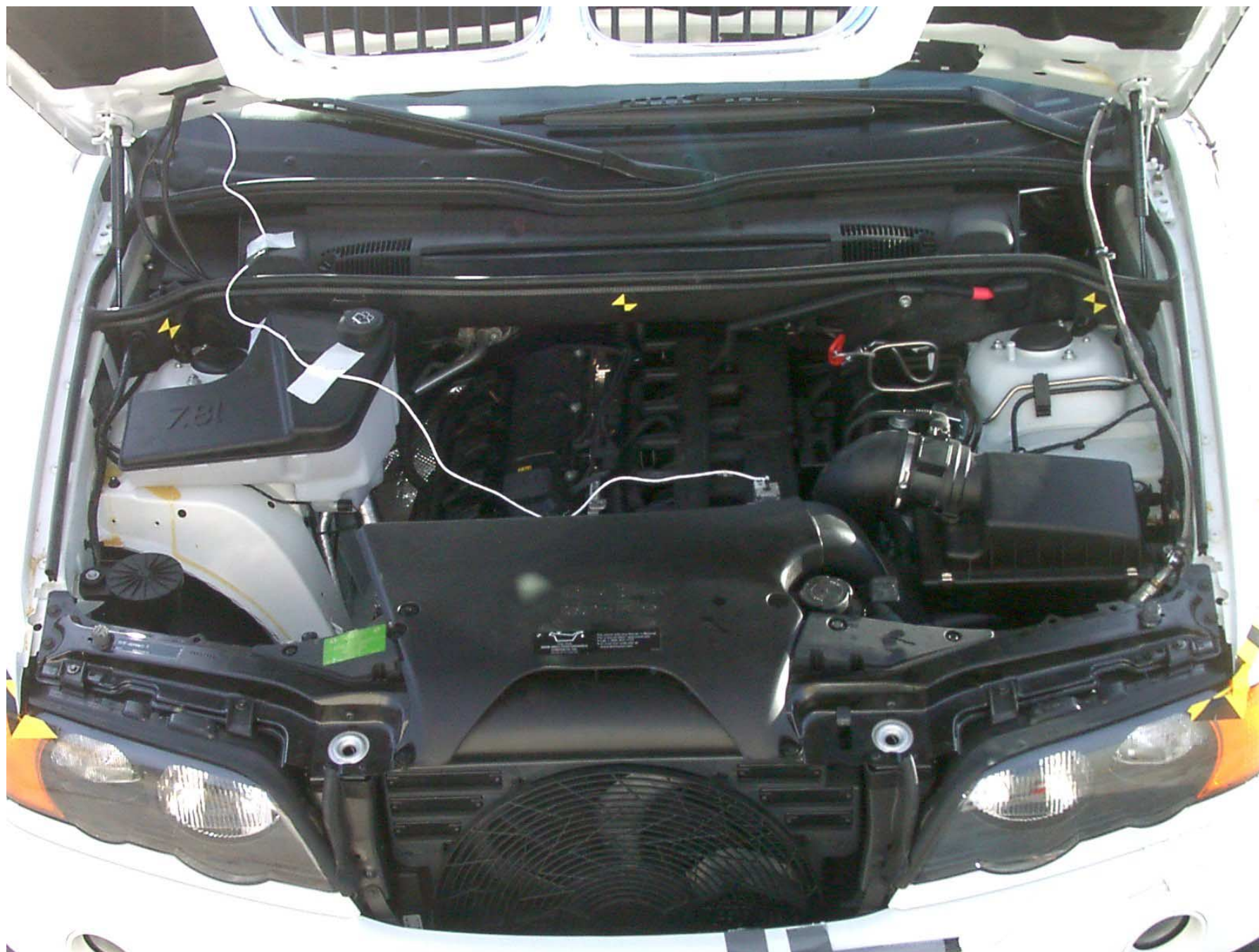


Figure A-20: Pre-Test Engine Compartment



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



Figure A-22: Pre-Test Fuel Cap



Figure A-23: Post-Test Fuel Cap

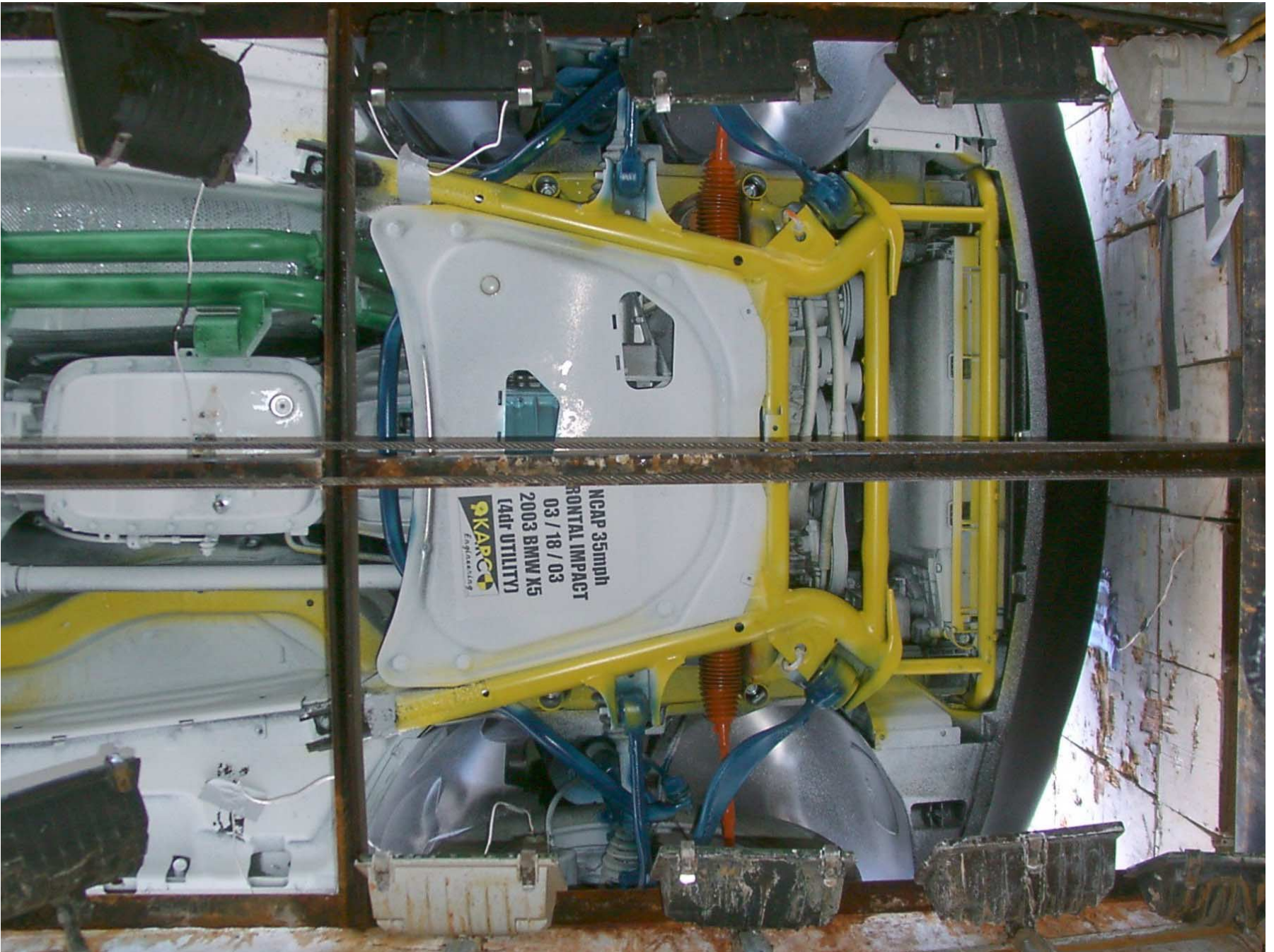


Figure A-24: Pre-Test Front Underbody View

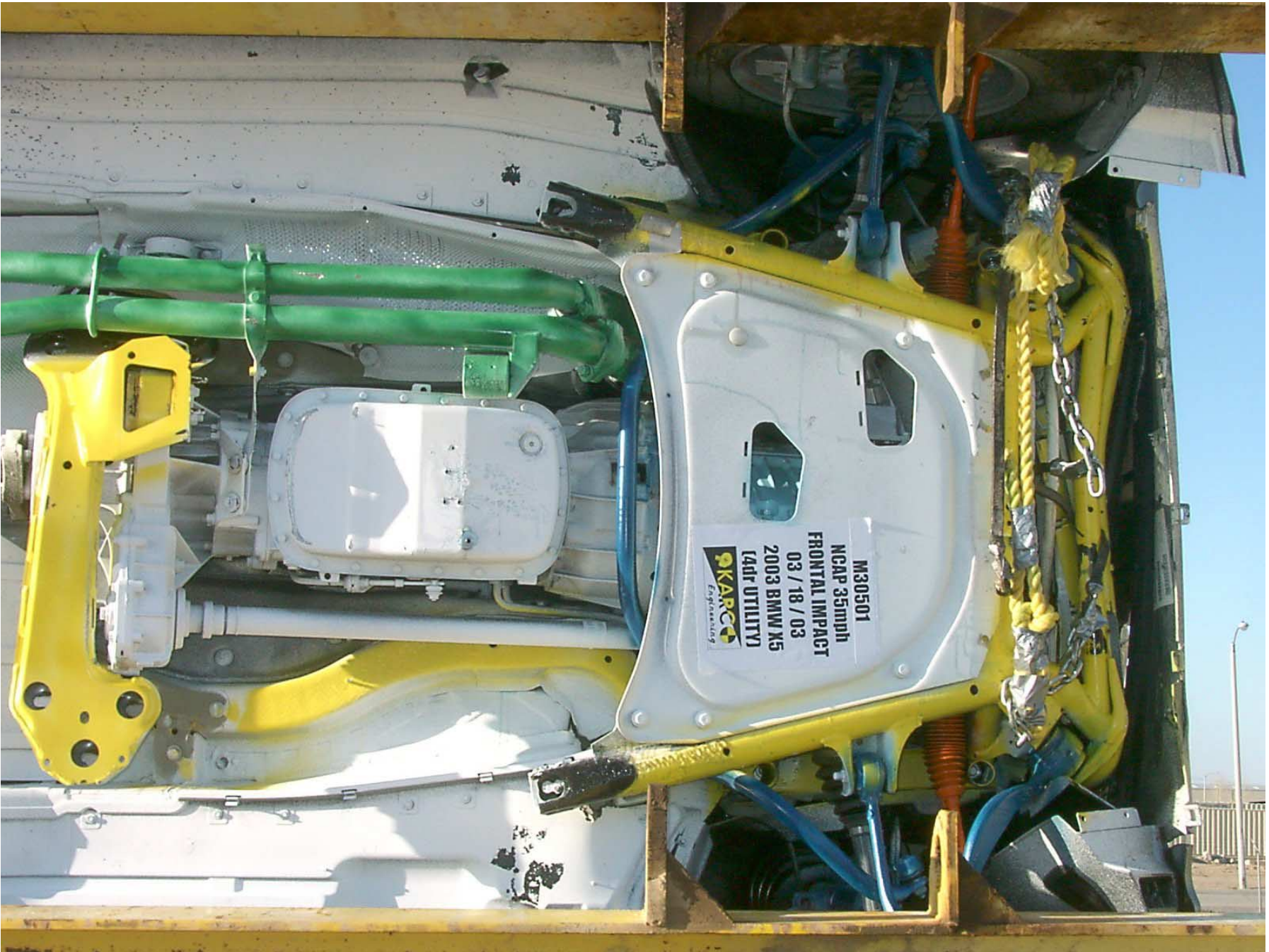


Figure A-25: Post-Test Front Underbody View



Figure A-26: Pre-Test Mid Underbody View

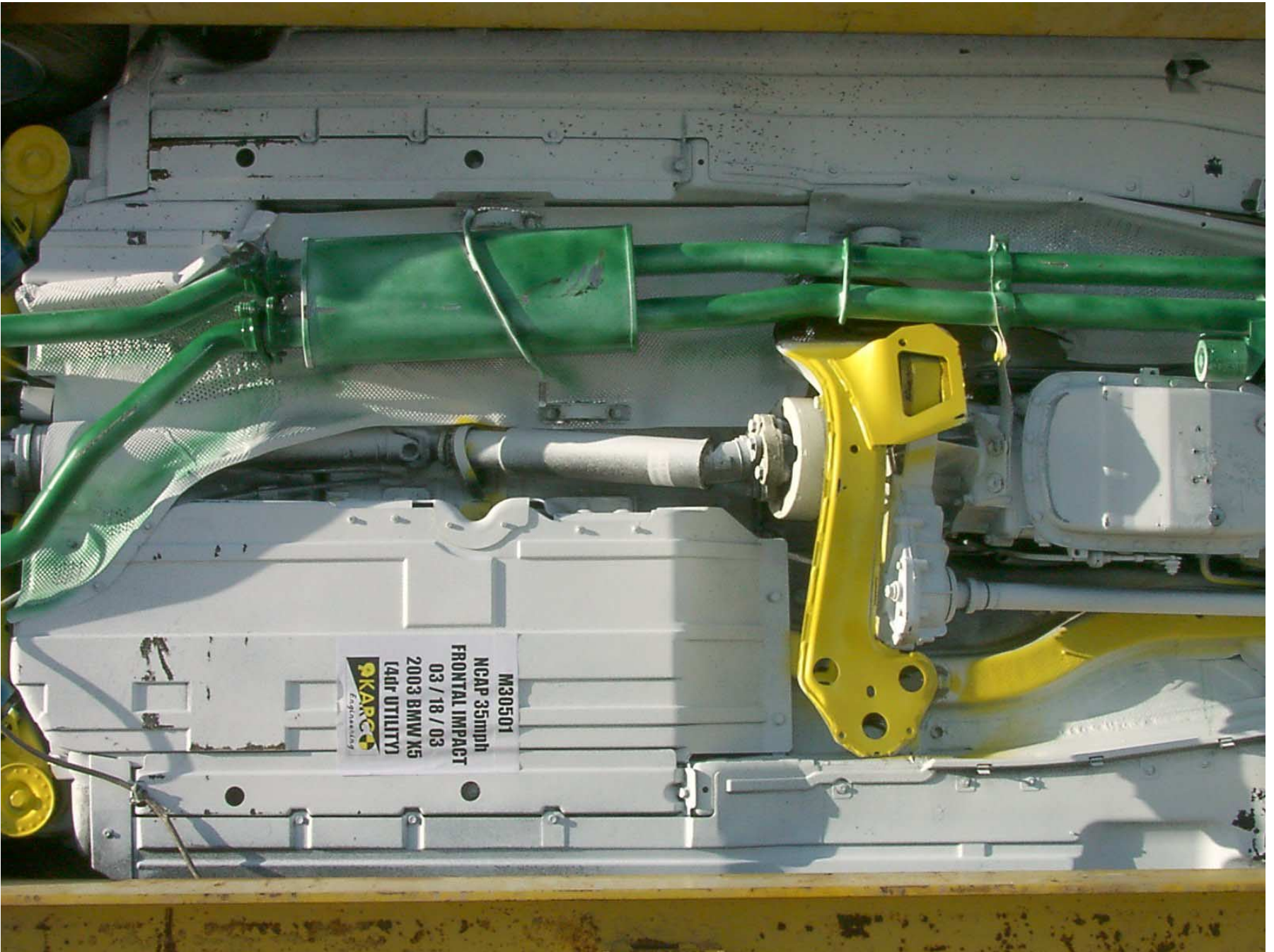


Figure A-27: Post-Test Mid Underbody View

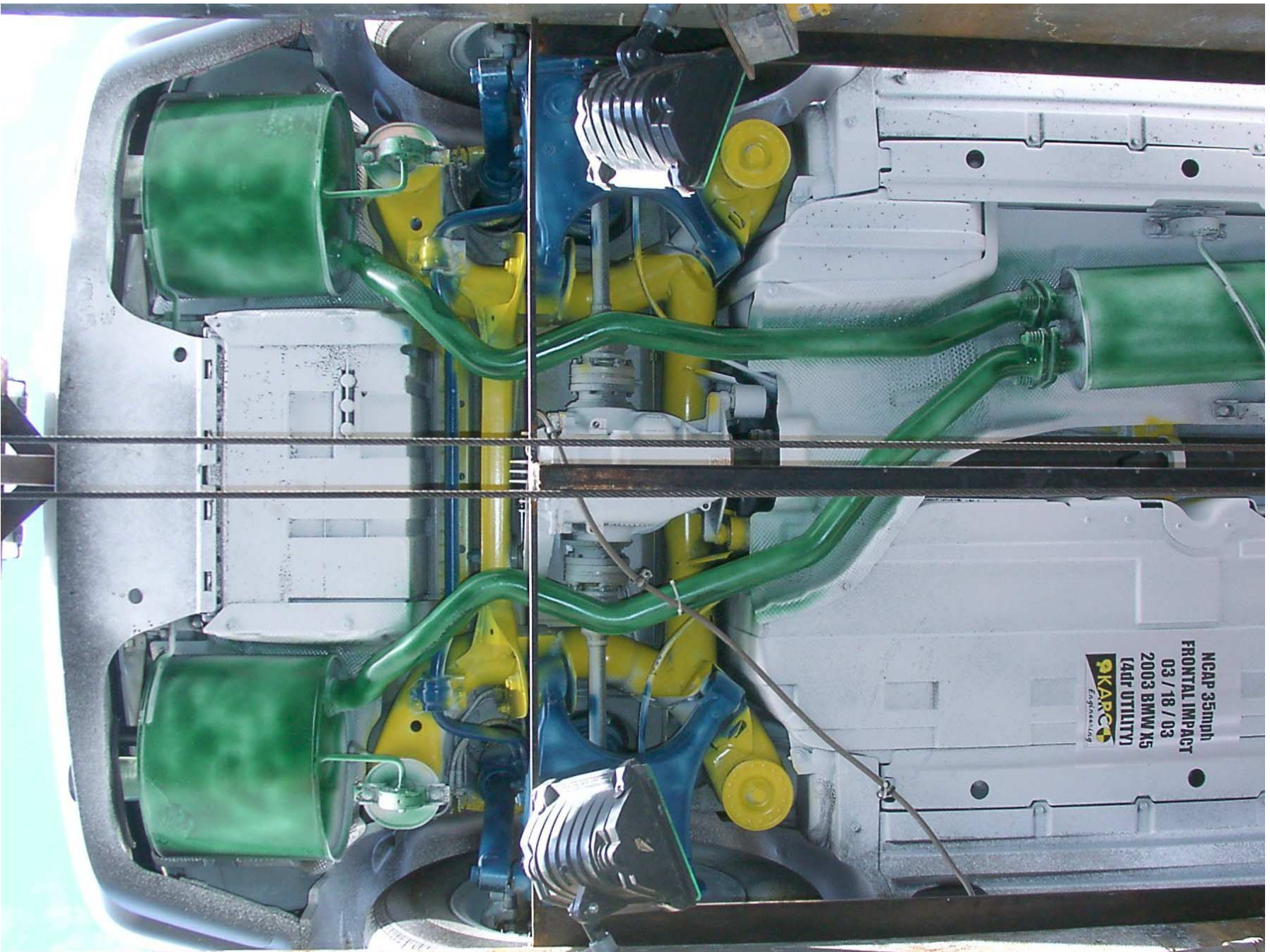


Figure A-28: Pre-Test Rear Underbody View

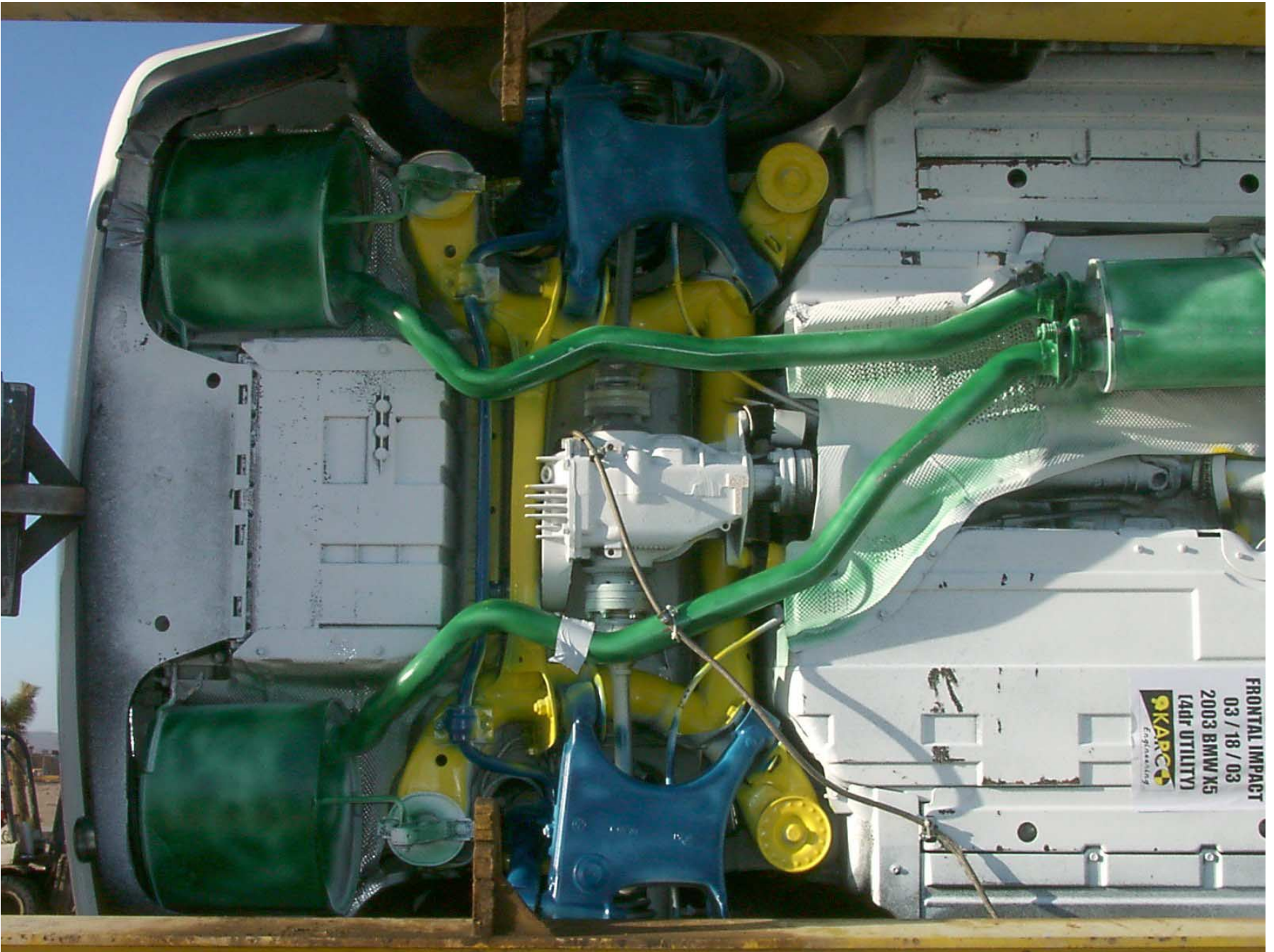


Figure A-29: Post-Test Rear Underbody View



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

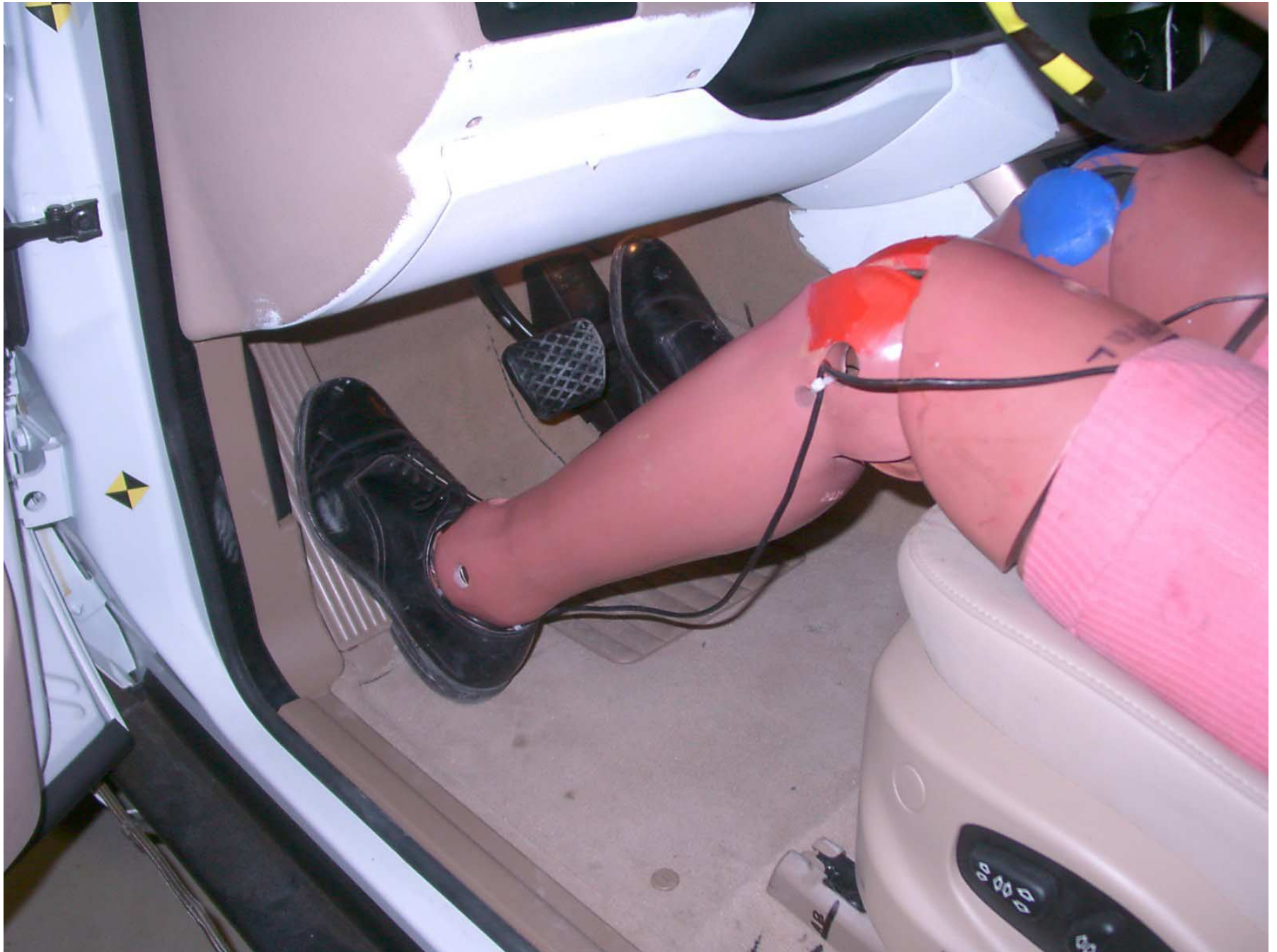


Figure A-36: Pre-Test Driver Dummy Feet



Figure A-37: Post-Test Driver Dummy Feet



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

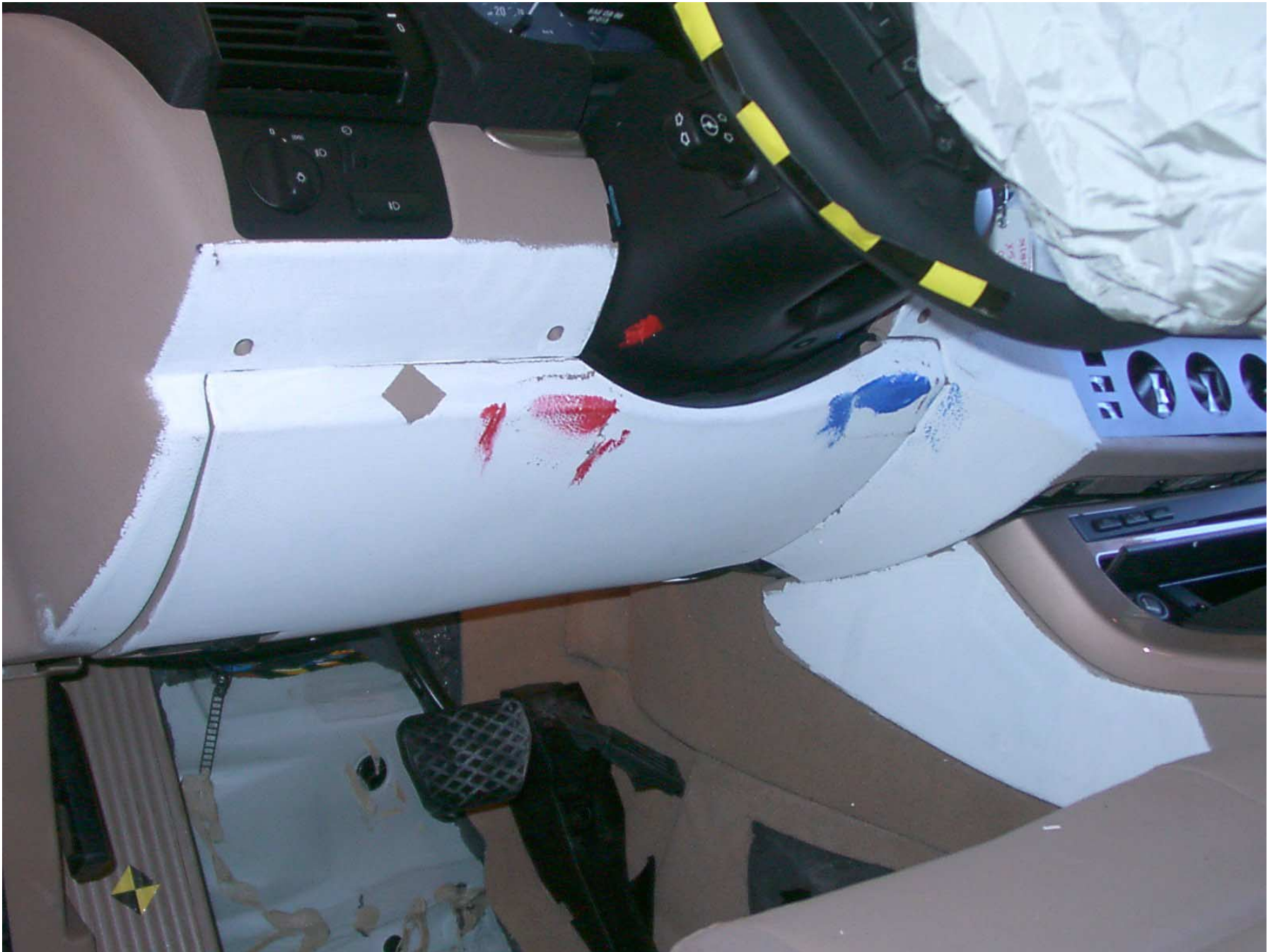


Figure A-39: Post-Test Driver Side Knee Bolster



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)



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



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

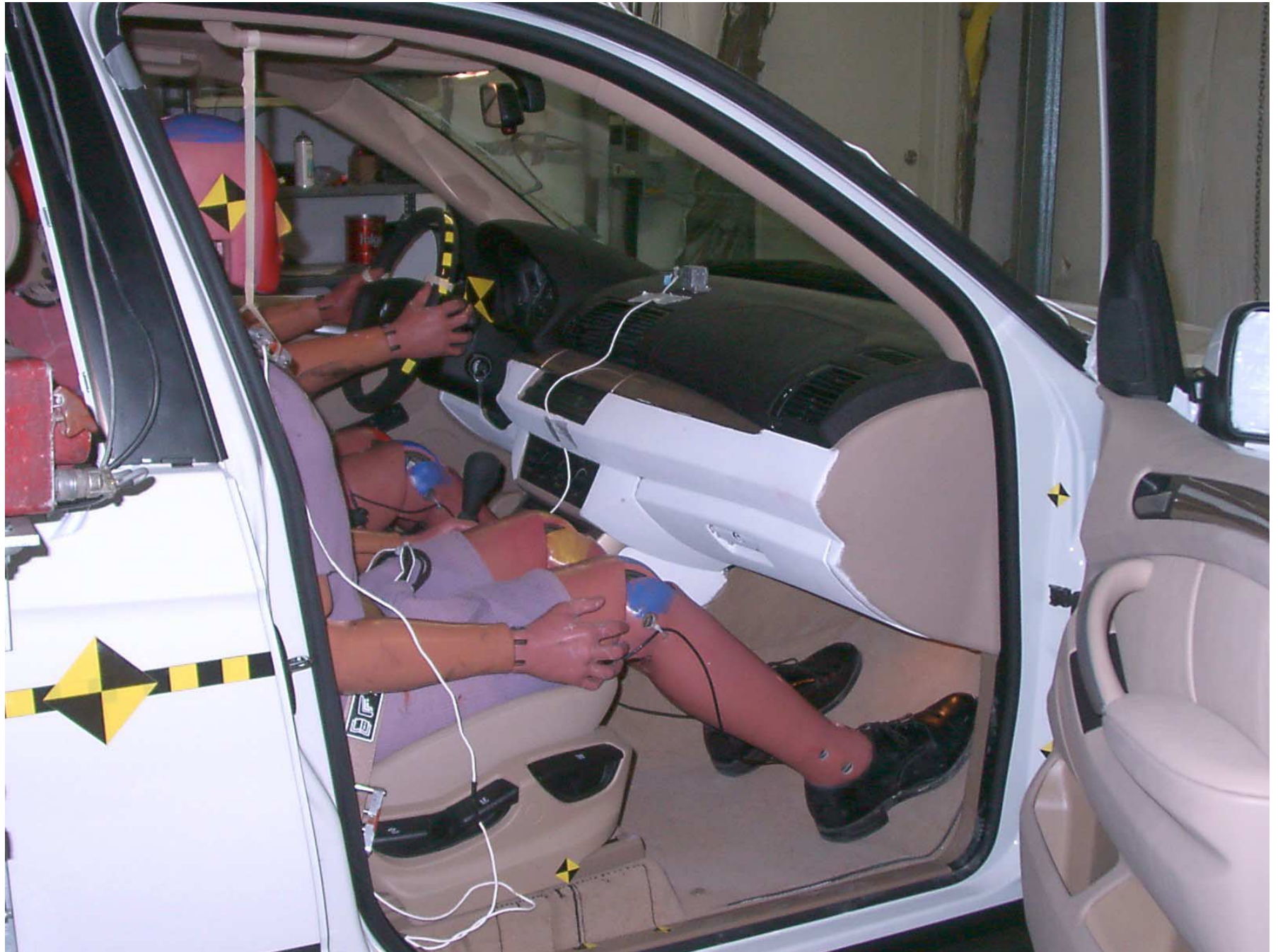


Figure A-48: Pre-Test Passenger Dummy Door Open



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

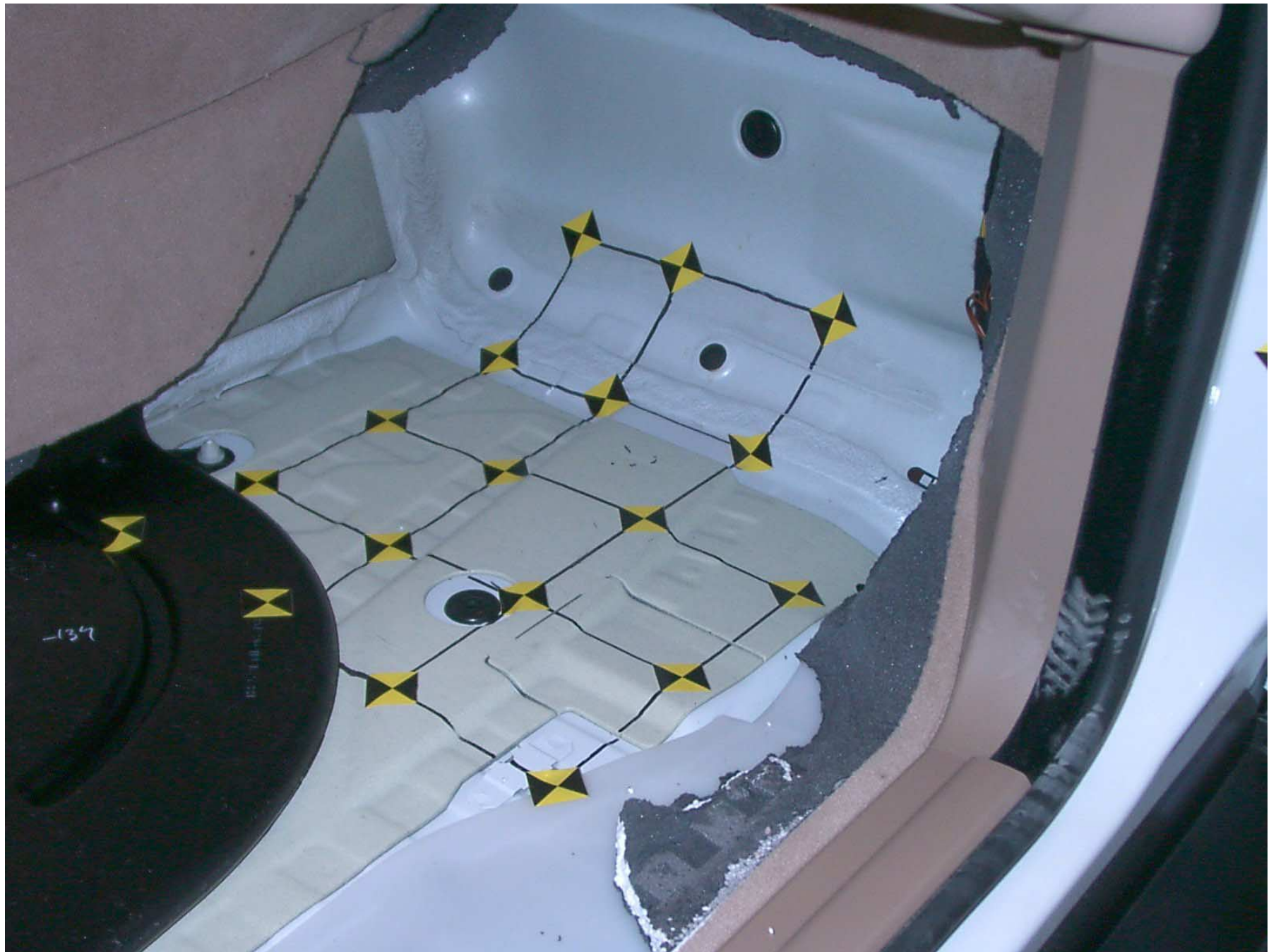


Figure A-52: Pre-Test Passenger Side Floor Pan



Figure A-53: Post-Test Passenger Side Floor Pan



Figure A-54: Pre-Test Passenger Side Knee Bolster



Figure A-55: Post-Test Passenger Side Knee Bolster



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 During Impact

APPENDIX B

DATA PLOTS

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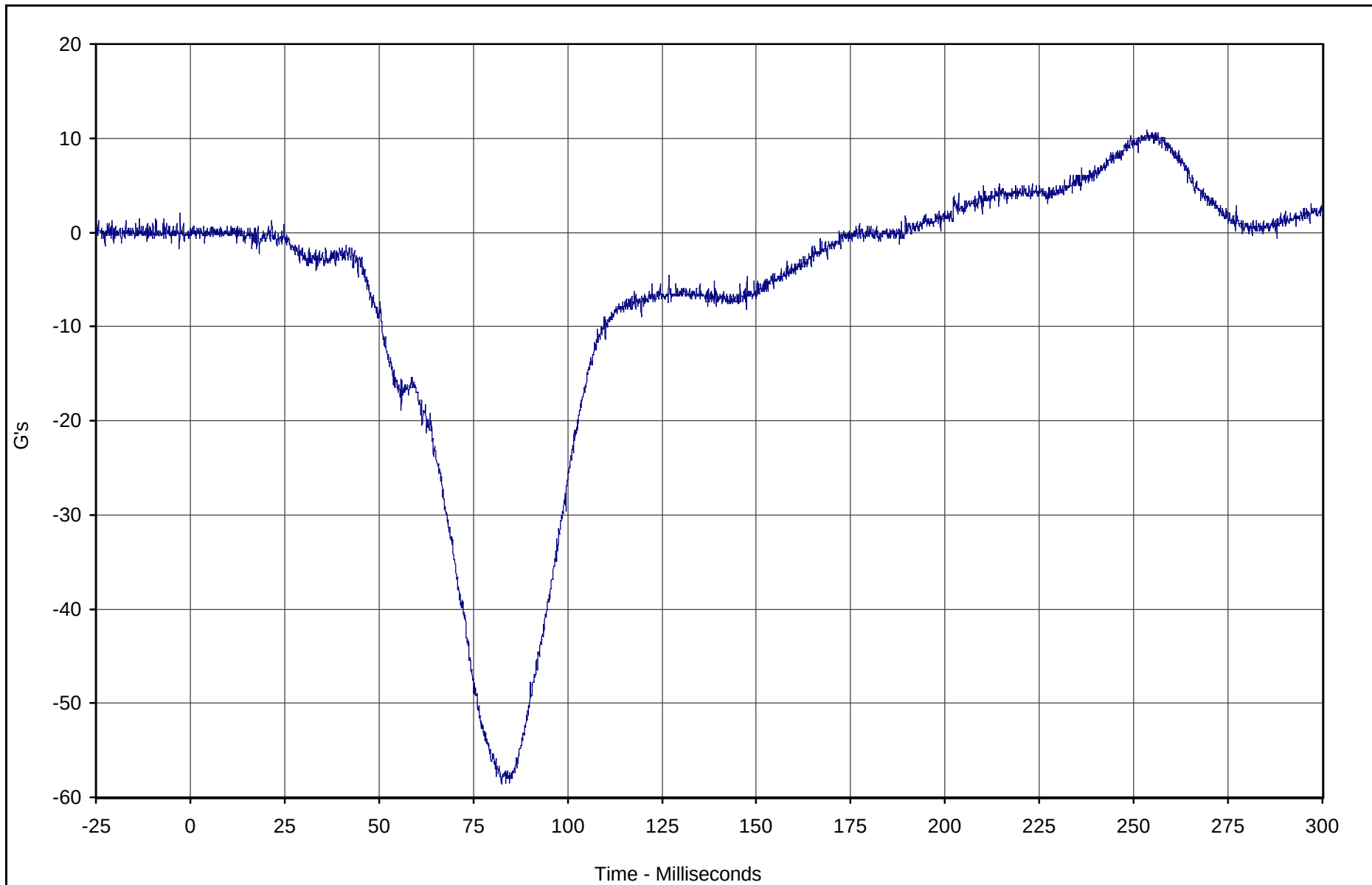
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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X	001	FIL	G's	10.9	253.5	-58.6	82.5	1000

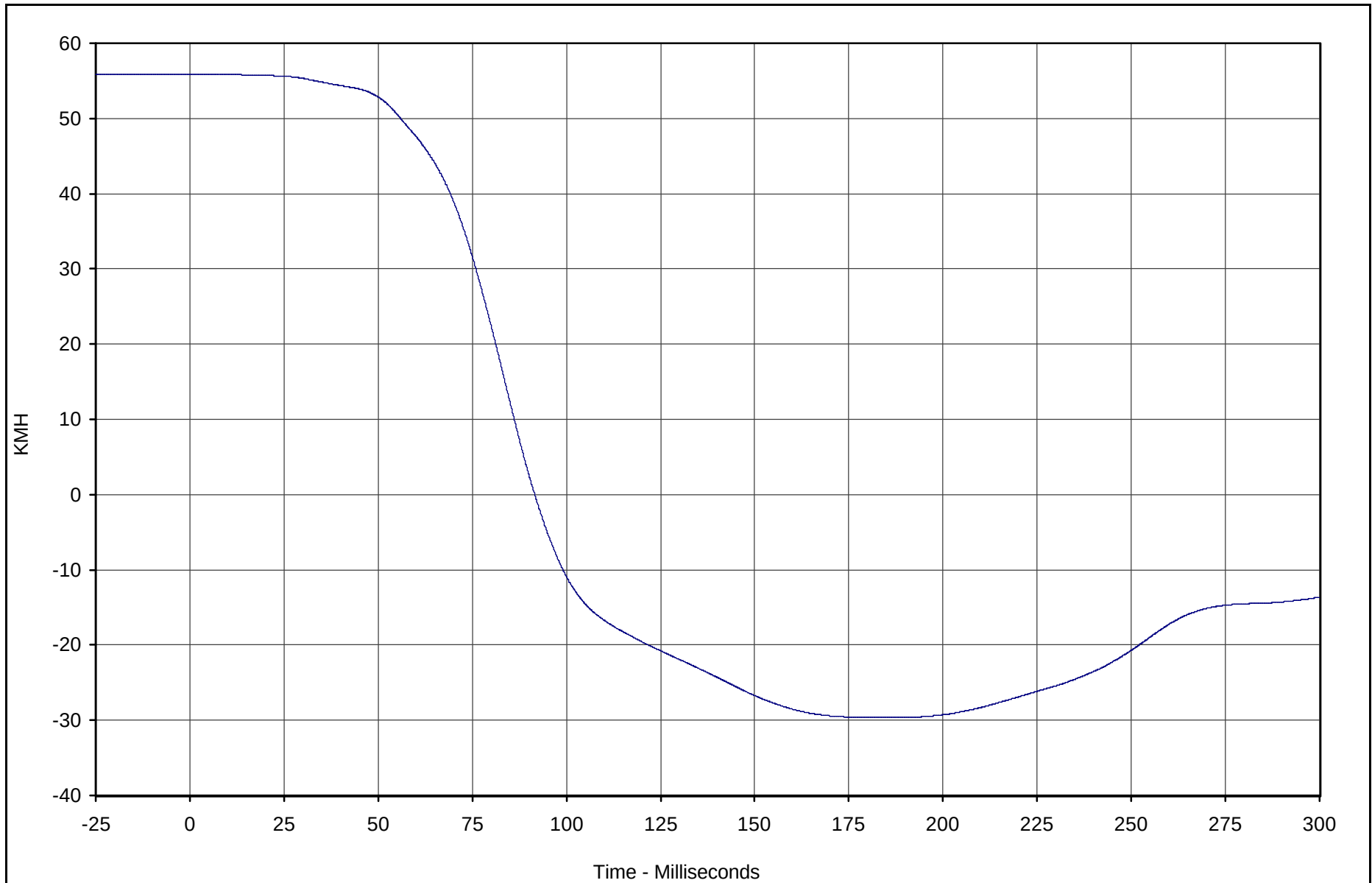


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X Velocity	001	IN1	KMH	55.8	1.9	-29.6	189.0	180

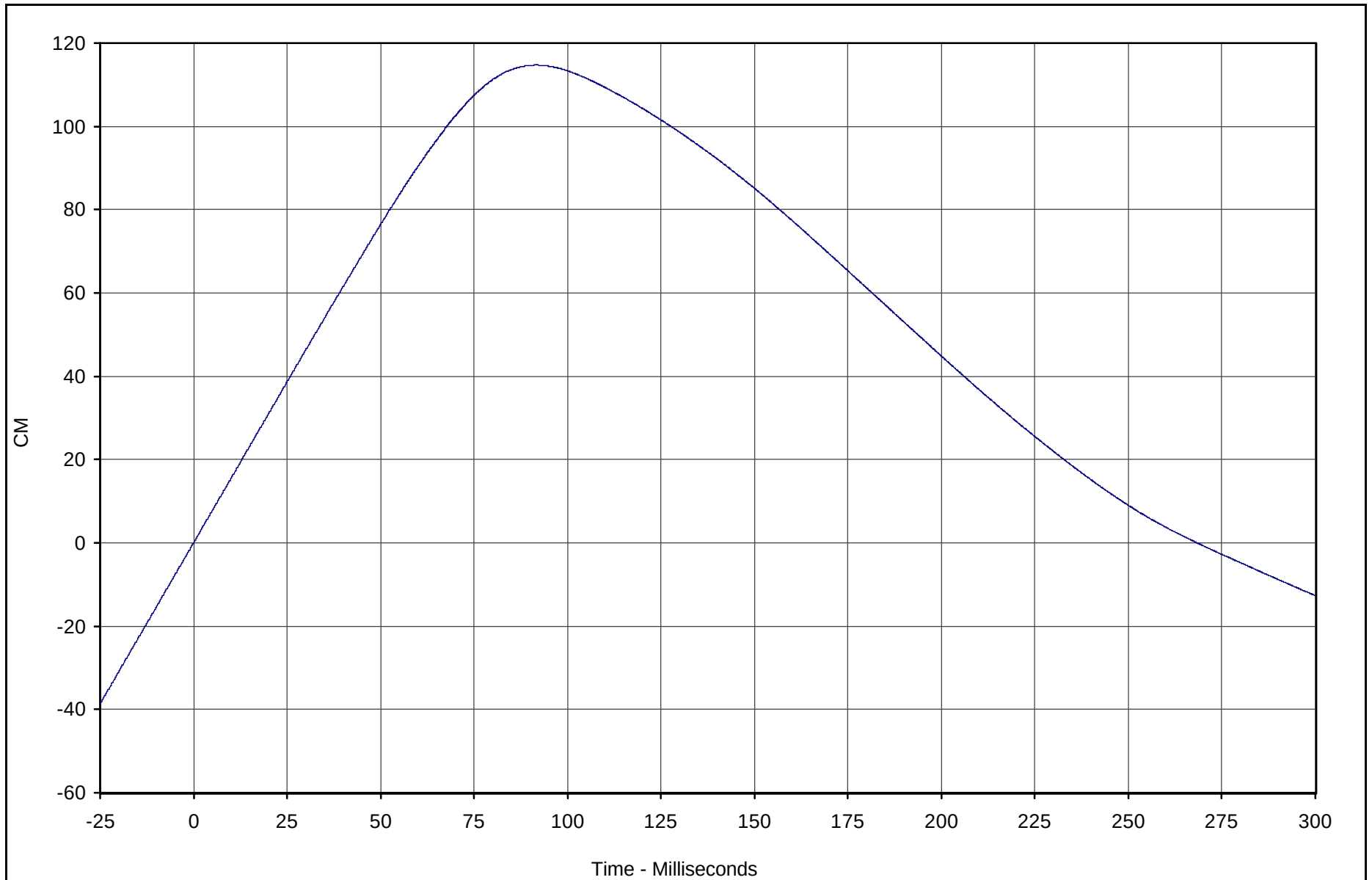


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X Displ.	001	IN2	CM	114.7	91.6	-12.6	299.9	180

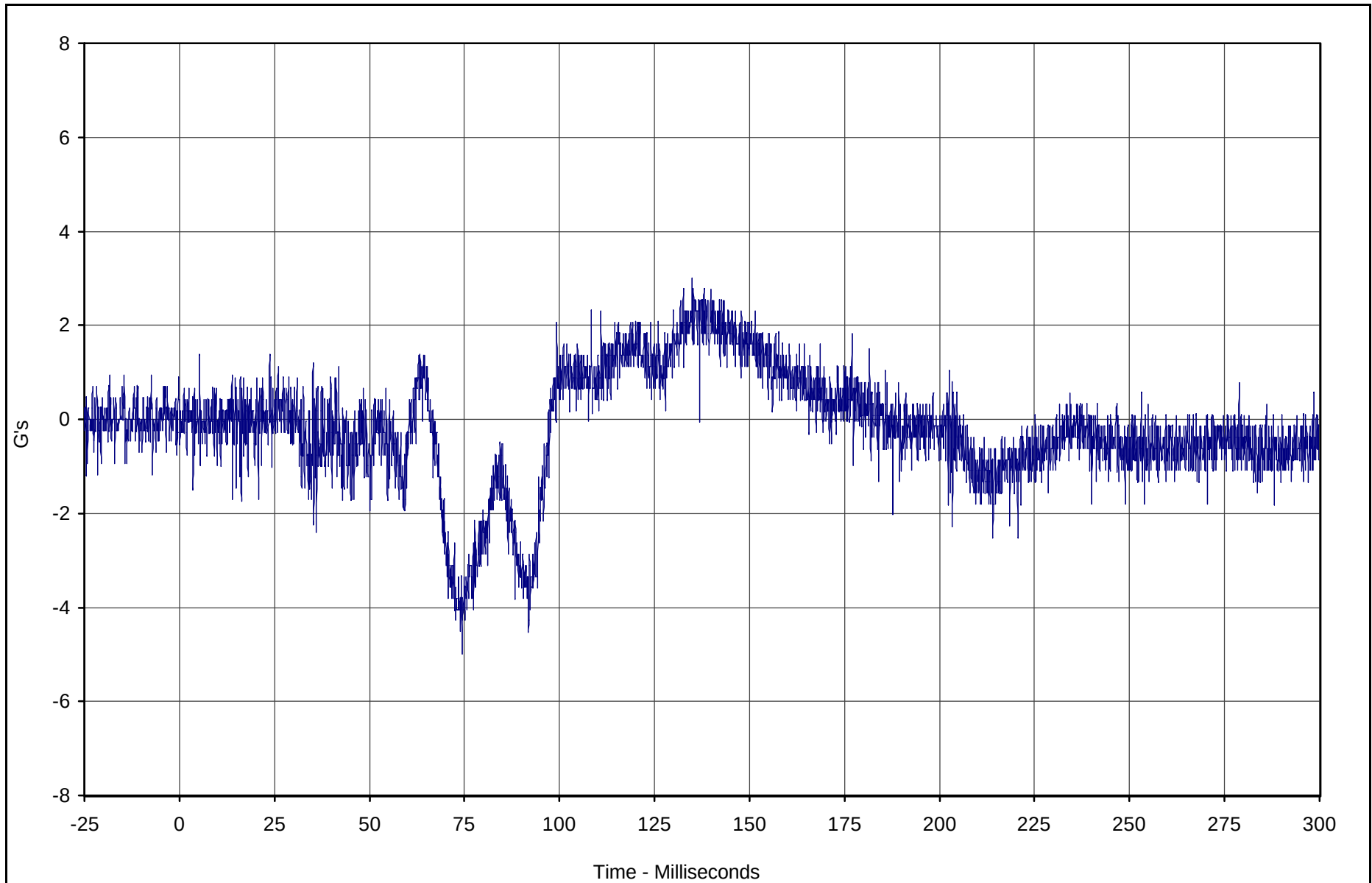


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Y	002	FIL	G's	3.0	134.9	-5.0	74.3	1000

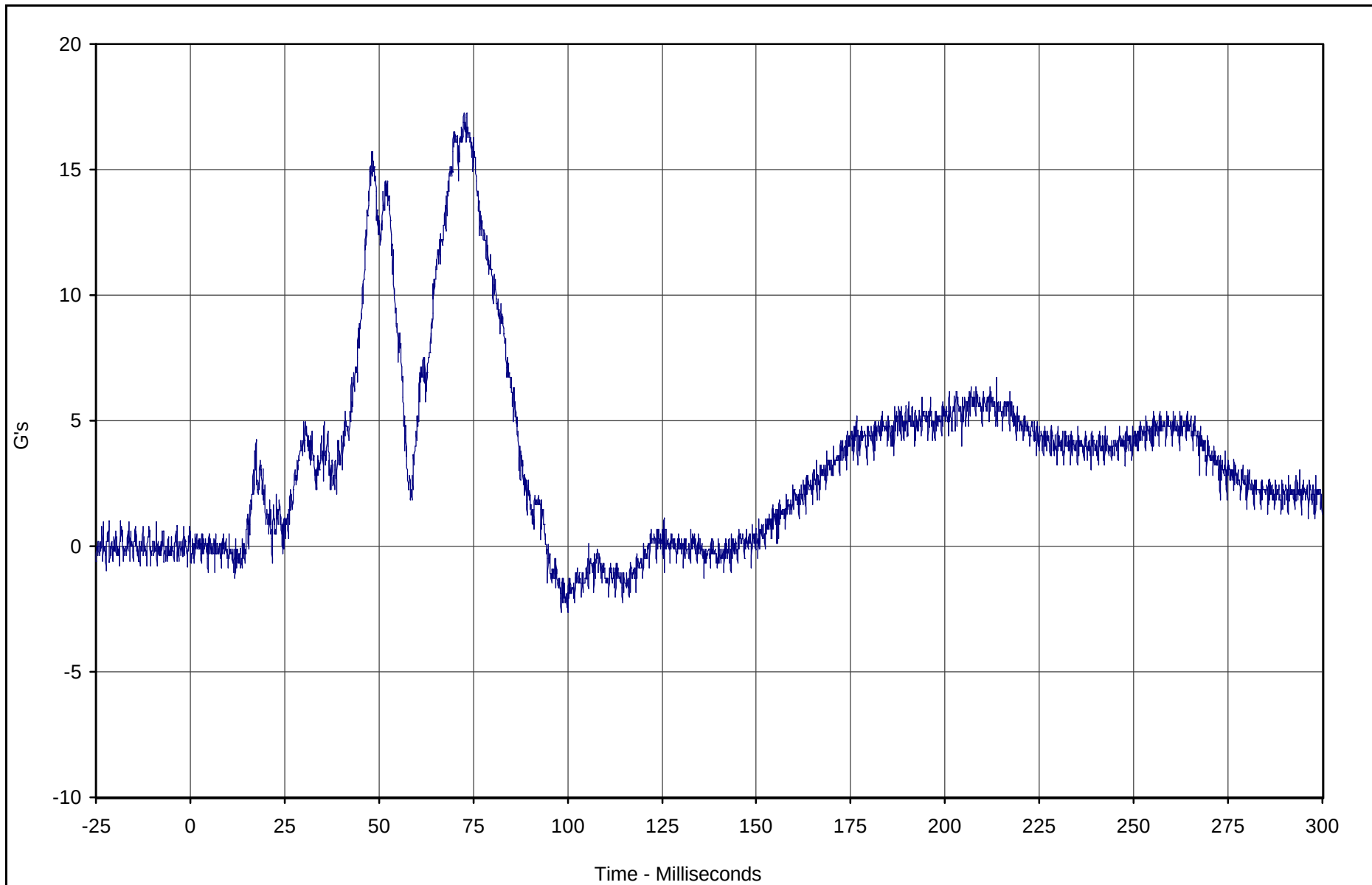


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Z	003	FIL	G's	17.3	72.5	-2.6	98.3	1000

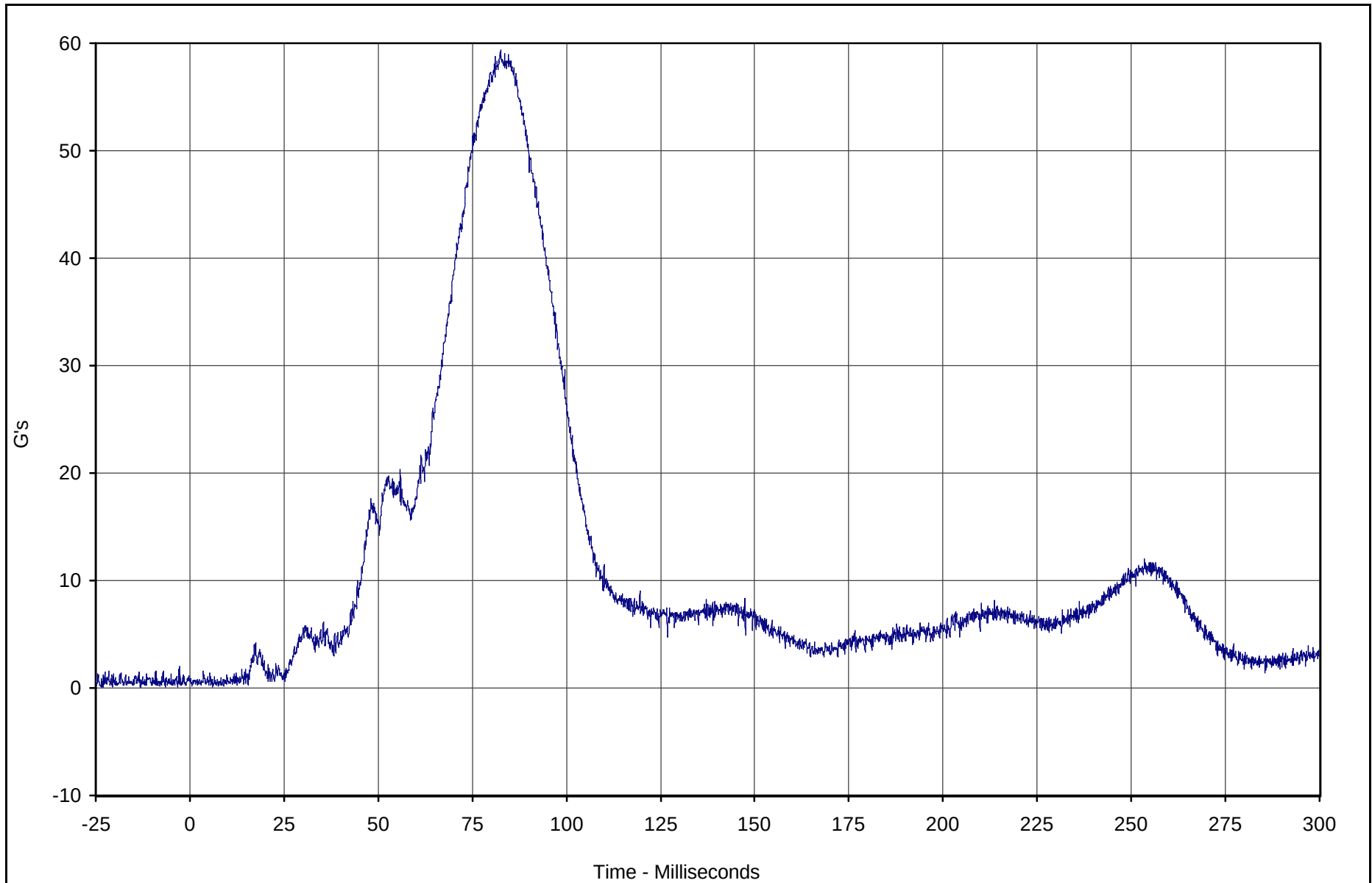


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Resultant Primary	001	RES	G's	59.4	82.5	0.1	6.0	1000

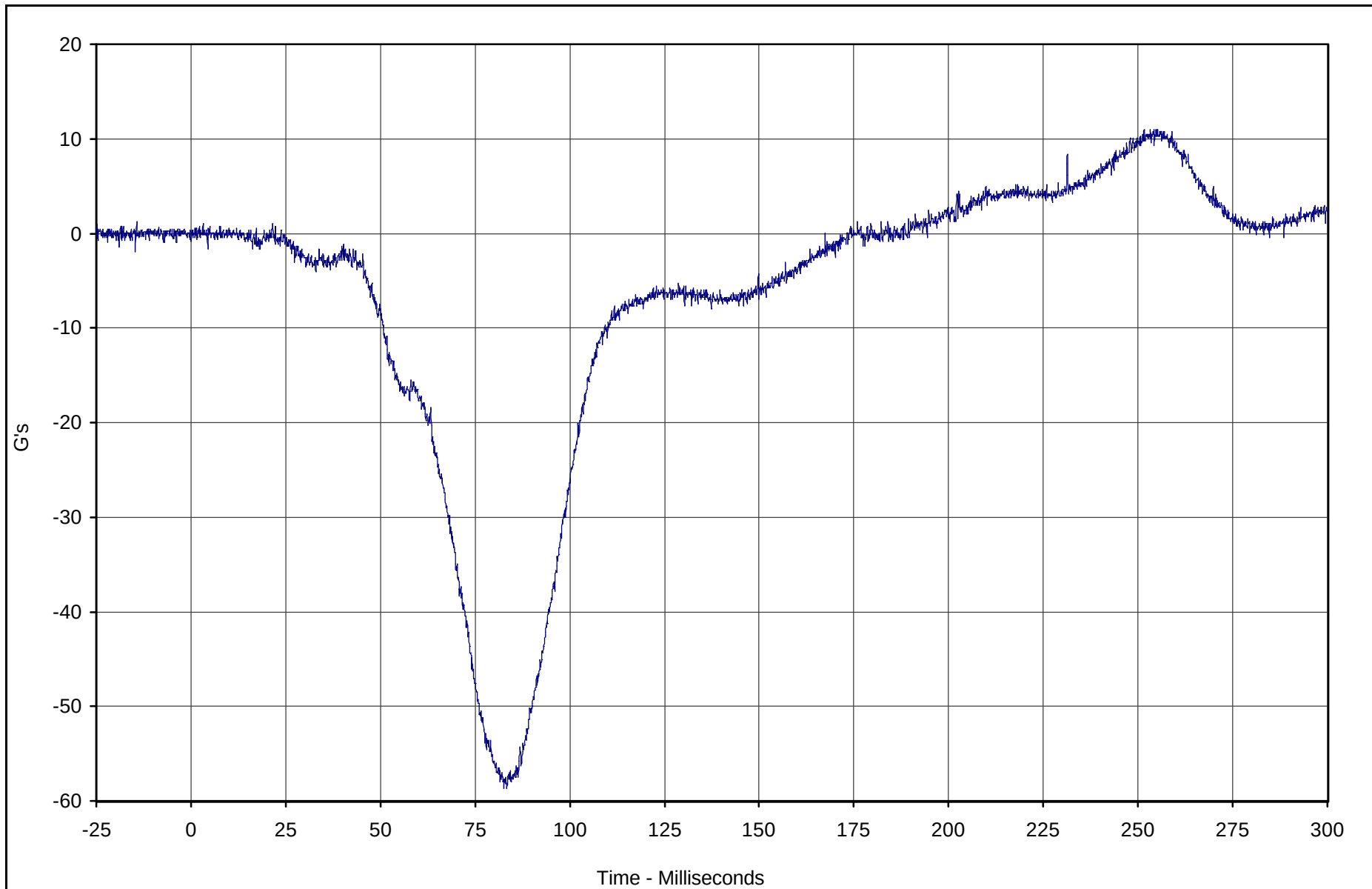


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X	004	FIL	G's	11.0	251.6	-58.7	82.7	1000

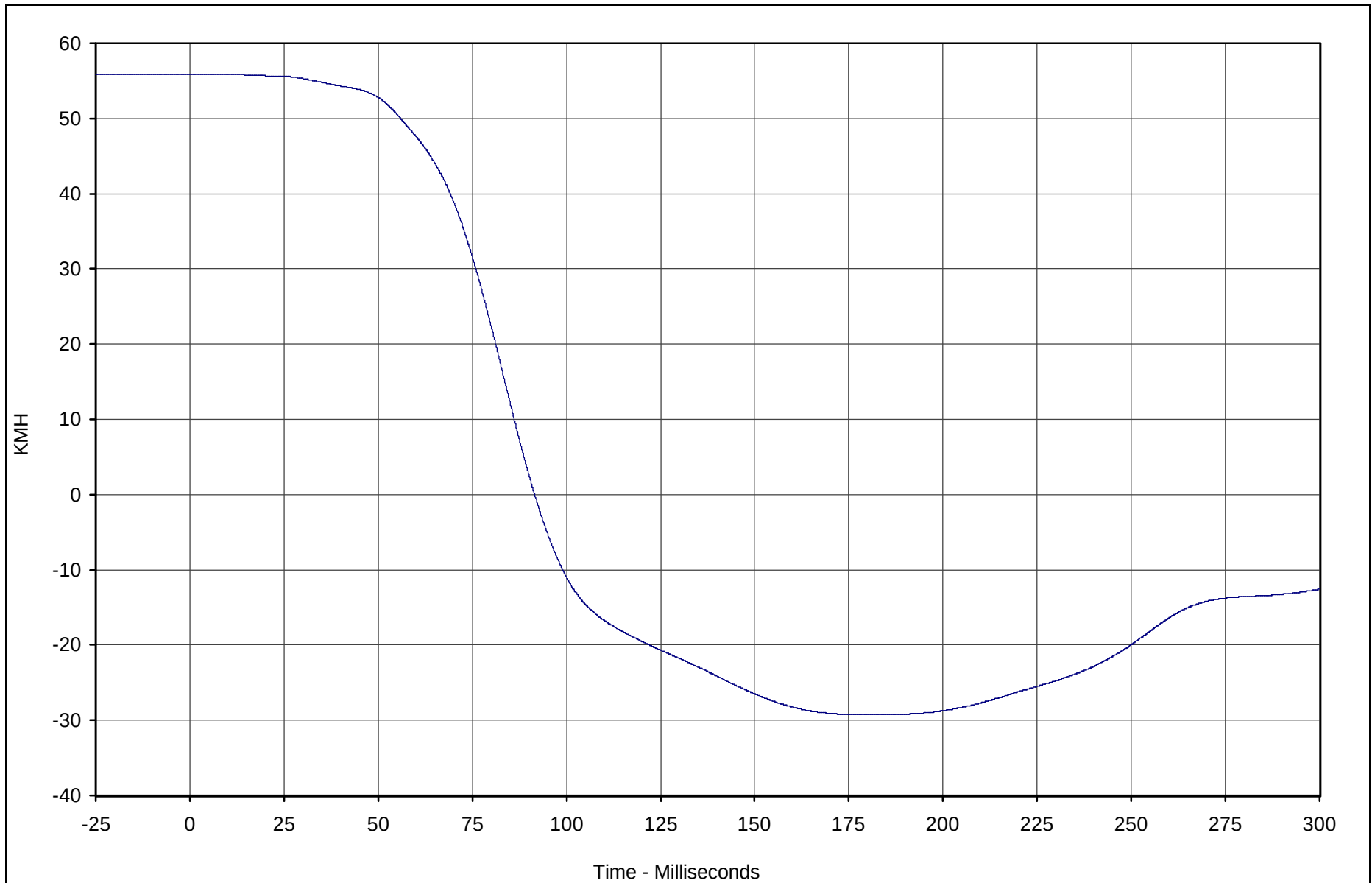


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X Velocity	004	IN1	KMH	55.8	3.7	-29.2	182.9	180

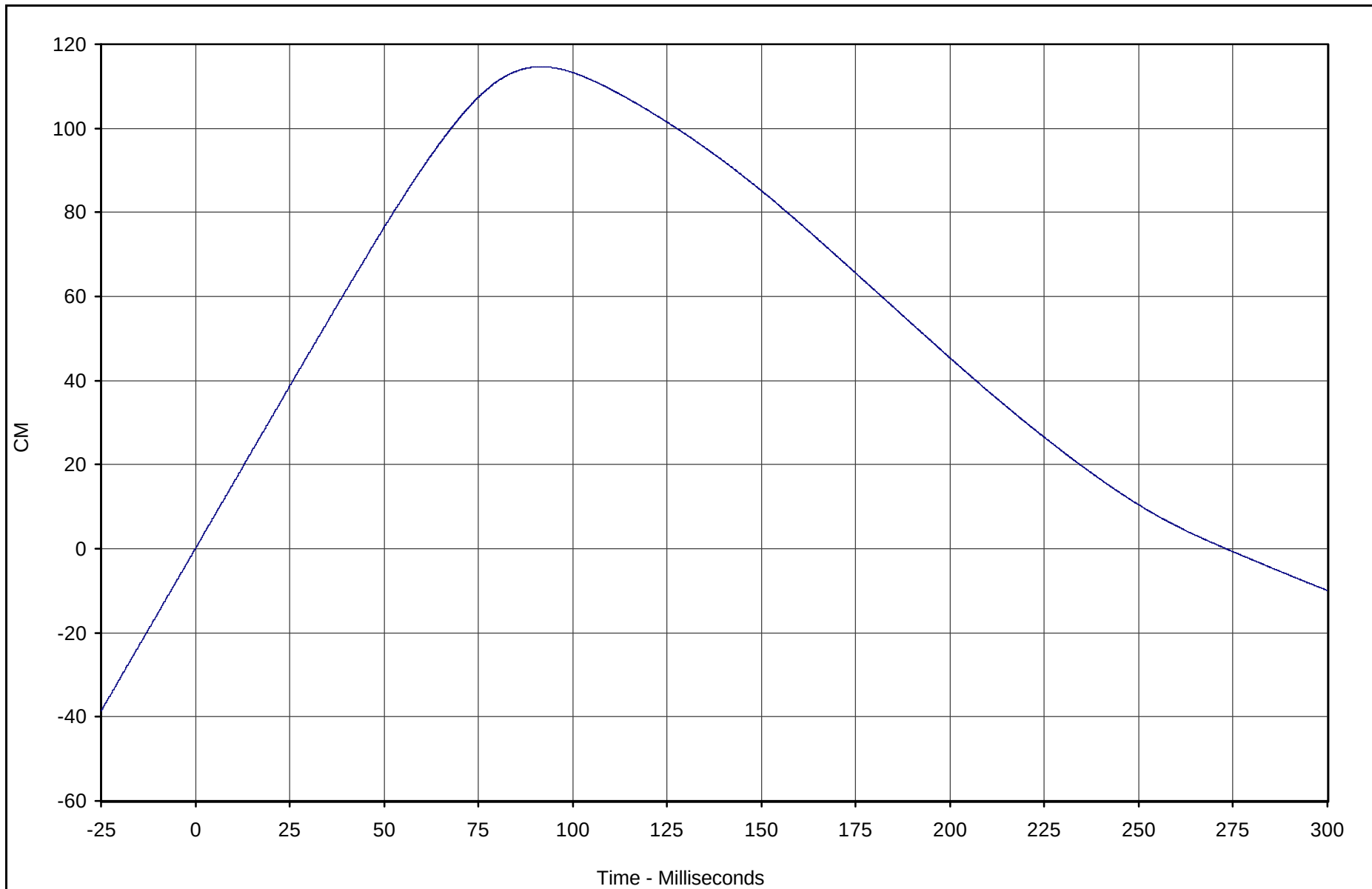


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X Displ.	004	IN2	CM	114.7	91.6	-9.9	299.9	180

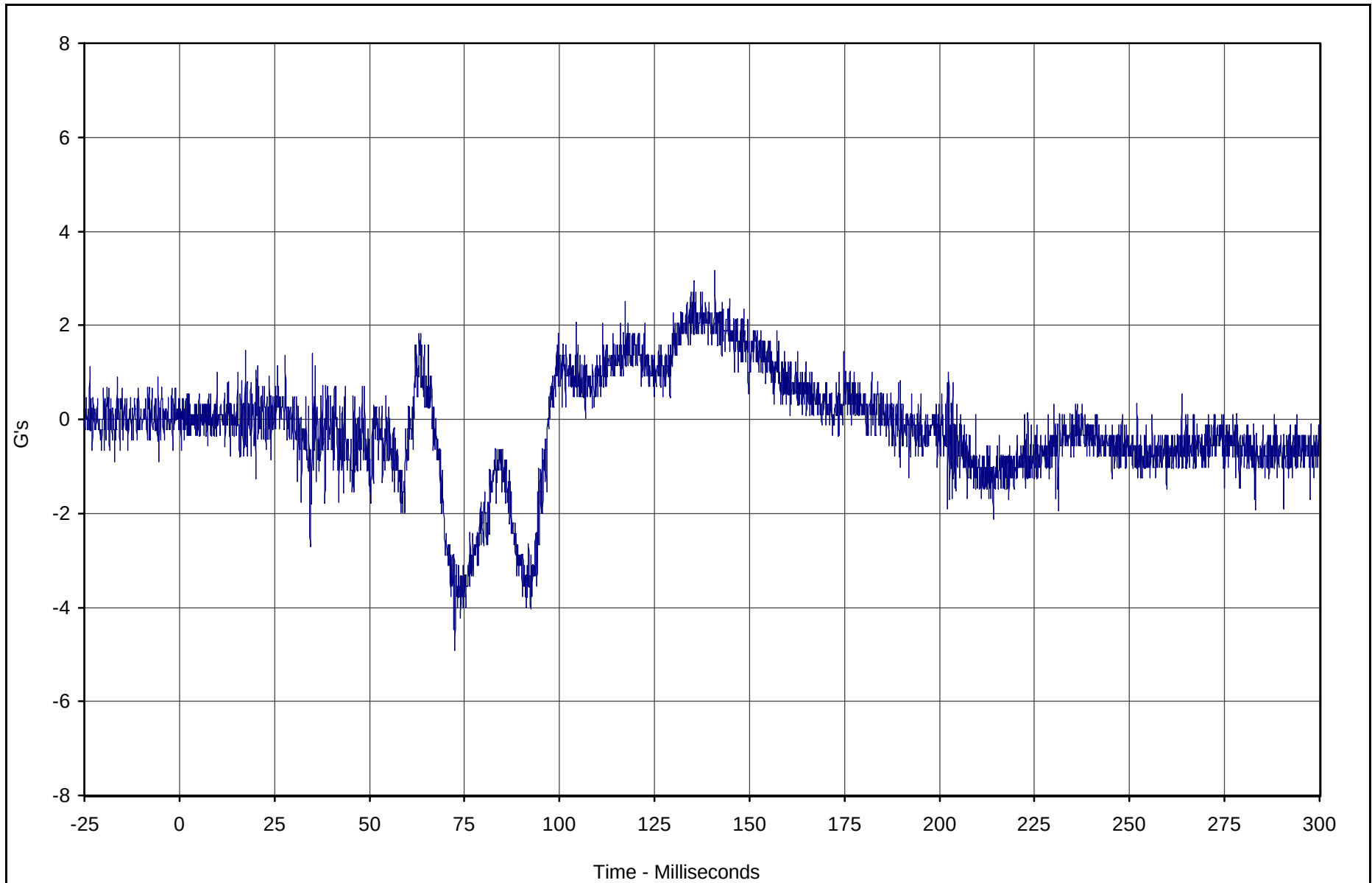


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant Y	005	FIL	G's	3.2	140.9	-4.9	72.5	1000

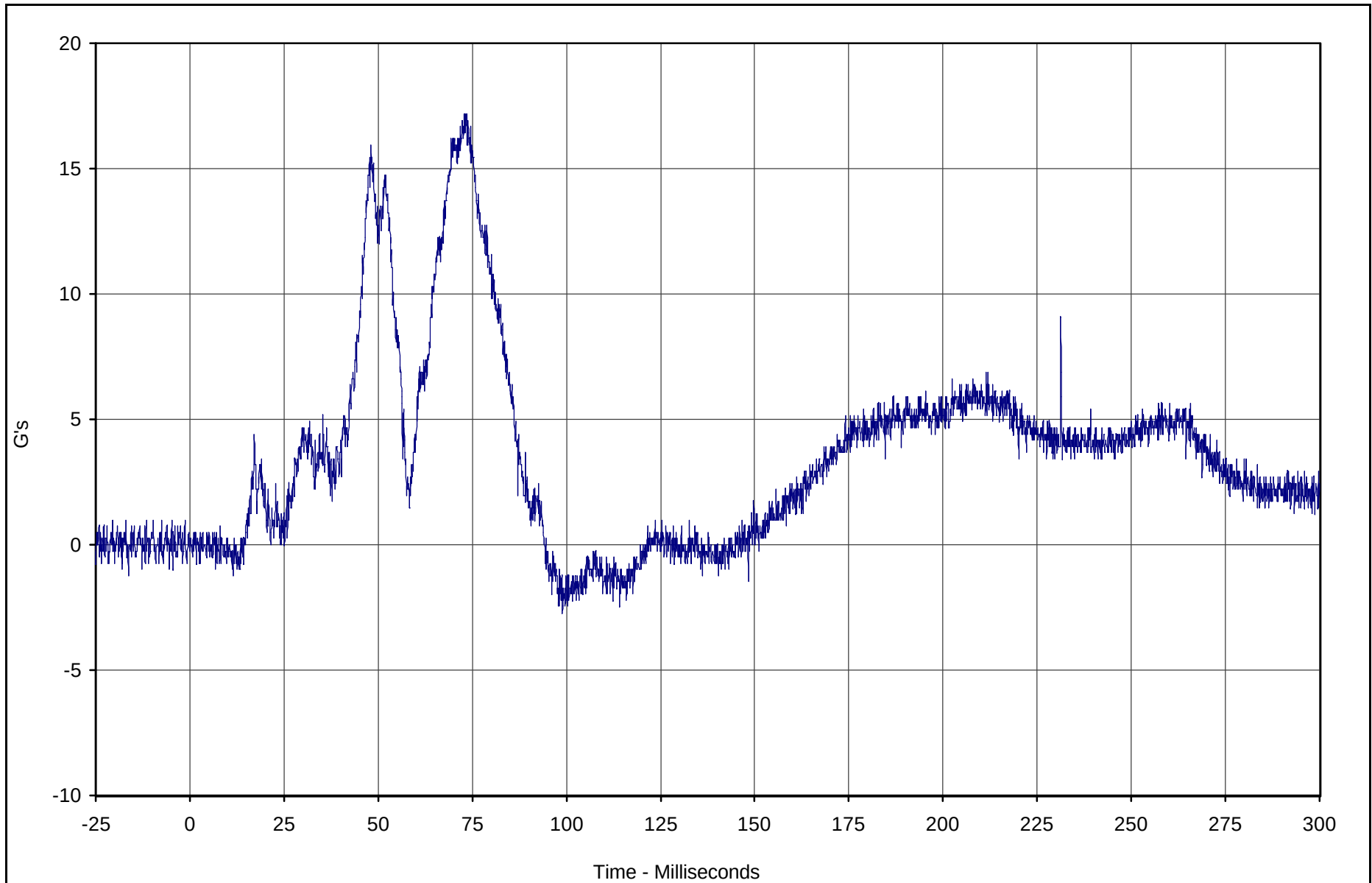


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant Z	006	FIL	G's	17.2	72.9	-2.7	98.9	1000

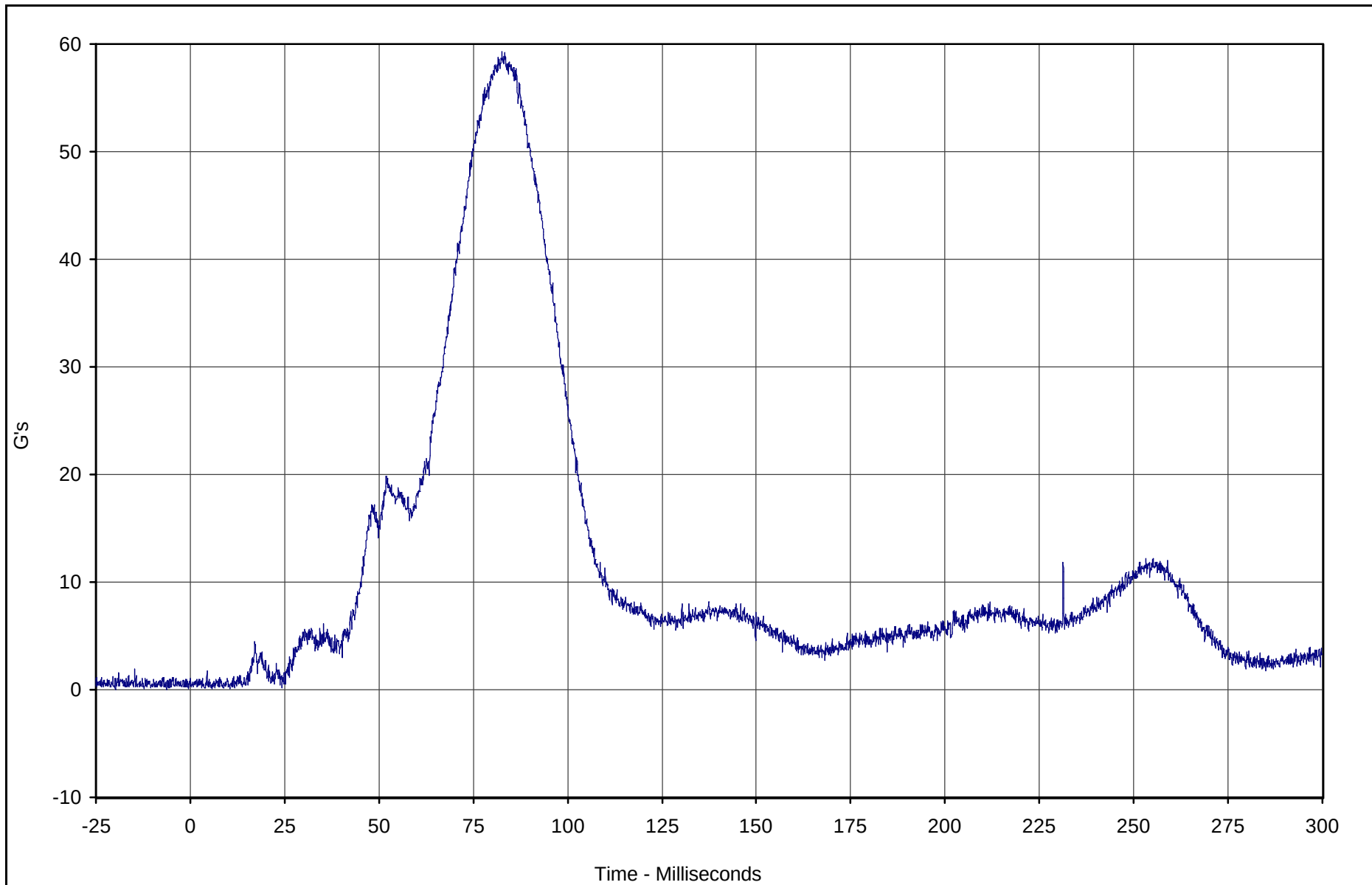


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Resultant Redundant	004	RES	G's	59.3	82.7	0.1	5.7	1000

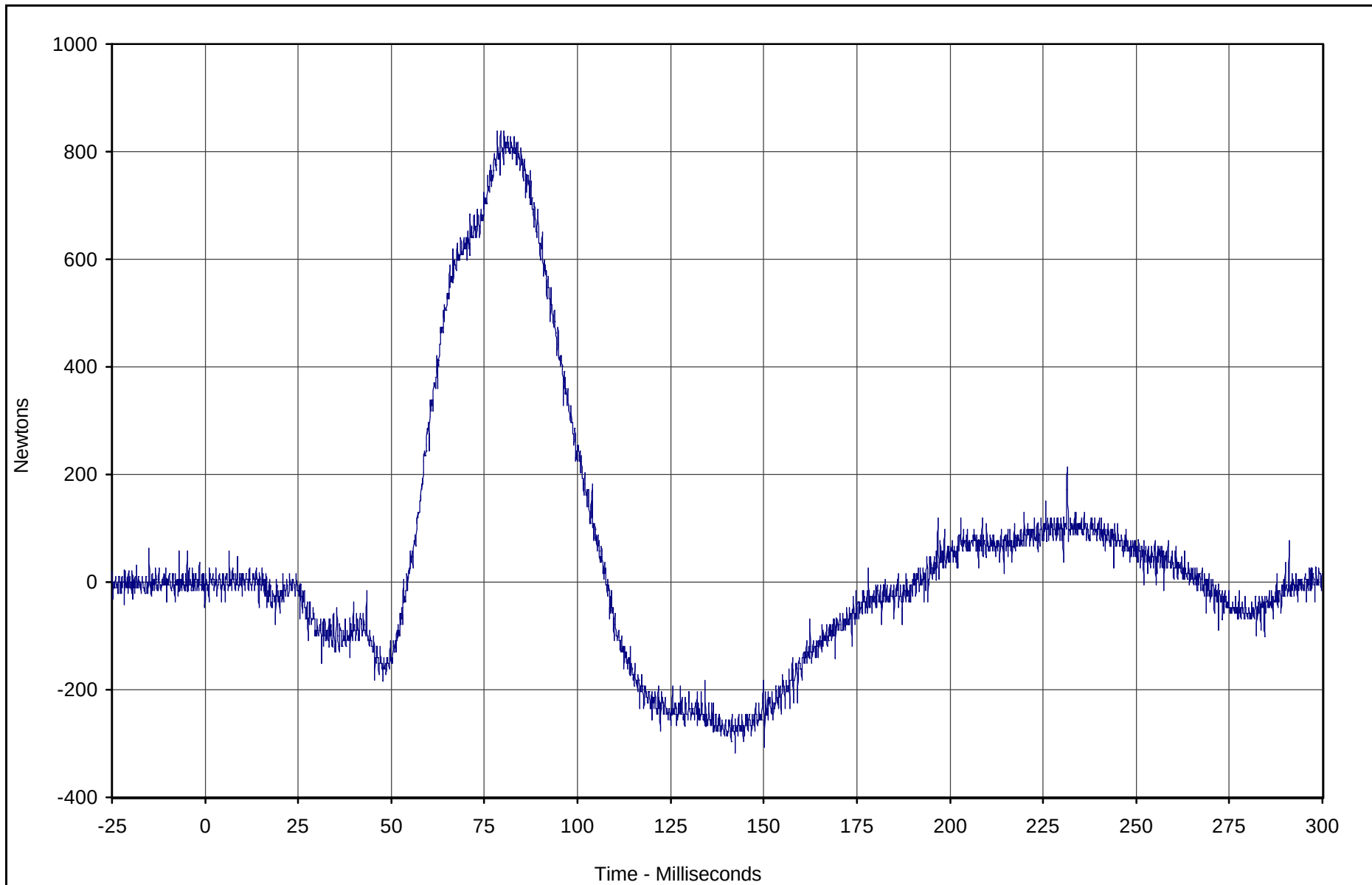


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force X	007	FIL	Newtons	838.7	78.5	-318.1	142.3	1000

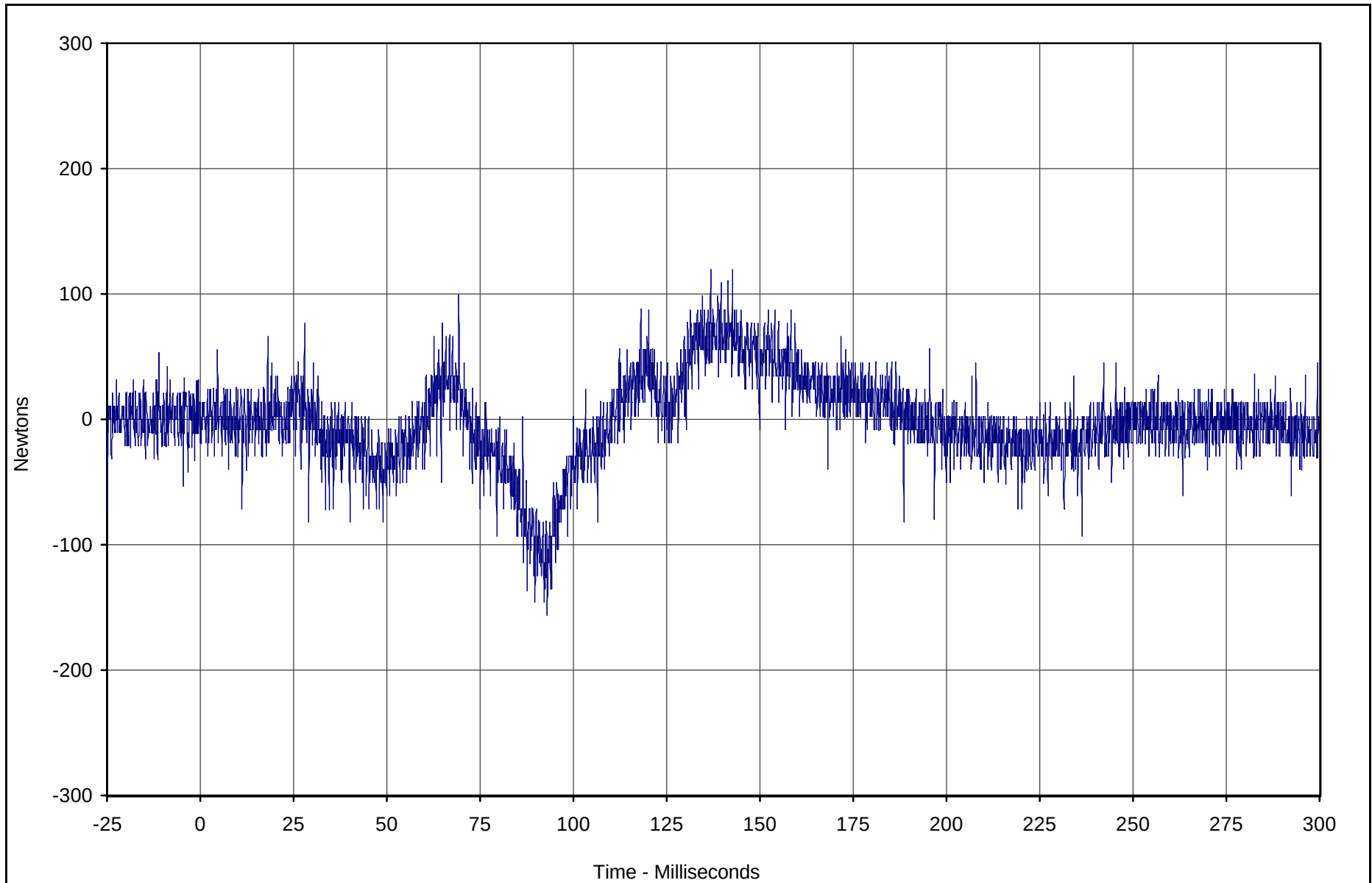


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Y	008	FIL	Newtons	119.4	136.8	-156.6	93.0	1000

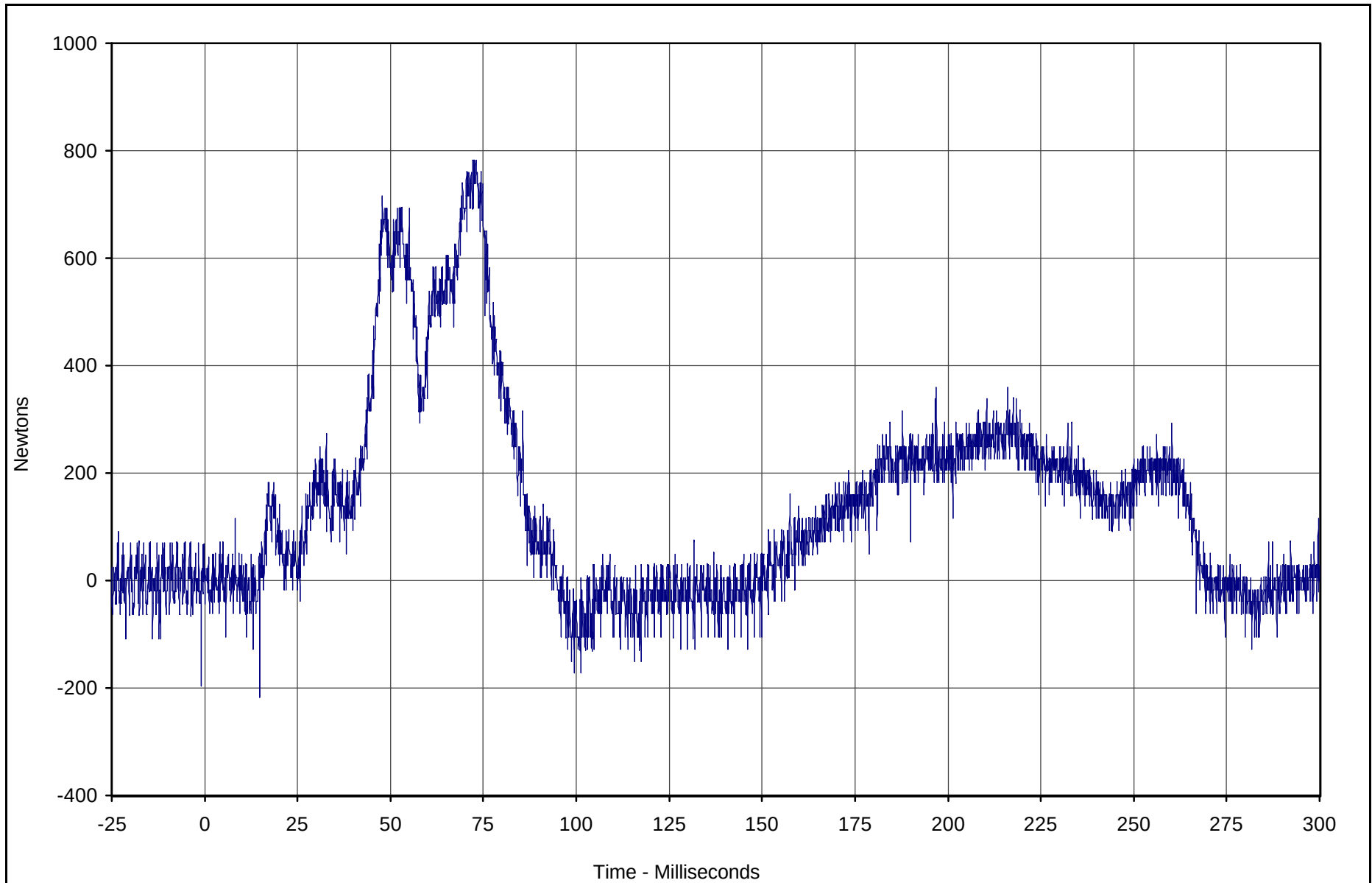


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Z	009	FIL	Newtons	782.2	72.2	-217.1	14.8	1000

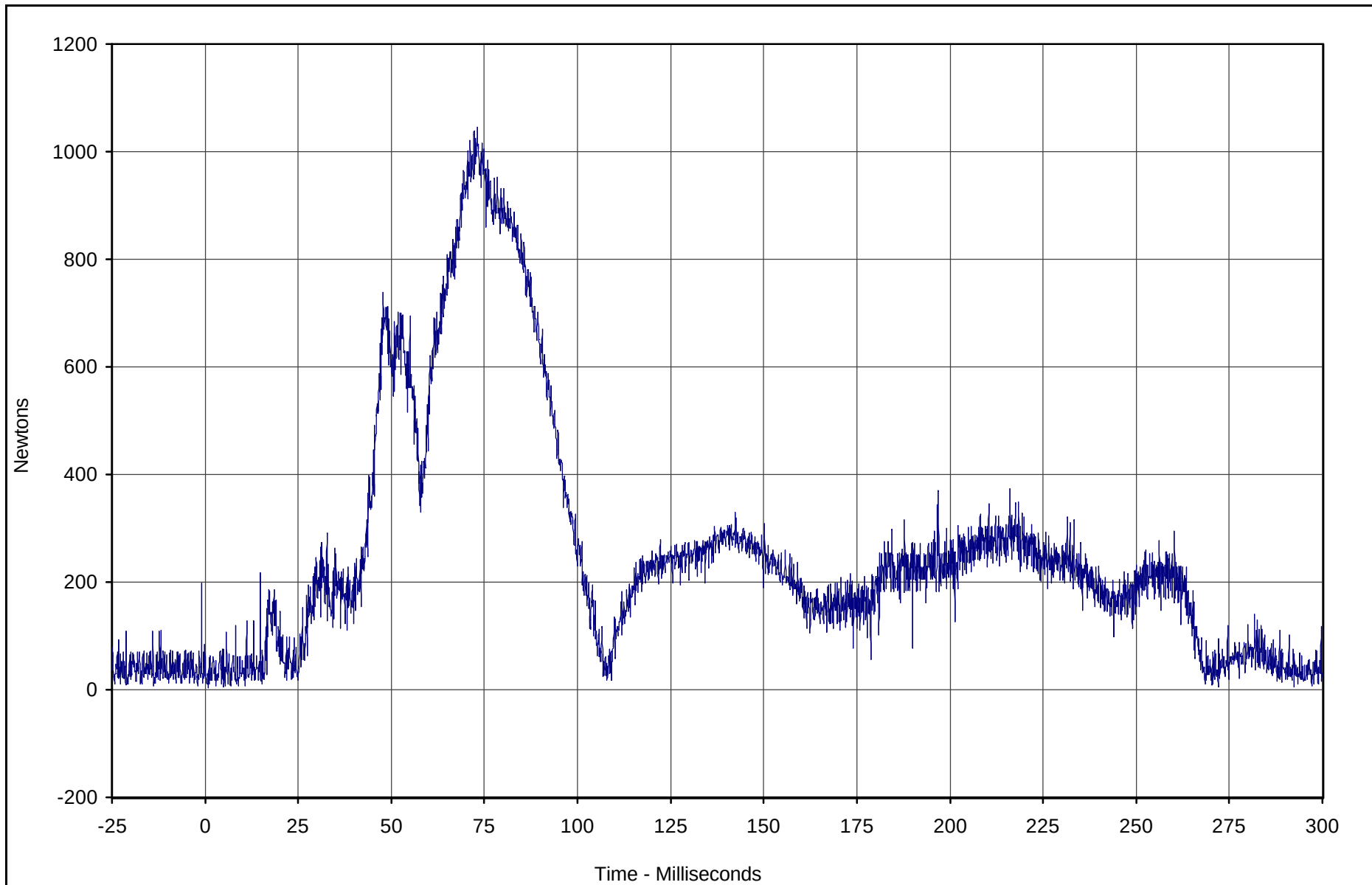


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Resultant	007	RES	Newtons	1045.0	73.1	6.0	0.9	1000

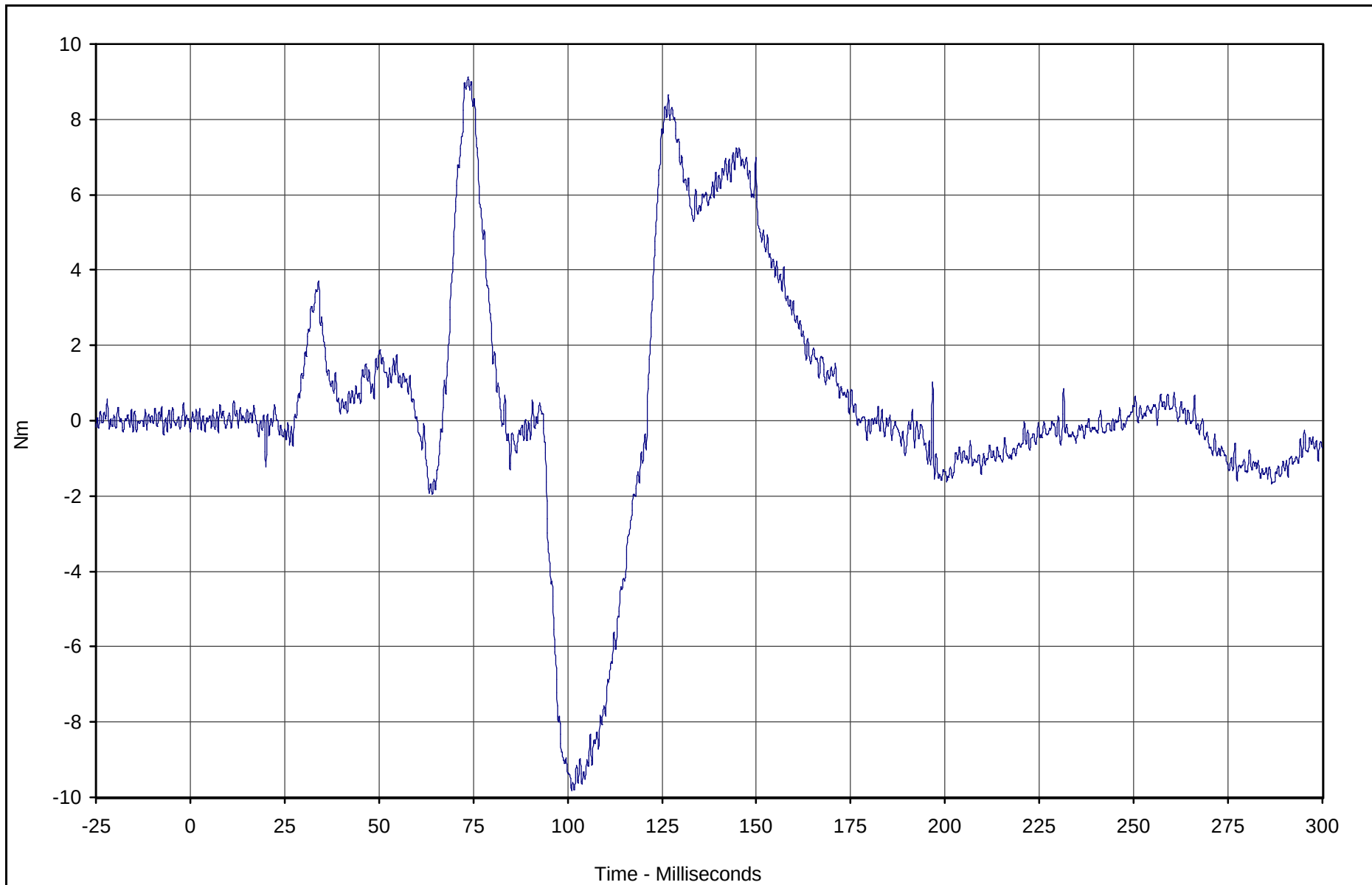


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment X	010	FIL	Nm	9.1	73.7	-9.8	101.1	600

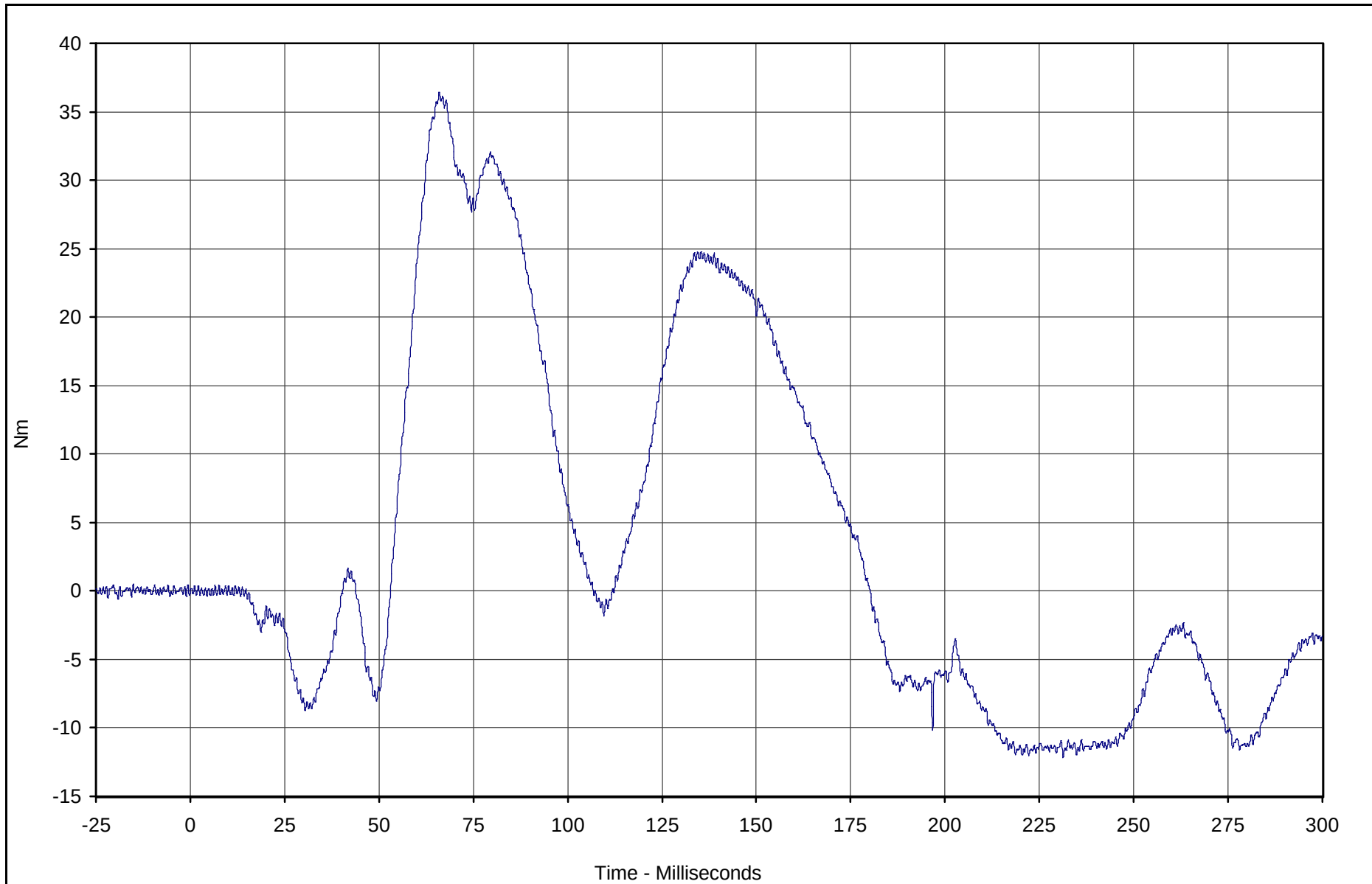


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Y	011	FIL	Nm	36.4	66.0	-12.2	231.3	600

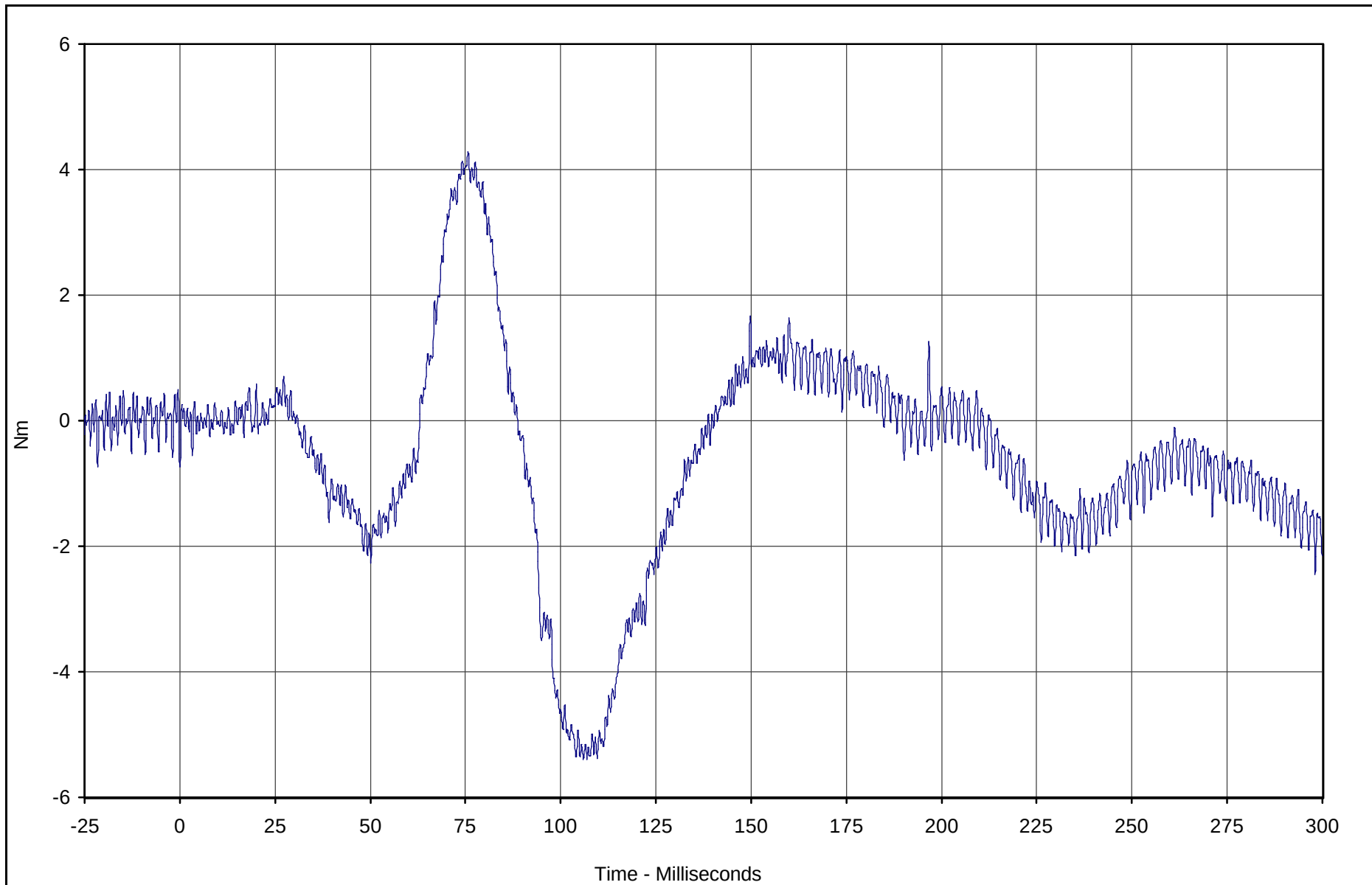


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Z	012	FIL	Nm	4.3	75.7	-5.4	106.9	600

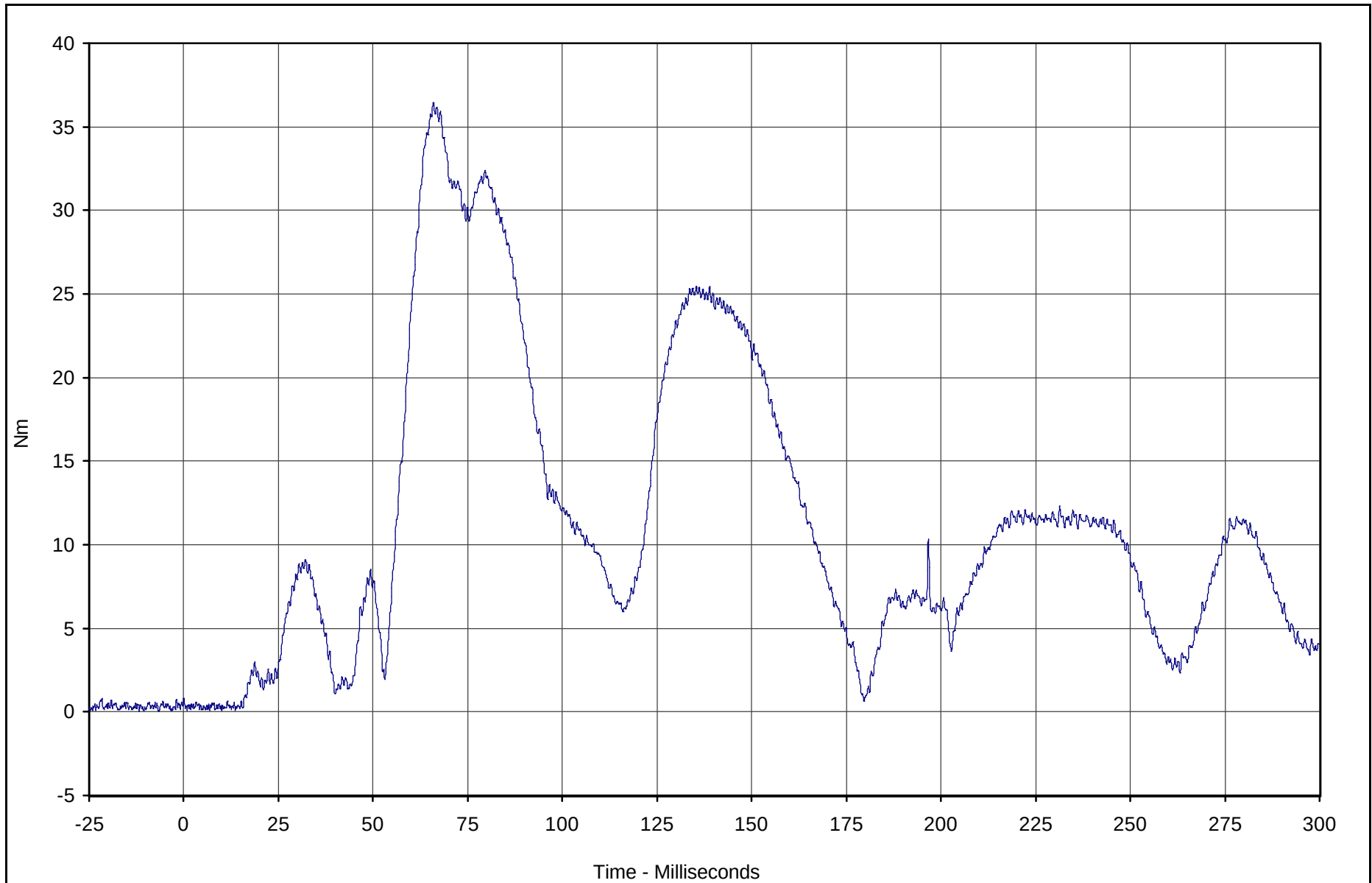


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Resultant	010	RES	Nm	36.4	66.0	0.1	10.0	600

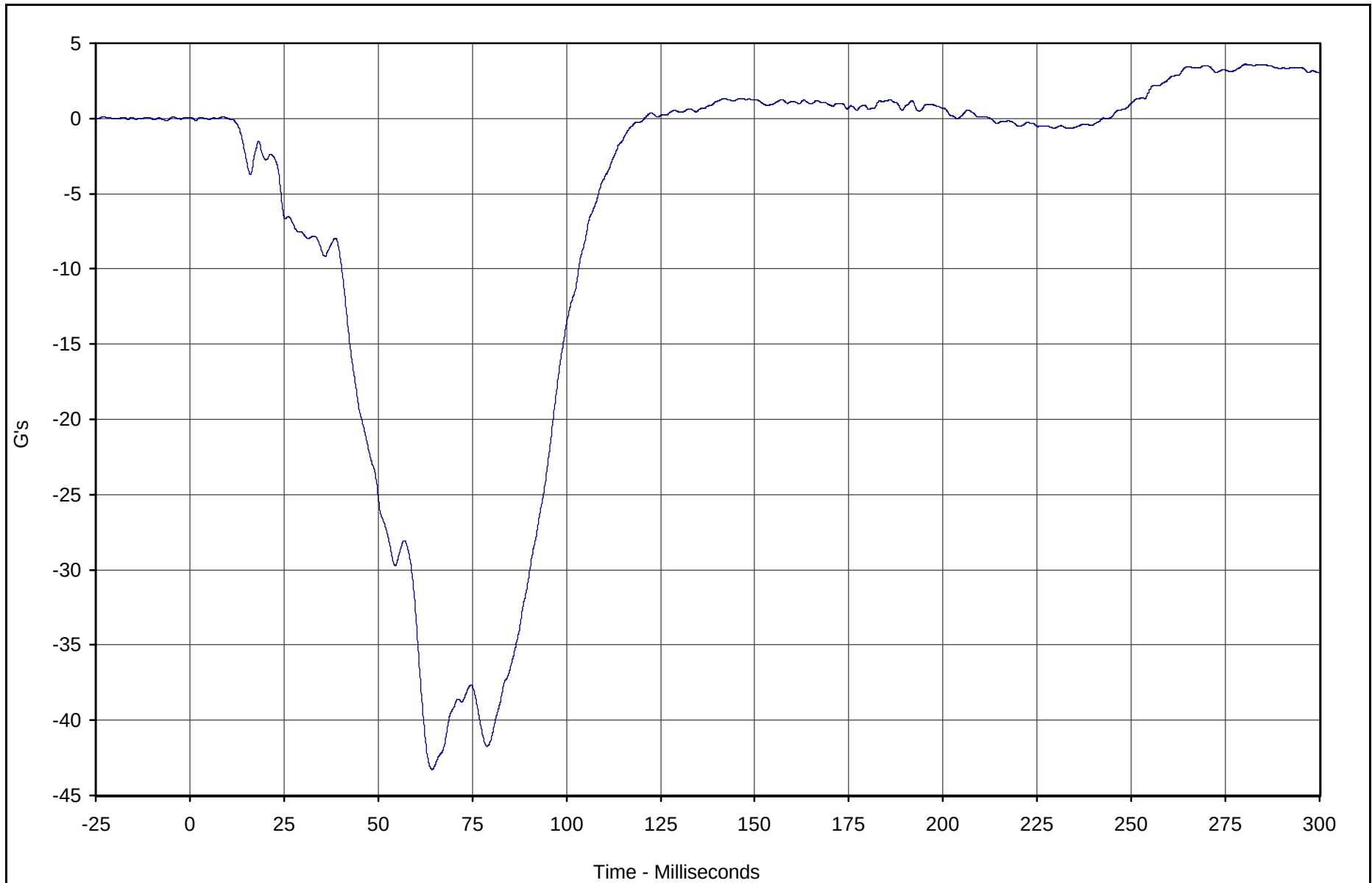


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X	013	FIL	G's	3.6	280.3	-43.3	64.4	180

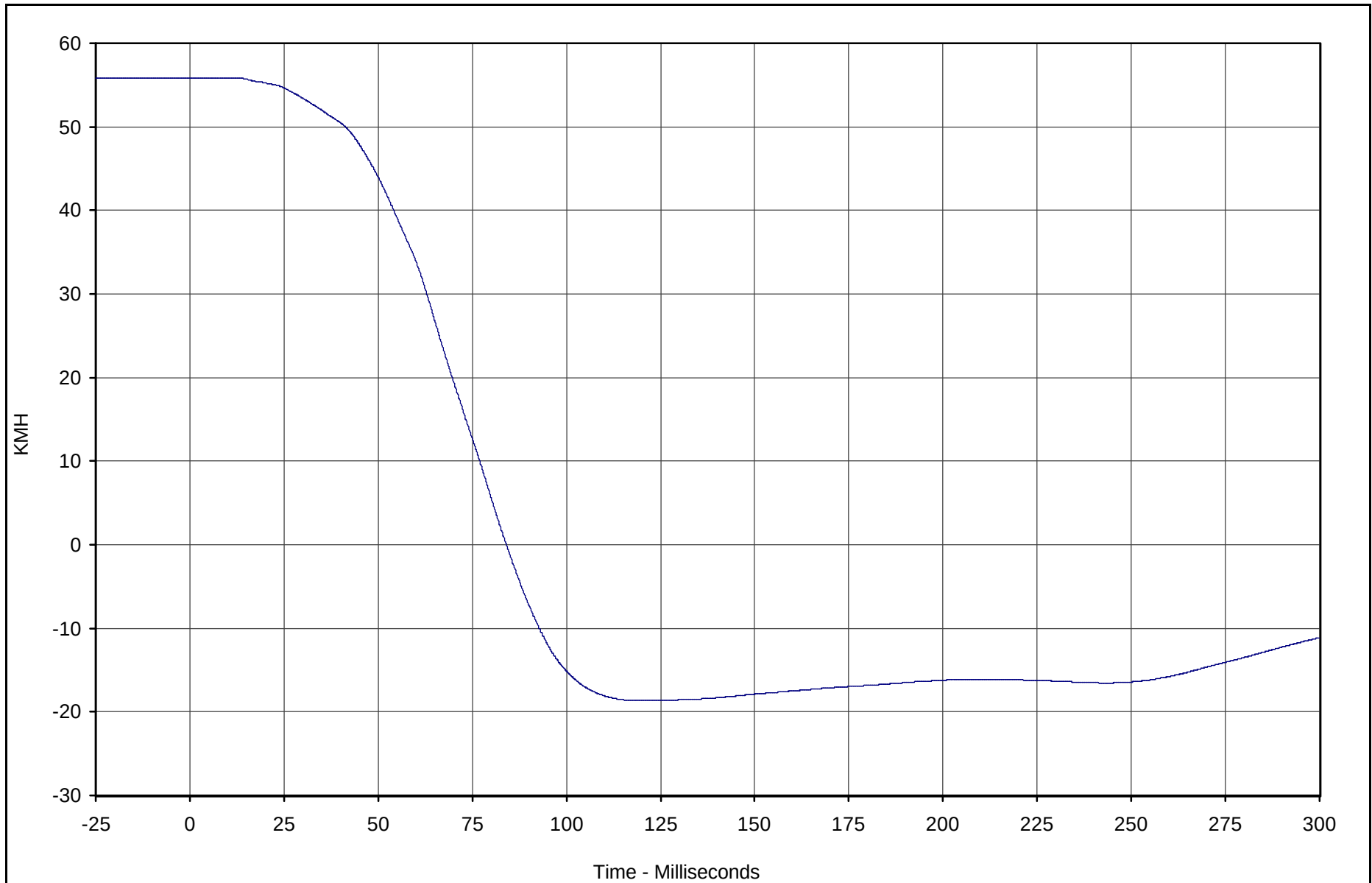


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X Velocity	013	IN1	KMH	55.8	10.0	-18.6	120.7	180

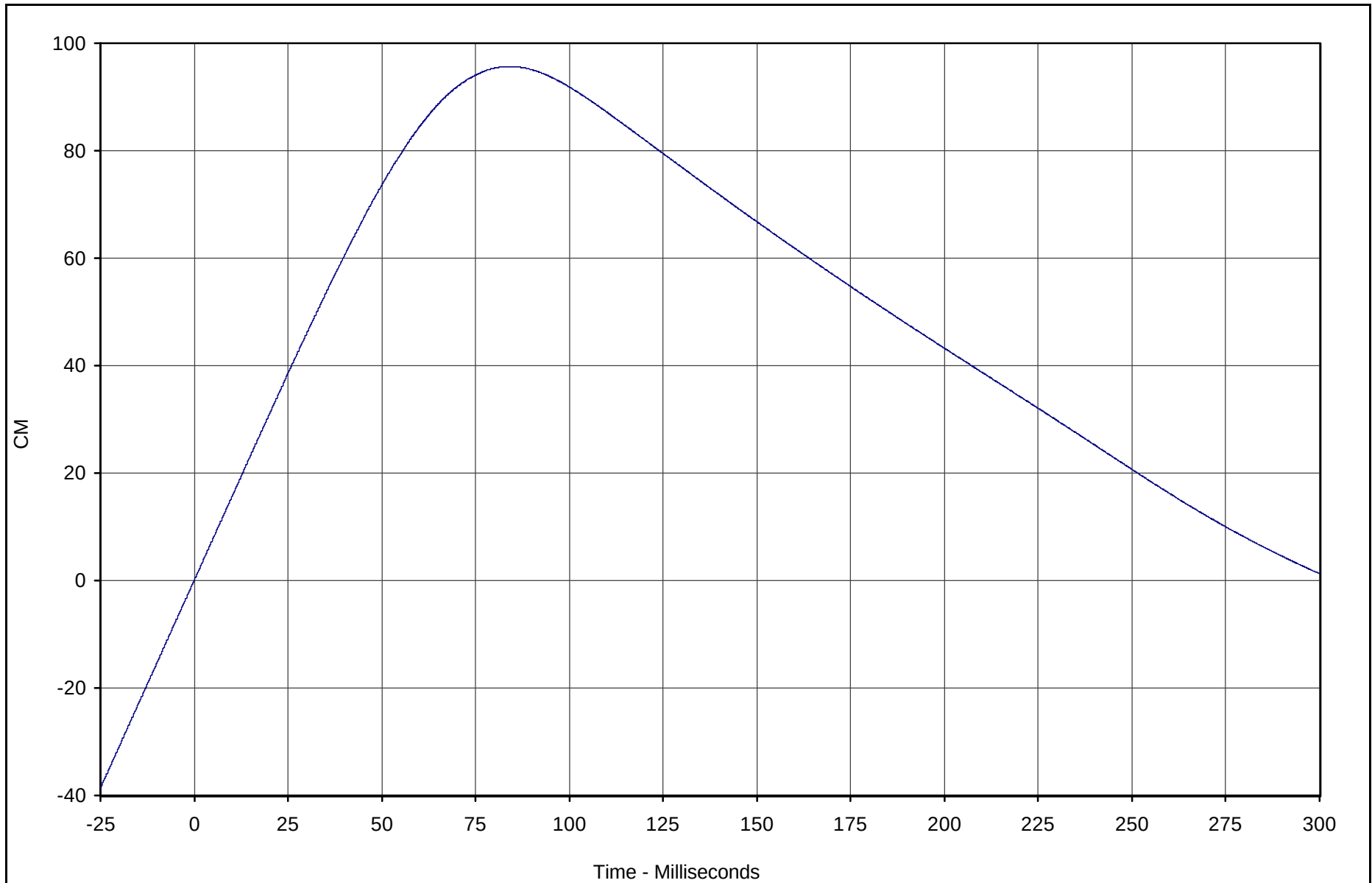


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X Displ.	013	IN2	CM	95.7	84.1	0.0	0.0	180

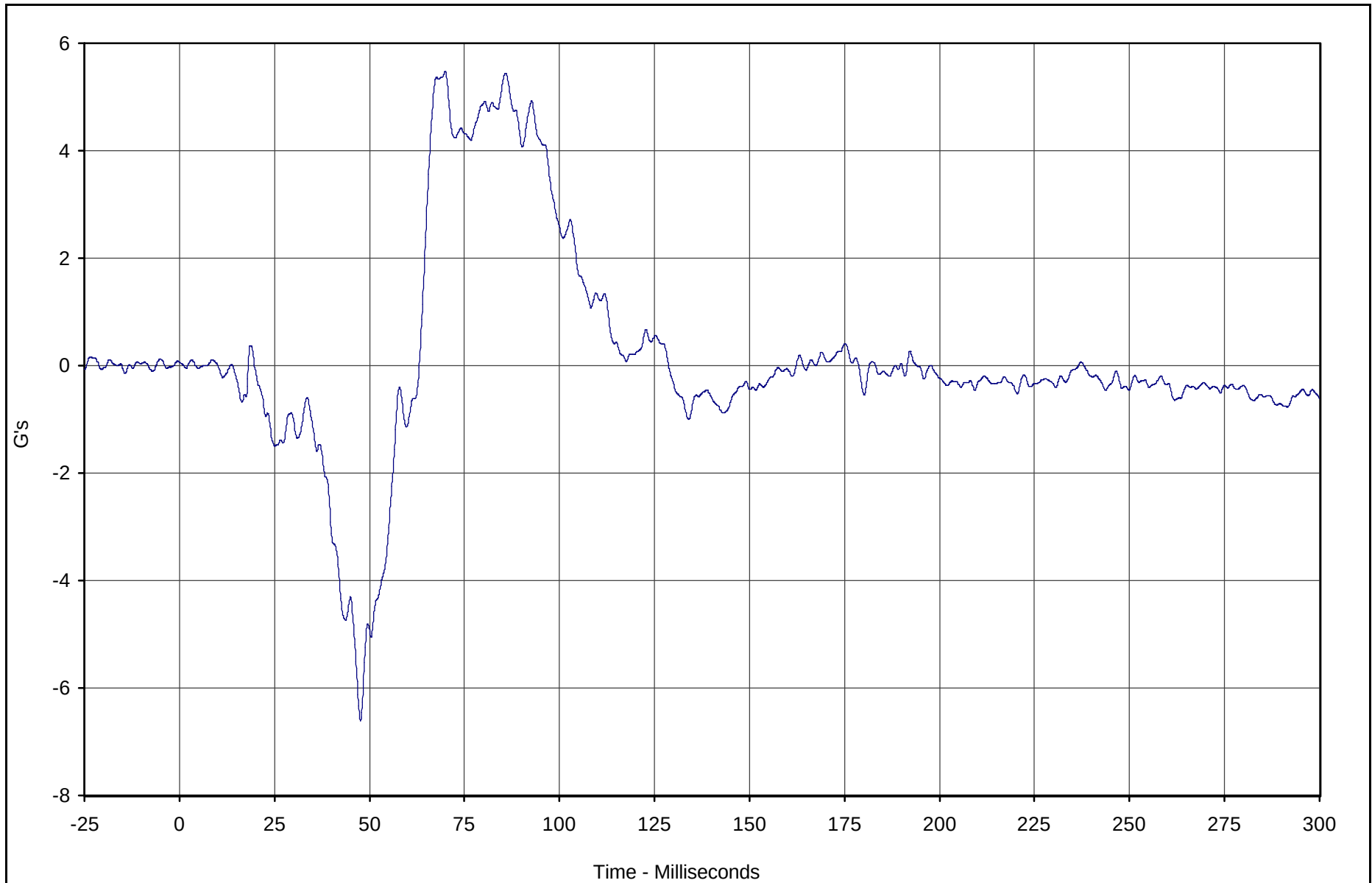


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary Y	014	FIL	G's	5.5	69.9	-6.6	47.7	180

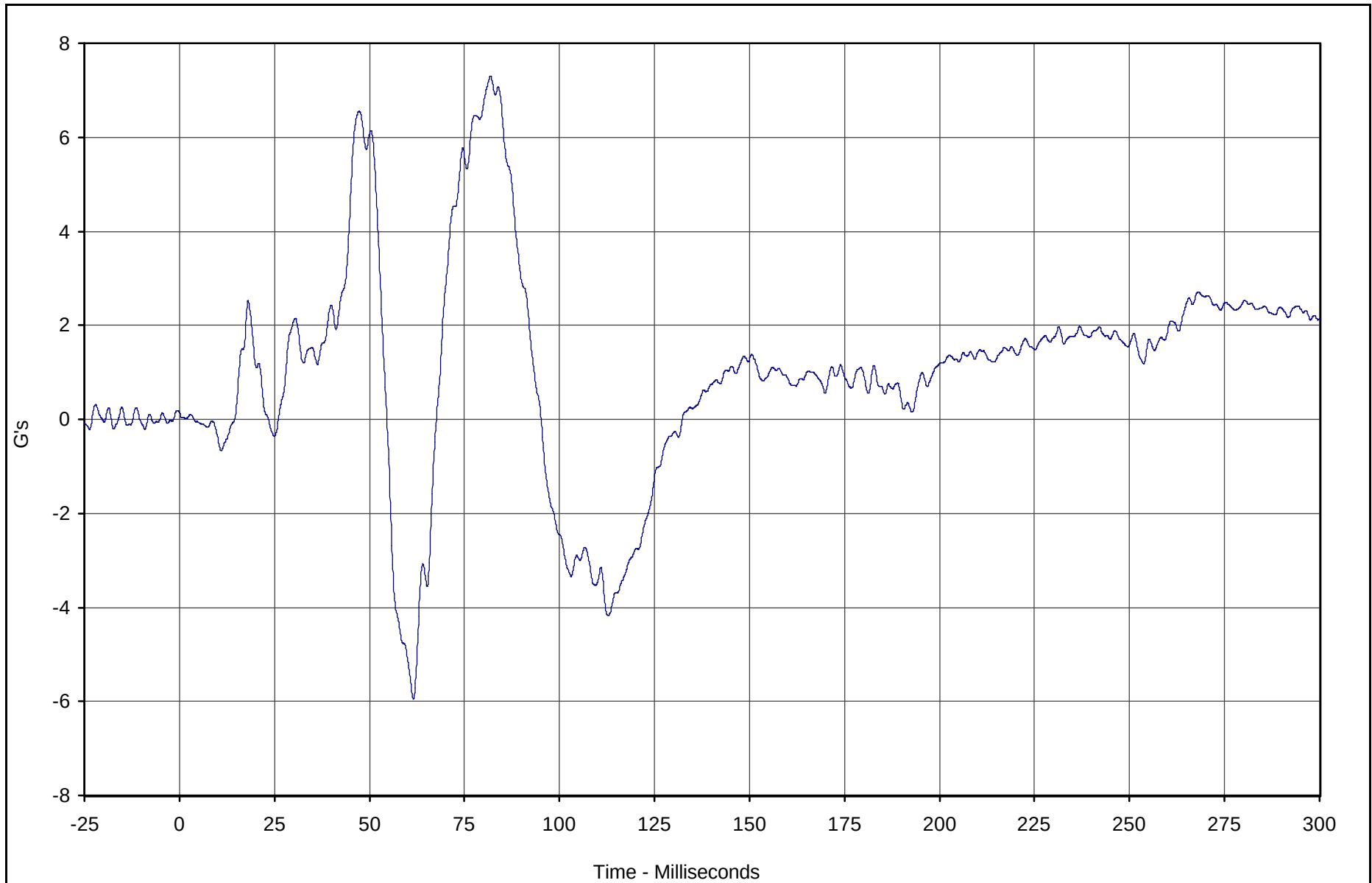


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary Z	015	FIL	G's	7.3	81.9	-6.0	61.6	180

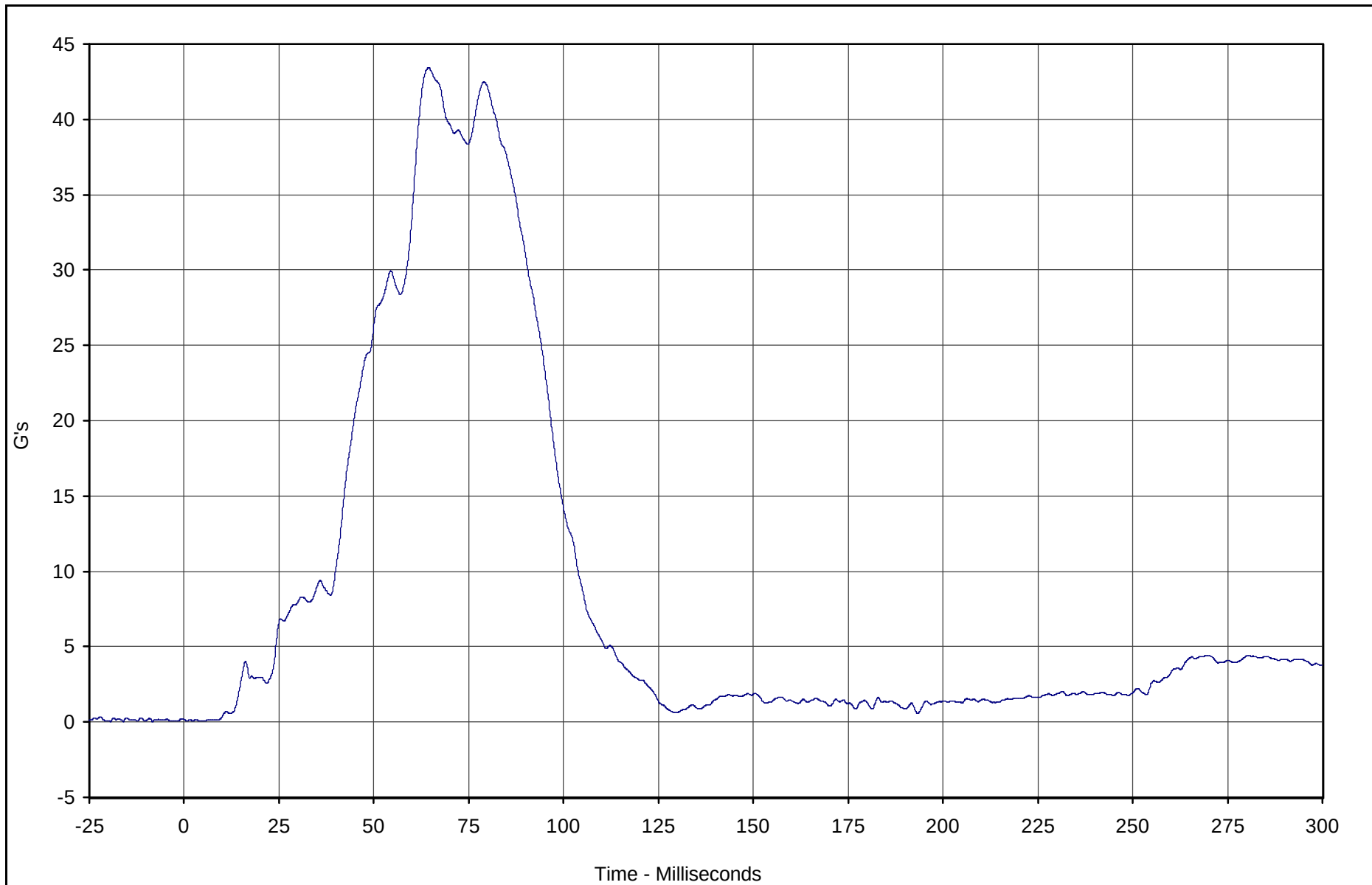


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Resultant Primary	013	RES	G's	43.4	64.5	0.0	0.7	180

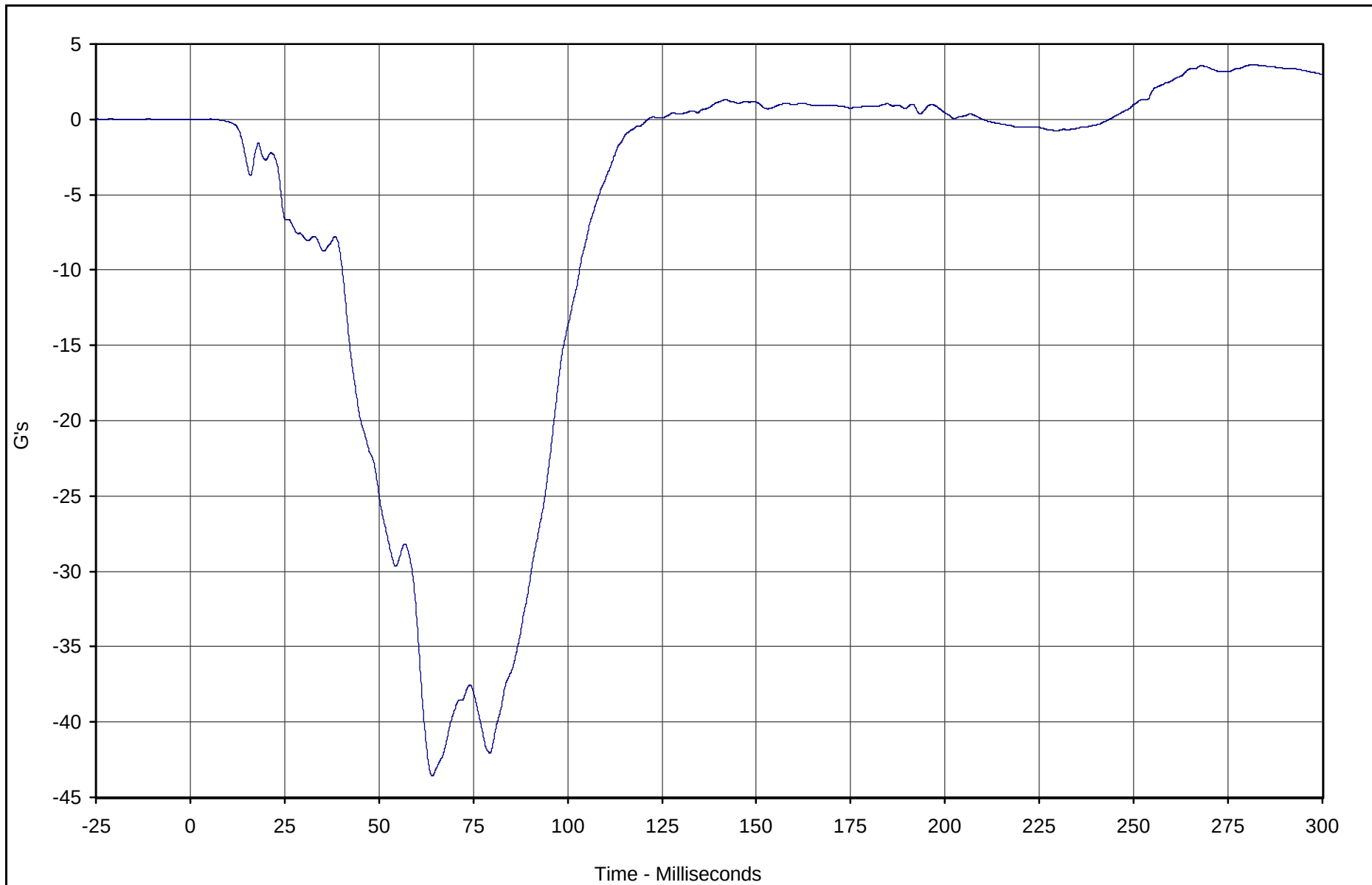


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X	016	FIL	G's	3.6	281.8	-43.6	64.1	180

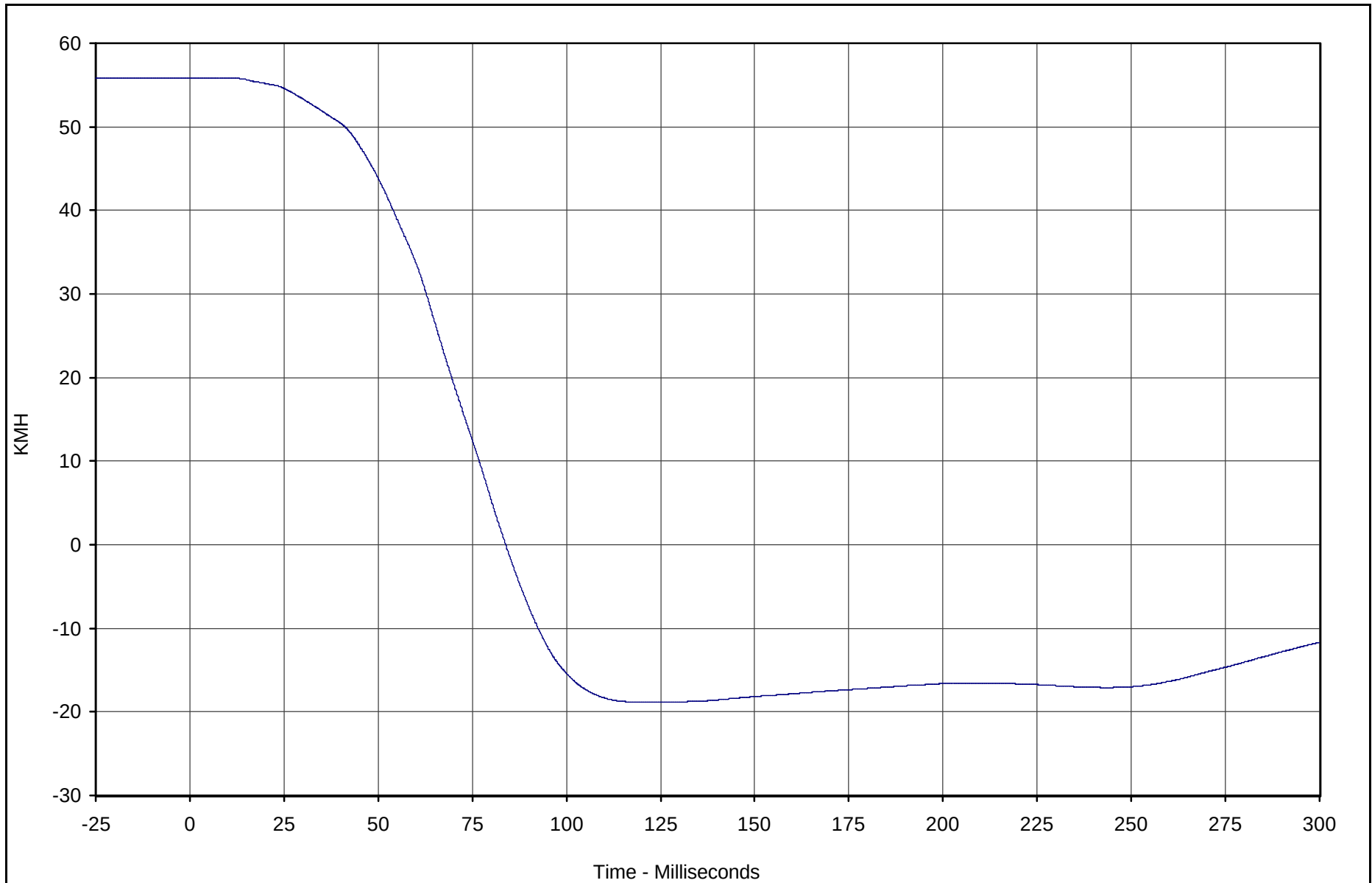


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X Velocity	016	IN1	KMH	55.8	0.0	-18.9	121.3	180

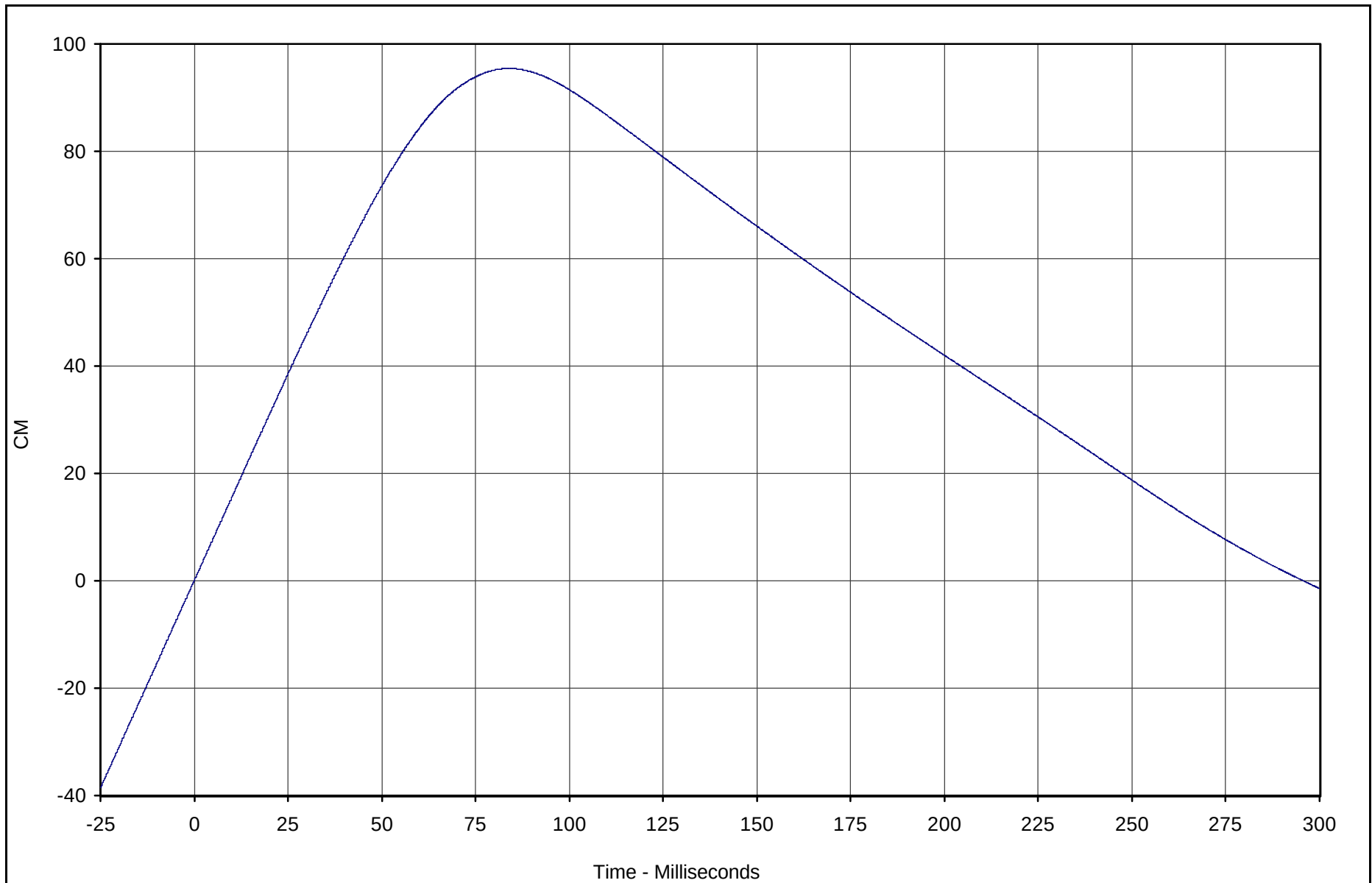


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X Displ.	016	IN2	CM	95.4	83.9	-1.4	299.9	180

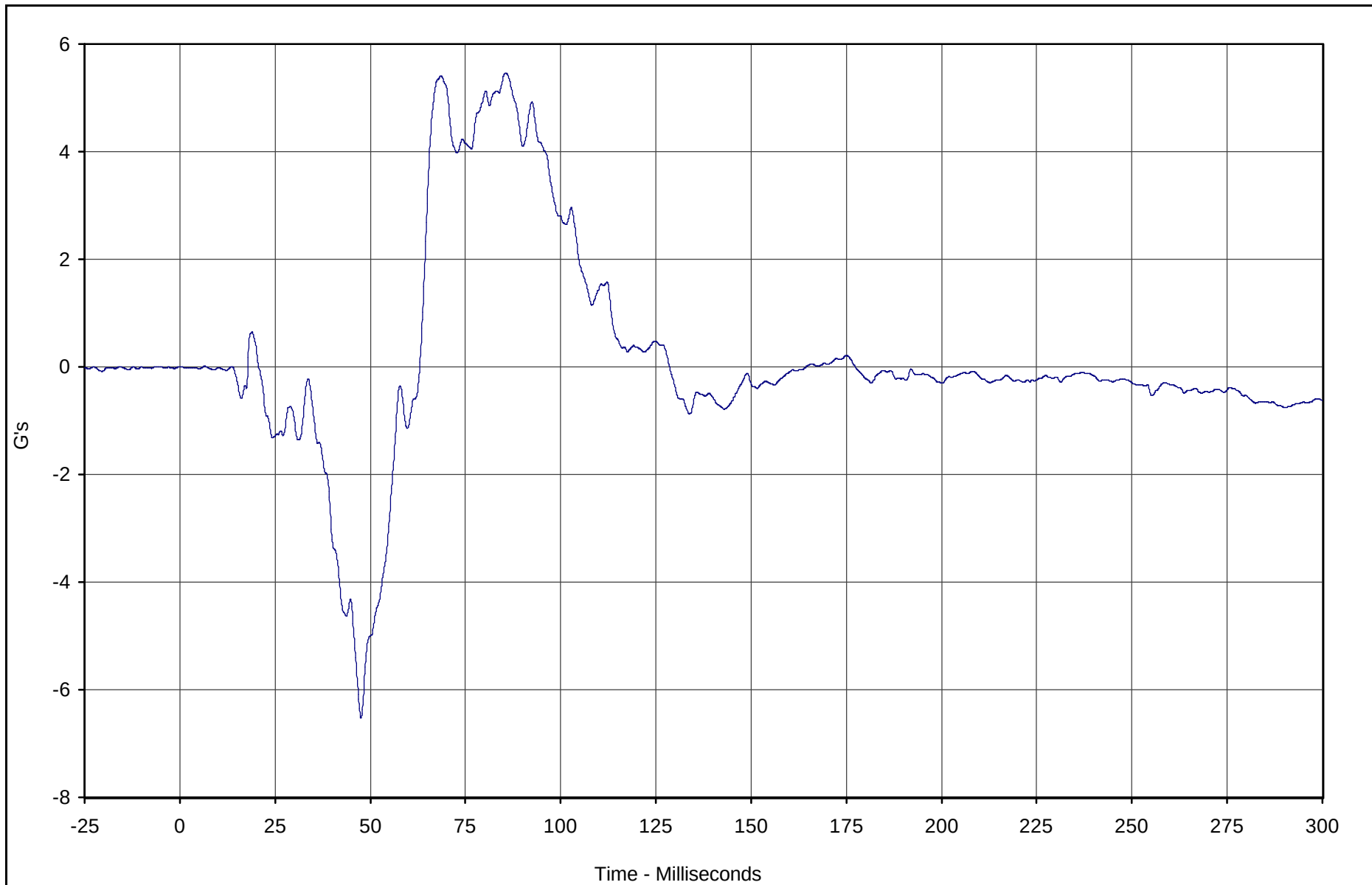


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant Y	017	FIL	G's	5.5	85.4	-6.5	47.6	180

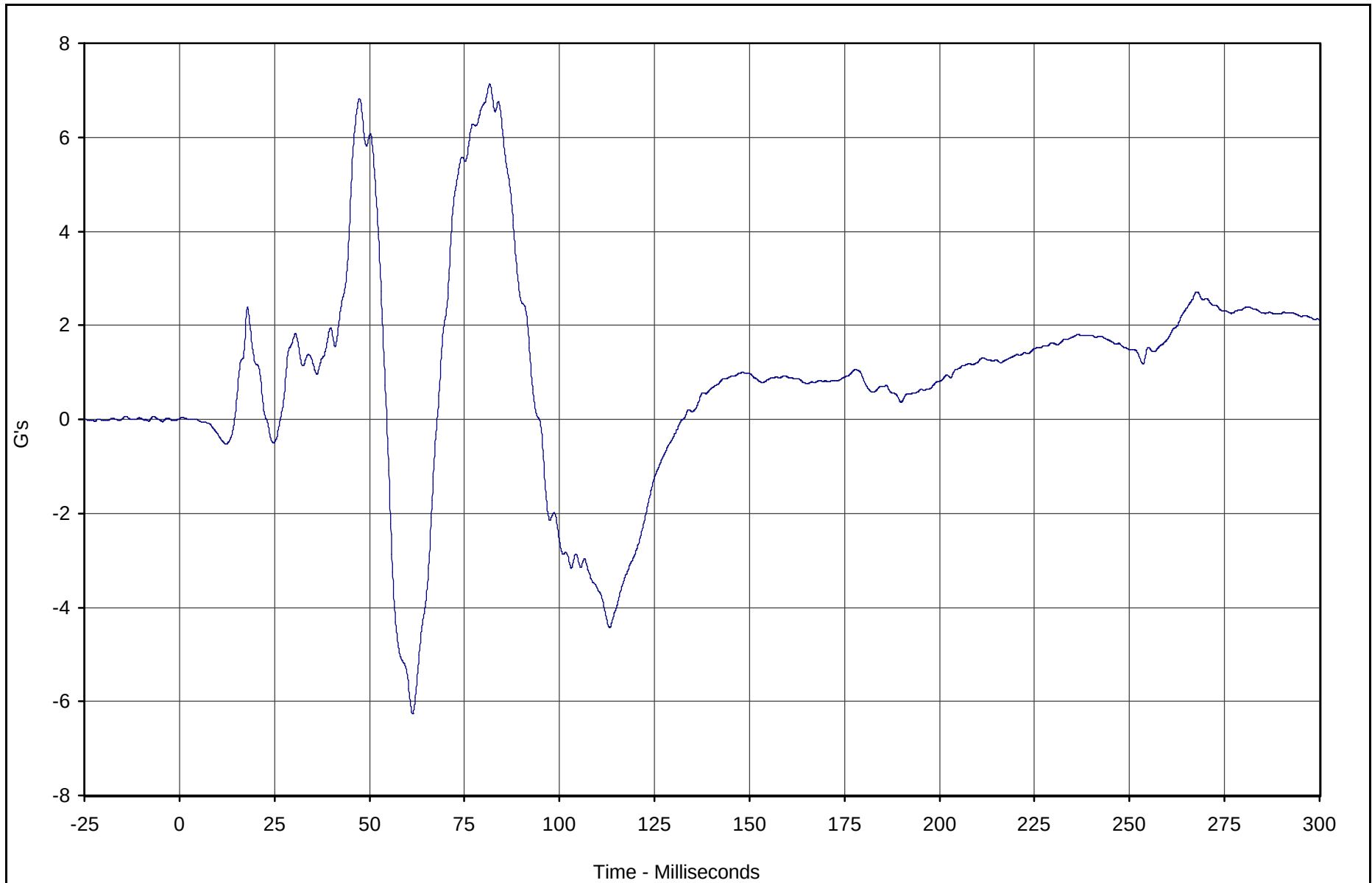


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant Z	018	FIL	G's	7.1	81.7	-6.3	61.4	180

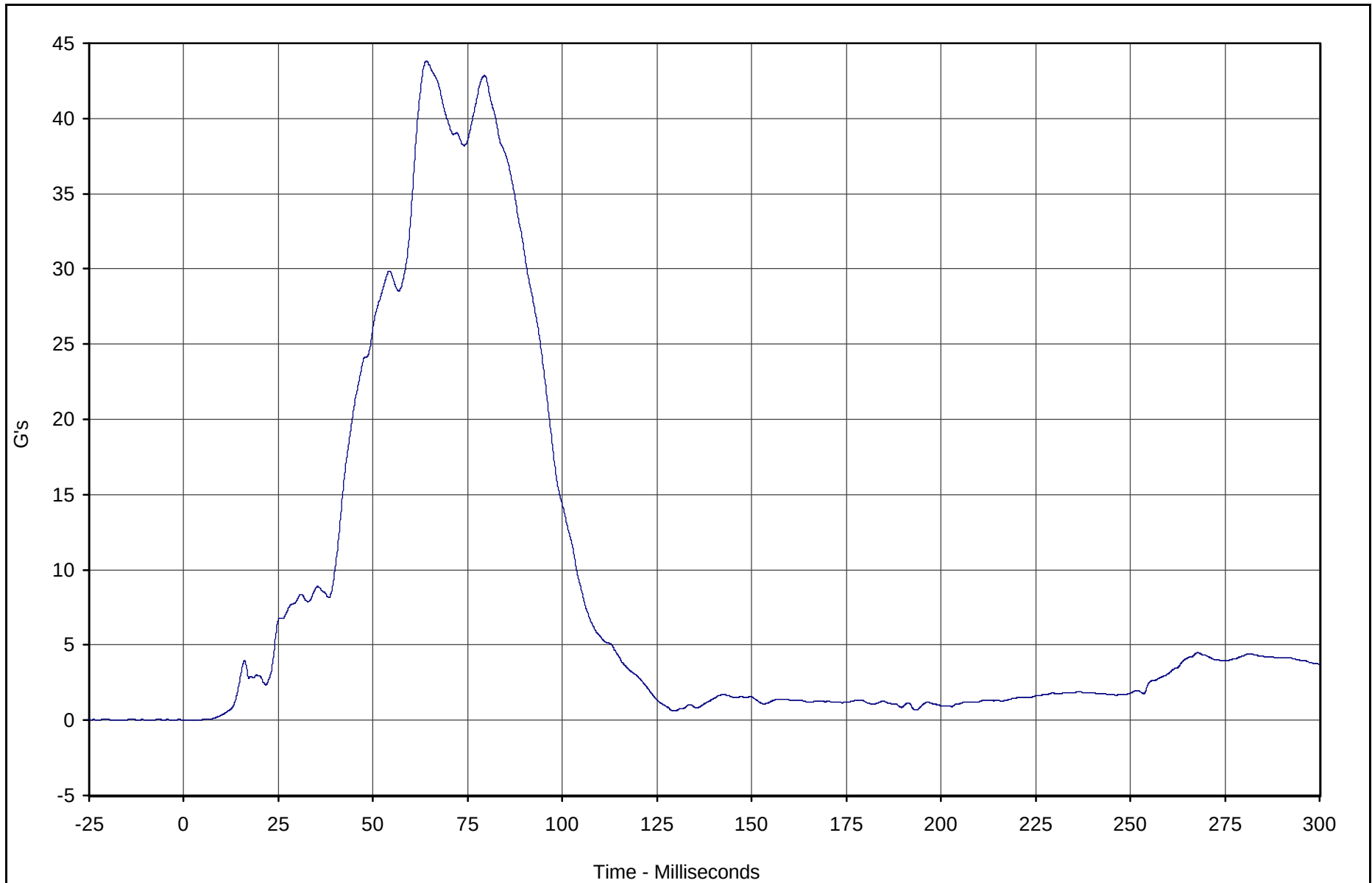


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Resultant Redundant	016	RES	G's	43.8	64.1	0.0	2.8	180

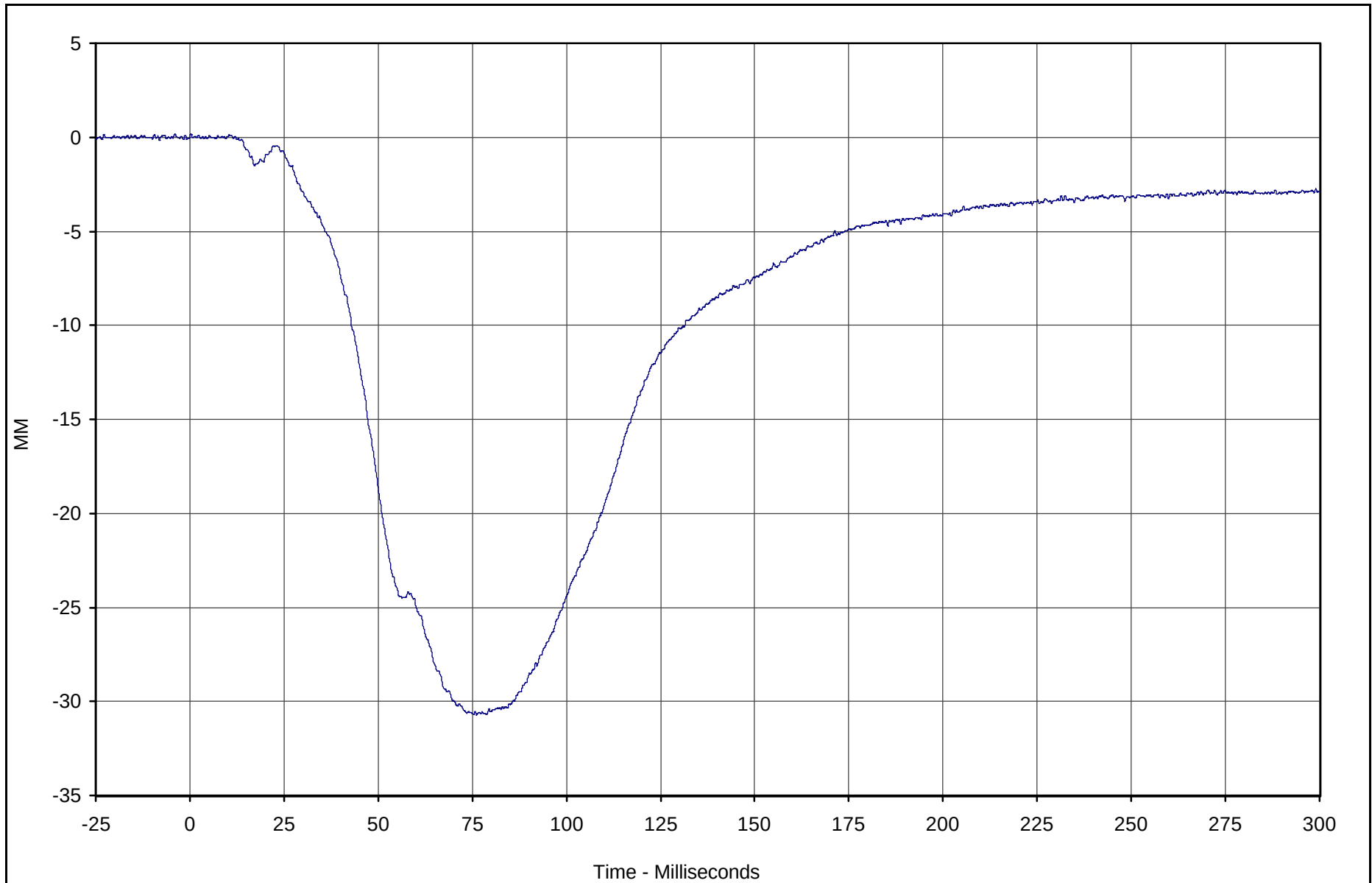


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Displacement X	019	FIL	MM	0.2	0.3	-30.7	76.2	600

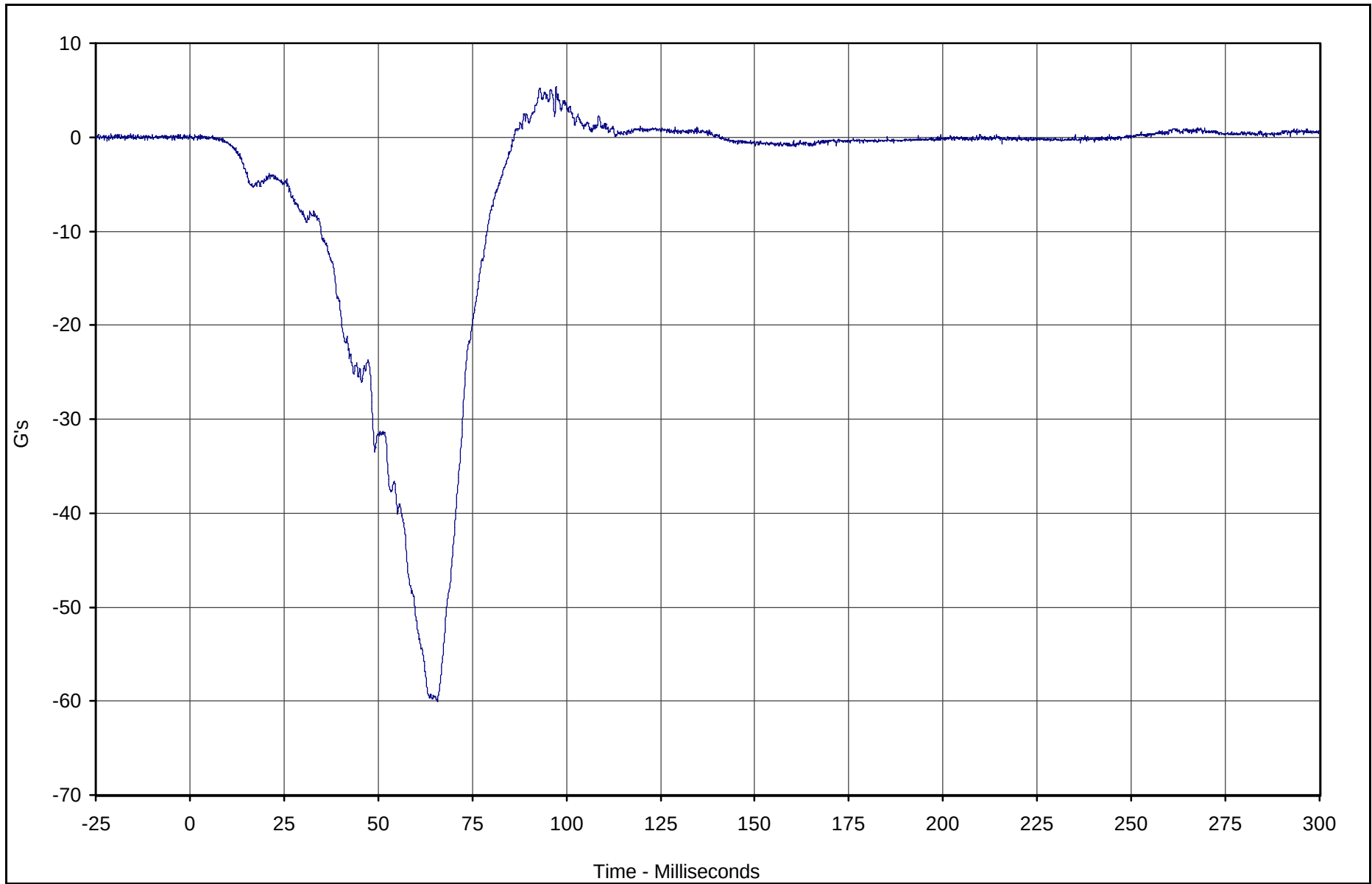


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X	020	FIL	G's	5.4	97.3	-60.1	65.7	1000

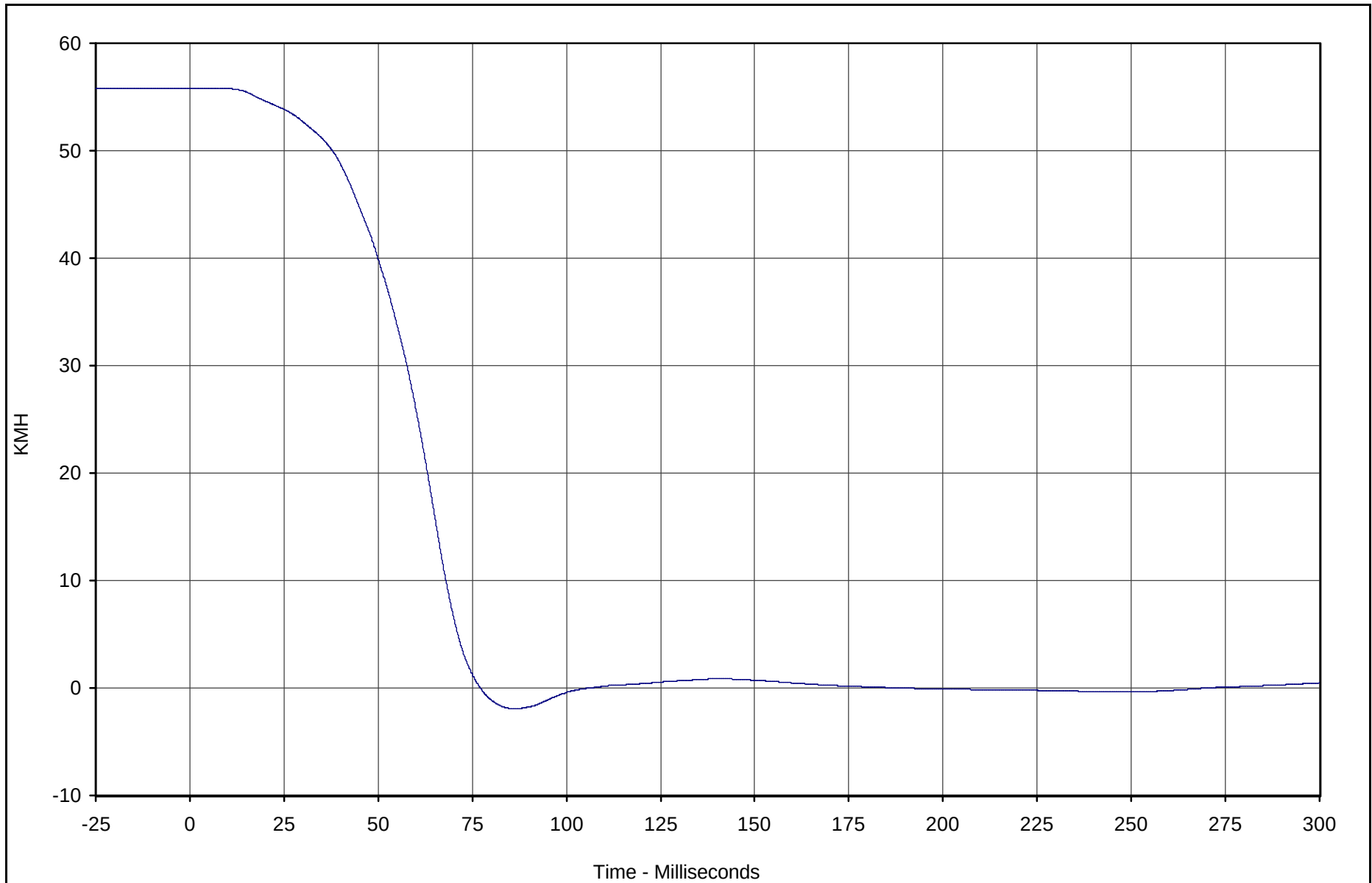


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X Velocity	020	IN1	KMH	55.8	0.0	-1.9	86.1	180

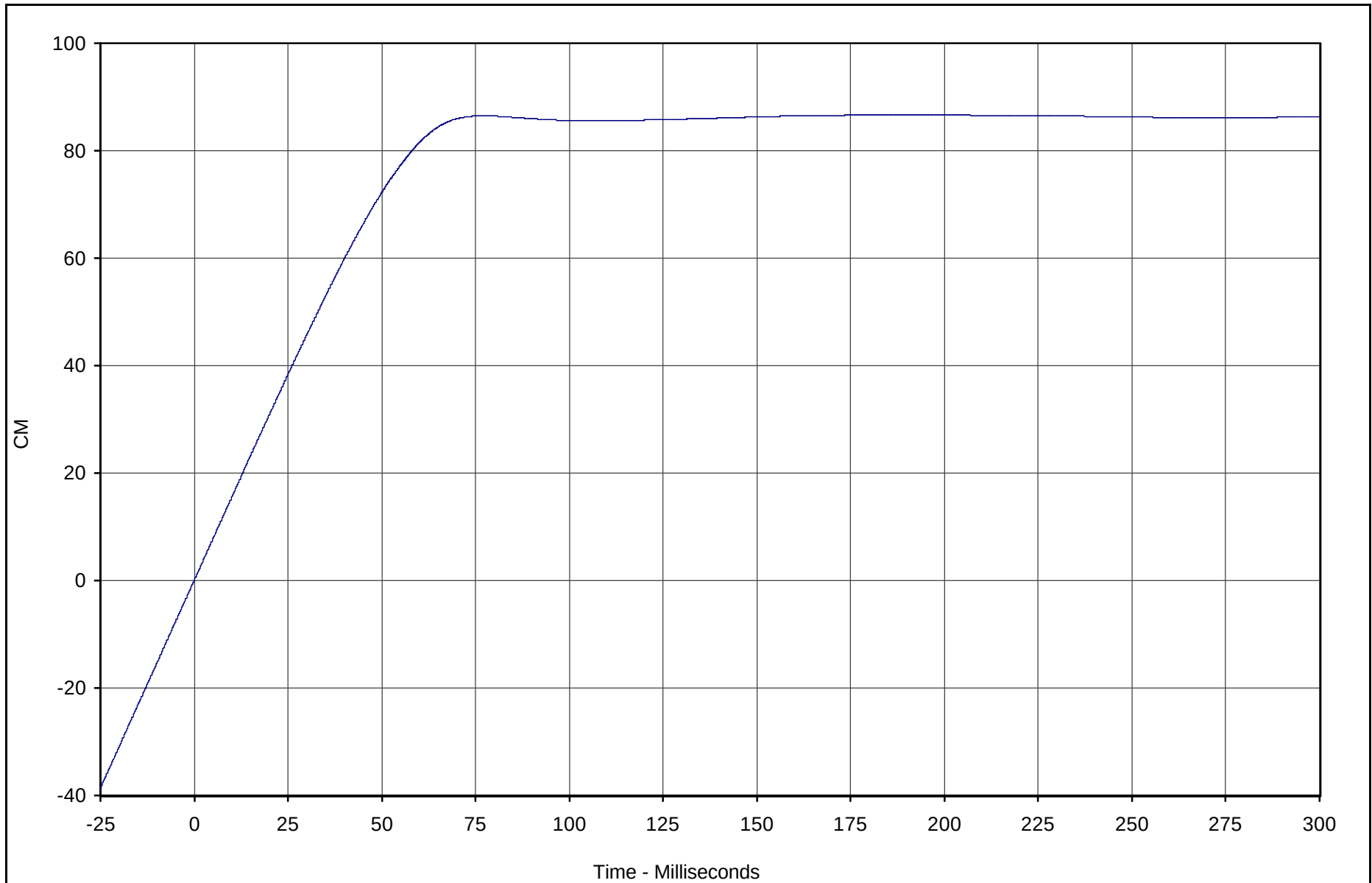


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X Displ.	020	IN2	CM	86.6	188.1	0.0	0.0	180

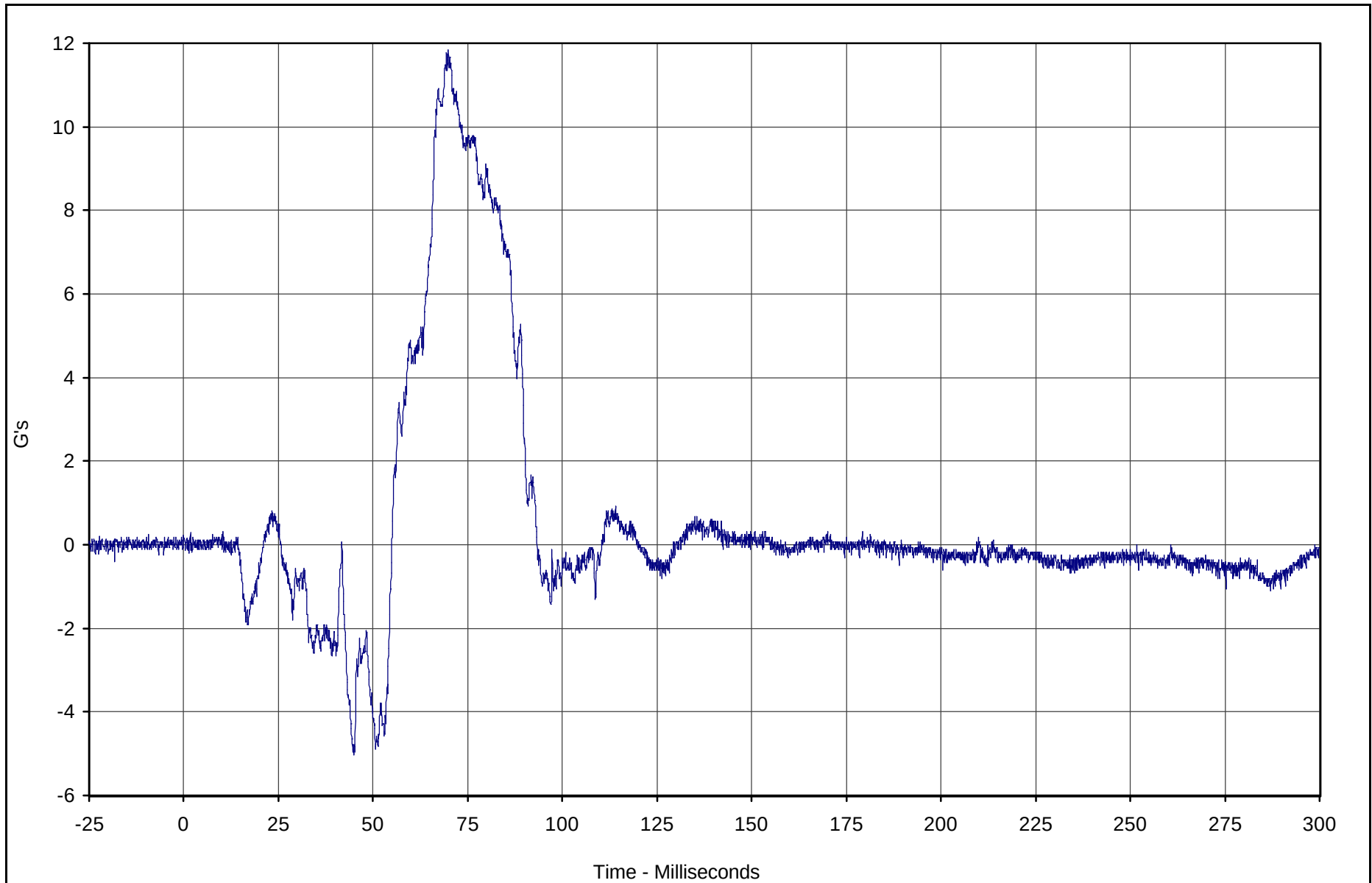


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Y	021	FIL	G's	11.8	69.9	-5.0	44.9	1000

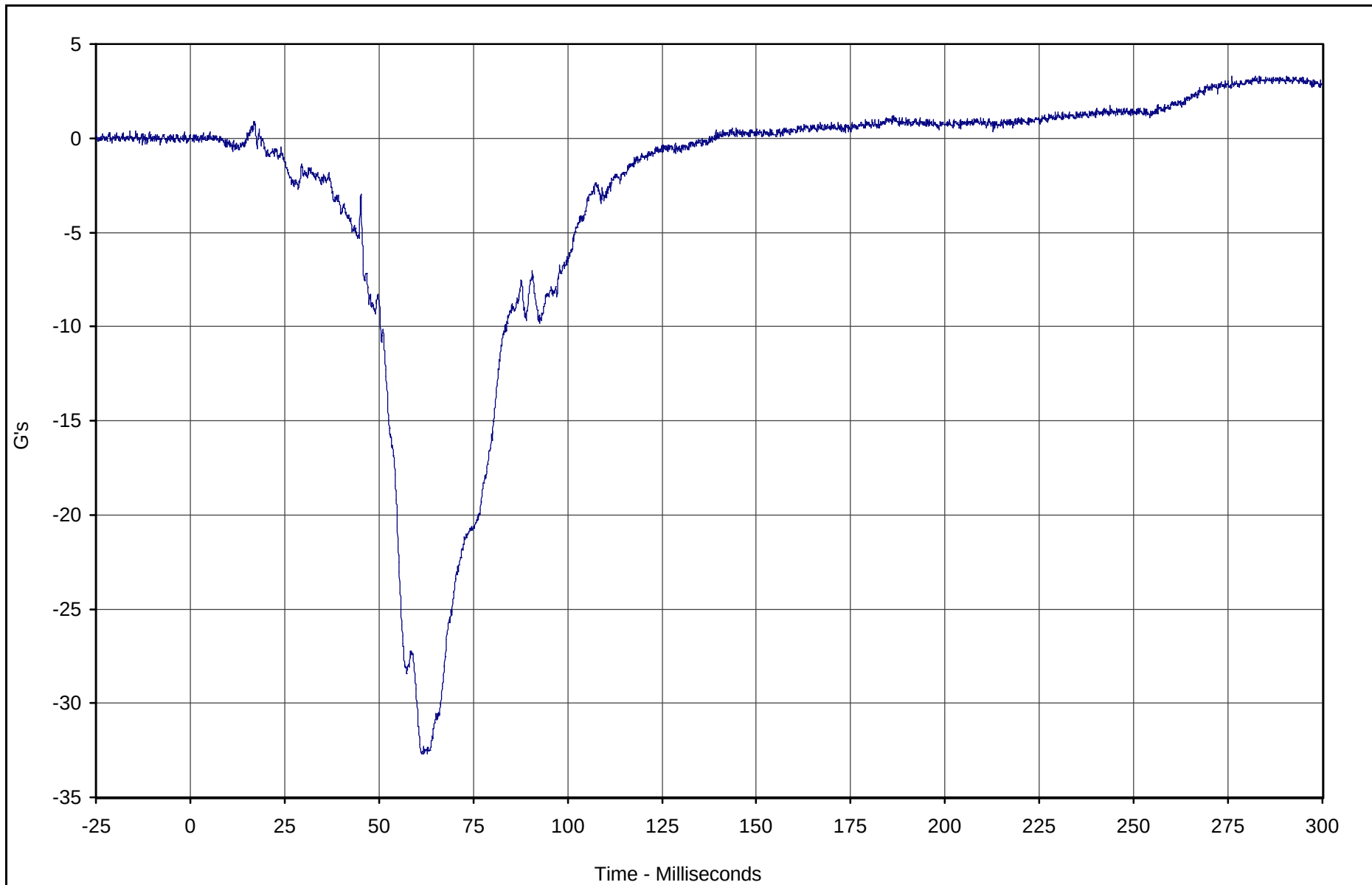


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Z	022	FIL	G's	3.3	276.1	-32.7	61.2	1000

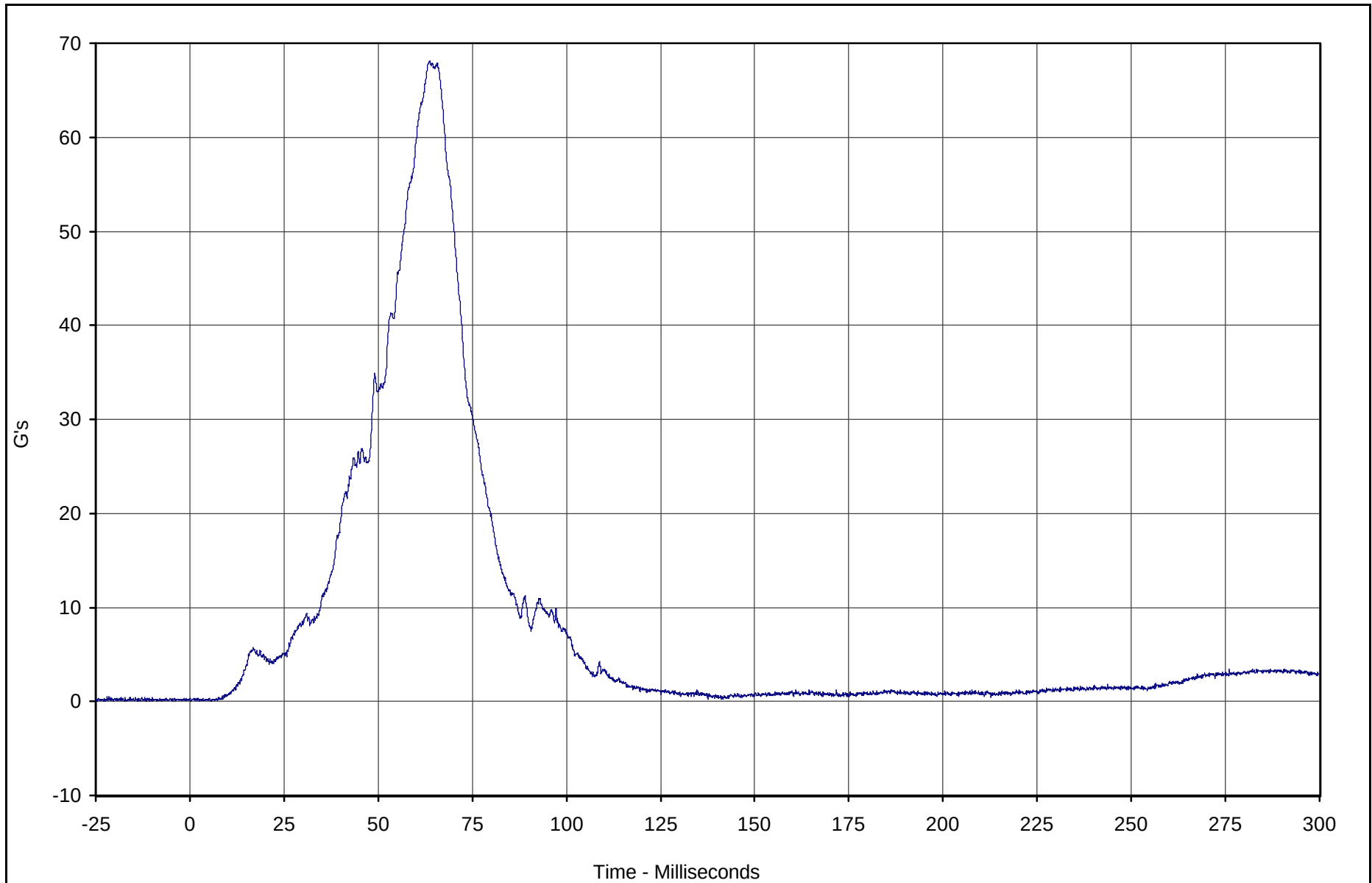


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Resultant	023	RES	G's	68.1	63.6	0.1	5.7	1000

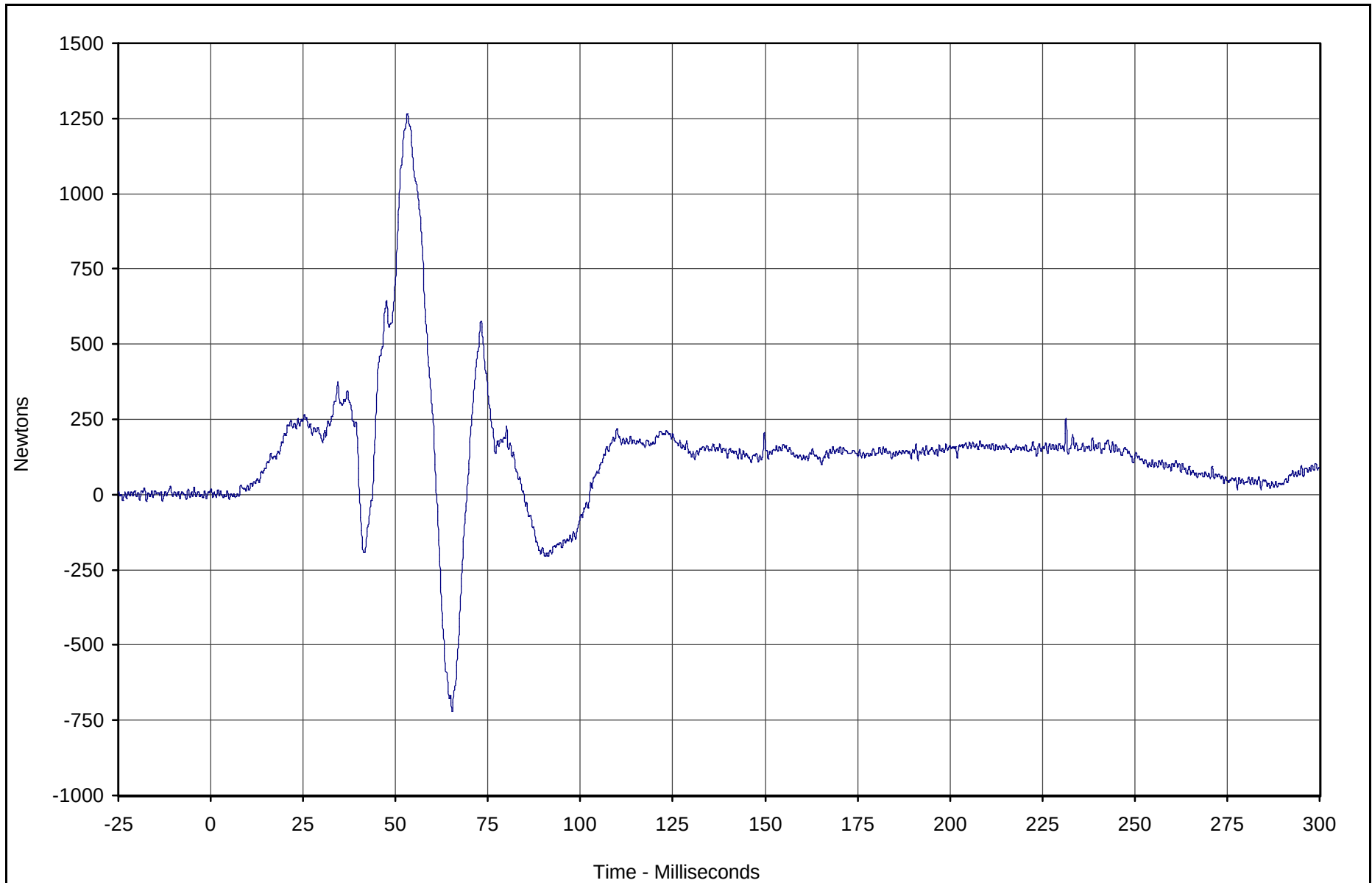


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Femur Force	023	FIL	Newtons	1266.5	53.2	-721.7	65.4	600

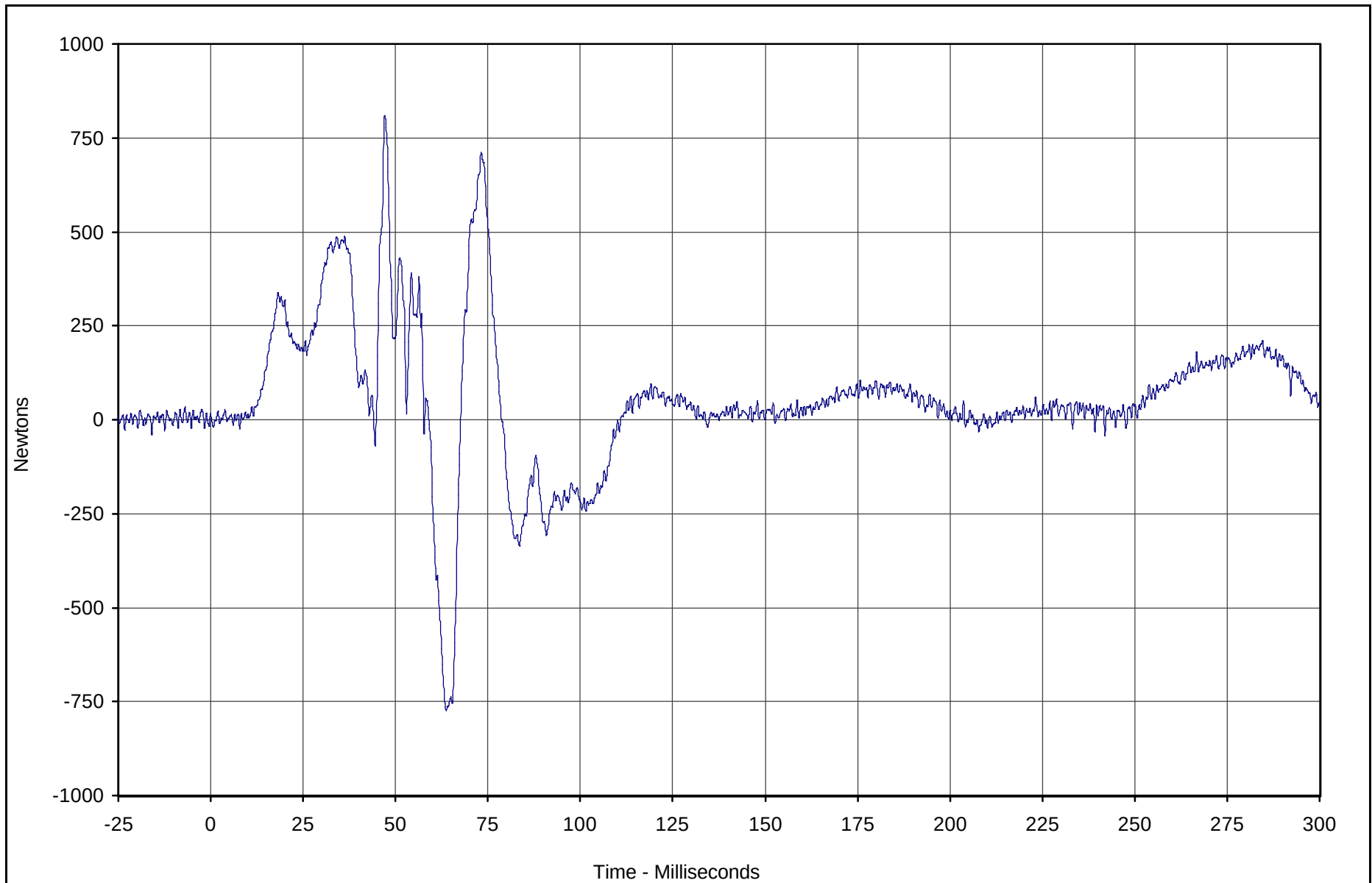


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Femur Force	024	FIL	Newtons	809.1	47.1	-774.3	63.7	600

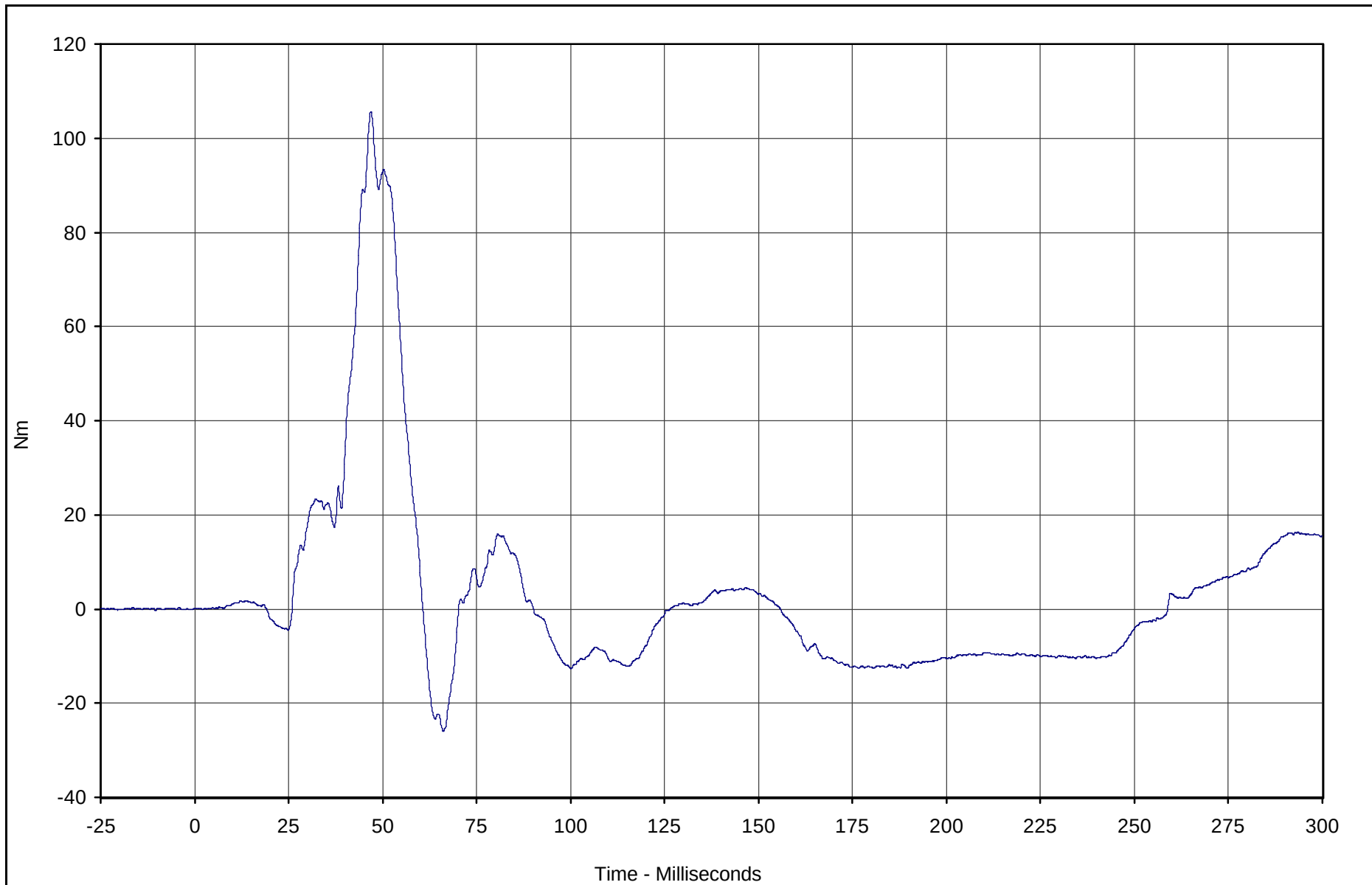


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Upper Tibia Moment X	025	FIL	Nm	105.7	46.9	-25.9	66.2	600

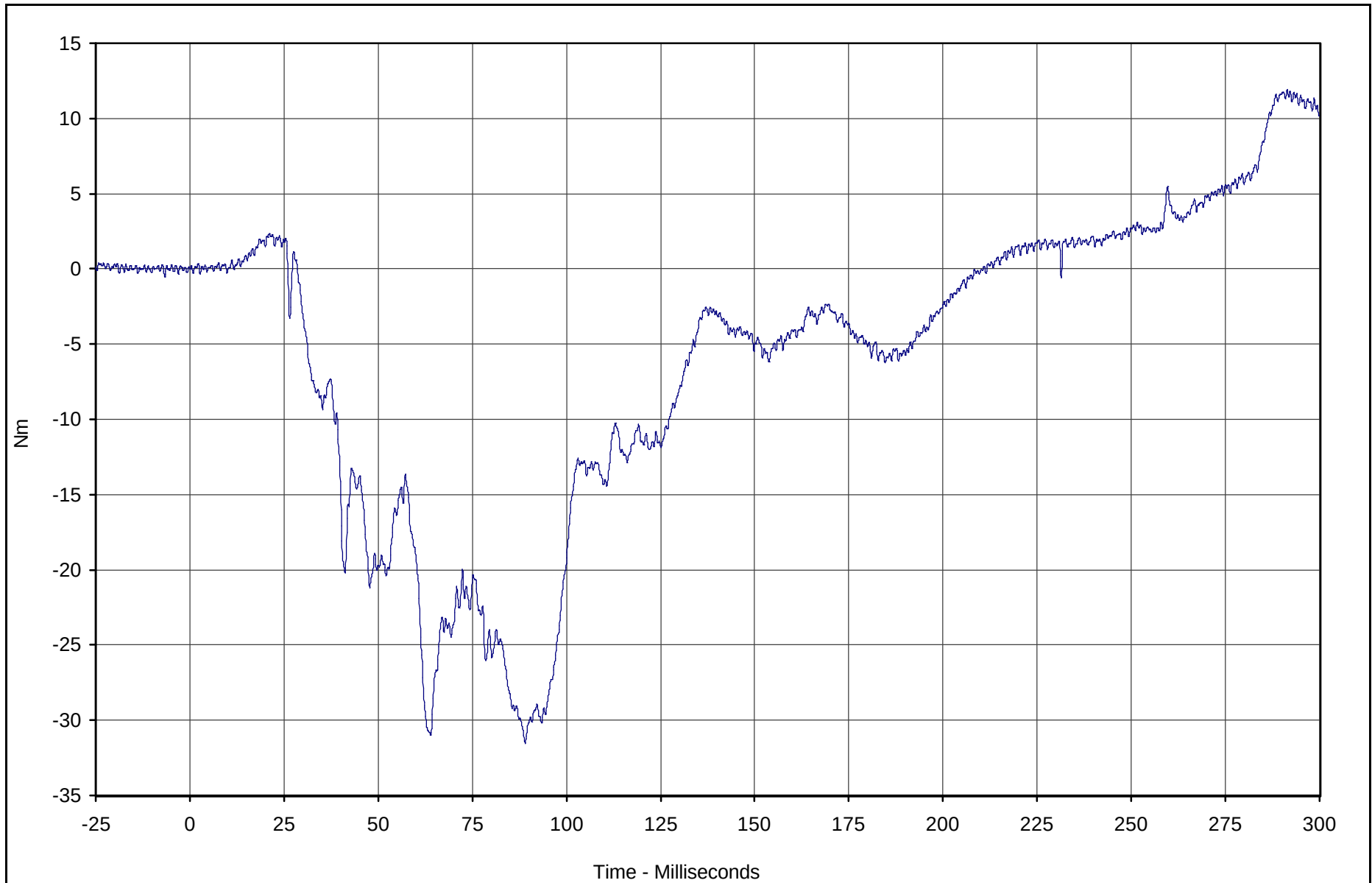


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Upper Tibia Moment Y	026	FIL	Nm	11.9	291.4	-31.5	89.1	600

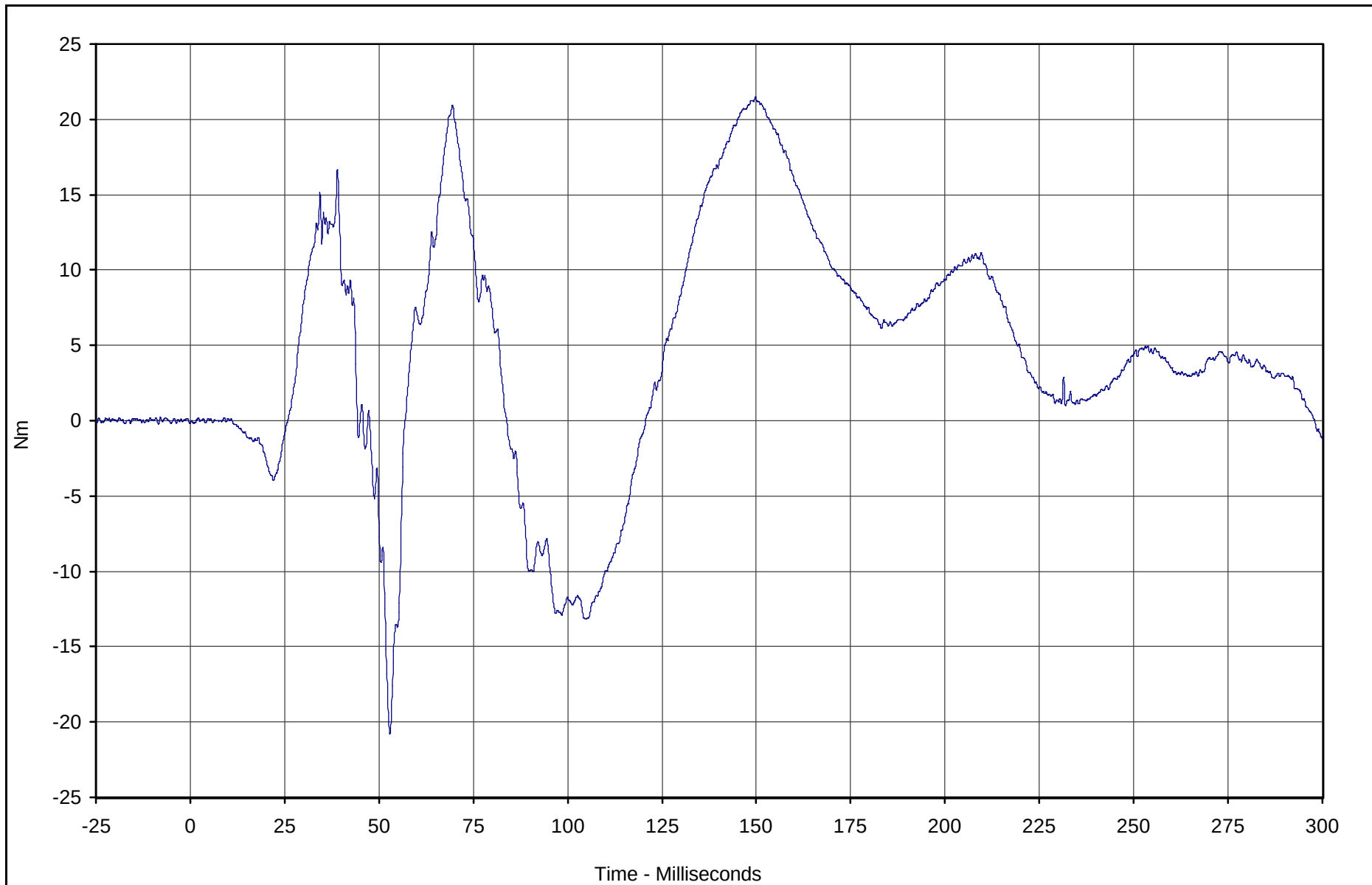


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Upper Tibia Moment X	027	FIL	Nm	21.5	149.8	-20.8	52.9	600

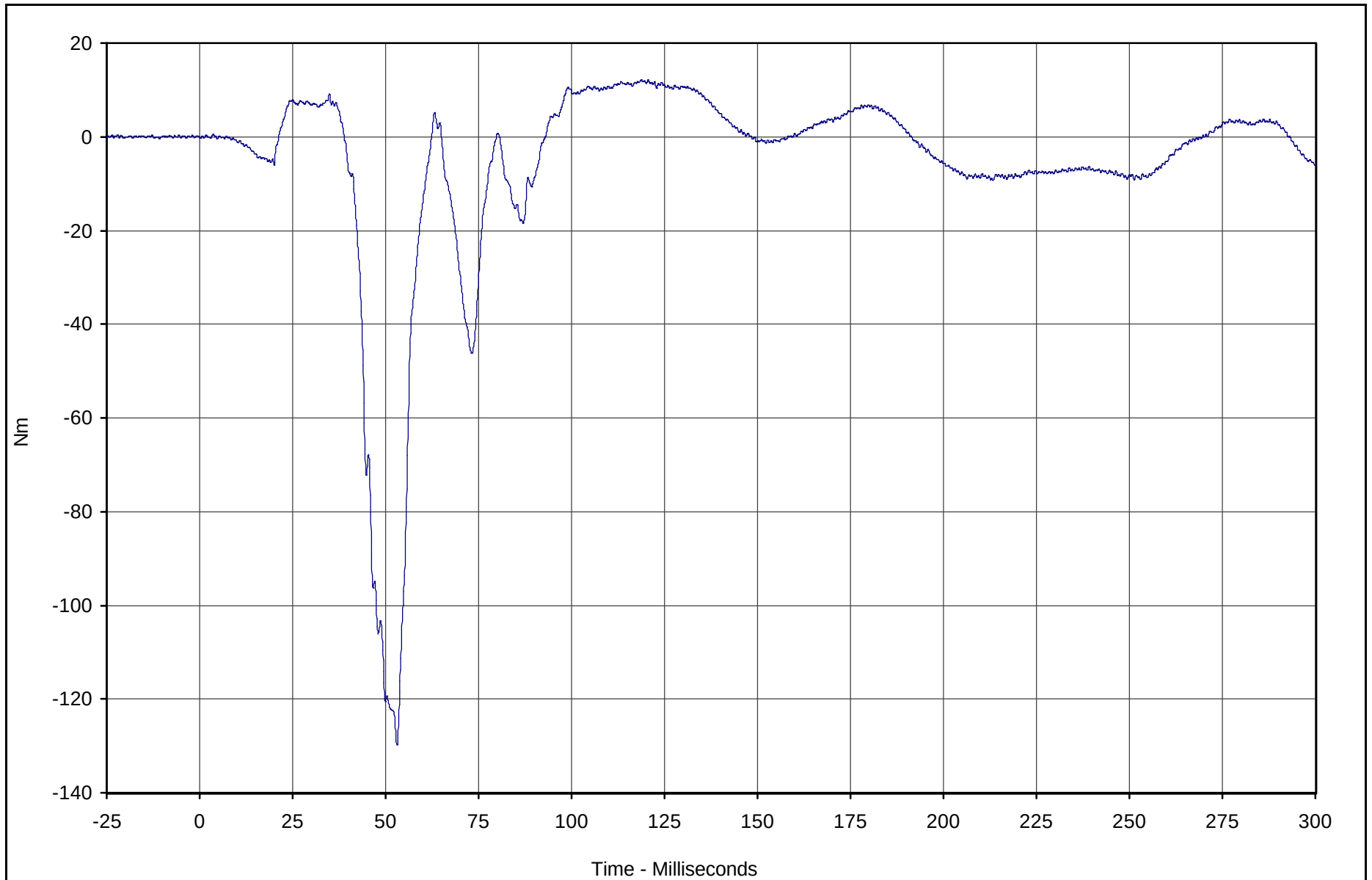


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Upper Tibia Moment Y	028	FIL	Nm	12.2	118.8	-129.8	53.1	600

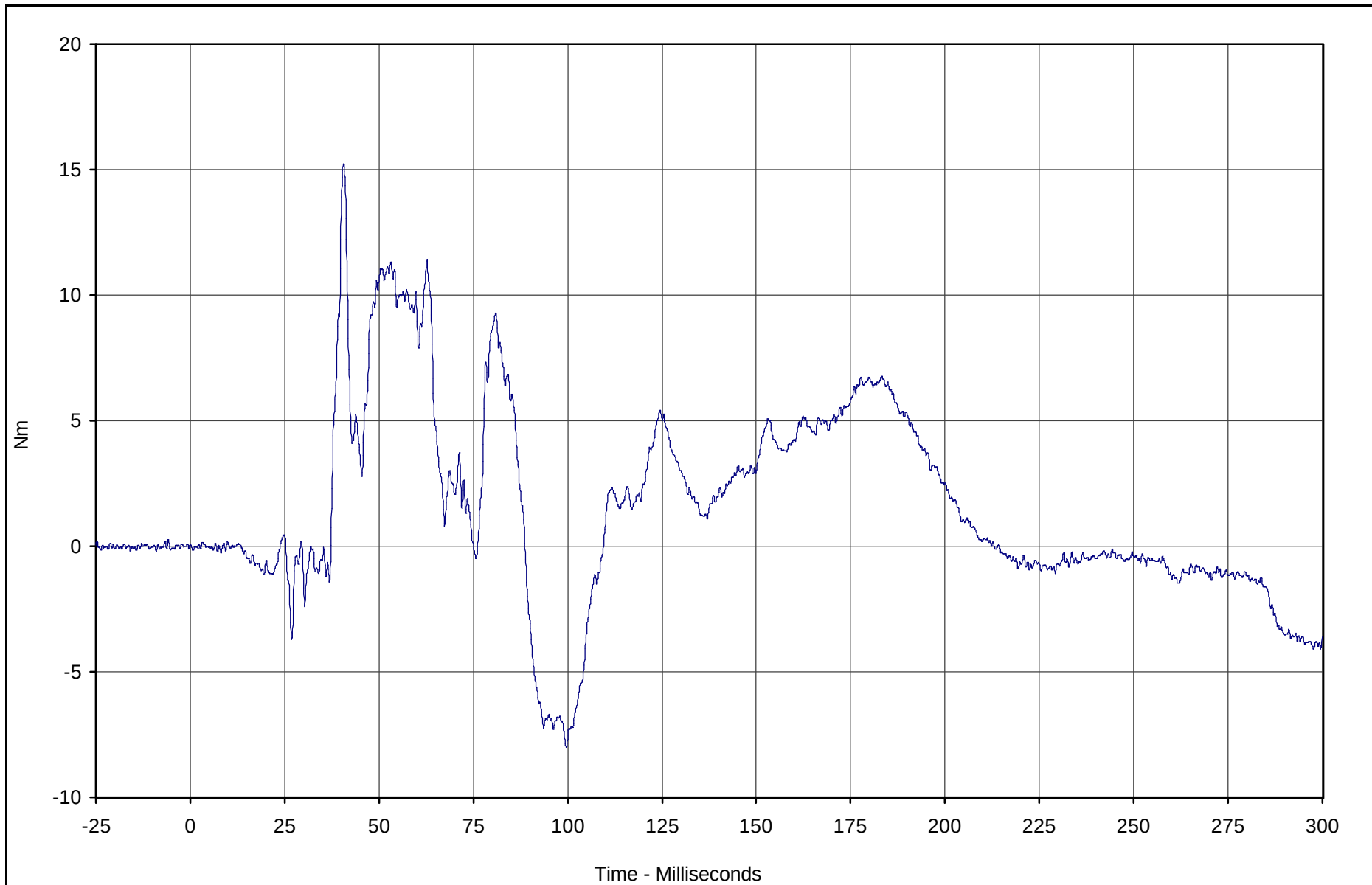


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Moment X	029	FIL	Nm	15.2	40.6	-8.0	99.6	600

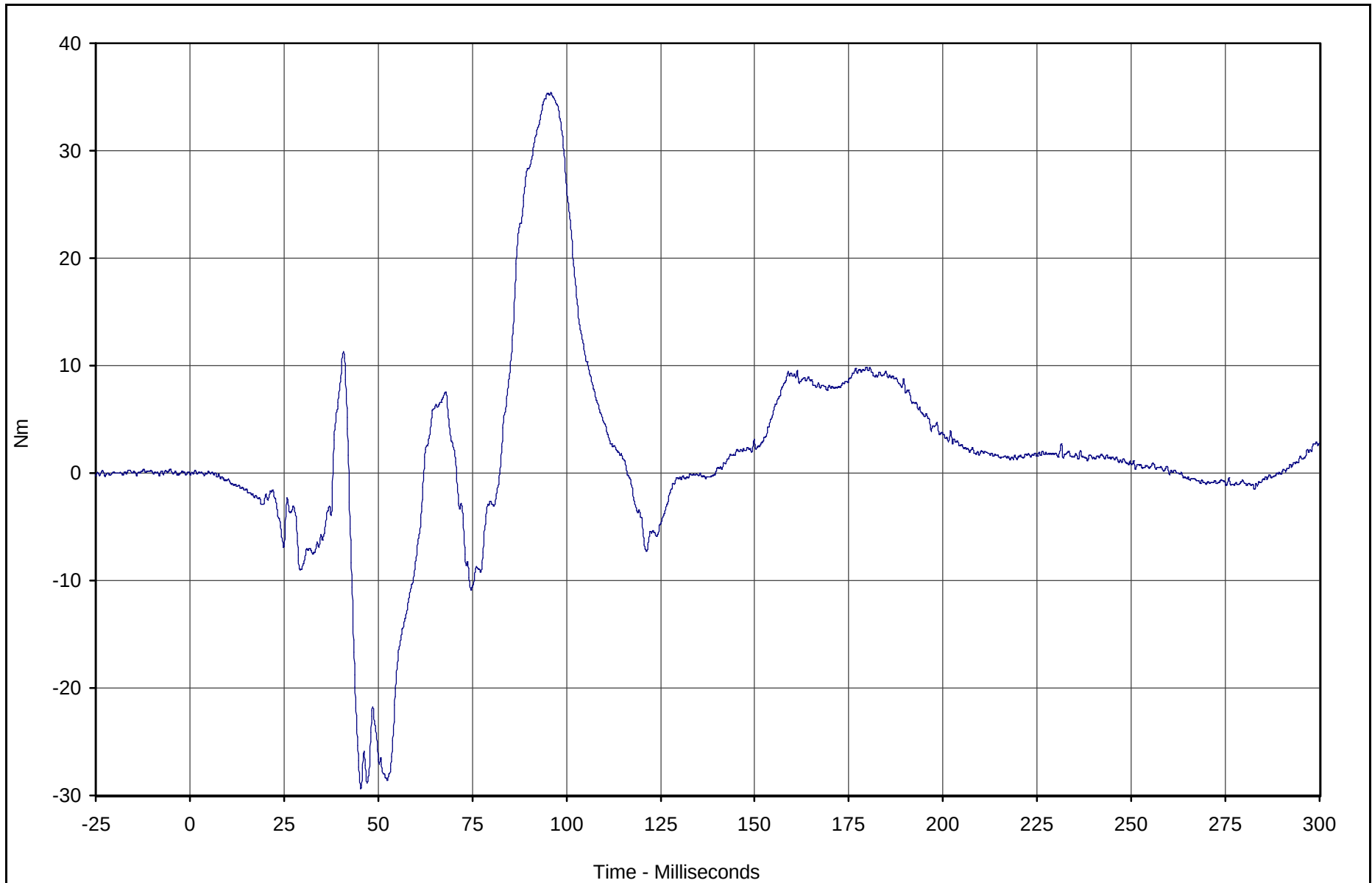


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Moment Y	030	FIL	Nm	35.4	95.9	-29.4	45.4	600

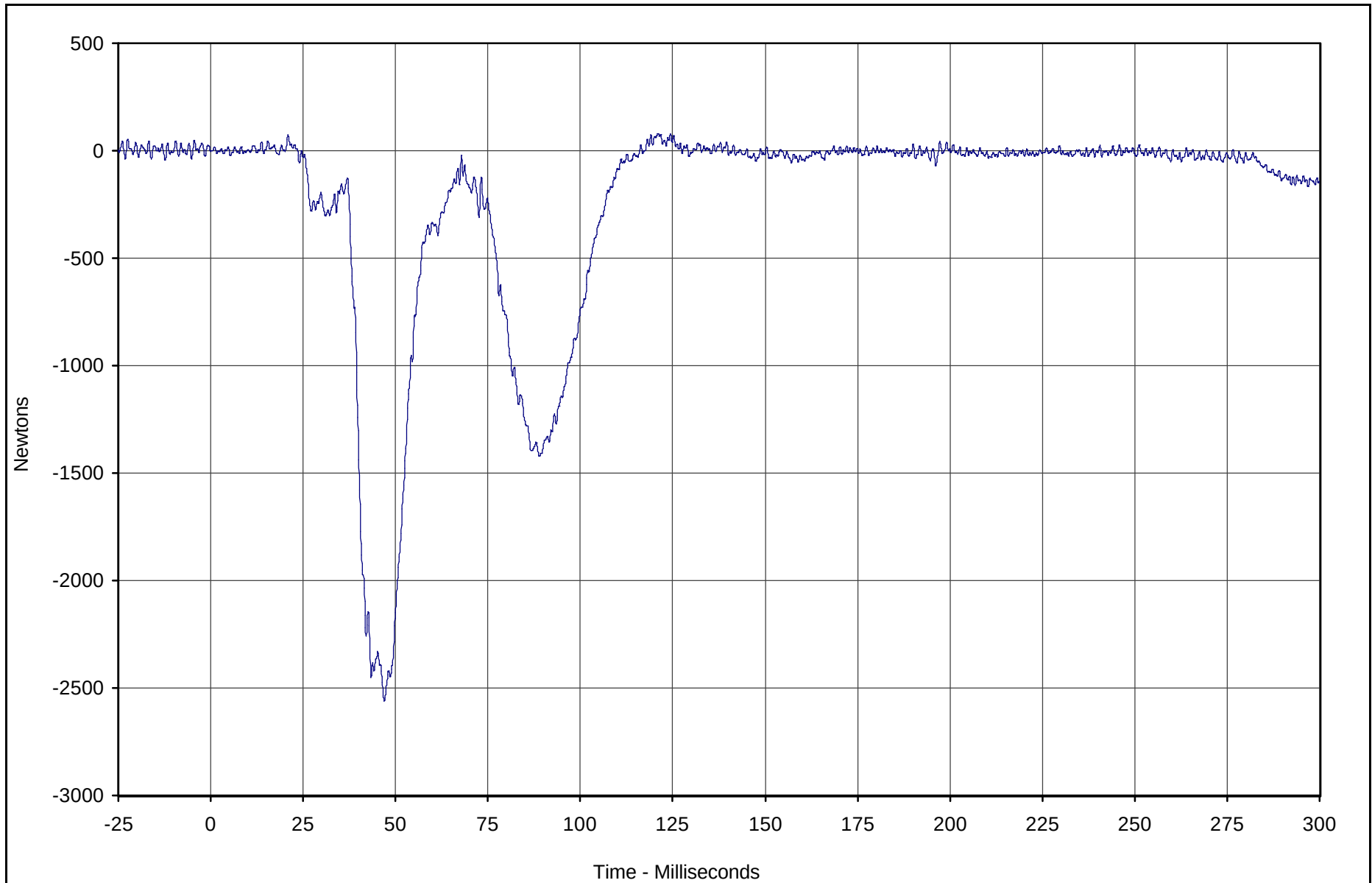


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Force Z	031	FIL	Newtons	78.7	121.0	-2560.8	47.0	600

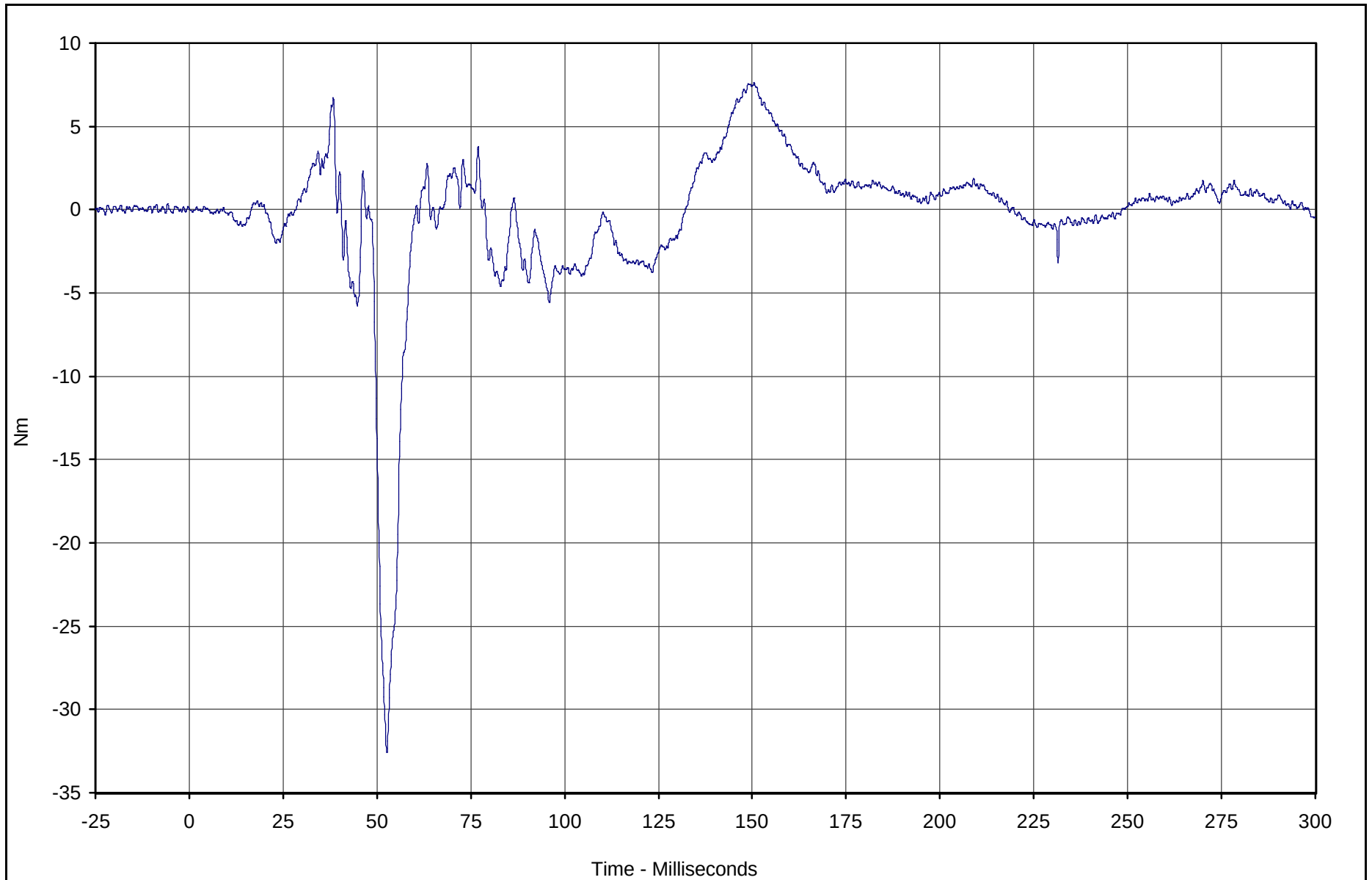


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Moment X	032	FIL	Nm	7.6	150.5	-32.6	52.7	600

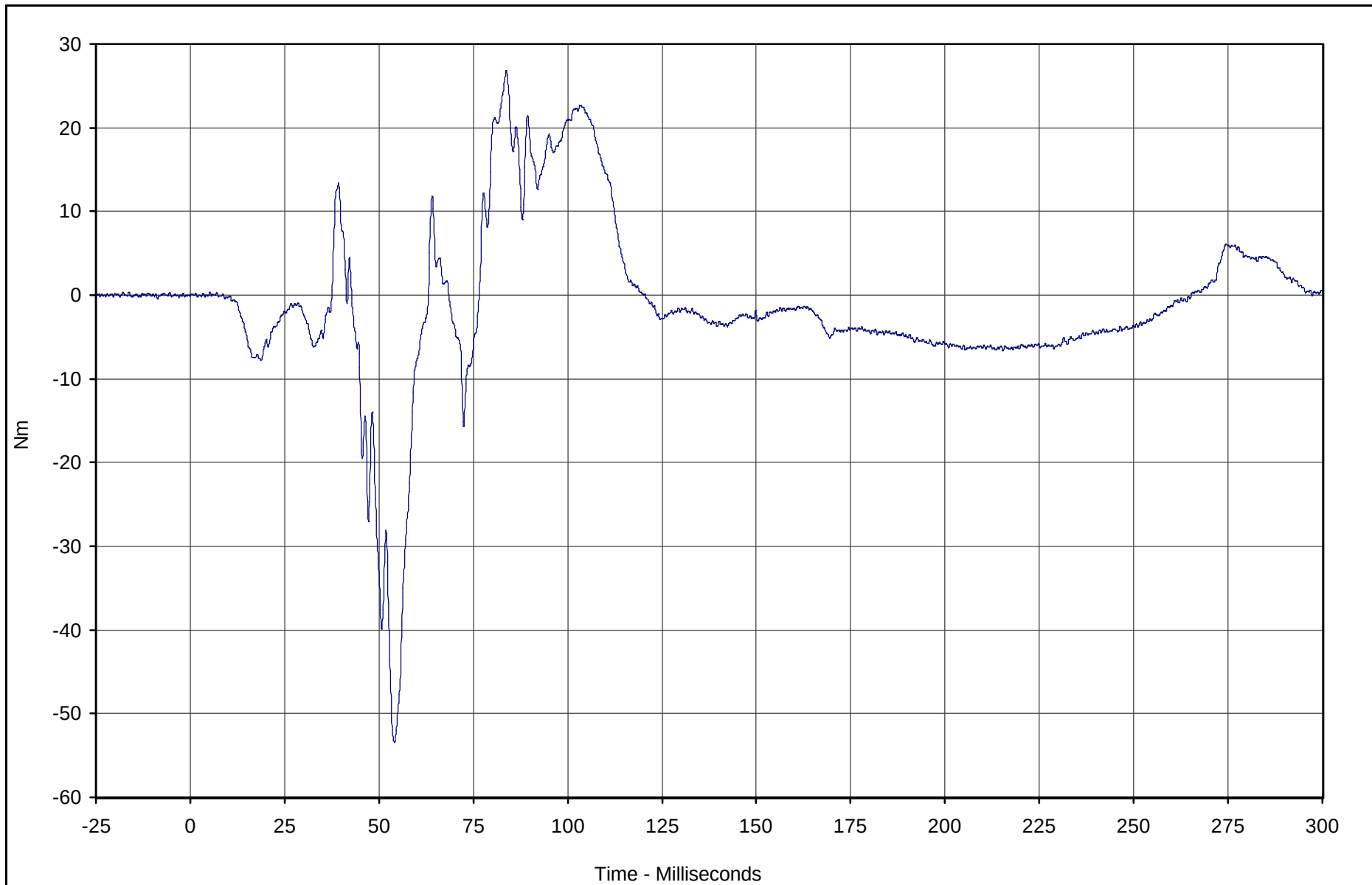


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Moment Y	033	FIL	Nm	26.8	83.8	-53.4	54.1	600

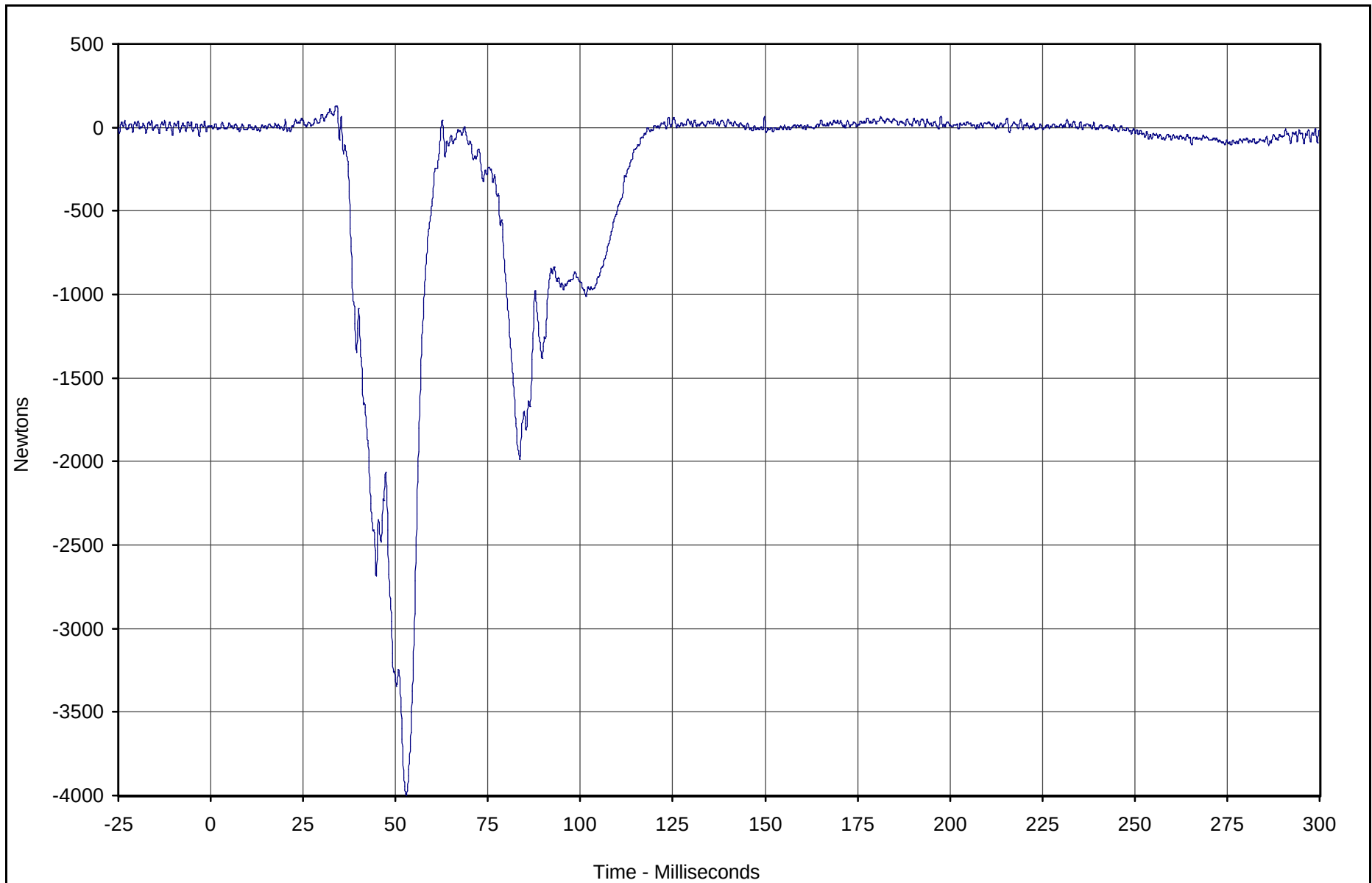


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Force Z	034	FIL	Newtons	130.6	34.1	-3997.3	52.9	600

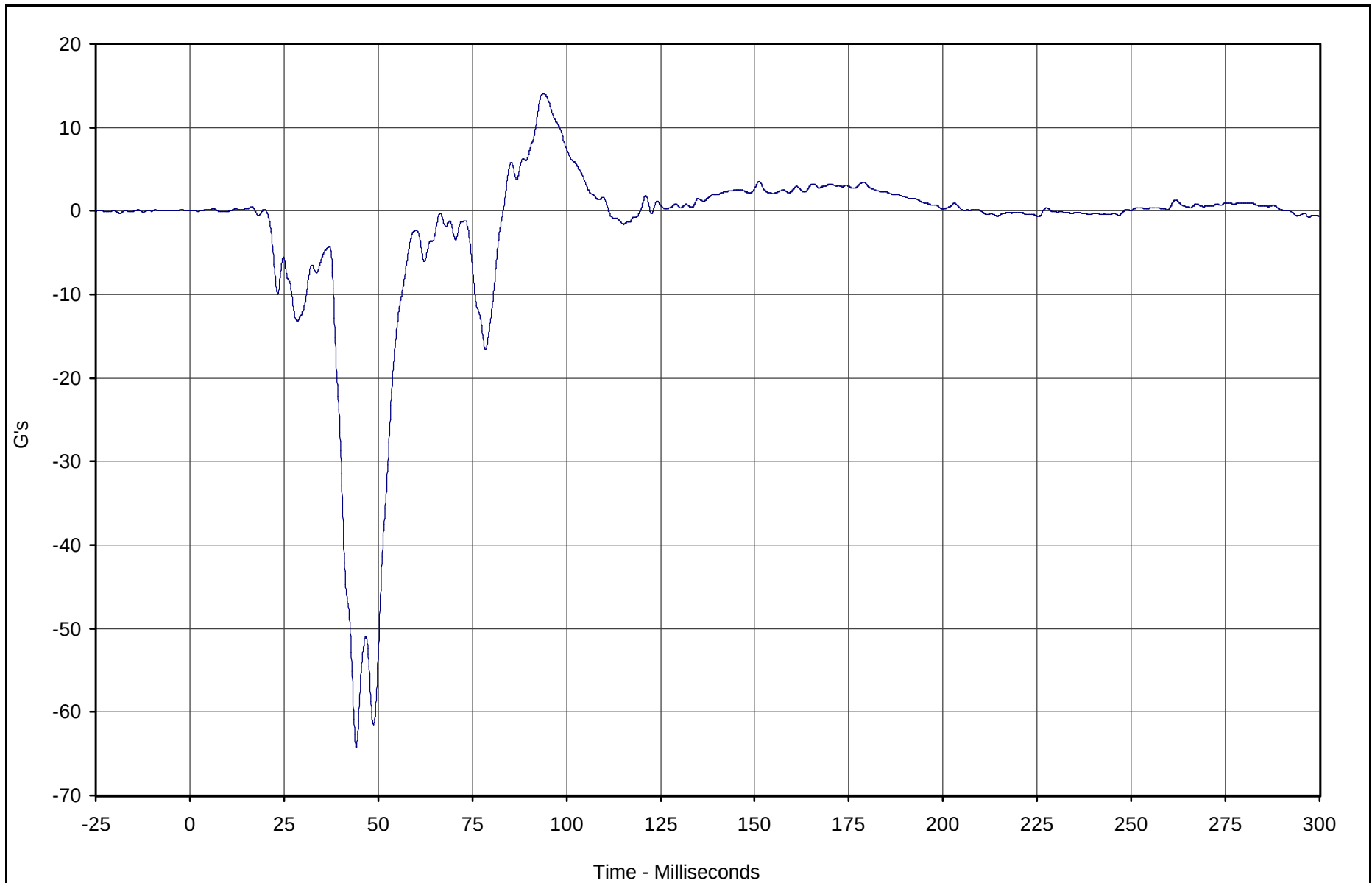


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Aft X	035	FIL	G's	14.0	93.9	-64.2	44.2	180

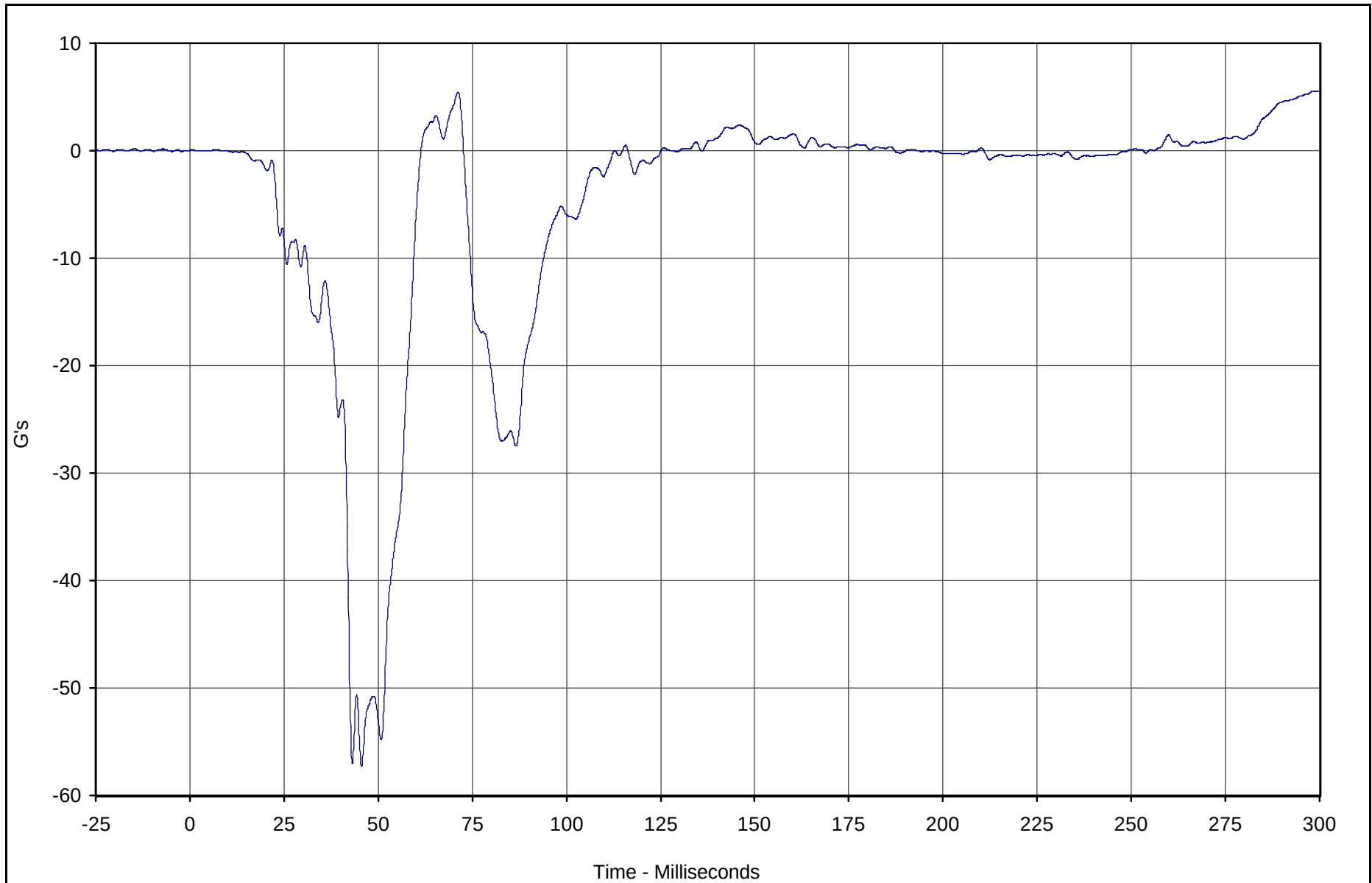


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Aft Z	036	FIL	G's	5.6	299.9	-57.3	45.6	180

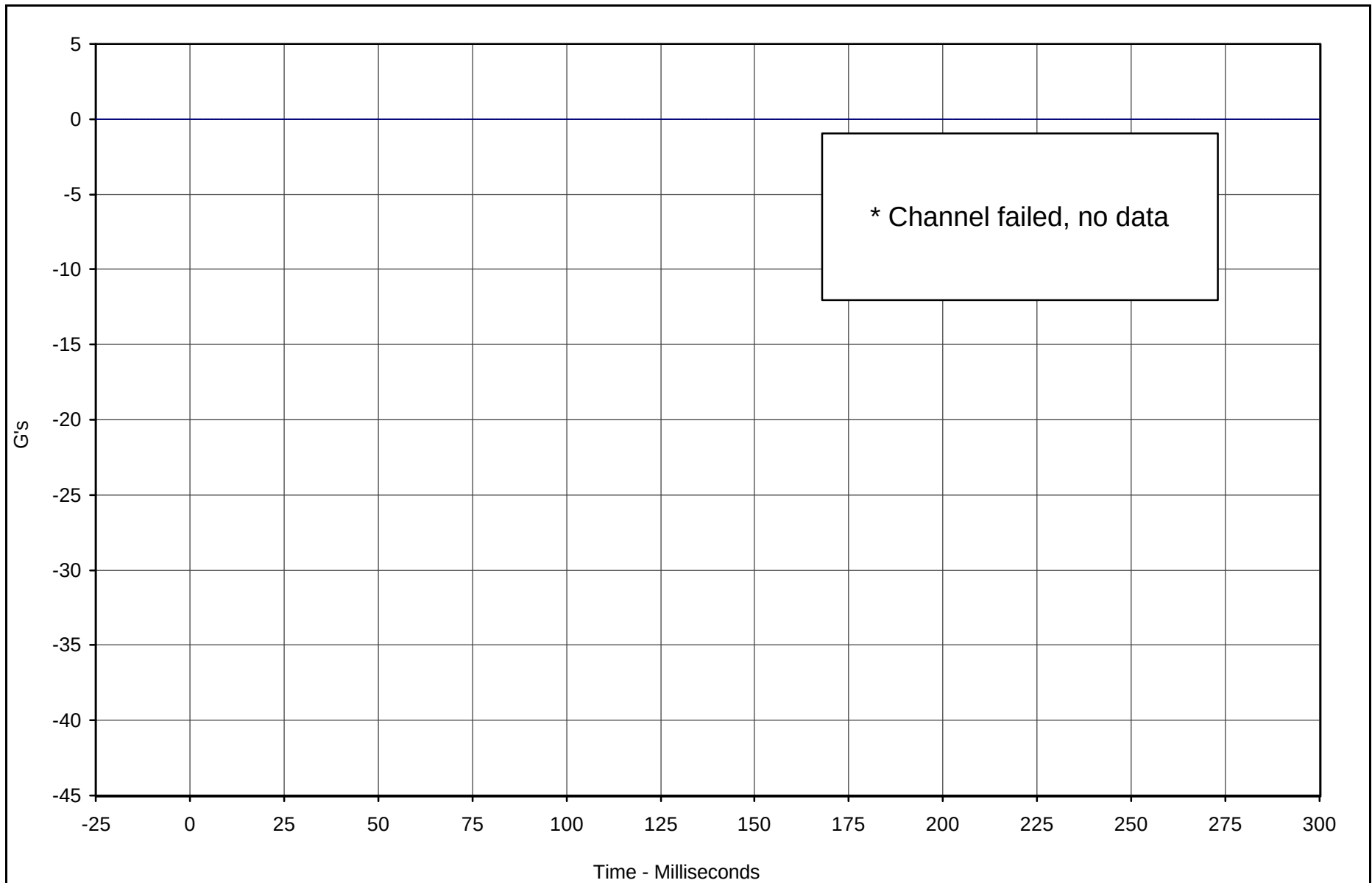


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



* Channel failed, no data

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Fore Z	037	FIL	G's	0.0	0.0	0.0	0.0	180

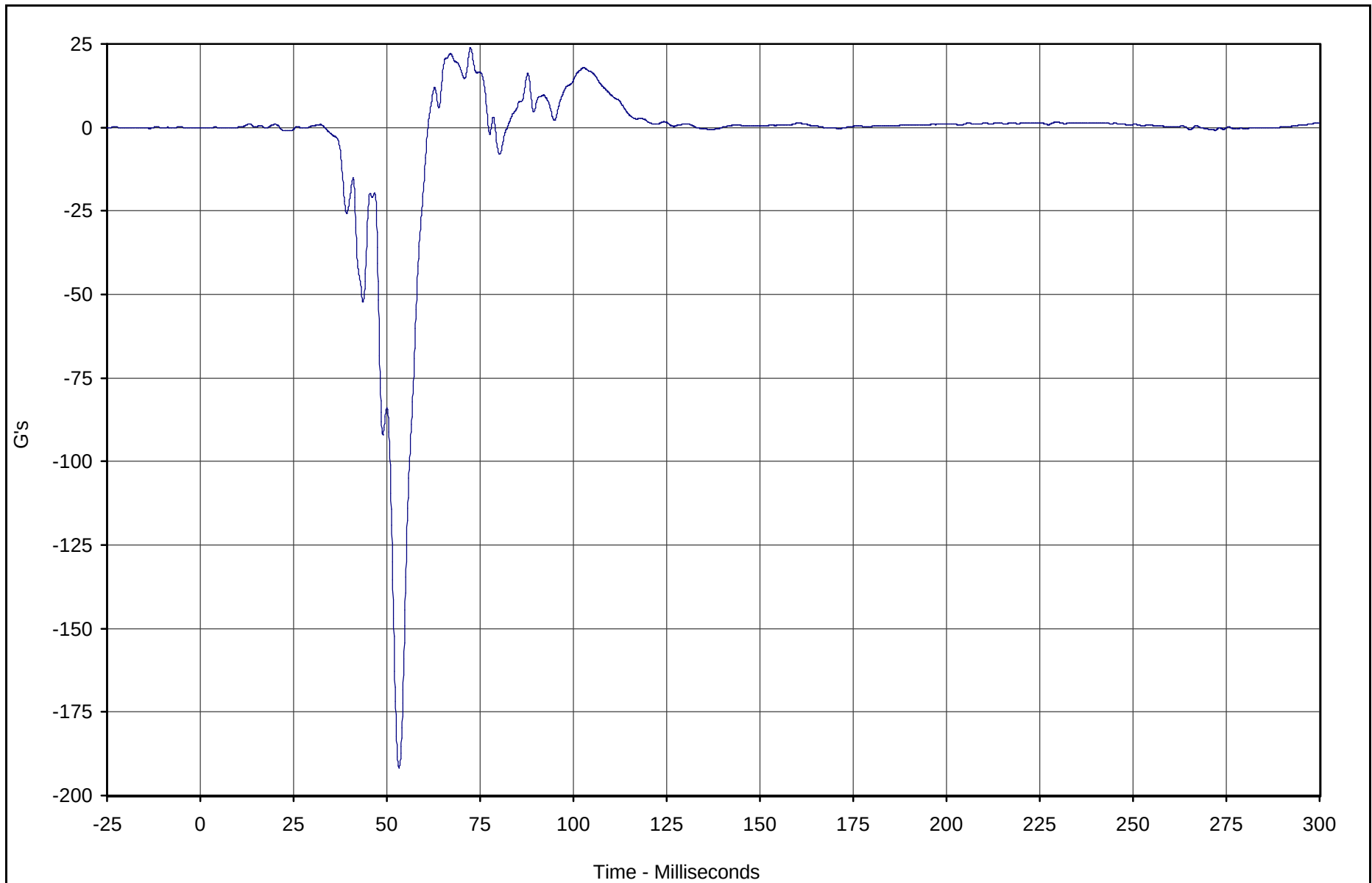


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Aft X	038	FIL	G's	24.0	72.4	-191.7	53.3	180

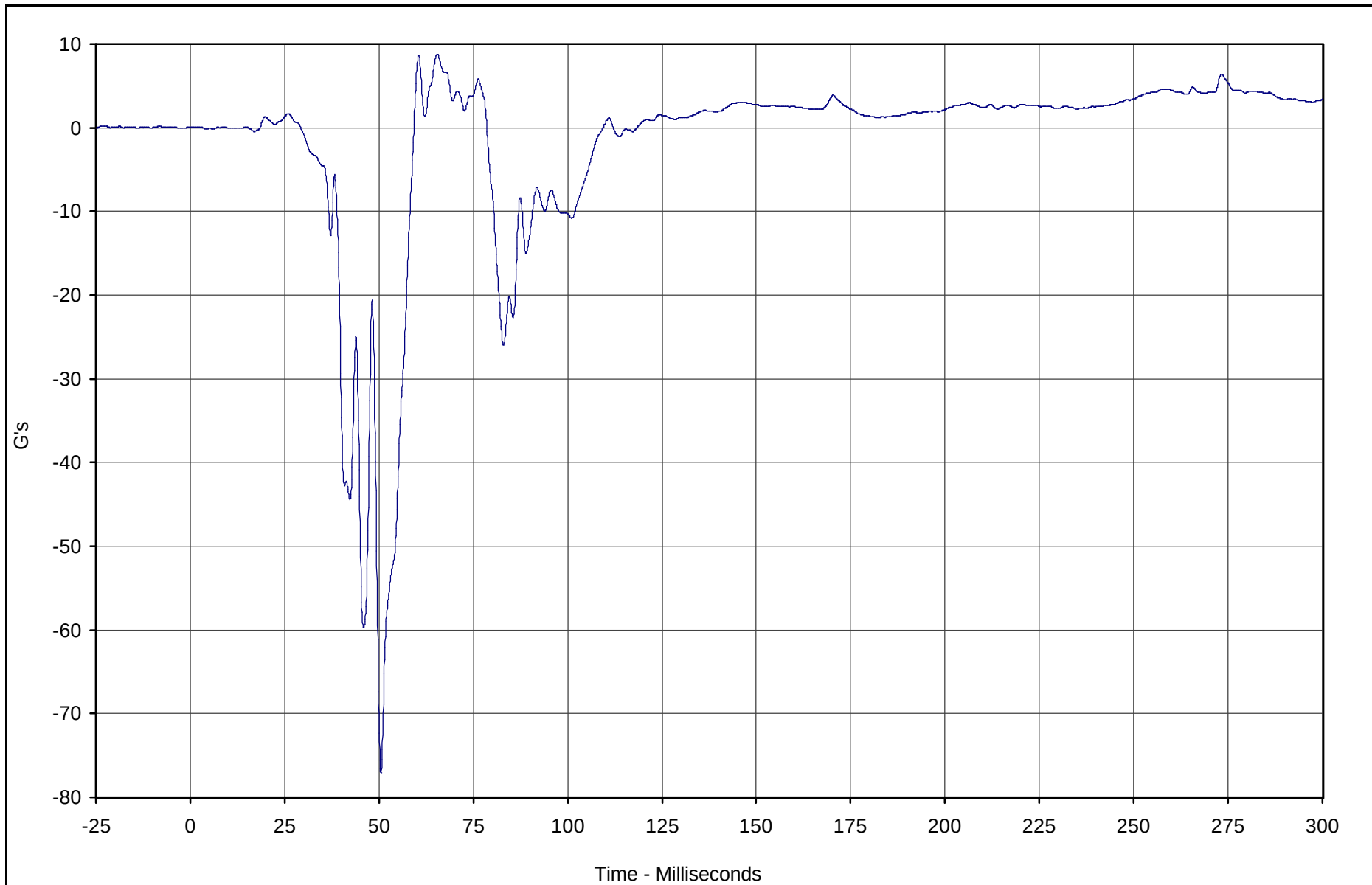


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Aft Z	039	FIL	G's	8.8	65.5	-77.1	50.5	180

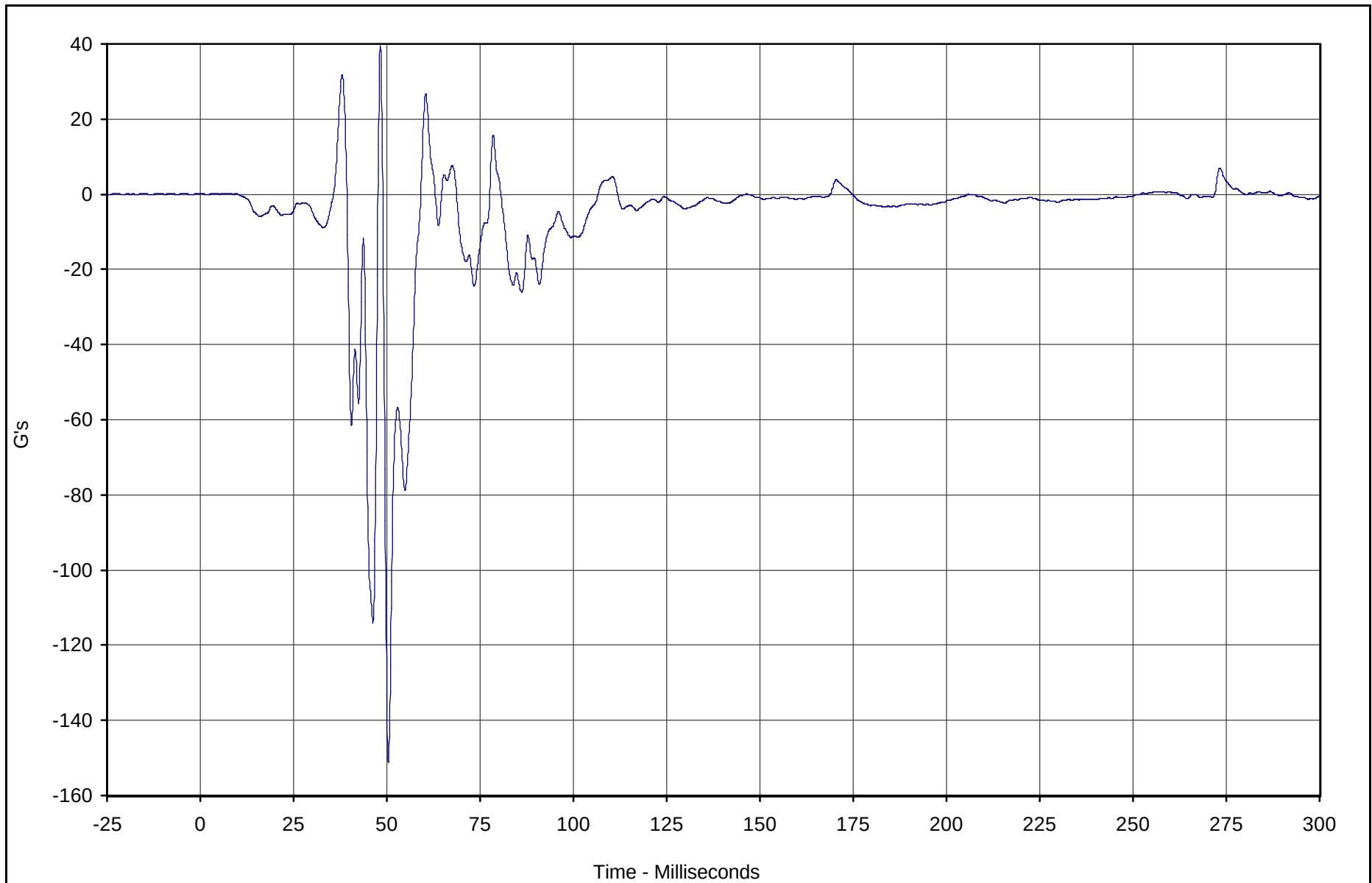


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Fore Z	040	FIL	G's	39.5	48.3	-151.3	50.4	180

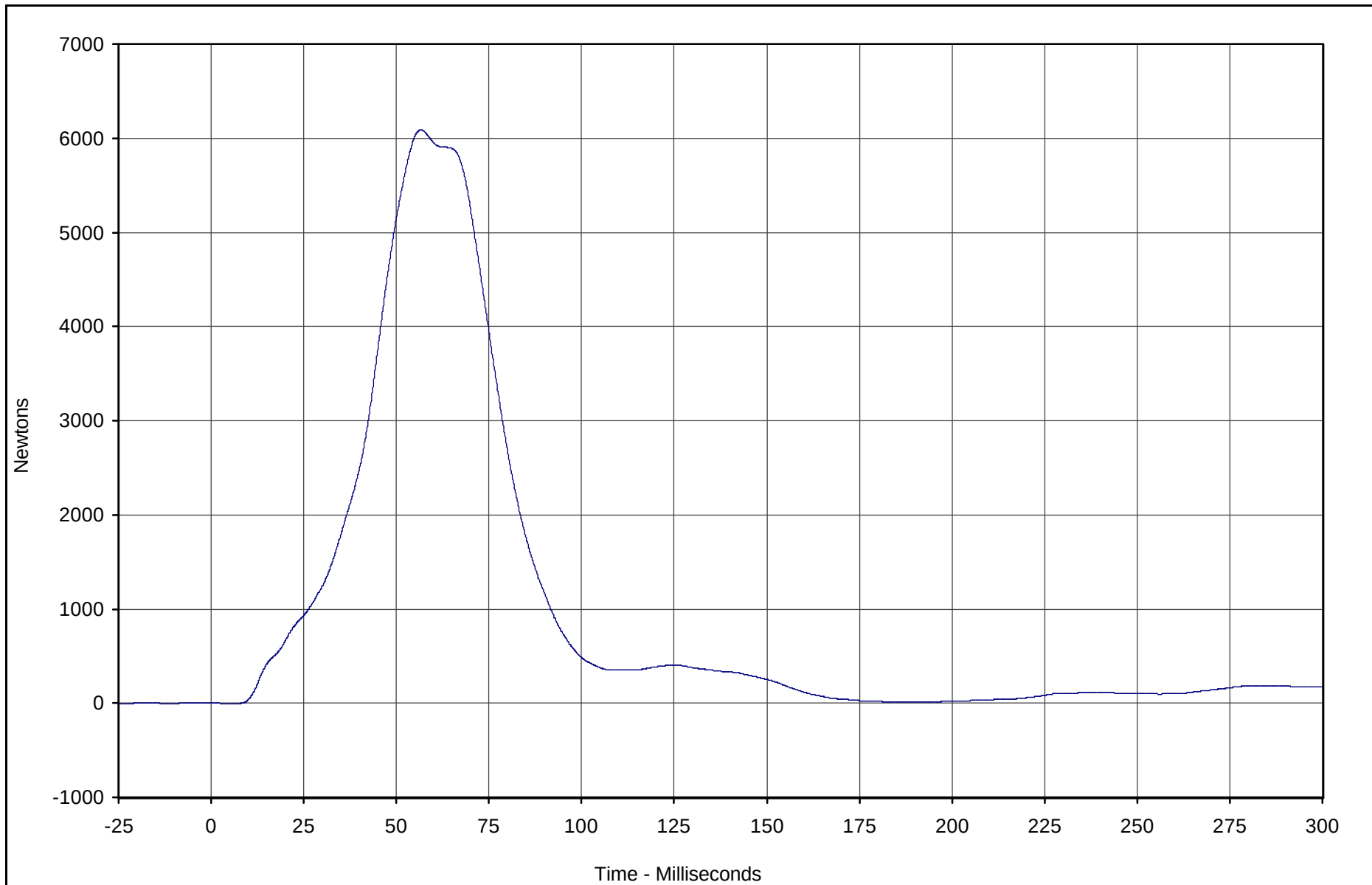


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Lap Belt Force	041	FIL	Newtons	6088.3	56.6	-4.8	6.7	60

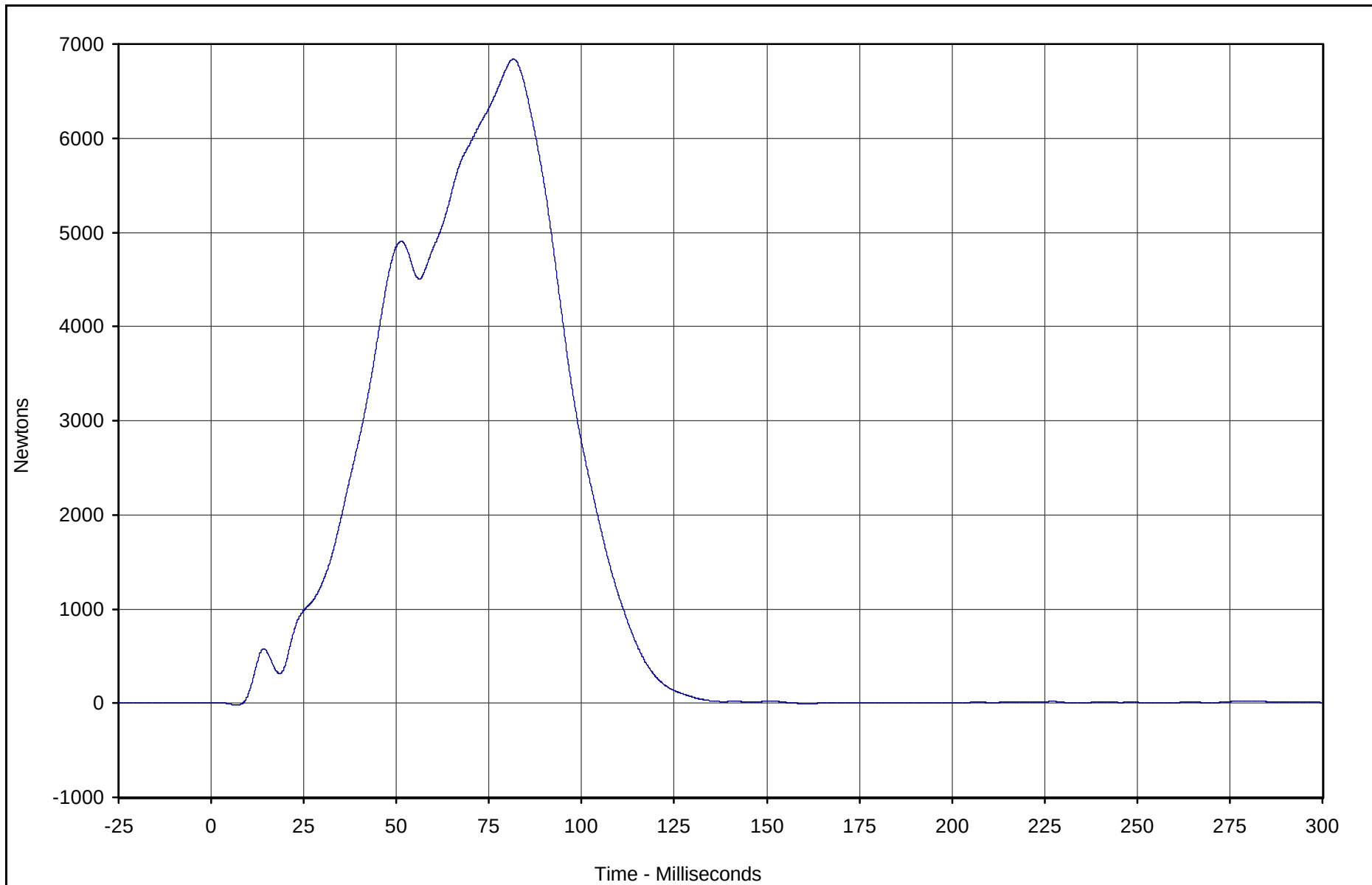


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Force	042	FIL	Newtons	6838.8	81.6	-20.6	7.0	60

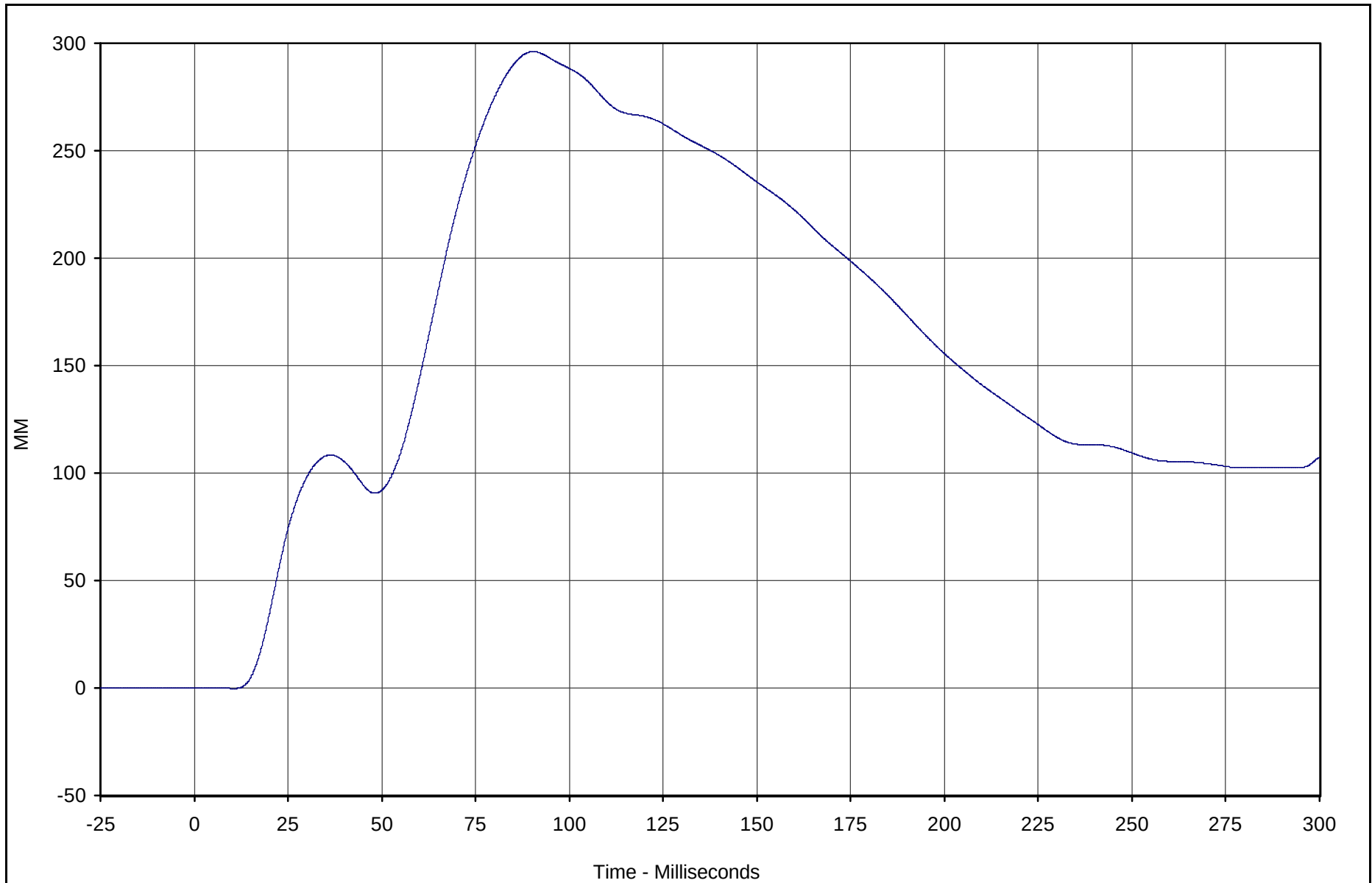


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Pullout	043	FIL	MM	296.1	90.4	-0.3	10.6	60

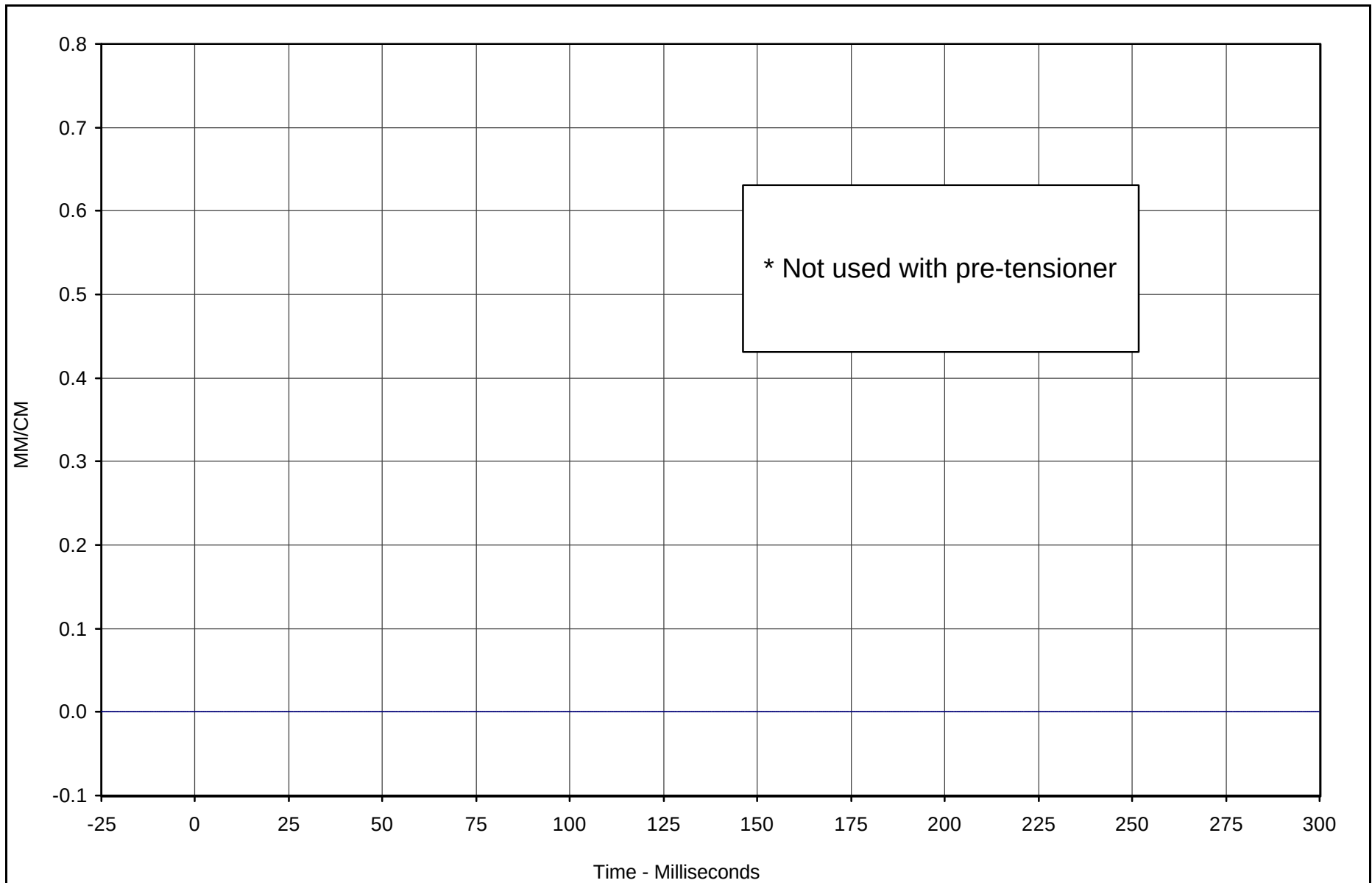


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



* Not used with pre-tensioner

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Elongation	044	FIL	MM/CM	0.00	0.0	0.00	0.0	60

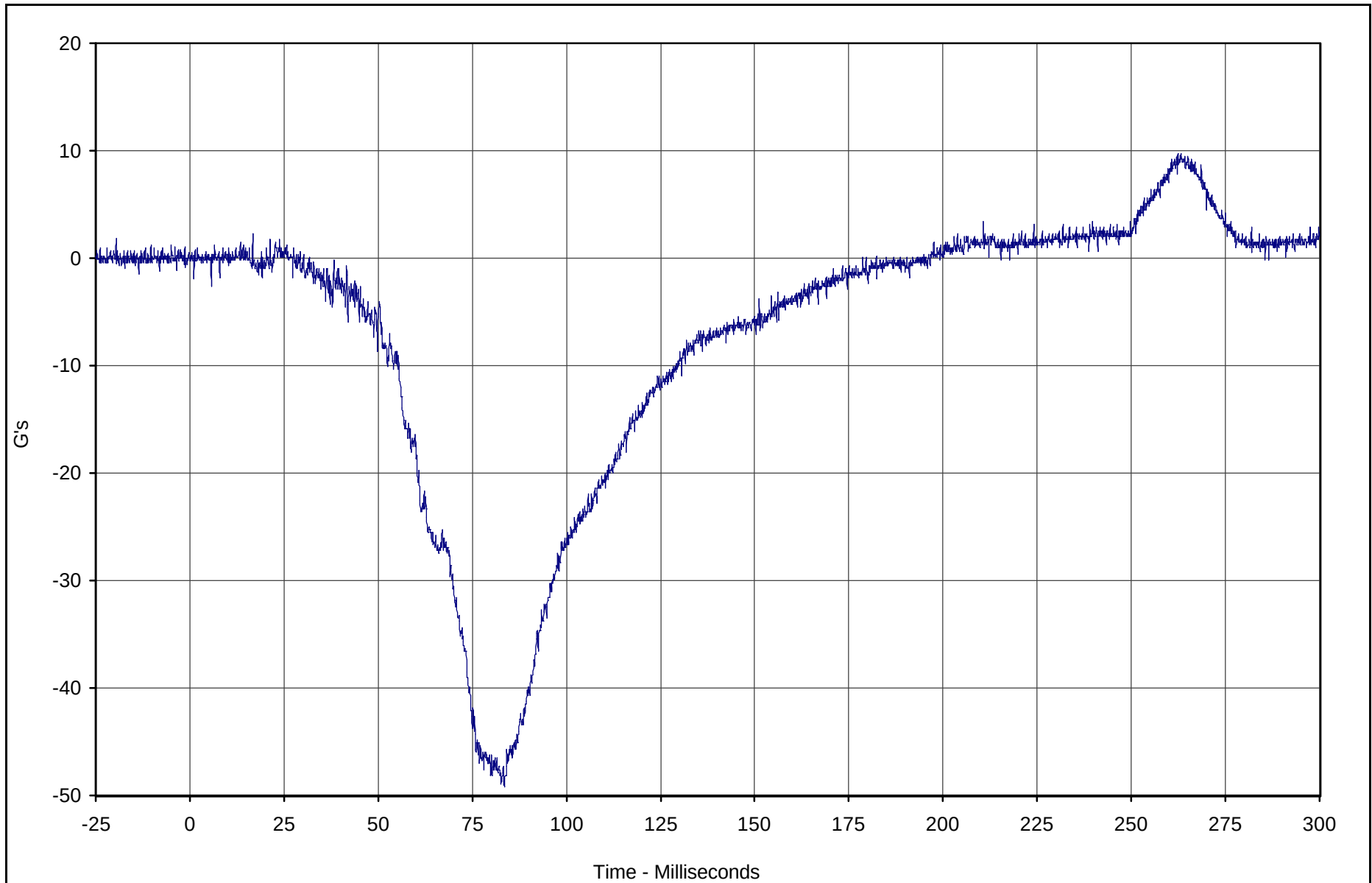


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X	045	FIL	G's	9.8	262.4	-49.2	83.5	1000

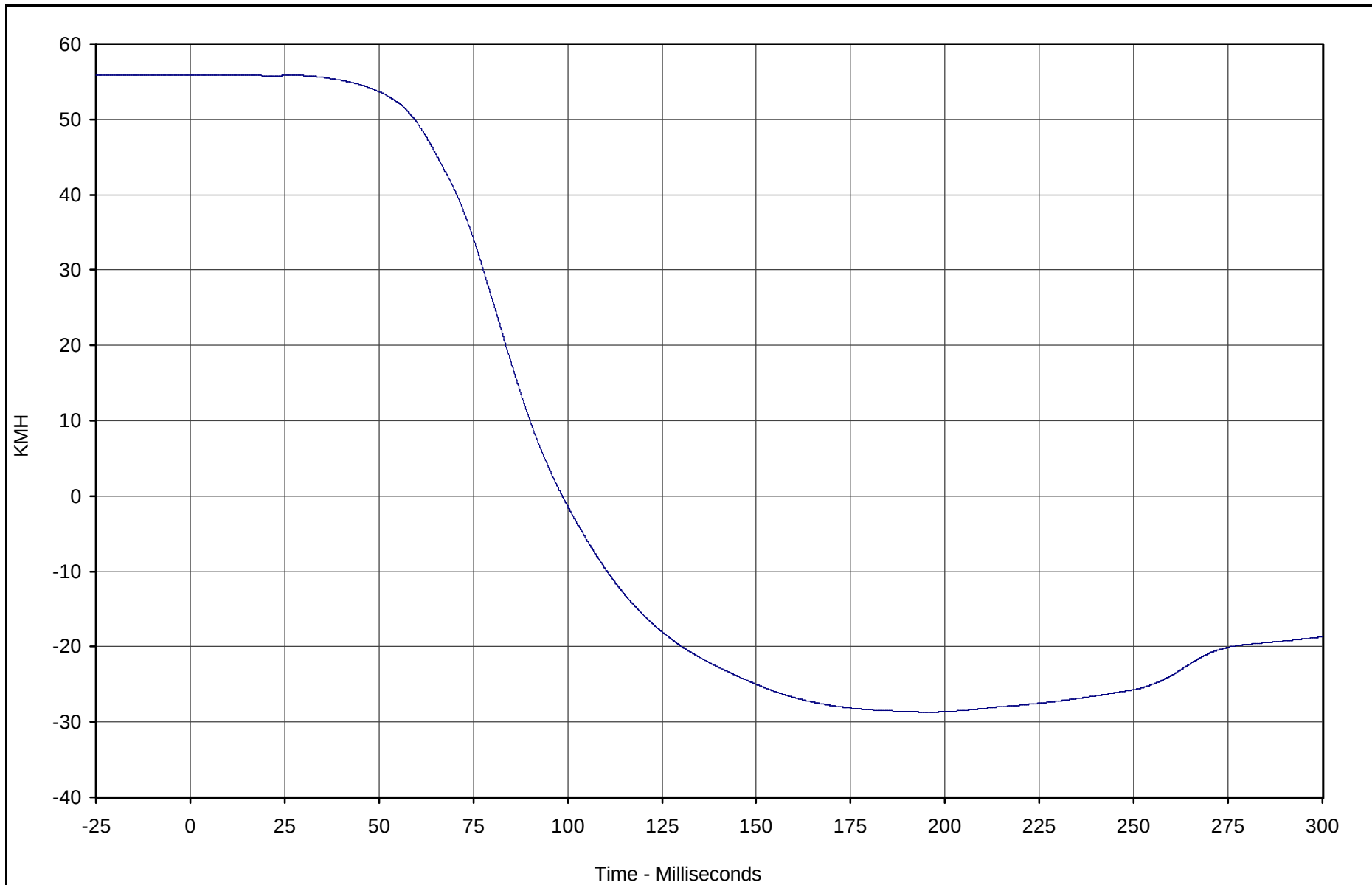


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X Velocity	045	IN1	KMH	55.9	15.9	-28.7	196.5	180

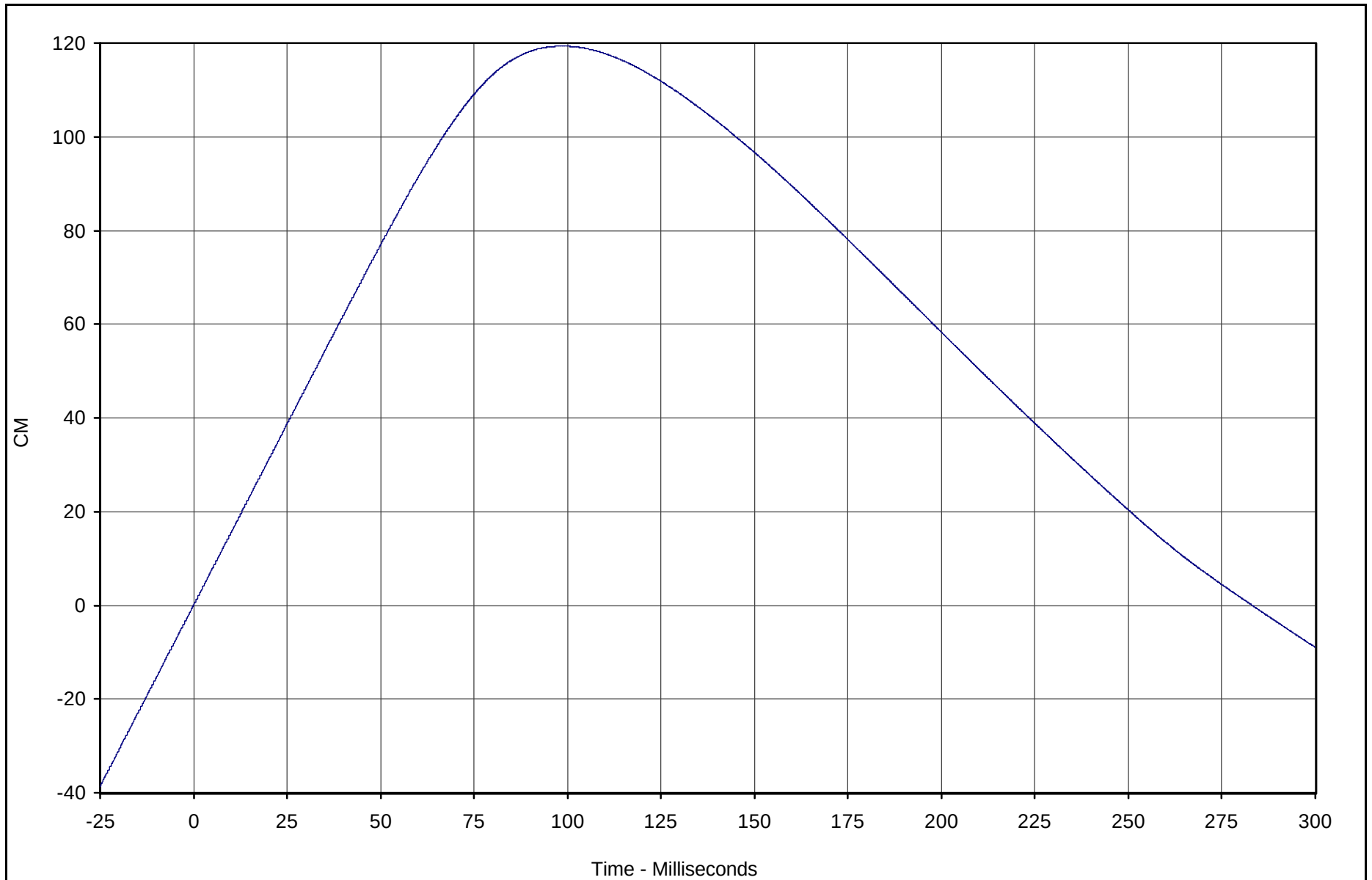


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X Displ.	045	IN2	CM	119.4	98.6	-8.9	299.9	180

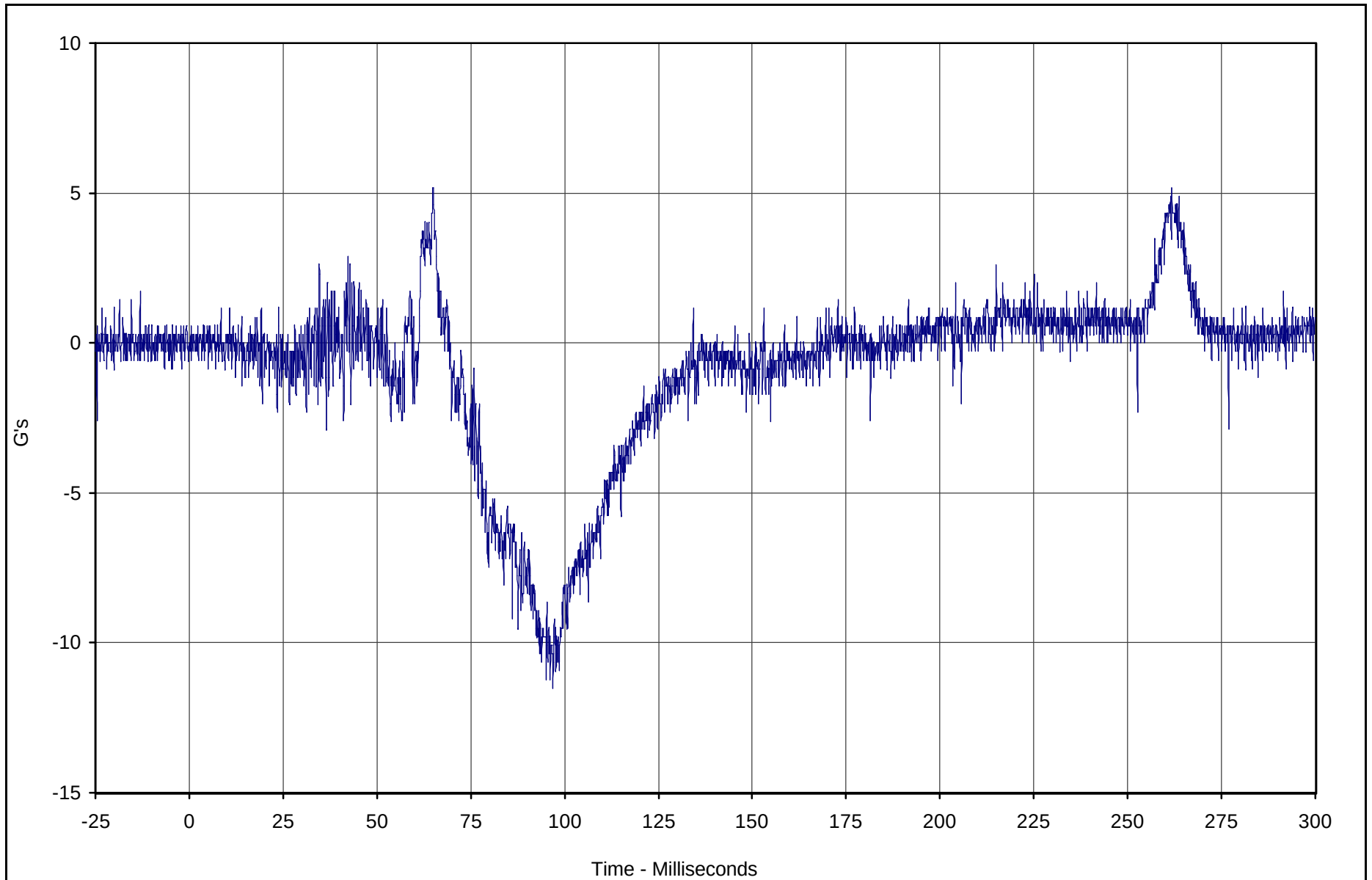


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Y	046	FIL	G's	5.2	64.9	-11.5	96.9	1000

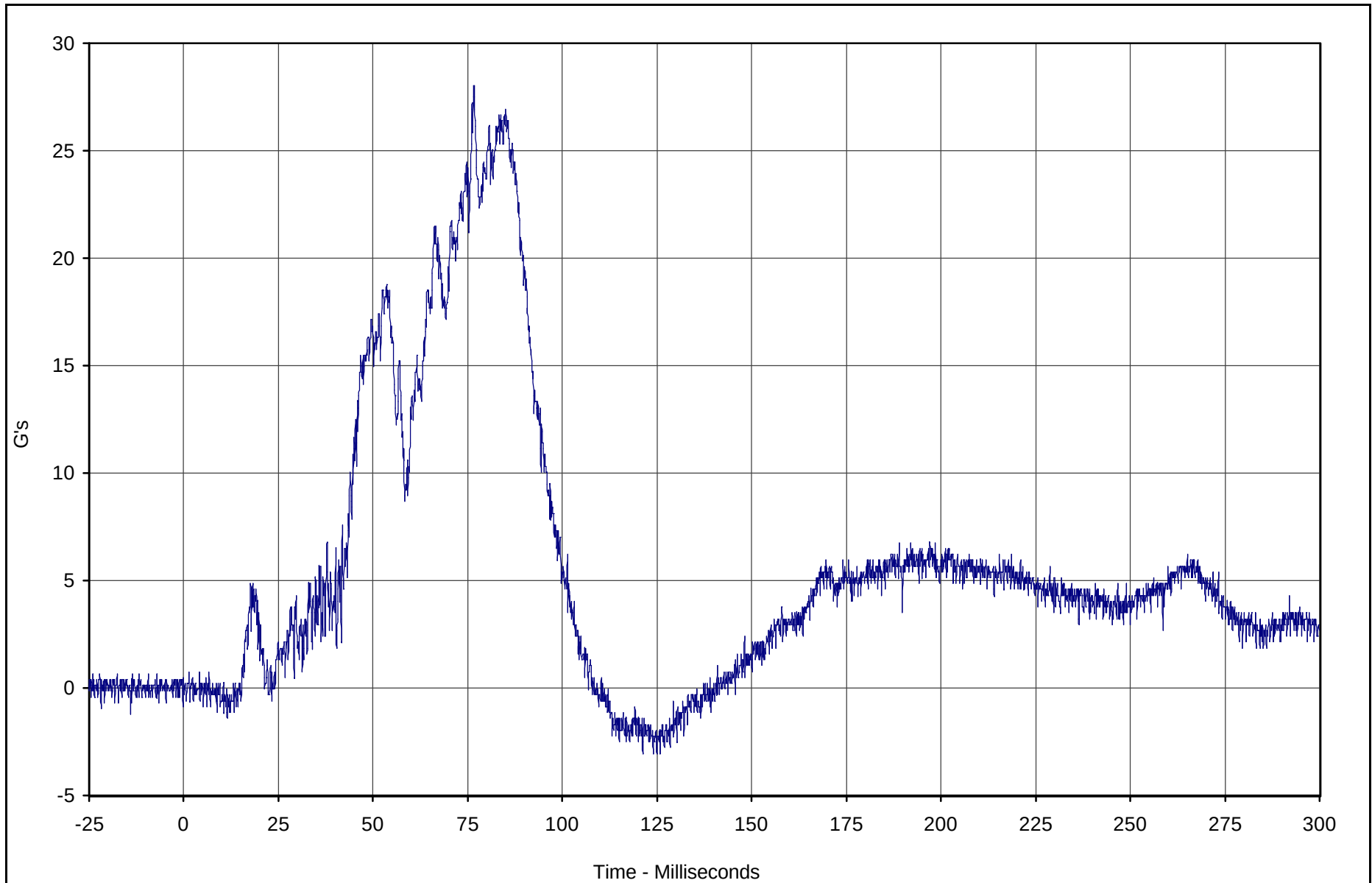


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Z	047	FIL	G's	28.0	76.6	-3.1	121.3	1000

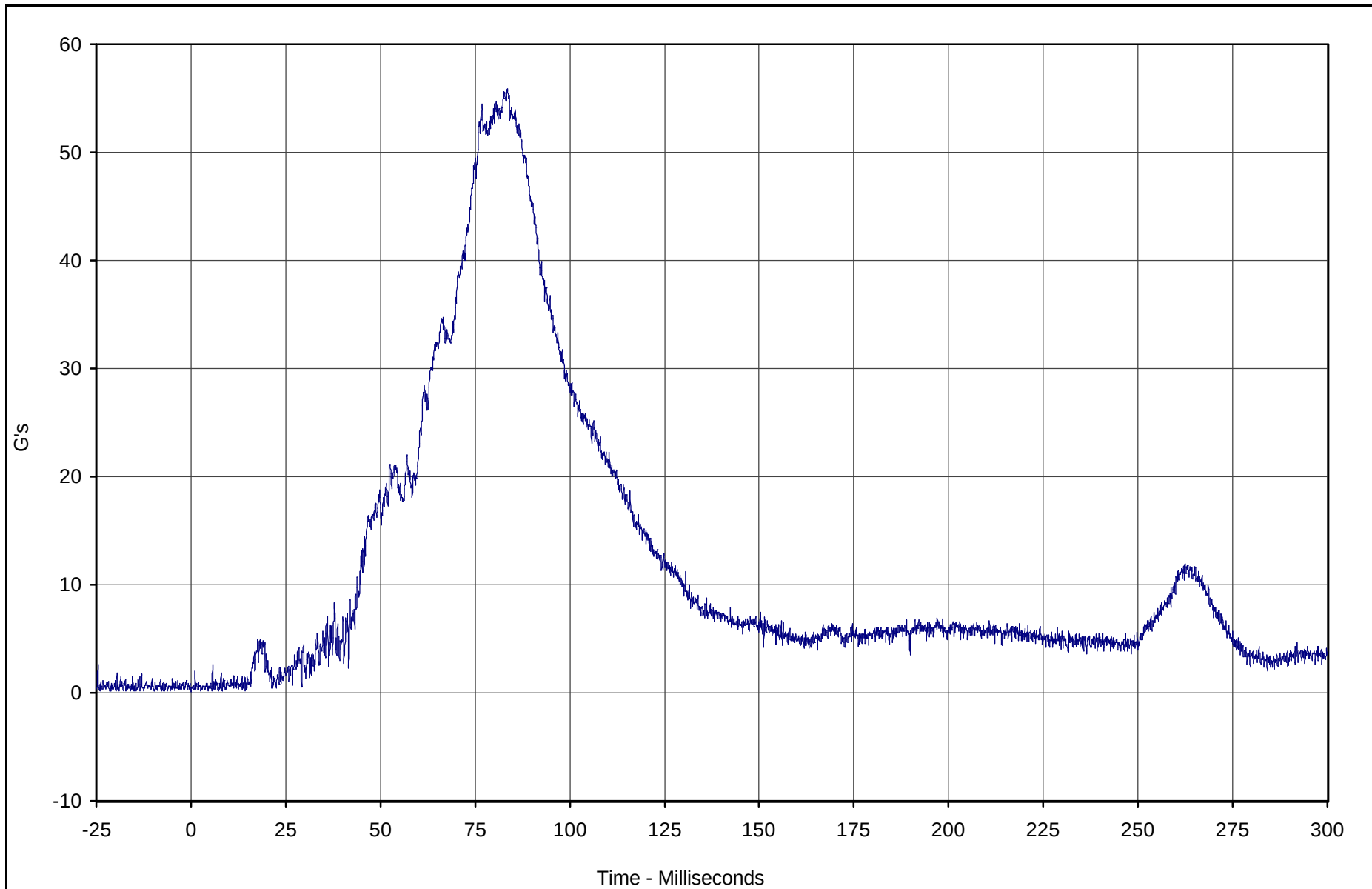


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Resultant Primary	045	RES	G's	55.8	83.5	0.2	2.6	1000

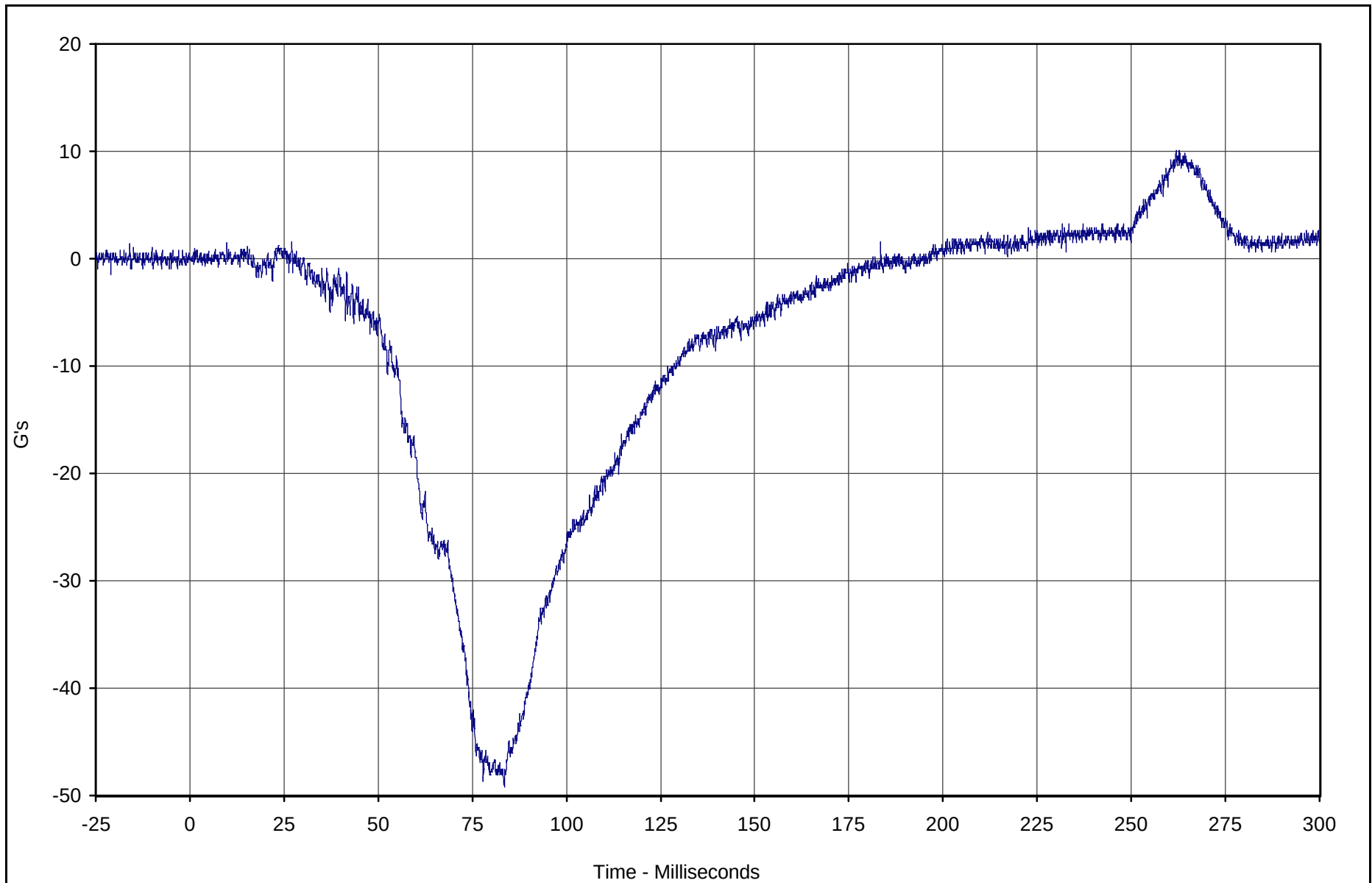


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X	048	FIL	G's	10.1	261.9	-49.2	83.5	1000

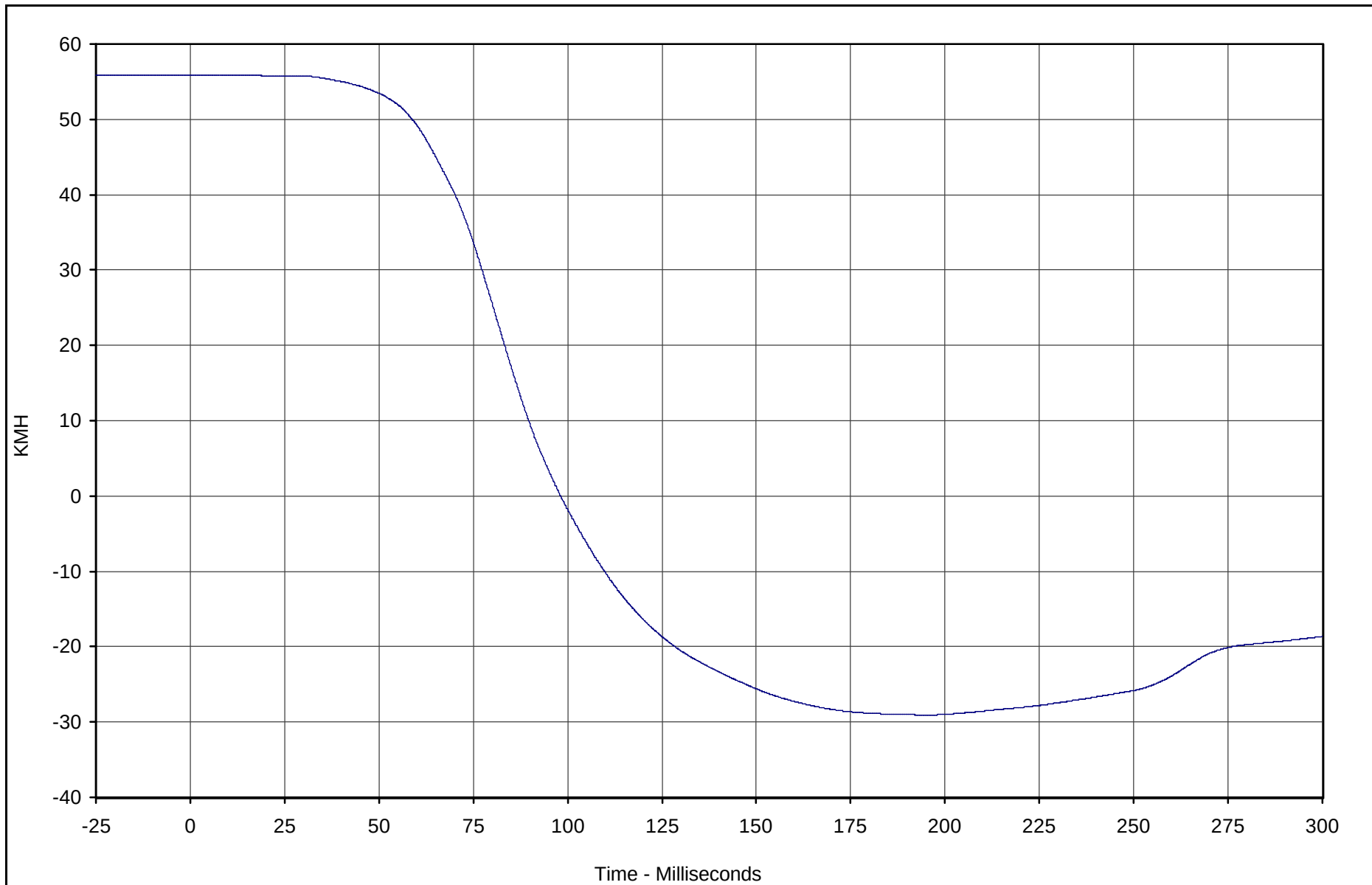


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X Velocity	048	IN1	KMH	55.9	16.0	-29.1	196.1	180

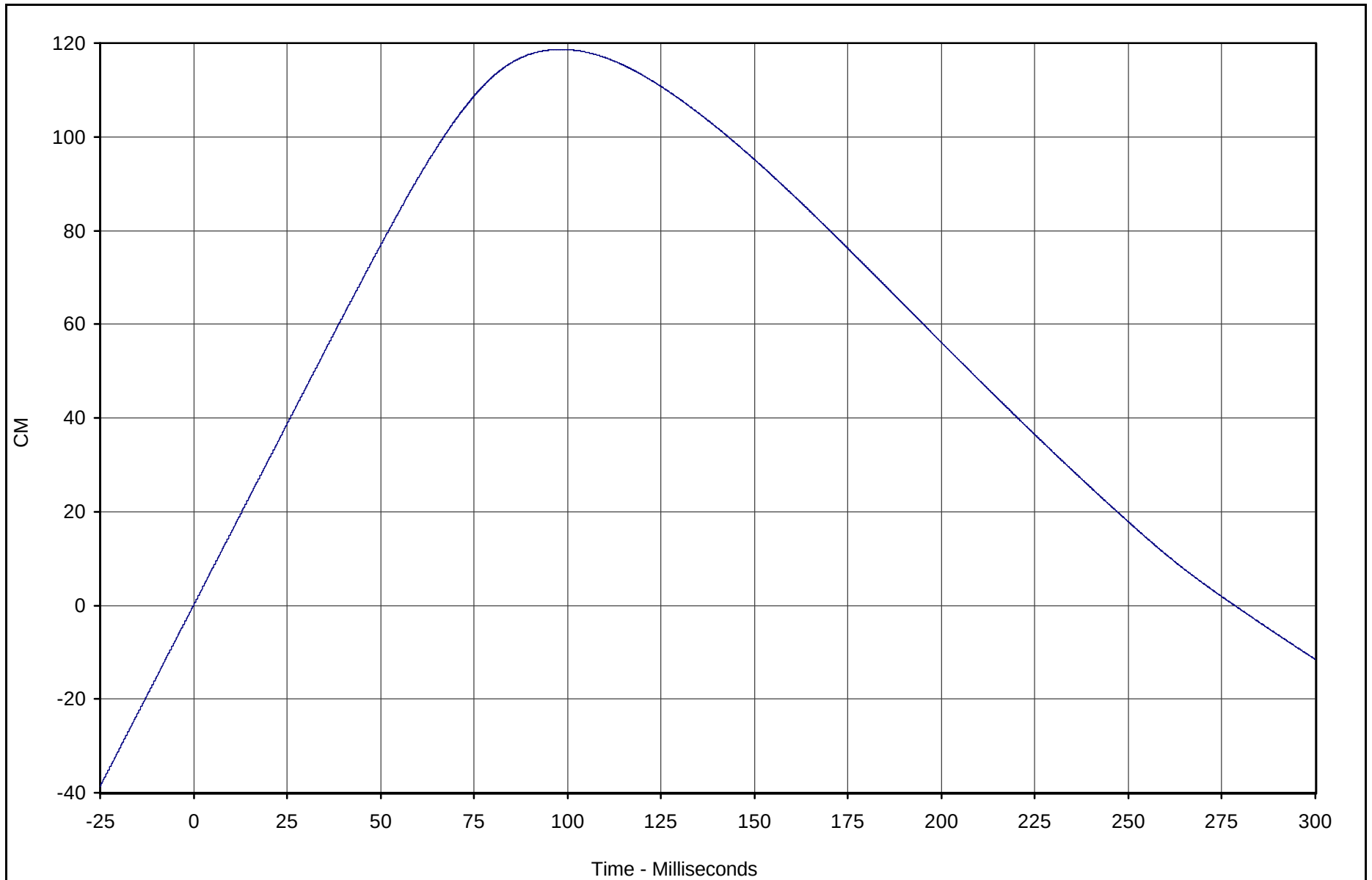


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X Displ.	048	IN2	CM	118.7	98.2	-11.5	299.9	180

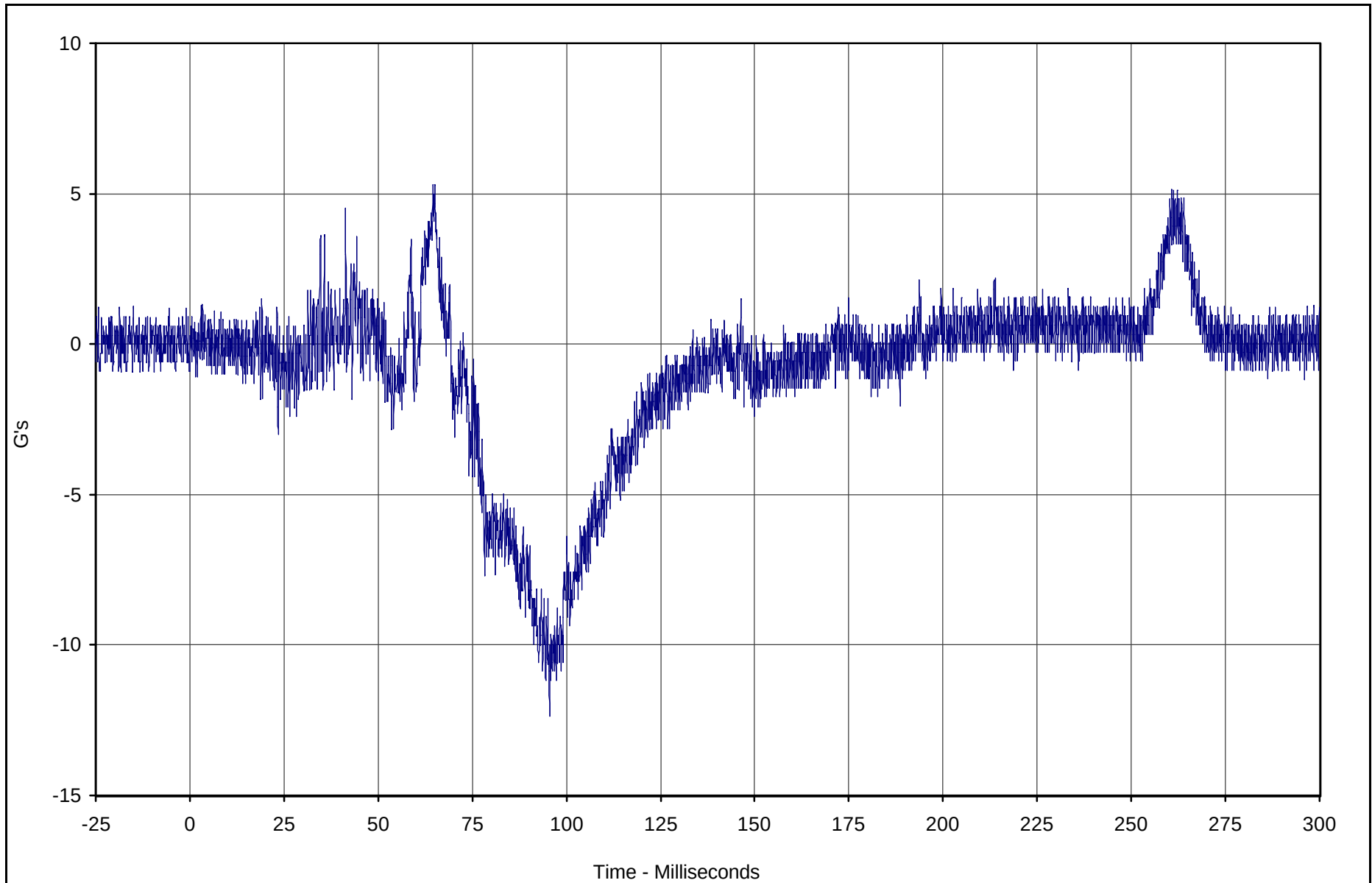


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant Y	049	FIL	G's	5.3	64.5	-12.4	95.5	1000

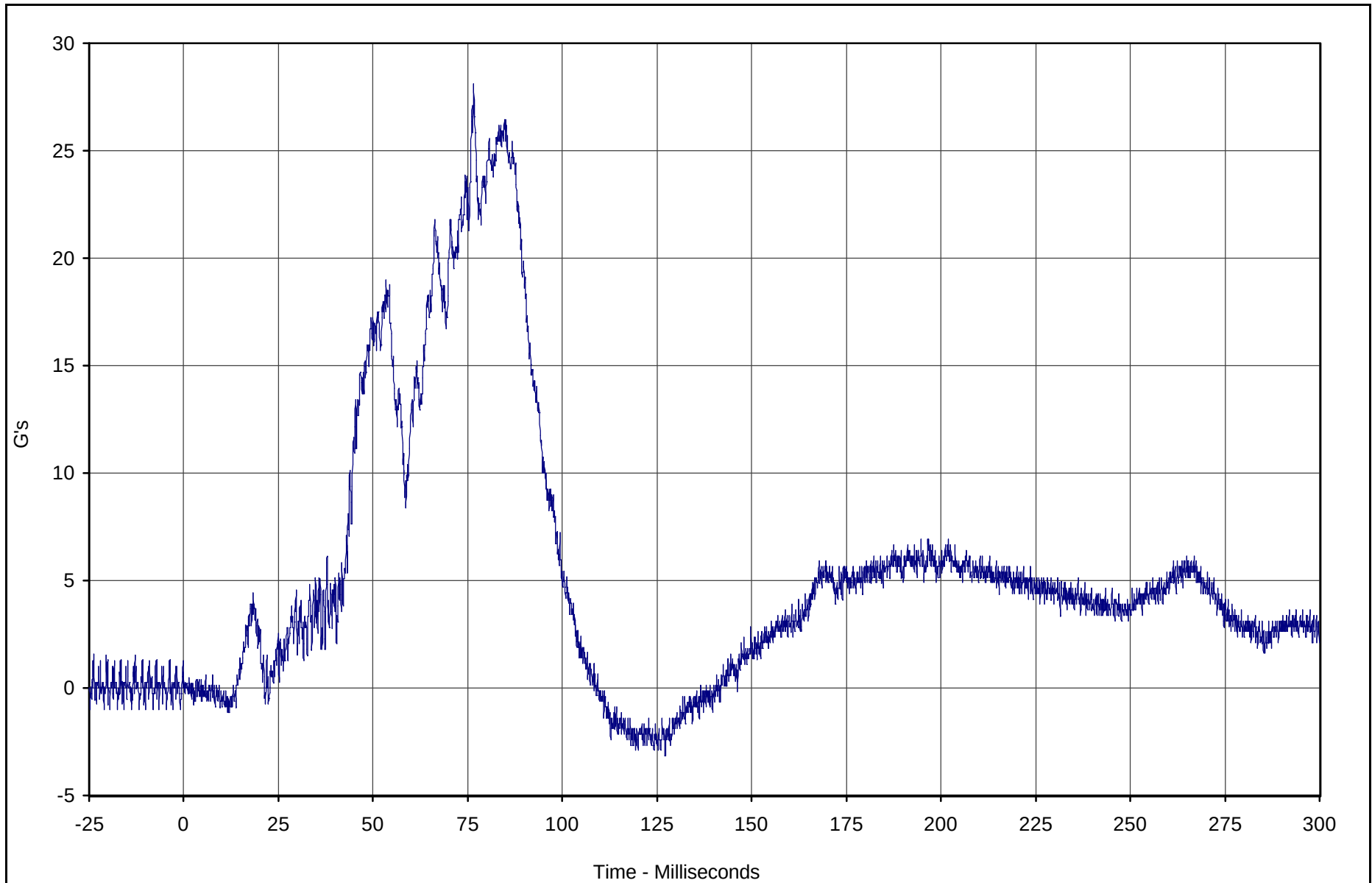


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant Z	050	FIL	G's	28.1	76.6	-3.2	127.1	1000

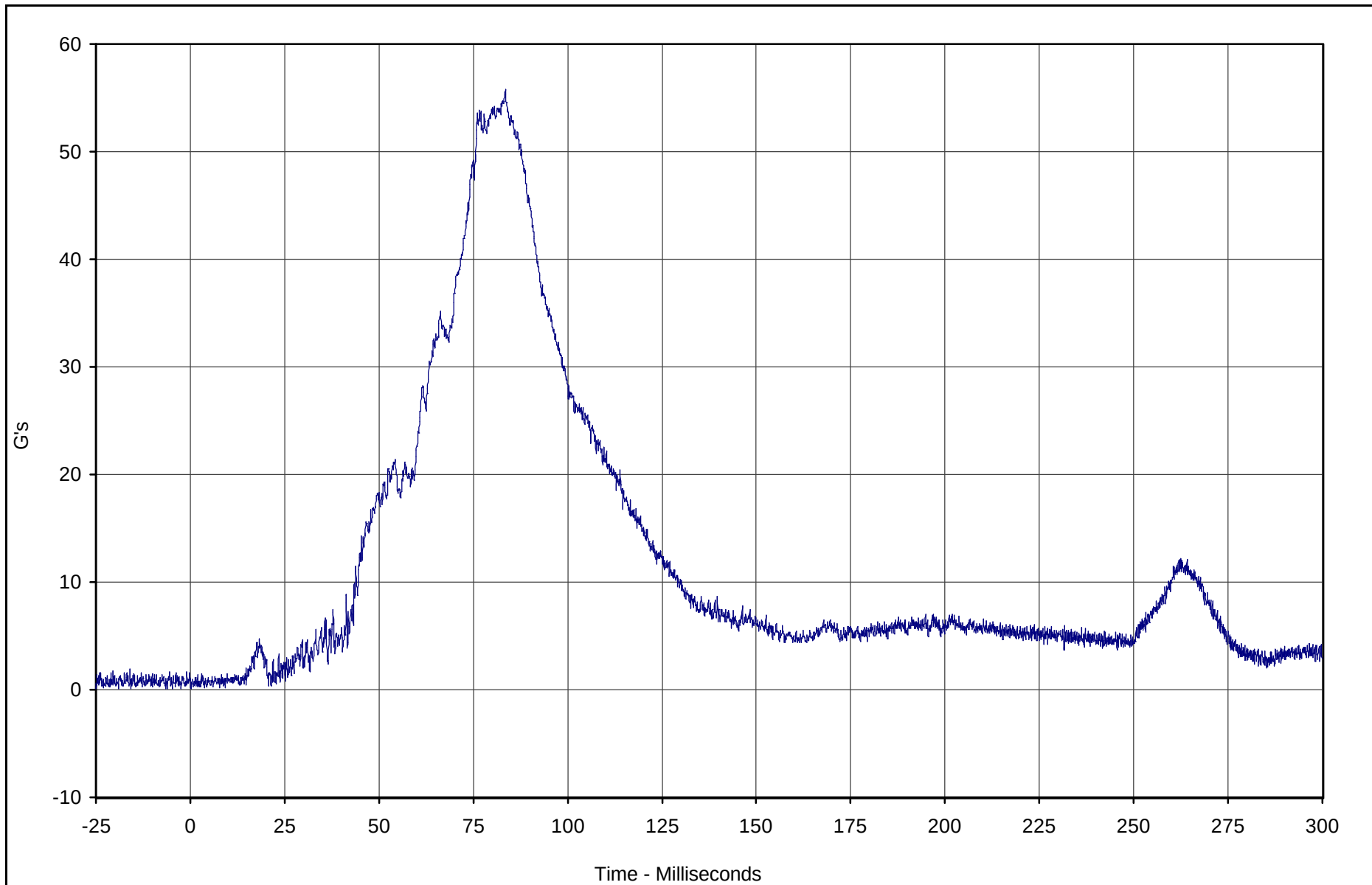


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Resultant Redundant	048	RES	G's	55.8	83.5	0.1	0.2	1000

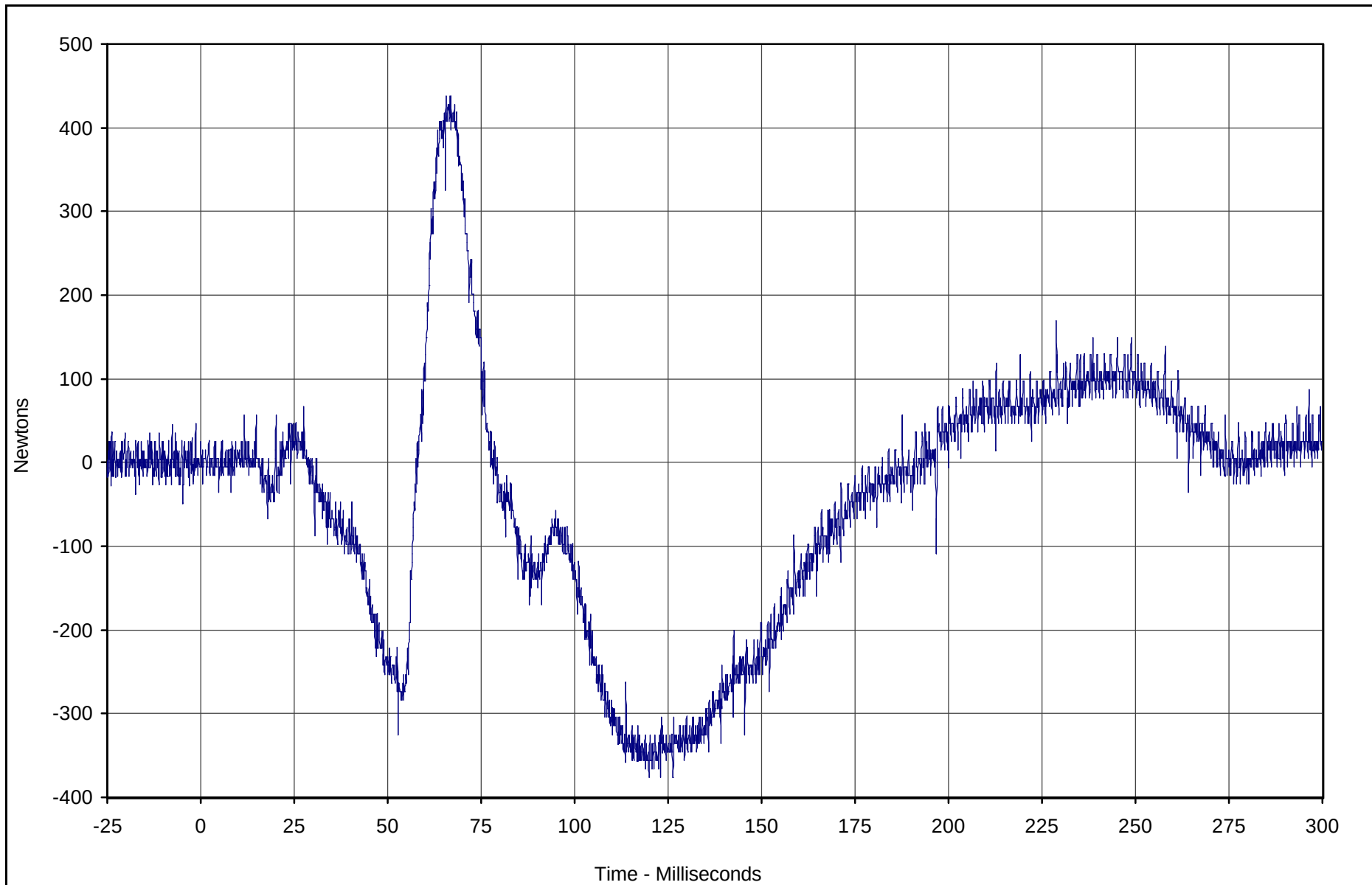


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force X	051	FIL	Newtons	438.3	65.6	-376.7	119.9	1000

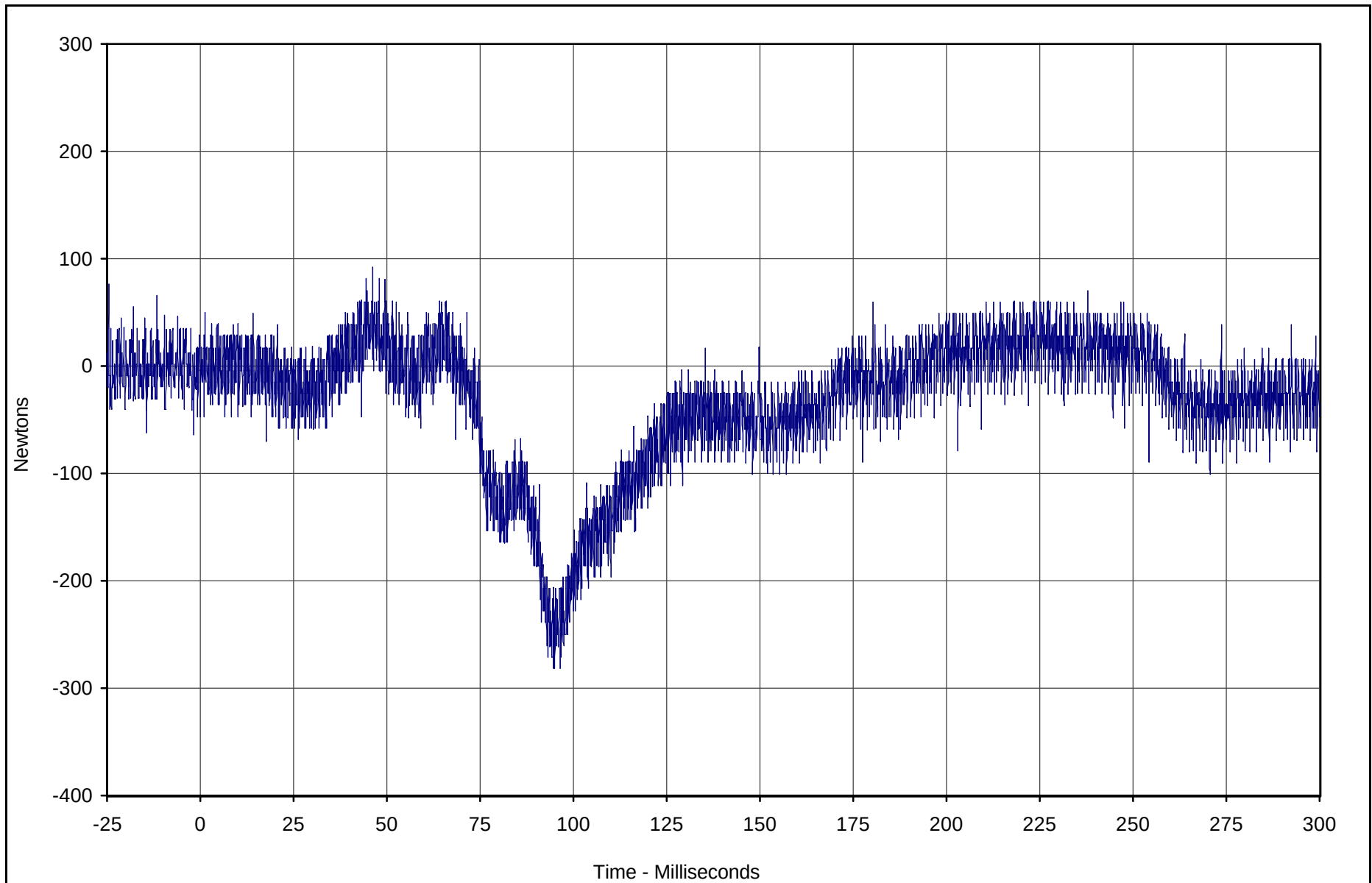


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Y	052	FIL	Newtons	91.6	46.2	-281.6	94.7	1000

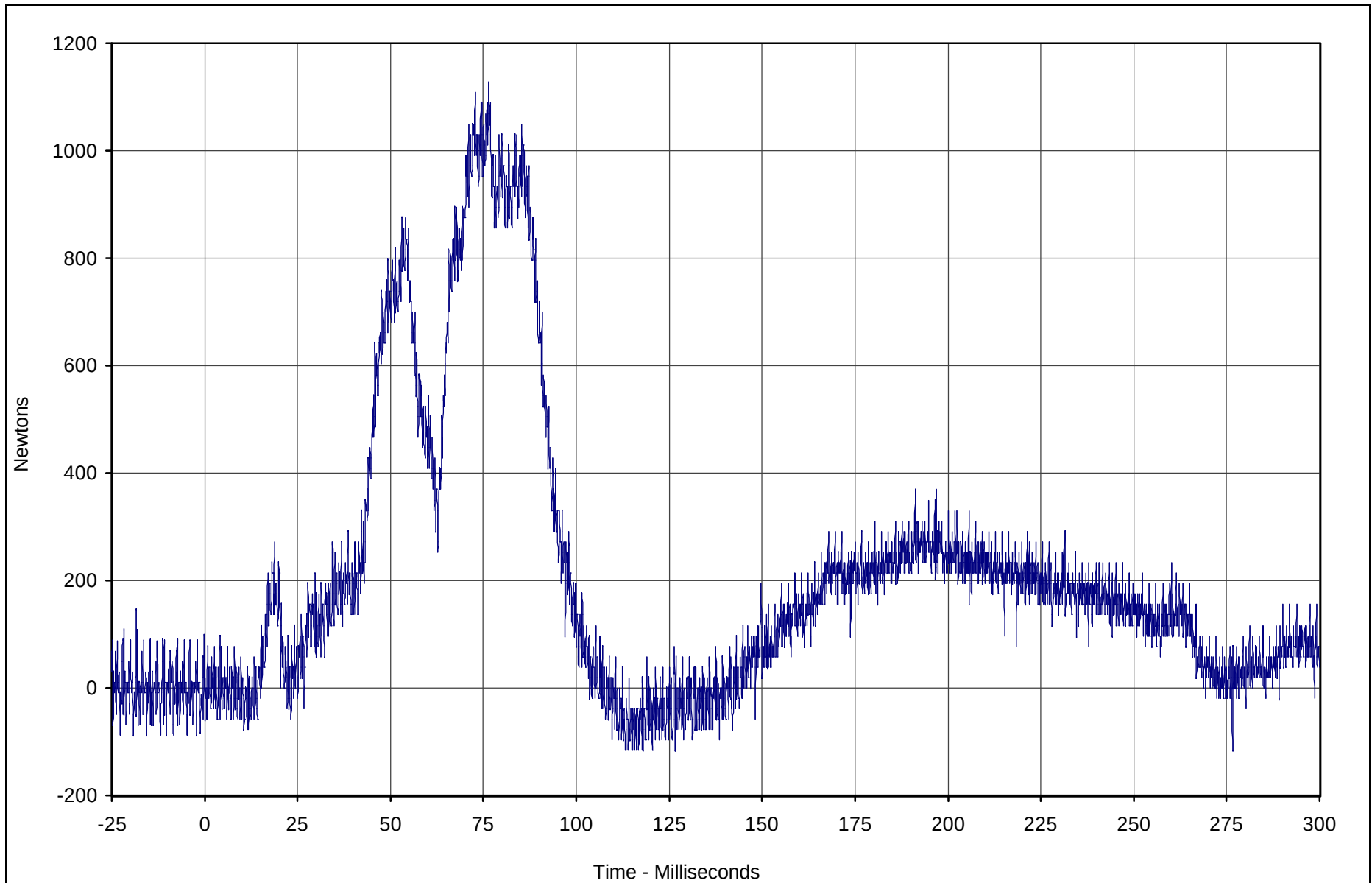


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Z	053	FIL	Newtons	1127.5	76.5	-116.6	113.2	1000

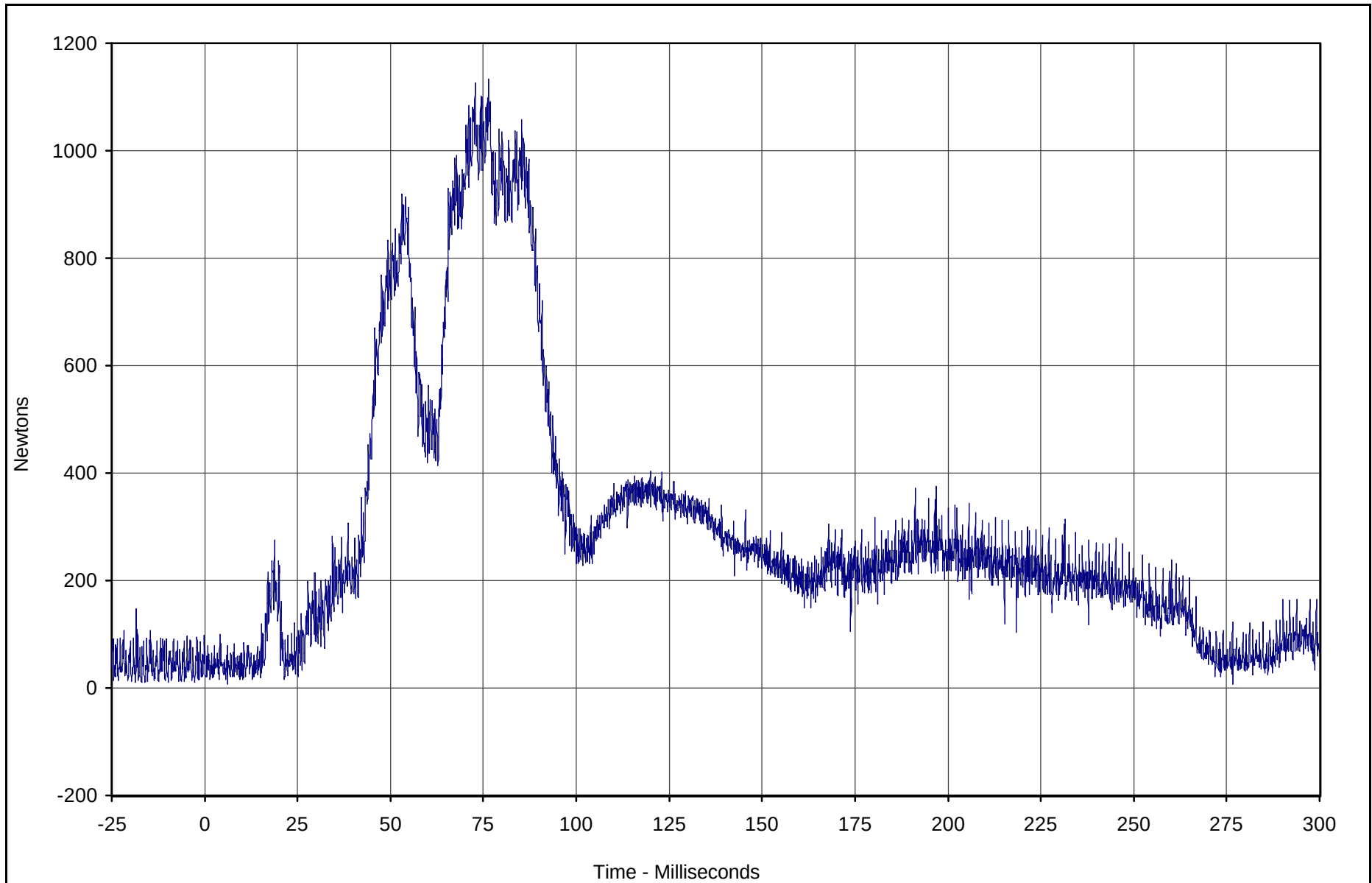


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Resultant	051	RES	Newtons	1133.9	76.5	6.6	276.8	1000

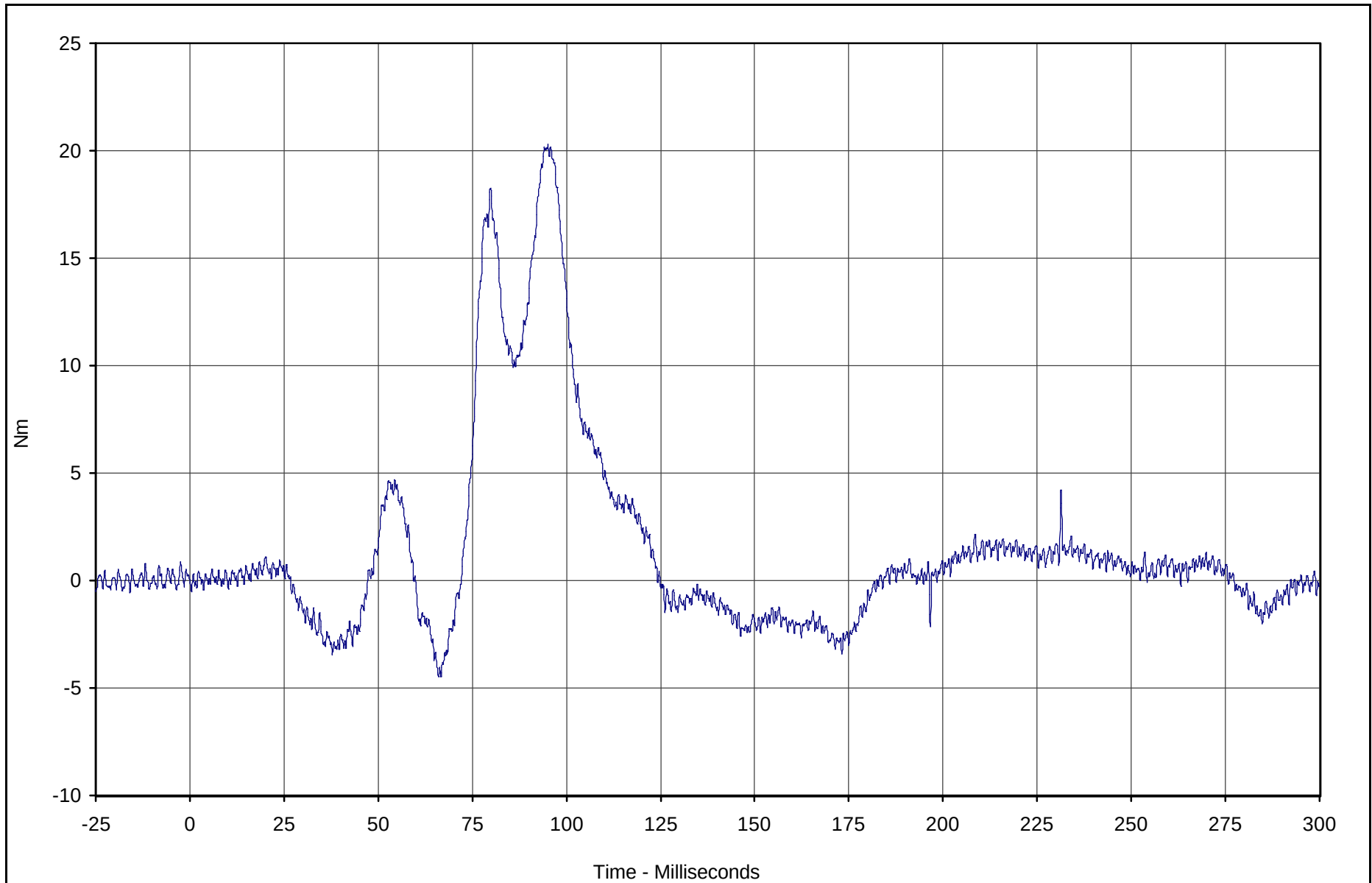


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment X	054	FIL	Nm	20.3	95.1	-4.5	66.7	600

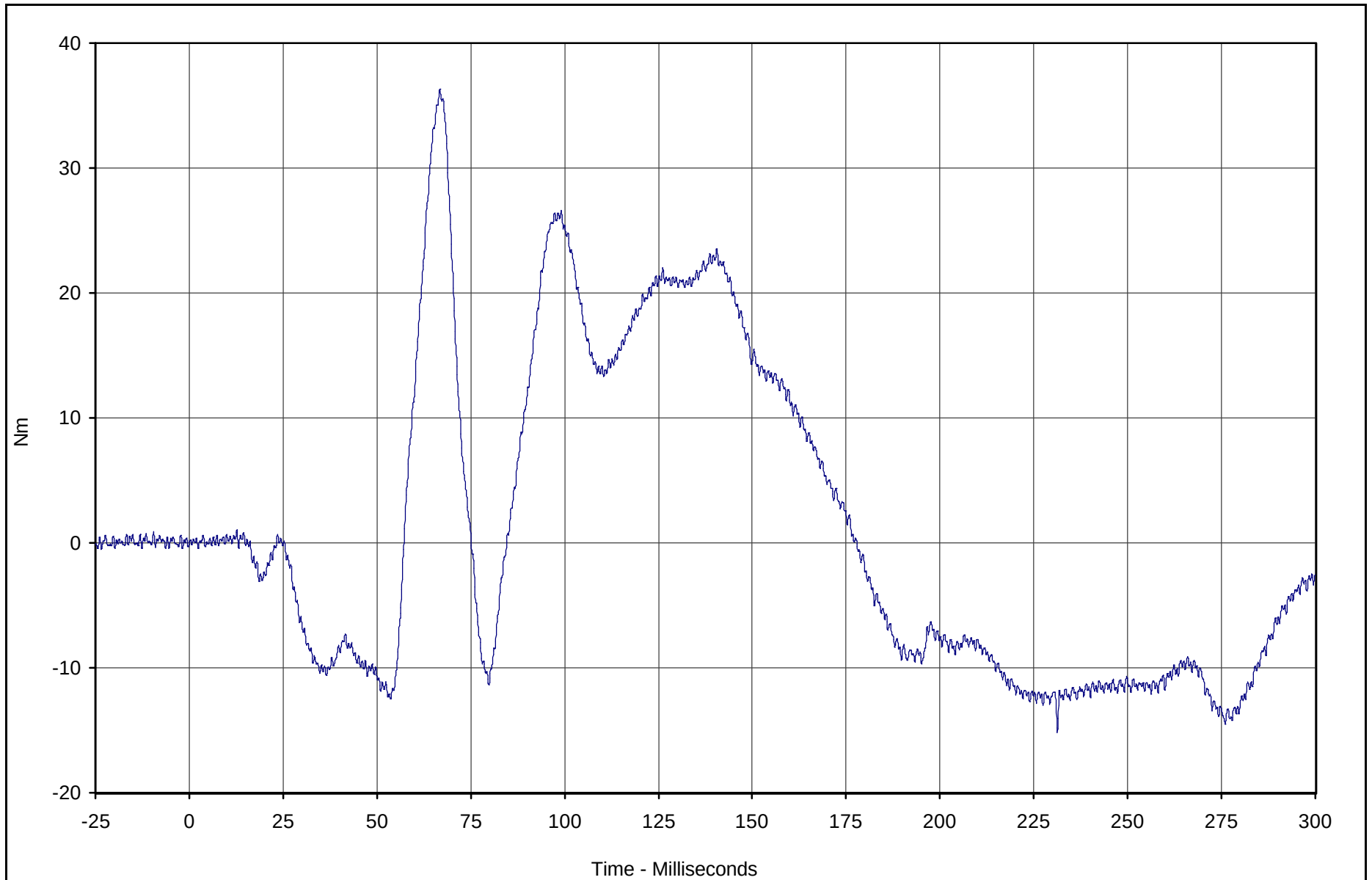


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Y	055	FIL	Nm	36.3	66.8	-15.2	231.3	600

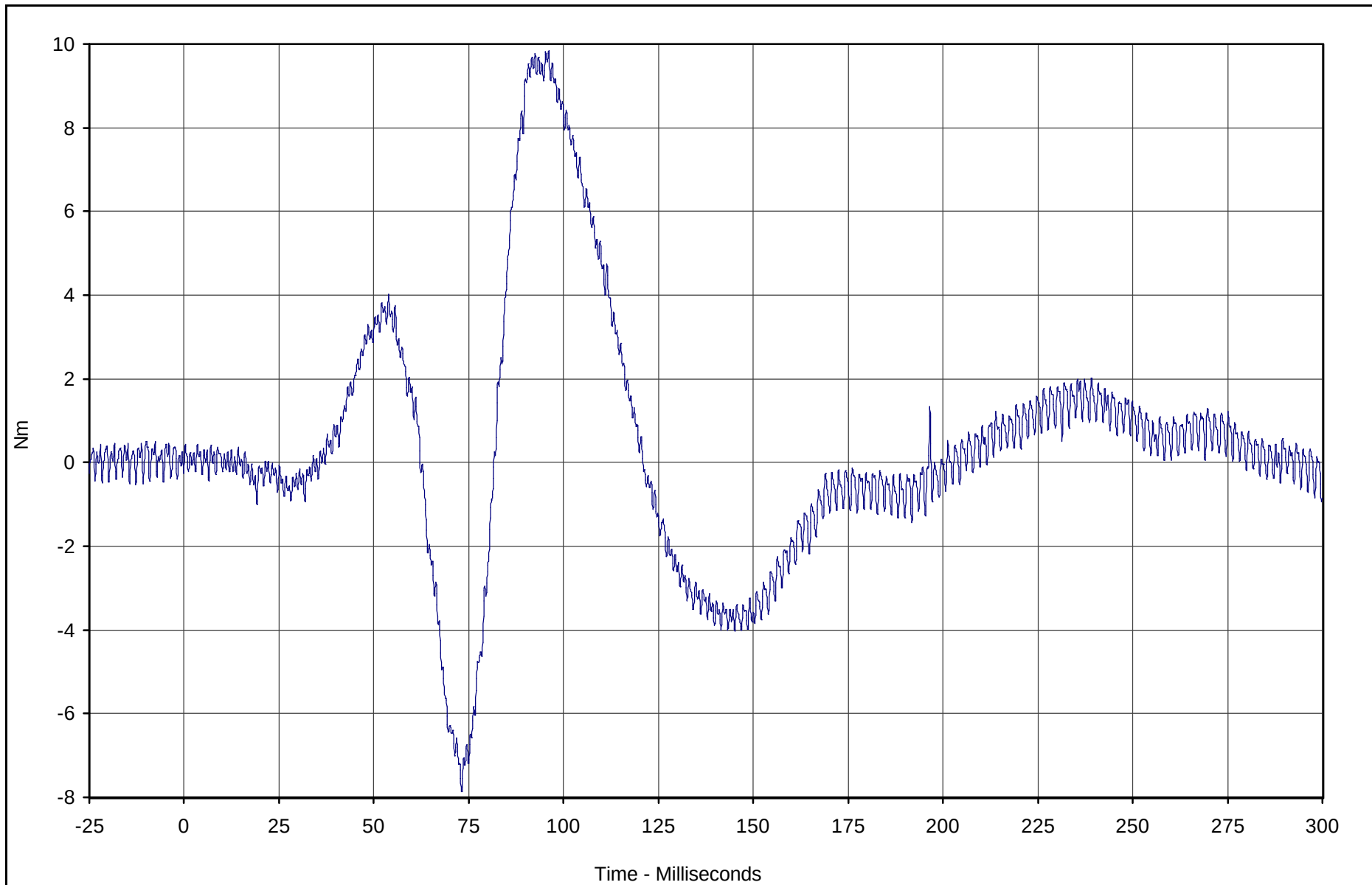


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Z	056	FIL	Nm	9.8	96.1	-7.9	73.2	600

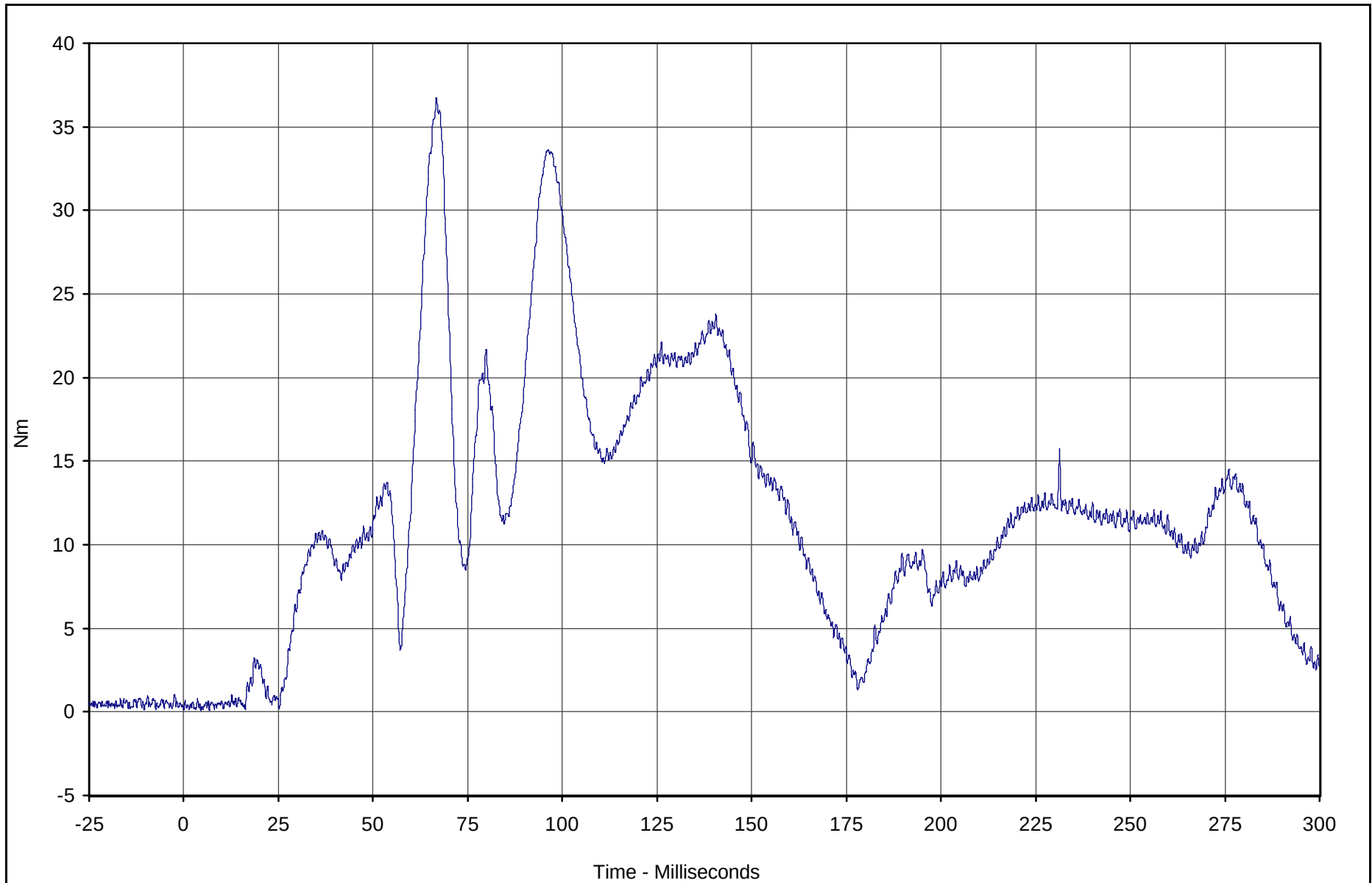


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Resultant	054	RES	Nm	36.7	66.8	0.1	6.8	600

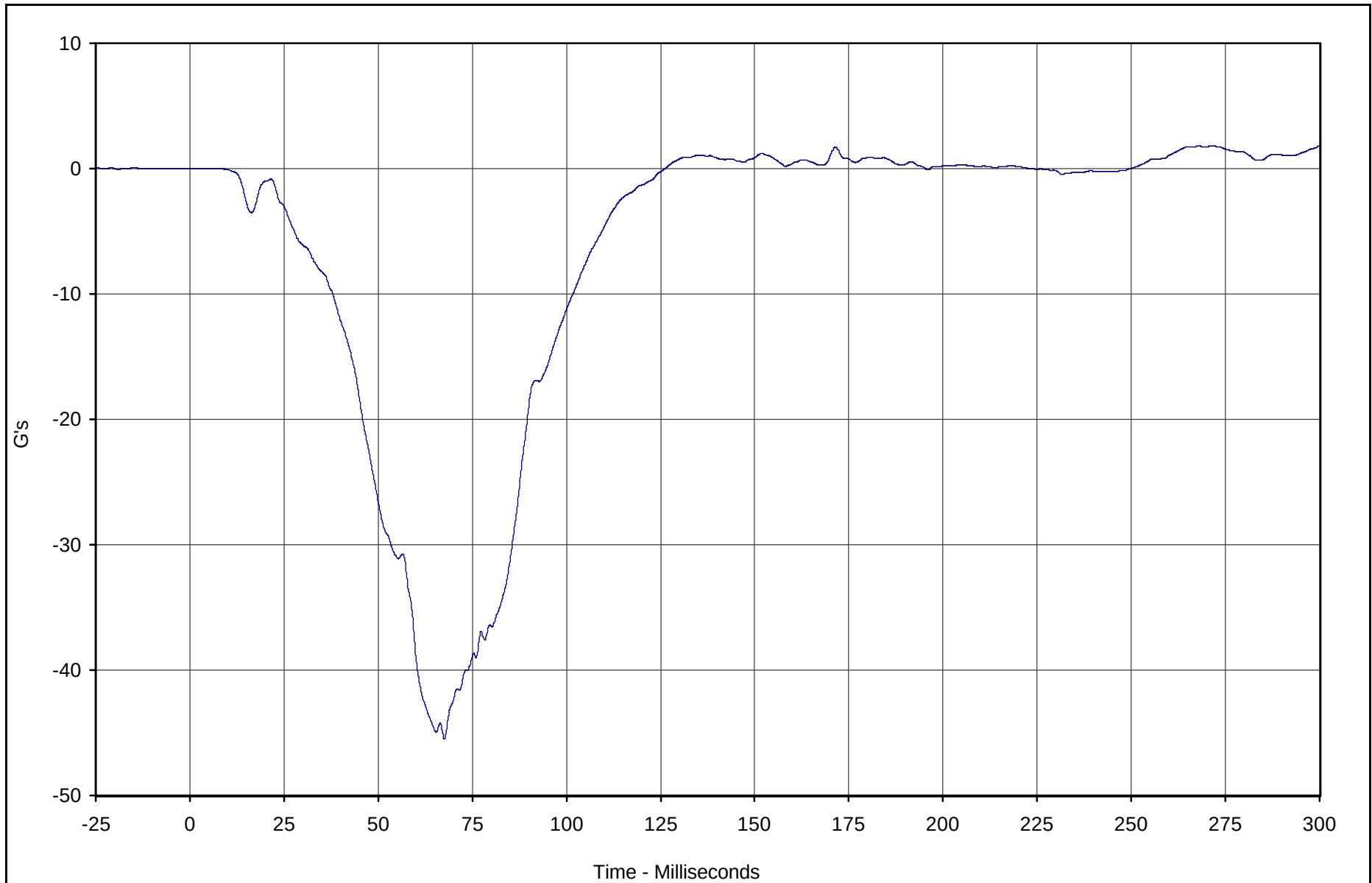


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X	057	FIL	G's	1.8	299.9	-45.5	67.6	180

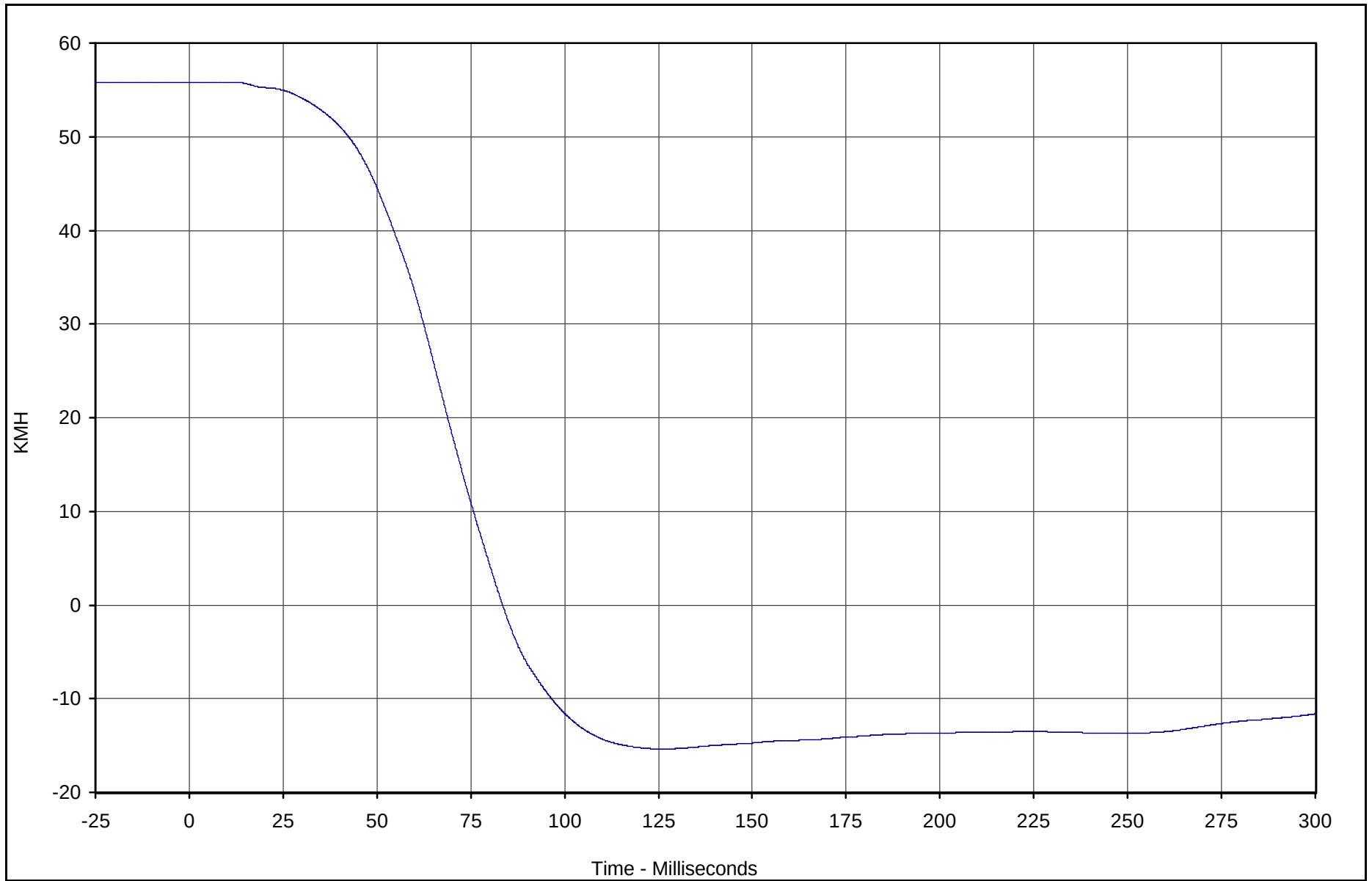


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X Velocity	057	IN1	KMH	55.8	7.2	-15.4	126.1	180

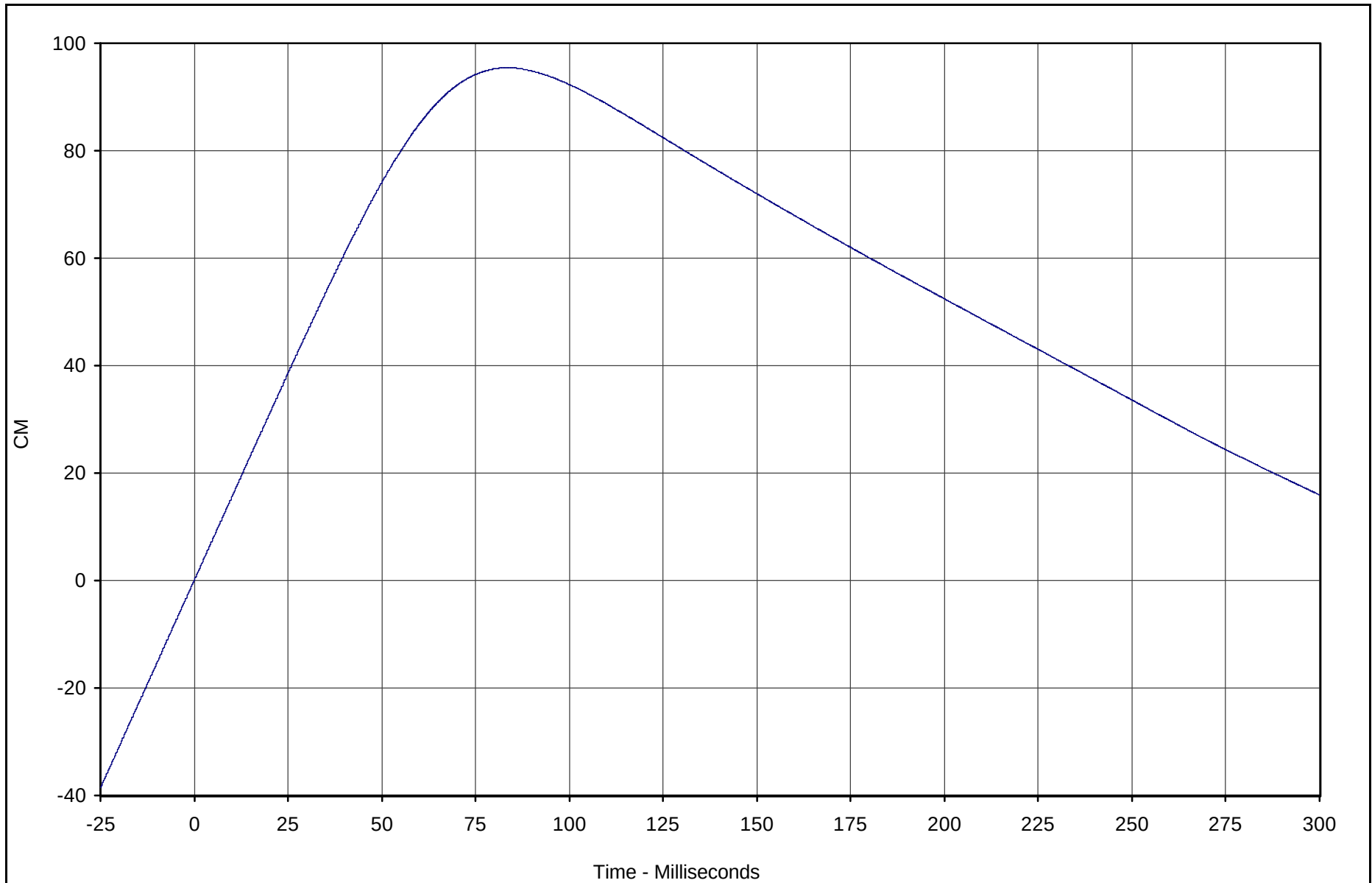


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X Displ.	057	IN2	CM	95.4	83.5	0.0	0.0	180

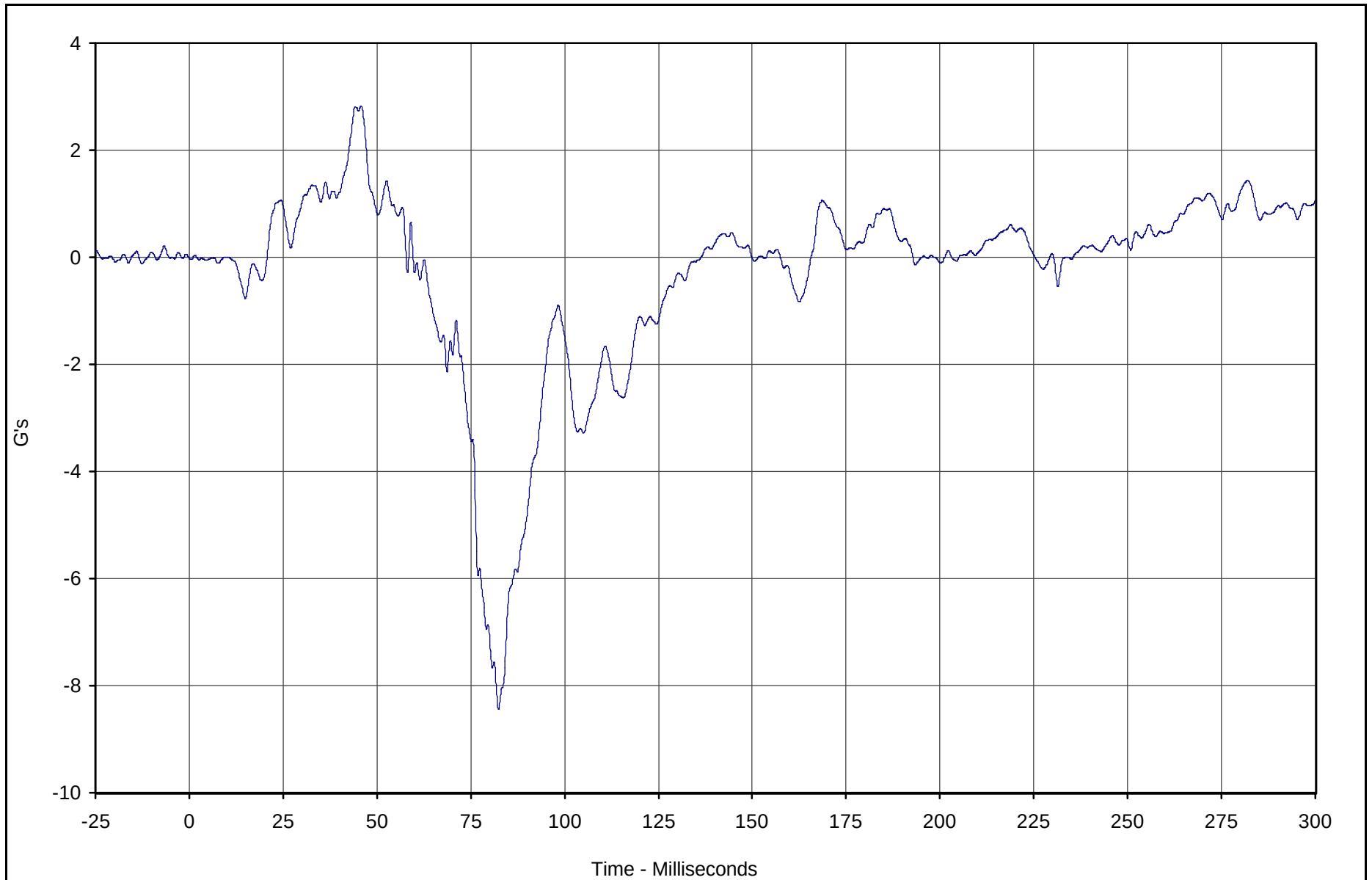


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary Y	058	FIL	G's	2.8	45.8	-8.4	82.4	180

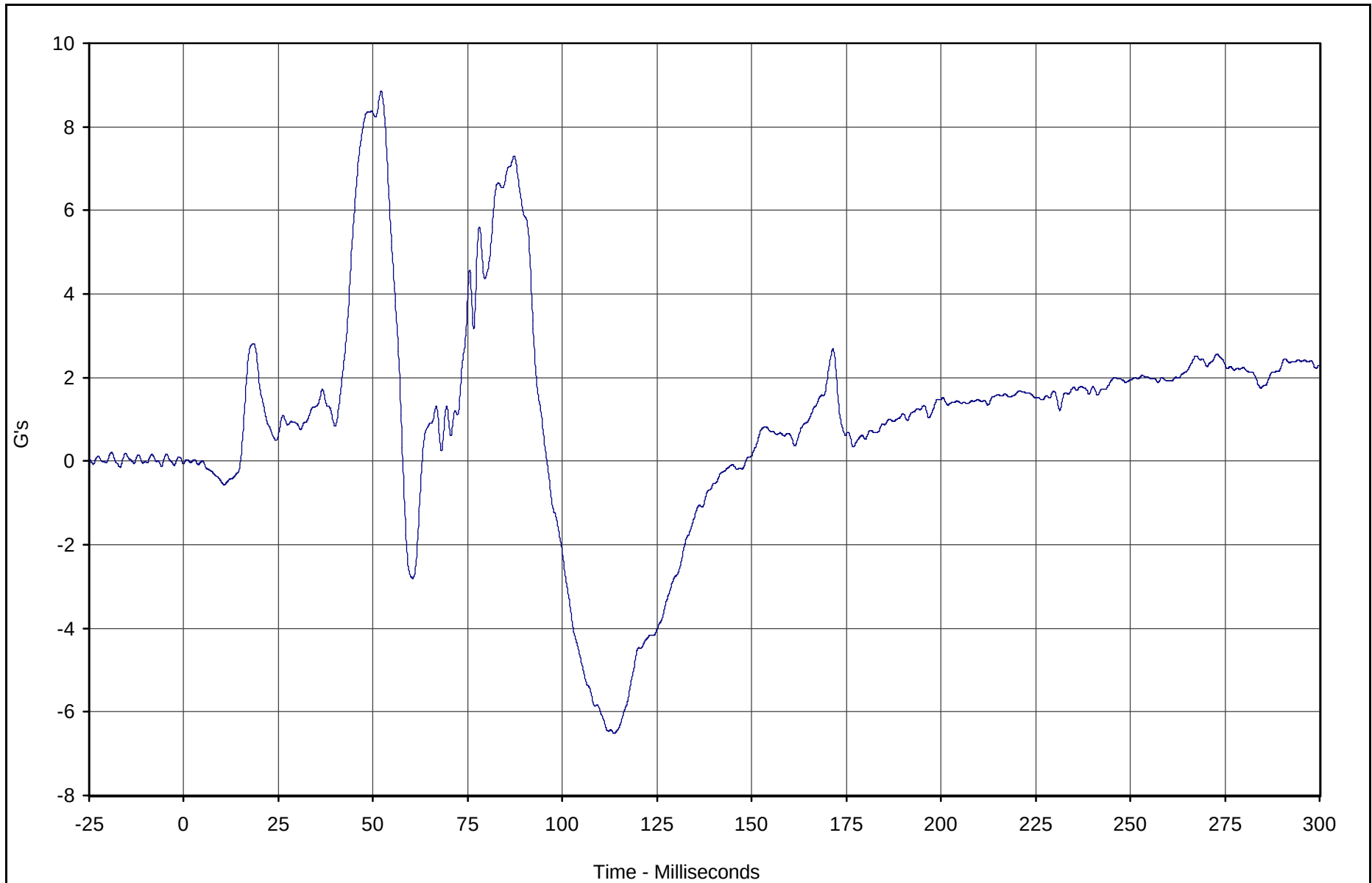


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary Z	059	FIL	G's	8.8	52.1	-6.5	113.7	180

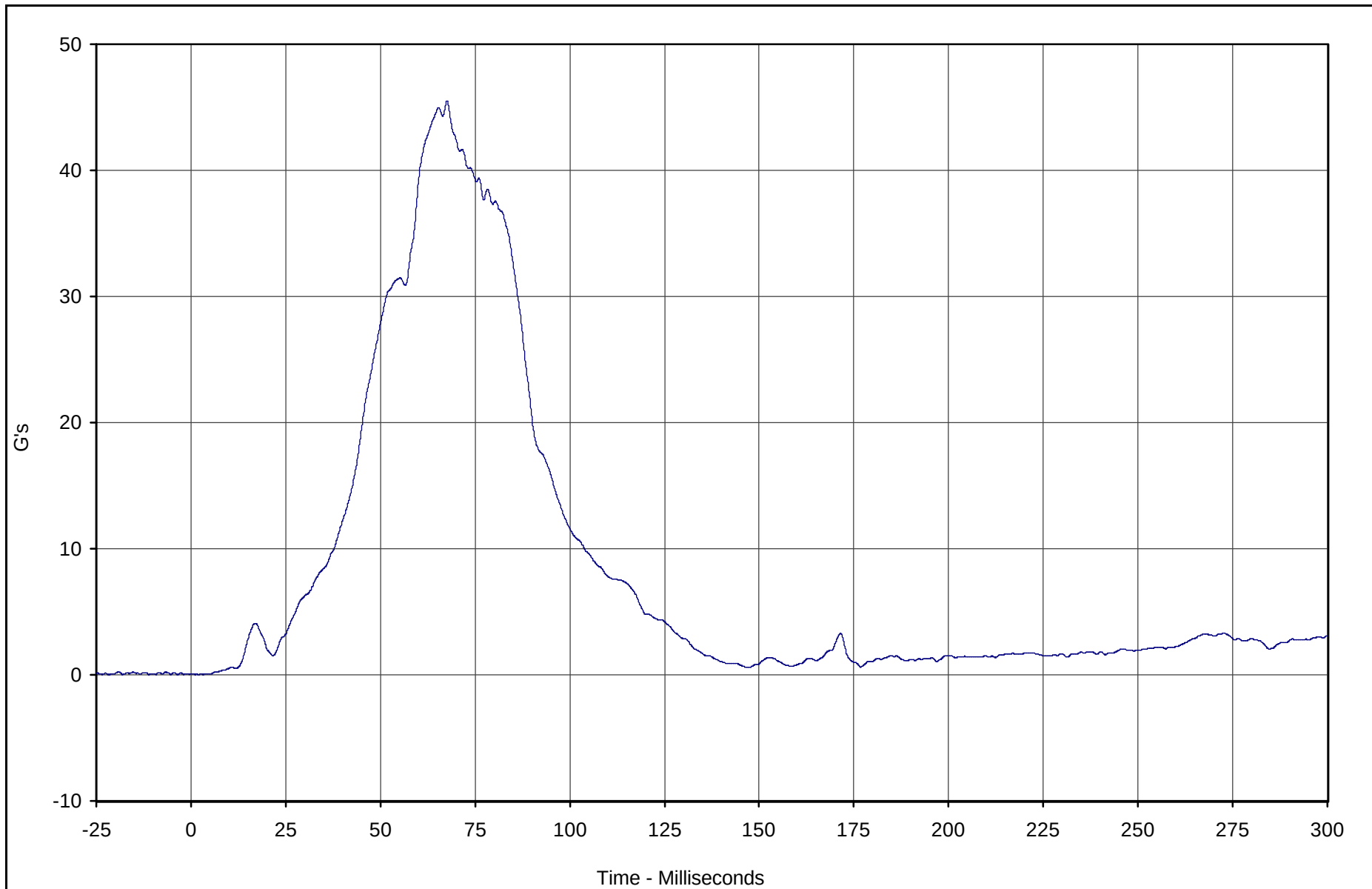


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Resultant Primary	057	RES	G's	45.5	67.6	0.0	3.2	180

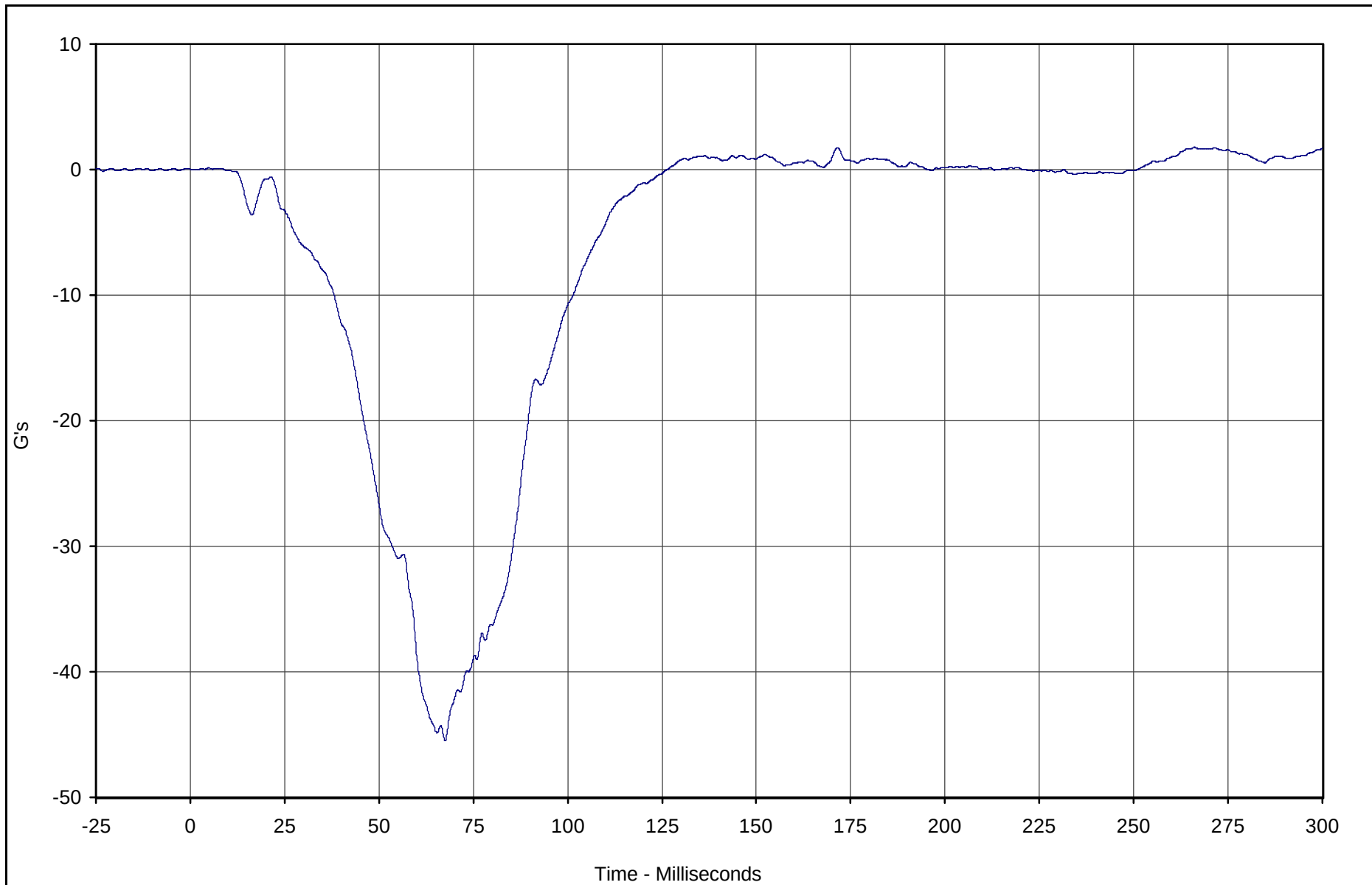


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X	060	FIL	G's	1.8	266.1	-45.5	67.5	180

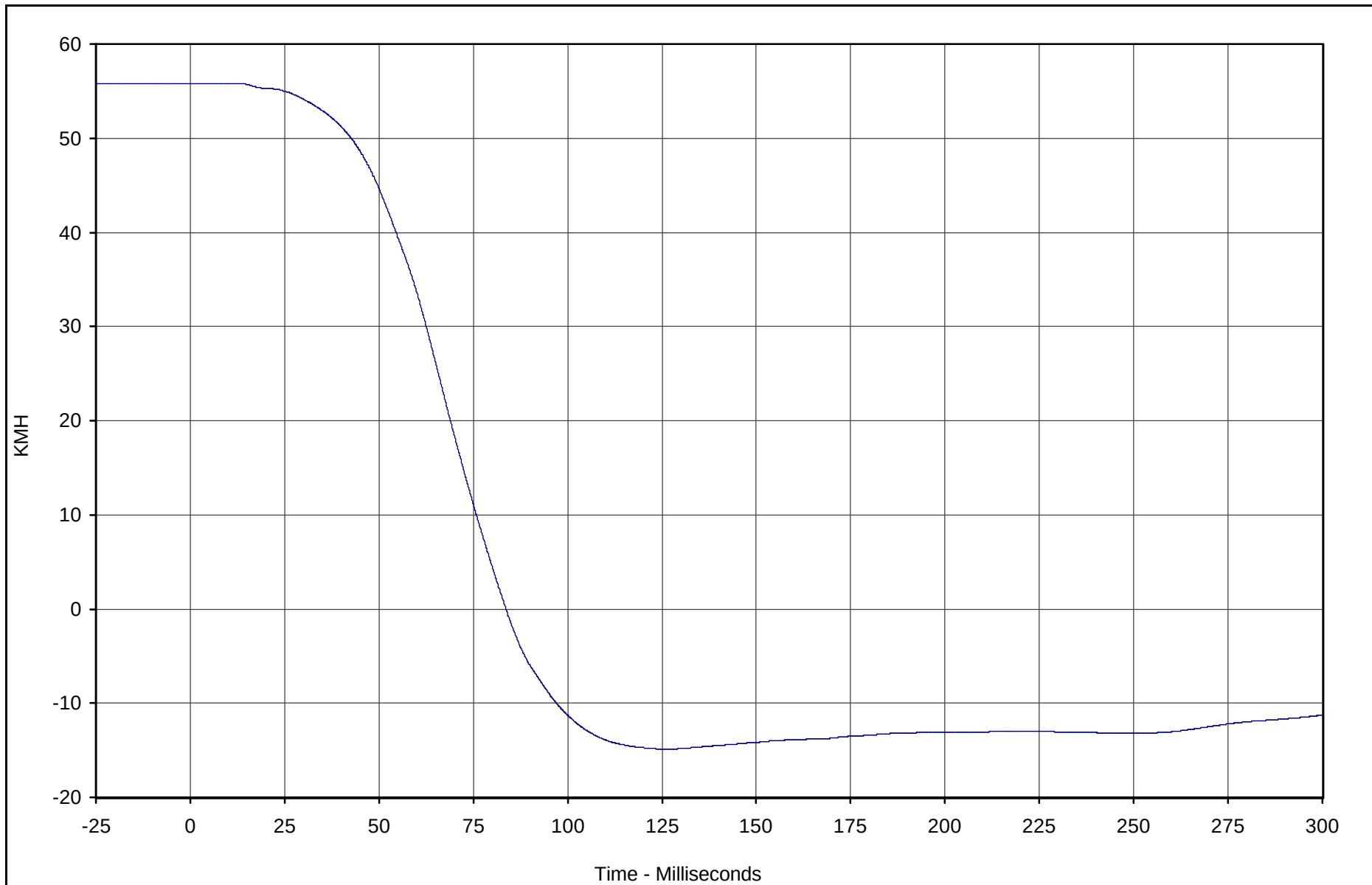


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X Velocity	060	IN1	KMH	55.8	9.0	-14.9	126.3	180

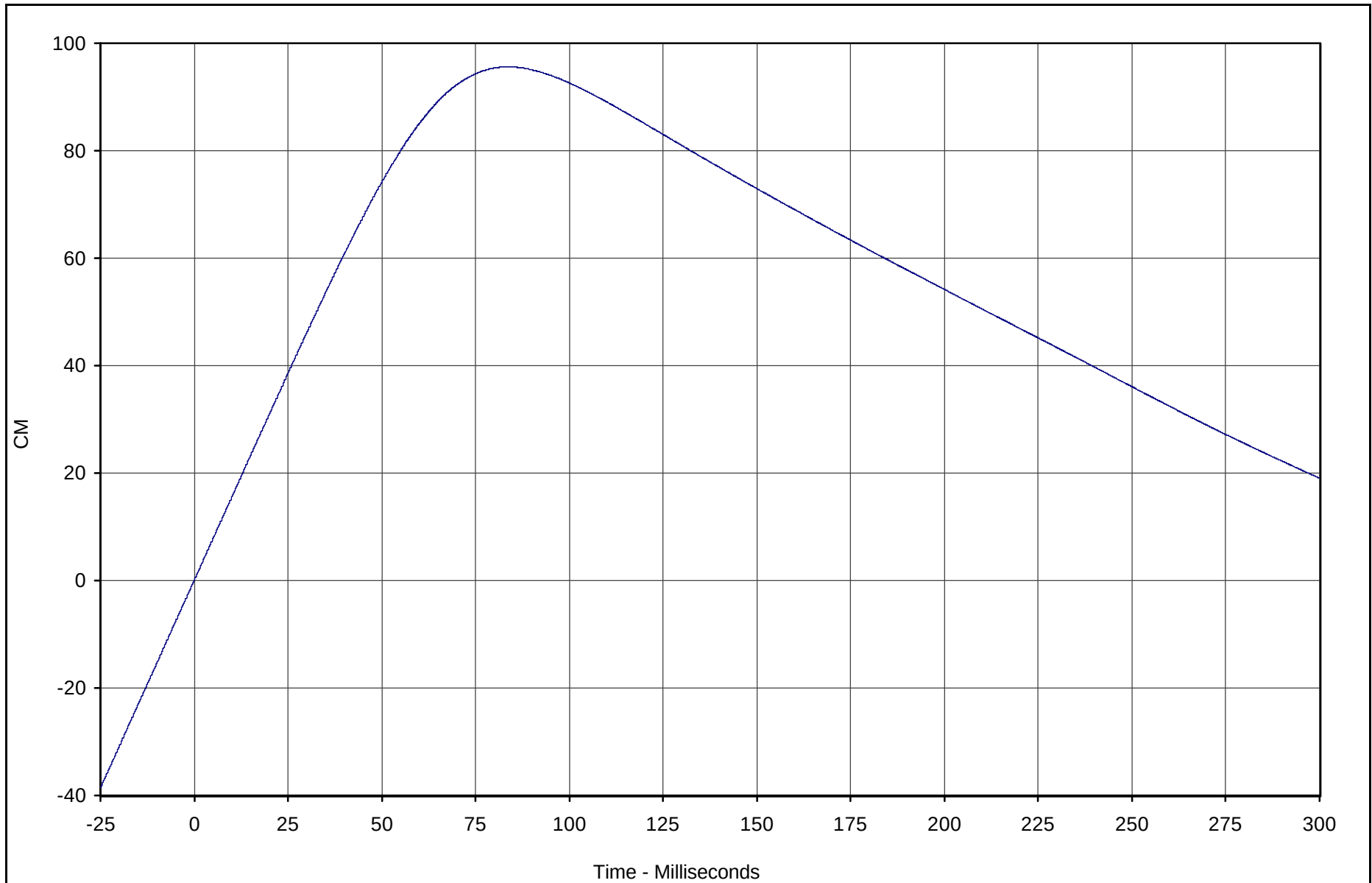


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X Displ.	060	IN2	CM	95.6	83.7	0.0	0.0	180

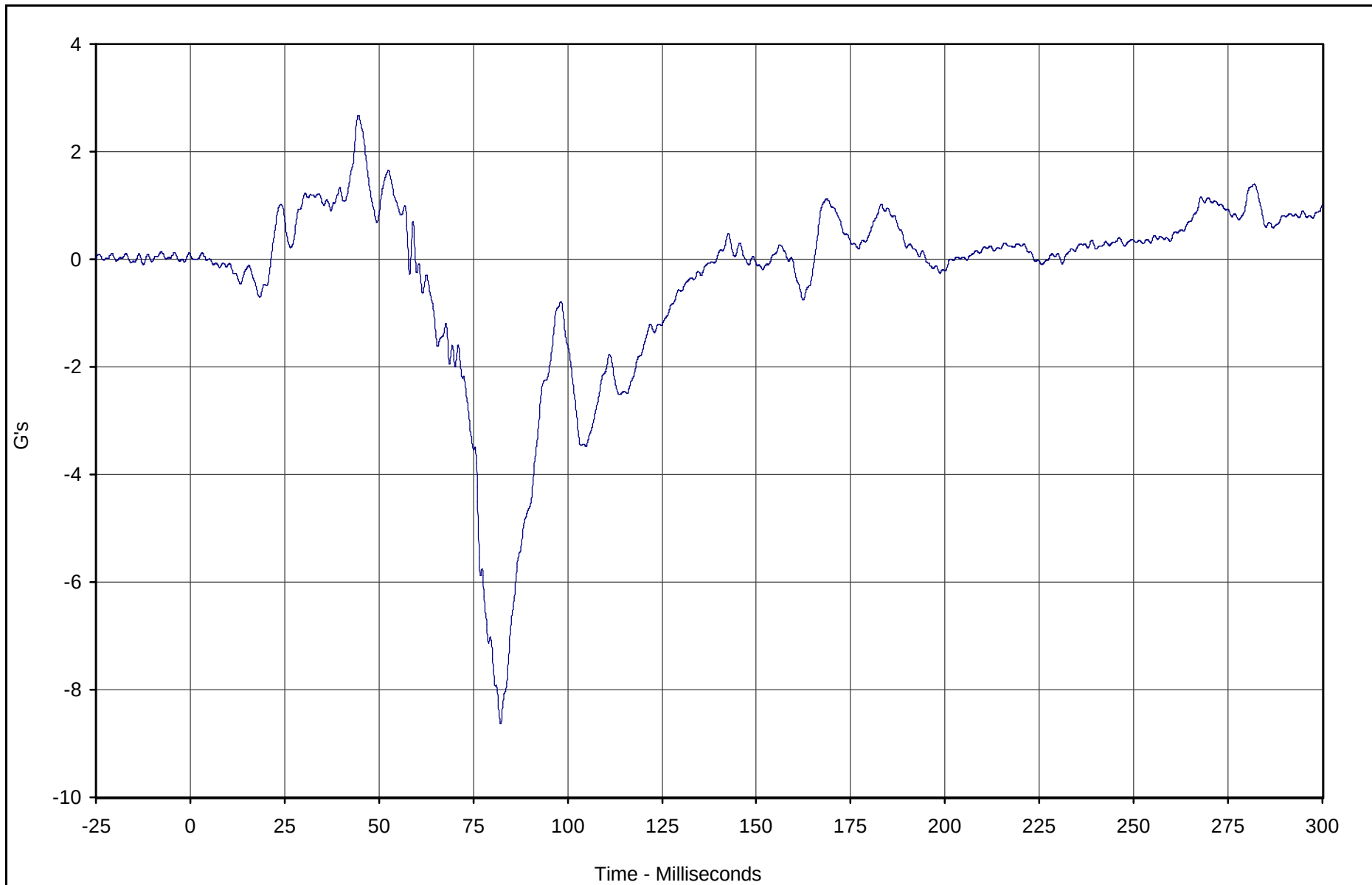


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant Y	061	FIL	G's	2.7	44.6	-8.6	82.3	180

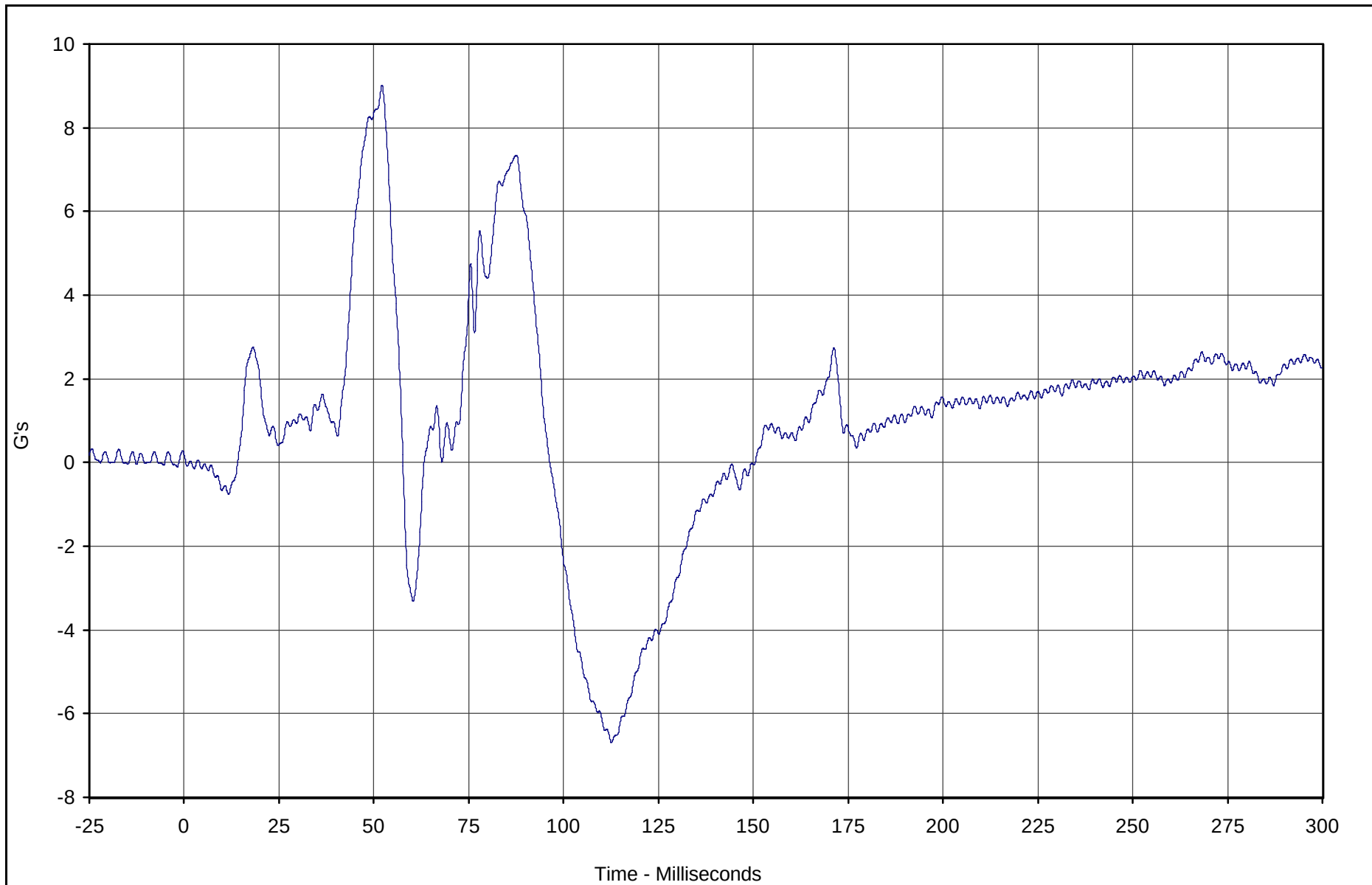


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant Z	062	FIL	G's	9.0	52.1	-6.7	112.6	180

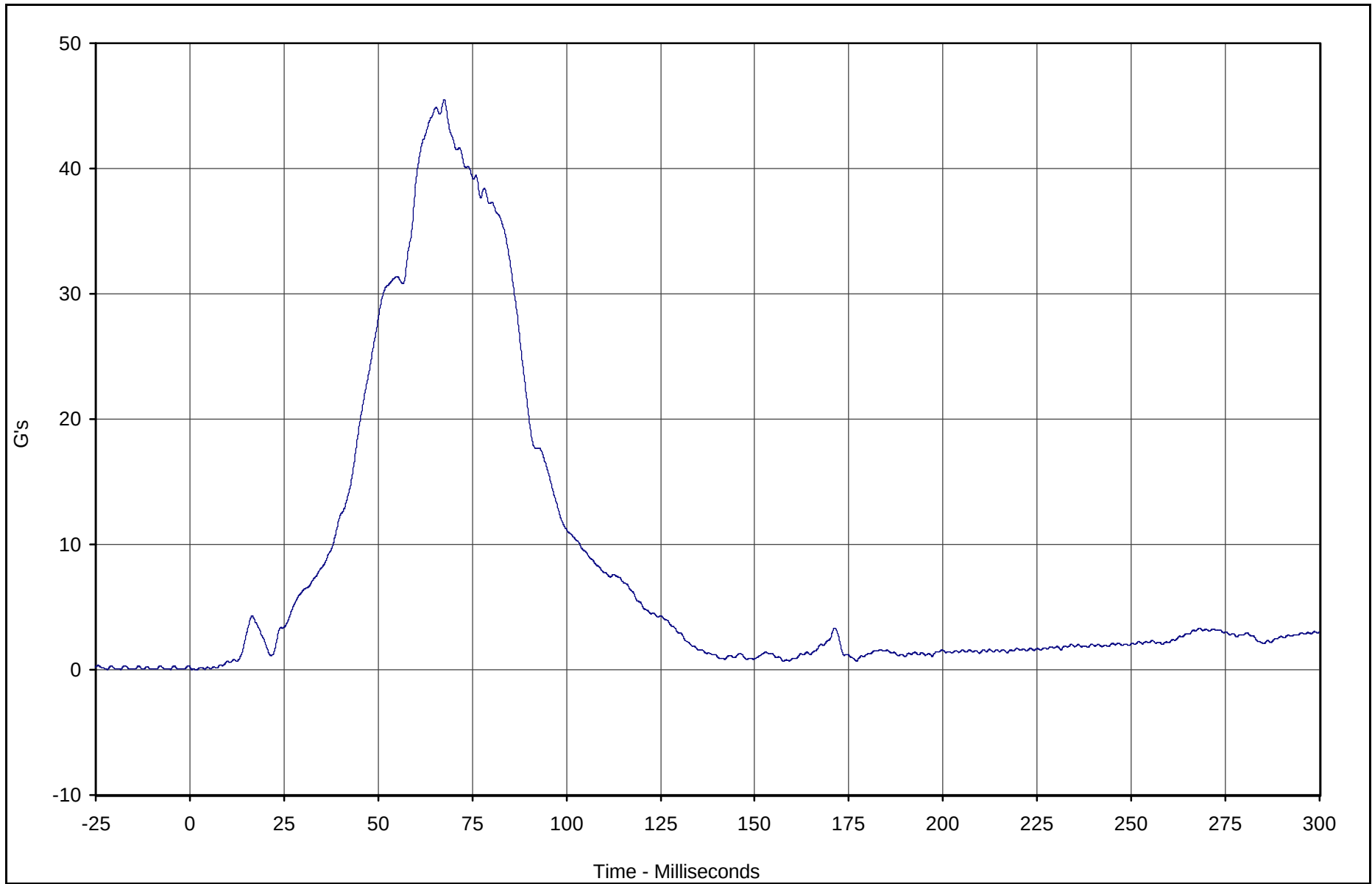


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Resultant Redundant	060	RES	G's	45.5	67.5	0.0	1.9	180

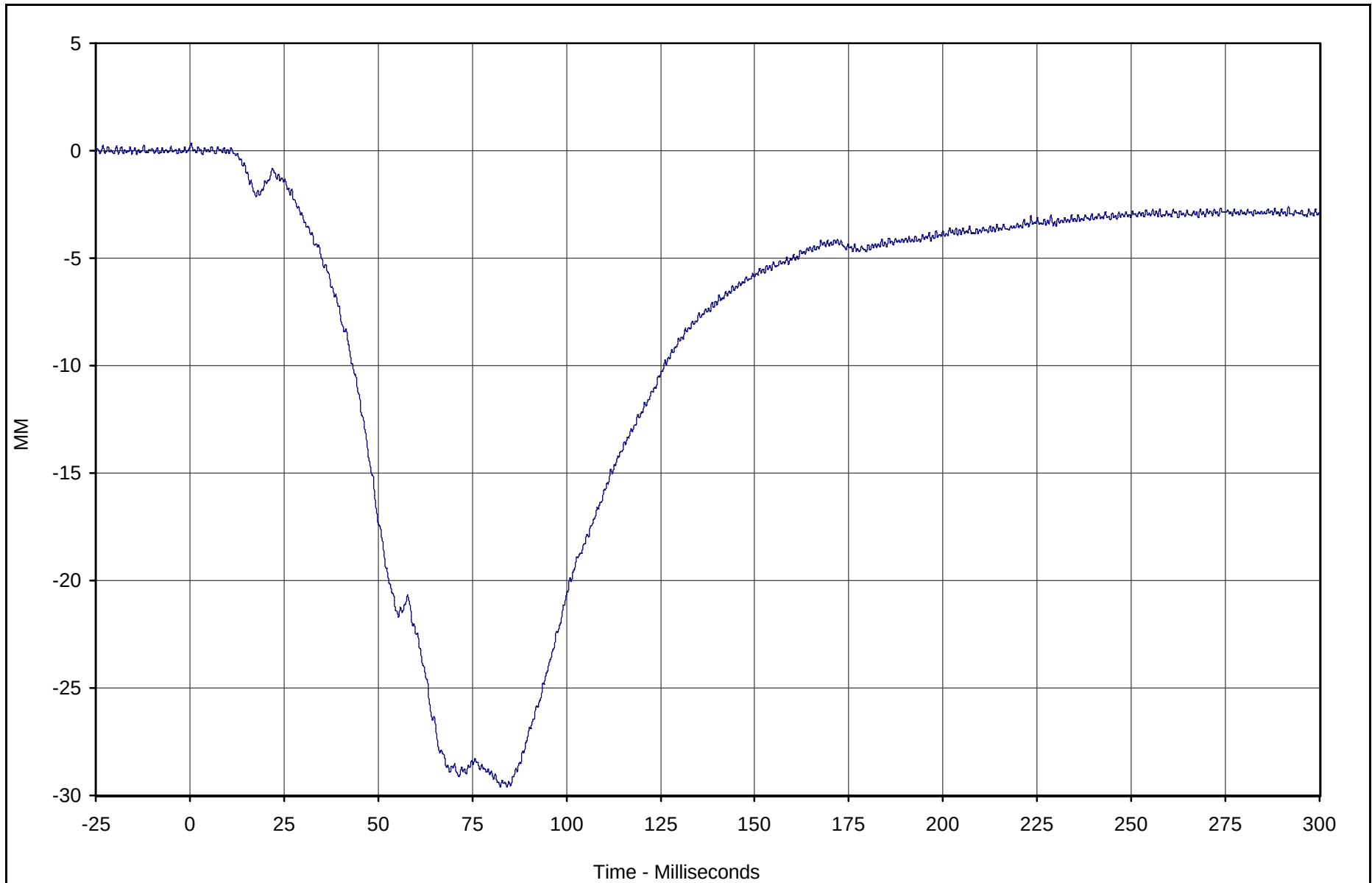


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Displacement X	063	FIL	MM	0.4	0.4	-29.6	84.2	600

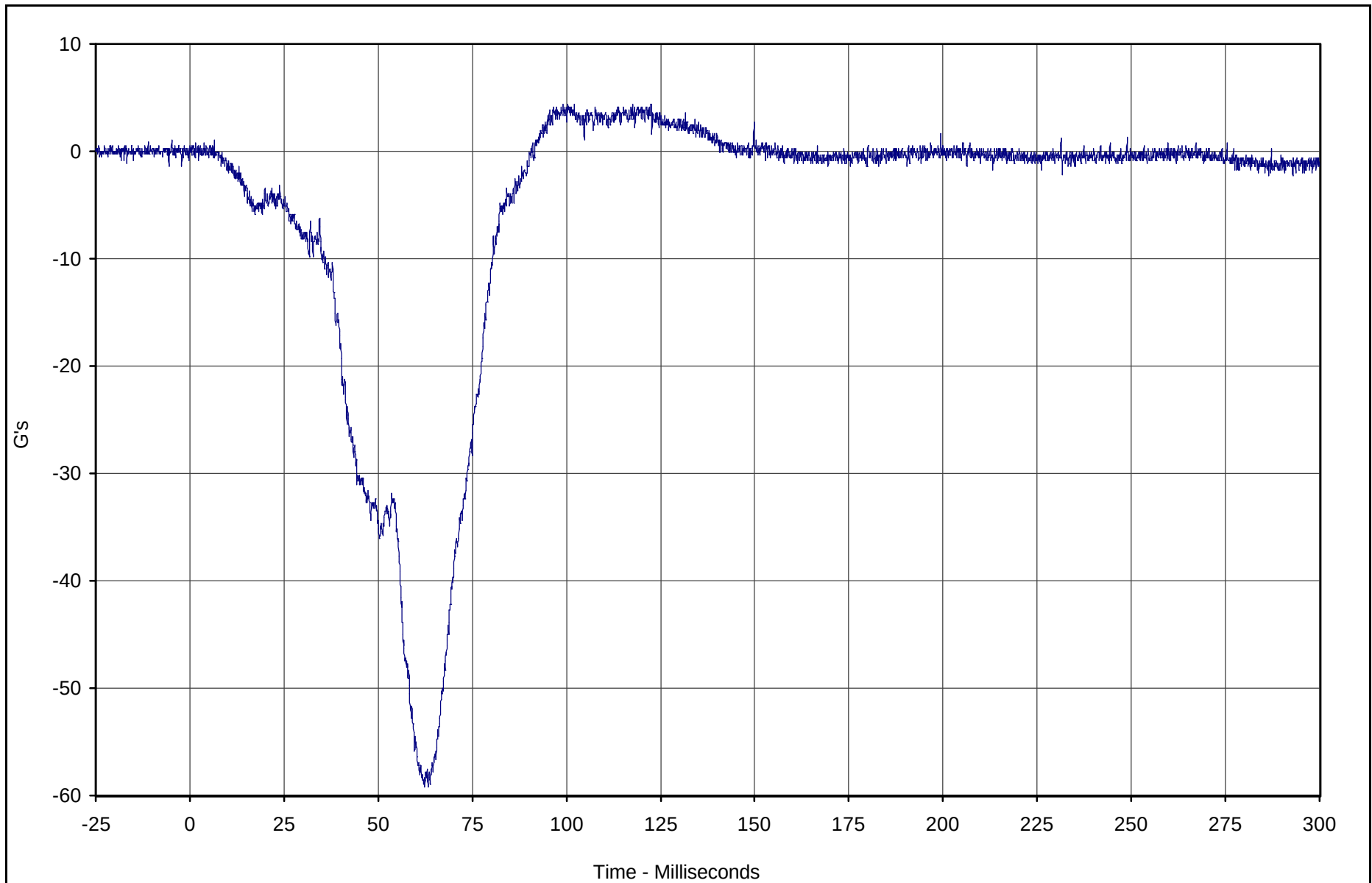


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X	064	FIL	G's	4.4	99.2	-59.2	62.4	1000

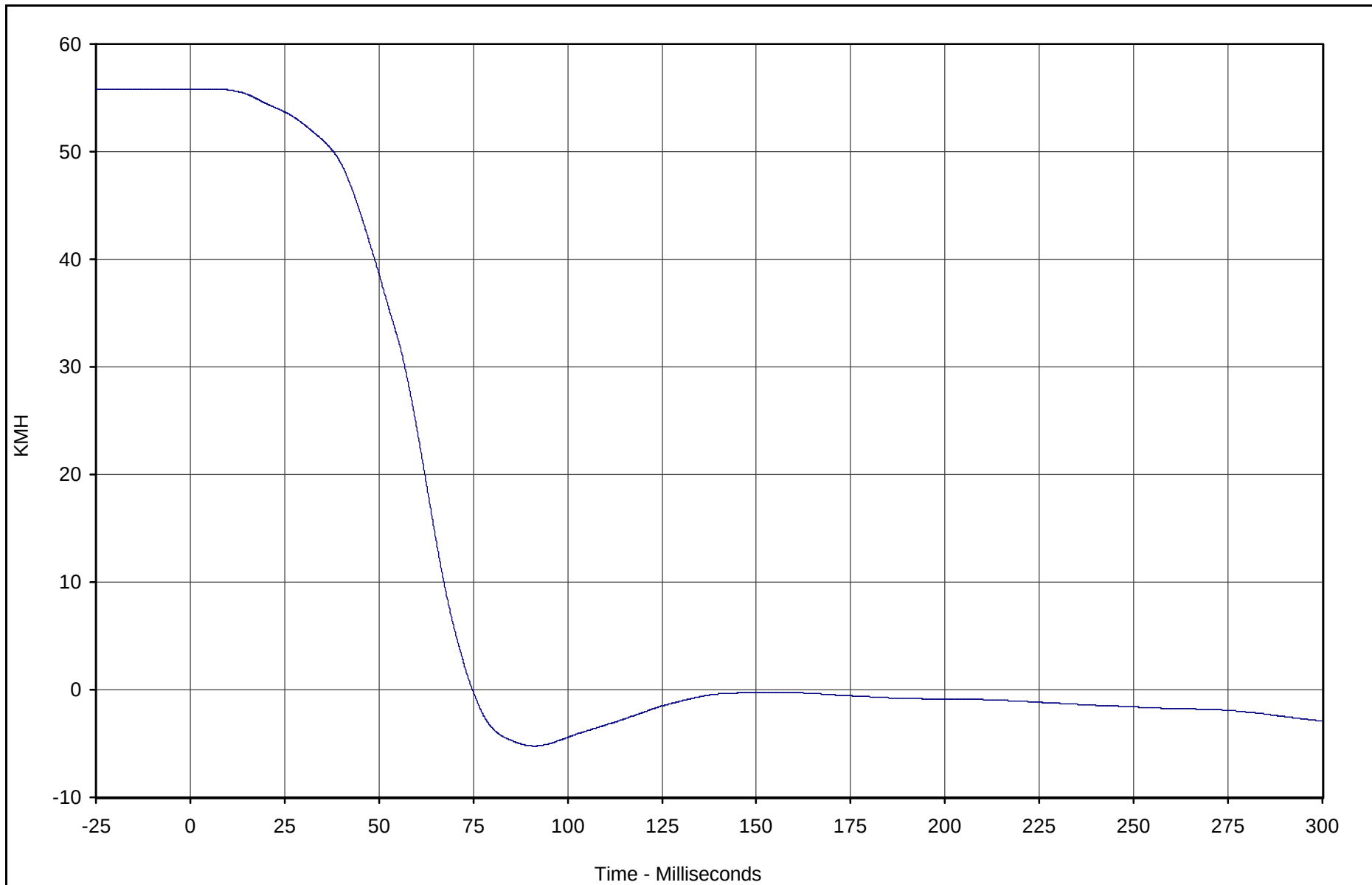


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X Velocity	064	IN1	KMH	55.8	1.2	-5.2	91.3	180

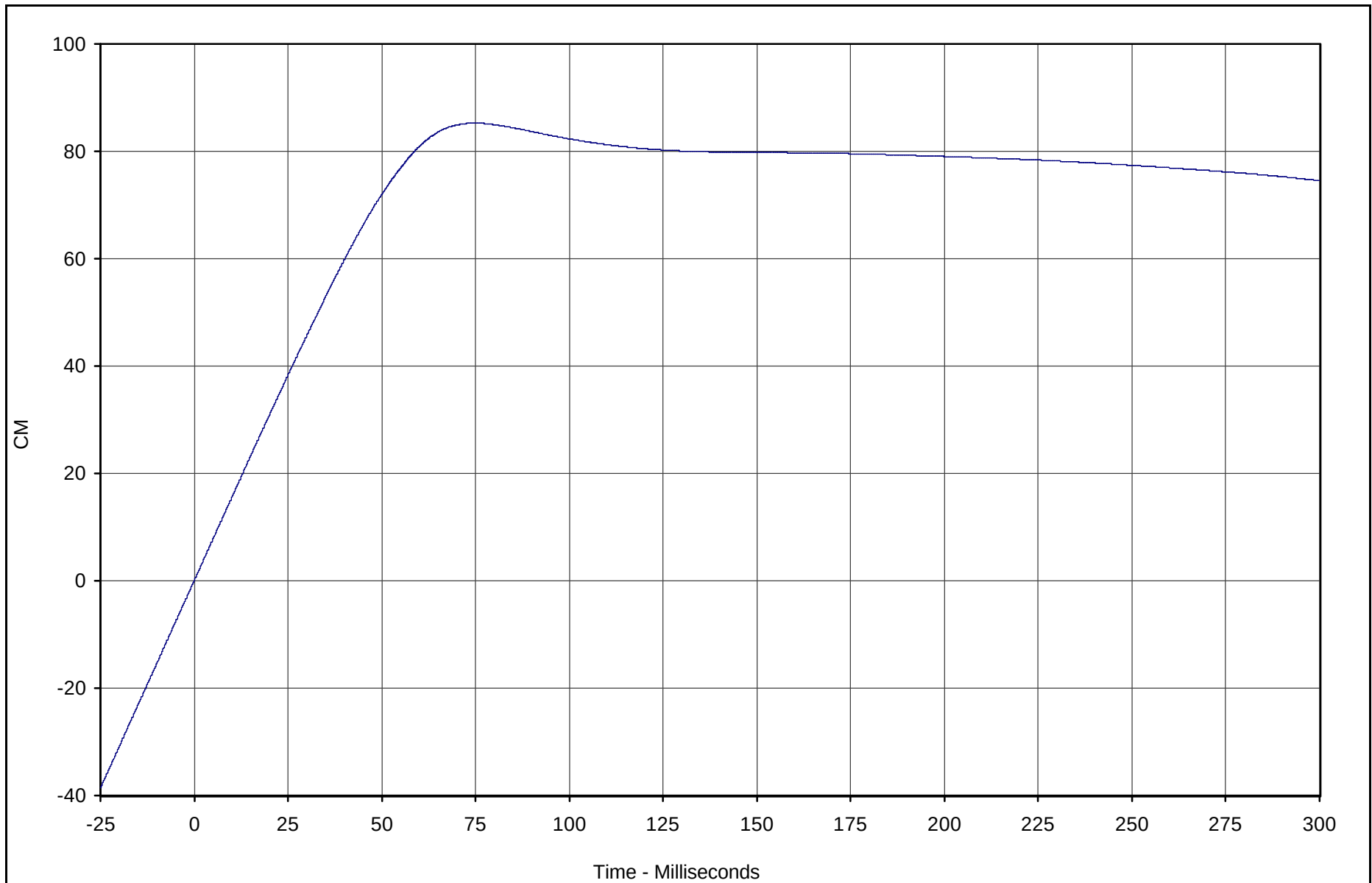


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X Displ.	064	IN2	CM	85.2	74.8	0.0	0.0	180

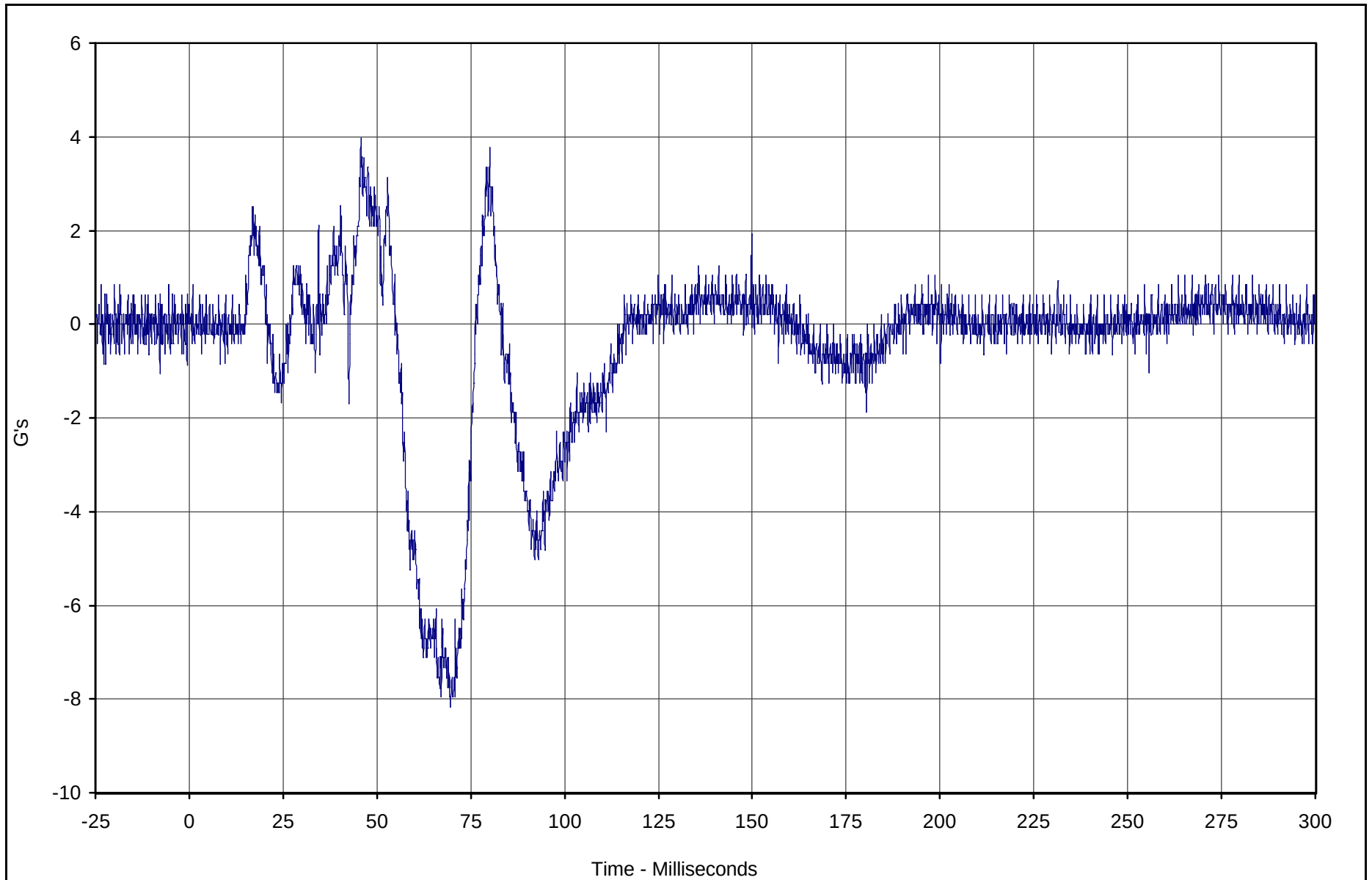


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Y	065	FIL	G's	4.0	45.7	-8.2	69.6	1000

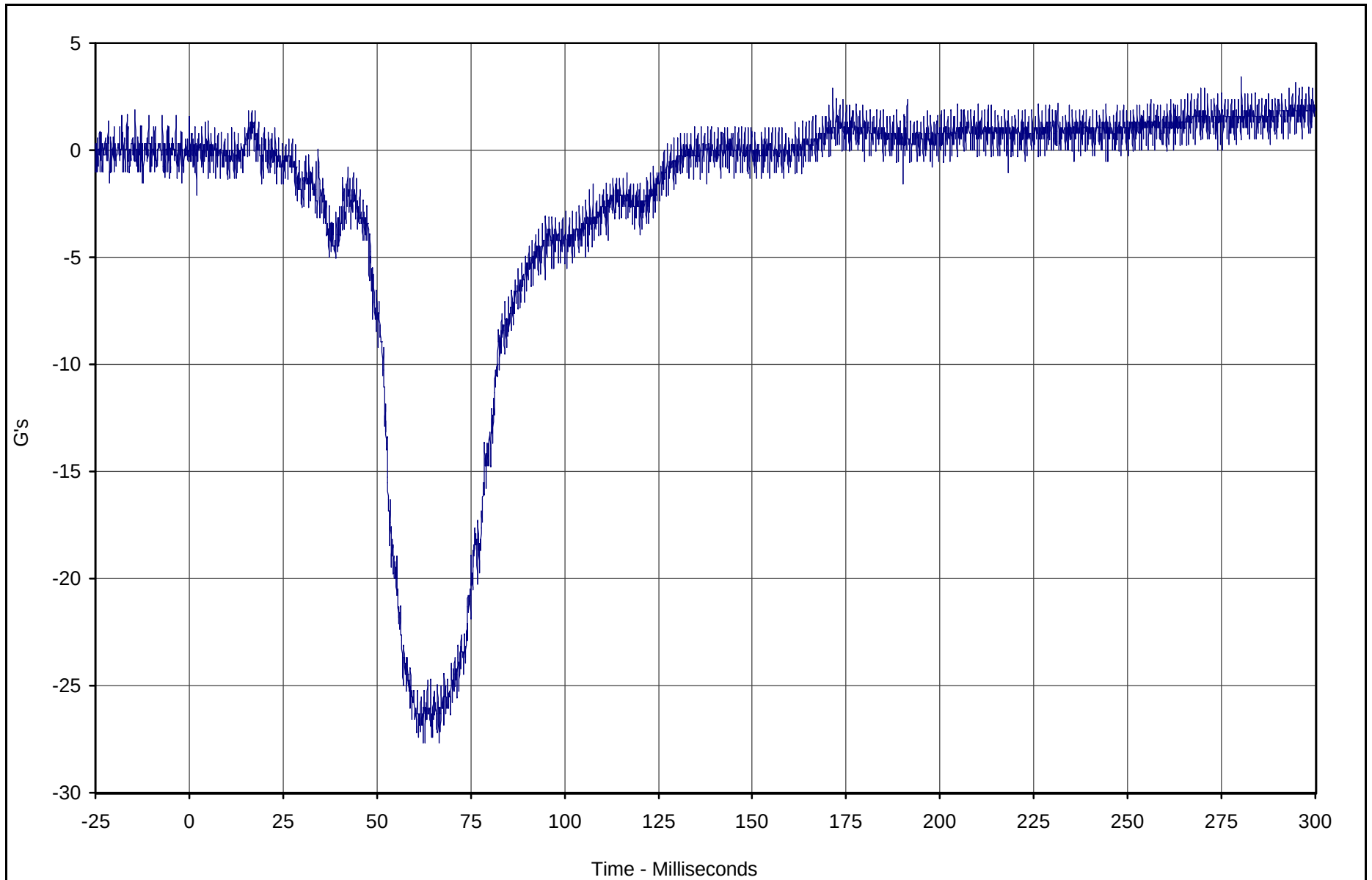


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Z	066	FIL	G's	3.4	280.3	-27.7	62.4	1000

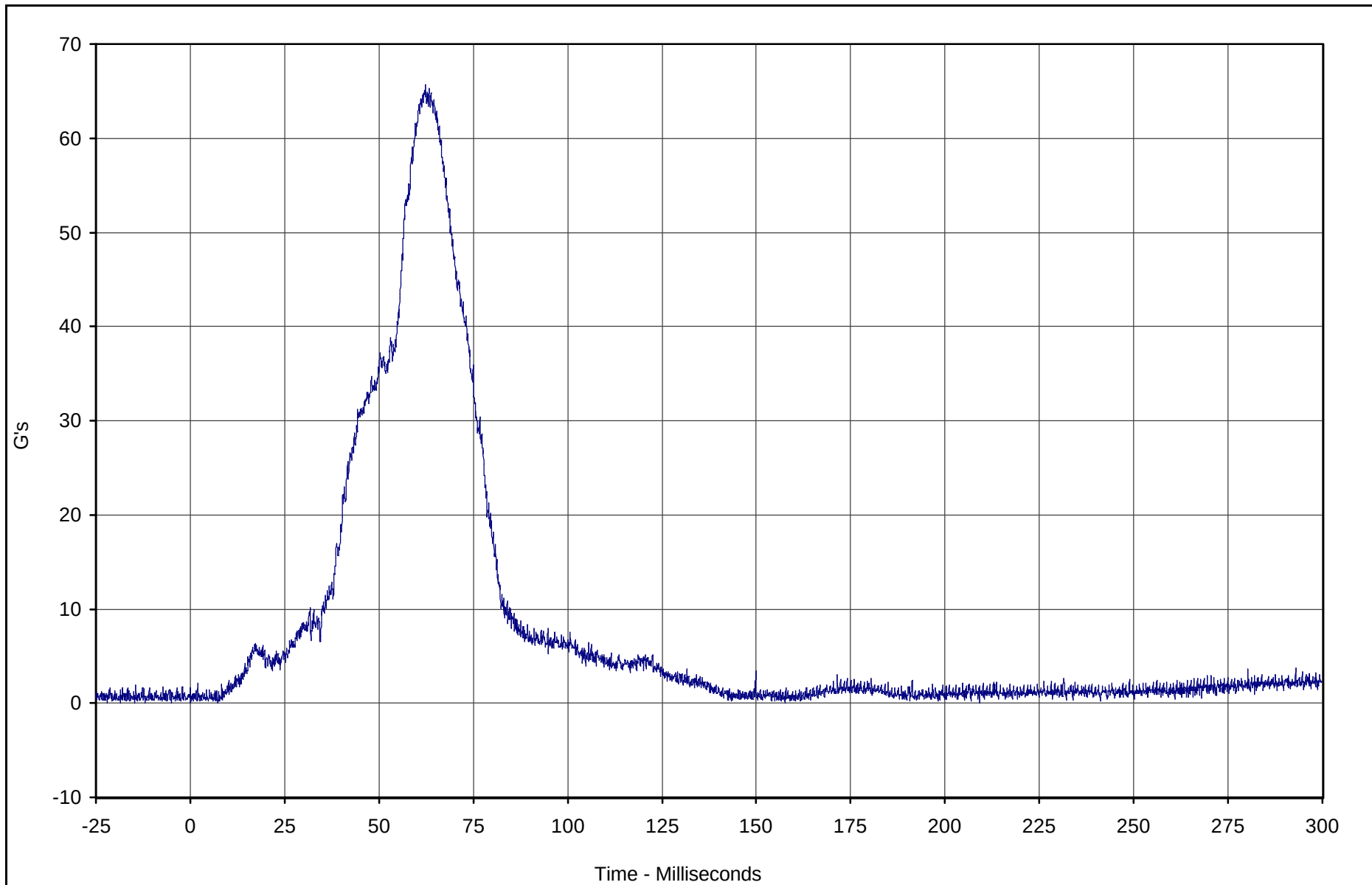


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Resultant	066	RES	G's	65.7	62.4	0.1	0.1	1000

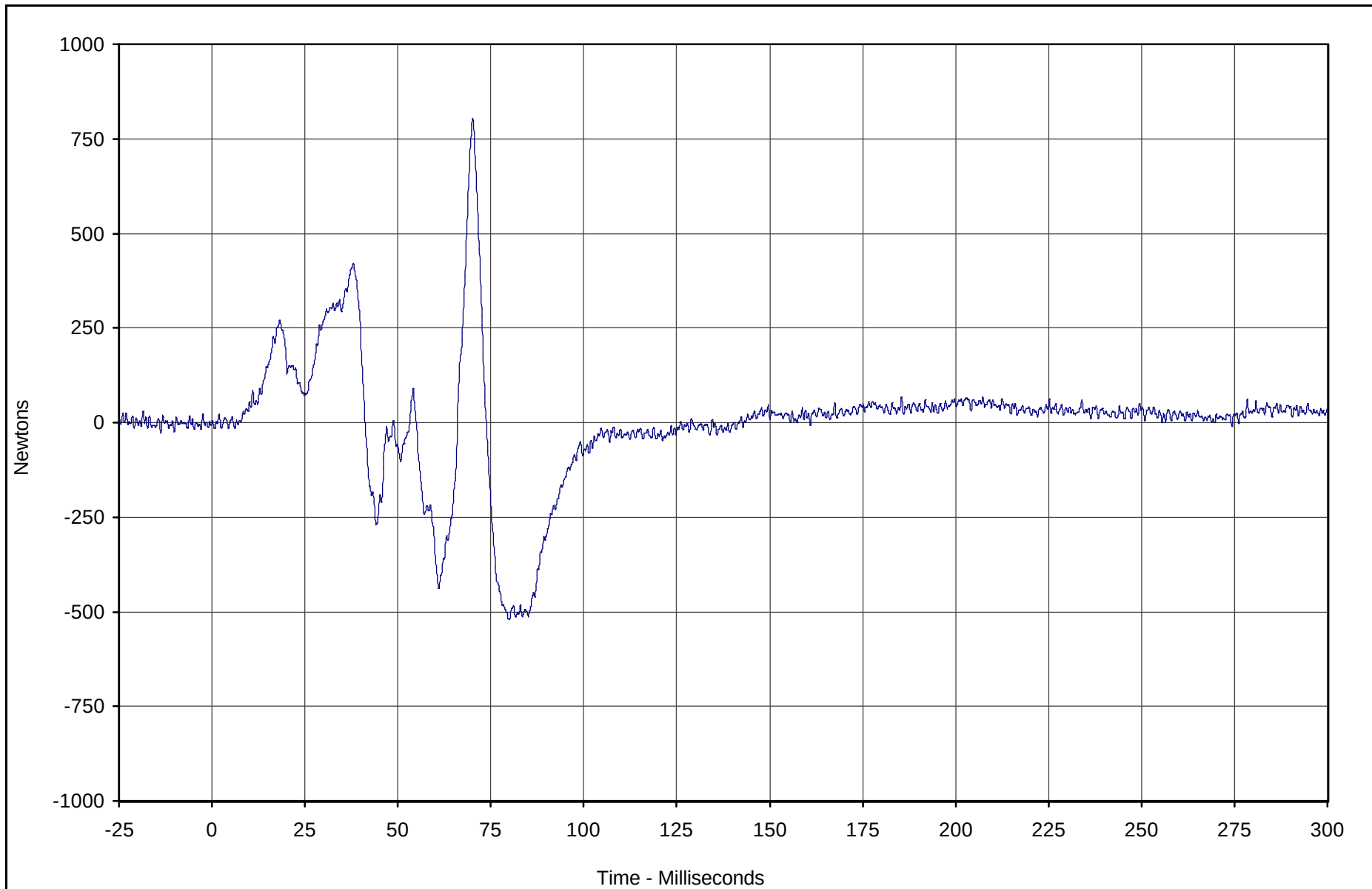


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Femur Force	067	FIL	Newtons	803.7	70.2	-520.7	80.0	600

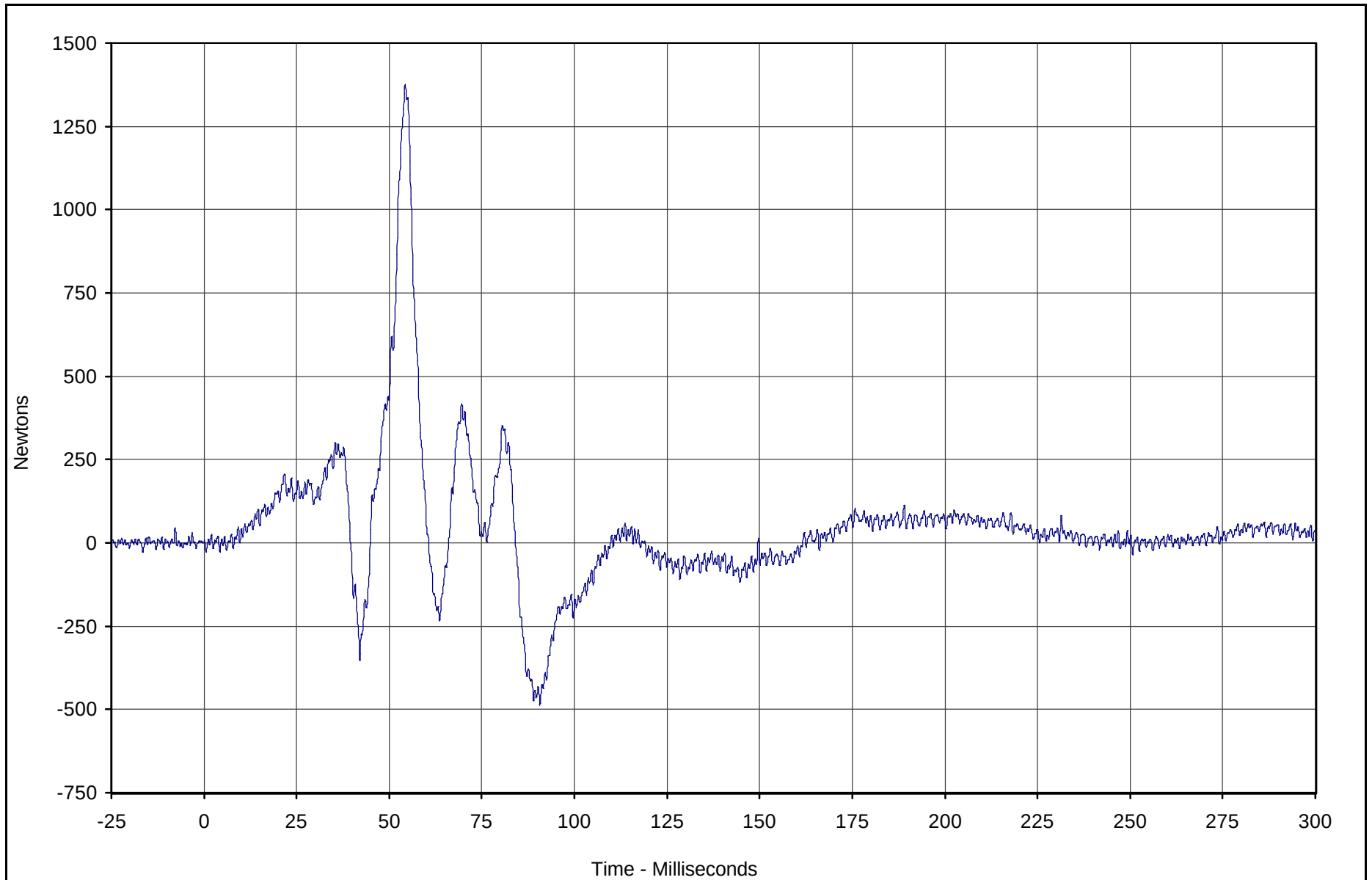


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Femur Force	068	FIL	Newtons	1375.6	54.3	-486.9	90.7	600

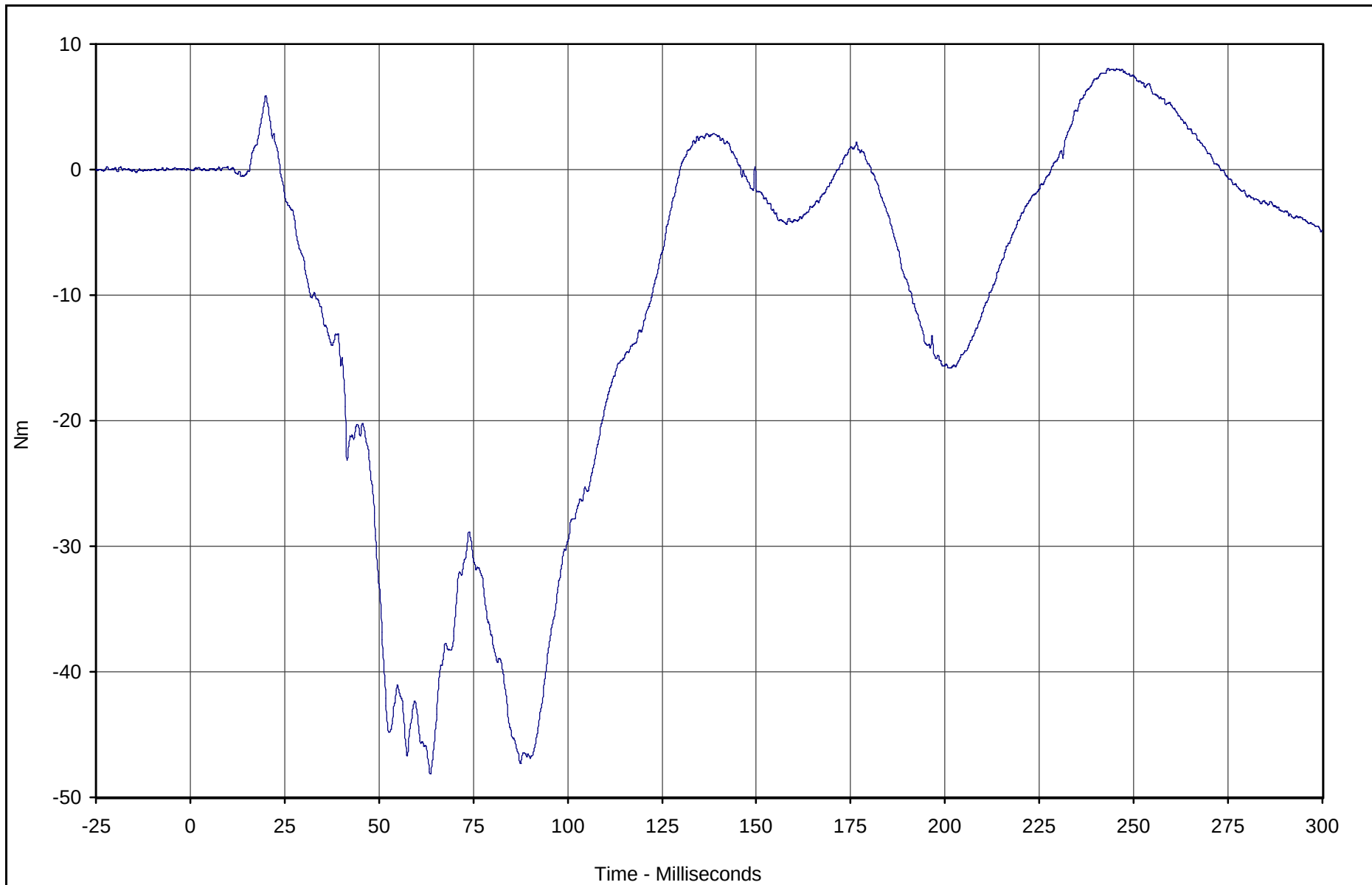


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Upper Tibia Moment X	069	FIL	Nm	8.1	243.3	-48.2	63.6	600

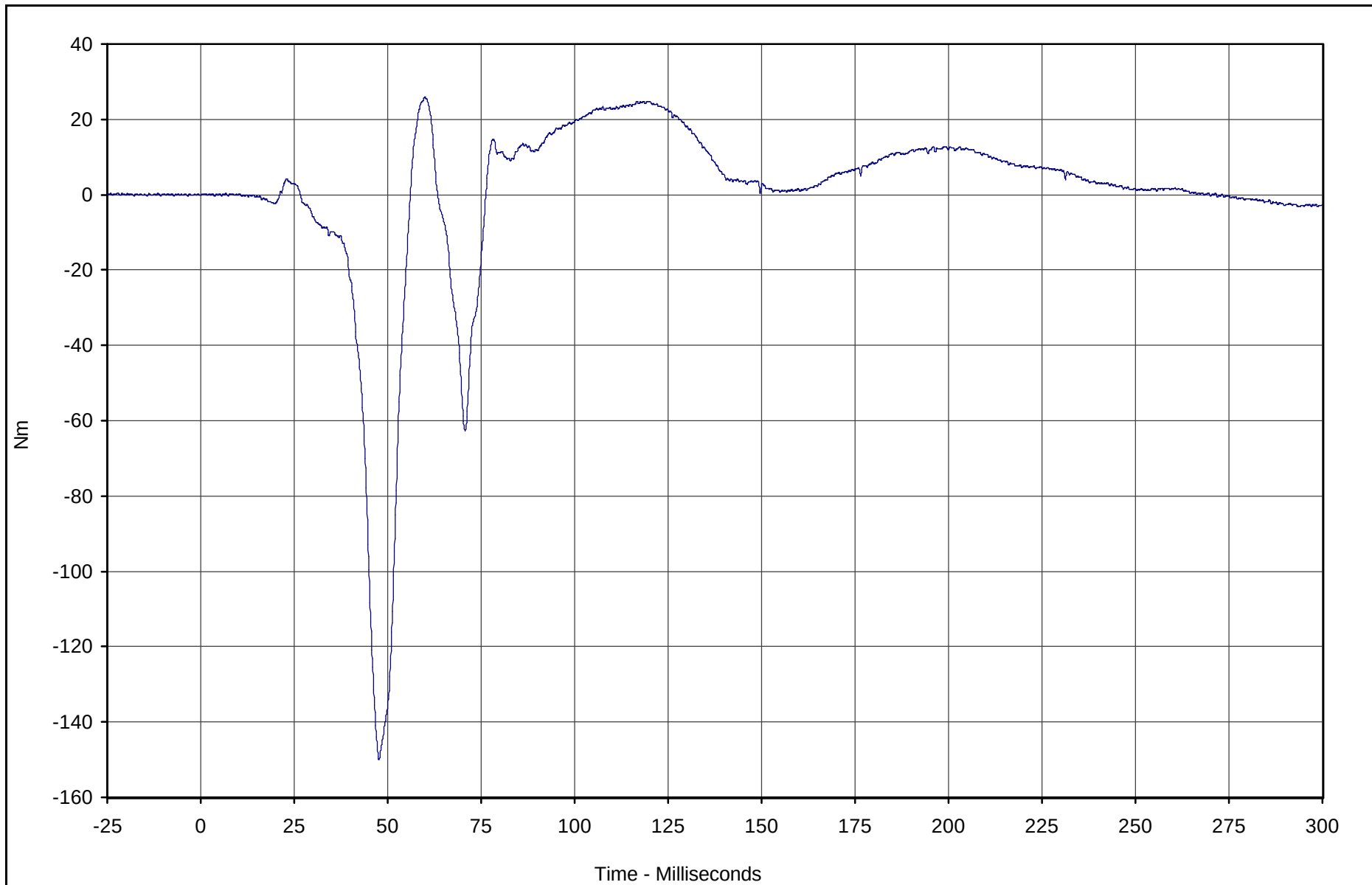


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Upper Tibia Moment Y	070	FIL	Nm	26.0	60.0	-149.9	47.7	600

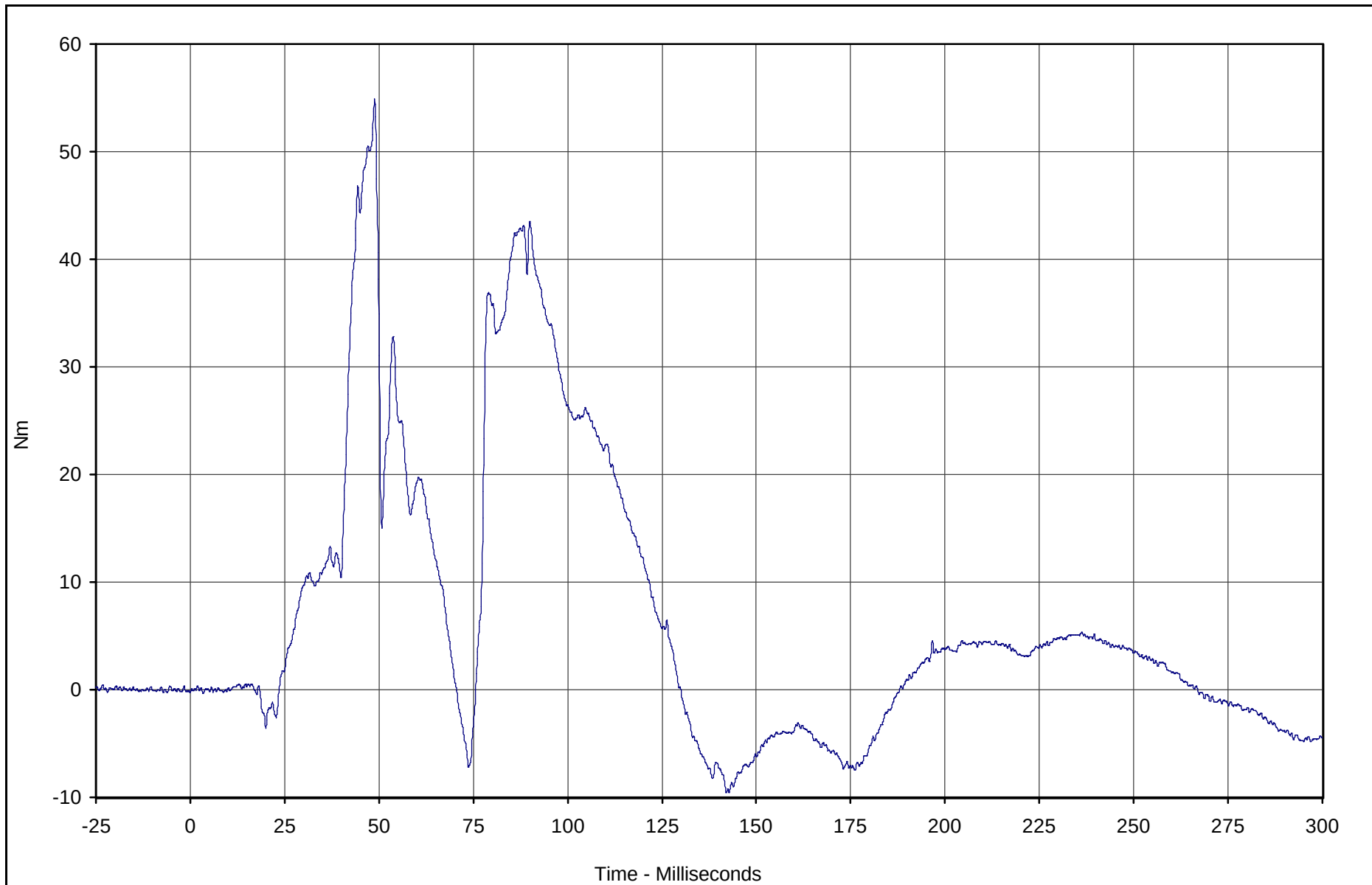


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Upper Tibia Moment X	071	FIL	Nm	54.9	48.9	-9.6	142.1	600

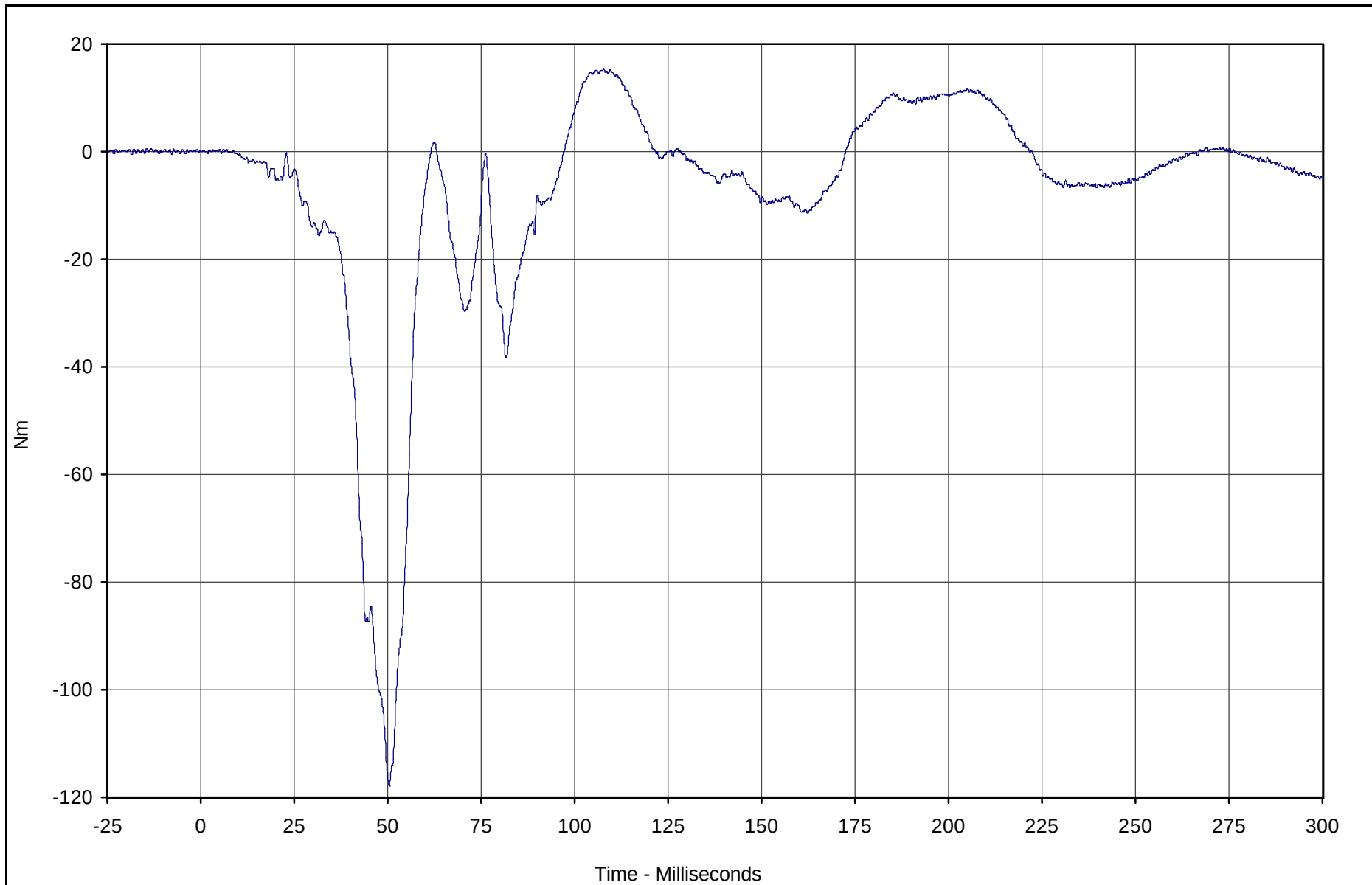


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Upper Tibia Moment Y	072	FIL	Nm	15.4	107.8	-117.9	50.5	600

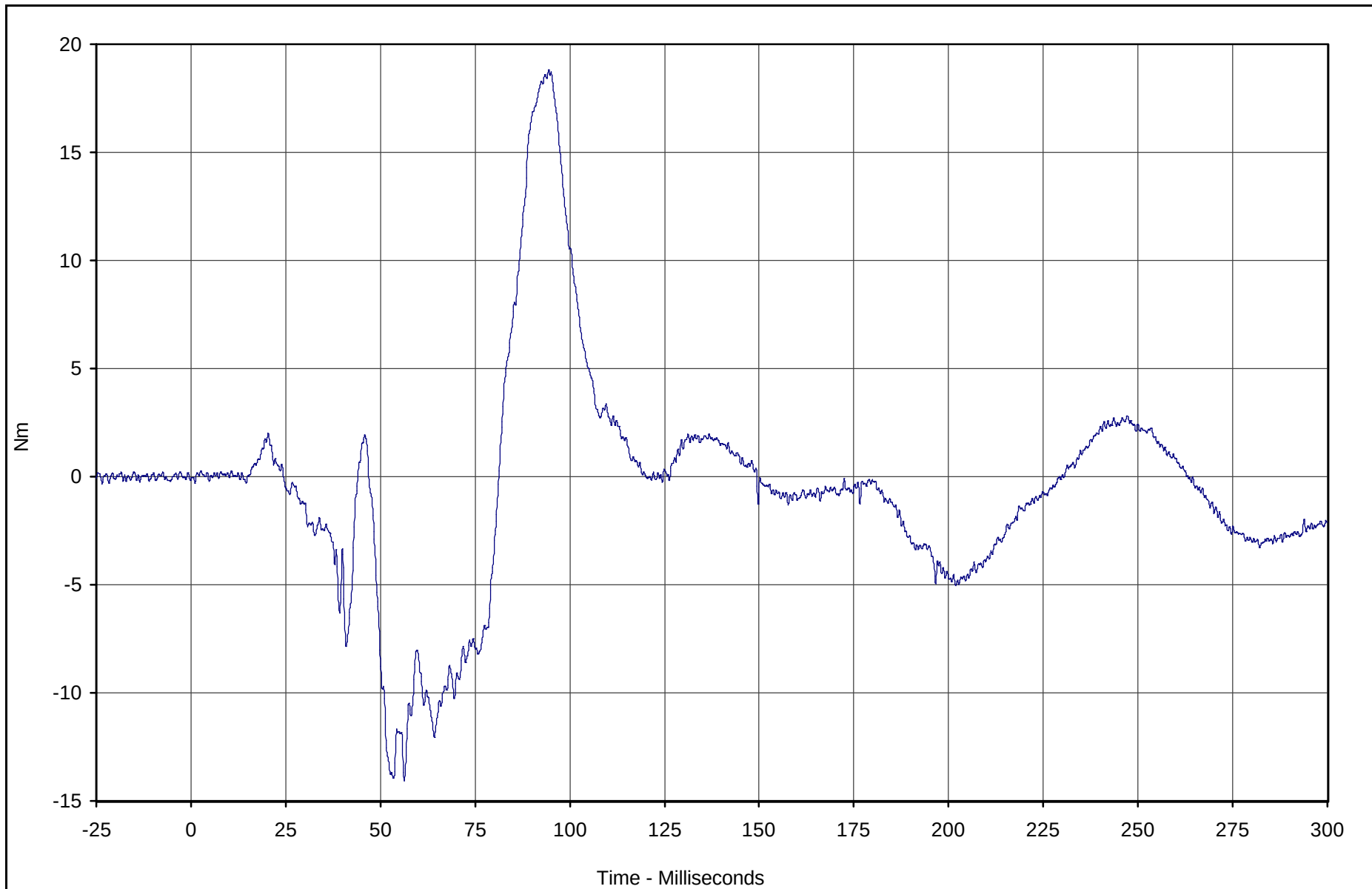


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Moment X	073	FIL	Nm	18.8	94.5	-14.1	56.3	600

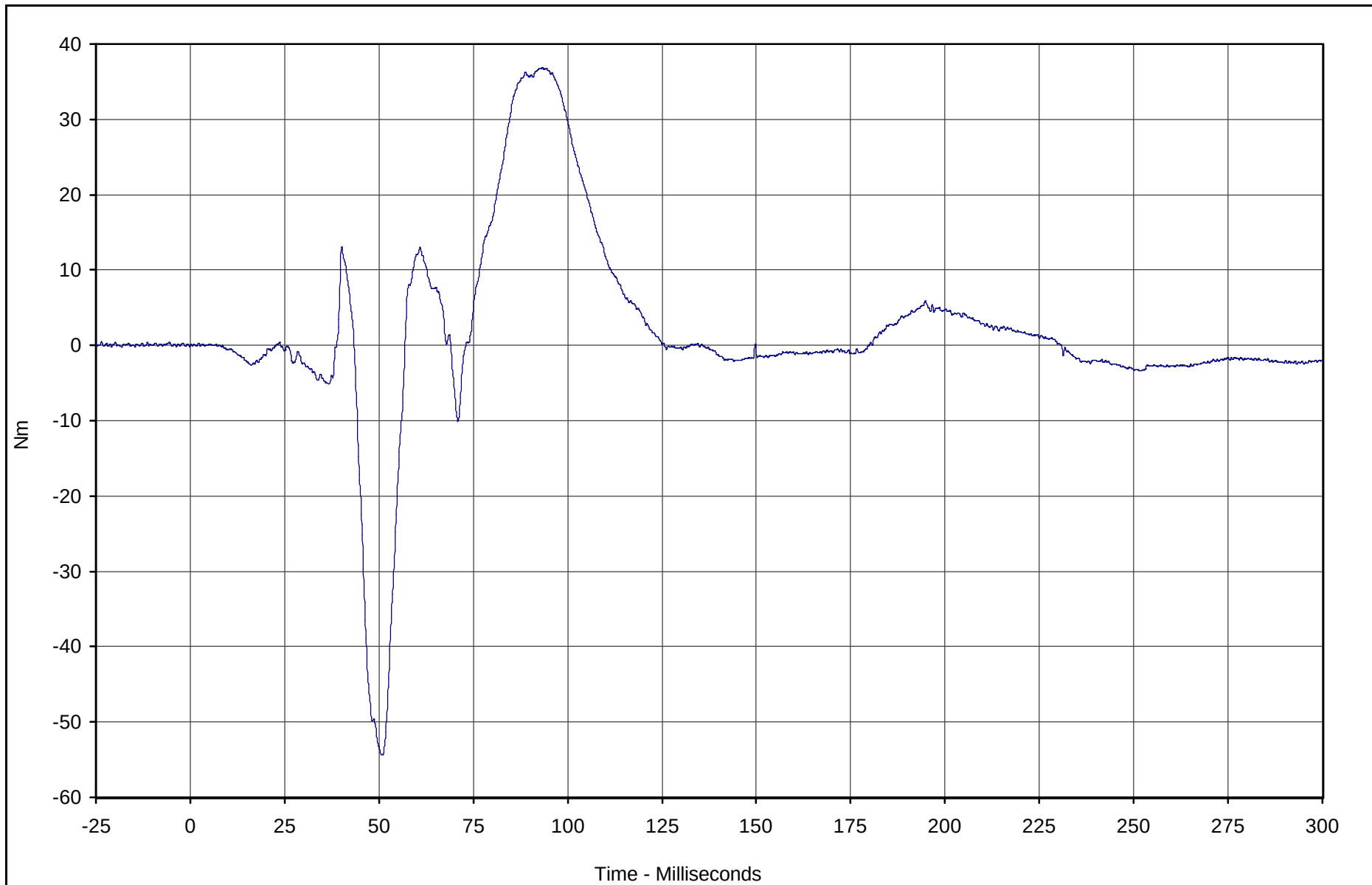


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Moment Y	074	FIL	Nm	36.9	93.3	-54.4	51.0	600

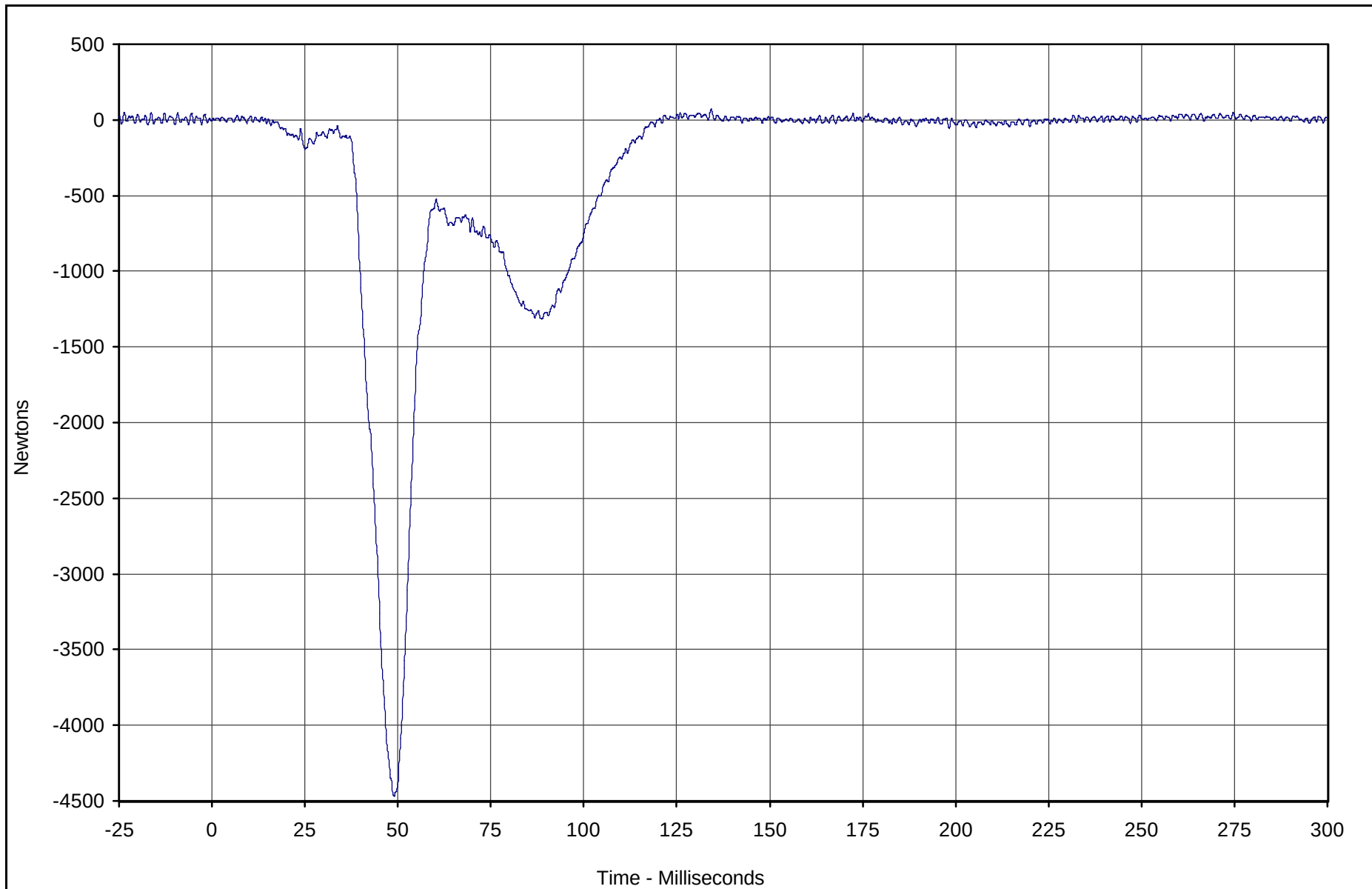


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Force Z	075	FIL	Newtons	71.5	134.3	-4470.2	49.0	600

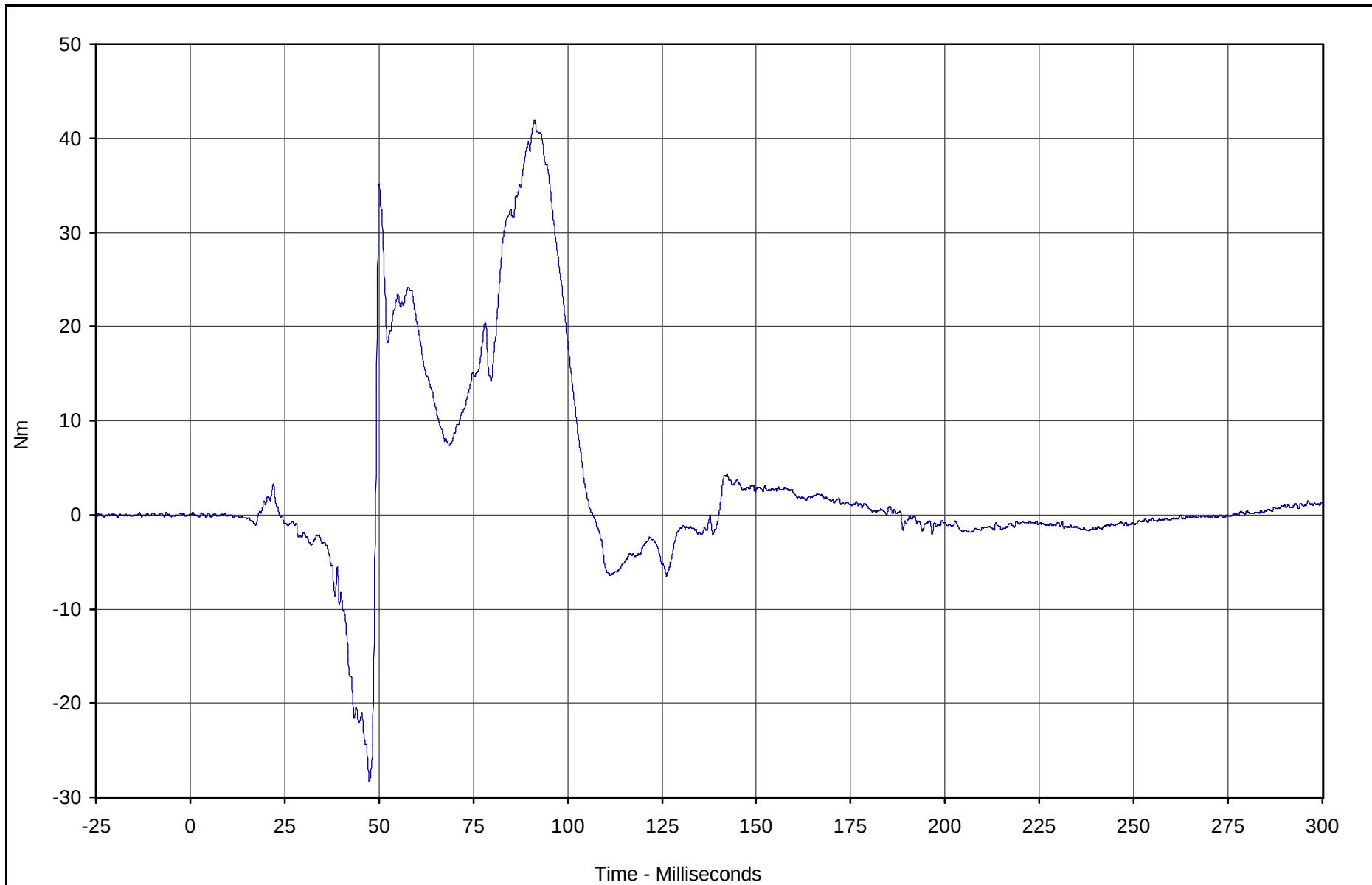


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Lower Tibia Moment X	076	FIL	Nm	41.9	91.2	-28.3	47.5	600

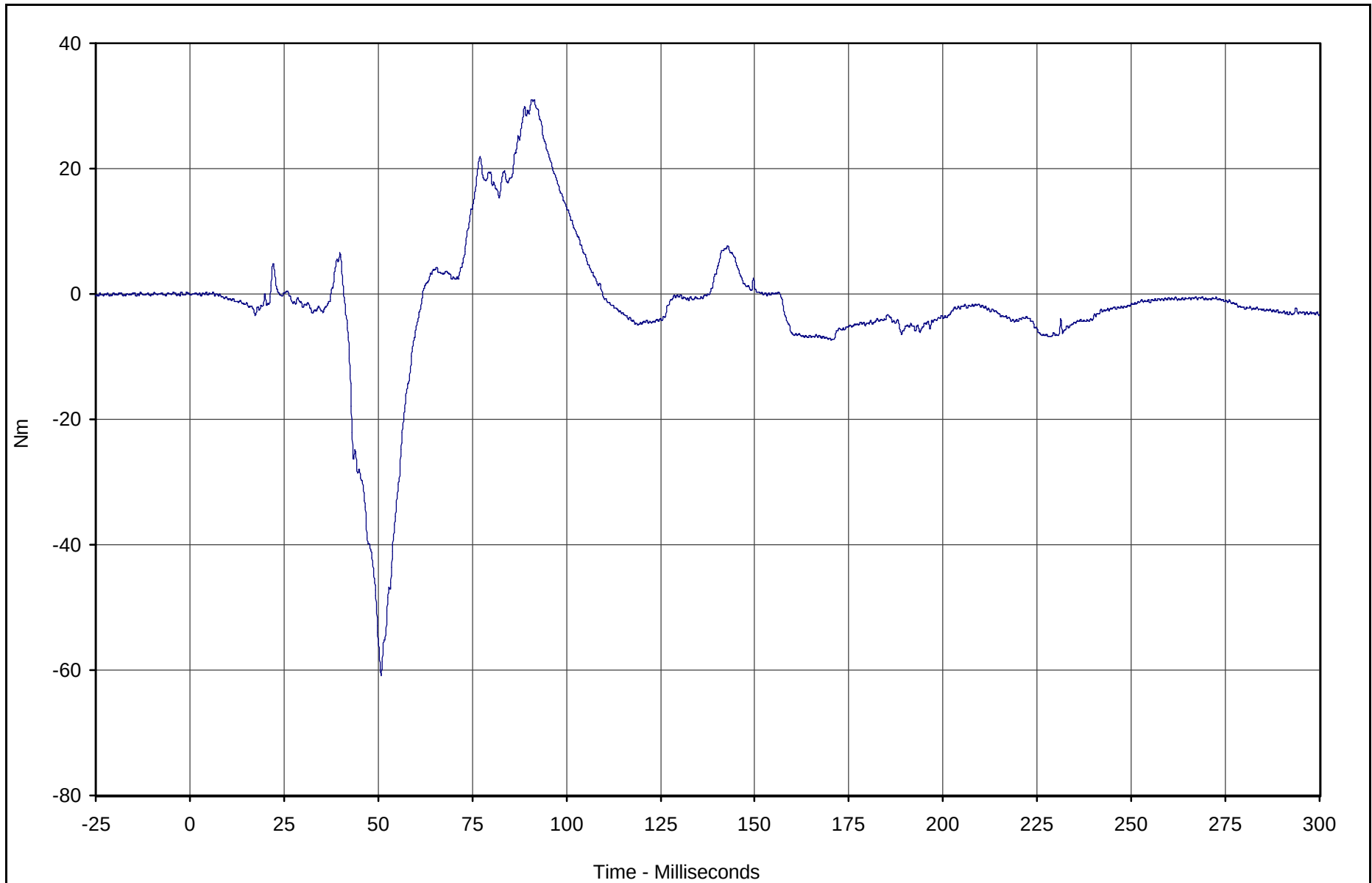


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Lower Tibia Moment Y	077	FIL	Nm	31.0	90.8	-60.8	50.8	600

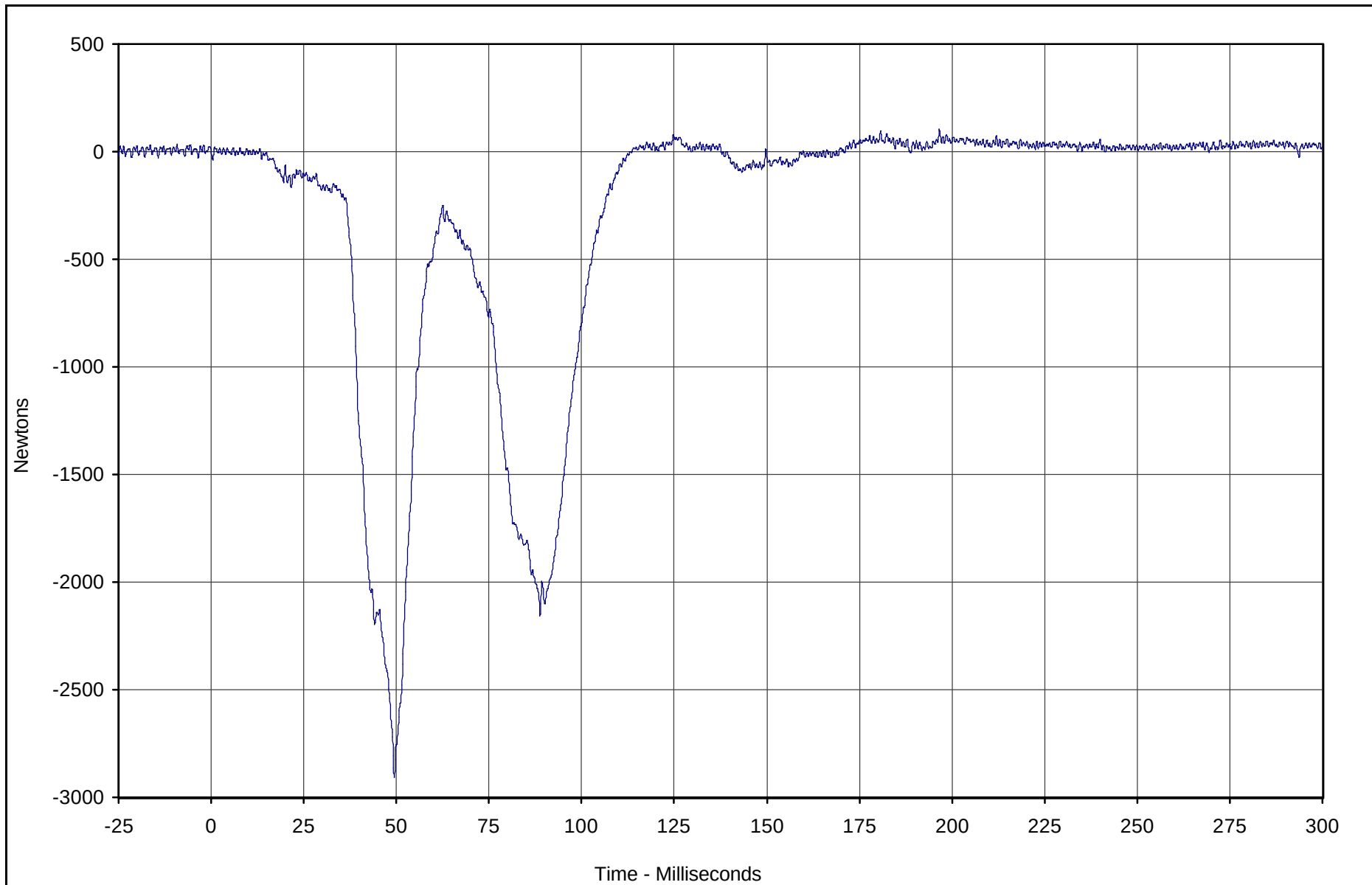


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right lower Tibia Force Z	078	FIL	Newtons	103.8	196.6	-2907.0	49.5	600

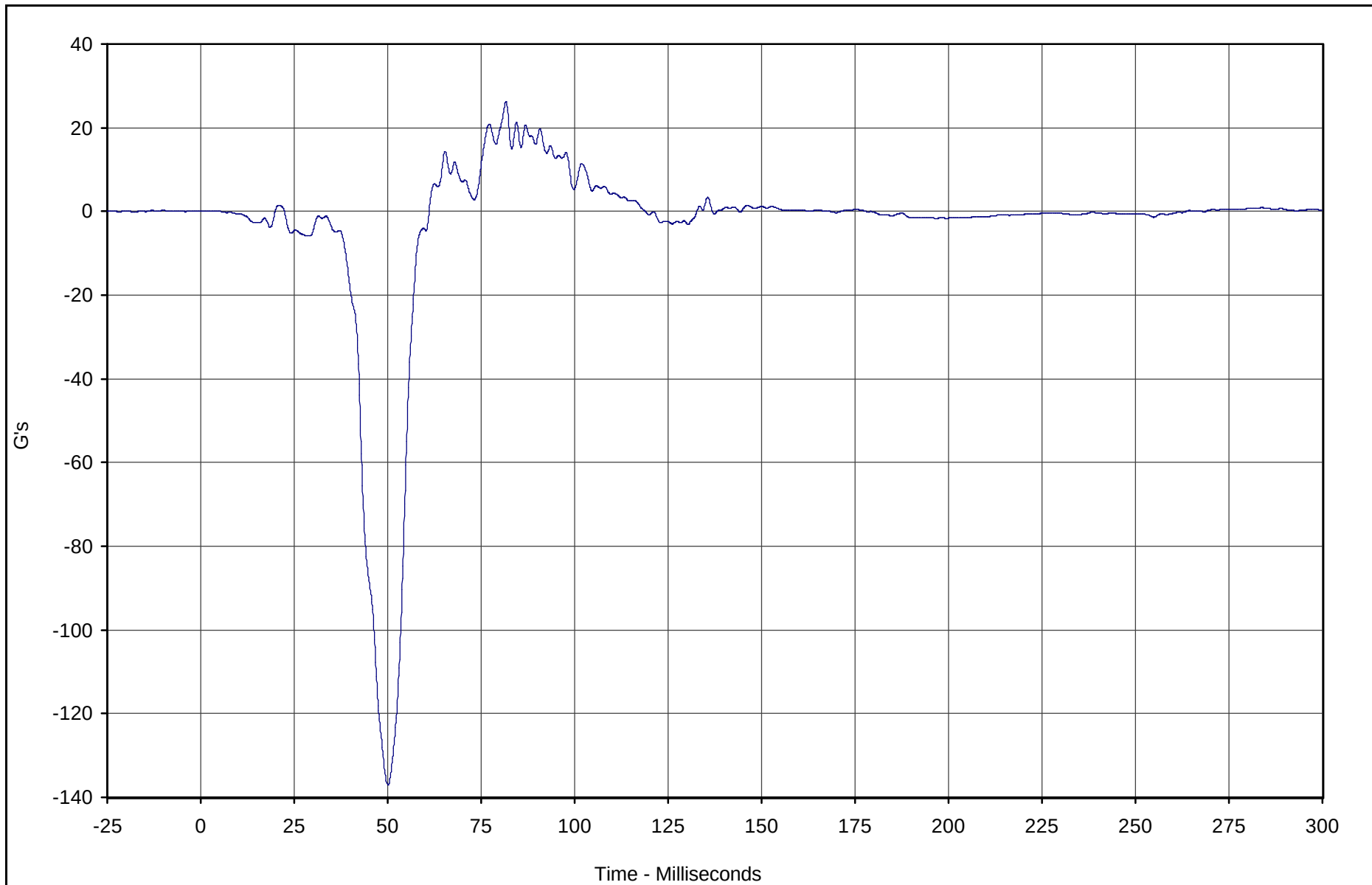


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Aft X	079	FIL	G's	26.2	81.6	-137.0	50.1	180

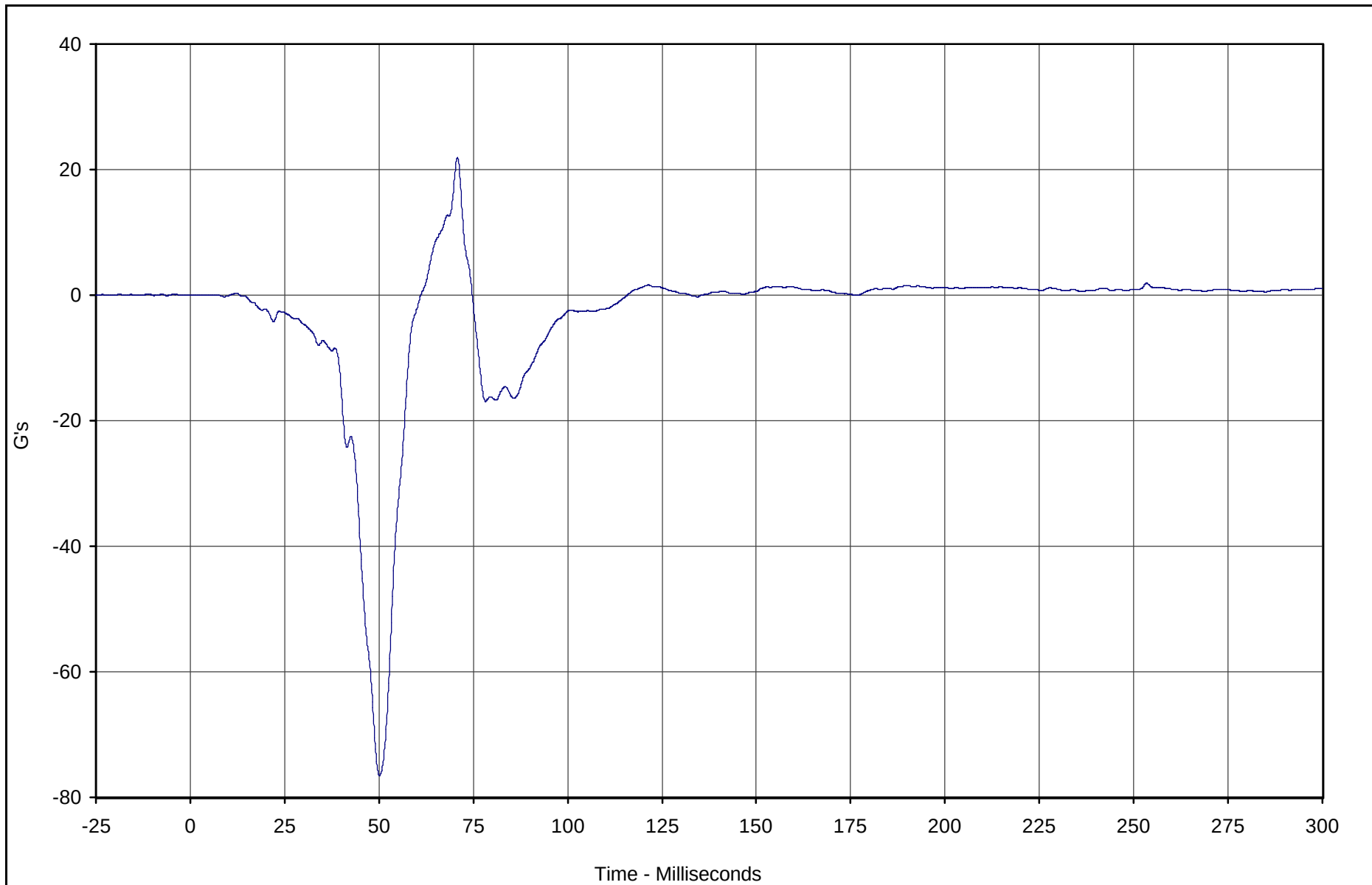


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Aft Z	080	FIL	G's	21.9	70.8	-76.6	50.2	180

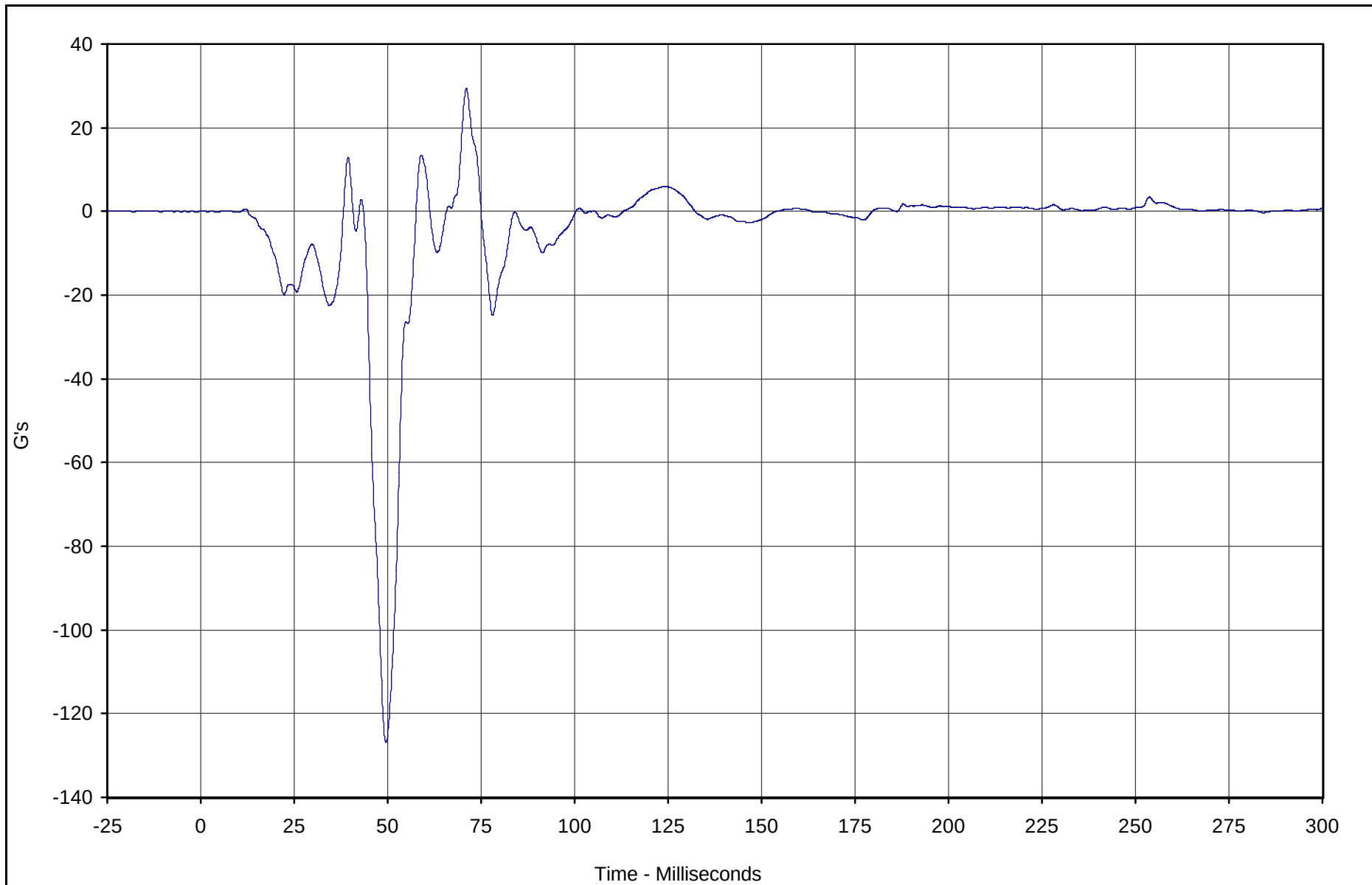


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Fore Z	081	FIL	G's	29.3	71.0	-127.0	49.6	180

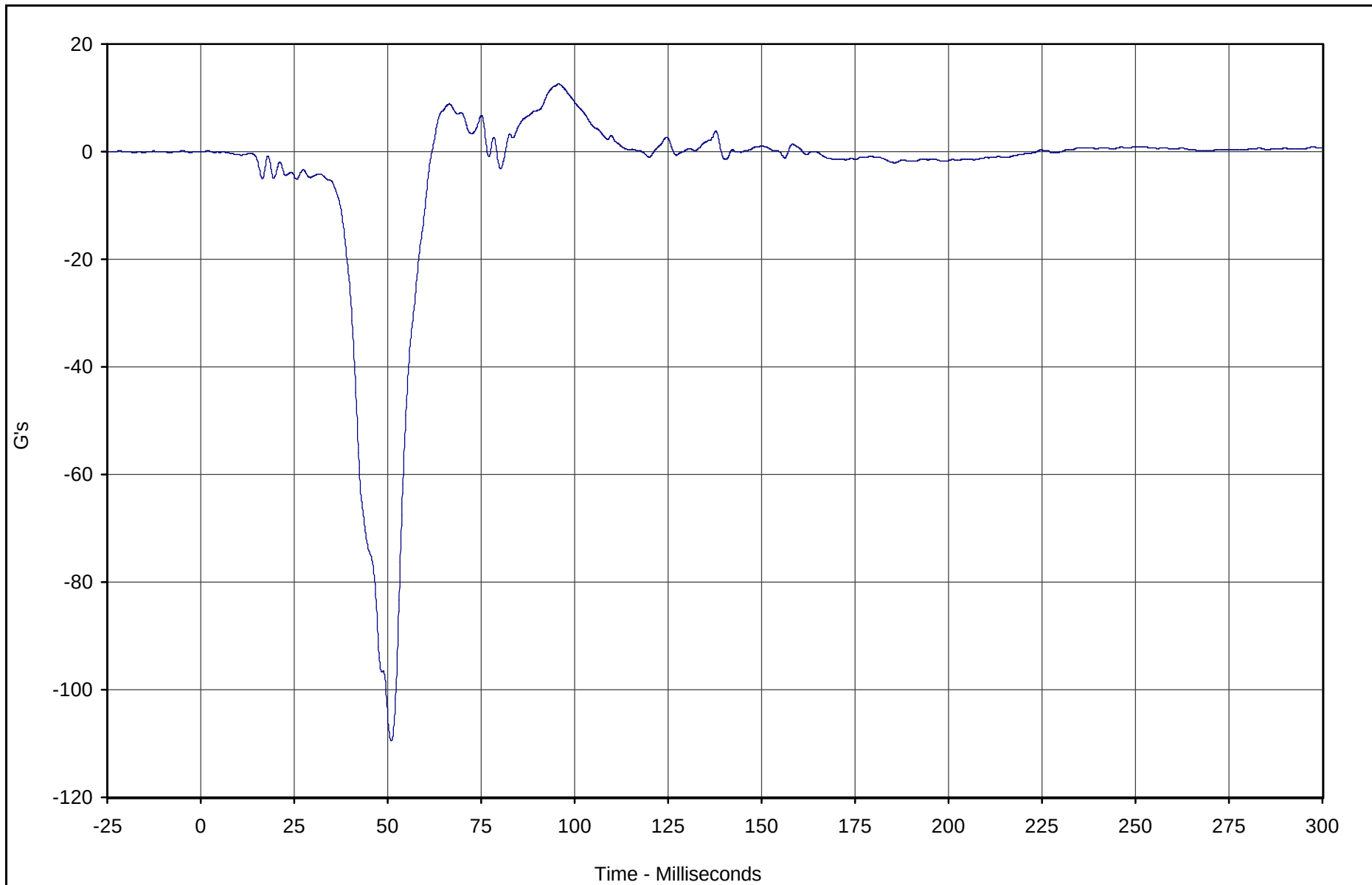


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Aft X	082	FIL	G's	12.6	95.7	-109.5	51.0	180

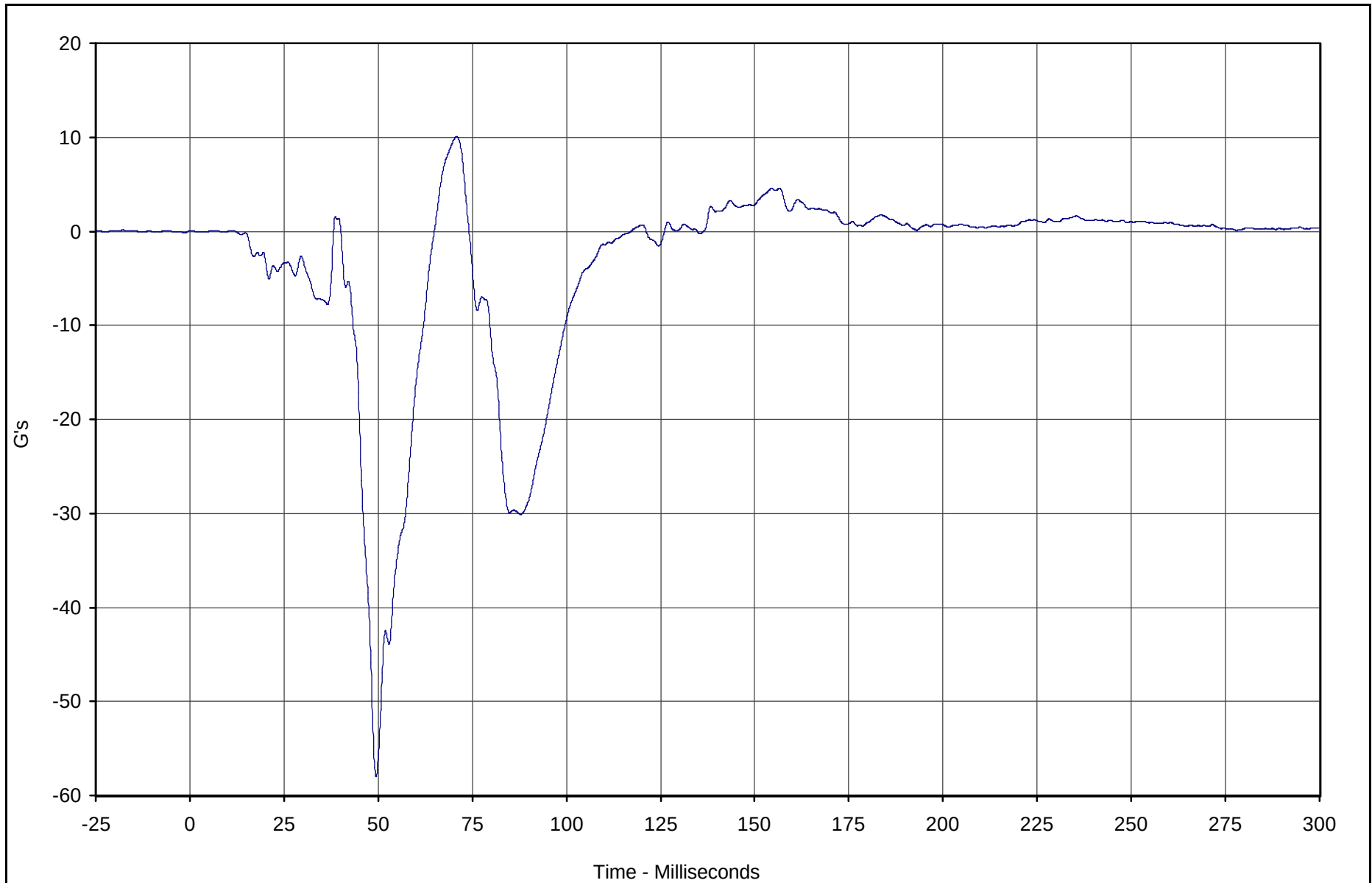


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Aft Z	083	FIL	G's	10.1	70.8	-58.0	49.5	180

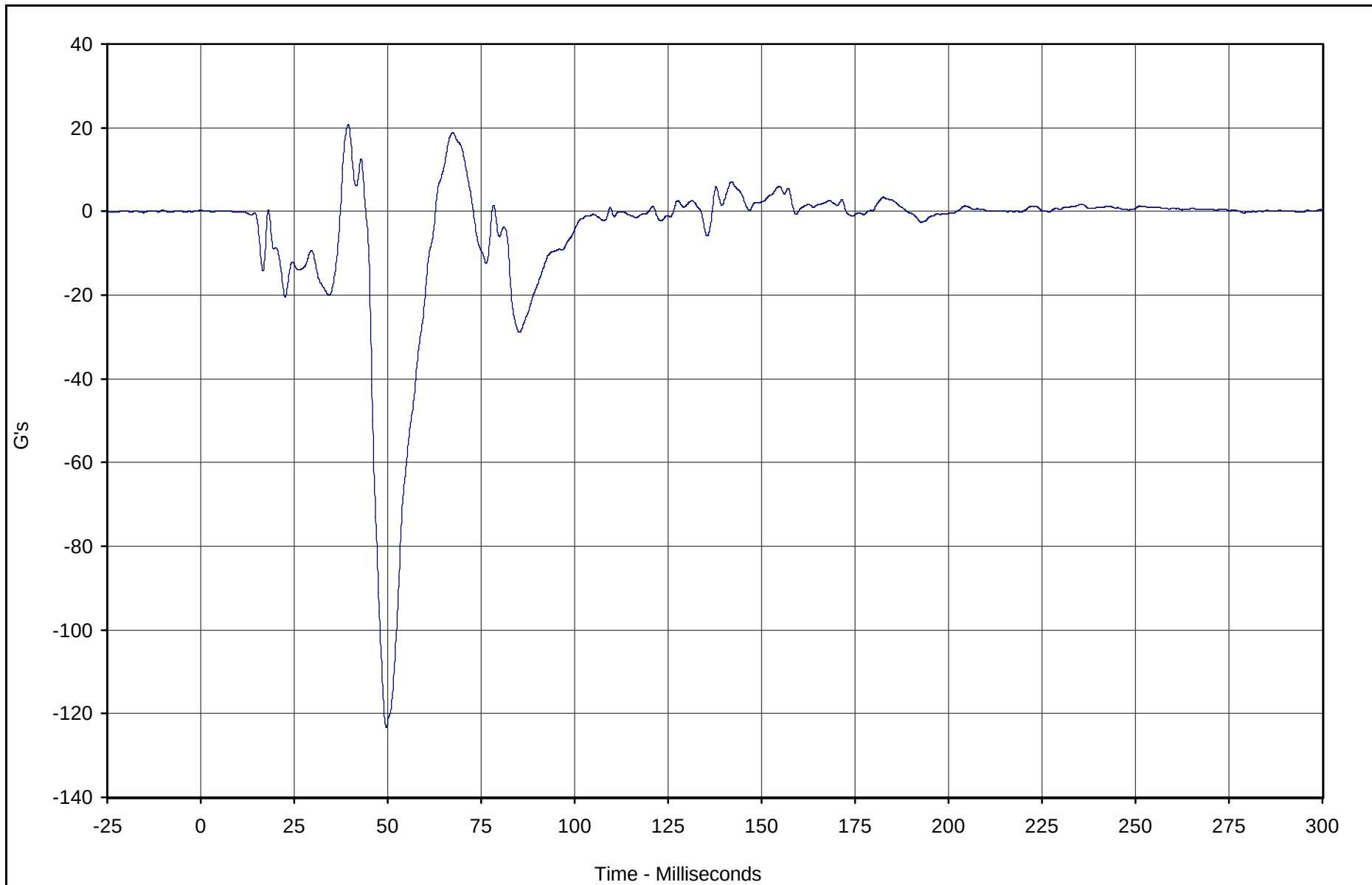


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Fore Z	084	FIL	G's	20.8	39.5	-123.3	49.7	180

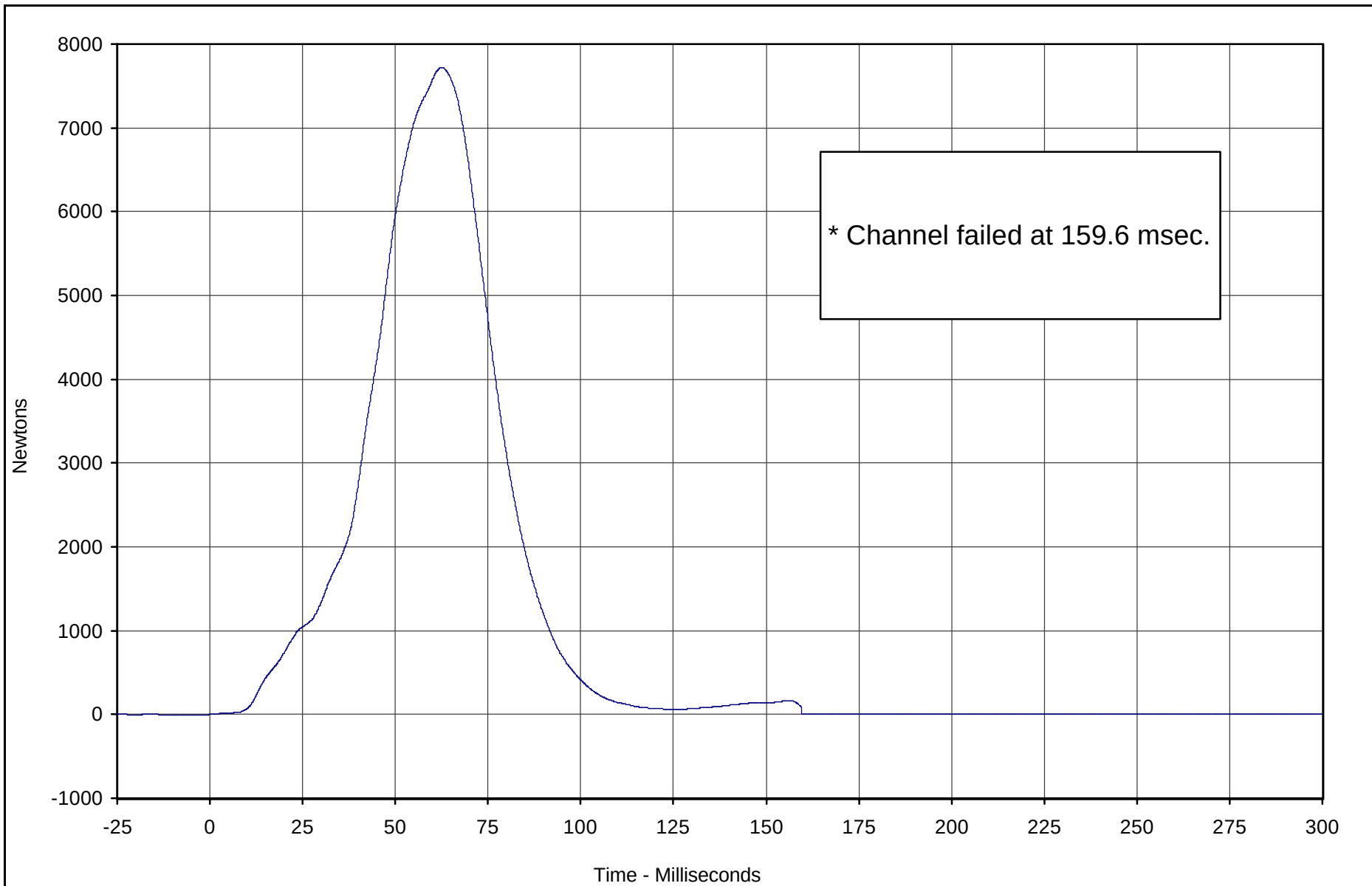


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



* Channel failed at 159.6 msec.

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Lap Belt Force	085	FIL	Newtons	7721.6	62.5	-1.2	0.0	60

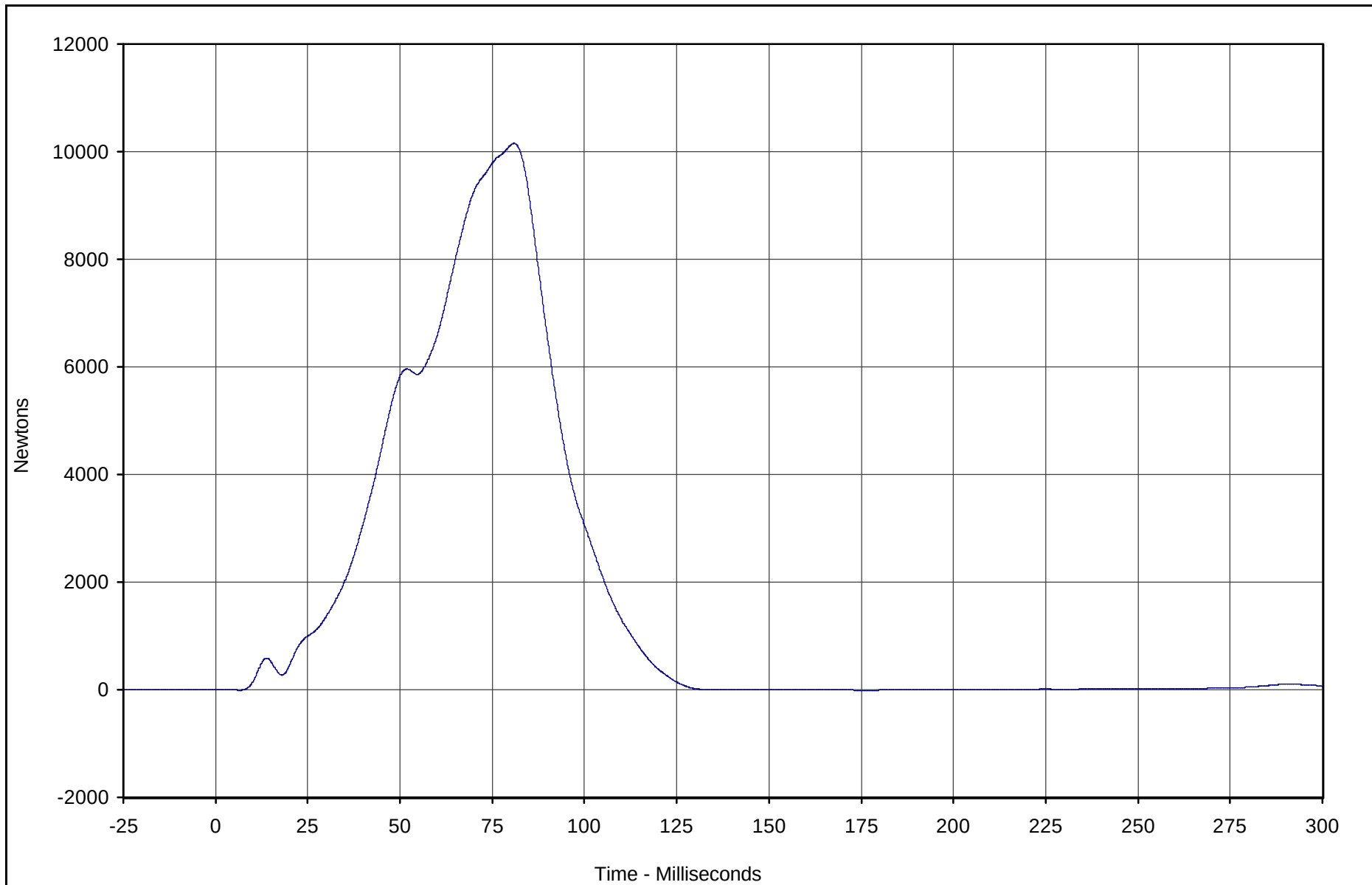


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Force	086	FIL	Newtons	10150.7	80.9	-16.0	176.7	60

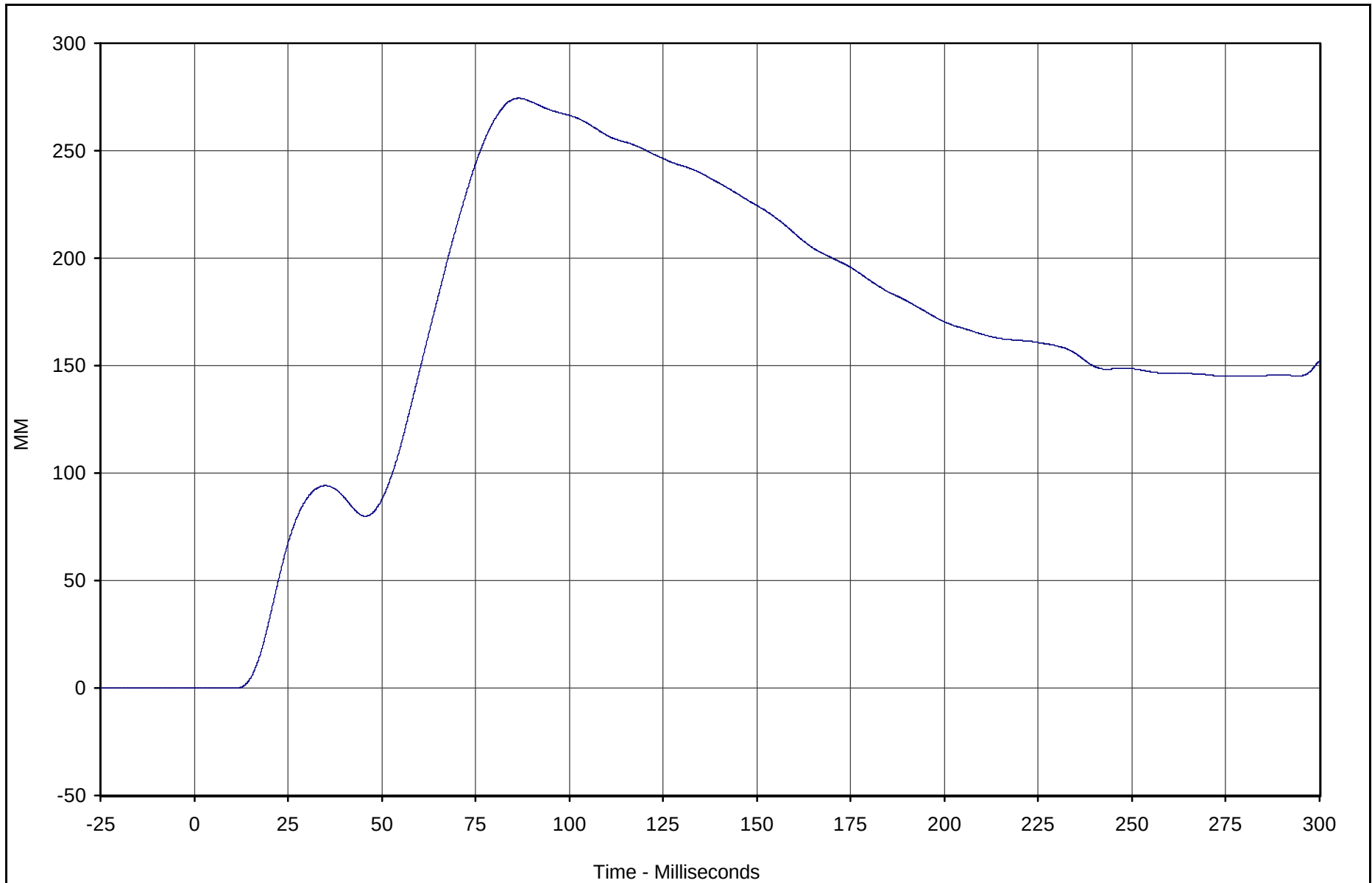


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Pullout	087	FIL	MM	274.4	86.4	-0.2	10.5	60

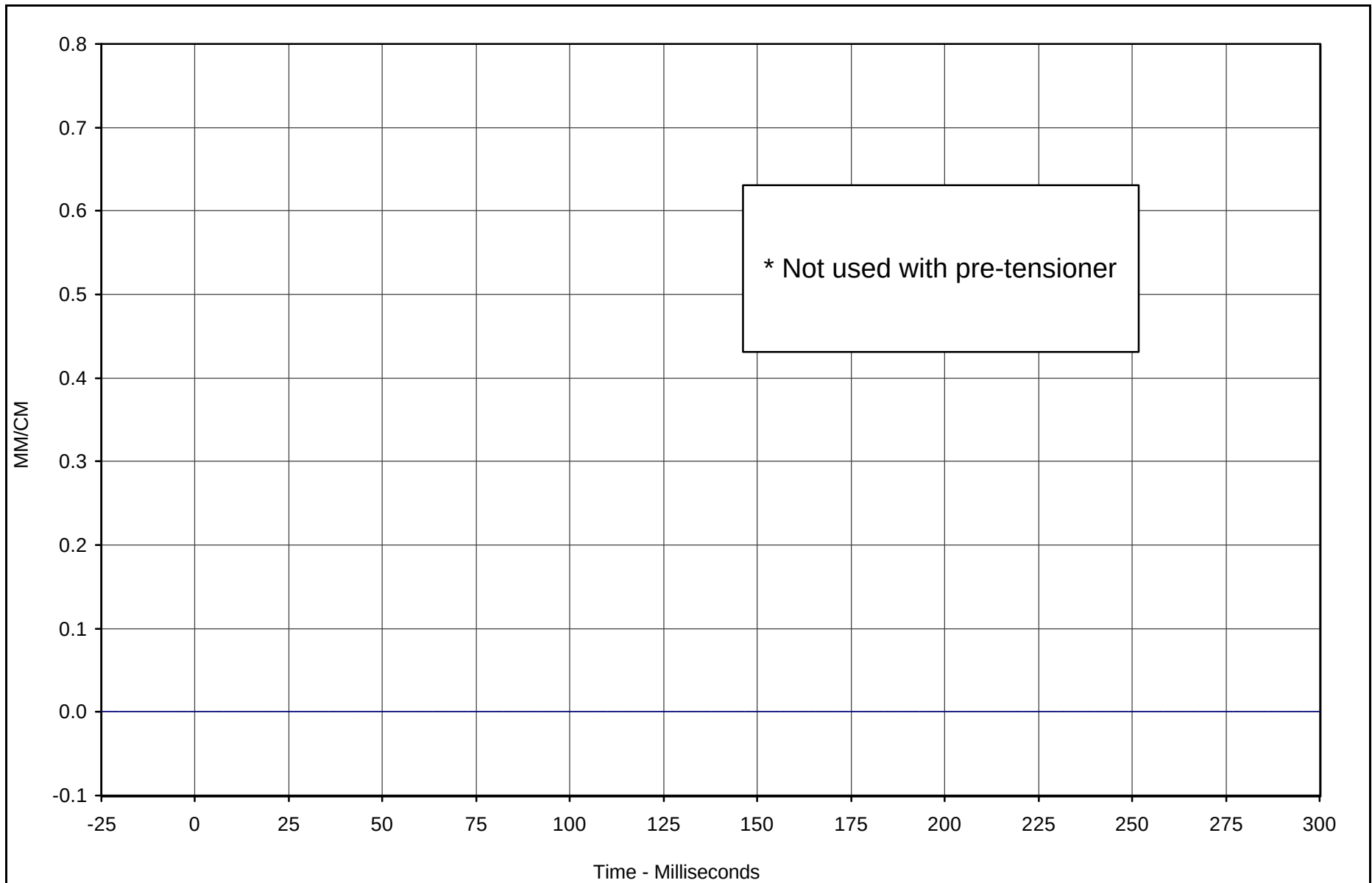


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



* Not used with pre-tensioner

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Elongation	088	FIL	MM/CM	0.00	0.0	0.00	0.0	60

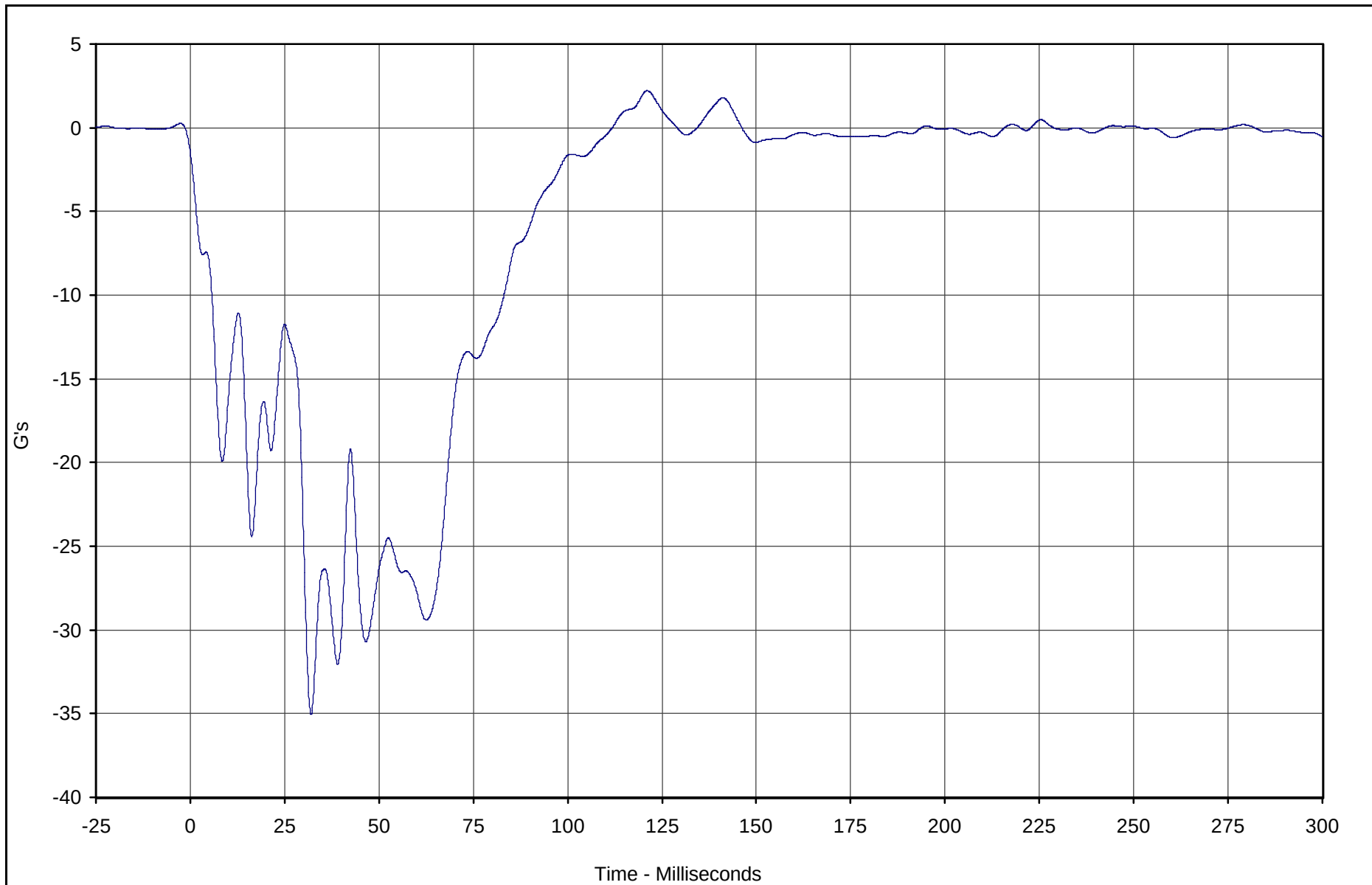


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X	089	FIL	G's	2.2	121.0	-35.0	32.0	60

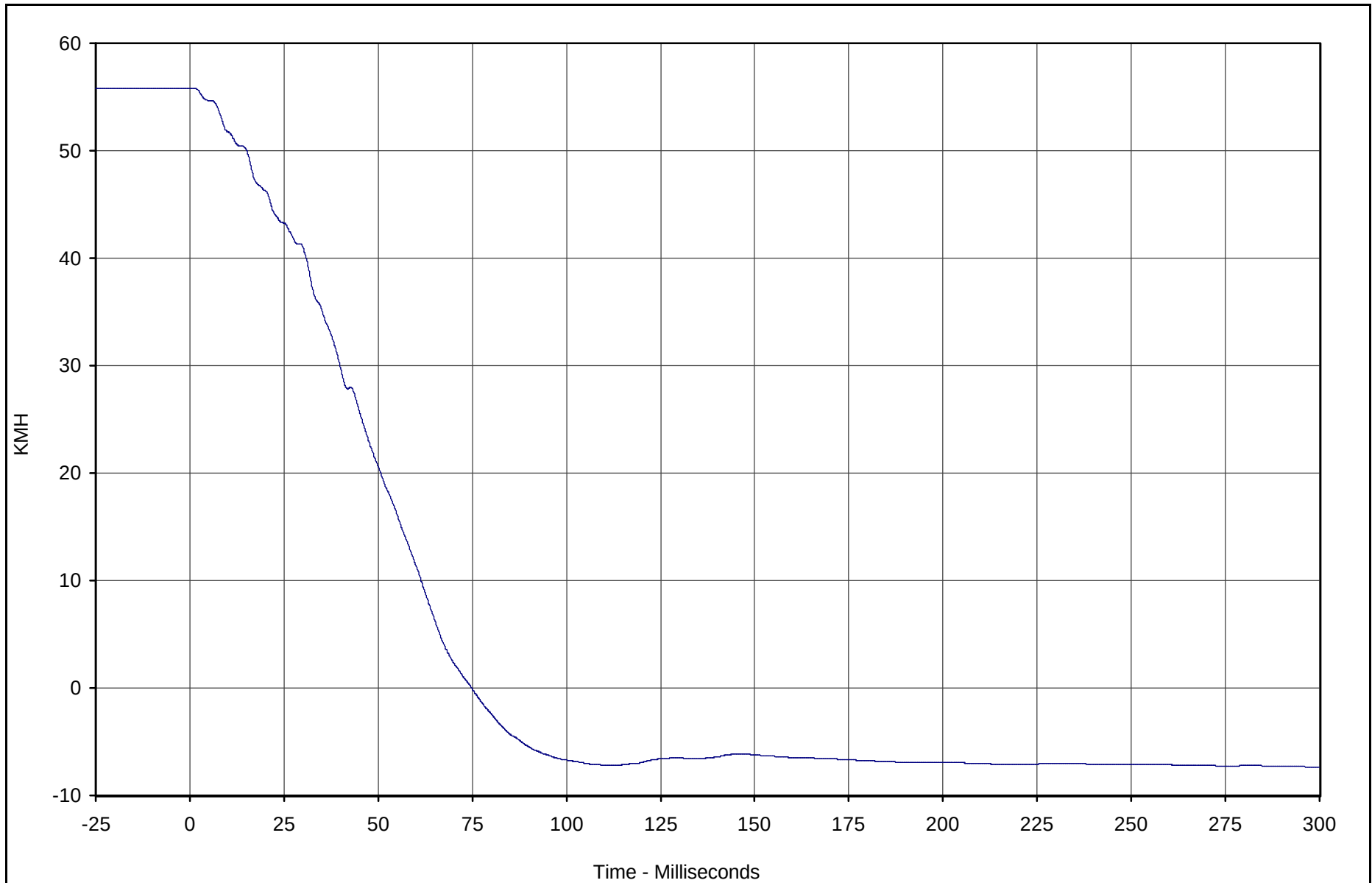


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X Velocity	089	IN1	KMH	55.8	1.0	-7.4	299.9	180

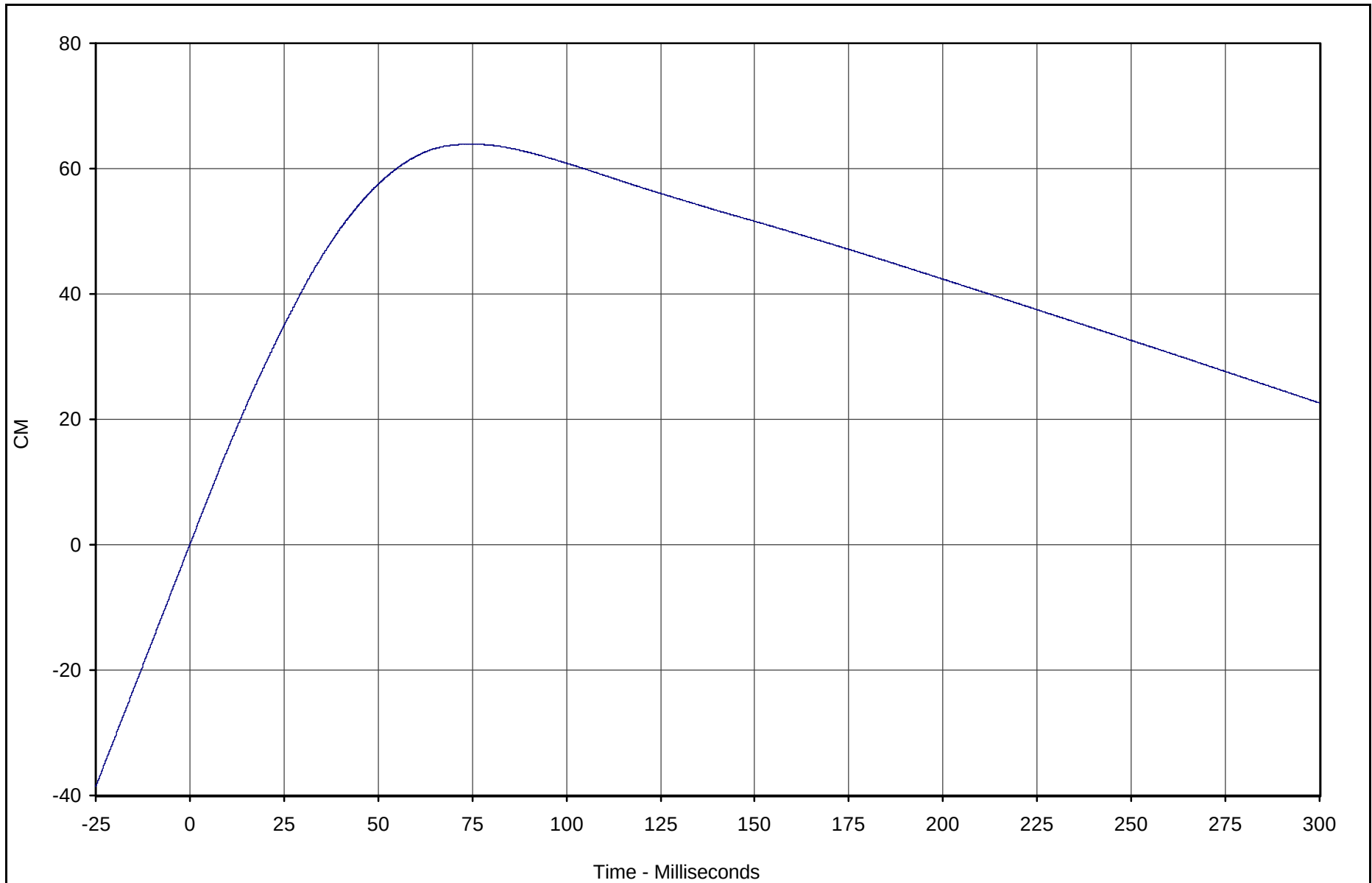


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X Displ.	089	IN2	CM	63.9	74.9	0.0	0.0	180

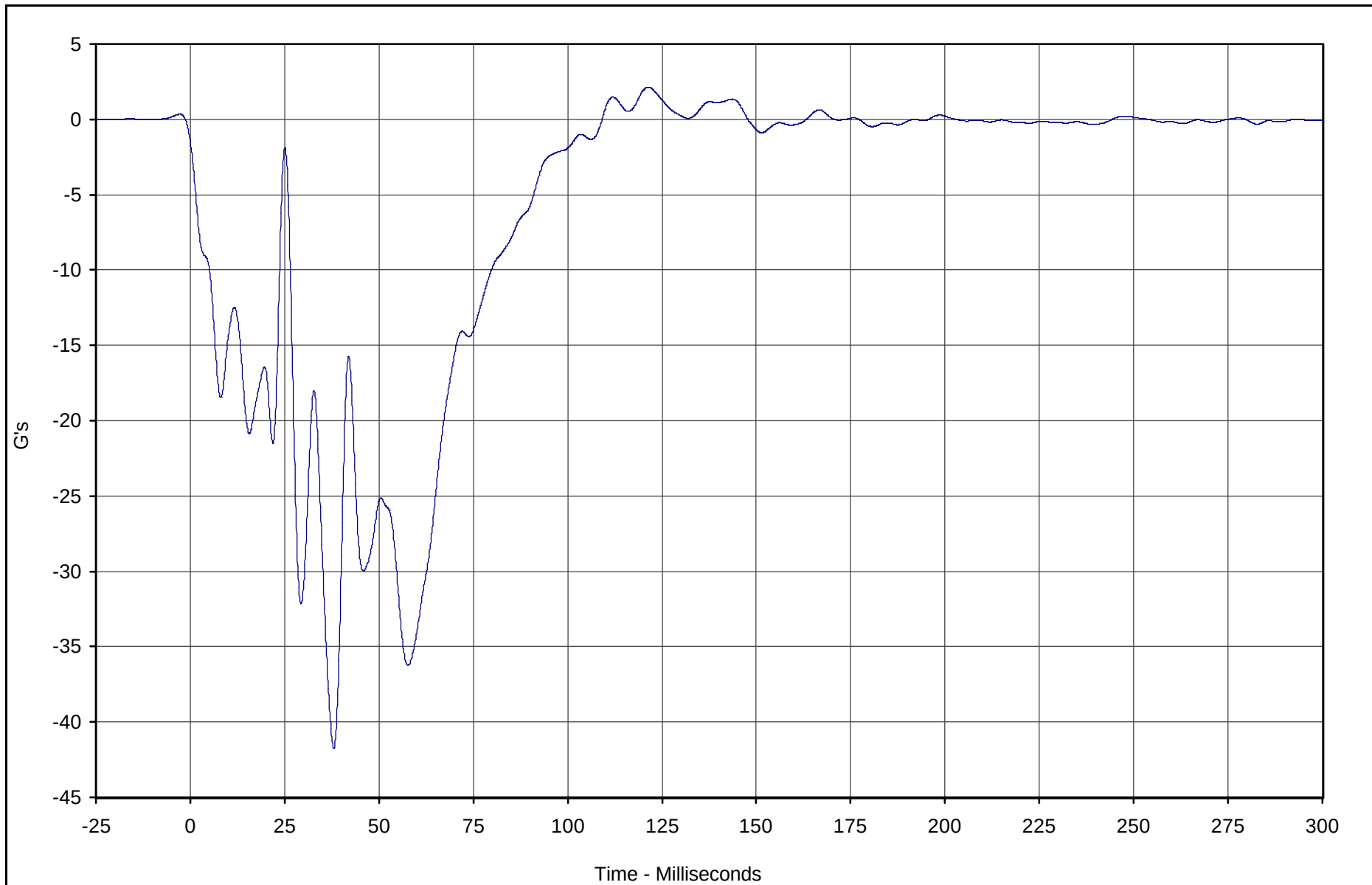


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X	090	FIL	G's	2.1	121.4	-41.7	38.0	60

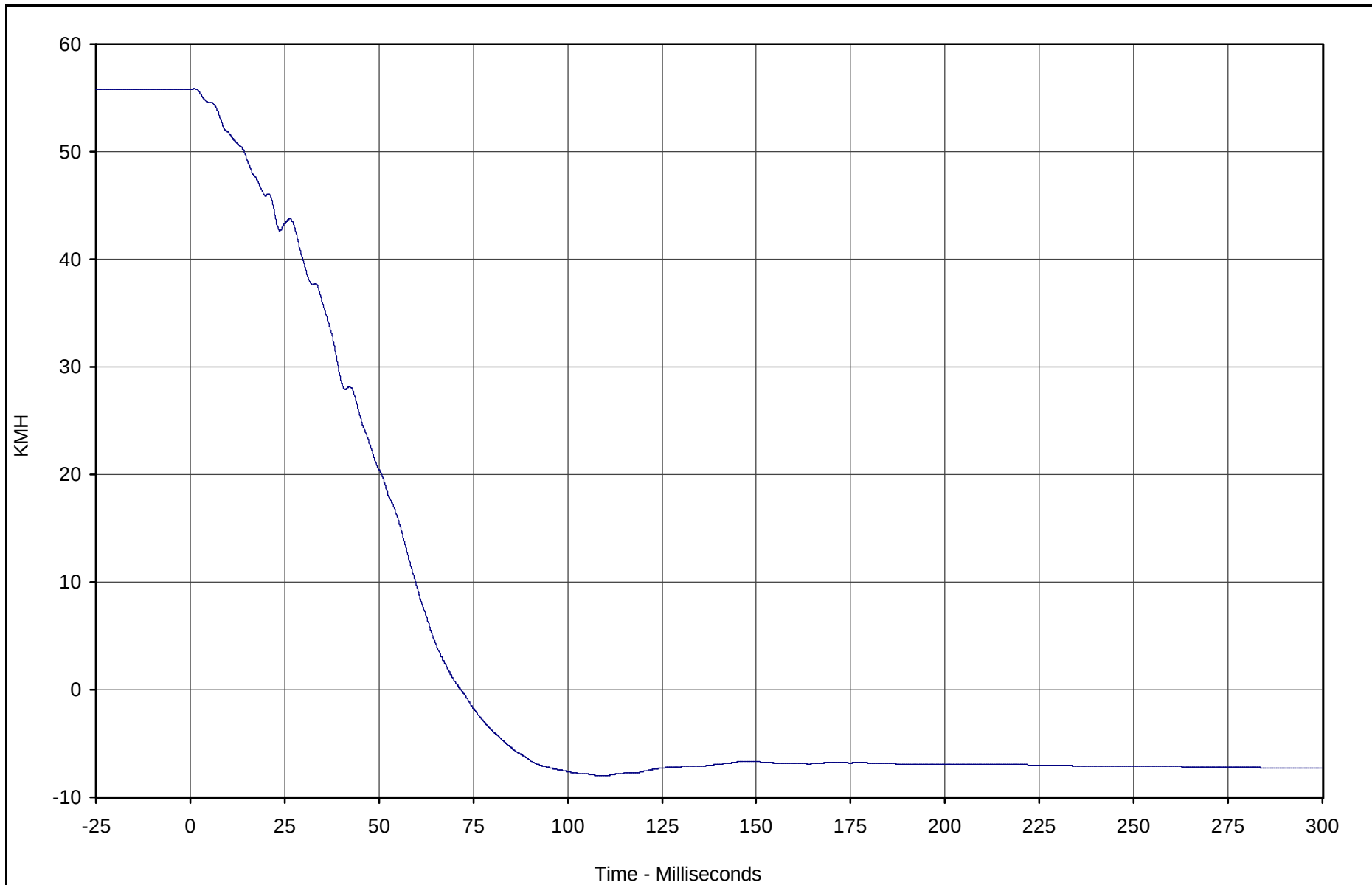


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X Velocity	090	IN1	KMH	55.8	1.0	-8.0	109.3	180

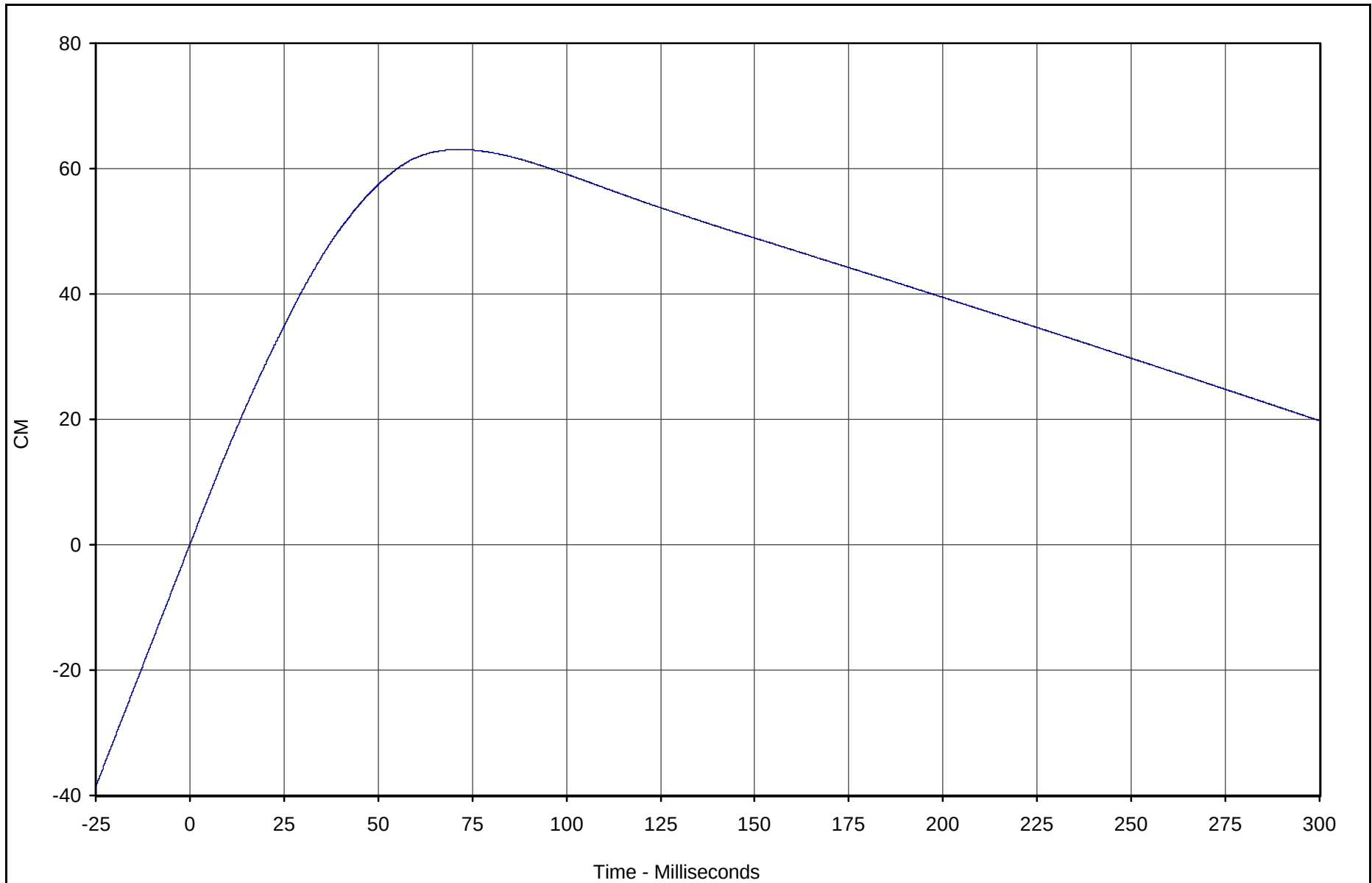


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X Displ.	090	IN2	CM	63.0	71.7	0.0	0.0	180

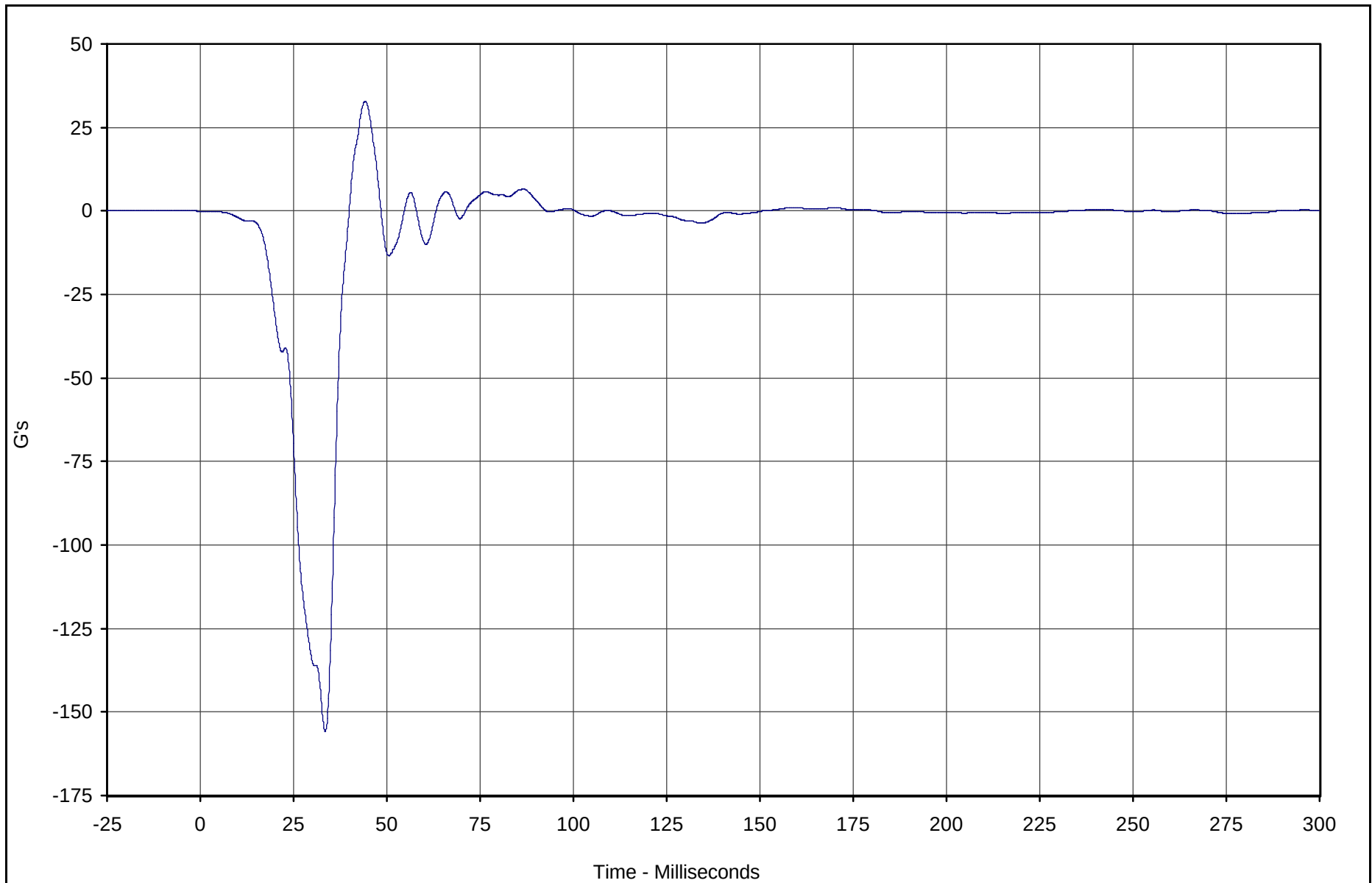


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top	091	FIL	G's	32.8	44.3	-155.9	33.5	60

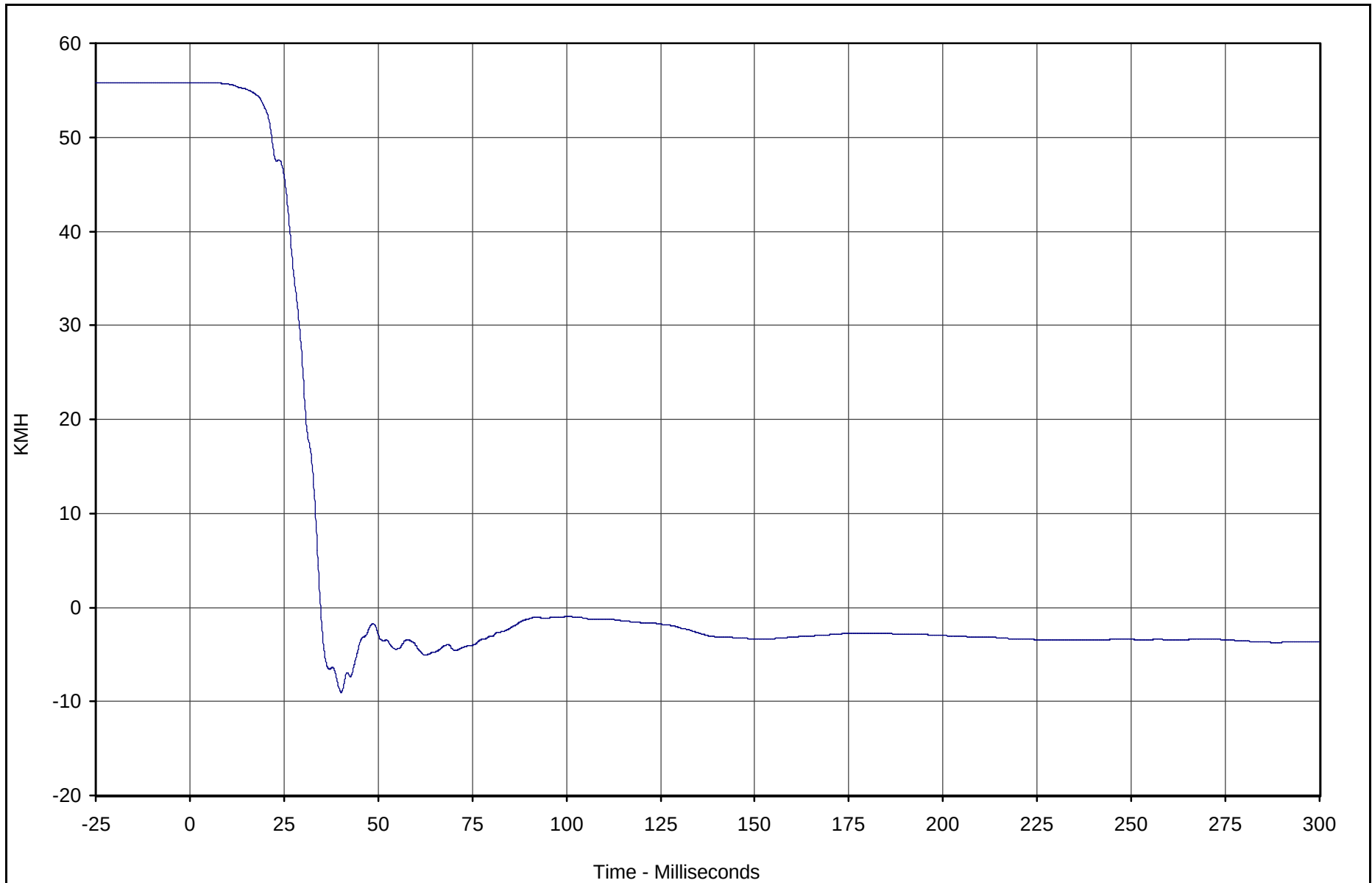


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top Velocity	091	IN1	KMH	55.8	0.0	-9.0	40.2	180

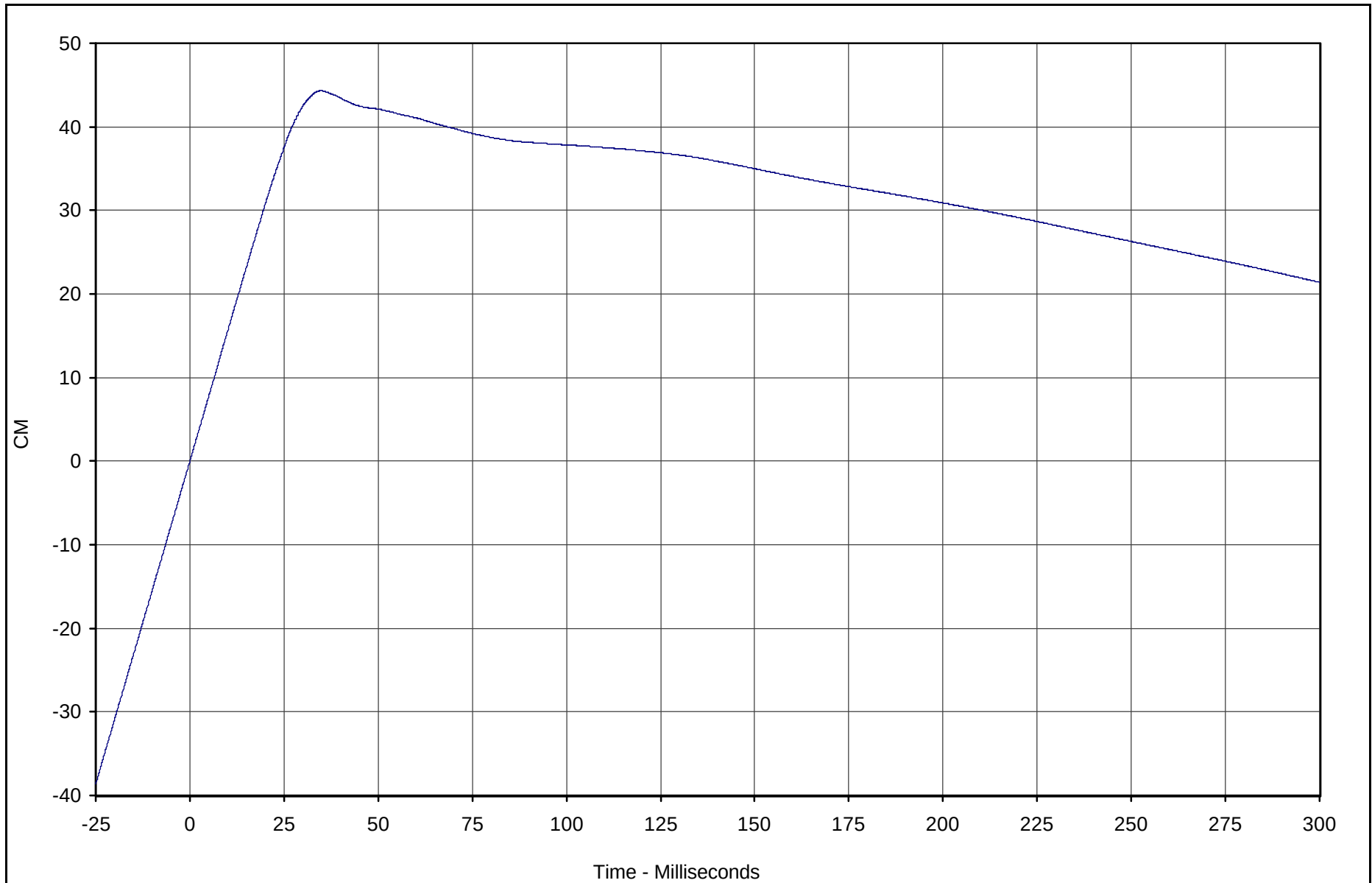


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top Displacement	091	IN2	CM	44.3	34.7	0.0	0.0	180

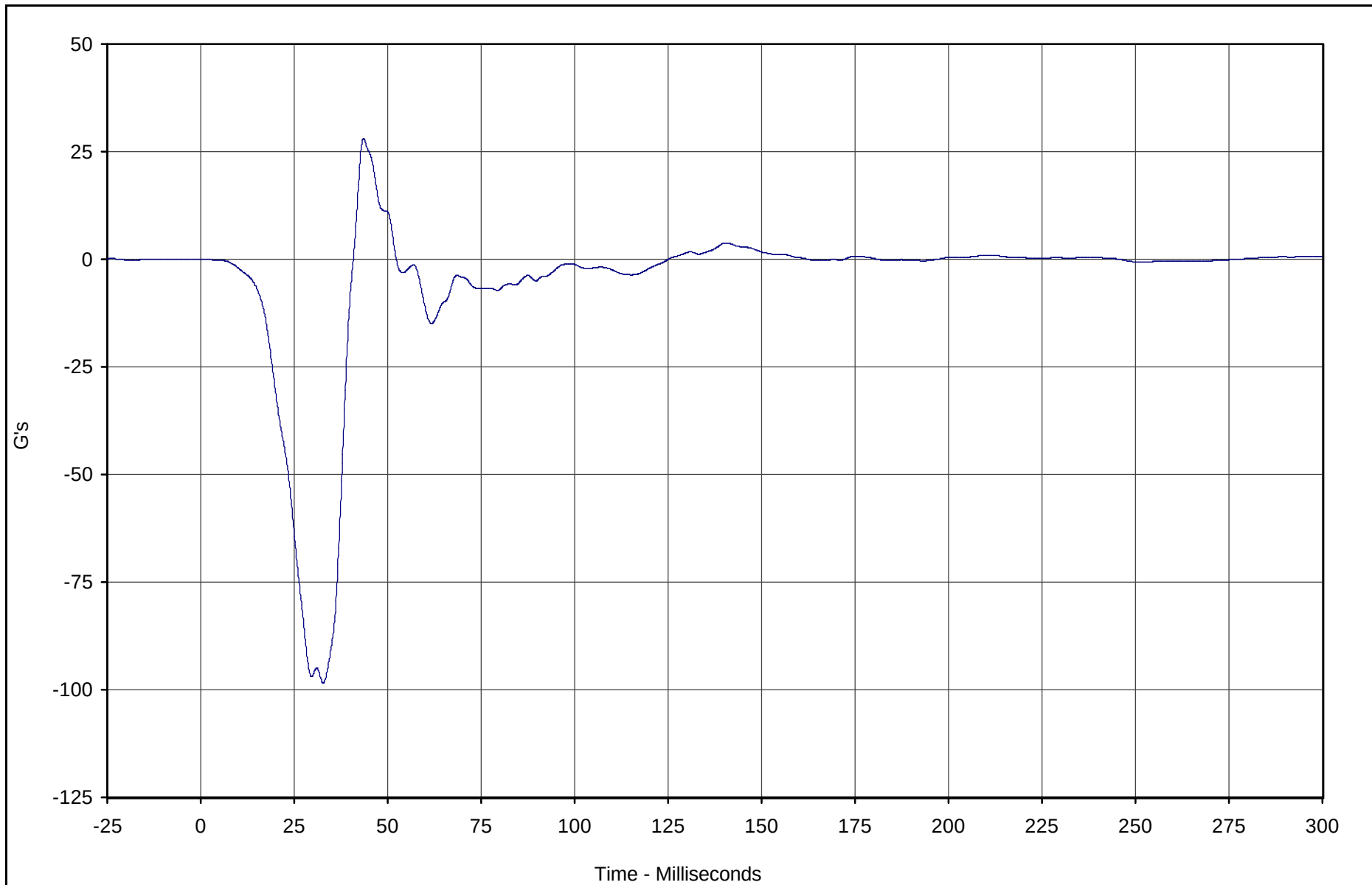


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom	092	FIL	G's	28.0	43.6	-98.5	32.7	60

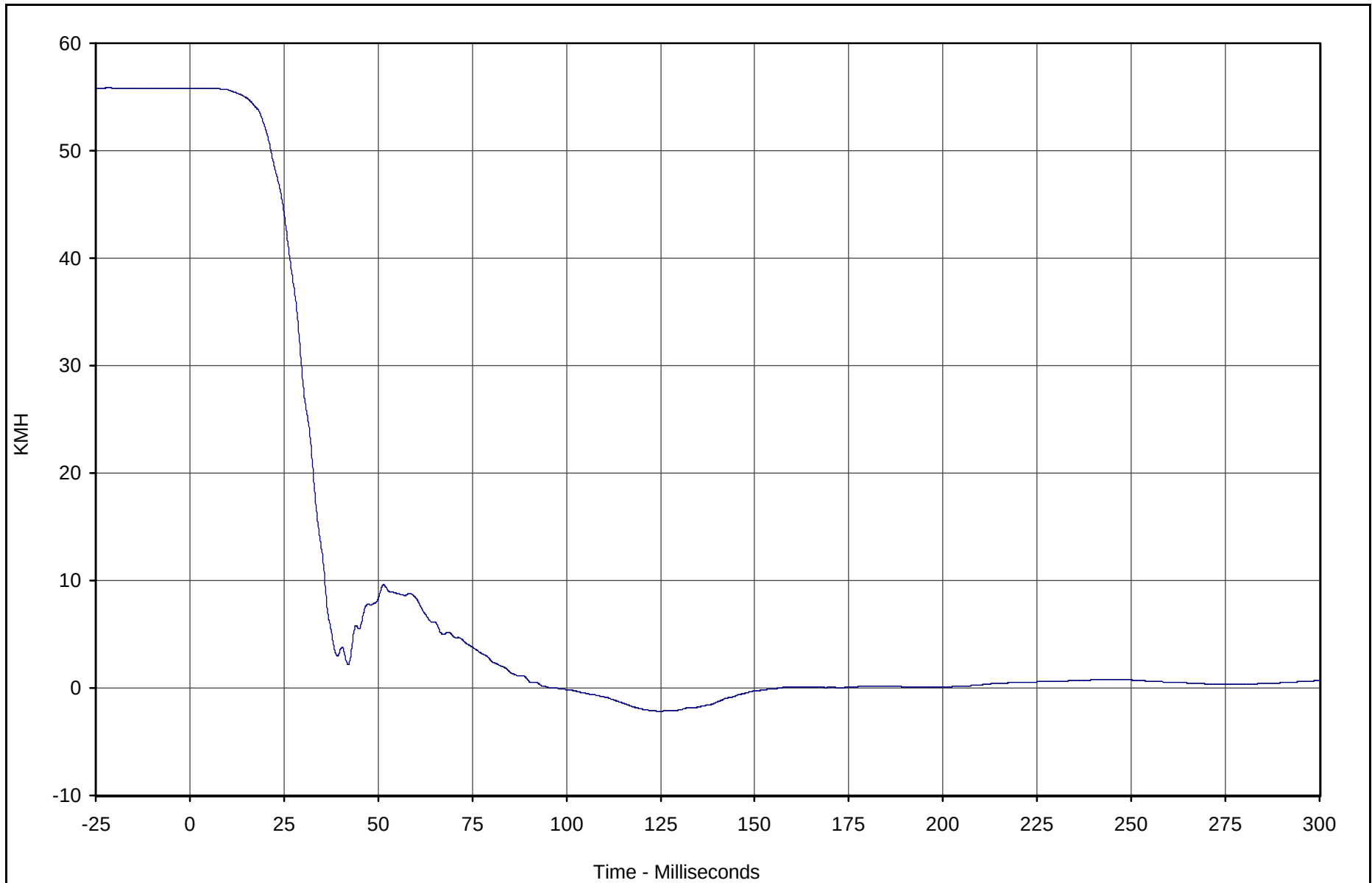


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom Velocity	092	IN1	KMH	55.8	2.4	-2.2	124.9	180

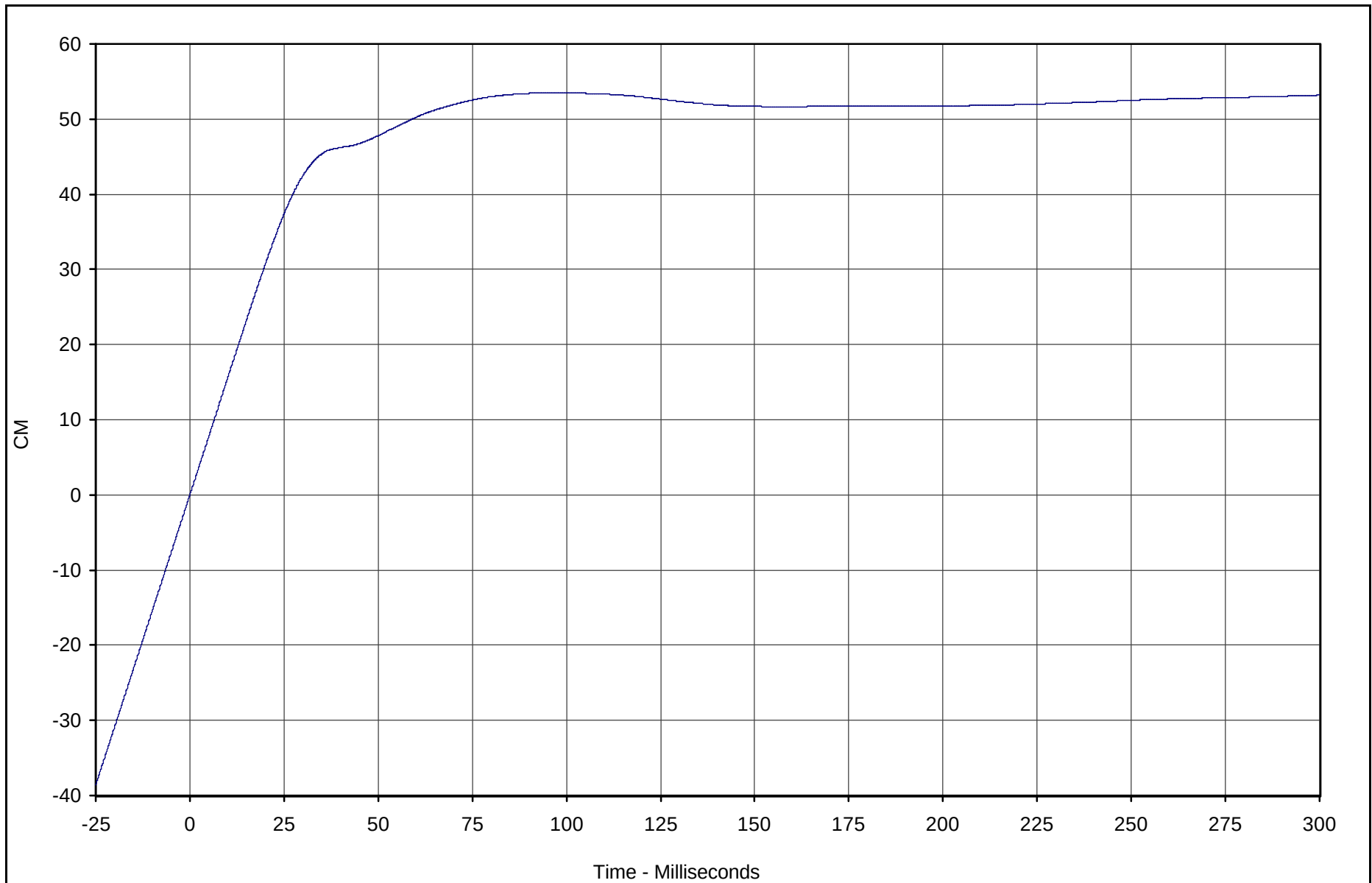


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom Displacement	092	IN2	CM	53.5	97.2	0.0	0.0	180

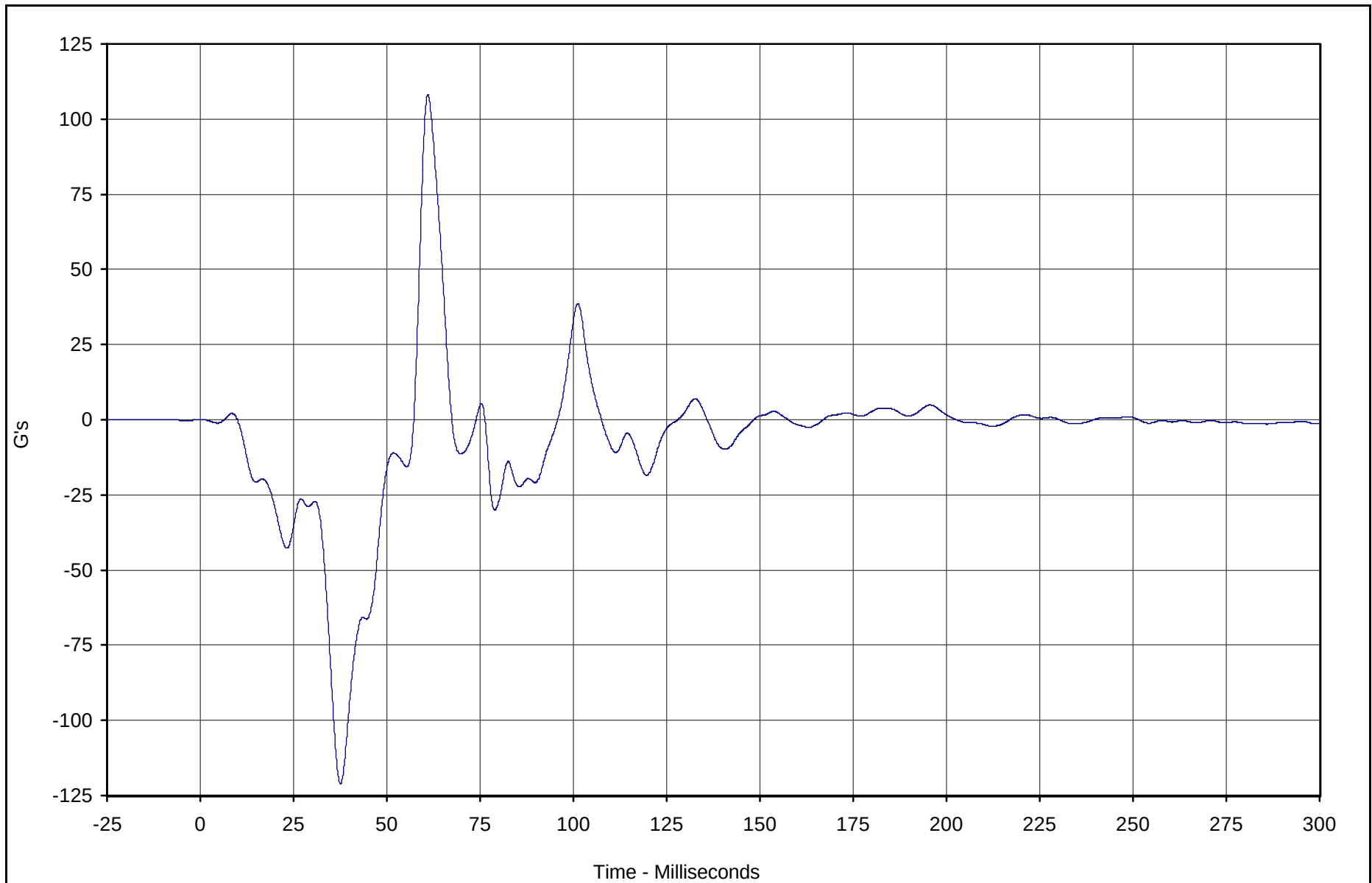


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper	093	FIL	G's	108.1	61.0	-121.1	37.6	60

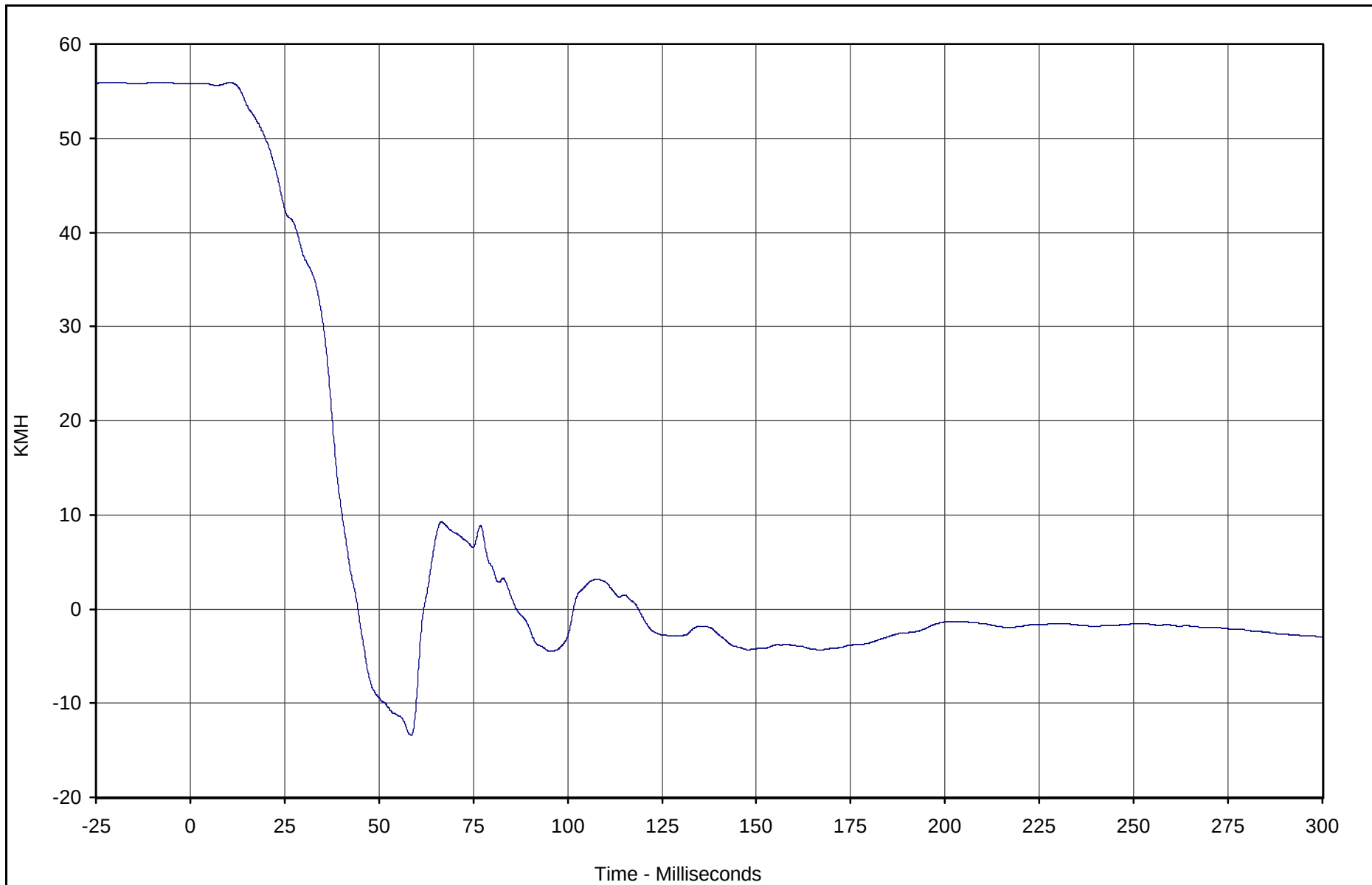


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper Velocity	093	IN1	KMH	55.9	10.5	-13.4	58.5	180

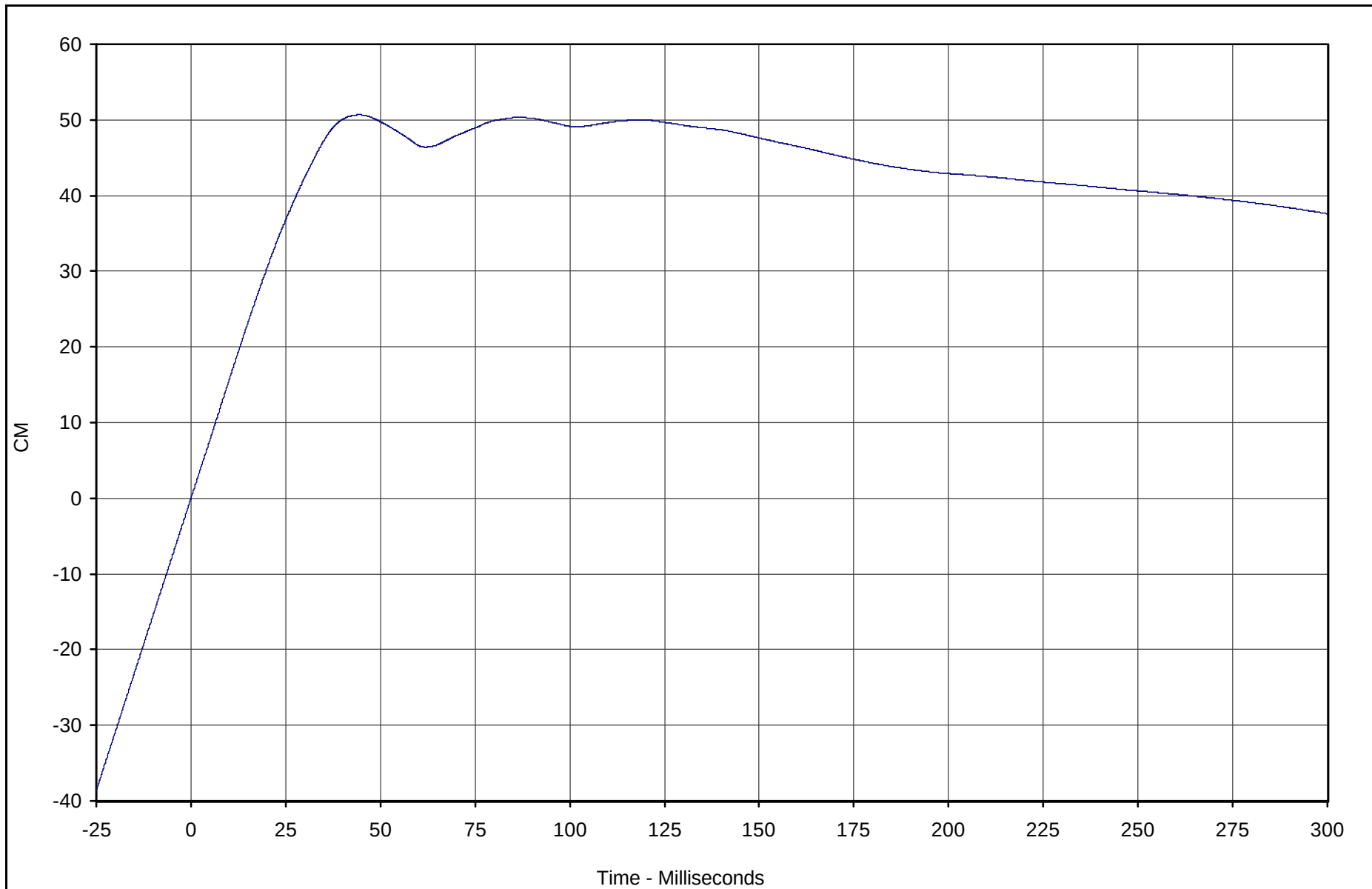


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper Displ.	093	IN2	CM	50.7	44.4	0.0	0.0	180

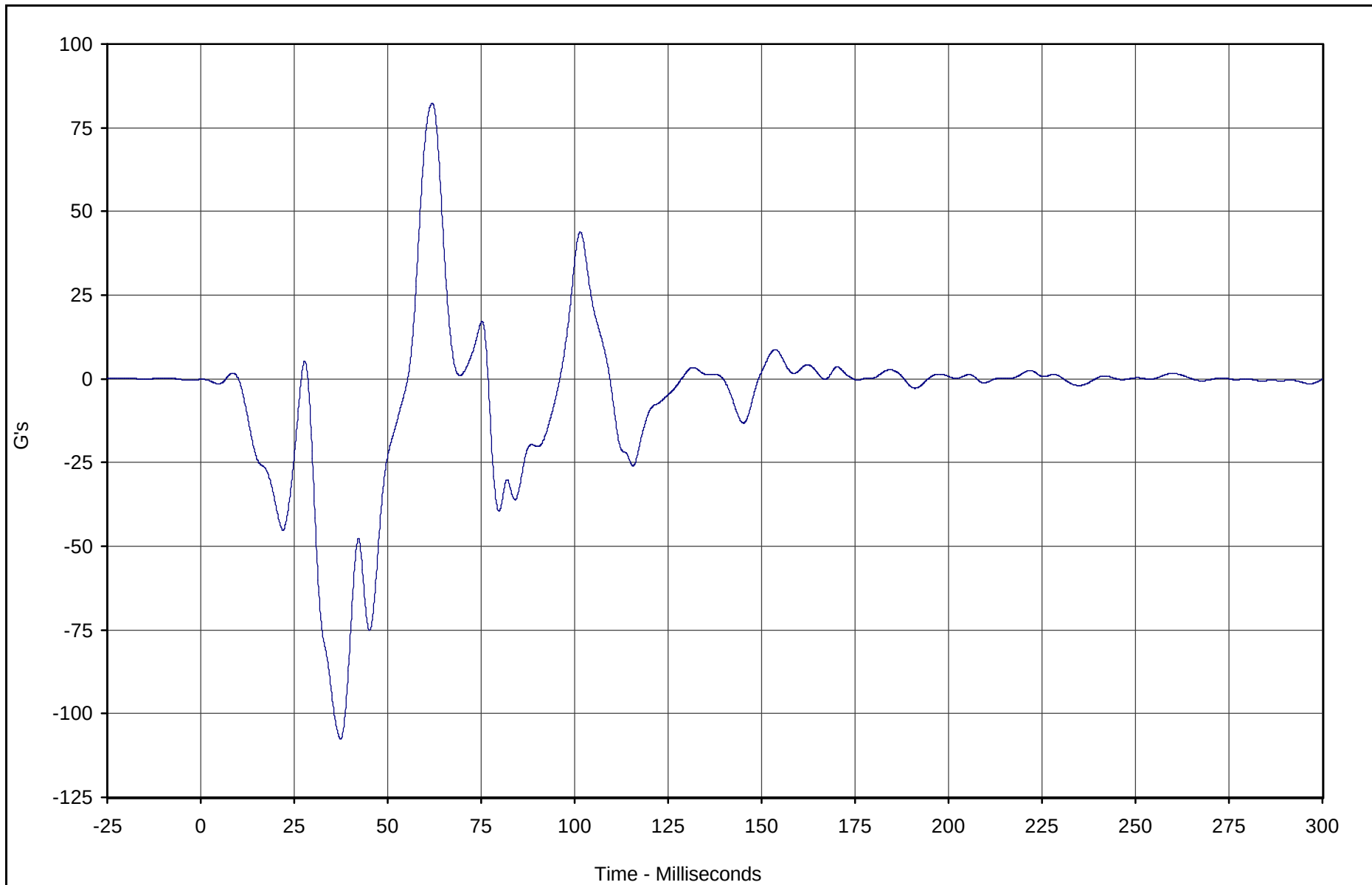


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper	094	FIL	G's	82.2	61.9	-107.6	37.4	60

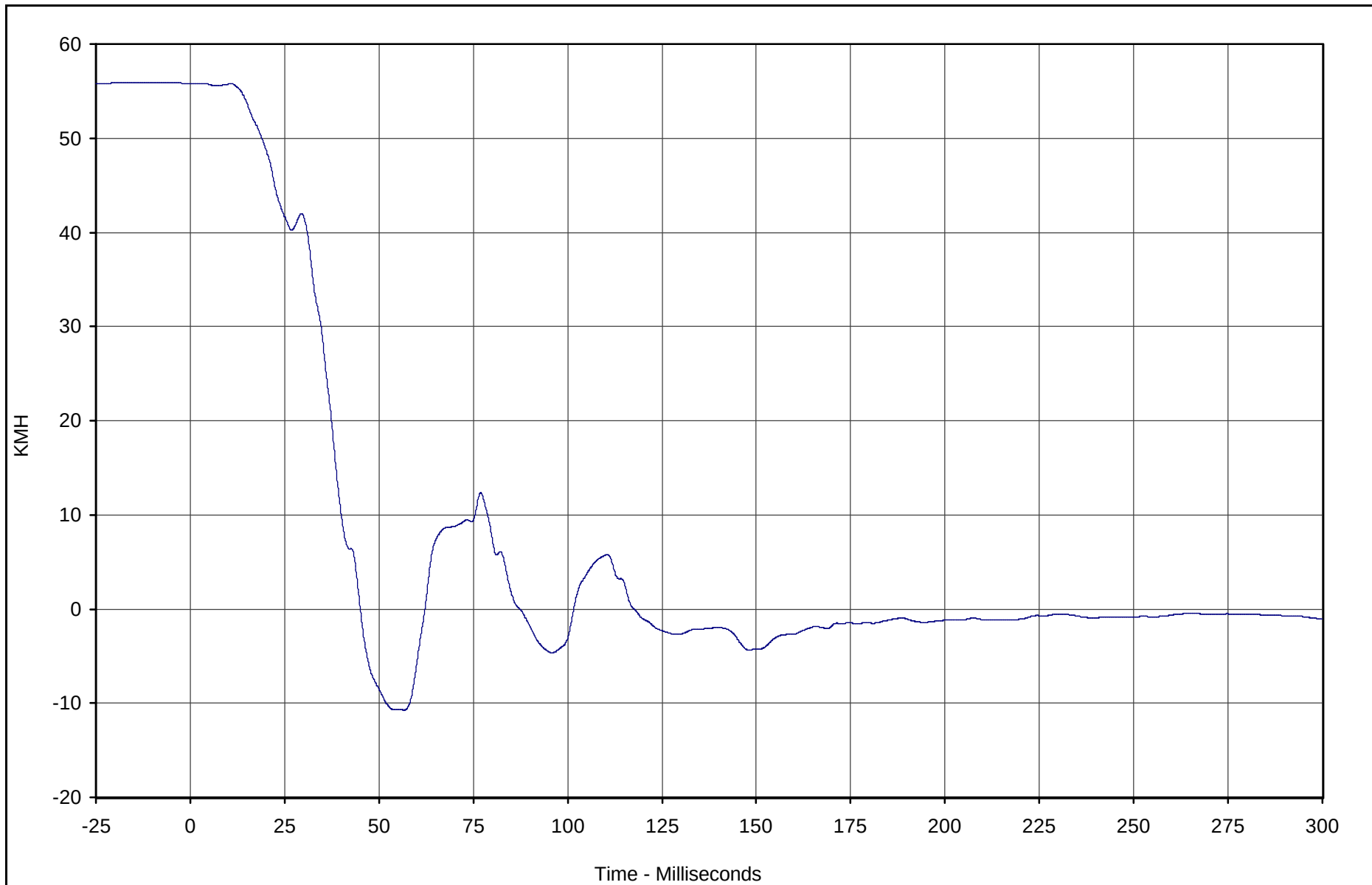


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper Velocity	094	IN1	KMH	55.8	0.0	-10.7	56.6	180

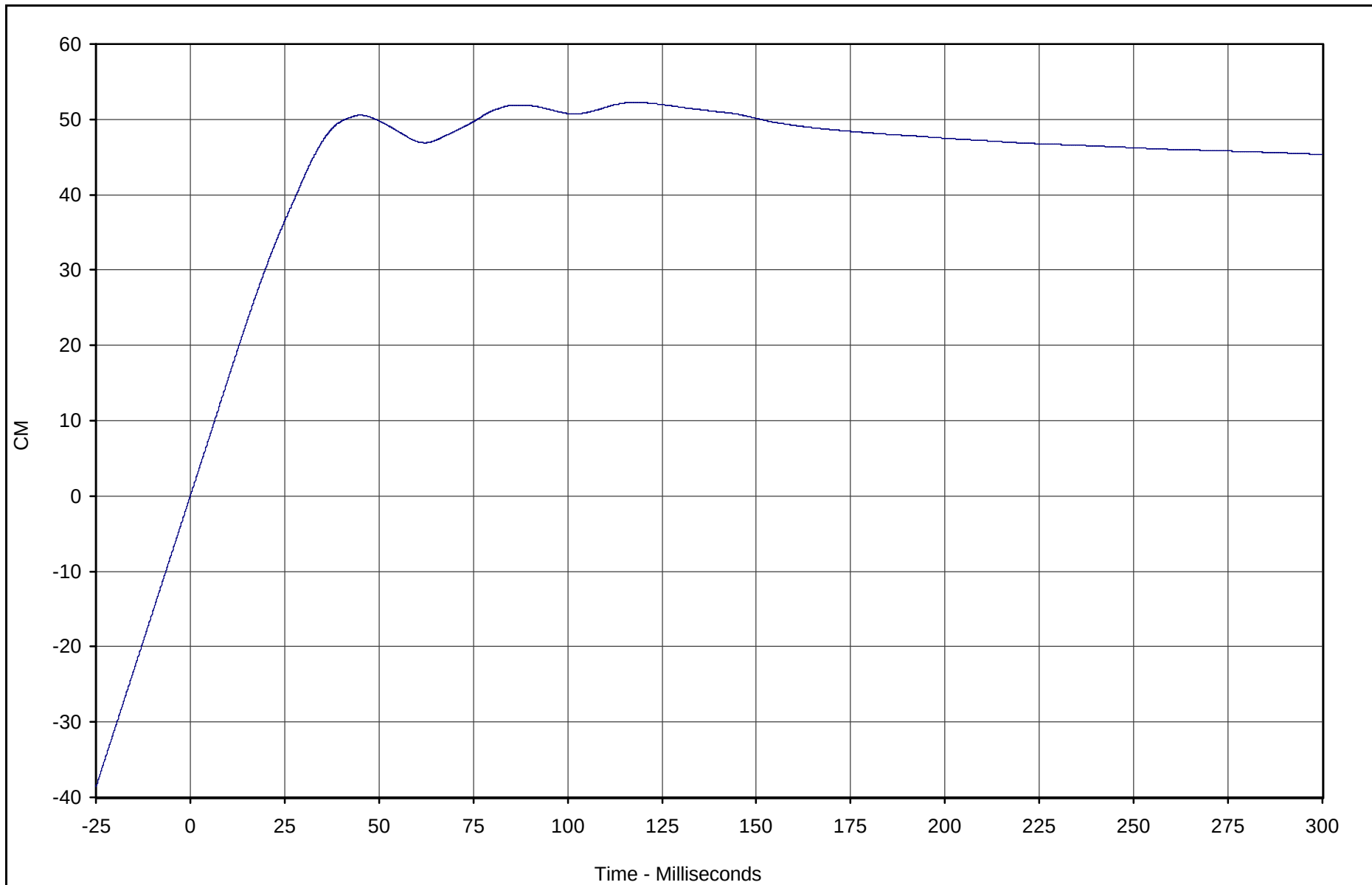


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper Displ.	094	IN2	CM	52.2	117.5	0.0	0.0	180

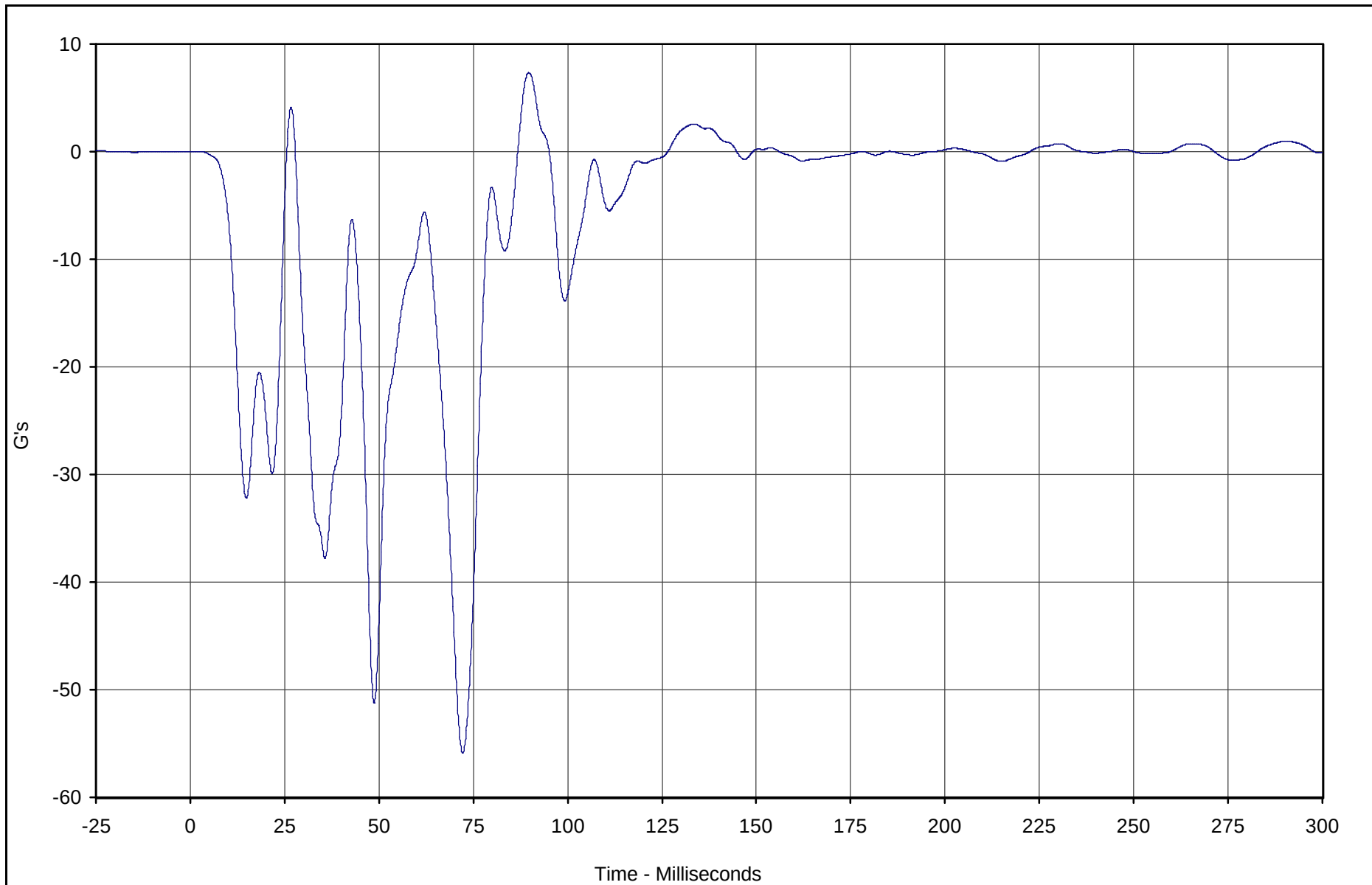


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel	095	FIL	G's	7.3	89.7	-55.9	72.2	60

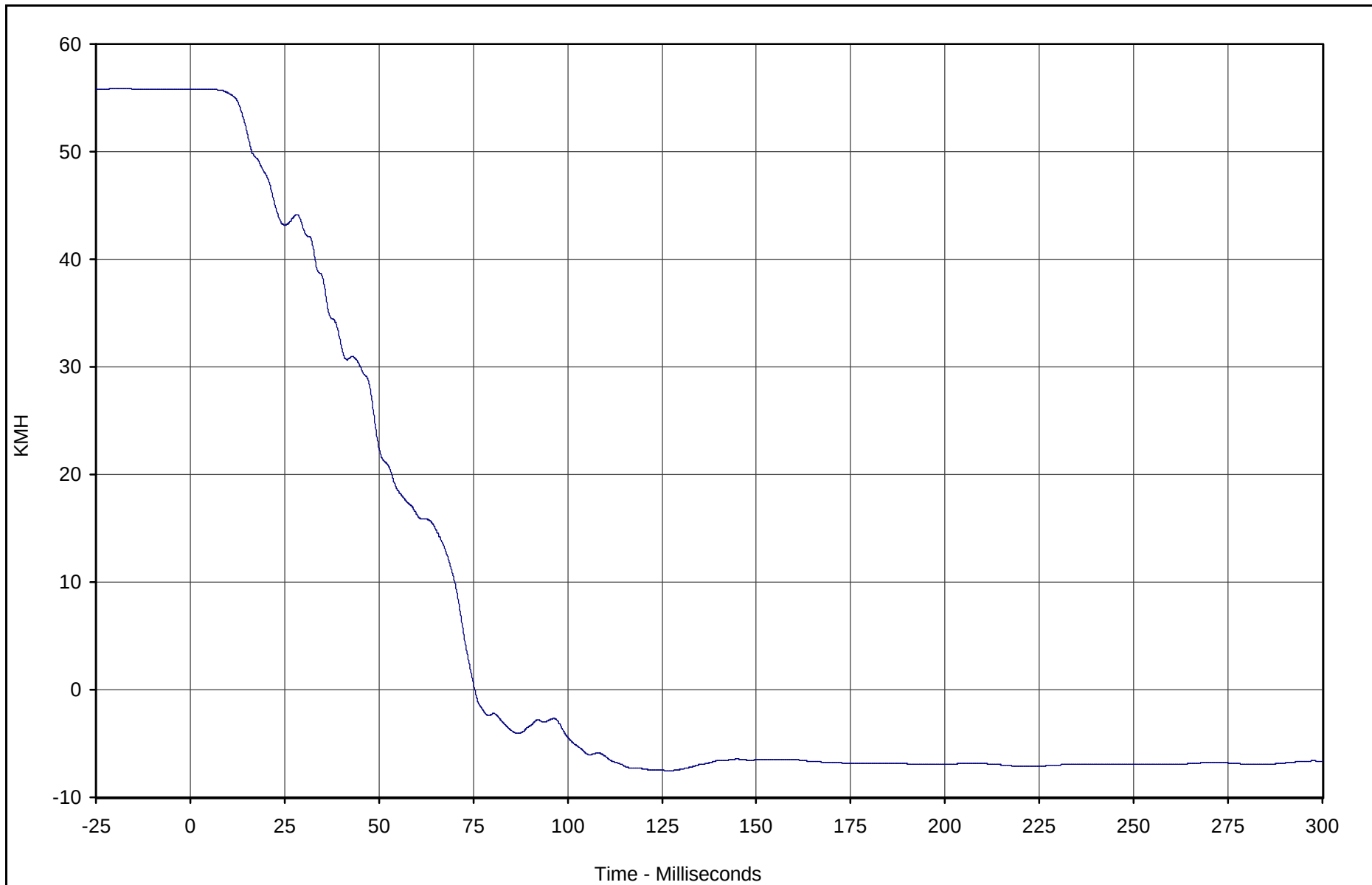


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel Velocity	095	IN1	KMH	55.8	4.3	-7.5	127.0	180

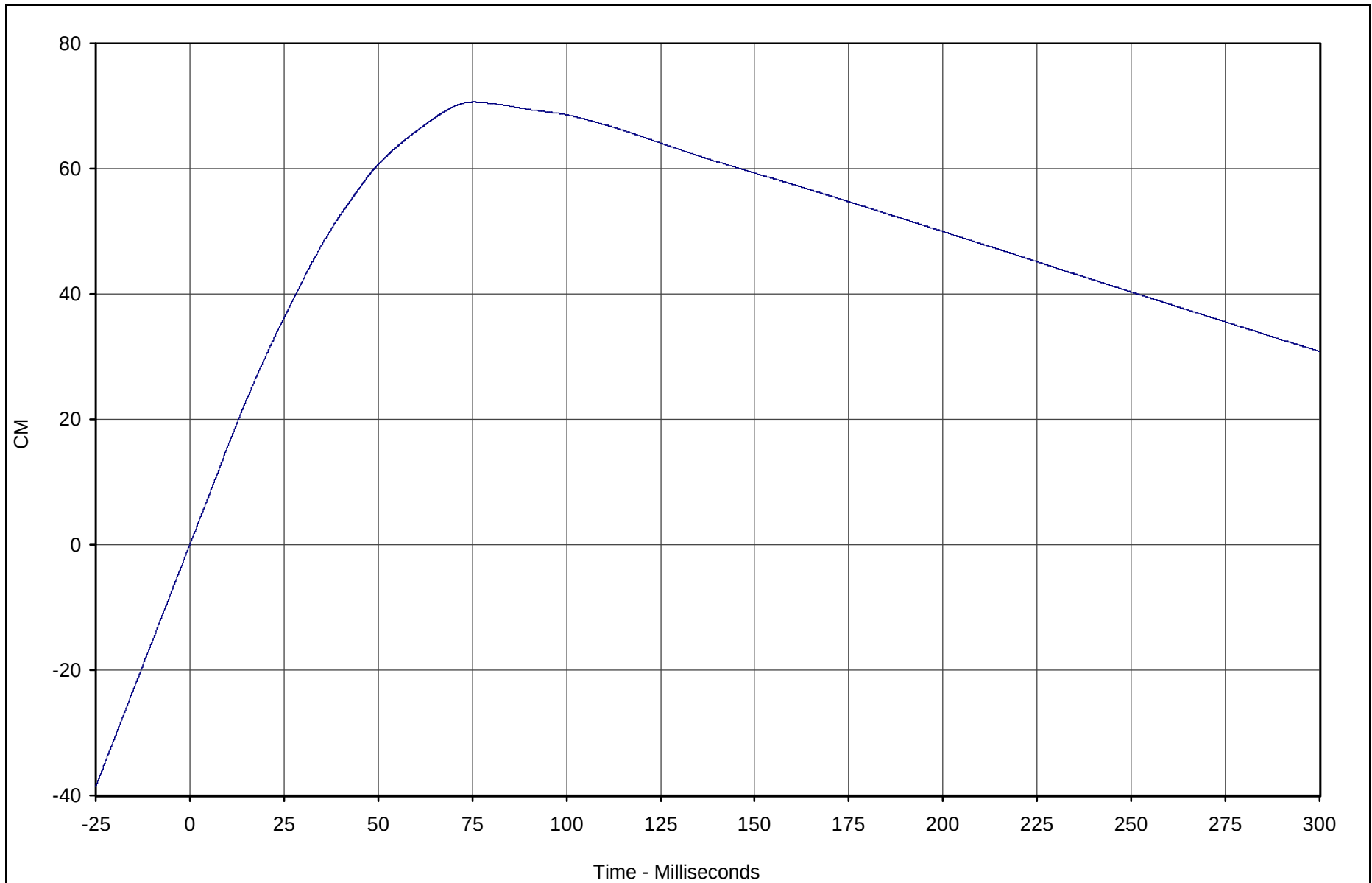


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel Displacement	095	IN2	CM	70.6	75.4	0.0	0.0	180

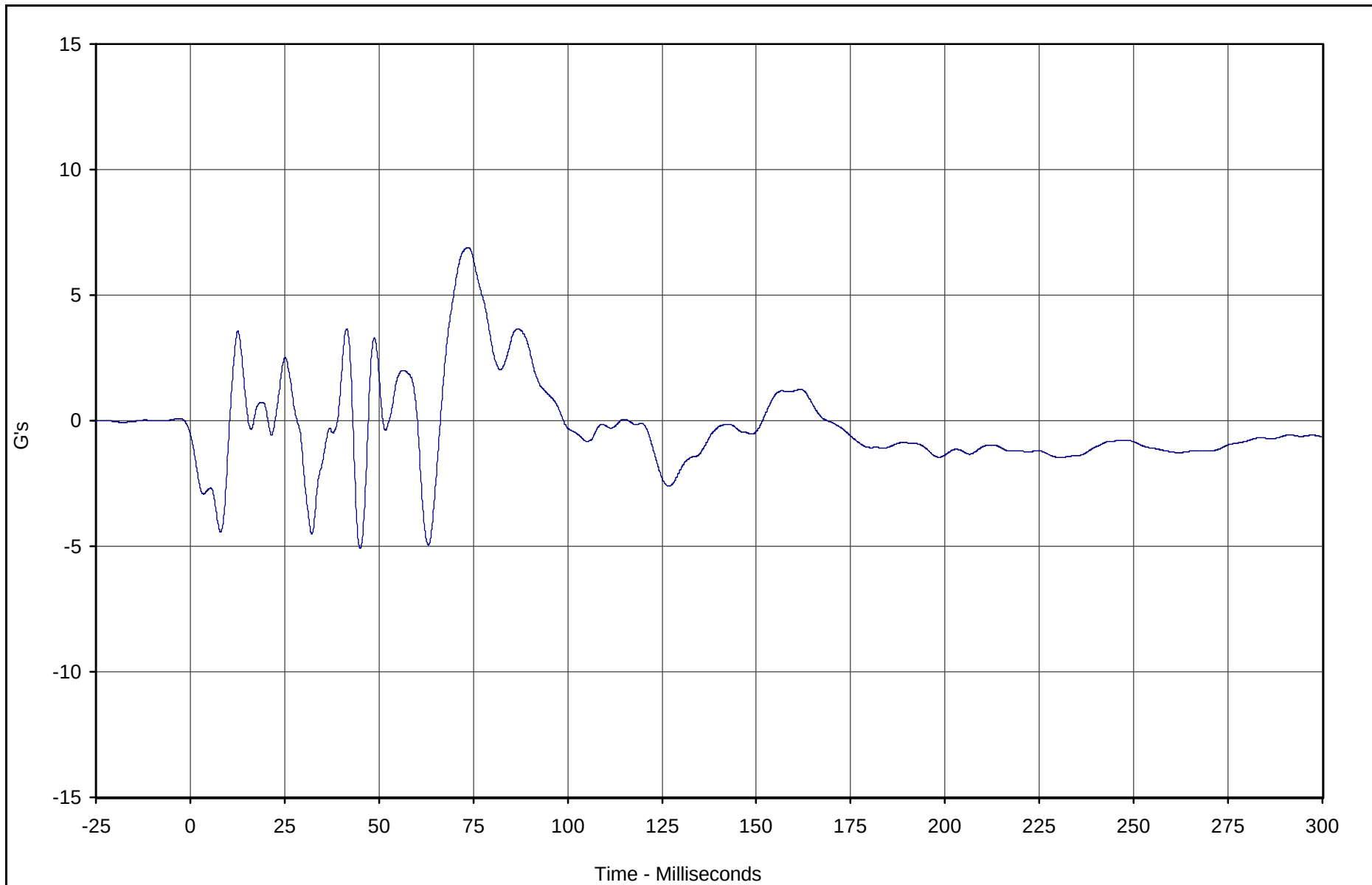


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z	096	FIL	G's	6.9	73.6	-5.1	45.1	60

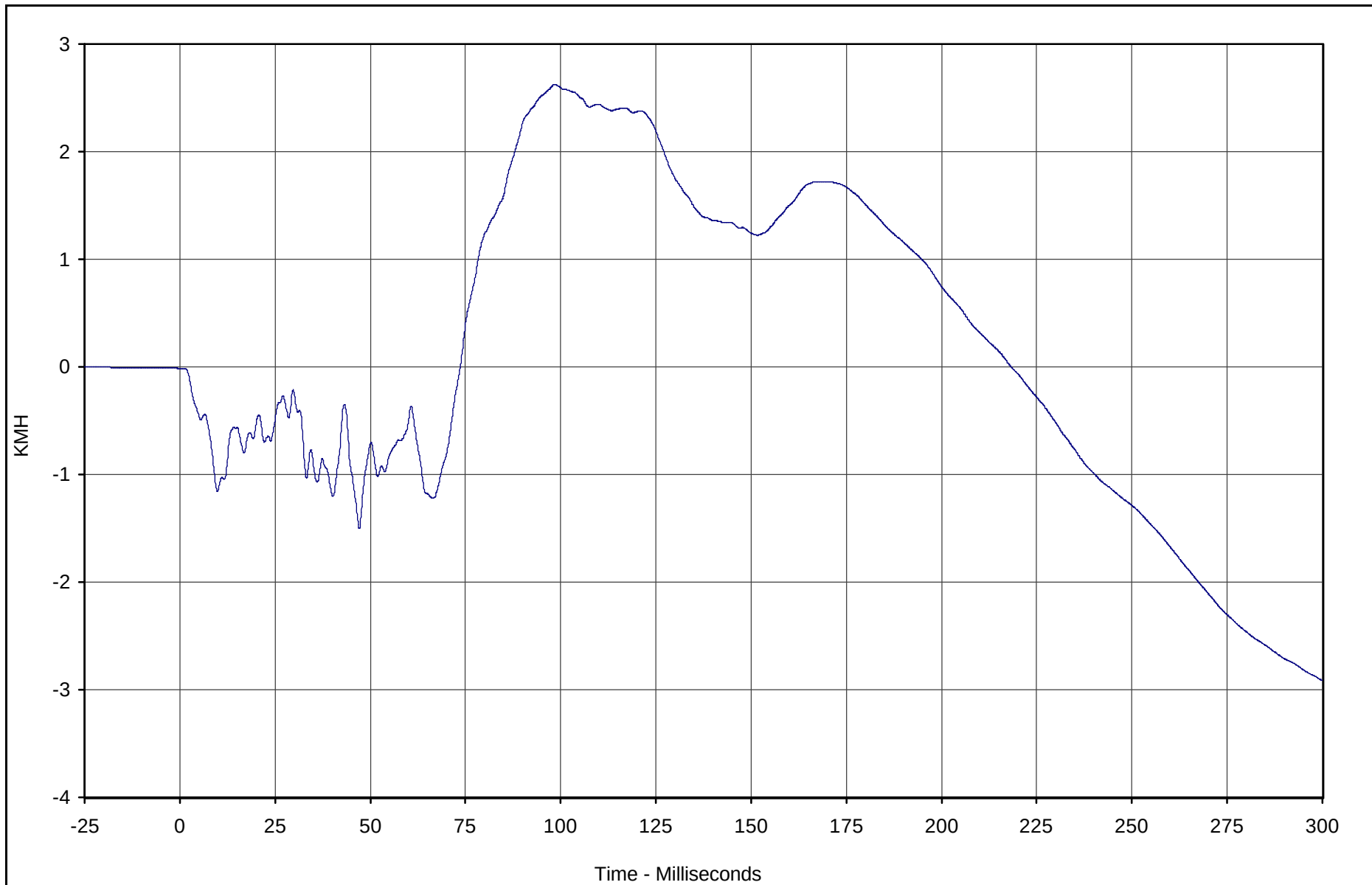


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z Velocity	096	IN1	KMH	2.6	98.4	-2.9	299.9	180

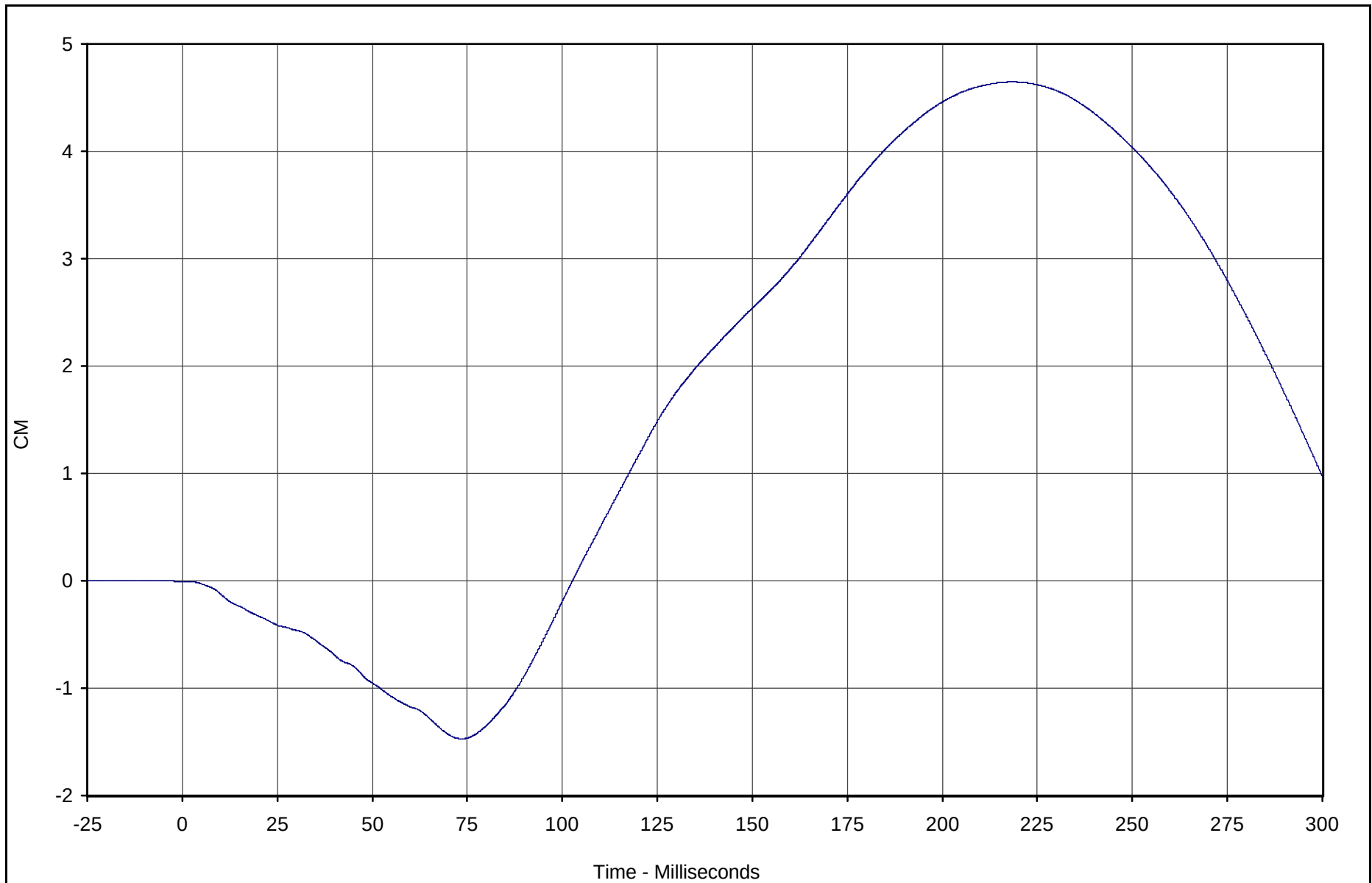


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z Displ.	096	IN2	CM	4.6	218.3	-1.5	73.6	180

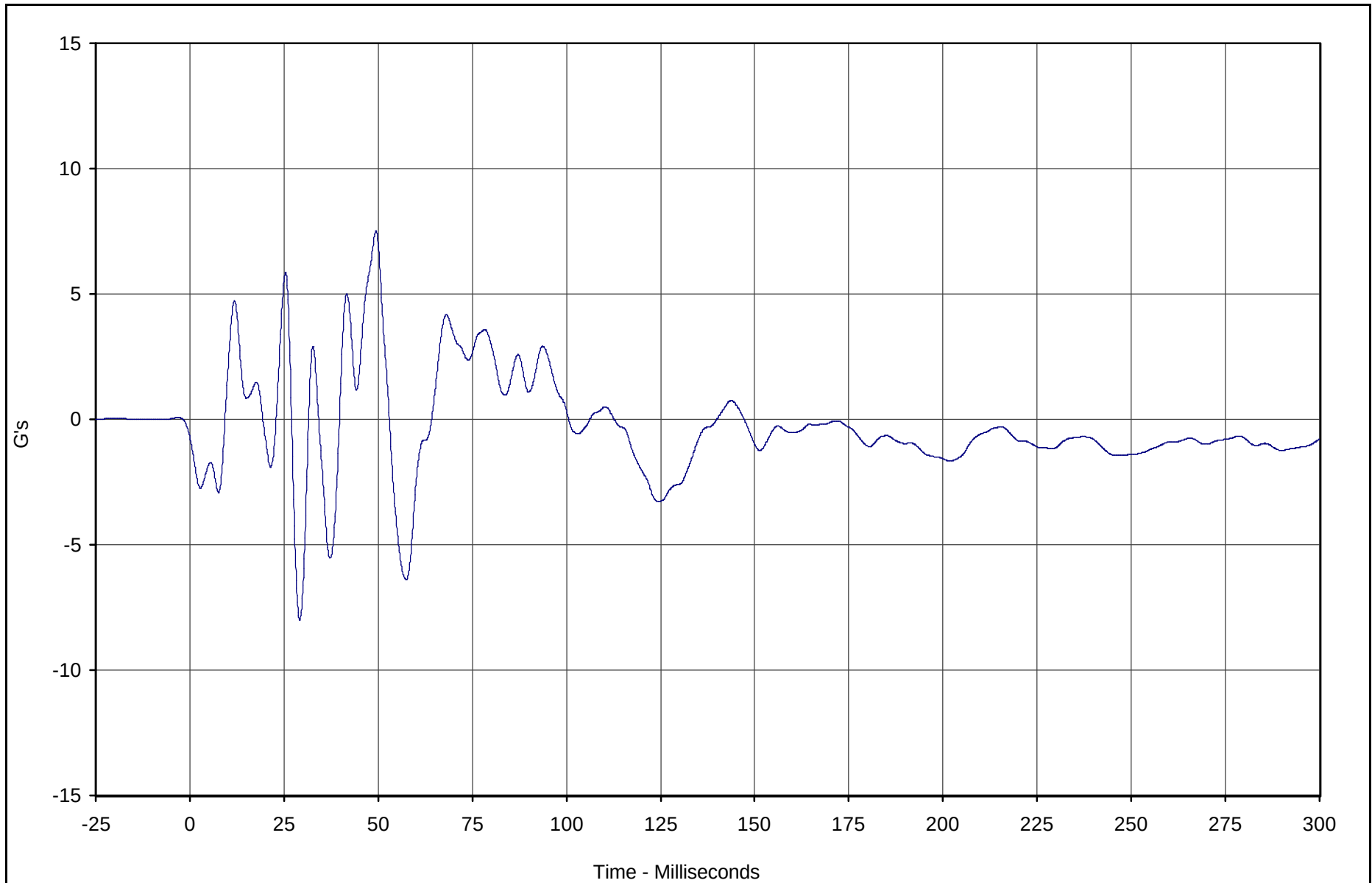


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z	097	FIL	G's	7.5	49.4	-8.0	29.2	60

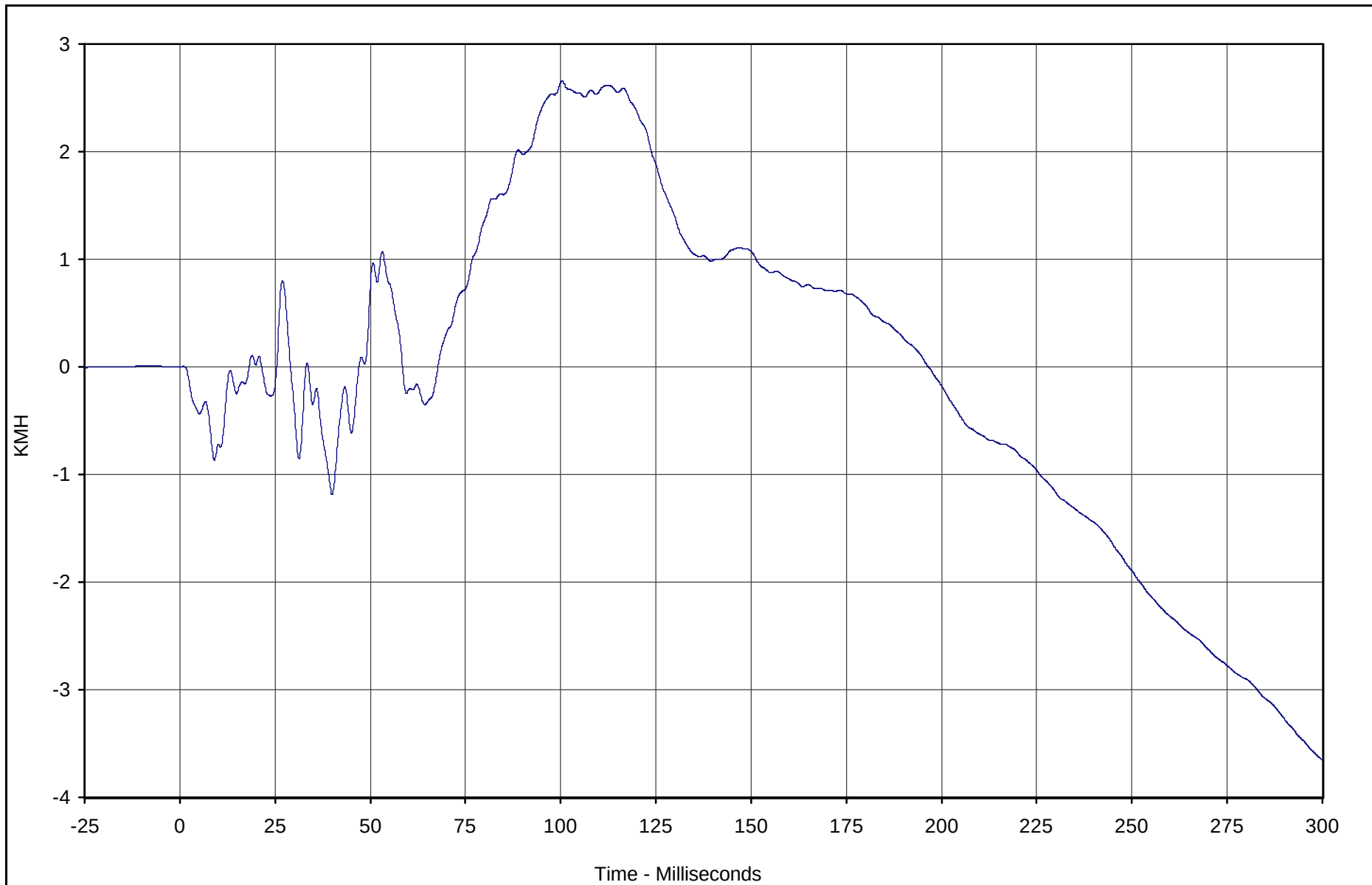


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z Velocity	097	IN1	KMH	2.7	100.4	-3.7	299.9	180

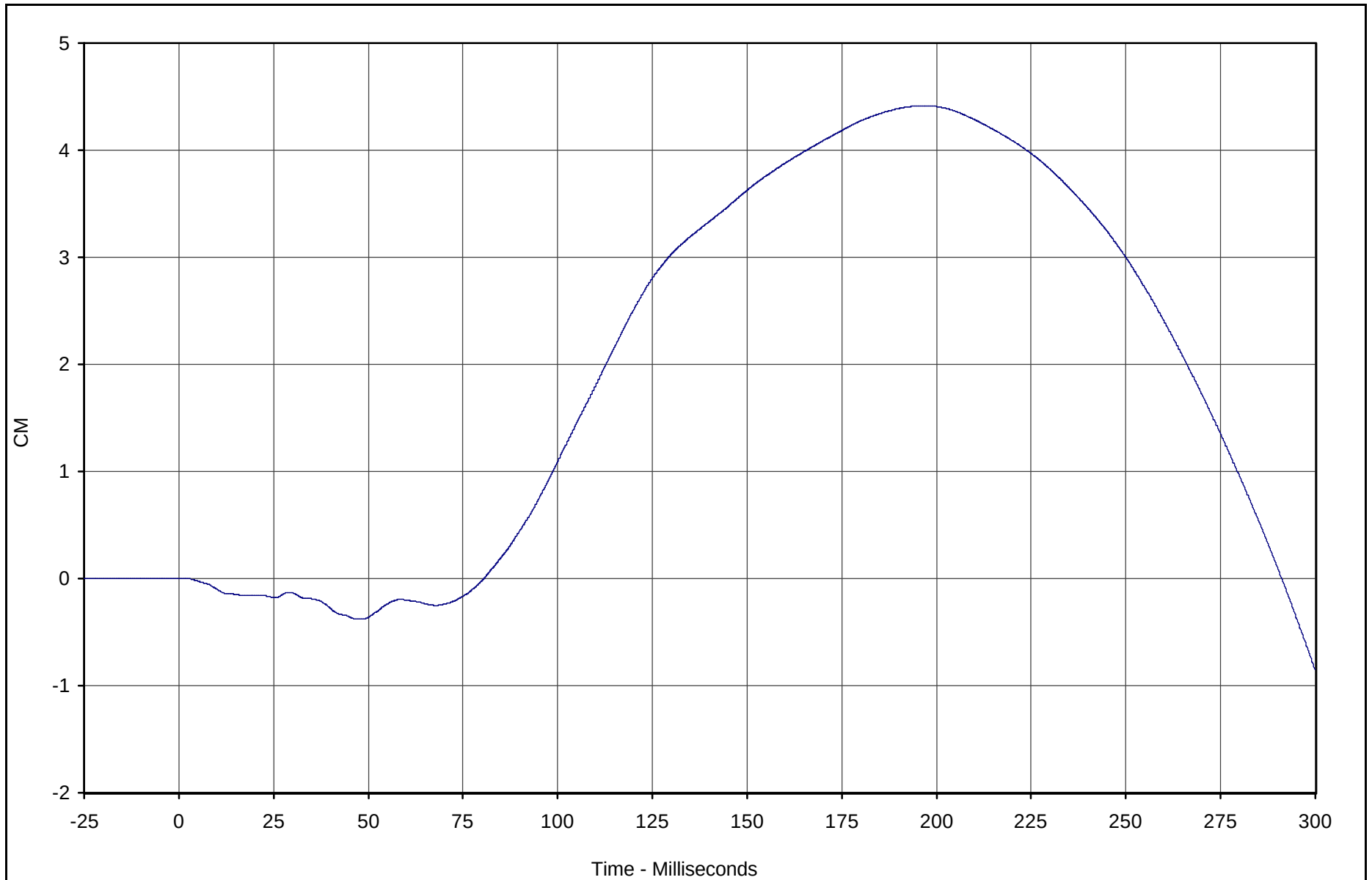


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z Displ.	097	IN2	CM	4.4	196.6	-0.8	299.9	180



Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

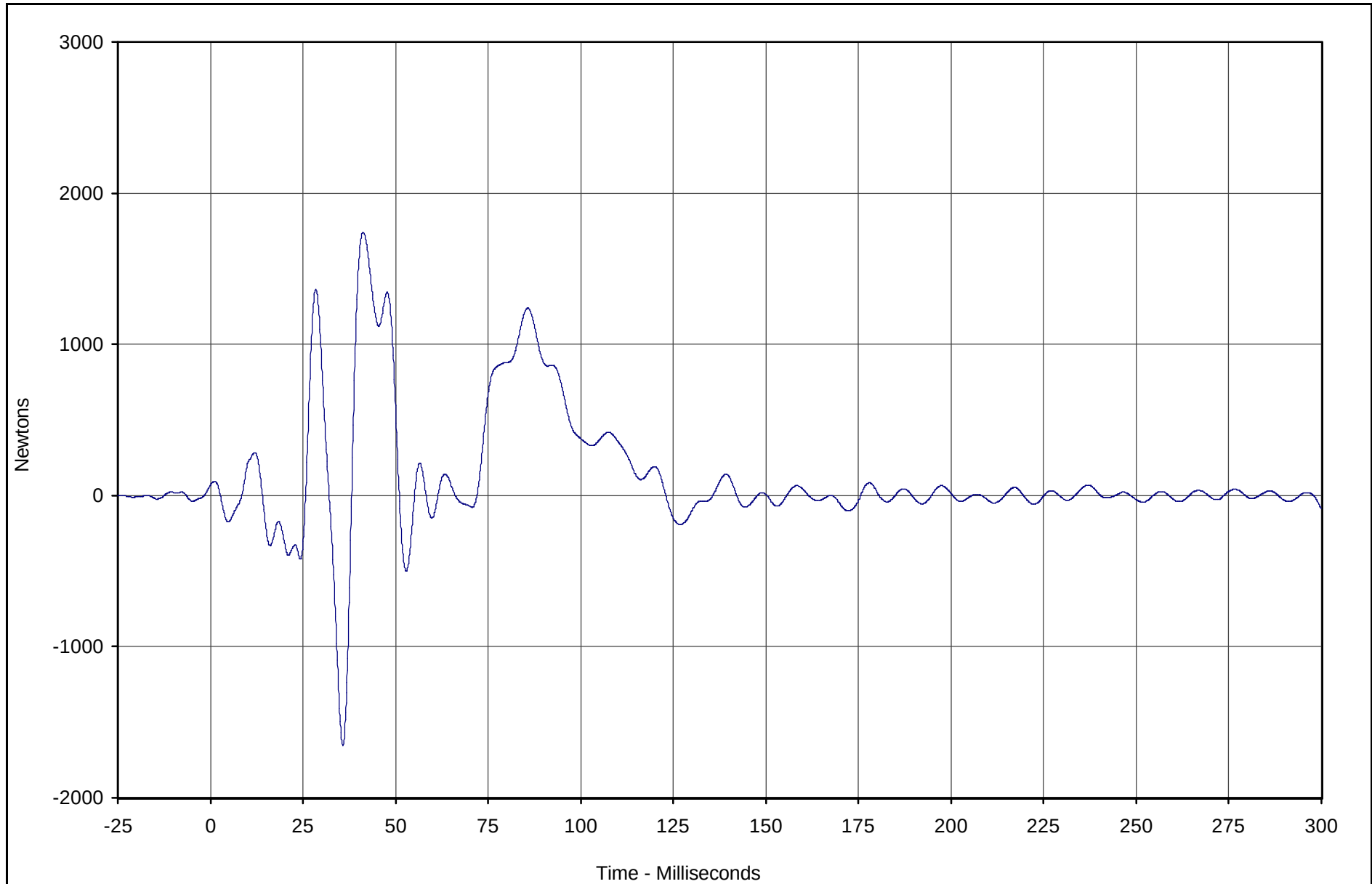
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

APPENDIX C

LOAD CELL BARRIER DATA PLOTS

C-1



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A1	098	FIL	Newtons	1740.4	41.2	-1657.6	35.8	60

Test Vehicle: 2003 BMW X5 3.0i SUV

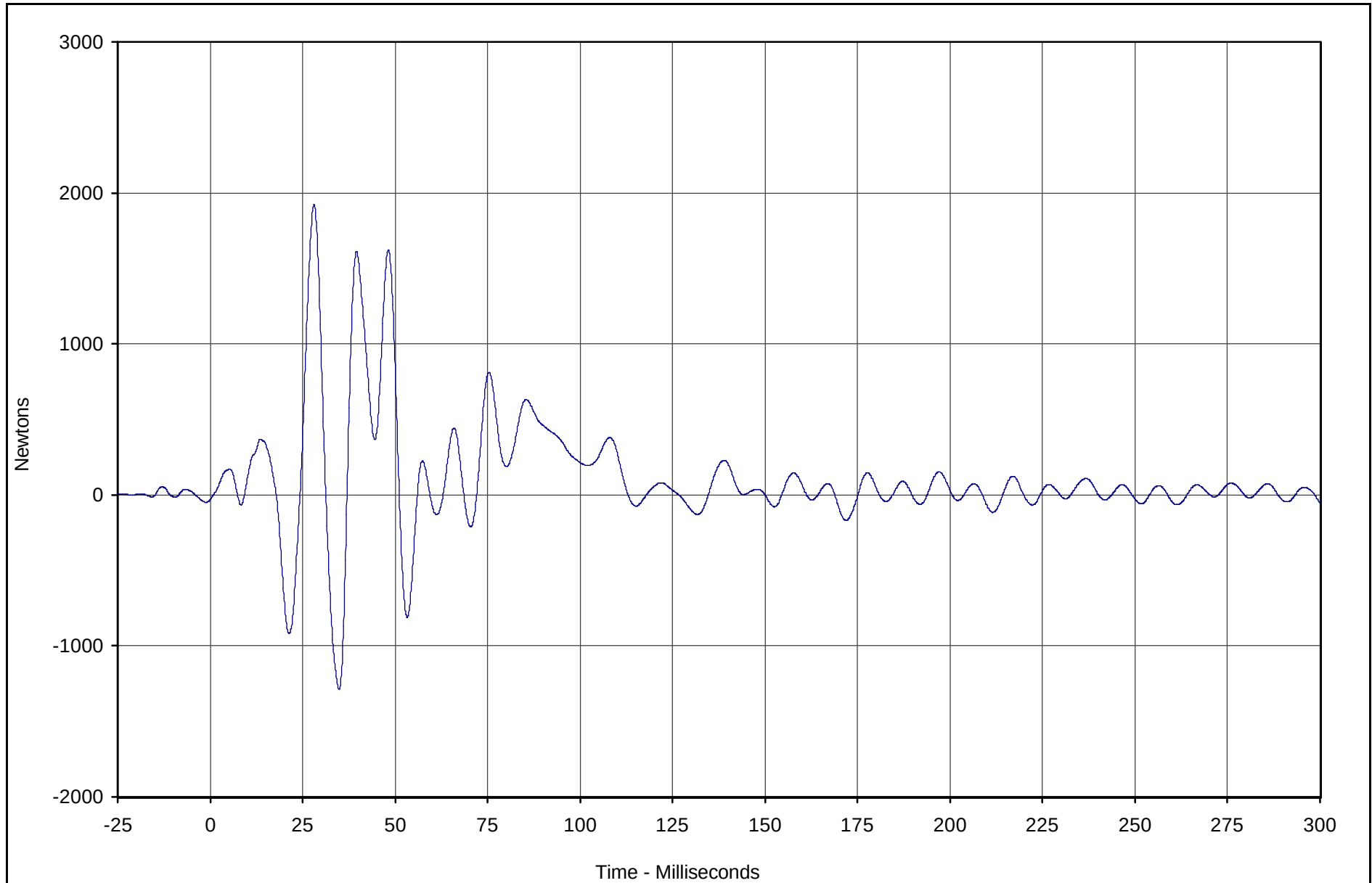
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A2	099	FIL	Newtons	1923.1	28.1	-1289.6	34.9	60

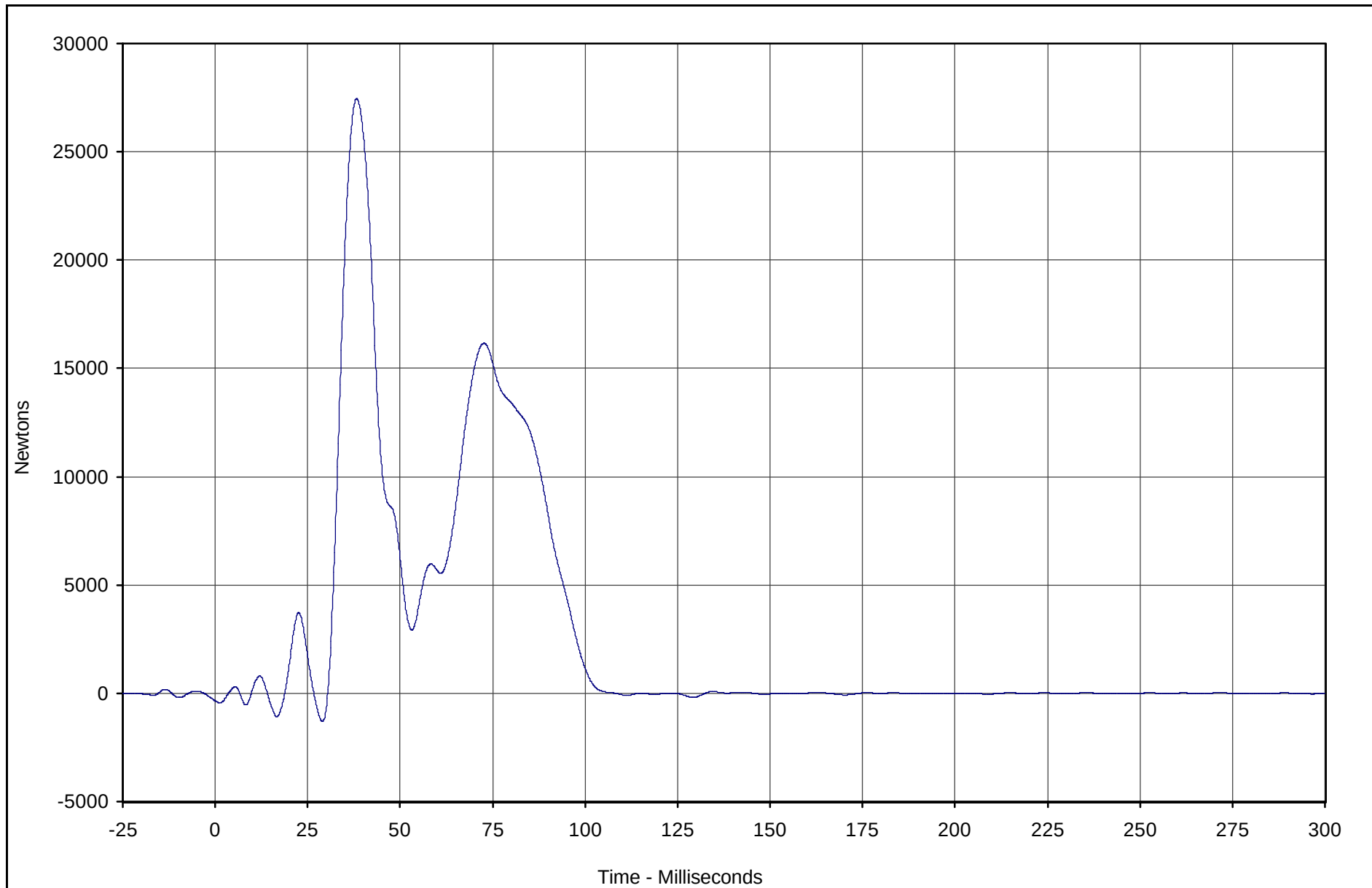
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A3	100	FIL	Newtons	27442.3	38.3	-1306.0	29.0	60

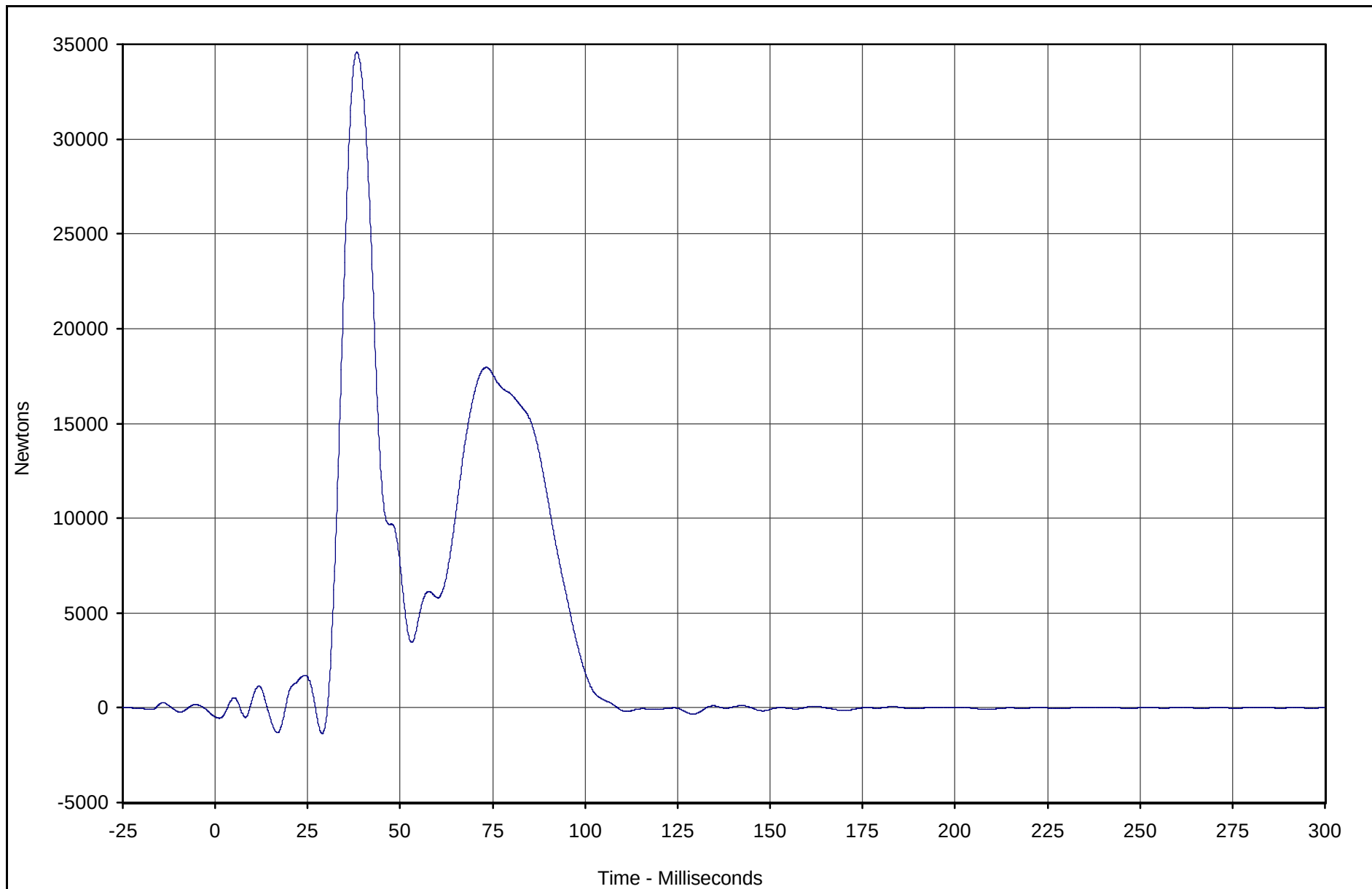
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A4	101	FIL	Newtons	34583.1	38.3	-1350.9	28.9	60

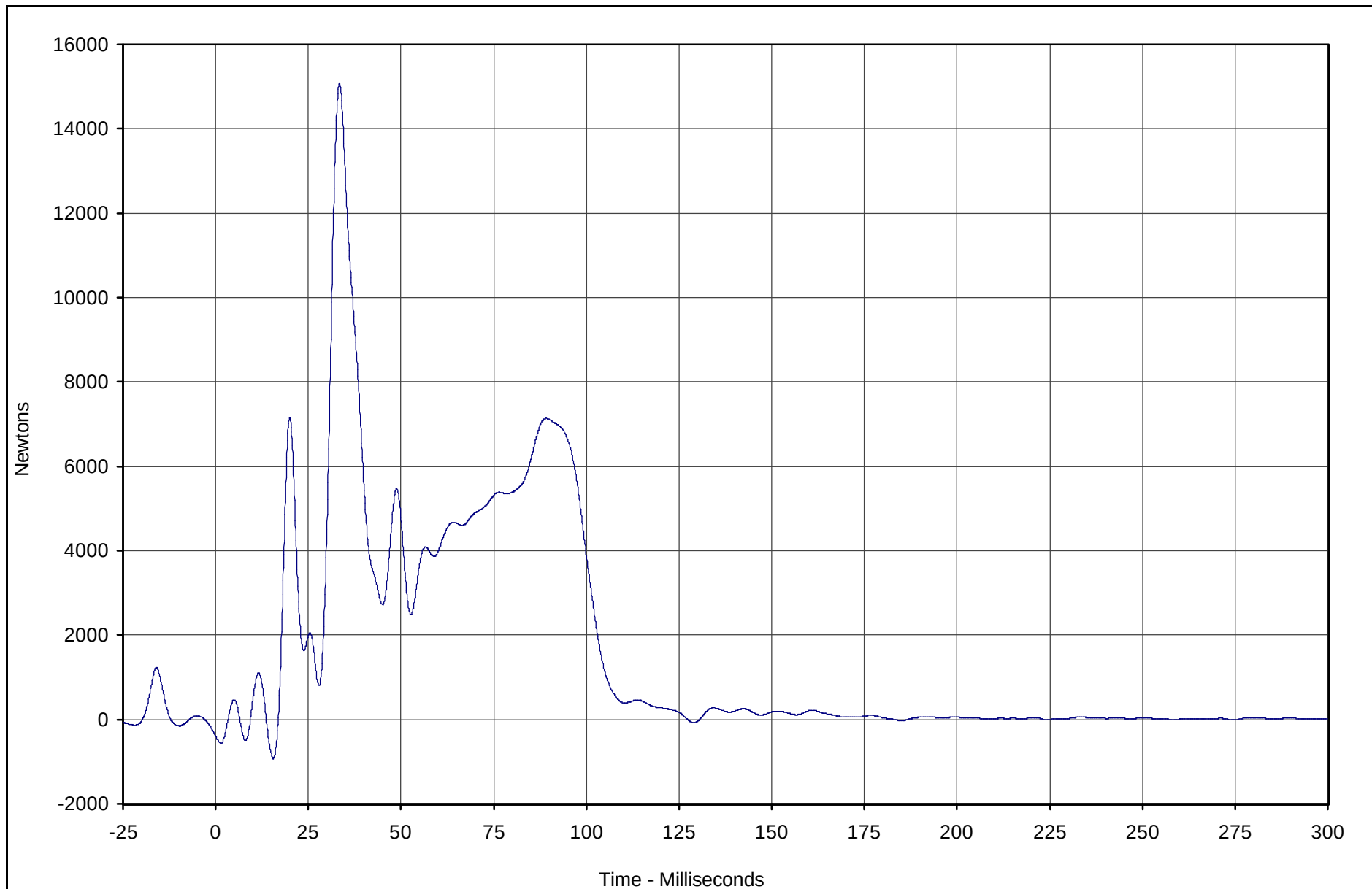
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A5	102	FIL	Newtons	15077.0	33.4	-927.2	15.5	60

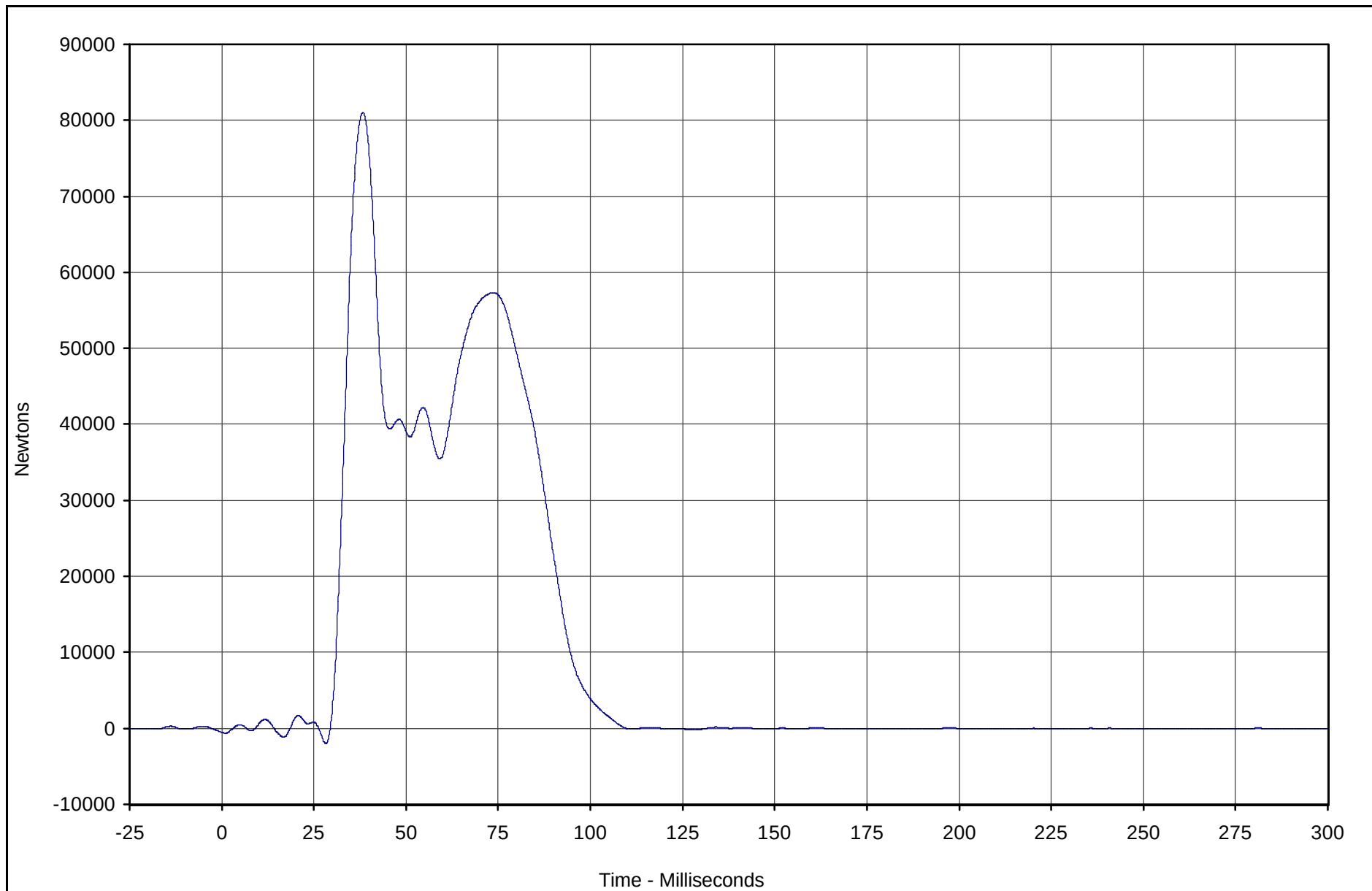
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A6	103	FIL	Newtons	81038.5	38.3	-1983.1	28.2	60

Test Vehicle: 2003 BMW X5 3.0i SUV

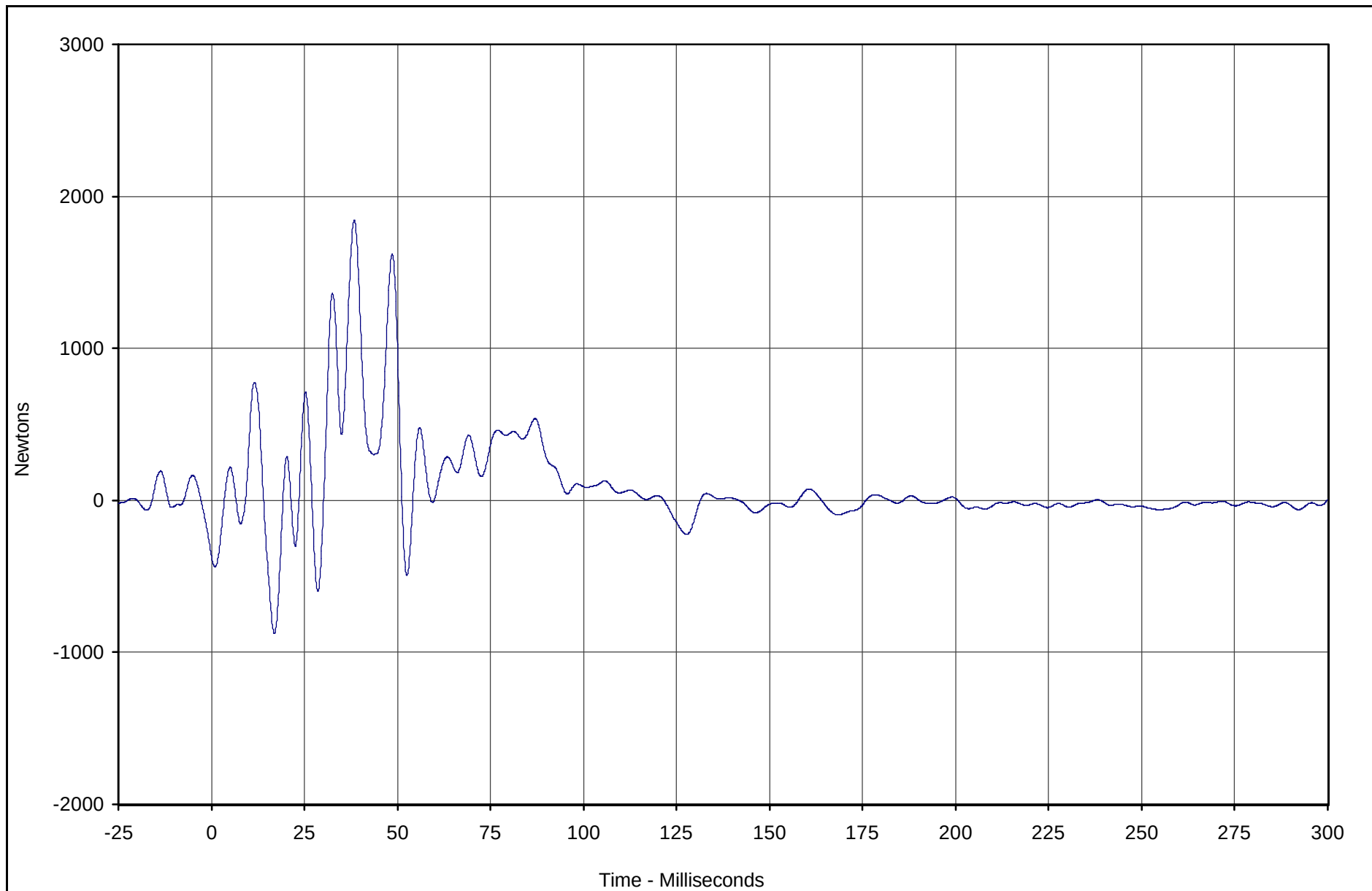
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



C-7



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A7	104	FIL	Newtons	1844.4	38.4	-875.9	16.9	60

Test Vehicle: 2003 BMW X5 3.0i SUV

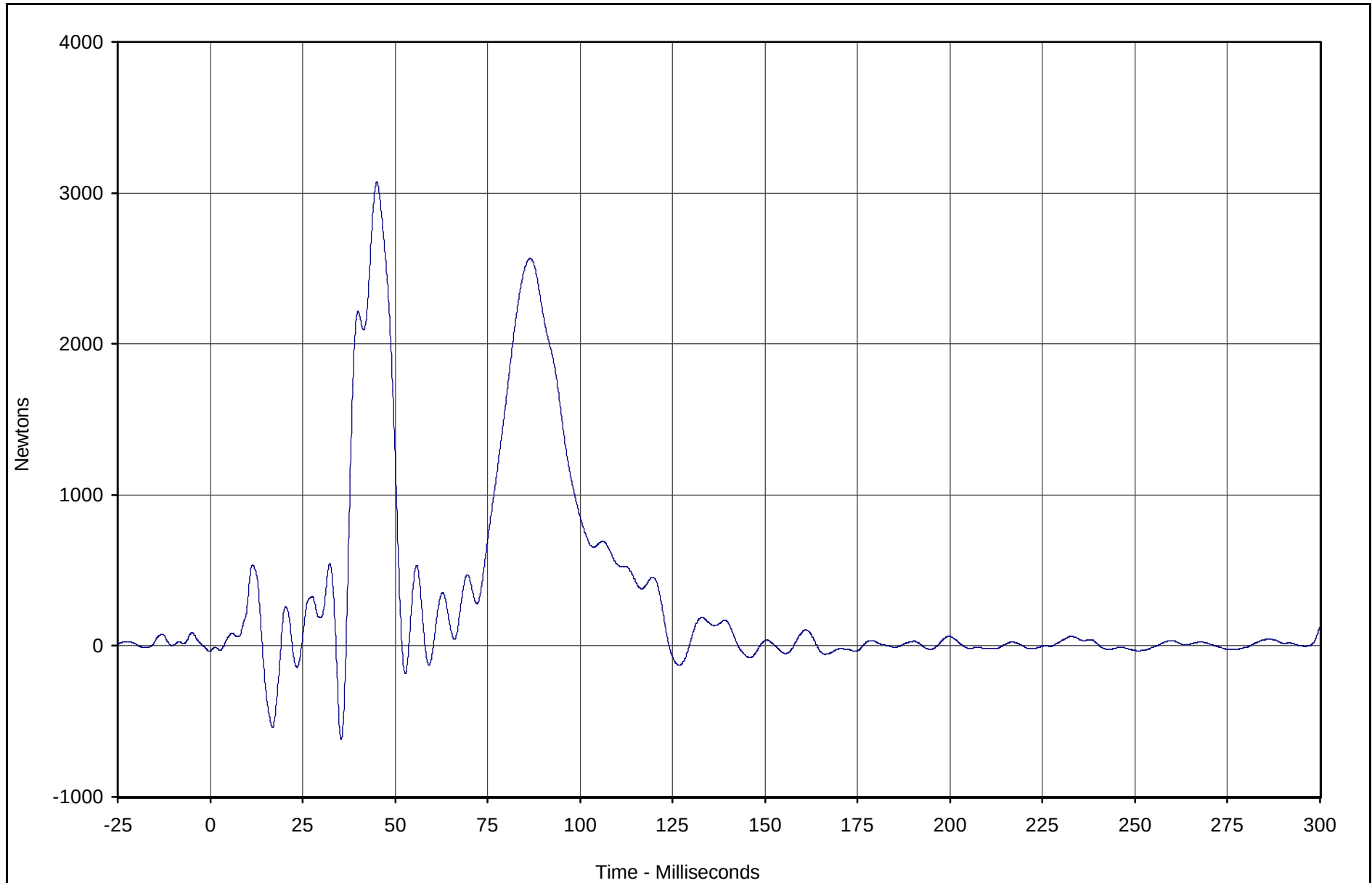
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A8	105	FIL	Newtons	3070.1	45.1	-619.1	35.5	60

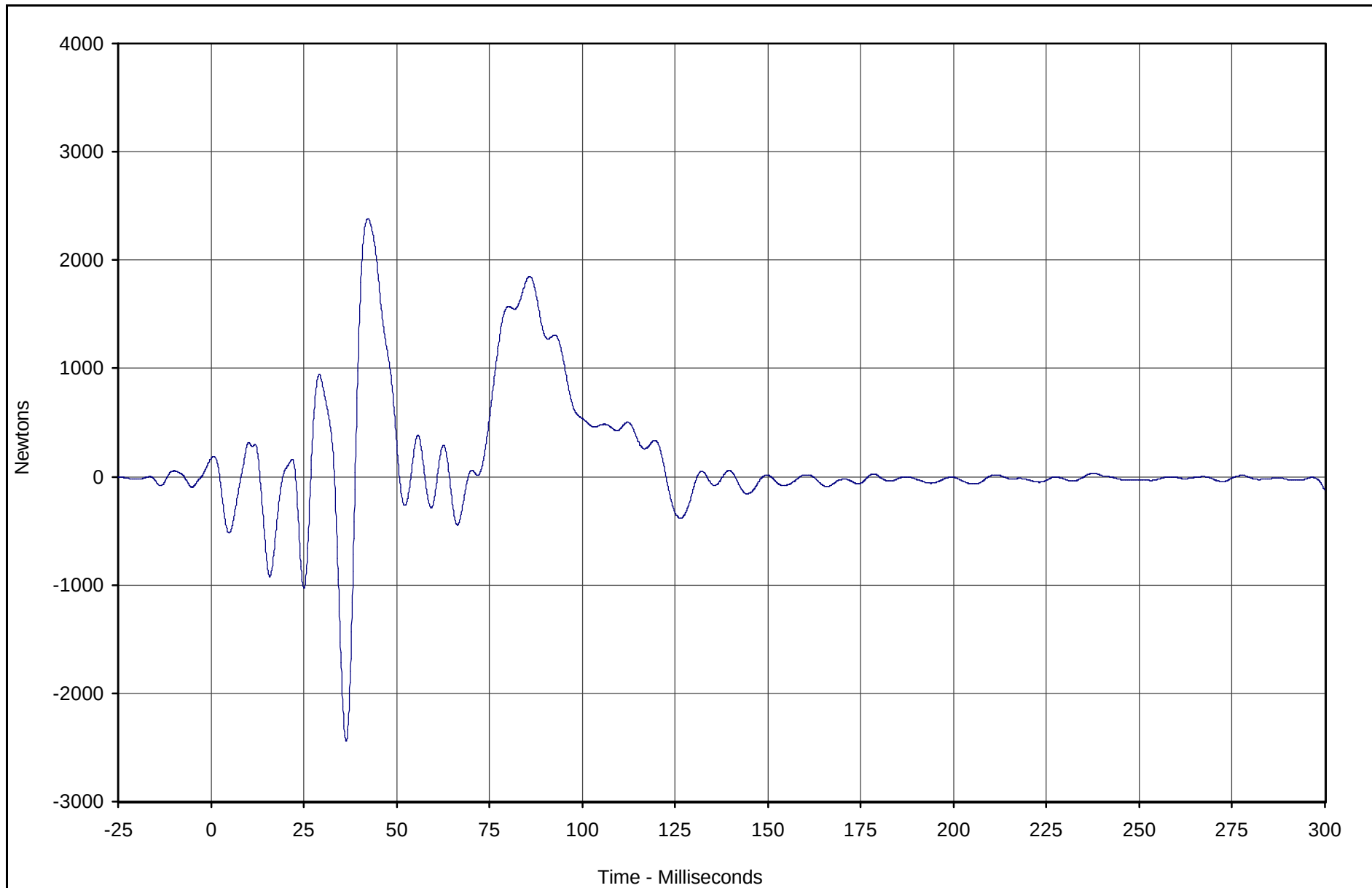


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A9	106	FIL	Newtons	2385.5	42.3	-2443.8	36.4	60

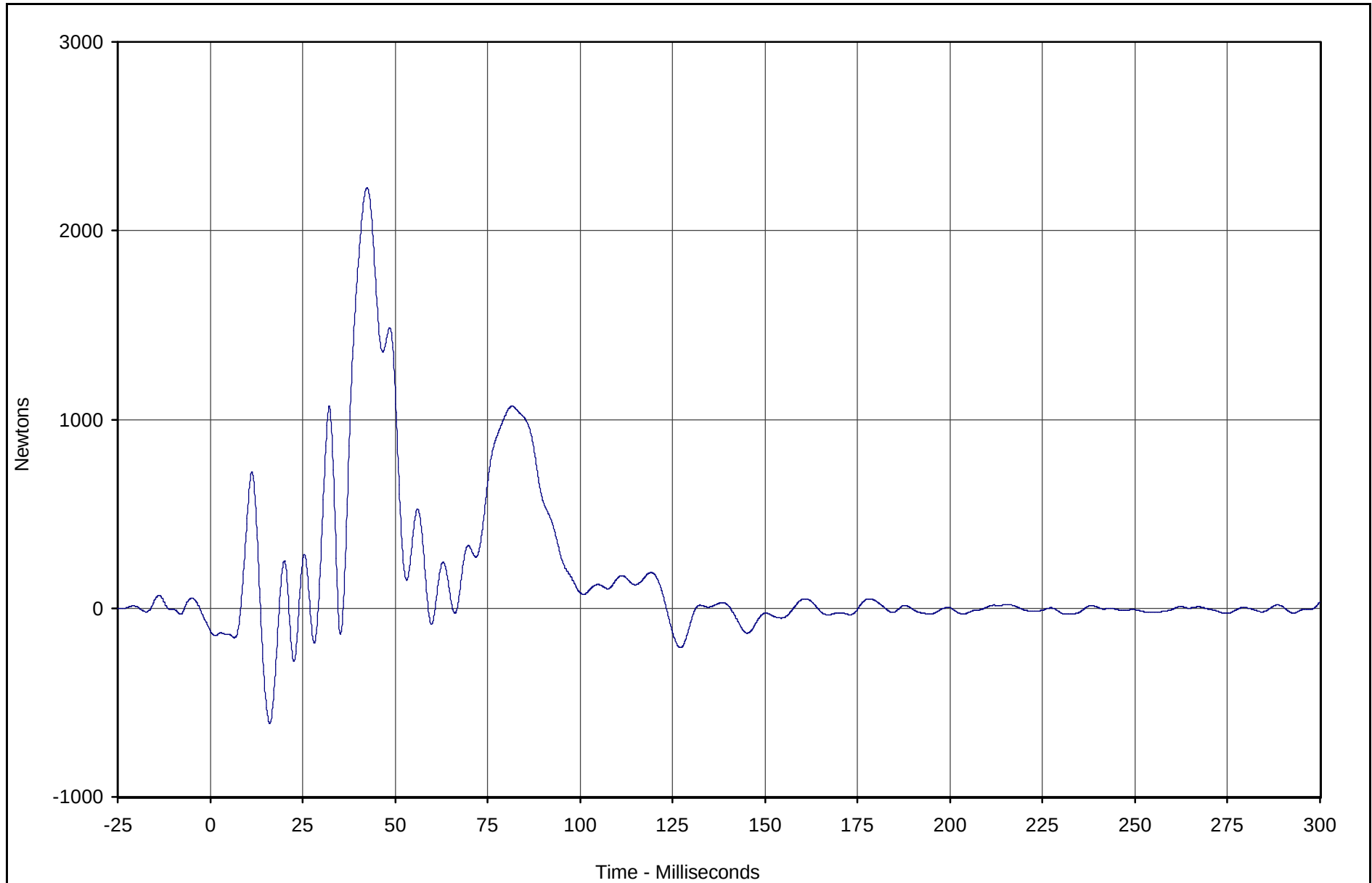
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B1	107	FIL	Newtons	2227.4	42.4	-613.5	16.2	60



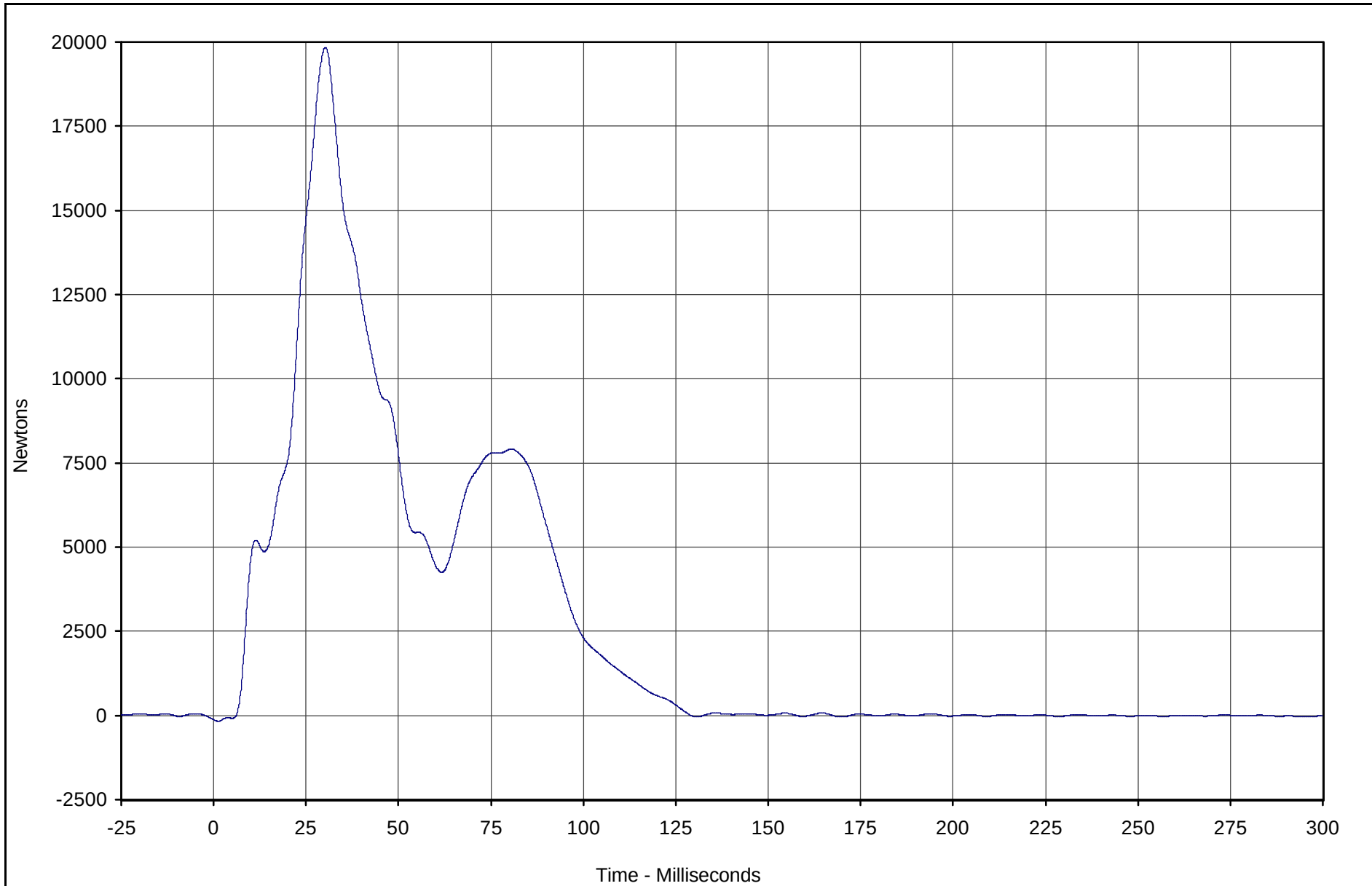
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

C-11



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B2	108	FIL	Newtons	19832.7	30.2	-169.9	1.3	60

Test Vehicle: 2003 BMW X5 3.0i SUV

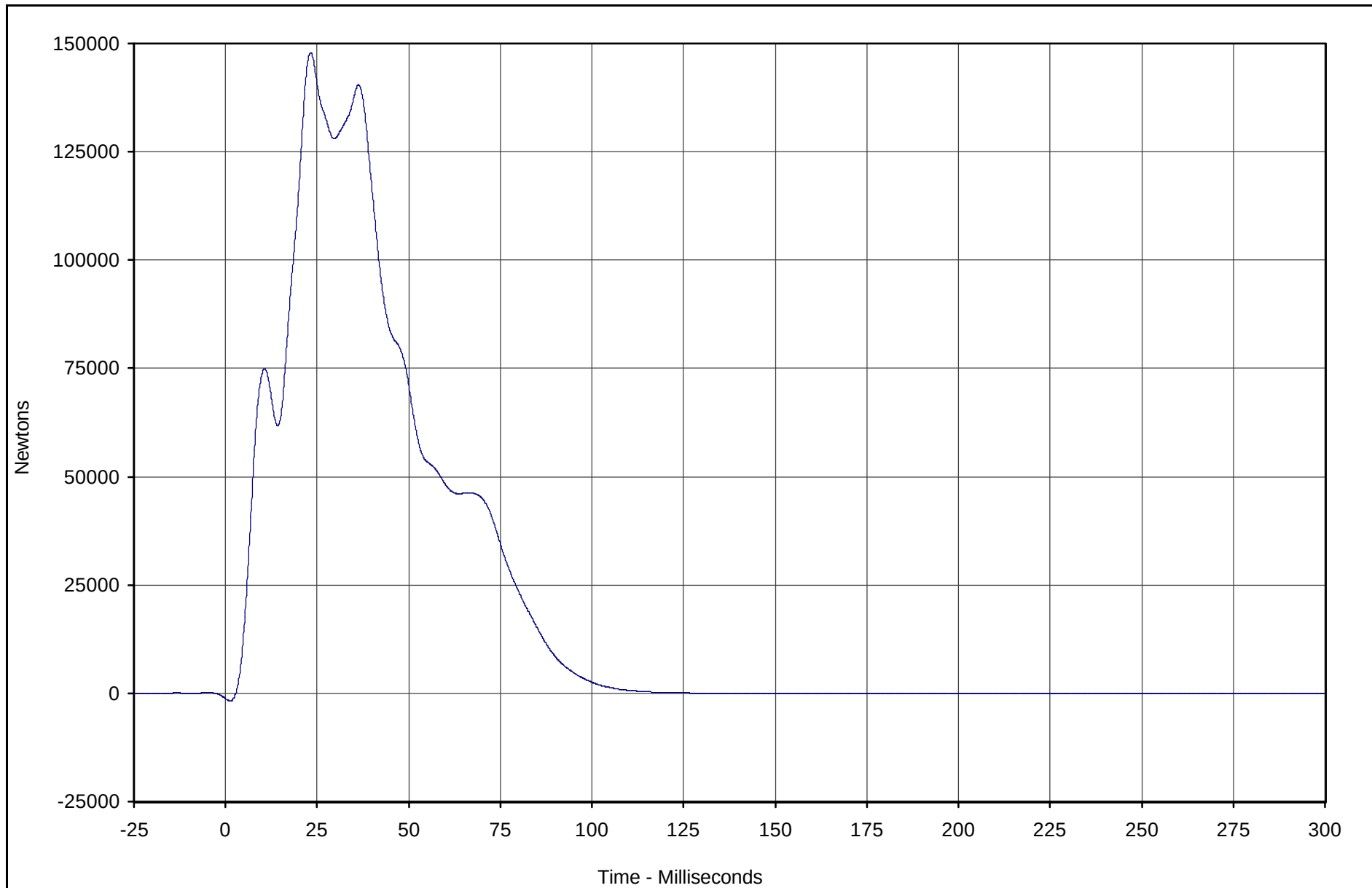
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B3	109	FIL	Newtons	147893.1	23.2	-1757.3	1.3	60

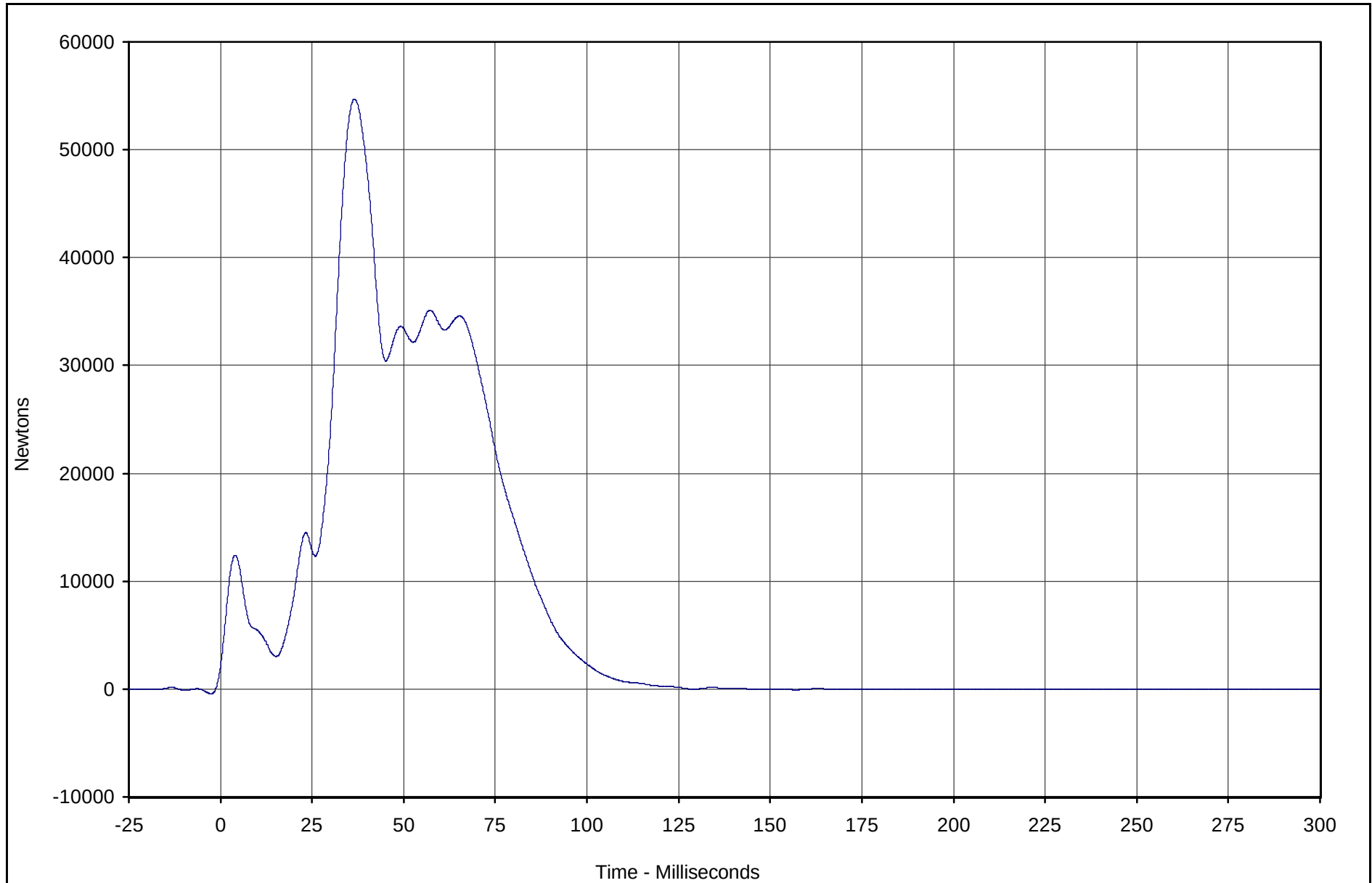


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B4	110	FIL	Newtons	54681.1	36.6	-64.0	157.0	60

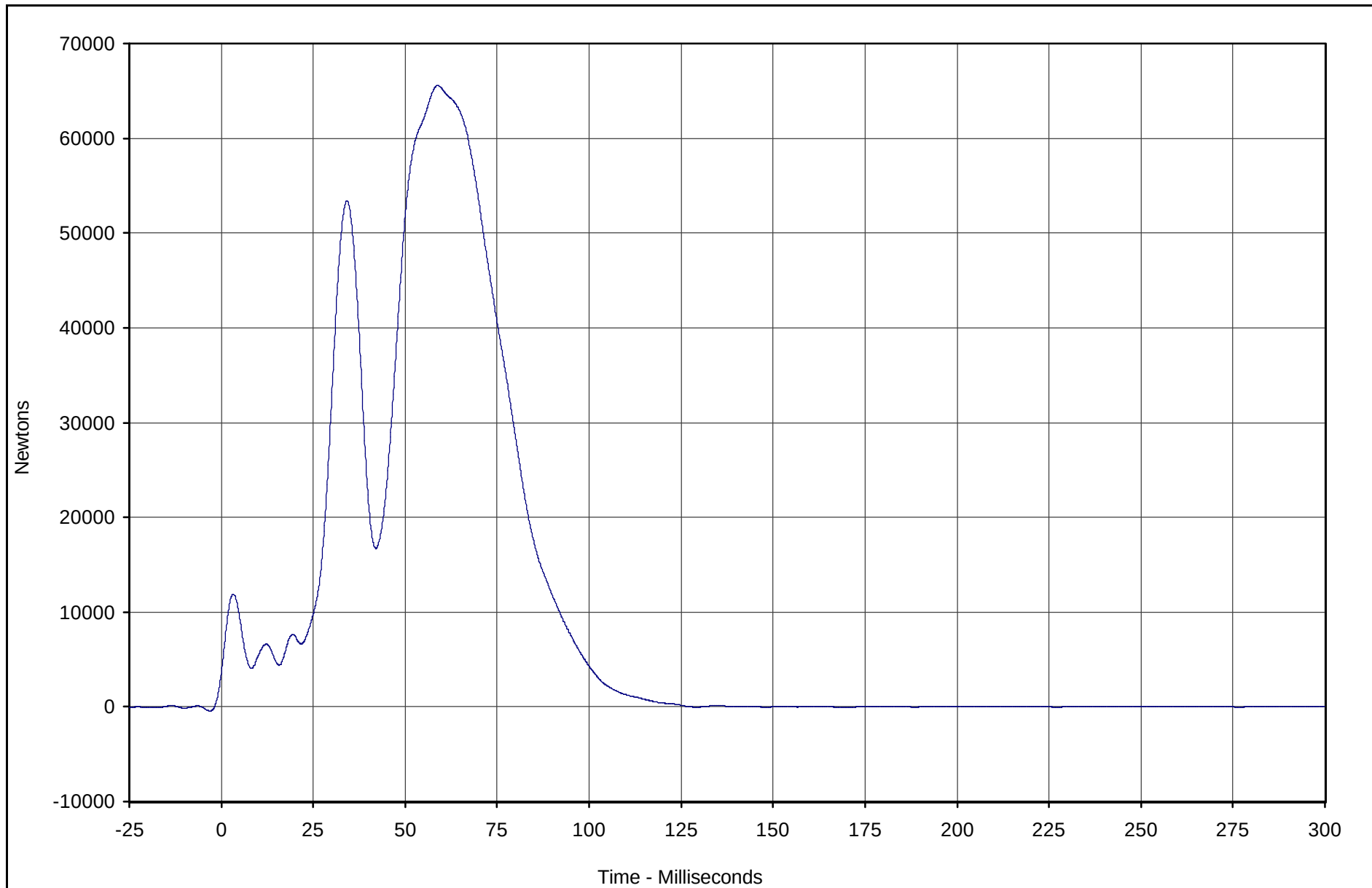
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B5	111	FIL	Newtons	65552.1	58.8	-27.8	171.0	60

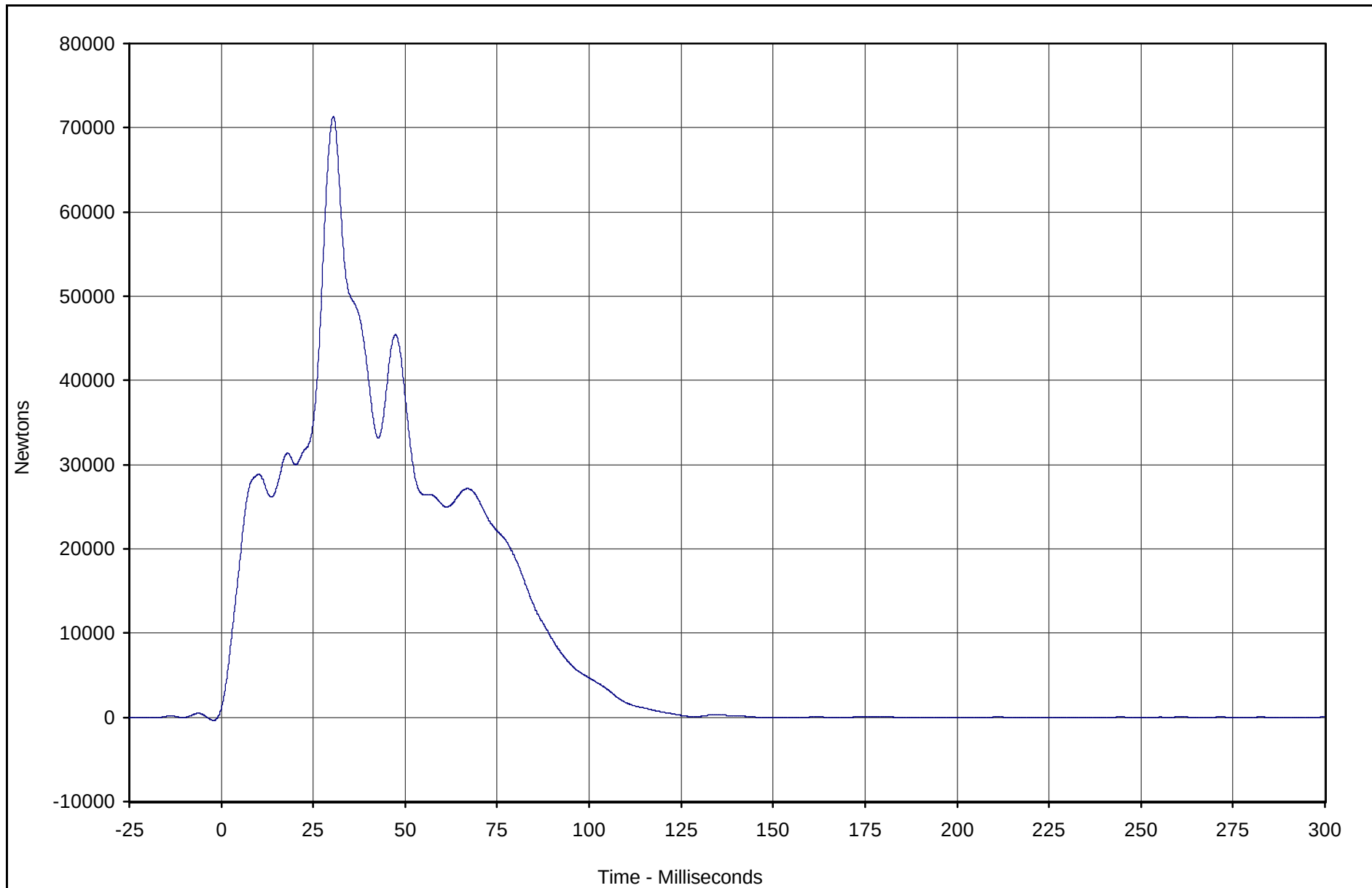
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B6	112	FIL	Newtons	71322.6	30.5	-71.5	156.3	60

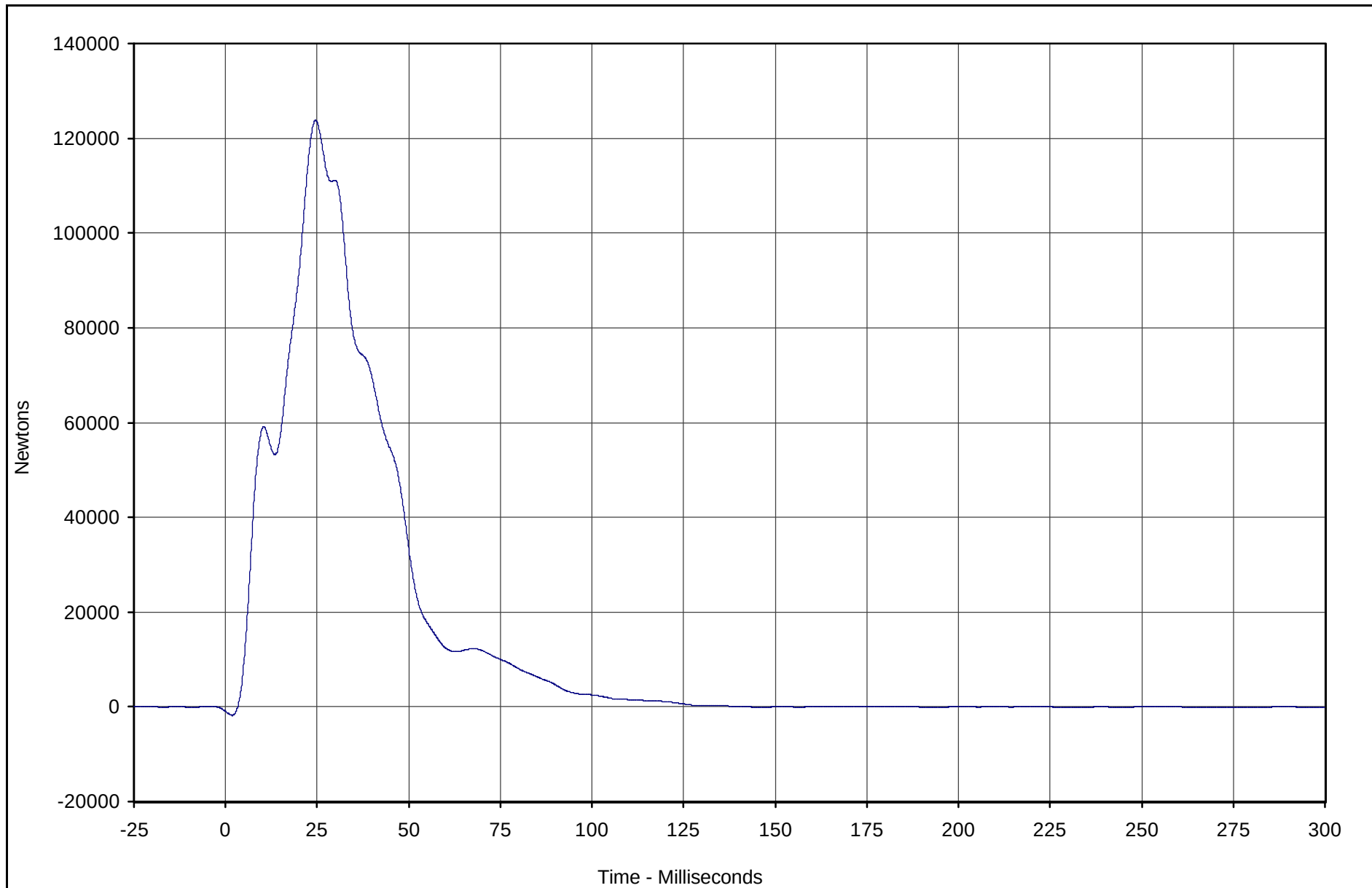


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B7	113	FIL	Newtons	123773.0	24.6	-1808.8	1.8	60

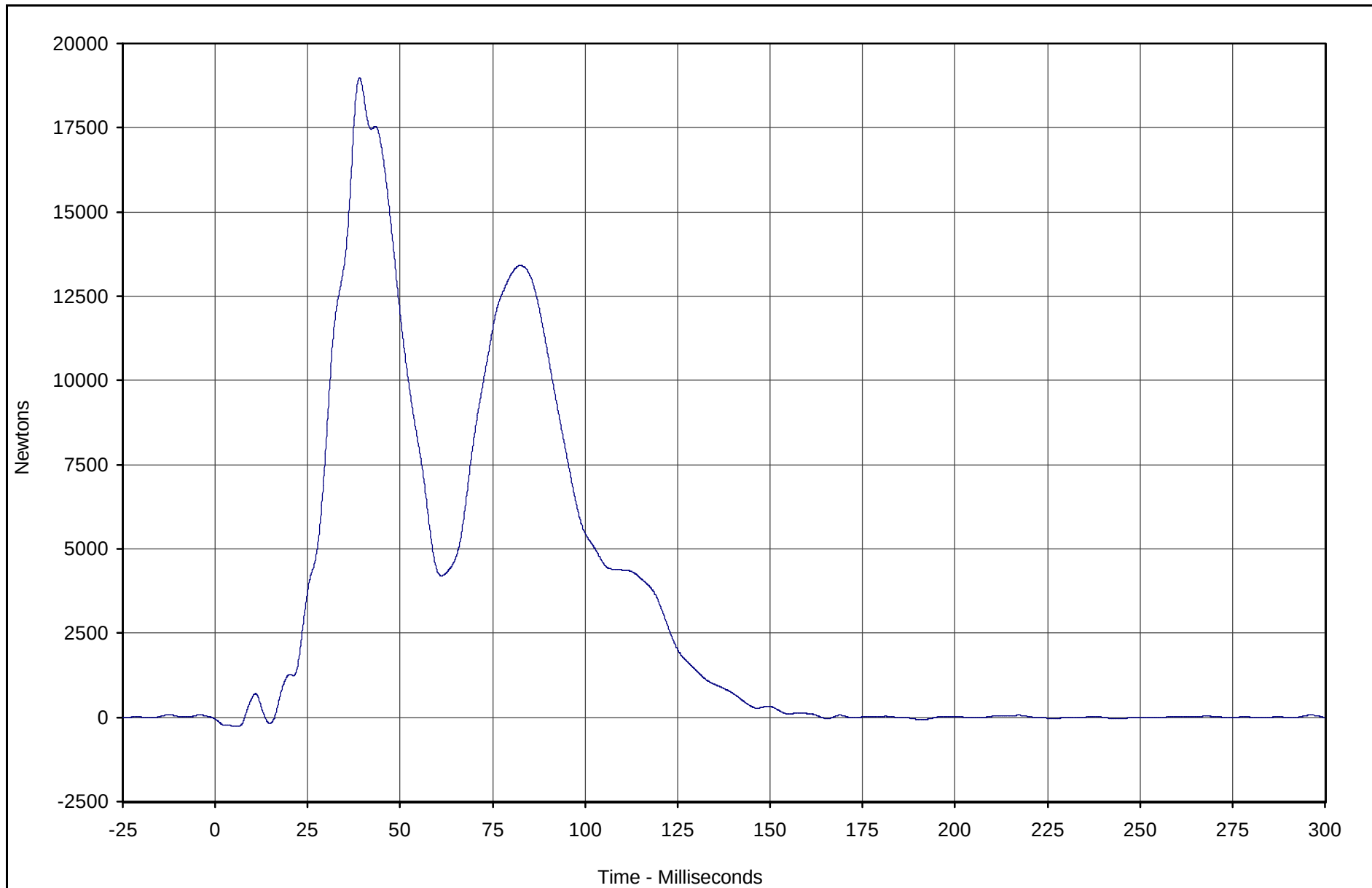


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B8	114	FIL	Newtons	18970.3	39.0	-270.0	5.9	60

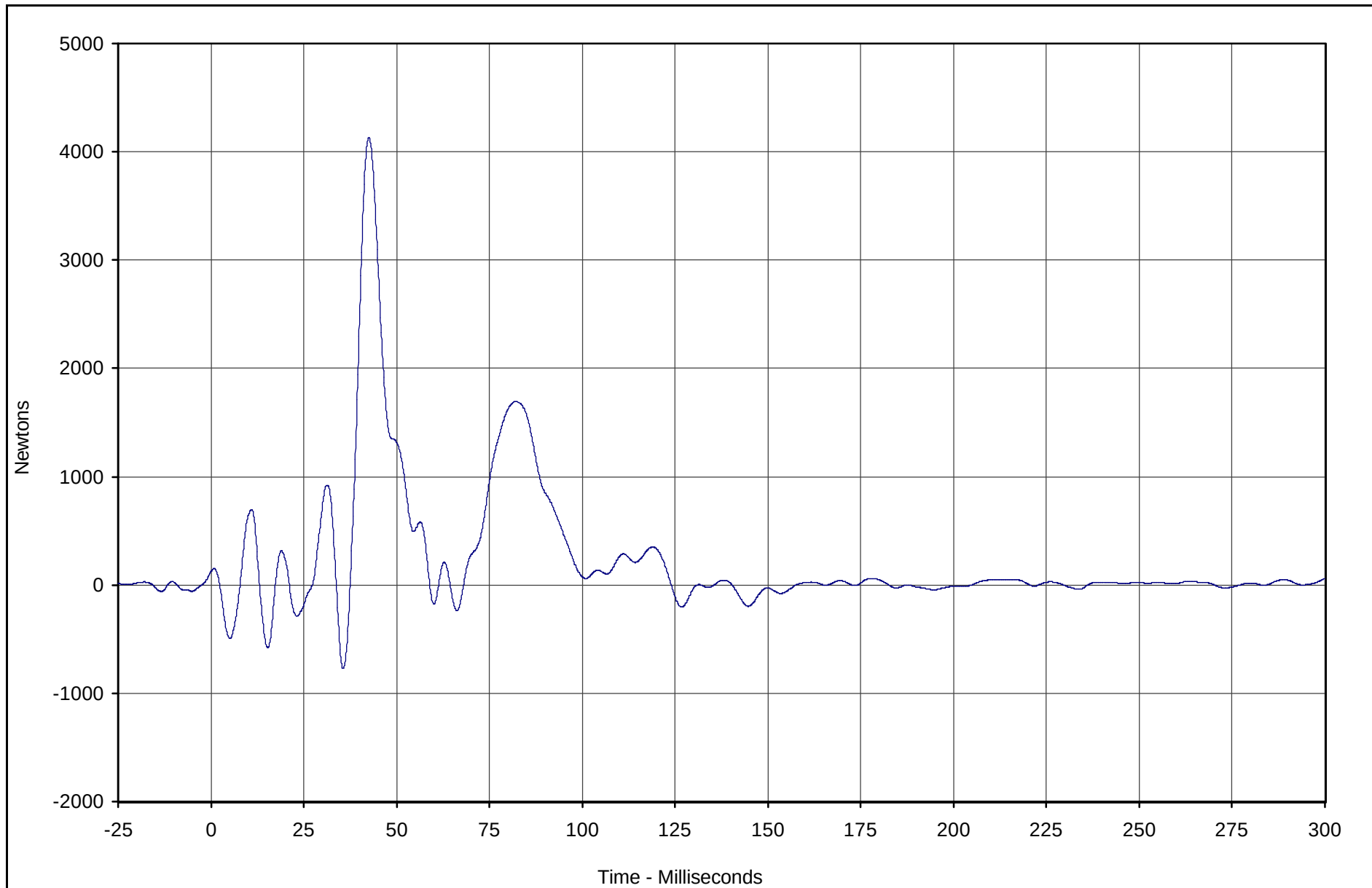


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B9	115	FIL	Newtons	4127.3	42.5	-771.9	35.6	60

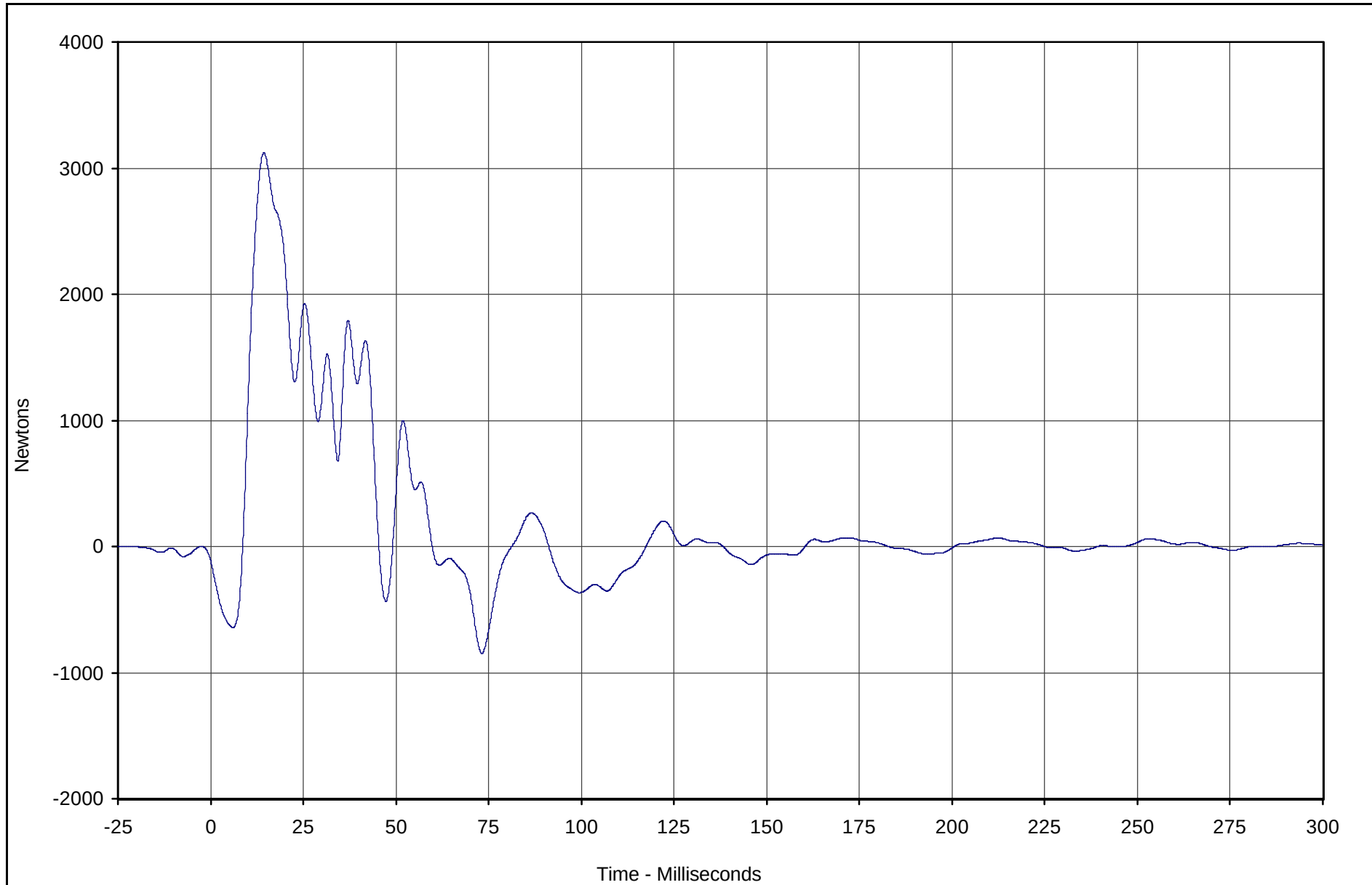
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C1	116	FIL	Newtons	3122.3	14.4	-848.6	73.2	60



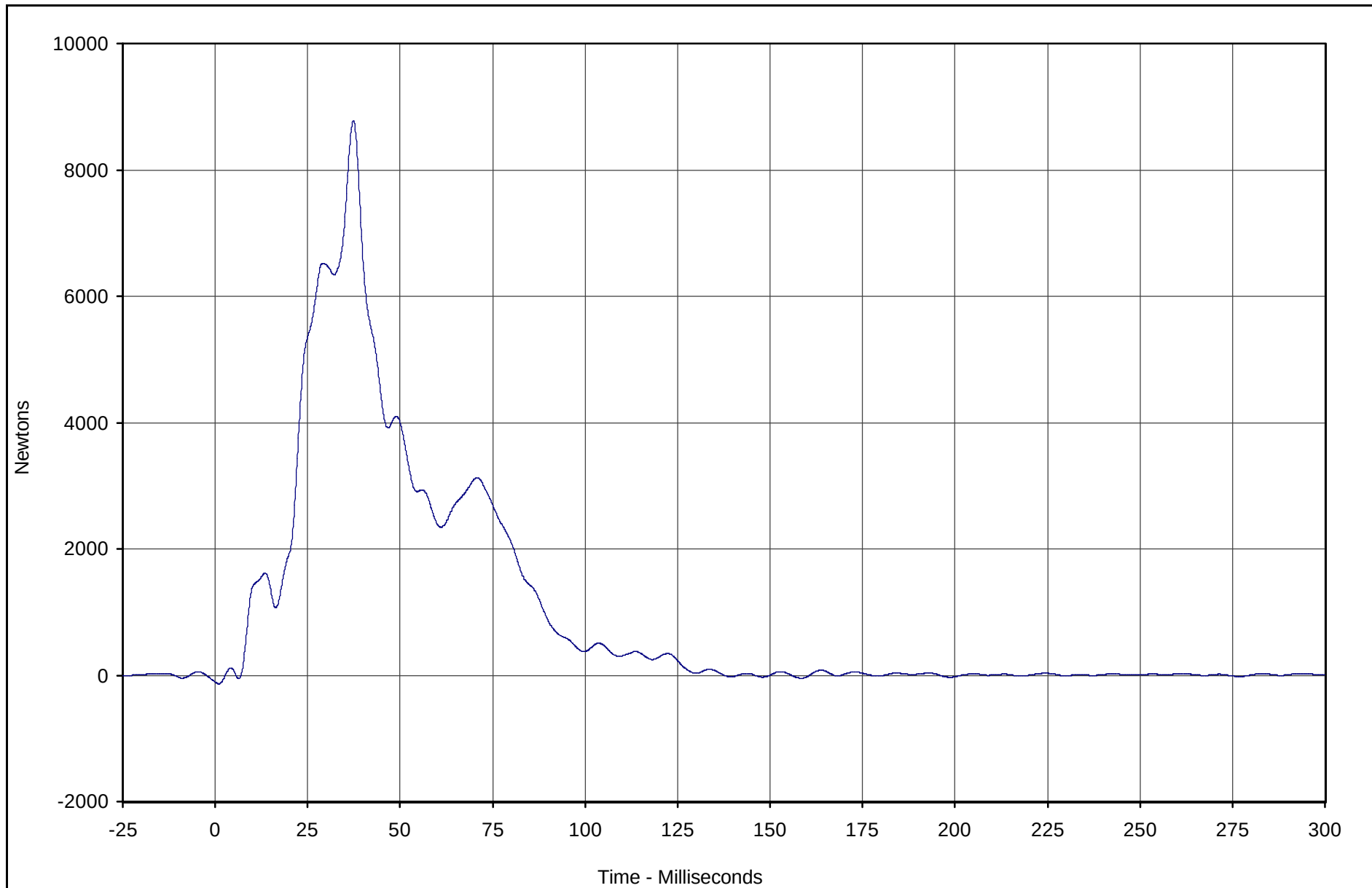
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C2	117	FIL	Newtons	8781.5	37.4	-136.6	1.0	60

Test Vehicle: 2003 BMW X5 3.0i SUV

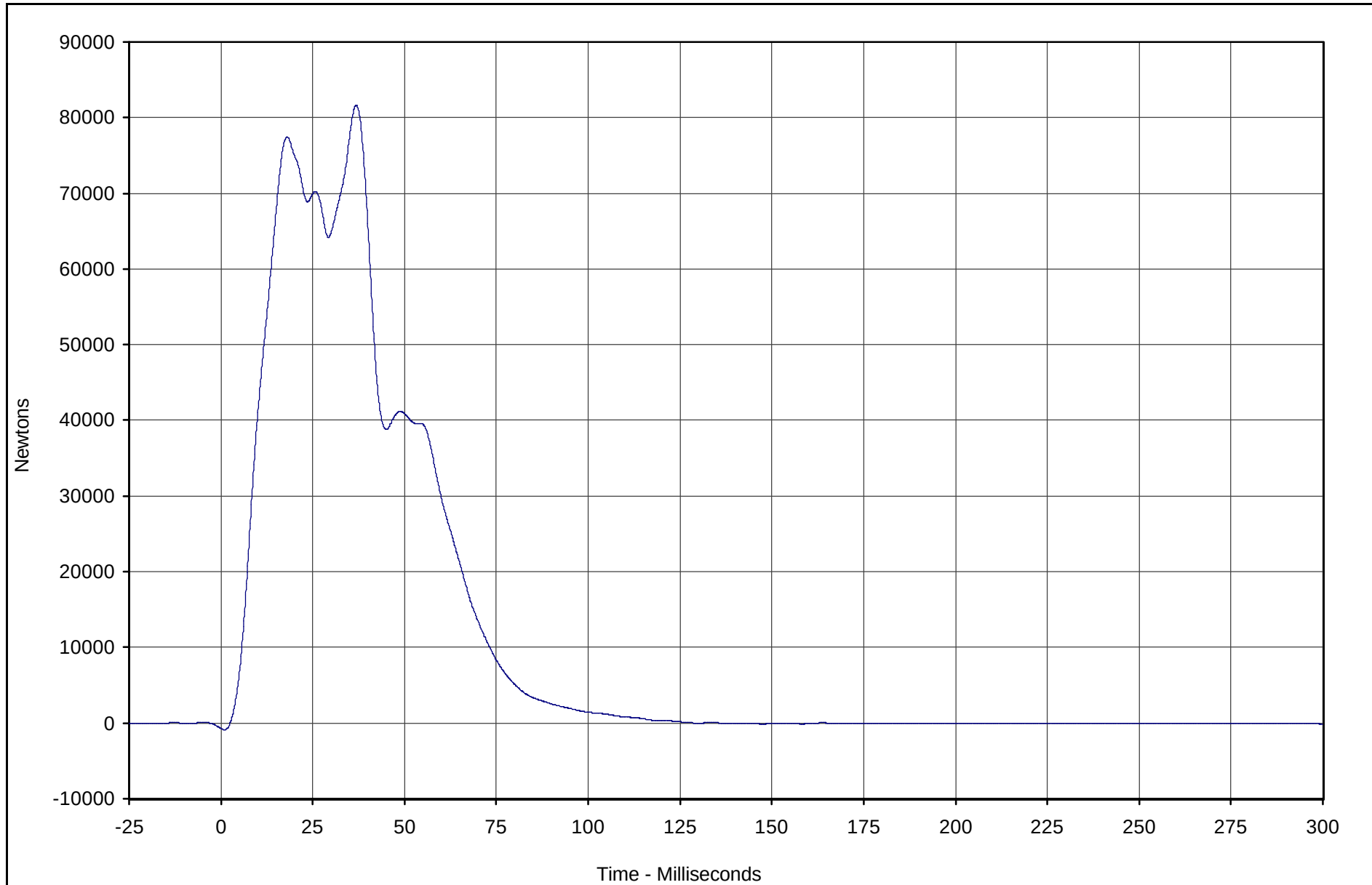
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C3	118	FIL	Newtons	81643.5	36.8	-880.8	0.9	60



Test Vehicle: 2003 BMW X5 3.0i SUV

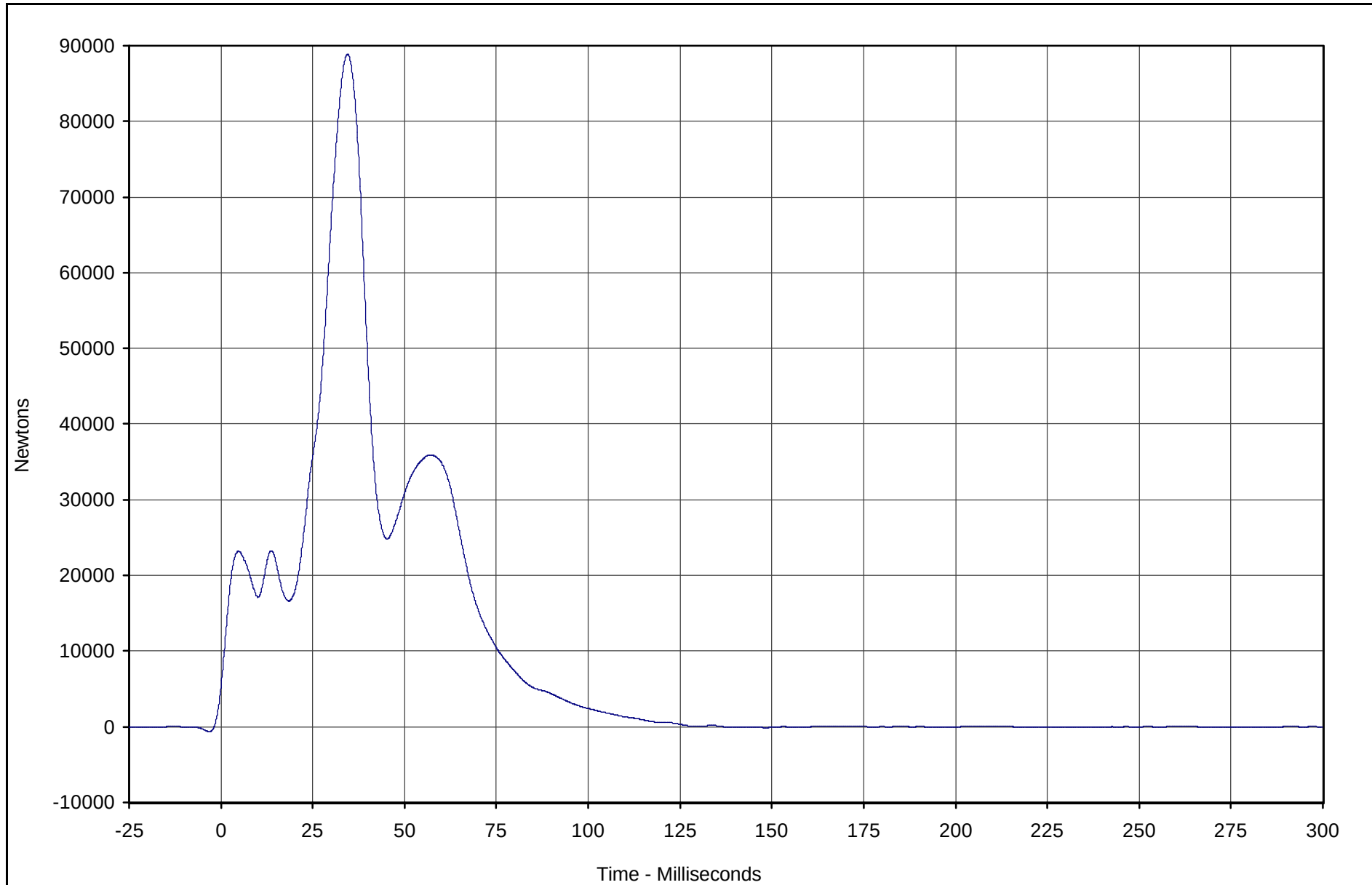
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

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TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C4	119	FIL	Newtons	88858.1	34.5	-105.2	148.4	60

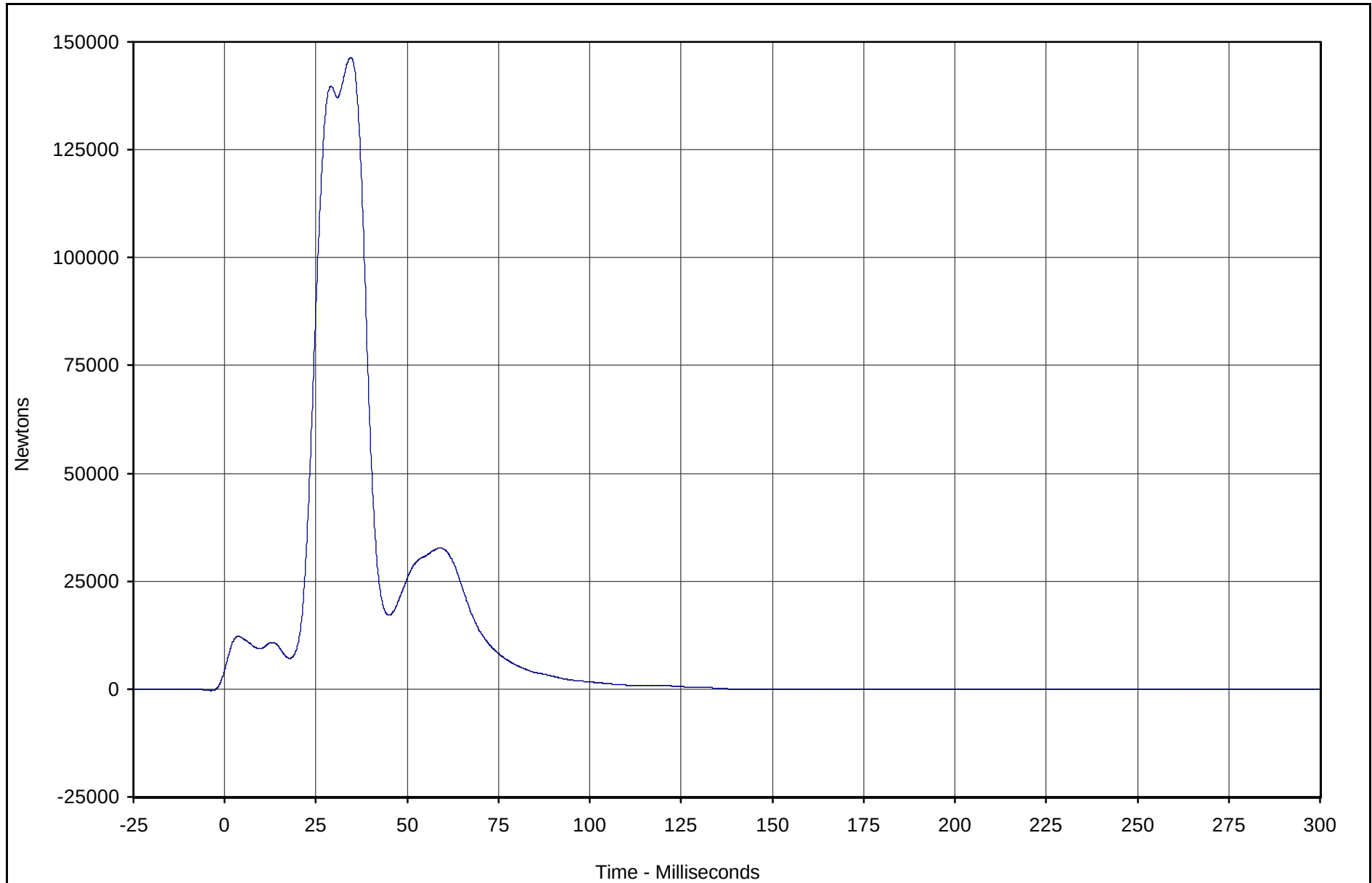


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C5	120	FIL	Newtons	146378.2	34.5	-94.6	147.3	60

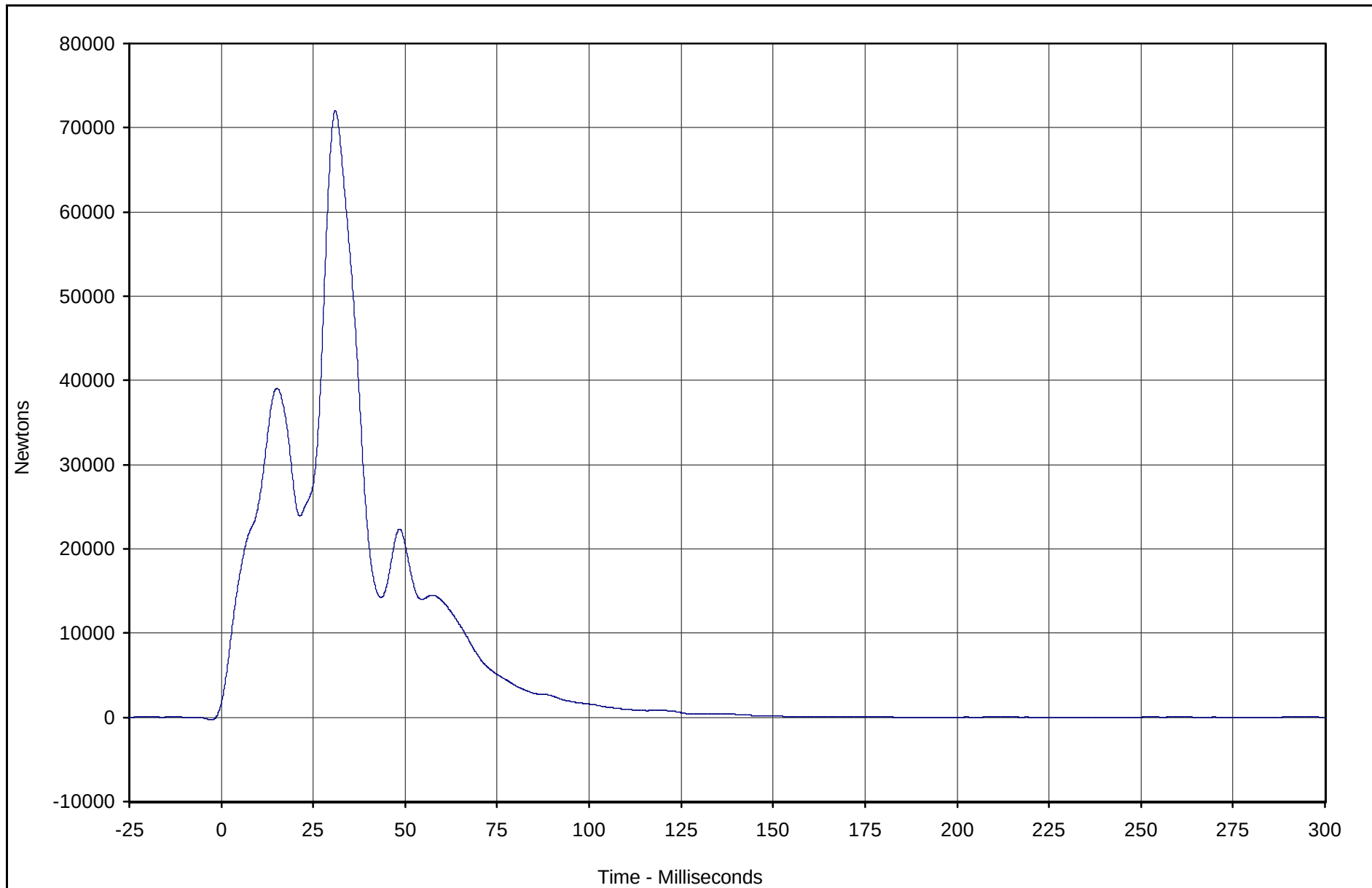


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C6	121	FIL	Newtons	72056.4	31.0	-75.9	193.8	60

Test Vehicle: 2003 BMW X5 3.0i SUV

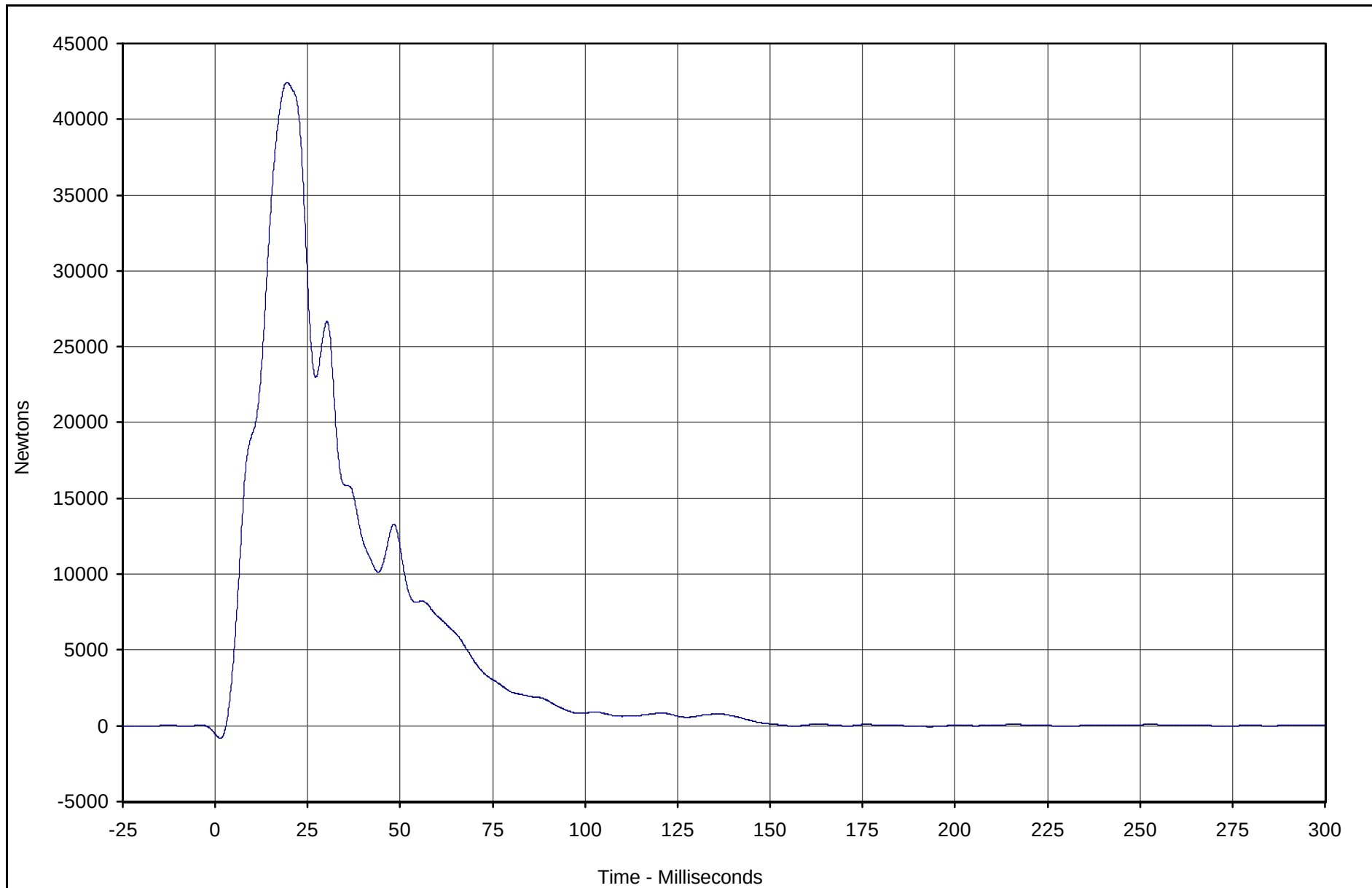
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C7	122	FIL	Newtons	42434.2	19.3	-825.7	1.3	60



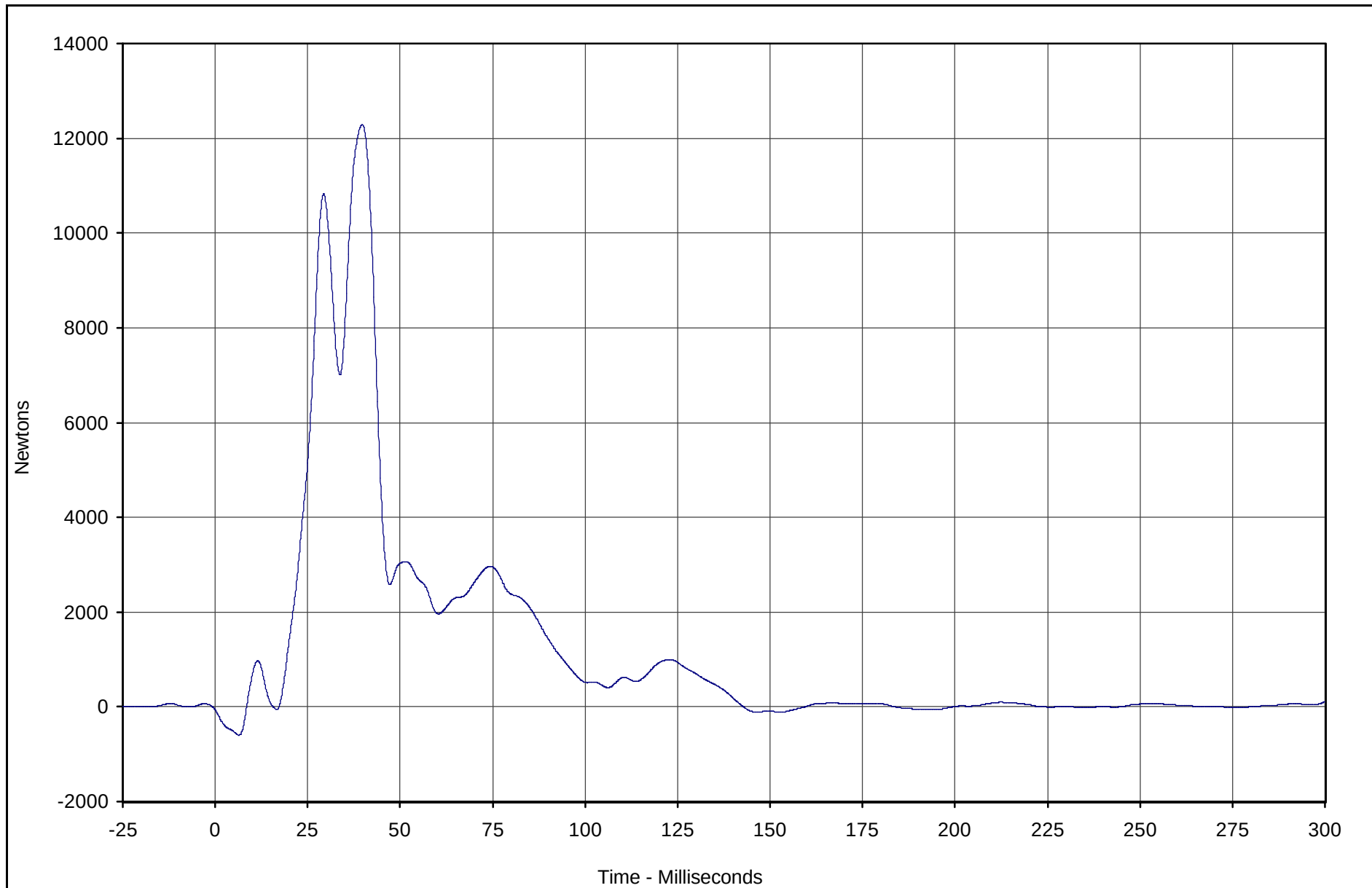
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C8	123	FIL	Newtons	12288.0	39.7	-599.2	6.4	60

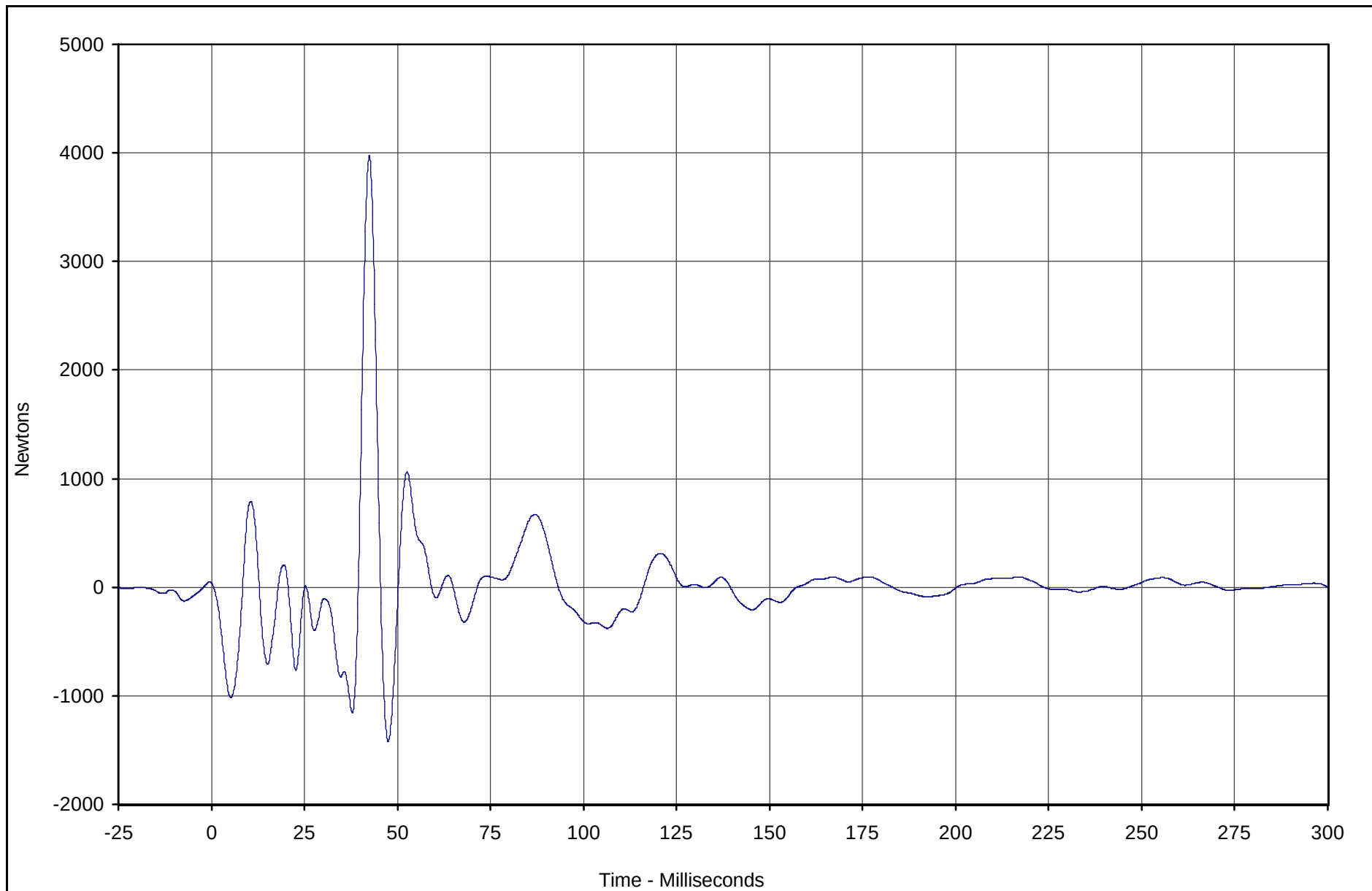
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C9	124	FIL	Newtons	3974.9	42.4	-1419.7	47.5	60



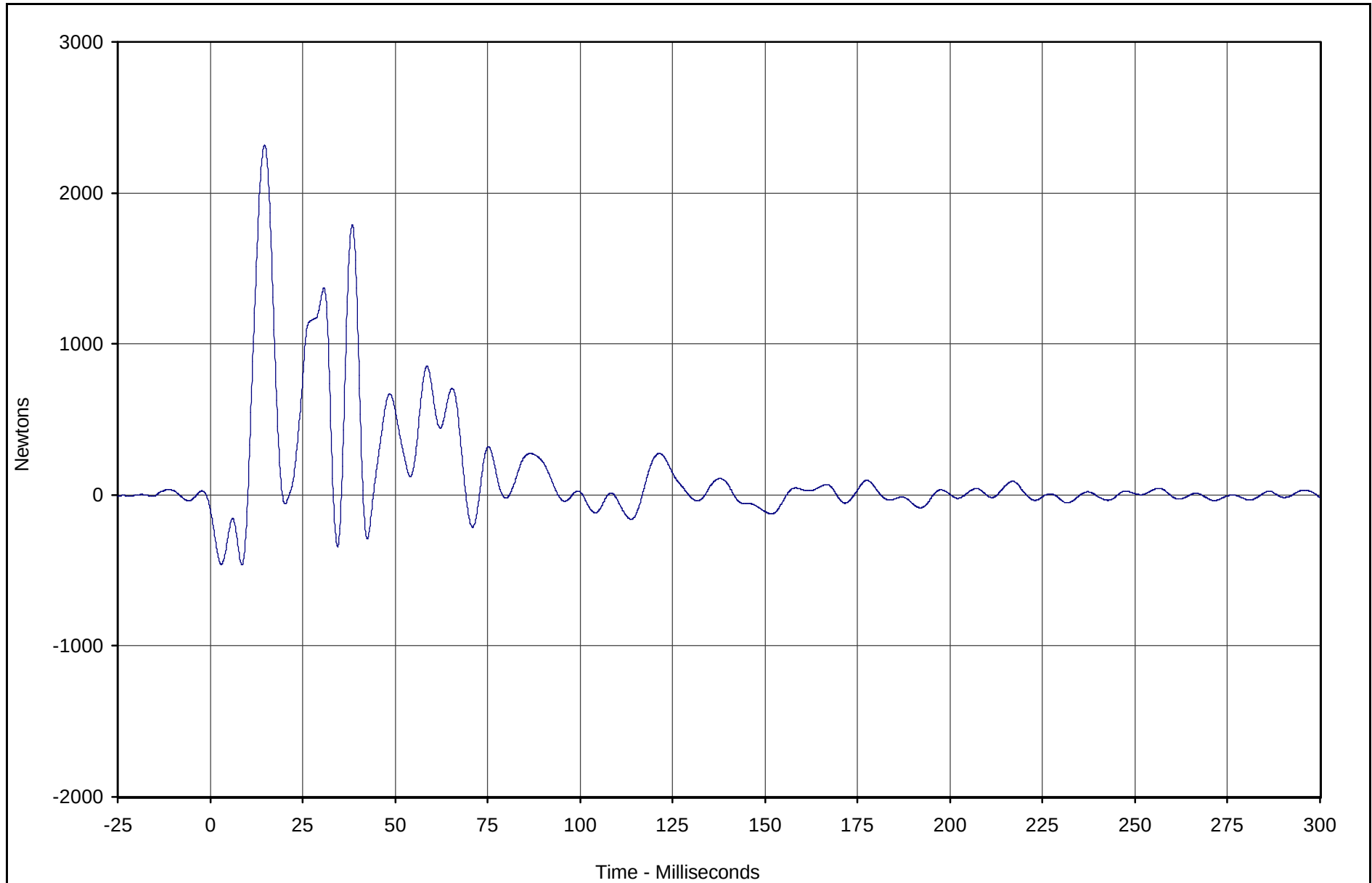
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D1	125	FIL	Newtons	2317.3	14.8	-463.4	8.6	60



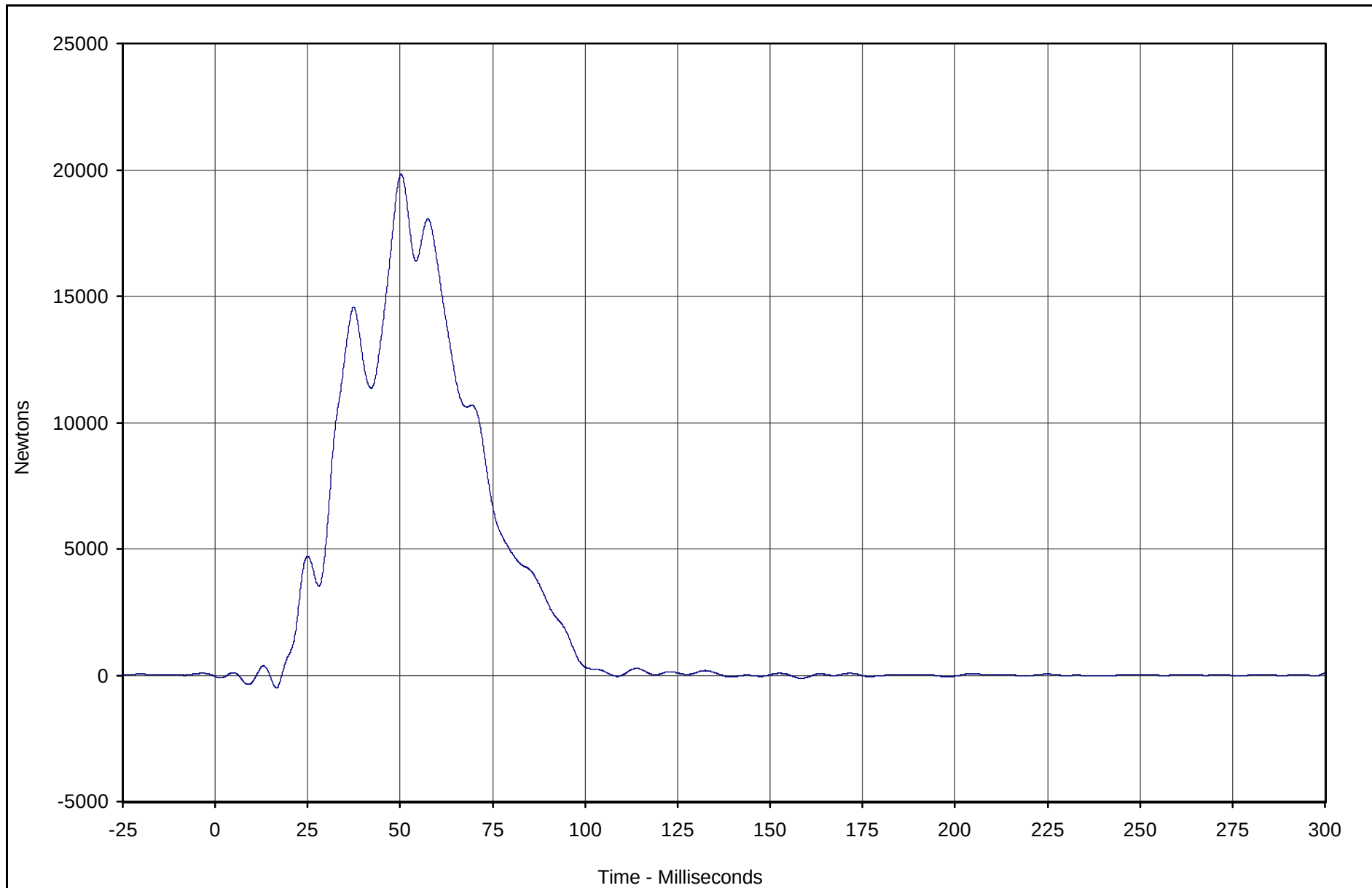
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

TR-P23001-17-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D2	126	FIL	Newtons	19819.1	50.3	-502.5	16.5	60

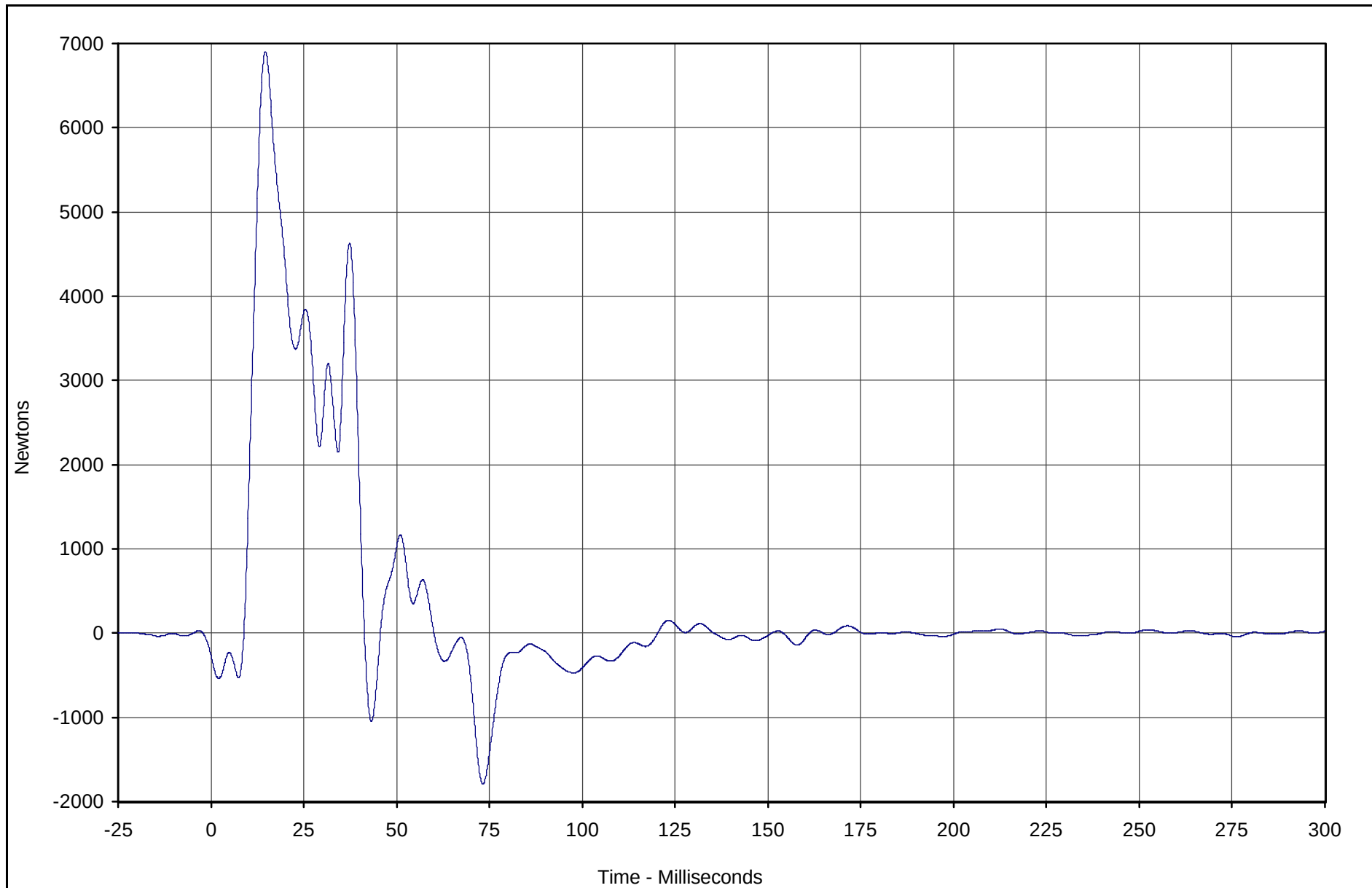
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D3	127	FIL	Newtons	6899.5	14.7	-1792.1	73.3	60

Test Vehicle: 2003 BMW X5 3.0i SUV

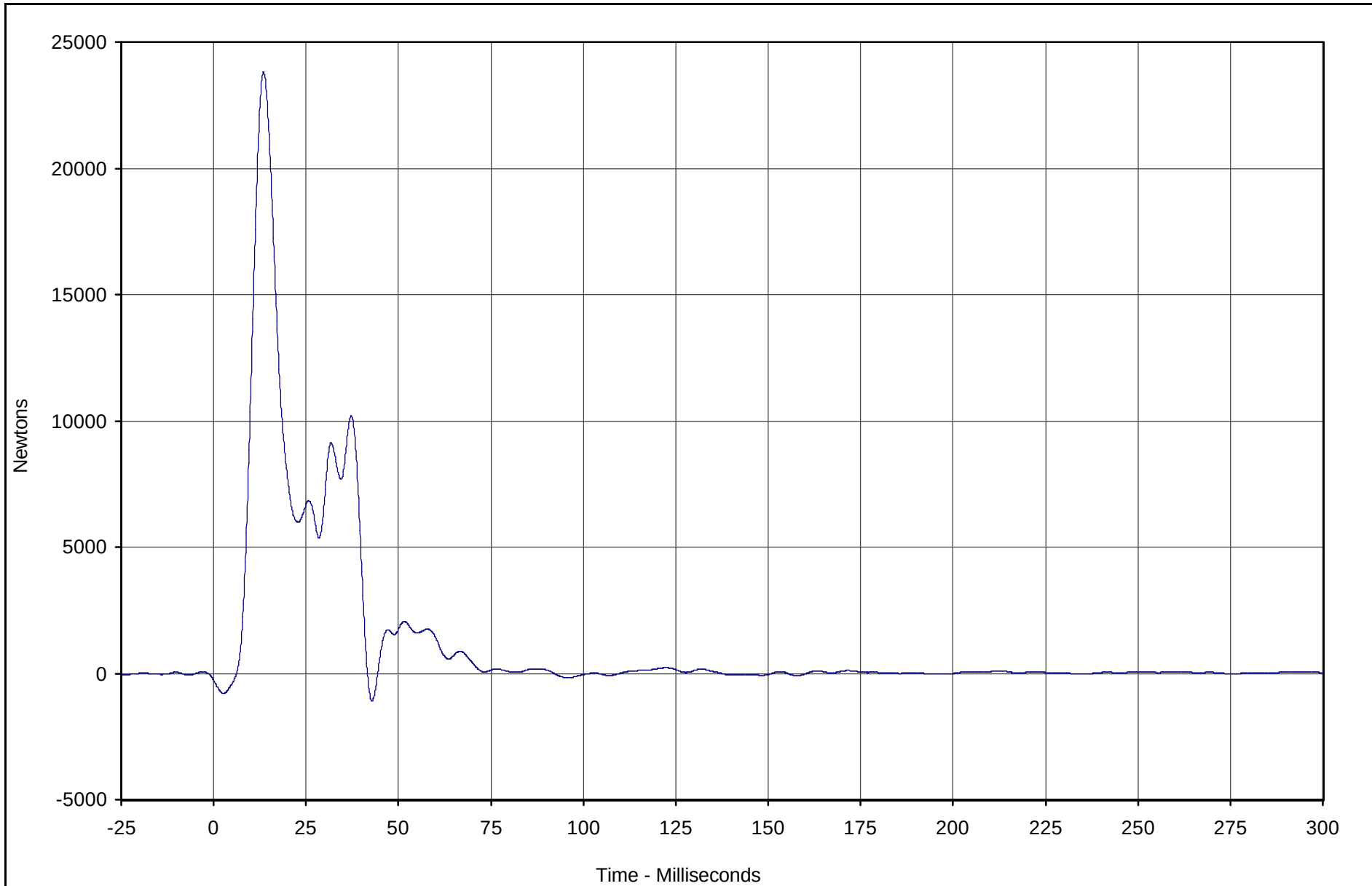
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D4	128	FIL	Newtons	23836.5	13.5	-1094.9	42.9	60

Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

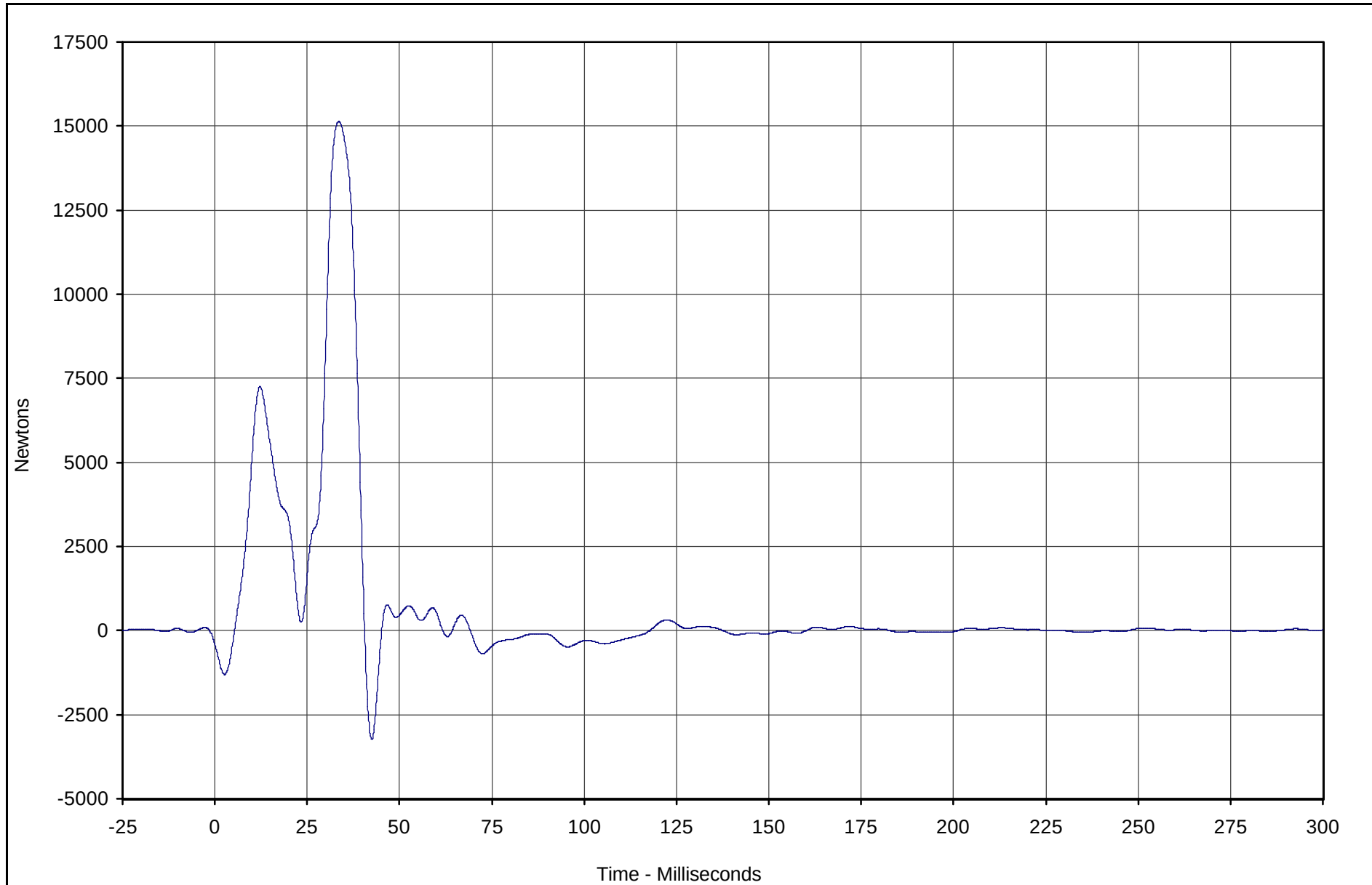
NHTSA No.: M30501



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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D5	129	FIL	Newtons	15137.8	33.5	-3234.3	42.5	60

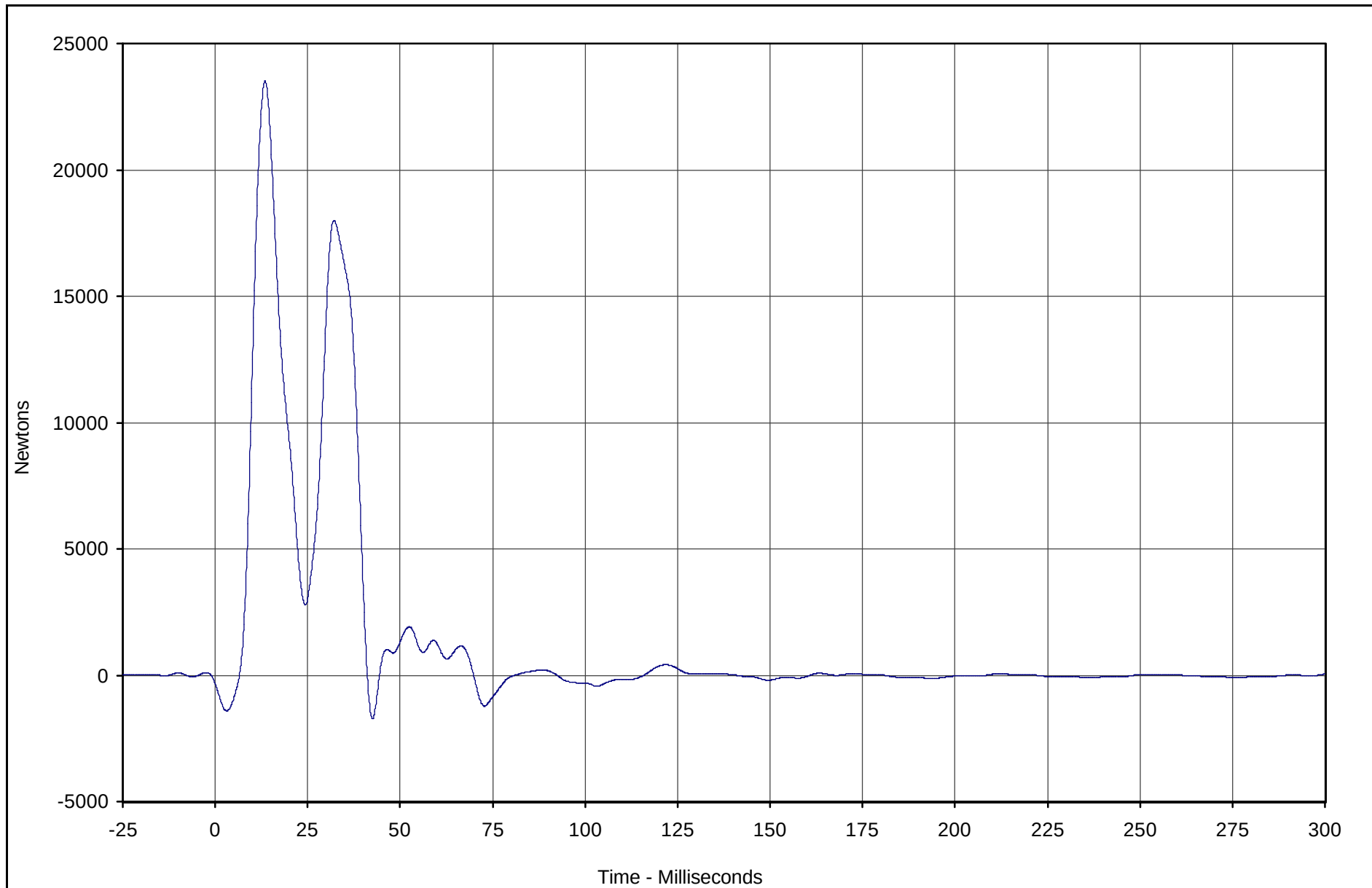


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D6	130	FIL	Newtons	23537.2	13.5	-1719.5	42.5	60

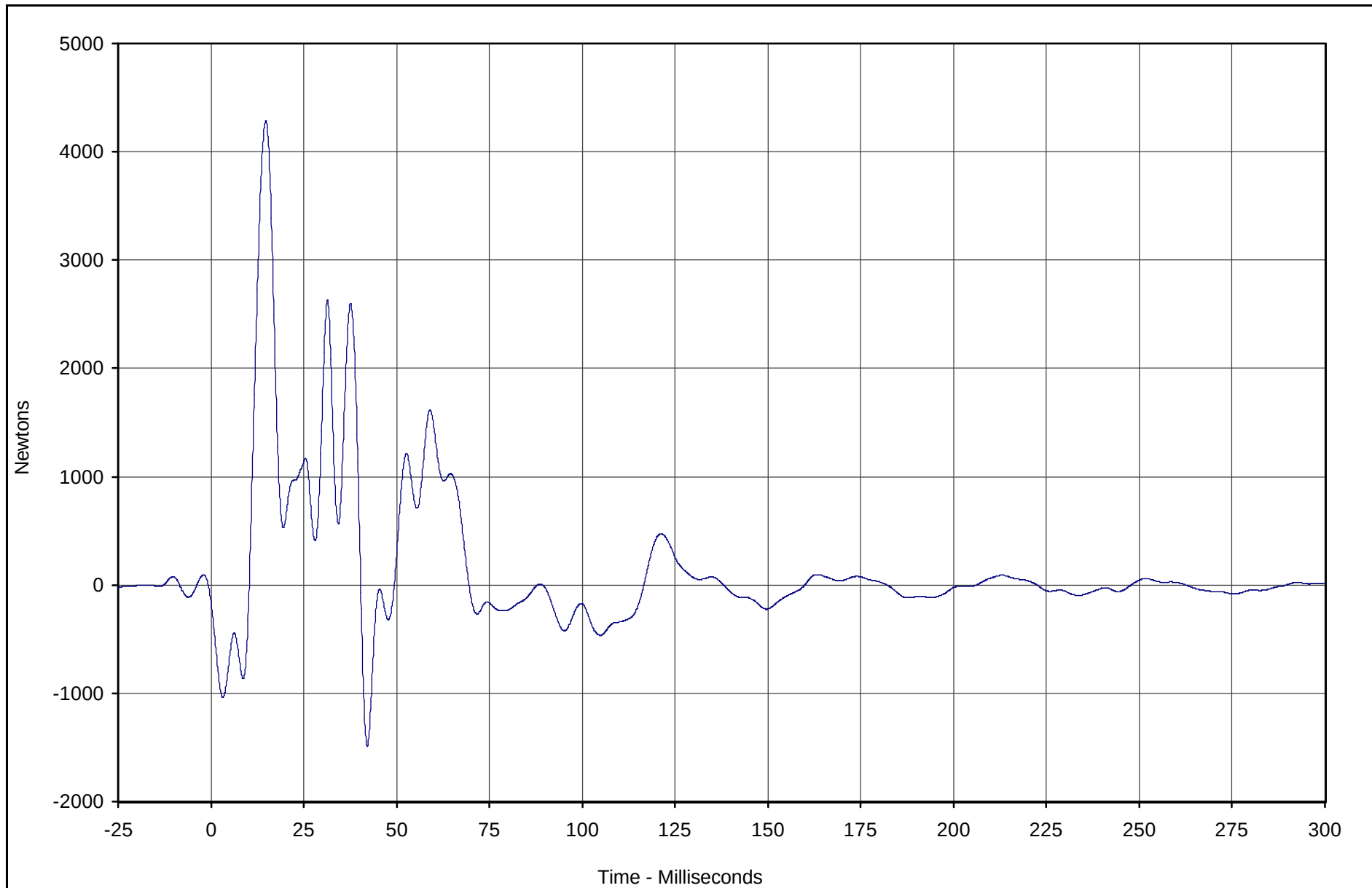


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D7	131	FIL	Newtons	4288.2	14.8	-1488.5	42.1	60

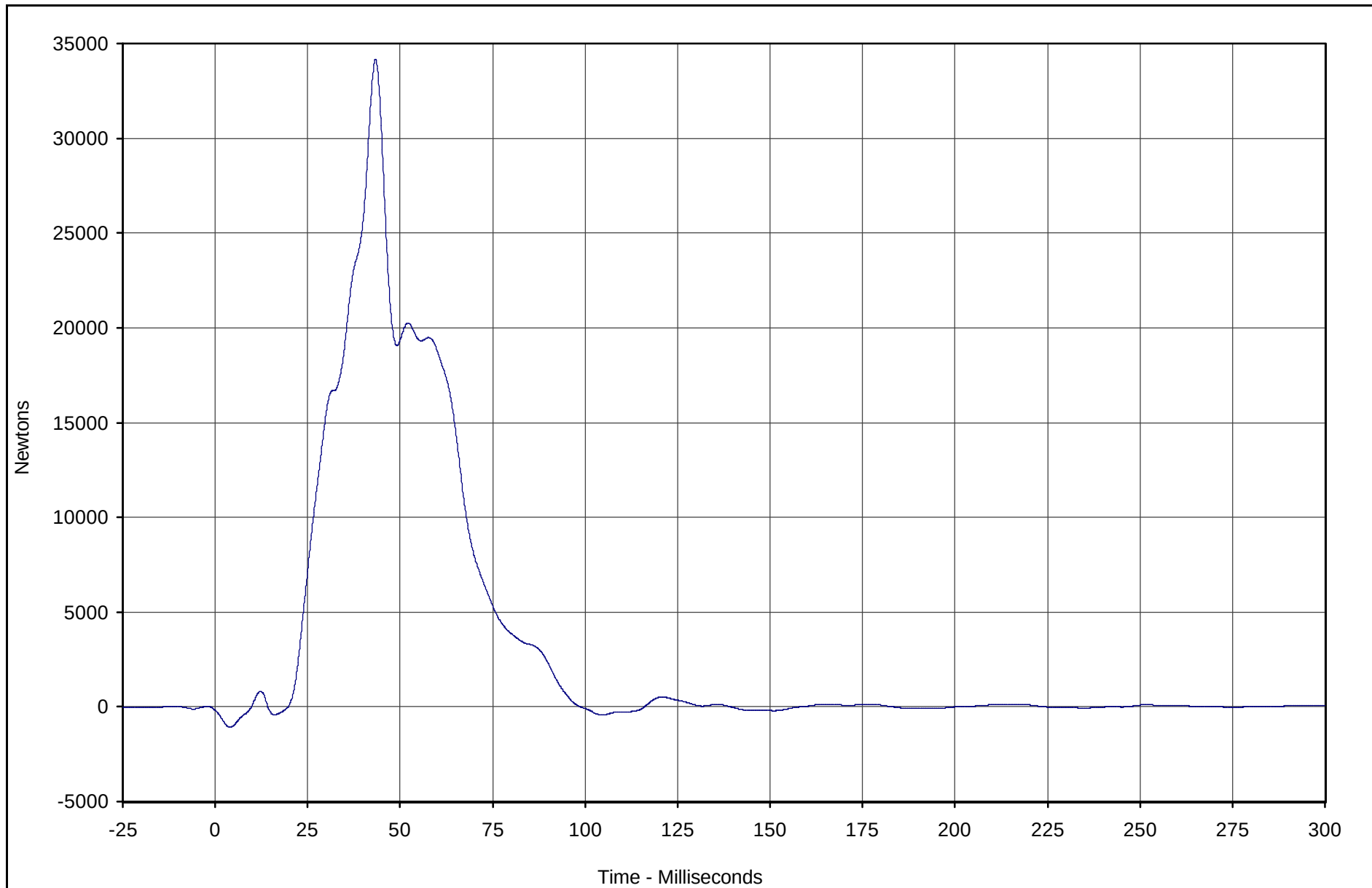


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D8	132	FIL	Newtons	34147.6	43.3	-1079.5	4.0	60

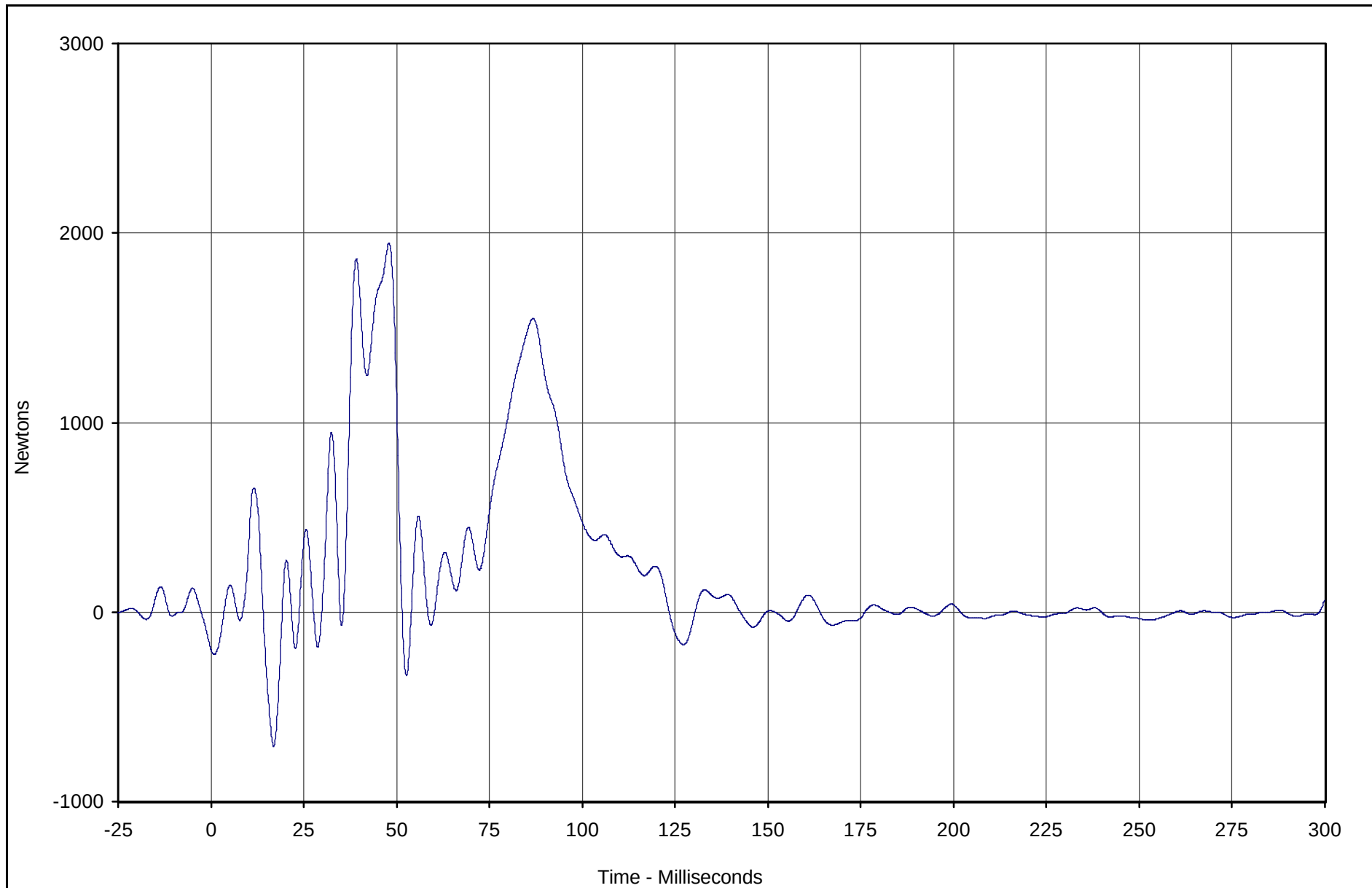


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D9	133	FIL	Newtons	1948.2	48.0	-707.3	16.9	60

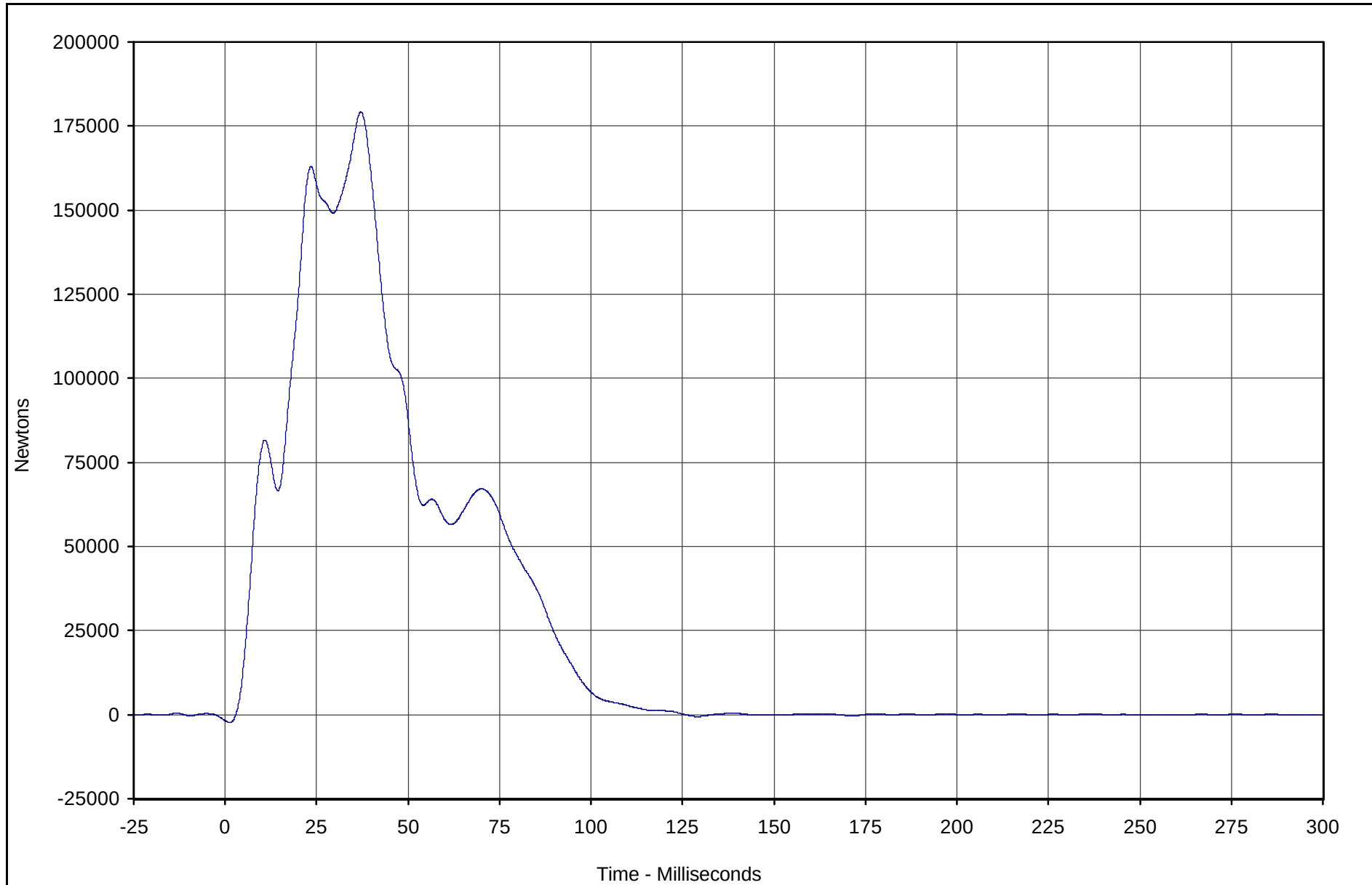


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 1	001	SUM	Newtons	179181.2	37.1	-2400.8	1.2	60



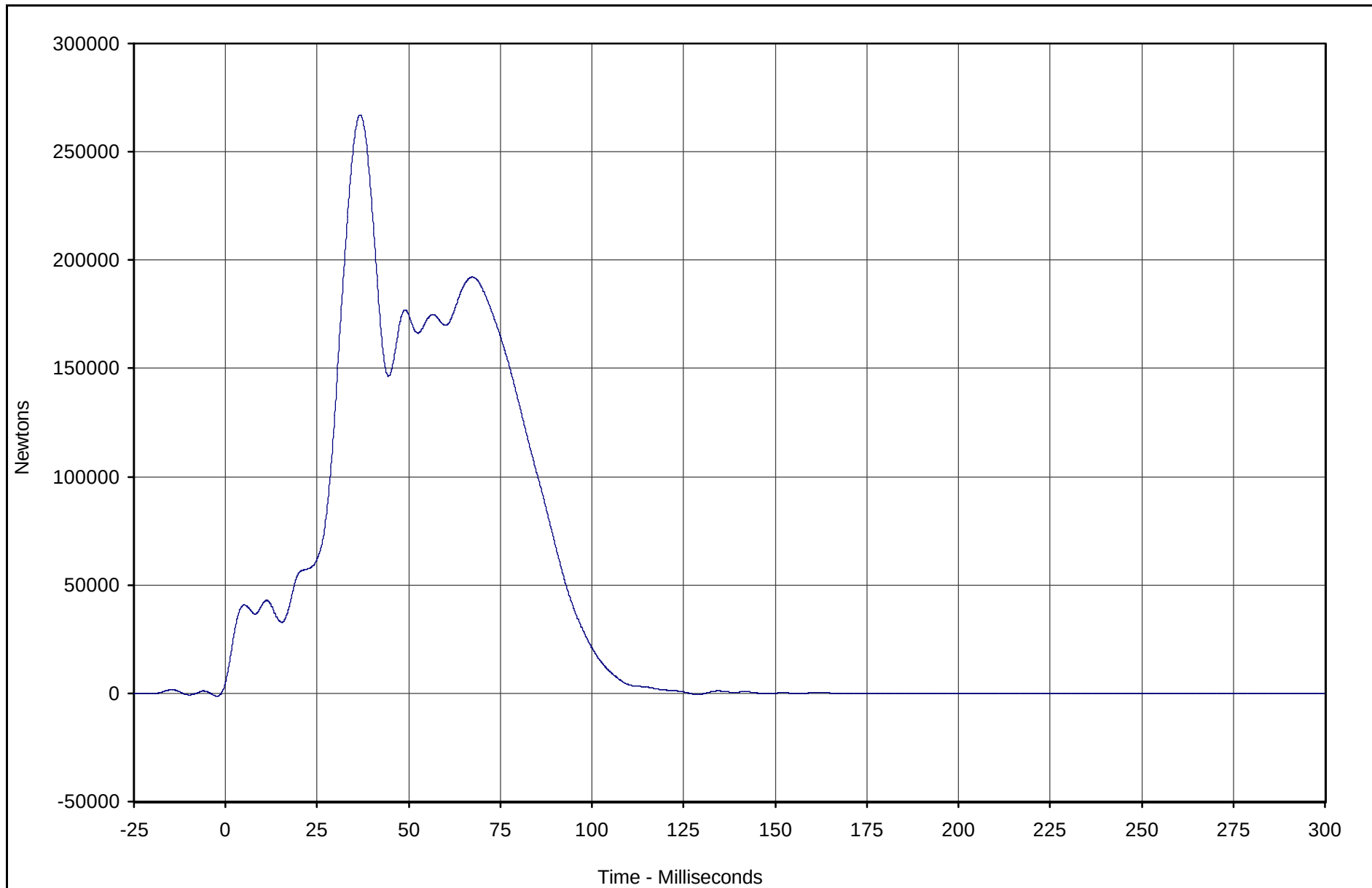
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 2	002	SUM	Newtons	267003.9	36.7	-566.5	128.8	60

Test Vehicle: 2003 BMW X5 3.0i SUV

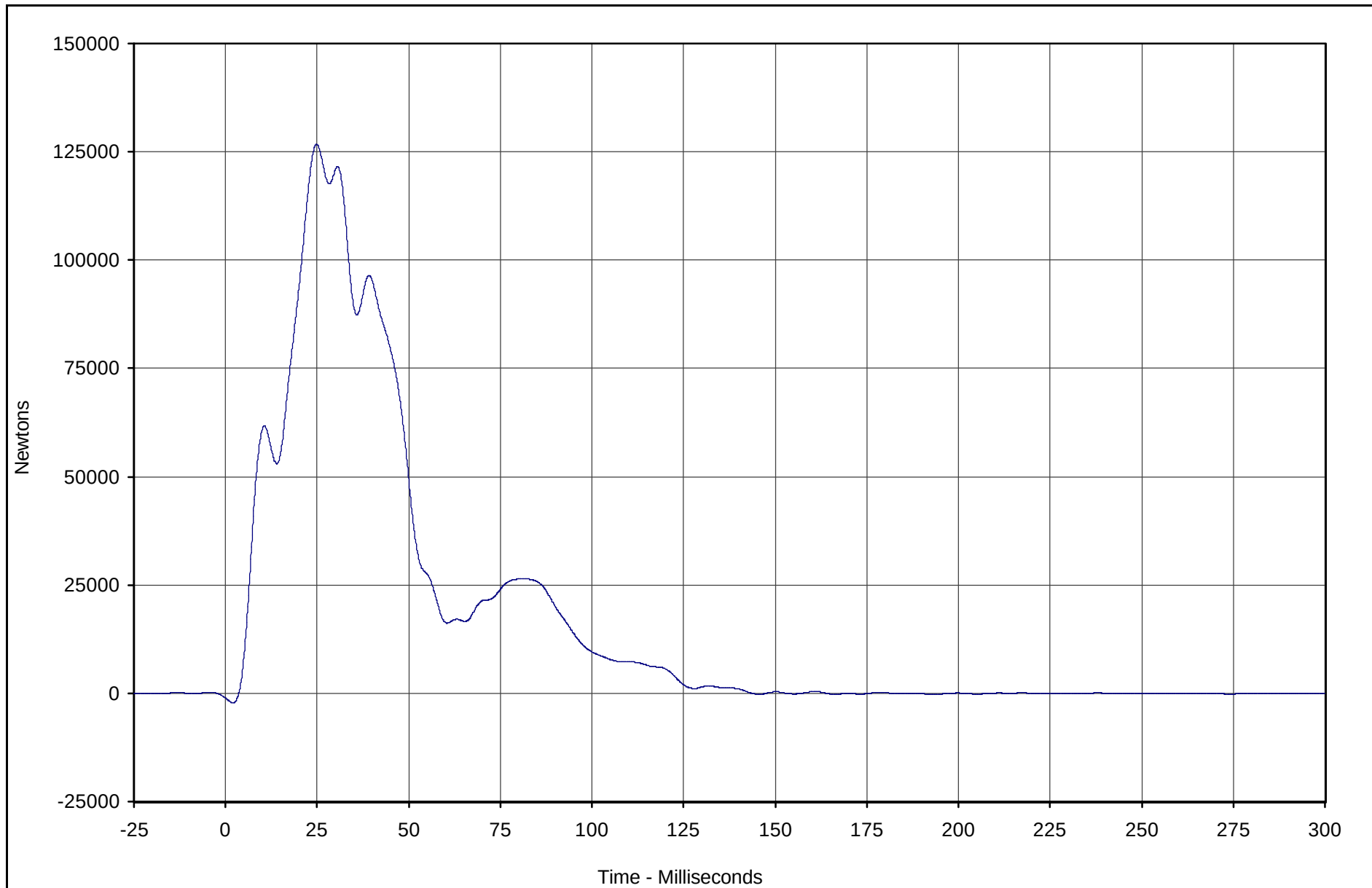
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 3	003	SUM	Newtons	126693.8	24.9	-2224.5	2.0	60

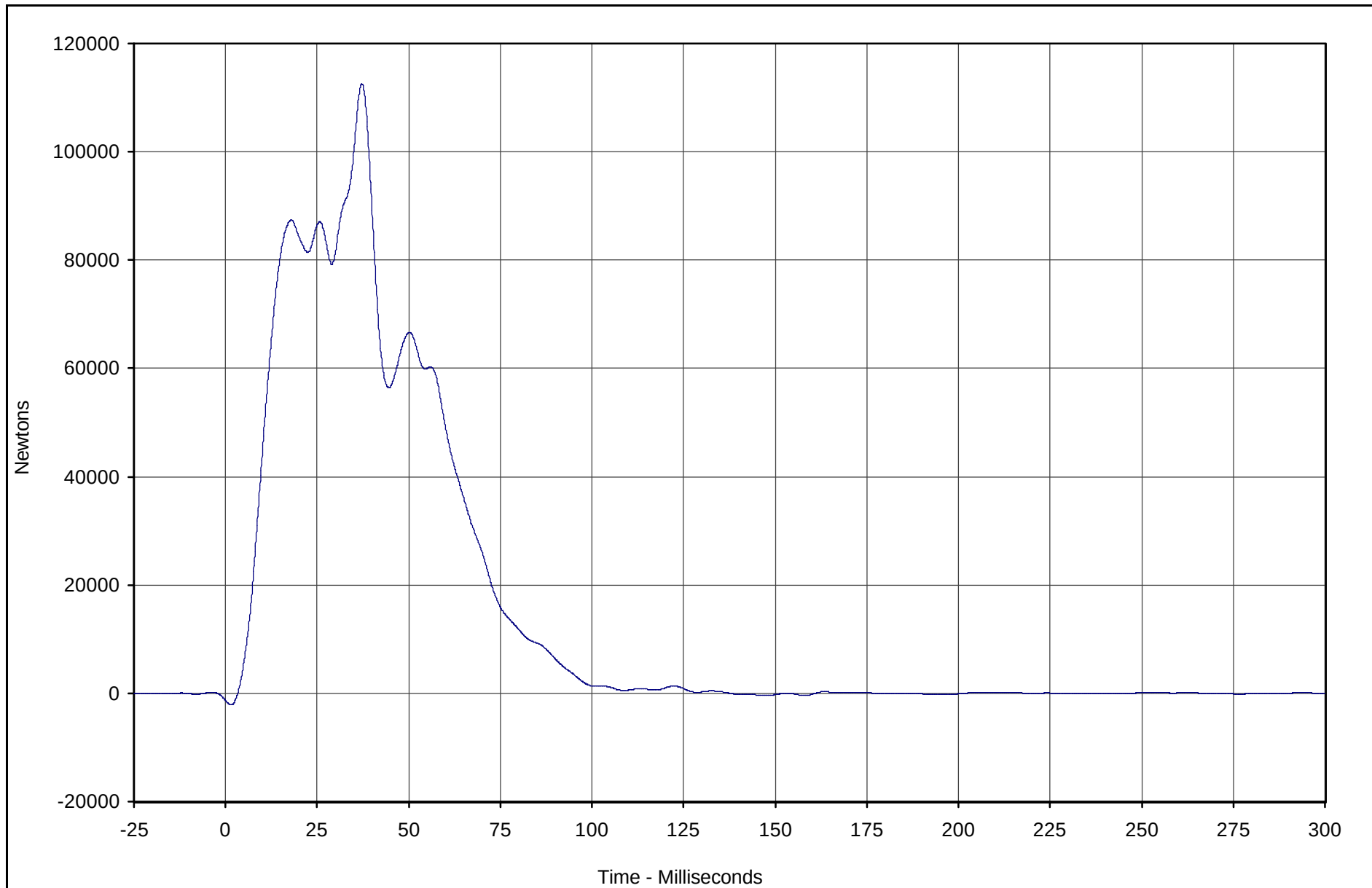
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 4	004	SUM	Newtons	112513.3	37.2	-2172.1	1.5	60

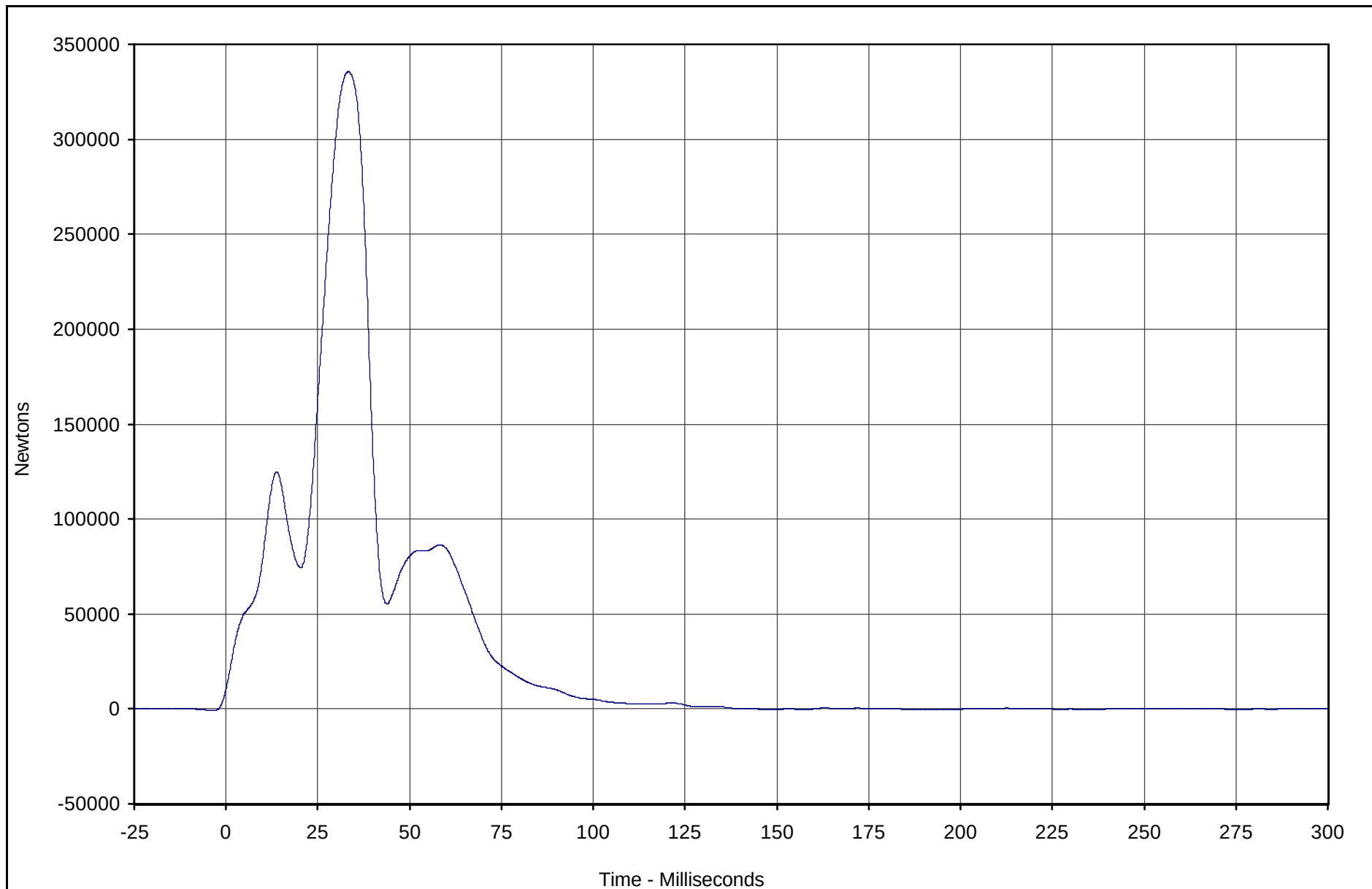
Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501





Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 5	005	SUM	Newtons	335603.9	33.3	-423.4	148.7	60

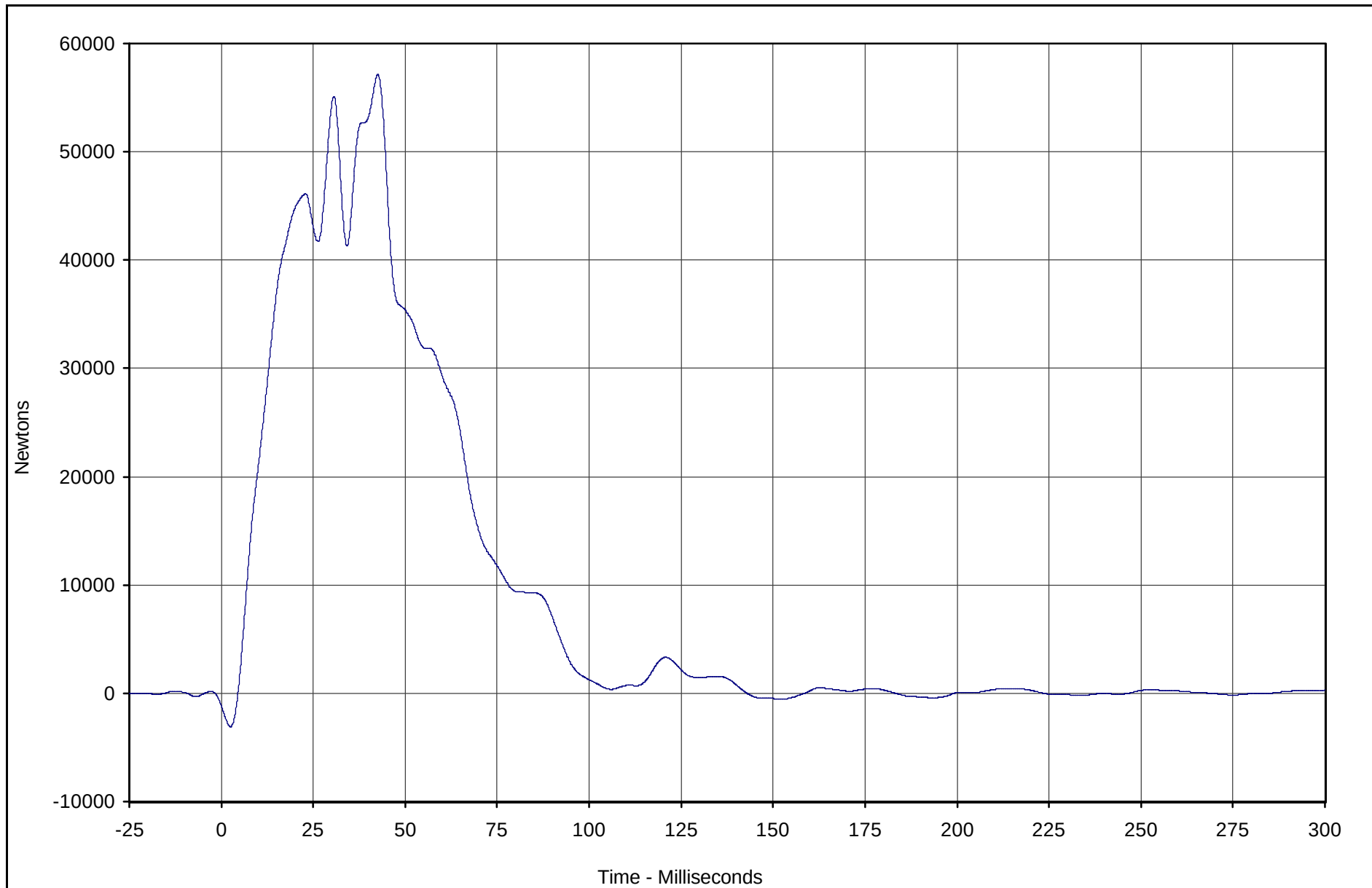


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 6	006	SUM	Newtons	57130.8	42.5	-3119.7	2.5	60

Test Vehicle: 2003 BMW X5 3.0i SUV

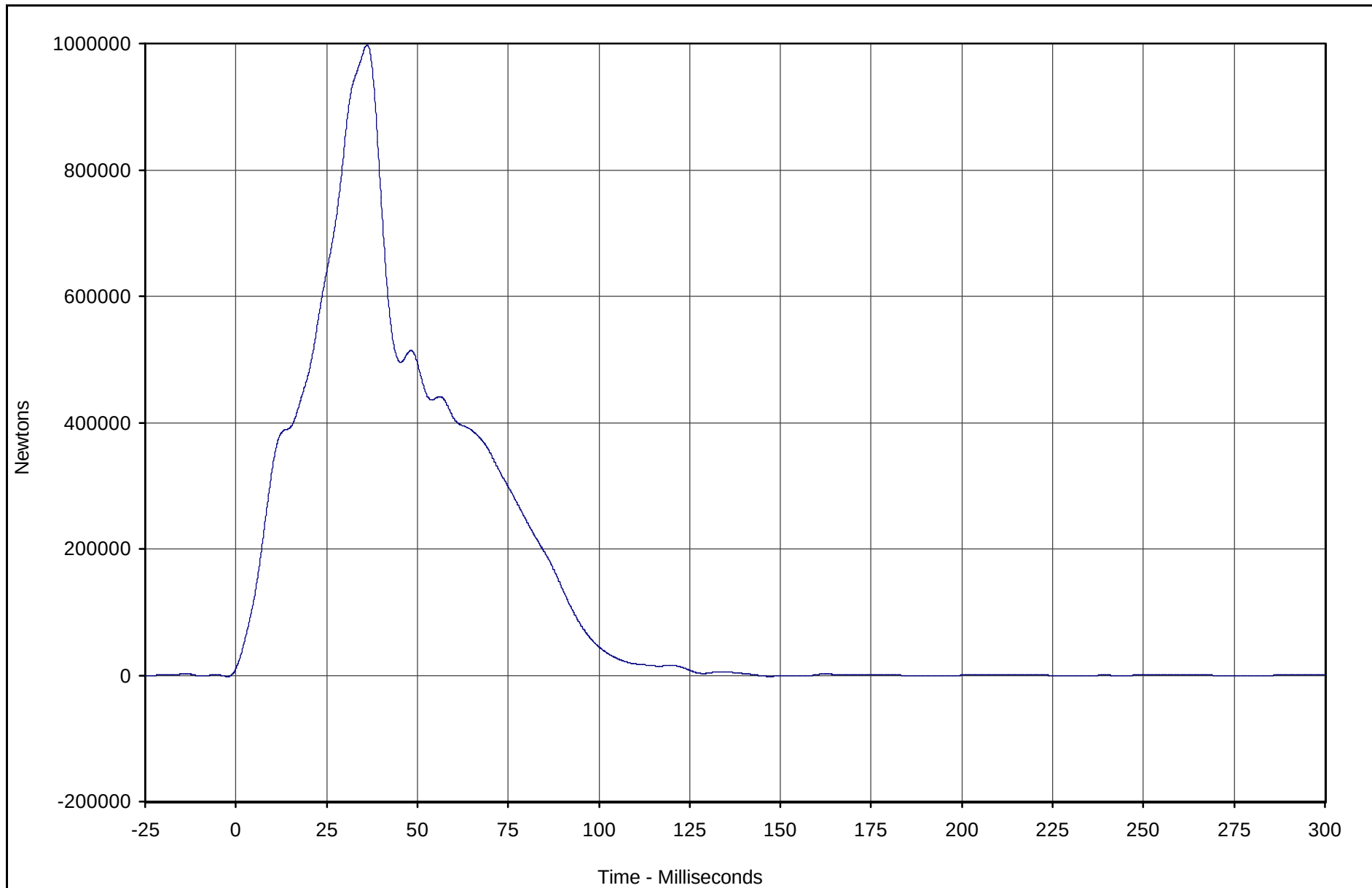
Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Total Sum	007	SUM	Newtons	997368	36.1	-1645.0	147.0	60

Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

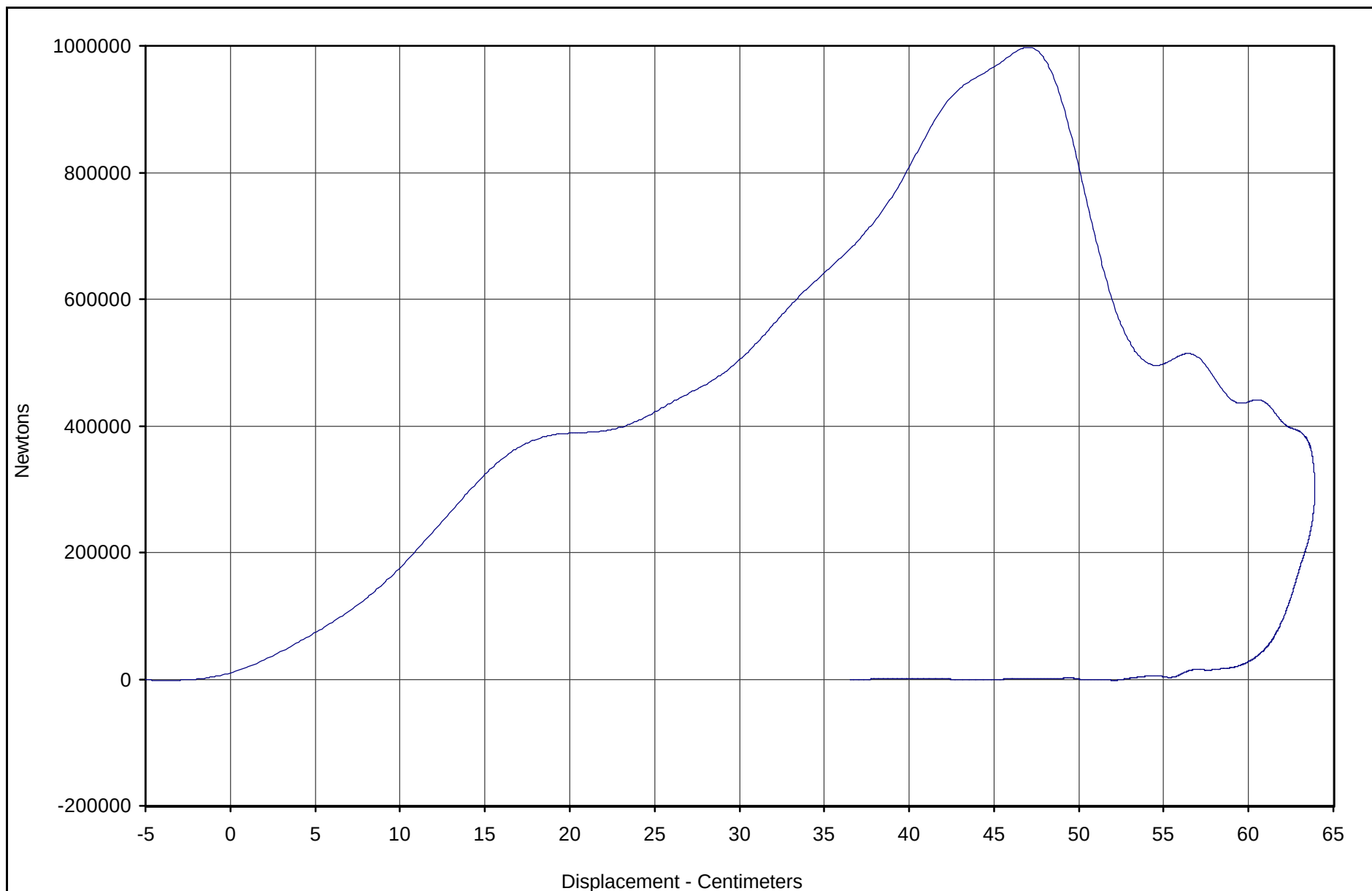
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



TR-P23001-17-NC

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Curve Description	CURNO	Type	Units	Max	CM	Energy (Joules)	SAE Class
Barrier Force Total Sum vs. Displ.	001	XVY	Newtons	997368	47.0	303665	60



Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

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BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

Location	Units	Max	Time	Min	Time
Barrier Force A1	Newtons	1740.4	41.2	-1657.6	35.8
Barrier Force A2	Newtons	1923.1	28.1	-1289.6	34.9
Barrier Force A3	Newtons	27442.3	38.3	-1306.0	29.0
Barrier Force A4	Newtons	34583.1	38.3	-1350.9	28.9
Barrier Force A5	Newtons	15077.0	33.4	-927.2	15.5
Barrier Force A6	Newtons	81038.5	38.3	-1983.1	28.2
Barrier Force A7	Newtons	1844.4	38.4	-875.9	16.9
Barrier Force A8	Newtons	3070.1	45.1	-619.1	35.5
Barrier Force A9	Newtons	2385.5	42.3	-2443.8	36.4
Barrier Force B1	Newtons	2227.4	42.4	-613.5	16.2
Barrier Force B2	Newtons	19832.7	30.2	-169.9	1.3
Barrier Force B3	Newtons	147893.1	23.2	-1757.3	1.3
Barrier Force B4	Newtons	54681.1	36.6	-64.0	157.0
Barrier Force B5	Newtons	65552.1	58.8	-27.8	171.0
Barrier Force B6	Newtons	71322.6	30.5	-71.5	156.3
Barrier Force B7	Newtons	123773.0	24.6	-1808.8	1.8
Barrier Force B8	Newtons	18970.3	39.0	-270.0	5.9
Barrier Force B9	Newtons	4127.3	42.5	-771.9	35.6
Barrier Force C1	Newtons	3122.3	14.4	-848.6	73.2
Barrier Force C2	Newtons	8781.5	37.4	-136.6	1.0
Barrier Force C3	Newtons	81643.5	36.8	-880.8	0.9
Barrier Force C4	Newtons	88858.1	34.5	-105.2	148.4
Barrier Force C5	Newtons	146378.2	34.5	-94.6	147.3
Barrier Force C6	Newtons	72056.4	31.0	-75.9	193.8
Barrier Force C7	Newtons	42434.2	19.3	-825.7	1.3
Barrier Force C8	Newtons	12288.0	39.7	-599.2	6.4
Barrier Force C9	Newtons	3974.9	42.4	-1419.7	47.5
Barrier Force D1	Newtons	2317.3	14.8	-463.4	8.6
Barrier Force D2	Newtons	19819.1	50.3	-502.5	16.5
Barrier Force D3	Newtons	6899.5	14.7	-1792.1	73.3
Barrier Force D4	Newtons	23836.5	13.5	-1094.9	42.9
Barrier Force D5	Newtons	15137.8	33.5	-3234.3	42.5
Barrier Force D6	Newtons	23537.2	13.5	-1719.5	42.5
Barrier Force D7	Newtons	4288.2	14.8	-1488.5	42.1
Barrier Force D8	Newtons	34147.6	43.3	-1079.5	4.0
Barrier Force D9	Newtons	1948.2	48.0	-707.3	16.9
Barrier Force Sum Group 1	Newtons	179181.2	37.1	-2400.8	1.2
Barrier Force Sum Group 2	Newtons	267003.9	36.7	-566.5	128.8
Barrier Force Sum Group 3	Newtons	126693.8	24.9	-2224.5	2.0
Barrier Force Sum Group 4	Newtons	112513.3	37.2	-2172.1	1.5
Barrier Force Sum Group 5	Newtons	335603.9	33.3	-423.4	148.7
Barrier Force Sum Group 6	Newtons	57130.8	42.5	-3119.7	2.5
Barrier Force Total Sum	Newtons	997368.3	36.1	-1645.0	147.0

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
3/18/03
2003 BMW X5 3.0i SUV

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

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
3/18/03
2003 BMW X5 3.0i SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
26	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
27	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
28	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	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	KELC001	Load cell, Seat belt	Lebow	3371	N
42	SHOULDER BELT FORCE	X	KELC002	Load cell, Seat belt	Lebow	3371	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	CM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
3/18/03
2003 BMW X5 3.0i SUV

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

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
3/18/03
2003 BMW X5 3.0i SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPOT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
70	UP. TIBIA LEFT MOM.	Y	GPOT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
71	UP. TIBIA RIGHT MOM.	X	GPOT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
72	UP. TIBIA RIGHT MOM.	Y	GPOT09MY	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	KELC003	Load cell, Seat belt	Lebow	3371	N
86	SHOULDER BELT FORCE	X	KELC004	Load cell, Seat belt	Lebow	3371	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

**2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
3/18/03
2003 BMW X5 3.0i SUV**

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

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
3/18/03
2003 BMW X5 3.0i SUV

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

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
3/18/03
2003 BMW X5 3.0i SUV

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

APPENDIX E

DUMMY CALIBRATION DATA



Calibration Data Sheet

Hybrid III 50th Percentile Male

Knee Impact Test

ATD Serial No.: 034

Location: Left Knee

Test I.D.: RK06A

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	N	4715 to 5782	5324	Pass
Overall Test Results			Pass	

ATD Serial No.: 034

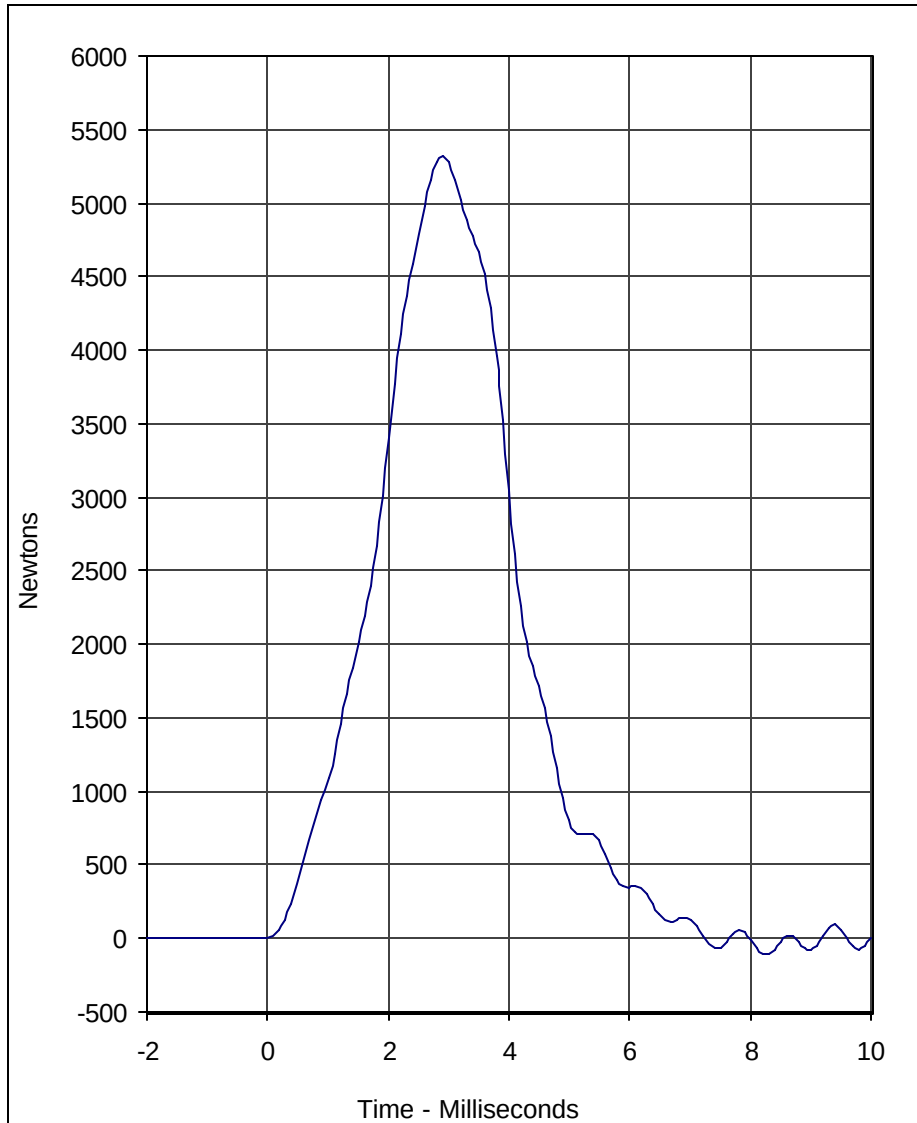
Location: Right Knee

Test I.D.: RK06D

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	2.11	Pass
Peak Probe Force	N	4715 to 5782	5315	Pass
Overall Test Results			Pass	

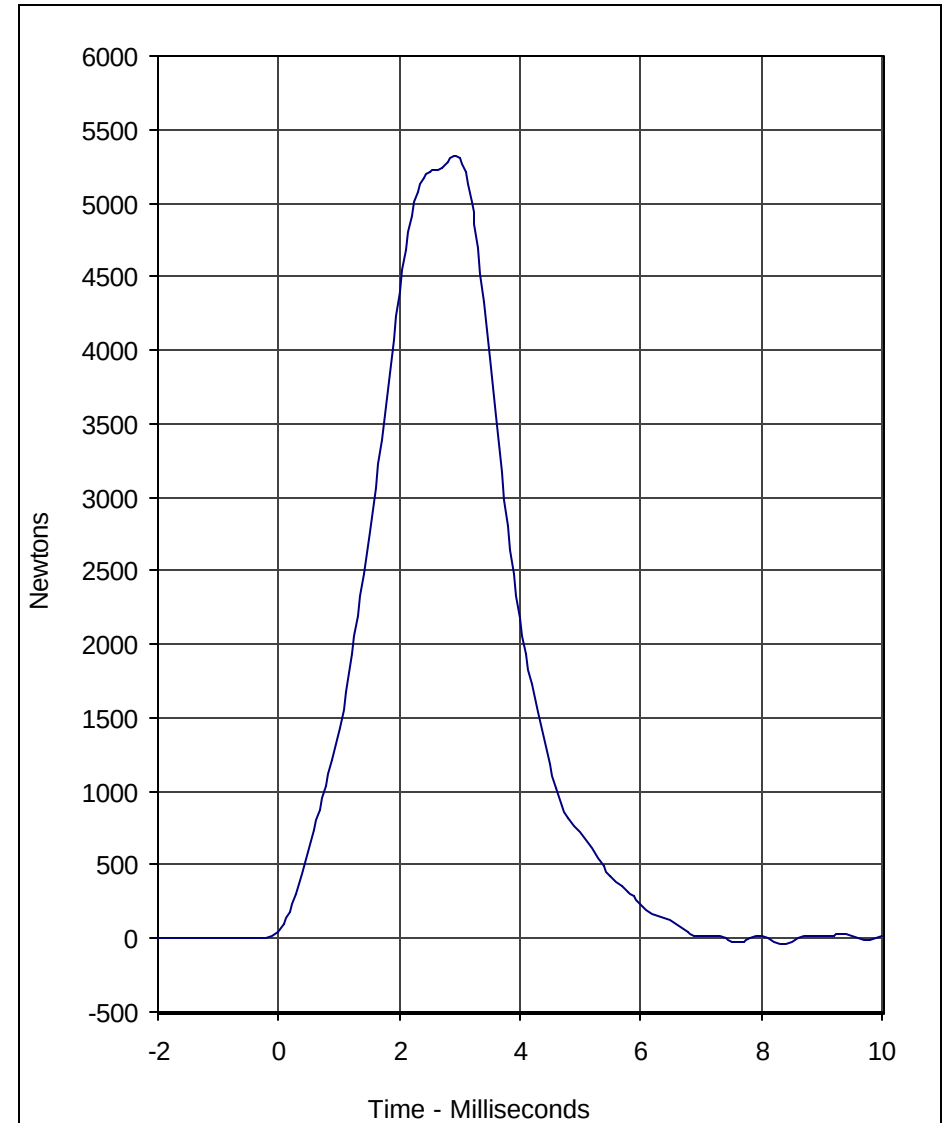
Laboratory Technician

March 12, 2003
Test Date



Curve Description		Location	Test I.D.	CURNO	Type
Probe Force		Left Knee	RK06A	001	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	5324.2	2.9	-111.1	8.3	600

Test Program: Hybrid III 50th Percentile Male Knee Impact Test
 Test Date: 3/12/03



Curve Description		Location	Test I.D.	CURNO	Type
Probe Force		Right Knee	RK06D	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5315.0	2.9	-43.5	8.3	600

A.T.D. Serial No.: 034





Calibration Data Sheet

Hybrid III 50th Percentile Male

Head Drop Test

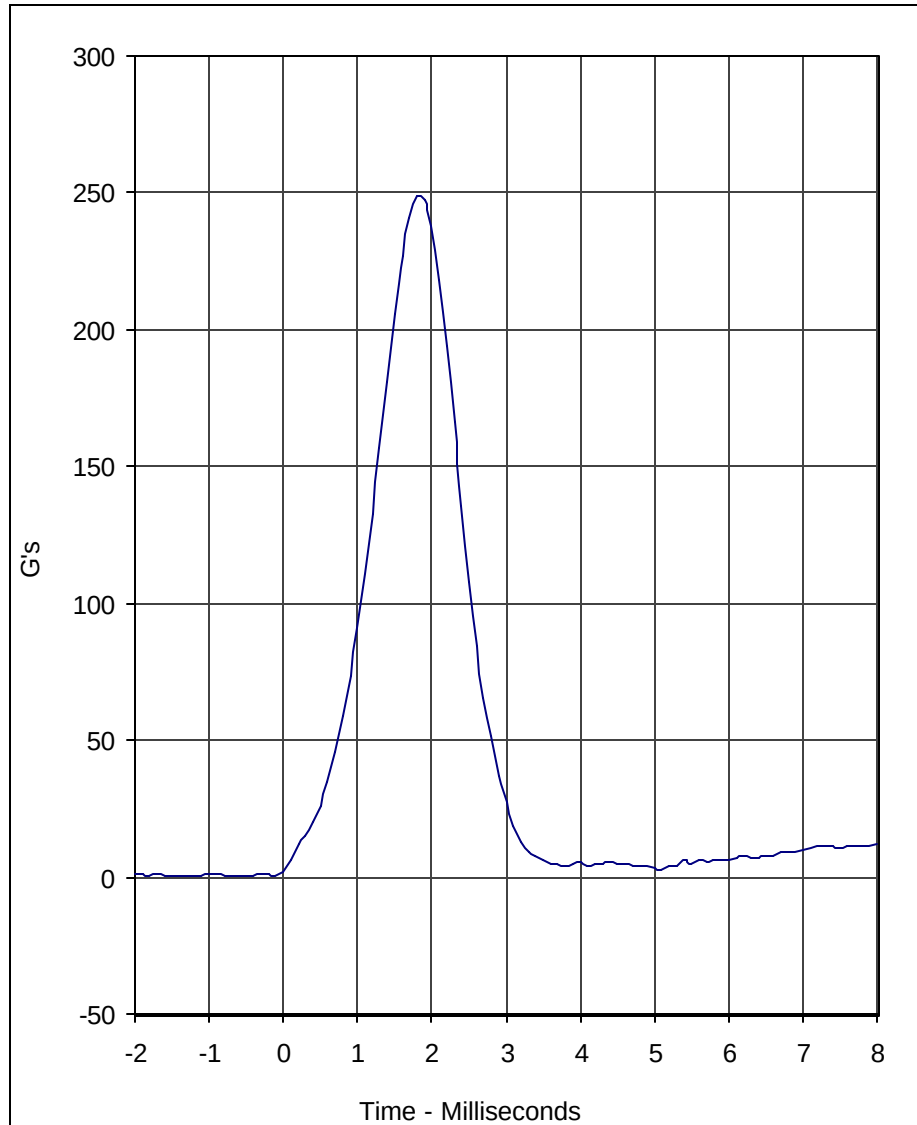
ATD Serial No.: 034

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	248.6	Pass
Peak Lateral Acceleration	G's	≤15.0	10.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

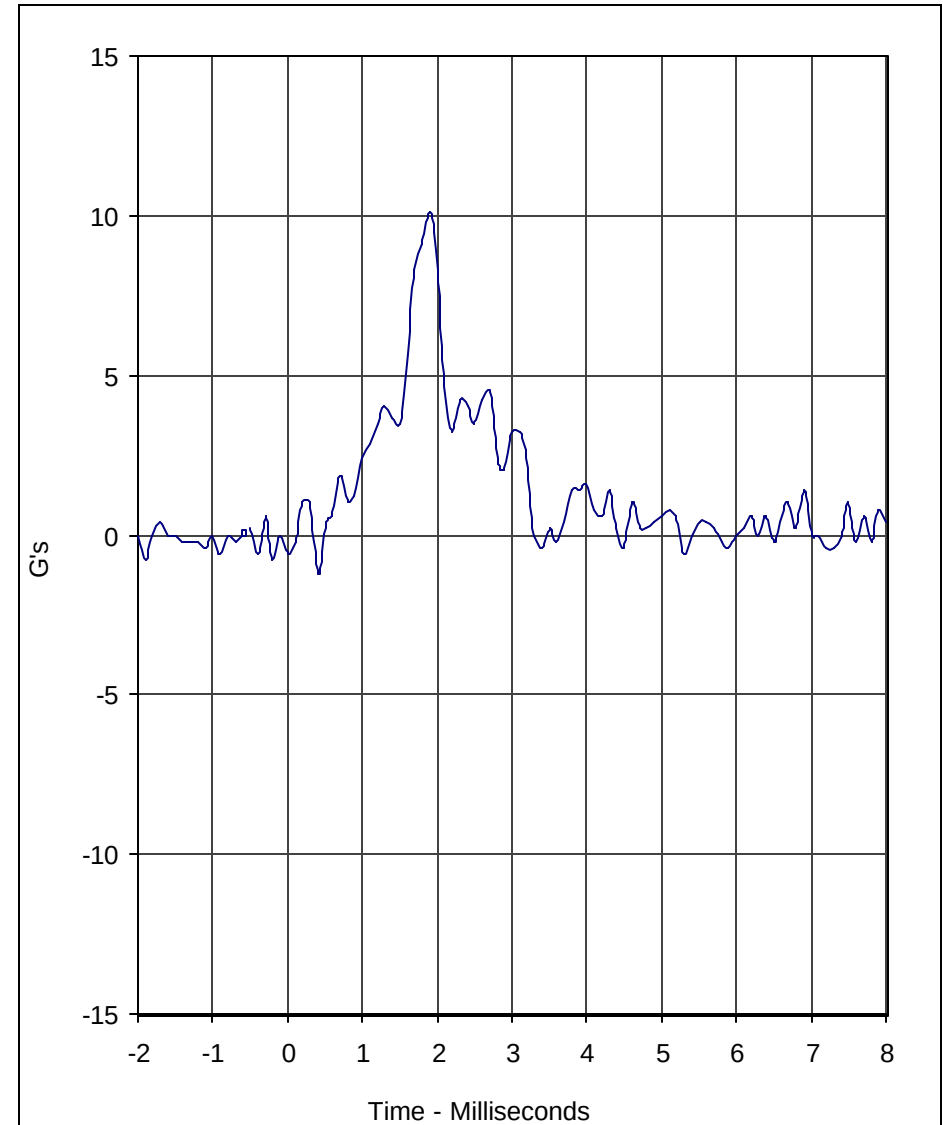
Laboratory Technician

March 12, 2003
Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES
Units	Max	Time	Min	Time	SAE Class
G's	248.6	1.8	0.2	-1.8	1000

Test Program: Hybrid III 50th Percentile Male Head Drop Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Head Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	10.1	1.9	-1.2	0.4	1000

A.T.D. Serial No.: 034
 Test I.D.: HD04A





Calibration Data Sheet

Hybrid III 50th Percentile Male

Thorax Impact Test

ATD Serial No.: 034

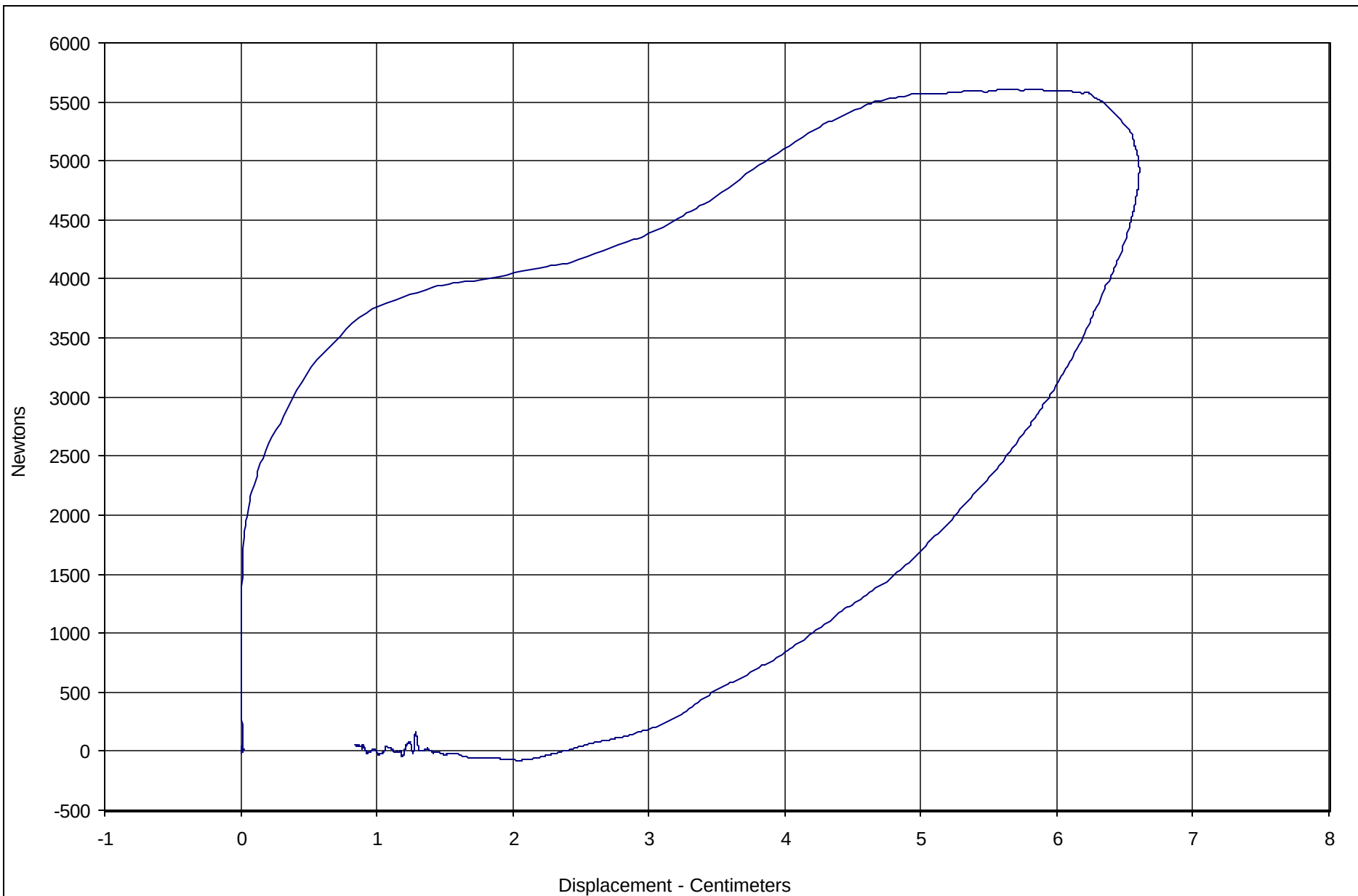
Test I.D.: CH01G

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	6.64	Pass
Peak Probe Force	Newtons	5159 to 5893	5608	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.61	Pass
Internal Hysteresis	%	69 to 85	78.5	Pass
Overall Test Results				Pass

Laboratory Technician

March 12, 2003

Test Date



Curve Description	CURNO	Type	Hysteresis	Peak Chest Displ.	Peak Probe Force	SAE Class
Probe Force vs. Chest Displacement	001	FIL	78.5	6.61	5607.5	180



Test Program: Hybrid III 50th Percentile Male Thorax Impact

A.T.D. Serial No.: 034

Test Date: 3/12/03

Test I.D.: CH01G



Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Flexion Test

ATD Serial No.: 034

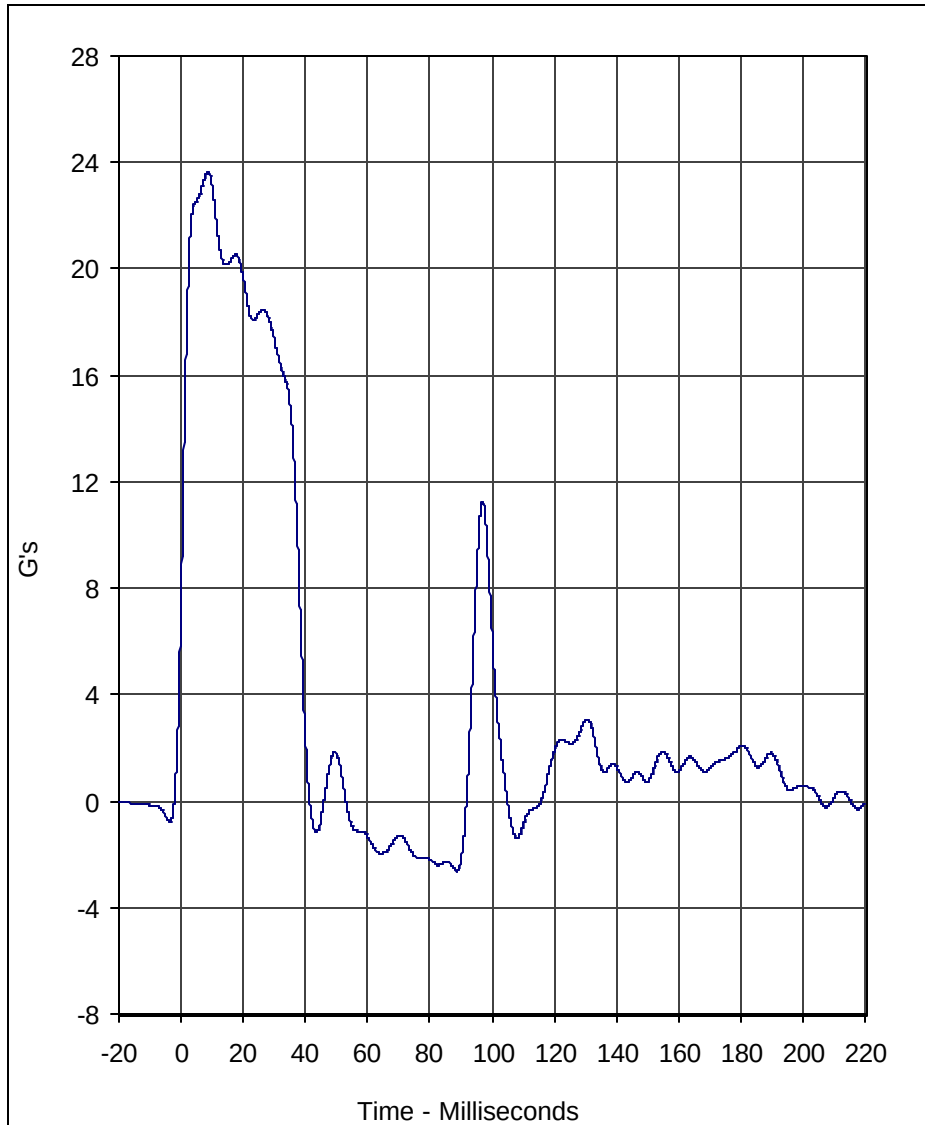
Test I.D.: NF09A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.1	Pass
	20 Msec.	G's	17.6 to 22.6	19.7	Pass
	30 Msec.	G's	12.5 to 18.5	17.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	67.4	Pass
	Time	Msec.	57.0 to 64.0	60.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.8	Pass
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	92.3	Pass
	Time	Msec.	47.0 to 58.0	51.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.5	Pass
Overall Test Results					Pass

Laboratory Technician

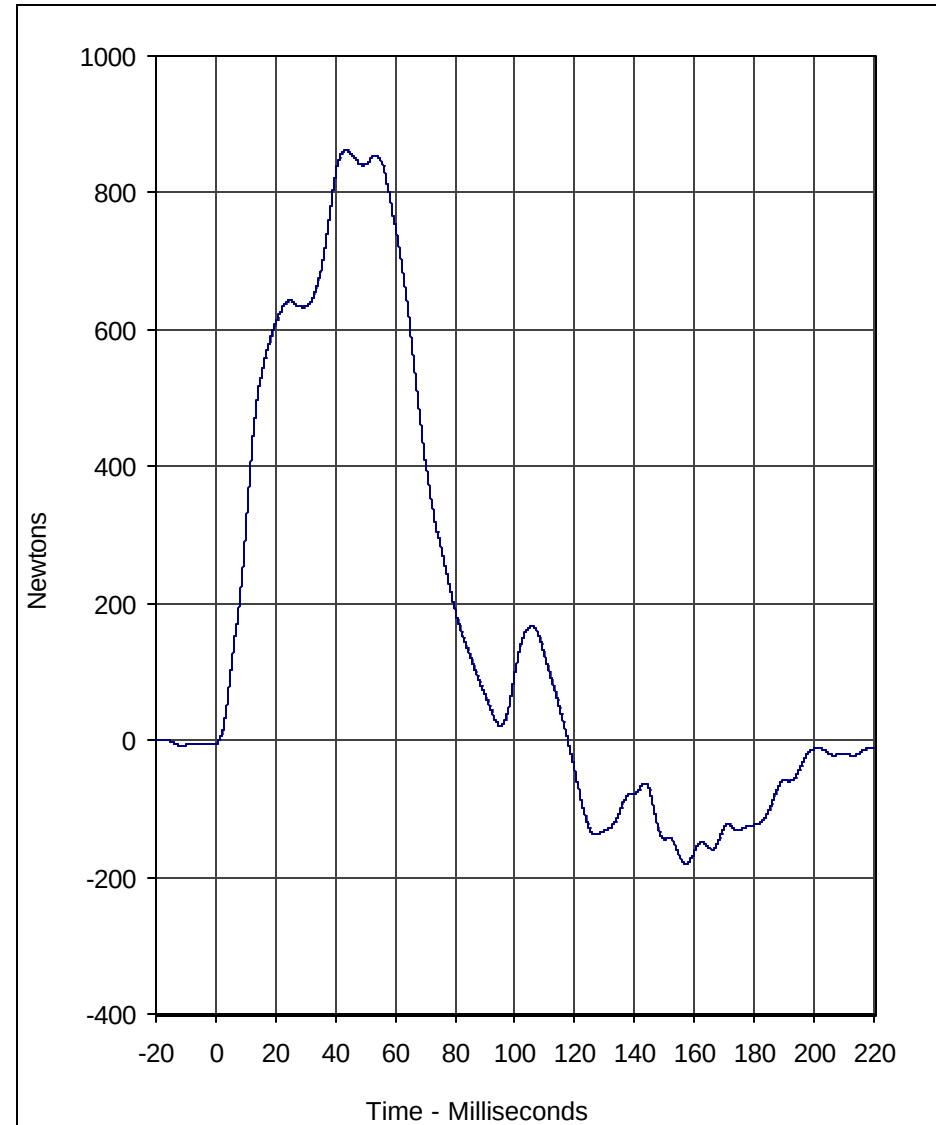
March 12, 2003

Test Date



Curve Description				CURNO	Type
Pendulum Deceleration				001	FIL
Units	Max	Time	Min	Time	SAE Class
G's	23.7	8.6	-2.6	88.7	60

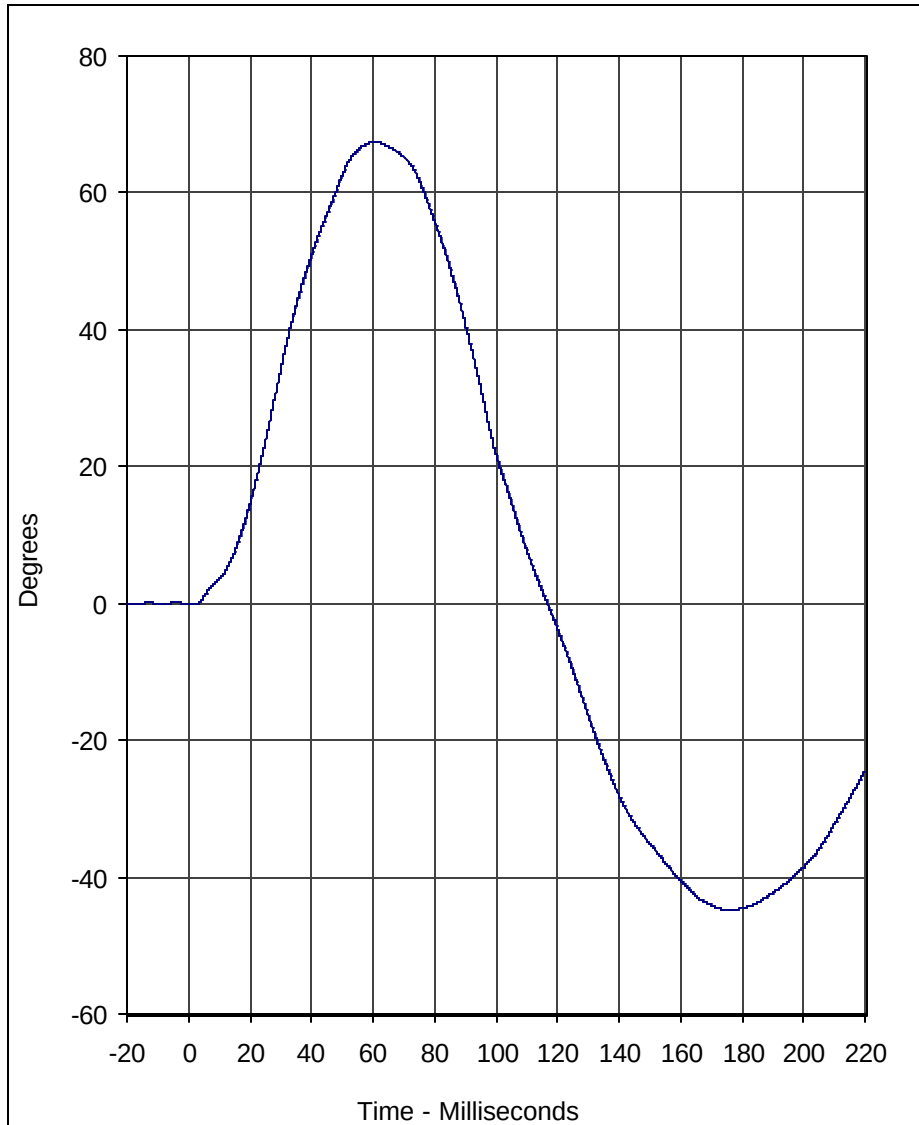
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	862.1	43.3	-181.1	157.1	60

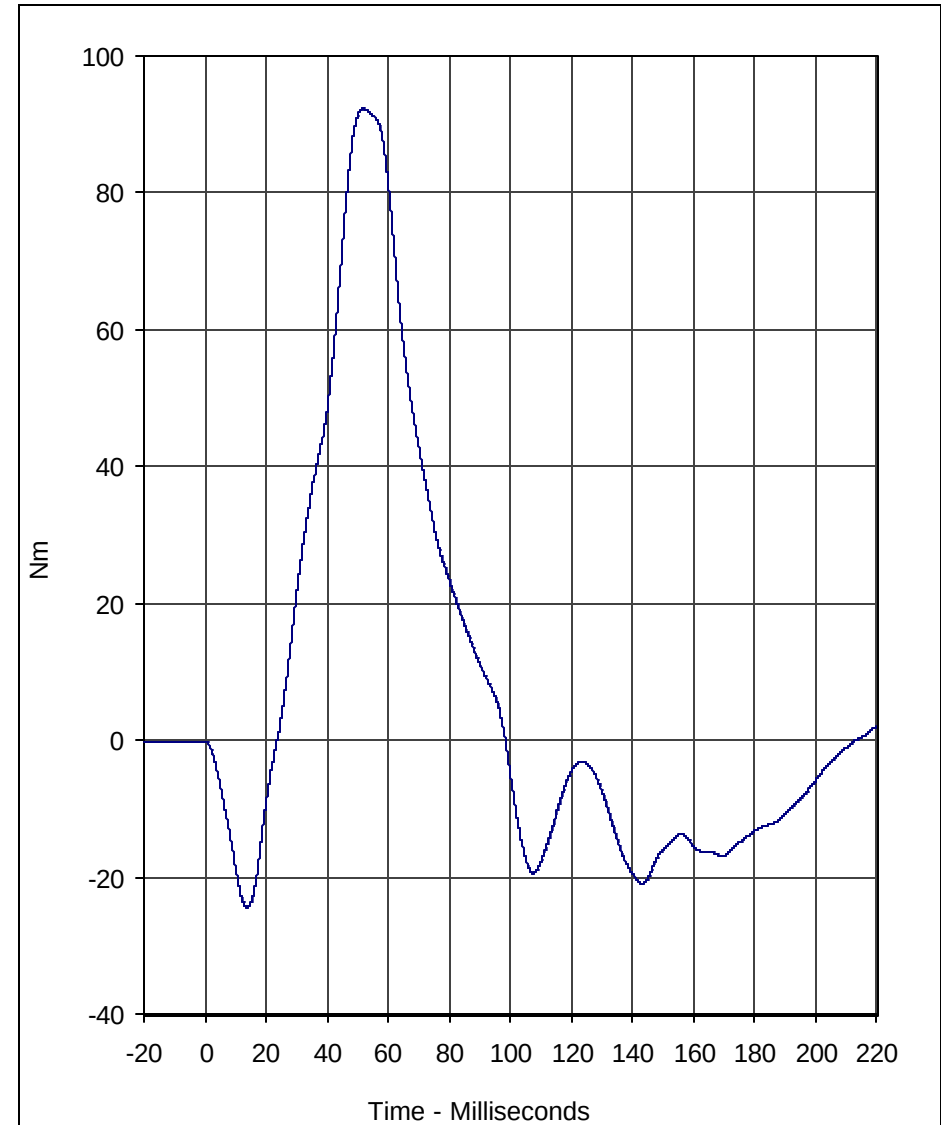
A.T.D. Serial No.: 034
 Test I.D.: NF09A





Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	67.4	60.4	-44.8	175.9	60

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Moment About Occipital Condyle				004	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	92.3	51.8	-24.5	13.8	60

A.T.D. Serial No.: 034
 Test I.D.: NF09A





Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Extension Test

ATD Serial No.: 034

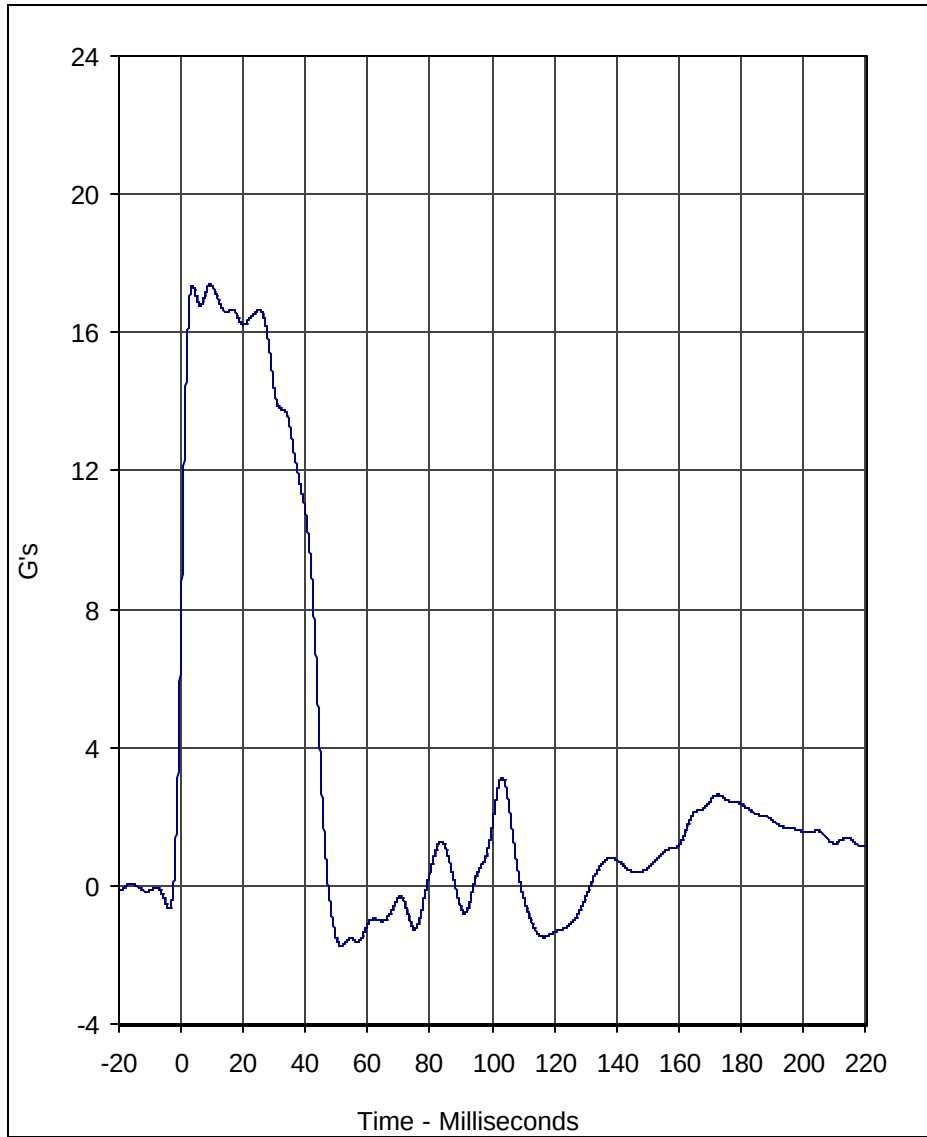
Test I.D.: NE04A

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	6.02	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.4	Pass
	20 Msec.	G's	14.0 to 19.0	16.2	Pass
	30 Msec.	G's	11.0 to 16.0	14.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	44.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.9	Pass
	Time	Msec.	72.0 to 82.0	82.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	154.8	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to- 79.9	-75.9	Pass
	Time	Msec.	65.0 to 79.0	70.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	141.4	Pass
Overall Test Results					Pass

Laboratory Technician

March 12, 2003

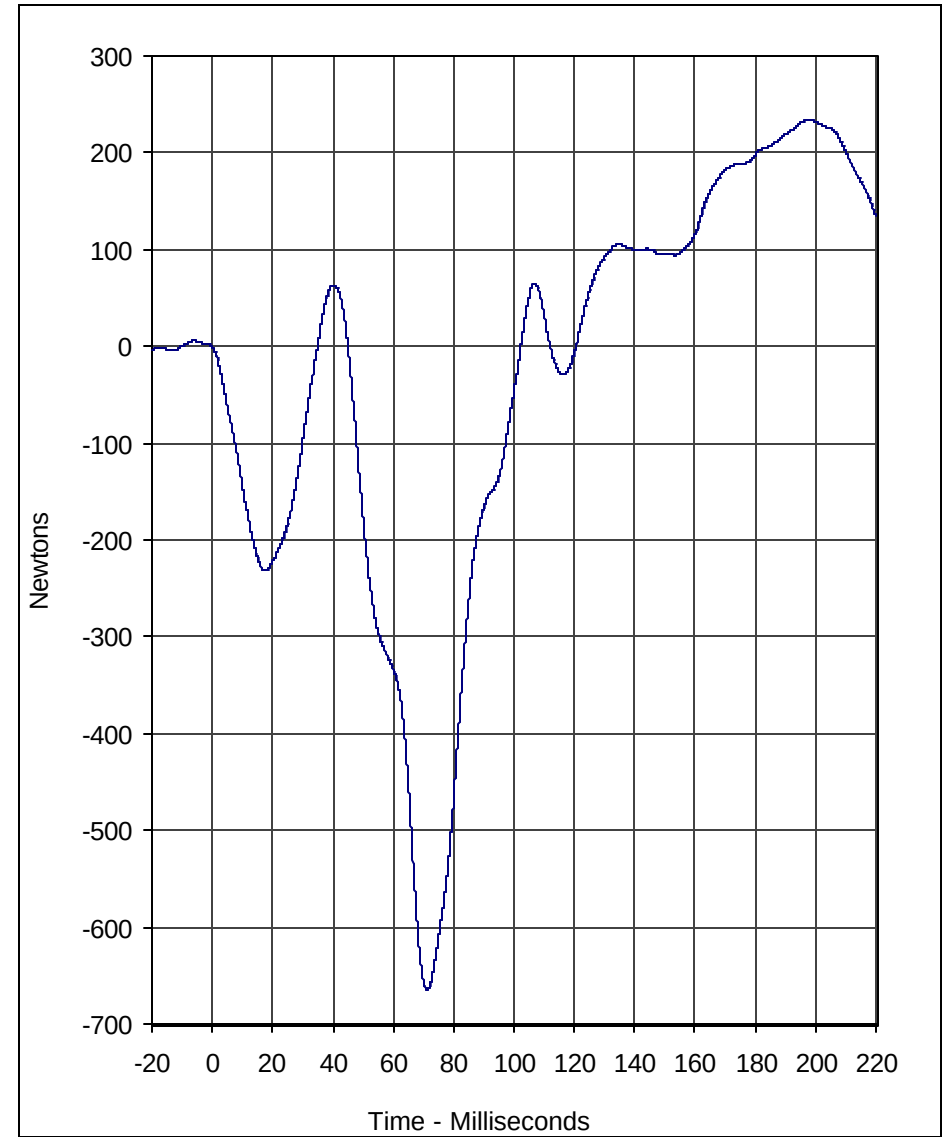
Test Date



Curve Description				CURNO	Type
Pendulum Deceleration				001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	17.4	9.4	-1.7	51.5	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 3/12/03

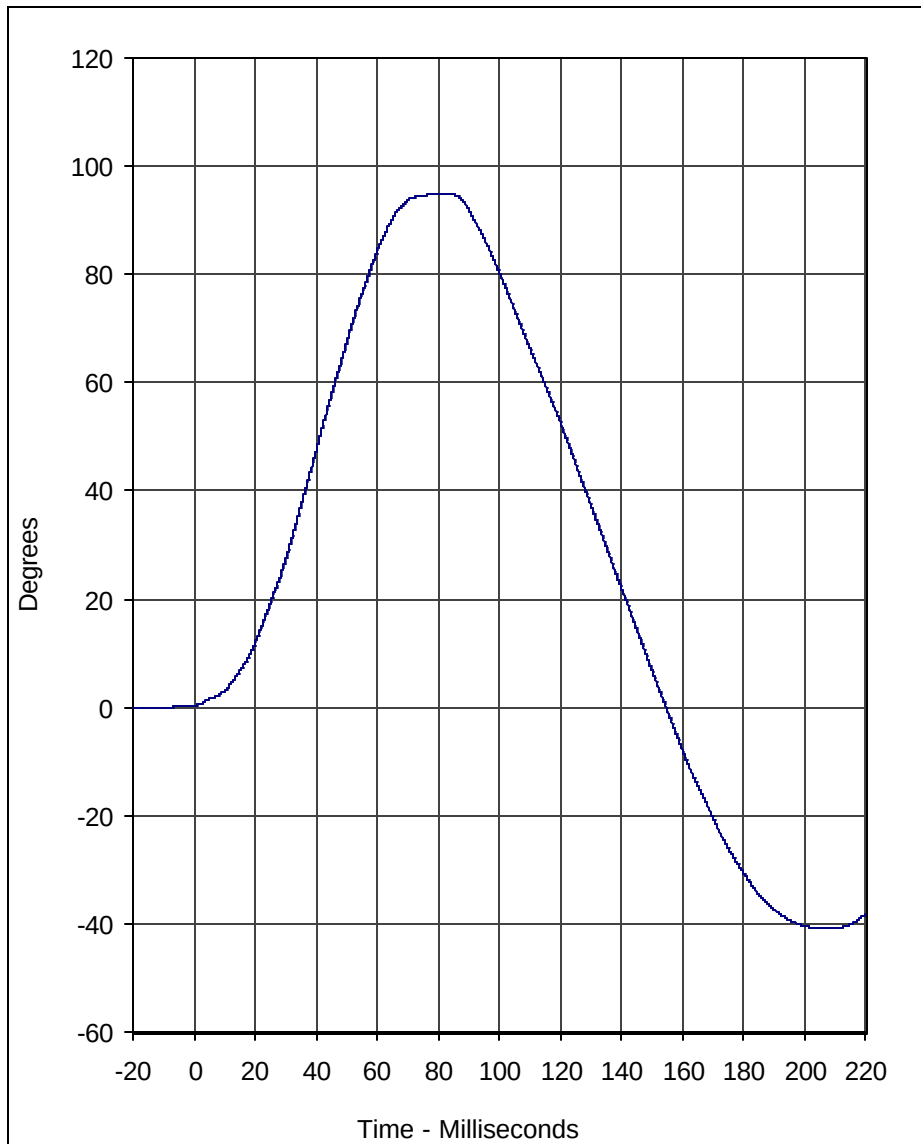


Curve Description				CURNO	Type
Neck Force X				002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	233.6	197.8	-665.3	71.2	60

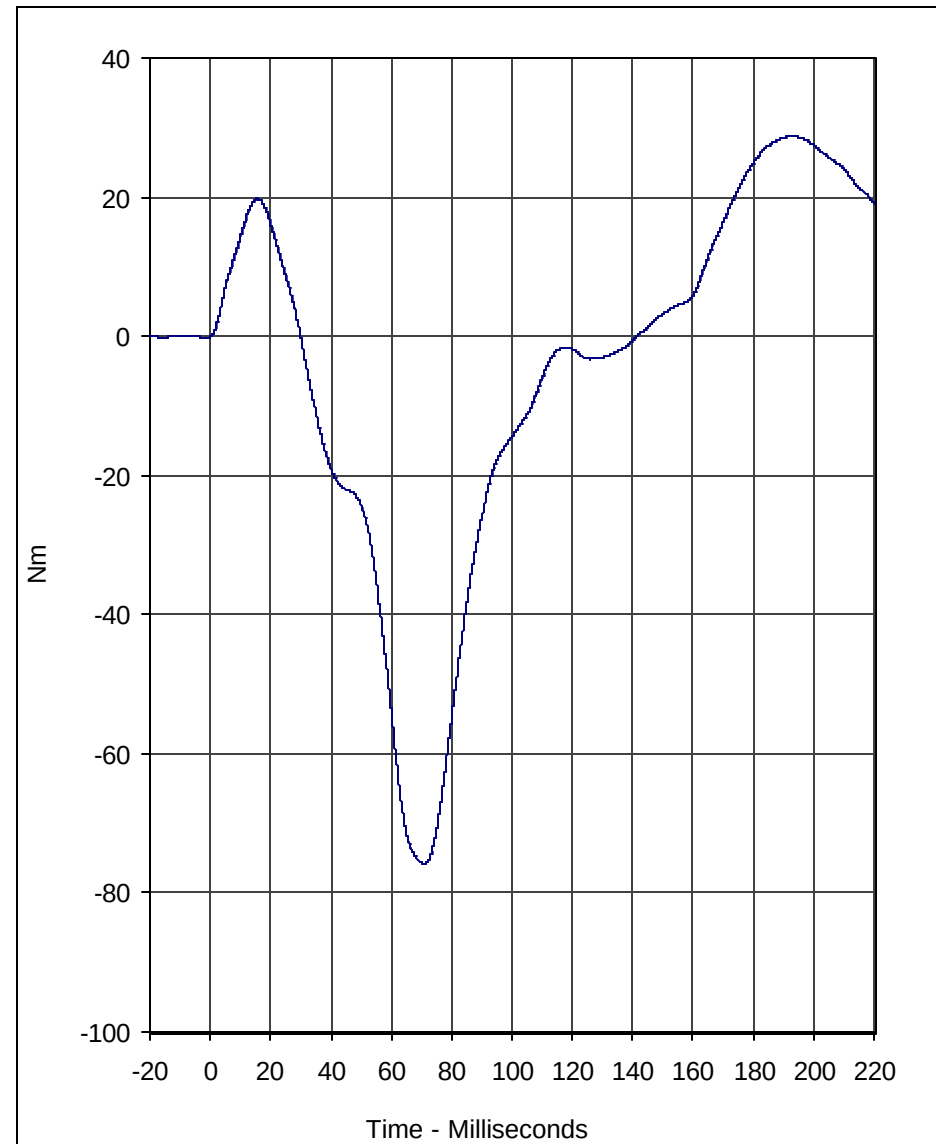
A.T.D. Serial No.: 034
 Test I.D.: NE04A





Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	94.9	83.2	-40.9	206.0	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Moment About Occipital Condyle				004	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	28.7	192.9	-75.9	70.9	60

A.T.D. Serial No.: 034
 Test I.D.: NE04A





Calibration Data Sheet

Hybrid III 50th Percentile Male

External Measurements

ATD Serial No.: 034

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	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	150	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	210	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	215	Pass
P - Foot length	mm	251 to 267	265	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	975	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

Laboratory Technician

March 12, 2003
Test Date



Calibration Data Sheet

Hybrid III 50th Percentile Male

Knee Impact Test

ATD Serial No.: 035

Location: Left Knee

Test I.D.: RK10B

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	N	4715 to 5782	5422	Pass
Overall Test Results				Pass

ATD Serial No.: 035

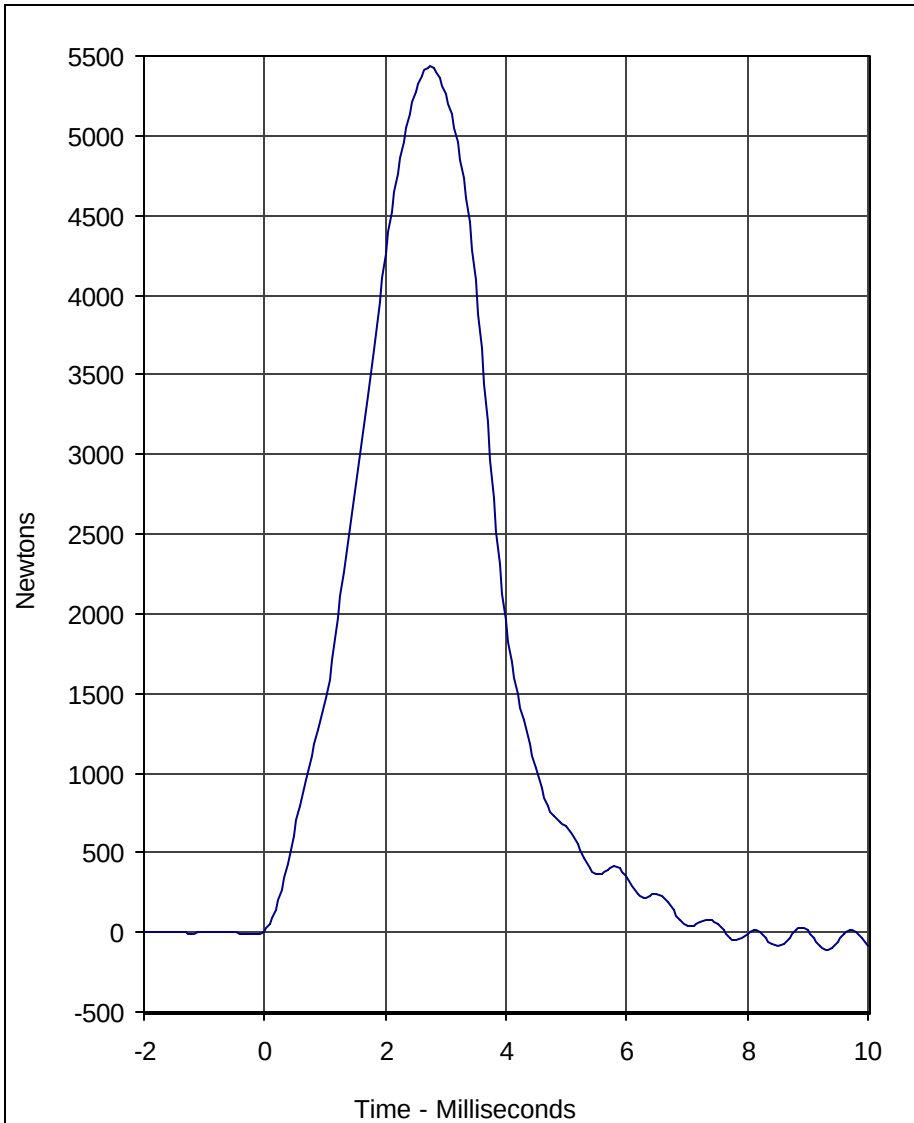
Location: Right Knee

Test I.D.: RK10B

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	2.11	Pass
Peak Probe Force	N	4715 to 5782	5422	Pass
Overall Test Results				Pass

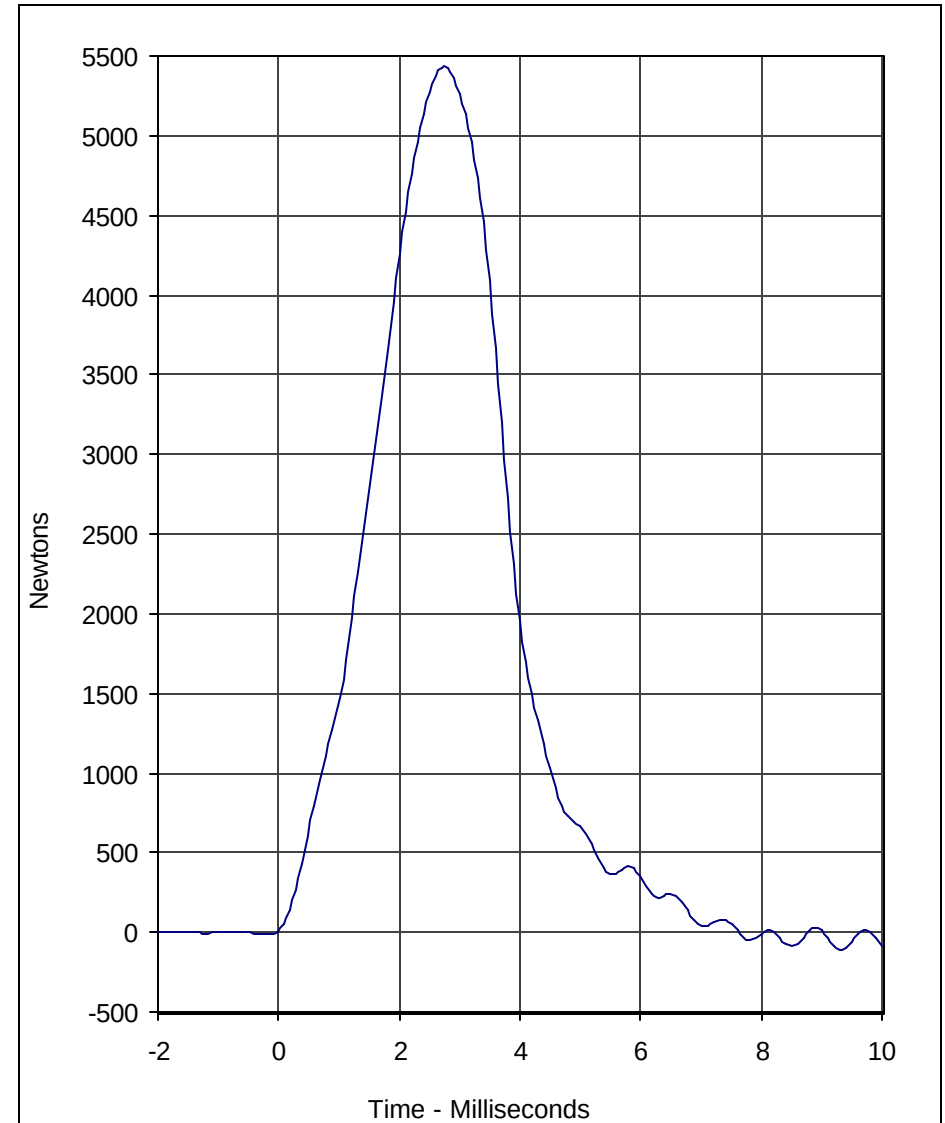
Laboratory Technician

March 12, 2003
Test Date



Curve Description		Location	Test I.D.	CURNO	Type
Probe Force		Left Knee	RK10B	001	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	5421.8	2.7	-109.3	9.3	600

Test Program: Hybrid III 50th Percentile Male Knee Impact Test
 Test Date: 3/12/03



Curve Description		Location	Test I.D.	CURNO	Type
Probe Force		Right Knee	RK10B	002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	5421.8	2.7	-109.3	9.3	600

A.T.D. Serial No.: 035





Calibration Data Sheet

Hybrid III 50th Percentile Male

Head Drop Test

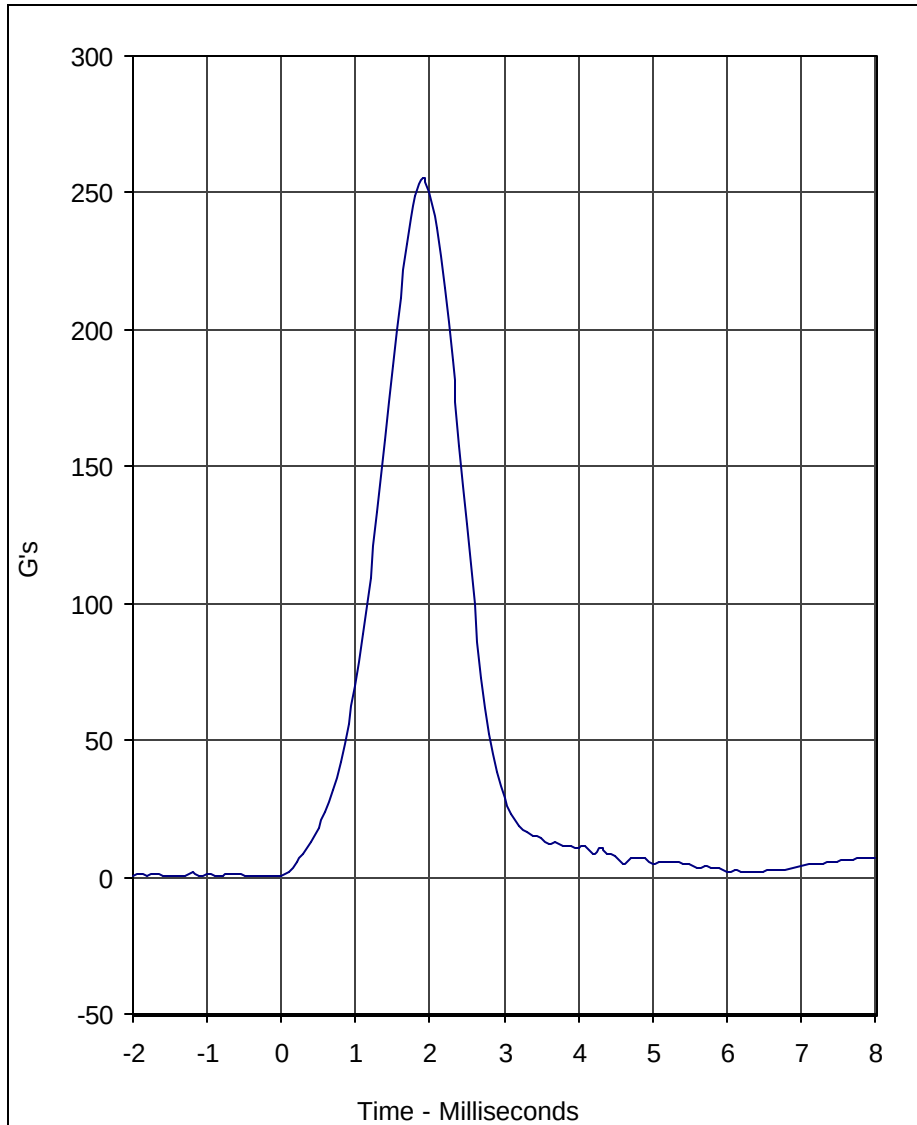
ATD Serial No.: 035

Test I.D.: HD05A

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	255.5	Pass
Peak Lateral Acceleration	G's	≤15.0	9.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

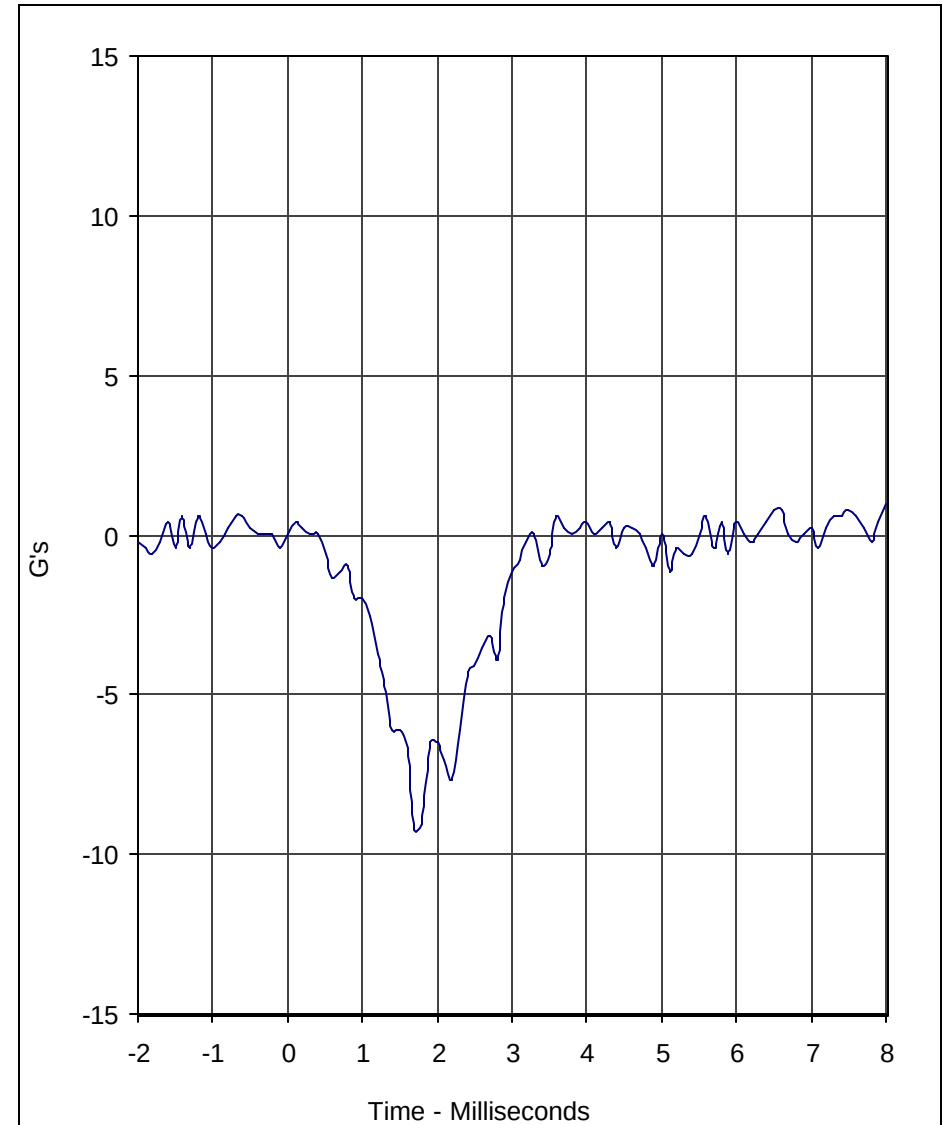
Laboratory Technician

March 12, 2003
Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES
Units	Max	Time	Min	Time	SAE Class
G's	255.5	1.9	0.1	-0.4	1000

Test Program: Hybrid III 50th Percentile Male Head Drop Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Head Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	0.6	-1.4	-9.2	1.7	1000

A.T.D. Serial No.: 035
 Test I.D.: HD05A





Calibration Data Sheet

Hybrid III 50th Percentile Male

Thorax Impact Test

ATD Serial No.: 035

Test I.D.: CH01H

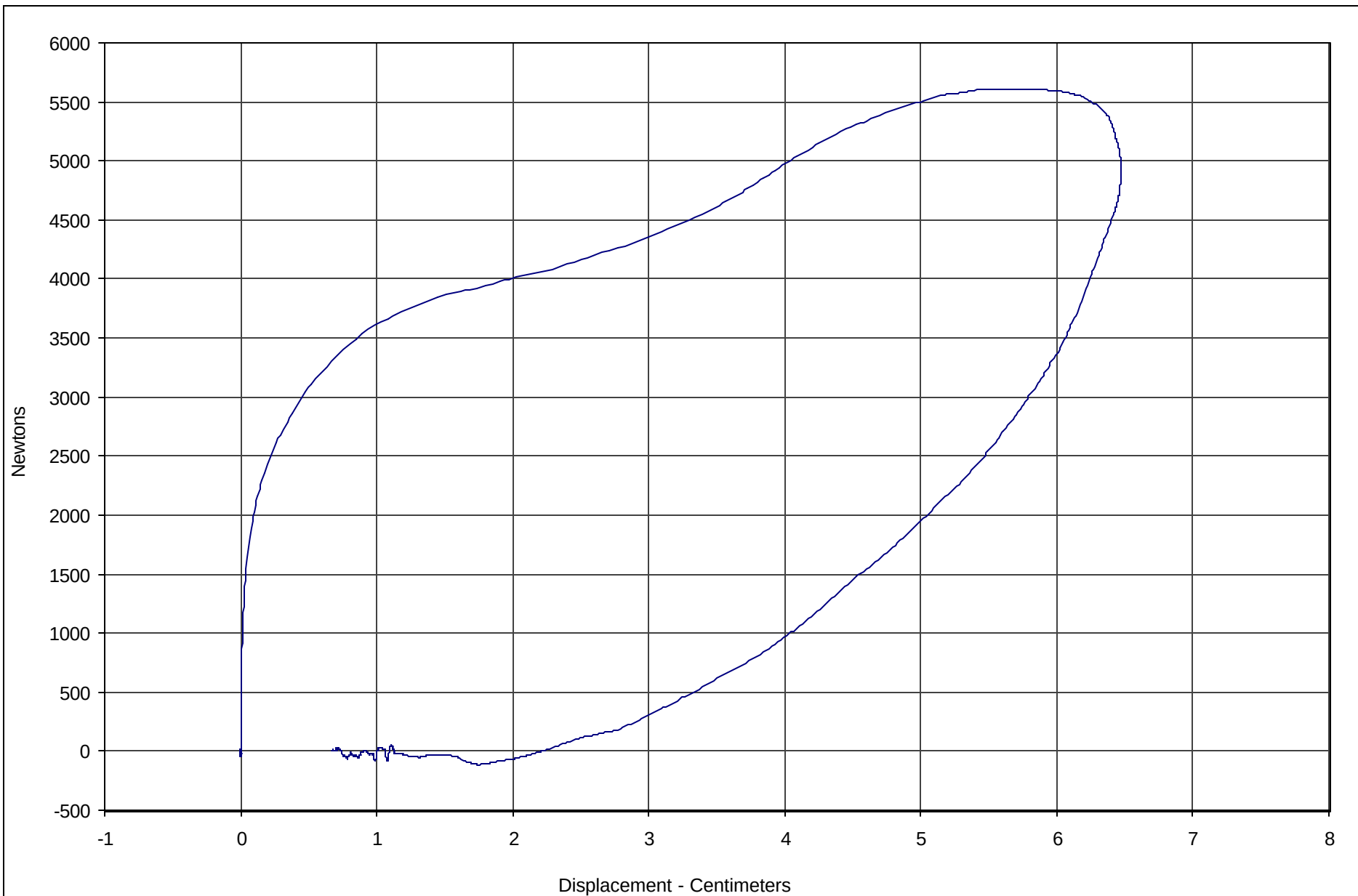
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.64	Pass
Peak Probe Force	Newtons	5159 to 5893	5610	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.47	Pass
Internal Hysteresis	%	69 to 85	77.1	Pass
Overall Test Results				Pass

E-18

TR-P23001-17-NC

Laboratory Technician

March 12, 2003
Test Date



Curve Description	CURNO	Type	Hysteresis	Peak Chest Displ.	Peak Probe Force	SAE Class
Probe Force vs. Chest Displacement	001	FIL	77.1	6.47	5610.0	180



Test Program: Hybrid III 50th Percentile Male Thorax Impact

A.T.D. Serial No.: 035

Test Date: 3/12/03

Test I.D.: CH01H



Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Flexion Test

ATD Serial No.: 035

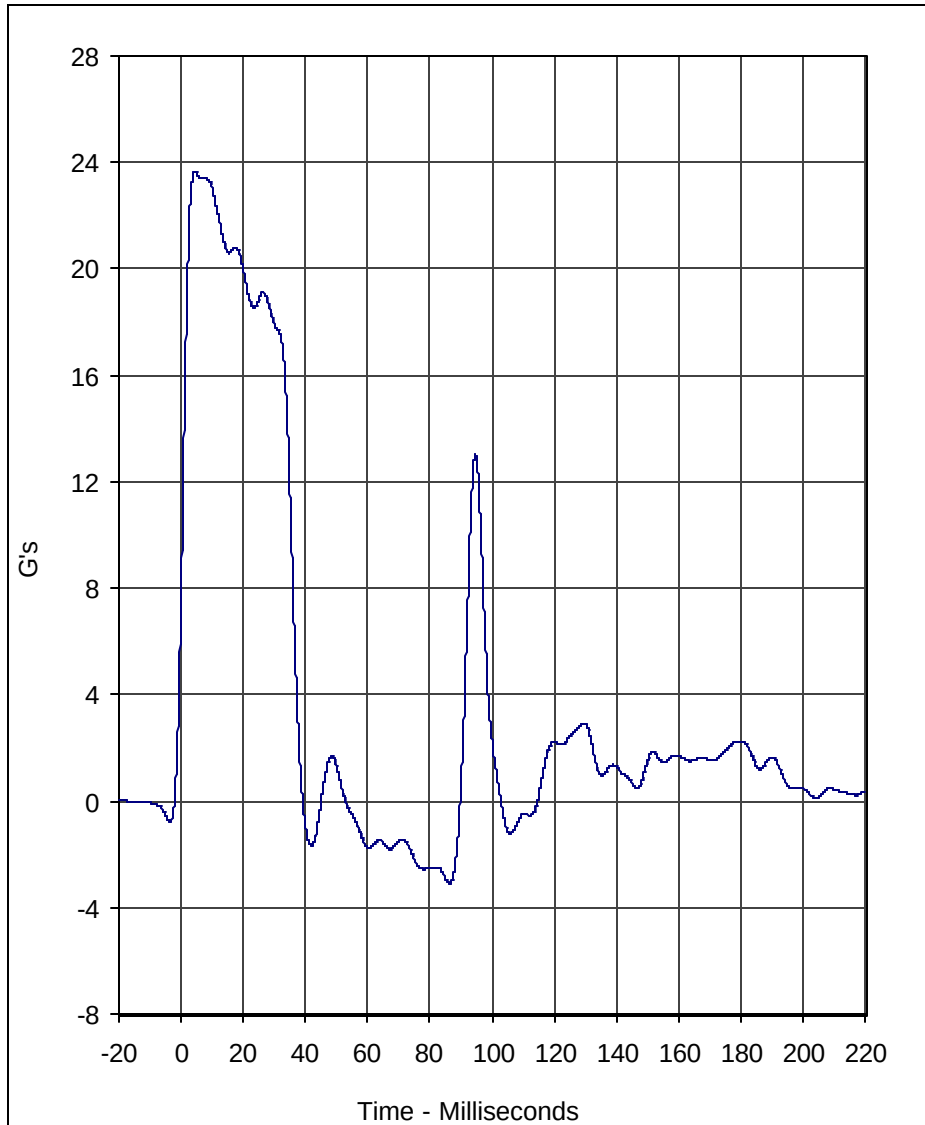
Test I.D.: NF09B

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	20.0	Pass
	30 Msec.	G's	12.5 to 18.5	17.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	64.9	Pass
	Time	Msec.	57.0 to 64.0	57.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	113.1	Pass
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	88.7	Pass
	Time	Msec.	47.0 to 58.0	54.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	Pass
Overall Test Results					Pass

Laboratory Technician

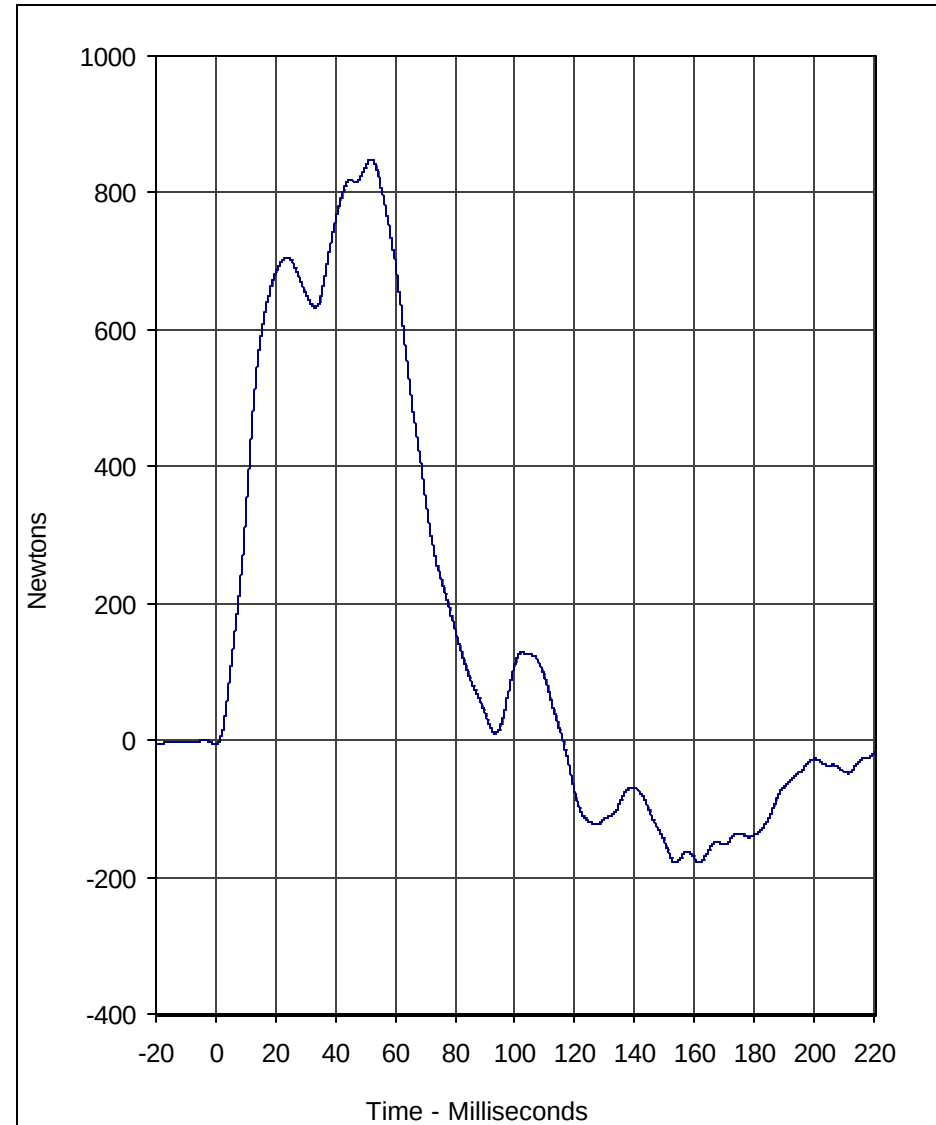
March 12, 2003

Test Date



Curve Description				CURNO	Type
Pendulum Deceleration				001	FIL
Units	Max	Time	Min	Time	SAE Class
G's	23.7	4.4	-3.1	86.4	60

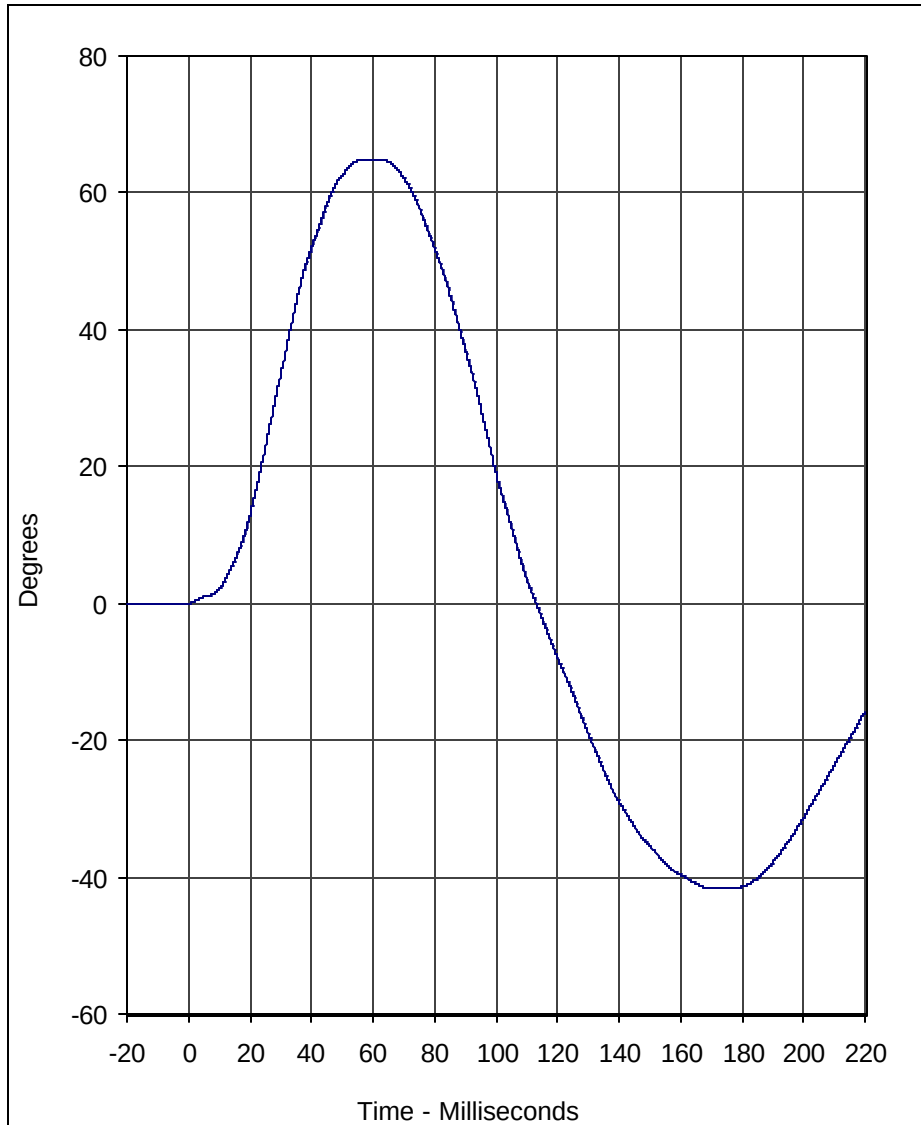
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	848.9	51.9	-179.1	153.7	60

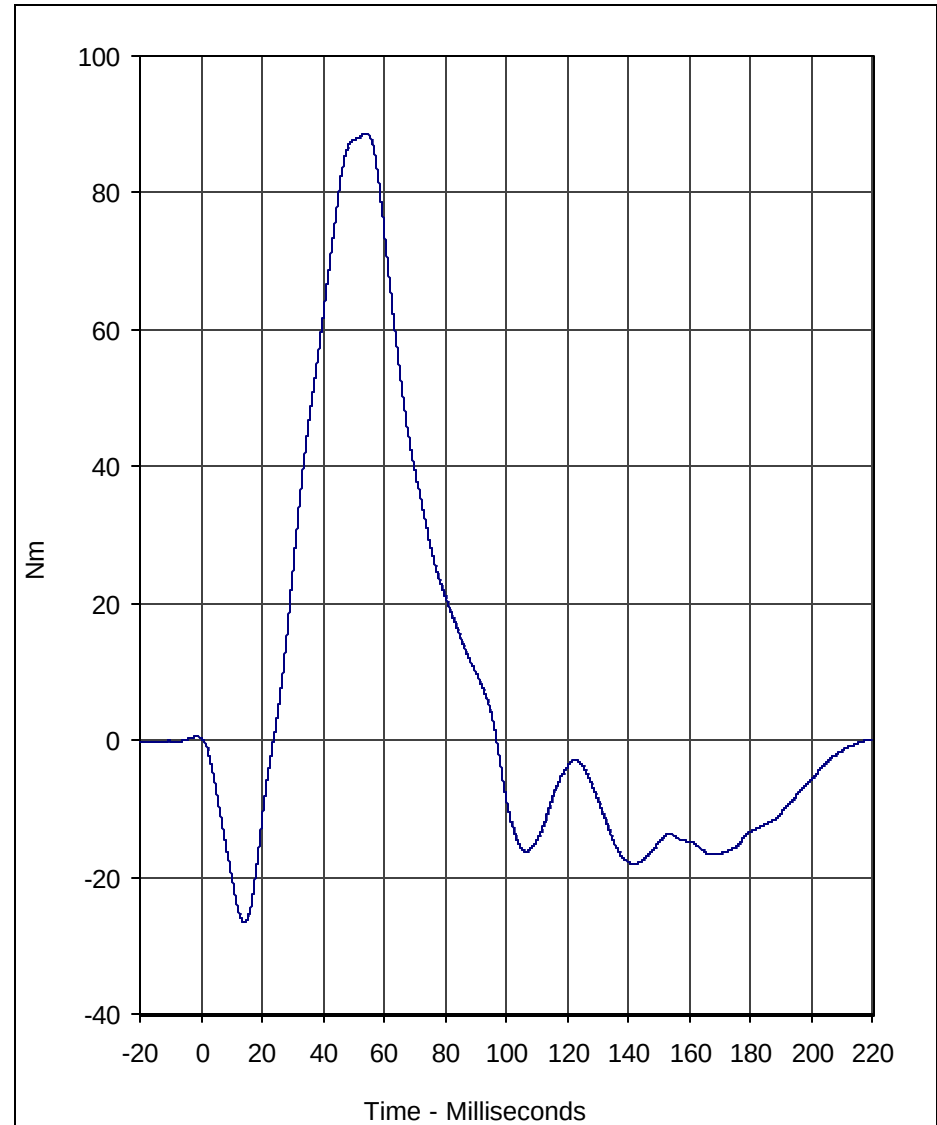
A.T.D. Serial No.: 035
 Test I.D.: NF09B





Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	64.9	57.4	-41.7	175.7	60

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Moment About Occipital Condyle				004	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	88.7	54.1	-26.6	14.2	60

A.T.D. Serial No.: 035
 Test I.D.: NF09B





Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Extension Test

ATD Serial No.: 035

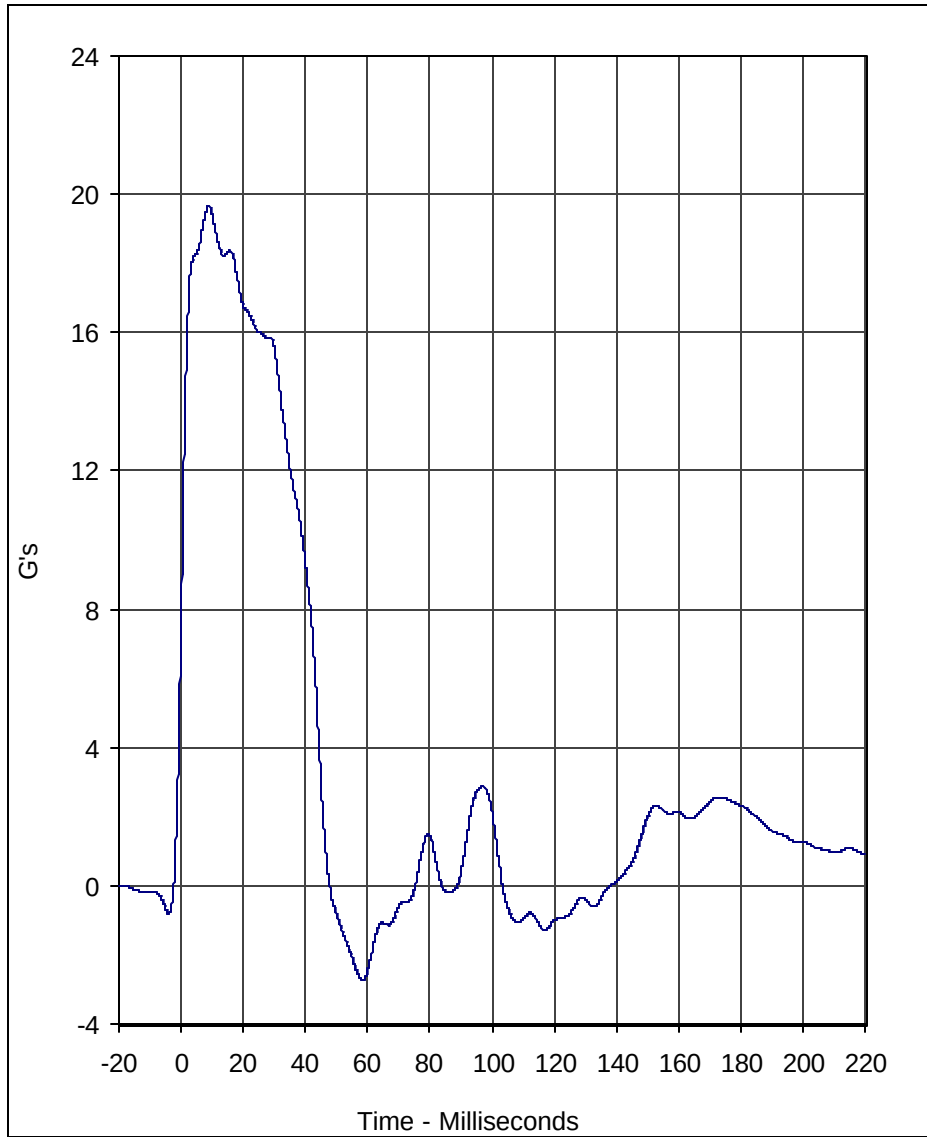
Test I.D.: NE04N

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	6.02	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.4	Pass
	20 Msec.	G's	14.0 to 19.0	16.8	Pass
	30 Msec.	G's	11.0 to 16.0	15.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	43.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.9	Pass
	Time	Msec.	72.0 to 82.0	78.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.1	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to- 79.9	-74.7	Pass
	Time	Msec.	65.0 to 79.0	67.2	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	136.8	Pass
Overall Test Results					Pass

Laboratory Technician

March 12, 2003

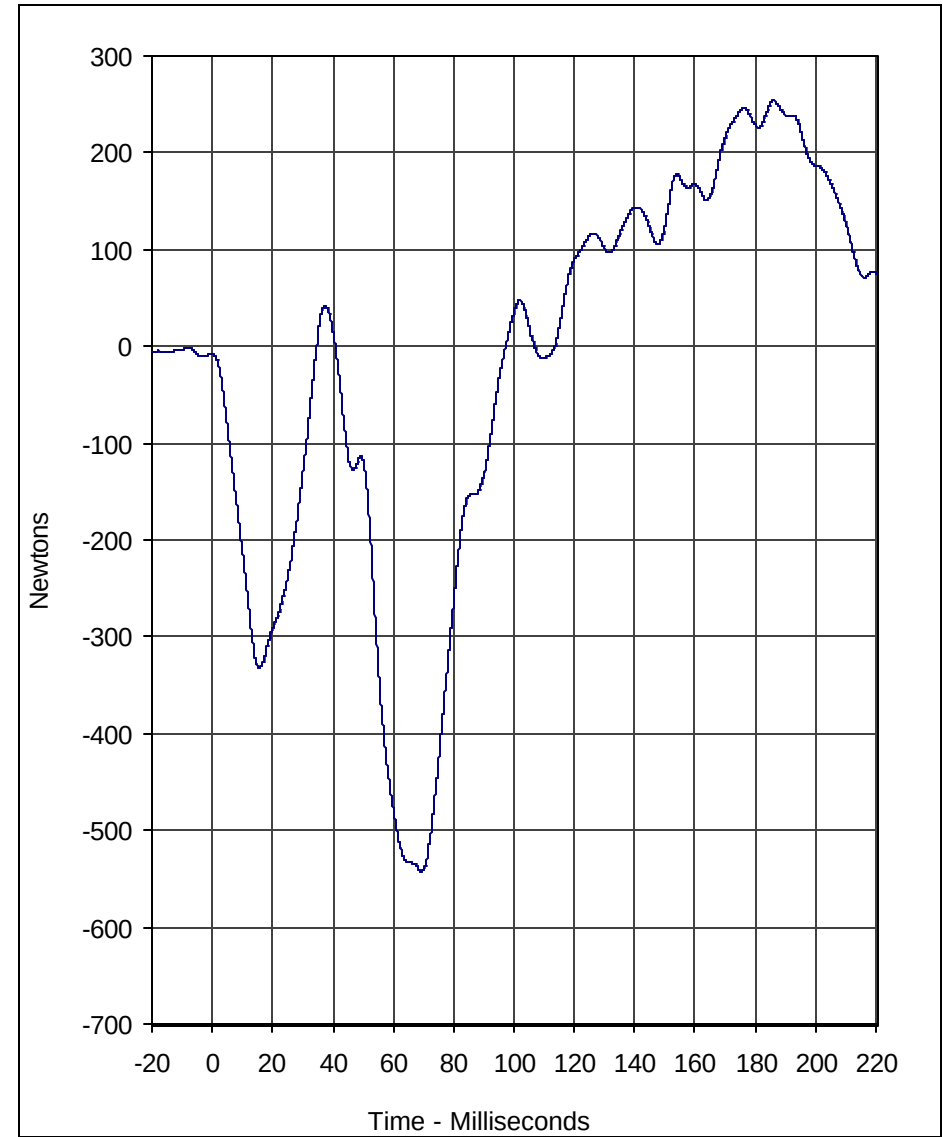
Test Date



Curve Description				CURNO	Type
Pendulum Deceleration				001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	19.7	8.8	-2.7	58.3	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 3/12/03

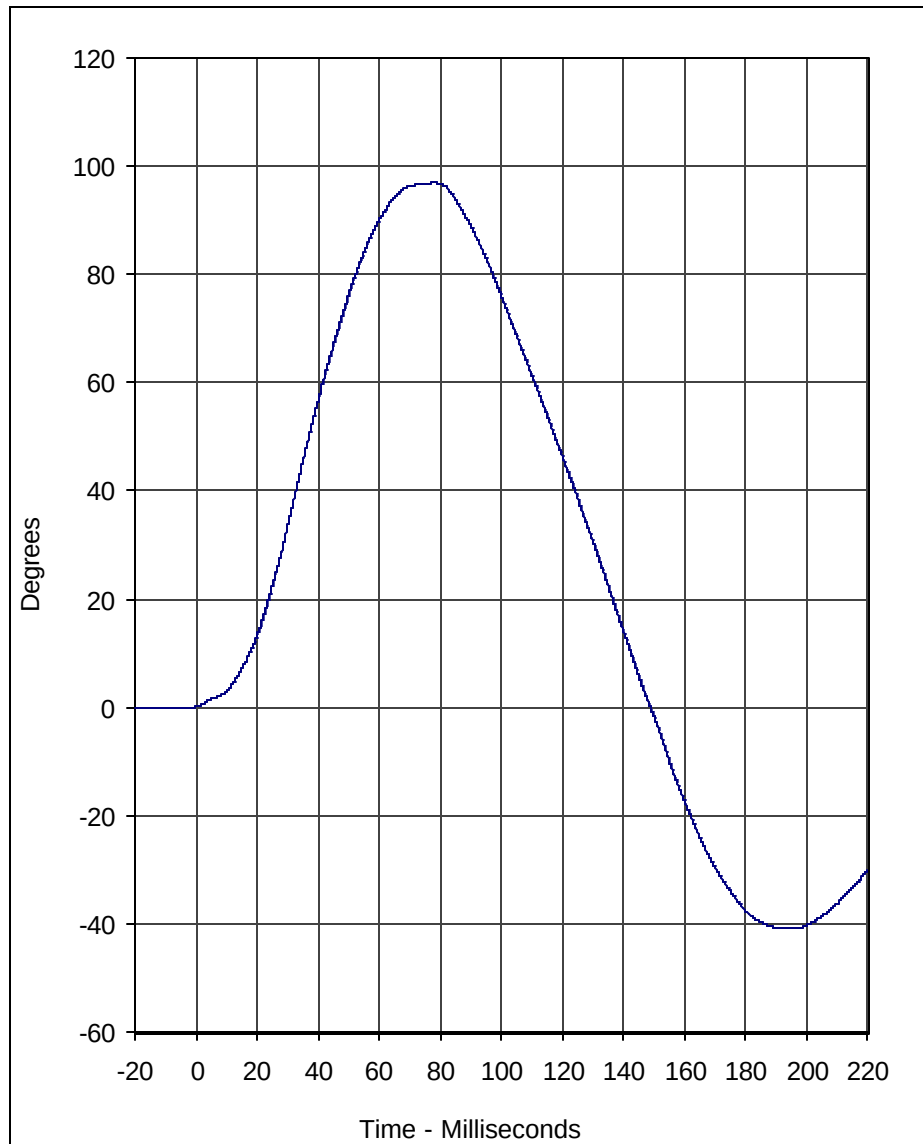


Curve Description				CURNO	Type
Neck Force X				002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	254.2	186.0	-542.3	69.4	60

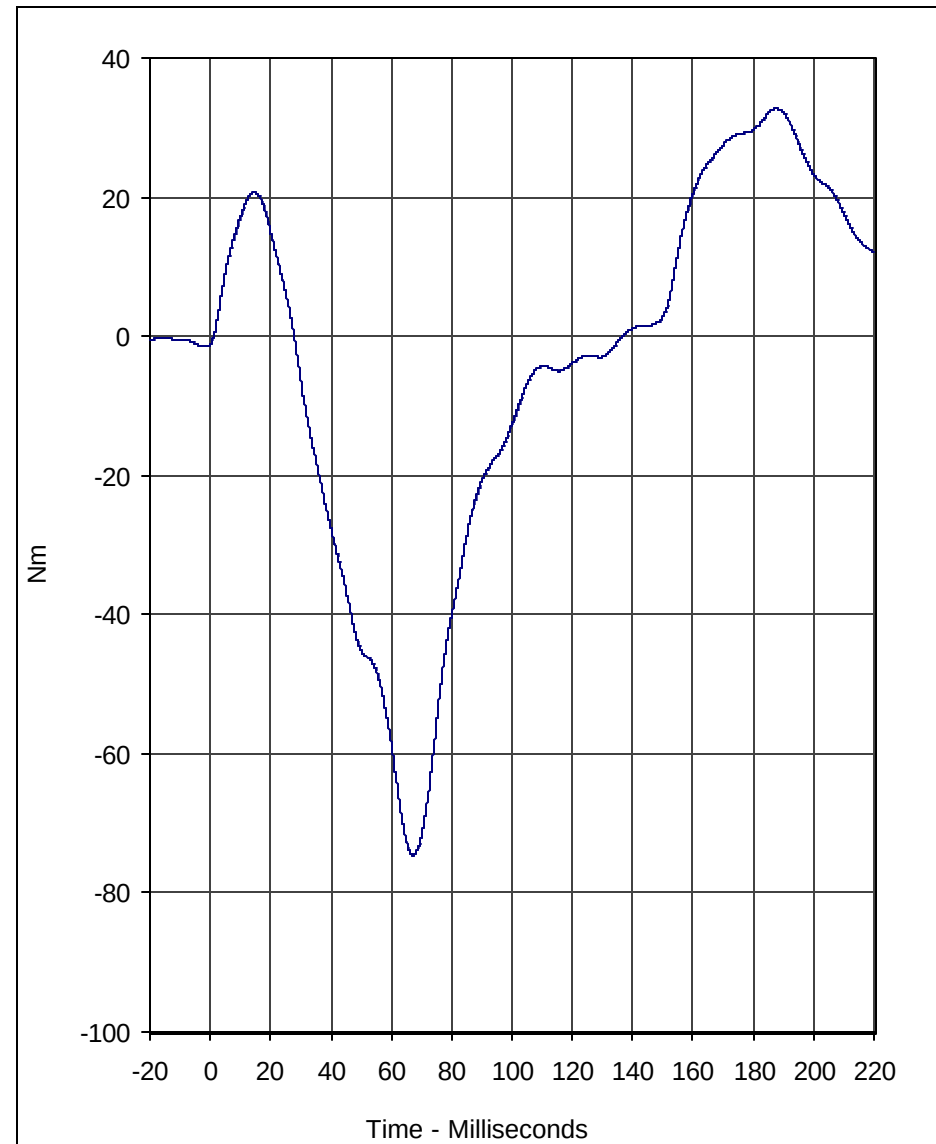
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 Test I.D.: NE04N





Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	96.9	78.2	-40.9	193.1	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Moment About Occipital Condyle				004	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	32.7	187.7	-74.7	67.2	60

A.T.D. Serial No.: 035
 Test I.D.: NE04N





Calibration Data Sheet Hybrid III 50th Percentile Male External Measurements

ATD Serial No.: 035

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	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	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	340	Pass
J - Elbow rest height	mm	190 to 211	210	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	265	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	975	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	

Laboratory Technician

March 12, 2003
Test Date

APPENDIX F

CHILD RESTRAINT SYSYTEM

REPORT NUMBER TR-P23001-17-NC

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

**BAYERICSHE MOTORENWERKE AG
2003 BMW X5 3.0i
SUV**

NHTSA NUMBER: M30501

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



MARCH 18, 2003

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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KARCO Engineering, LLC

Date: March 24, 2003

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

Date: March 24, 2003

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-P23001-17-NC	2. Government Accession No.	3. Recipients Catalog No.			
4. Title and Subtitle Final Report of Evenflo Vanguard 5 Convertible Final Report of Evenflo Vanguard Convertible Comfort Touch NHTSA No. M30501		5. Report Date March 24, 2003			
		6. Performing Organization Code KAR			
7. Authors Mr. James E. Gorth, Project Engineer, Karco Mr. Frank Richardson, Project Manager, Karco		8. Performing Organization Report No. TR-P23001-17-NC			
9. Performing Organization Name and Address KARCO Engineering, LLC 9270 Holly Road 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: NVS-111 400 Seventh Street, SW, Room 5311 Washington, D.C 20590		13. Type of Report and Period Covered Final Test Report Option Year 2			
		14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS/NVS 111			
15. Supplementary Notes					
16. Abstract A CRS Test was performed in conjunction with a New Car Assessment Program (NCAP) Load Cell Barrier Test This test was conducted at Karco Engineering, LLC on March 18, 2003.					
Measurement Description		Units		Left Rear	Right Rear
Head Injury Criteria (HIC) 36		N/A		536.6	543.0
Head Injury Criteria (HIC) 15		N/A		382.9	341.0
3 M sec. Chest Clip		G's		48.7	48.2
Peak Chest Displacement		mm		-11.5	-11.9
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2003 BMW X5 3.0i SUV NHTSA No. M30501			18. Distribution 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. Pages 150	22. Price	

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SECTION F-1

PURPOSE AND SUMMARY OF TEST M30501

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

The 55.82 km/h NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

The 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 and a load cell on the upper tether.

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

CHILD DUMMY VALUES

	HIC36 Values	HIC15 Values	3 Msec Chest Clip	Peak Chest Disp.
Left Rear Child	536.6	382.9	48.7	-11.5
Right Rear Child	543.0	341.0	48.2	-11.9

SECTION F-1**DATA SHEET NO.1.....CRASH TEST SUMMARY**

Test Vehicle: 2003 BMW X5 3.0i SUV
Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
Test Date: 3/18/03

TEST DUMMY INFORMATION

Description	Position #3 CRS	Position # 4 CRS
Manufacturer	Evenflo	Evenflo
Model Name	Vanguard 5	Vanguard Comfort Touch
Serial No.	3691261 P1	3681261 P1
Type	Convertible	Convertible
Forward/Rearward	Forward	Forward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS	Position # 4 CRS
Head Contact	None	Tray
Chest Contact	Harness	Harness
Abdomen Contact	Harness	Harness
Left Knee Contact	None	None
Right Knee Contact	None	None
Left Toe contact	Seatback	Seatback
Right Toe Contact	Seatback	Seatback

POST TEST DOOR OPENING

Description	Front	Rear
Left Side Doors	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Right Side Doors	Remained closed, opened w/o tools	Remained closed, opened w/o 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	4
Real Time	0
Total	4

SECTION F-1

DATA SHEET NO. 2.....CRS PARAMETER DATA

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

TEST VEHICLE WEIGHTS

		As Delivered			As Tested		
	Units	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	518	550		553	666	
Right	kg	516	533		543	638	
Ratio	%	48.8	51.2		45.7	54.3	
Totals	kg	1034	1083	2117	1096	1304	2400

TARGET TEST WEIGHT CALCULATION

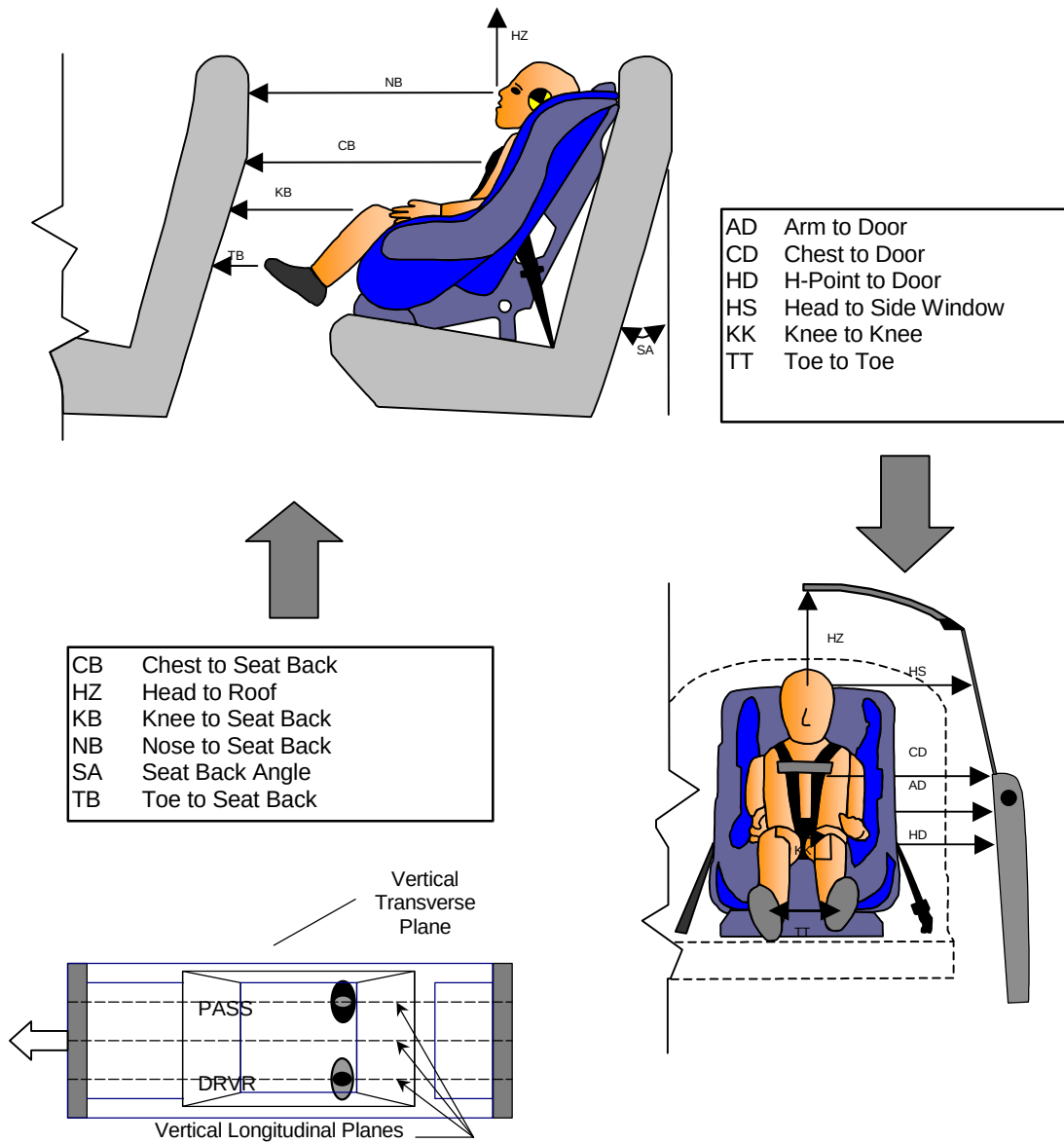
Measured Parameter	Units	Value
Total Delivered Weight (<i>UVW</i>)	kg	2117
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Weight (<i>RCLW</i>)	kg	136
Calculated Vehicle Target Weight (<i>TVTW</i>)	kg	2405

SECTION F-1

DATA SHEET NO. 3CHILD DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 3/18/03



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

SECTION F-1

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

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 3/18/03

CHILD DUMMY POSITION MEASUREMENTS

Code	Measurement	Units	P3 CRS (082)		P4 CRS (139)	
			Pre-Test	Post-test	Pre-Test	Post-test
SA	Seat Back Angle	Deg.	23	23	23	23
HZ	Head to Roof (Z)	mm	400	425	410	440
CD	Chest to Dash	mm	430	405	420	420
KK	Knee to Knee (Y)	mm	275	280	260	255
HS	Head to Side Window	mm	305	330	285	345
HD	H-Point to Door (Y)	mm	365	375	380	390
AD	Arm to Door (Y)	mm	500	552	495	552
NB	Nose to Seat Back	mm	465	527	475	535
CB	Chest to Seat Back	mm	155	206	160	213
FF	Foot to Foot	mm	215	265	190	227
KB-LEFT	Knee to Seat Back	mm	260	360	215	300
KB-RIGHT	Knee to Seat Back	mm	250	344	230	297
TB-LEFT	Toe to Seat Back	mm	35	82	70	98
TB-RIGHT	Toe to Seat Back	mm	55	97	40	105

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

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	37.6	199.4	-25.4	76.1	44.1	200.3	-29.3	107.9
Head CG	Y	G's	10.7	107.1	-8.1	68.5	3.6	108.1	-5.8	201.0
Head CG	Z	G's	55.9	72.8	-13.9	35.1	59.5	76.8	-11.5	34.8
Head CG Resultant	N/A	G's	60.5	72.8			62.9	76.8		

PRIMARY HEAD INJURY CRITERAS (HIC)

Location	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary (HIC36)	543.0	61.6	97.6	46.9	536.6	62.8	96.7	47.8
Head CG Primary (HIC15)	341.0	68.7	83.7	55.3	382.9	68.4	83.4	57.9

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	5.7	226.1	-39.2	80.4	10.0	210.2	-35.2	58.8
Chest CG	Y	G's	2.5	214.1	-7.8	56.2	4.7	69.4	-1.7	220.4
Chest CG	Z	G's	13.1	85.7	-36.2	56.1	20.1	84.0	-35.0	60.1
Chest CG Resultant	N/A	G's	50.3	56.0			49.6	58.8		

PRIMARY CHEST CLIP (3MSEC)

Location	Right Rear (3 Yr.)			Left Rear (3 Yr.)		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	48.2	54.7	57.7	48.7	58.0	61.0

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.0	23.4	-11.9	71.2	0.0	4.2	-11.5	102.5

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	6.0	172.8	-39.2	62.1	6.4	103.9	-44.5	55.6
Pelvis	Y	G's	4.1	69.4	-5.8	48.3	5.3	64.6	-3.3	99.9
Pelvis	Z	G's	12.4	204.6	-30.3	51.2	11.4	84.6	-34.6	56.5
Pelvis Resultant	N/A	G's	47.7	50.6			56.1	56.3		

DATA SHEET NO. 3...(continued)

Test Vehicle: 2003 BMW X5 3.0i SUV

NHTSA No.: M30501

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 3/18/03

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	2.9	163.7	-604.4	76.1	67.8	242.5	-598.7	109.7
Neck Force	Y	Newtons	61.3	108.6	-183.8	70.2	82.8	78.8	-39.3	122.3
Neck Force	Z	Newtons	1622.0	81.6	-377.0	35.7	1577.1	80.1	-301.4	34.9
Neck Force Resultant	N/A	Newtons	1716.7	81.6			1662.1	80.1		
Neck Moment	X	Nm	2.5	299.9	-11.8	79.6	5.9	83.1	-4.3	126.8
Neck Moment	Y	Nm	5.4	299.9	-14.1	212.7	9.0	83.4	-21.1	212.4
Neck Moment	Z	Nm	2.9	111.2	-1.7	208.1	2.5	64.9	-1.3	286.3
Neck Moment Resultant	N/A	Nm	14.2	212.6			21.1	212.4		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	233.3	199.9	-288.5	73.6	138.9	198.5	-482.2	80.3
Neck Force	Y	Newtons	353.2	76.9	-13.8	162.4	11.3	243.5	-419.8	98.5
Neck Force	Z	Newtons	922.0	72.8	-469.4	36.3	1113.9	71.5	-435.5	34.8
Neck Force Resultant	N/A	Newtons	988.7	72.8			1212.9	73.6		
Neck Moment	X	Nm	6.7	297.4	-40.8	79.5	16.7	85.3	-4.9	123.6
Neck Moment	Y	Nm	97.2	78.8	-16.8	199.3	94.2	83.0	-12.5	195.3
Neck Moment	Z	Nm	1.6	135.6	-24.0	75.8	7.8	71.5	-3.7	123.9
Neck Moment Resultant	N/A	Nm	107.6	78.8			95.8	83.0		

CHILD SEAT TETHER BELT SENSOR PEAK VALUES

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Tether Belt Force	N/A	Newtons	663.4	76.1	-26.7	18.9	762.0	68.9	-17.2	18.1

CHILD SEAT ACCELEROMETER PEAK VALUES

Location	Axis	Units	Right Rear (3 Yr.)				Left Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Child Seat	X	G's	6.0	216.9	-46.4	46.1	5.1	217.1	-44.6	45.8
Child Seat	Y	G's	3.9	218.7	-4.0	73.3	5.3	62.8	-4.0	53.5
Child Seat	Z	G's	20.3	112.5	-23.3	37.4	0.0	0.0	0.0	0.0
Child Seat Resultant	N/A	G's	46.8	45.3			44.6	45.8		

1.) Left rear passenger channel failed, no data

SECTION F-1

DATA SHEET NO. 5.....CRS PERFORMANCE DATA

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 3/18/03

CRS PERFORMANCE DATA

Location	Serial # Position # 3		Serial # Position # 4	
	Damage	Remarks	Damage	Remarks
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	No	None	No	None
Vehicle Seat Fabric Tears	No	None	No	None
Child Dummy	Yes	Shoulder harness dug into vest	No	None

SECTION F-1

DATA SHEET NO. 6.....CRS CAMERA DATA

Test Vehicle: 2003 BMW X5 3.0i SUV
 Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501
 Test Date: 3/18/03

No.	Camera View	Location (mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Driver Side Child	2997	-584	1219	10	1100	6	950
2	Driver Side Child	2642	8230	2286	15	7878	35	No Time
3	Driver Side Child	2642	6096	1524	1	5692	25	500
4	Passenger Side Child	2997	582	1219	10	1100	6	720
5	Passenger Side Child	2438	-9144	2032	10	8773	25	DNR
6	Passenger Side Child	2743	-8331	1524	1	7903	25	500

X - Barrier Face Y - Monorail Centerline Z - Ground DNR = Did Not Run

SECTION F-2

PHOTOGRAPHS

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Manufactured in 22NOV02

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

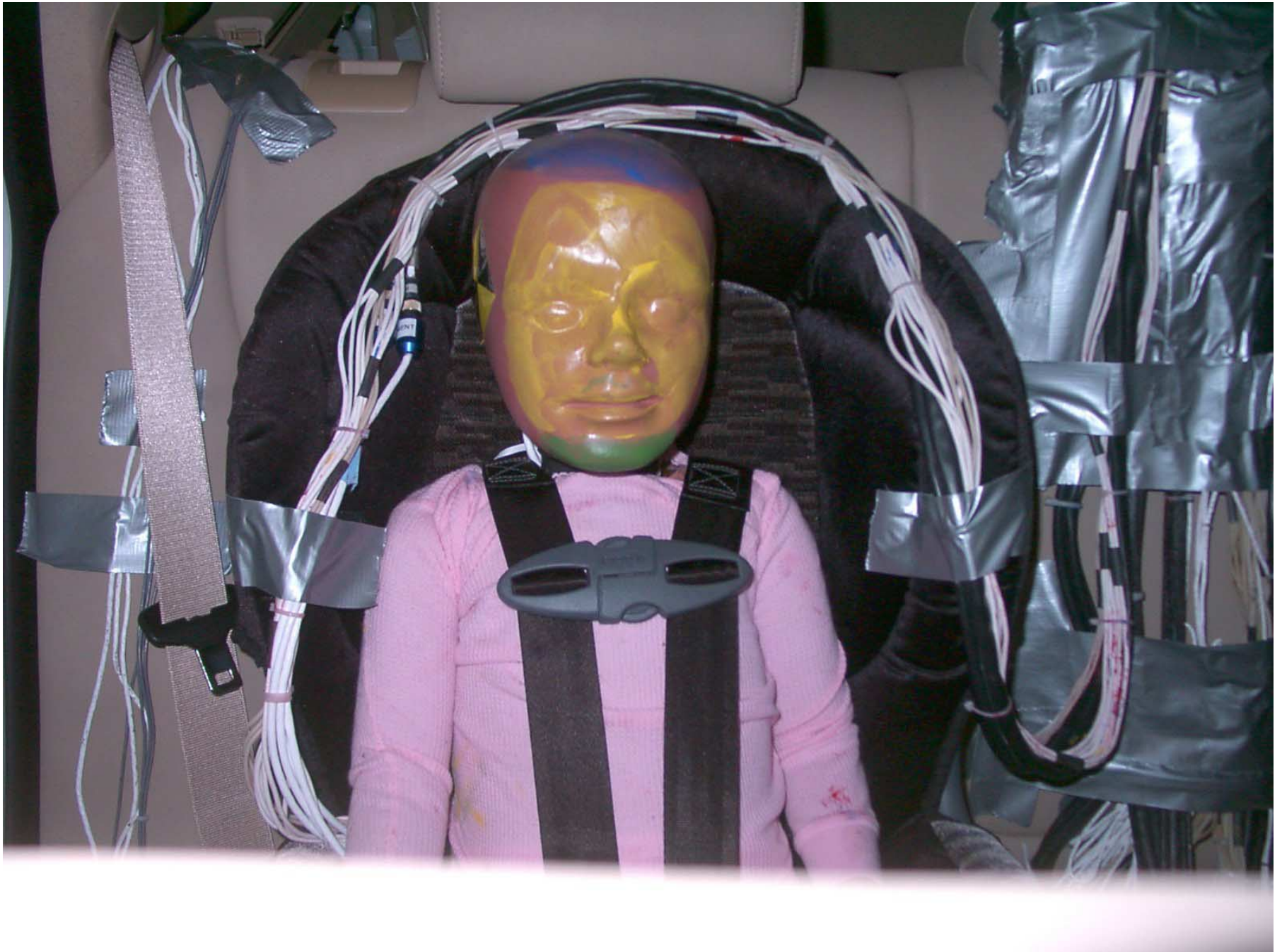


Figure F2-10: Pre-Test Position 3 Front View



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 Right Side View



Figure F2-33: Post-Test Damage to Position 3 Dummy



Figure F2-34: Post-Test Damage to Position 3 Dummy

SECTION F-3

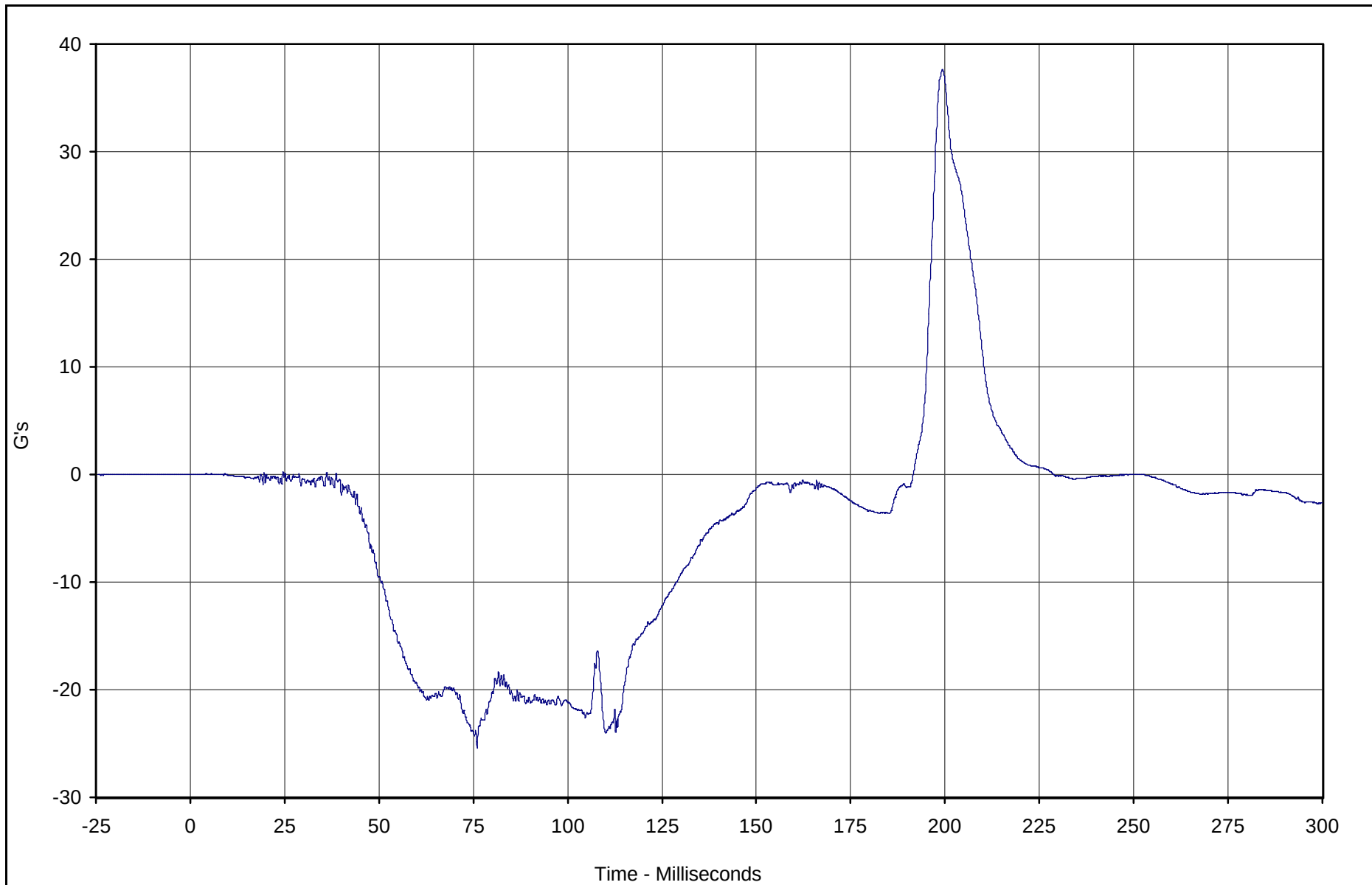
CHILD DUMMY RESPONSE AND CRS DATA TRACES

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head X	134	FIL	G's	37.6	199.4	-25.4	76.1	1000

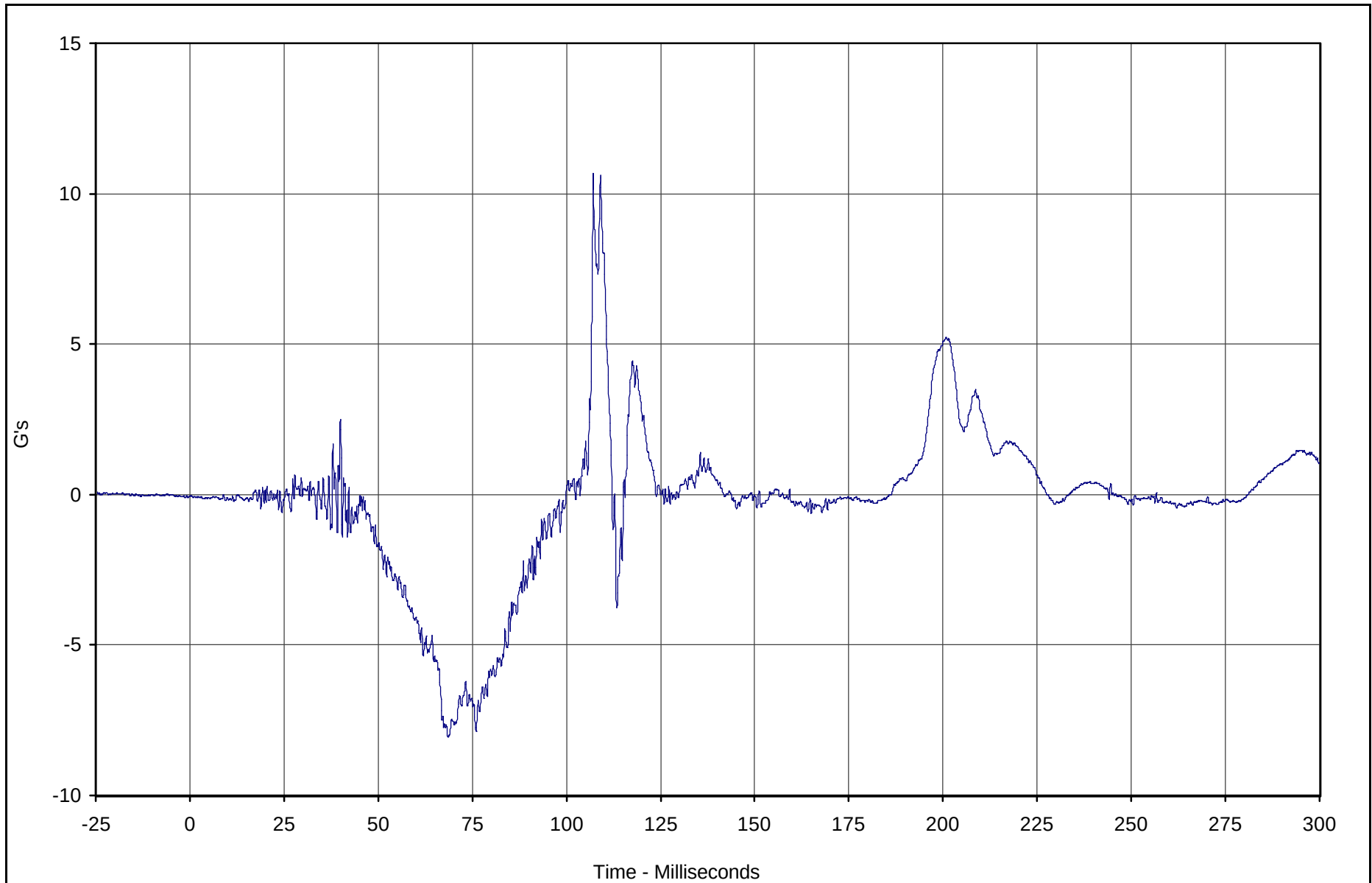


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head Y	135	FIL	G's	10.7	107.1	-8.1	68.5	1000

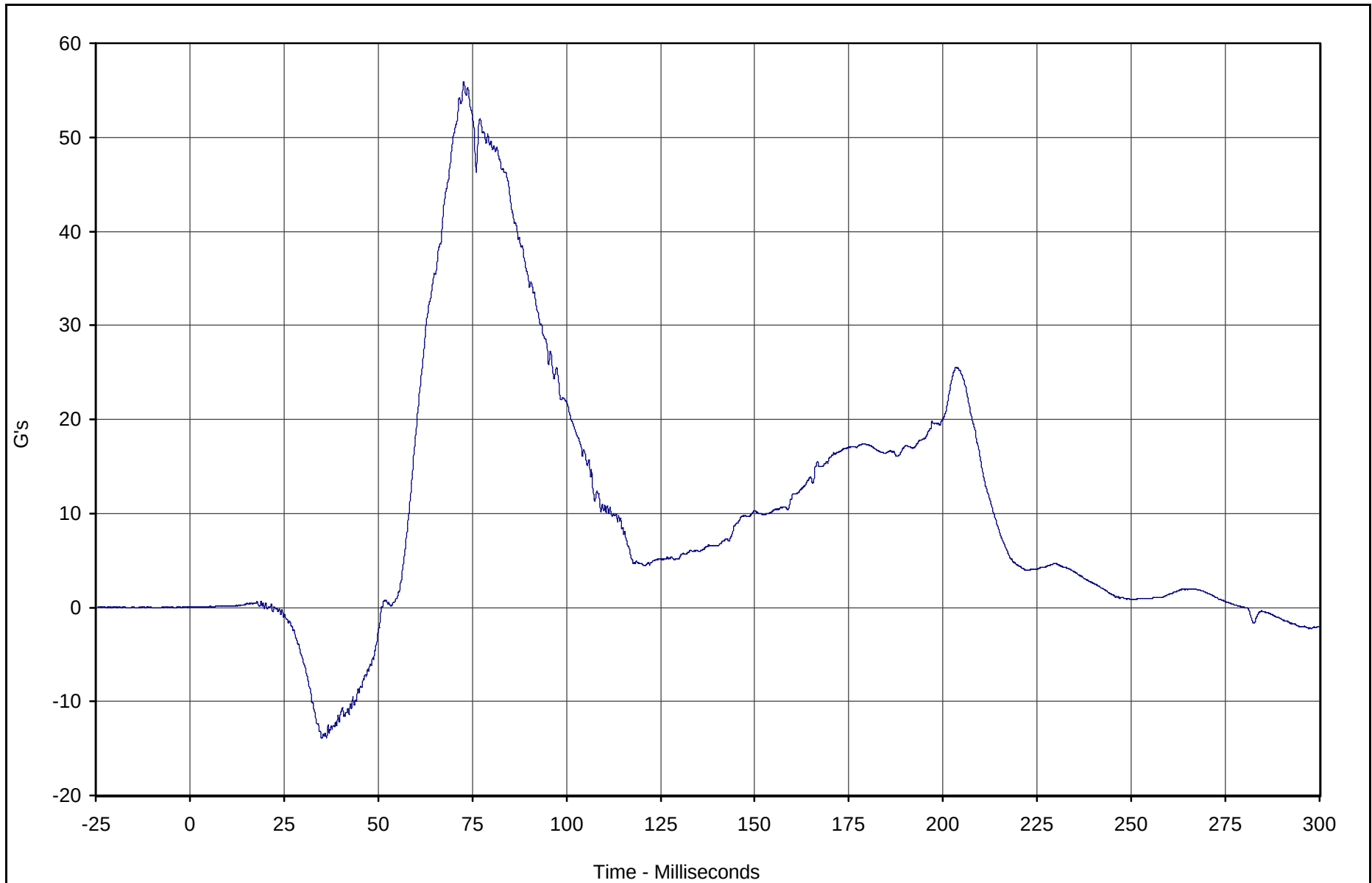


Test Vehicle: 2003 BMW X5 3.0i SUV

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head Z	136	FIL	G's	55.9	72.8	-13.9	35.1	1000

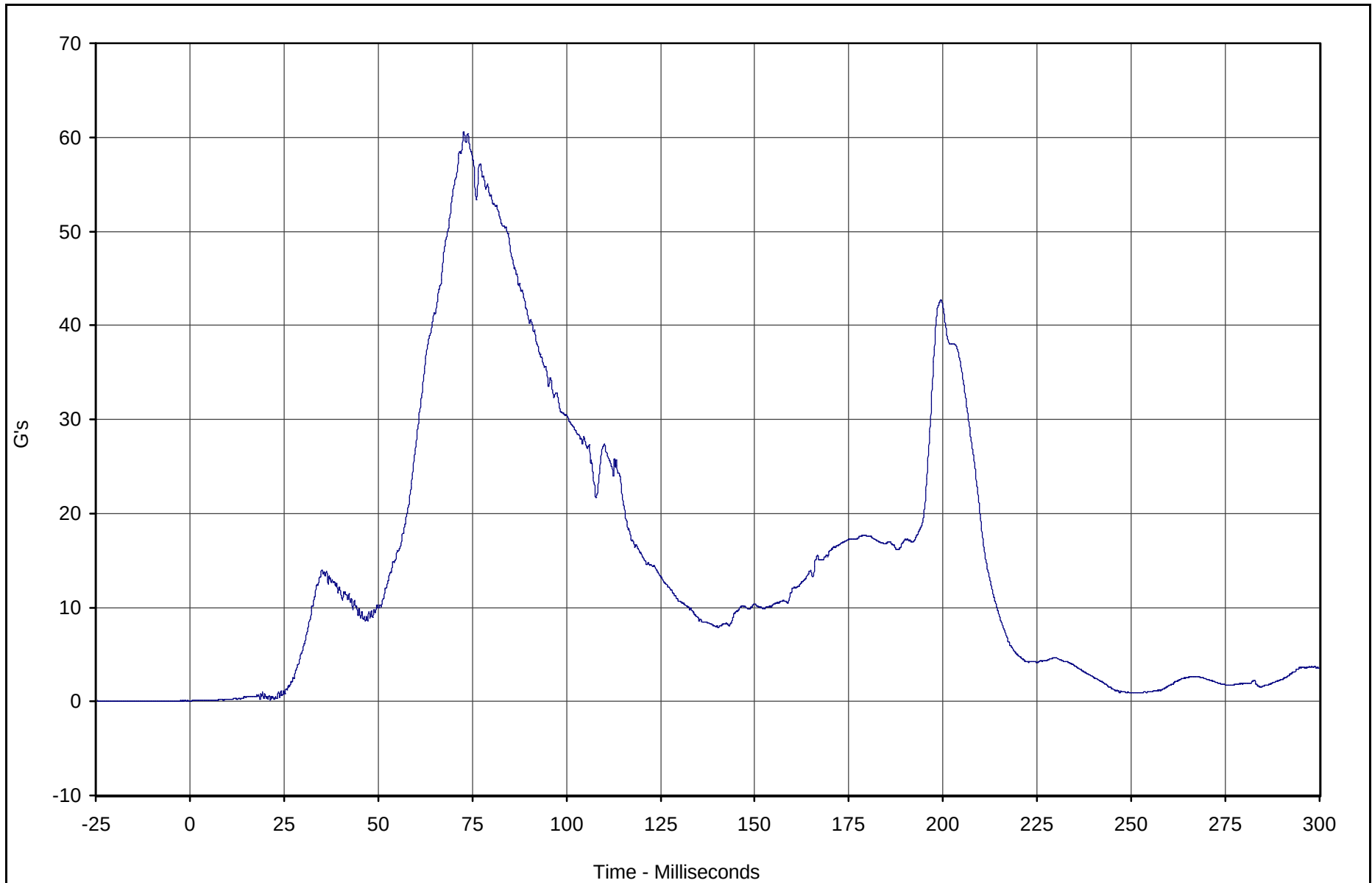


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head Resultant	134	RES	G's	60.5	72.8	0.0	0.2	1000

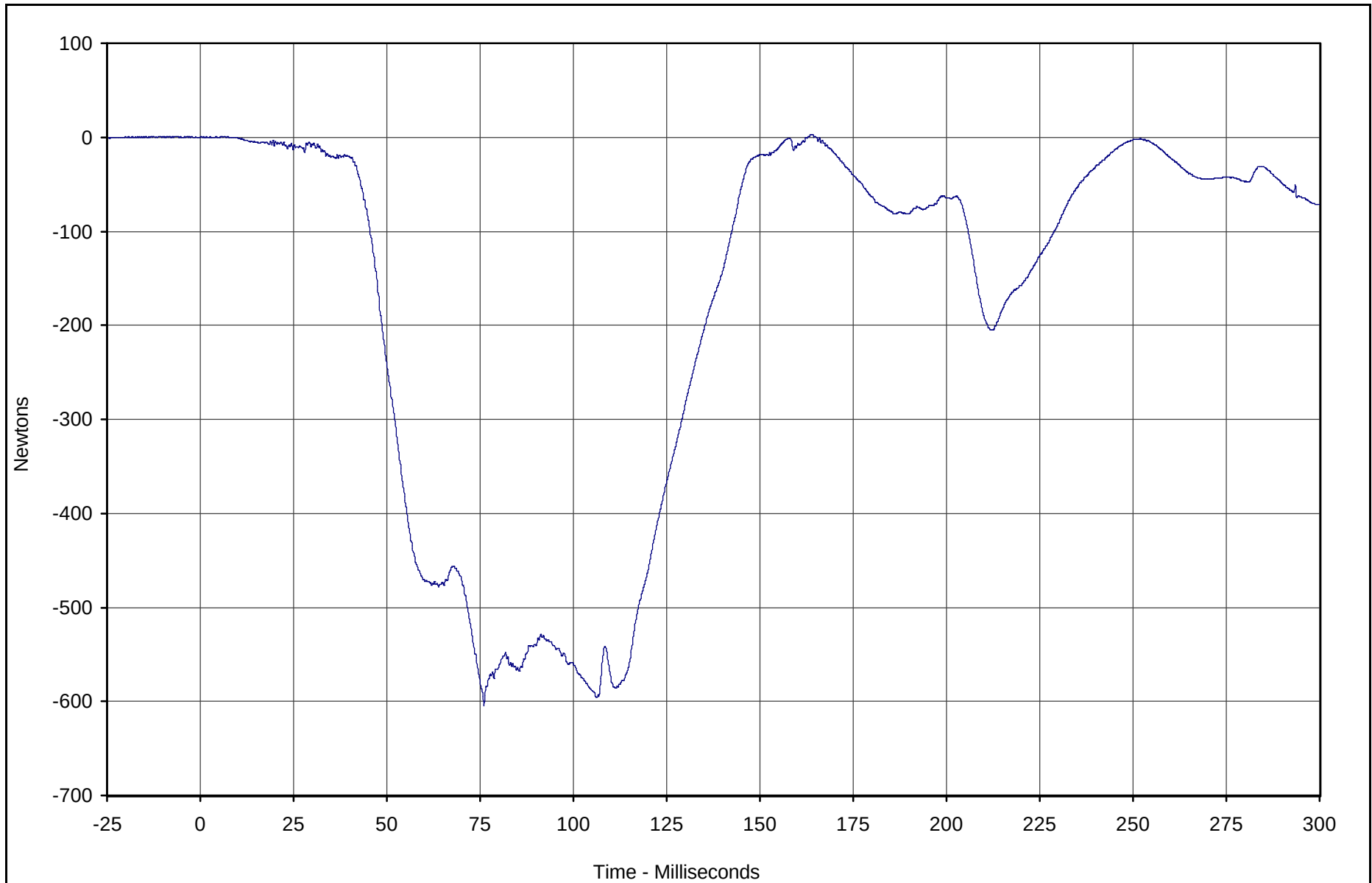


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force X	137	FIL	Newtons	2.9	163.7	-604.4	76.1	1000

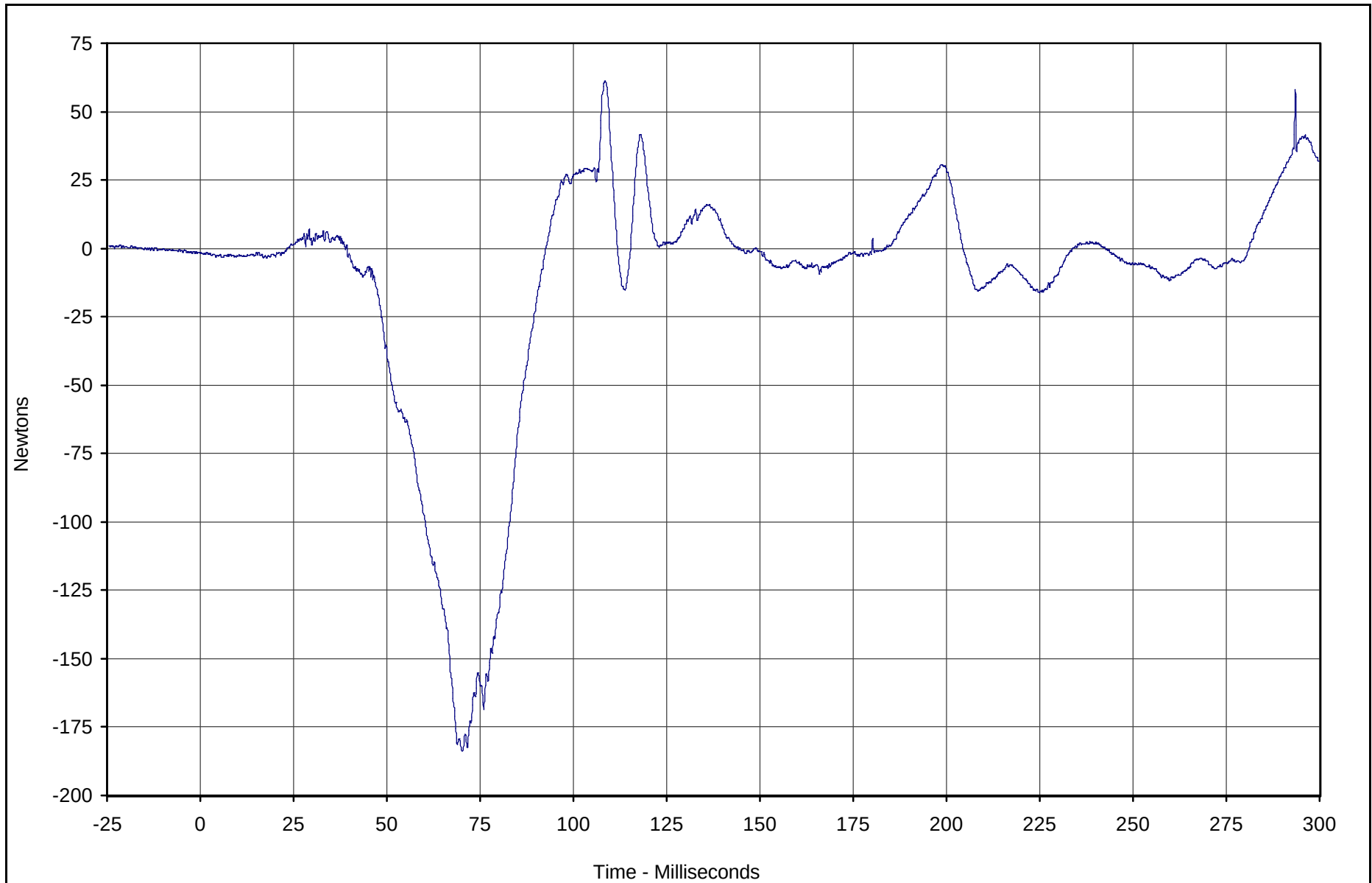


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force Y	138	FIL	Newtons	61.3	108.6	-183.8	70.2	1000

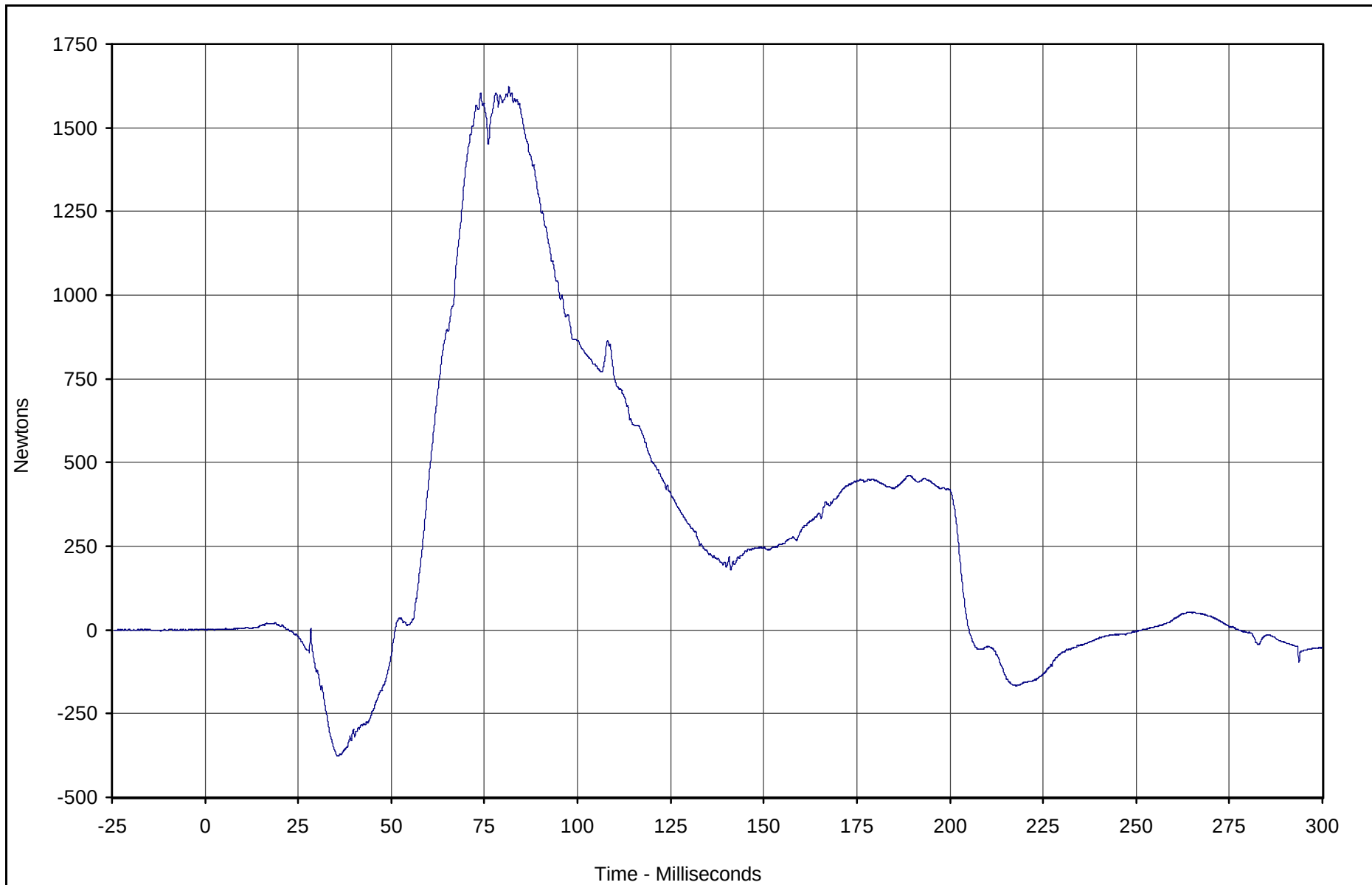


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force Z	139	FIL	Newtons	1622.0	81.6	-377.0	35.7	1000

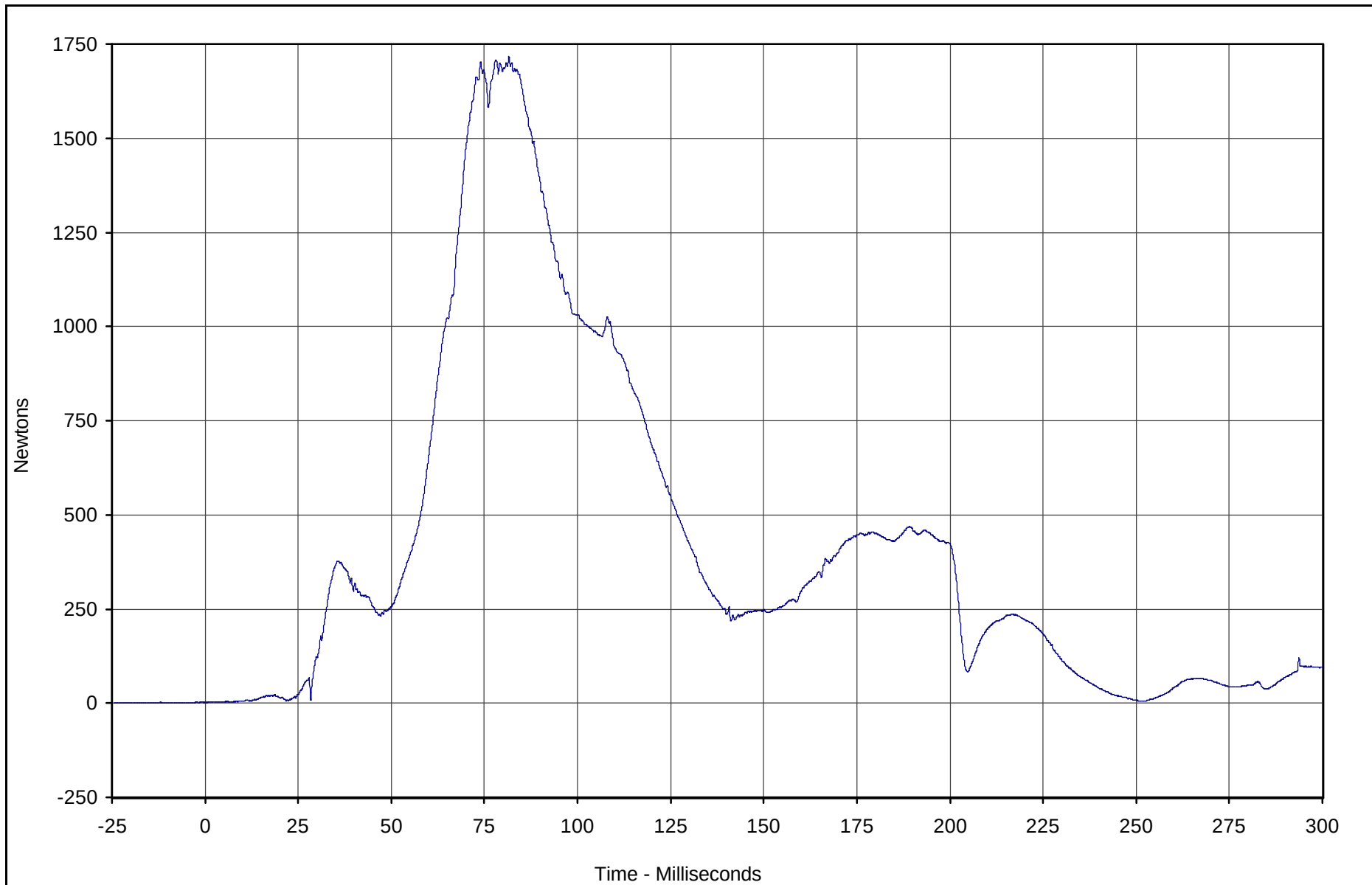


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force Res.	137	RES	Newtons	1716.7	81.6	1.8	0.4	1000

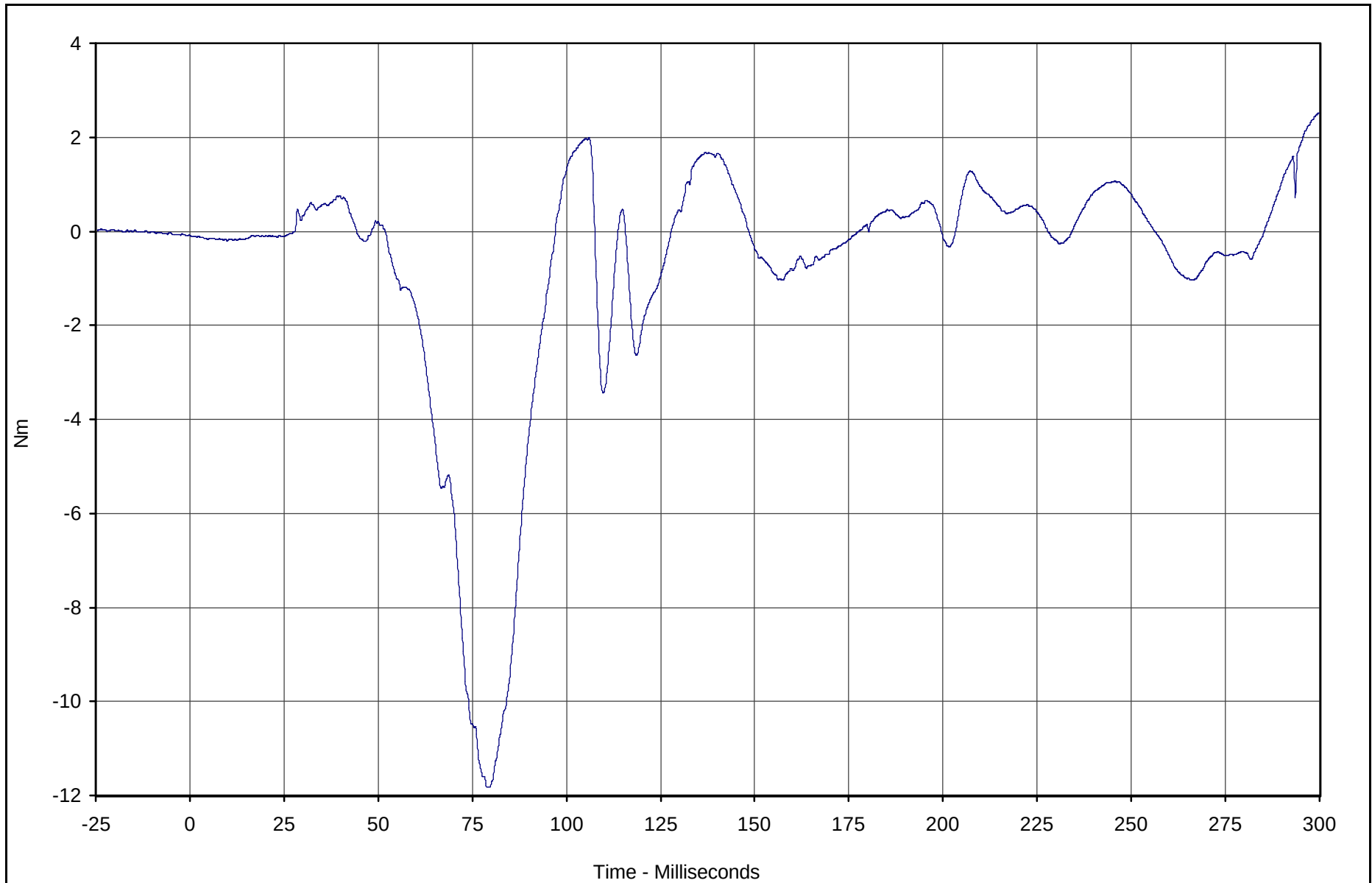


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Moment X	140	FIL	Nm	2.5	299.9	-11.8	79.6	600

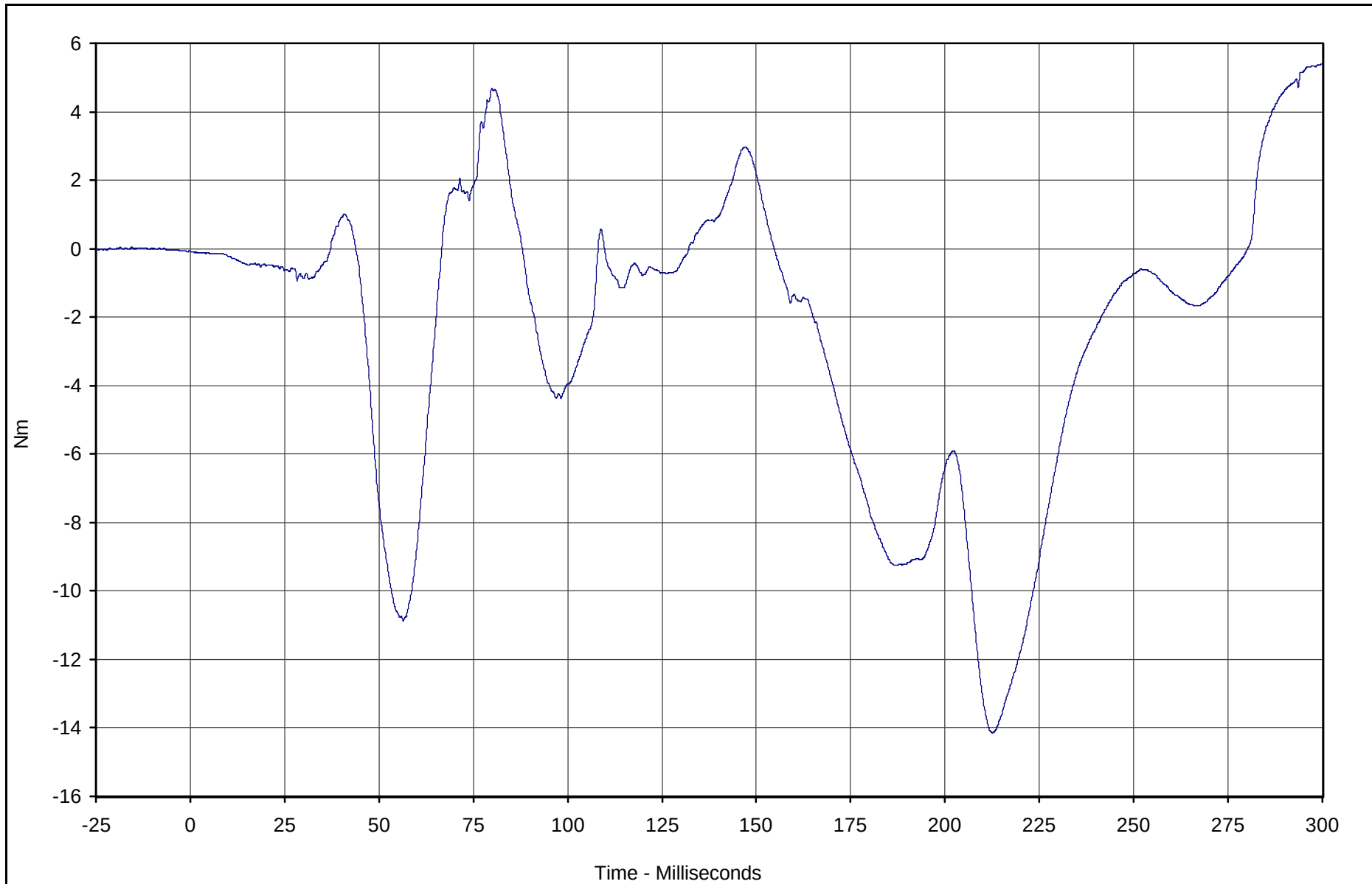


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Moment Y	141	FIL	Nm	5.4	299.9	-14.1	212.7	600

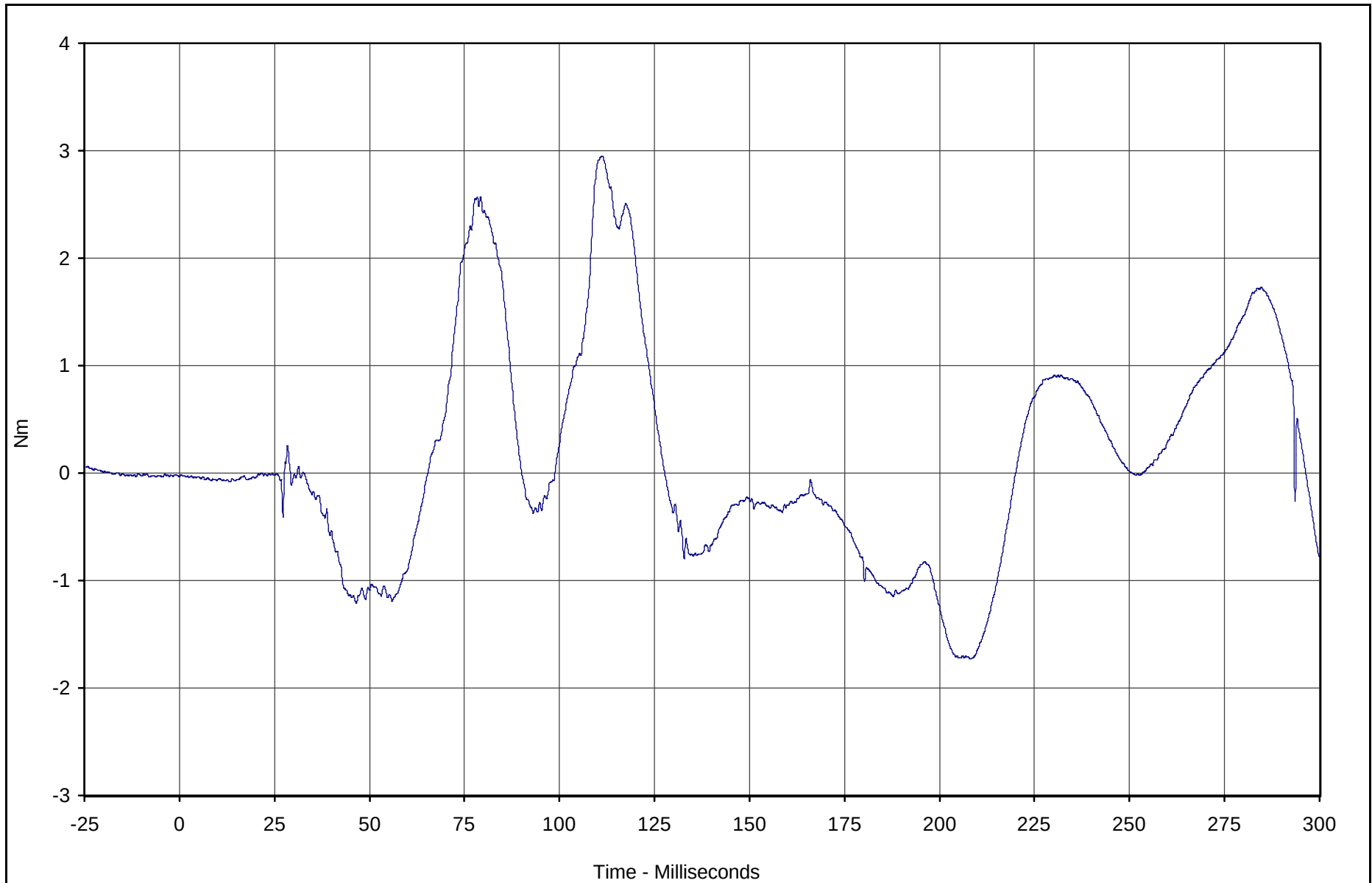


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Moment Z	142	FIL	Nm	2.9	111.2	-1.7	208.1	600

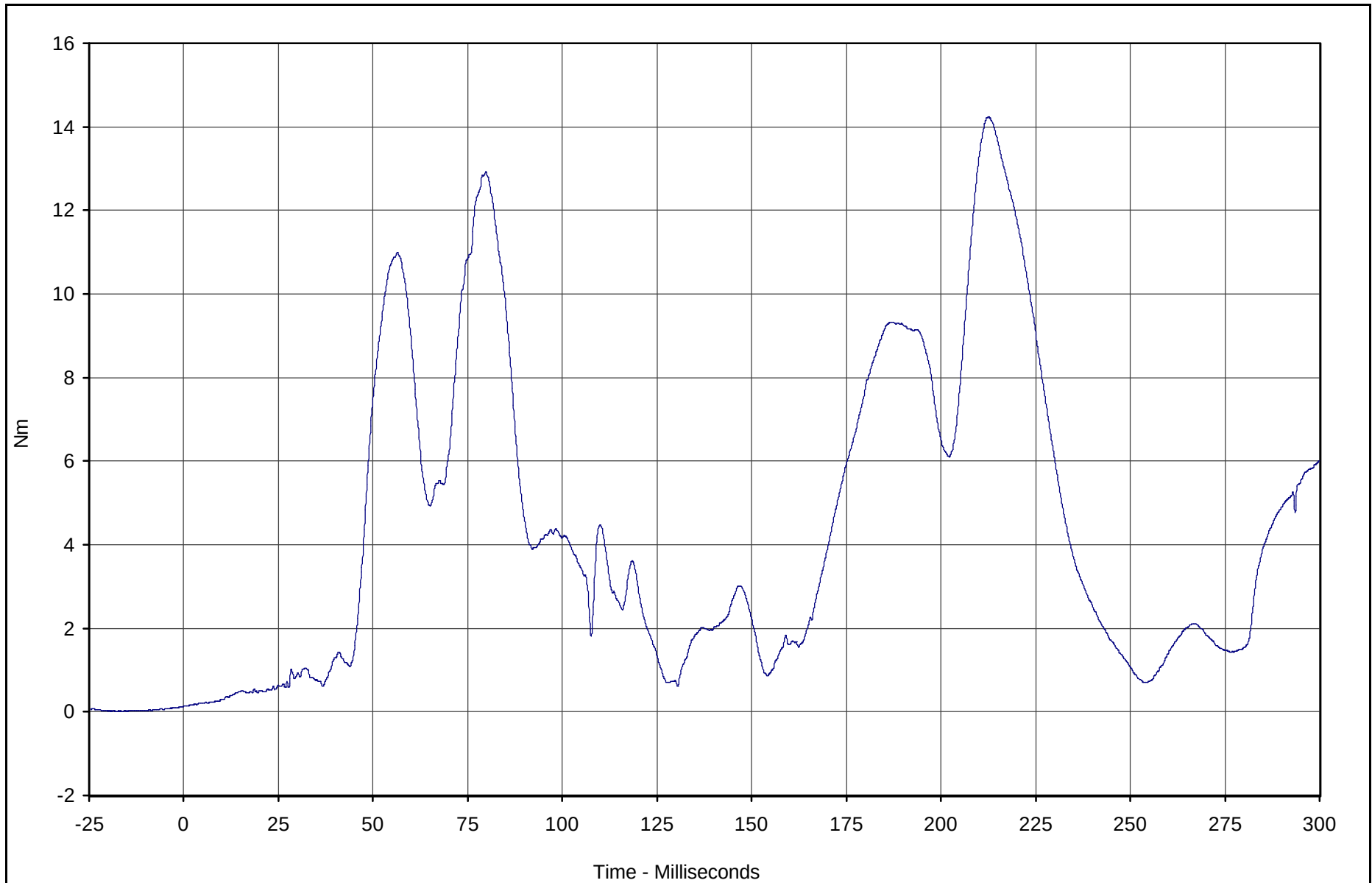


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Mom Res.	140	RES	Nm	14.2	212.6	0.1	0.0	600

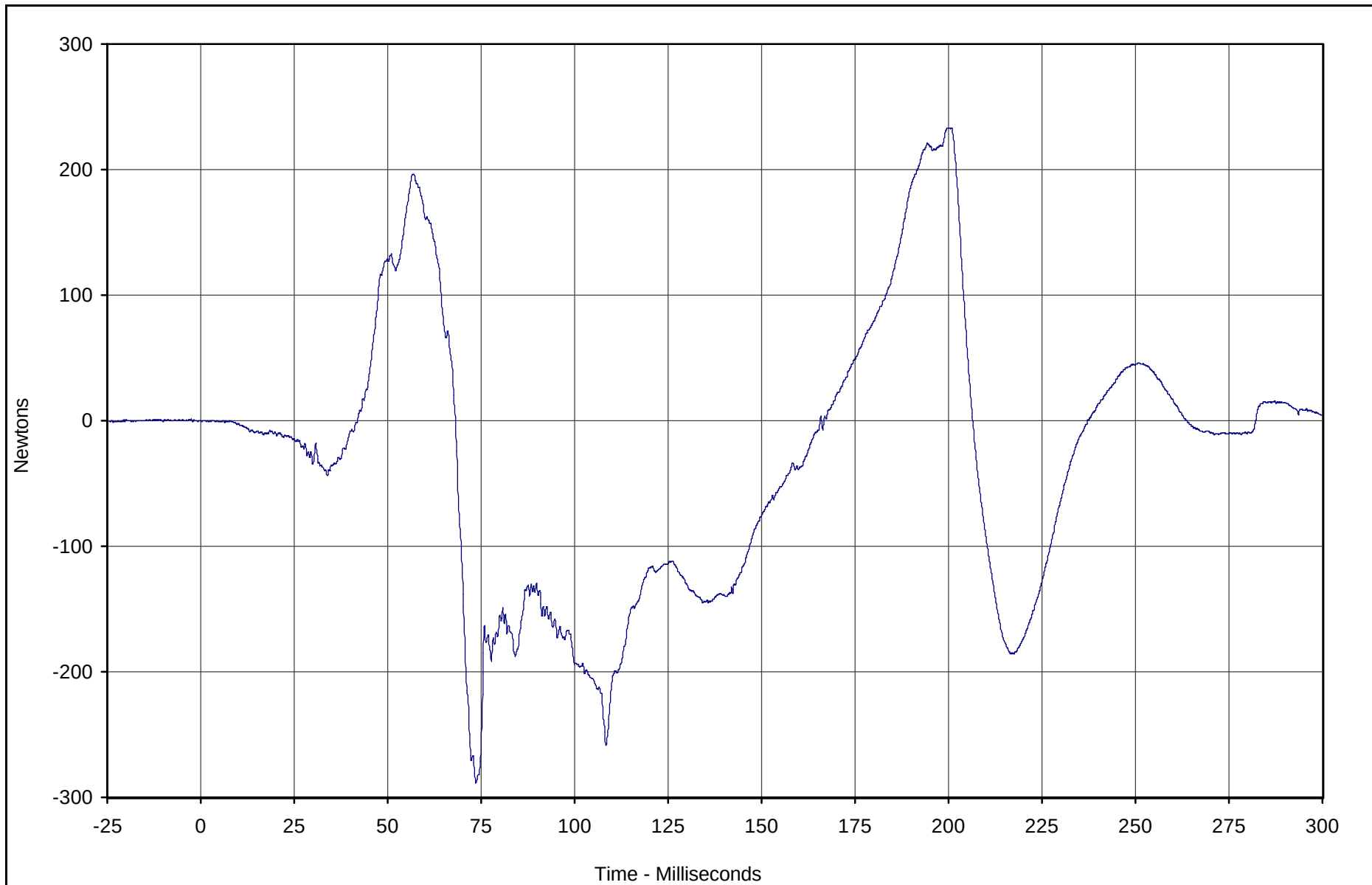


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force X	143	FIL	Newtons	233.3	199.9	-288.5	73.6	1000

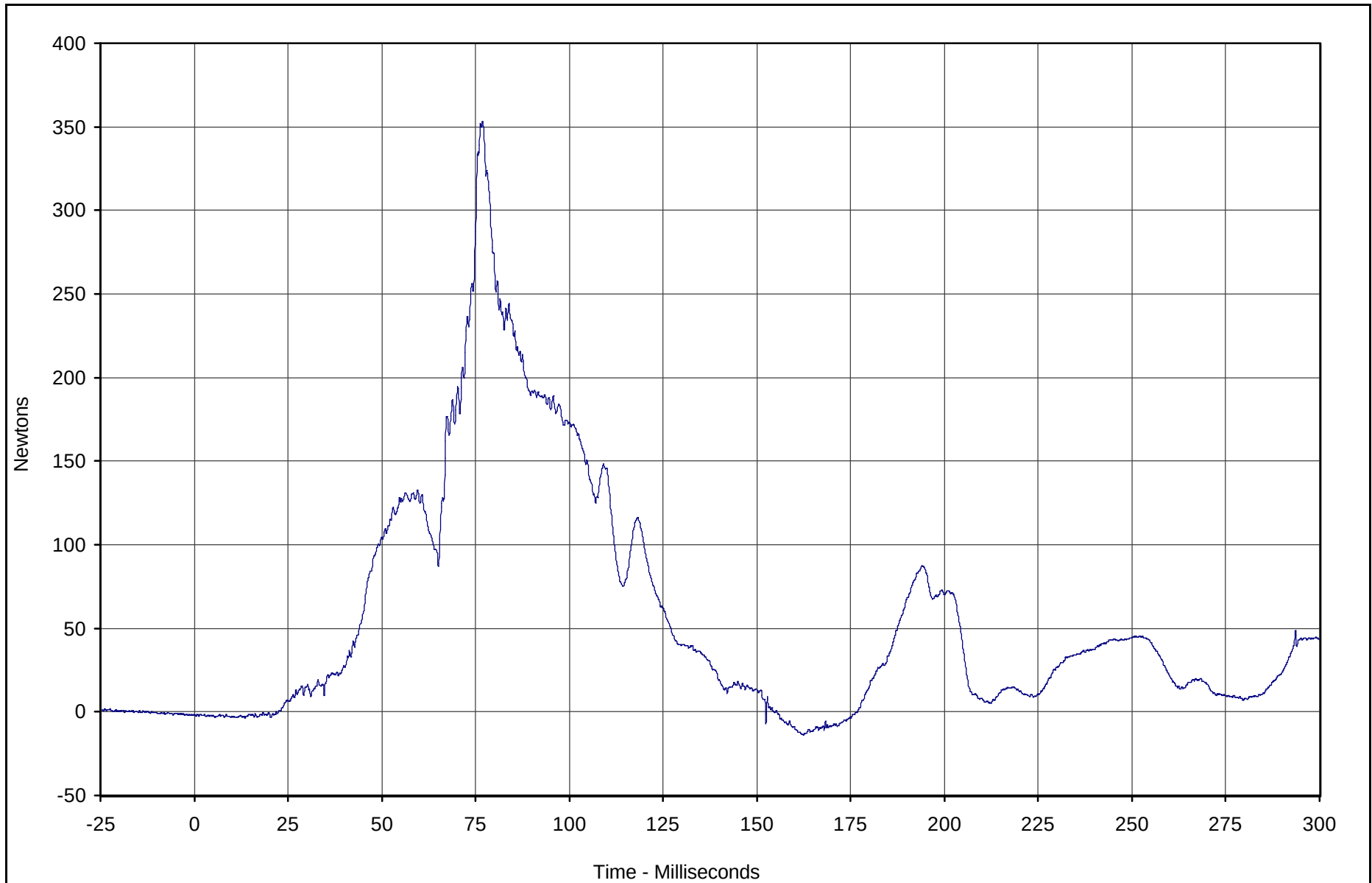


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force Y	144	FIL	Newtons	353.2	76.9	-13.8	162.4	1000

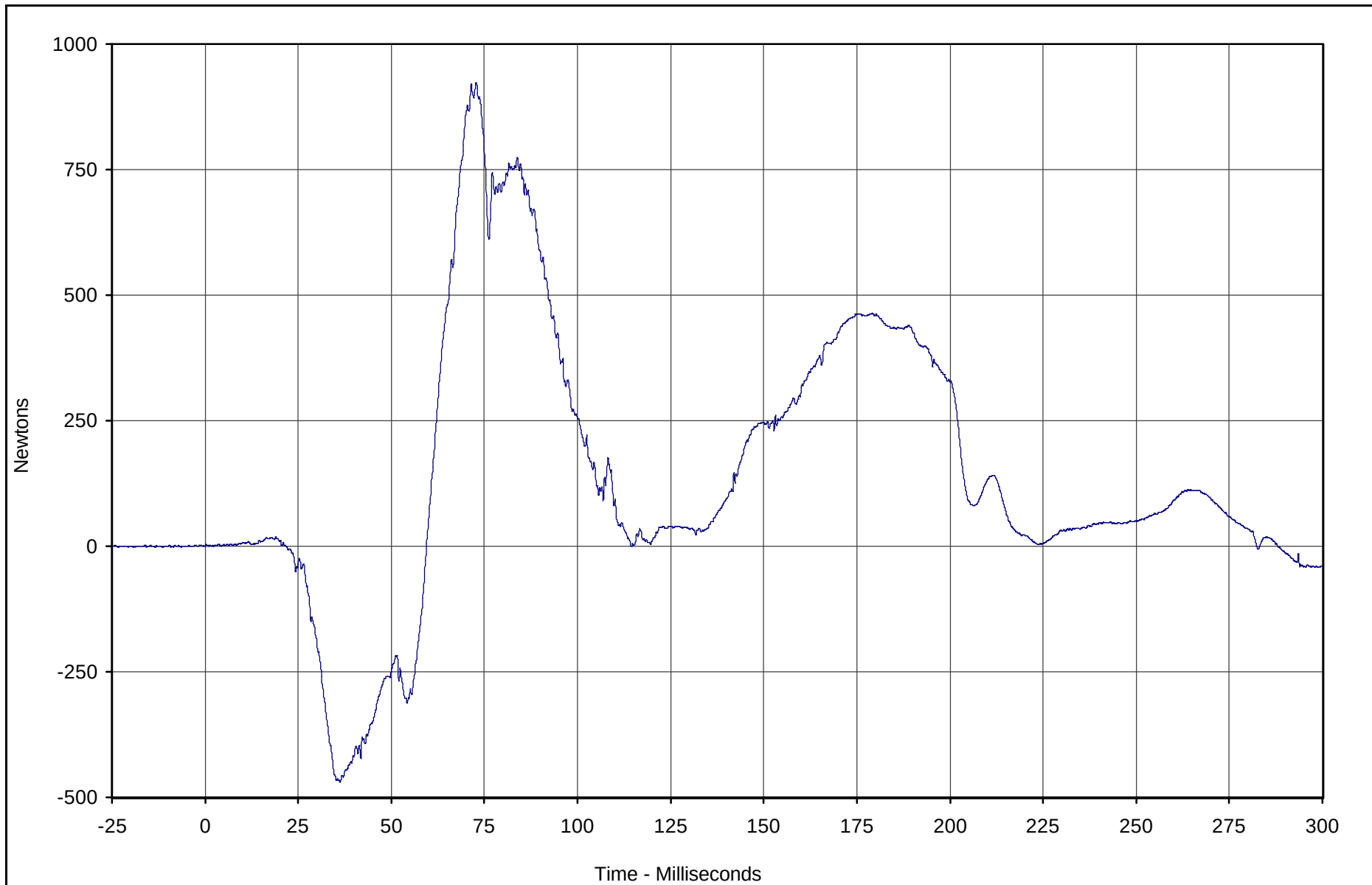


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force Z	145	FIL	Newtons	922.0	72.8	-469.4	36.3	1000

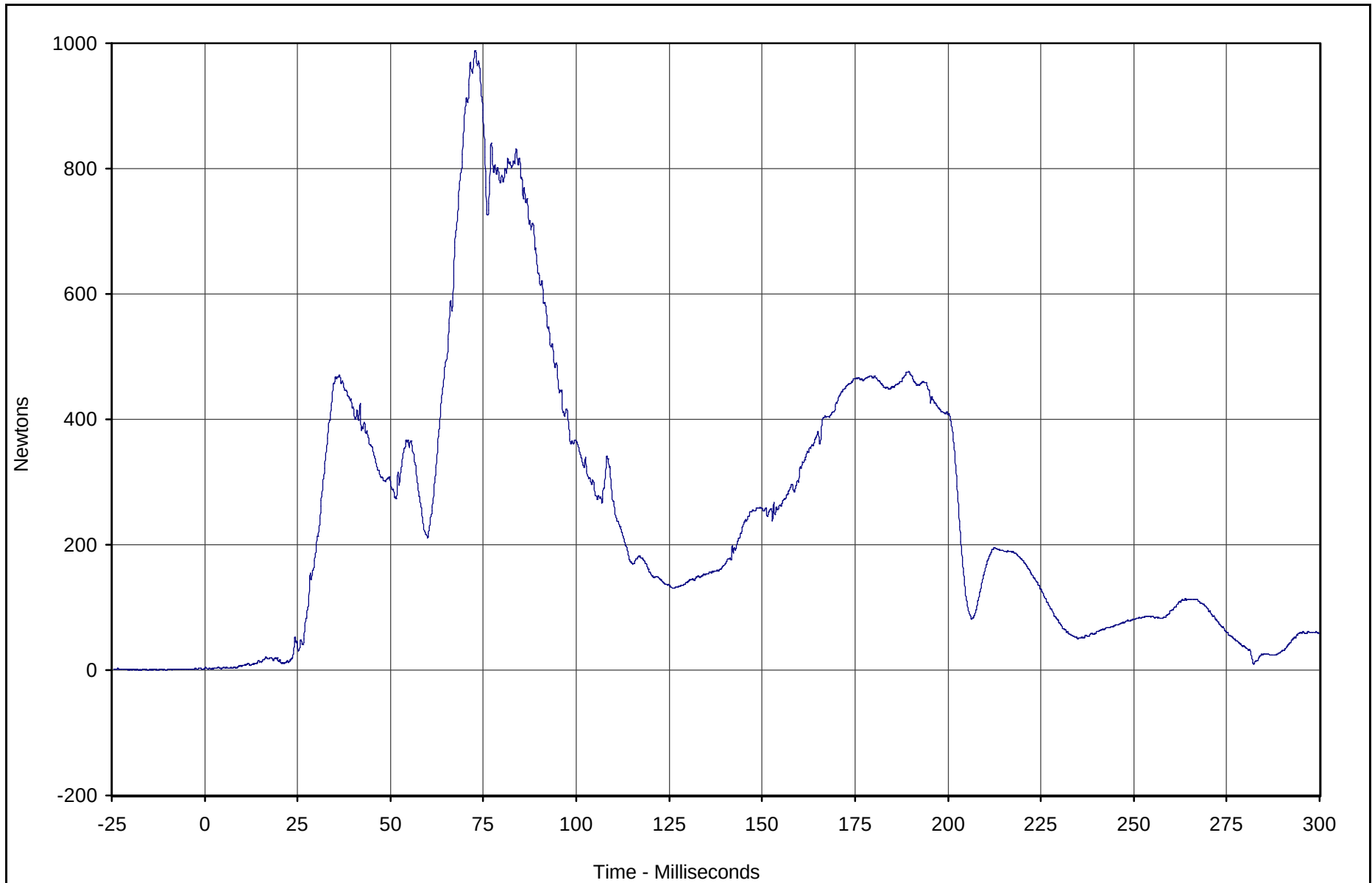


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force Res.	143	RES	Newtons	988.7	72.8	1.5	1.6	1000

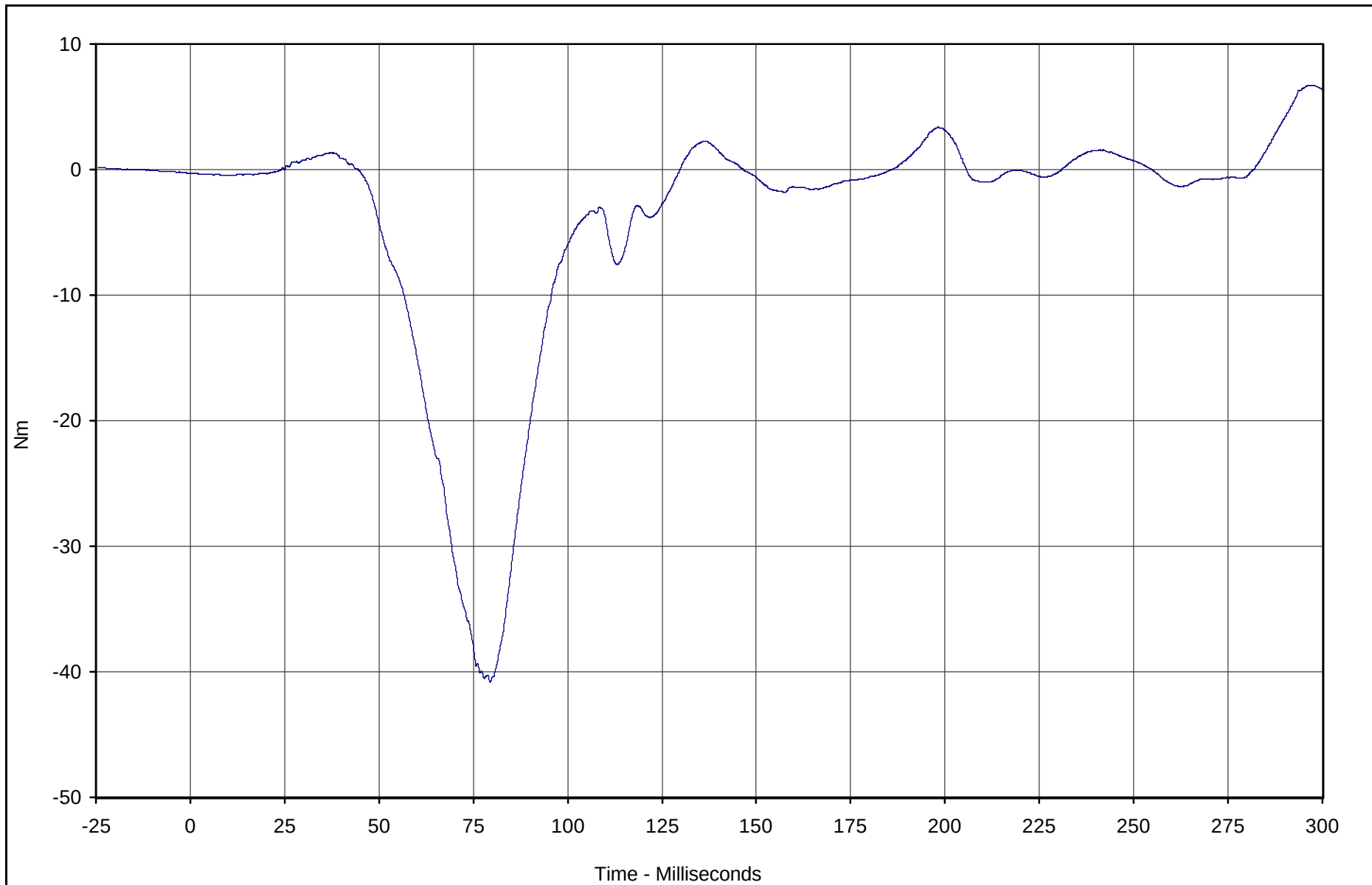


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Moment X	146	FIL	Nm	6.7	297.4	-40.8	79.5	600

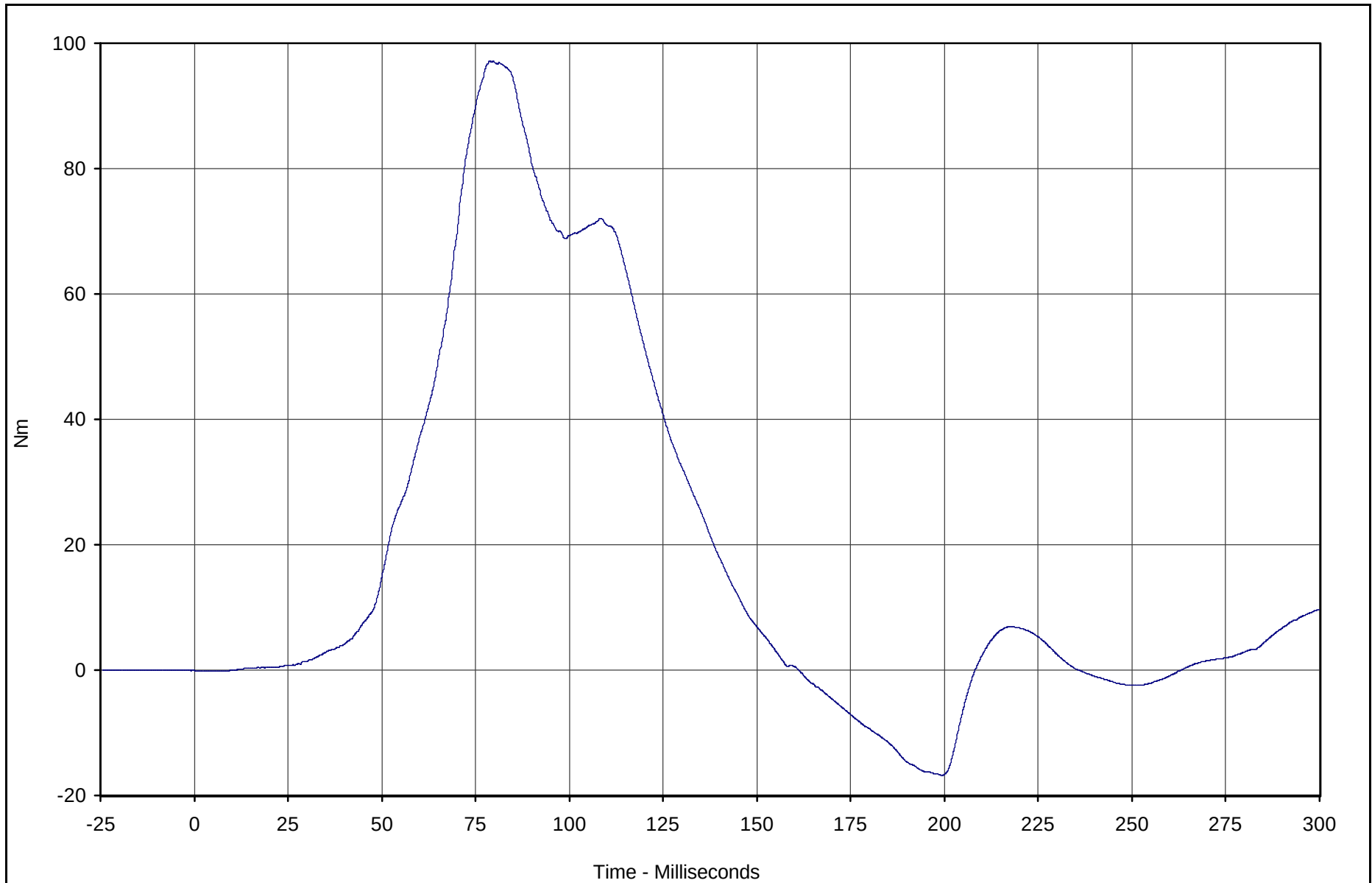


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Moment Y	147	FIL	Nm	97.2	78.8	-16.8	199.3	600

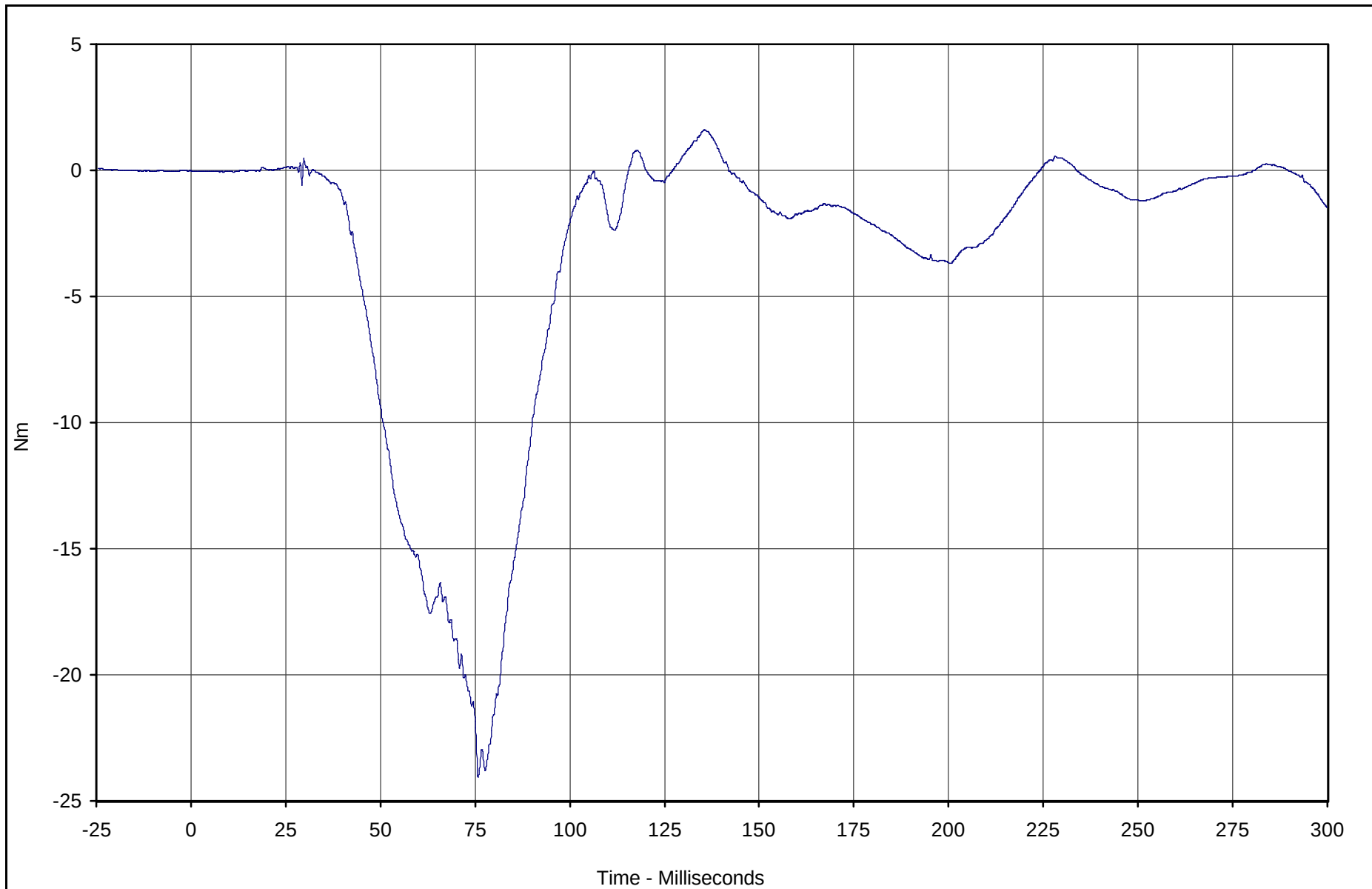


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Moment Z	148	FIL	Nm	1.6	135.6	-24.0	75.8	600

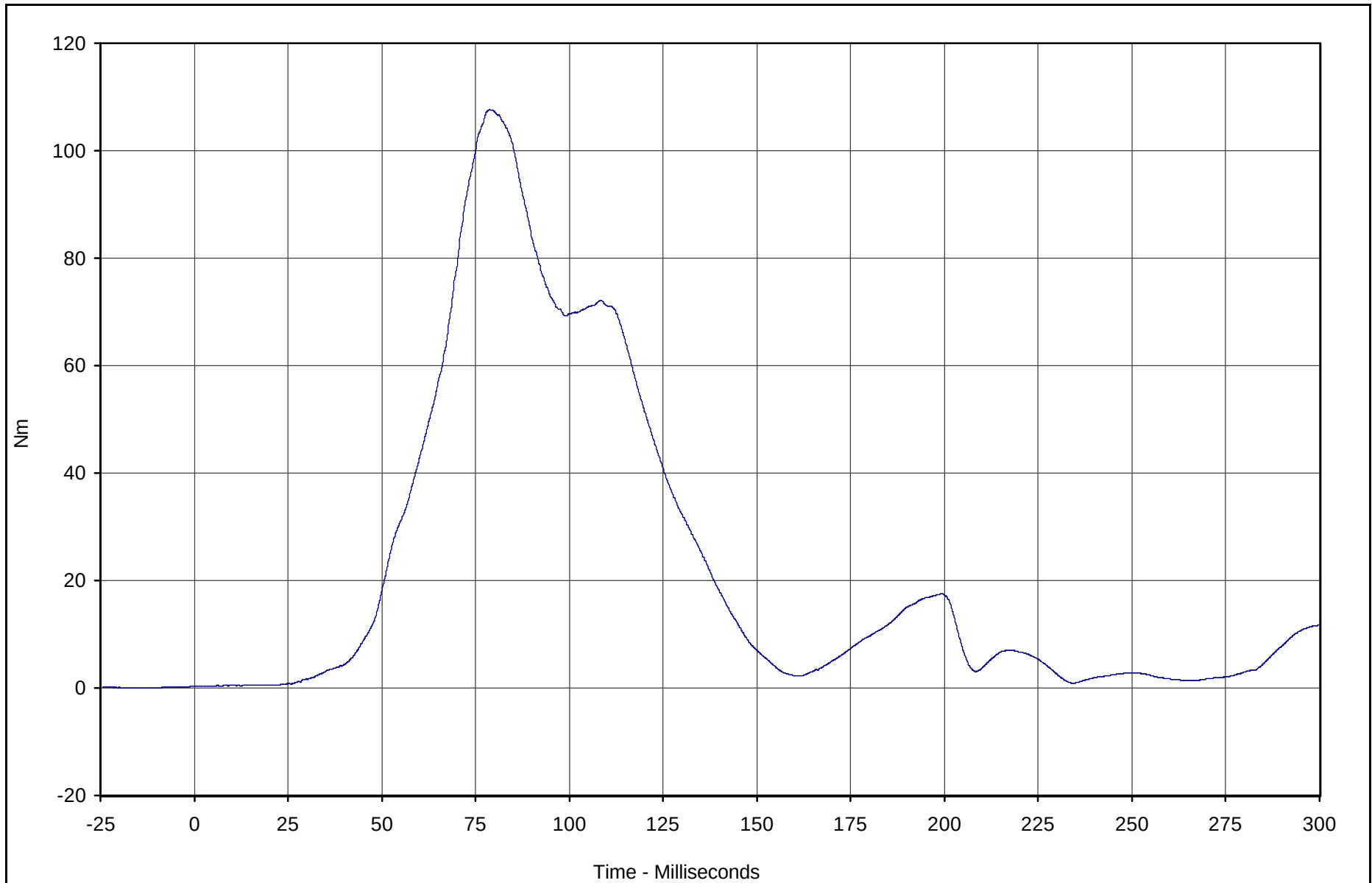


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Mom Res.	146	RES	Nm	107.6	78.8	0.3	0.0	600

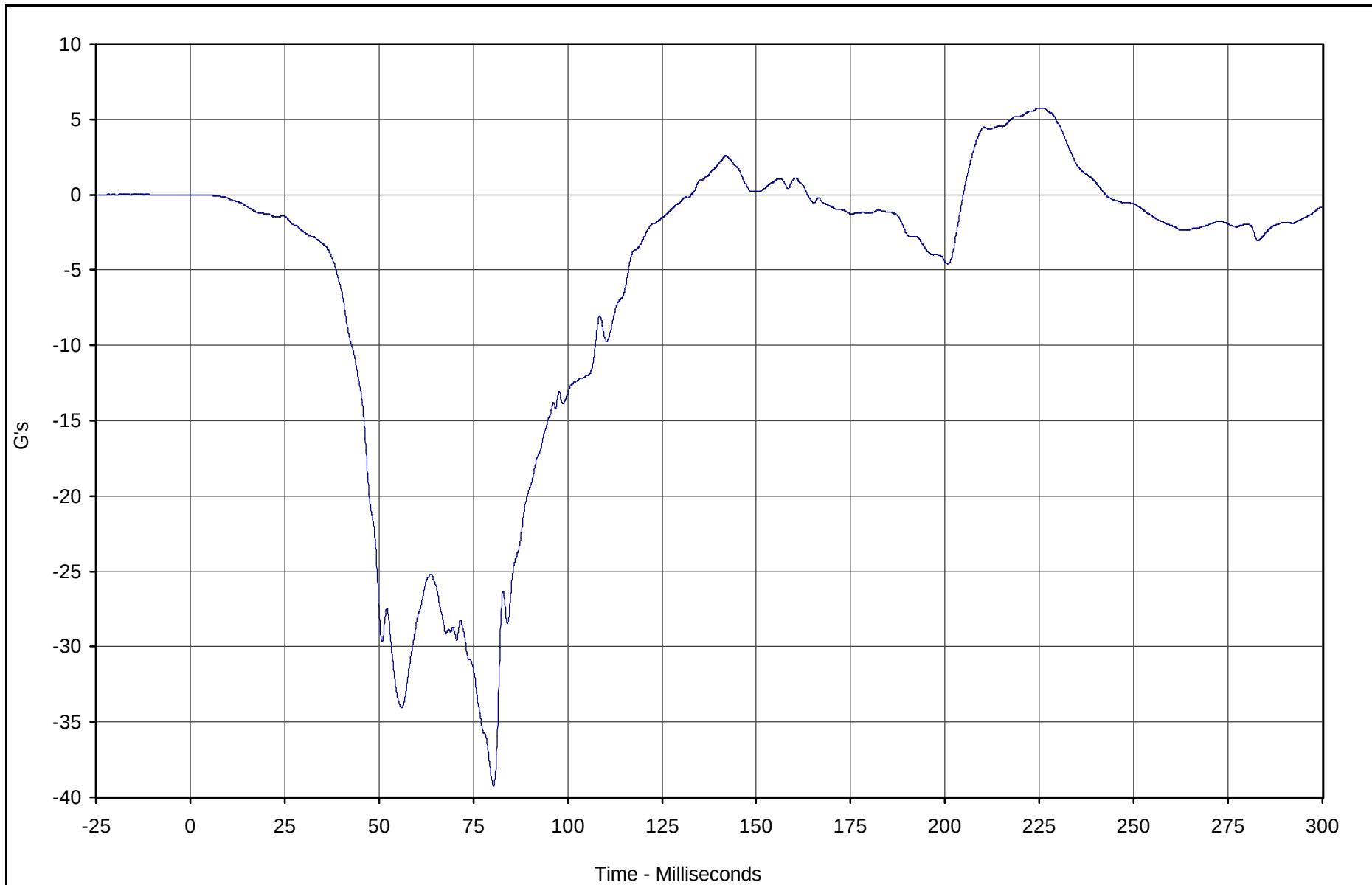


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest X	149	FIL	G's	5.7	226.1	-39.2	80.4	180

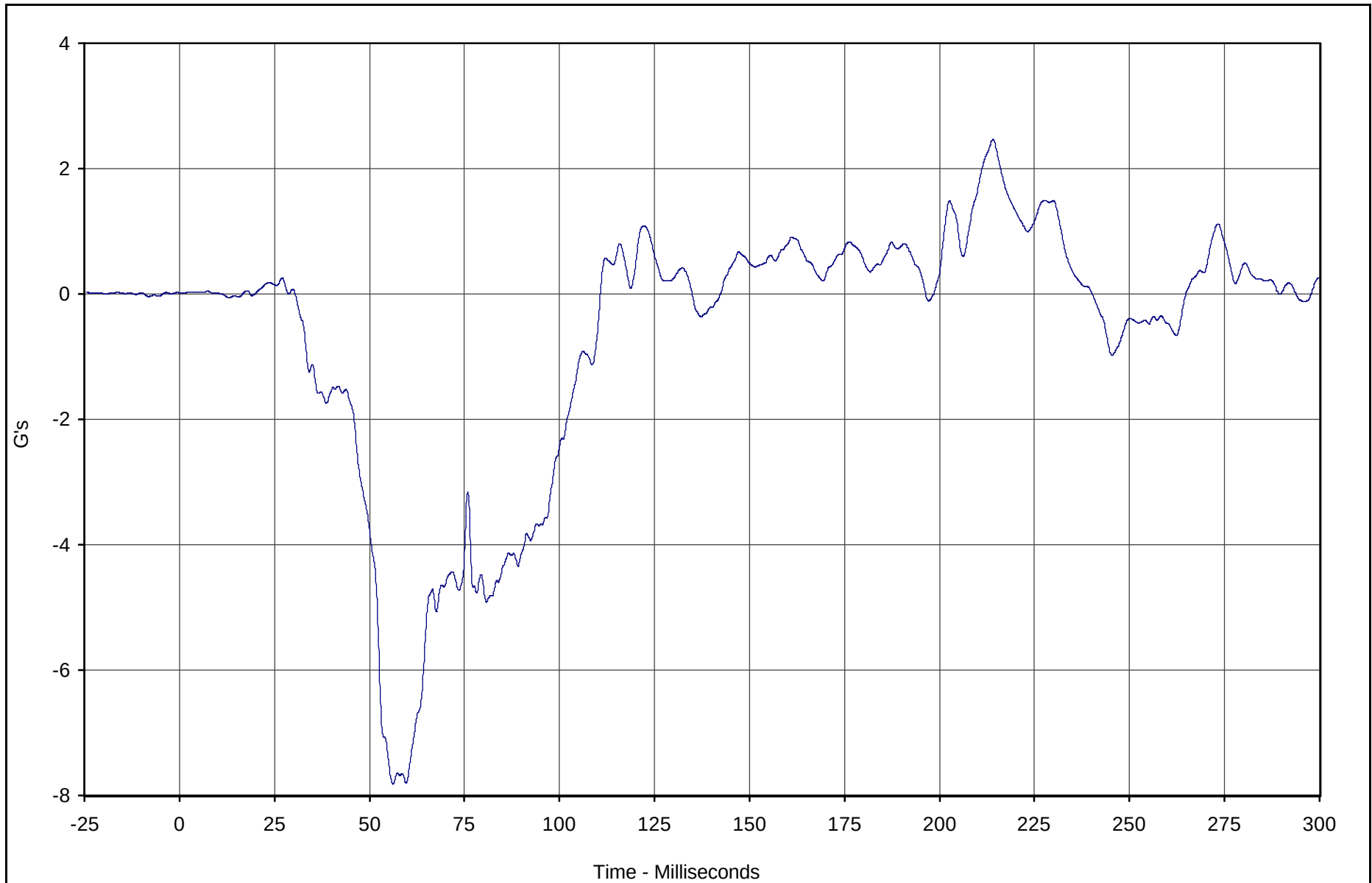


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Y	150	FIL	G's	2.5	214.1	-7.8	56.2	180

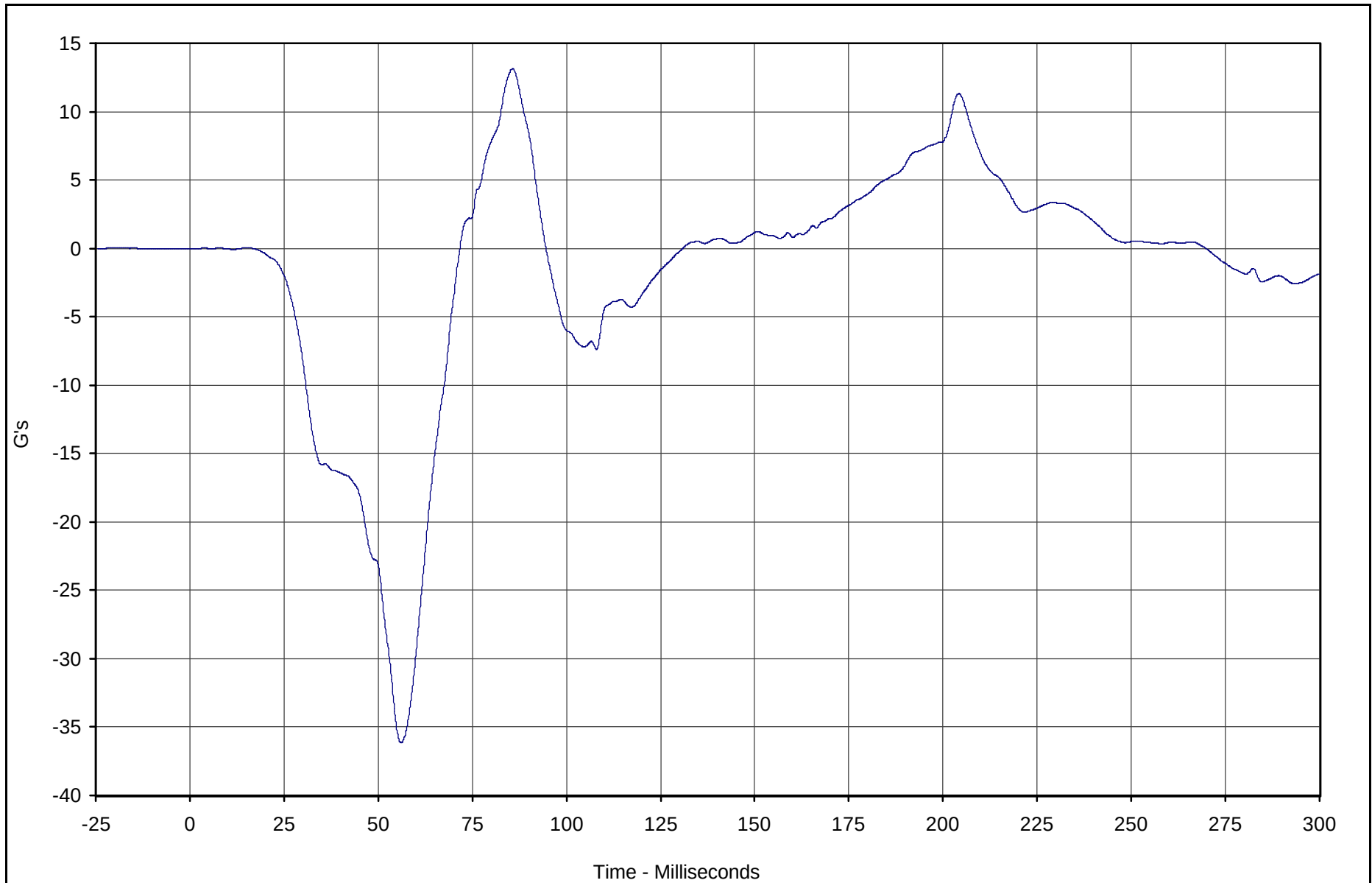


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Z	151	FIL	G's	13.1	85.7	-36.2	56.1	180

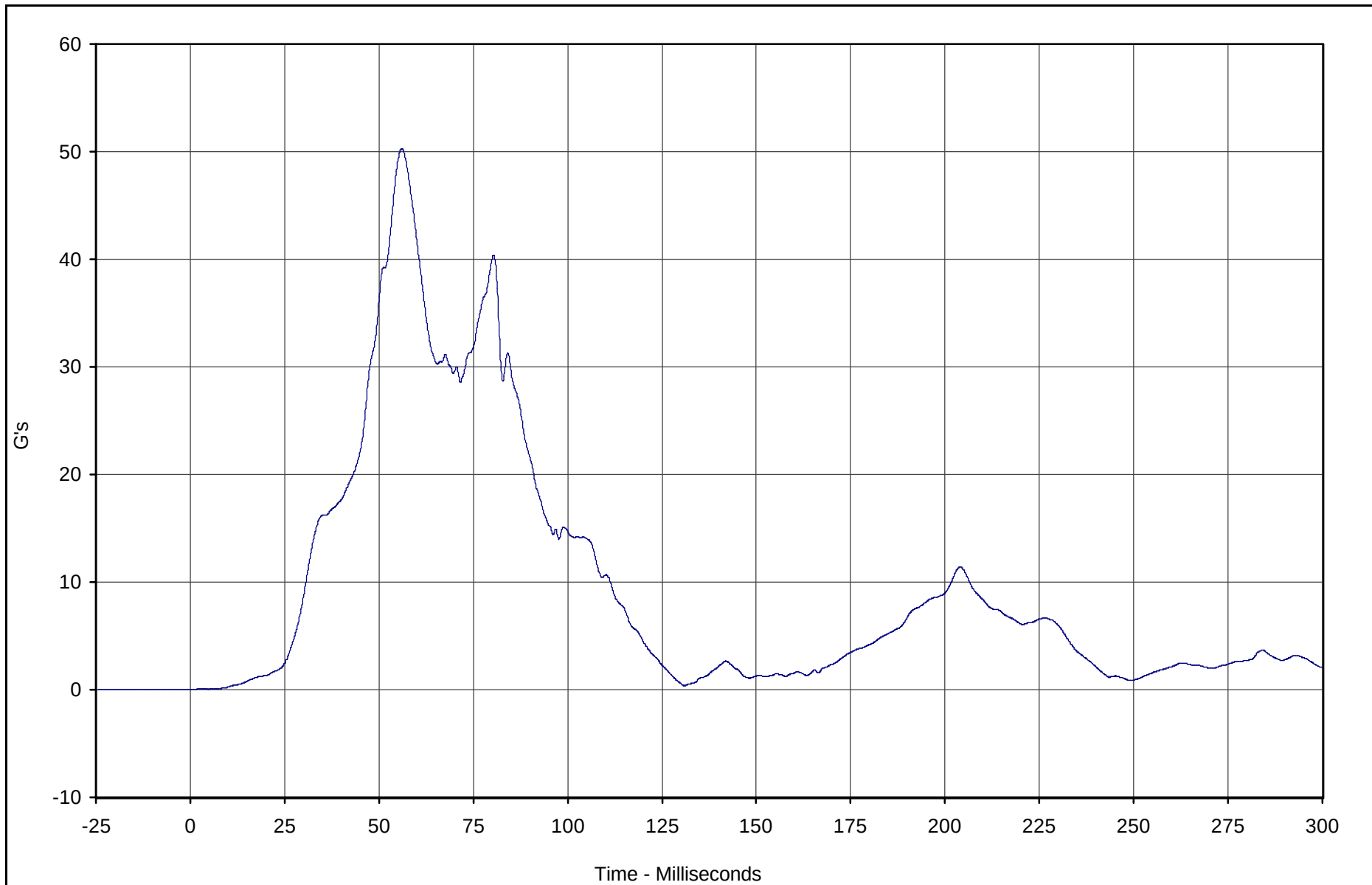


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Resultant	149	RES	G's	50.3	56.0	0.0	0.0	180

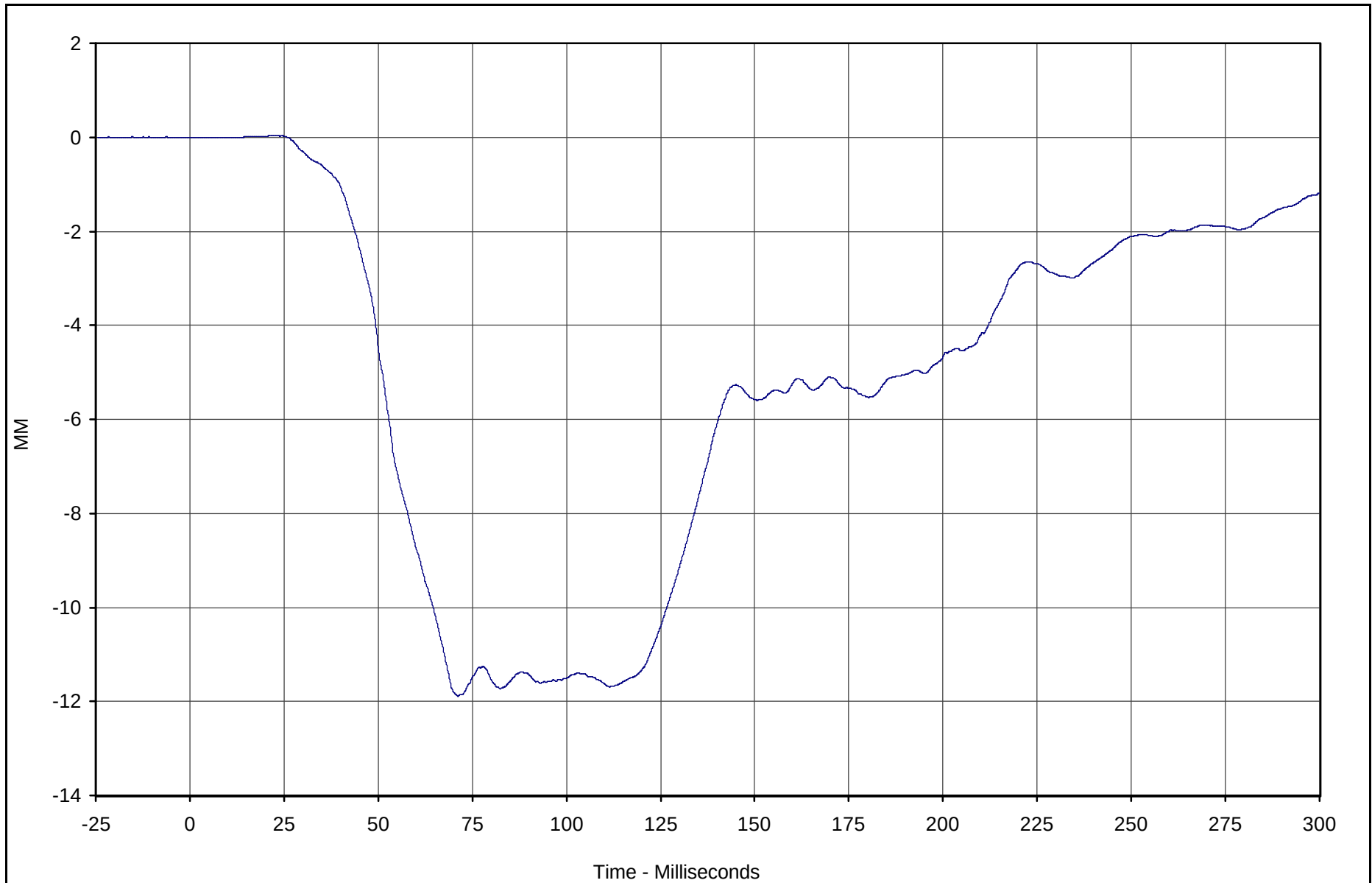


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Deflection	152	FIL	MM	0.0	23.4	-11.9	71.2	600

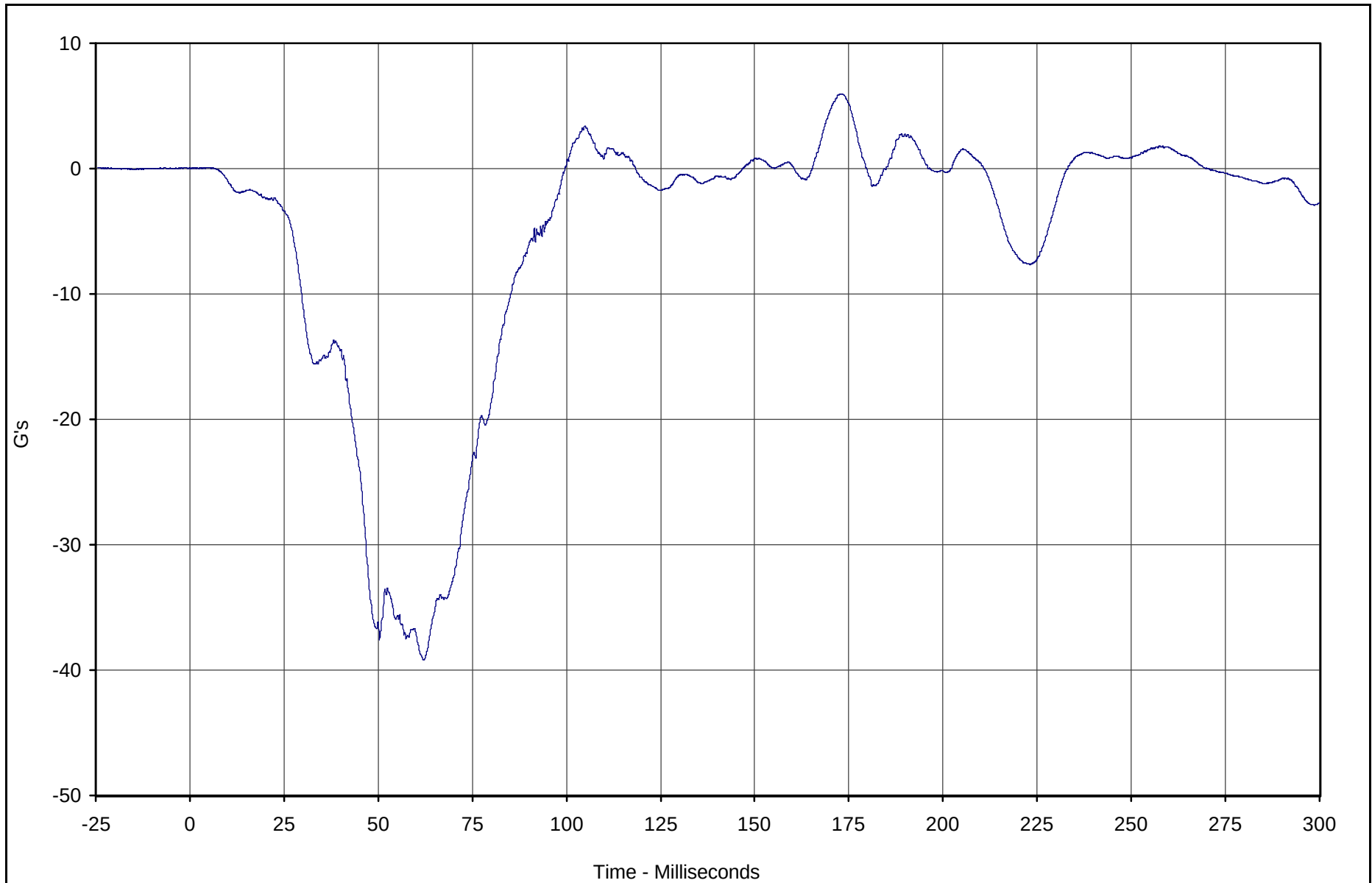


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis X	153	FIL	G's	6.0	172.8	-39.2	62.1	1000

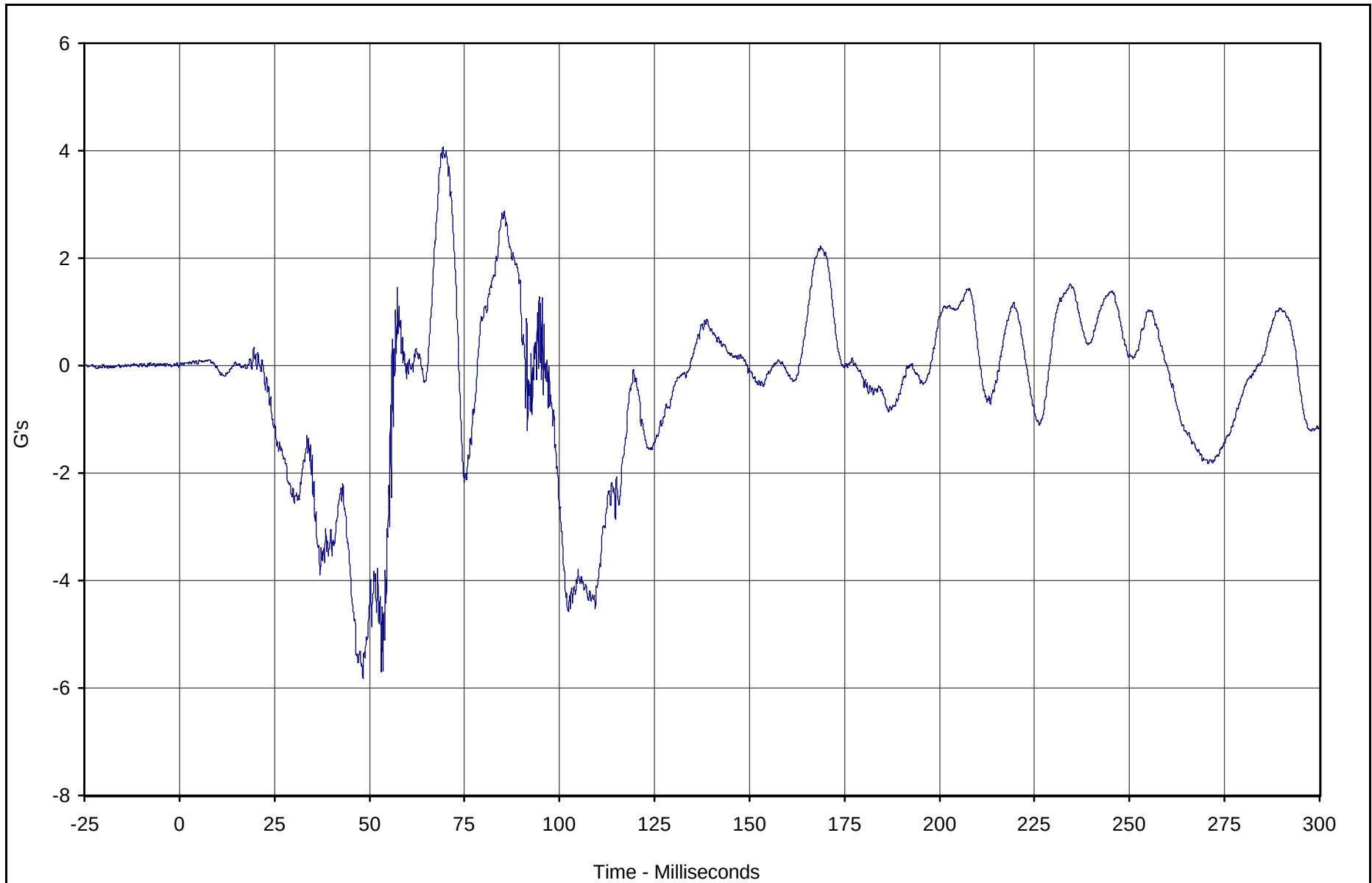


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis Y	154	FIL	G's	4.1	69.4	-5.8	48.3	1000

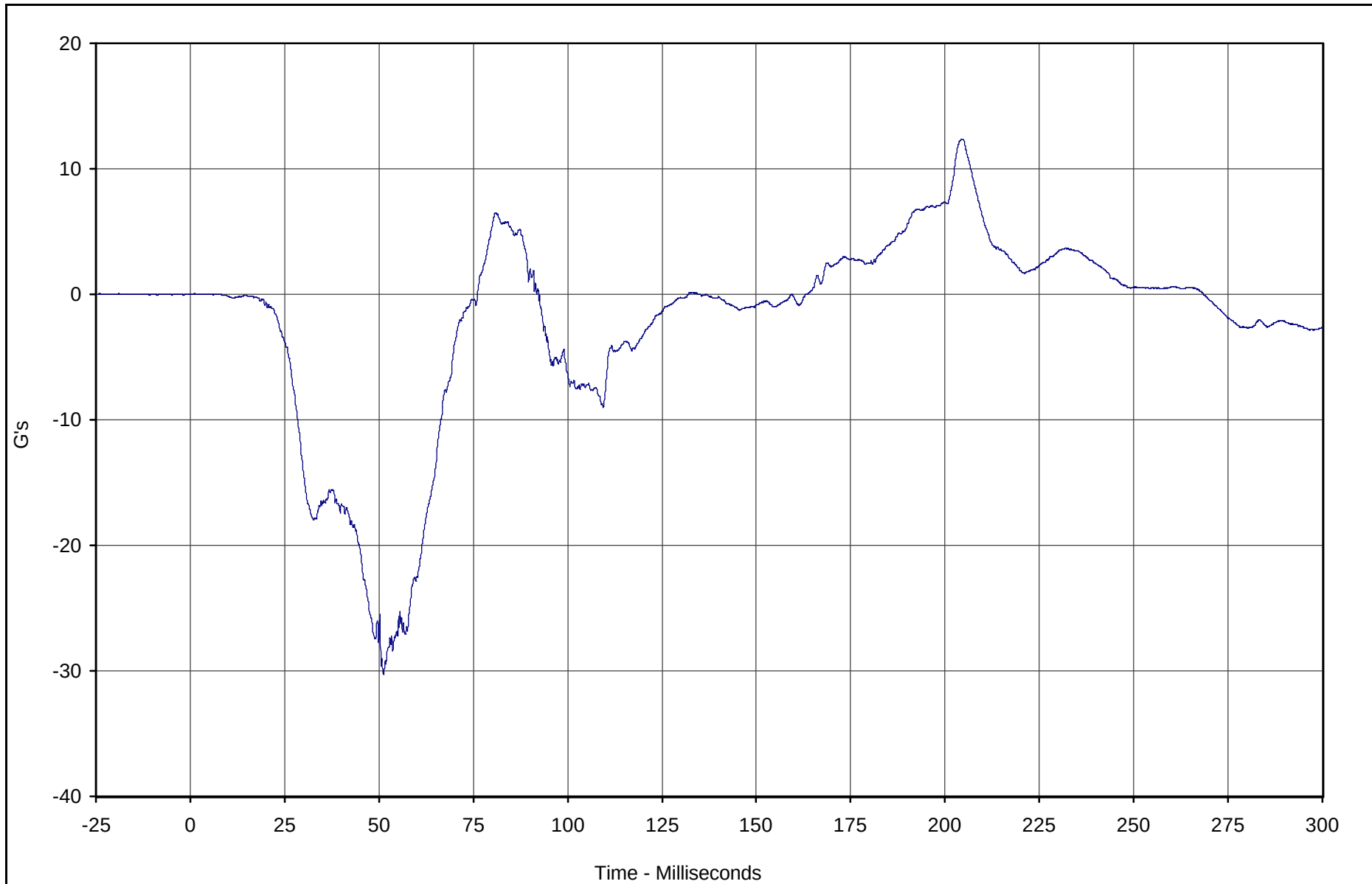


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis Z	155	FIL	G's	12.4	204.6	-30.3	51.2	1000

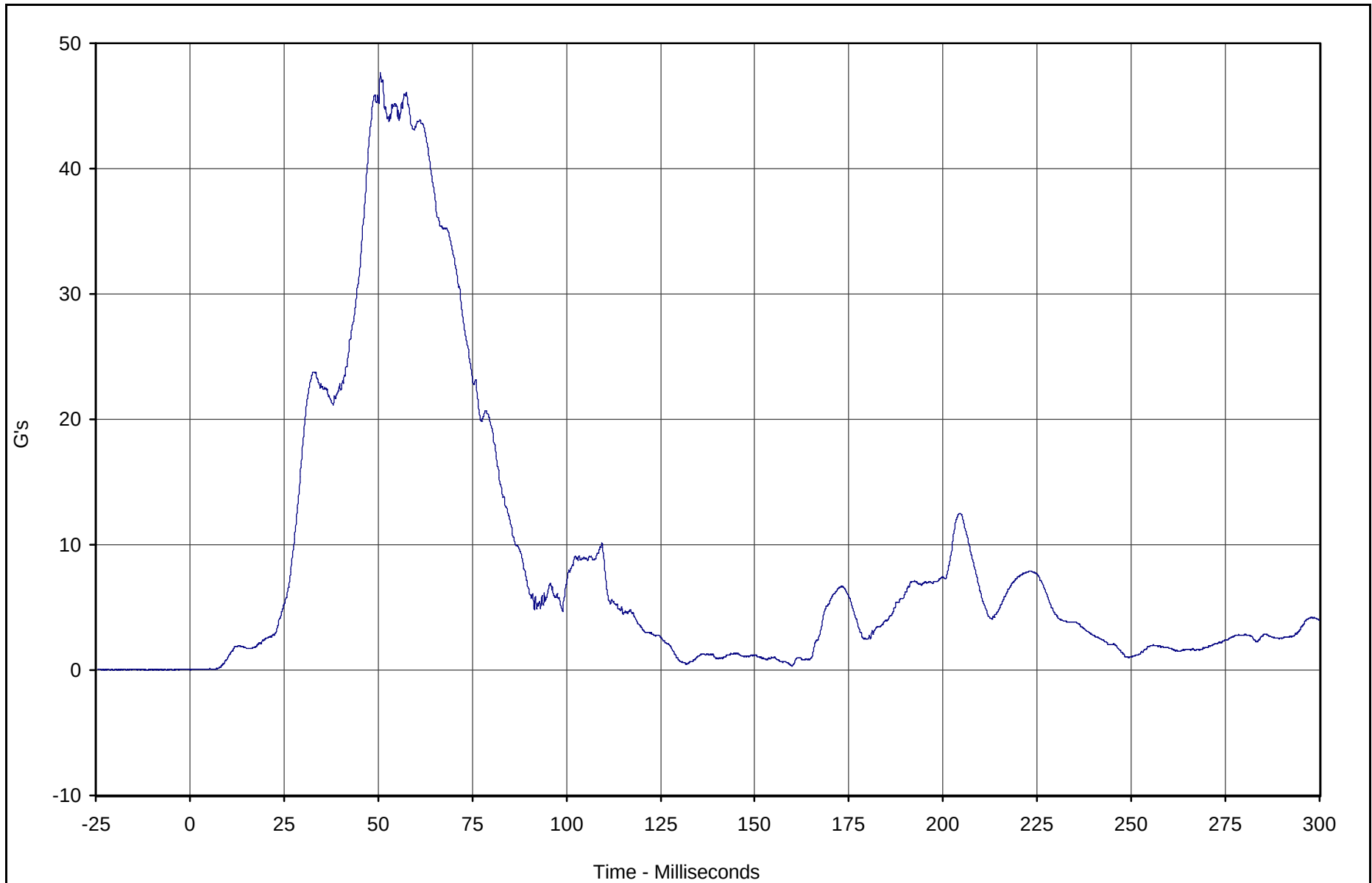


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis Resultant	153	RES	G's	47.7	50.6	0.0	0.2	1000

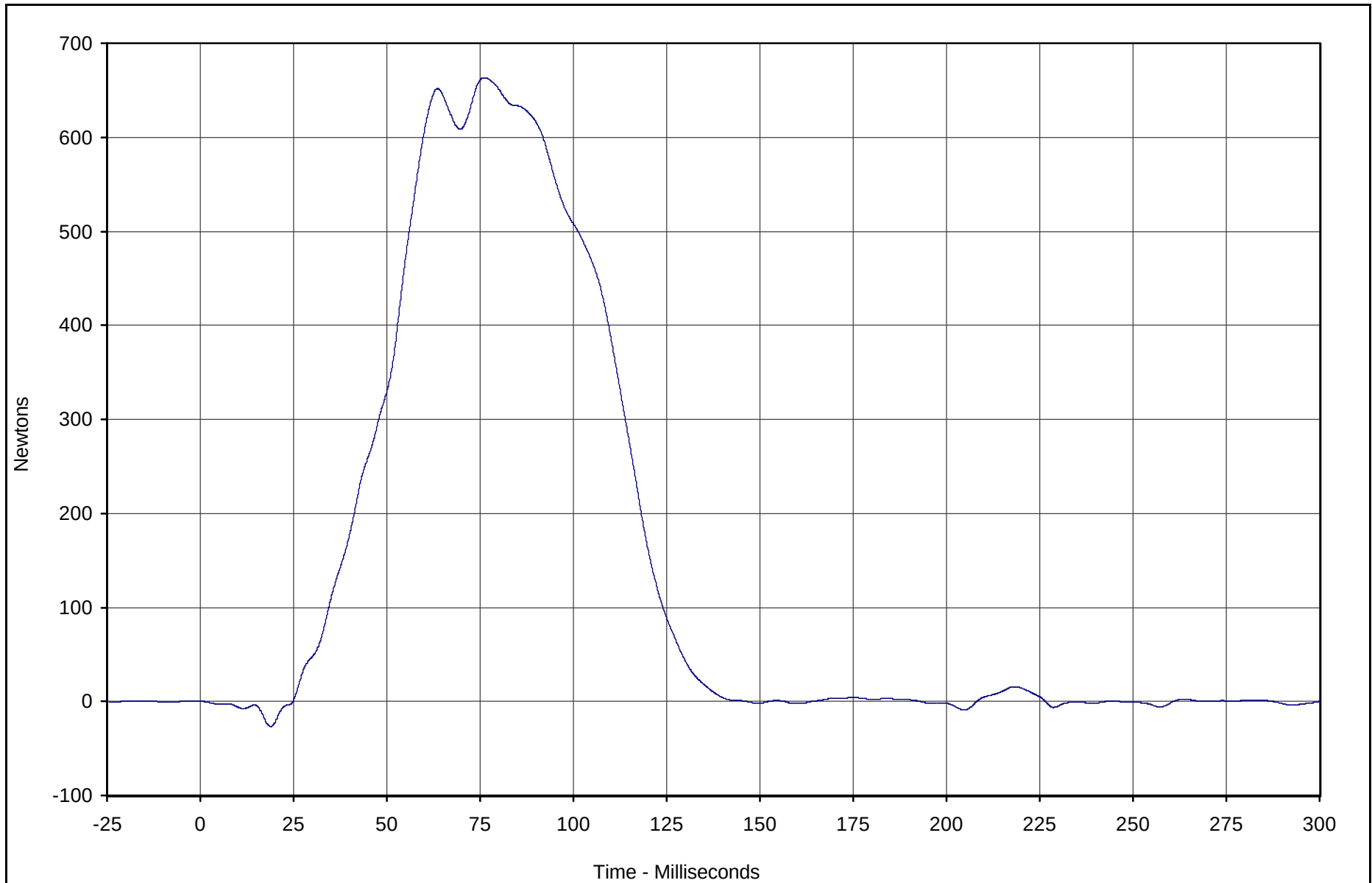


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Seat Tether Load	156	FIL	Newtons	663.4	76.1	-26.7	18.9	60

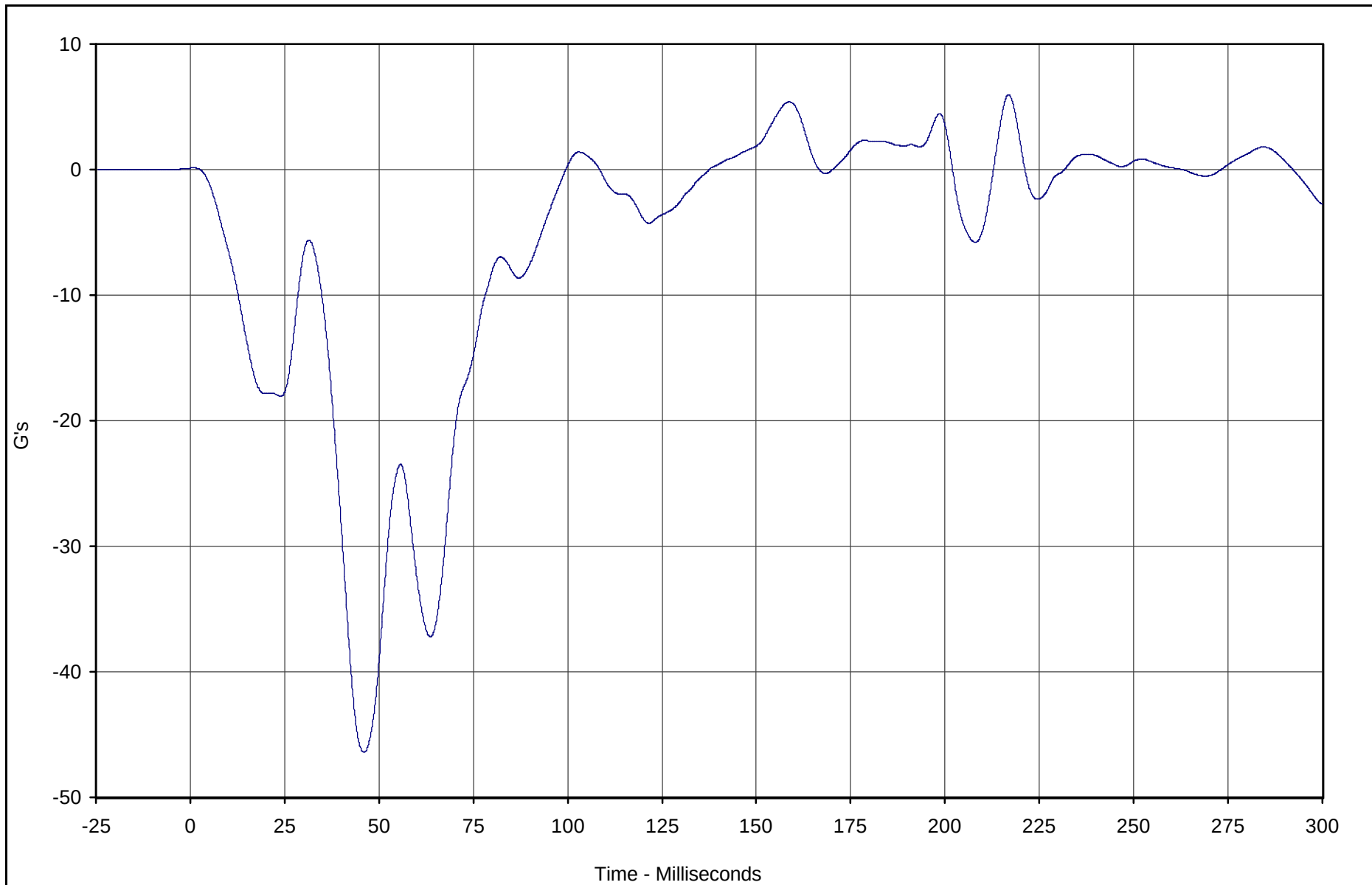


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat X	157	FIL	G's	6.0	216.9	-46.4	46.1	60

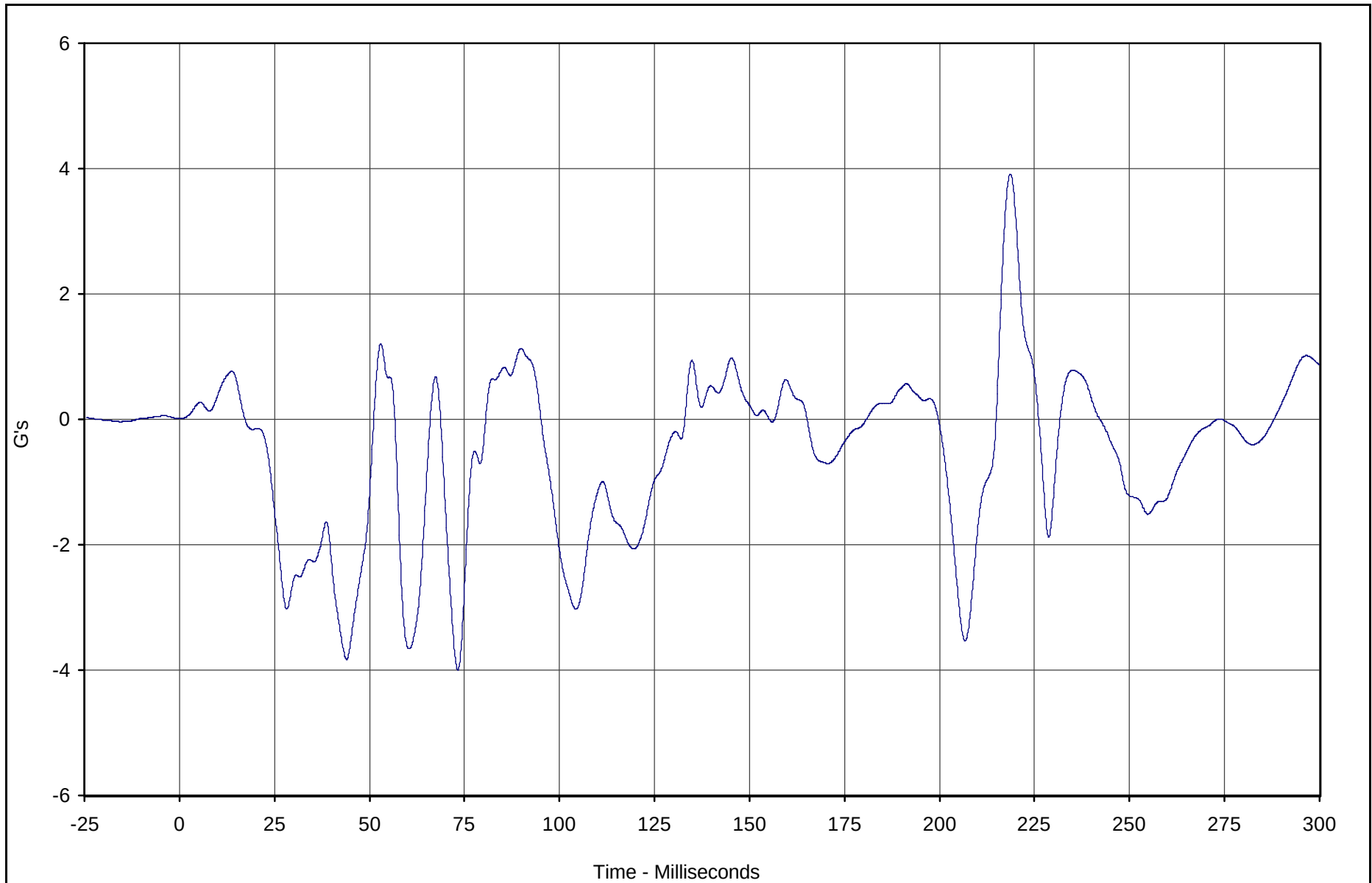


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Y	158	FIL	G's	3.9	218.7	-4.0	73.3	60

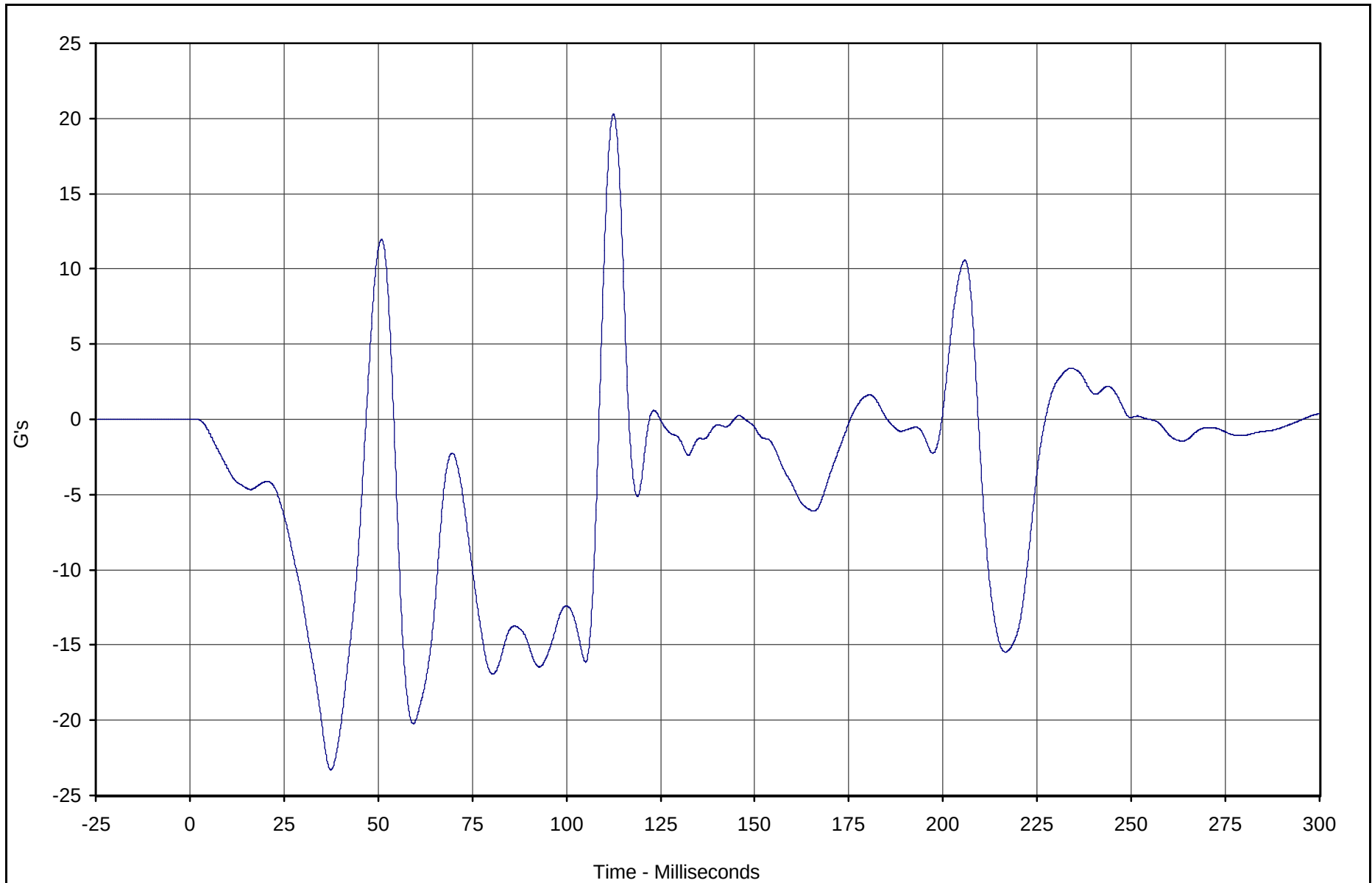


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Z	159	FIL	G's	20.3	112.5	-23.3	37.4	60

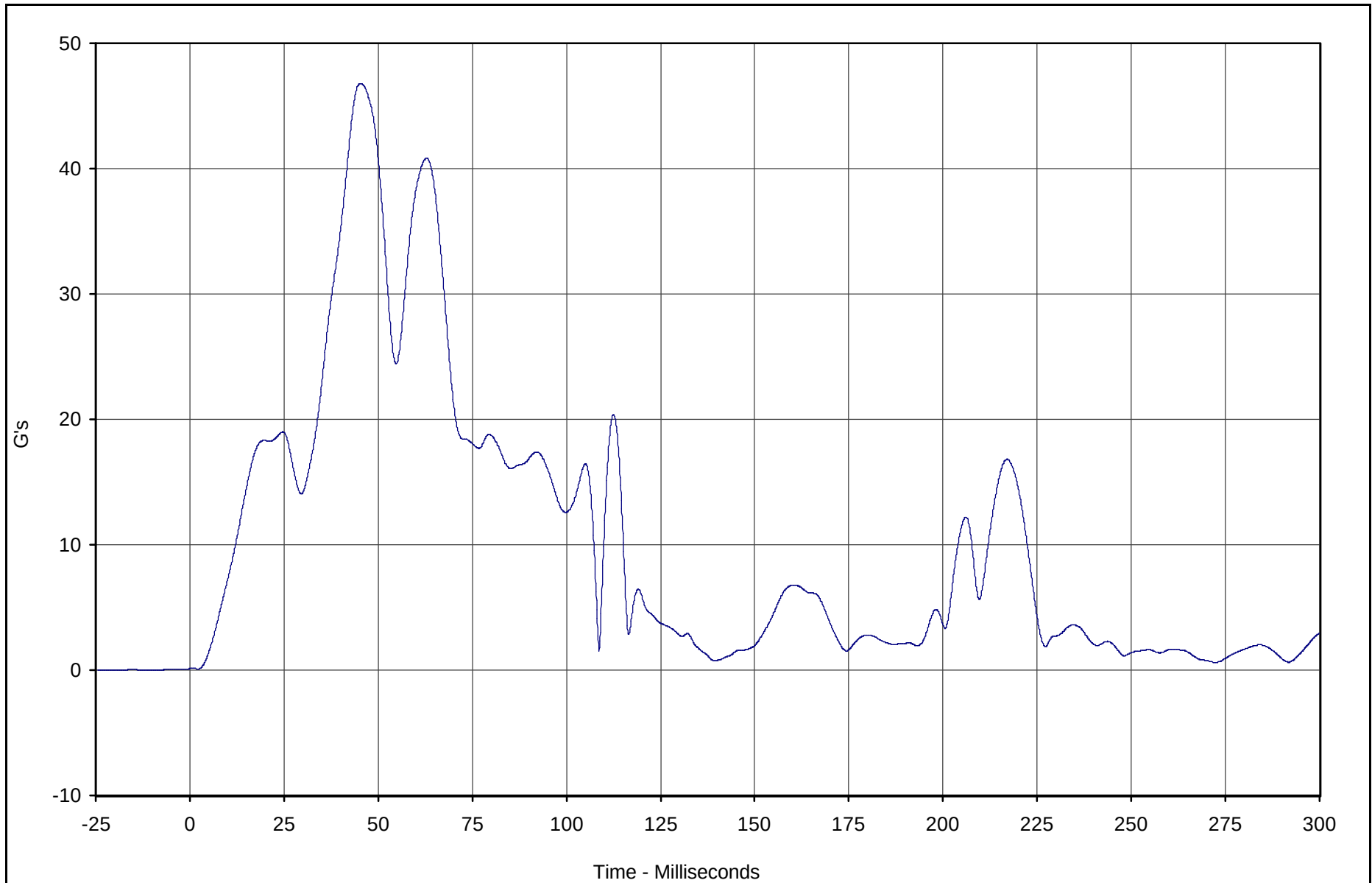


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Resultant	157	RES	G's	46.8	45.3	0.1	2.3	60

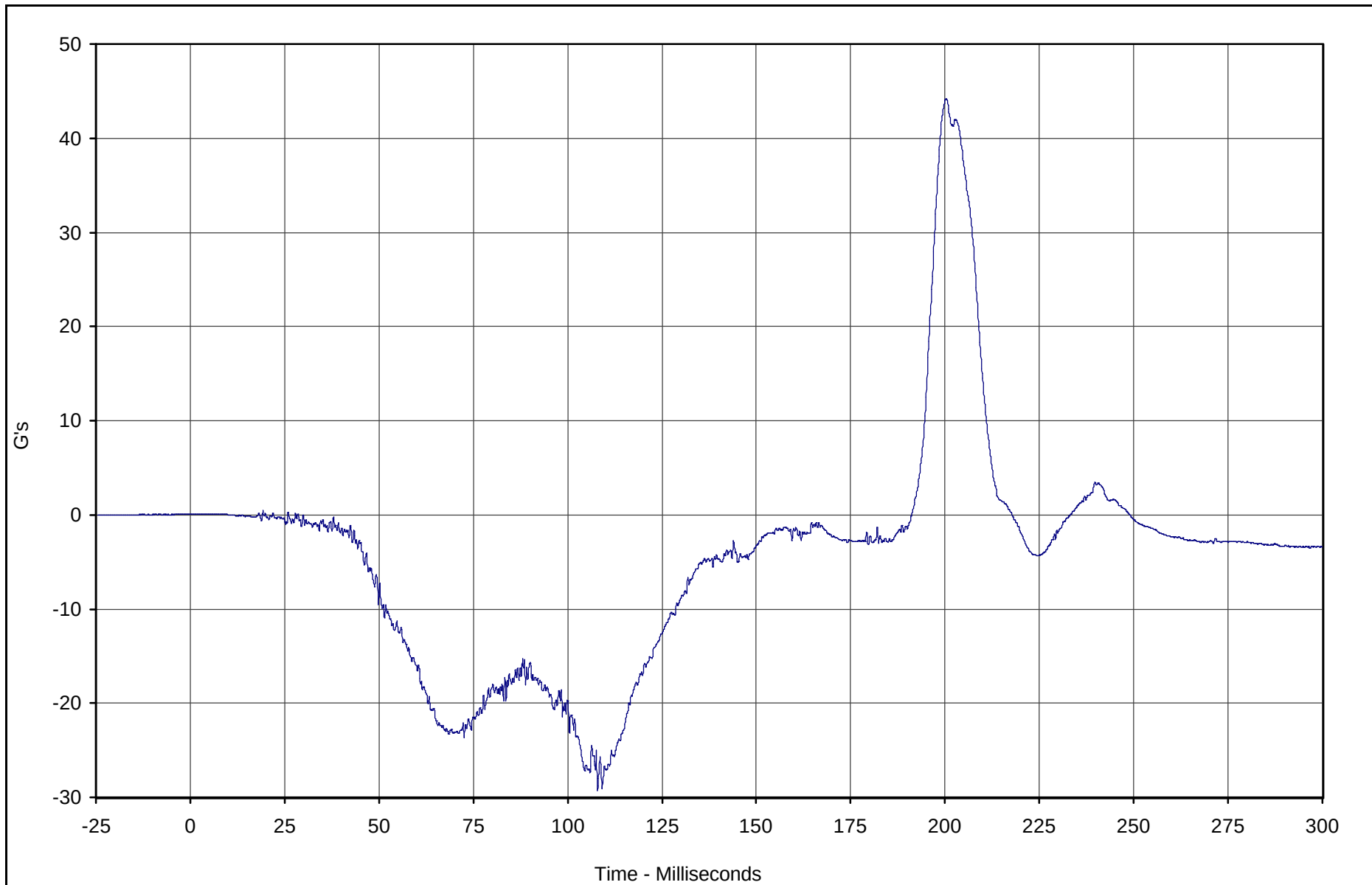


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head X	160	FIL	G's	44.1	200.3	-29.3	107.9	1000

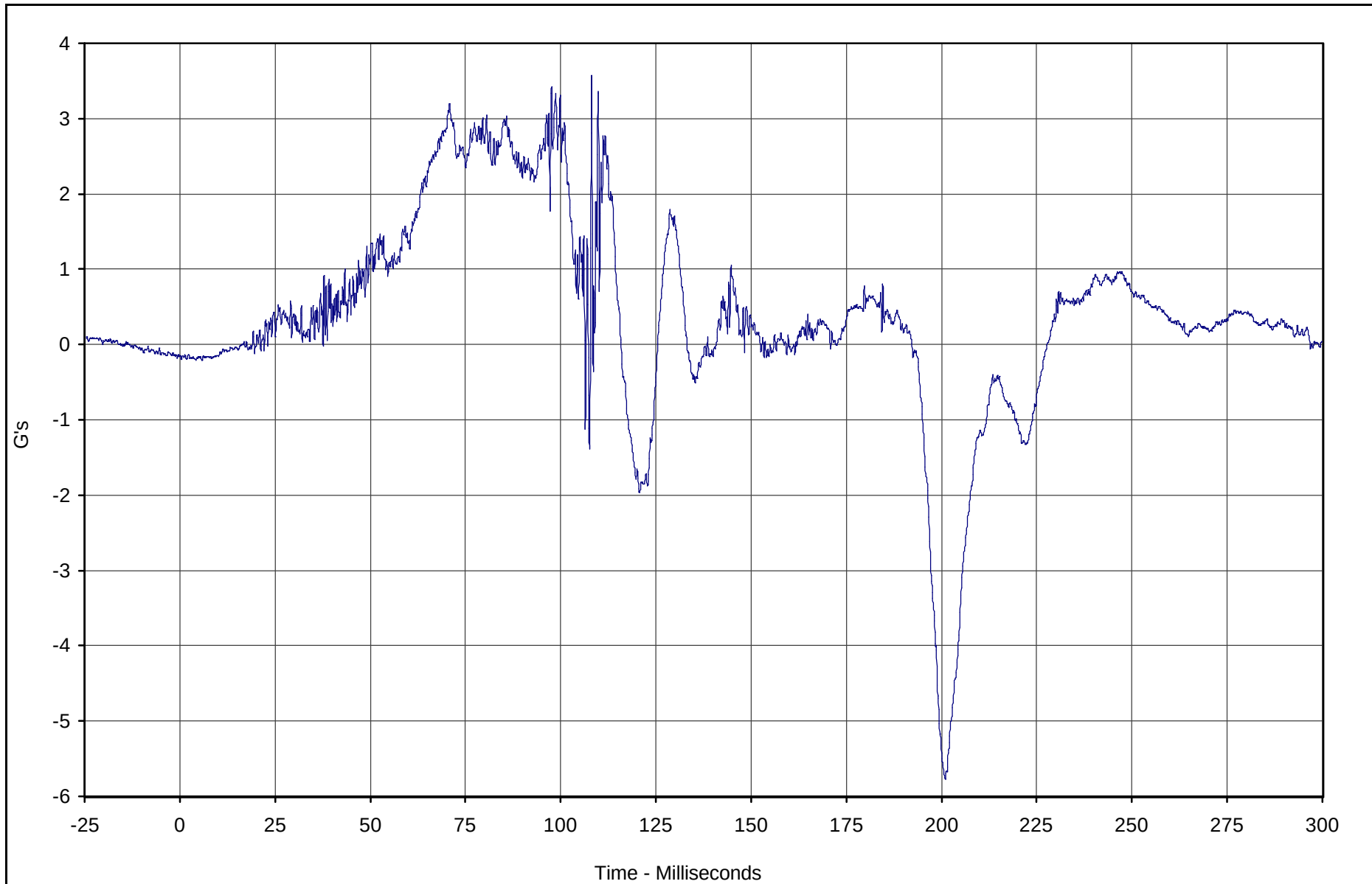


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head Y	161	FIL	G's	3.6	108.1	-5.8	201.0	1000

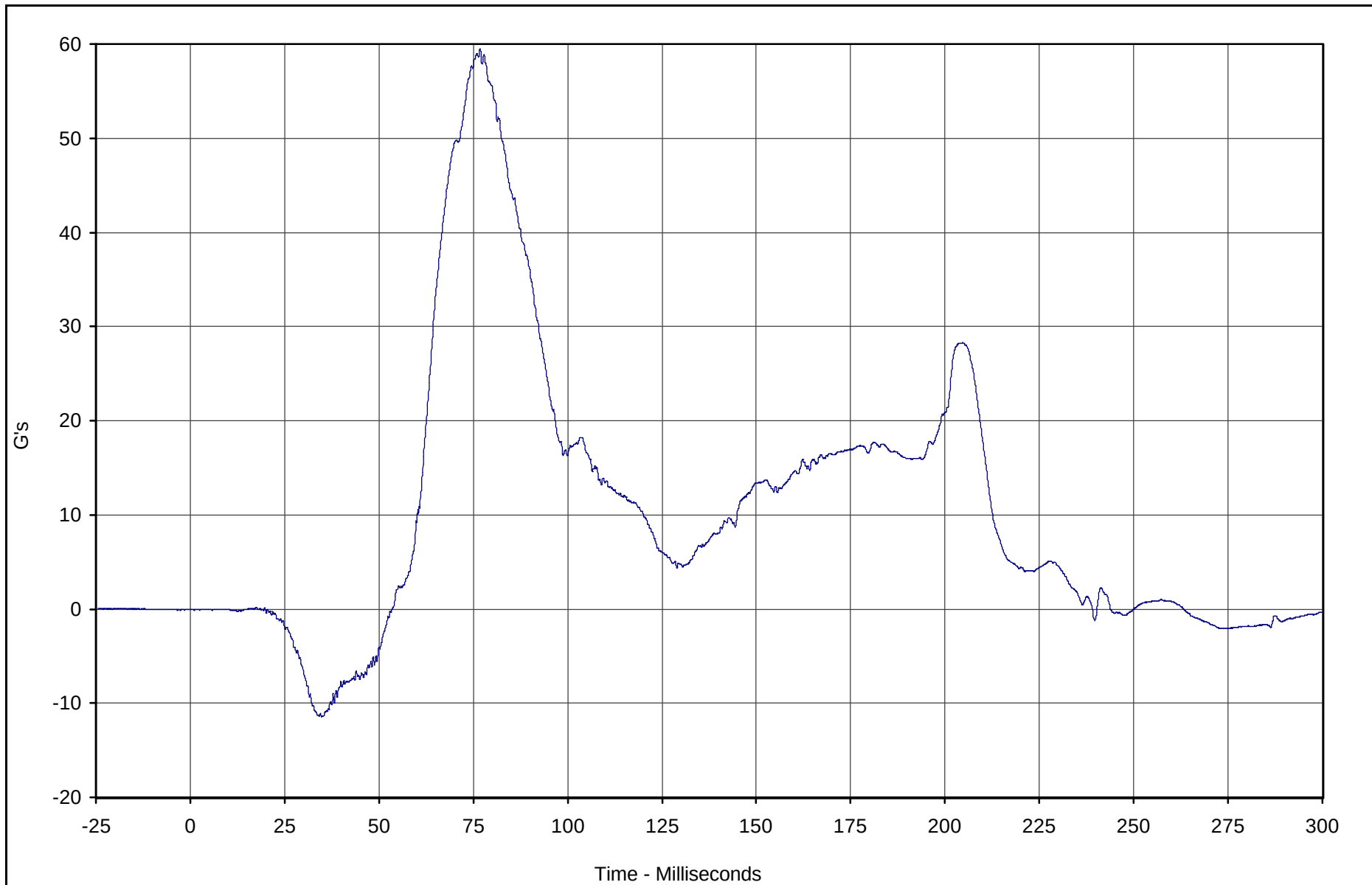


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head Z	162	FIL	G's	59.5	76.8	-11.5	34.8	1000

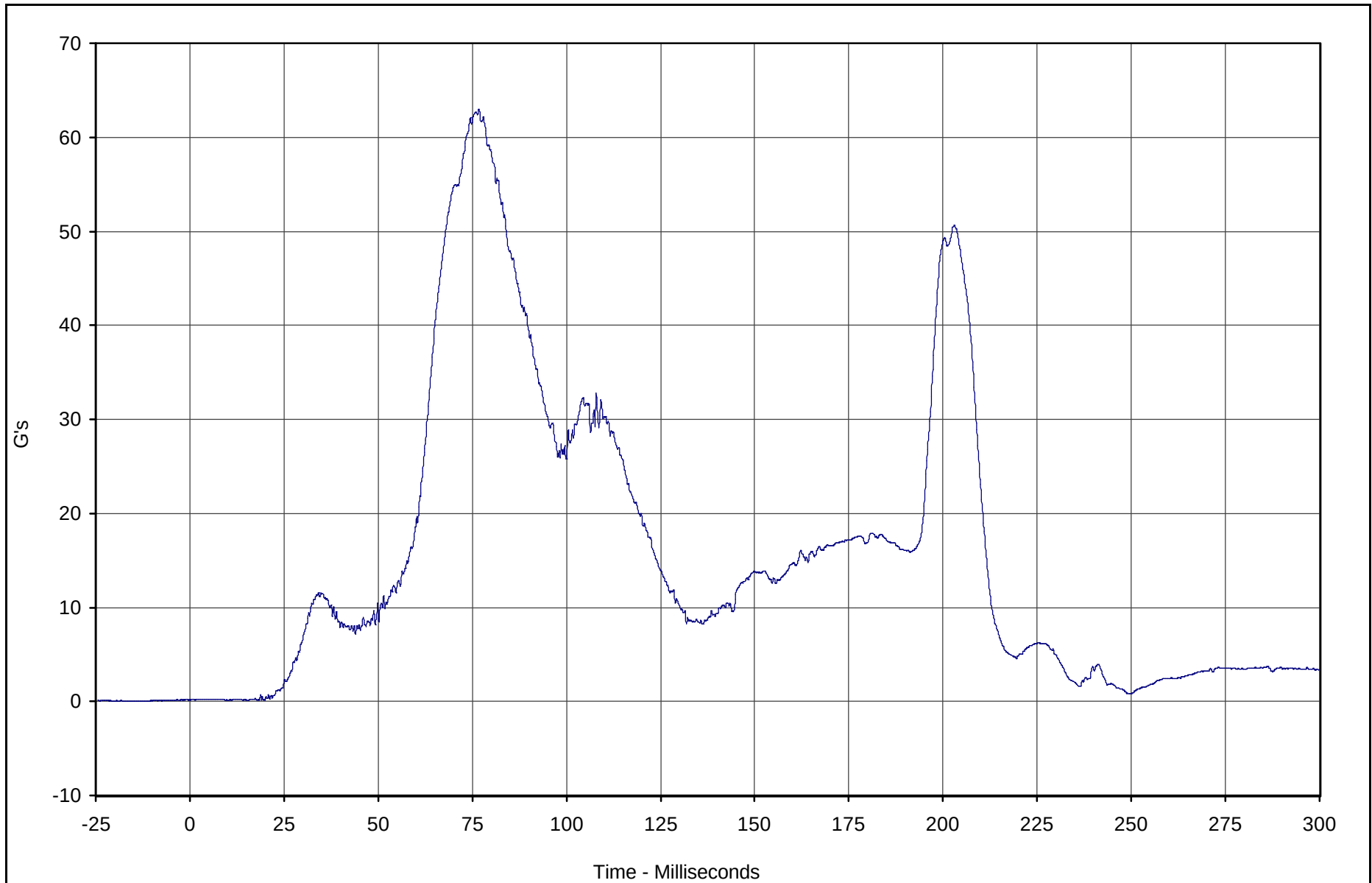


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head Resultant	160	RES	G's	62.9	76.8	0.1	18.4	1000

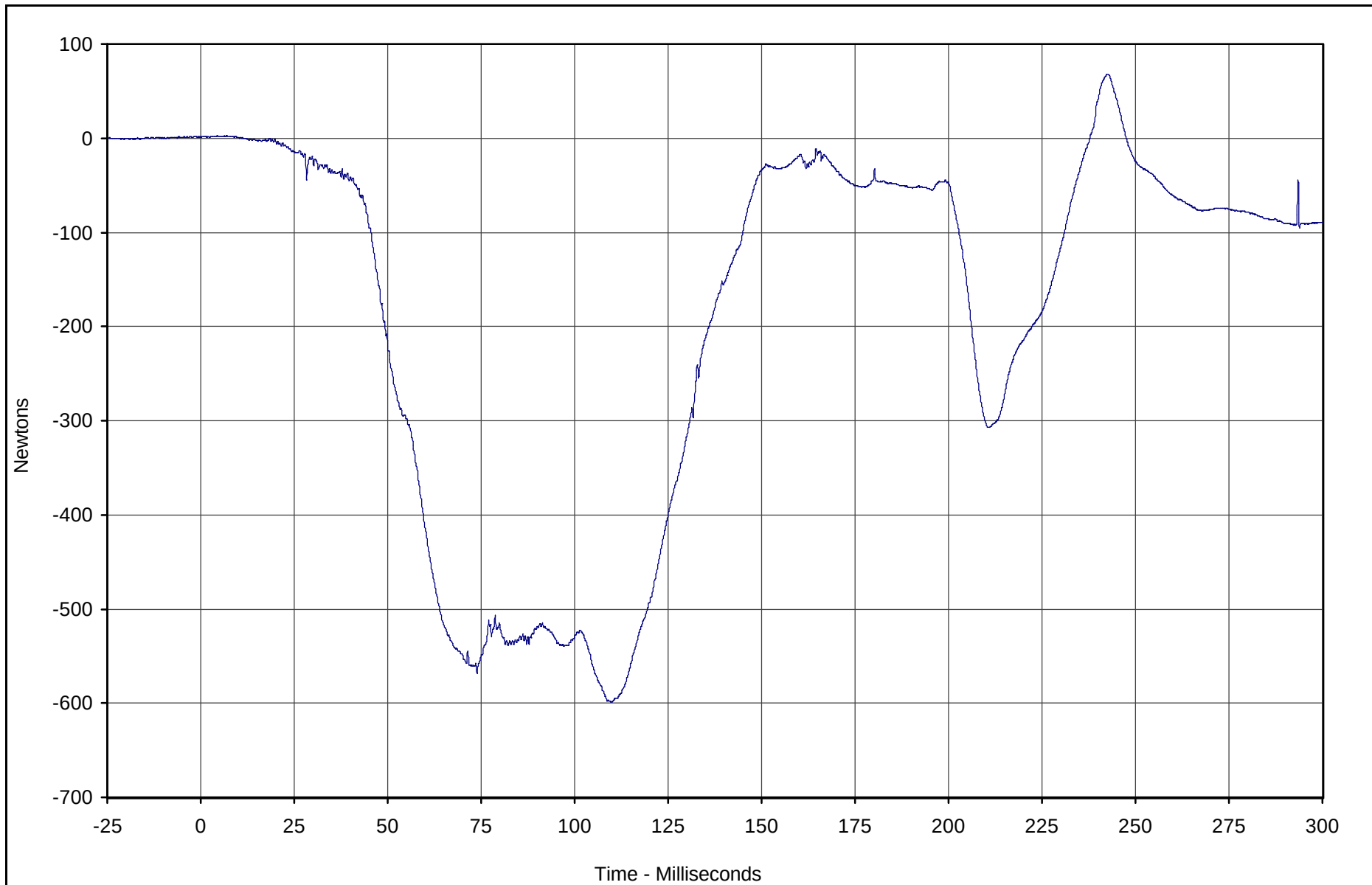


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force X	163	FIL	Newtons	67.8	242.5	-598.7	109.7	1000

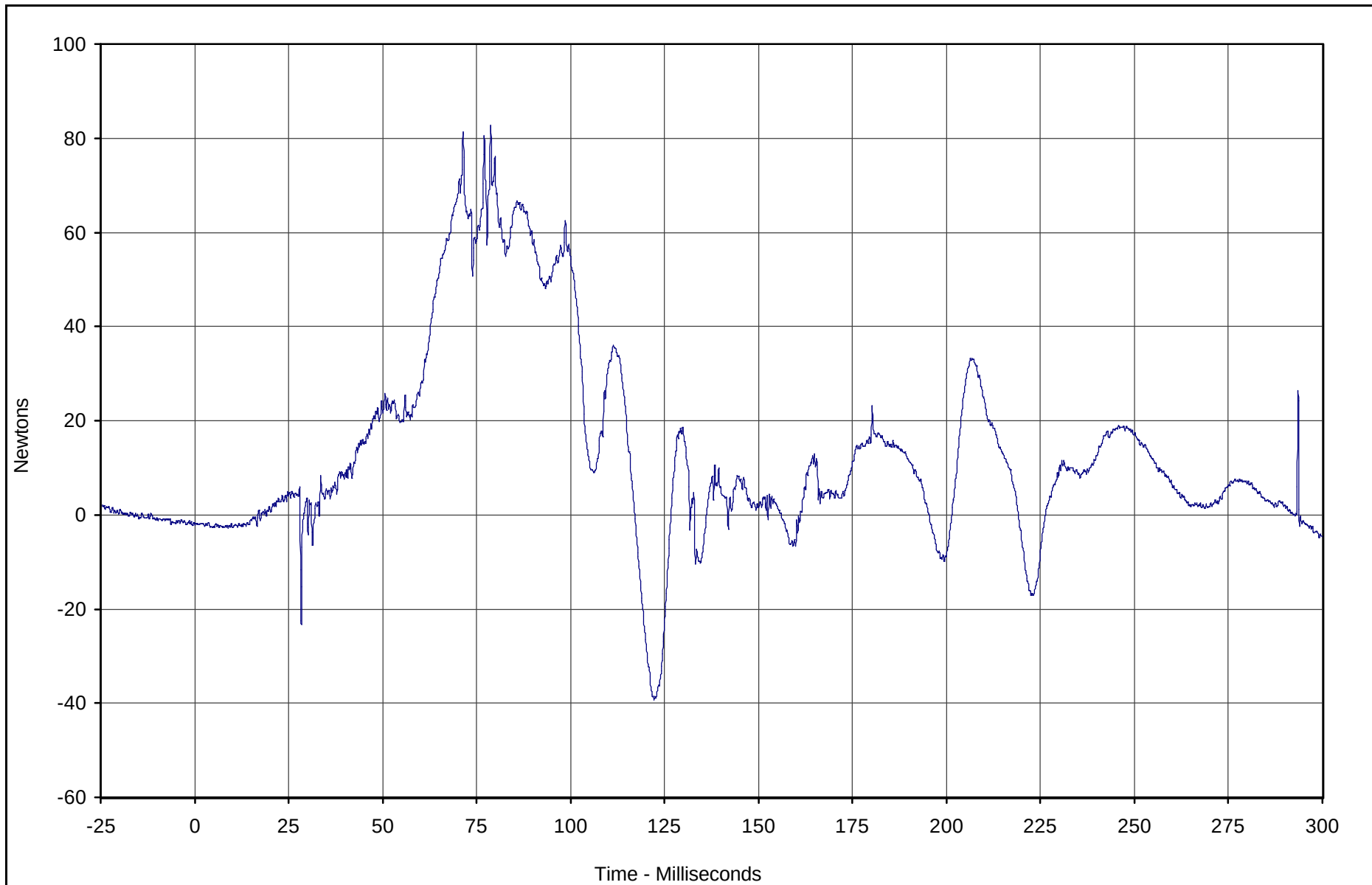


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force Y	164	FIL	Newtons	82.8	78.8	-39.3	122.3	1000

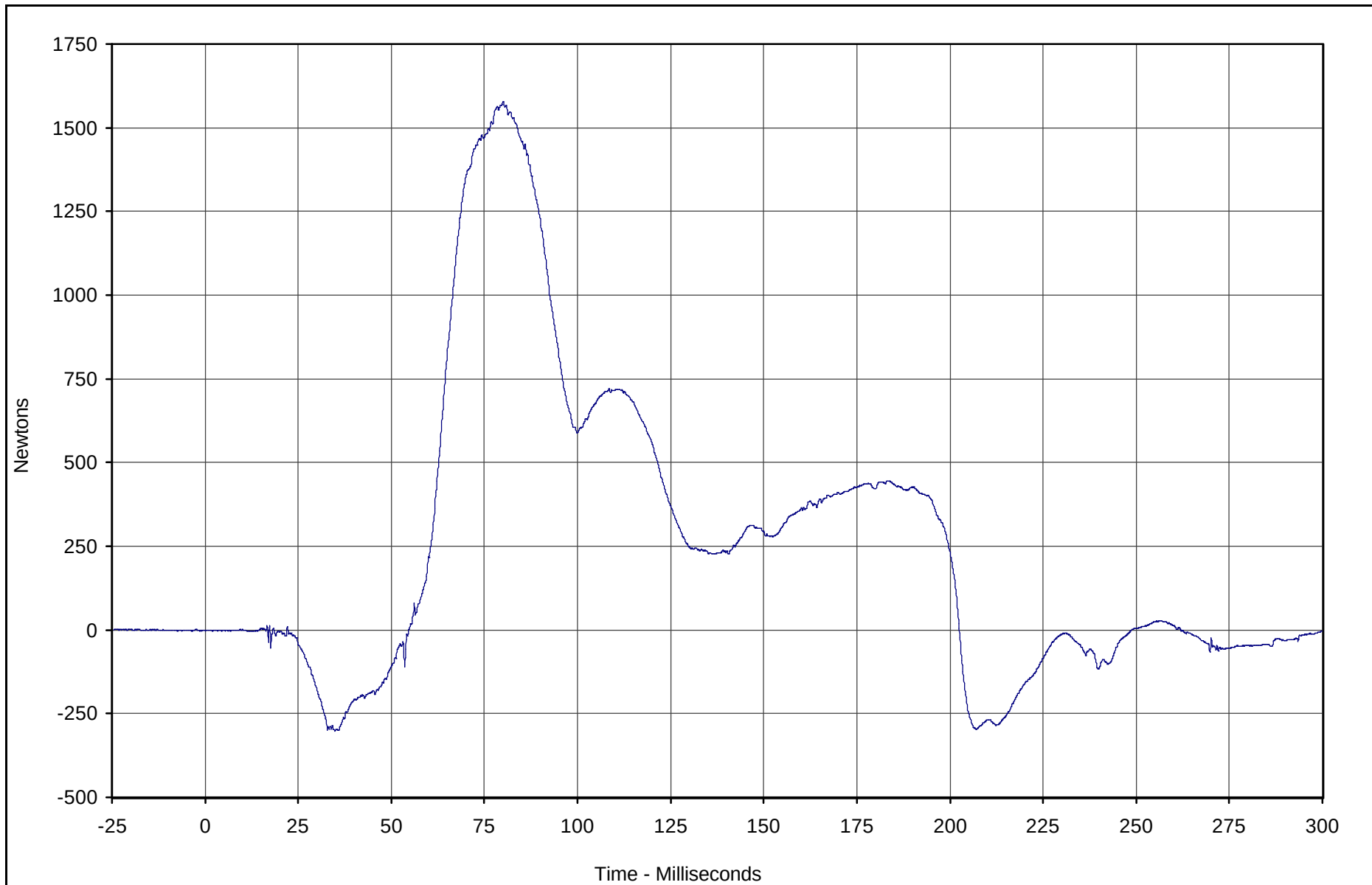


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force Z	165	FIL	Newtons	1577.1	80.1	-301.4	34.9	1000

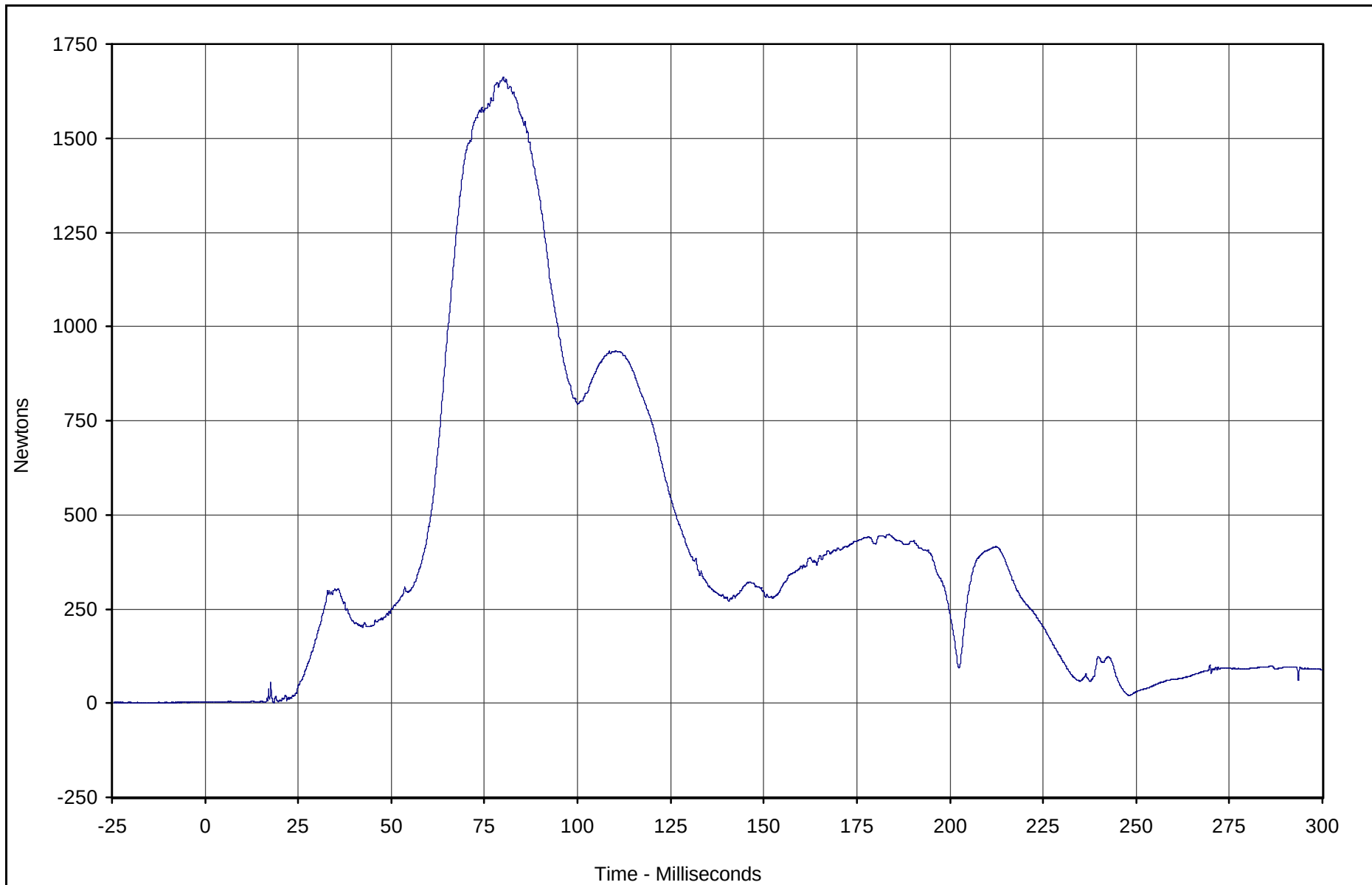


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force Res.	163	RES	Newtons	1662.1	80.1	0.6	18.5	1000

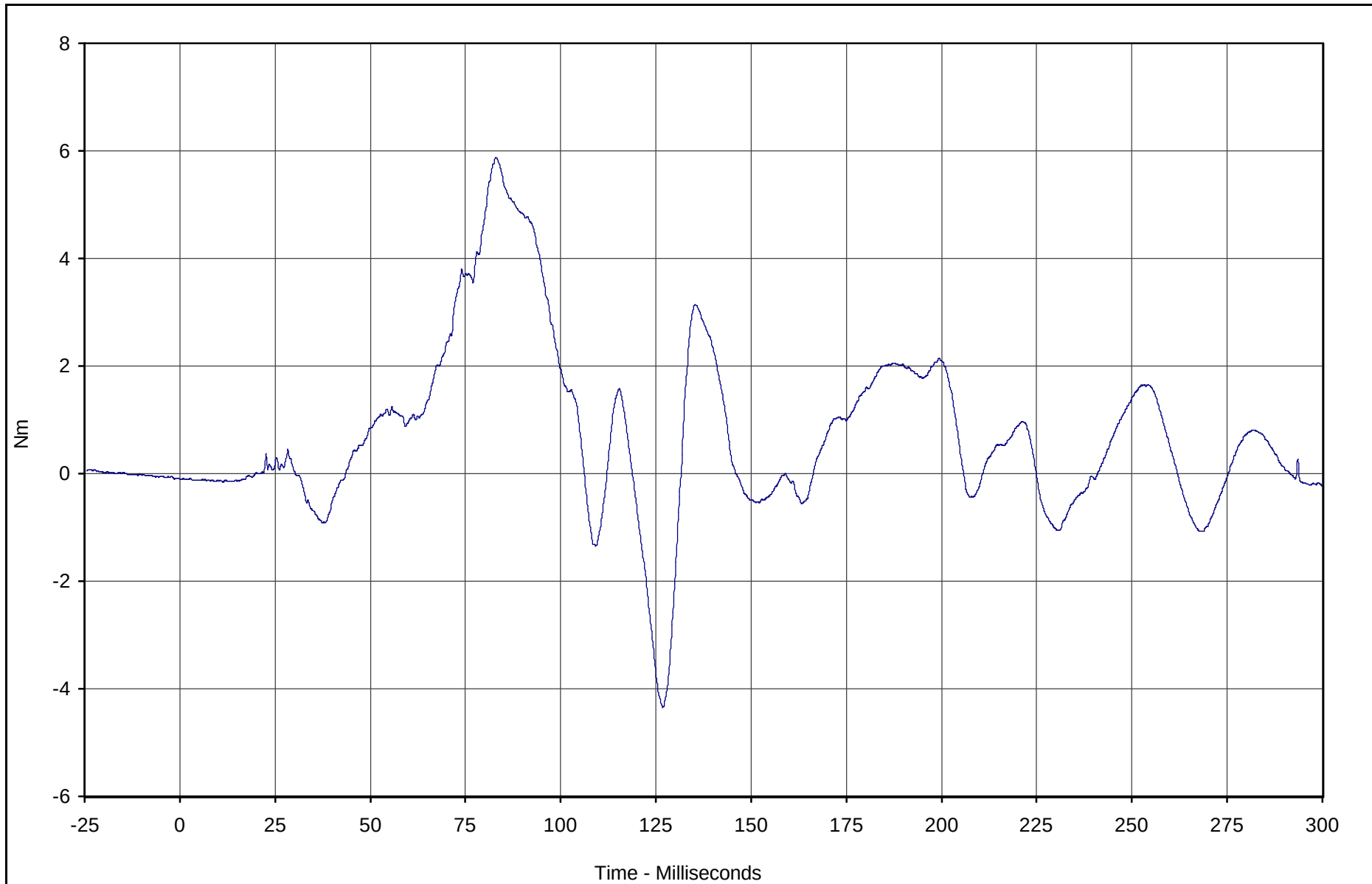


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Moment X	166	FIL	Nm	5.9	83.1	-4.3	126.8	600

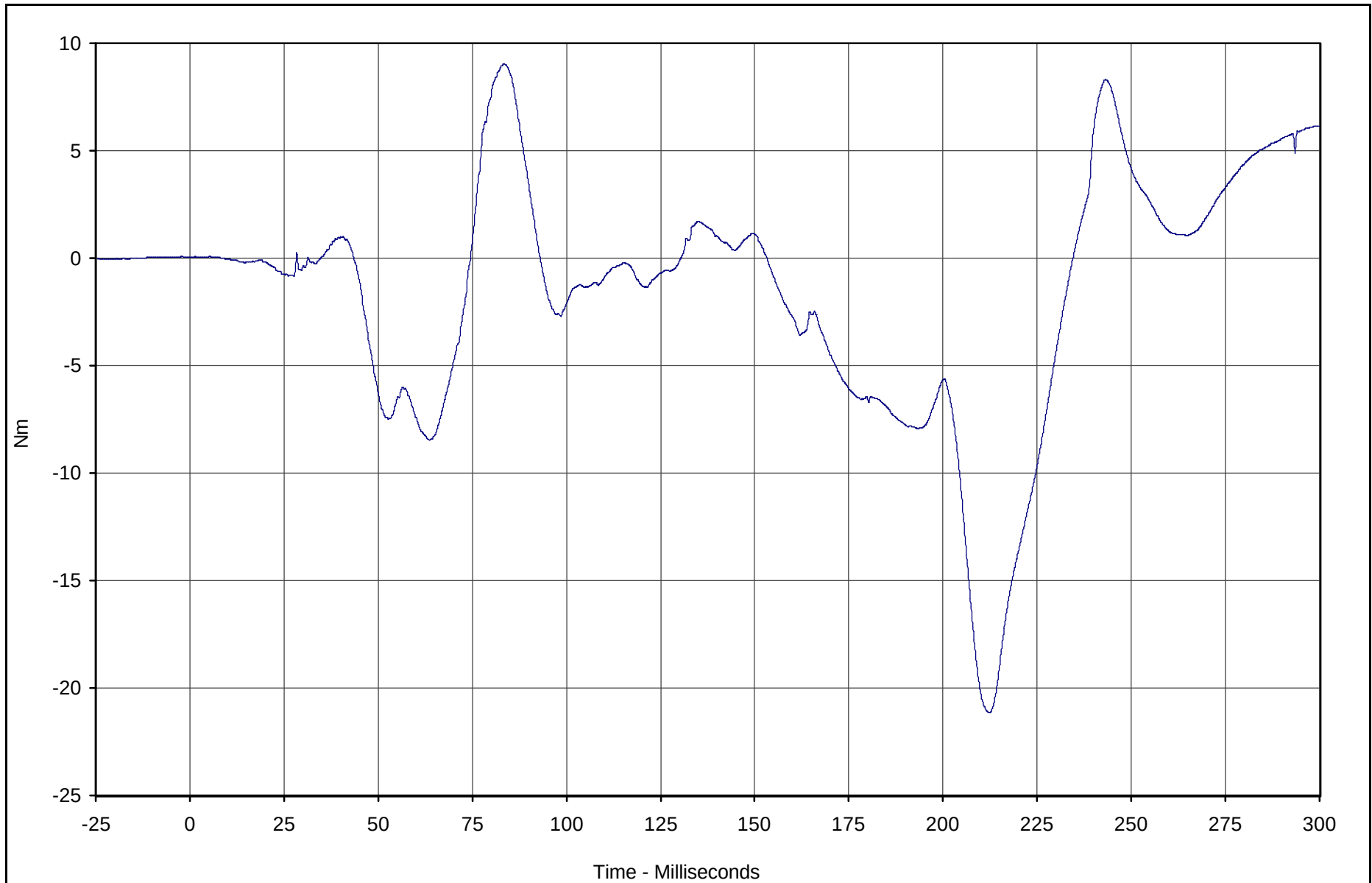


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Moment Y	167	FIL	Nm	9.0	83.4	-21.1	212.4	600

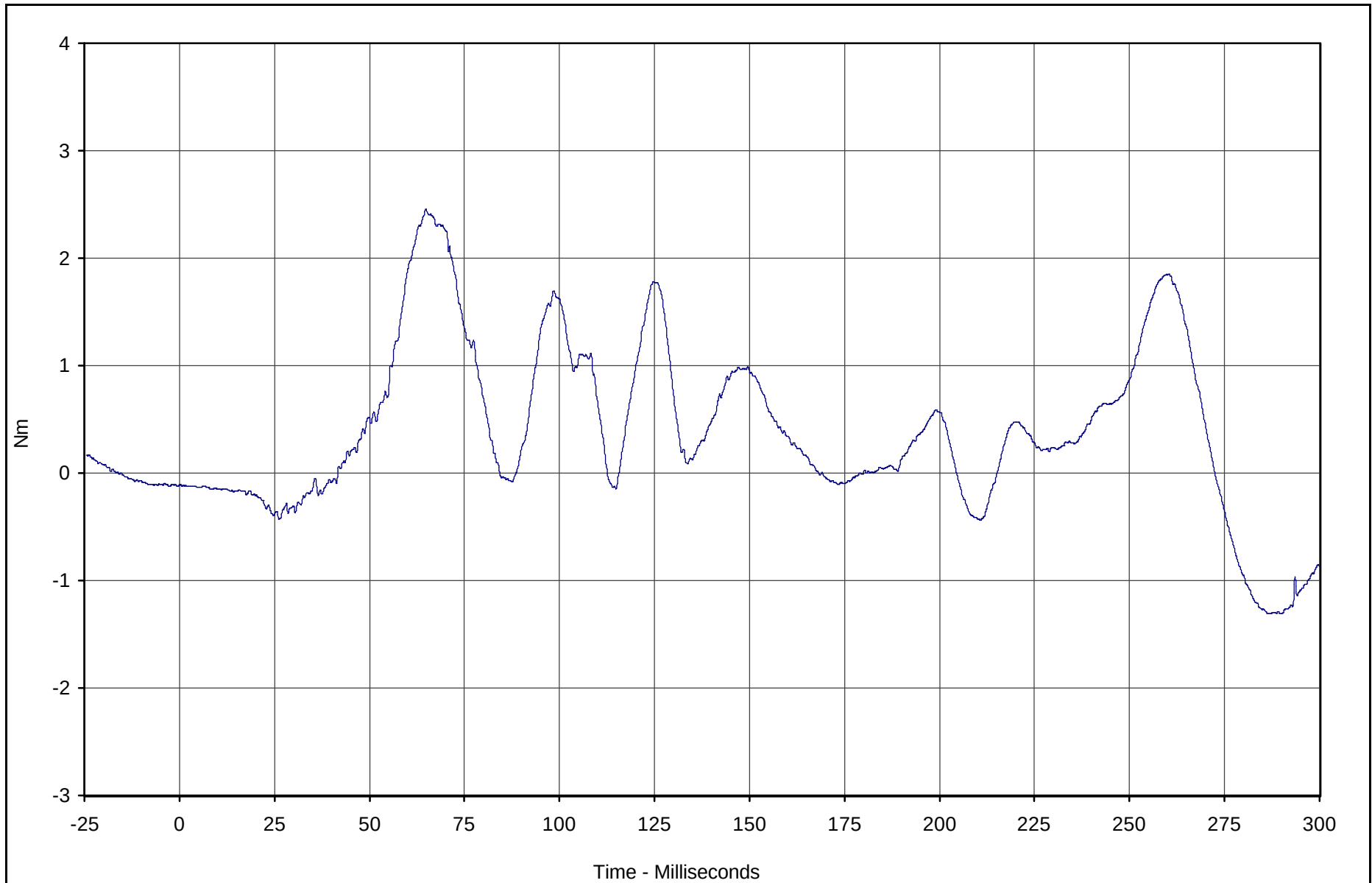


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Moment Z	168	FIL	Nm	2.5	64.9	-1.3	286.3	600

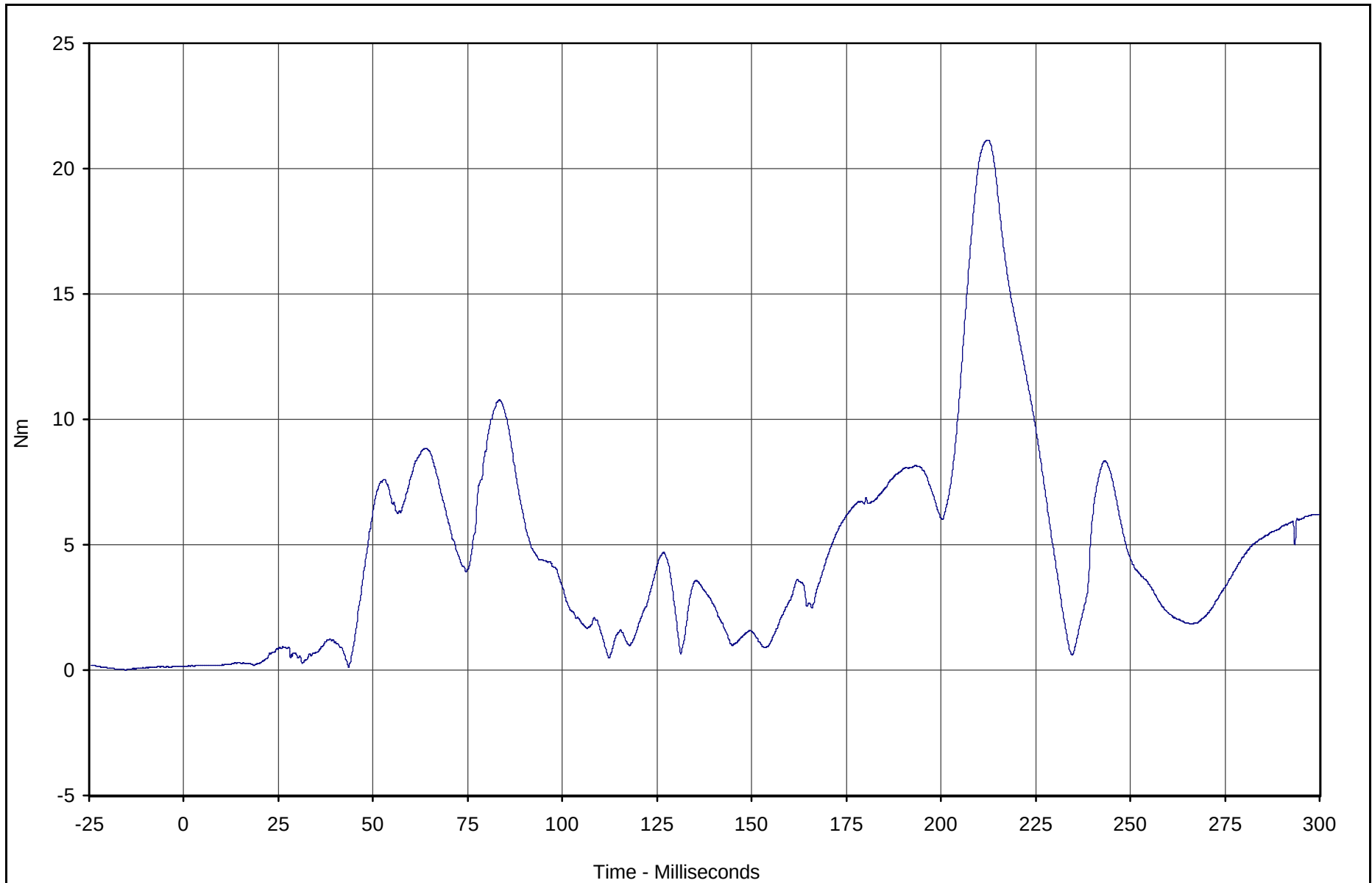


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Mom Res.	166	RES	Nm	21.1	212.4	0.1	43.5	600

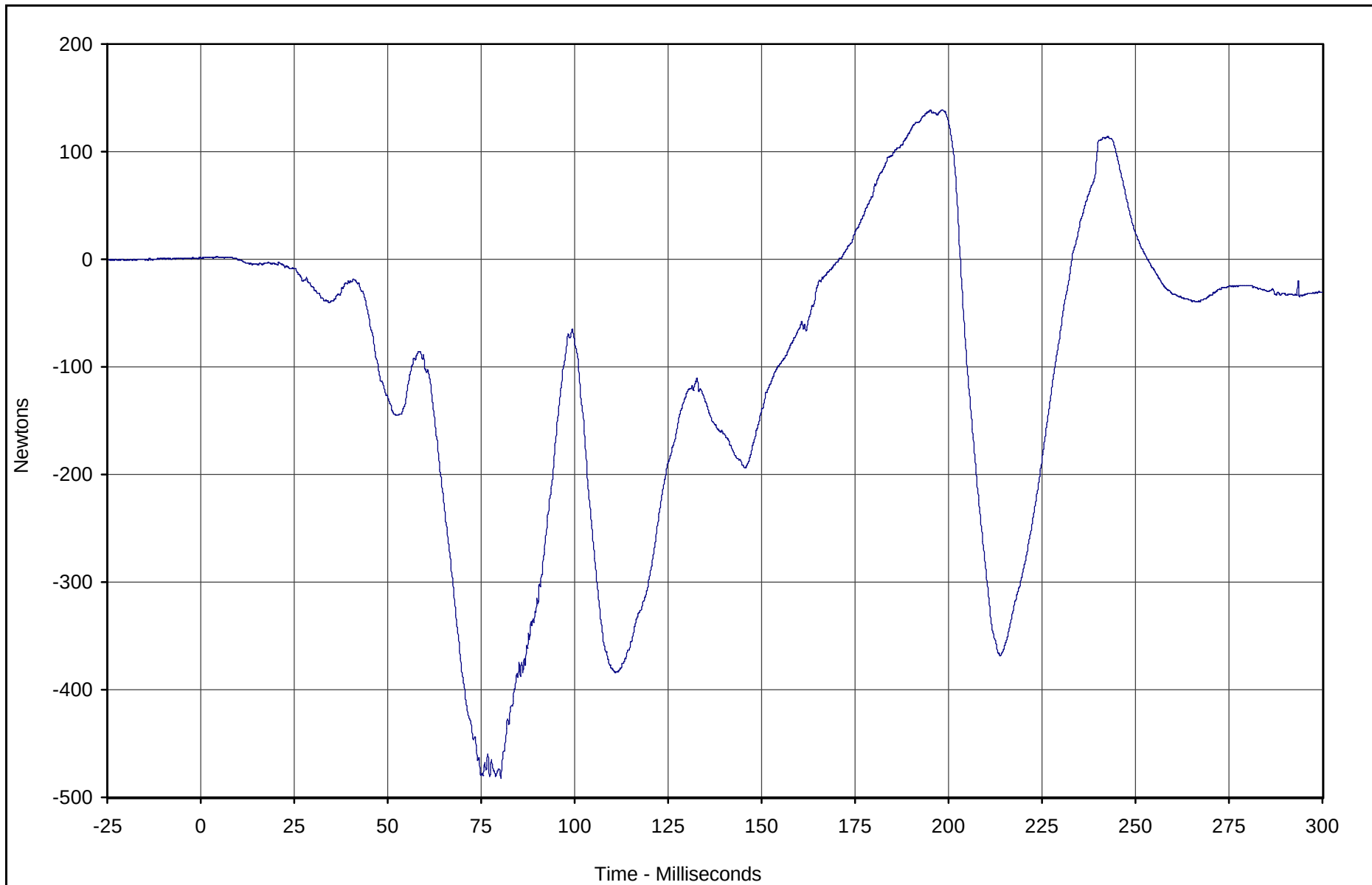


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force X	169	FIL	Newtons	138.9	198.5	-482.2	80.3	1000

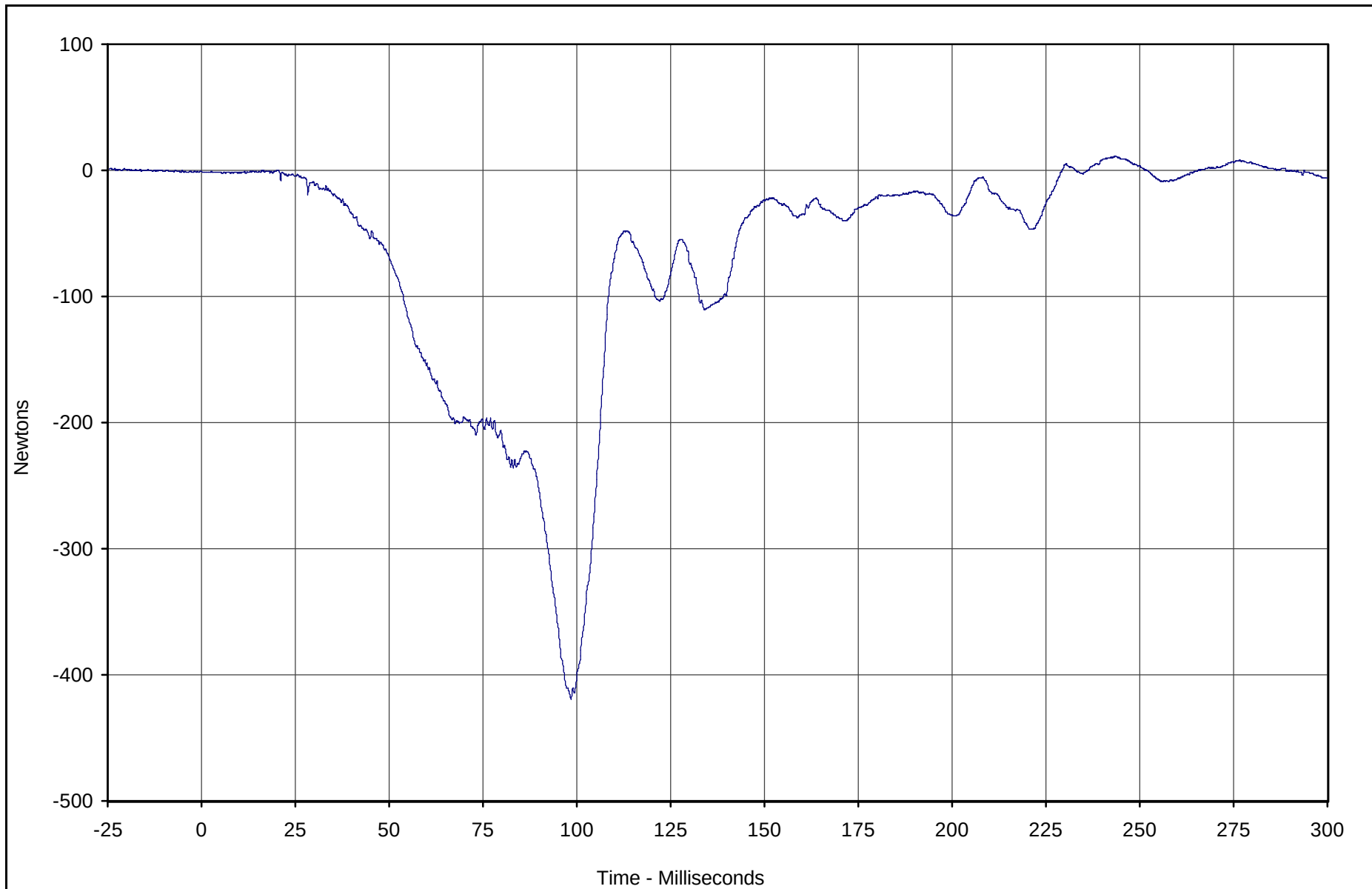


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force Y	170	FIL	Newtons	11.3	243.5	-419.8	98.5	1000

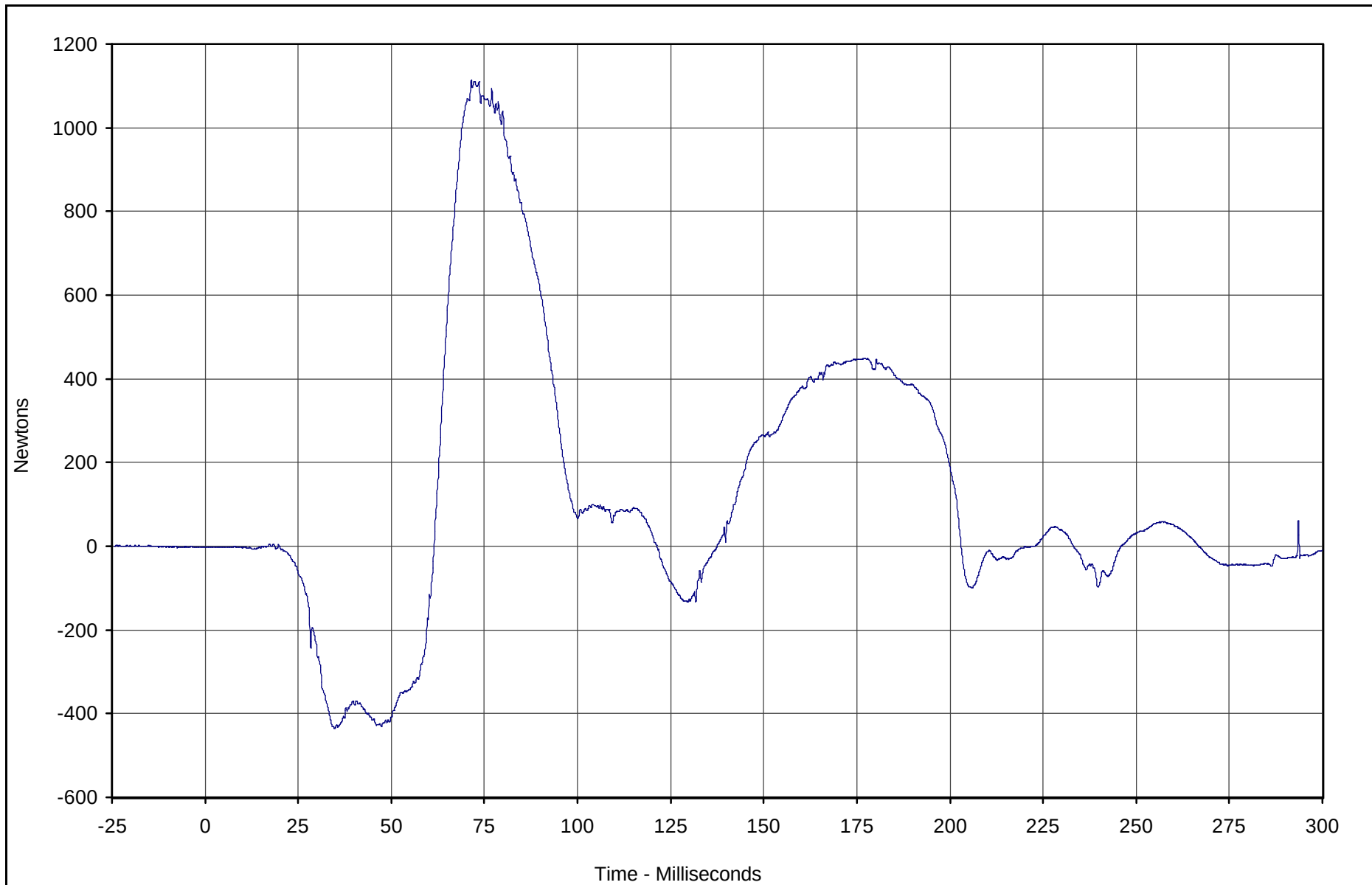


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force Z	171	FIL	Newtons	1113.9	71.5	-435.5	34.8	1000

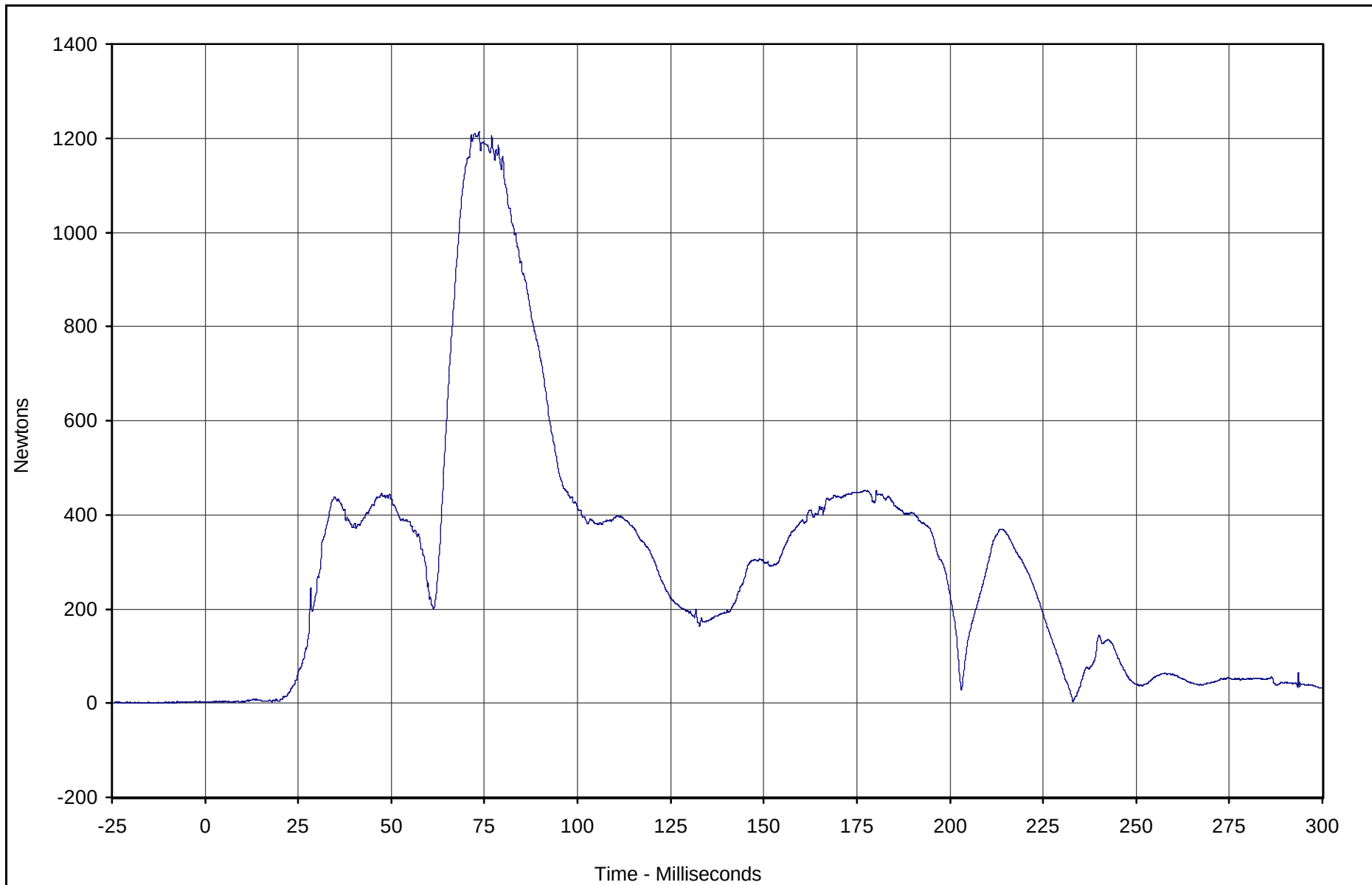


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force Res.	169	RES	Newtons	1212.9	73.6	2.2	8.1	1000

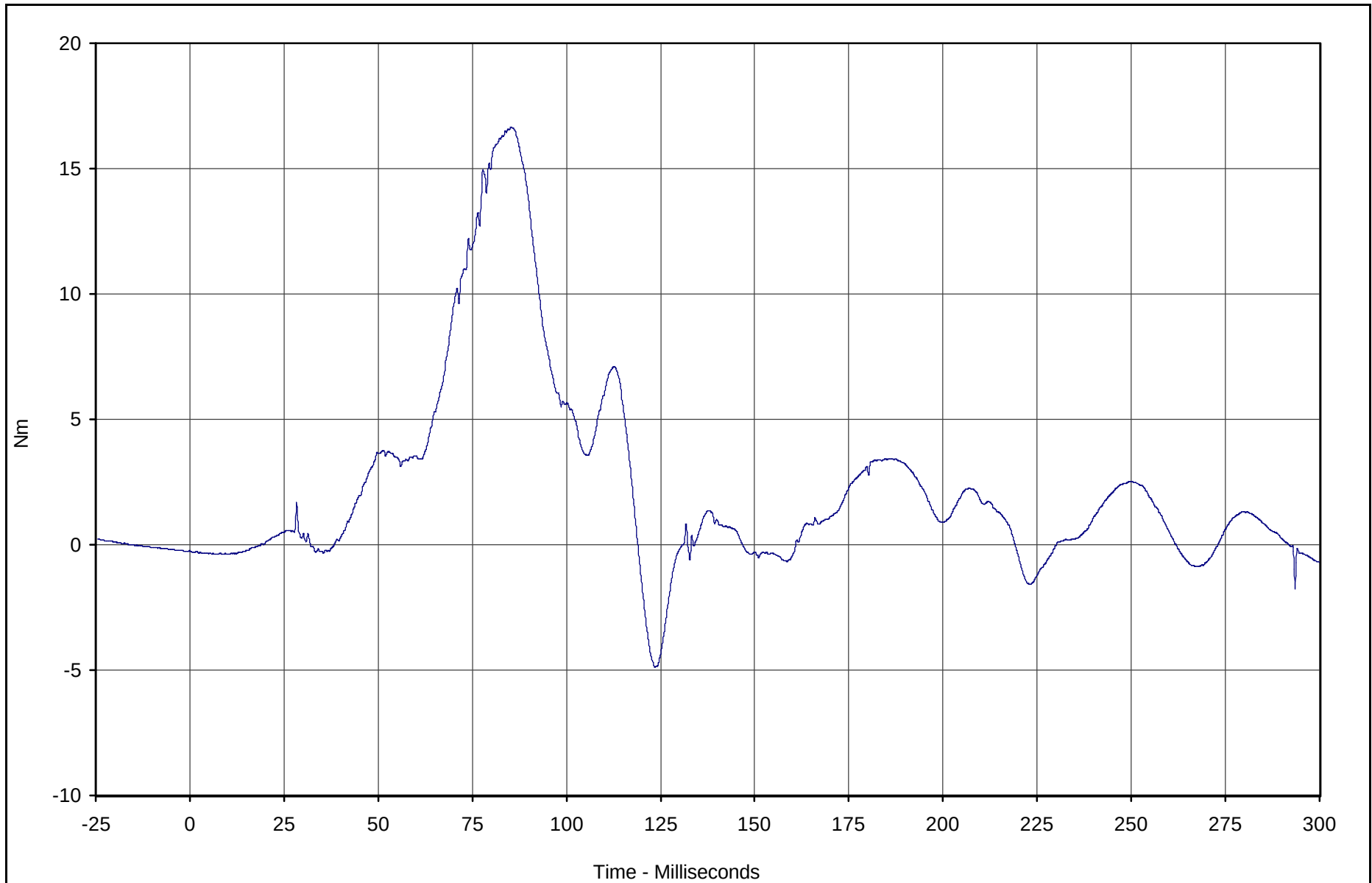


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Moment X	172	FIL	Nm	16.7	85.3	-4.9	123.6	600

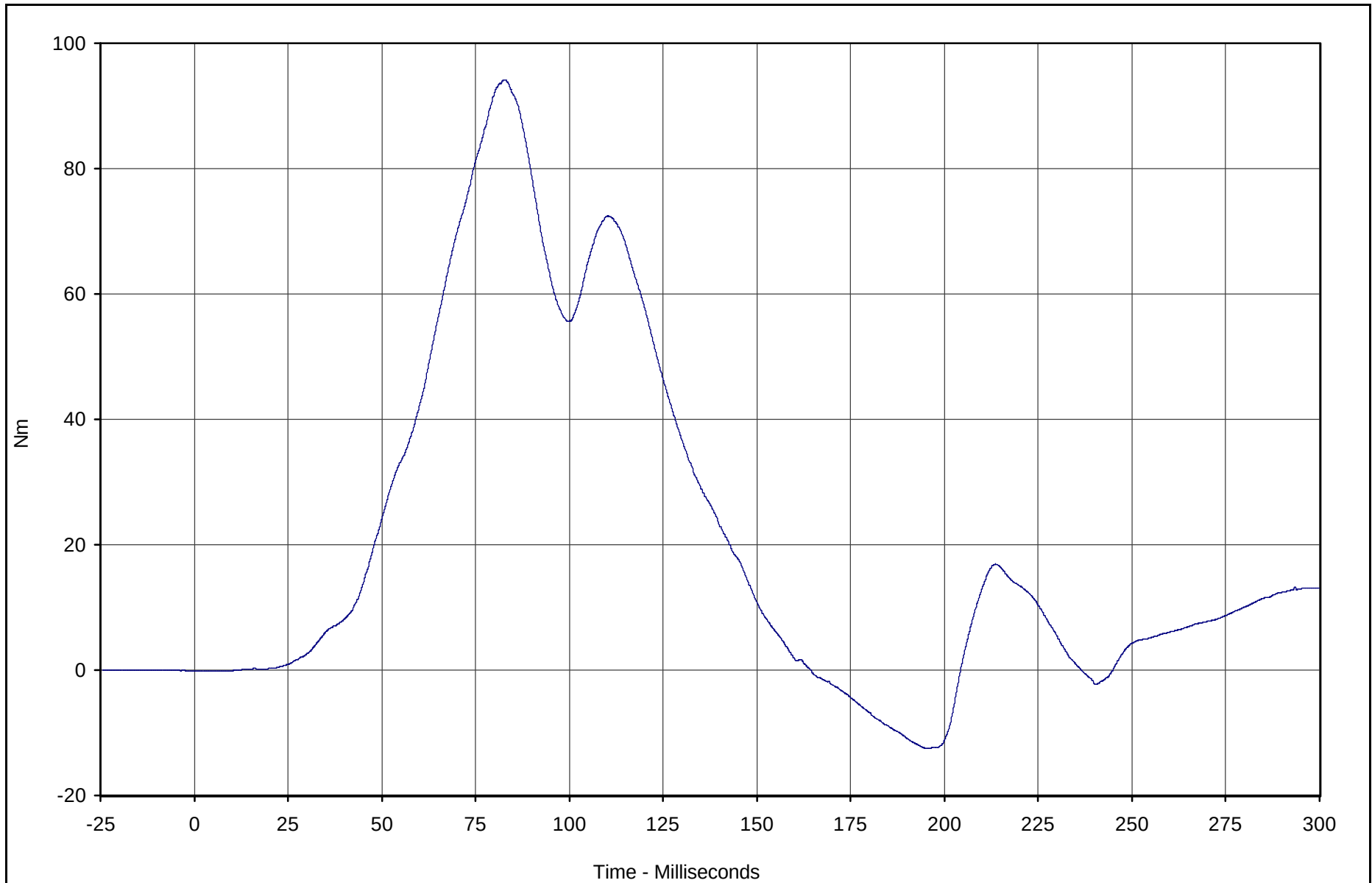


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Moment Y	173	FIL	Nm	94.2	83.0	-12.5	195.3	600

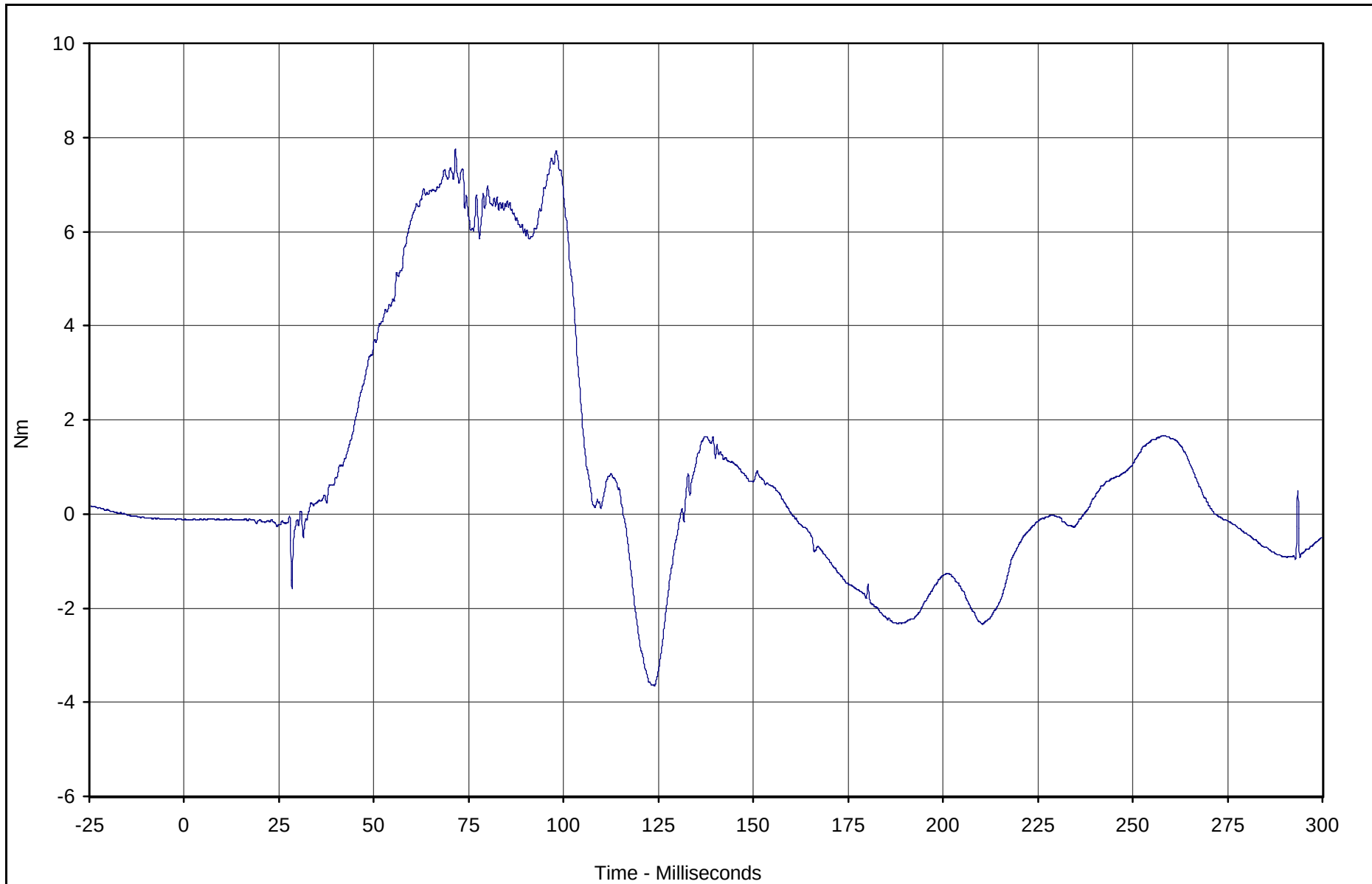


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Moment Z	174	FIL	Nm	7.8	71.5	-3.7	123.9	600

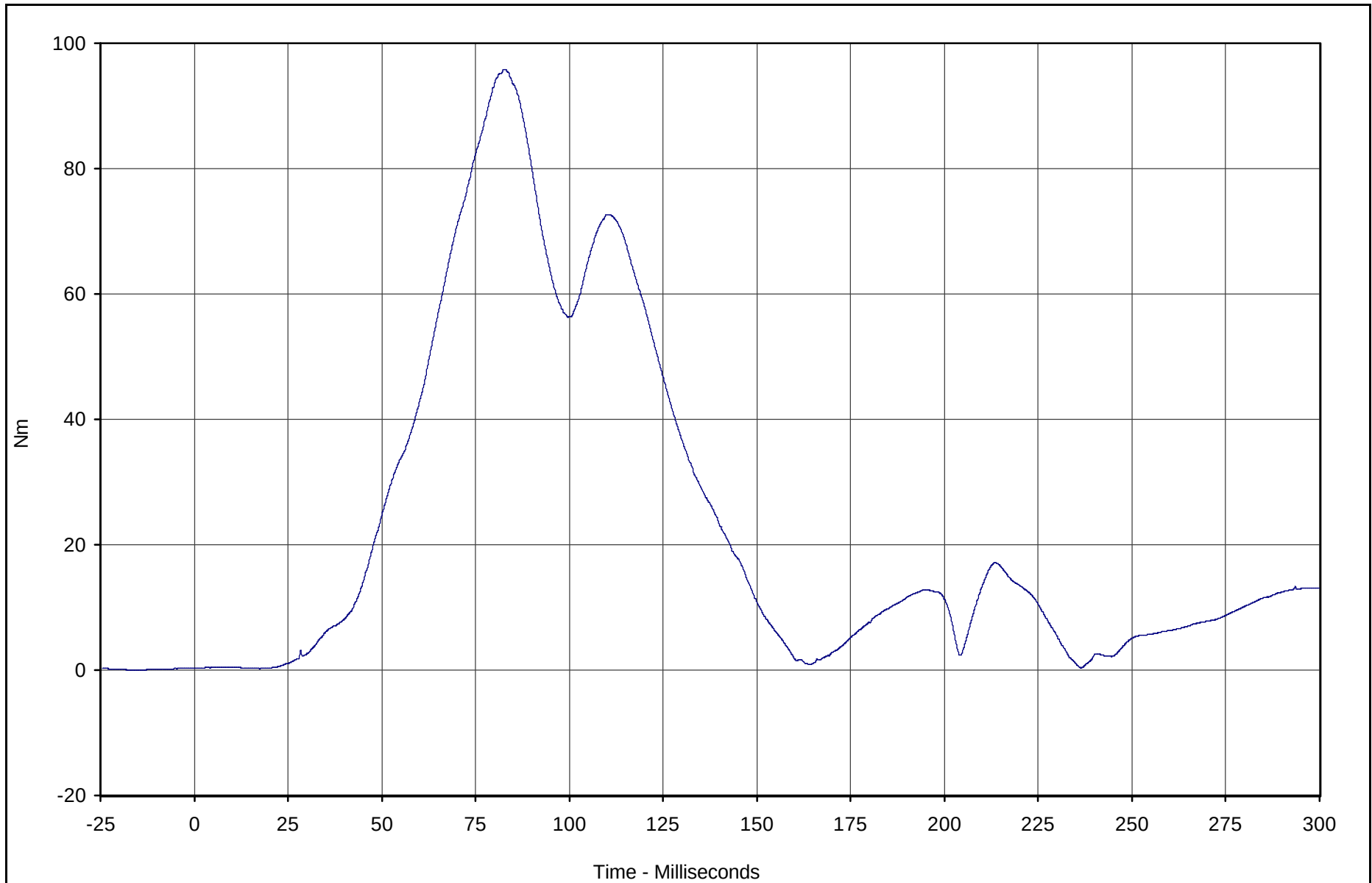


Test Vehicle: 2003 BMW X5 3.0i SUV

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Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Mom Res.	172	RES	Nm	95.8	83.0	0.2	17.5	600

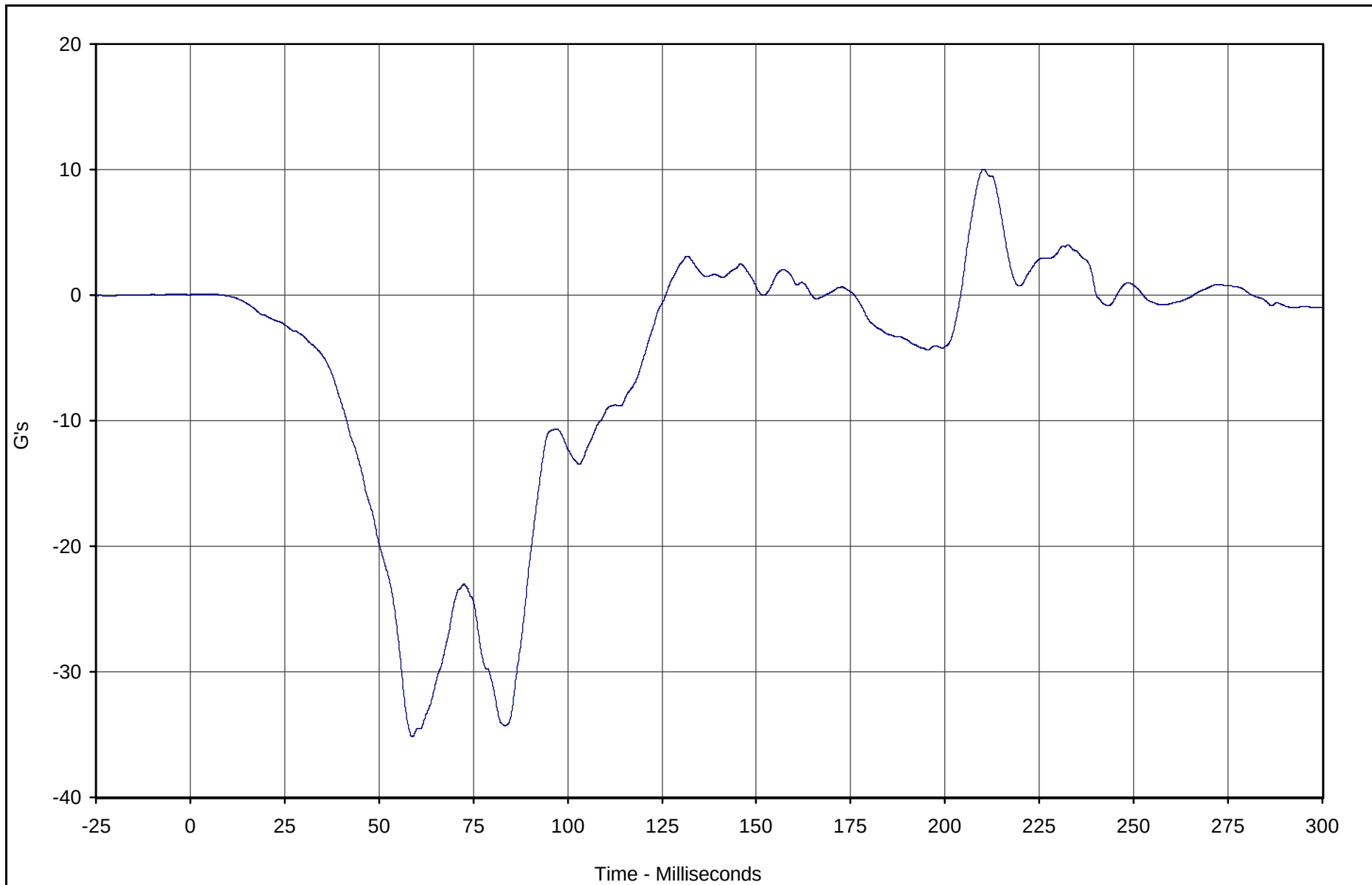


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Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest X	175	FIL	G's	10.0	210.2	-35.2	58.8	180

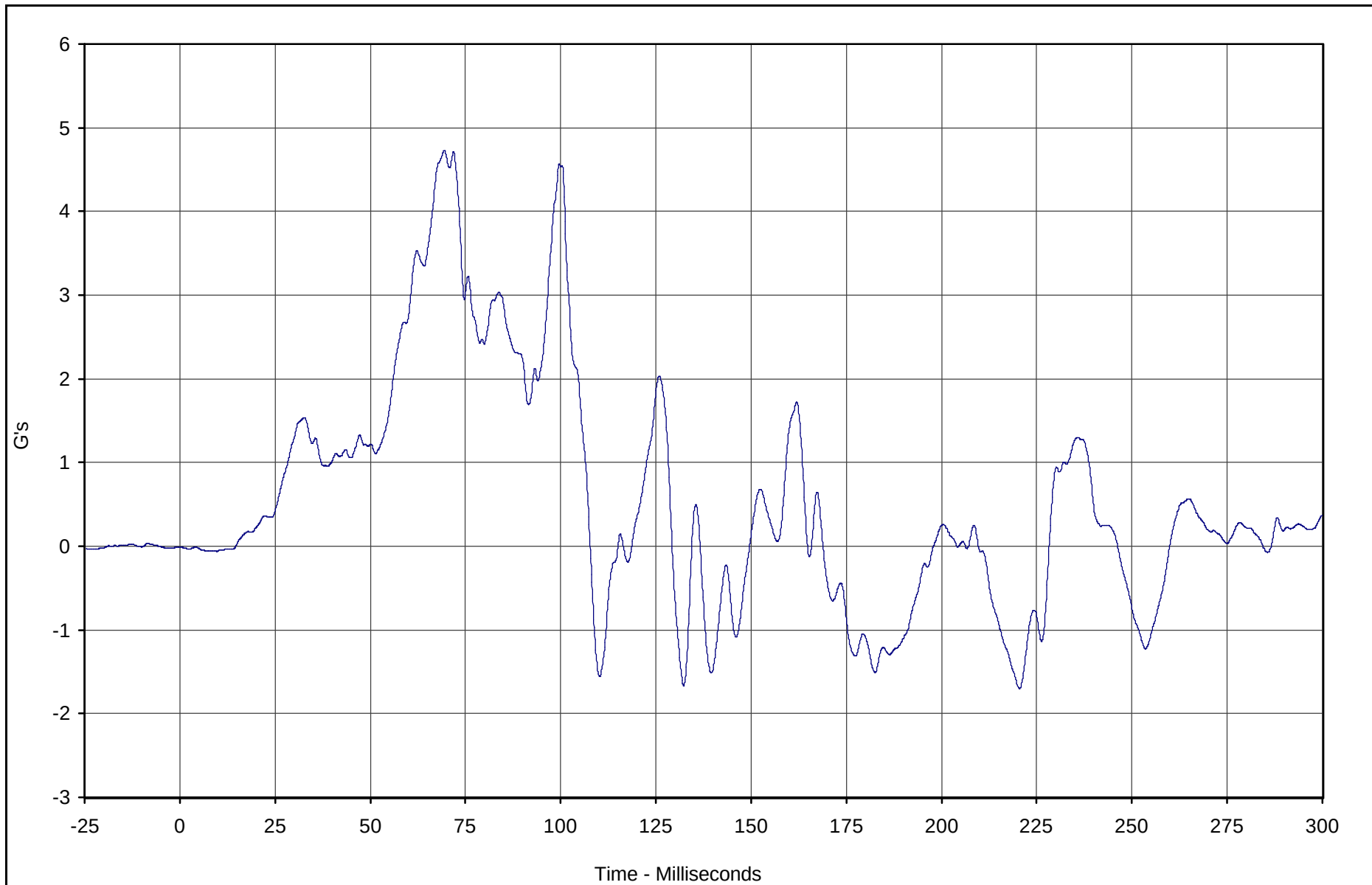


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Y	176	FIL	G's	4.7	69.4	-1.7	220.4	180

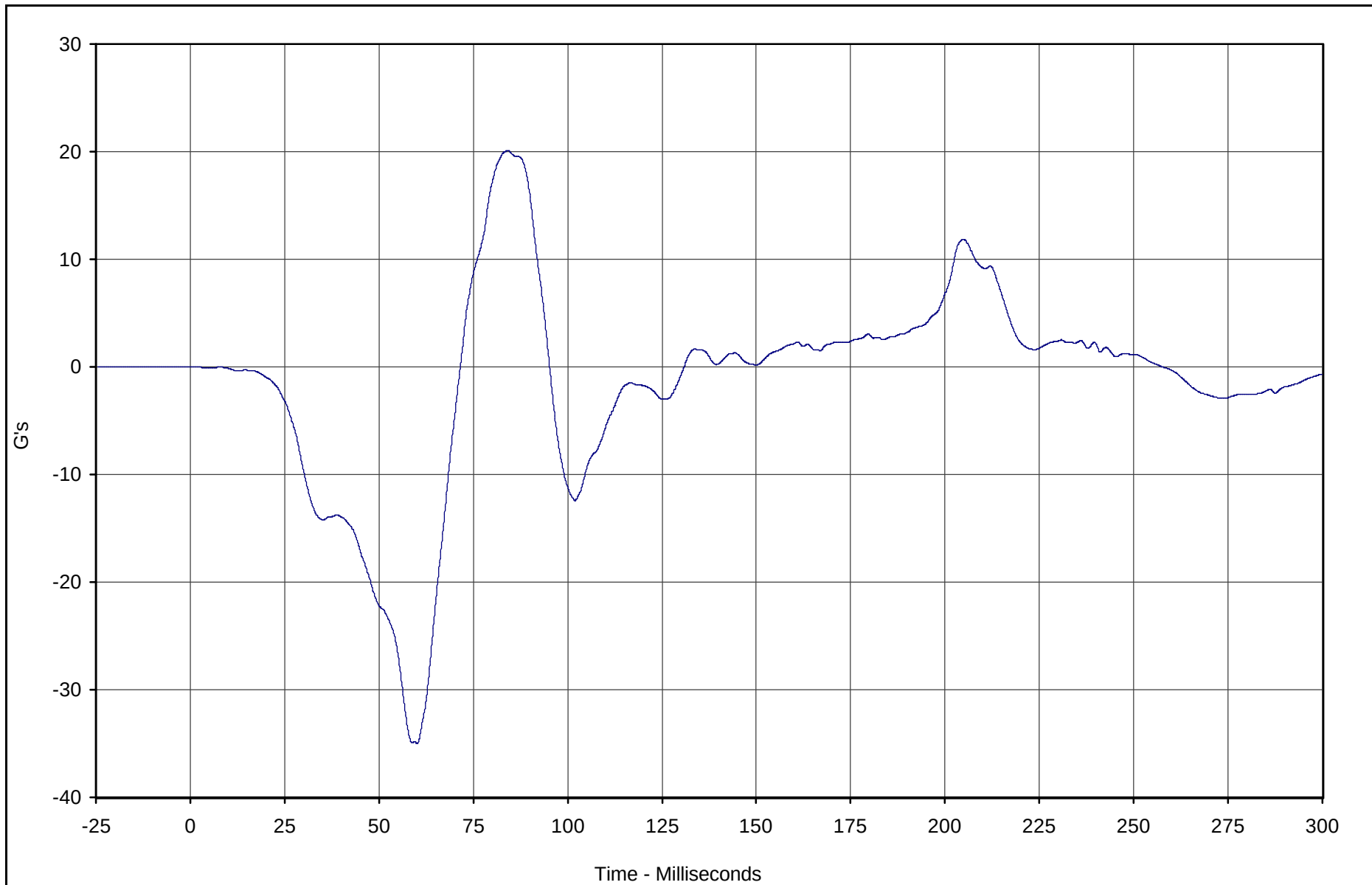


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Z	177	FIL	G's	20.1	84.0	-35.0	60.1	180

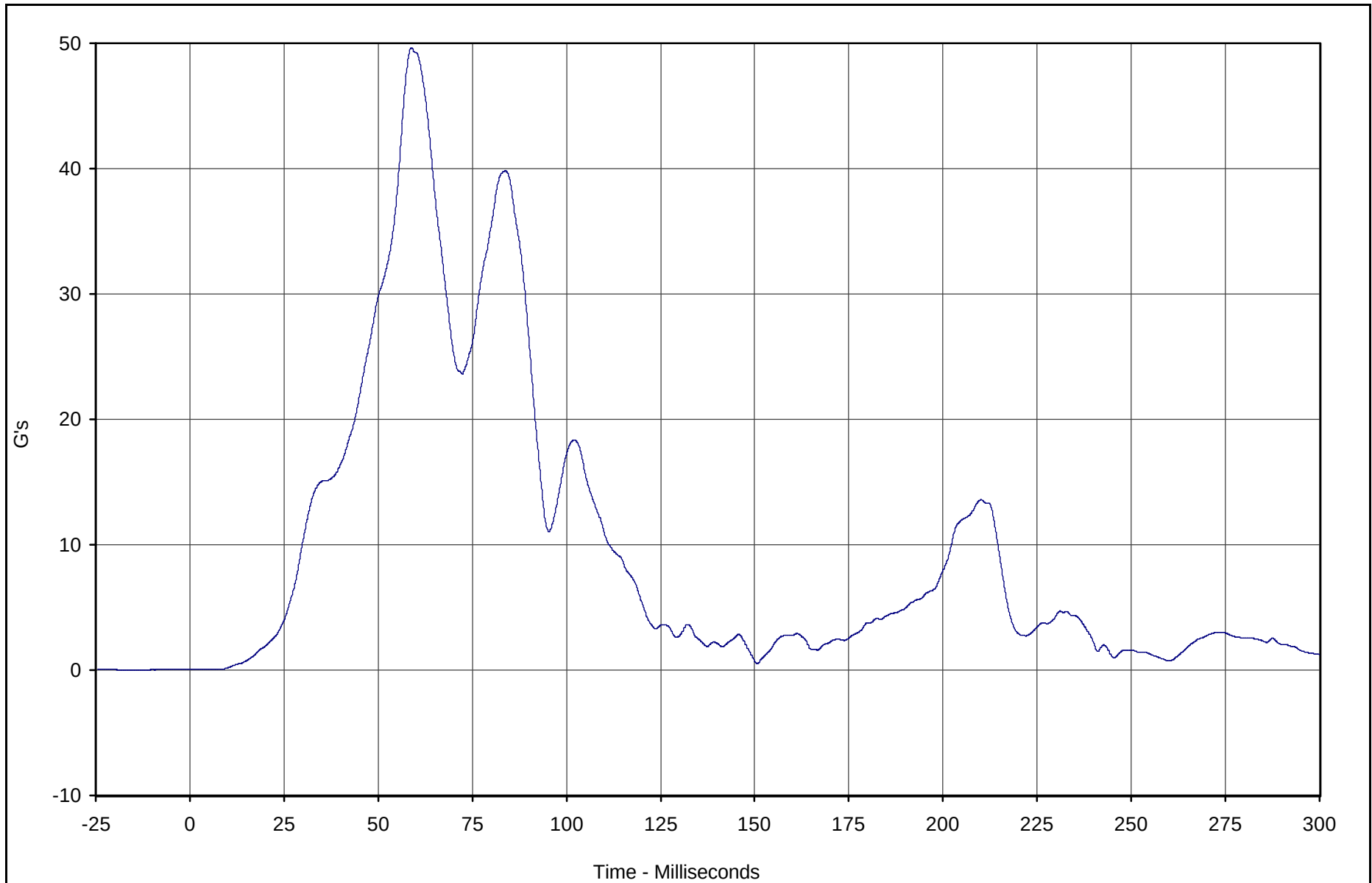


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Resultant	177	RES	G's	49.6	58.8	0.0	0.0	180

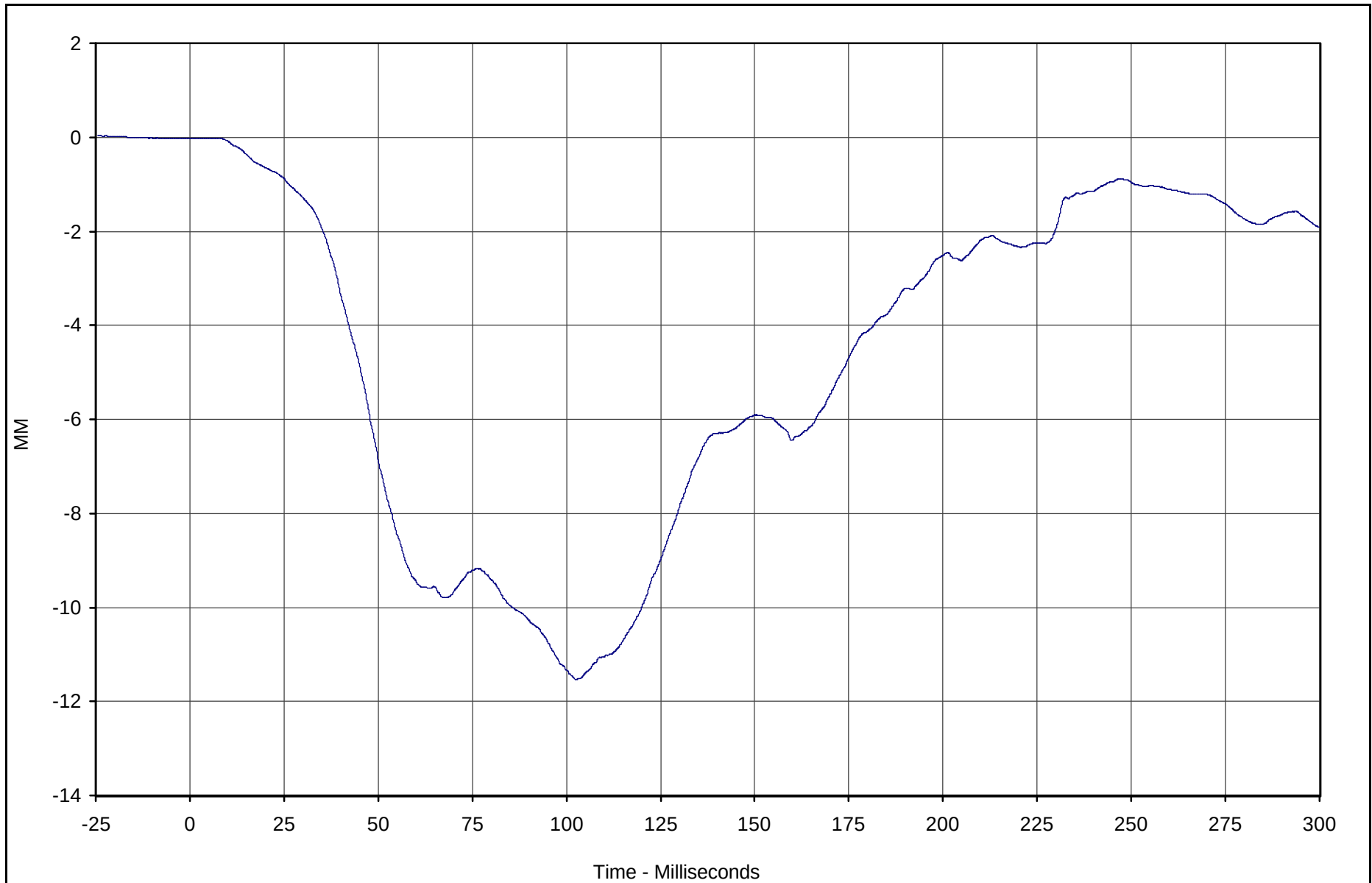


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Deflection	178	FIL	MM	0.0	4.2	-11.5	102.5	600

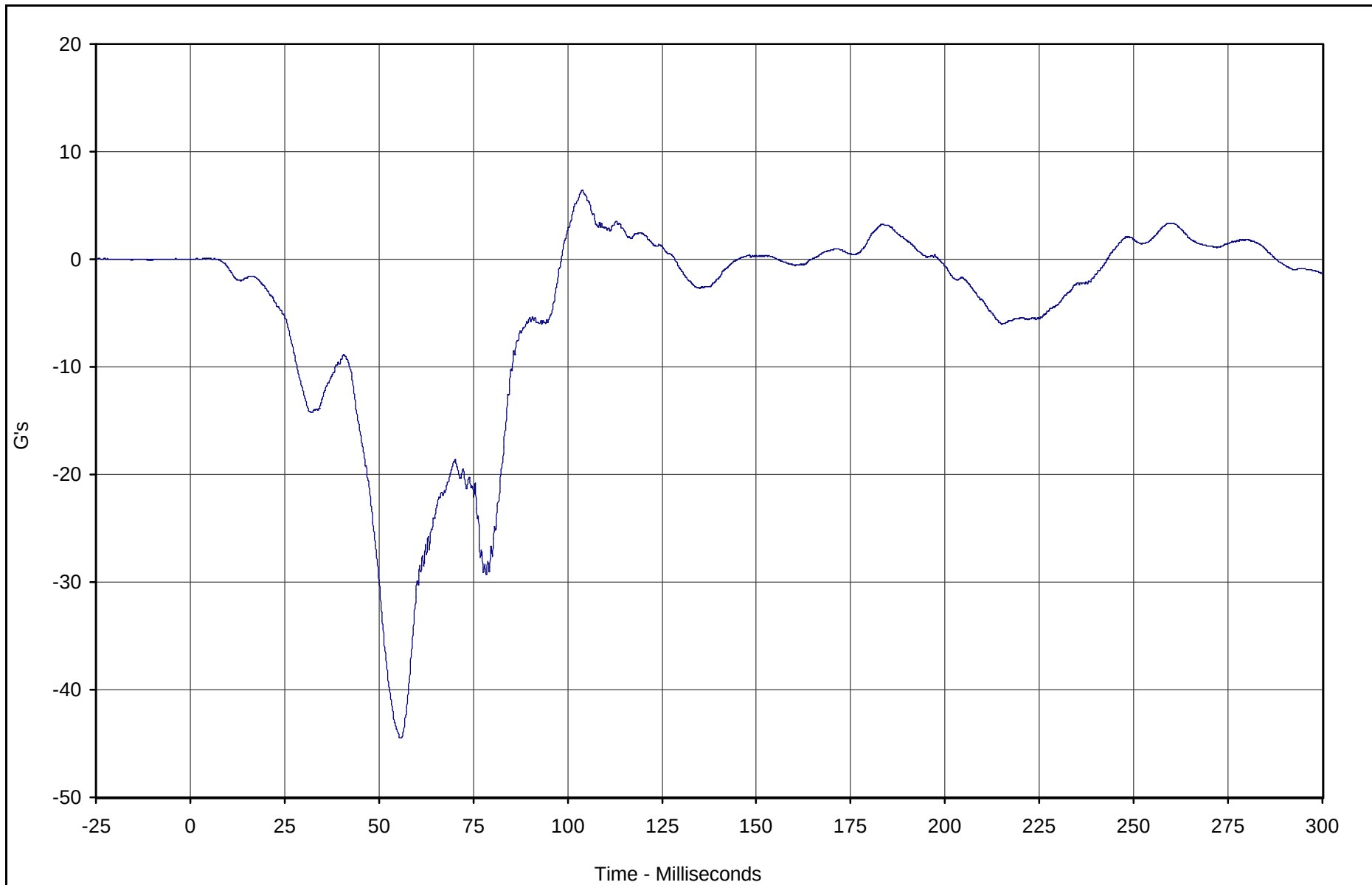


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis X	179	FIL	G's	6.4	103.9	-44.5	55.6	1000

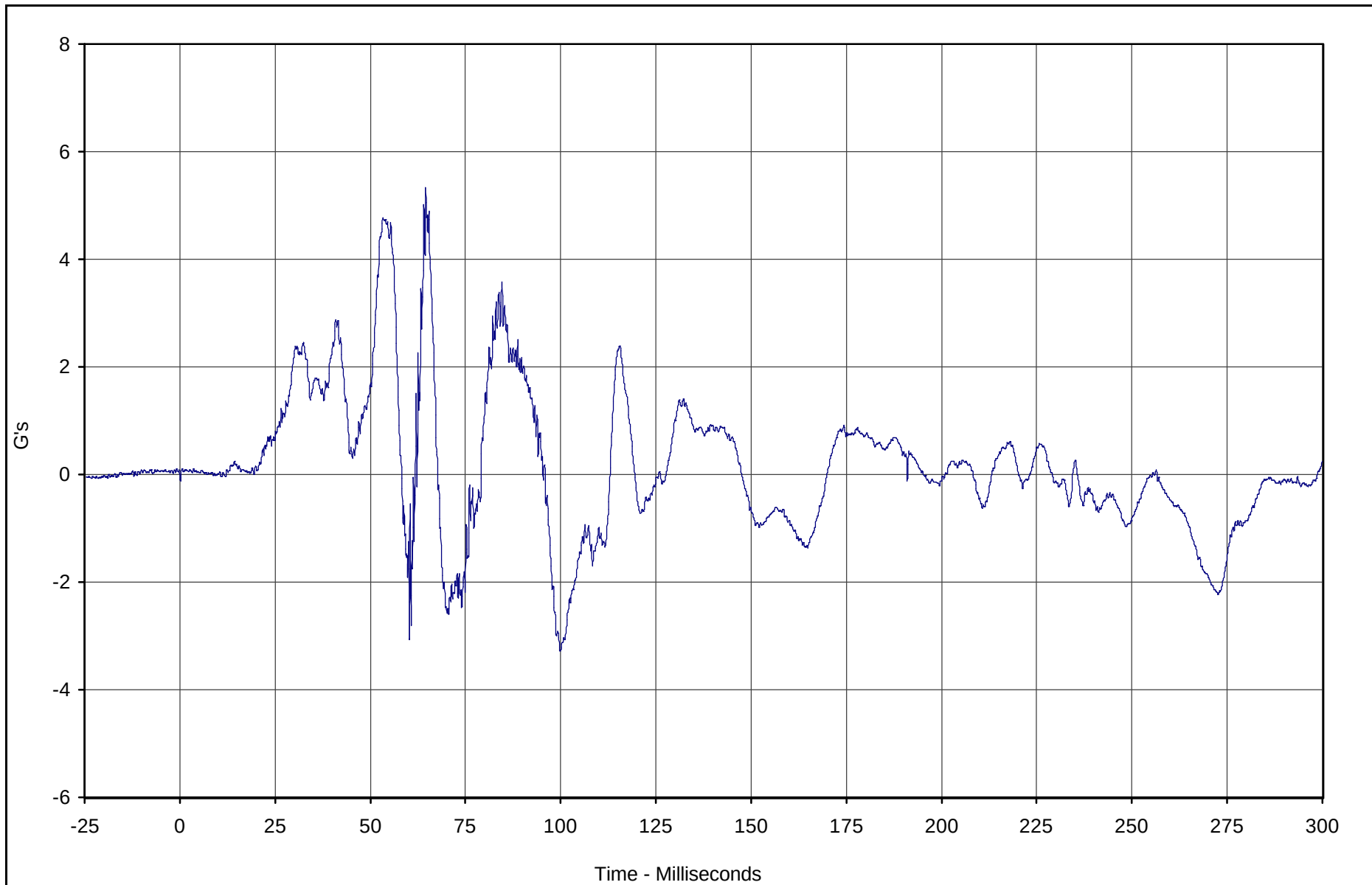


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis Y	180	FIL	G's	5.3	64.6	-3.3	99.9	1000

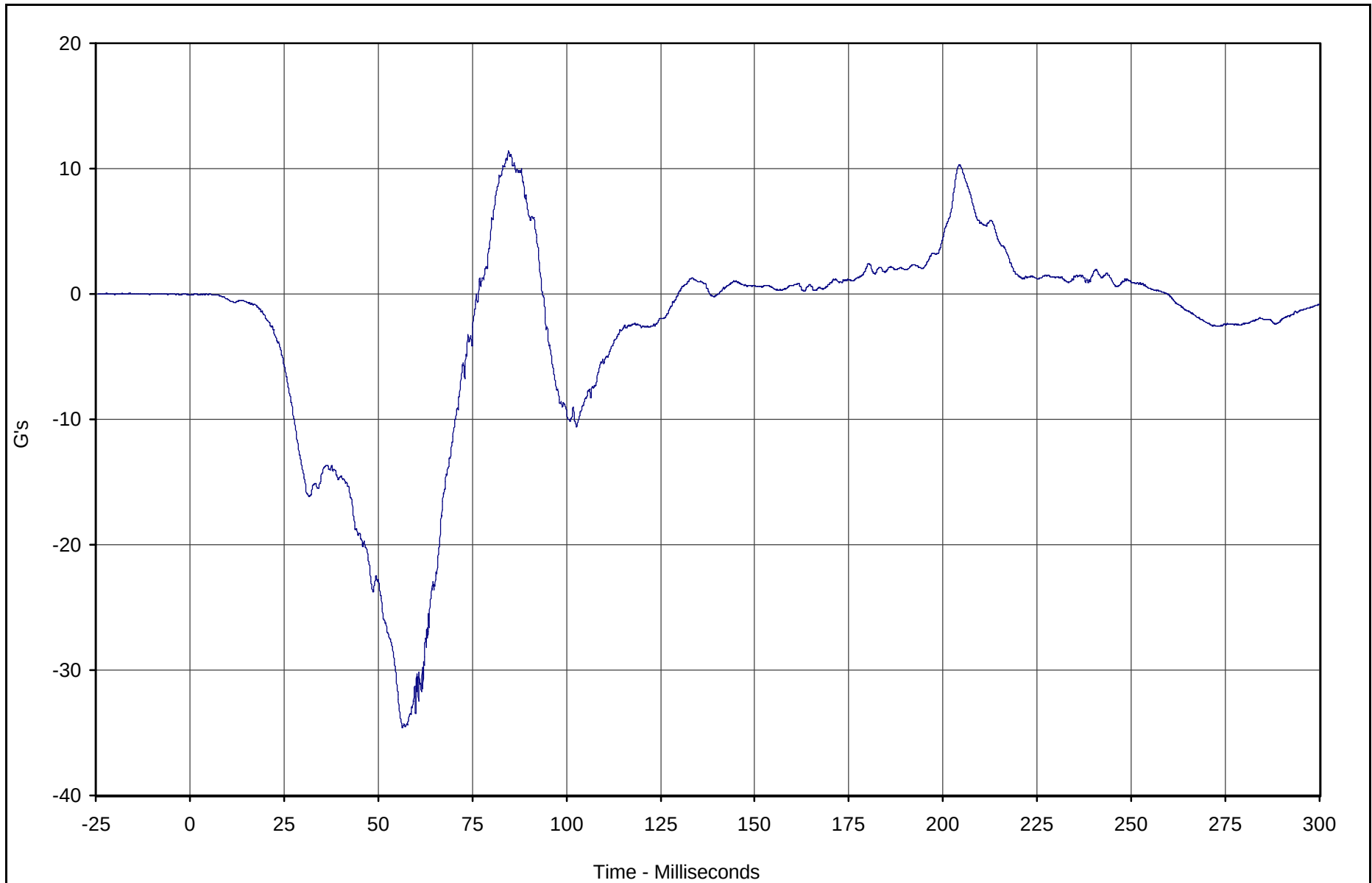


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis Z	181	FIL	G's	11.4	84.6	-34.6	56.5	1000

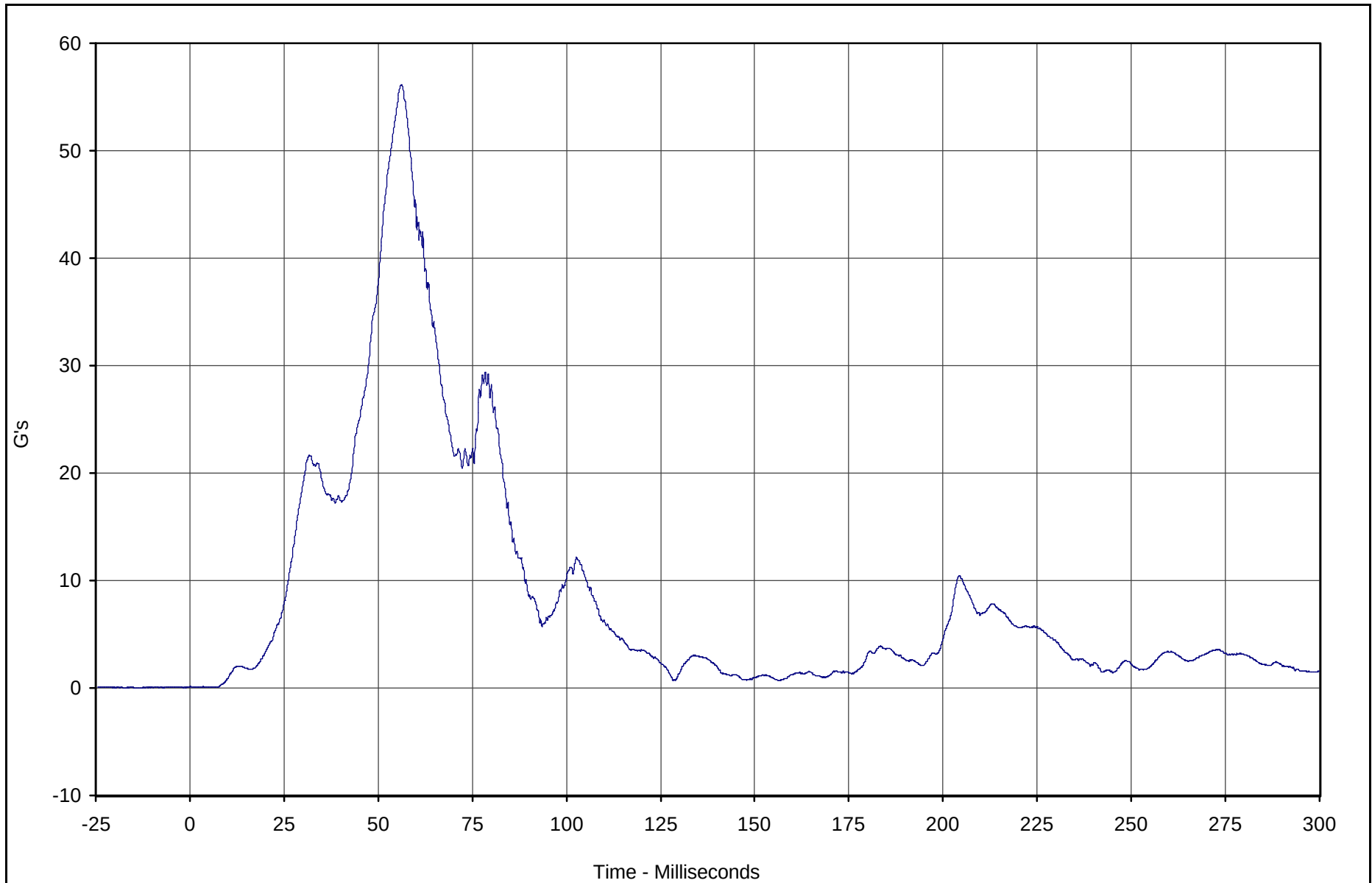


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis Resultant	179	RES	G's	56.1	56.3	0.1	0.0	1000

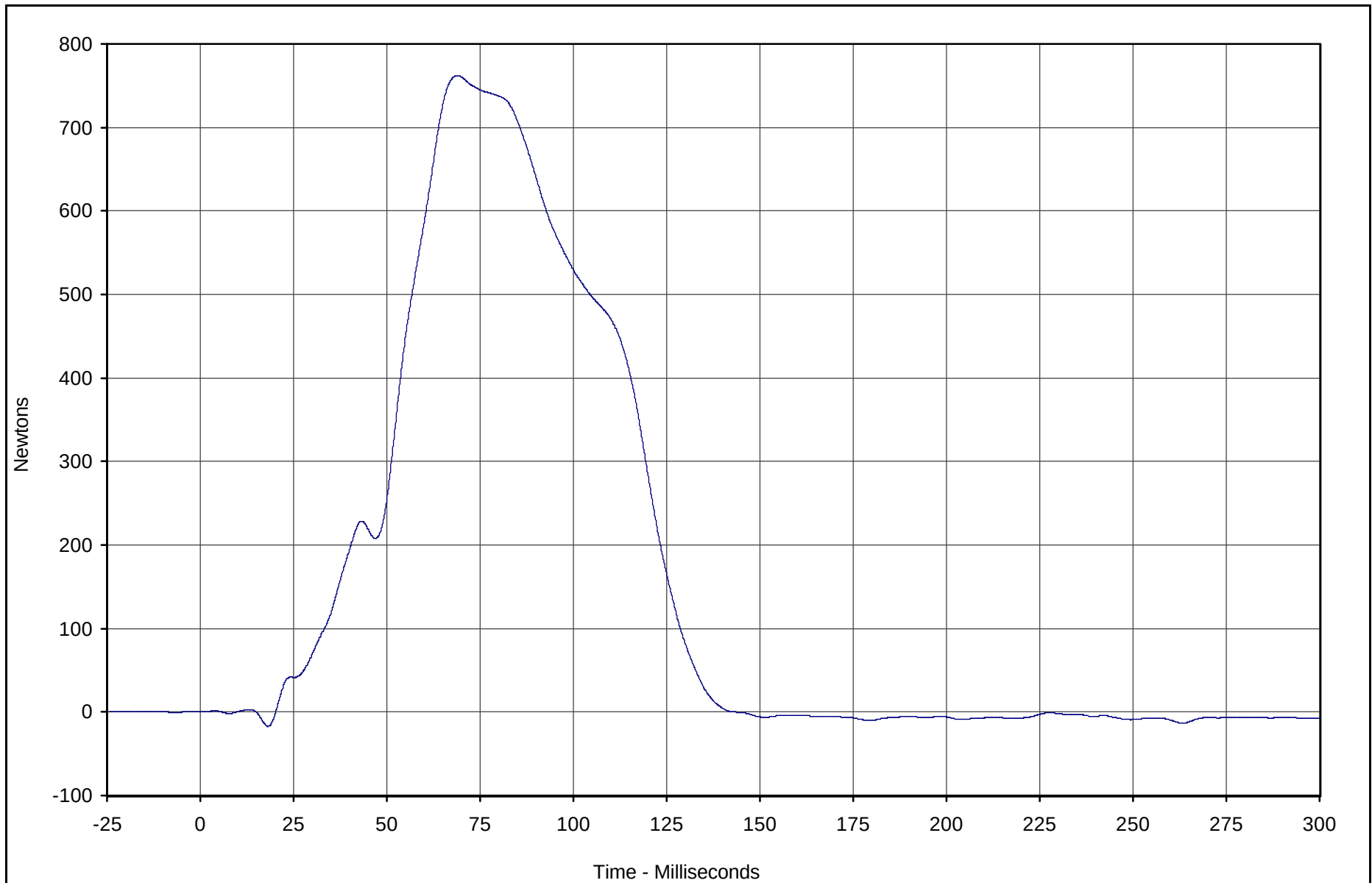


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Seat Tether Load	182	FIL	Newtons	762.0	68.9	-17.2	18.1	60

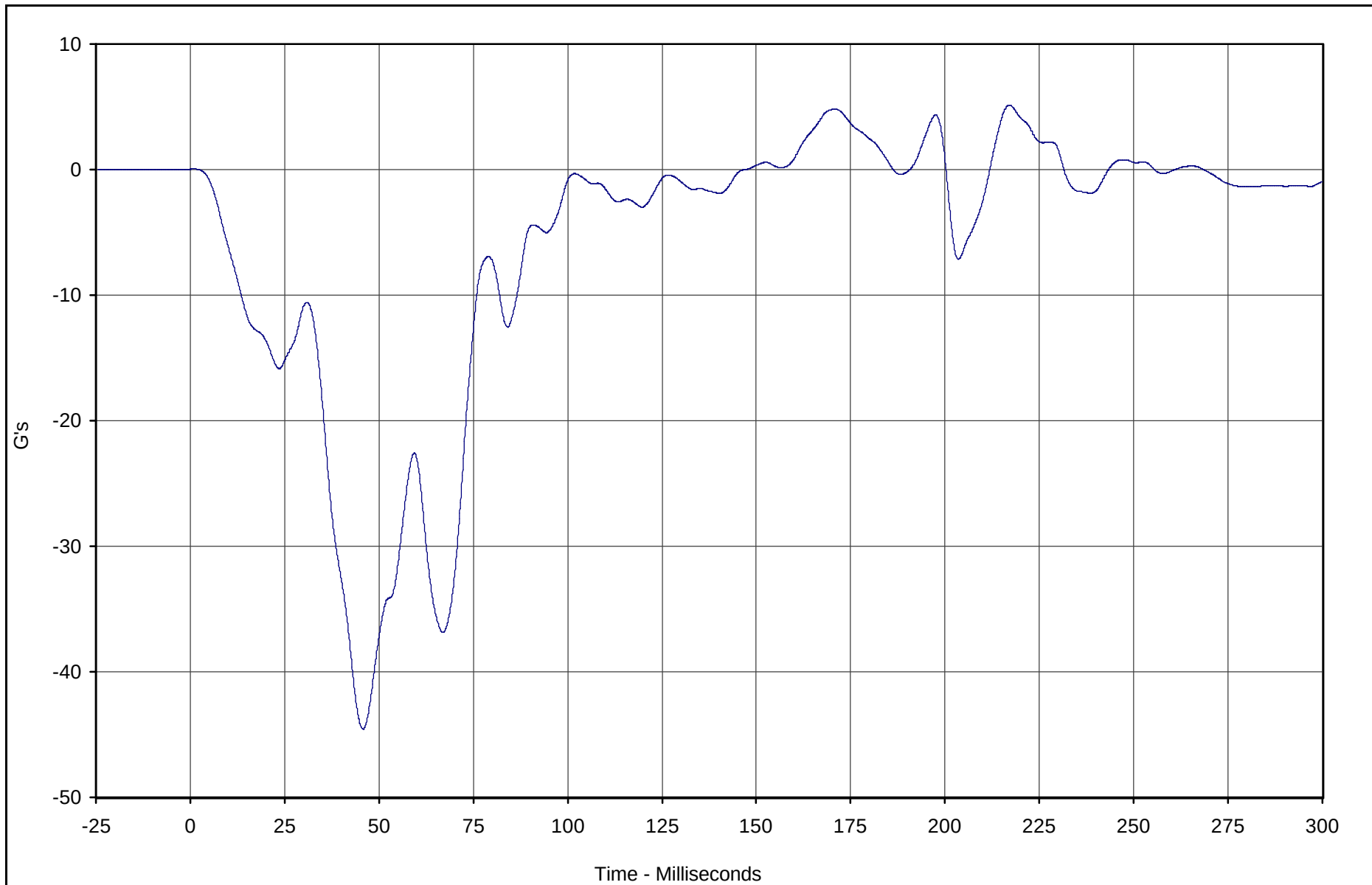


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat X	183	FIL	G's	5.1	217.1	-44.6	45.8	60

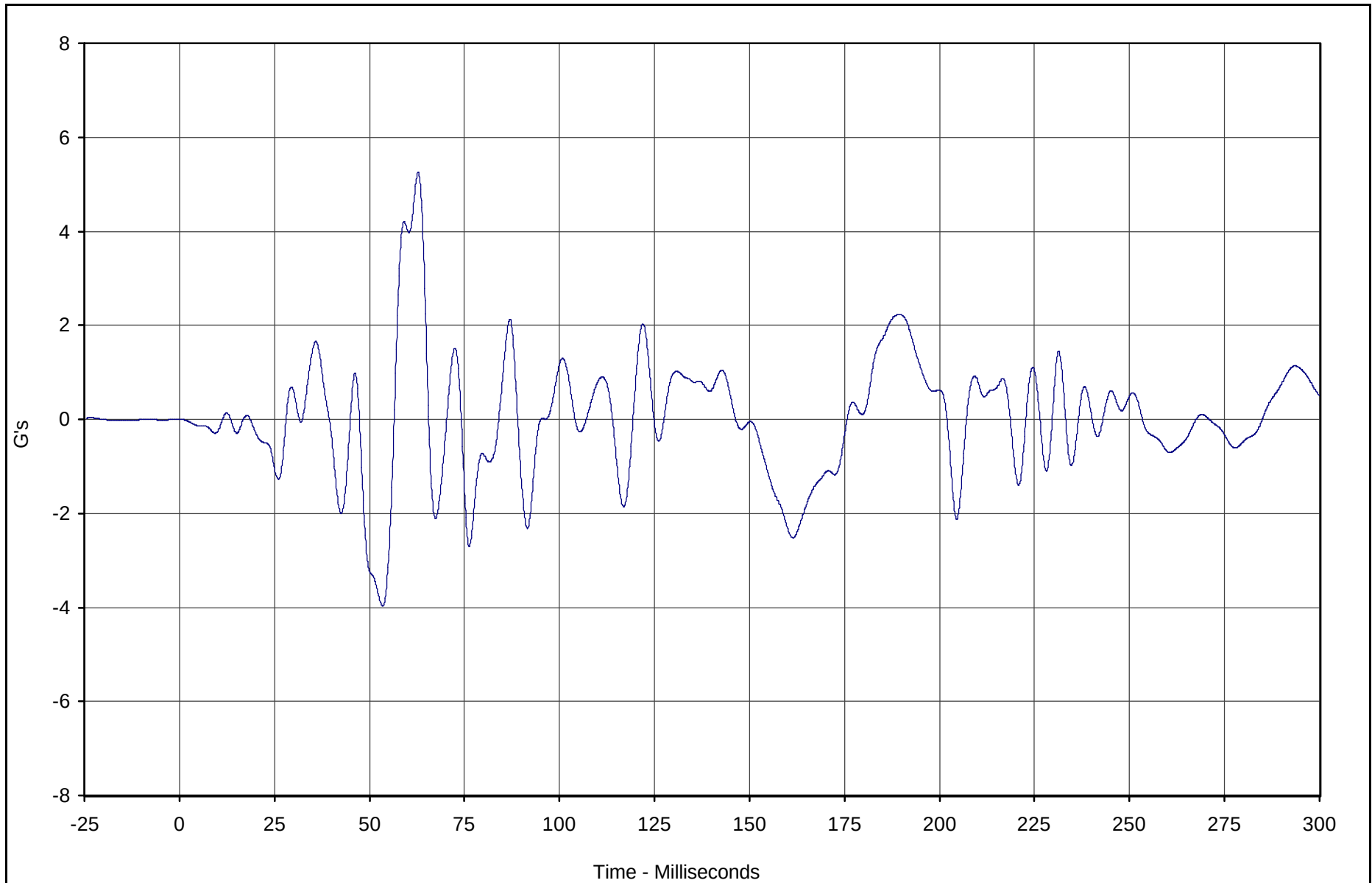


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Y	184	FIL	G's	5.3	62.8	-4.0	53.5	60

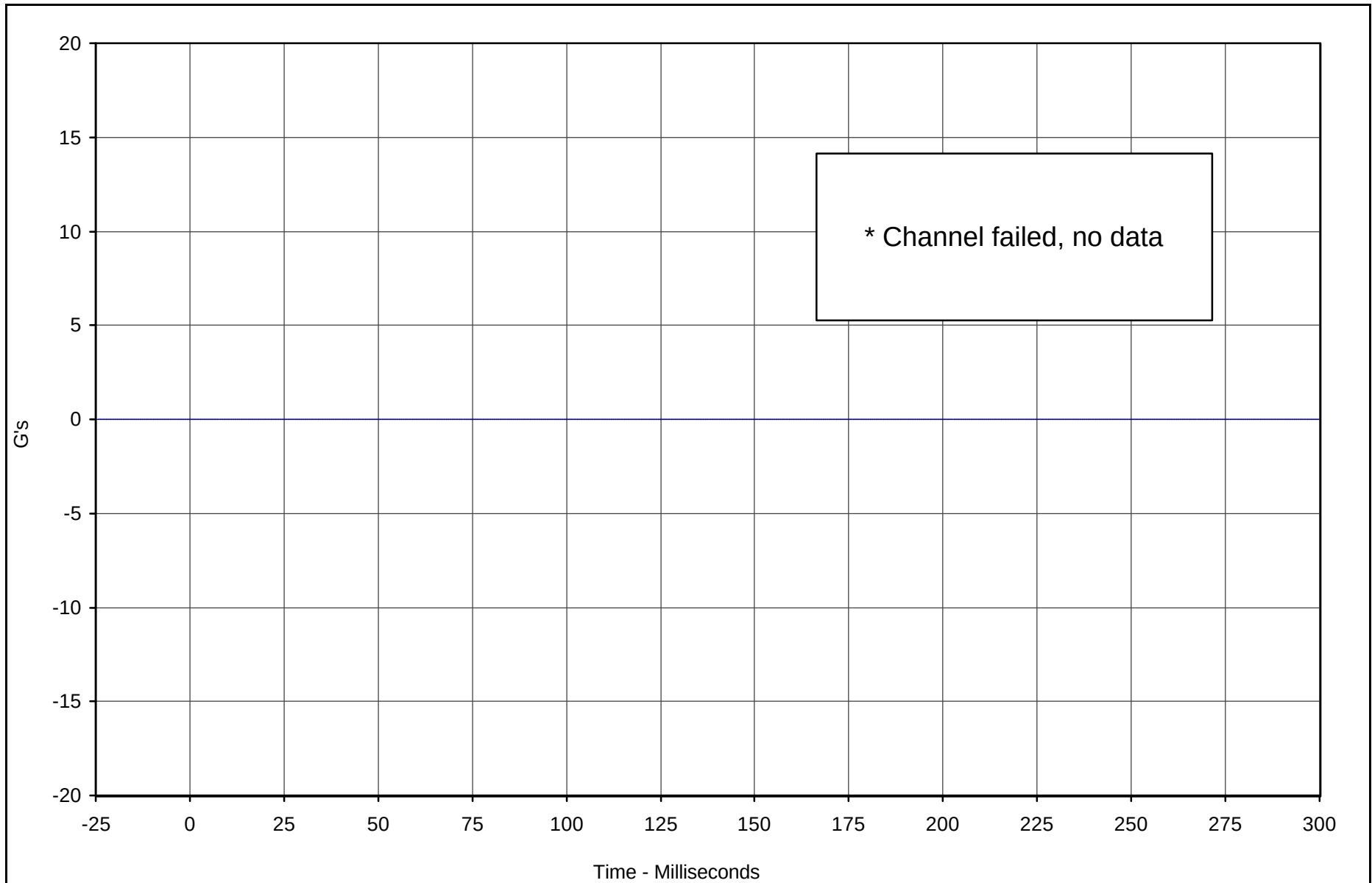


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



* Channel failed, no data

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Z	185	FIL	G's	0.0	0.0	0.0	0.0	60

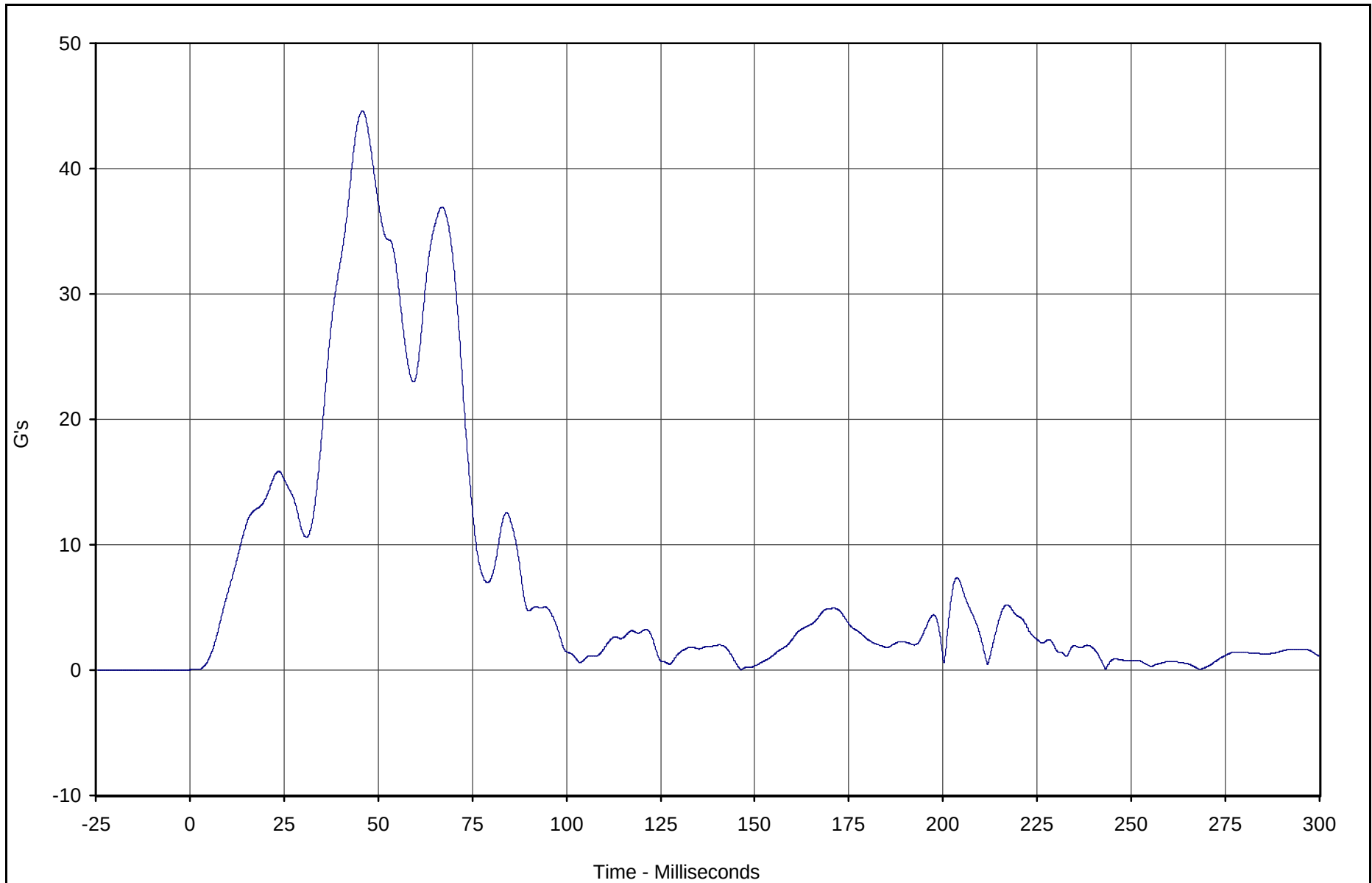


Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Resultant	183	RES	G's	44.6	45.8	0.0	146.4	60



Test Vehicle: 2003 BMW X5 3.0i SUV

Test Date: 3/18/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M30501

SECTION F-4

CHILD DUMMY INSTRUMENTATION INFORMATION

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Right Rear Child A.T.D. Serial Number 082
3/18/03
2003 BMW X5 3.0i SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
134	HEAD, PRIMARY	X	GPAC050	Accel.,1/2 bridge	Endevco	7264-2000	G
135	HEAD, PRIMARY	Y	GPAC051	Accel.,1/2 bridge	Endevco	7264-2000	G
136	HEAD, PRIMARY	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 , PRIMARY	X	2116-A11	Accel., Full Bridge	Entran	2000JF	G
150	CHEST , PRIMARY	Y	2116-A14	Accel., Full Bridge	Entran	2000JF	G
151	CHEST , PRIMARY	Z	2116-A23	Accel., Full Bridge	Entran	2000JF	G
152	CHEST DISPLACEMENT	X	082CP	Rotary Pot Chest	Servo	14CBI	MM
153	PELVIS, PRIMARY	X	2116-A12	Accel., Full Bridge	Entran	2000JF	G
154	PELVIS, PRIMARY	Y	2116-A19	Accel., Full Bridge	Entran	2000JF	G
155	PELVIS, PRIMARY	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G
156	CAR SEAT TETHER	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

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Left Rear Child A.T.D. Serial Number 139
3/18/03
2003 BMW X5 3.0i SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
160	HEAD, PRIMARY	X	GPAC047	Accel.,1/2 bridge	Endevco	7264-2000	G
161	HEAD, PRIMARY	Y	GPAC048	Accel.,1/2 bridge	Endevco	7264-2000	G
162	HEAD, PRIMARY	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 , PRIMARY	X	2116-A01	Accel., Full Bridge	Entran	2000JF	G
176	CHEST , PRIMARY	Y	2116-A06	Accel., Full Bridge	Entran	2000JF	G
177	CHEST , PRIMARY	Z	2116-A07	Accel., Full Bridge	Entran	2000JF	G
178	CHEST DISPLACEMENT	X	139CP	Rotary Pot Chest	Servo	14CBI	MM
179	PELVIS, PRIMARY	X	2116-N07	Accel., Full Bridge	Entran	2000JF	G
180	PELVIS, PRIMARY	Y	2116-A03	Accel., Full Bridge	Entran	2000JF	G
181	PELVIS, PRIMARY	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G
182	CAR SEAT TETHER	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



Calibration Data Sheet Hybrid III 3 Year Old Head Drop Test

ATD Serial No.: 082

Test I.D.: HD03C

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	269.1	Pass
Peak Lateral Acceleration	G's	≤15.0	10.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	3.6	Pass
Overall Test Results				Pass

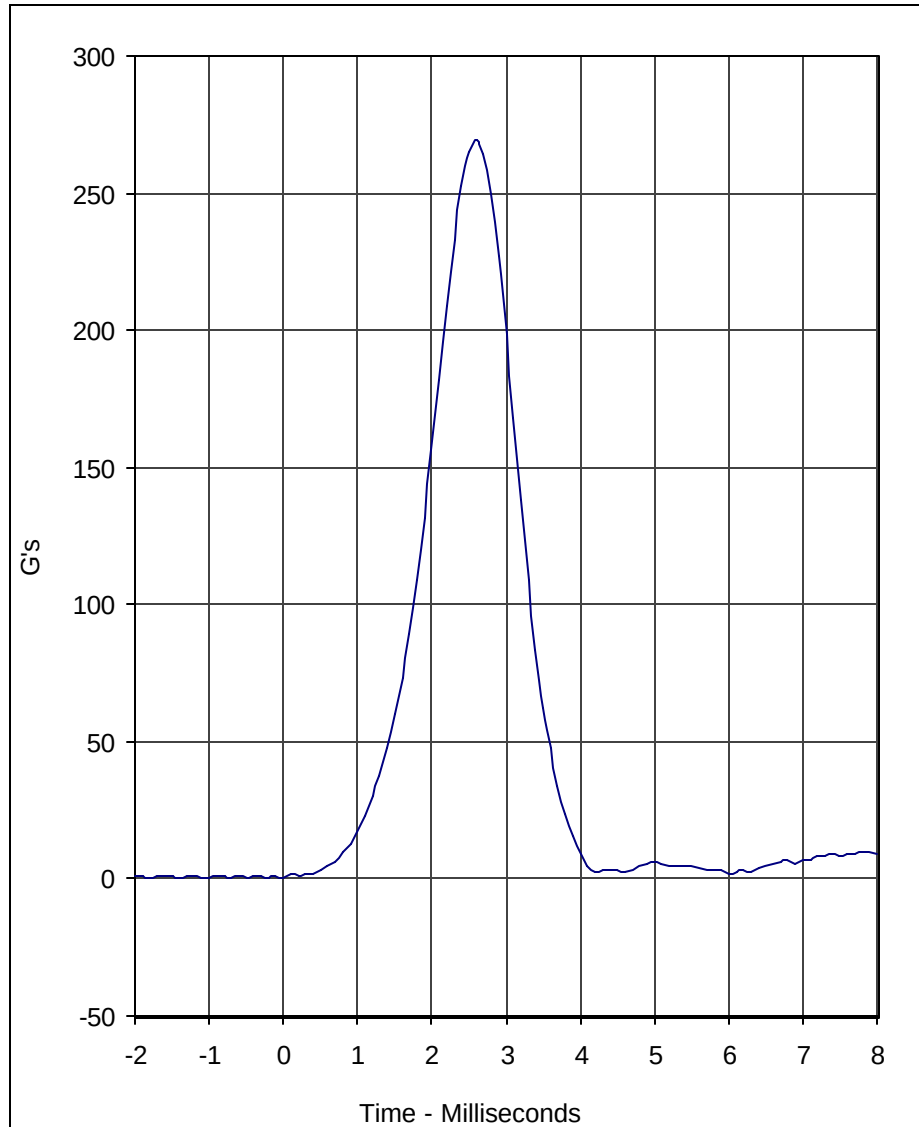
F5-1

TR-P23001-17-NC

Laboratory Technician

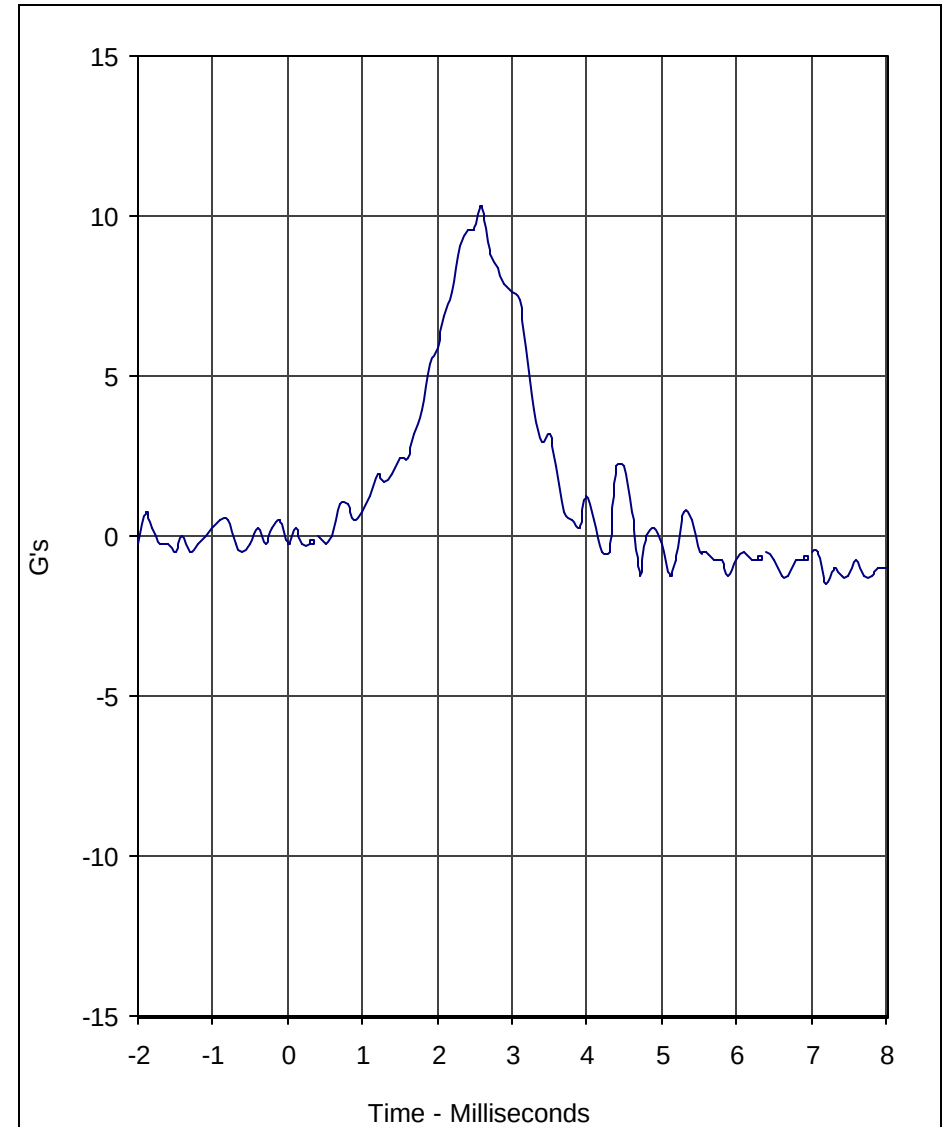
March 12, 2003

Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES
Units	Max	Time	Min	Time	SAE Class
G's	269.1	2.6	0.2	-1.8	1000

Test Program: Hybrid III 3 Year Old Head Drop Test
 Test Date: 3/12/03



Curve Description				CURNO	Type
Head Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	10.3	2.6	-1.2	4.7	1000

A.T.D. Serial No.: 082
 Test I.D.: HD03C





Calibration Data Sheet

Hybrid III 3 Year Old

Thorax Impact Test

ATD Serial No.: 082

Test I.D.: CH03G

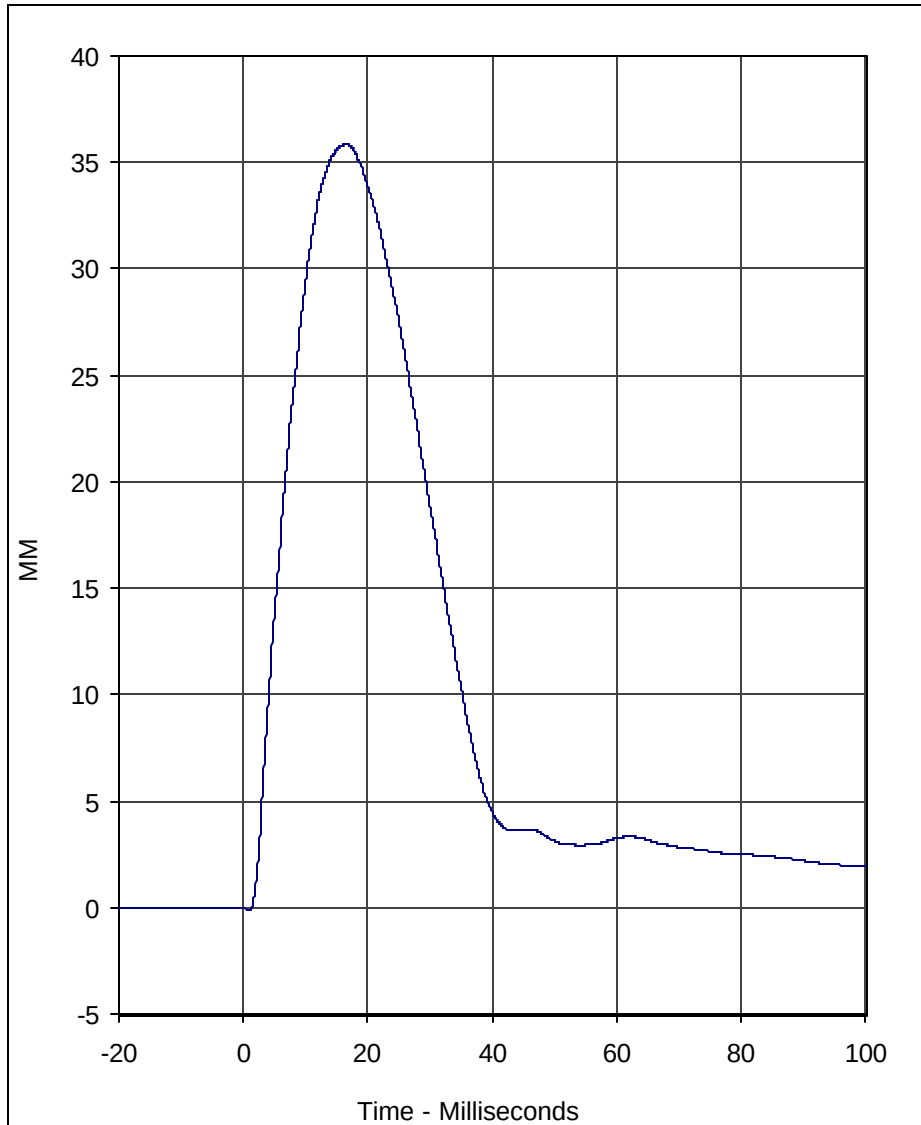
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	6.10	Pass
Peak Chest Compression	MM	32 to 38	35.8	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	804.0	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	788.8	Pass
Internal Hysteresis	%	65 to 85	70.1	Pass
Overall Test Results				Pass

F5-3

TR-P23001-17-NC

Laboratory Technician

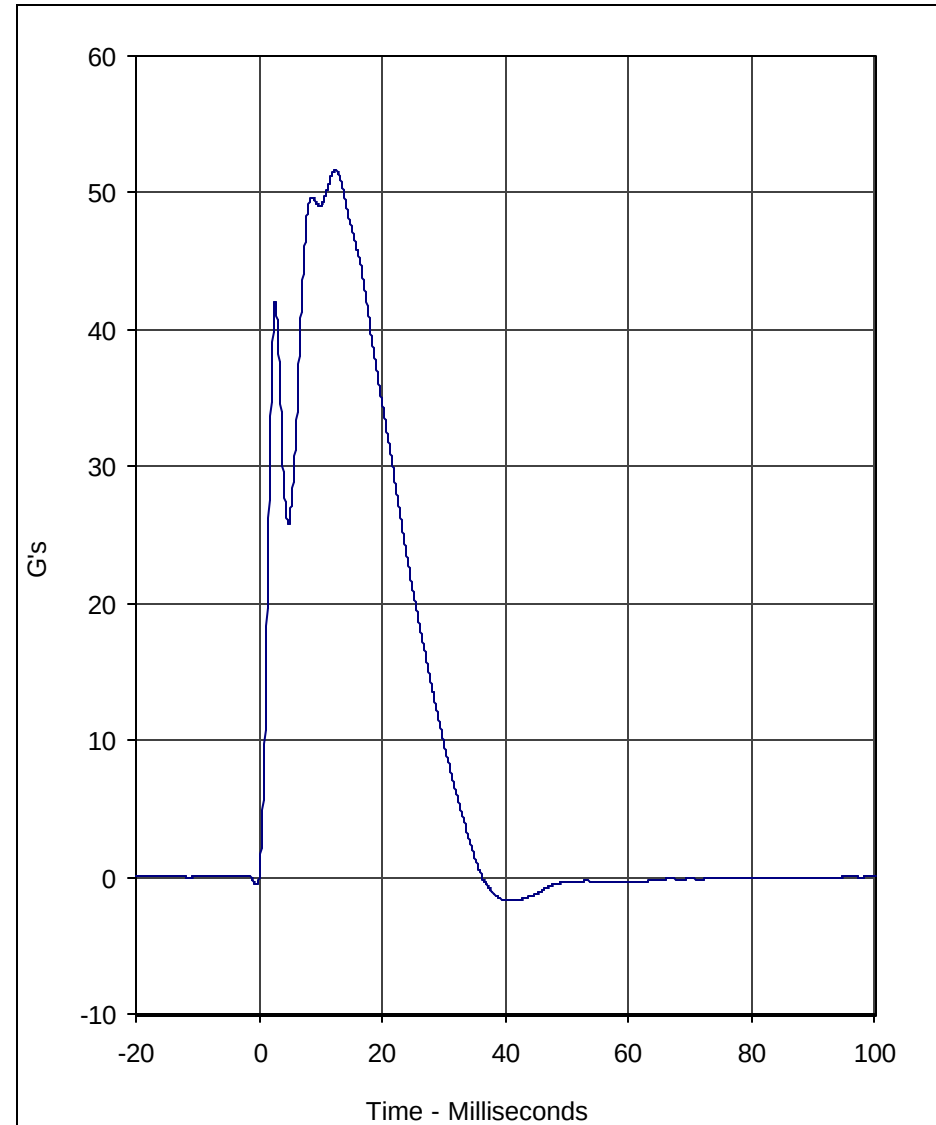
March 12, 2003
Test Date



Curve Description				CURNO	Type
Chest Compression				001	FIL
Units	Max	Time	Min	Time	SAE Class
MM	35.8	16.5	-0.1	0.8	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 3/12/03

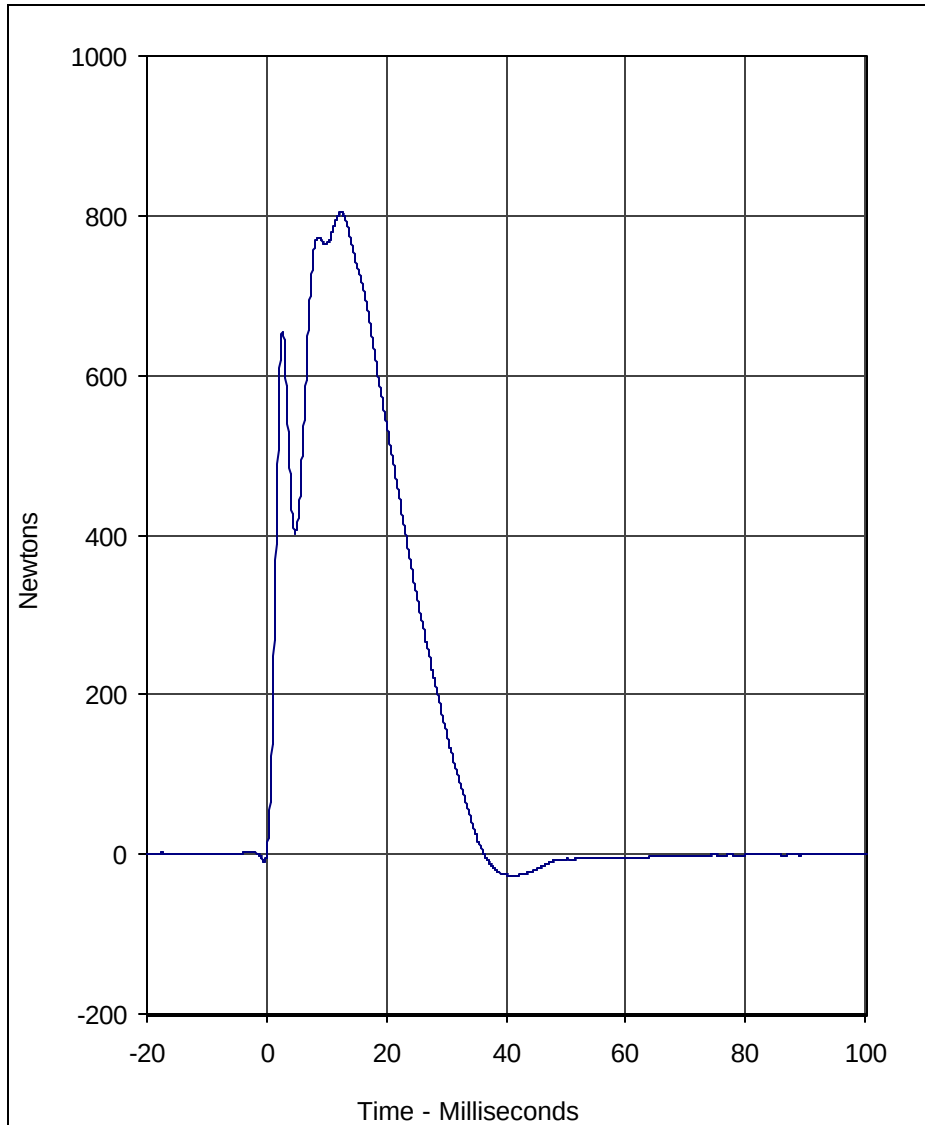


Curve Description				CURNO	Type
Probe Acceleration				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	51.6	12.5	-1.7	41.8	180

A.T.D. Serial No.: 082

Test I.D.: CH03G

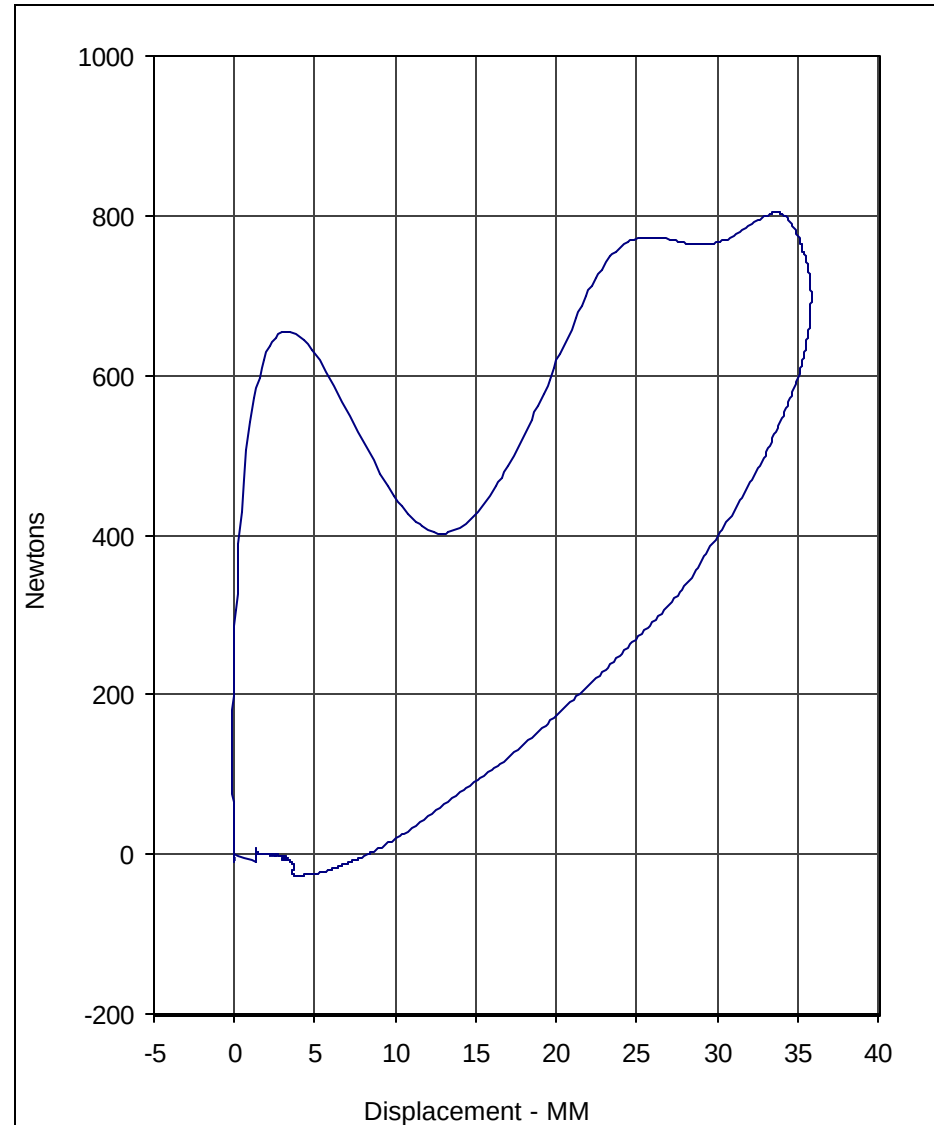




Curve Description				CURNO	Type
Probe Force				003	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	804.0	12.5	-26.3	41.8	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 3/12/03



Curve Description			CURNO	Type
Probe Force vs. Chest Displacement			004	FIL
Units	Hysteresis	SAE Class		
%	70.3	180		

A.T.D. Serial No.: 082

Test I.D.: CH03G





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

ATD Serial No.: 082

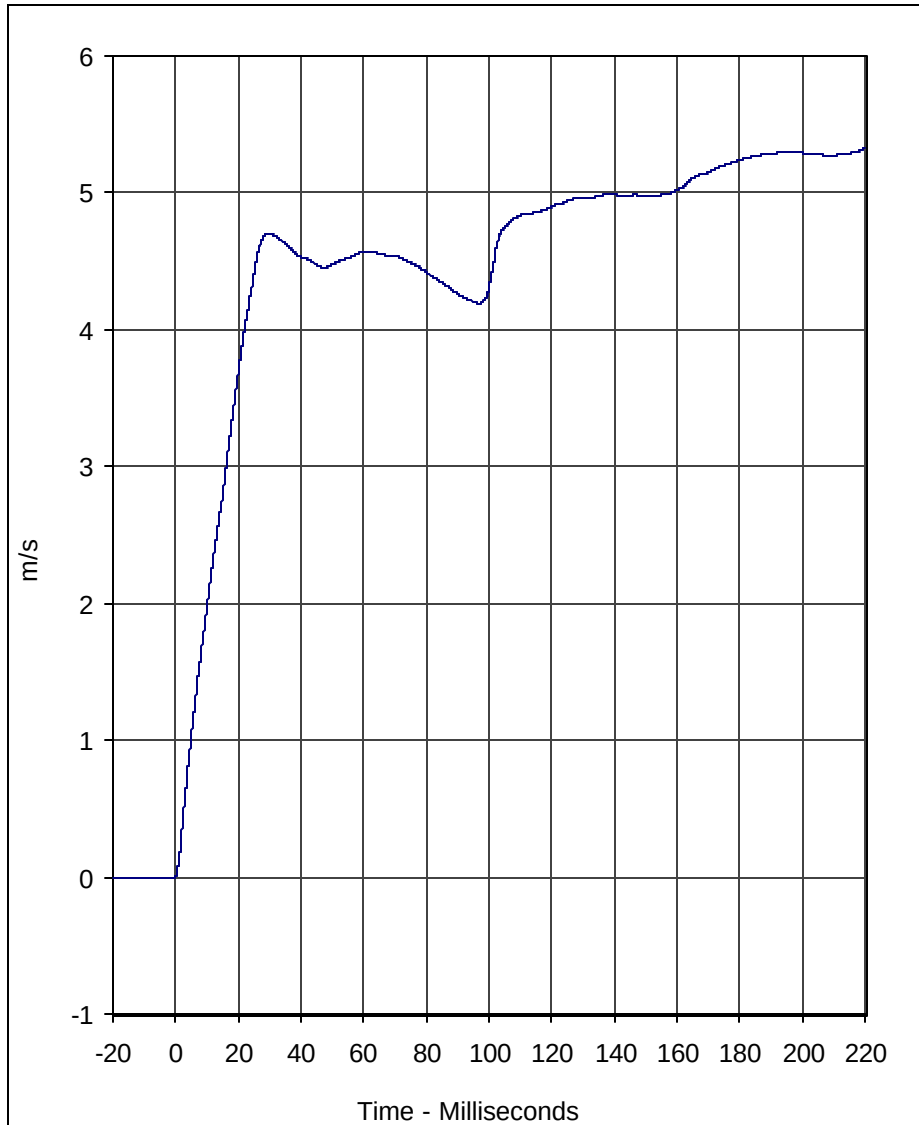
Test I.D.: NF03A

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	5.50	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.7	Pass
	30 Msec.	m/s	4.0 to 5.1	4.7	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	43.5	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	72.0	Pass
Overall Test Results					Pass

Laboratory Technician

March 12, 2003

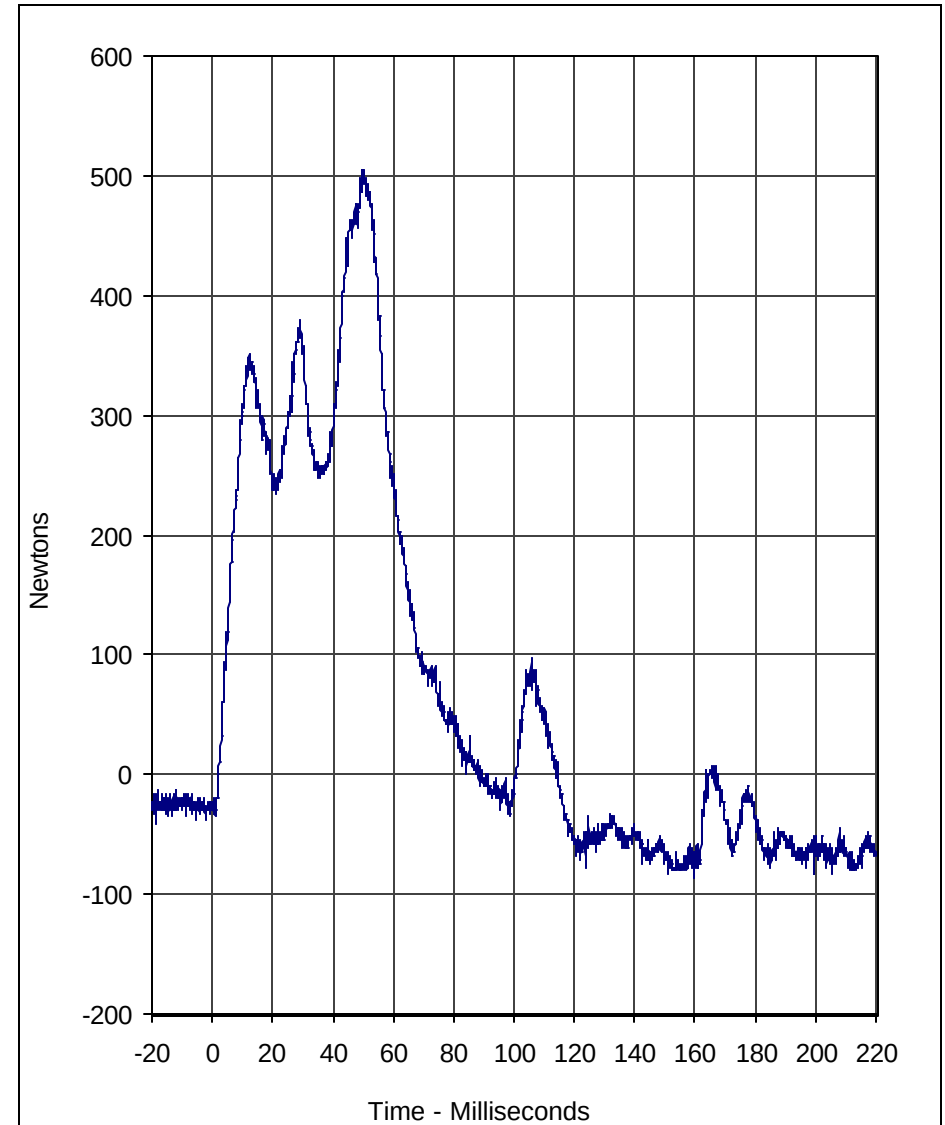
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	5.3	220.0	0.0	-0.6	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 3/12/03

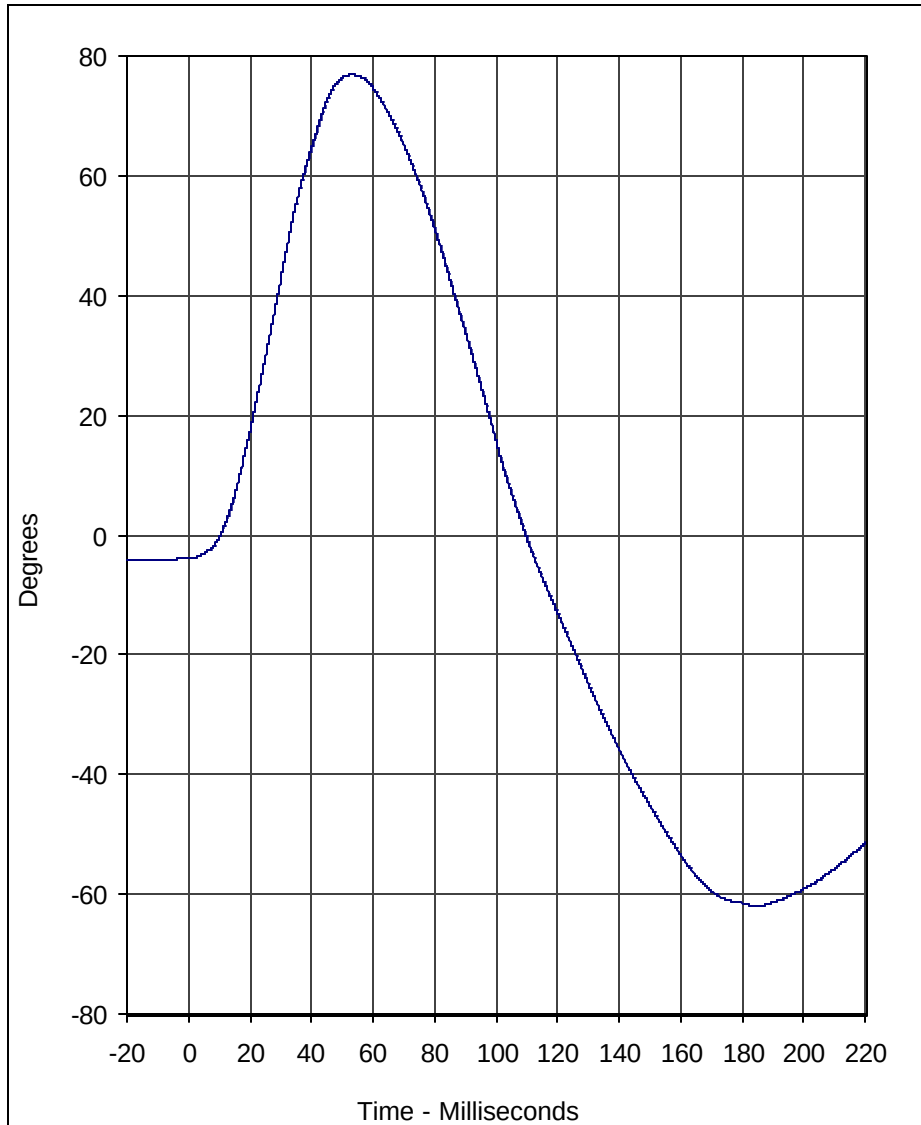


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	505.4	49.5	-86.9	159.6	1000

A.T.D. Serial No.: 082

Test I.D.: NF03A

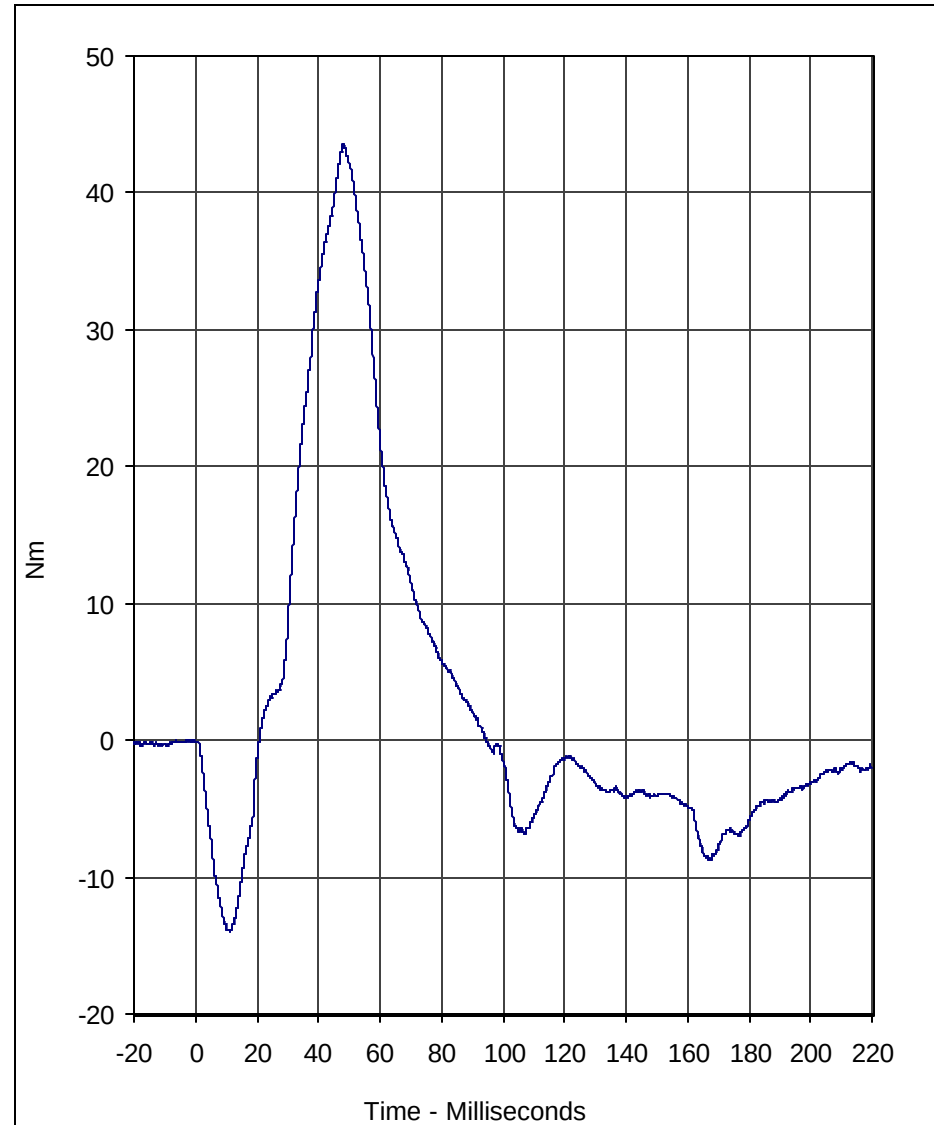




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	76.9	53.2	-62.0	185.0	60

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 3/12/03



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	43.5	48.1	-14.0	11.1	600

A.T.D. Serial No.: 082

Test I.D.: NF03A





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

ATD Serial No.: 082

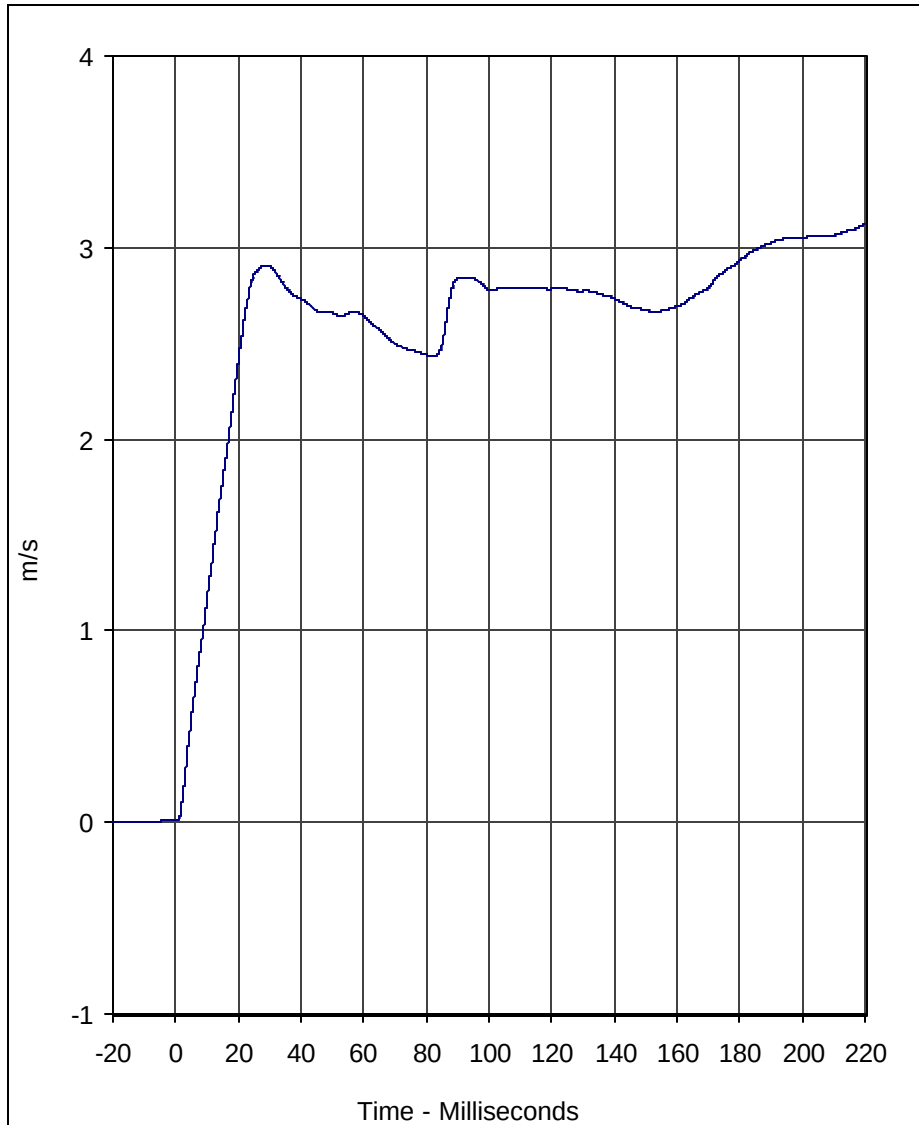
Test I.D.: NE03D

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	Maximum	Degrees	83.0 to 93.0	87.5	Pass
Peak Moment in Rotation	Maximum	Nm	-43.7 to -53.3	-51.3	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	67.3	Pass
Overall Test Results					Pass

Laboratory Technician

March 12, 2003

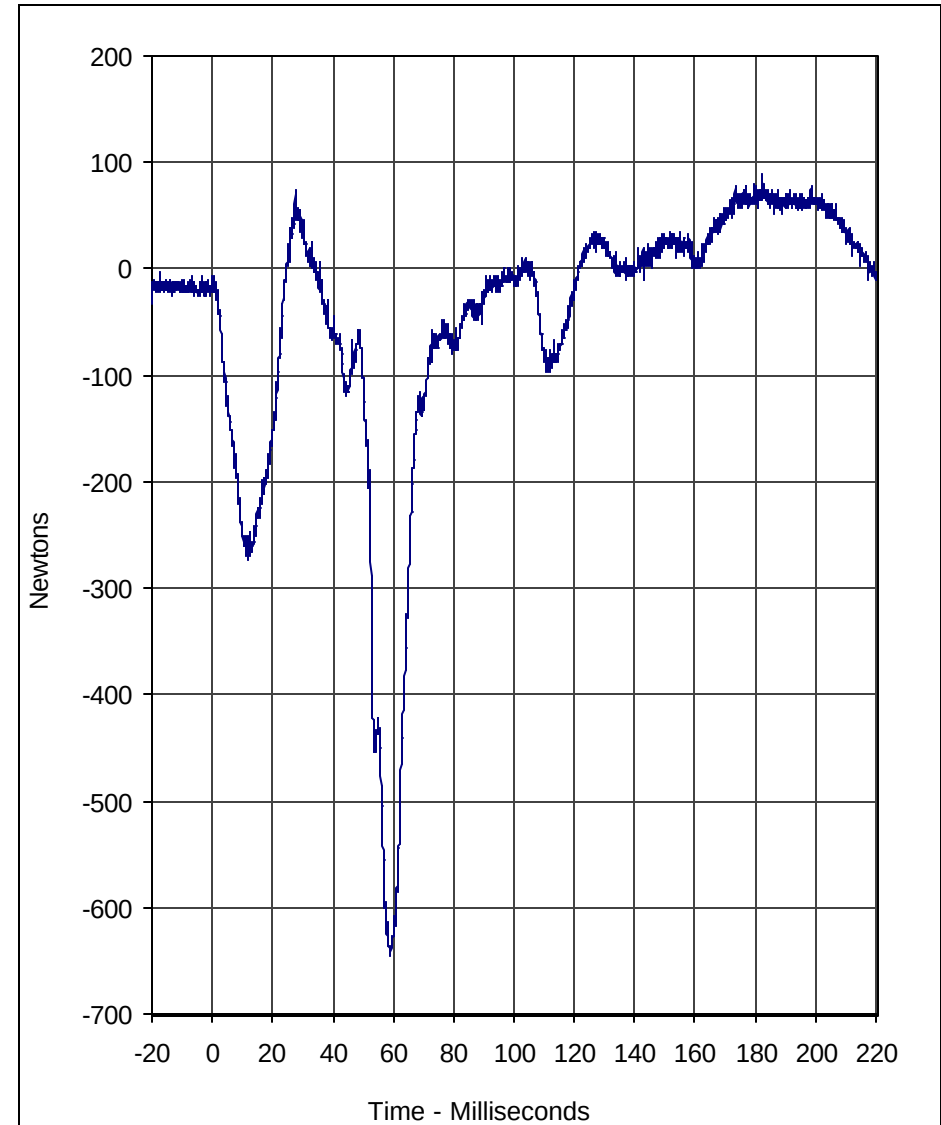
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	3.1	220.0	0.0	-20.0	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 3/12/03

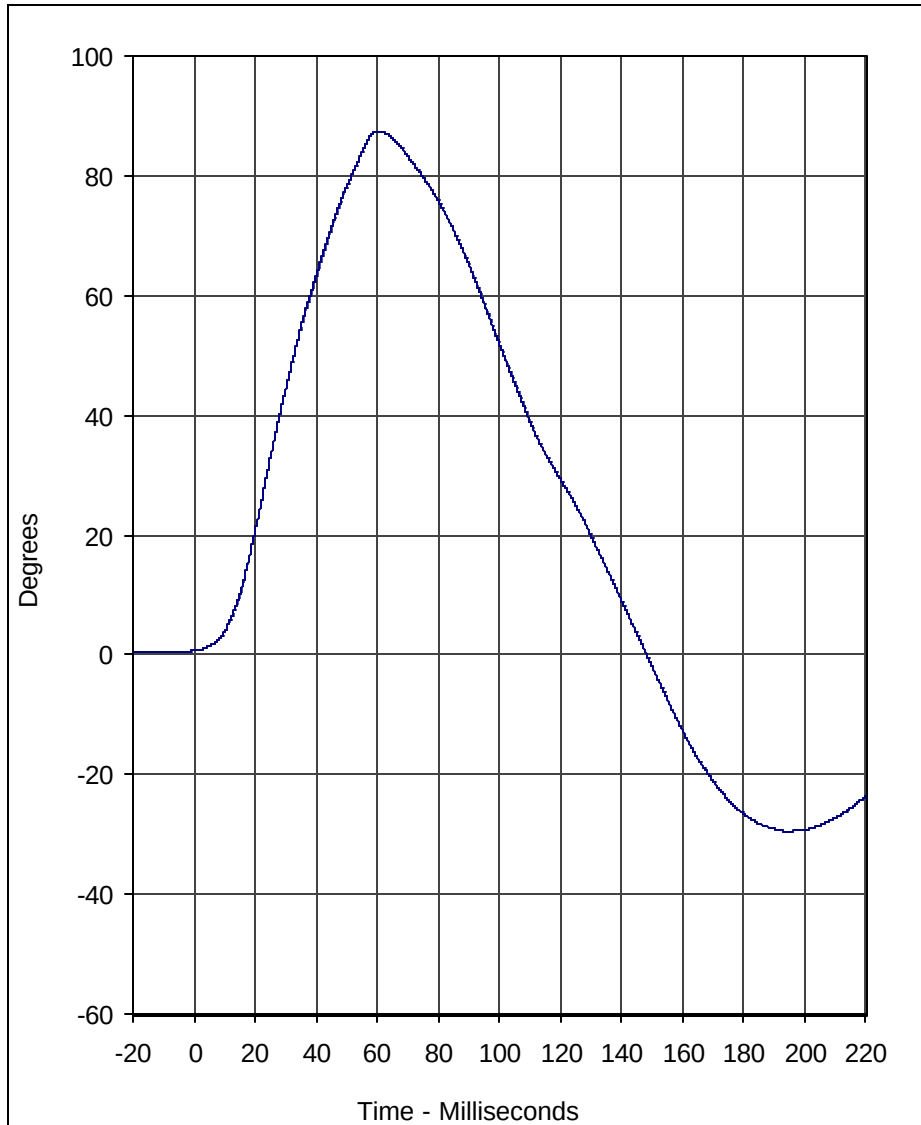


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	90.0	182.5	-646.0	59.2	1000

A.T.D. Serial No.: 082

Test I.D.: NE03D



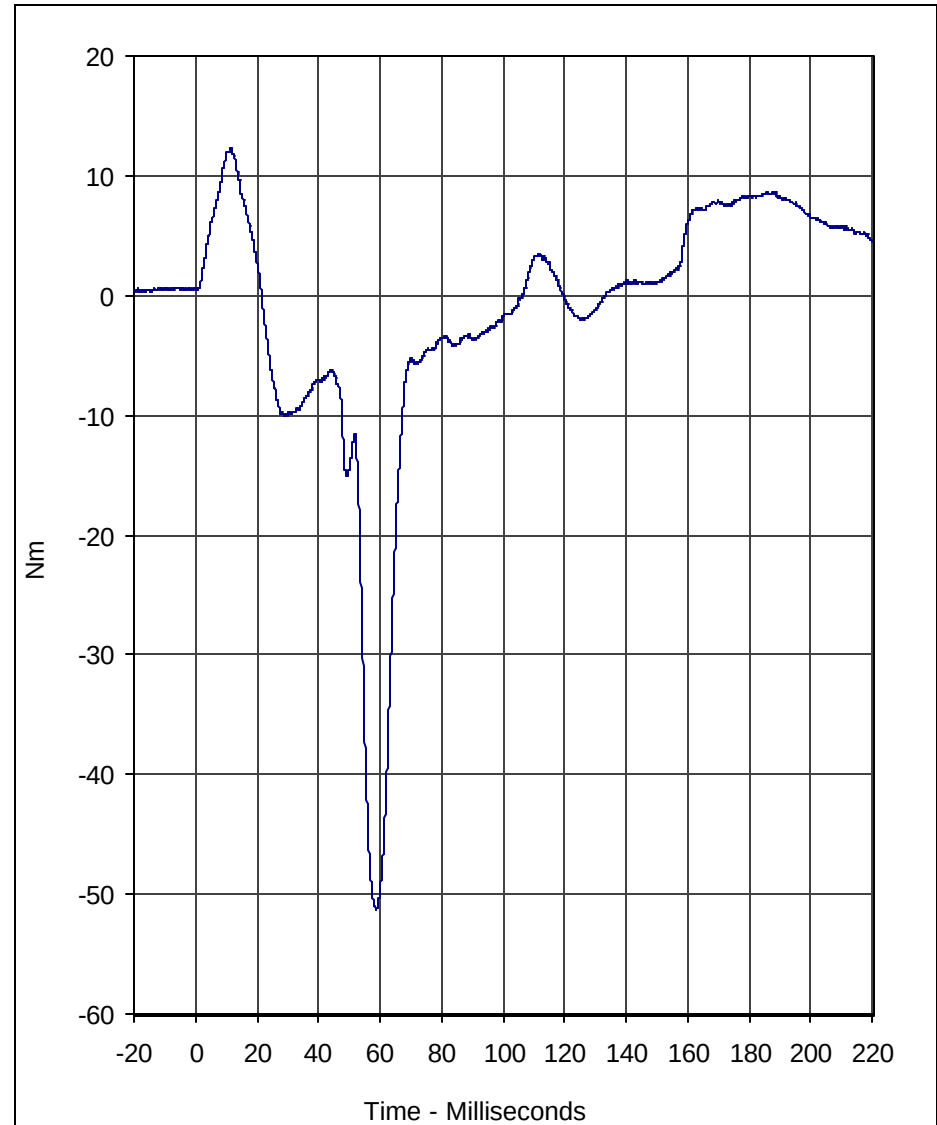


Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	87.5	60.4	-29.5	194.8	60

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 3/12/03



Curve Description				CURNO	Type
Neck Moment Y				002	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	12.3	11.5	-51.3	58.8	600

A.T.D. Serial No.: 082

Test I.D.: NE03D





Calibration Data Sheet

Hybrid III 3 Year Old

Torso Flexion Test

ATD Serial No.: 082

Test I.D.: TF03G

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	7.3	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	156.8	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	1.2	Pass
Final reference plane angle	Degrees	+/-10	8.2	Pass
Overall Test Results				Pass

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Laboratory Technician

March 12, 2003

Test Date



Calibration Data Sheet Hybrid III 3 Year Old External Measurements

ATD Serial No.: 082

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	550	Pass
B - Shoulder pivot height	mm	307 to 323	310	Pass
C - "H" point height	mm	34 to 45	40	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	90	Pass
G - Elbow back to wrist pivot	mm	247 to 263	255	Pass
H - Skull cap to back line	mm	48 to 58	50	Pass
I - Shoulder to elbow length	mm	185 to 201	195	Pass
J - Elbow rest height	mm	134 to 149	145	Pass
K - Buttock to knee length	mm	285 to 300	290	Pass
L - Popliteal length	mm	219 to 234	230	Pass
M - Knee pivot height	mm	242 to 257	250	Pass
N - Buttock popliteal length	mm	218 to 233	225	Pass
O - Chest depth with jacket	mm	139 to 154	145	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	180	Pass
U - Hip breadth	mm	201 to 216	215	Pass
V - Shoulder breadth	mm	237 to 252	250	Pass
W - Foot breadth	mm	54 to 64	60	Pass
X - Head circumference	mm	500 to 516	510	Pass
Y - Chest circumference with jacket	mm	527 to 553	535	Pass
Z - Waist circumference	mm	527 to 553	545	Pass
AA - Location for chest circumference	mm	249 to 259	255	Pass
BB - Location for waist circumference	mm	160 to 170	165	Pass
Overall Test Results				Pass

Laboratory Technician

March 12, 2003
Test Date



Calibration Data Sheet Hybrid III 3 Year Old Head Drop Test

ATD Serial No.: 139

Test I.D.: HD03A

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	275.1	Pass
Peak Lateral Acceleration	G's	≤15.0	12.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	3.8	Pass
Overall Test Results				Pass

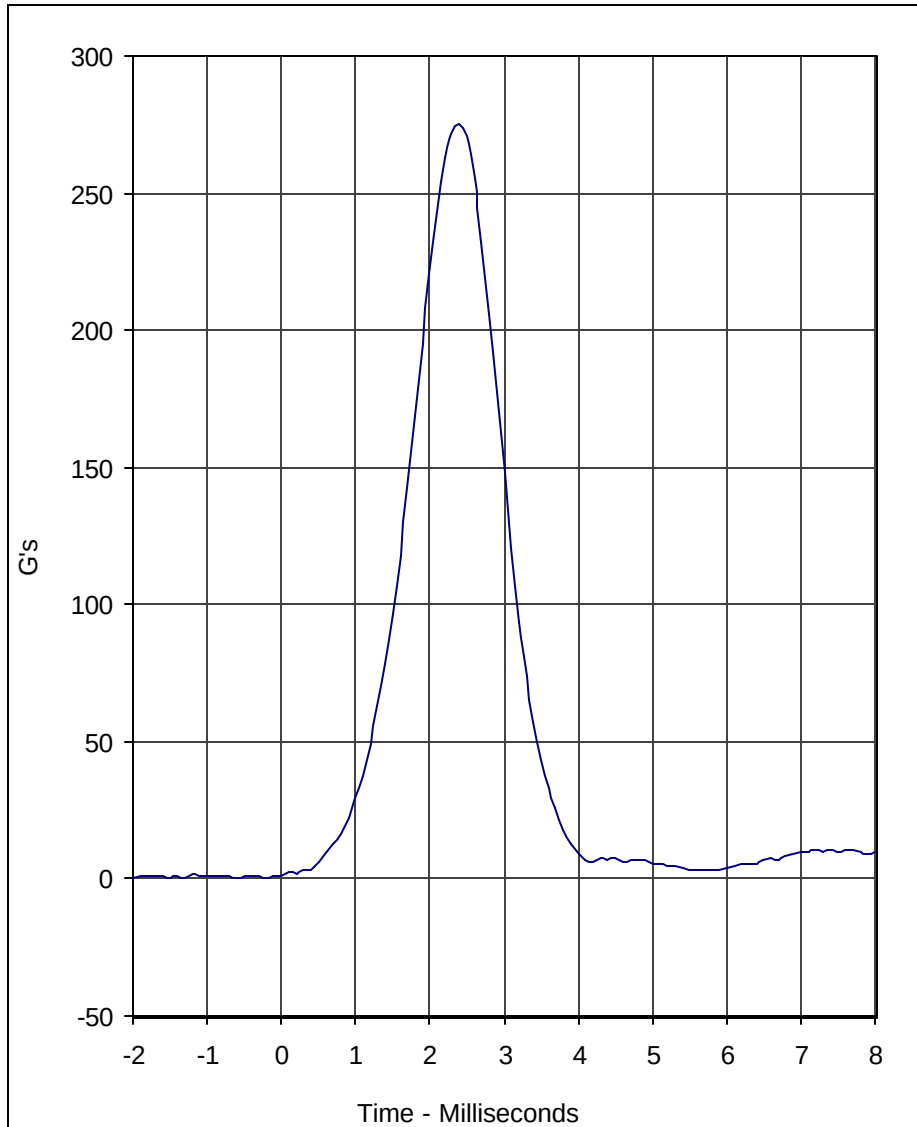
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Laboratory Technician

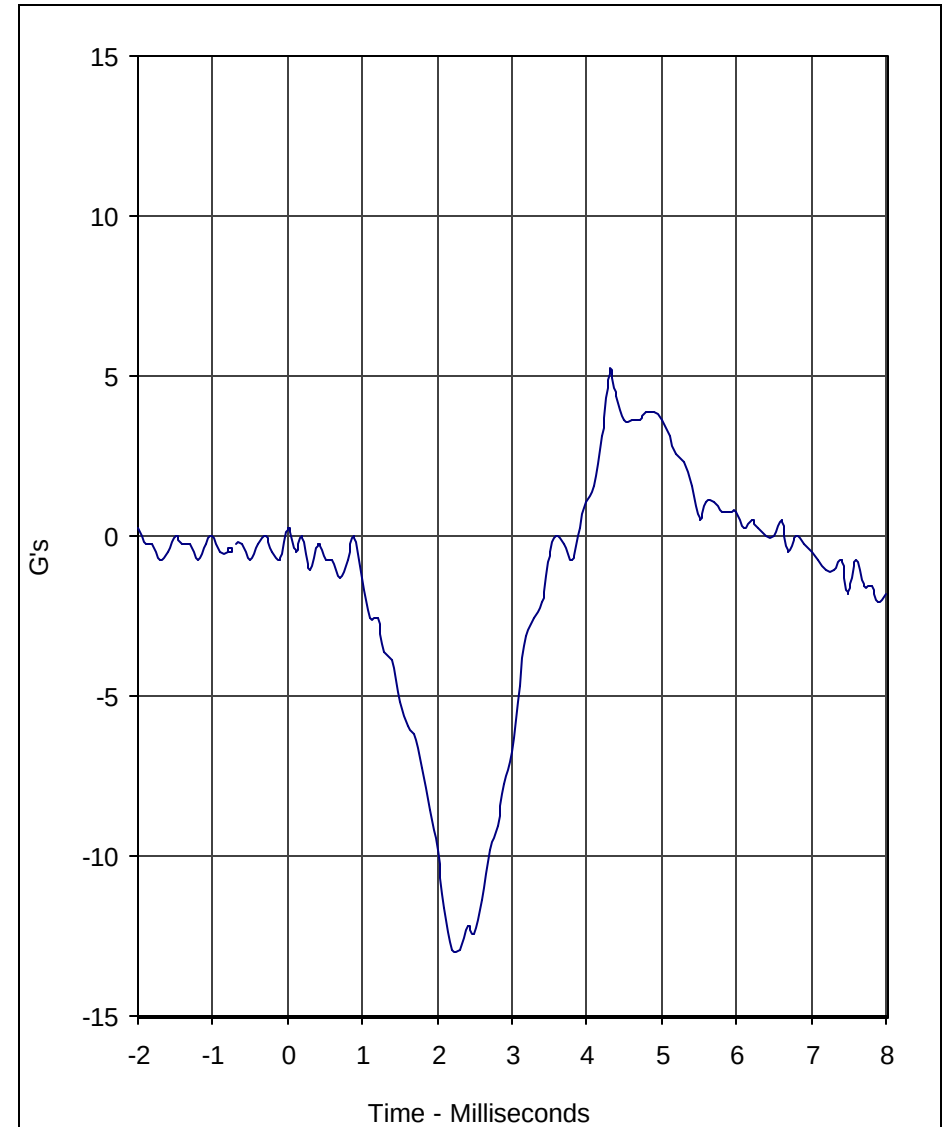
March 2, 2003

Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES

Units	Max	Time	Min	Time	SAE Class
G's	275.1	2.4	0.4	-0.6	1000



Curve Description				CURNO	Type
Head Y				002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	5.2	4.3	-12.9	2.2	1000

Test Program: Hybrid III 3 Year Old Head Drop Test
 Test Date: 3/2/03

A.T.D. Serial No.: 139
 Test I.D.: HD03A





Calibration Data Sheet

Hybrid III 3 Year Old

Thorax Impact Test

ATD Serial No.: 082

Test I.D.: CH04A

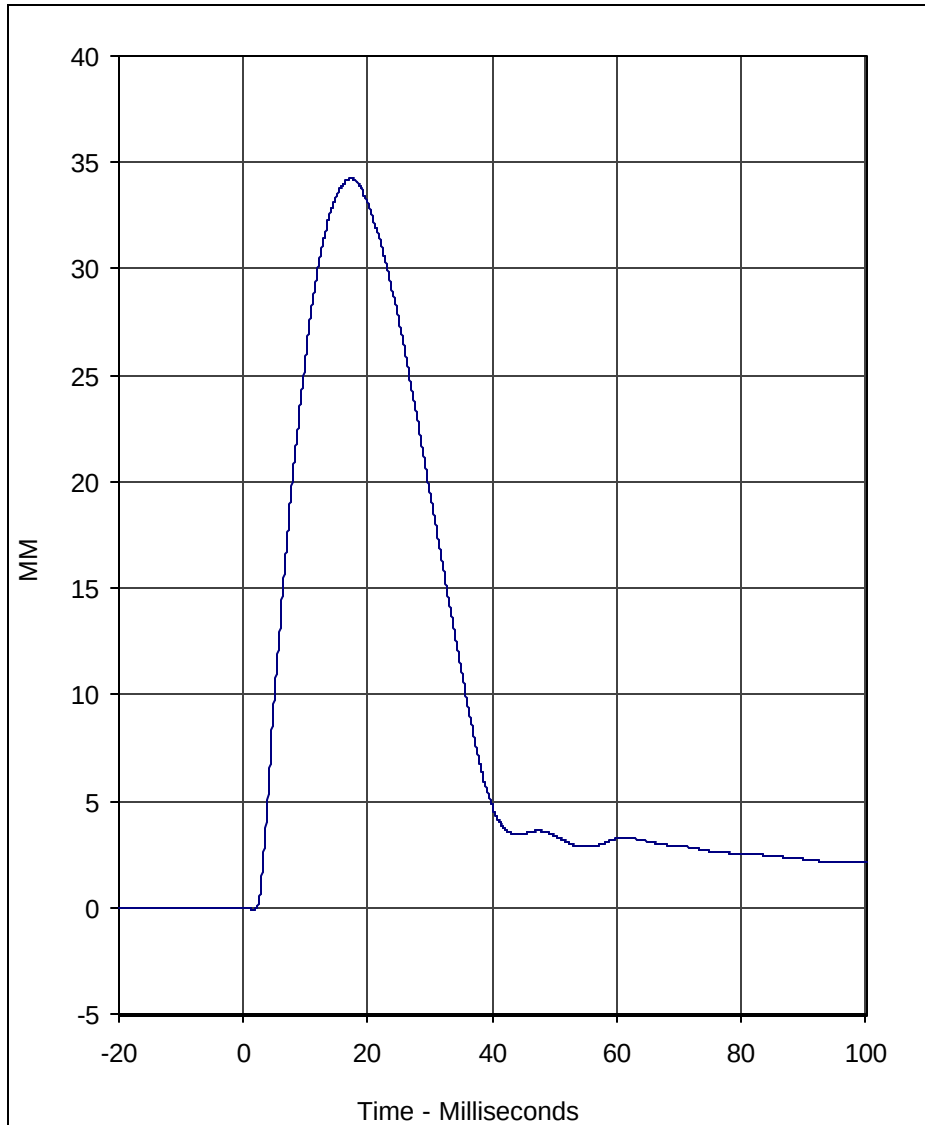
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	6.00	Pass
Peak Chest Compression	MM	32 to 38	34.2	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	759.7	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	759.6	Pass
Internal Hysteresis	%	65 to 85	70.0	Pass
Overall Test Results				Pass

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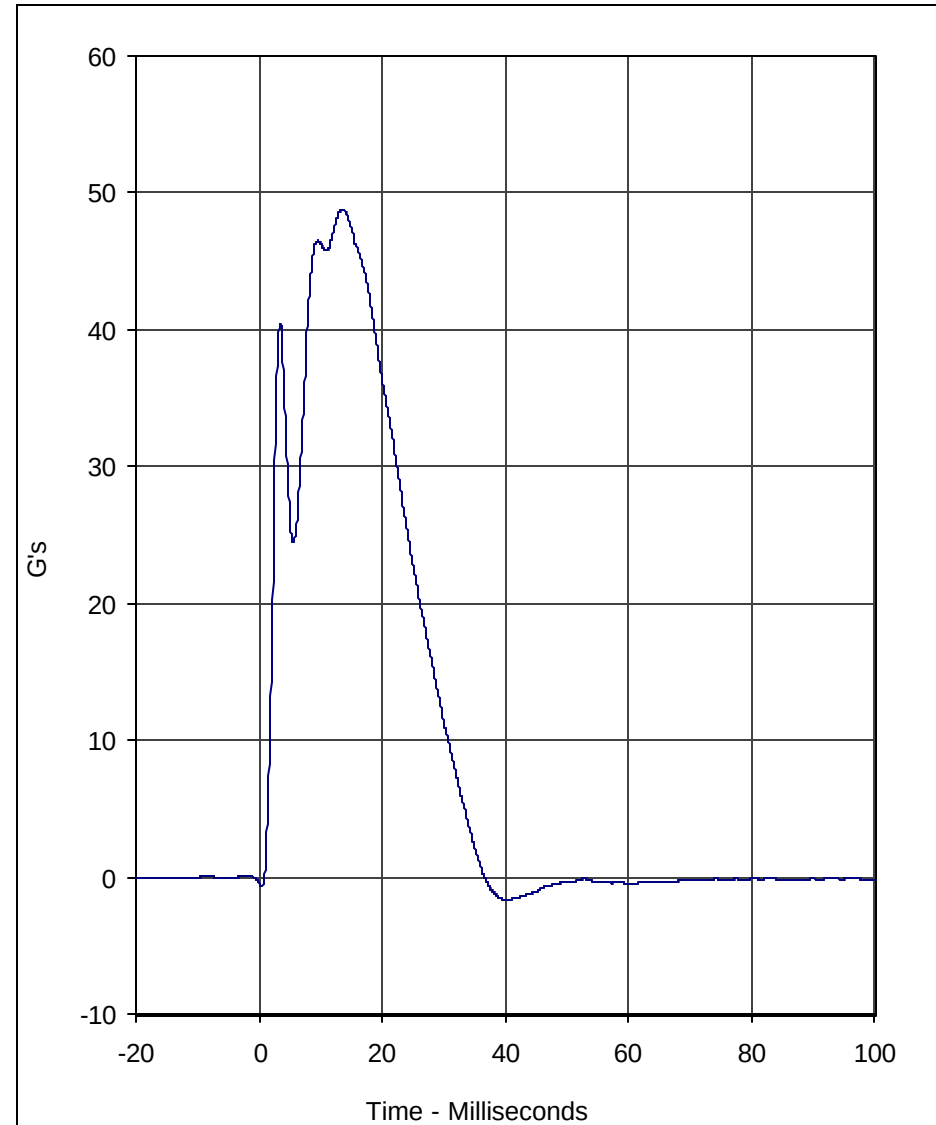
March 1, 2003
Test Date



Curve Description				CURNO	Type
Chest Compression				001	FIL
Units	Max	Time	Min	Time	SAE Class
MM	34.2	17.4	-0.1	1.7	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 3/1/03

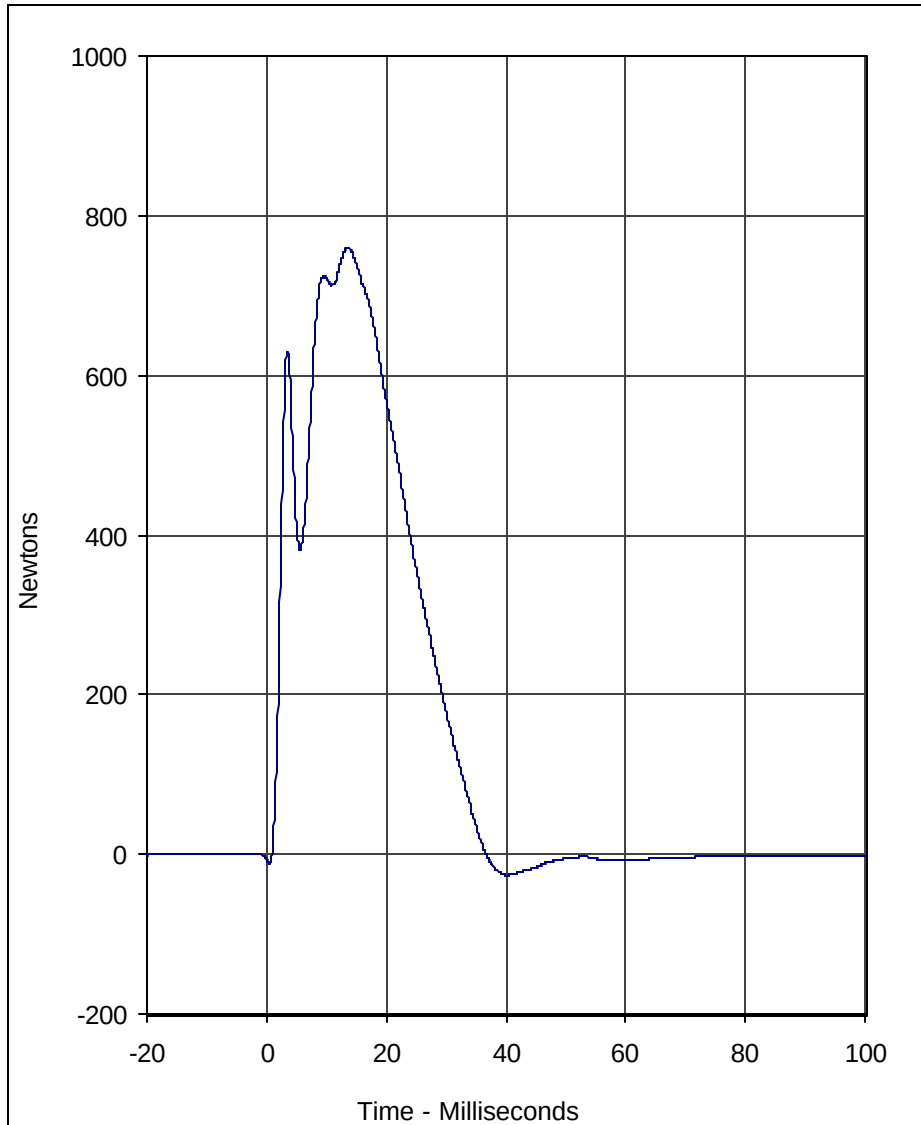


Curve Description				CURNO	Type
Probe Acceleration				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	48.8	13.6	-1.7	40.1	180

A.T.D. Serial No.: 082

Test I.D.: CH04A

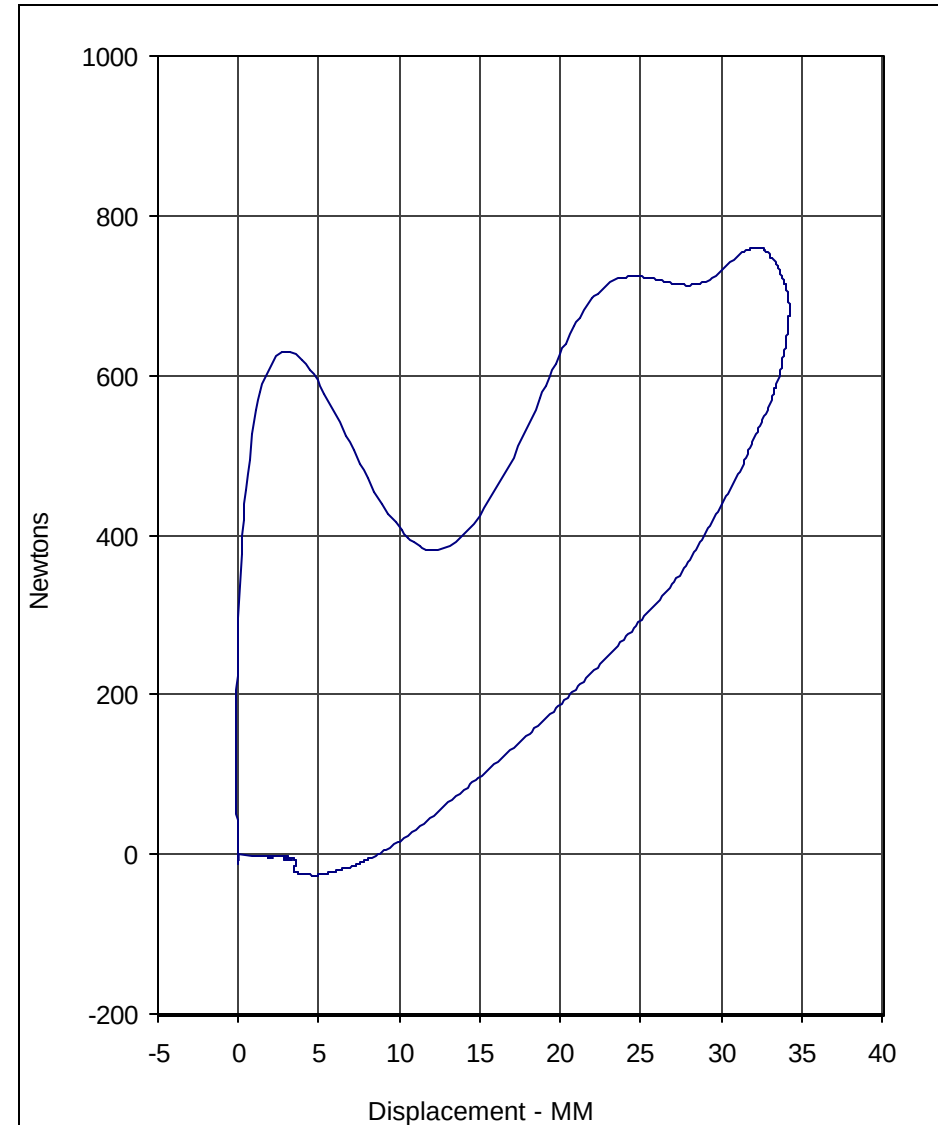




Curve Description				CURNO	Type
Probe Force				003	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	759.7	13.6	-26.2	40.1	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 3/1/03



Curve Description			CURNO	Type
Probe Force vs. Chest Displacement			004	FIL
Units	Hysteresis	SAE Class		
%	69.3	180		

A.T.D. Serial No.: 082

Test I.D.: CH04A





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

ATD Serial No.: 139

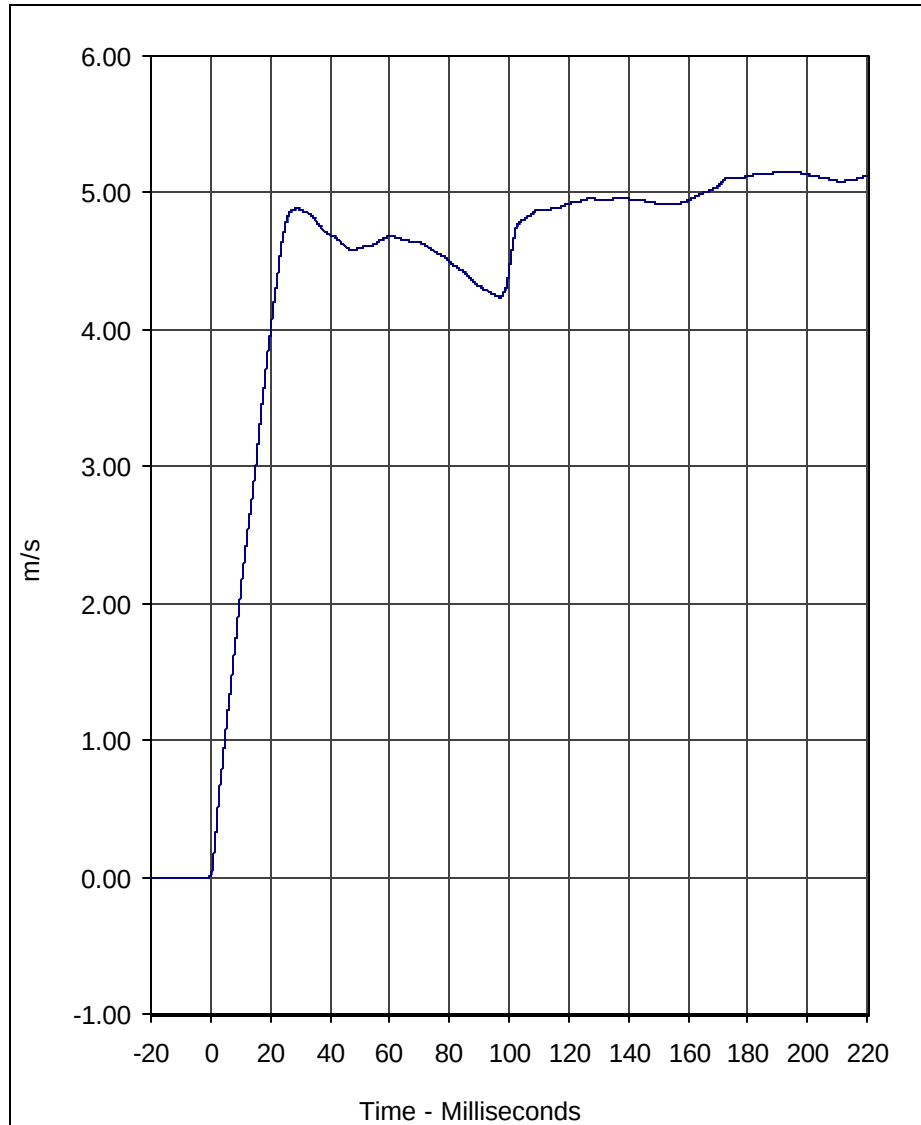
Test I.D.: NF03C

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	2.1	Pass
	20 Msec.	m/s	3.0 to 4.0	4.0	Pass
	30 Msec.	m/s	4.0 to 5.1	4.9	Pass
"D" Plane Rotation	Maximum	Degrees	70.0 to 82.0	78.4	Pass
Peak Moment in Rotation	Maximum	Nm	42.0 to 53.0	42.3	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	71.4	Pass
Overall Test Results					Pass

Laboratory Technician

March 3, 2003

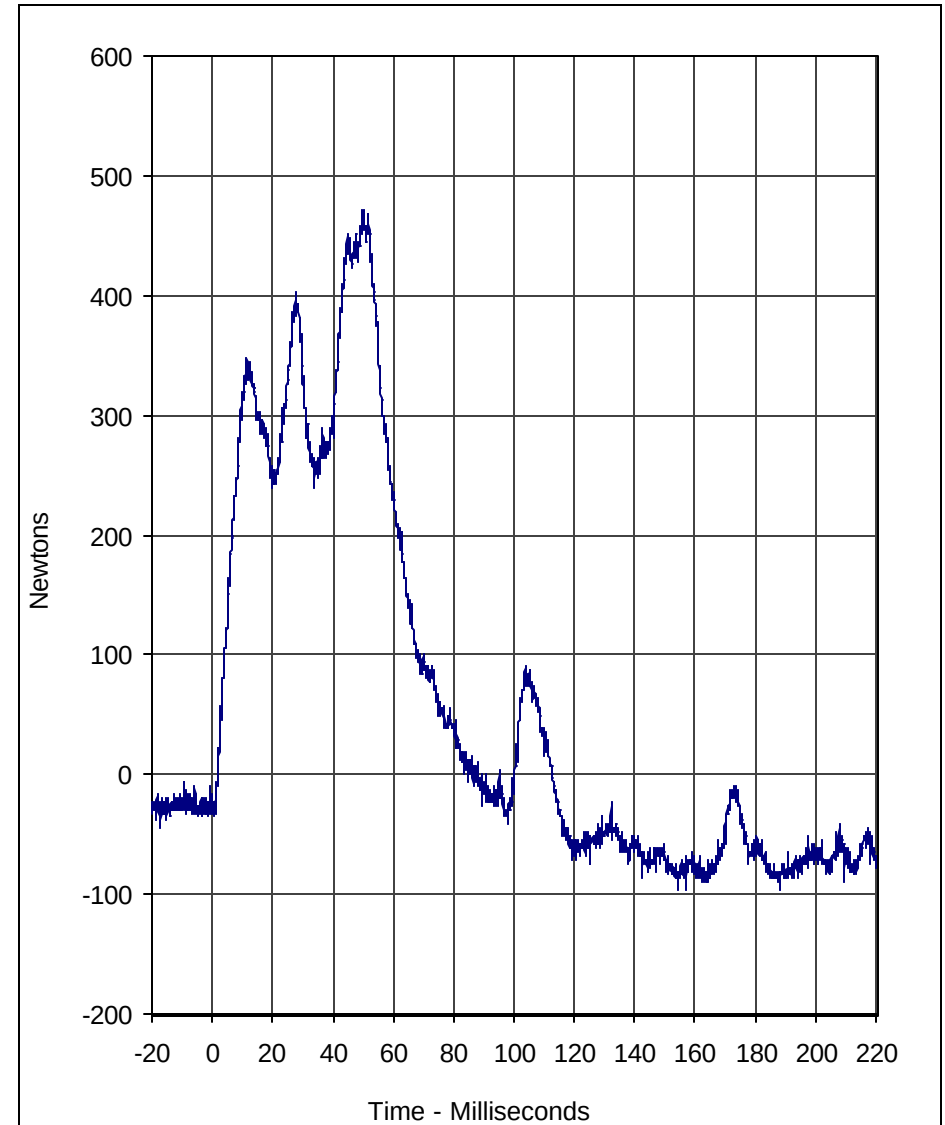
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	5.2	191.3	0.0	-0.7	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 3/3/03

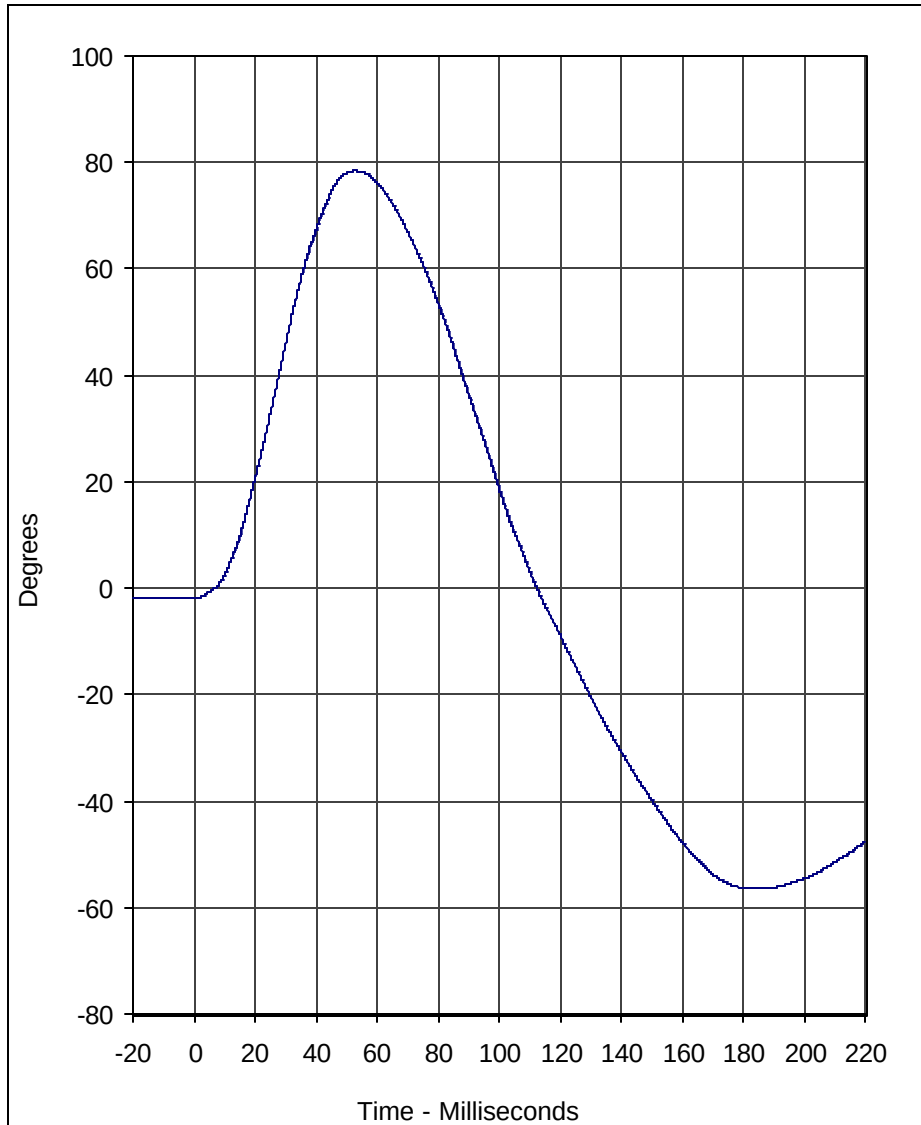


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	470.7	49.5	-96.7	154.3	1000

A.T.D. Serial No.: 139

Test I.D.: NF03C

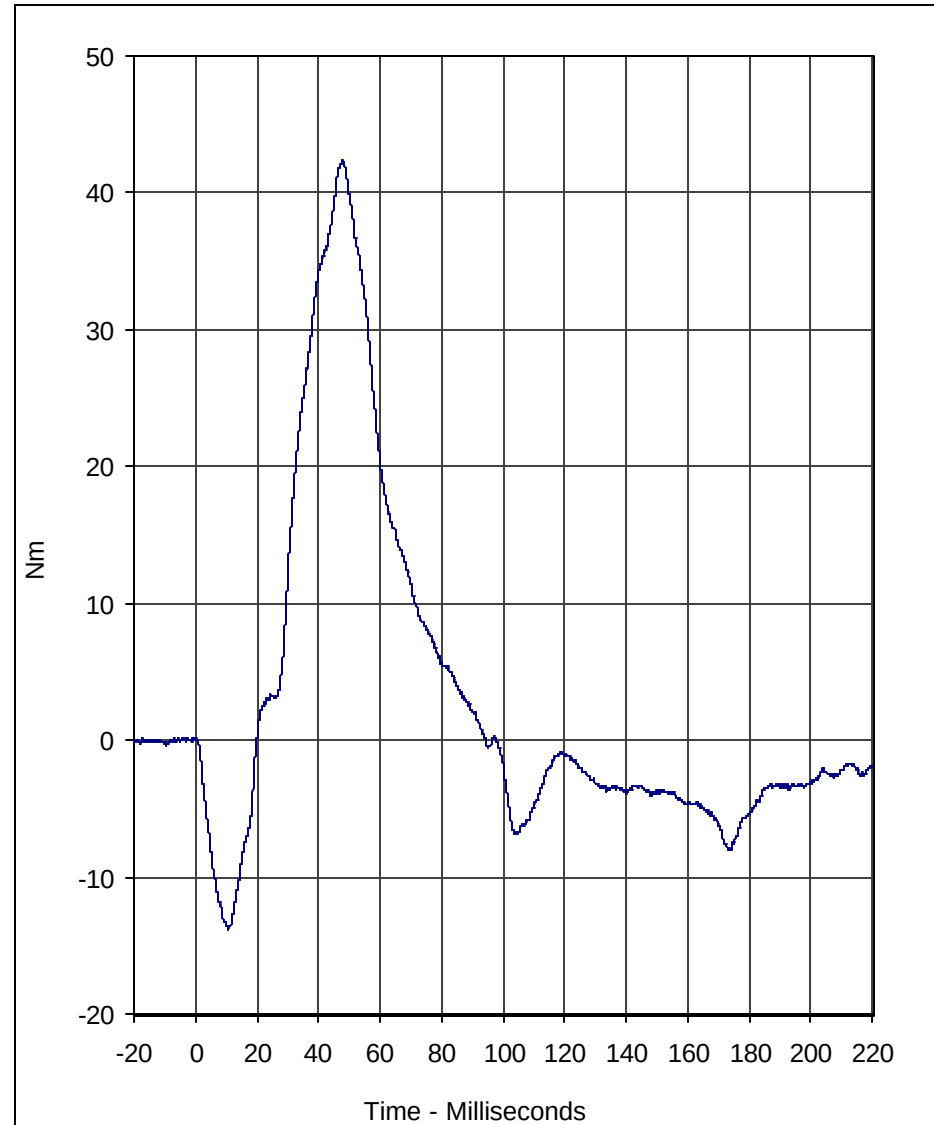




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	78.4	52.9	-56.4	184.2	60

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 3/3/03



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	42.3	47.8	-13.8	10.6	600

A.T.D. Serial No.: 139

Test I.D.: NF03C





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

ATD Serial No.: 139

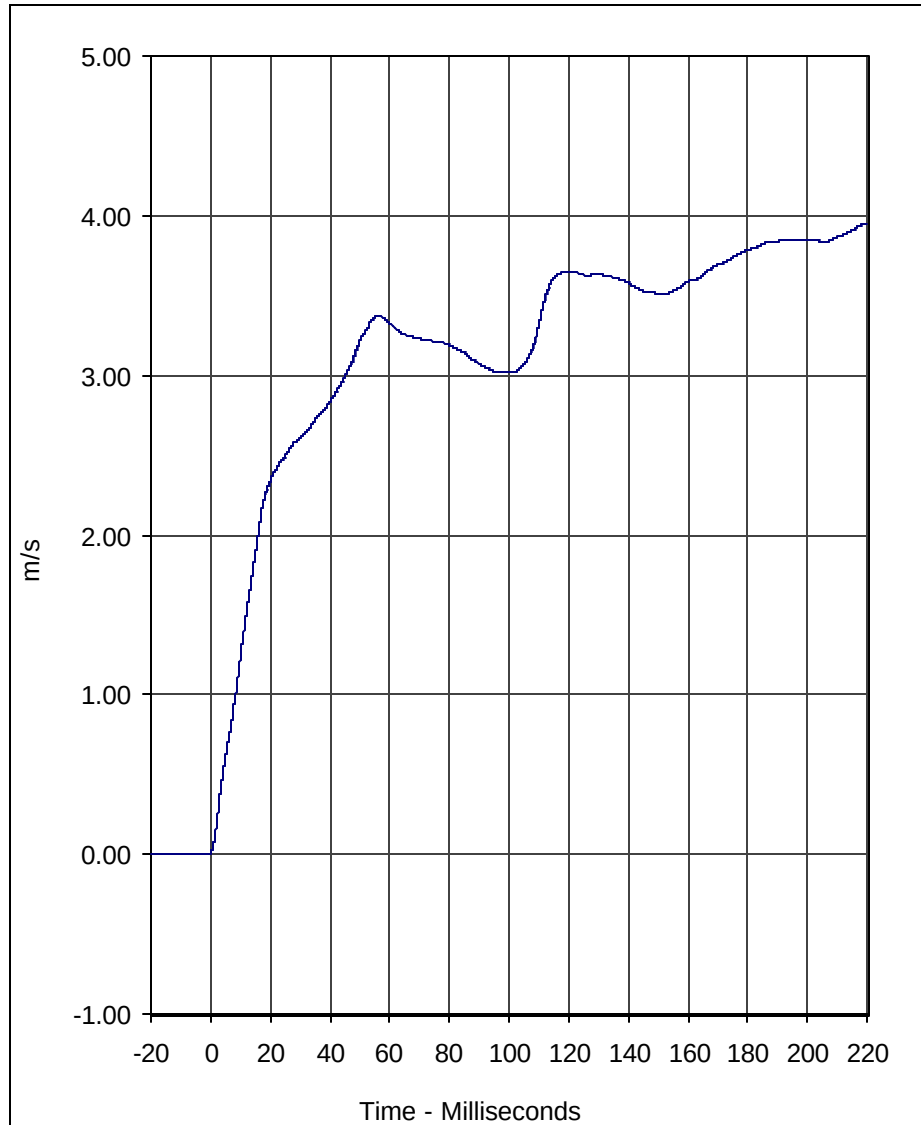
Test I.D.: NE03B

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	2.3	Pass
	30 Msec.	m/s	2.8 to 3.5	2.8	Pass
"D" Plane Rotation	Maximum	Degrees	83.0 to 93.0	85.6	Pass
Peak Moment in Rotation	Maximum	Nm	-43.7 to -53.3	-50.2	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	67.8	Pass
Overall Test Results					Pass

Laboratory Technician

March 3, 2003

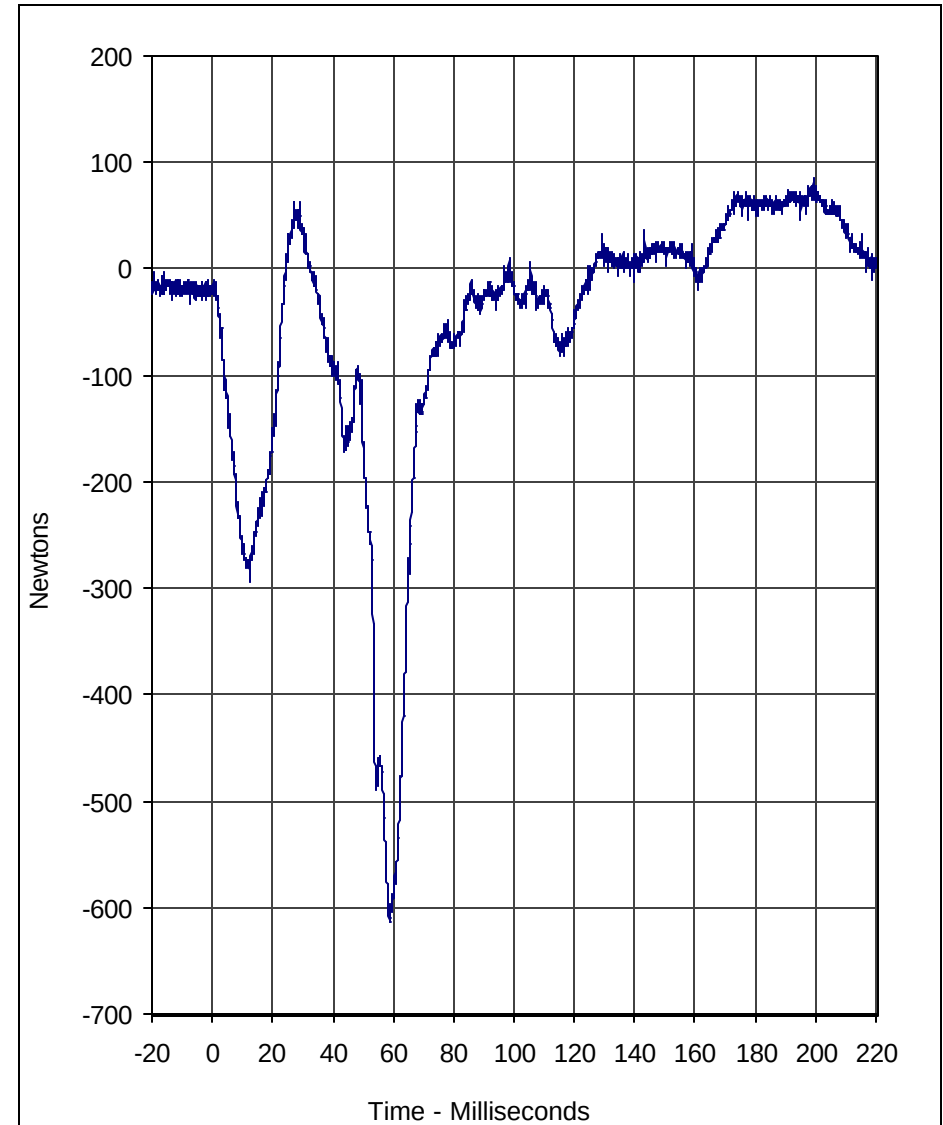
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	4.0	220.0	0.0	-0.9	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 3/3/03

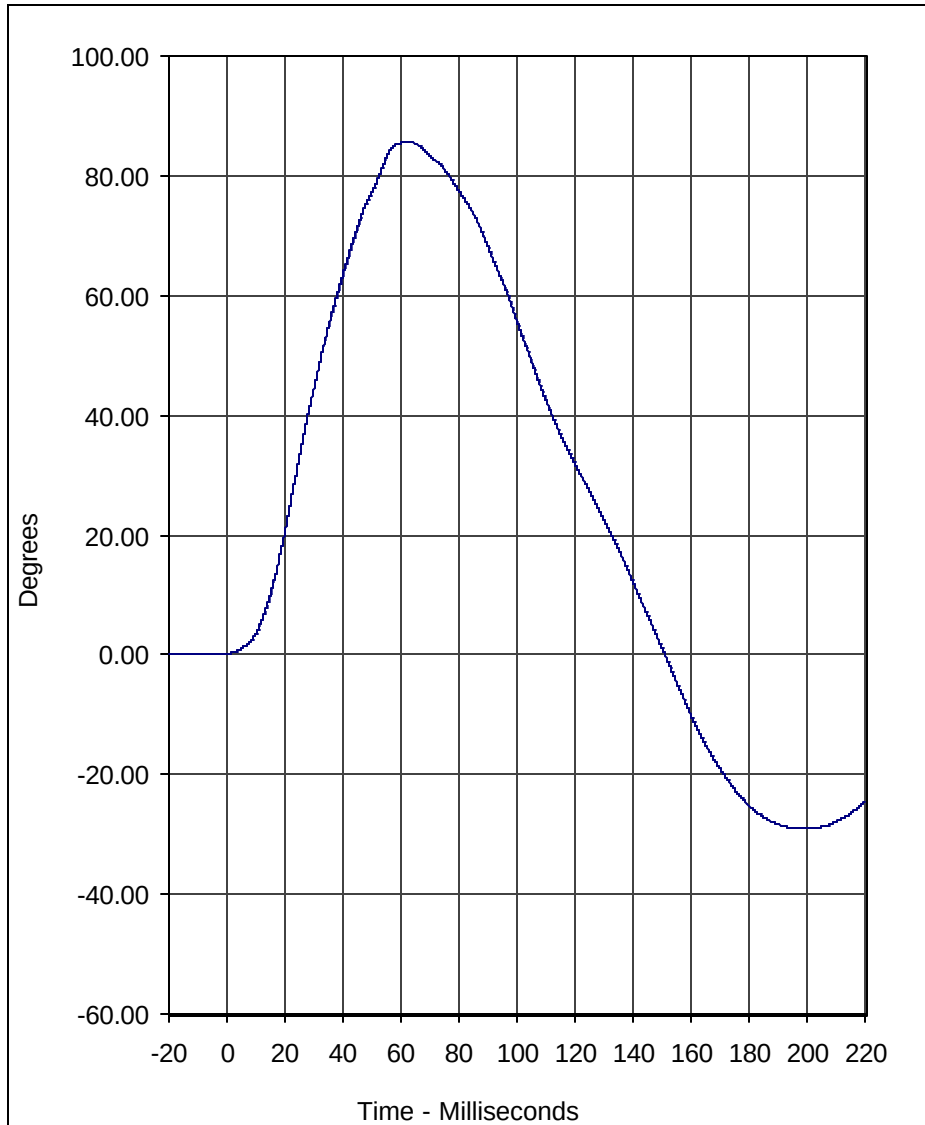


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	84.8	199.2	-613.3	58.6	1000

A.T.D. Serial No.: 139

Test I.D.: NE03B

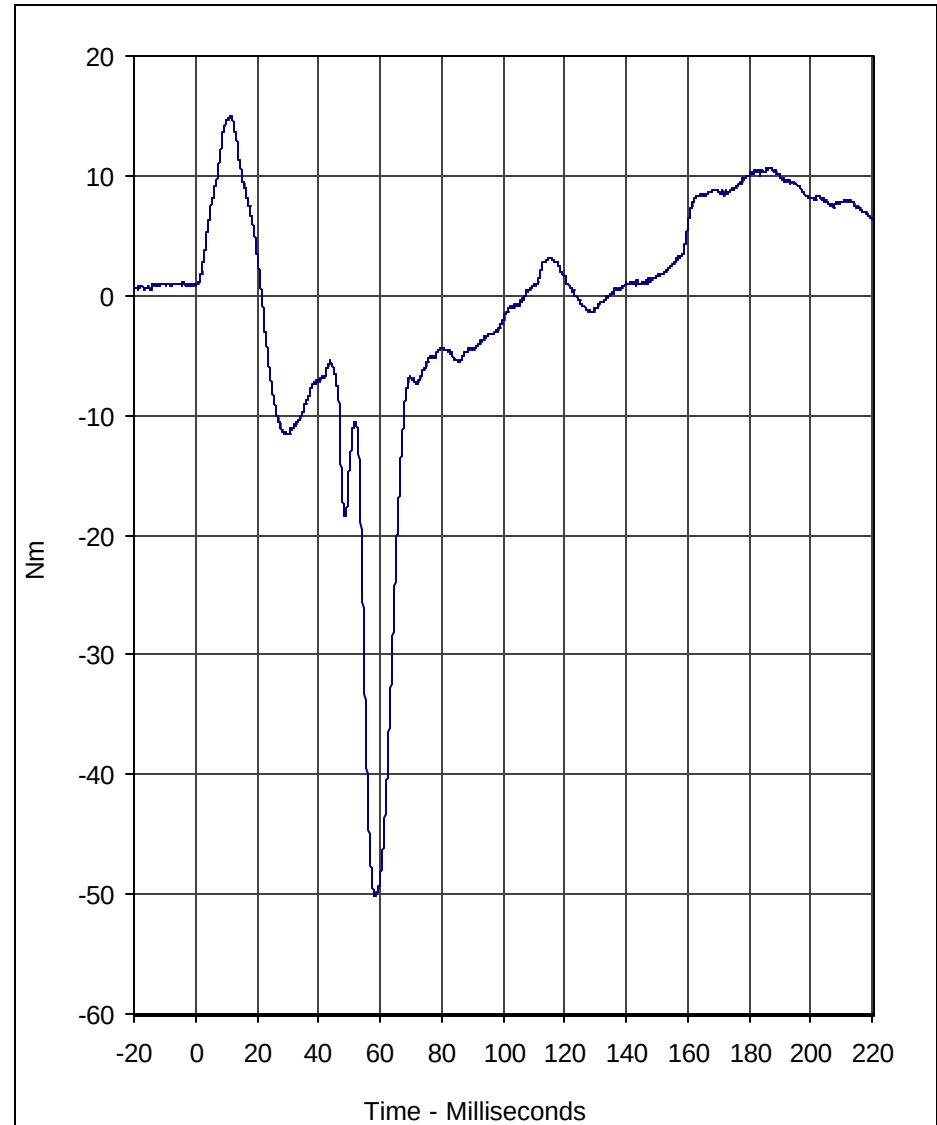




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	85.6	62.6	-29.0	196.8	60

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 3/3/03



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	15.0	11.4	-50.2	58.6	600

A.T.D. Serial No.: 139

Test I.D.: NE03B





Calibration Data Sheet

Hybrid III 3 Year Old

Torso Flexion Test

ATD Serial No.: 139

Test I.D.: TF03B

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	178.4	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	0.6	Pass
Final reference plane angle	Degrees	+/-10	6.9	Pass
Overall Test Results				Pass

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Laboratory Technician

March 3, 2003

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	550	Pass
B - Shoulder pivot height	mm	307 to 323	310	Pass
C - "H" point height	mm	34 to 45	40	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	90	Pass
G - Elbow back to wrist pivot	mm	247 to 263	255	Pass
H - Skull cap to back line	mm	48 to 58	50	Pass
I - Shoulder to elbow length	mm	185 to 201	195	Pass
J - Elbow rest height	mm	134 to 149	145	Pass
K - Buttock to knee length	mm	285 to 300	290	Pass
L - Popliteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	250	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	175	Pass
U - Hip breadth	mm	201 to 216	210	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	510	Pass
Y - Chest circumference with jacket	mm	527 to 553	550	Pass
Z - Waist circumference	mm	527 to 553	550	Pass
AA - Location for chest circumference	mm	249 to 259	255	Pass
BB - Location for waist circumference	mm	160 to 170	165	Pass
Overall Test Results				Pass

Laboratory Technician

March 3, 2003
Test Date

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