REPORT NUMBER TR-P23001-22-NC

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION
2004 PONTIAC GRAND PRIX GT
4 DOOR SEDAN

NHTSA NUMBER: M40100

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

10/7/03

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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Technical Report Documentation Page

1. Report No. TR-P23001-22-NC	**2. Government Accession No.**	**3. Recipients Catalog No.**
4. Title and Subtitle Final Report of New Car Assessment Program Testing of a 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No. M40100		**5. Report Date** October 13, 2003 **6. Performing Organization Code**
7. Authors Mr. James E. Gorth, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco		**8. Performing Organization Report No.** TR-P23001-22-NC
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301		**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-01-D-02005
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NPS-111 400 Seventh Street, SW, Room 5311 Washington, D.C 20590		**13. Type of Report and Period Covered** Final Test Report Option Year 2 **14. Sponsoring Agency Code** DOT/NHTSA/NRM/OCS
15. Supplementary Notes		

16. Abstract

A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2004 Pontiac Grand Prix GT 4 Door Sedan at Karco Engineering, LLC on 10/7/03. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 55.89 km/h. The ambient temperature at the barrier face at the time of impact is 28.9 degrees Celcius. The vehicle's maximum post test static crush is 584 mm at the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:

Measurement Description	Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)	N/A	1000	596.2	509.3
Max. Chest Accel. (3 msec Clip)	G's	60	58.5	43.7
Left Femur Force	Newtons	10008	-6795.1	-5511.6
Right Femur Force	Newtons	10008	-6024.3	-3737.1

17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No. M40100		**18. Distribution of Statement** Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified	**20. Security Classification (this page)** Unclassified	**21. No. of Pages** 486	**22. Price**

Form DOT F1700.7 (8-72)

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SECTION 1

PURPOSE AND SUMMARY OF TEST M40100

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 2004 Pontiac Grand Prix GT 4 Door Sedan at a velocity of 55.89 km/h. The test was performed at Karco Engineering, LLC on October 7, 2003.

One real-time and 19 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 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. 35) and the right-front passenger (position 2) ATD (Serial No. 34) 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 584 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, chest and abdomen contacted the airbag. Both left and right knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD head, chest and abdomen contacted the airbag. Both left and right knees contacted the glovebox.

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	596.2	58.5	-25.3	-6795.1	-6024.3	240.4
Passenger	509.3	43.7	-20.2	-5511.6	-3737.1	262.4

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

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	^oF	^oC	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

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

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.89
Test Weight	kg	1789
Impact Angle	degrees	0
Average Rebound	mm	739
Maximum Static Crush	mm	584

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. 35	50% Male Hybrid III No. 34
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

16mm MOVIE COVERAGE

High Speed	19
Real Time	1
Total	20

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: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M40100	Anti-Lock Brakes	Yes
Make	Pontiac	All Wheel Drive	No
Model	Grand Prix GT	Power Steering	Yes
Body Style	4-Door	Driver Front Airbag	Yes
Vin No.	2G2WP522941121660	Driver Side Airbag	No
Color	Silver	Driver Head Airbag	No
Delivery Date	8/22/2003	Driver Curtain Airbag	No
Odometer	120	Pass. Airbag	Yes
Dealer	Rally Pontiac	Pass. Side Airbag	No
Transmission	4 Speed Automatic	Pass. Head Airbag	No
Final Drive	Front	Pass. Curtain Airbag	No
Type/No. Cyl.	V-6	Pre-Tensioners	Yes
Engine Disp. (L)	3.8	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air. Cond.	Yes
Sunroof/T-Top	No	AM/FM Cassette	Yes
Tinted Glass	No	Tilt Steering	Yes
Traction Control	Yes	Power Door Locks	Yes
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	Yes
Rear Disc	Yes	Other	None

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors Corporation	GVWR (kg)	2005
		GAWR Front (kg)	1100
Date of Manufacture	Apr-03	GAWR Rear (kg)	905

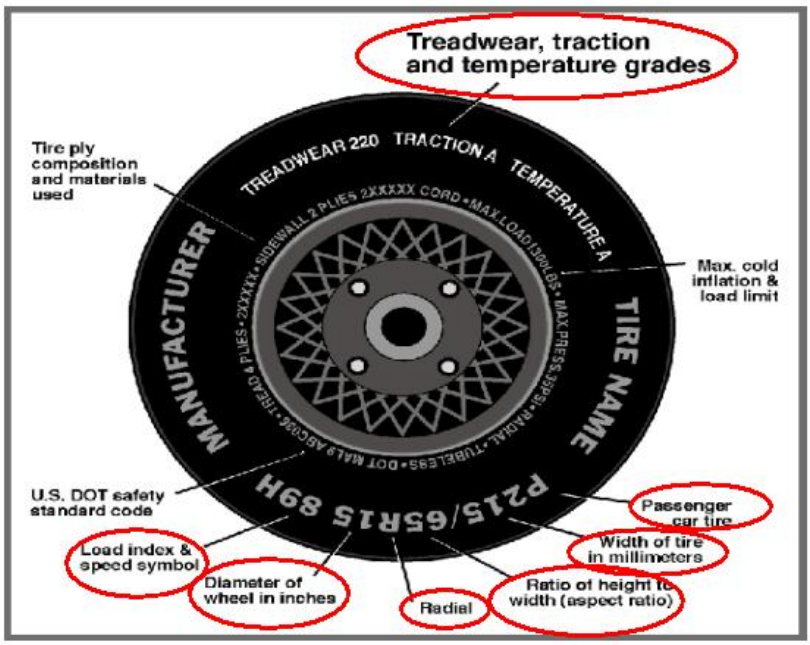
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	None	
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				416
Cargo Weight (RCLW) (kg)				76

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

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



Max. Tire Pressure (kpa)	308	308
Cold Pressure (kpa)	210*	210*
Recommened Tire Size	P225/60R16	P225/60R16
Tire Size on Vehicle	P225/60R16	P225/60R16
Tire Manufacturer	Goodyear	Goodyear
Treadwear	360	360
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	97S	97S
Tire Material	Polyester/Steel	Polyester/Steel
DOT Safety Code Right	M6X0BMWR1403	M6X0BMWR1403
DOT Safety Code Left	M6X0BMWR1403	M6X0BMWR1403

* Add 28Kpa if tires are hot.

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	487	293		525	362	
Right	kg	504	284		545	357	
Ratio	%	63.2	36.8		59.8	40.2	
Totals	kg	991	577	1568	1070	719	1789

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1568
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	76
Calculated Vehicle Target Wt. (TVTW)	kg	1796

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	729	729	746	752	1036
As Tested	mm	724	723	720	720	1131

Vehicle Wheel Base (mm): 2815

Weight of Ballast Secured in cargo area (kg): 0

Vehicle Components Removed: Rear window & bumper,trunk lid, mufflers, tail lights, rear side window and rear door panels.

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L): 64.35

Usable Capacity Furnished by COTR (L): 64.35

Actual Test Volume with entire fuel System Filled (L): 59.85

1/3 of Usable Capacity (L): 21.45

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 — Purple

Is Vehicle Fuel Pump Electric or Mechanical? Electric

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

Fuel System Particulars:

DATA SHEET NO. 3
POST TEST IMPACT DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	55.89
Trap No. 1 Entry Distance	mm	<1524	1524
Trap No.1 Exit Distance	mm	<1524	305
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	55.91
Trap No.2 Entry Distance	mm	<1524	1524
Trap No.2 Exit Distance	mm	<1524	305

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4834	4362	-472
Center	mm	5034	4450	-584
Right Side	mm	4832	4409	-423

VEHICLE REBOUND FROM BARRIER

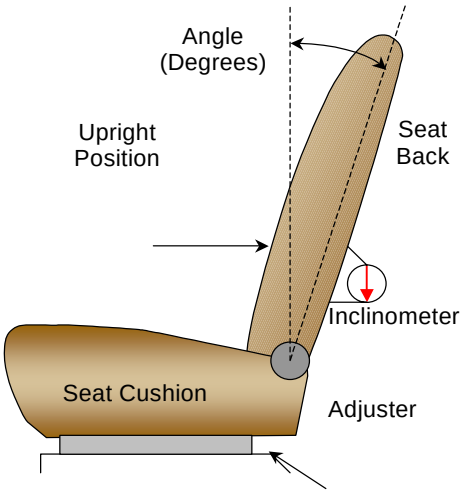
Measured Parameter	Units	Value
Left Side	mm	800
Center	mm	700
Right Side	mm	718
Average	mm	739

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

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.



FRONT SEAT ASSEMBLY

SEAT BACK ANGLES

	Deg.
Driver w/seated dummy	23.4
Passenger w/seated Dummy	25.2

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	240mm	120mm
Passenger Seat	29	15

SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position.

SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	3rd from Top
Passenger Seat	5	3rd from Top

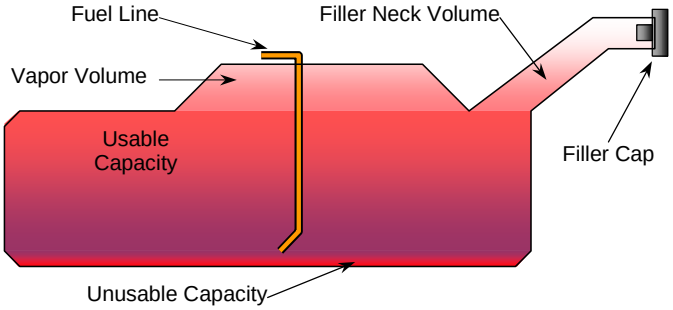
DATA SHEET NO. 4…..(CONTINUED)
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	64.4
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	59.20 to 60.49
Actual Amount of Solvent used	59.8
1/3 of Usable Capacity	21.5

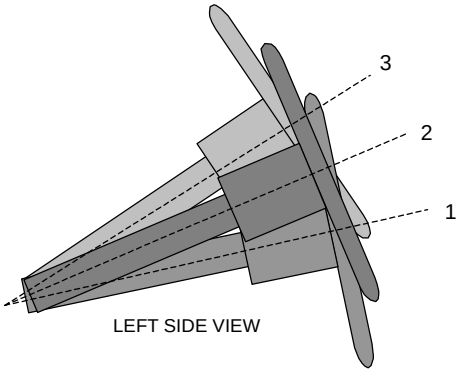
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies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



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees
Lowermost positon No. 1	13.5
Geometric center position No. 2	24.5
Uppermost position No. 3	35.5

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

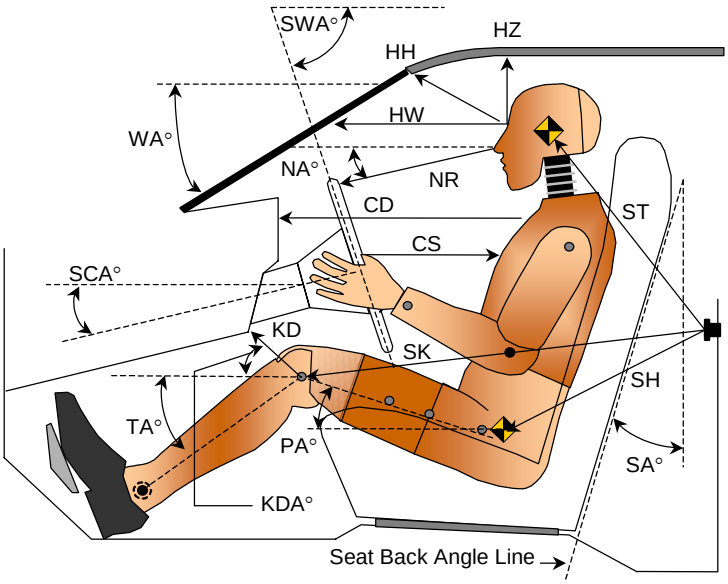
Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

TEST DUMMY POSITION MEASUREMENTS

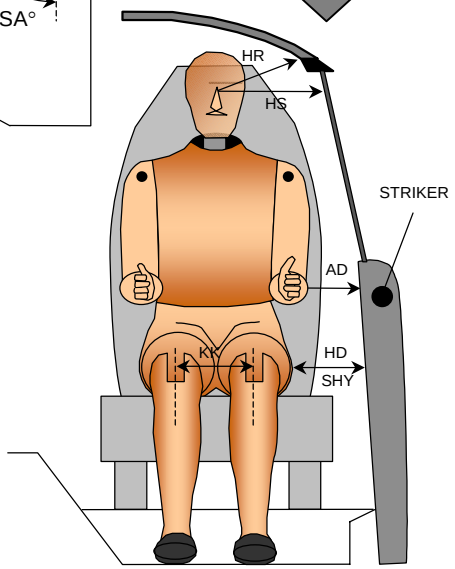
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		68		
SWA	Steering Wheel Angle		65.0		
SCA	Steering Column Angle		25.0		
SA	Seat Back Angle		23.4		25.2
HZ	Head to Roof (Z)	180	90	245	90
HH	Head to Header	300		465	
HW	Head to Windshield	590		785	
HR	Head to Side Header (Y)	235		290	
NR	Nose to Rim	375	11		
CD	Chest to Dash	530		595	
CS	Chest to Steering Hub	285			
RA	Rim to Abdomen	180			
KDL	Left Knee to Dash	175	33	155	
KDR	Right Knee to Dash	185		205	15
PA	Pelvic Angle		22		24
TA	Tibia Angle		42		48
KK	Knee to Knee (Y0	310		315	
SK	Striker to Knee	560	11	464	10
ST	Striker to Head	535	87	540	86
SH	Striker to H-Point	210		135	
SHY	Striker to H-Point (Y)	218		240	
HS	Head to Side Window	335		355	
HD	H-Point to Door (Y)	185		165	
AD	Arm to Door (Y)	30		50	

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

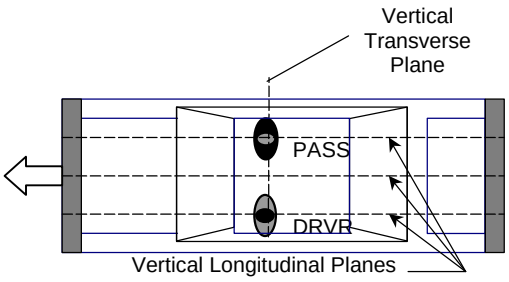
Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



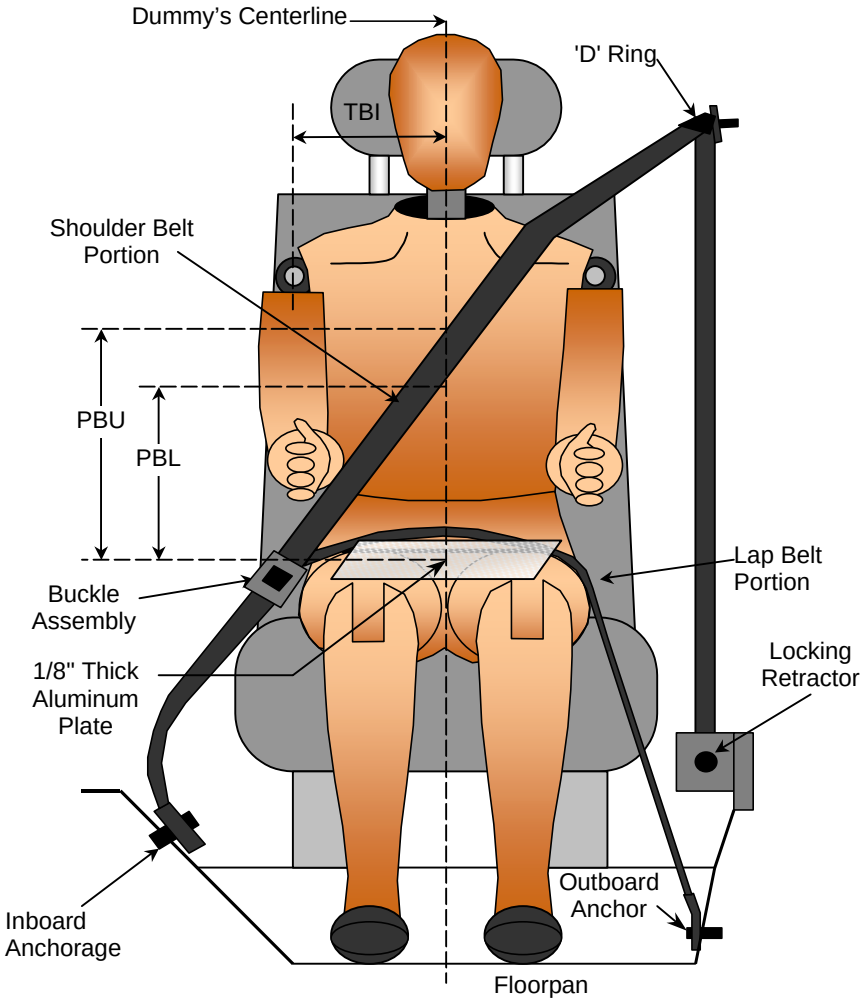
CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	195	180
PBU - Top Surface of reference to belt upper edge	mm	295	290
PBL - Top Surface of reference to belt lower edge	mm	220	210
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: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

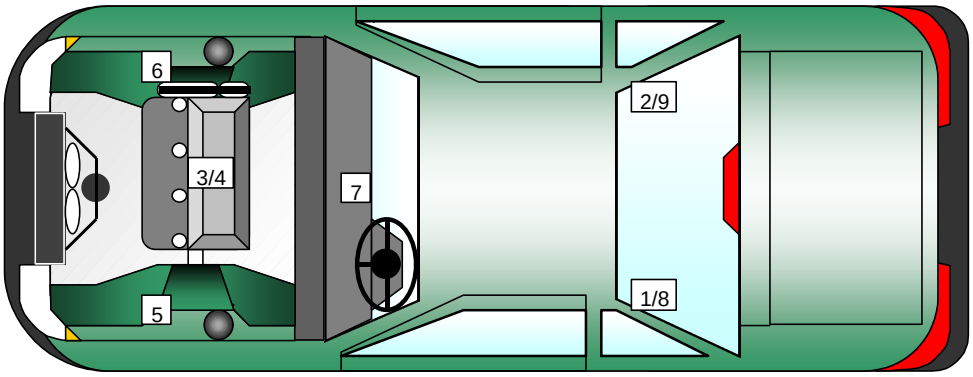
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

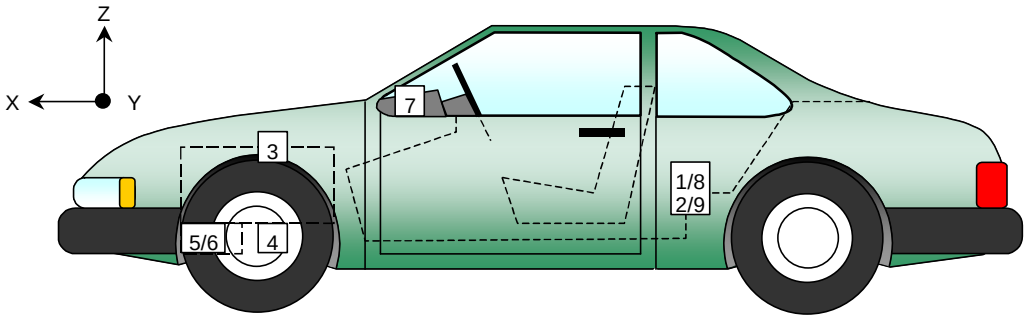
VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member	2080	-660	250	G's	1.1	145.3	-34.6	55.4
2	Right Rear X-Member	2080	560	250	G's	1.8	152.8	-37.2	58.0
3	Engine Top	4275	-10	742	G's	0.0	0.0	0.0	0.0 [1]
4	Engine Bottom	4110	70	257	G's	0.0	0.0	0.0	0.0 [1]
5	Left Brake Caliper	4080	-736	137	G's	0.0	0.0	0.0	0.0 [1]
6	Right Brake Caliper	4080	736	137	G's	0.0	0.0	0.0	0.0 [1]
7	Instrument Panel	3050	0	1070	G's	50.1	35.8	-94.3	74.3
8	Left Rear X-Member (Z-Axis)	2080	-630	250	G's	10.3	48.1	-8.5	44.8
9	Right Rear X-Member (Z-Axis)	2080	600	250	G's	13.4	59.1	-12.6	54.6

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

1.) Channel failed, no data





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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

HEAD PRIMARY PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	16.4	250.4	-56.4	75.4	5.3	298.8	-50.7	84.0
Head CG	Y	G's	3.5	157.4	-23.2	90.3	4.9	52.6	-22.2	87.7
Head CG	Z	G's	19.9	83.3	-8.5	96.0	29.1	82.3	-9.9	110.0
Head CG Resultant	N/A	G's	60.2	77.9			61.5	84.7		

CHEST PRIMARY PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.7	192.9	-57.9	90.2	2.0	151.8	-41.1	89.0
Chest CG	Y	G's	3.1	103.9	-7.5	91.9	1.3	154.7	-7.6	85.4
Chest CG	Z	G's	17.8	83.5	-8.4	117.3	18.9	80.0	-8.6	111.6
Chest CG Resultant	N/A	G's	59.2	90.0			43.9	85.4		

FEMUR PEAK FORCES

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	178.5	51.3	-6795.1	67.8	281.9	57.7	-5511.6	67.9
Right Femur	Z	Newtons	129.3	159.6	-6024.3	66.8	225.1	53.6	-3737.1	73.9

SEAT BELT SENSOR PEAK VALUES

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Shoulder Belt Pullout	N/A	MM	240.4	105.5	0.0	5.8	262.4	101.2	-0.1	0.0
Shoulder Belt Stretch	N/A	MM/CM	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0 [1]
Lap Belt Force	N/A	Newtons	3934.5	69.6	-76.1	160.2	3955.0	72.4	-37.8	299.9
Shoulder Belt Force	N/A	Newtons	3763.0	83.0	-0.6	0.0	4090.4	83.9	-22.8	299.9

1.) Not used with pre-tensioners

	Driver				Passenger			
Location	HIC	T^1	T^2	Avg G	HIC	T^1	T^2	Avg G
Head CG Primary	596.2	61.8	96.1	49.6	509.3	61.9	97.8	45.8

PRIMARY CHEST CLIP (3MSEC)

	Driver			Passenger		
Location	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	58.5	88.2	91.2	43.7	84.8	87.8

DATA SHEET NO. 8…(continued)

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

PELVIC PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	3.4	142.6	-77.6	67.3	2.1	138.3	-59.8	68.2
Pelvis	Y	G's	11.4	90.8	-7.5	71.8	3.3	60.7	-6.8	95.2
Pelvis	Z	G's	3.8	276.2	-16.5	69.3	2.9	288.0	-17.4	103.8
Pelvis Resultant	N/A	G's	79.0	67.3			60.5	68.2		

UPPER NECK PEAK FORCES AND MOMENTS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	724.8	72.7	-304.3	155.3	1161.8	76.5	-193.0	61.9
Neck Force	Y	Newtons	309.5	82.5	-91.7	62.0	421.5	68.1	-217.3	151.3
Neck Force	Z	Newtons	1721.0	84.4	-350.4	117.4	1108.1	62.8	-404.4	108.7
Neck Force Resultant	N/A	Newtons	1816.4	84.4			1246.3	84.4		
Neck Moment	X	N•m	17.4	95.0	-12.8	111.5	9.5	112.9	-31.4	71.1
Neck Moment	Y	N•m	48.2	73.0	-23.3	270.3	116.1	76.5	-16.7	57.2
Neck Moment	Z	N•m	23.9	97.0	-8.8	160.8	21.9	109.5	-12.3	173.0
Neck Moment Resultant	N/A	N•m	50.3	73.5			119.2	76.5		

FOOT PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	30.5	40.0	-29.5	63.9	20.3	86.2	-102.3	63.6
Left Foot Aft	Z	G's	9.9	88.8	-44.3	75.0	16.3	81.9	-39.0	43.1
Left Foot Fore	Z	G's	10.3	71.0	-79.2	74.3	0.0	0.0	0.0	0.0 [1]
Right Foot Aft	X	G's	13.6	85.0	-83.8	65.9	25.6	84.3	-50.5	71.0
Right Foot Aft	Z	G's	20.5	88.8	-41.9	59.6	8.6	92.0	-27.8	40.4
Right Foot Fore	Z	G's	30.0	89.0	-124.2	65.2	16.1	89.9	-38.1	42.4

1.) Channel failed, no data

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Left Upper Moment	X	N•m	43.0	77.1	-11.9	48.9	36.6	107.0	-45.4	46.2
Left Upper Moment	Y	N•m	17.8	164.2	-79.9	65.4	16.9	153.1	-91.9	62.3
Right Upper Moment	X	N•m	40.9	70.8	-44.1	56.5	35.4	66.6	-39.9	81.9
Right Upper Moment	Y	N•m	18.8	147.9	-147.8	70.7	16.1	139.6	-95.7	72.6
Left Lower Moment	X	N•m	26.4	77.0	-41.0	41.7	75.5	74.7	-19.3	44.8
Left Lower Moment	Y	N•m	37.7	40.5	-44.6	68.5	40.3	89.3	-62.0	62.5
Left Lower Force	Z	Newtons	51.7	273.4	-2239.4	39.6	98.4	186.6	-4836.2	72.5
Right Lower Moment	X	N•m	17.6	55.2	-145.7	70.1	9.7	33.9	-77.2	82.1
Right Lower Moment	Y	N•m	52.7	78.6	-70.0	64.5	40.6	83.6	-39.6	71.4
Right Lower Force	Z	Newtons	182.8	291.5	-4631.5	67.0	125.2	144.0	-2284.6	83.4 [1]

1.) Channel failed at 156.7 msec.

DATA SHEET NO. 8…(continued)

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

CHEST PEAK DISPLACEMENTS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.2	1.8	-25.3	89.7	0.5	29.7	-20.2	83.5

HEAD REDUNDANT PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	16.8	250.4	-56.8	75.3	5.2	299.9	-50.2	84.7
Head CG	Y	G's	3.6	173.5	-23.3	91.8	4.8	59.5	-22.2	89.0
Head CG	Z	G's	19.3	83.0	-8.7	96.2	29.0	84.5	-10.4	109.5
Head CG Resultant	N/A	G's	59.8	77.7			61.2	85.2		

CHEST REDUNDANT PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.7	192.6	-58.1	90.2	2.0	151.7	-41.3	88.9
Chest CG	Y	G's	3.3	101.9	-7.4	91.9	1.2	144.2	-7.7	85.2
Chest CG	Z	G's	17.5	83.5	-8.3	115.8	19.0	80.1	-8.9	106.9
Chest CG Resultant	N/A	G's	59.3	90.1			44.2	85.3		

REDUNDANT HEAD INJURY CRITERA (HIC)

	Driver				Passenger			
Location	HIC	T^1	T^2	Avg G	HIC	T^1	T^2	Avg G
Head CG Redundant	603.0	61.7	96.3	49.7	508.0	62.0	97.9	45.7

REDUNDANT CHEST CLIP (3MSEC)

	Driver			Passenger		
Location	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Redundant	58.5	88.3	91.3	43.9	84.7	87.7

DATA SHEET NO. 9
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	195	180
PBU - Top Surface of reference to belt upper edge	mm	295	290
PBL - Top Surface of reference to belt lower edge	mm	220	210
Lap Belt Tension	Newton's	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	645	645
Shoulder Belt length as measured on ATD	mm	780	775
Lap Belt length as measured on ATD	mm	645	575
Remainder of belt on reel	mm	1160	1280
Total belt length for continuous webbing systems	mm	3230	3275

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	N/A	N/A
As determined electronically	mm	240.4	262.4

BELT STRETCH DATA

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

* Not used with shoulder belt pre-tensioner systems

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

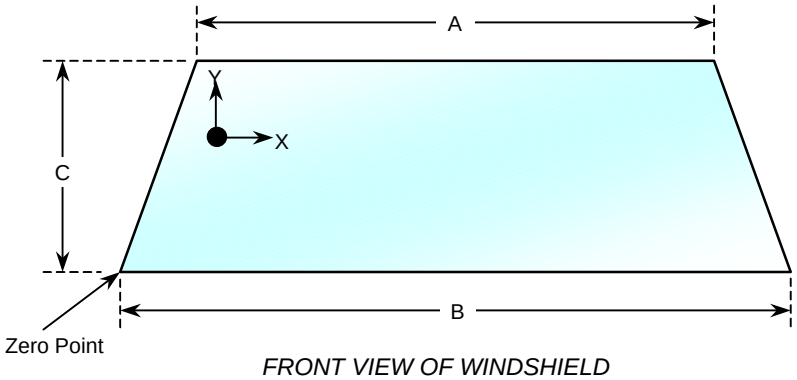
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

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	2171.0	2171.0	100.0
Right Side	2171.0	2171.0	100.0
Total	4342.0	4342.0	100.0



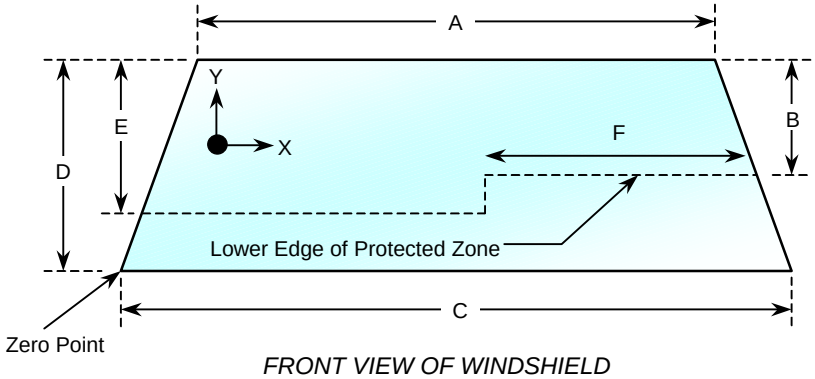
FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1230.0	8.0
B	mm	1620.0	18.0
C-Left	mm	746.0	8.0
C-Right	mm	746.0	8.0

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03



FRONT VIEW OF WINDSHIELD

WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1230
B	mm	510
C	mm	1620
D	mm	746
E	mm	486
F	mm	340

AREA OF PROTECTED ZONE FAILURES

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

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

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

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

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

Test Time: 12:03 PM Temperature: 28.9 Deg. C.

STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

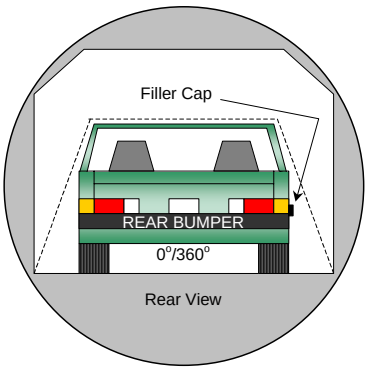
B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)

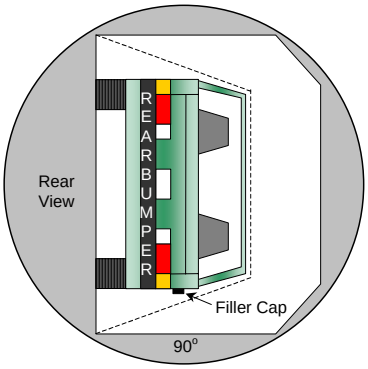
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)

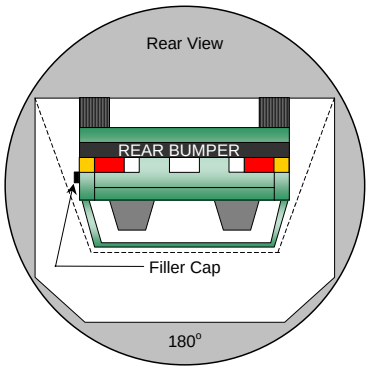
D. Spillage Location Details: No leakage occurred

DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

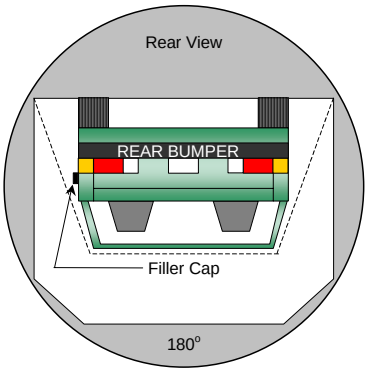
Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

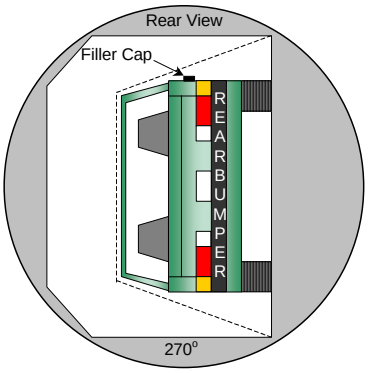


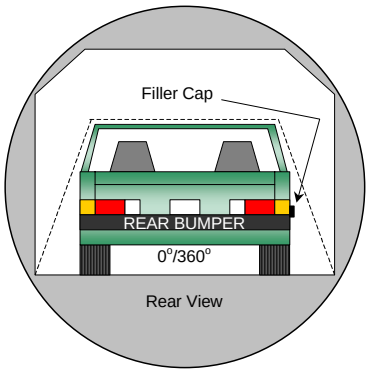




0° to 90° **90° to 180°**







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: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	87	300	387
90° to 180°	87	300	387
180° to 270°	75	300	375
270° to 360°	80	300	380

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

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

ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)

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

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	5034	4450	-584
2	RSOV to front of engine	mm	4400	4088	-312
3	RSOV to firewall centerline	mm	3816	3763	-53
4	RSOV to leading edge of right door	mm	3414	3405	-9
5	RSOV to leading edge of left door	mm	3414	3401	-13
6	RSOV to lower leading edge of right door	mm	3371	3356	-15
7	RSOV to lower leading edge of left door	mm	3372	3360	-12
8	RSOV to upper trailing edge of right door	mm	2314	2304	-10
9	RSOV to upper trailing edge of left door	mm	2315	2301	-14
10	RSOV to lower trailing edge of right door	mm	2322	2310	-12
11	RSOV to lower trailing edge of left door	mm	2329	2317	-12
12	RSOV to bottom of right 'A' pillar	mm	3359	3346	-13
13	RSOV to bottom of left 'A' pillar	mm	3371	3355	-16
14	RSOV to firewall on right side	mm	3759	3714	-45
15	RSOV to firewall on left side	mm	3764	3699	-65
16	RSOV to steering column	mm	2932	2940	8
17	Center of steering column to left 'A' pillar	mm	405	415	10
18	Center of steering column to headlining	mm	415	373	-42
19	RSOV to right side of front bumper	mm	4832	4409	-423
20	RSOV to left side of front bumper	mm	4834	4362	-472
21	Length of engine block	mm	420	420	0
RD	RSOV to right side of dash panel	mm	3136	3116	-20
CD	RSOV to center of dash panel	mm	3070	3116	46
LD	RSOV to left side of dash panel	mm	3077	3118	41

All measurements in millimeters

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

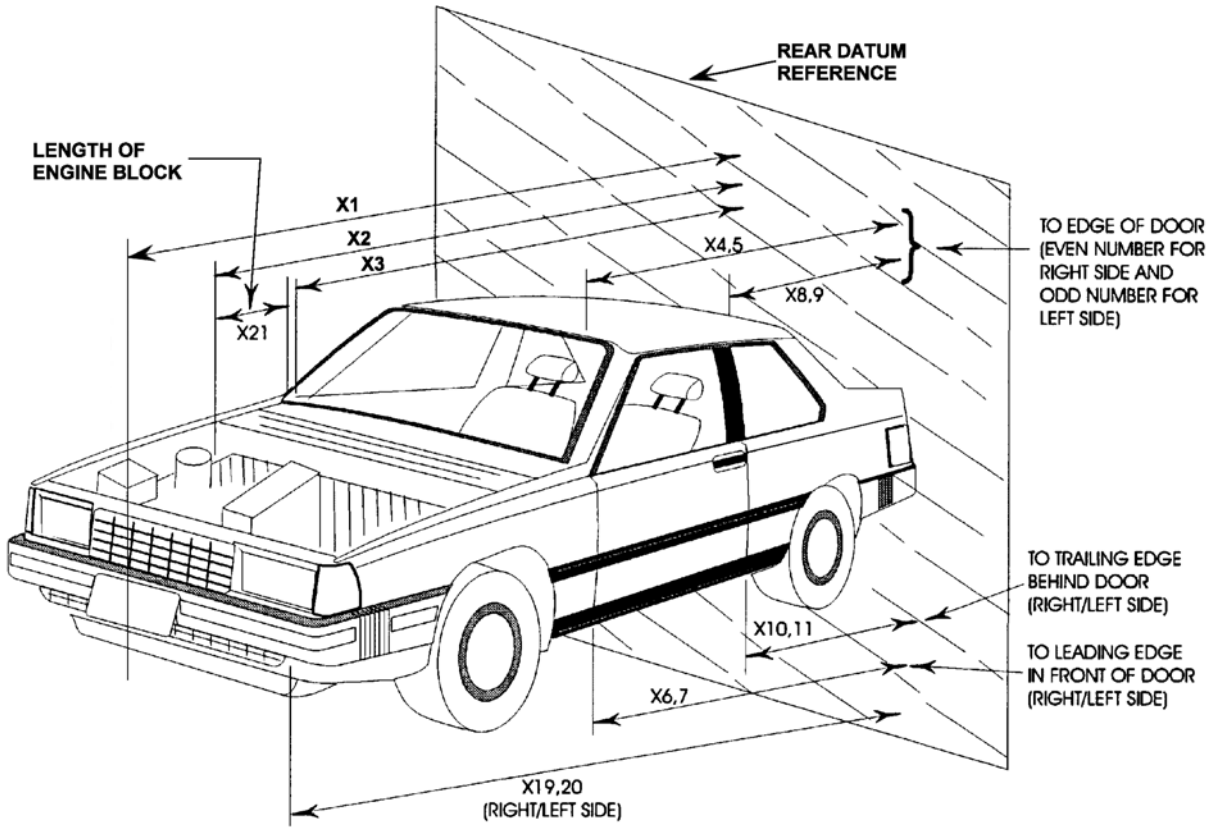
VEHICLE STRUCTURAL MEASUREMENT TABLE

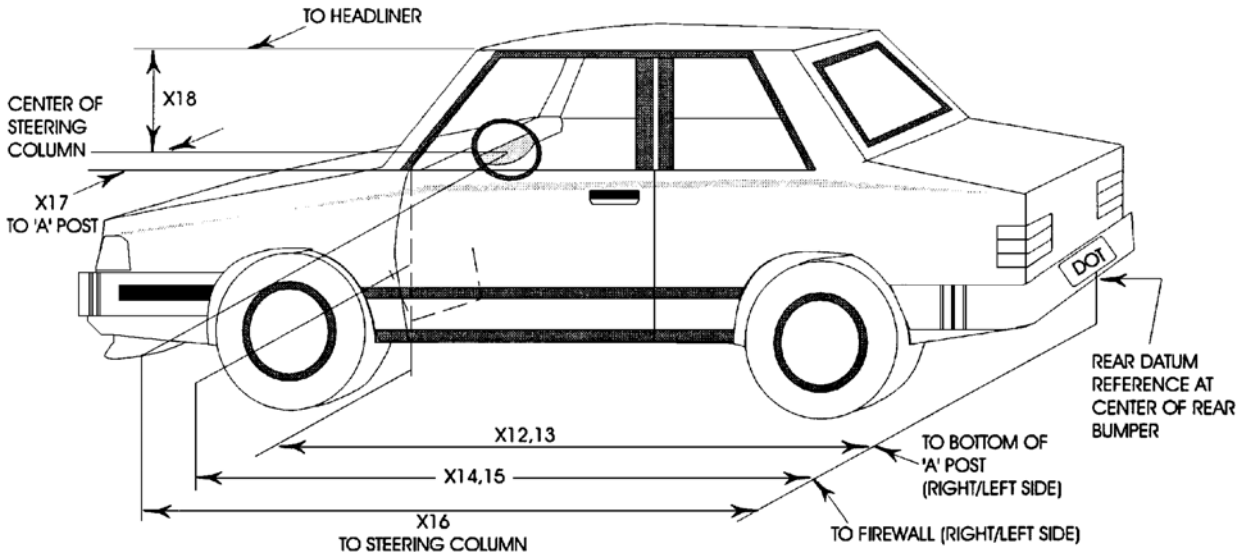
No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	5034	4450	-584
2	Total width	mm	1800	1815	15
3	Bumper top height	mm	596	556	-40
4	Bumper bottom height	mm	225	232	7
5	Longitudinal member top height	mm	507	607	100
6	Longitudinal member bottom height	mm	372	482	110
7	Distance between longitudinal members	mm	911	935	24
8	Longitudunal member width	mm	106	125	19
9	Engine top height	mm	835	823	-12
10	Engine bottom height	mm	166	178	12
11	Engine and gear box width	mm	525	625	100
12	Front bumper to engine distance	mm	632	242	-390
13	Front shock absorber fixing width	mm	880	956	76
14	Bonnet leading edge height	mm	711	663	-48
15	Front shock absorber fixing width	mm	1193	1115	-78
16	Front bumper to front axle distance	mm	1115	528	-587
17	Front axle to 'A' pillar distance	mm	500	445	-55
18	'A' pillar to 'B' pillar distance	mm	968	966	-2
19	'B' pillar to rear axle distance	mm	1225	1215	-10
20	'B' pillar to 'C' pillar distance	mm	891	880	-11
21	Roof sill bottom height	mm	1270	1326	56
22	Roof sill top height	mm	1398	1445	47
23	Floor sill bottom height	mm	199	256	57
24	Floor sill top height	mm	315	356	41

All measurements in millimeters

DATA SHEET NO. 14…(CONTINUED)
VEHICLE MEASUREMENTS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03





DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

VEHICLE CAMERA MEASUREMENT TABLE

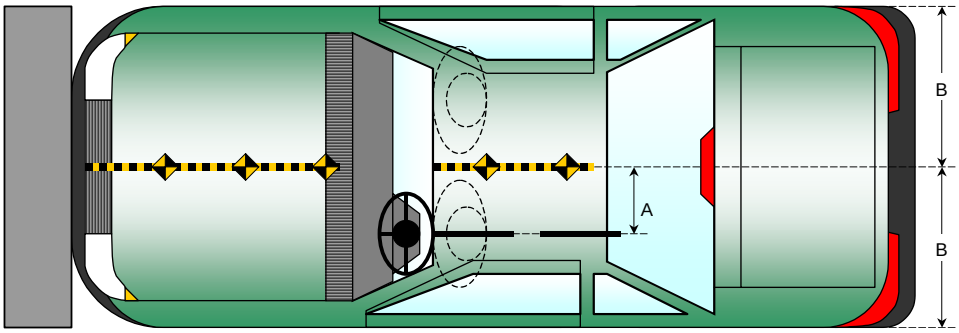
No.	Camera View	Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time	18288	-22860	2540	10	N/A	17-70	24
2	Driver Overall	1930	8357	1321	4	7906	13	1020
2B	Driver Overall	1626	8230	1092	4	7815	17	No Time
3	Driver Close-up	1727	8230	1600	4	7808	35	1010
4	3/4 Driver	6477	10185	4648	13	10966	105	990
5	Steering Column	1524	8230	3404	20	8113	19	970
6	Steering Column	1524	8230	2997	16	8016	19	1020
7	Driver Side Child	3048	-762	1372	20	1274	13	1270
7B	Driver Side Child	2489	8230	2388	20	7948	50	1000
8	Passenger Overall	2286	-8230	1524	6	7759	13	850
9	Passenger Close-up	1219	-6096	1524	4	5796	35	1020
10	3/4 Passenger	8026	-8941	2997	9	10174	80	960
11	Passenger Door	1626	-8836	1702	4	8426	50	990
12	Passenger Side Child	3048	762	1372	20	1274	13	1060
12B	Passenger Side Child	3048	-8839	2032	20	8458	35-85	1020
13	Overhead	610	0	6172	90	N/A	13	1090
14	Driver Front	-610	406	2743	40	N/A	13	1010
15	Passenger Front	-610	406	2743	40	N/A	13	1030
16	Pit Engine	762	0	-1499	90	N/A	9	1050
17	Pit Fuel Tank	3658	0	-1499	90	N/A	6	1080

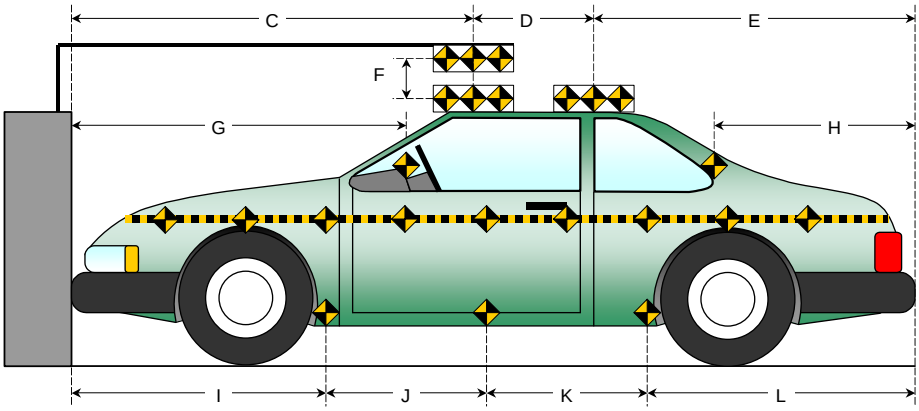
X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run

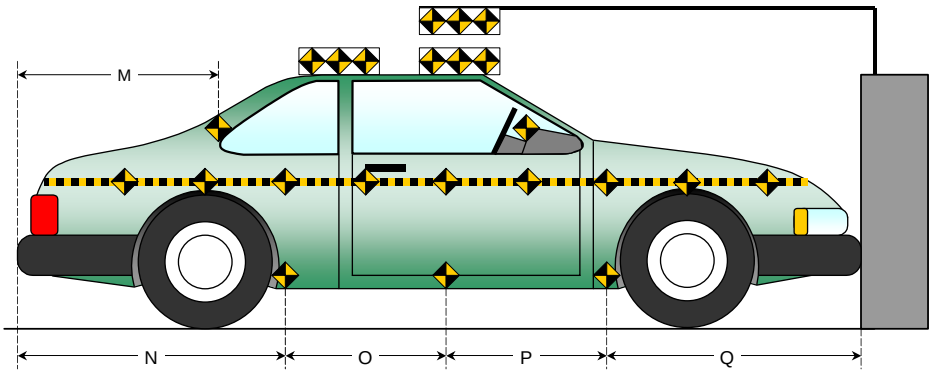
DATA SHEET NO. 16
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

All Dimensions in (mm)	
Item	Value
A	376
B	917
C	2453
D	610
E	1985
F	155
G	1909
H	1181
I	1601
J	954
K	954
L	1554
M	1189
N	1540
O	995
P	995
Q	1588







DATA SHEET NO. 17
VEHICLE INTRUSION MEASUREMENTS

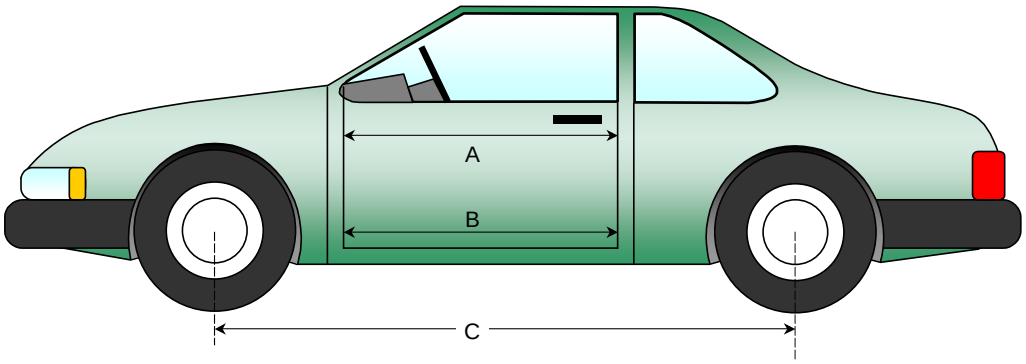
Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

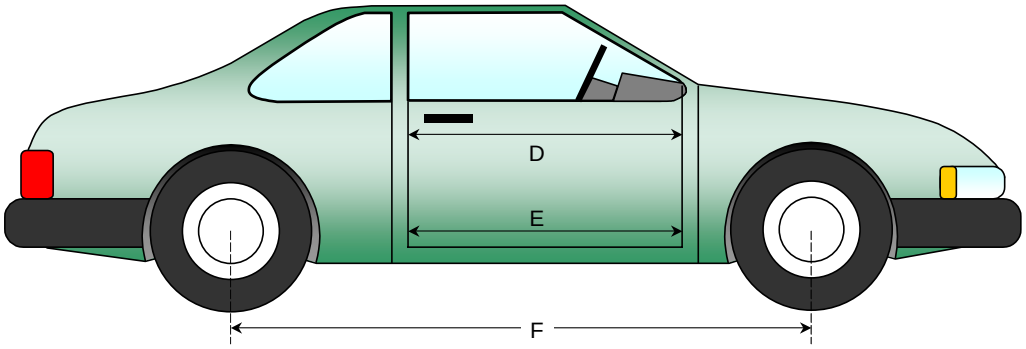
DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	970	966	-4
B	Left Side Lower	mm	908	908	0
D	Right Side Upper	mm	967	969	2
E	Right Side Lower	mm	912	916	4

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2815	2725	-90
F	Right Side Wheel Base	mm	2815	2670	-145





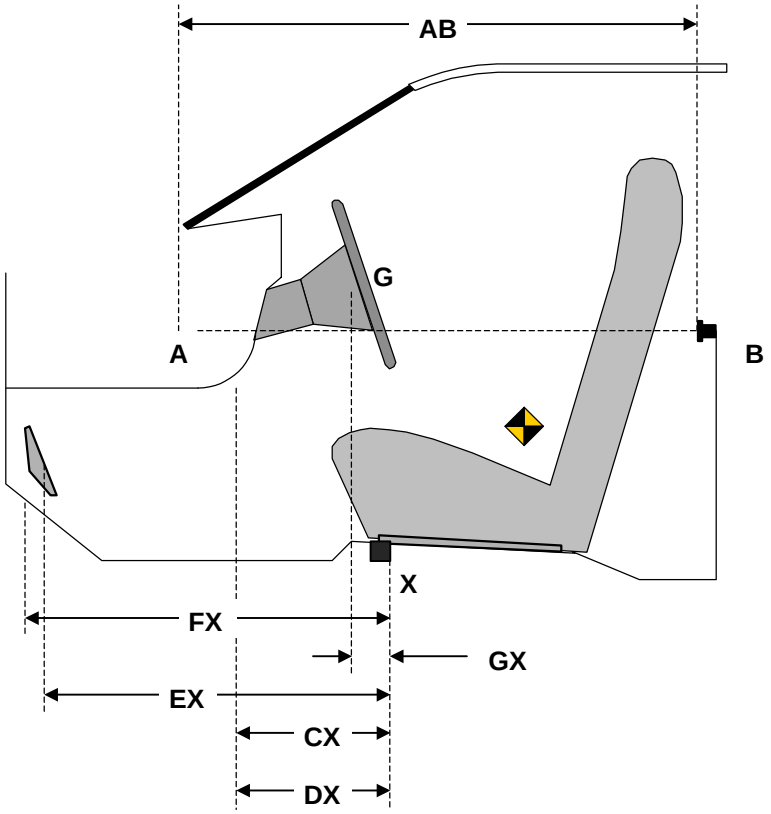
DATA SHEET NO. 17…(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	970	970	0
CX	Left Knee Bolster to X	mm	214	204	-10
DX	Right Knee Bolster to X	mm	210	206	-4
EX	Brake Pedal to X	mm	541	427	-114
FX	Foot Rest to X	mm	550	512	-38
GX	Center of Steering Wheel Hub to X	mm	22	25	3

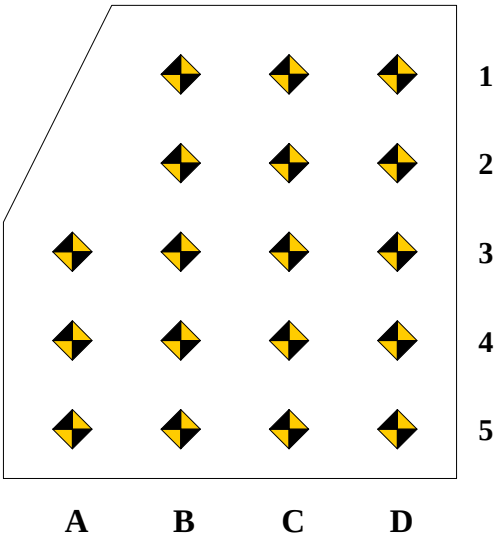
X = Left Front Seat Outboard Anchor Bolt Head



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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP



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		699	690	700		611	615	589		-88	-75	-111
2		599	590	604		541	535	509		-58	-55	-95
3	496	495	490	500	471	436	430	409	-25	-59	-60	-91
4	391	395	390	390	366	356	336	356	-25	-39	-54	-34
5	291	295	290	290	279	272	263	271	-12	-23	-27	-19

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-21	-24	-23		39	43	34		60	67	57
2		-84	-86	-89		-26	-6	-11		58	80	78
3	-92	-95	-95	-88	-56	-81	-48	-14	36	14	47	74
4	-121	-104	-102	-133	-113	-97	-83	-86	8	7	19	47
5	-116	-105	-106	-122	-138	-127	-117	-145	-22	-22	-11	-23

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

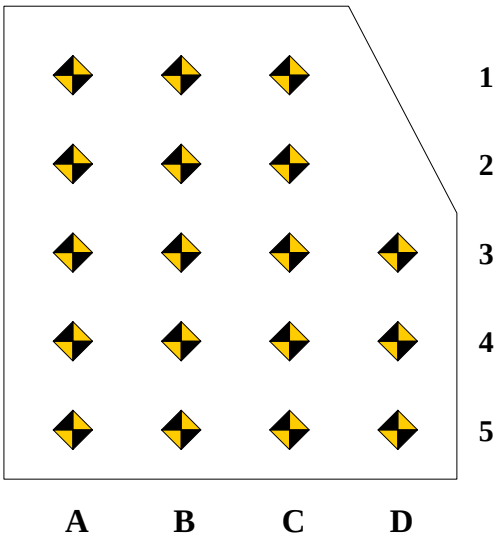
Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

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 Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	681	670	671		548	559	570		-133	-111	-101	
2	582	576	573		493	514	519		-89	-62	-54	
3	477	470	467	482	395	414	419	424	-82	-56	-48	-58
4	375	365	362	380	330	319	320	349	-45	-46	-42	-31
5	271	265	260	270	240	240	236	252	-31	-25	-24	-18

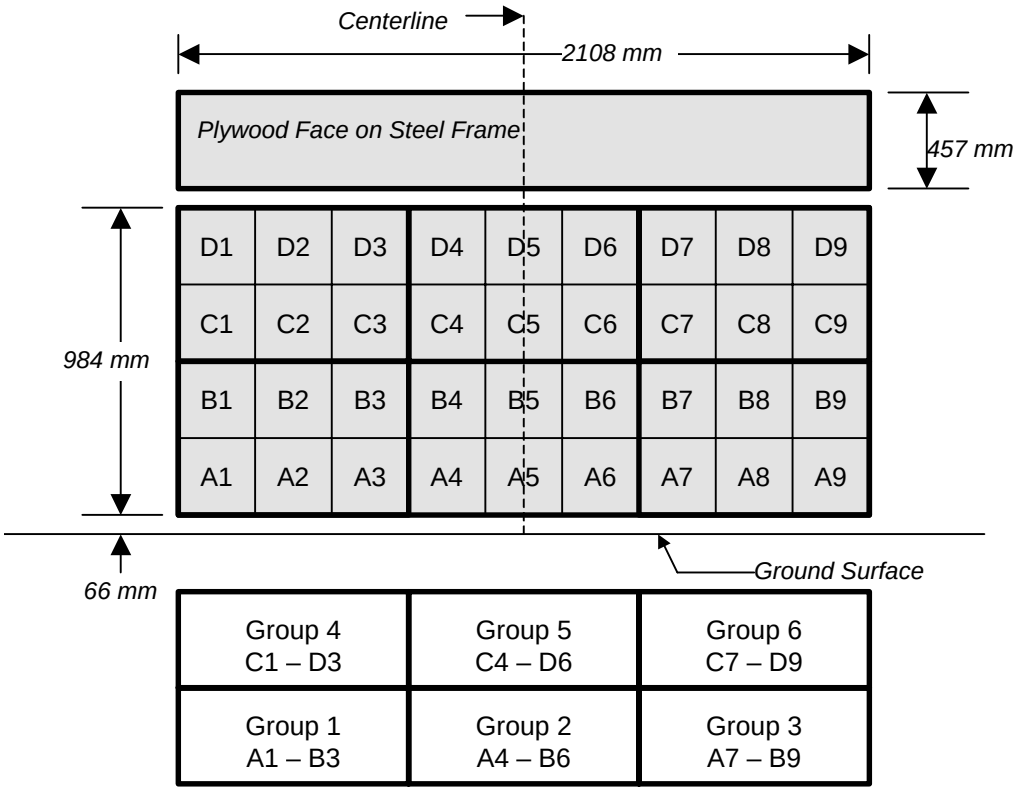
PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	0	0	0		45	52	50		45	52	50	
2	-91	-81	-82		-8	-19	-36		83	62	46	
3	-92	-94	-89	-92	-20	-52	-73	-60	72	42	16	32
4	-110	-100	-105	-115	-91	-93	-105	-125	19	7	0	-10
5	-125	-110	-106	-120	-150	-140	-129	-124	-25	-30	-23	-4

DATA SHEET NO. 18
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

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



6 Groups of 6 Load Cells Each

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

1.) Data from 36 individual load cells

2.) Sum data from 6 groupings shown above (6 cells/group)

3.) Total or sum of all 36 individual load cells

4.) Sum of all 36 individual load cells vs. vehicle dynamic crush

DATA SHEET NO. 19
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

VEHICLE INFORMATION

VIN: 2G2WP522941121660 Wheel base (mm): 2815
Vehicle Size Category: 4-Door Test Weight (kg): 1789

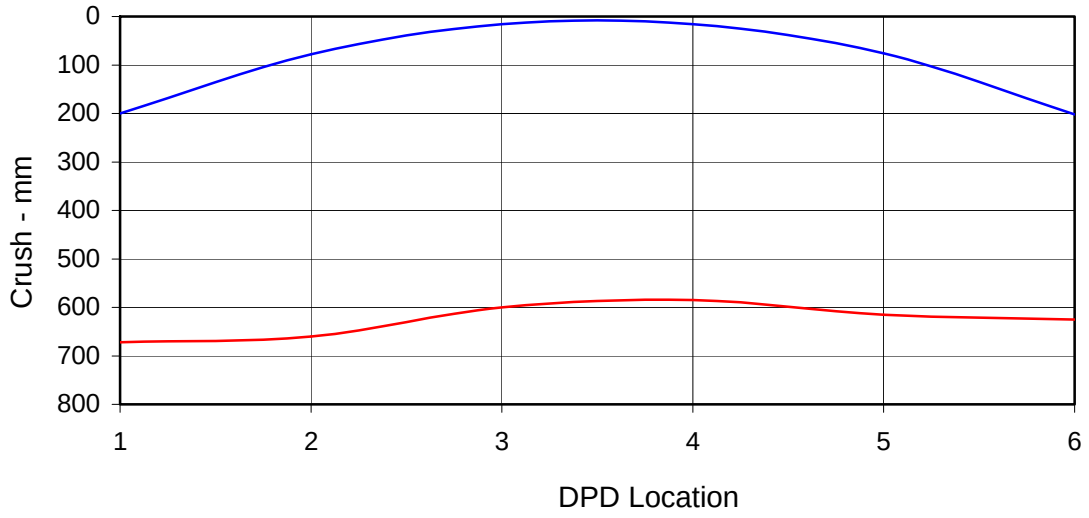
ACCELEROMETER DATA

Accelerometer Location: Left rear floor pan
Cal. Procedure/Interval: 6 months / drop test
Integration Algorithm: NHTSA Standard Linearity: Good
Impact Velocity (km/h): 55.89
Velocity Change (km/h): 64.28 Time of Separation (msec): 90.5

CRUSH PROFILE

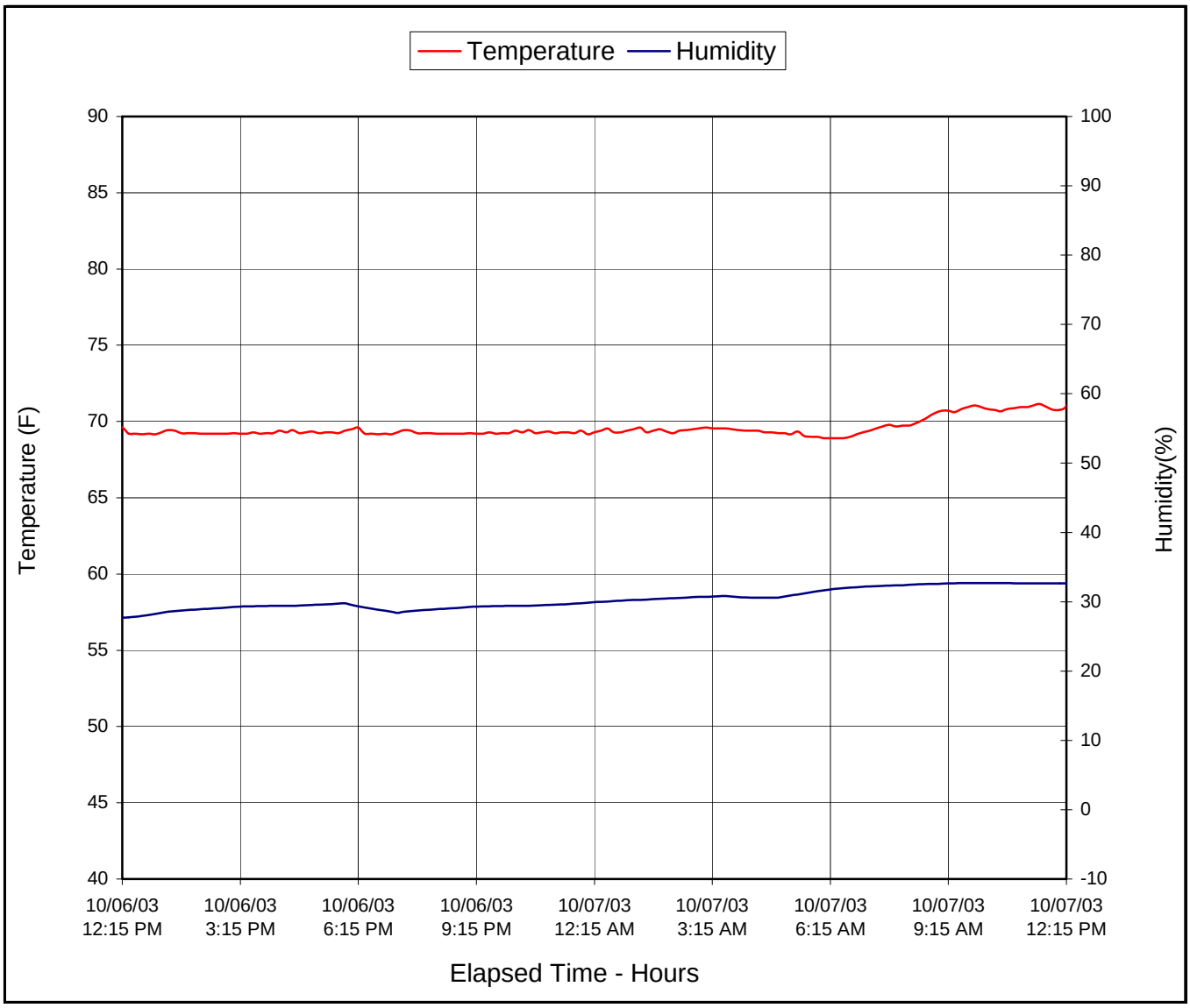
Collision Deformation Classification: 12FDEW6 Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1383 Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	200	672	-472
C2	Crush zone 2 on left side	mm	78	660	-582
C3	Crush zone 3 on left side	mm	16	600	-584
C4	Crush zone 4 on right side	mm	16	585	-569
C5	Crush zone 5 on right side	mm	76	615	-539
C6	Crush zone 6 at right side	mm	202	625	-423



DATA SHEET NO. 20
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03



APPENDIX A

PHOTOGRAPHS

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

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A-58	Vehicle on Rollover Device	A-58
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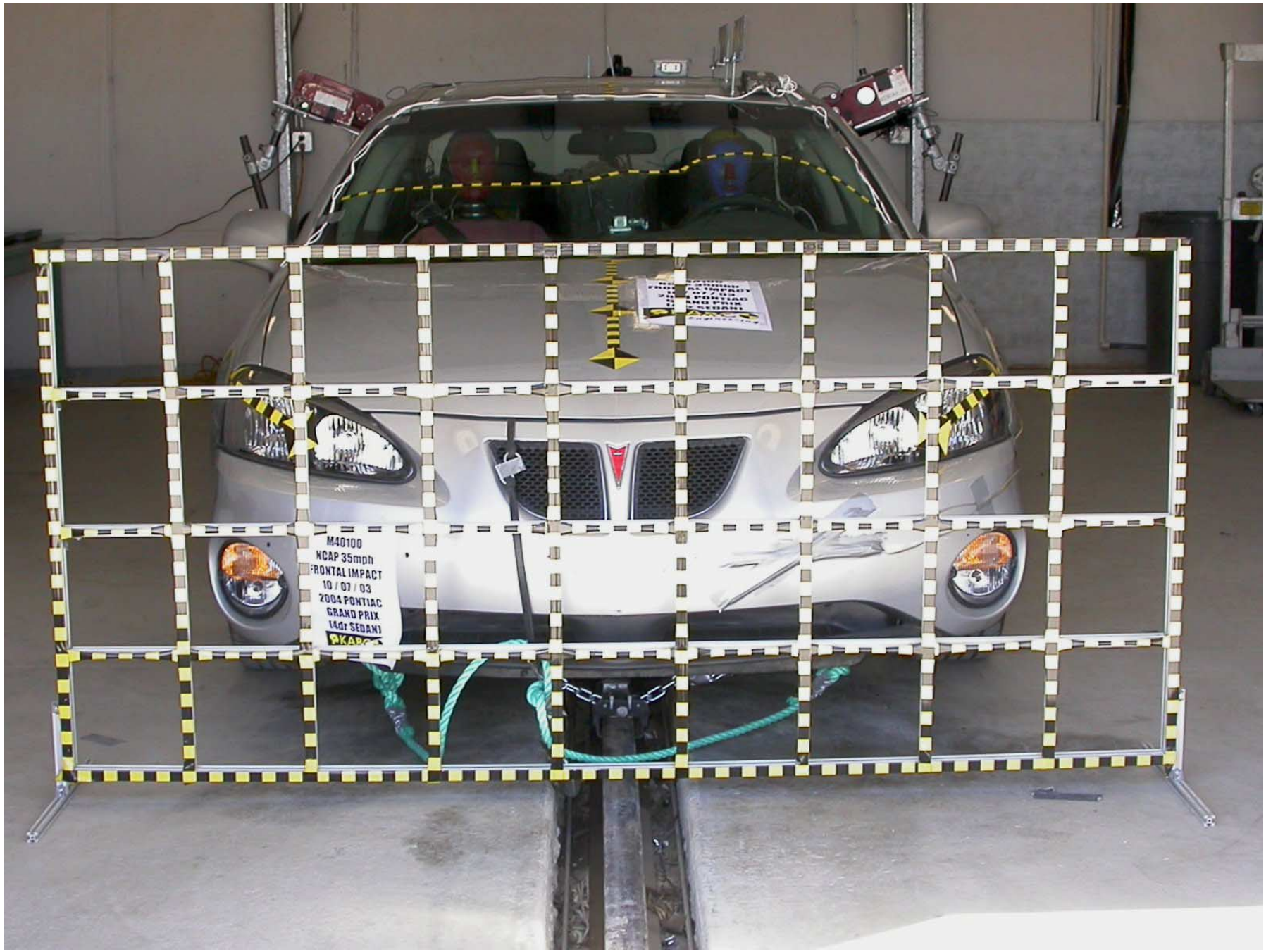

Figure A-1: Load Cell Location

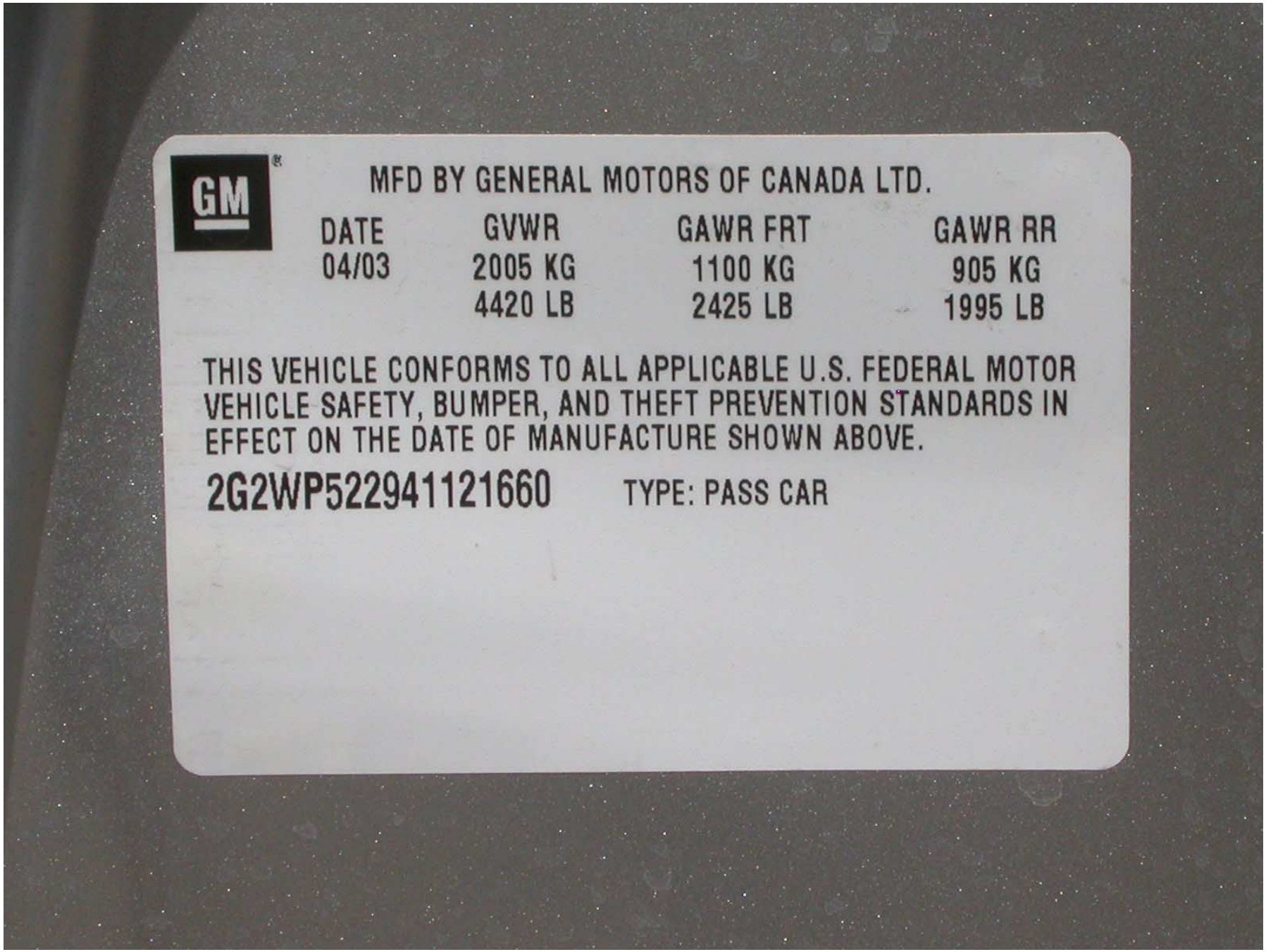

Figure A-2: Vehicle Certification Label

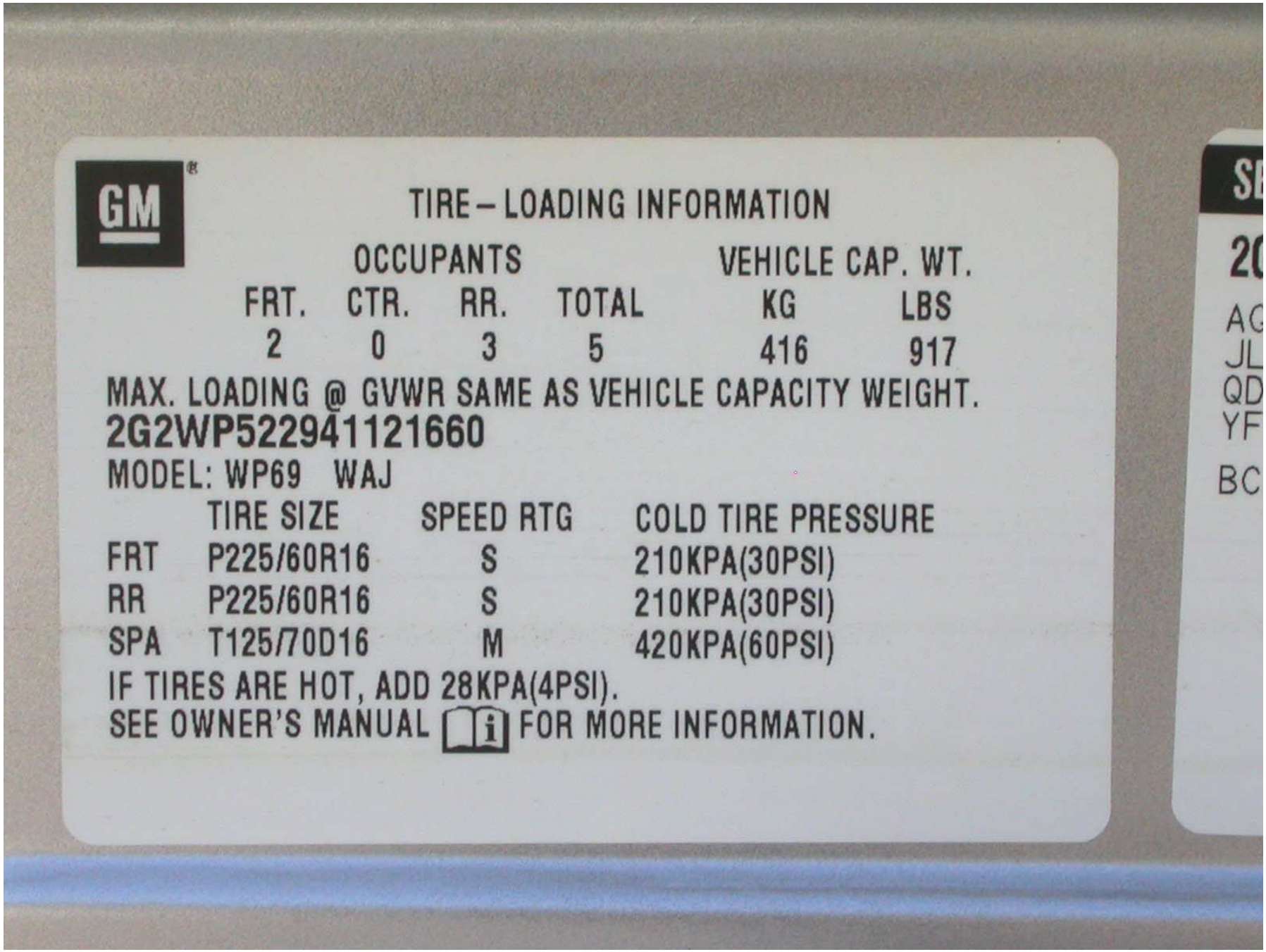

Figure A-3: Vehicle Tire Label

Figure A-4: Right Front ¾ View, As Received

Figure A-5: Left Rear ¾ View, as Received

Figure A-6: Pre-Test Front View

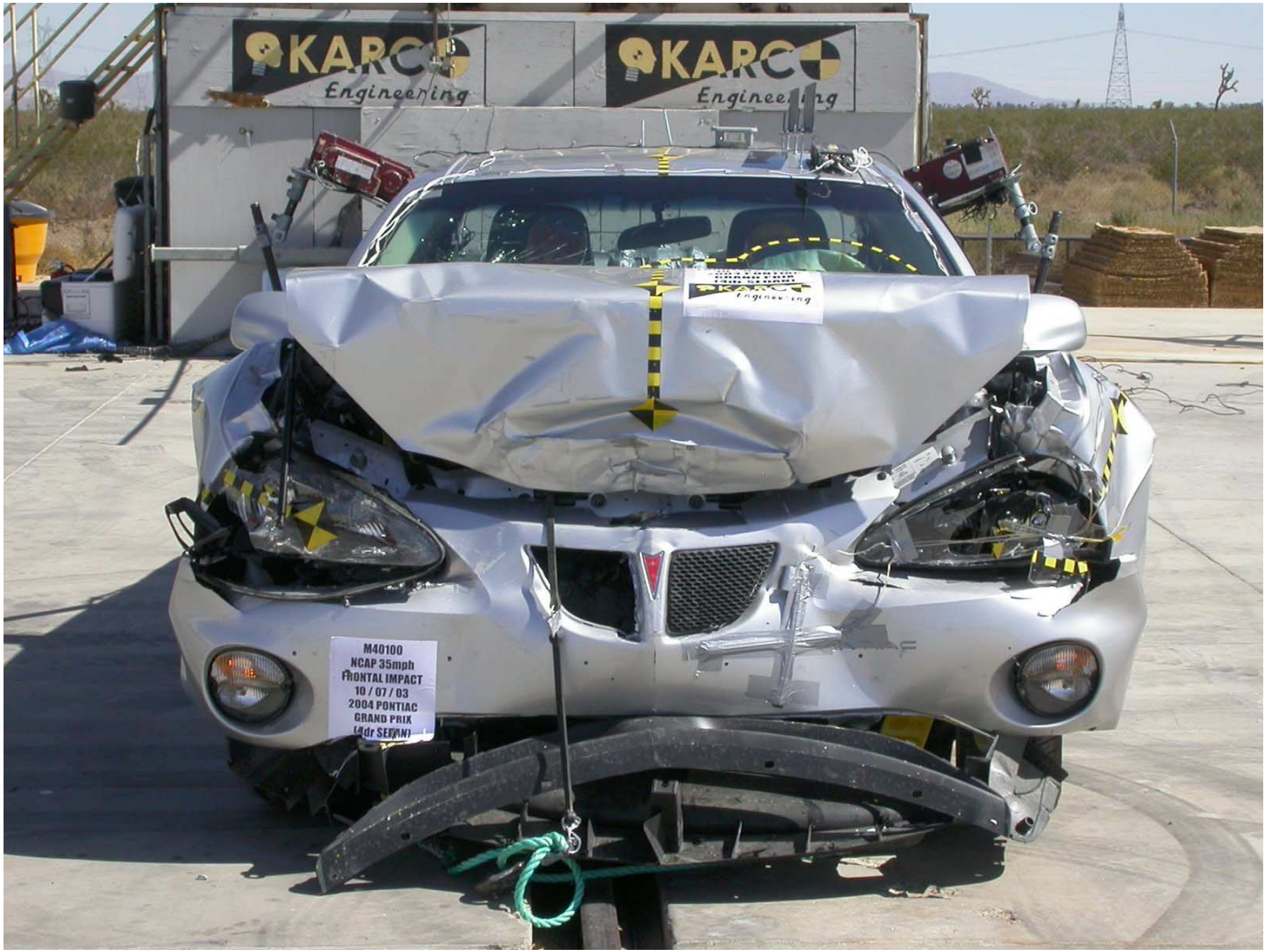

Figure A-7: Post-Test Front View (Vehicle Moved)

Figure A-8: Pre-Test Left Side View

Figure A-9: Post-Test Left Side View

Figure A-10: Pre-Test Right Side View

Figure A-11: Post-Test Right Side View

Figure A-12: Pre-Test Right Front ¾ View

Figure A-13: Post-Test Right Front ¾ View

Figure A-14: Pre-Test Left Rear ¾ View

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

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

Figure A-17: Right Rear ¾ View of Doors After Impact

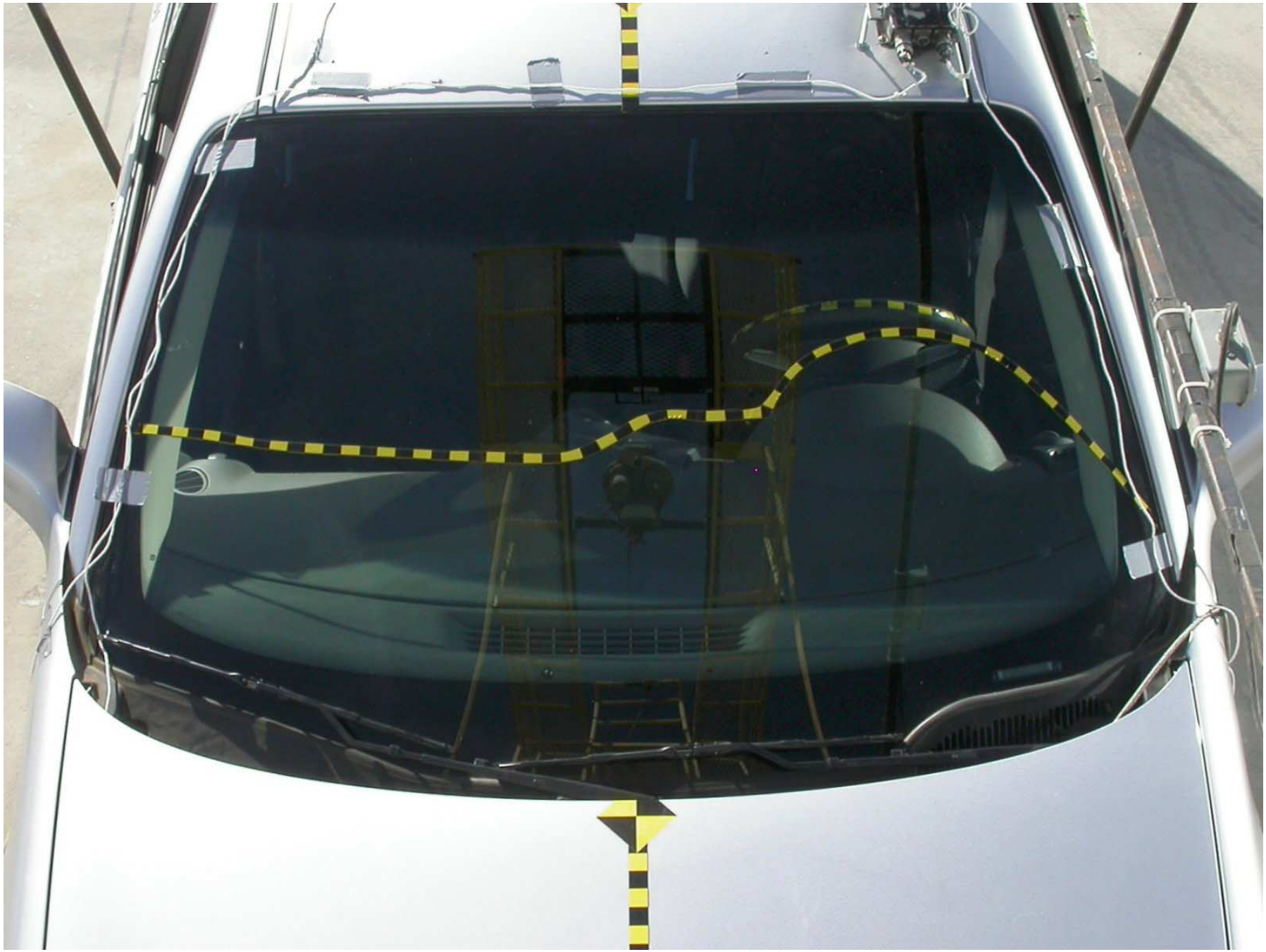

Figure A-18: Pre-Test Windshield View

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

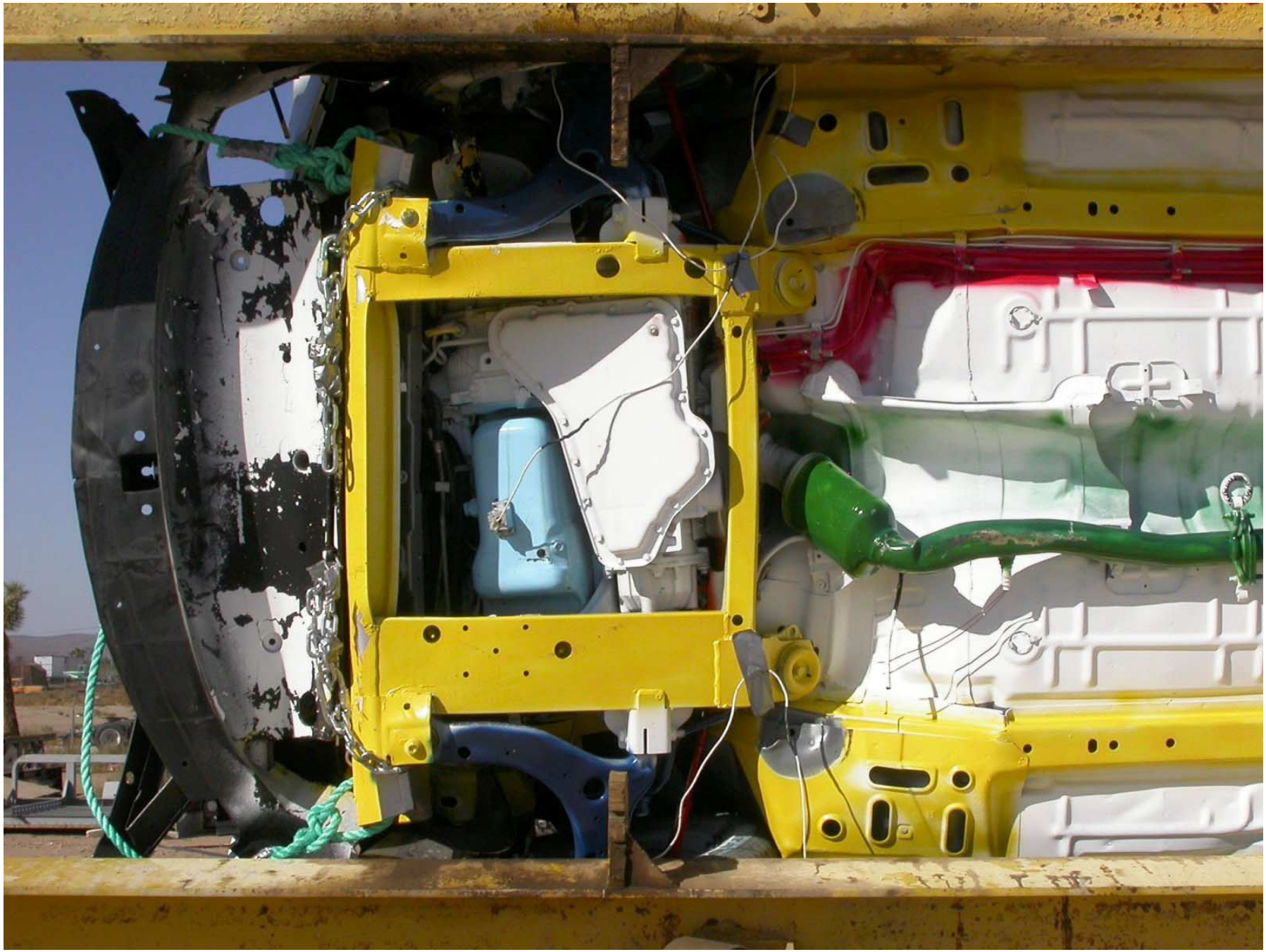

Figure A-25: Post-Test Front Underbody View

Figure A-26: Pre-Test Mid Underbody View

Figure A-27: Post-Test Mid Underbody View

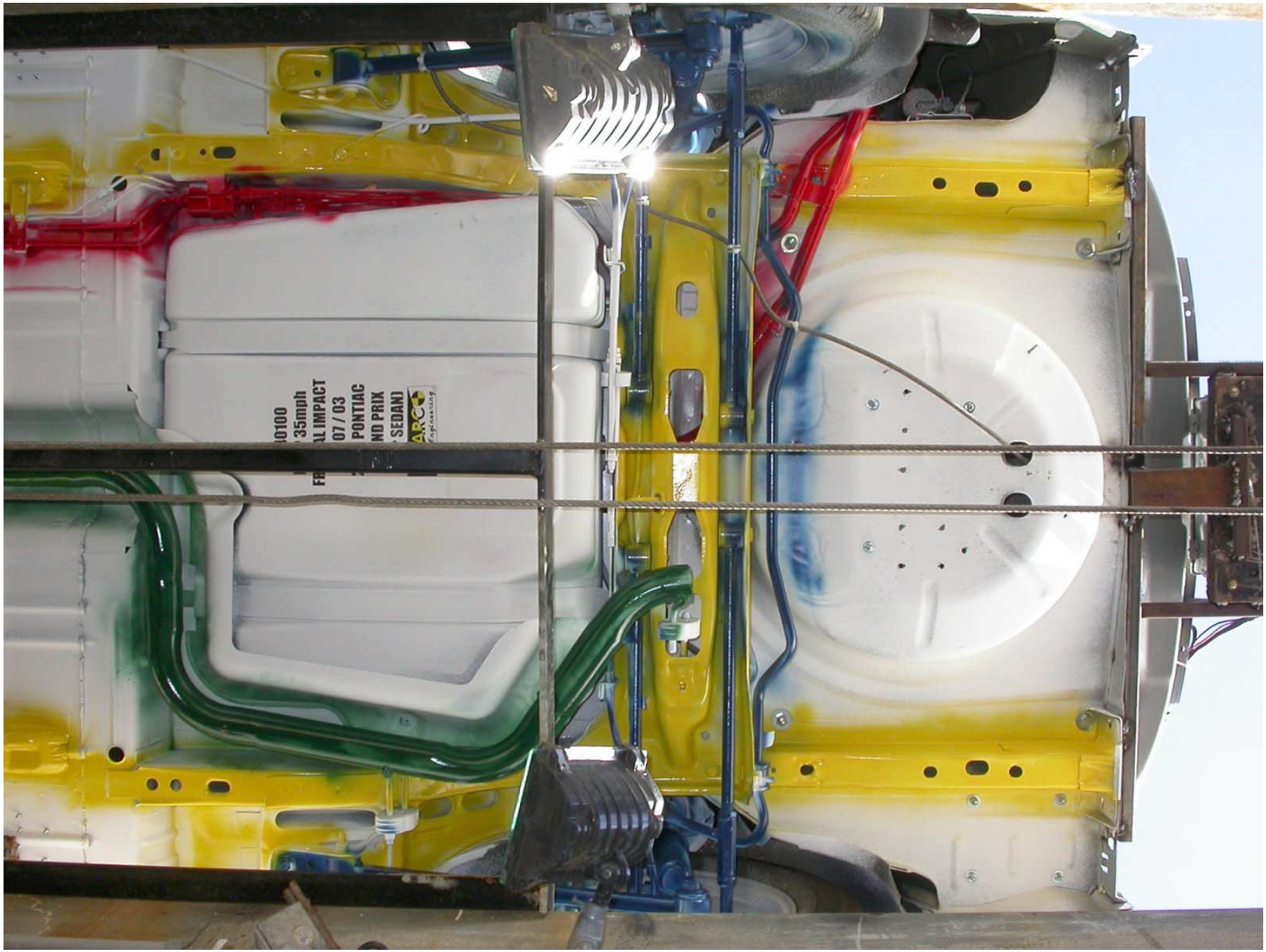

Figure A-28: Pre-Test Rear Underbody View

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

LIST OF DATA PLOTS

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B-3	Driver Head Primary X Displacement	B-3
B-4	Driver Head Primary Y	B-4
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B-9	Driver Head Redundant X Displacement	B-9
B-10	Driver Head Redundant Y	B-10
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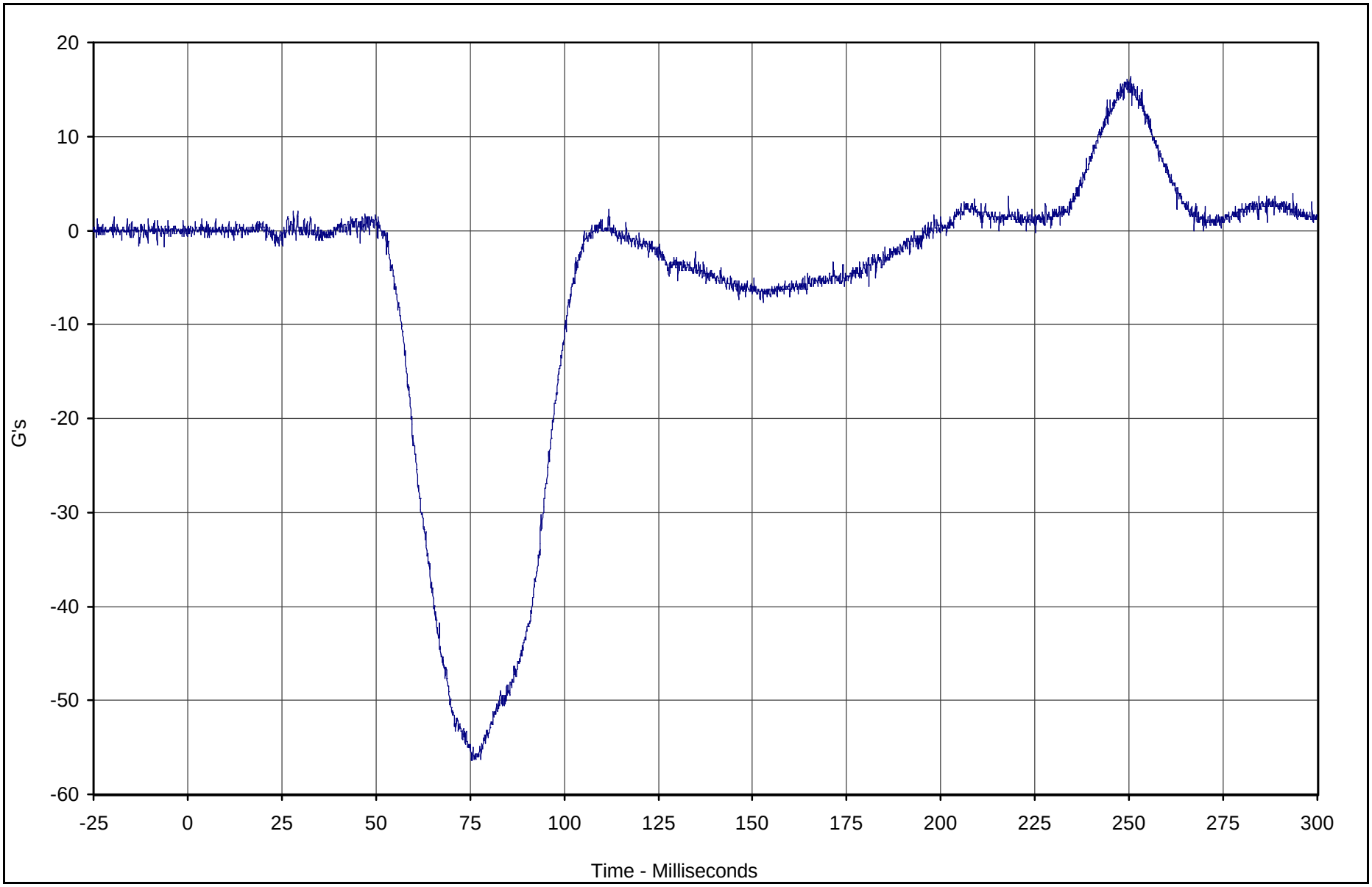


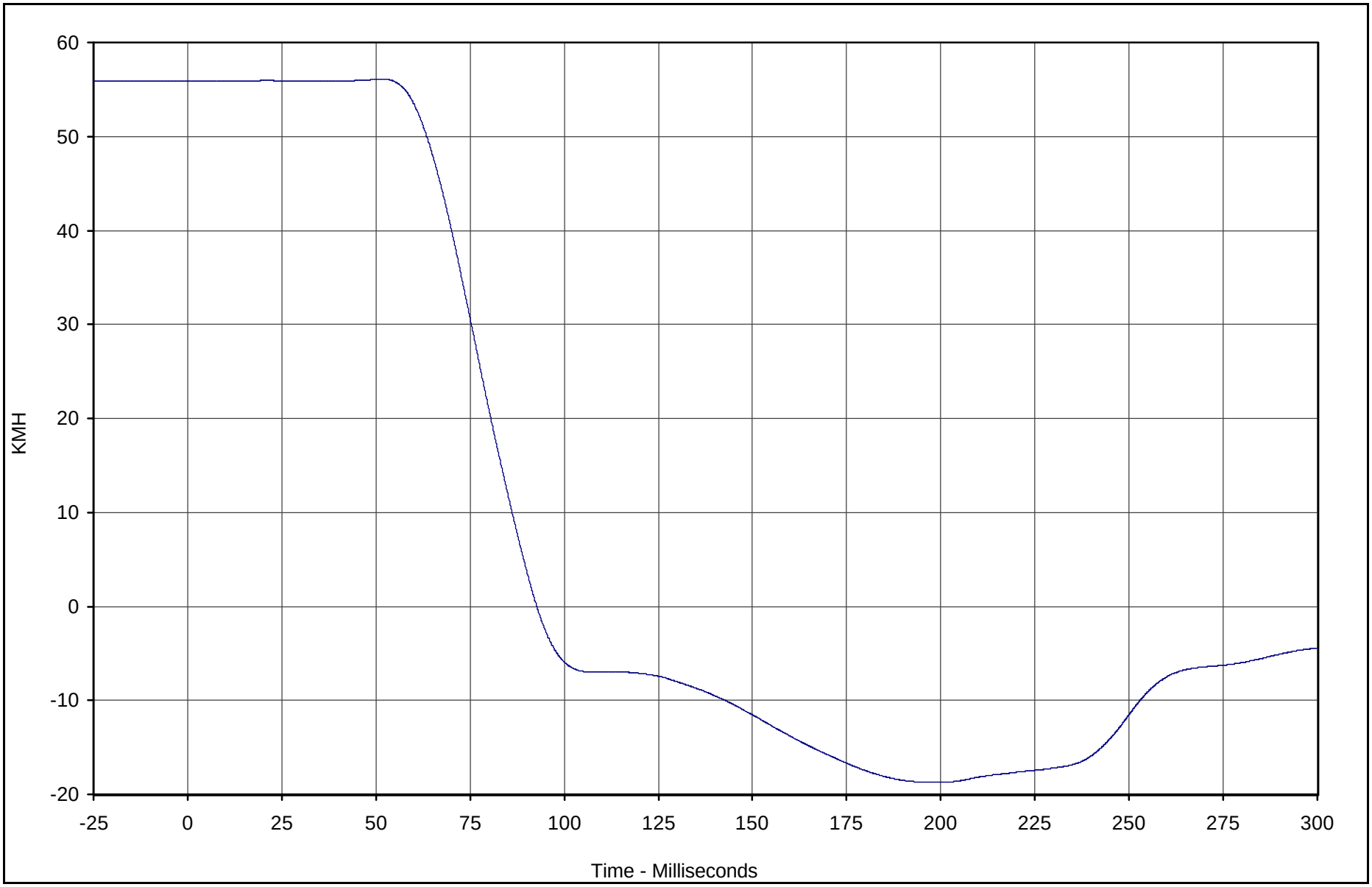
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X	001	FIL	G's	16.4	250.4	-56.4	75.4	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



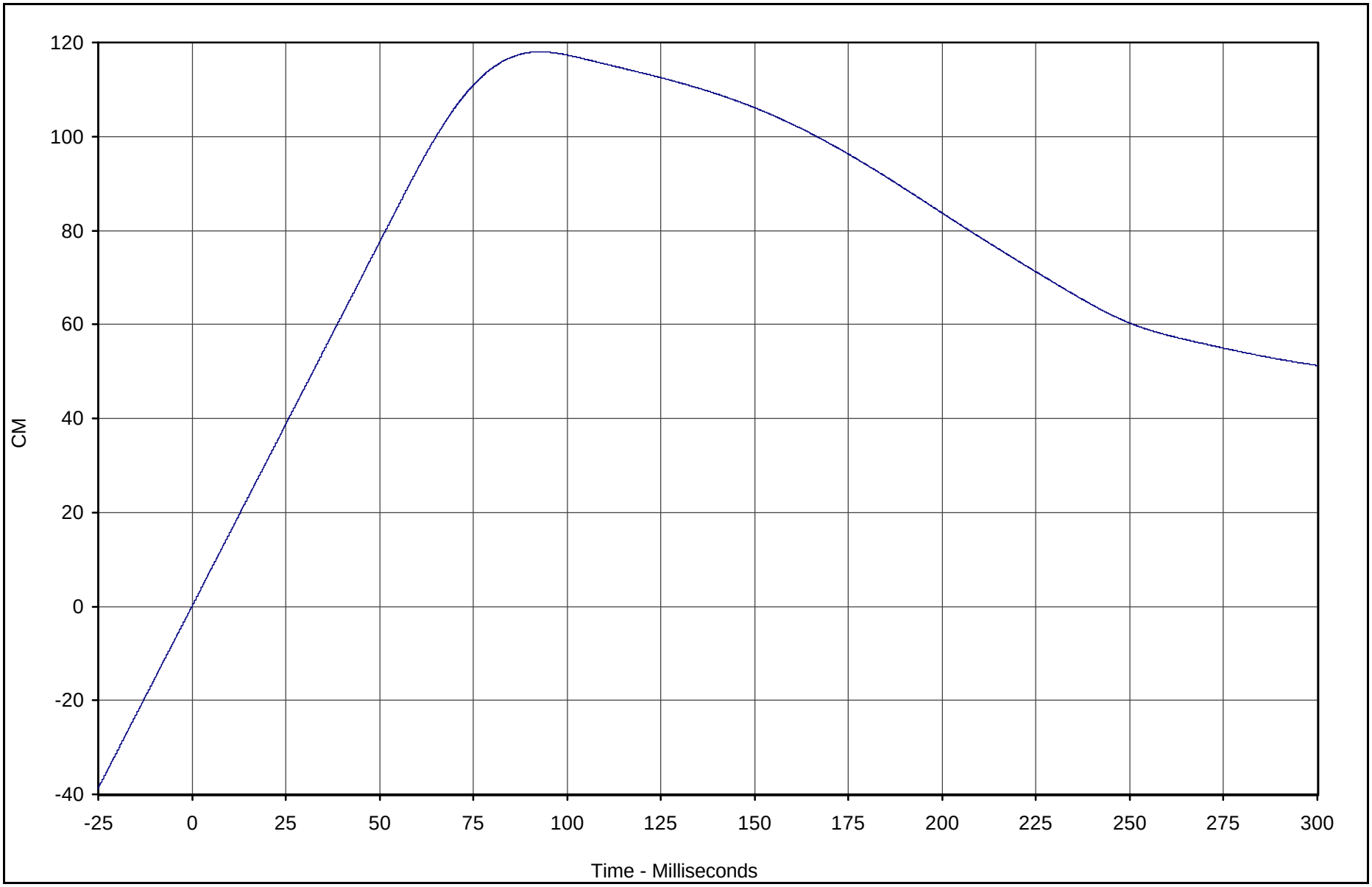
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X Velocity	001	IN1	KMH	56.1	51.5	-18.7	196.6	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



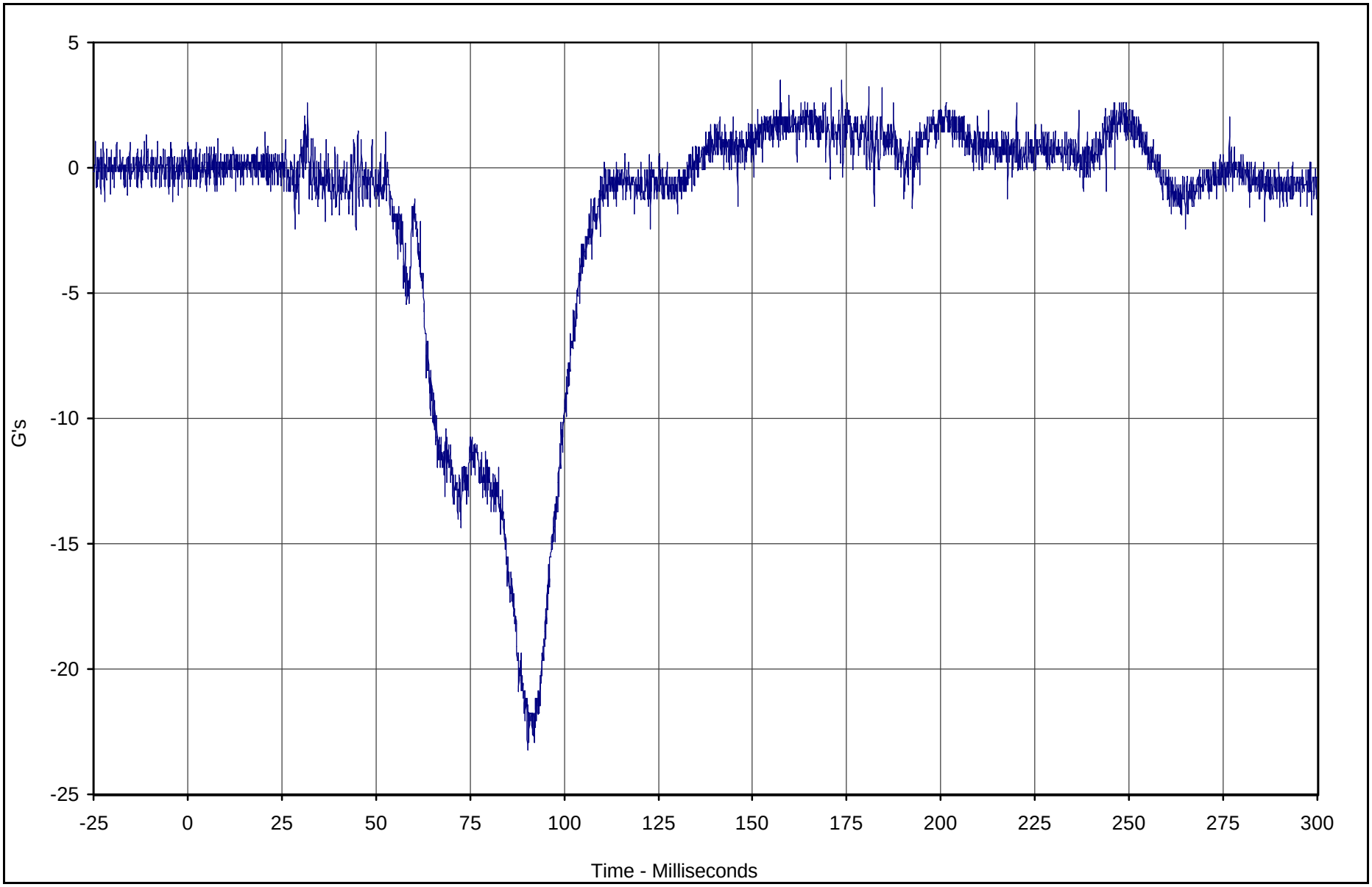
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X Displ.	001	IN2	CM	118.0	92.7	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



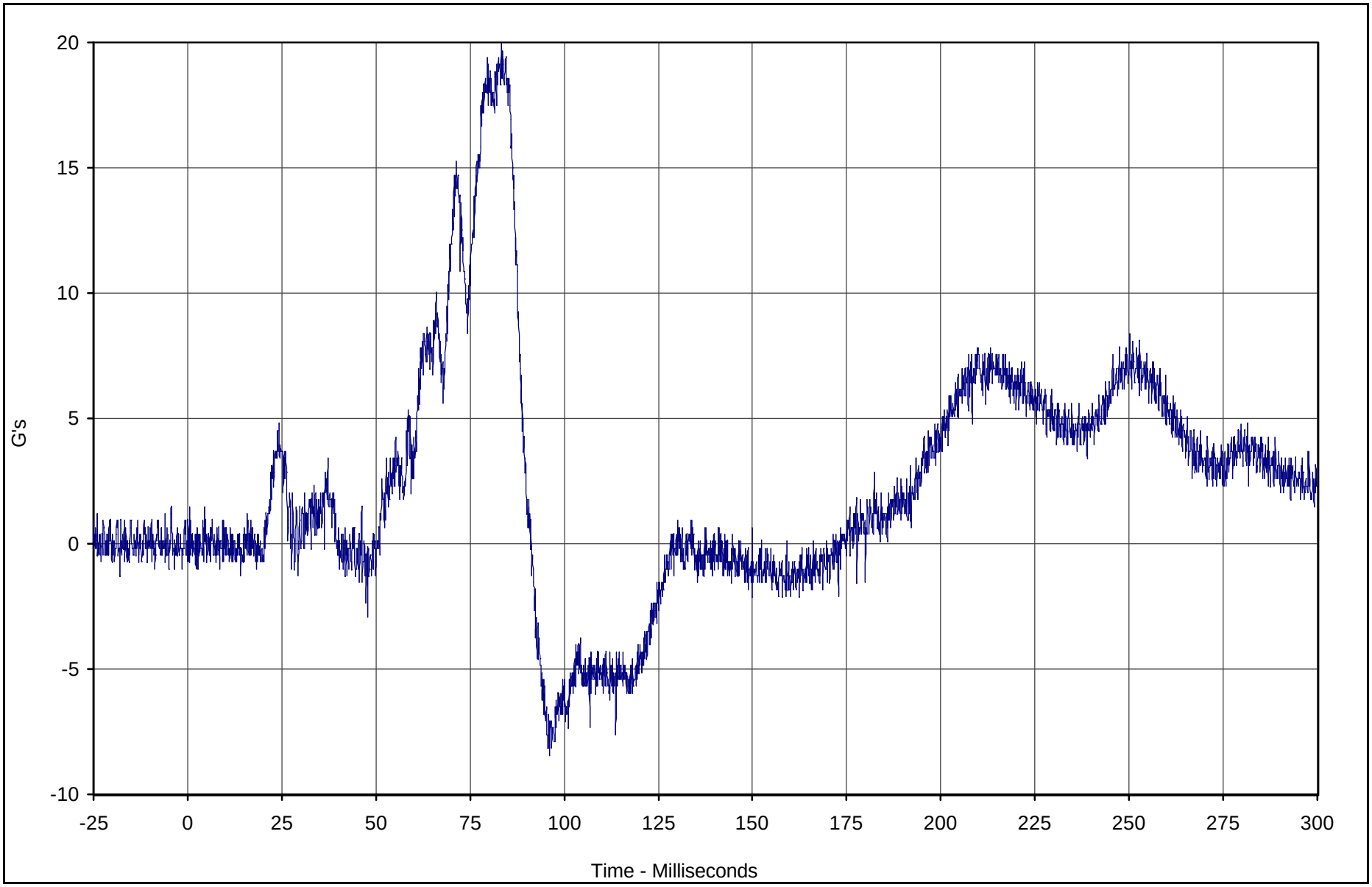
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Y	002	FIL	G's	3.5	157.4	-23.2	90.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



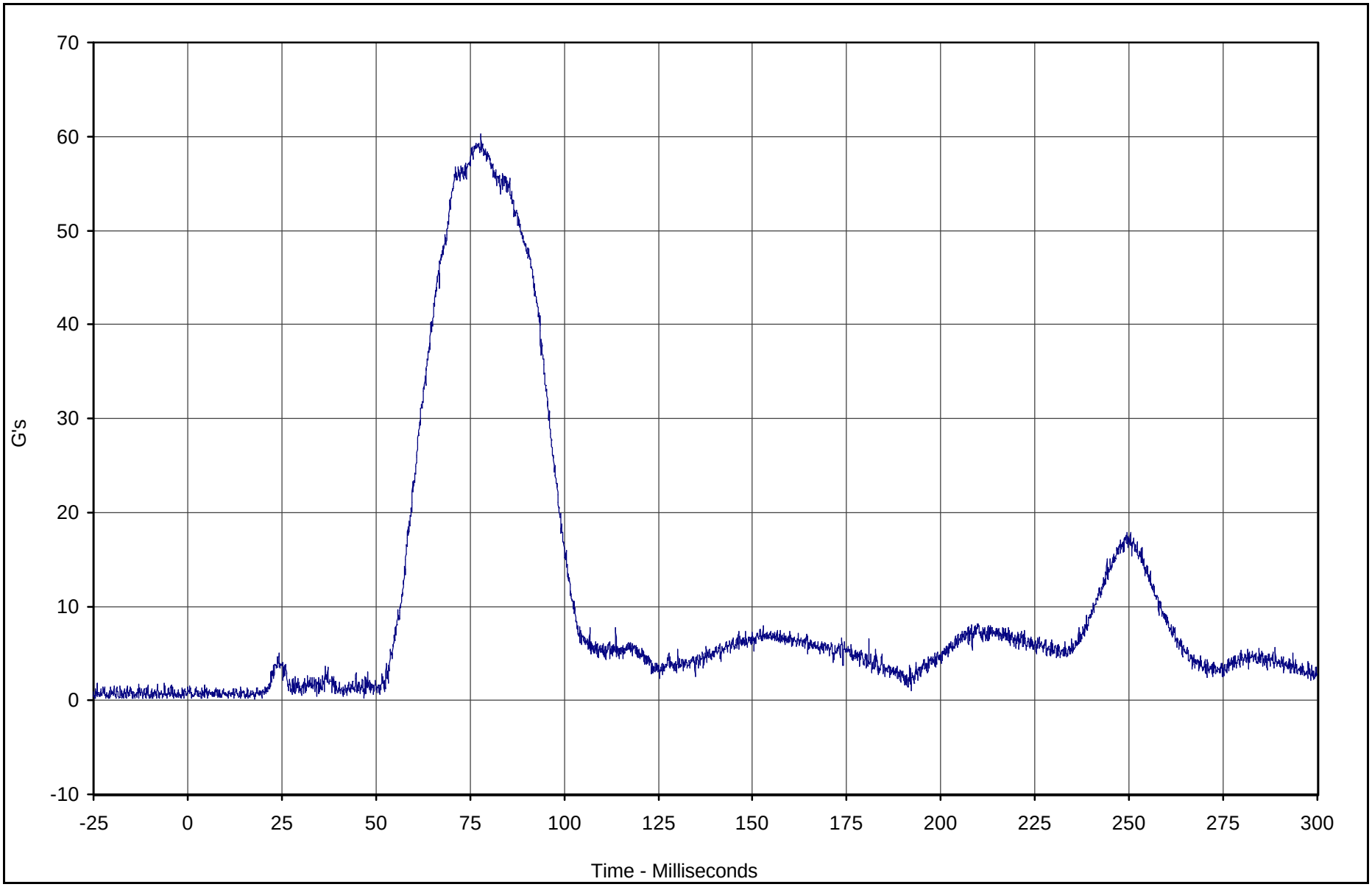
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Z	003	FIL	G's	19.9	83.3	-8.5	96.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



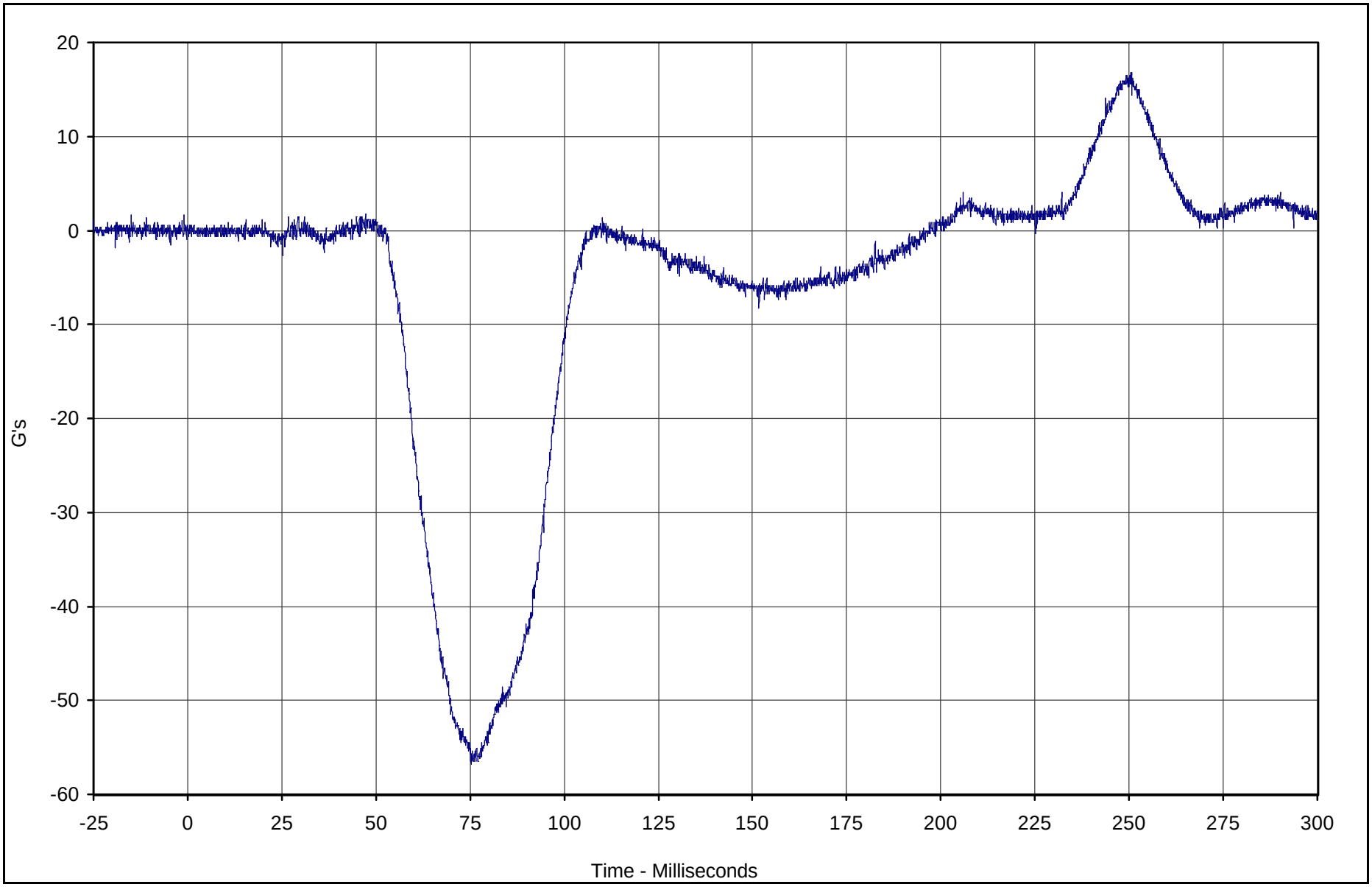
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Resultant Primary	001	RES	G's	60.2	77.9	0.1	17.9	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



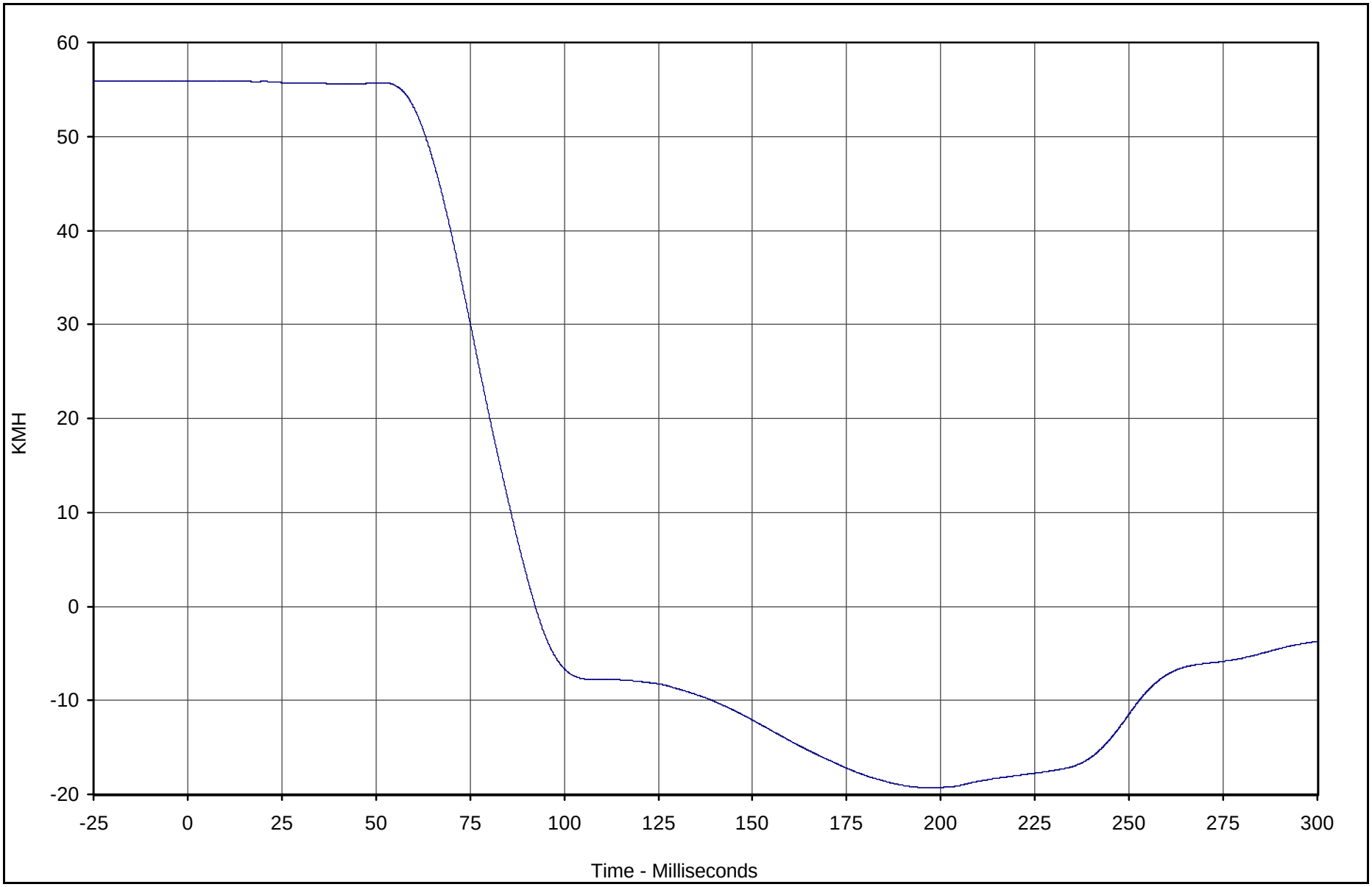
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X	004	FIL	G's	16.8	250.4	-56.8	75.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



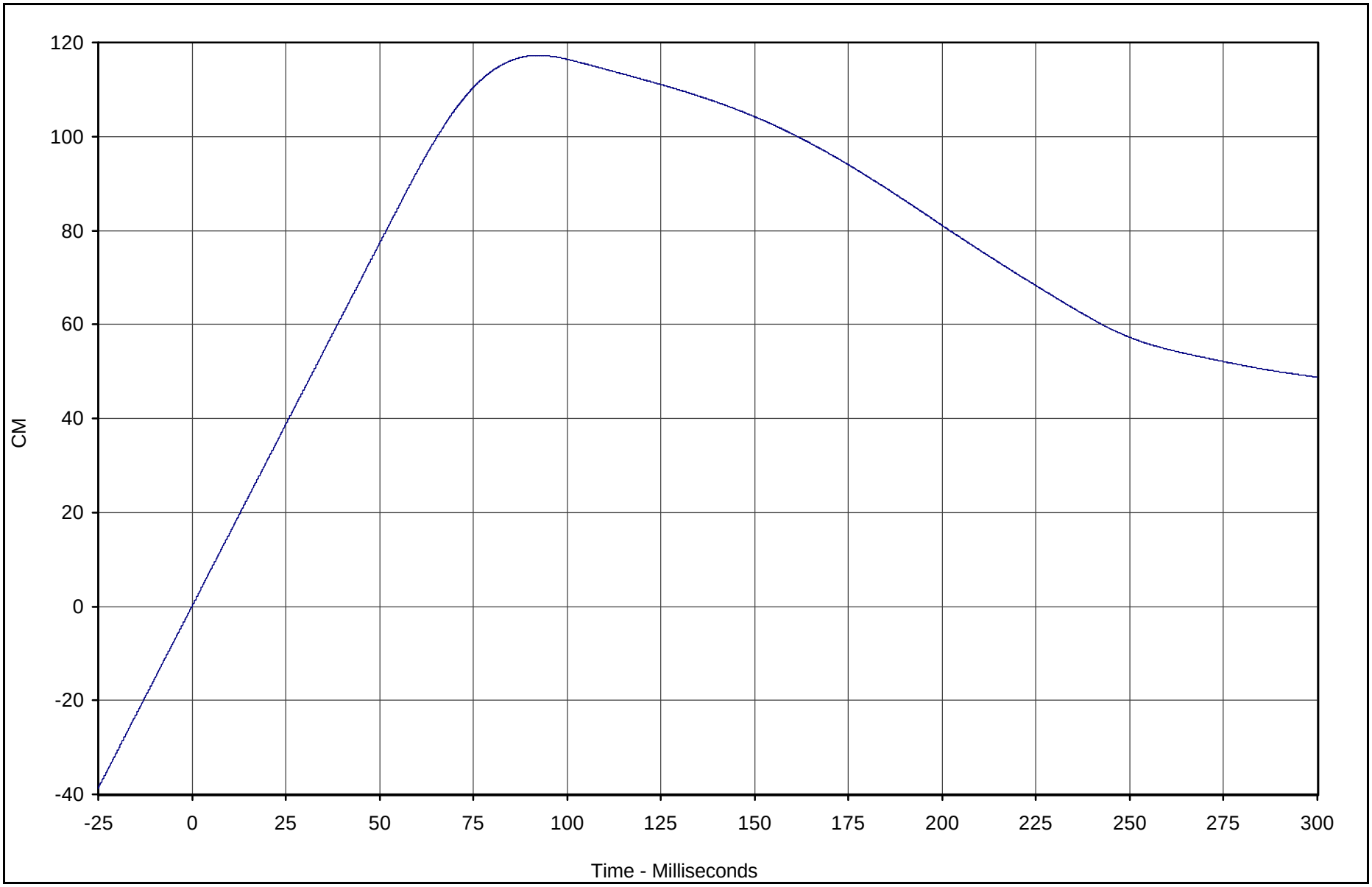
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X Velocity	004	IN1	KMH	55.9	0.2	-19.3	196.8	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



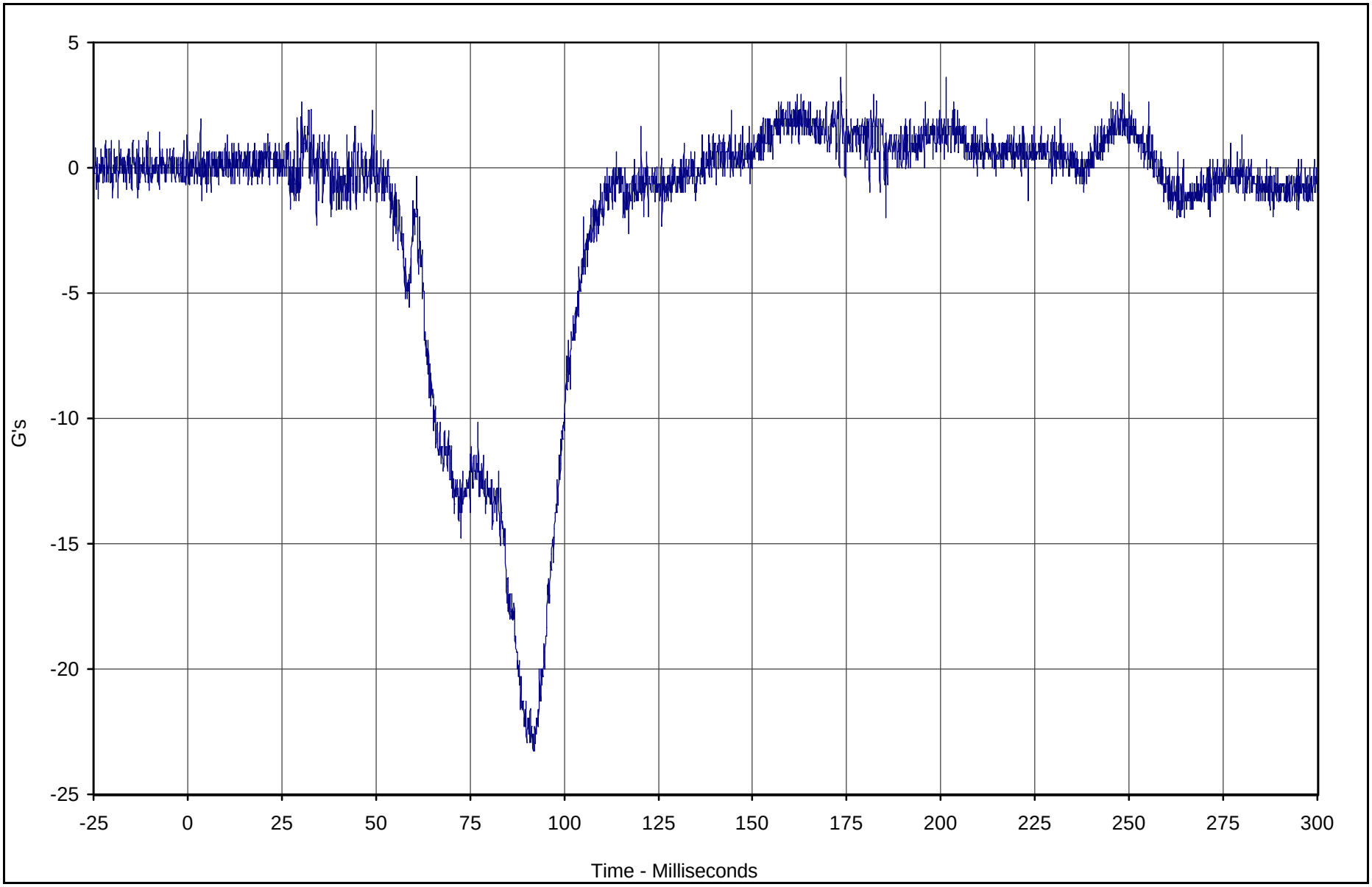
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X Displ.	004	IN2	CM	117.3	92.3	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



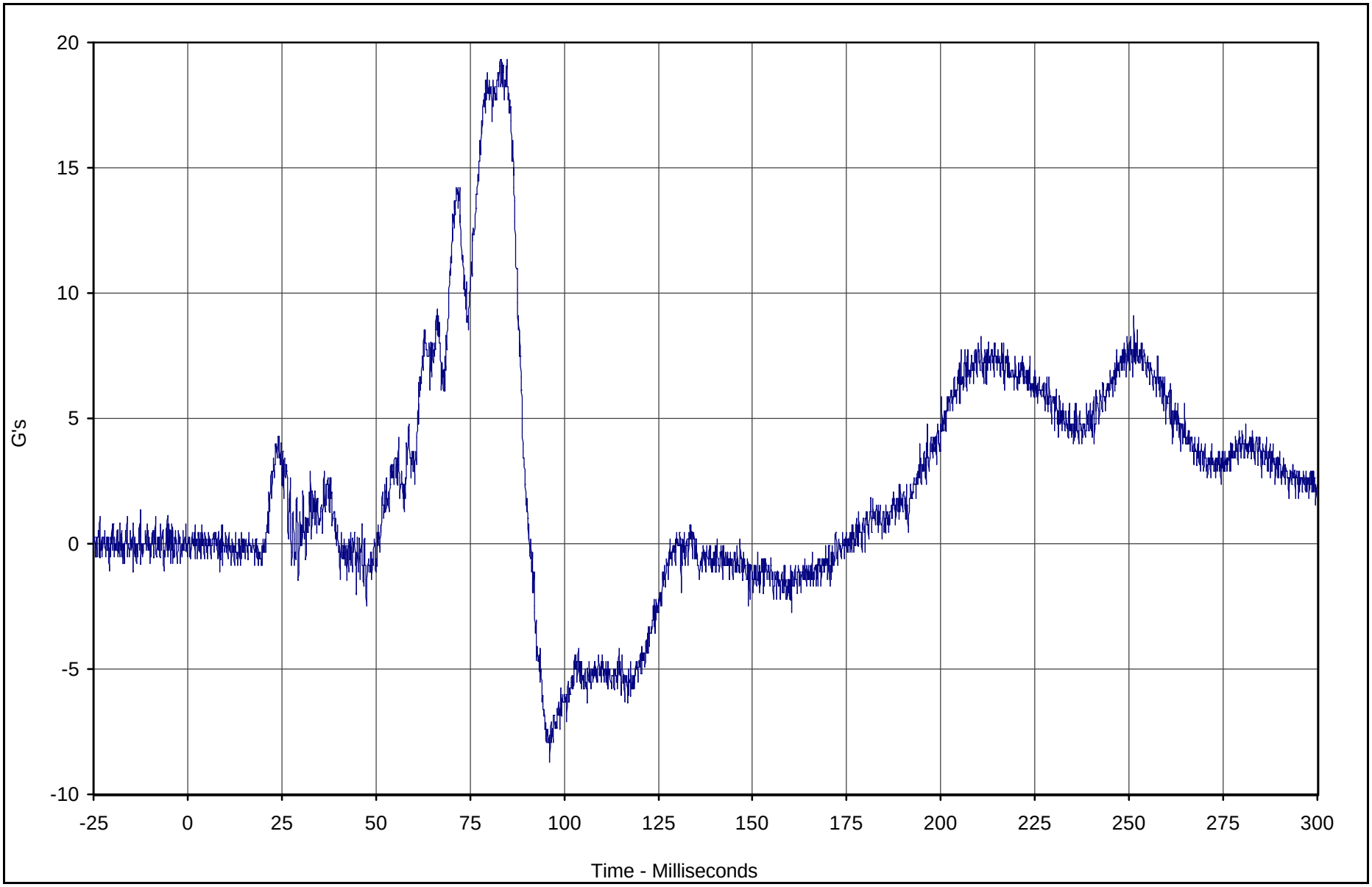
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant Y	005	FIL	G's	3.6	173.5	-23.3	91.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



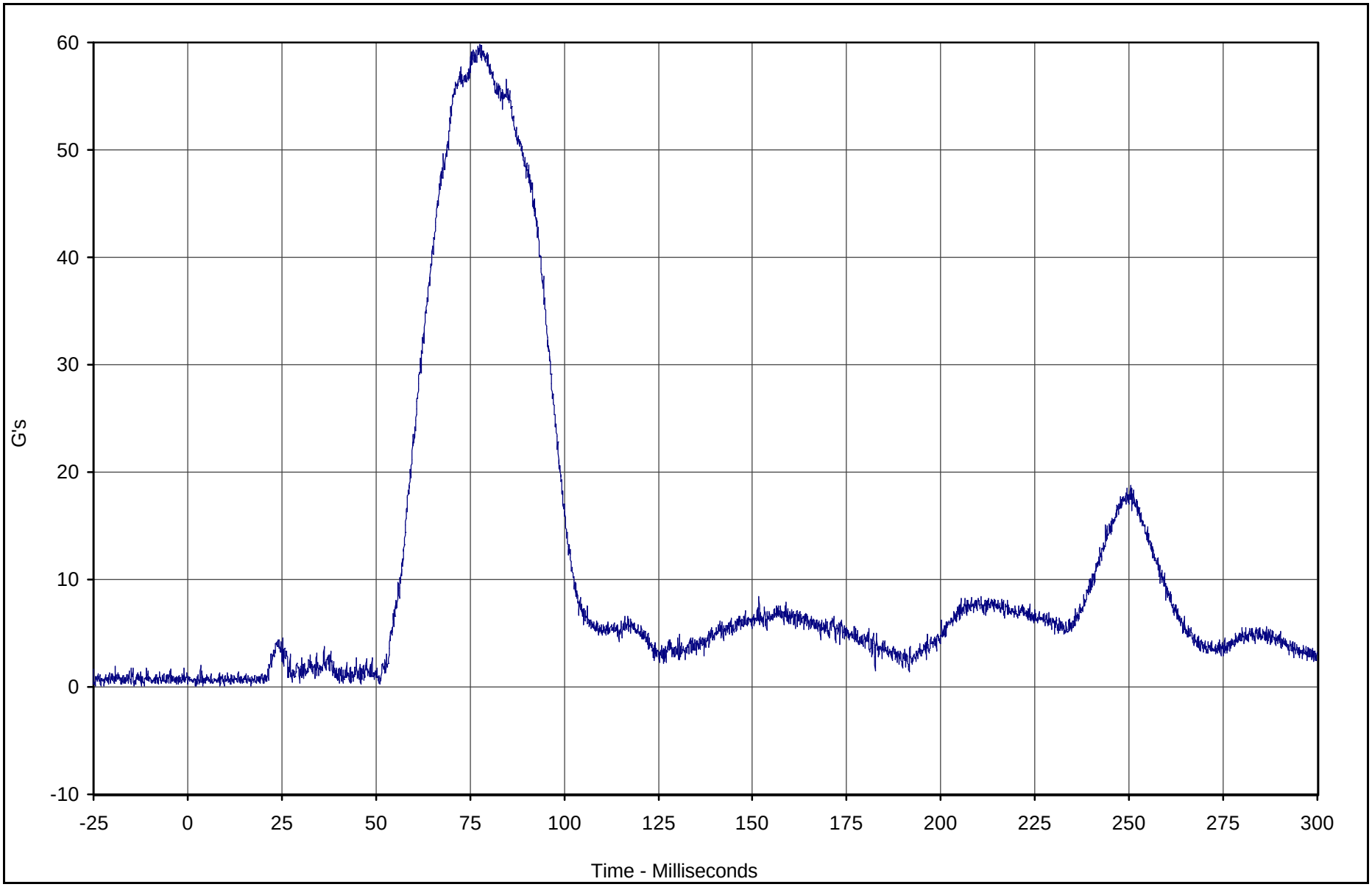
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant Z	006	FIL	G's	19.3	83.0	-8.7	96.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



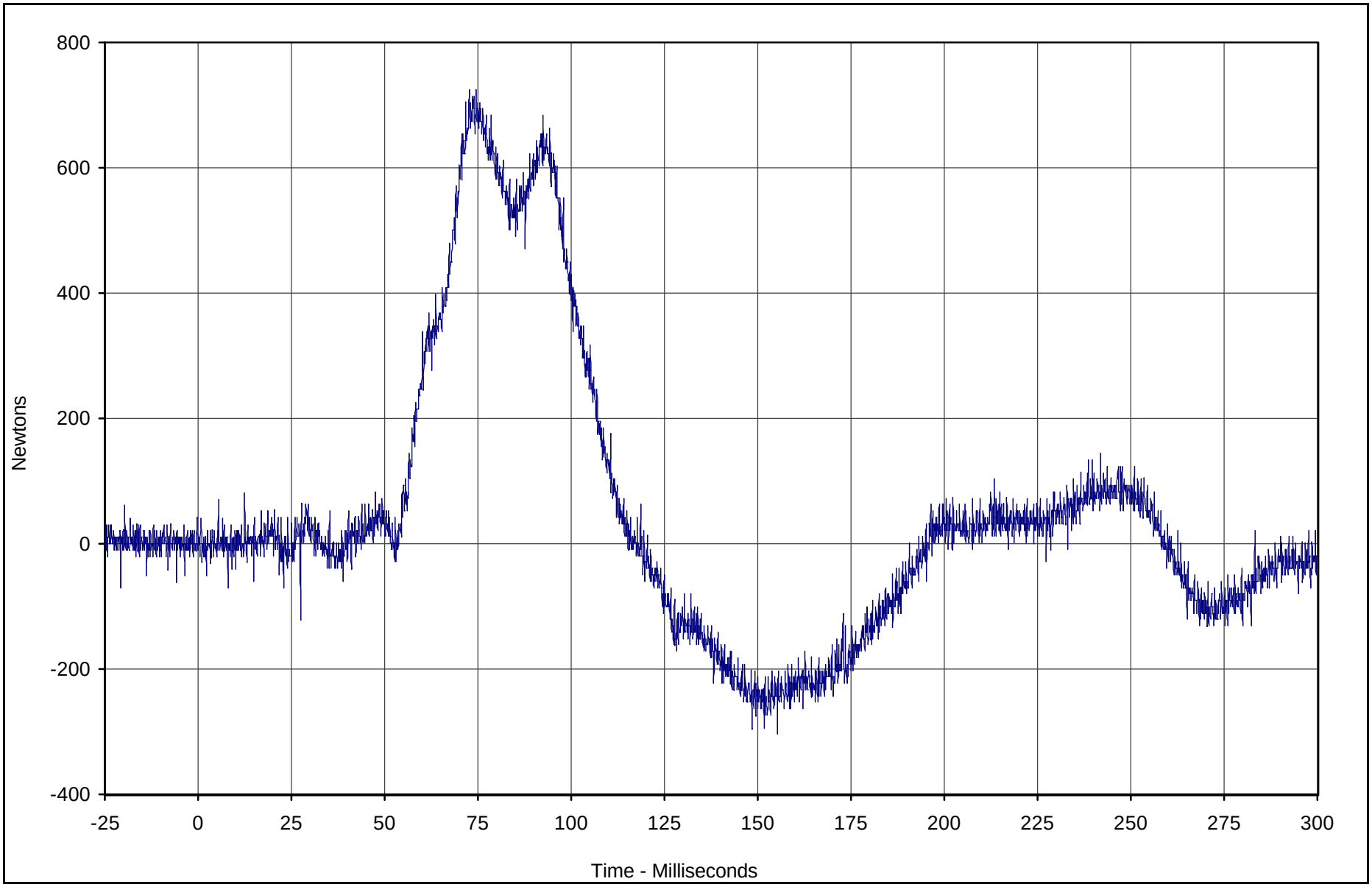
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Resultant Redundant	004	RES	G's	59.8	77.7	0.1	2.1	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



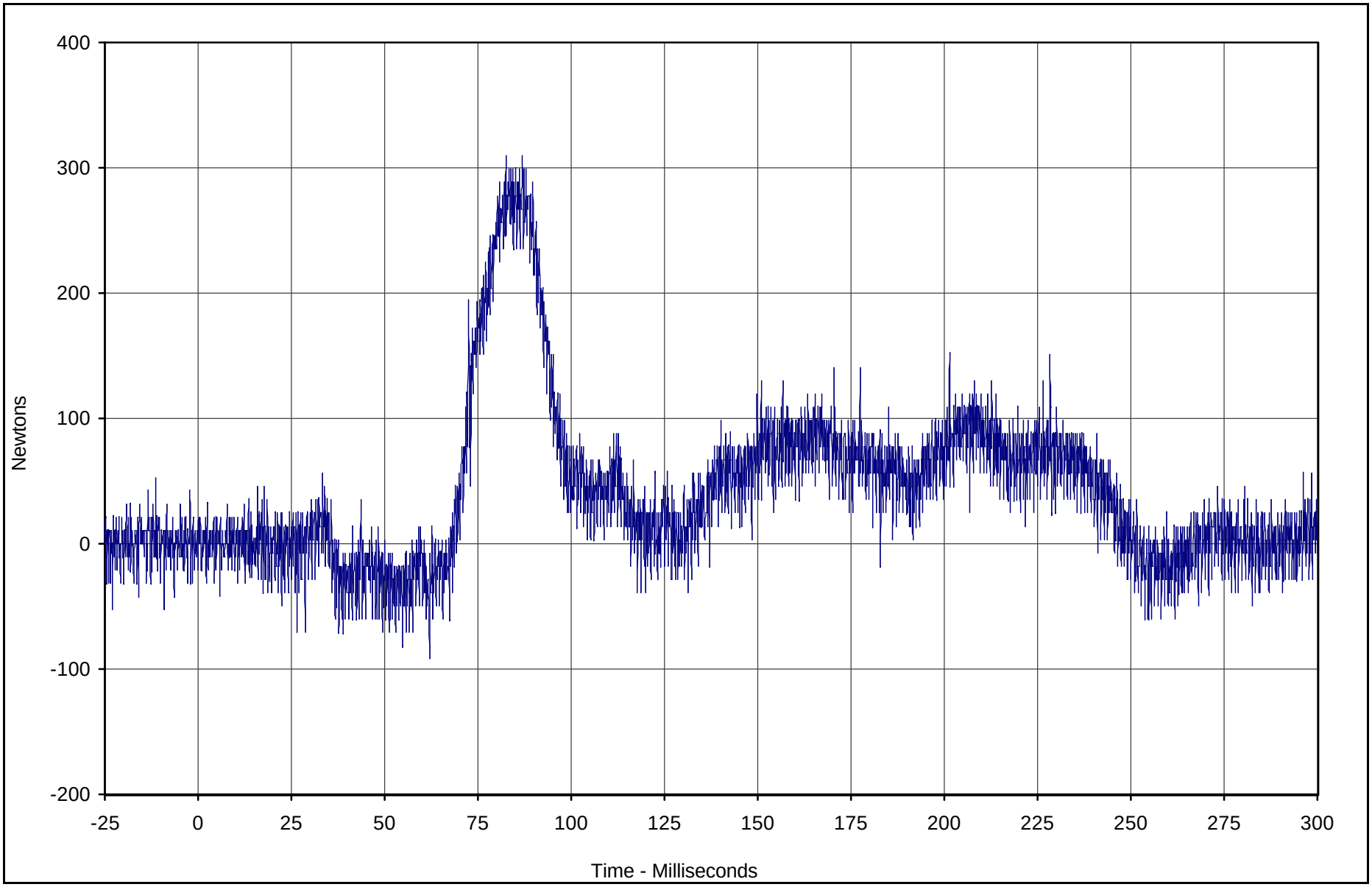
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force X	007	FIL	Newtons	724.8	72.7	-304.3	155.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



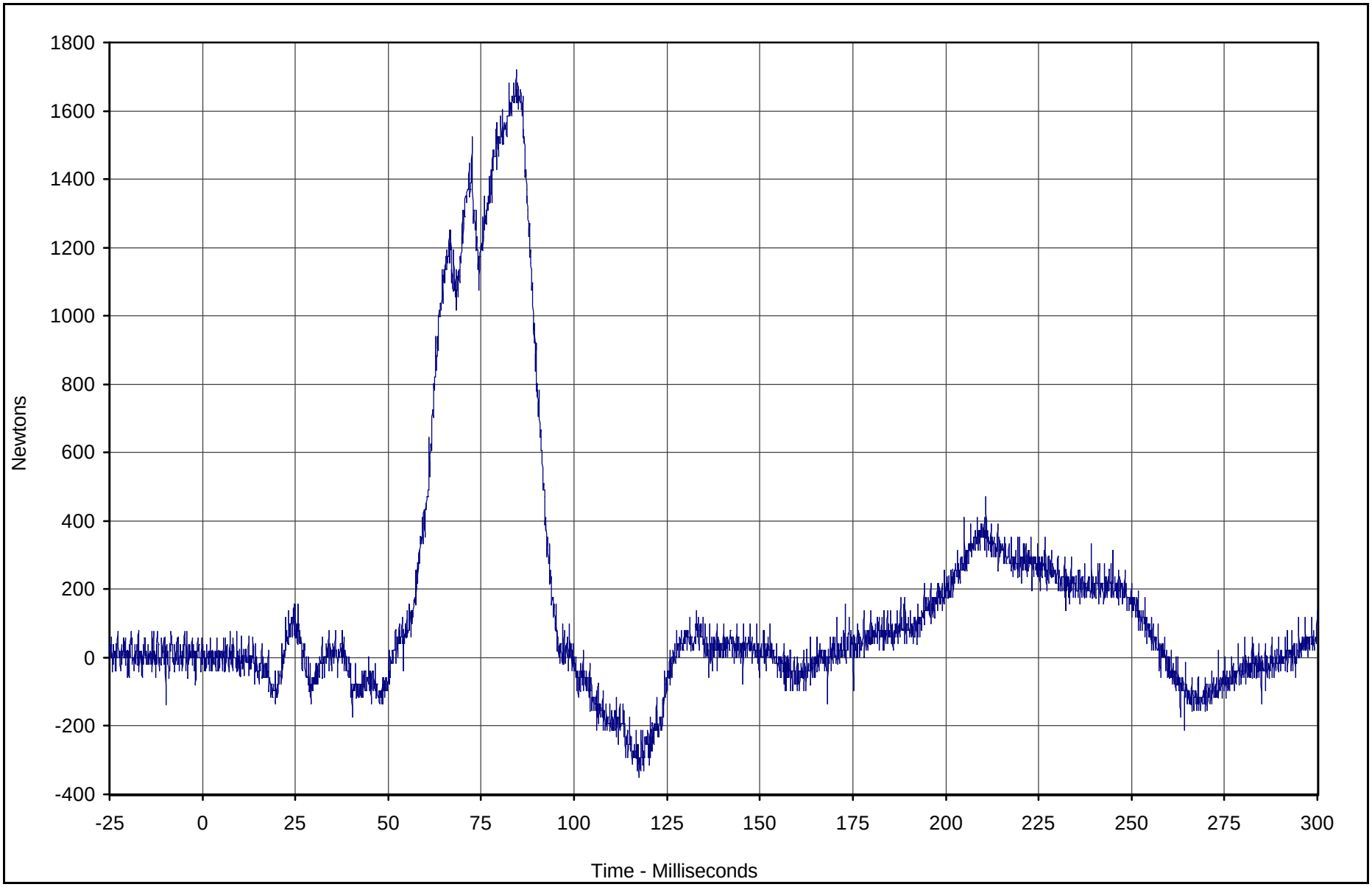
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Y	008	FIL	Newtons	309.5	82.5	-91.7	62.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



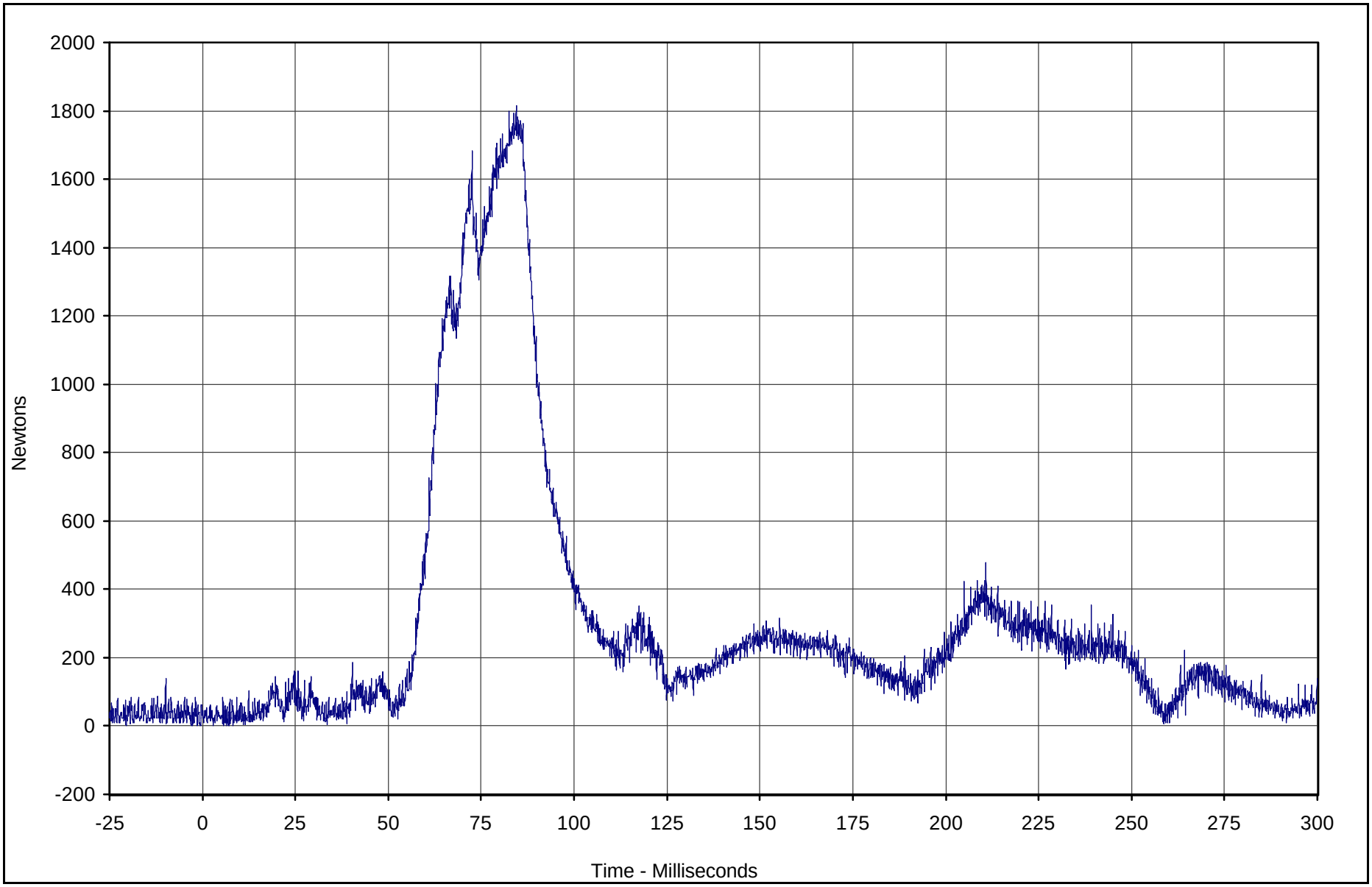
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Z	009	FIL	Newtons	1721.0	84.4	-350.4	117.4	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



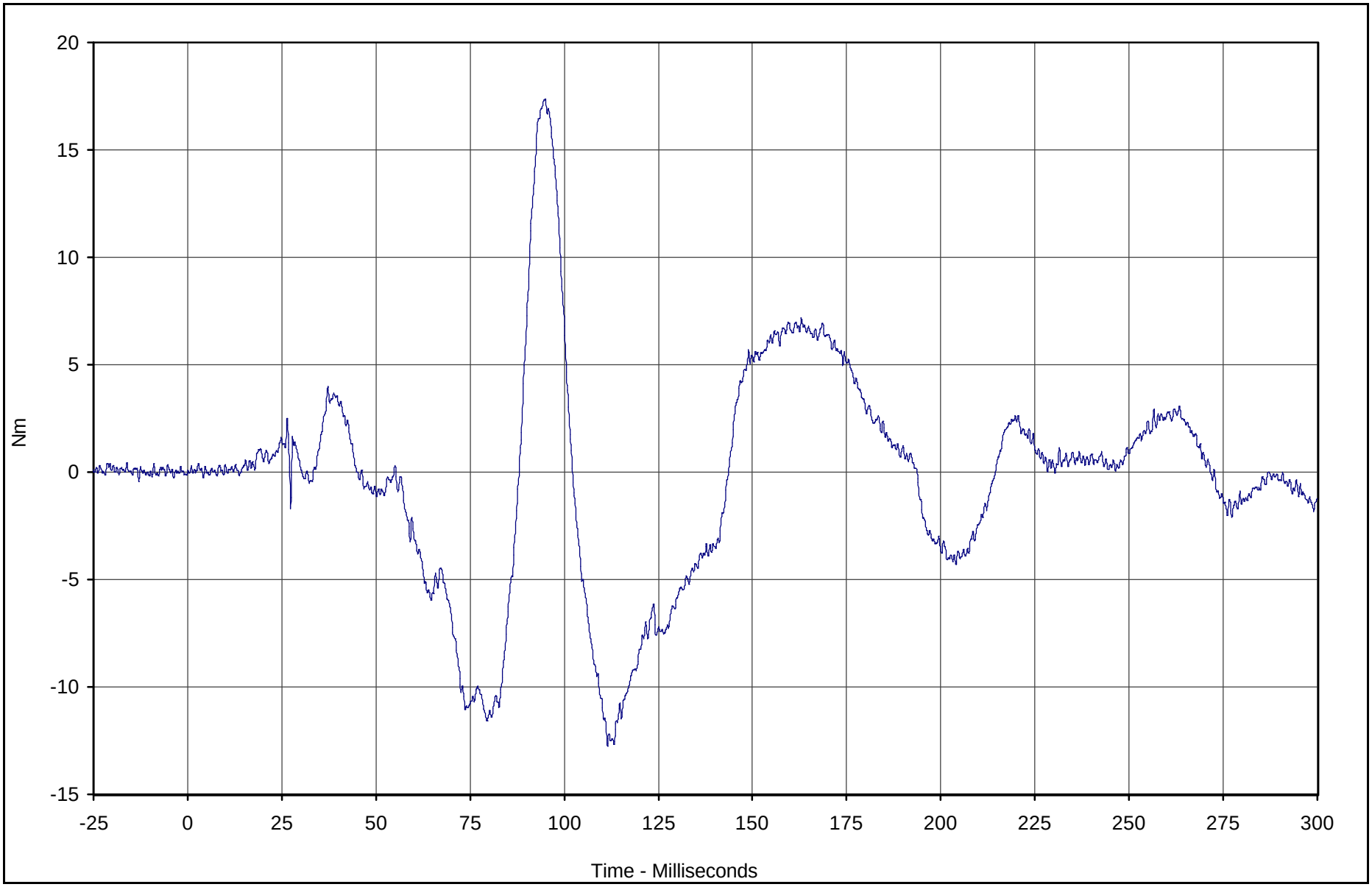
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Resultant	007	RES	Newtons	1816.4	84.4	0.0	2.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



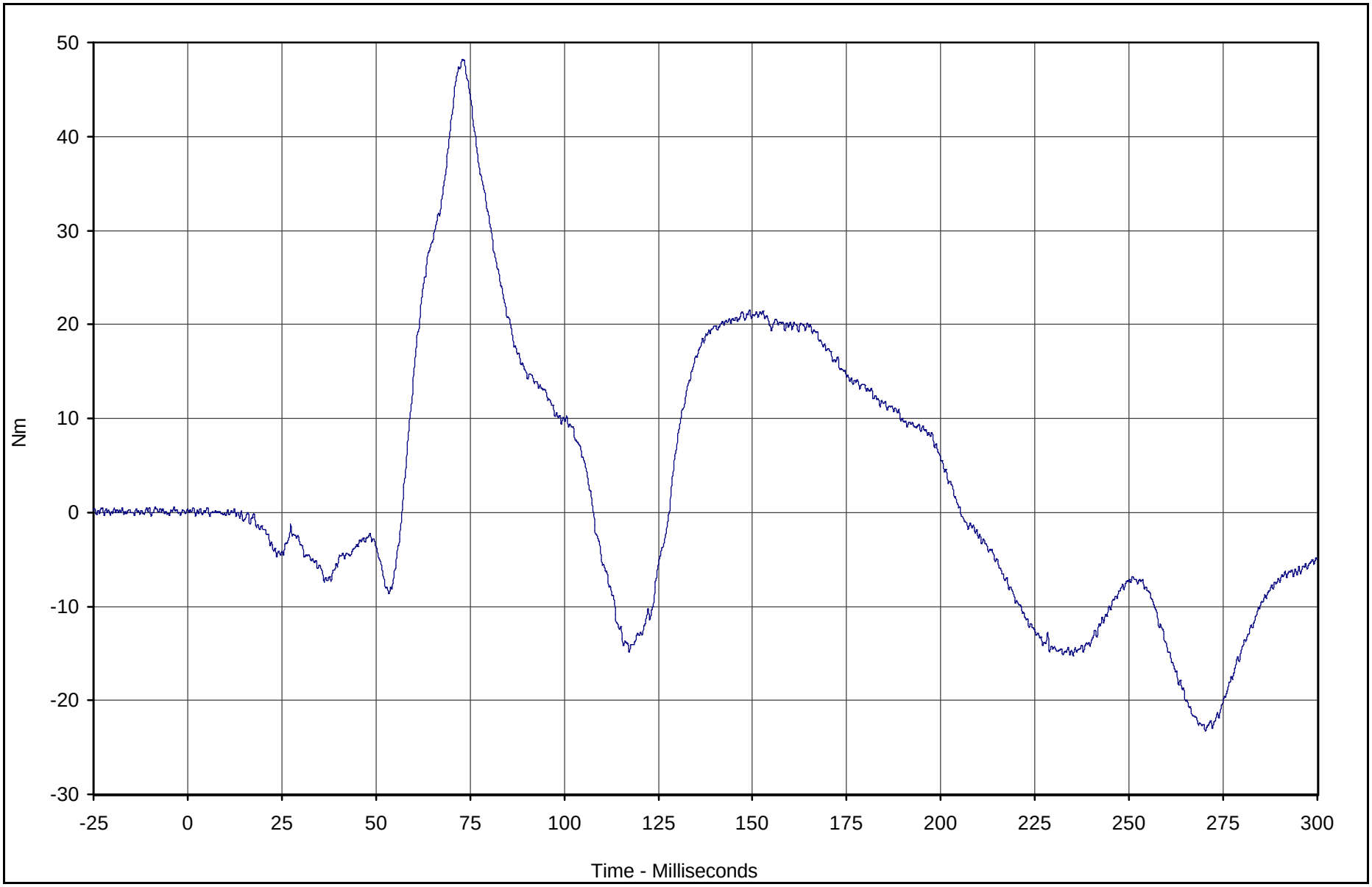
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment X	010	FIL	Nm	17.4	95.0	-12.8	111.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



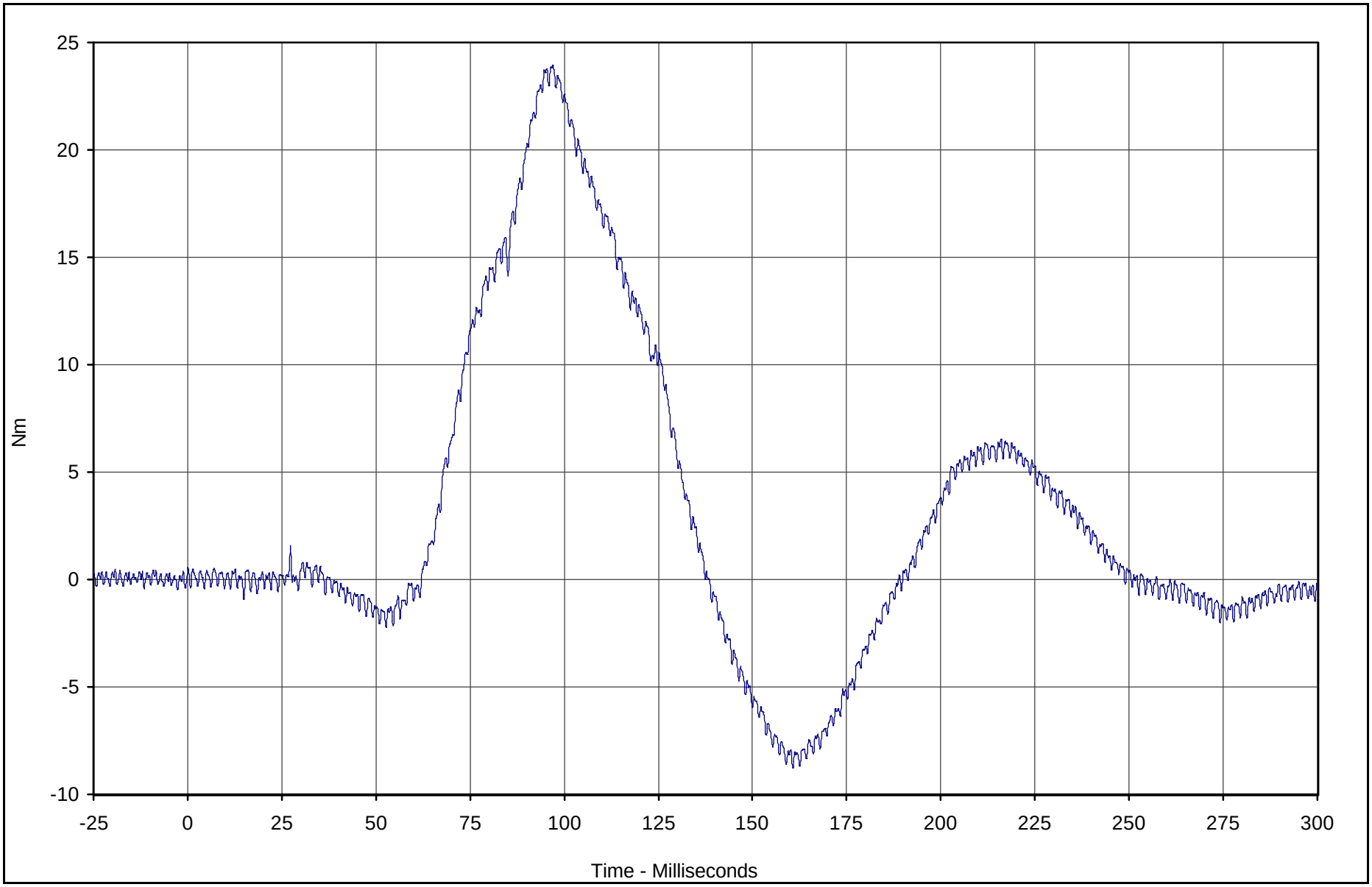
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Y	011	FIL	Nm	48.2	73.0	-23.3	270.3	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



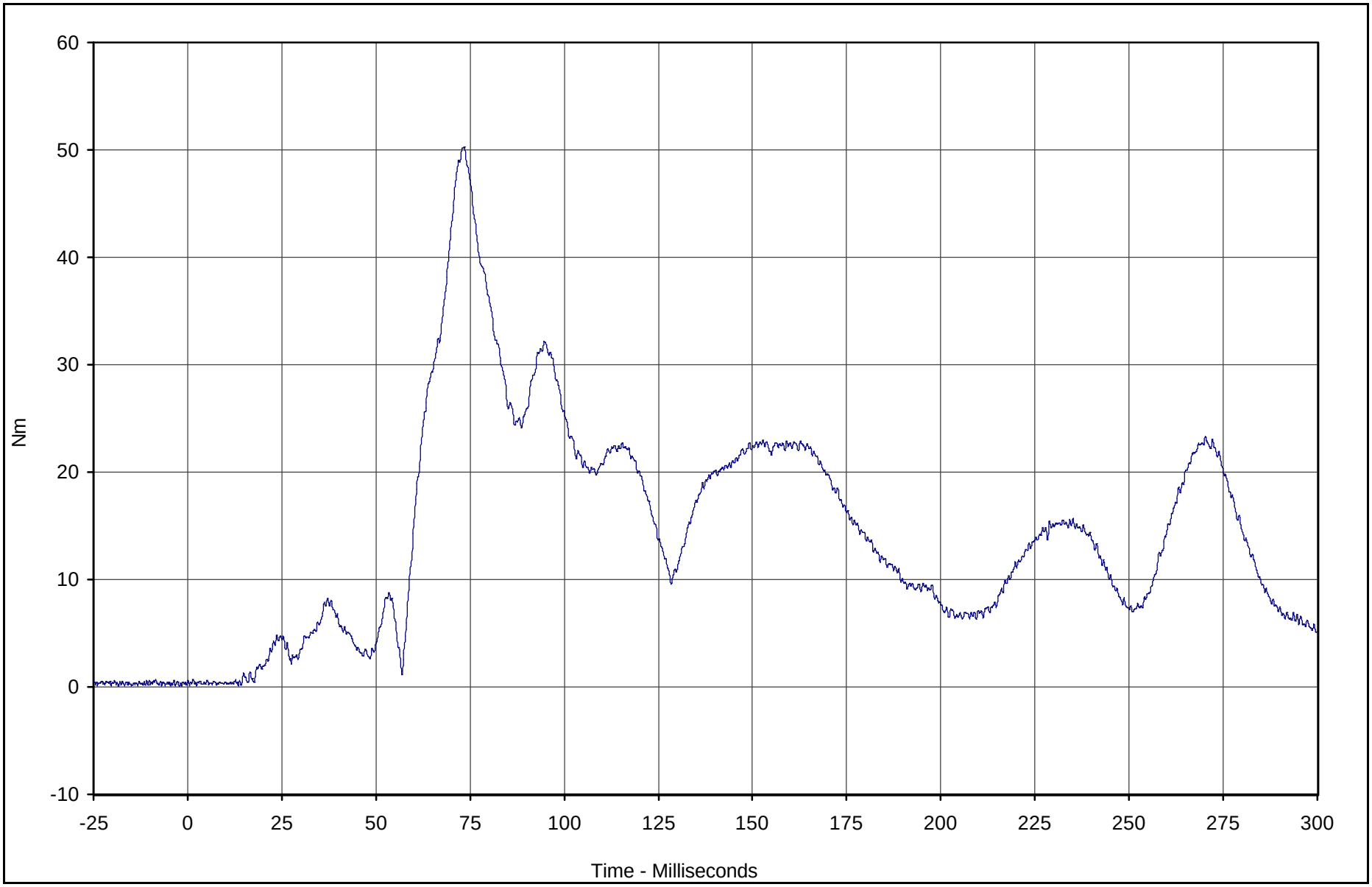
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Z	012	FIL	Nm	23.9	97.0	-8.8	160.8	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



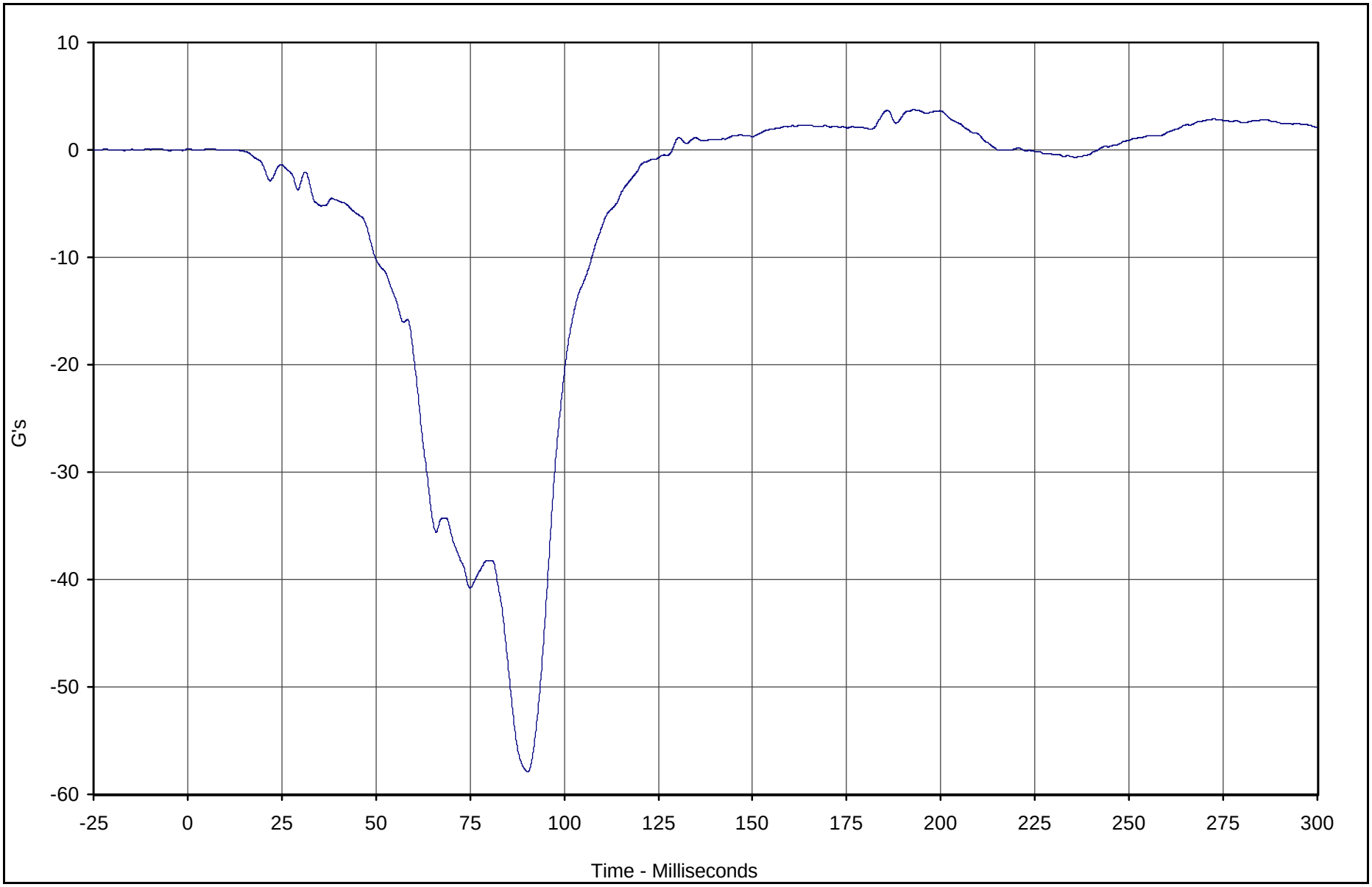
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Resultant	010	RES	Nm	50.3	73.5	0.1	13.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



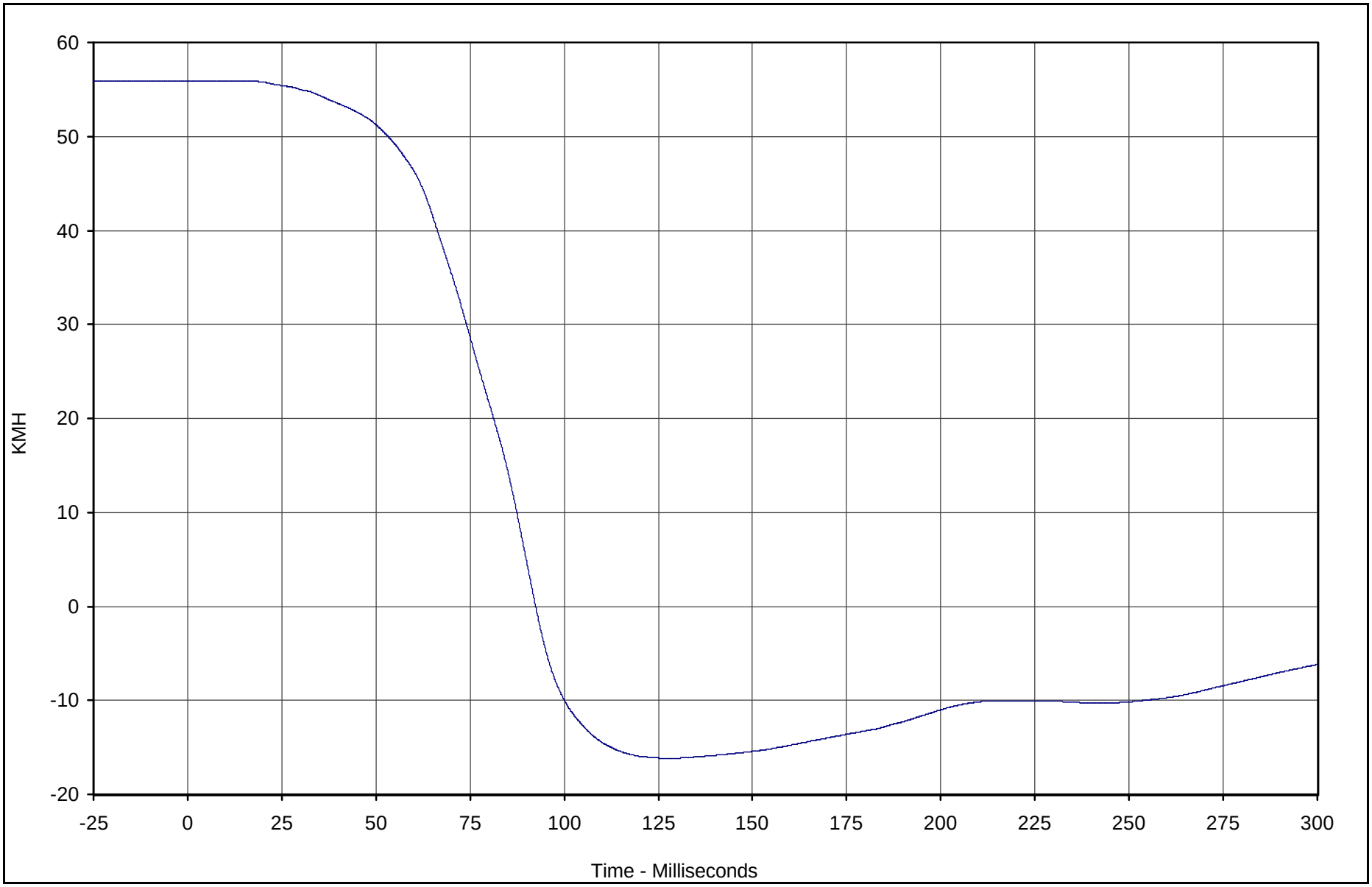
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X	013	FIL	G's	3.7	192.9	-57.9	90.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



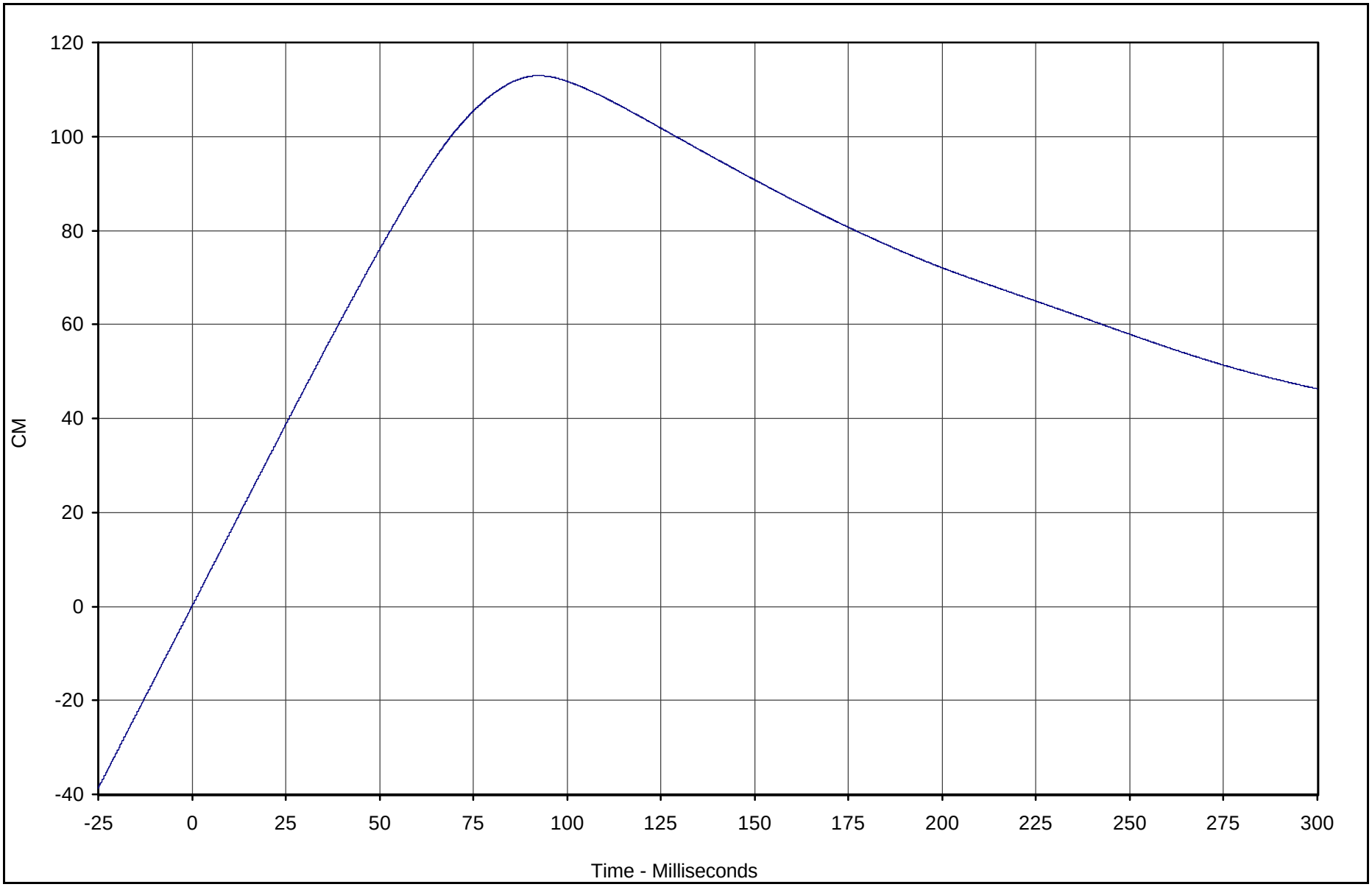
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X Velocity	013	IN1	KMH	55.9	13.3	-16.2	128.7	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



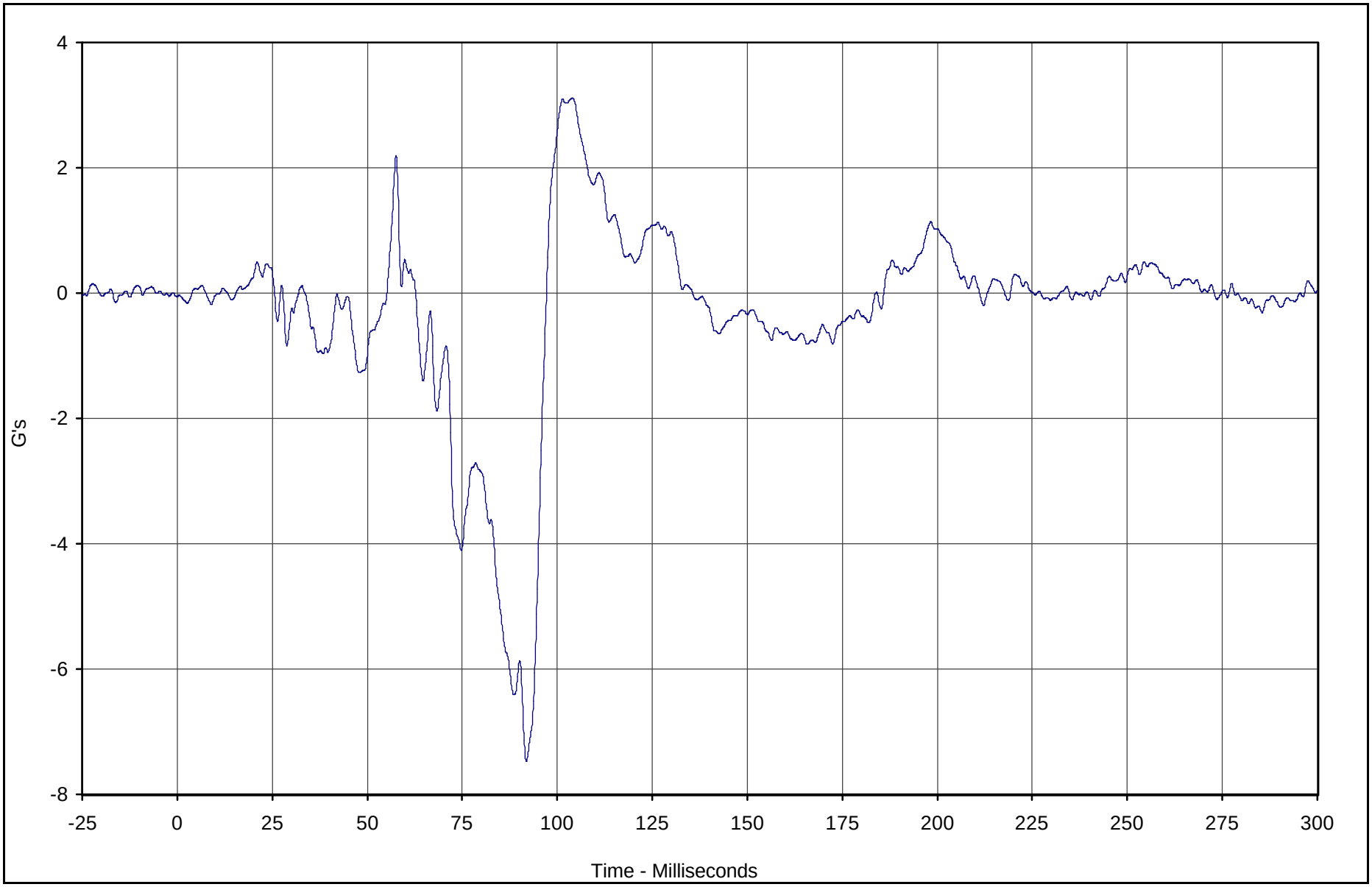
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X Displ.	013	IN2	CM	112.9	92.4	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



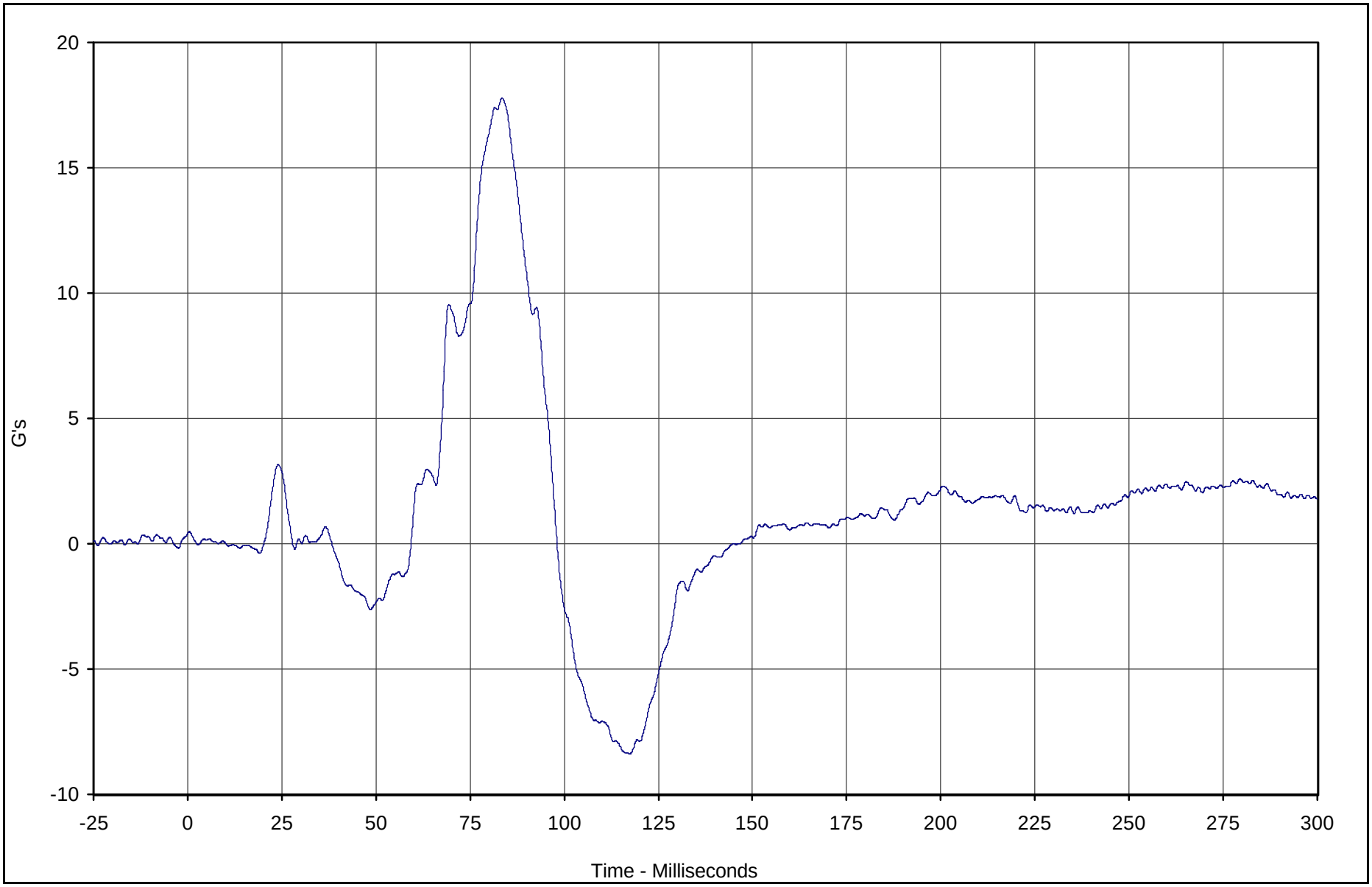
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary Y	014	FIL	G's	3.1	103.9	-7.5	91.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



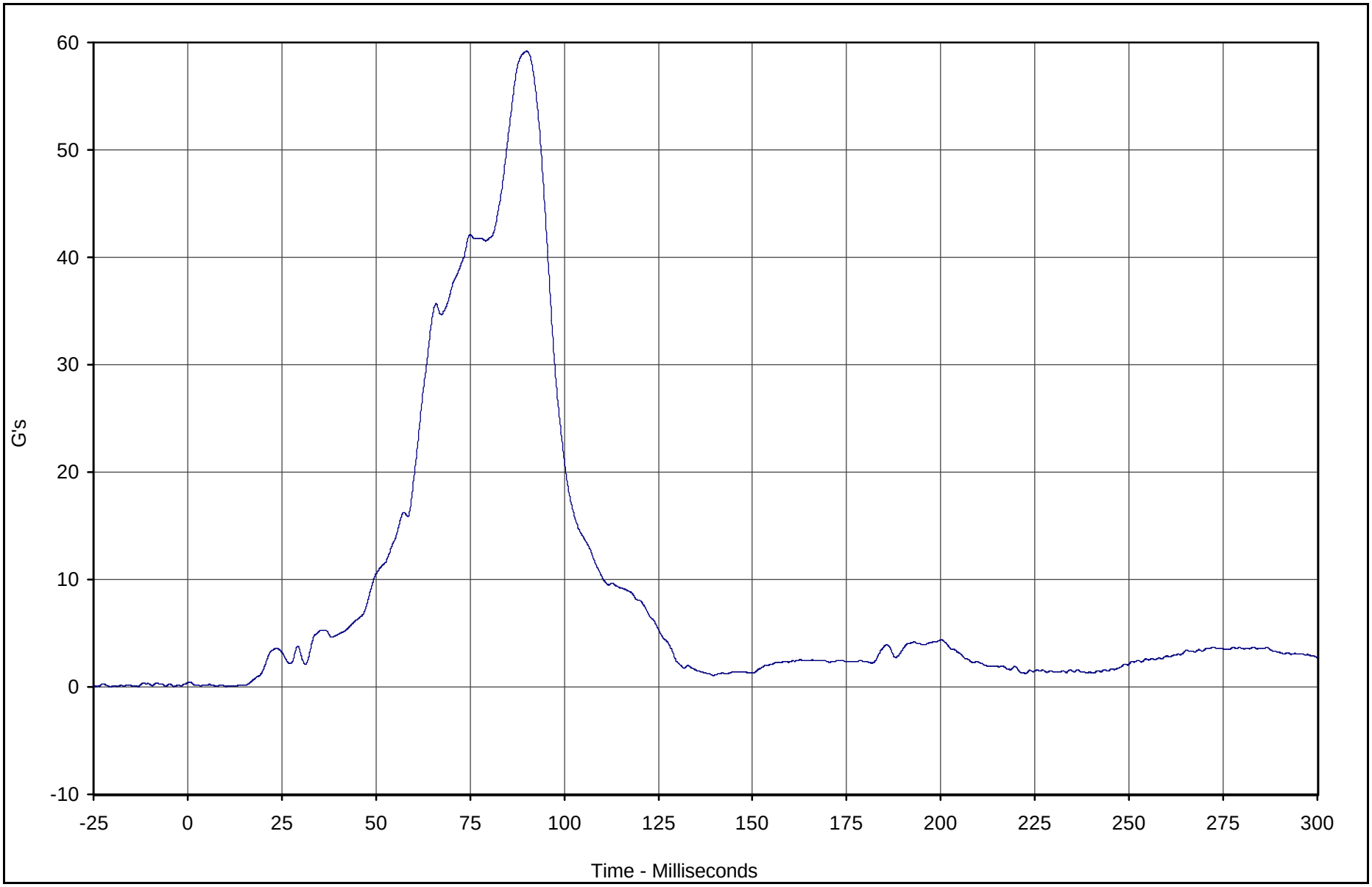
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary Z	015	FIL	G's	17.8	83.5	-8.4	117.3	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



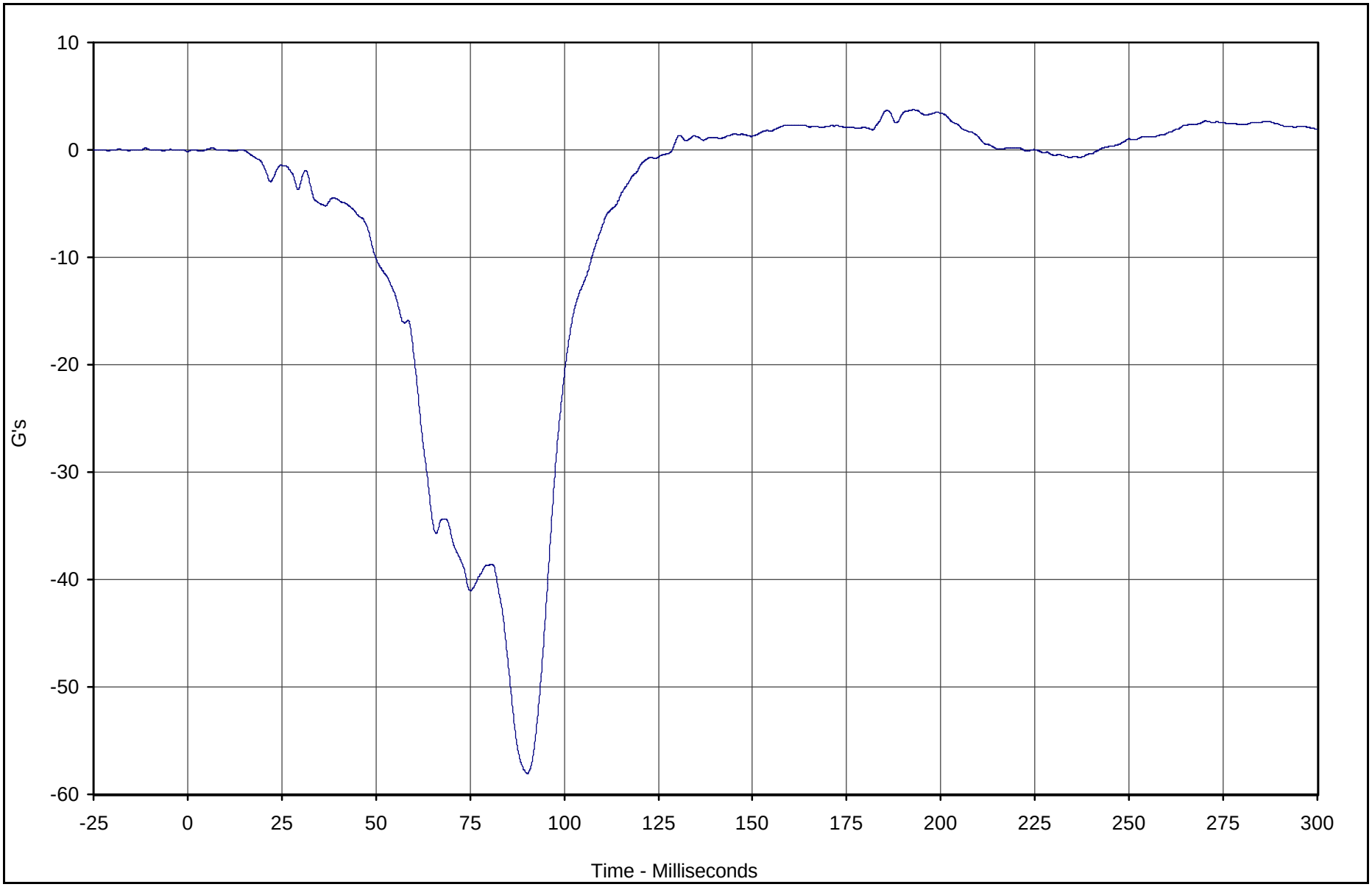
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Resultant Primary	013	RES	G's	59.2	90.0	0.0	10.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



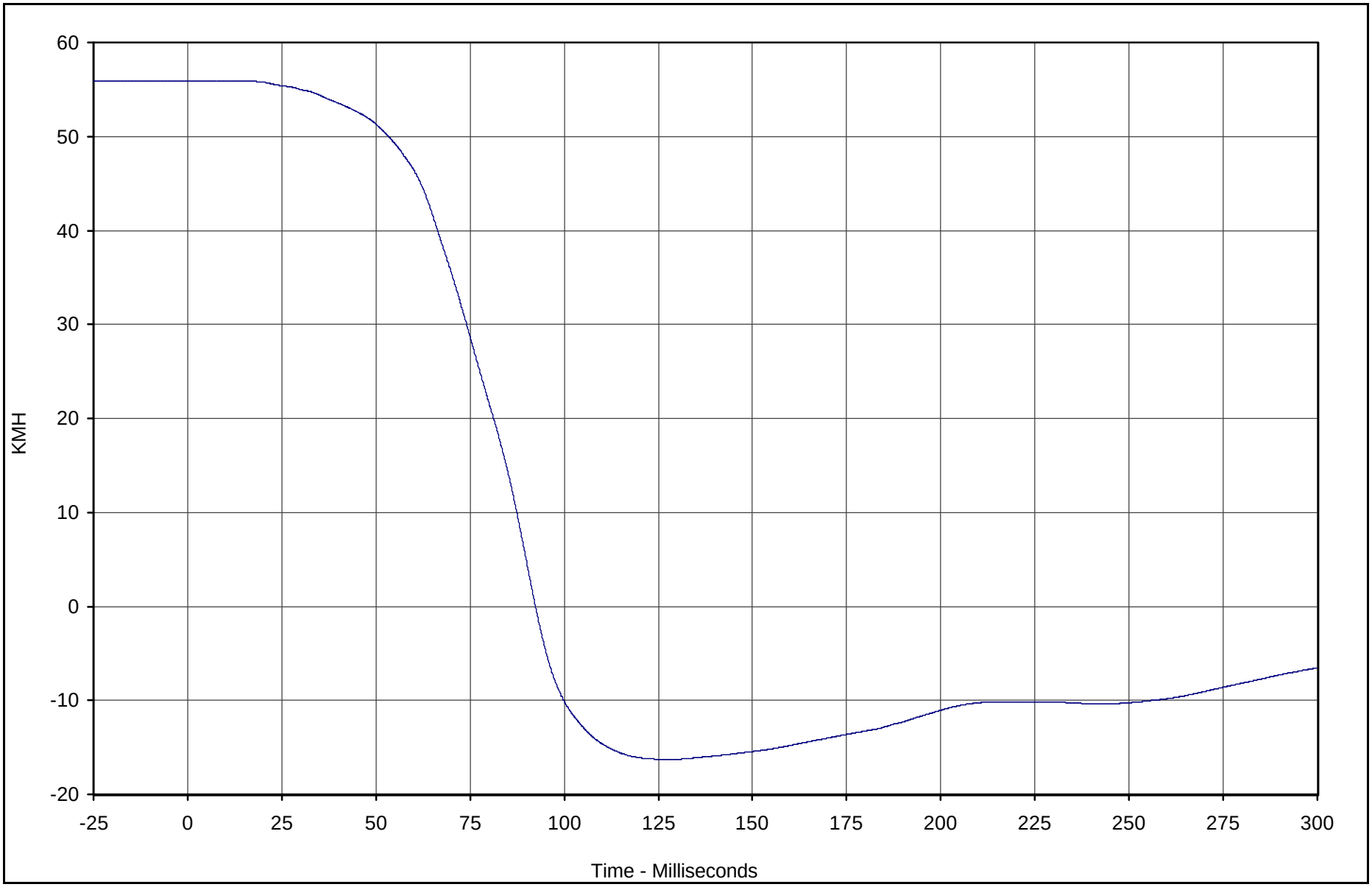
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X	016	FIL	G's	3.7	192.6	-58.1	90.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



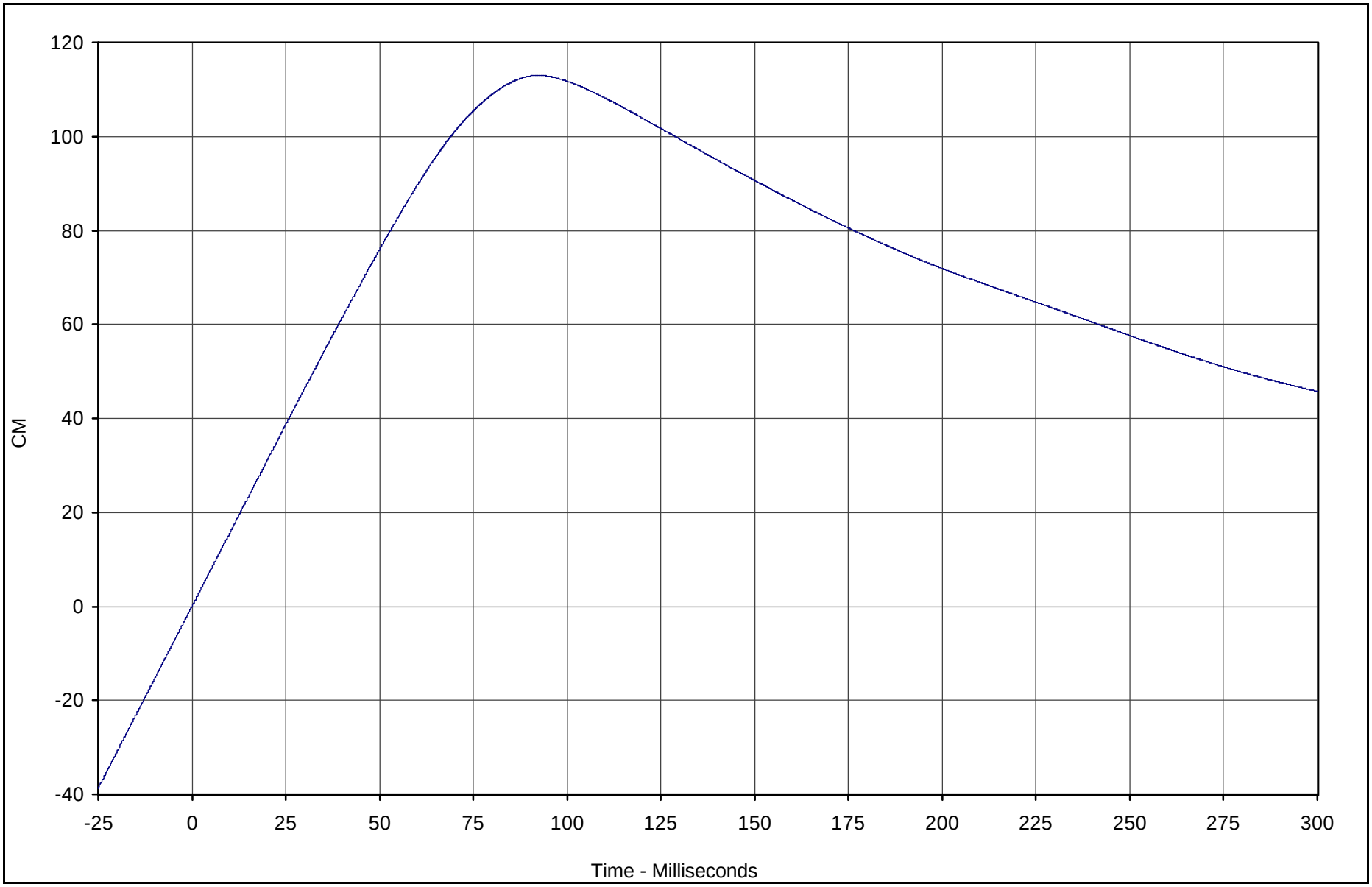
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X Velocity	016	IN1	KMH	55.9	10.4	-16.3	128.7	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



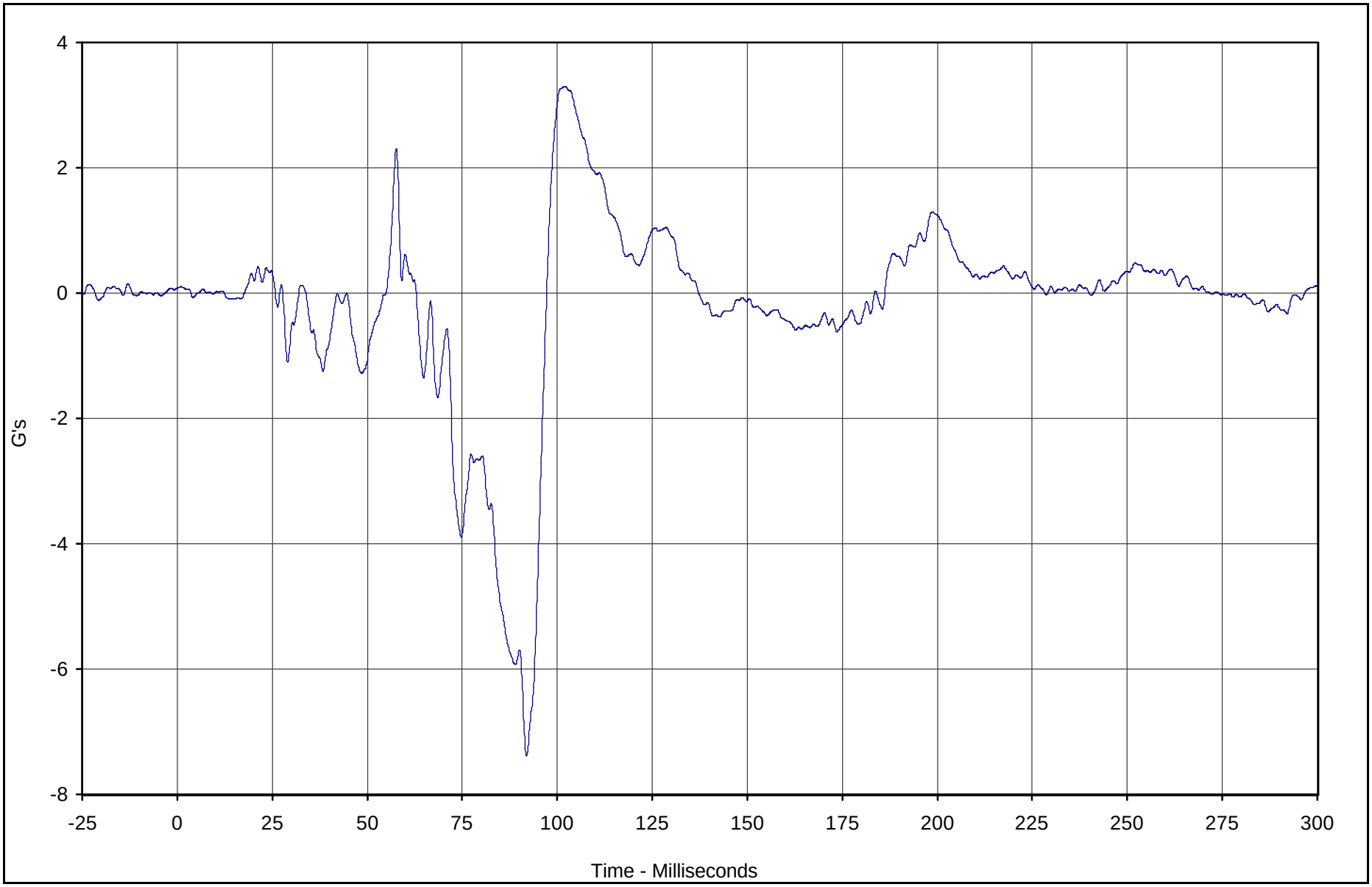
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X Displ.	016	IN2	CM	113.0	92.4	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



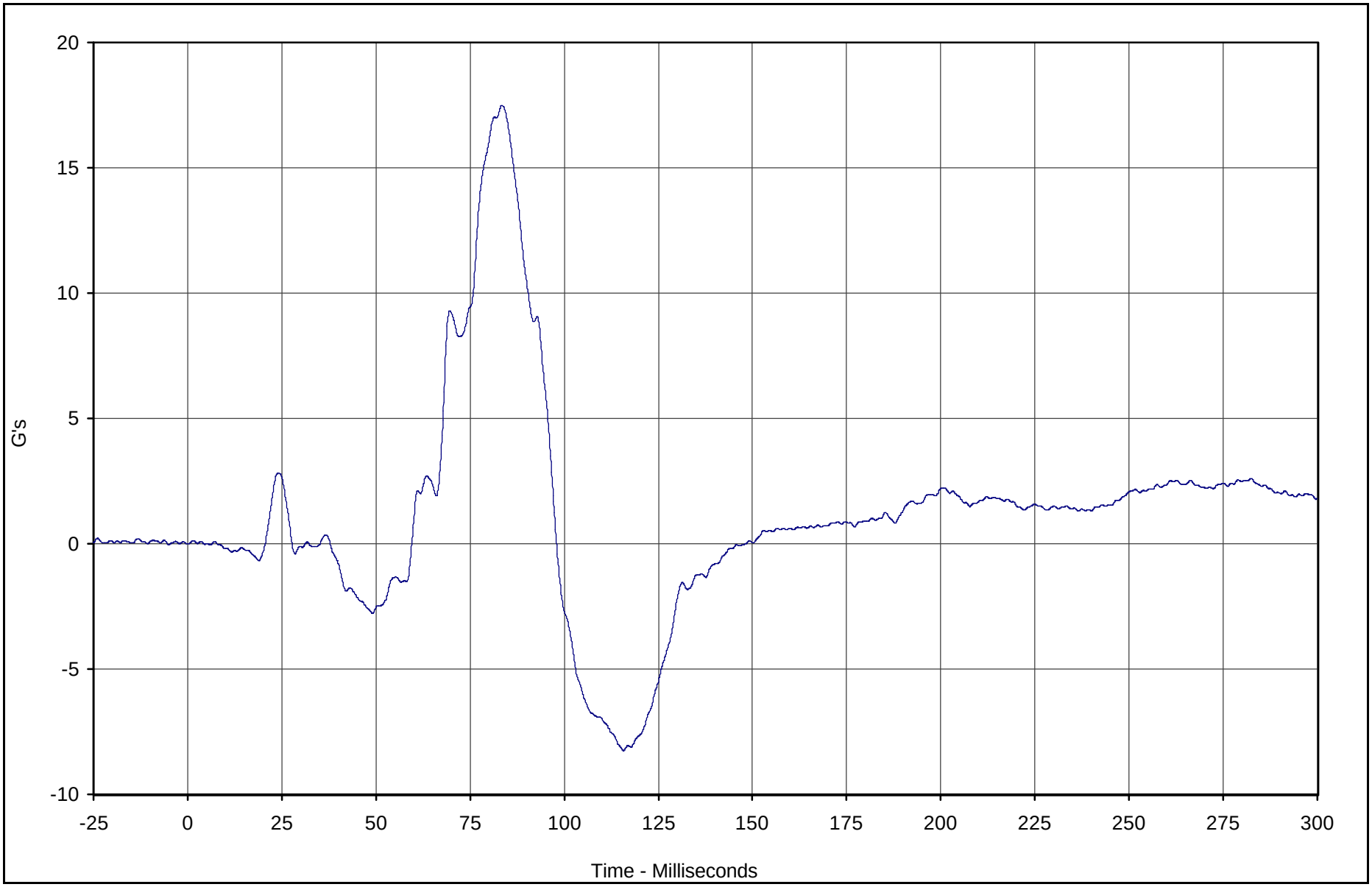
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant Y	017	FIL	G's	3.3	101.9	-7.4	91.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



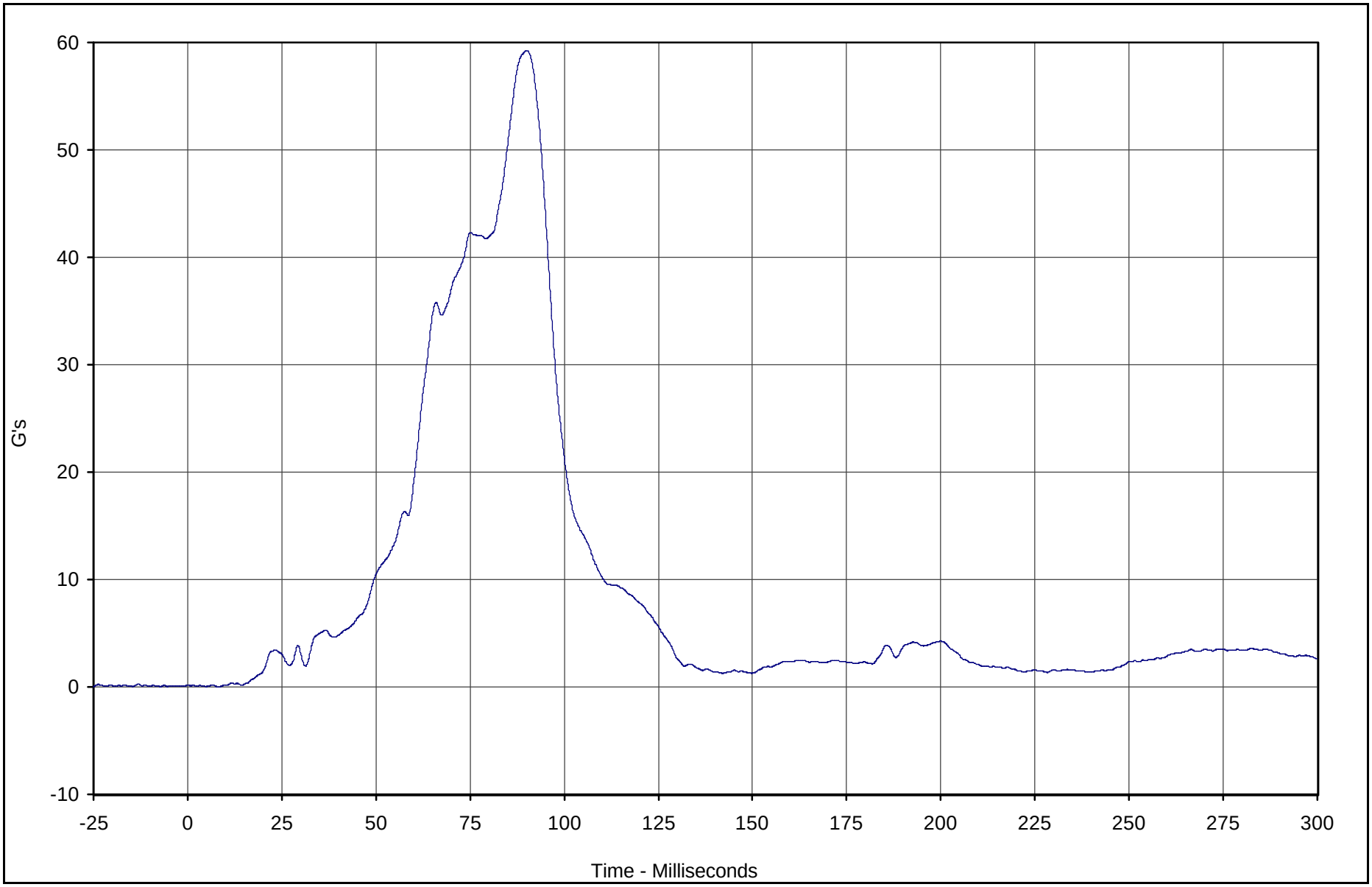
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant Z	018	FIL	G's	17.5	83.5	-8.3	115.8	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



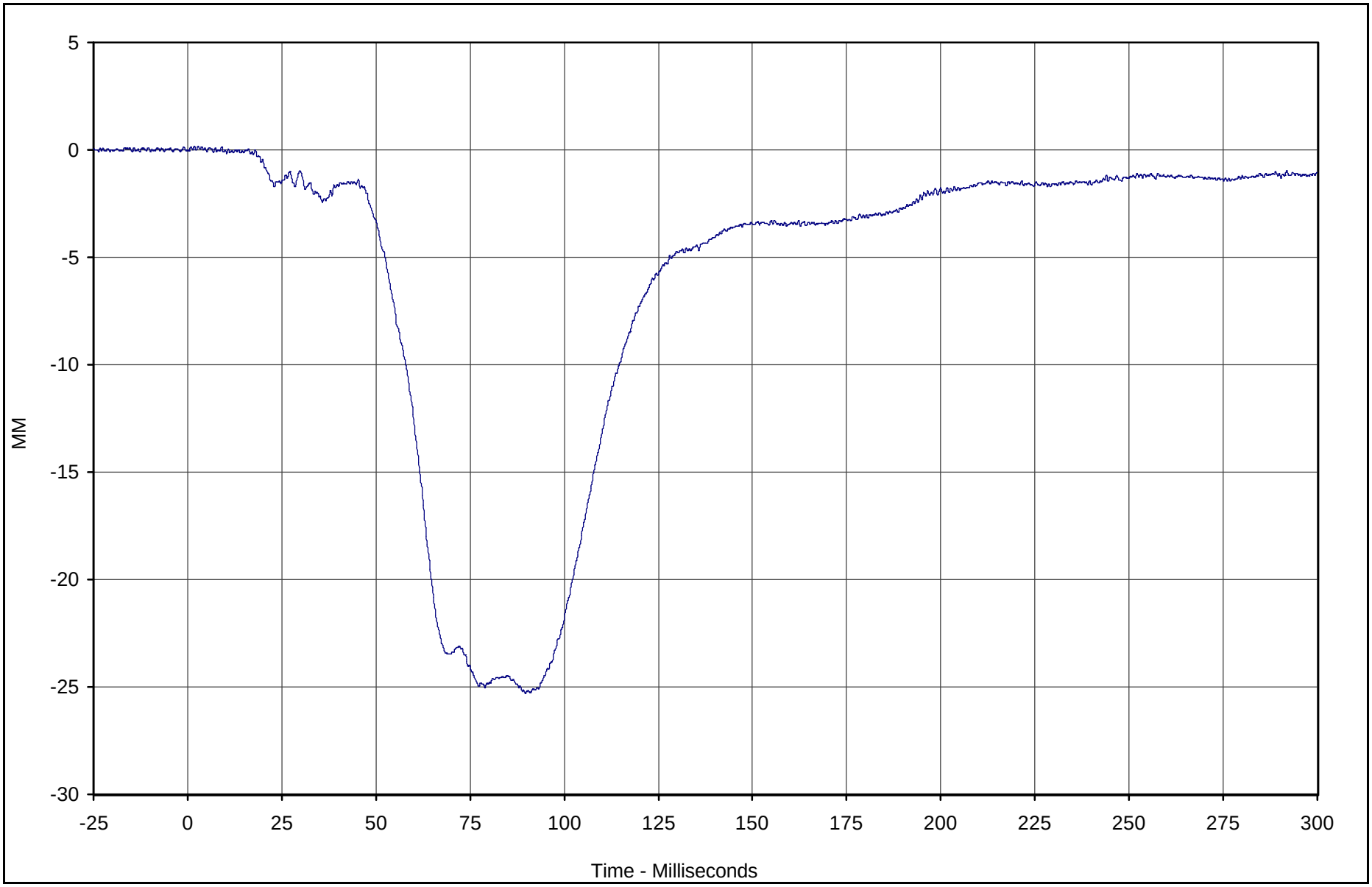
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Resultant Redundant	016	RES	G's	59.3	90.1	0.0	7.7	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



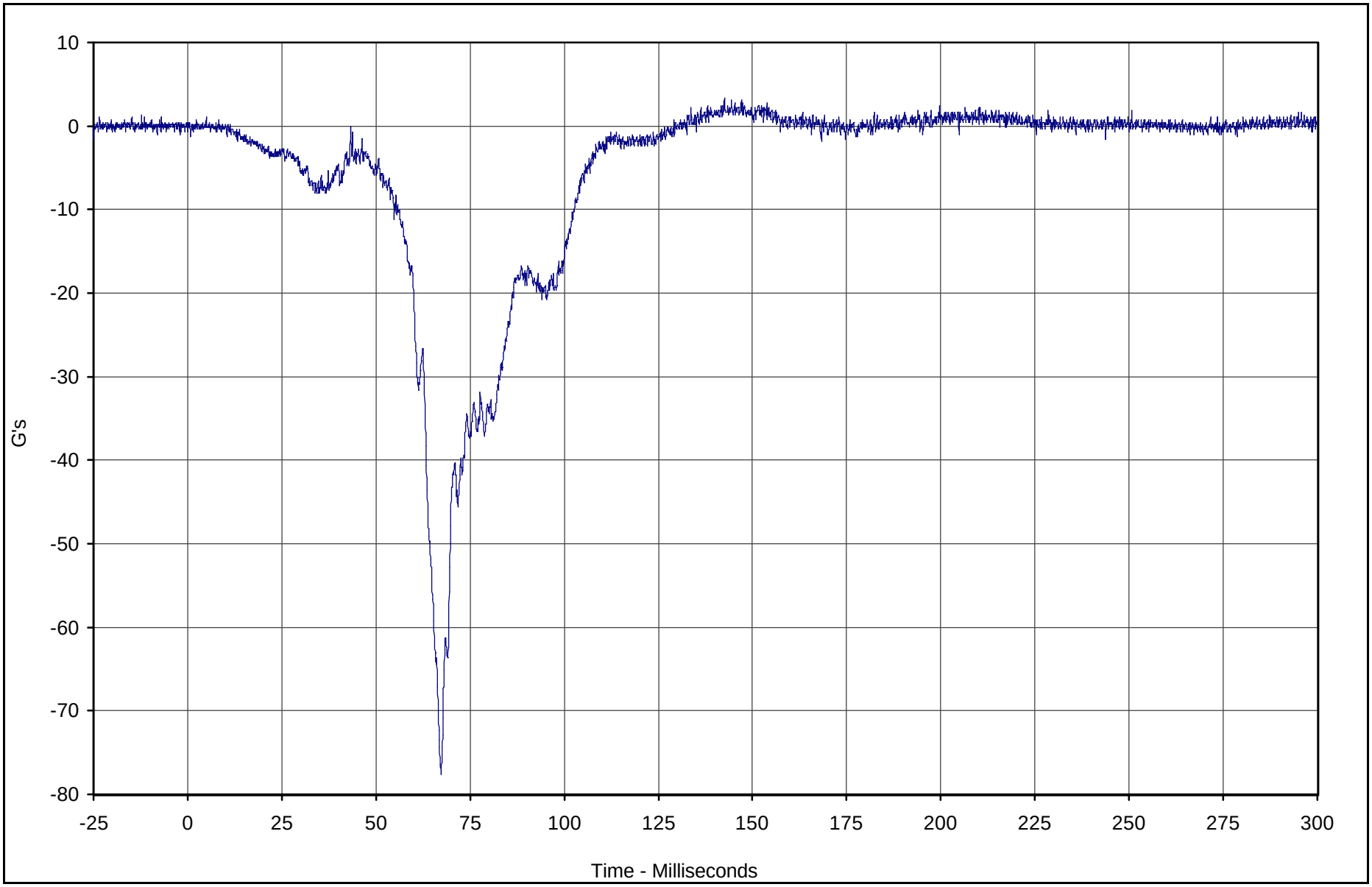
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Displacement X	019	FIL	MM	0.2	1.8	-25.3	89.7	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



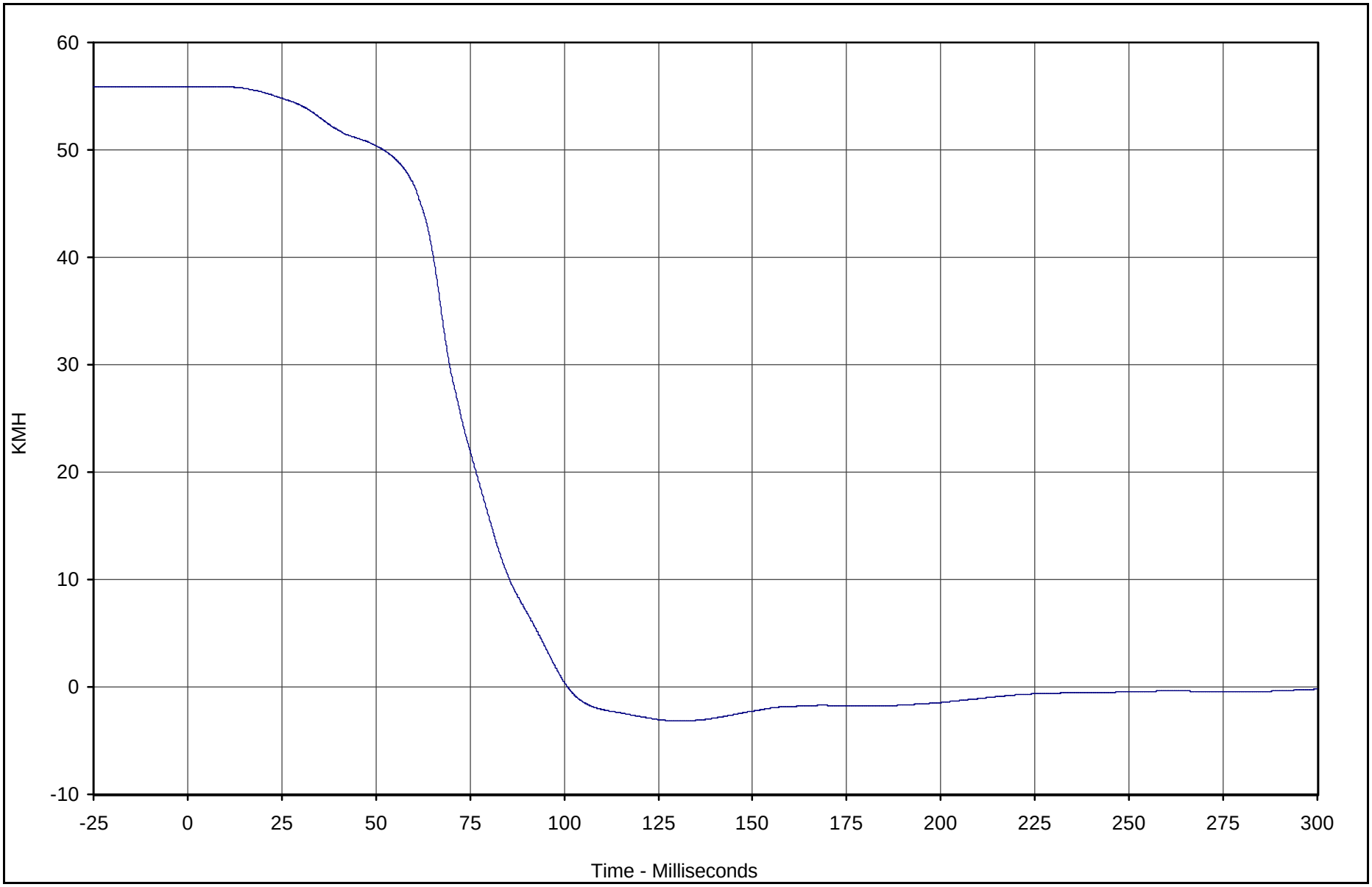
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X	020	FIL	G's	3.4	142.6	-77.6	67.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



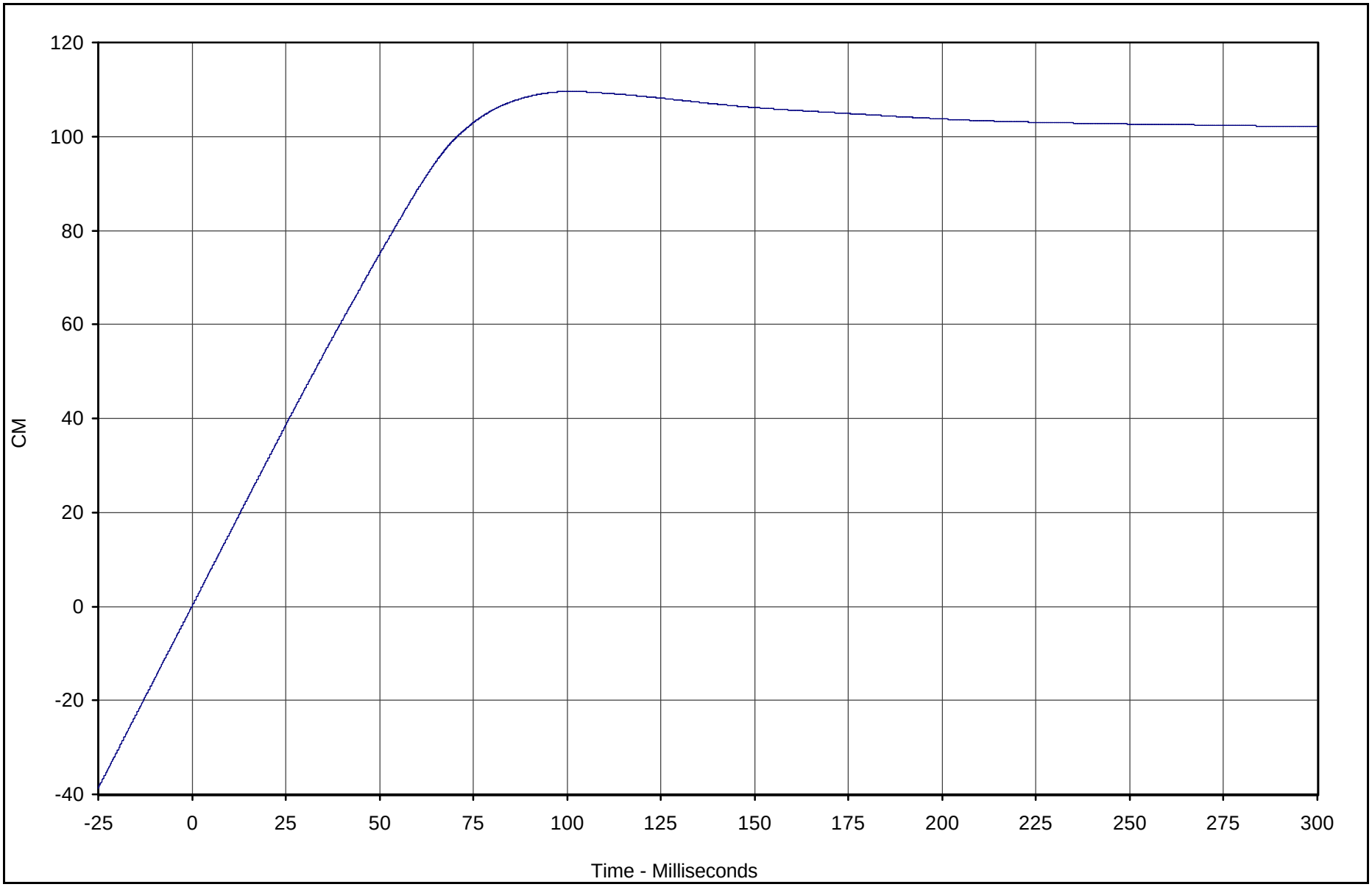
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X Velocity	020	IN1	KMH	55.9	0.0	-3.2	130.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



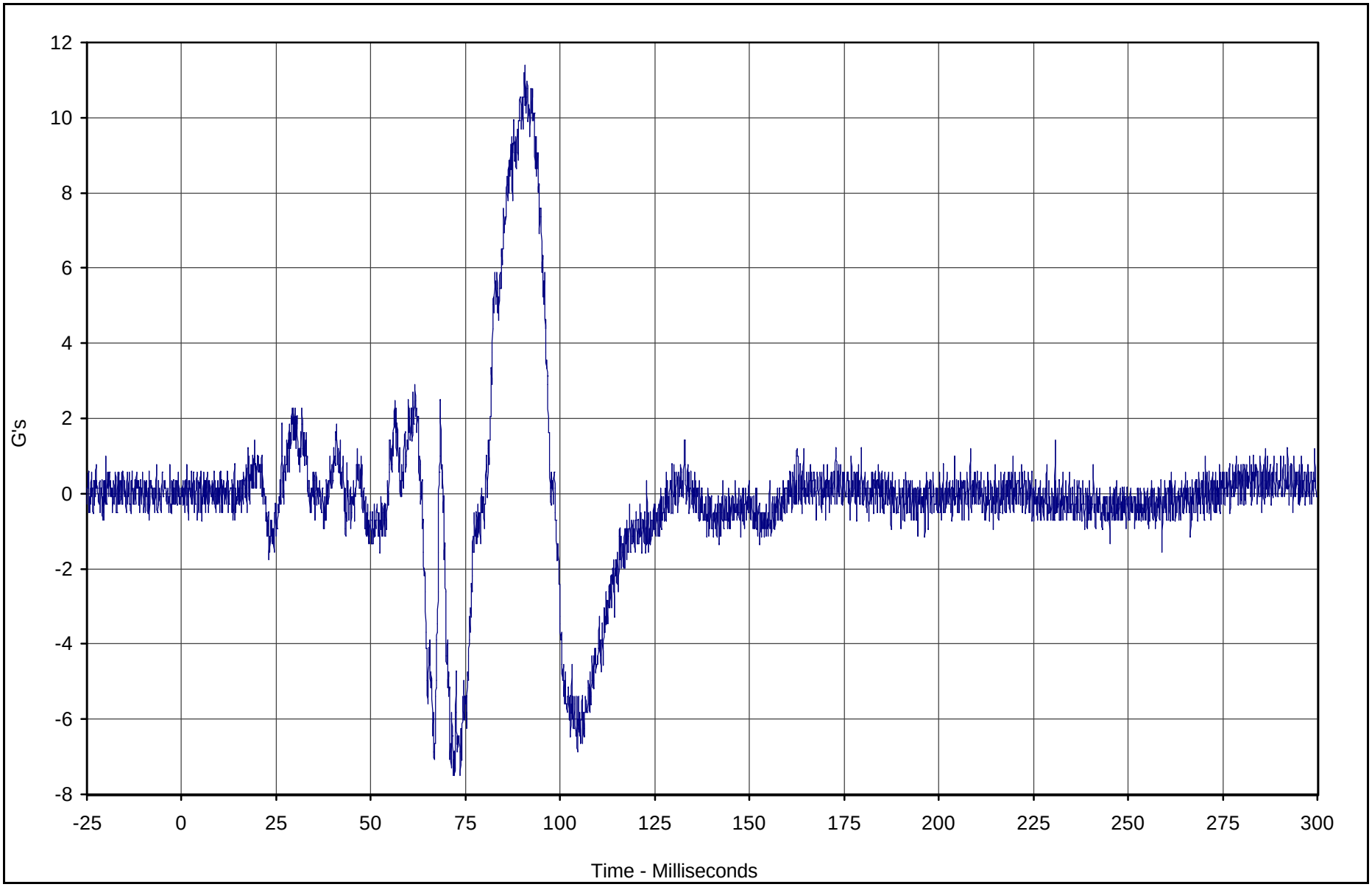
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X Displ.	020	IN2	CM	109.6	100.9	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



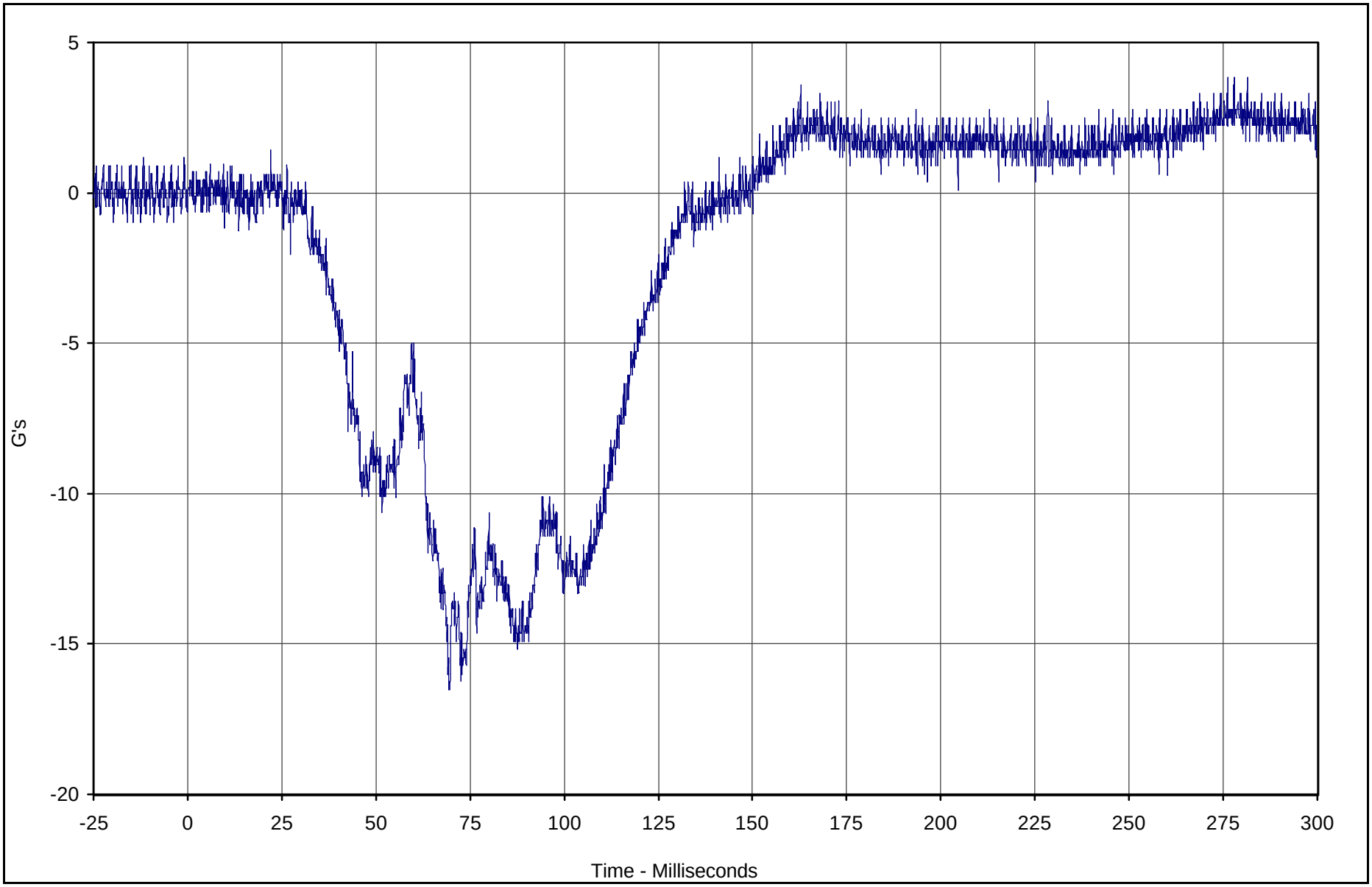
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Y	021	FIL	G's	11.4	90.8	-7.5	71.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



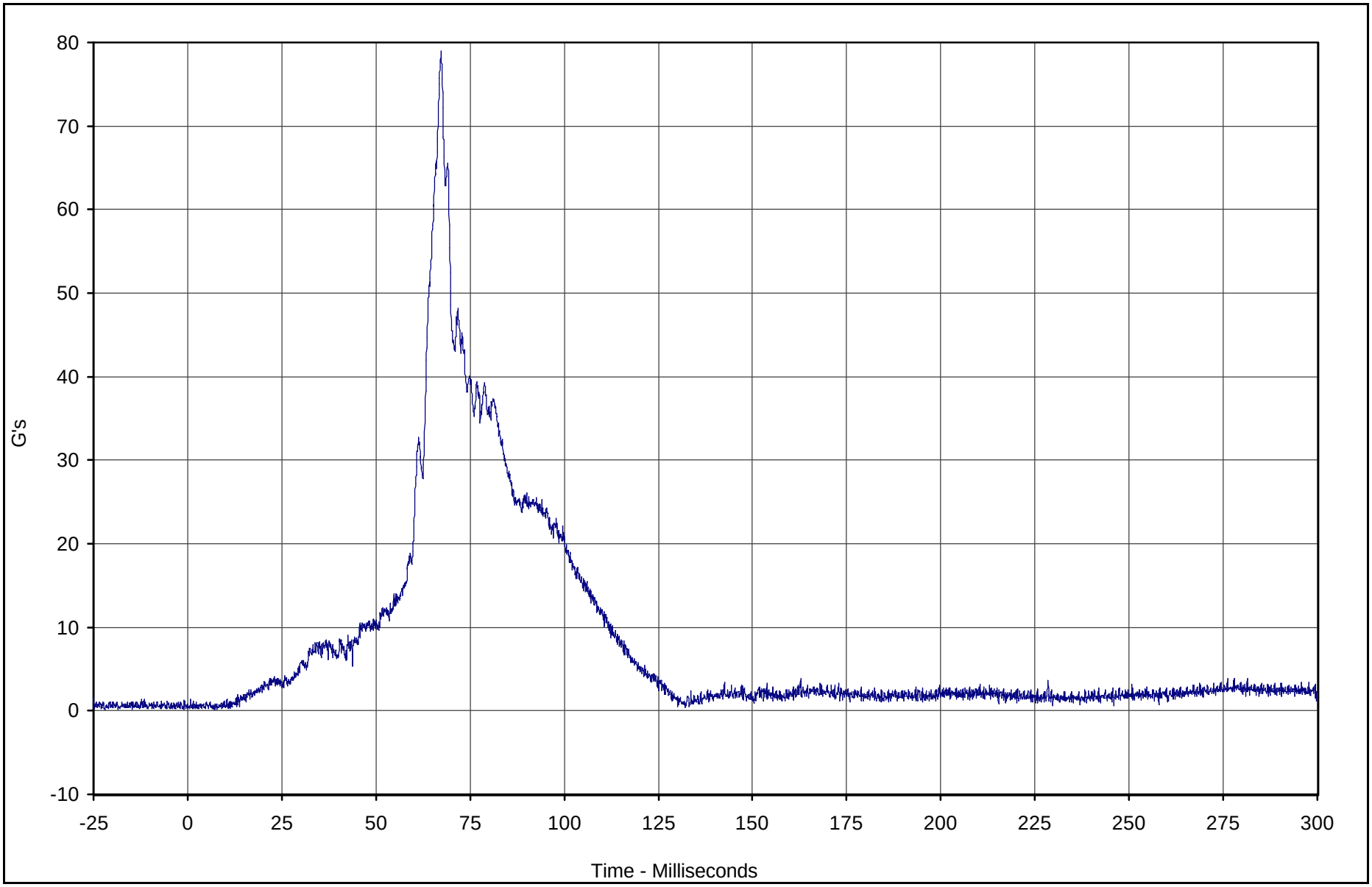
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Z	022	FIL	G's	3.8	276.2	-16.5	69.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



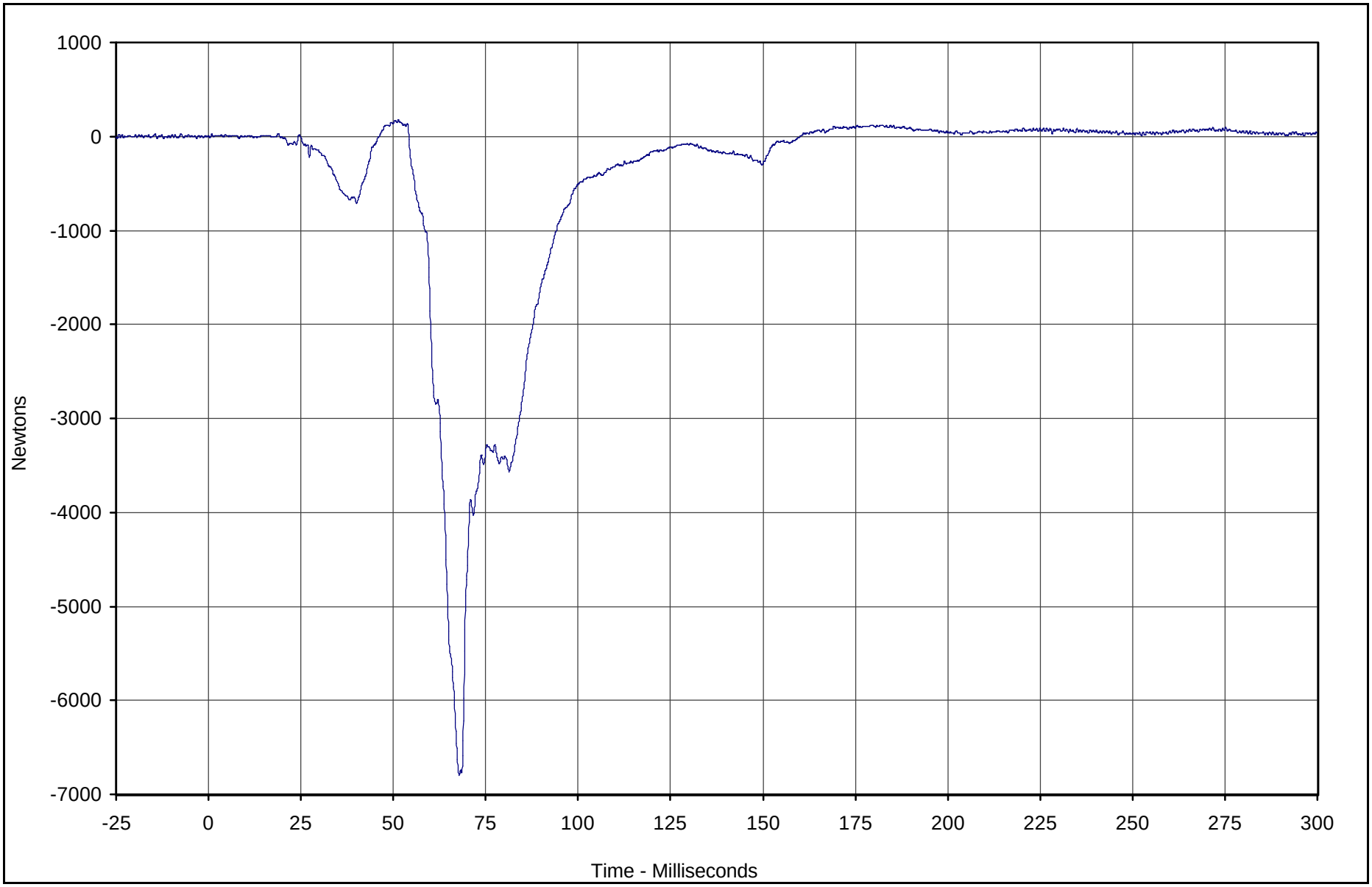
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Resultant	023	RES	G's	79.0	67.3	0.2	7.1	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



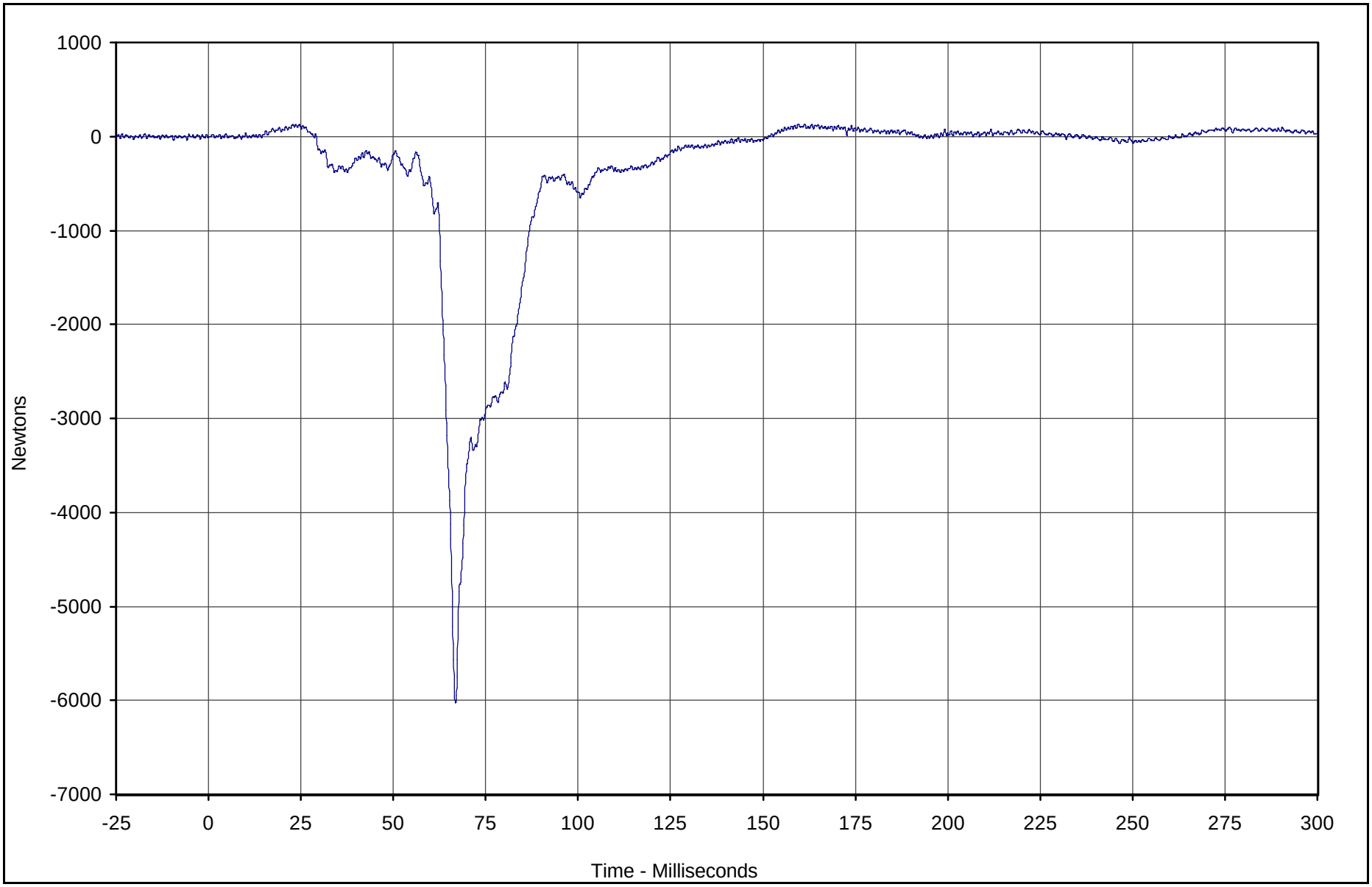
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Femur Force	023	FIL	Newtons	178.5	51.3	-6795.1	67.8	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



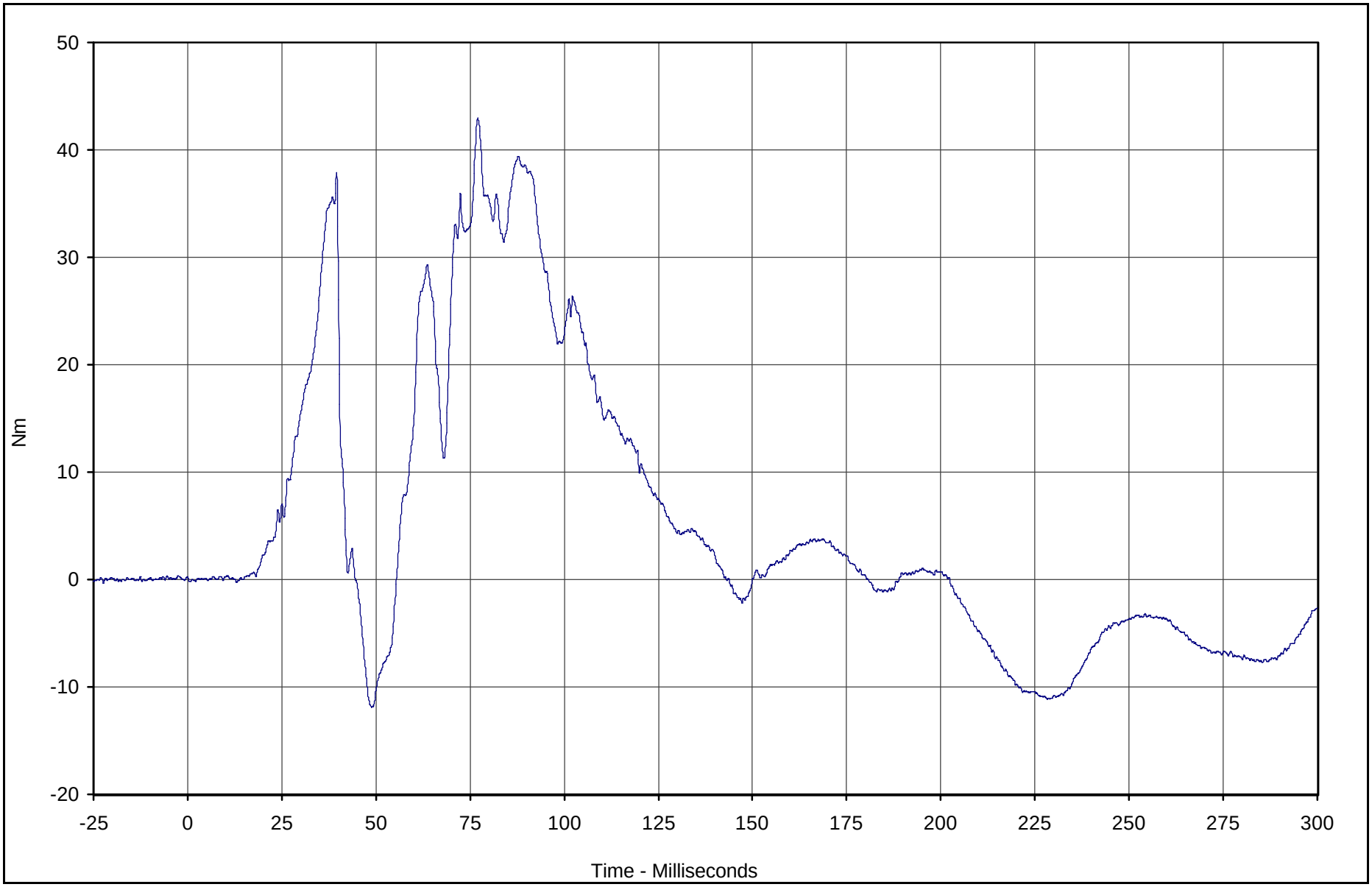
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Femur Force	024	FIL	Newtons	129.3	159.6	-6024.3	66.8	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



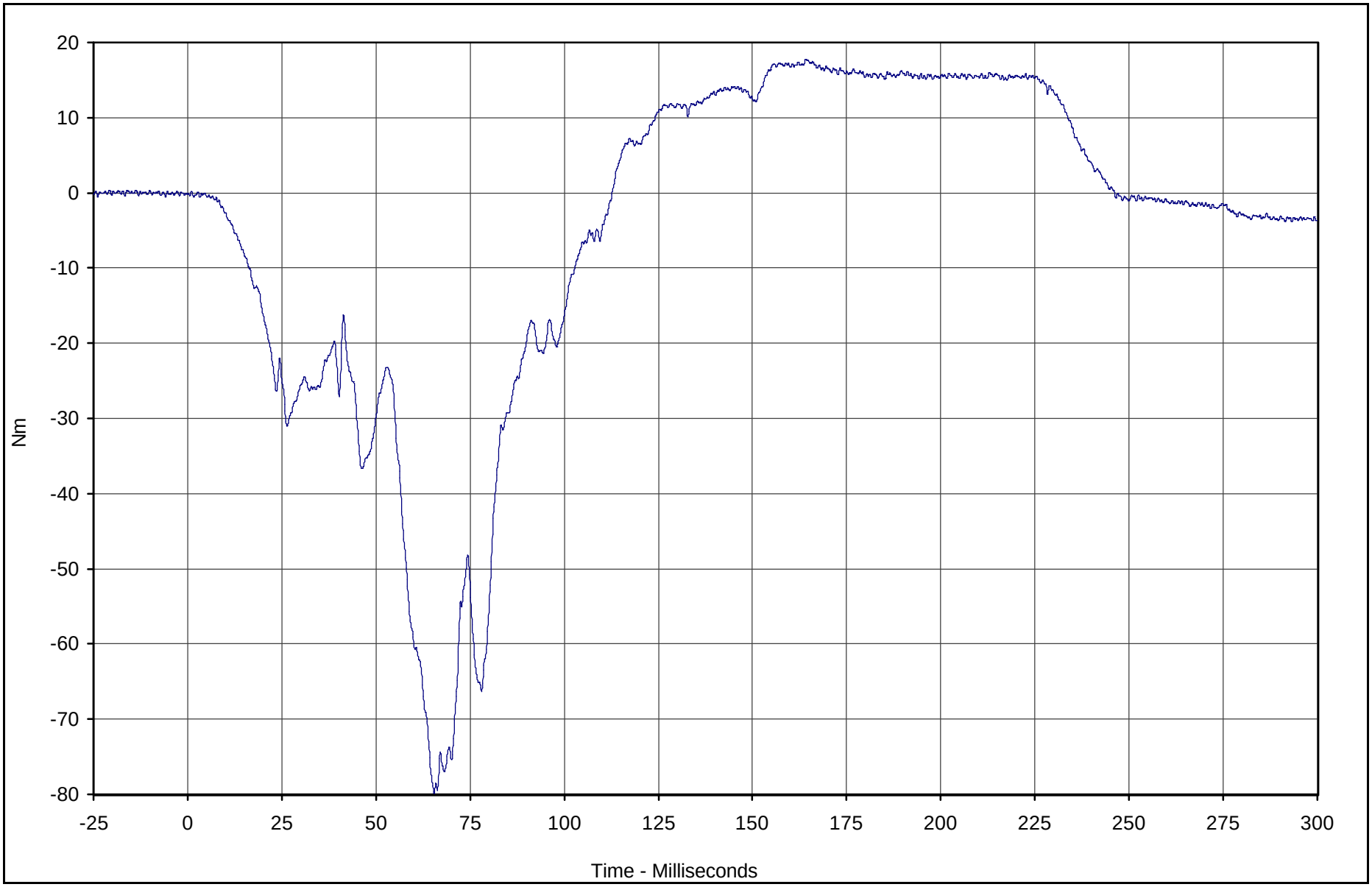
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Upper Tibia Moment X	025	FIL	Nm	43.0	77.1	-11.9	48.9	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



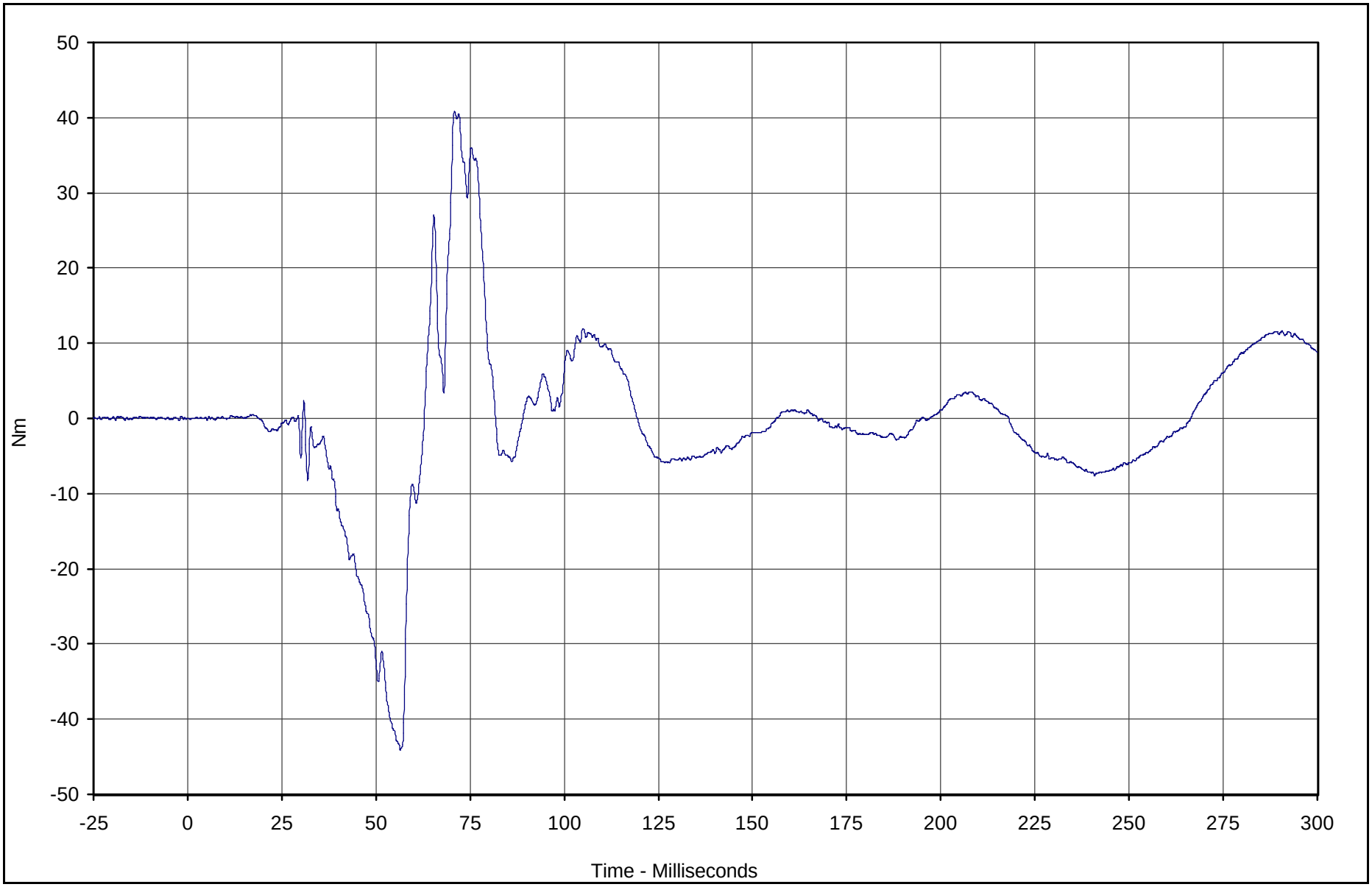
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Upper Tibia Moment Y	026	FIL	Nm	17.8	164.2	-79.9	65.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



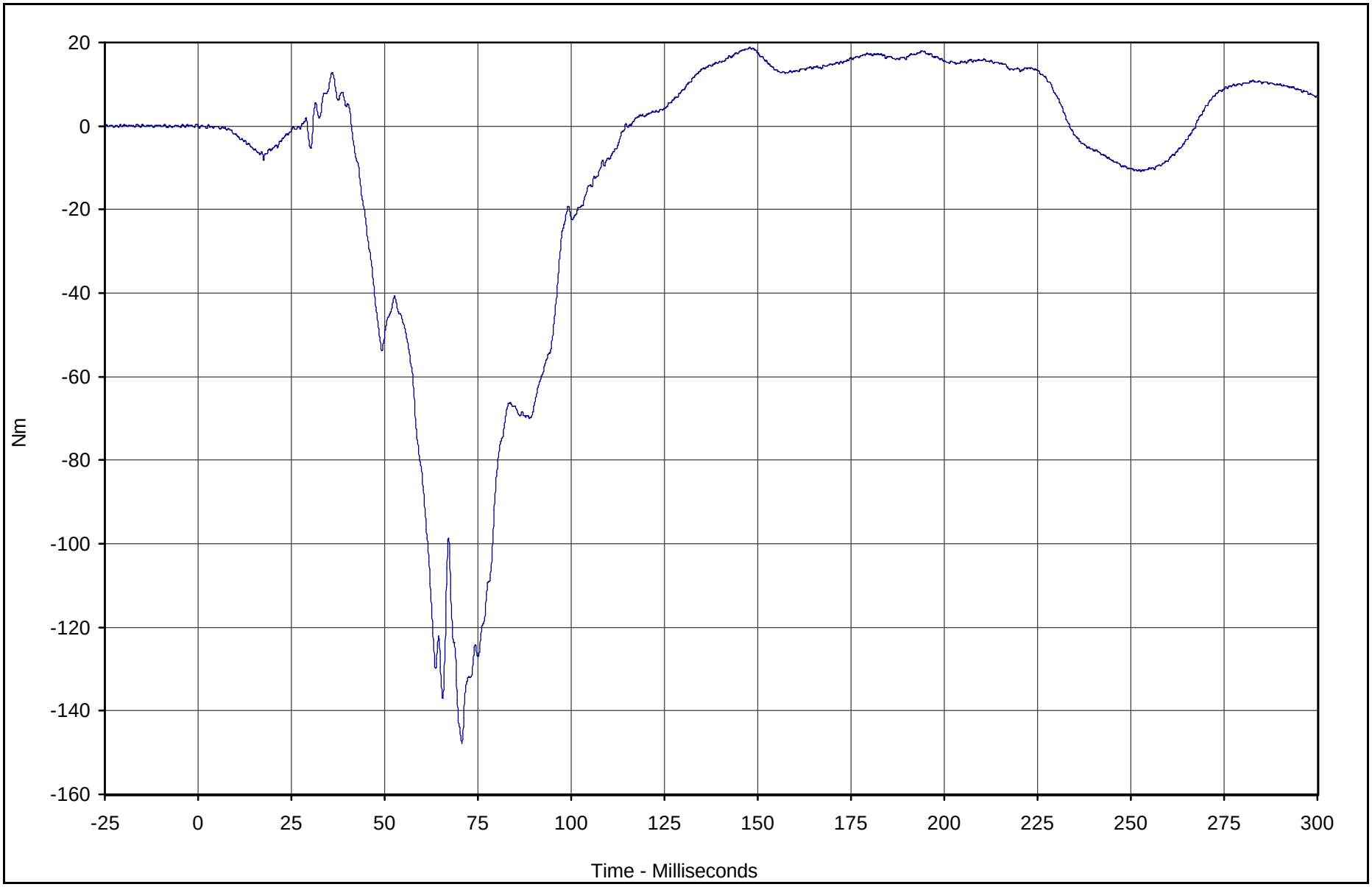
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Upper Tibia Moment X	027	FIL	Nm	40.9	70.8	-44.1	56.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



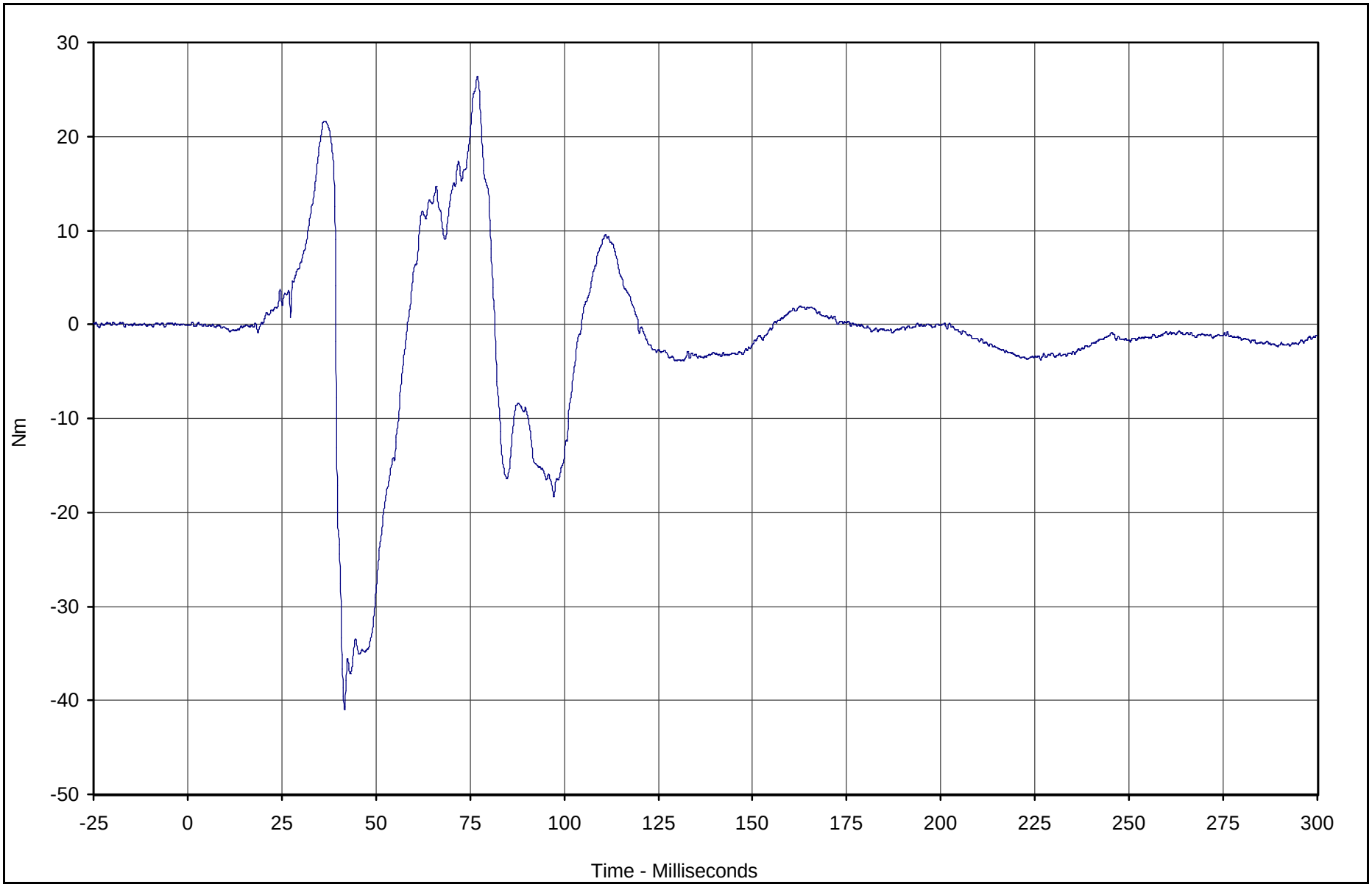
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Upper Tibia Moment Y	028	FIL	Nm	18.8	147.9	-147.8	70.7	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



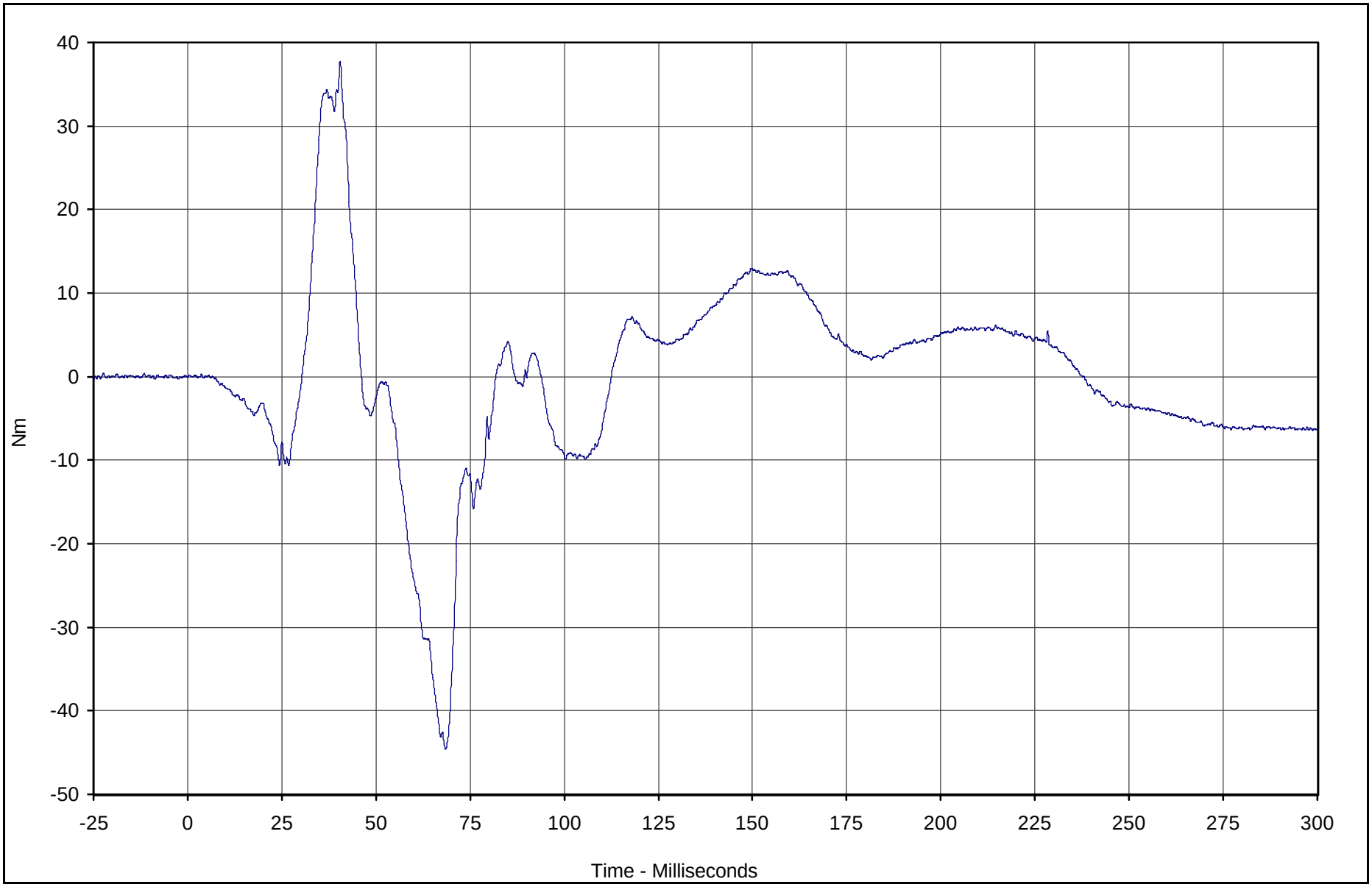
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Moment X	029	FIL	Nm	26.4	77.0	-41.0	41.7	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



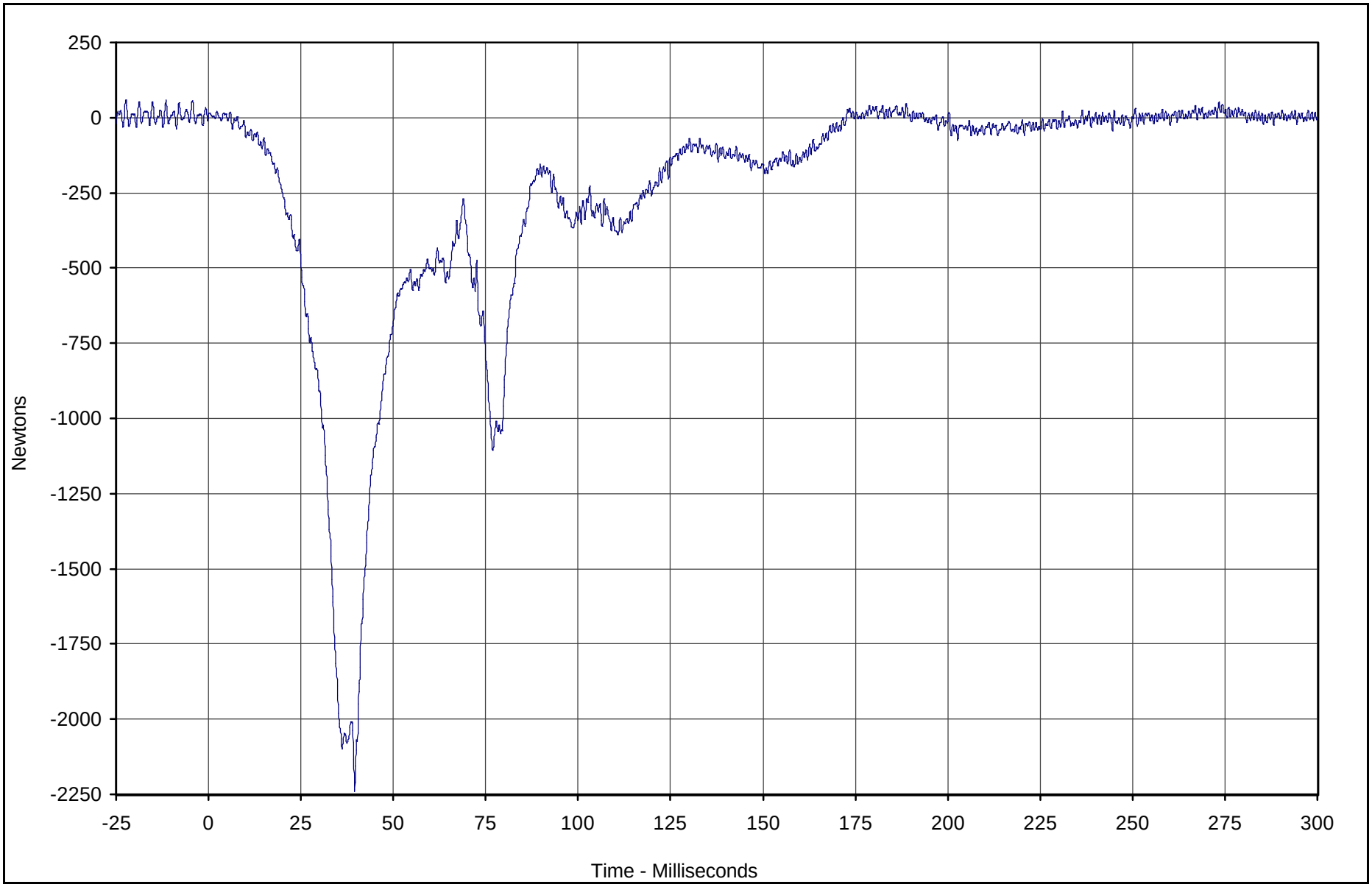
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Moment Y	030	FIL	Nm	37.7	40.5	-44.6	68.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Force Z	031	FIL	Newtons	51.7	273.4	-2239.4	39.6	600

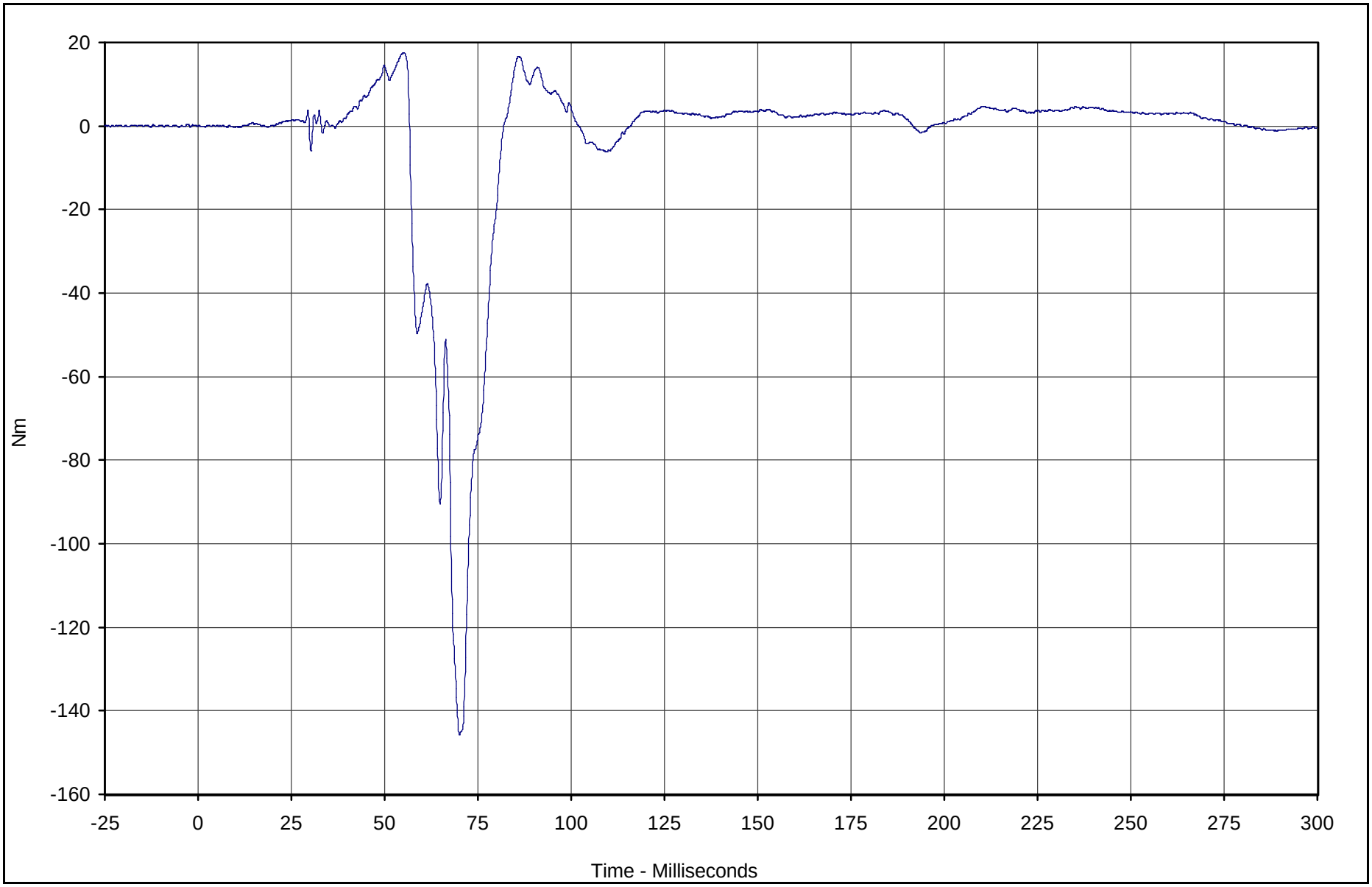
KARCO Engineering

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



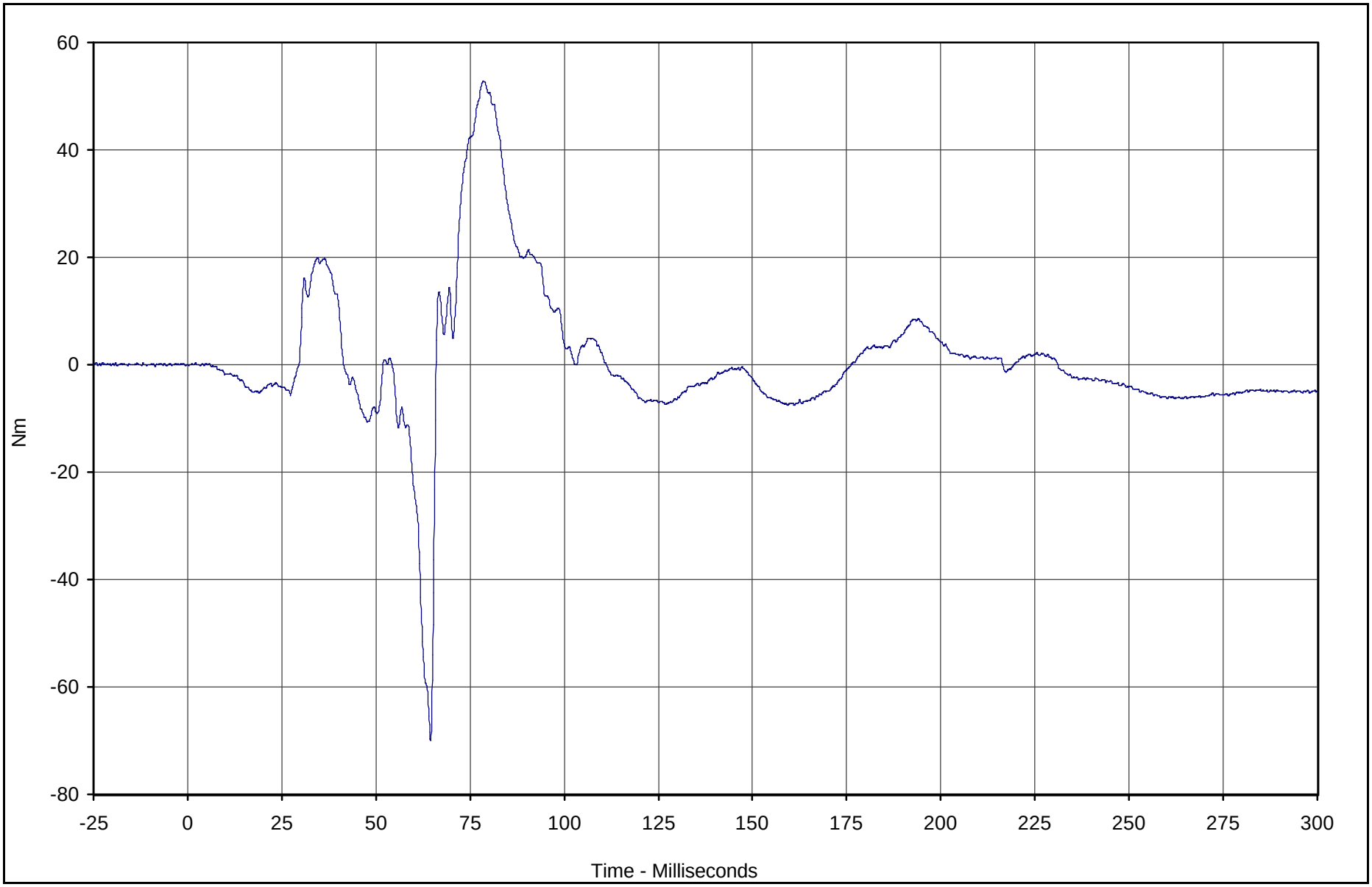
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Moment X	032	FIL	Nm	17.6	55.2	-145.7	70.1	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



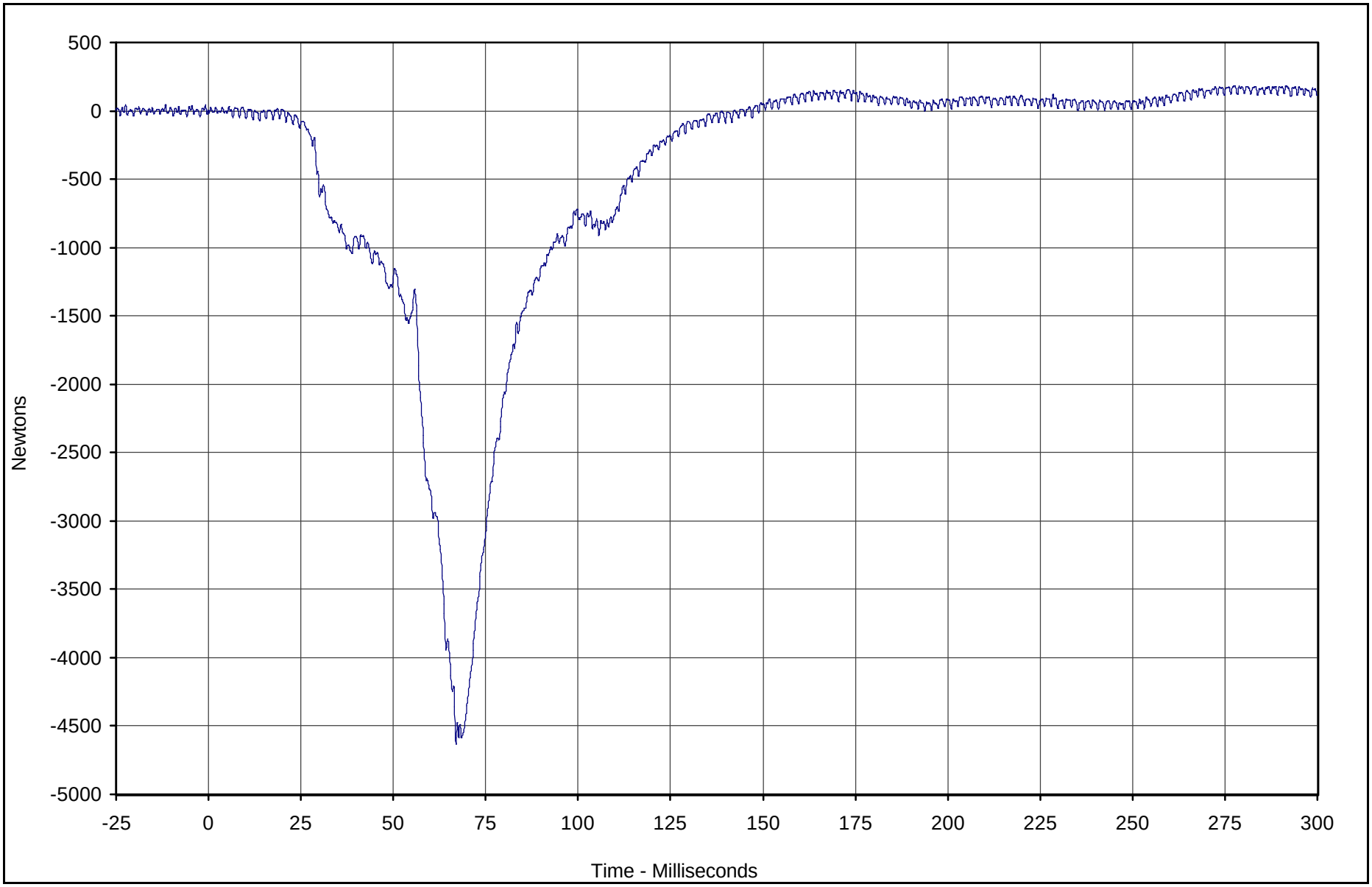
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Moment Y	033	FIL	Nm	52.7	78.6	-70.0	64.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



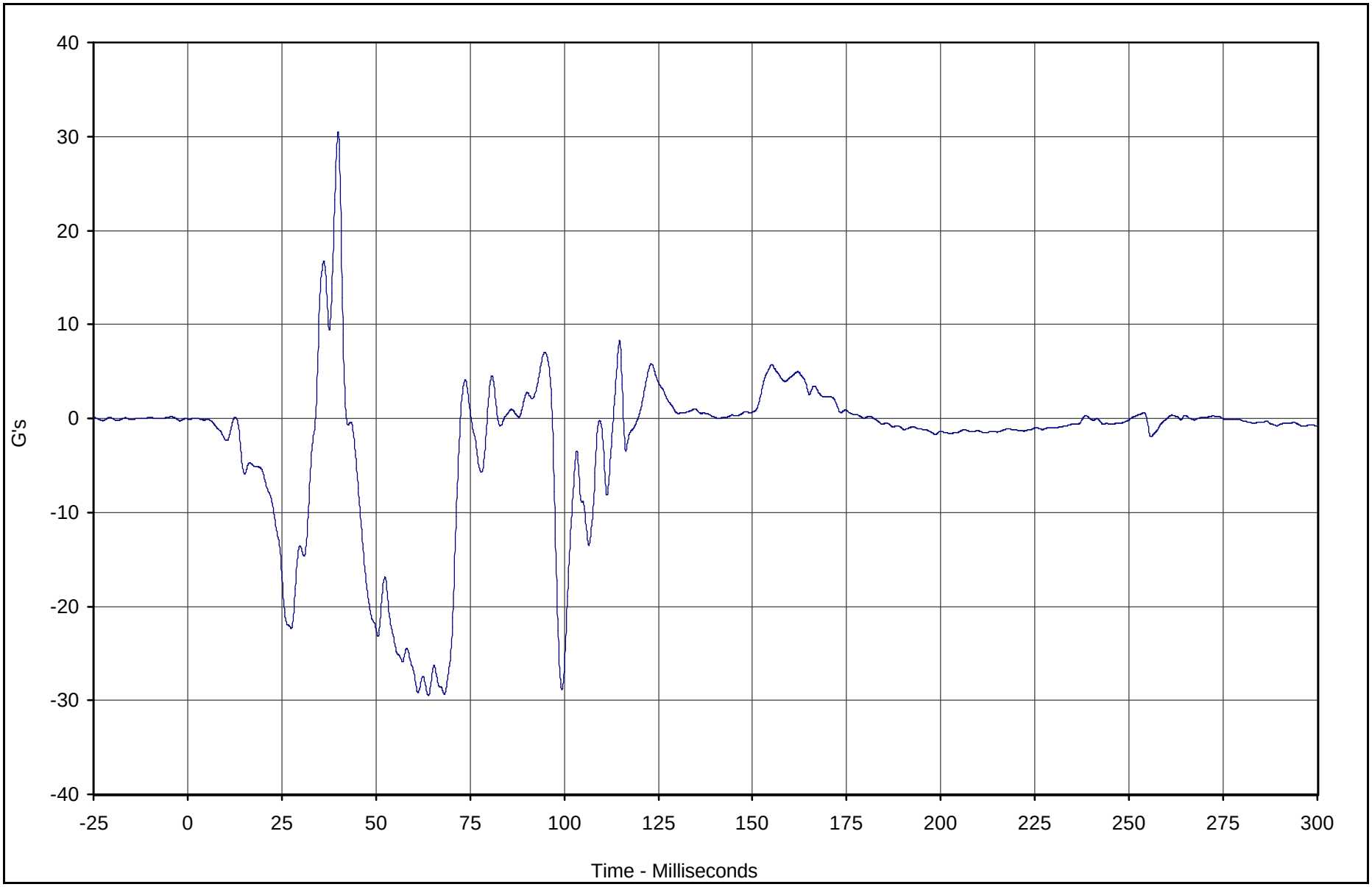
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Force Z	034	FIL	Newtons	182.8	291.5	-4631.5	67.0	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



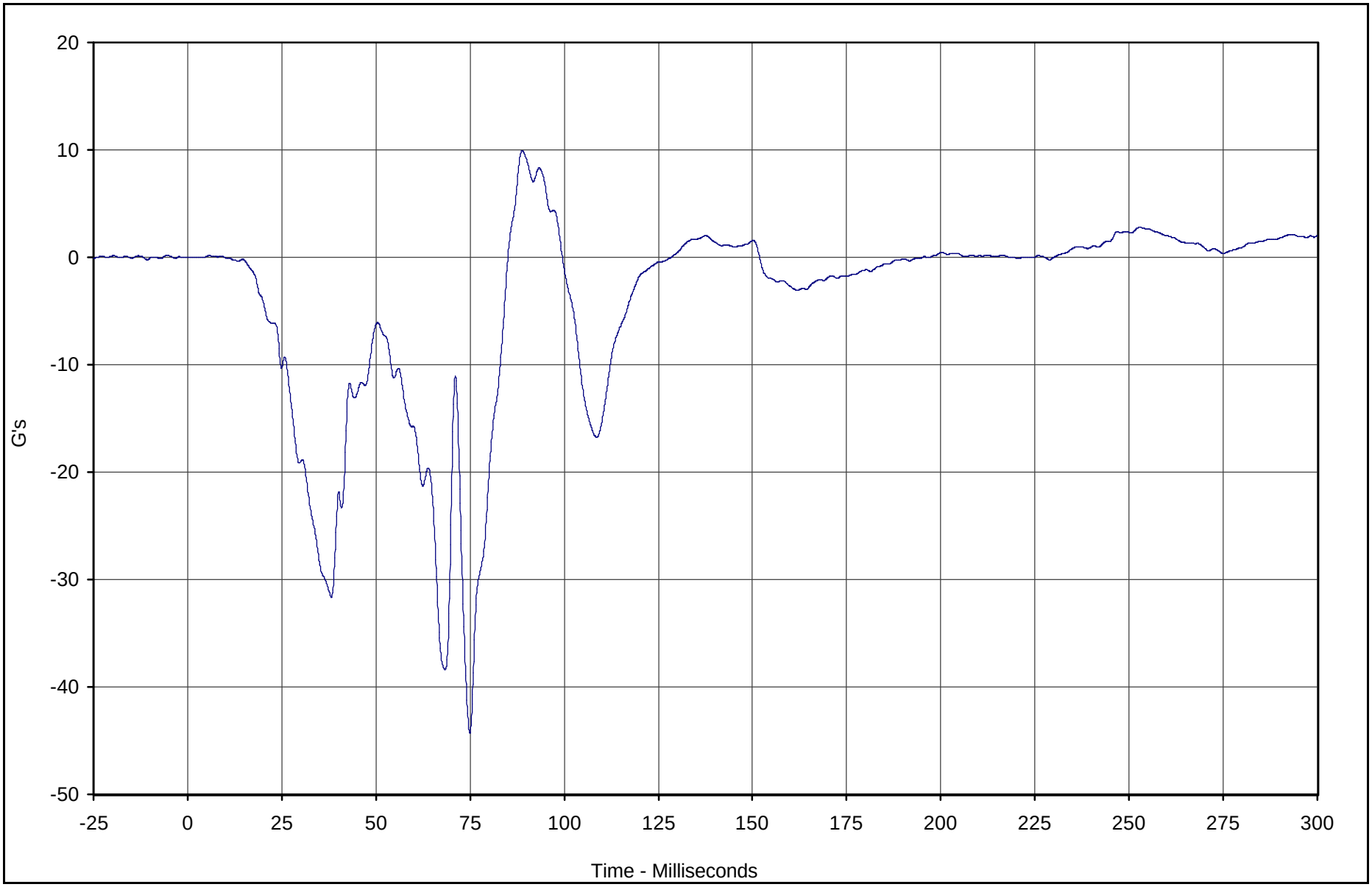
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Aft X	035	FIL	G's	30.5	40.0	-29.5	63.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



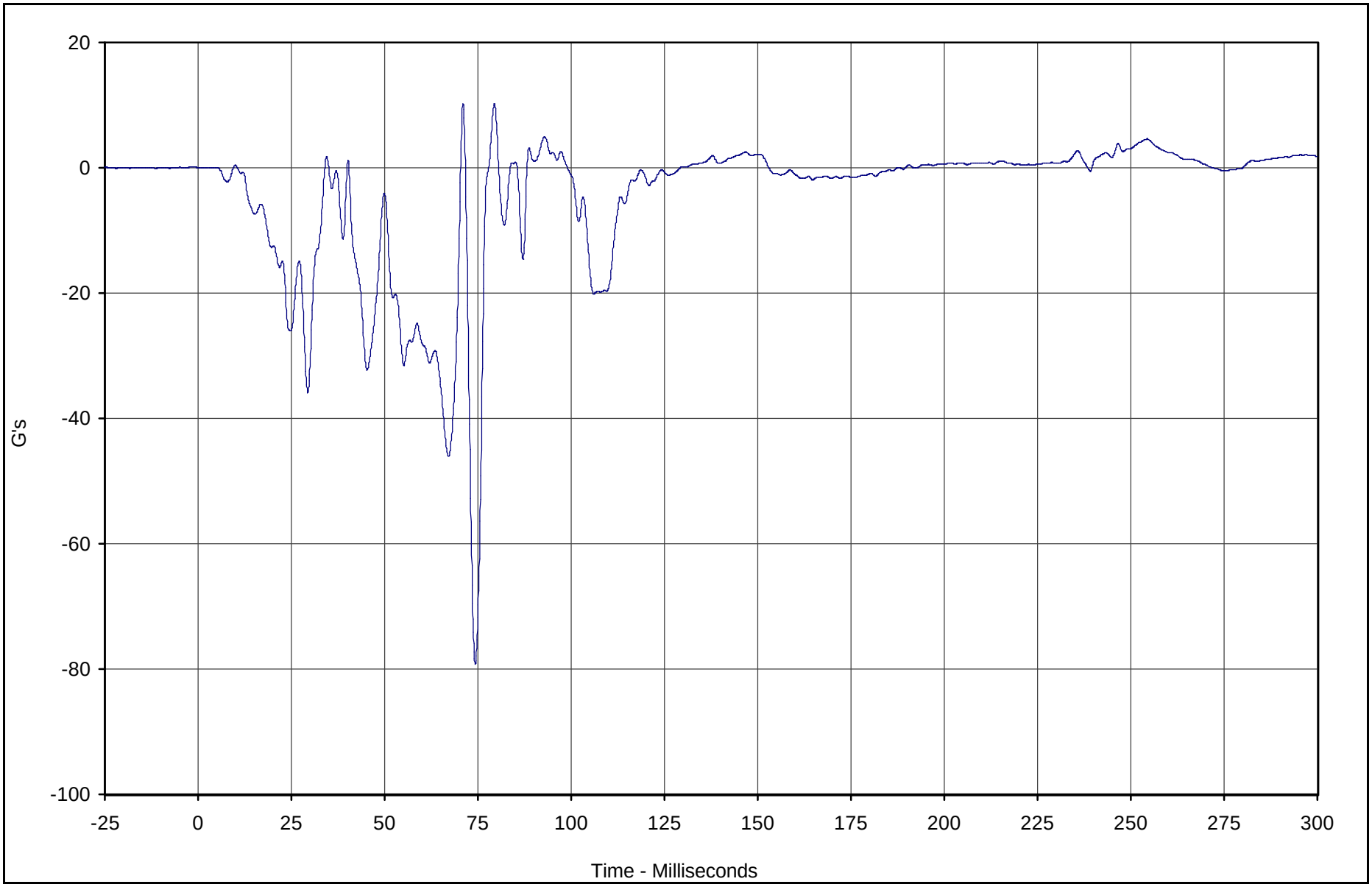
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Aft Z	036	FIL	G's	9.9	88.8	-44.3	75.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



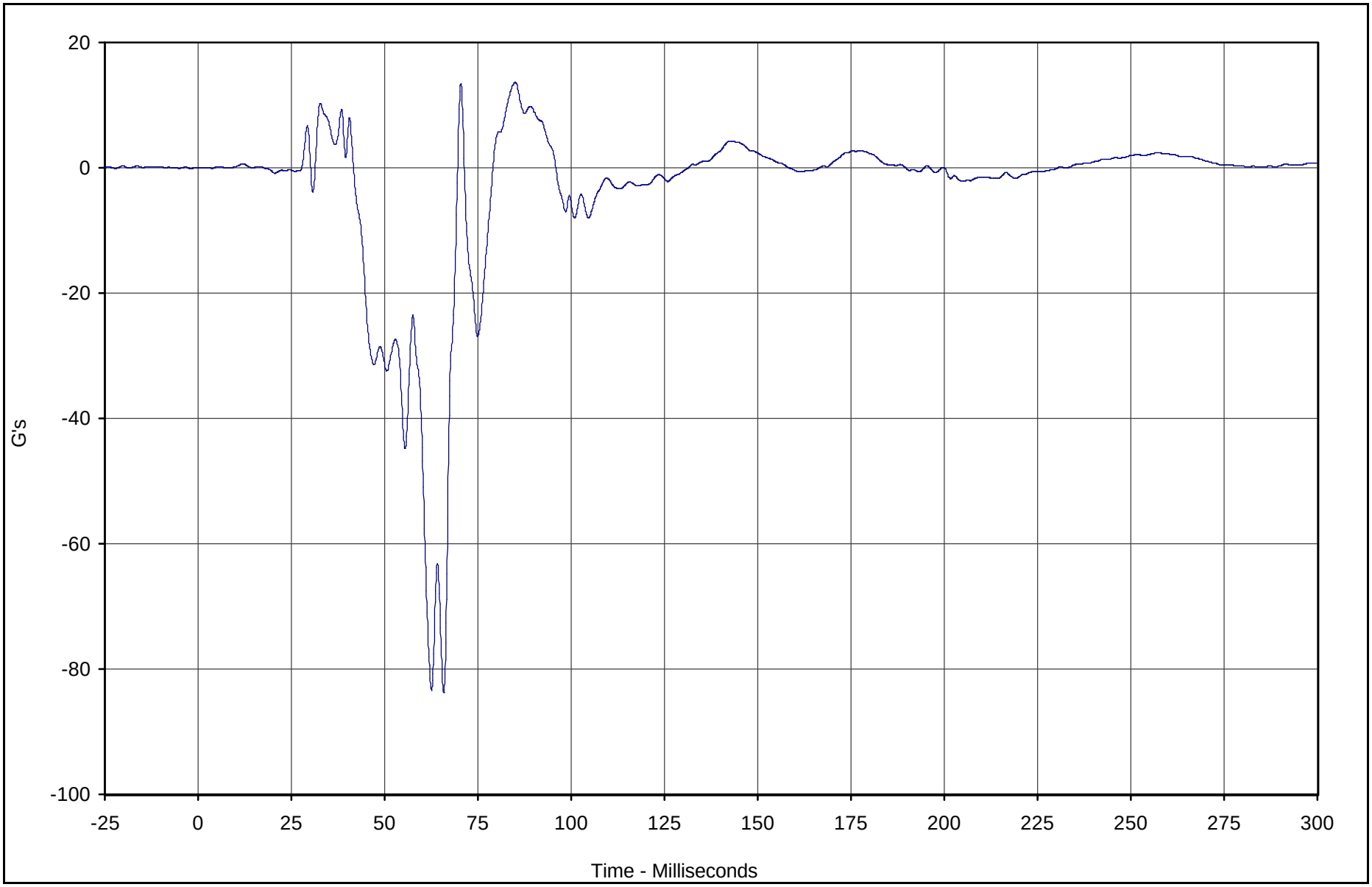
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Fore Z	037	FIL	G's	10.3	71.0	-79.2	74.3	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



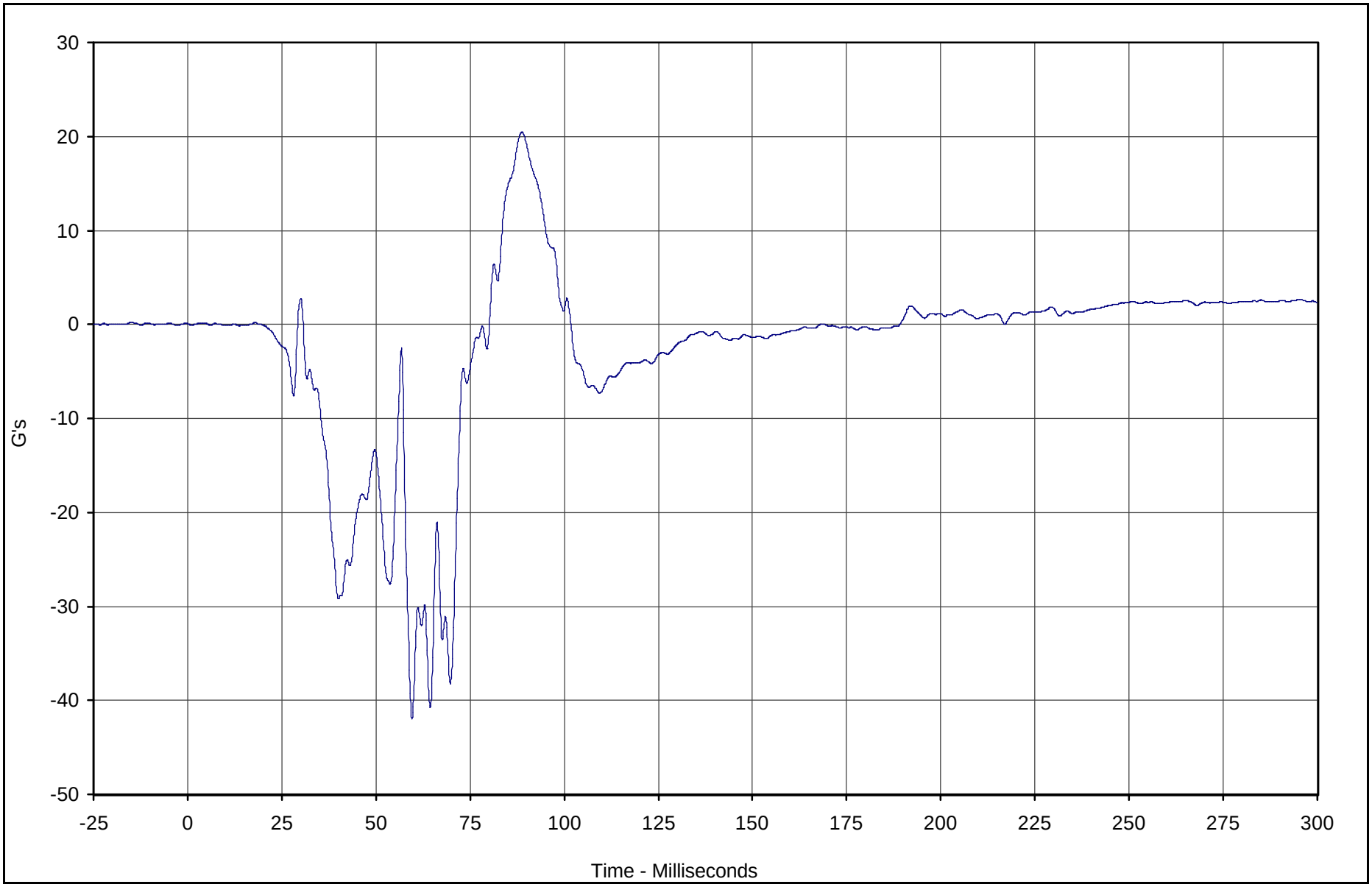
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Aft X	038	FIL	G's	13.6	85.0	-83.8	65.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



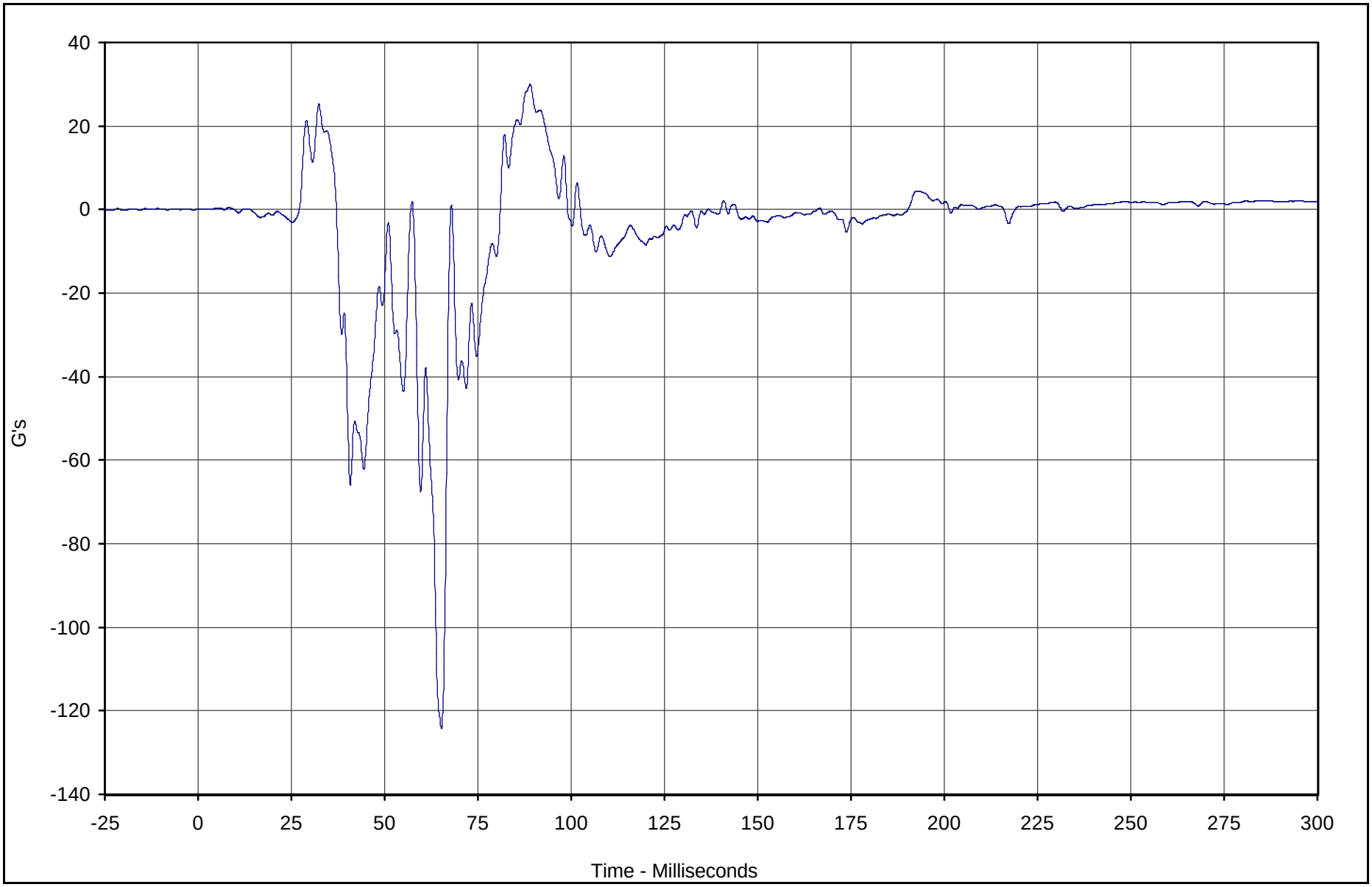
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Aft Z	039	FIL	G's	20.5	88.8	-41.9	59.6	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



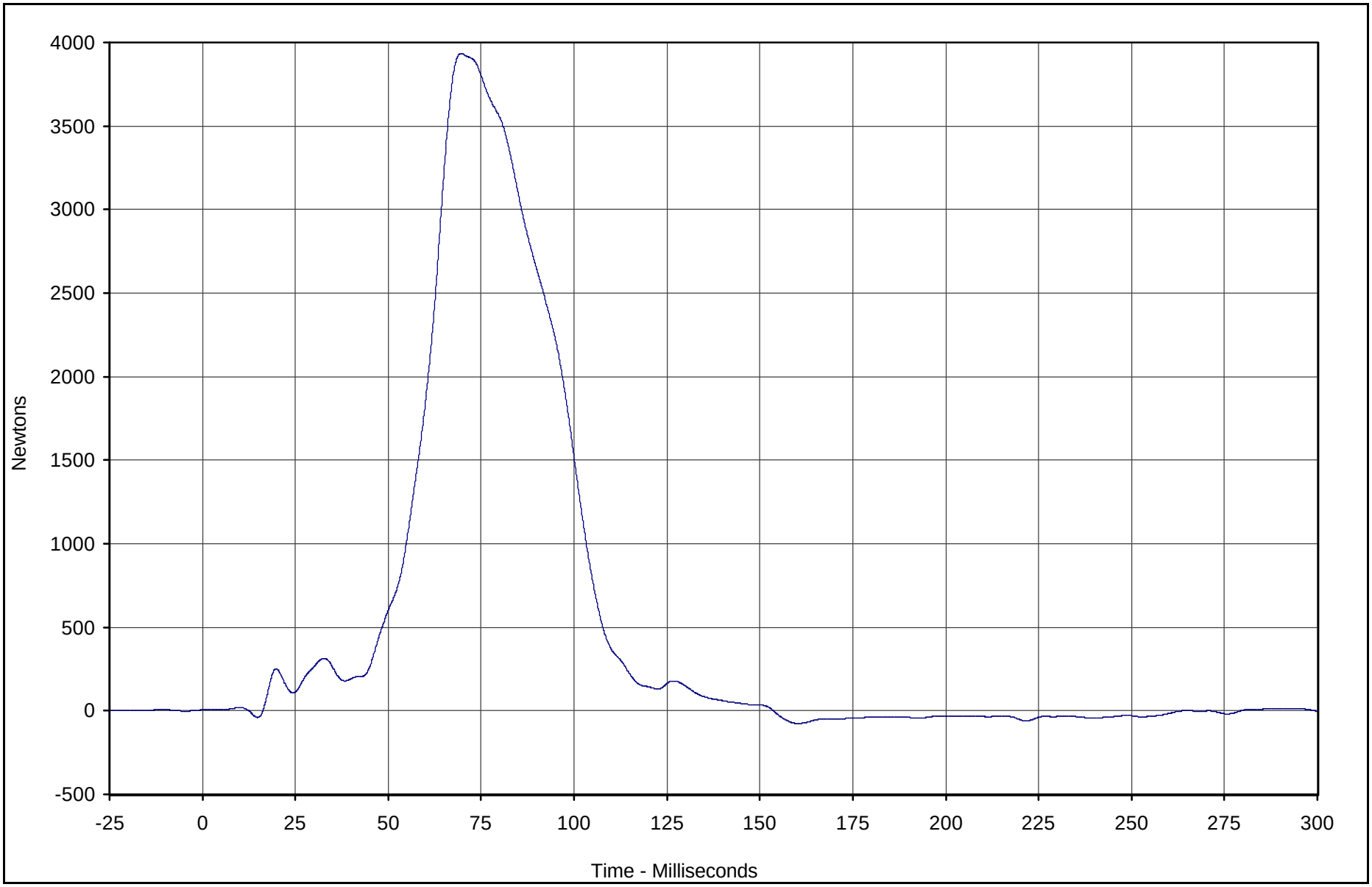
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Fore Z	040	FIL	G's	30.0	89.0	-124.2	65.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



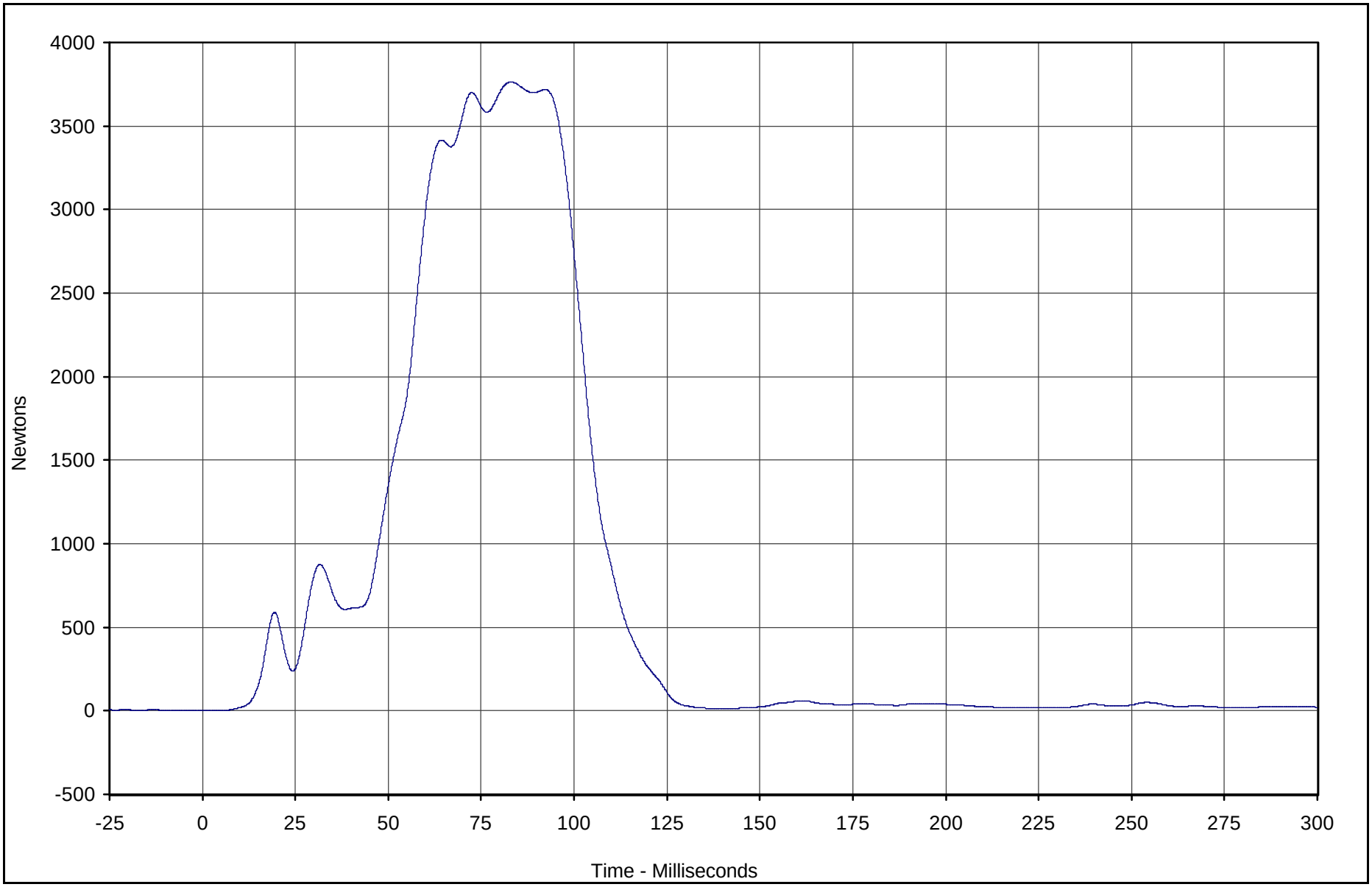
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Lap Belt Force	041	FIL	Newtons	3934.5	69.6	-76.1	160.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



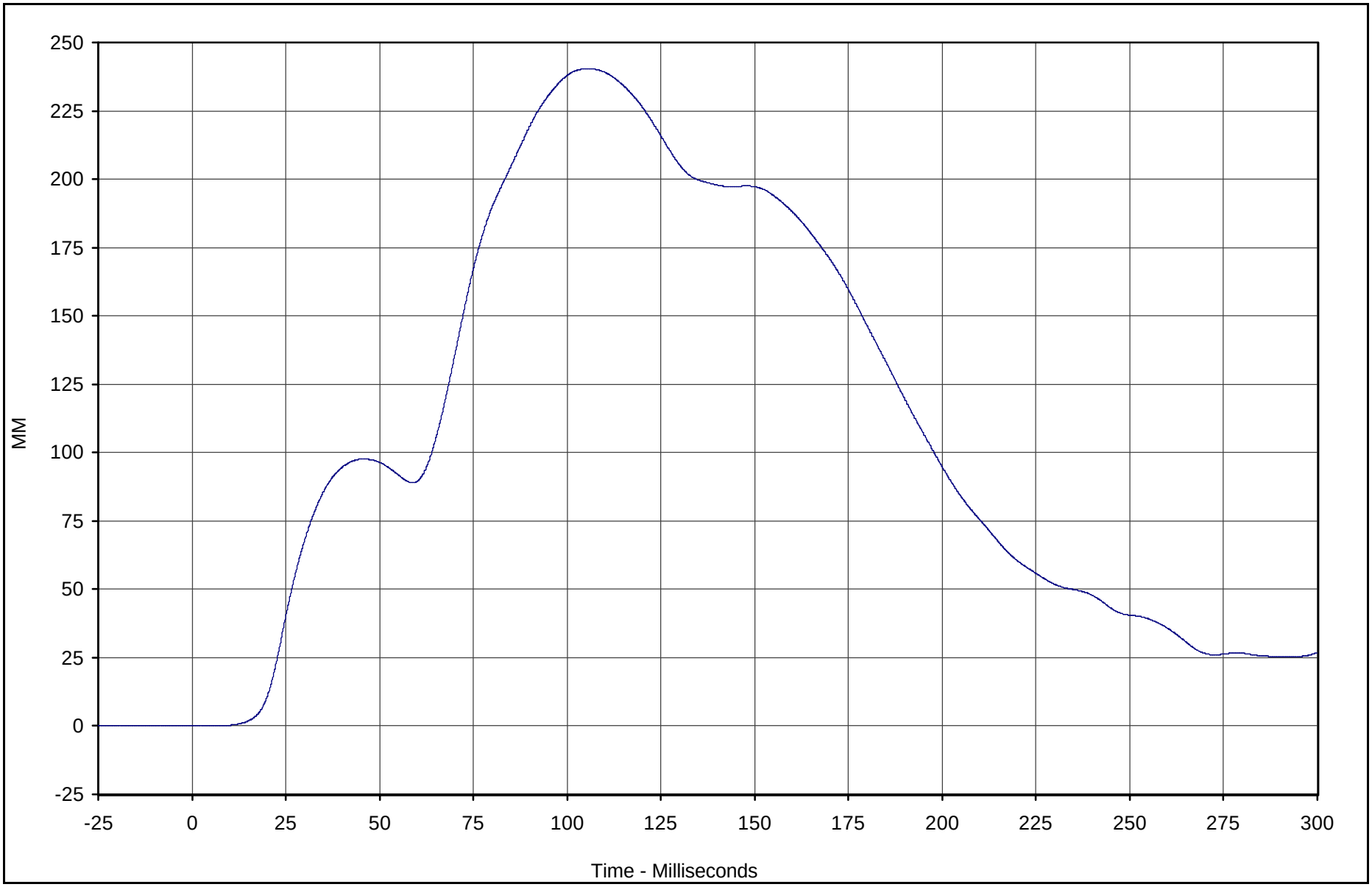
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Force	042	FIL	Newtons	3763.0	83.0	-0.6	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



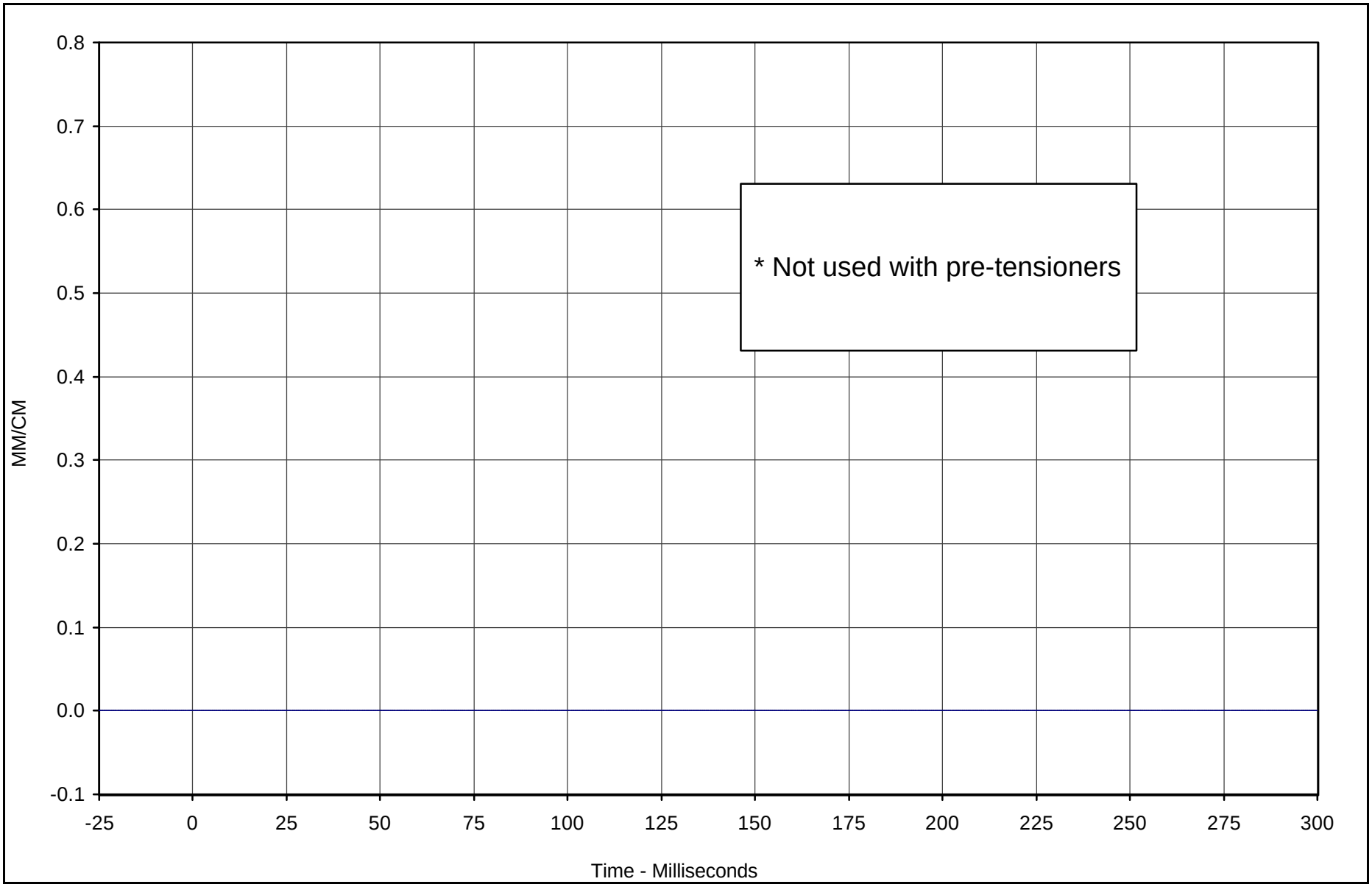
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Pullout	043	FIL	MM	240.4	105.5	0.0	5.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



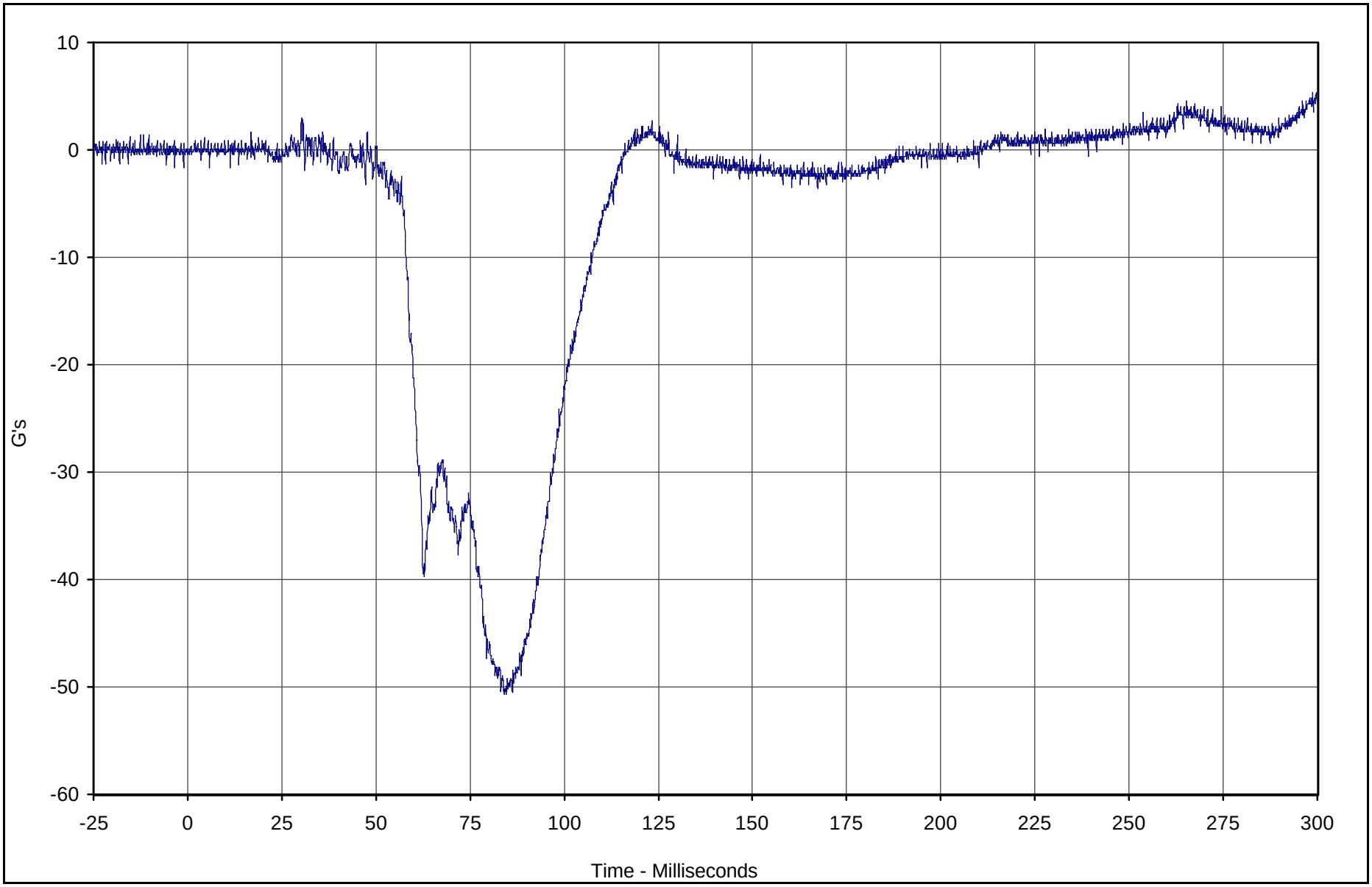
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Elongation	044	FIL	MM/CM	0.00	0.0	0.00	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



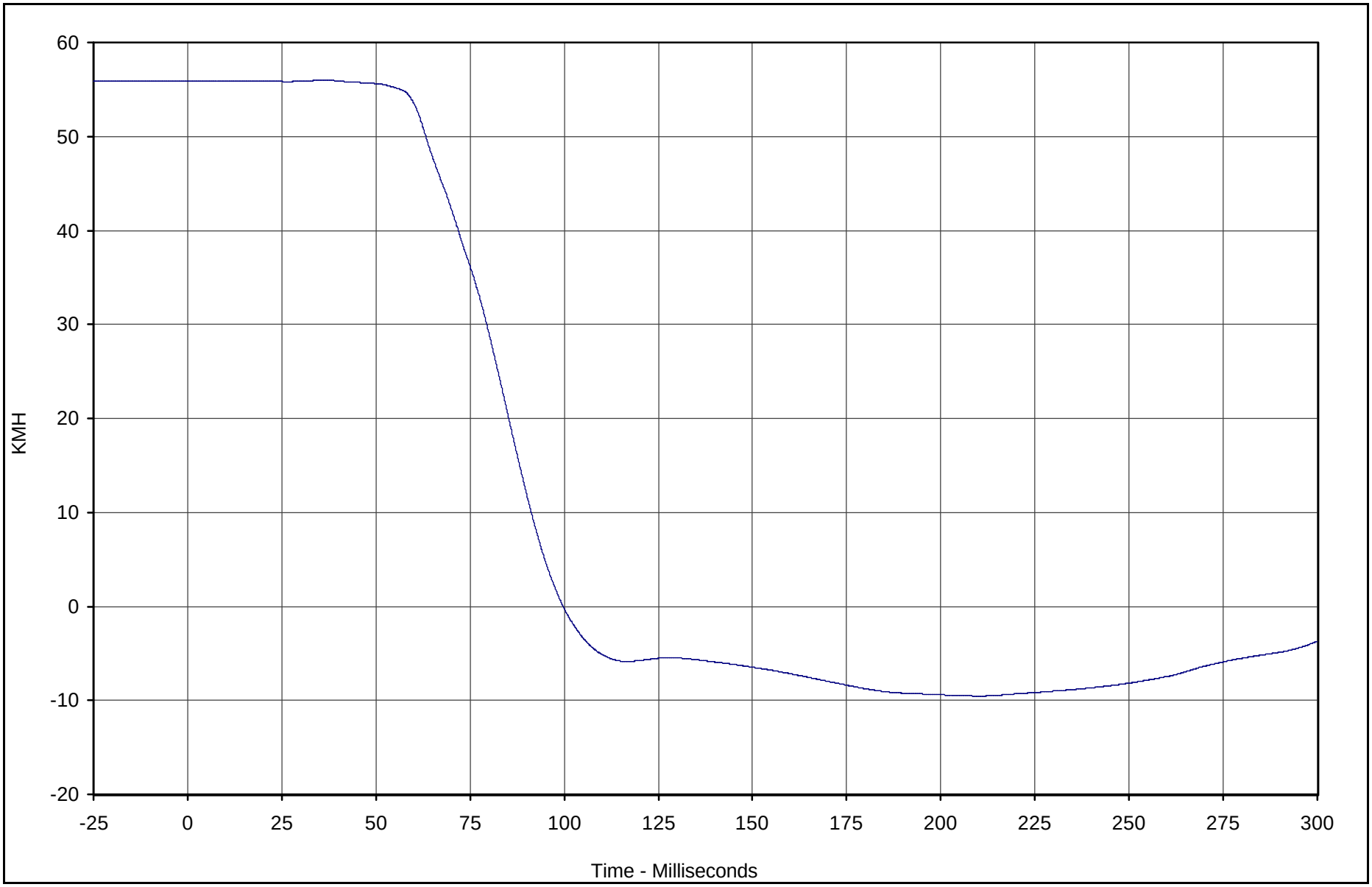
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X	045	FIL	G's	5.3	298.8	-50.7	84.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



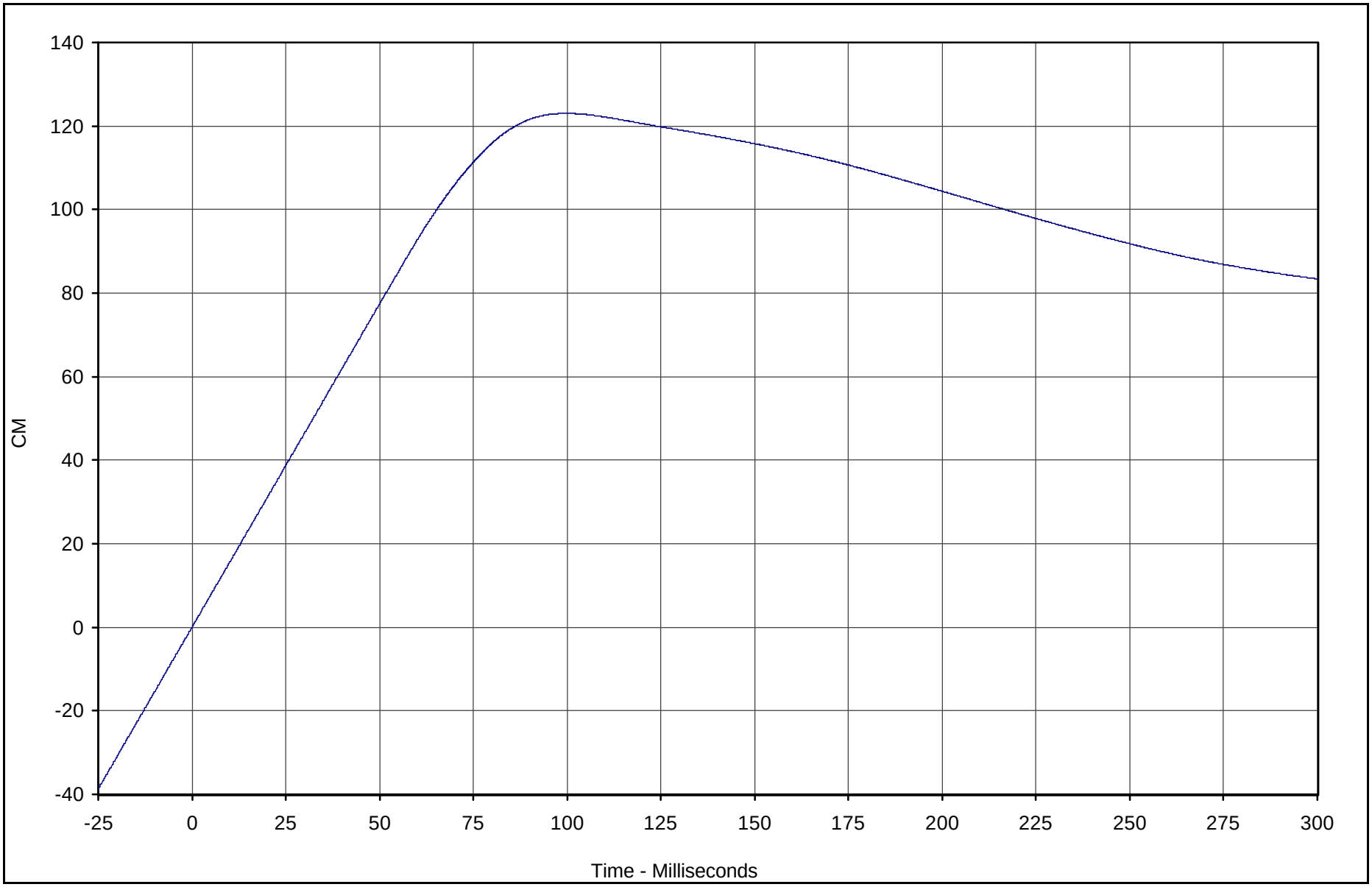
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X Velocity	045	IN1	KMH	56.0	36.6	-9.5	210.4	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



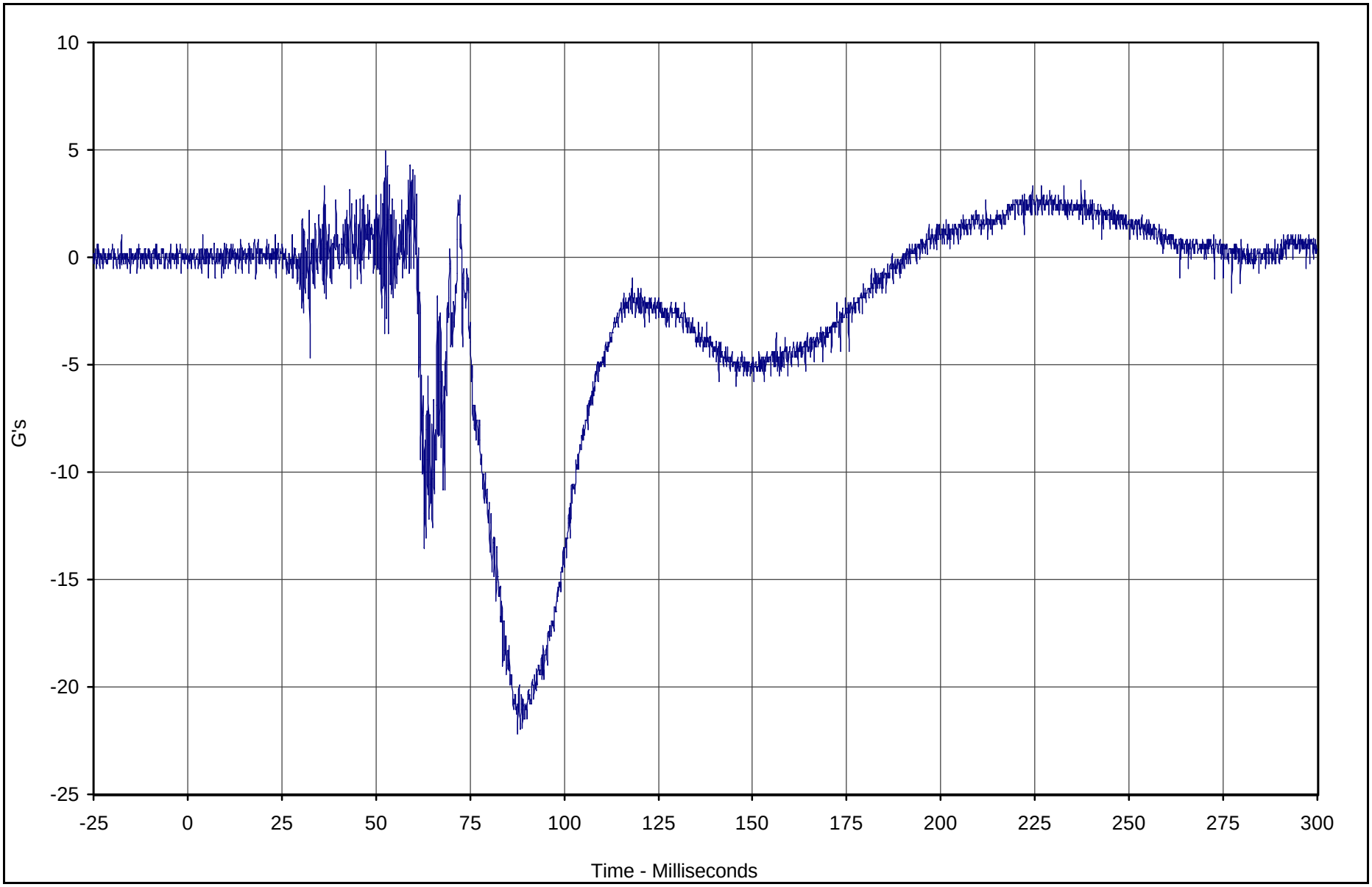
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X Displ.	045	IN2	CM	123.0	99.7	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



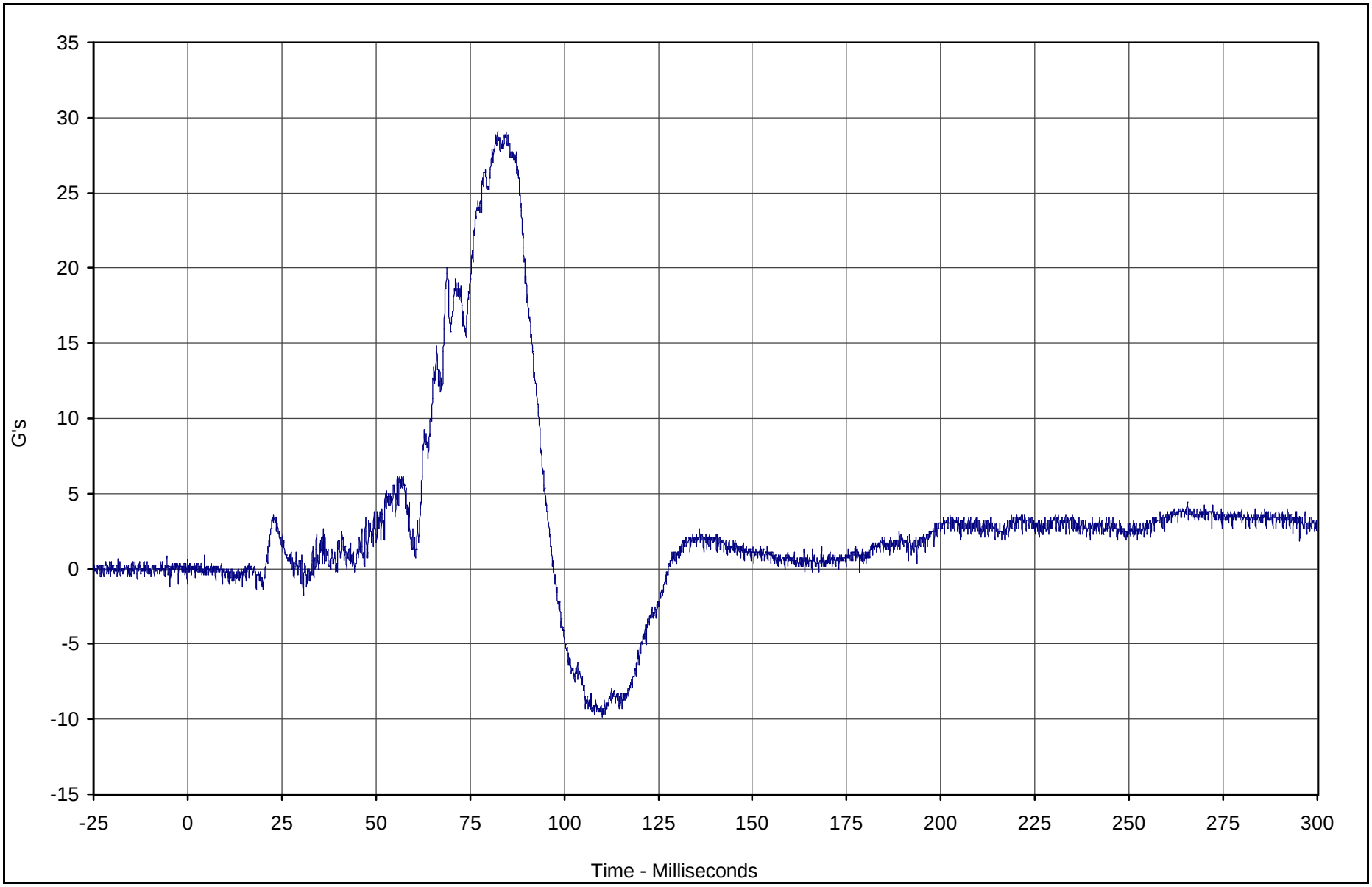
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Y	046	FIL	G's	4.9	52.6	-22.2	87.7	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



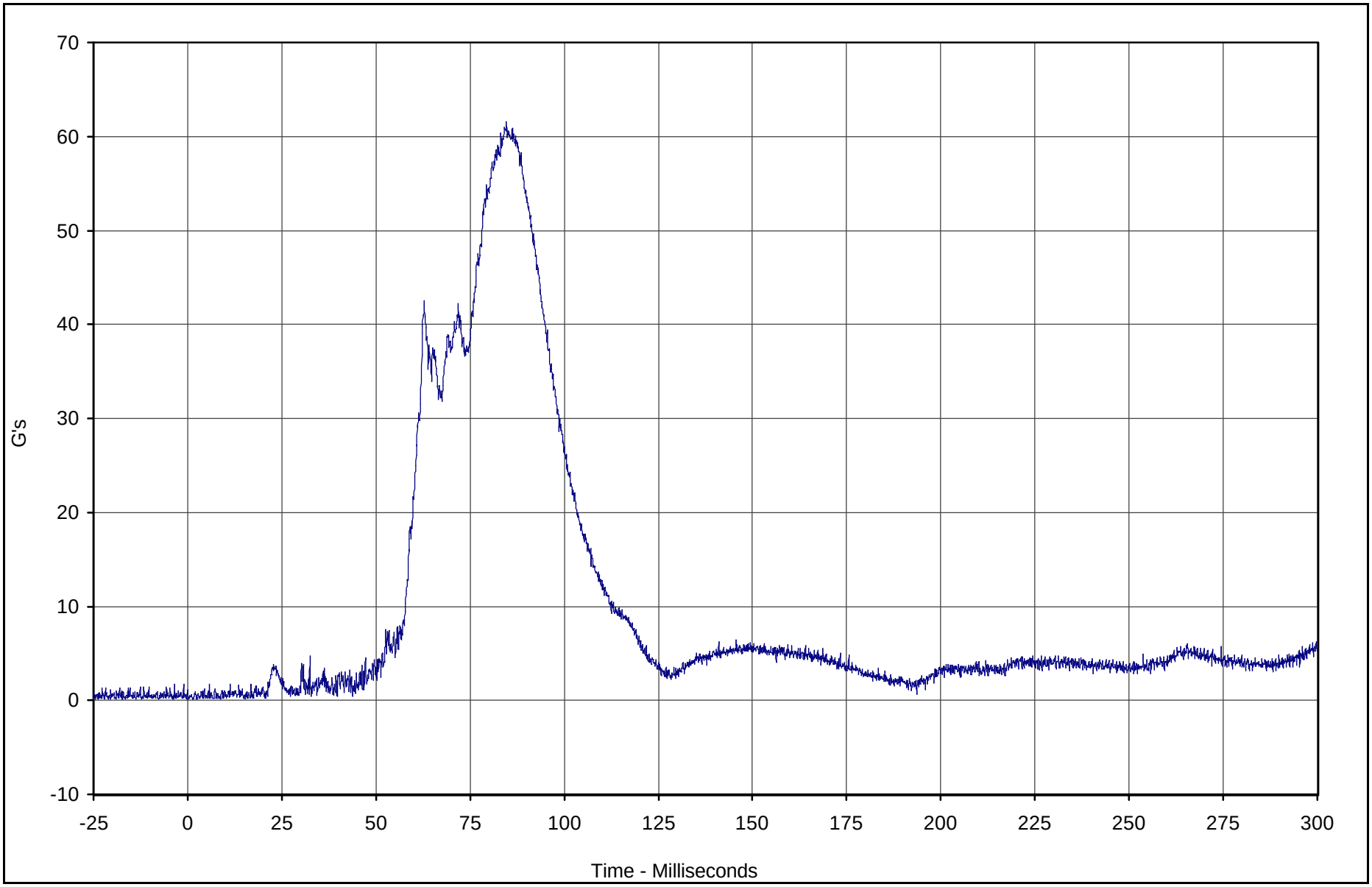
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Z	047	FIL	G's	29.1	82.3	-9.9	110.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



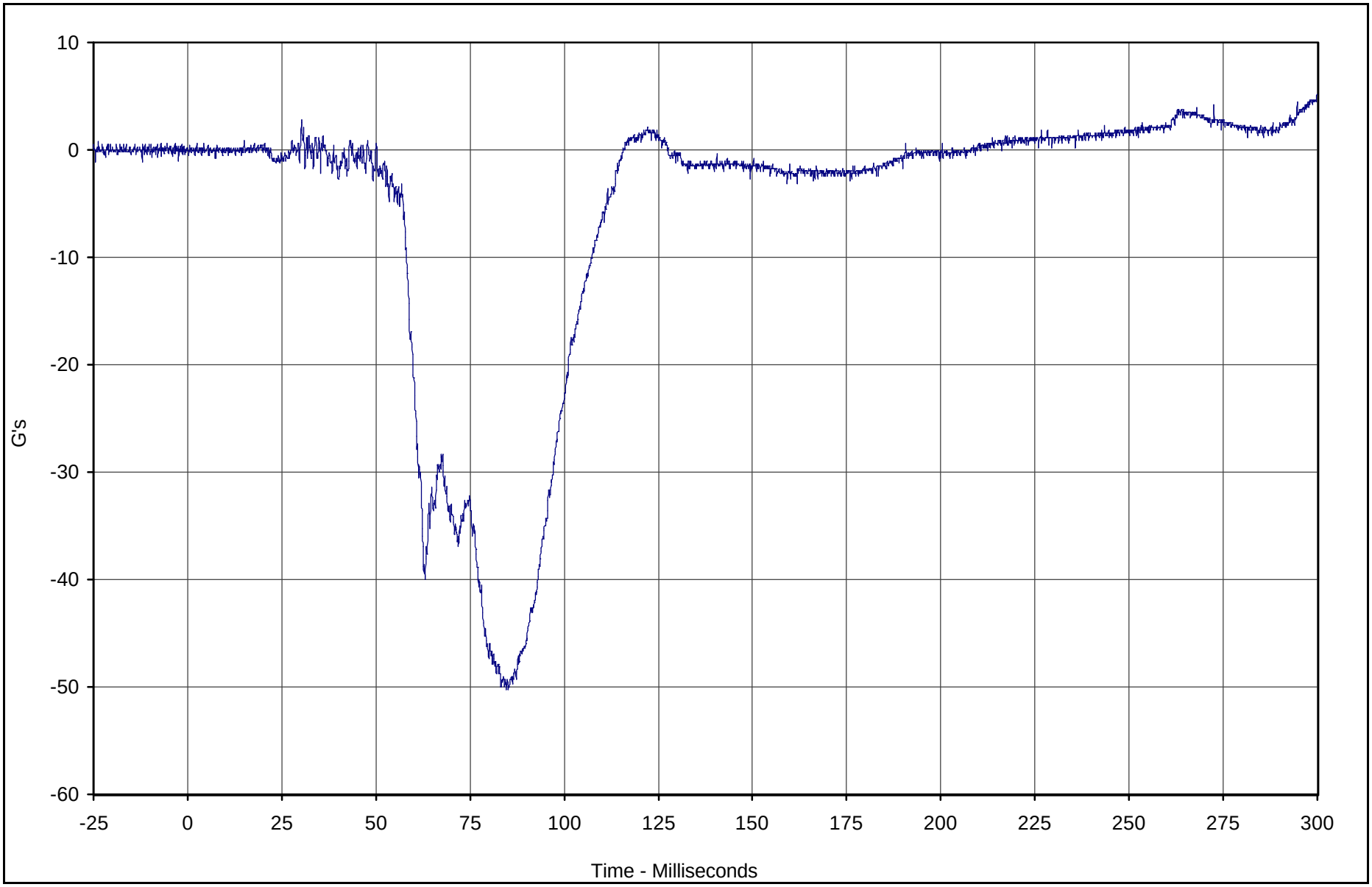
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Resultant Primary	045	RES	G's	61.5	84.7	0.2	0.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



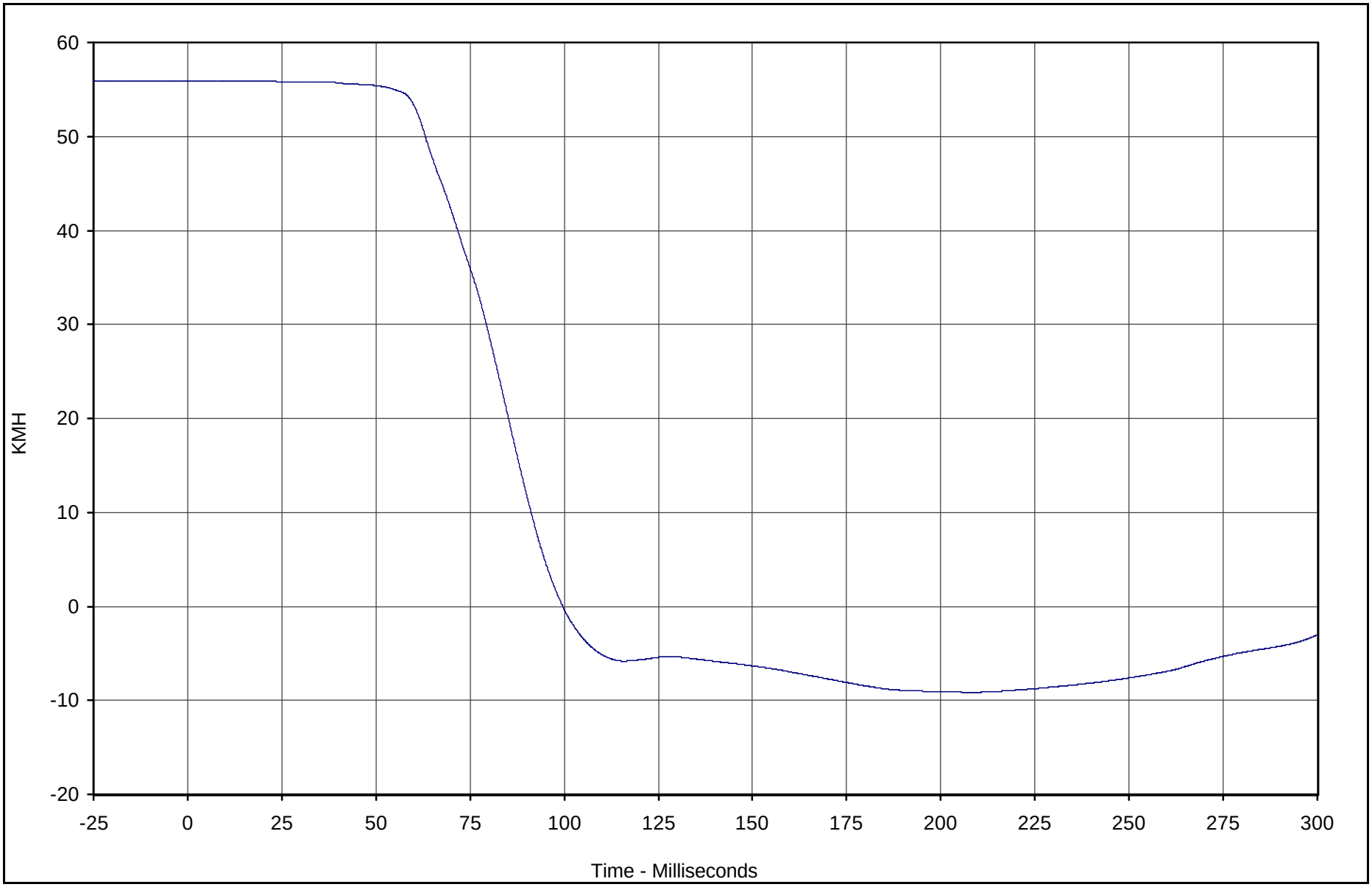
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X	048	FIL	G's	5.2	299.9	-50.2	84.7	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



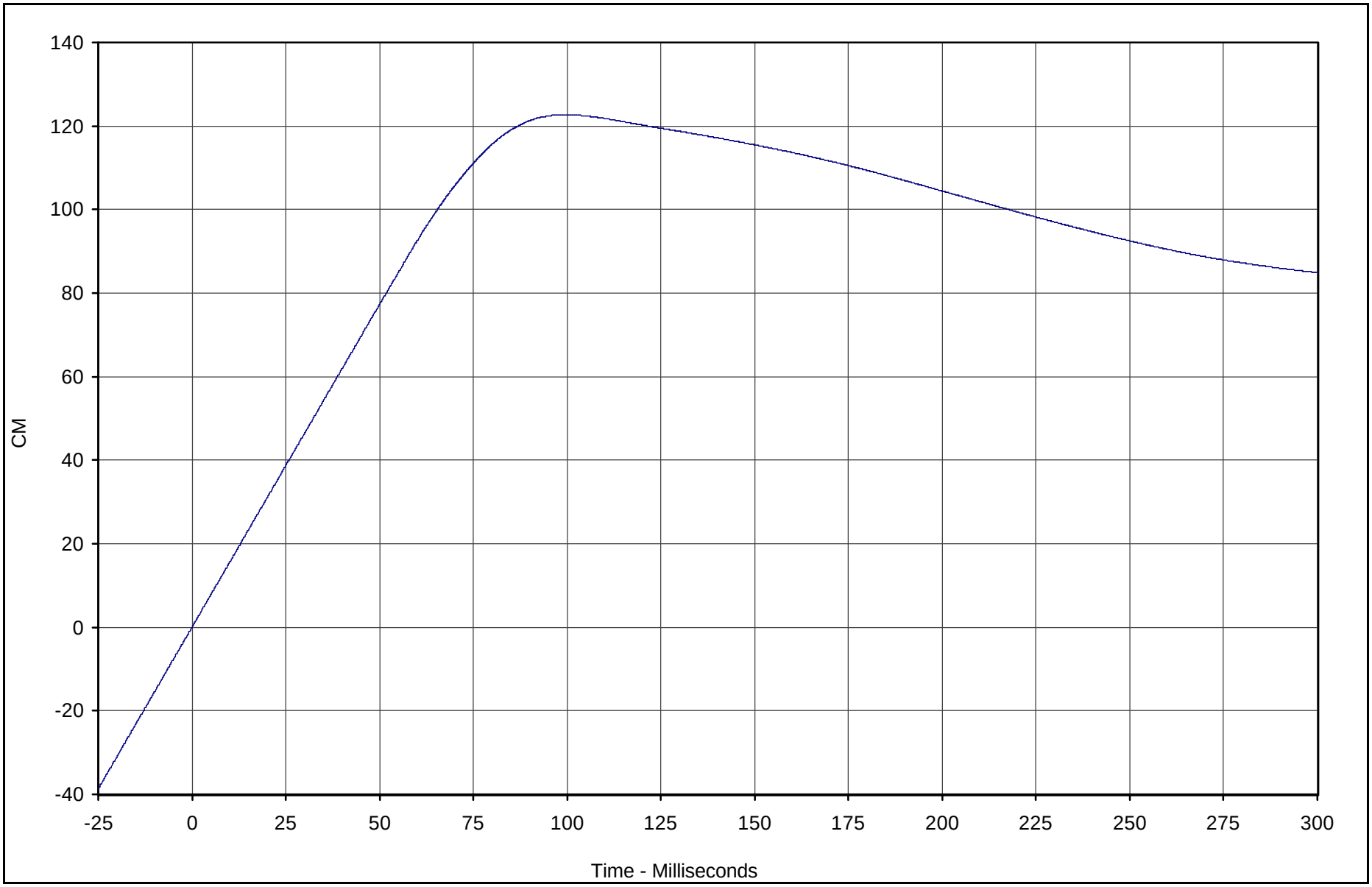
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X Velocity	048	IN1	KMH	55.9	0.0	-9.1	208.1	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



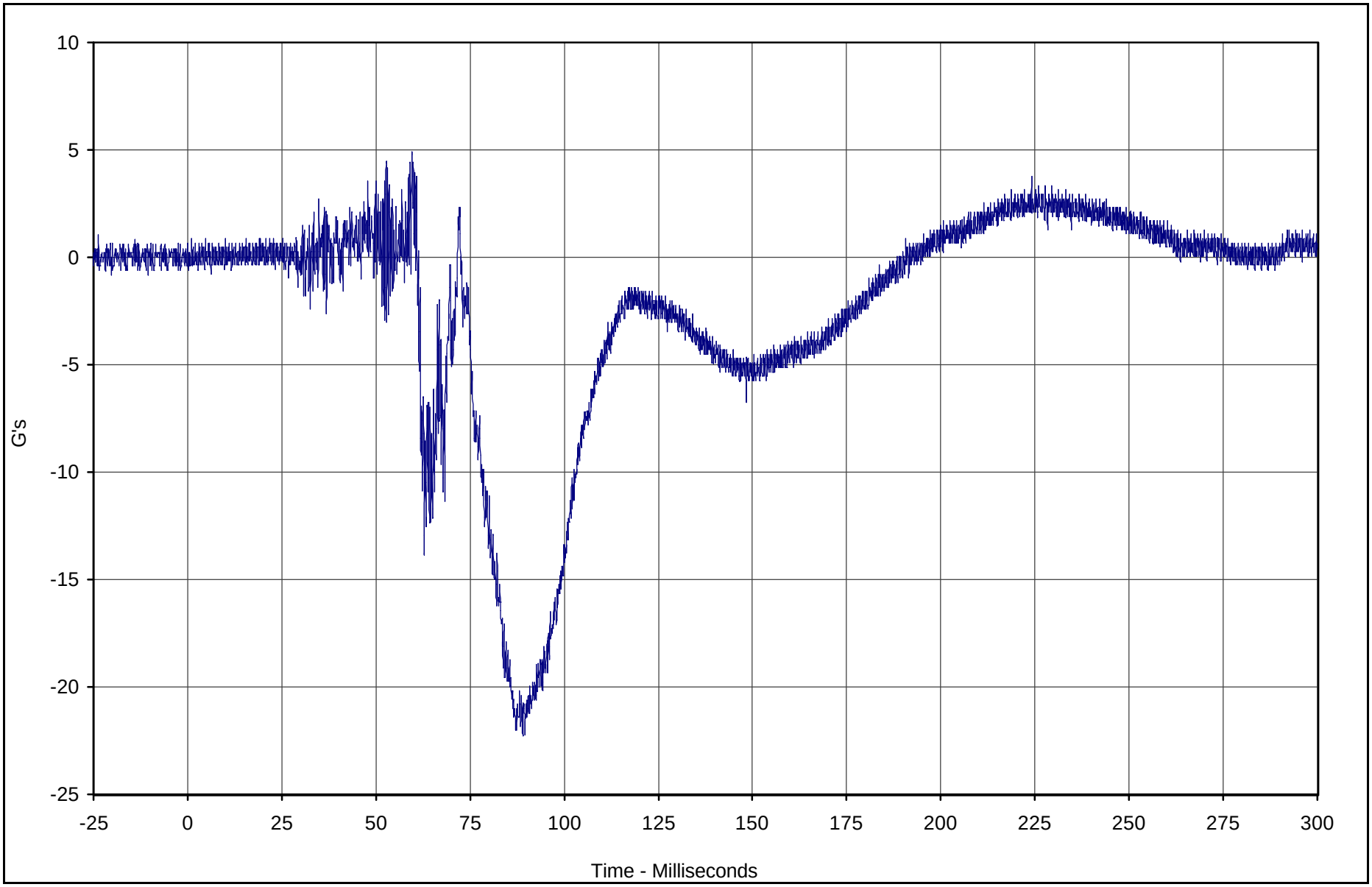
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X Displ.	048	IN2	CM	122.7	99.6	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



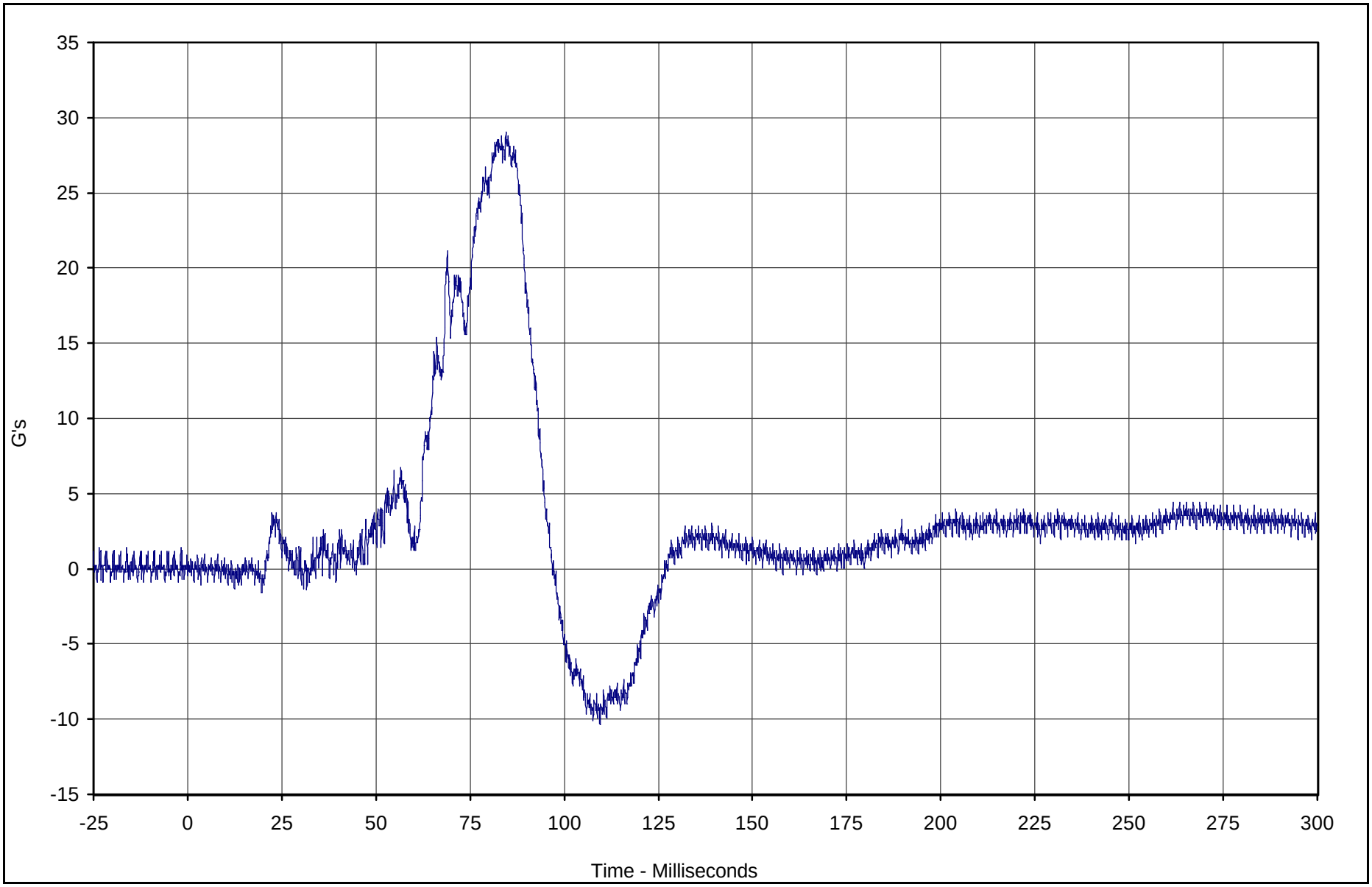
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant Y	049	FIL	G's	4.8	59.5	-22.2	89.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



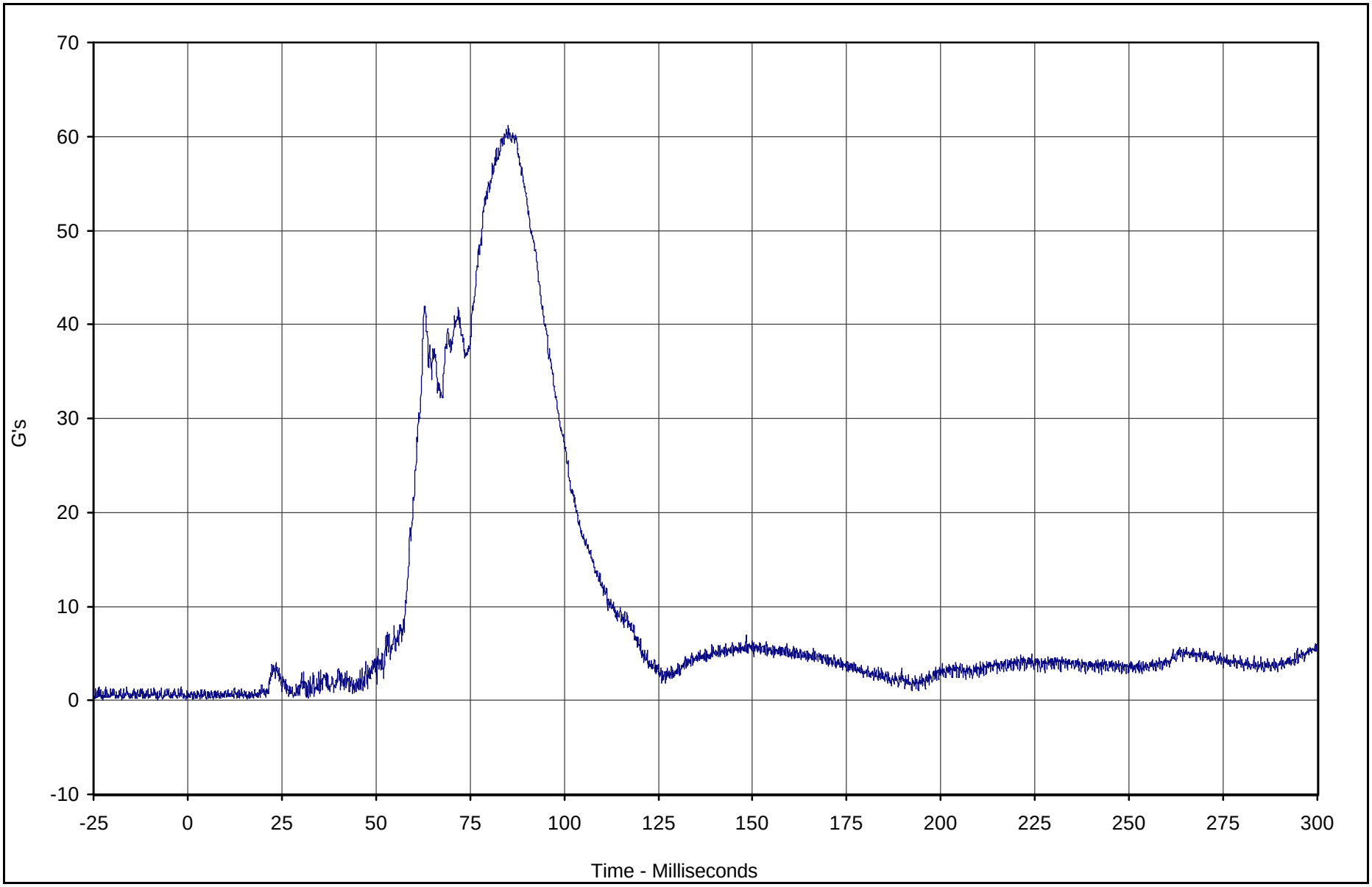
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant Z	050	FIL	G's	29.0	84.5	-10.4	109.5	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



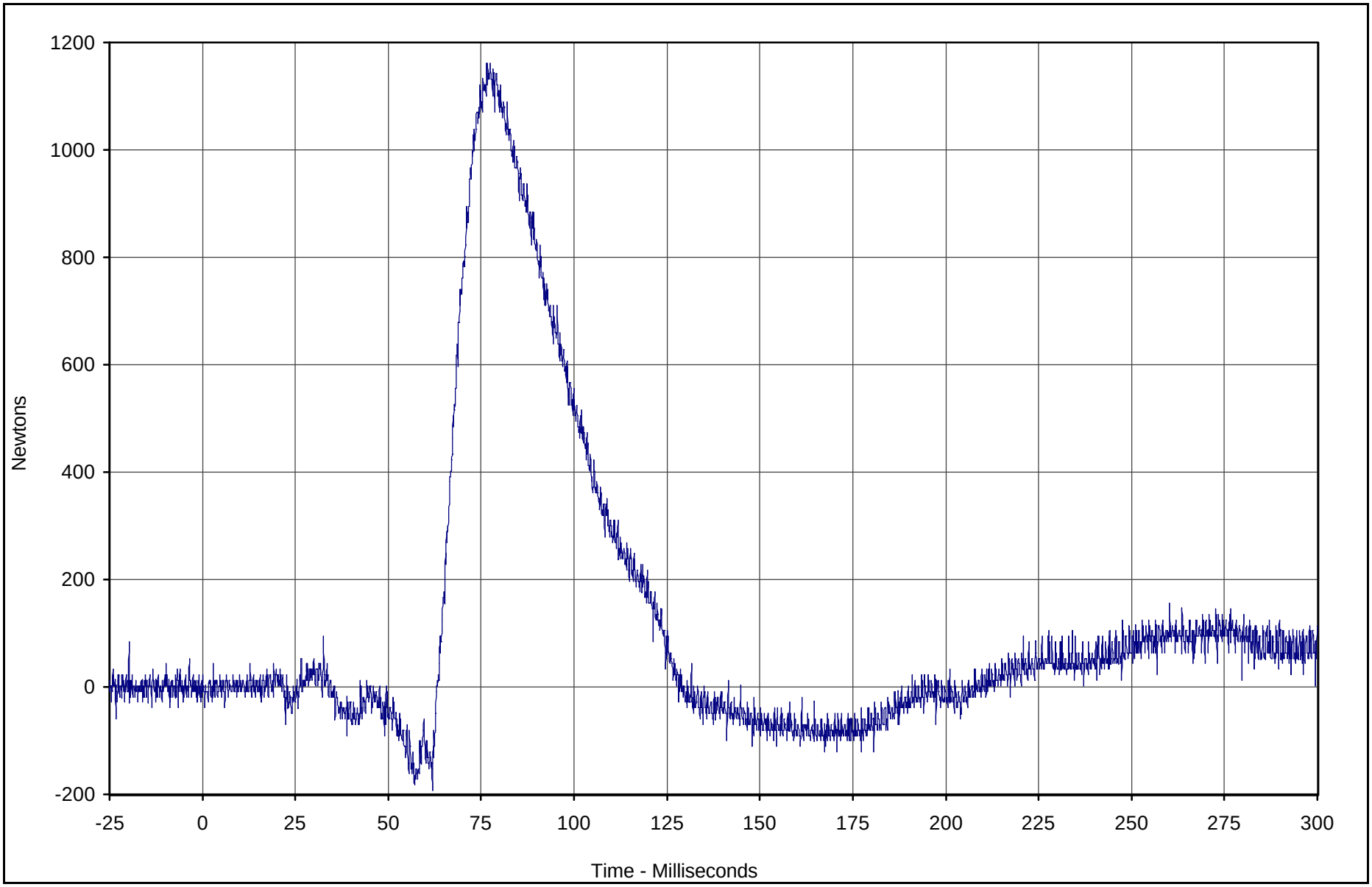
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Resultant Redundant	048	RES	G's	61.2	85.2	0.1	1.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



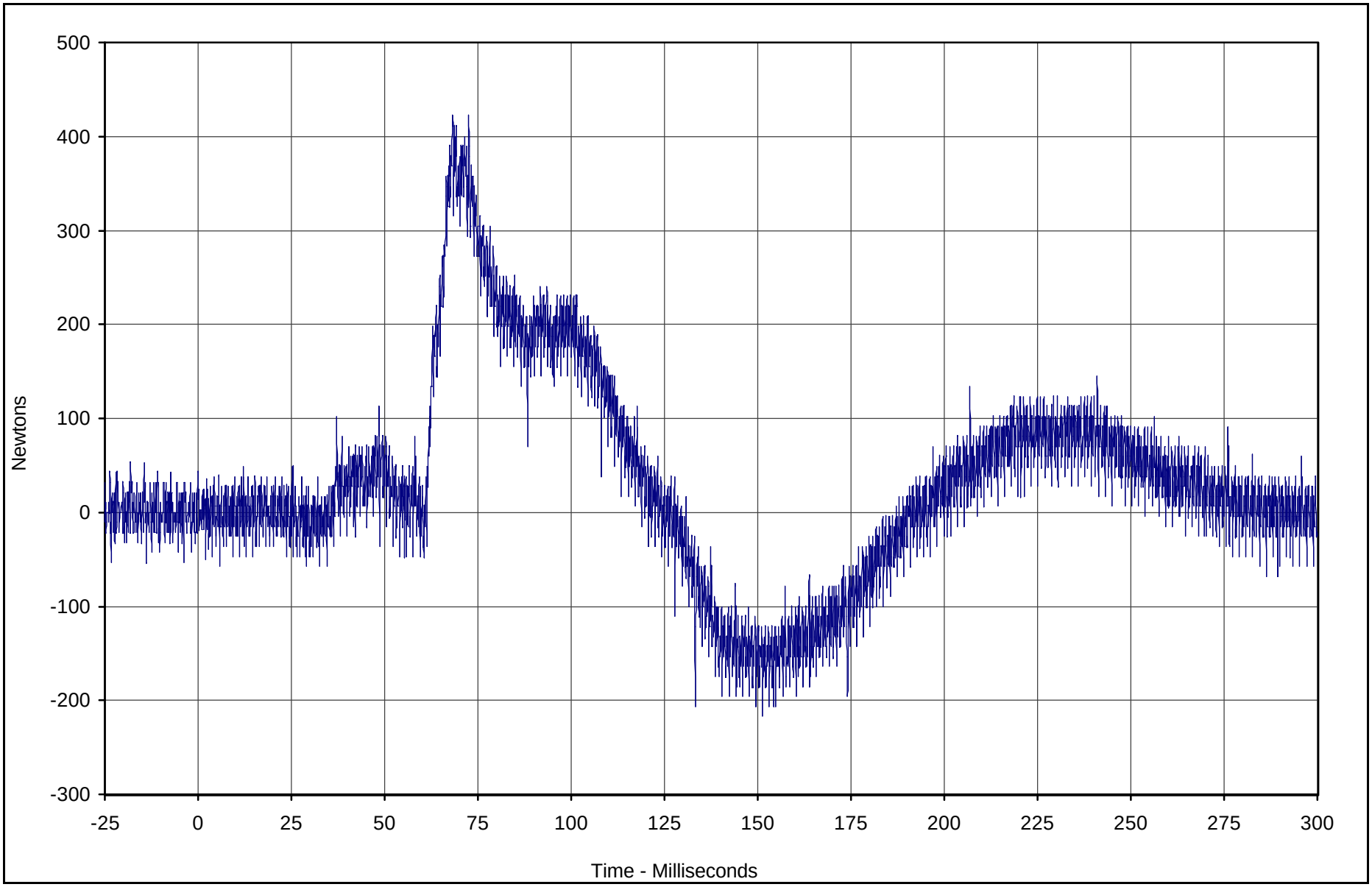
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force X	051	FIL	Newtons	1161.8	76.5	-193.0	61.9	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



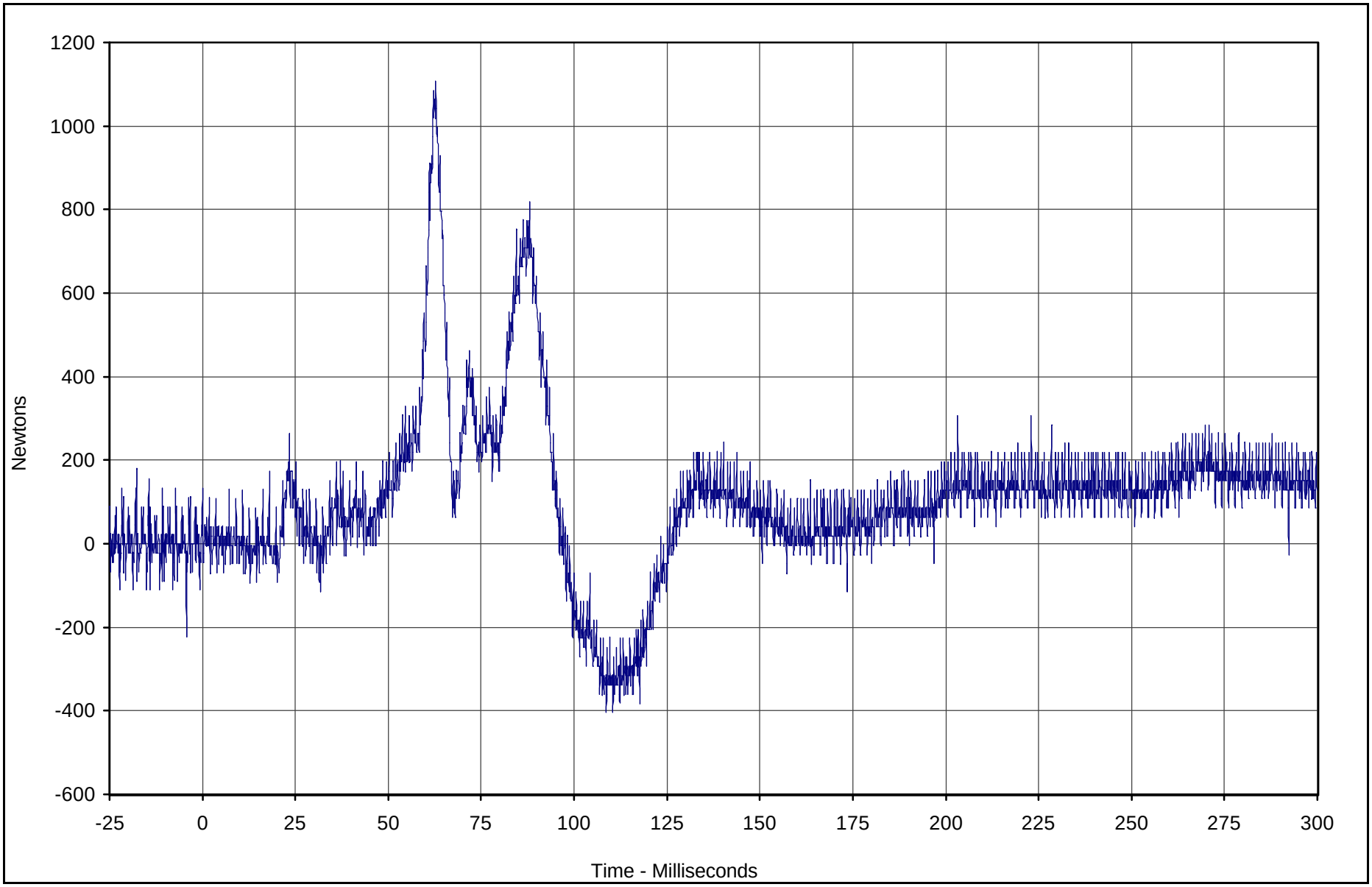
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Y	052	FIL	Newtons	421.5	68.1	-217.3	151.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



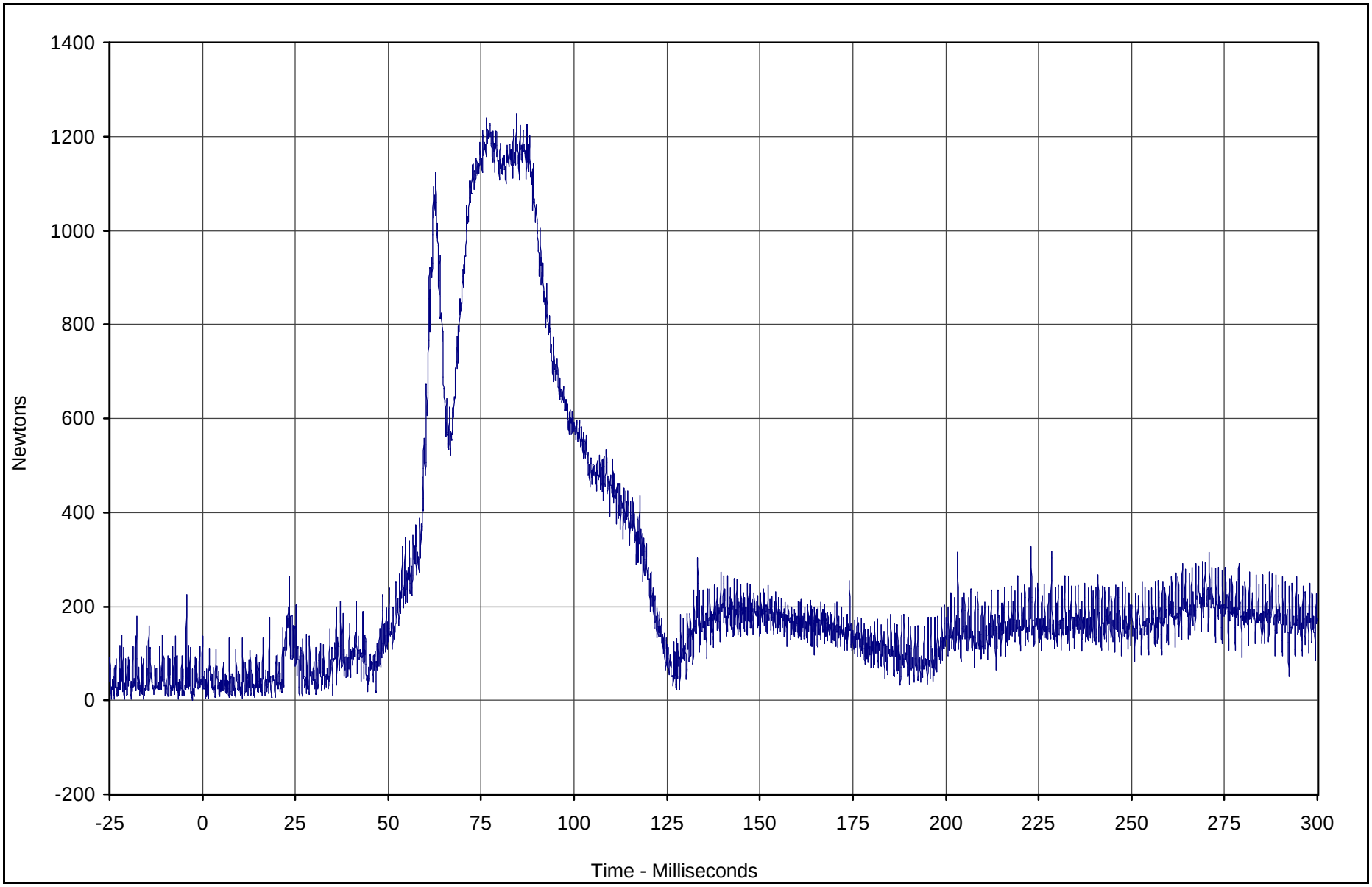
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Z	053	FIL	Newtons	1108.1	62.8	-404.4	108.7	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



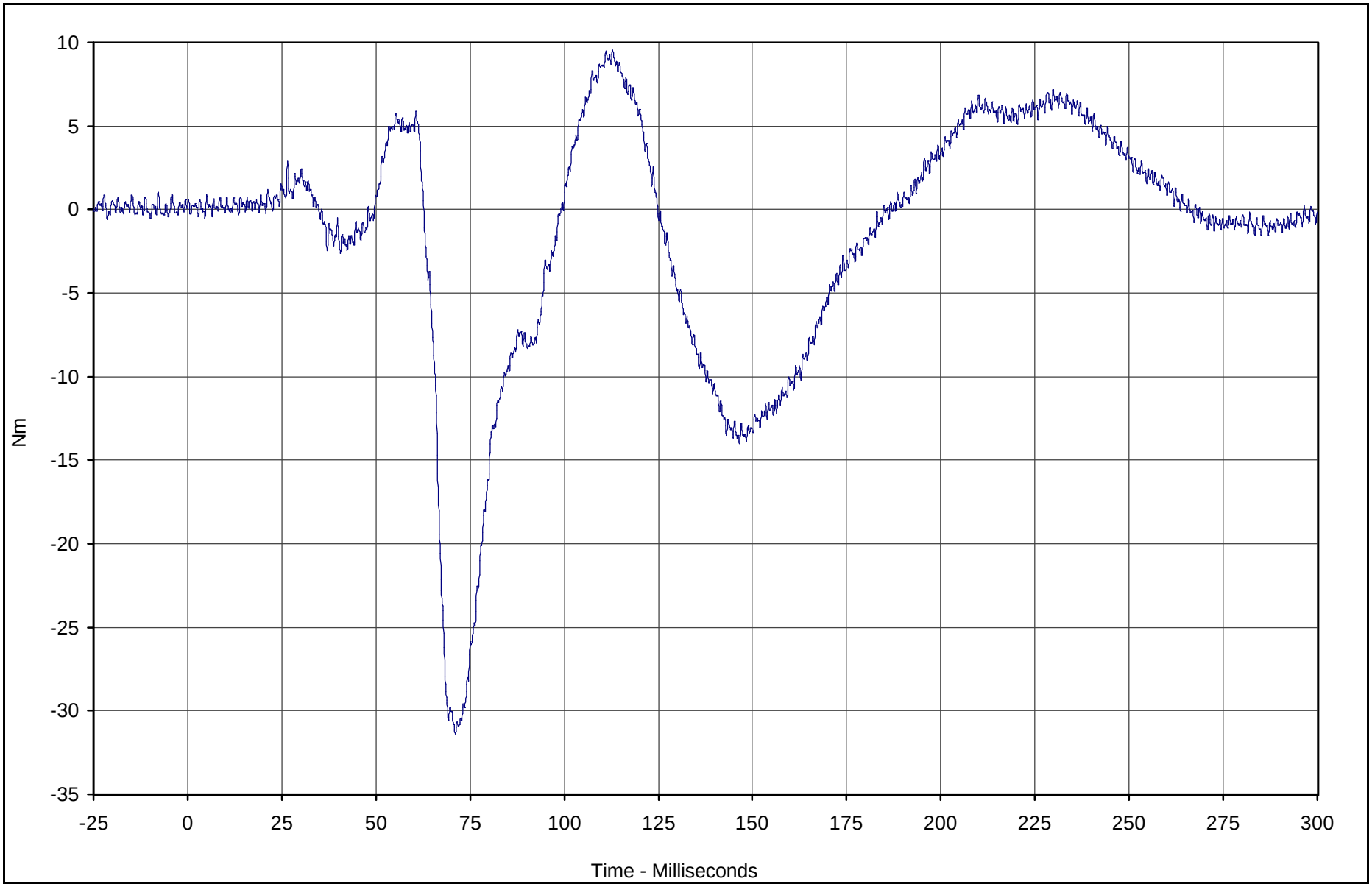
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Resultant	051	RES	Newtons	1246.3	84.4	5.2	0.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



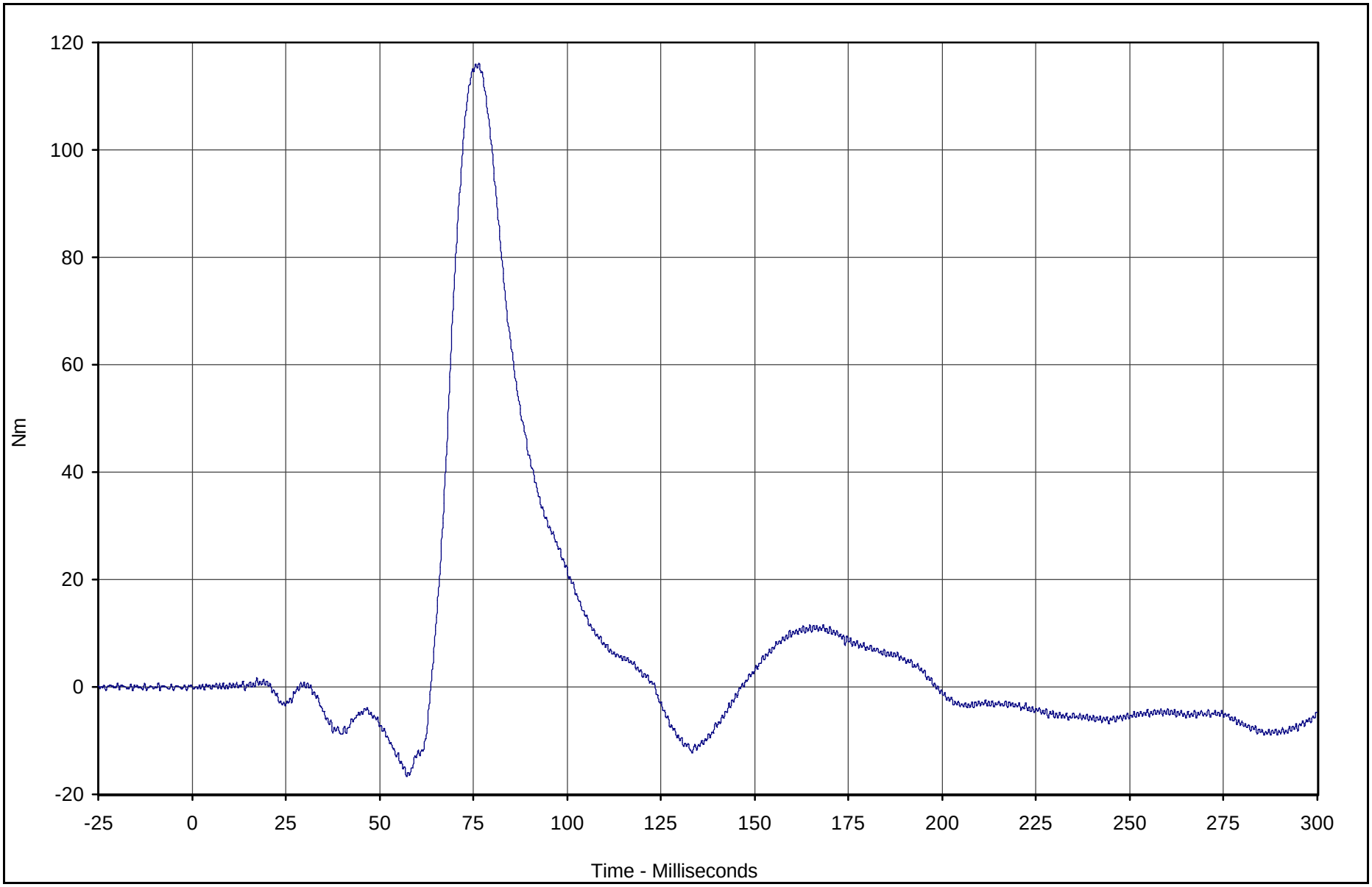
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment X	054	FIL	Nm	9.5	112.9	-31.4	71.1	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



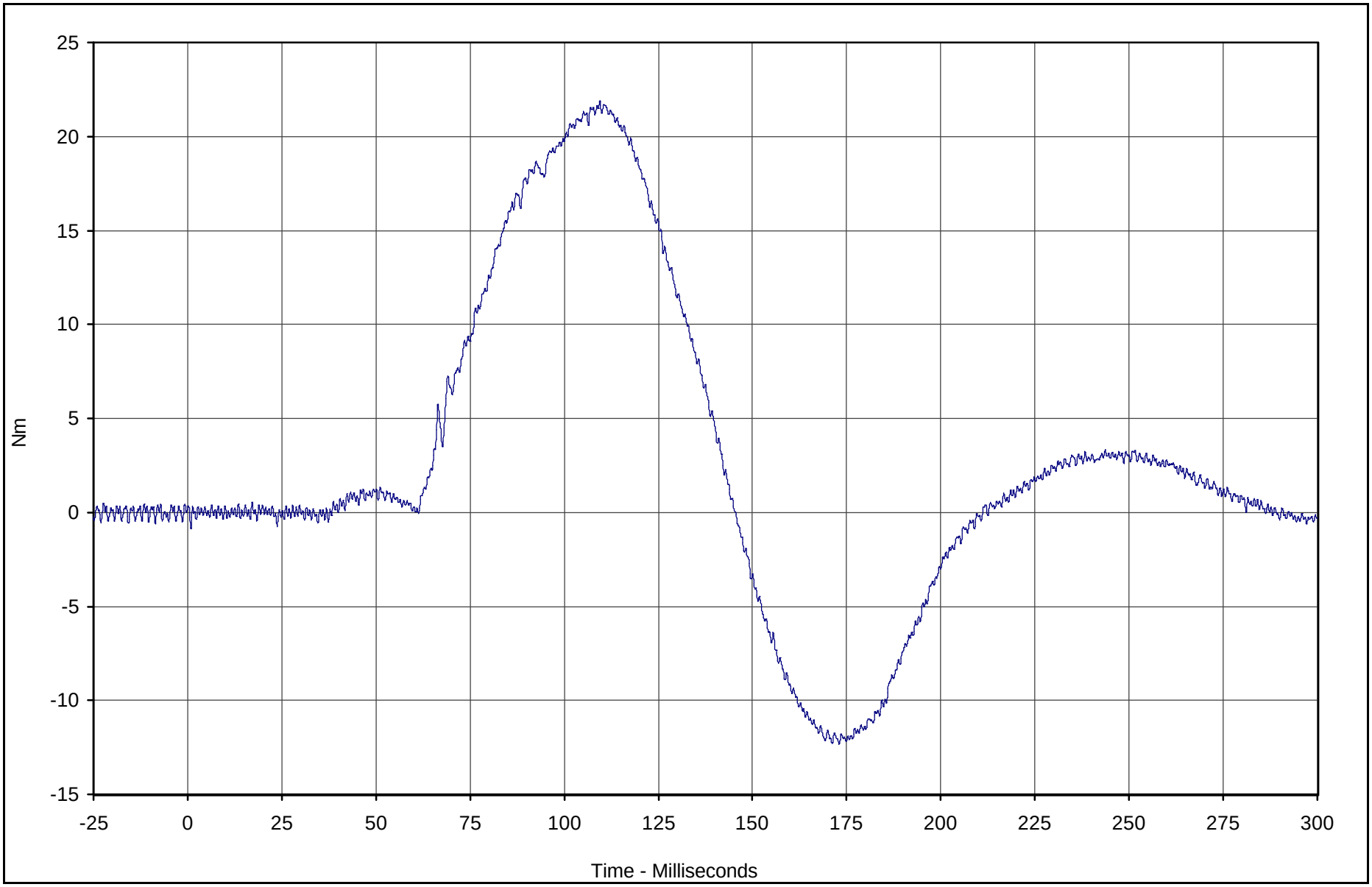
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Y	055	FIL	Nm	116.1	76.5	-16.7	57.2	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



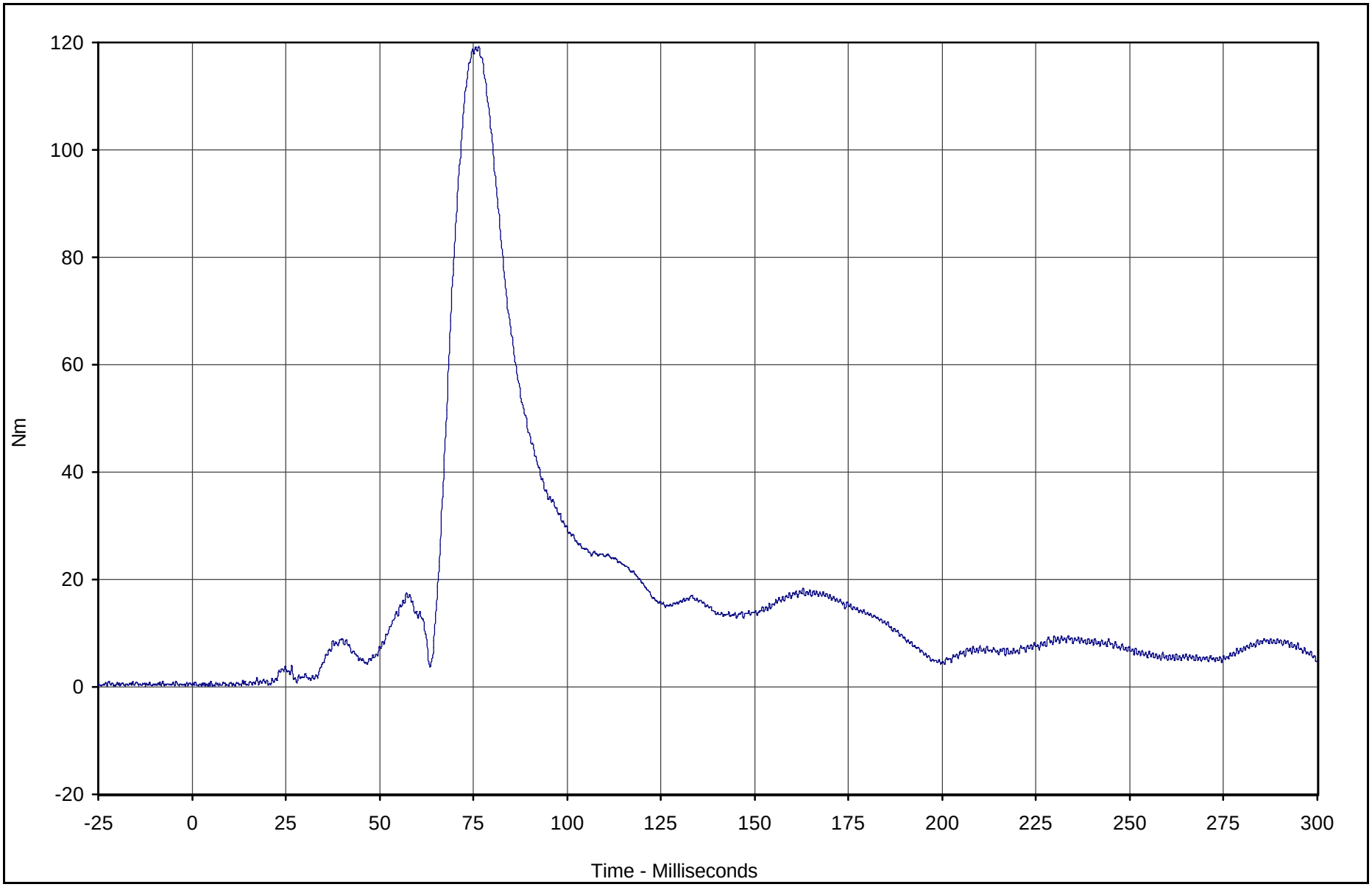
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Z	056	FIL	Nm	21.9	109.5	-12.3	173.0	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



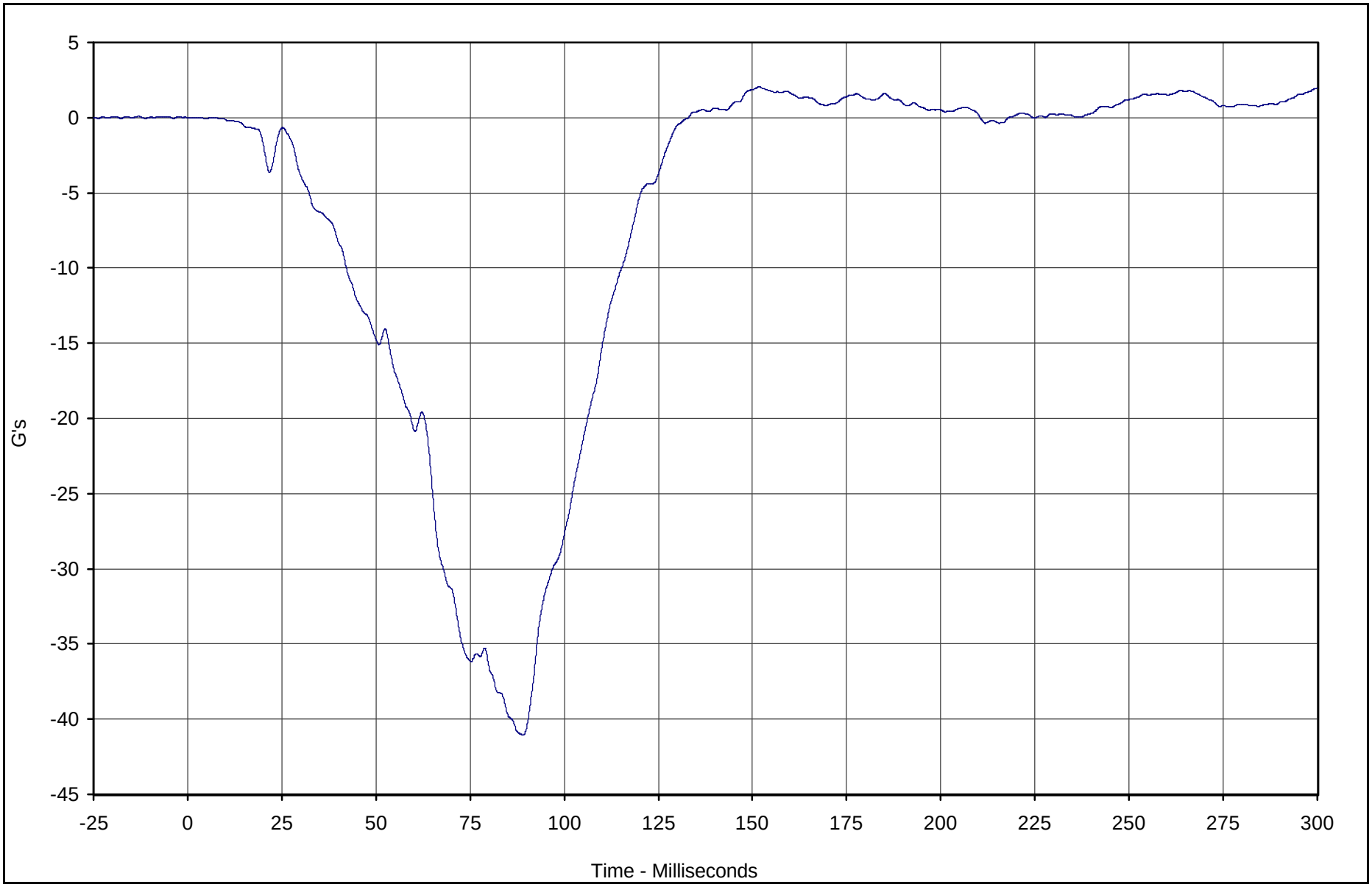
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Resultant	054	RES	Nm	119.2	76.5	0.1	4.3	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



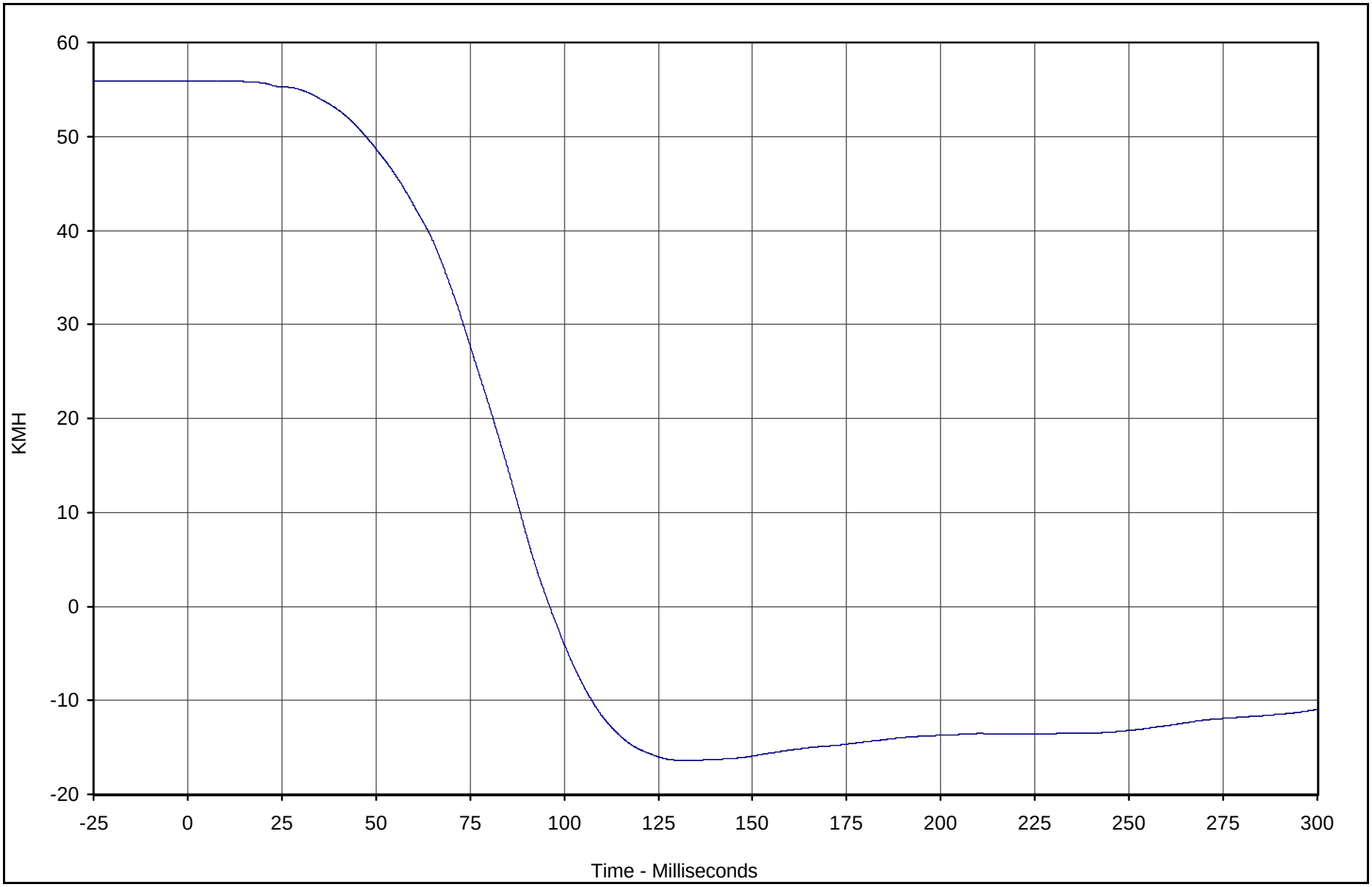
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X	057	FIL	G's	2.0	151.8	-41.1	89.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



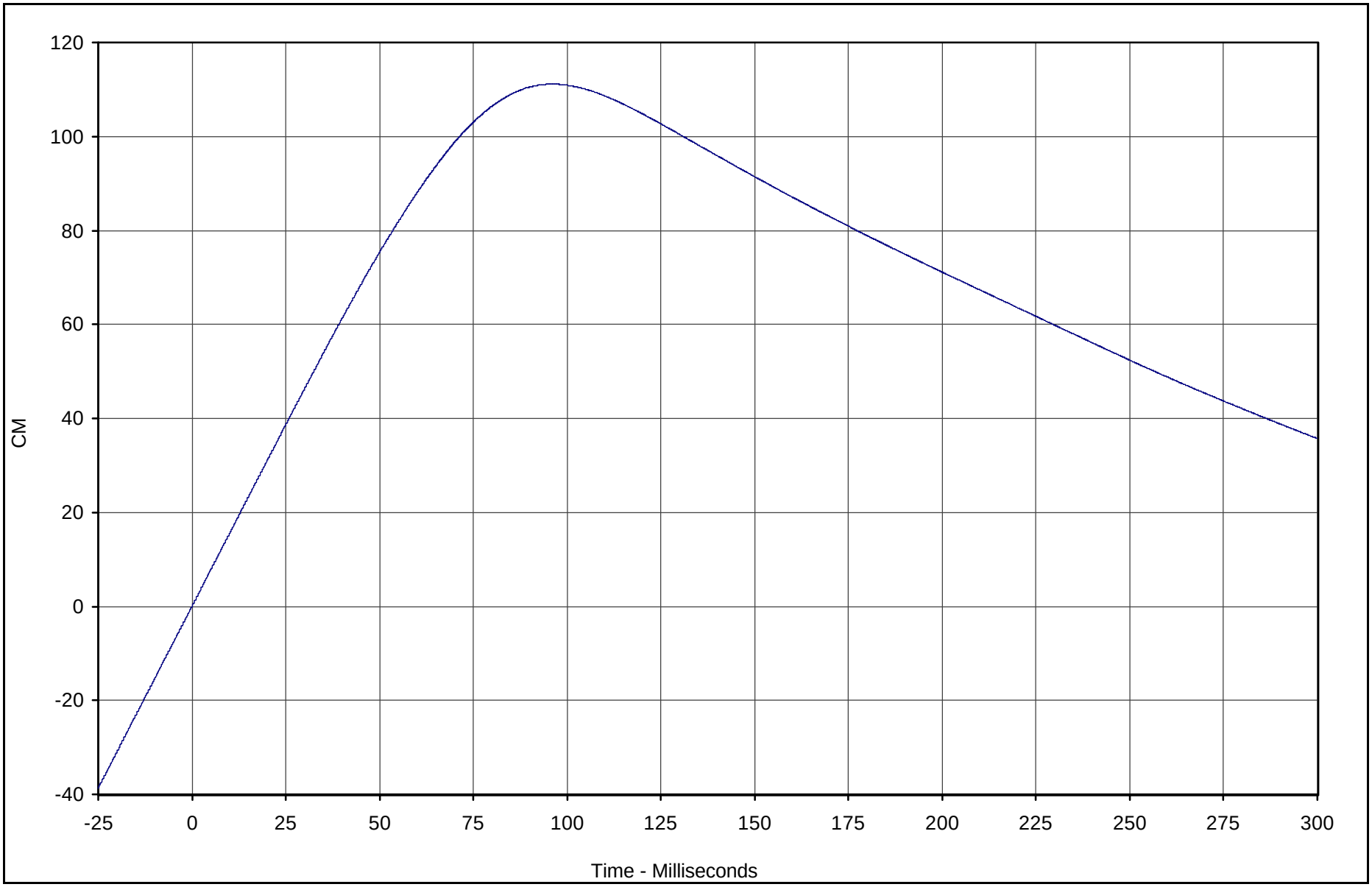
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X Velocity	057	IN1	KMH	55.9	0.0	-16.4	133.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



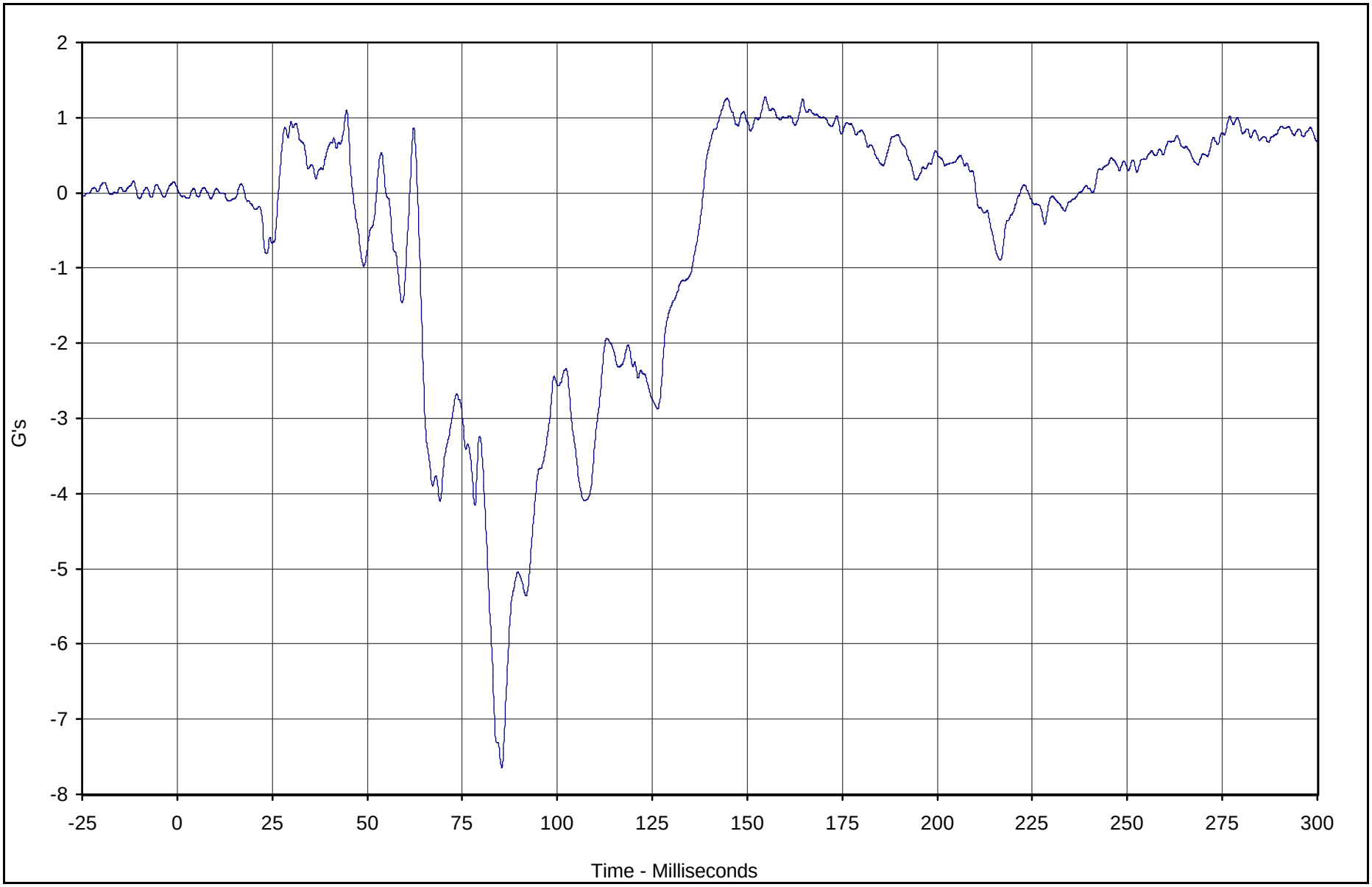
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X Displ.	057	IN2	CM	111.1	96.1	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



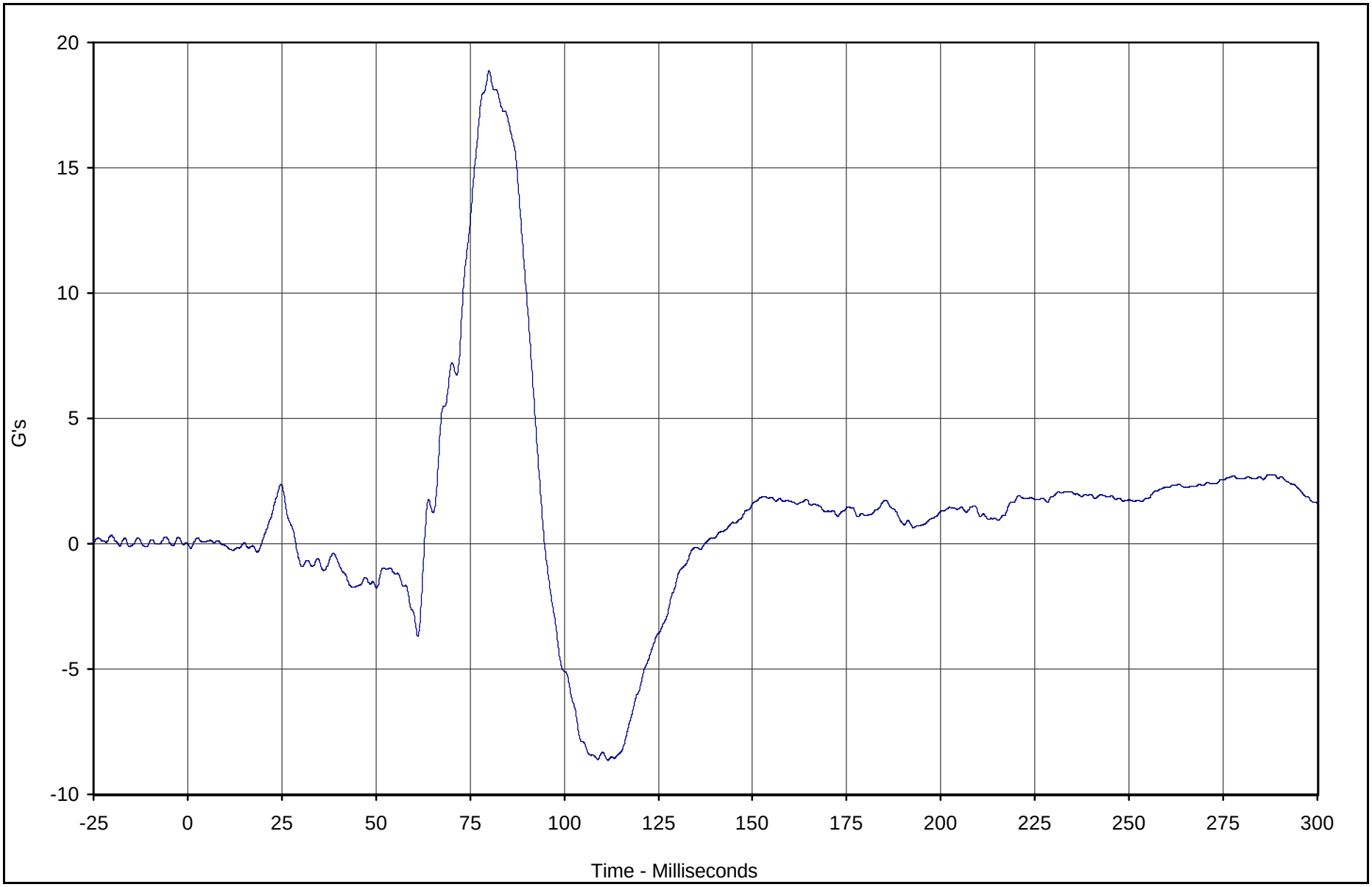
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary Y	058	FIL	G's	1.3	154.7	-7.6	85.4	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



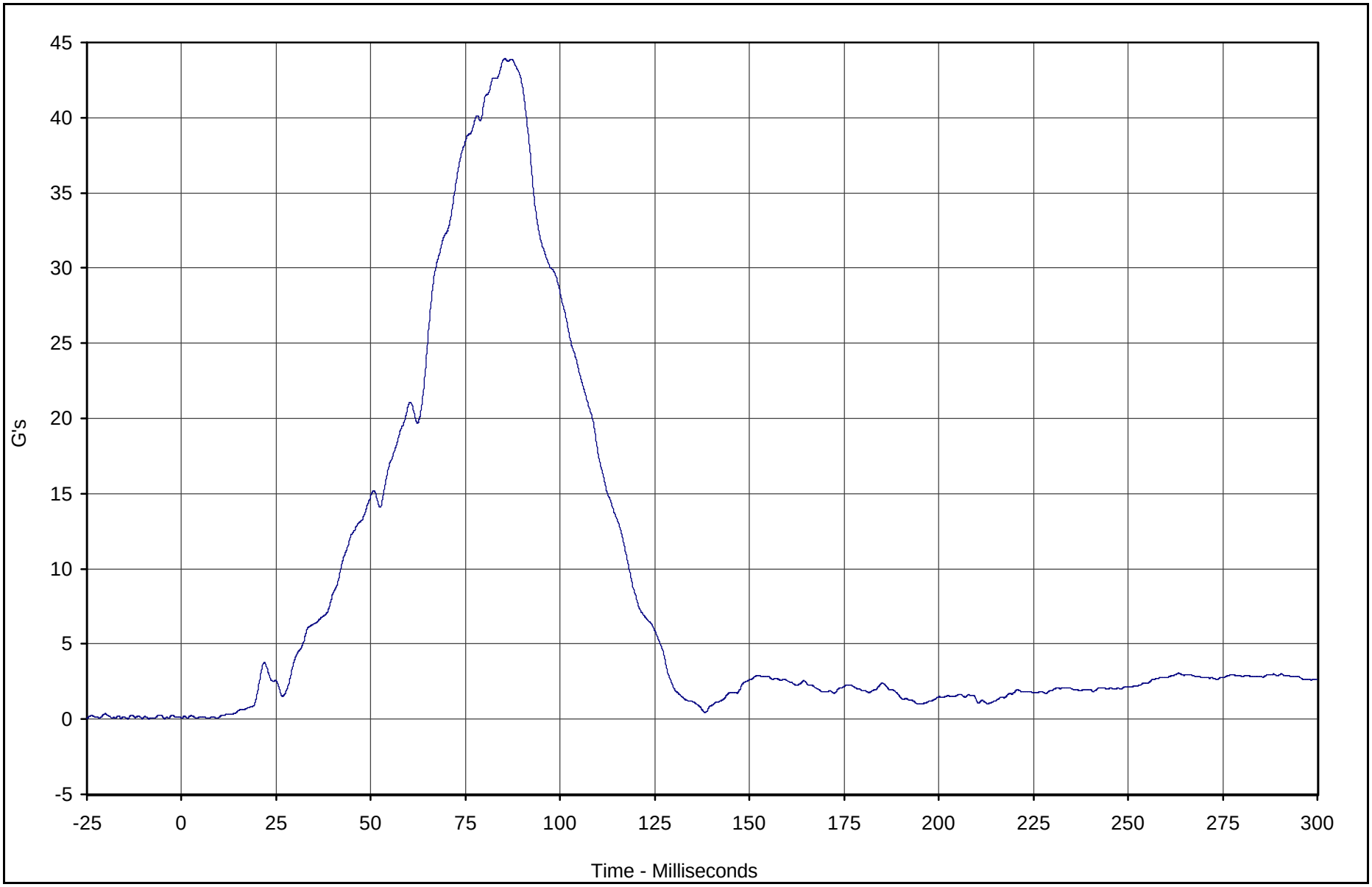
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary Z	059	FIL	G's	18.9	80.0	-8.6	111.6	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



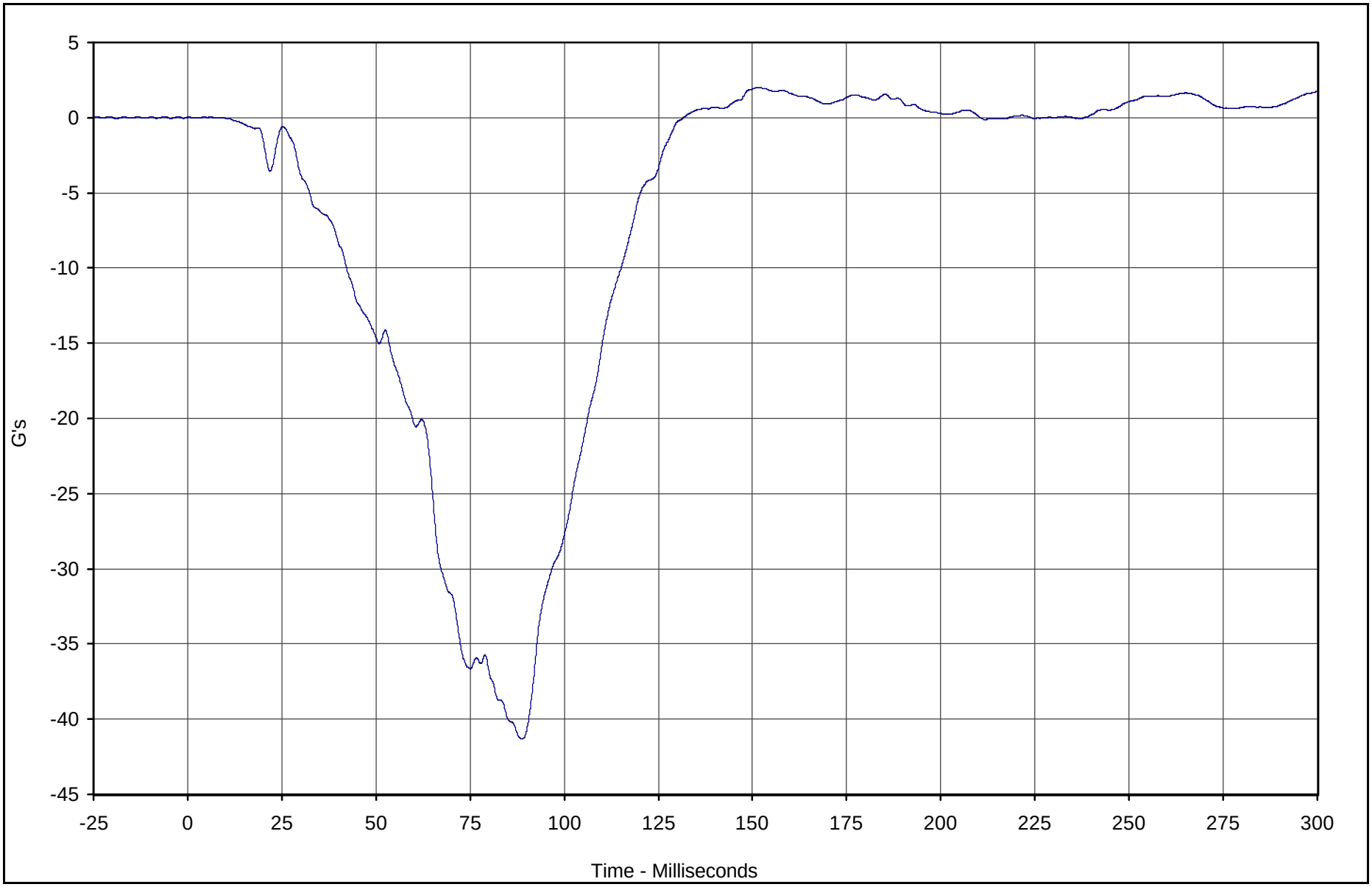
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Resultant Primary	057	RES	G's	43.9	85.4	0.0	1.5	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



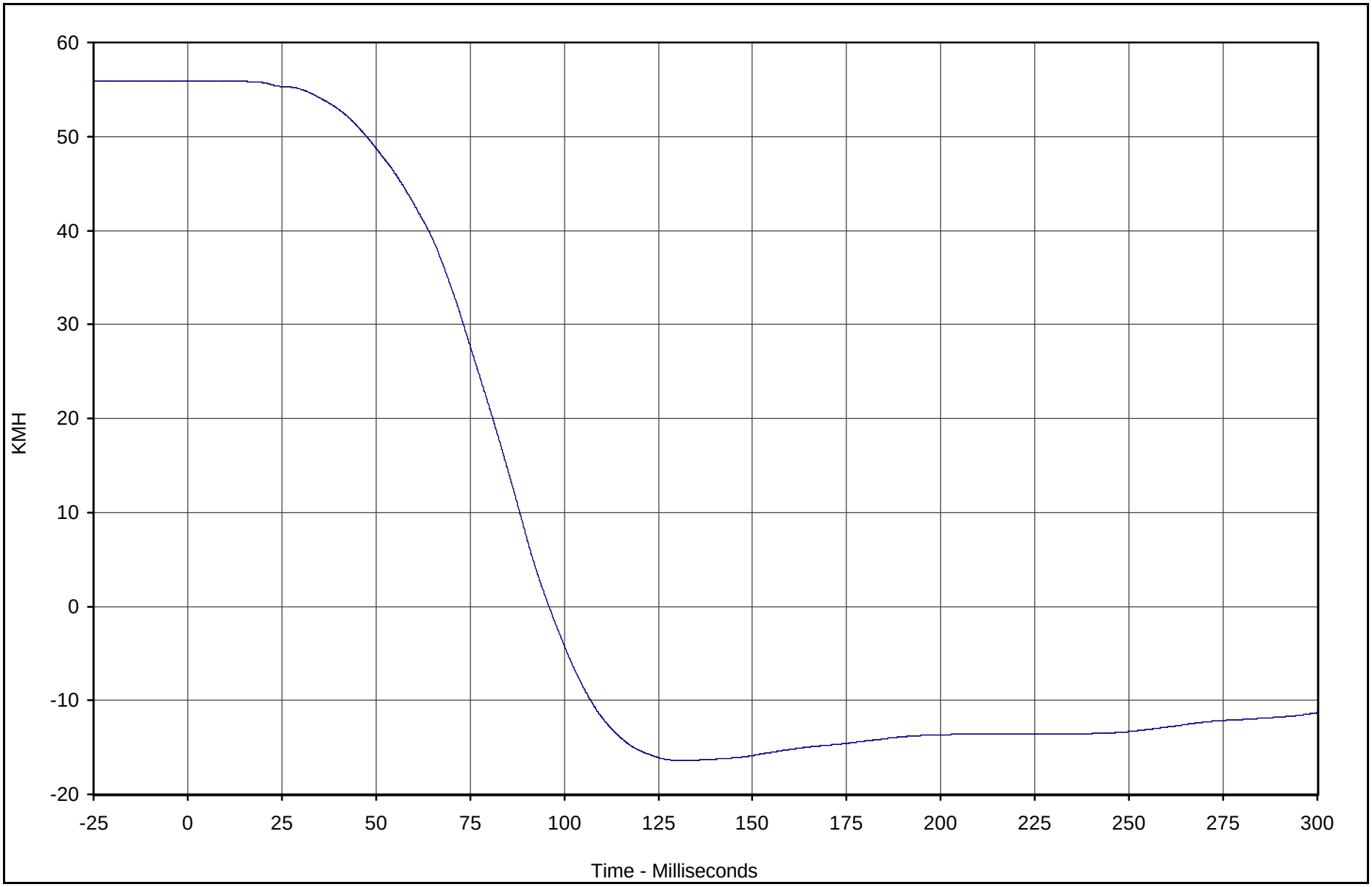
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X	060	FIL	G's	2.0	151.7	-41.3	88.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



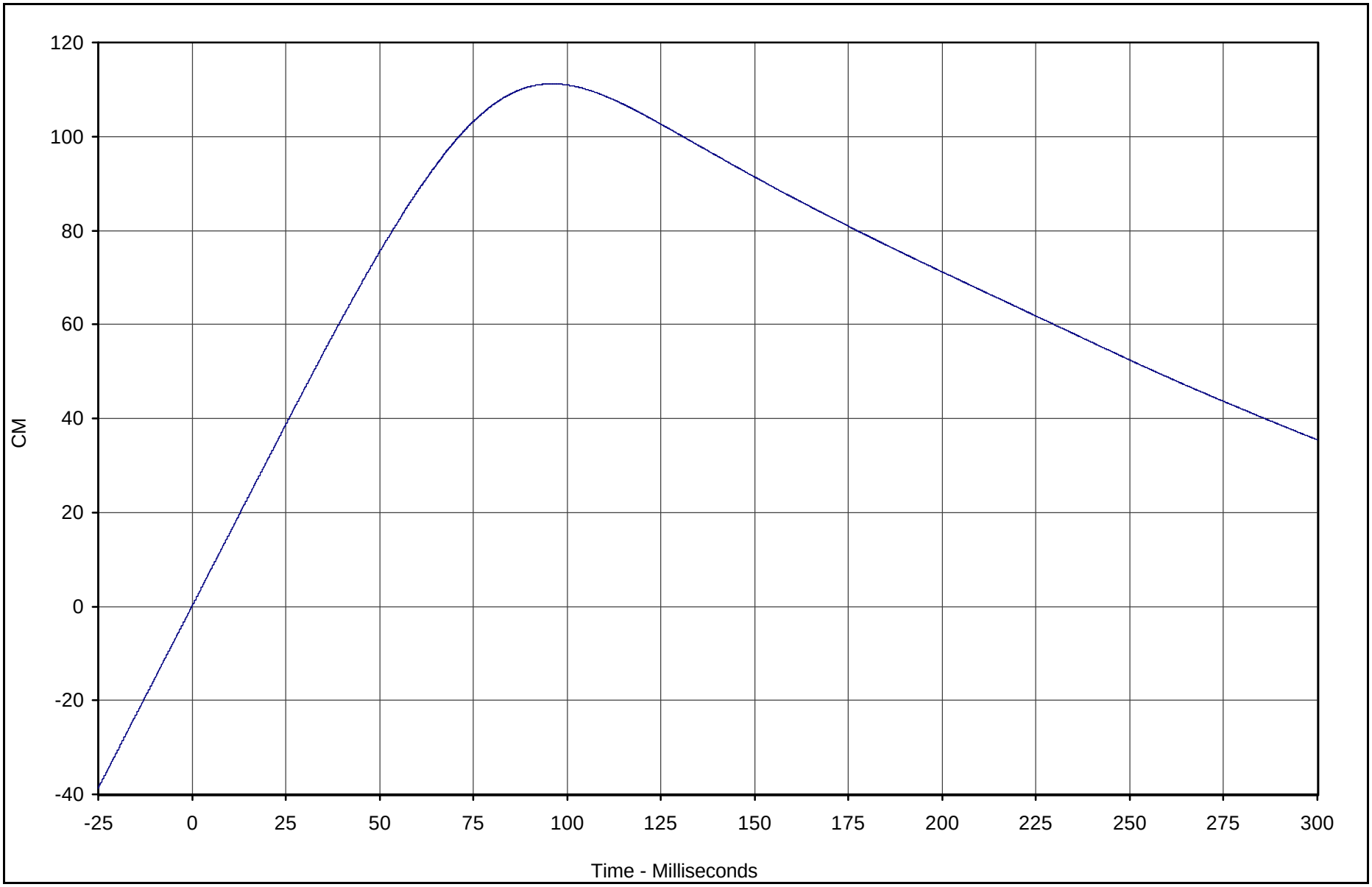
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X Velocity	060	IN1	KMH	55.9	7.9	-16.4	131.7	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



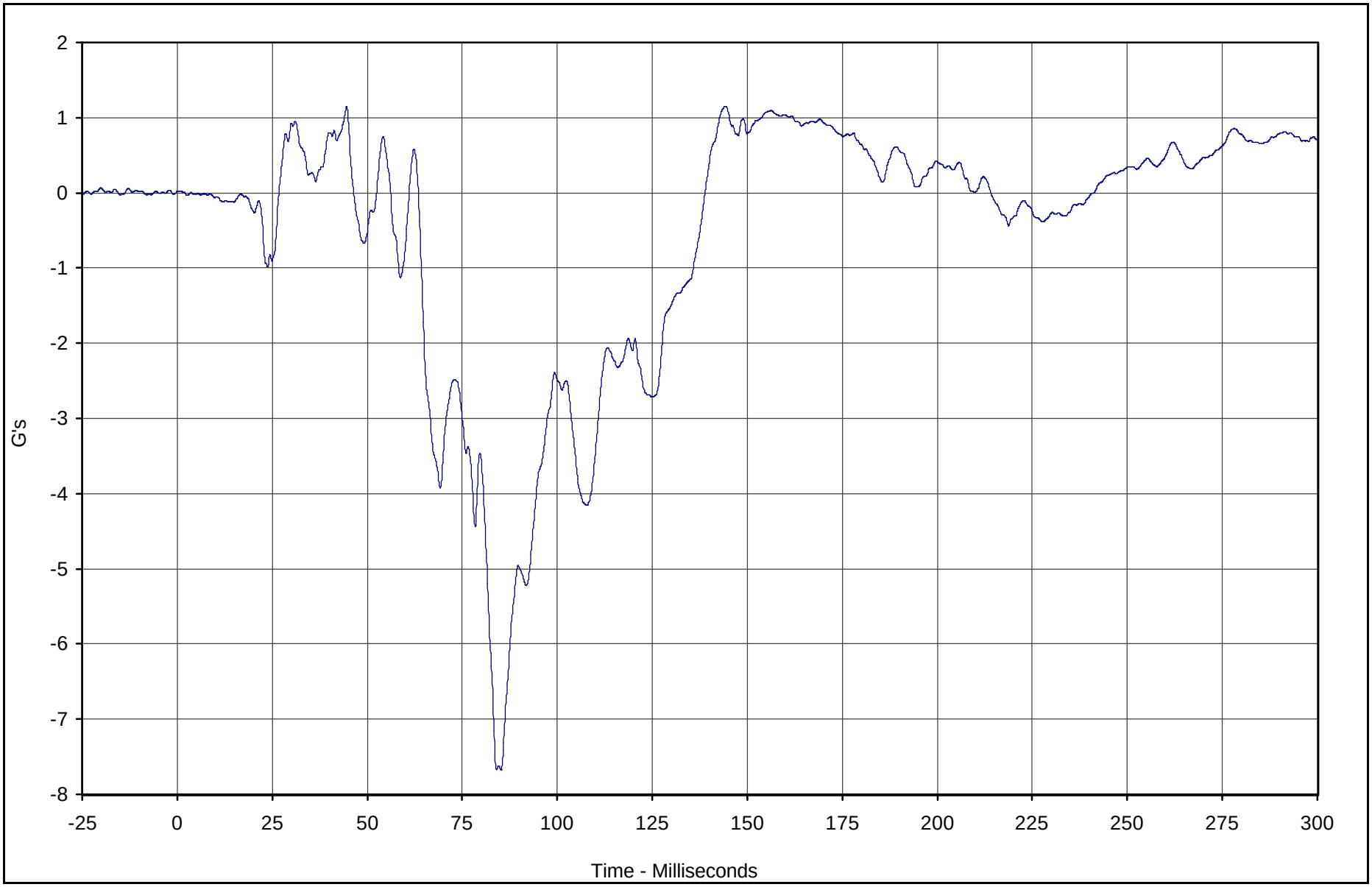
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X Displ.	060	IN2	CM	111.2	96.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



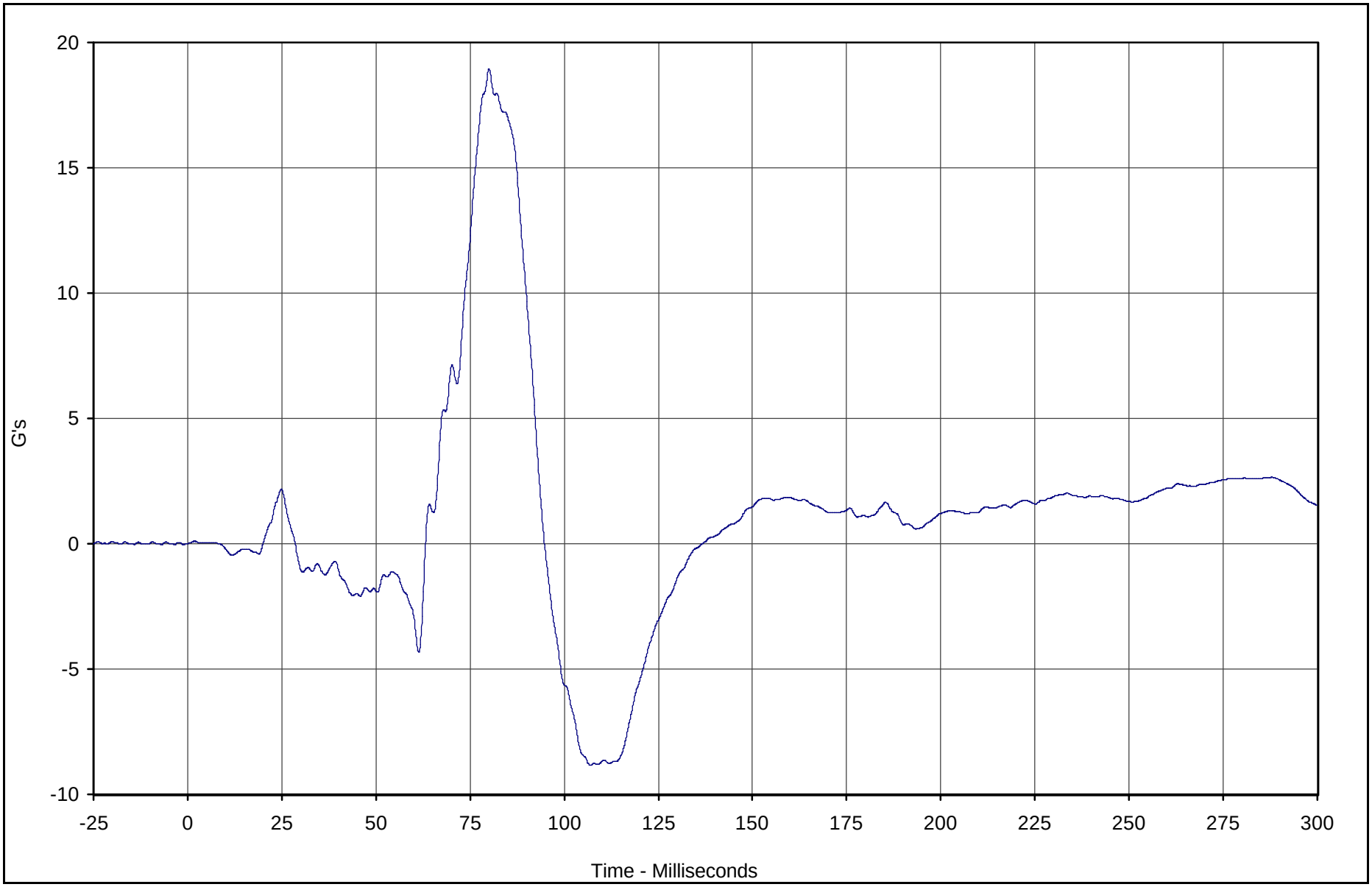
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant Y	061	FIL	G's	1.2	144.2	-7.7	85.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



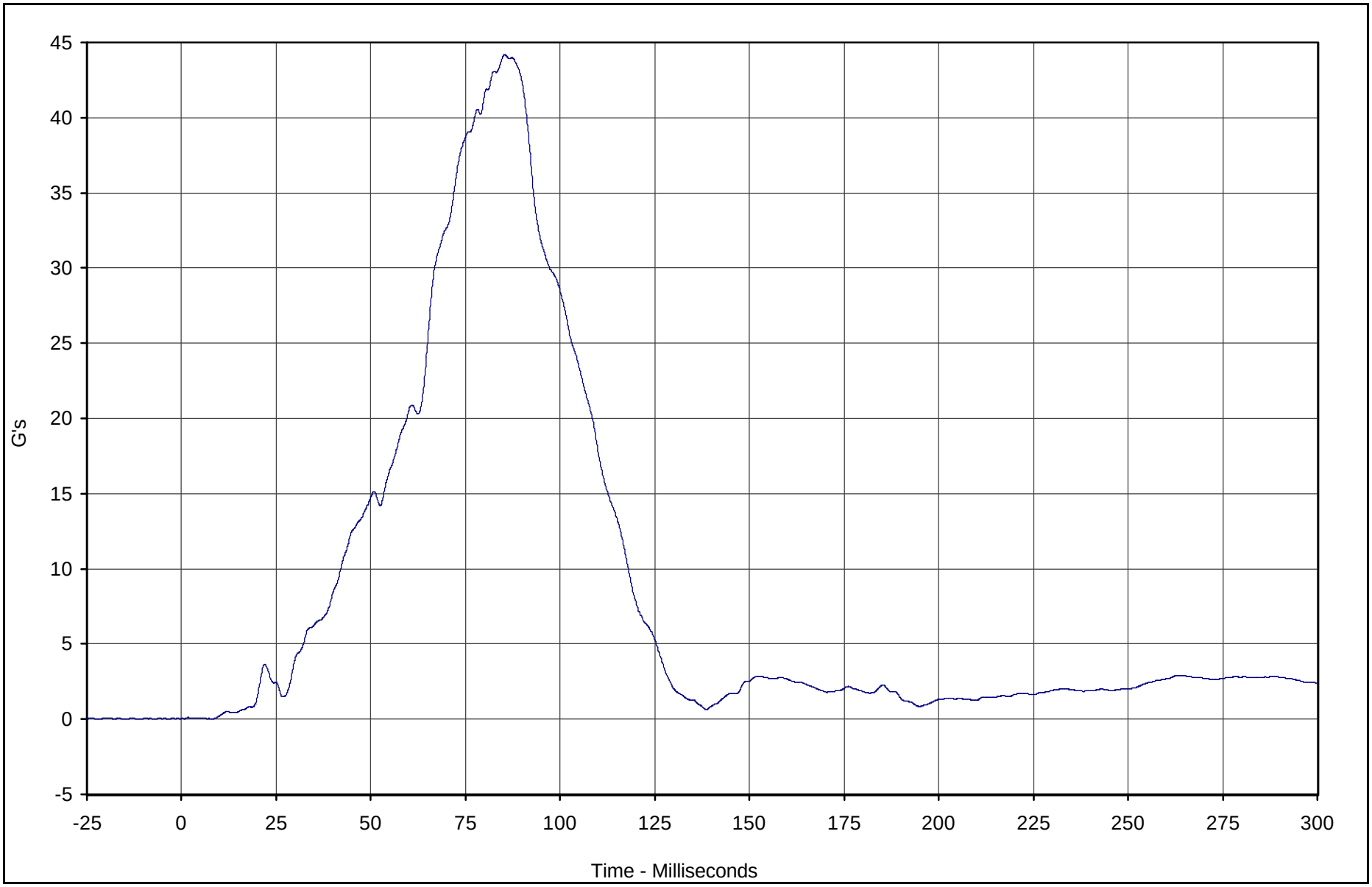
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant Z	062	FIL	G's	19.0	80.1	-8.9	106.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



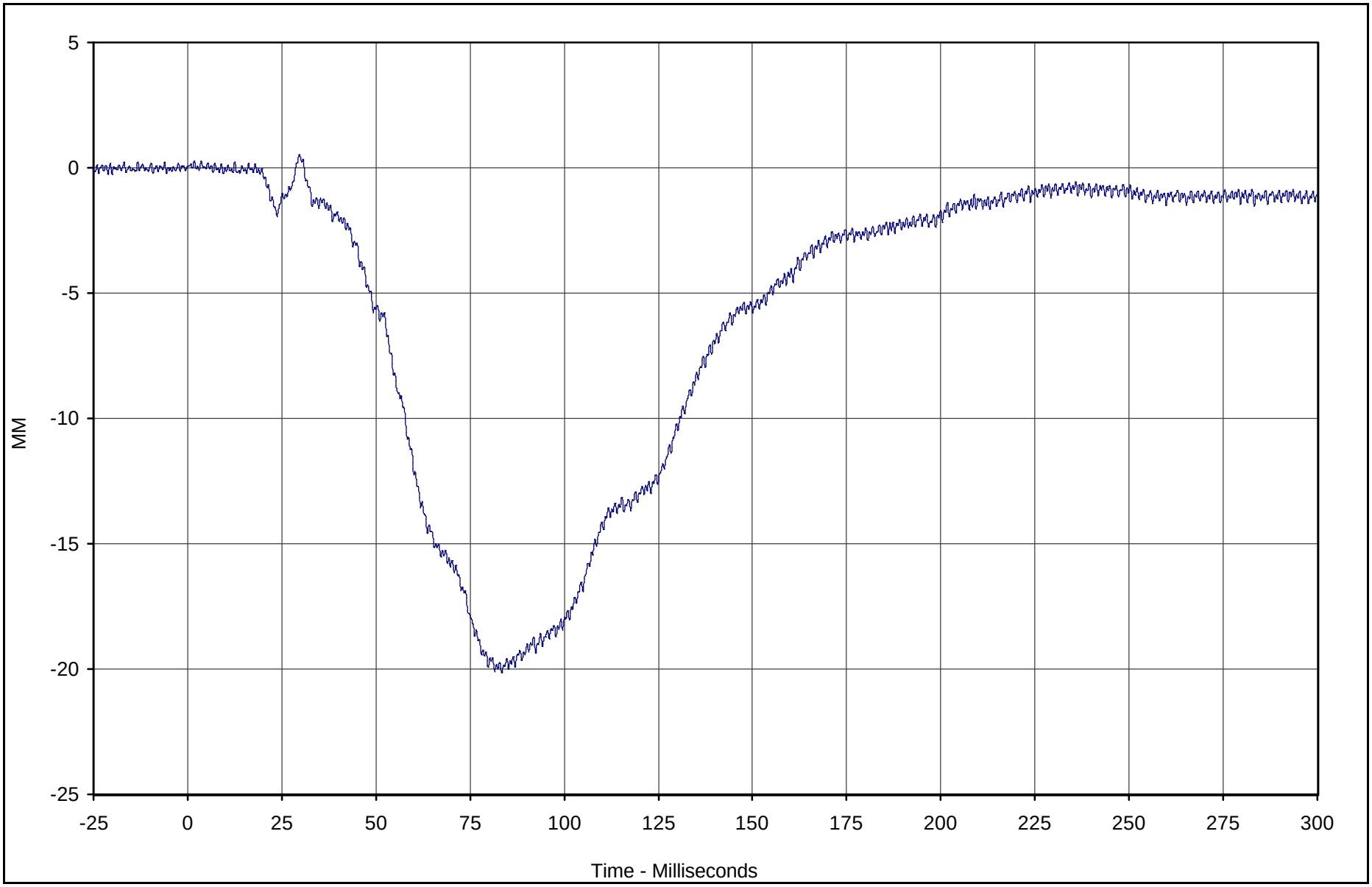
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Resultant Redundant	060	RES	G's	44.2	85.3	0.0	8.2	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



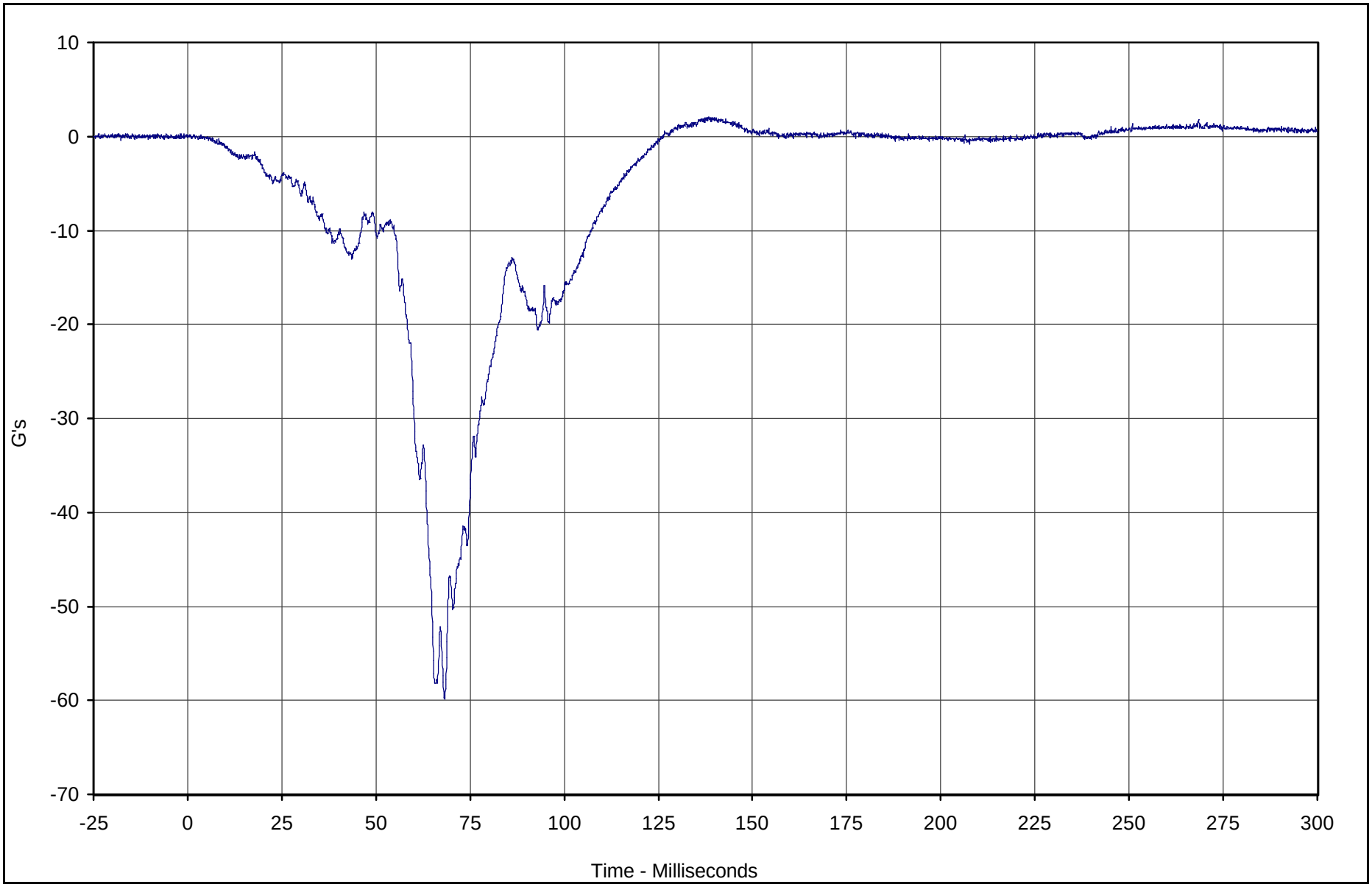
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Displacement X	063	FIL	MM	0.5	29.7	-20.2	83.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



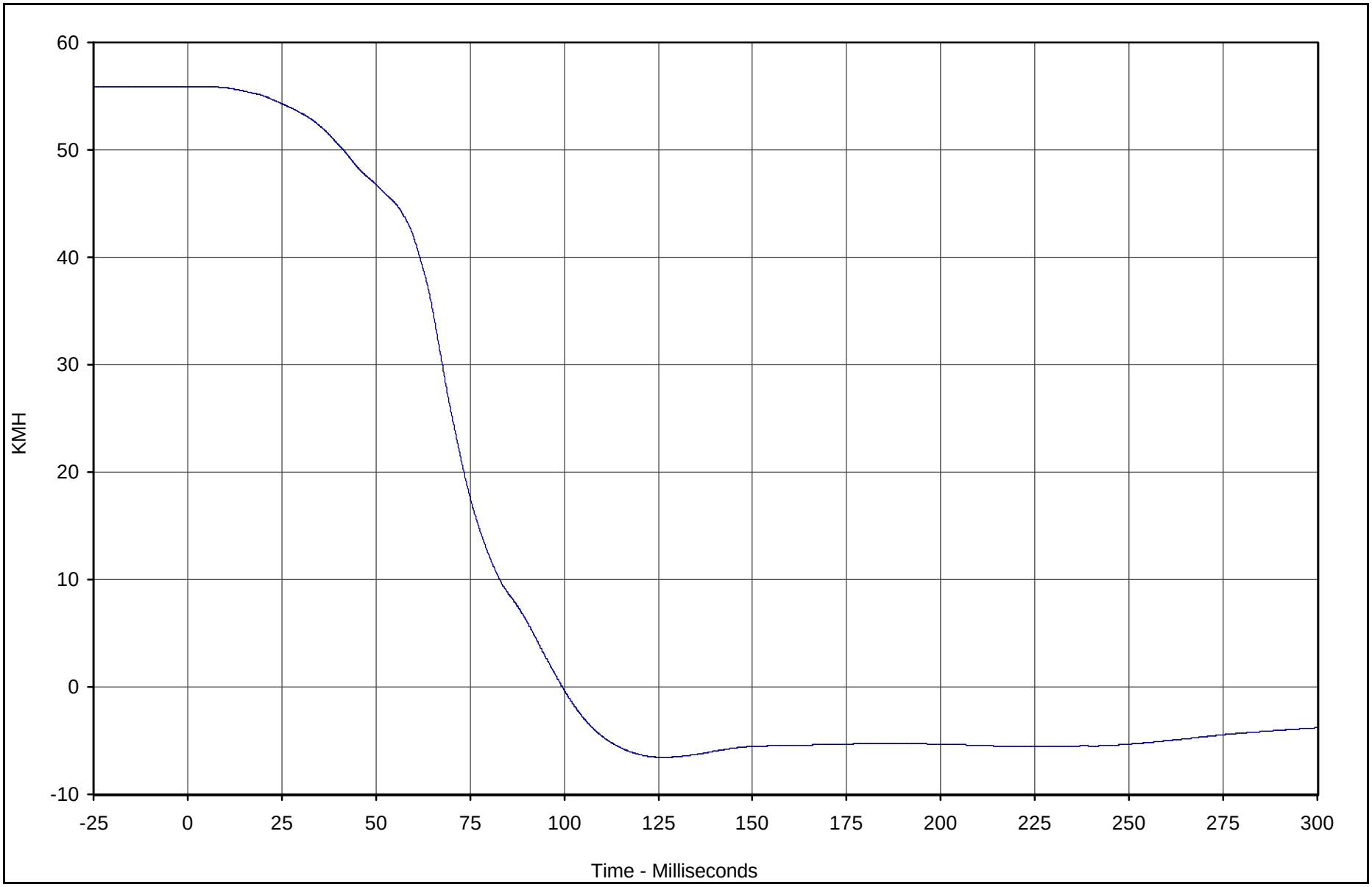
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X	064	FIL	G's	2.1	138.3	-59.8	68.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



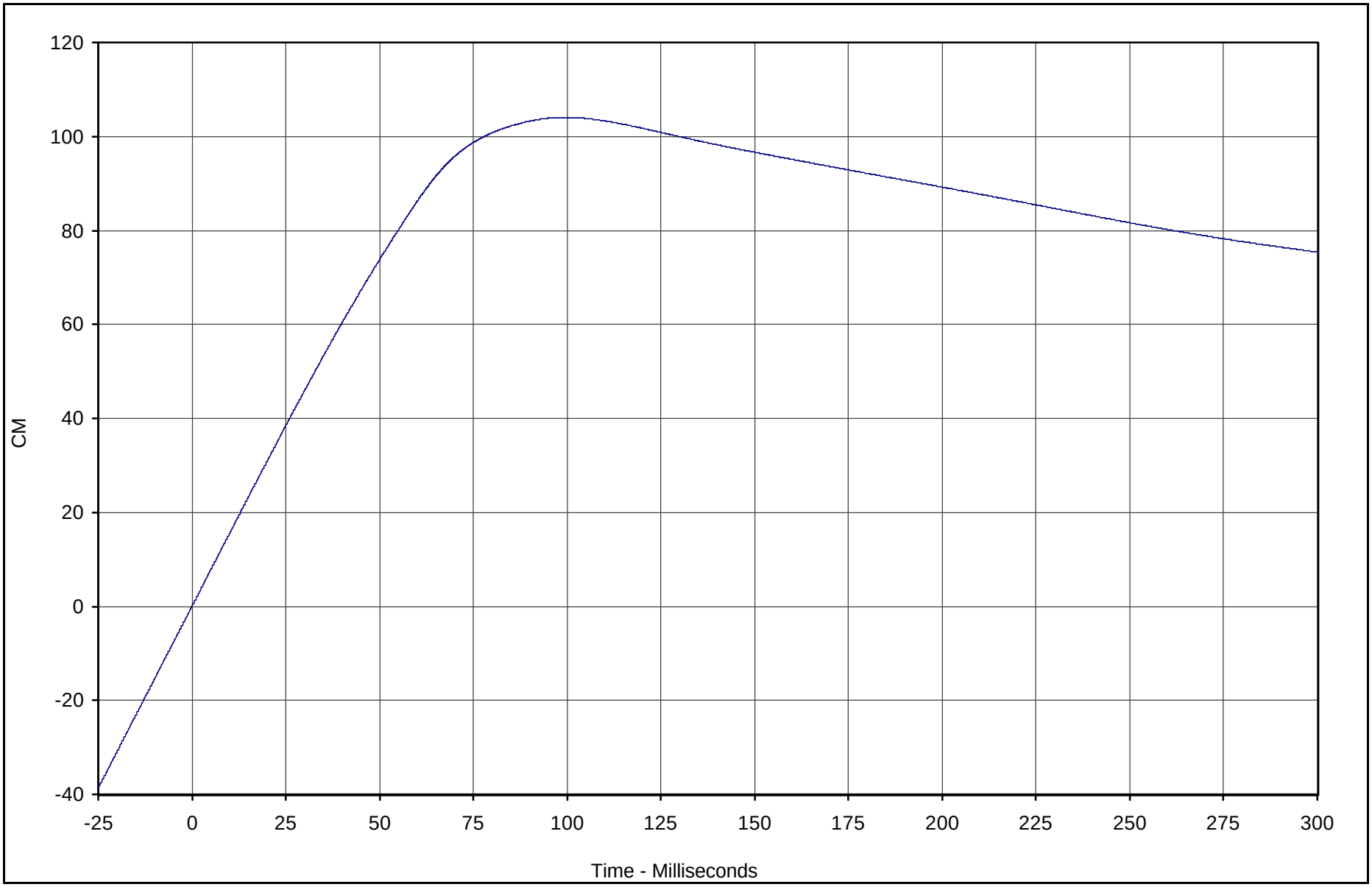
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X Velocity	064	IN1	KMH	55.9	1.1	-6.6	126.1	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



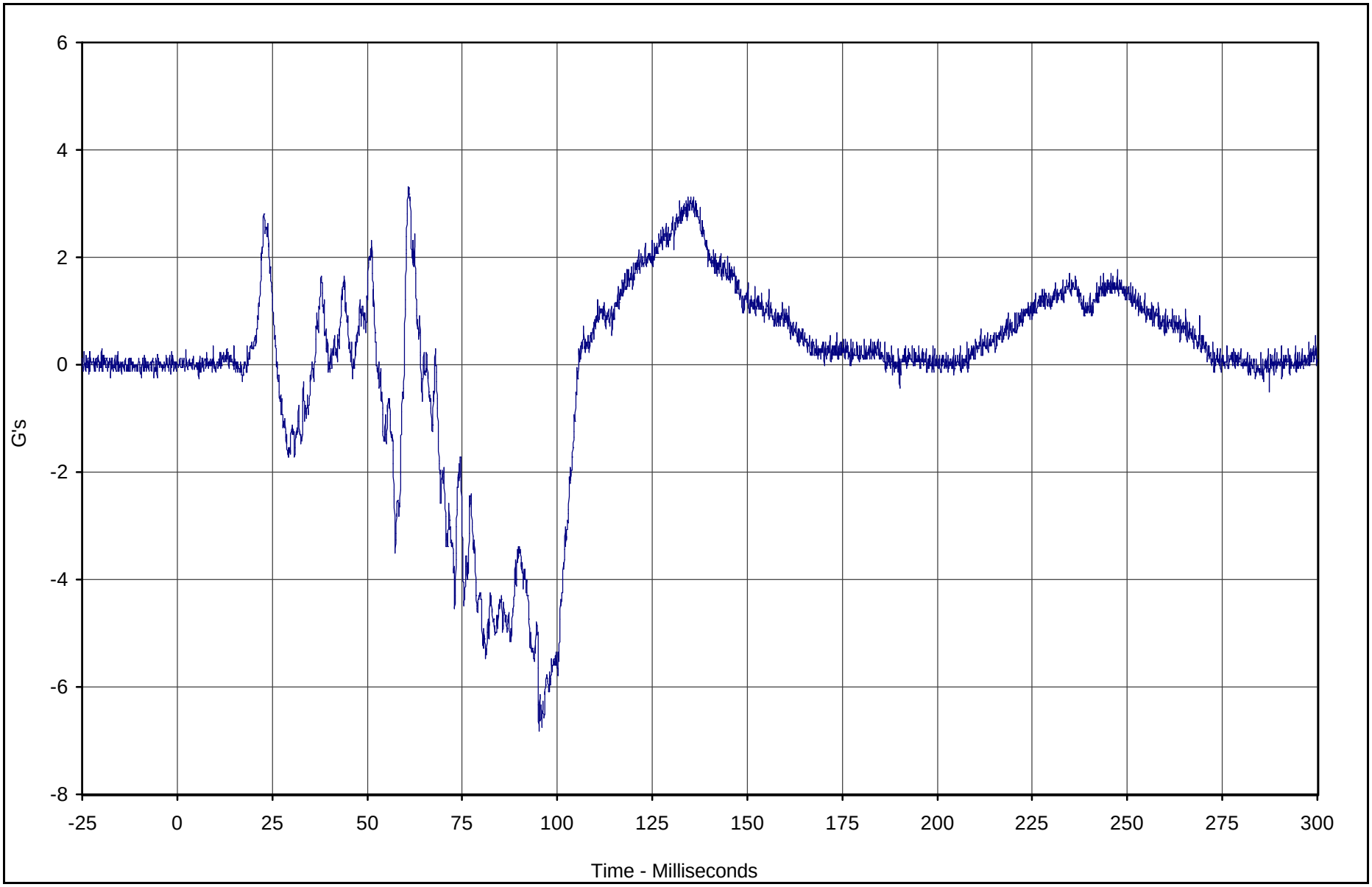
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X Displ.	064	IN2	CM	104.1	99.5	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



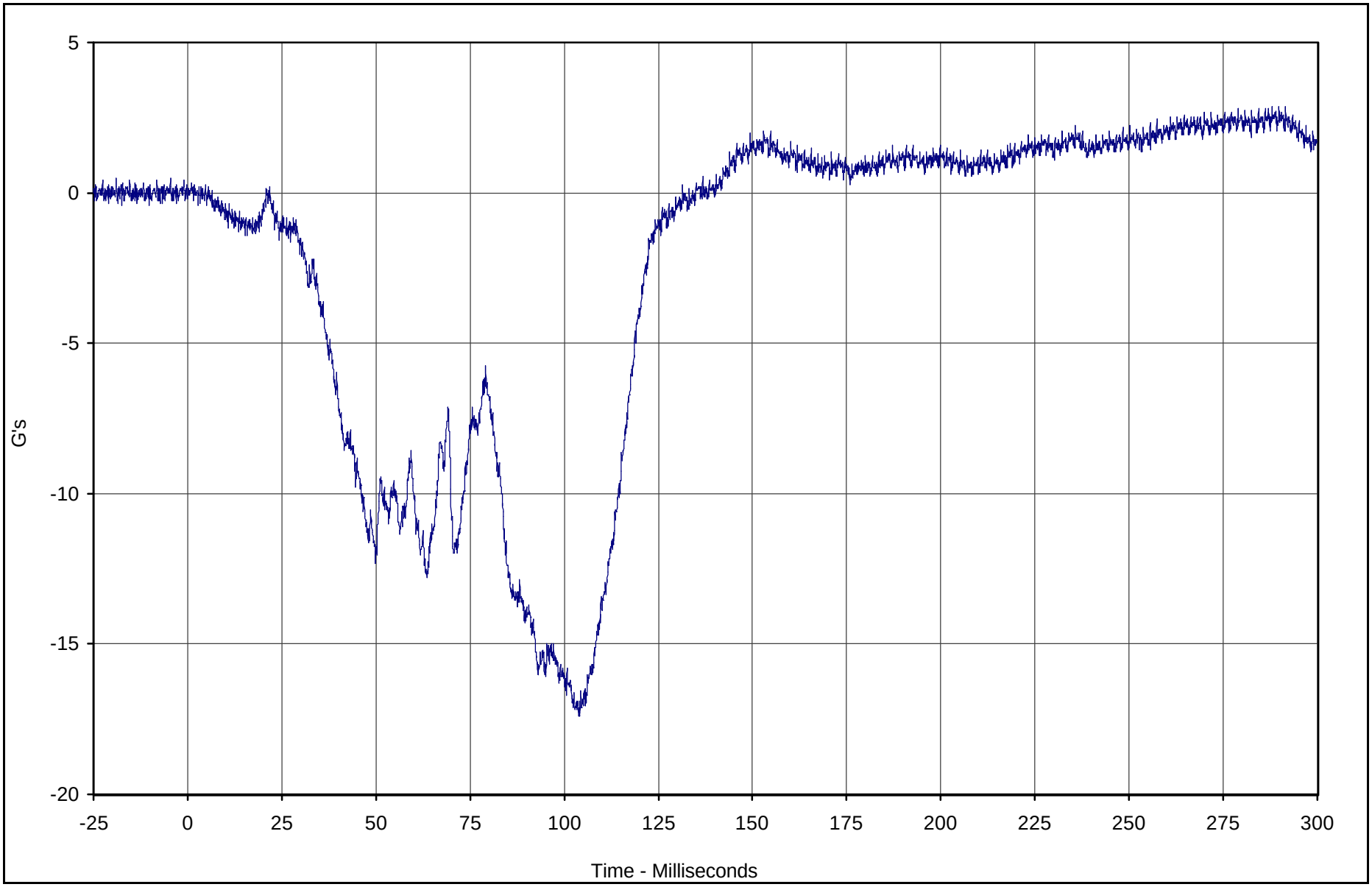
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Y	065	FIL	G's	3.3	60.7	-6.8	95.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



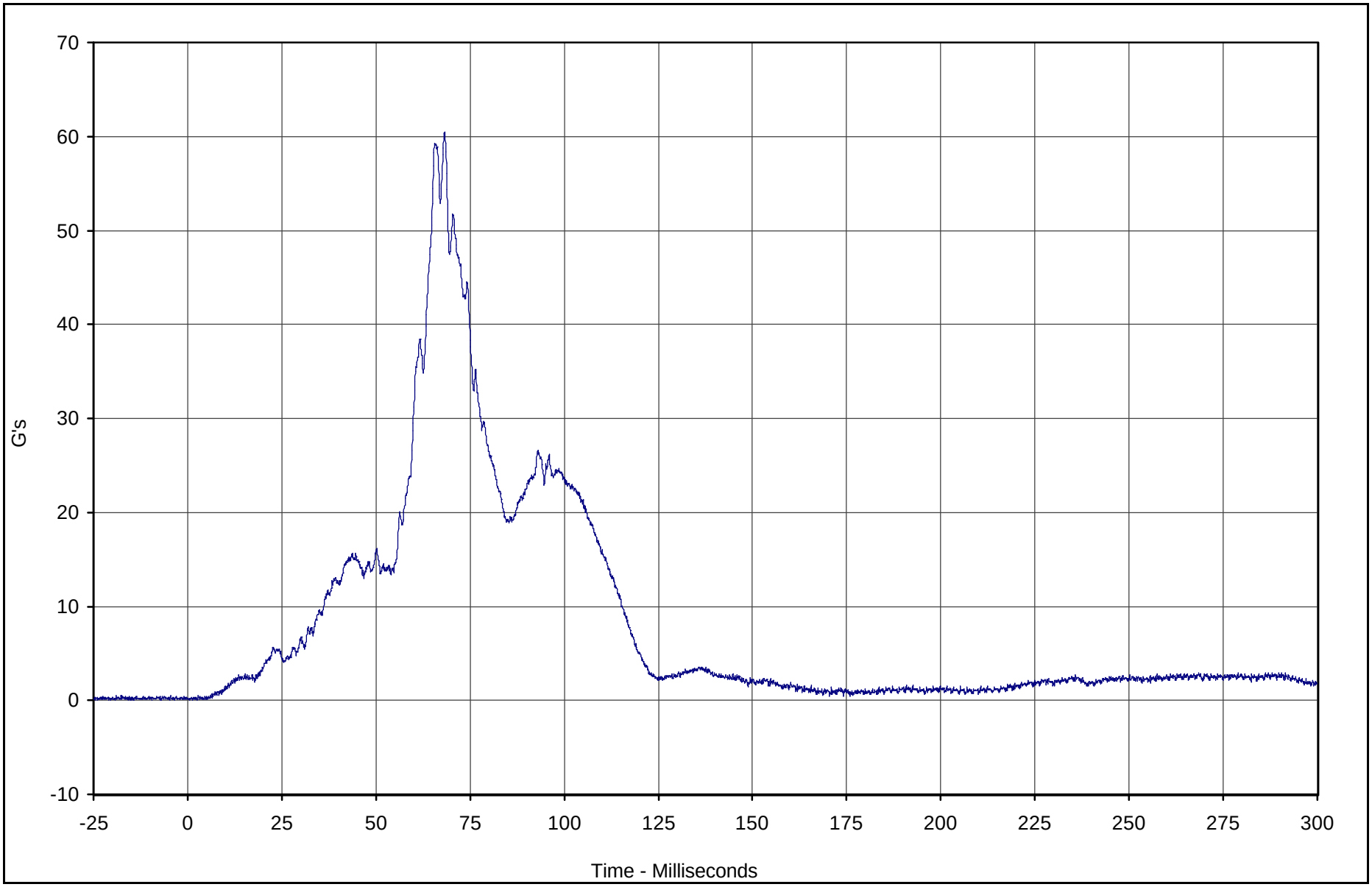
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Z	066	FIL	G's	2.9	288.0	-17.4	103.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



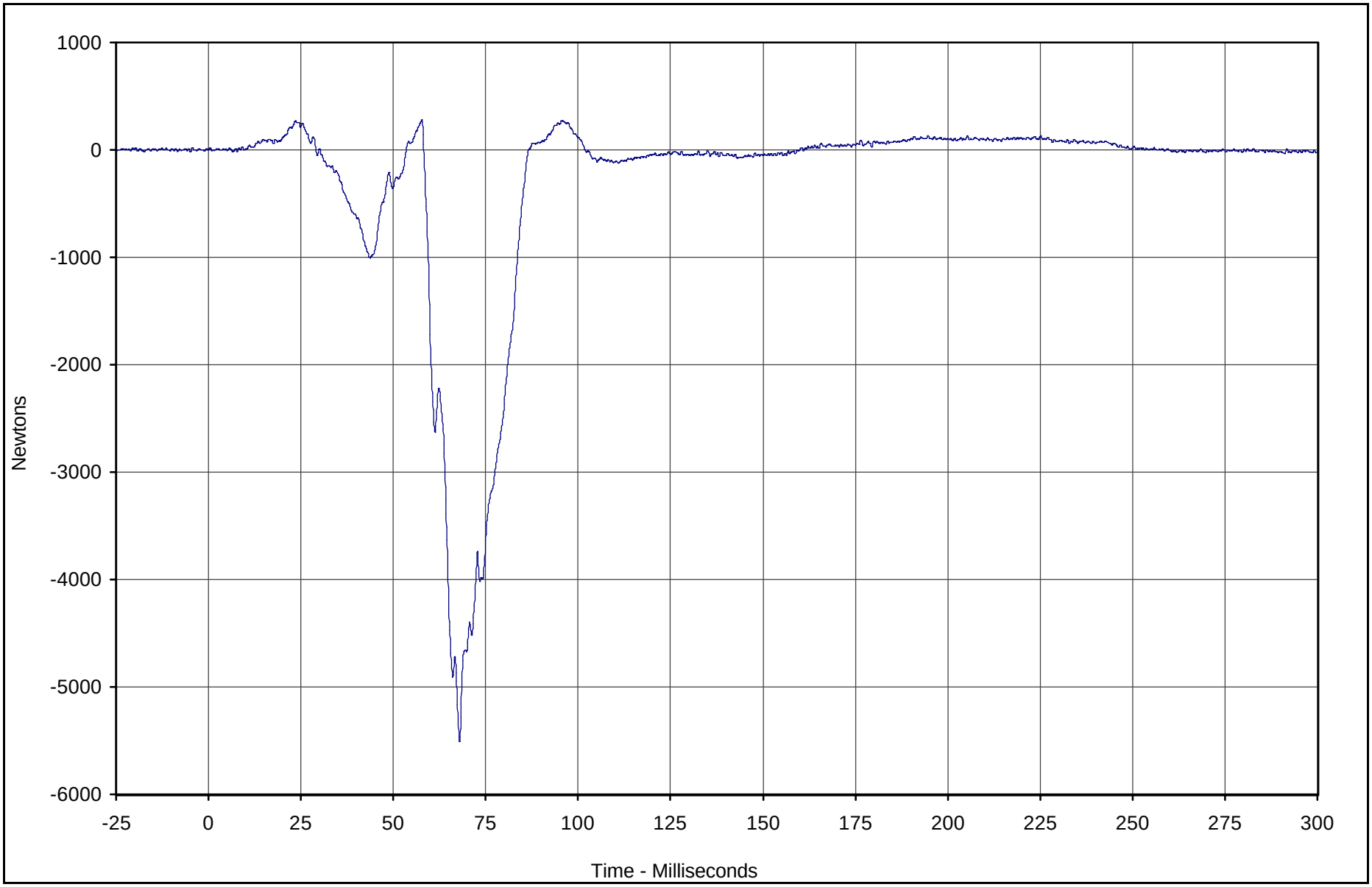
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Resultant	066	RES	G's	60.5	68.2	0.1	1.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



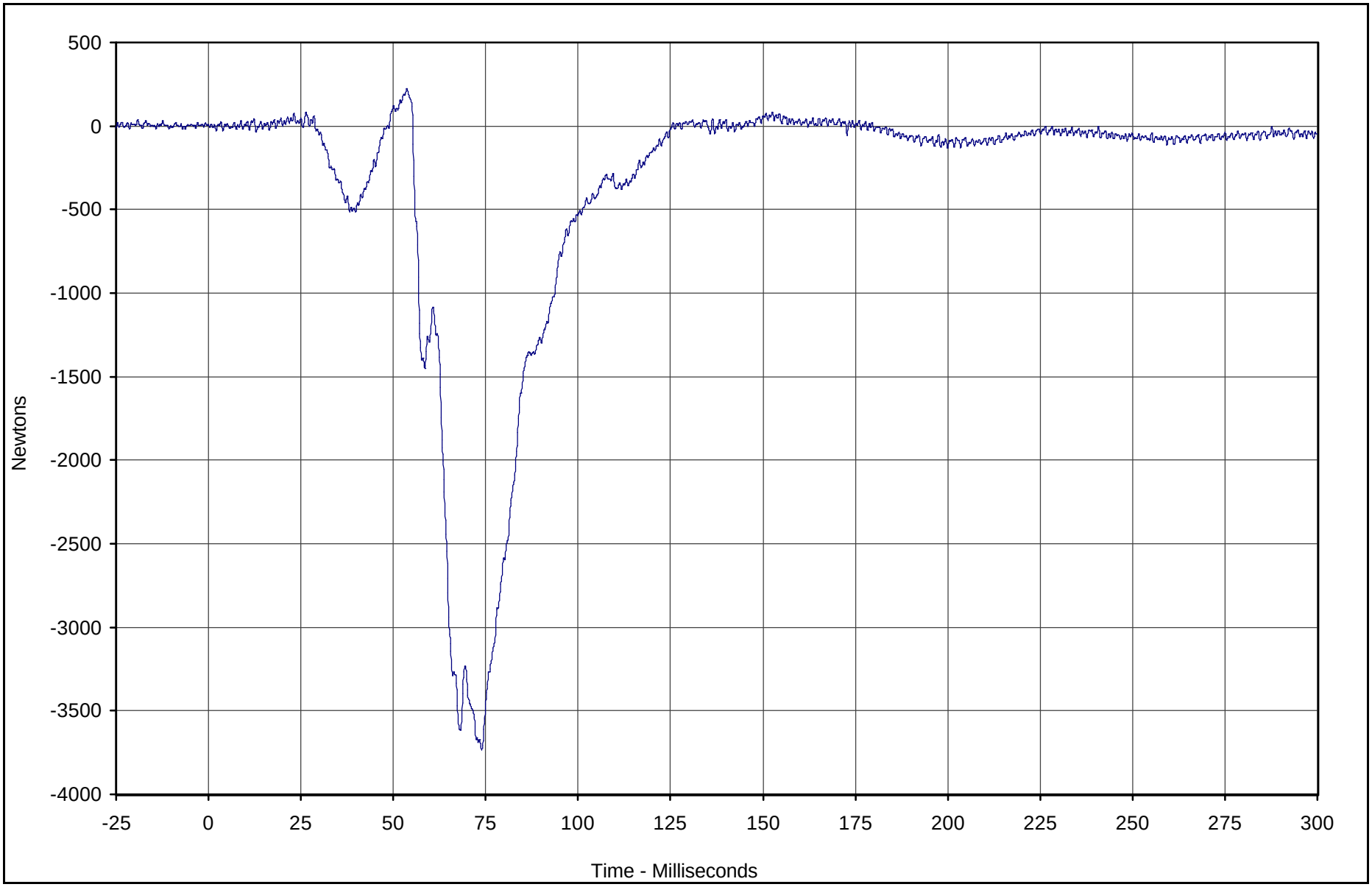
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Femur Force	067	FIL	Newtons	281.9	57.7	-5511.6	67.9	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



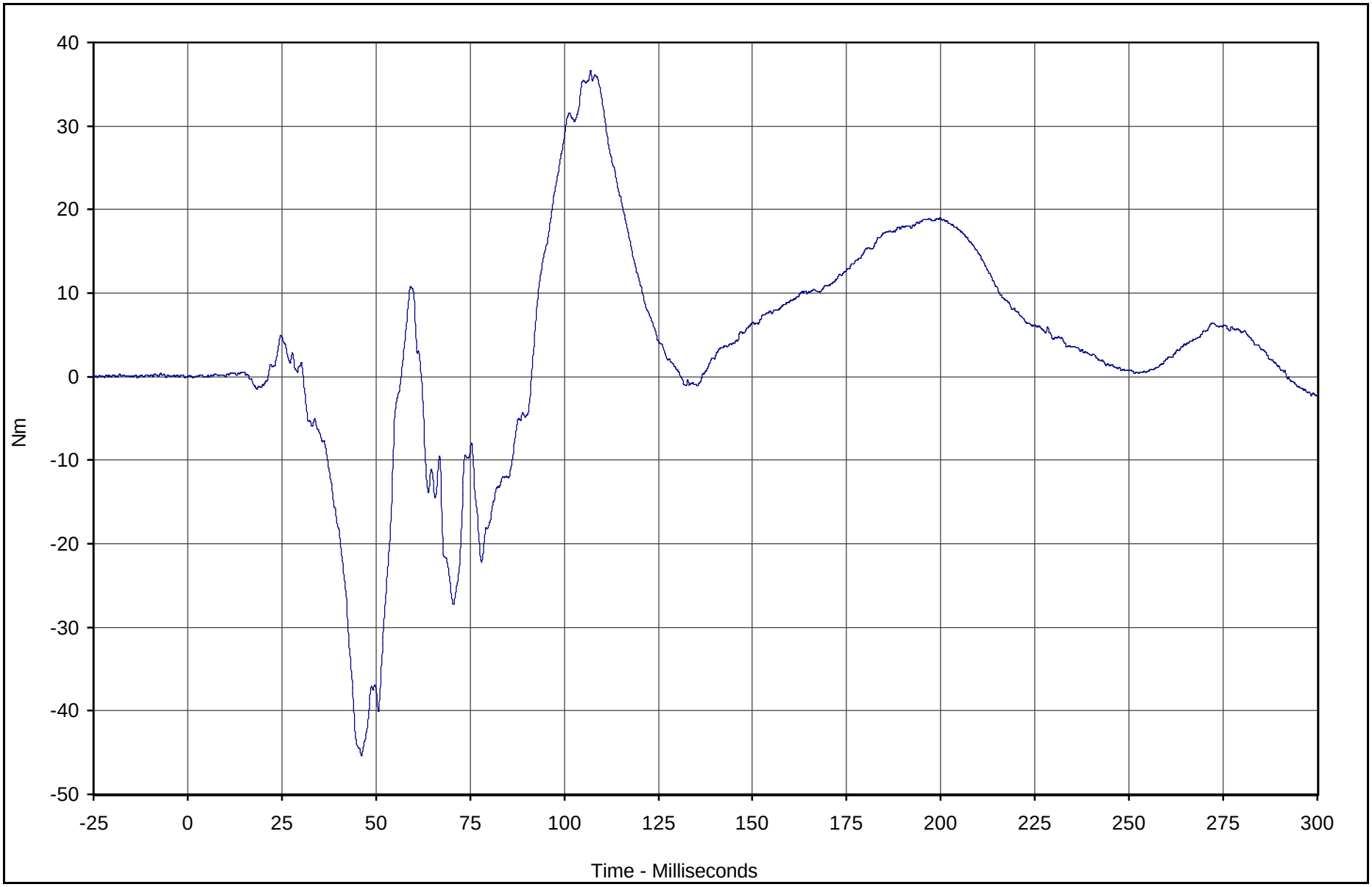
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Femur Force	068	FIL	Newtons	225.1	53.6	-3737.1	73.9	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



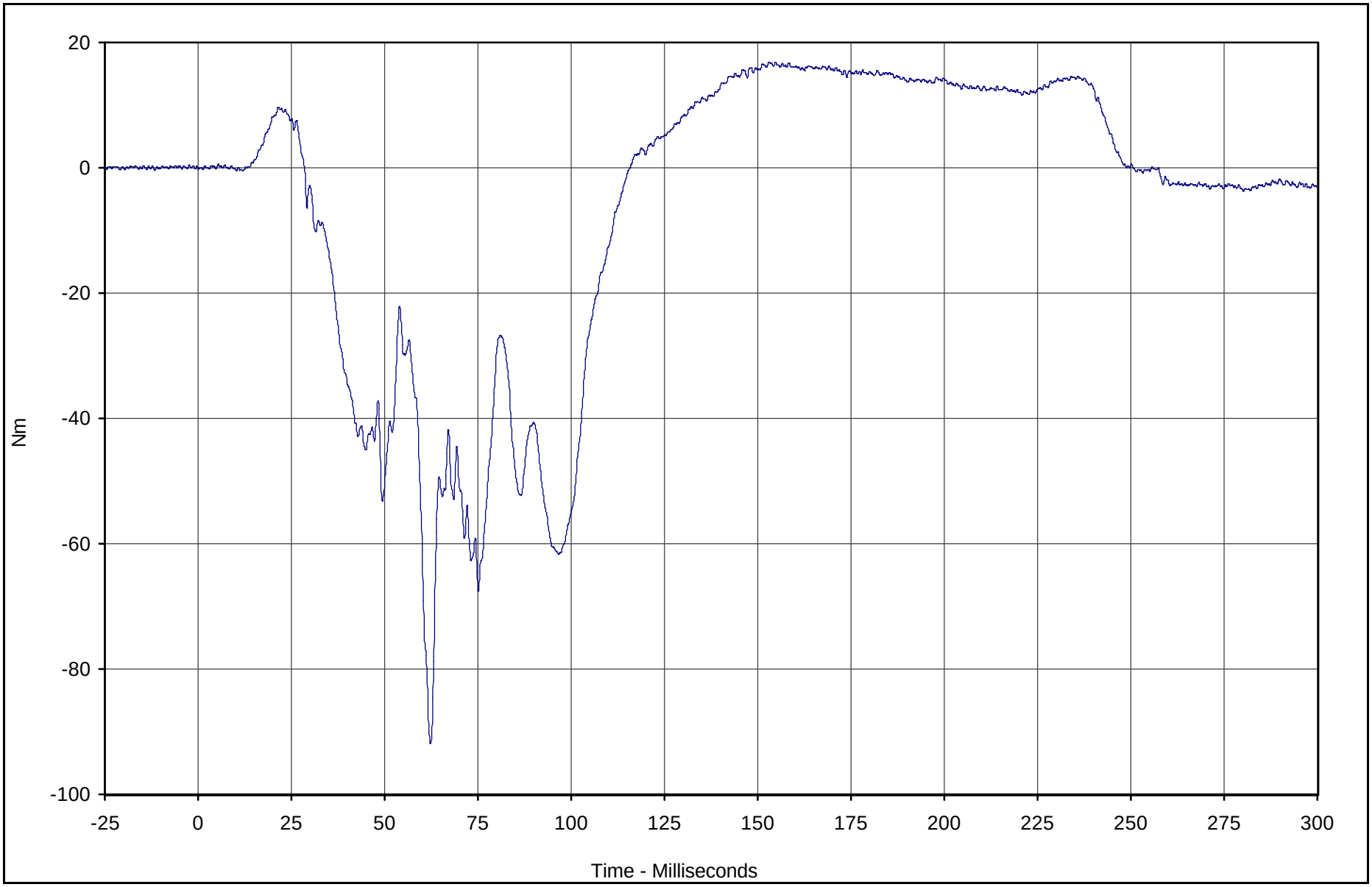
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Upper Tibia Moment X	069	FIL	Nm	36.6	107.0	-45.4	46.2	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



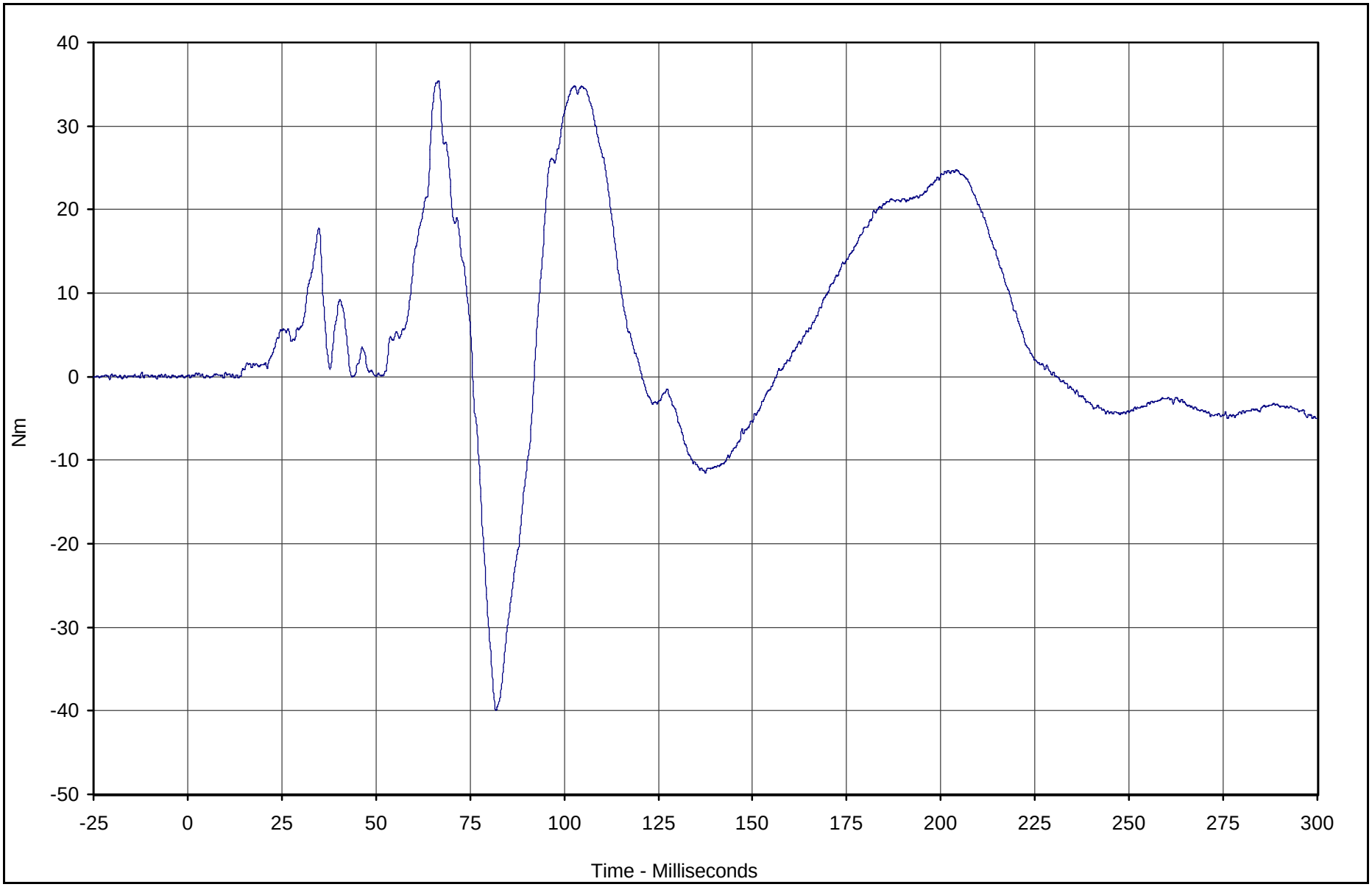
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Upper Tibia Moment Y	070	FIL	Nm	16.9	153.1	-91.9	62.3	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



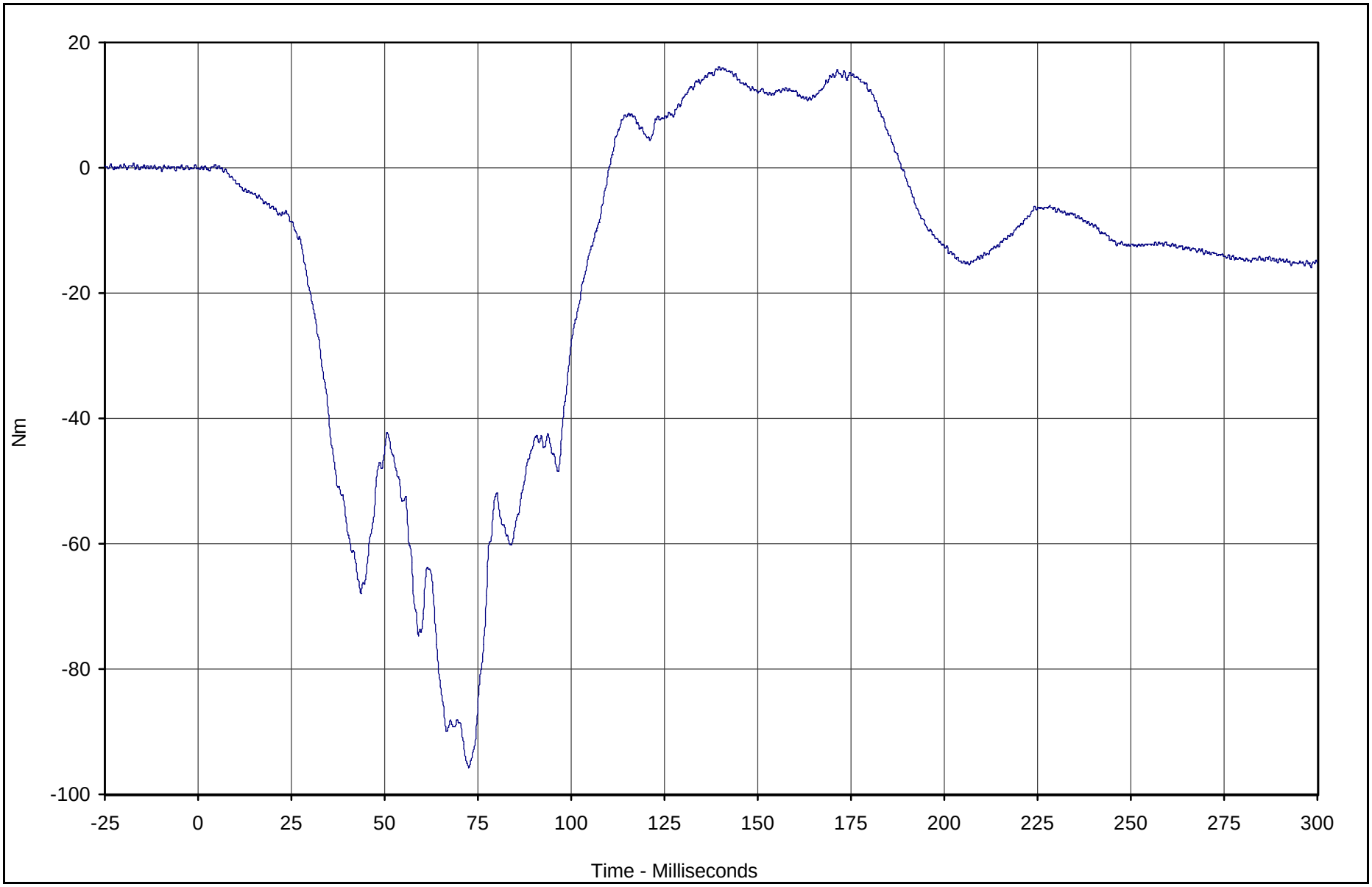
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Upper Tibia Moment X	071	FIL	Nm	35.4	66.6	-39.9	81.9	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



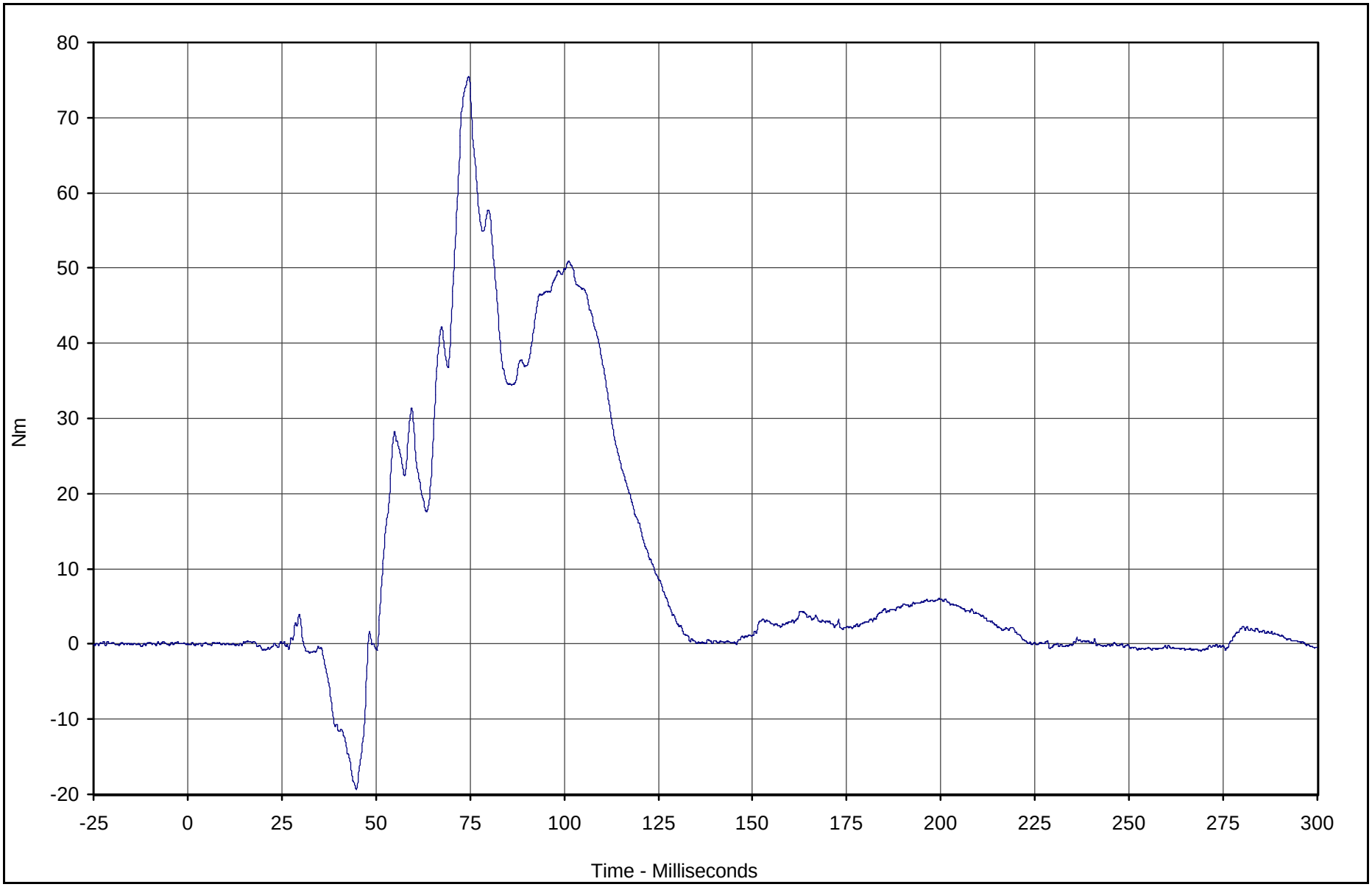
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Upper Tibia Moment Y	072	FIL	Nm	16.1	139.6	-95.7	72.6	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



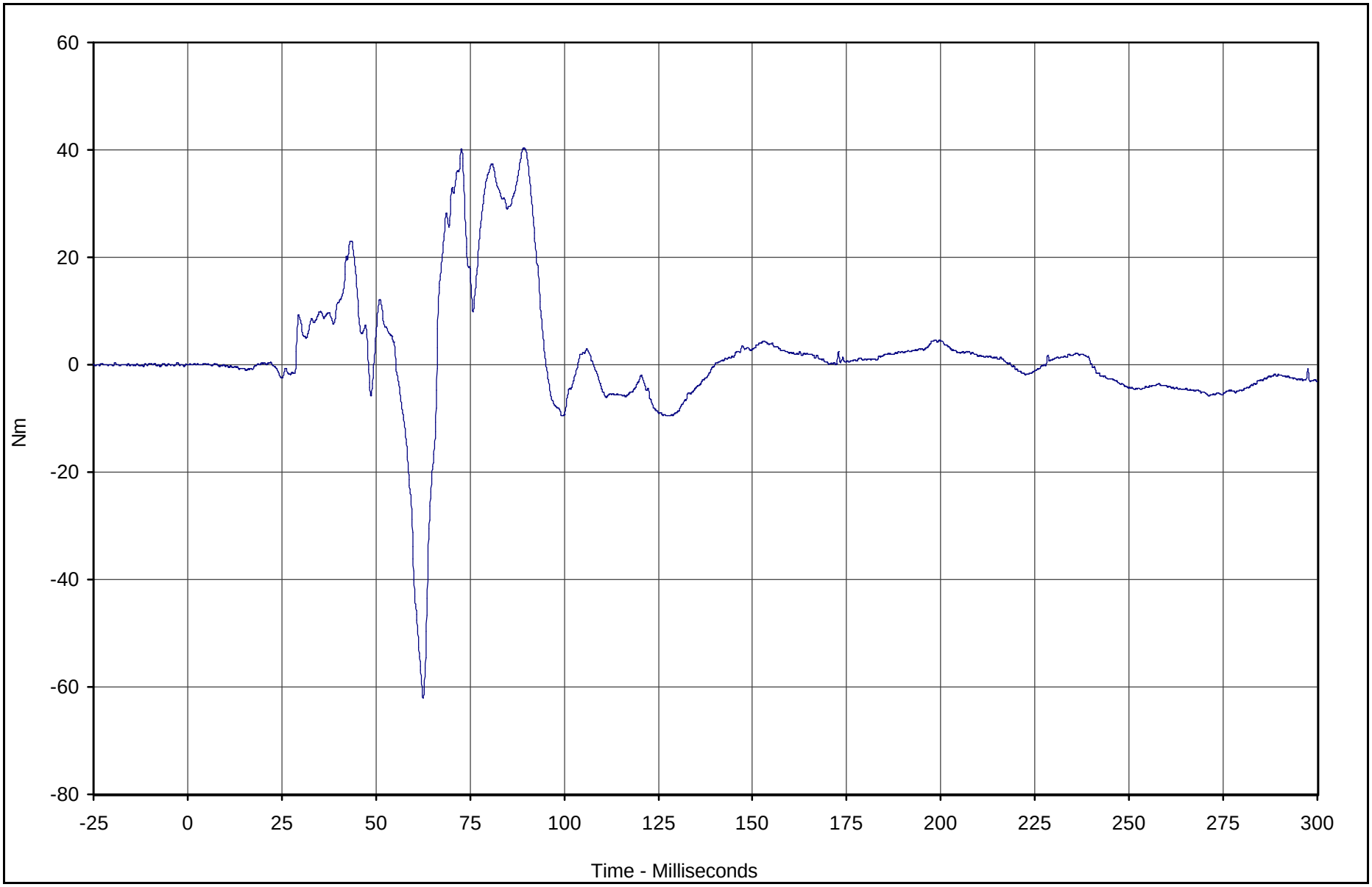
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Moment X	073	FIL	Nm	75.5	74.7	-19.3	44.8	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



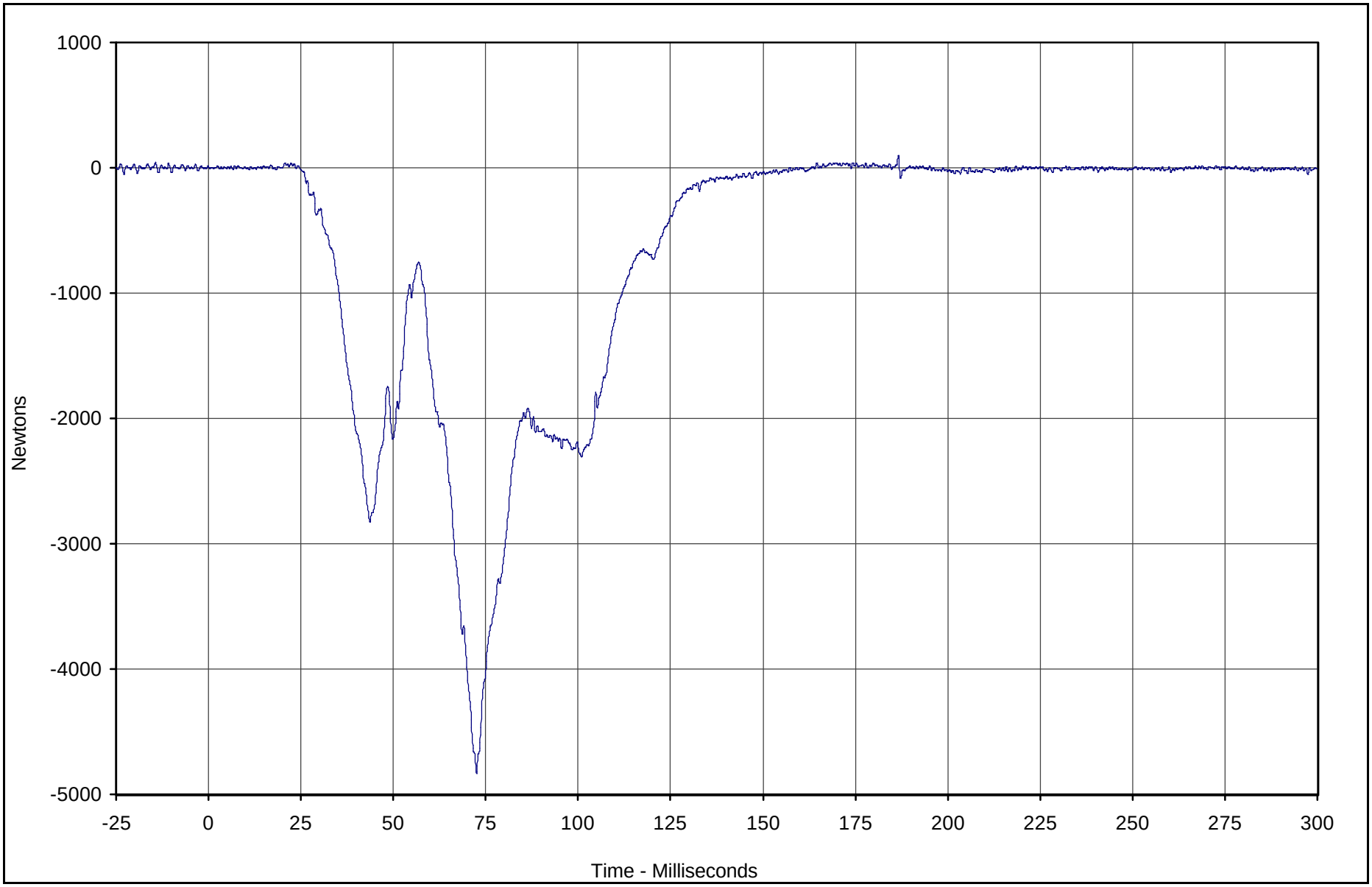
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Moment Y	074	FIL	Nm	40.3	89.3	-62.0	62.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



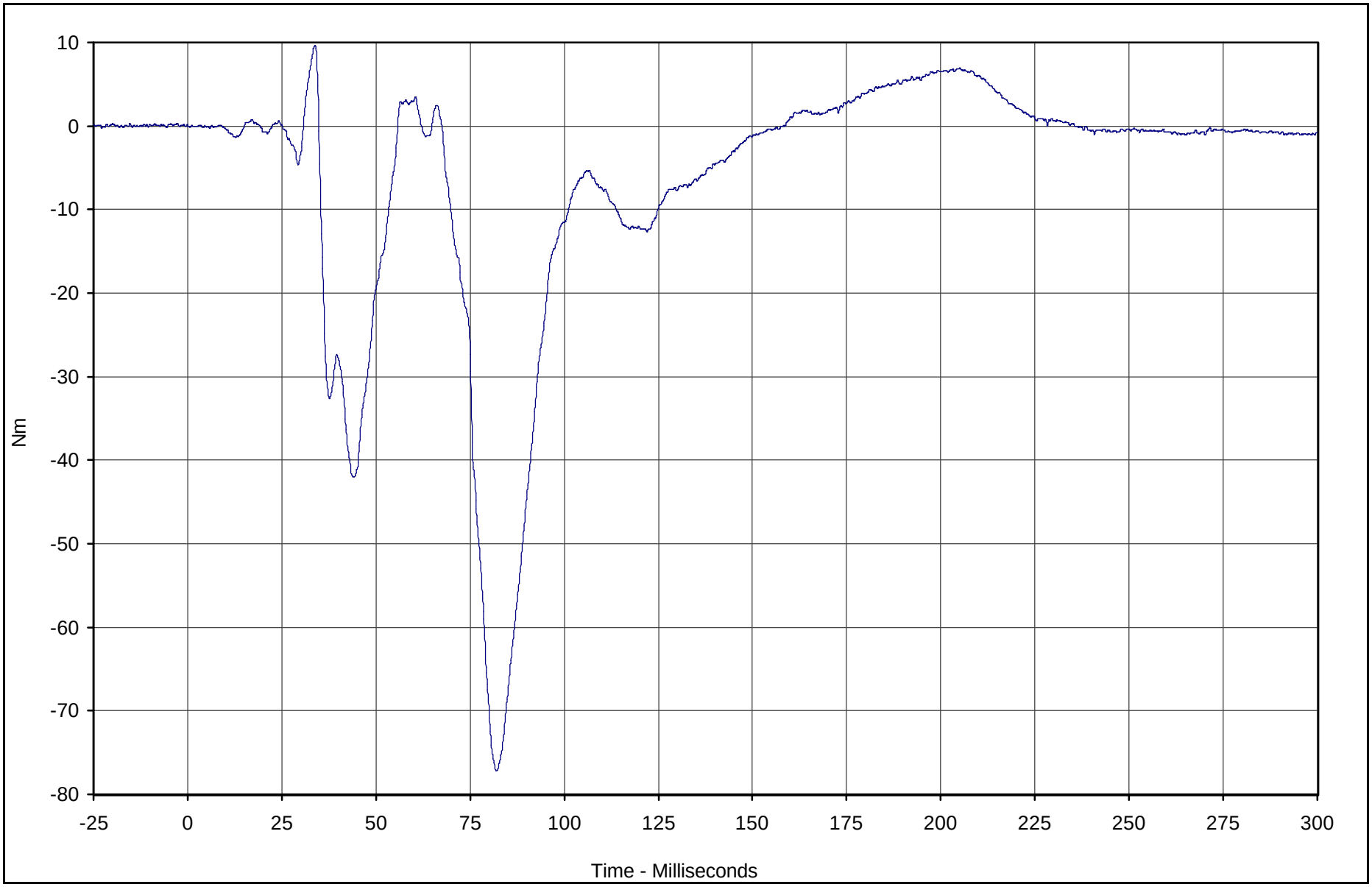
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Force Z	075	FIL	Newtons	98.4	186.6	-4836.2	72.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



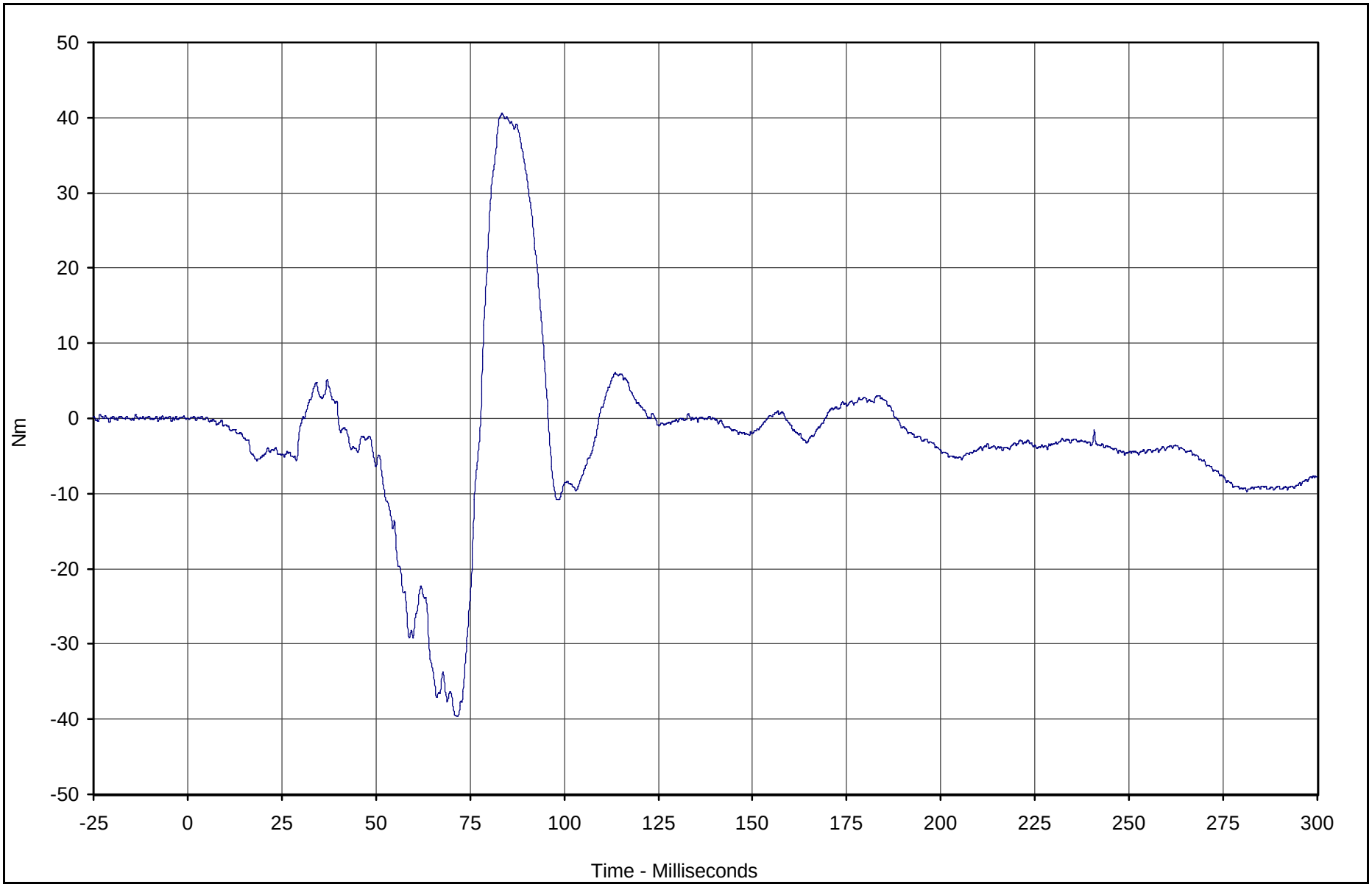
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Lower Tibia Moment X	076	FIL	Nm	9.7	33.9	-77.2	82.1	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



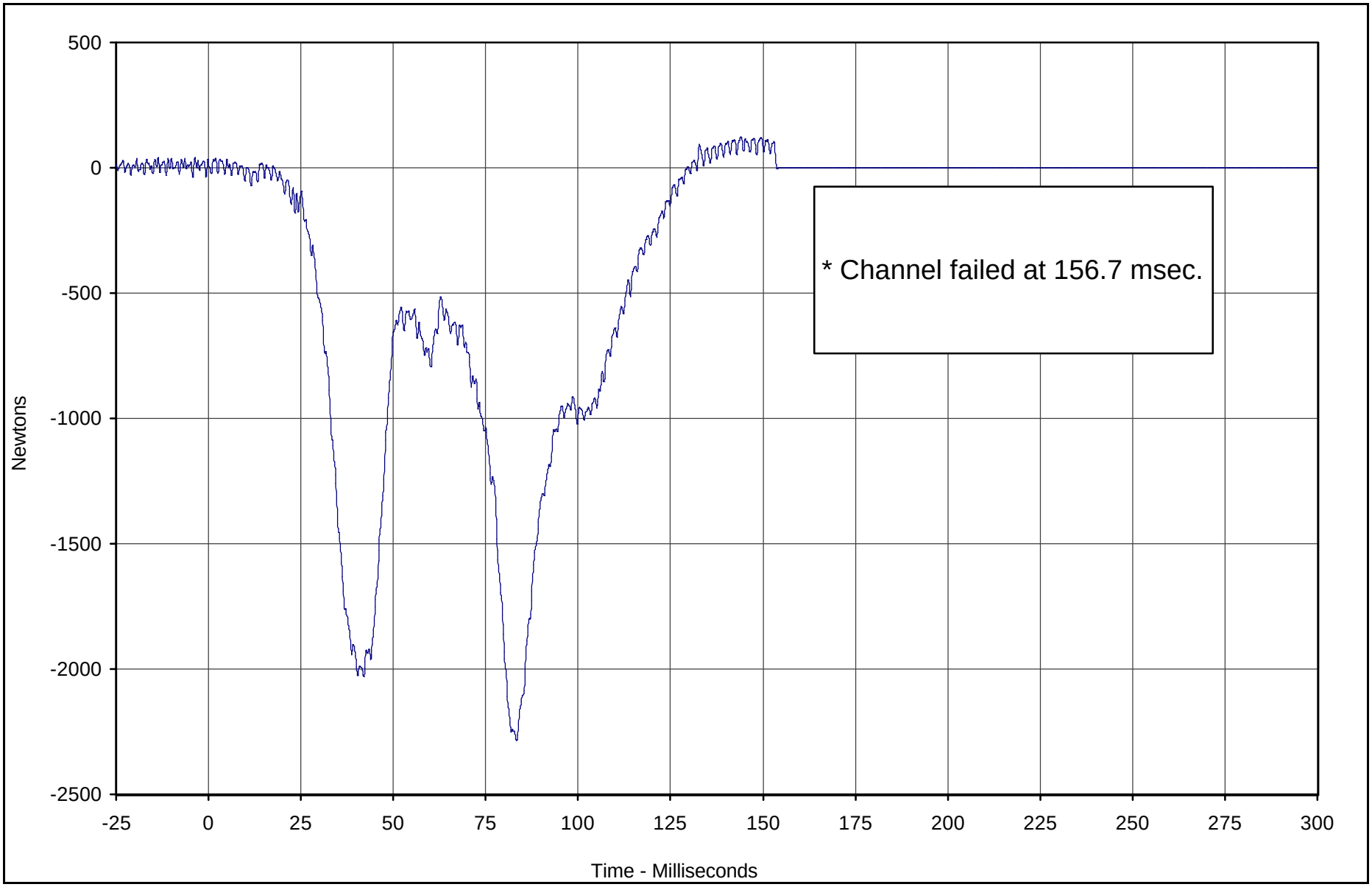
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Lower Tibia Moment Y	077	FIL	Nm	40.6	83.6	-39.6	71.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



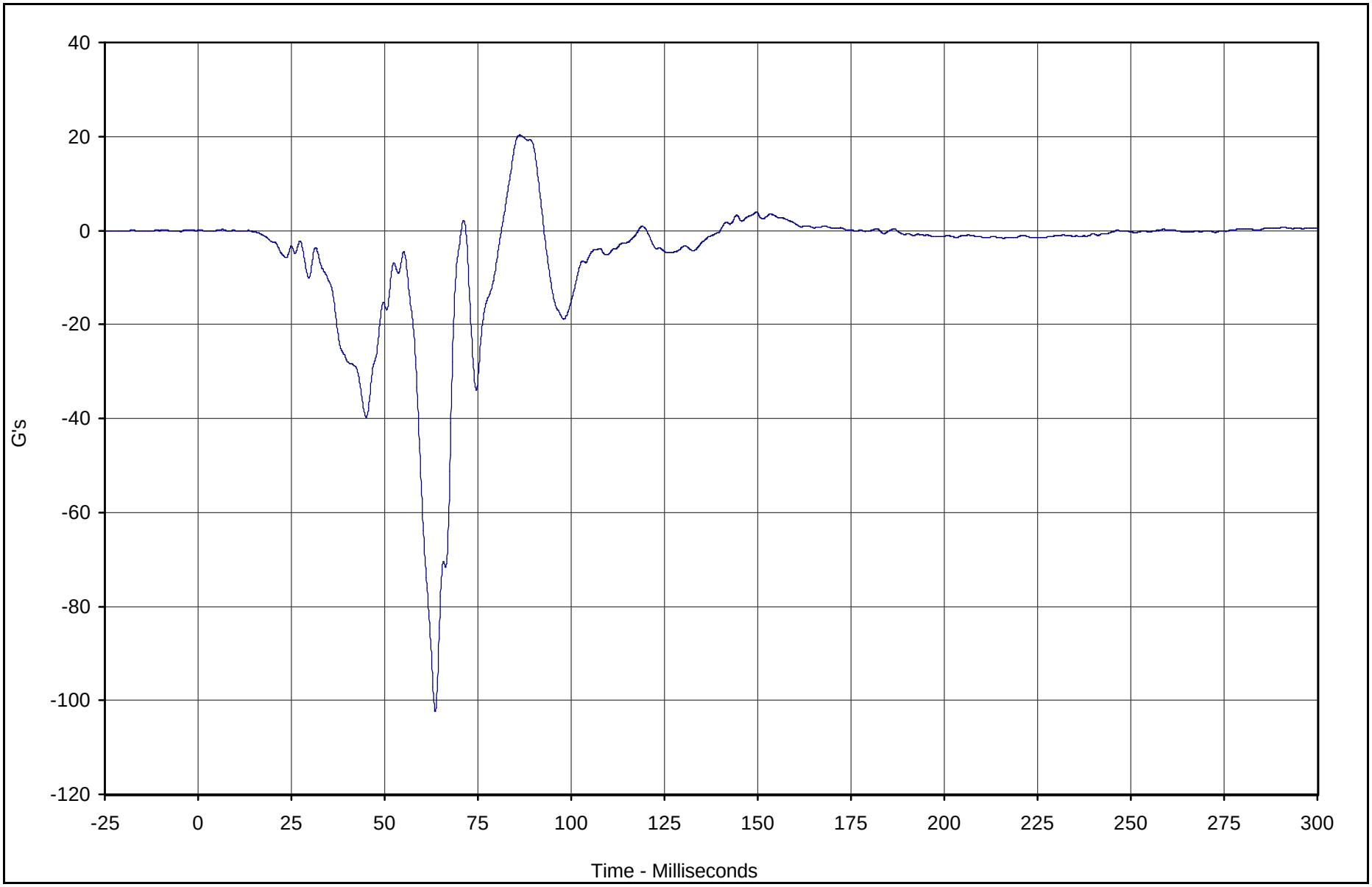
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right lower Tibia Force Z	078	FIL	Newtons	125.2	144.0	-2284.6	83.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



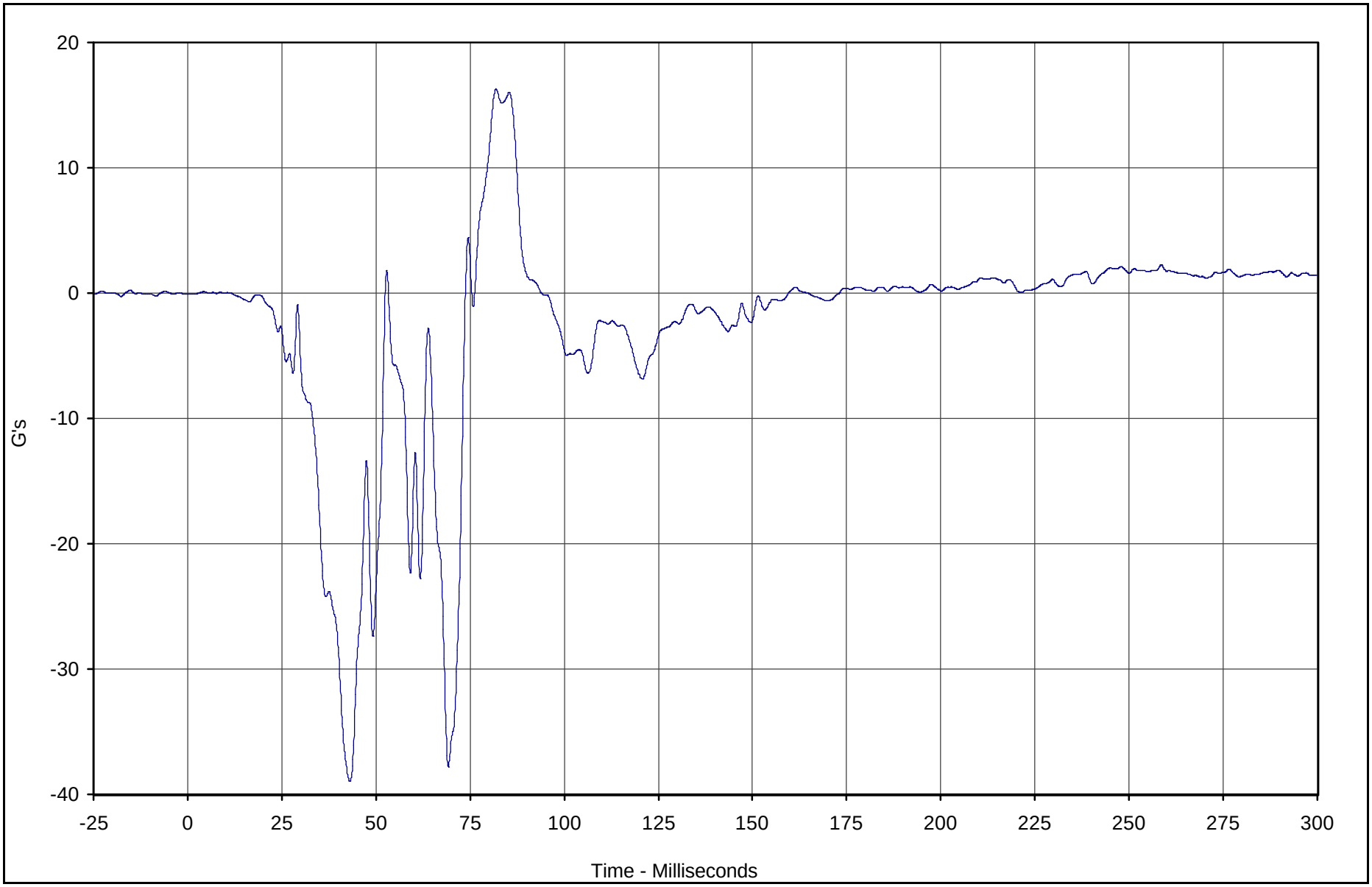
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Aft X	079	FIL	G's	20.3	86.2	-102.3	63.6	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



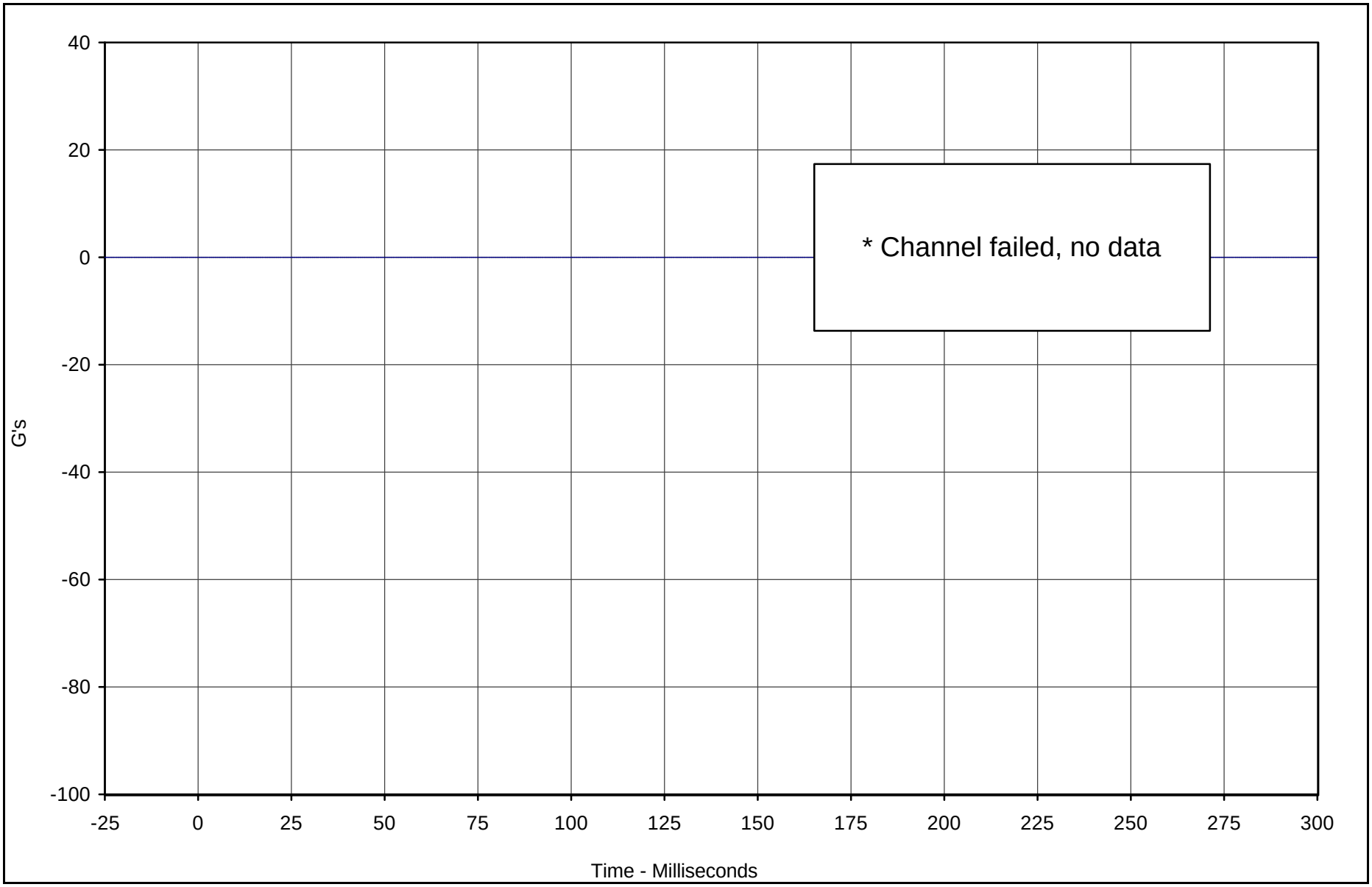
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Aft Z	080	FIL	G's	16.3	81.9	-39.0	43.1	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



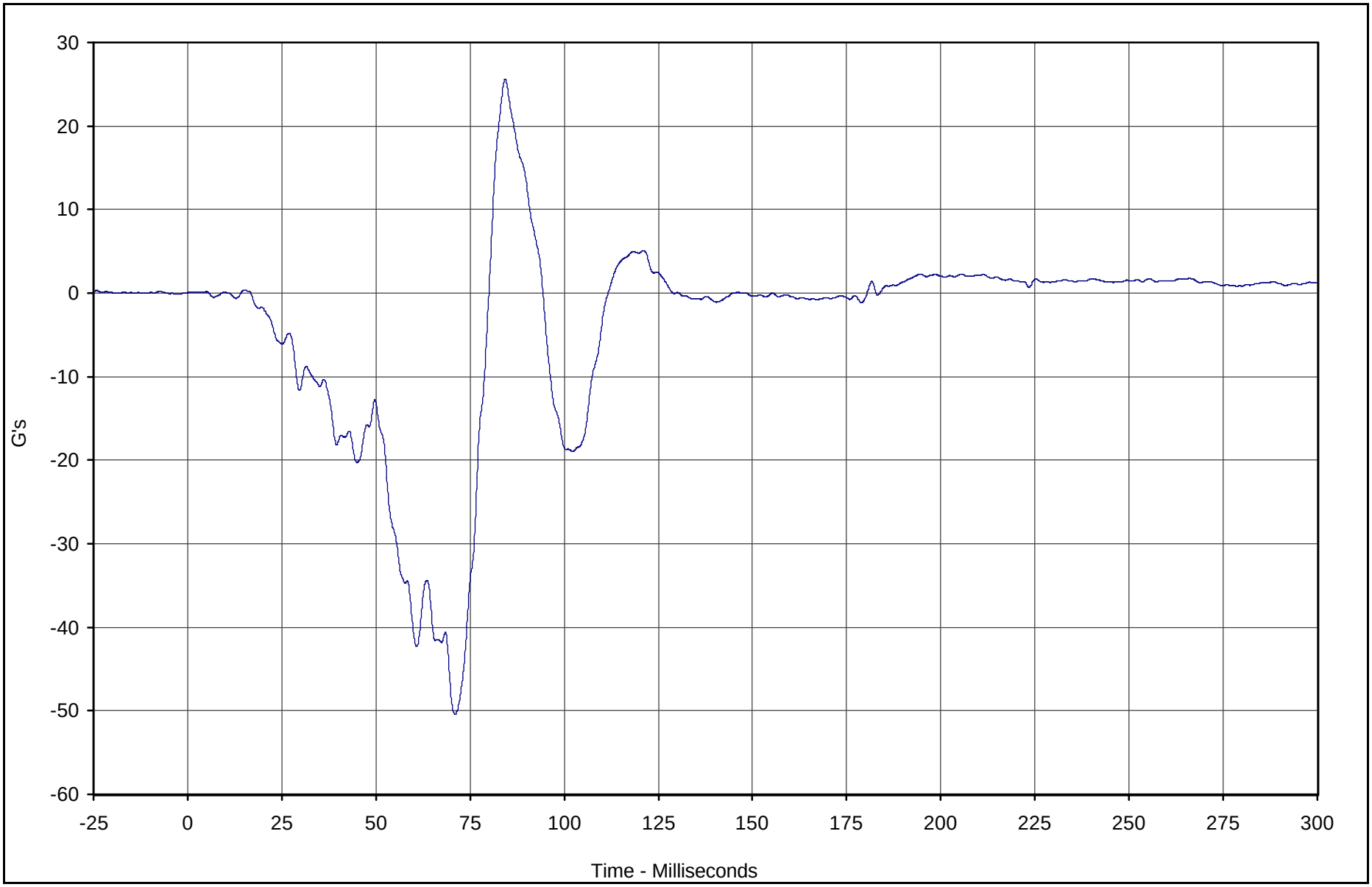
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Fore Z	081	FIL	G's	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



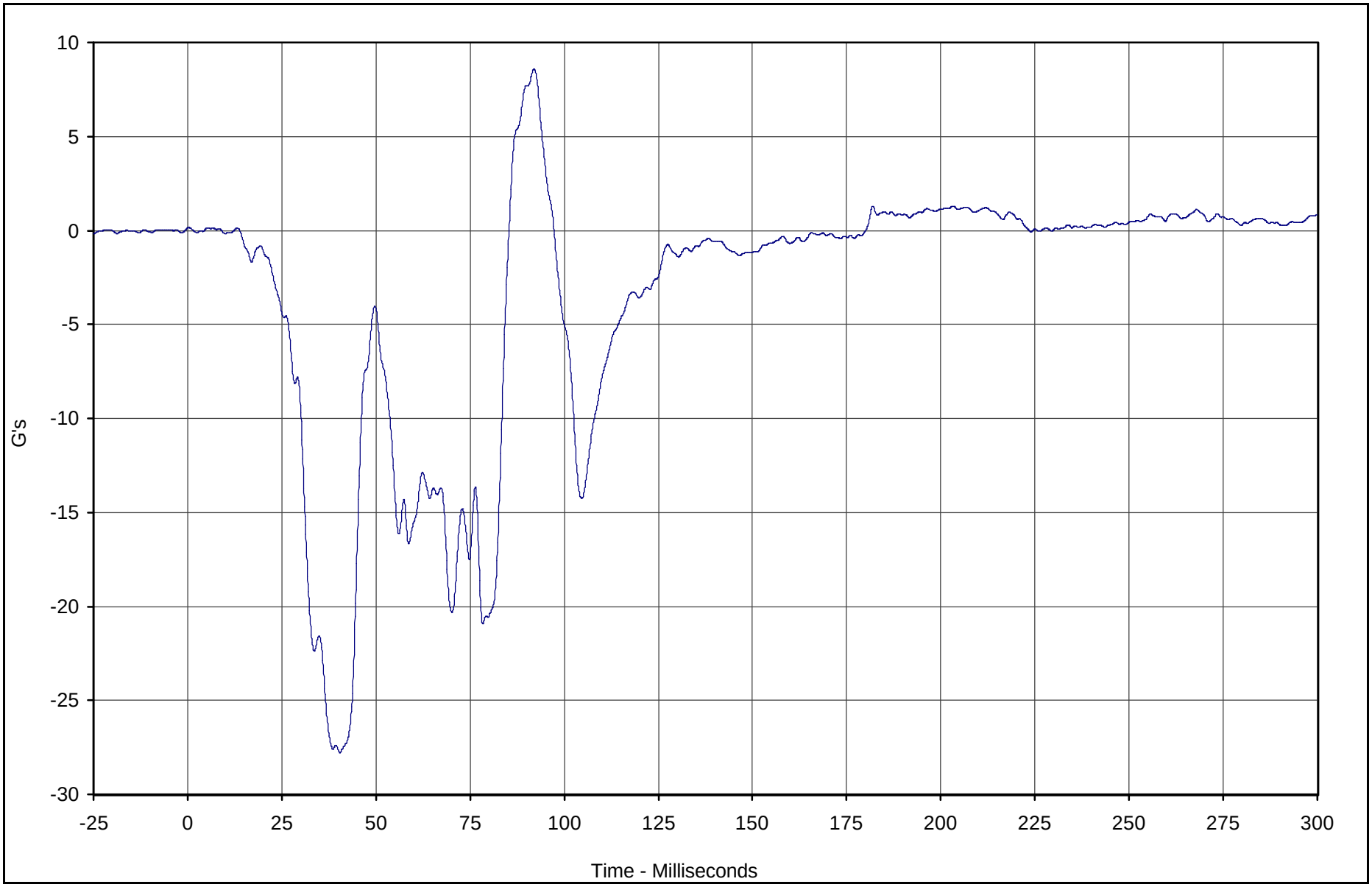
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Aft X	082	FIL	G's	25.6	84.3	-50.5	71.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



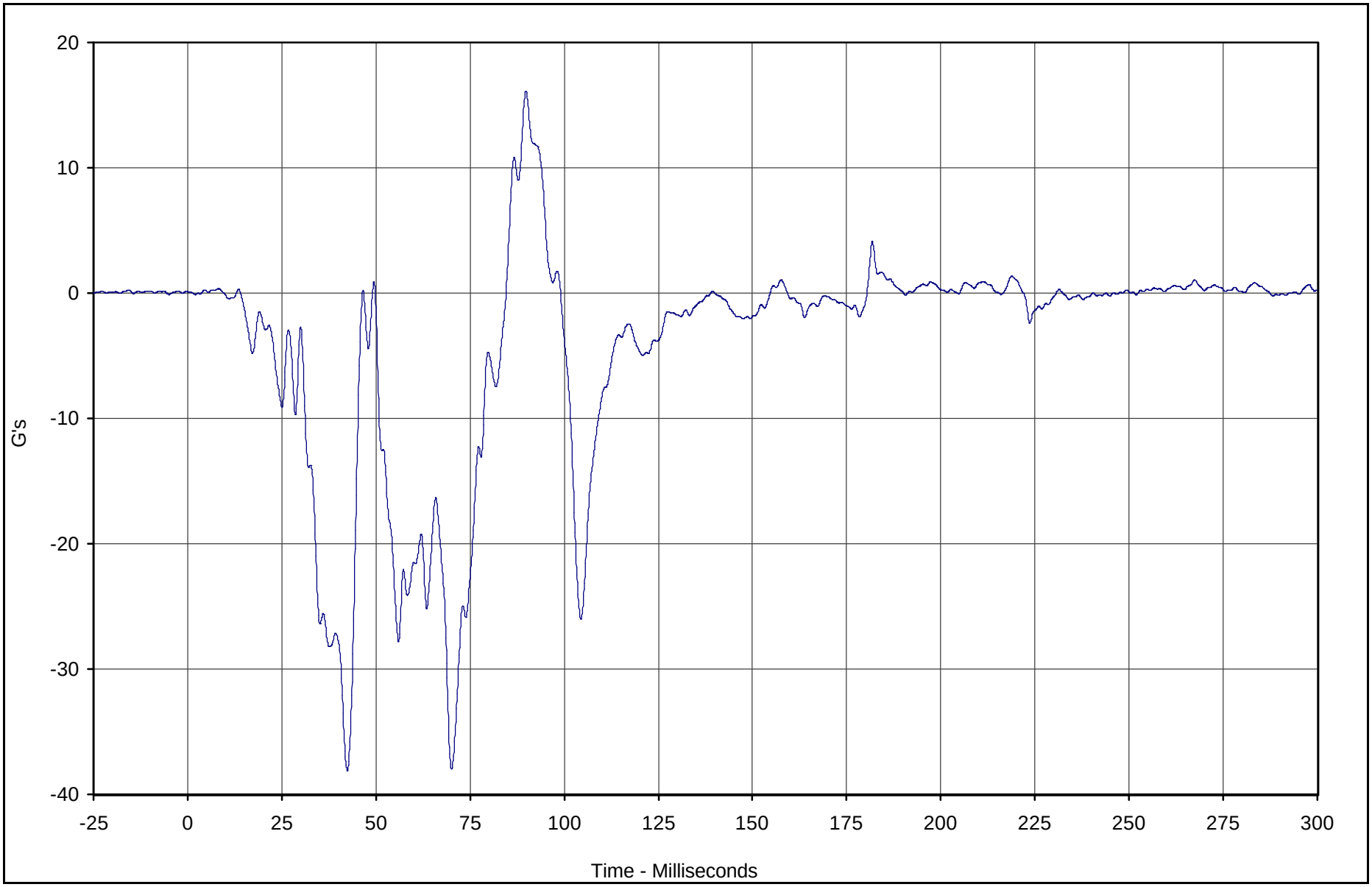
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Aft Z	083	FIL	G's	8.6	92.0	-27.8	40.4	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



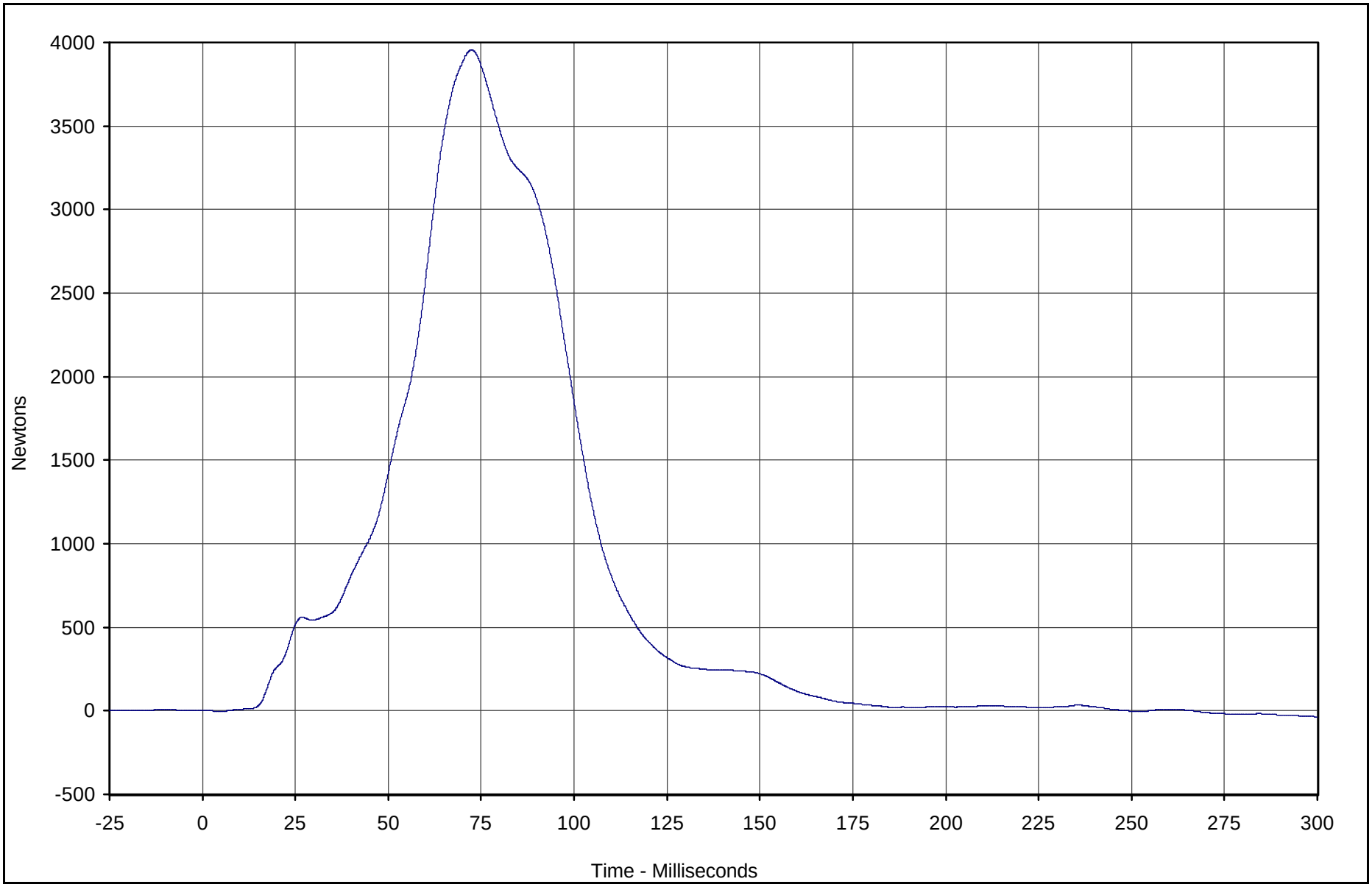
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Fore Z	084	FIL	G's	16.1	89.9	-38.1	42.4	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



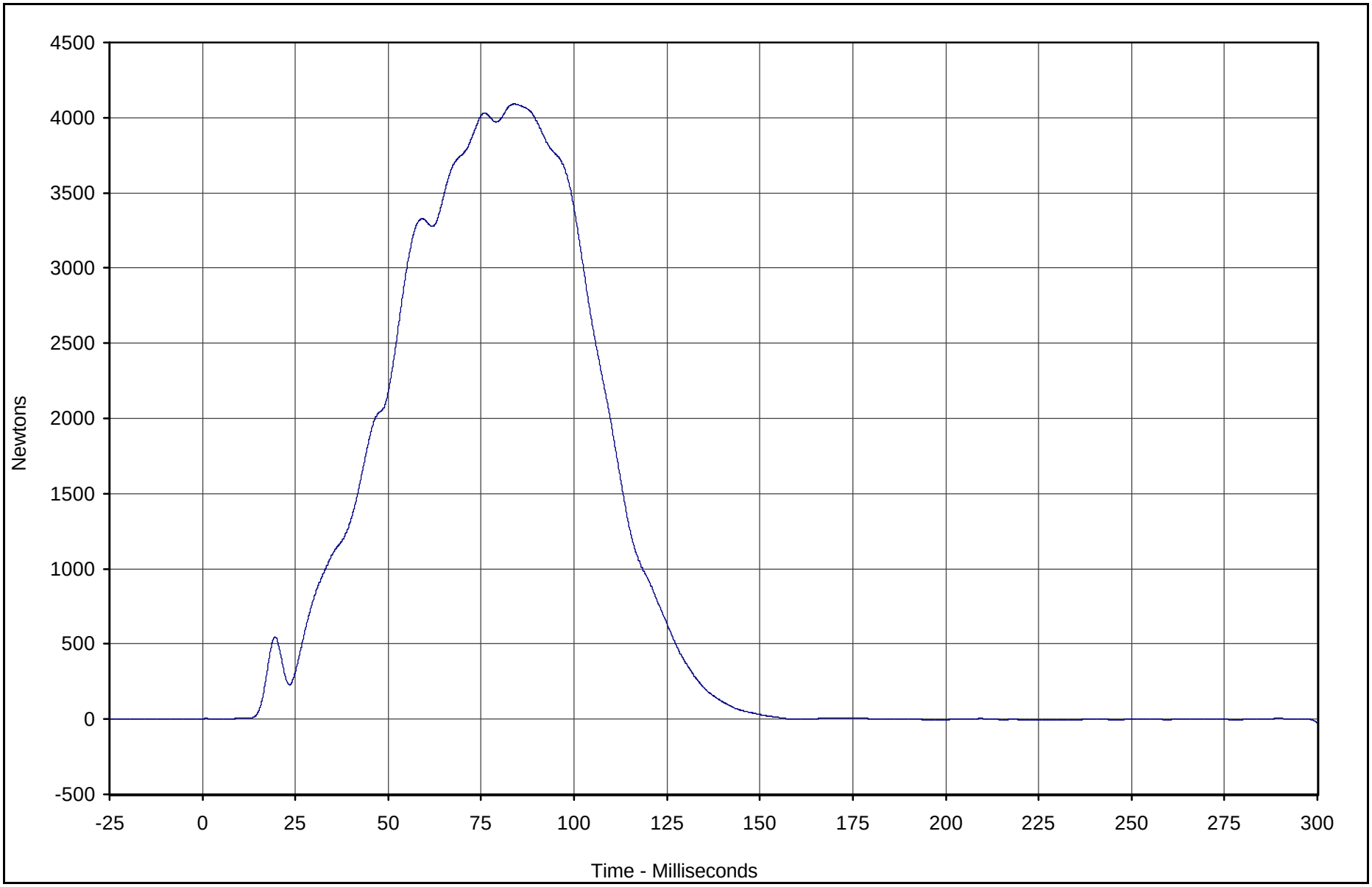
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Lap Belt Force	085	FIL	Newtons	3955.0	72.4	-37.8	299.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



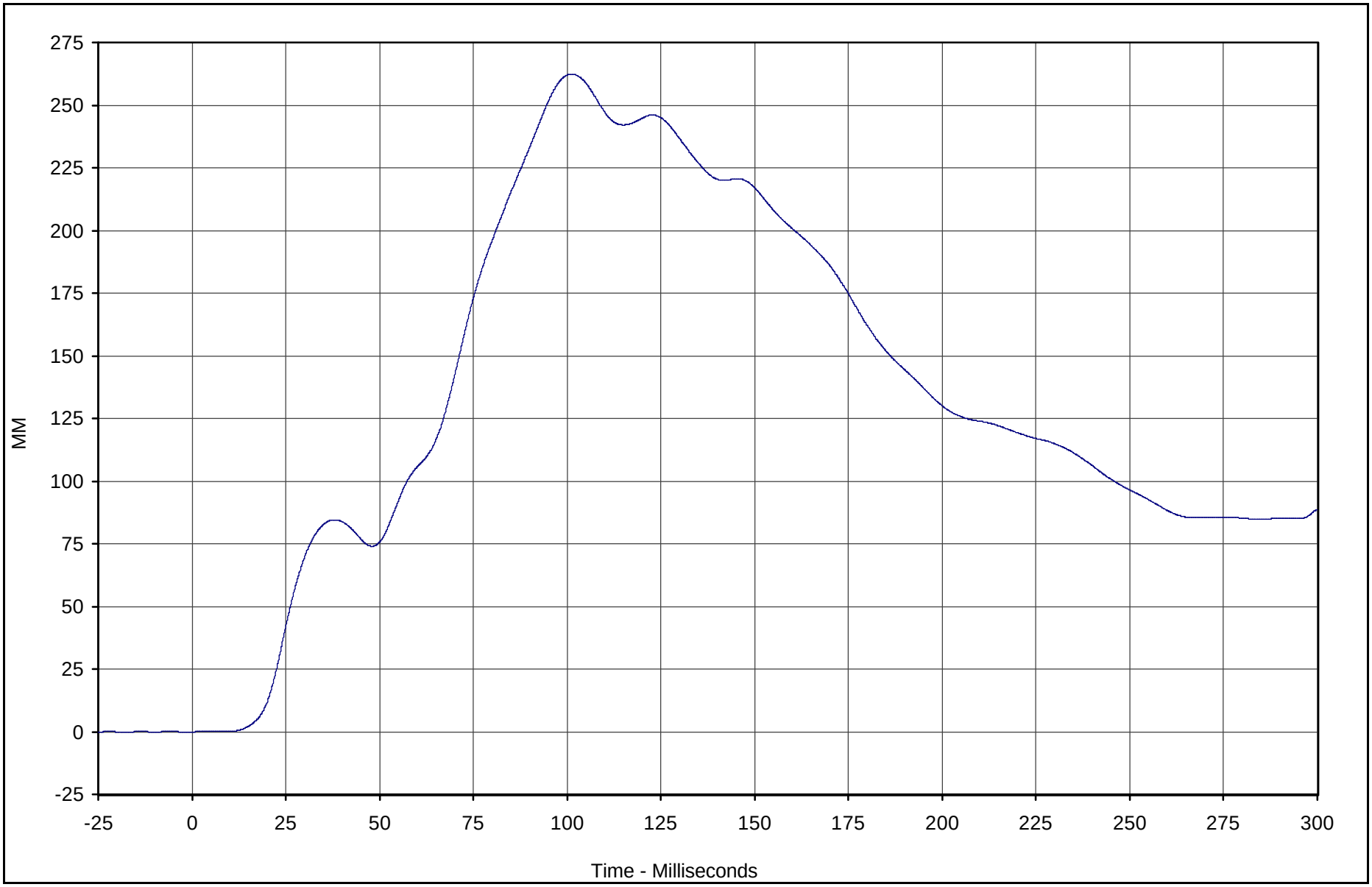
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Force	086	FIL	Newtons	4090.4	83.9	-22.8	299.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



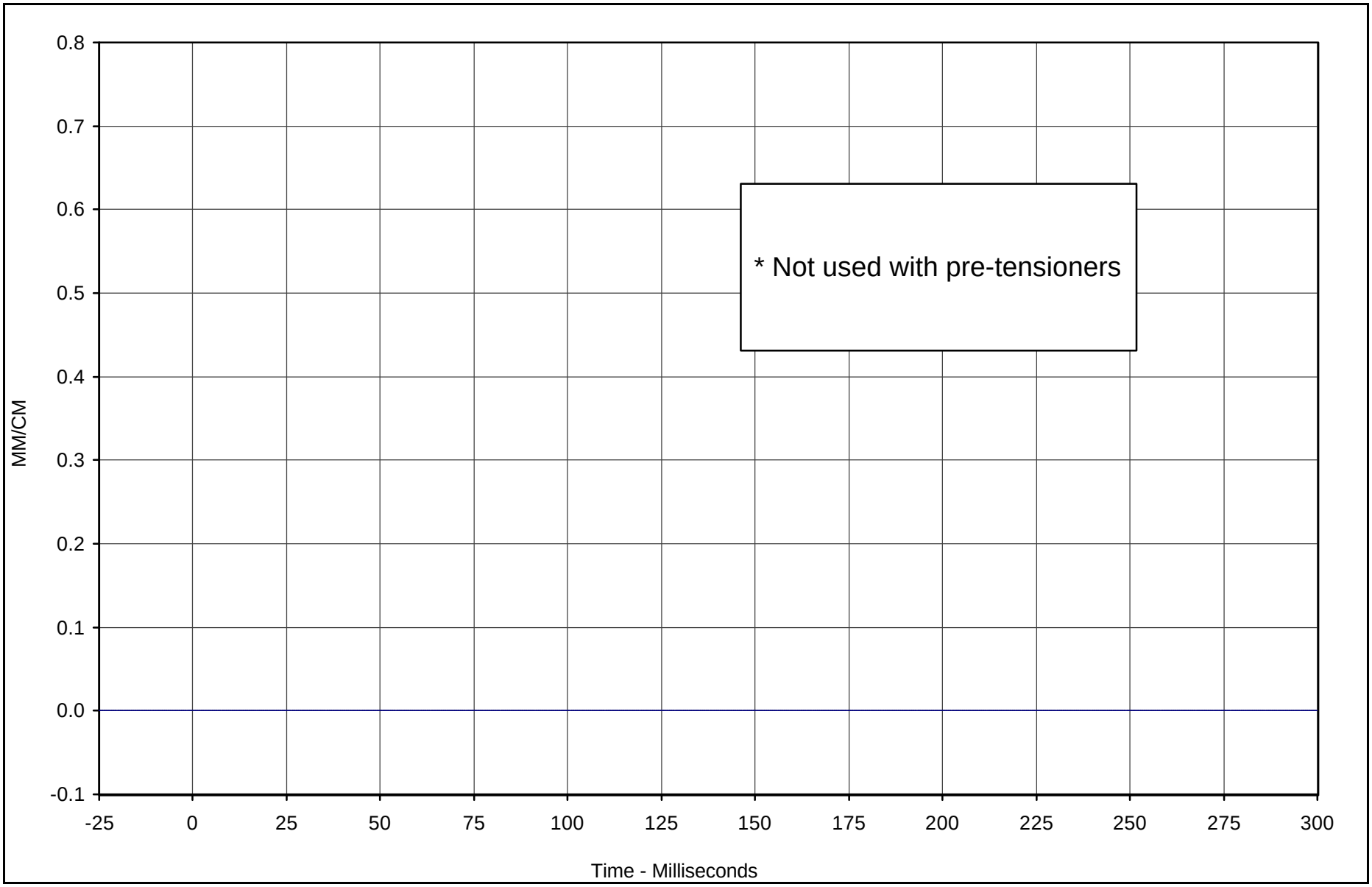
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Pullout	087	FIL	MM	262.4	101.2	-0.1	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



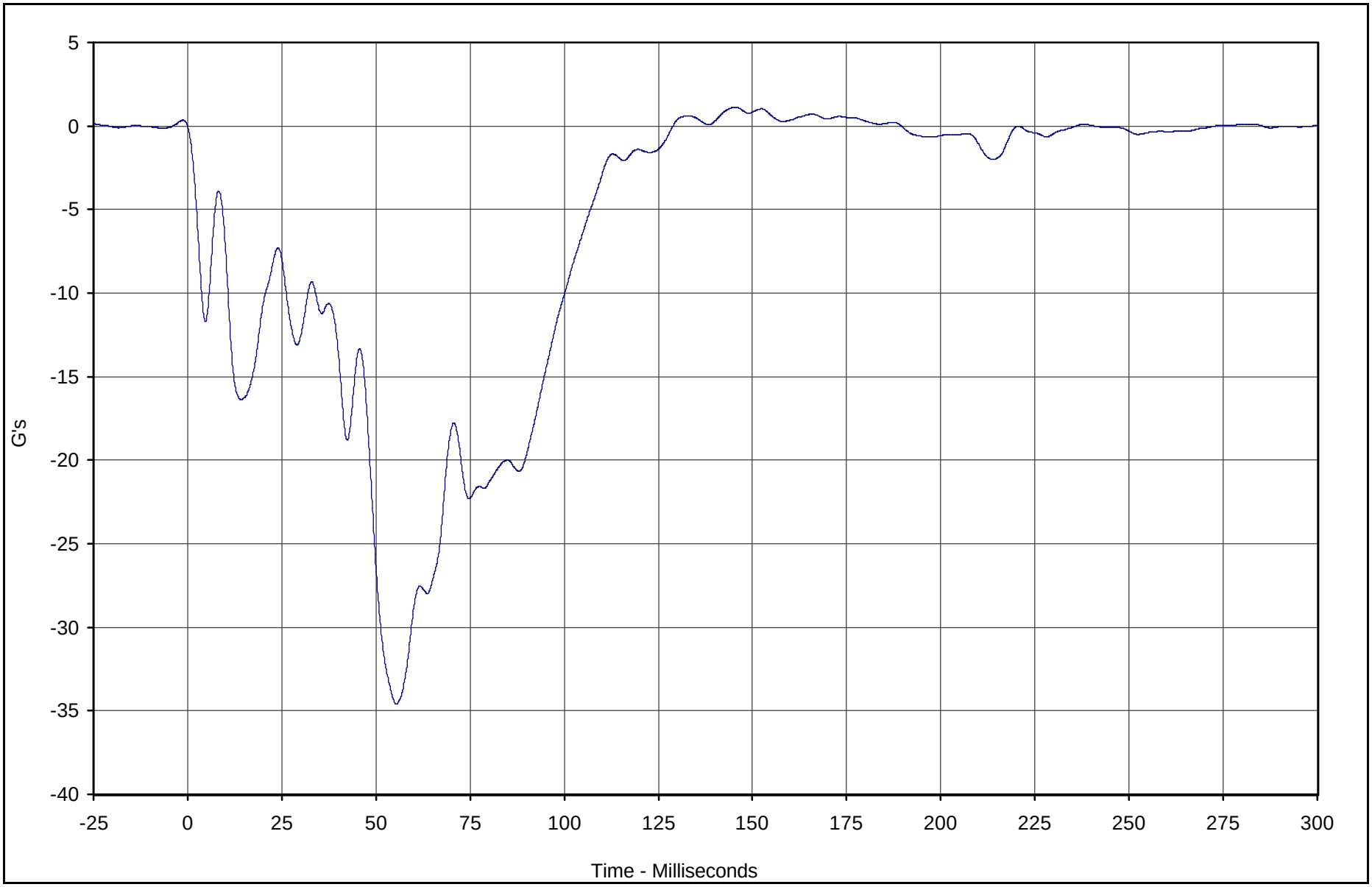
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Elongation	088	FIL	MM/CM	0.00	0.0	0.00	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



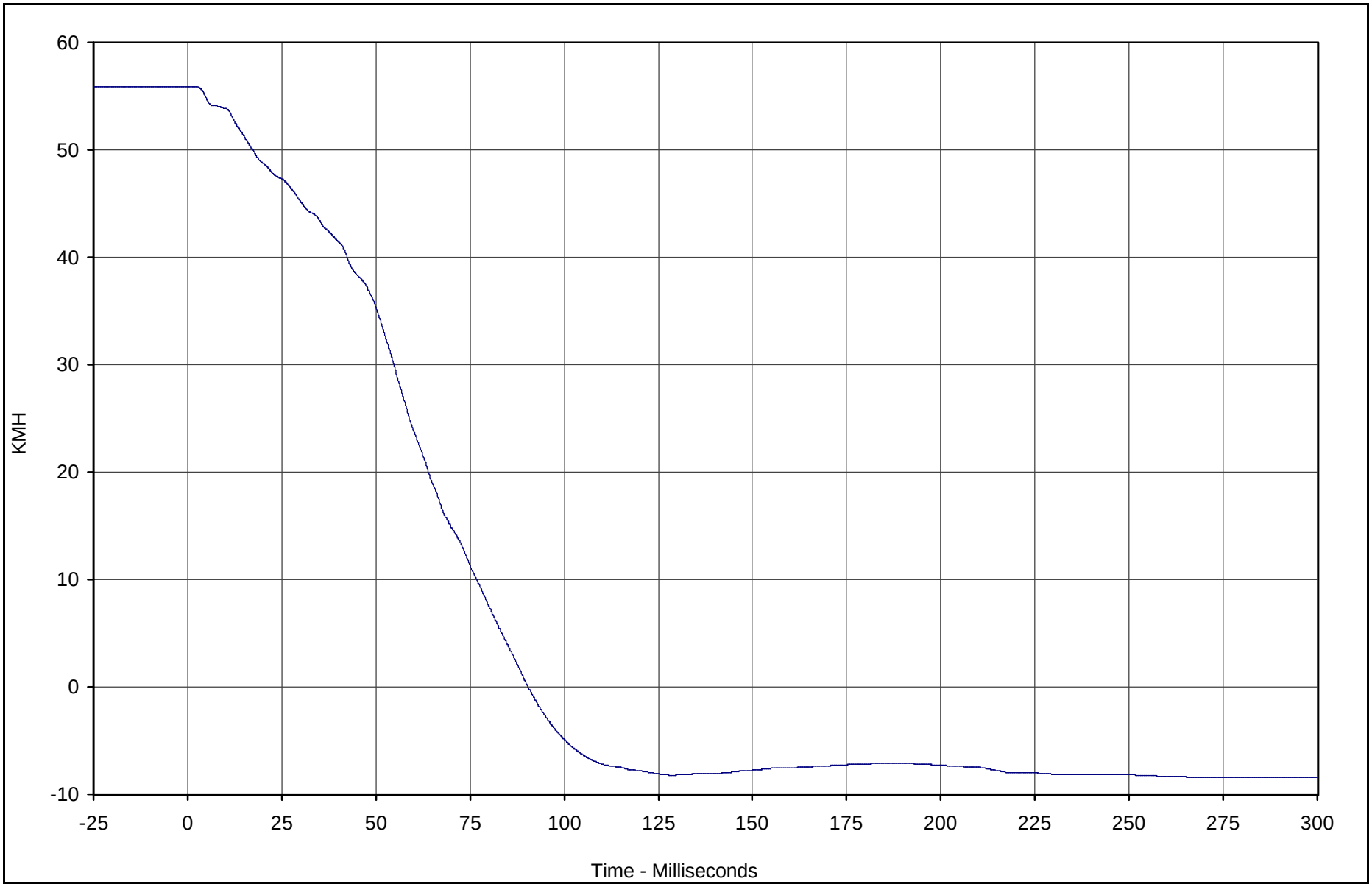
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X	089	FIL	G's	1.1	145.3	-34.6	55.4	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



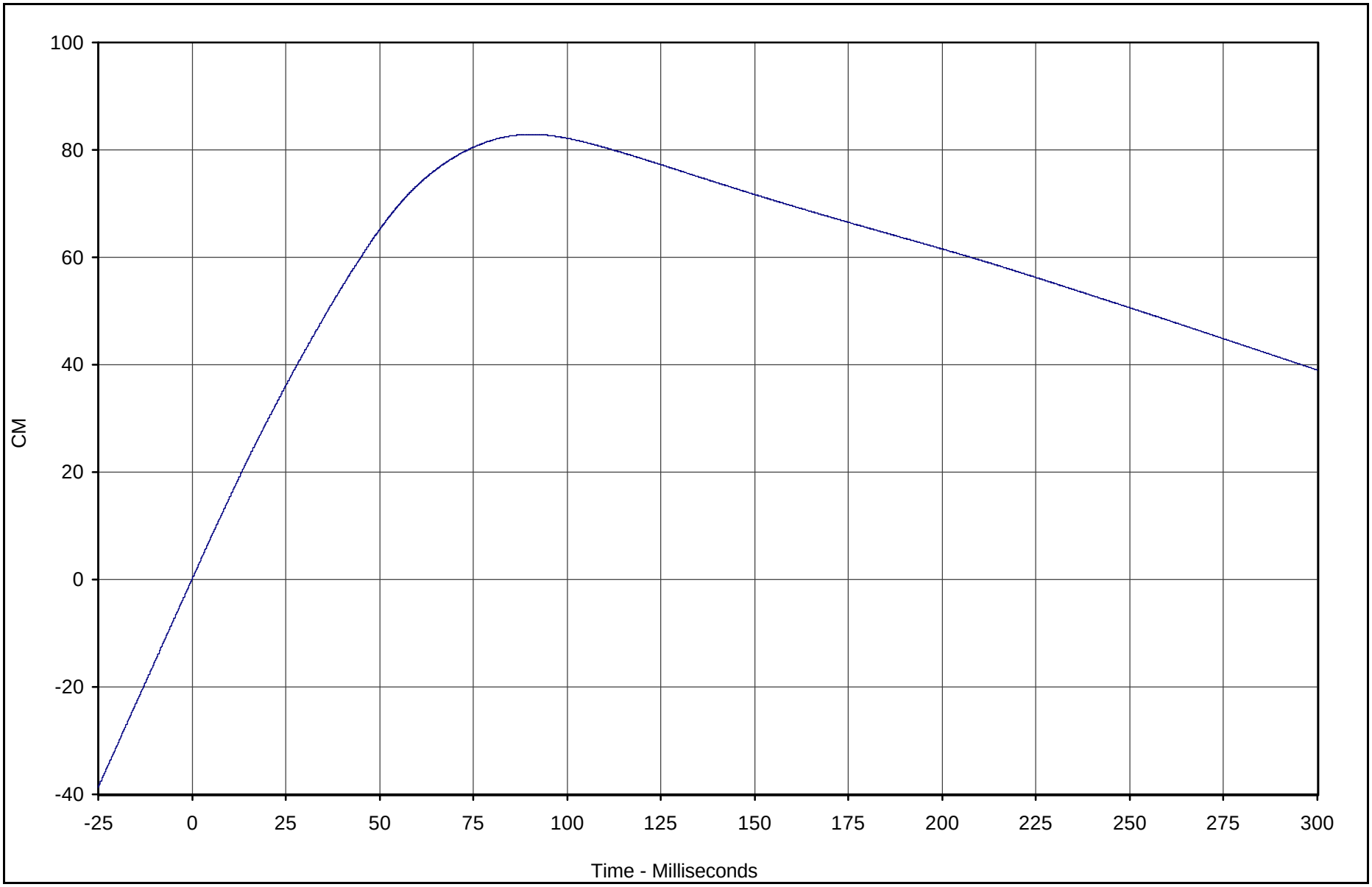
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X Velocity	089	IN1	KMH	55.9	2.0	-8.4	271.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



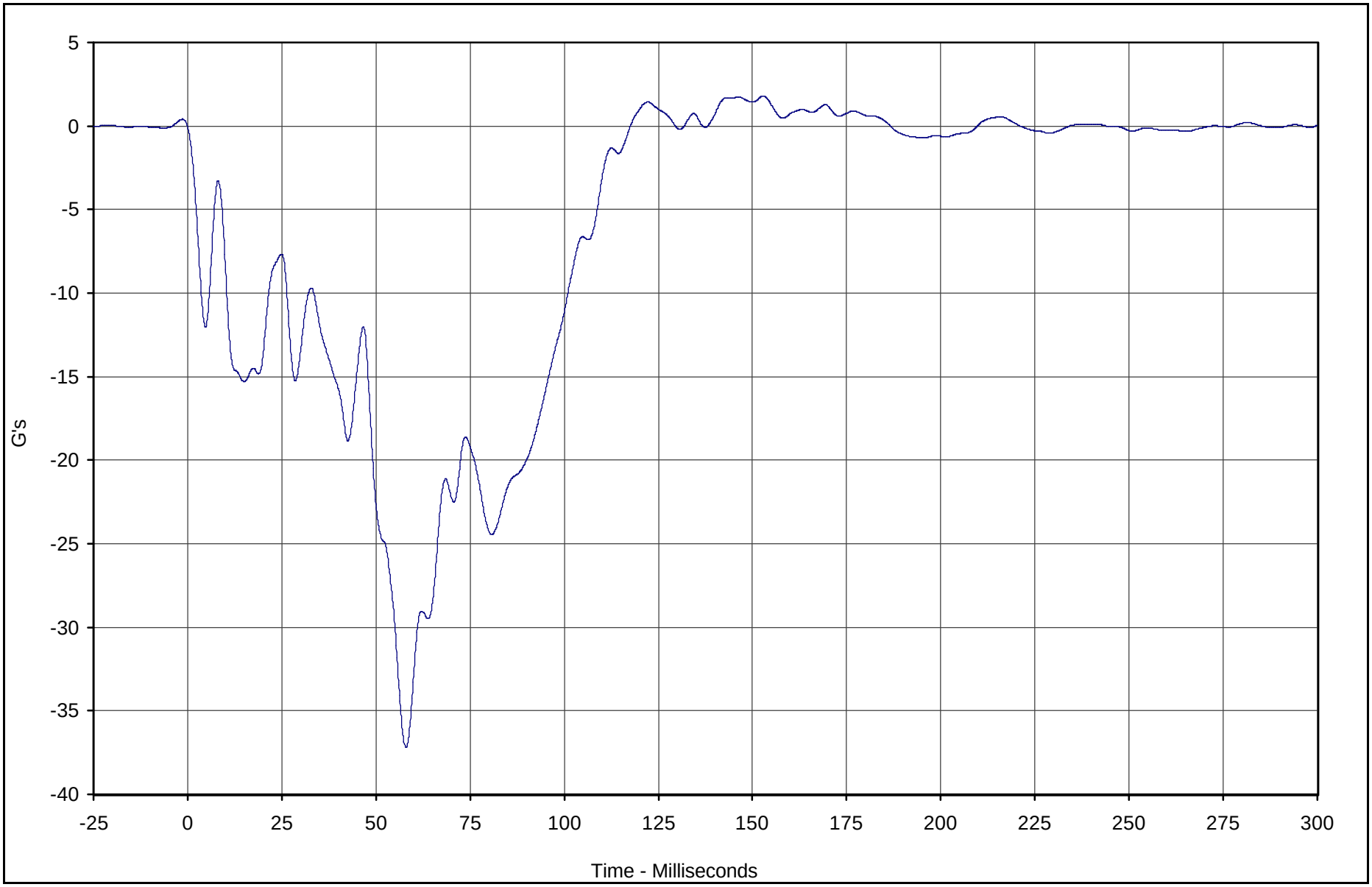
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X Displ.	089	IN2	CM	82.9	90.4	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



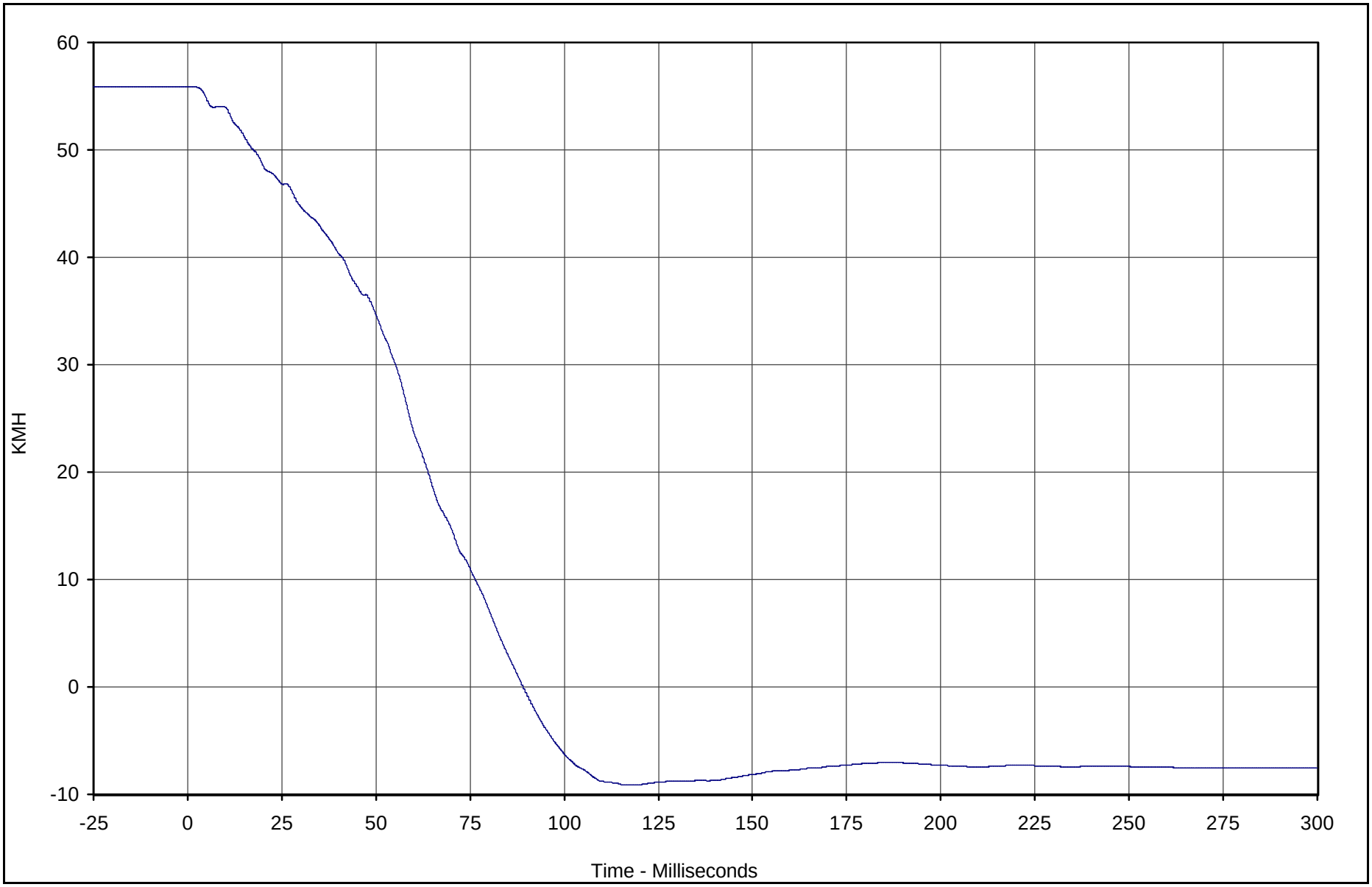
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X	090	FIL	G's	1.8	152.8	-37.2	58.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



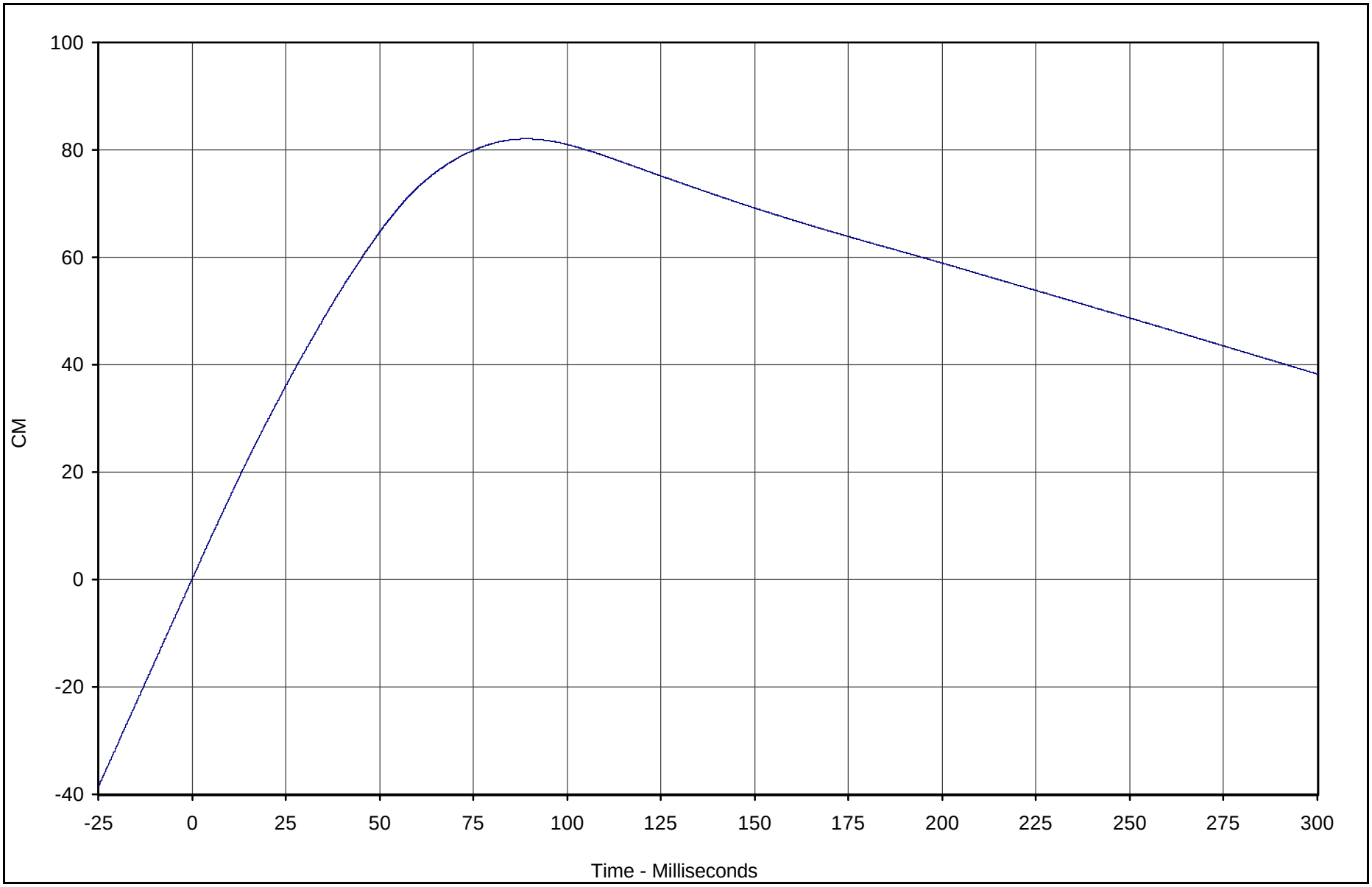
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X Velocity	090	IN1	KMH	55.8	1.5	-9.2	116.8	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



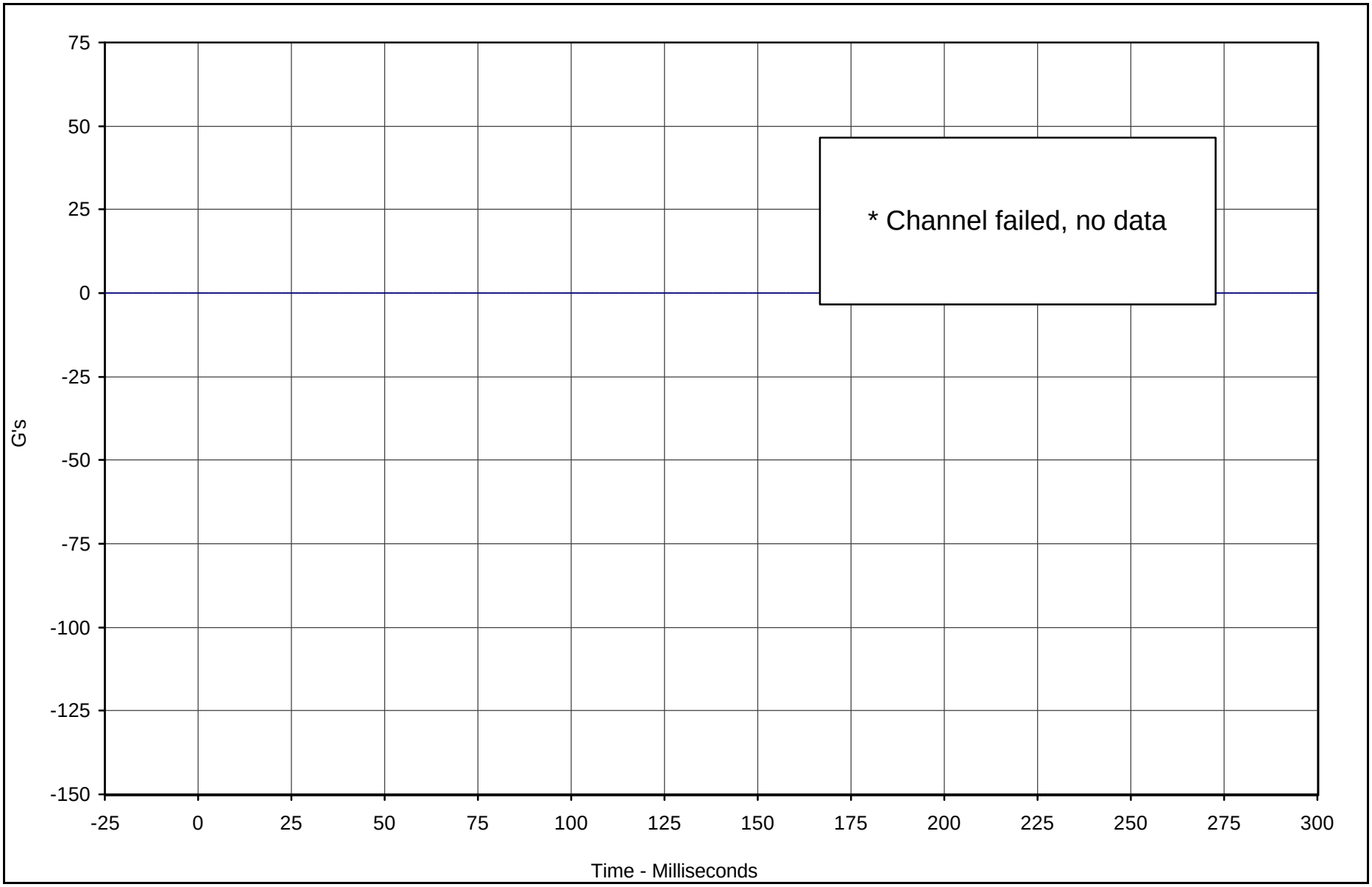
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X Displ.	090	IN2	CM	82.0	89.1	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



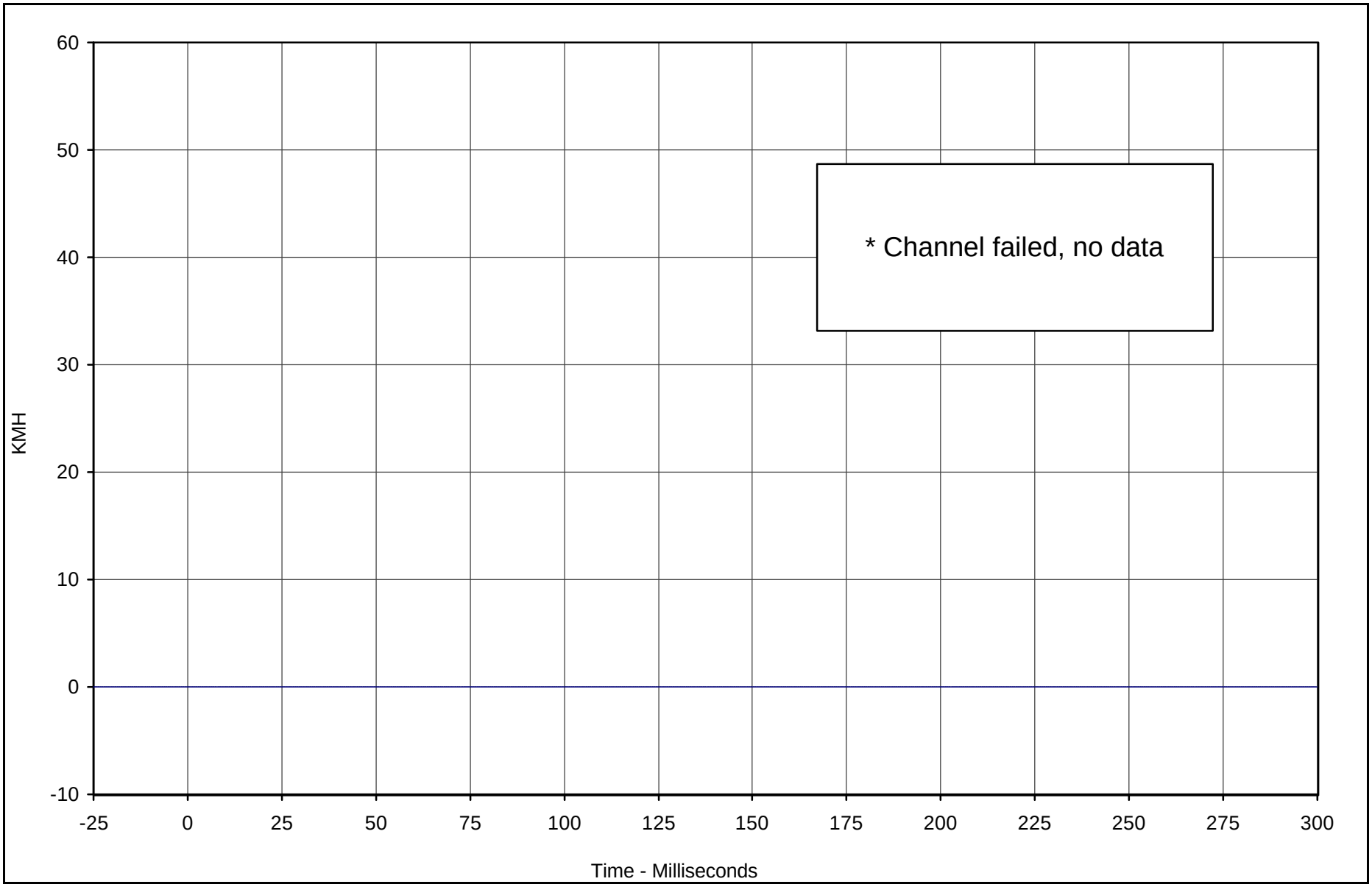
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top	091	FIL	G's	0.0	0.0	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



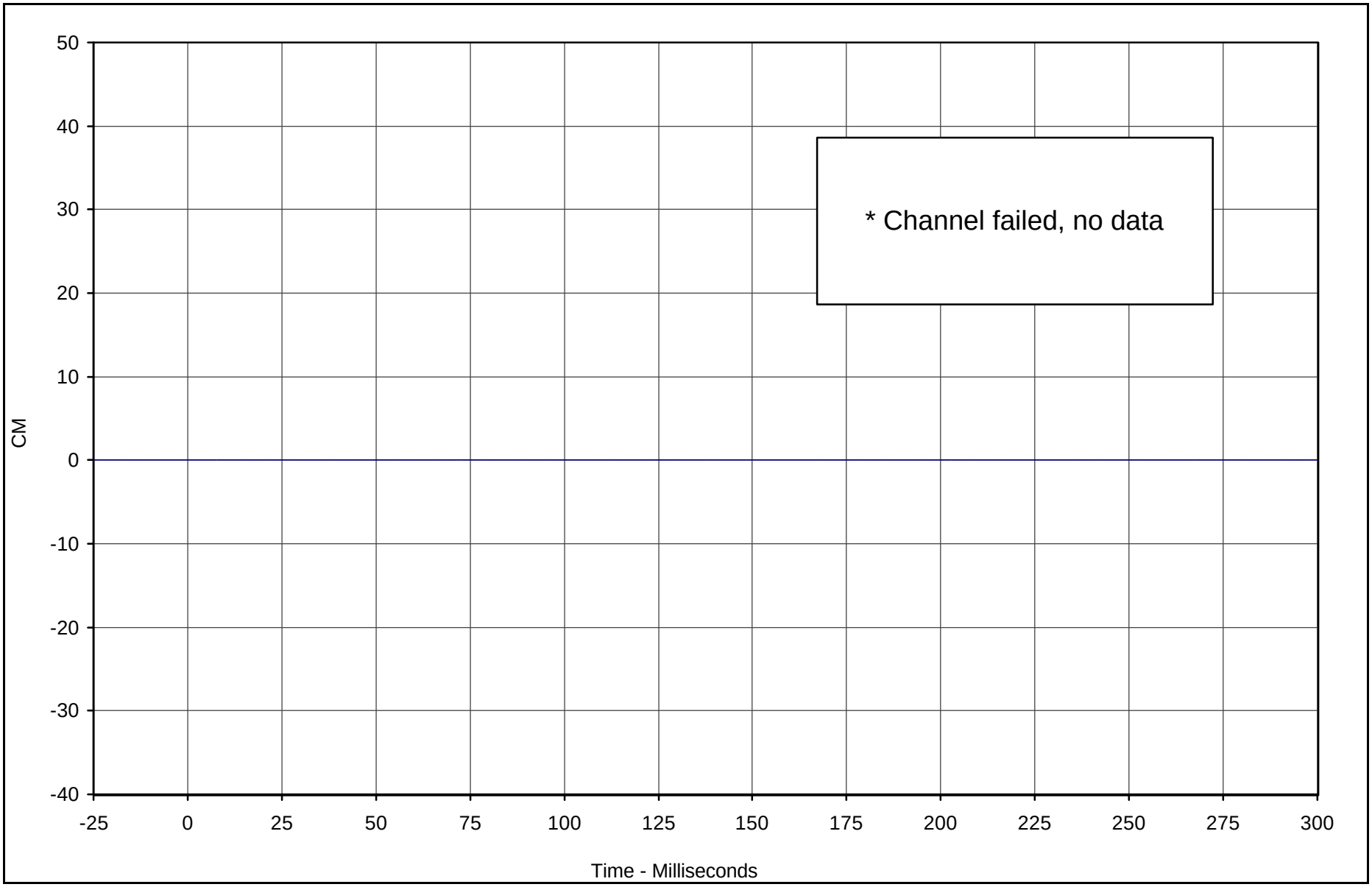
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top Velocity	091	IN1	KMH	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



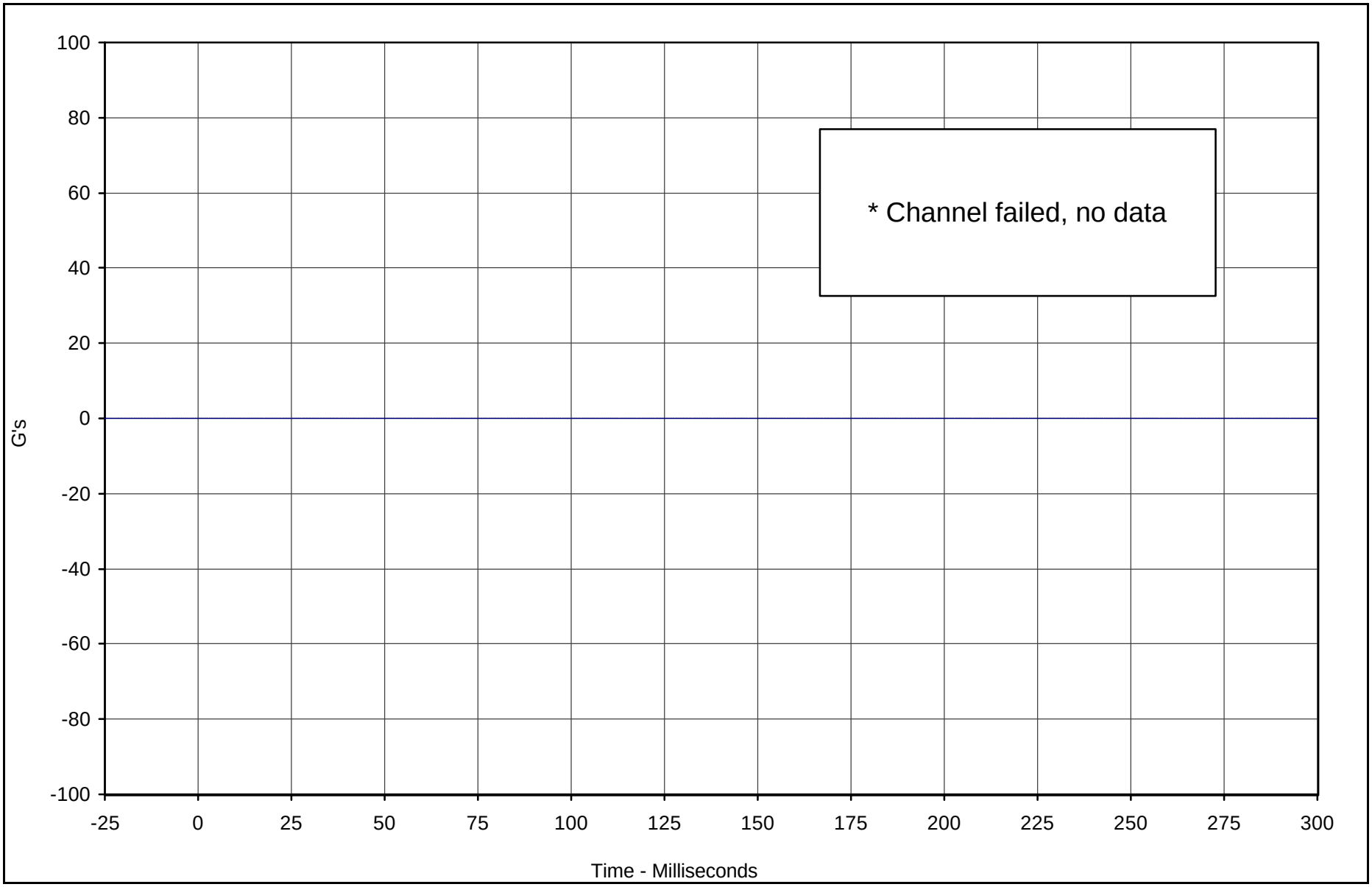
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top Displacement	091	IN2	CM	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



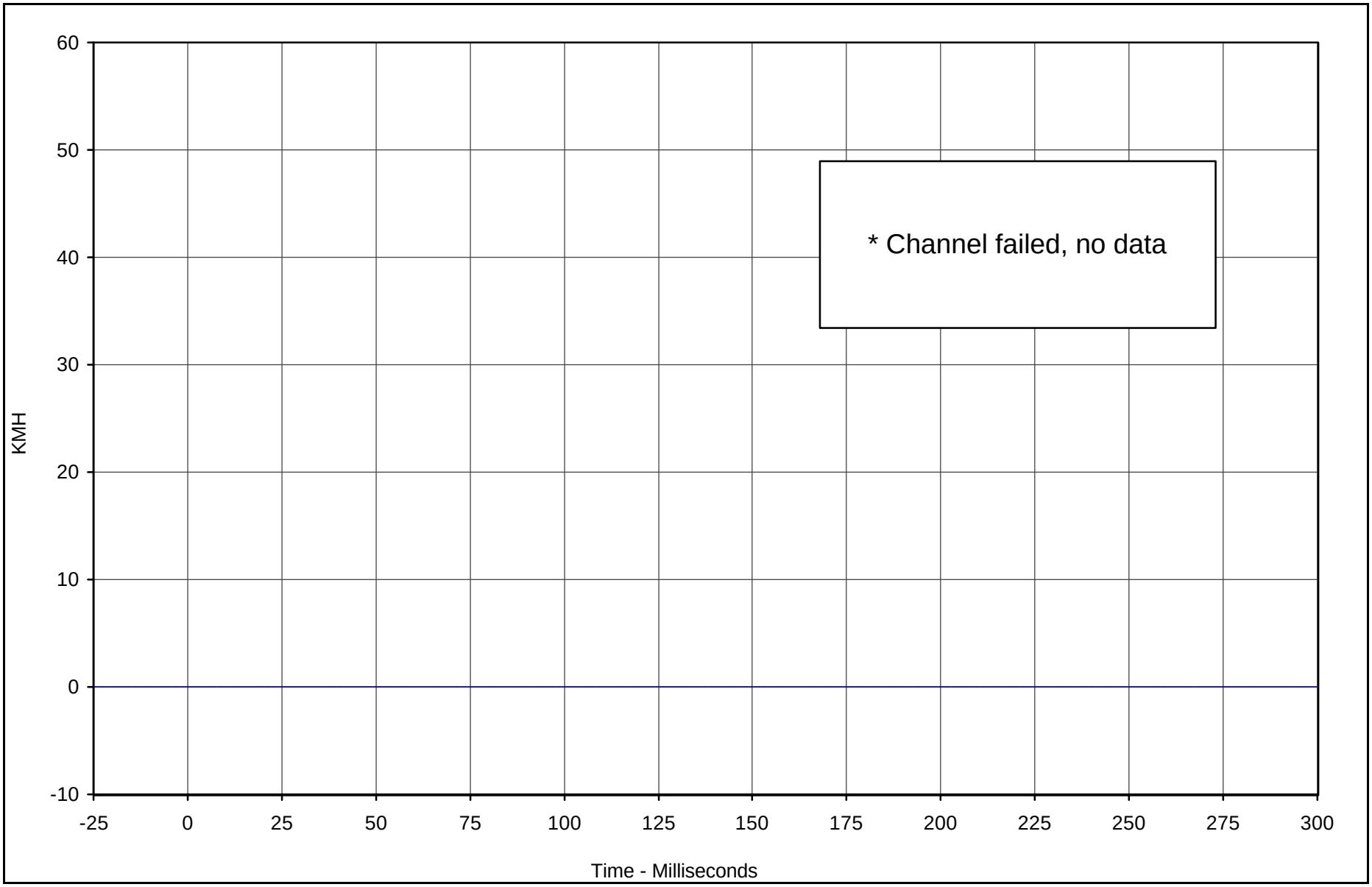
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom	092	FIL	G's	0.0	0.0	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



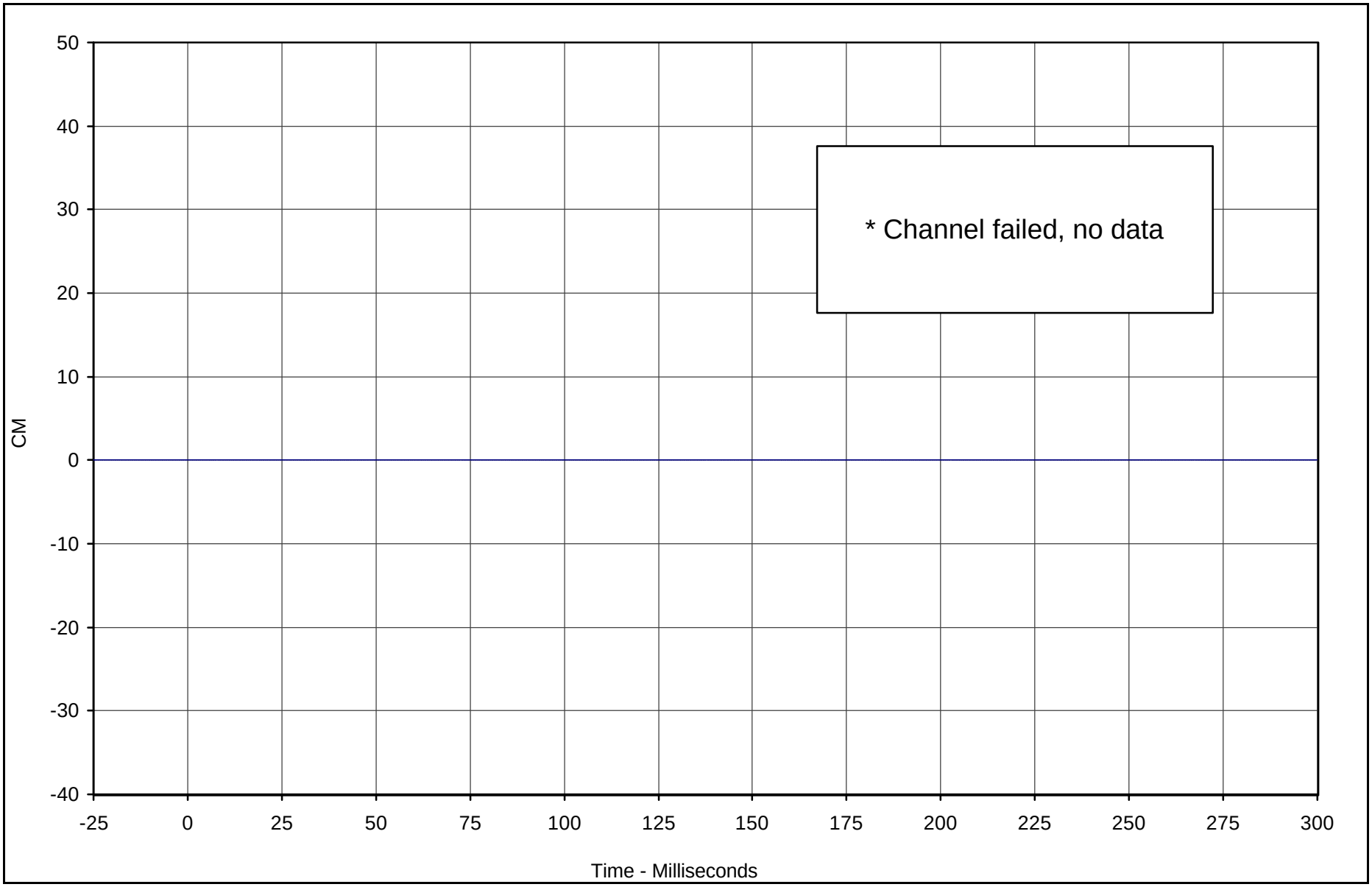
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom Velocity	092	IN1	KMH	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



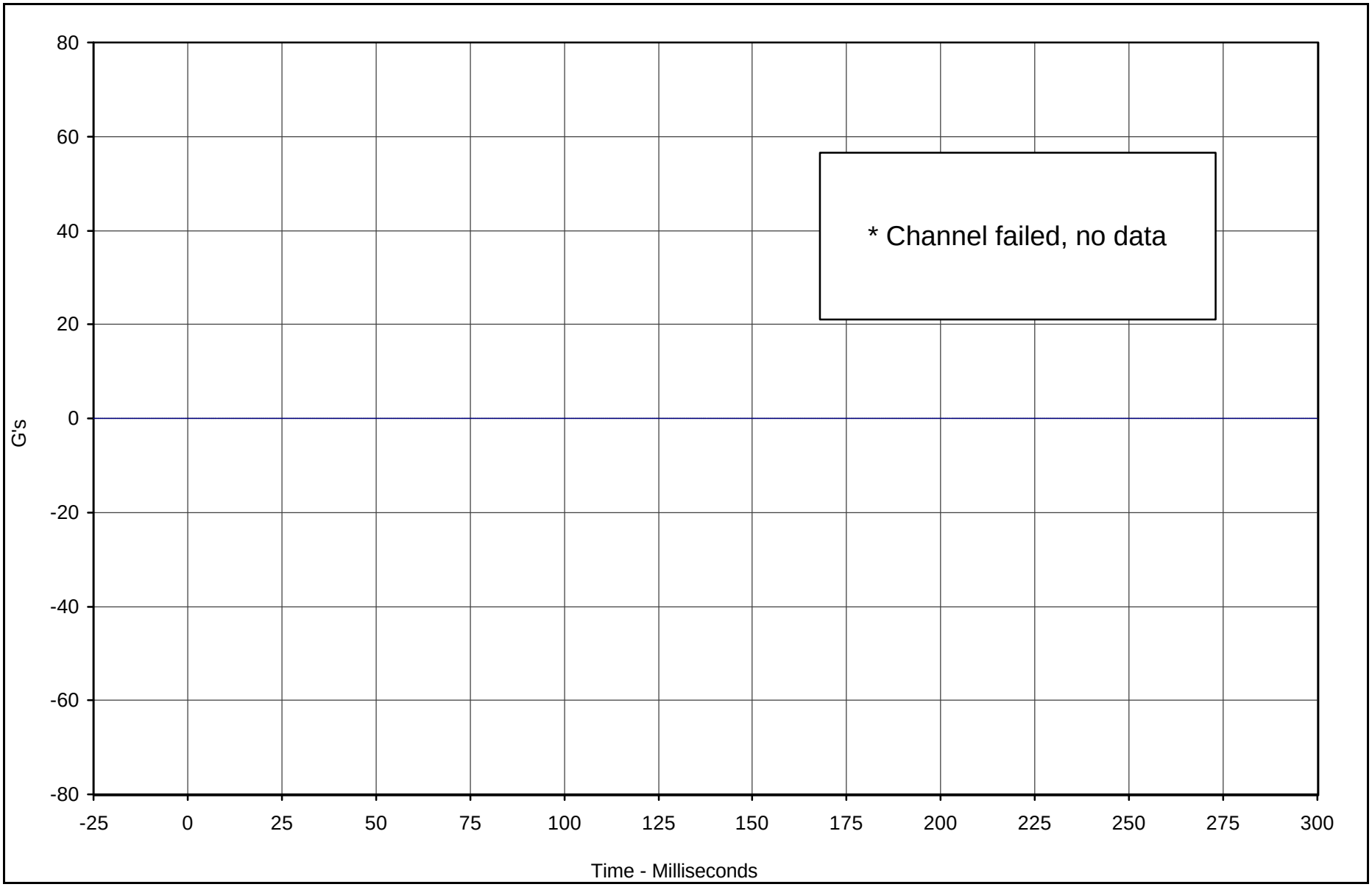
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom Displacement	092	IN2	CM	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



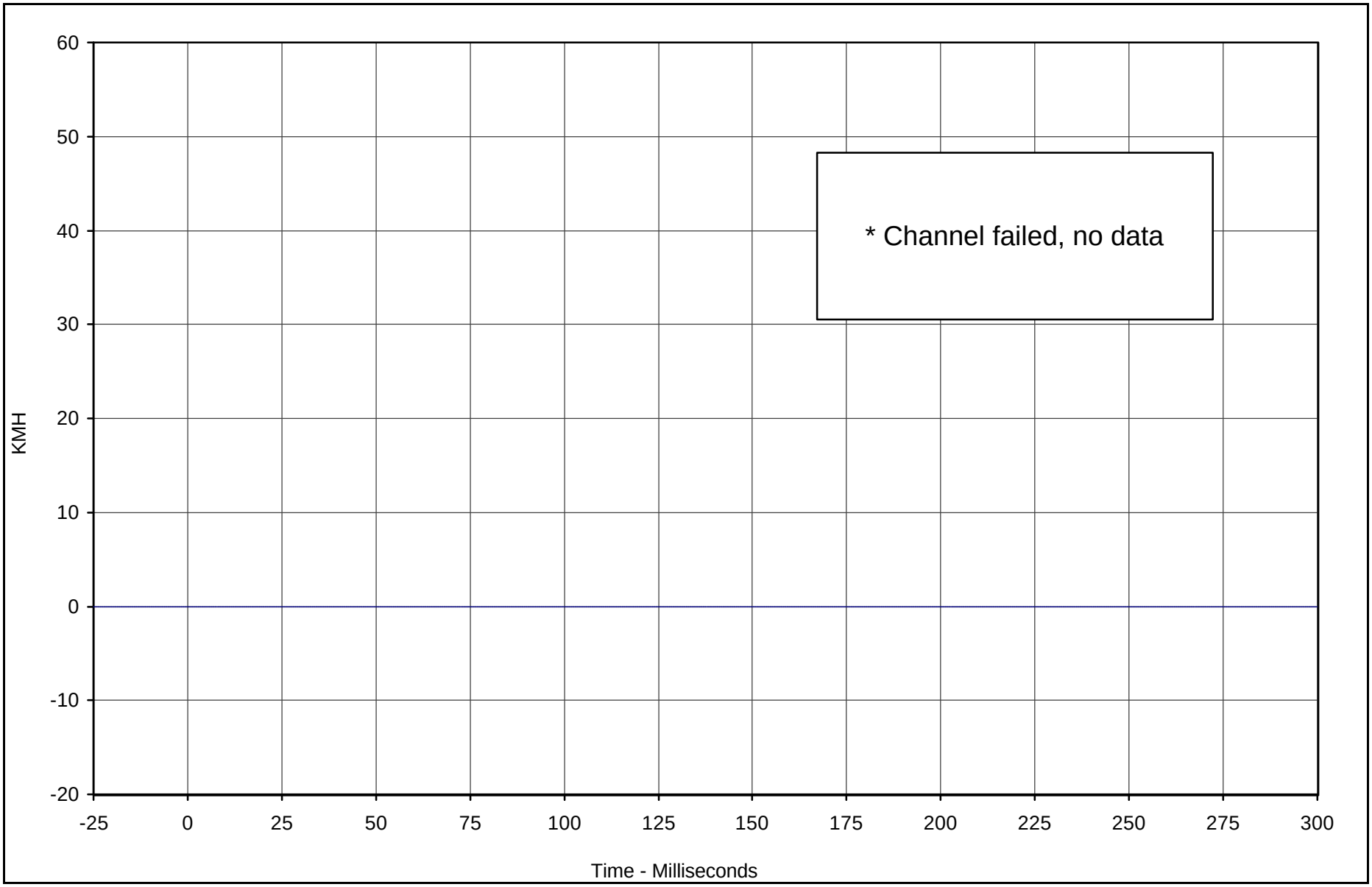
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper	093	FIL	G's	0.0	0.0	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



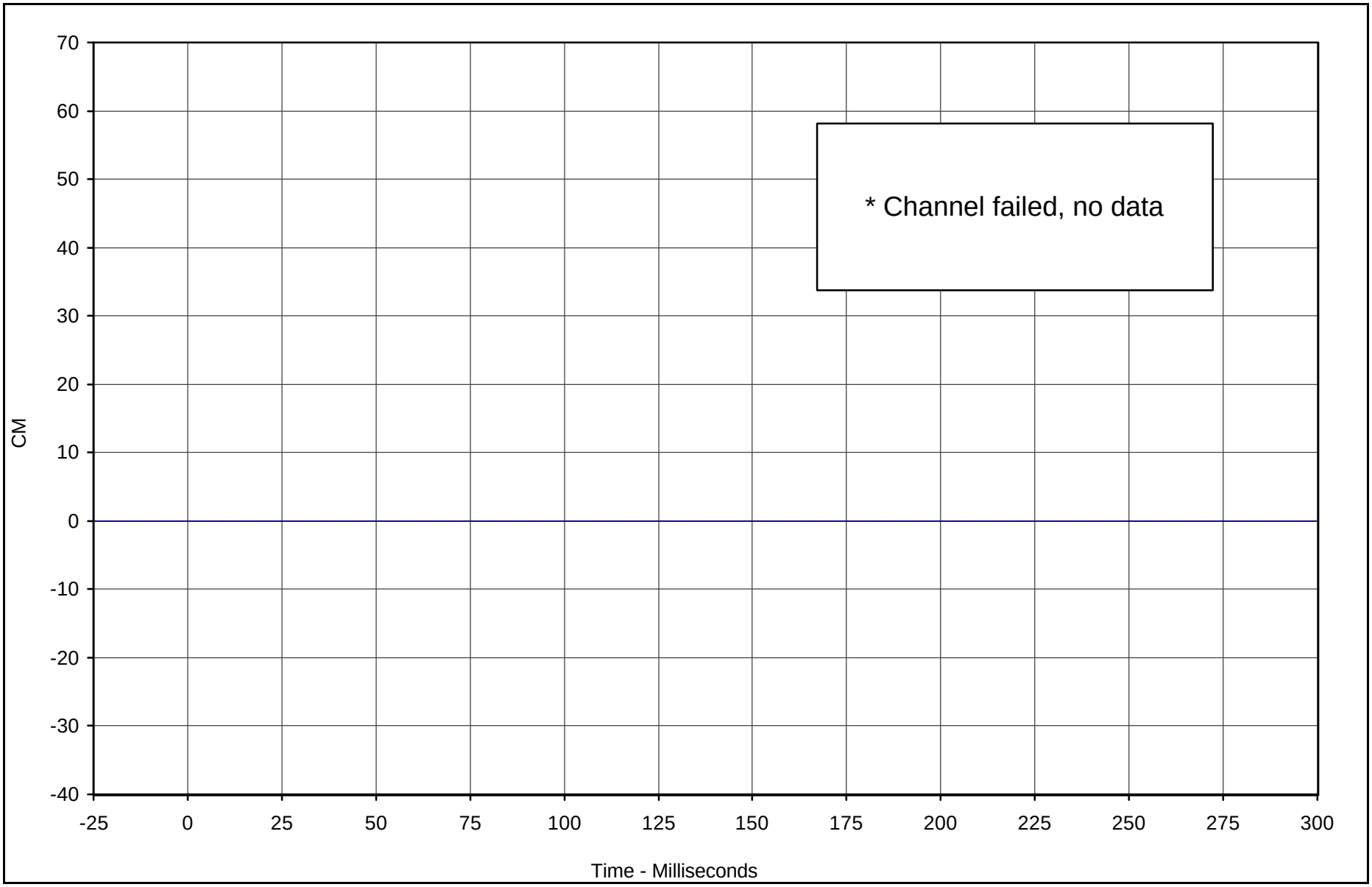
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper Velocity	093	IN1	KMH	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



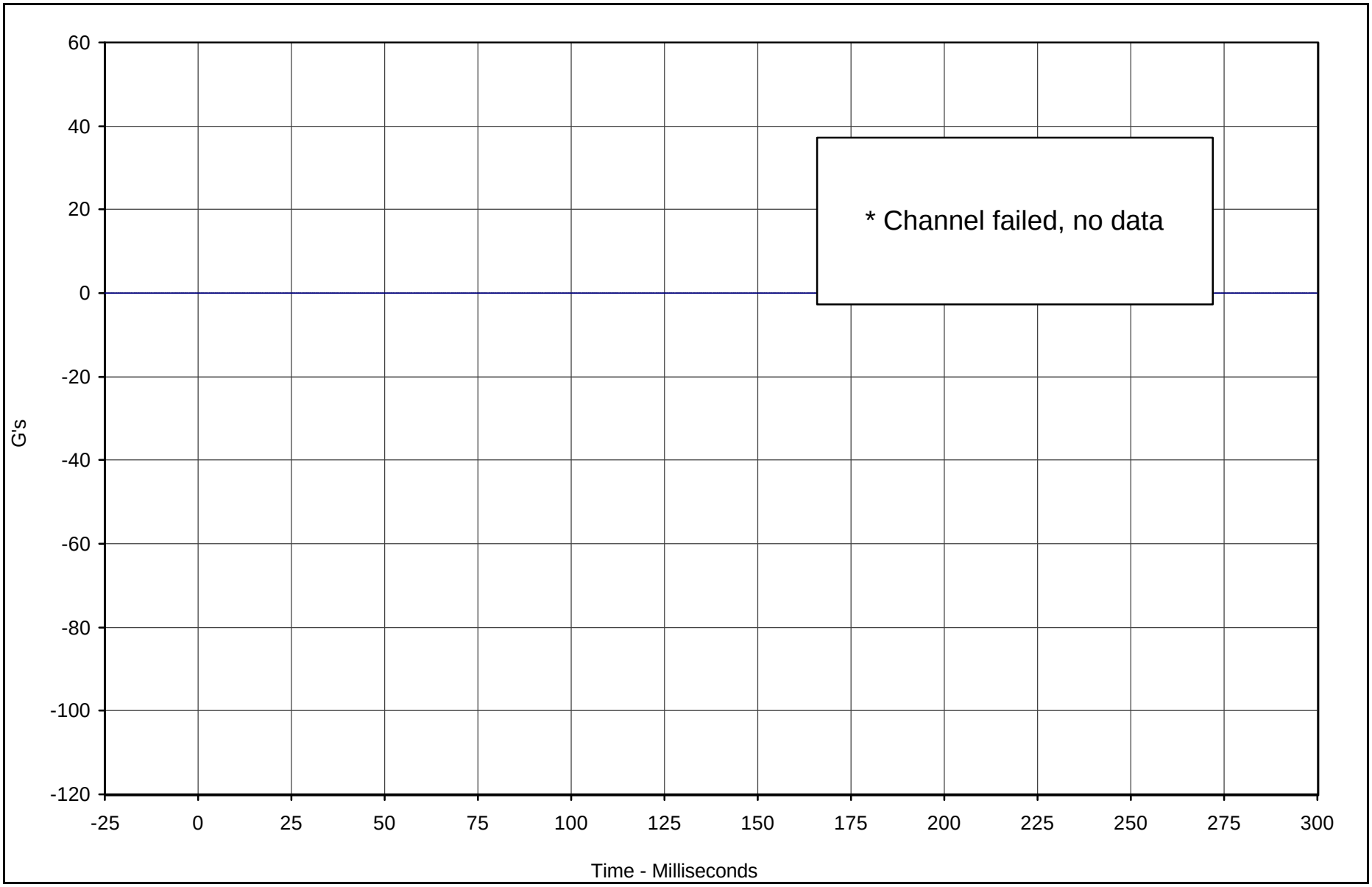
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper Displ.	093	IN2	CM	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



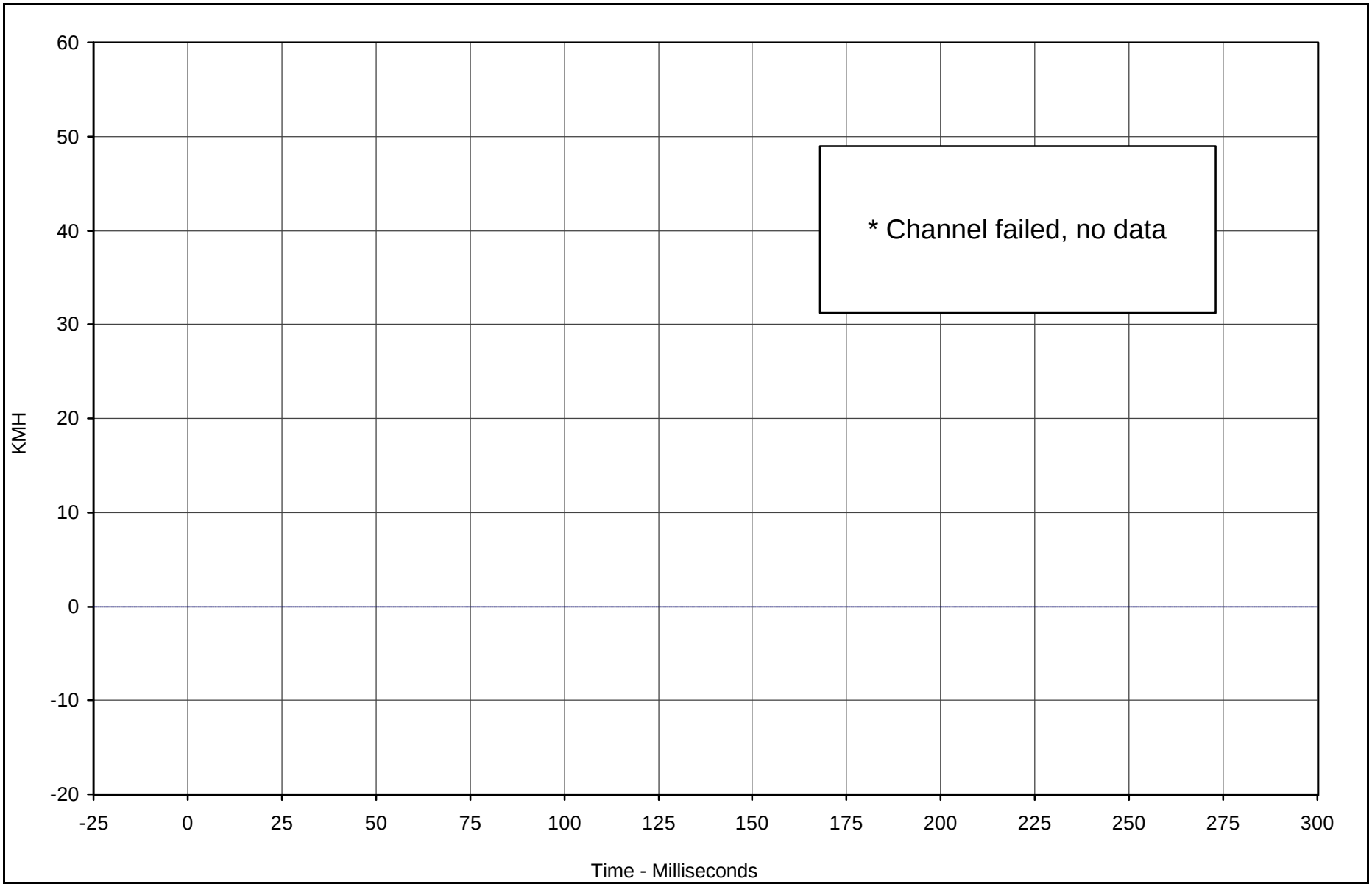
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper	094	FIL	G's	0.0	0.0	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



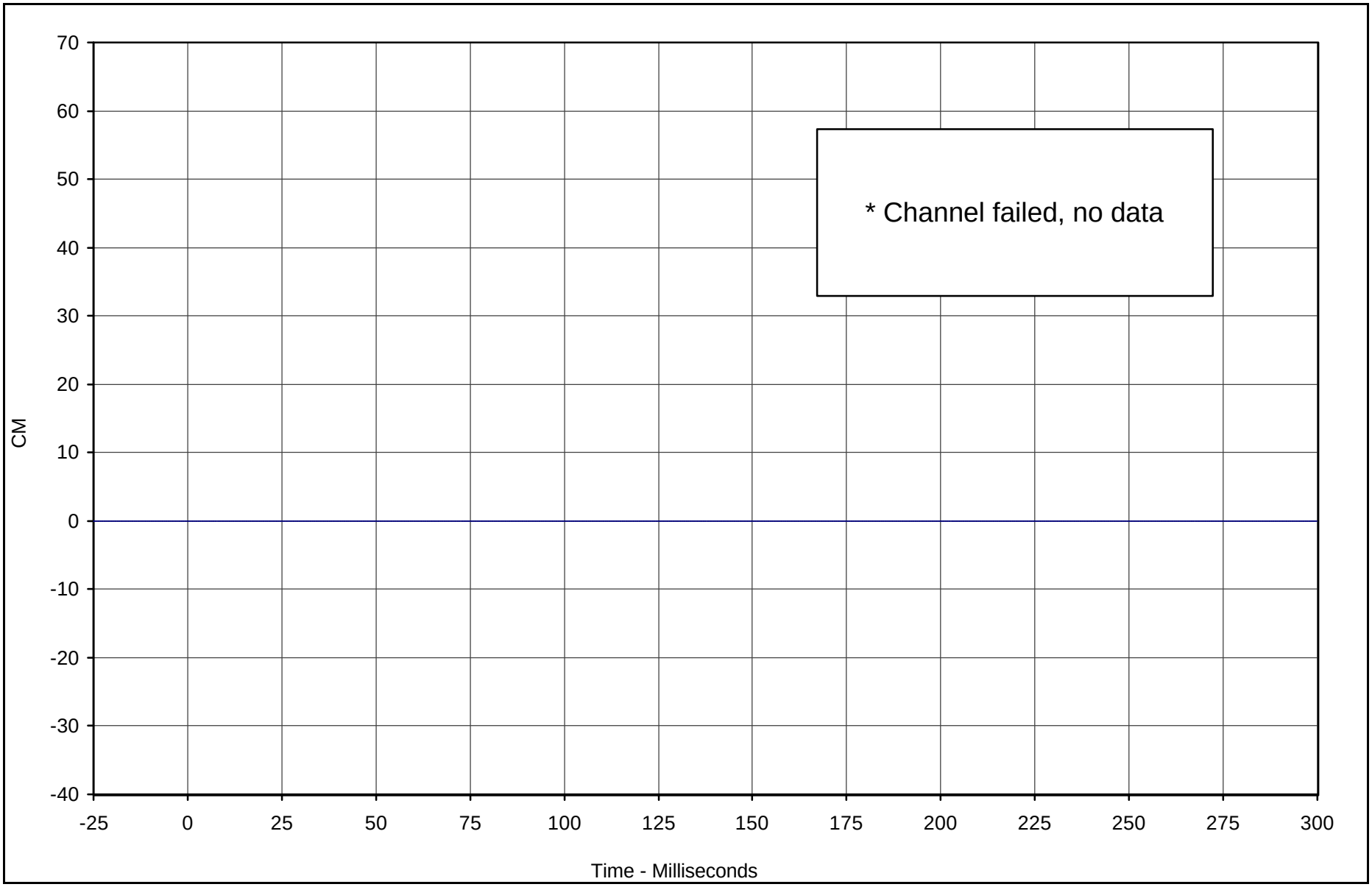
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper Velocity	094	IN1	KMH	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



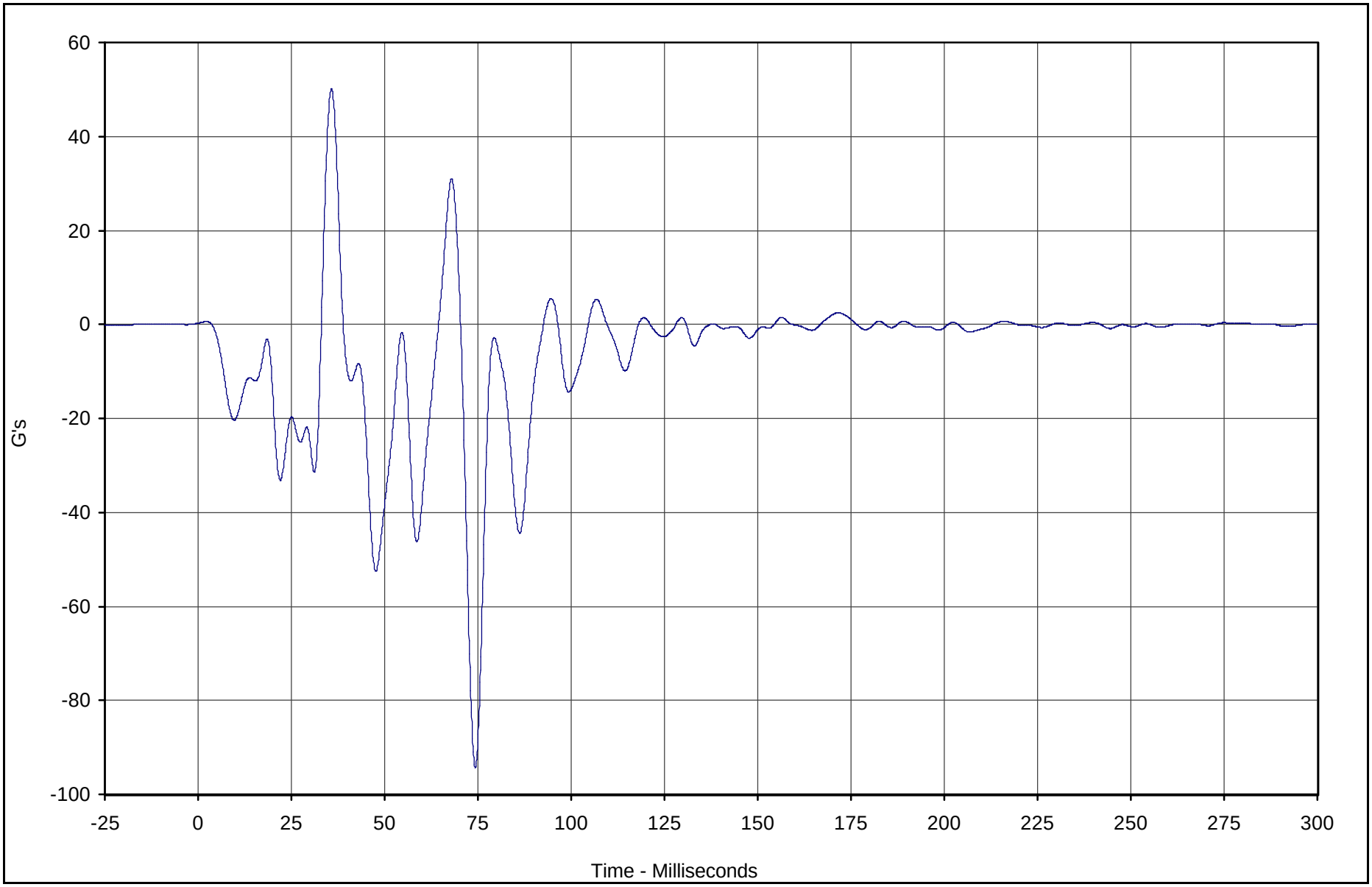
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper Displ.	094	IN2	CM	0.0	0.0	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



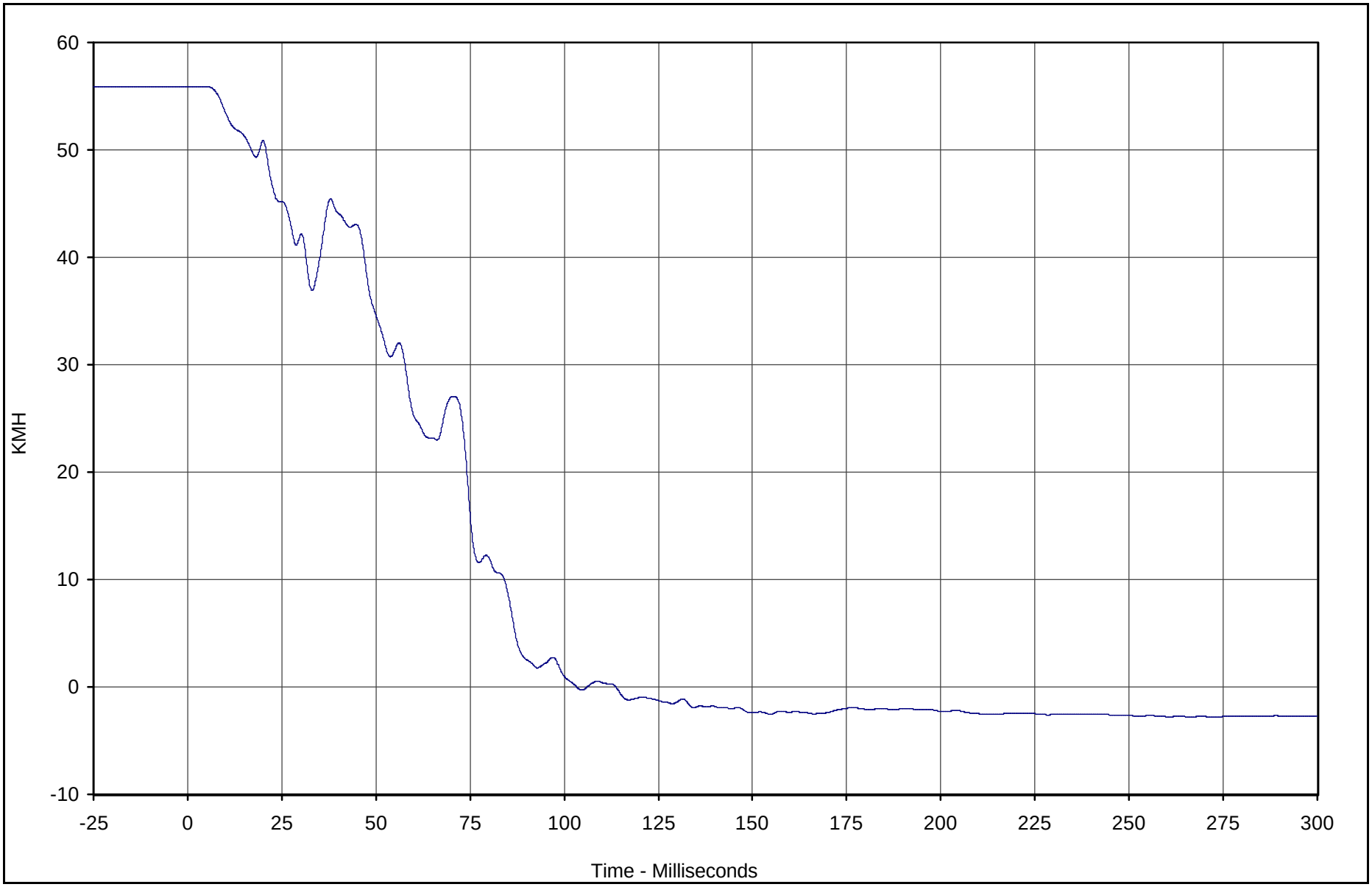
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel	095	FIL	G's	50.1	35.8	-94.3	74.3	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



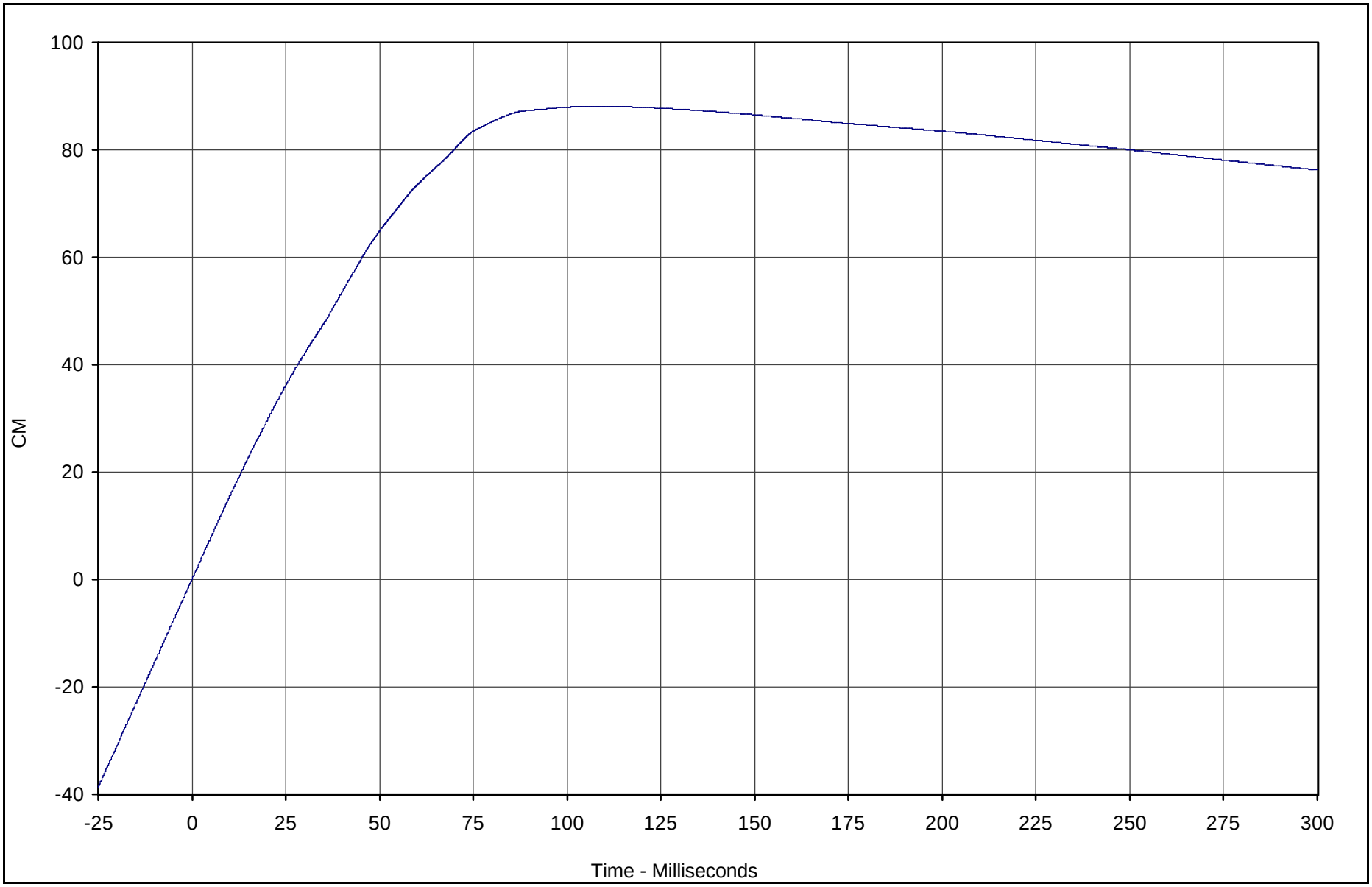
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel Velocity	095	IN1	KMH	55.9	4.3	-2.8	272.4	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



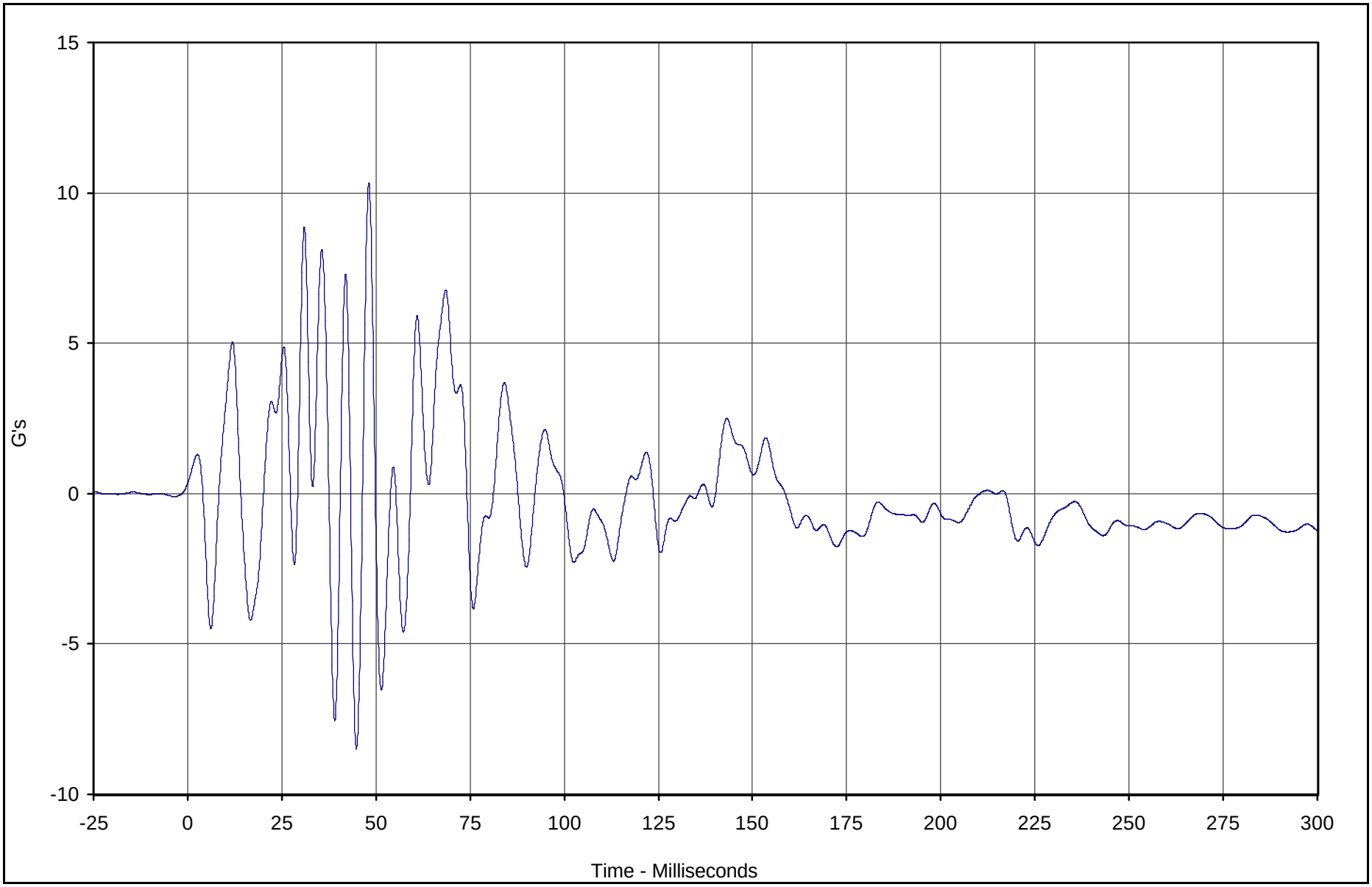
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel Displacement	095	IN2	CM	88.1	113.7	0.0	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



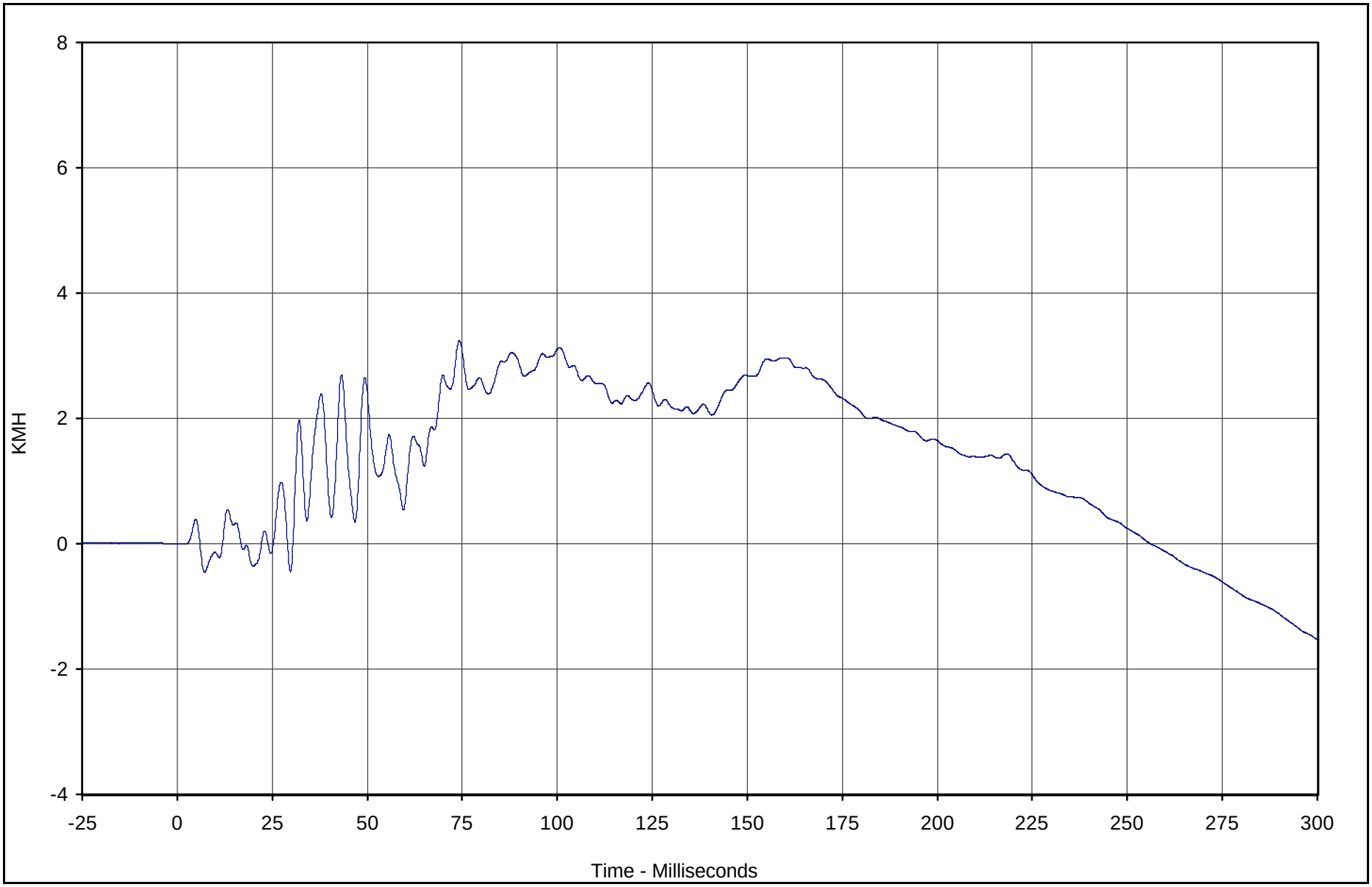
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z	096	FIL	G's	10.3	48.1	-8.5	44.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



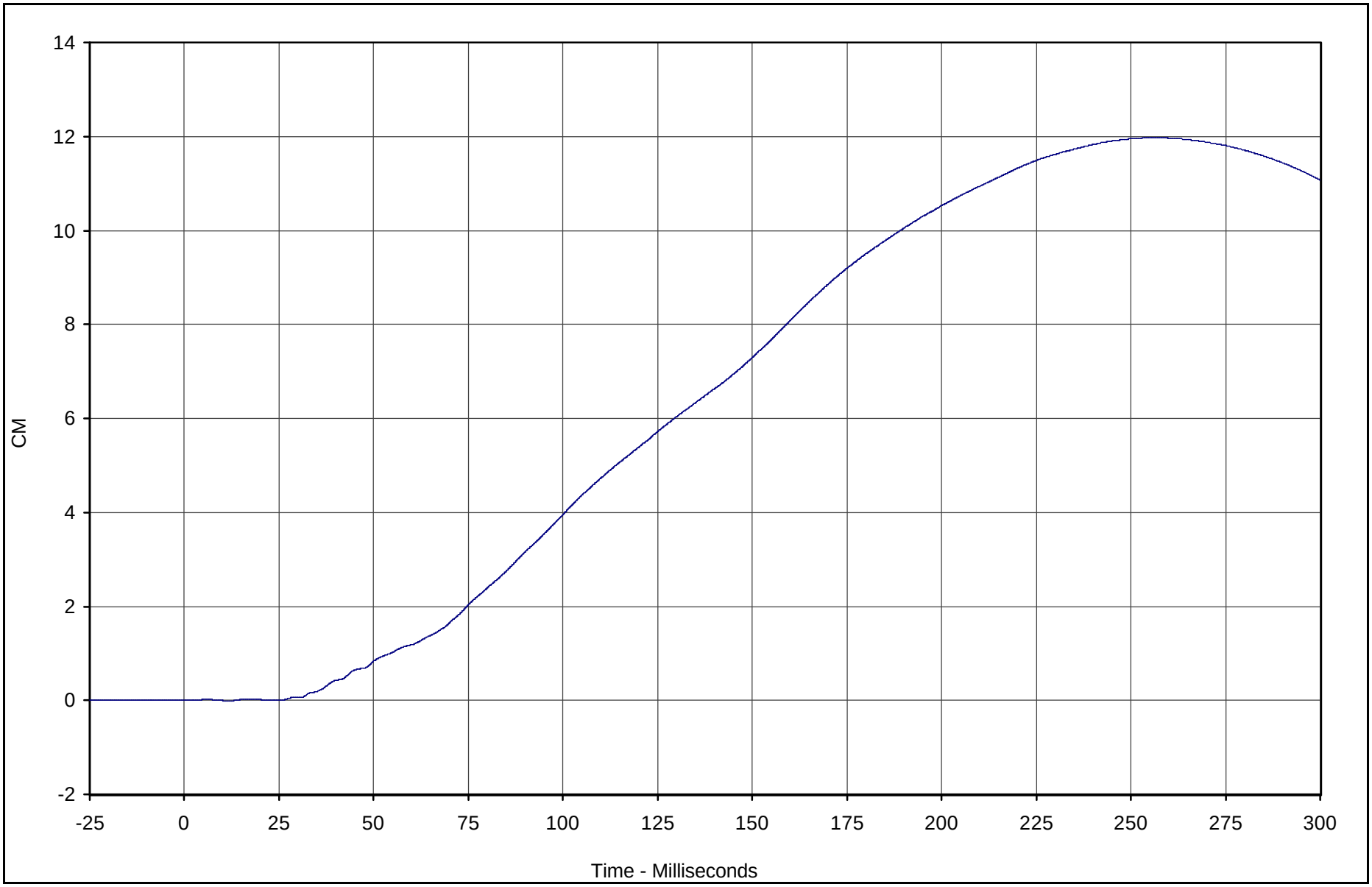
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z Velocity	096	IN1	KMH	3.2	74.2	-1.5	299.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



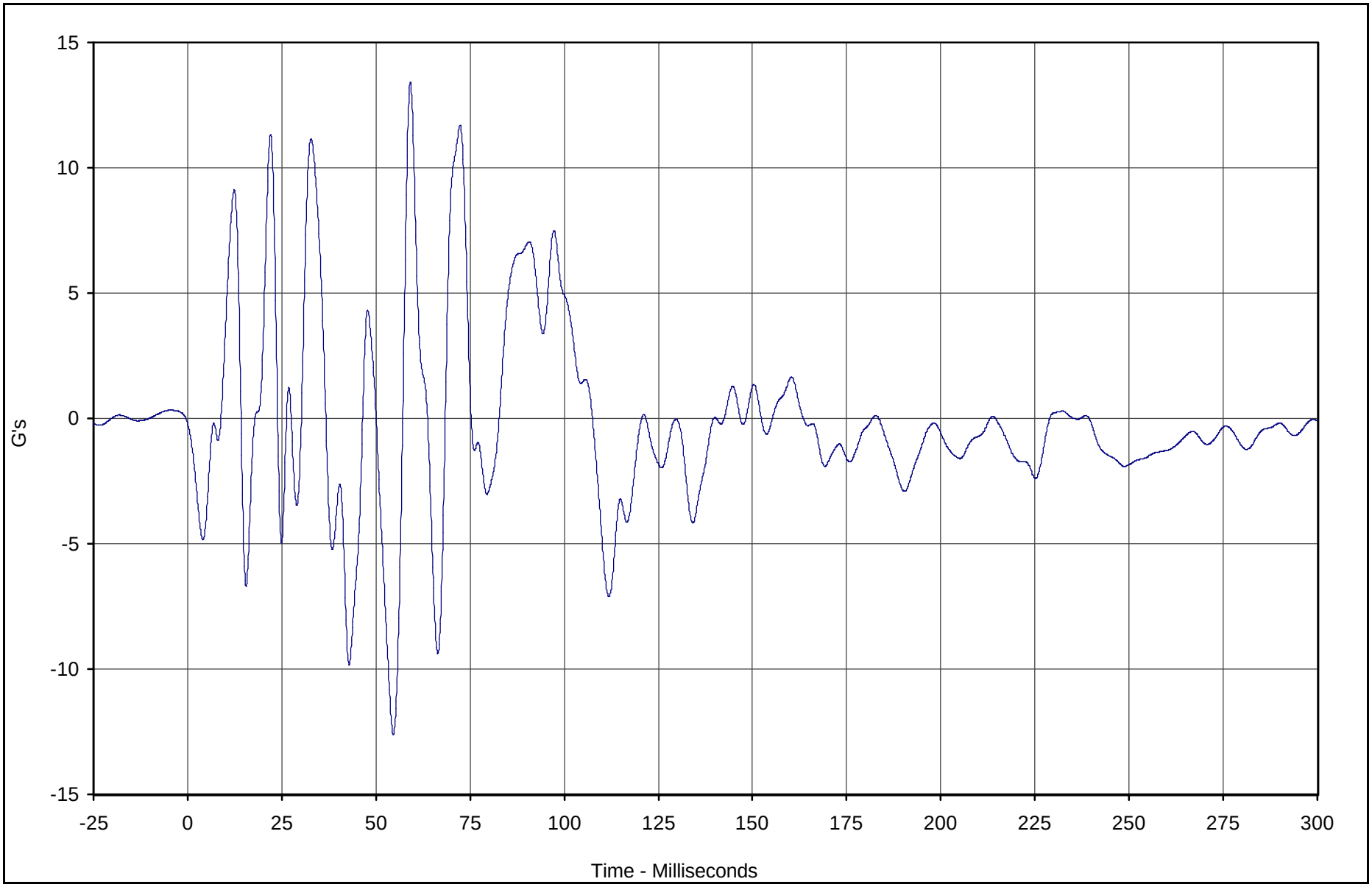
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z Displ.	096	IN2	CM	12.0	256.0	0.0	12.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



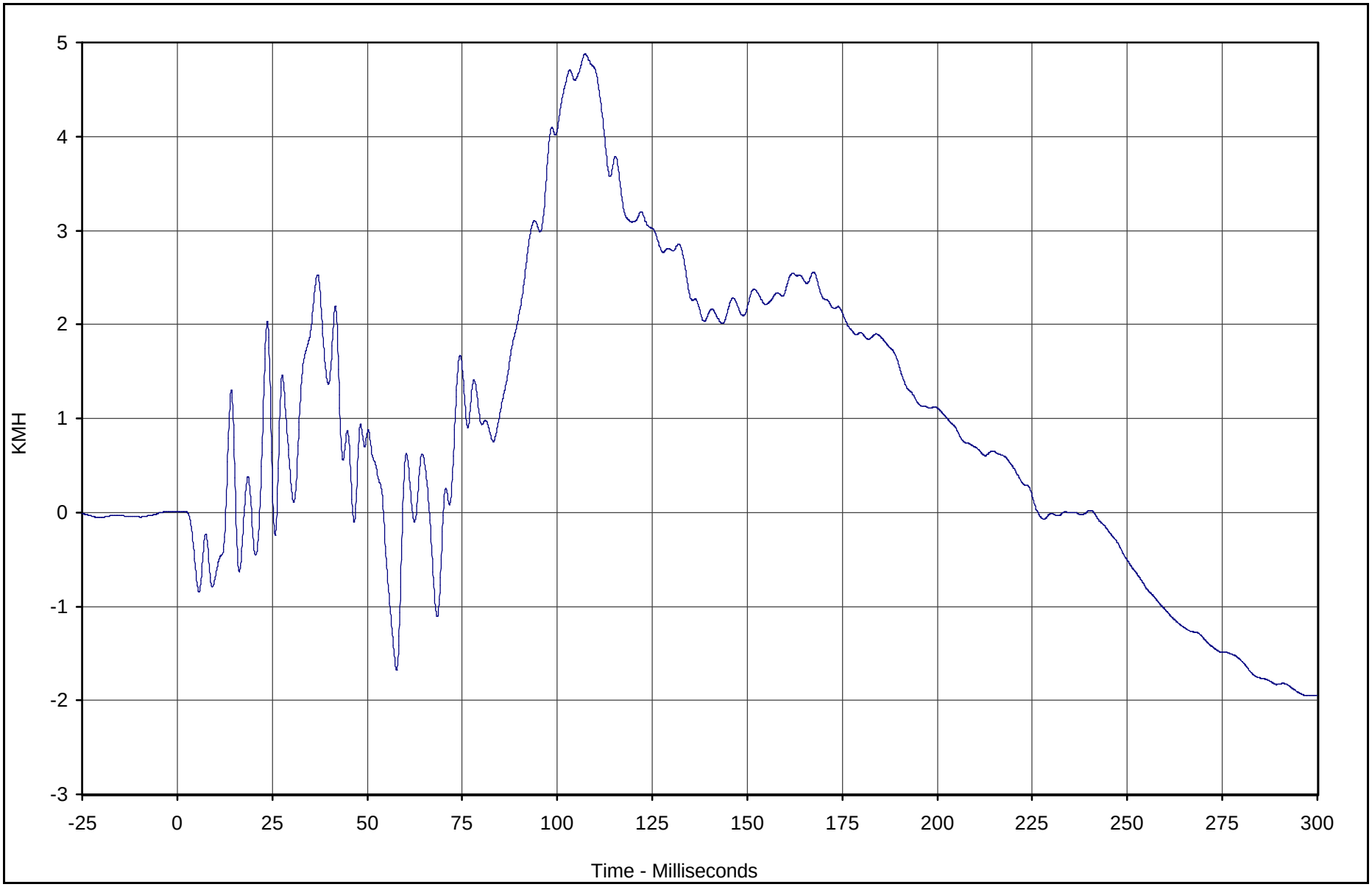
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z	097	FIL	G's	13.4	59.1	-12.6	54.6	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



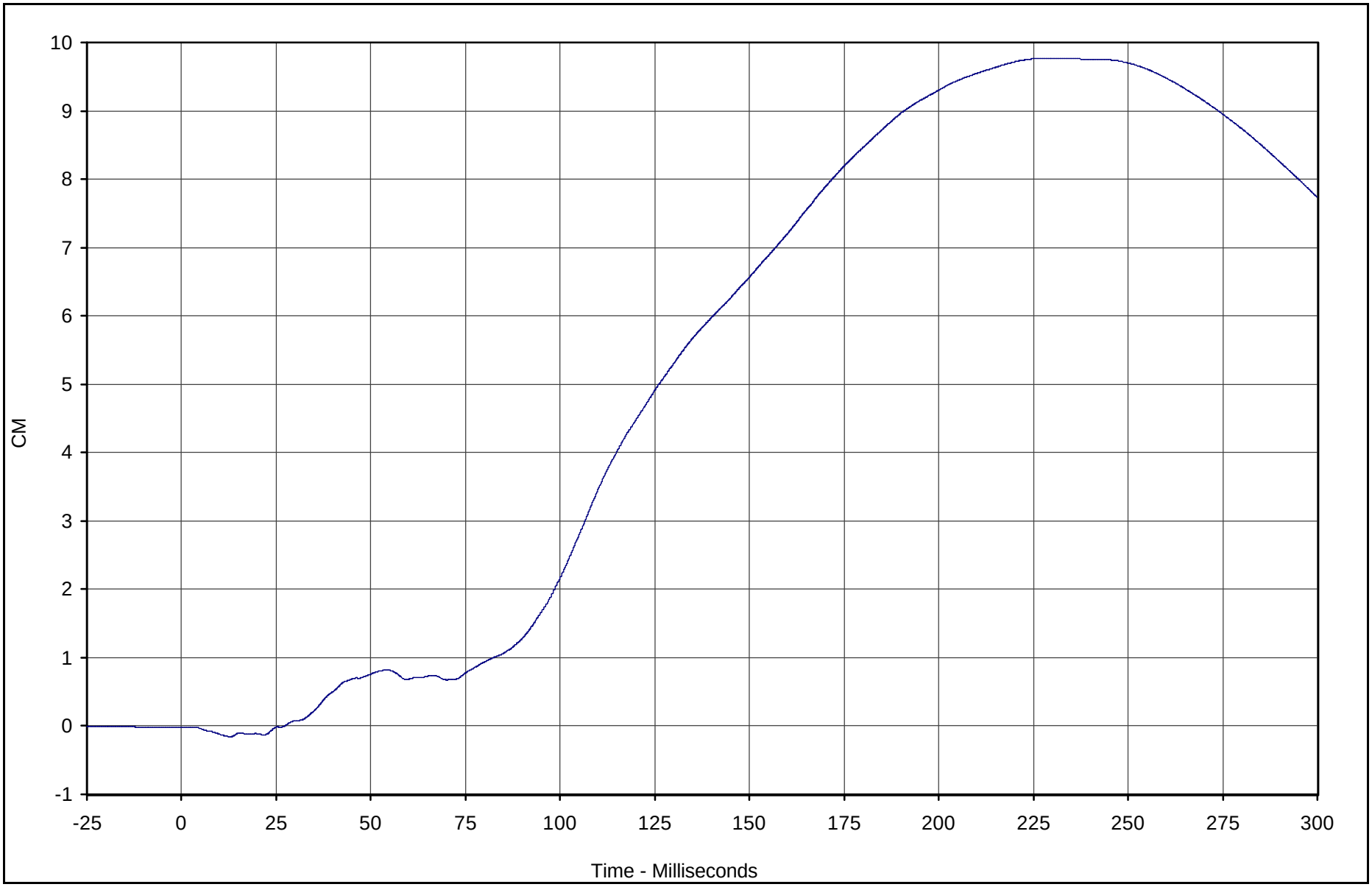
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z Velocity	097	IN1	KMH	4.9	107.3	-2.0	298.1	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z Displ.	097	IN2	CM	9.8	226.5	-0.2	12.8	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

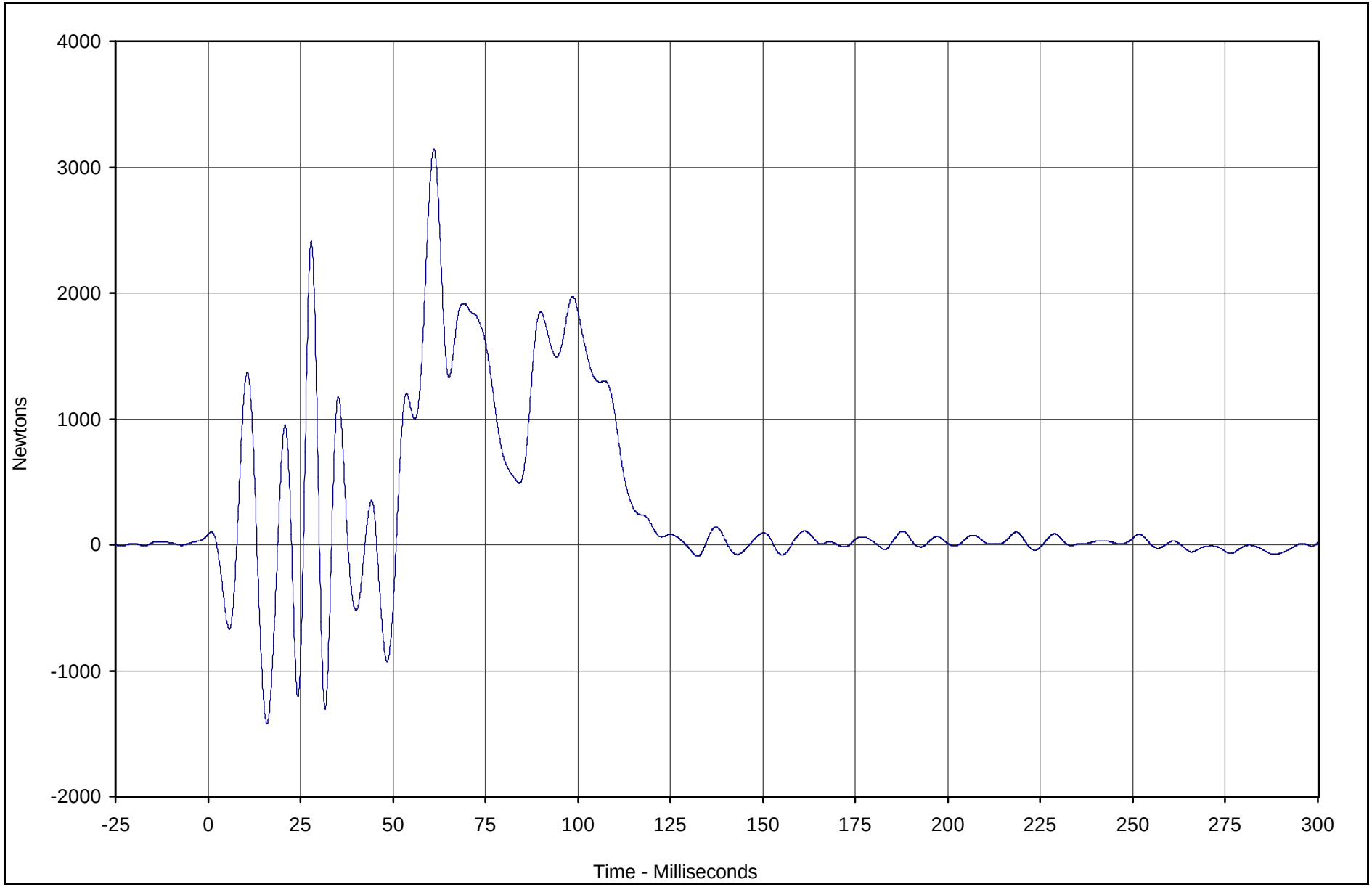
Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100

APPENDIX C

LOAD CELL BARRIER DATA PLOTS



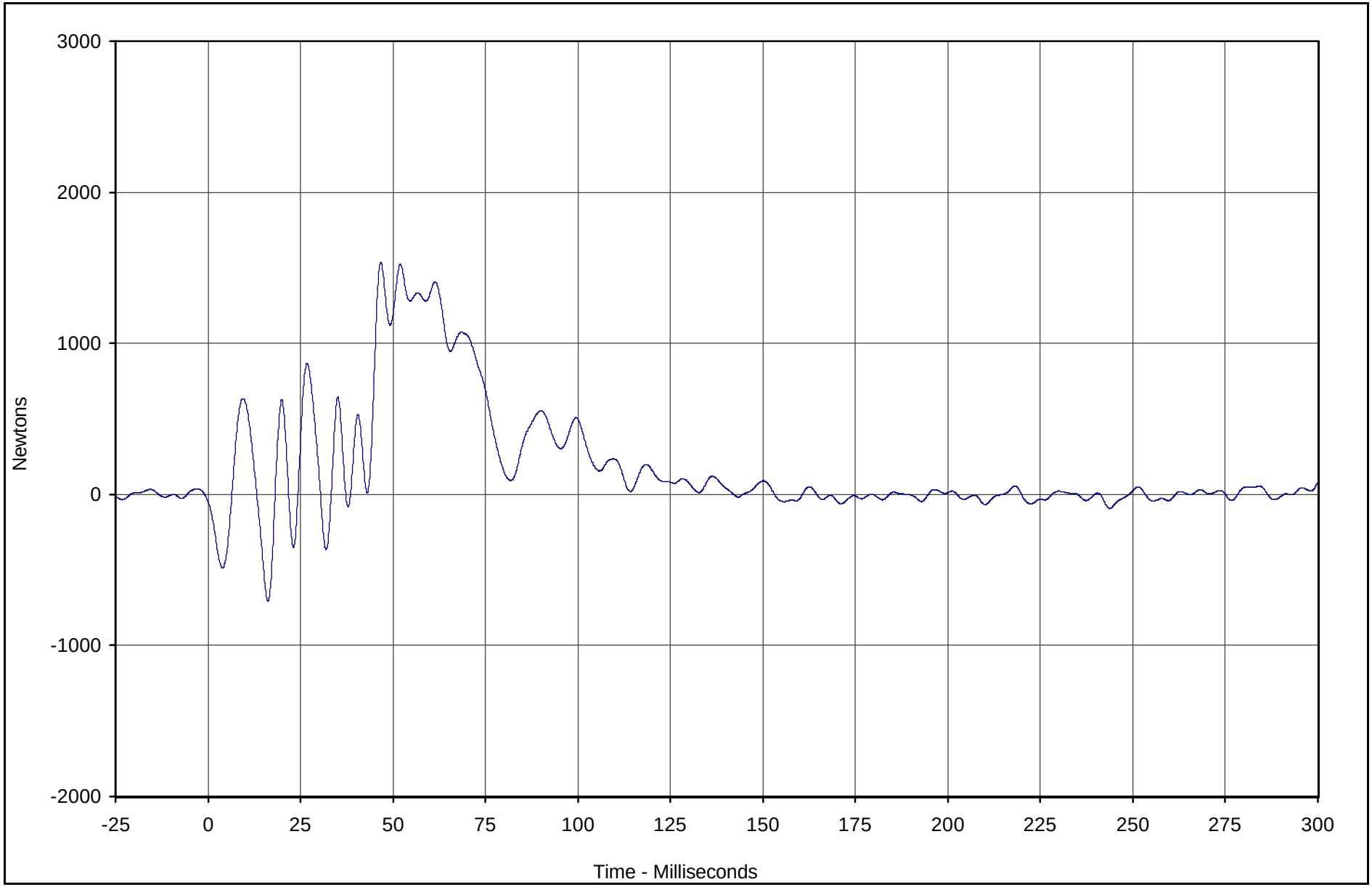
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A1	098	FIL	Newtons	3141.9	61.1	-1421.1	16.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 10/7/03

NHTSA No.: M40100



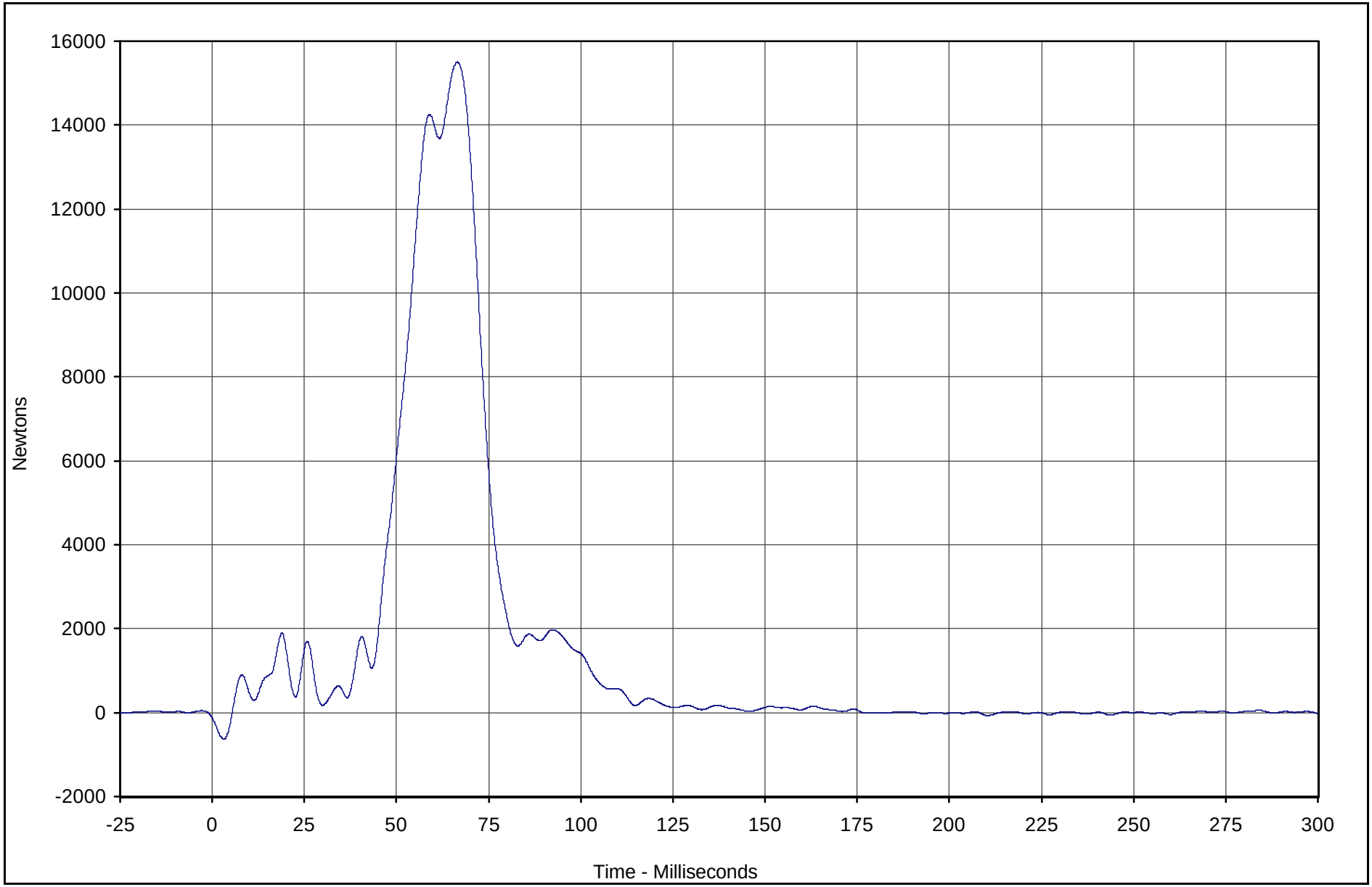
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A2	099	FIL	Newtons	1536.7	46.8	-707.3	16.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



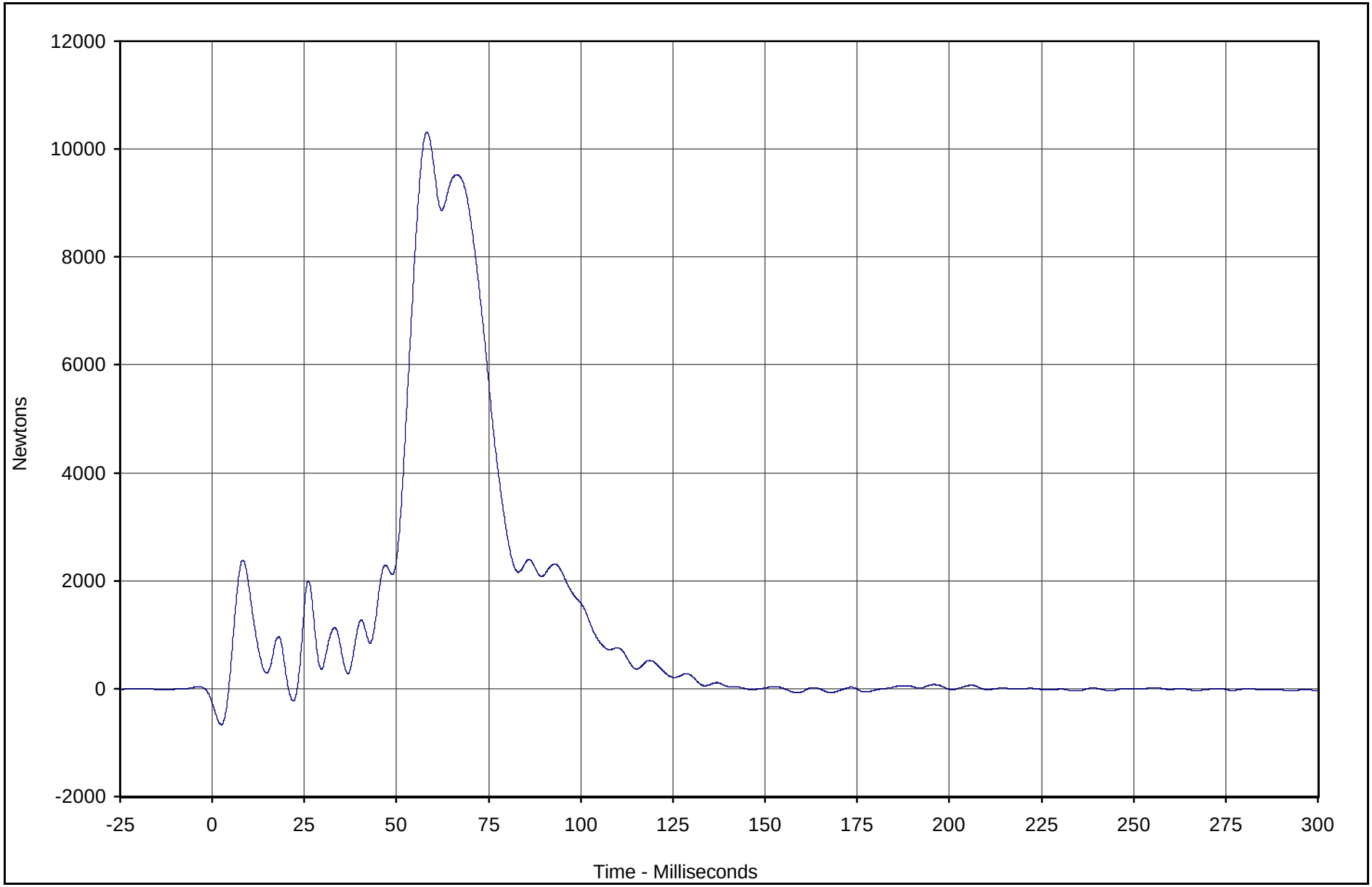
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A3	100	FIL	Newtons	15502.8	66.5	-630.9	3.1	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



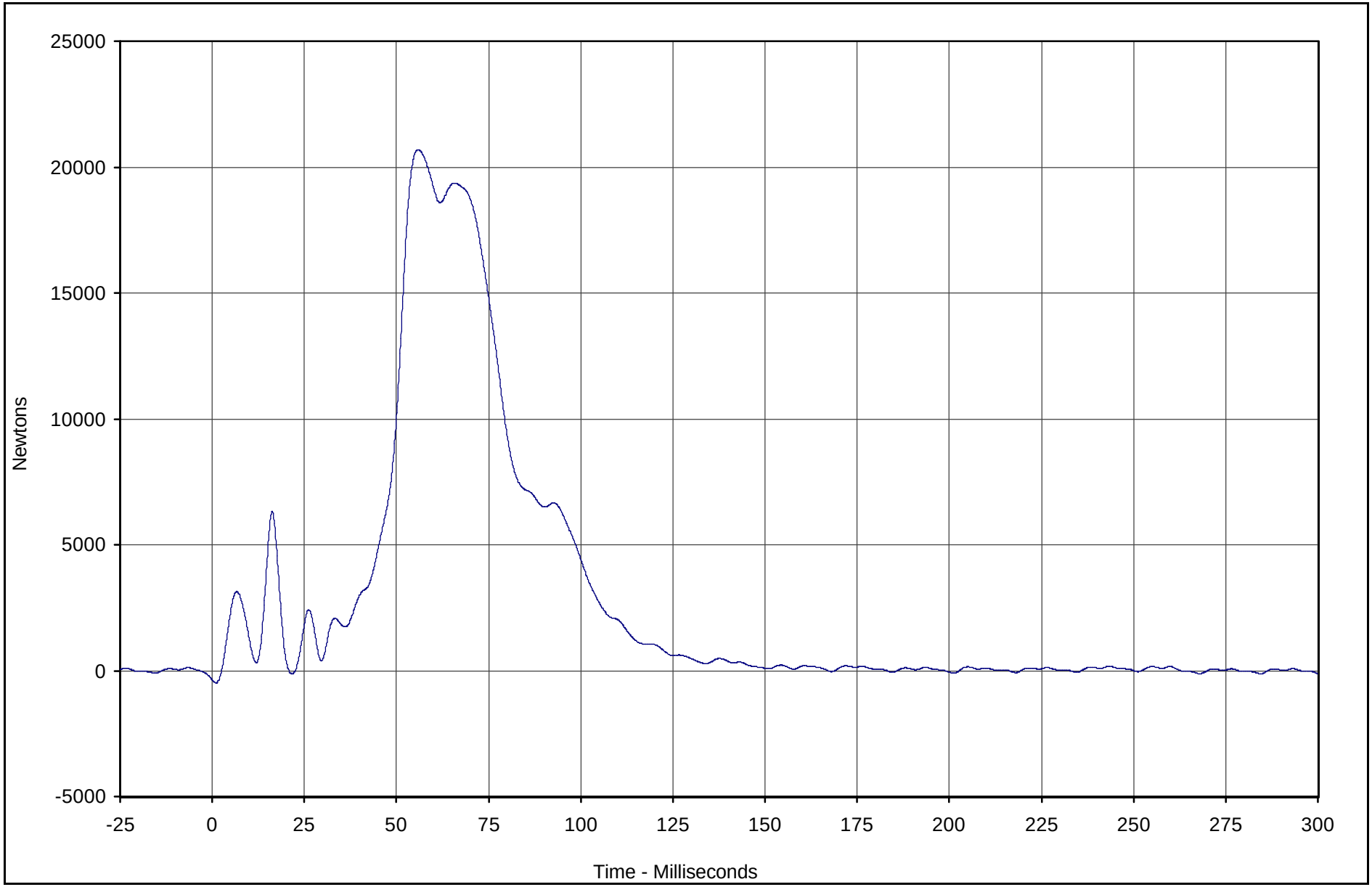
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A4	101	FIL	Newtons	10310.2	58.2	-667.8	2.5	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



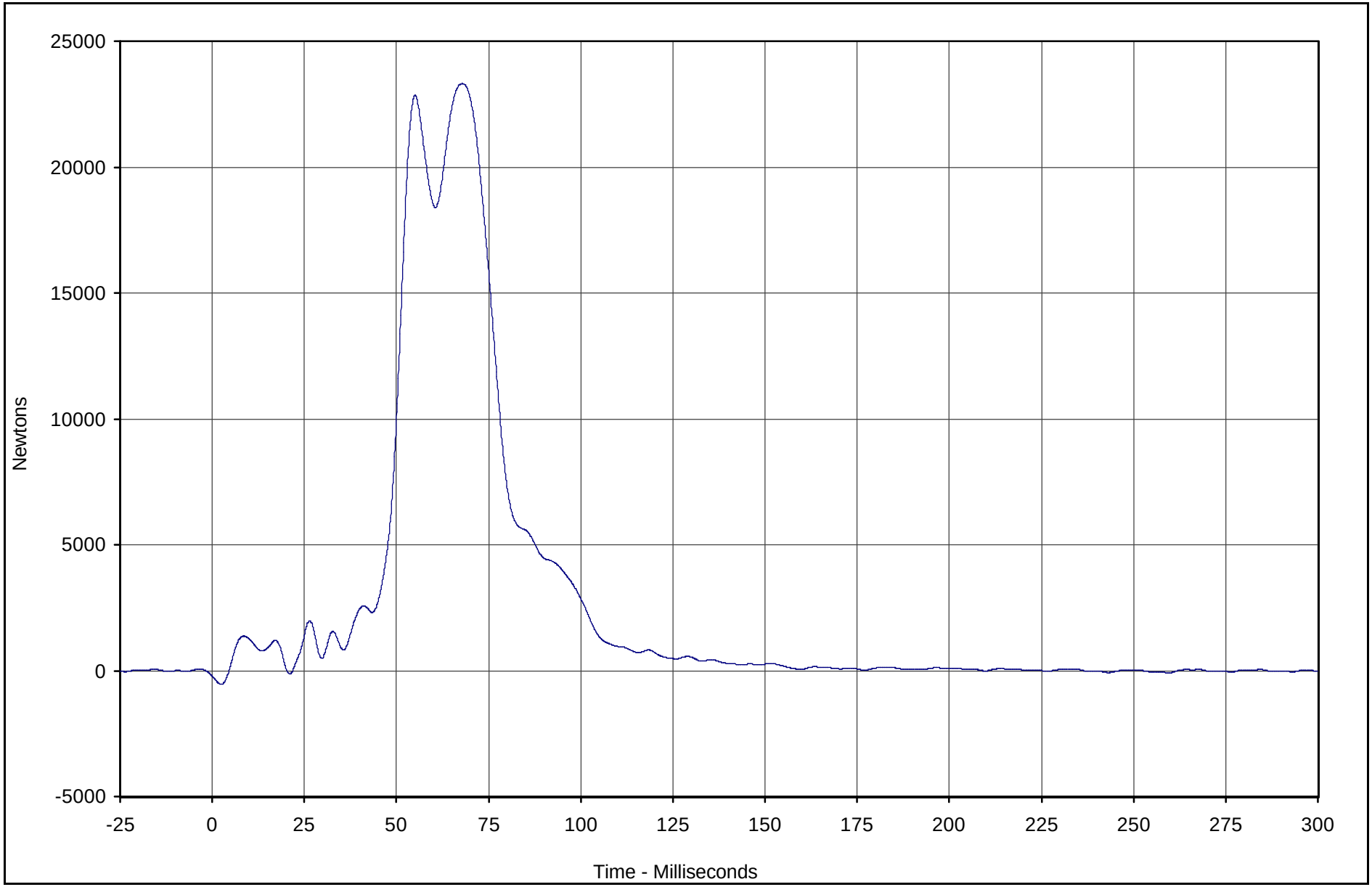
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A5	102	FIL	Newtons	20682.6	55.9	-485.7	1.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



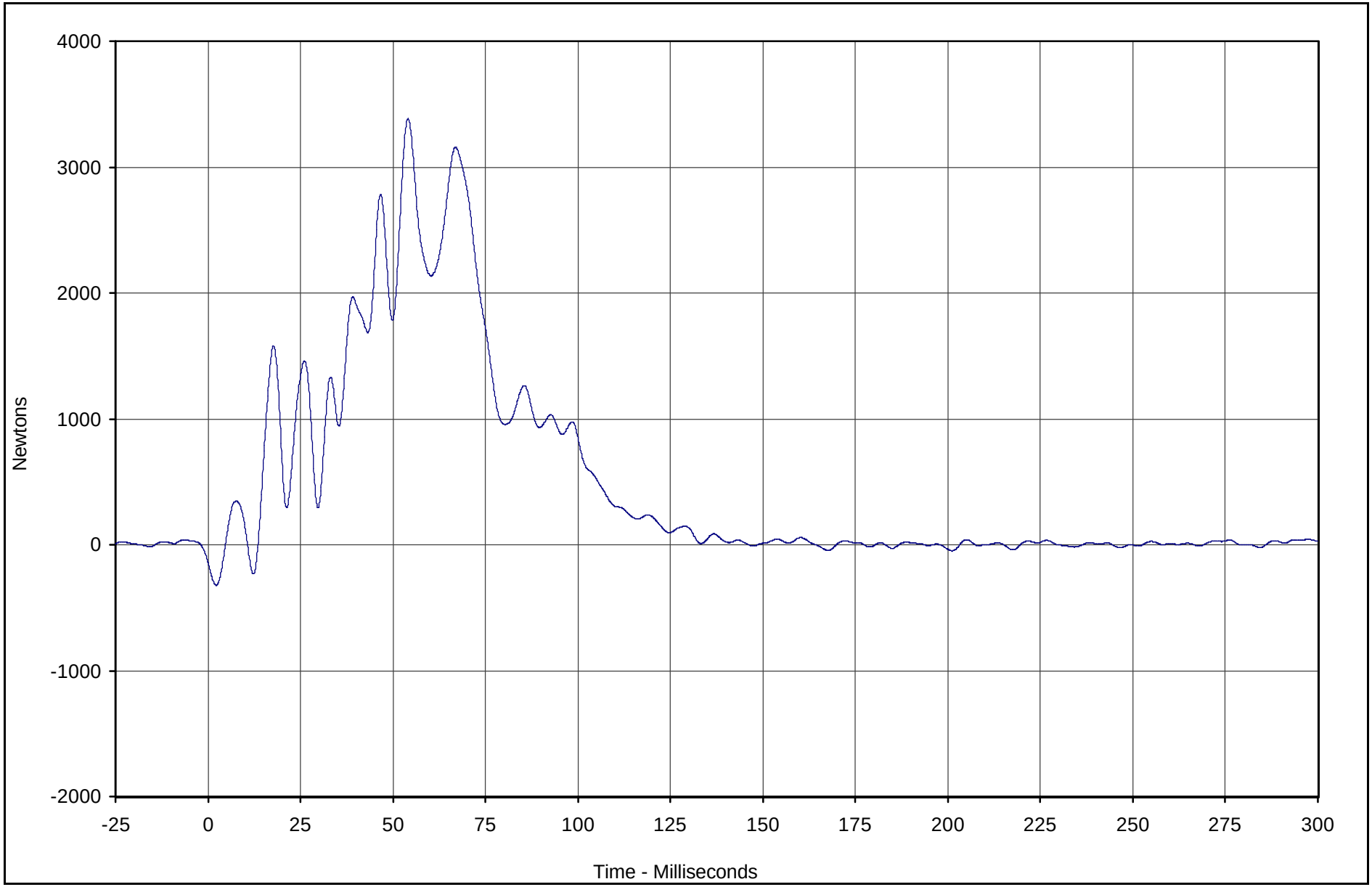
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A6	103	FIL	Newtons	23321.2	67.9	-543.8	2.4	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



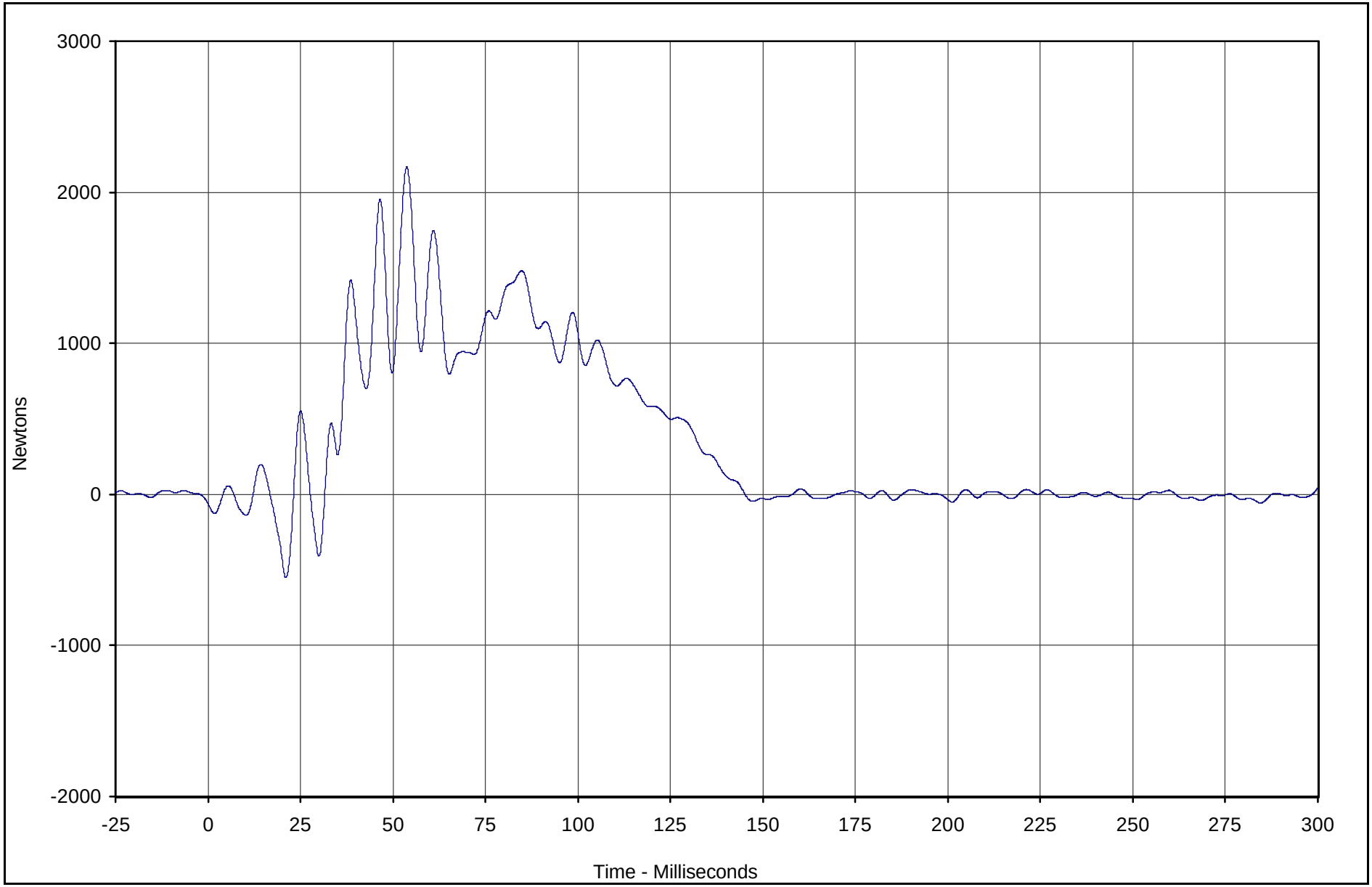
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A7	104	FIL	Newtons	3384.5	54.1	-321.5	2.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



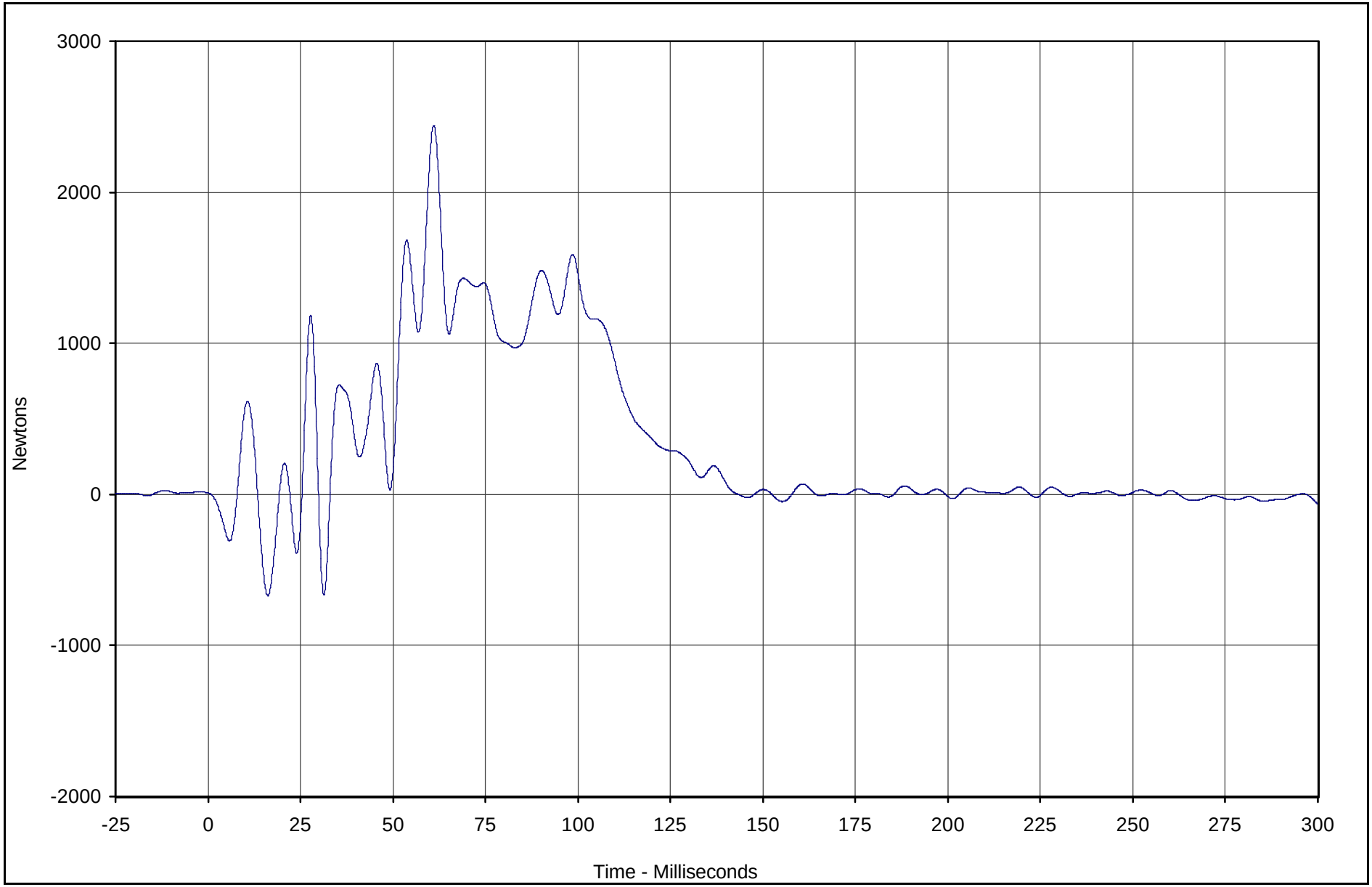
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A8	105	FIL	Newtons	2167.7	53.7	-549.8	21.1	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



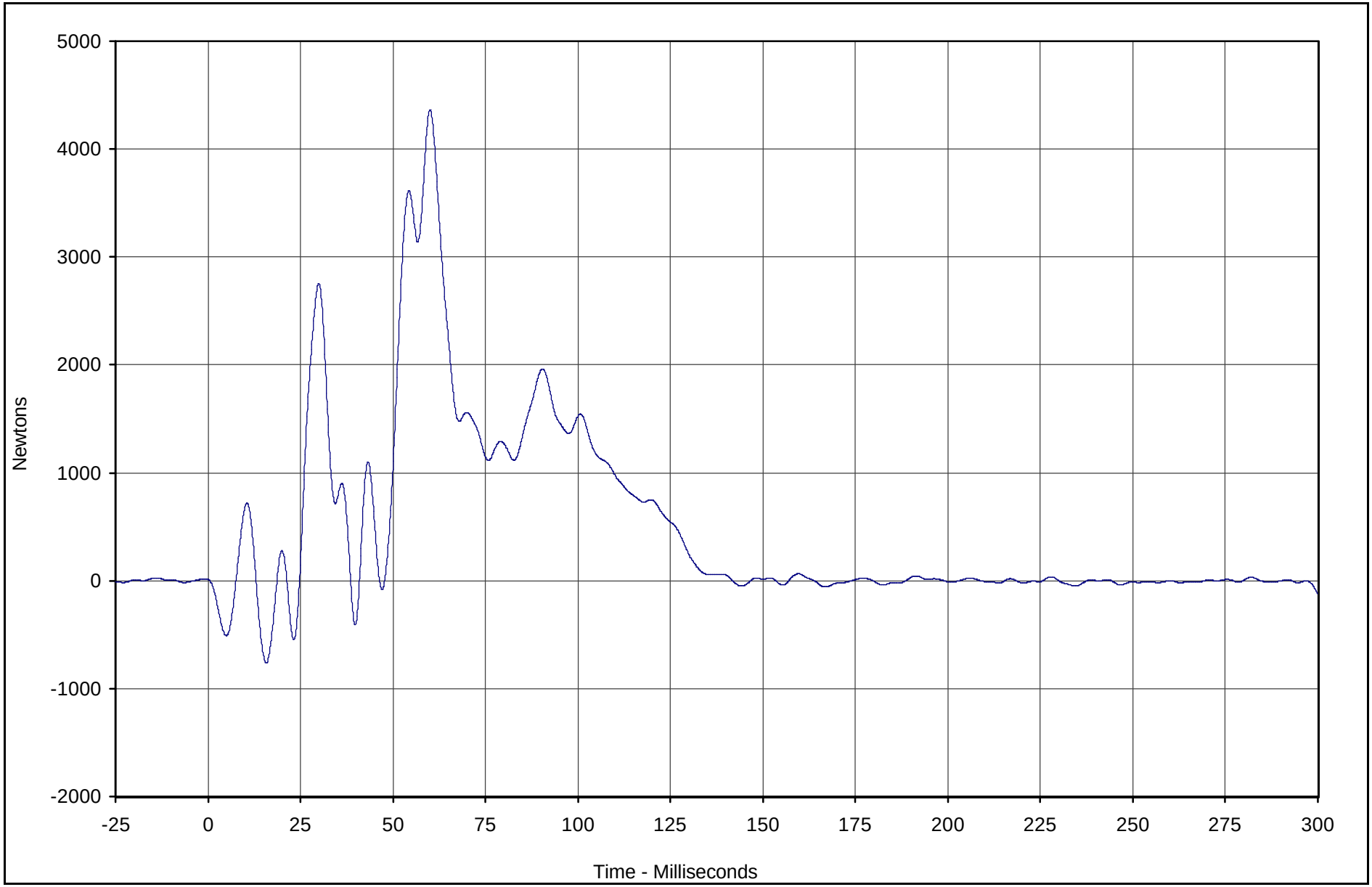
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force A9	106	FIL	Newtons	2443.0	61.0	-669.5	16.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



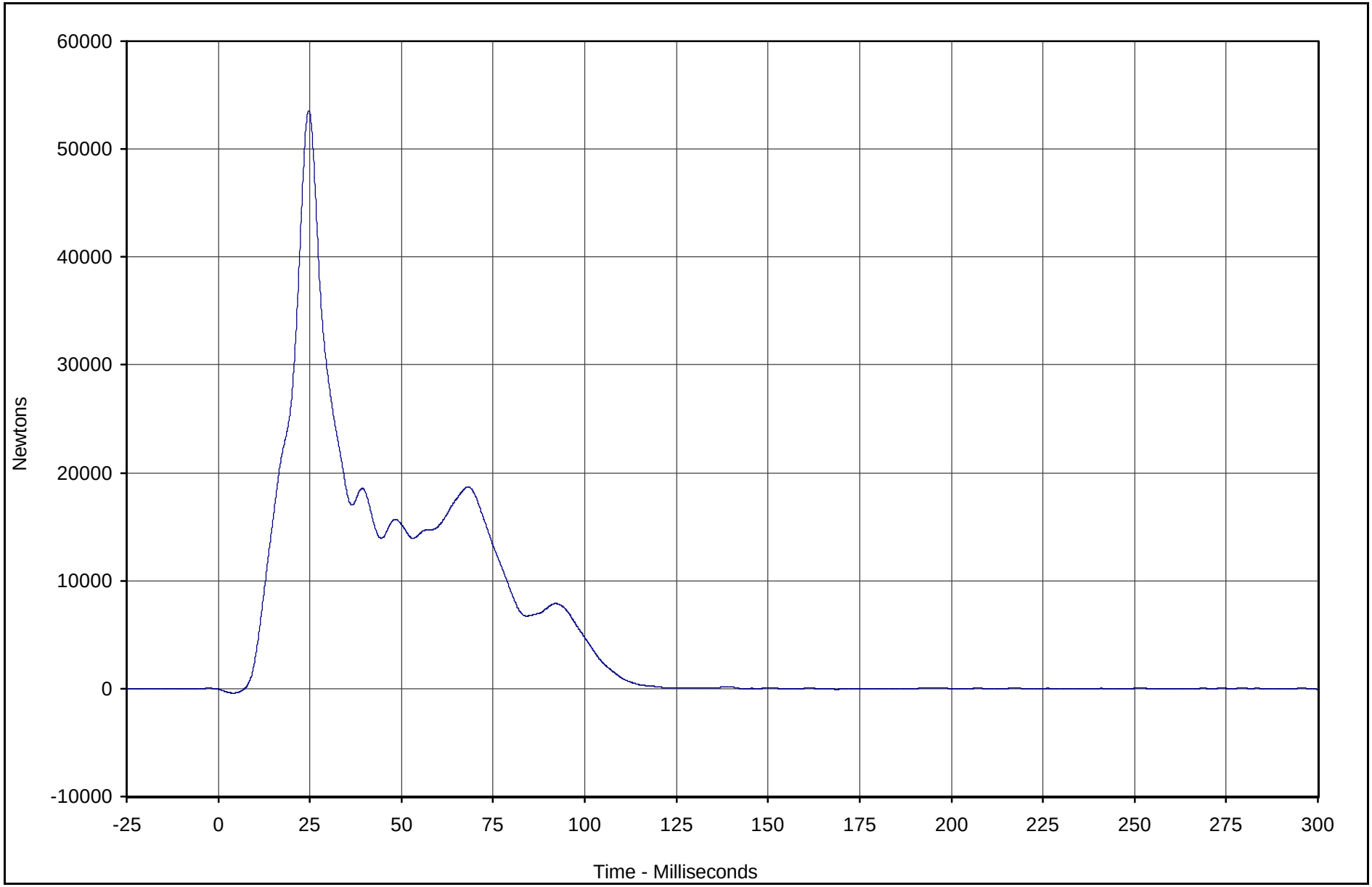
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B1	107	FIL	Newtons	4366.0	60.0	-762.7	15.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



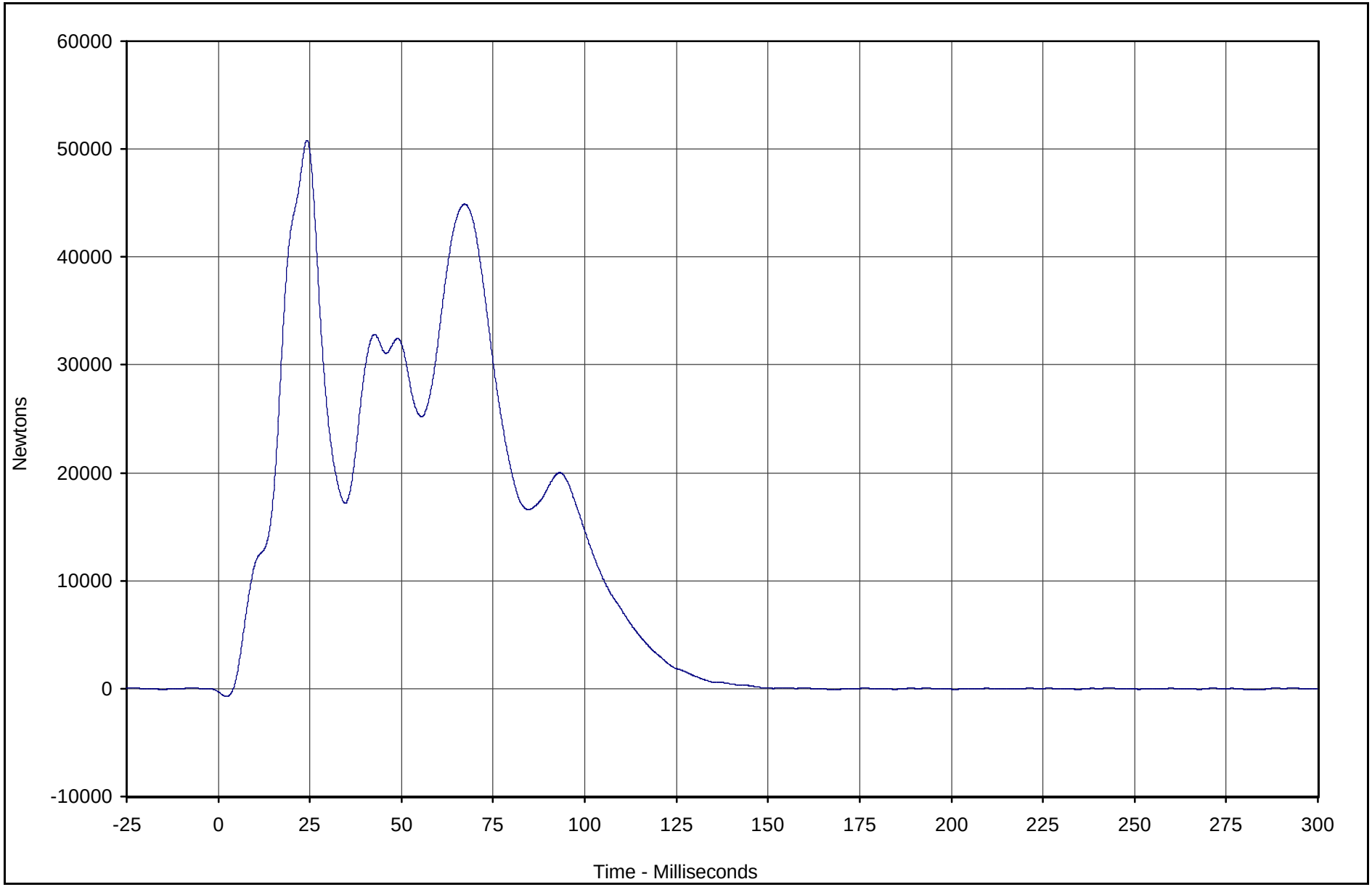
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B2	108	FIL	Newtons	53543.7	24.7	-411.2	4.1	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



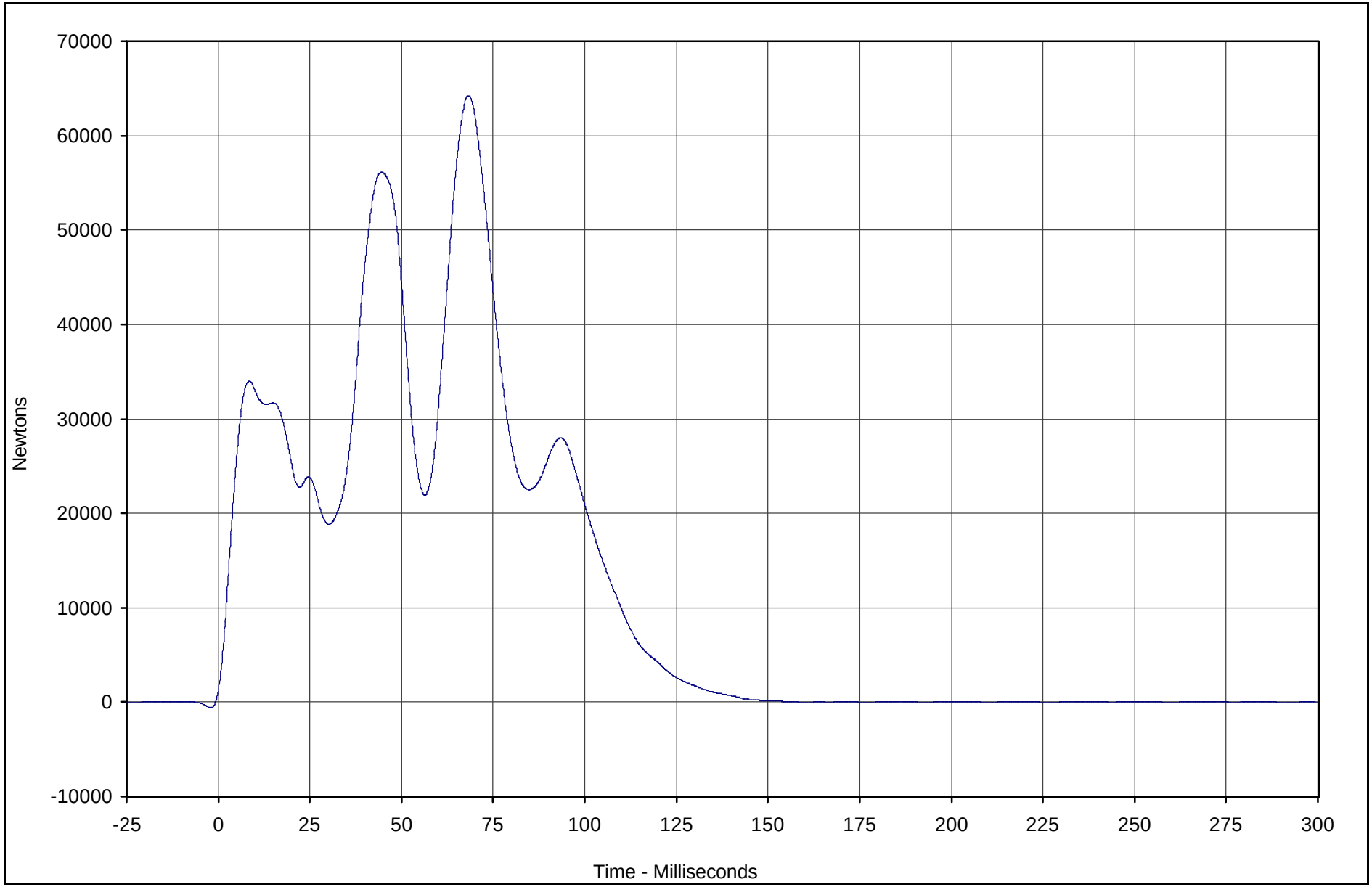
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B3	109	FIL	Newtons	50812.0	24.2	-730.2	2.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



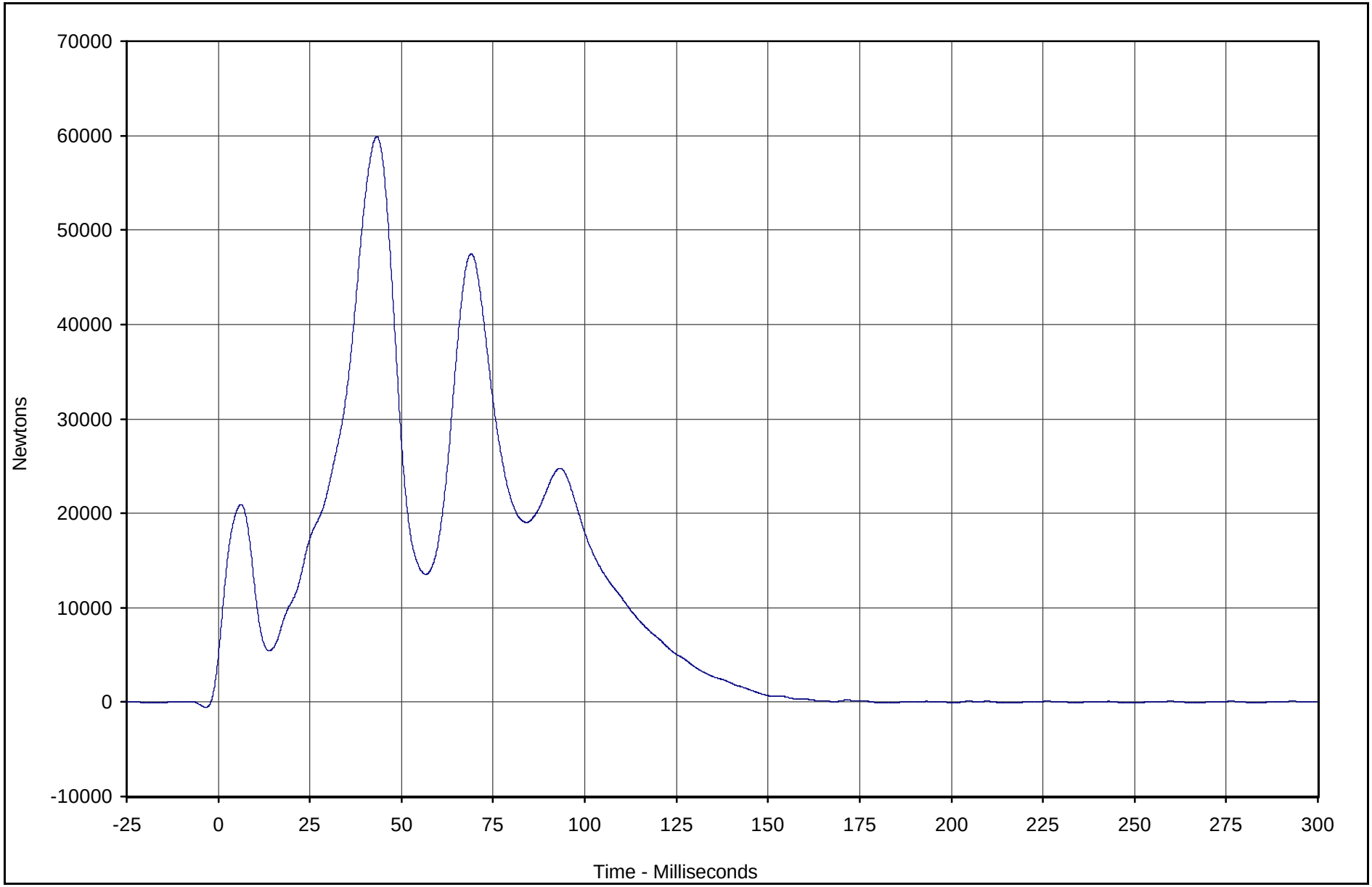
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B4	110	FIL	Newtons	64235.4	68.3	-74.6	177.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



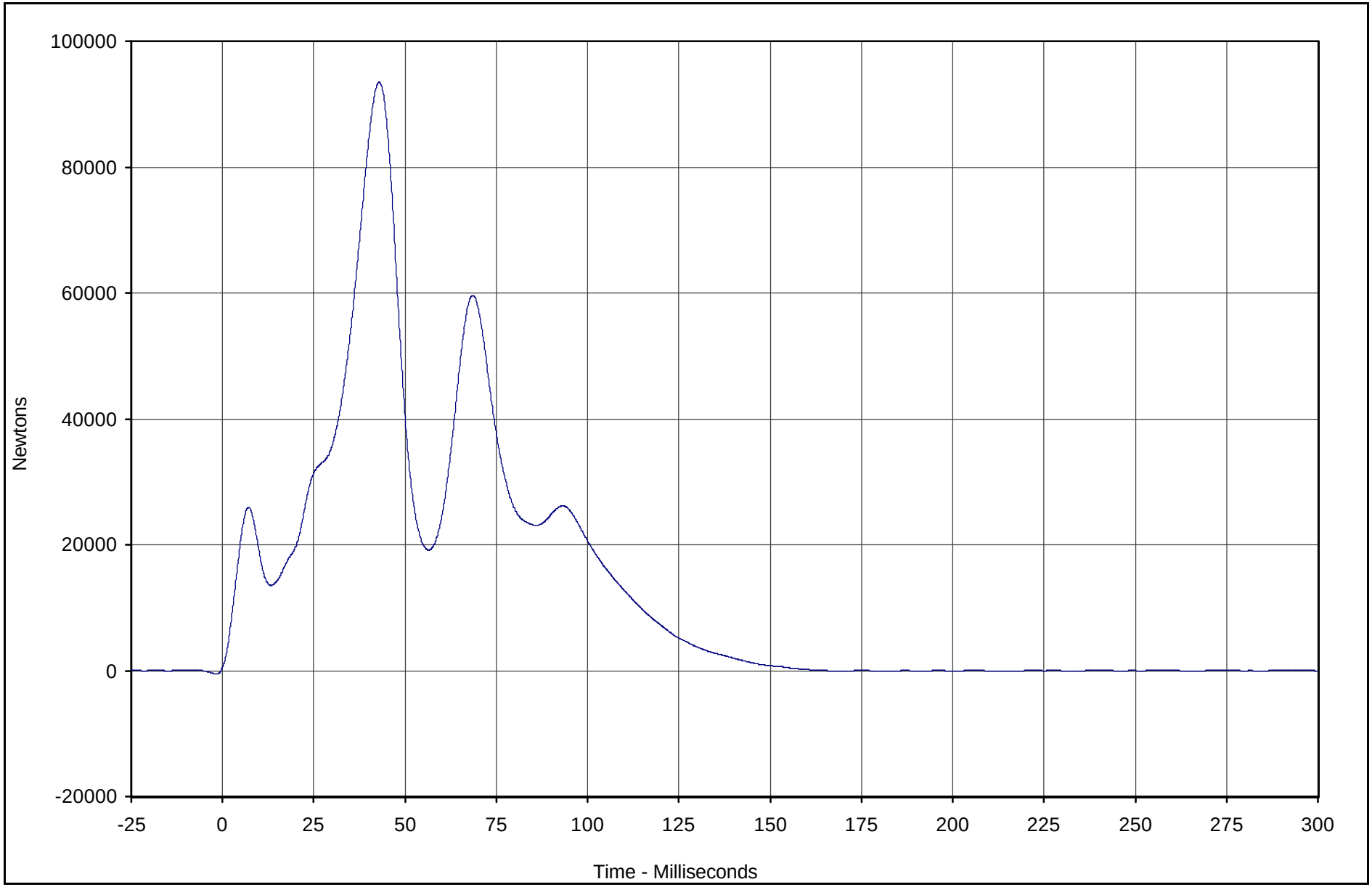
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B5	111	FIL	Newtons	59868.5	43.3	-101.6	201.1	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



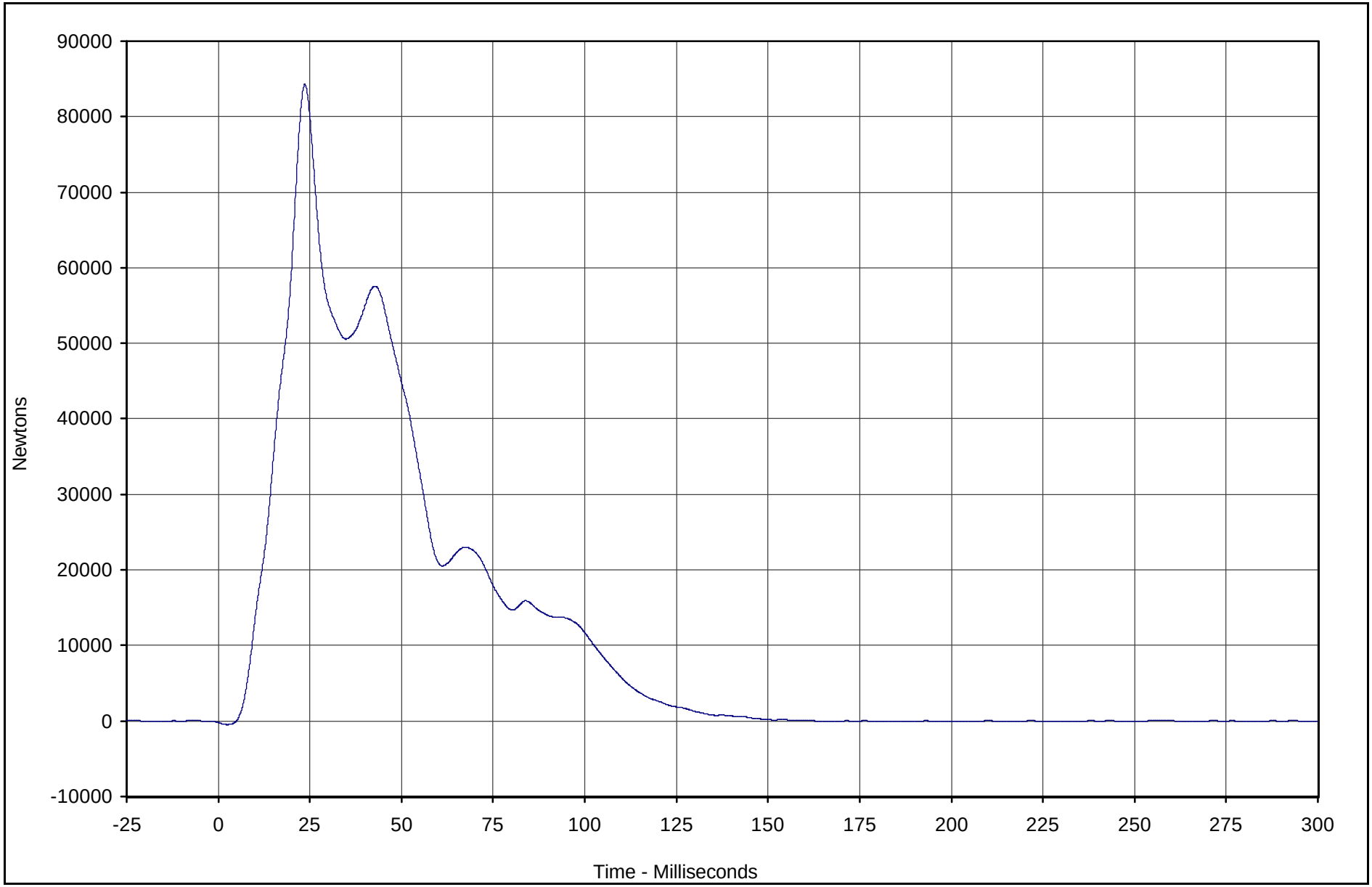
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B6	112	FIL	Newtons	93456.8	42.9	-86.3	168.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



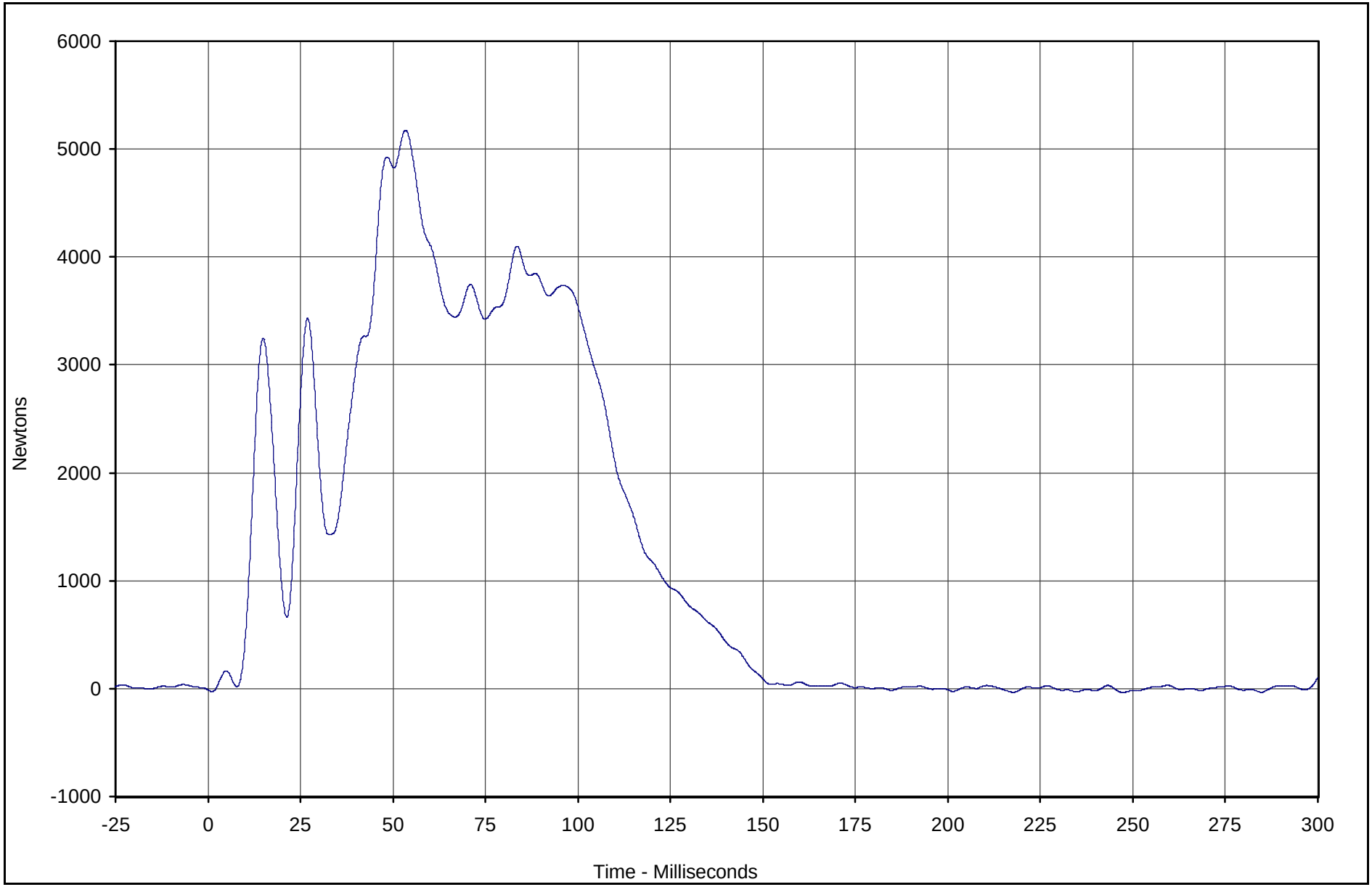
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B7	113	FIL	Newtons	84287.6	23.7	-473.2	2.4	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



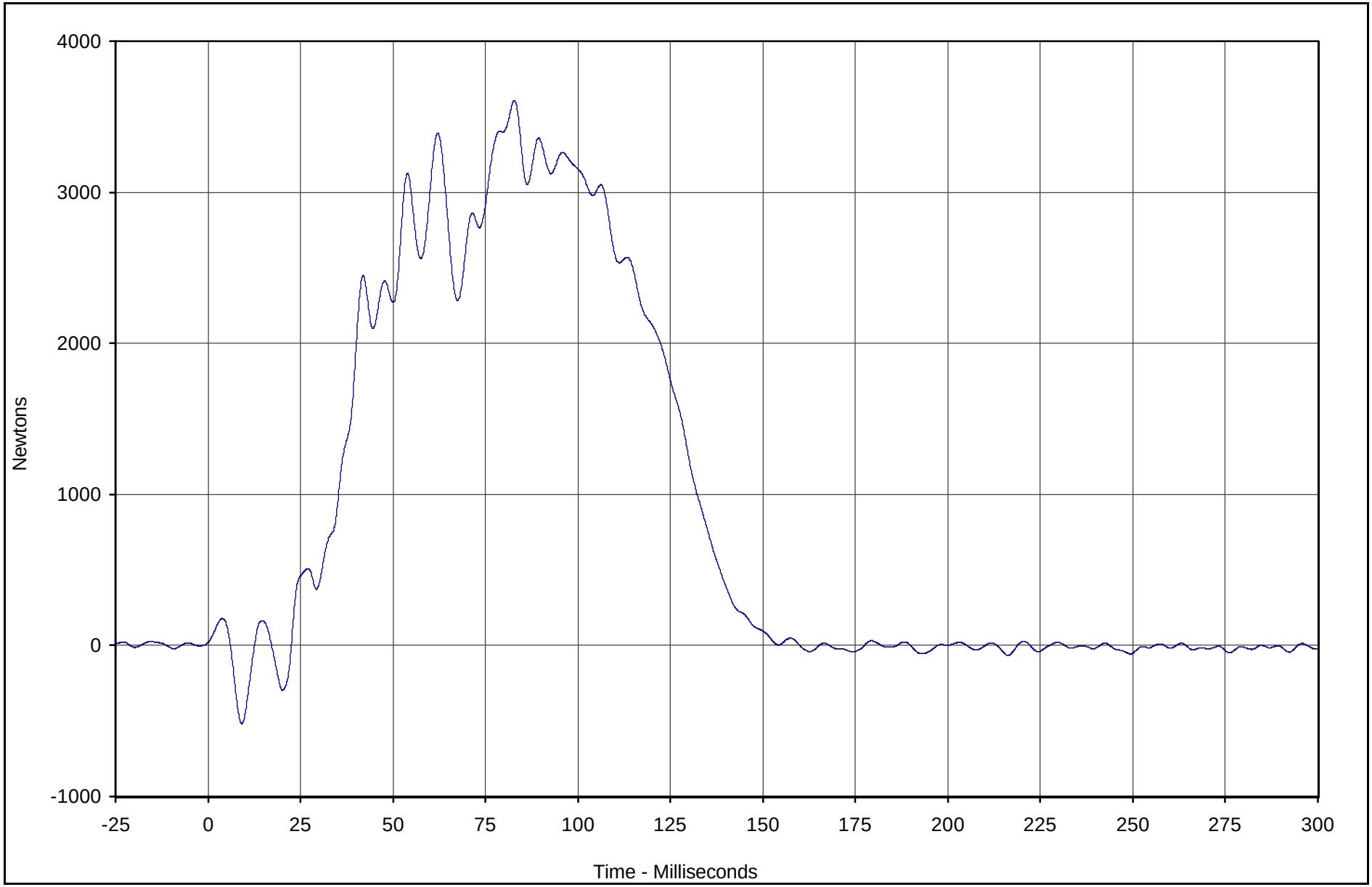
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B8	114	FIL	Newtons	5175.0	53.4	-35.4	247.3	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 10/7/03

NHTSA No.: M40100



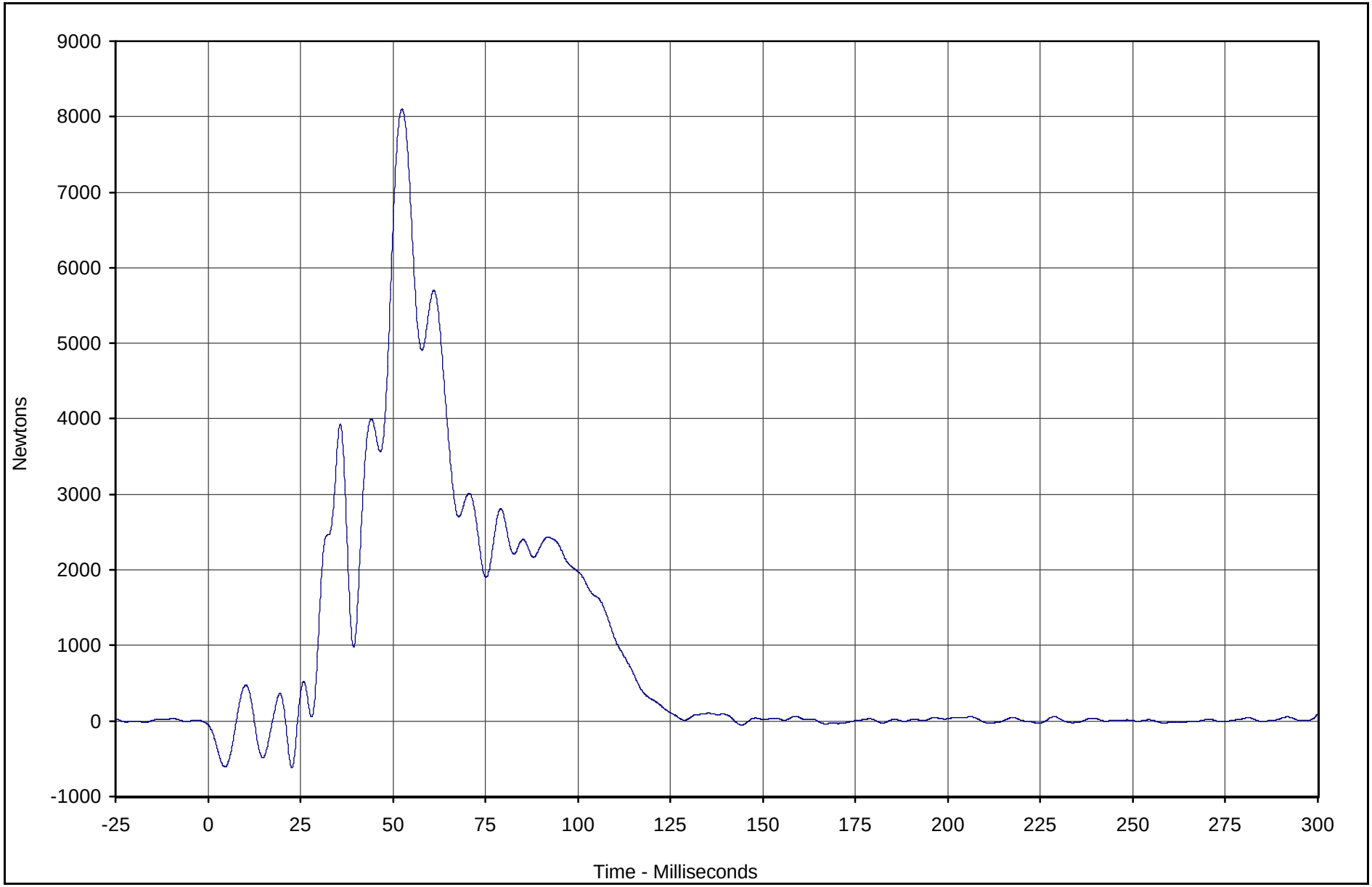
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force B9	115	FIL	Newtons	3608.5	82.8	-518.7	9.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



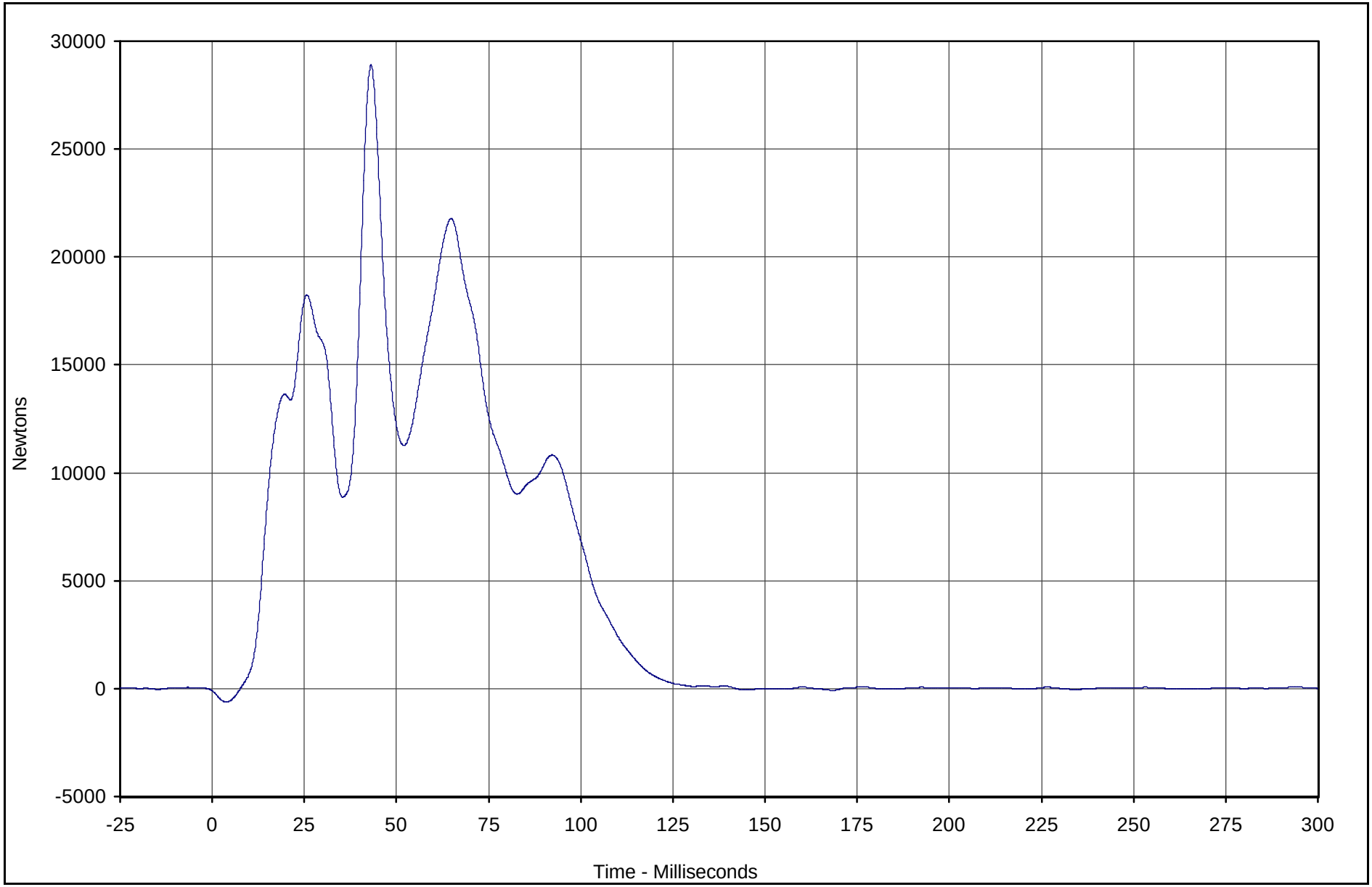
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C1	116	FIL	Newtons	8097.7	52.4	-617.4	22.7	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



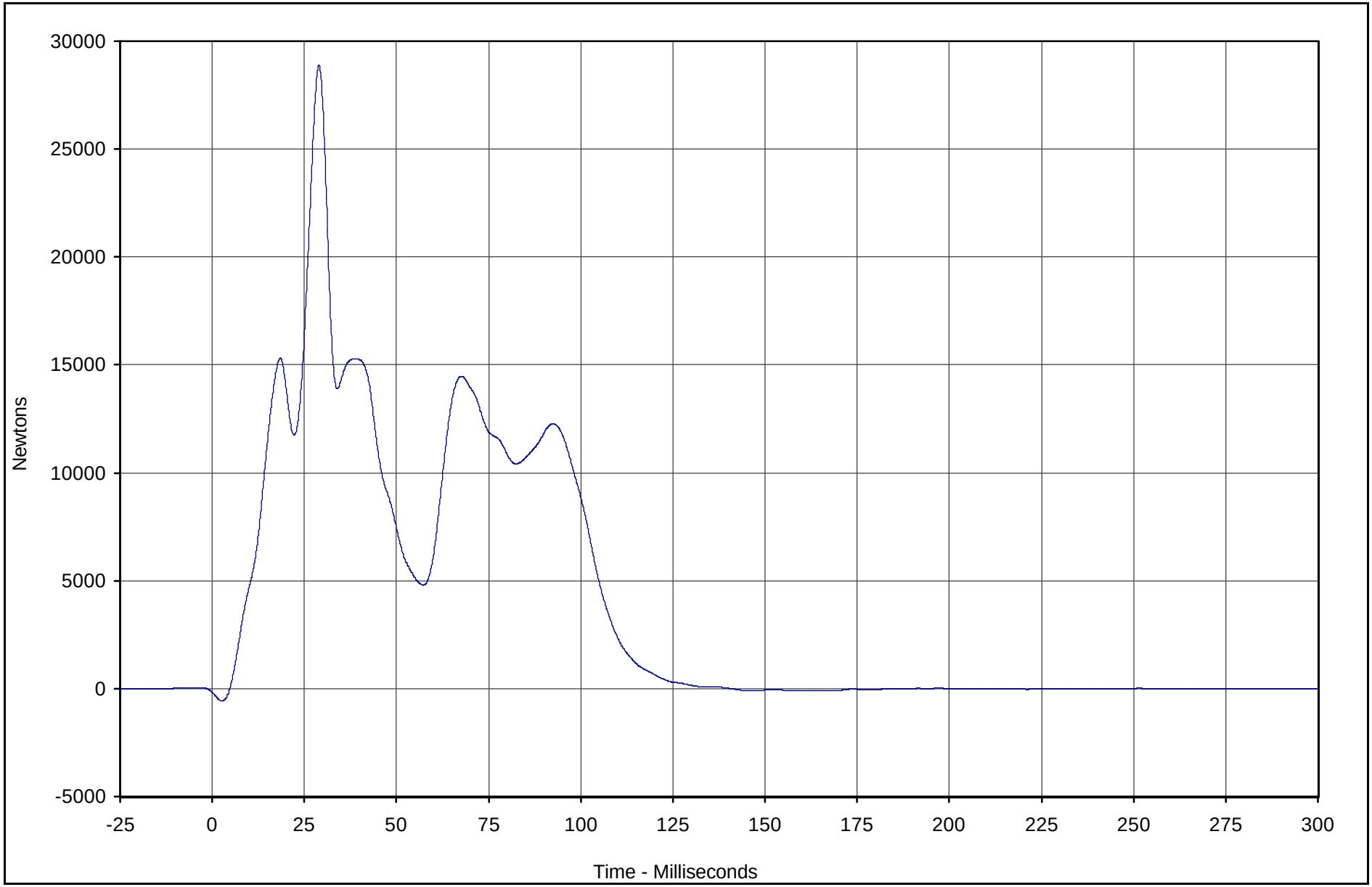
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C2	117	FIL	Newtons	28911.1	43.1	-620.6	3.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



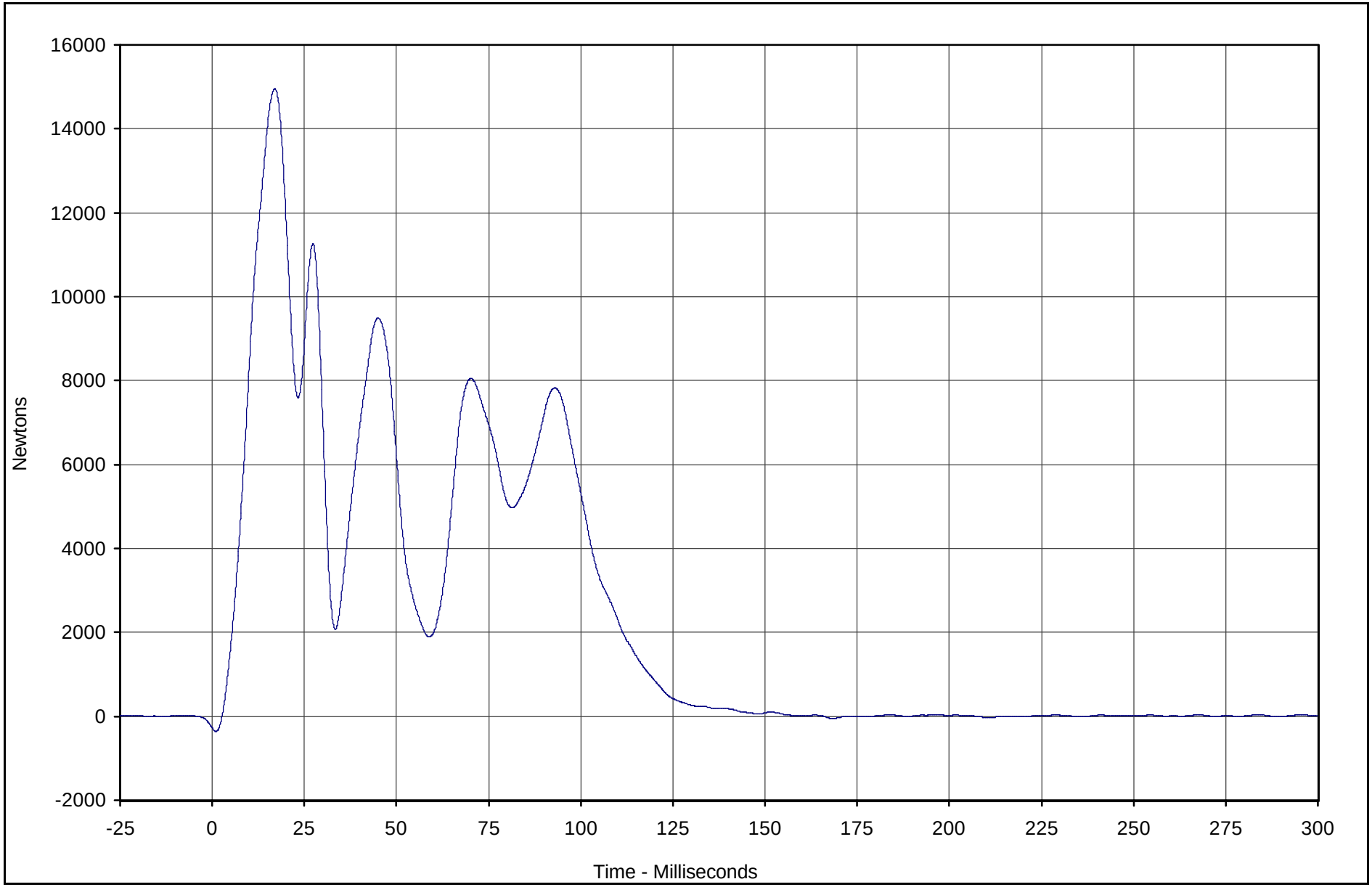
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C3	118	FIL	Newtons	28875.5	28.9	-565.6	2.7	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



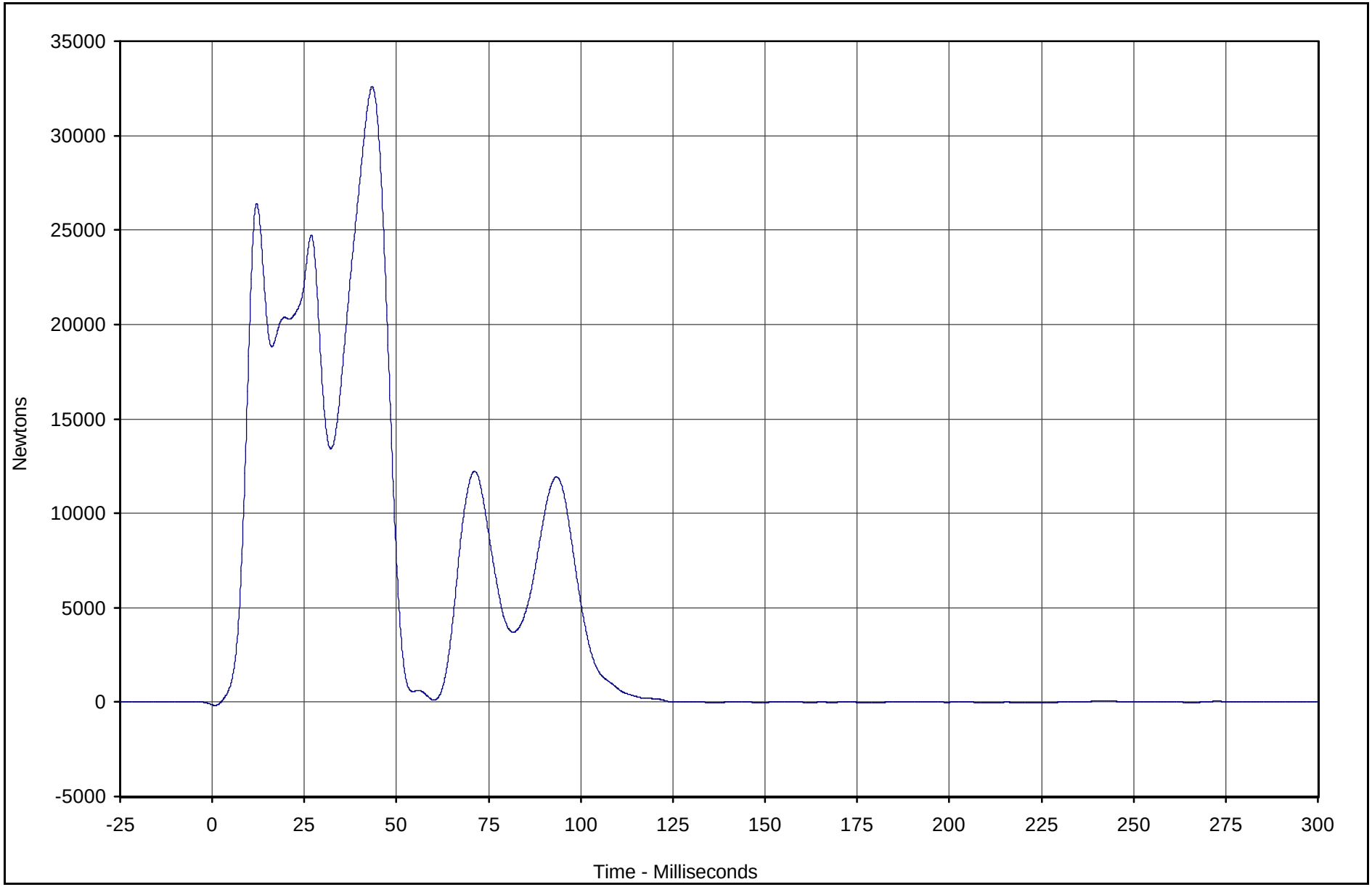
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C4	119	FIL	Newtons	14955.4	17.0	-365.3	1.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



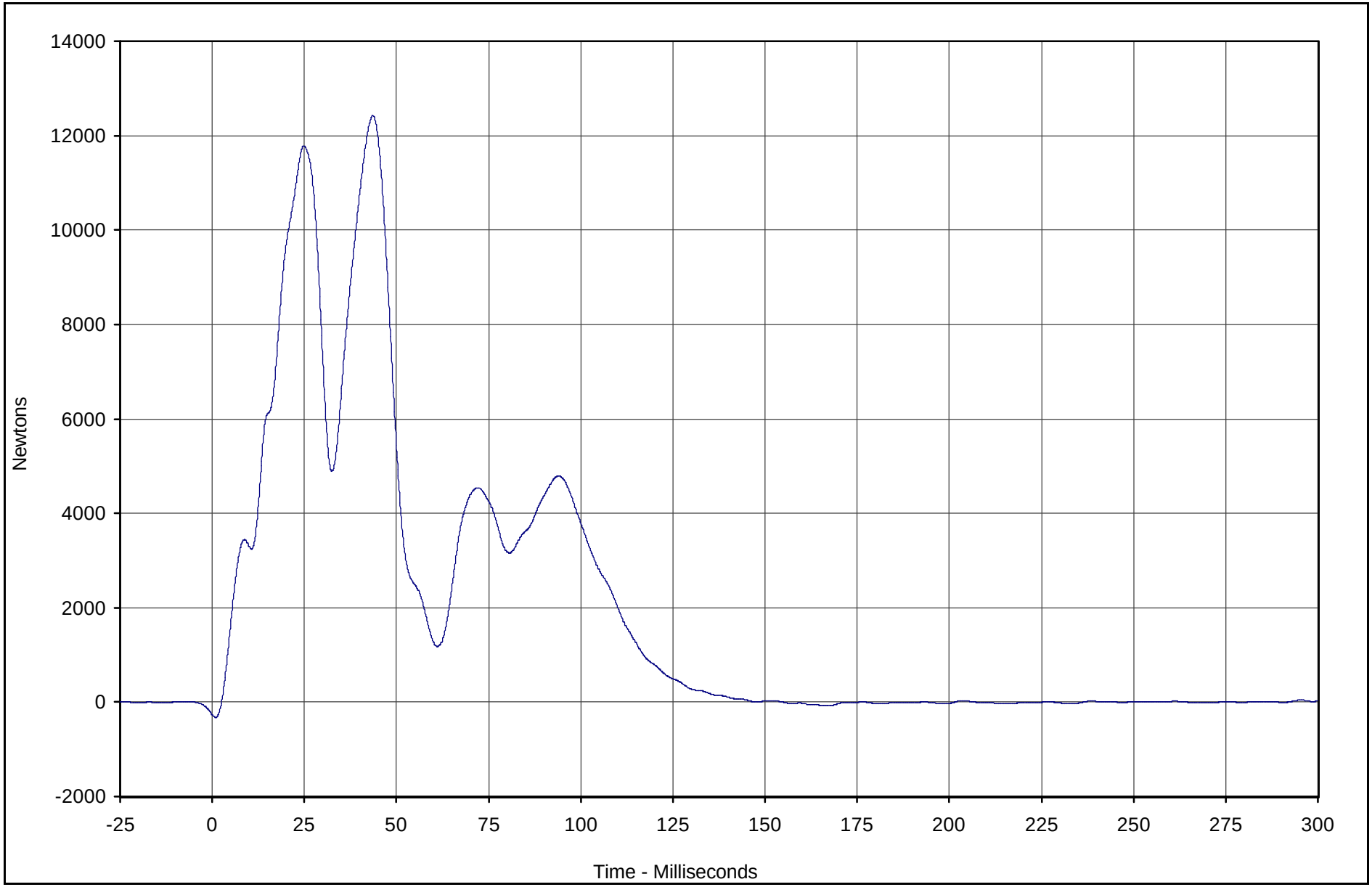
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C5	120	FIL	Newtons	32582.0	43.4	-171.8	0.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



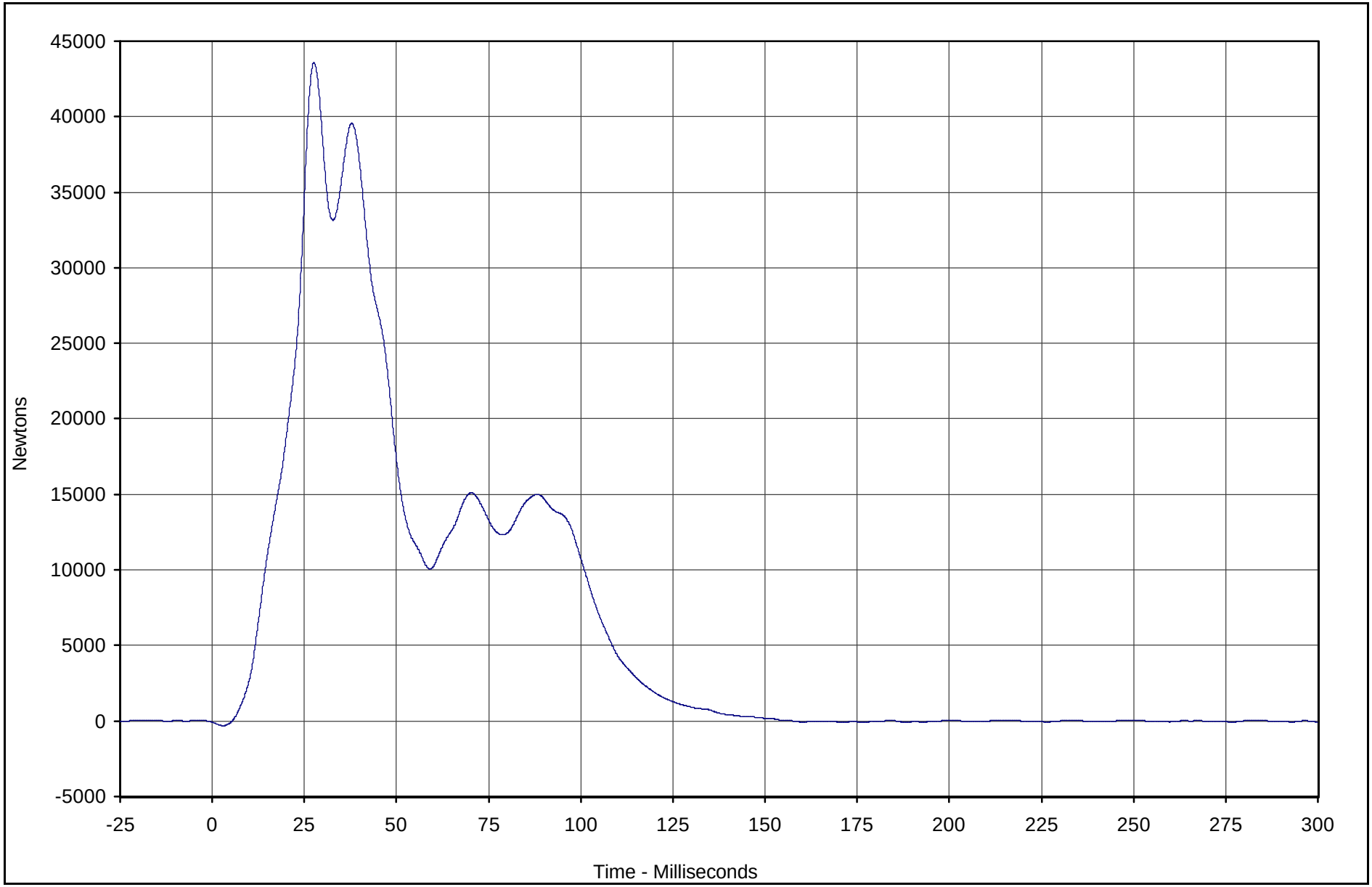
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C6	121	FIL	Newtons	12426.6	43.6	-323.8	0.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



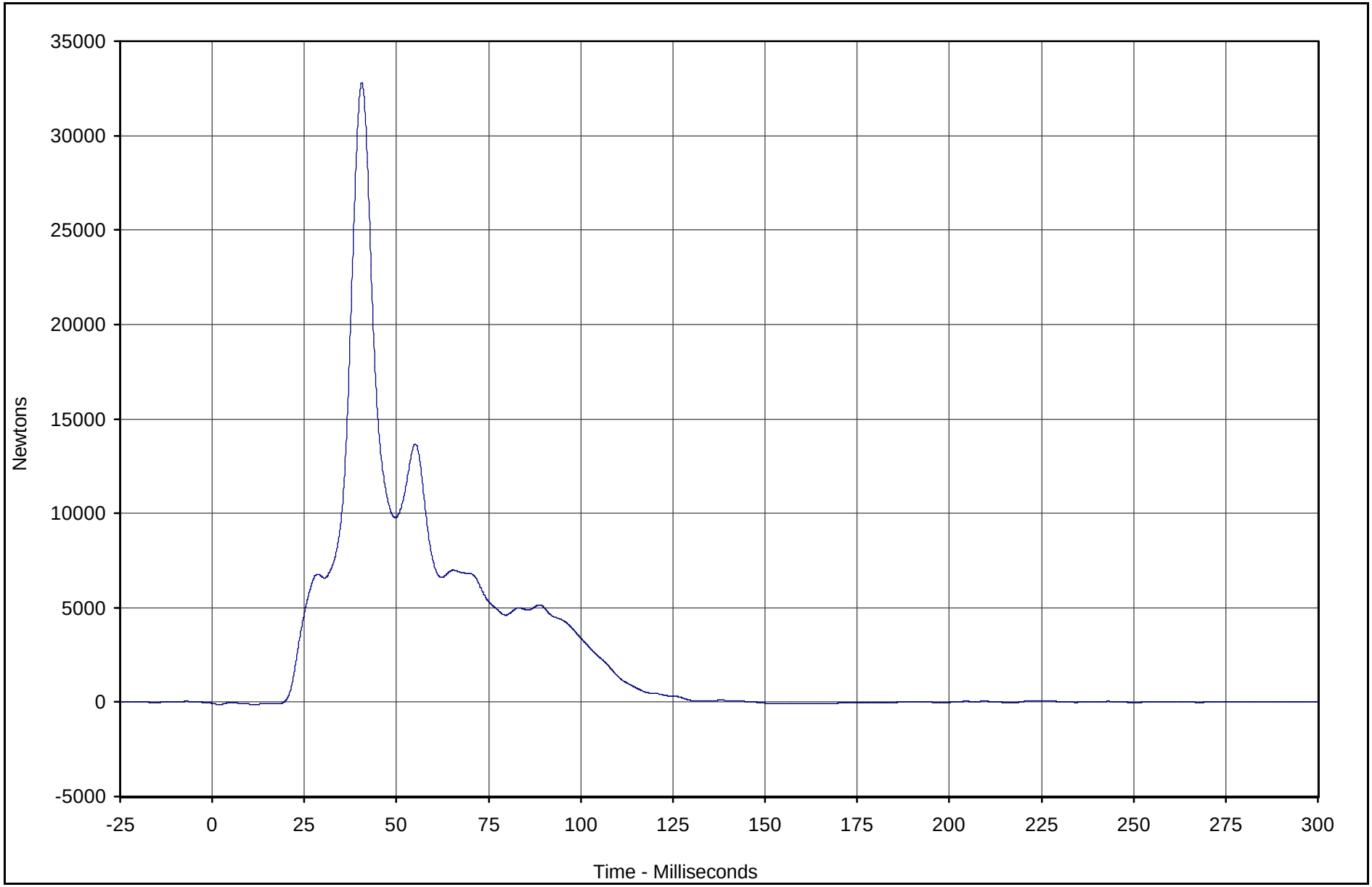
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C7	122	FIL	Newtons	43577.7	27.6	-312.4	2.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 10/7/03

NHTSA No.: M40100



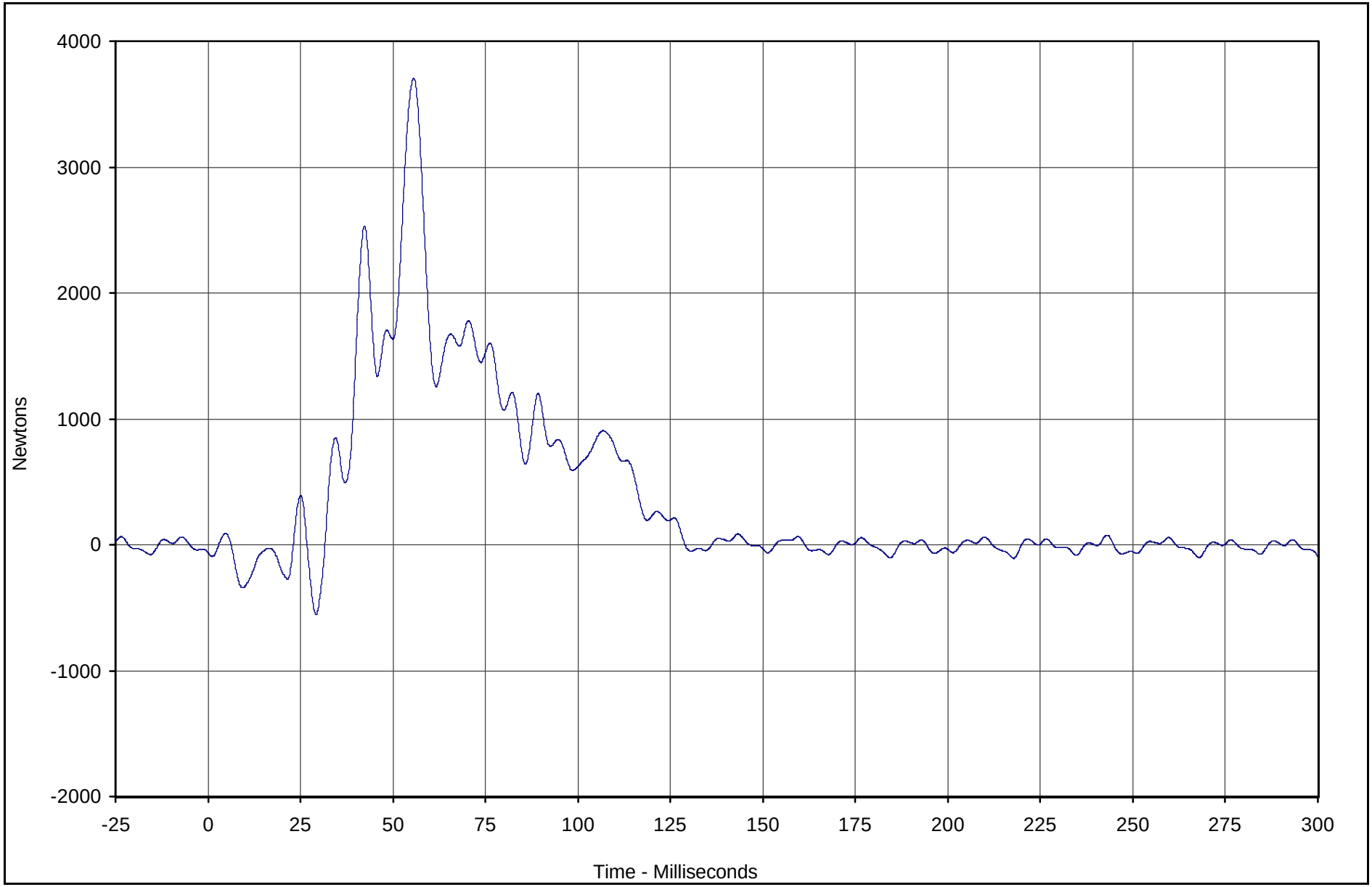
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C8	123	FIL	Newtons	32803.9	40.6	-149.6	11.3	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



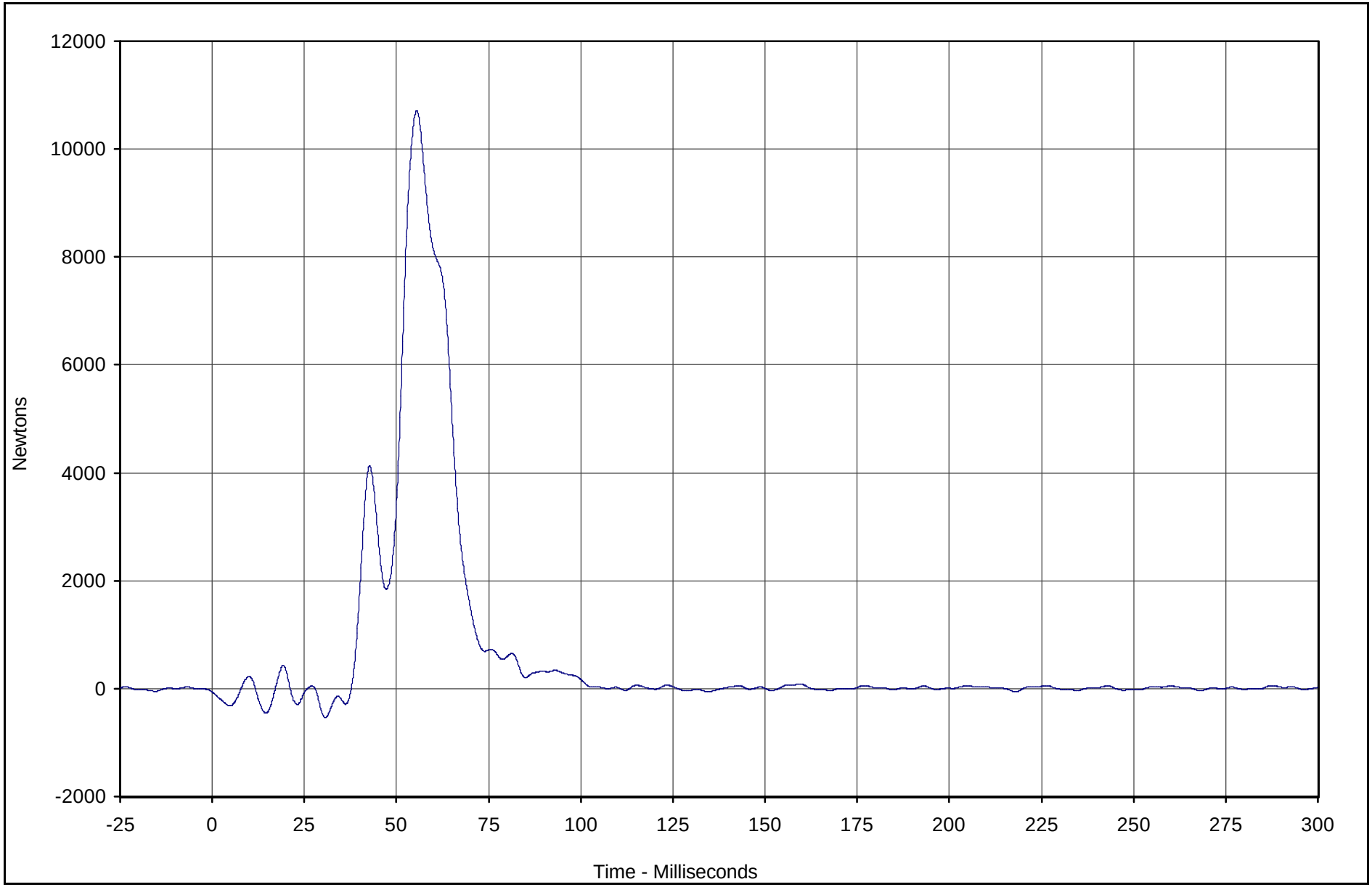
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force C9	124	FIL	Newtons	3706.7	55.6	-554.1	29.2	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 10/7/03

NHTSA No.: M40100



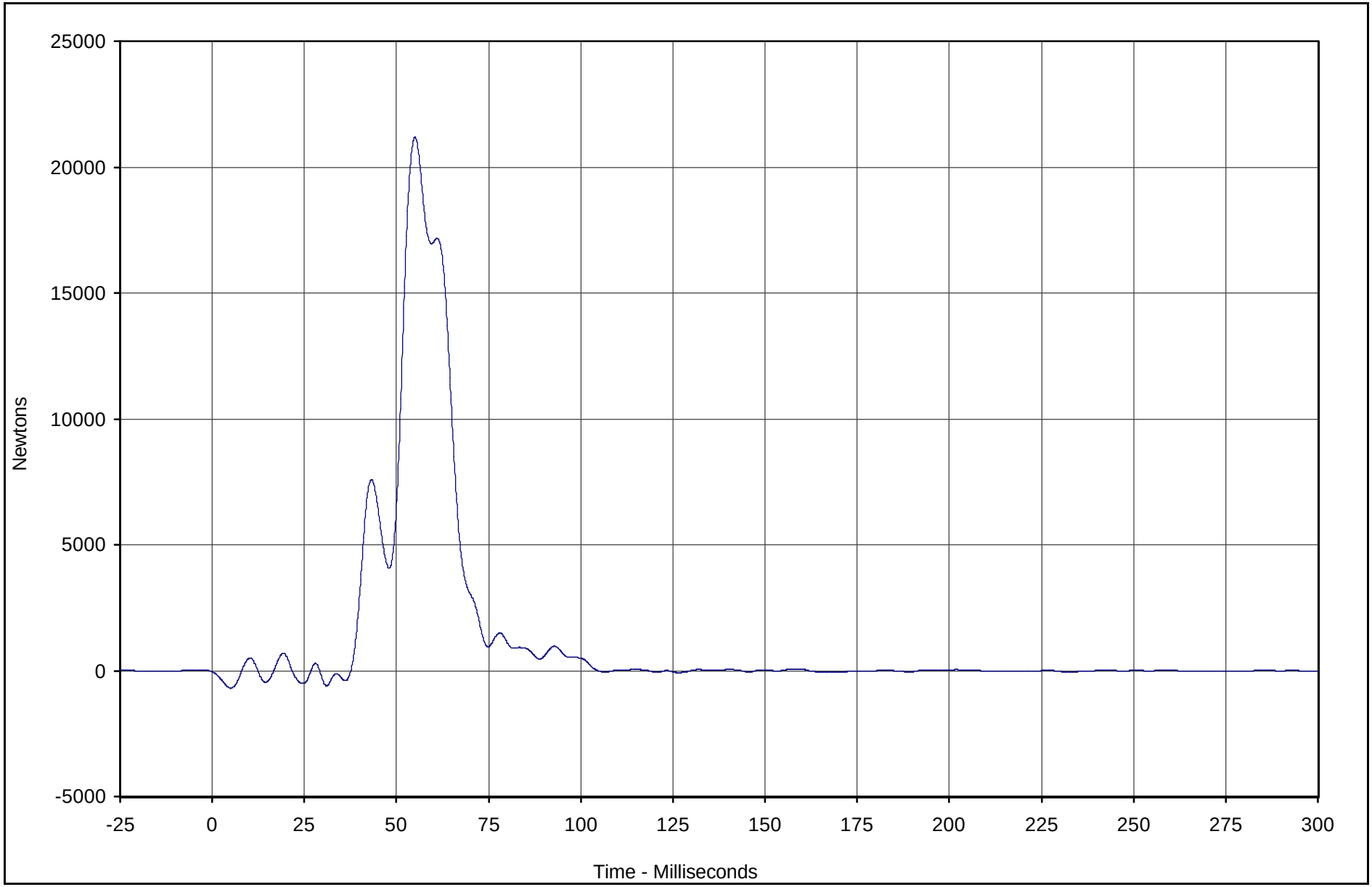
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D1	125	FIL	Newtons	10706.9	55.5	-536.2	30.6	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



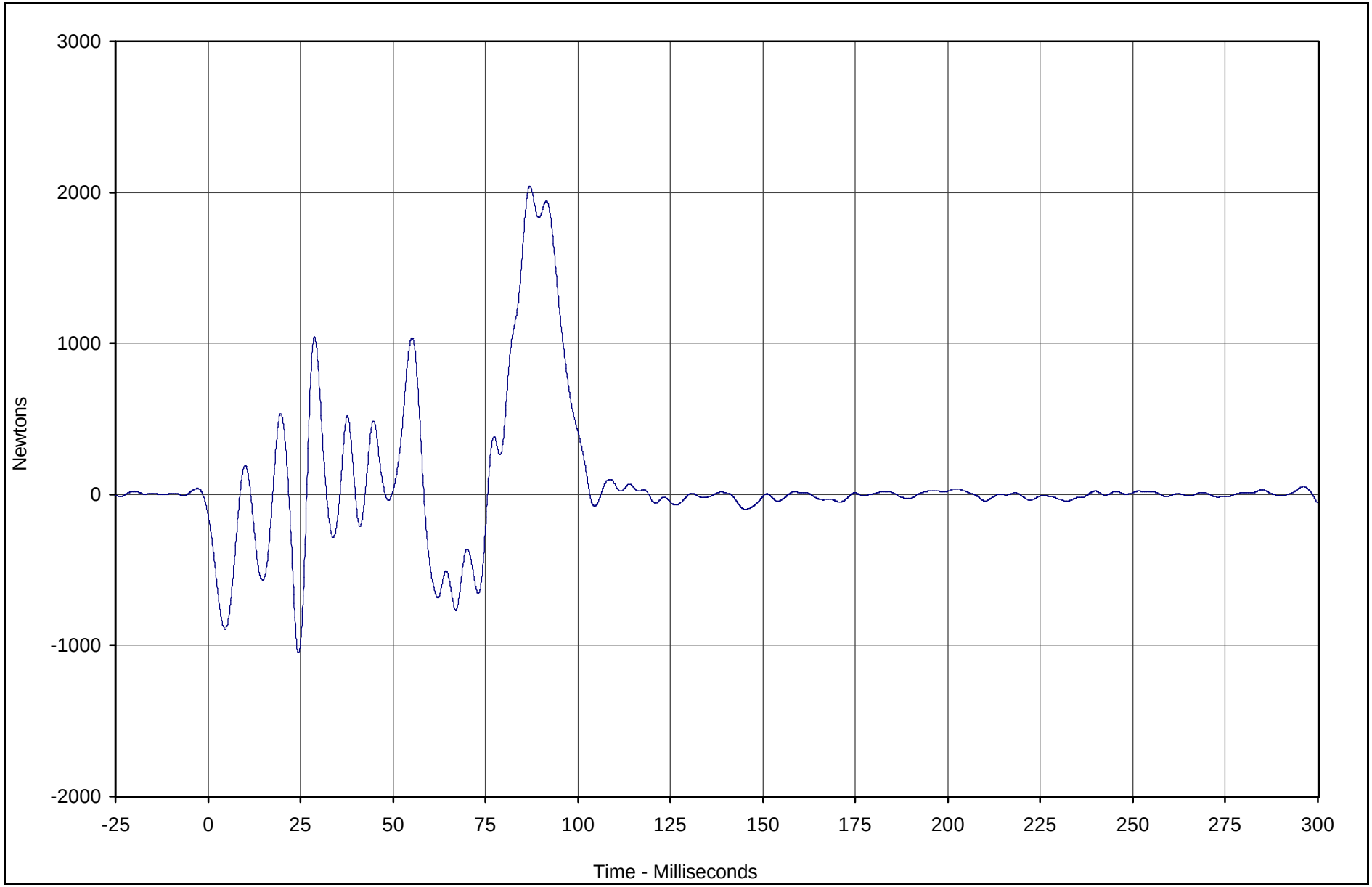
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D2	126	FIL	Newtons	21187.9	55.0	-701.8	5.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



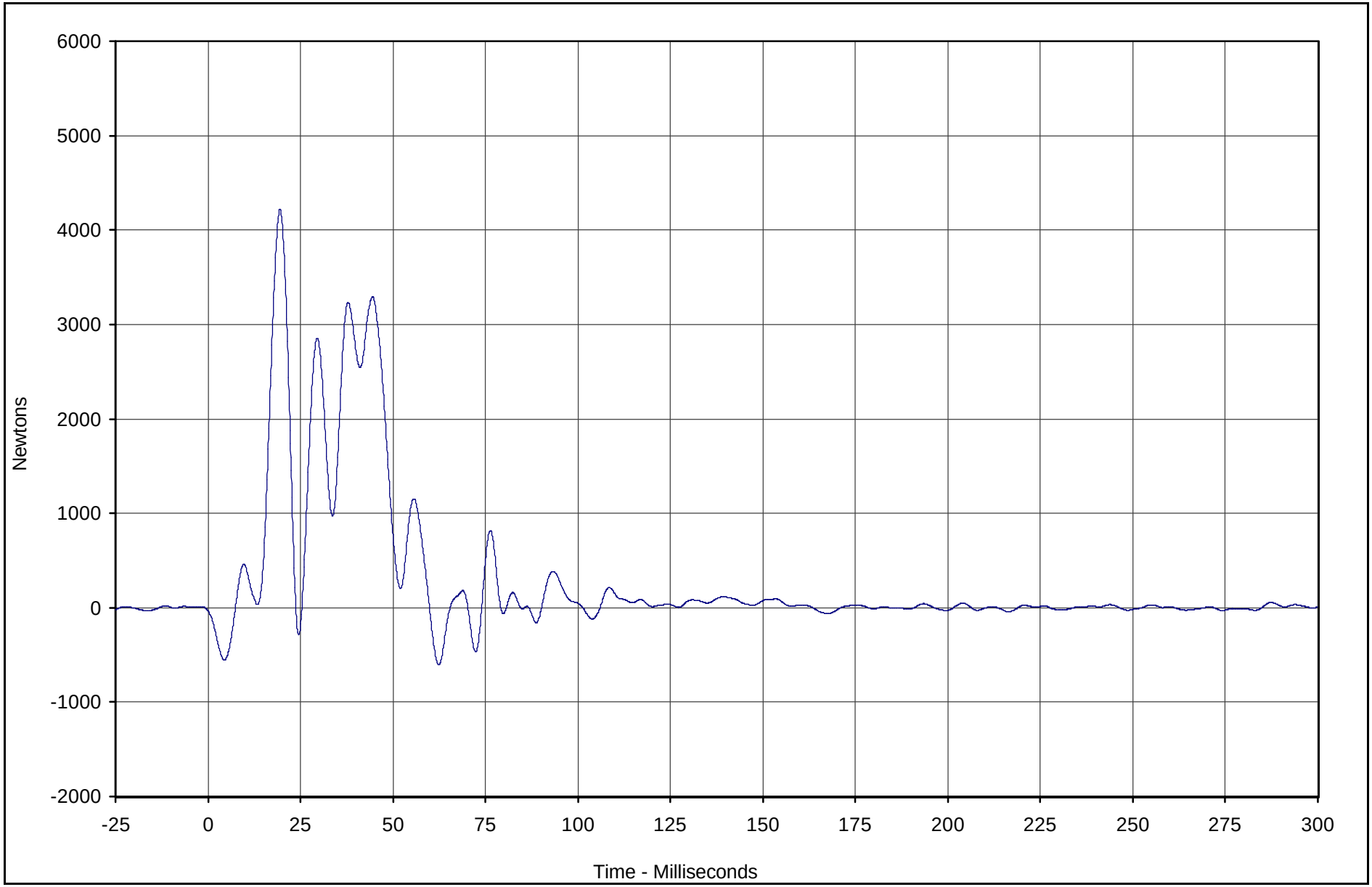
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D3	127	FIL	Newtons	2040.9	87.0	-1049.5	24.5	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



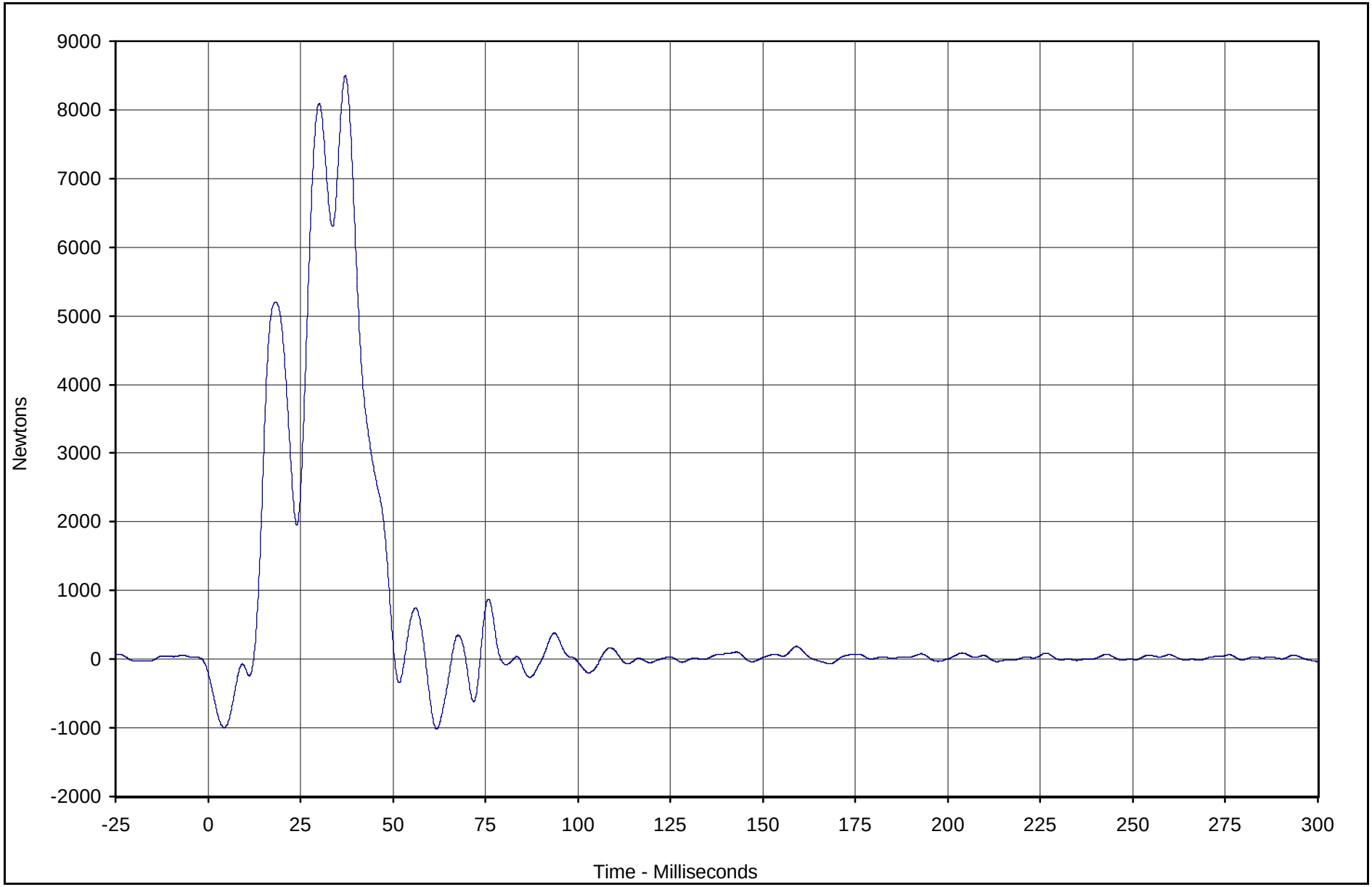
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D4	128	FIL	Newtons	4215.9	19.5	-605.7	62.4	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



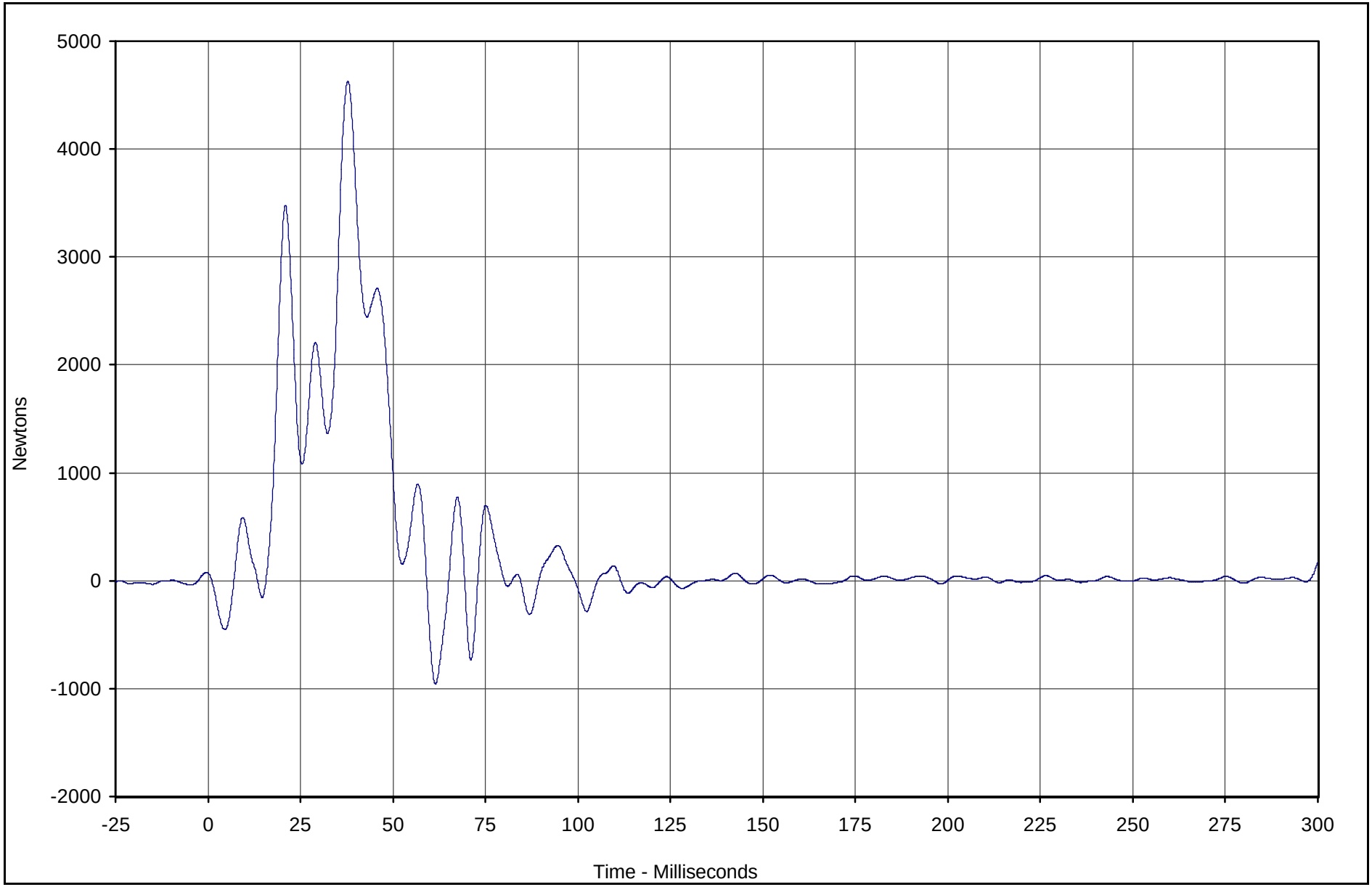
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D5	129	FIL	Newtons	8495.8	37.2	-1016.3	61.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



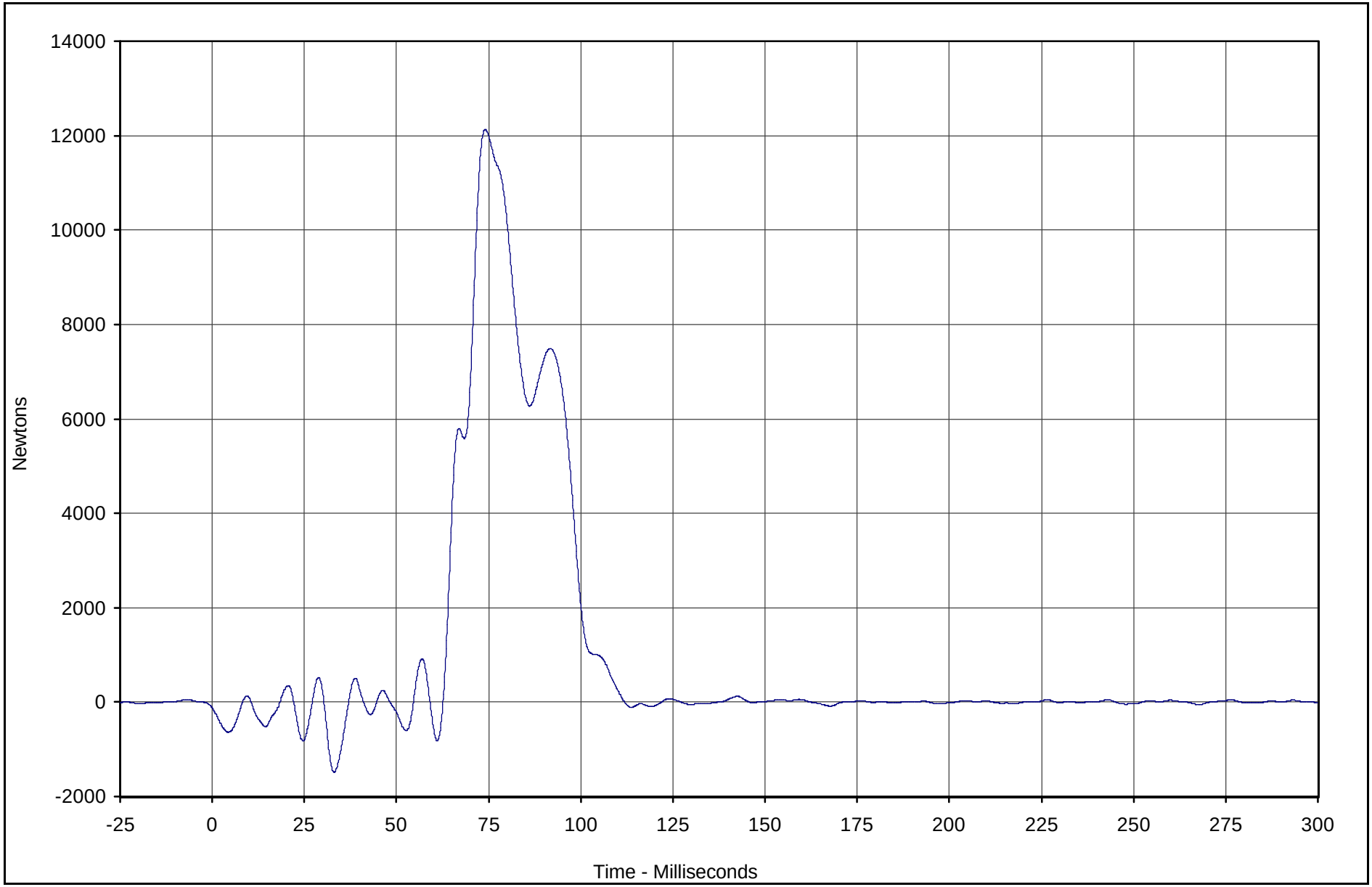
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D6	130	FIL	Newtons	4628.3	37.9	-957.6	61.5	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



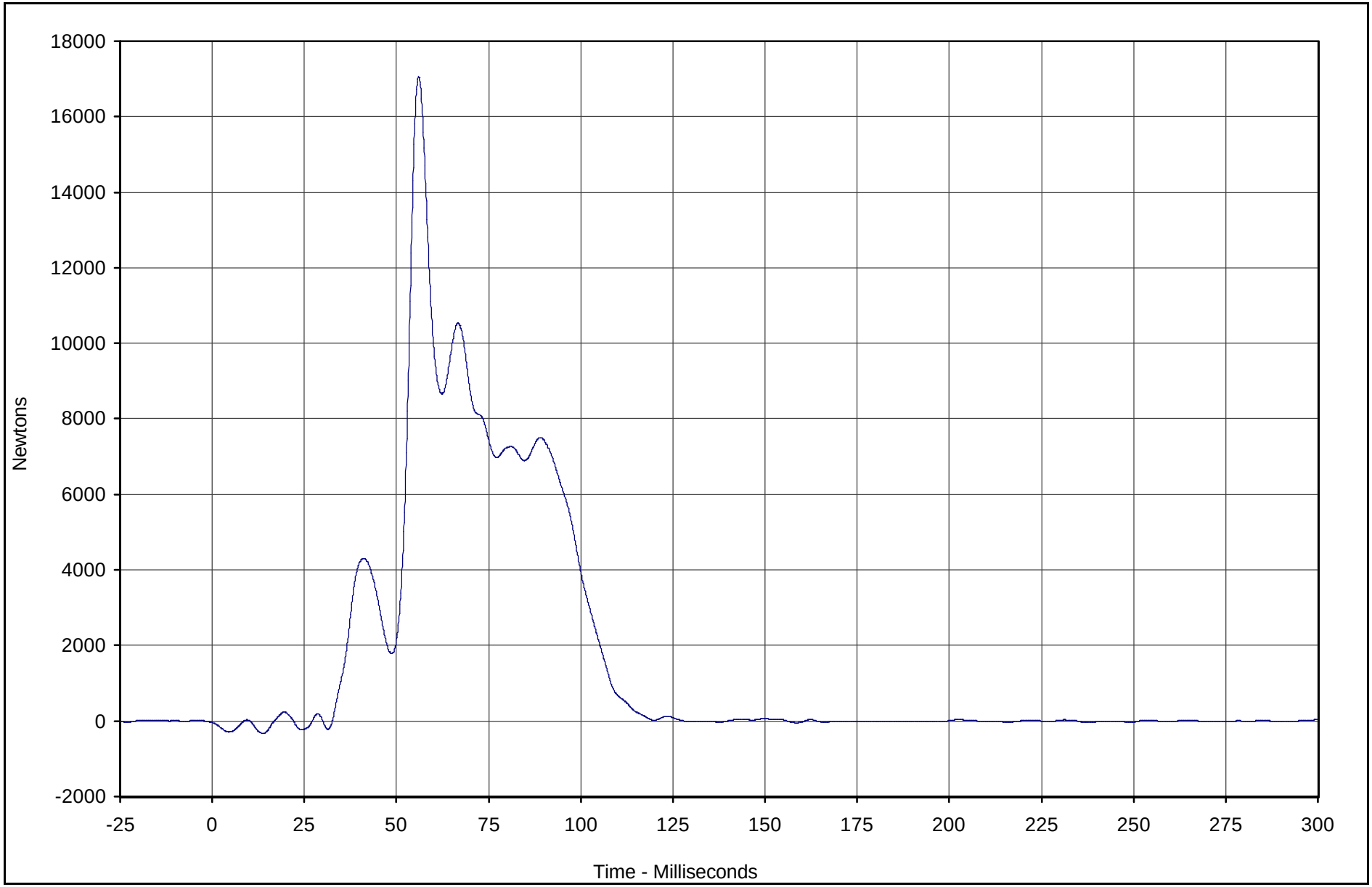
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D7	131	FIL	Newtons	12129.2	74.1	-1483.3	33.1	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



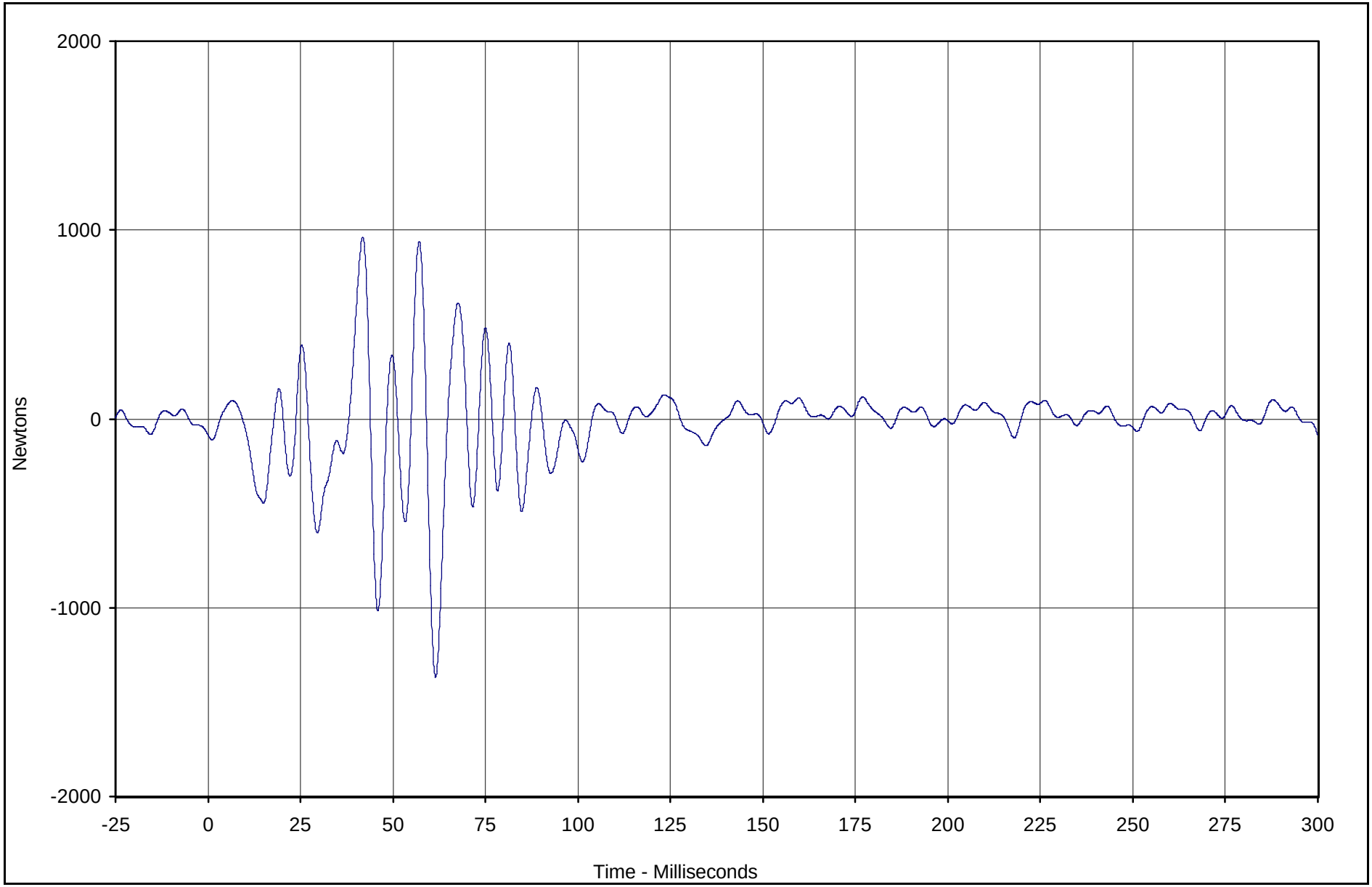
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D8	132	FIL	Newtons	17054.0	56.0	-327.1	13.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



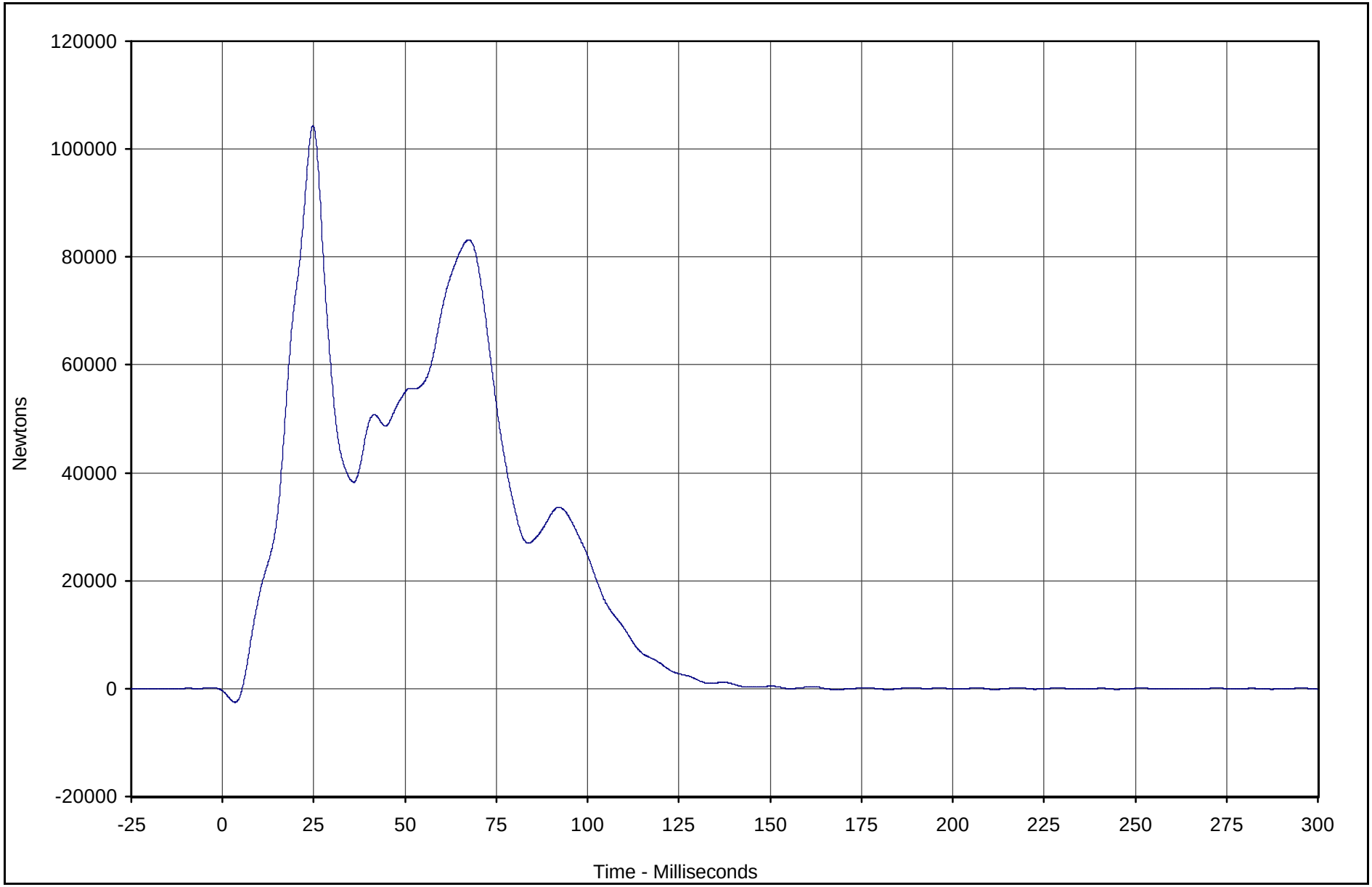
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force D9	133	FIL	Newtons	963.2	41.8	-1367.9	61.5	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



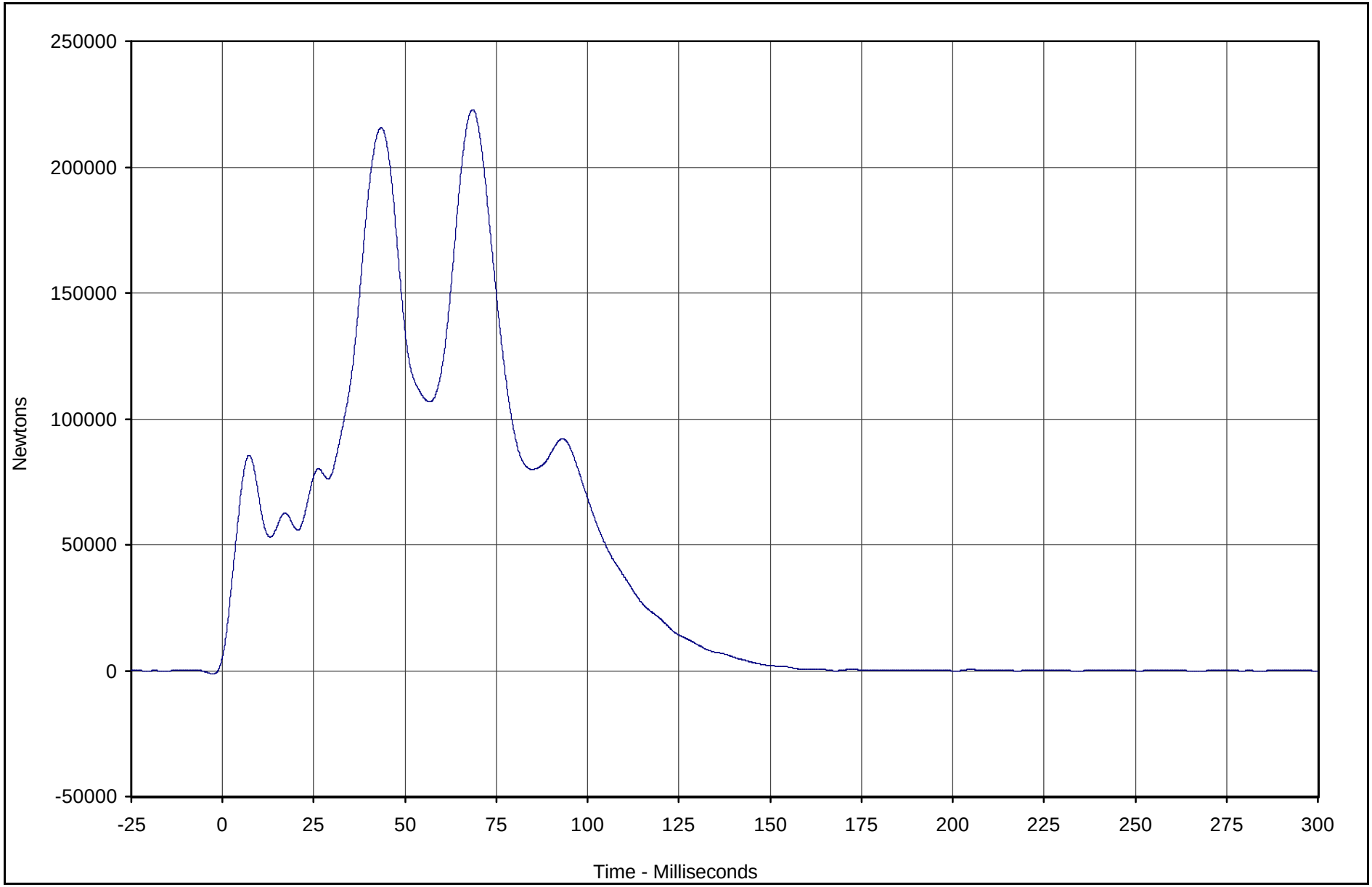
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 1	001	SUM	Newtons	104362.2	24.8	-2522.5	3.4	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



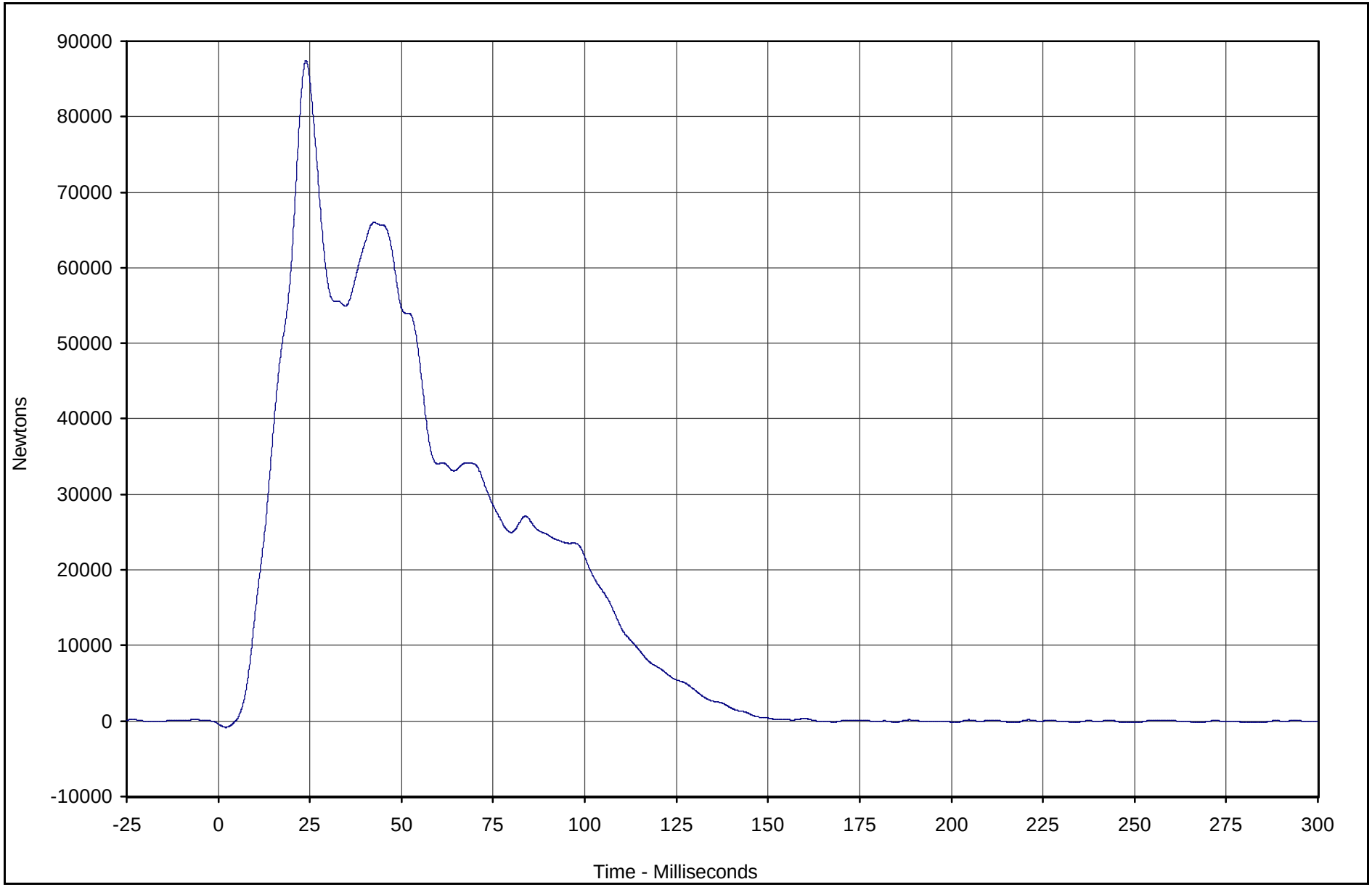
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 2	002	SUM	Newtons	222757.6	68.5	-237.8	299.9	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 10/7/03

NHTSA No.: M40100



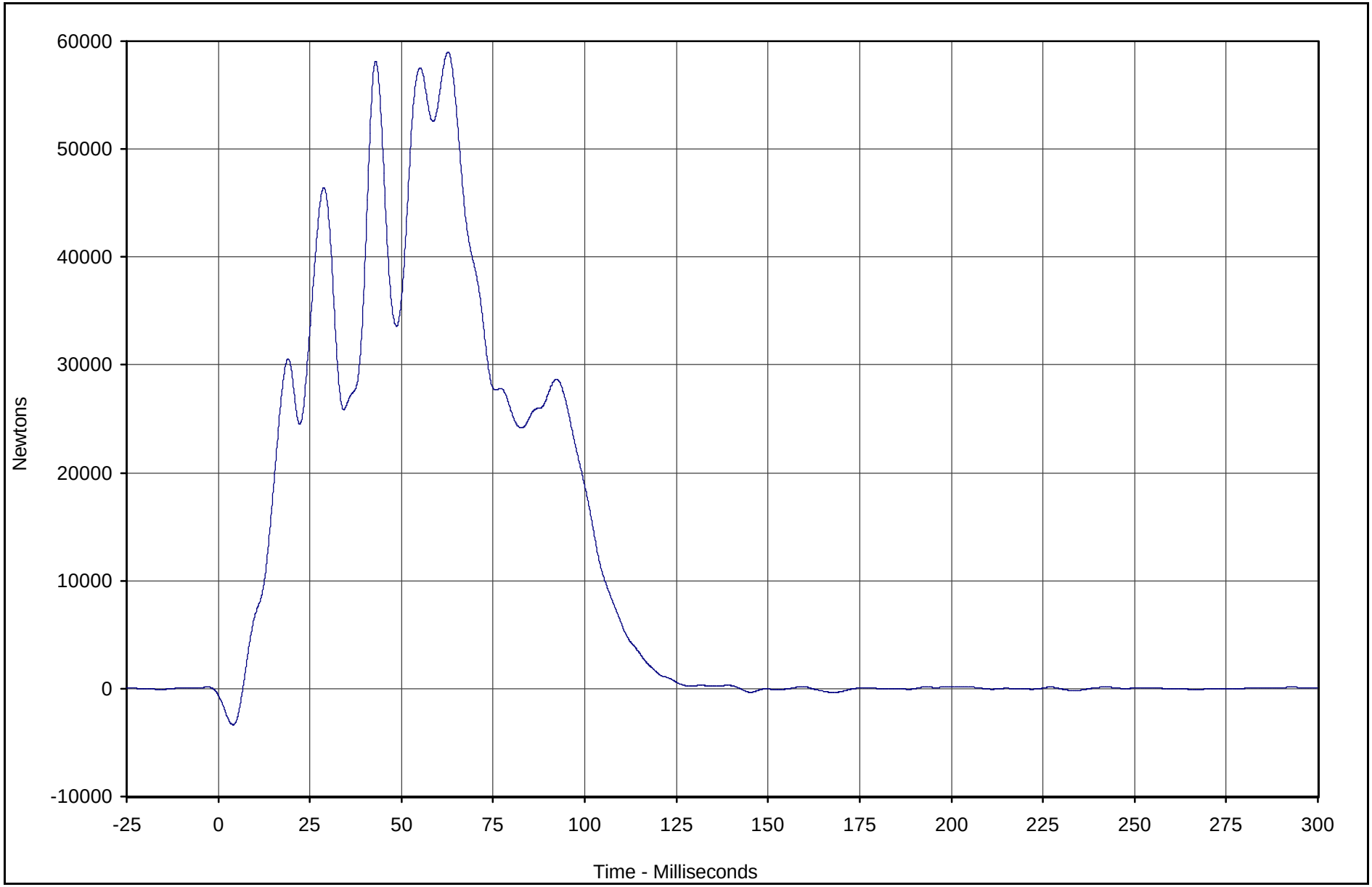
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 3	003	SUM	Newtons	87409.5	23.9	-840.1	2.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



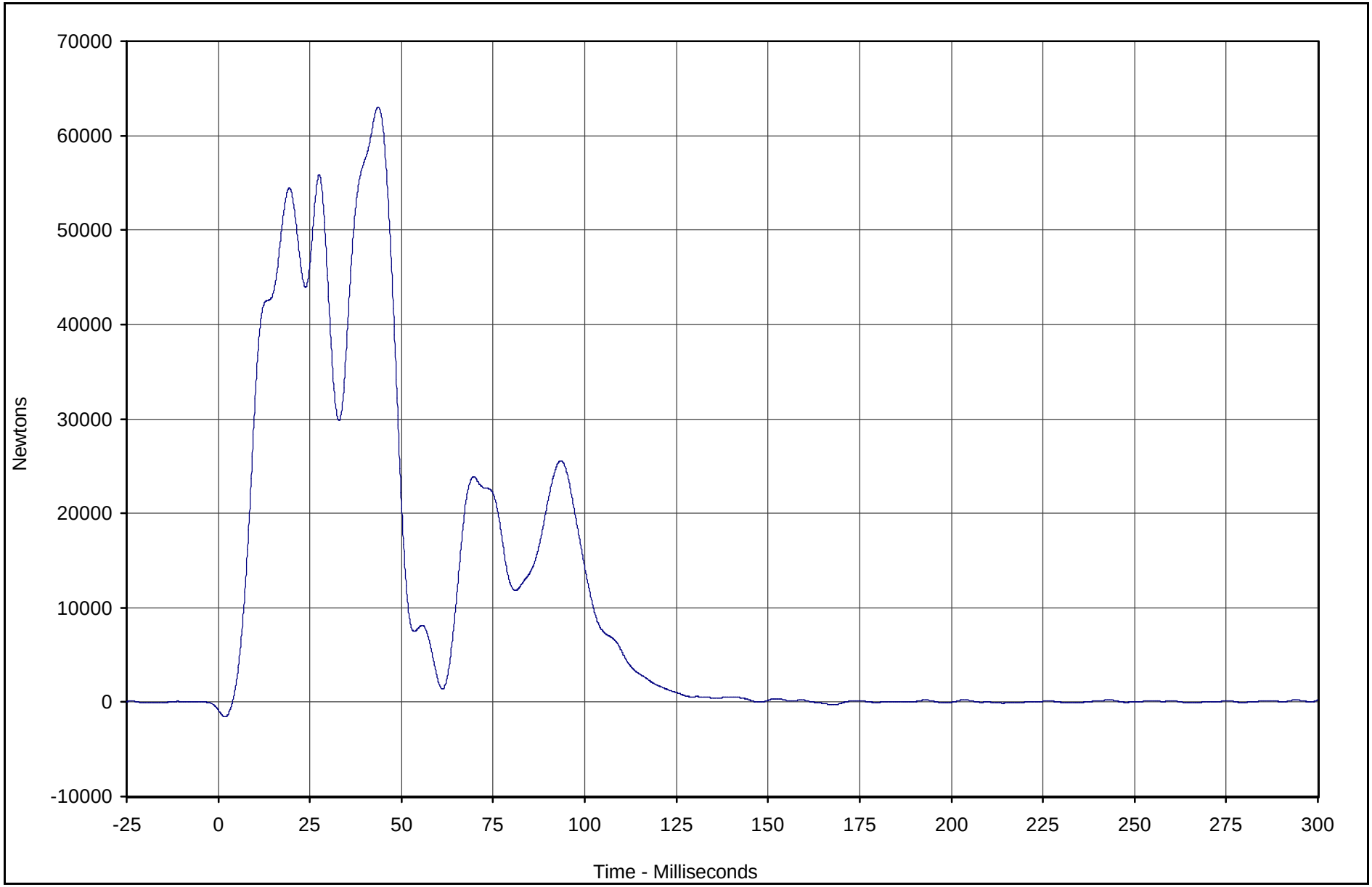
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 4	004	SUM	Newtons	59001.3	62.7	-3344.0	4.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



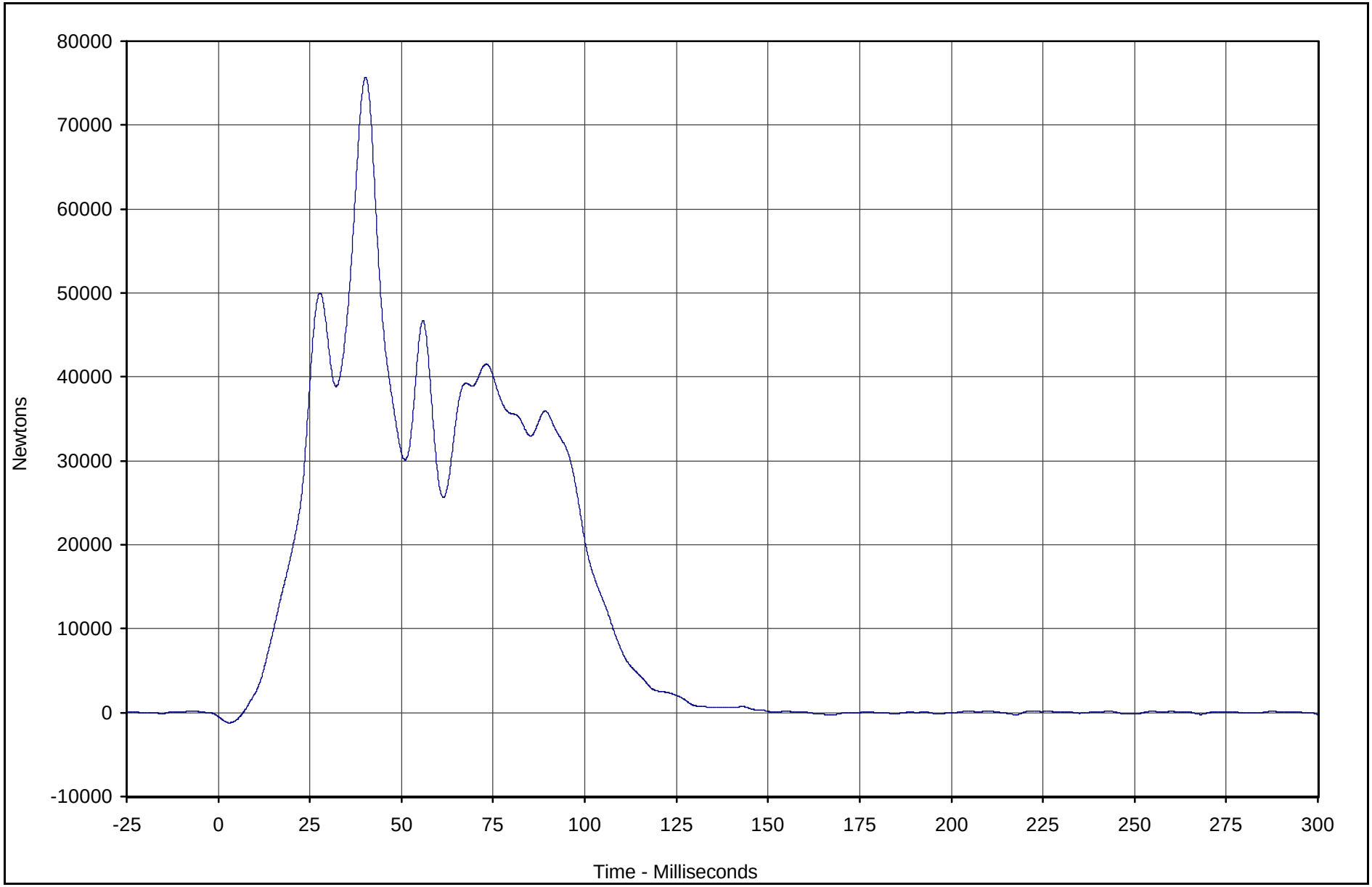
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 5	005	SUM	Newtons	63024.6	43.6	-1580.1	1.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Program: 2003 NHTSA 35mph NCAP

Test Date: 10/7/03

NHTSA No.: M40100



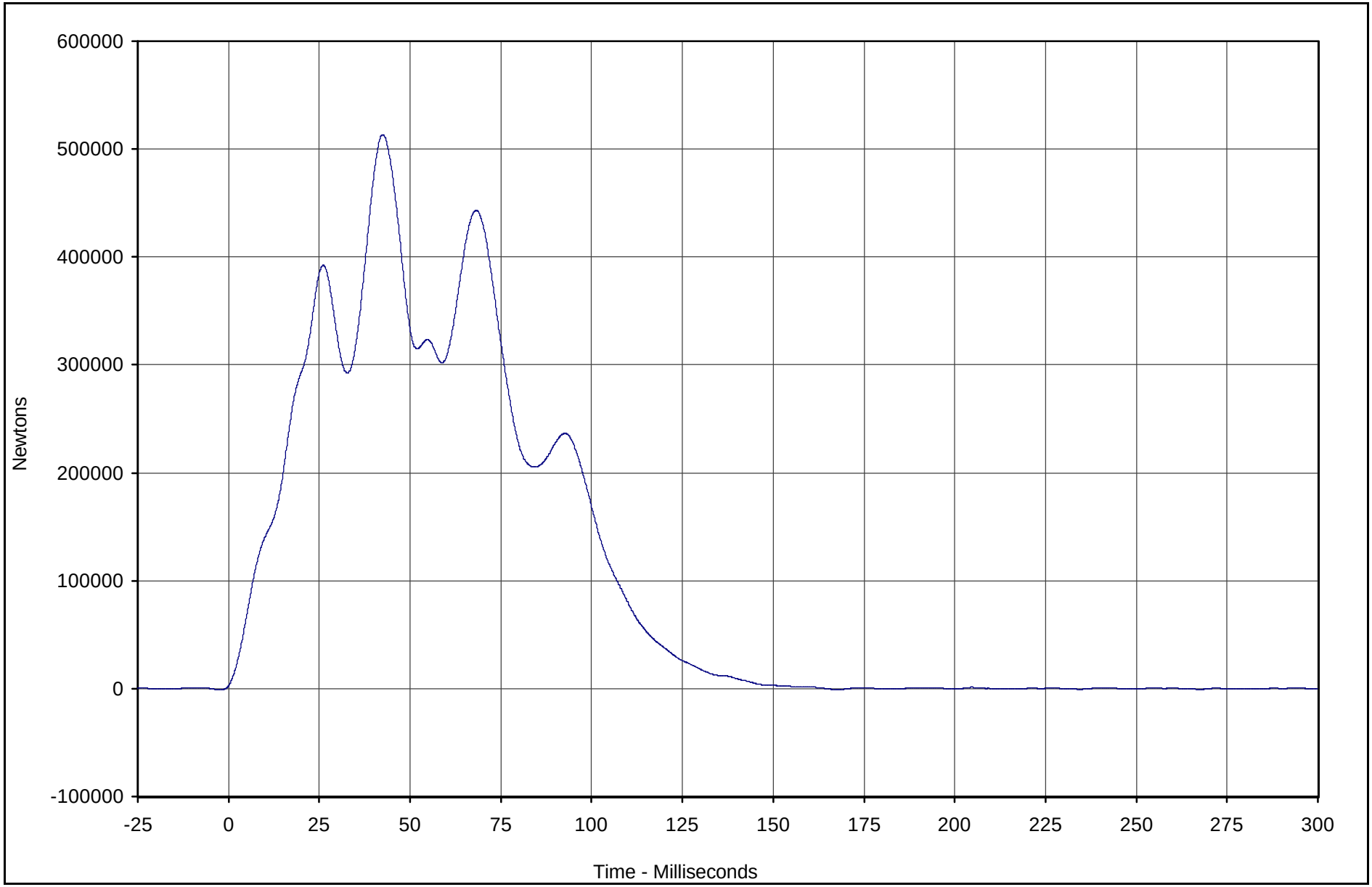
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 6	006	SUM	Newtons	75680.4	40.2	-1208.8	3.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



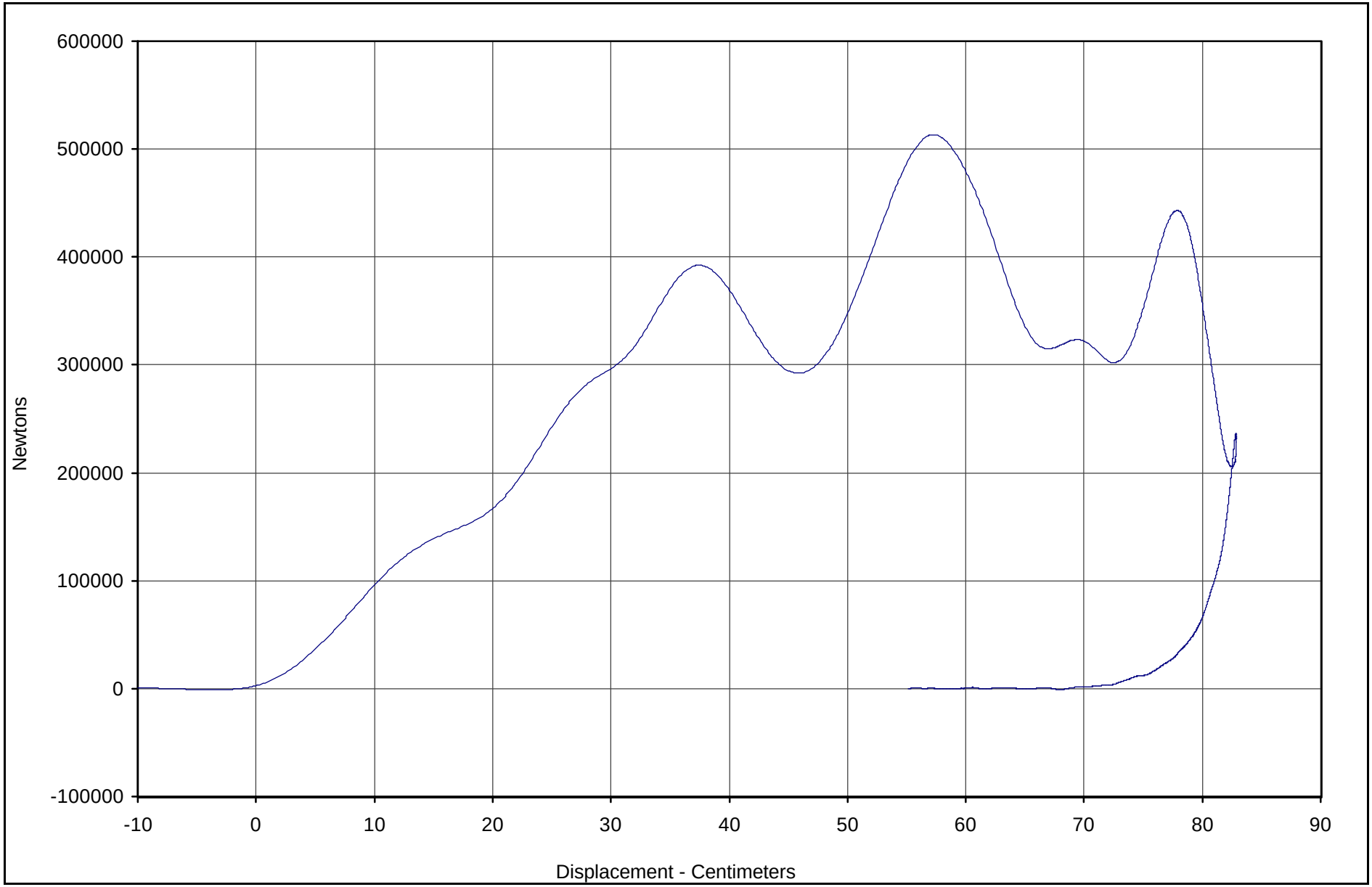
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Total Sum	007	SUM	Newtons	513338	42.5	-1250.8	167.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



Curve Description	CURNO	Type	Units	Max	CM	Energy (Joules)	SAE Class
Barrier Force Total Sum vs. Displ.	001	XVY	Newtons	513338	57.3	229871	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100

BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

Location	Units	Max	Time	Min	Time
Barrier Force A1	Newtons	3141.9	61.1	-1421.1	16.0
Barrier Force A2	Newtons	1536.7	46.8	-707.3	16.2
Barrier Force A3	Newtons	15502.8	66.5	-630.9	3.1
Barrier Force A4	Newtons	10310.2	58.2	-667.8	2.5
Barrier Force A5	Newtons	20682.6	55.9	-485.7	1.0
Barrier Force A6	Newtons	23321.2	67.9	-543.8	2.4
Barrier Force A7	Newtons	3384.5	54.1	-321.5	2.2
Barrier Force A8	Newtons	2167.7	53.7	-549.8	21.1
Barrier Force A9	Newtons	2443.0	61.0	-669.5	16.2
Barrier Force B1	Newtons	4366.0	60.0	-762.7	15.8
Barrier Force B2	Newtons	53543.7	24.7	-411.2	4.1
Barrier Force B3	Newtons	50812.0	24.2	-730.2	2.2
Barrier Force B4	Newtons	64235.4	68.3	-74.6	177.0
Barrier Force B5	Newtons	59868.5	43.3	-101.6	201.1
Barrier Force B6	Newtons	93456.8	42.9	-86.3	168.2
Barrier Force B7	Newtons	84287.6	23.7	-473.2	2.4
Barrier Force B8	Newtons	5175.0	53.4	-35.4	247.3
Barrier Force B9	Newtons	3608.5	82.8	-518.7	9.2
Barrier Force C1	Newtons	8097.7	52.4	-617.4	22.7
Barrier Force C2	Newtons	28911.1	43.1	-620.6	3.9
Barrier Force C3	Newtons	28875.5	28.9	-565.6	2.7
Barrier Force C4	Newtons	14955.4	17.0	-365.3	1.0
Barrier Force C5	Newtons	32582.0	43.4	-171.8	0.8
Barrier Force C6	Newtons	12426.6	43.6	-323.8	0.9
Barrier Force C7	Newtons	43577.7	27.6	-312.4	2.9
Barrier Force C8	Newtons	32803.9	40.6	-149.6	11.3
Barrier Force C9	Newtons	3706.7	55.6	-554.1	29.2
Barrier Force D1	Newtons	10706.9	55.5	-536.2	30.6
Barrier Force D2	Newtons	21187.9	55.0	-701.8	5.0
Barrier Force D3	Newtons	2040.9	87.0	-1049.5	24.5
Barrier Force D4	Newtons	4215.9	19.5	-605.7	62.4
Barrier Force D5	Newtons	8495.8	37.2	-1016.3	61.8
Barrier Force D6	Newtons	4628.3	37.9	-957.6	61.5
Barrier Force D7	Newtons	12129.2	74.1	-1483.3	33.1
Barrier Force D8	Newtons	17054.0	56.0	-327.1	13.9
Barrier Force D9	Newtons	963.2	41.8	-1367.9	61.5
Barrier Force Sum Group 1	Newtons	104362.2	24.8	-2522.5	3.4
Barrier Force Sum Group 2	Newtons	222757.6	68.5	-237.8	299.9
Barrier Force Sum Group 3	Newtons	87409.5	23.9	-840.1	2.0
Barrier Force Sum Group 4	Newtons	59001.3	62.7	-3344.0	4.0
Barrier Force Sum Group 5	Newtons	63024.6	43.6	-1580.1	1.8
Barrier Force Sum Group 6	Newtons	75680.4	40.2	-1208.8	3.0
Barrier Force Total Sum	Newtons	513338.2	42.5	-1250.8	167.8

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 35
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
8	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
9	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
11	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
12	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	CHEST , PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST , PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST , PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST , REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
17	CHEST , REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
18	CHEST , REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
19	CHEST DISPLACEMENT	X	GPCP002	Rotary Pot Chest	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
21	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
22	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
23	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	KEFF004	Load cell, Femur	R.A. Denton	2121	N

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 35
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

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	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT, AFT	Z	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT, FORE	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT, AFT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT, AFT	Z	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT, FORE	Z	KEIC001Z	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	MM
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 34
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	KEAC039	Accel.,1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	KEAC038	Accel.,1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	KEAC027	Accel.,1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	KEAC031	Accel.,1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	KEAC032	Accel.,1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	KEAC026	Accel.,1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
52	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
53	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
54	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
55	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
56	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
57	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	KEAC023	Accel.,1/2 bridge	Endevco	7264-200	G
61	CHEST , REDUNDANT	Y	KEAC022	Accel.,1/2 bridge	Endevco	7264-200	G
62	CHEST , REDUNDANT	Z	KEAC024	Accel.,1/2 bridge	Endevco	7264-200	G
63	CHEST DISPLACEMENT	X	GPCP001	Rotary Pot Chest	Servo	14CBI	MM
64	PELVIS, PRIMARY	X	KEAC019	Accel.,1/2 bridge	Endevco	7264-200	G
65	PELVIS, PRIMARY	Y	KEAC020	Accel.,1/2 bridge	Endevco	7264-200	G
66	PELVIS, PRIMARY	Z	KEAC021	Accel.,1/2 bridge	Endevco	7264-200	G
67	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 34
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
70	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
71	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
72	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
73	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
74	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
75	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
76	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
77	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
78	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
79	FOOT LEFT, AFT	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT, AFT	Z	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT, FORE	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT, AFT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT, AFT	Z	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT, FORE	Z	KEIC004Z	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	CM
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
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

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
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

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
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

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.: LK08C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5502	Pass
		Overall Test Results		Pass

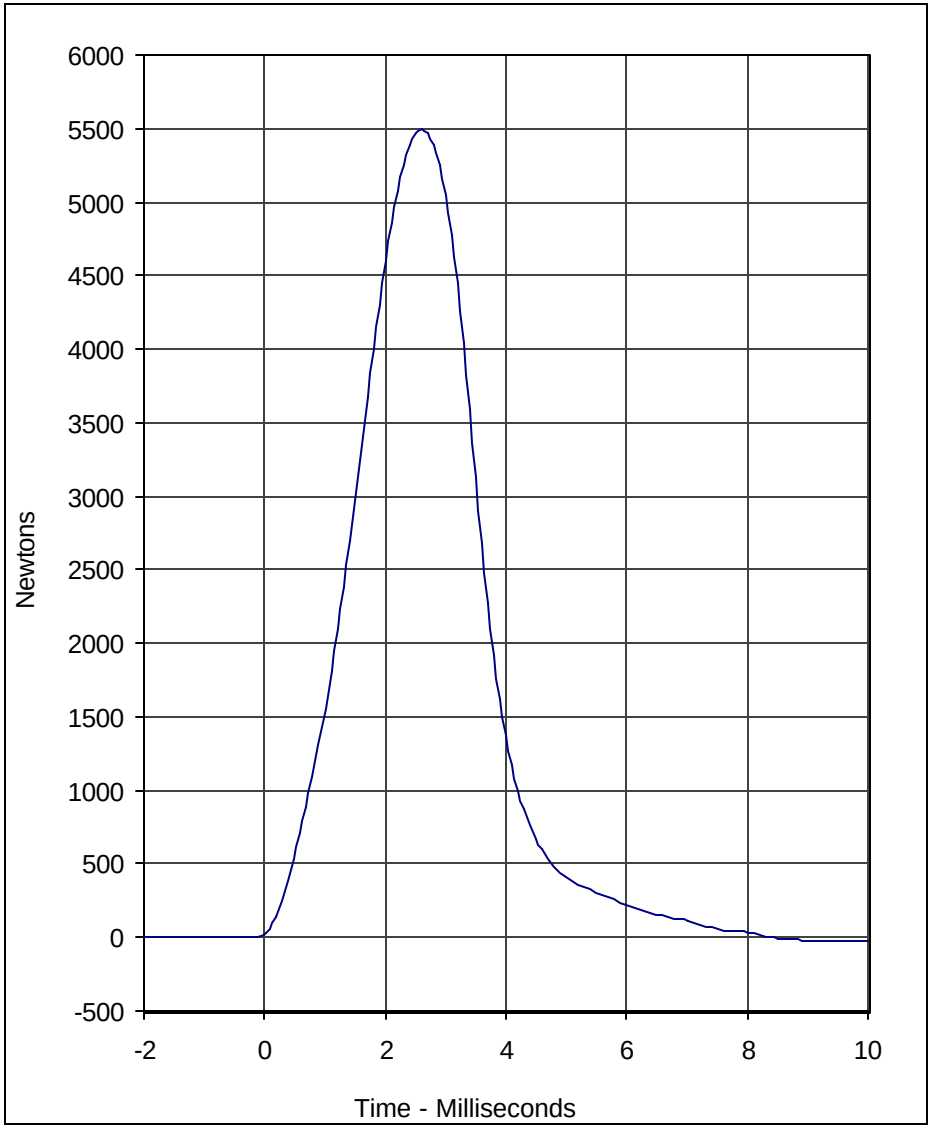
ATD Serial No.: 034 Location: Right Knee Test I.D.: RK08C

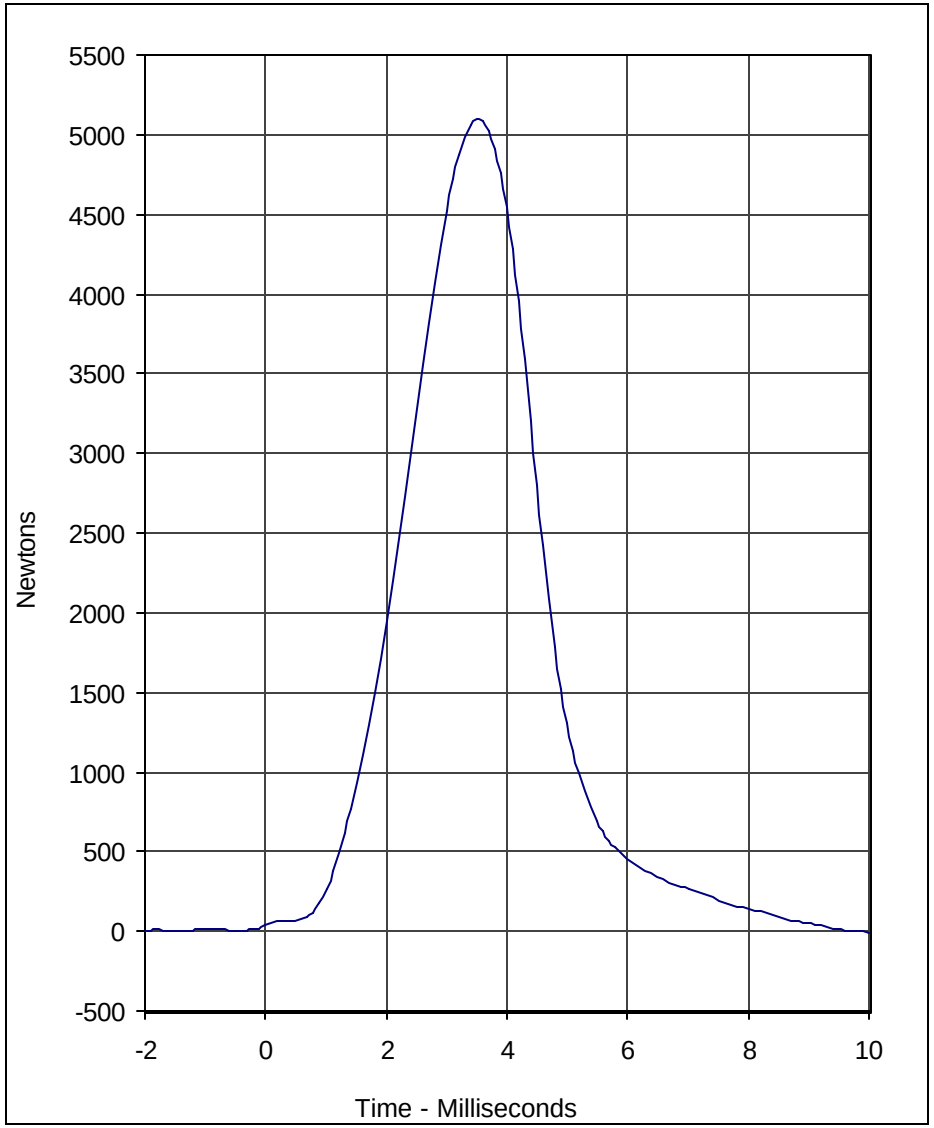
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5098	Pass
		Overall Test Results		Pass

Laboratory Technician

September 26, 2003

Test Date





Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Left Knee	LK08C	001	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5501.7	2.6	-21.9	9.0	600

Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Right Knee	RK08C	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5098.4	3.5	-7.4	10.0	600

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

Test Date: 9/26/03

A.T.D. Serial No.: 034

KARCO Engineering

Calibration Data Sheet
Hybrid III 50th Percentile Male
Head Drop Test

ATD Serial No.: 034

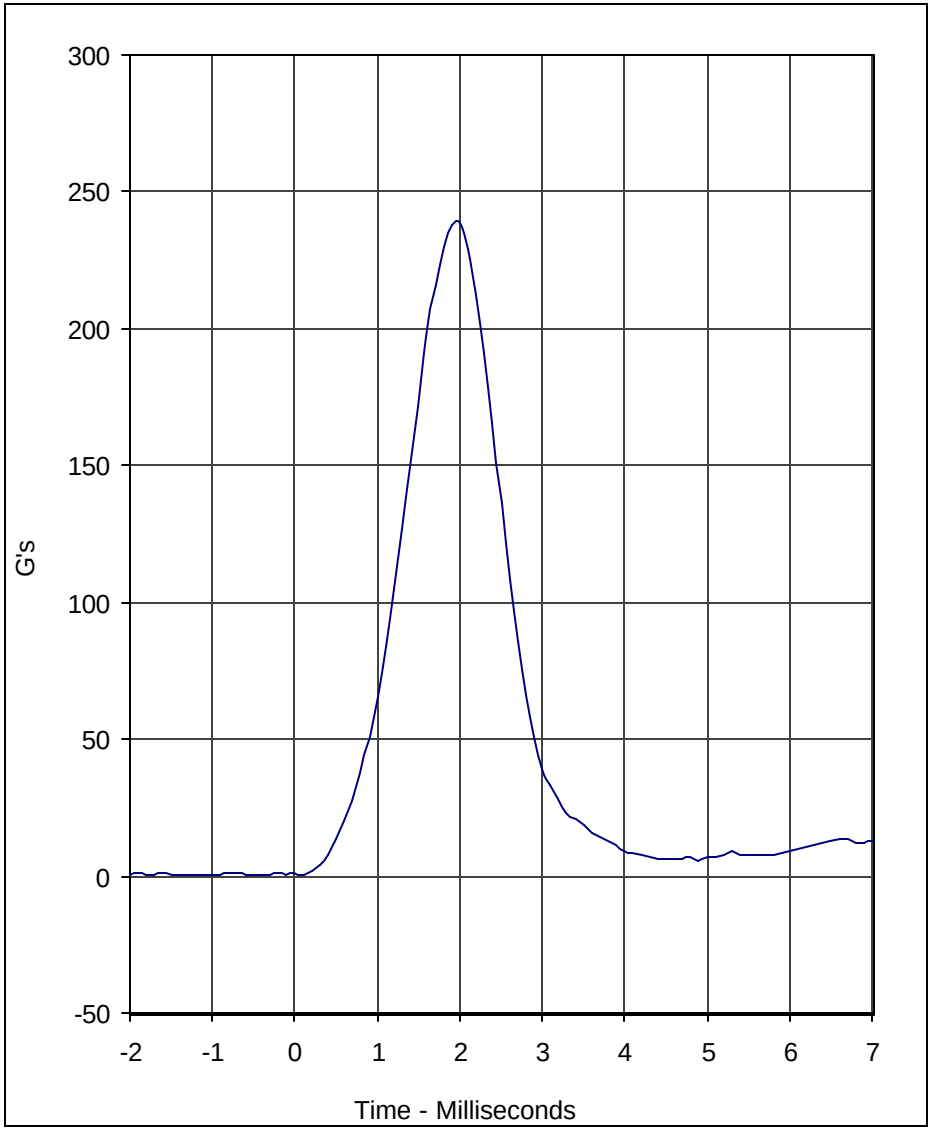
Test I.D.: HD08E

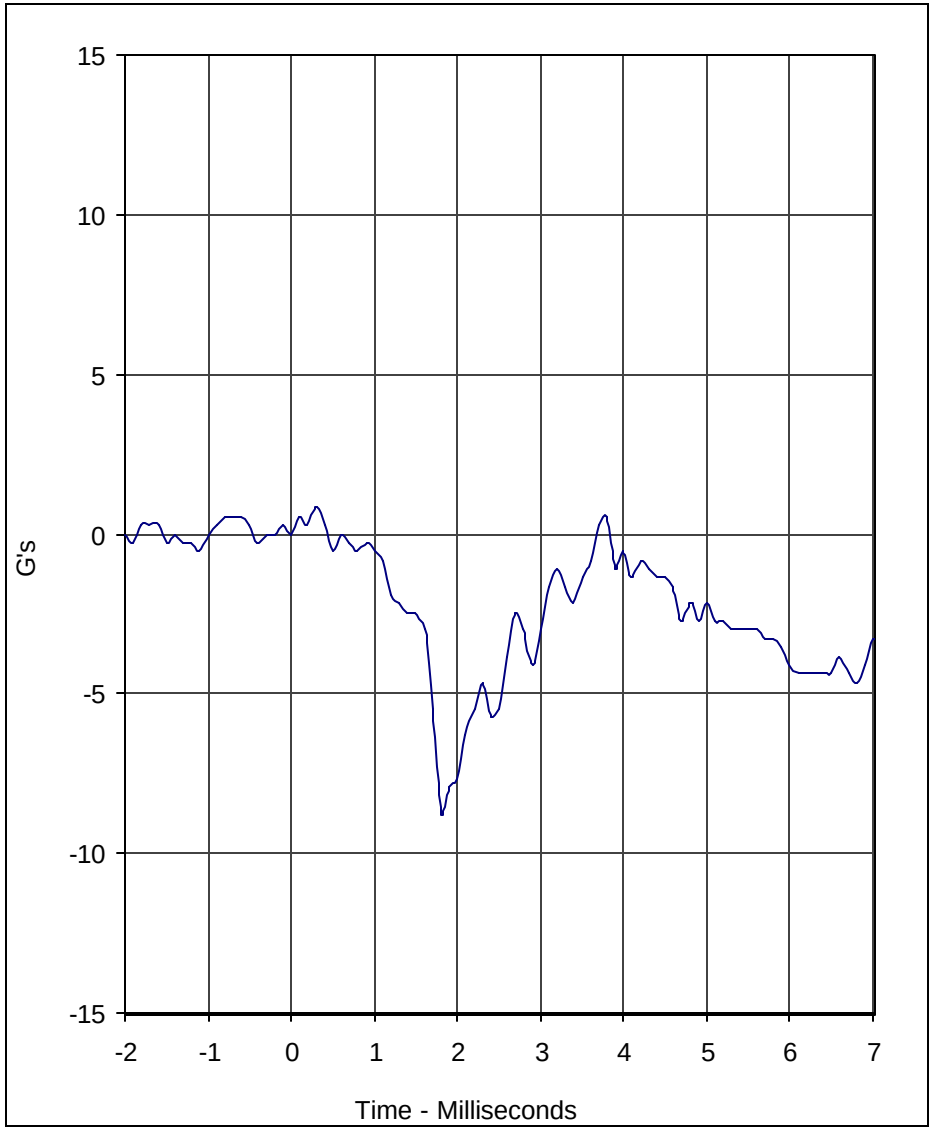
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	238.7	Pass
Peak Lateral Acceleration	G's	≤15.0	8.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

September 26, 2003

Test Date





Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	238.7	2.0	0.3	-0.4	1000

Curve Description	CURNO	Type
Head Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	0.8	0.3	-8.7	1.8	1000

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

Test Date: 9/26/03

A.T.D. Serial No.: 034

Test I.D.: HD08E

Calibration Data Sheet
Hybrid III 50th Percentile Male
Thorax Impact Test

ATD Serial No.: 034

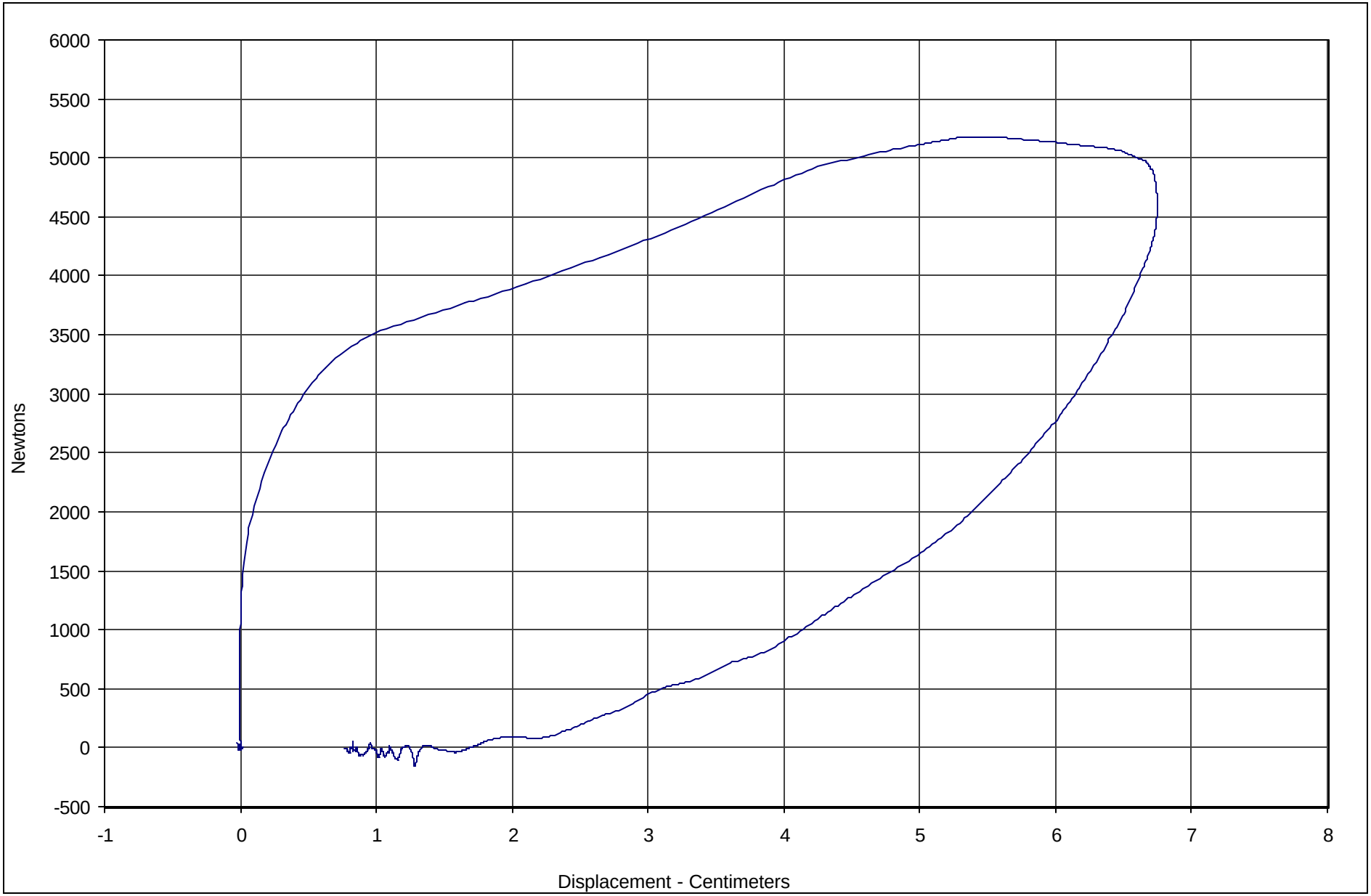
Test I.D.: CH10A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.74	Pass
Peak Probe Force	Newtons	5159 to 5893	5178	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.75	Pass
Internal Hysterysis	%	69 to 85	76.3	Pass
		Overall Test Results		Pass

Laboratory Technician

September 30, 2003

Test Date



Curve Description	CURNO	Type	Hysterysis	Peak Chest Displ.	Peak Probe Force	SAE Class
Probe Force vs. Chest Displacement	001	FIL	76.3	6.75	5177.7	180

Test Program: Hybrid III 50th Percentile Male Thorax Impact

A.T.D. Serial No.: 034

Test Date: 9/30/03

Test I.D.: CH10A

Calibration Data Sheet
Hybrid III 50th Percentile Male
Neck Flexion Test

ATD Serial No.: 034

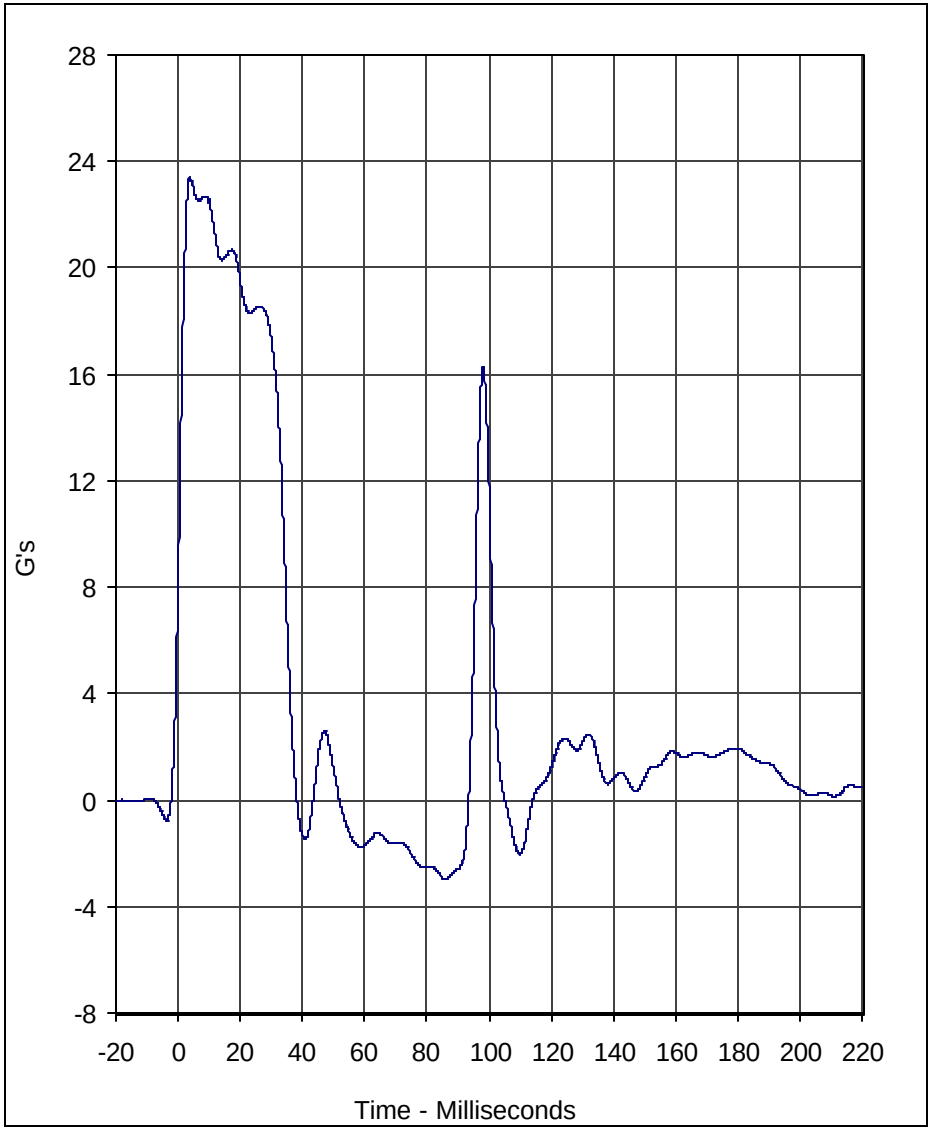
Test I.D.: NF08E

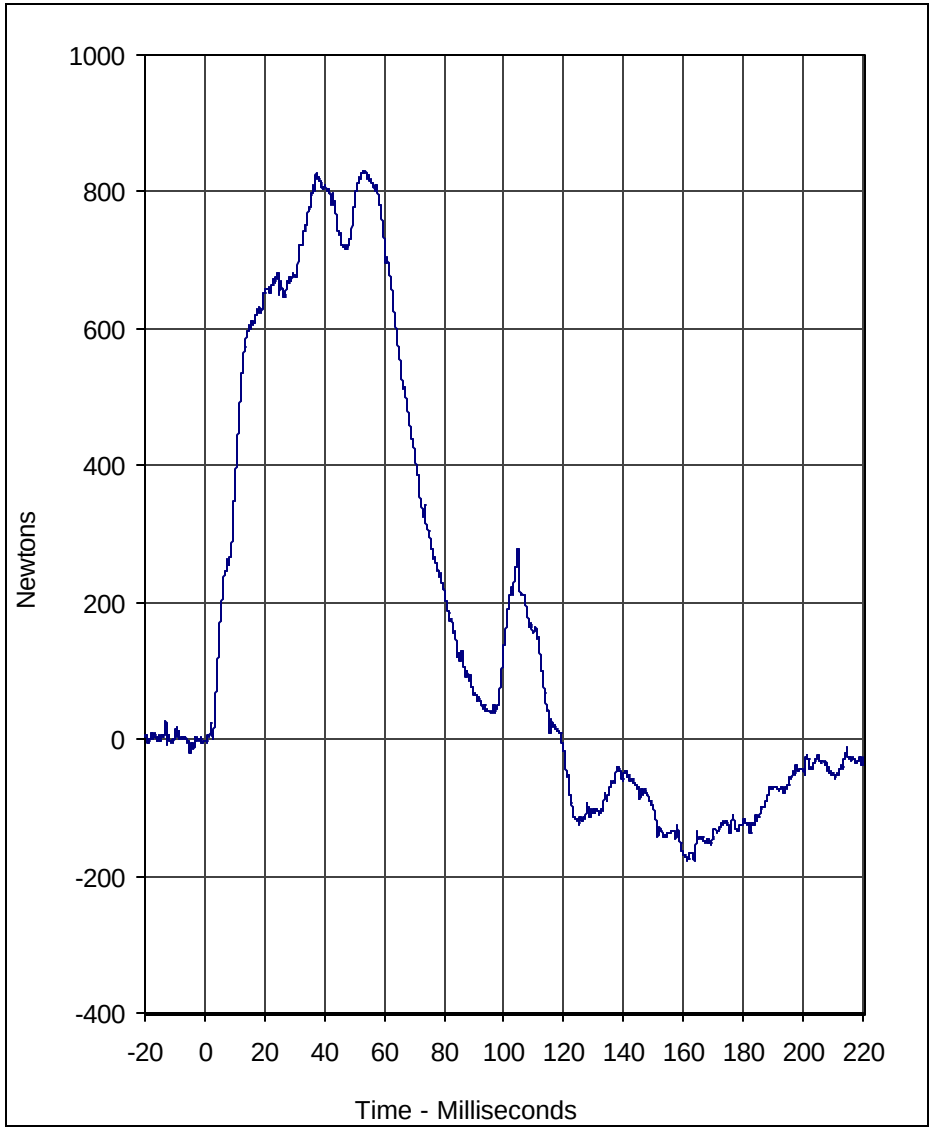
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	19.5	Pass
	30 Msec.	G's	12.5 to 18.5	17.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	69.0	Pass
	Time	Msec.	57.0 to 64.0	60.1	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	89.3	Pass
	Time	Msec.	47.0 to 58.0	48.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.9	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	23.4	3.5	-3.0	86.0	60

Curve Description	CURNO	Type
Neck Force X	002	FIL

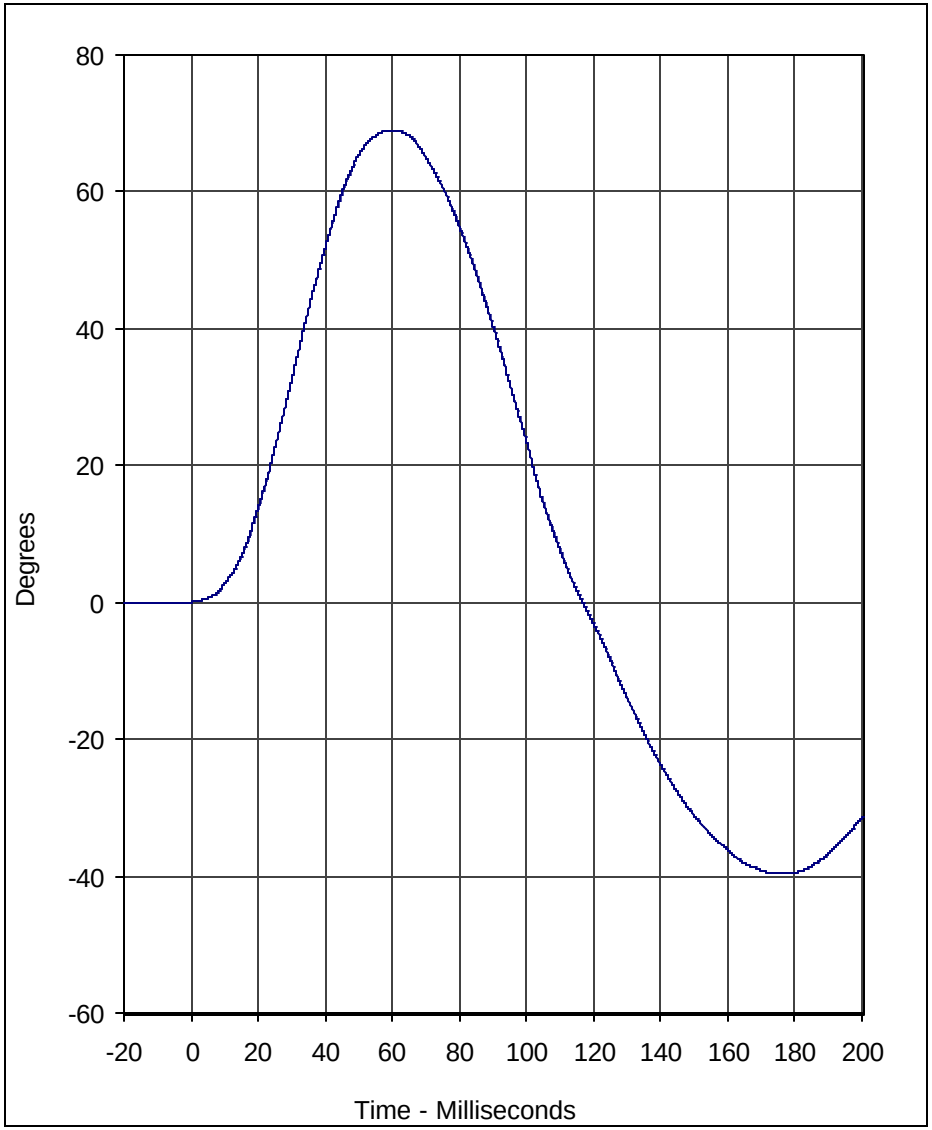
Units	Max	Time	Min	Time	SAE Class
Newtons	830.8	53.7	-178.6	161.4	600

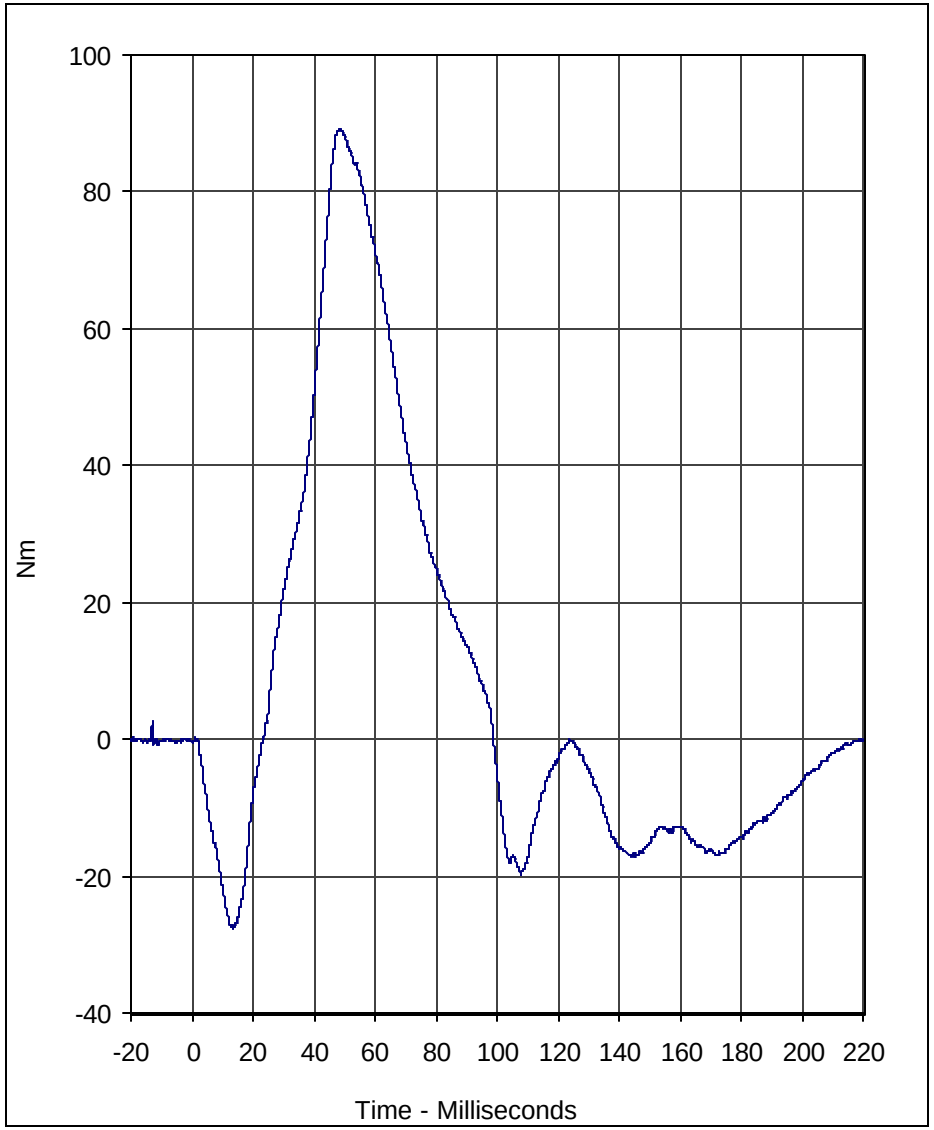
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

Test Date: 9/29/03

A.T.D. Serial No.: 034

Test I.D.: NF08E





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	69.0	60.1	-39.6	175.9	60

Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	89.3	48.3	-27.7	13.6	600

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

Test Date: 9/29/03

A.T.D. Serial No.: 034

Test I.D.: NF08E

Calibration Data Sheet
Hybrid III 50th Percentile Male
Neck Extension Test

ATD Serial No.: 034

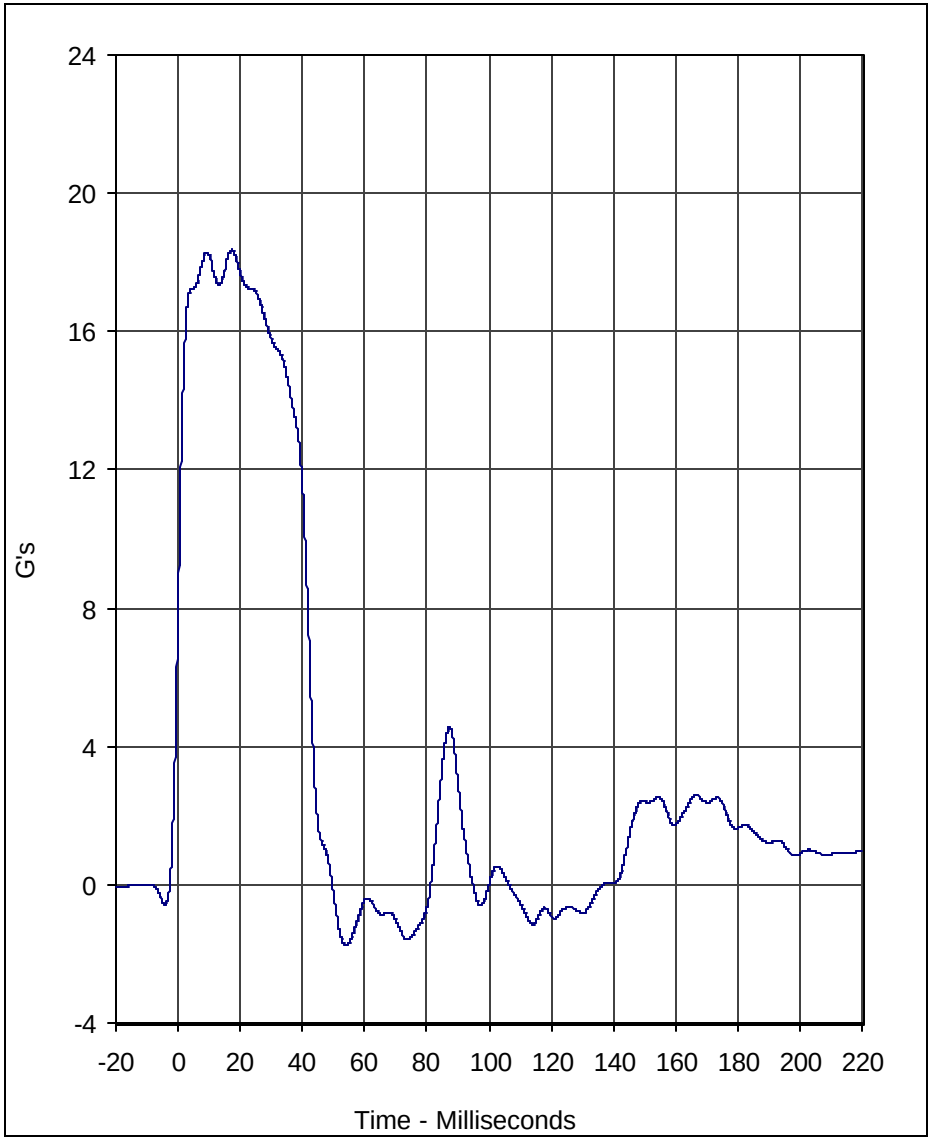
Test I.D.: NE08D

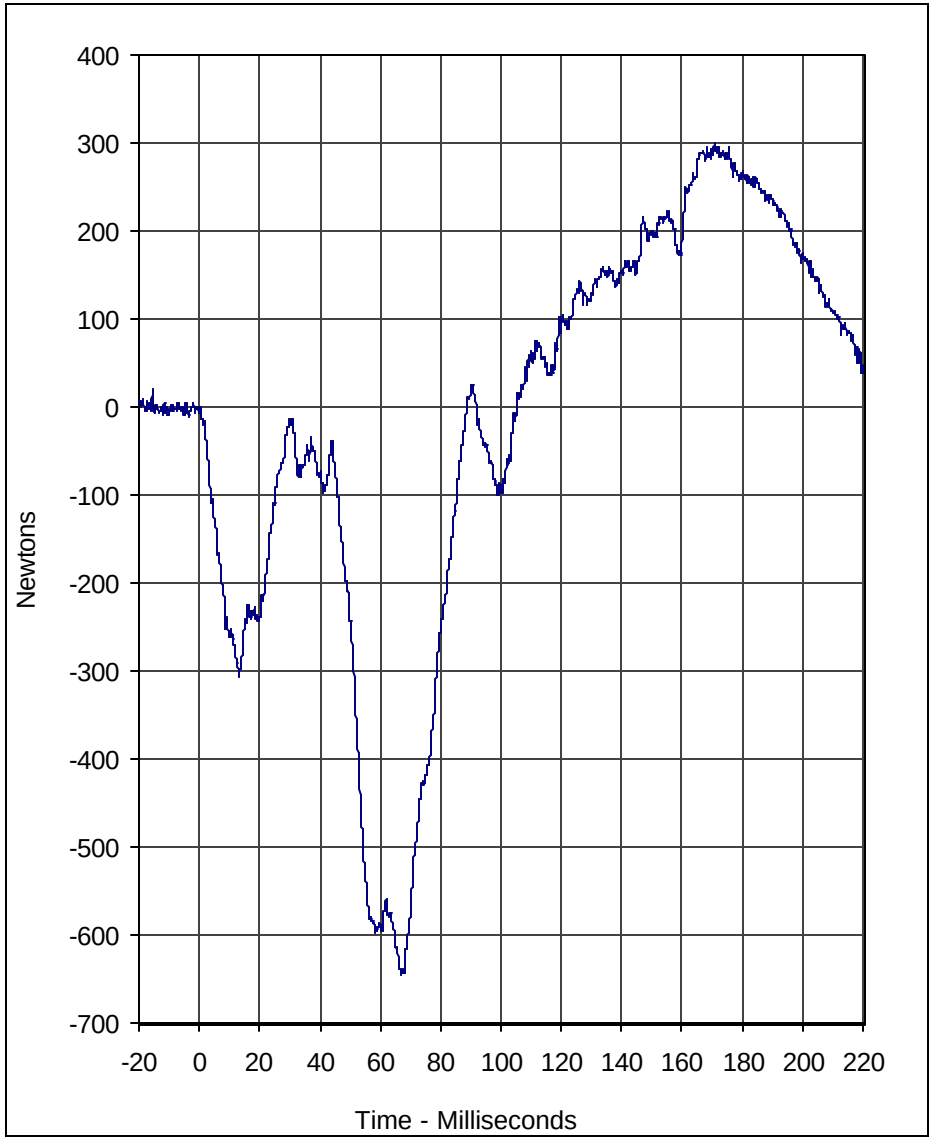
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.16	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.2	Pass
	20 Msec.	G's	14.0 to 19.0	17.7	Pass
	30 Msec.	G's	11.0 to 16.0	15.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	43.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.6	Pass
	Time	Msec.	72.0 to 82.0	72.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.7	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to- 79.9	-76.2	Pass
	Time	Msec.	65.0 to 79.0	66.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	143.4	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	18.4	17.2	-1.8	54.0	60

Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	301.1	170.8	-645.6	67.0	600

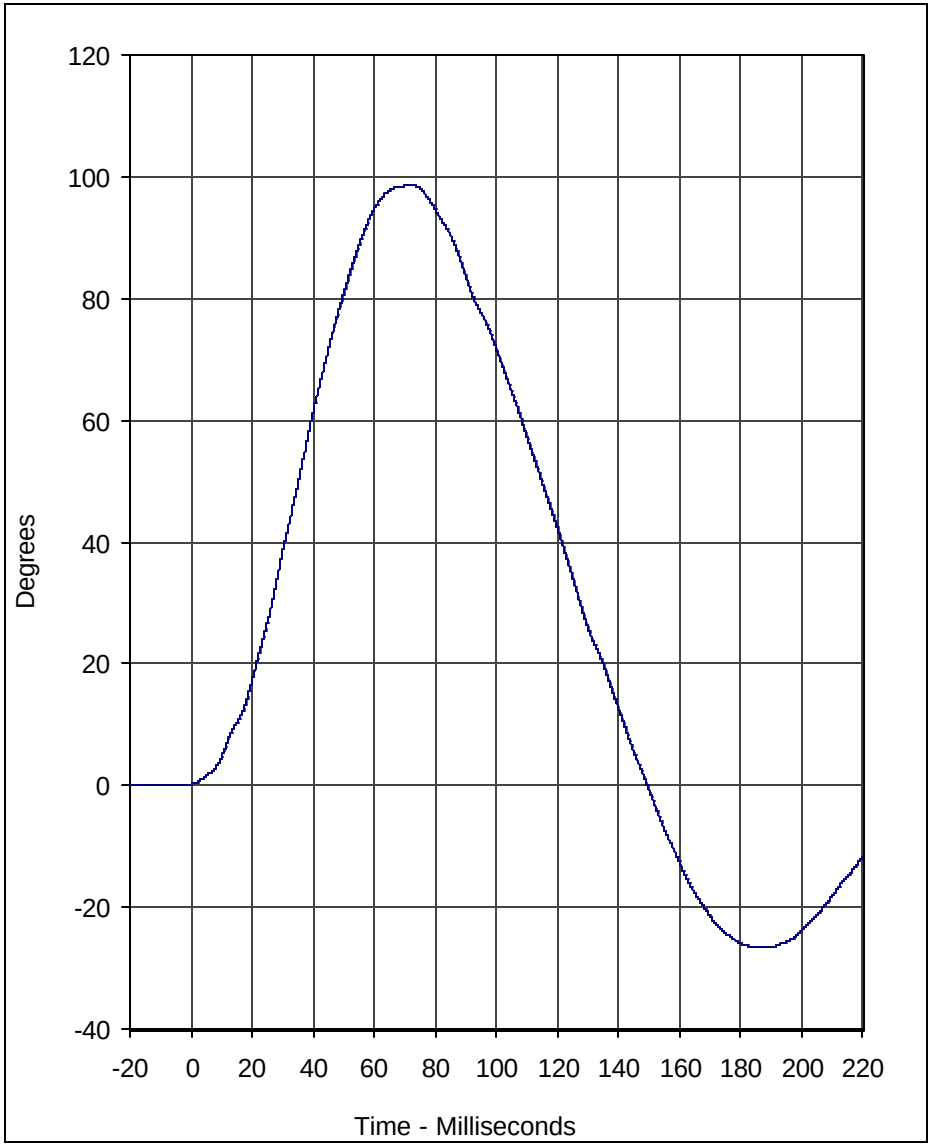
Test Program: Hybrid III 50th Percentile Male Neck Extension Test

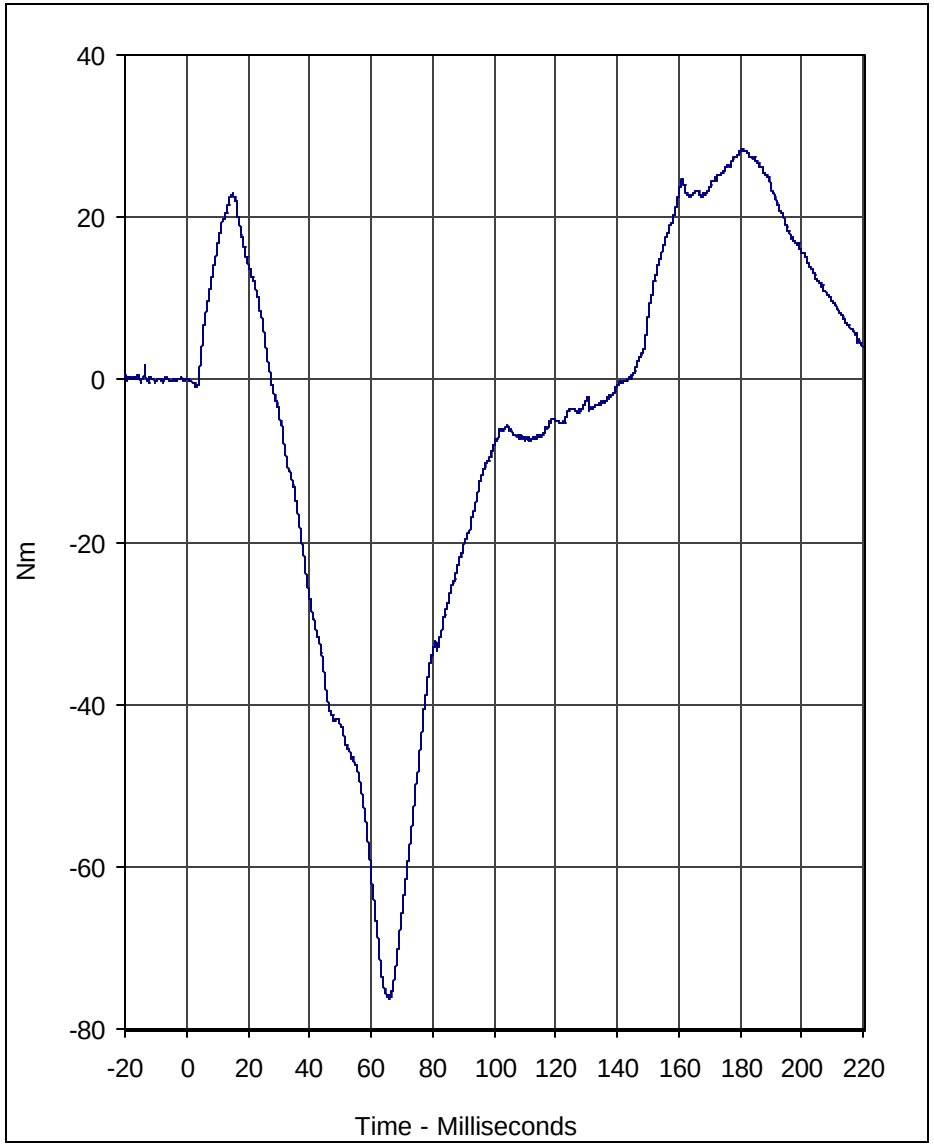
Test Date: 9/29/03

A.T.D. Serial No.: 034

Test I.D.: NE08D

KARCO Engineering





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	98.6	72.4	-26.5	188.7	60

Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	28.3	180.9	-76.2	66.0	600

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

Test Date: 9/29/03

A.T.D. Serial No.: 034

Test I.D.: NE08D

KARCO Engineering

Calibration Data Sheet
Hybrid III 50th Percentile Male
External Measurements

ATD Serial No.: 034

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	520	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	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	195	Pass
K - Buttock to knee length	mm	579 to 604	585	Pass
L - Poplipteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock poplipteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	95	Pass
Y - Chest circumference	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Laboratory Technician

September 30, 2003
Test Date

Calibration Data Sheet
Hybrid III 50th Percentile Male
Knee Impact Test

ATD Serial No.: 035 Location: Left Knee Test I.D.: LK08D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5613	Pass
		Overall Test Results		Pass

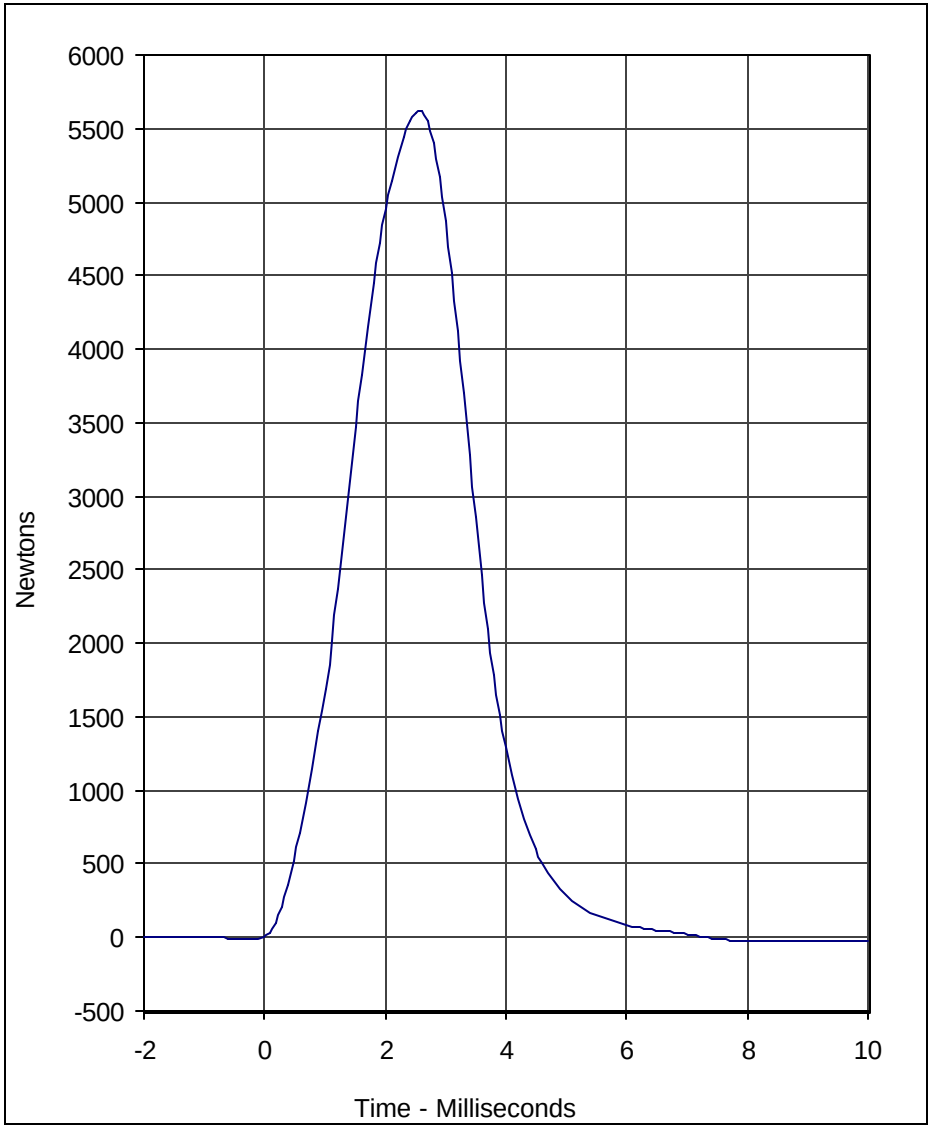
ATD Serial No.: 035 Location: Right Knee Test I.D.: RK08D

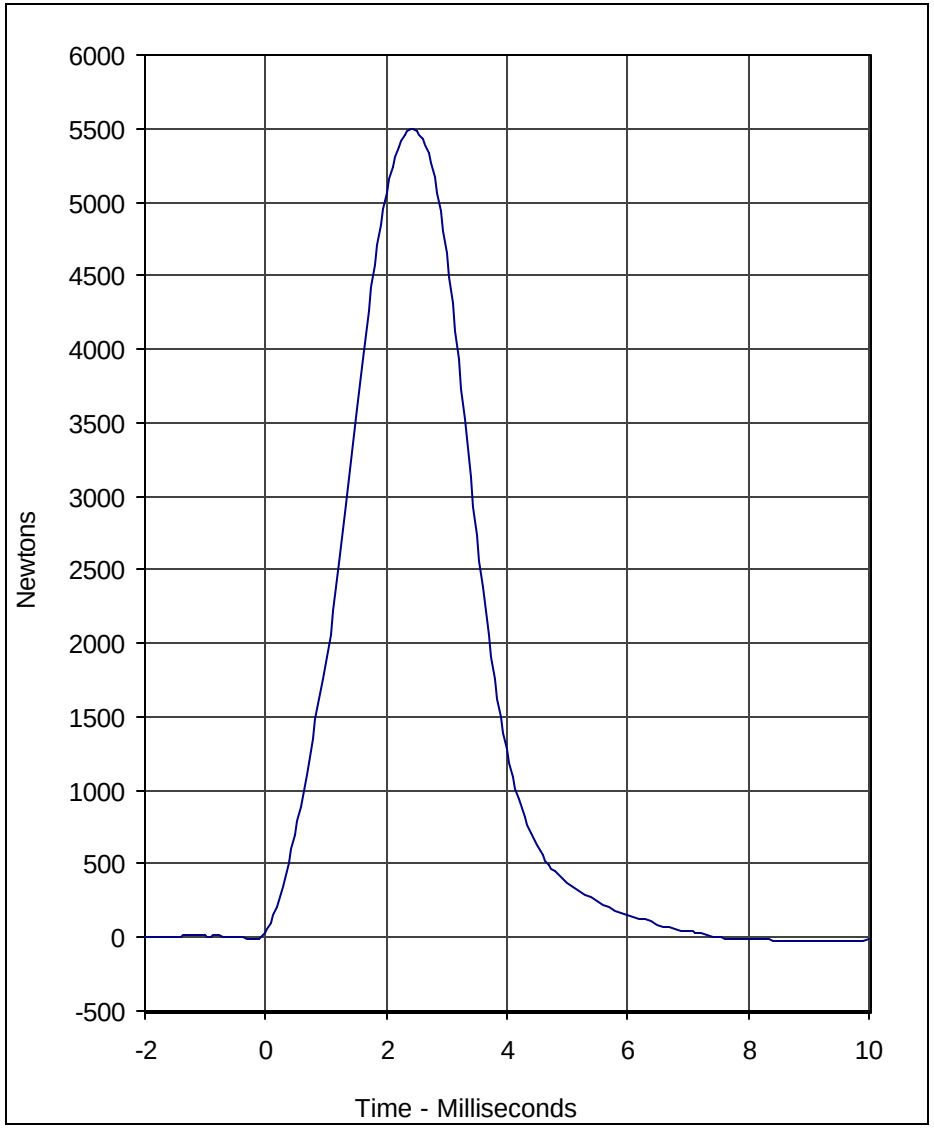
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5491	Pass
		Overall Test Results		Pass

Laboratory Technician

September 26, 2003

Test Date





Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Left Knee	LK08D	001	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5613.3	2.6	-30.5	9.4	600

Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Right Knee	RK08D	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5490.7	2.4	-22.3	8.5	600

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

Test Date: 9/26/03

A.T.D. Serial No.: 035

Calibration Data Sheet
Hybrid III 50th Percentile Male
Head Drop Test

ATD Serial No.: 035

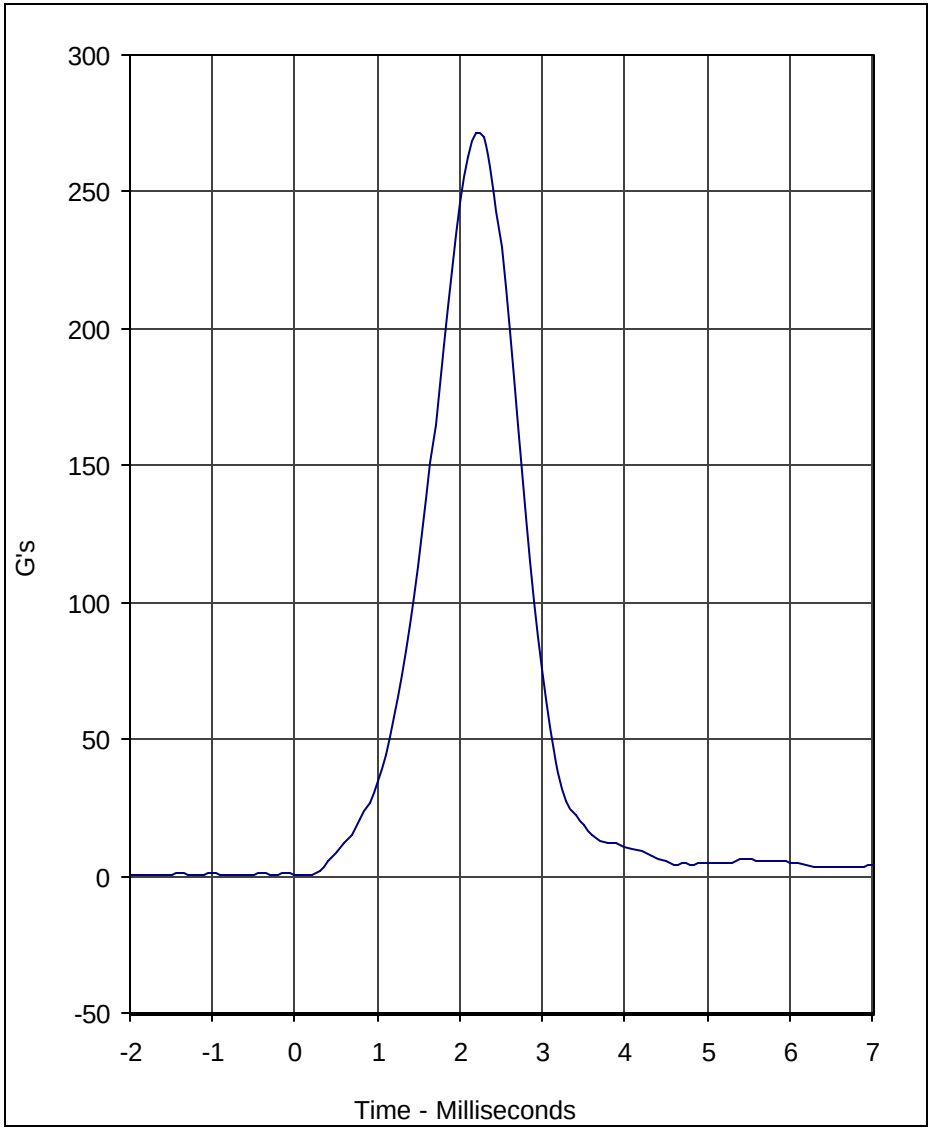
Test I.D.: HD08C

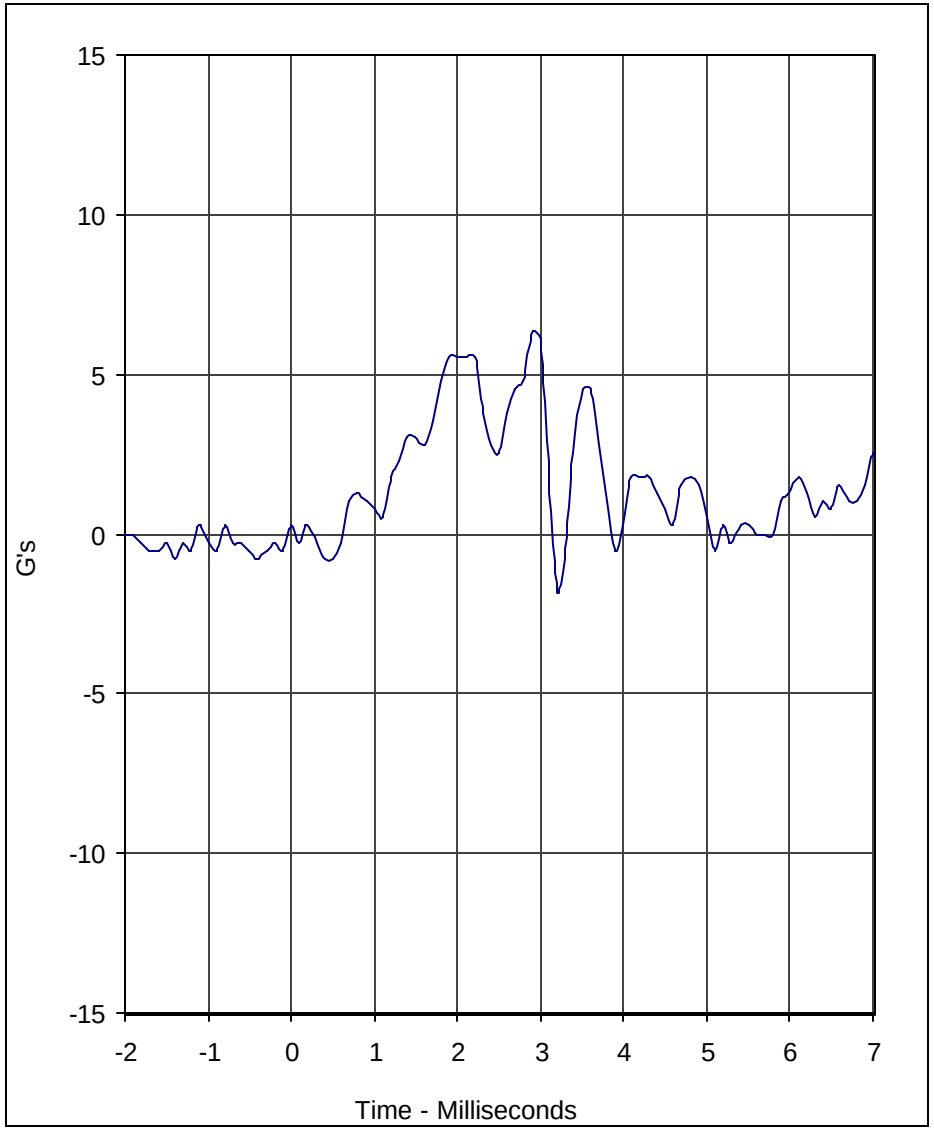
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	271.6	Pass
Peak Lateral Acceleration	G's	≤15.0	6.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

September 26, 2003

Test Date





Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	271.6	2.2	0.2	-2.0	1000

Curve Description	CURNO	Type
Head Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	6.3	2.9	-1.8	3.2	1000

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

Test Date: 9/26/03

A.T.D. Serial No.: 035

Test I.D.: HD08C

Calibration Data Sheet
Hybrid III 50th Percentile Male
Thorax Impact Test

ATD Serial No.: 035

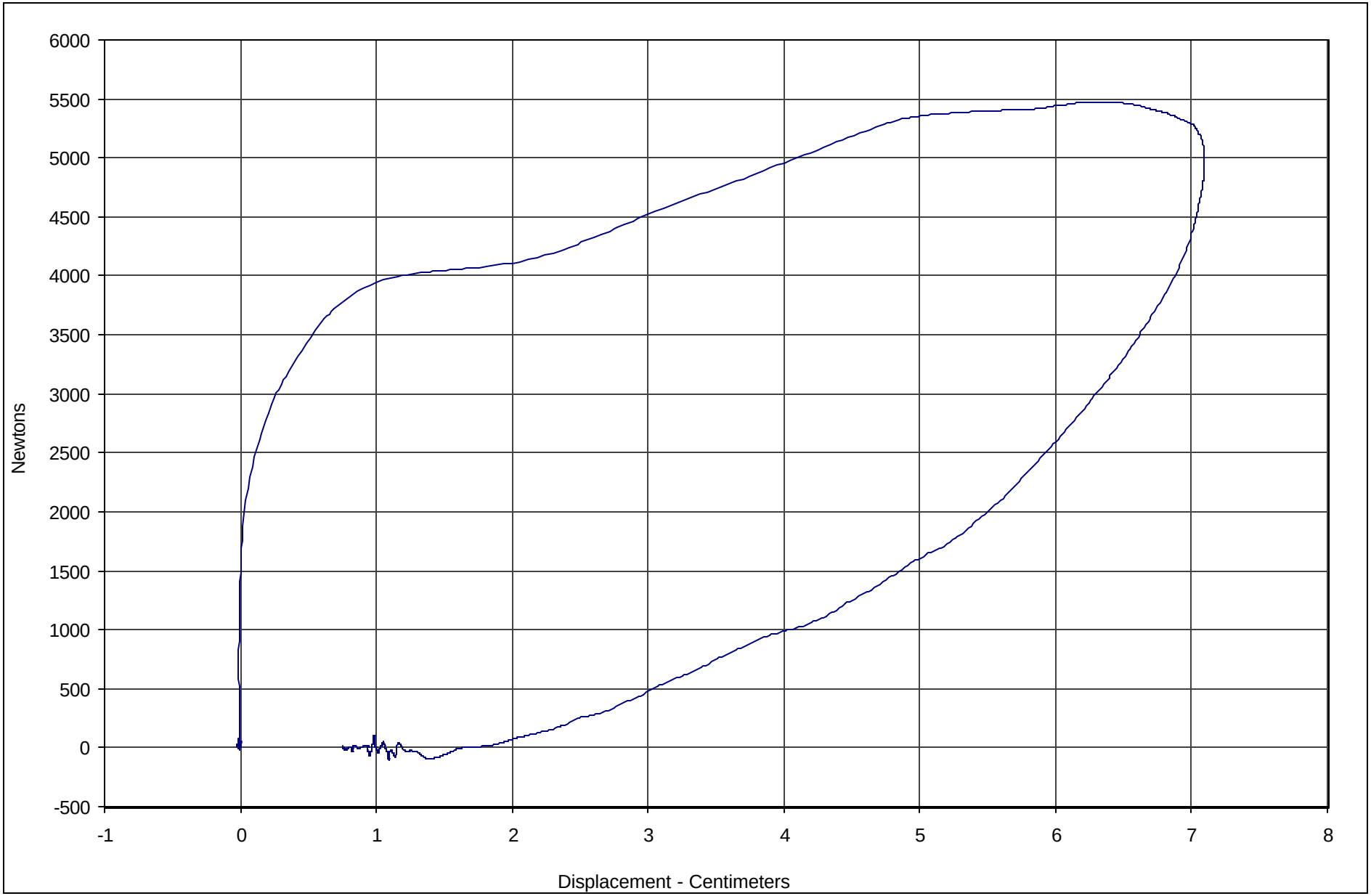
Test I.D.: CH10B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}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	5474	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	7.09	Pass
Internal Hysterysis	%	69 to 85	75.4	Pass
		Overall Test Results		Pass

Laboratory Technician

September 30, 2003

Test Date



Curve Description	CURNO	Type	Hysterysis	Peak Chest Displ.	Peak Probe Force	SAE Class
Probe Force vs. Chest Displacement	001	FIL	75.4	7.09	5473.9	180

Test Program: Hybrid III 50th Percentile Male Thorax Impact

A.T.D. Serial No.: 035

Test Date: 9/30/03

Test I.D.: CH10B

Calibration Data Sheet
Hybrid III 50th Percentile Male
Neck Flexion Test

ATD Serial No.: 035

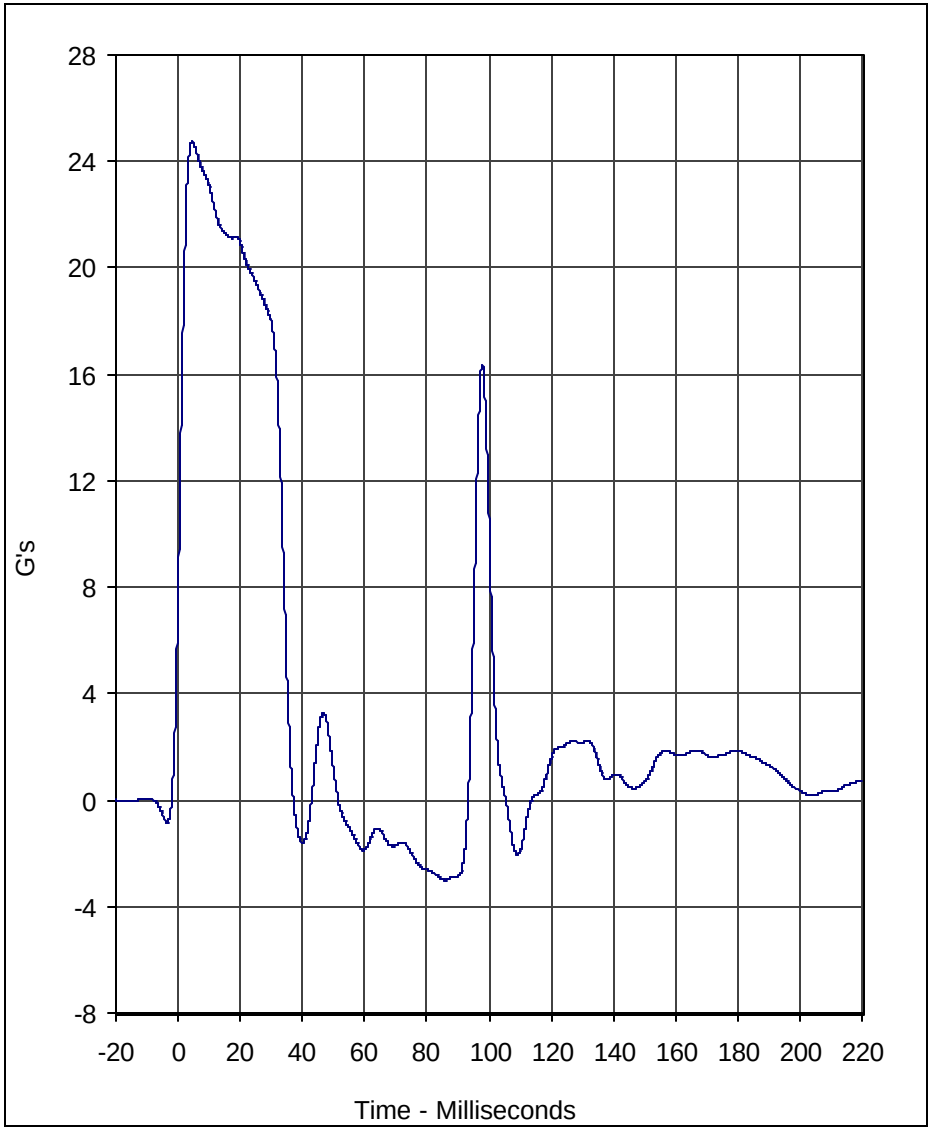
Test I.D.: NF08F

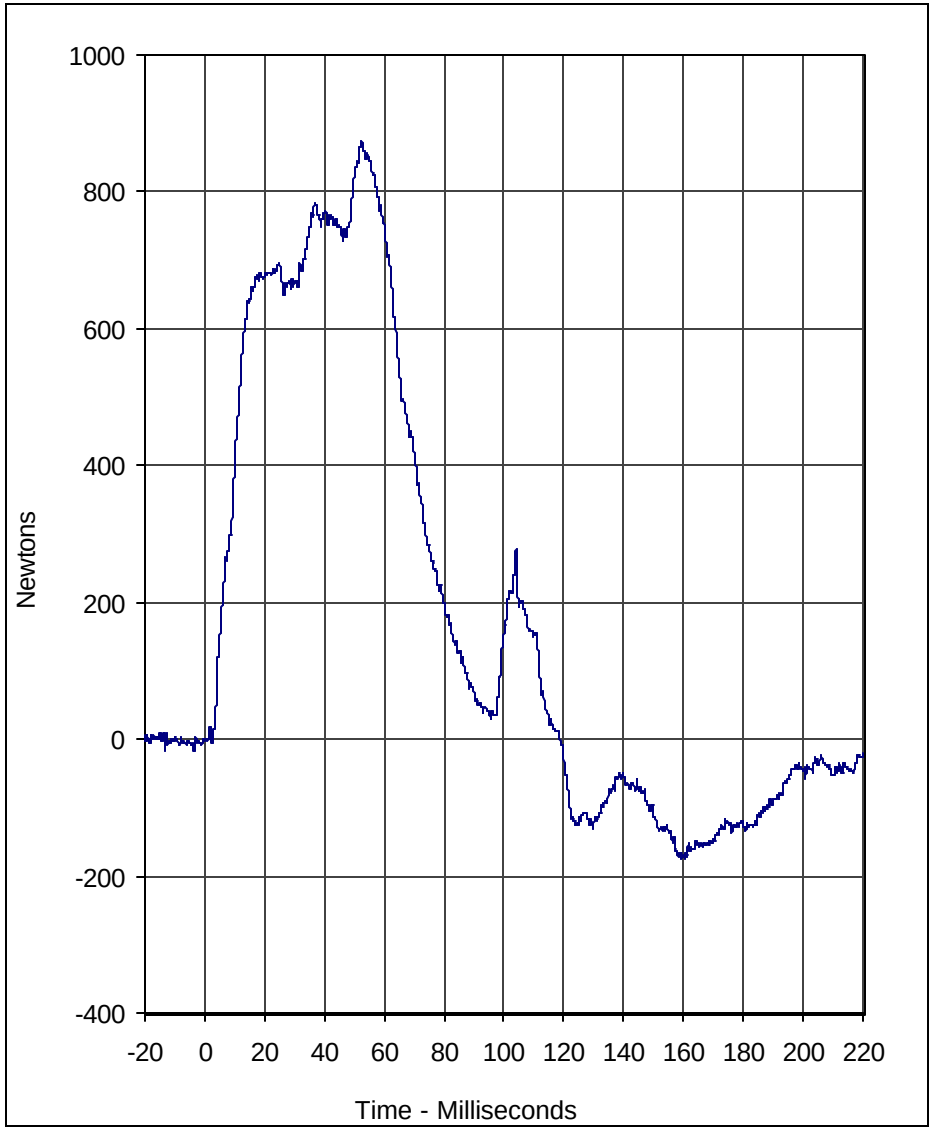
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.98	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.1	Pass
	20 Msec.	G's	17.6 to 22.6	20.9	Pass
	30 Msec.	G's	12.5 to 18.5	18.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	69.4	Pass
	Time	Msec.	57.0 to 64.0	59.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.0	Pass
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	87.1	Pass
	Time	Msec.	47.0 to 58.0	47.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.2	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	24.8	4.5	-3.0	85.7	60

Curve Description	CURNO	Type
Neck Force X	002	FIL

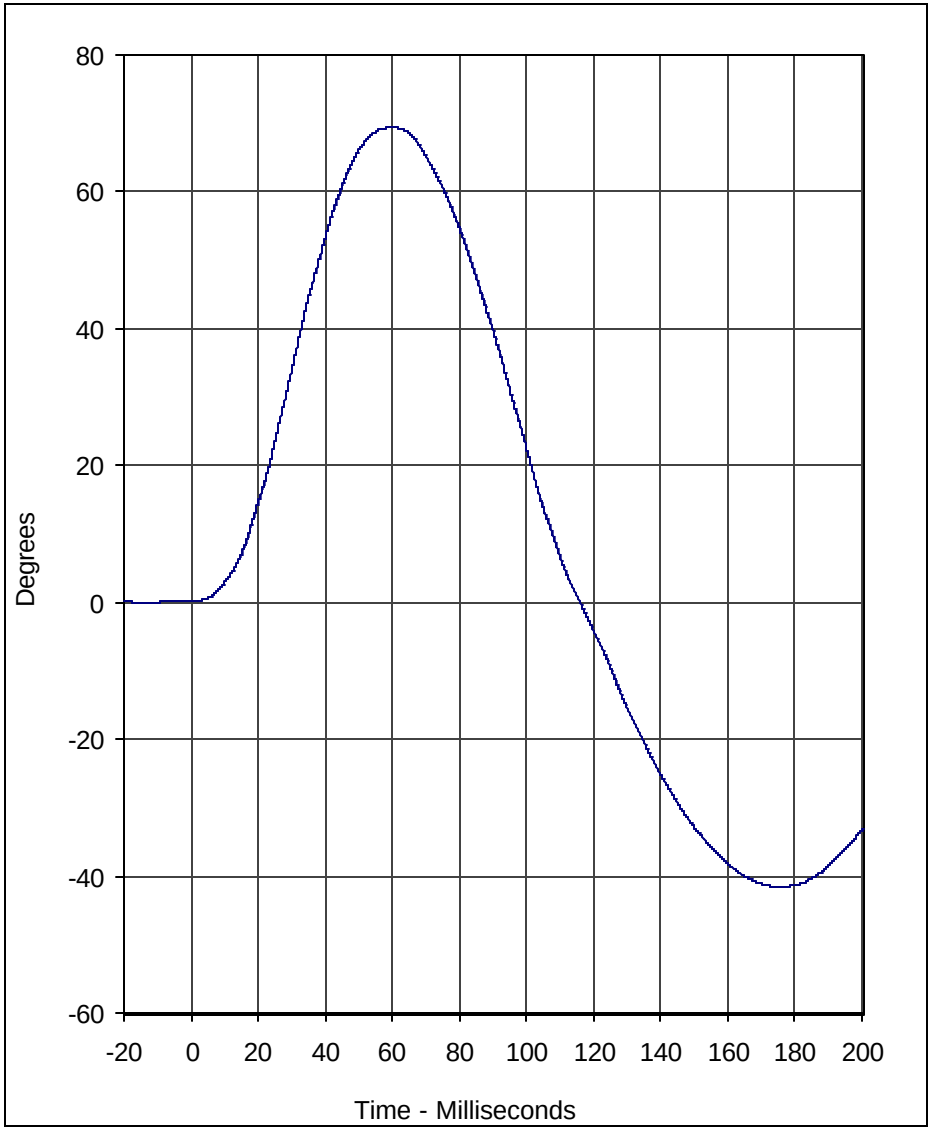
Units	Max	Time	Min	Time	SAE Class
Newtons	874.7	52.3	-173.8	160.4	600

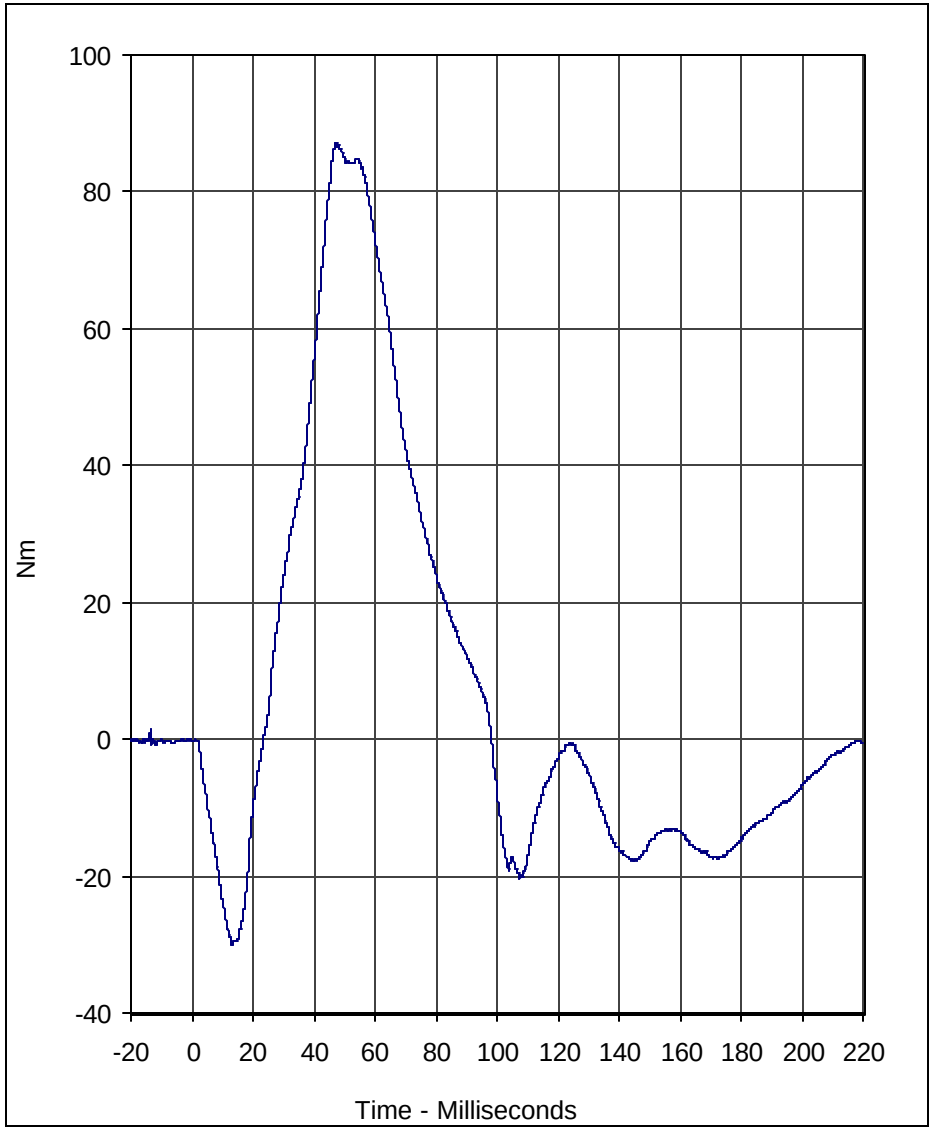
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

Test Date: 9/29/03

A.T.D. Serial No.: 035

Test I.D.: NF08F





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	69.4	59.9	-41.6	175.2	60

Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	87.1	47.3	-30.1	13.2	600

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

Test Date: 9/29/03

A.T.D. Serial No.: 035

Test I.D.: NF08F

Calibration Data Sheet
Hybrid III 50th Percentile Male
Neck Extension Test

ATD Serial No.: 035

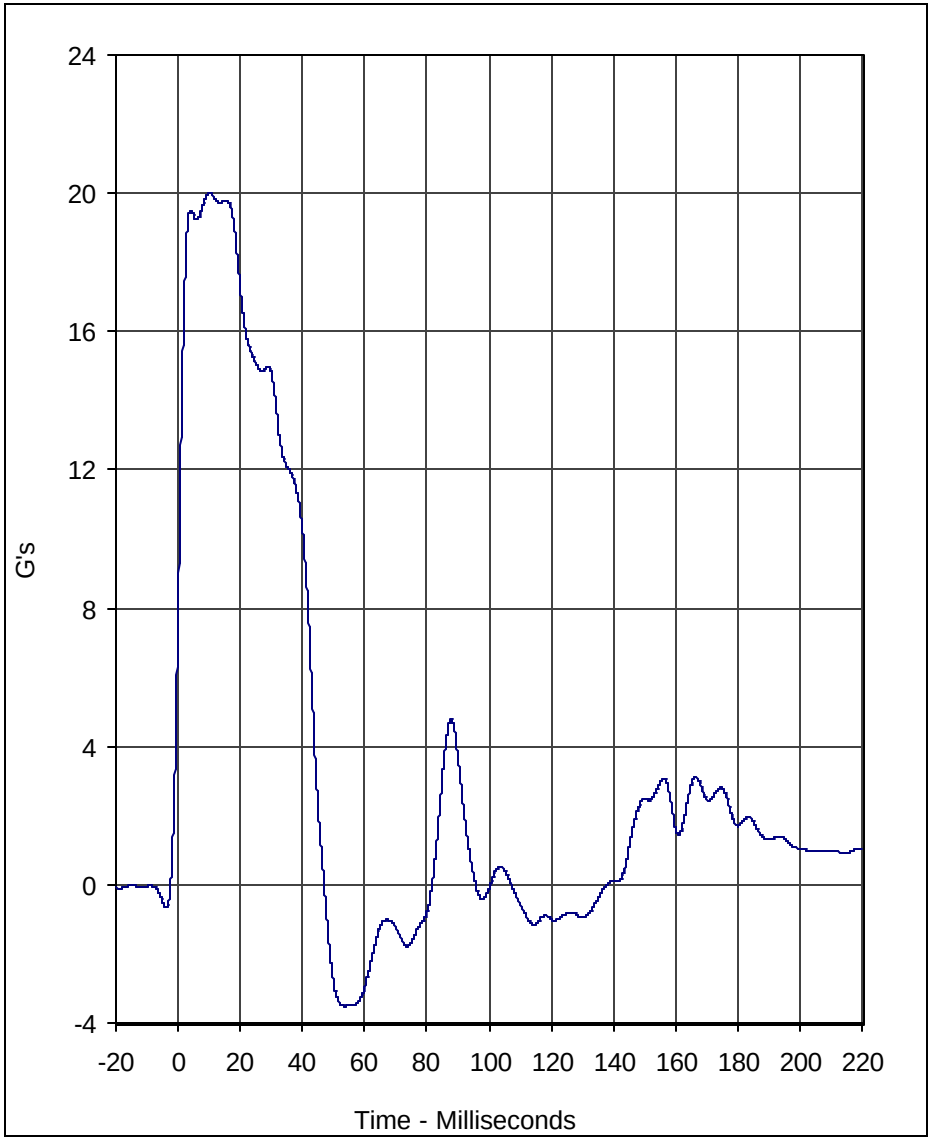
Test I.D.: NE08E

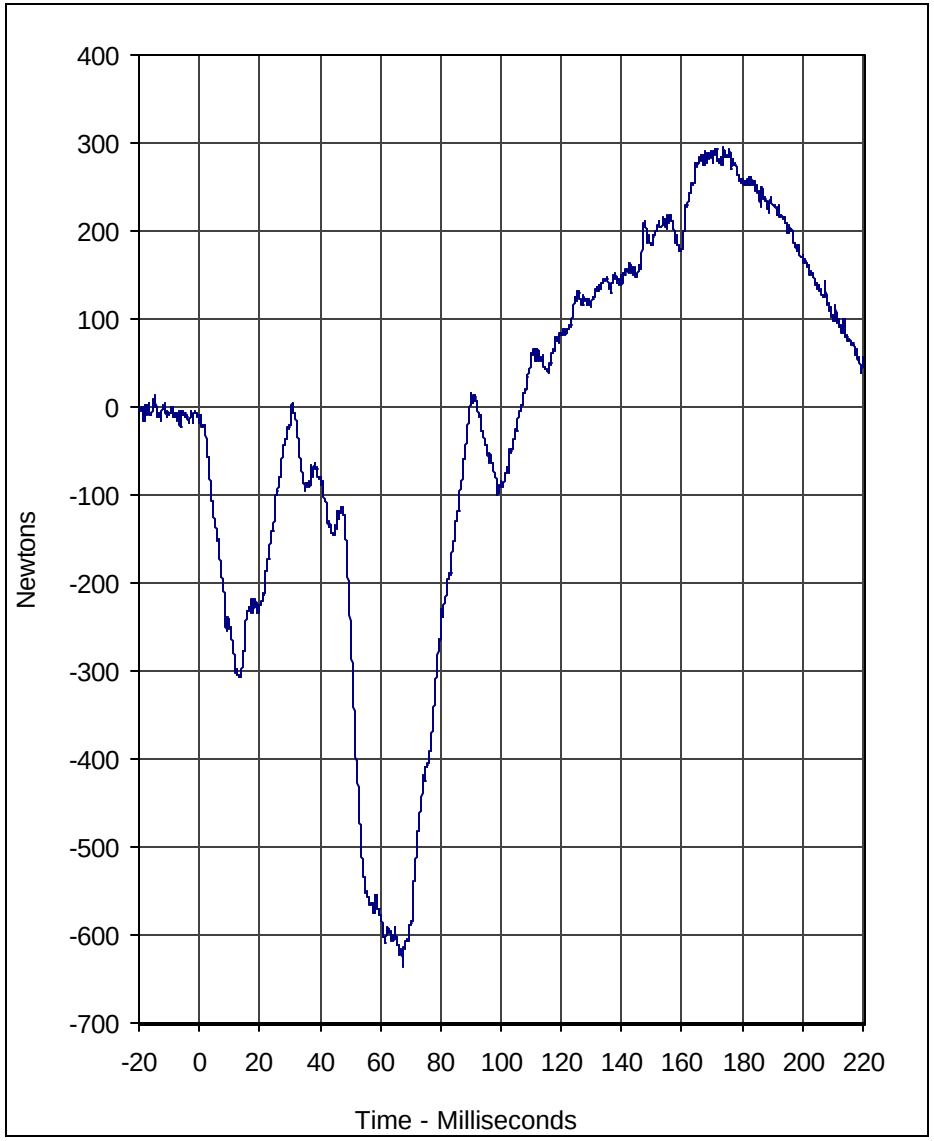
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.97	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	20.0	Pass
	20 Msec.	G's	14.0 to 19.0	17.3	Pass
	30 Msec.	G's	11.0 to 16.0	14.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	43.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.2	Pass
	Time	Msec.	72.0 to 82.0	78.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.4	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to- 79.9	-77.4	Pass
	Time	Msec.	65.0 to 79.0	67.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.7	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	20.0	10.2	-3.5	53.5	60

Curve Description	CURNO	Type
Neck Force X	002	FIL

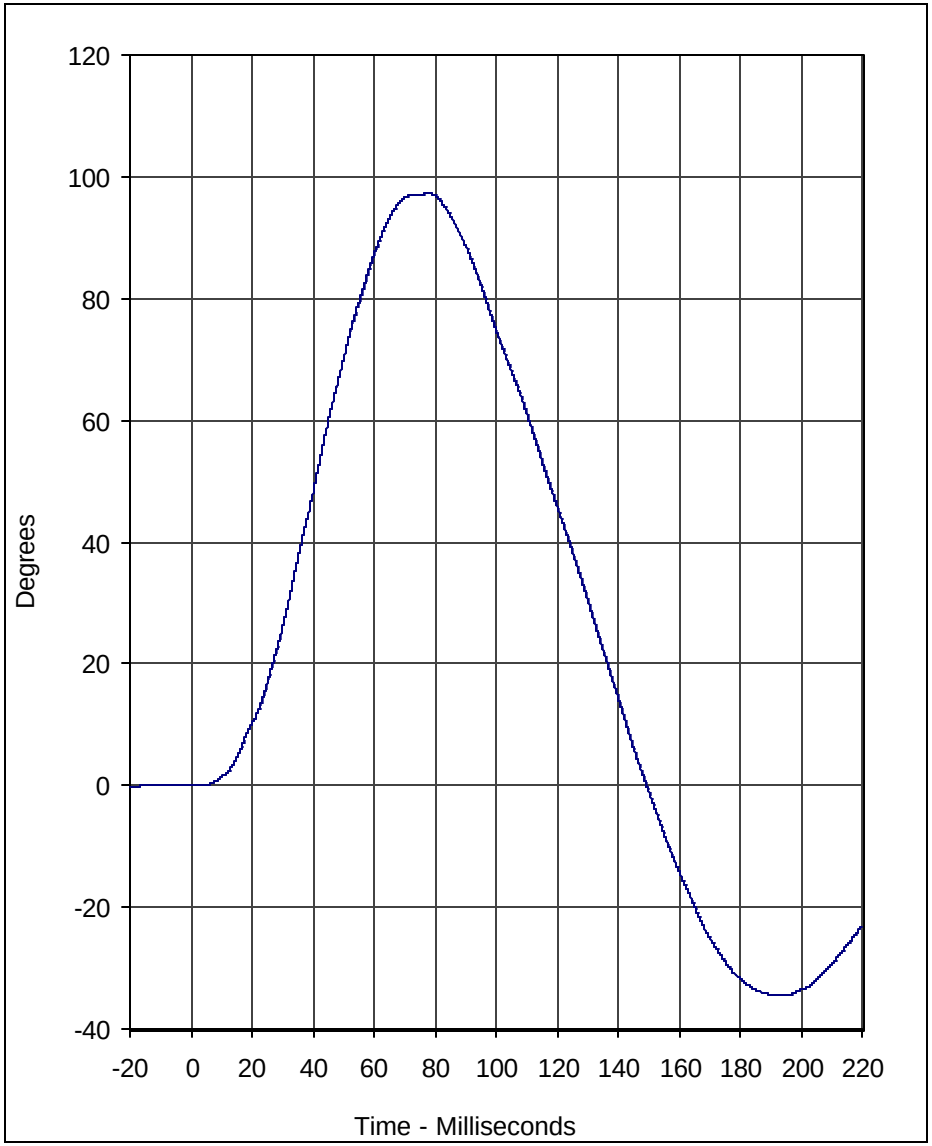
Units	Max	Time	Min	Time	SAE Class
Newtons	294.8	173.8	-635.4	67.4	600

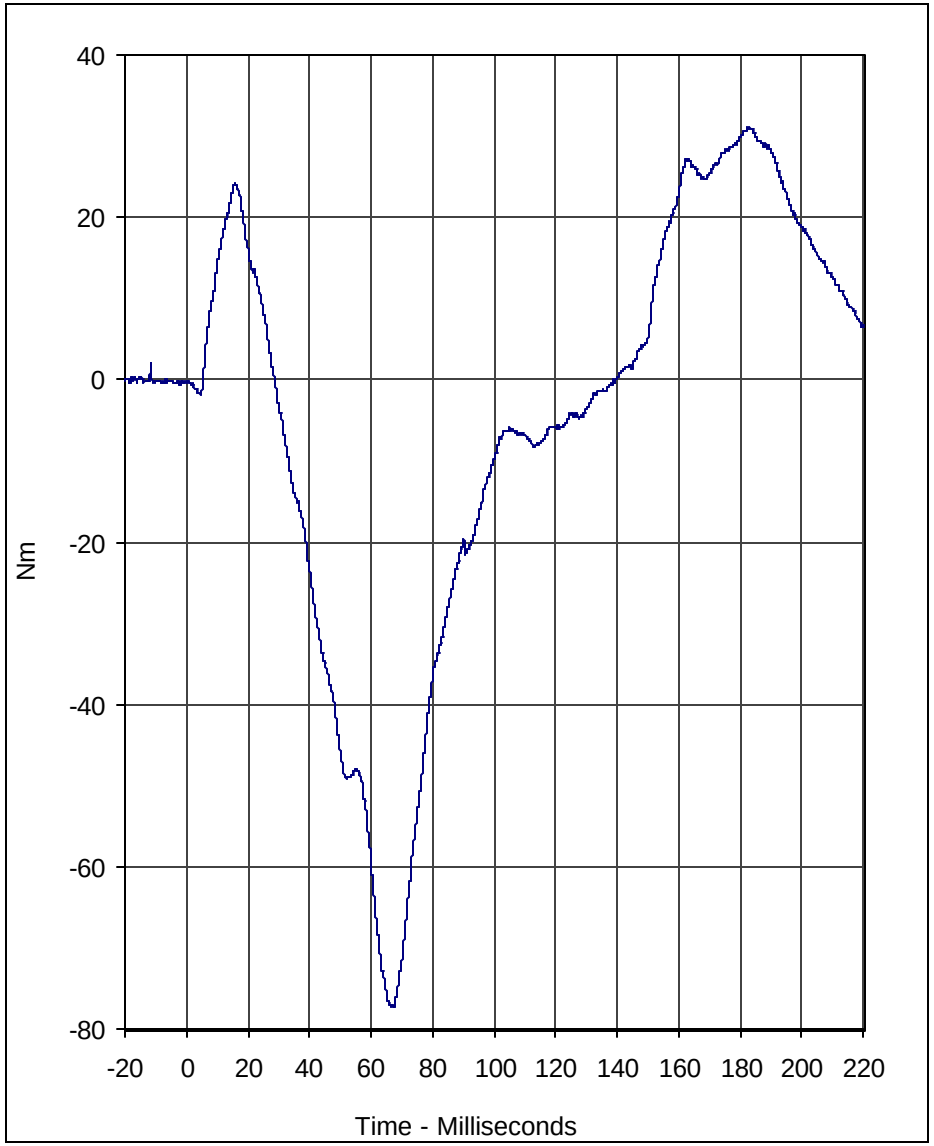
Test Program: Hybrid III 50th Percentile Male Neck Extension Test

Test Date: 9/29/03

A.T.D. Serial No.: 035

Test I.D.: NE08E





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	97.2	78.0	-34.5	193.6	60

Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	31.1	182.4	-77.4	67.4	600

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

Test Date: 9/29/03

A.T.D. Serial No.: 035

Test I.D.: NE08E

KARCO Engineering

Calibration Data Sheet
Hybrid III 50th Percentile Male
External Measurements

ATD Serial No.: 035

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	150	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	200	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Poplipteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock poplipteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	220	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	425	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	995	Pass
Z - Waist circumference	mm	836 to 866	855	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Laboratory Technician

September 30, 2003
Test Date

APPENDIX F

CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P23001-22-NC

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION
2004 PONTIAC GRAND PRIX GT
4 DOOR SEDAN

NHTSA NUMBER: M40100

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

10/7/03

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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Reviewed by: _____ Date: October 13, 2003
Mr. Jerry L. Kratzke, Director of Operations
KARCO Engineering, LLC

Approved by: _____ Date: October 13, 2003
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

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-P23001-22-NC	**2. Government Accession No.**	**3. Recipients Catalog No.**
4. Title and Subtitle Final Report of Century 1500 STE Convertible Final Report of Evenflo Vanguard 5 Convertible NHTSA No. M40100		**5. Report Date** October 13, 2003 **6. Performing Organization Code**
7. Authors Mr. James E. Gorth, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco		**8. Performing Organization Report No.** TR-P23001-22-NC
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301		**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-01-D-02005
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NPS-111 400 Seventh Street, SW, Room 5311 Washington, D.C 20590		**13. Type of Report and Period Covered** Final Test Report Option Year 4 **14. Sponsoring Agency Code** DOT/NHTSA/NRM/OCS
15. Supplementary Notes		

16. Abstract

A frontal test was conducted on the subject CRS's Century 1500 STE convertible and a Evenflo Vanguard 5 convertible in conjunction with frontal NCAP testing on a 2004 Pontiac Grand Prix GT 4 Door Sedan and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on October 7, 2003.

Measurement Description	Units		Left Rear	Right Rear
Head Injury Criteria (HIC) 36	N/A		582.9	532.5
Head Injury Criteria (HIC) 15	N/A		342.3	285.5
3 msec. Chest Clip	G's		40.6	37.1
Peak Chest Displacement	mm		-21.2	-11.9

17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) Final Report of Century 1500 STE Convertible Final Report of Evenflo Vanguard 5 Convertible NHTSA No. M40100		**18. Distribution of Statement** Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified	**20. Security Classification (this page)** Unclassified	**21. No. of Pages** 148	**22. Price**

Form DOT F1700.7 (8-72)

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SECTION F-1

PURPOSE AND SUMMARY OF TEST M40100

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

The 55.89 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.

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

CHILD DUMMY VALUES

Location	HIC 36 Values	HIC 15 Values	3 Msec. Chest Clip	Peak Chest Disp.
Right Rear Child	532.5	285.5	37.1	-11.9
Left Rear Child	582.9	342.3	40.6	-21.2

SECTION F-1

DATA SHEET NO.1…..CRASH TEST SUMMARY

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

CHILD RESTRAINT SYSTEM INFORMATION

Description	Position # 3 CRS	Position #4 CRS
Manufacturer	Evenflo	Century
Model Name	Vanguard 5	1500 STE
Serial No.	3691261 P1	44164WES
Type	Convertible	Convertible
Forward/Rearward	Forward	Forward

VISIBLE DUMMY CONTACT POINTS

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

POST TEST DOOR OPENINGS

Description	Position #3 CRS	Position #4 CRS
Left Side Doors	Remained closed/latched, opend w/o tools	Remained closed/latched, opend w/o tools
Right Side Doors	Remained closed/latched, opend w/o tools	Remained closed/latched, opend 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	1
Total	5

SECTION F-1

DATA SHEET NO.2…..CRS PARAMETER DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	487	293		525	362	
Right	kg	504	284		545	357	
Ratio	%	63.2	36.8		59.8	40.2	
Totals	kg	991	577	1568	1070	719	1789

TARGET TEST WEIGHT CALCULATION

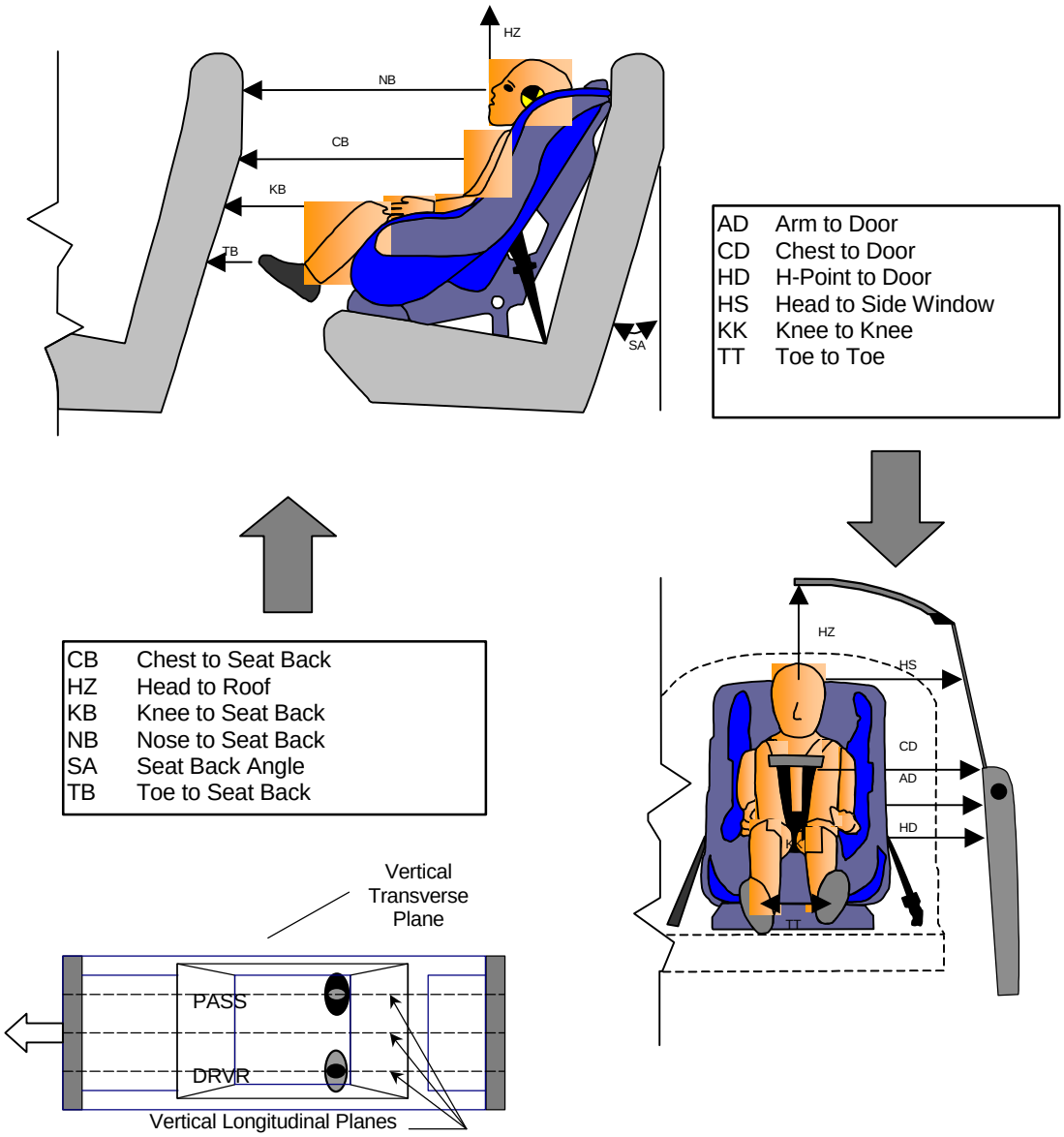
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1568
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	76
Calculated Vehicle Target Wt. (TVTW)	kg	1796

SECTION F-1

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

CHILD DUMMY POSITION MEASUREMENTS

Code	Measurement	Units	P3 CRS Serial No. 139			P4 CRS Serial No. 082		
			Pre-Test	Post-Test	Diff.	Pre-Test	Post-Test	Diff.
SA	Seat Back Angle	deg.	63	63	0	27	27	0
HS	Head to Side Window	mm	406	395	-11	385	390	5
CD	Chest to Door	mm	430	415	-15	385	395	10
AD	Arm to Door	mm	275	270	-5	250	260	10
HD	H-Point to Door (Y)	mm	330	325	-5	275	320	45
HZ	Head to Rood (Z)	mm	300	285	-15	340	315	-25
NB	Nose to Seat Back	mm	550	602	52	555	602	47
CB	Chest to Seat Back	mm	525	605	80	500	580	80
KK	Knee to Knee	mm	185	205	20	213	198	-15
FF	Foot to Foot	mm	175	270	95	275	250	-25
KB-Left	Knee to Seat Back	mm	395	450	55	335	373	38
KB-Right	Knee to Seat Back	mm	374	430	56	315	360	45
TB-Left	Toe to Seat Back	mm	90	130	40	85	100	15
TB-Right	Toe to Seat Back	mm	85	120	35	70	55	-15

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

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	26.4	216.6	-33.5	110.3	53.4	220.6	-26.3	110.5
Head CG	Y	G's	19.3	110.5	-7.4	90.2	5.3	124.6	-8.7	110.1
Head CG	Z	G's	57.0	93.9	-2.2	37.3	49.3	96.7	-5.3	42.0
Head CG Resultant	N/A	G's	59.7	93.9			62.7	220.6		

PRIMARY HEAD INJURY CRITERAS (HIC)

Location	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
	HIC	T^1	T^2	Avg G	HIC	T^1	T^2	Avg G
Head CG Primary (HIC36)	582.9	76.4	112.4	48.2	532.5	76.9	112.9	46.5
Head CG Primary (HIC15)	342.3	84.3	99.3	55.4	285.5	88.2	103.2	51.5

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	7.6	235.6	-33.3	81.7	13.0	228.7	-36.4	94.4
Chest CG	Y	G's	1.9	235.3	-6.5	75.1	1.9	250.2	-6.7	81.5
Chest CG	Z	G's	20.2	95.8	-31.2	72.6	15.7	222.4	-17.7	75.9
Chest CG Resultant	N/A	G's	41.3	74.5			37.3	94.3		

PRIMARY CHEST CLIP (3MSEC)

Location	Left Rear (3 Yr.)			Right Rear (3 Yr.)		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	40.6	42.8	72.8	37.1	62.9	92.9

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.0	5.8	-21.2	107.8	0.1	0.0	-11.9	112.4

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	7.1	116.1	-41.6	70.5	6.0	186.3	-31.7	82.4
Pelvis	Y	G's	4.1	94.9	-5.7	74.8	2.8	276.7	-9.2	69.4
Pelvis	Z	G's	12.1	222.2	-33.8	72.1	13.4	222.2	-23.6	81.2
Pelvis Resultant	N/A	G's	53.4	70.6			39.3	82.0		

DATA SHEET NO. 4…(continued)

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100

Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

UPPER NECK PEAK FORCES AND MOMENTS

			Left Rear (3 Yr.)				Right Rear (3 Yr.)			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	40.8	263.5	-574.4	89.4	67.2	251.8	-626.7	94.1
Neck Force	Y	Newtons	28.5	216.5	-133.9	90.6	21.5	270.9	-139.0	97.7
Neck Force	Z	Newtons	1731.9	93.8	-278.8	235.0	1610.3	95.0	-269.6	225.0
Neck Force Resultant	N/A	Newtons	1789.9	93.8			1731.1	95.0		
Neck Moment	X	Nm	3.8	224.3	-10.3	94.4	3.6	137.7	-13.2	99.1
Neck Moment	Y	Nm	6.3	148.6	-16.8	234.5	3.9	88.1	-14.1	229.2
Neck Moment	Z	Nm	2.3	127.4	-1.7	206.3	1.4	74.2	-1.4	117.1
Neck Moment Resultant	N/A	Nm	17.1	234.4			14.1	229.2		

LOWER NECK PEAK FORCES AND MOMENTS

			Left Rear (3 Yr.)				Right Rear (3 Yr.)			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	183.8	213.6	-1185.5	96.8	189.1	216.1	-478.7	97.3
Neck Force	Y	Newtons	65.7	115.5	-152.4	92.1	56.9	77.6	-109.4	119.0
Neck Force	Z	Newtons	971.6	94.0	-139.9	132.6	1050.4	96.8	-199.5	41.0
Neck Force Resultant	N/A	Newtons	1524.6	94.1			1152.5	96.8		
Neck Moment	X	Nm	4.3	218.0	-33.2	91.3	4.2	273.6	-32.0	100.0
Neck Moment	Y	Nm	106.7	88.6	-13.9	213.3	96.1	93.5	-11.1	213.4
Neck Moment	Z	Nm	1.9	140.6	-17.7	90.9	4.5	139.2	-17.6	97.5
Neck Moment Resultant	N/A	Nm	111.8	93.7			100.7	94.1		

CHILD SEAT TETHER BELT SENSOR PEAK VALUES

			Left Rear (3 Yr.)				Right Rear (3 Yr.)			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Tether Belt Force	N/A	Newtons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 [1]

1.) Not Installed

CHILD SEAT ACCELEROMETER PEAK VALUES

			Left Rear (3 Yr.)				Right Rear (3 Yr.)			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Child Seat	X	G's	9.3	232.1	-40.8	66.8	10.5	231.3	-38.4	79.8
Child Seat	Y	G's	5.2	227.7	-8.2	80.8	2.6	60.9	-7.1	79.6
Child Seat	Z	G's	14.7	218.9	-19.9	236.5	16.3	235.3	-16.1	76.3
Child Seat Resultant	N/A	G's	40.8	66.8			39.2	79.5		

SECTION F-1

DATA SHEET NO.5 …..CRS PERFORMANCE DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

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

SECTION F-1

DATA SHEET NO.6 …..CRS CAMERA DATA

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan NHTSA No.: M40100
Test Program: 2003 NHTSA 35mph NCAP Test Date: 10/7/03

CAMERA LOCATIONS

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time	18288	-22860	2540	10	N/A	17-70	24
2	Driver Side Child Dummy	3048	-762	1372	20	1274	13	1270
3	Driver Side Child Dummy	2489	8230	2388	20	7948	50	1000
4	Passenger Side Child Dummy	3048	762	1372	20	1274	50	1060
5	Passenger Side Child Dummy	3048	-8839	2032	20	8458	13	1020

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

SECTION F-2

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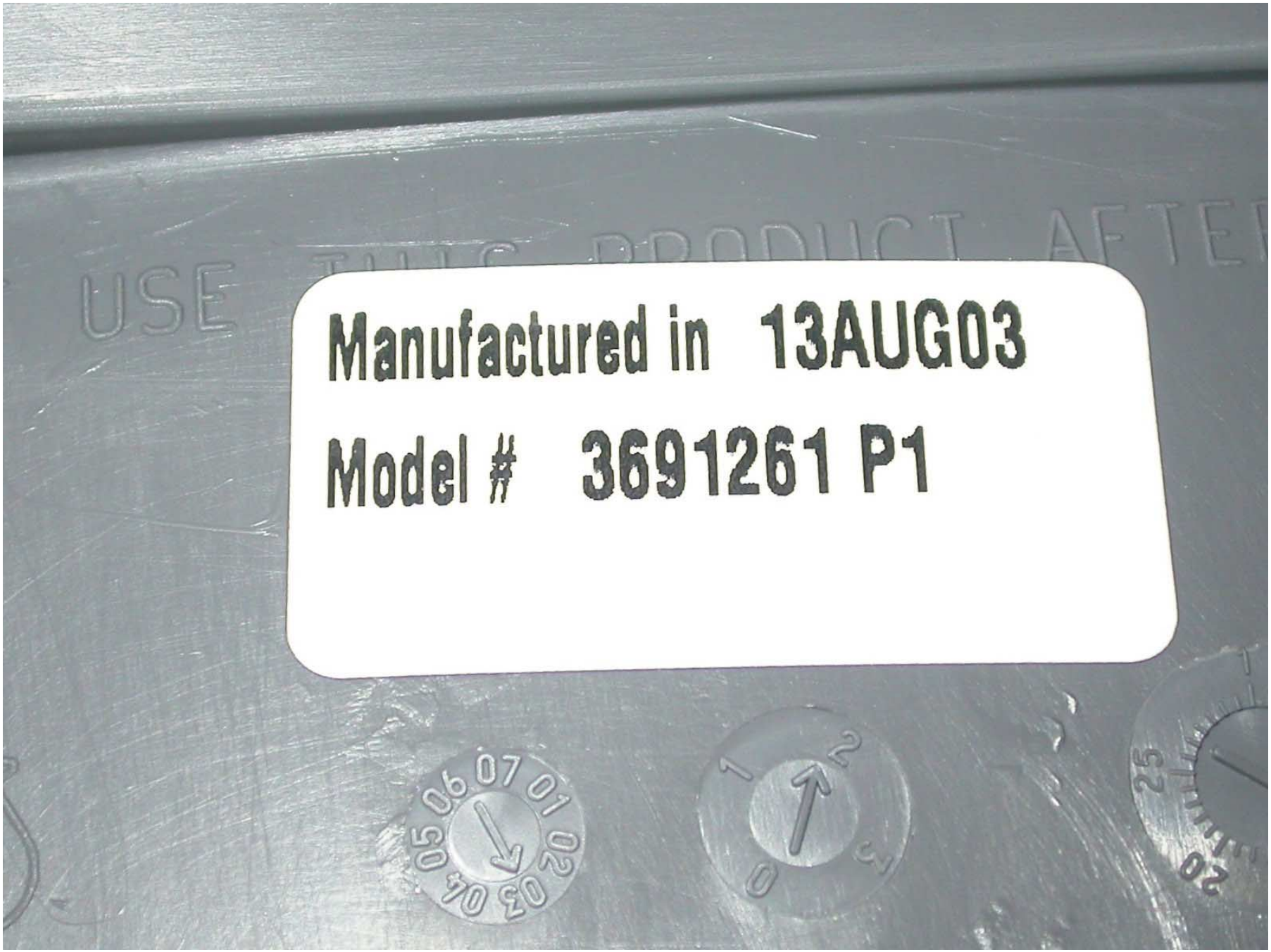

Figure F2-1: Close-up View Position 3 CRS Label

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

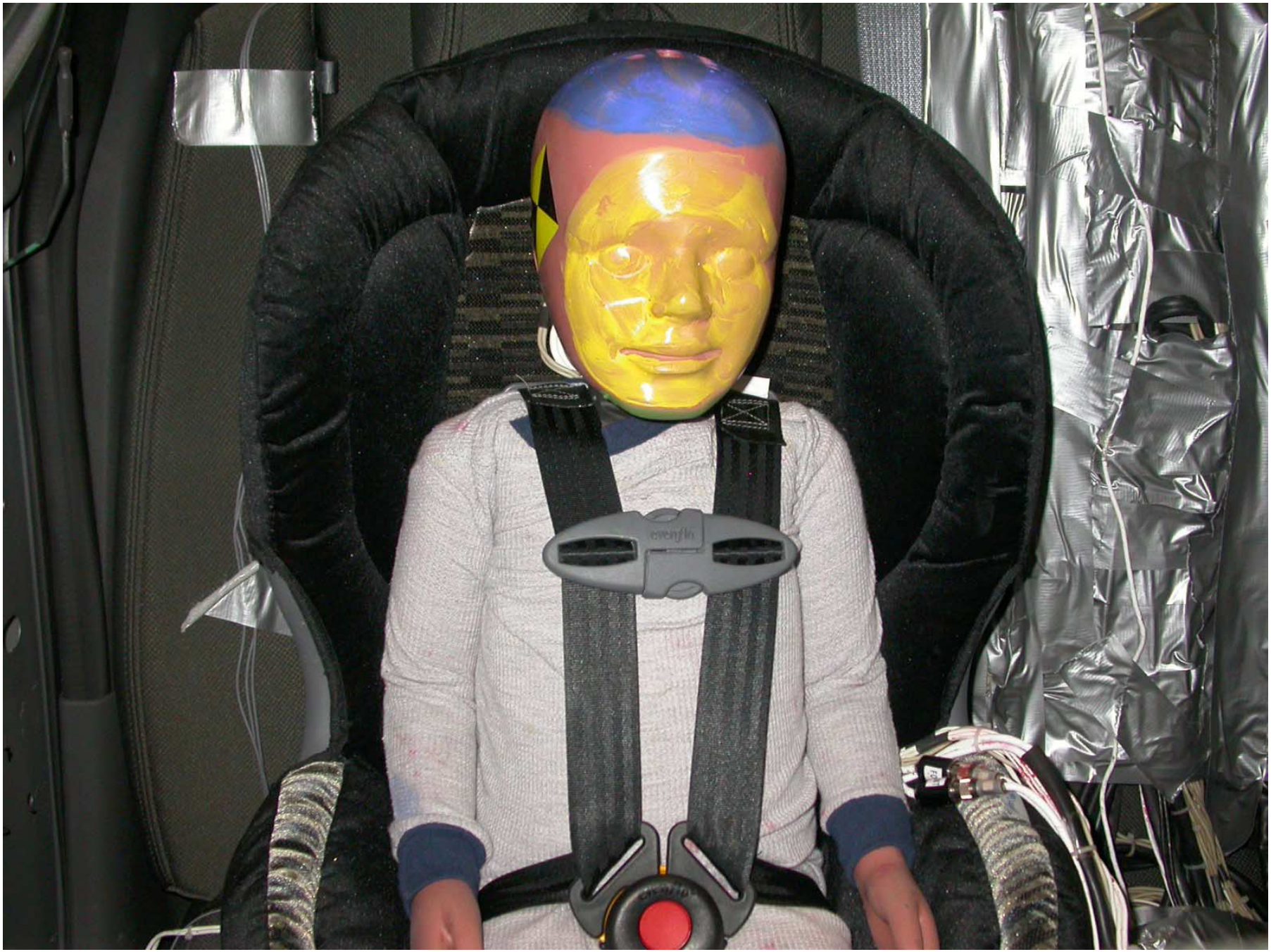

Figure F2-10: Pre-Test Position 3 Front View

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

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

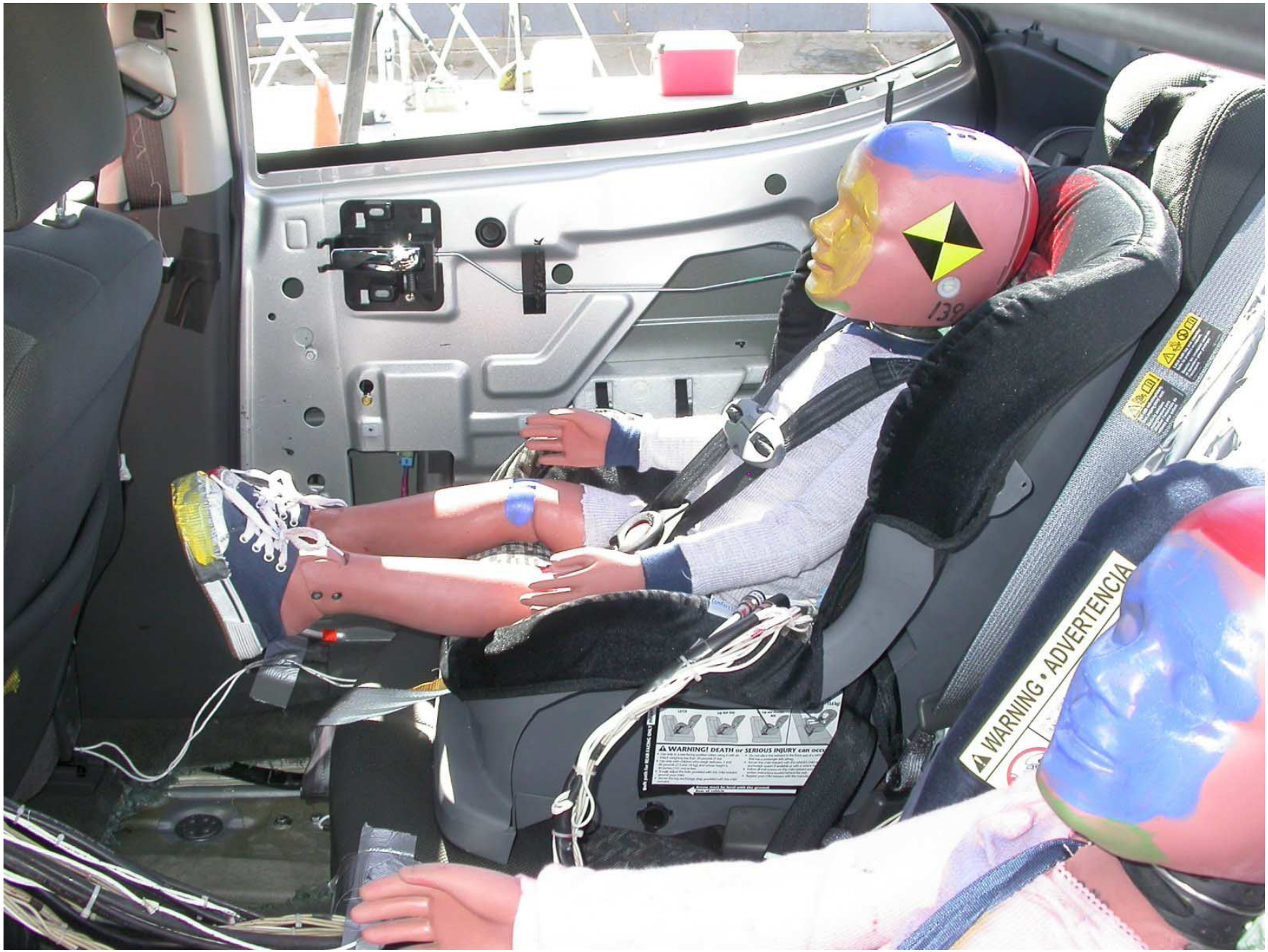

Figure F2-13: Post-Test Position 3 Left Side View

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)

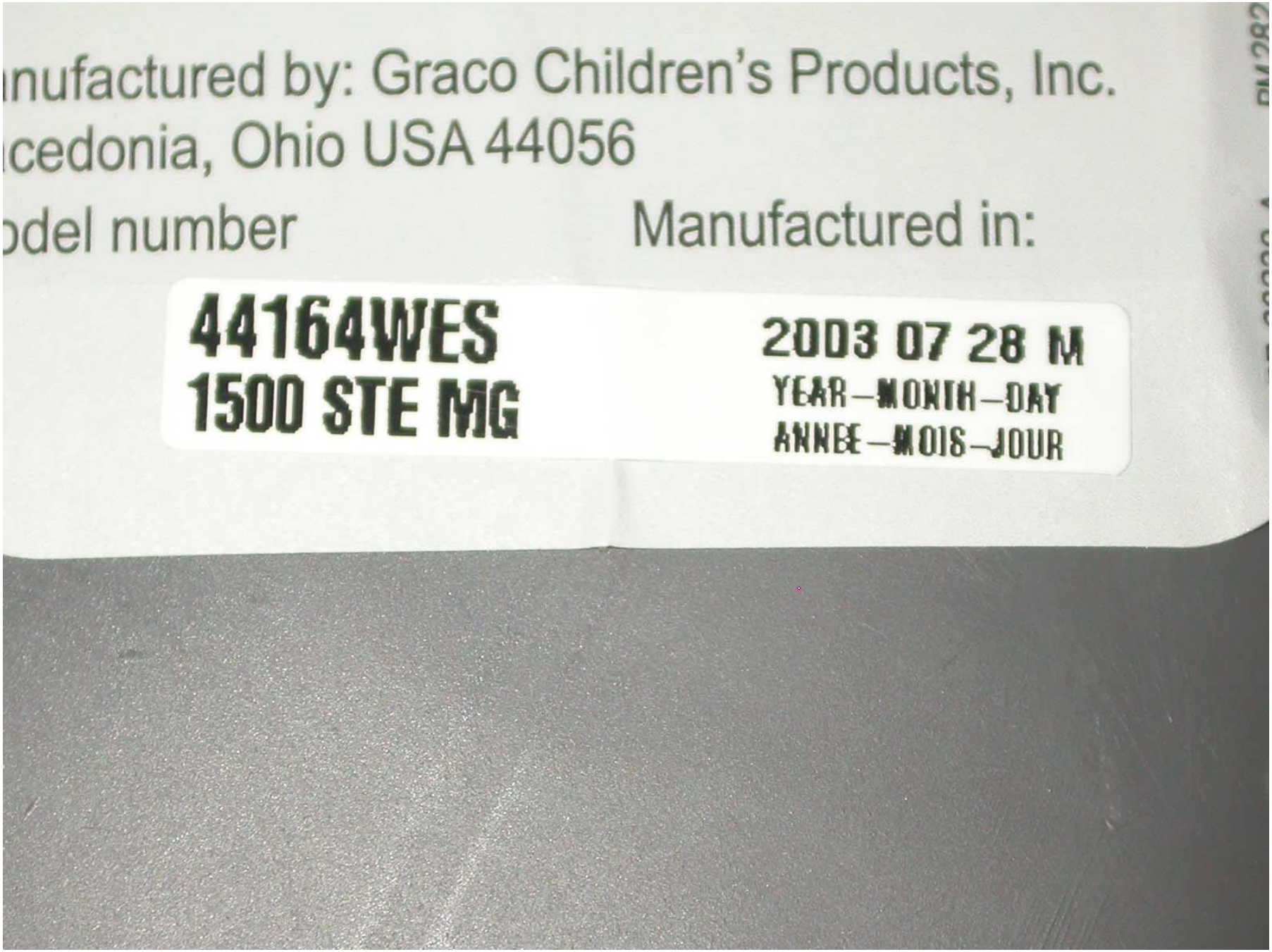

Figure F2-17: Close-up View Position 4 CRS Label

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

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

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

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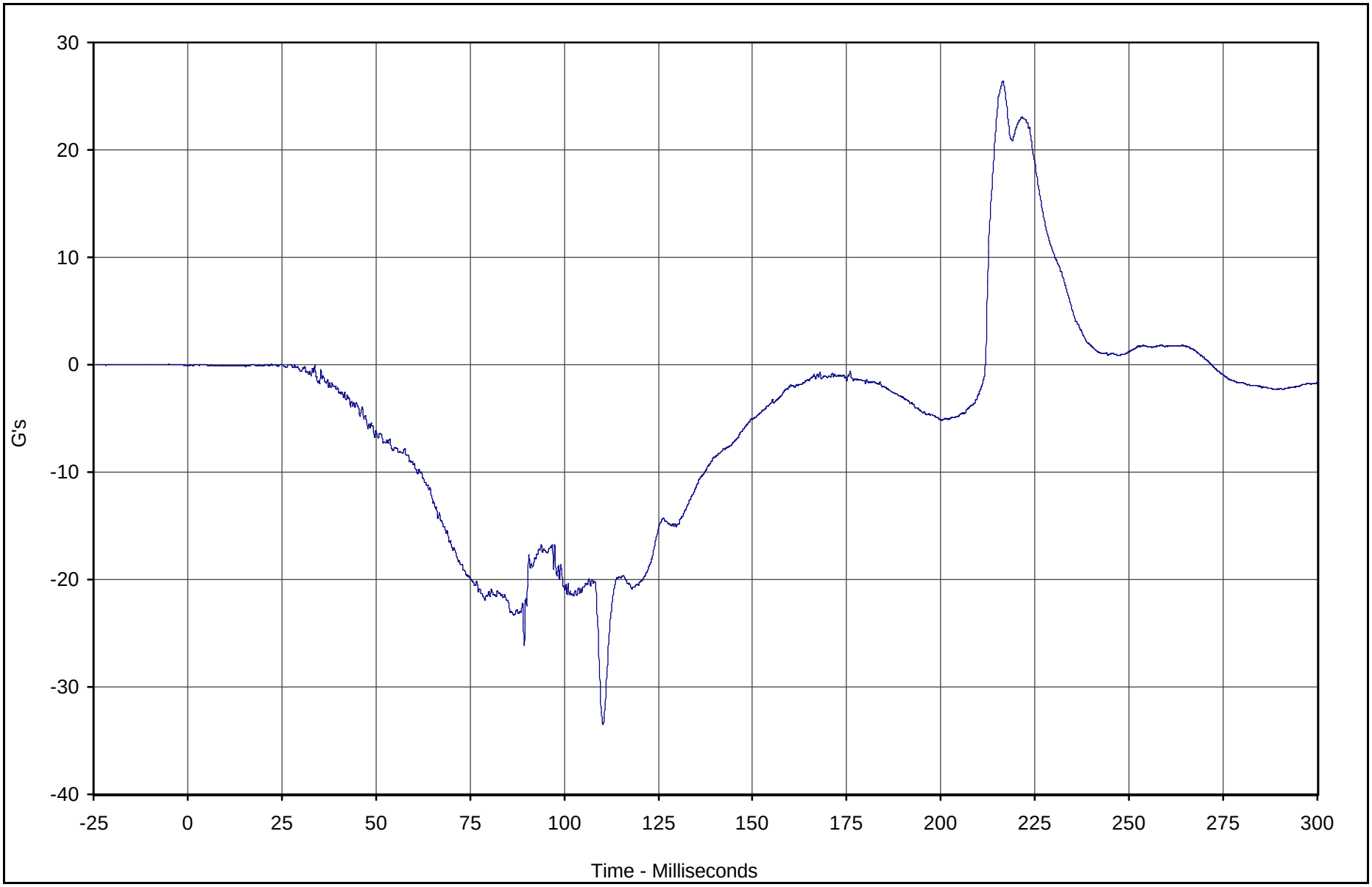


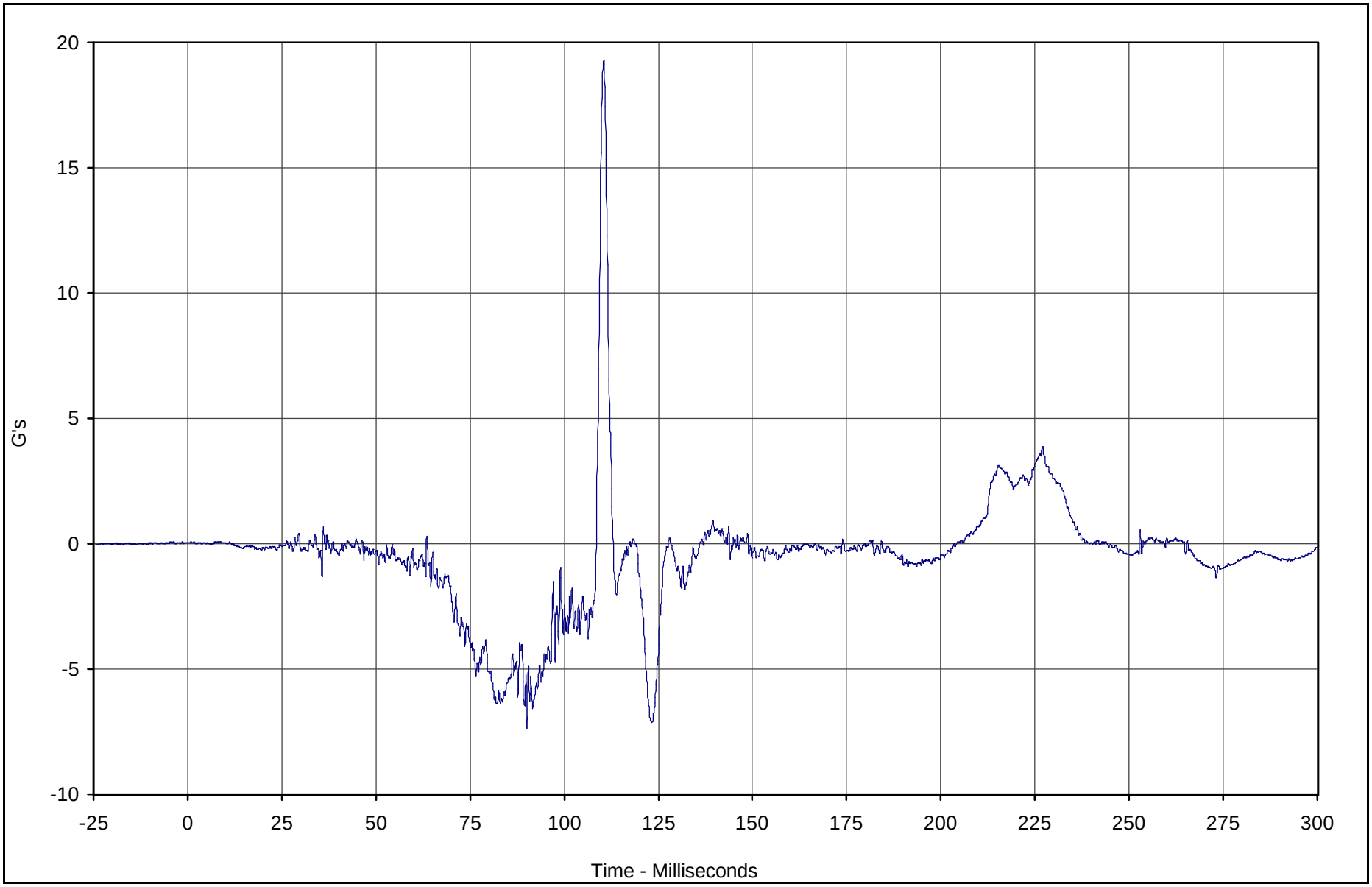
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head X	134	FIL	G's	26.4	216.6	-33.5	110.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



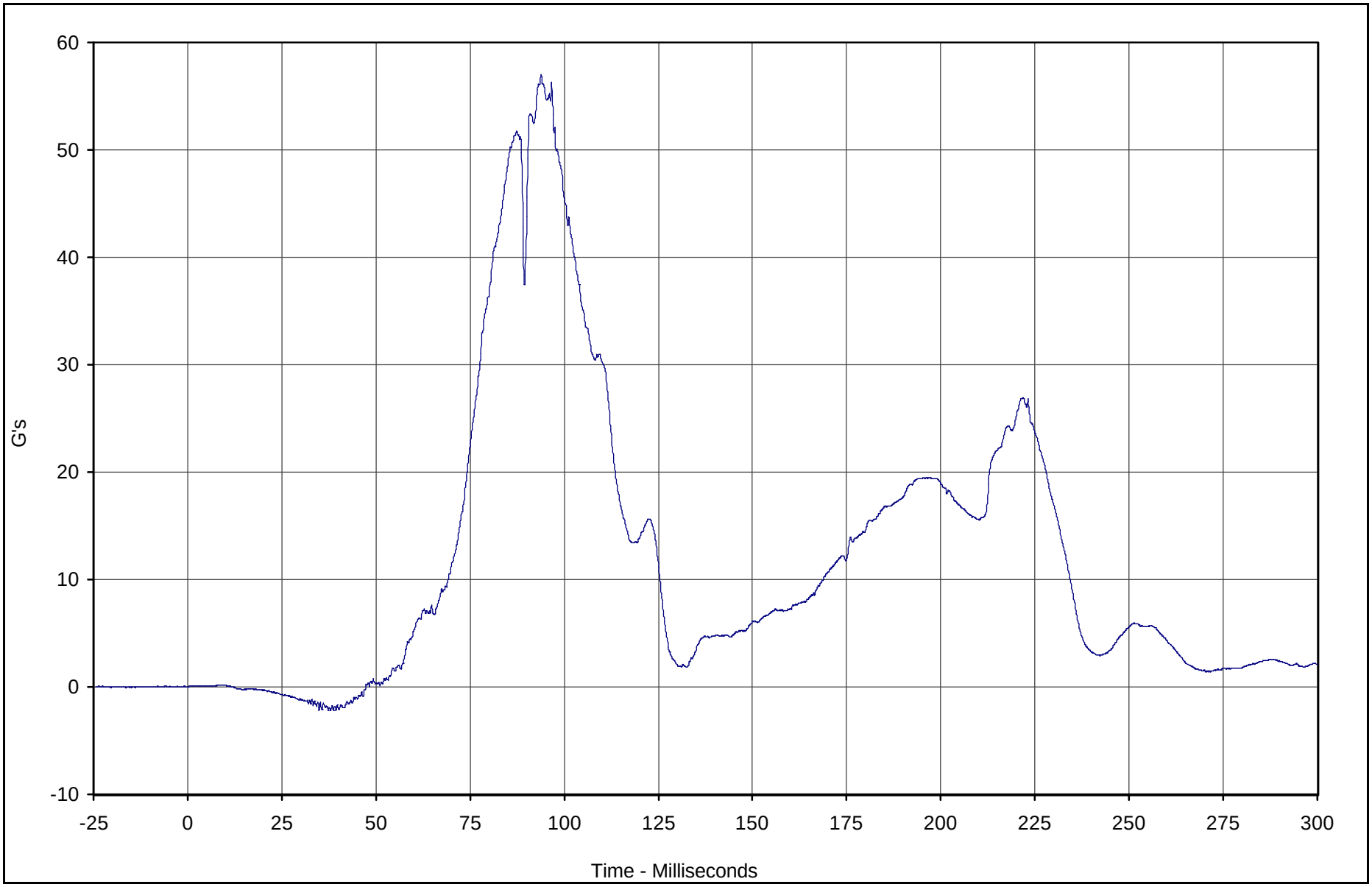
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head Y	135	FIL	G's	19.3	110.5	-7.4	90.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



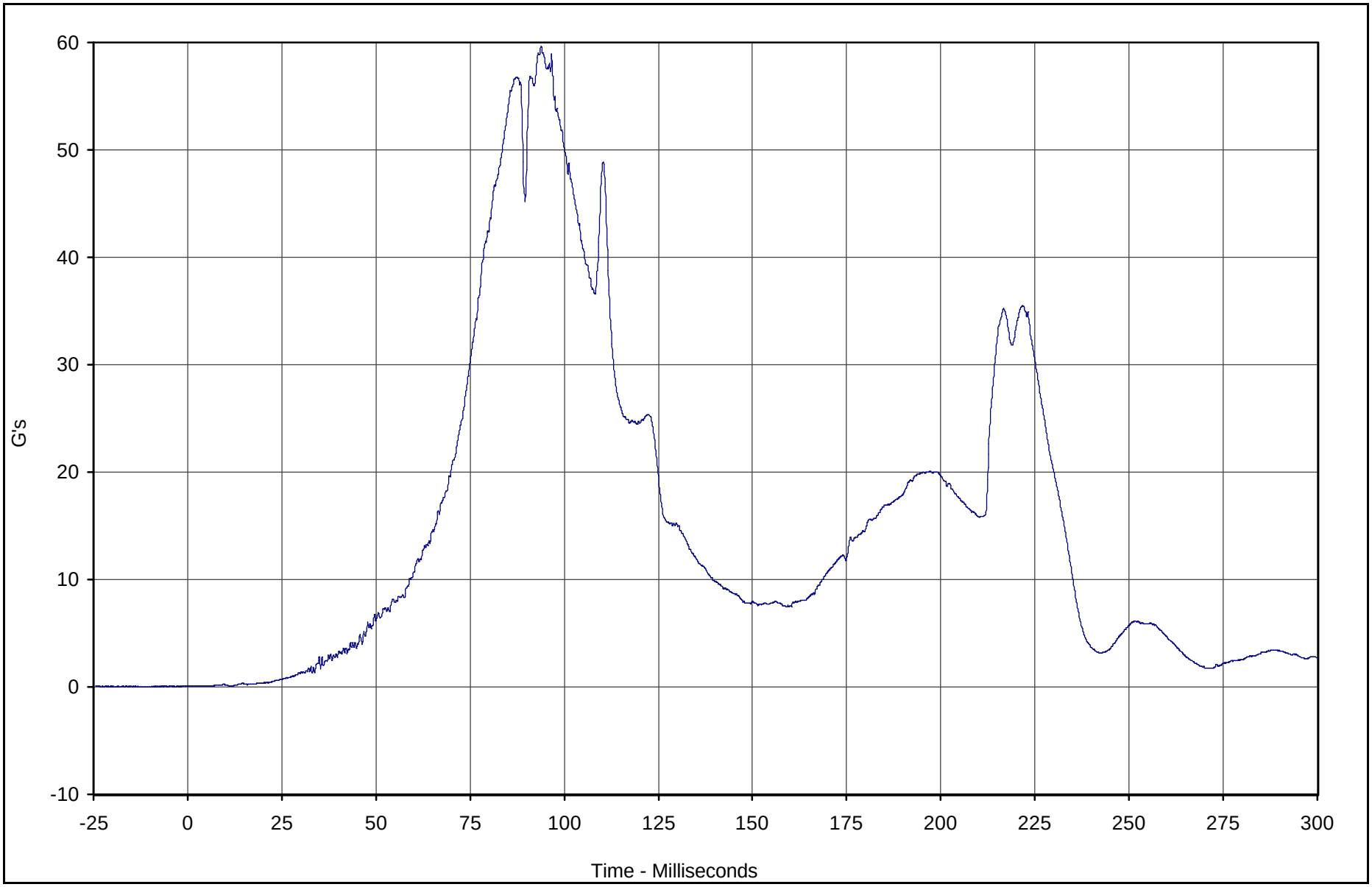
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head Z	136	FIL	G's	57.0	93.9	-2.2	37.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



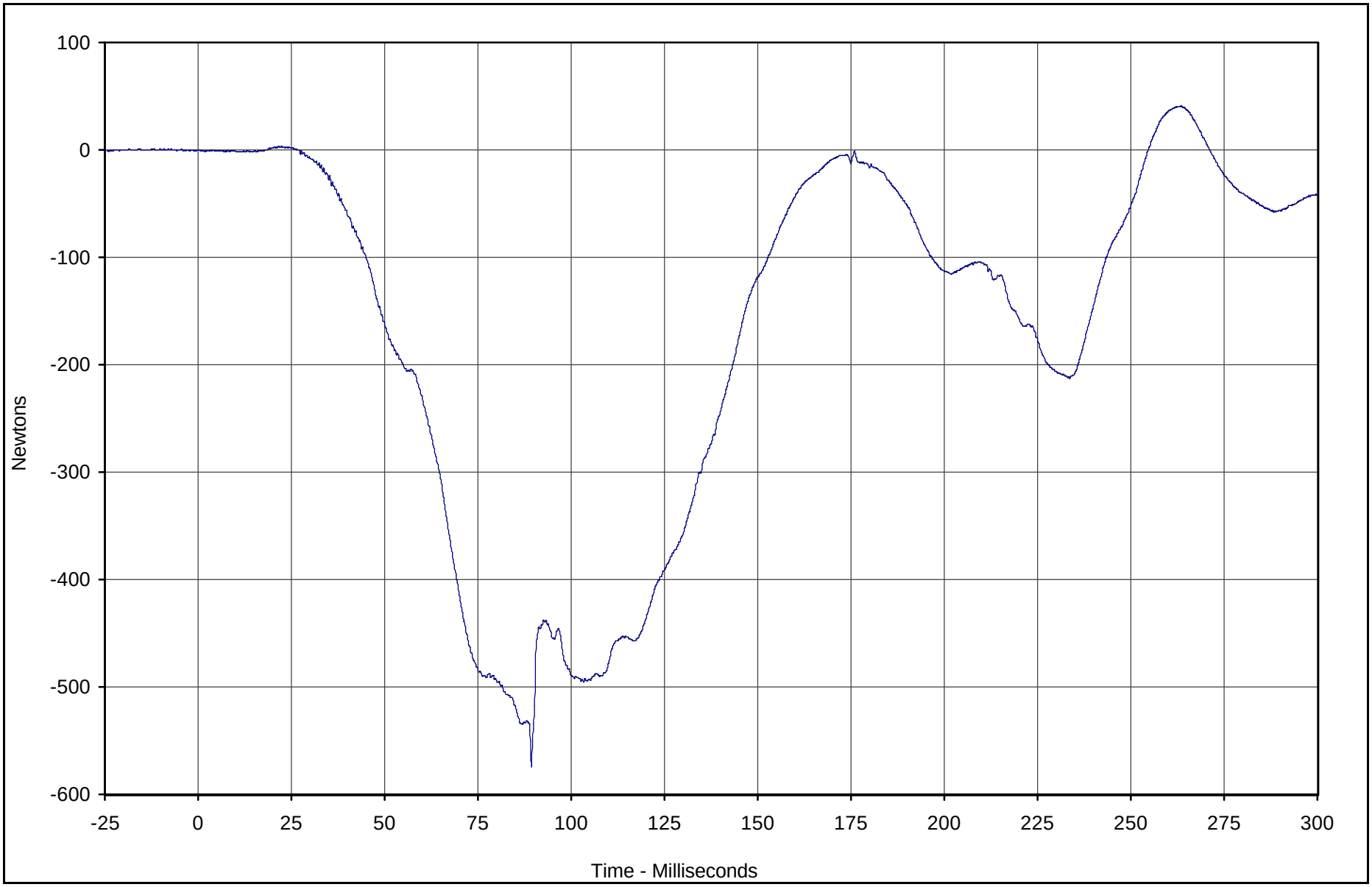
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Head Resultant	134	RES	G's	59.7	93.9	0.1	0.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



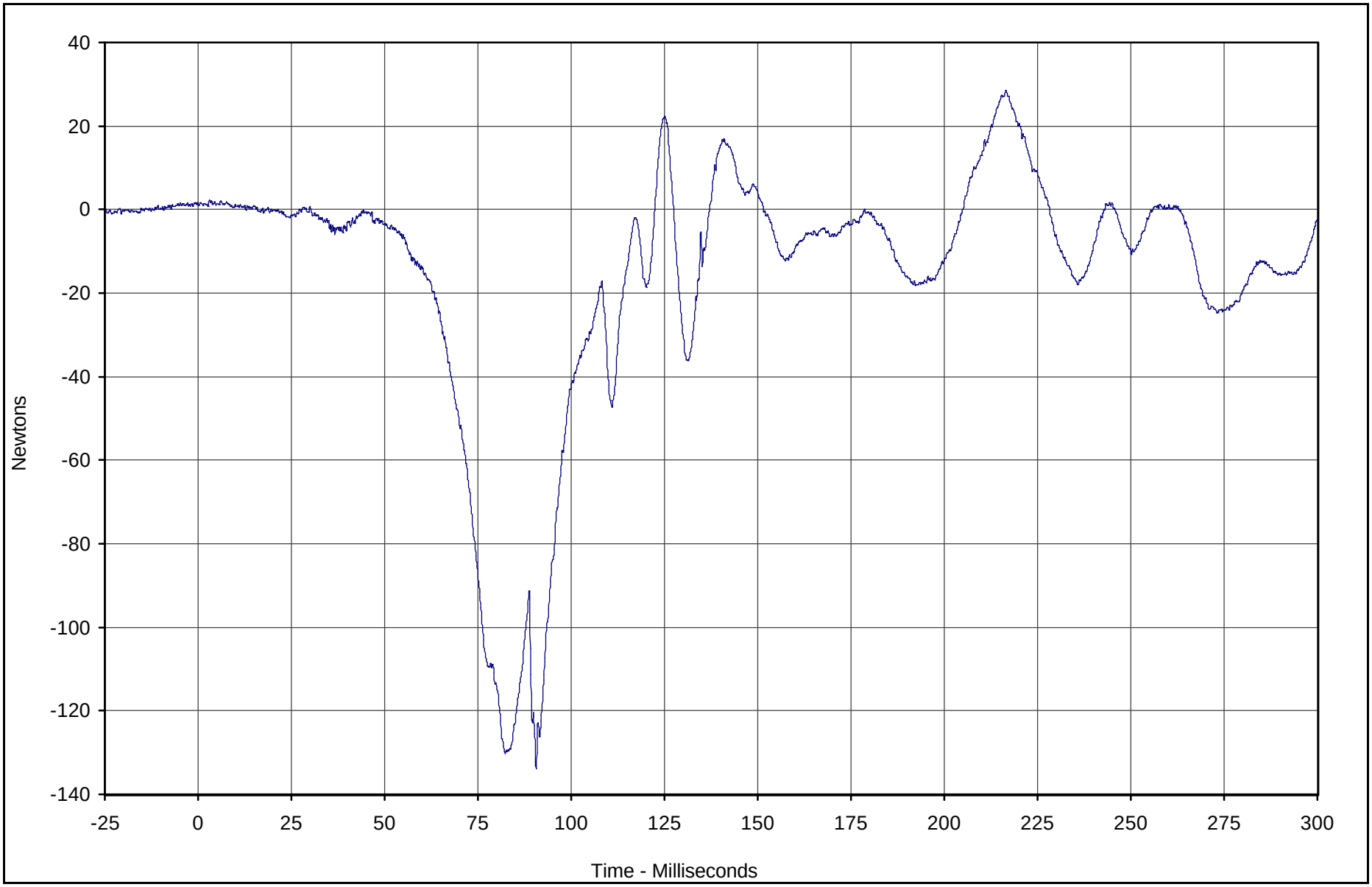
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force X	137	FIL	Newtons	40.8	263.5	-574.4	89.4	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



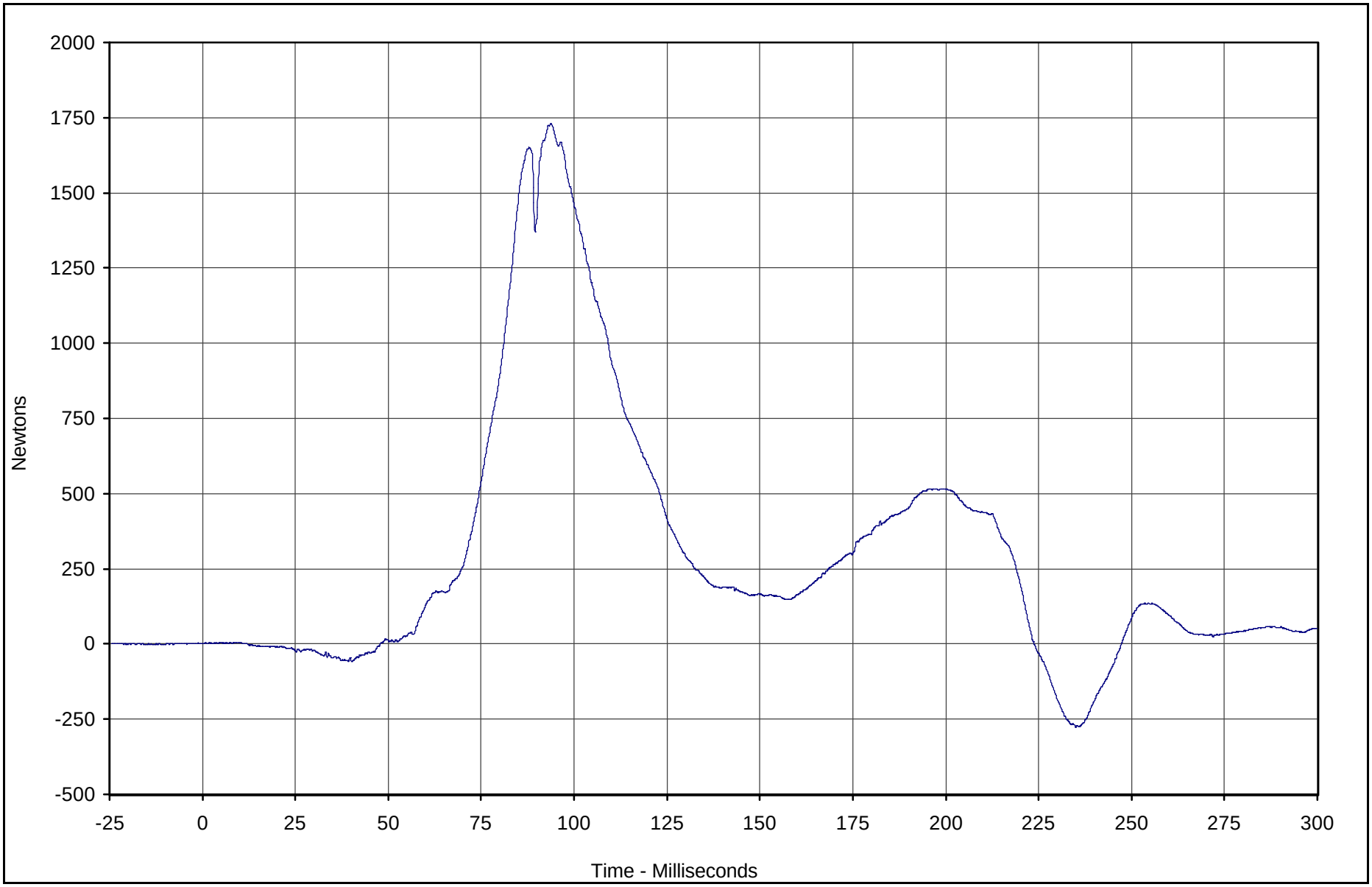
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force Y	138	FIL	Newtons	28.5	216.5	-133.9	90.6	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



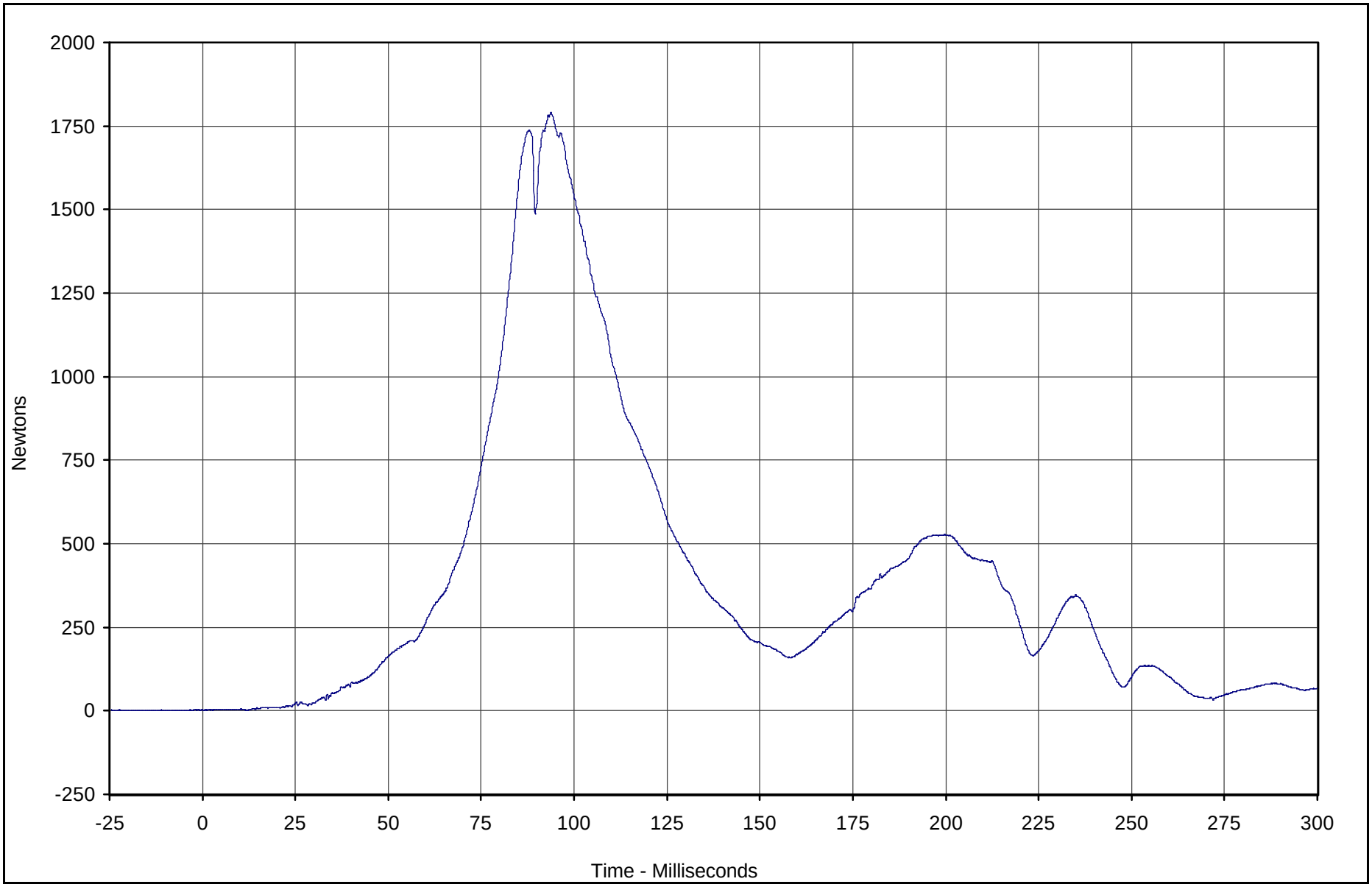
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force Z	139	FIL	Newtons	1731.9	93.8	-278.8	235.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



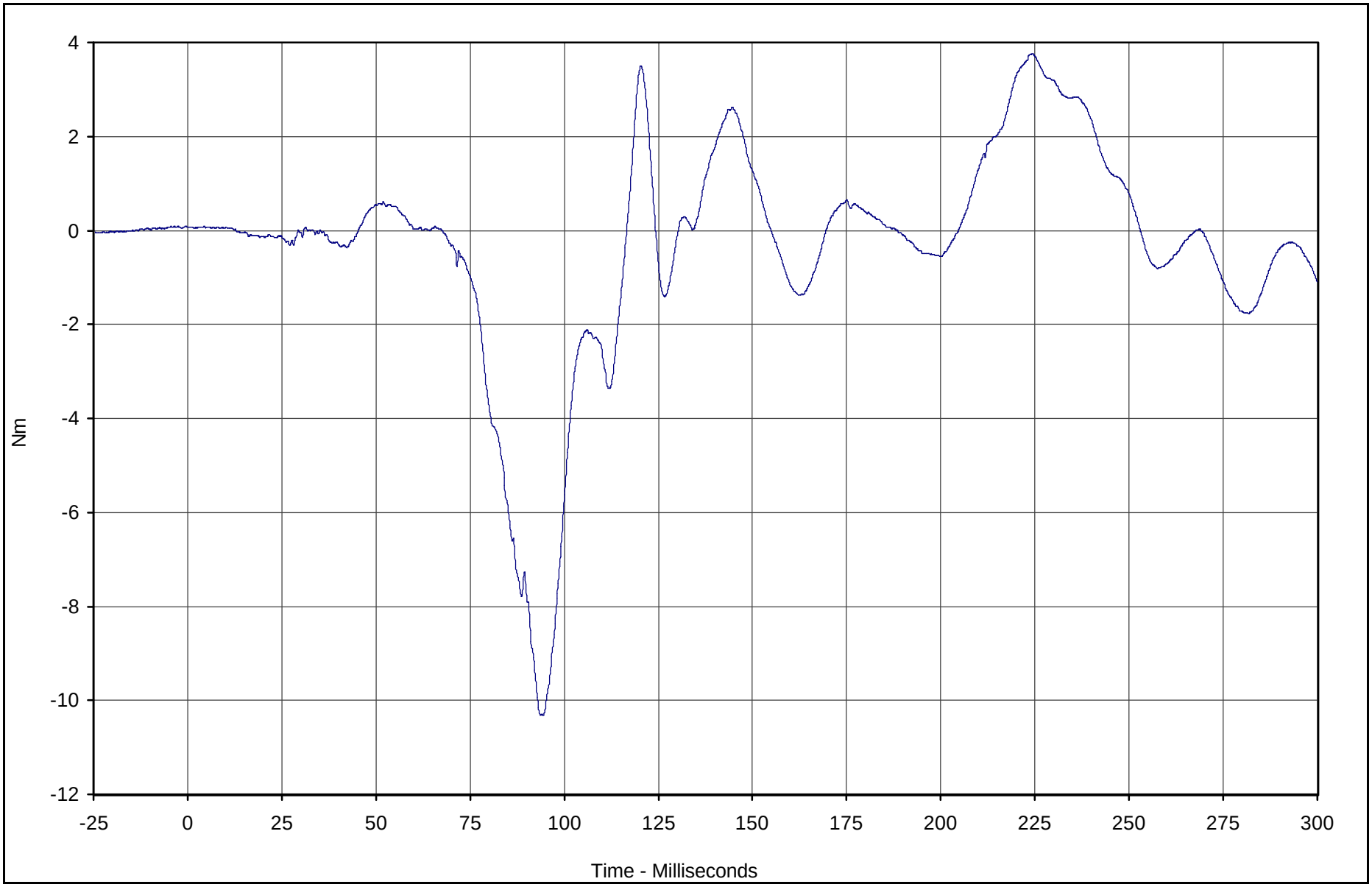
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Force Res.	137	RES	Newtons	1789.9	93.8	1.3	0.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



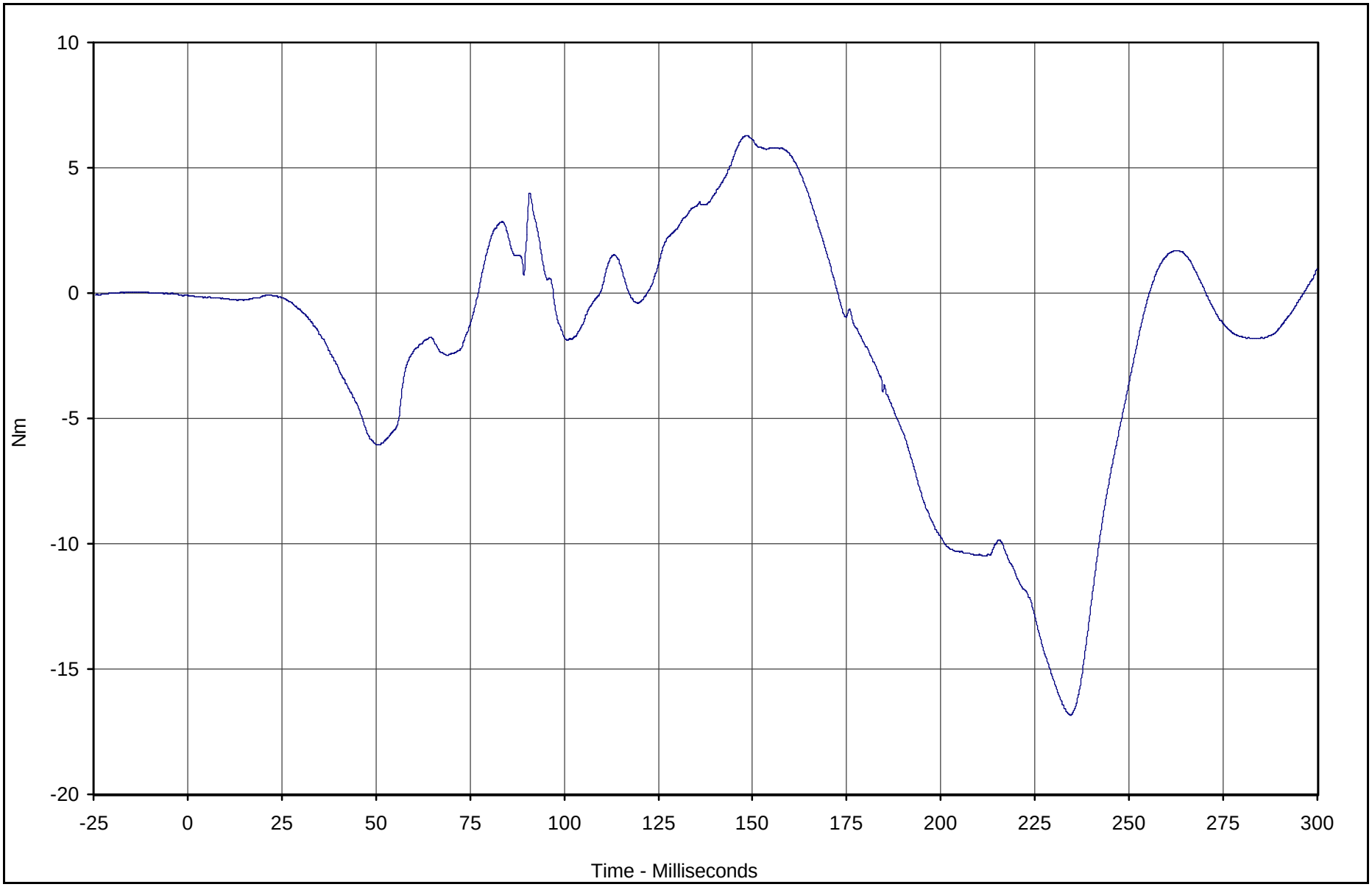
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Moment X	140	FIL	Nm	3.8	224.3	-10.3	94.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



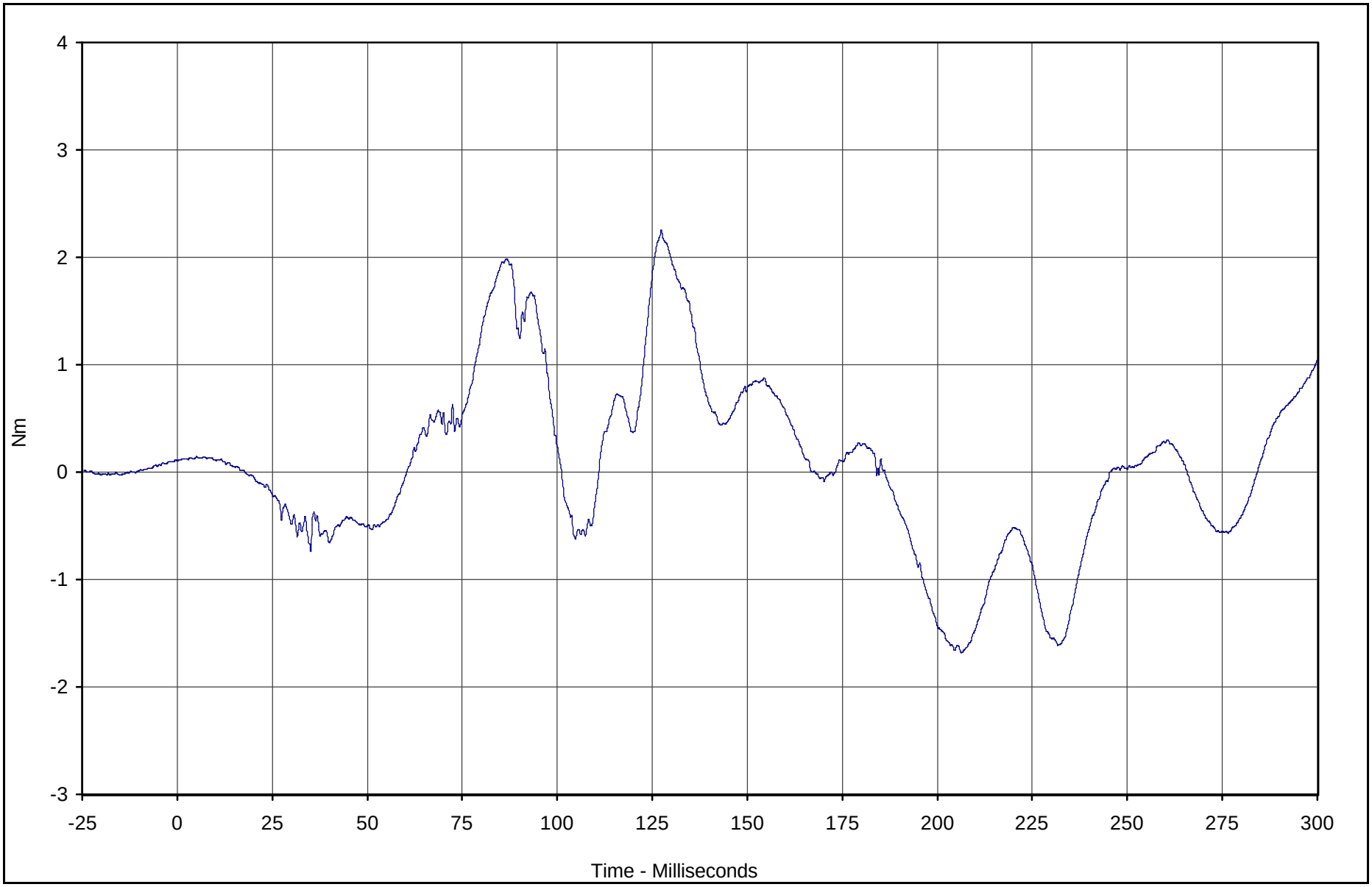
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Moment Y	141	FIL	Nm	6.3	148.6	-16.8	234.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



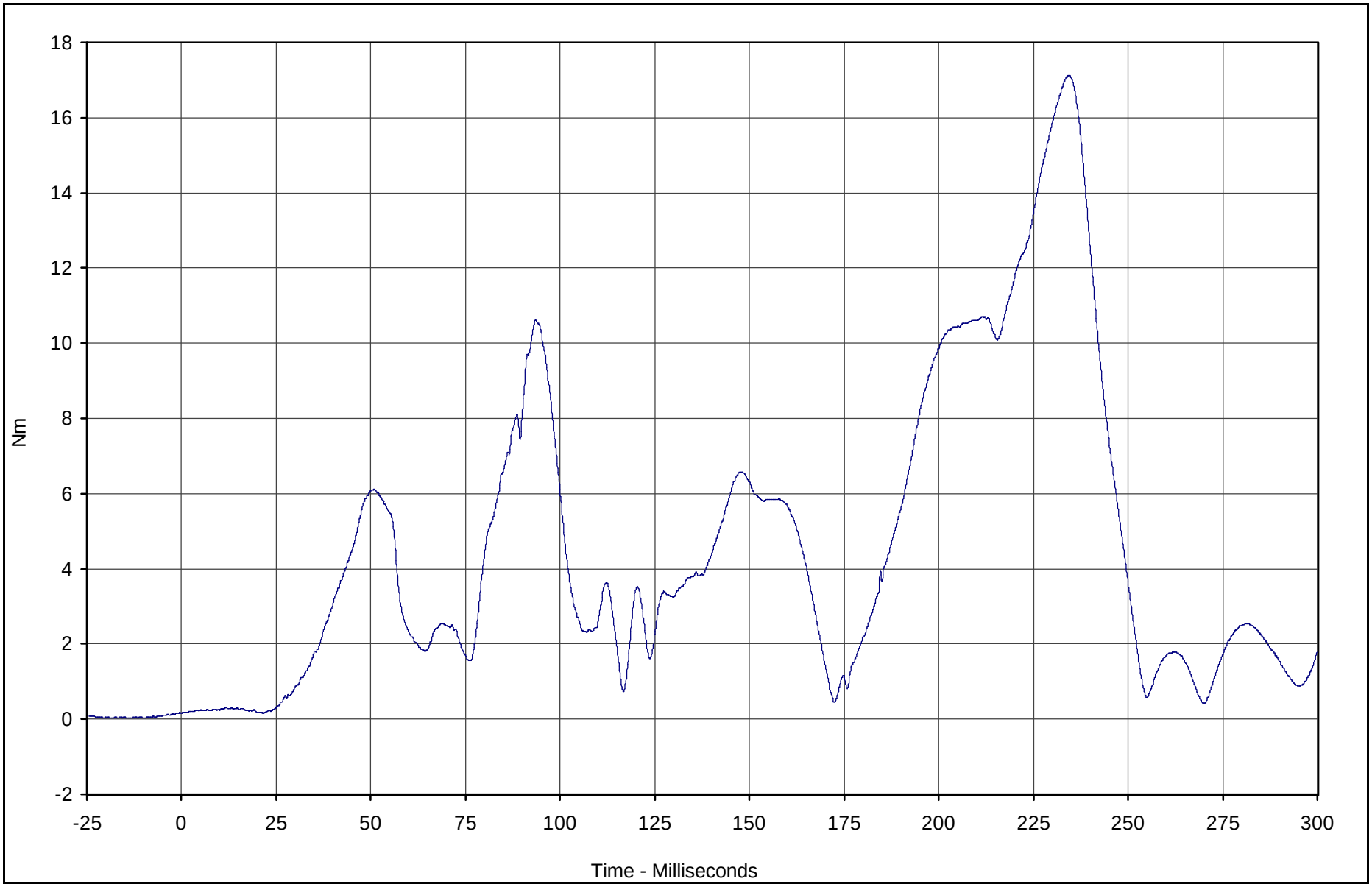
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Moment Z	142	FIL	Nm	2.3	127.4	-1.7	206.3	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



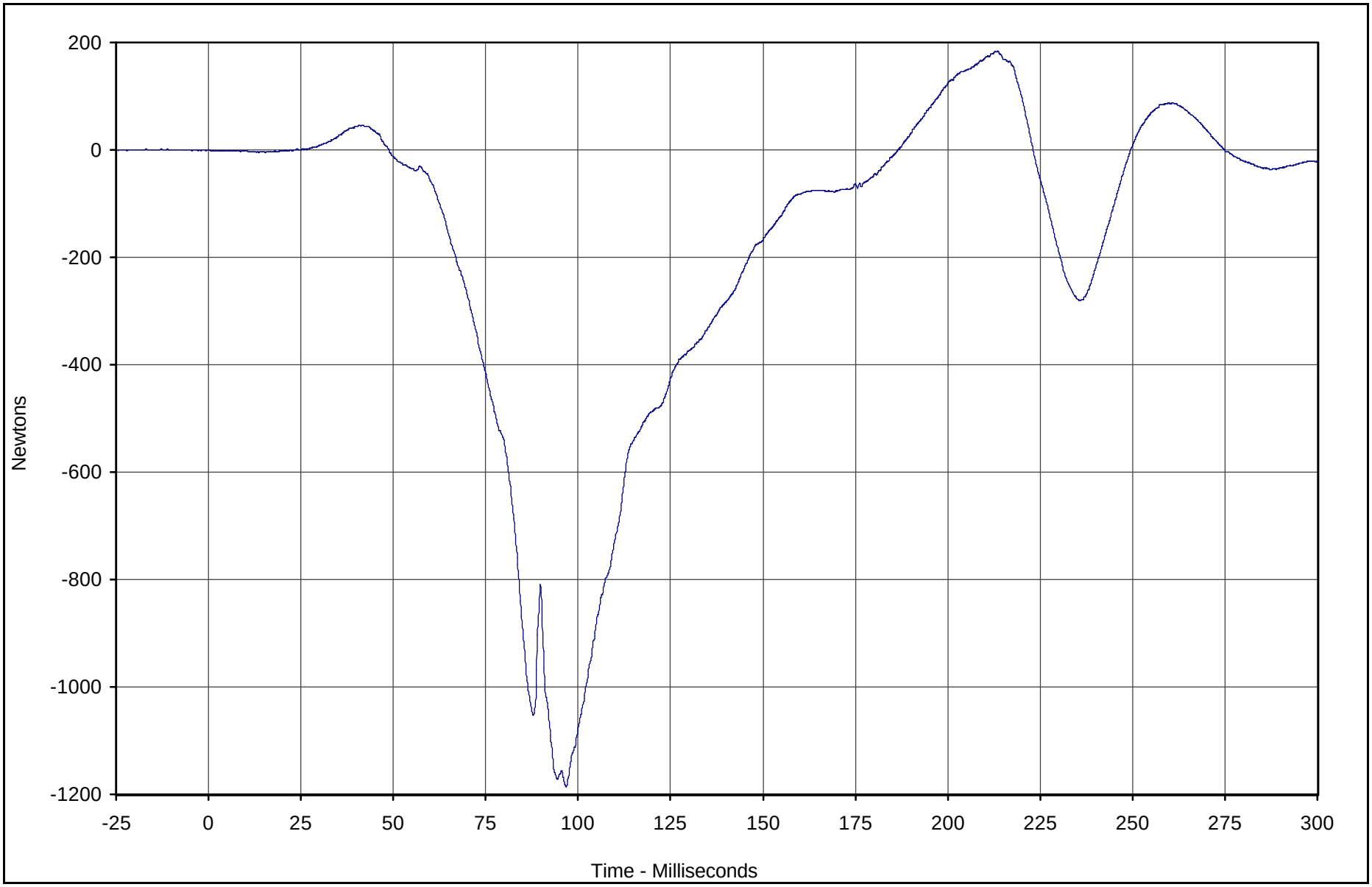
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Upper Neck Mom Res.	140	RES	Nm	17.1	234.4	0.2	21.7	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



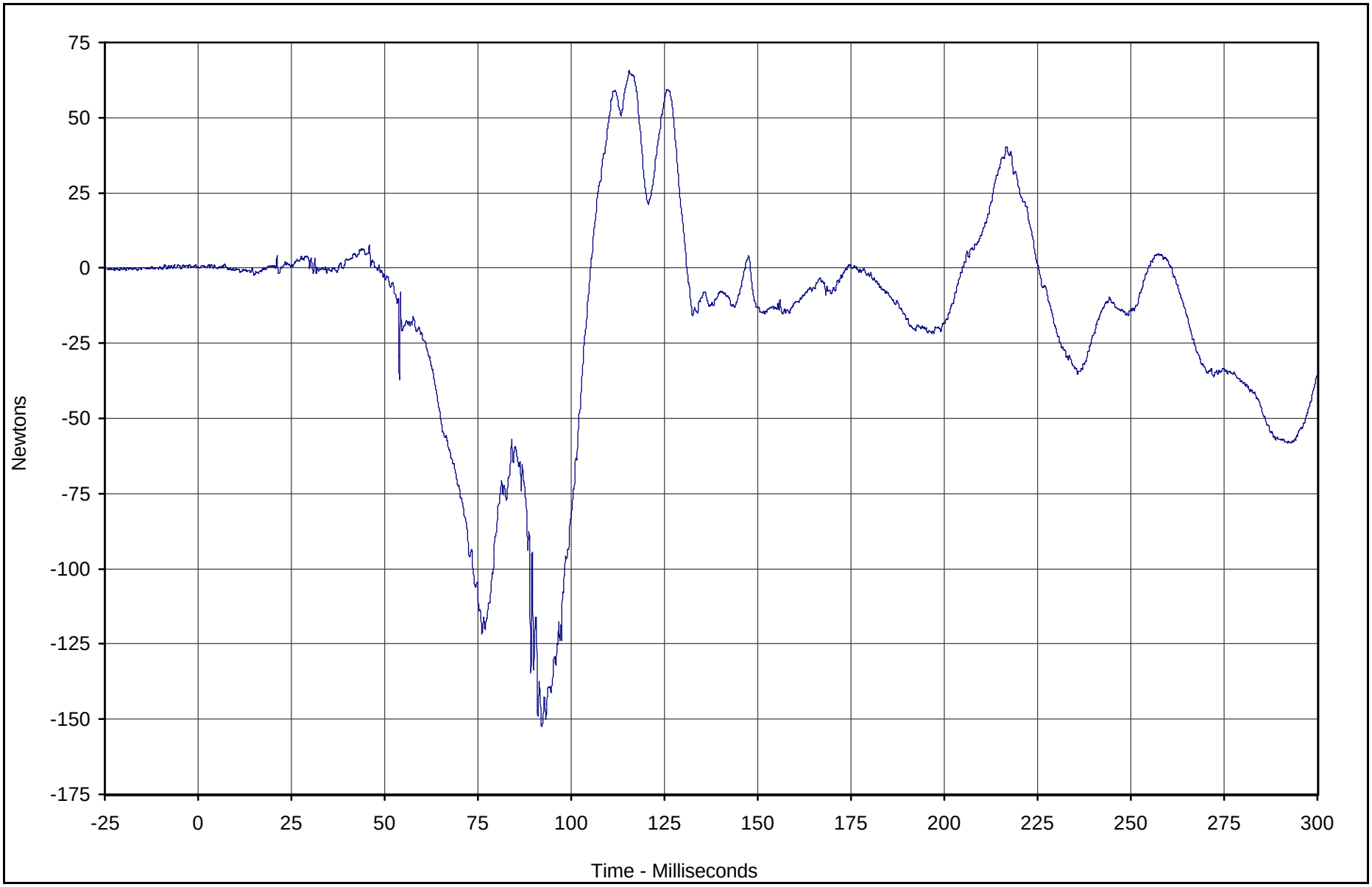
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force X	143	FIL	Newtons	183.8	213.6	-1185.5	96.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



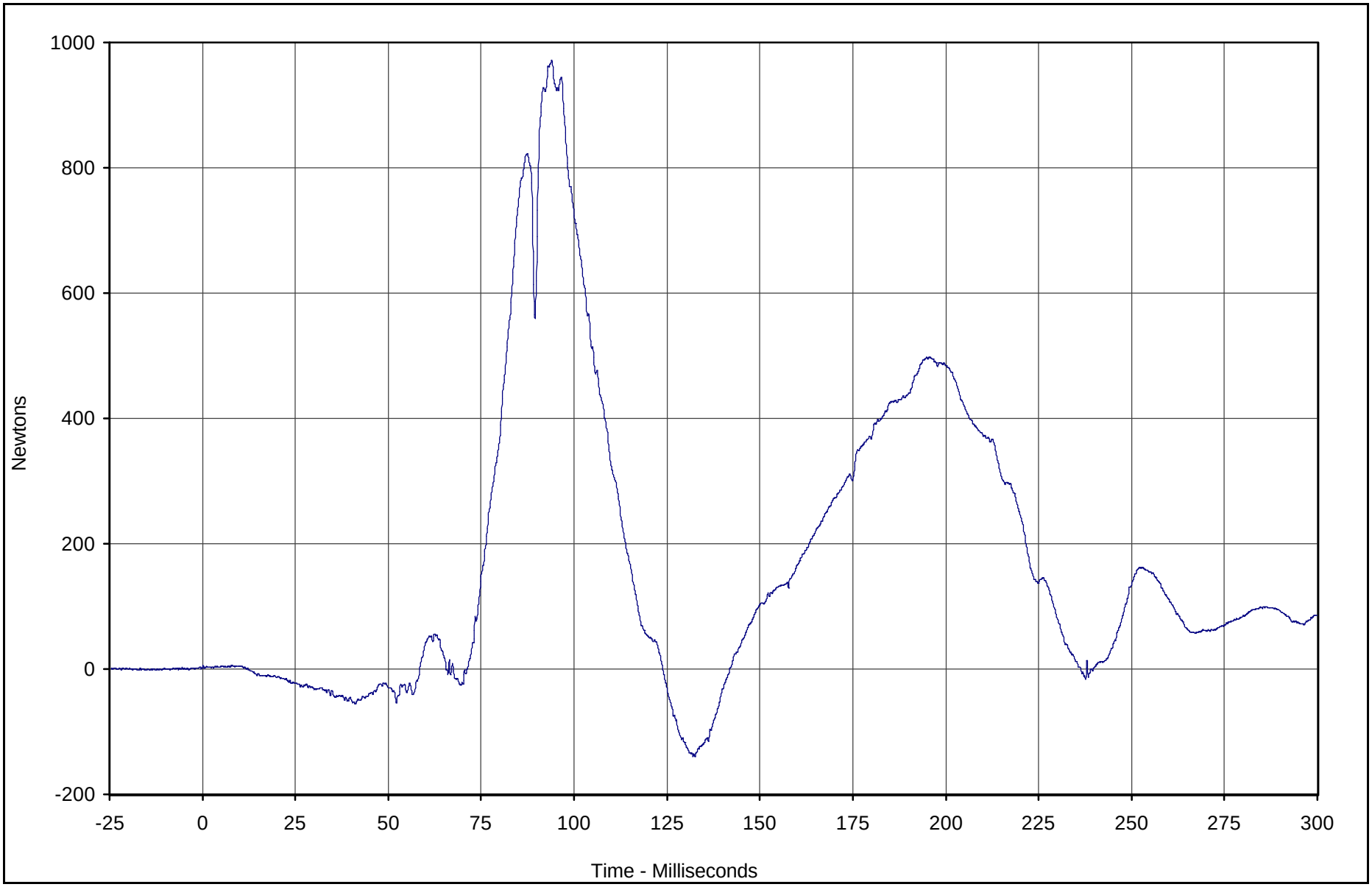
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force Y	144	FIL	Newtons	65.7	115.5	-152.4	92.1	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



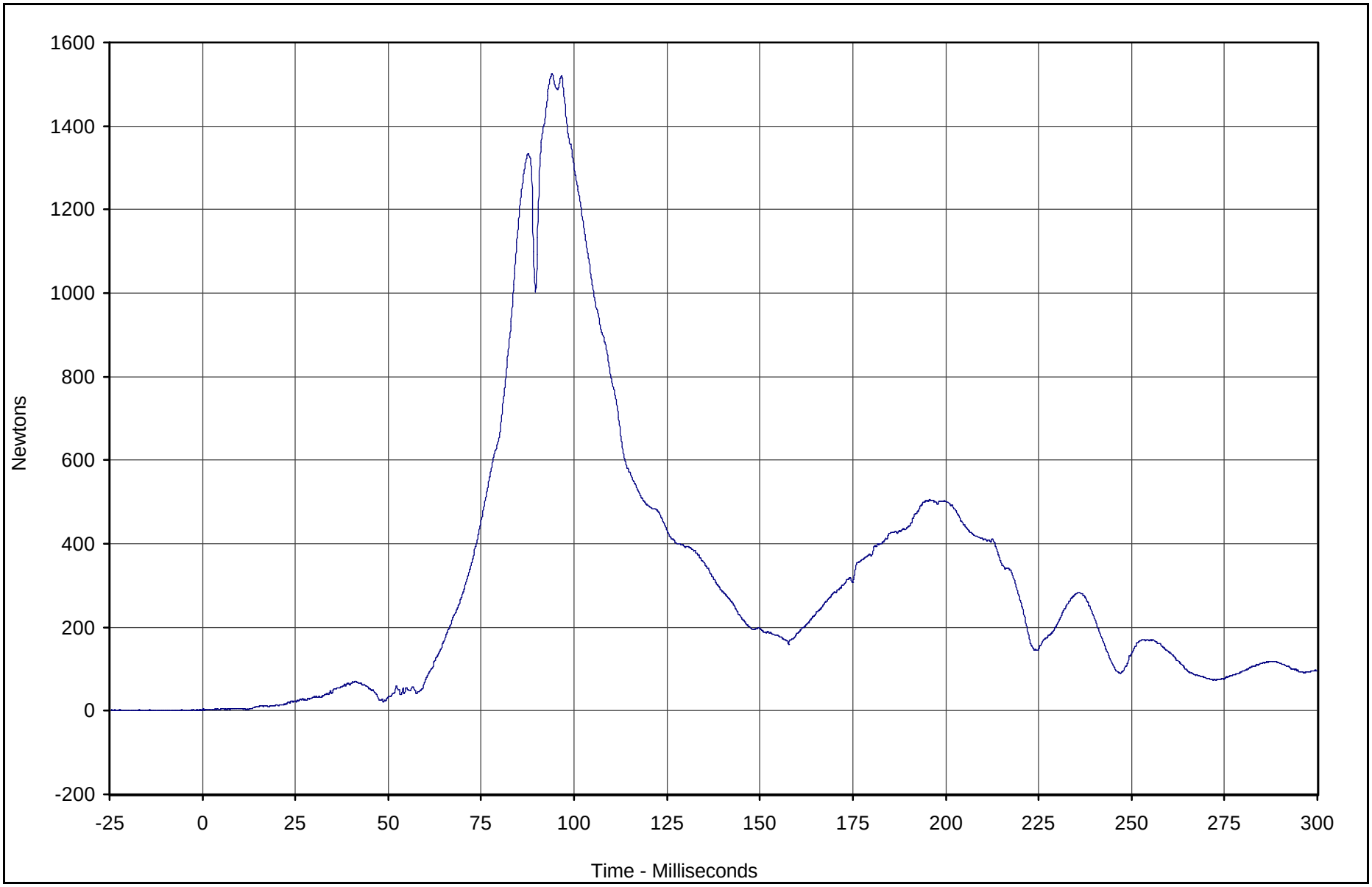
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force Z	145	FIL	Newtons	971.6	94.0	-139.9	132.6	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



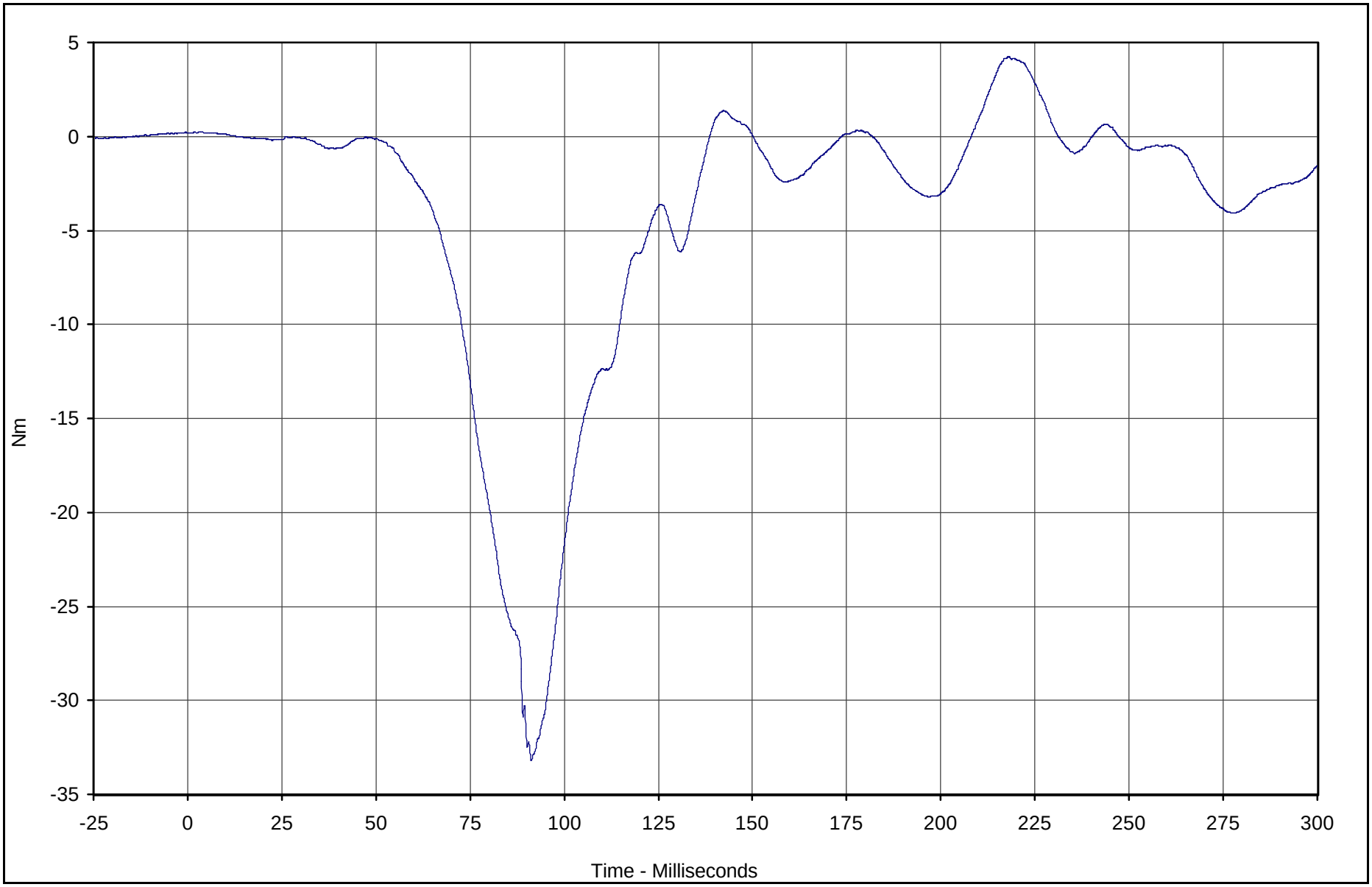
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Force Res.	143	RES	Newtons	1524.6	94.1	1.5	0.5	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



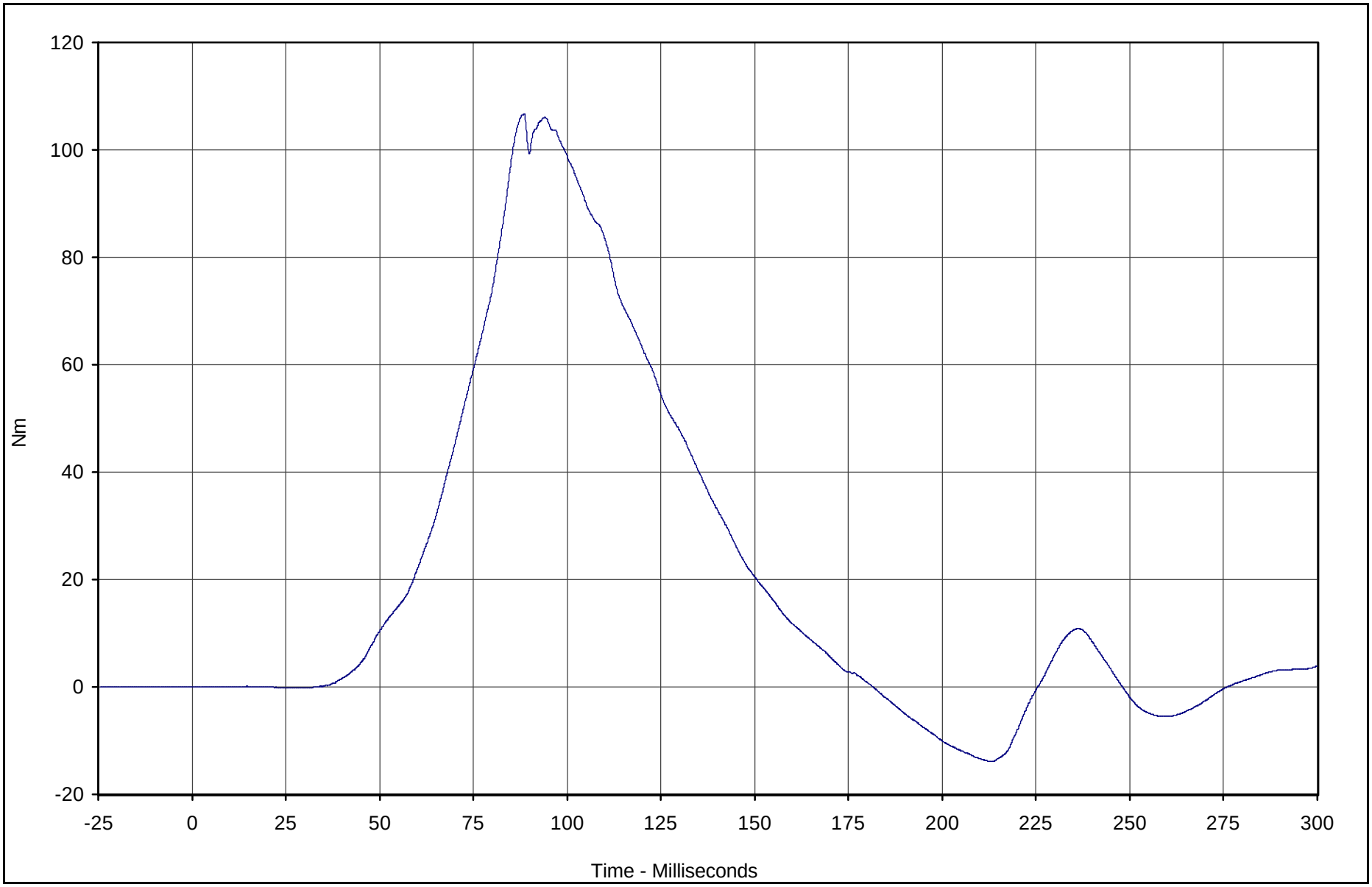
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Moment X	146	FIL	Nm	4.3	218.0	-33.2	91.3	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



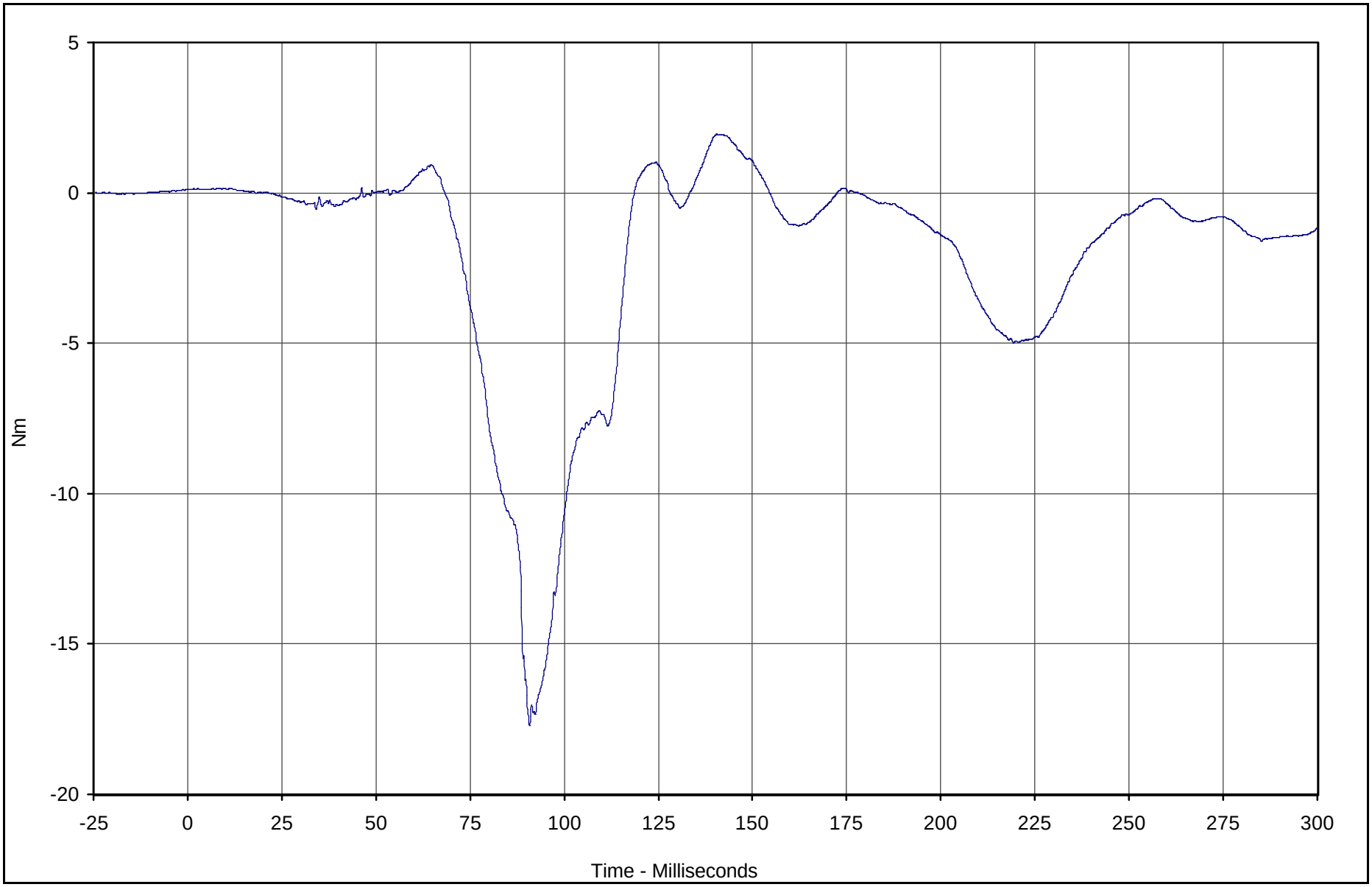
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Moment Y	147	FIL	Nm	106.7	88.6	-13.9	213.3	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



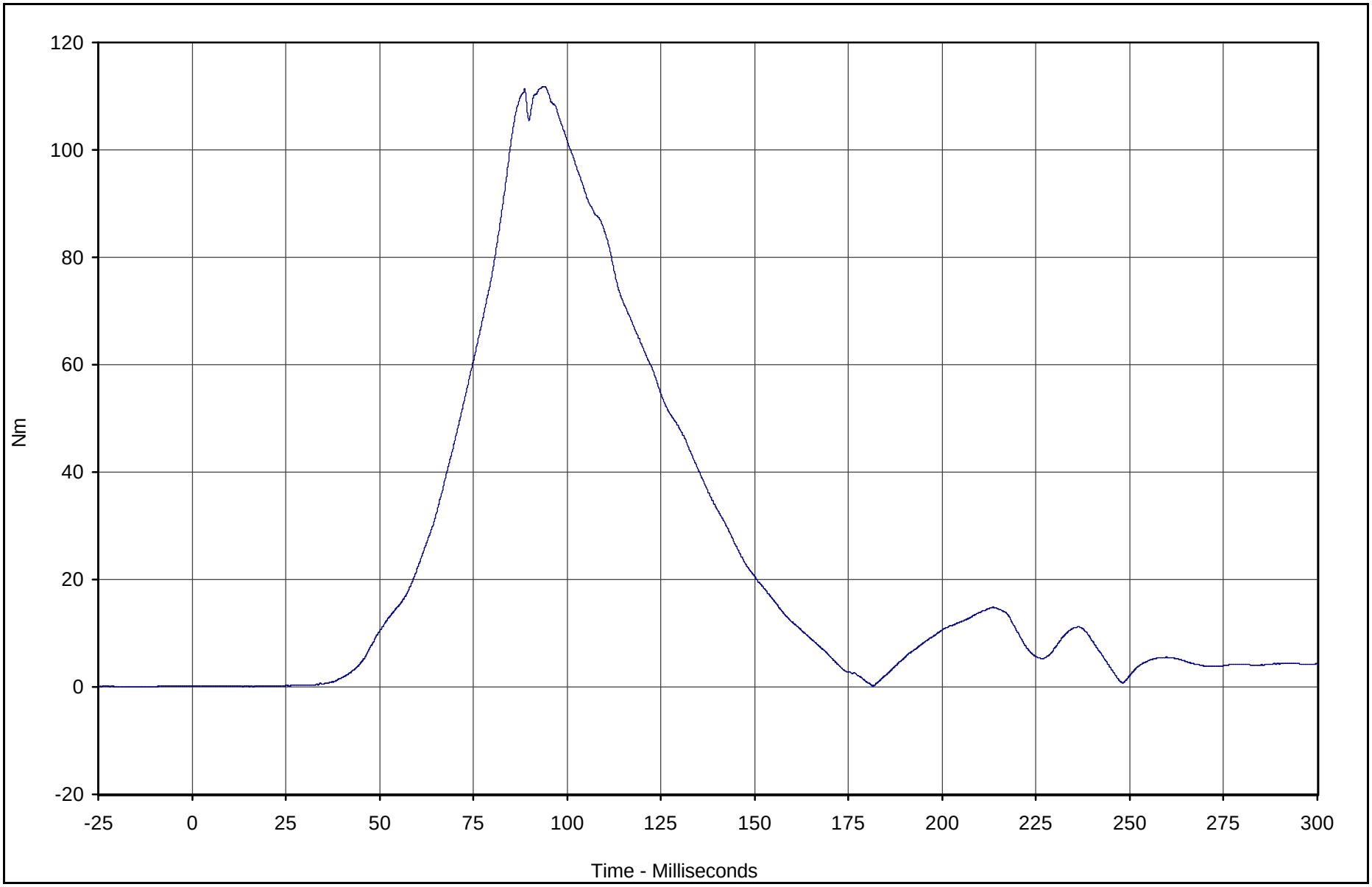
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Moment Z	148	FIL	Nm	1.9	140.6	-17.7	90.9	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



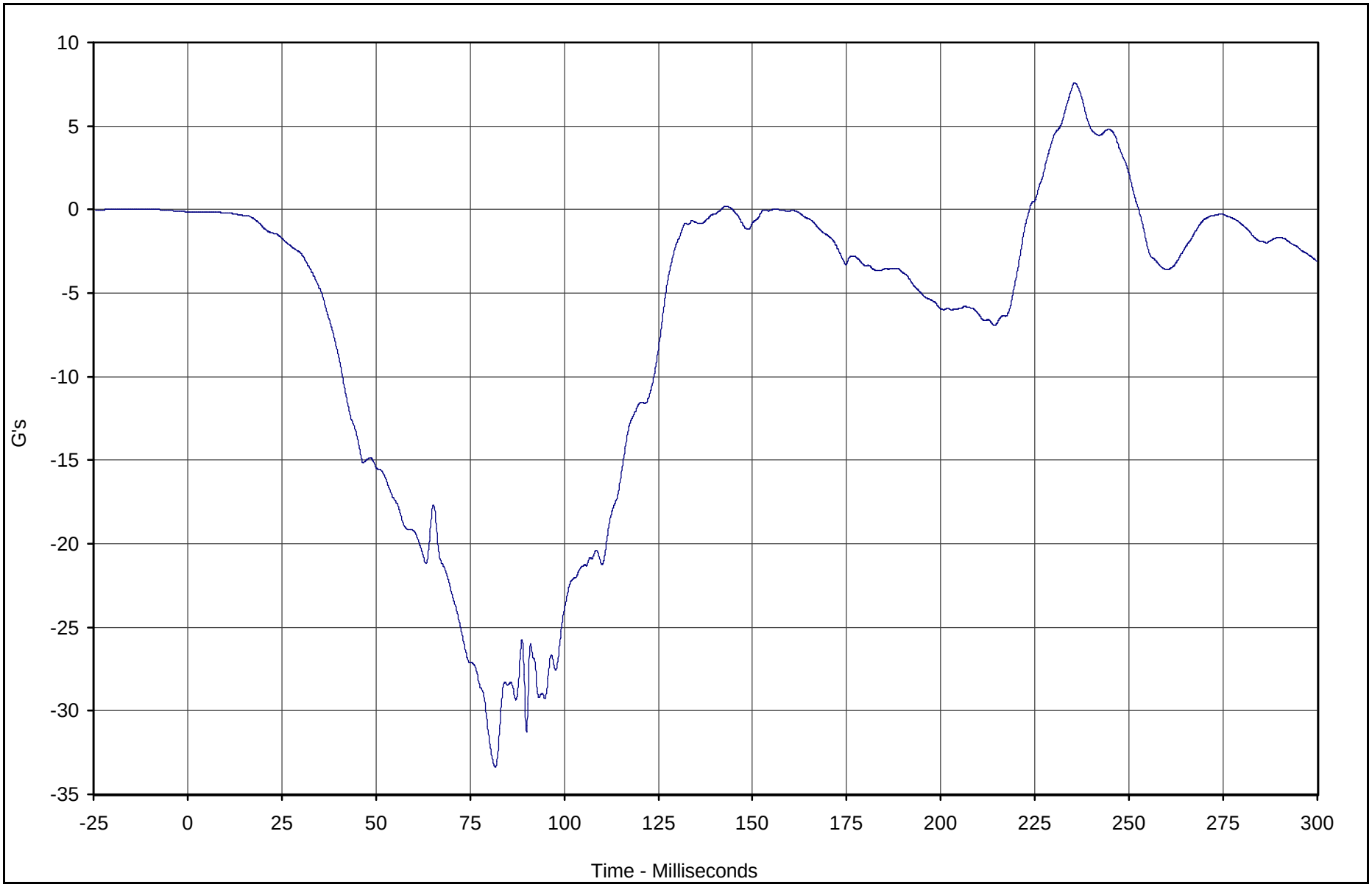
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Lower Neck Mom Res.	146	RES	Nm	111.8	93.7	0.1	16.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



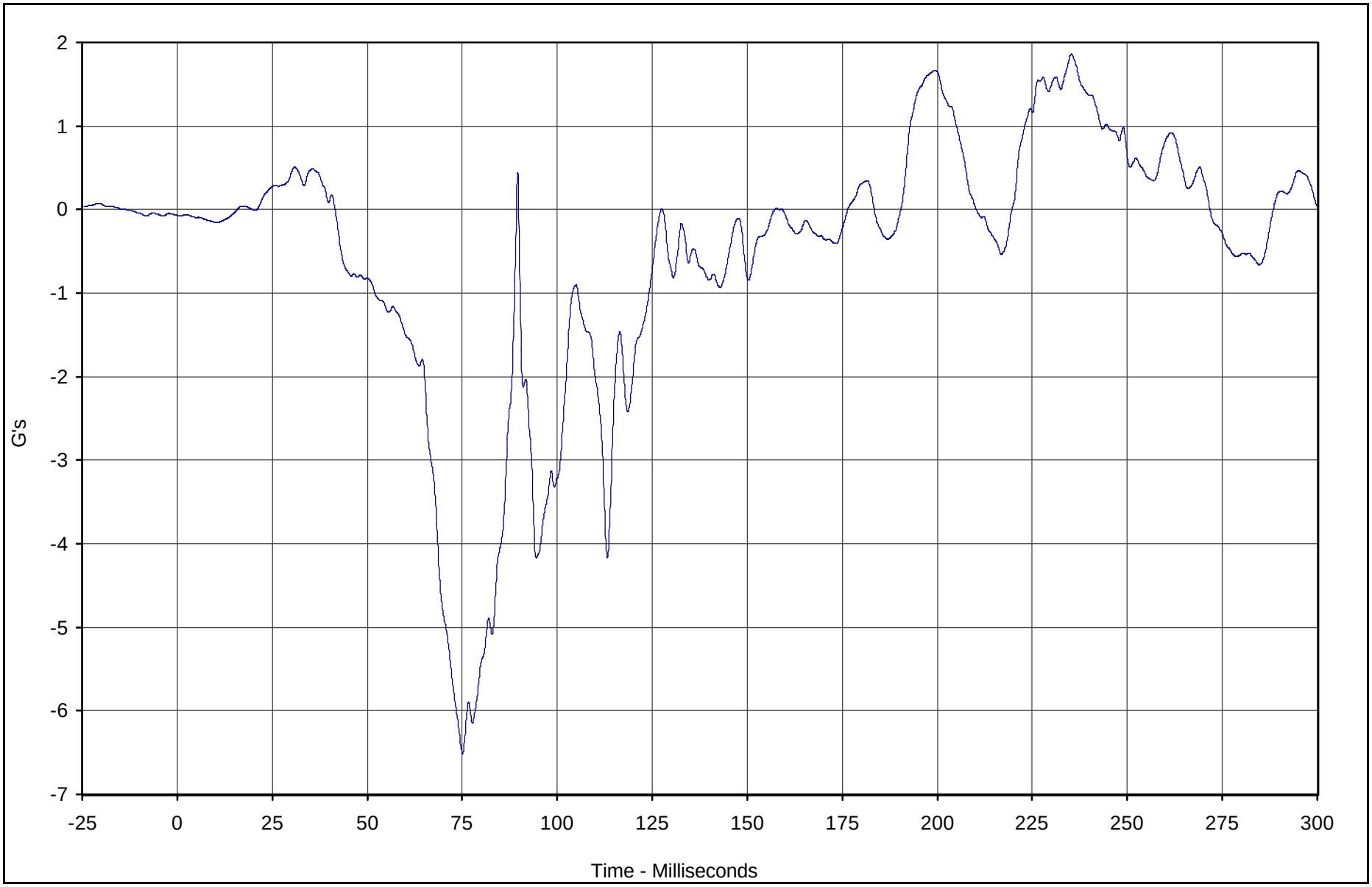
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest X	149	FIL	G's	7.6	235.6	-33.3	81.7	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



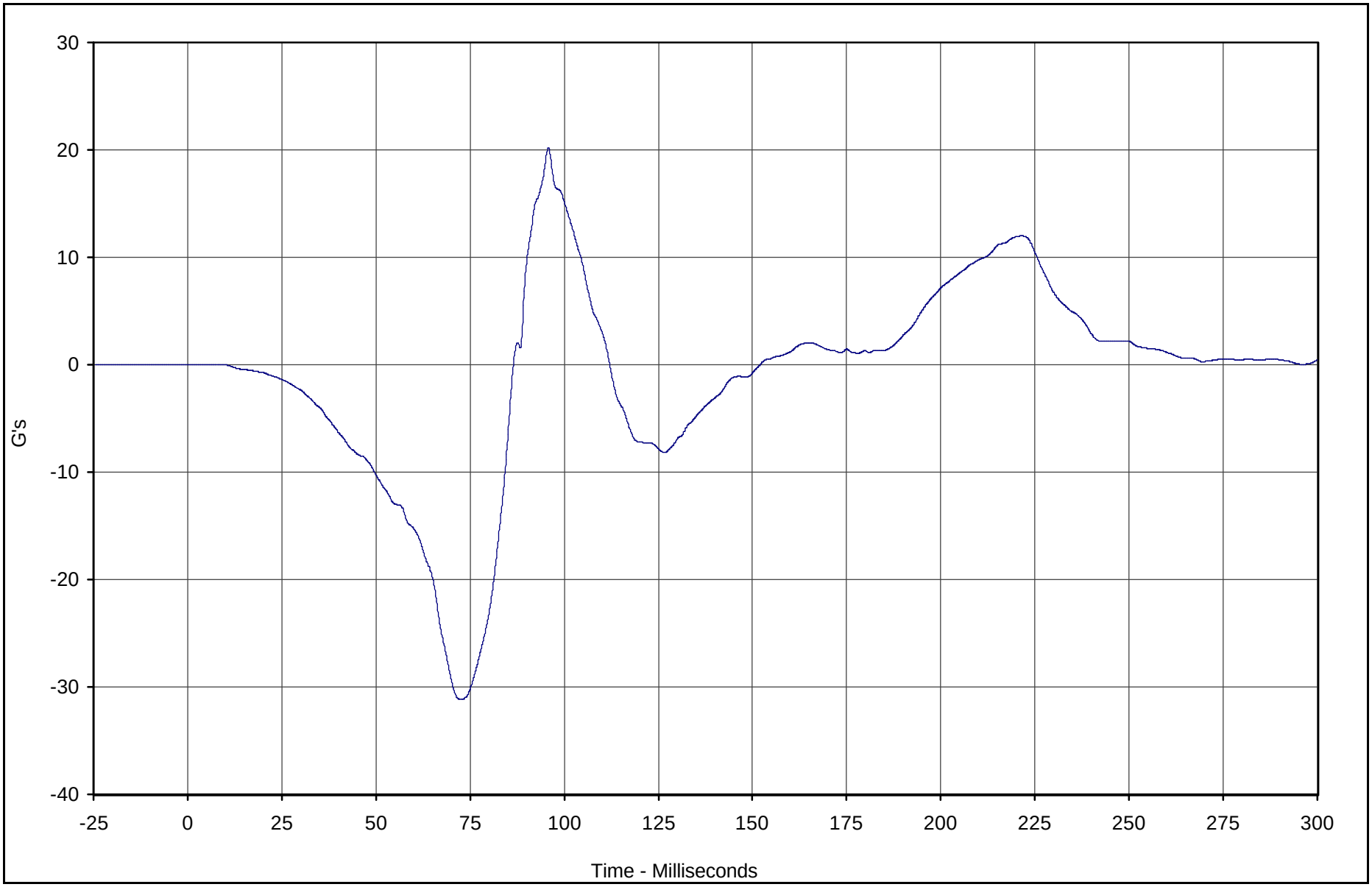
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Y	150	FIL	G's	1.9	235.3	-6.5	75.1	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



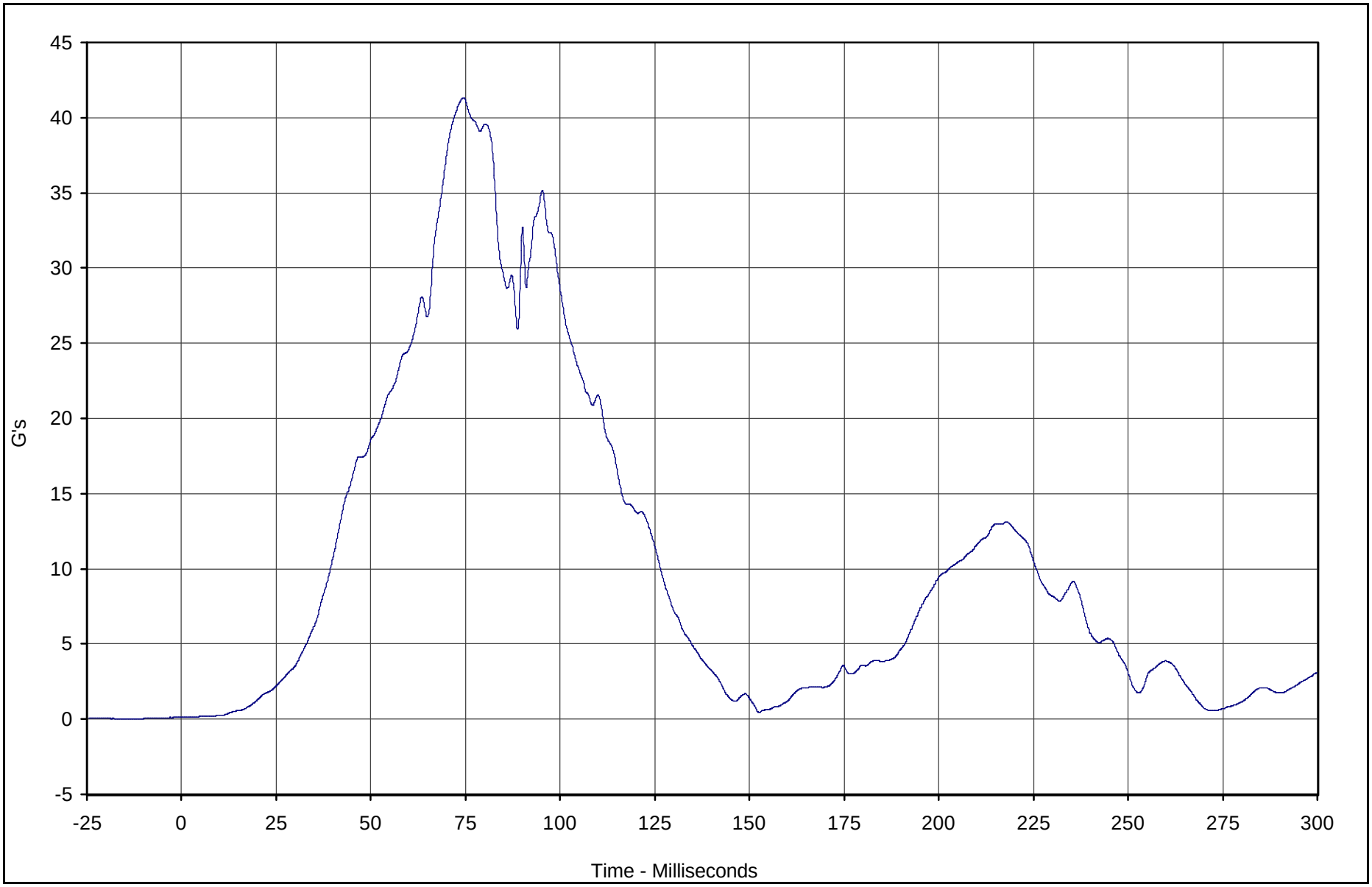
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Z	151	FIL	G's	20.2	95.8	-31.2	72.6	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



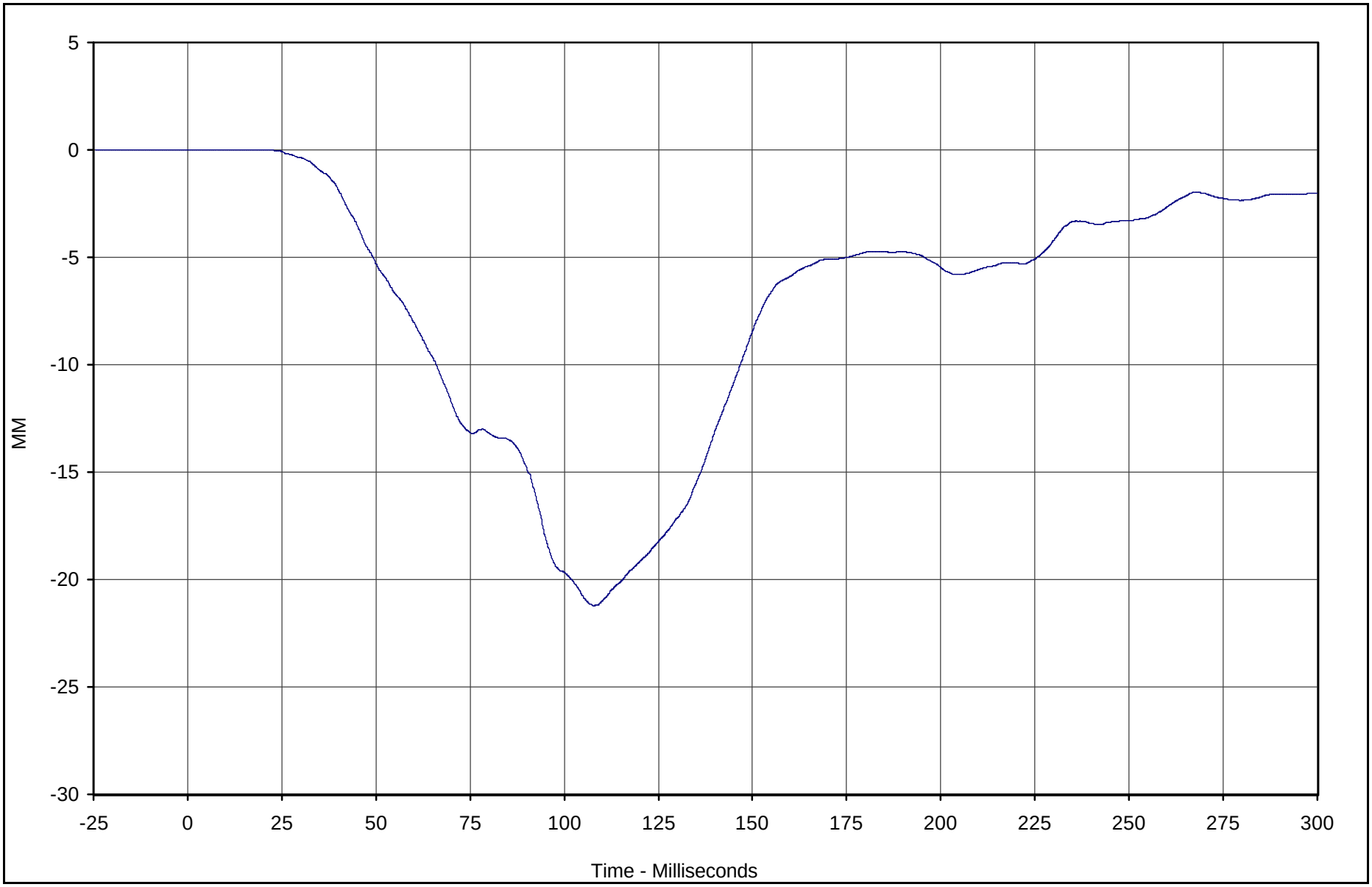
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Resultant	149	RES	G's	41.3	74.5	0.1	2.3	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



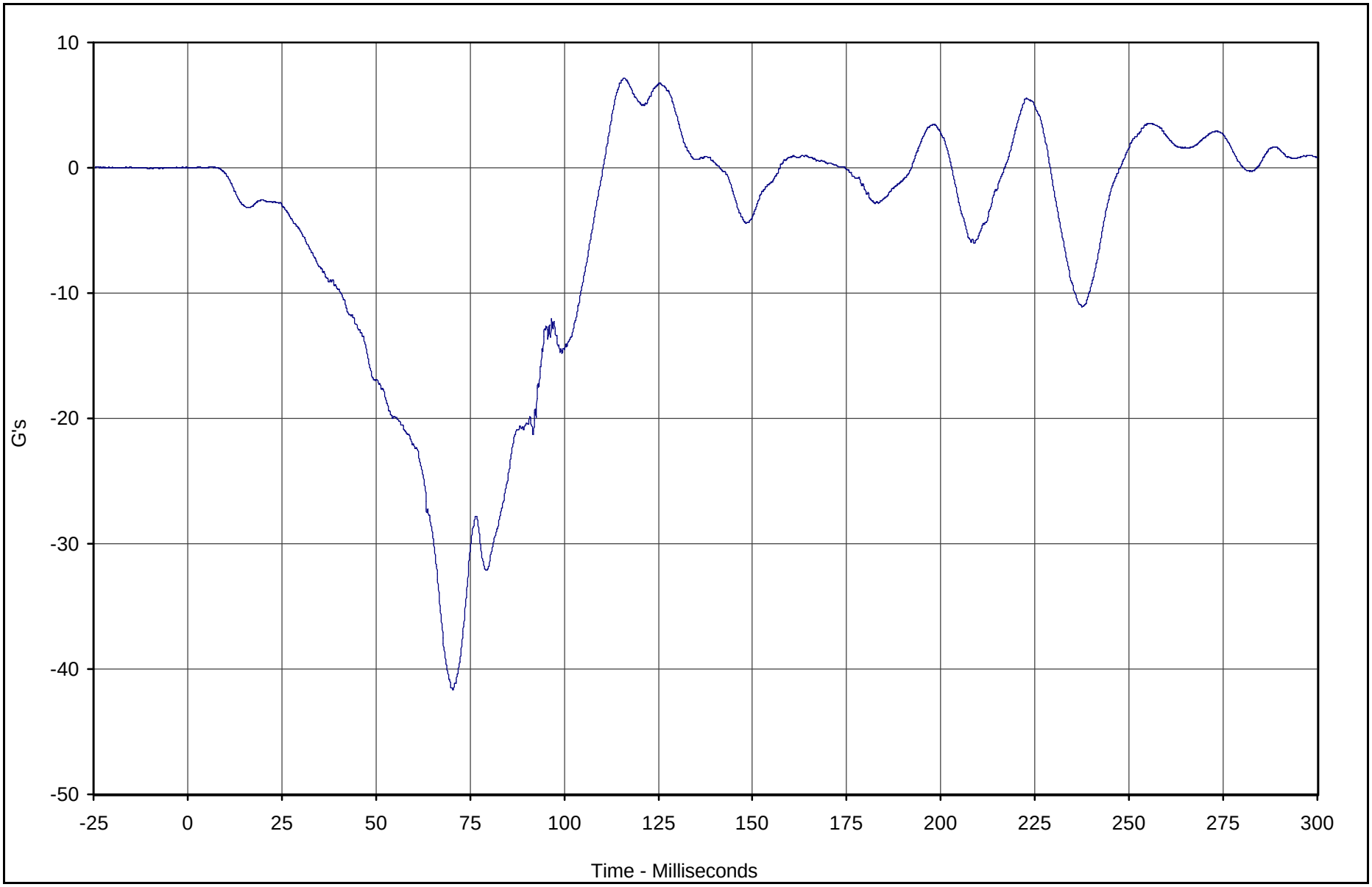
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Chest Displacement	152	FIL	MM	0.0	5.8	-21.2	107.8	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



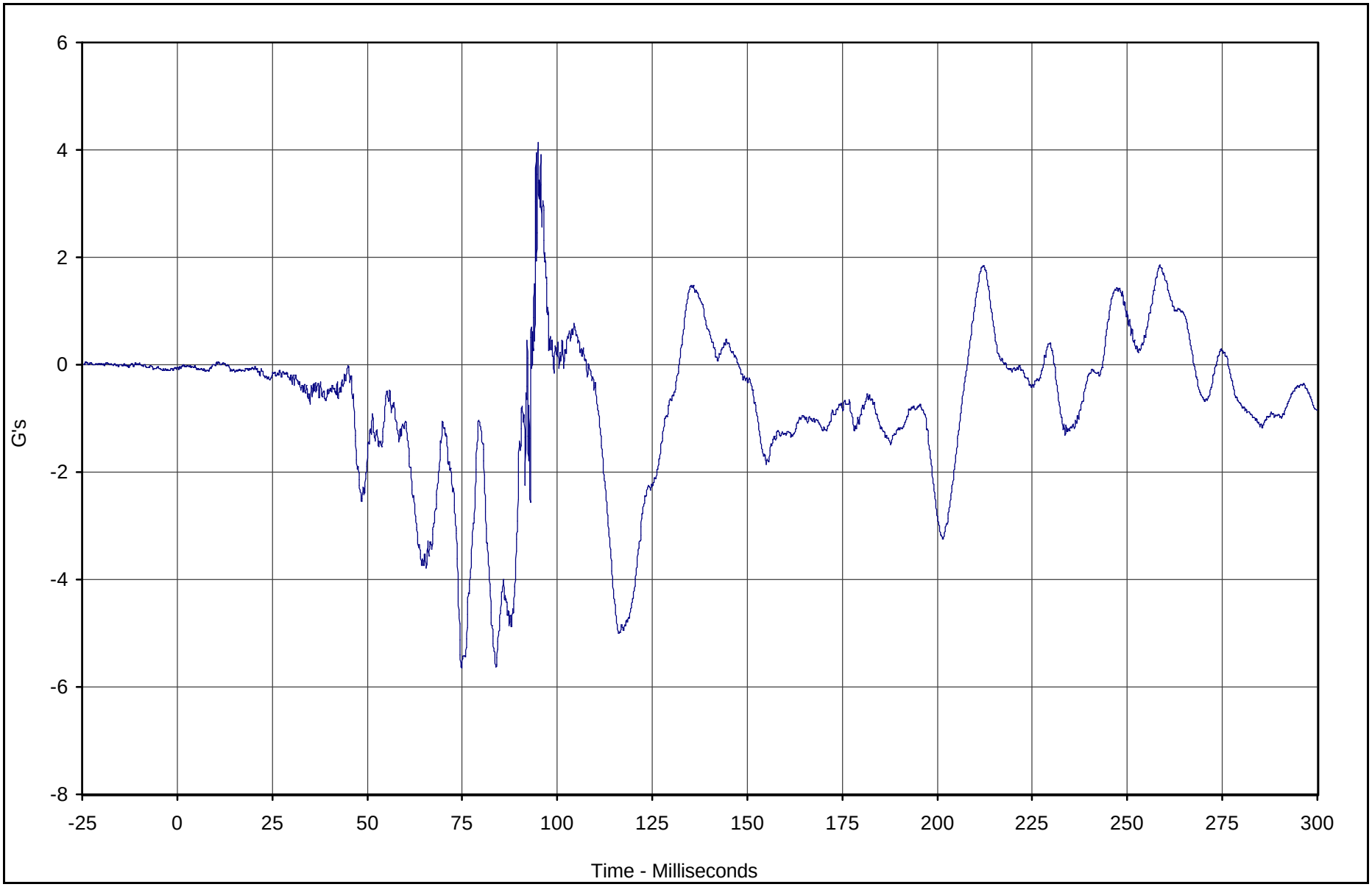
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis X	153	FIL	G's	7.1	116.1	-41.6	70.5	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



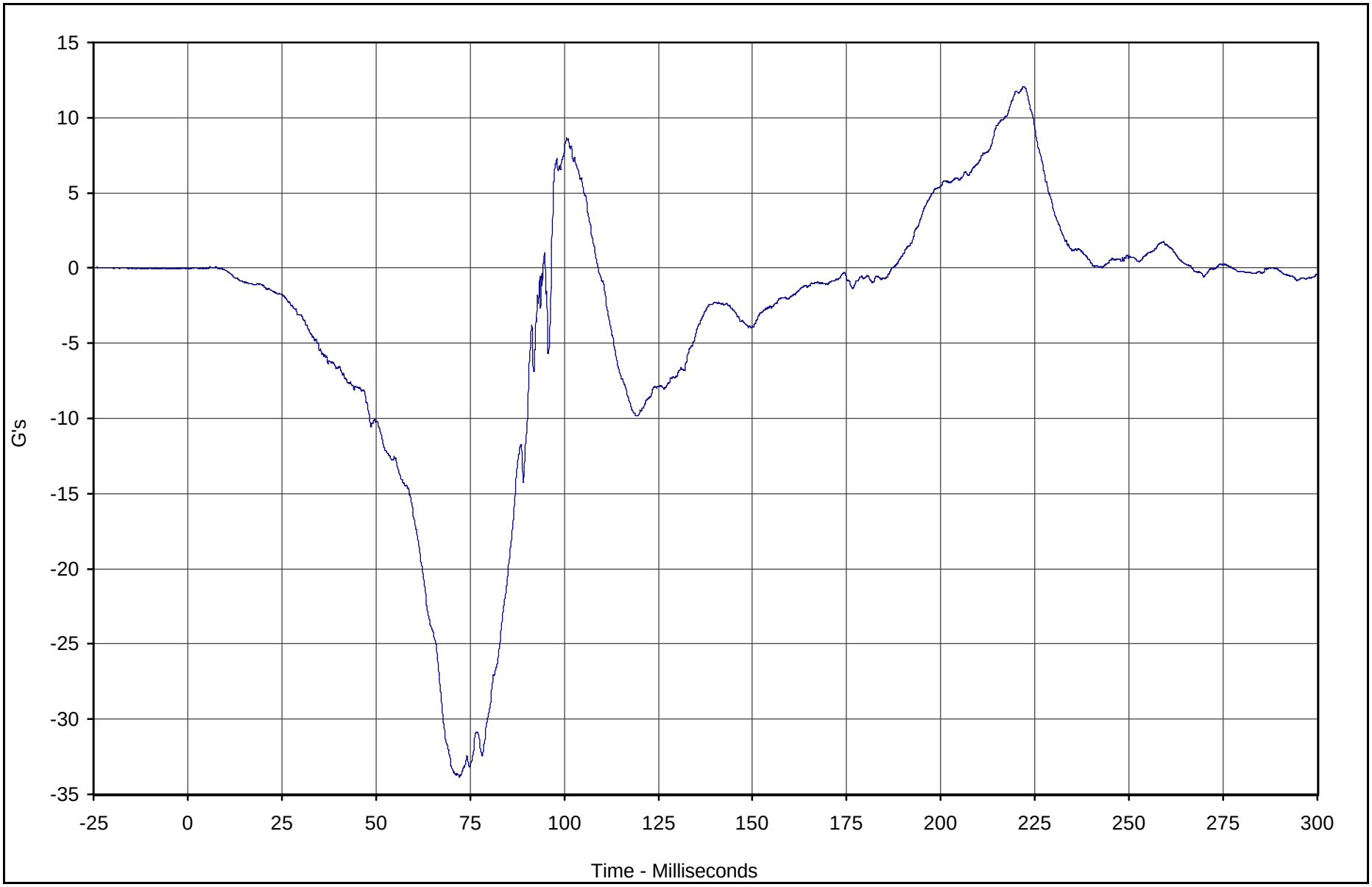
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis Y	154	FIL	G's	4.1	94.9	-5.7	74.8	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



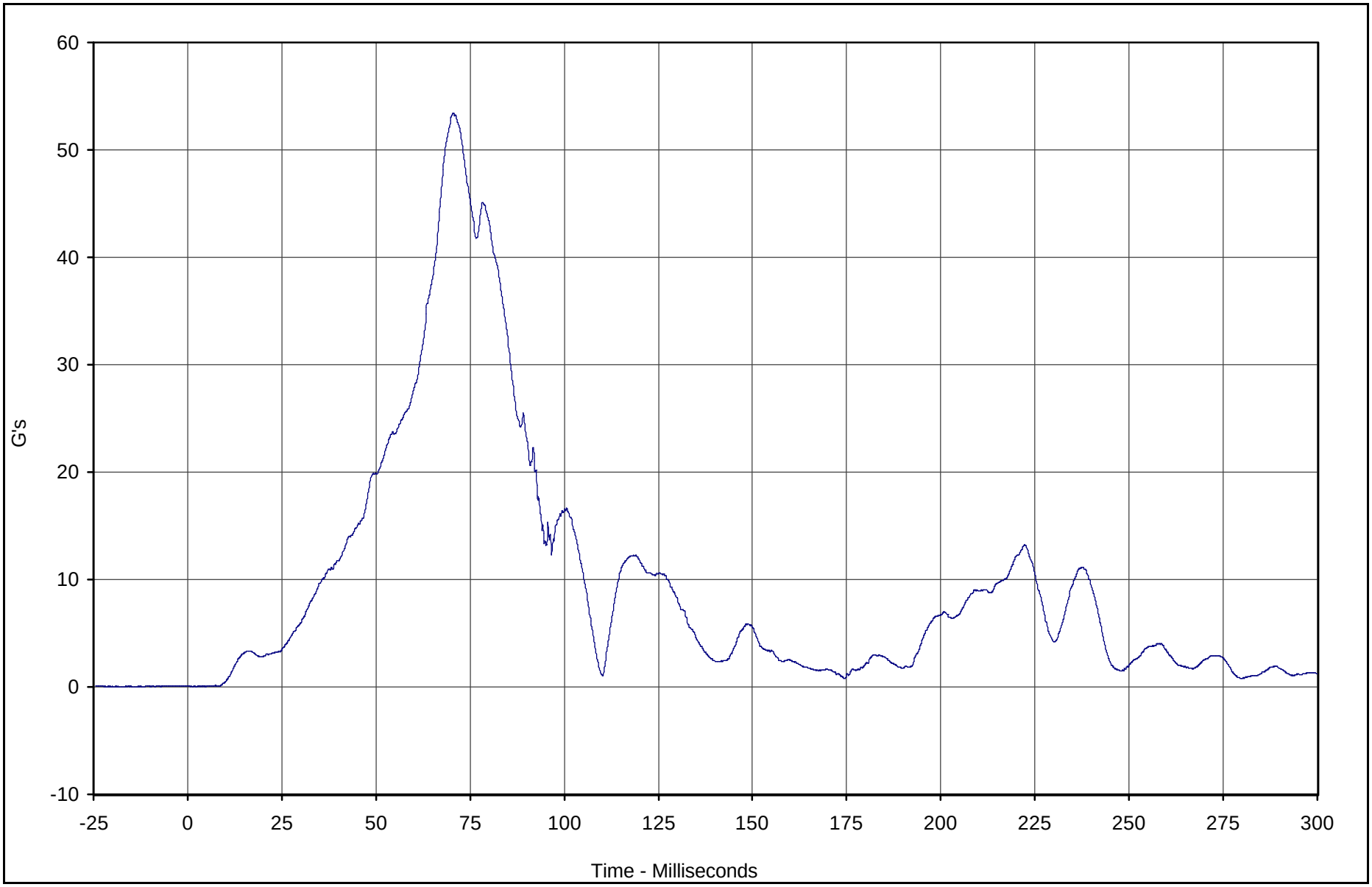
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis Z	155	FIL	G's	12.1	222.2	-33.8	72.1	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



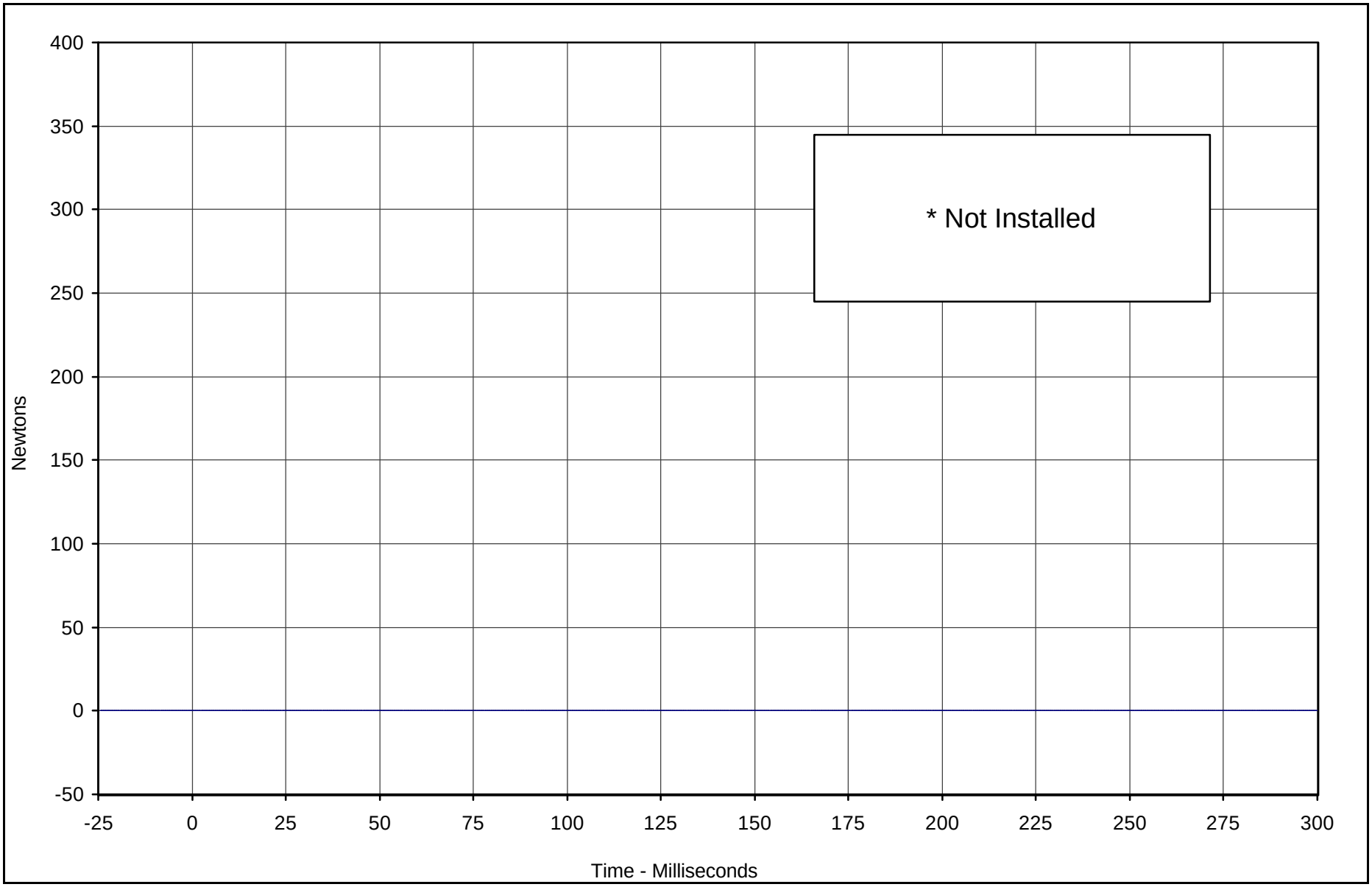
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Pelvis Resultant	153	RES	G's	53.4	70.6	0.0	1.6	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



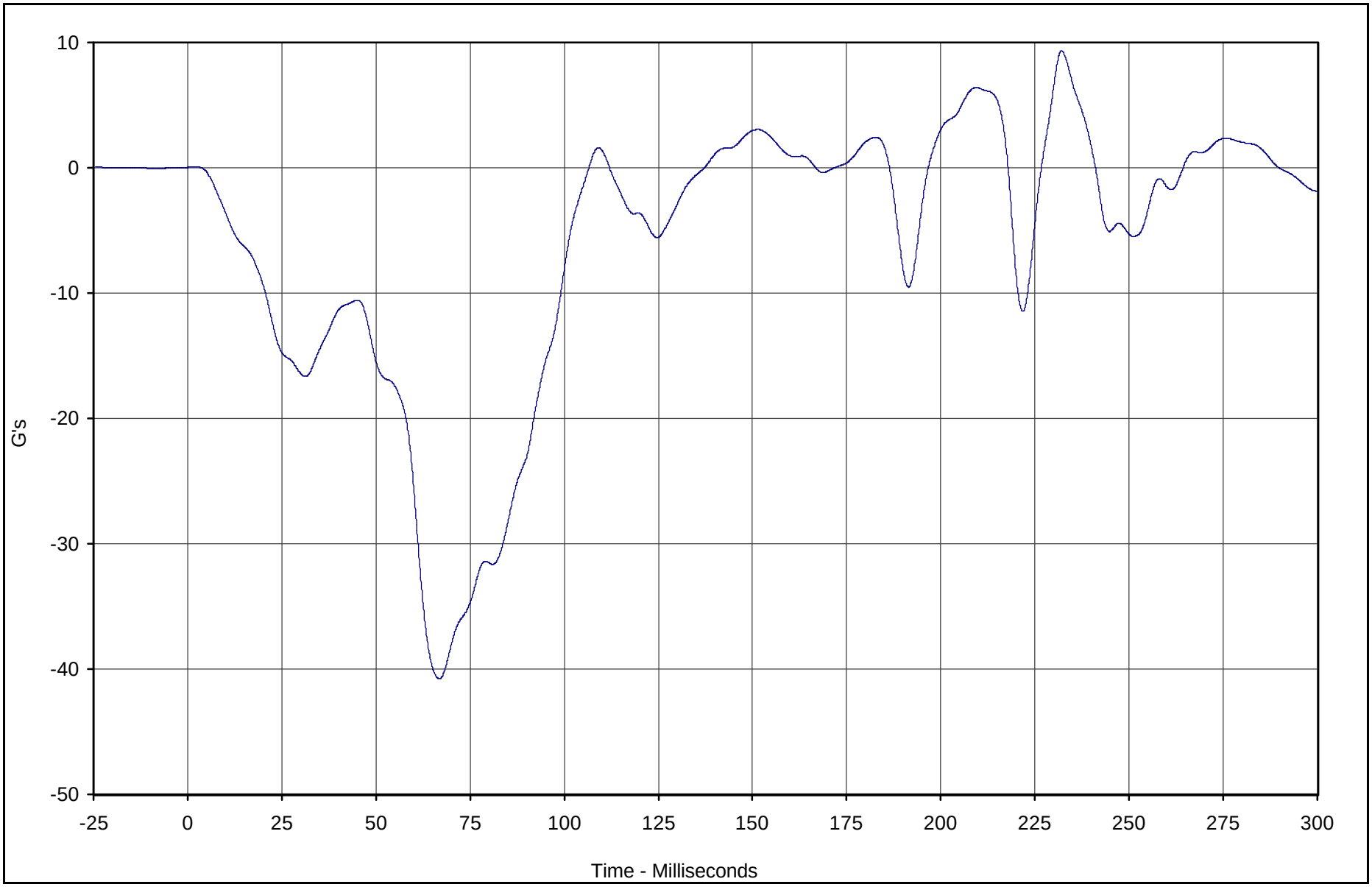
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Tether Load	156	FIL	Newtons	0.0	0.0	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



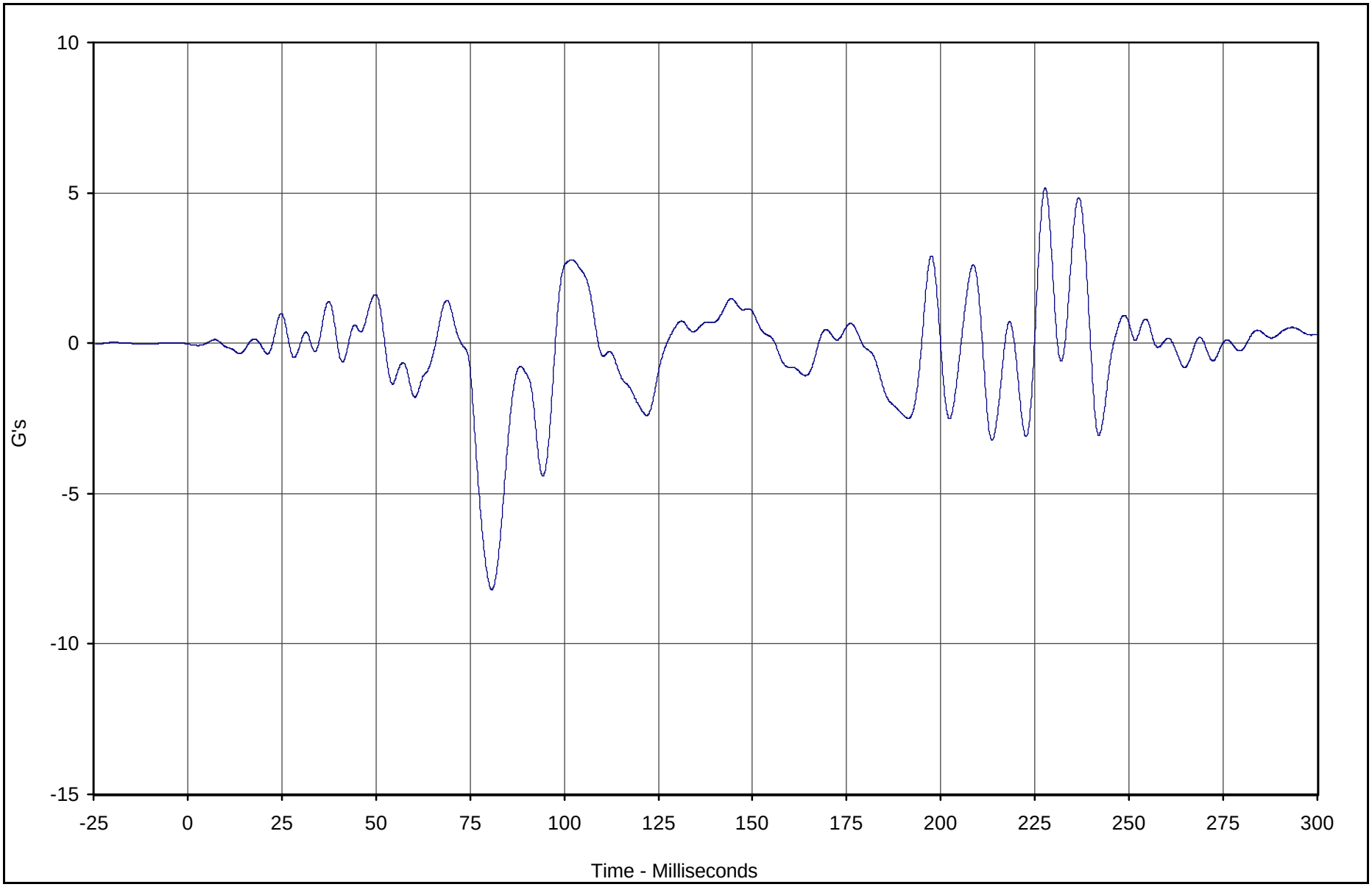
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat X	157	FIL	G's	9.3	232.1	-40.8	66.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



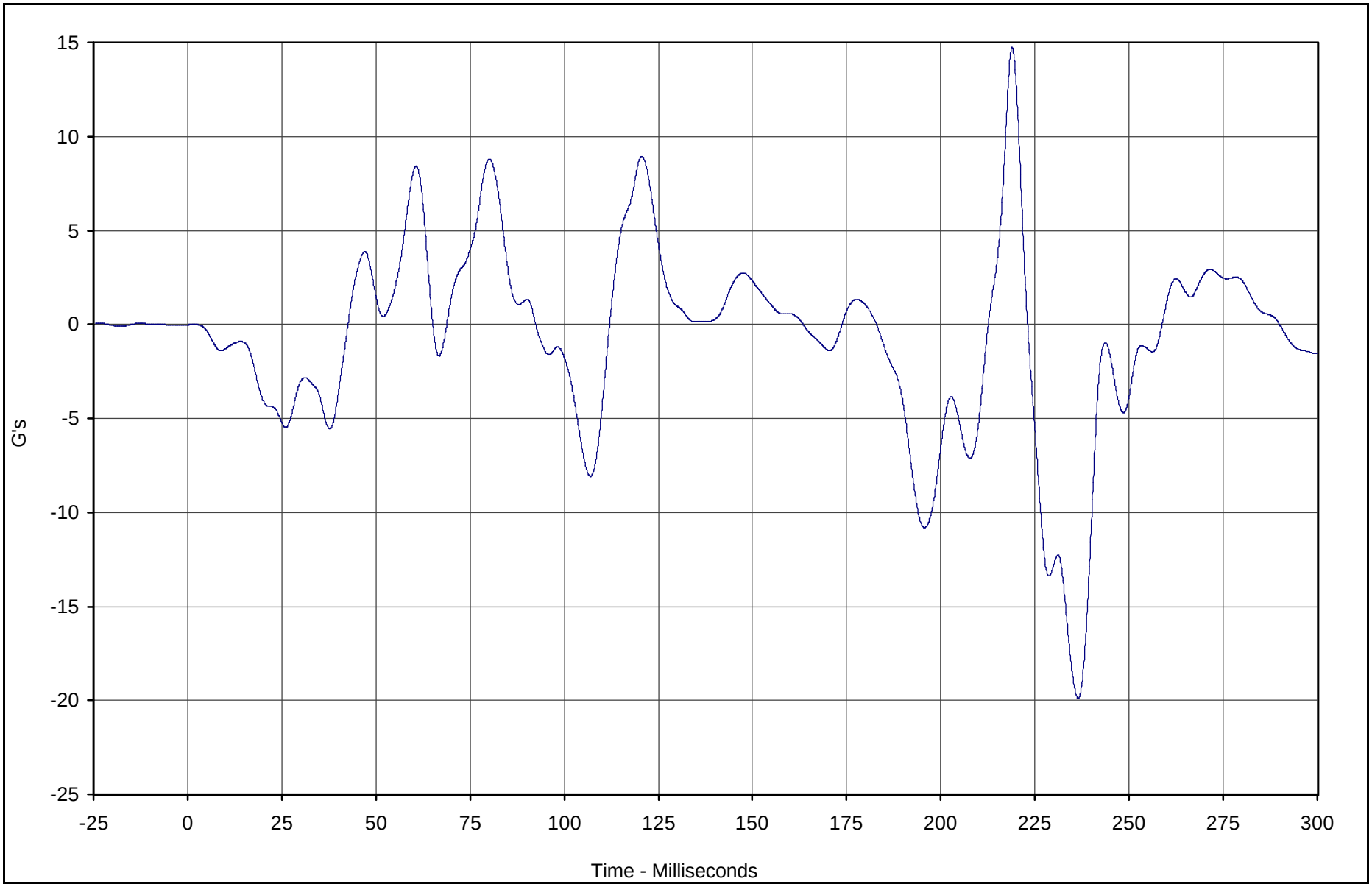
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Y	158	FIL	G's	5.2	227.7	-8.2	80.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



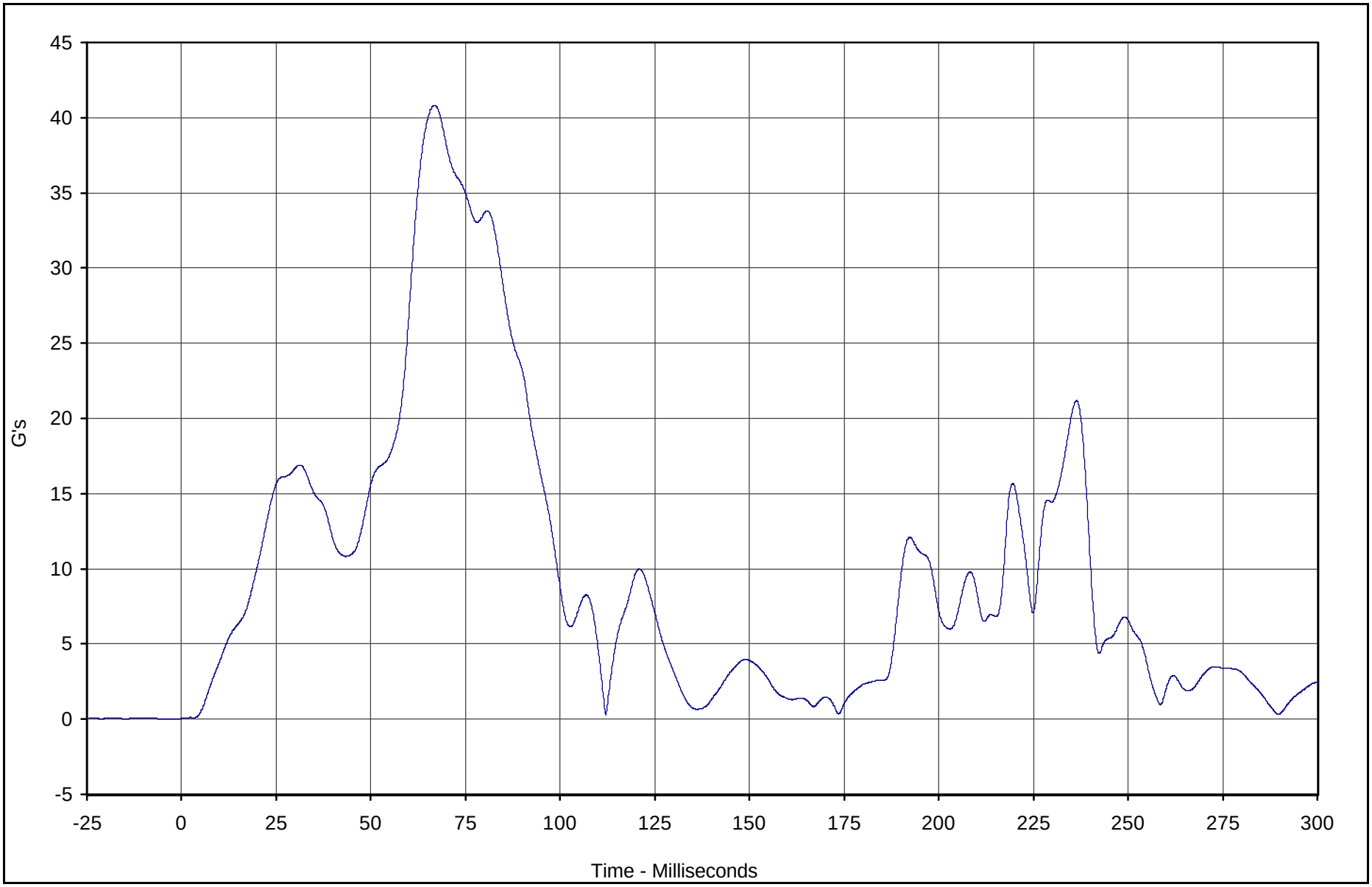
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Z	159	FIL	G's	14.7	218.9	-19.9	236.5	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



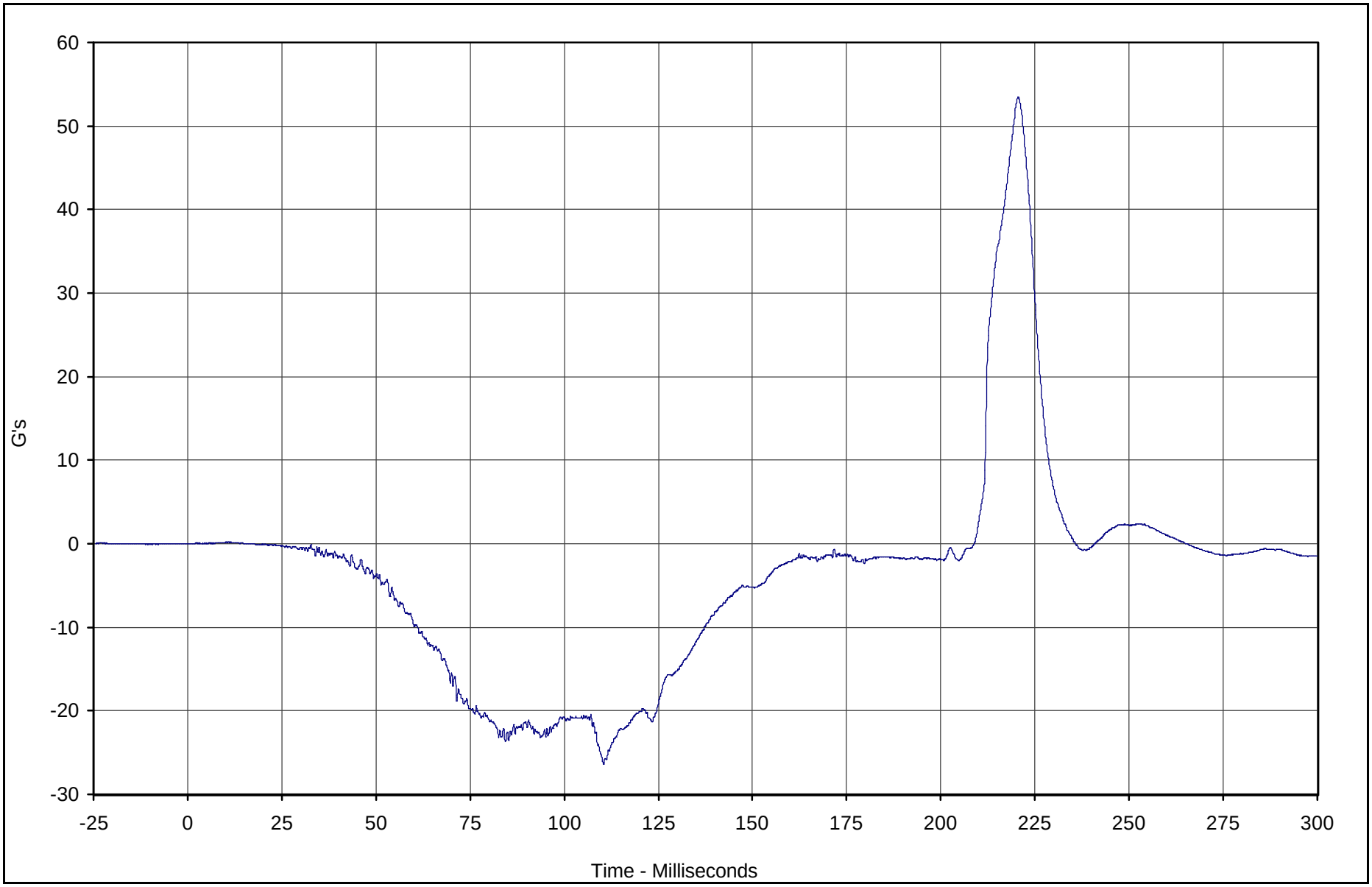
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Left Rear (3 Yr.) Car Seat Resultant	157	RES	G's	40.8	66.8	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



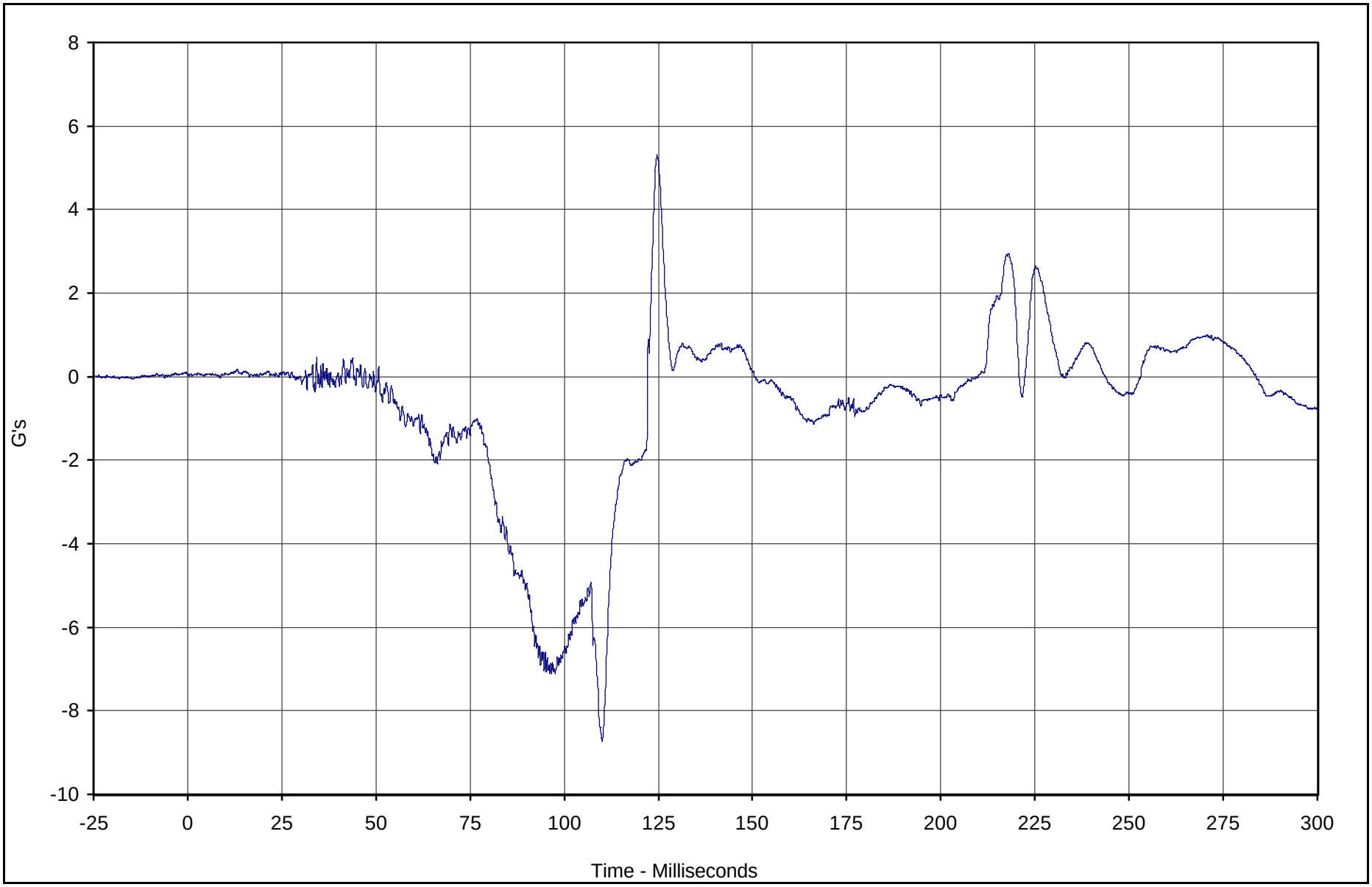
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head X	160	FIL	G's	53.4	220.6	-26.3	110.5	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



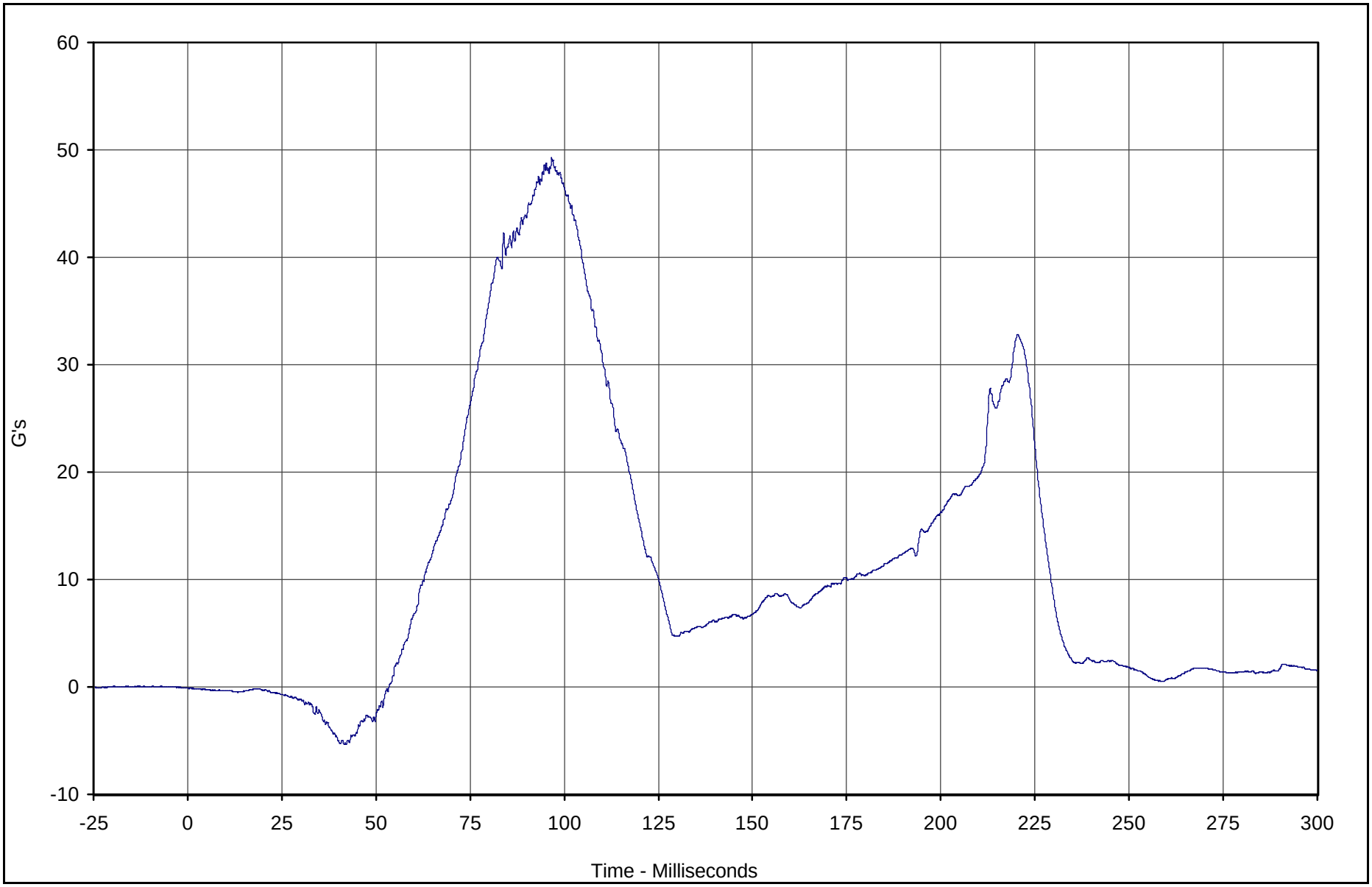
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head Y	161	FIL	G's	5.3	124.6	-8.7	110.1	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



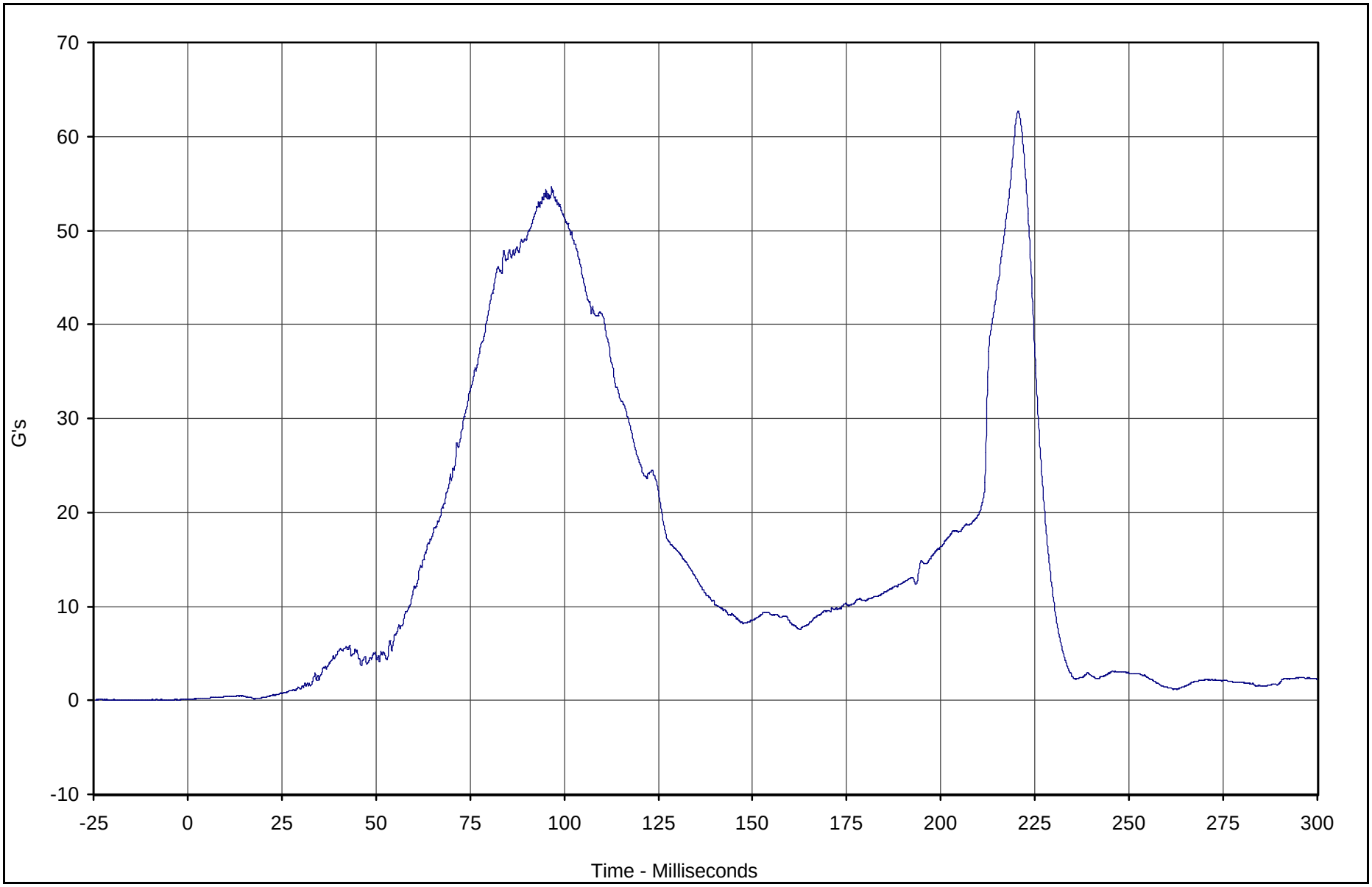
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head Z	162	FIL	G's	49.3	96.7	-5.3	42.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



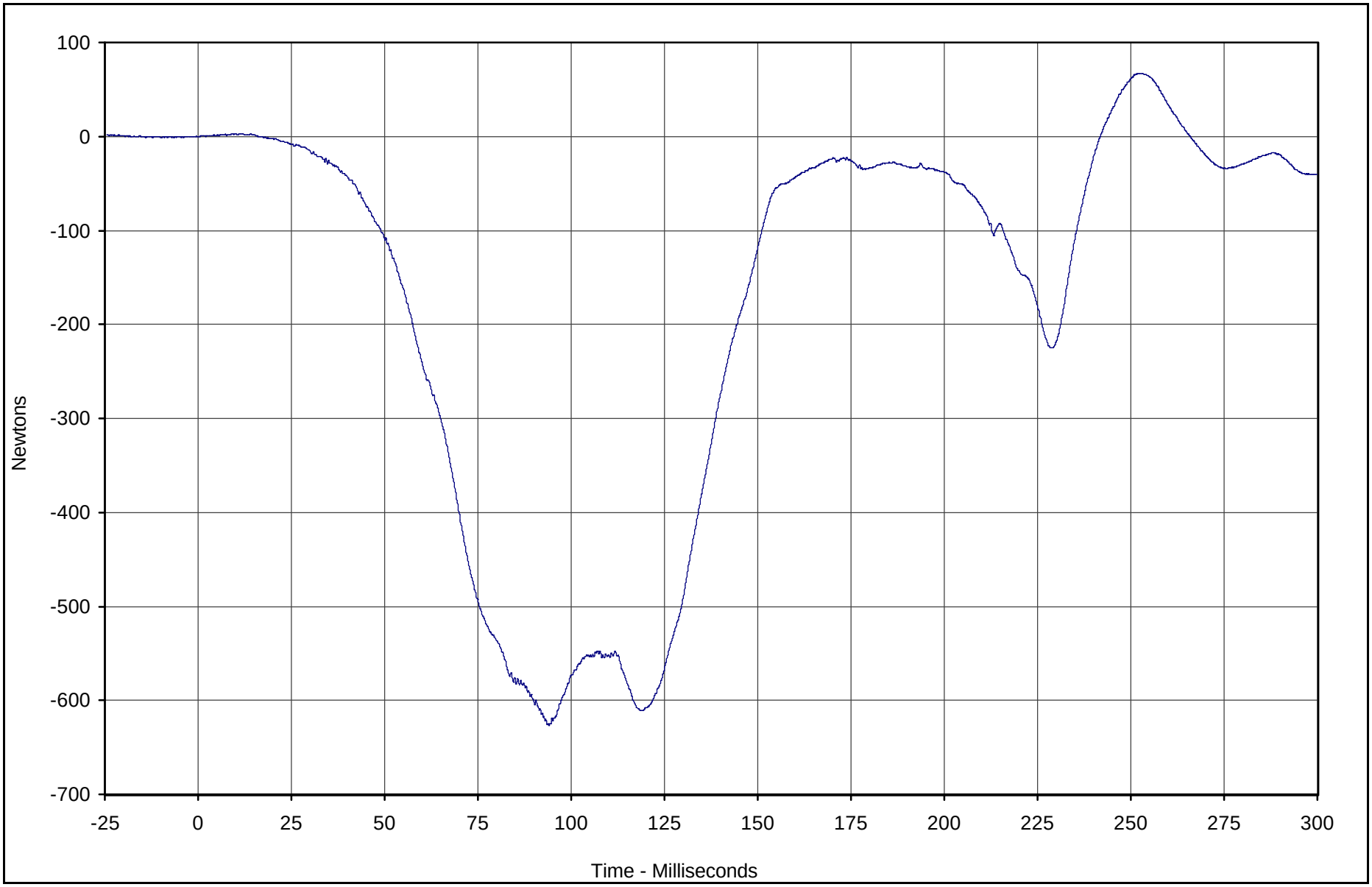
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Head Resultant	160	RES	G's	62.7	220.6	0.1	0.7	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



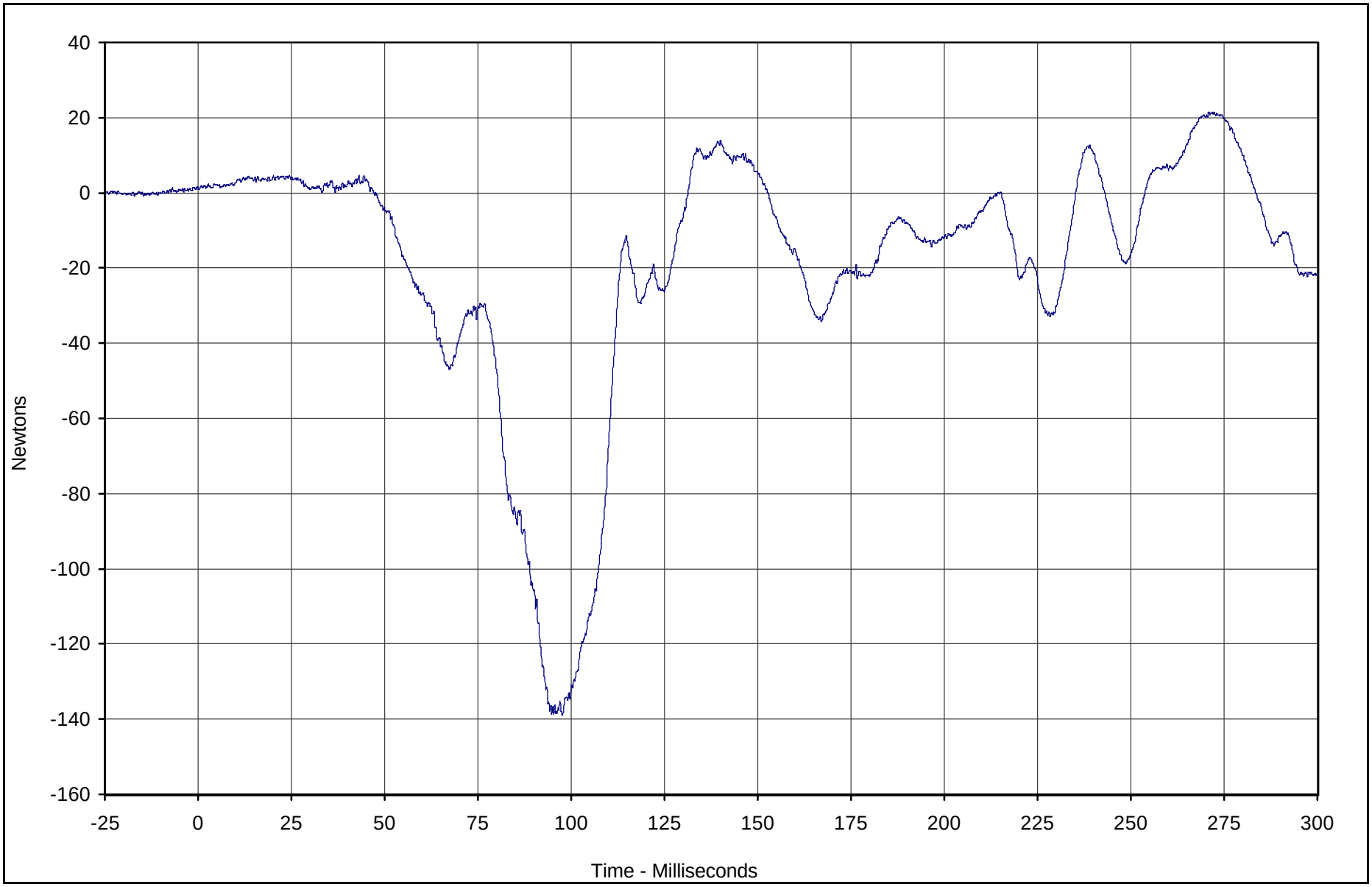
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force X	163	FIL	Newtons	67.2	251.8	-626.7	94.1	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



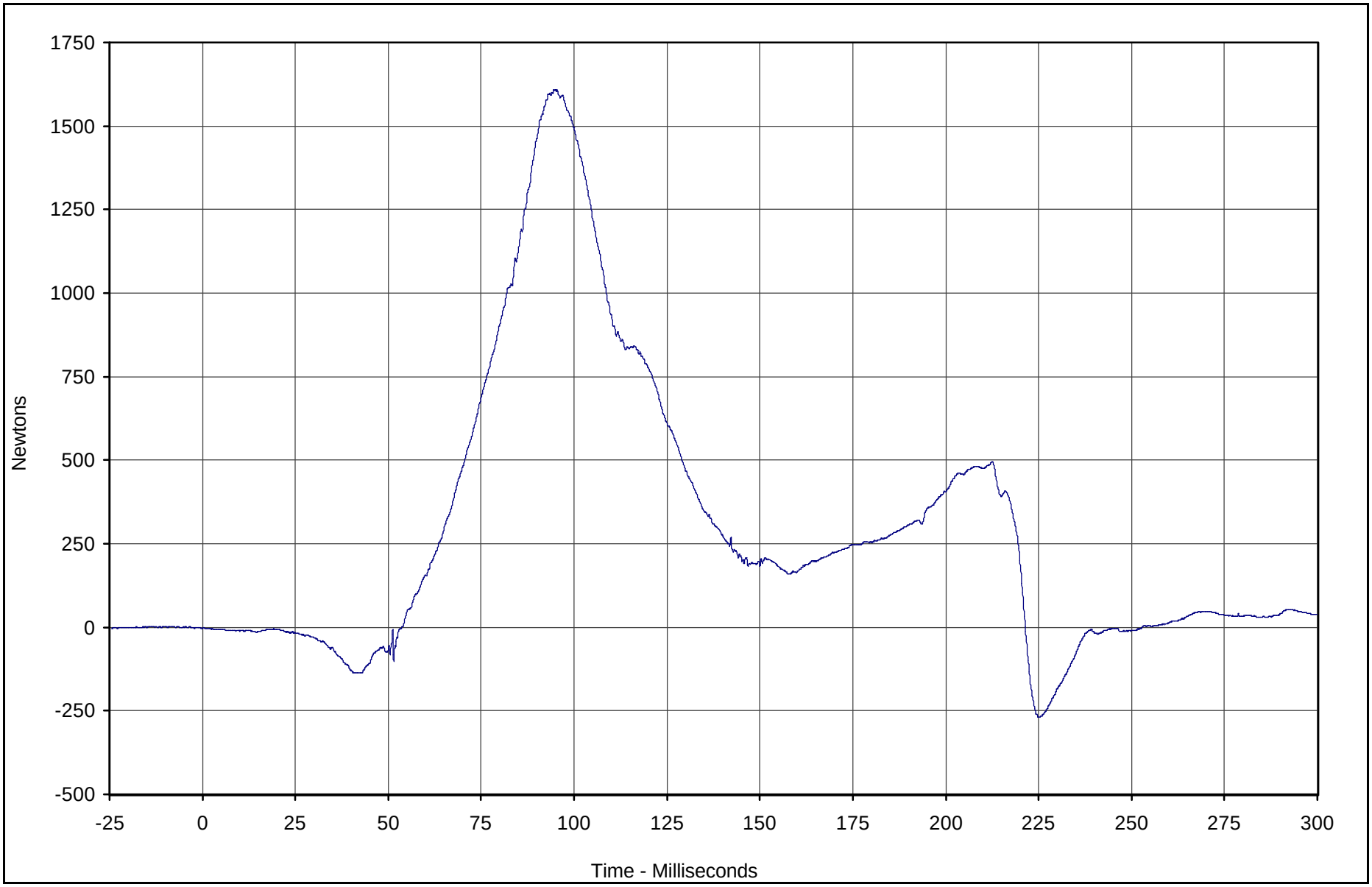
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force Y	164	FIL	Newtons	21.5	270.9	-139.0	97.7	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



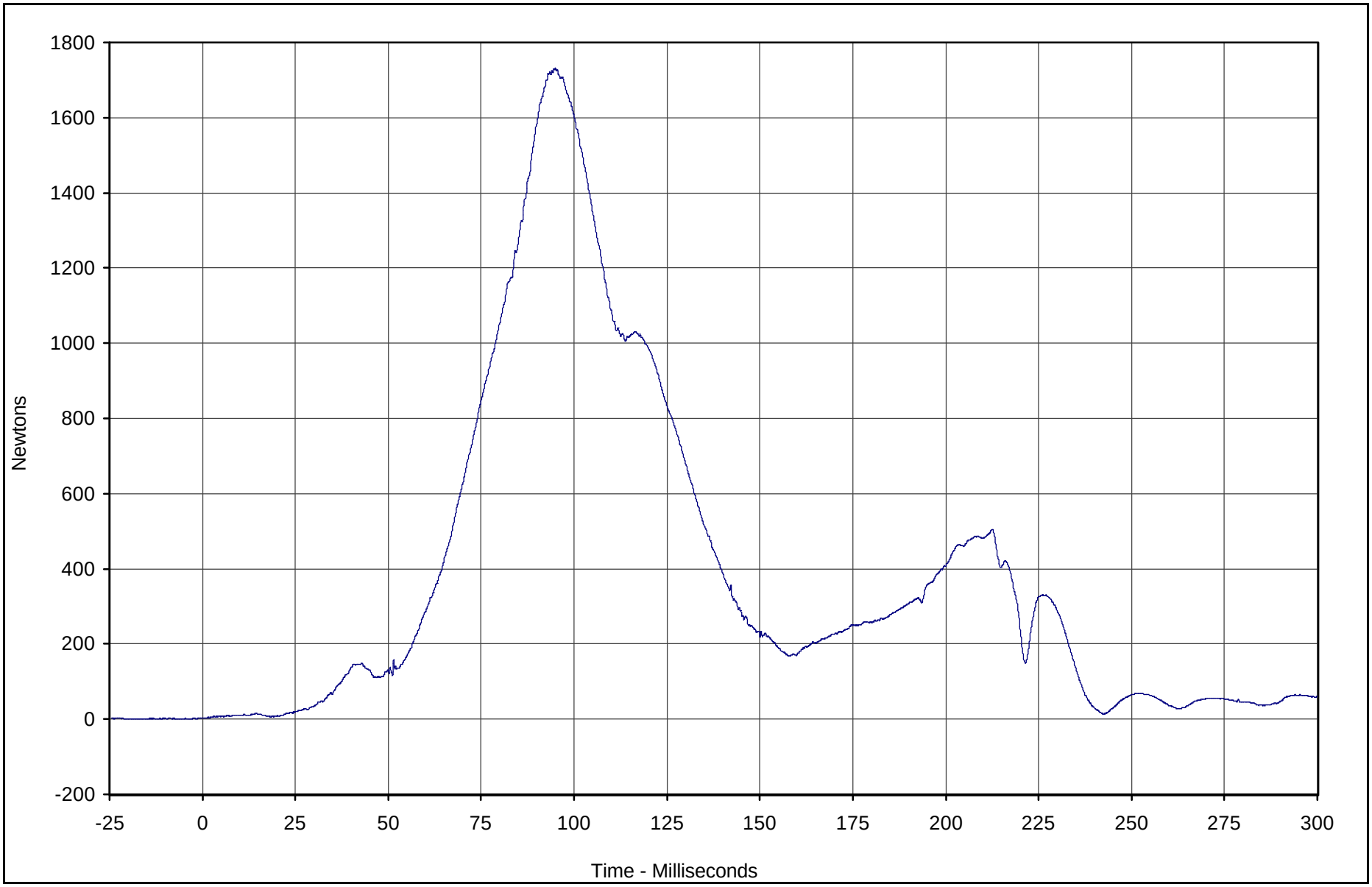
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force Z	165	FIL	Newtons	1610.3	95.0	-269.6	225.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



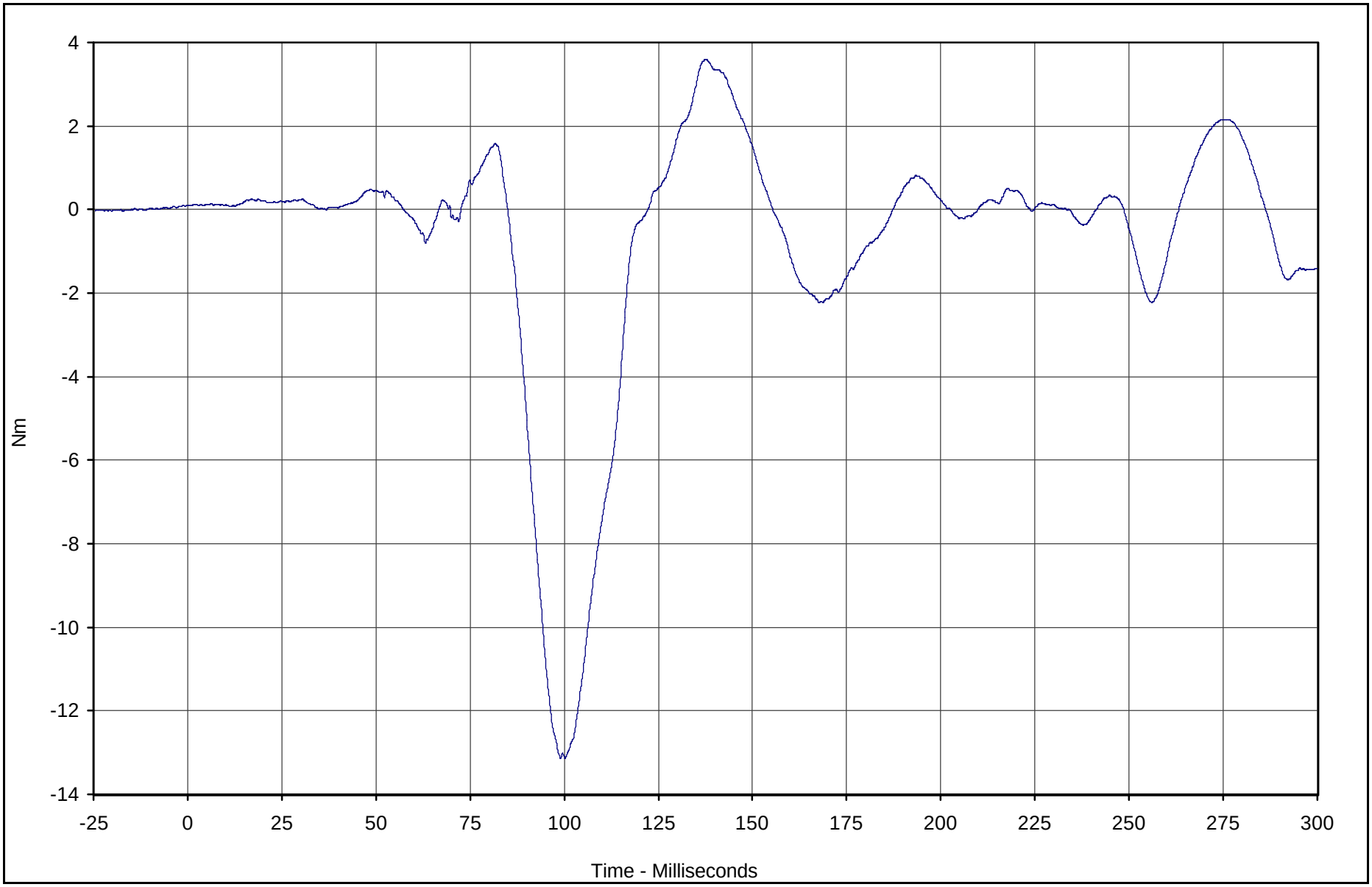
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Force Res.	163	RES	Newtons	1731.1	95.0	2.3	0.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



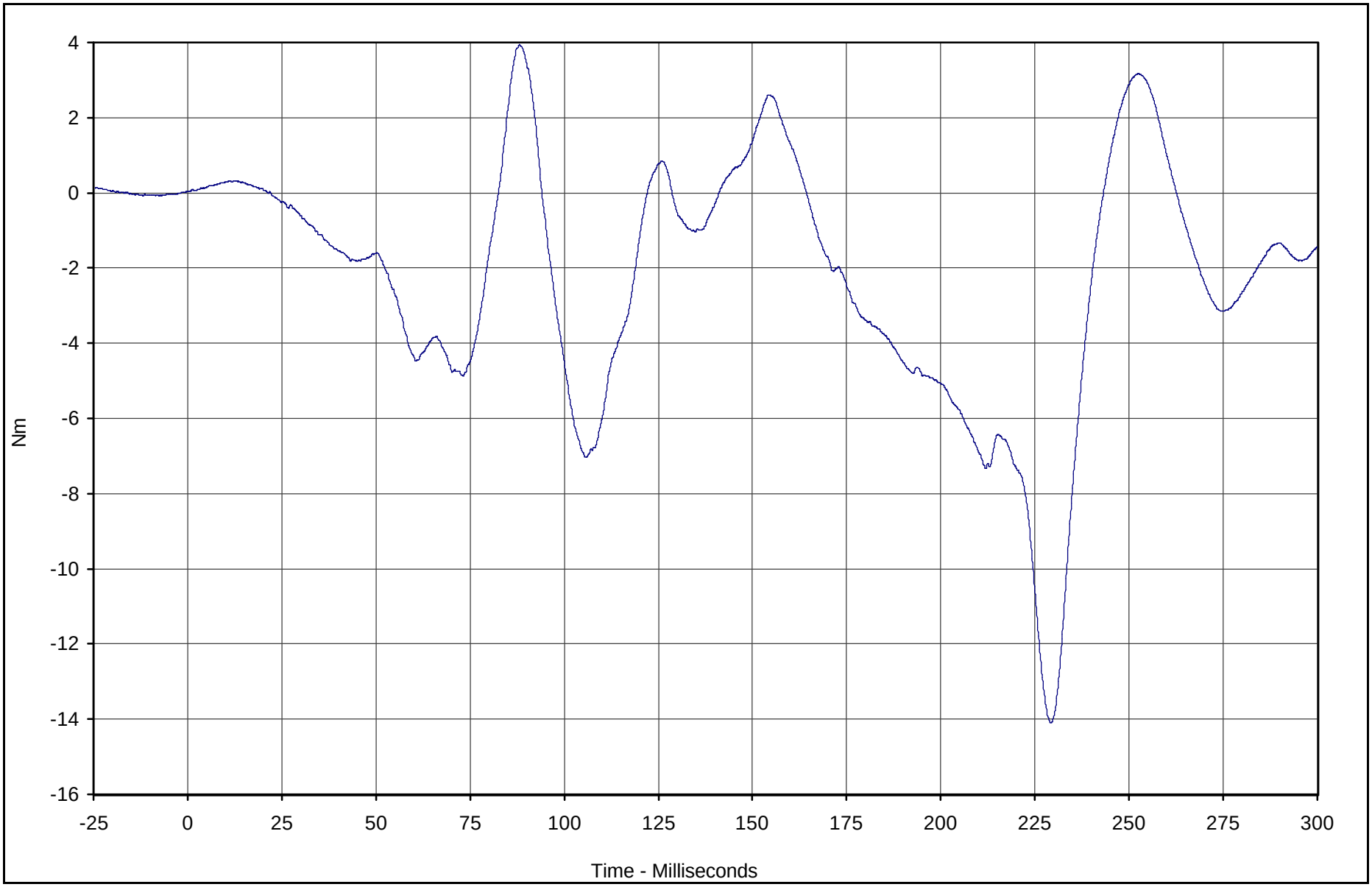
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Moment X	166	FIL	Nm	3.6	137.7	-13.2	99.1	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



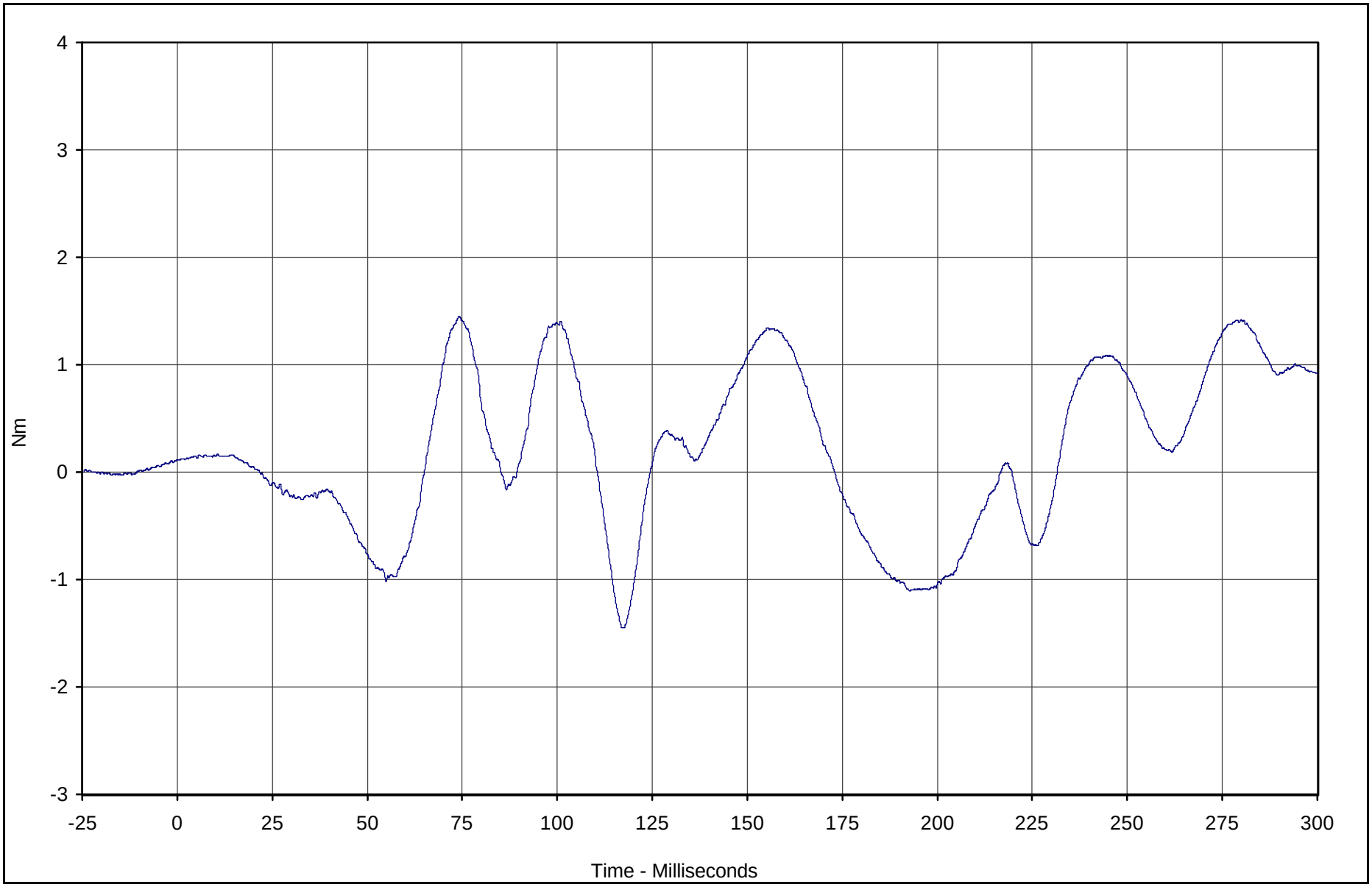
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Moment Y	167	FIL	Nm	3.9	88.1	-14.1	229.2	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



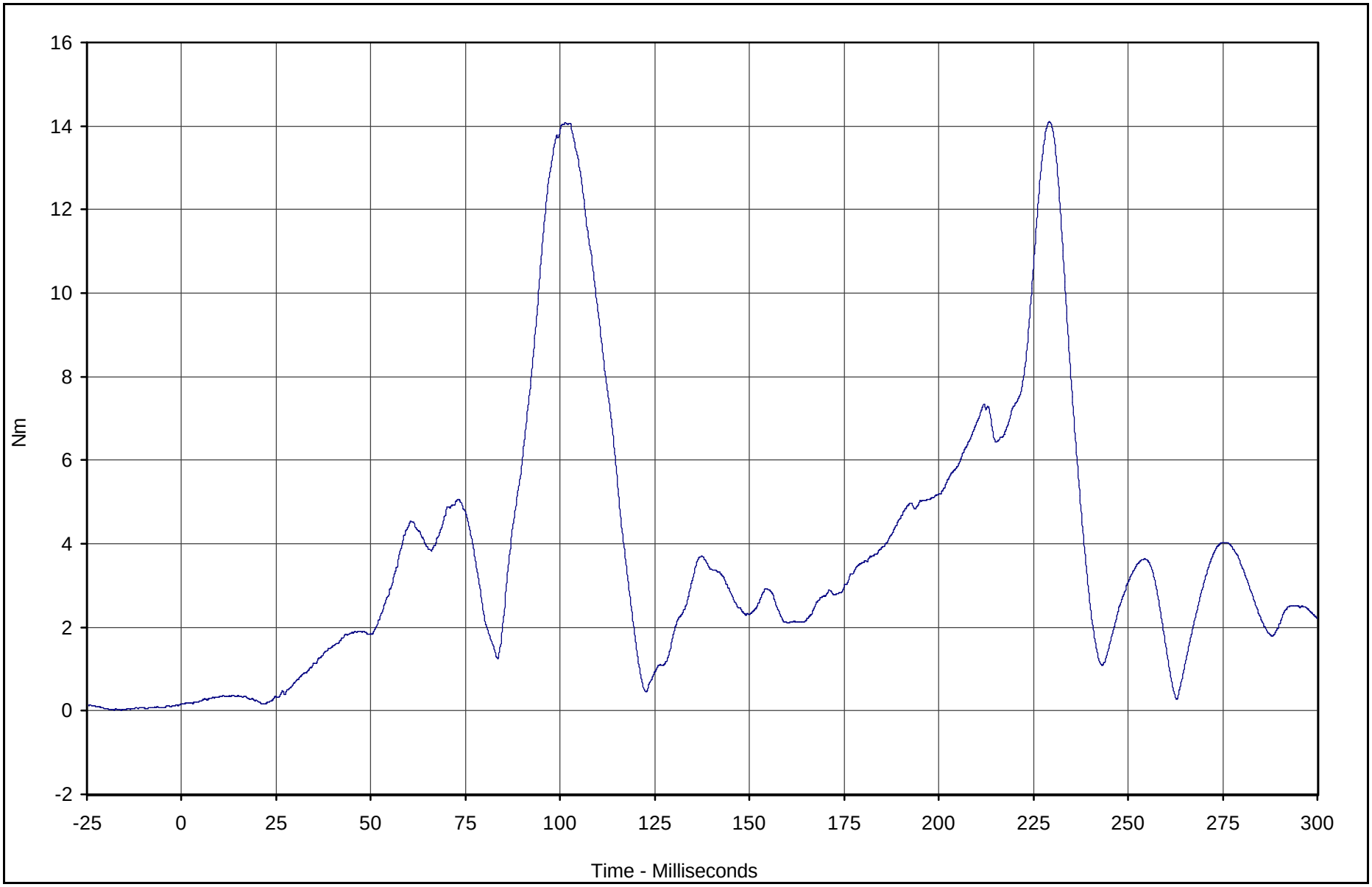
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Moment Z	168	FIL	Nm	1.4	74.2	-1.4	117.1	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



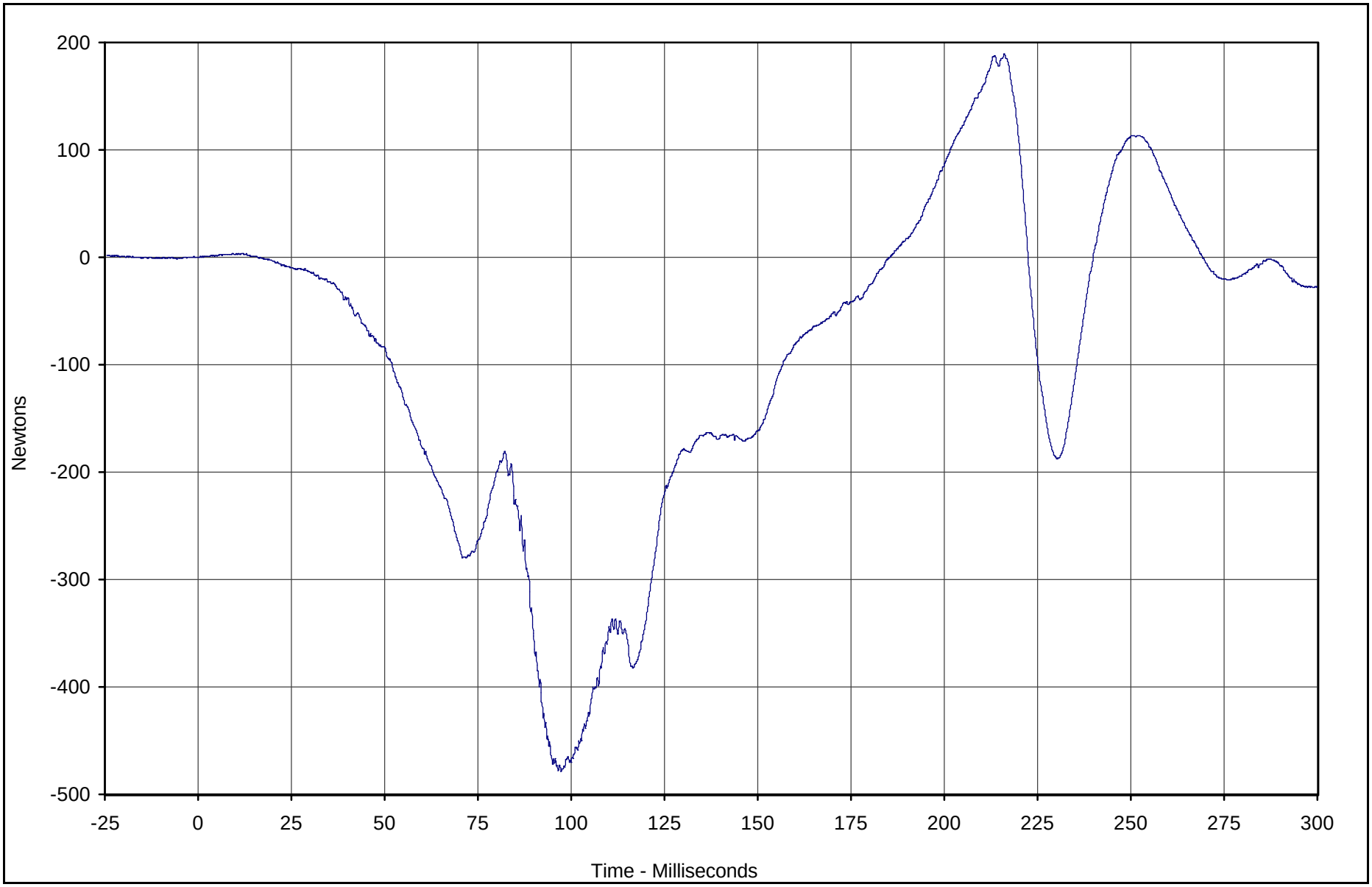
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Upper Neck Mom Res.	166	RES	Nm	14.1	229.2	0.2	0.6	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



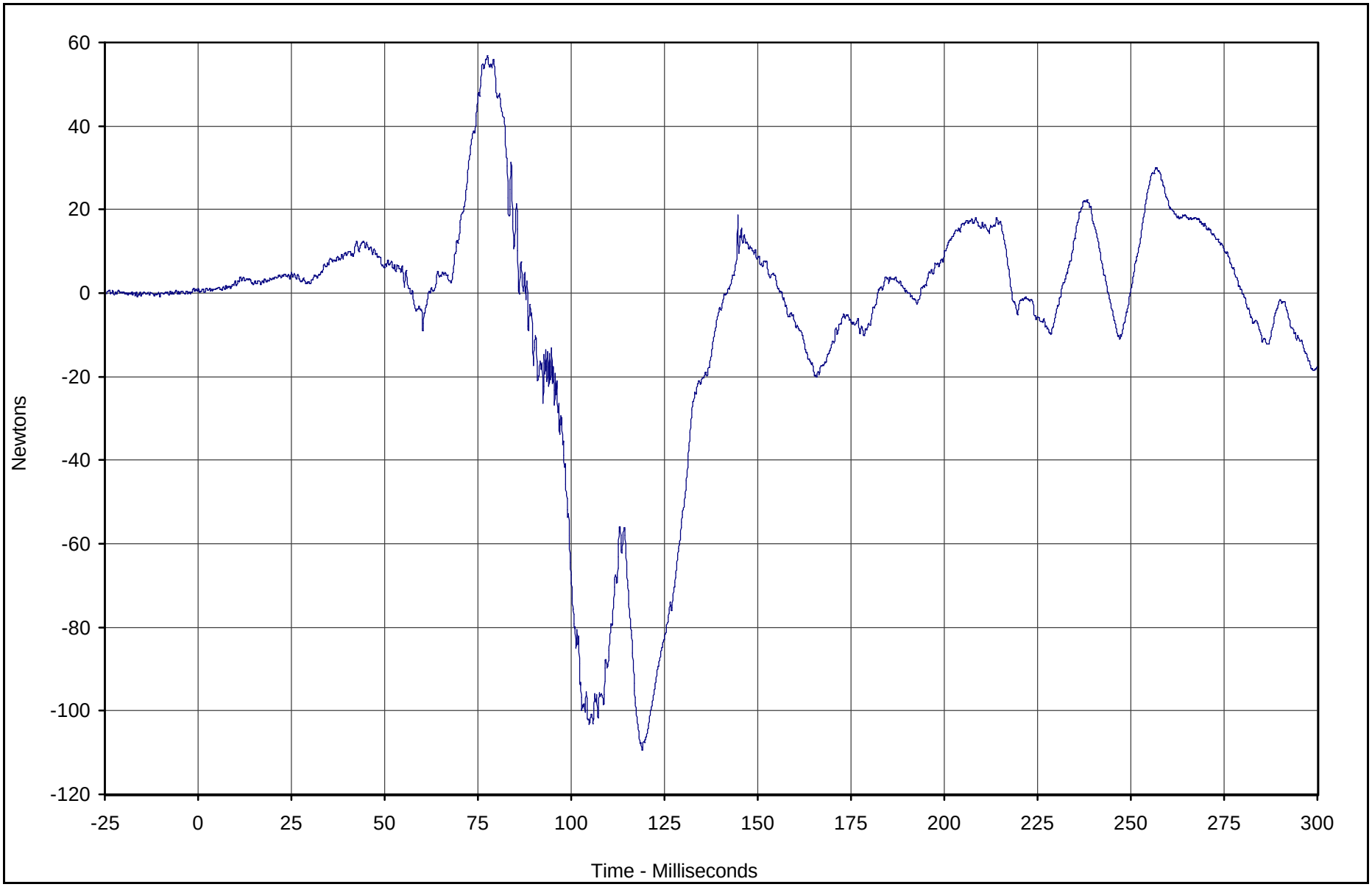
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force X	169	FIL	Newtons	189.1	216.1	-478.7	97.3	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



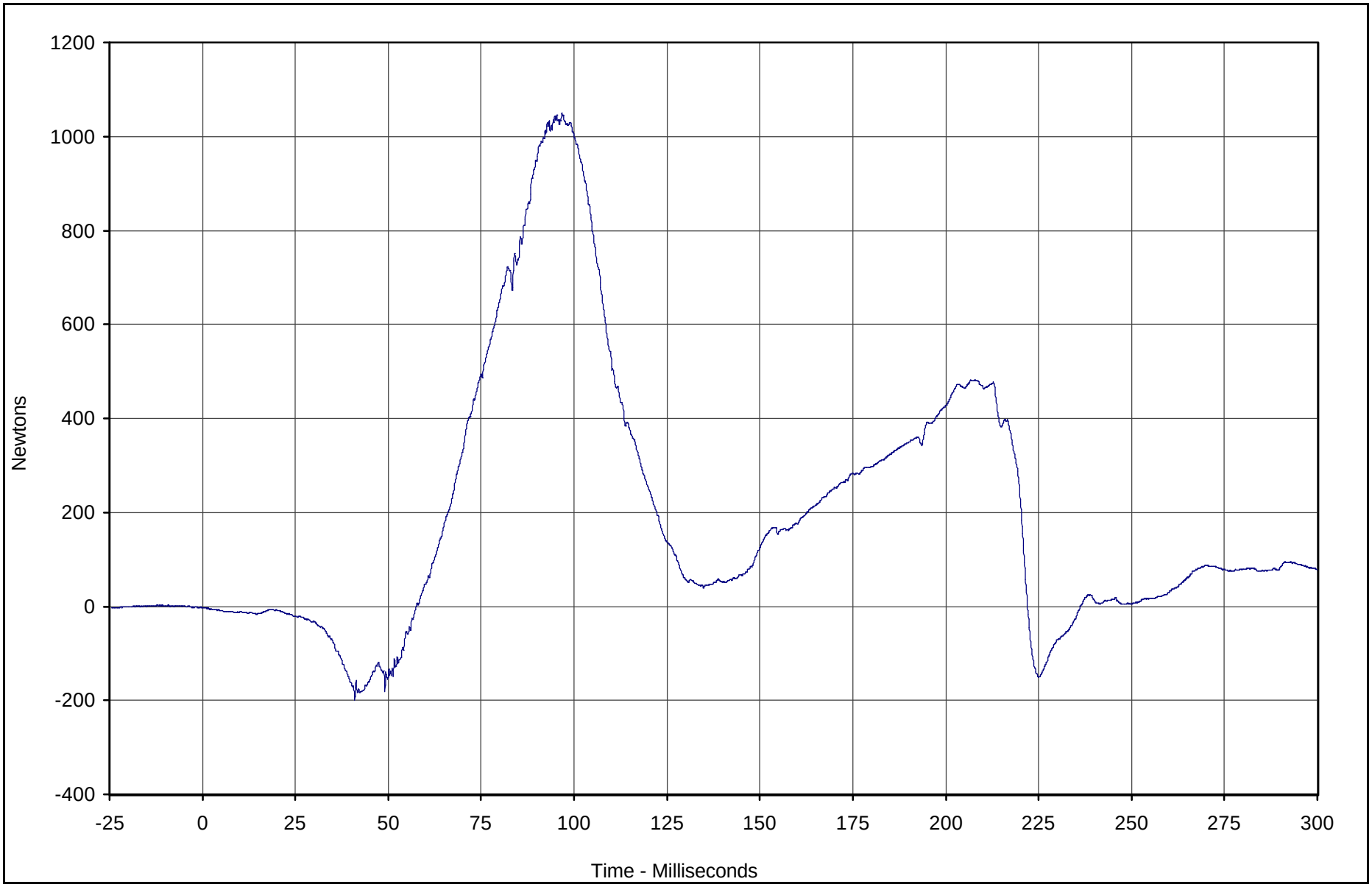
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force Y	170	FIL	Newtons	56.9	77.6	-109.4	119.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



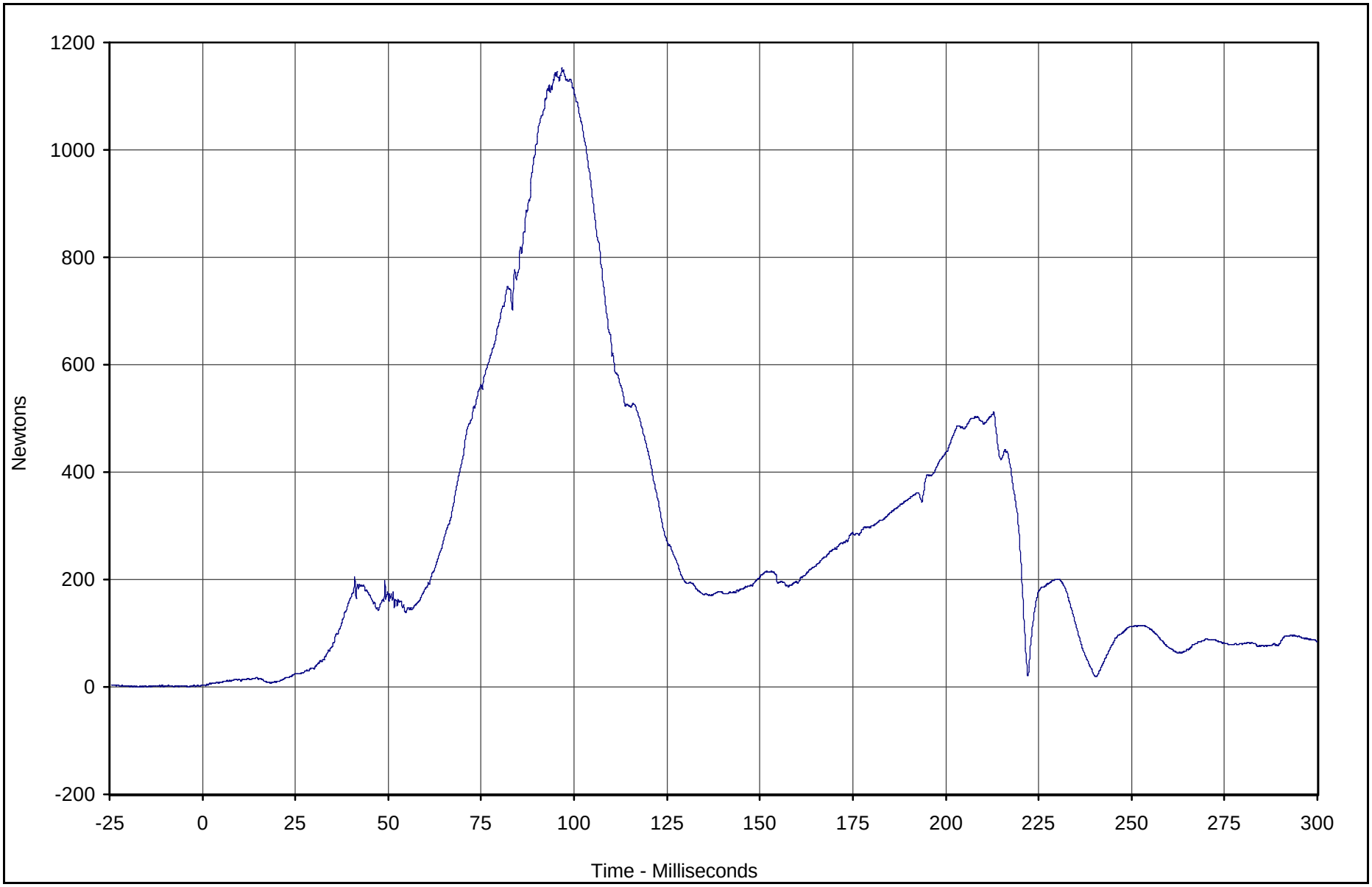
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force Z	171	FIL	Newtons	1050.4	96.8	-199.5	41.0	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



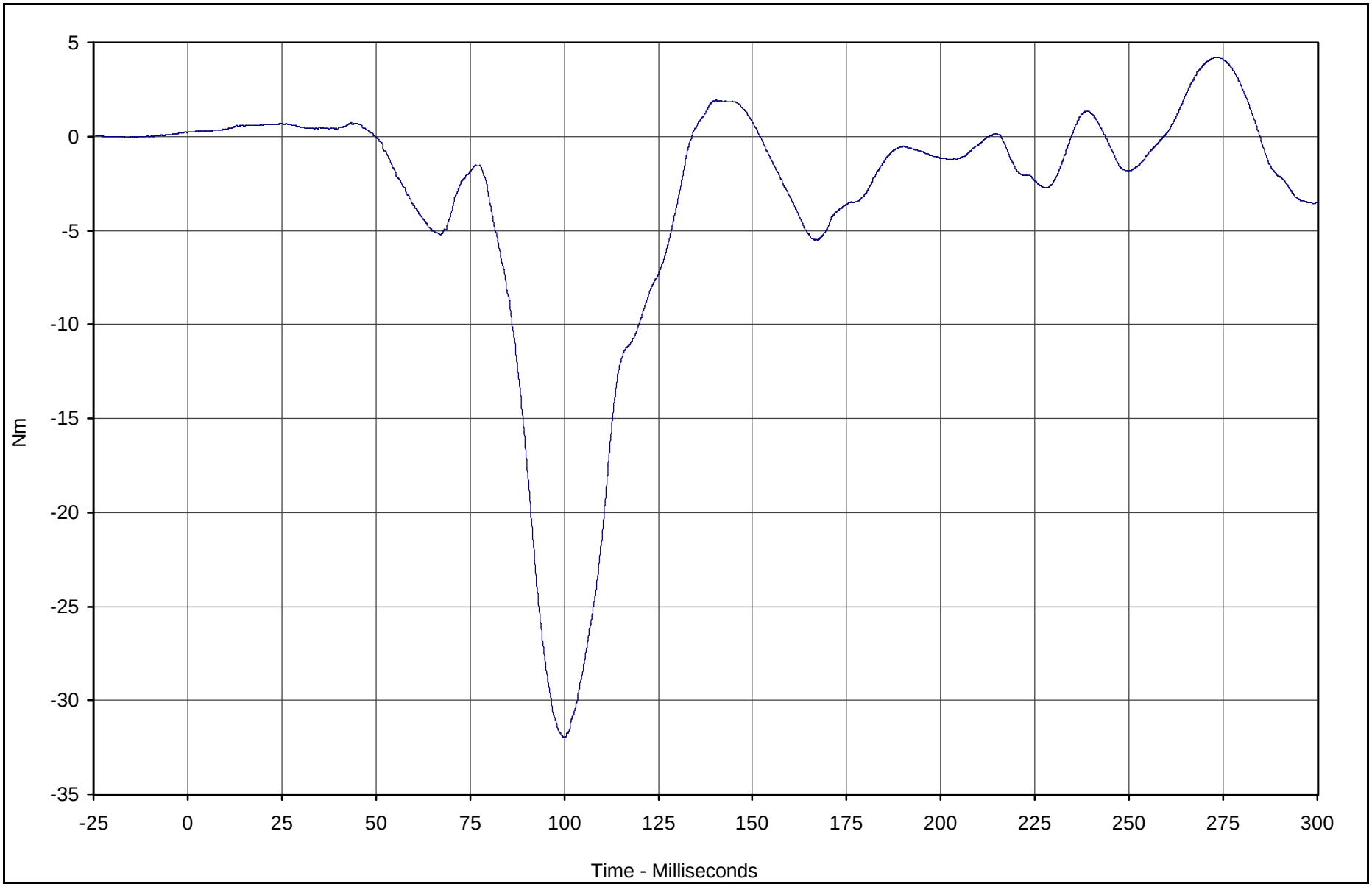
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Force Res.	169	RES	Newtons	1152.5	96.8	2.5	0.9	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



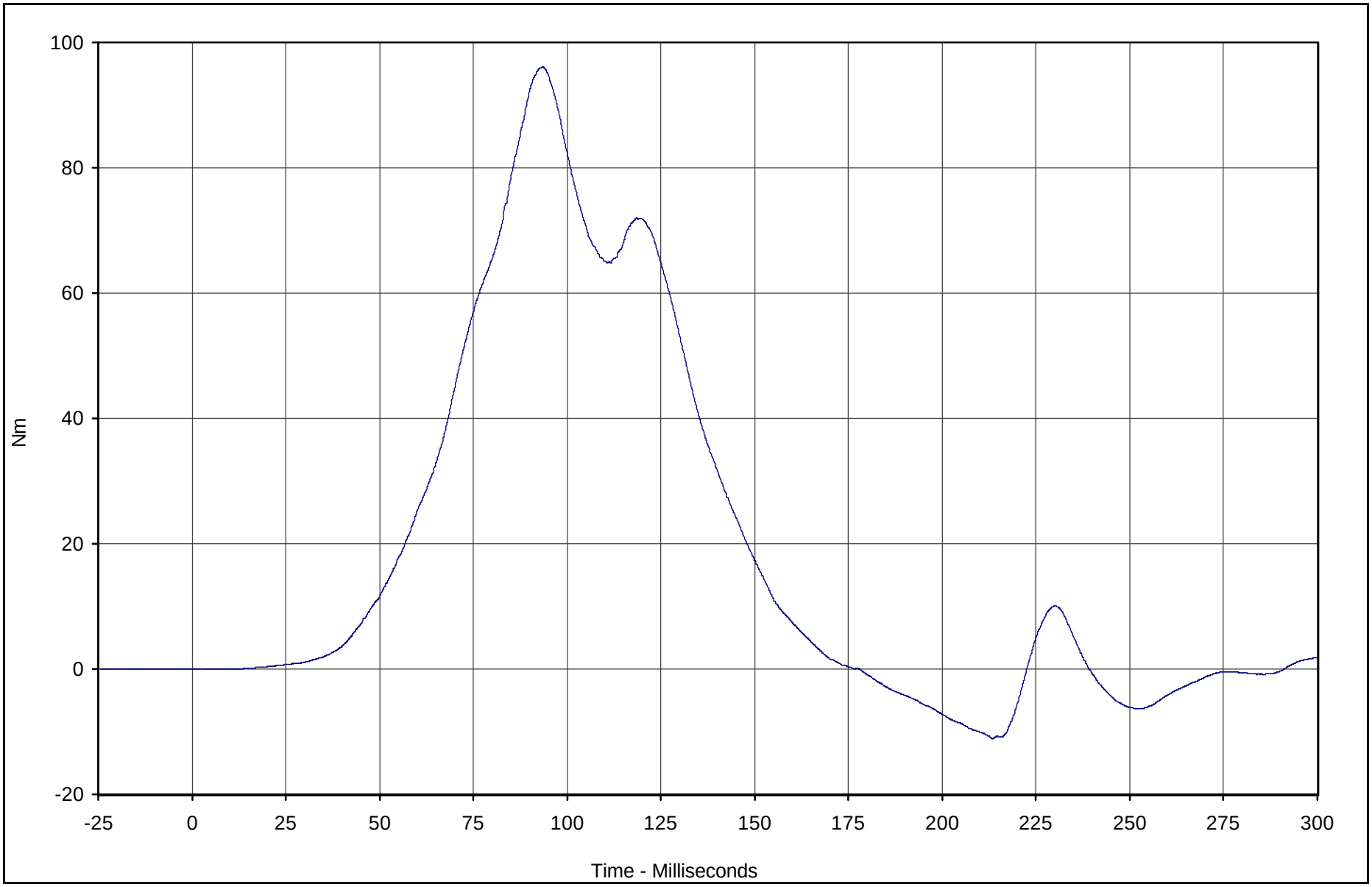
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Moment X	172	FIL	Nm	4.2	273.6	-32.0	100.0	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



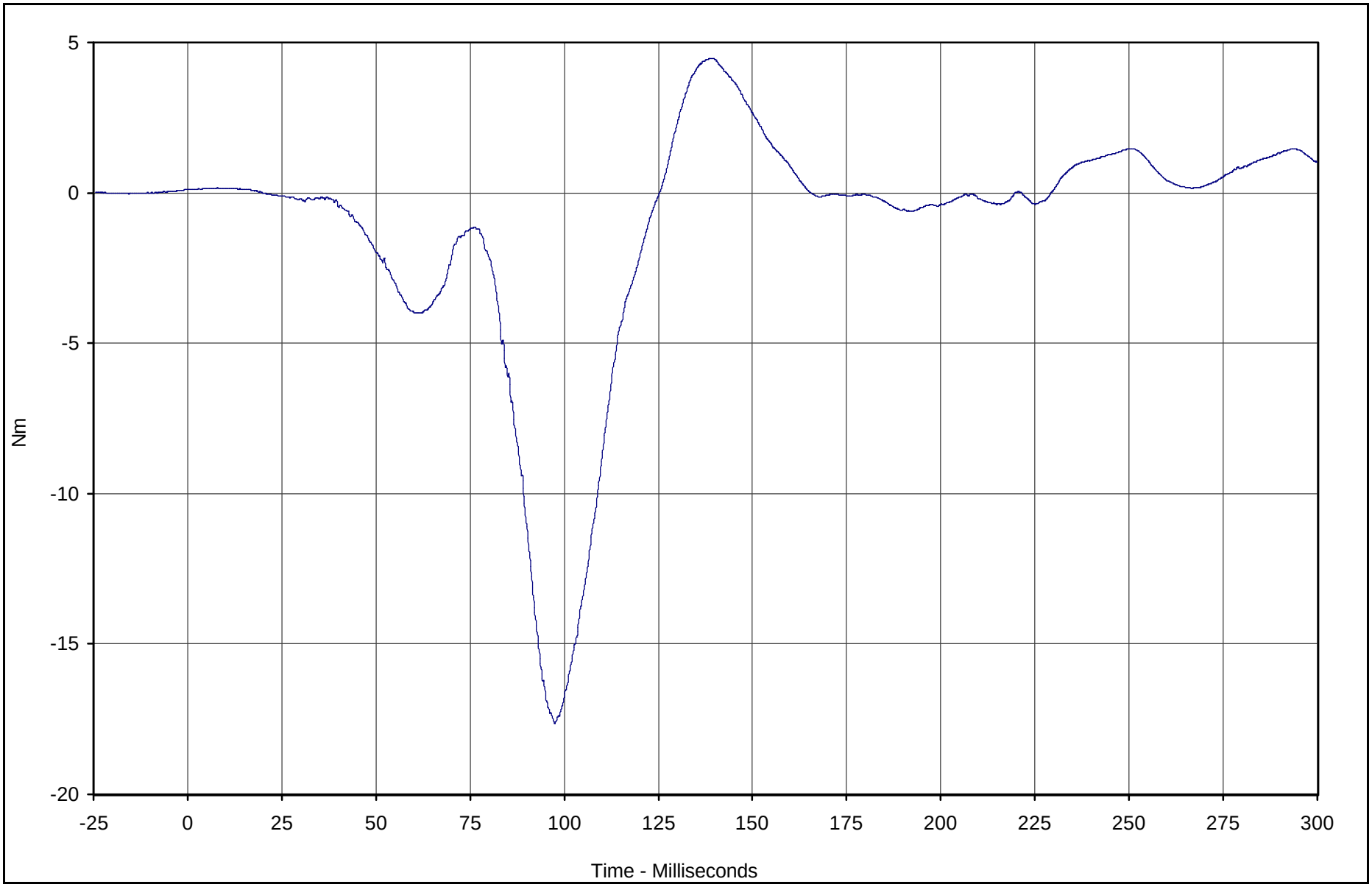
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Moment Y	173	FIL	Nm	96.1	93.5	-11.1	213.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



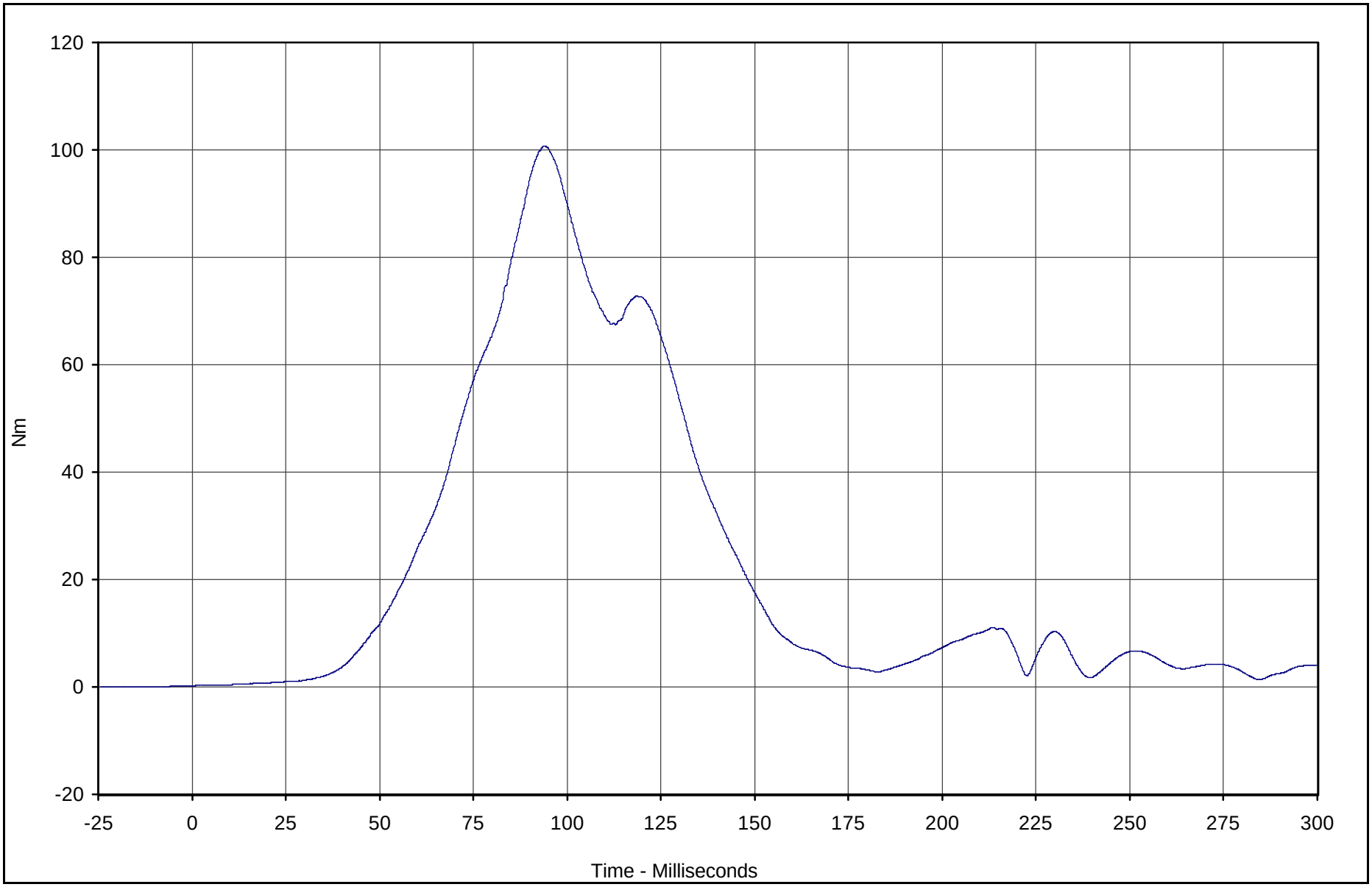
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Moment Z	174	FIL	Nm	4.5	139.2	-17.6	97.5	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



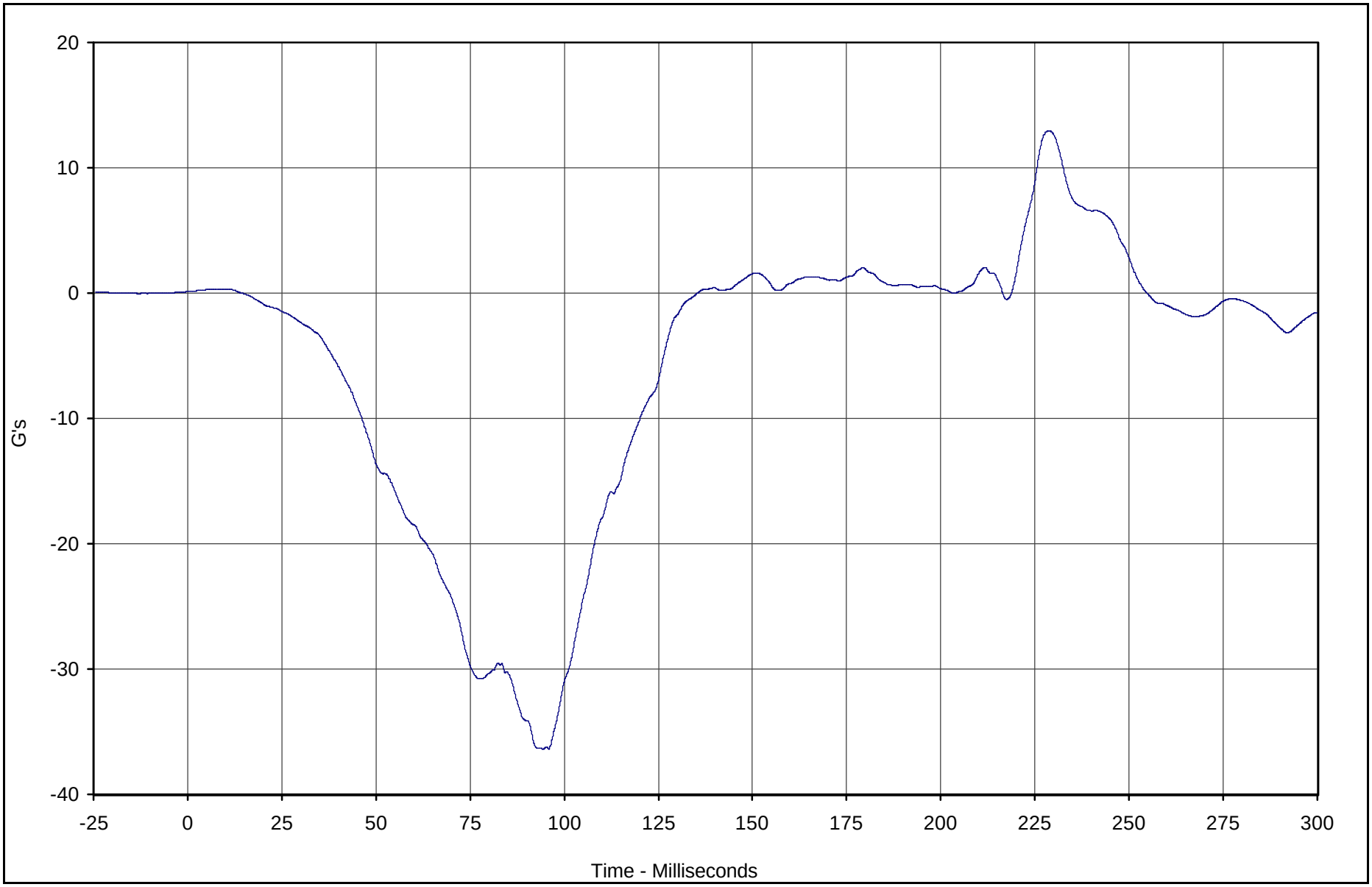
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Lower Neck Mom Res.	172	RES	Nm	100.7	94.1	0.2	0.0	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



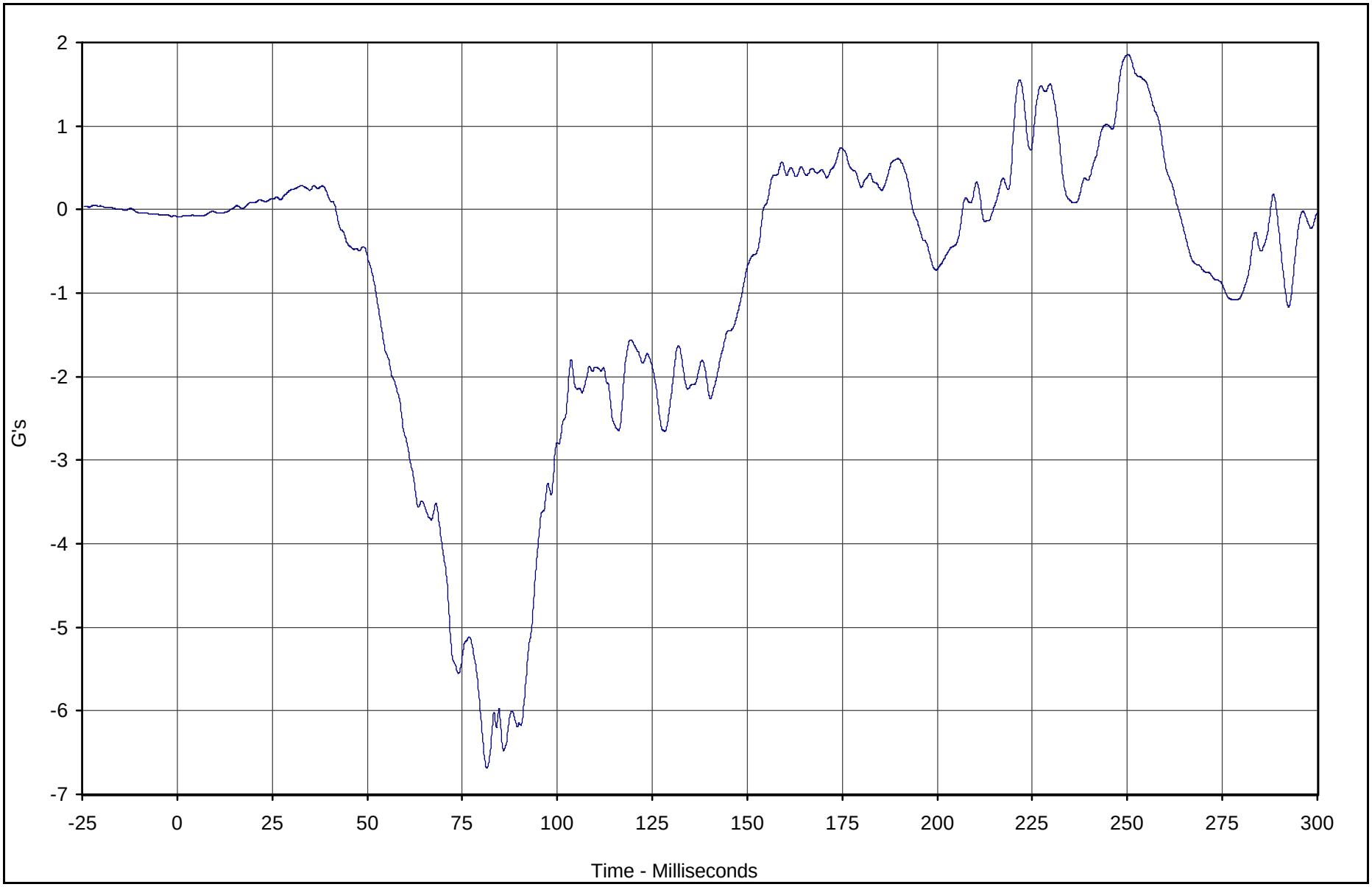
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest X	175	FIL	G's	13.0	228.7	-36.4	94.4	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



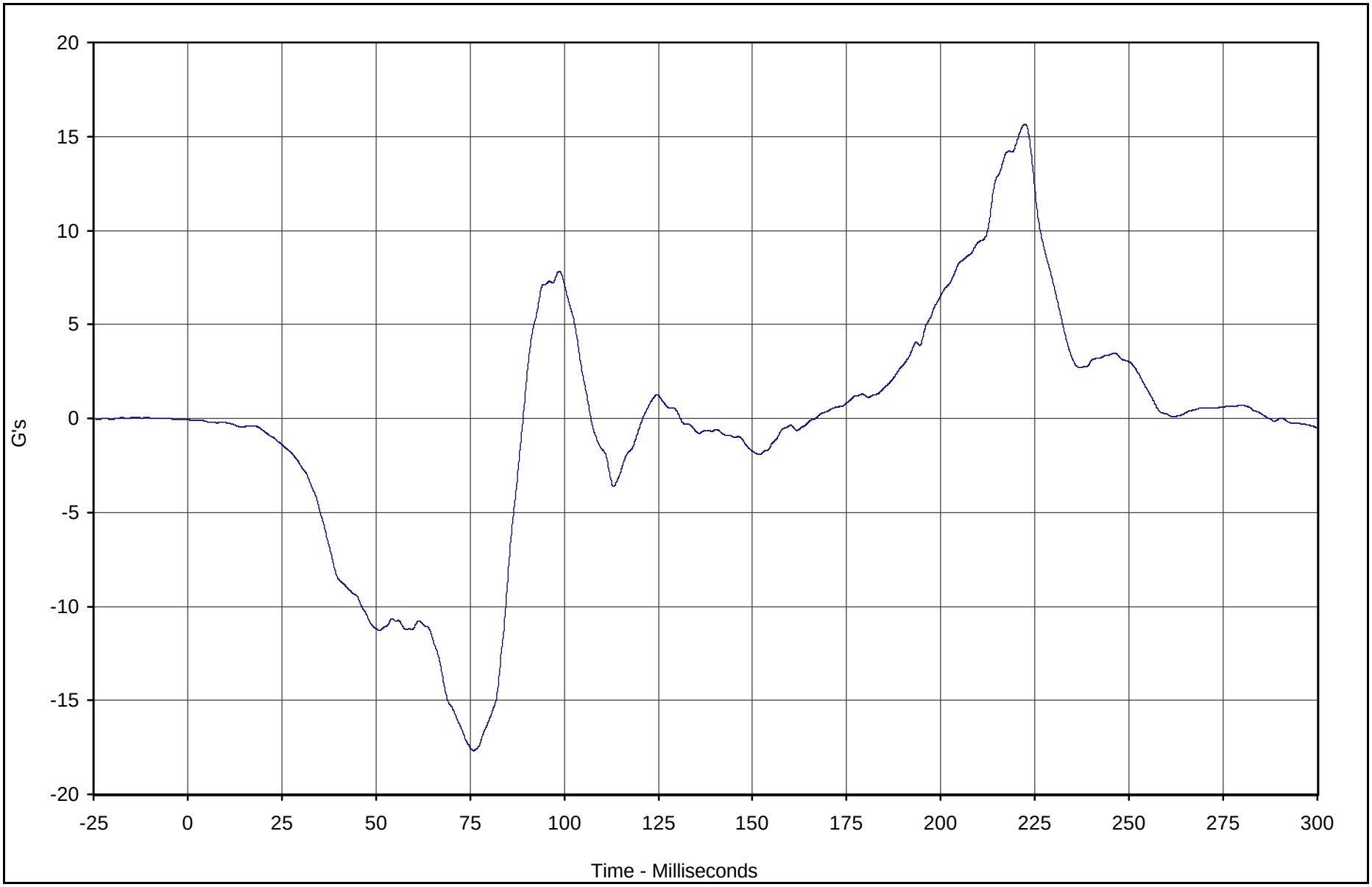
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Y	176	FIL	G's	1.9	250.2	-6.7	81.5	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



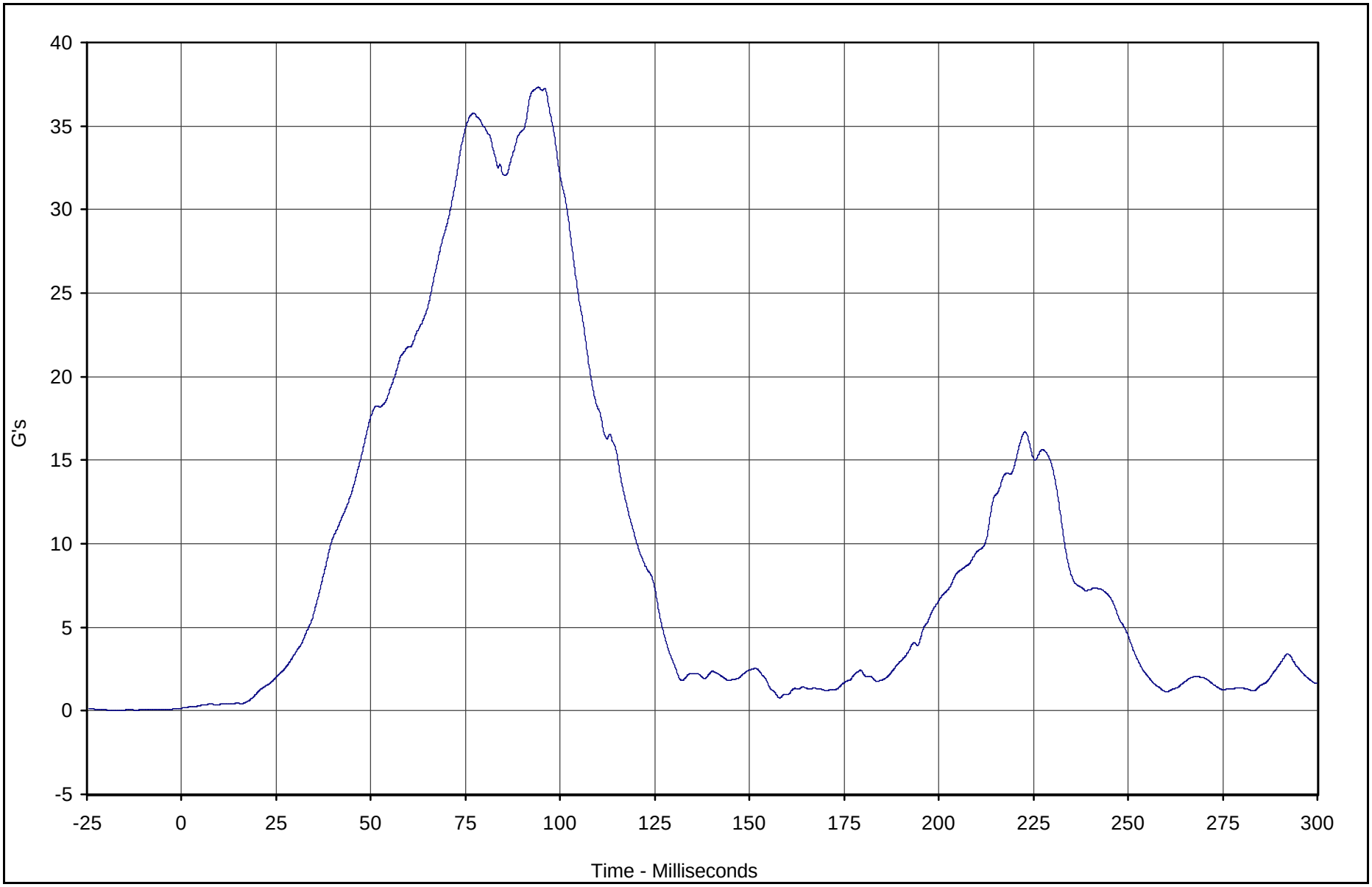
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Z	177	FIL	G's	15.7	222.4	-17.7	75.9	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



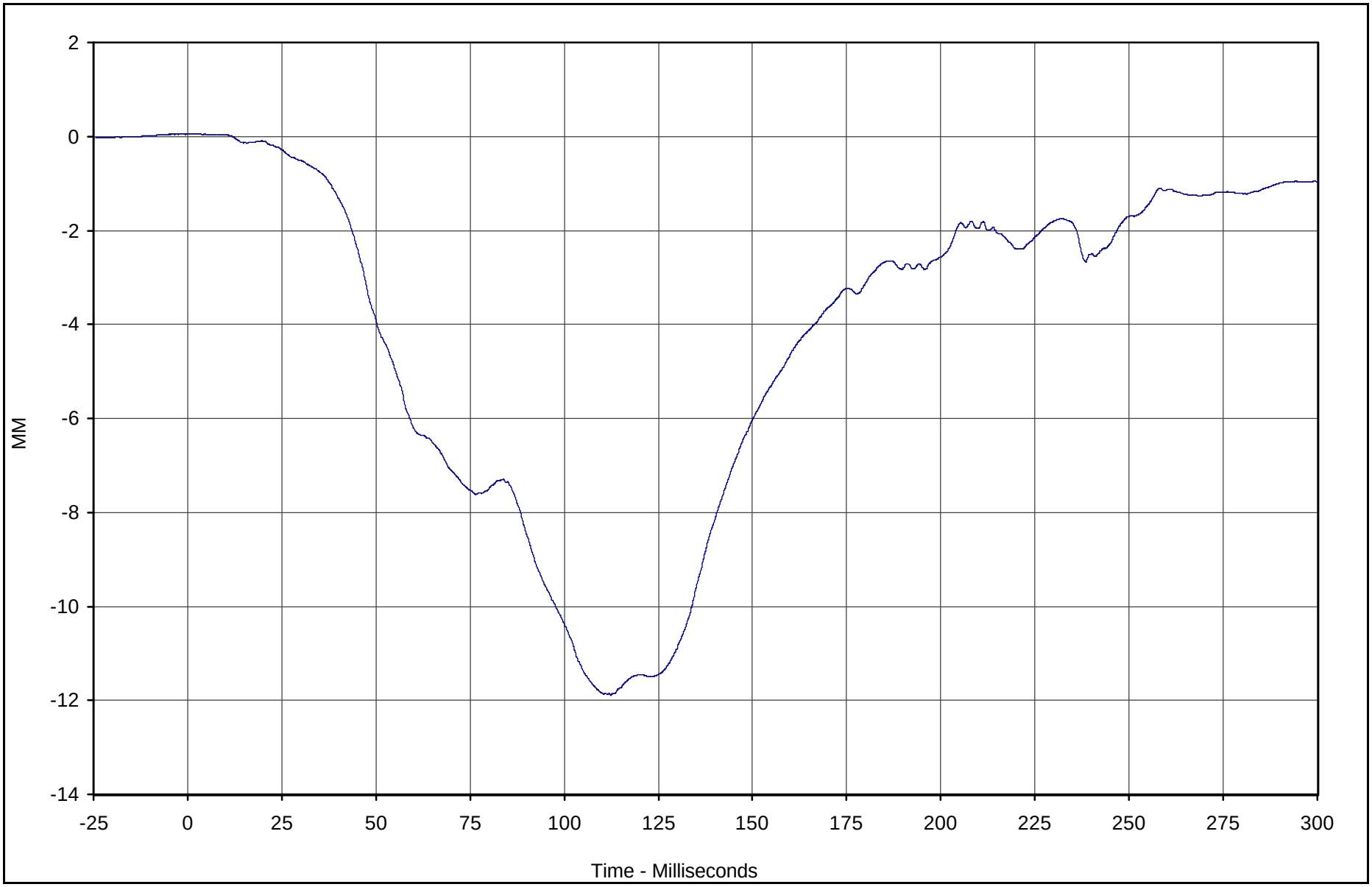
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Resultant	177	RES	G's	37.3	94.3	0.2	0.0	180

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



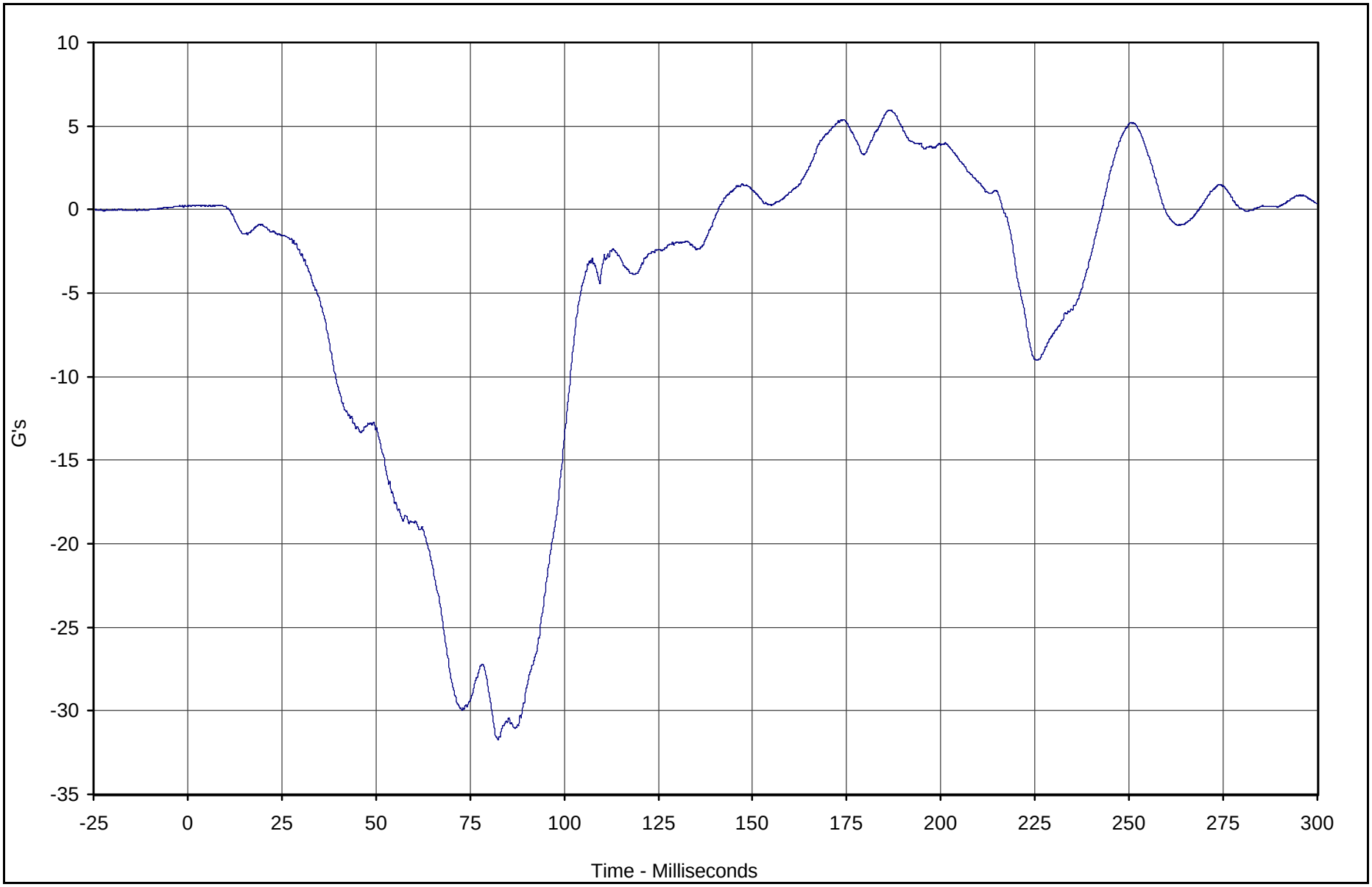
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Chest Displacement	178	FIL	MM	0.1	0.0	-11.9	112.4	600

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



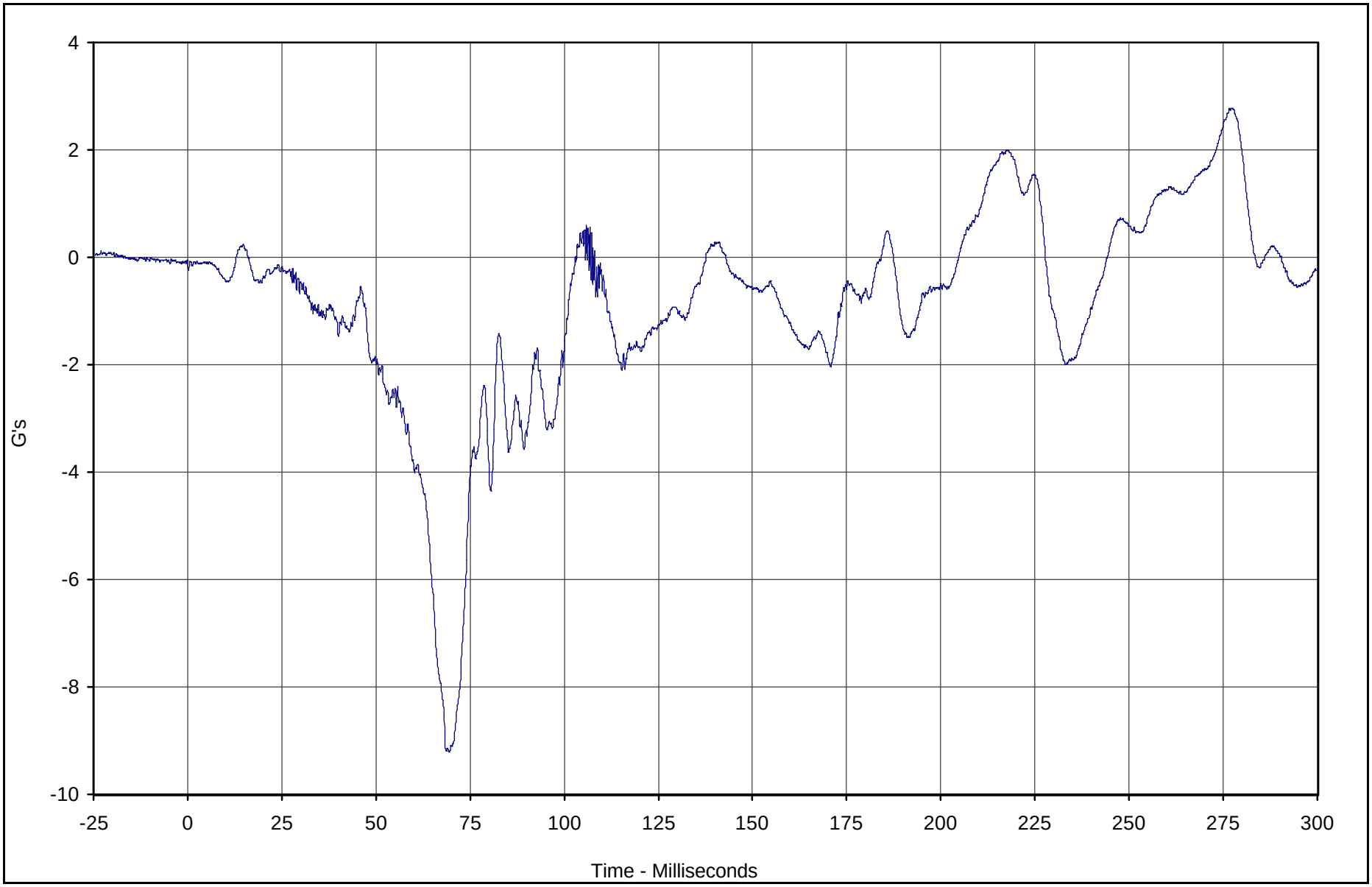
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis X	179	FIL	G's	6.0	186.3	-31.7	82.4	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



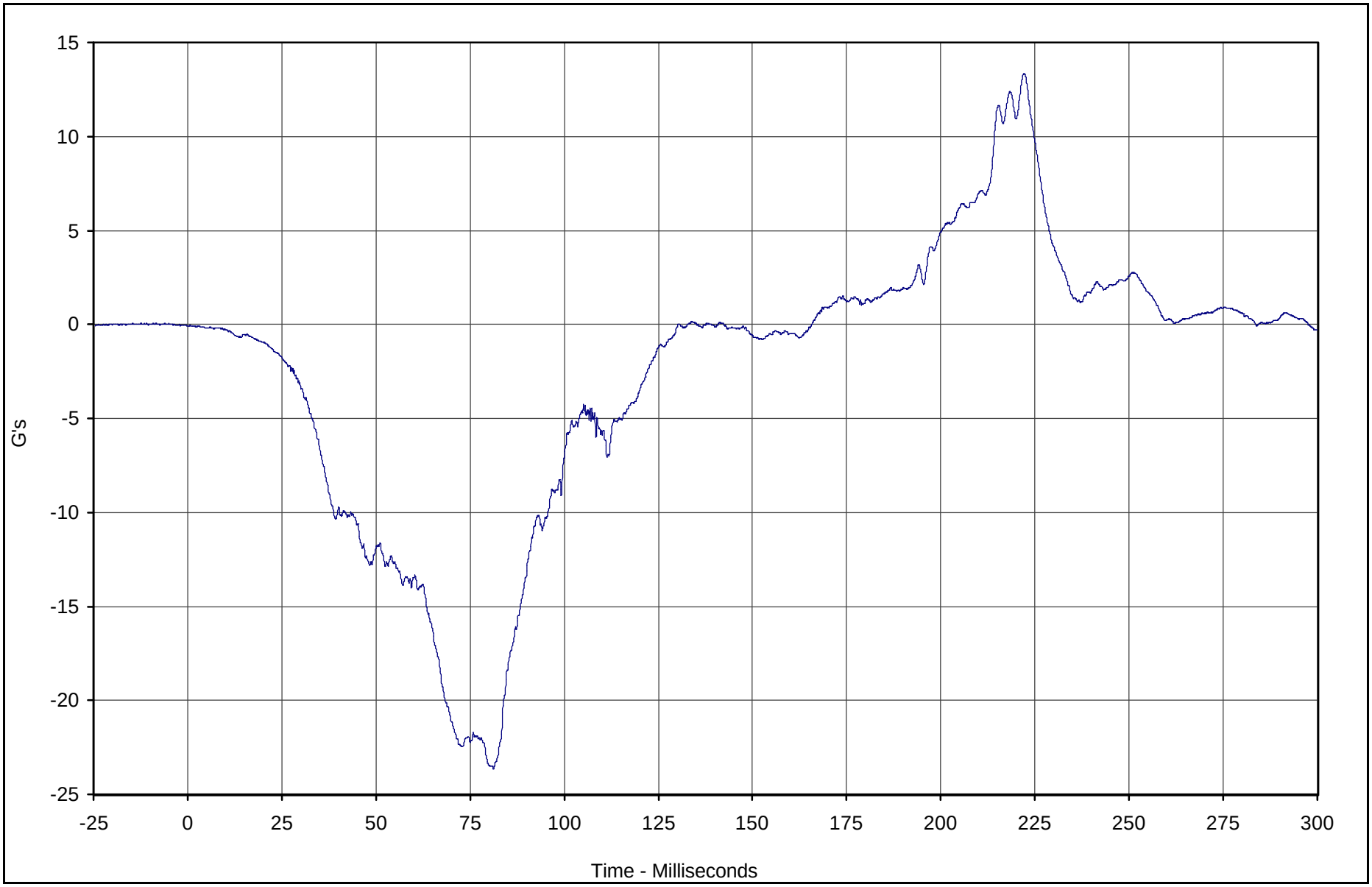
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis Y	180	FIL	G's	2.8	276.7	-9.2	69.4	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



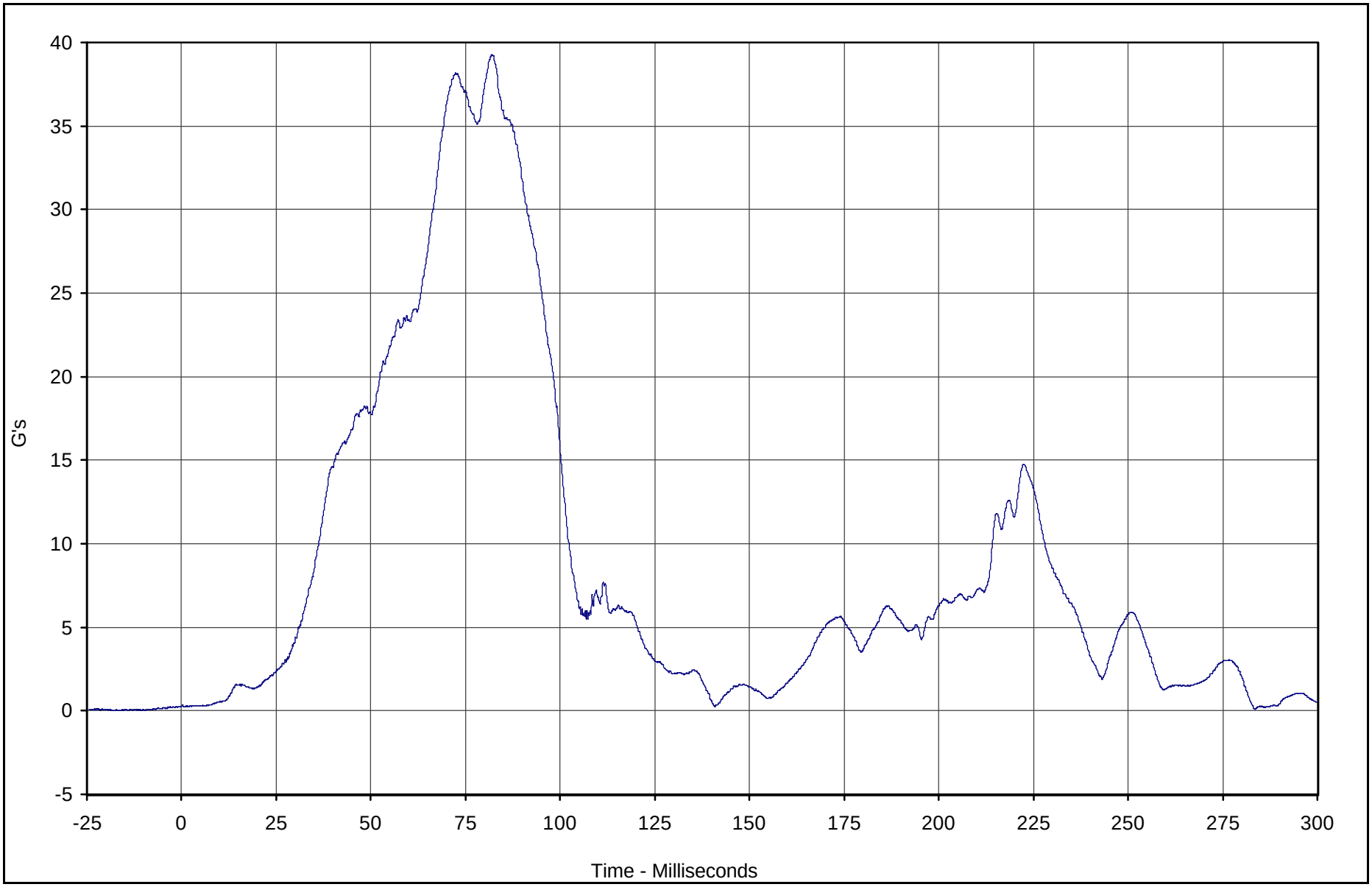
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis Z	181	FIL	G's	13.4	222.2	-23.6	81.2	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



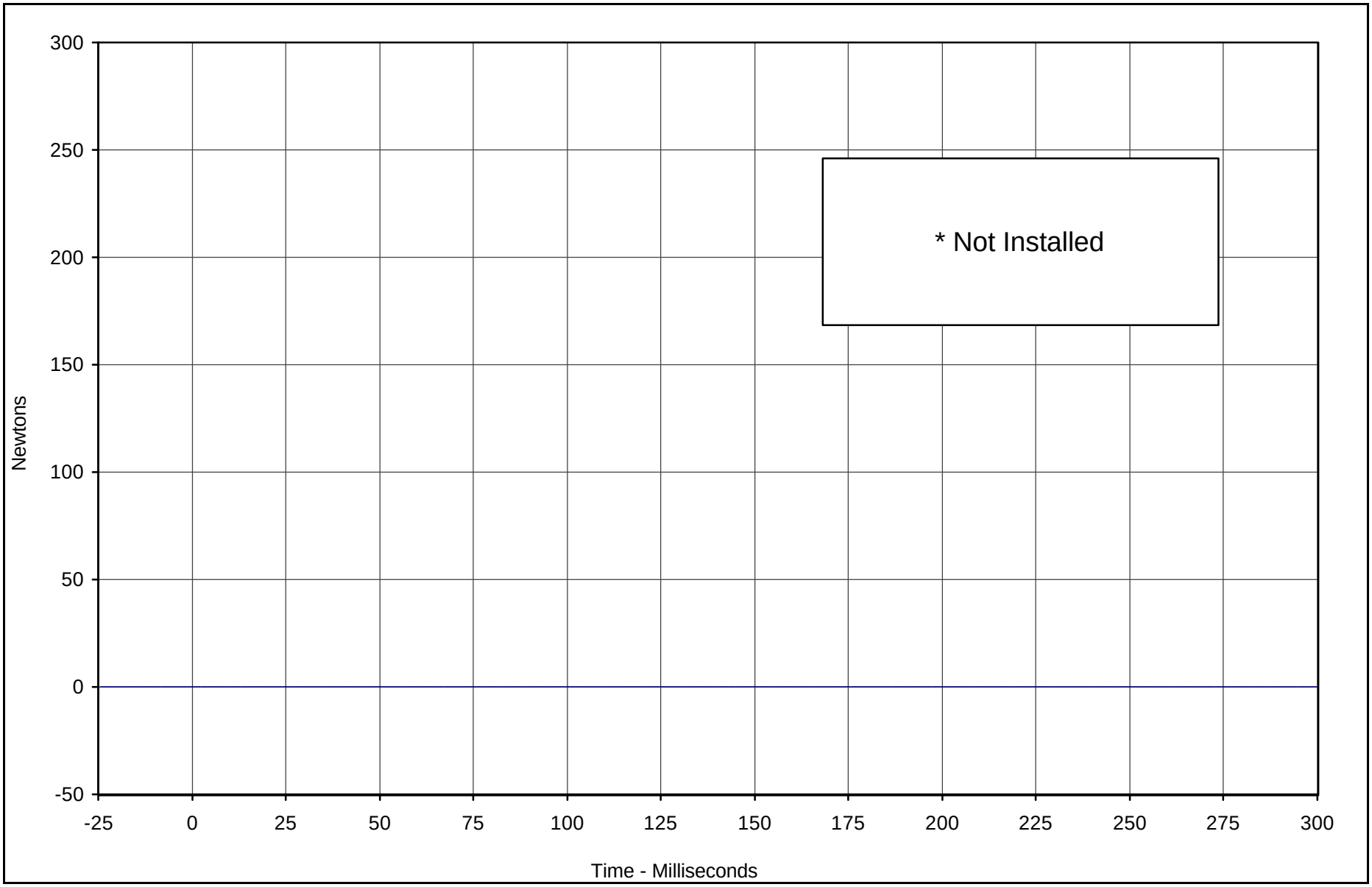
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Pelvis Resultant	179	RES	G's	39.3	82.0	0.1	283.6	1000

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



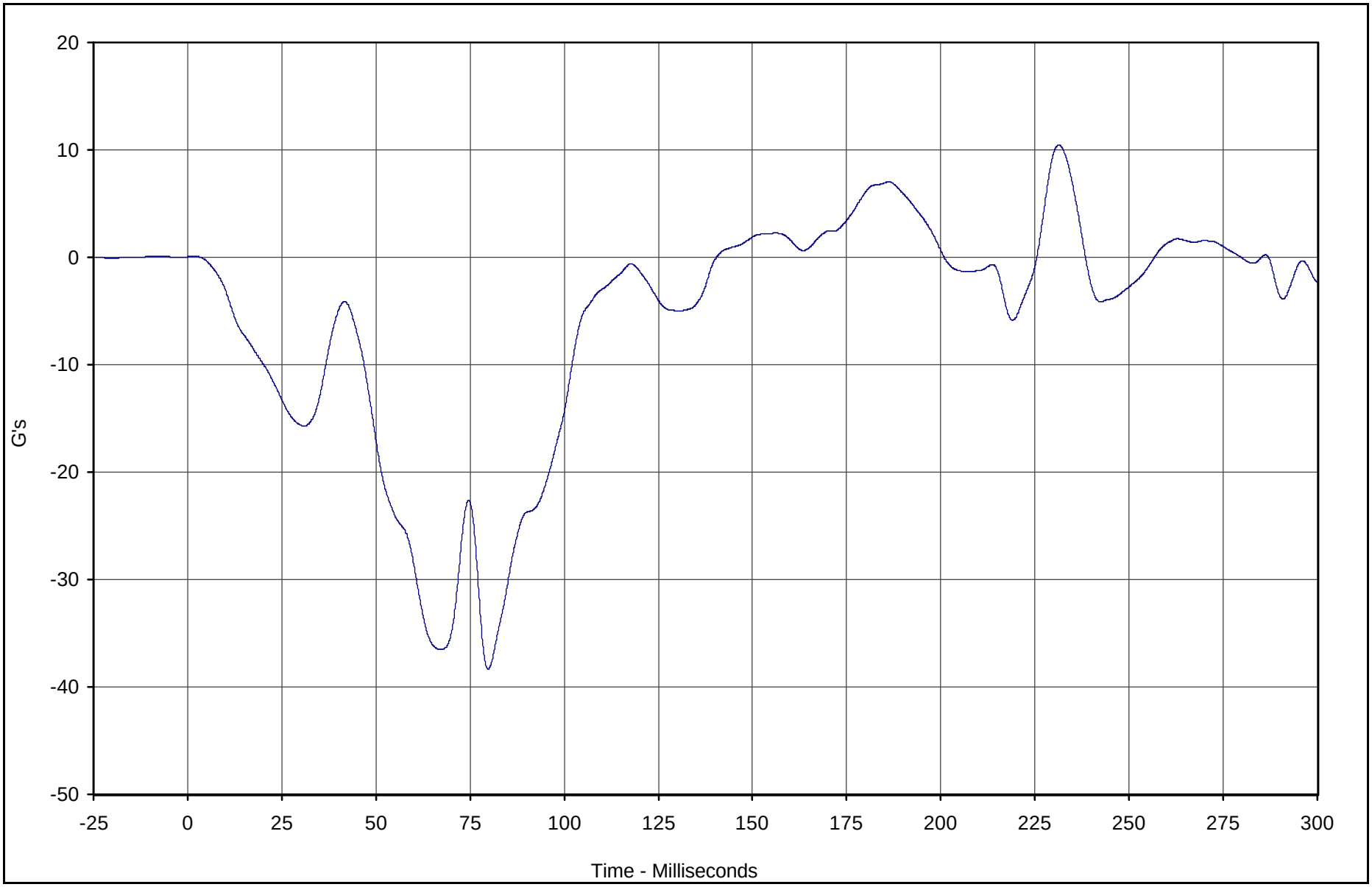
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Tether Load	182	FIL	Newtons	0.0	0.0	0.0	0.0	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



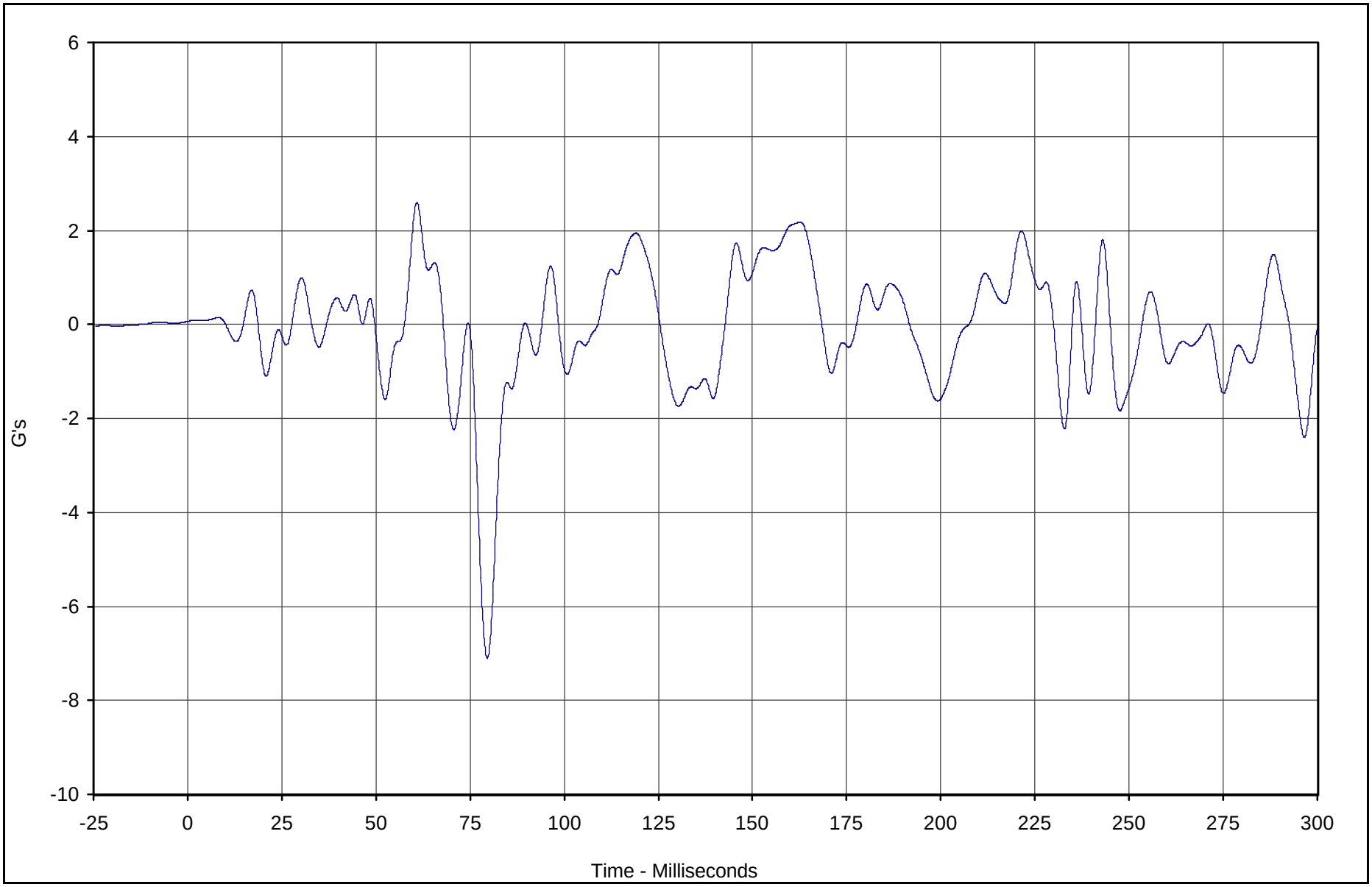
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat X	183	FIL	G's	10.5	231.3	-38.4	79.8	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



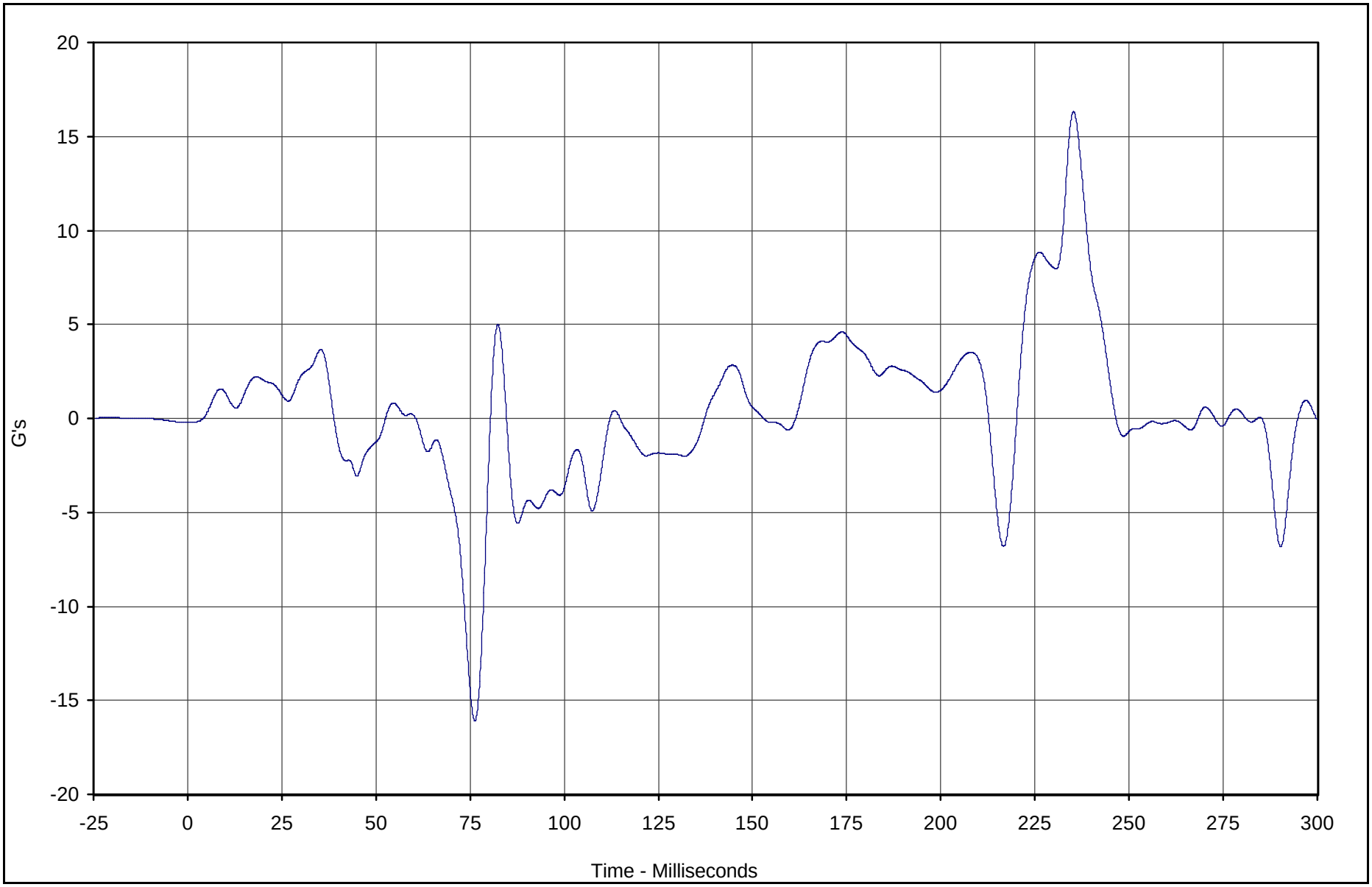
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Y	184	FIL	G's	2.6	60.9	-7.1	79.6	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



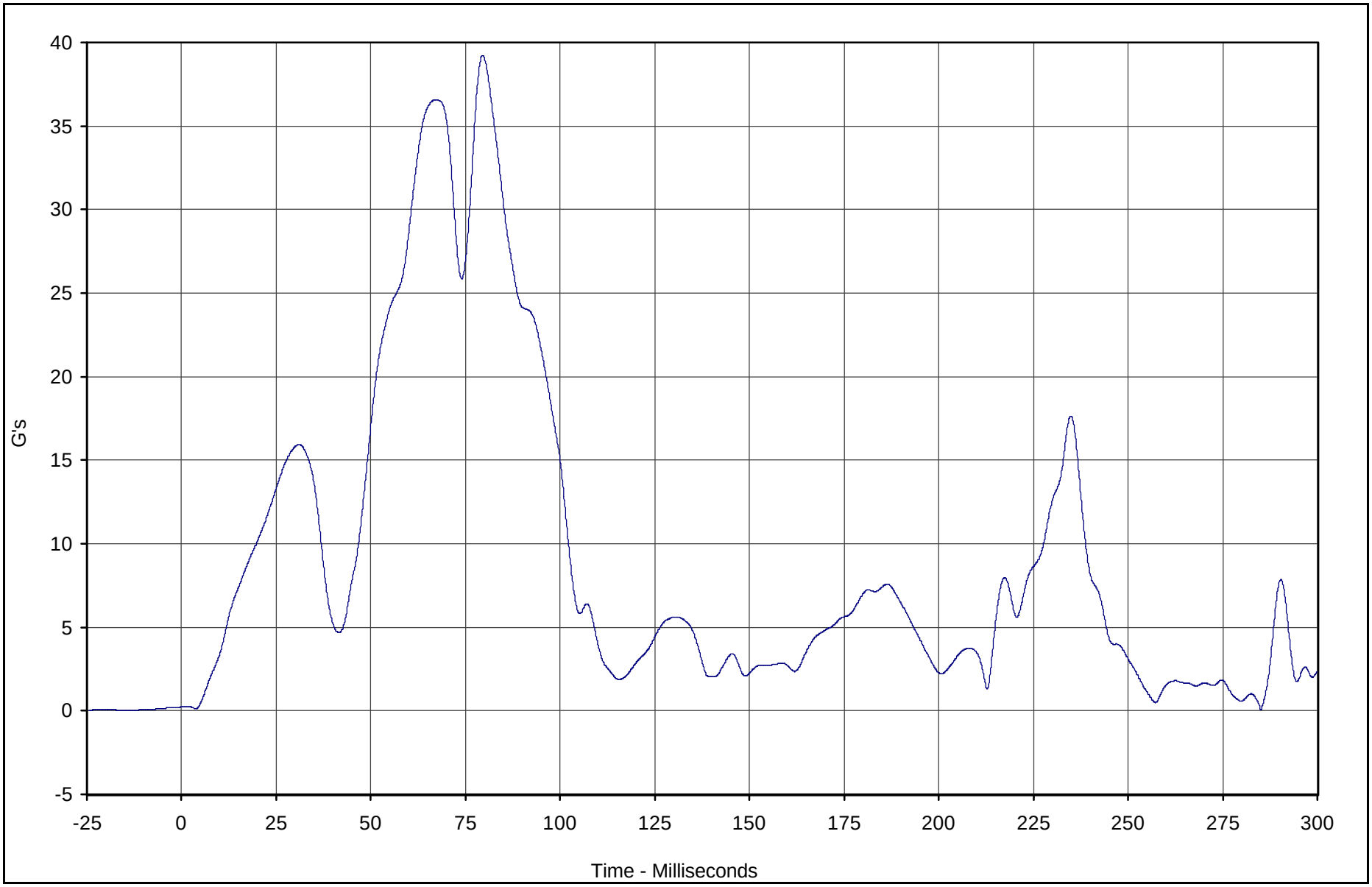
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Z	185	FIL	G's	16.3	235.3	-16.1	76.3	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Right Rear (3 Yr.) Car Seat Resultant	183	RES	G's	39.2	79.5	0.1	285.1	60

Test Vehicle: 2004 Pontiac Grand Prix GT 4 Door Sedan

Test Date: 10/7/03

Test Program: 2003 NHTSA 35mph NCAP

NHTSA No.: M40100

SECTION F-4

CHILD DUMMY INSTRUMENTATION INFORMATION

2003 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Left Rear Child A.T.D. Serial Number 082
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

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
Right Rear Child A.T.D. Serial Number 139
10/7/03
2004 Pontiac Grand Prix GT 4 Door Sedan

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

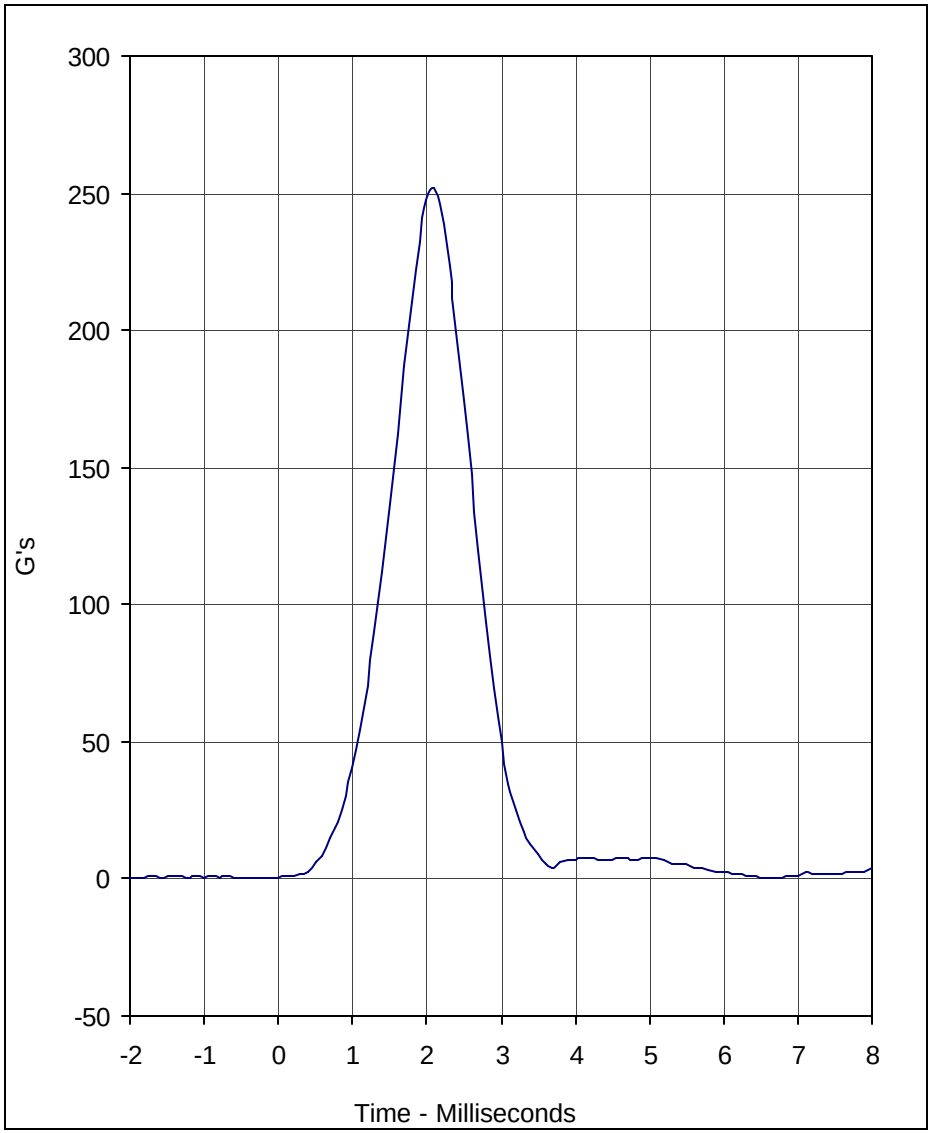
Test I.D.: HD10A

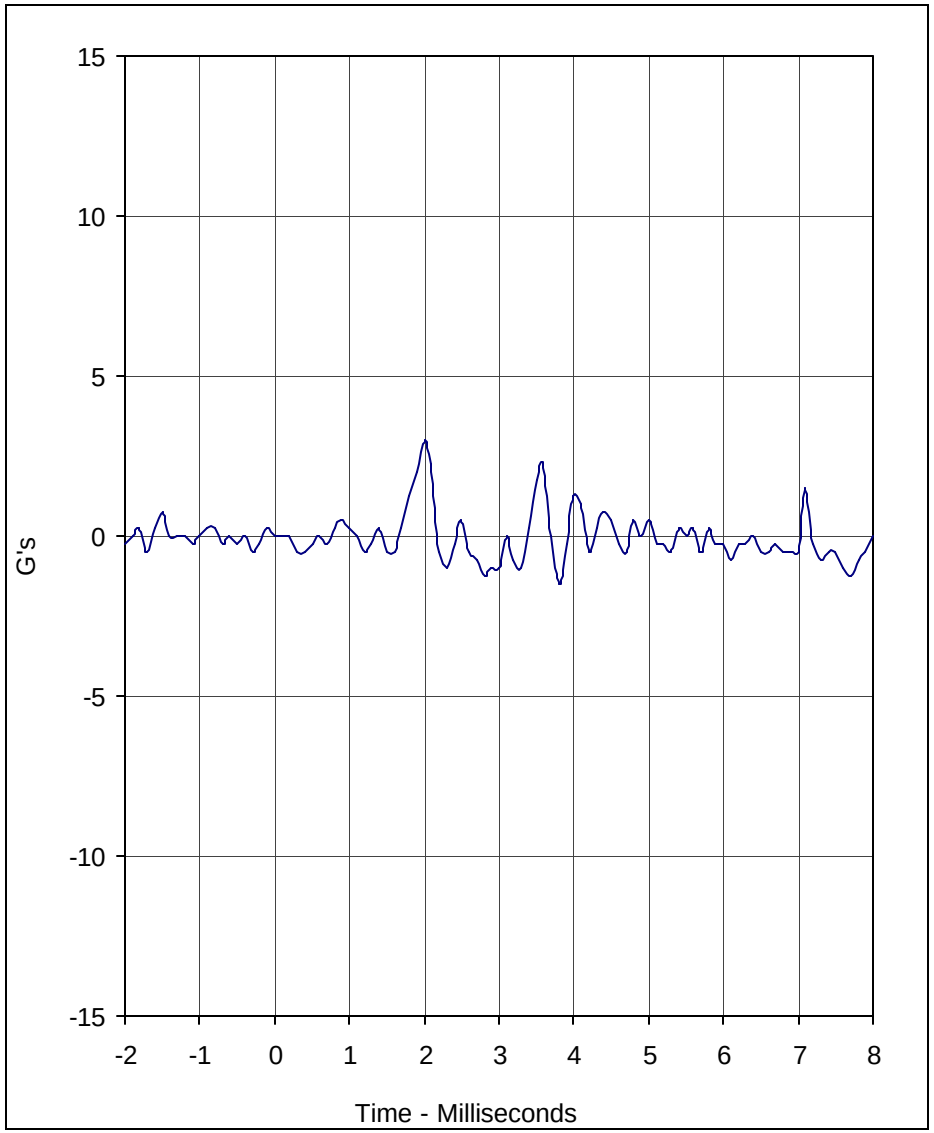
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	250.0 to 280.0	251.6	Pass
Peak Lateral Acceleration	G's	≤15.0	3.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	3.1	Pass
		Overall Test Results		Pass

Laboratory Technician

September 26, 2003

Test Date





Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	251.6	2.1	0.0	-0.6	1000

Curve Description	CURNO	Type
Head Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	3.0	2.0	-1.5	3.8	1000

Test Program: Hybrid III 3 Year Old Head Drop Test

Test Date: 9/26/2003

A.T.D. Serial No.: 082

Test I.D.: HD10A

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Thorax Impact Test

ATD Serial No.: 082

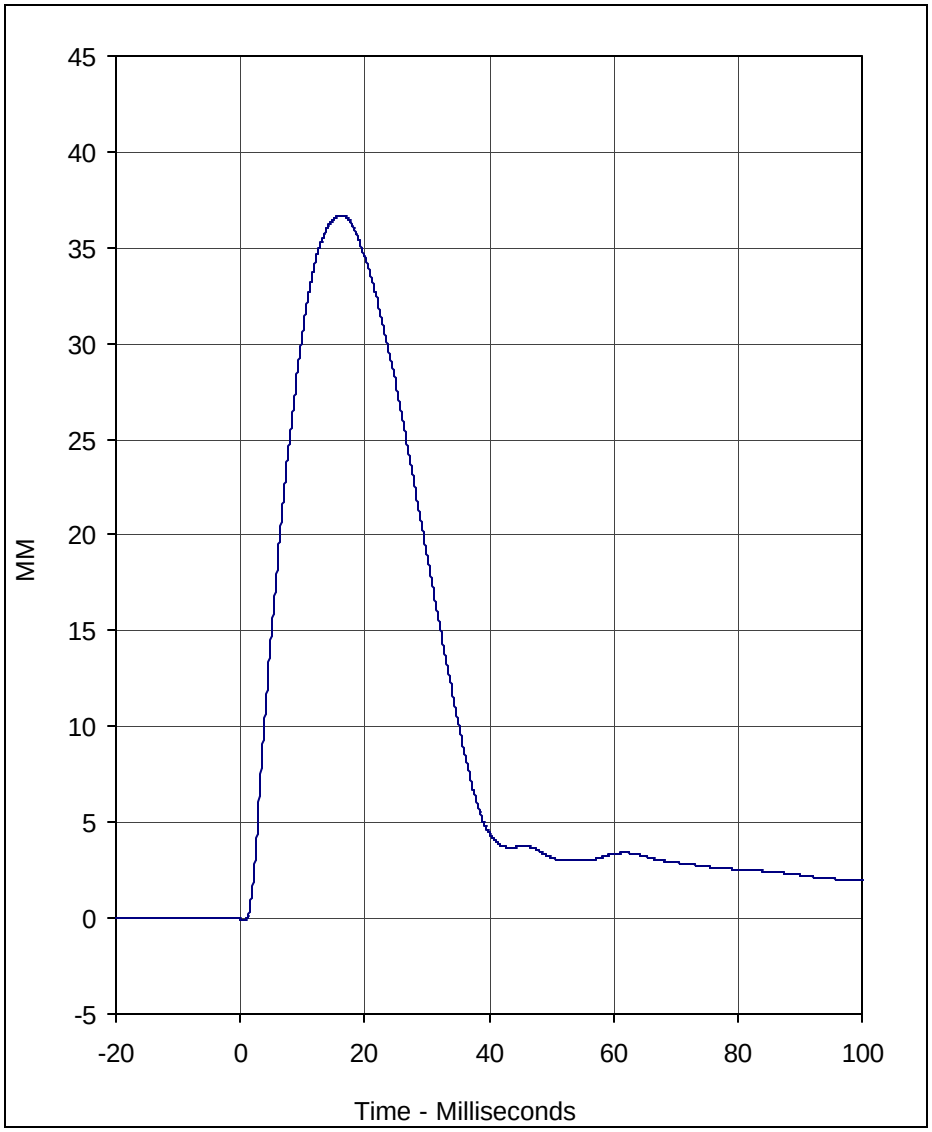
Test I.D.: CH10A

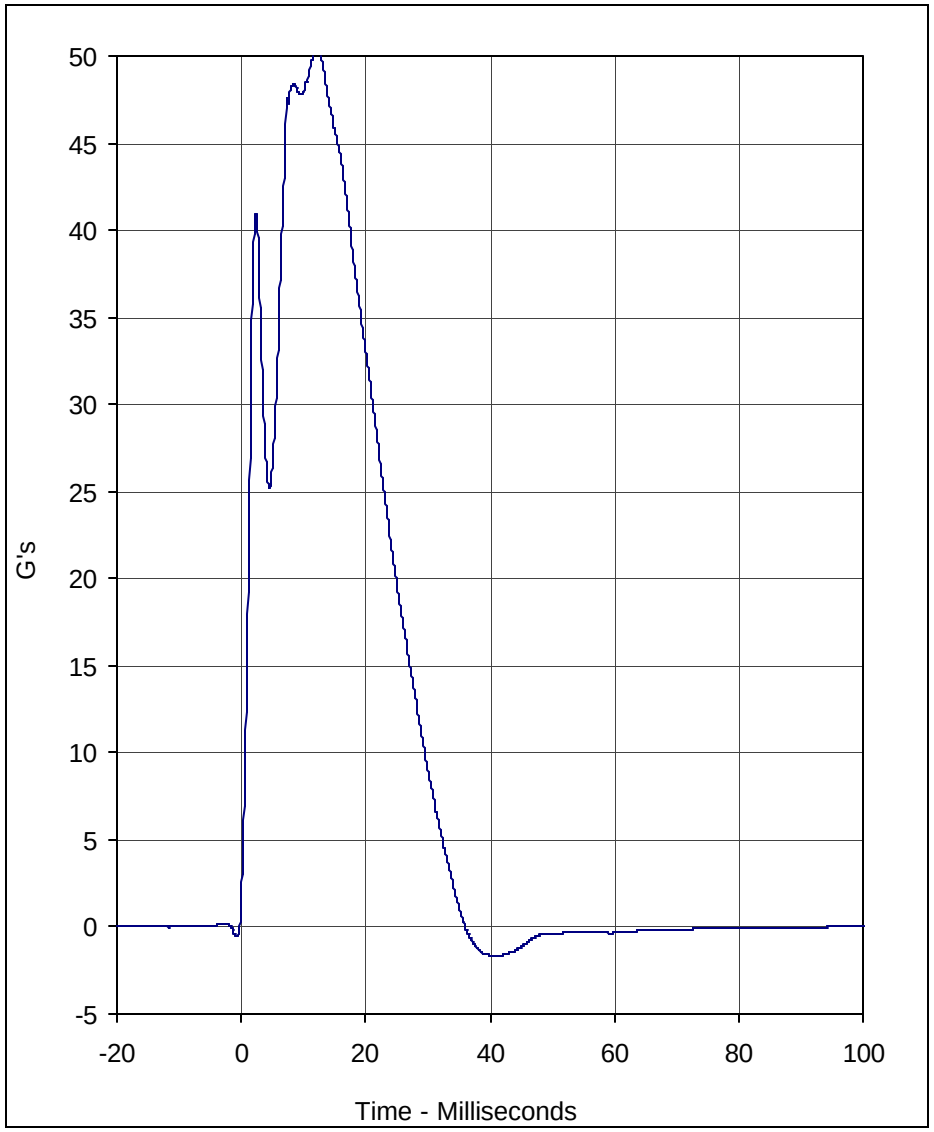
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	6.10	Pass
Peak Chest Compression	MM	32 to 38	36.7	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	783.4	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	761.3	Pass
Internal Hysterysis	%	65 to 85	70.8	Pass
		Overall Test Results		Pass

Laboratory Technician

September 30, 2003

Test Date





Curve Description	CURNO	Type
Chest Compression	001	FIL

Units	Max	Time	Min	Time	SAE Class
MM	36.7	16.3	-0.1	0.6	600

Curve Description	CURNO	Type
Probe Acceleration	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	50.3	12.2	-1.6	41.5	180

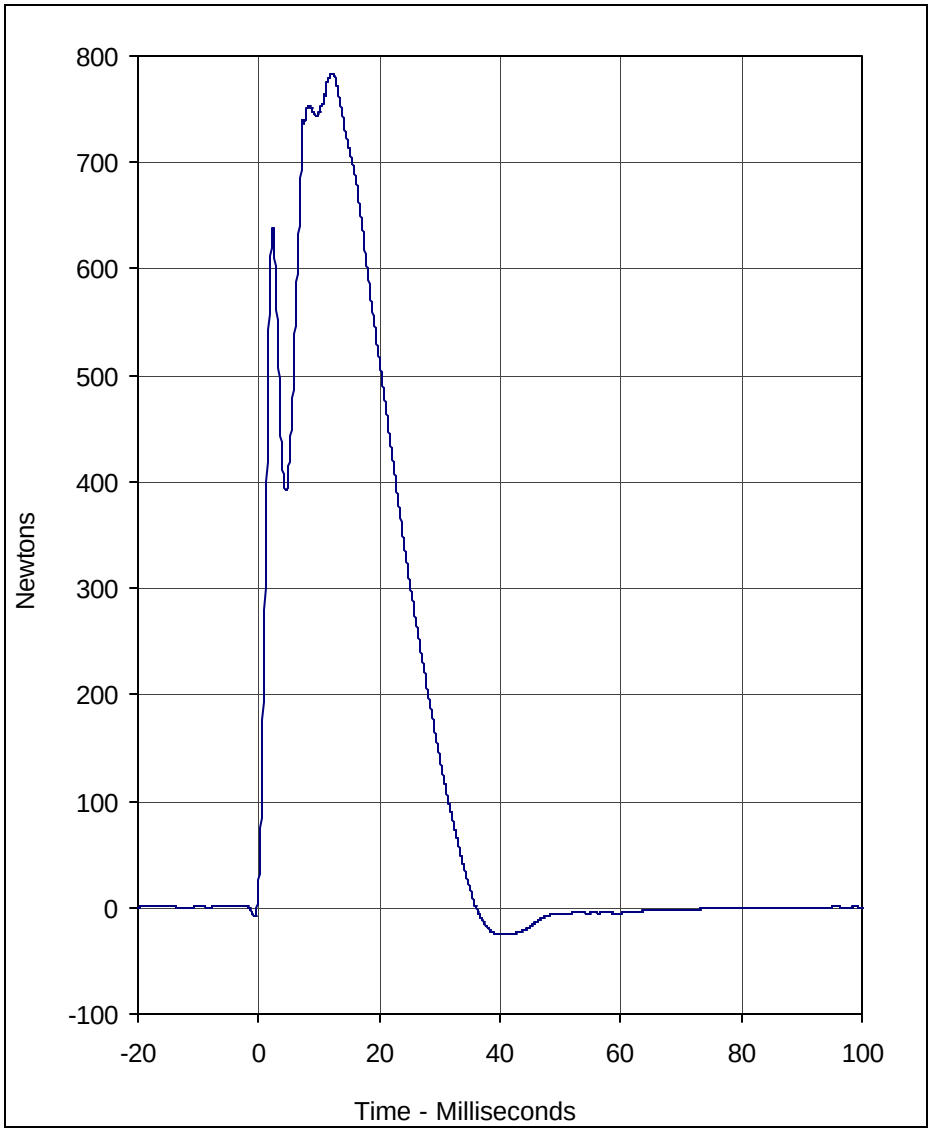
Test Program: Hybrid III 3 Year Old Thorax Impact

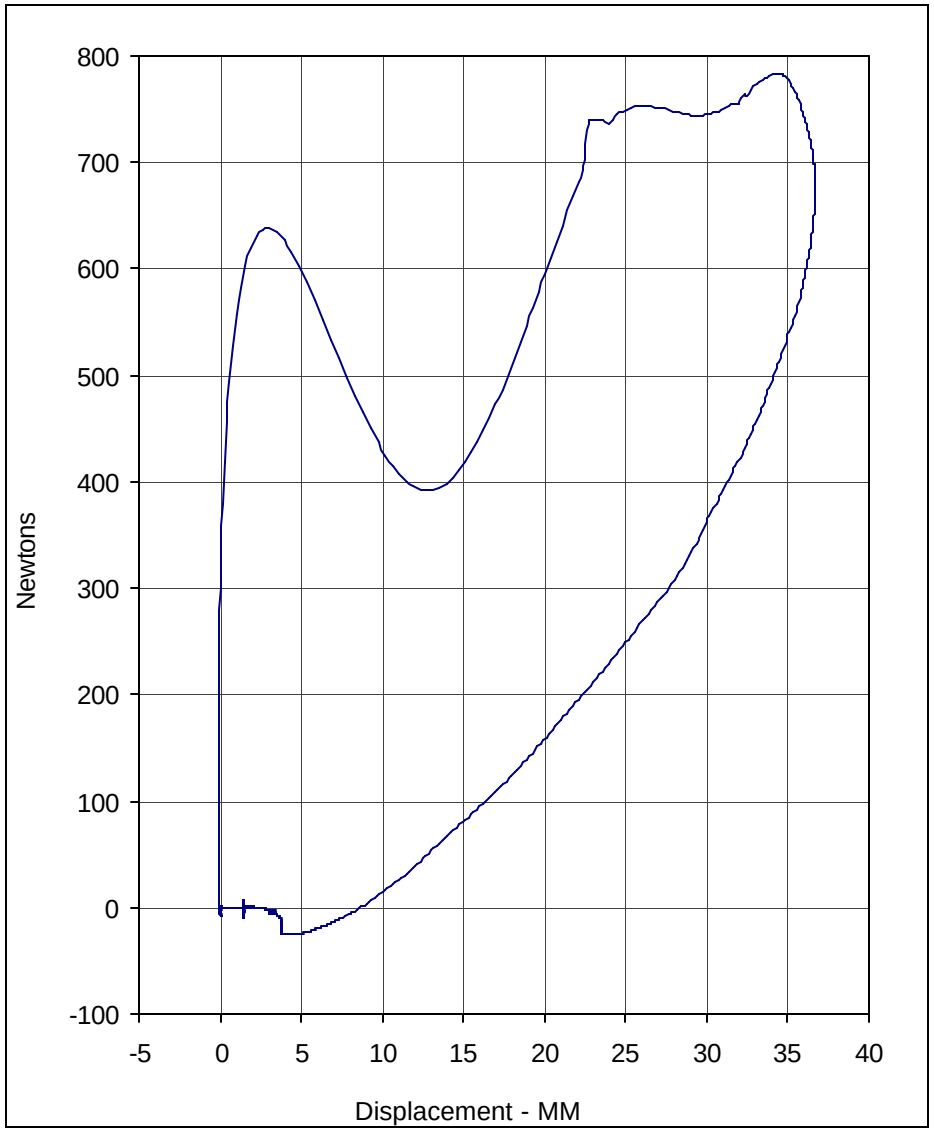
Test Date: 9/30/2003

A.T.D. Serial No.: 082

Test I.D.: CH10A

KARCO Engineering





Curve Description	CURNO	Type
Probe Force	003	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	783.4	12.2	-25.6	41.5	180

Curve Description	CURNO	Type
Probe Force vs. Chest Compression	004	FIL

Units	Hysterysis	SAE Class
%	70.8	180/600

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 9/30/2003

A.T.D. Serial No.: 082

Test I.D.: CH10A

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Neck Flexion Test

ATD Serial No.: 082

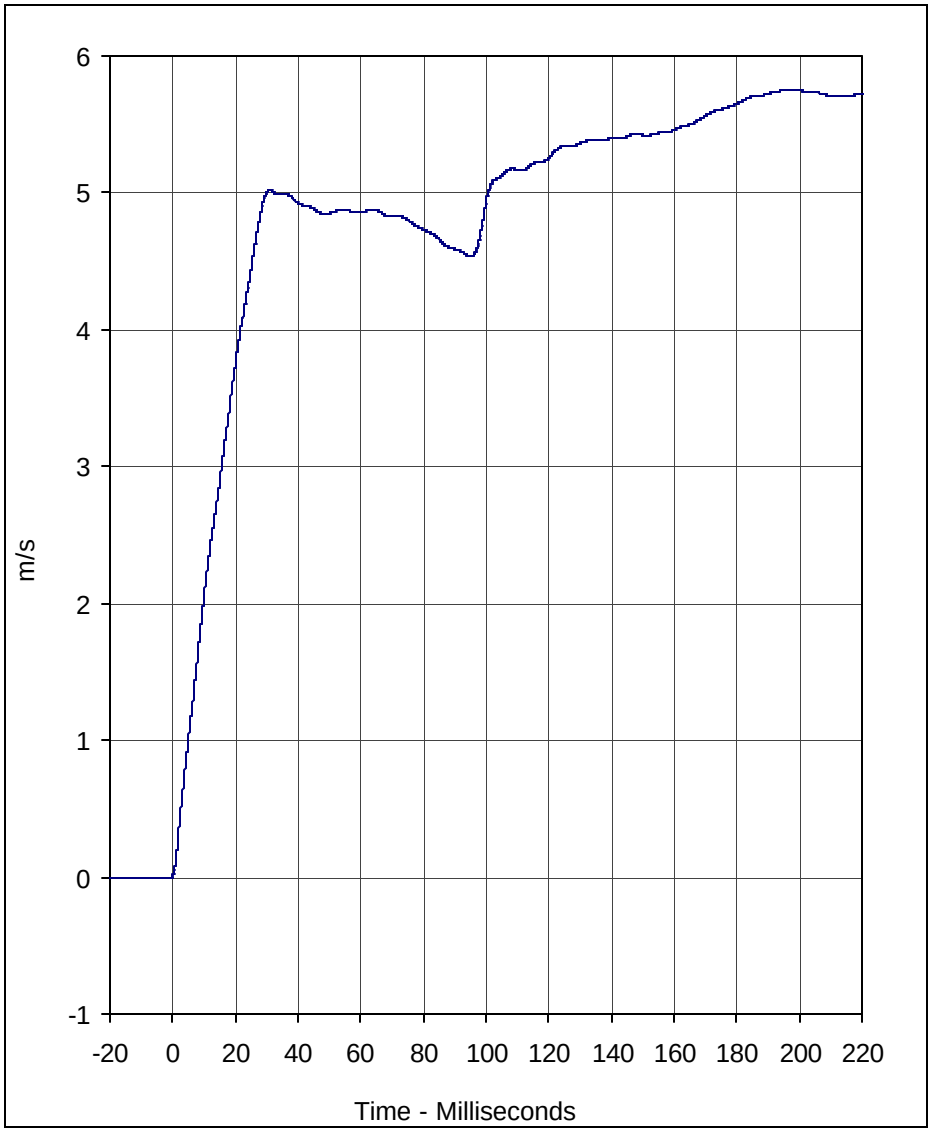
Test I.D.: NF10A

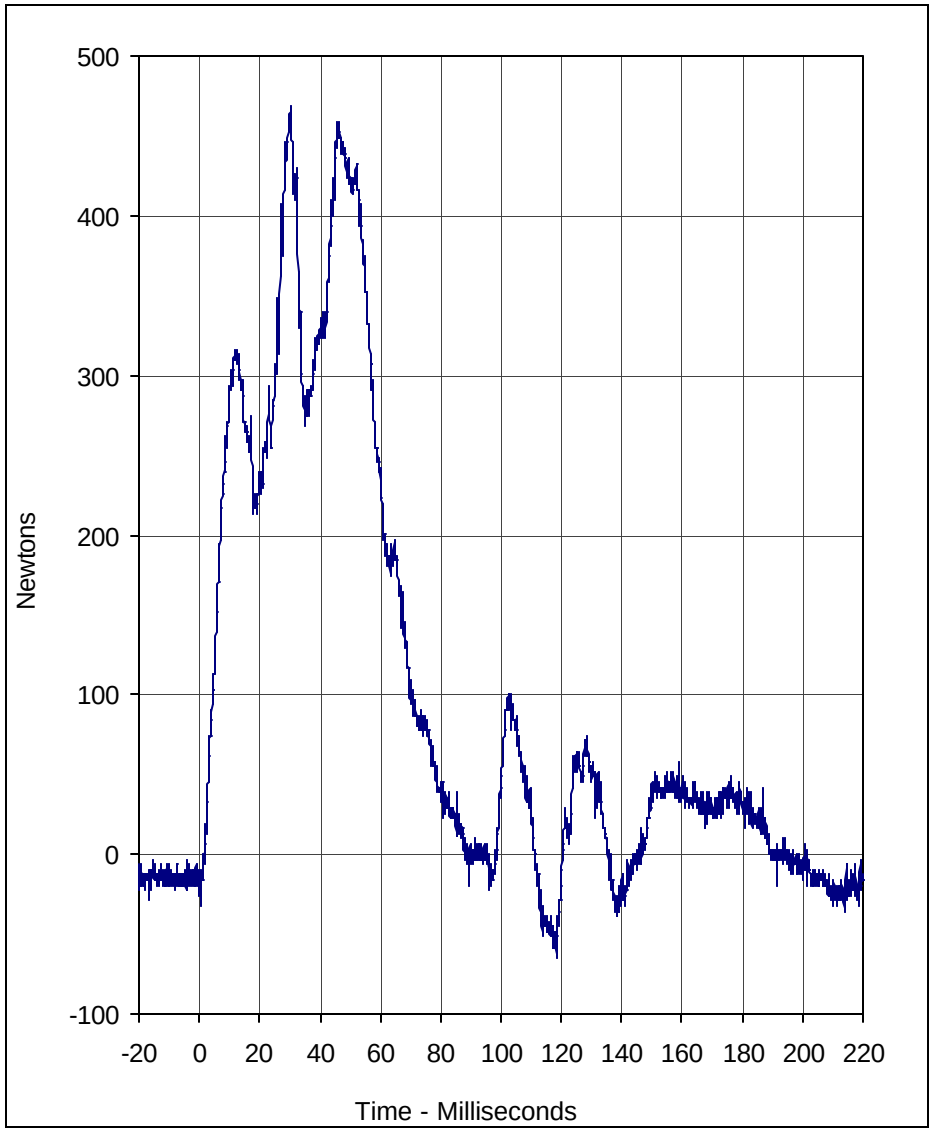
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.49	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.7	Pass
	30 Msec.	m/s	4.0 to 5.1	5.0	Pass
"D" Plane Rotation	Maximum	Degrees	70.0 to 82.0	71.3	Pass
Peak Moment in Rotation	Maximum	Nm	42.0 to 53.0	46.7	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	74.1	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
m/s	5.7	198.7	0.0	-0.7	180

Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	468.2	30.4	-64.6	118.3	1000

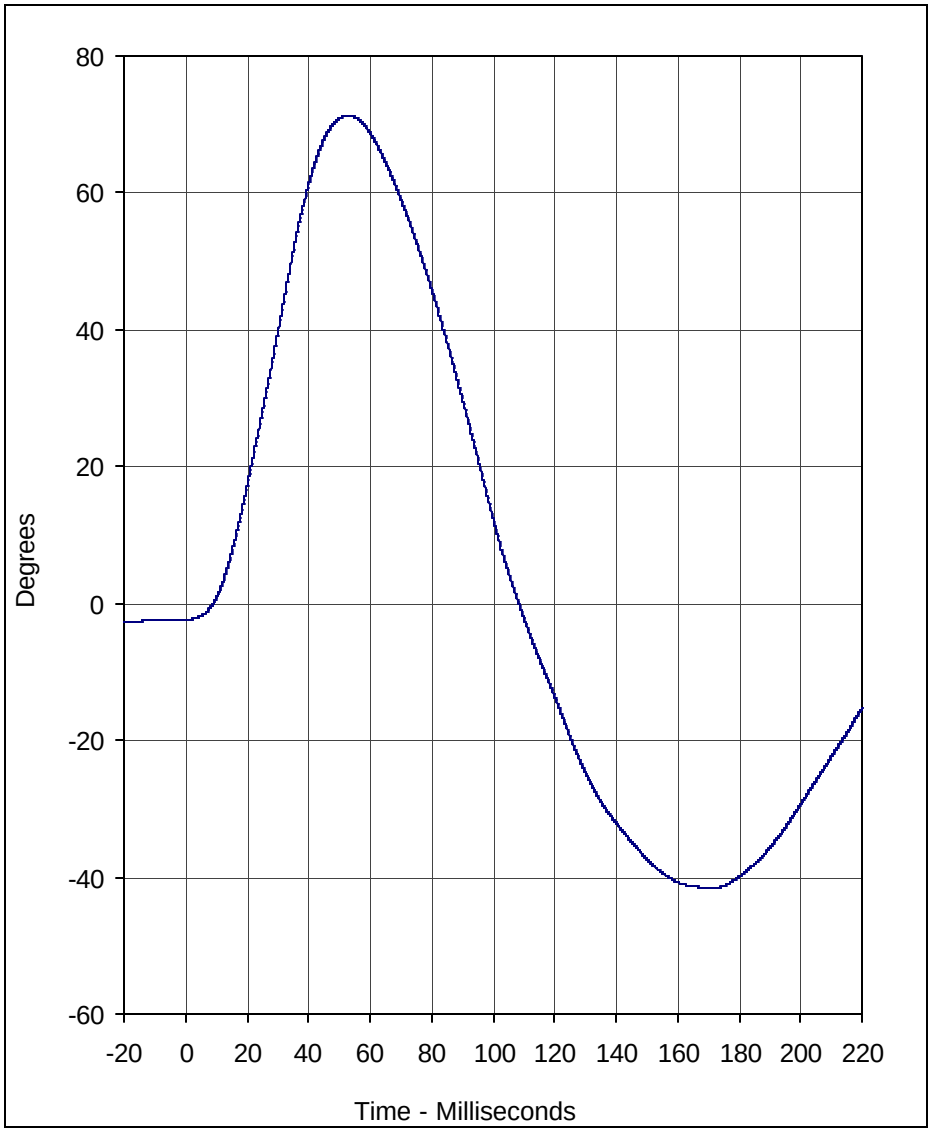
Test Program: 3 Year Old Hybrid III Neck Flexion Test

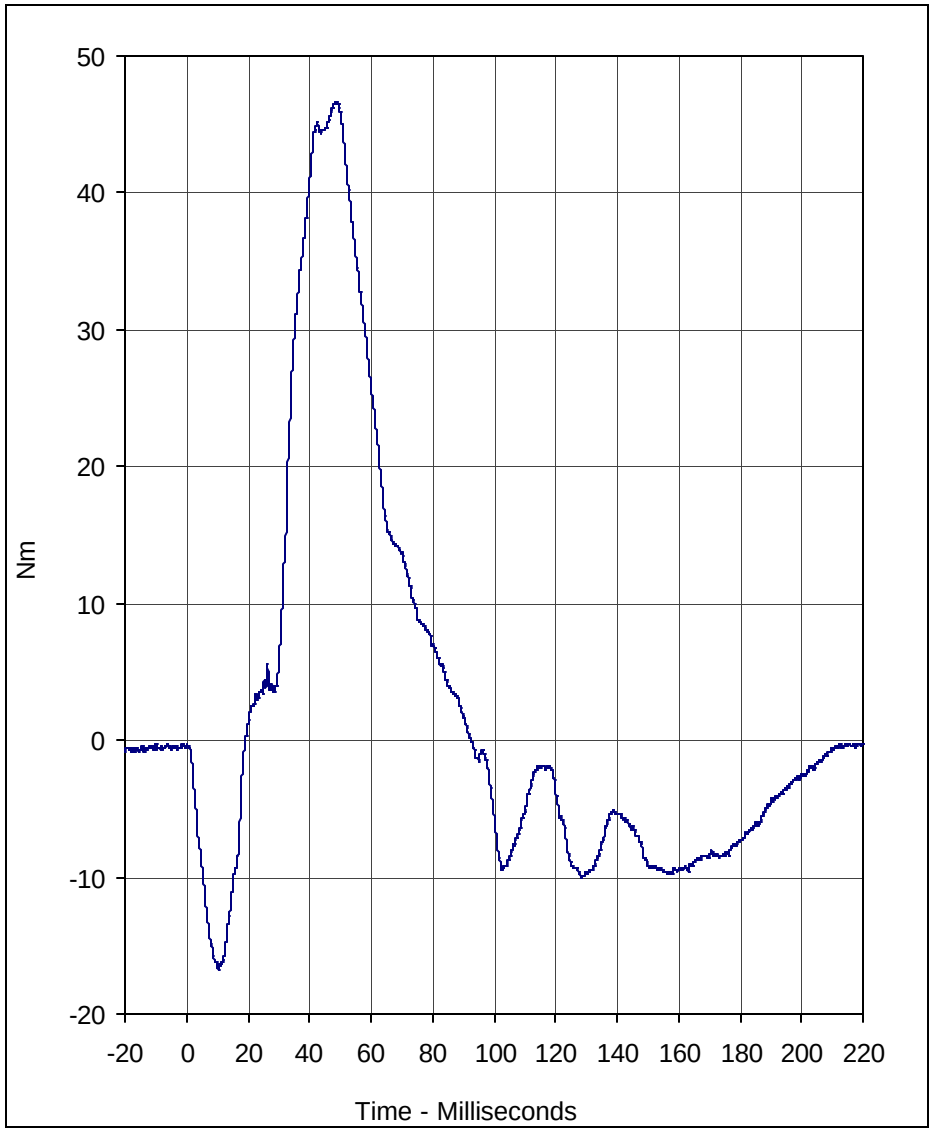
Test Date: 9/29/2003

A.T.D. Serial No.: 082

Test I.D.: NF10A

KARCO Engineering





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	71.3	52.8	-41.7	171.2	60

Curve Description	CURNO	Type
Neck Moment Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	46.7	48.8	-16.7	10.3	600

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 9/29/2003

A.T.D. Serial No.: 082

Test I.D.: NF10A

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Neck Extension Test

ATD Serial No.: 082

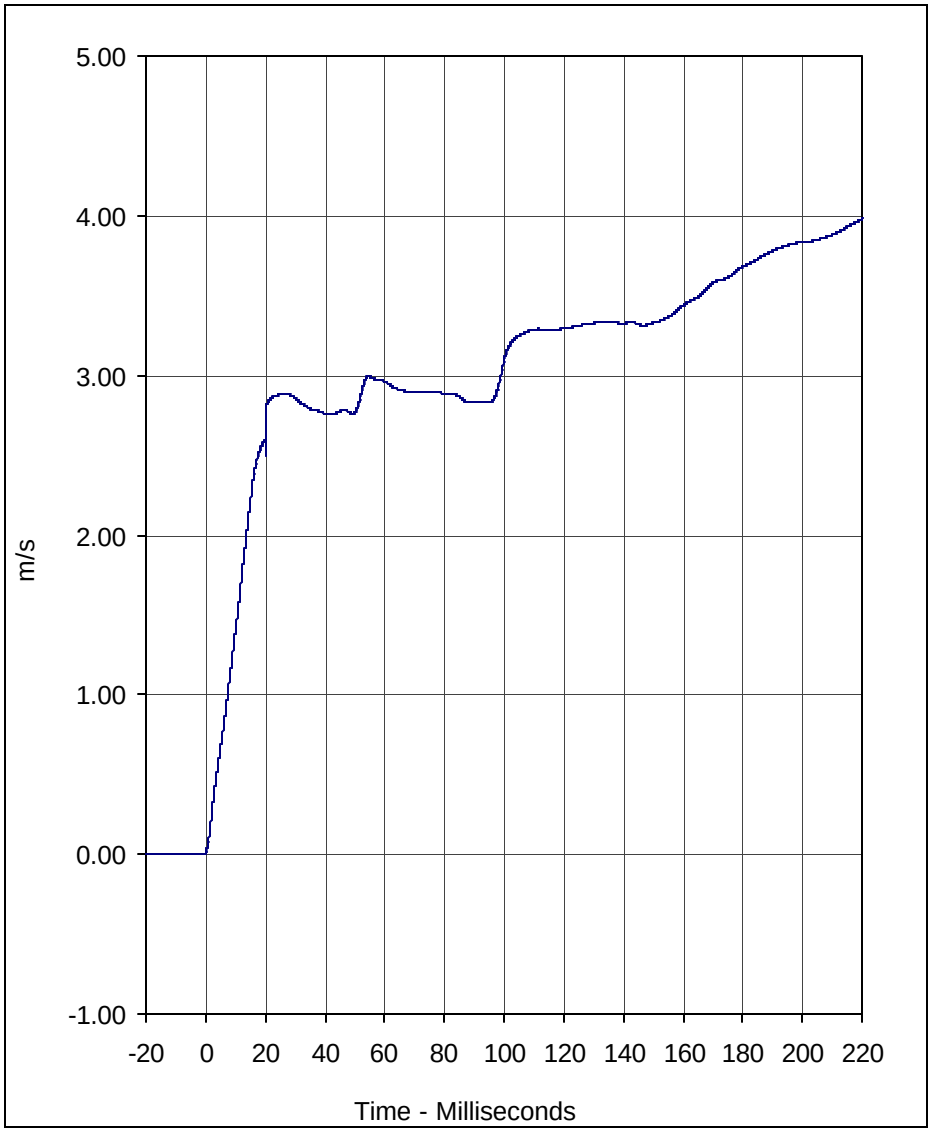
Test I.D.: NE10A

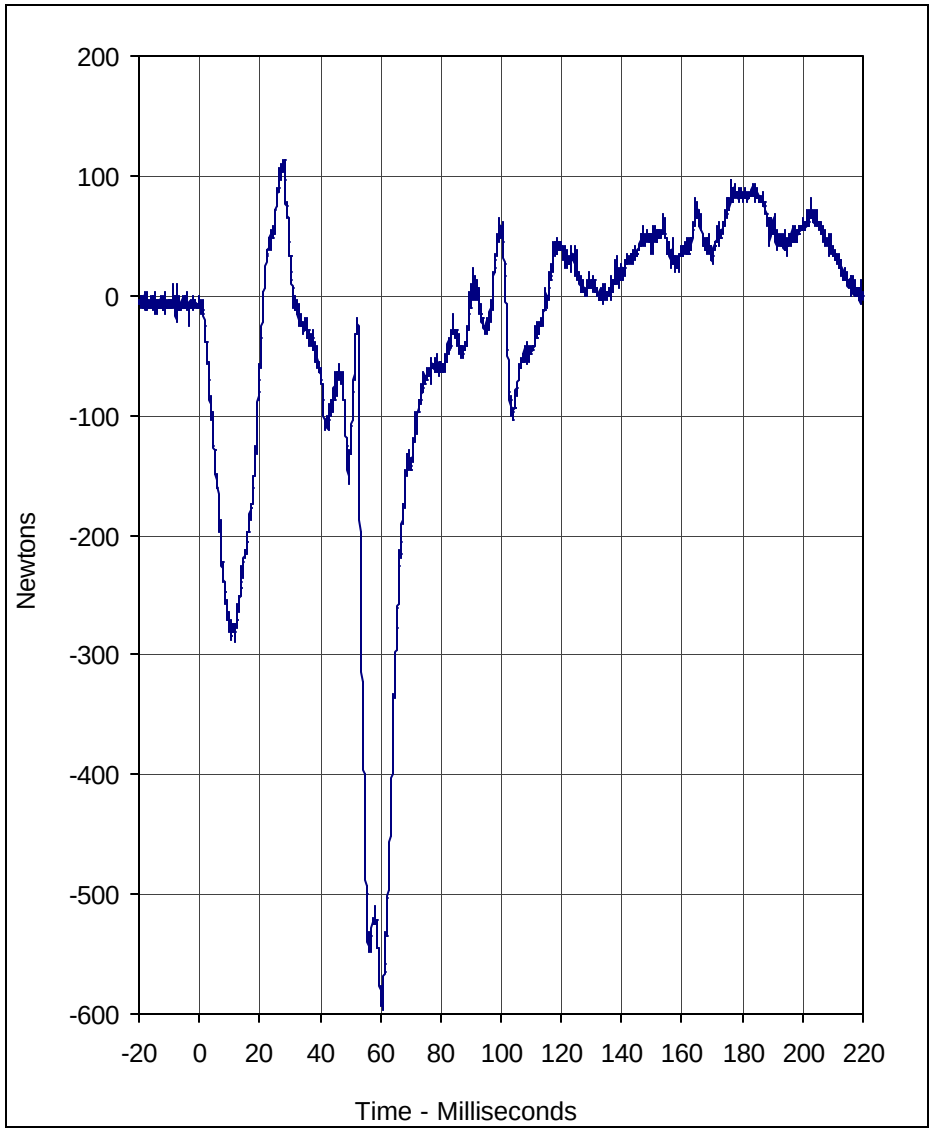
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	3.55 to 3.75	3.60	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.4	Pass
	20 Msec.	m/s	1.9 to 2.5	2.5	Pass
	30 Msec.	m/s	2.8 to 3.5	2.9	Pass
"D" Plane Rotation	Maximum	Degrees	83.0 to 93.0	84.0	Pass
Peak Moment in Rotation	Maximum	Nm	-43.7 to -53.3	-53.0	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	67.8	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 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	-1.0	180

Curve Description	CURNO	Type
Neck Force X	002	FIL

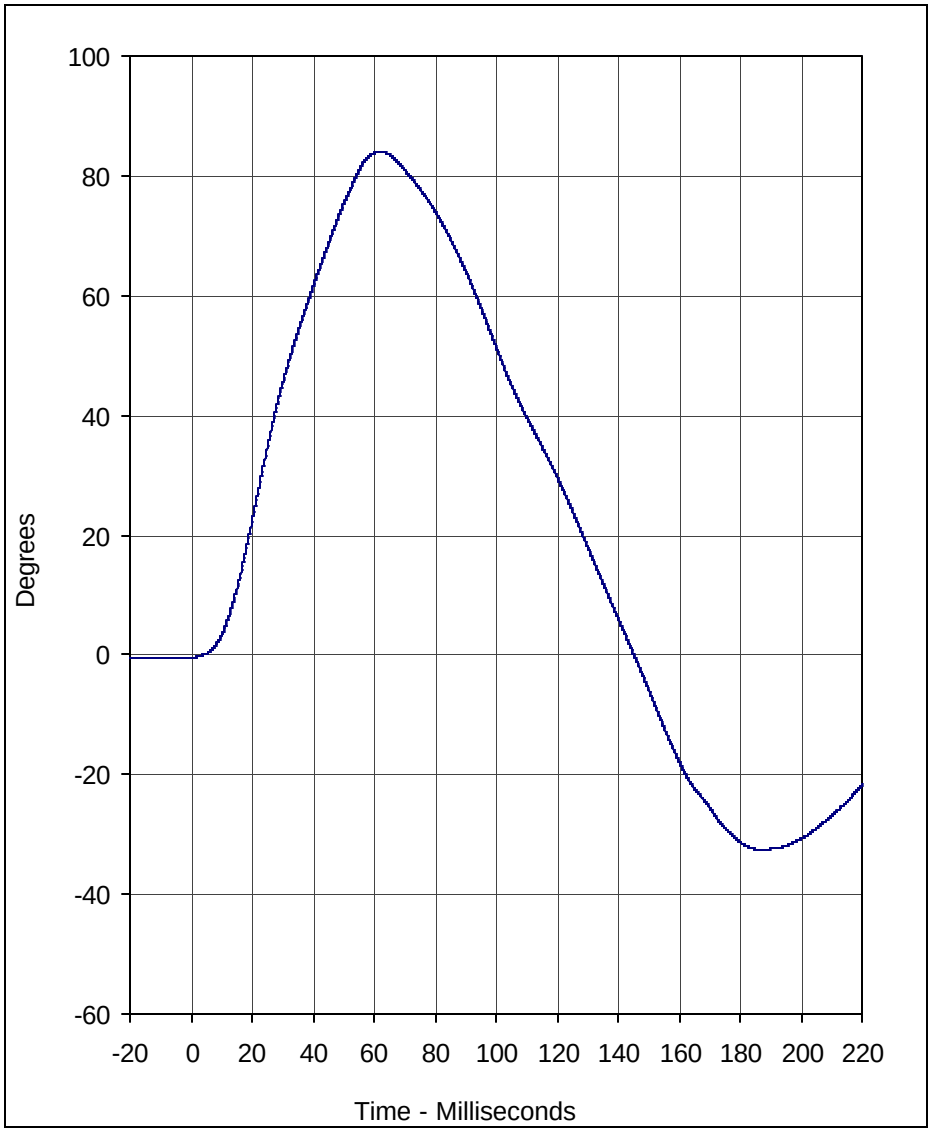
Units	Max	Time	Min	Time	SAE Class
Newtons	112.8	27.6	-596.4	60.7	1000

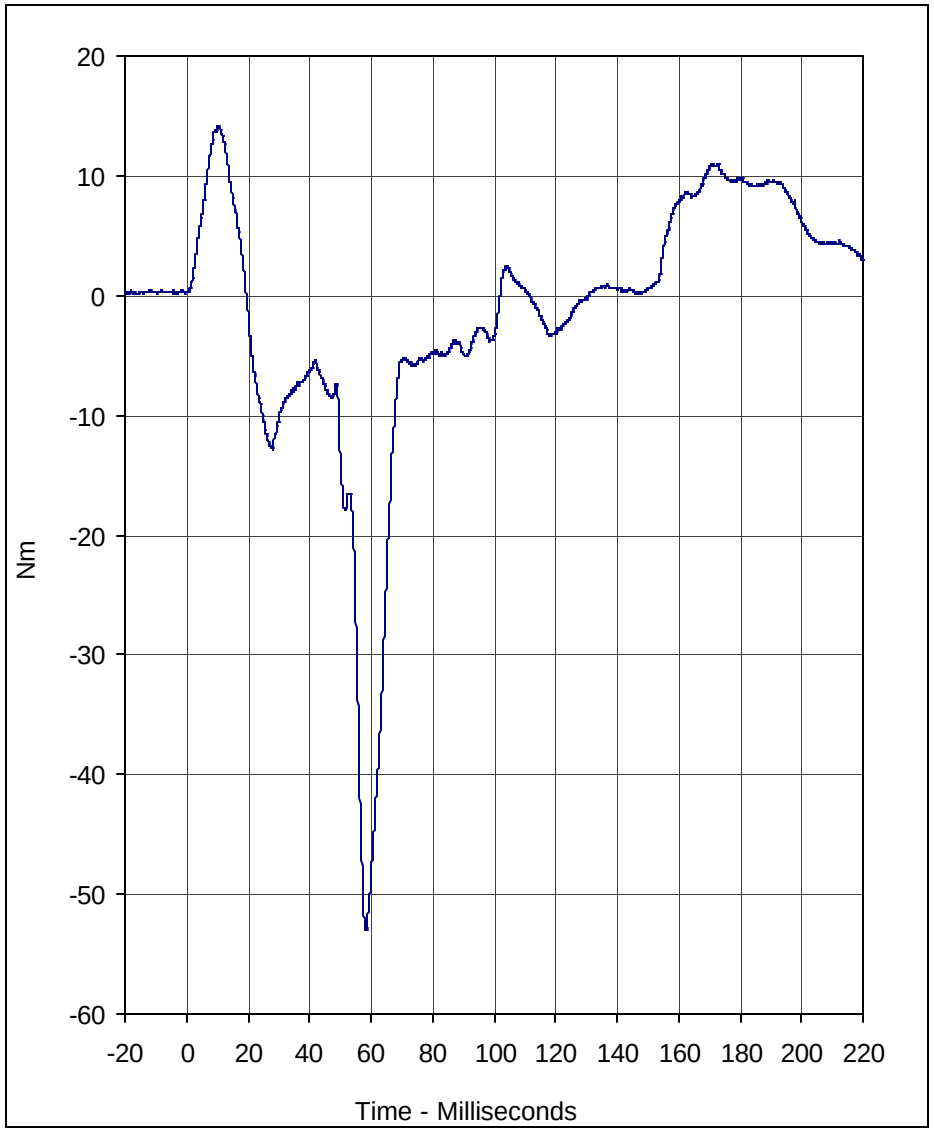
Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 9/29/2003

A.T.D. Serial No.: 082

Test I.D.: NE10A





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	84.0	62.0	-32.6	186.9	60

Curve Description	CURNO	Type
Neck Moment Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	14.1	10.3	-53.0	58.4	600

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 9/29/2003

A.T.D. Serial No.: 082

Test I.D.: NE10A

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Torso Flexion Test

ATD Serial No.: 082

Test I.D.: LF10A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Initial reference plane angle	Degrees	≤15.0	4.2	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	155.8	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	0.8	Pass
Final reference plane angle	Degrees	+/-10	4.2	Pass
		Overall Test Results		Pass

Laboratory Technician

September 29, 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 - Poplipteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	250	Pass
N - Buttock poplipteal 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	250	Pass
W - Foot breadth	mm	54 to 64	60	Pass
X - Head circumference	mm	500 to 516	515	Pass
Y - Chest circumference with jacket	mm	527 to 553	550	Pass
Z - Waist circumference	mm	527 to 553	535	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

September 30, 2003
Test Date

Calibration Data Sheet
Hybrid III 3 Year Old
Head Drop Test

ATD Serial No.: 139

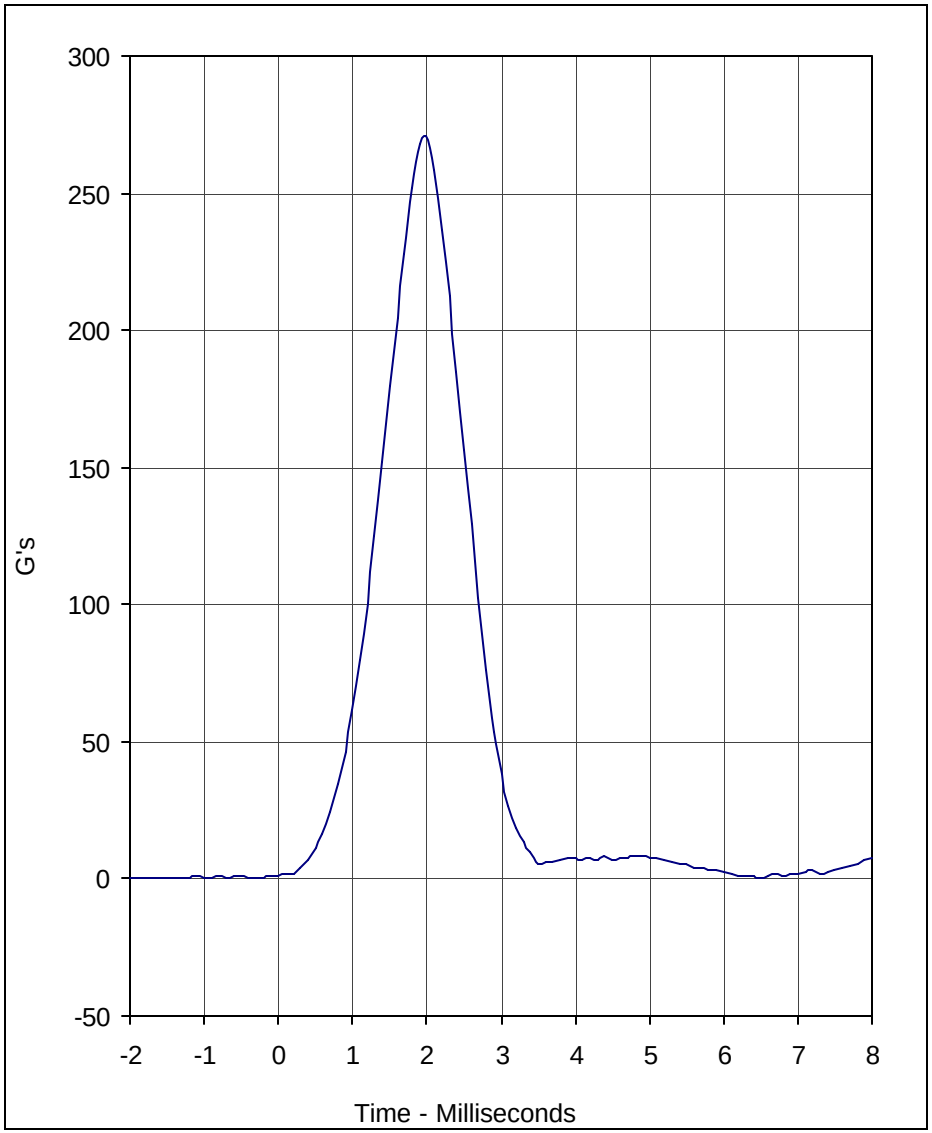
Test I.D.: HD10B

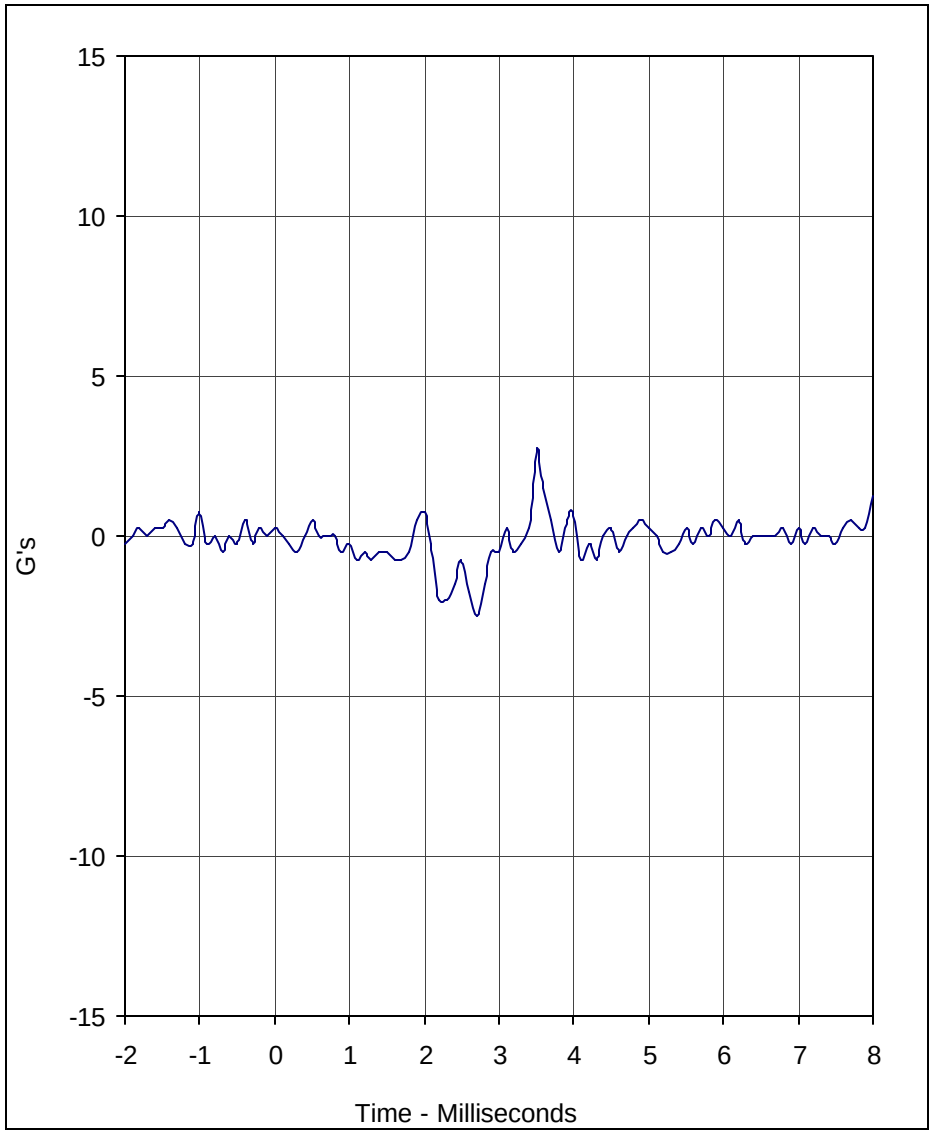
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	250.0 to 280.0	270.5	Pass
Peak Lateral Acceleration	G's	≤15.0	2.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	3.1	Pass
		Overall Test Results		Pass

Laboratory Technician

September 26, 2003

Test Date





Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	270.5	2.0	0.0	-0.7	1000

Curve Description	CURNO	Type
Head Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	2.8	3.5	-2.5	2.7	1000

Test Program: Hybrid III 3 Year Old Head Drop Test

Test Date: 9/26/2003

A.T.D. Serial No.: 139

Test I.D.: HD10B

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Thorax Impact Test

ATD Serial No.: 139

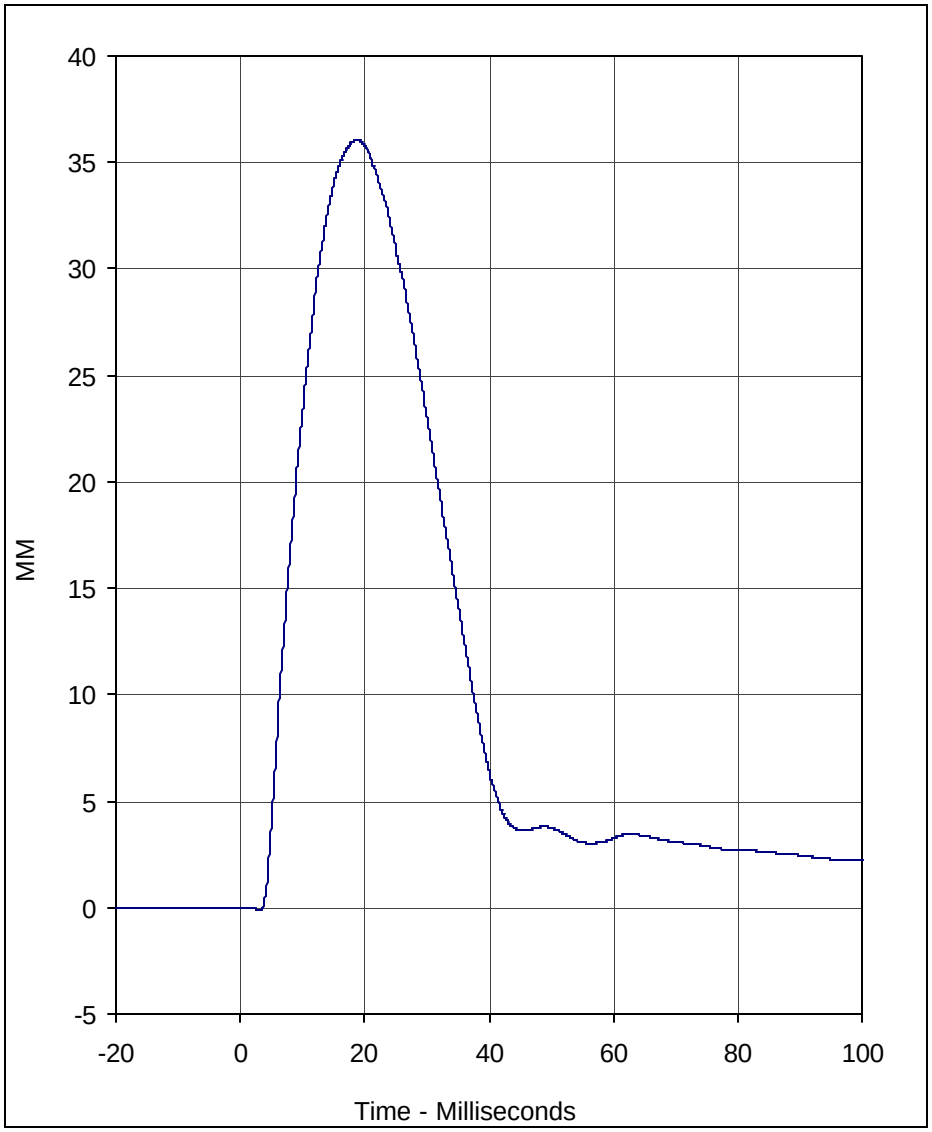
Test I.D.: CH10B

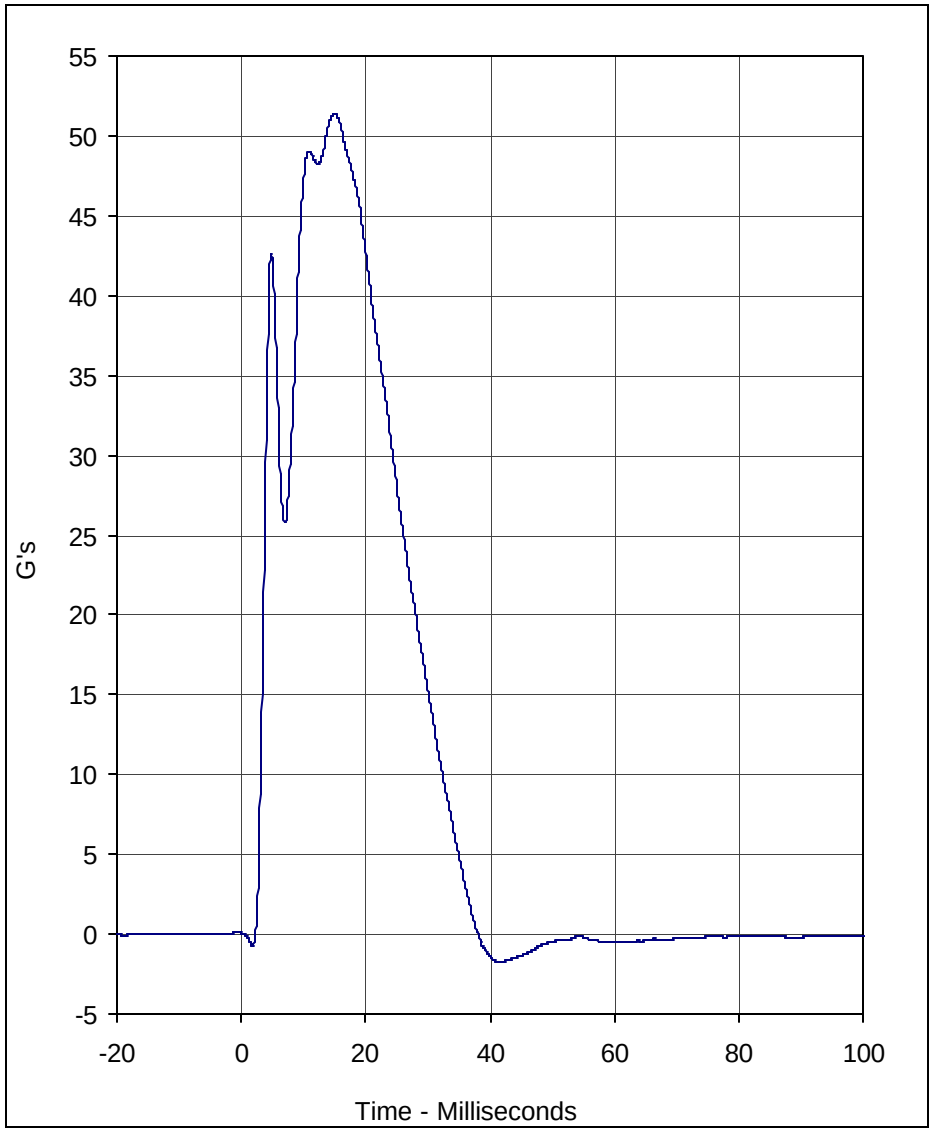
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	5.96	Pass
Peak Chest Compression	MM	32 to 38	36.1	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	800.2	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	778.5	Pass
Internal Hysterysis	%	65 to 85	69.3	Pass
		Overall Test Results		Pass

Laboratory Technician

September 30, 2003

Test Date





Curve Description	CURNO	Type
Chest Compression	001	FIL

Units	Max	Time	Min	Time	SAE Class
MM	36.1	18.8	-0.1	3.1	600

Curve Description	CURNO	Type
Probe Acceleration	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	51.4	15.0	-1.8	41.5	180

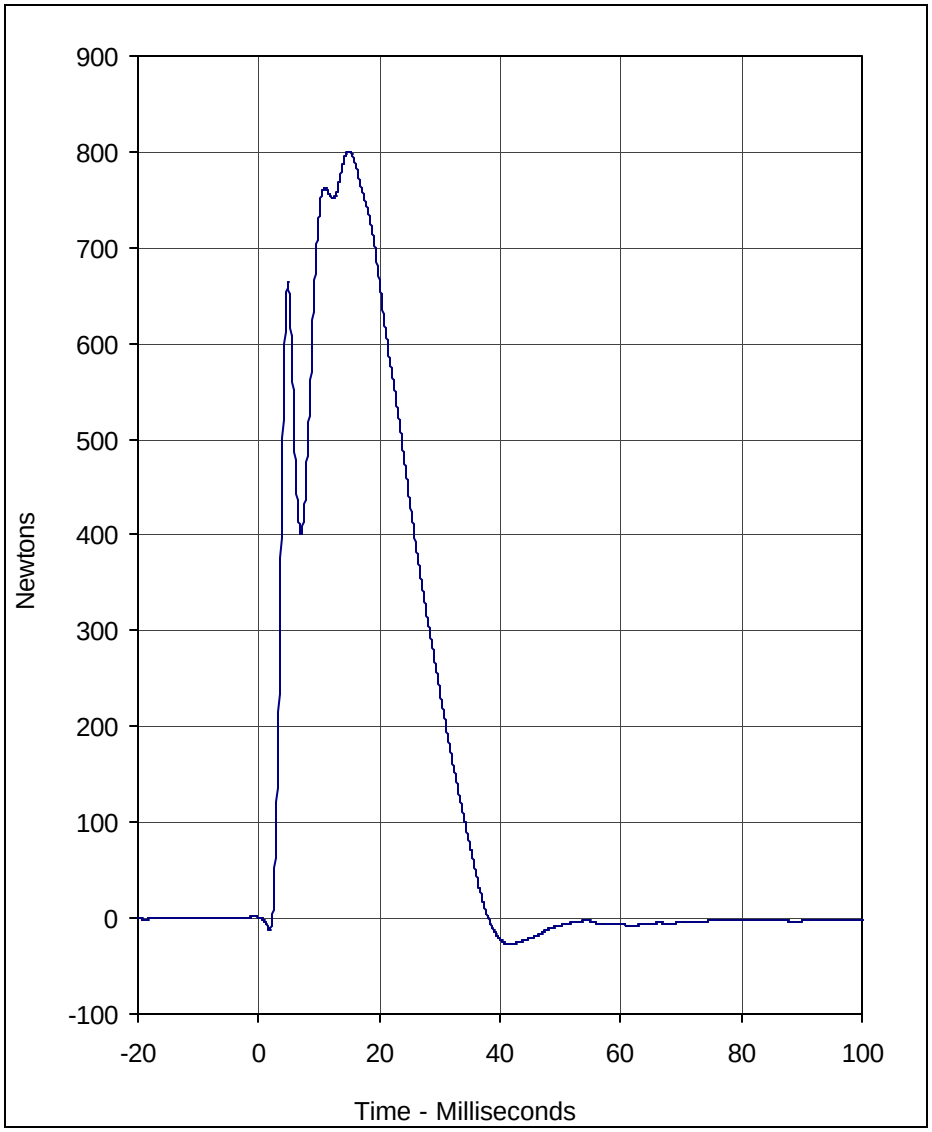
Test Program: Hybrid III 3 Year Old Thorax Impact

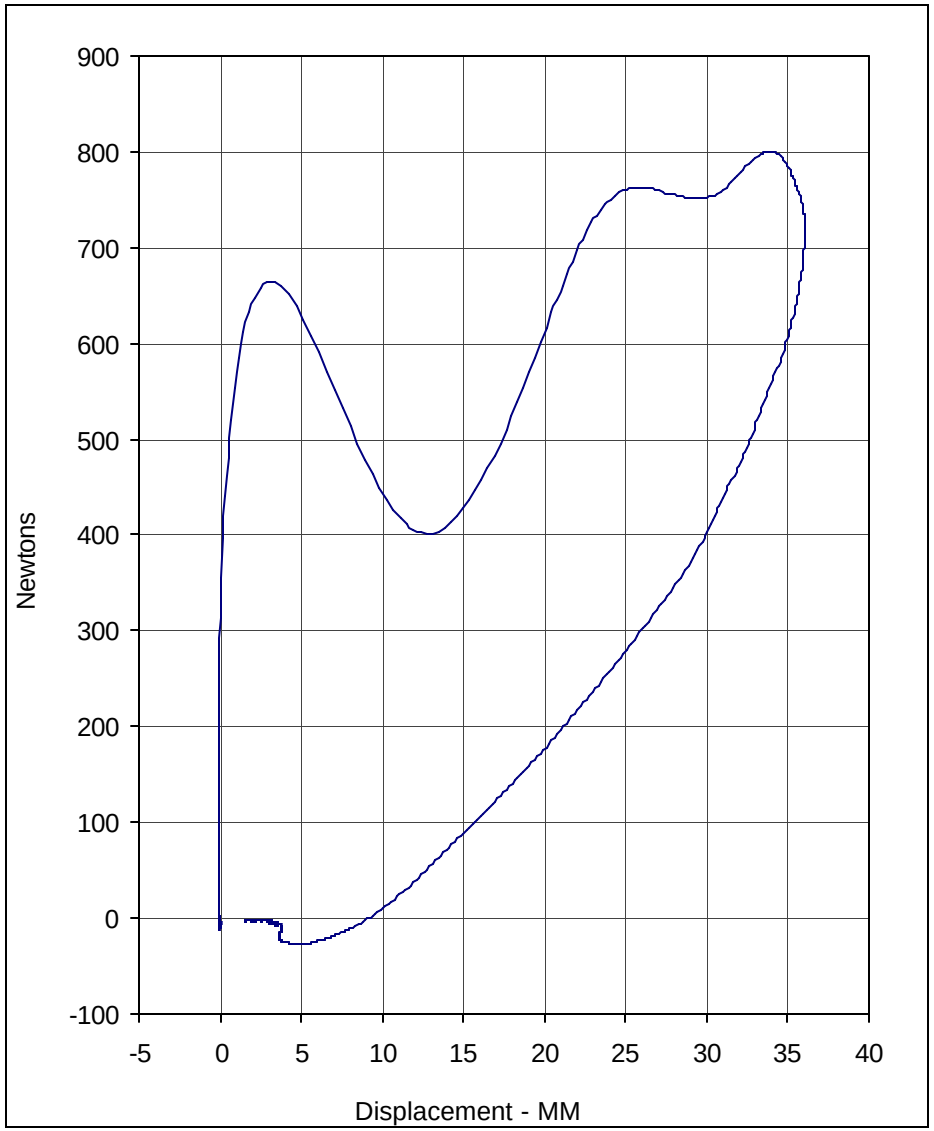
Test Date: 9/30/2003

A.T.D. Serial No.: 139

Test I.D.: CH10B

KARCO Engineering





Curve Description	CURNO	Type
Probe Force	003	FIL

Curve Description	CURNO	Type
Probe Force vs. Chest Compression	004	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	800.2	15.0	-27.6	41.5	180

Units	Hysterysis	SAE Class
%	69.3	180/600

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 9/30/2003

A.T.D. Serial No.: 139

Test I.D.: CH10B

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Neck Flexion Test

ATD Serial No.: 139

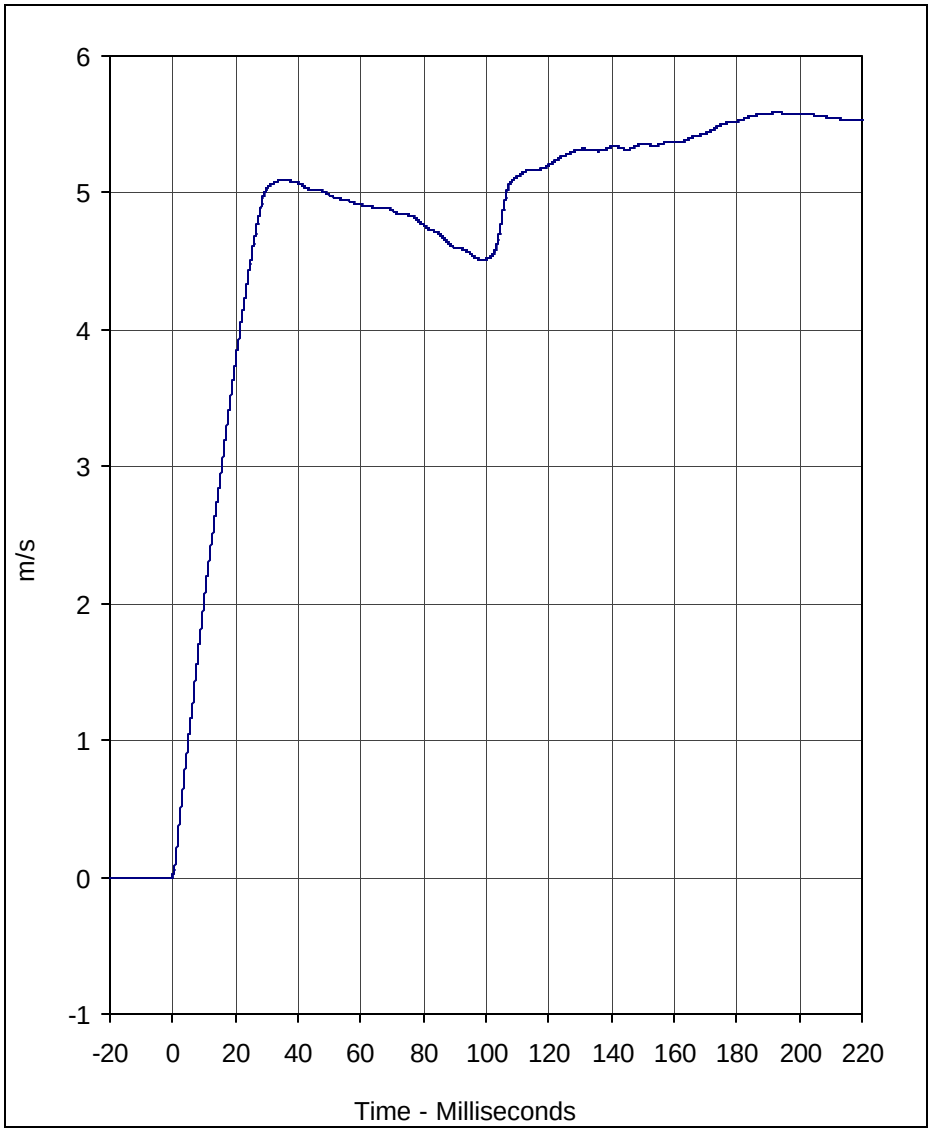
Test I.D.: NF10B

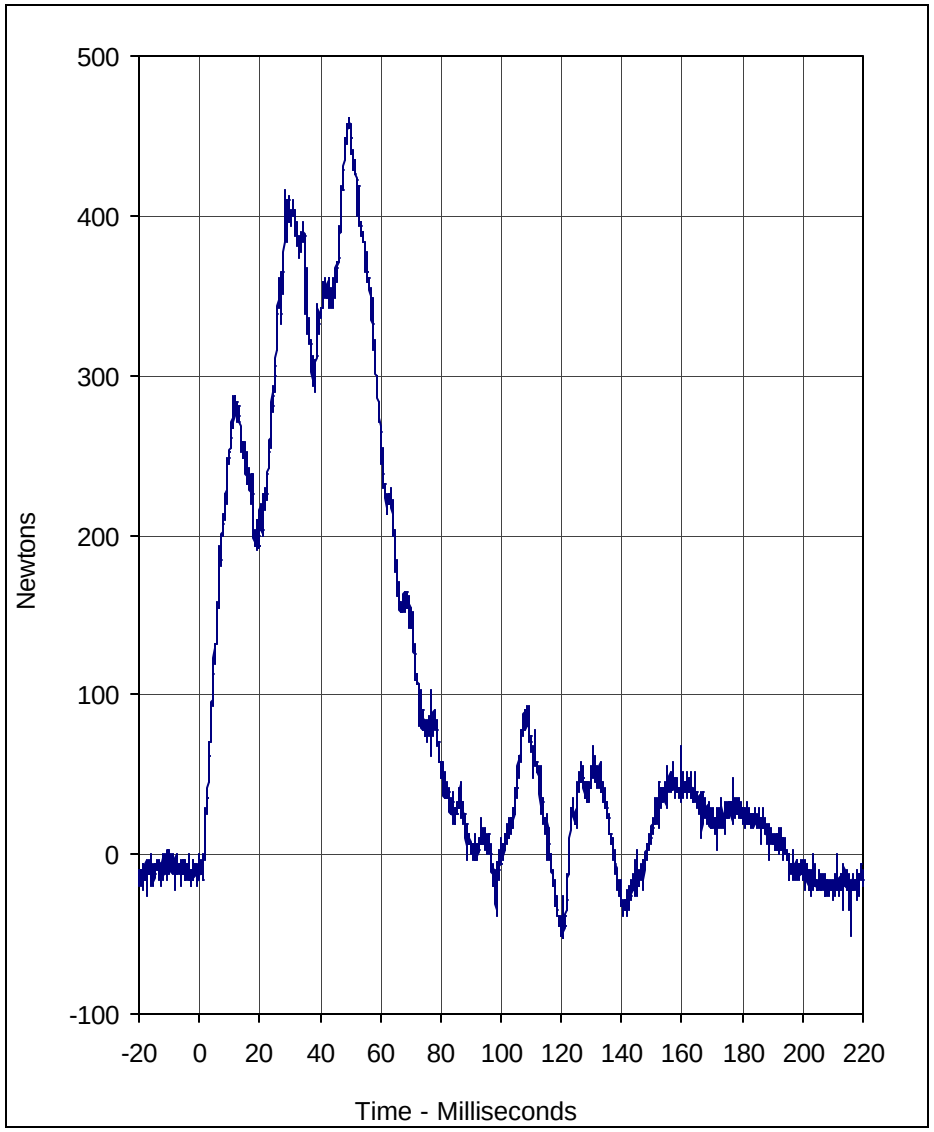
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.49	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.8	Pass
	30 Msec.	m/s	4.0 to 5.1	5.0	Pass
"D" Plane Rotation	Maximum	Degrees	70.0 to 82.0	73.2	Pass
Peak Moment in Rotation	Maximum	Nm	42.0 to 53.0	49.4	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	76.7	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
m/s	5.6	192.9	0.0	-0.7	180

Curve Description	CURNO	Type
Neck Force X	002	FIL

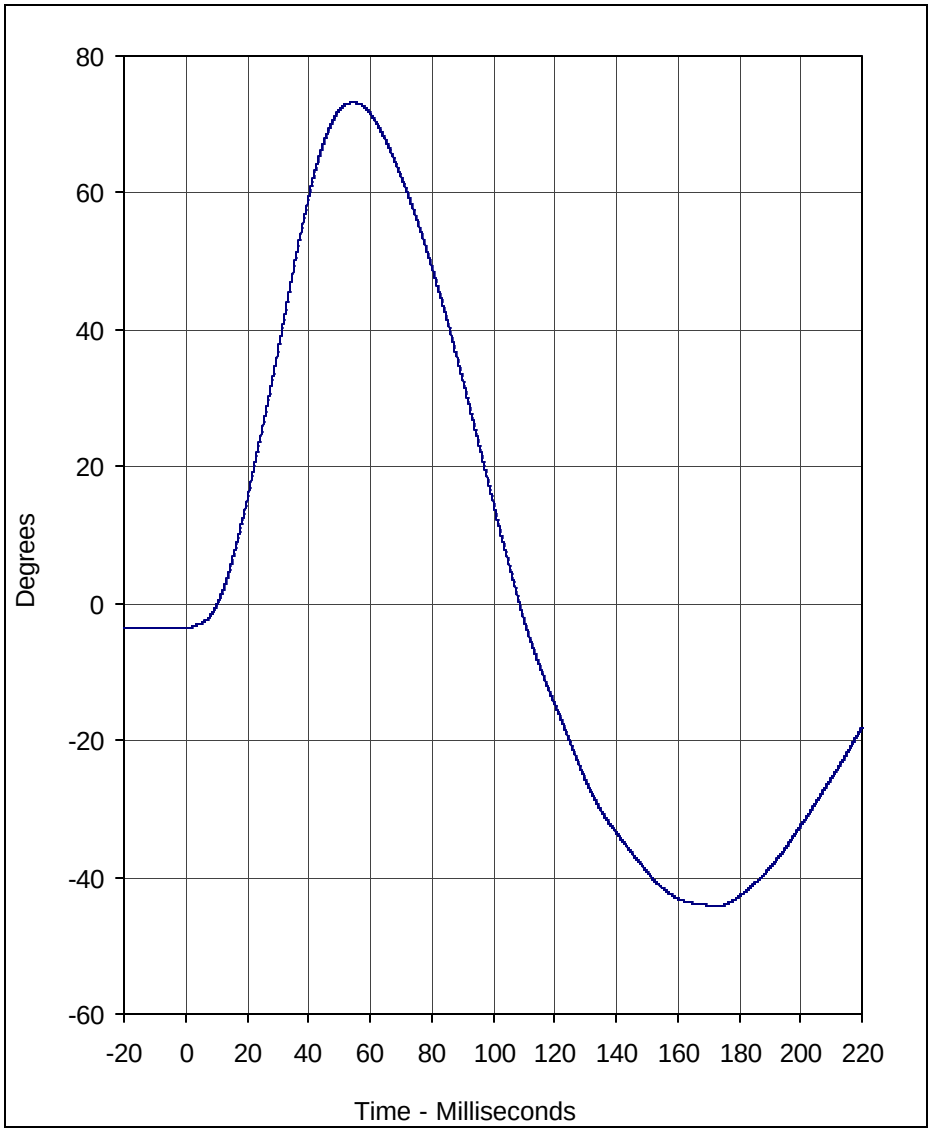
Units	Max	Time	Min	Time	SAE Class
Newtons	461.0	49.4	-51.6	119.9	1000

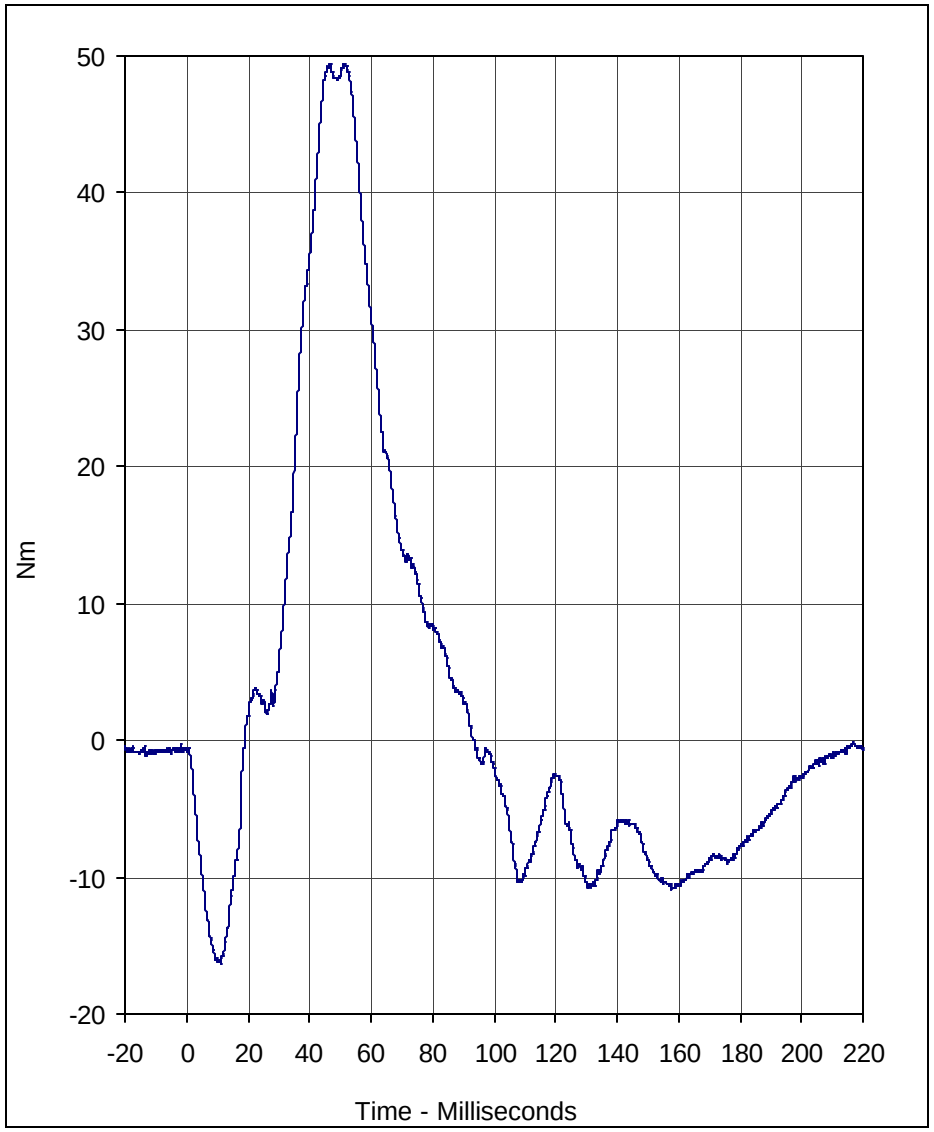
Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 9/29/2003

A.T.D. Serial No.: 139

Test I.D.: NF10B





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	73.2	54.5	-44.3	172.4	60

Curve Description	CURNO	Type
Neck Moment Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	49.4	46.7	-16.3	11.0	600

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 9/29/2003

A.T.D. Serial No.: 139

Test I.D.: NF10B

KARCO Engineering

Calibration Data Sheet
Hybrid III 3 Year Old
Neck Extension Test

ATD Serial No.: 139

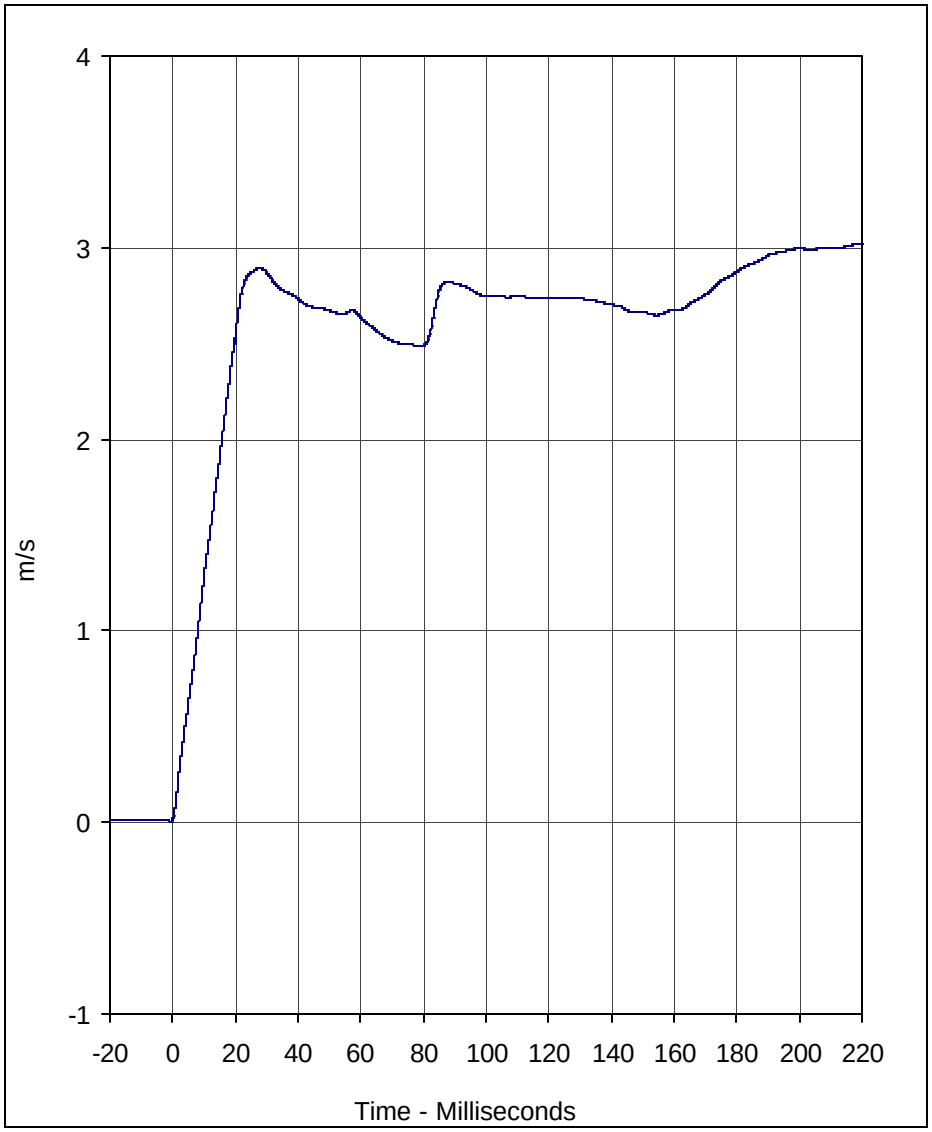
Test I.D.: NE10B

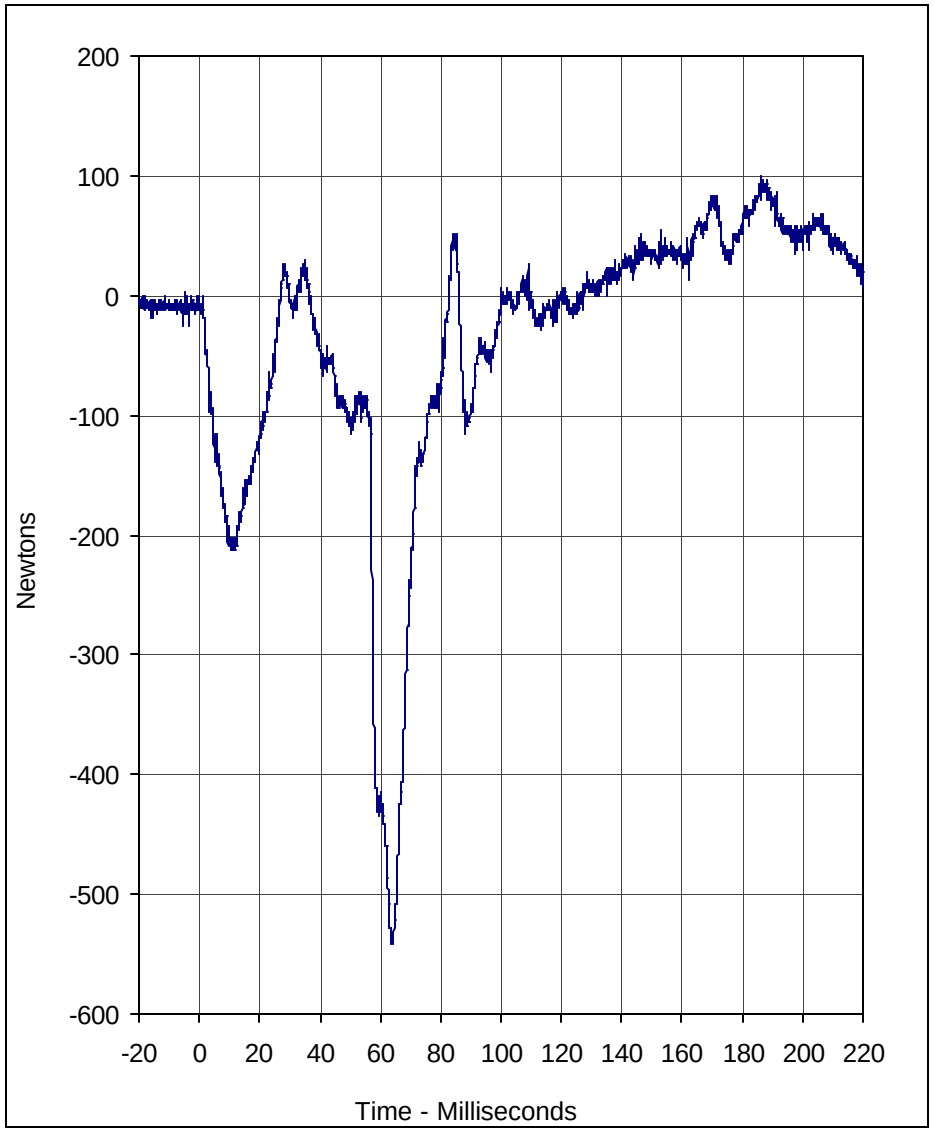
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		^{o}C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	3.55 to 3.75	3.60	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.3	Pass
	20 Msec.	m/s	1.9 to 2.5	2.5	Pass
	30 Msec.	m/s	2.8 to 3.5	2.9	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	-46.8	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	72.0	Pass
			Overall Test Results		Pass

Laboratory Technician

September 29, 2003

Test Date





Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
m/s	3.0	220.0	0.0	-0.7	180

Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	99.8	186.2	-540.8	63.6	1000

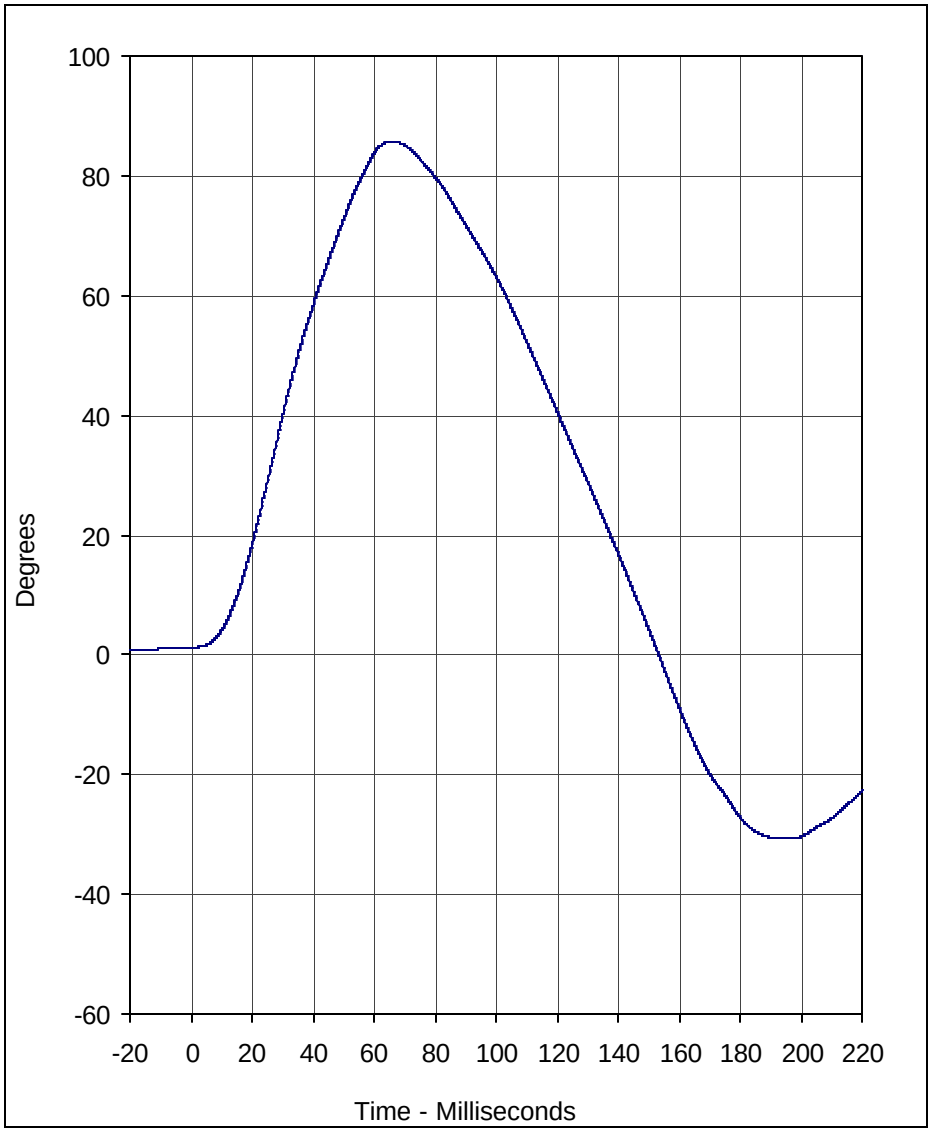
Test Program: 3 Year Old Hybrid III Neck Extension Test

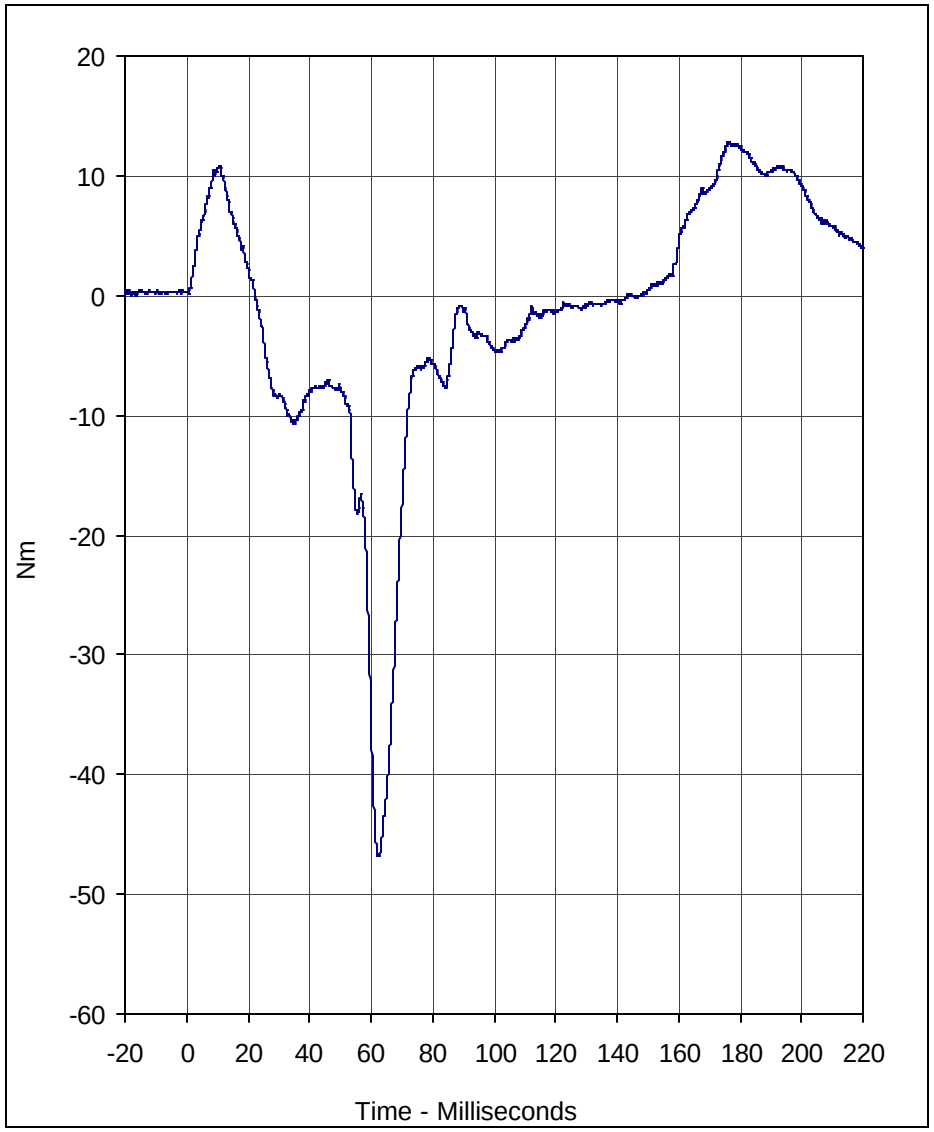
Test Date: 9/29/2003

A.T.D. Serial No.: 139

Test I.D.: NE10B

KARCO Engineering





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	85.6	65.9	-30.8	195.8	60

Curve Description	CURNO	Type
Neck Moment Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	12.8	176.5	-46.8	62.5	600

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 9/29/2003

A.T.D. Serial No.: 139

Test I.D.: NE10B

Calibration Data Sheet
Hybrid III 3 Year Old
Torso Flexion Test

ATD Serial No.: 139

Test I.D.: LF10A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	^{o}C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Initial reference plane angle	Degrees	≤15.0	3.1	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	145.7	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	0.9	Pass
Final reference plane angle	Degrees	+/-10	3.2	Pass
		Overall Test Results		Pass

Laboratory Technician

September 29, 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	70	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	200	Pass
J - Elbow rest height	mm	134 to 149	145	Pass
K - Buttock to knee length	mm	285 to 300	290	Pass
L - Poplipteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	255	Pass
N - Buttock poplipteal 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	250	Pass
W - Foot breadth	mm	54 to 64	60	Pass
X - Head circumference	mm	500 to 516	515	Pass
Y - Chest circumference with jacket	mm	527 to 553	550	Pass
Z - Waist circumference	mm	527 to 553	535	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

September 30, 2003
Test Date