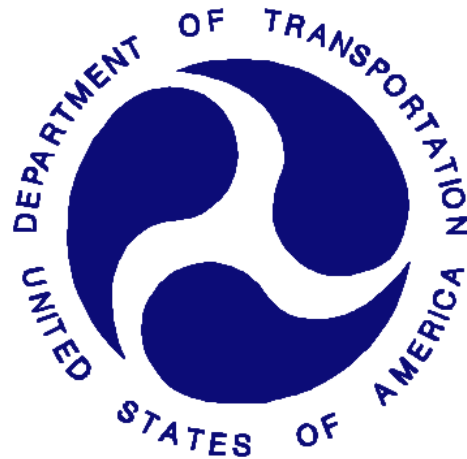


**REPORT NUMBER KAR -20-08**

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

**MAZDA MOTOR COMPANY  
2000 MAZDA MPV MINI-VAN  
NHTSA NUMBER: MY5401**

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



**JANUARY 20, 2000**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
SAFETY PERFORMANCE STANDARDS  
OFFICE OF CRASHWORTHINESS STANDARDS  
MAIL CODE: NPS-10  
400 SEVENTH STREET, SW, ROOM 5313  
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 DTNH22-97-D-02007.

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Date: January 20, 2000

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Date: January 20, 2000

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KARCO Engineering

Date: January 20, 2000

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Manager, New Car Assessment Program

\_\_\_\_\_  
Date of Acceptance

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COTR, NCAP Frontal Impact Program

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Date of Acceptance

## Technical Report Documentation Page

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2000 Mazda MPV Mini-Van at KARCO Engineering on January 13, 2000. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity was 55.78 km/h. The ambient temperature at the barrier face at the time of impact is 21.7 degrees Celcius. The vehicle's maximum post test static crush is 380 mm located to the right of the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;">Measurement Description</th> <th style="width: 15%;">Units</th> <th style="width: 15%;">Threshold</th> <th style="width: 15%;">Driver ATD</th> <th style="width: 20%;">Passenger ATD</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>N/A</td> <td>1000</td> <td>784.4</td> <td>517.6</td> </tr> <tr> <td>Max. Thorax Accel. (3 msec Clip)</td> <td>G's</td> <td>60</td> <td>50.0</td> <td>51.6</td> </tr> <tr> <td>Left Femur force</td> <td>Newtons</td> <td>10009</td> <td>-6397.7</td> <td>-3121.4</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10009</td> <td>-4329.4</td> <td>-3134.1</td> </tr> </tbody> </table>				Measurement Description	Units	Threshold	Driver ATD	Passenger ATD	Head Injury Criteria (HIC)	N/A	1000	784.4	517.6	Max. Thorax Accel. (3 msec Clip)	G's	60	50.0	51.6	Left Femur force	Newtons	10009	-6397.7	-3121.4	Right Femur Force	Newtons	10009	-4329.4	-3134.1
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## SECTION 1

### PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MY5401

#### 1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the FY' 99 New Car Assessment Program (NCAP) frontal barrier crash worthiness evaluation program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract Number DTNH22-97-D-02007. The purpose of this test is to obtain vehicle crashworthiness, occupant restraint system performance, and lower leg data for frontal barrier impacts. The impact velocity used in this test is in excess of the current 30 mph (48.3 km/h) FMVSS 208/212/219/301 requirements.

#### 1.2 TEST PROCEDURE

This 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated 01 October, 1996 and the corresponding KARCO Engineering Test Procedure KTP-001, dated October 18, 1996. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301 "Fuel System Integrity" performance. Procedures for receiving, inspection testing and reporting of test results are described in the test procedures and are not repeated in this report.

The test was conducted at KARCO Engineering on January 13, 2000 at a speed of 55.78 km/h. The test vehicle was instrumented with eight (8) accelerometers to measure longitudinal axis accelerations. The driver and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap and shoulder belt tension. The specified impact velocity range was 55.5 to 57.1 km/h. The frontal barrier impact event was documented by one (1) real-time panning motion picture camera and eighteen (18) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The test vehicle contained two (2) part 572E 50th percentile adult male anthropomorphic test devices (ATDs). Both ATDs were instrumented with head, chest, and pelvic tri-axial accelerometers, left and right femur load cells, upper and lower tibia sensors, and foot accelerometers. In addition, chest displacement and upper neck six-axis force and moment sensors were utilized. The ATDs were positioned in the front outboard seating positions according to the dummy placement procedures specified in the Laboratory Indicant Test Procedure. Ninety-four (94) channels of data were recorded with a PC based (TDAS) on-board data acquisition system. The data was digitally sampled at 10,000 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The Driver ATD (Serial No. 35) and the right-front passenger ATD (Serial No. 34) were re-calibrated prior to this test. FMVSS 208 "Occupant Crash Protection" injury criteria were not exceeded by either ATD during this frontal barrier impact test.

### **1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST**

A rigid load cell barrier was impacted by a 2000 Mazda MPV Mini-Van Pick-up at a velocity of 55.78 km/h. The test vehicle weight is 1875 kilograms with two (2) part 572E 50th percentile adult male ATDs. Twenty-four (24) load cell barrier data channels were obtained in conducting the January 13, 2000 NCAP test. The test vehicle is equipped with a transversally mounted 2.5-liter, 6-cylinder engine and a 4-speed automatic transmission.

The driver Head Injury Criteria (HIC) is 784.4. The maximum resultant chest deceleration over three (3) milliseconds is 50.0 g's. The left and right femur loads are -6397.7 and -4329.4 Newtons, respectively. Chest deflection for the driver ATD peaked at -28.0 mm. The driver ATD head contacted the airbag and headrest, its chest and abdomen contacted the airbag, the left and right knees contacted the knee bolster.

The right front passenger's HIC is 517.6. The maximum resultant chest deceleration over three (3) milliseconds is 51.6 g's. The left and right femur loads are -3121.4 and -3134.1 Newtons respectively. Chest deflection for the passenger ATD peaked at -37.8 mm. The passenger ATD head contacted the airbag and headrest, the chest and abdomen contacted the airbag and both knees contacted the glove box.

Maximum seat belt spool out as measured by on-board pullout potentiometers is 235.5mm for the driver ATD and 245.9 mm for the passenger ATD. The shoulder belt stretch is 0.419 mm/cm for the driver ATD and 0.253 cm/mm for the passenger ATD.

There was 100 percent windshield retention (minimum 50 percent required for passive restraint systems). No intrusion occurred into the protected or unprotected zone of the windshield. No Stoddard solvent leakage occurred after impact or during any phase of the rollover.

The test vehicle sustained a maximum static crush of 380 mm located to the right of the vehicle centerline. The driver and passenger side doors did not require the aid of tools to open.

### **1.4 GENERAL COMMENTS**

The 2000 Mazda MPV Mini-Van Pick-up passed the requirements of FMVSS 208, FMVSS 212, FMVSS 219 and FMVSS 301-75. Data pertaining to these standards are presented in the data sheets.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. Appendix B contains the dummy and vehicle 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 owner's manual instructions for the occupant seating and restraint systems.

**SECTION 2**  
**OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS**

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 1/13/00

**CONVERSION FACTORS USED IN THIS REPORT\***

Quantity	Typical Application	Old 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 <sup>2</sup>	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

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

**DATA SHEET NO. 1  
CRASH TEST SUMMARY**

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00

**PRIMARY IMPACT DATA**

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.78
Test Weight	kg	1875
Impact Angle	degrees	0
Average Rebound	mm	658
Maximum Static Crush	mm	380

**DOOR OPENING AND SEAT TRACK INFORMATION**

Description	Driver	Passenger
Front Door Opening	Opened	Opened
Rear Door Opening	Opened	Opened
Seat Track Shift (mm)	0	0
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/Headrest	Airbag/Headrest
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

**16mm MOVIE COVERAGE**

High Speed	18
Real Time	1
Total	19

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	8
Rigid Barrier Load Cells	24
Total	120

**DATA SHEET NO. 2  
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00

**TEST VEHICLE INFORMATION**

Manufacturer	Mazda Motor Company
Model	Mazda MPV
Body Style	Mini-Van
NHTSA NO.	MY5401
VIN	JM3LW2858Y0112816
Color	White
Delivery Date	11/22/99
Odometer Reading (mile)	7
Dealer	Romero Mazda
Transmission	4-Speed Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	2.5
Engine Placement	Transverse

**TEST VEHICLE OPTIONS**

Driver Airbag	Yes
Passenger Airbag	Yes
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	No
Anti-lock Brakes	Yes
AM/FM/Cassette	Yes
Anti-Theft System	No
Cruise Control	Yes

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Mazda Motor Company	GVWR (kg)	2303
Date of Manufacture	June-99	GAWR Front (kg)	1132
		GAWR Rear (kg)	1171

**DATA FROM TIRE PLACARD**

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	245	245
Cold Pressure (kPa)	245	245
Recommend Tire Size	205/65/R15	205/65/R15
Tire Size on Vehicle	205/65/R15	205/65/R15
Tire Manufacturer	Yokohama	Yokohama

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	None	
Number of Occupants	2	2	3	7
Capacity Wt. (VCW) (kg)				643
Cargo Weight (RCLW) (kg)				63

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

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	497	358		552	412	
Right	kg	477	328		505	406	
Ratio	%	58.7	41.3		56.4	43.6	
Totals	kg	974	686	1660	1057	818	1875

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1660
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Weight (RCLW)	kg	63
Calculated Vehicle Target Weight (TVTW)	kg	1875

NOTE: Target weight and test weight are the same per manufacturers request

**TEST VEHICLE ATTITUDE AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	744	756	766	780	1174
As Tested	mm	707	720	718	736	1239

Vehicle Wheel base (mm): 2841  
 Weight of Ballast secured in cargo area (kg): 17 \*  
 Vehicle Components Removed: Side mirrors, jack, tools, spare tire and paneling.

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

**FUEL SYSTEM DATA**

Fuel System Capacity From Owner's Manual (L): 70.0  
 Usable Capacity Figure Furnished by COTR (L): 70.0  
 Actual Test Volume with entire fuel System Filled (L): 65.1  
 Test Fluid Type: Stoddard Solvent ; Specific Gravity: 0.764  
 Is Vehicle Fuel Pump Electric or Mechanical?: Electric  
 If electric, does pump operate with ignition switch "ON" & engine "OFF"? Yes  
 Fuel System Particulars: Will pump for 5 seconds when ignition is turned on.

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

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00

**SPEED TRAP DATA**

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.51 to 57.12	55.78
Trap No. 1 Entry Distance	mm	< 1524	1524
Trap No. 1 Exit Distance	mm	< 1524	305
Trap No. 2 Velocity (Redundant)	km/h	55.51 to 57.12	55.83
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	4481	4186	-295
Center	mm	4741	4381	-360
Right Side	mm	4481	4181	-300

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	730
Center	mm	530
Right Side	mm	715
Average	mm	658

**DATA SHEET NO. 4**  
**TEST VEHICLE INFORMATION**

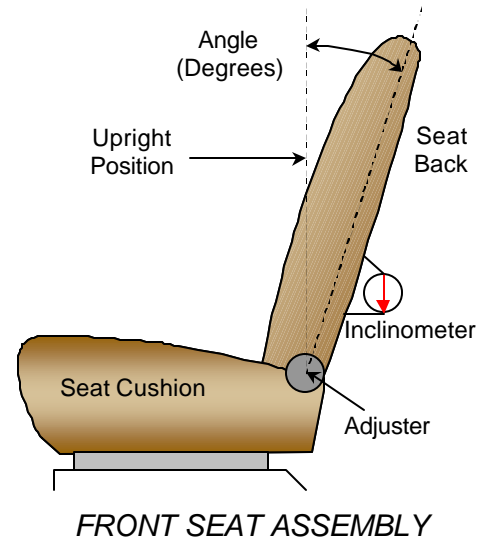
Test Vehicle: 2000 Mazda MPV Mini-Van  
Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
Test Date: 1/13/00

**NOMINAL DESIGN RIDING POSITION**

The driver and passenger seat backs are positioned to the manufacturers designated angle. The procedure is as follows: The seat back angle is adjusted so that the distance from the center of the inner sun visor bracket bolt to the center of the outer headrest mounting hole is per manufacturers specifications. An inclinometer is placed against the flat surface of the tool and the seat back angle is measured directly from the dial face.

Driver seat back angle: 18.0° with a seated dummy  
Passenger seat back angle: 18.0° with a seated dummy



**SEAT FORE/AFT POSITIONS**

Both driver and passenger seats have manually operated seats. The total travel on the driver and the passenger is 21 seat positions. The fore/aft position is set at the middle position for both driver and passenger.

Driver seat fore/aft total travel: 17 seat detent positions  
Passenger seat fore/aft total travel: 17 seat detent positions  
Driver seat fore/aft position: Set at 9<sup>th</sup> detent position  
Passenger seat fore/aft position: Set at 9<sup>th</sup> detent position

**SEAT BELT UPPER ANCHORAGE**

The test vehicle was equipped with adjustable anchorages for both driver and passenger seats. Both driver and passenger had 5 positions with each being placed in the mid or 3<sup>rd</sup> position.

## DATA SHEET NO. 4...(continued)

### TEST VEHICLE INFORMATION

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 1/13/00

### FUEL TANK CAPACITY DATA

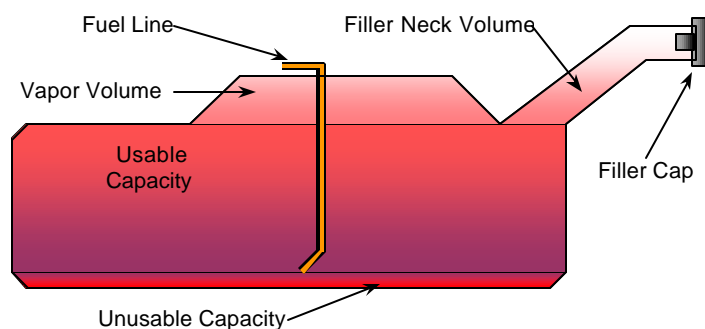
The "Usable Capacity" of the standard equipment fuel tank is: 70.0 liters

The "Usable Capacity" of any optional equipment fuel tank is: N/A liters

"Usable Capacity" used for certification tests FMVSS 301 requirements: 64.4 to 65.8 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 65.1 liters

The test vehicle is equipped with an electric fuel pump. The fuel pump is starter operated and will not w/o starter rotation. The fuel filler door is located on the left rear fender.



VEHICLE FUEL TANK ASSEMBLY

### STEERING COLUMN ADJUSTMENT

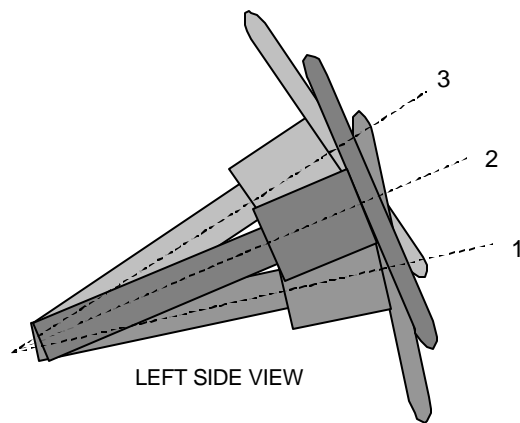
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes, when it is moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed onto the plate and the angle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

Lowermost, position 1: 26.5°

Geometric center, position 2: 29.0°

Uppermost, position 3: 31.5°

Note: Steering column is fixed on this vehicle.



LEFT SIDE VIEW  
STEERING COLUMN ASSEMBLY

# DATA SHEET NO. 5

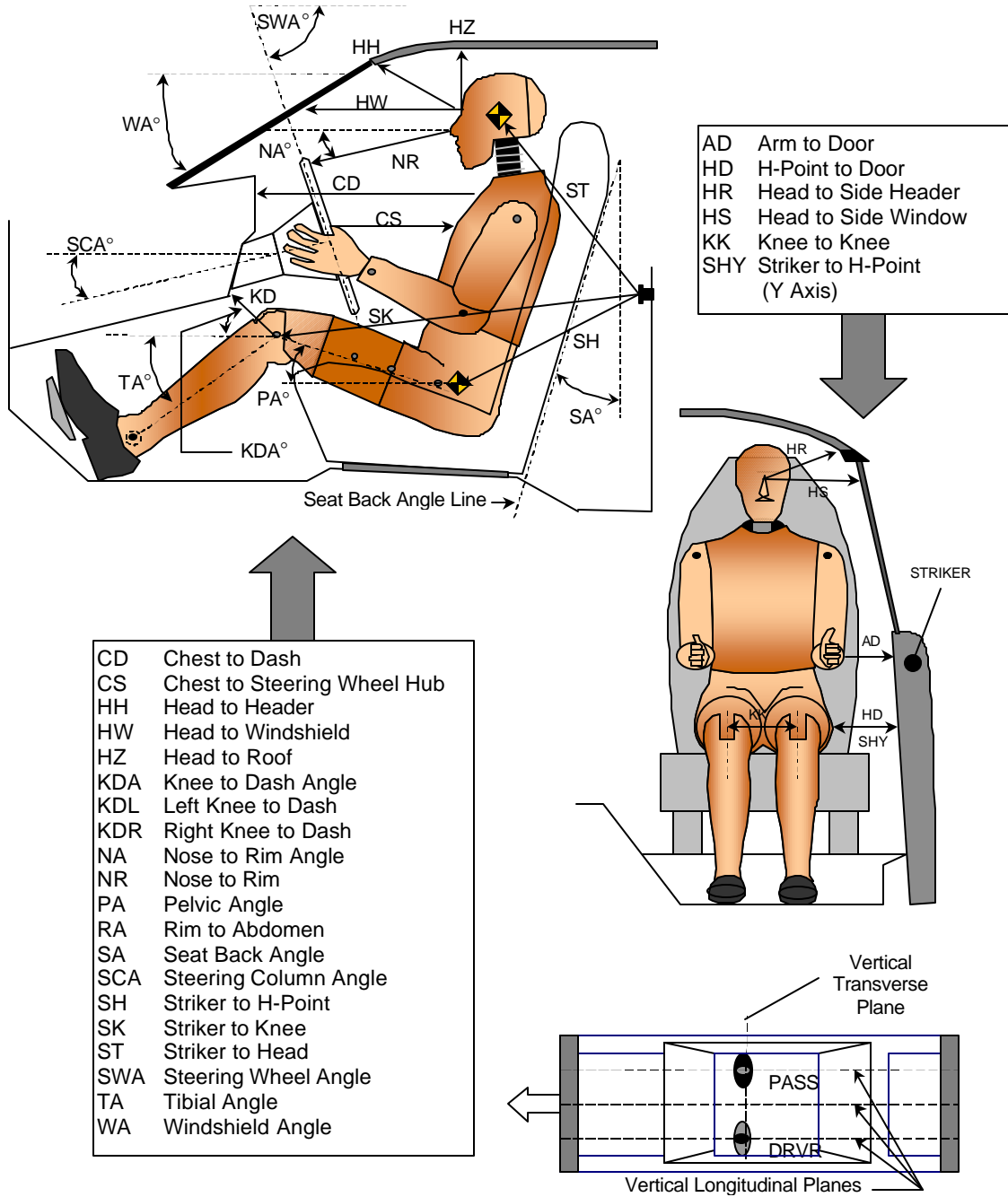
## DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 1/13/00



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

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

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00

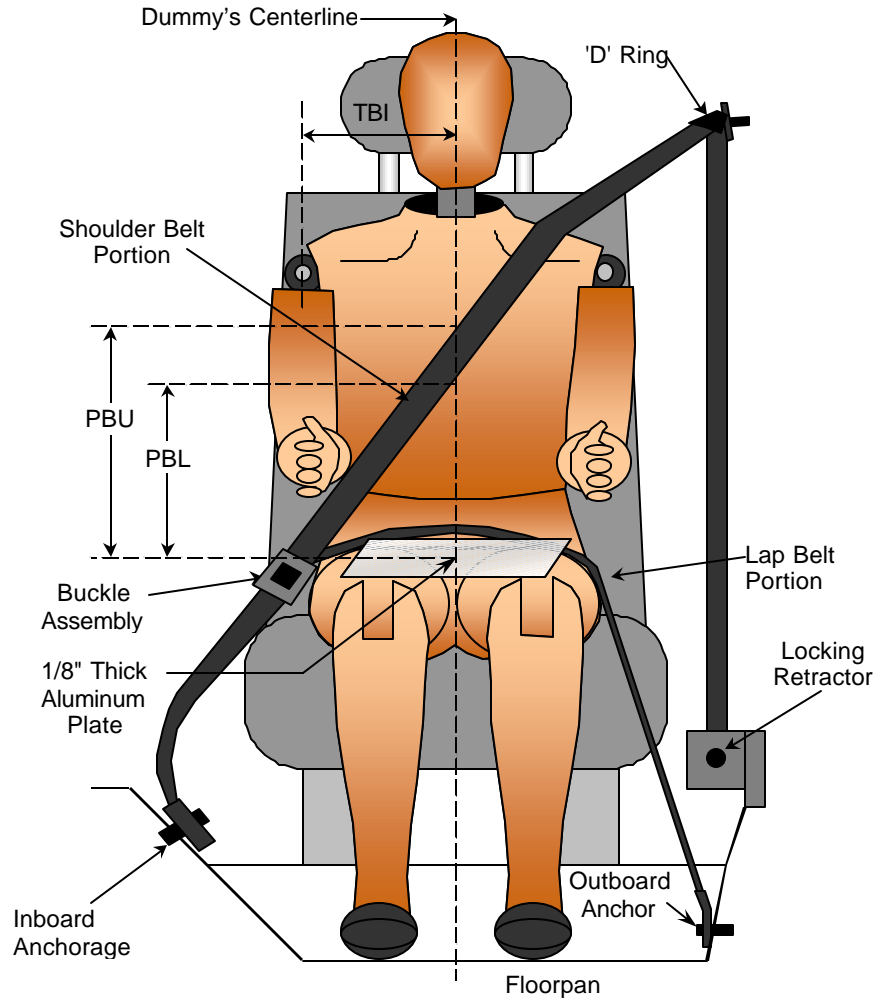
**TEST DUMMY POSITION MEASUREMENTS**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		30		
SWA	Steering Wheel Angle		61		
SCA	Steering Column Angle		29		
SA	Seat Back Angle		18		18
HZ	Head to Roof (Z)	247	90	235	90
HH	Head to Header	392	0	400	0
HW	Head to Windshield	685	0	695	0
HR	Head to Side Header (Y)	280		272	
NR	Nose to Rim	396	15		
CD	Chest to Dash	515		510	
CS	Chest to Steering Hub	290	0		
RA	Rim to Abdomen	160	0		
KDL	Left Knee to Dash	112	14	75	
KDR	Right Knee to Dash	85		95	17
PA	Pelvic Angle		23		23
TA	Tibia Angle		55		50
KK	Knee to Knee (Y)	270		235	
SK	Striker to Knee	635	0	635	3
ST	Striker to Head	610	10	600	7
SH	Striker to H-Point	255	19	250	19
SHY	Striker to H-Point (Y)	245		255	
HS	Head to Side Window	325		350	
HD	H-Point to Door (Y)	142		153	
AD	Arm to Door (Y)	130		45	
AA	Ankle to Ankle	n/a		n/a	

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

Test Vehicle: 2000 Mazda MPV Mini-Van  
Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
Test Date: 01/13/00



**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	210	210
PBU - Top surface of reference to belt upper edge	mm	340	367
PBL - Top surface of reference to belt lower edge	mm	257	280
Lap Belt tension	Newtons	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

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

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 mph NCAP

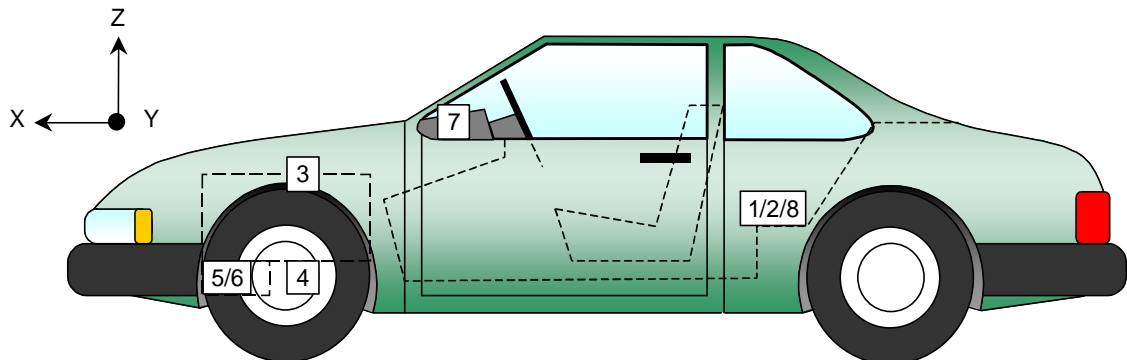
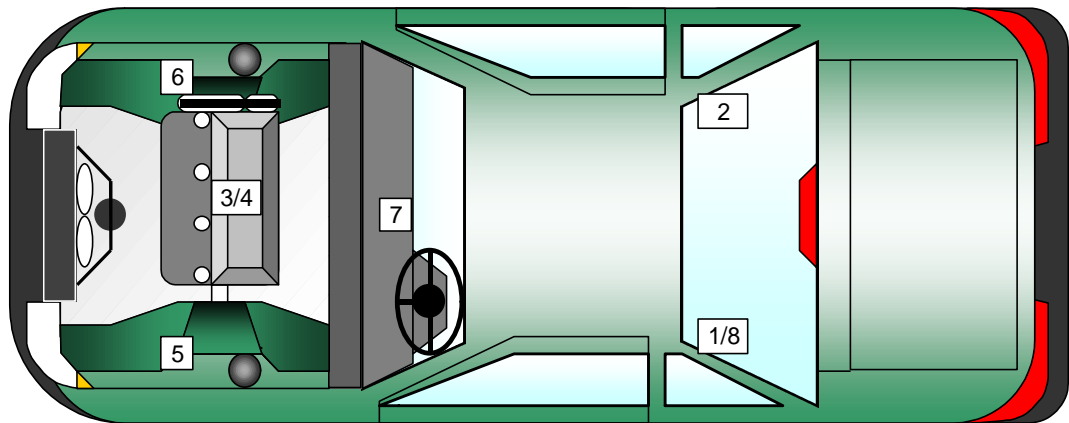
Test Date: 1/13/00

### VEHICLE X-AXIS 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 (Pri.)	2015	-750	515	G's	1.5	102.0	-38.7	29.8
2	Right Rear X-Member (Pri.)	2015	750	515	G's	1.4	104.0	-38.6	31.0
3	Engine Top	4050	55	860	G's	47.7	34.5	-187.3	24.7*
4	Engine Bottom	4130	85	185	G's	54.0	32.5	-183.5	25.1*
5	Left Brake Caliper	3965	-677	275	G's	18.1	48.7	-130.4	33.5*
6	Right Brake Caliper	3965	677	275	G's	22.8	32.1	-160.8	36.6*
7	Instrument Panel	3195	0	1160	G's	25.3	62.3	-108.4	53.4
8	Left Rear X-Member (Rednt.)	1835	-750	515	G's	1.7	102.2	-39.4	30.0

Reference Points      X - From Rear Surface of Vehicle      Y - Vehicle Centerline      Z - Ground Plane

\* Channels Failed at 58.6 Msec.



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

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 mph NCAP

Test Date: 1/13/00

**HEAD PRIMARY PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	12.0	258.3	-71.4	80.0	4.2	265.9	-46.8	74.9
Head CG	Y	G's	11.0	93.8	-2.8	251.5	7.1	51.9	-8.6	60.6
Head CG	Z	G's	38.8	59.8	-12.1	99.6	39.0	57.4	-7.3	121.6
Head CG Resultant	N/A	G's	72.1	80.0			55.4	67.3		

**CHEST PRIMARY PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.4	140.1	-50.6	74.9	2.0	125.7	-48.0	70.4
Chest CG	Y	G's	5.7	74.4	-3.2	52.4	4.5	45.1	-11.5	65.8
Chest CG	Z	G's	22.9	58.3	-13.7	109.9	24.5	55.9	-14.1	104.1
Chest CG Resultant	N/A	G's	52.5	74.7			52.5	66.3		

**FEMUR PEAK FORCES**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	218.0	28.1	-6397.7	36.3	735.4	58.8	-3121.4	40.0
Right Femur	Z	Newtons	209.8	27.1	-4329.4	36.9	719.3	62.5	-3134.1	49.5

**SEAT BELT SENSOR PEAK VALUES**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	6937.6	59.4	-5.6	158.0	8077.3	61.3	-0.3	107.1
Shoulder Belt Force	N/A	Newtons	7946.2	73.0	-72.7	271.4	6627.3	64.4	-3.1	125.3
Shoulder Belt Pullout	N/A	MM	235.5	80.9	0.0	0.0	245.9	79.3	0.0	8.2
Shoulder Belt Stretch	N/A	MM/CM	0.419	53.2	-0.007	19.5	0.253	77.1	0.000	95.0*

\* Passenger Side Failed at 95.0 Msec.

**HEAD INJURY CRITERIA (HIC)**

Location	Driver				Passenger			
	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>
Head CG Primary	784.4	54.4	56.1	92.0	517.6	46.1	51.8	87.7

**CHEST CLIP (3MSEC)**

Location	Driver			Passenger		
	CLIP	T <sup>1</sup>	T <sup>2</sup>	CLIP	T <sup>1</sup>	T <sup>2</sup>
Chest CG Primary	50.0	73.9	76.9	51.6	64.4	67.4

**DATA SHEET NO. 8...(continued)**

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 mph NCAP

Test Date: 1/13/00

**PELVIC PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	3.6	108.5	-66.4	36.3	6.6	103.7	-68.7	49.6
Pelvis	Y	G's	11.4	92.9	-7.6	50.7	11.7	62.1	-9.0	78.0
Pelvis	Z	G's	5.9	33.8	-19.3	96.4	4.1	42.9	-14.0	86.4

**UPPER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	170.6	240.2	-409.0	65.7	586.4	70.1	-591.7	127.7
Neck Force	Y	Newtons	258.7	101.4	-123.4	39.9	151.5	139.6	-288.1	63.0
Neck Force	Z	Newtons	2779.0	75.2	-479.4	105.8	1578.3	53.5	-347.4	115.6
Neck Moment	X	N•m	13.5	83.9	-3.5	30.1	25.9	62.2	-14.4	71.9
Neck Moment	Y	N•m	33.0	143.2	-33.2	79.0	39.2	136.4	-31.9	53.3
Neck Moment	Z	N•m	3.2	146.6	-5.1	106.5	12.0	98.2	-8.4	69.8

**FOOT PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	13.1	80.1	-88.5	36.5	42.0	47.3	-193.4	40.4
Left Foot Aft	Z	G's	1.7	133.1	-44.1	39.5	57.0	48.3	-109.4	39.6
Left Foot Fore	Z	G's	54.2	31.9	-81.9	39.7	110.4	51.5	-266.7	39.0
Right Foot Aft	X	G's	46.6	75.8	-217.0	45.4	39.9	78.1	-180.3	41.2
Right Foot Aft	Z	G's	32.2	54.5	-284.2	44.5	6.6	48.6	-130.6	43.3
Right Foot Fore	Z	G's	156.3	53.7	-249.2	43.9	116.8	48.7	-151.0	34.0

**UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Lower Moment	X	N•m	4.8	47.6	-26.0	73.1	33.3	47.9	-9.8	94.0
Left Lower Moment	Y	N•m	21.7	81.0	-43.0	42.8	250.5	63.0	-110.2	40.0
Left Lower Force	Z	Newtons	162.6	58.5	-1917.4	78.5	506.7	42.4	-2378.1	63.2
Left Upper Moment	X	N•m	8.7	61.2	-20.4	83.9	67.1	51.7	-15.5	93.5
Left Upper Moment	Y	N•m	65.7	33.8	-70.8	42.3	77.1	33.1	-85.2	41.4
Right Lower Moment	X	N•m	8.5	95.4	-22.2	54.2	81.0	66.3	-34.5	42.3
Right Lower Moment	Y	N•m	194.7	79.0	-148.0	45.7	221.6	79.5	-107.7	42.7
Right Lower Force	Z	Newtons	119.5	123.7	-2318.9	48.8	141.0	114.9	-2508.8	80.1
Right Upper Moment	X	N•m	11.0	37.9	-45.4	49.1	31.7	65.6	-49.6	76.9
Right Upper Moment	Y	N•m	153.5	37.0	-263.1	48.7	12.1	114.5	-188.5	42.3

**DATA SHEET NO. 8...(continued)**

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 mph NCAP

Test Date: 1/13/00

**CHEST PEAK DISPLACEMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.3	8.6	-28.0	75.9	0.6	9.6	-37.8	66.0

**HEAD REDUNDANT PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	12.1	258.1	-70.9	79.5	3.8	251.8	-46.4	74.7
Head CG	Y	G's	10.4	95.0	-8.2	70.2	6.1	75.3	-7.8	60.1
Head CG	Z	G's	35.8	59.9	-11.6	109.1	33.6	57.1	-7.0	104.9
Head CG Resultant	N/A	G's	71.6	79.5			55.4	67.8		

**CHEST REDUNDANT PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.5	140.0	-49.5	75.0	2.3	125.4	-47.7	70.3
Chest CG	Y	G's	4.4	74.4	-4.6	54.3	5.4	45.0	-13.0	65.8
Chest CG	Z	G's	23.5	61.7	-12.8	107.4	22.8	66.0	-13.2	104.1
Chest CG Resultant	N/A	G's	52.1	74.8			52.6	66.2		

**REDUNDANT HEAD INJURY CRITERIA (HIC)**

Location	Driver				Passenger			
	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>
Head CG Redundant	764.5	53.8	56.0	91.9	485.5	44.9	51.8	87.7

**REDUNDANT CHEST CLIP (3MSEC)**

Location	Driver			Passenger		
	CLIP	T <sup>1</sup>	T <sup>2</sup>	CLIP	T <sup>1</sup>	T <sup>2</sup>
Chest CG Redundant	49.6	73.9	76.9	51.4	64.4	67.4

**DATA SHEET NO. 9****SEAT BELT PERFORMANCE ASSESSMENT TEST DATA**Test Vehicle: 2000 Mazda MPV Mini-VanNHTSA No.: MY5401Test Program: 2000 NHTSA 35 MPH NCAPTest Date: 01/13/00**SEAT BELT PLACEMENT MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
TCI - Dummy centerline to shoulder bolt	mm	210	210
PBU - Top surface of reference to belt upper edge	mm	340	367
PBL - Top surface of reference to belt lower edge	mm	257	280
Lap Belt tension	Newtons	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

**BELT LENGTH DATA**

Measurement Description	Units	Driver	Passenger
Retractor reel to 'D' ring	mm	780	780
Shoulder belt length as measured on ATD	mm	865	890
Lap belt length as measured on ATD	mm	925	945
Remainder of belt on reel	mm	585	530
Total belt length for continuous webbing systems	mm	3155	3145

**SHOULDER BELT SPOOL-OFF DATA**

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	151.0	25.0
As determined electronically	mm	235.5	245.9

**BELT STRETCH DATA**

Measurement Description	Units	Driver	Passenger
Electronically from shoulder belt load cell and "D" ring	mm/cm	0.42	0.25
Mechanically	mm/cm	0.00	0.00

**DATA SHEET NO. 10**  
**SUMMARY OF FMVSS 212 DATA**

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 01/13/00

**Windshield Mounting Details:**

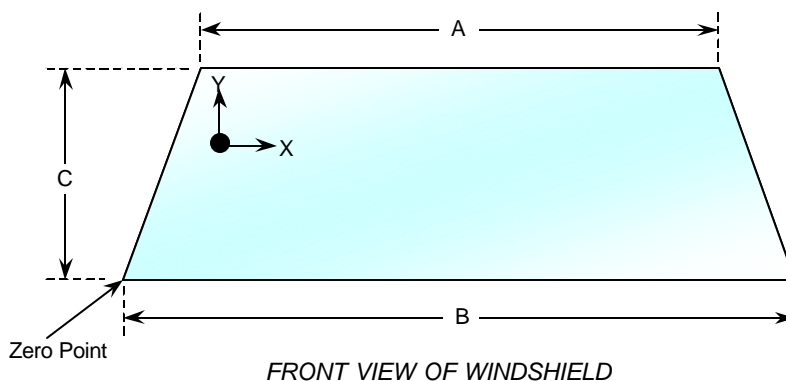
Windshield glass is secured to the vehicle frame with a rubber type adhesive. There is no molding that covers the windshield periphery at any point.

The standard requires that the post test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles which 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	2287.5	2287.5	100
Right Side	2287.5	2287.5	100
Total	4575.0	4575.0	100



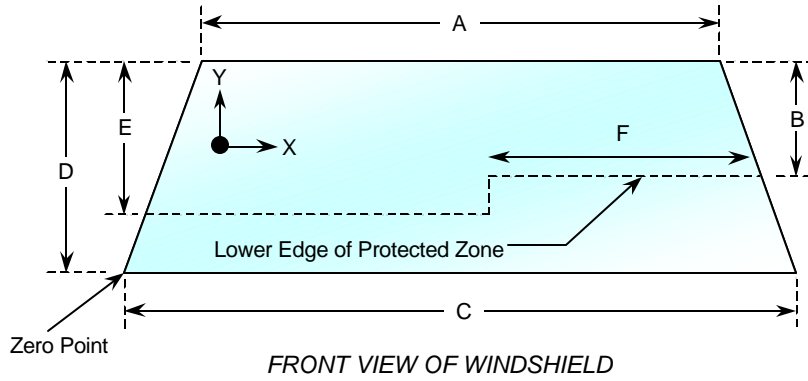
Item	Units	Segment Length	Molding Width
A	mm	1230	19
B	mm	1535	8
C	mm	905	0

**DATA SHEET NO. 11**

**WINDSHIELD ZONE INTRUSION FMVSS 219 (PARTIAL) DATA**

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00



**WINDSHIELD AND PROTECTED ZONE**

Item	Units	Value
A	mm	1230
B	mm	612
C	mm	1535
D	mm	905
E	mm	655
F	mm	690

**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: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 01/13/00

Test Time: 1:50 PM      Temperature at Time of Impact: 21.7 °C

**STODDARD SOLVENT SPILLAGE MEASUREMENT**

- 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 Details: No leakage occurred

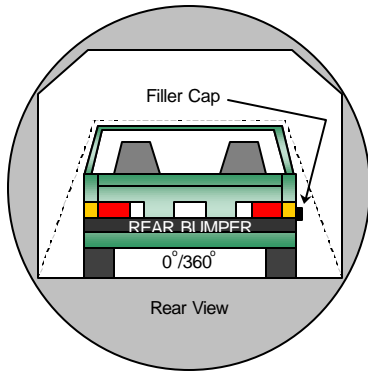
**DATA SHEET NO. 13**  
**FMVSS 301 STATIC ROLLOVER DATA SHEET**

Test Vehicle: 2000 Mazda MPV Mini-Van

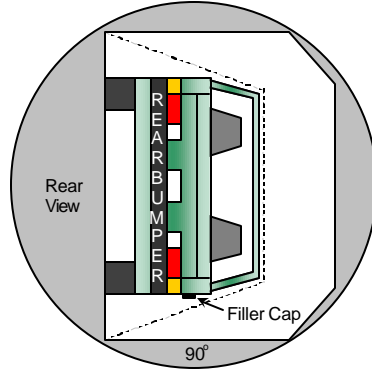
NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

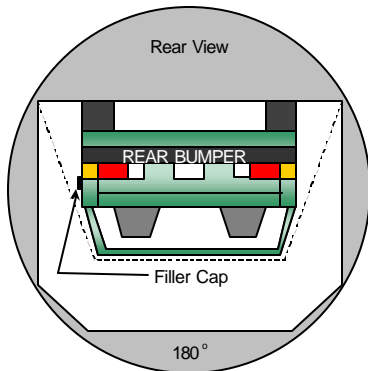
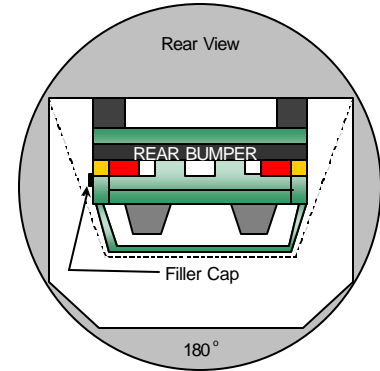
Test Date: 01/13/00



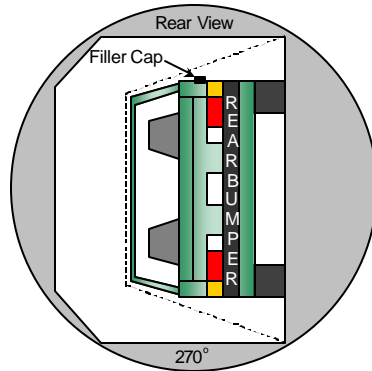
**0° TO 90°**



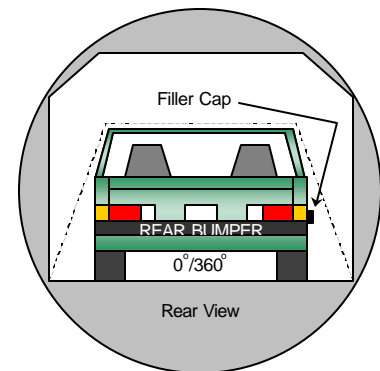
**90° TO 180°**



**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. Details of Stoddard Solvent spillage locations:  
 No solvent leakage occurred during static rollover testing.

TEST PHASE	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° TO 90°	81	300	0.0
90° TO 180°	82	300	0.0
180° TO 270°	75	334	0.0
270° TO 360°	82	300	0.0

**DATA SHEET NO. 14**  
**VEHICLE MEASUREMENTS**

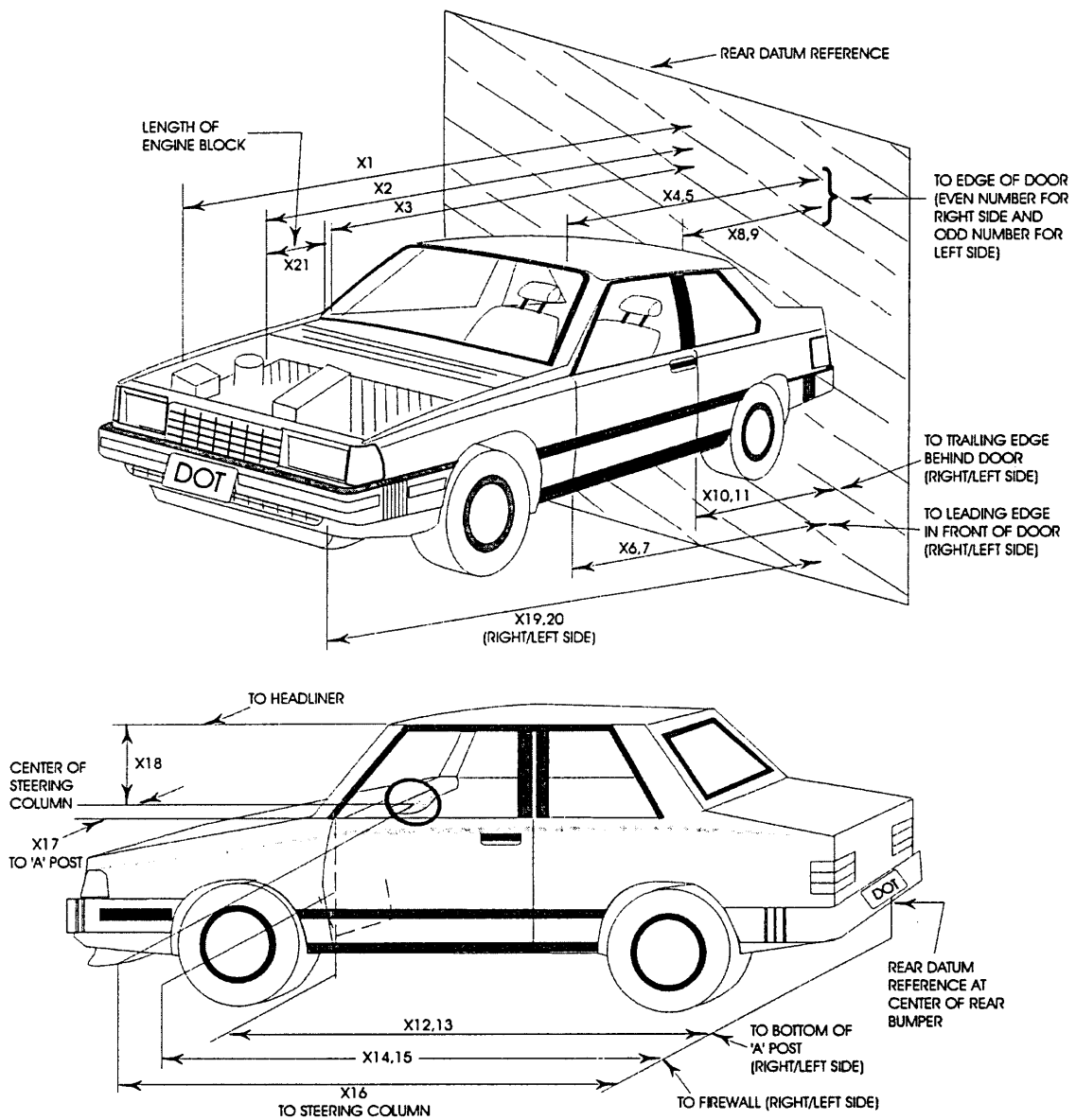
Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 1/13/00

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4741	4381	-360
2	RSOV to front of engine	mm	4395	4006	-389
3	RSOV to firewall centerline	mm	3639	3489	-150
4	RSOV to leading edge of right door	mm	3395	3395	0
5	RSOV to leading edge of left door	mm	3389	3390	1
6	RSOV to lower leading edge of right door	mm	3363	3360	-3
7	RSOV to lower leading edge of left door	mm	3360	3358	-2
8	RSOV to upper trailing edge of right door	mm	2323	2332	9
9	RSOV to upper trailing edge of left door	mm	2320	2333	13
10	RSOV to lower trailing edge of right door	mm	2359	2357	-2
11	RSOV to lower trailing edge of left door	mm	2347	2355	8
12	RSOV to bottom of right 'A' pillar	mm	3370	3373	3
13	RSOV to bottom of left 'A' pillar	mm	3370	3385	15
14	RSOV to firewall on right side	mm	3596	3486	-110
15	RSOV to firewall of left side	mm	3748	3626	-122
16	RSOV to steering column	mm	2942	2895	-47
17	Center of steering column to left 'A' pillar	mm	445	545	100
18	Center of steering column to headlining	mm	490	545	55
19	RSOV to right side of front bumper	mm	4481	4181	-300
20	RSOV to left side of front bumper	mm	4481	4186	-295
21	Length of engine block	mm	454	454	0
RD	RSOV to right side of dash panel	mm	3128	3130	2
CD	RSOV to center of dash panel	mm	3010	2985	-25
LD	RSOV to left side of dash panel	mm	3120	3080	-40



**DATA SHEET NO. 15**  
**CAMERA LOCATIONS**

Test Vehicle: 2000 Mazda MPV Mini-Van  
Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
Test Date: 1/13/00

No.	Camera View	Location (mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Right Side, Real Time	3454	10973	1245	0	1651	Zoom	24
2	Left Side, No. 1	2000	8315	1285	1	7970	12	1010
3A	Left Side No. 2	1450	8285	1690	7	7970	35	1000
3B	Left Side No. 3A	1700	9325	1425	1	8970	50	990
4	Left Side No. 3B	8200	10900	2930	9	12220	80	990
5	Left Side, No. 4	1800	8175	2820	17	8200	19	1020
6	Left Side, No. 5	1800	8370	3200	15	8400	19	1020
7	Right Side, No. 1	2100	8317	1030	3	8000	13	980
8A	Right Side, No. 2A	1800	8237	1670	2	7950	35	1020
8B	Right Side, No. 2B	1600	10317	1370	2	10010	50	700
9	Right Side, No. 3	8150	9400	2970	15	11380	80	950
10	Right Side, No. 4	2400	7917	1185	3	7700	24	1000
11	Overhead Overall	530	0	5486	90	N/A	13	900
12	Front View, Driver	390	300	2605	41	N/A	13	1000
13	Front View, Passenger	390	300	2605	41	N/A	13	1020
14	Pit Camera, Engine	450	0	1500	90	N/A	13	930
15	Pit Camera, Fuel Tank	4555	0	1800	45	N/A	19	900
16	Onboard, Driver	1450	315	1305	3	1230	13	550
17	Onboard, Passenger	1450	340	1305	3	1270	13	450

X - Barrier Face    Y - Monorail Centerline    Z - Ground

# DATA SHEET NO. 16

## PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2000 Mazda MPV Mini-Van

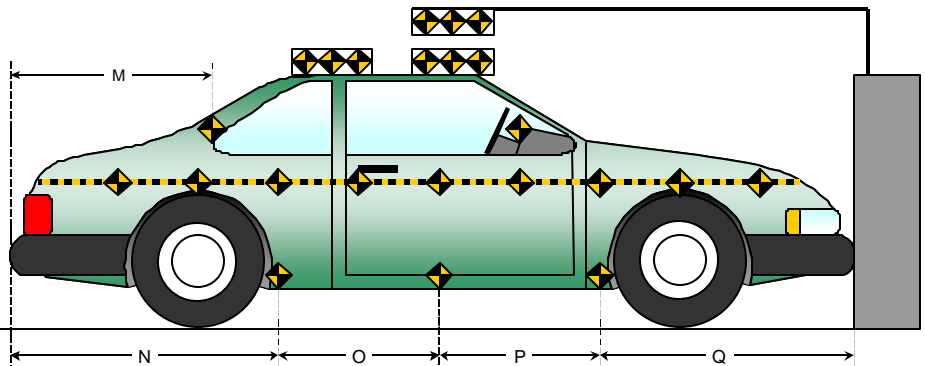
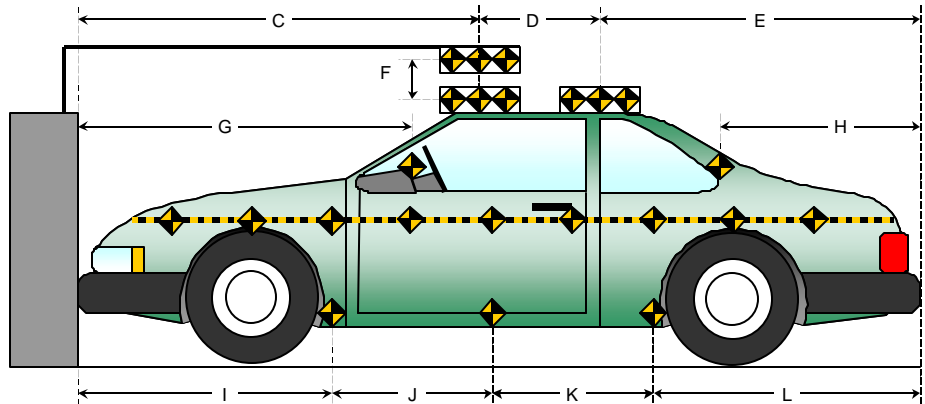
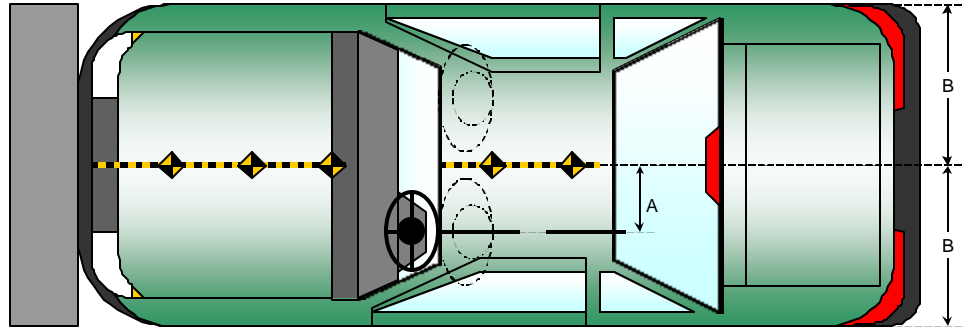
NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 1/13/00

All Dimensions  
in mm

Item	Value
A	355
B	862
C	1940
D	609
E	2278
F	153.6
G	1765
H	2268
I	1293
J	900
K	900
L	1673
M	2266
N	1673
O	926
P	918
Q	1318



**DATA SHEET NO. 17**

**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

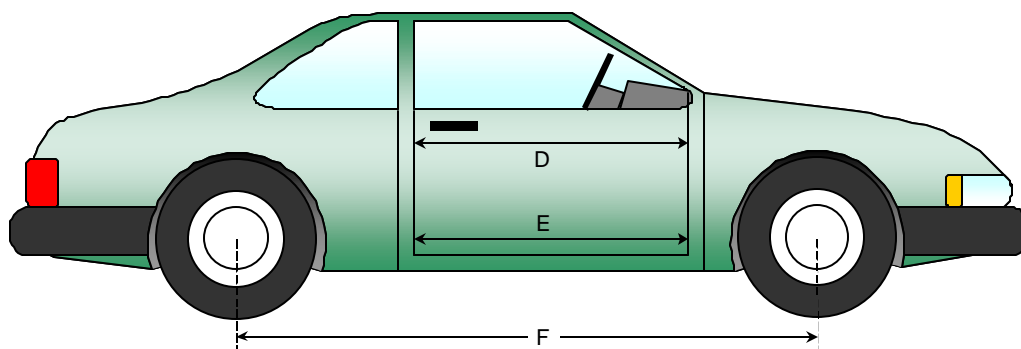
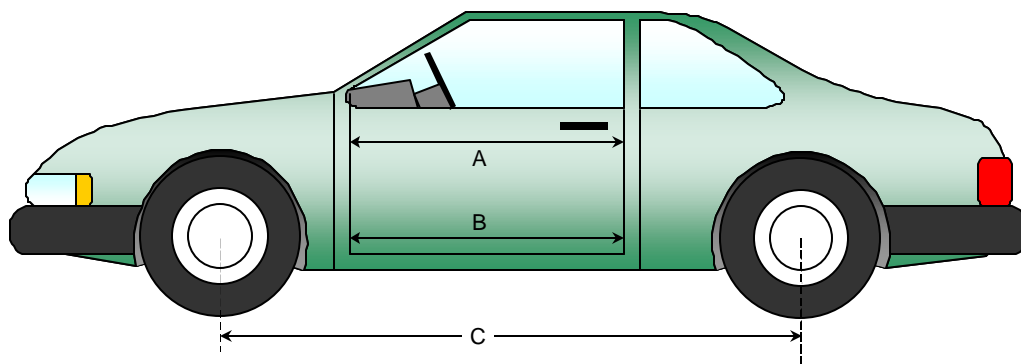
Test Date: 1/13/00

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	958	958	0
B	Left Side Lower	mm	933	933	0
D	Right Side Upper	mm	963	958	-5
E	Right Side Lower	mm	928	933	5

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheel base	mm	2841	2800	-41
F	Right Side Wheel base	mm	2841	2860	19



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

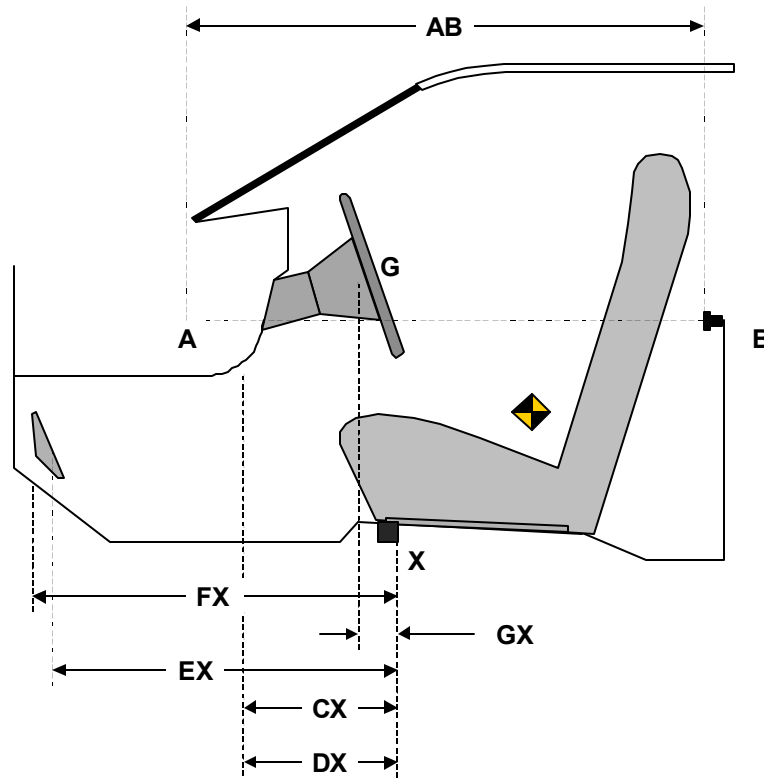
Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 1/13/00

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	958	958	0
CX	Left Knee Bolster to X	mm	244	245	1
DX	Right Knee Bolster to X	mm	255	235	-20
EX	Brake Pedal to X	mm	512	380	-132
FX	Foot Rest to X	mm	566	540	-26
GX	Center of Steering Wheel Hub to X	mm	55	-30	-85

X = Left Front Seat Outboard Anchor Bolt Head

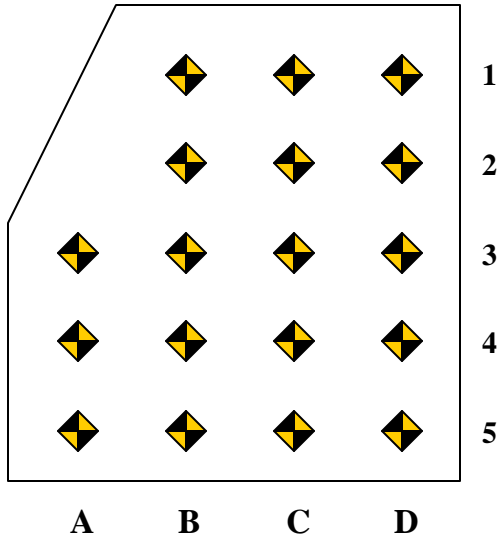


**DRIVER COMPARTMENT**

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

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 1/13/00



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	N/A	N/A	665	672	N/A	N/A	610	640	N/A	N/A	-55	-32
2	N/A	576	566	565	N/A	573	570	569	N/A	-3	4	4
3	477	474	464	460	468	473	470	470	-9	-1	6	10
4	377	375	364	359	375	375	370	370	-2	0	6	11
5	275	275	264	260	275	275	270	270	0	0	6	10

**DRIVER FLOOR PAN Z-AXIS**

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	N/A	N/A	29	5	N/A	N/A	10	-16	N/A	N/A	-19	-21
2	N/A	-40	-40	-50	N/A	-90	-100	-100	N/A	-50	-60	-50
3	-45	-45	-42	-50	-80	-90	-85	-100	-35	-45	-43	-50
4	-42	-42	-40	-40	-77	-80	-80	-85	-35	-38	-40	-45
5	-55	-48	-45	-45	-73	-75	-80	-80	-18	-27	-35	-35

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

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

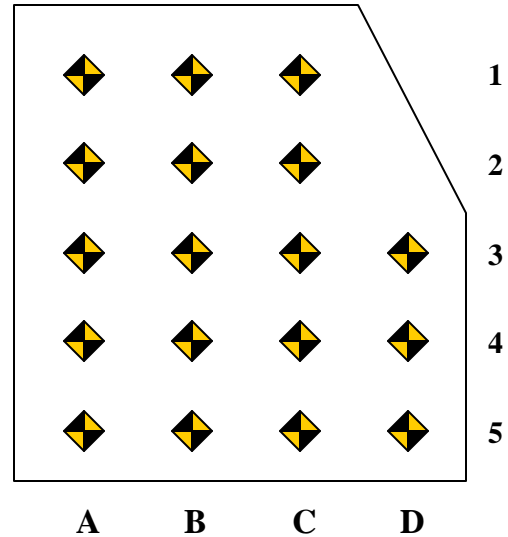
NHTSA No.: MY5401  
 Test Date: 1/13/00

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

Columns A through D are evenly spaced.

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

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



**PASSENGER FLOOR PAN X-AXIS**

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	801	702	N/A	N/A	648	637	N/A	N/A	-153	-65	N/A	N/A
2	596	600	597	N/A	596	602	597	N/A	0	2	0	N/A
3	498	502	500	471	496	502	500	466	-2	0	0	-5
4	398	402	400	378	396	402	400	374	-2	0	0	-4
5	295	302	302	273	294	302	302	275	-1	0	0	2

**PASSENGER FLOOR PAN Z-AXIS**

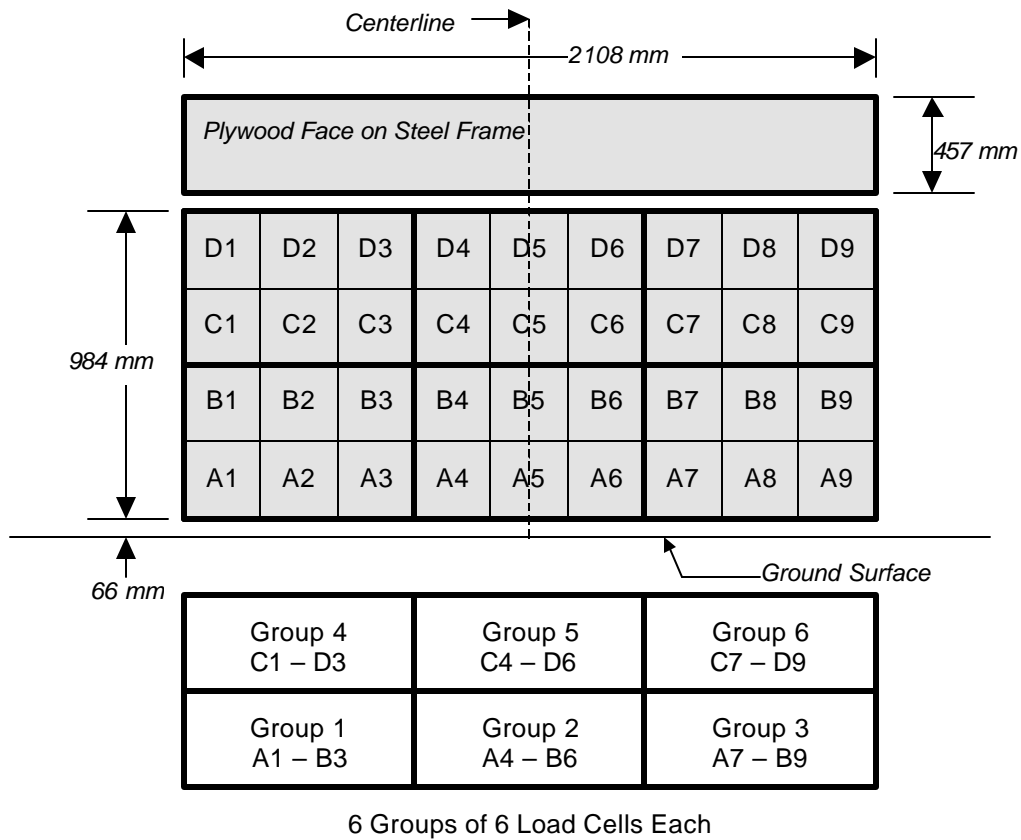
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	60	60	N/A	N/A	-46	-33	N/A	N/A	-106	-93	N/A	N/A
2	-30	-30	-35	N/A	-73	-65	-50	N/A	-43	-35	-15	N/A
3	-58	-51	-50	-105	80	-73	-70	-29	138	-22	-20	76
4	-50	-45	-45	-105	-75	-74	-70	-35	-25	-29	-25	70
5	-50	-50	-50	-110	-70	-65	-60	-42	-20	-15	-10	68

**DATA SHEET NO. 18**  
**FIXED BARRIER TYPE**

Test Vehicle: 2000 Mazda MPV Mini-Van  
Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
Test Date: 1/13/00

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



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

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

**DATA SHEET NO. 19  
ACCIDENT INVESTIGATION DATA**

Test Vehicle: 2000 Mazda MPV Mini-Van  
 Test Program: 2000 NHTSA 35 MPH NCAP

NHTSA No.: MY5401  
 Test Date: 01/13/00

**VEHICLE INFORMATION**

VIN: JM3LW2858Y0112816  
 Vehicle Size Category: Mini-Van

Wheel base (mm): 2841  
 Test Weight (kg): 1875

**ACCELEROMETER DATA**

Accelerometer Location: Left rear floor pan  
 Cal. Procedure/Interval: 6 months / drop test  
 Integration Algorithm: NHTSA Standard  
 Impact Velocity (km/h): 55.78  
 Velocity Change (km/h): 61.74

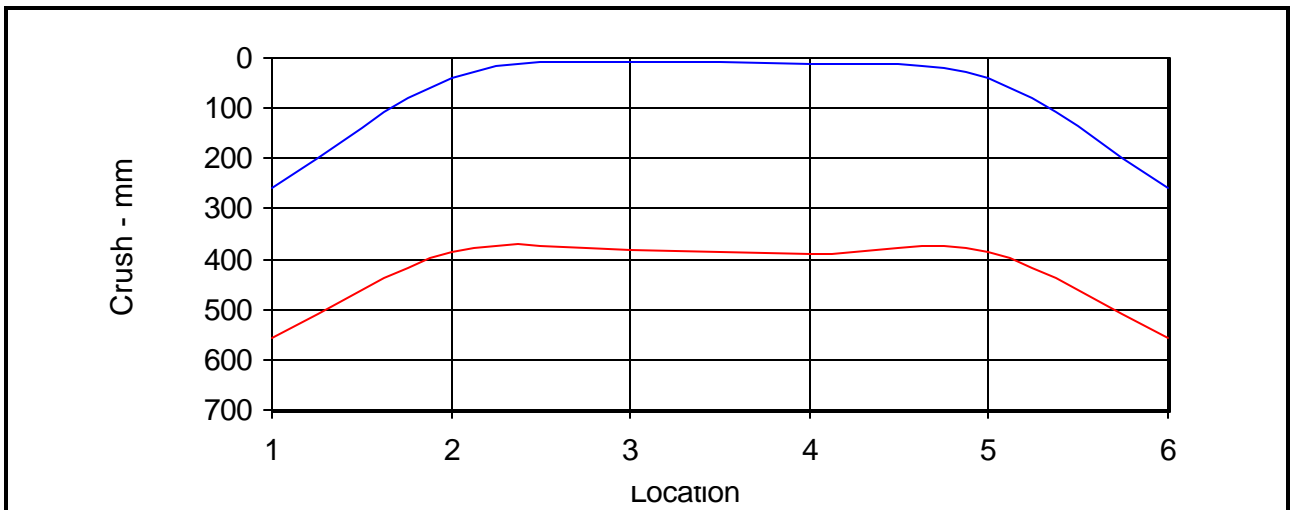
Linearity: Good

Time of Separation (msec): 65.7

**CRUSH PROFILE**

Collision Deformation Classification: 12FDEW6 Midpoint of Damage: Vehicle Centerline  
 Damage Region Length (mm): 1615 Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	260	555	-295
C2	Crush zone 2 on left side	mm	38	386	-348
C3	Crush zone 3 on left side	mm	9	380	-371
C4	Crush zone 4 on right side	mm	10	390	-380
C5	Crush zone 5 on right side	mm	38	386	-348
C6	Crush zone 6 at right side	mm	260	555	-295



DATA SHEET NO. 20

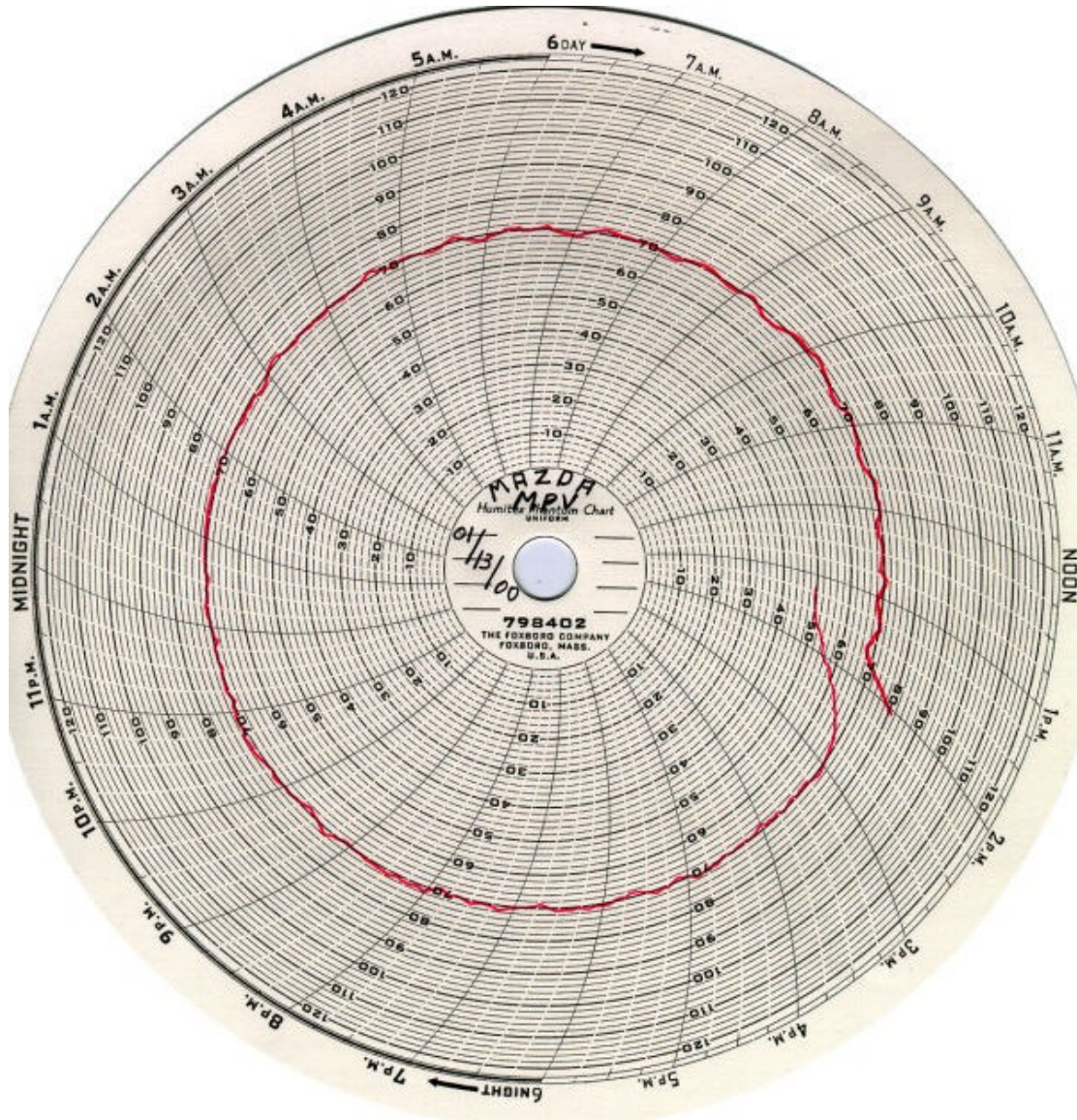
DUMMY/ VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2000 Mazda MPV Mini-Van

NHTSA No.: MY5401

Test Program: 2000 NHTSA 35 MPH NCAP

Test Date: 1/13/00



**APPENDIX A**  
**PHOTOGRAPHS**

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FIGURE A-1. RIGHT FRONT AS RECEIVED

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FIGURE A-2. LEFT REAR AS RECEIVED

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MFD. BY MAZDA MOTOR CORPORATION

DATE	GVWR/PNBV	GAWR/PNBE	FRT	GAWR/PNBE	RR
06/99	5077 LB	2496 LB		2581 LB	
	2303 KG	1132 KG		1193 KG	

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

JM3LW28G8Y0112816 TYPE:MPV



BODY COLOR CODE;PT

MADE IN JAPAN

FIGURE A-3. VEHICLE CERTIFICATION LABEL

VEHICLE CAPACITY WEIGHT (LC62A)  
 CAPACITÉ PORTEUSE DU VÉHICULE 539kg (1188lbs)

SEATING CAPACITY  
 NOMBRE DE PLACES

FRONT SEAT . . . . 2  
 SIÈGE AVANT  
 2ND SEAT . . . . 2  
 SIÈGE 2e  
 3RD SEAT . . . . 3  
 SIÈGE 3e  
 TOTAL . . . . 7

TIRE SIZE	TIRE INFLATION PRESSURE PRESSION DE GONFLAGE DES PNEUS Kg/cm <sup>2</sup> (p.s.i., lb/po <sup>2</sup> )	
	FRONT/AV.	REAR/AR.
P205/65R15 92S	2.4(35)	2.4(35)
P215/60R16 94H	2.2(32)	2.2(32)

FIGURE A-4. VEHICLE TIRE PLACARD

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FIGURE A-5. PRETEST FRONT VIEW

A-5

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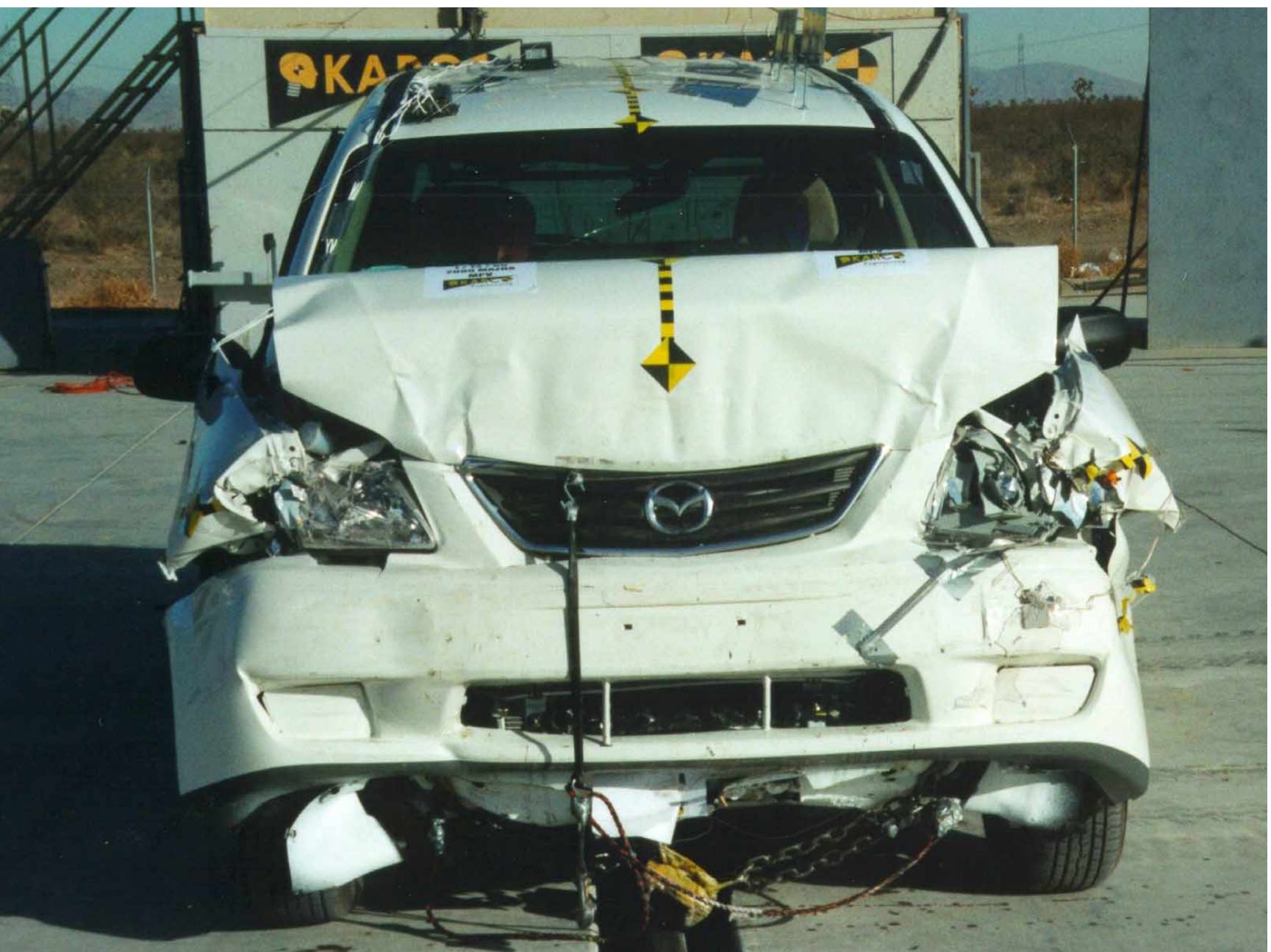


FIGURE A-6. POST TEST FRONT VIEW

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FIGURE A-7. PRETEST LEFT SIDE VIEW

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FIGURE A-8. POST TEST LEFT SIDE VIEW

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FIGURE A-9. PRETEST RIGHT SIDE VIEW

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FIGURE A-10. POST TEST RIGHT SIDE VIEW

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FIGURE A-11. PRETEST RIGHT FRONT VIEW

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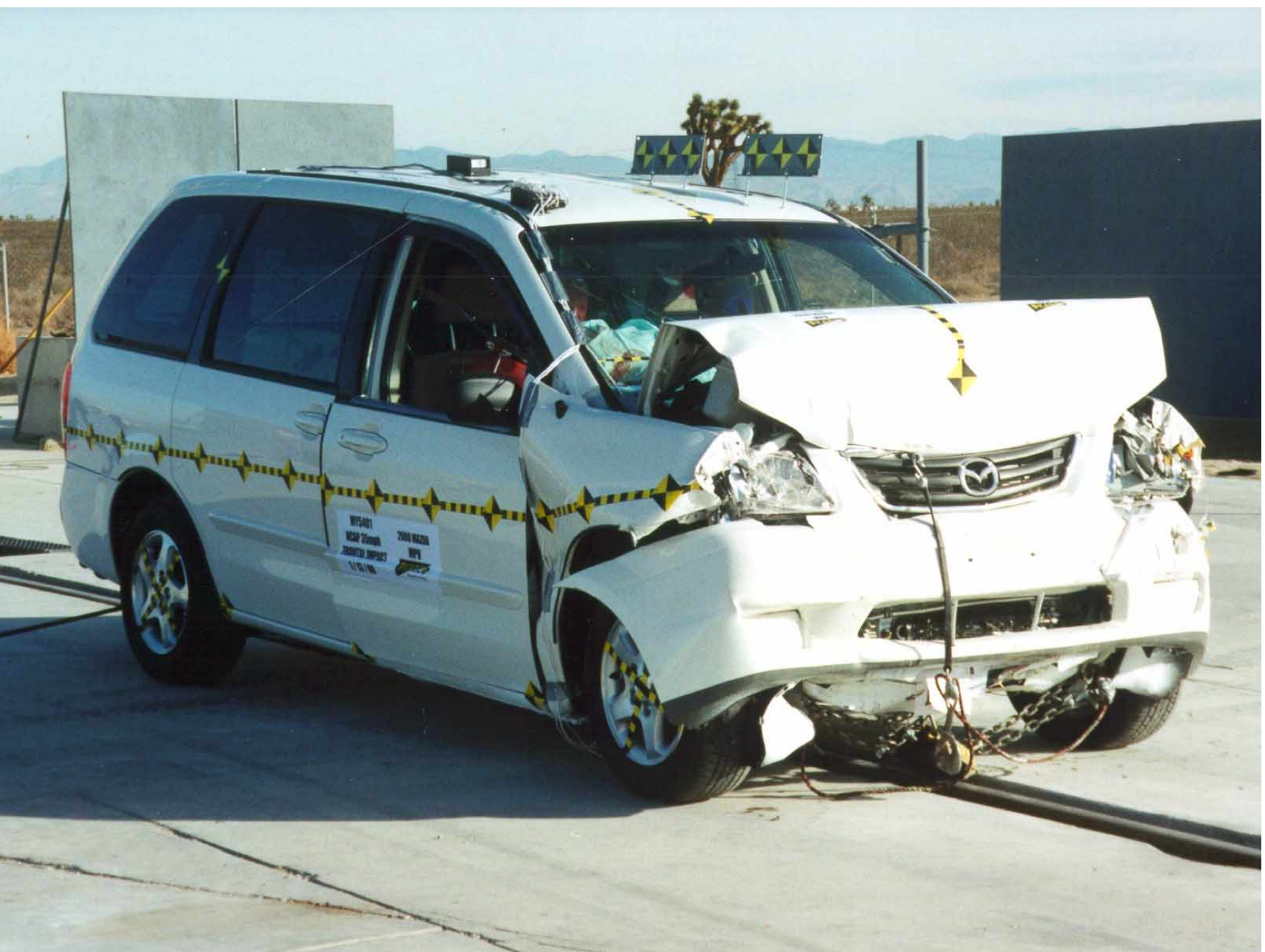


FIGURE A-12. POST TEST RIGHT FRONT VIEW

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FIGURE A-13. PRETEST LEFT REAR VIEW

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FIGURE A-14. POST TEST LEFT REAR VIEW

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FIGURE A-15. PRETEST WINDSHIELD

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FIGURE A-16. POST TEST WINDSHIELD

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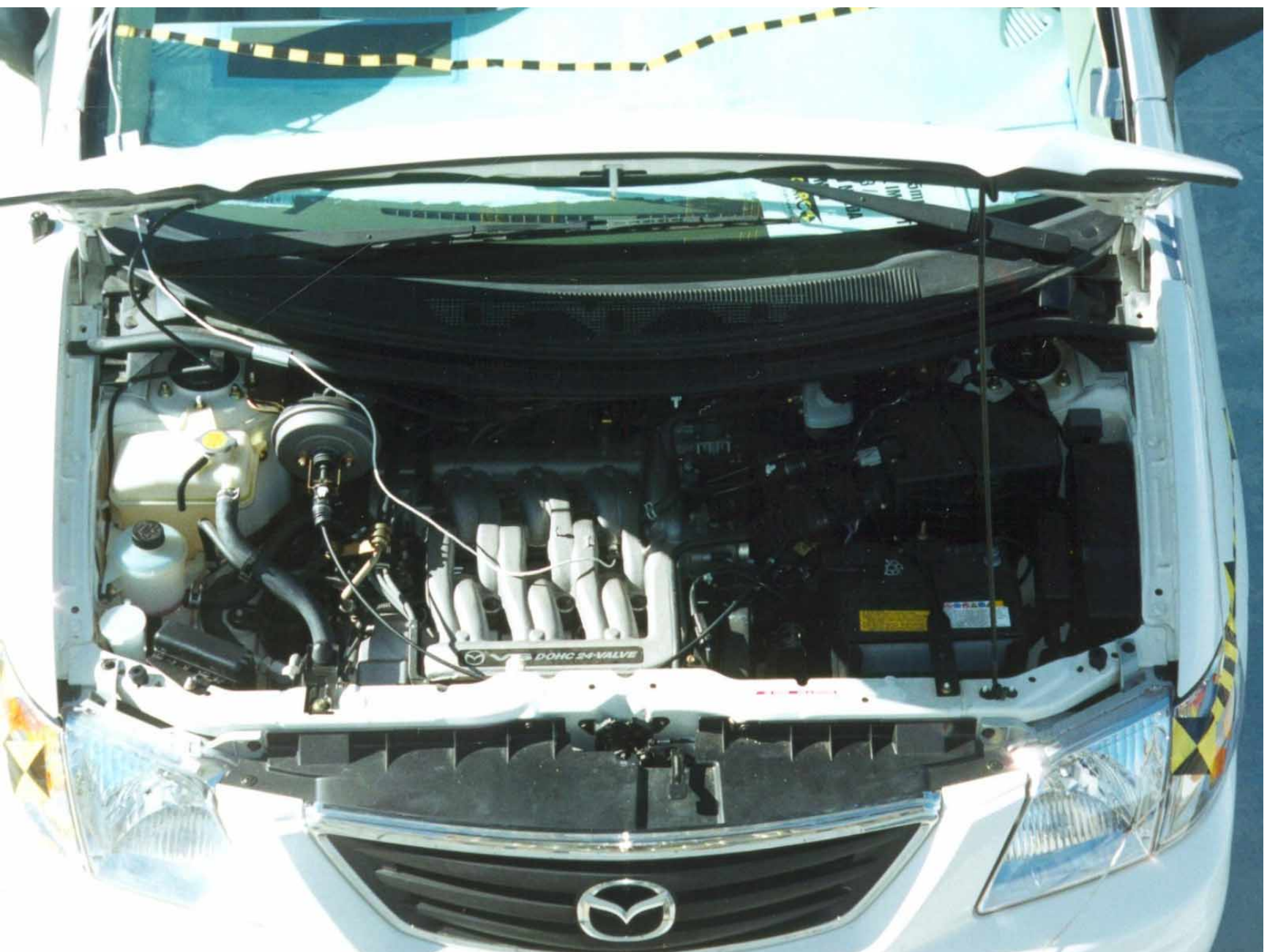


FIGURE A-17. PRETEST ENGINE COMPARTMENT

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FIGURE A-18. POST TEST ENGINE COMPARTMENT

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FIGURE A-19. PRETEST FUEL CAP

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FIGURE A-20. POST TEST FUEL CAP

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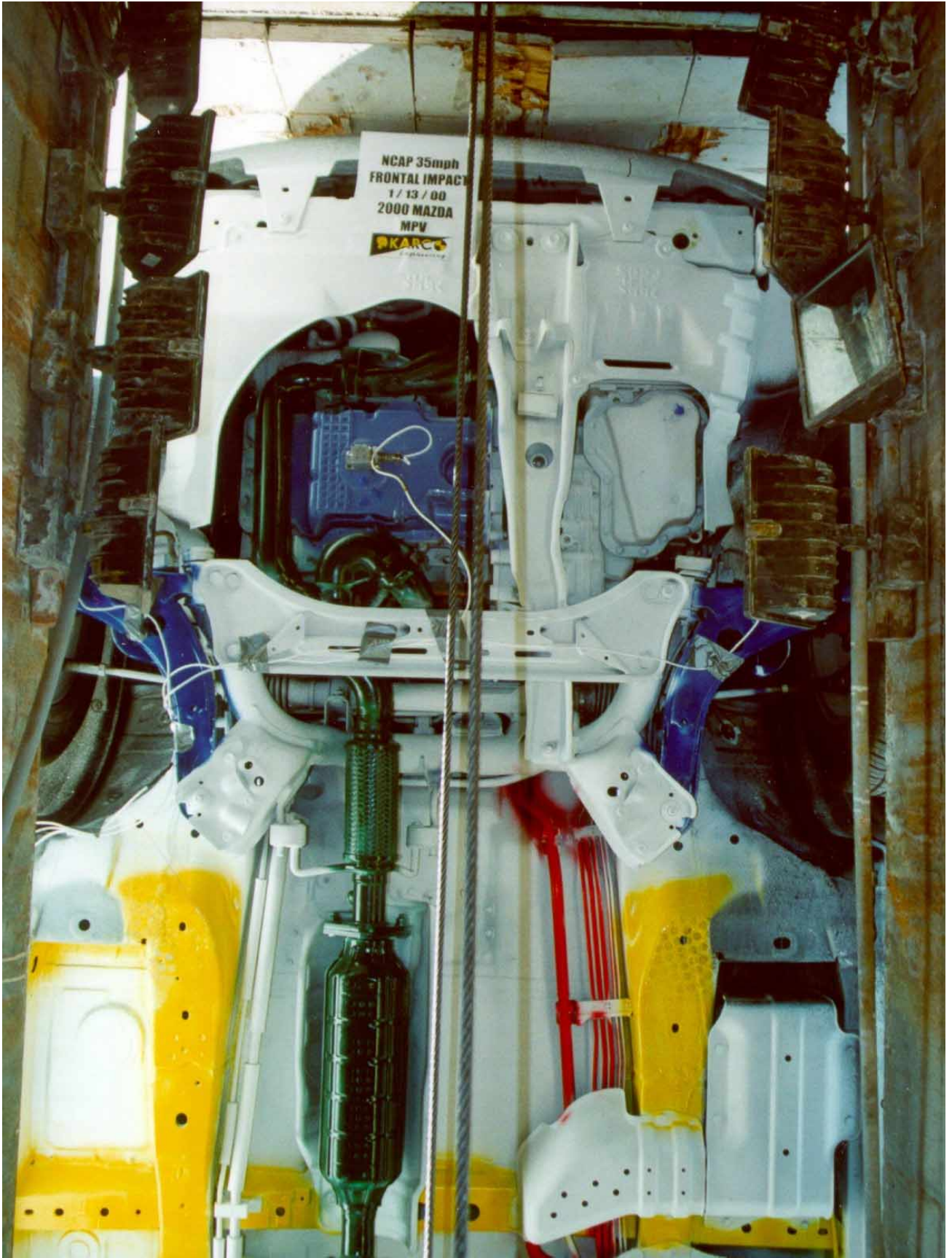


FIGURE A-21. PRETEST FRONT UNDERSIDE

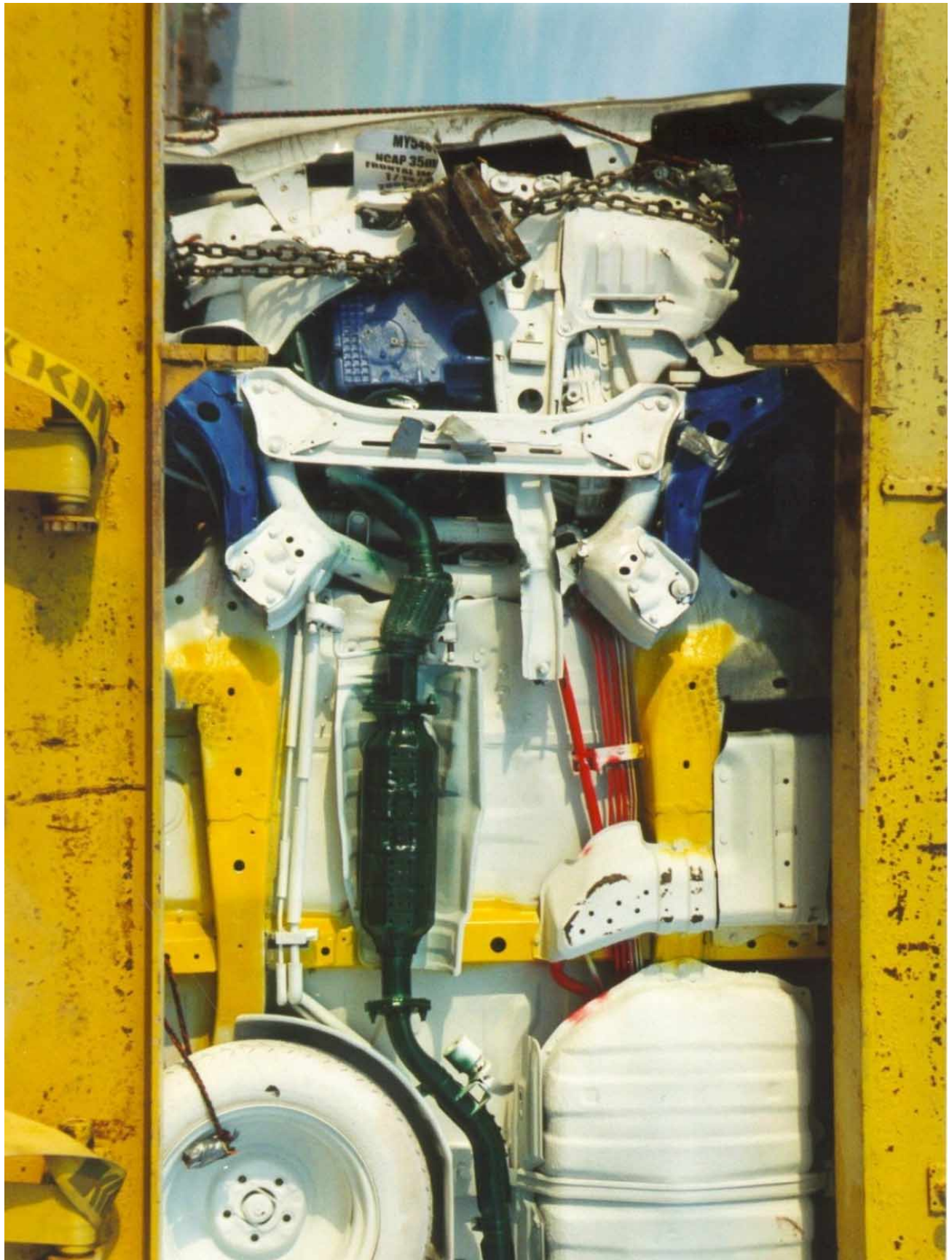


FIGURE A-22. POST TEST FRONT UNDERSIDE

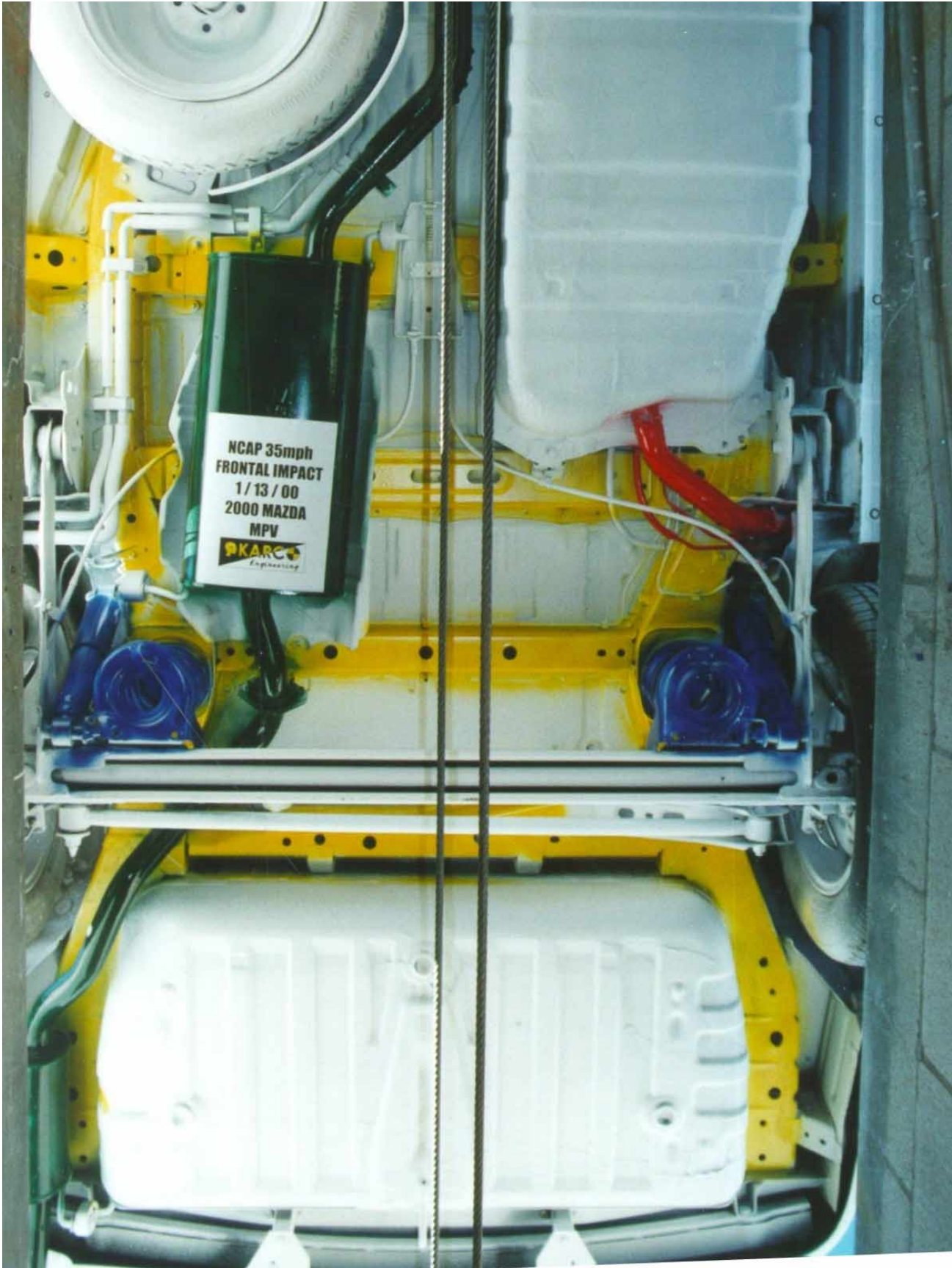


FIGURE A-23. PRETEST REAR UNDERSIDE

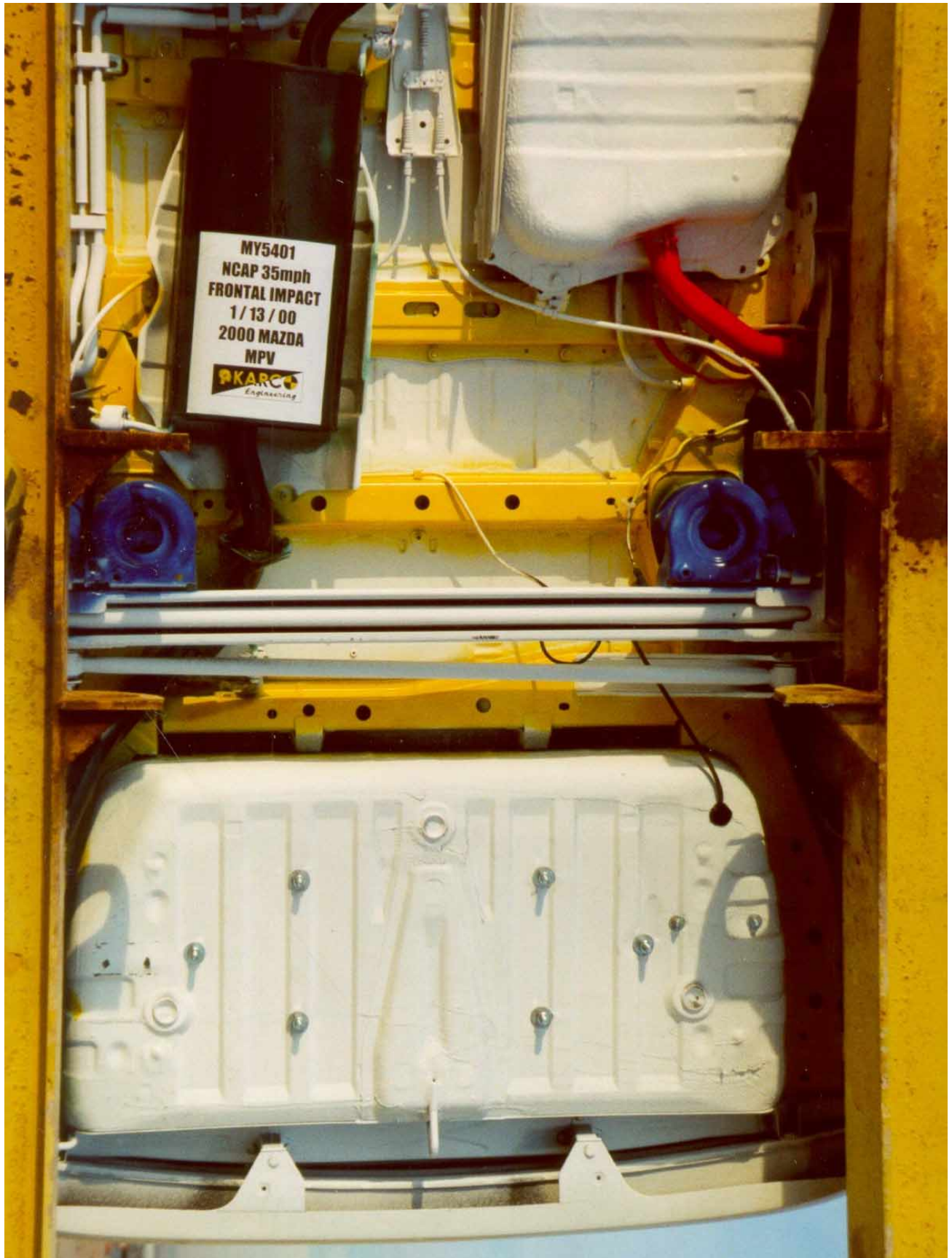


FIGURE A-24. POST TEST REAR UNDERSIDE



FIGURE A-25. PRETEST DRIVER DUMMY (FRONT VIEW)



FIGURE A-26. POST TEST DRIVER DUMMY (FRONT VIEW)



FIGURE A-27. PRETEST DRIVER DUMMY (THRU WINDOW)

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FIGURE A-28. POST TEST DRIVER DUMMY (THRU WINDOW)

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FIGURE A-29. PRETEST DRIVER DUMMY (DOOR OPEN)



FIGURE A-30. POST TEST DRIVER DUMMY (DOOR OPEN)



FIGURE A-31. PRETEST DRIVER DUMMY (90° TO VEHICLE)



FIGURE A-32. POST TEST DRIVER DUMMY (90° TO VEHICLE)

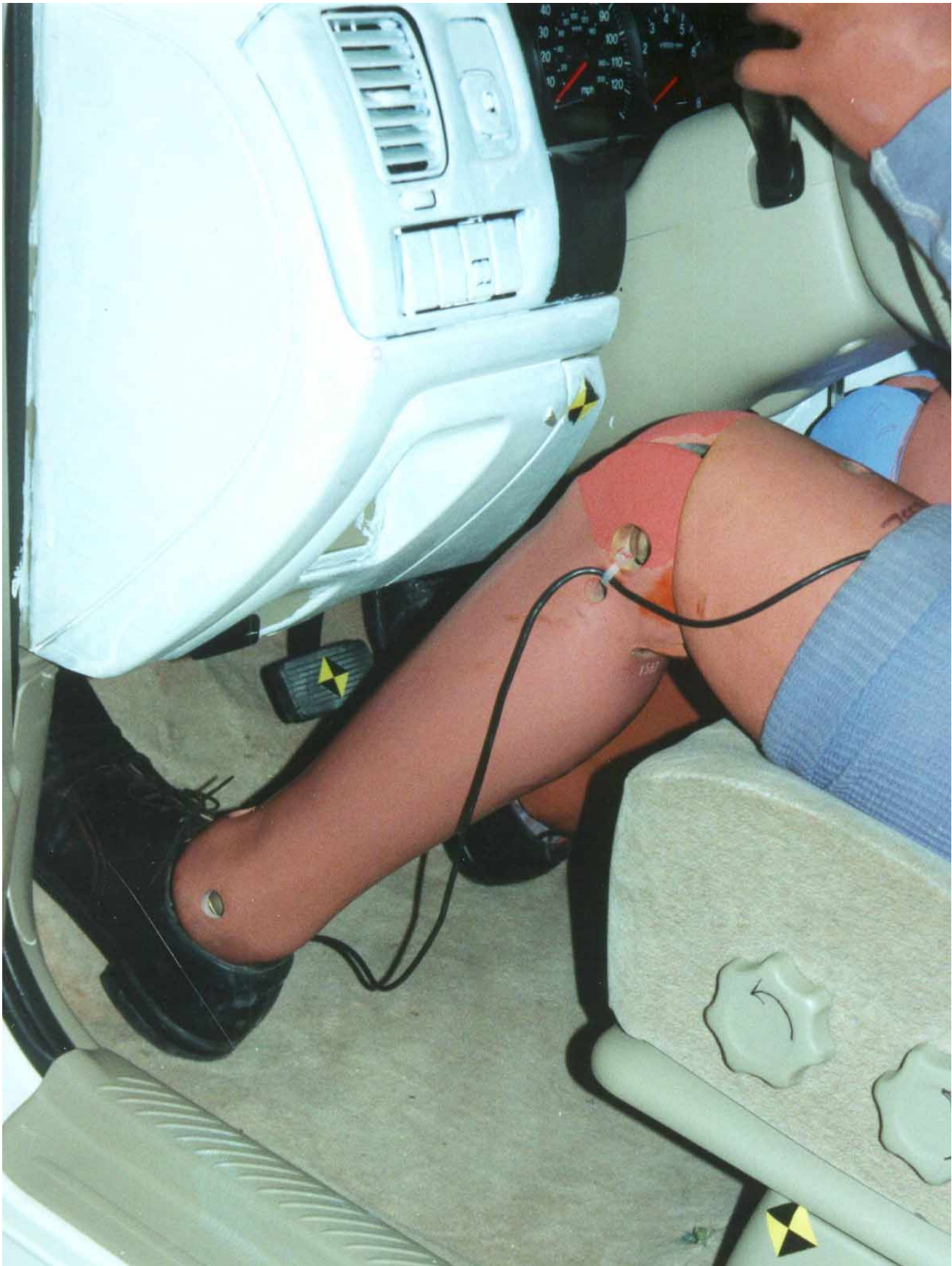


FIGURE A-33. PRETEST DRIVER DUMMY FEET



FIGURE A-34. POST TEST DRIVER DUMMY FEET AND KNEE CONTACT

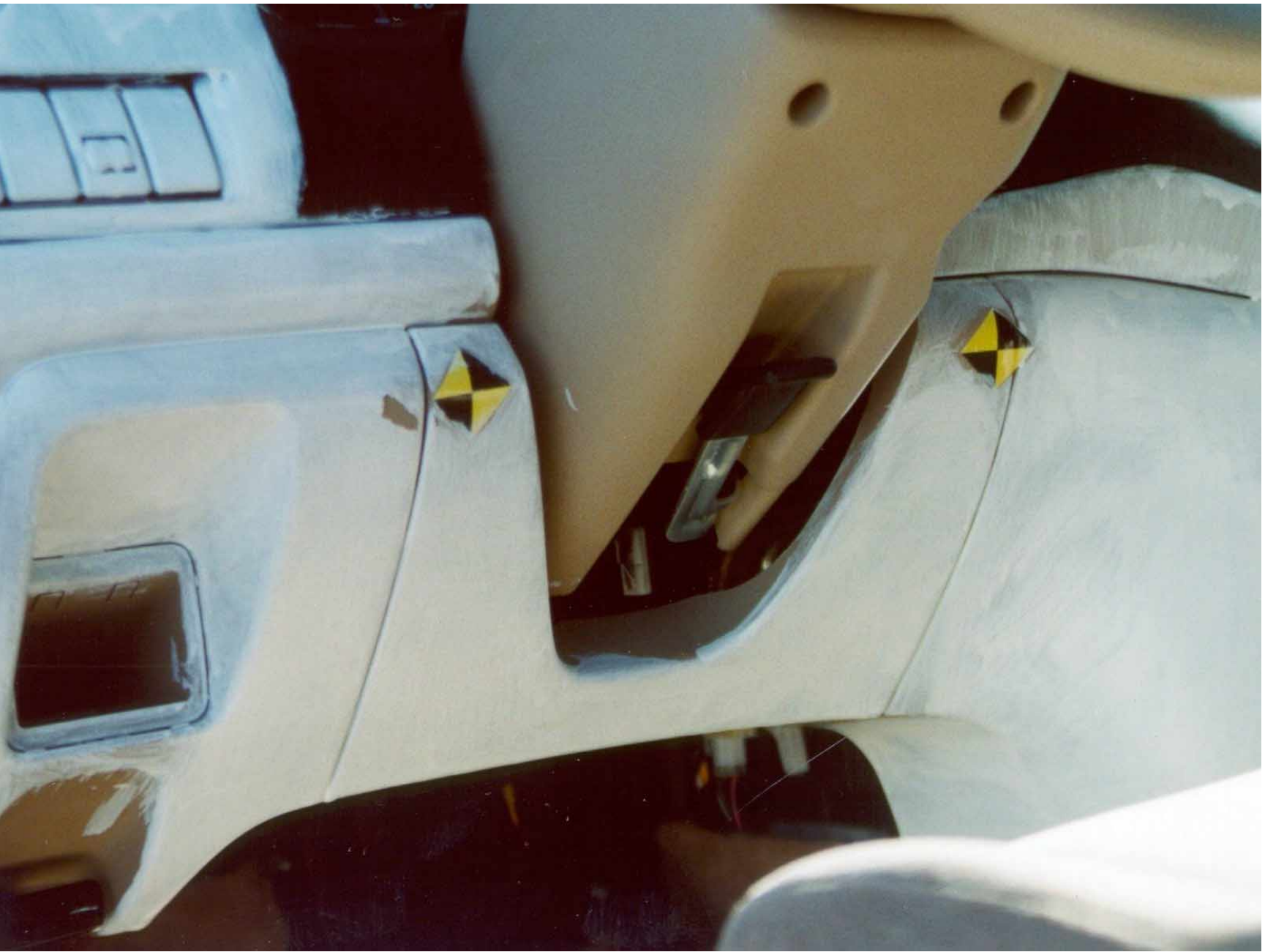


FIGURE A-35. PRE TEST DRIVER KNEE BOLSTER

A-35

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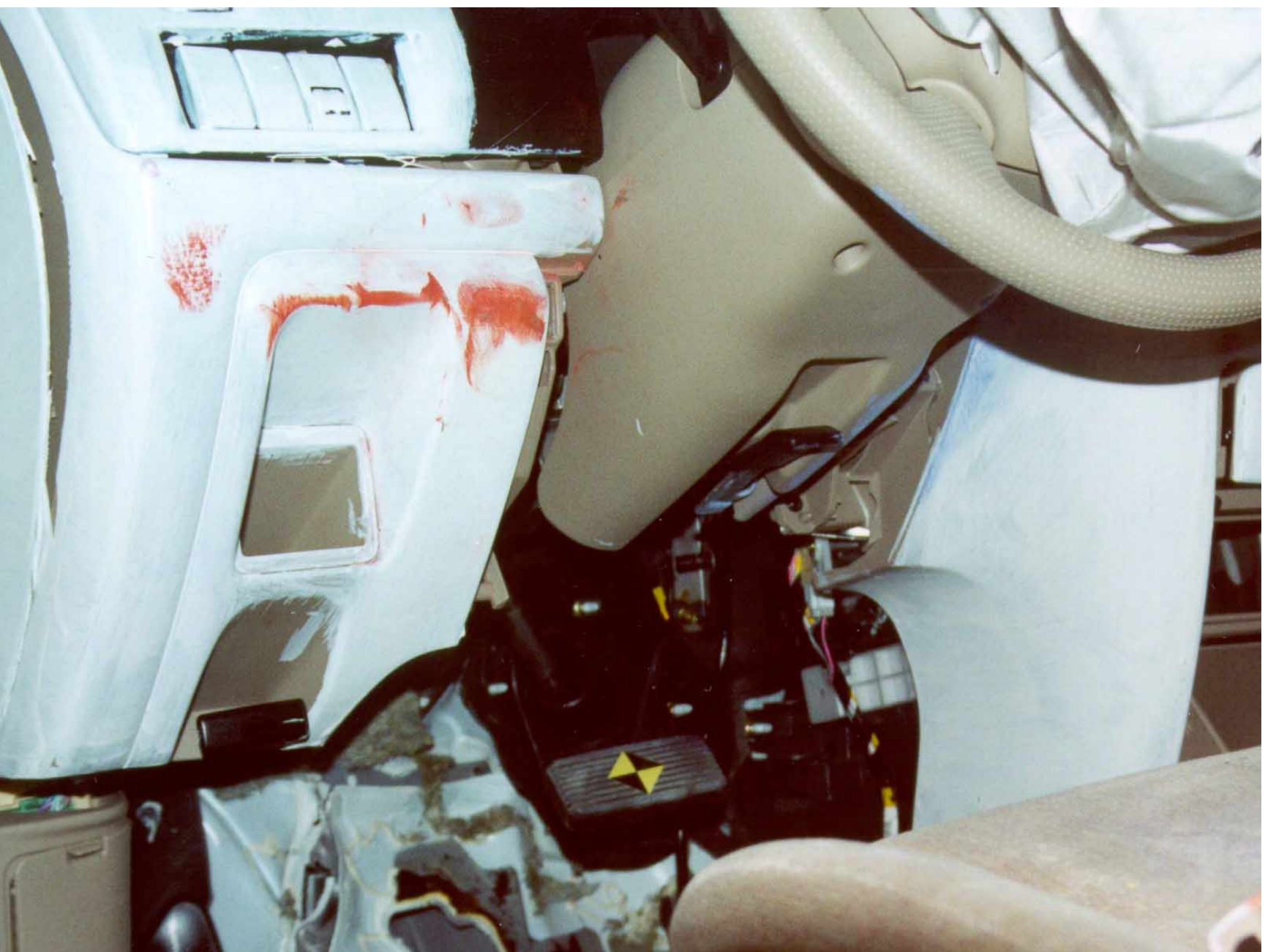


FIGURE A-36. POST TEST DRIVER KNEE BOLSTER

A-36

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FIGURE A-37. PRE TEST DRIVER SIDE FLOOR PAN

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FIGURE A-38. POST TEST DRIVER SIDE FLOOR PAN

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FIGURE A-39. POST TEST DRIVER HEAD



FIGURE A-40. POST TEST DRIVER DUMMY CONTACT

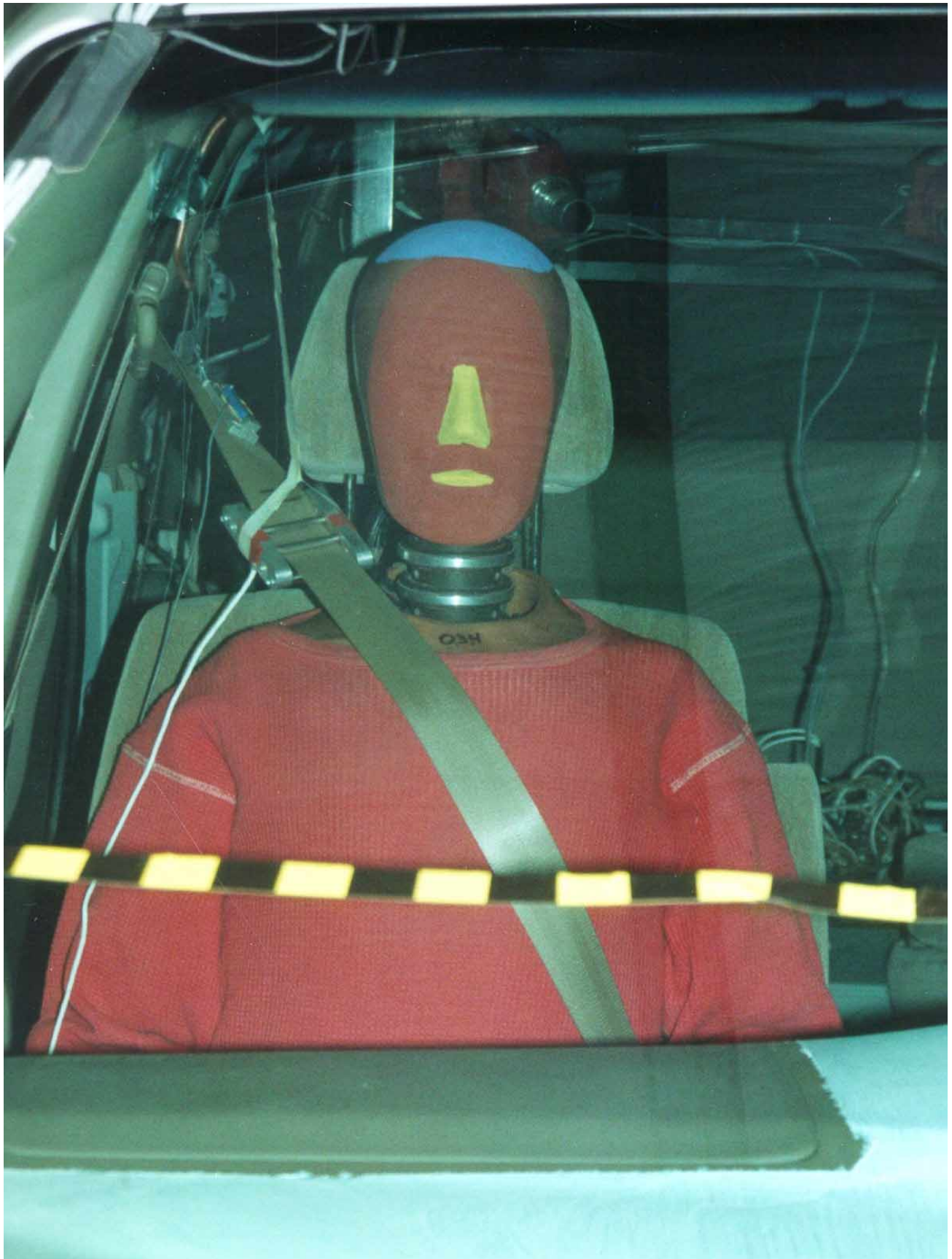


FIGURE A-41. PRE TEST PASSENGER DUMMY (FRONT VIEW)



FIGURE A-42. POST TEST PASSENGER DUMMY (FRONT VIEW)



FIGURE A-43. PRE TEST PASSENGER DUMMY (THRU WINDOW)

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FIGURE A-44. POST TEST PASSENGER DUMMY (THRU WINDOW)

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FIGURE A-45. PRE TEST PASSENGER DUMMY (DOOR OPEN)

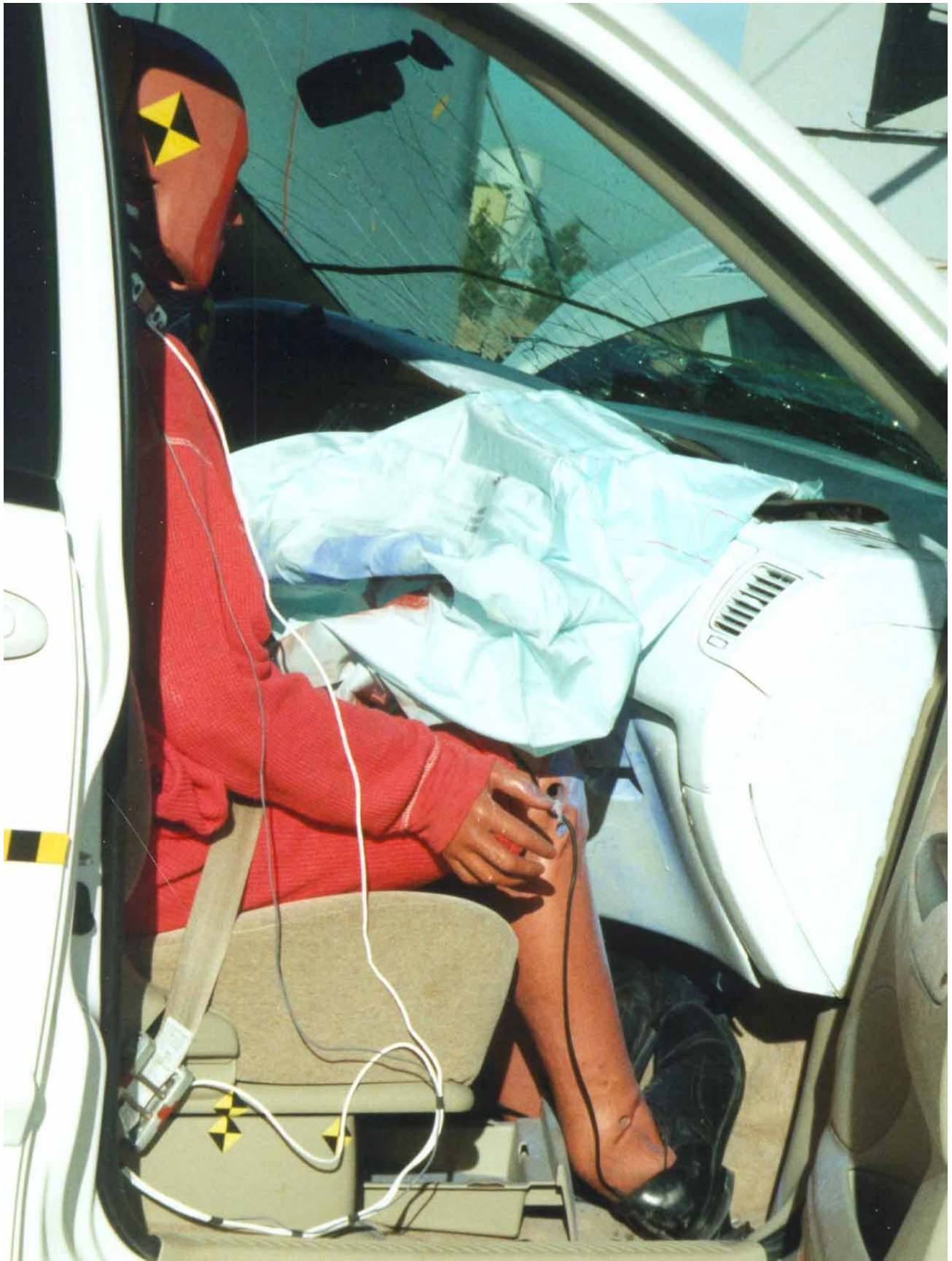


FIGURE A-46. POST TEST PASSENGER DUMMY (DOOR OPEN)

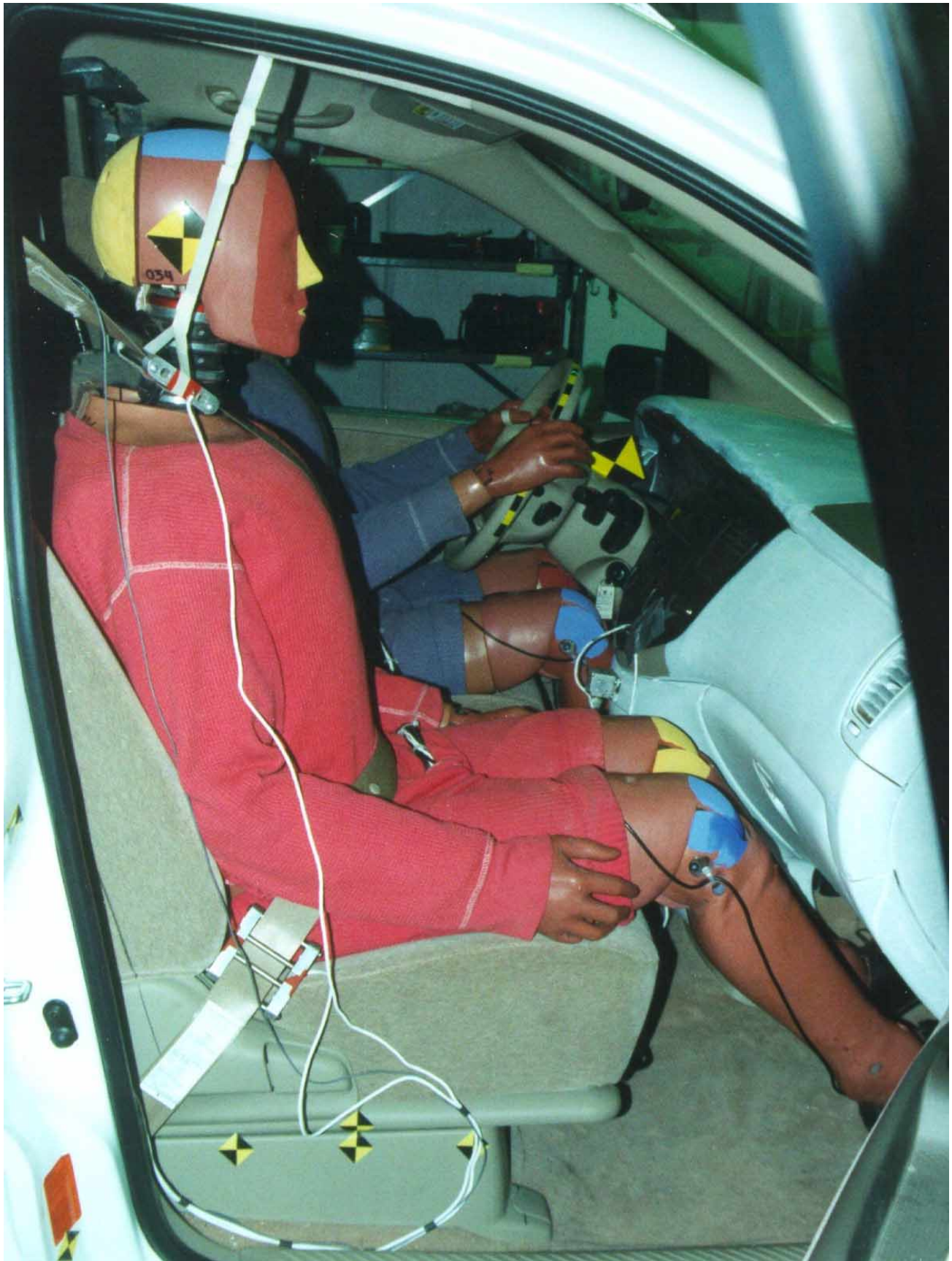


FIGURE A-47. PRE TEST PASSENGER DUMMY (90° TO VEHICLE)



FIGURE A-48. POST TEST PASSENGER DUMMY (90° TO VEHICLE)



FIGURE A-49. PRE TEST PASSENGER DUMMY FEET

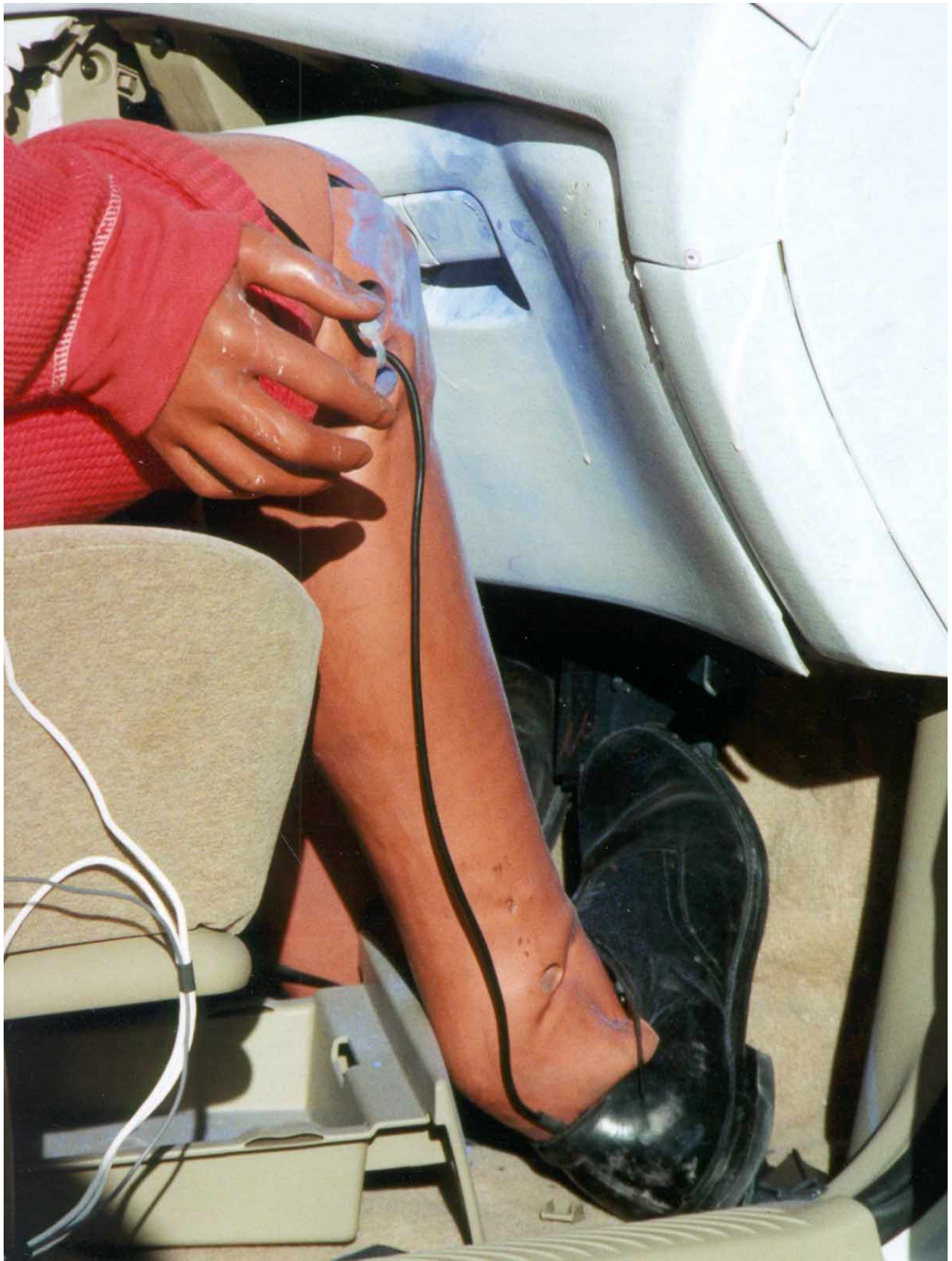


FIGURE A-50. POST TEST PASSENGER DUMMY FEET AND CONTACT POINT

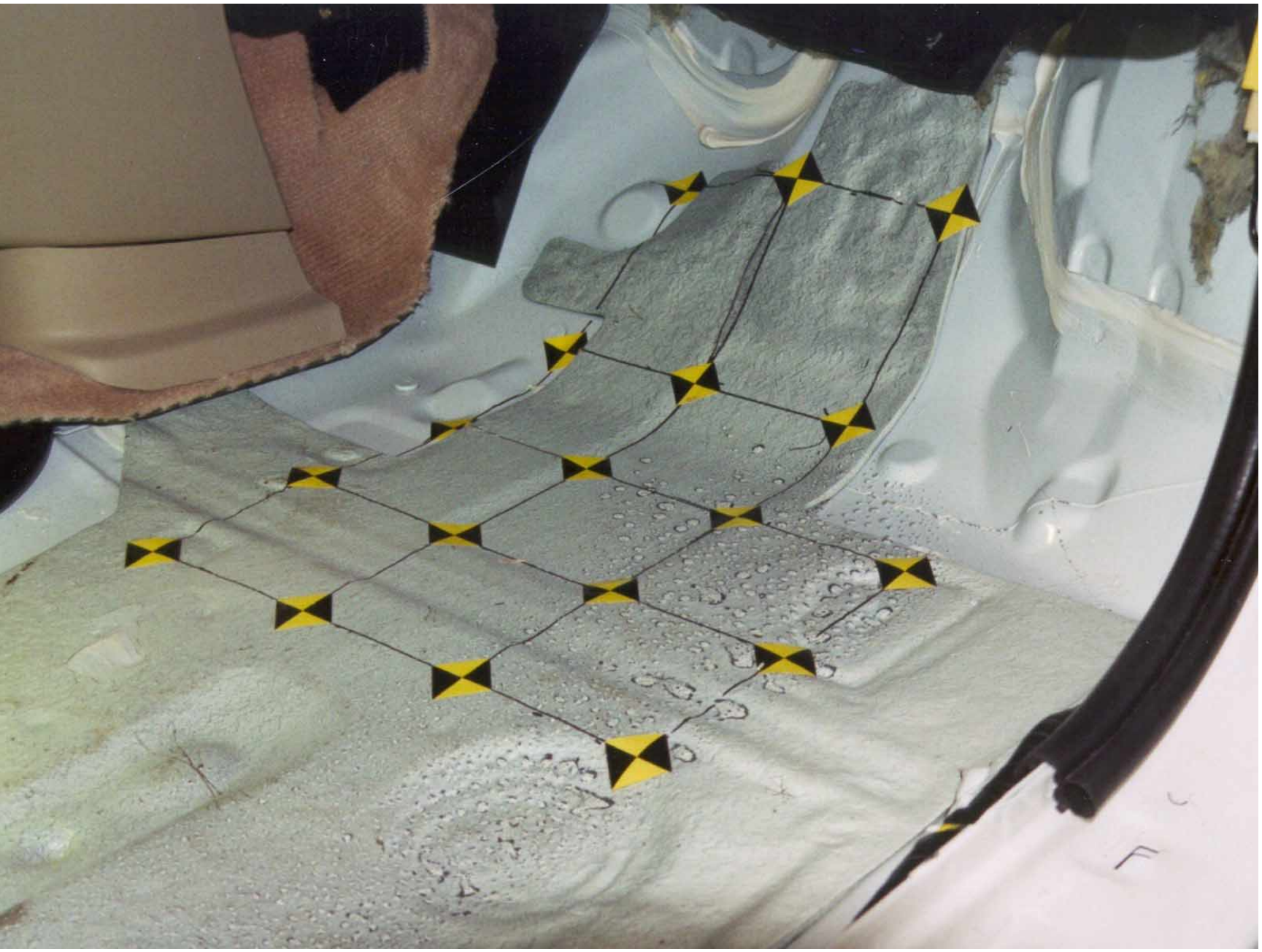


FIGURE A-51. PRETEST PASSENGER SIDE FLOOR PAN

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FIGURE A-52. POST TEST PASSENGER SIDE FLOOR PAN

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FIGURE A-53. PRE TEST PASSENGER SIDE KNEE BOLSTER

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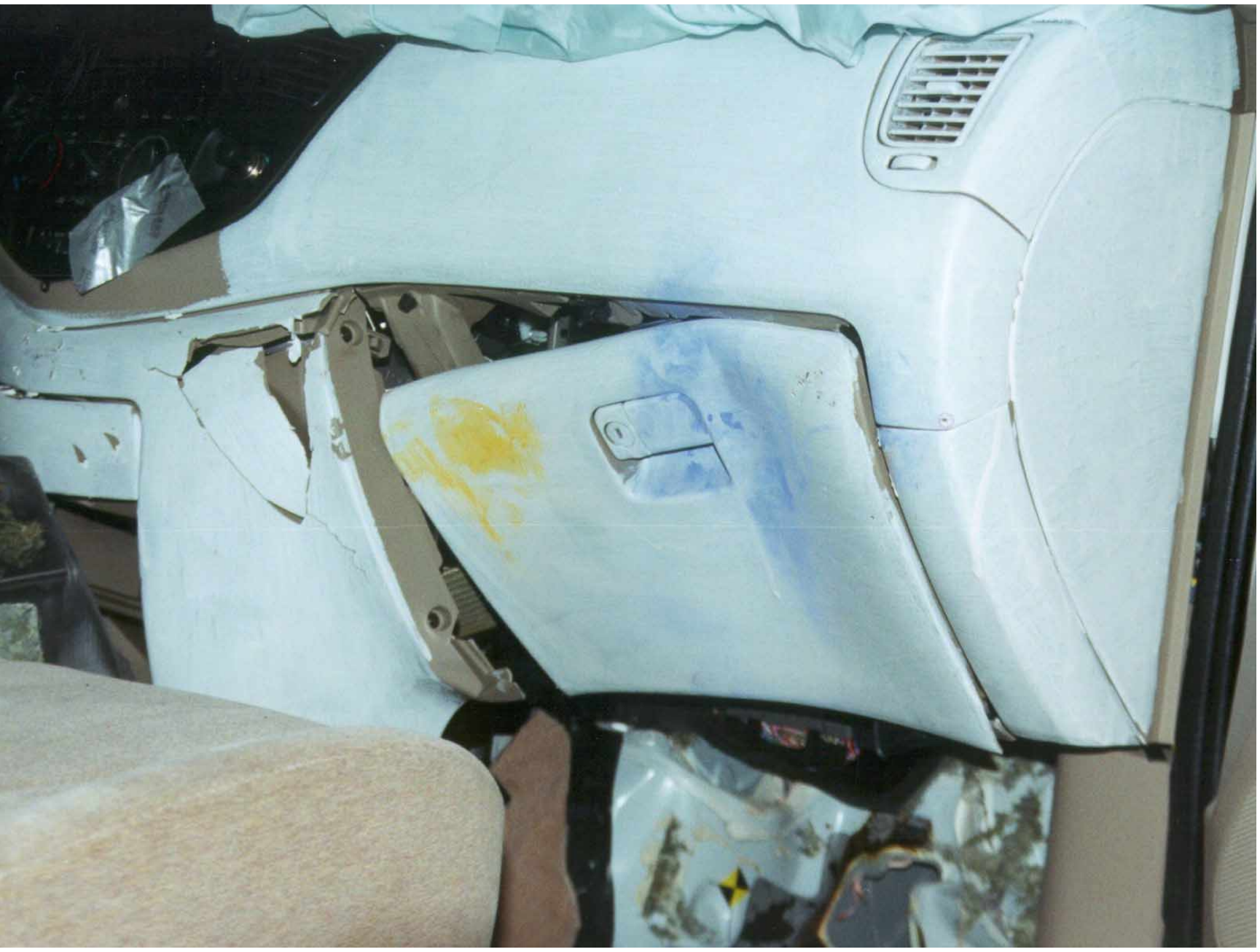


FIGURE A-54. POST TEST PASSENGER SIDE KNEE BOLSTER AND DUMMY CONTACT

A-54

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FIGURE A-55. POST TEST PASSENGER HEAD



FIGURE A-56. POST TEST PASSENGER DUMMY CONTACT



FIGURE A-57. VEHICLE ON ROLLOVER

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FIGURE A-58. VEHICLE DURING IMPACT

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**APPENDIX B**  
**DUMMY AND VEHICLE RESPONSE DATA TRACES**

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B-3 Driver Head Primary X Displacement	B-3
B-4 Driver Head Primary Y	B-4
B-5 Driver Head Primary Z	B-5
B-6 Driver Head Resultant Primary	B-6
B-7 Driver Head Redundant X	B-7
B-8 Driver Head Redundant X Velocity	B-8
B-9 Driver Head Redundant X Displacement	B-9
B-10 Driver Head Redundant Y	B-10
B-11 Driver Head Redundant Z	B-11
B-12 Driver Head Resultant Redundant	B-12
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B-14 Driver Neck Force Y	B-14
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B-18 Driver Neck Moment Y	B-18
B-19 Driver Neck Moment Z	B-19
B-20 Driver Neck Moment Resultant	B-20
B-21 Driver Chest Primary X	B-21
B-22 Driver Chest Primary X Velocity	B-22
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B-24 Driver Chest Primary Y	B-24
B-25 Driver Chest Primary Z	B-25
B-26 Driver Chest Primary Resultant	B-26
B-27 Driver Chest Redundant X	B-27
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B-29 Driver Chest Redundant X Displacement	B-29
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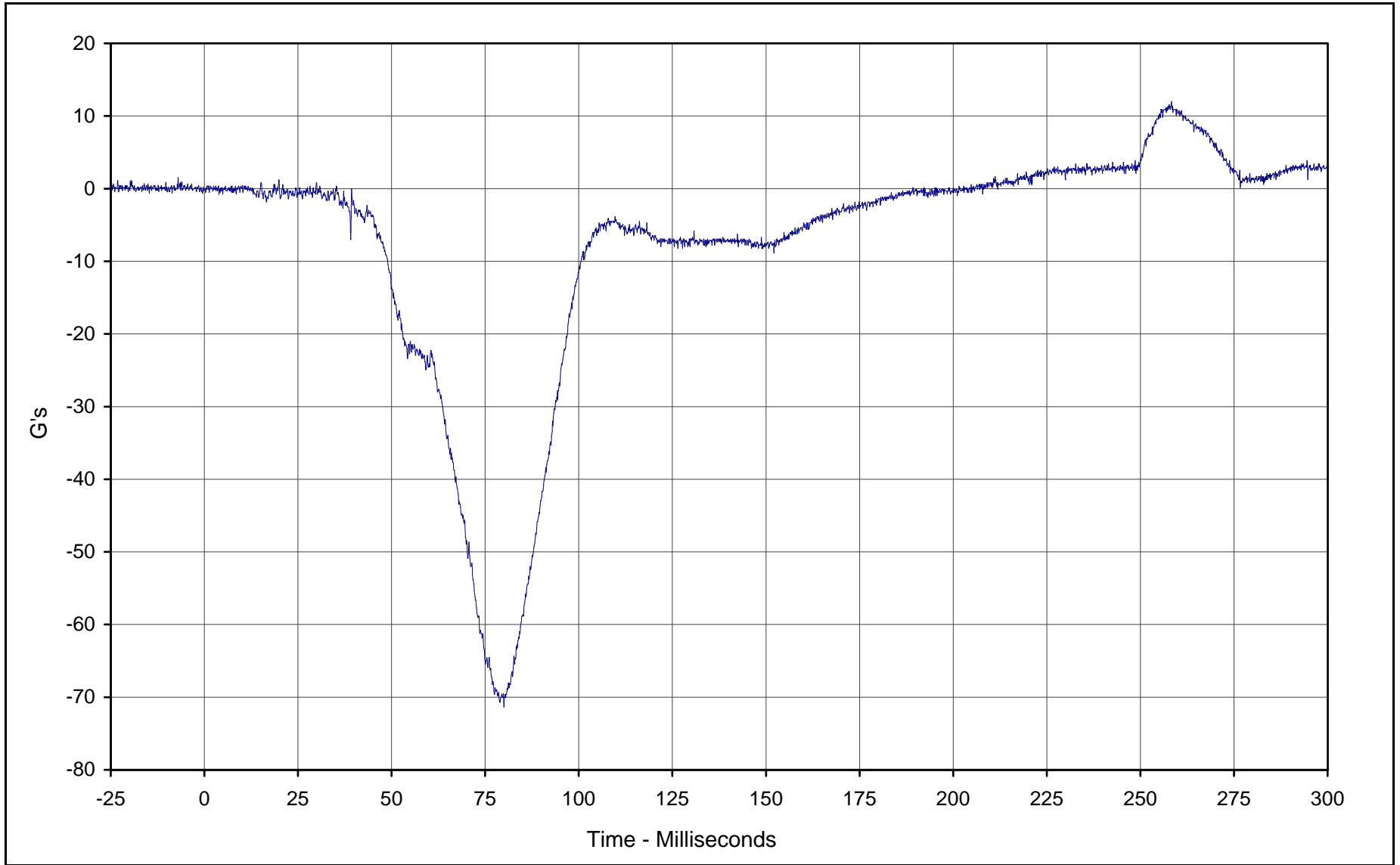
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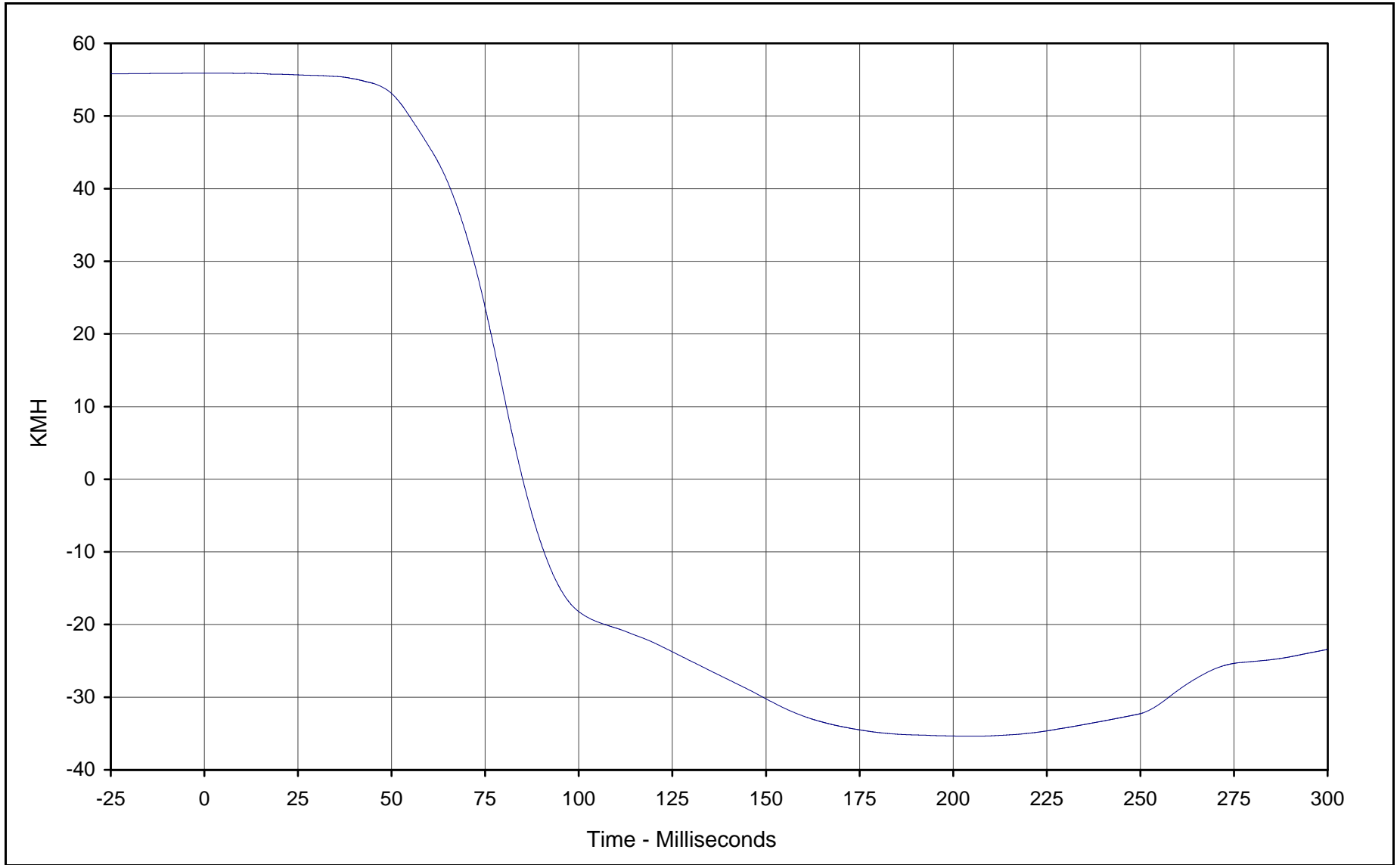


Curve Description: Driver Head Primary X  
Maximum Value: 12.0 at 258.3 Milliseconds  
Minimum Value: -71.4 at 80.0 Milliseconds  
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Date of Test: 1/13/00  
Curve Number: FIL-001

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



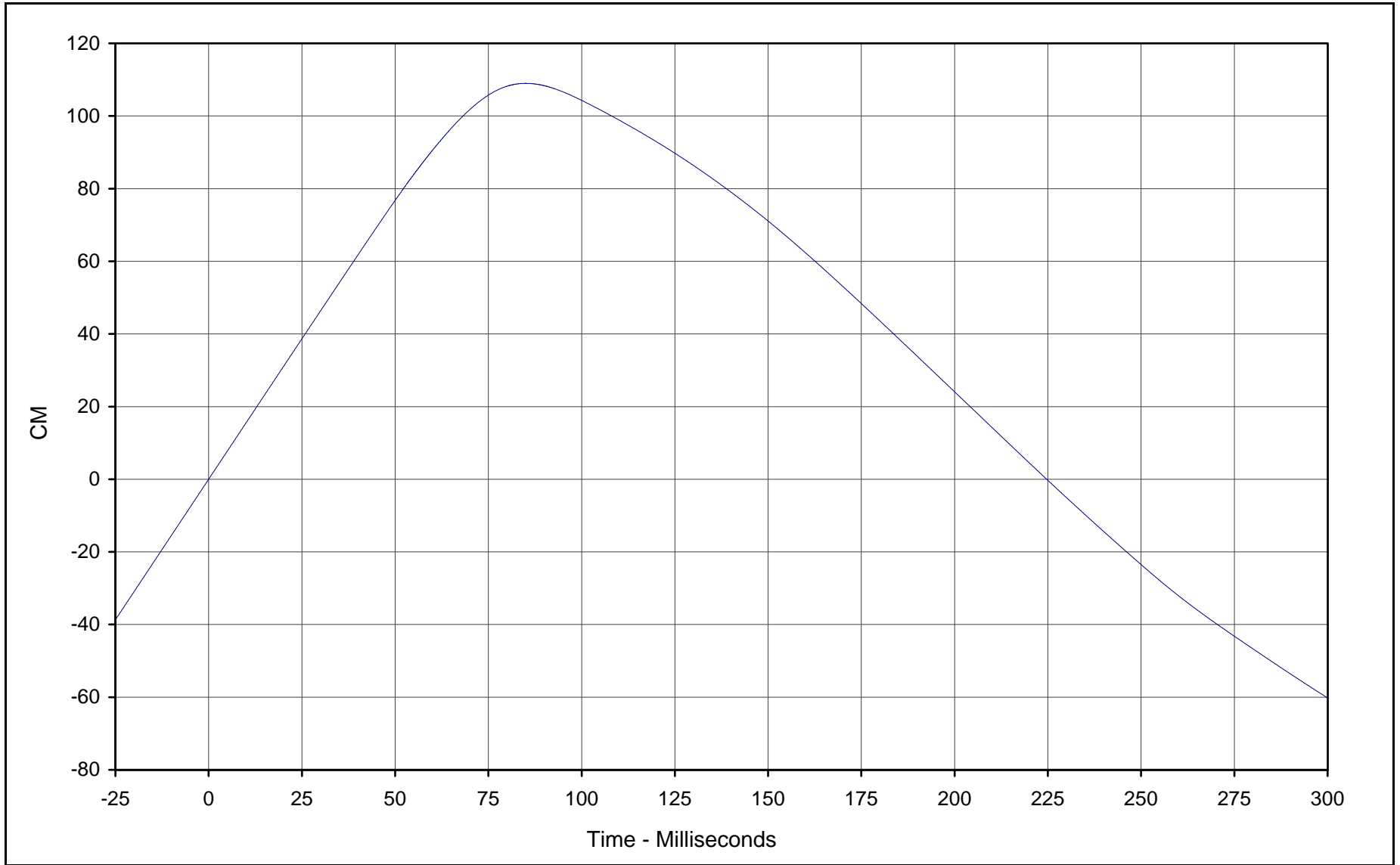
KARR20001-08



Curve Description: Driver Head Primary X Velocity  
Maximum Value: 55.9 at 2.8 Milliseconds  
Minimum Value: -35.4 at 205.2 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-001

Testing Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

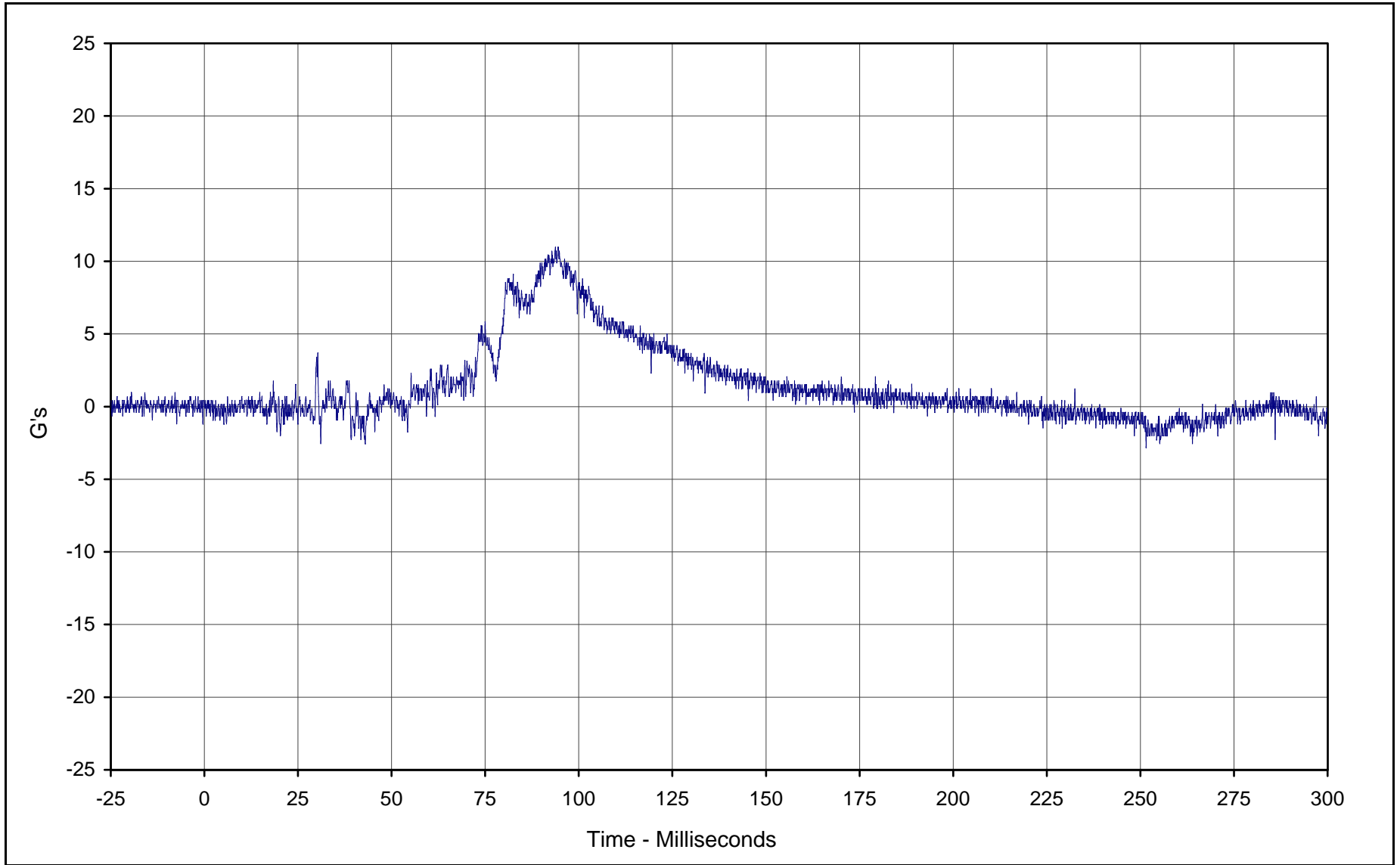




Curve Description: Driver Head Primary X Displ.  
 Maximum Value: 109.0 at 85.0 Milliseconds  
 Minimum Value: -60.1 at 299.9 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: IN2-001

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



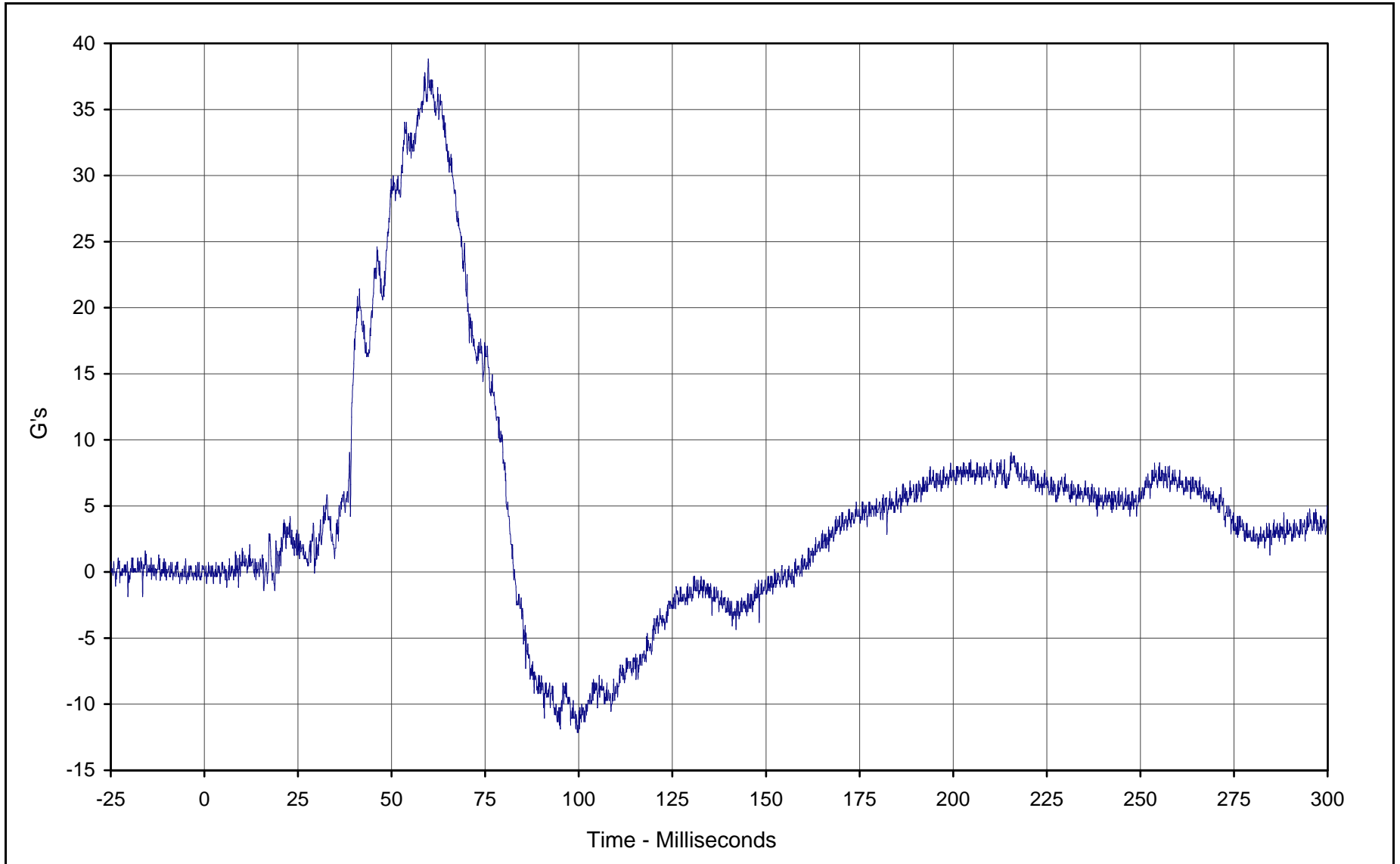


Curve Description: Driver Head Primary Y  
 Maximum Value: 11.0 at 93.8 Milliseconds  
 Minimum Value: -2.8 at 251.5 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: FIL-002

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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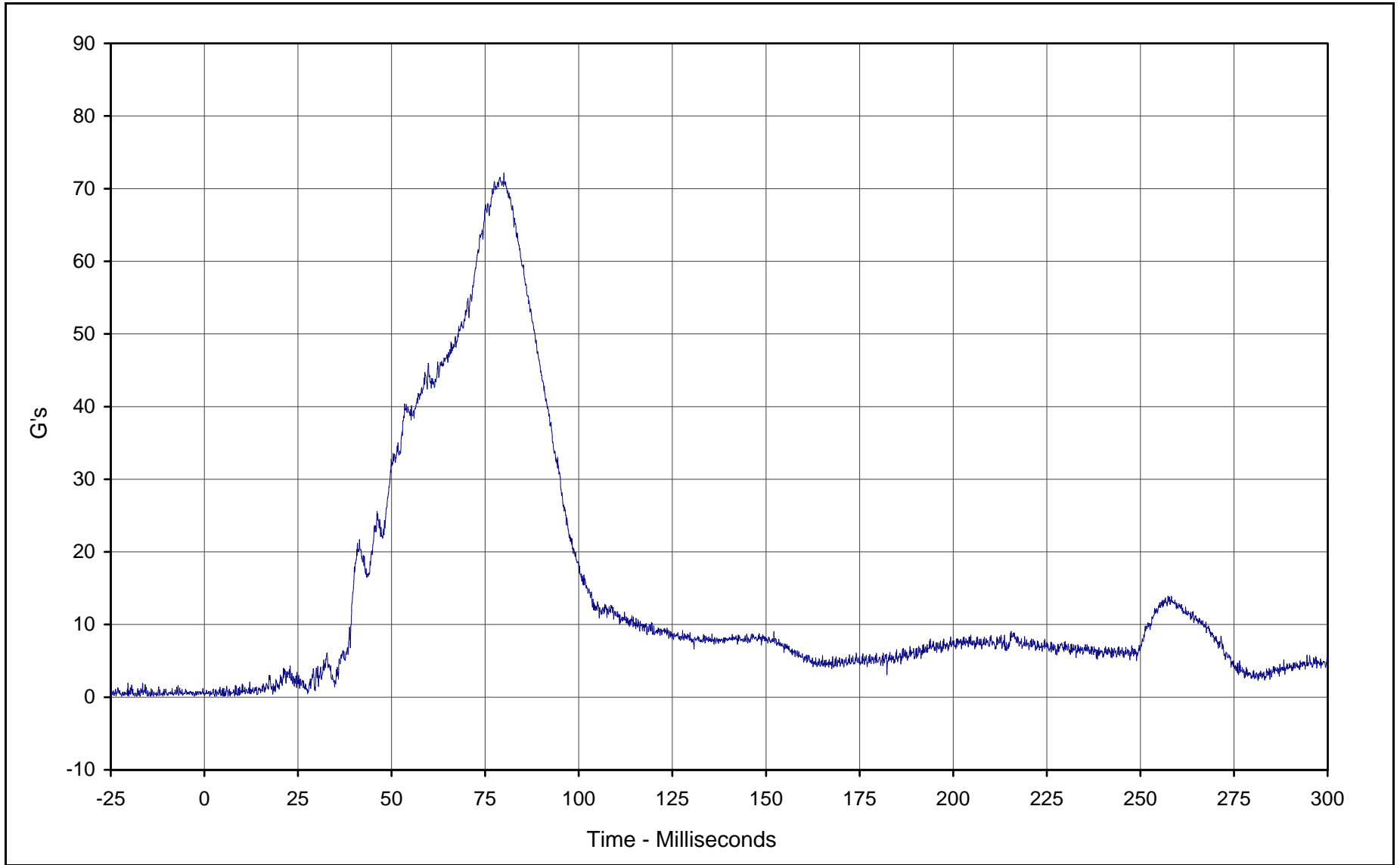


Curve Description: Driver Head Primary Z  
Maximum Value: 38.8 at 59.8 Milliseconds  
Minimum Value: -12.1 at 99.6 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-003

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



KARR20001-08

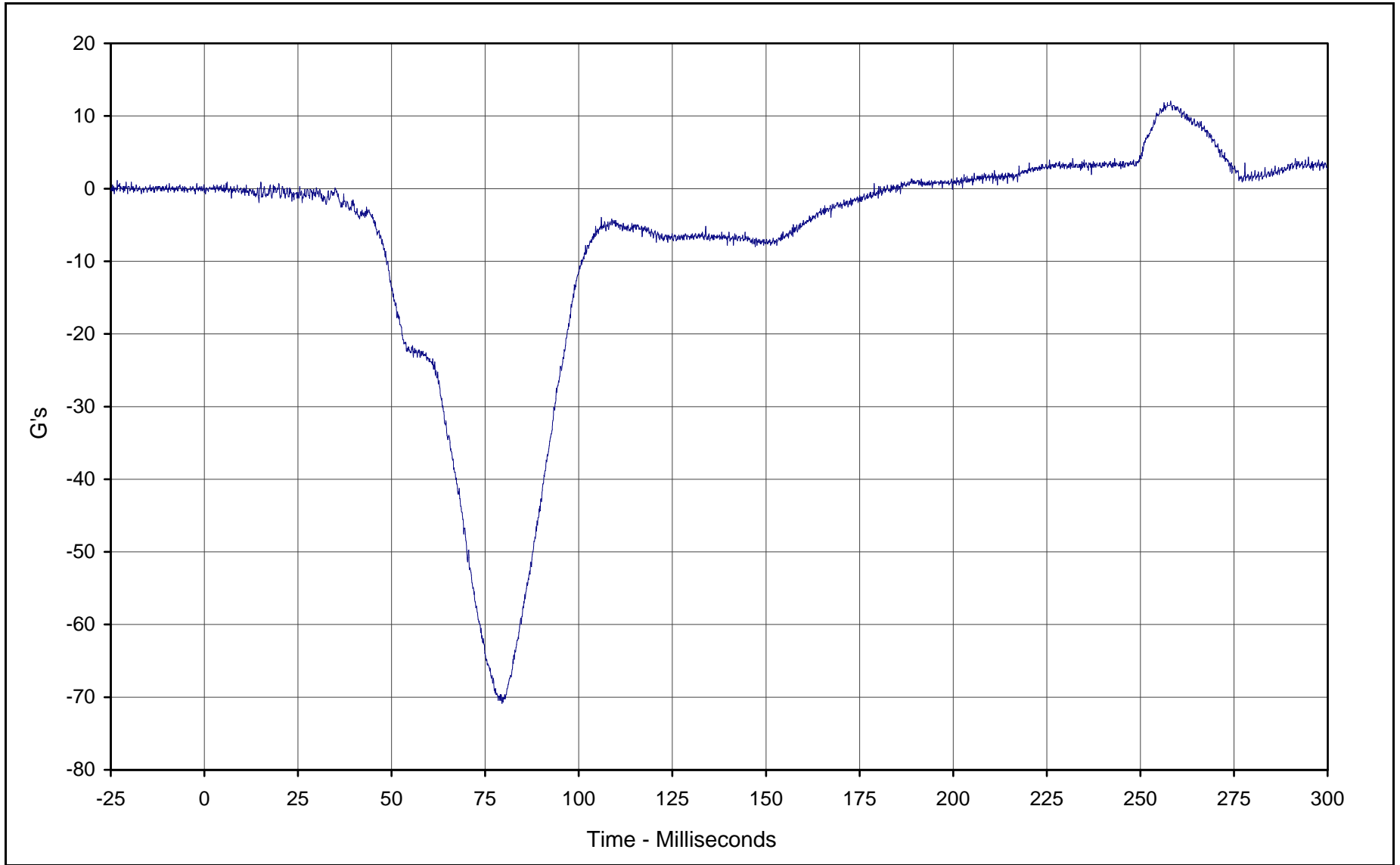


Curve Description: Driver Head Resultant Primary  
 Maximum Value: 72.1 at 80.0 Milliseconds  
 Minimum Value: 0.2 at 1.4 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: RES-001

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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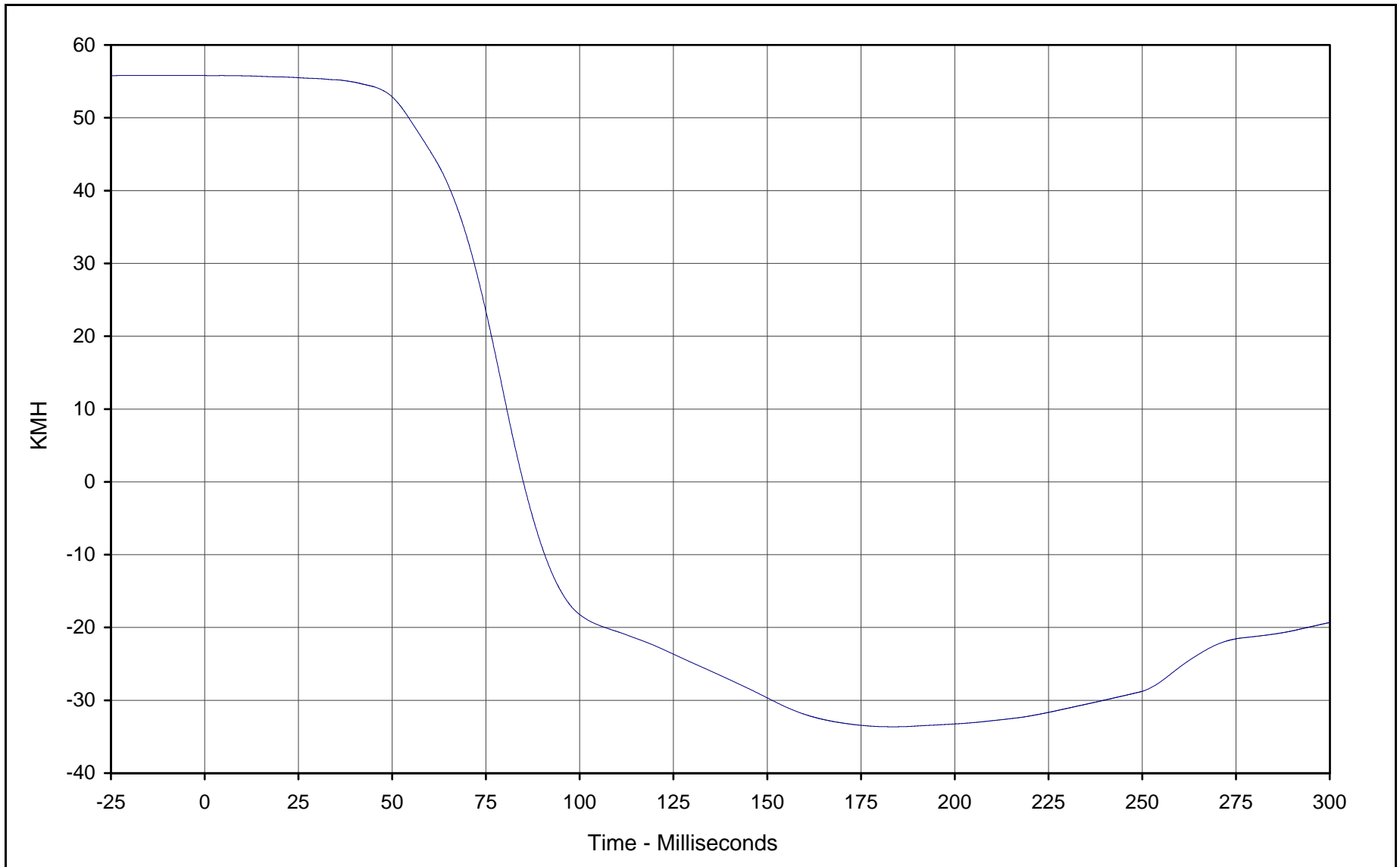


Curve Description: Driver Head Redundant X  
Maximum Value: 12.1 at 258.1 Milliseconds  
Minimum Value: -70.9 at 79.5 Milliseconds  
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Date of Test: 1/13/00  
Curve Number: FIL-004

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



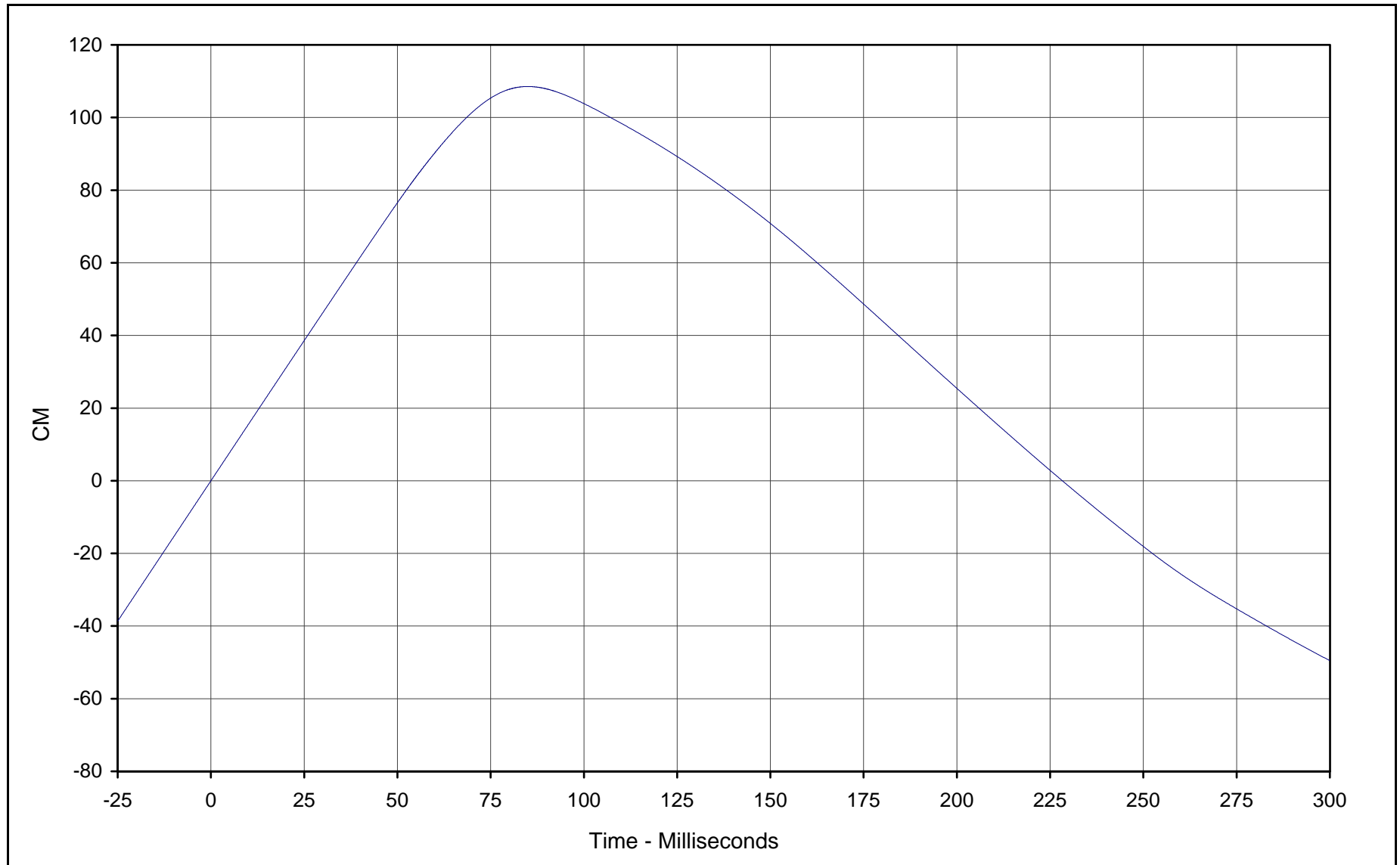
KARR20001-08



Curve Description: Driver Head Redundant X Velocity  
Maximum Value: 55.8 at 0.0 Milliseconds  
Minimum Value: -33.6 at 183.5 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-004

Testing Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



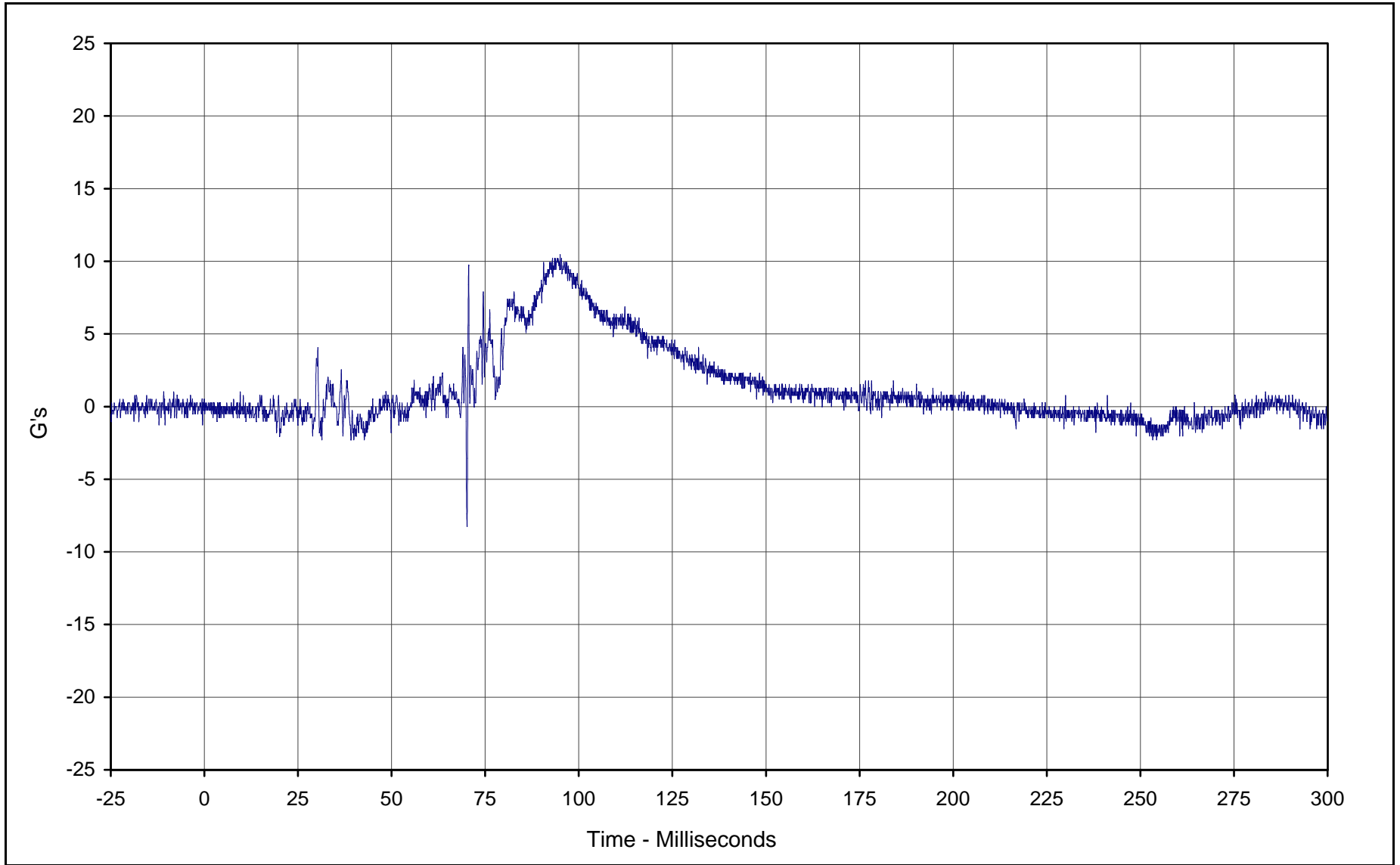


Curve Description: Driver Head Redundant X Displ.  
 Maximum Value: 108.5 at 84.9 Milliseconds  
 Minimum Value: -49.5 at 299.9 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: IN2-004

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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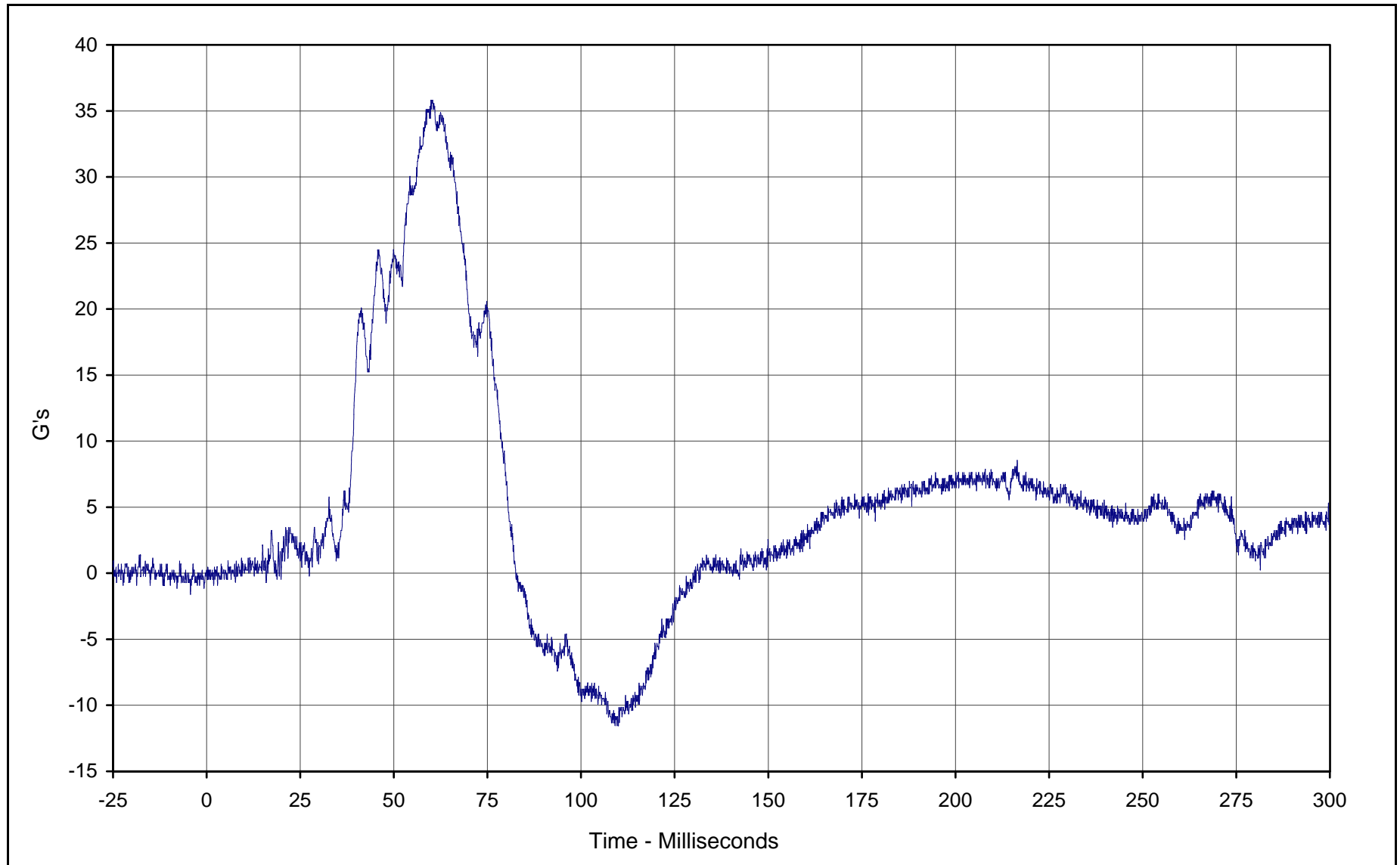


Curve Description: Driver Head Redundant Y  
Maximum Value: 10.4 at 95.0 Milliseconds  
Minimum Value: -8.2 at 70.2 Milliseconds  
SAE Filter Class: 1000  
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Curve Number: FIL-005

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



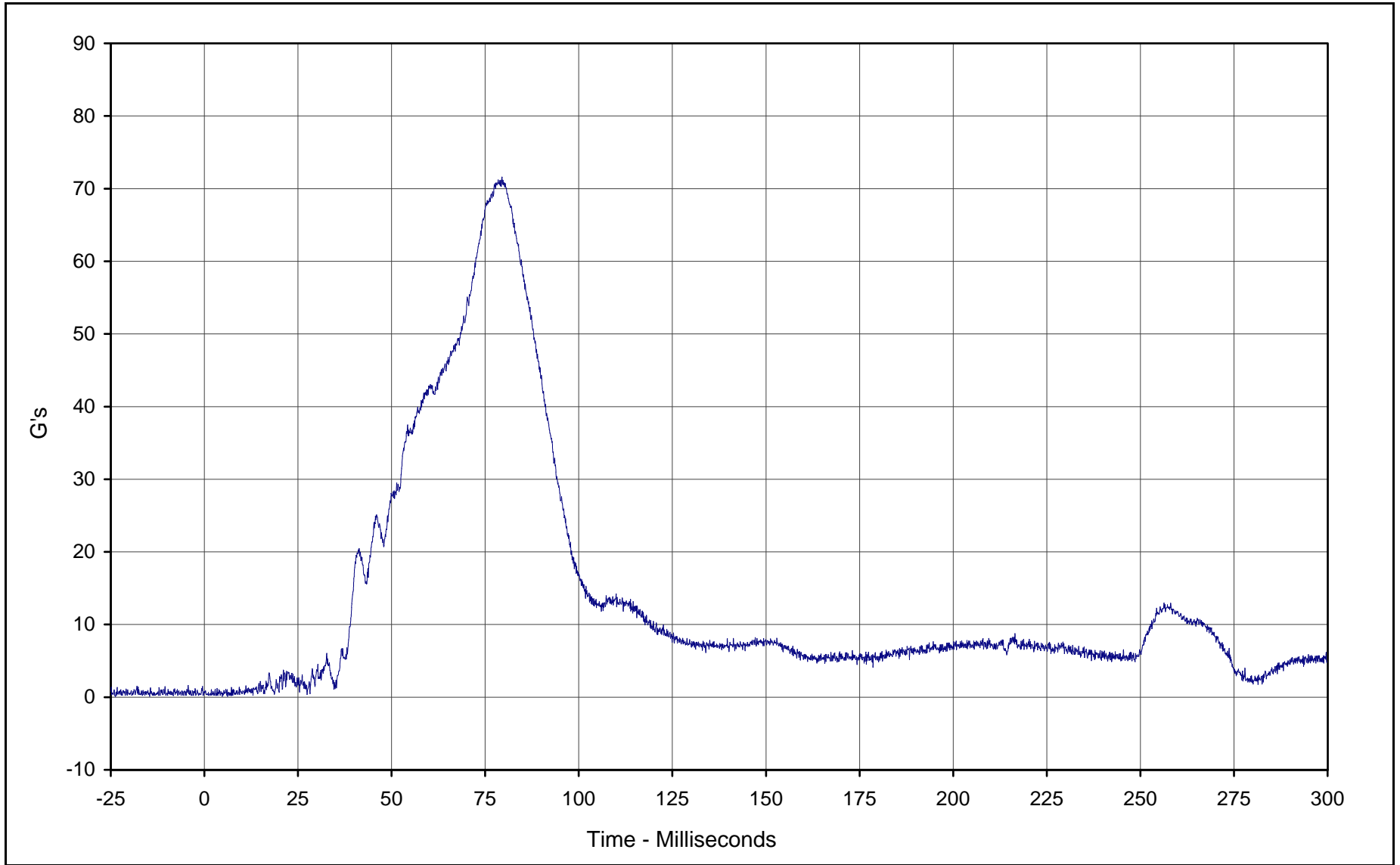
KARR20001-08



Curve Description: Driver Head Redundant Z  
 Maximum Value: 35.8 at 59.9 Milliseconds  
 Minimum Value: -11.6 at 109.1 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: FIL-006

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

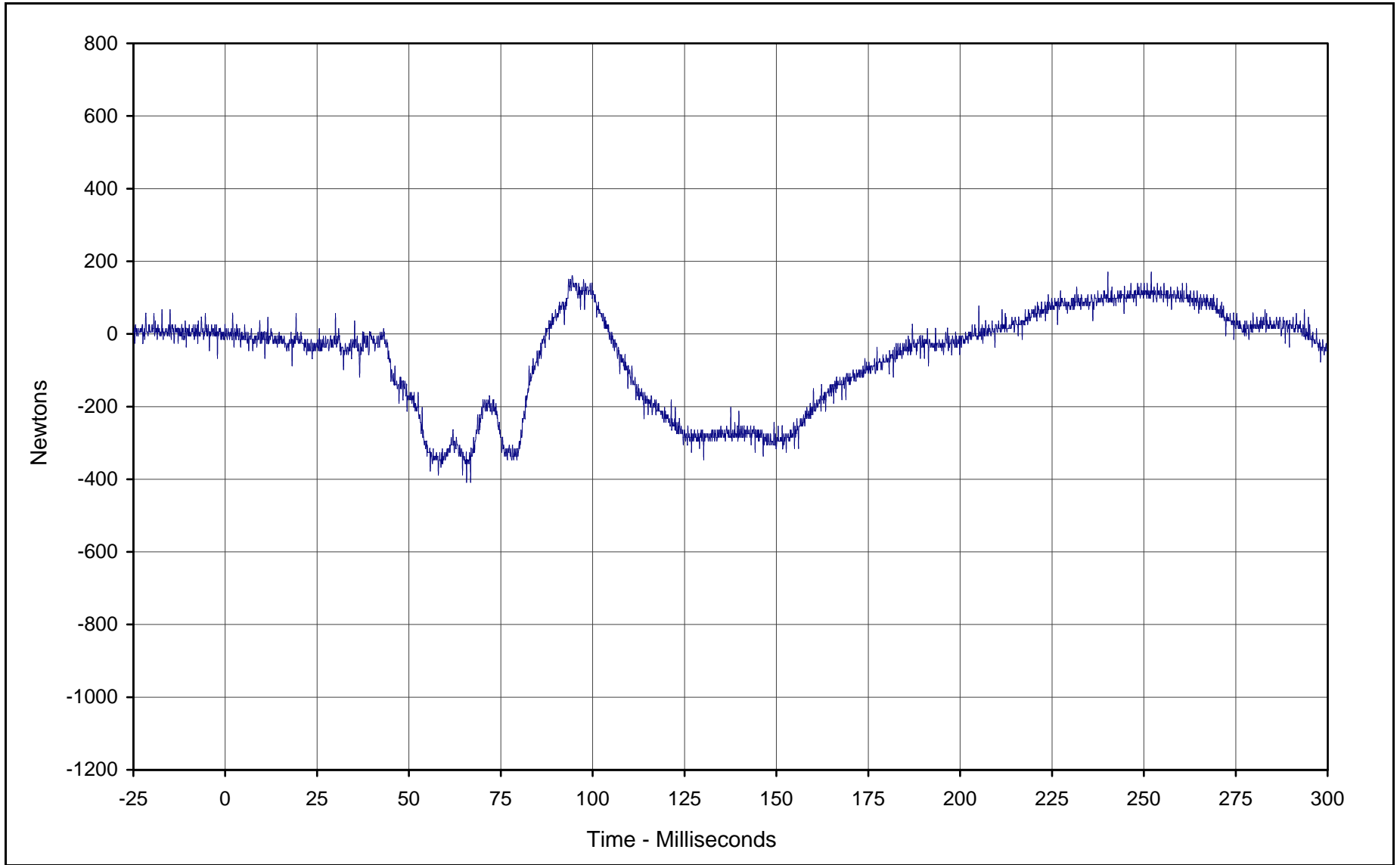




Curve Description: Driver Head Resultant Redundant  
 Maximum Value: 71.6 at 79.5 Milliseconds  
 Minimum Value: 0.1 at 4.8 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: RES-004

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

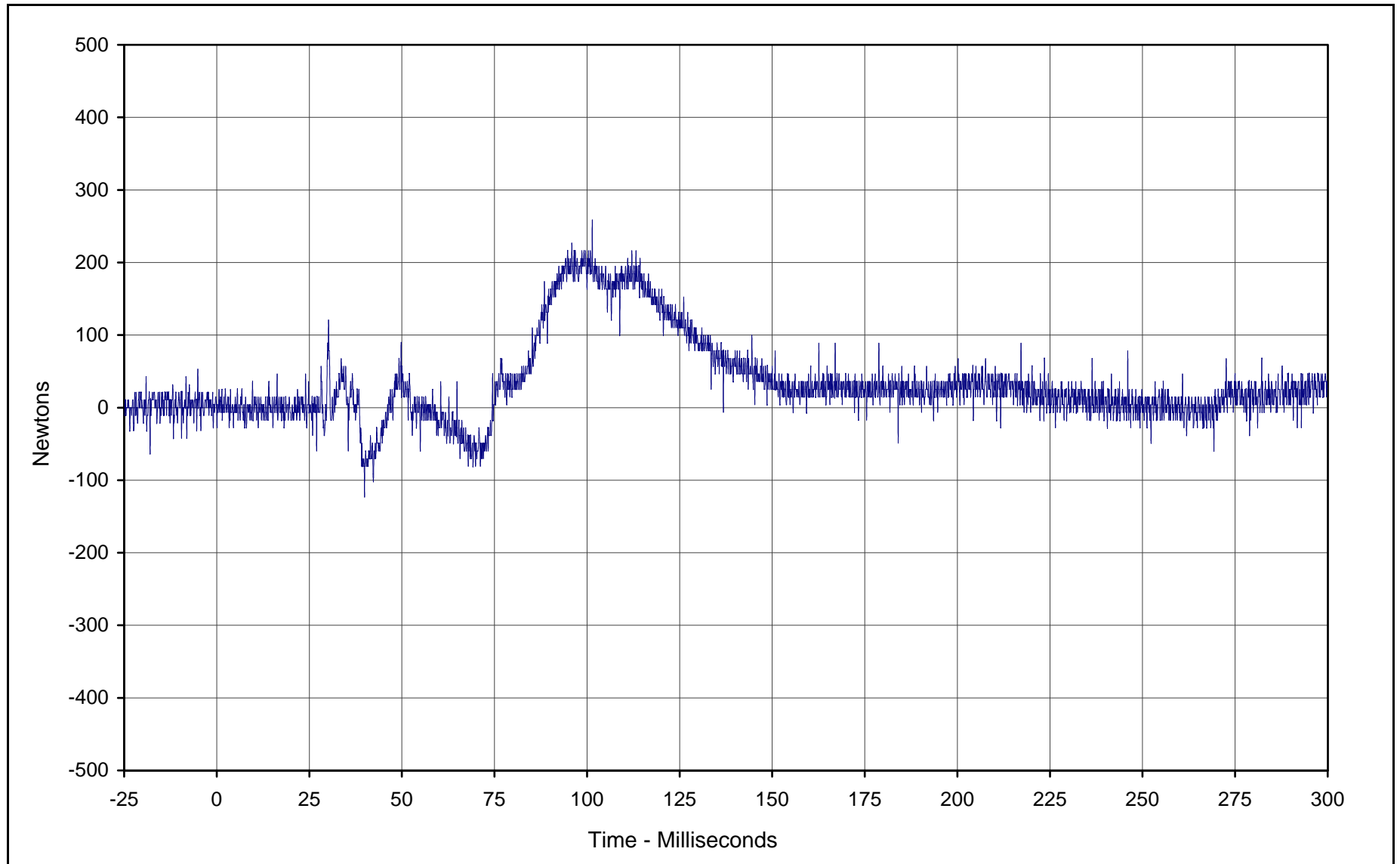




Curve Description: Driver Neck Force X  
Maximum Value: 170.6 at 240.2 Milliseconds  
Minimum Value: -409.0 at 65.7 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-007

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

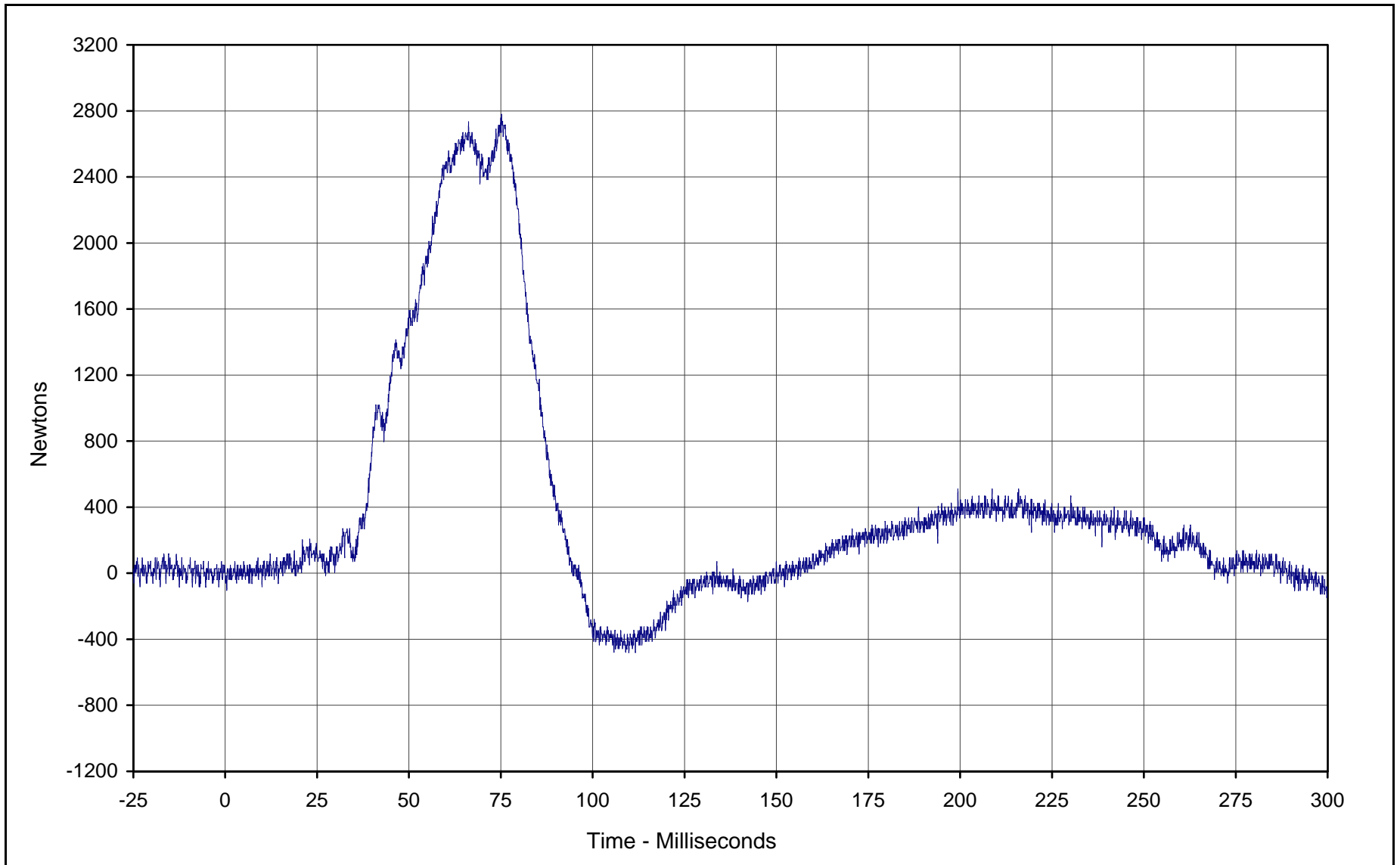




Curve Description: Driver Neck Force Y  
Maximum Value: 258.7 at 101.4 Milliseconds  
Minimum Value: -123.4 at 39.9 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-008

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

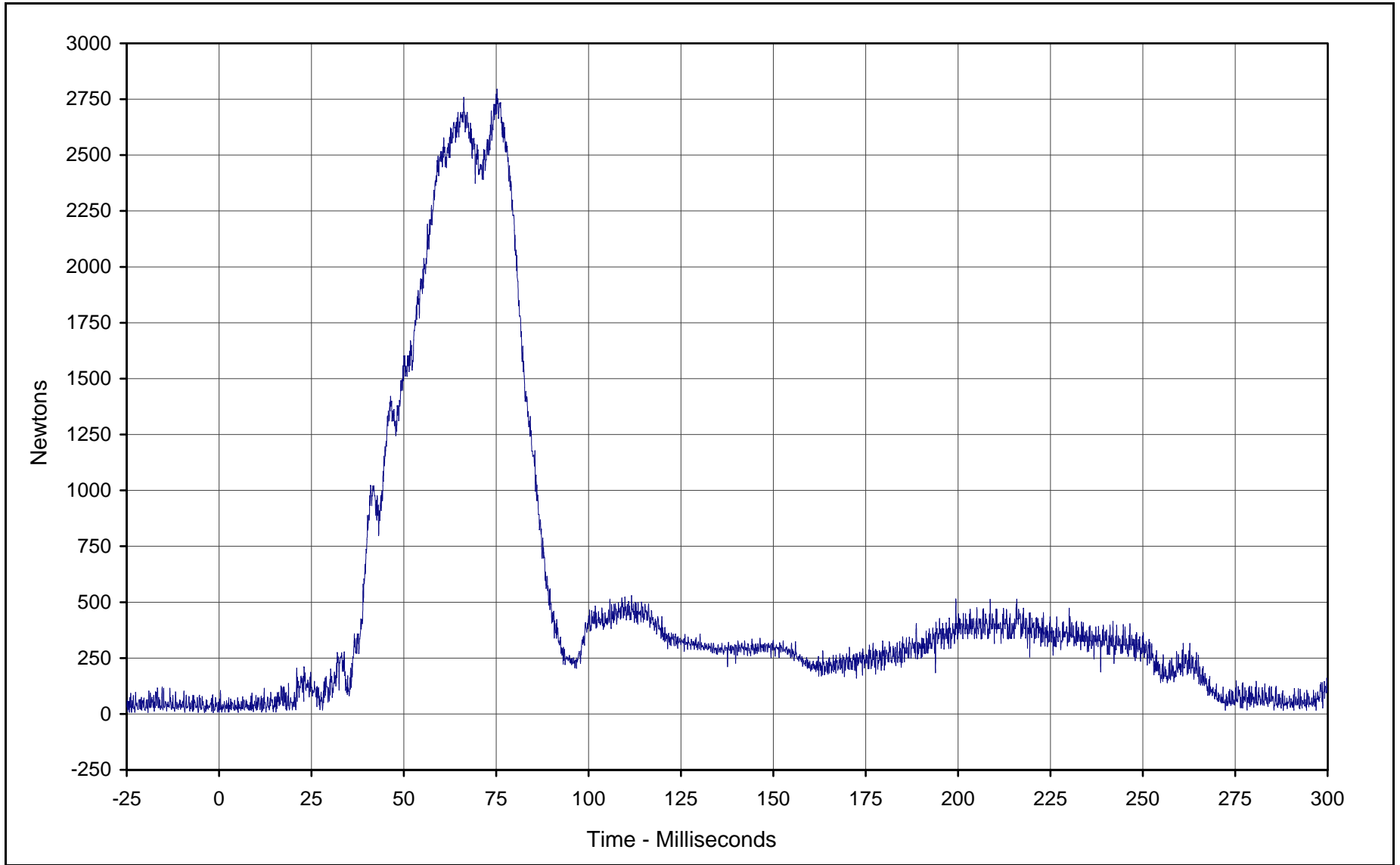




Curve Description: Driver Neck Force Z  
 Maximum Value: 2779.0 at 75.2 Milliseconds  
 Minimum Value: -479.4 at 105.8 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: FIL-009

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

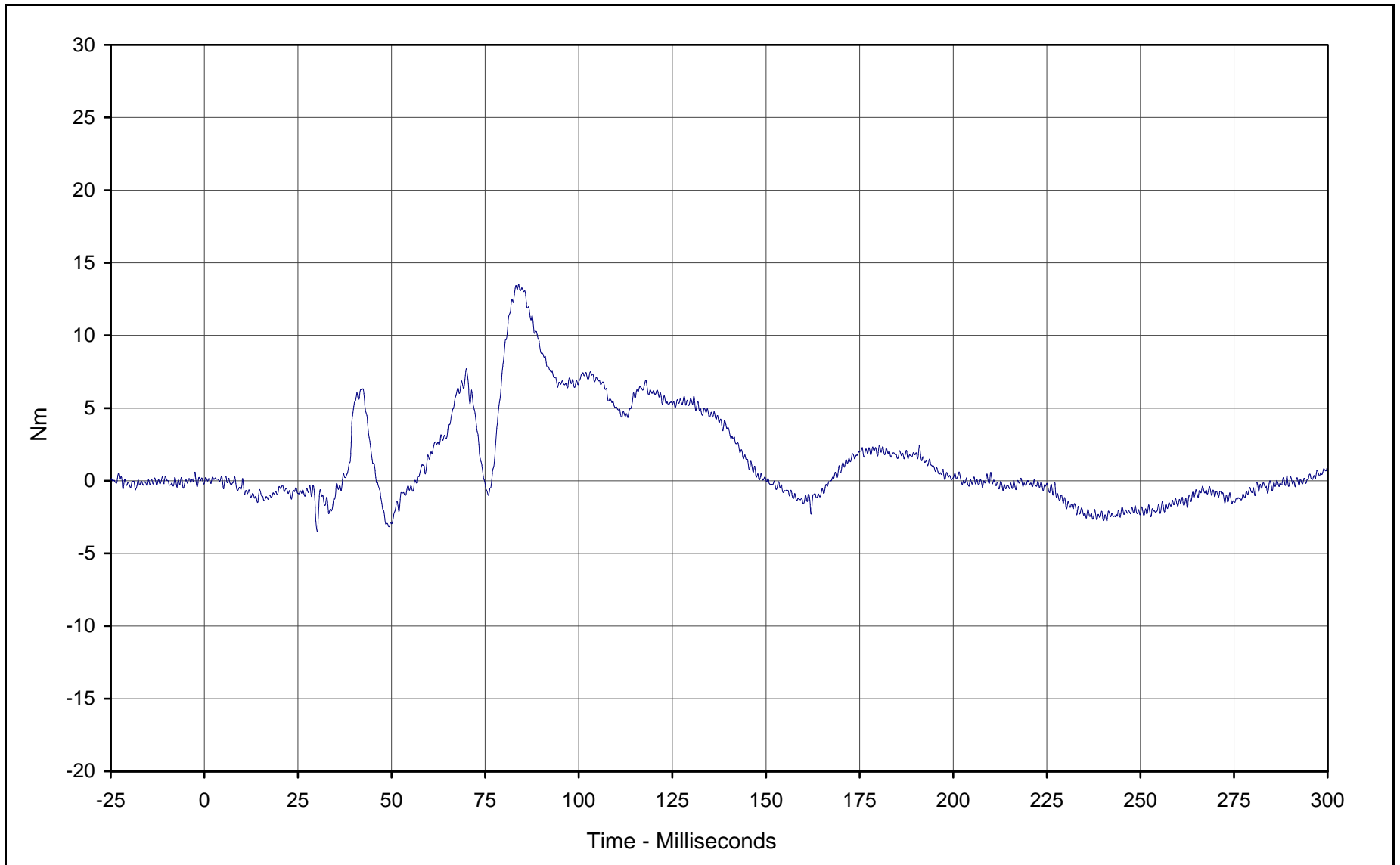




Curve Description: Driver Neck Force Resultant  
Maximum Value: 2793.8 at 75.2 Milliseconds  
Minimum Value: 8.1 at 0.7 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: RES-007

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

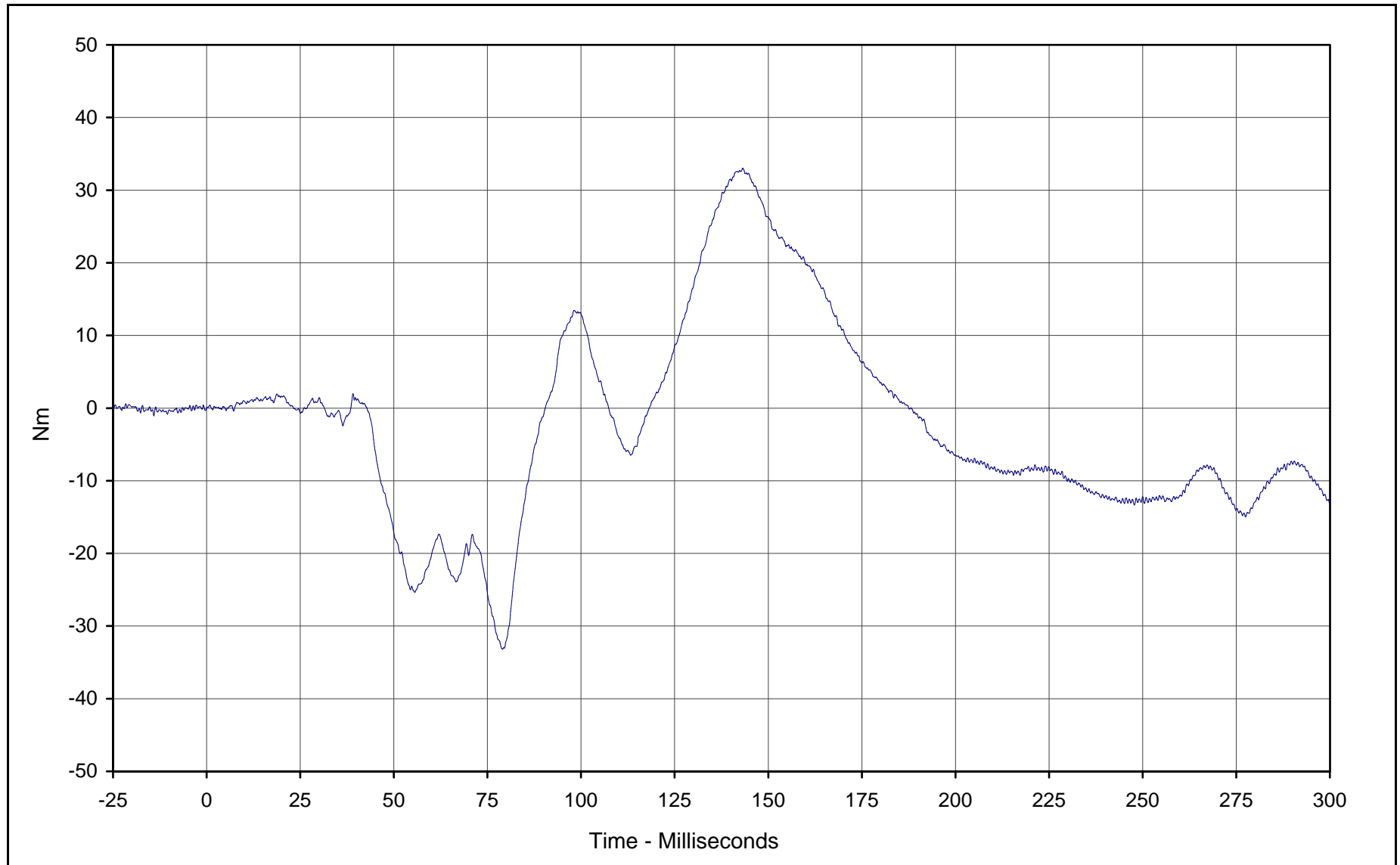




Curve Description: Driver Neck Moment X  
Maximum Value: 13.5 at 83.9 Milliseconds  
Minimum Value: -3.5 at 30.1 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-010

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

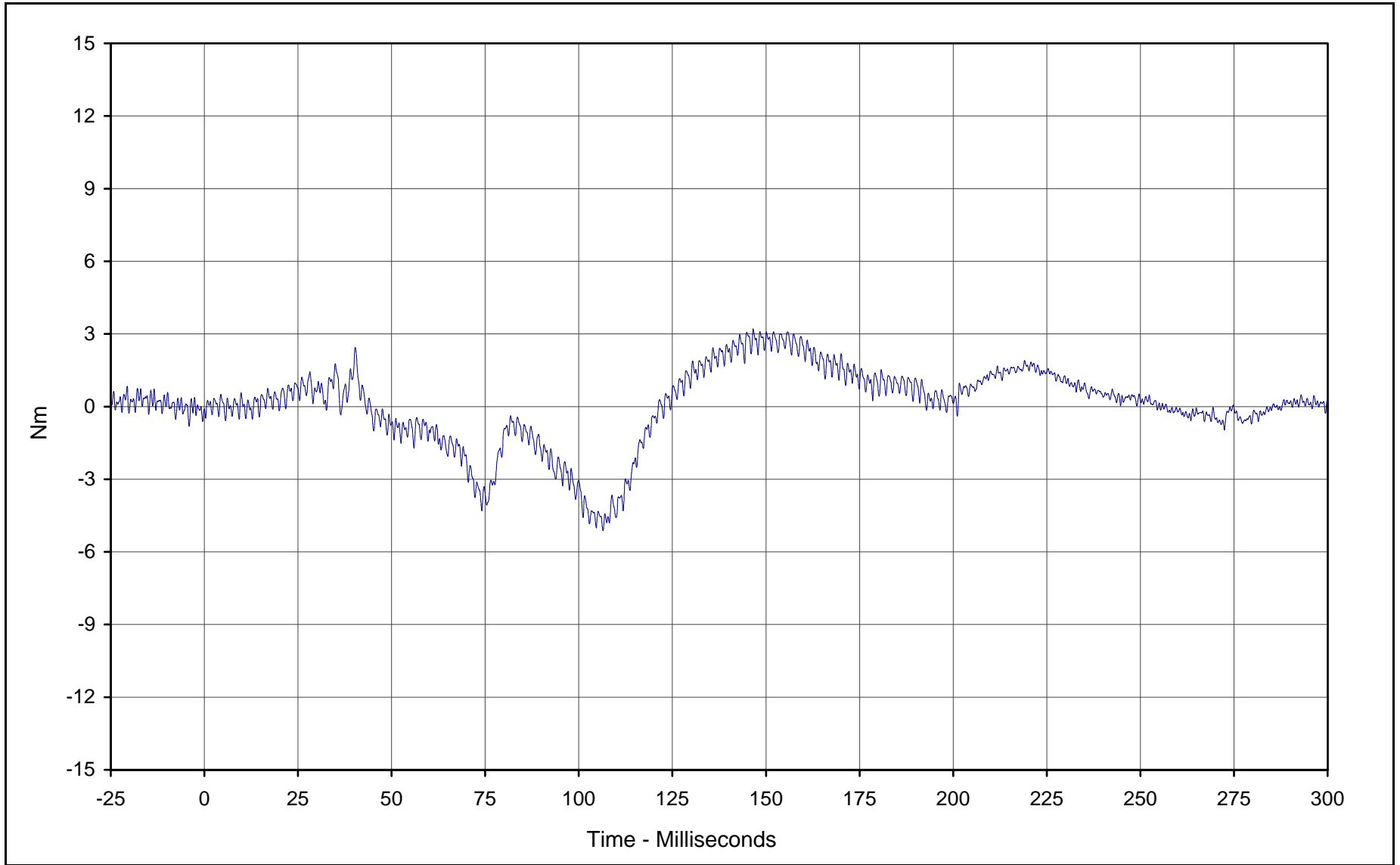




Curve Description: Driver Neck Moment Y  
Maximum Value: 33.0 at 143.2 Milliseconds  
Minimum Value: -33.2 at 79.0 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-011

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

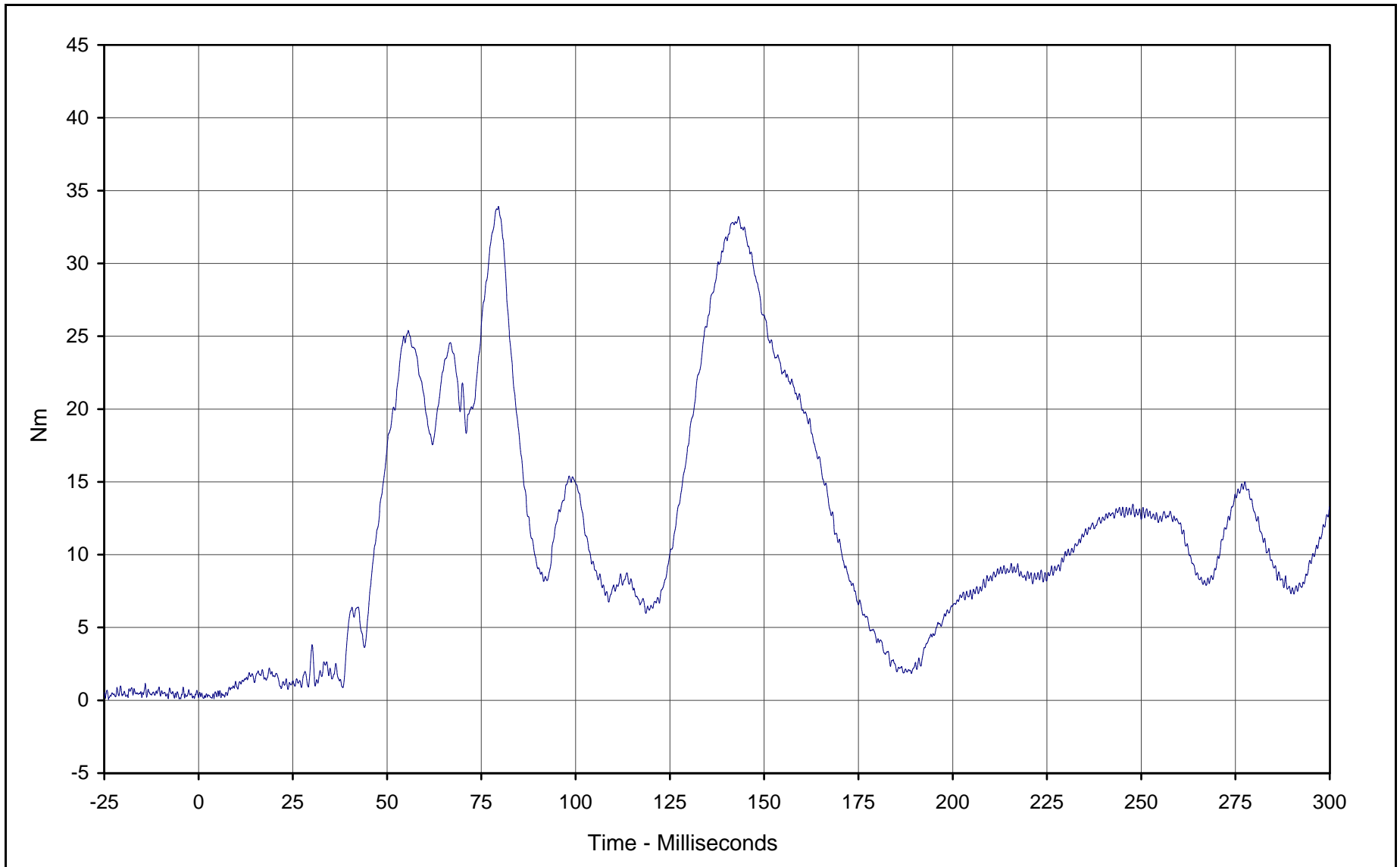




Curve Description: Driver Neck Moment Z  
 Maximum Value: 3.2 at 146.6 Milliseconds  
 Minimum Value: -5.1 at 106.5 Milliseconds  
 SAE Filter Class: 600  
 Date of Test: 1/13/00  
 Curve Number: FIL-012

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



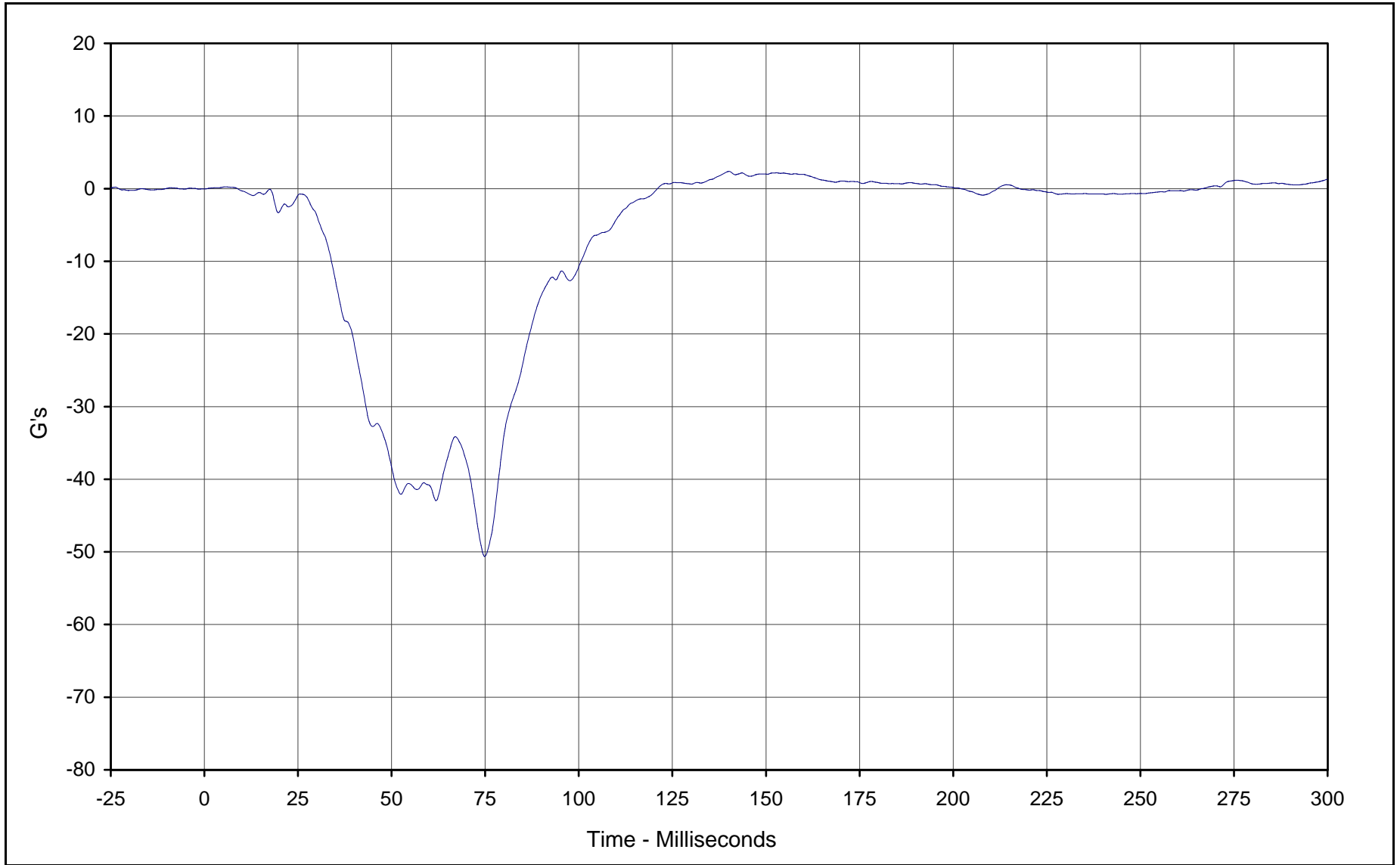


Curve Description: Driver Neck Moment Resultant  
Maximum Value: 33.9 at 79.5 Milliseconds  
Minimum Value: 0.1 at 4.1 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: RES-010

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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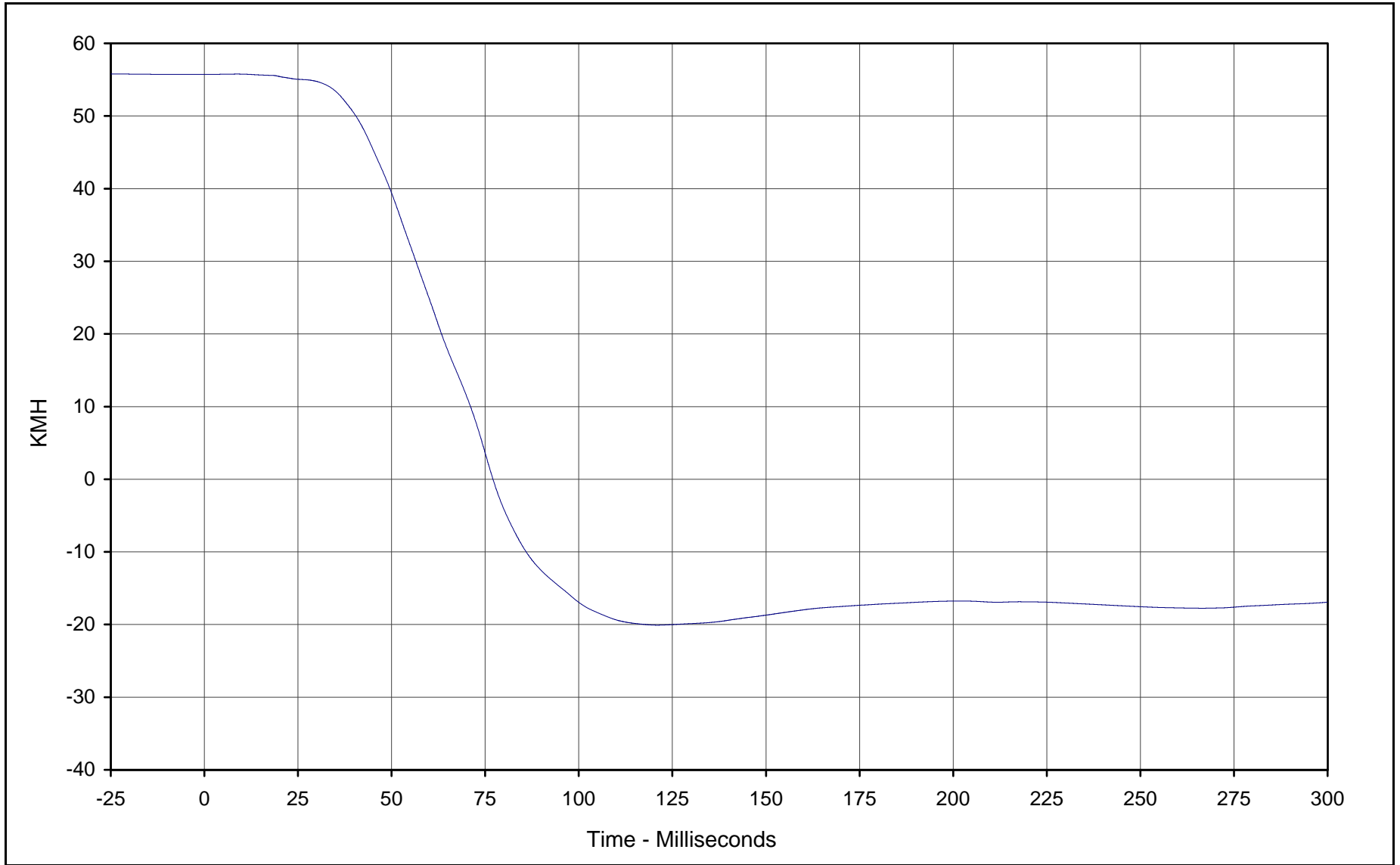


Curve Description: Driver Chest Primary X  
Maximum Value: 2.4 at 140.1 Milliseconds  
Minimum Value: -50.6 at 74.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-013

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



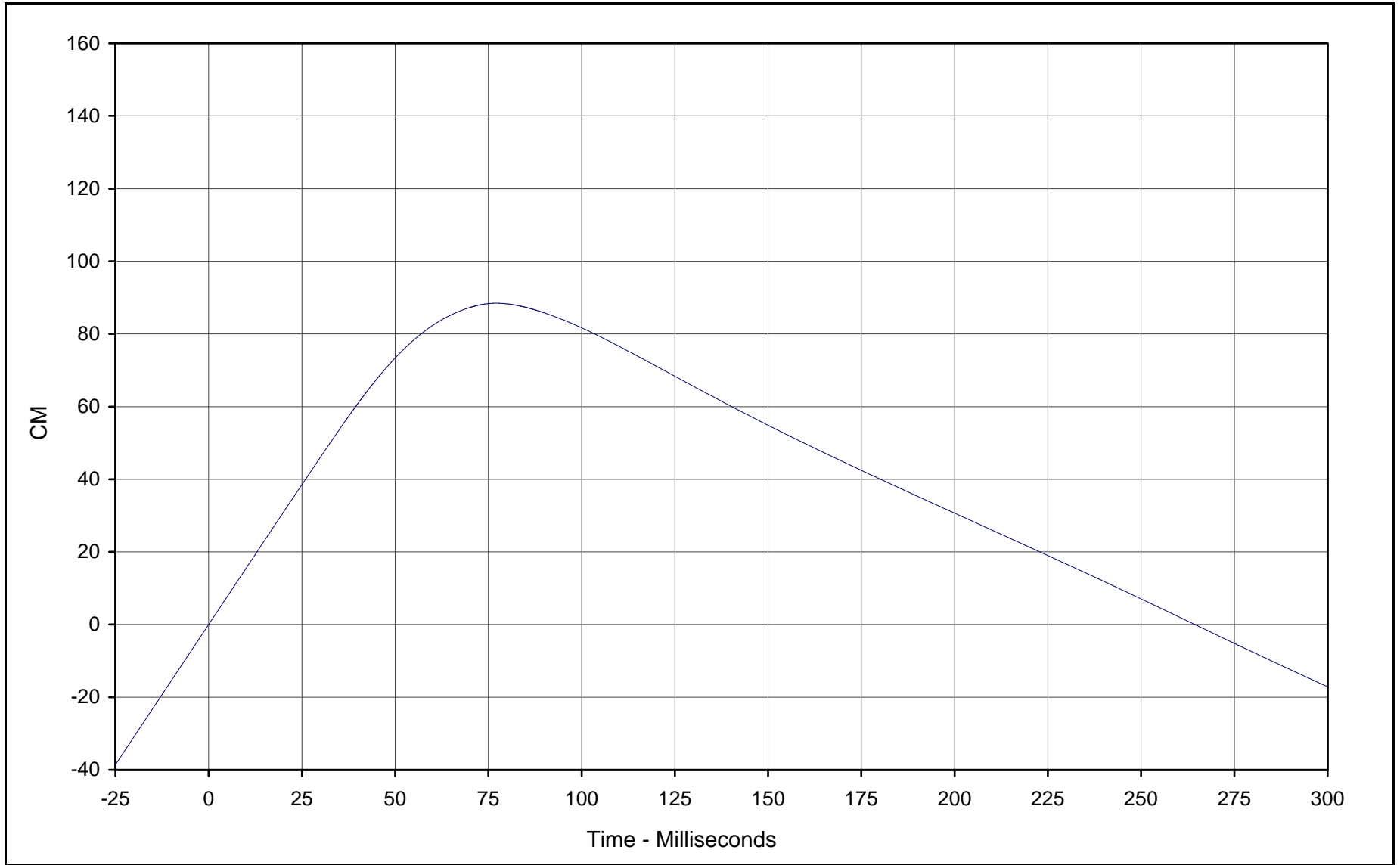
KARR20001-08



Curve Description: Driver Chest Primary X Velocity  
Maximum Value: 55.8 at 8.9 Milliseconds  
Minimum Value: -20.1 at 121.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-013

Testing Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

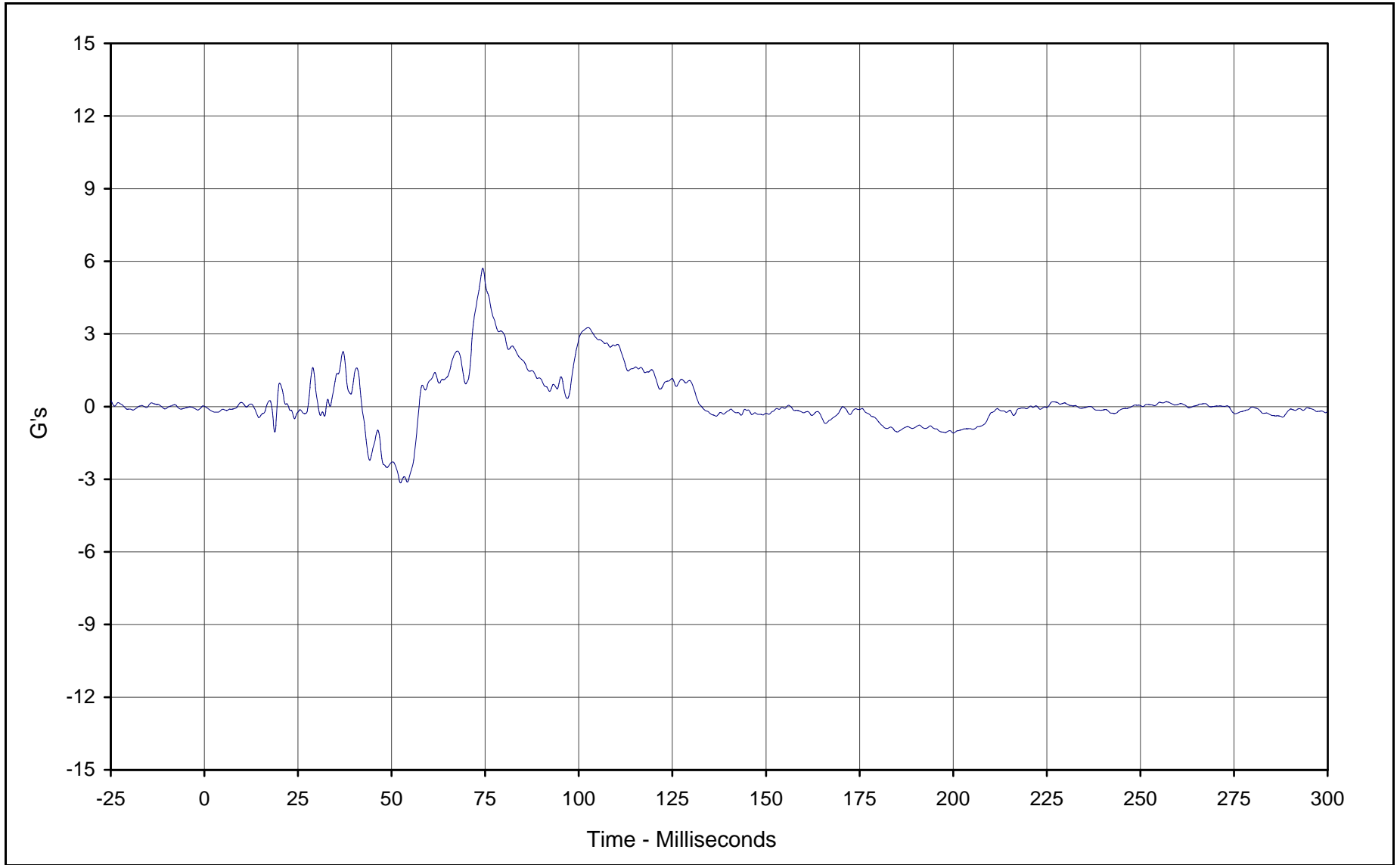




Curve Description: Driver Chest Primary X Displ.  
 Maximum Value: 88.4 at 77.1 Milliseconds  
 Minimum Value: -17.1 at 299.9 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: IN2-013

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

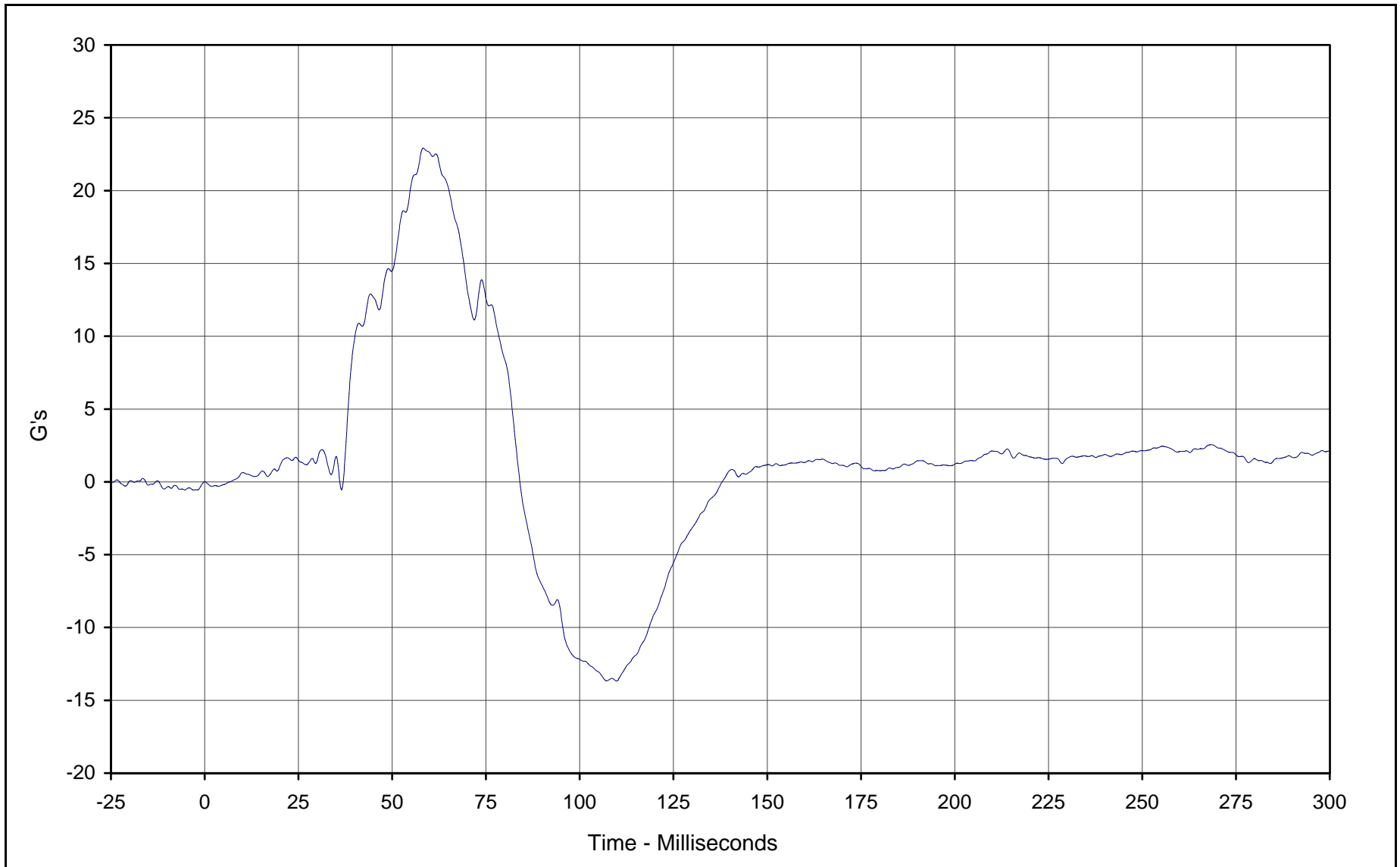




Curve Description: Driver Chest Primary Y  
Maximum Value: 5.7 at 74.4 Milliseconds  
Minimum Value: -3.2 at 52.4 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-014

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

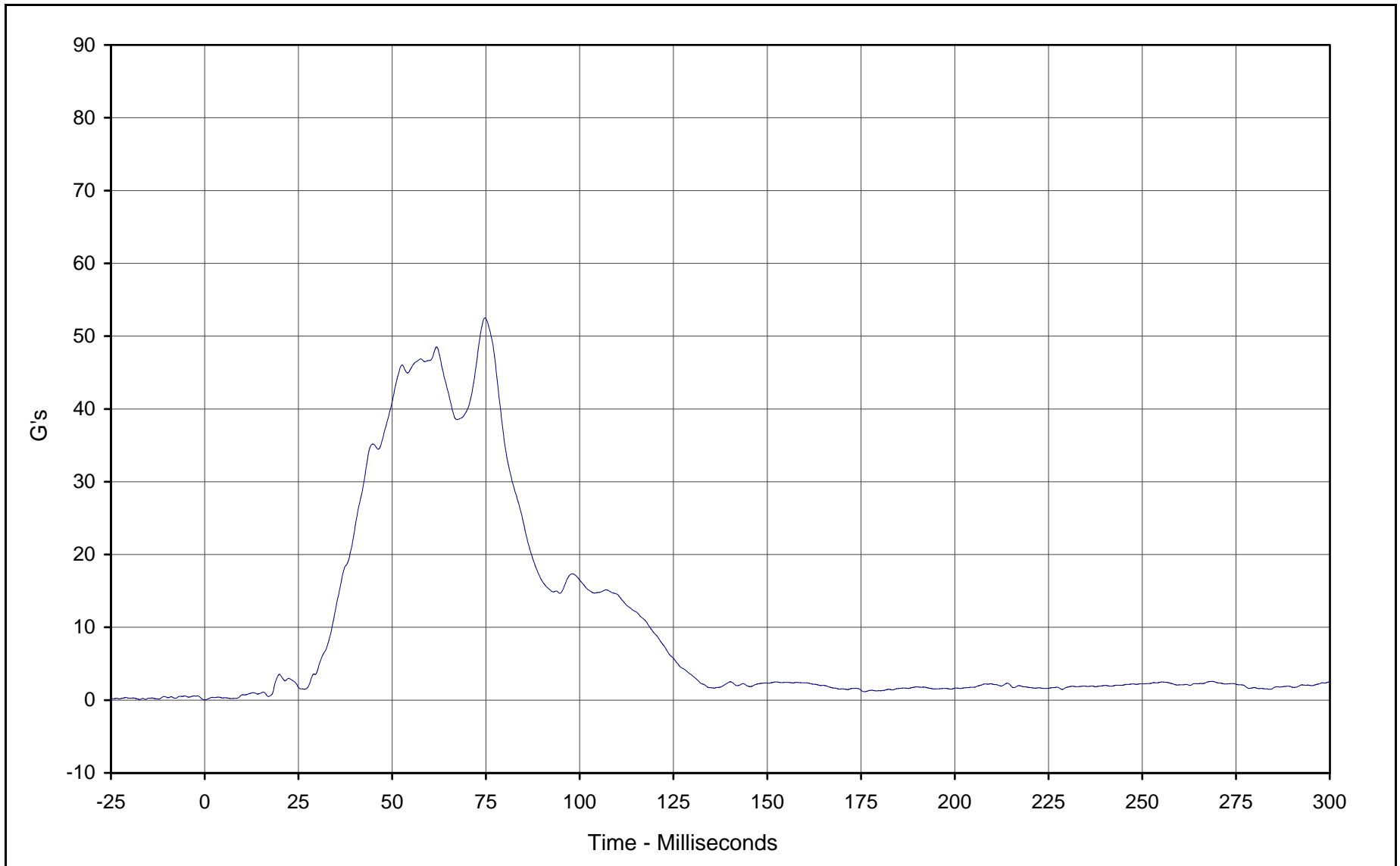




Curve Description: Driver Chest Primary Z  
Maximum Value: 22.9 at 58.3 Milliseconds  
Minimum Value: -13.7 at 109.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-015

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

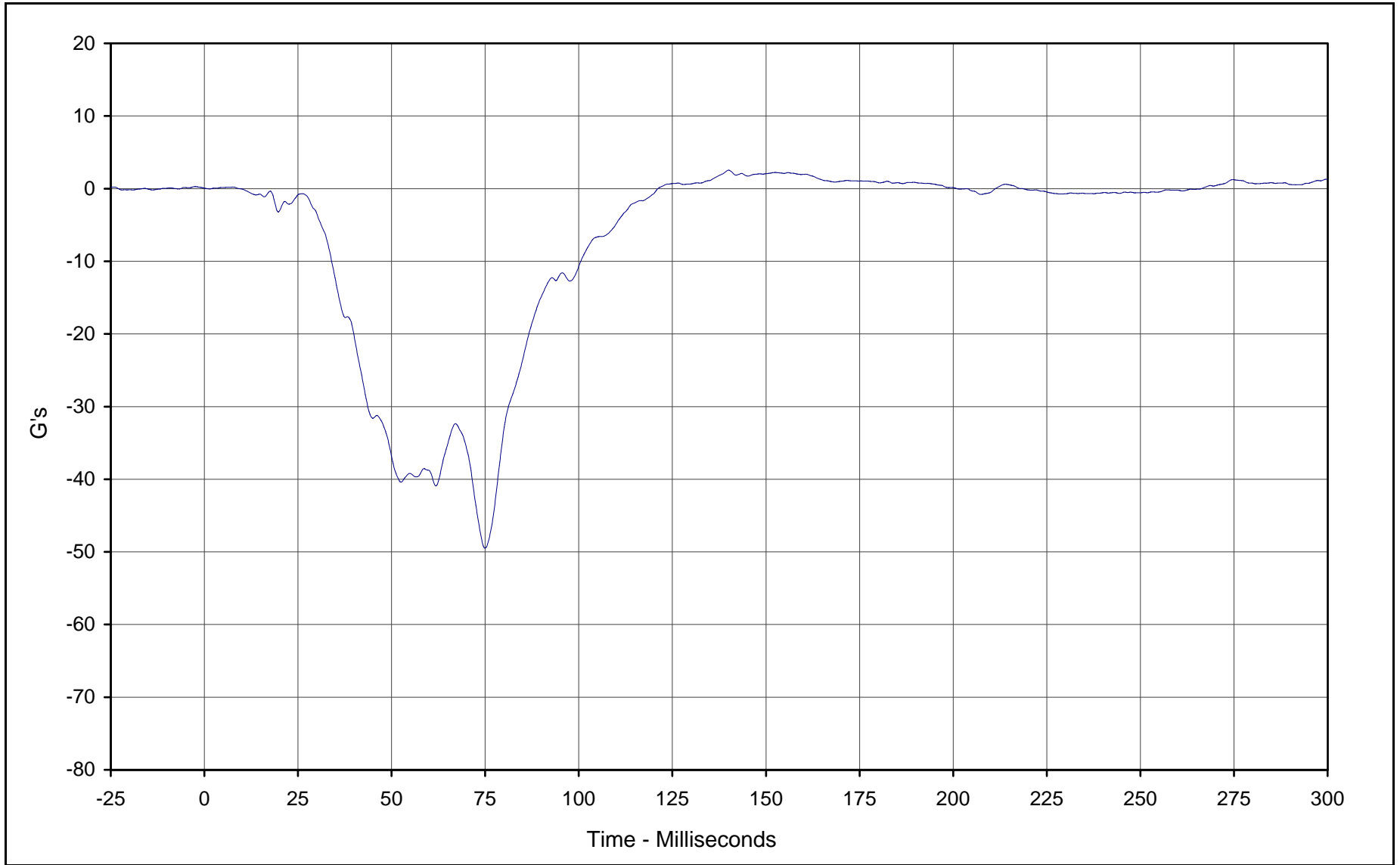




Curve Description: Driver Chest Resultant Primary  
Maximum Value: 52.5 at 74.7 Milliseconds  
Minimum Value: 0.0 at 0.2 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: RES-013

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

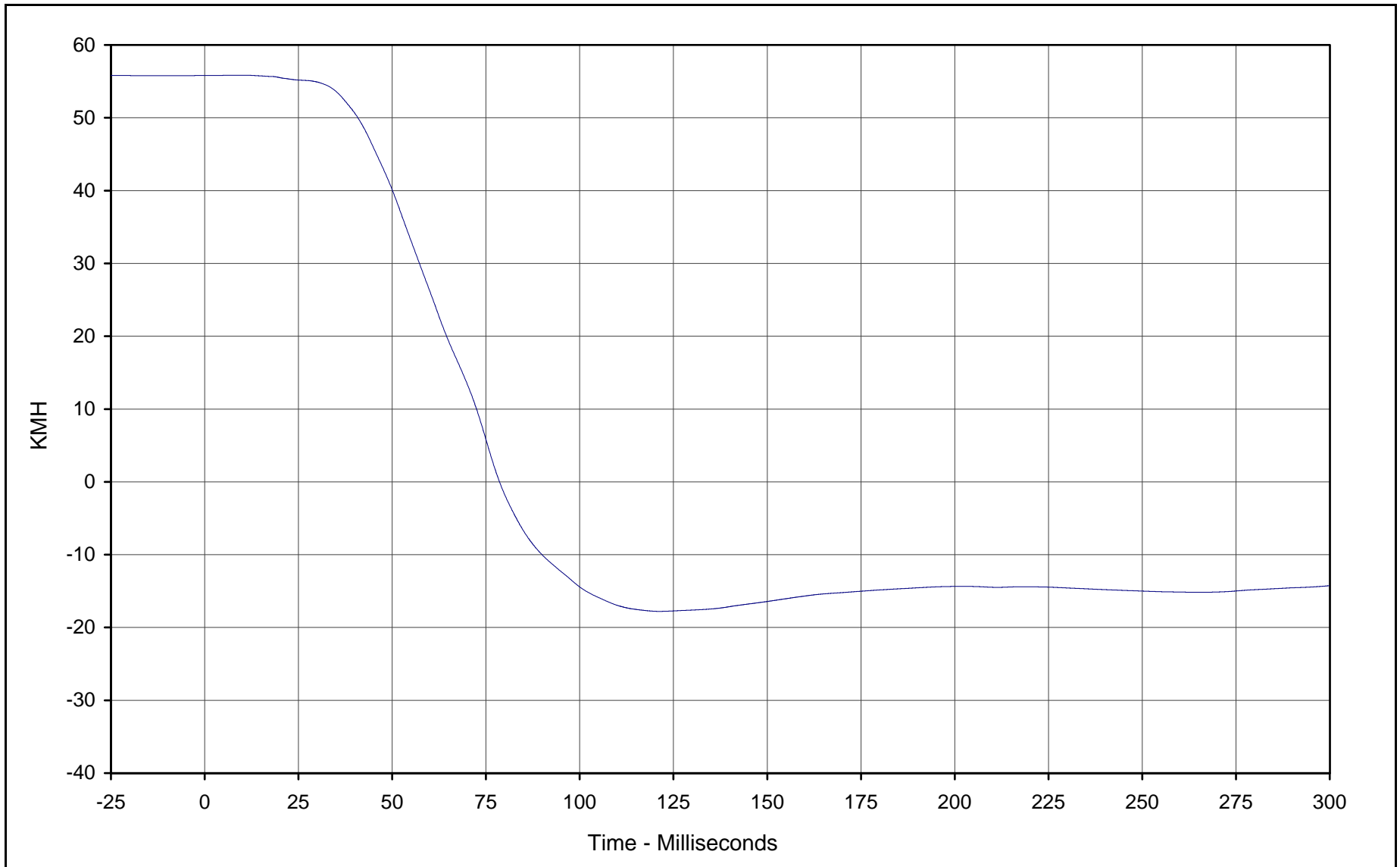




Curve Description: Driver Chest Redundant X  
 Maximum Value: 2.5 at 140.0 Milliseconds  
 Minimum Value: -49.5 at 75.0 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: FIL-016

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van





Curve Description: Driver Chest Redundant X Velocity

Maximum Value: 55.8 at 9.3 Milliseconds

Minimum Value: -17.8 at 121.1 Milliseconds

SAE Filter Class: 180

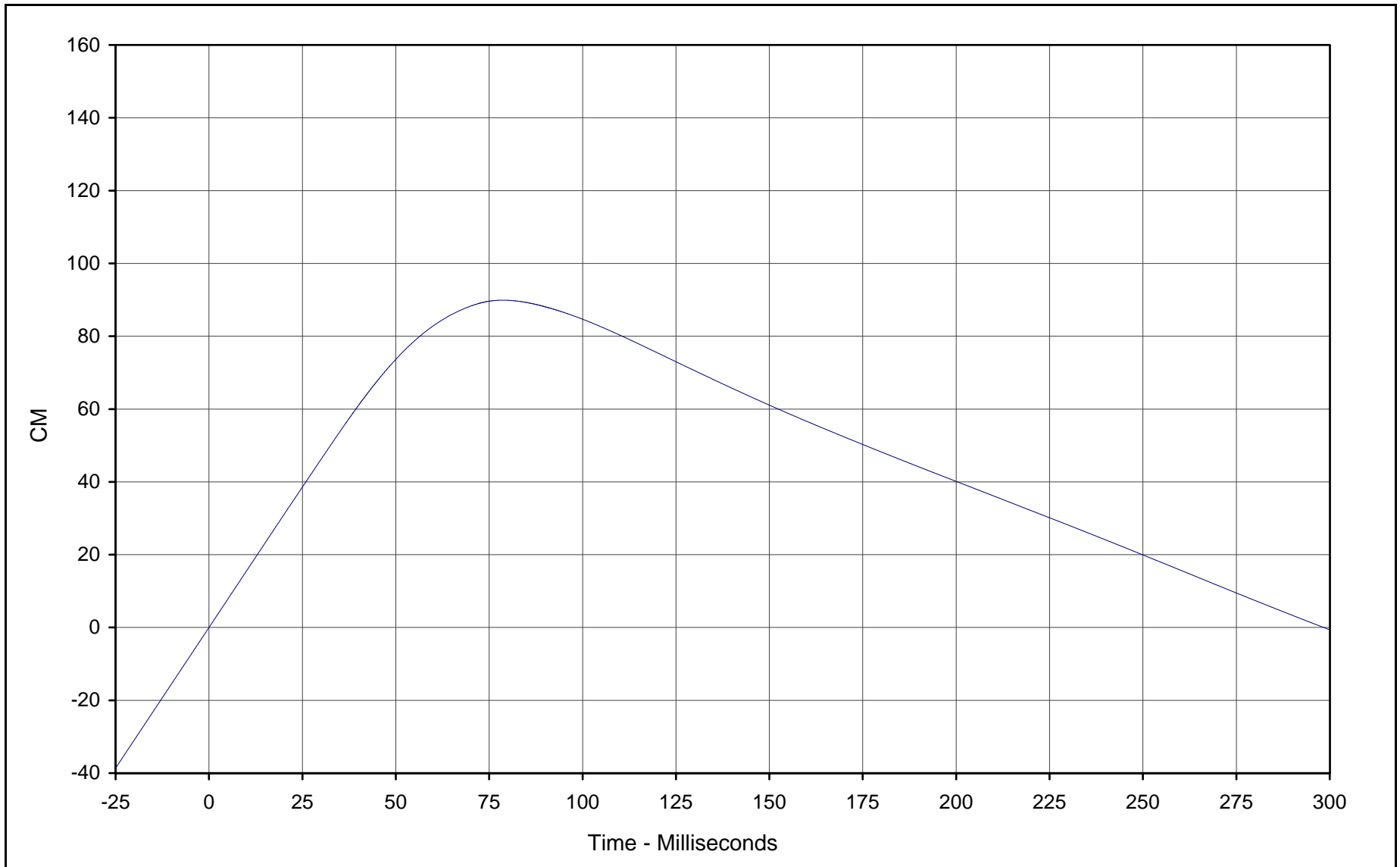
Date of Test: 1/13/00

Curve Number: IN1-016

Testing Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van



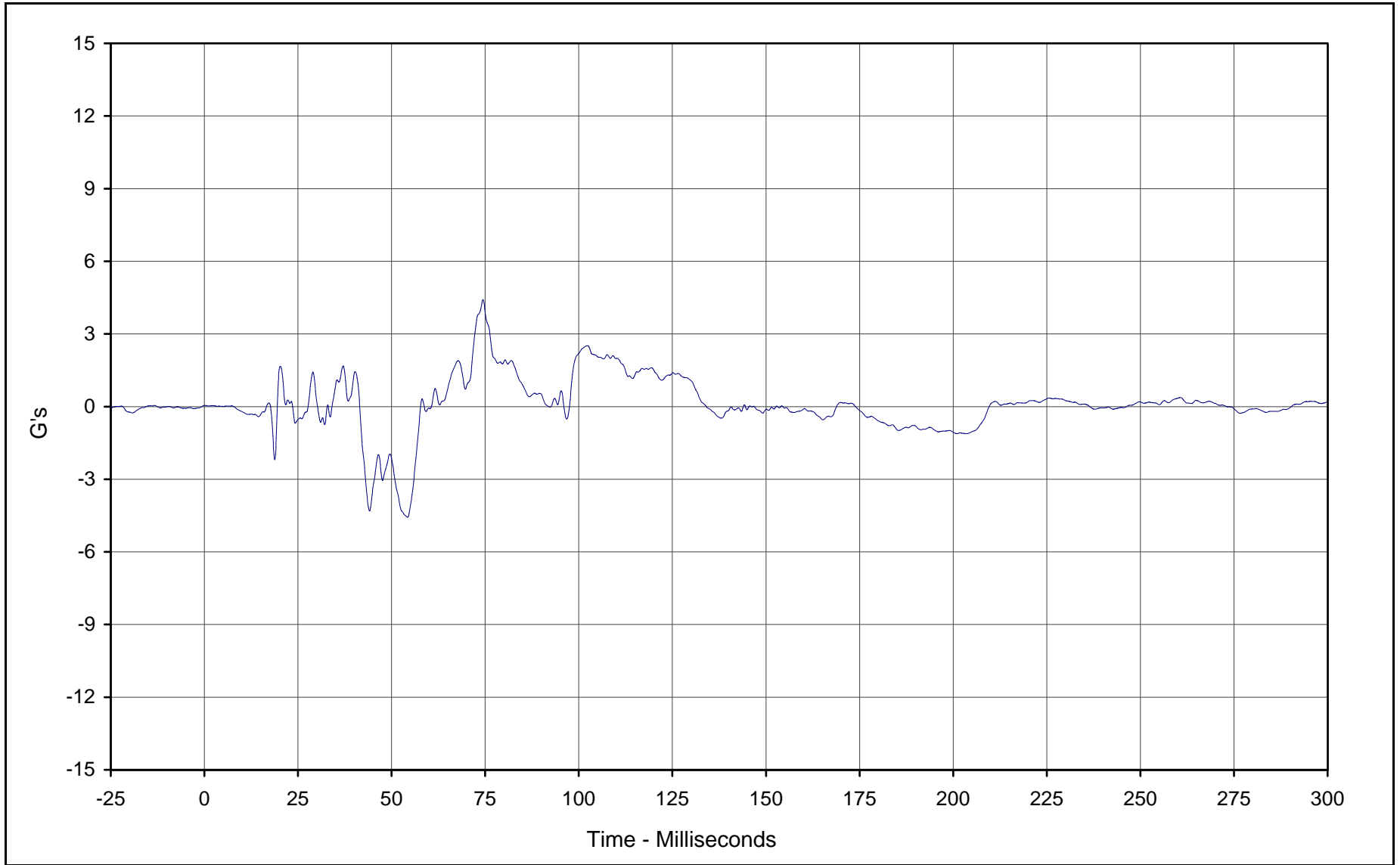


Curve Description: Driver Chest Redundant X Displ.  
Maximum Value: 89.9 at 78.6 Milliseconds  
Minimum Value: -0.6 at 299.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-016

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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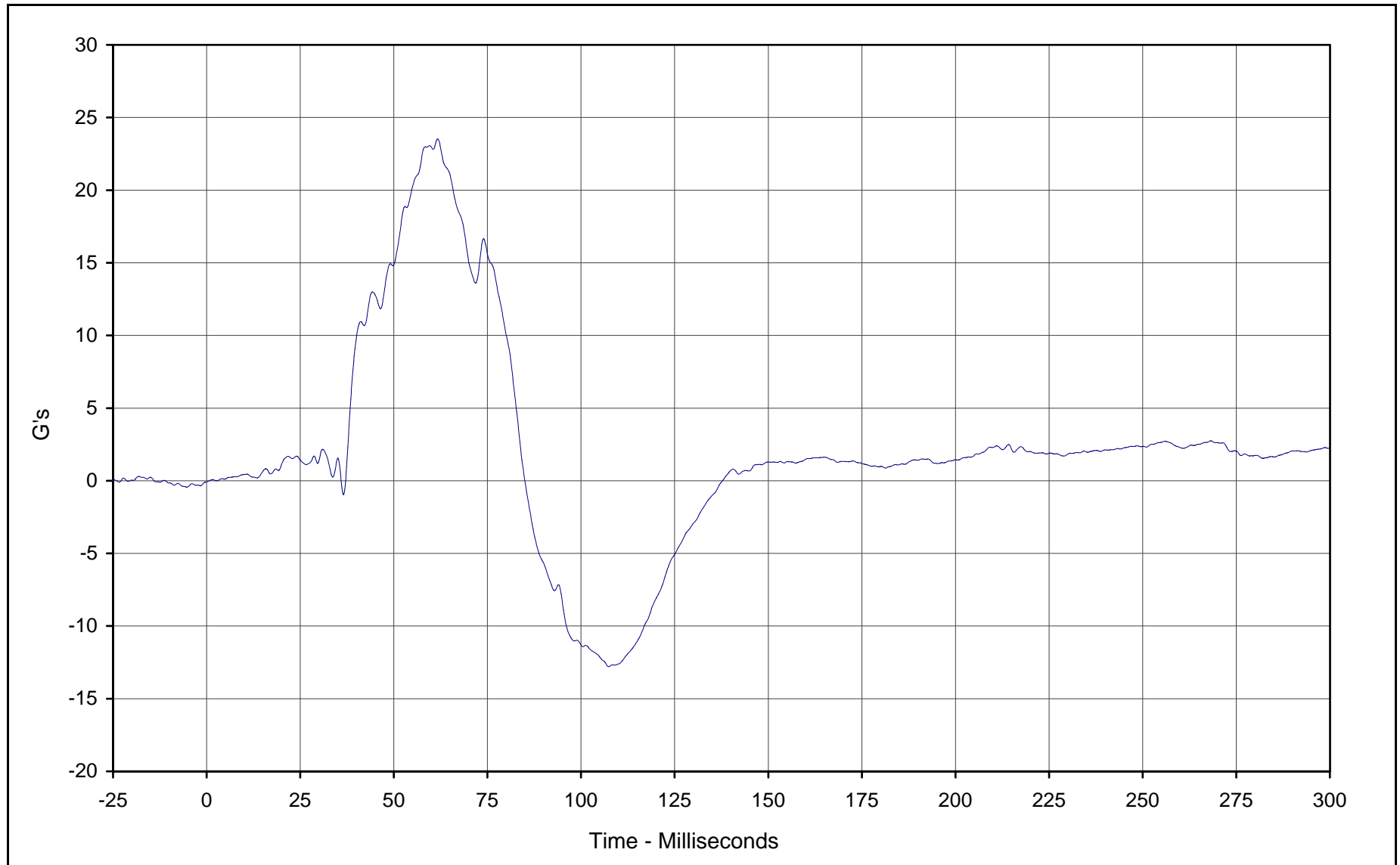


Curve Description: Driver Chest Redundant Y  
Maximum Value: 4.4 at 74.4 Milliseconds  
Minimum Value: -4.6 at 54.3 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-017

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



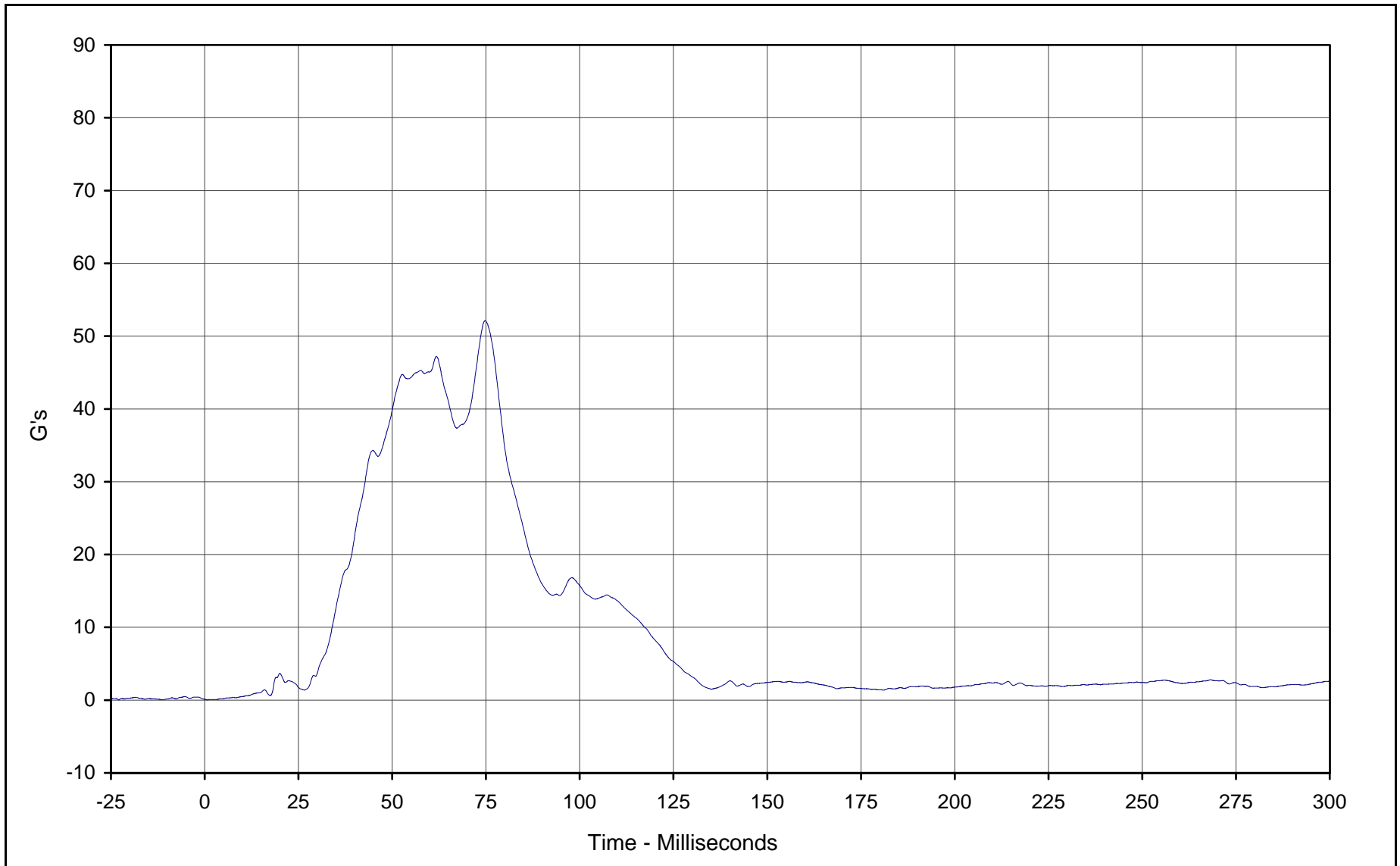
KARR20001-08



Curve Description: Driver Chest Redundant Z  
 Maximum Value: 23.5 at 61.7 Milliseconds  
 Minimum Value: -12.8 at 107.4 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: FIL-018

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

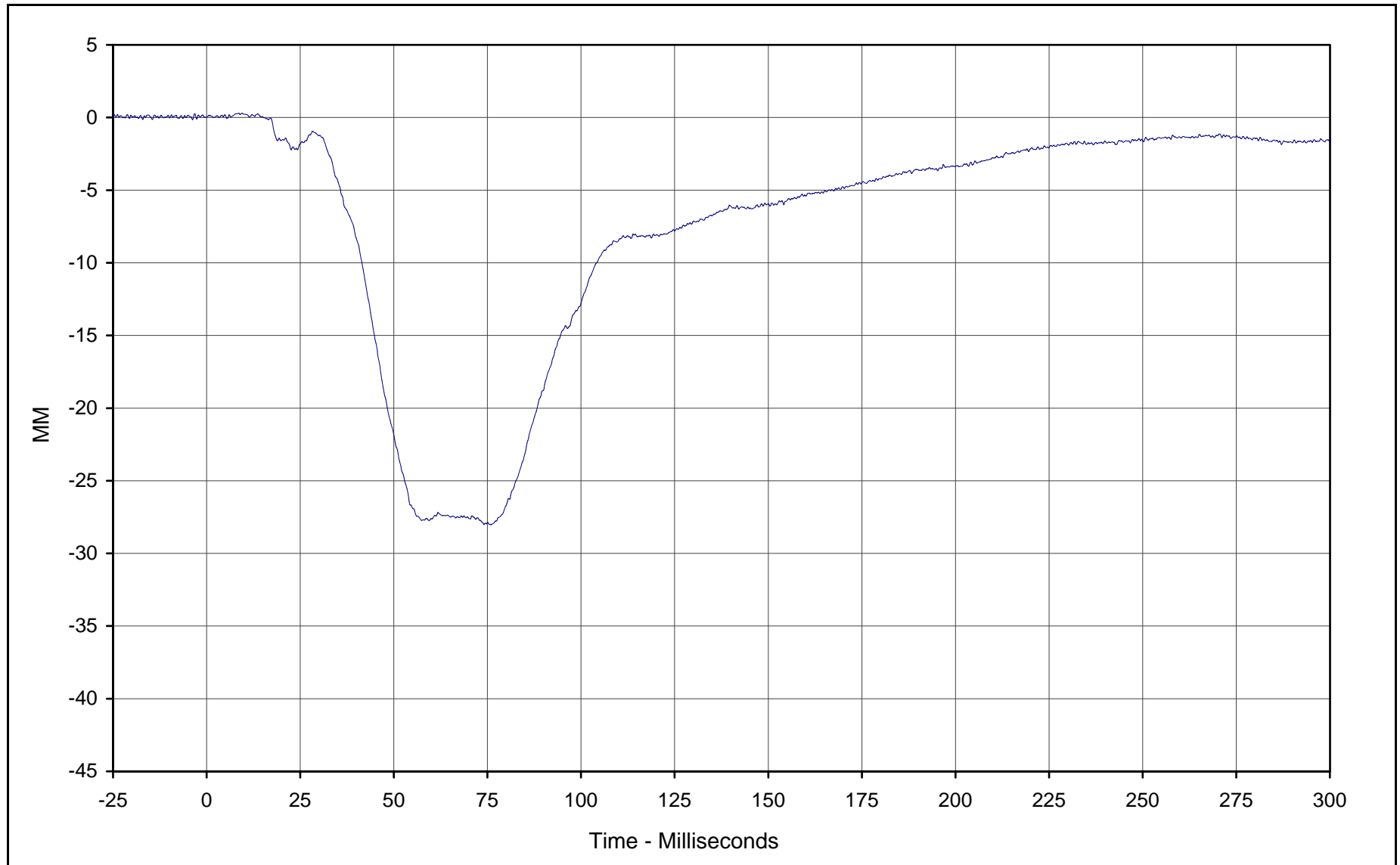




Curve Description: Driver Chest Resultant Redundant  
Maximum Value: 52.1 at 74.8 Milliseconds  
Minimum Value: 0.0 at 0.7 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: RES-016

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

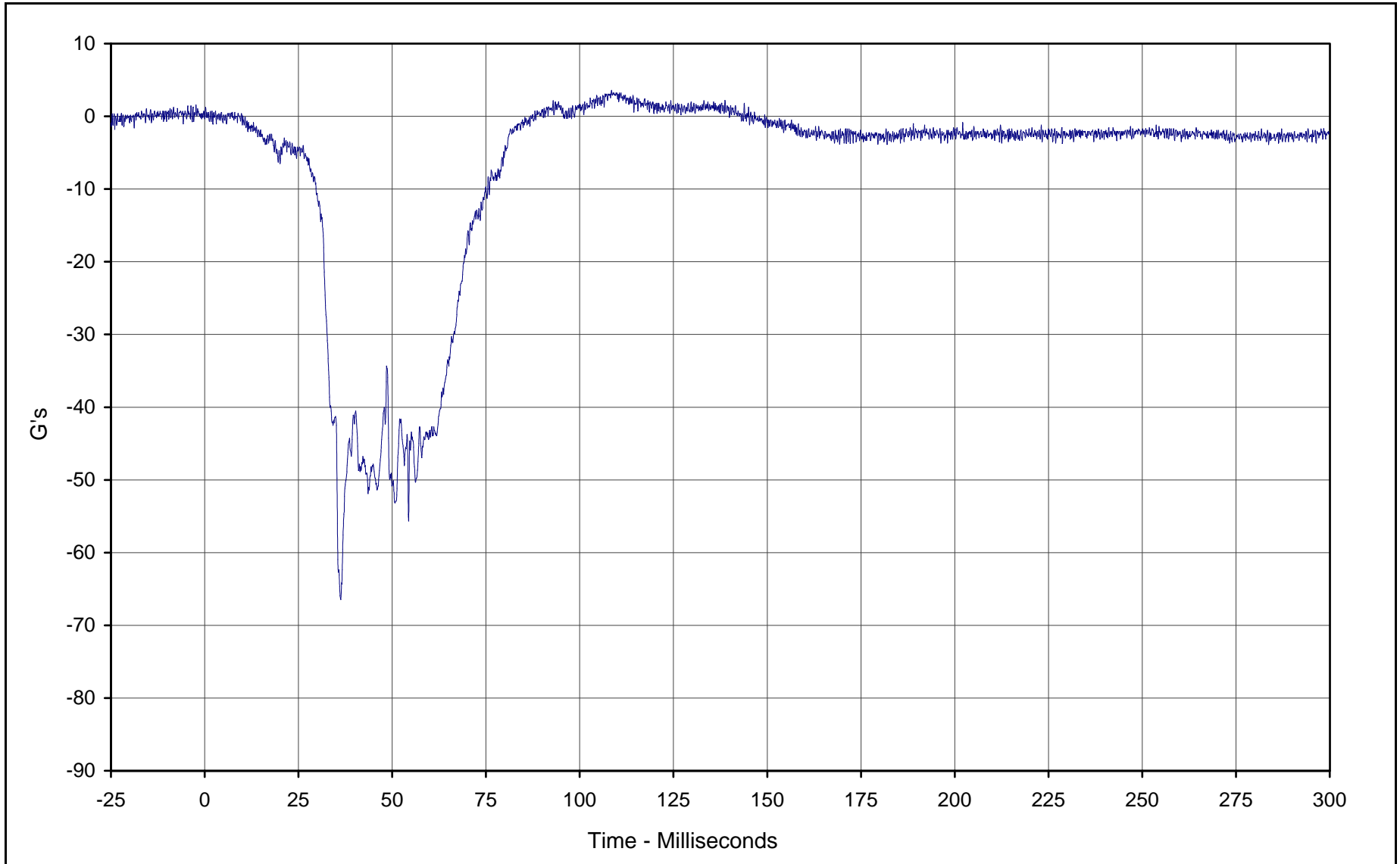




Curve Description: Driver Chest Displacement X  
Maximum Value: 0.3 at 8.6 Milliseconds  
Minimum Value: -28.0 at 75.9 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-019

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

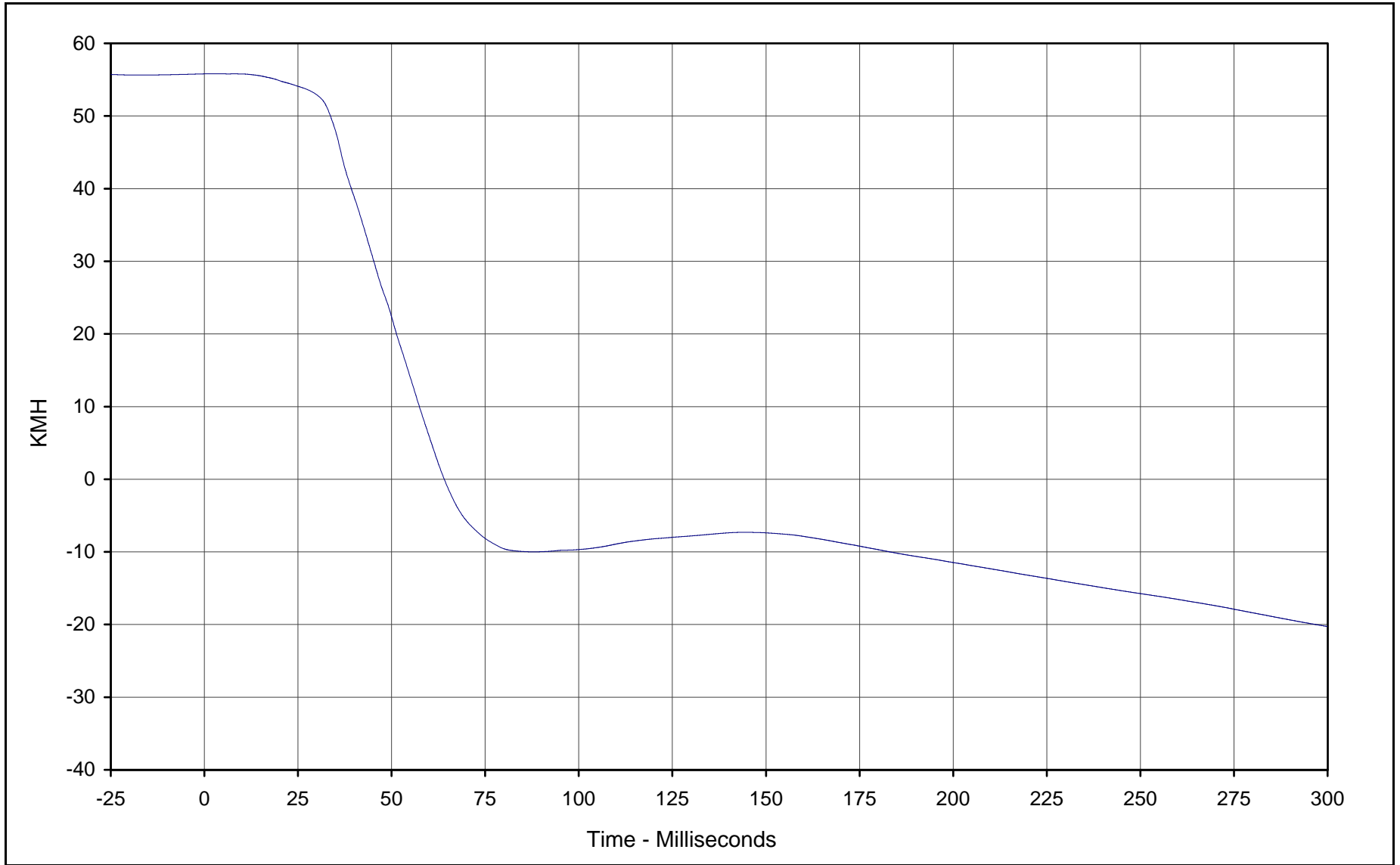




Curve Description: Driver Pelvis X  
 Maximum Value: 3.6 at 108.5 Milliseconds  
 Minimum Value: -66.4 at 36.3 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: FIL-020

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

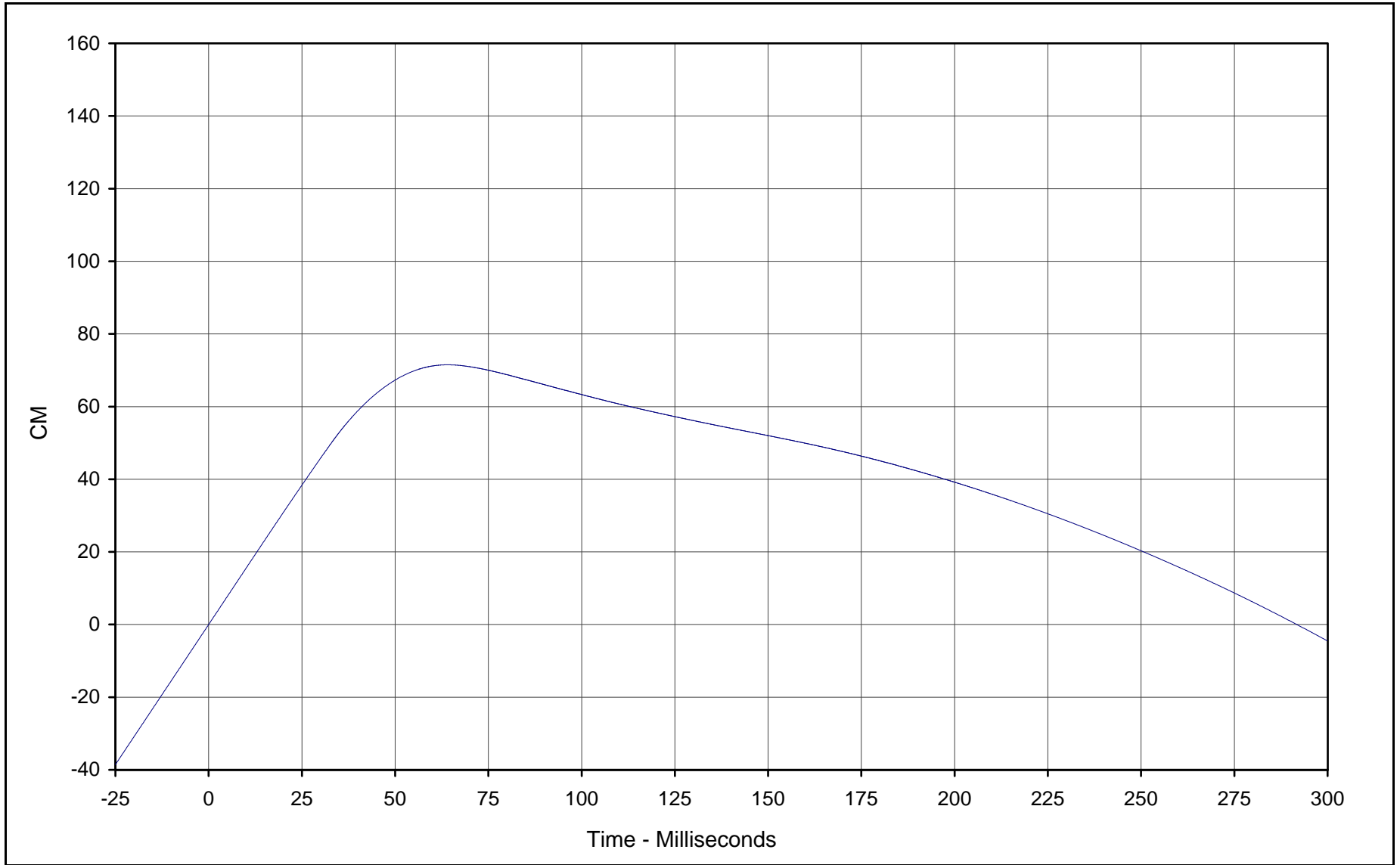




Curve Description: Driver Pelvis X Velocity  
 Maximum Value: 55.8 at 1.6 Milliseconds  
 Minimum Value: -20.3 at 299.9 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: IN1-020

Testing Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

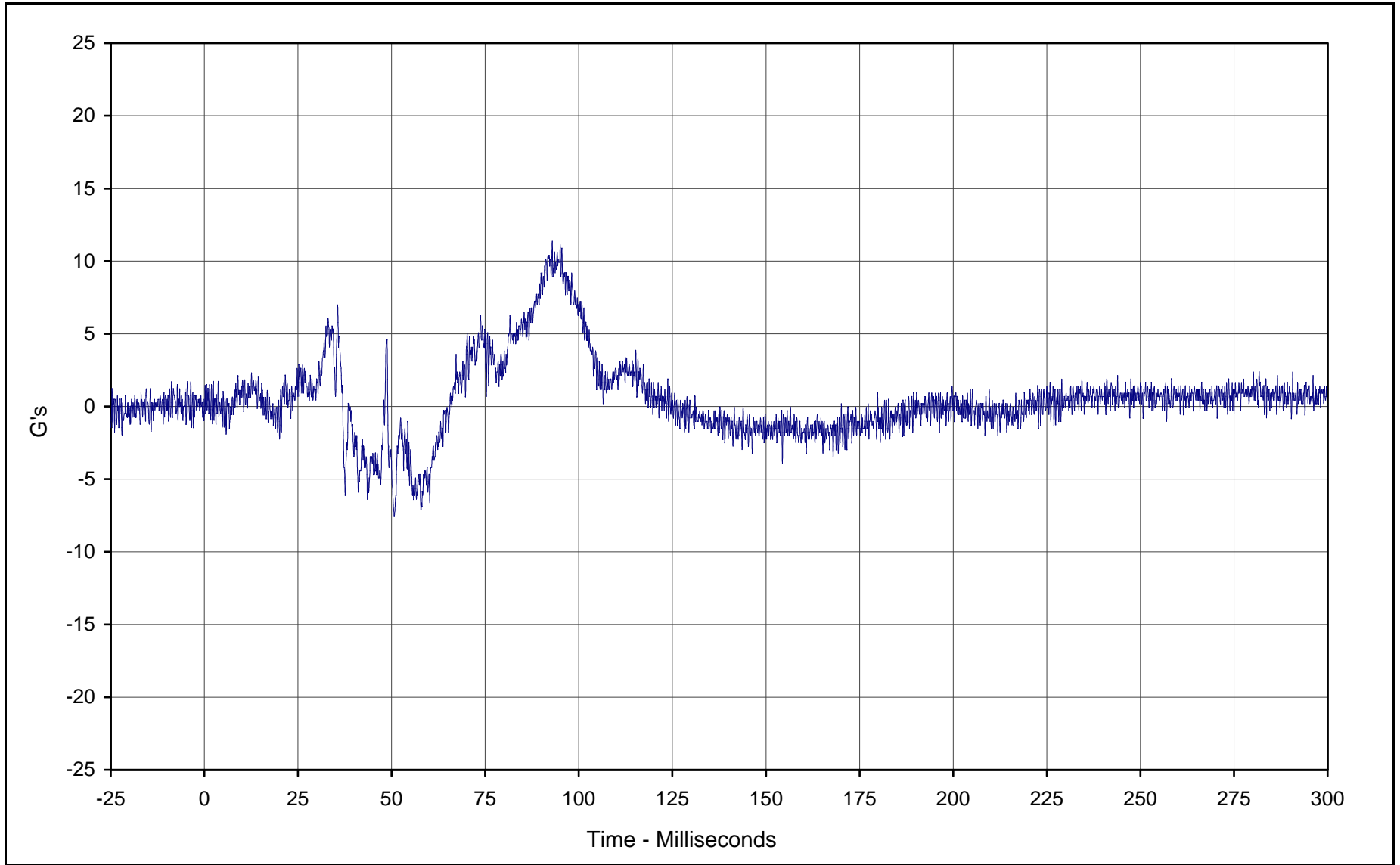




Curve Description: Driver Pelvis X Displ.  
 Maximum Value: 71.5 at 64.1 Milliseconds  
 Minimum Value: -4.5 at 299.9 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: IN2-020

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

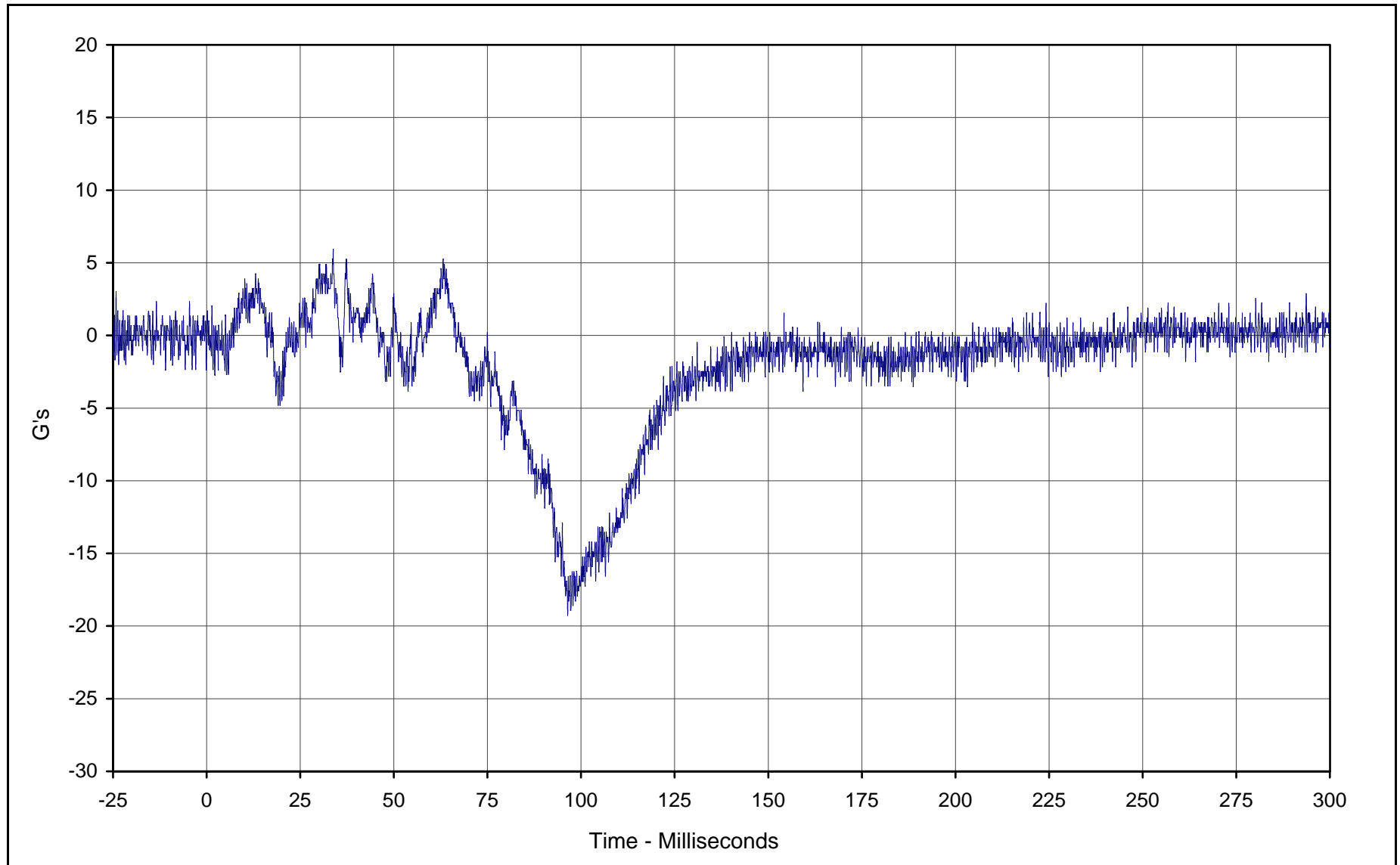




Curve Description: Driver Pelvis Y  
 Maximum Value: 11.4 at 92.9 Milliseconds  
 Minimum Value: -7.6 at 50.7 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: FIL-021

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

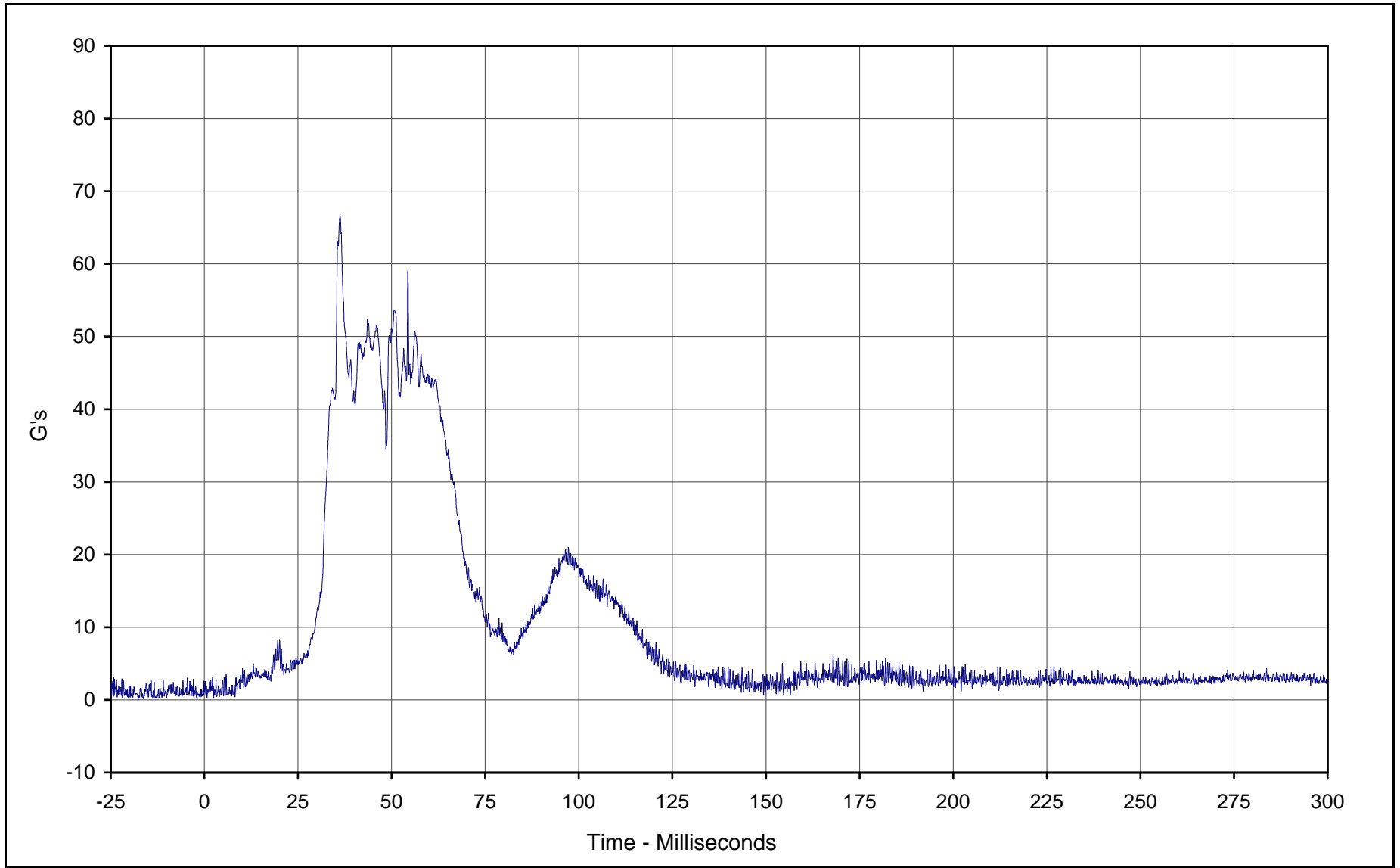




Curve Description: Driver Pelvis Z  
Maximum Value: 5.9 at 33.8 Milliseconds  
Minimum Value: -19.3 at 96.4 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-022

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



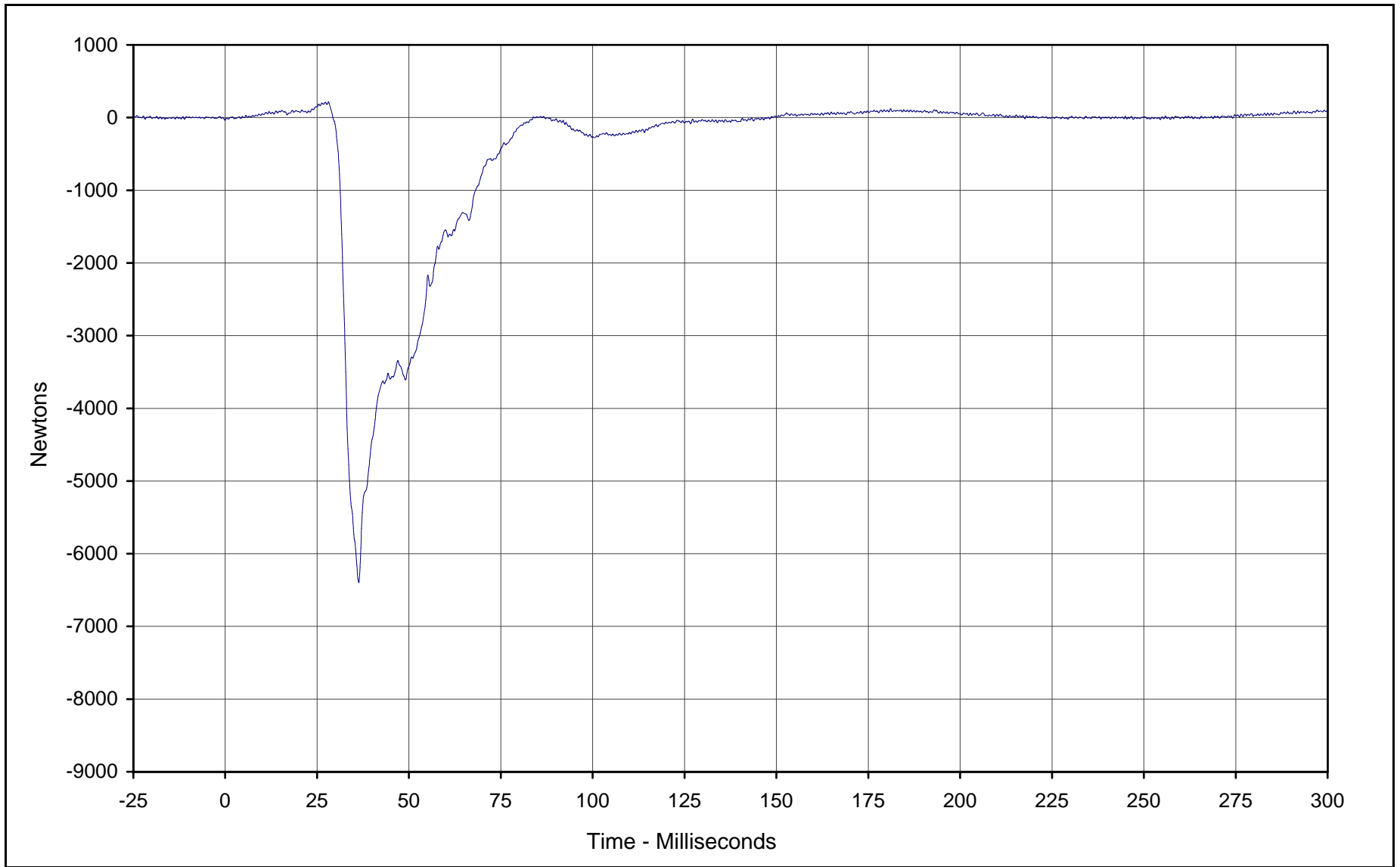


Curve Description: Driver Pelvis Resultant  
 Maximum Value: 66.6 at 36.3 Milliseconds  
 Minimum Value: 0.3 at 2.5 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: RES-020

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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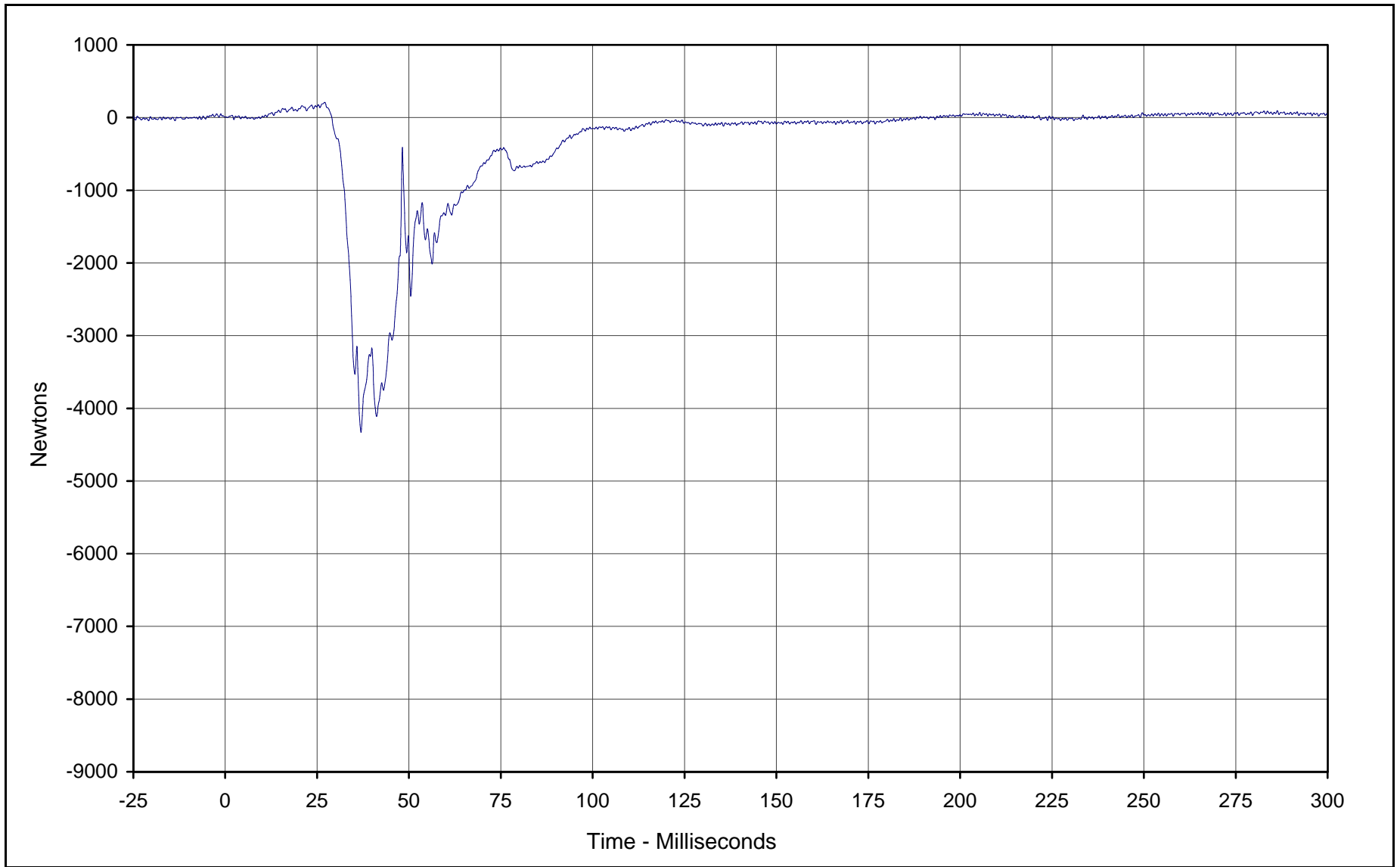
Curve Description: Driver Left Femur Force  
Maximum Value: 218.0 at 28.1 Milliseconds  
Minimum Value: -6397.7 at 36.3 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-023

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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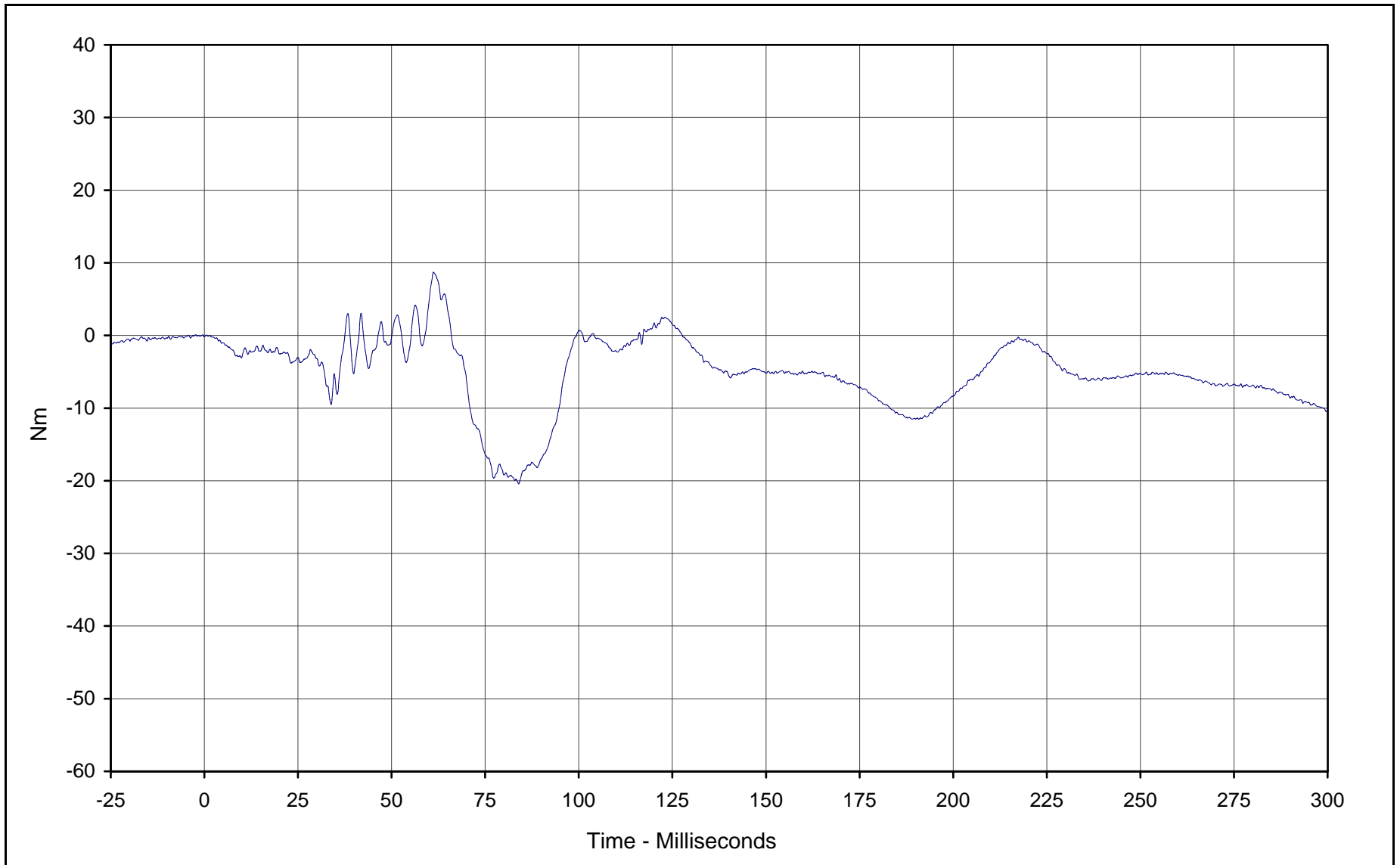
Curve Description: Driver Right Femur Force  
Maximum Value: 209.8 at 27.1 Milliseconds  
Minimum Value: -4329.4 at 36.9 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-024

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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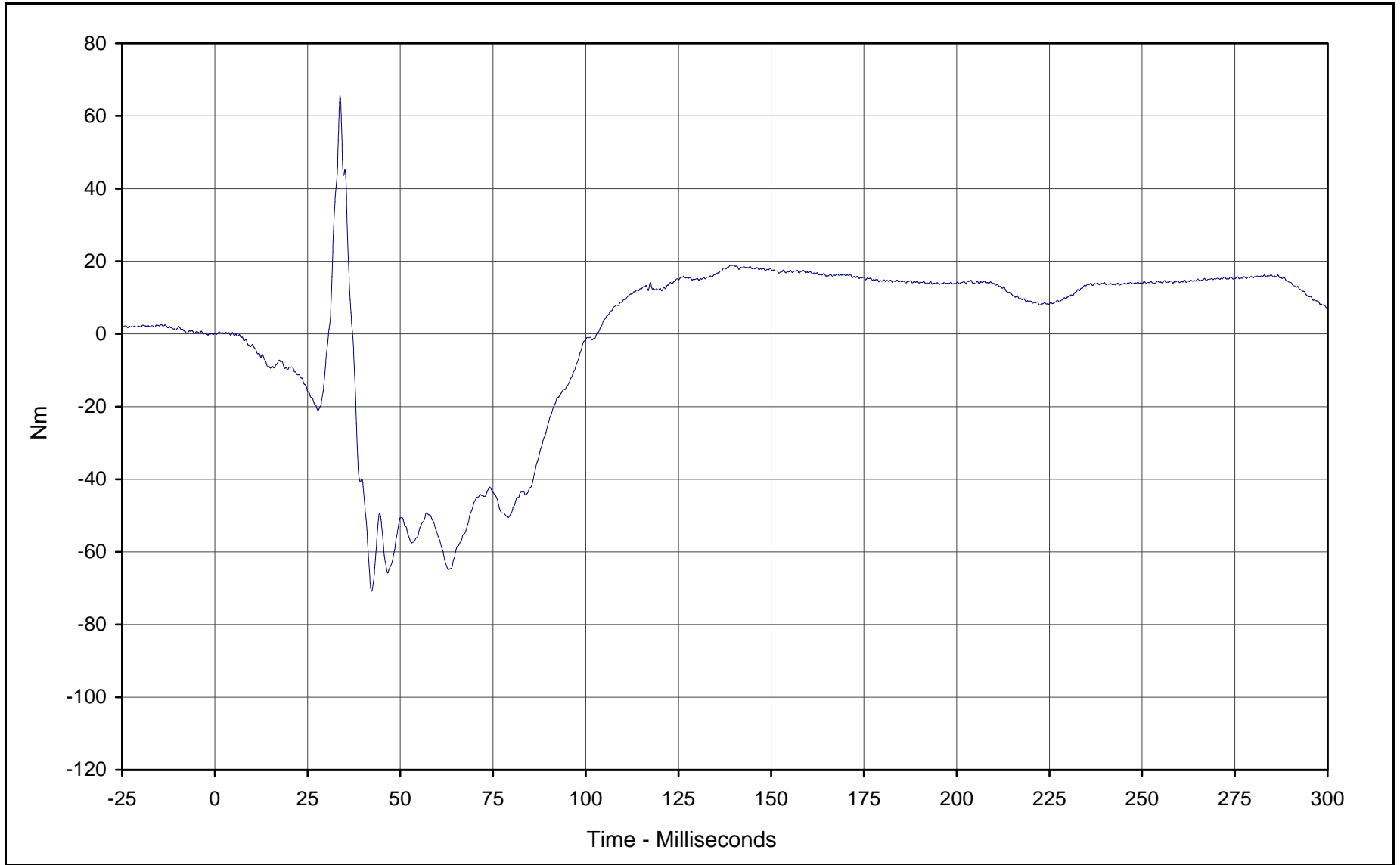
Curve Description: Driver Left Upper Tibia Moment X  
Maximum Value: 8.7 at 61.2 Milliseconds  
Minimum Value: -20.4 at 83.9 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-025

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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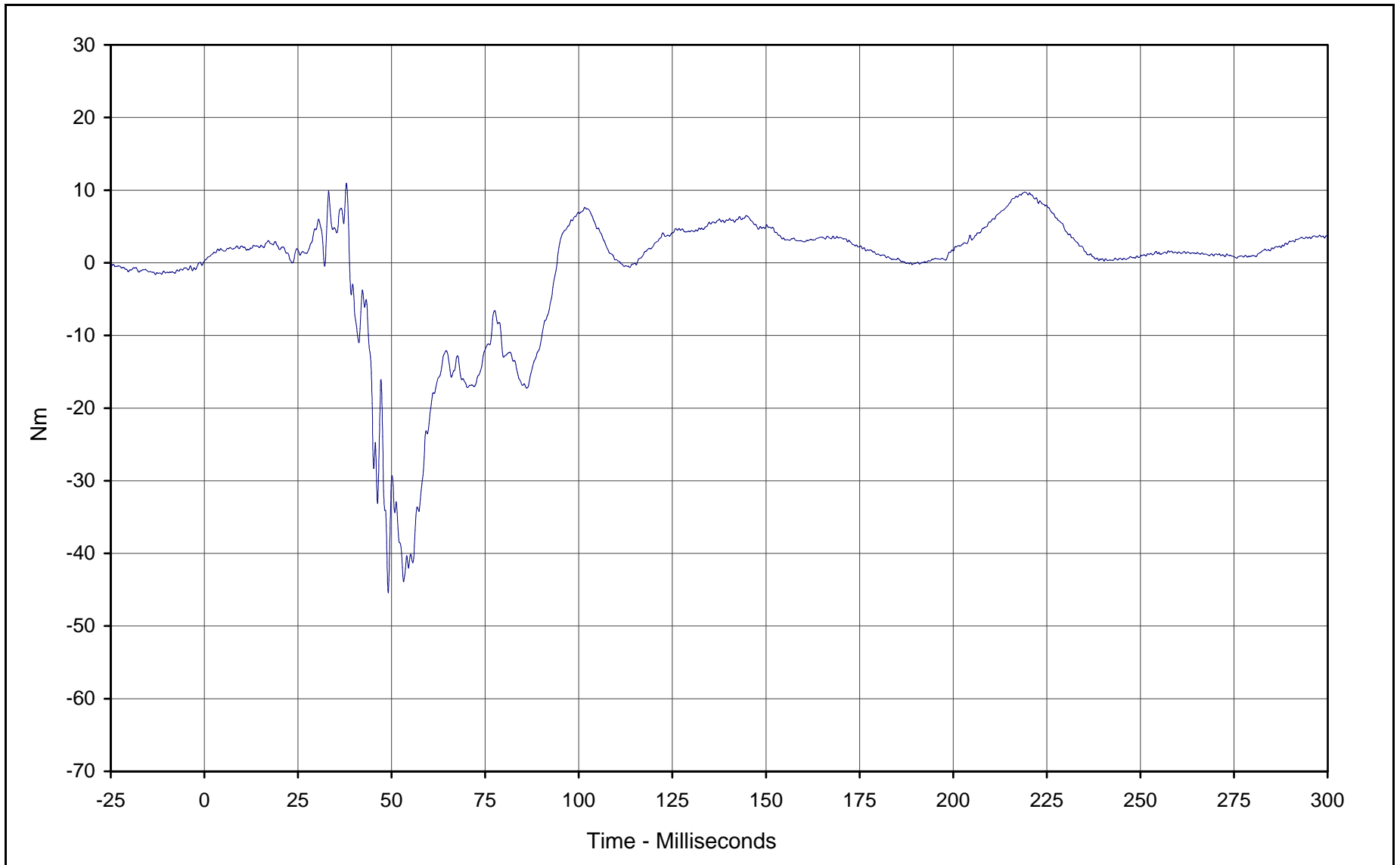


Curve Description: Driver Left Upper Tibia Moment Y  
Maximum Value: 65.7 at 33.8 Milliseconds  
Minimum Value: -70.8 at 42.3 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-026

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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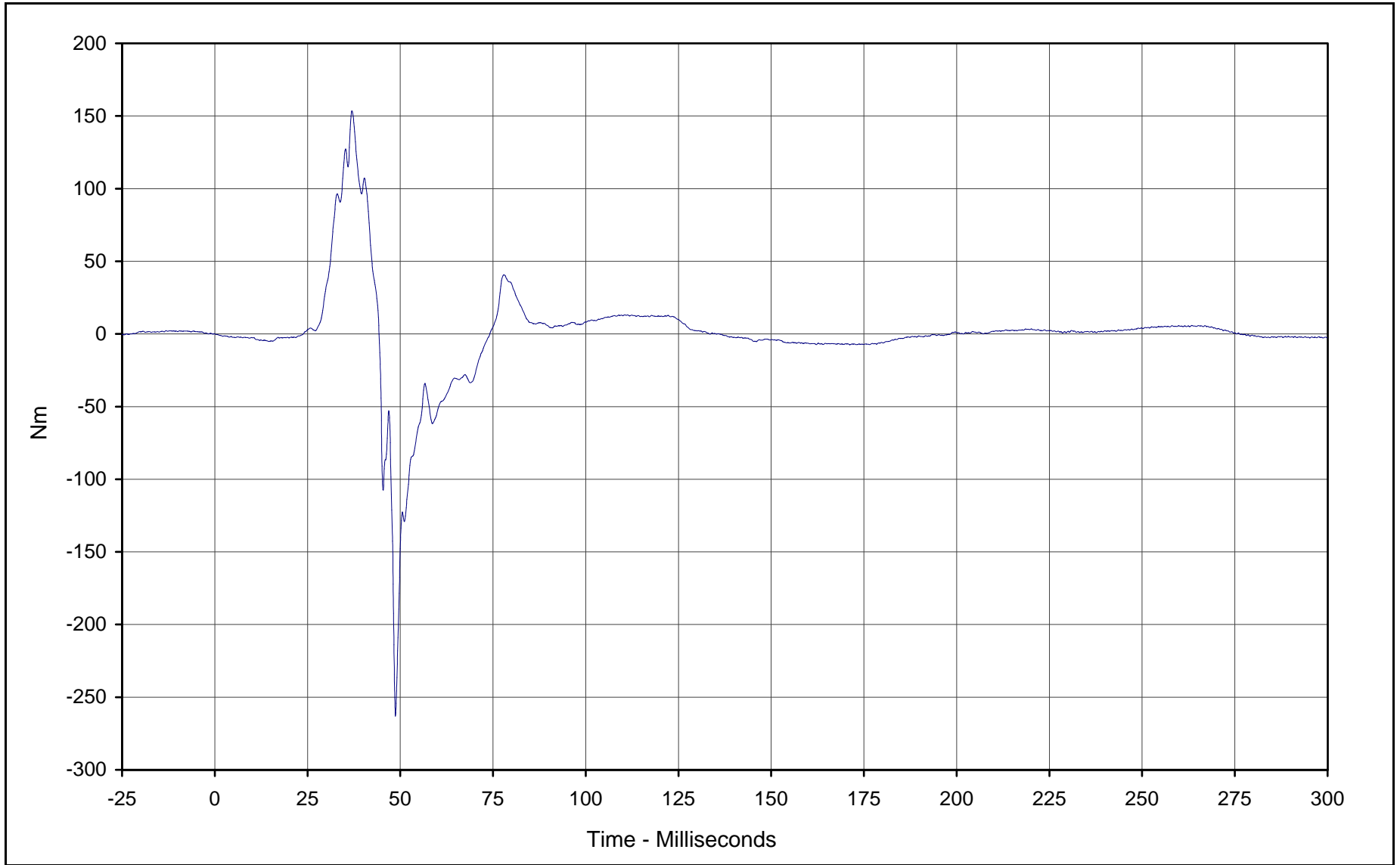


Curve Description: Driver Right Upper Tibia Moment X  
Maximum Value: 11.0 at 37.9 Milliseconds  
Minimum Value: -45.4 at 49.1 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-027

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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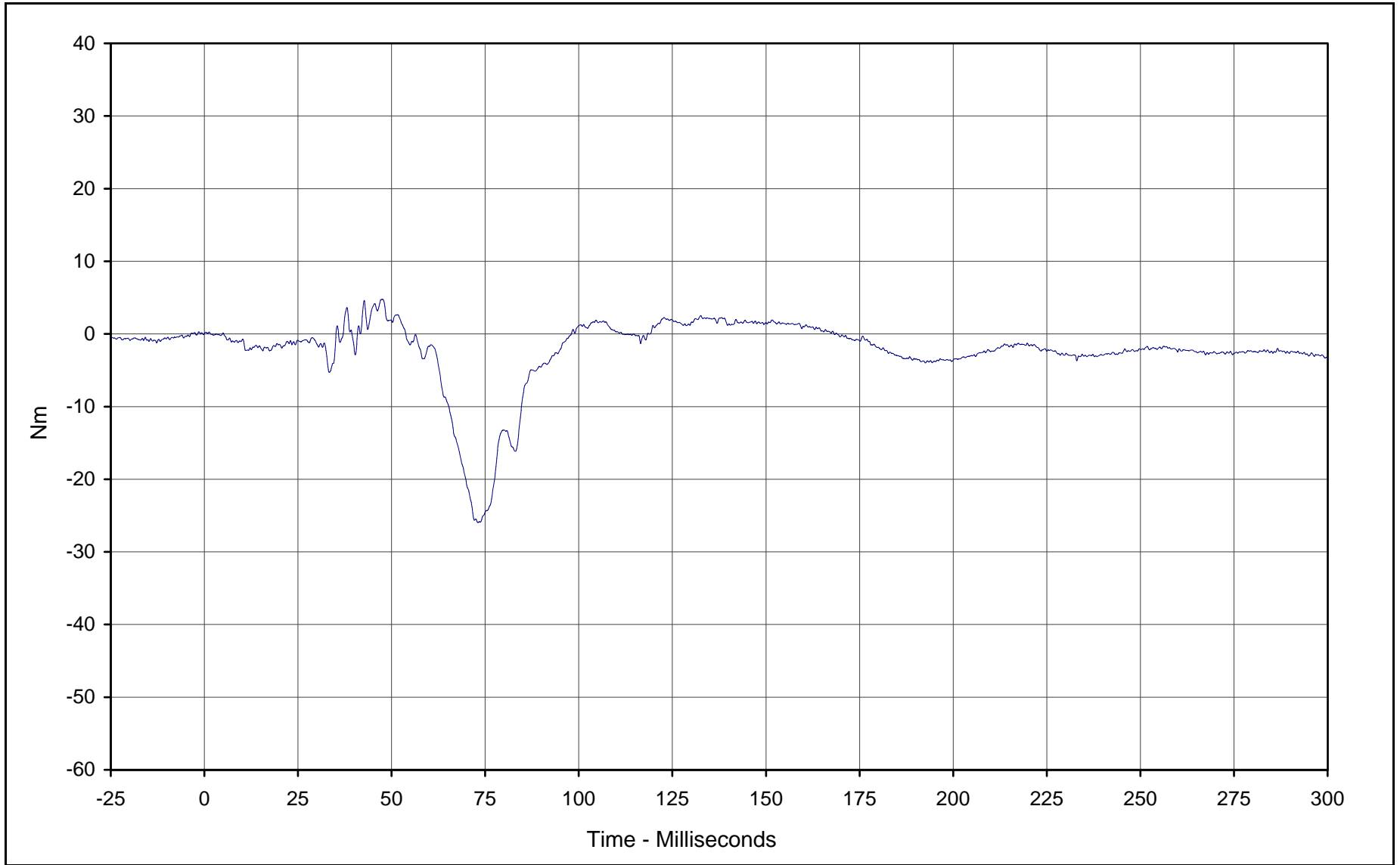
Curve Description: Driver Right Upper Tibia Moment Y  
Maximum Value: 153.5 at 37.0 Milliseconds  
Minimum Value: -263.1 at 48.7 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-028

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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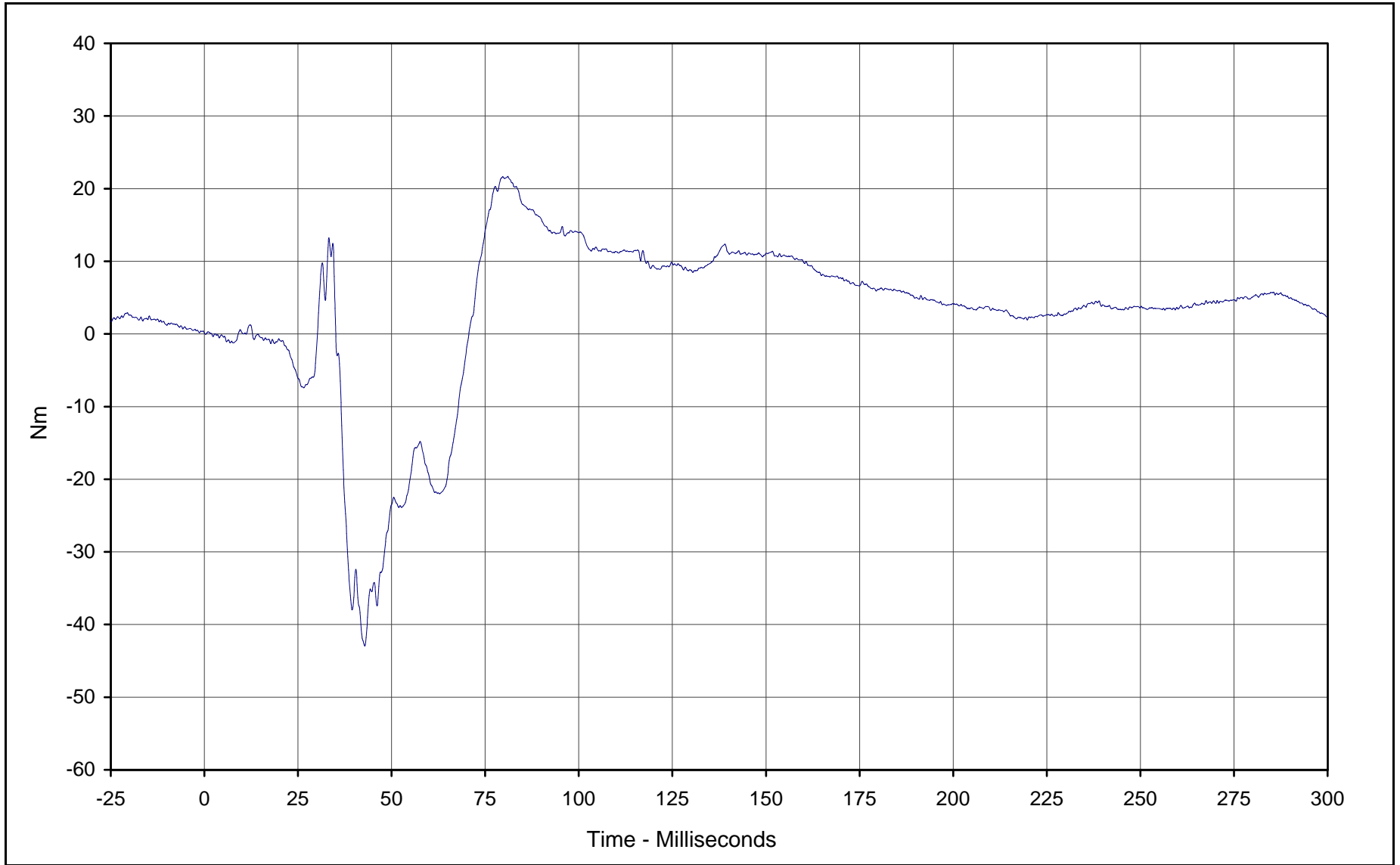
Curve Description: Driver Left Lower Tibia Moment X  
Maximum Value: 4.8 at 47.6 Milliseconds  
Minimum Value: -26.0 at 73.1 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-029

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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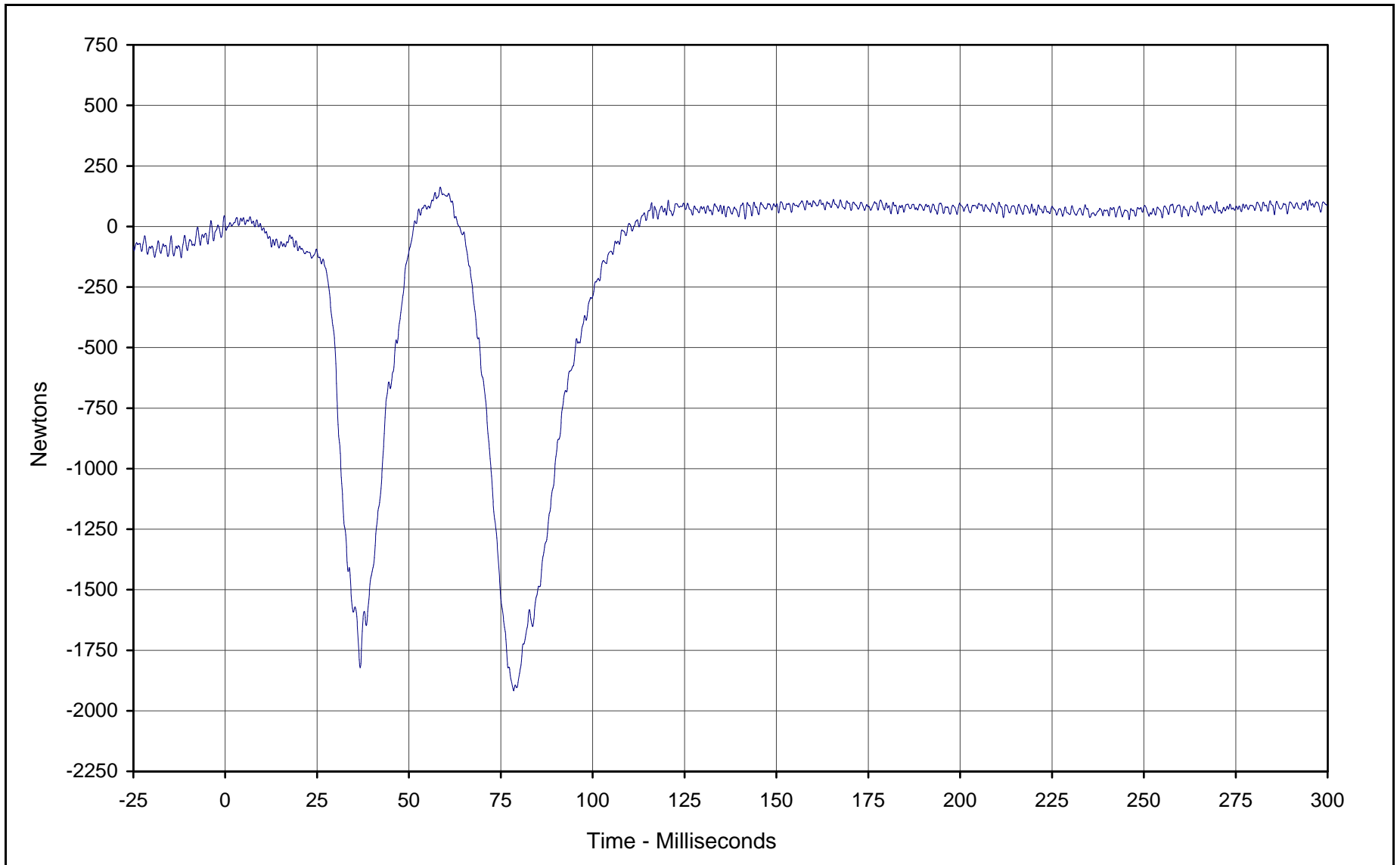
Curve Description: Driver Left Lower Tibia Moment Y  
Maximum Value: 21.7 at 81.0 Milliseconds  
Minimum Value: -43.0 at 42.8 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-030

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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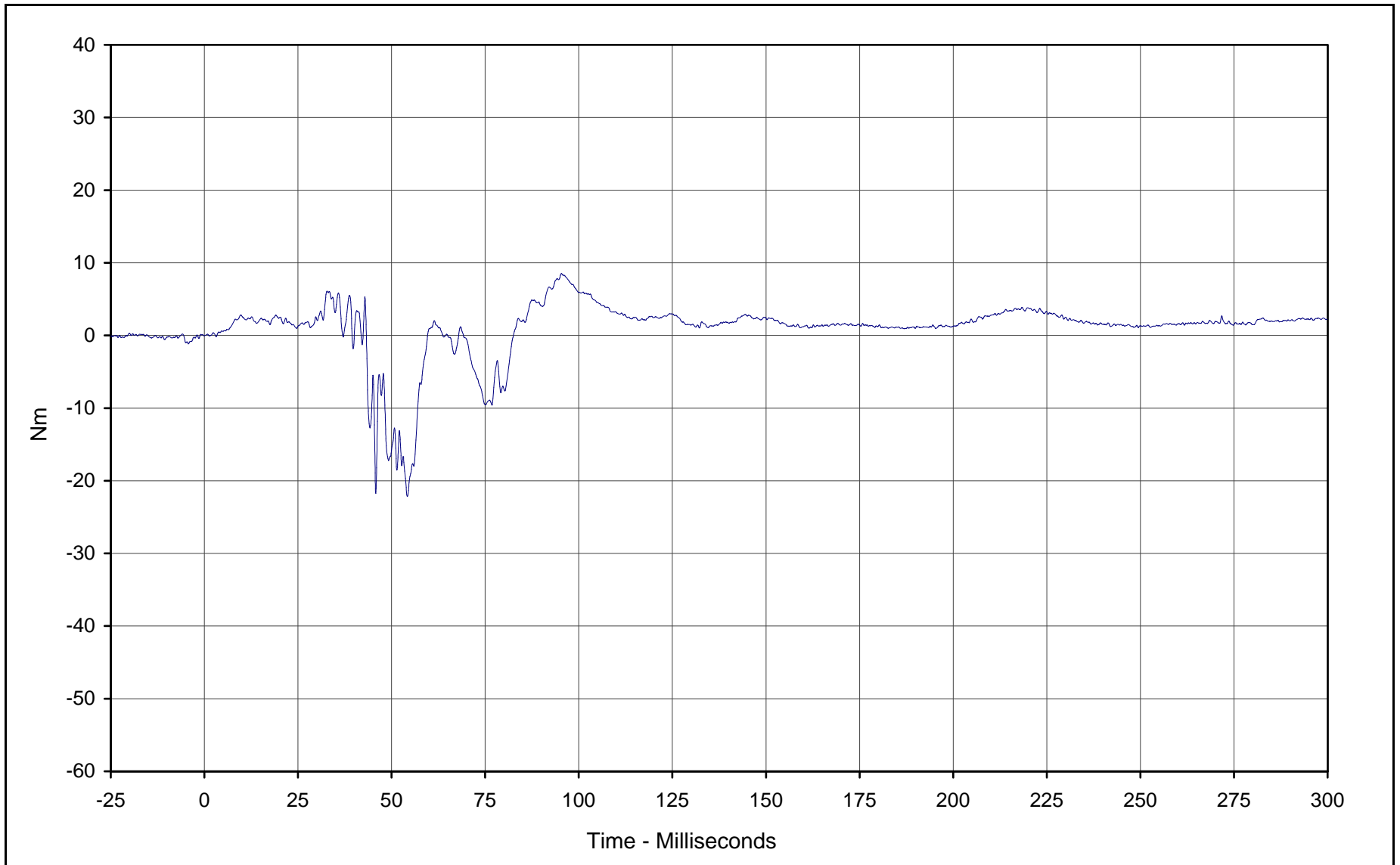
Curve Description: Driver Left Lower Tibia Force Z  
Maximum Value: 162.6 at 58.5 Milliseconds  
Minimum Value: -1917.4 at 78.5 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-031

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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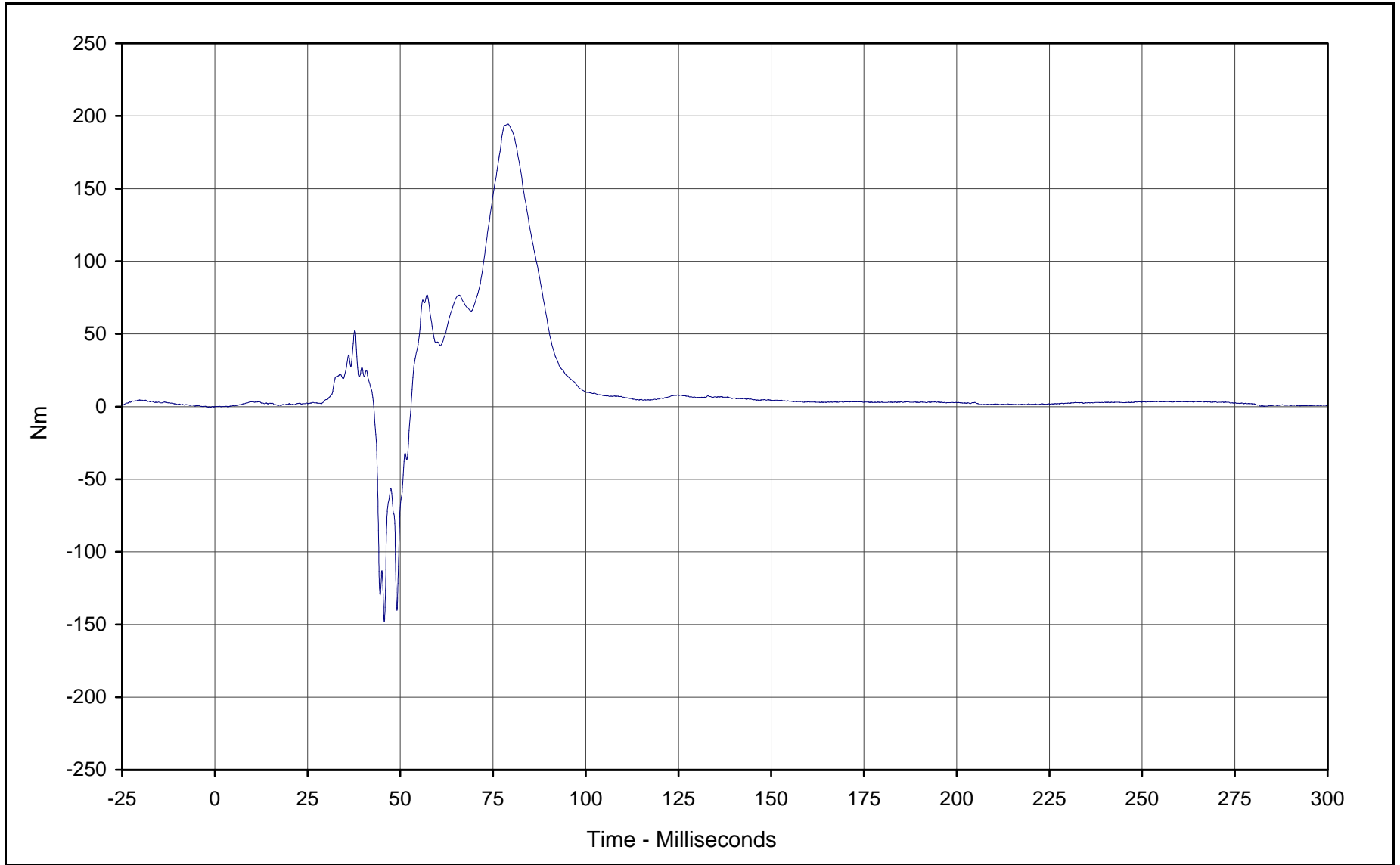
Curve Description: Driver Right Lower Tibia Moment X  
Maximum Value: 8.5 at 95.4 Milliseconds  
Minimum Value: -22.2 at 54.2 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-032

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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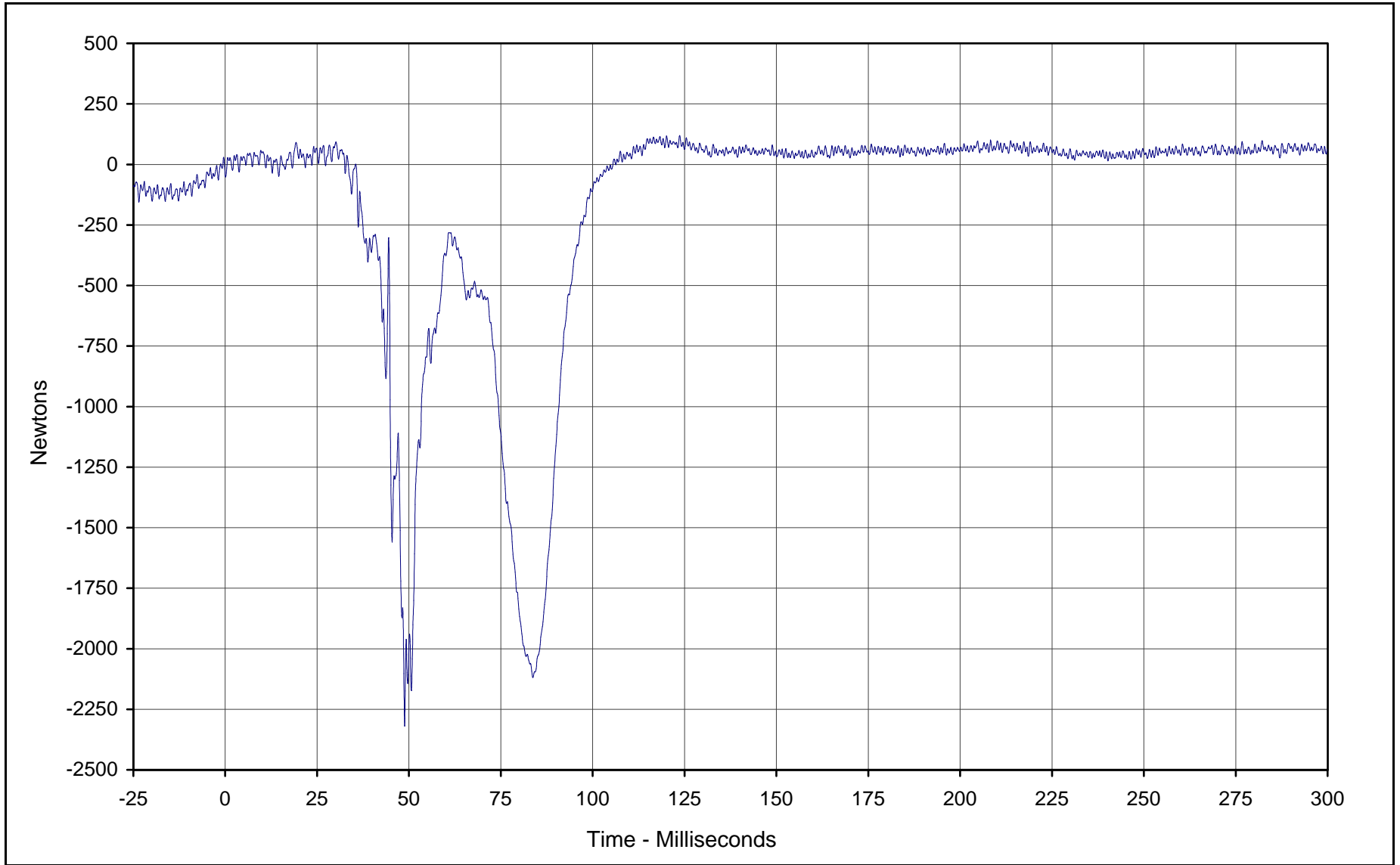
Curve Description: Driver Right Lower Tibia Moment Y  
Maximum Value: 194.7 at 79.0 Milliseconds  
Minimum Value: -148.0 at 45.7 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-033

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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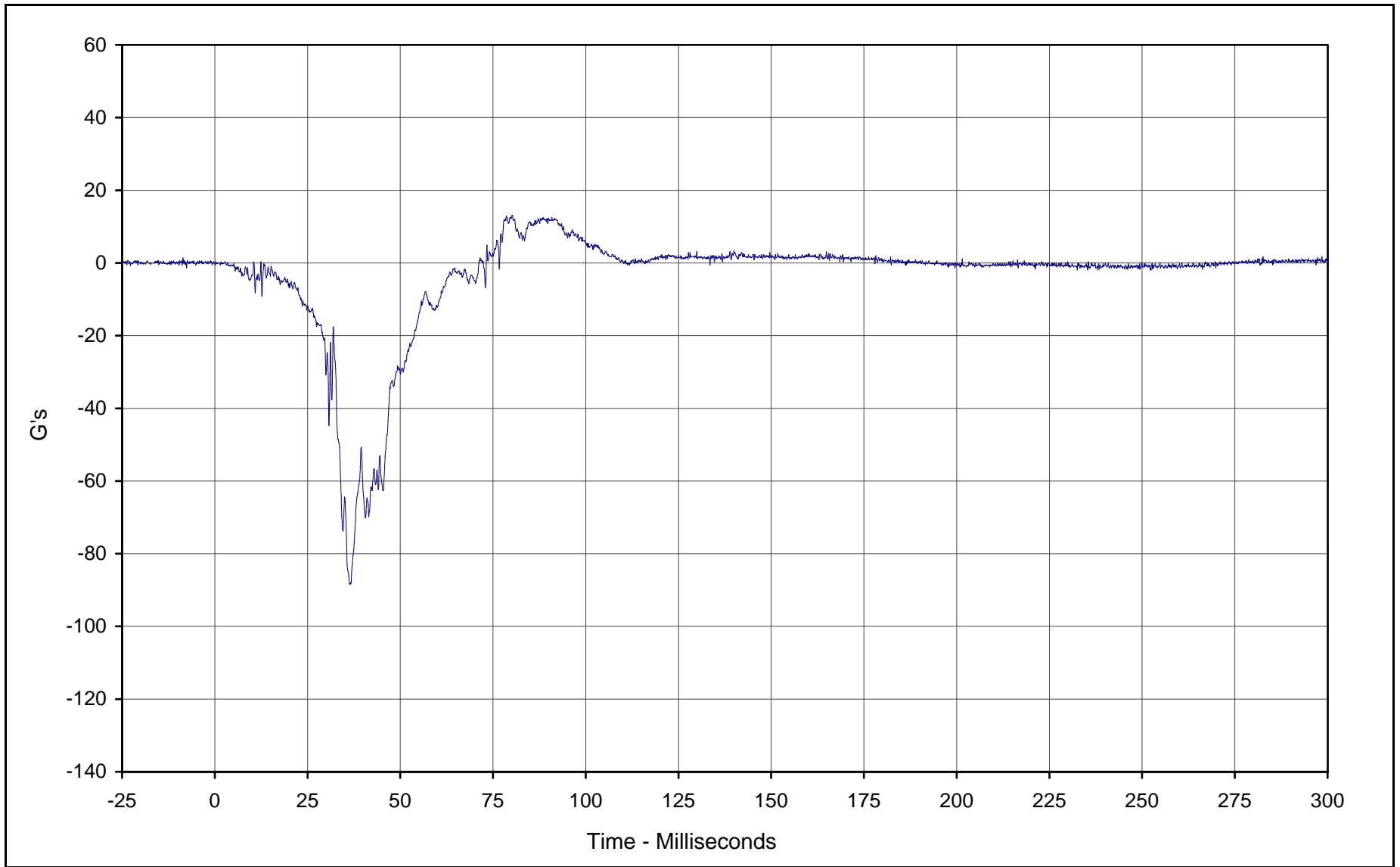
Curve Description: Driver Right Lower Tibia Force Z  
Maximum Value: 119.5 at 123.7 Milliseconds  
Minimum Value: -2318.9 at 48.8 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-034

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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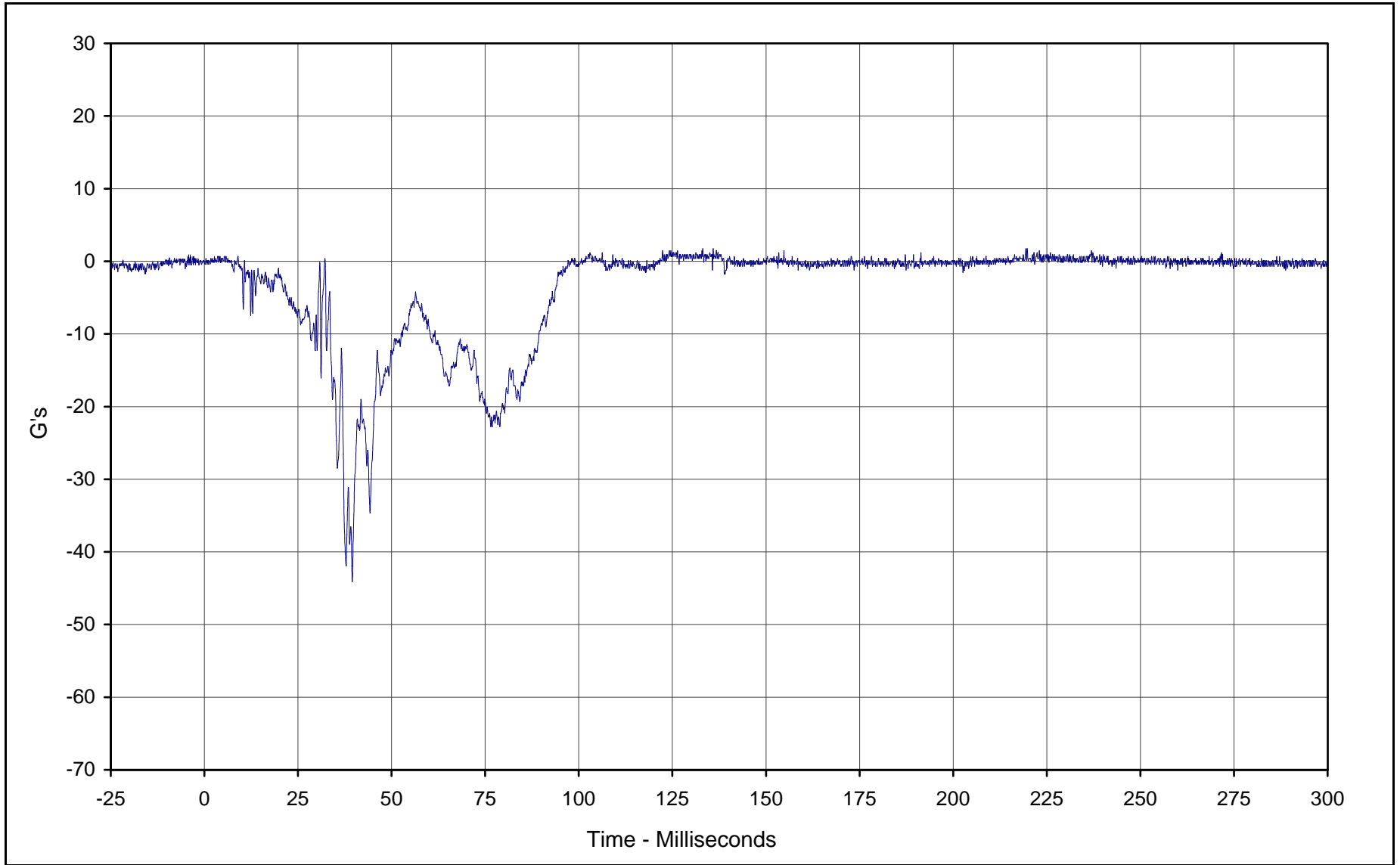
Curve Description: Driver Left Foot Aft X  
Maximum Value: 13.1 at 80.1 Milliseconds  
Minimum Value: -88.5 at 36.5 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-035

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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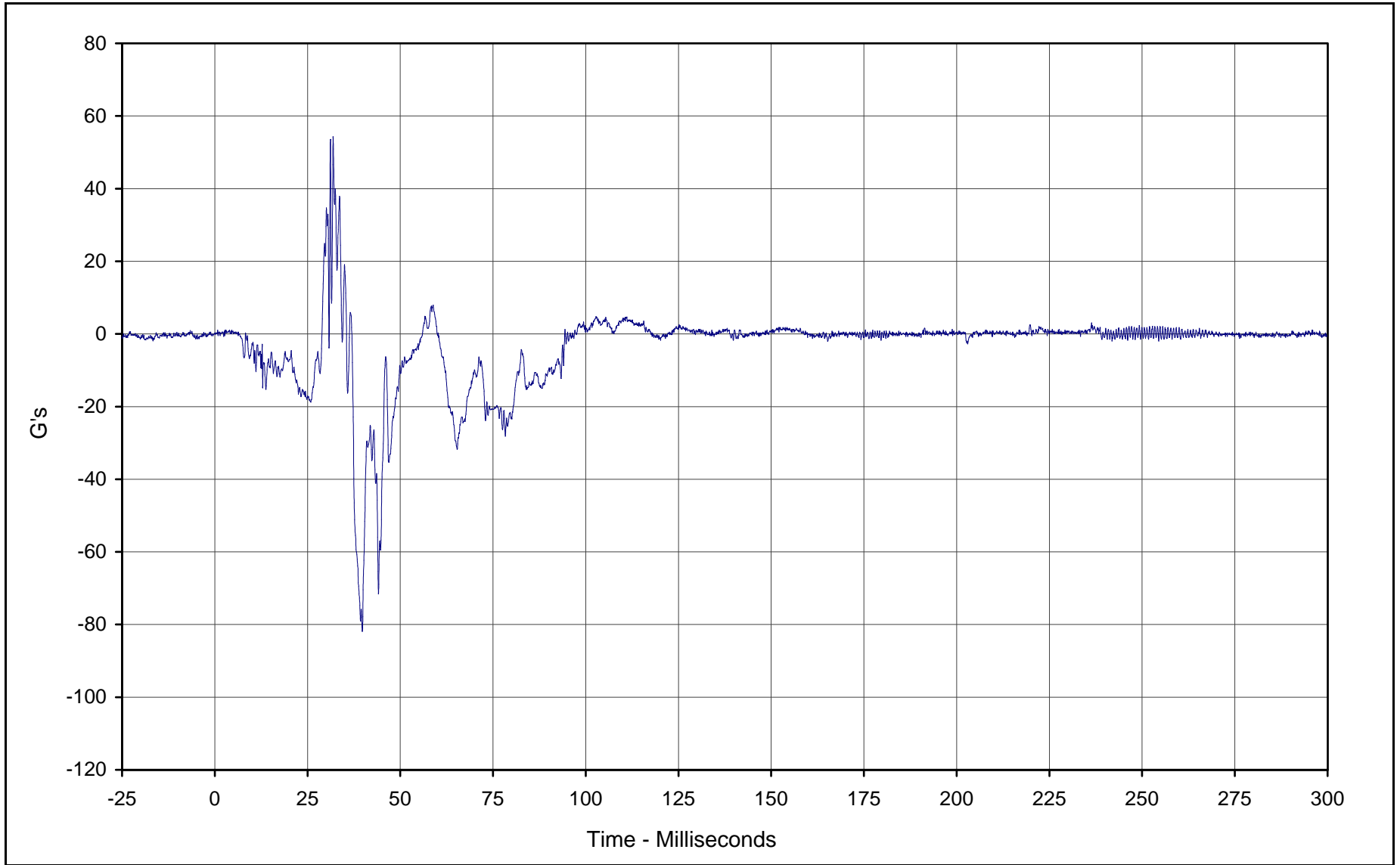
Curve Description: Driver Left Foot Aft Z  
Maximum Value: 1.7 at 133.1 Milliseconds  
Minimum Value: -44.1 at 39.5 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-036

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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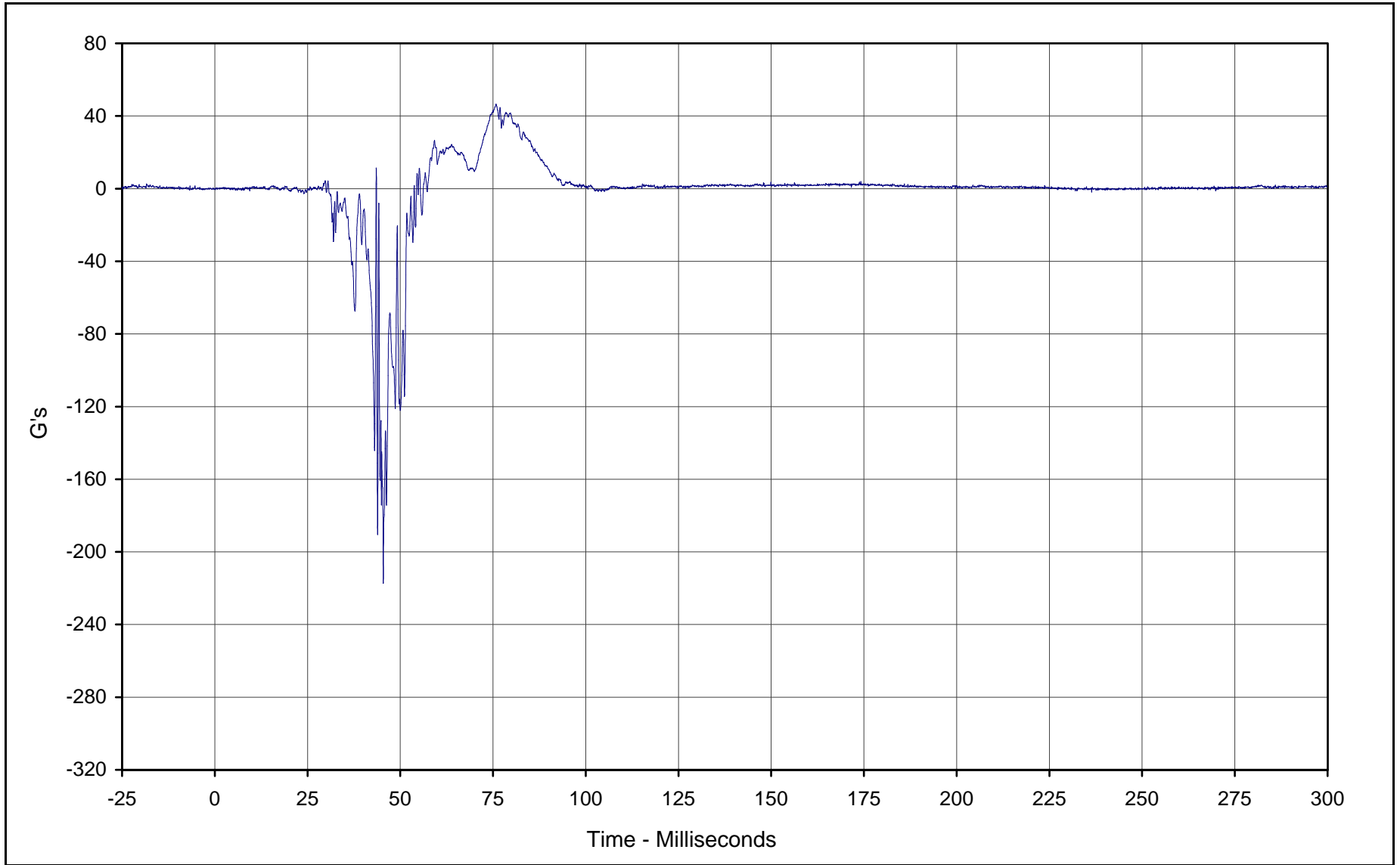
Curve Description: Driver Left Foot Fore Z  
Maximum Value: 54.2 at 31.9 Milliseconds  
Minimum Value: -81.9 at 39.7 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-037

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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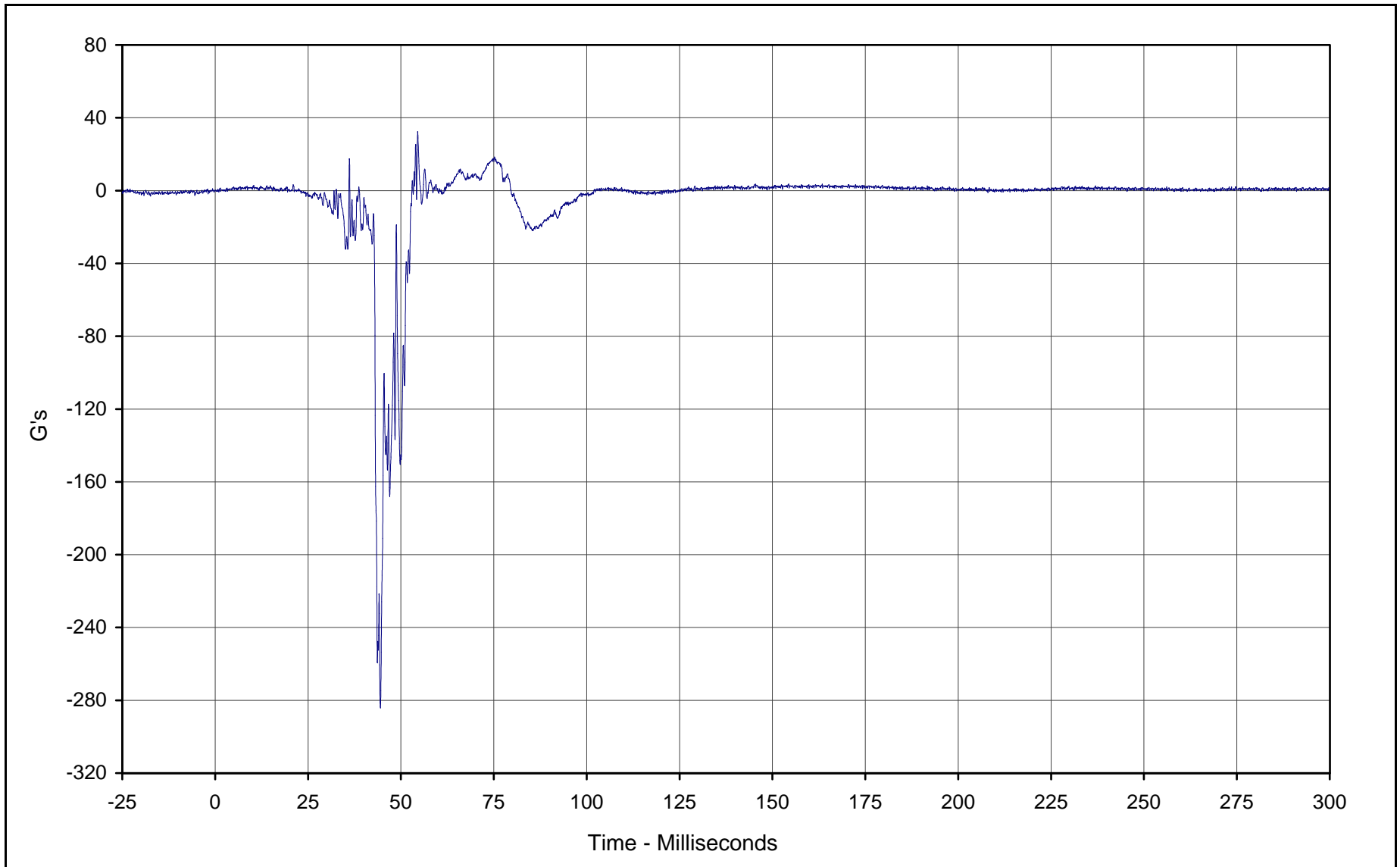
Curve Description: Driver Right Foot Aft X  
Maximum Value: 46.6 at 75.8 Milliseconds  
Minimum Value: -217.0 at 45.4 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-038

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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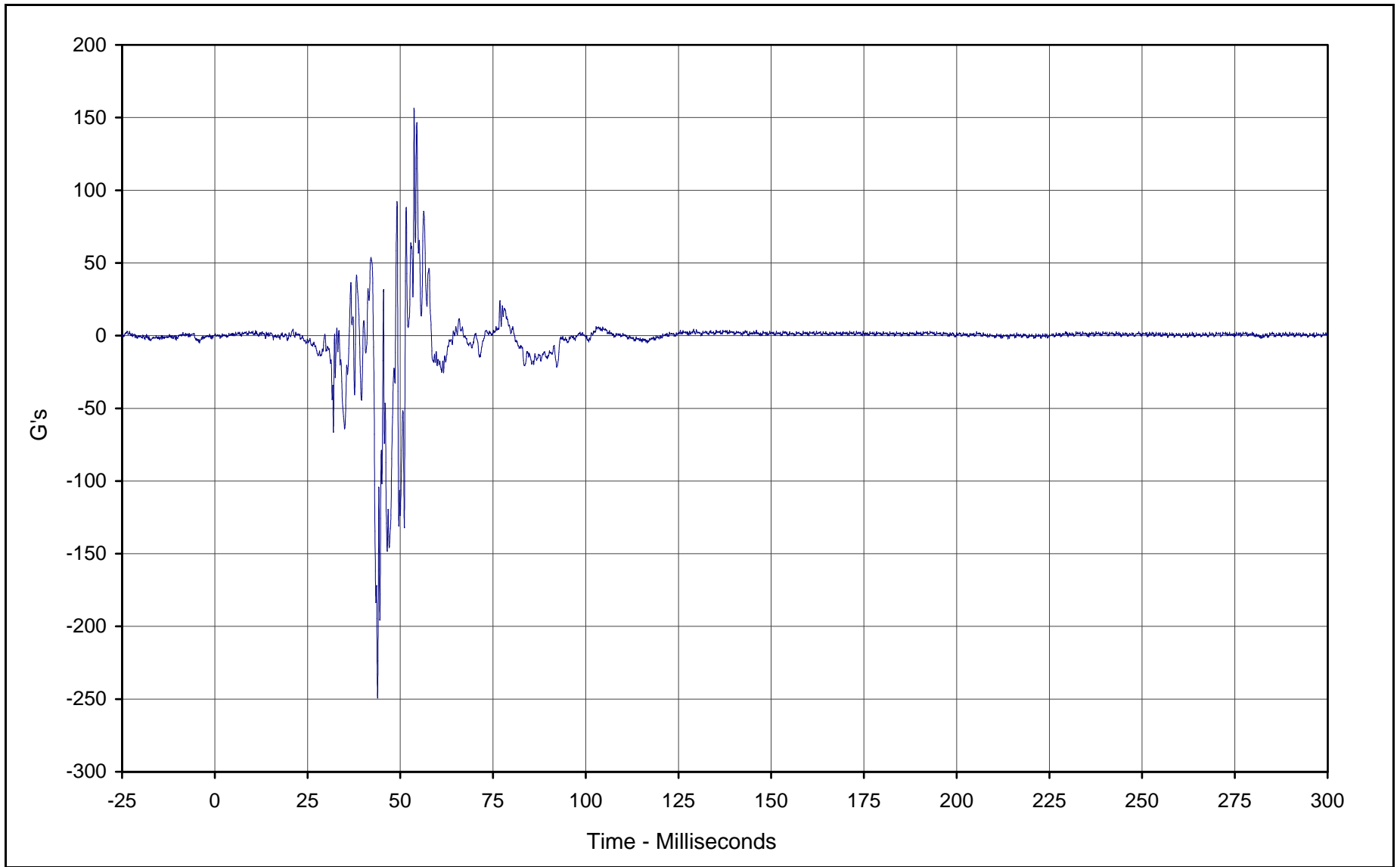
Curve Description: Driver Right Foot Aft Z  
Maximum Value: 32.2 at 54.5 Milliseconds  
Minimum Value: -284.2 at 44.5 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-039

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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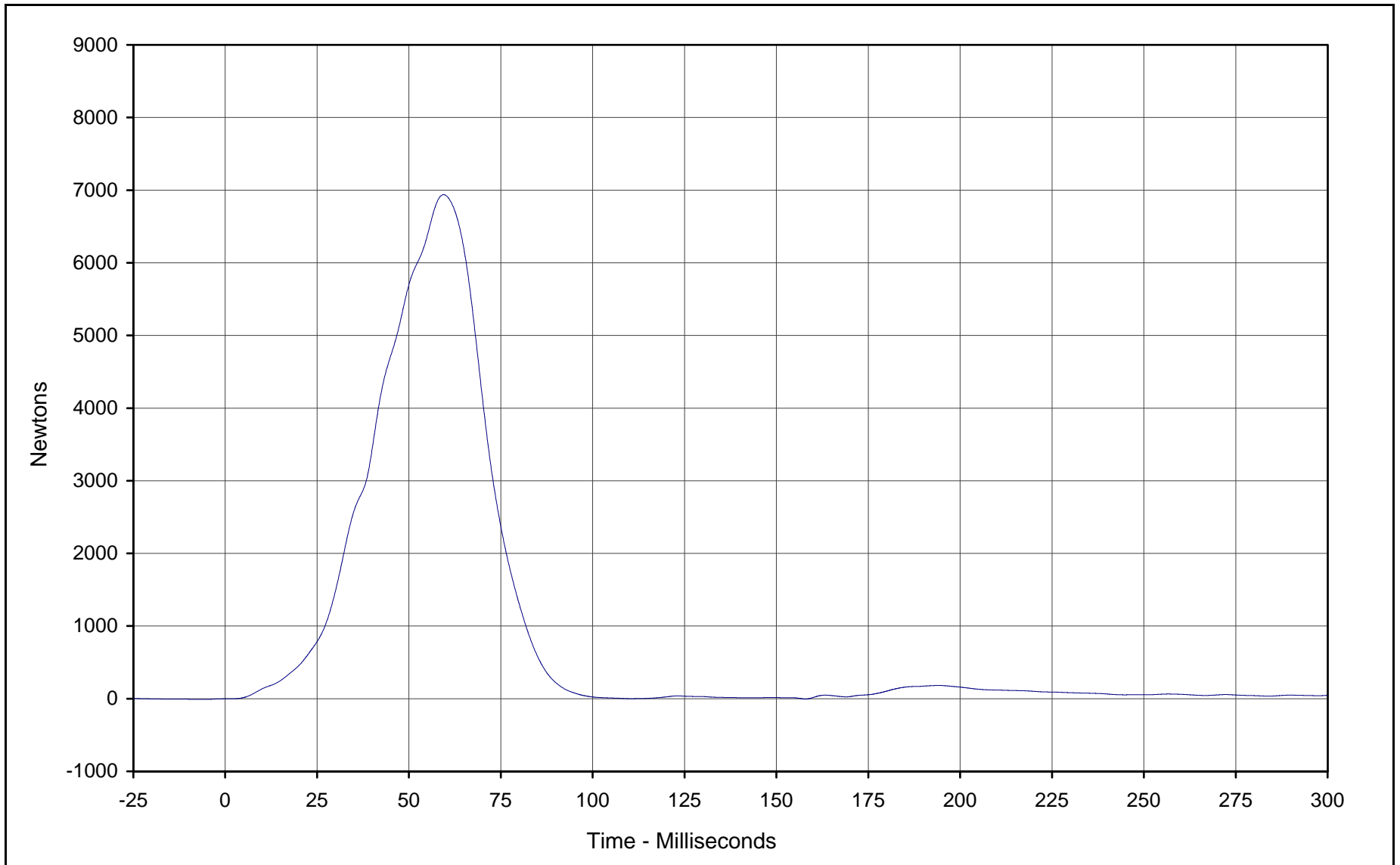
Curve Description: Driver Right Foot Fore Z  
Maximum Value: 156.3 at 53.7 Milliseconds  
Minimum Value: -249.2 at 43.9 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-040

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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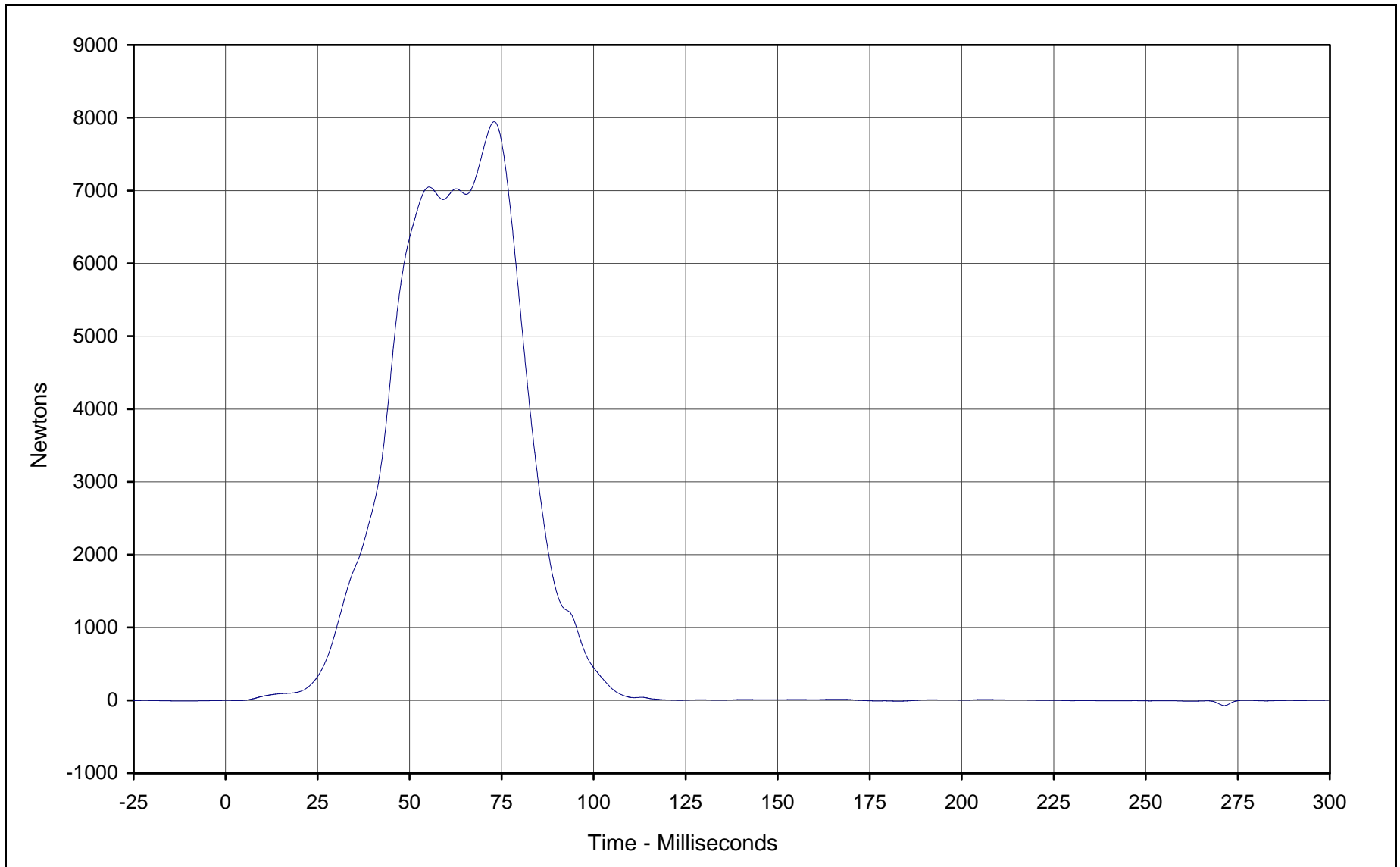


Curve Description: Driver Lap Belt Force  
Maximum Value: 6937.6 at 59.4 Milliseconds  
Minimum Value: -5.6 at 158.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-041

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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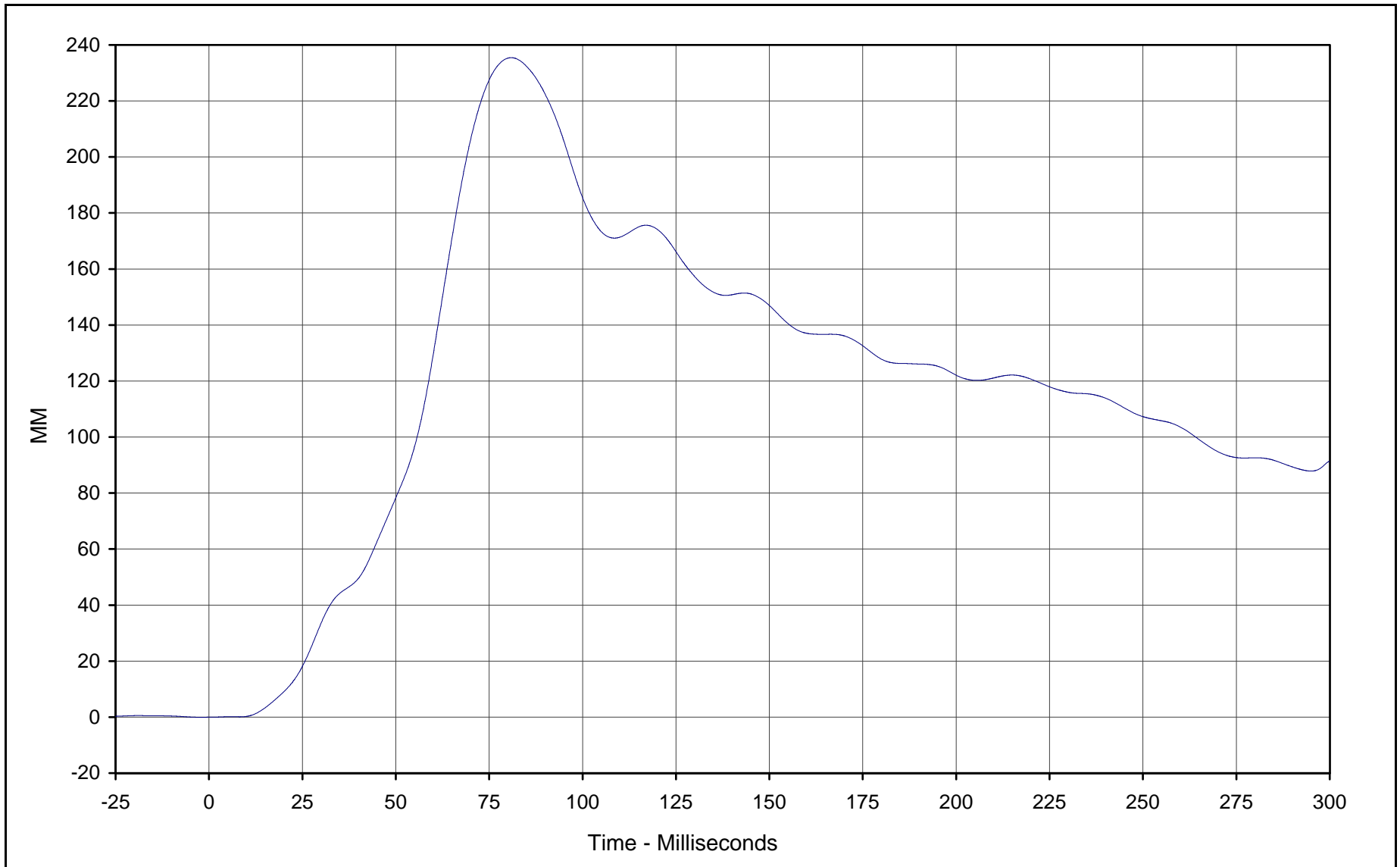


Curve Description: Driver Shoulder Belt Force  
Maximum Value: 7946.2 at 73.0 Milliseconds  
Minimum Value: -72.7 at 271.4 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-042

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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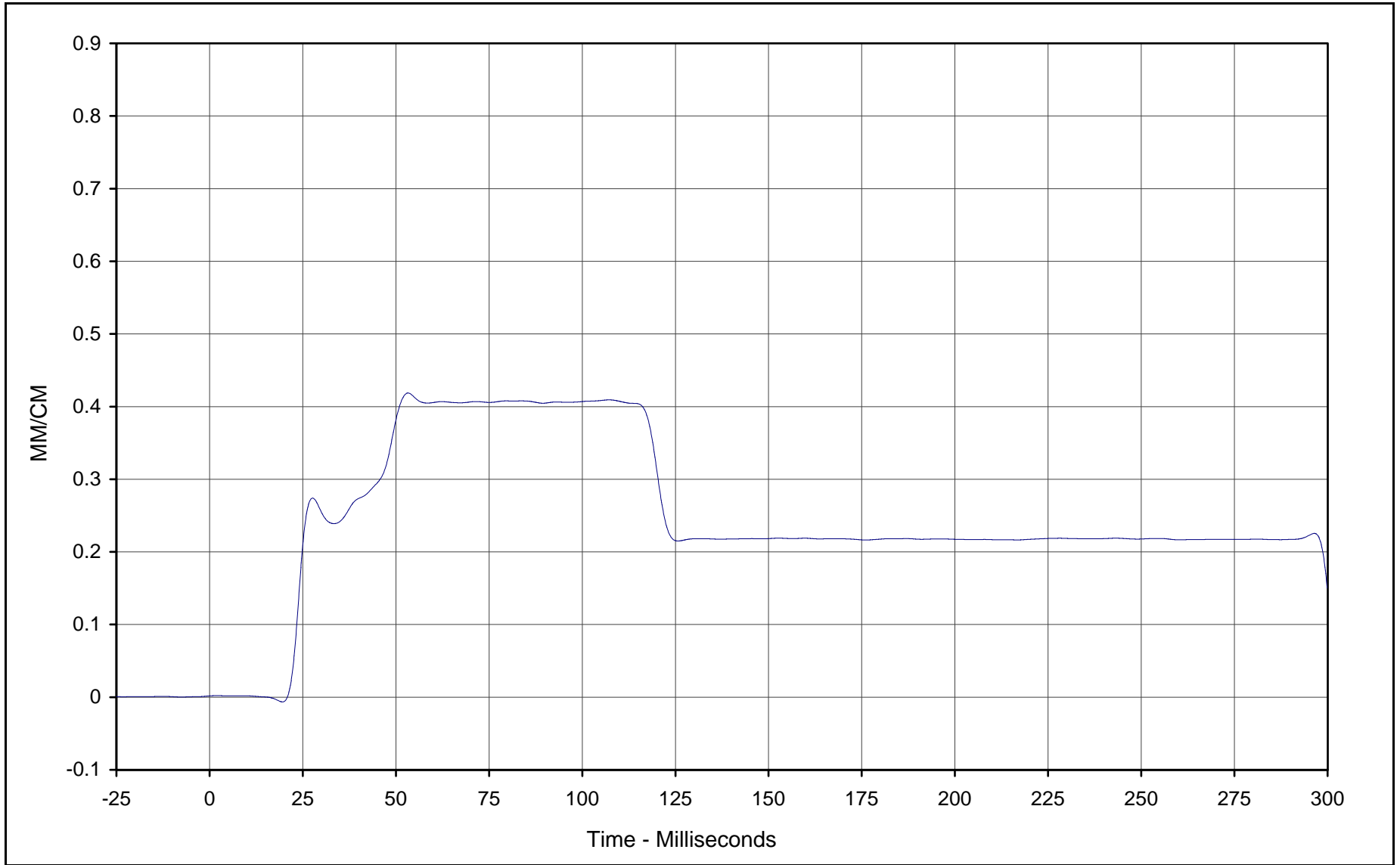
Curve Description: Driver Shoulder Belt Pullout  
Maximum Value: 235.5 at 80.9 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-043

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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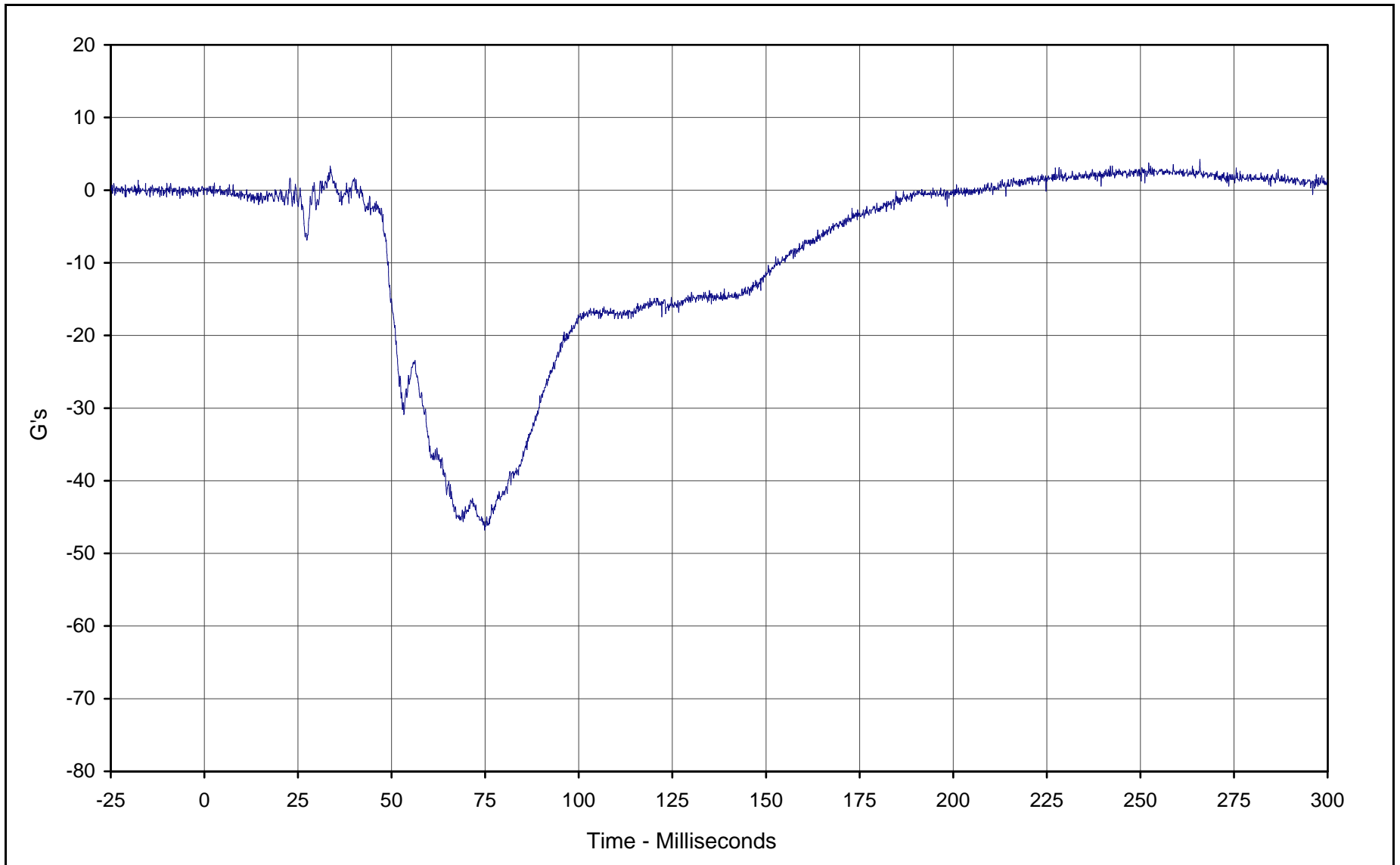
Curve Description: Driver Shoulder Belt Elongation  
Maximum Value: 0.42 at 53.2 Milliseconds  
Minimum Value: -0.01 at 19.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-044

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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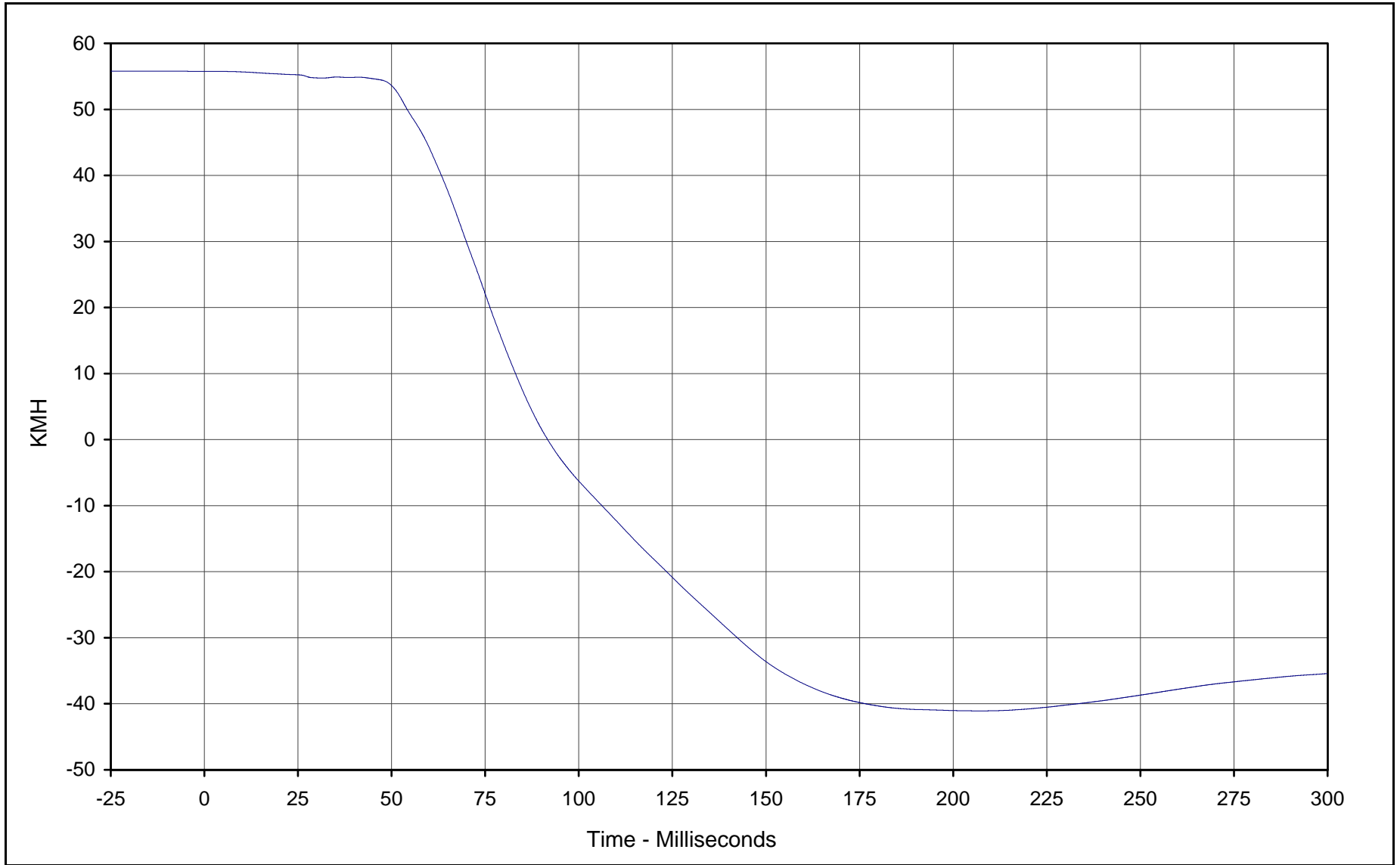
Curve Description: Passenger Head Primary X  
Maximum Value: 4.2 at 265.9 Milliseconds  
Minimum Value: -46.8 at 74.9 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-045

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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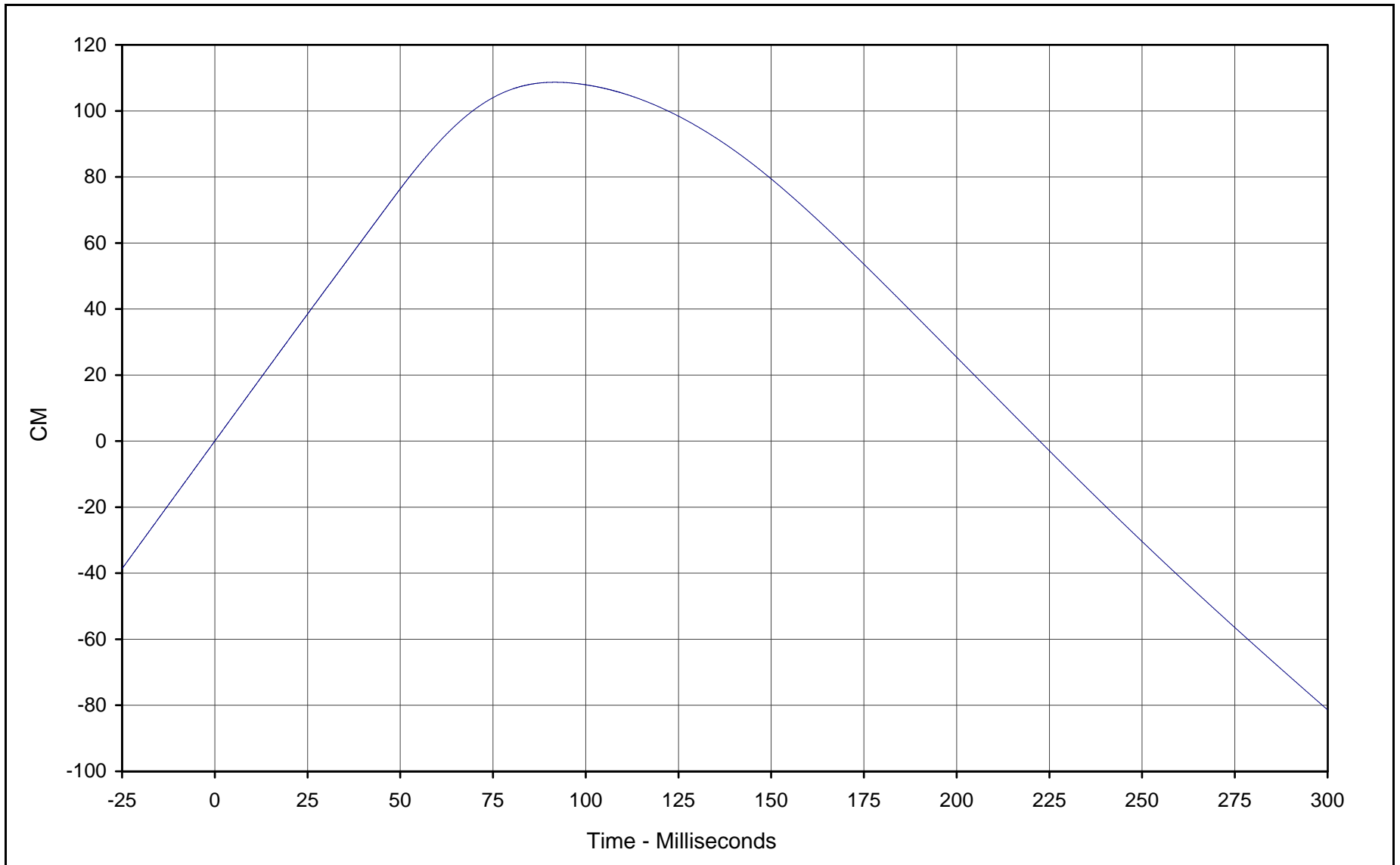
Curve Description: Passenger Head Primary X Velocity  
Maximum Value: 55.8 at 1.7 Milliseconds  
Minimum Value: -41.1 at 207.7 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-045

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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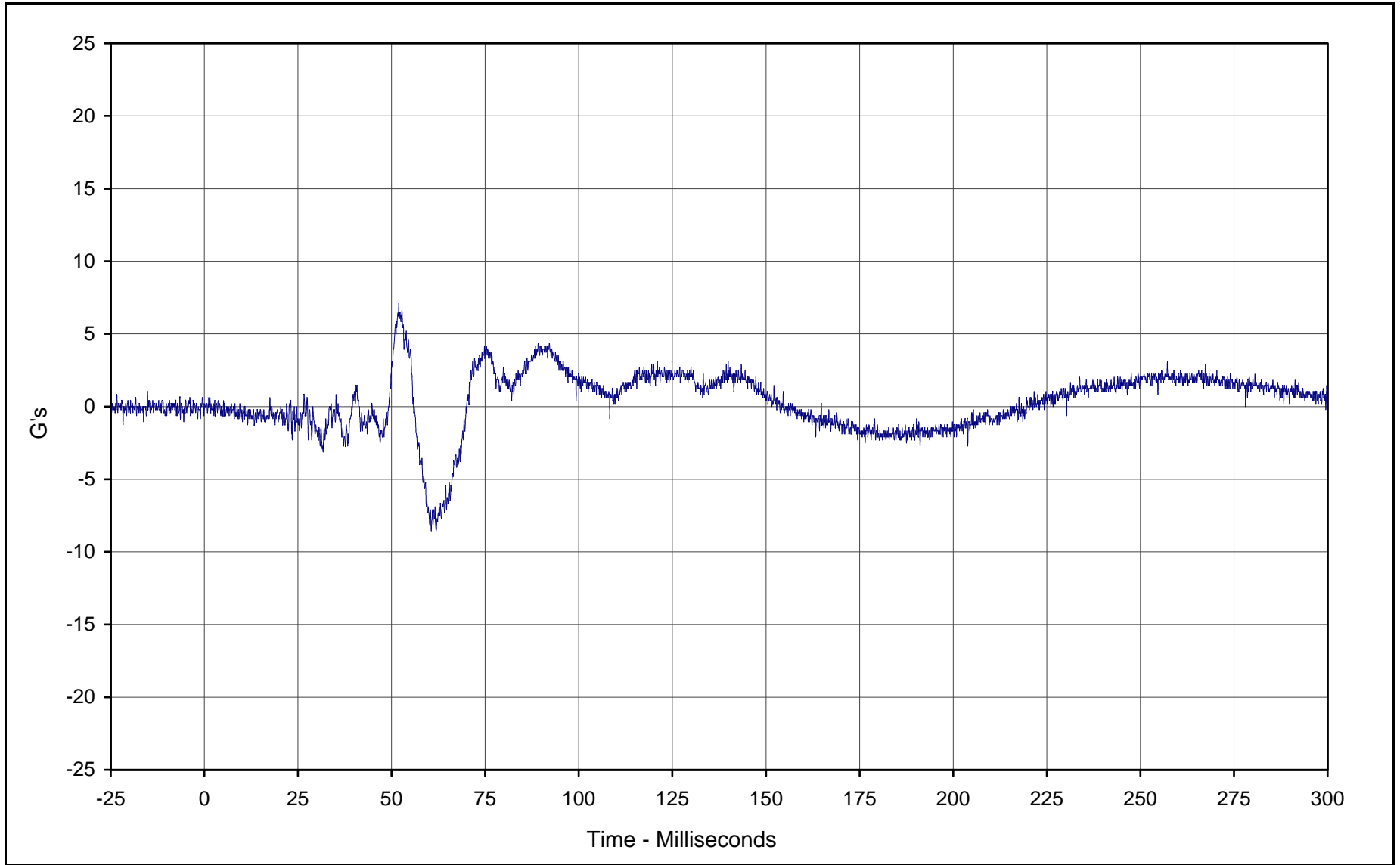
Curve Description: Passenger Head Primary X Displ.  
Maximum Value: 108.7 at 91.7 Milliseconds  
Minimum Value: -81.3 at 299.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-045

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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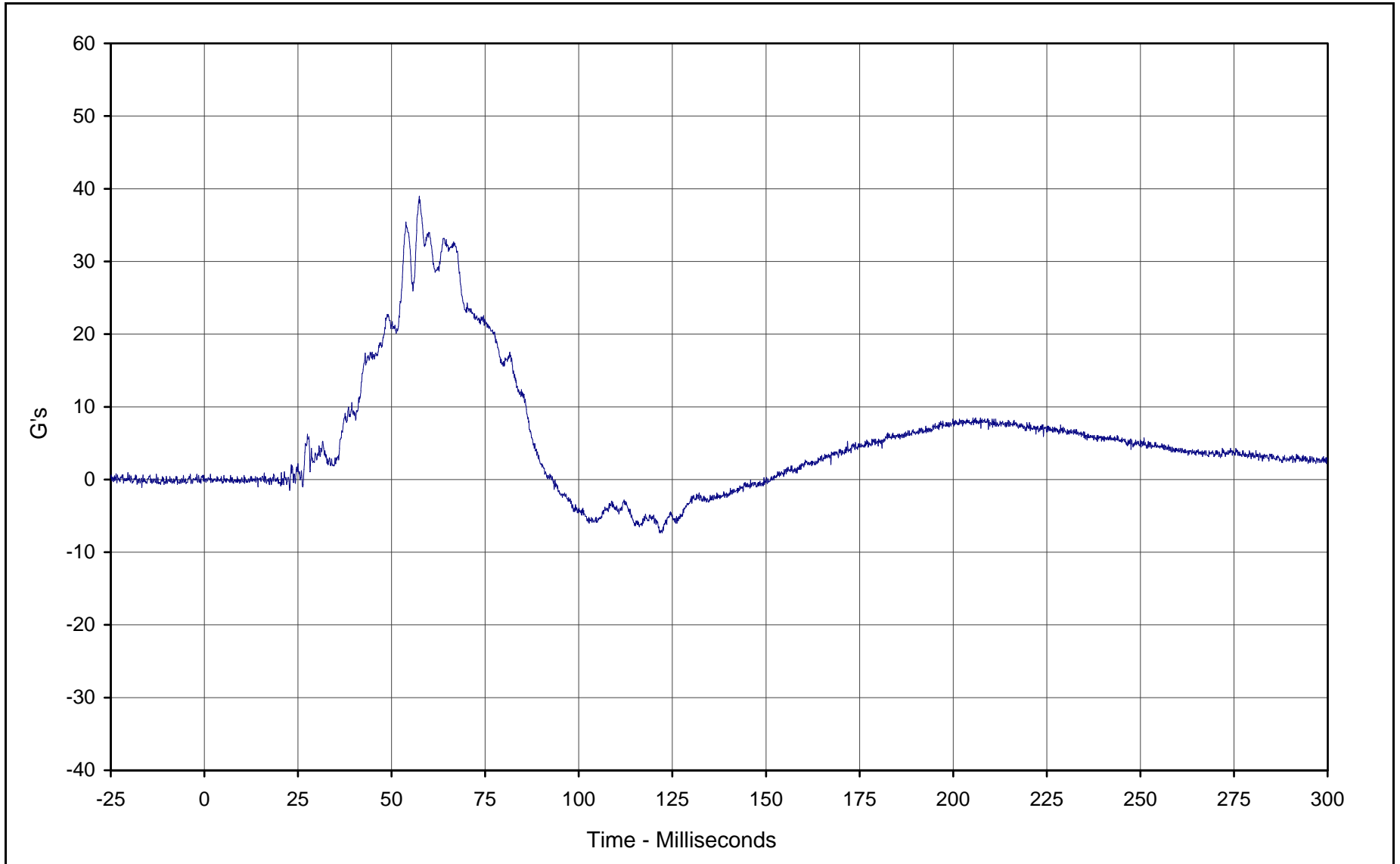
Curve Description: Passenger Head Primary Y  
Maximum Value: 7.1 at 51.9 Milliseconds  
Minimum Value: -8.6 at 60.6 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-046

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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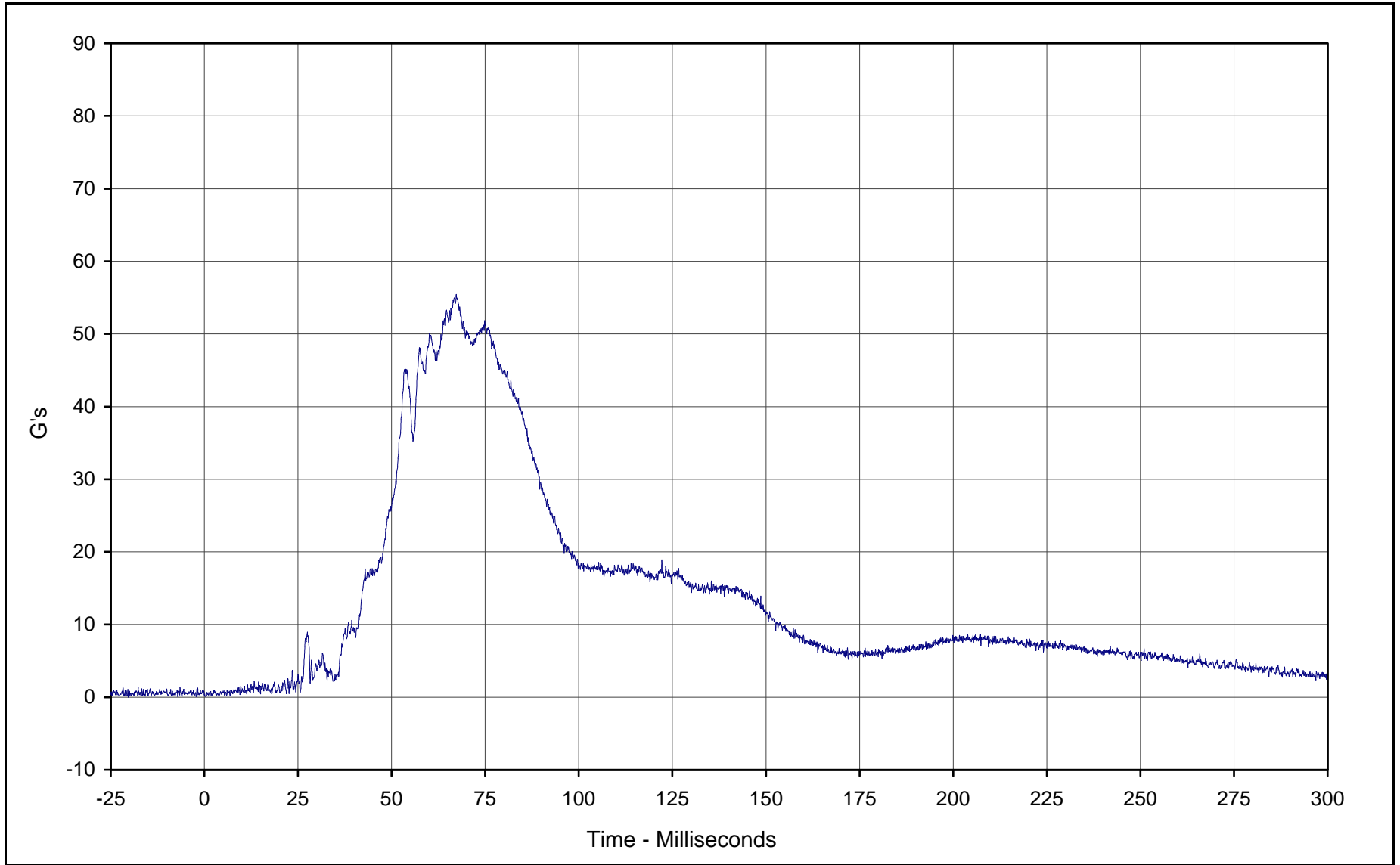
Curve Description: Passenger Head Primary Z  
Maximum Value: 39.0 at 57.4 Milliseconds  
Minimum Value: -7.3 at 121.6 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-047

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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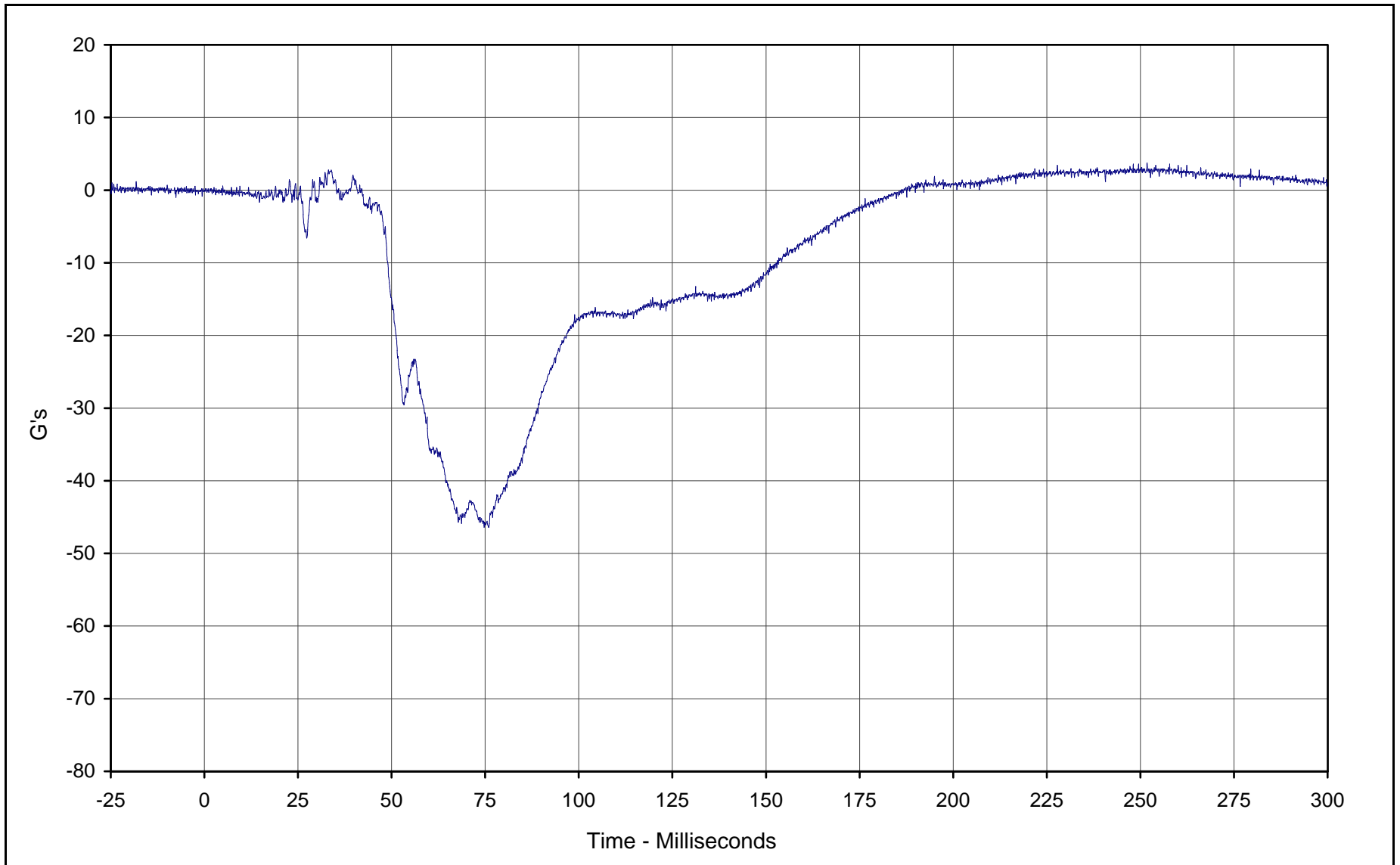
Curve Description: Passenger Head Resultant Primary  
Maximum Value: 55.4 at 67.3 Milliseconds  
Minimum Value: 0.1 at 0.3 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: RES-045

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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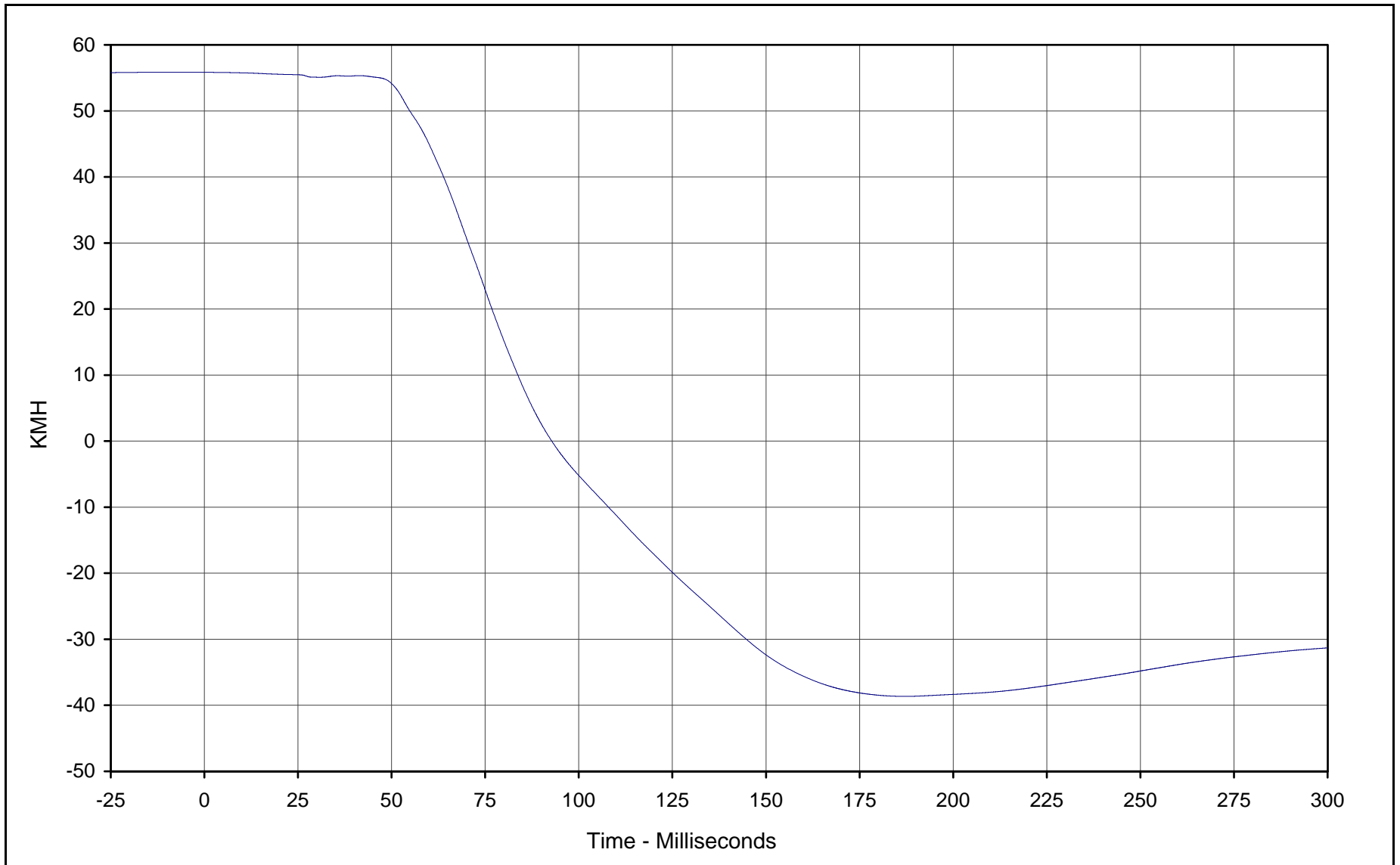
Curve Description: Passenger Head Redundant X  
Maximum Value: 3.8 at 251.8 Milliseconds  
Minimum Value: -46.4 at 74.7 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-048

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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Curve Description: Passenger Head Redundant X Velocity

Maximum Value: 55.8 at 0.0 Milliseconds

Minimum Value: -38.7 at 187.1 Milliseconds

SAE Filter Class: 180

Date of Test: 1/13/00

Curve Number: IN1-048

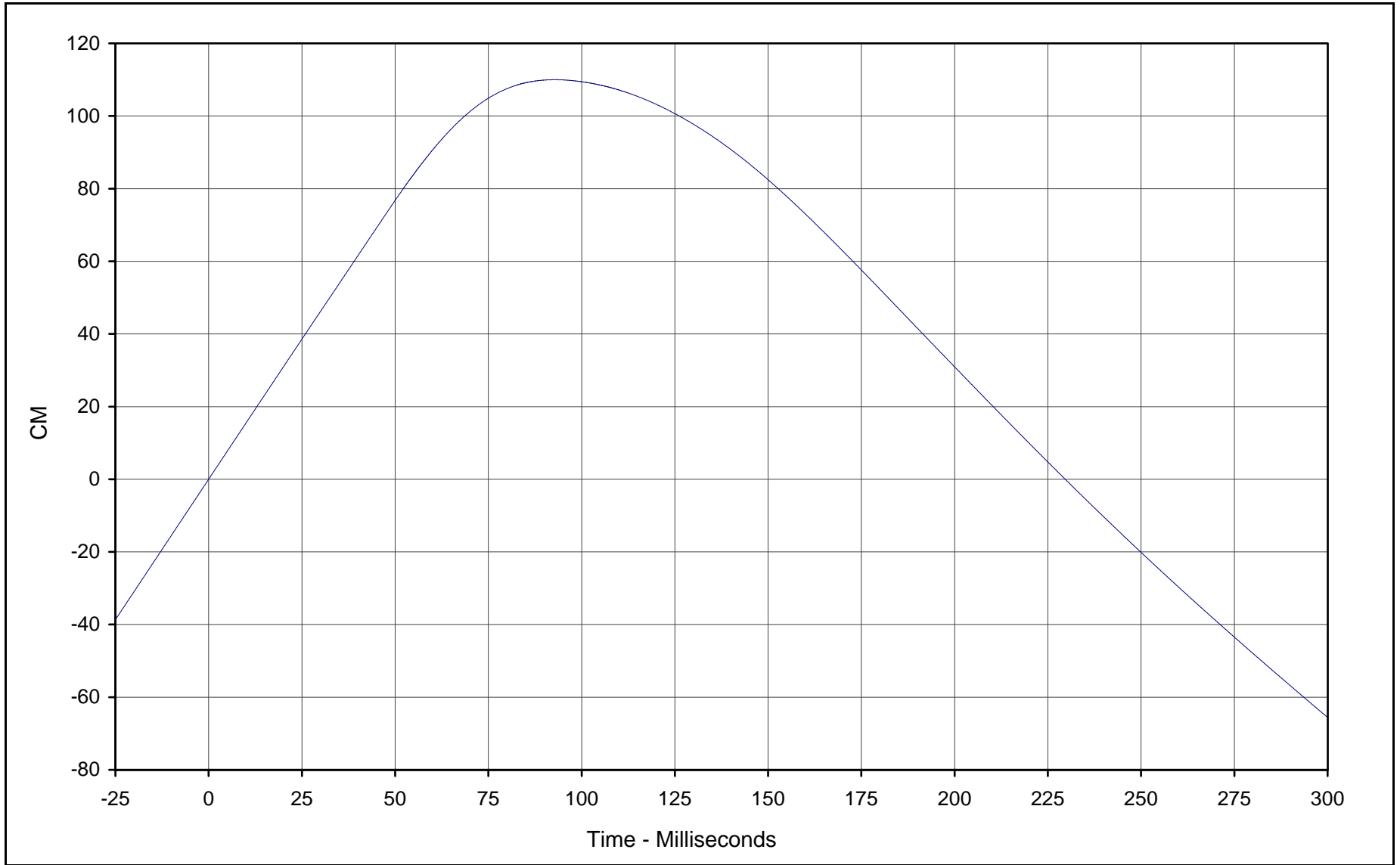
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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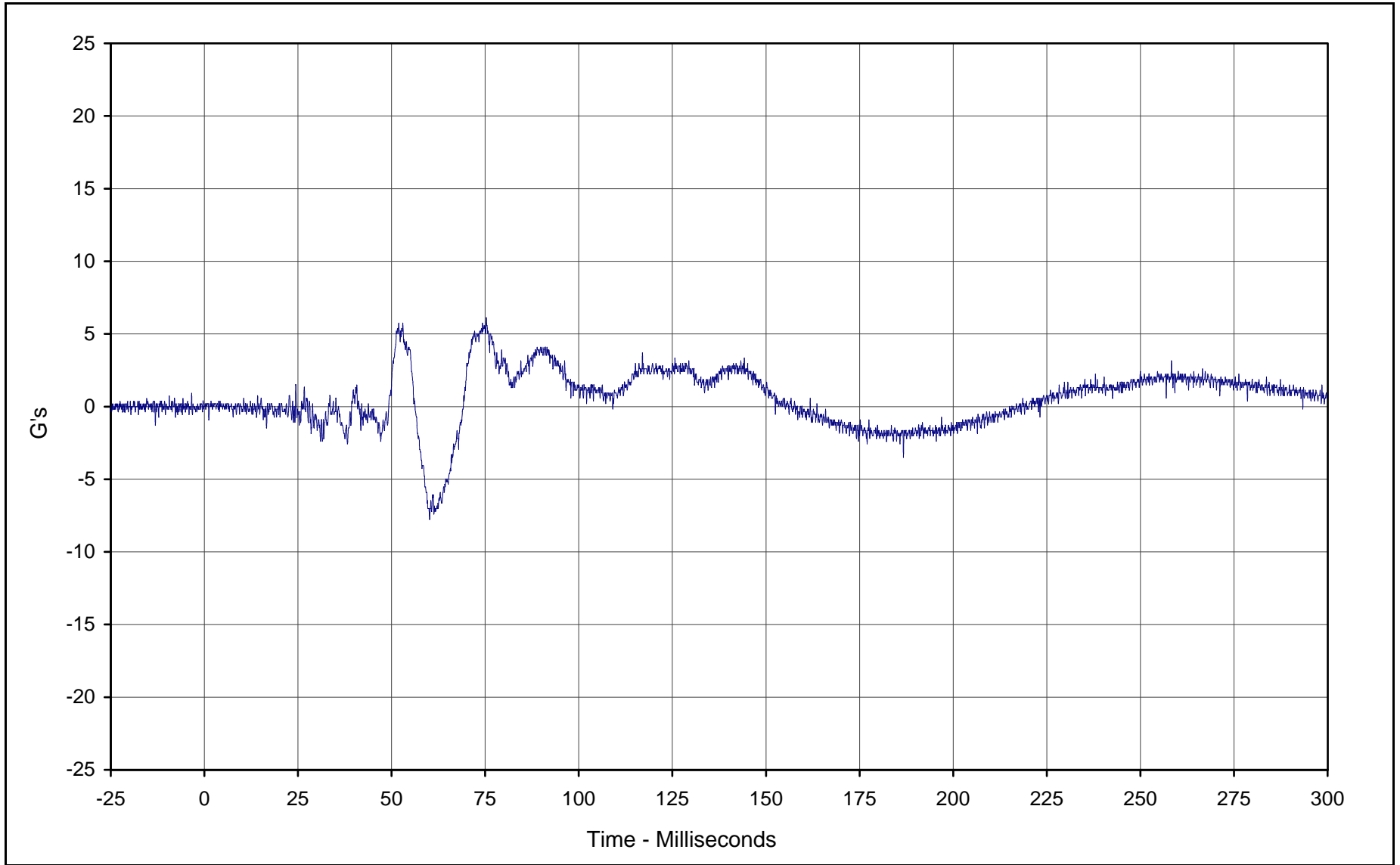
Curve Description: Passenger Head Redundant X Displ.  
Maximum Value: 110.0 at 92.8 Milliseconds  
Minimum Value: -65.5 at 299.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-048

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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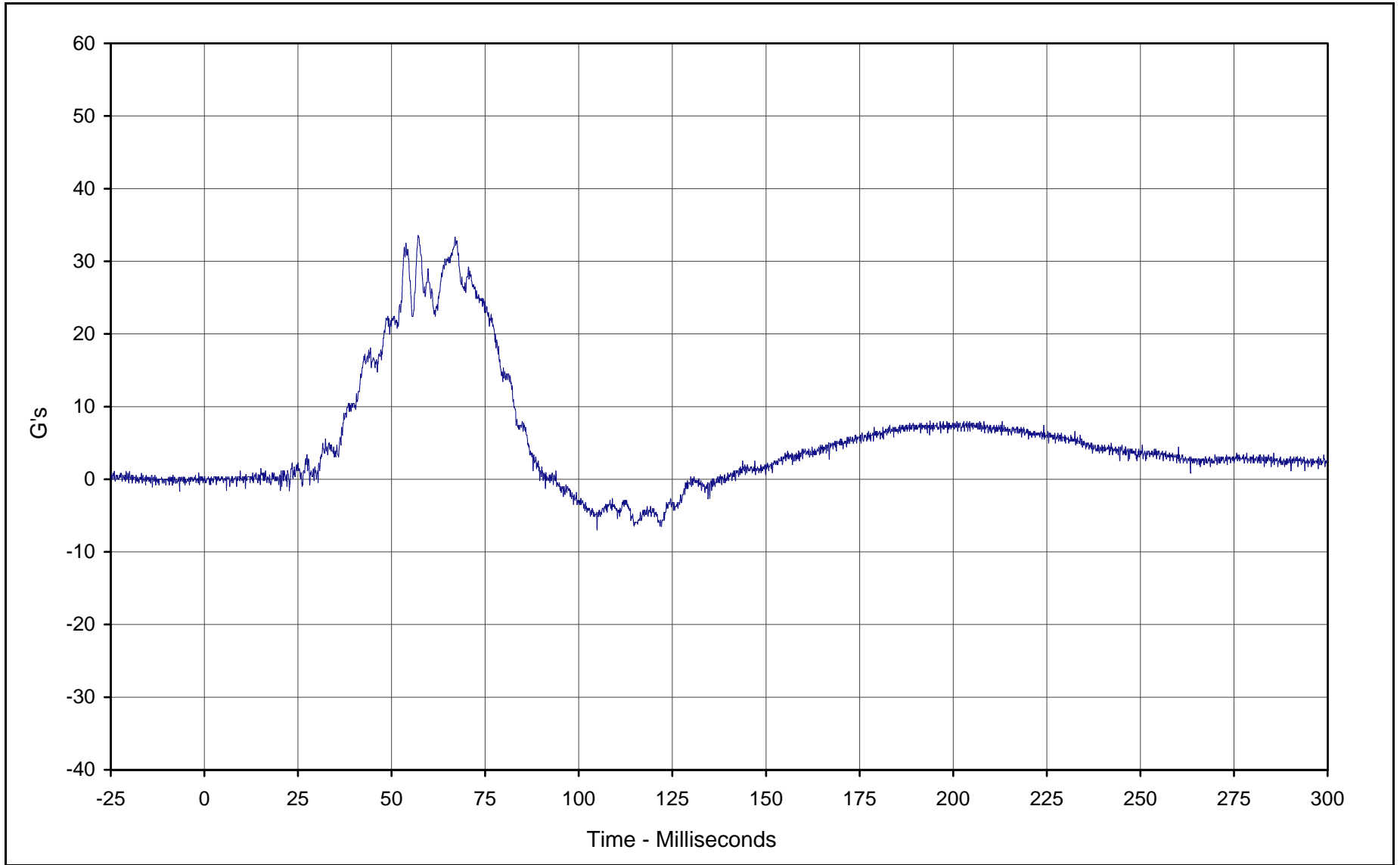
Curve Description: Passenger Head Redundant Y  
Maximum Value: 6.1 at 75.3 Milliseconds  
Minimum Value: -7.8 at 60.1 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-049

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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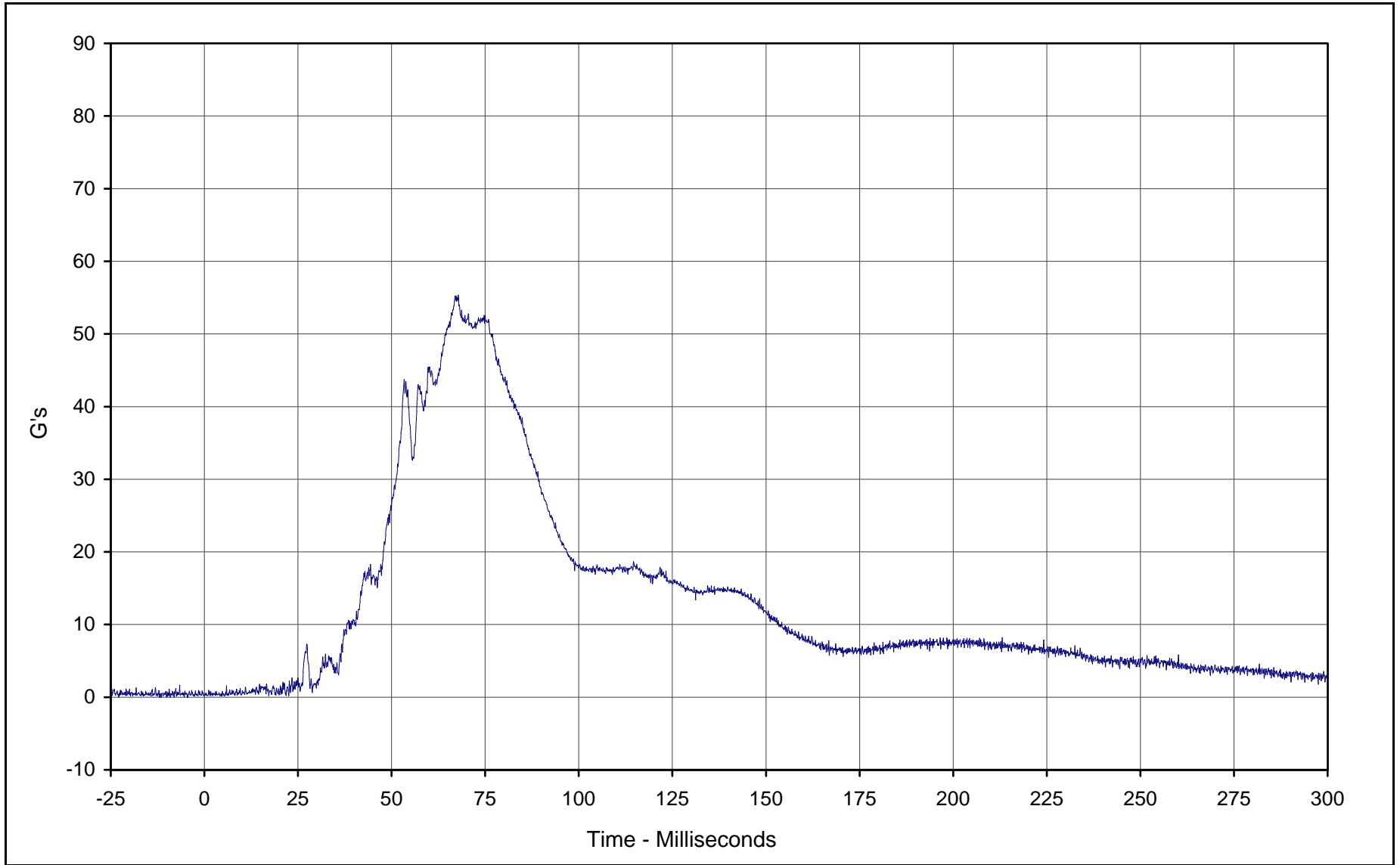
Curve Description: Passenger Head Redundant Z  
Maximum Value: 33.6 at 57.1 Milliseconds  
Minimum Value: -7.0 at 104.9 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-050

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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Curve Description: Passenger Head Resultant Redundant

Maximum Value: 55.4 at 67.8 Milliseconds

Minimum Value: 0.2 at 4.4 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/13/00

Curve Number: RES-048

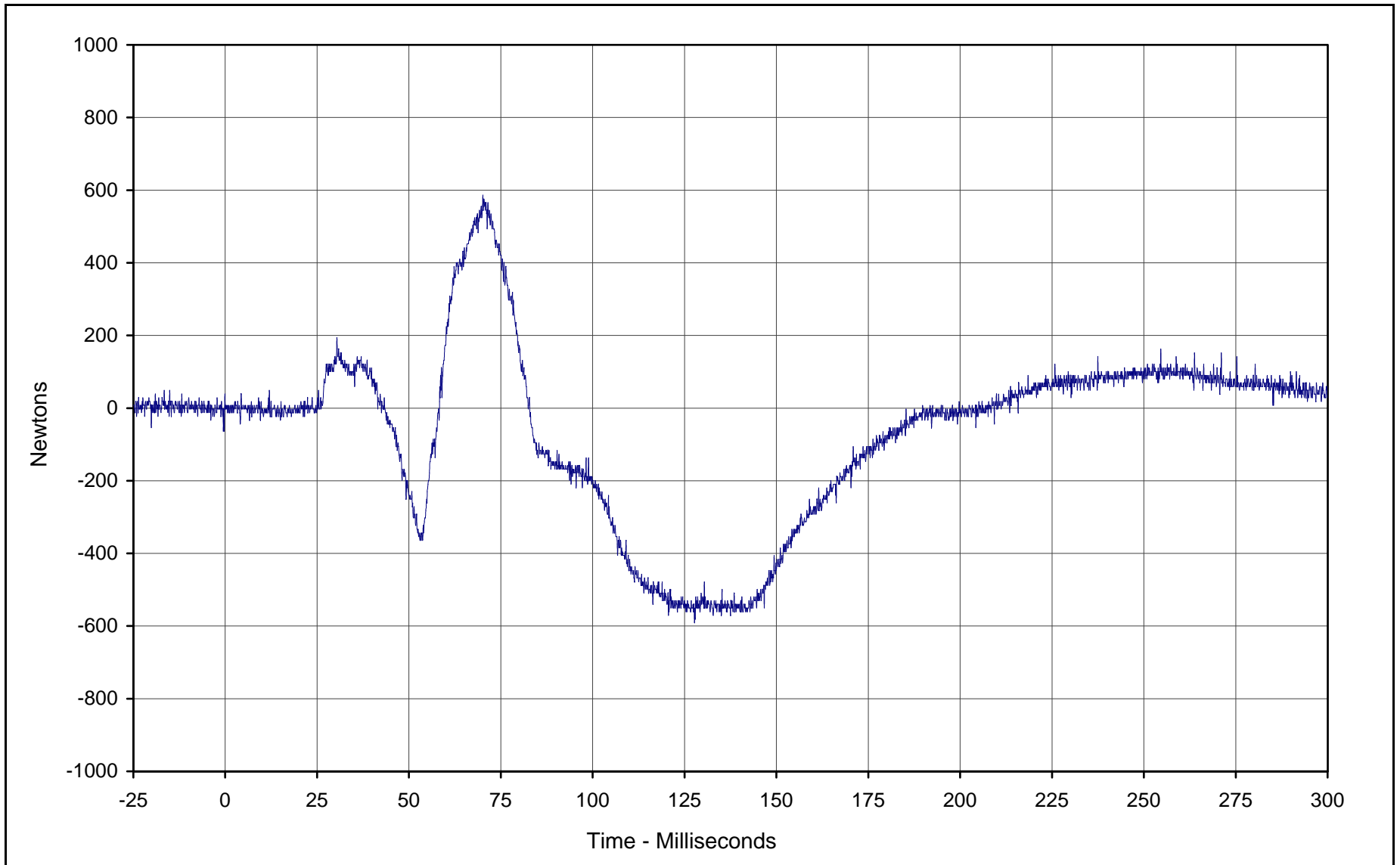
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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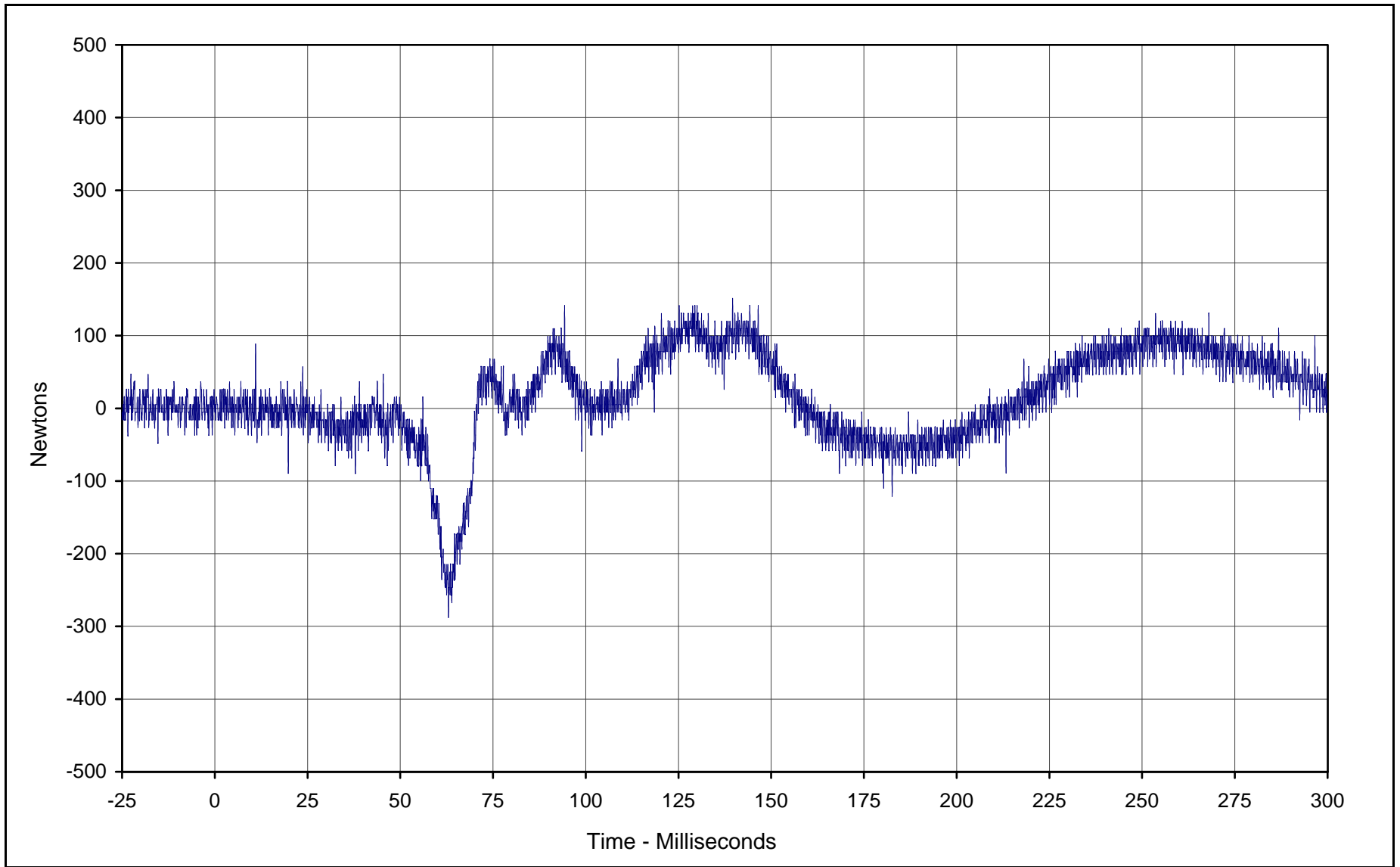
Curve Description: Passenger Neck Force X  
Maximum Value: 586.4 at 70.1 Milliseconds  
Minimum Value: -591.7 at 127.7 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-051

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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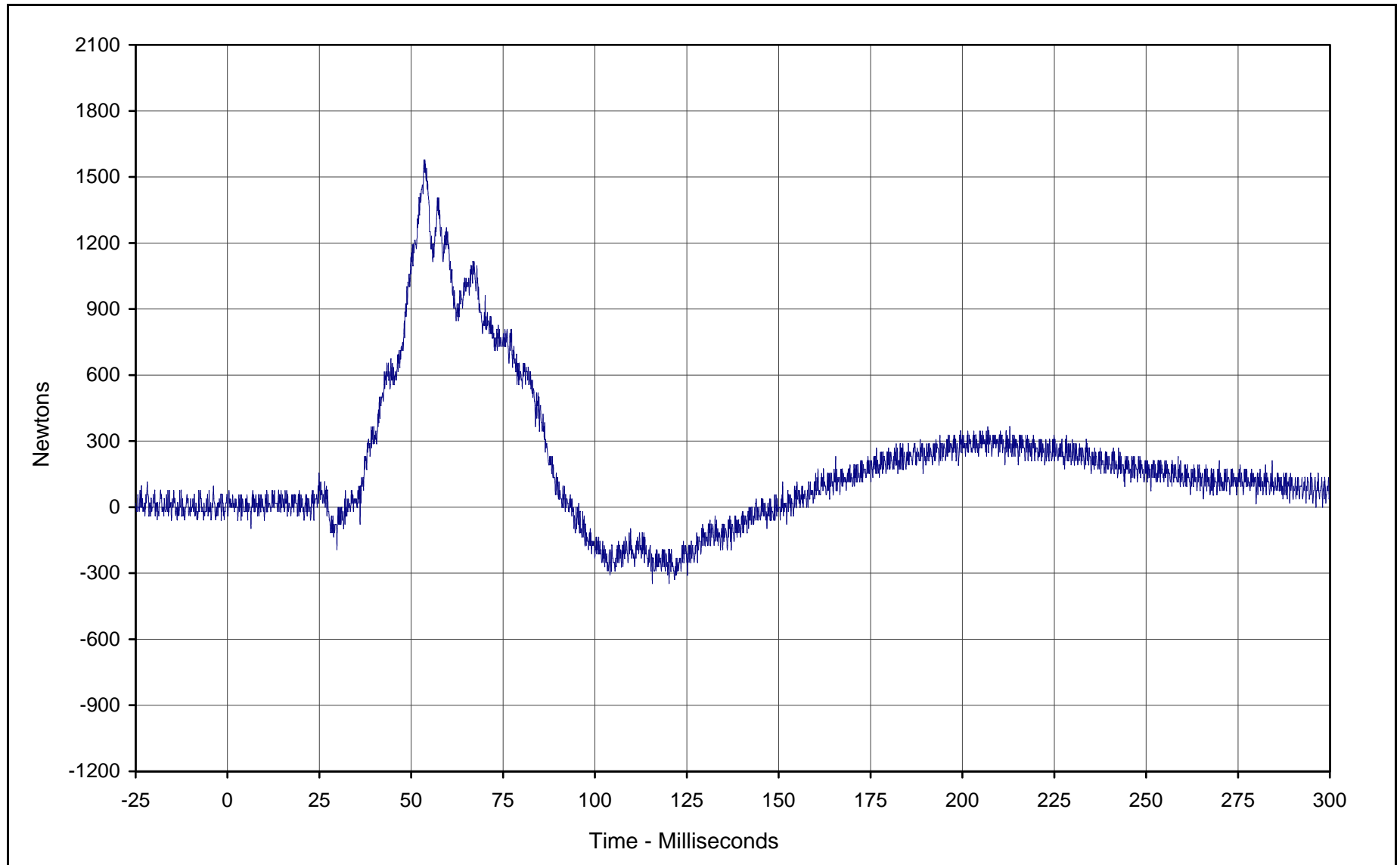


Curve Description: Passenger Neck Force Y  
Maximum Value: 151.5 at 139.6 Milliseconds  
Minimum Value: -288.1 at 63.0 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-052

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



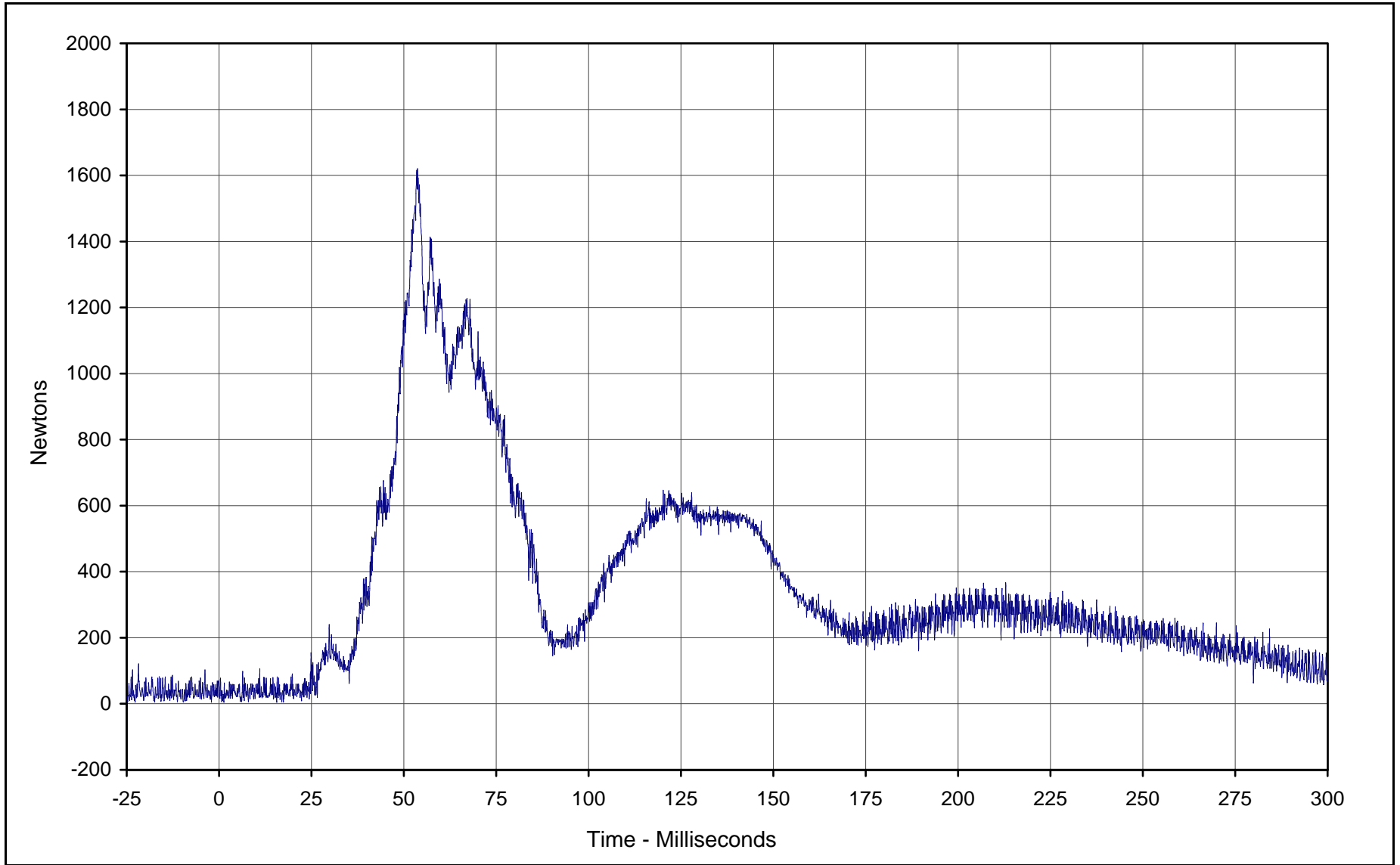
KARR20001-08



Curve Description: Passenger Neck Force Z  
Maximum Value: 1578.3 at 53.5 Milliseconds  
Minimum Value: -347.4 at 115.6 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-053

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



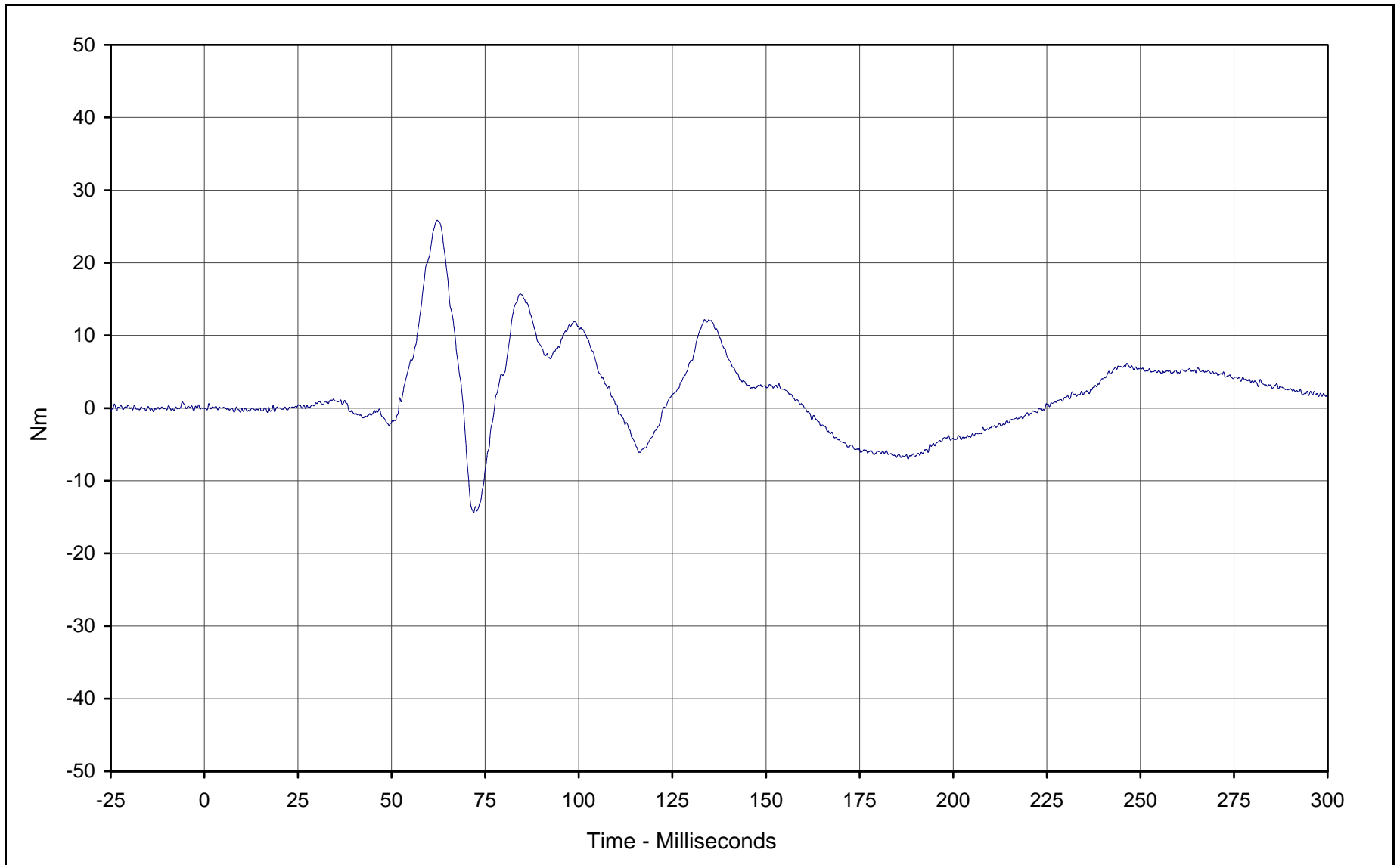


Curve Description: Passenger Neck Force Resultant  
 Maximum Value: 1620.8 at 53.7 Milliseconds  
 Minimum Value: 5.7 at 0.7 Milliseconds  
 SAE Filter Class: 1000  
 Date of Test: 1/13/00  
 Curve Number: RES-051

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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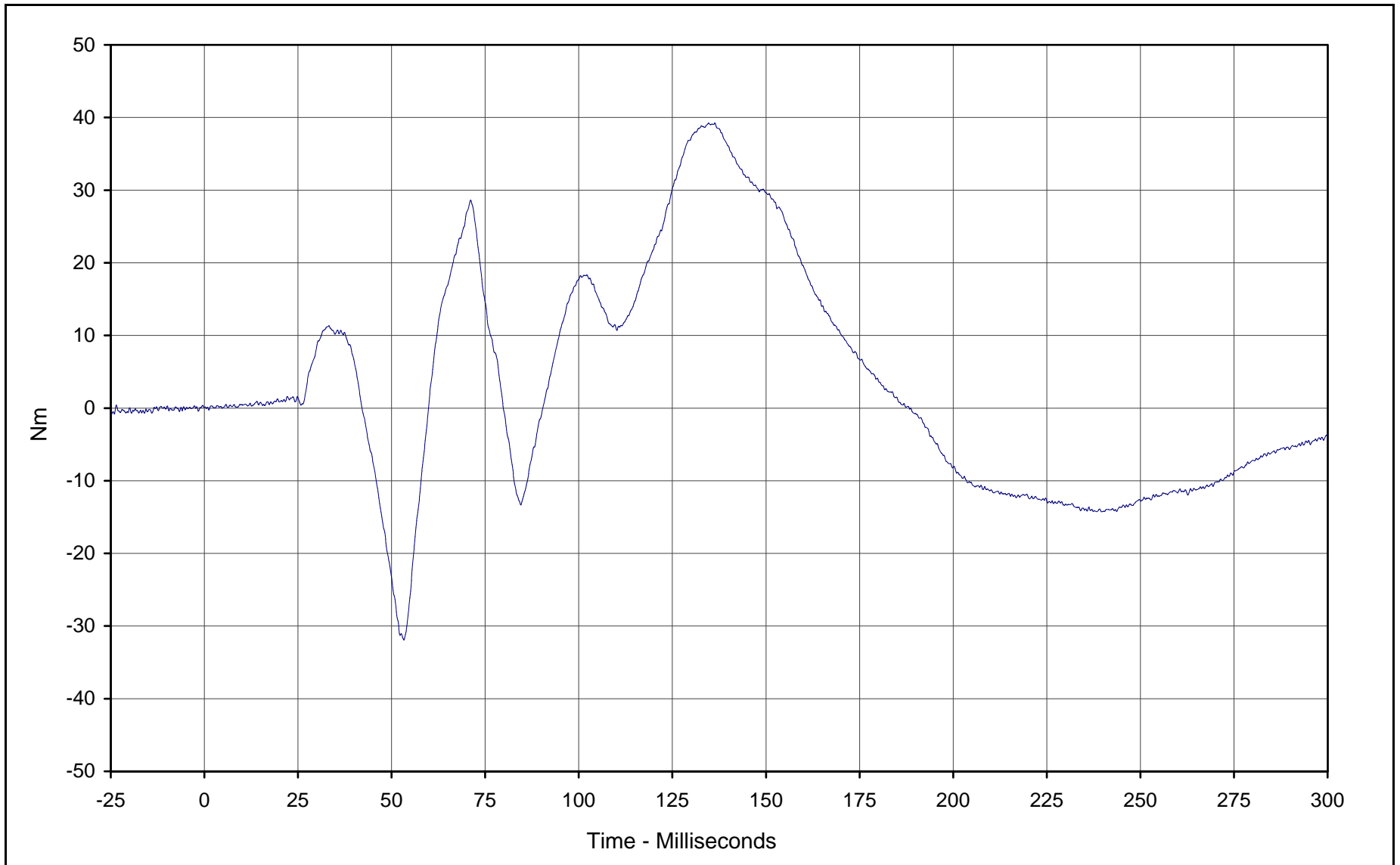
Curve Description: Passenger Neck Moment X  
Maximum Value: 25.9 at 62.2 Milliseconds  
Minimum Value: -14.4 at 71.9 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-054

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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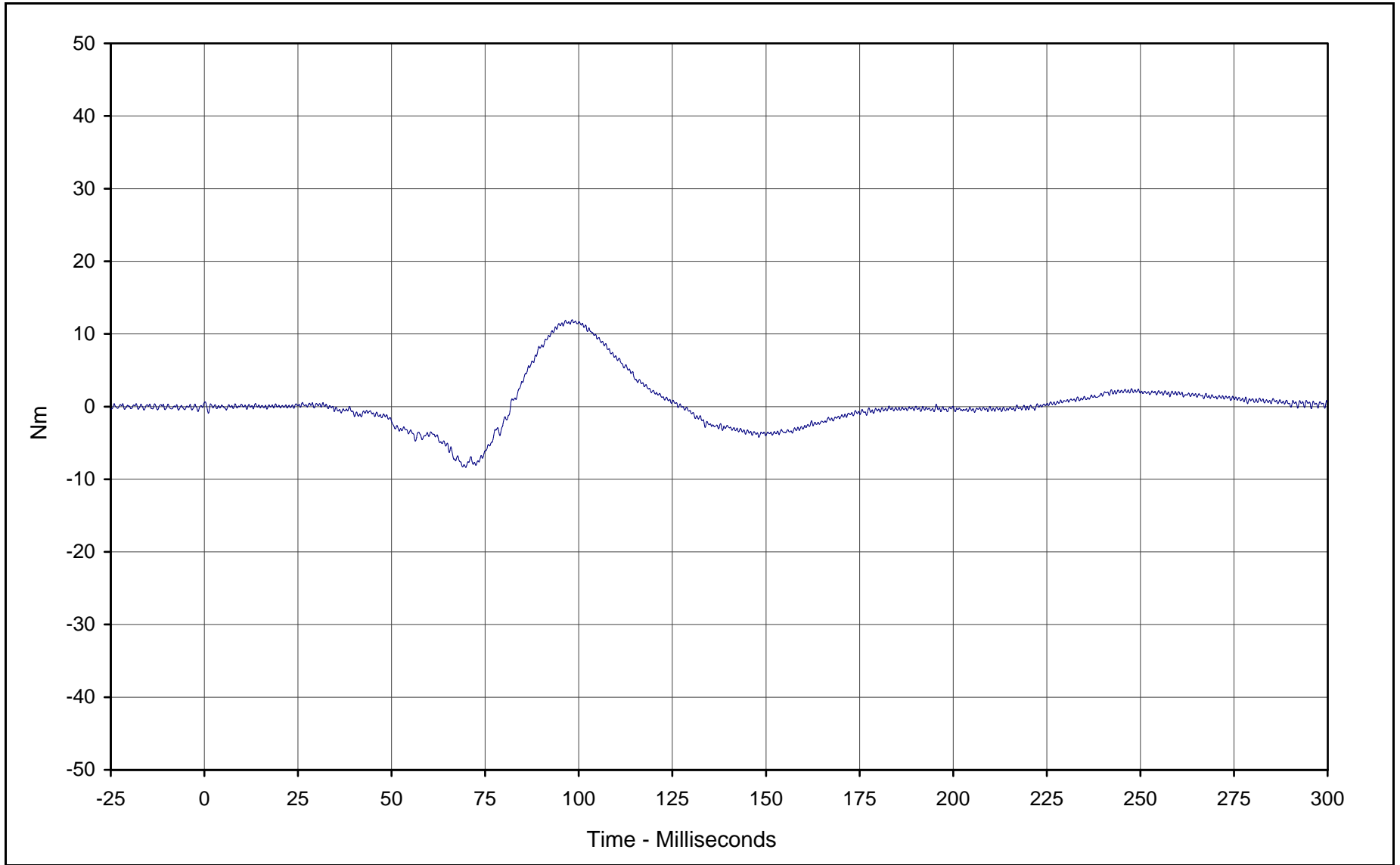
Curve Description: Passenger Neck Moment Y  
Maximum Value: 39.2 at 136.4 Milliseconds  
Minimum Value: -31.9 at 53.3 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-055

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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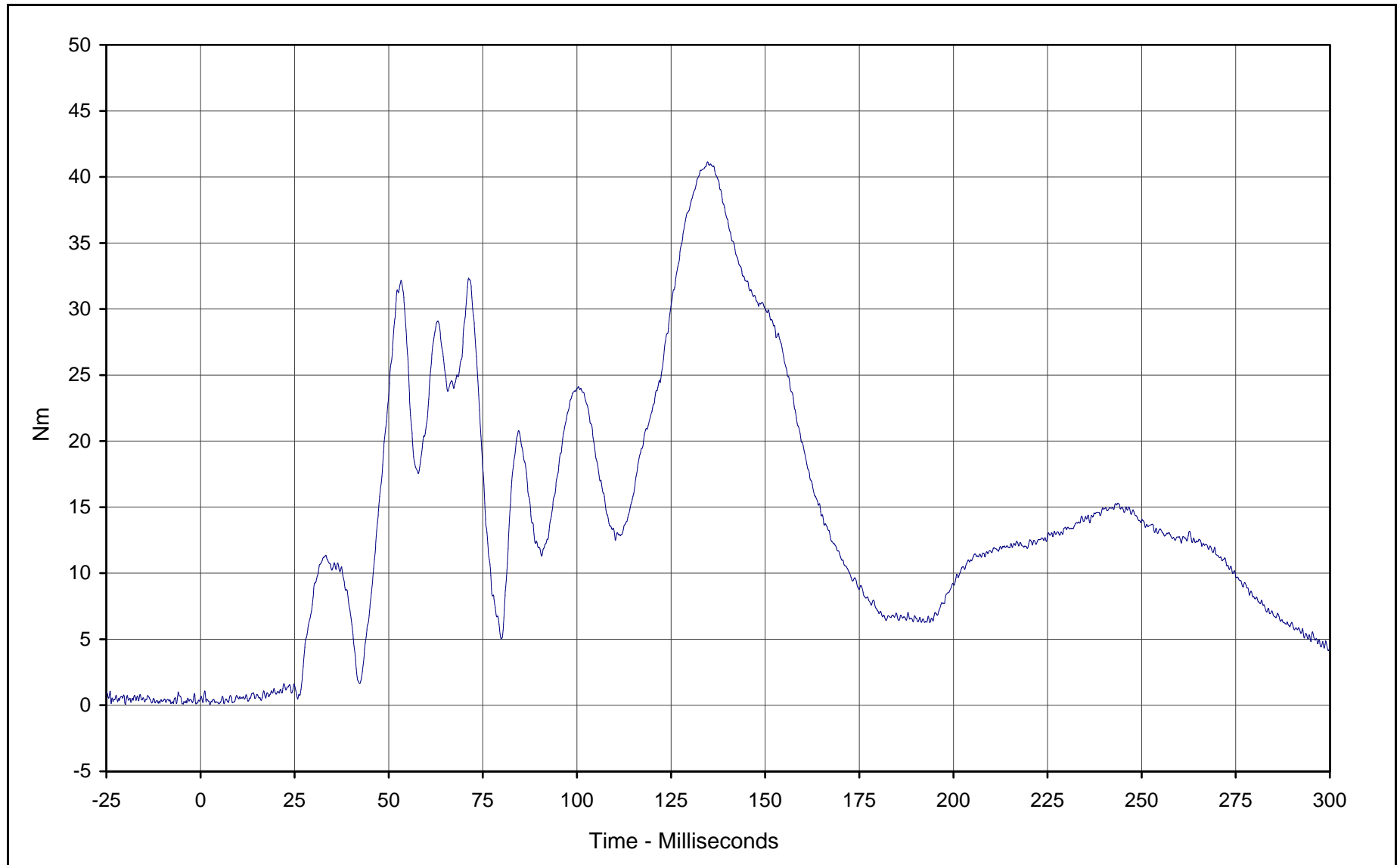


Curve Description: Passenger Neck Moment Z  
Maximum Value: 12.0 at 98.2 Milliseconds  
Minimum Value: -8.4 at 69.8 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-056

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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Curve Description: Passenger Neck Moment Resultant

Maximum Value: 41.1 at 134.7 Milliseconds

Minimum Value: 0.1 at 2.5 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

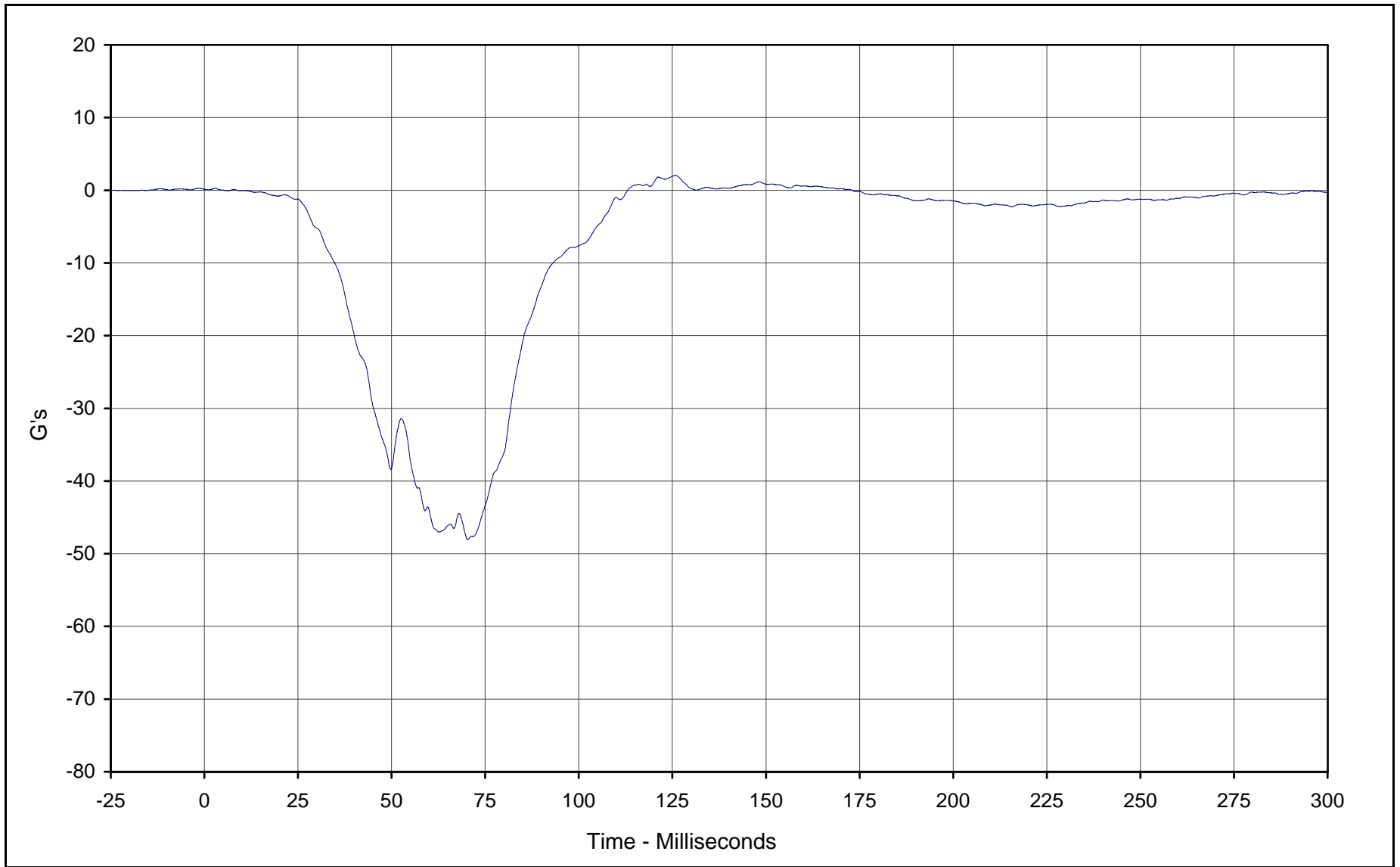
Curve Number: RES-054

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van



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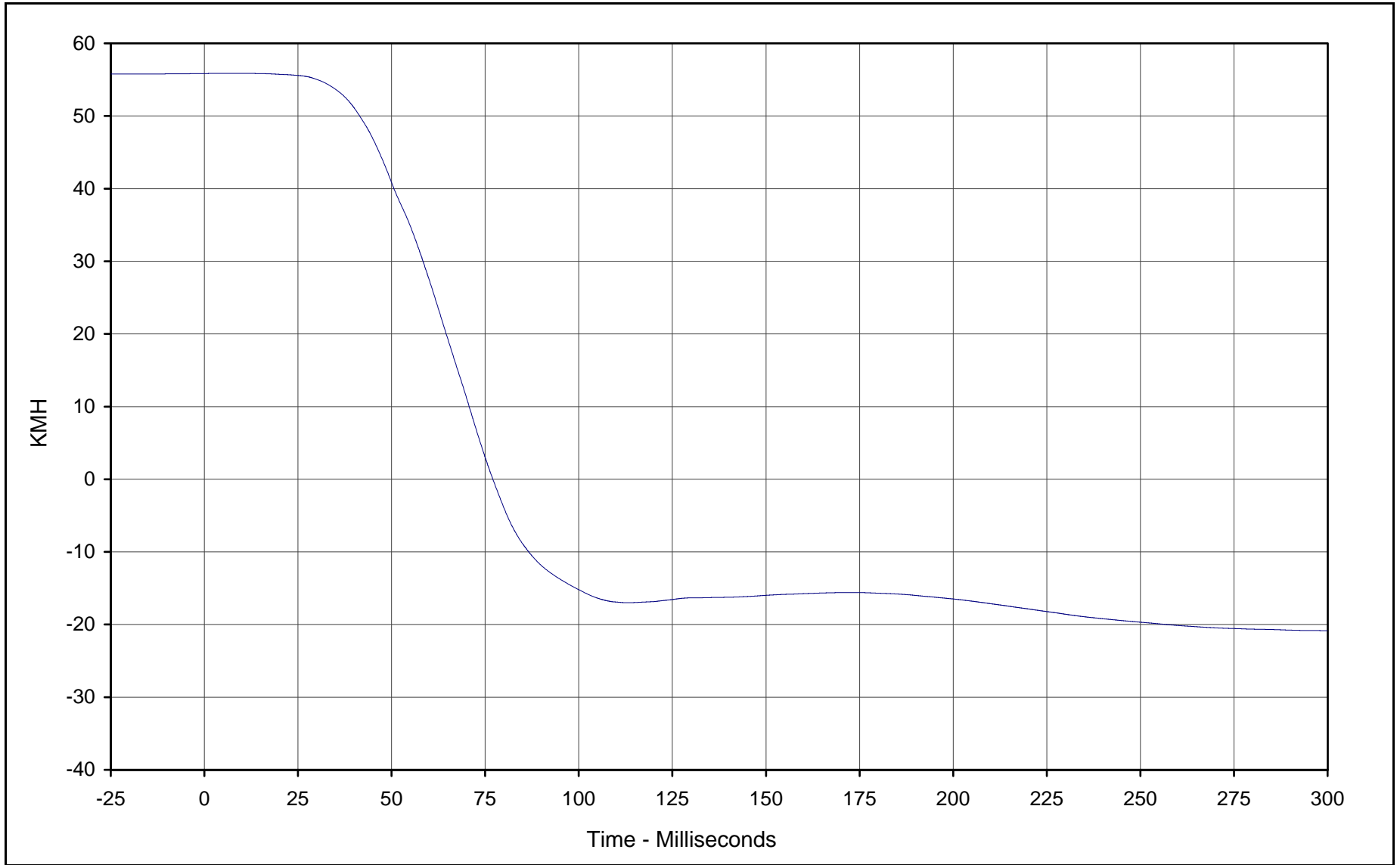


Curve Description: Passenger Chest Primary X  
Maximum Value: 2.0 at 125.7 Milliseconds  
Minimum Value: -48.0 at 70.4 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-057

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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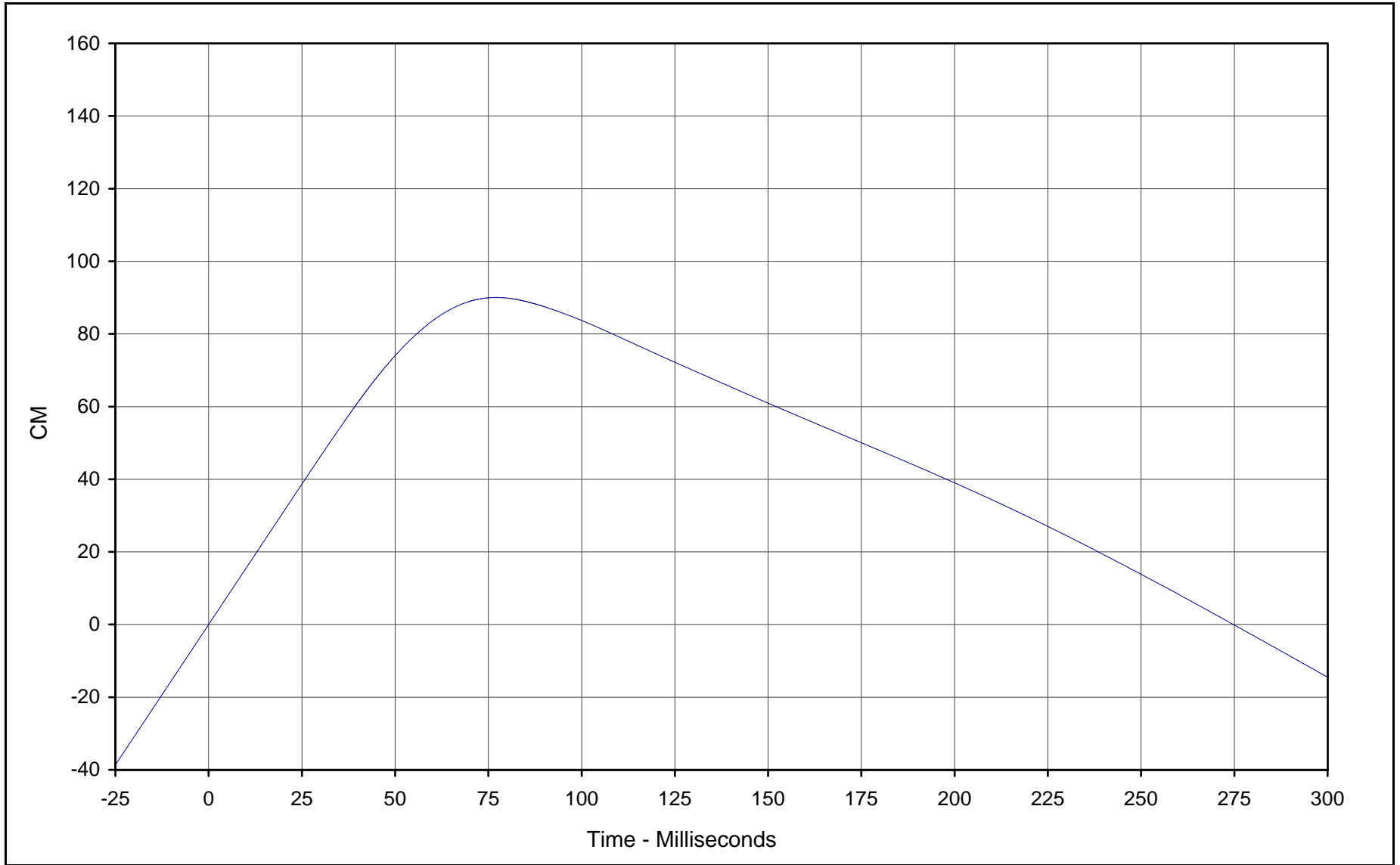


Curve Description: Passenger Chest Primary X Velocity  
Maximum Value: 55.9 at 8.8 Milliseconds  
Minimum Value: -20.9 at 299.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-057

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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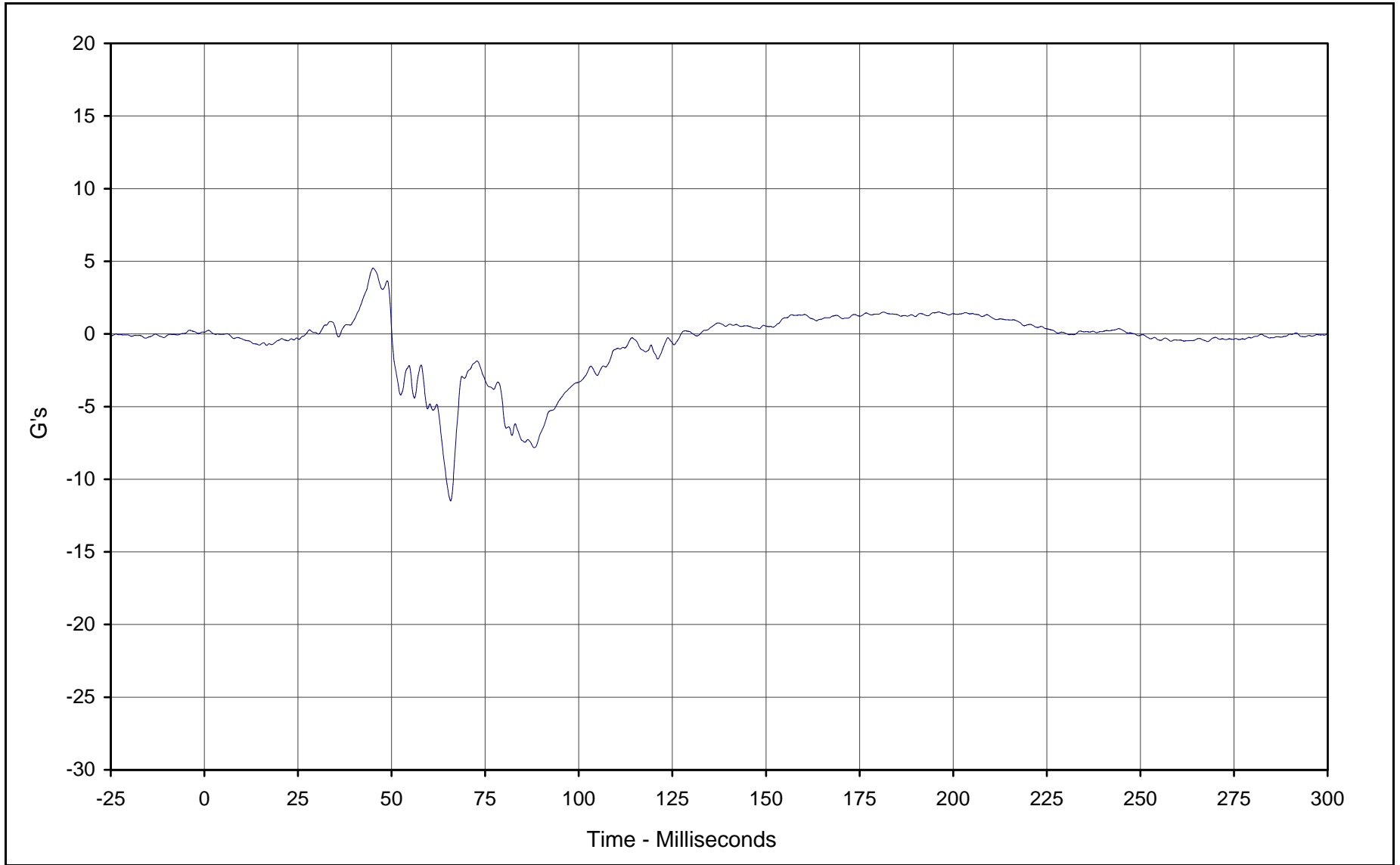
Curve Description: Passenger Chest Primary X Displ.  
Maximum Value: 90.0 at 77.1 Milliseconds  
Minimum Value: -14.4 at 299.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-057

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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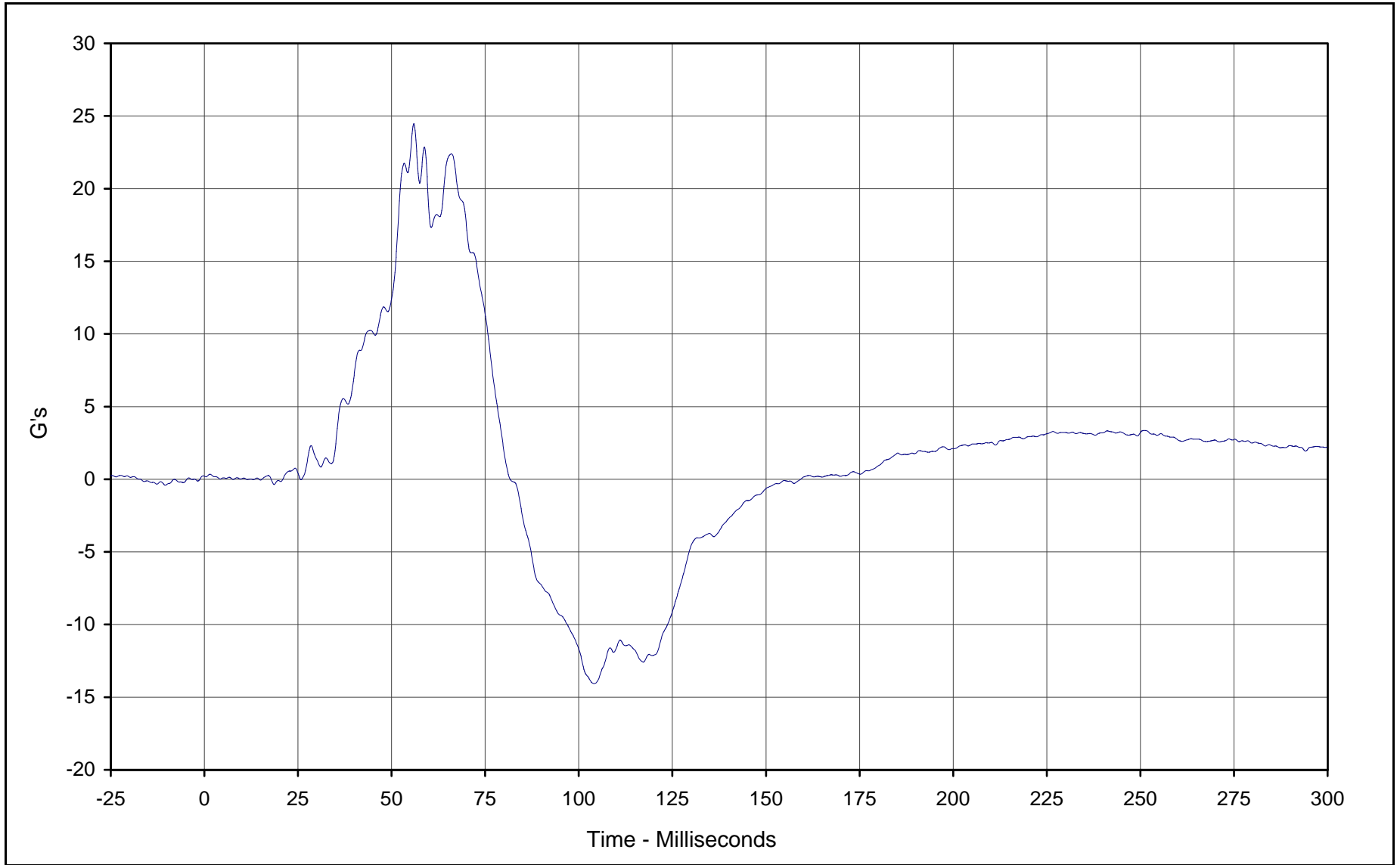
Curve Description: Passenger Chest Primary Y  
Maximum Value: 4.5 at 45.1 Milliseconds  
Minimum Value: -11.5 at 65.8 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-058

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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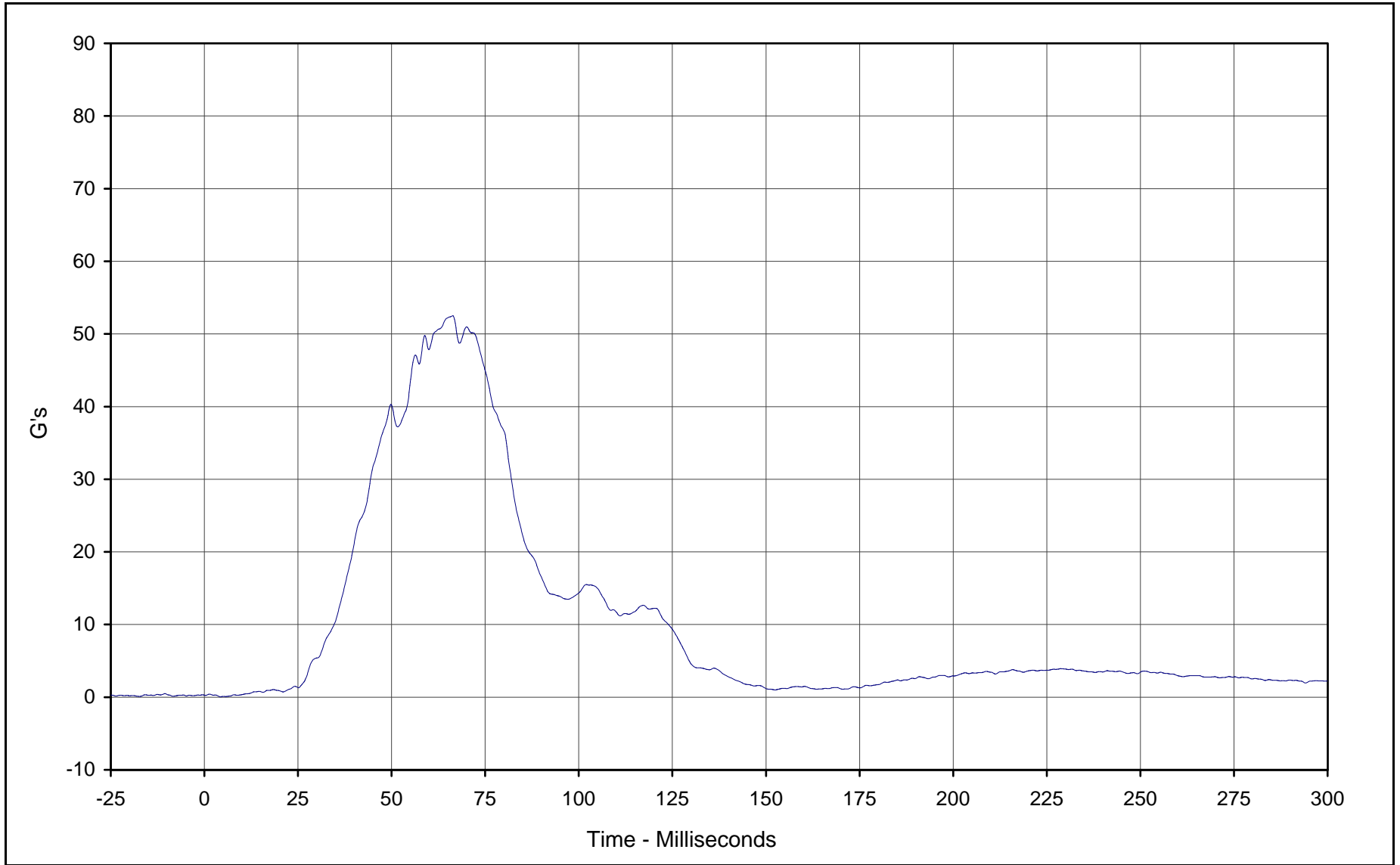
Curve Description: Passenger Chest Primary Z  
Maximum Value: 24.5 at 55.9 Milliseconds  
Minimum Value: -14.1 at 104.1 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-059

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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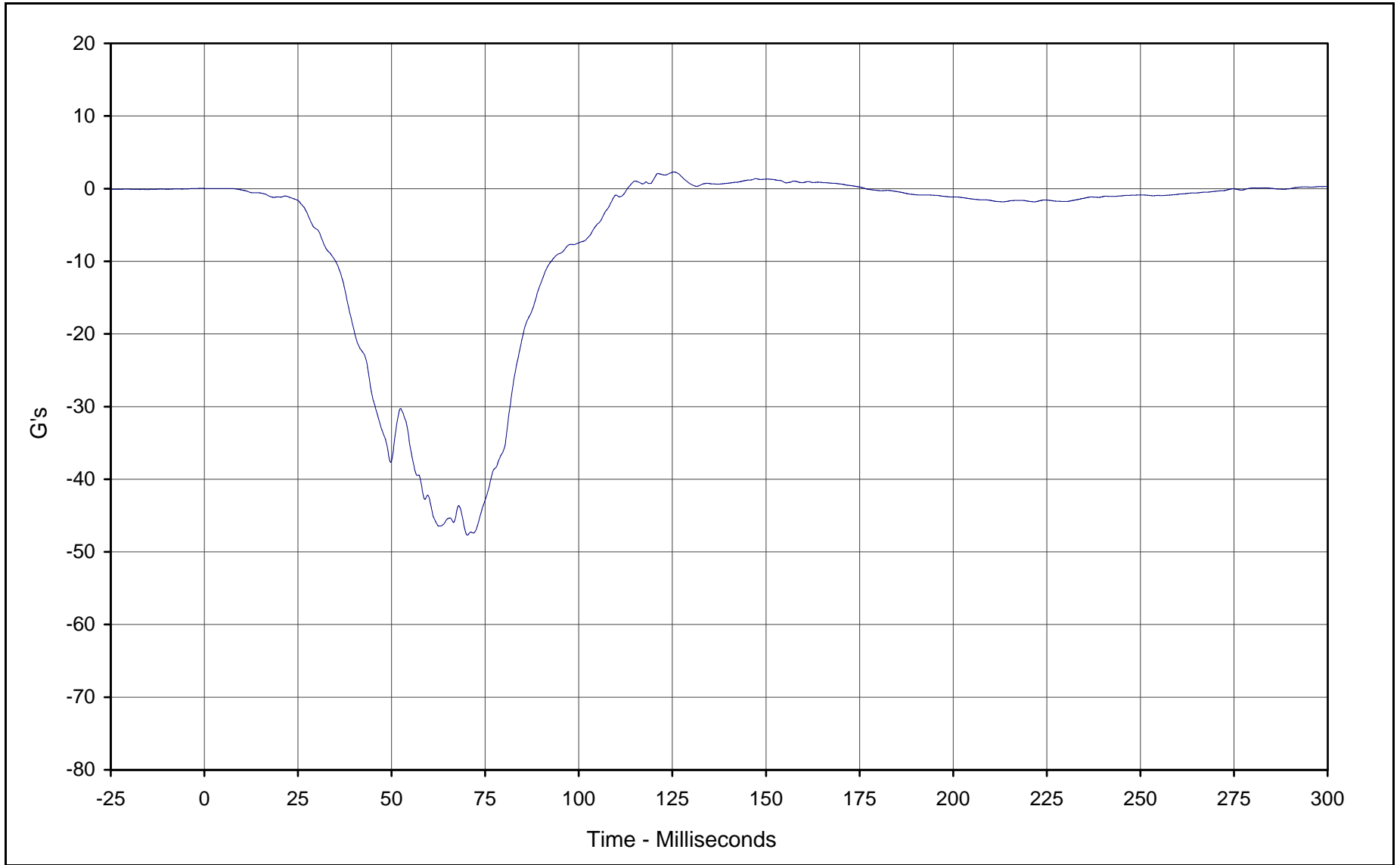


Curve Description: Passenger Chest Resultant Primary  
Maximum Value: 52.5 at 66.3 Milliseconds  
Minimum Value: 0.1 at 4.4 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: RES-057

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



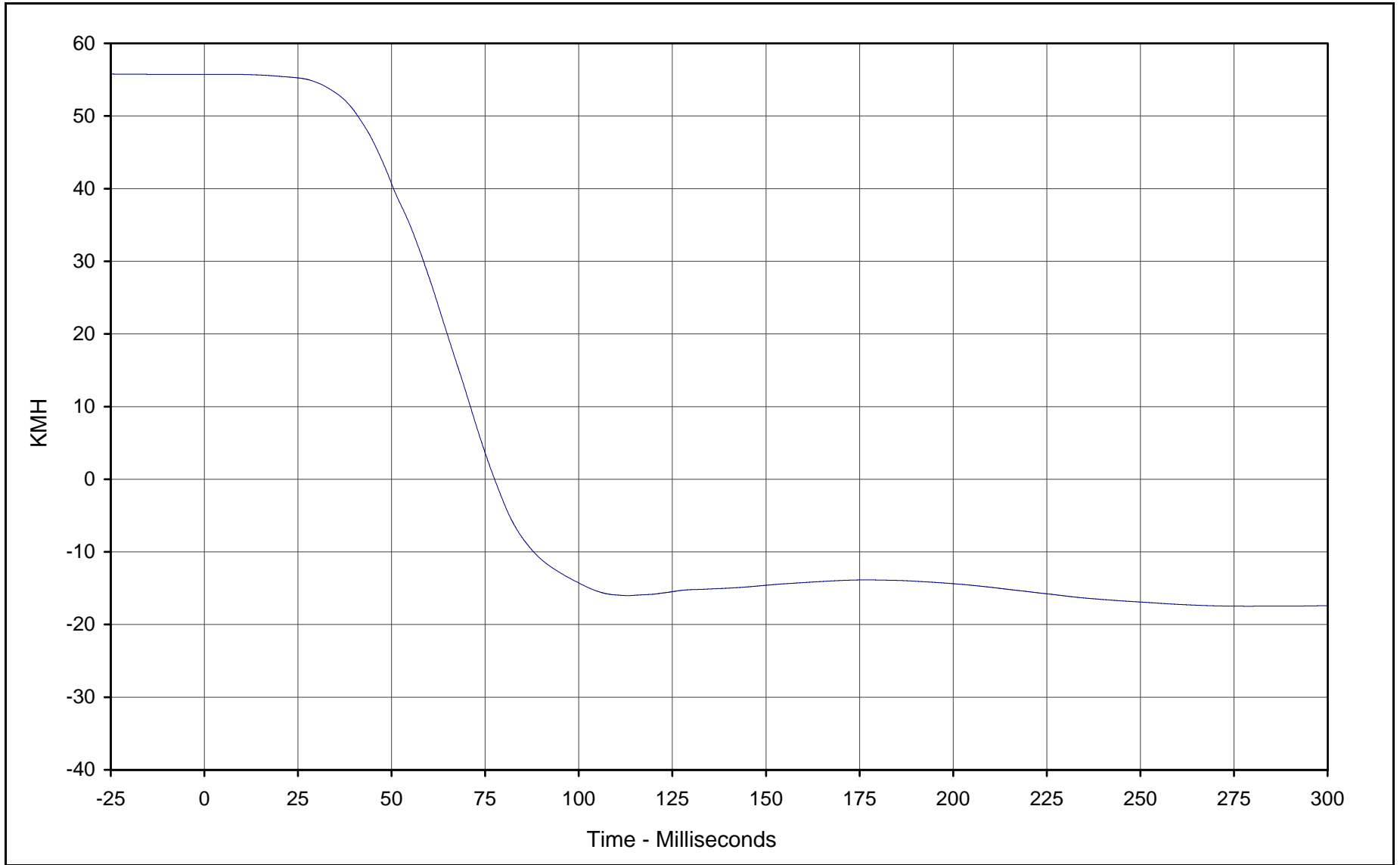
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Curve Description: Passenger Chest Redundant X  
Maximum Value: 2.3 at 125.4 Milliseconds  
Minimum Value: -47.7 at 70.3 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-060

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van





Curve Description: Passenger Chest Redundant X Velocity

Maximum Value: 55.7 at 7.9 Milliseconds

Minimum Value: -17.5 at 278.7 Milliseconds

SAE Filter Class: 180

Date of Test: 1/13/00

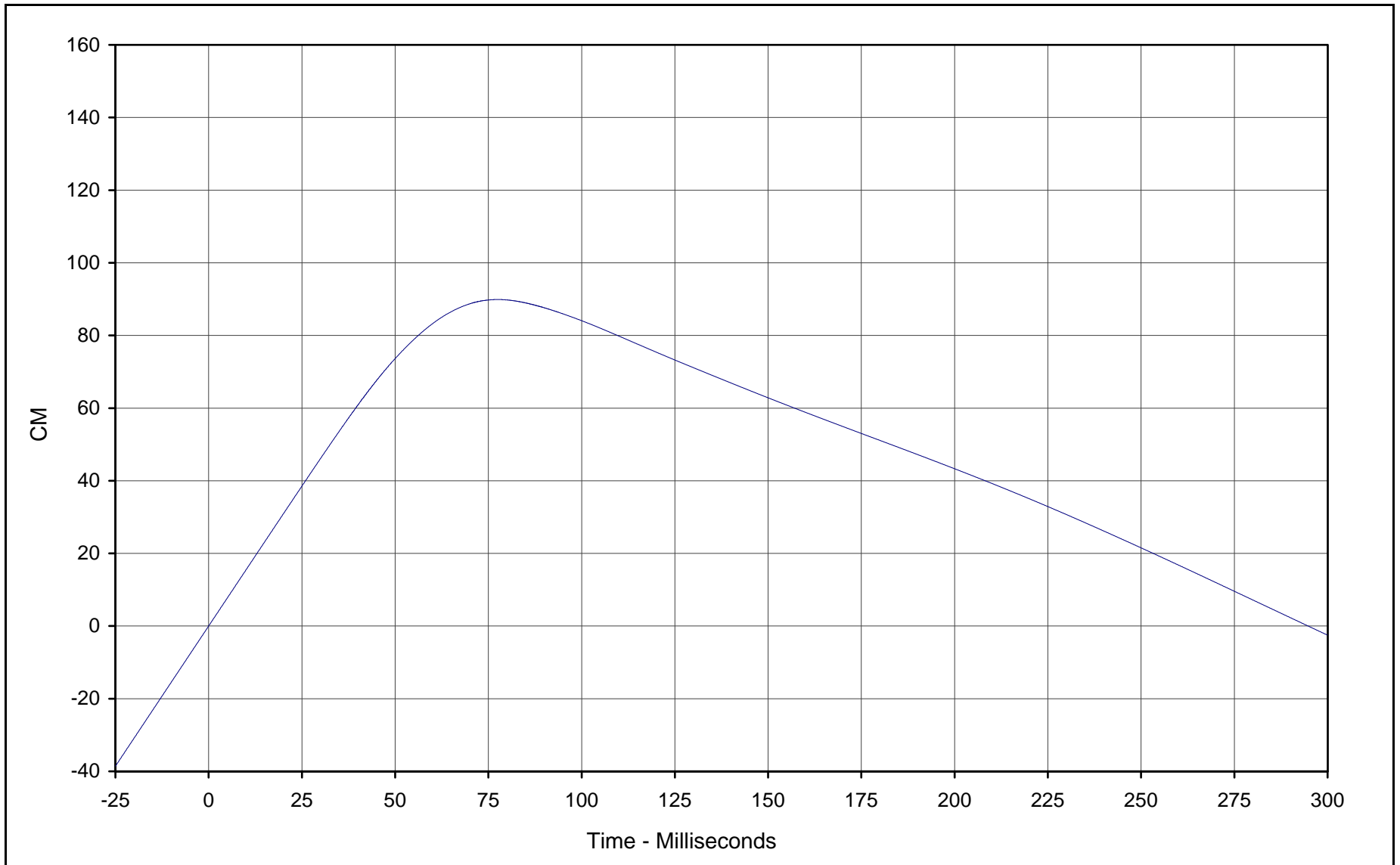
Curve Number: IN1-060

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van



B-90



Curve Description: Passenger Chest Redundant X Displ.

Maximum Value: 89.9 at 77.5 Milliseconds

Minimum Value: -2.5 at 299.9 Milliseconds

SAE Filter Class: 180

Date of Test: 1/13/00

Curve Number: IN2-060

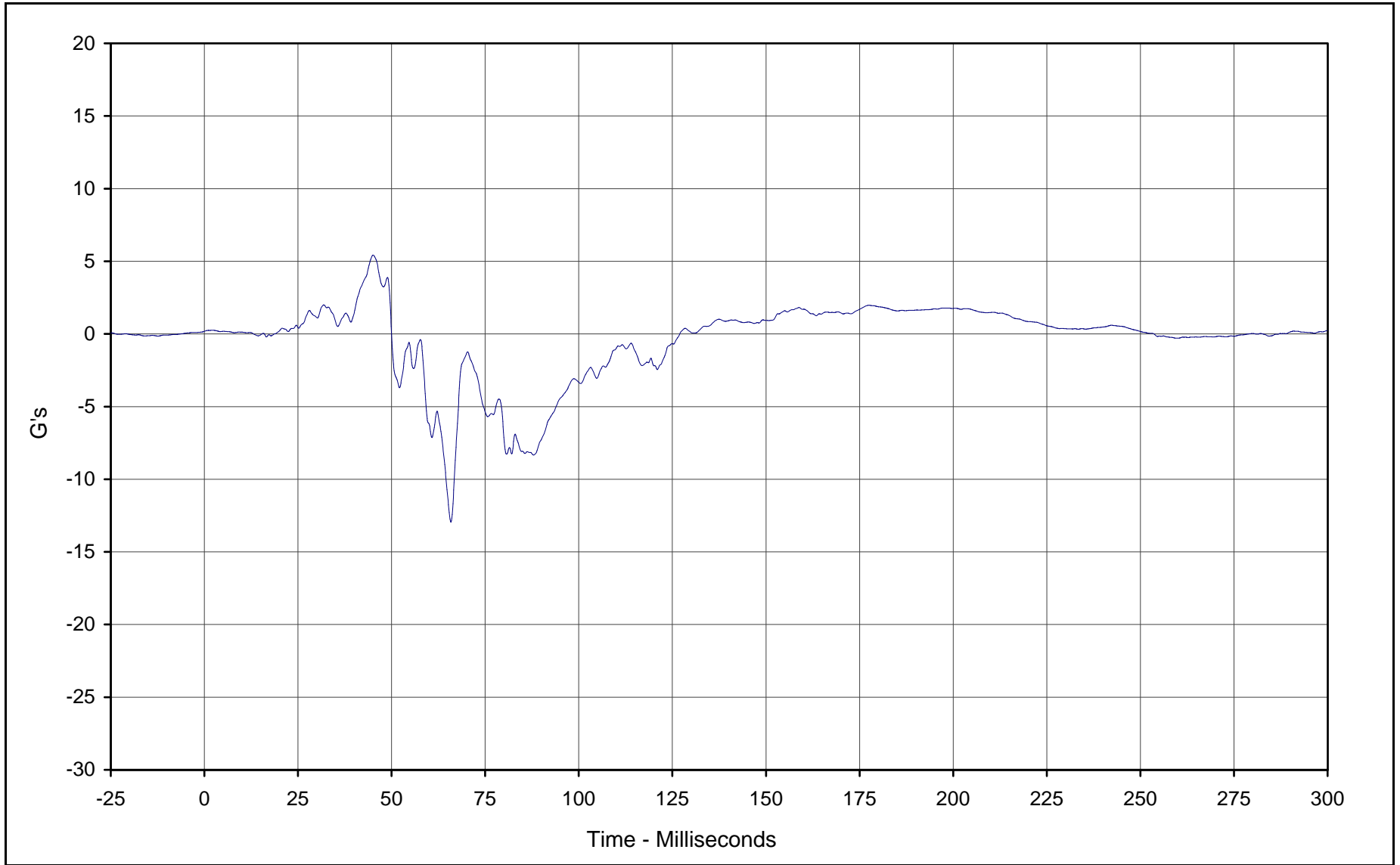
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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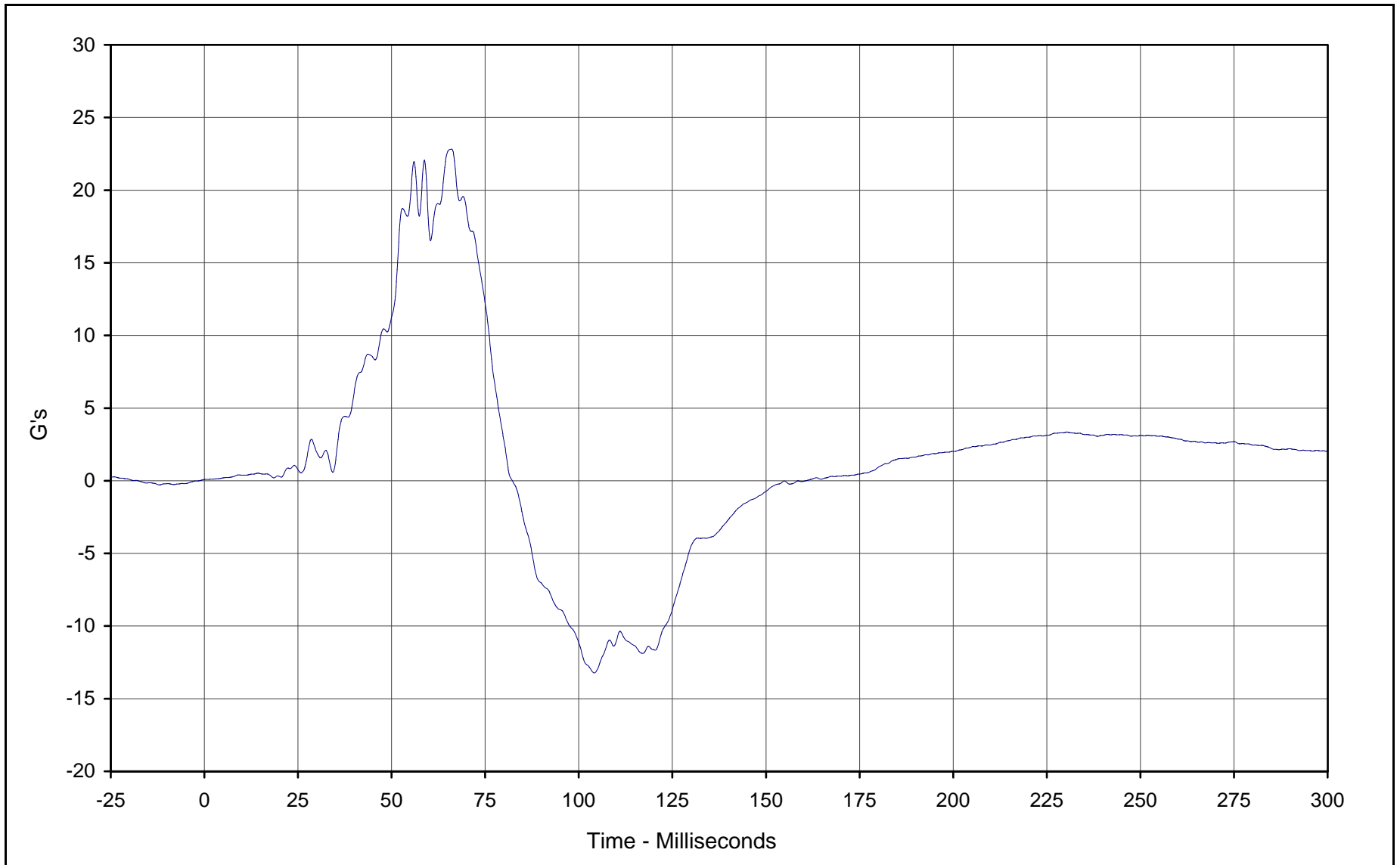
Curve Description: Passenger Chest Redundant Y  
Maximum Value: 5.4 at 45.0 Milliseconds  
Minimum Value: -13.0 at 65.8 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-061

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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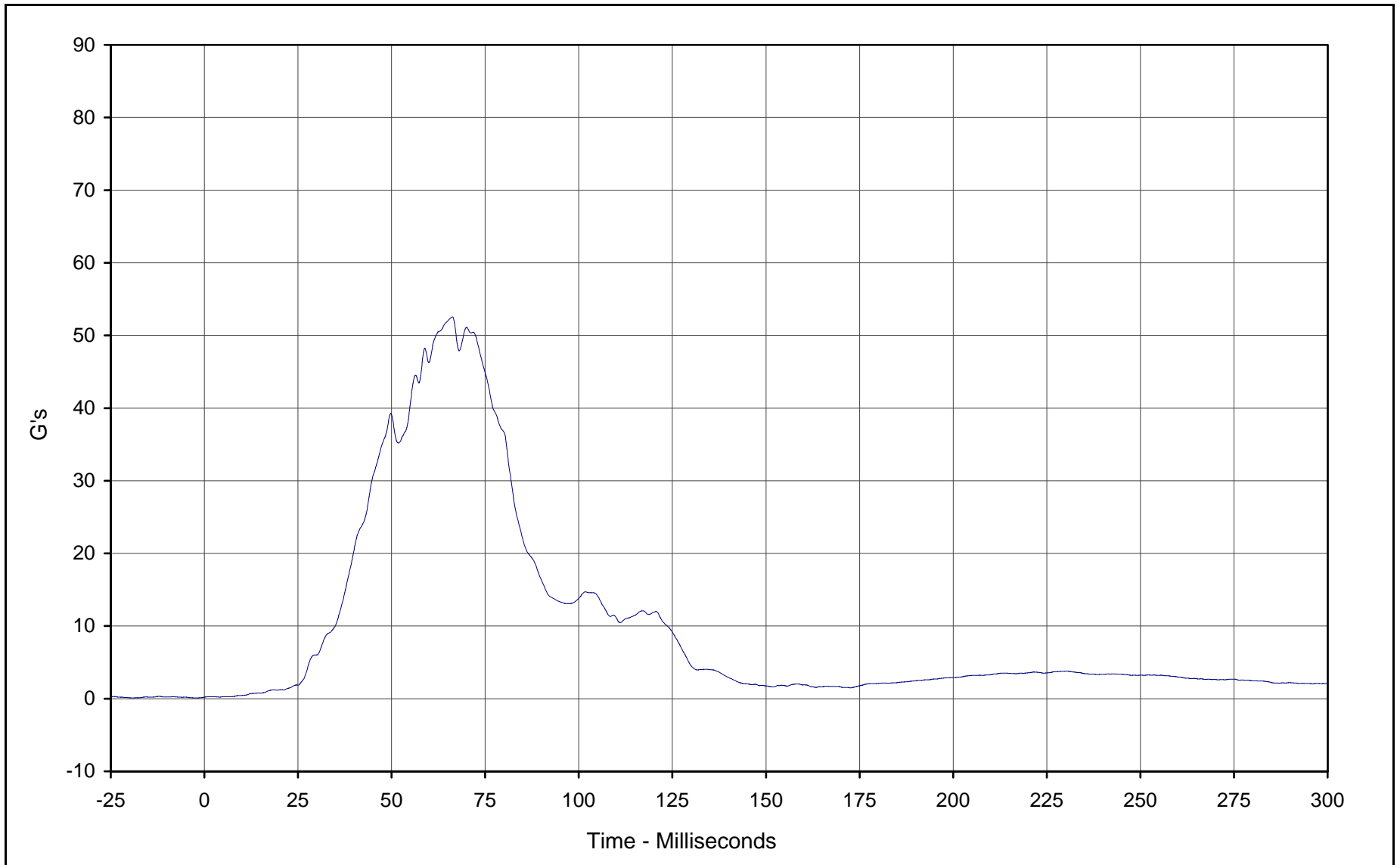
Curve Description: Passenger Chest Redundant Z  
Maximum Value: 22.8 at 66.0 Milliseconds  
Minimum Value: -13.2 at 104.1 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: FIL-062

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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Curve Description: Passenger Chest Resultant Redundant

Maximum Value: 52.6 at 66.2 Milliseconds

Minimum Value: 0.2 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/13/00

Curve Number: RES-060

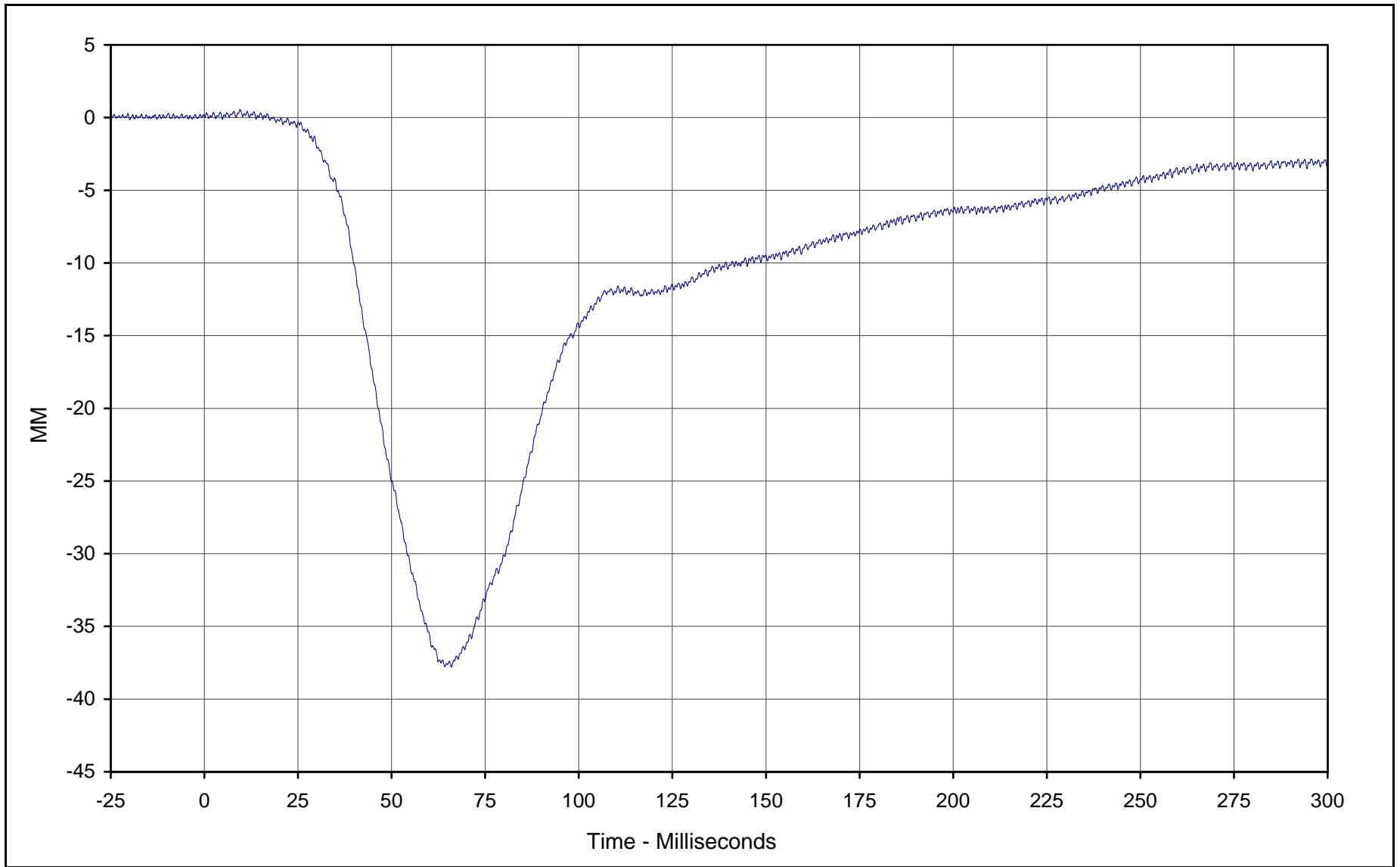
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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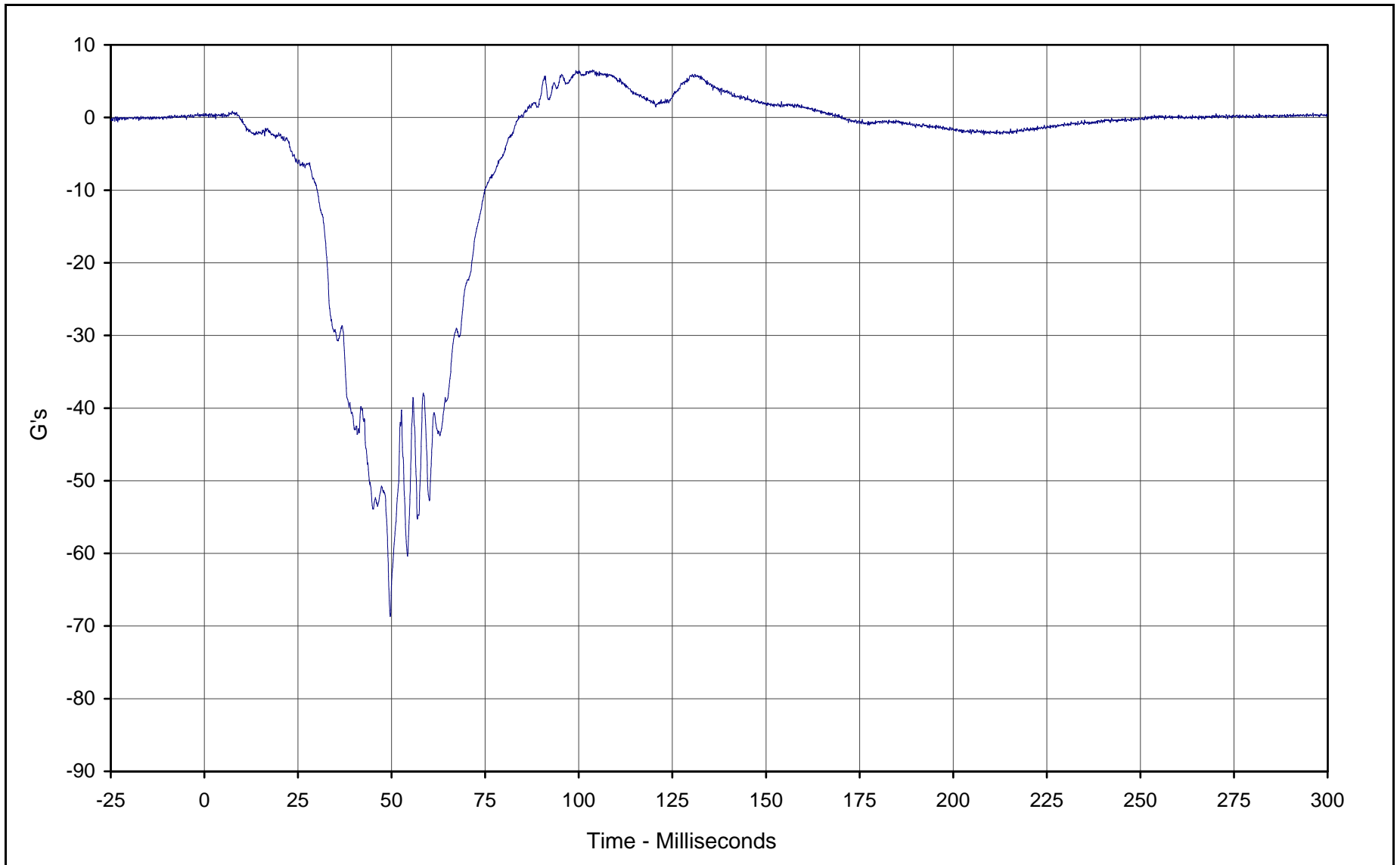
Curve Description: Passenger Chest Displacement X  
Maximum Value: 0.6 at 9.6 Milliseconds  
Minimum Value: -37.8 at 66.0 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-063

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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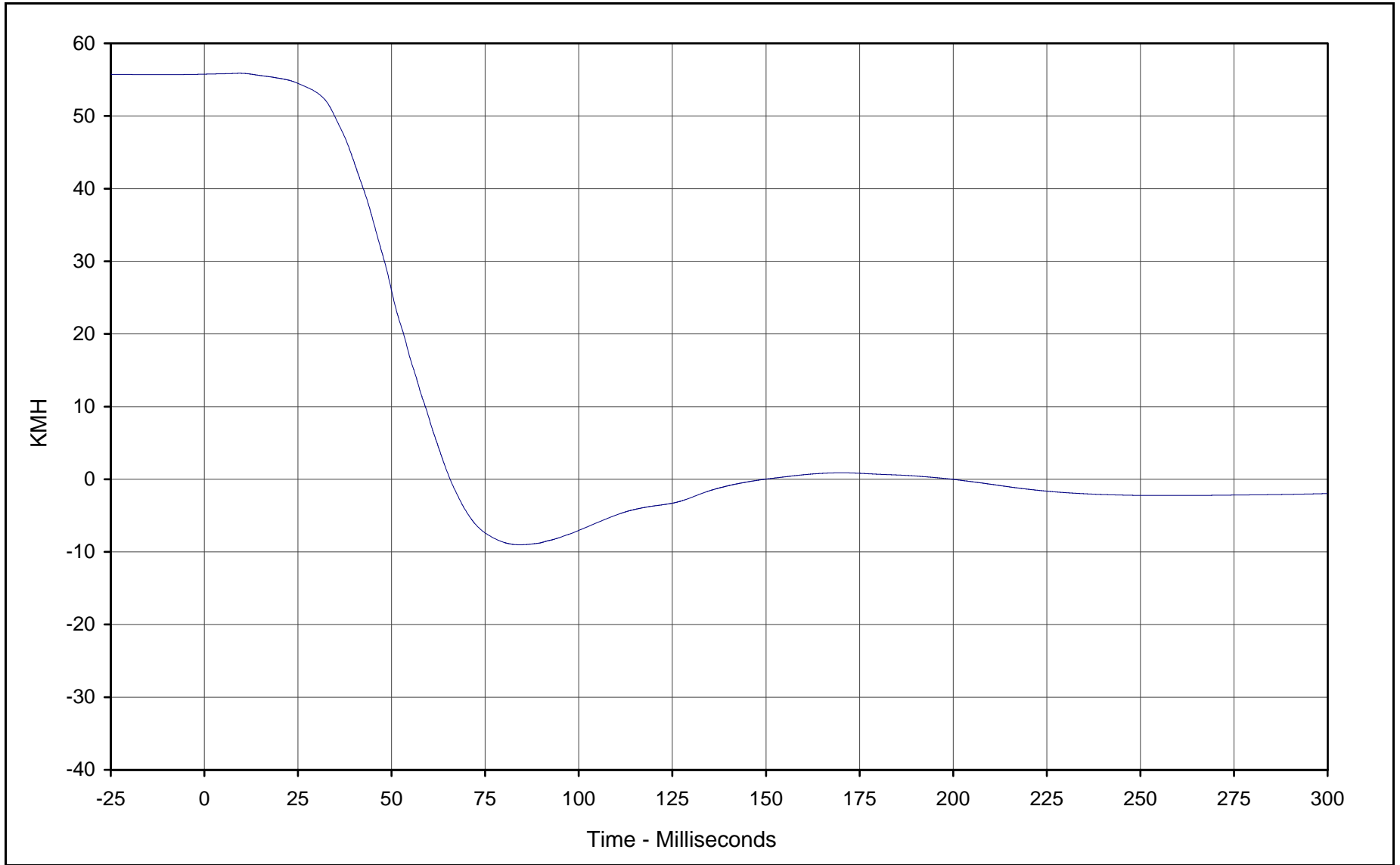
Curve Description: Passenger Pelvis X  
Maximum Value: 6.6 at 103.7 Milliseconds  
Minimum Value: -68.7 at 49.6 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-064

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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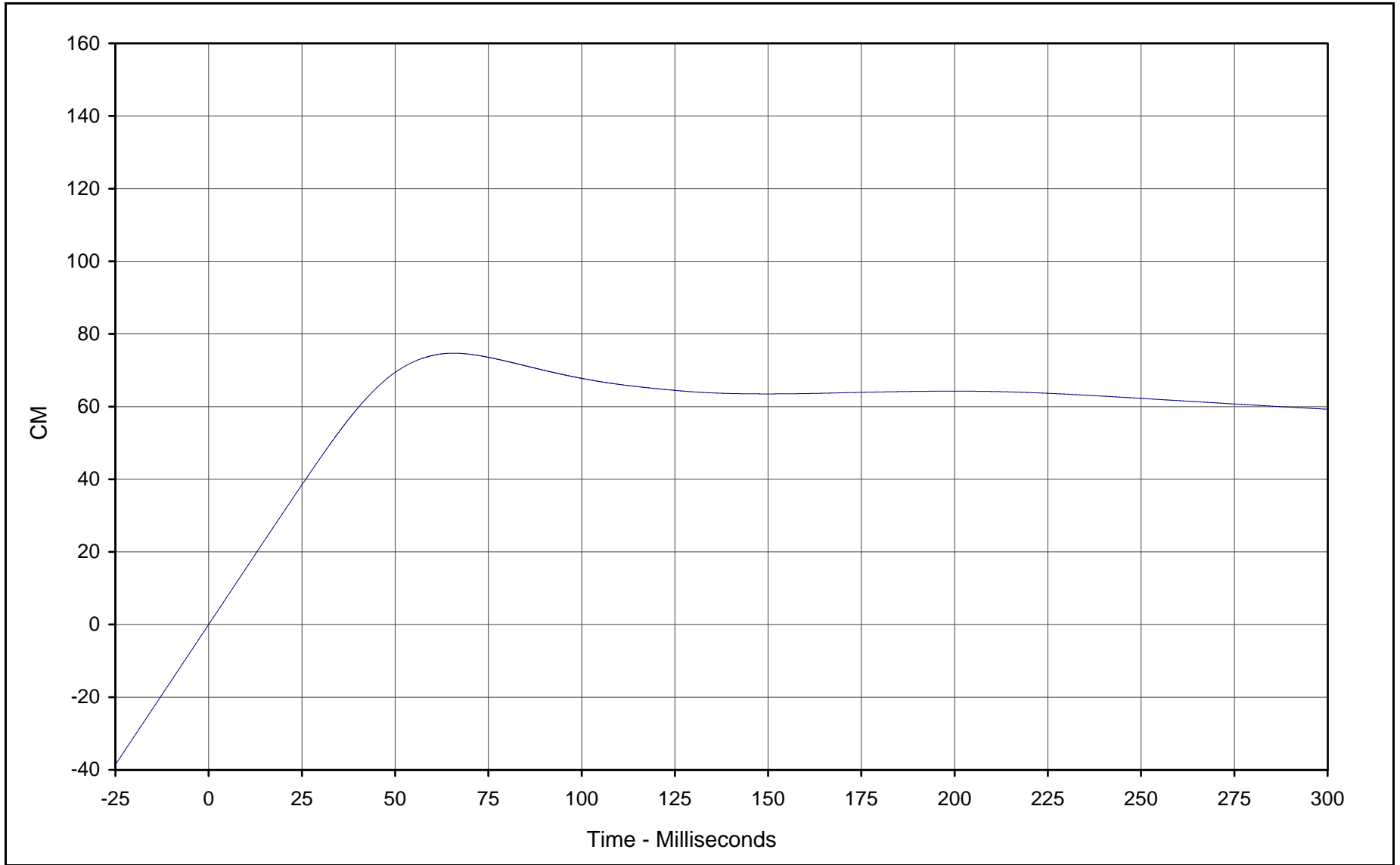
Curve Description: Passenger Pelvis X Velocity  
Maximum Value: 55.9 at 9.4 Milliseconds  
Minimum Value: -9.0 at 84.1 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-064

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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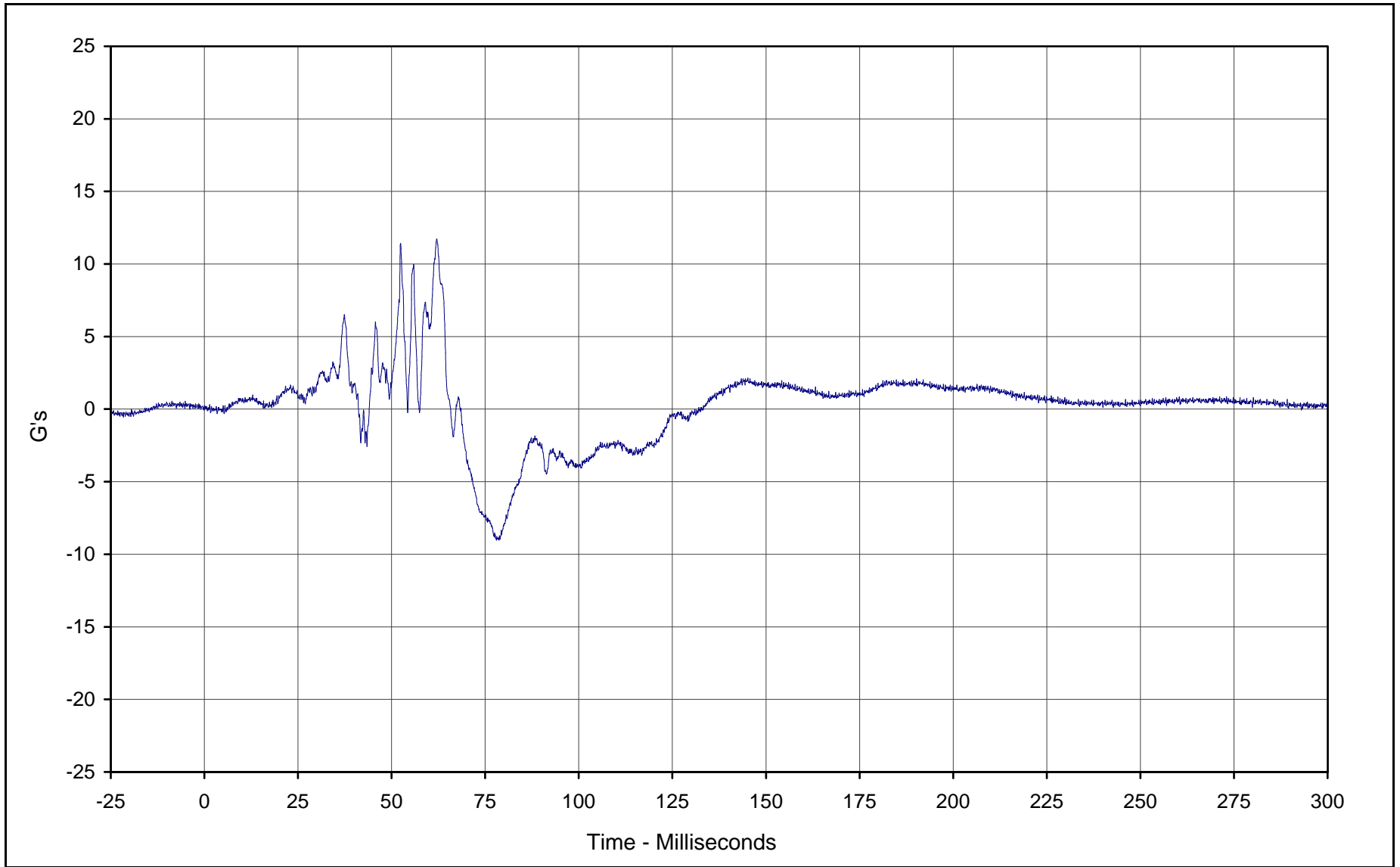
Curve Description: Passenger Pelvis X Displ.  
Maximum Value: 74.7 at 65.6 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-064

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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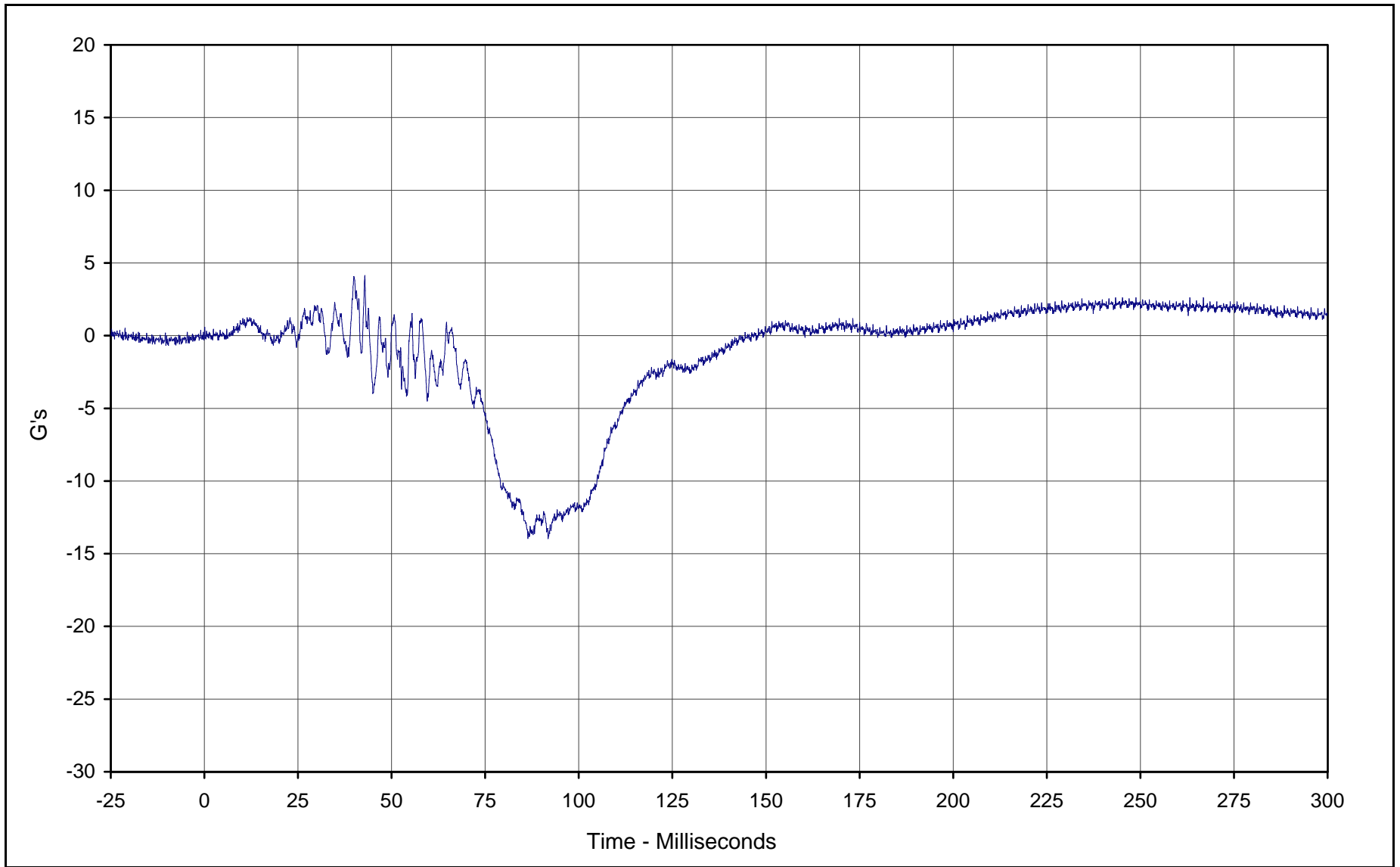
Curve Description: Passenger Pelvis Y  
Maximum Value: 11.7 at 62.1 Milliseconds  
Minimum Value: -9.0 at 78.0 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-065

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-99



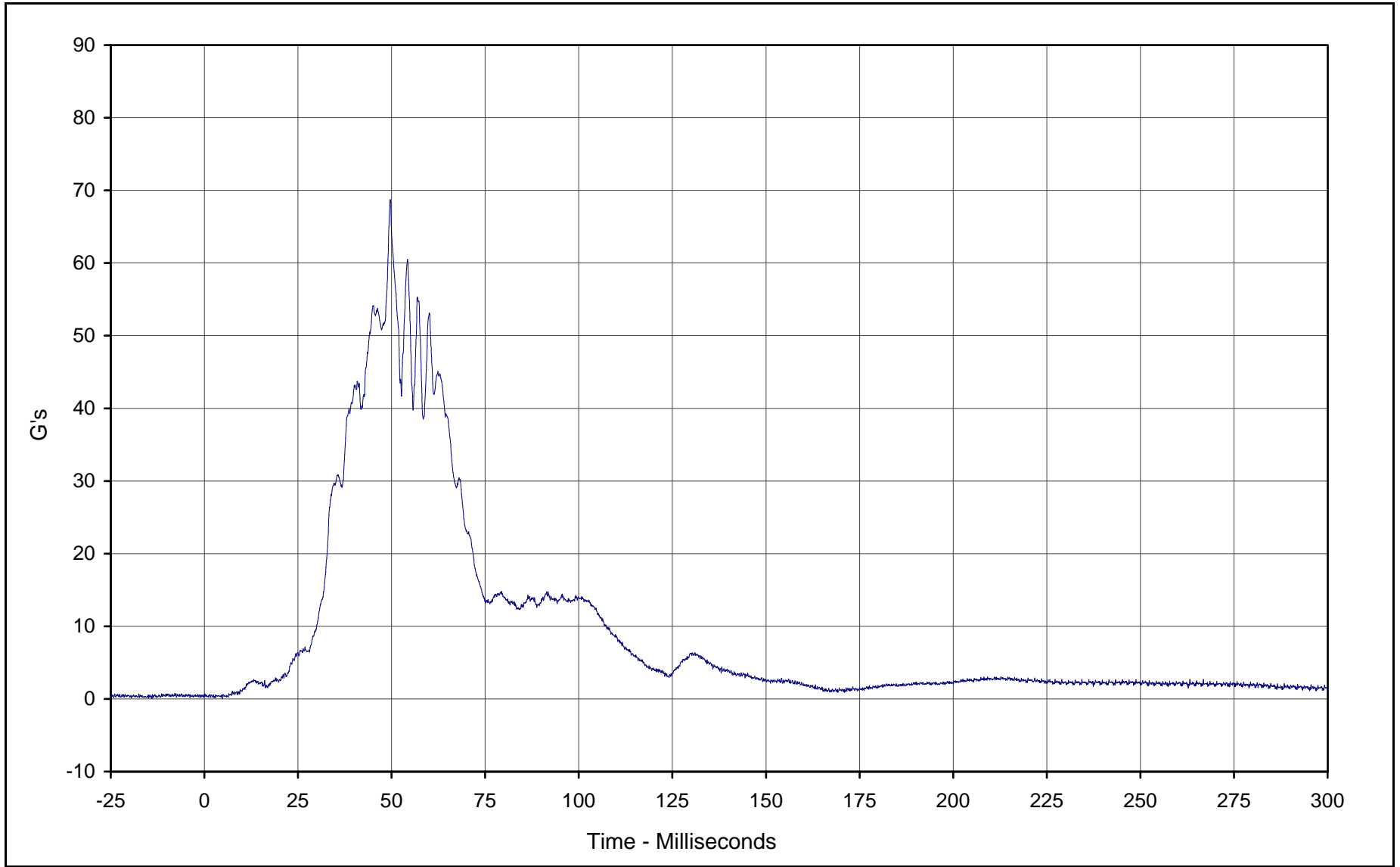
Curve Description: Passenger Pelvis Z  
Maximum Value: 4.1 at 42.9 Milliseconds  
Minimum Value: -14.0 at 86.4 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-066

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-100



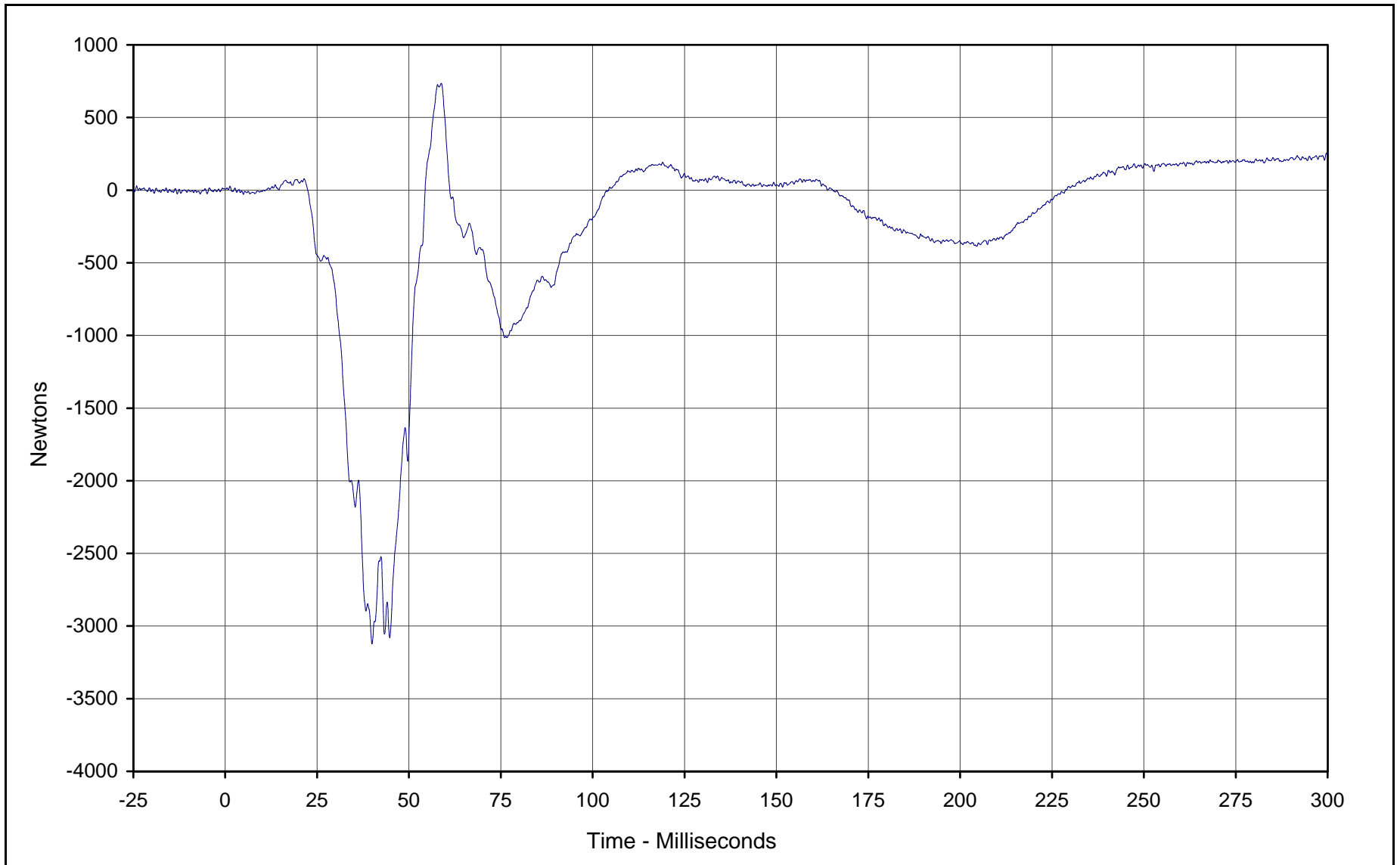
Curve Description: Passenger Pelvis Resultant  
Maximum Value: 68.7 at 49.6 Milliseconds  
Minimum Value: 0.0 at 4.8 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: RES-064

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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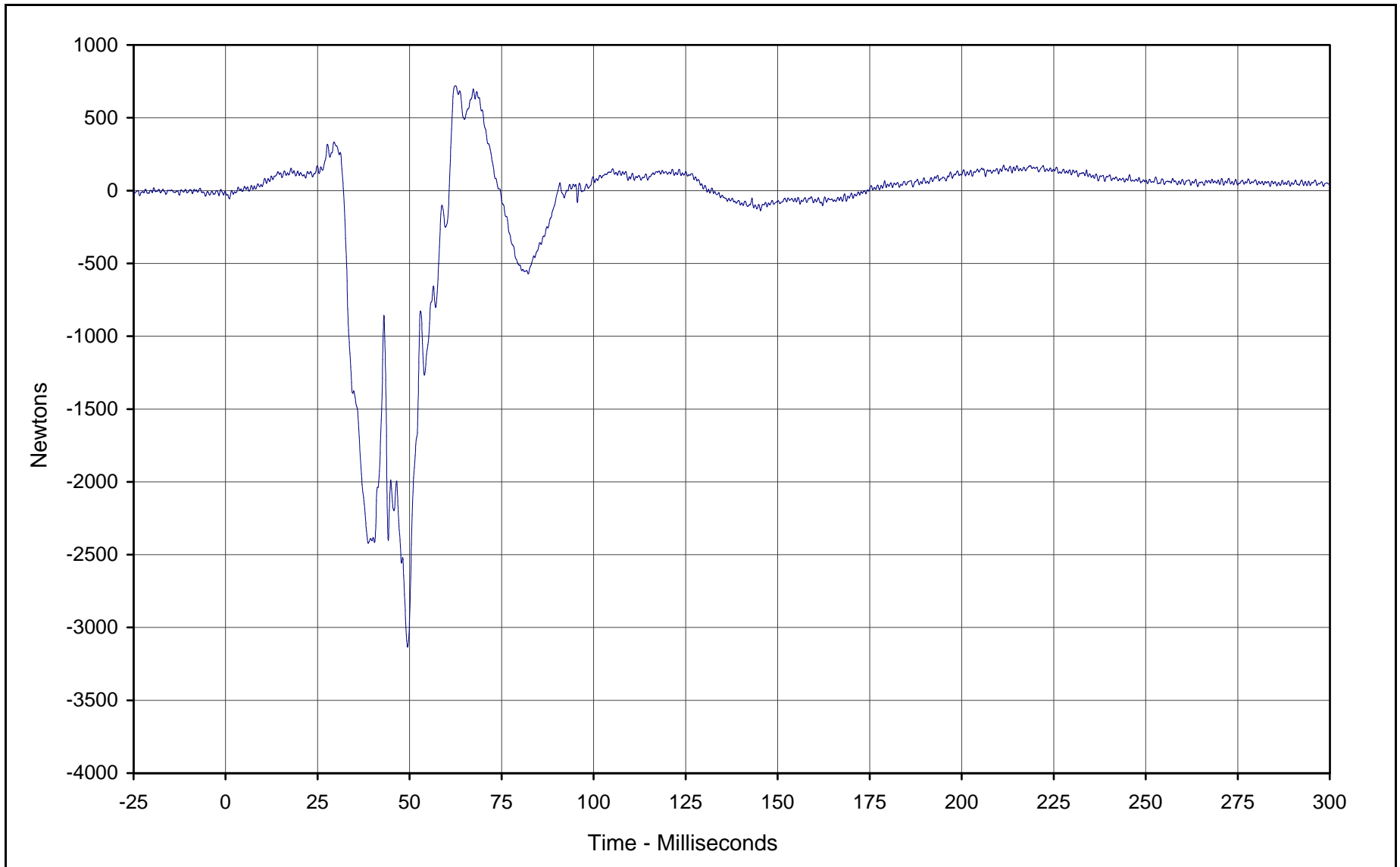


Curve Description: Passenger Left Femur Force  
Maximum Value: 735.4 at 58.8 Milliseconds  
Minimum Value: -3121.4 at 40.0 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-067

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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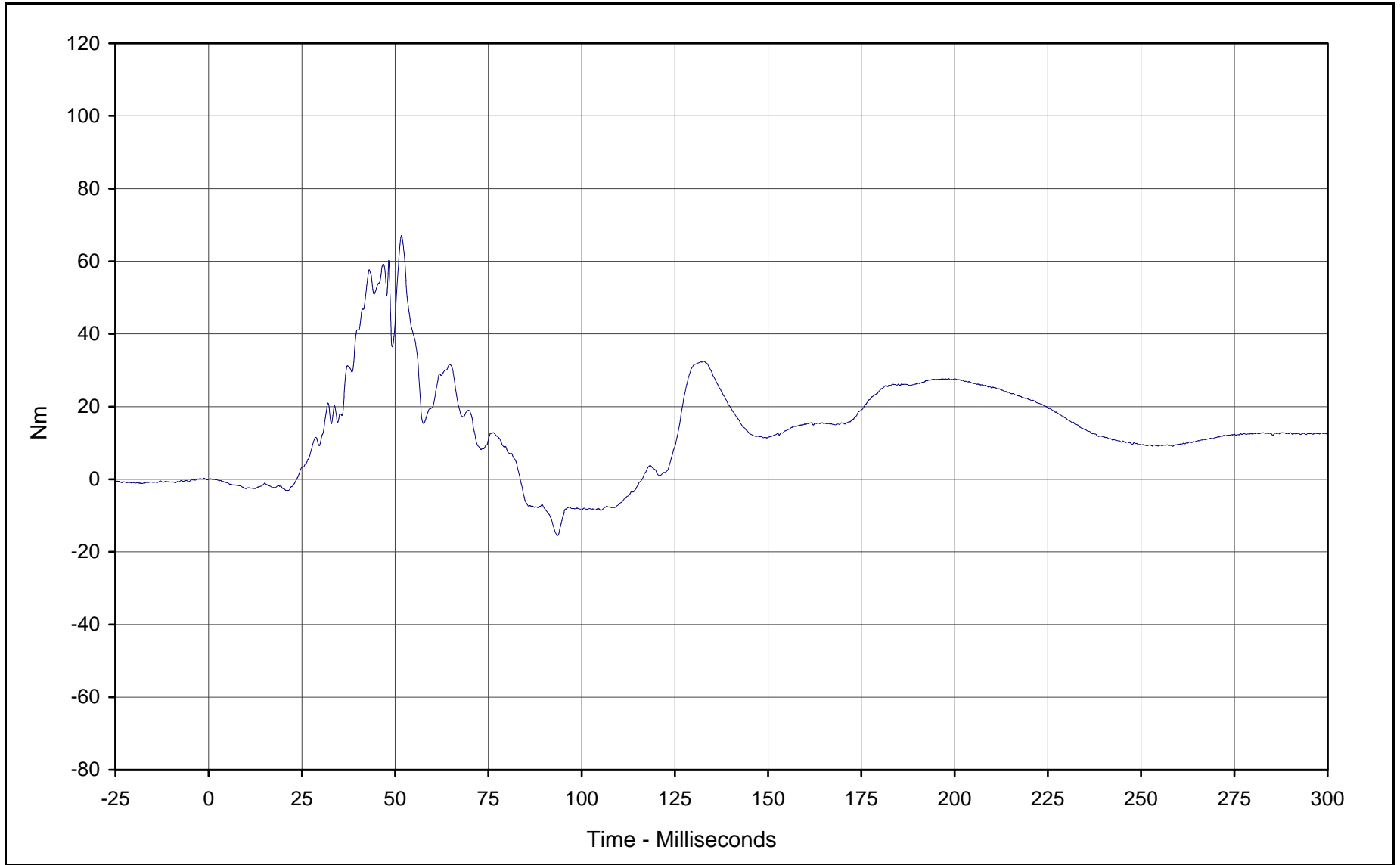


Curve Description: Passenger Right Femur Force  
Maximum Value: 719.3 at 62.5 Milliseconds  
Minimum Value: -3134.1 at 49.5 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-068

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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Curve Description: Passenger Left Upper Tibia Moment X

Maximum Value: 67.1 at 51.7 Milliseconds

Minimum Value: -15.5 at 93.5 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

Curve Number: FIL-069

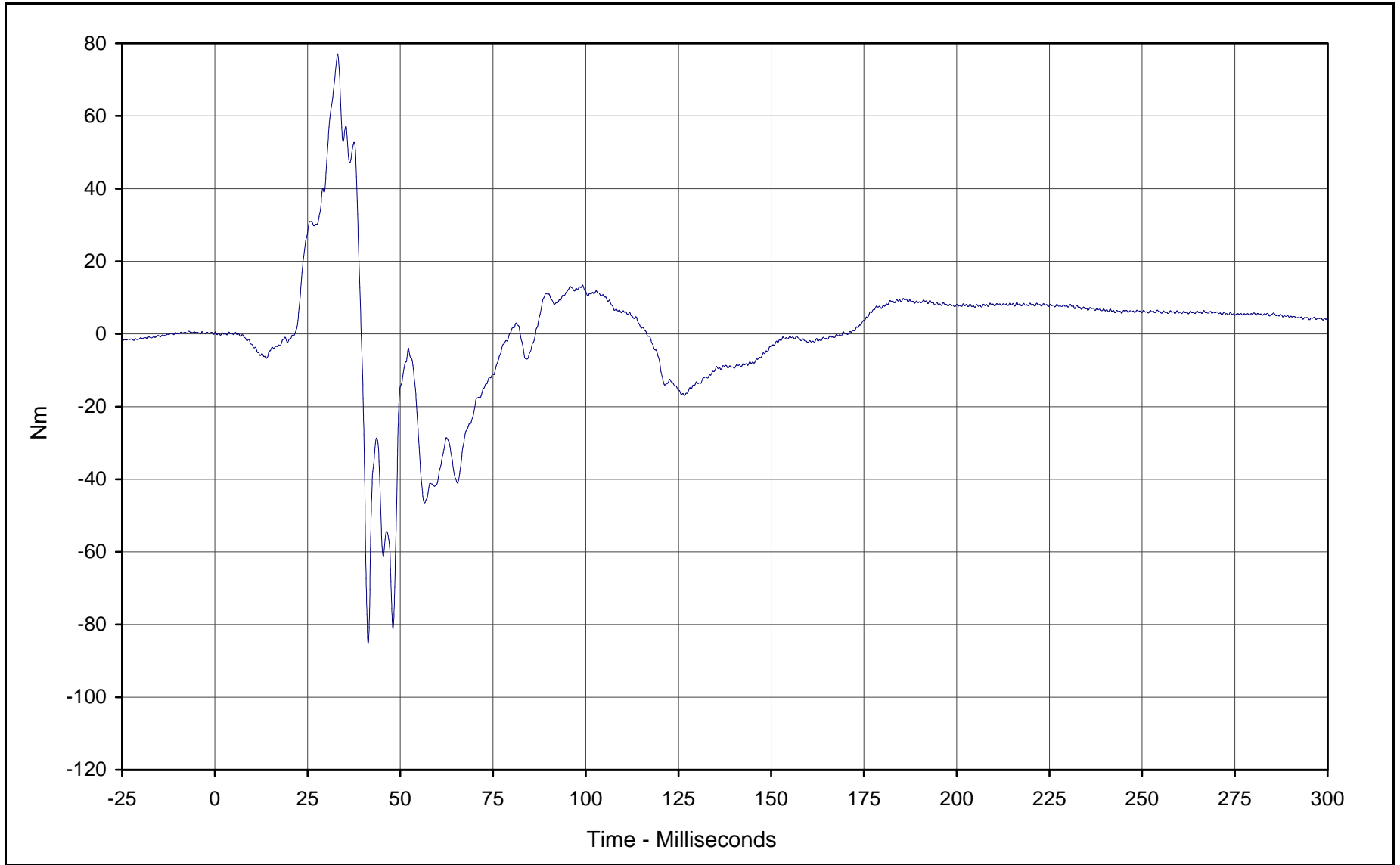
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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B-104



Curve Description: Passenger Left Upper Tibia Moment Y

Maximum Value: 77.1 at 33.1 Milliseconds

Minimum Value: -85.2 at 41.4 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

Curve Number: FIL-070

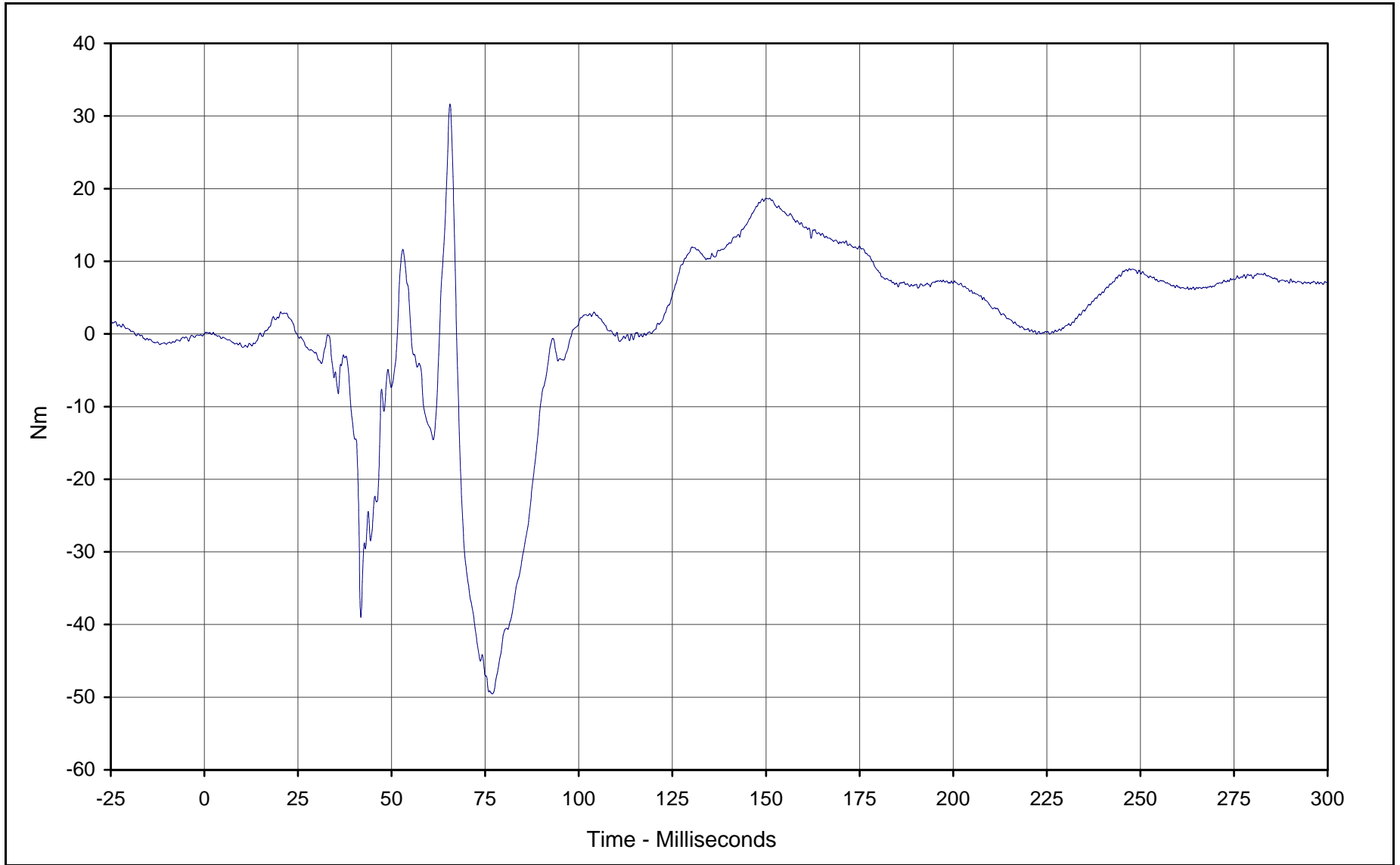
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

KARR20001-08



B-105



Curve Description: Passenger Right Upper Tibia Moment X

Maximum Value: 31.7 at 65.6 Milliseconds

Minimum Value: -49.6 at 76.9 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

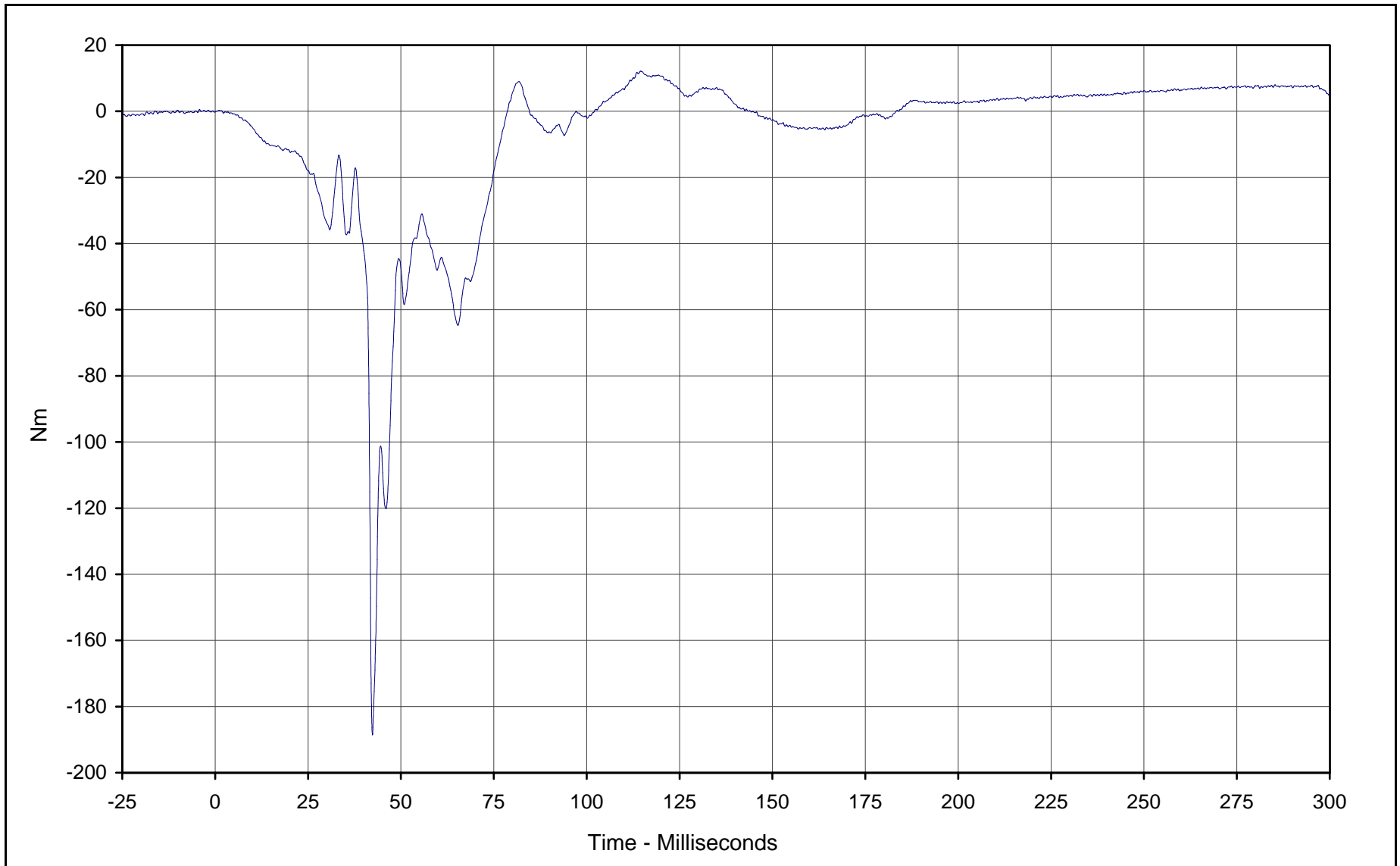
Curve Number: FIL-071

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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Curve Description: Passenger Right Upper Tibia Moment Y

Maximum Value: 12.1 at 114.5 Milliseconds

Minimum Value: -188.5 at 42.3 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

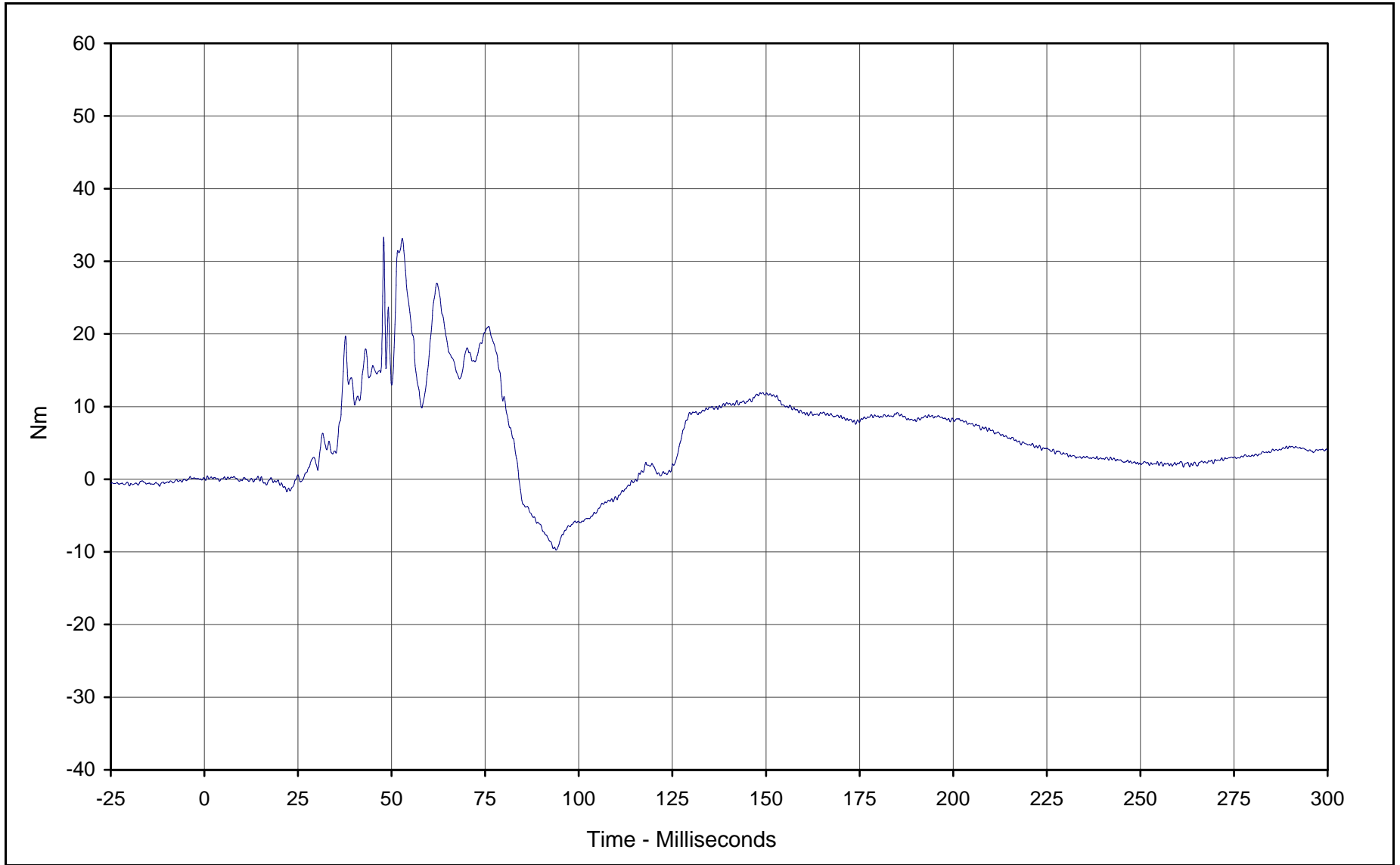
Curve Number: FIL-072

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van



B-107



Curve Description: Passenger Left Lower Tibia Moment X

Maximum Value: 33.3 at 47.9 Milliseconds

Minimum Value: -9.8 at 94.0 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

Curve Number: FIL-073

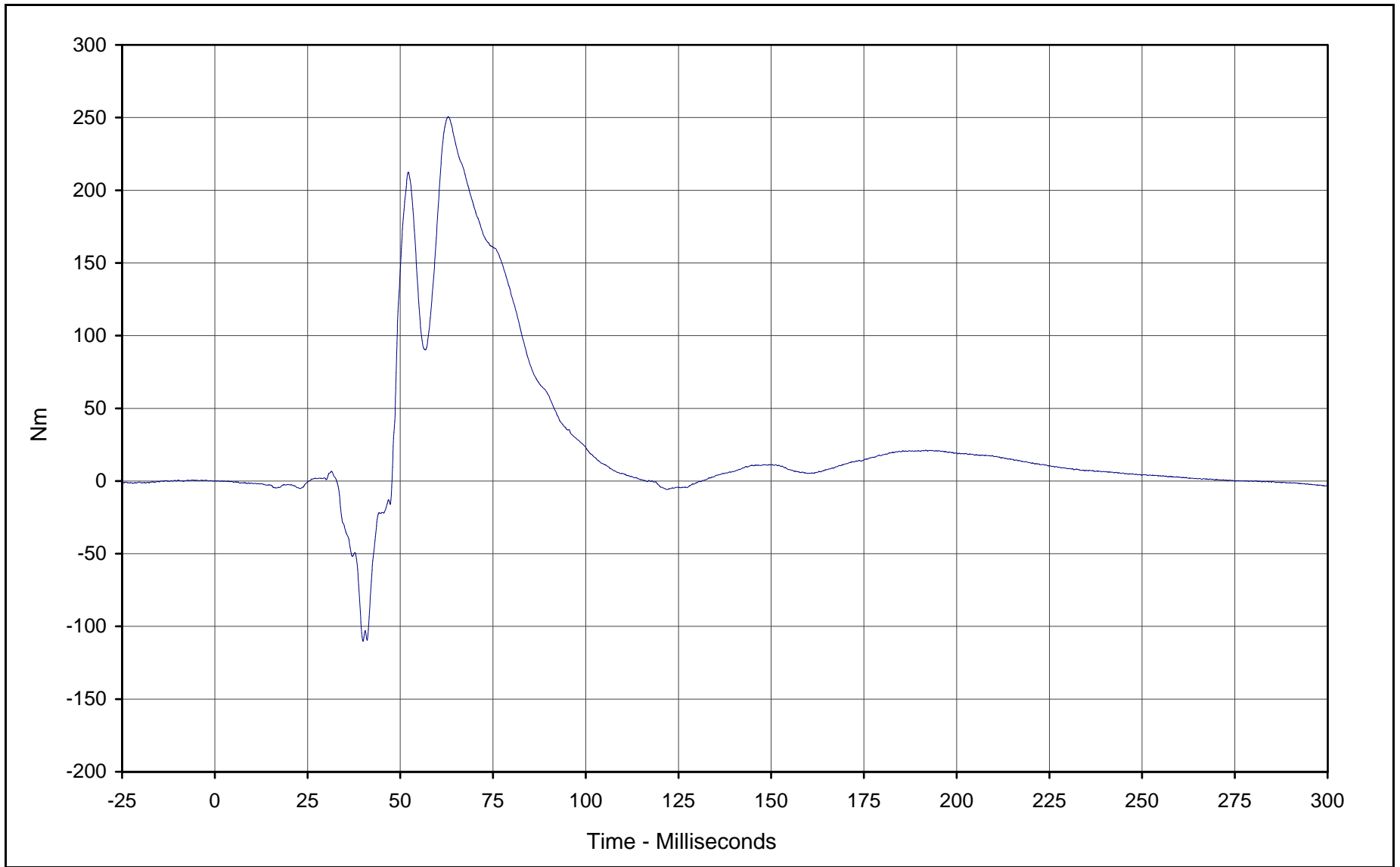
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van



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B-108



Curve Description: Passenger Left Lower Tibia Moment Y

Maximum Value: 250.5 at 63.0 Milliseconds

Minimum Value: -110.2 at 40.0 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

Curve Number: FIL-074

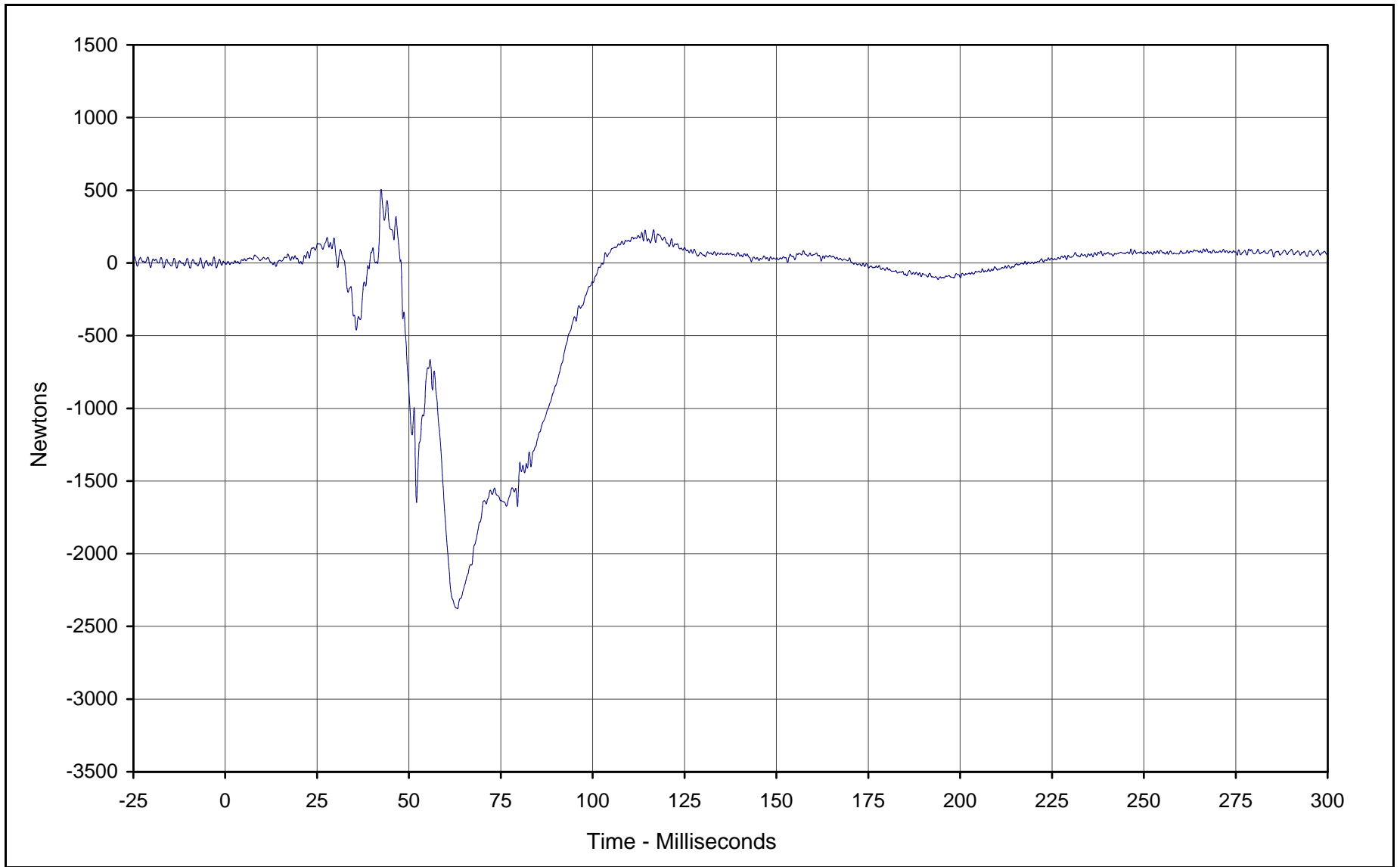
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

KARR20001-08



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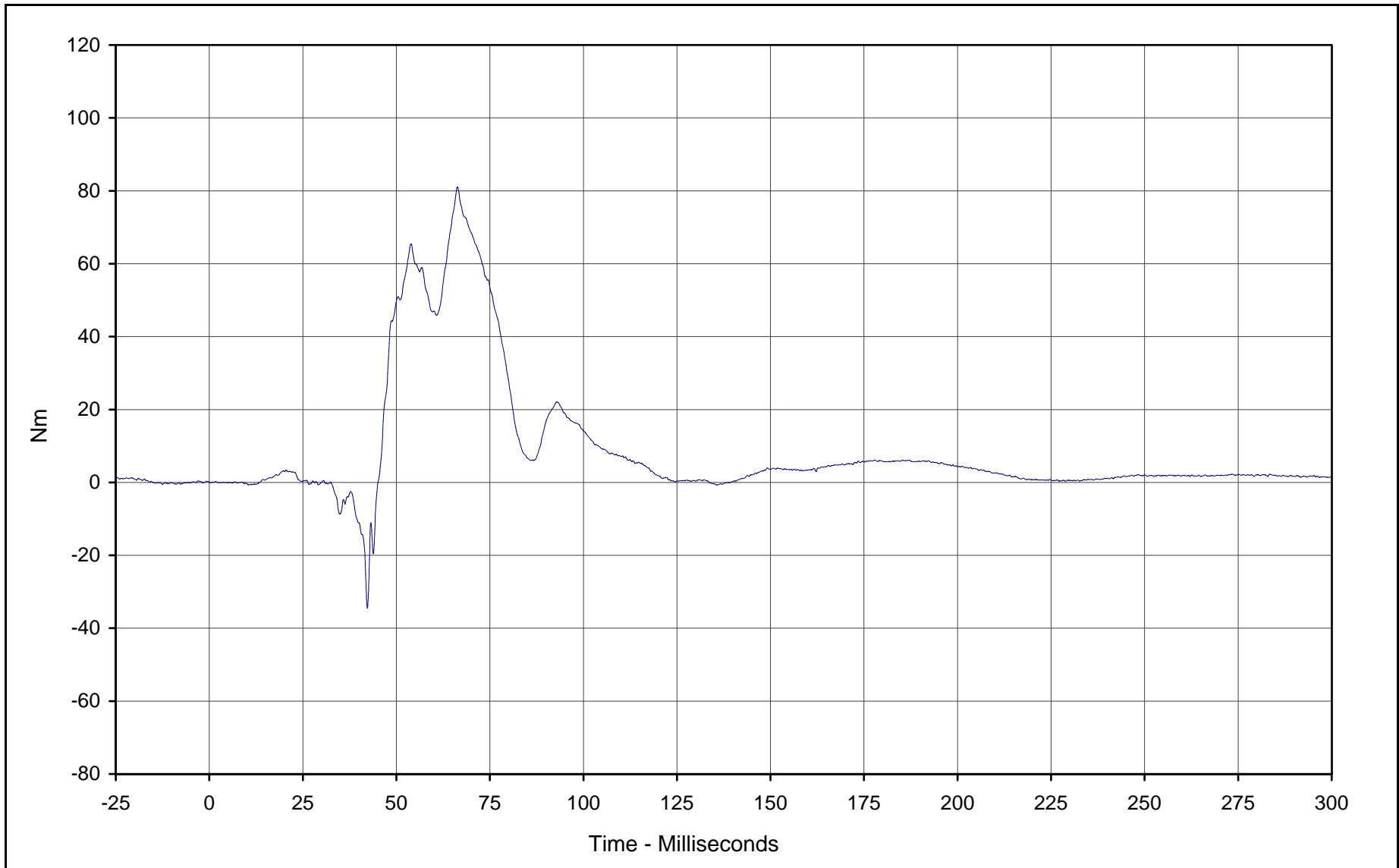
Curve Description: Passenger Left Lower Tibia Force Z  
Maximum Value: 506.7 at 42.4 Milliseconds  
Minimum Value: -2378.1 at 63.2 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-075

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-110



Curve Description: Passenger Right Lower Tibia Moment X

Maximum Value: 81.0 at 66.3 Milliseconds

Minimum Value: -34.5 at 42.3 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

Curve Number: FIL-076

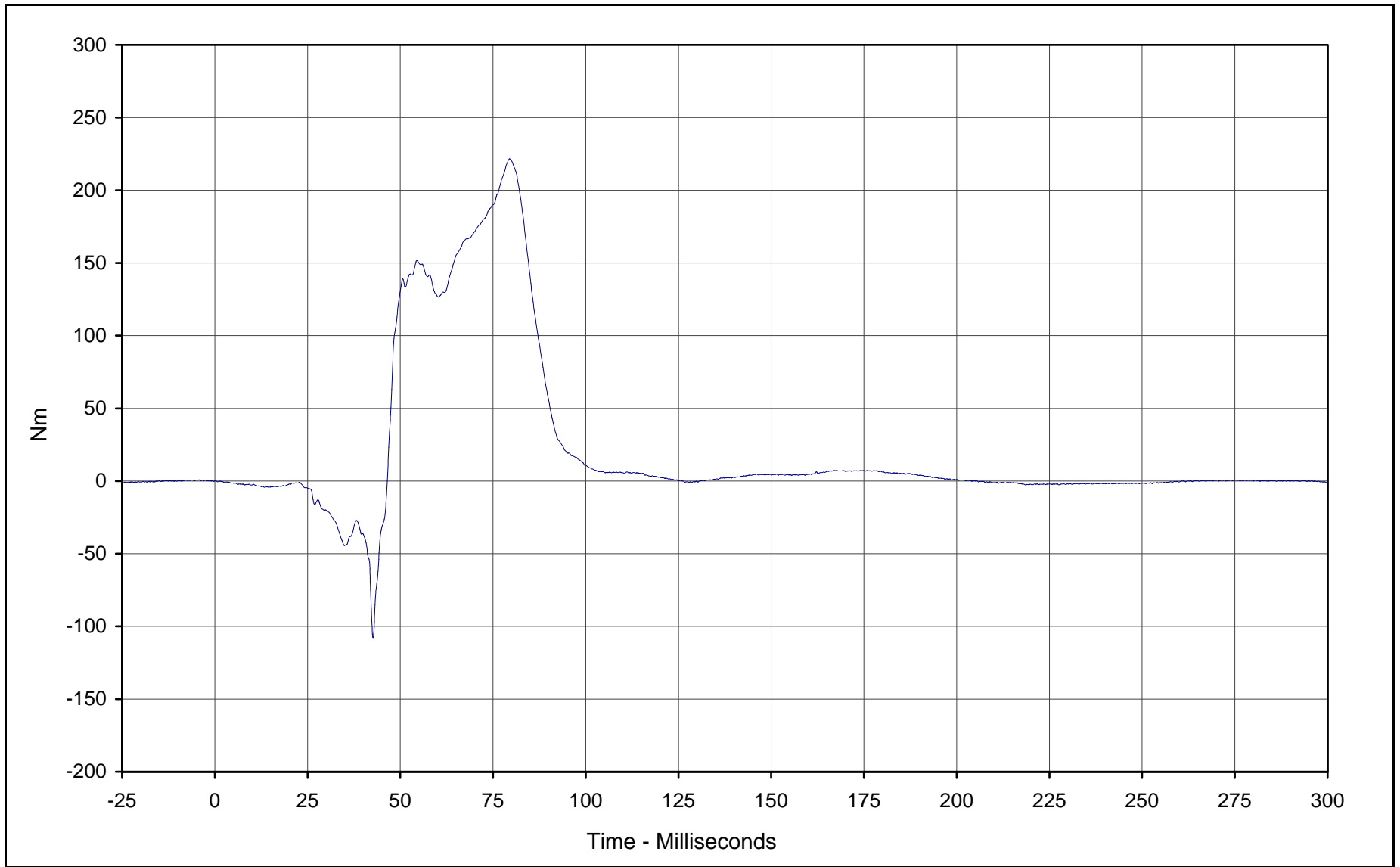
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

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B-111



Curve Description: Passenger Right Lower Tibia Moment Y

Maximum Value: 221.6 at 79.5 Milliseconds

Minimum Value: -107.7 at 42.7 Milliseconds

SAE Filter Class: 600

Date of Test: 1/13/00

Curve Number: FIL-077

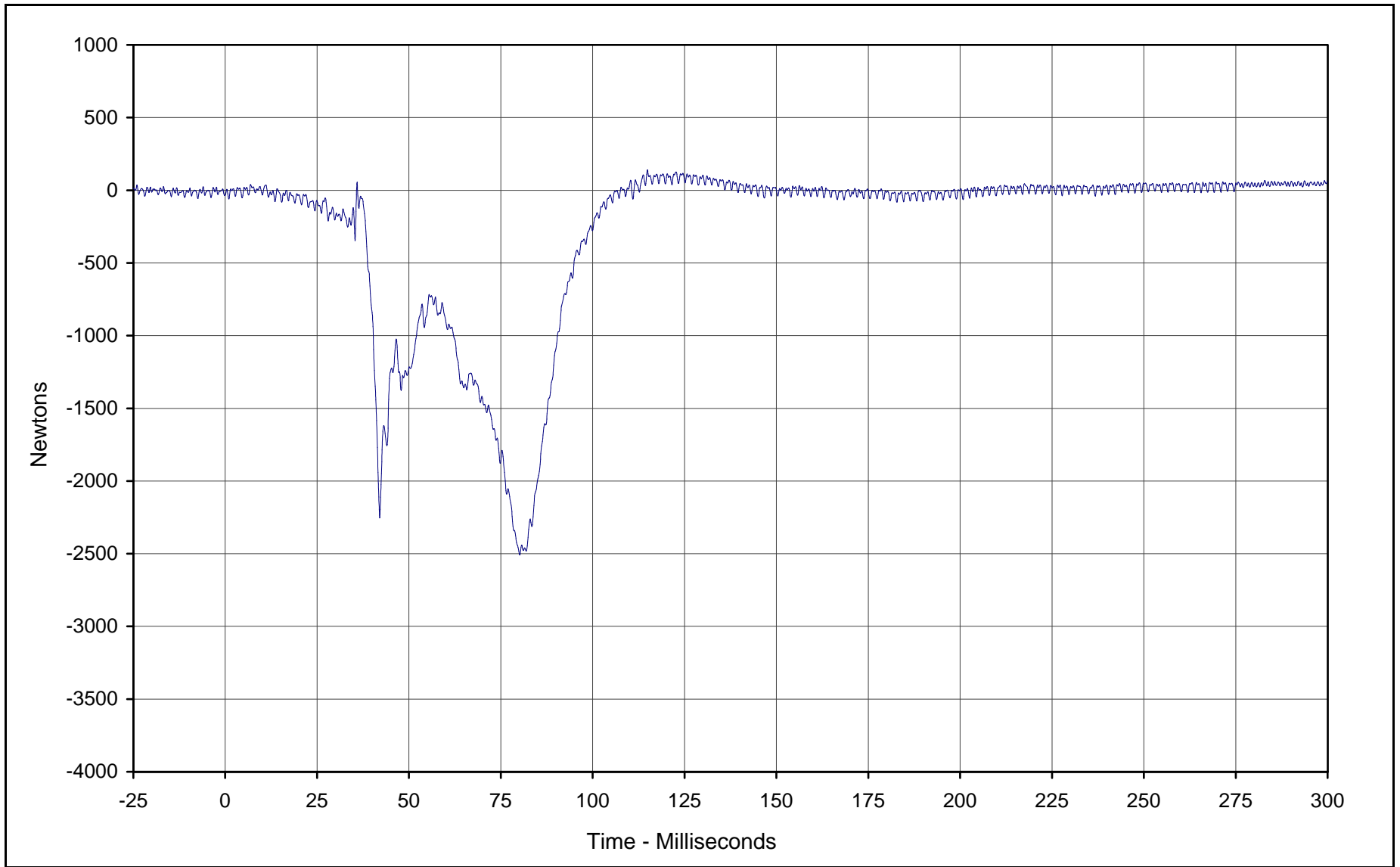
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

KARR20001-08



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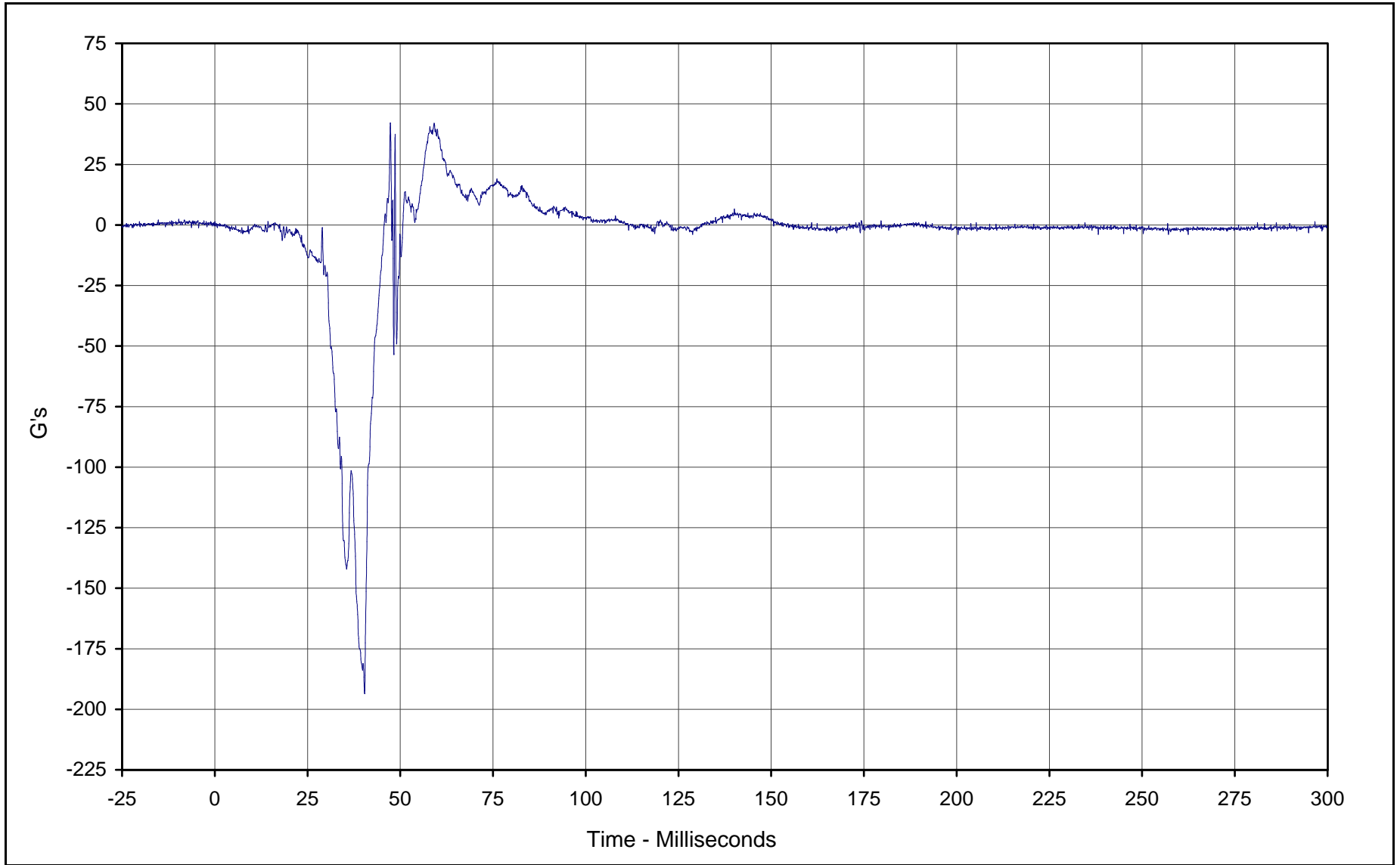
Curve Description: Passenger Right lower Tibia Force Z  
Maximum Value: 141.0 at 114.9 Milliseconds  
Minimum Value: -2508.8 at 80.1 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/13/00  
Curve Number: FIL-078

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-113



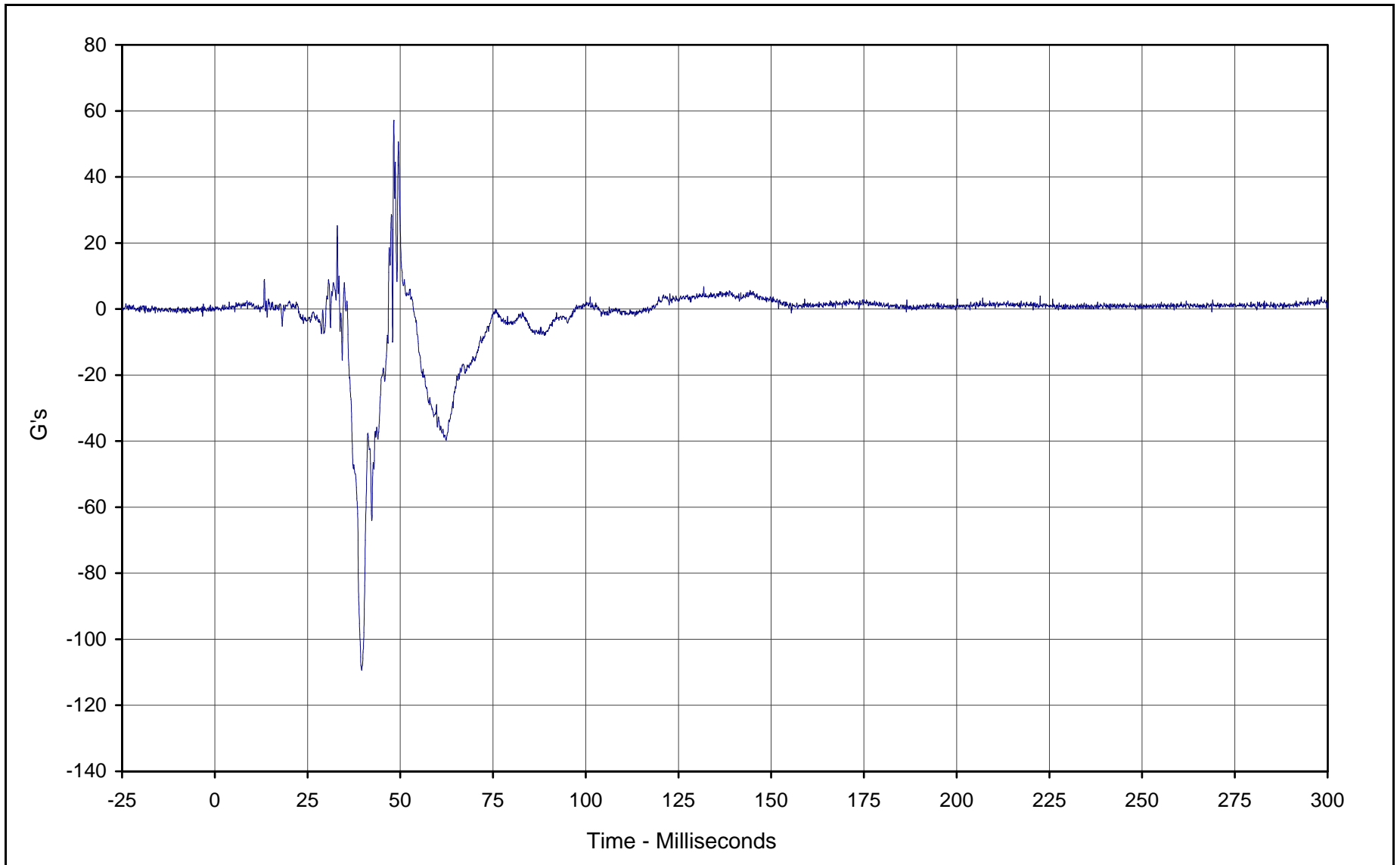
Curve Description: Passenger Left Foot Aft X  
Maximum Value: 42.0 at 47.3 Milliseconds  
Minimum Value: -193.4 at 40.4 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-079

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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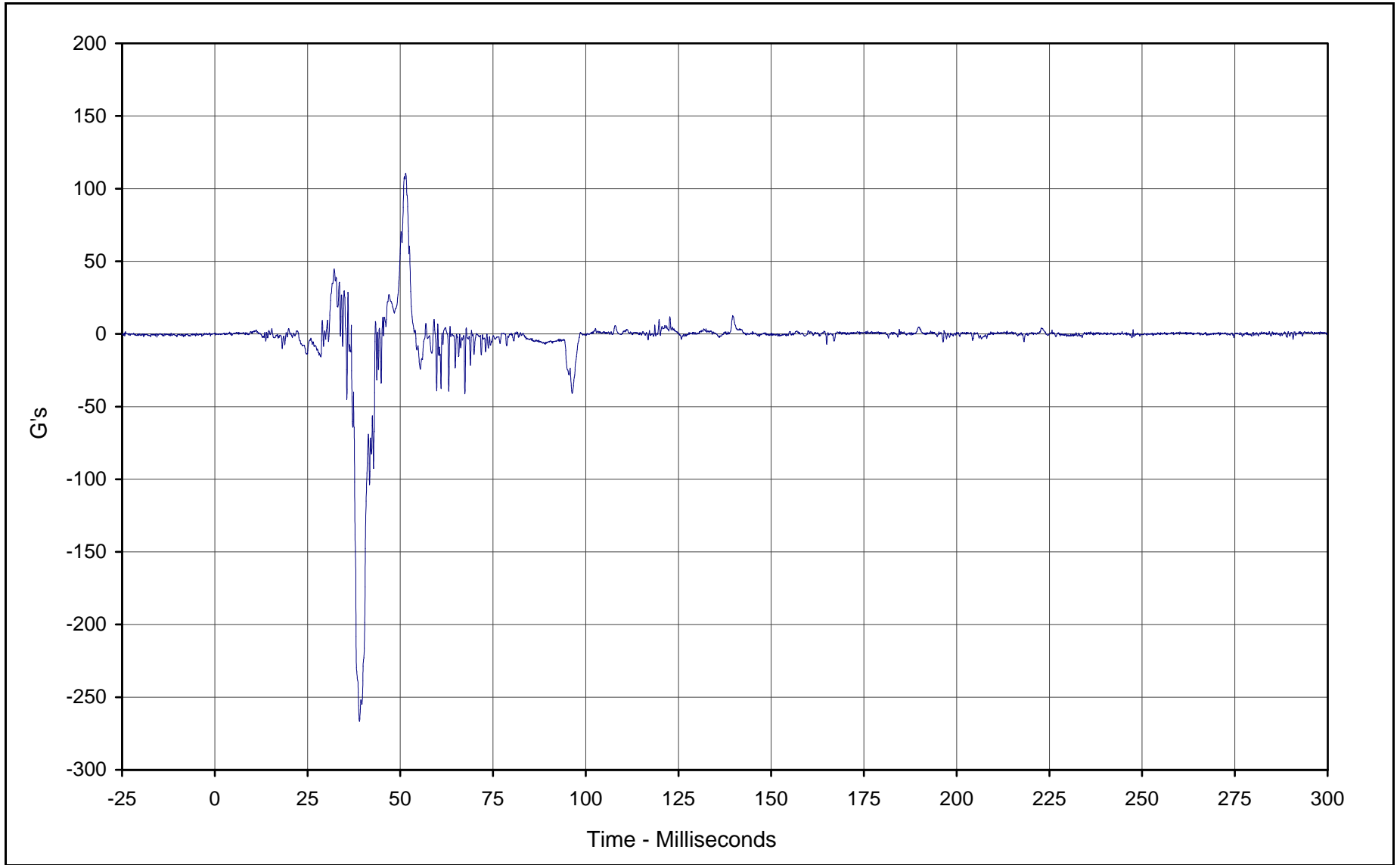
Curve Description: Passenger Left Foot Aft Z  
Maximum Value: 57.0 at 48.3 Milliseconds  
Minimum Value: -109.4 at 39.6 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-080

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-115



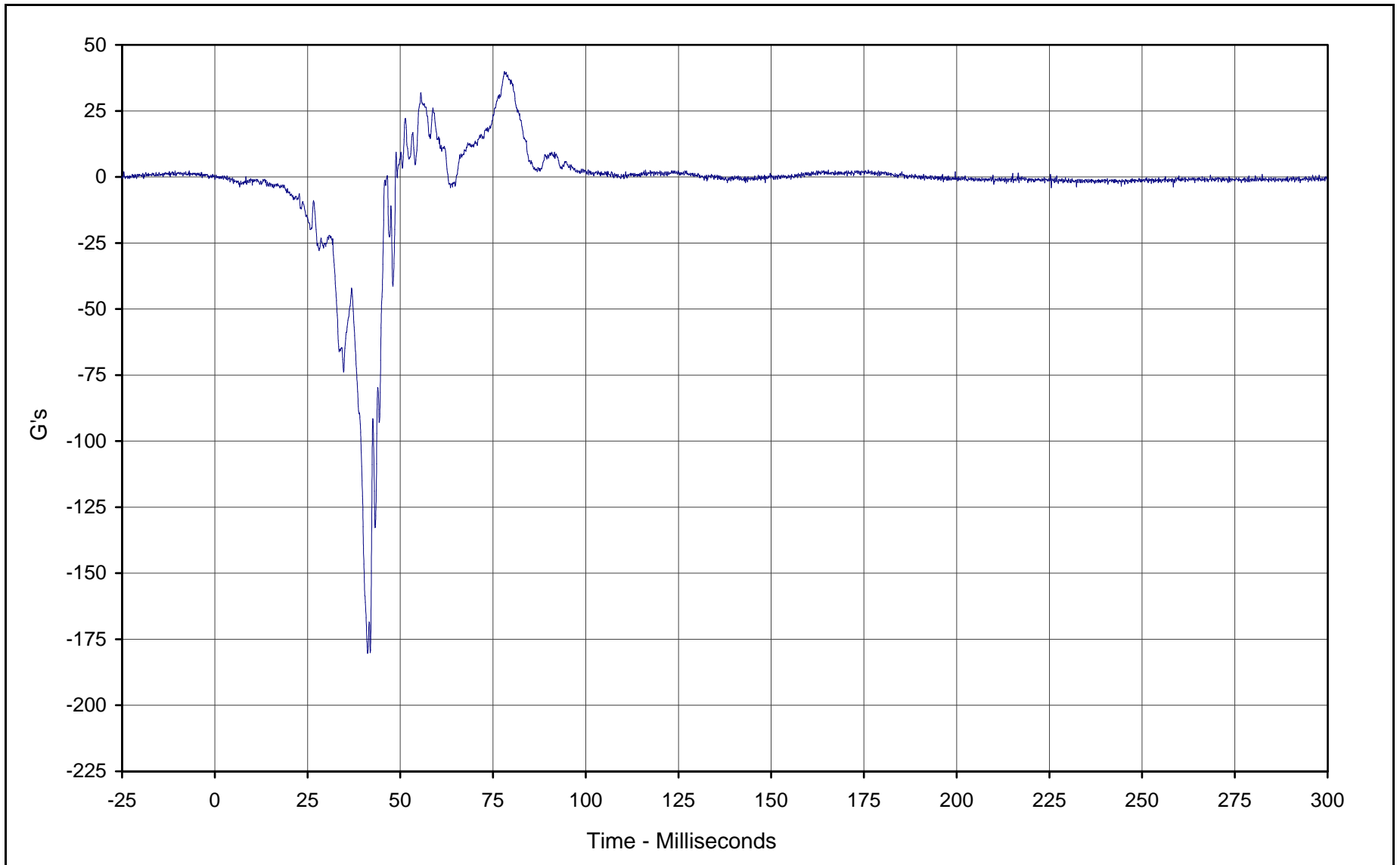
Curve Description: Passenger Left Foot Fore Z  
Maximum Value: 110.4 at 51.5 Milliseconds  
Minimum Value: -266.7 at 39.0 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-081

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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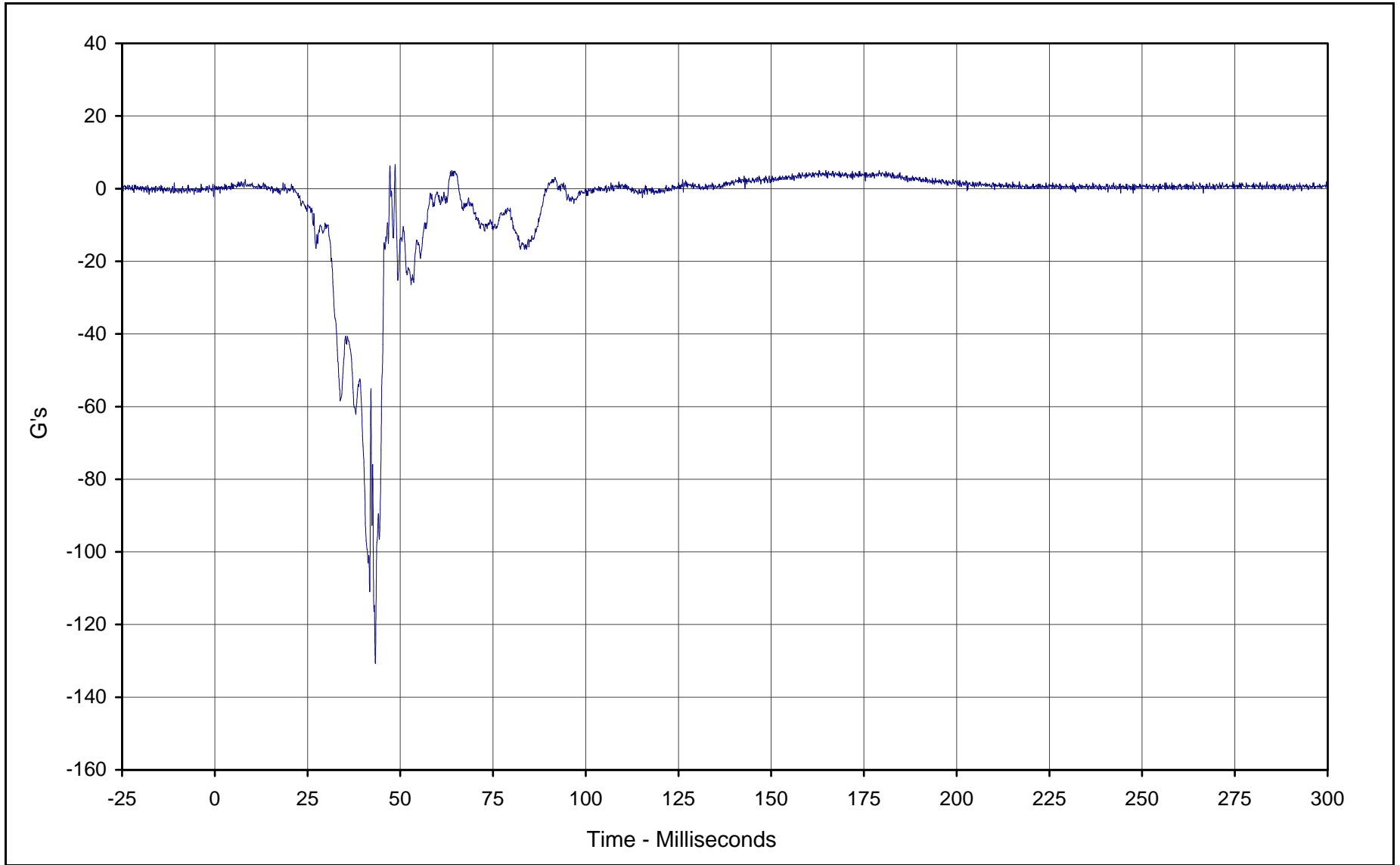
Curve Description: Passenger Right Foot Aft X  
Maximum Value: 39.9 at 78.1 Milliseconds  
Minimum Value: -180.3 at 41.2 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-082

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-117



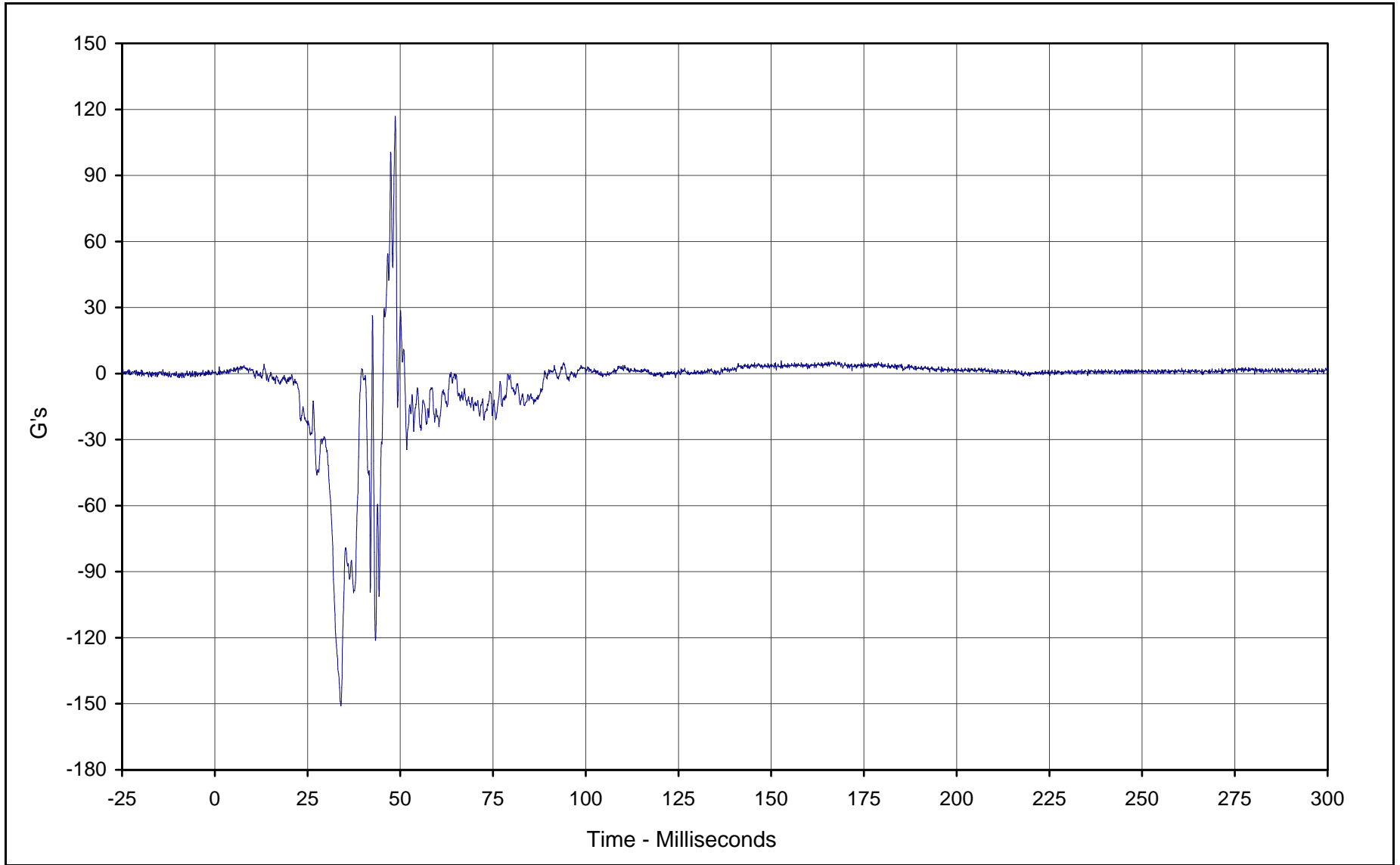
Curve Description: Passenger Right Foot Aft Z  
Maximum Value: 6.6 at 48.6 Milliseconds  
Minimum Value: -130.6 at 43.3 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-083

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-118



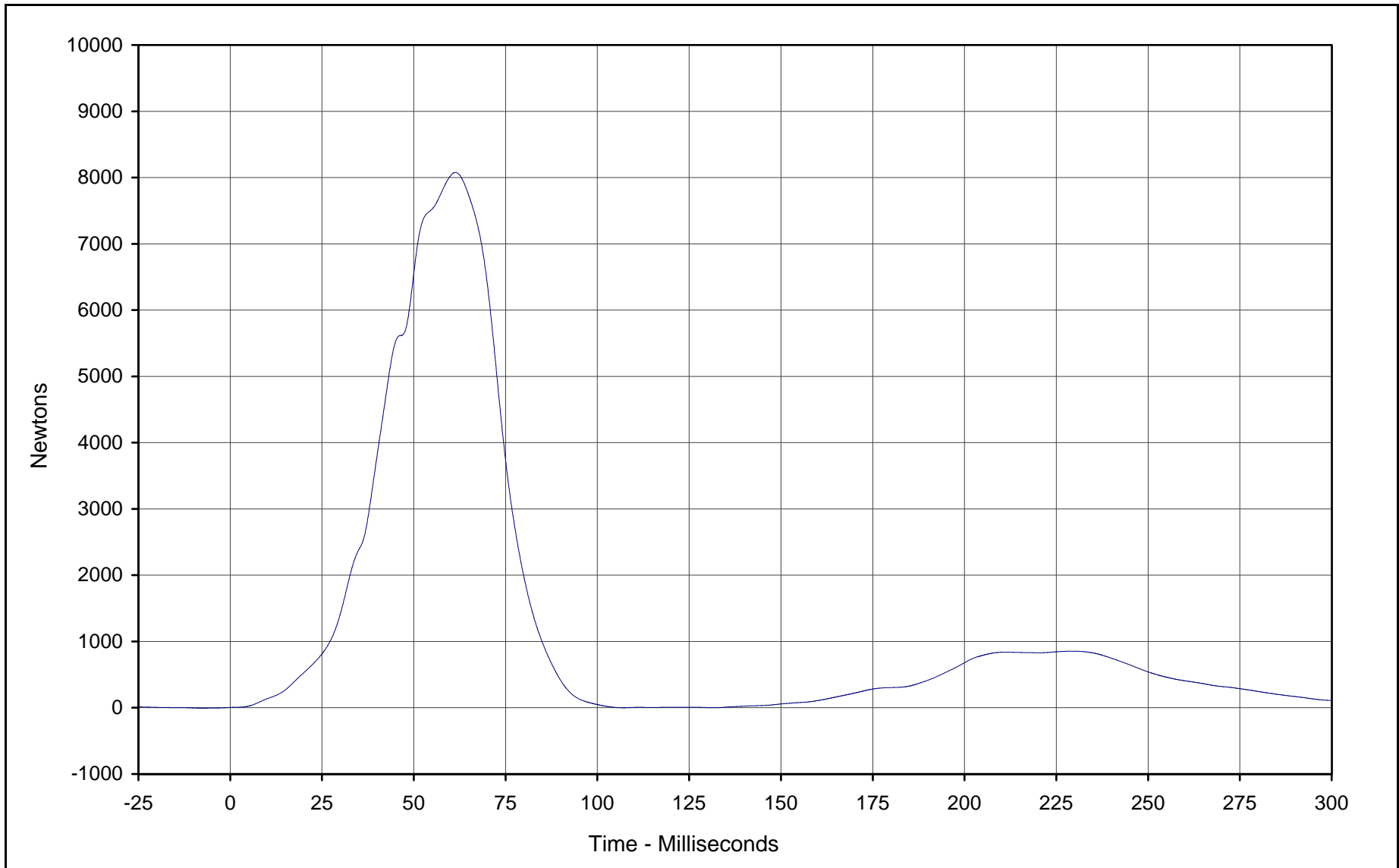
Curve Description: Passenger Right Foot Fore Z  
Maximum Value: 116.8 at 48.7 Milliseconds  
Minimum Value: -151.0 at 34.0 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/13/00  
Curve Number: FIL-084

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-119



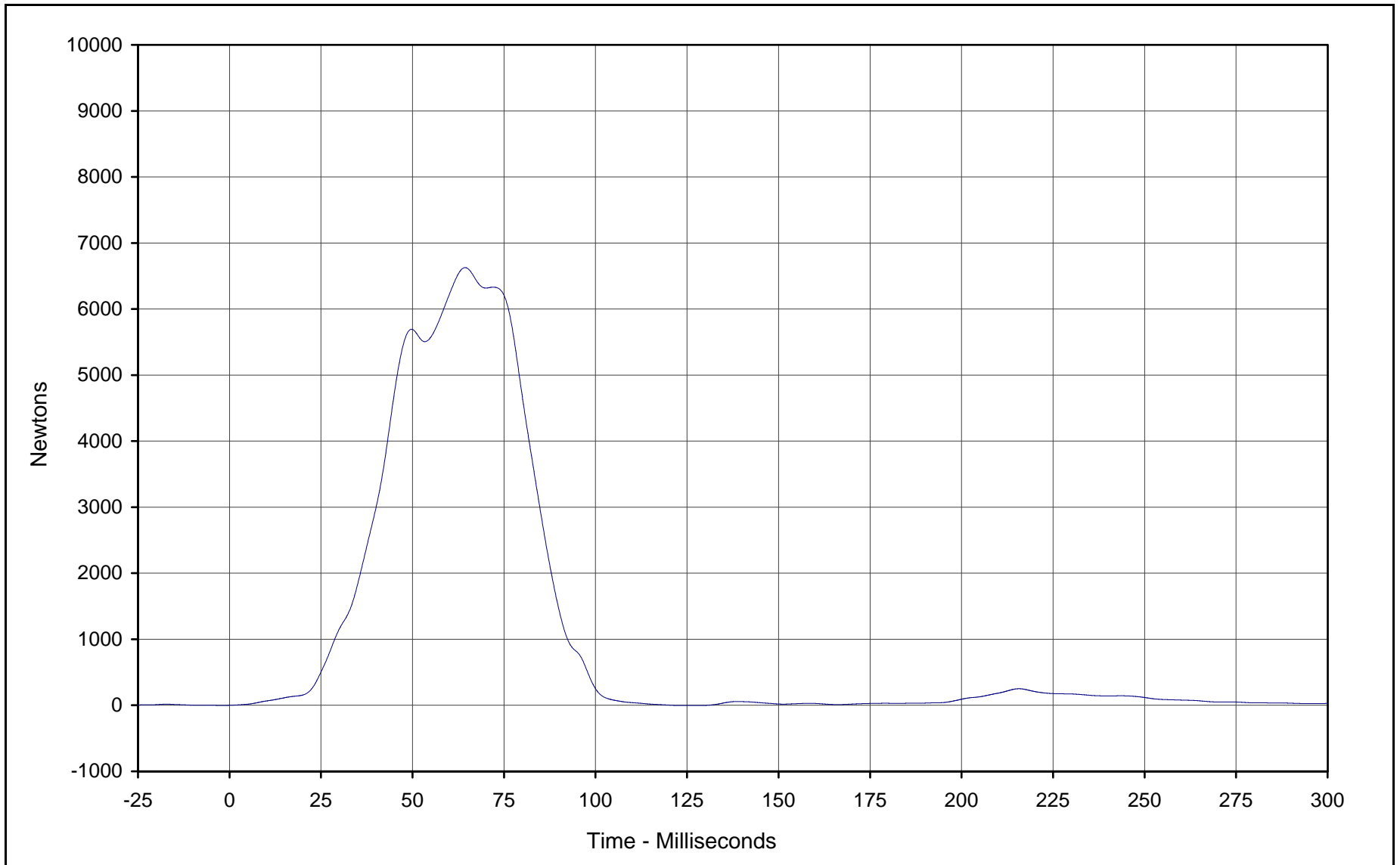
Curve Description: Passenger Lap Belt Force  
Maximum Value: 8077.3 at 61.3 Milliseconds  
Minimum Value: -0.3 at 107.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-085

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-120



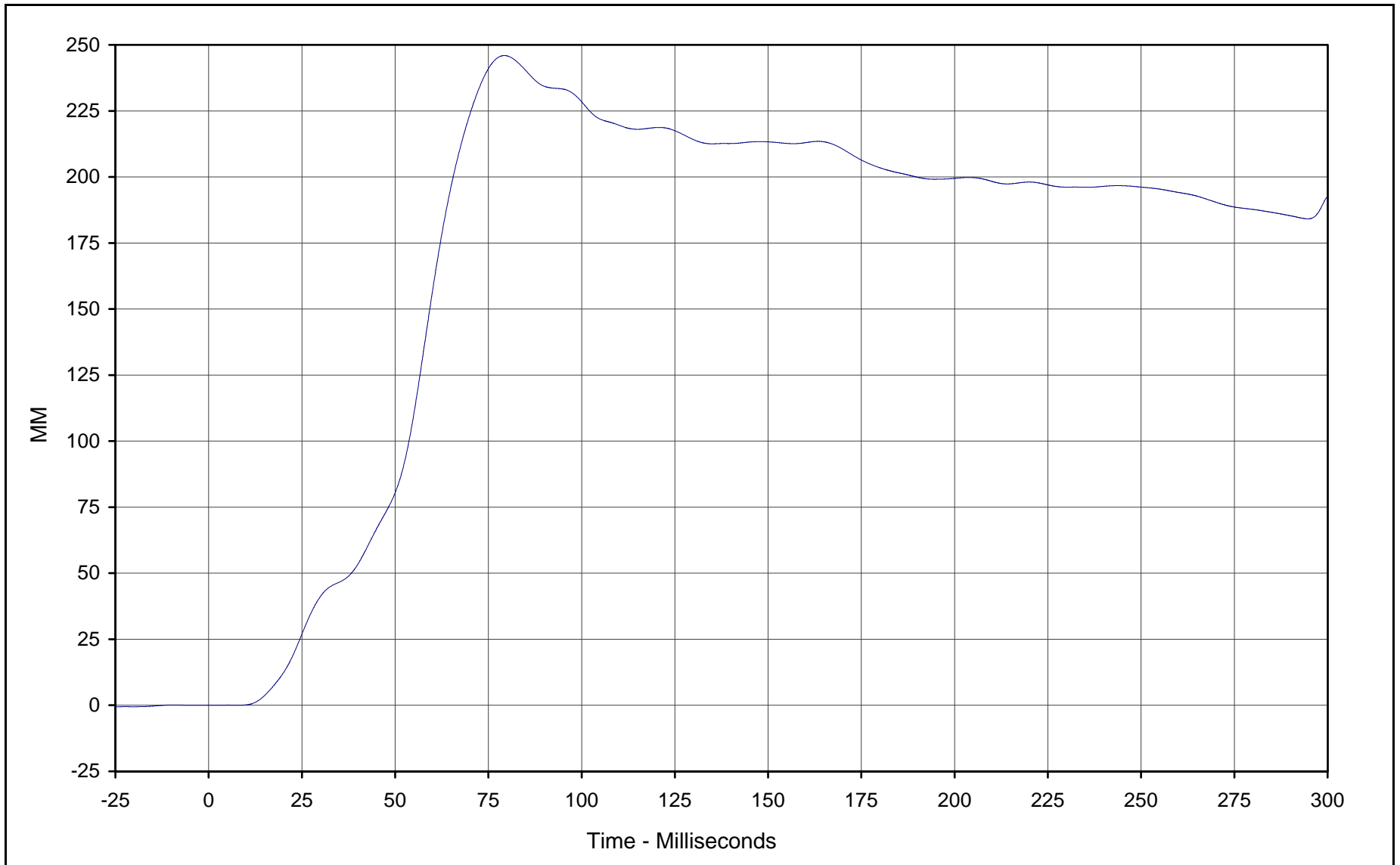
Curve Description: Passenger Shoulder Belt Force  
Maximum Value: 6627.3 at 64.4 Milliseconds  
Minimum Value: -3.1 at 125.3 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-086

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-121



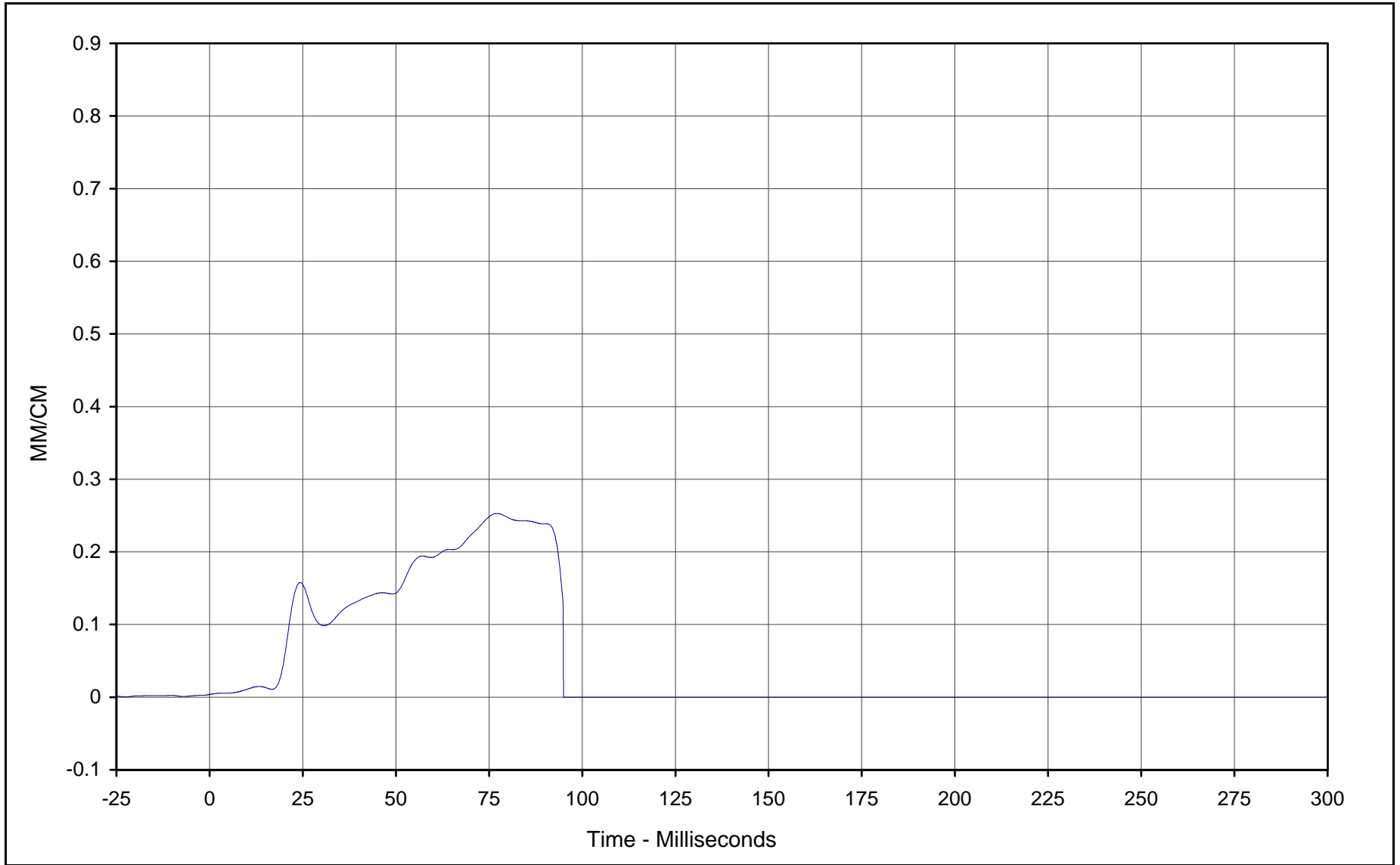
Curve Description: Passenger Shoulder Belt Pullout  
Maximum Value: 245.9 at 79.3 Milliseconds  
Minimum Value: 0.0 at 8.2 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-087

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-122



Curve Description: Passenger Shoulder Belt Elongation \*

Maximum Value: 0.25 at 77.1 Milliseconds

Minimum Value: 0.00 at 95.0 Milliseconds

SAE Filter Class: 60

Date of Test: 1/13/00

Curve Number: FIL-088

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

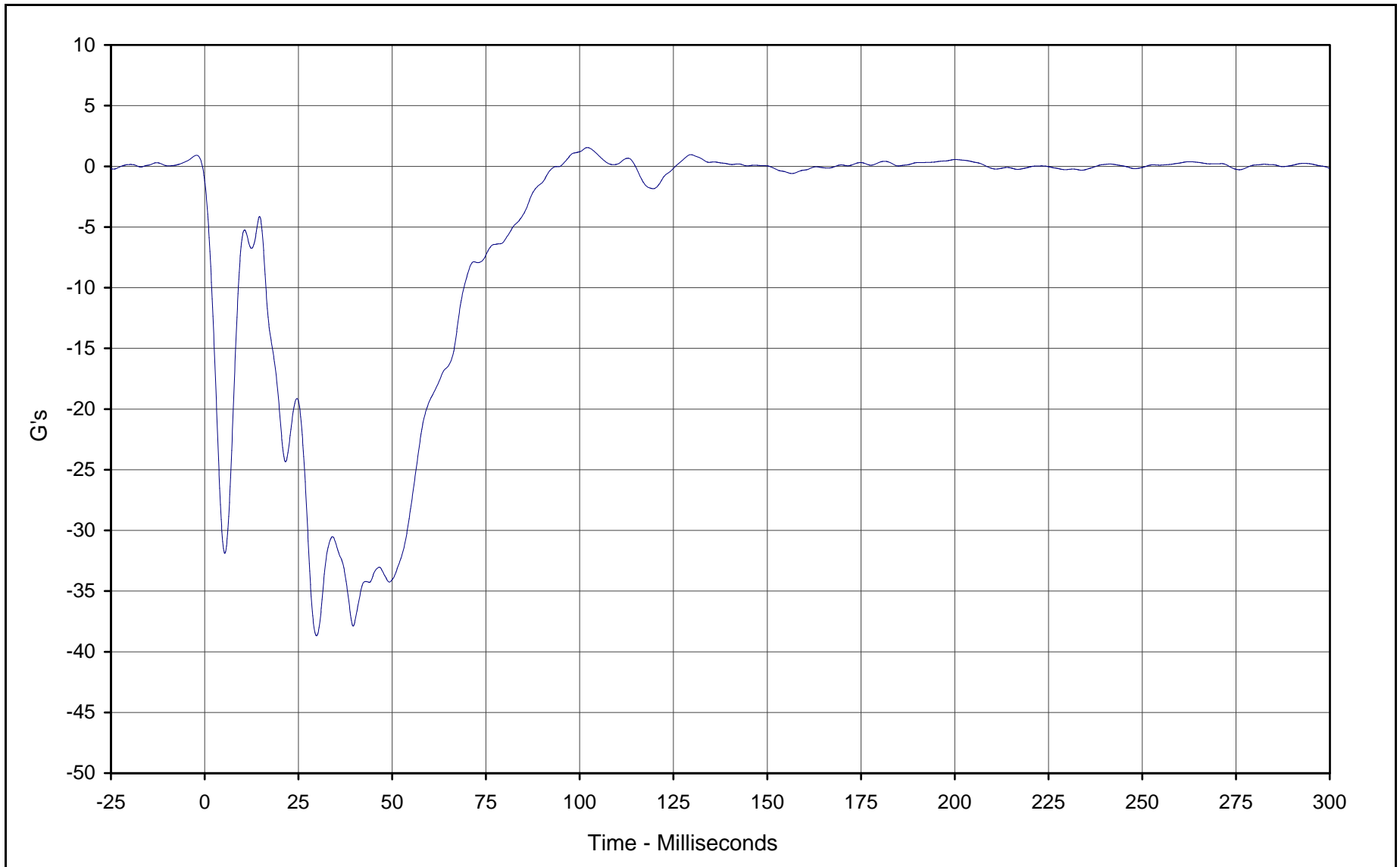
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 95.0 Msec.



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B-123



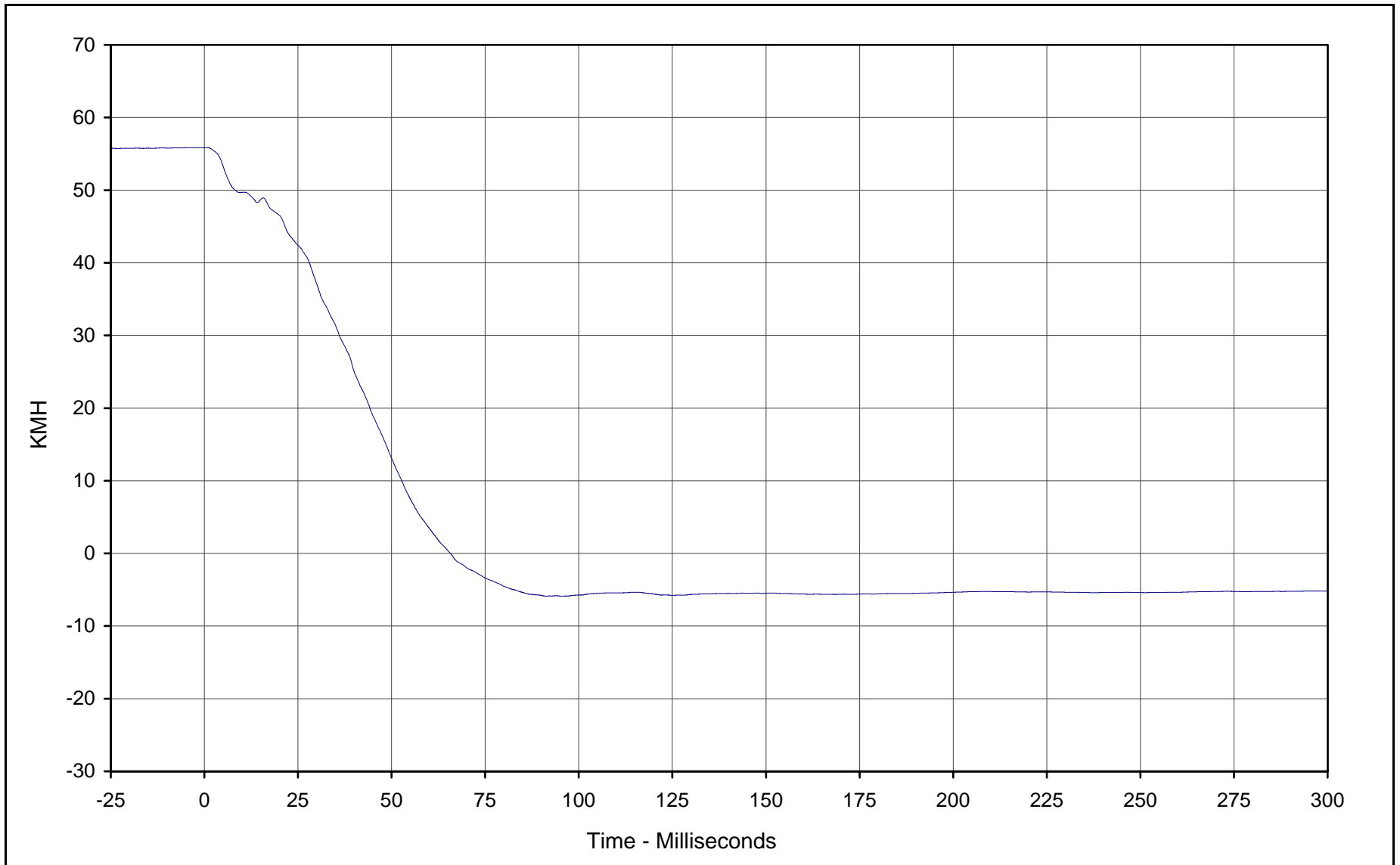
Curve Description: Vehicle Left Rear Primary  
Maximum Value: 1.5 at 102.0 Milliseconds  
Minimum Value: -38.7 at 29.8 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-089

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-124



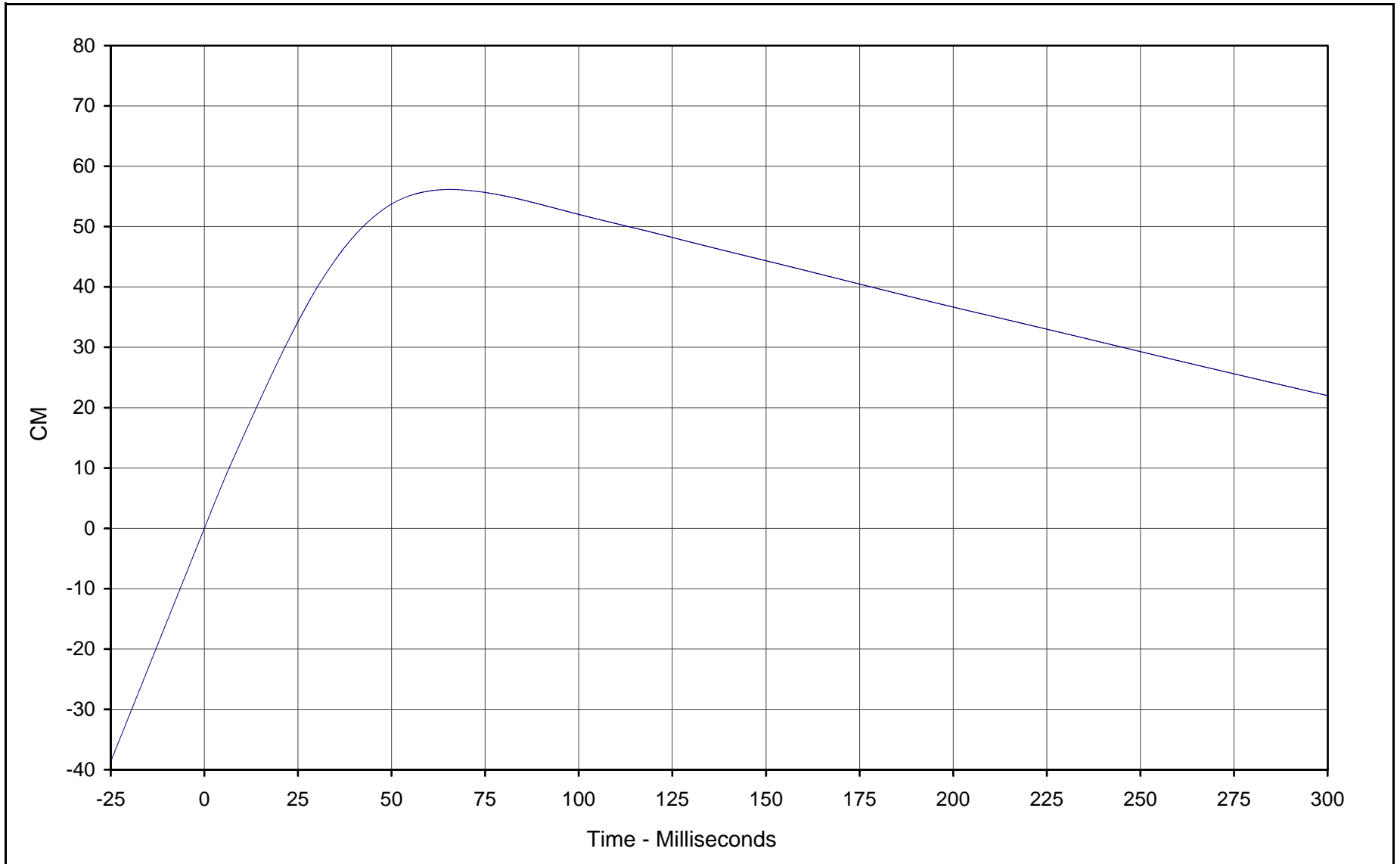
Curve Description: Vehicle Left Rear Primary Velocity  
Maximum Value: 55.8 at 0.5 Milliseconds  
Minimum Value: -5.9 at 95.4 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-089

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-125



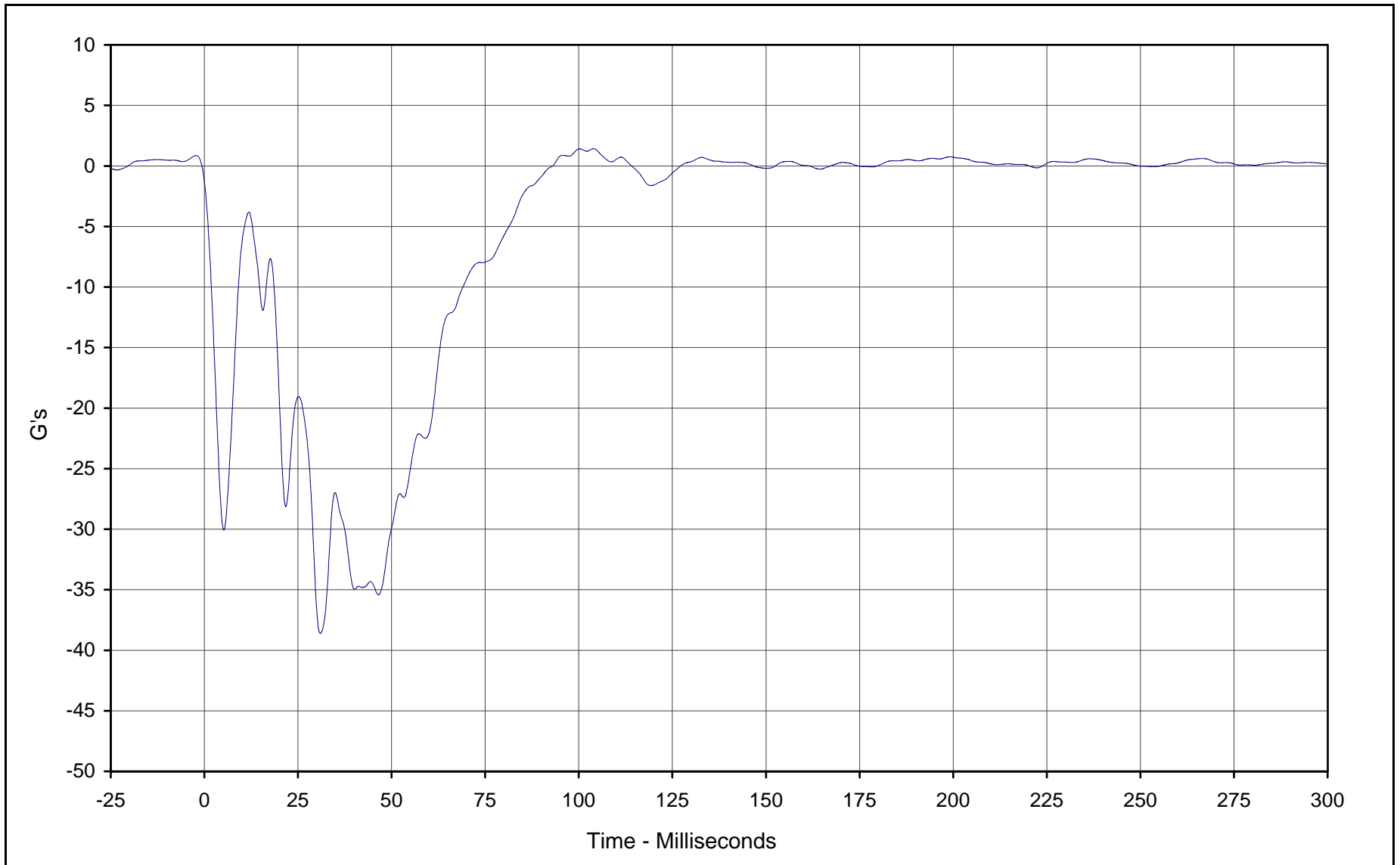
Curve Description: Vehicle Left Rear Primary Displ.  
Maximum Value: 56.2 at 65.7 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-089

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-126



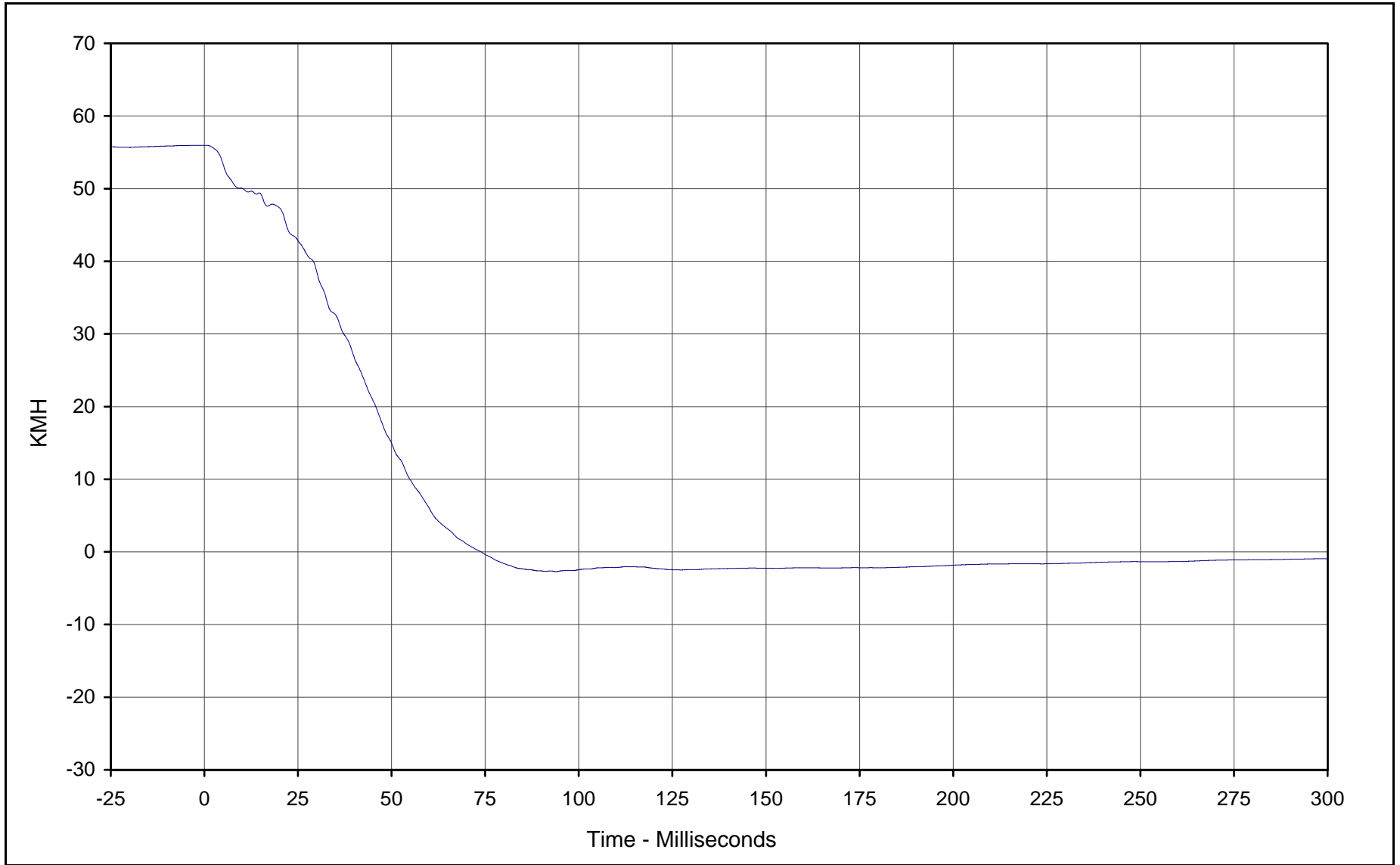
Curve Description: Vehicle Right Rear Primary  
Maximum Value: 1.4 at 104.0 Milliseconds  
Minimum Value: -38.6 at 31.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-090

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-127



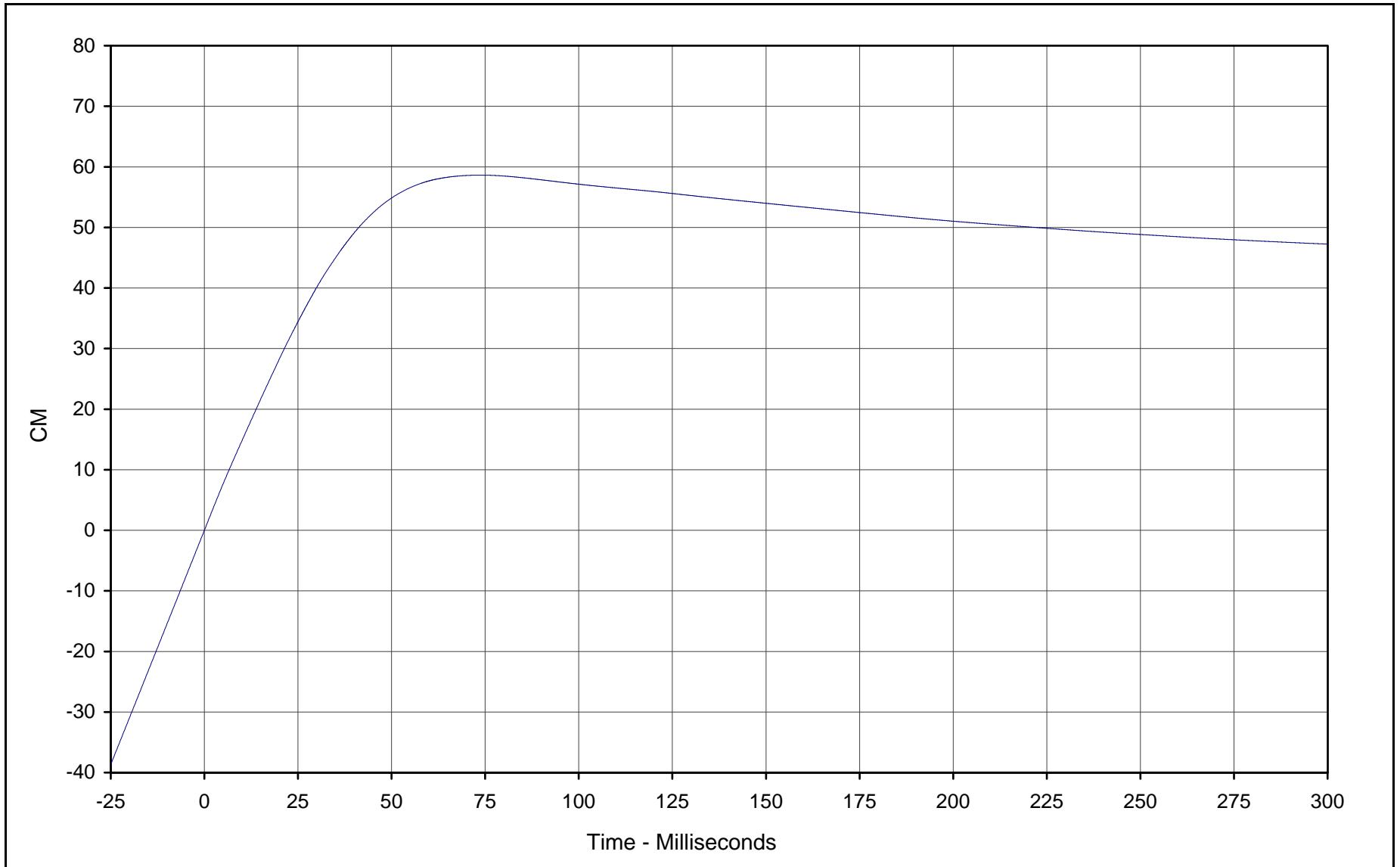
Curve Description: Vehicle Right Rear Primary Velocity  
Maximum Value: 56.0 at 0.4 Milliseconds  
Minimum Value: -2.7 at 93.9 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-090

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-128



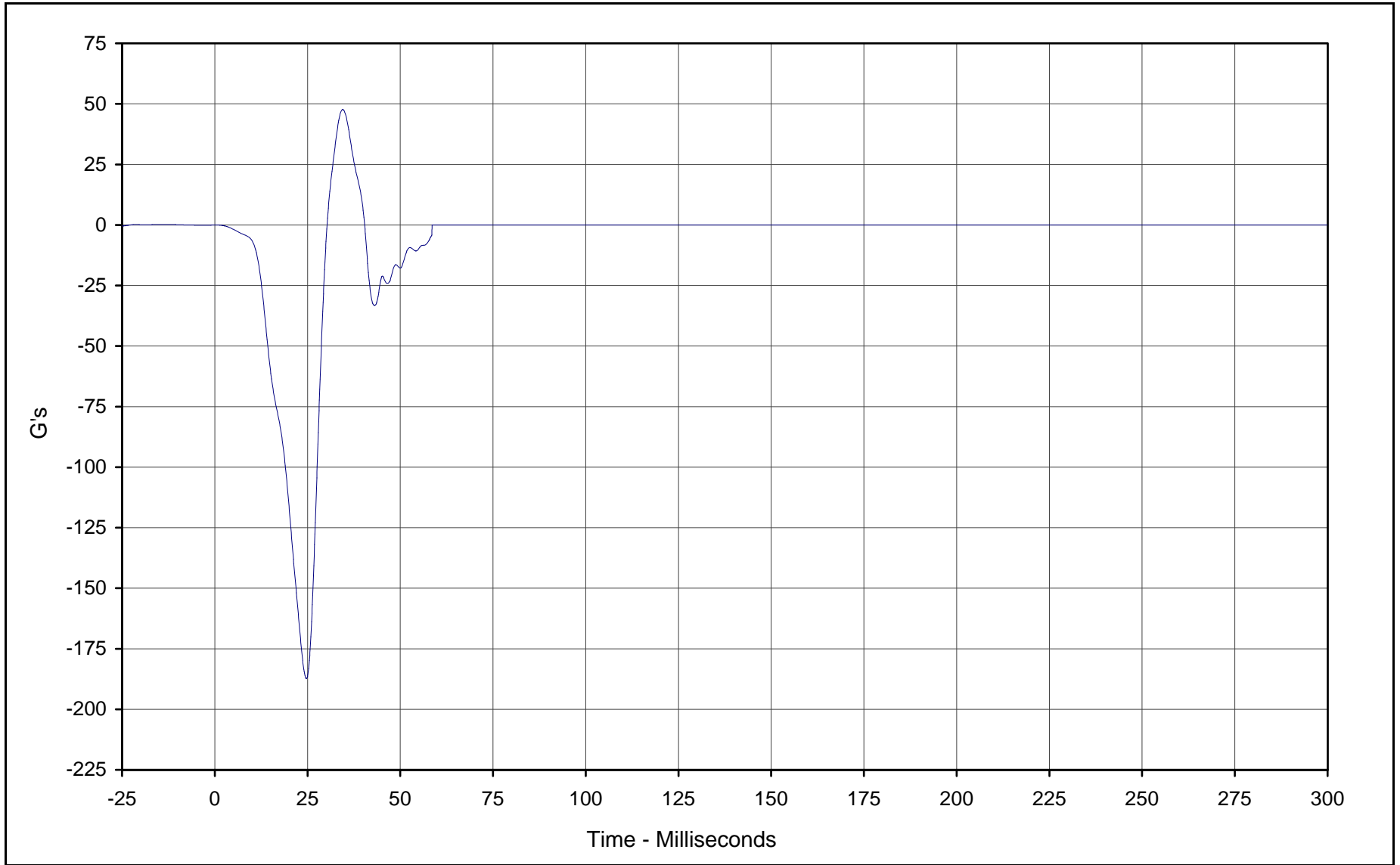
Curve Description: Vehicle Right Rear Primary Displ.  
Maximum Value: 58.6 at 73.9 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-090

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-129



Curve Description: Vehicle Engine Top \*  
Maximum Value: 47.7 at 34.5 Milliseconds  
Minimum Value: -187.3 at 24.7 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-091

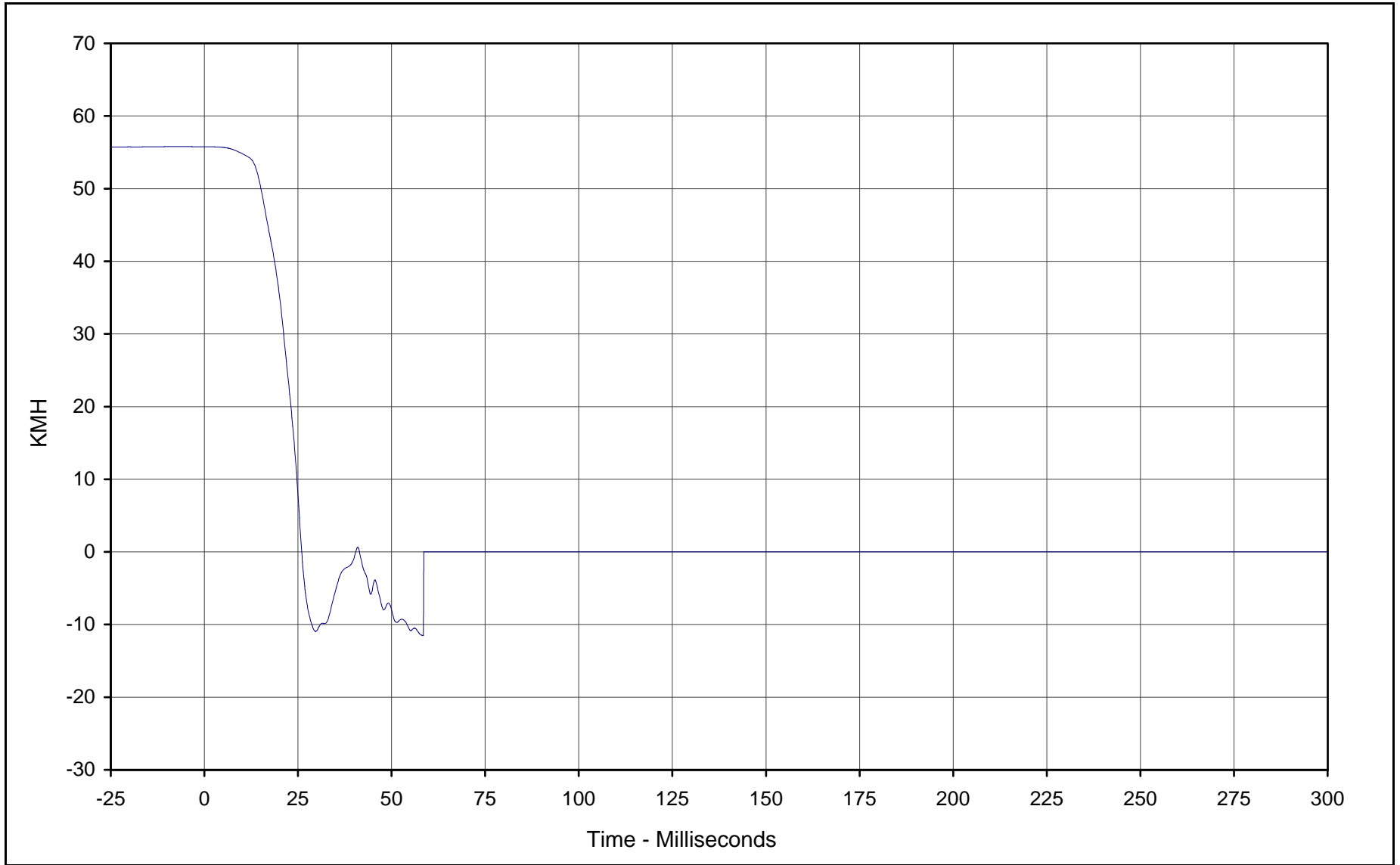
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-130



Curve Description: Vehicle Engine Top Velocity \*  
Maximum Value: 55.8 at 1.0 Milliseconds  
Minimum Value: -11.5 at 58.4 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-091

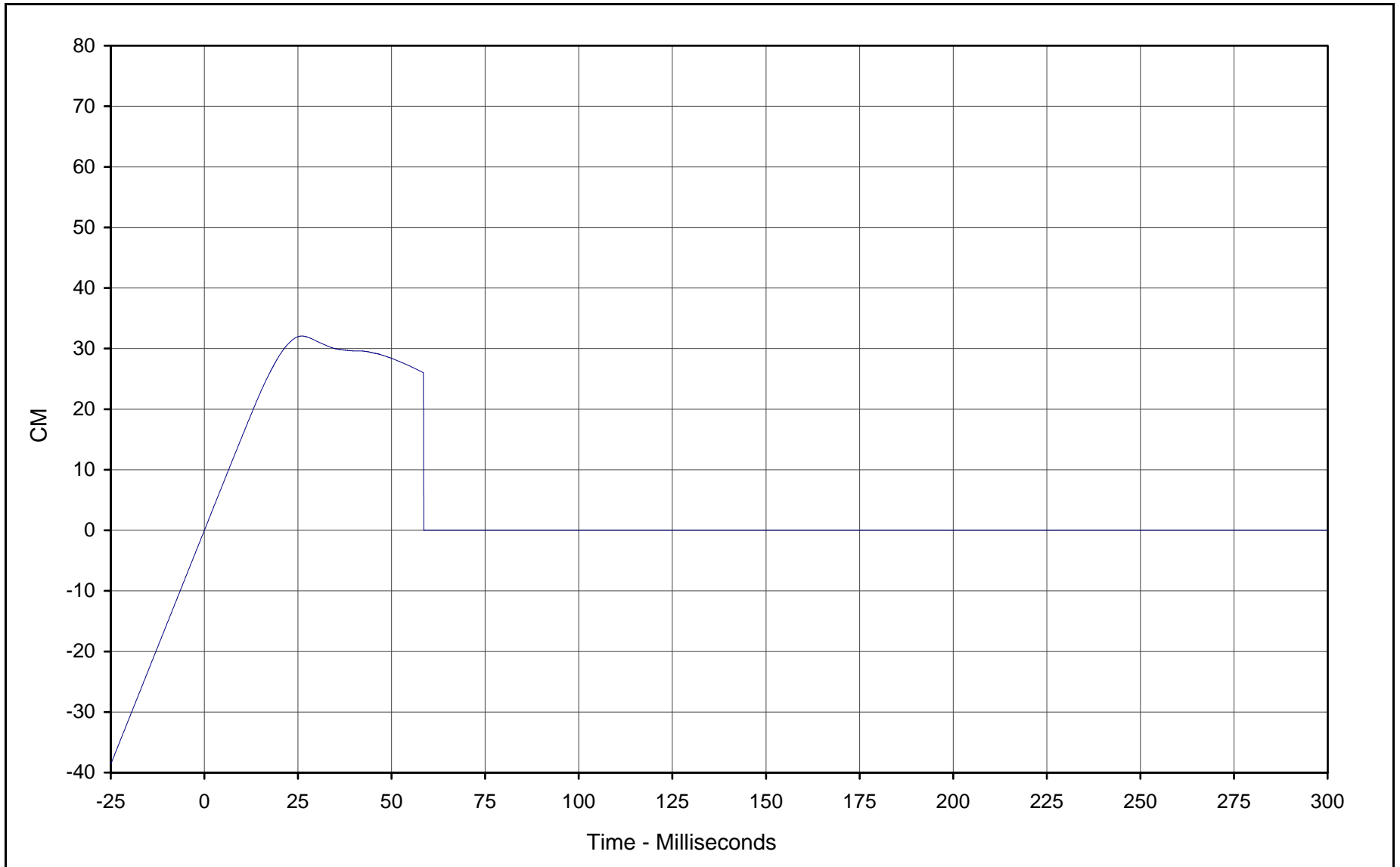
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-131



Curve Description: Vehicle Engine Top Displ. \*  
Maximum Value: 32.1 at 26.0 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-091

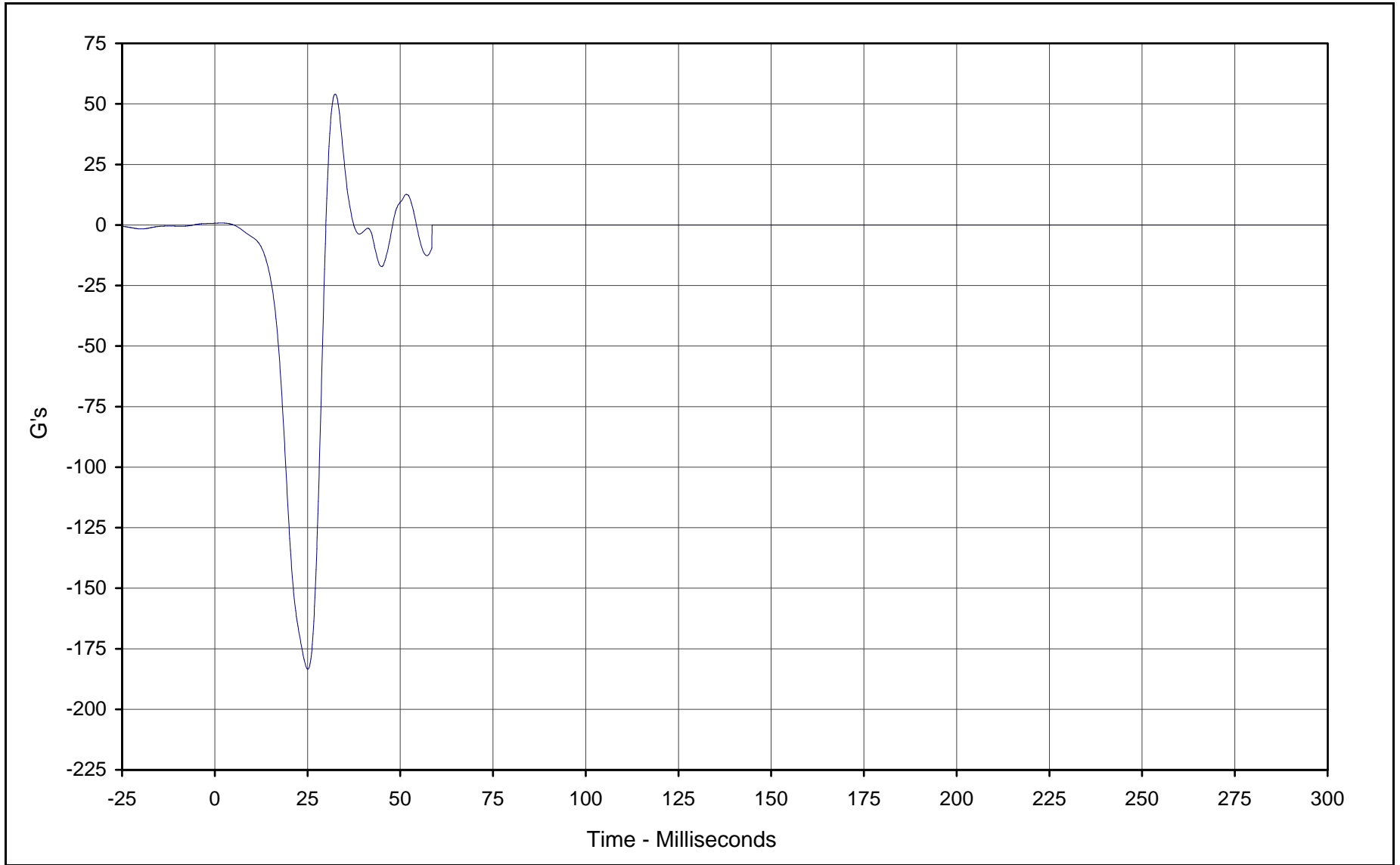
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-132



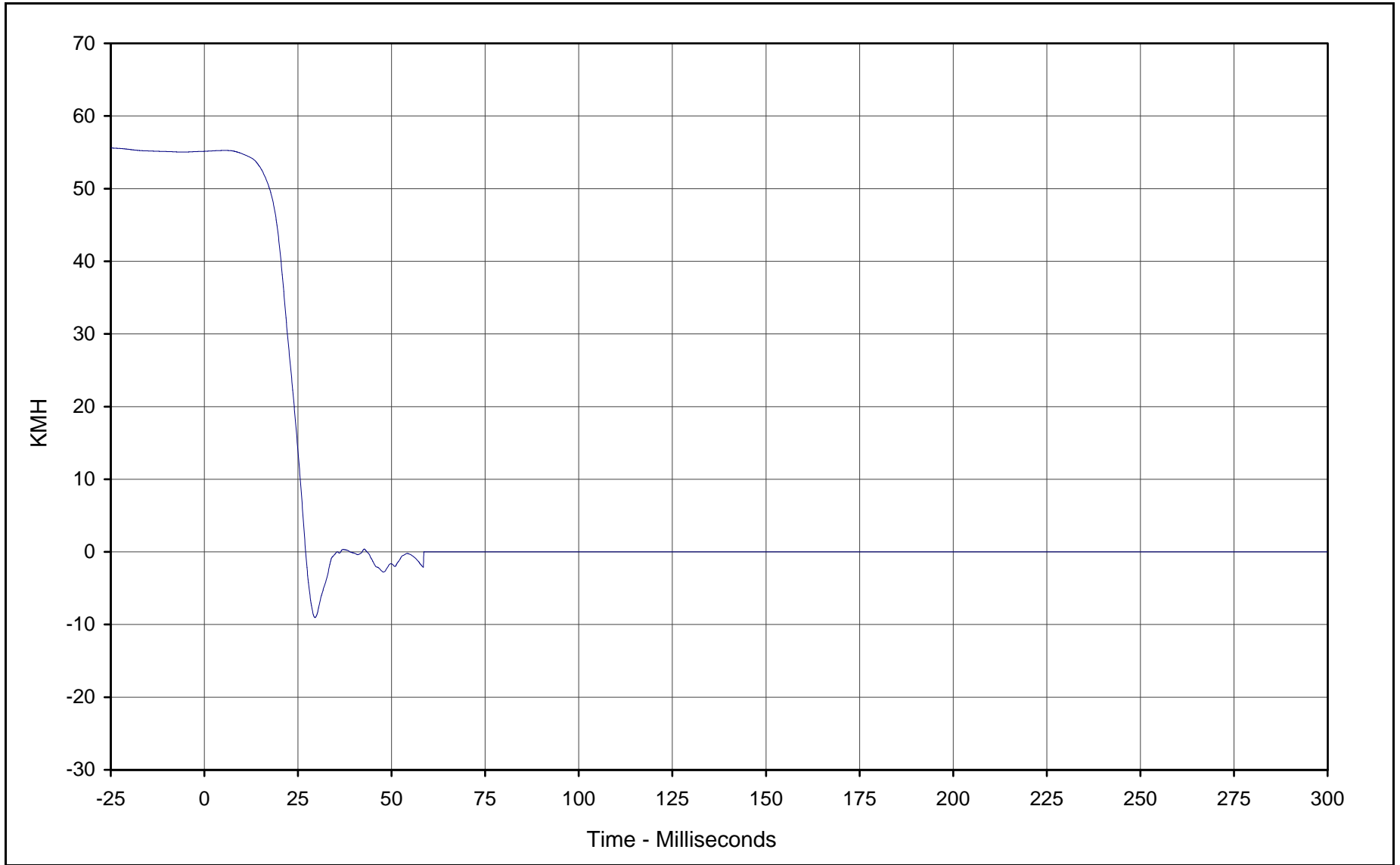
Curve Description: Vehicle Engine Bottom \*  
Maximum Value: 54.0 at 32.5 Milliseconds  
Minimum Value: -183.5 at 25.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-092

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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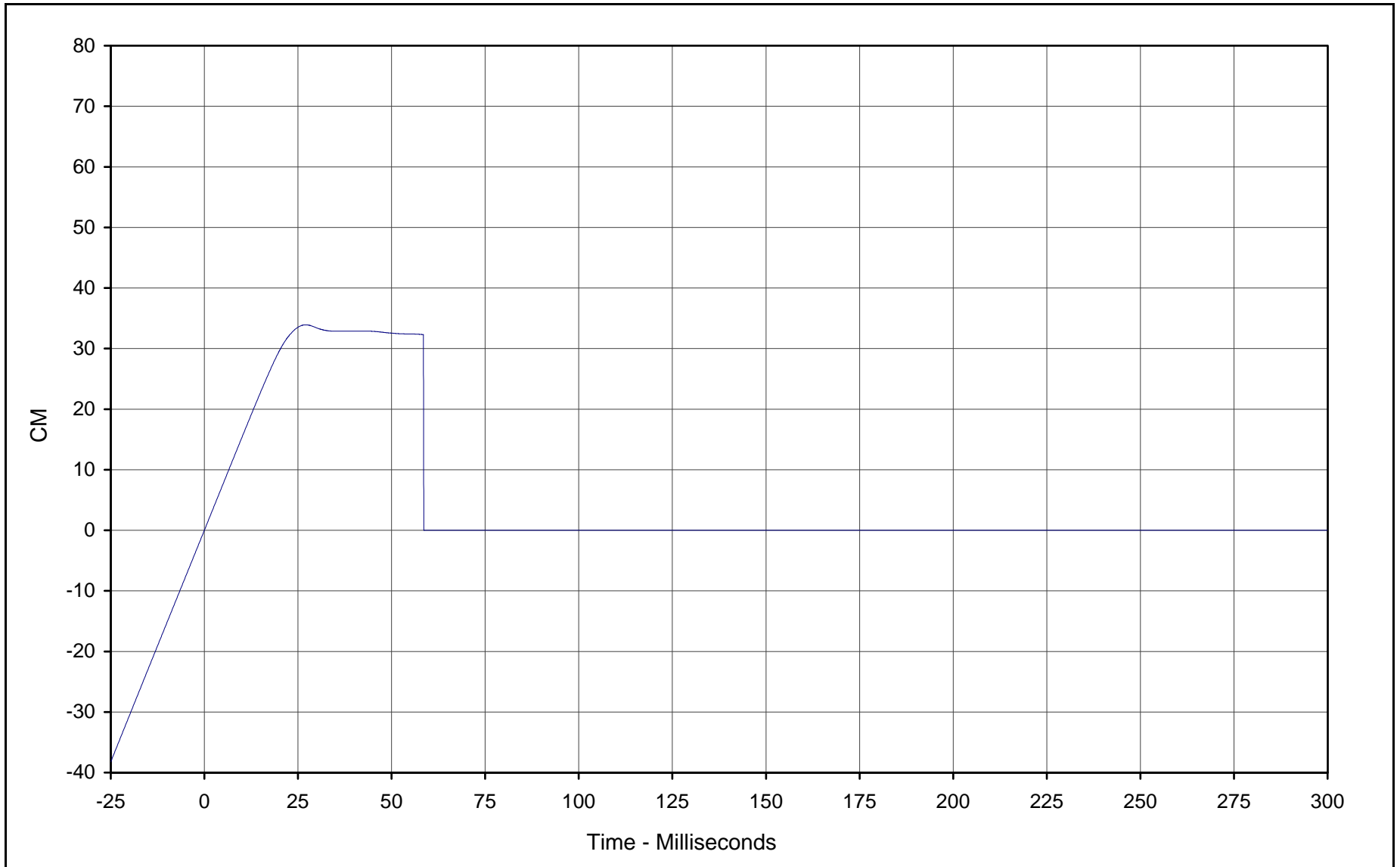
Curve Description: Vehicle Engine Bottom Velocity \*  
 Maximum Value: 55.3 at 5.6 Milliseconds  
 Minimum Value: -9.0 at 29.6 Milliseconds  
 SAE Filter Class: 180  
 Date of Test: 1/13/00  
 Curve Number: IN1-092

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



B-134



Curve Description: Vehicle Engine Bottom Displ. \*  
Maximum Value: 33.9 at 27.1 Milliseconds  
Minimum Value: 0.0 at 58.6 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-092

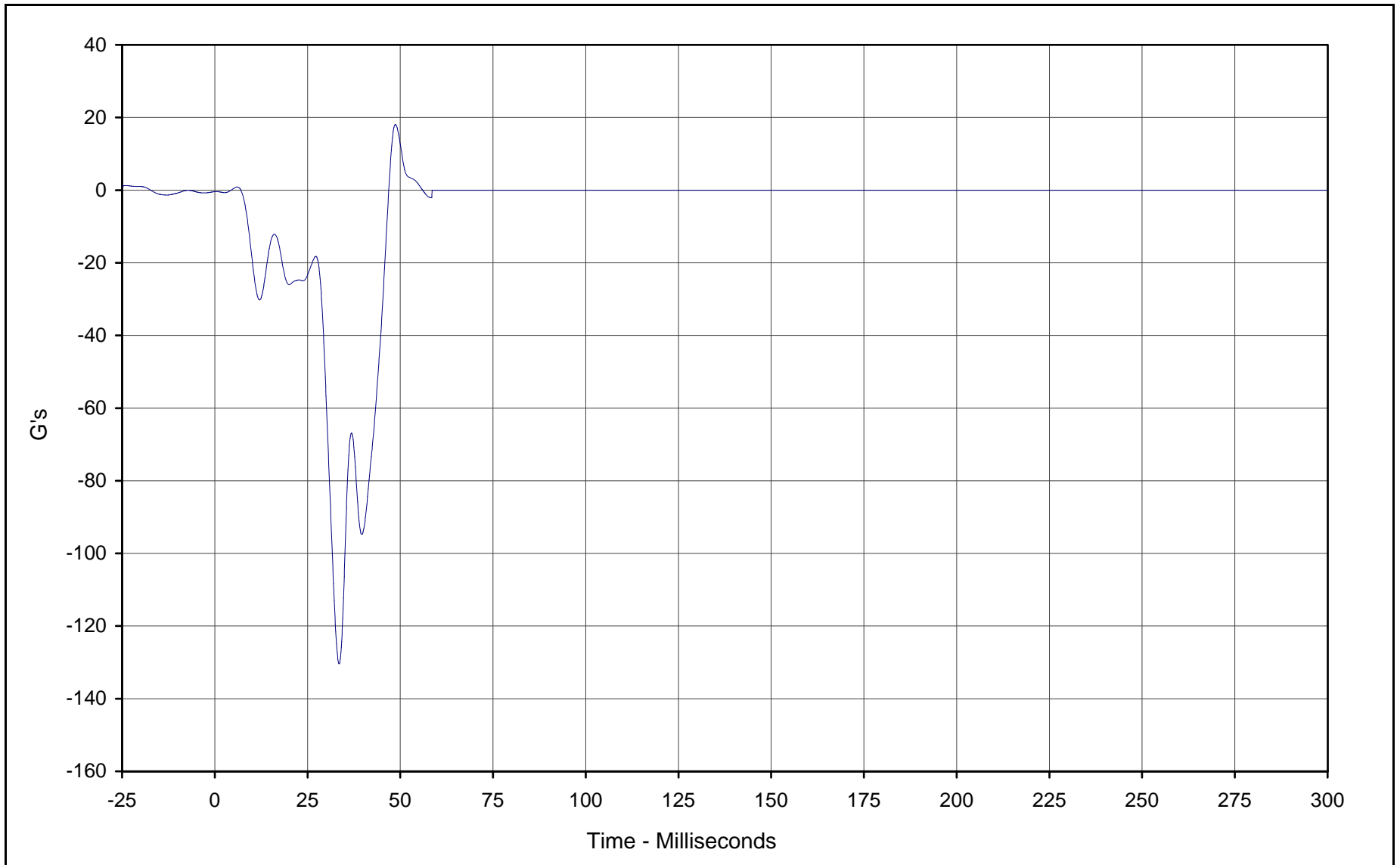
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-135



Curve Description: Vehicle Left Brake Caliper \*  
Maximum Value: 18.1 at 48.7 Milliseconds  
Minimum Value: -130.4 at 33.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-093

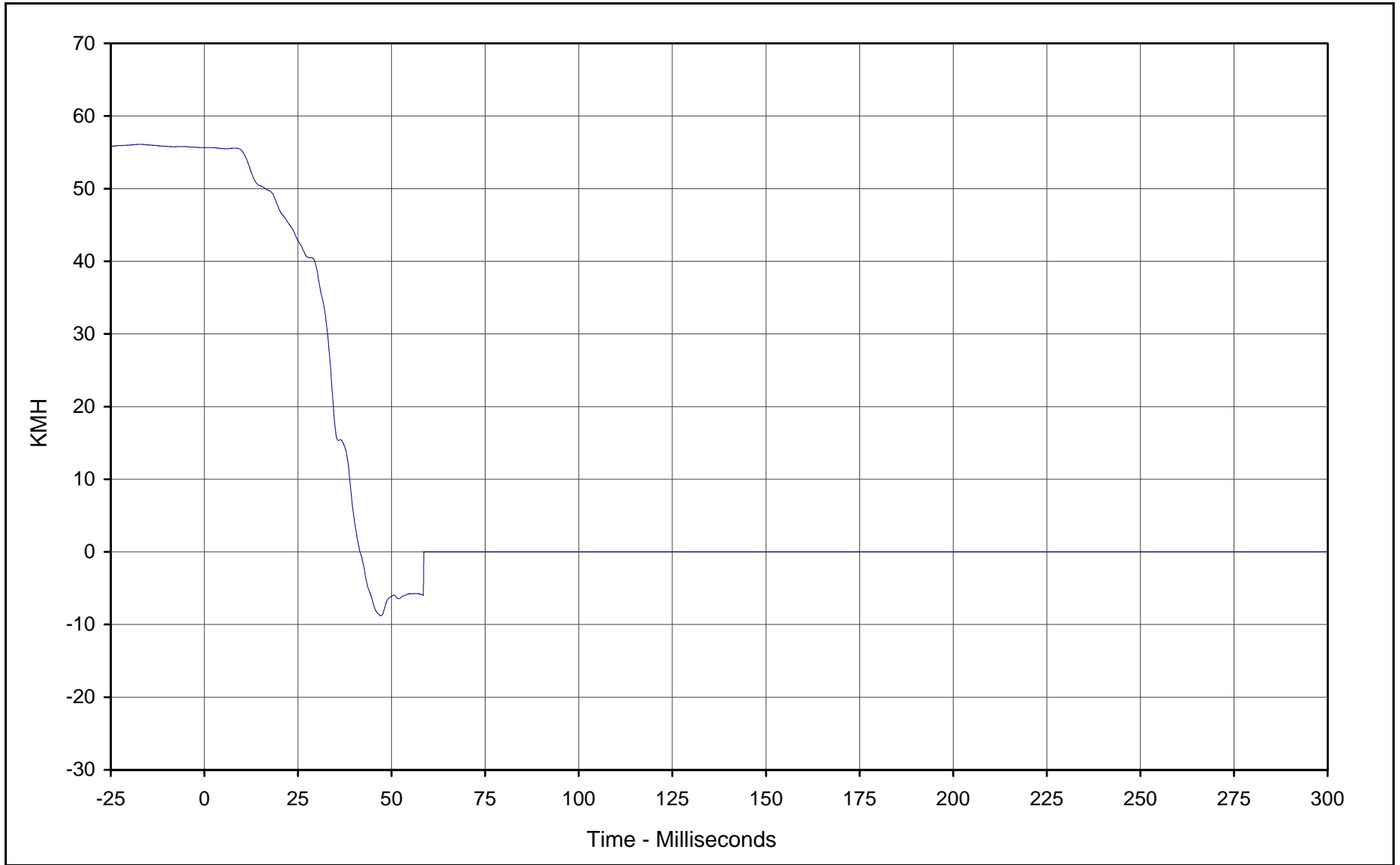
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



KARR20001-08

B-136



Curve Description: Vehicle Left Brake Caliper Velocity \*

Maximum Value: 55.7 at 1.5 Milliseconds

Minimum Value: -8.8 at 47.1 Milliseconds

SAE Filter Class: 180

Date of Test: 1/13/00

Curve Number: IN1-093

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

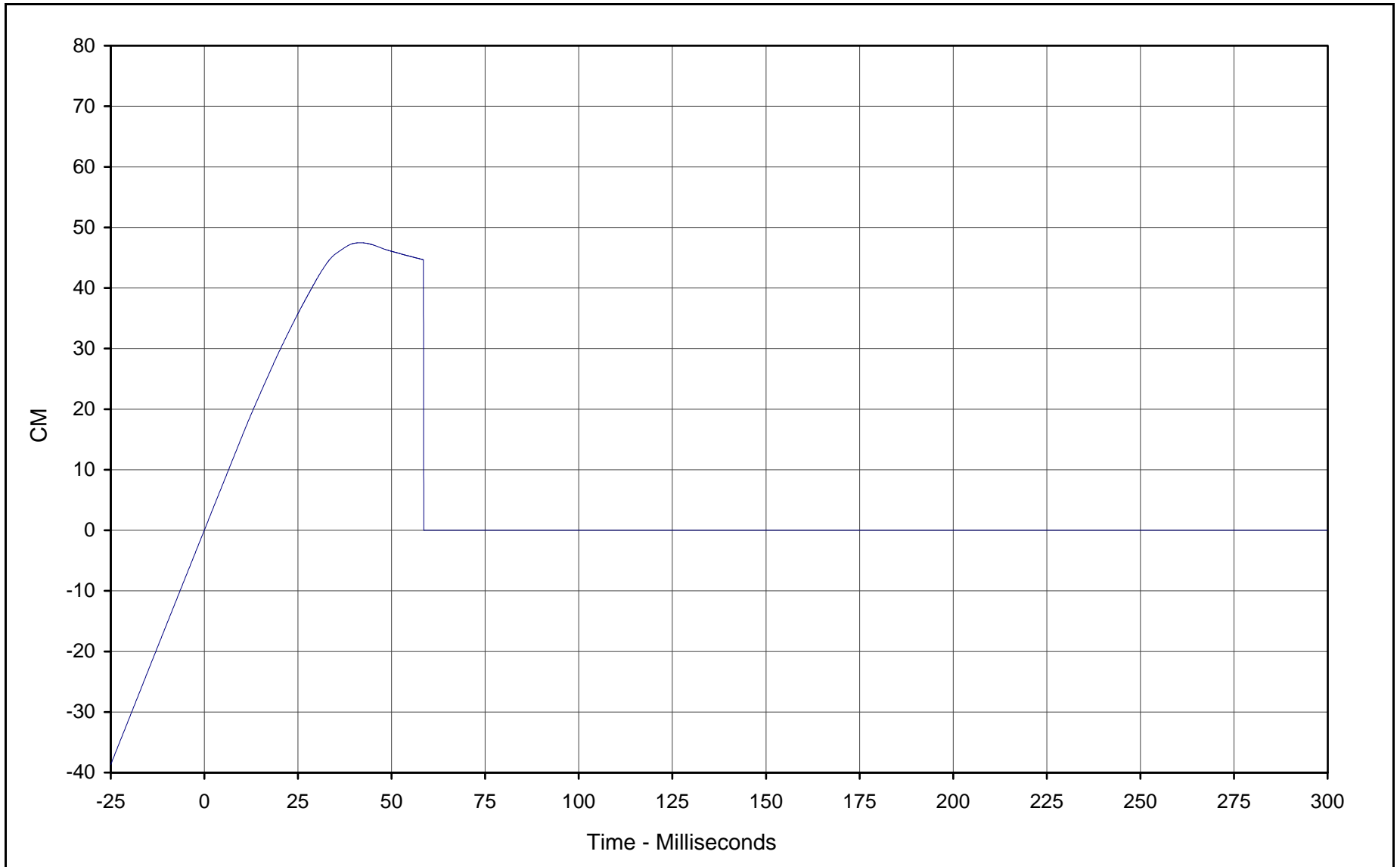
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-137



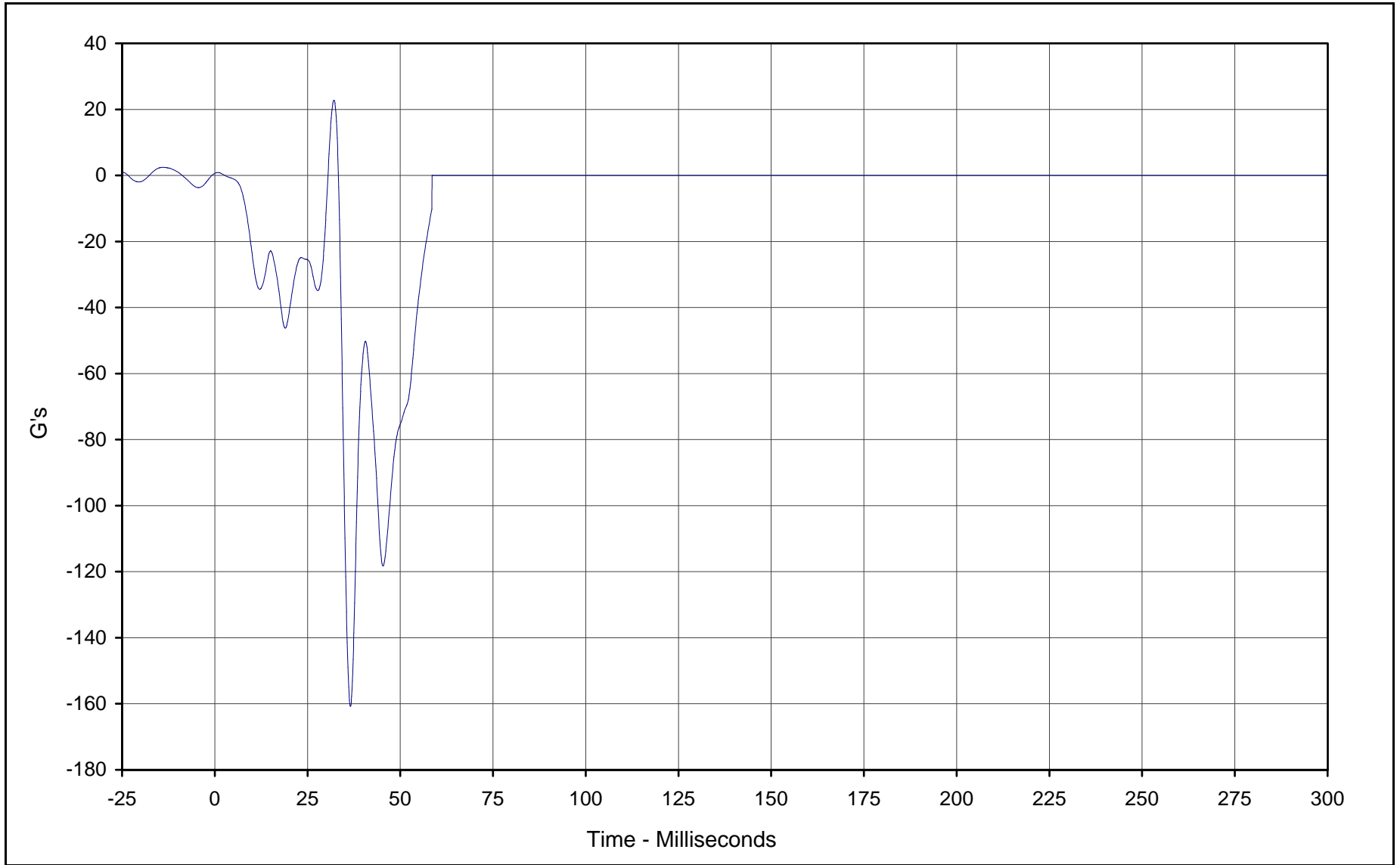
Curve Description: Vehicle Left Brake Caliper Displ. \*  
Maximum Value: 47.5 at 41.6 Milliseconds  
Minimum Value: 0.0 at 58.6 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-093

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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Curve Description: Vehicle Right Brake Caliper \*

Maximum Value: 22.8 at 32.1 Milliseconds

Minimum Value: -160.8 at 36.6 Milliseconds

SAE Filter Class: 60

Date of Test: 1/13/00

Curve Number: FIL-094

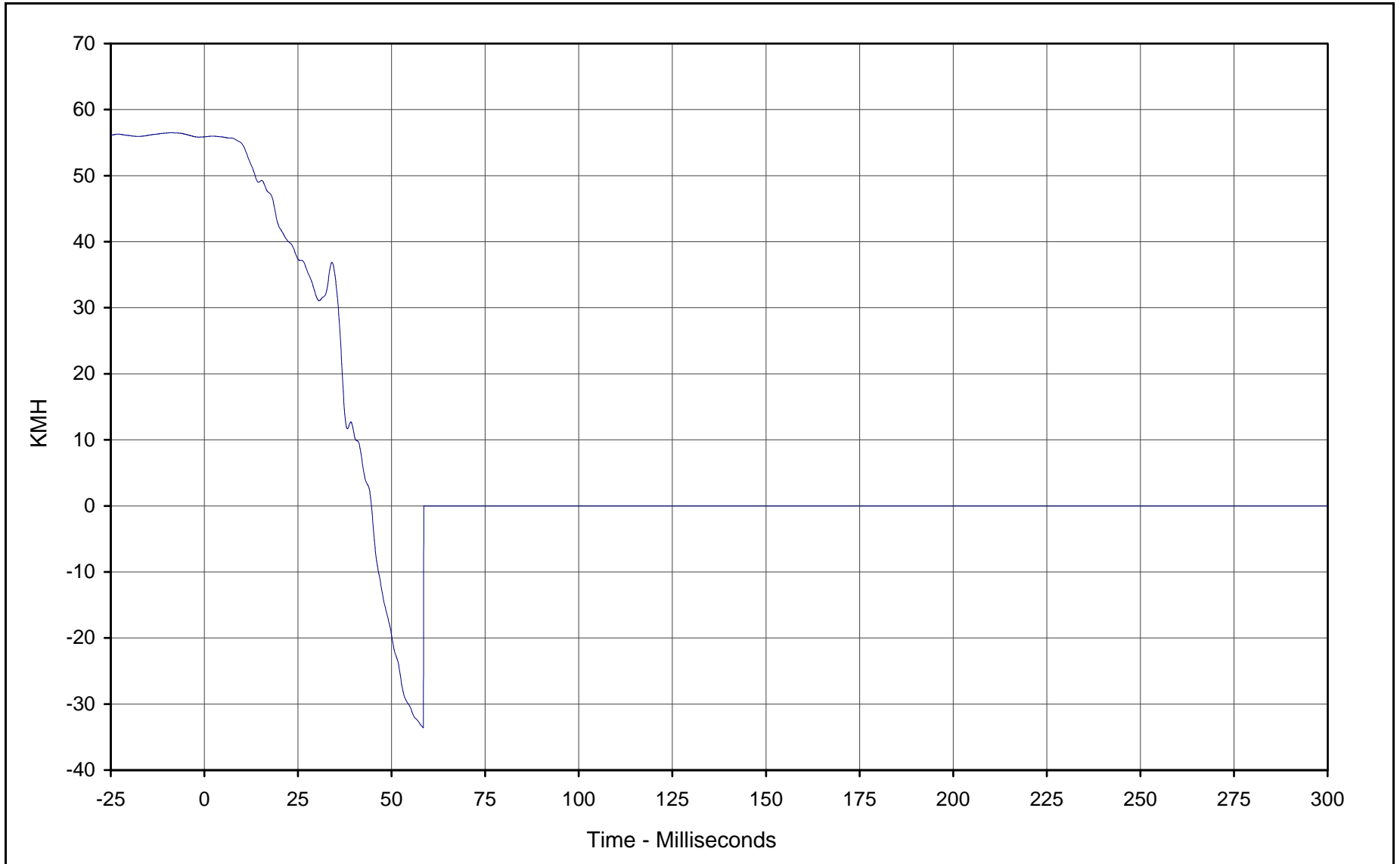
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



B-139



Curve Description: Vehicle Right Brake Caliper Velocity \*

Maximum Value: 56.0 at 2.1 Milliseconds

Minimum Value: -33.6 at 58.5 Milliseconds

SAE Filter Class: 180

Date of Test: 1/13/00

Curve Number: IN1-094

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

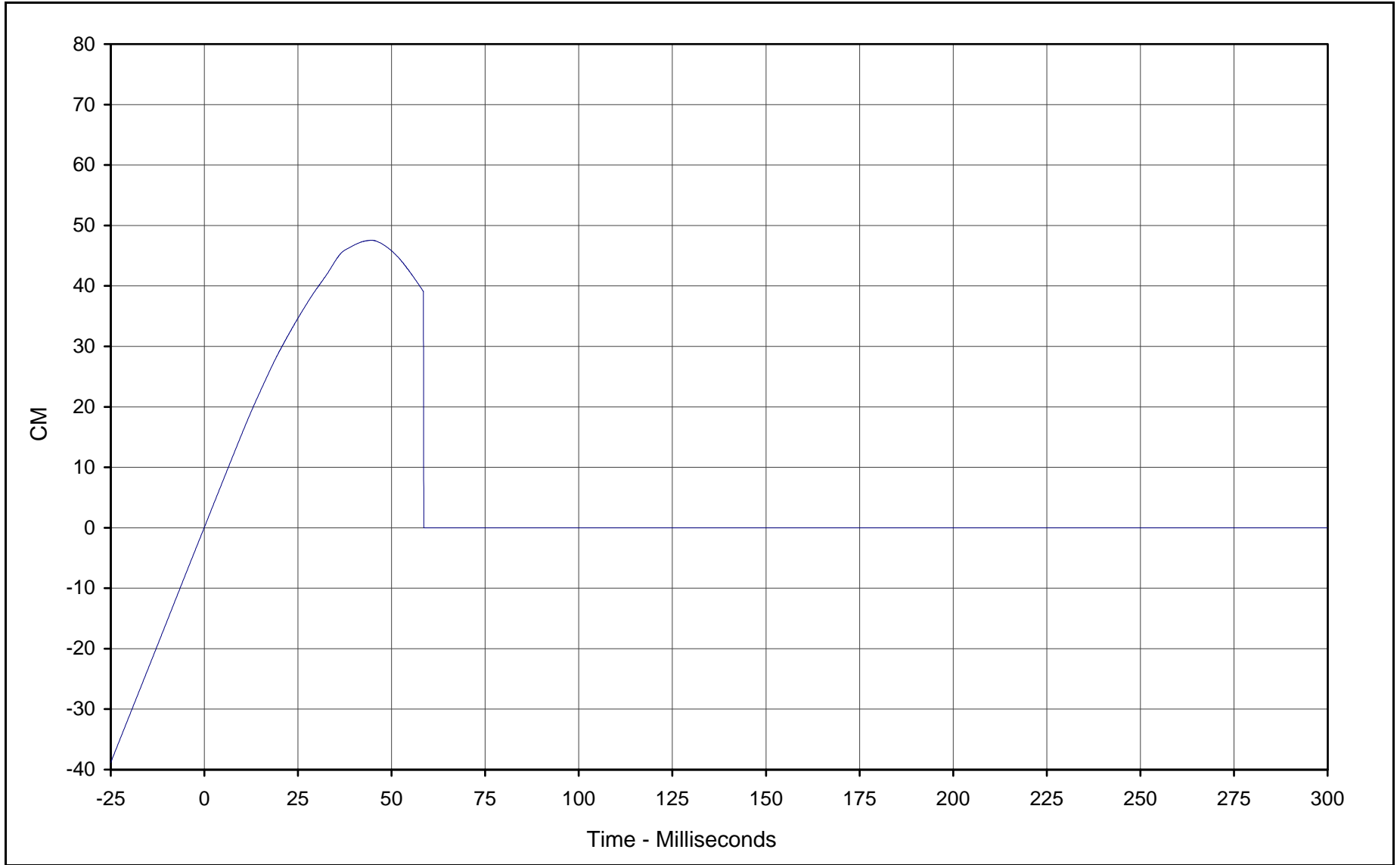
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-140



Curve Description: Vehicle Right Brake Caliper Displ. \*  
Maximum Value: 47.6 at 44.6 Milliseconds  
Minimum Value: 0.0 at 58.6 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-094

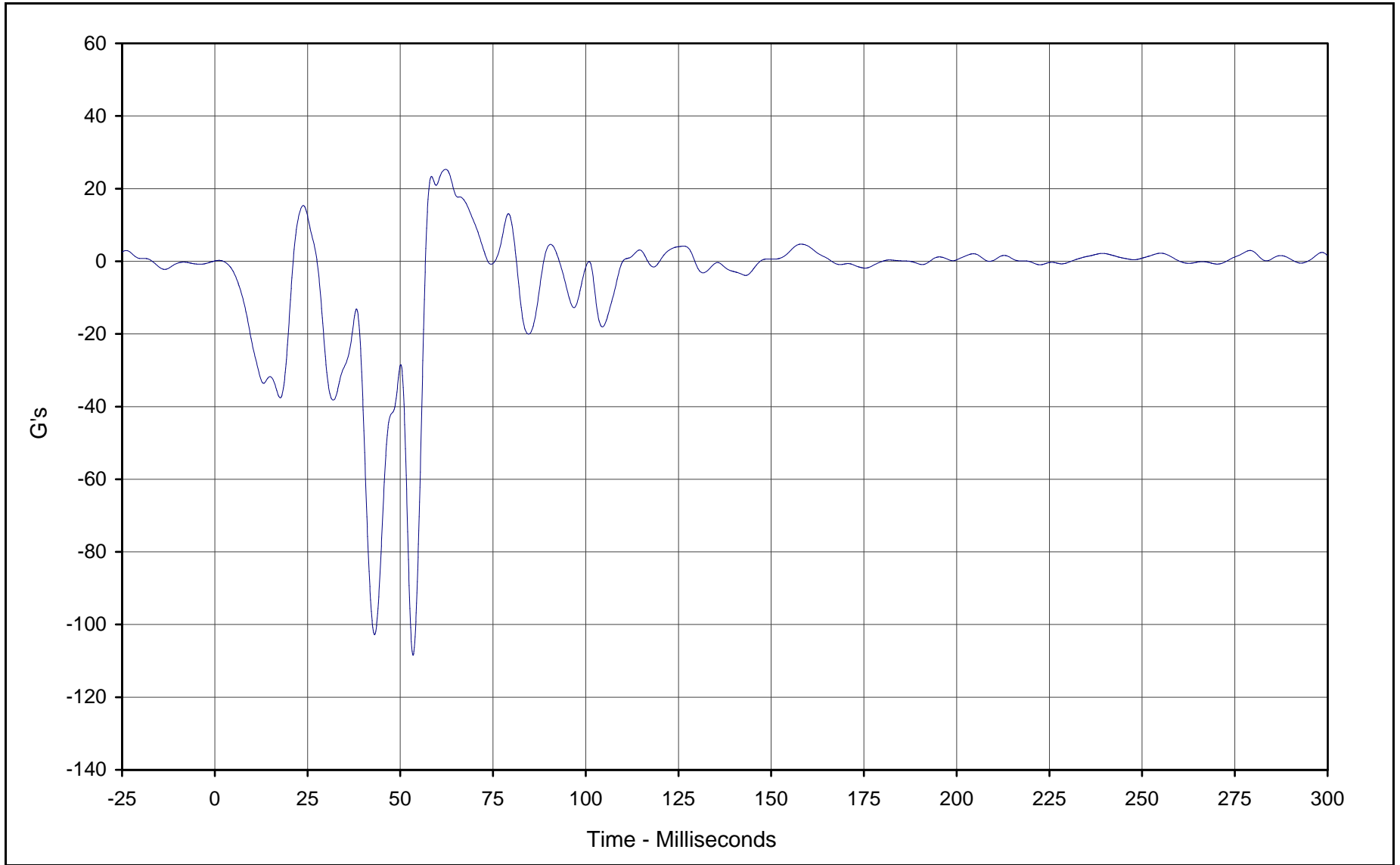
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel Failed at 58.6 Msec.



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B-141



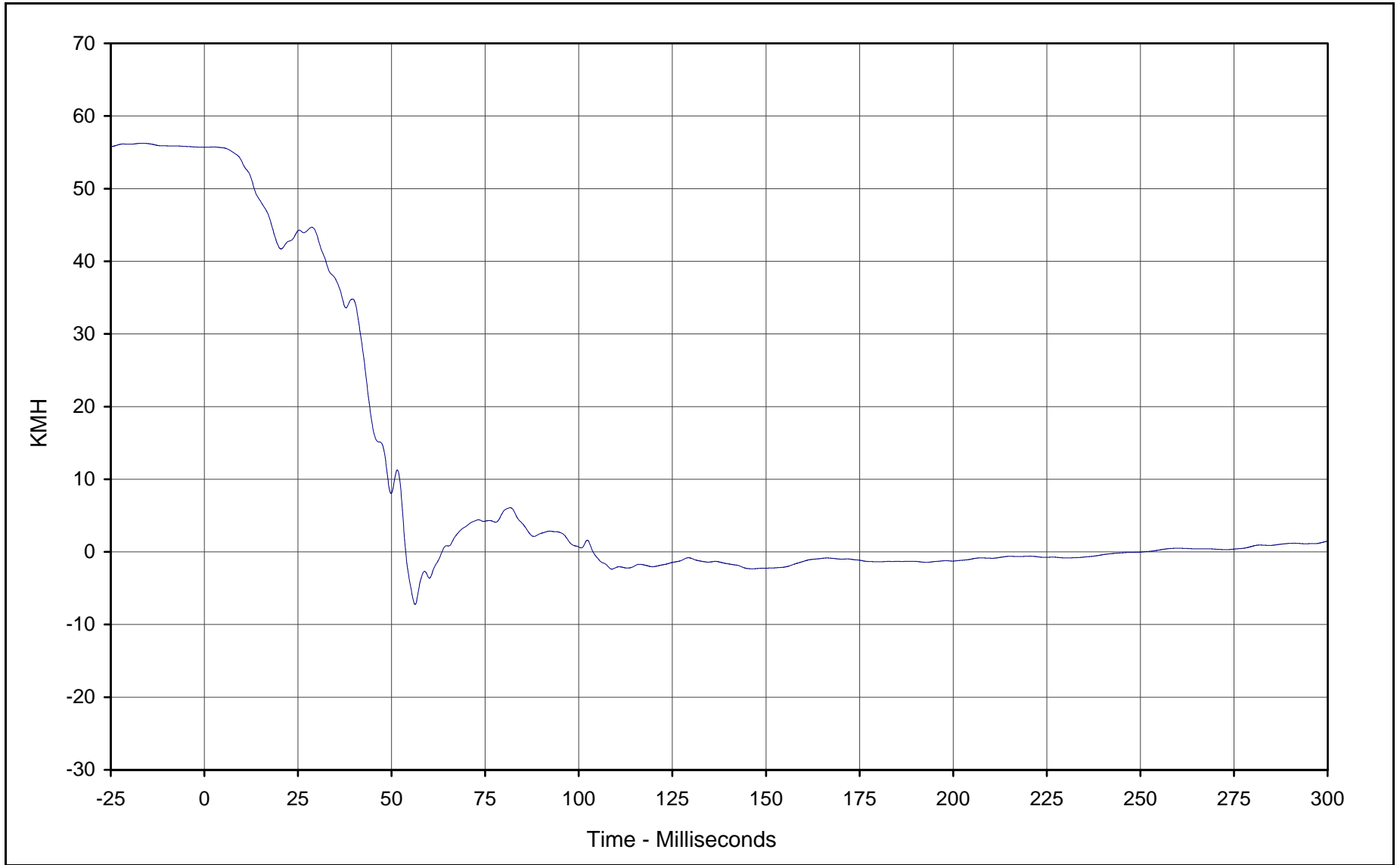
Curve Description: Vehicle Instrument Panel  
Maximum Value: 25.3 at 62.3 Milliseconds  
Minimum Value: -108.4 at 53.4 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-095

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-142



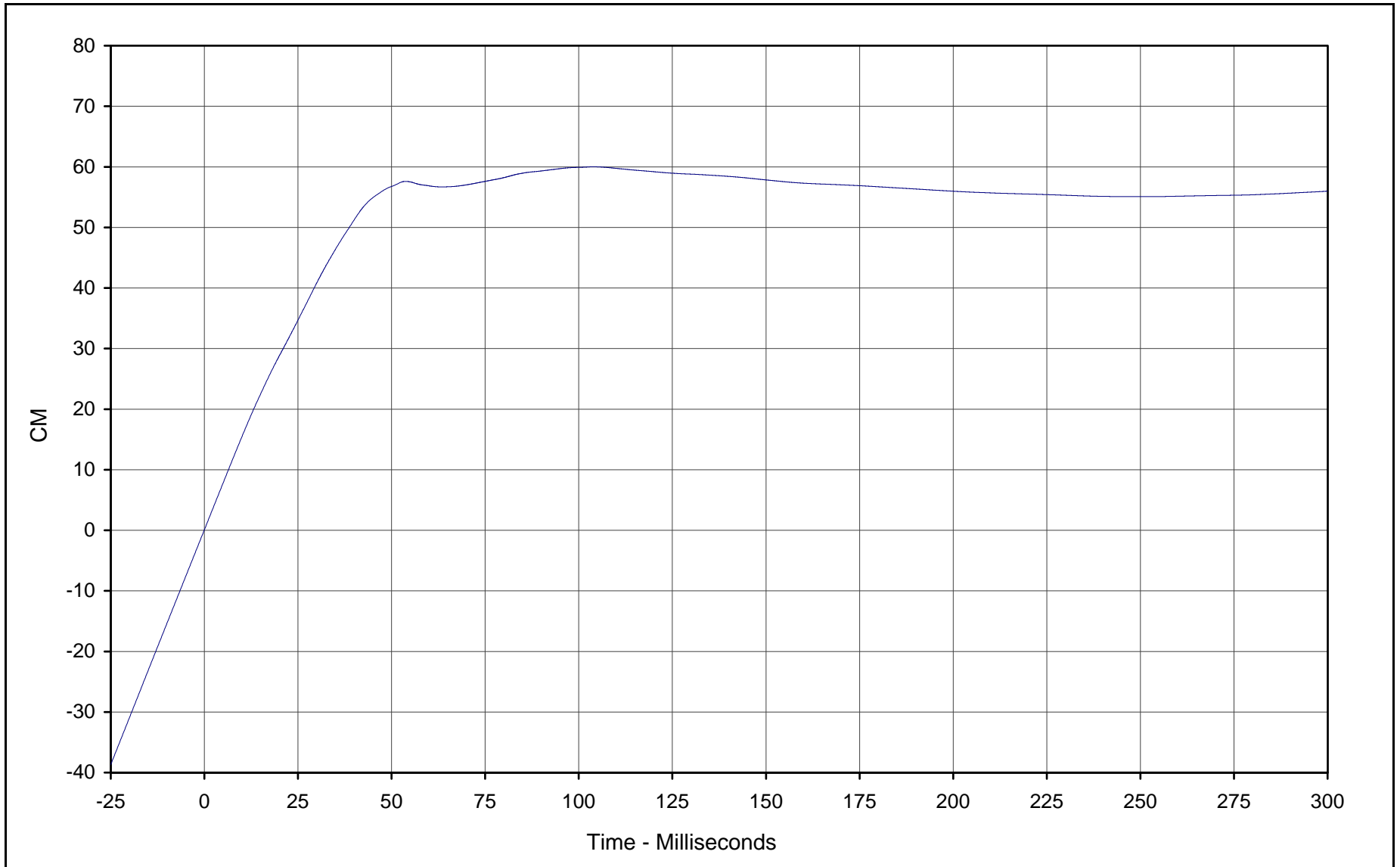
Curve Description: Vehicle Instrument Panel Velocity  
Maximum Value: 55.7 at 2.5 Milliseconds  
Minimum Value: -7.2 at 56.3 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-095

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-143



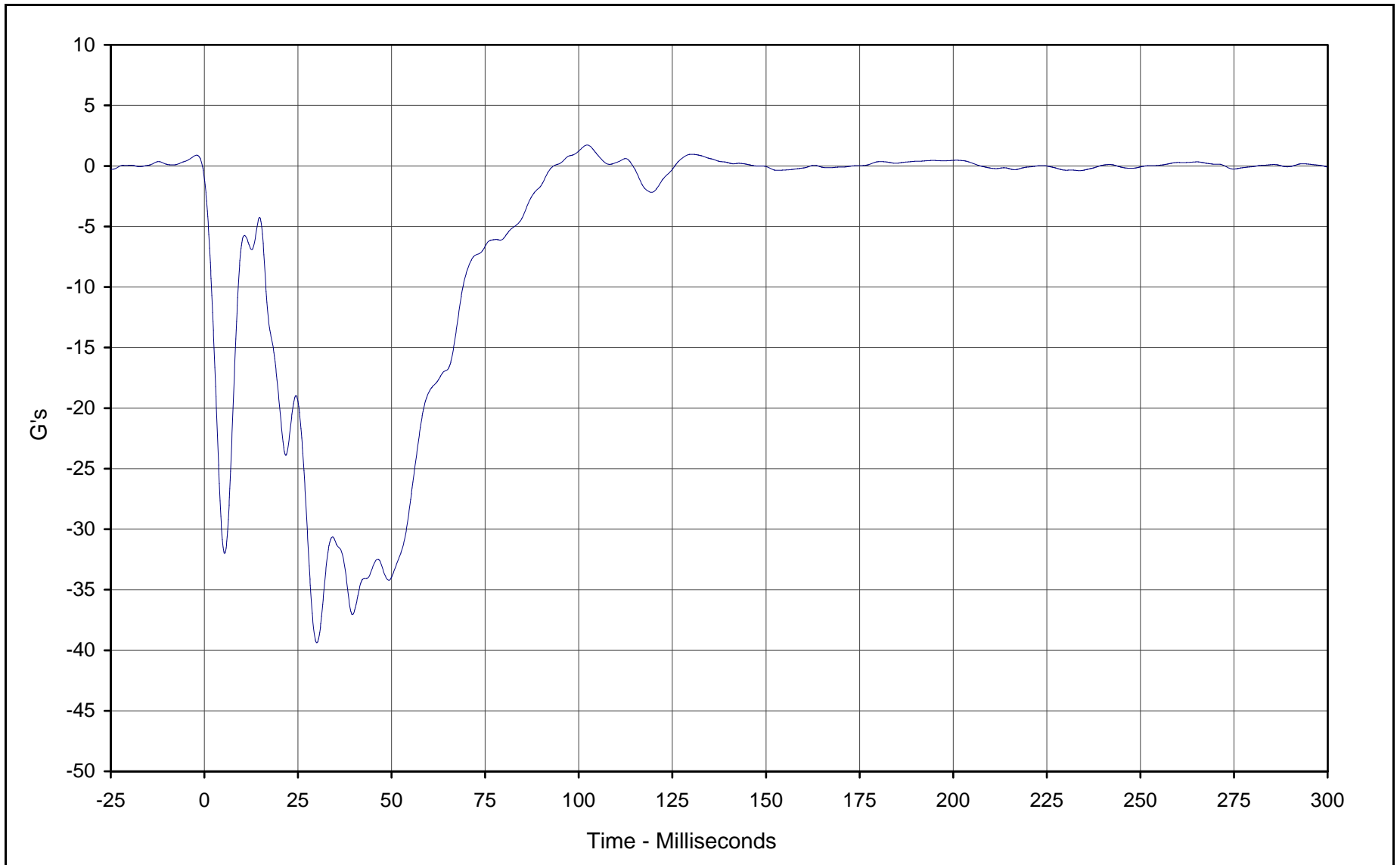
Curve Description: Vehicle Instrument Panel Displ.  
Maximum Value: 60.0 at 103.8 Milliseconds  
Minimum Value: 0.1 at 0.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-095

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-144



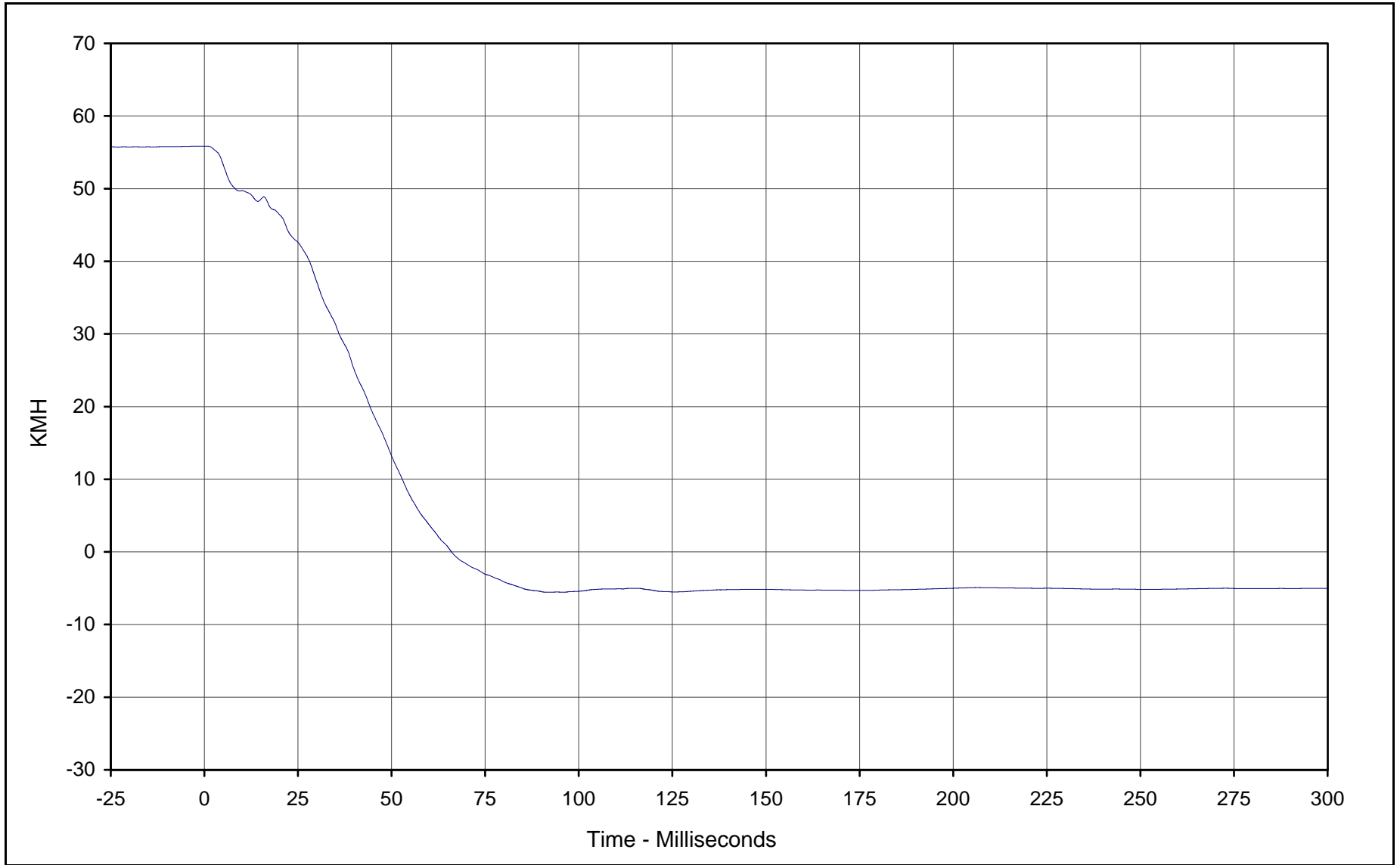
Curve Description: Vehicle Left Rear Redundant  
Maximum Value: 1.7 at 102.2 Milliseconds  
Minimum Value: -39.4 at 30.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-096

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-145



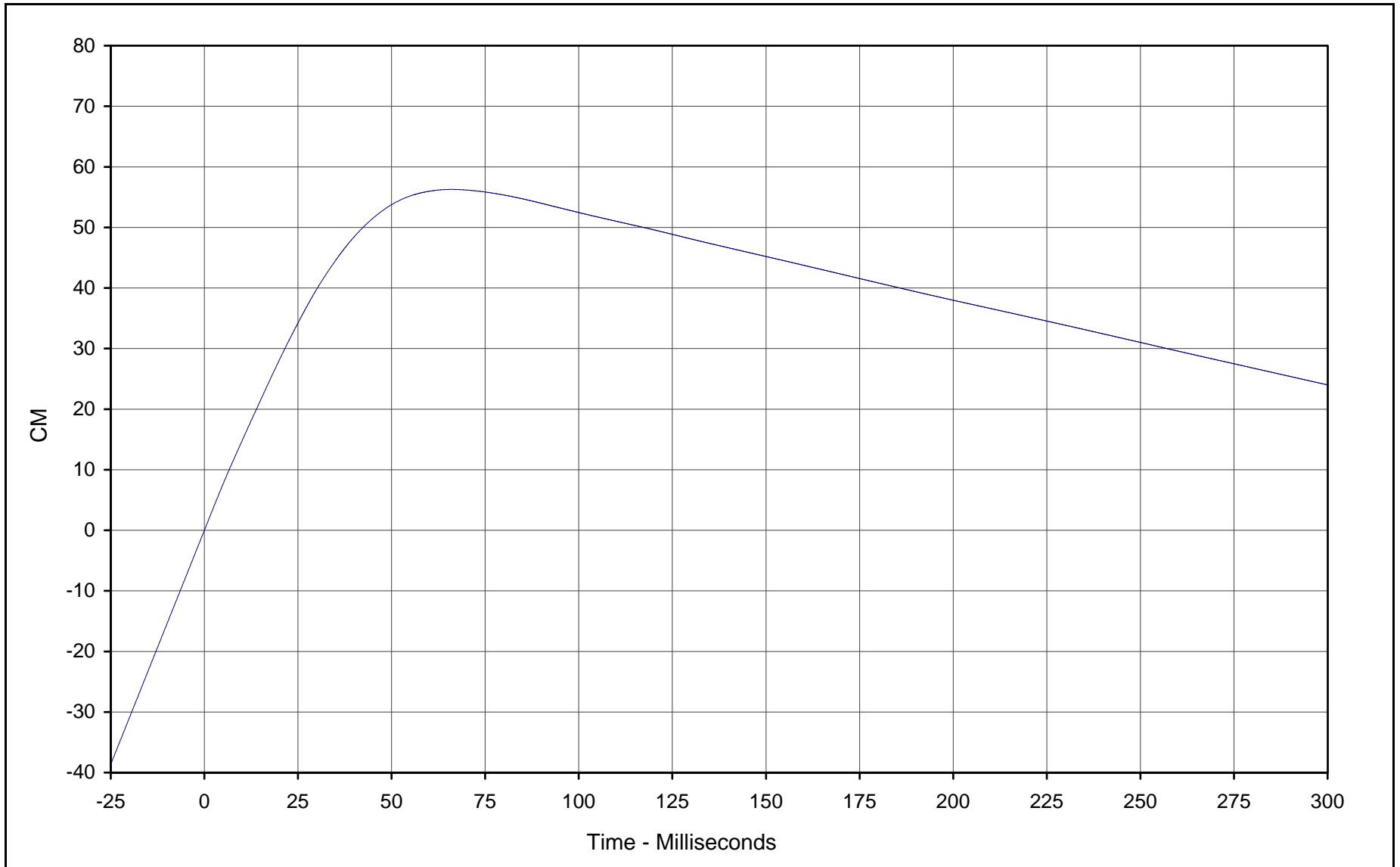
Curve Description: Vehicle Left Rear Redundant Velocity  
Maximum Value: 55.8 at 0.7 Milliseconds  
Minimum Value: -5.6 at 96.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN1-096

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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B-146



Curve Description: Vehicle Left Rear Redundant Displ.  
Maximum Value: 56.3 at 66.0 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 180  
Date of Test: 1/13/00  
Curve Number: IN2-096

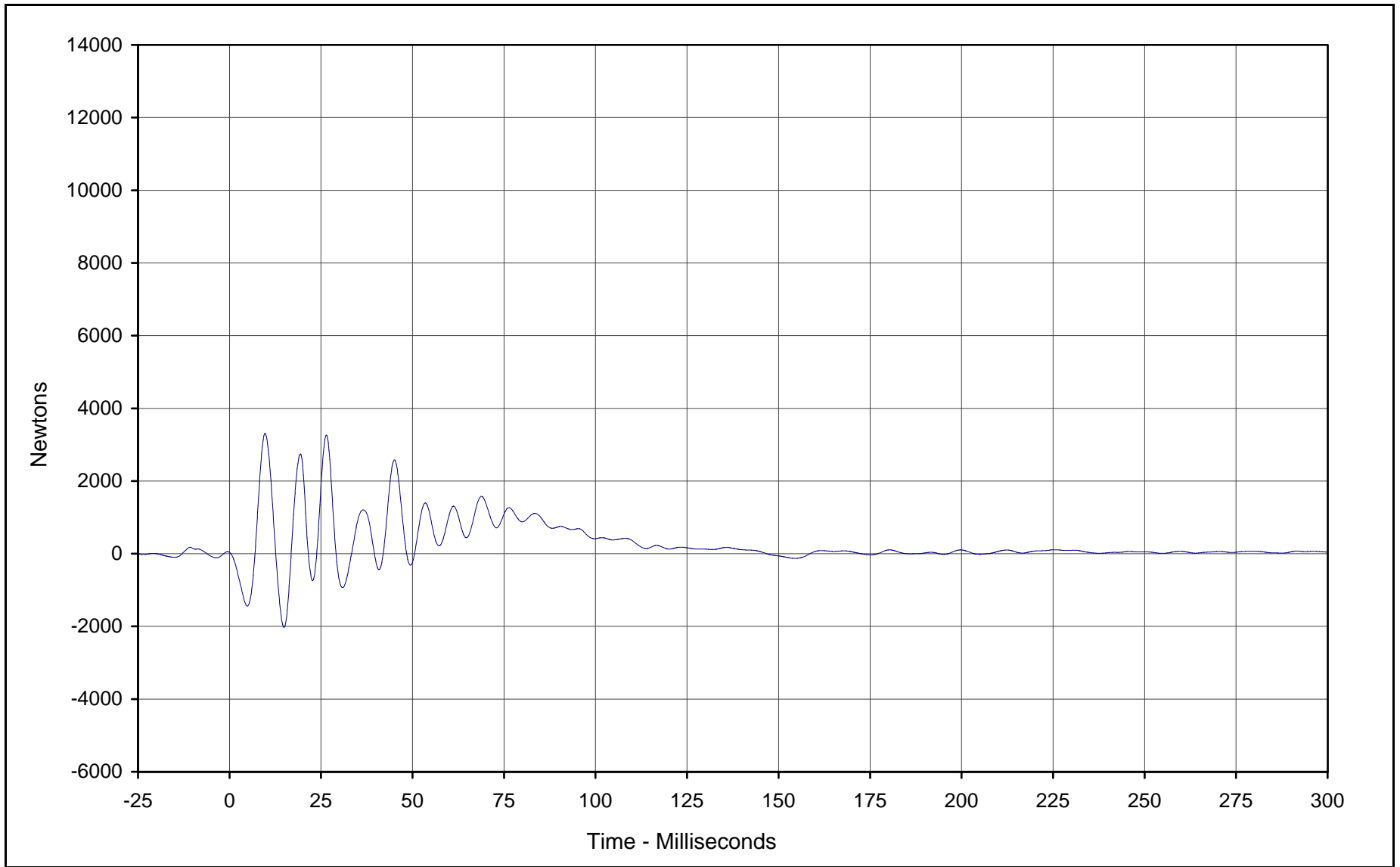
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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**APPENDIX C**  
**LOAD CELL BARRIER INFORMATION**

C-1



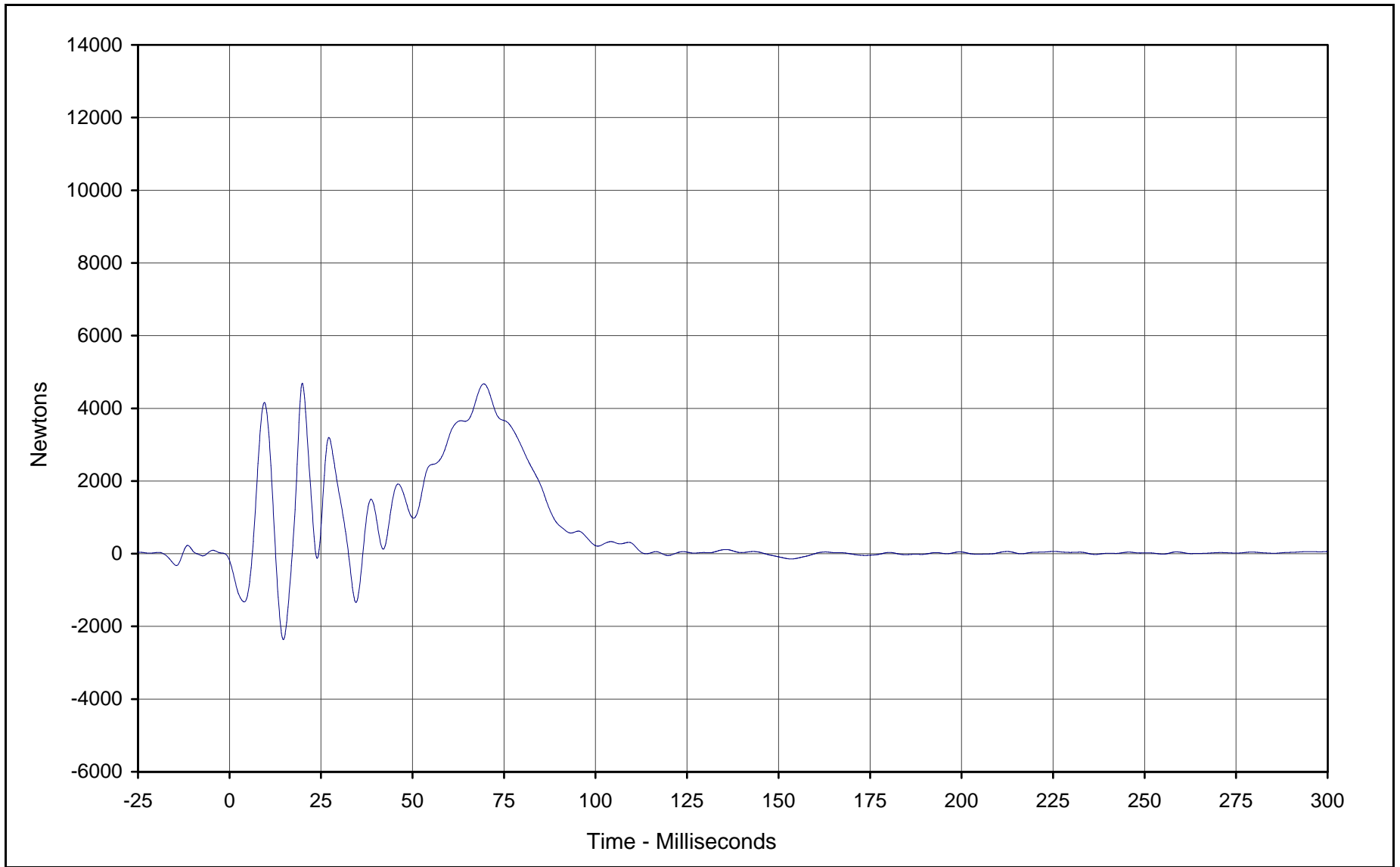
Curve Description: Barrier Force A2  
Maximum Value: 3309.7 at 9.7 Milliseconds  
Minimum Value: -2027.4 at 14.9 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-099

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-2

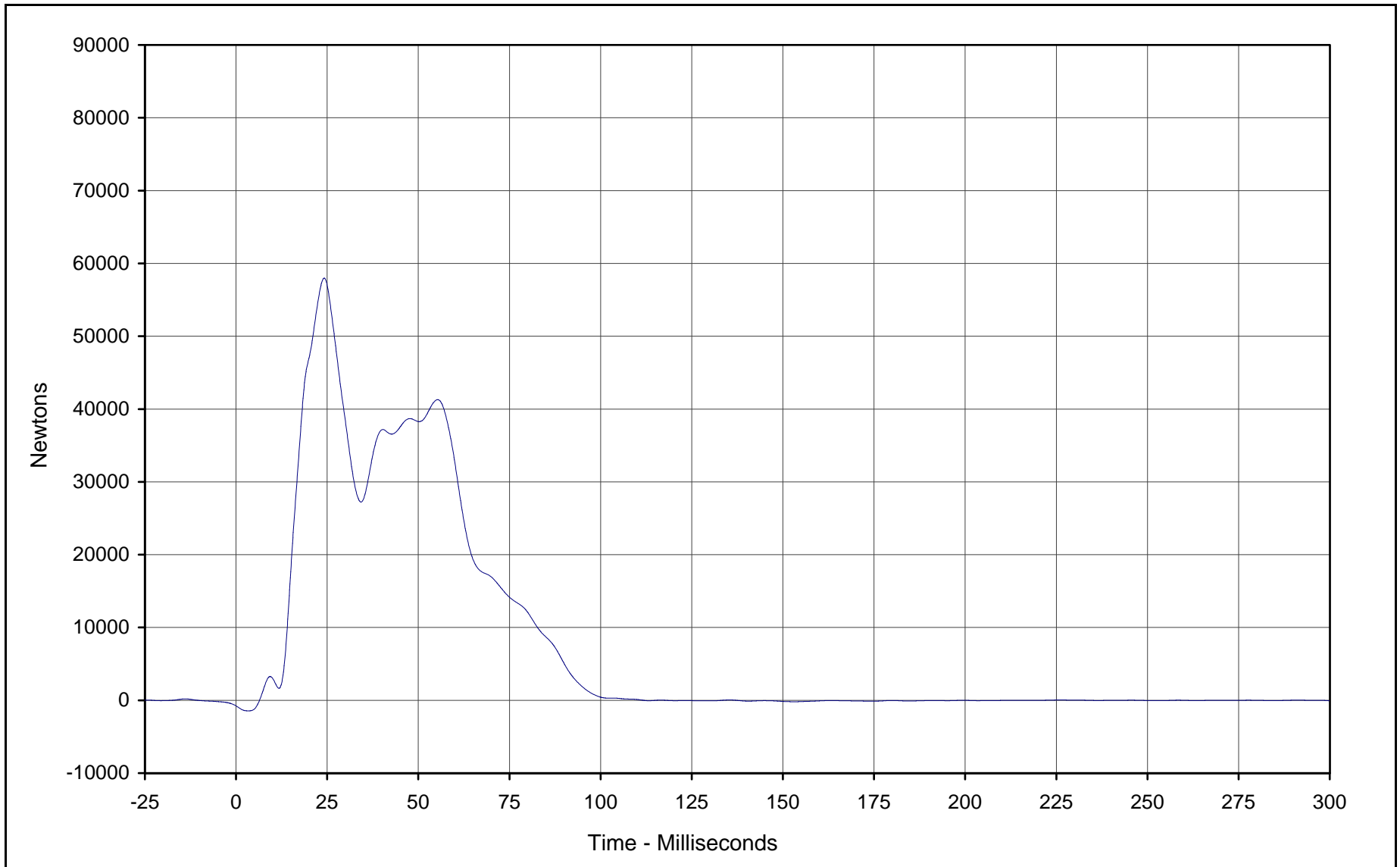


Curve Description: Barrier Force A3  
Maximum Value: 4690.6 at 19.9 Milliseconds  
Minimum Value: -2365.2 at 14.7 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-100

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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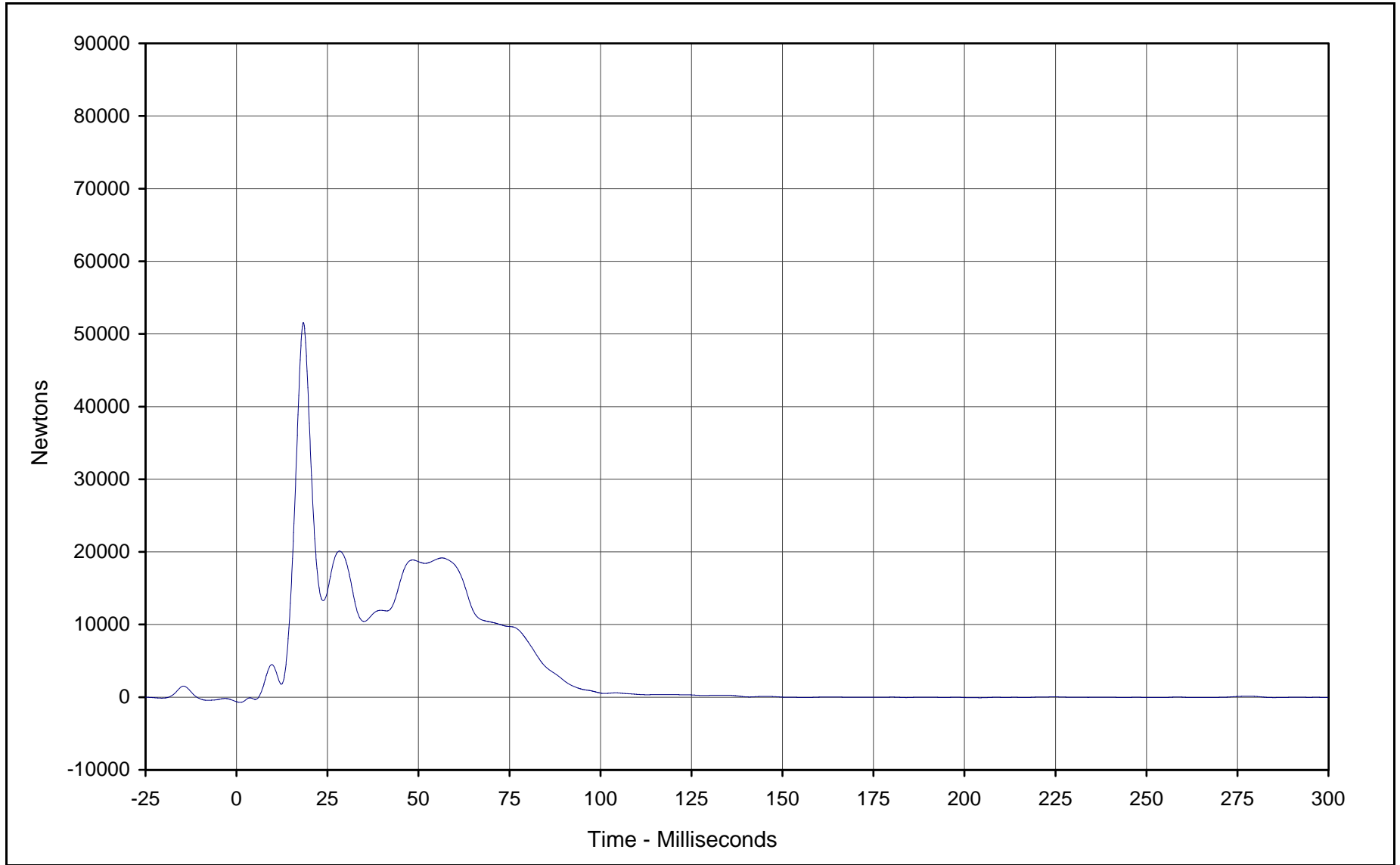


Curve Description: Barrier Force A4  
Maximum Value: 57983.4 at 24.2 Milliseconds  
Minimum Value: -1446.9 at 3.4 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-101

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



C-4



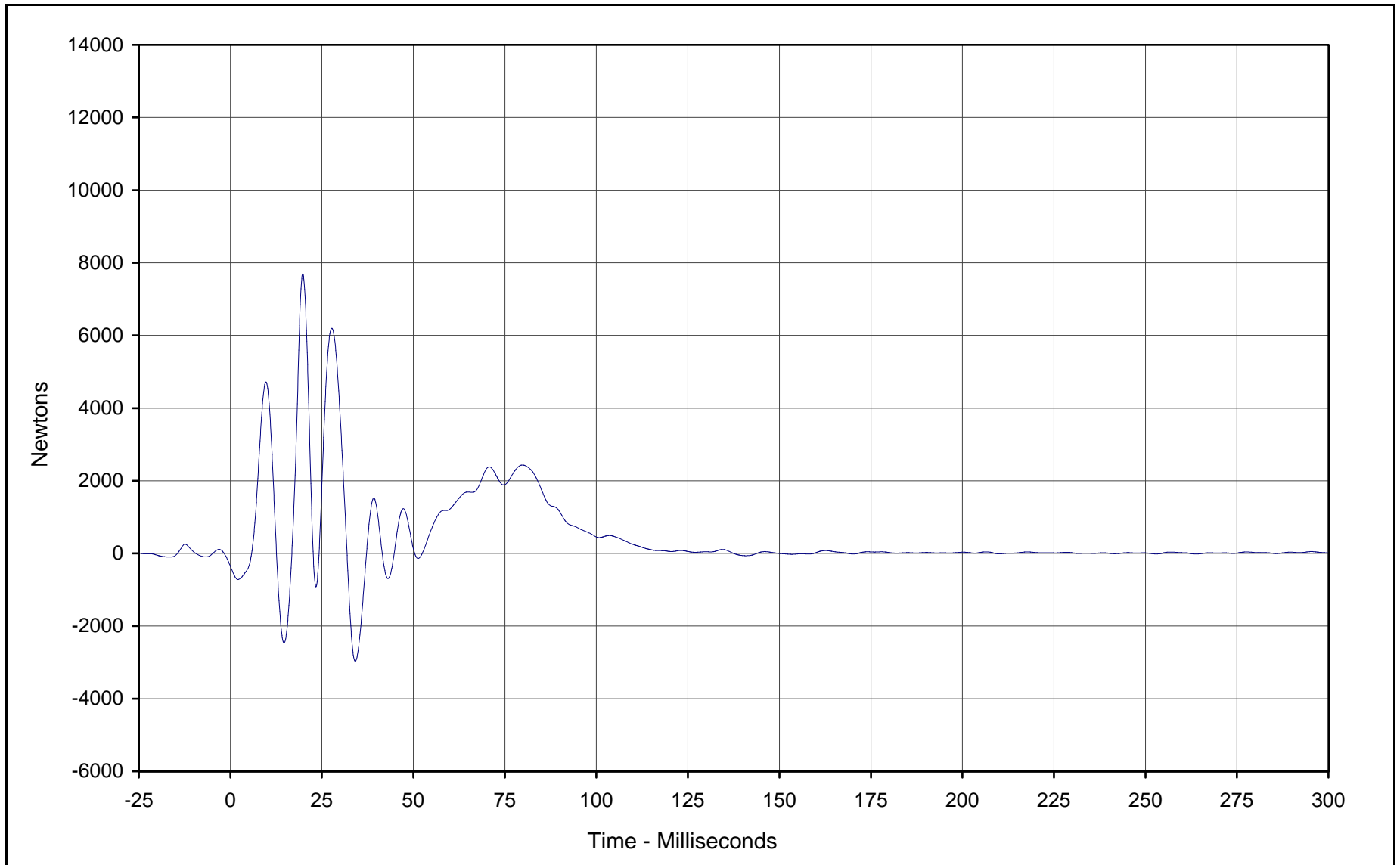
Curve Description: Barrier Force A5  
Maximum Value: 51554.6 at 18.4 Milliseconds  
Minimum Value: -713.8 at 1.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-102

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-5



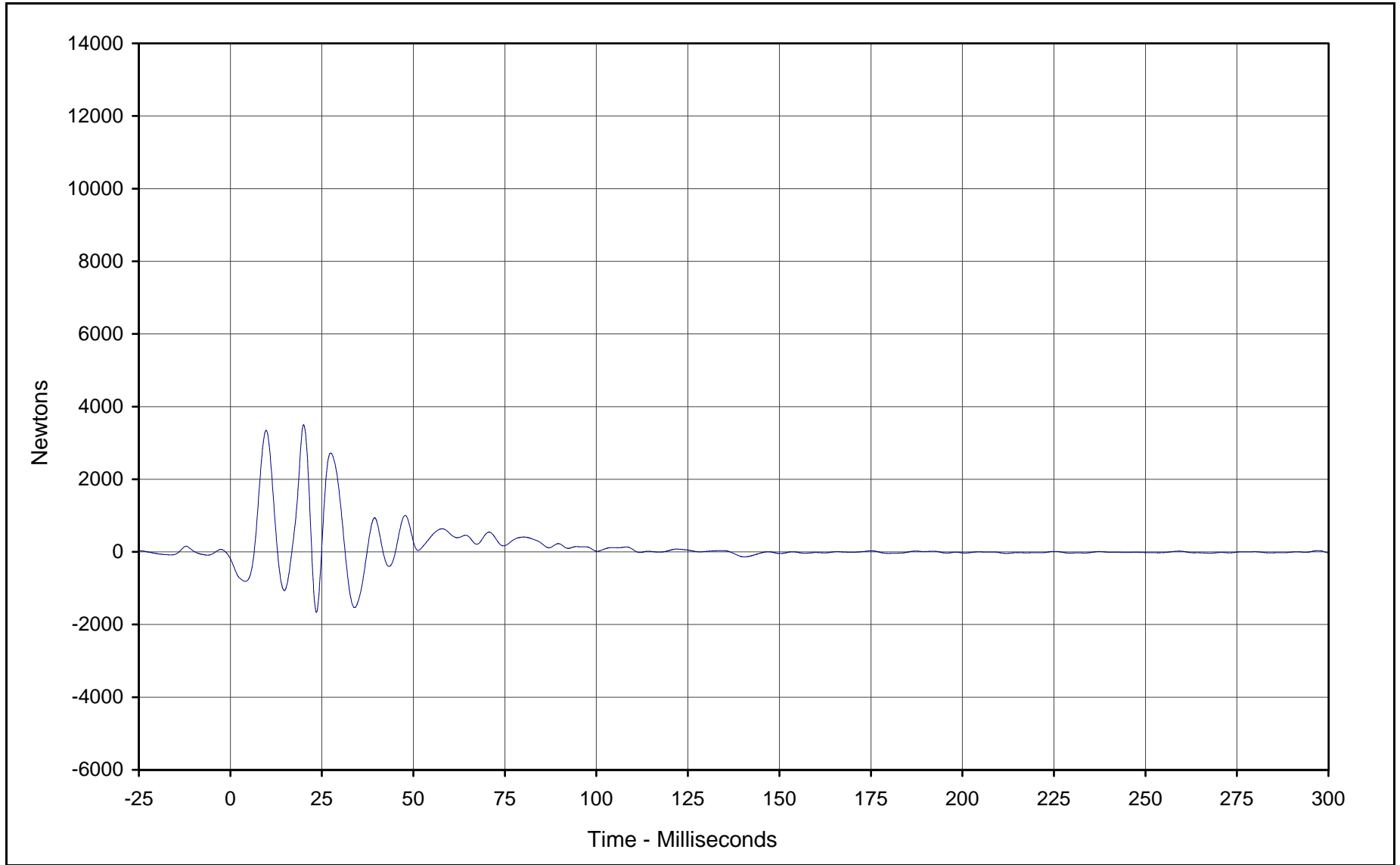
Curve Description: Barrier Force A6  
Maximum Value: 7696.6 at 19.8 Milliseconds  
Minimum Value: -2970.2 at 34.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-103

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-6



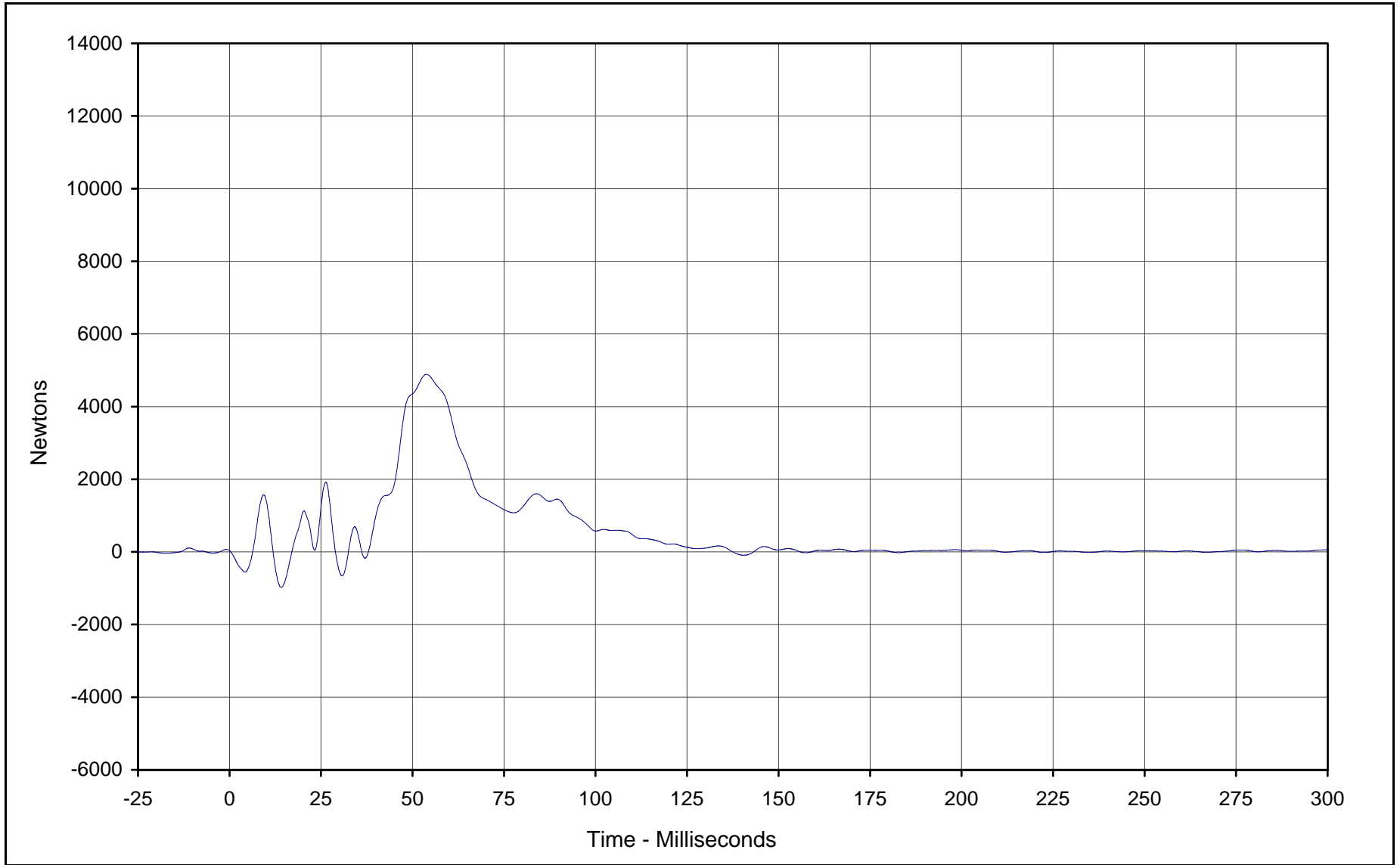
Curve Description: Barrier Force A7  
Maximum Value: 3503.1 at 20.0 Milliseconds  
Minimum Value: -1662.3 at 23.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-104

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-7



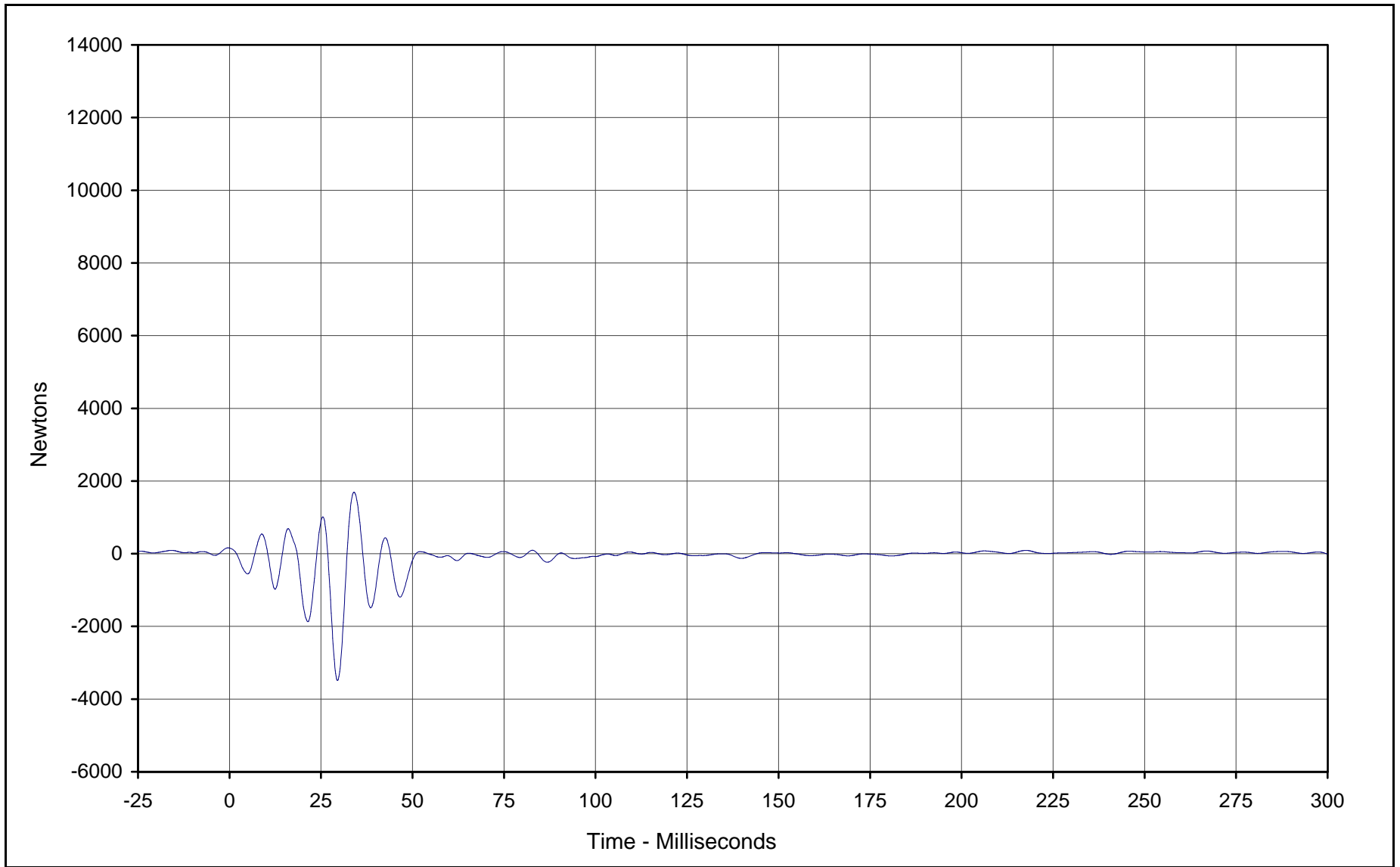
Curve Description: Barrier Force A8  
Maximum Value: 4887.4 at 53.8 Milliseconds  
Minimum Value: -975.4 at 14.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-105

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



KARR20001-08

C-8



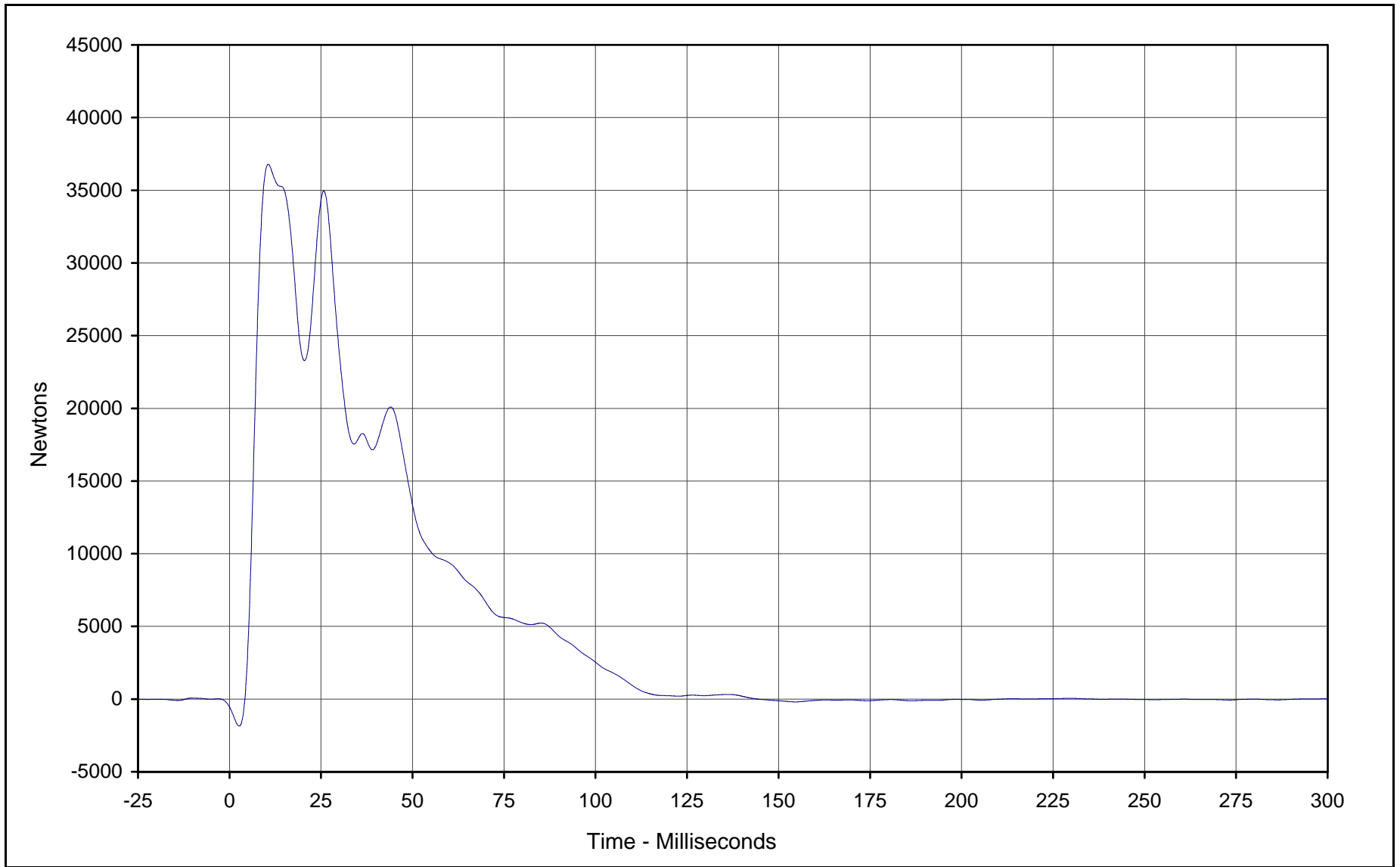
Curve Description: Barrier Force A9  
Maximum Value: 1692.3 at 34.0 Milliseconds  
Minimum Value: -3487.5 at 29.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-106

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-9



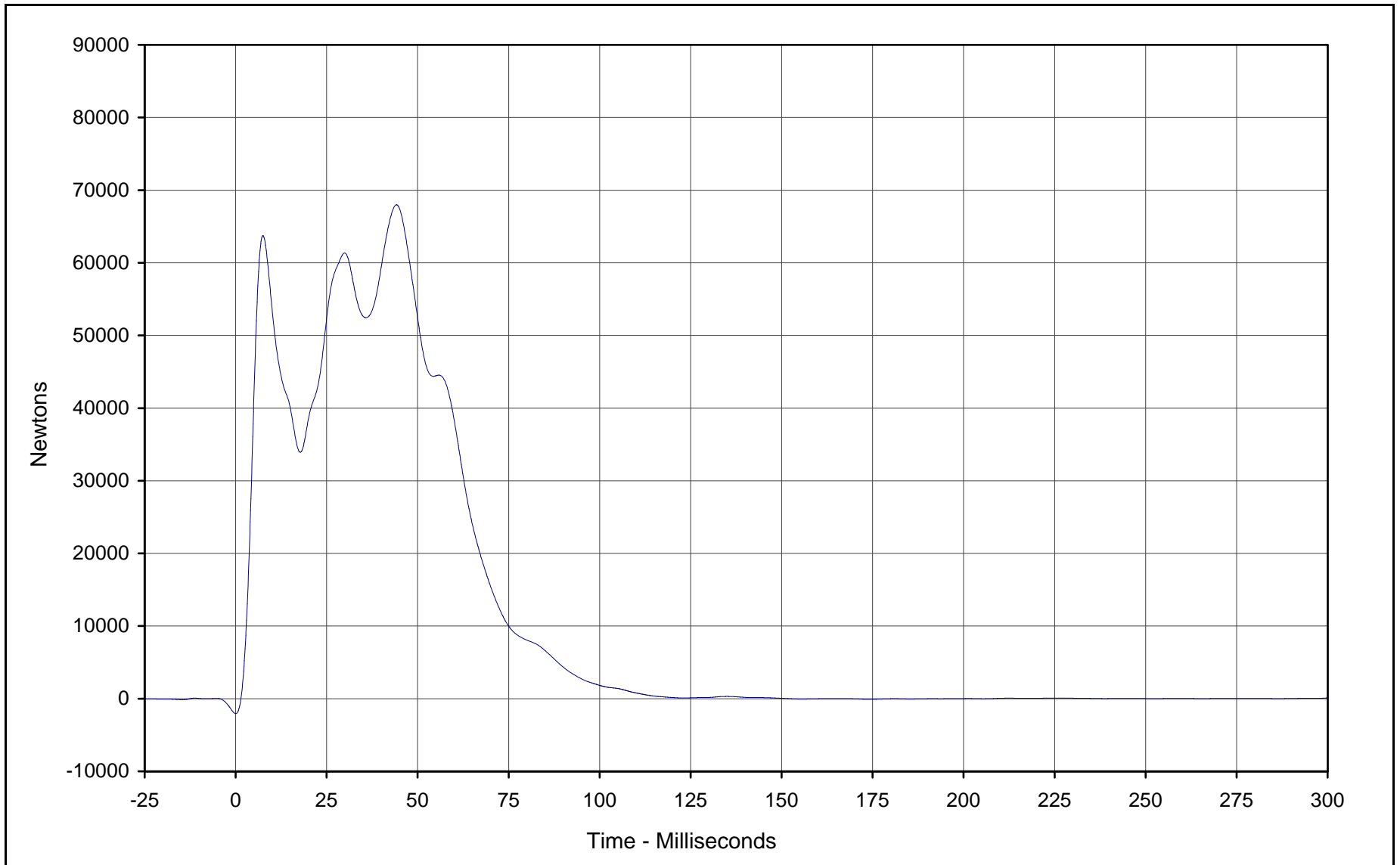
Curve Description: Barrier Force B2  
Maximum Value: 36788.7 at 10.6 Milliseconds  
Minimum Value: -1852.1 at 2.6 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-108

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-10



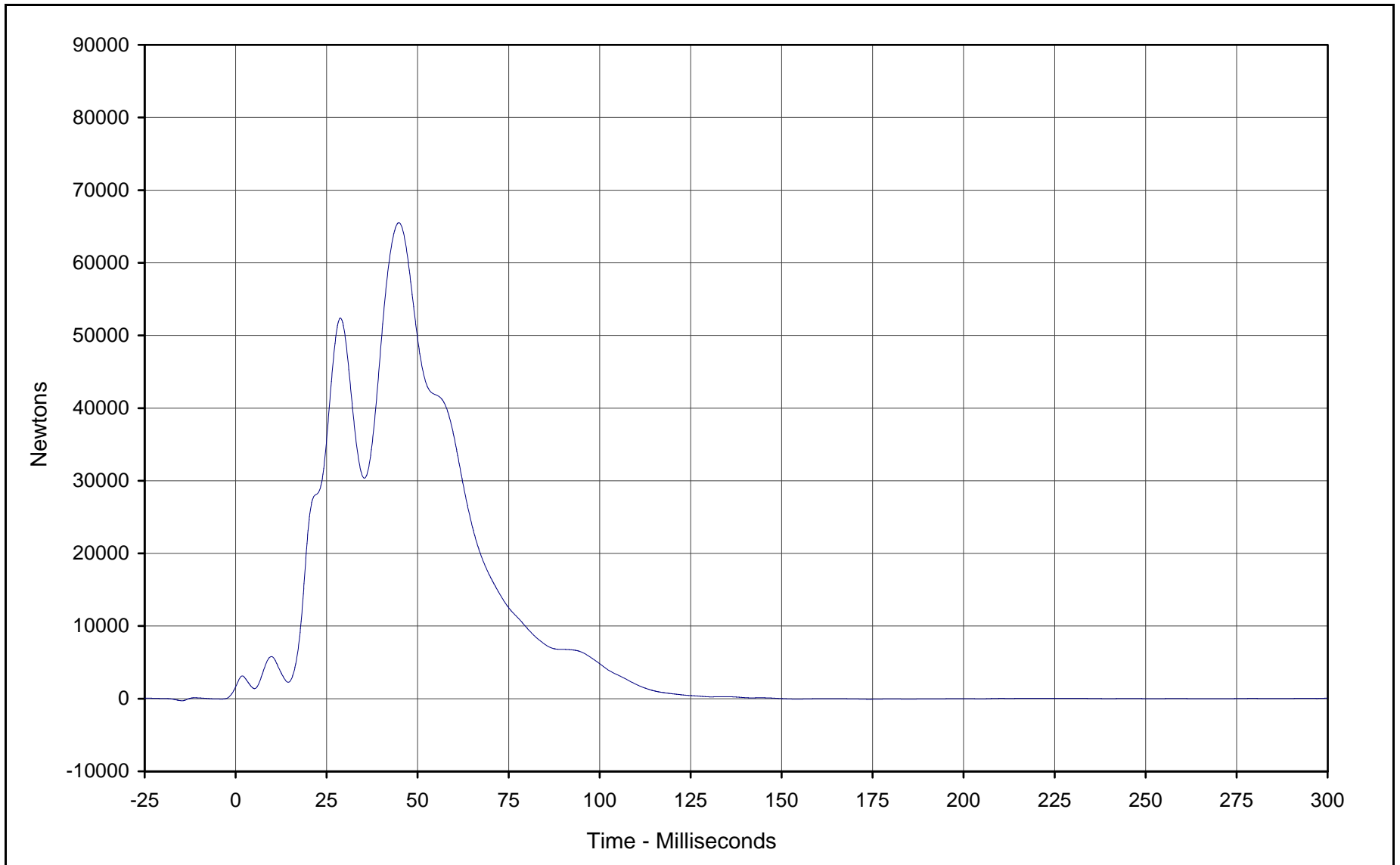
Curve Description: Barrier Force B3  
Maximum Value: 67986.3 at 44.2 Milliseconds  
Minimum Value: -2047.4 at 0.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-109

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-11



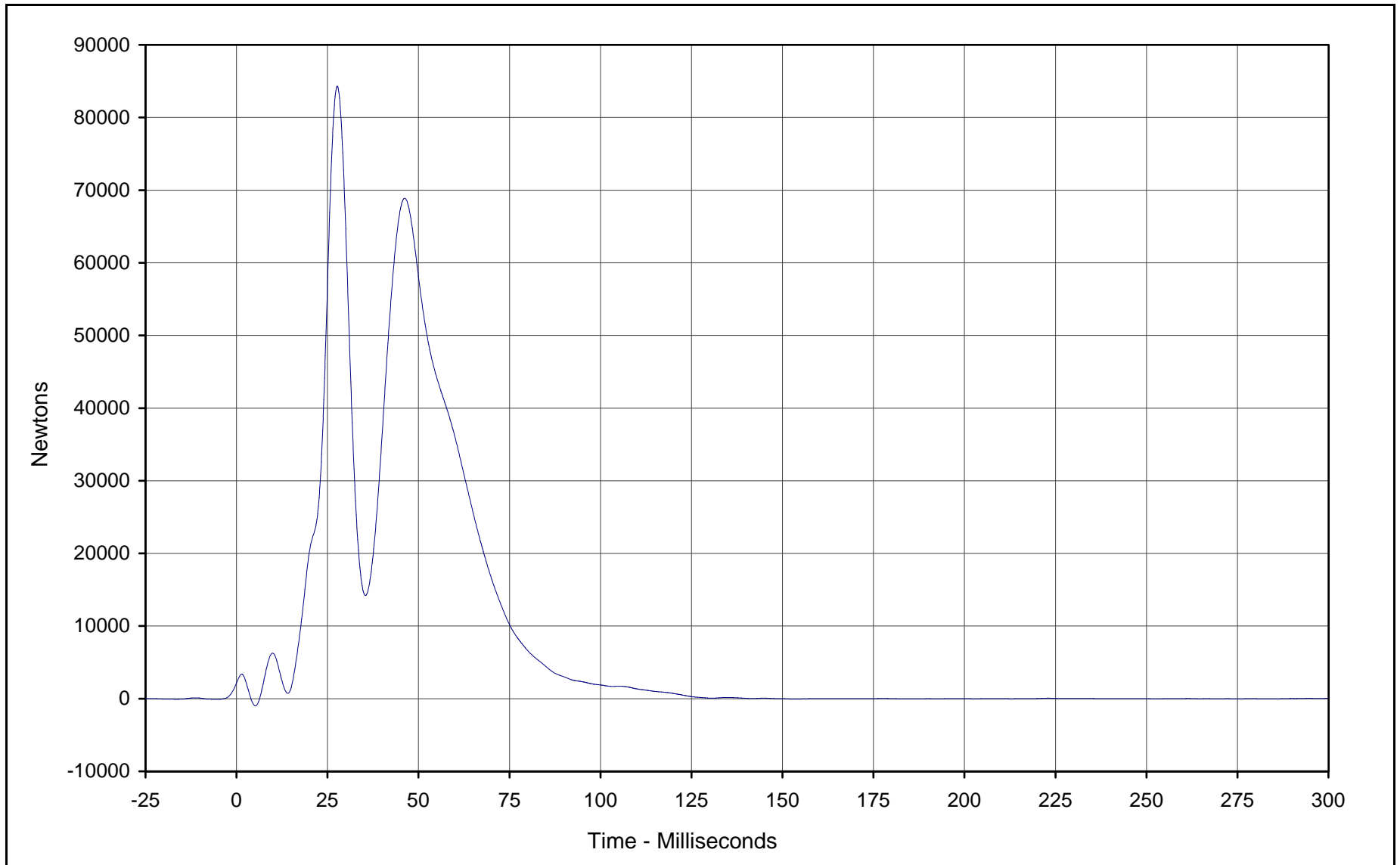
Curve Description: Barrier Force B4  
Maximum Value: 65518.7 at 44.8 Milliseconds  
Minimum Value: -79.2 at 174.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-110

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



KARR20001-08

C-12



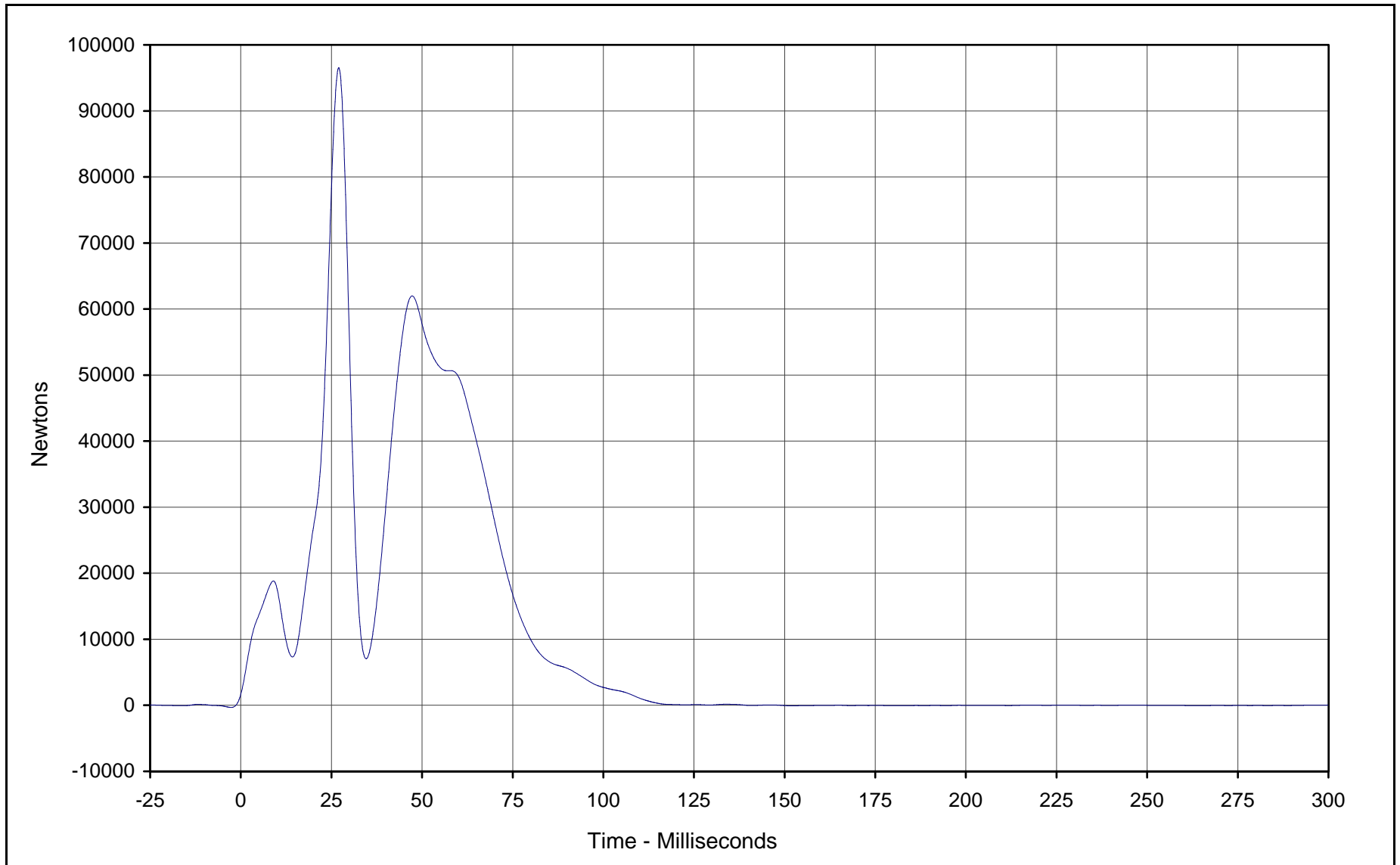
Curve Description: Barrier Force B5  
Maximum Value: 84318.6 at 27.7 Milliseconds  
Minimum Value: -990.5 at 5.2 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-111

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-13



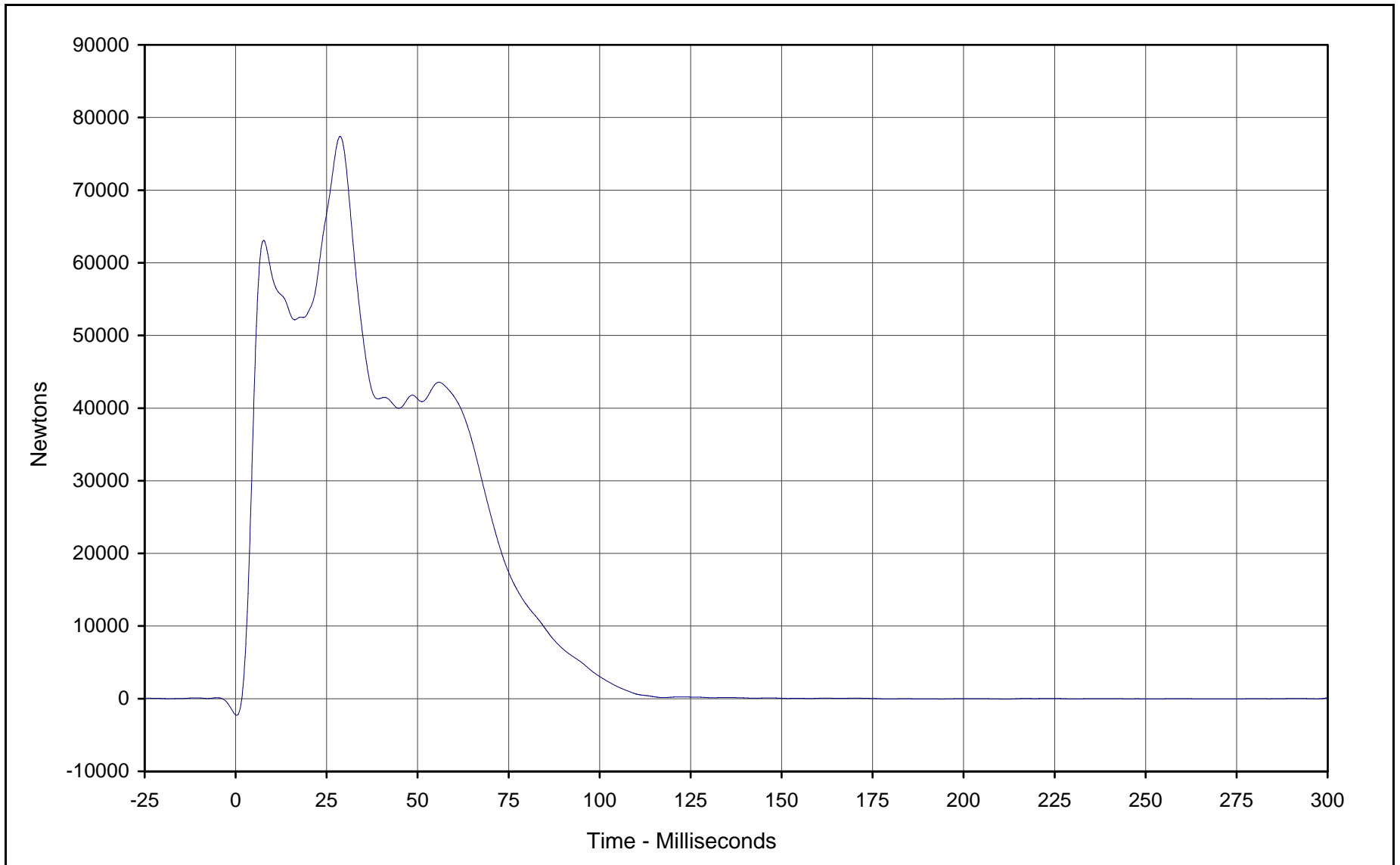
Curve Description: Barrier Force B6  
Maximum Value: 96543.0 at 27.0 Milliseconds  
Minimum Value: -76.8 at 151.9 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-112

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-14



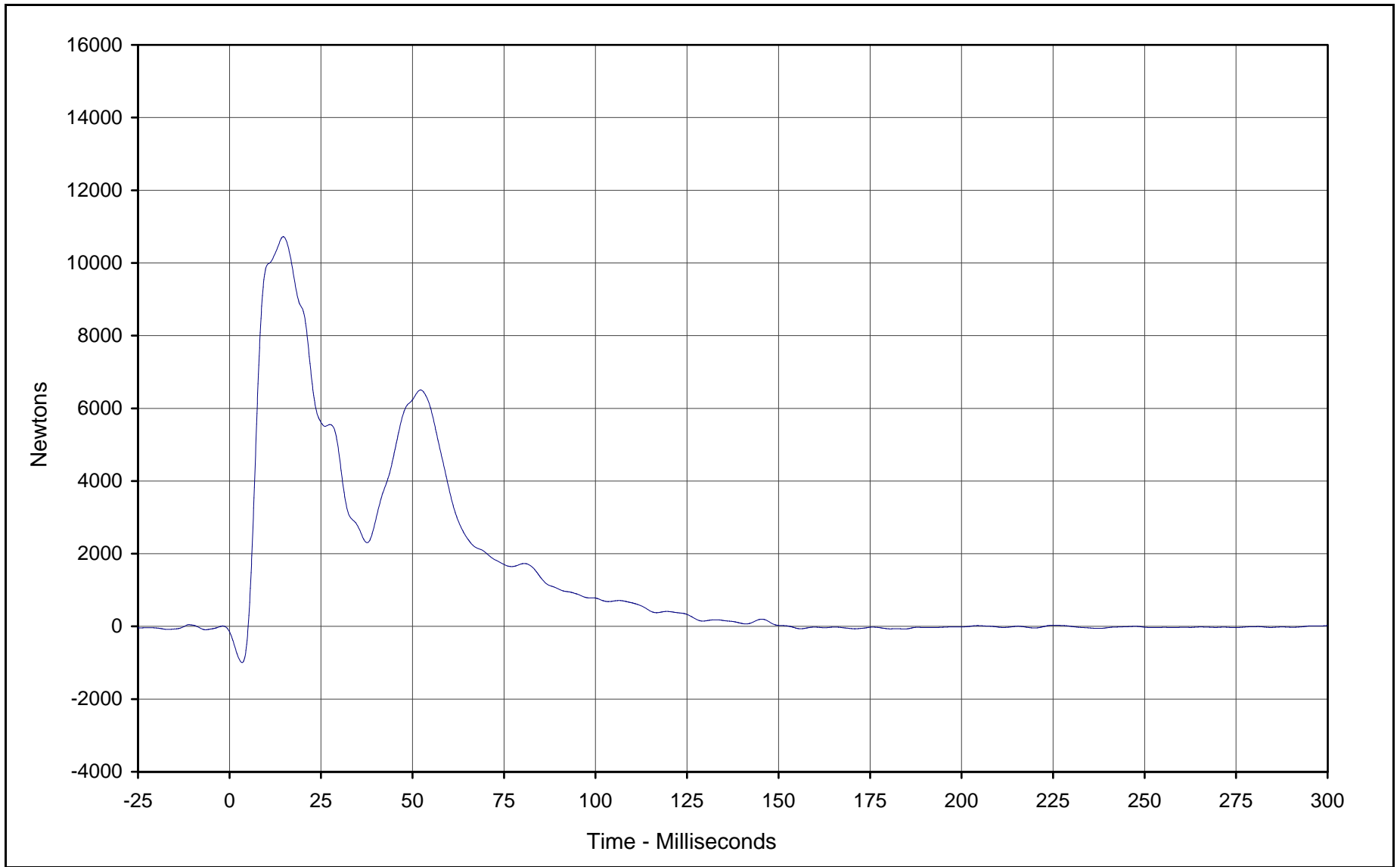
Curve Description: Barrier Force B7  
Maximum Value: 77403.0 at 28.7 Milliseconds  
Minimum Value: -2286.4 at 0.3 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-113

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-15



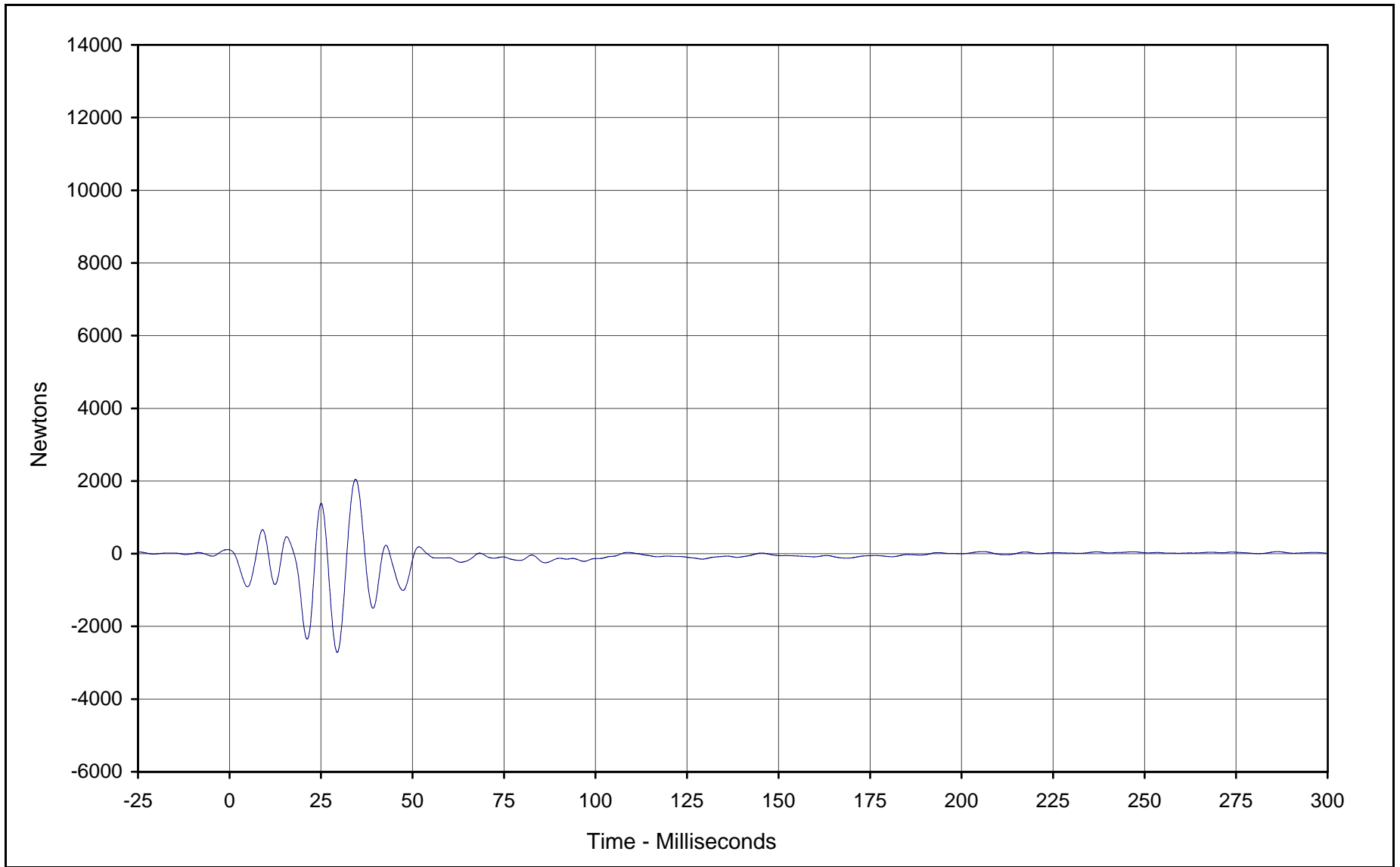
Curve Description: Barrier Force B8  
Maximum Value: 10724.1 at 14.7 Milliseconds  
Minimum Value: -994.6 at 3.4 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-114

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-16



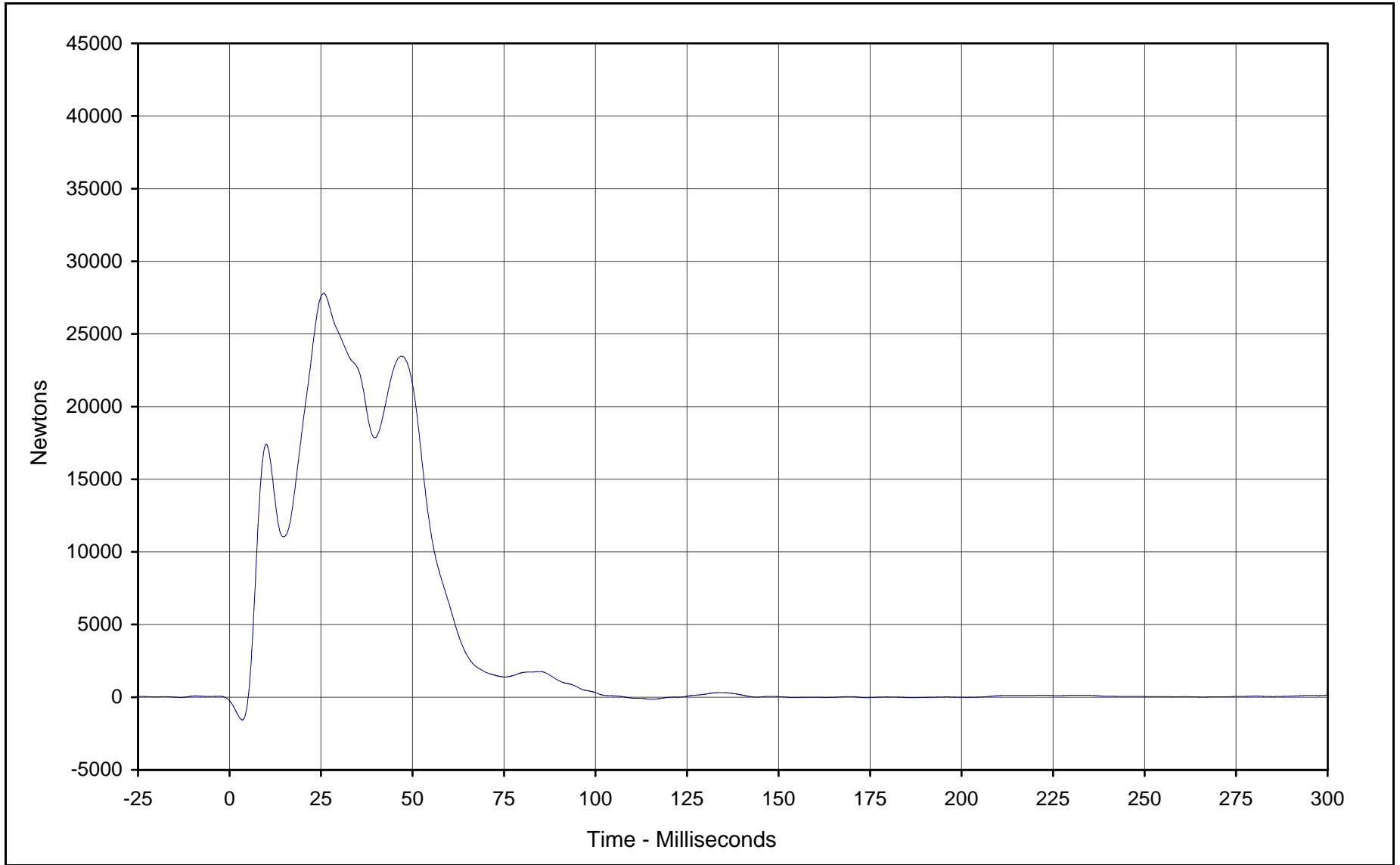
Curve Description: Barrier Force B9  
Maximum Value: 2050.1 at 34.4 Milliseconds  
Minimum Value: -2714.6 at 29.4 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-115

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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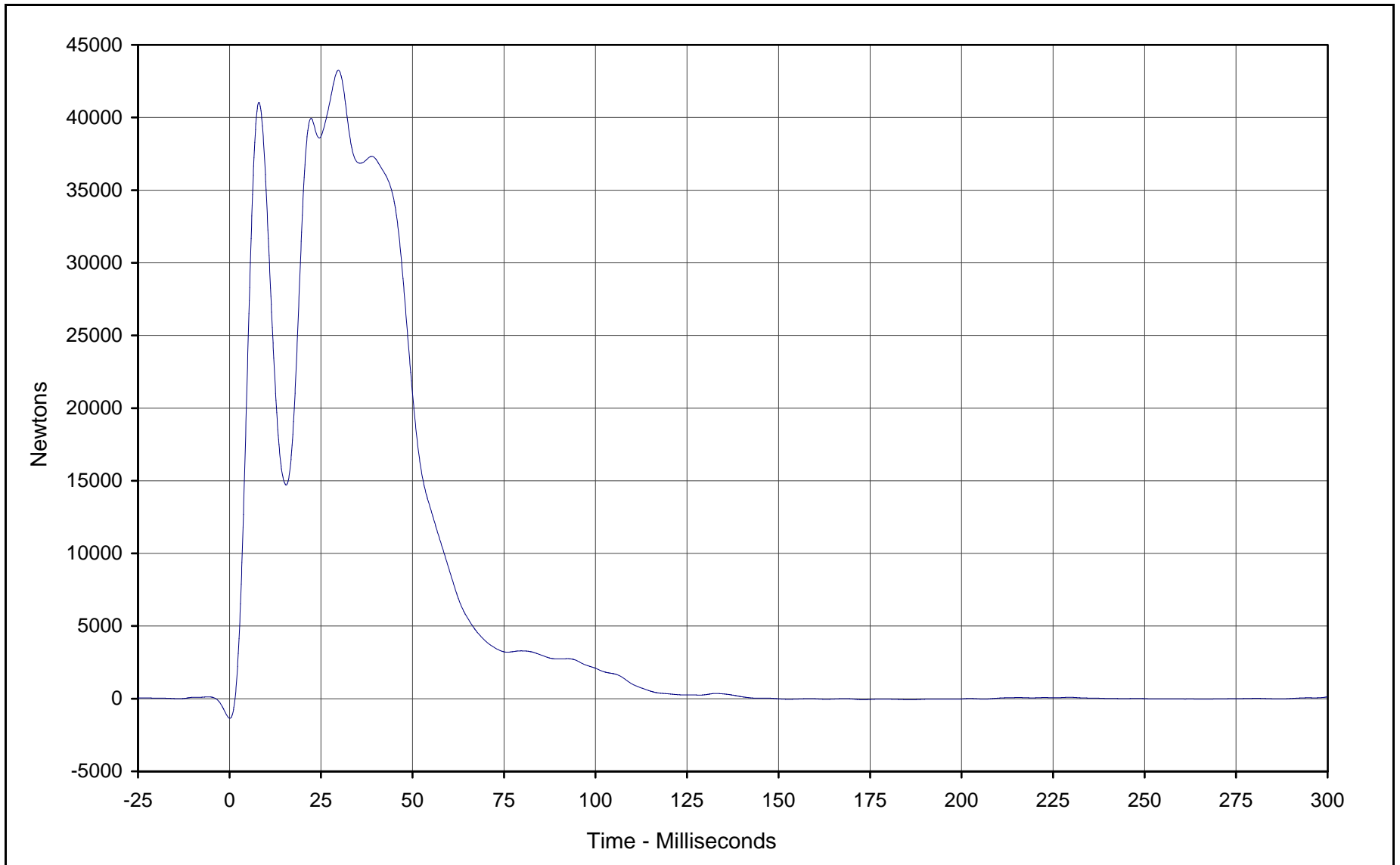
Curve Description: Barrier Force C2  
Maximum Value: 27793.8 at 25.8 Milliseconds  
Minimum Value: -1565.8 at 3.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-117

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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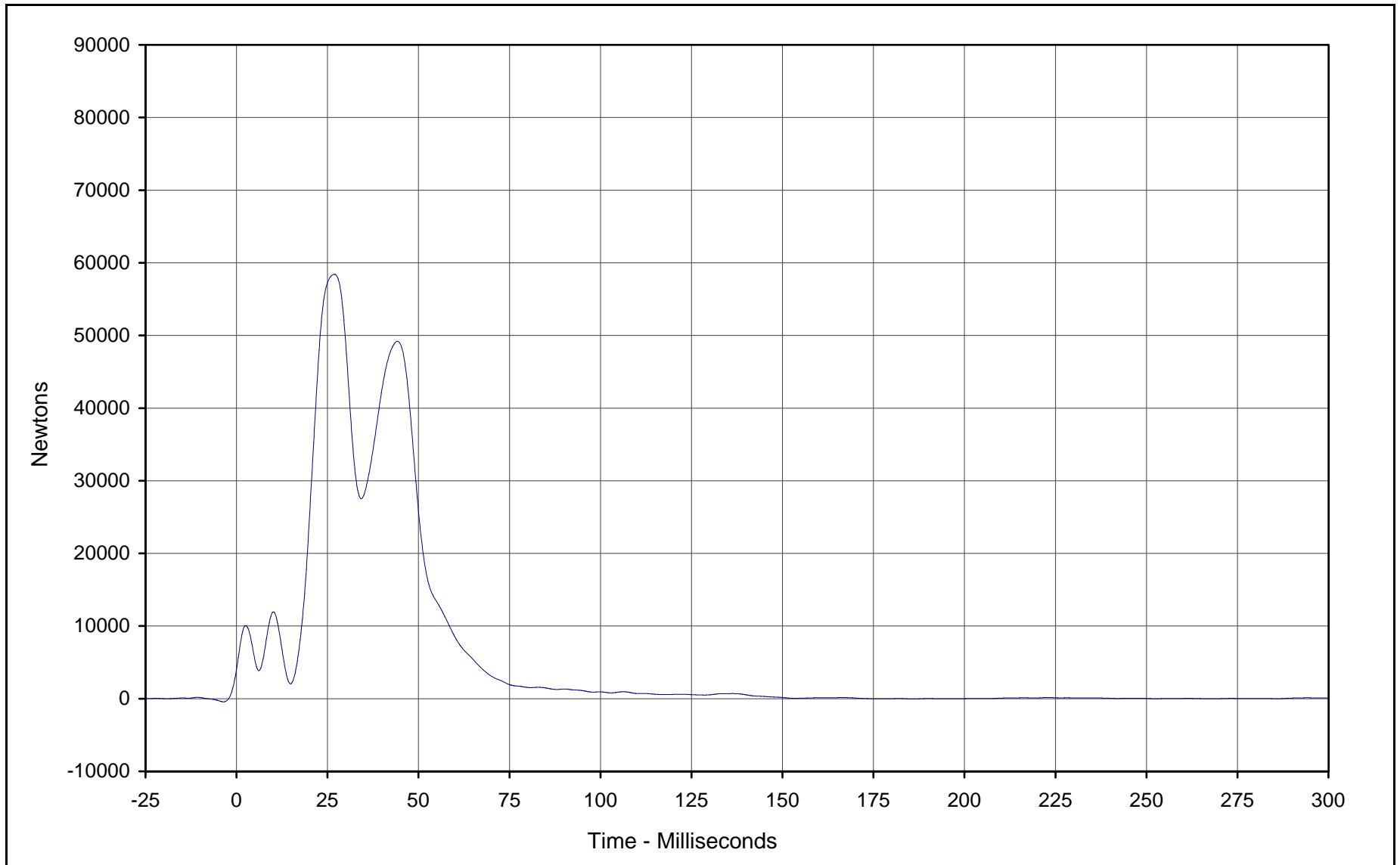
Curve Description: Barrier Force C3  
Maximum Value: 43252.1 at 29.7 Milliseconds  
Minimum Value: -1355.7 at 0.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-118

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-19



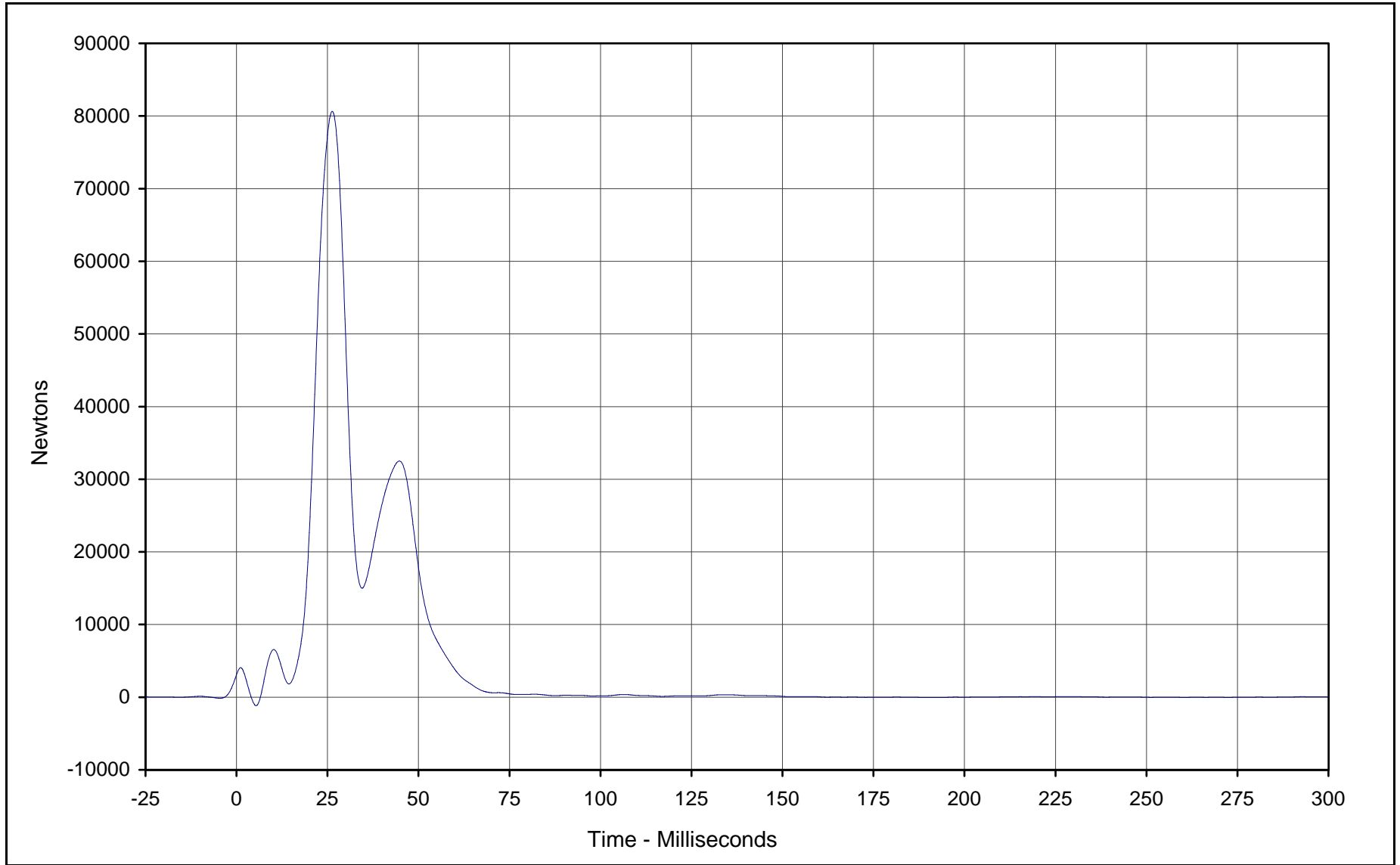
Curve Description: Barrier Force C4  
Maximum Value: 58419.0 at 26.9 Milliseconds  
Minimum Value: -49.9 at 186.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-119

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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C-20



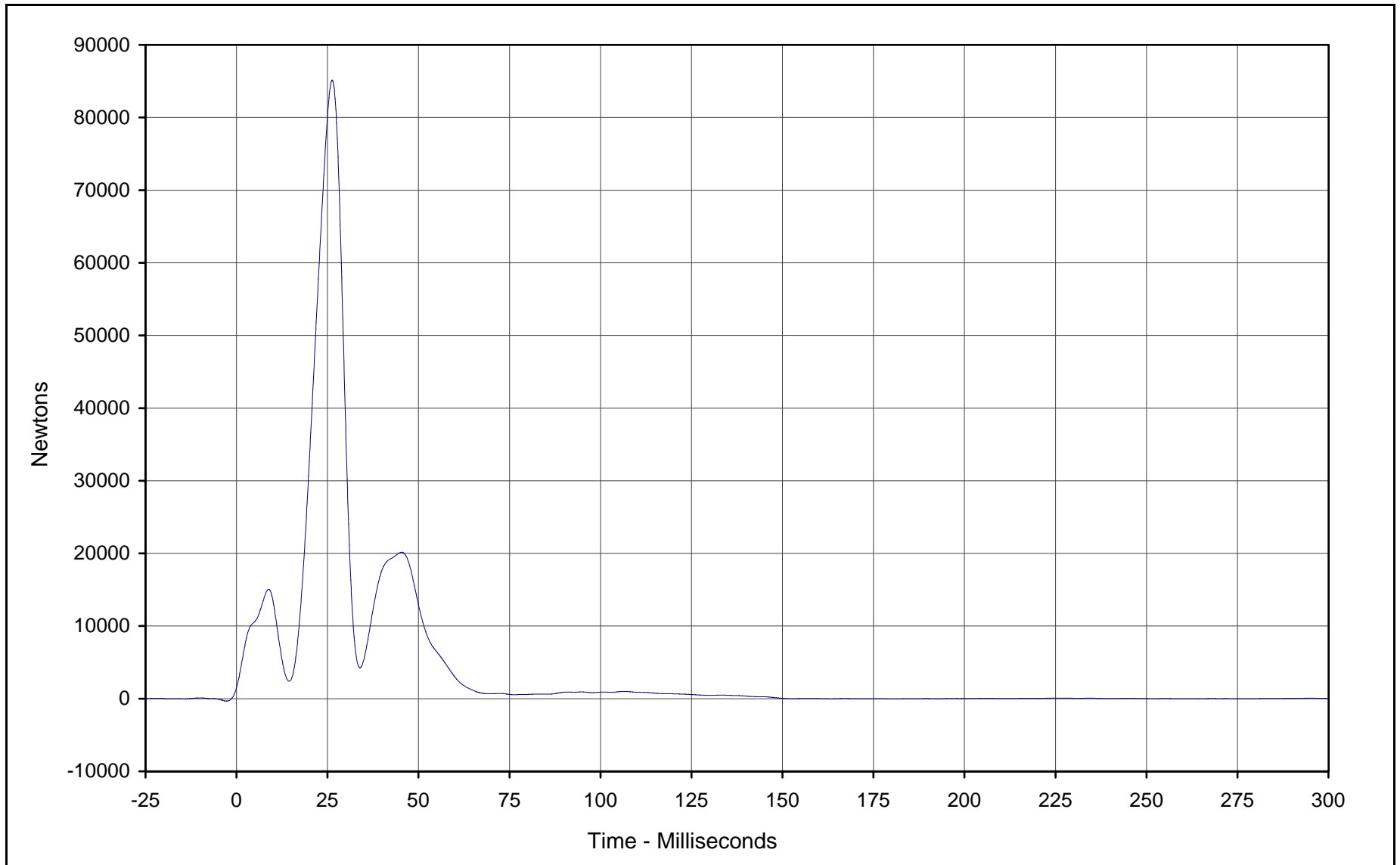
Curve Description: Barrier Force C5  
Maximum Value: 80648.2 at 26.3 Milliseconds  
Minimum Value: -1166.2 at 5.4 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-120

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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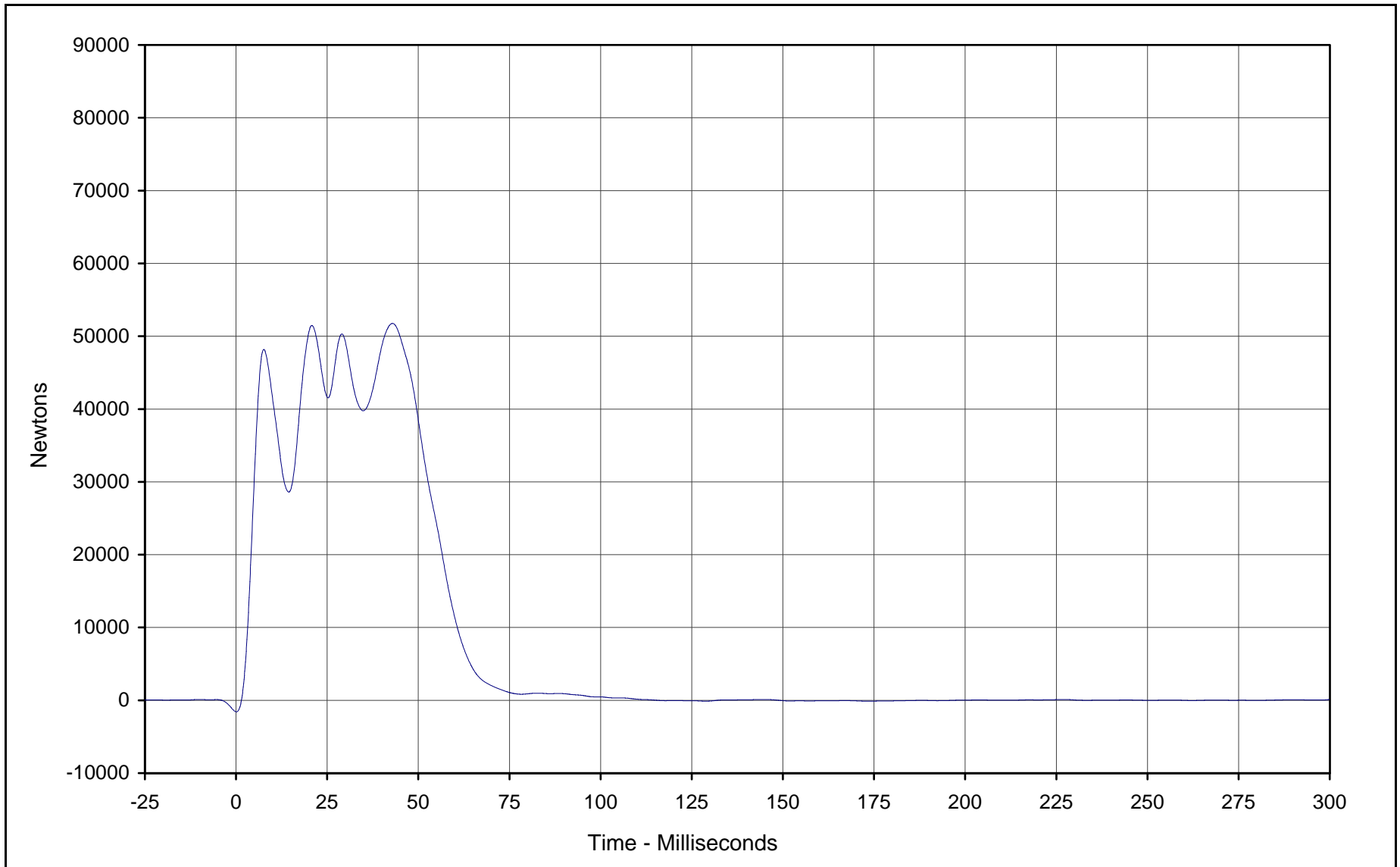


Curve Description: Barrier Force C6  
Maximum Value: 85140.5 at 26.3 Milliseconds  
Minimum Value: -46.1 at 180.8 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-121

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



KARR20001-08

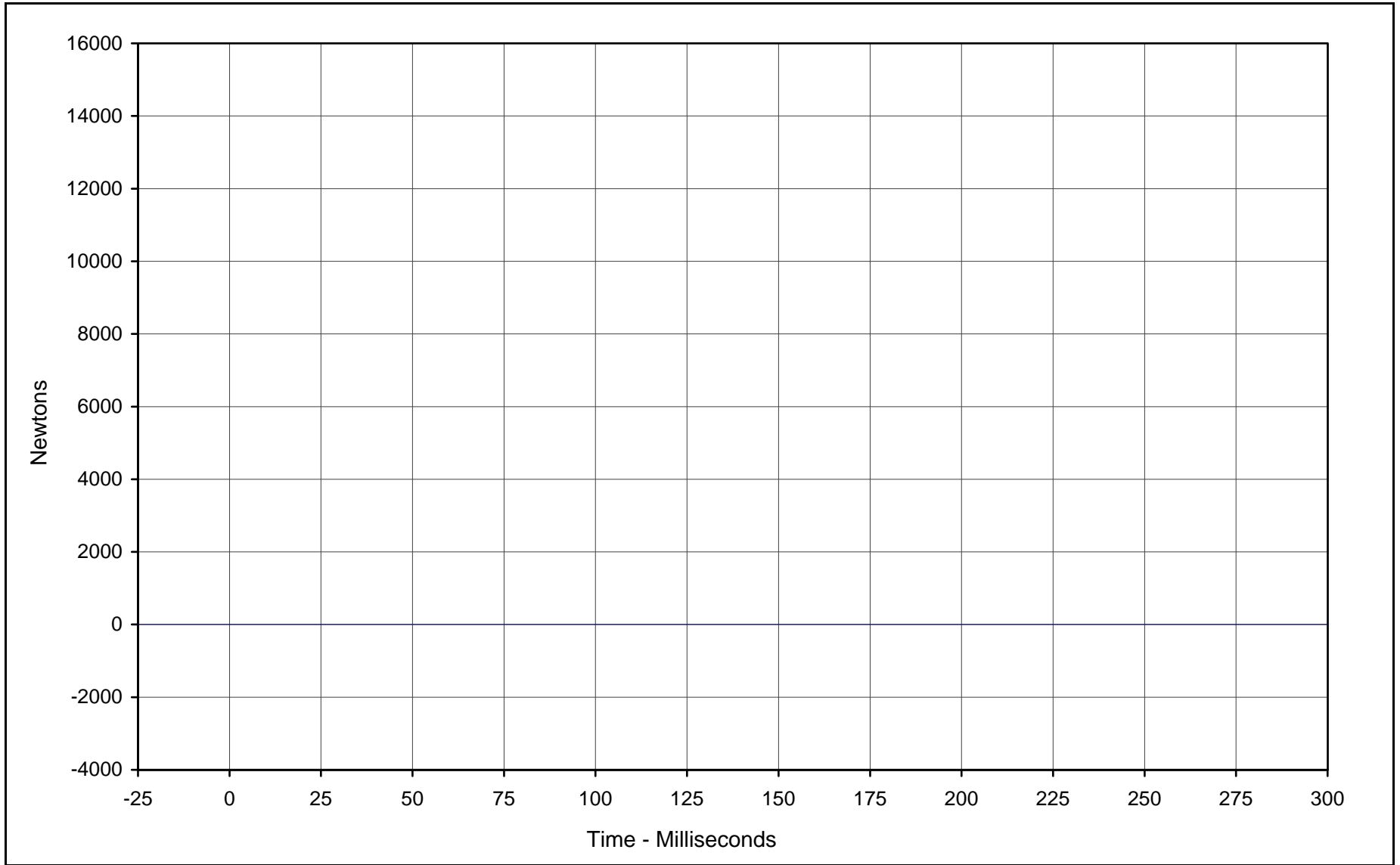


Curve Description: Barrier Force C7  
 Maximum Value: 51757.7 at 42.9 Milliseconds  
 Minimum Value: -1582.7 at 0.1 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/13/00  
 Curve Number: FIL-122

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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Curve Description: Barrier Force C8 \*  
Maximum Value: 0.0 at 0.0 Milliseconds  
Minimum Value: 0.0 at 0.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-123

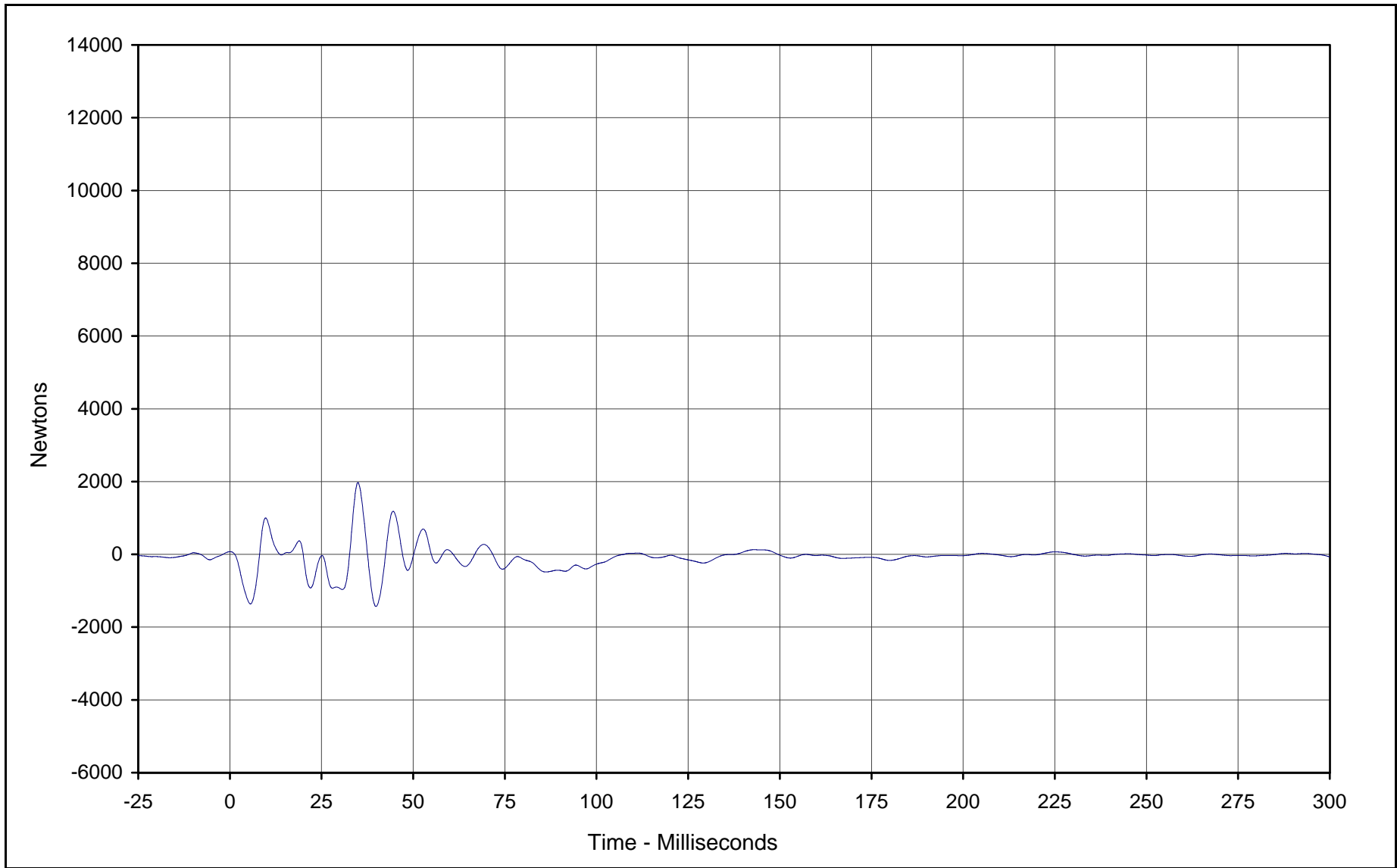
Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

\* Channel failed, no data



KARR20001-08

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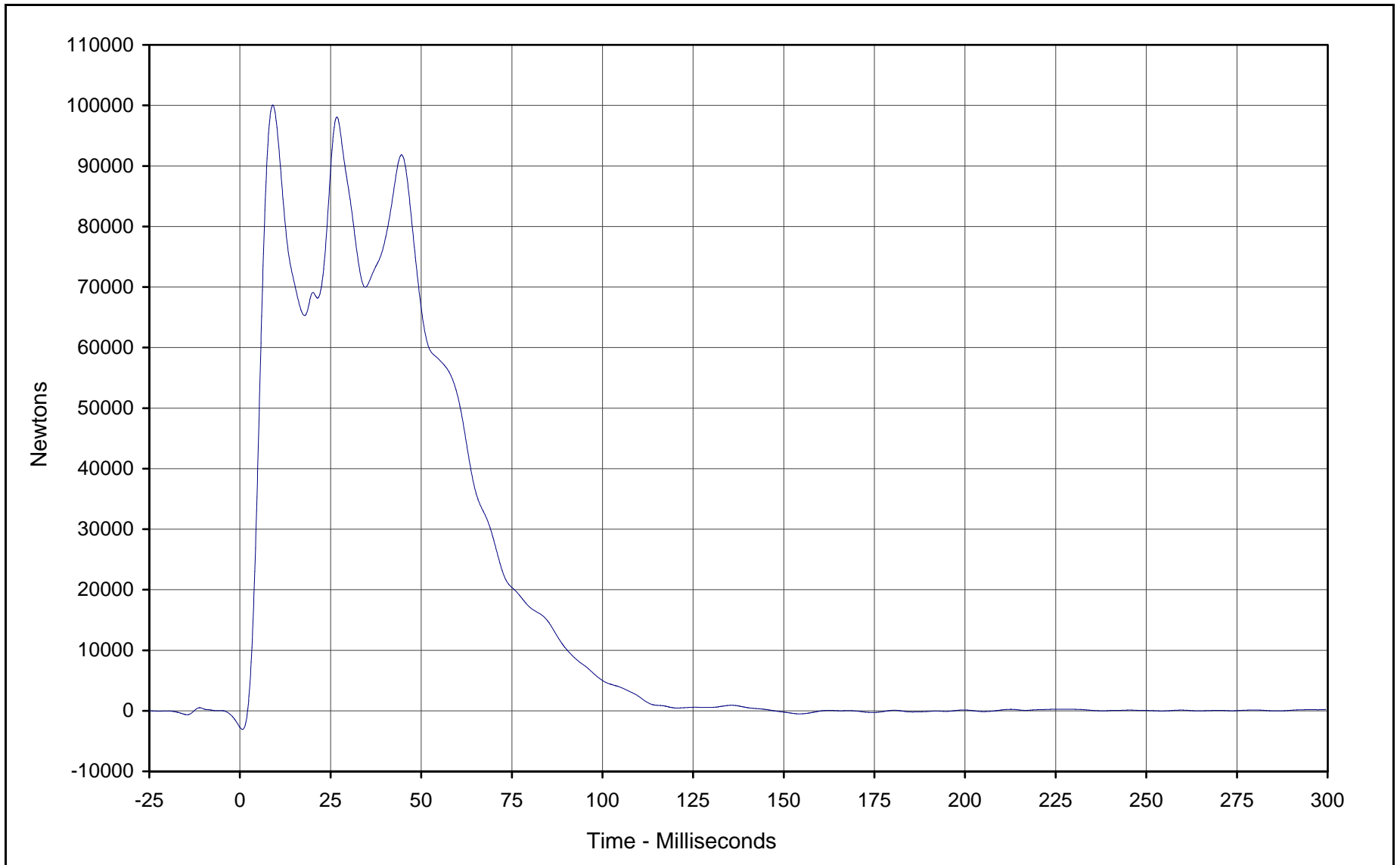
Curve Description: Barrier Force C9  
Maximum Value: 1972.7 at 34.9 Milliseconds  
Minimum Value: -1432.3 at 39.8 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: FIL-124

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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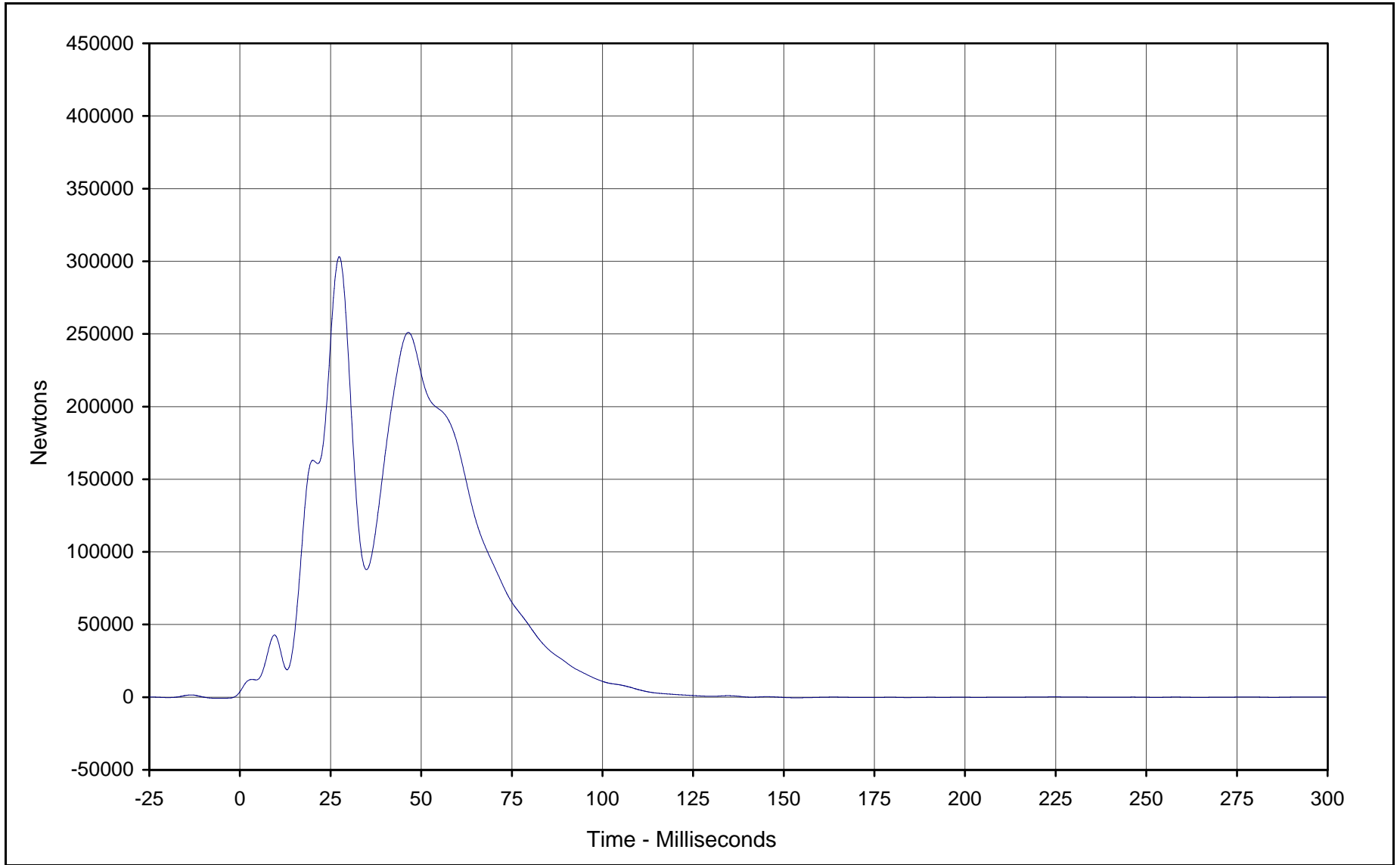


Curve Description: Barrier Force Sum Group 1  
Maximum Value: 100032.3 at 9.1 Milliseconds  
Minimum Value: -3067.3 at 0.7 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: SUM-001

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



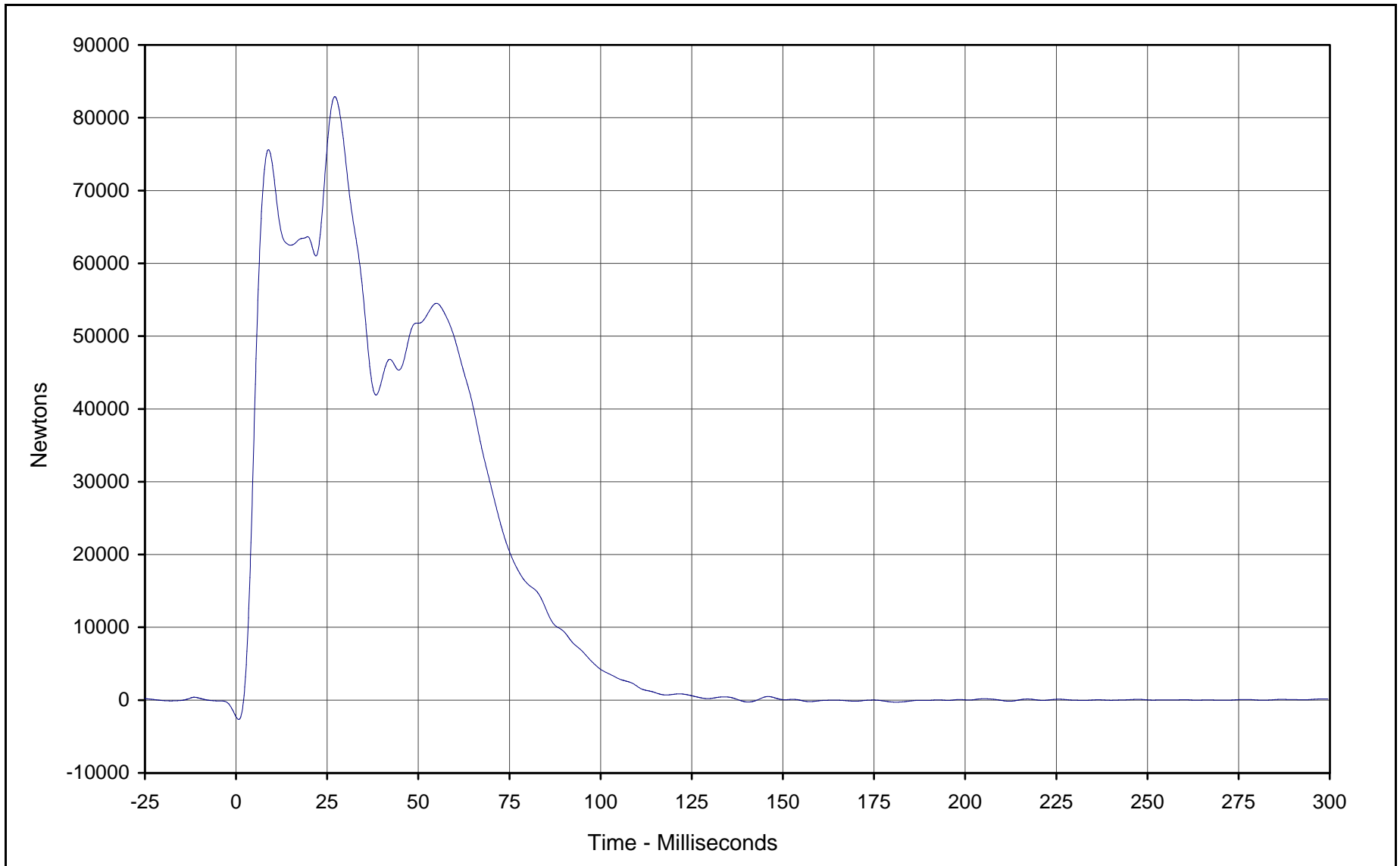
KARR20001-08



Curve Description: Barrier Force Sum Group 2  
Maximum Value: 303137.3 at 27.4 Milliseconds  
Minimum Value: -431.4 at 153.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: SUM-002

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van

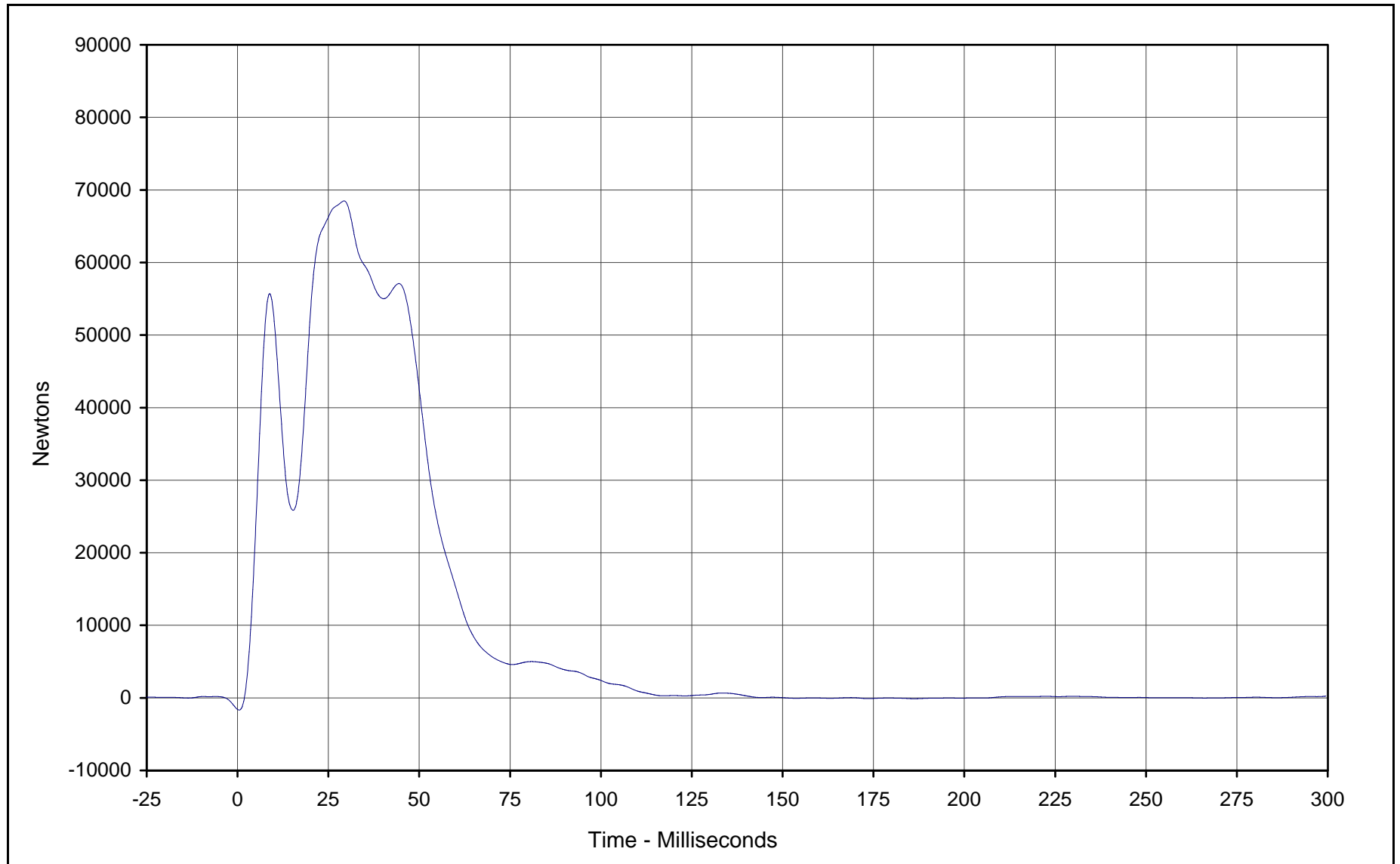




Curve Description: Barrier Force Sum Group 3  
 Maximum Value: 82902.0 at 27.1 Milliseconds  
 Minimum Value: -2649.9 at 0.7 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/13/00  
 Curve Number: SUM-003

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



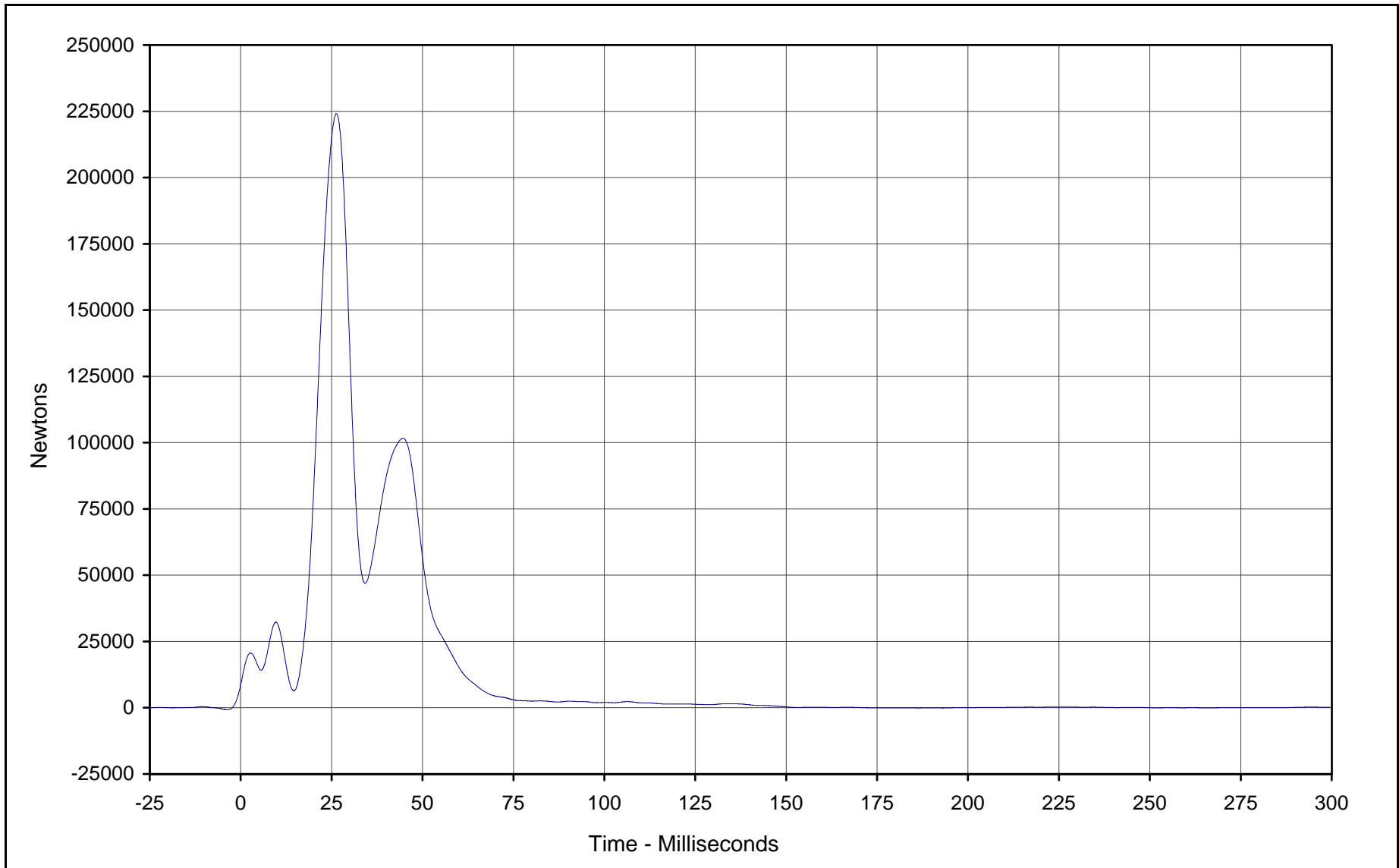


Curve Description: Barrier Force Sum Group 4  
 Maximum Value: 68482.6 at 29.3 Milliseconds  
 Minimum Value: -1677.9 at 0.4 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/13/00  
 Curve Number: SUM-004

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
 Test Vehicle: 2000 Mazda MPV Mini-Van



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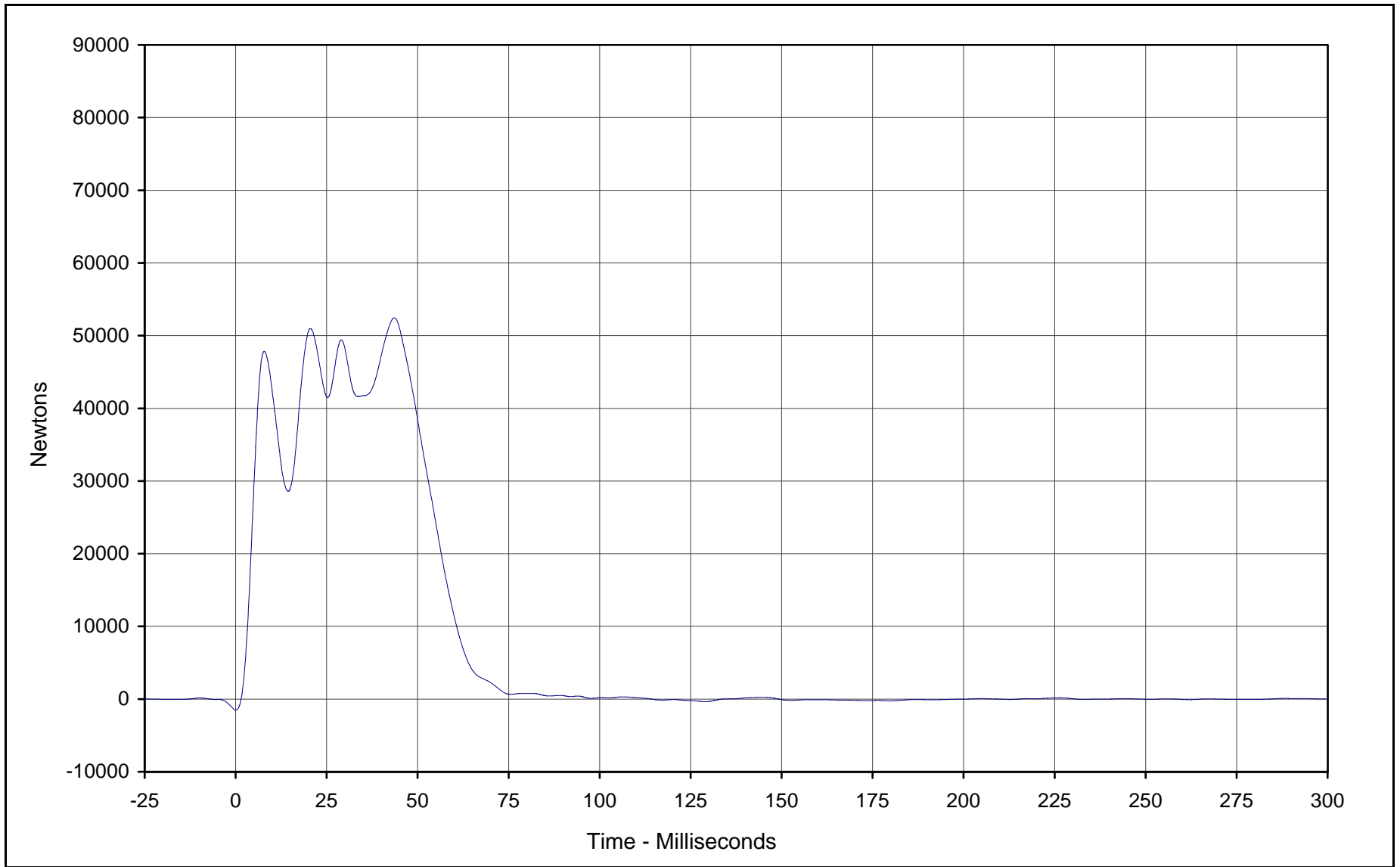
Curve Description: Barrier Force Sum Group 5  
Maximum Value: 224095.1 at 26.3 Milliseconds  
Minimum Value: -84.8 at 186.3 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: SUM-005

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



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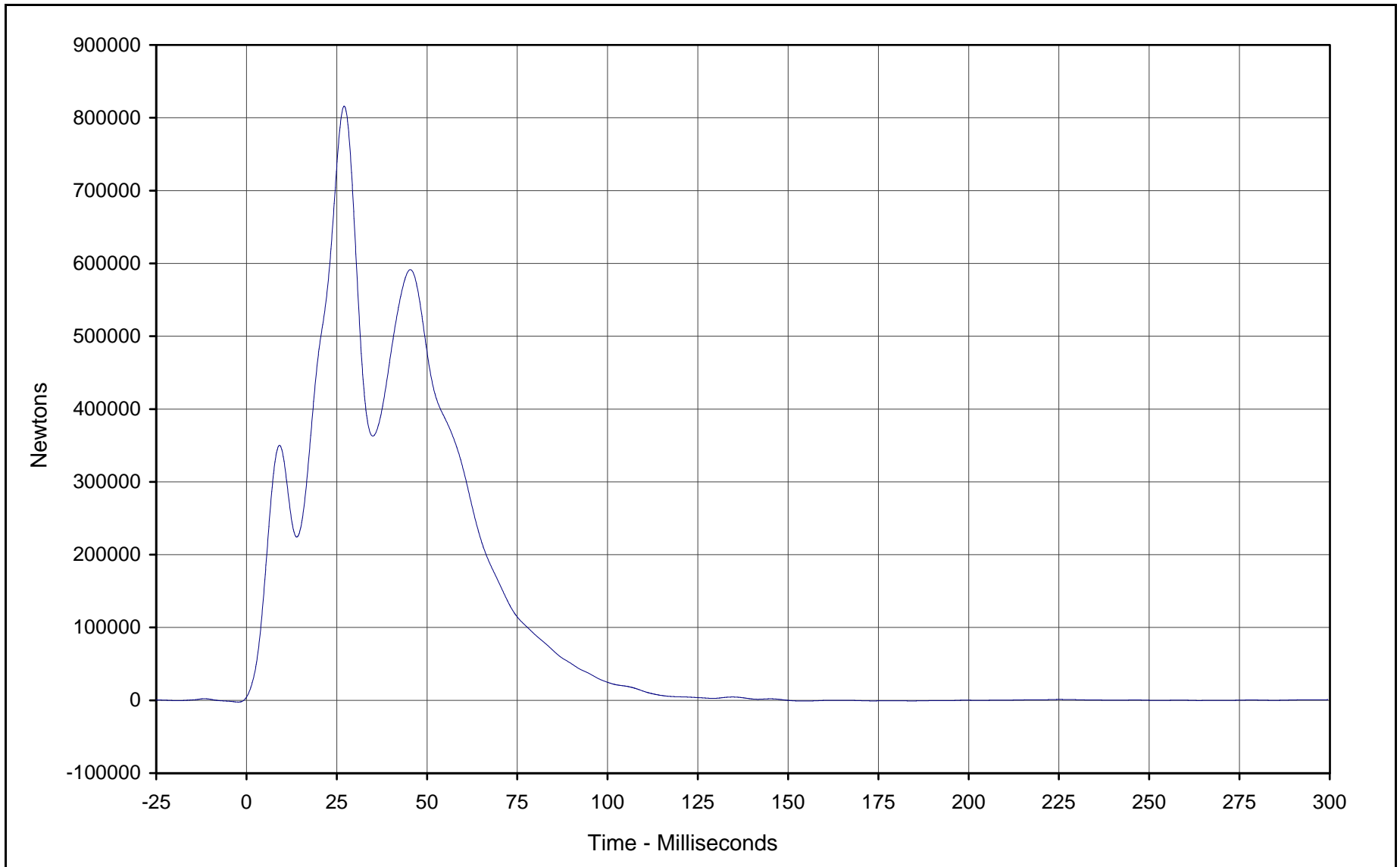


Curve Description: Barrier Force Sum Group 6  
Maximum Value: 52461.4 at 43.6 Milliseconds  
Minimum Value: -1510.1 at 0.1 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: SUM-006

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van



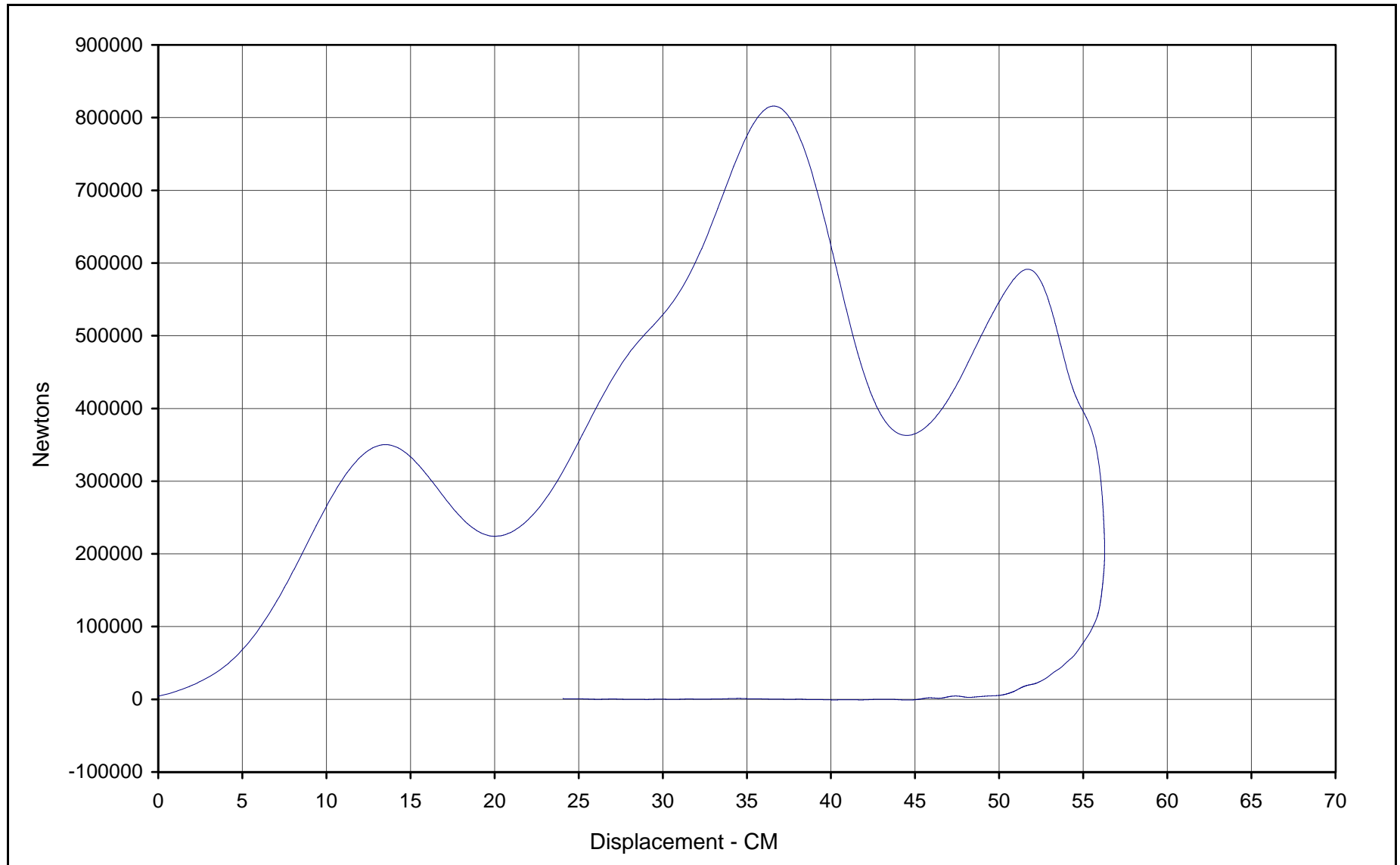
KARR20001-08



Curve Description: Barrier Force Sum Total  
Maximum Value: 815899.2 at 27.1 Milliseconds  
Minimum Value: -967.0 at 154.2 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/13/00  
Curve Number: SUM-007

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401  
Test Vehicle: 2000 Mazda MPV Mini-Van





Curve Description: Sum Force Total vs. Dynamic Crush

Maximum Displ.: 56.3 at 66.0 Milliseconds

Maximum Force: 815899.2 at 27.1 Milliseconds

Measured Energy: 217,474 joules

Date of Test: 1/13/00

Curve Number: XVY-001

Test Program: 2000 NHTSA 35 mph NCAP No.: MY5401

Test Vehicle: 2000 Mazda MPV Mini-Van



## BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2000 Mazda MPV Mini-Van NHTSA No.: MY5401  
 Test Program: 2000 NHTSA 35 mph NCAP Test Date: 1/13/00

### BARRIER LOAD CELL PEAK FORCES

Location	Units	Max	Time	Min	Time
Barrier Force A2	Newtons	3309.7	9.7	-2027.4	14.9
Barrier Force A3	Newtons	4690.6	19.9	-2365.2	14.7
Barrier Force A4	Newtons	57983.4	24.2	-1446.9	3.4
Barrier Force A5	Newtons	51554.6	18.4	-713.8	1.0
Barrier Force A6	Newtons	7696.6	19.8	-2970.2	34.1
Barrier Force A7	Newtons	3503.1	20.0	-1662.3	23.5
Barrier Force A8	Newtons	4887.4	53.8	-975.4	14.1
Barrier Force A9	Newtons	1692.3	34.0	-3487.5	29.5
Barrier Force B2	Newtons	36788.7	10.6	-1852.1	2.6
Barrier Force B3	Newtons	67986.3	44.2	-2047.4	0.0
Barrier Force B4	Newtons	65518.7	44.8	-79.2	174.0
Barrier Force B5	Newtons	84318.6	27.7	-990.5	5.2
Barrier Force B6	Newtons	96543.0	27.0	-76.8	151.9
Barrier Force B7	Newtons	77403.0	28.7	-2286.4	0.3
Barrier Force B8	Newtons	10724.1	14.7	-994.6	3.4
Barrier Force B9	Newtons	2050.1	34.4	-2714.6	29.4
Barrier Force C2	Newtons	27793.8	25.8	-1565.8	3.5
Barrier Force C3	Newtons	43252.1	29.7	-1355.7	0.1
Barrier Force C4	Newtons	58419.0	26.9	-49.9	186.1
Barrier Force C5	Newtons	80648.2	26.3	-1166.2	5.4
Barrier Force C6	Newtons	85140.5	26.3	-46.1	180.8
Barrier Force C7	Newtons	51757.7	42.9	-1582.7	0.1
Barrier Force C8	Newtons	0.0	0.0	0.0	0.0
Barrier Force C9	Newtons	1972.7	34.9	-1432.3	39.8
Barrier Force Sum Group 1	Newtons	100032.3	9.1	-3067.3	0.7
Barrier Force Sum Group 2	Newtons	303137.3	27.4	-431.4	153.5
Barrier Force Sum Group 3	Newtons	82902.0	27.1	-2649.9	0.7
Barrier Force Sum Group 4	Newtons	68482.6	29.3	-1677.9	0.4
Barrier Force Sum Group 5	Newtons	224095.1	26.3	-84.8	186.3
Barrier Force Sum Group 6	Newtons	52461.4	43.6	-1510.1	0.1
Barrier Force Sum Total	Newtons	815899.2	27.1	-967.0	154.2

Barrier Load cells A1,B1,C1, and D1 through D9 (12 locations) were not recorded.

\* Channel failed, no data

**APPENDIX D**  
**INSTRUMENTATION DATA CHANNEL ASSIGNMENTS**

**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Driver A.T.D Serial Number 35  
1/13/00  
2000 Mazda MPV Mini-Van**

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

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**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Driver A.T.D Serial Number 35  
1/13/00  
2000 Mazda MPV Mini-Van**

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	X	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT	Y	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT	Y	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT	Z	KEIC001Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
41	LAP BELT FORCE	X	KELC003	Load cell, Seat belt	Lebow	3371	N
42	SHOULDER BELT FORCE	X	KELC004	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

D-2

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**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Driver A.T.D Serial Number 34  
1/13/00  
2000 Mazda MPV Mini-Van**

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

D-3

KAR20001-08

**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Driver A.T.D Serial Number 34  
1/13/00  
2000 Mazda MPV Mini-Van**

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	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT	Y	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT	Y	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT	Z	KEIC004Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
85	LAP BELT FORCE	X	KELC001	Load cell, Seat belt	Lebow	3371	N
86	SHOULDER BELT FORCE	X	KELC002	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

D-4

KAR20001-08

**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Vehicle Accelerometers and Reference Channel  
1/13/00  
2000 Mazda MPV Mini-Van**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	Left Rear X-Member (Pri.)	X	KEVA002	Accel., Pre-Amp	I.C.S/Karco	3031-500	G
90	Right Rear X-Member (Pri.)	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
91	Engine Top	X	KEVA001	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	KEVA003	Accel., Vehicle block	I.C. Sensor	3031-500	G
95	Instrument Panel	X	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G
96	Left Rear X-Member (Rednt.)	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G
97	ZERO REFERENCE	N/A	N/A	N/A	N/A	N/A	N/A

**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Rigid Load Cell Barrier  
1/13/00  
2000 Mazda MPV Mini-Van**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
98	BARRIER FORCE A1	X	BARRIER	Not Used	N/A	N/A	N/A
99	BARRIER FORCE A2	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
100	BARRIER FORCE A3	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
101	BARRIER FORCE A4	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
102	BARRIER FORCE A5	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
103	BARRIER FORCE A6	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
104	BARRIER FORCE A7	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
105	BARRIER FORCE A8	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
106	BARRIER FORCE A9	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
107	BARRIER FORCE B1	X	BARRIER	Not Used	N/A	N/A	N/A
108	BARRIER FORCE B2	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
109	BARRIER FORCE B3	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
110	BARRIER FORCE B4	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
111	BARRIER FORCE B5	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
112	BARRIER FORCE B6	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
113	BARRIER FORCE B7	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
114	BARRIER FORCE B8	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
115	BARRIER FORCE B9	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N

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KAR20001-08

**2000 NHTSA 35 mph NCAP  
Instrumentation Data Channel Assignments  
Rigid Load Cell Barrier  
1/13/00  
2000 Mazda MPV Mini-Van**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
116	BARRIER FORCE C1	X	BARRIER	Not Used	N/A	N/A	N/A
117	BARRIER FORCE C2	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
118	BARRIER FORCE C3	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
119	BARRIER FORCE C4	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
120	BARRIER FORCE C5	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
121	BARRIER FORCE C6	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
122	BARRIER FORCE C7	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
123	BARRIER FORCE C8	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
124	BARRIER FORCE C9	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
125	BARRIER FORCE D1	X	BARRIER	Not Used	N/A	N/A	N/A
126	BARRIER FORCE D2	X	BARRIER	Not Used	N/A	N/A	N/A
127	BARRIER FORCE D3	X	BARRIER	Not Used	N/A	N/A	N/A
128	BARRIER FORCE D4	X	BARRIER	Not Used	N/A	N/A	N/A
129	BARRIER FORCE D5	X	BARRIER	Not Used	N/A	N/A	N/A
130	BARRIER FORCE D6	X	BARRIER	Not Used	N/A	N/A	N/A
131	BARRIER FORCE D7	X	BARRIER	Not Used	N/A	N/A	N/A
132	BARRIER FORCE D8	X	BARRIER	Not Used	N/A	N/A	N/A
133	BARRIER FORCE D9	X	BARRIER	Not Used	N/A	N/A	N/A

D-7

KAR20001-08

**APPENDIX E**  
**DUMMY CALIBRATION DATA**



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Left Knee Impact Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: KN00A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.081	Pass
Peak Probe Force	Newtons	4715 to 5782	5445.8	Pass
Overall Test Results				Pass

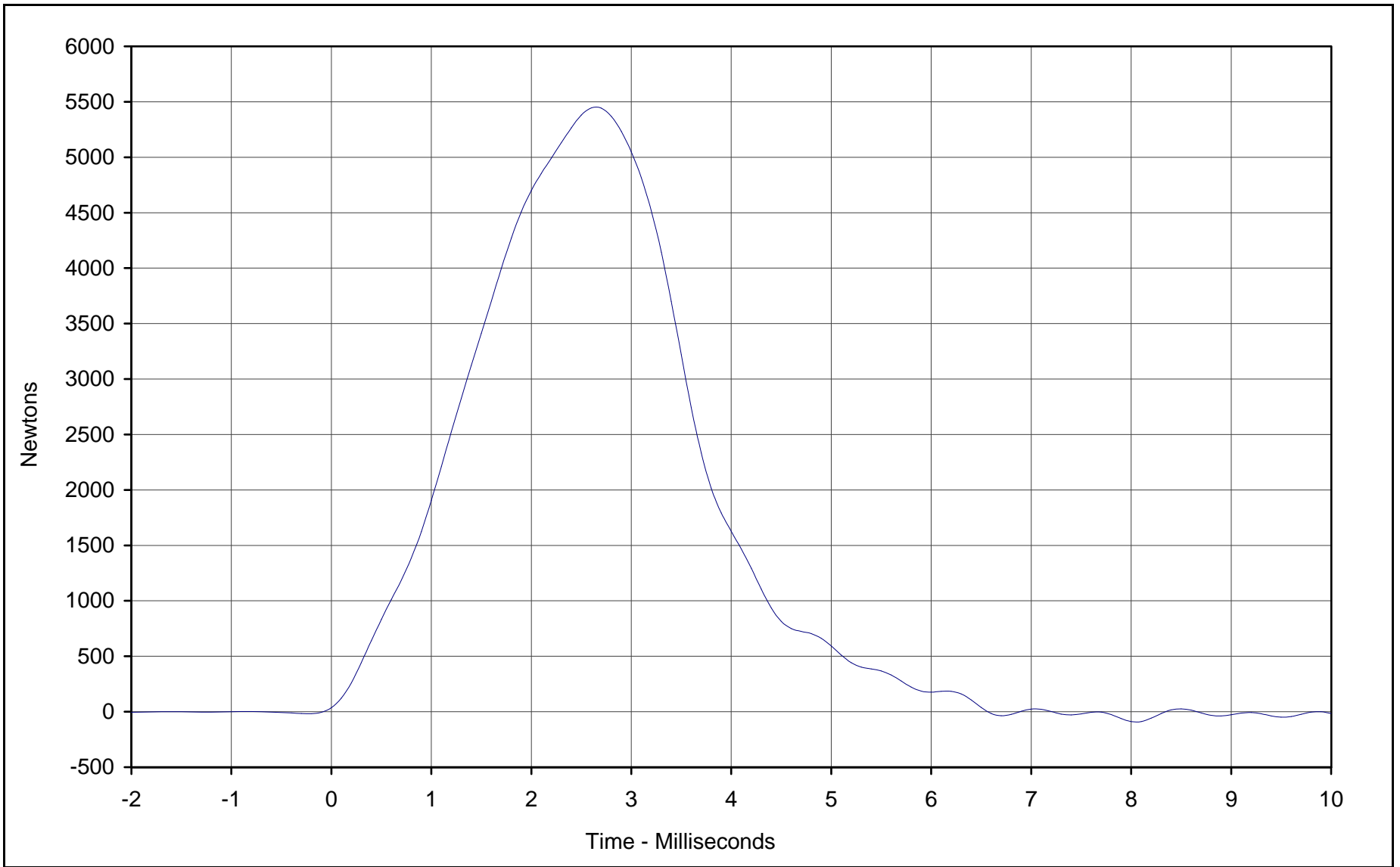
\_\_\_\_\_  
Laboratory Technician

January 6, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-2



Curve Description: Probe Force  
Maximum Value: 5445.8 at 2.6 Milliseconds  
Minimum Value: -89.0 at 8.0 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/6/00  
ATD Serial No.: 034

Testing Program: Hybrid III Left Knee Impact Test  
Test Information: Part S/N: n/a Test I.D.: KN00A



KAR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Right Knee Impact Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: KN00B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.084	Pass
Peak Probe Force	Newtons	4715 to 5782	5591.9	Pass
Overall Test Results				Pass

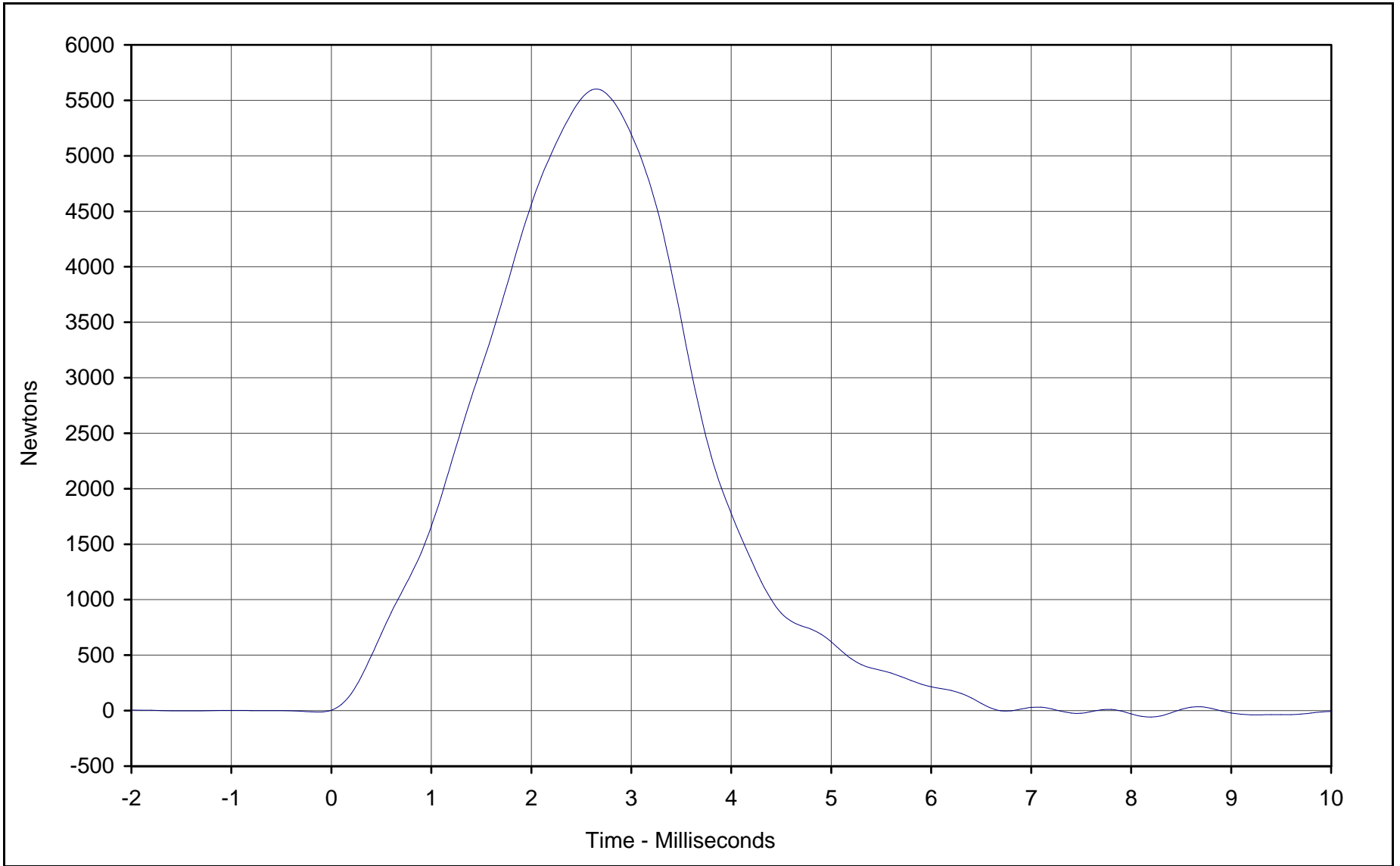
\_\_\_\_\_  
Laboratory Technician

January 6, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-4



Curve Description: Probe Force  
Maximum Value: 5591.9 at 2.6 Milliseconds  
Minimum Value: -28.2 at 8.0 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/6/00  
ATD Serial No.: 034

Testing Program: Hybrid III Right Knee Impact Test  
Test Information: Part S/N: n/a Test I.D.: KN00B



KARR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Head Drop Calibration

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: HD00B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	245.3	Pass
Peak Lateral Acceleration	G's	≤15.0	7.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

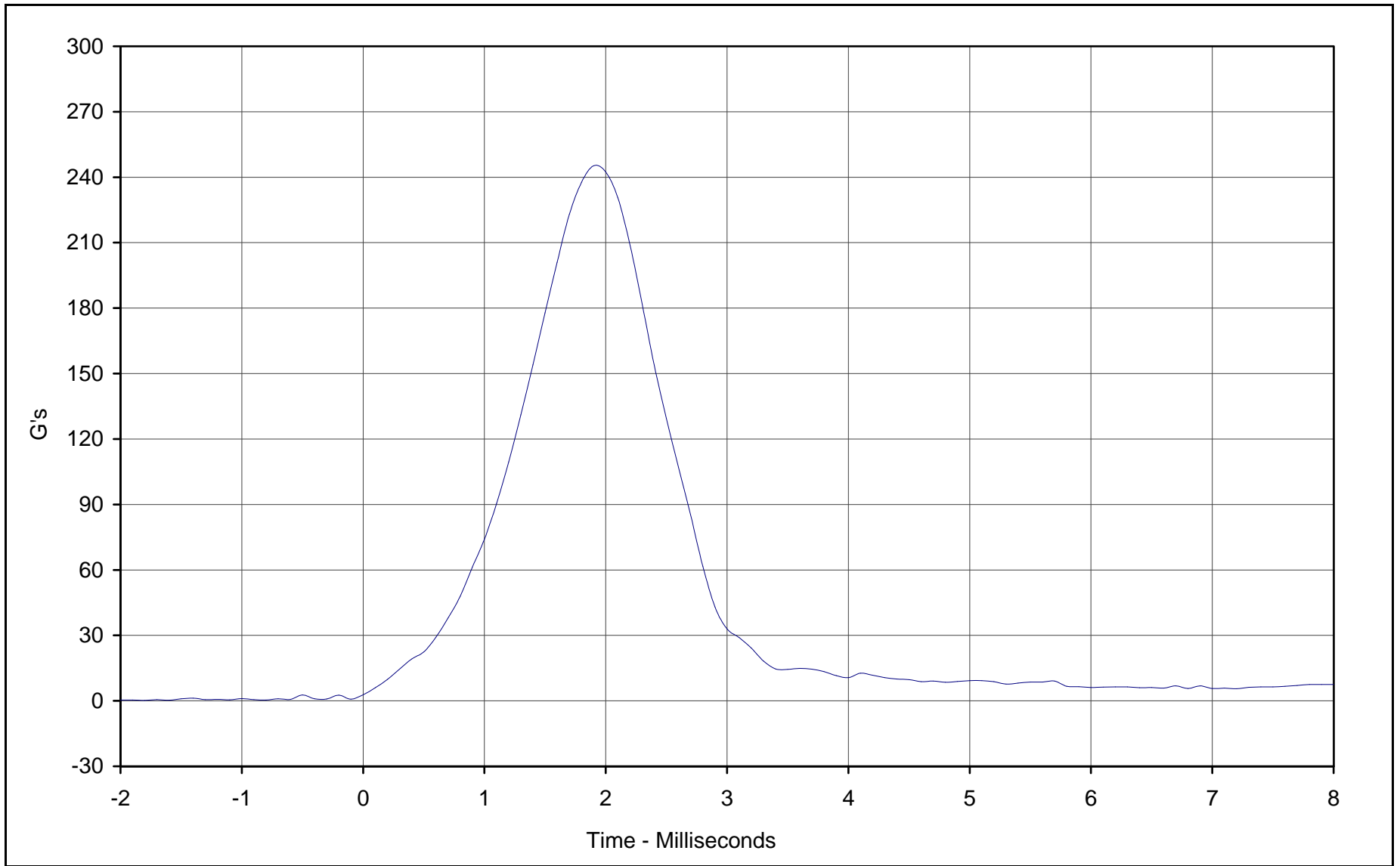
\_\_\_\_\_  
Laboratory Technician

January 5, 2000  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-6



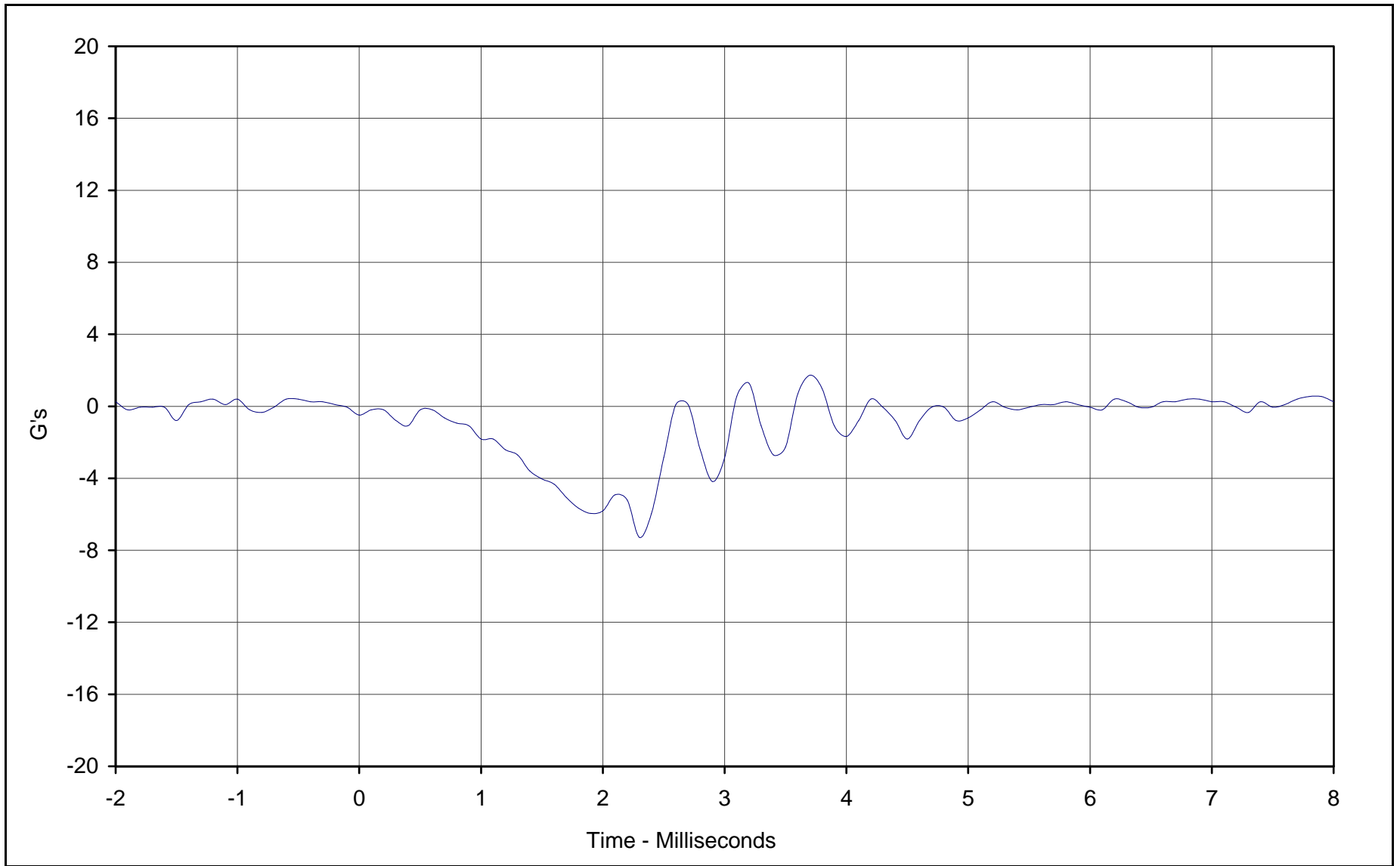
Curve Description: Head Resultant Acceleration  
Maximum Value: 245.3 at 1.9 Milliseconds  
Minimum Value: 0.2 at -1.8 Milliseconds  
SAE Filter Class: 1000  
Date of Test: 1/5/00  
ATD Serial No.: 034

Testing Program: Hybrid III Head Drop Calibration (Male)  
Test Information: S/N of Part: n/a Test I.D.: HD00B



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E-7



Curve Description: Head Acceleration Y Axis

Maximum Value: 1.7 at 3.7 Milliseconds

Minimum Value: -7.3 at 2.3 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/5/00

ATD Serial No.: 034

Testing Program: Hybrid III Head Drop Calibration (Male)

Test Information: S/N of Part: n/a Test I.D.: HD00B



KARR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Thorax Impact Test

ATD Serial No.: 034

Part Serial No.: N/A

Test I.D.: CH00A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.70	Pass
Peak Probe Force	Newtons	5159 to 5893	5709	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.54	Pass
Internal Hysteresis	%	69 to 85	78.4	Pass
Overall Test Results				Pass

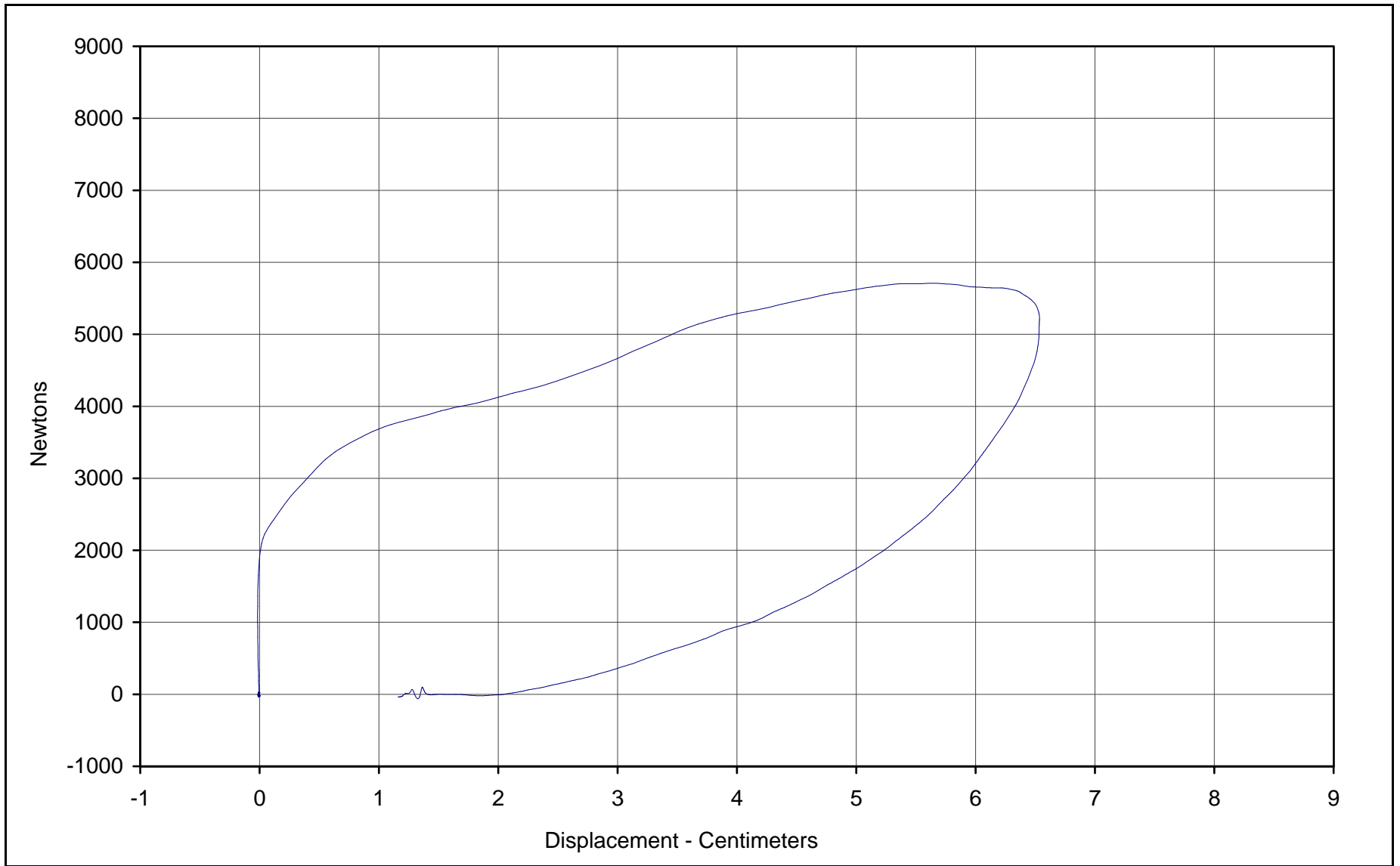
\_\_\_\_\_  
Laboratory Technician

January 6, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-9



Curve Description: Probe Force vs. Chest Displacement

Testing Program: Hybrid III Thorax Impact Test

Probe Force: 5708.6 Newtons

Test Information: S/N of Part: N/A Test I.D.: CH00A

Chest Displ.: 6.54 Centimeters

SAE Filter Class: 180

Date of Test: 1/6/00

ATD Serial No.: 034



KAR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Neck Flexion Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: NF00B

Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass	
Laboratory Relative Humidity	%	10 to 70	40	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.92	Pass	
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	20.3	Pass
	30 Msec.	G's	12.5 to 18.5	18.2	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 29.0	18.2	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	34.0 to 42.0	39.6	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	68.3	Pass
	Time	Msec.	57.0 to 64.0	58.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	113.0 to 128.0	114.1	Pass	
Moment About Occipital Condyle	Maximum	N•m	84.1 to 108.5	87.8	Pass
	Time	Msec.	47.0 to 58.0	52.6	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	97.0 to 107.0	98.6	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	

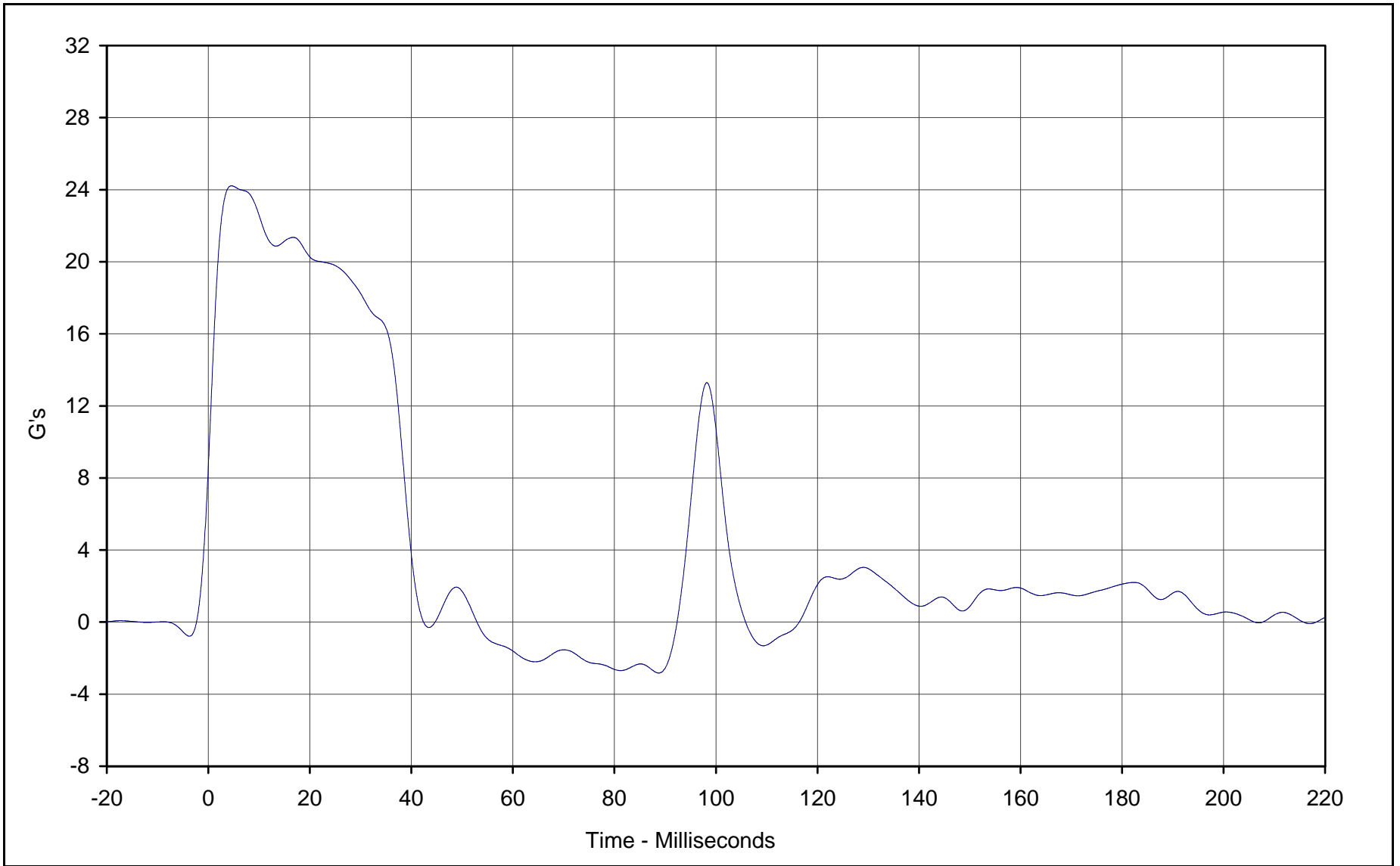
\_\_\_\_\_  
Laboratory Technician

January 5, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-11



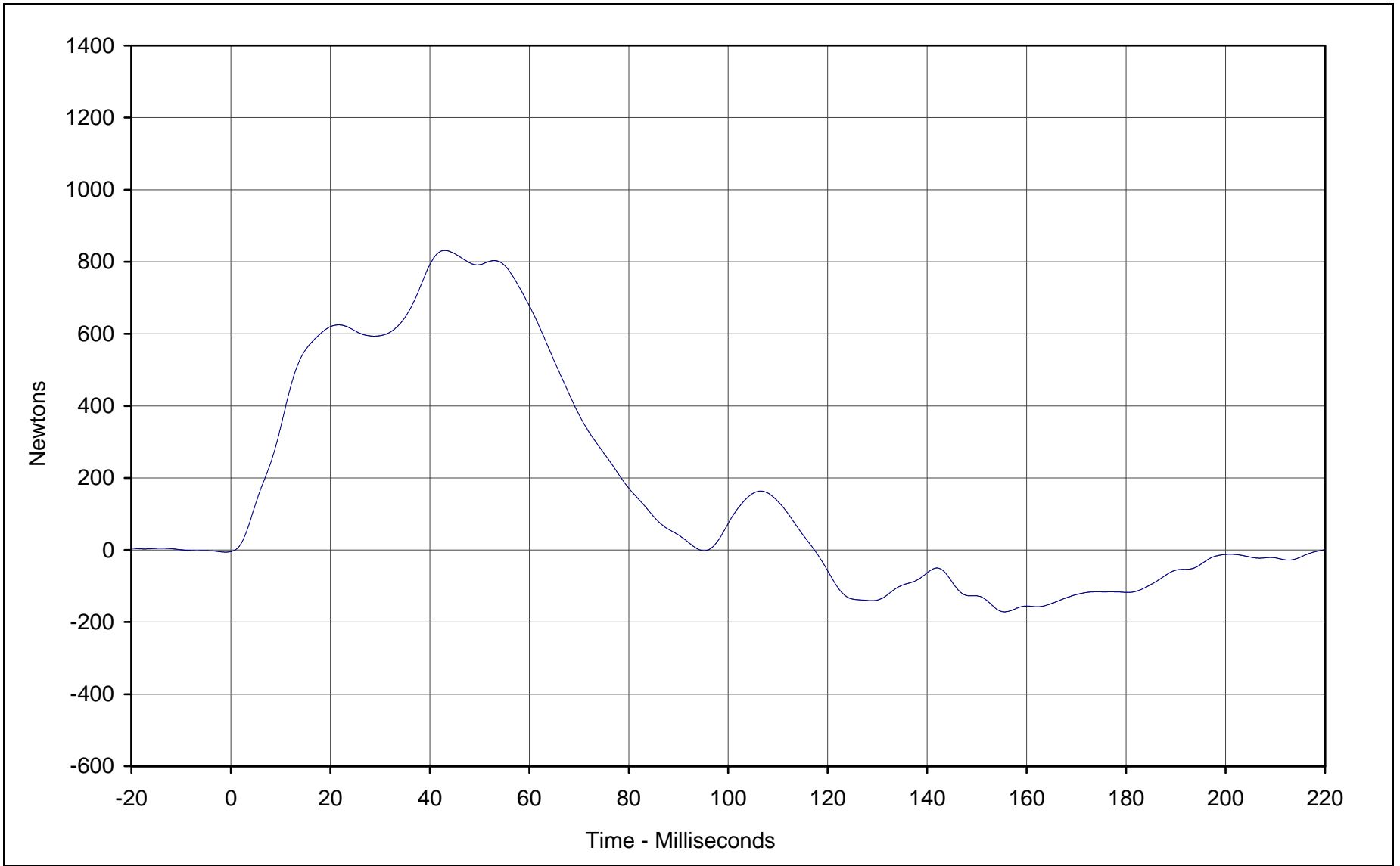
Curve Description: Pendulum Deceleration  
Maximum Value: 24.2 at 4.6 Milliseconds  
Minimum Value: -2.8 at 88.8 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 034

Testing Program: Hybrid III Neck Flexion Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NF00B



KAR20001-08

E-12

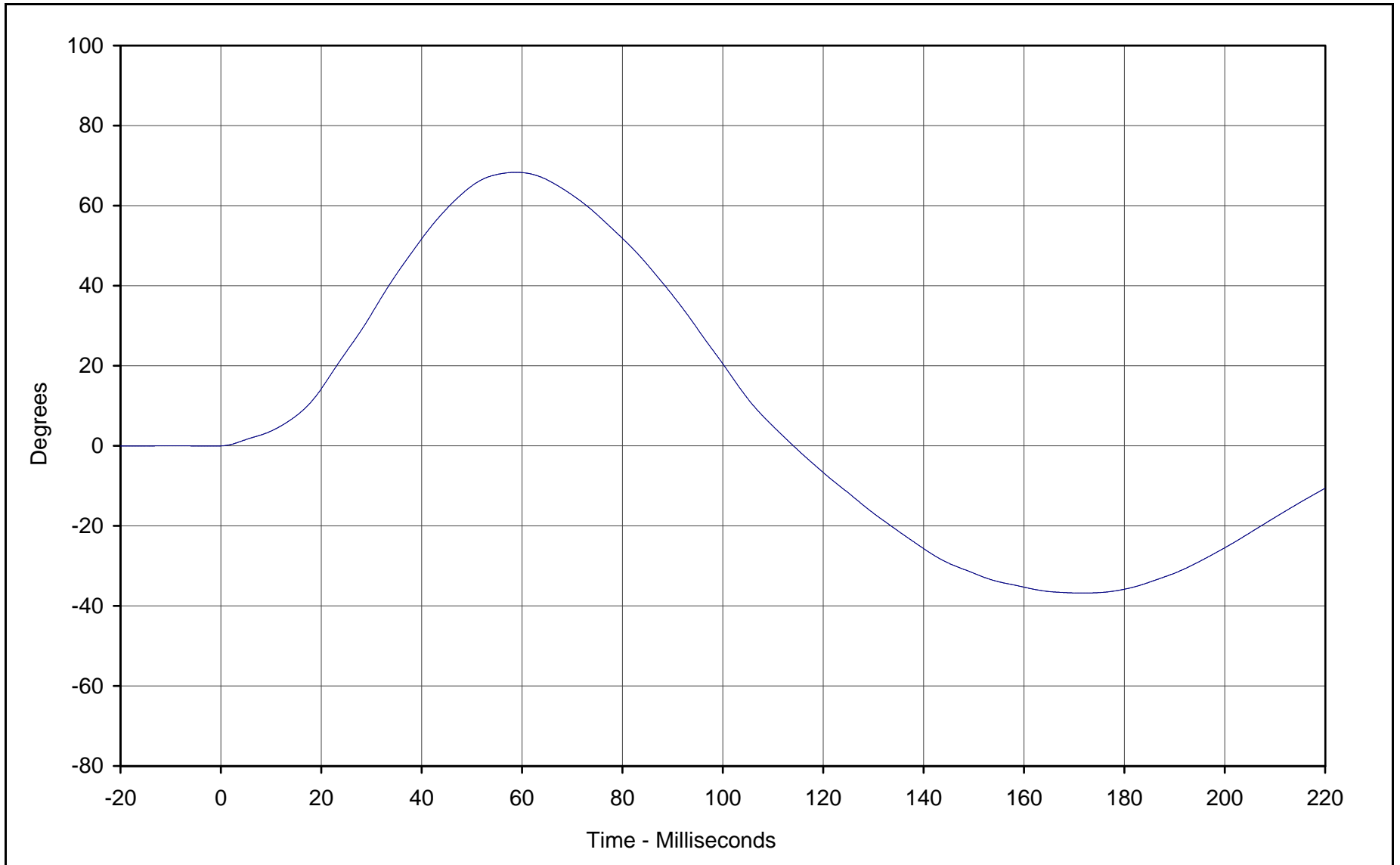


Curve Description: Neck Force X  
Maximum Value: 831.2 at 43.0 Milliseconds  
Minimum Value: -171.6 at 155.6 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 034

Testing Program: Hybrid III Neck Flexion Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NF00B



KARR20001-08



Curve Description: "D" Plane Rotation

Maximum Value: 68.3 at 58.7 Milliseconds

Minimum Value: -36.8 at 171.6 Milliseconds

SAE Filter Class: 60

Date of Test: 1/5/00

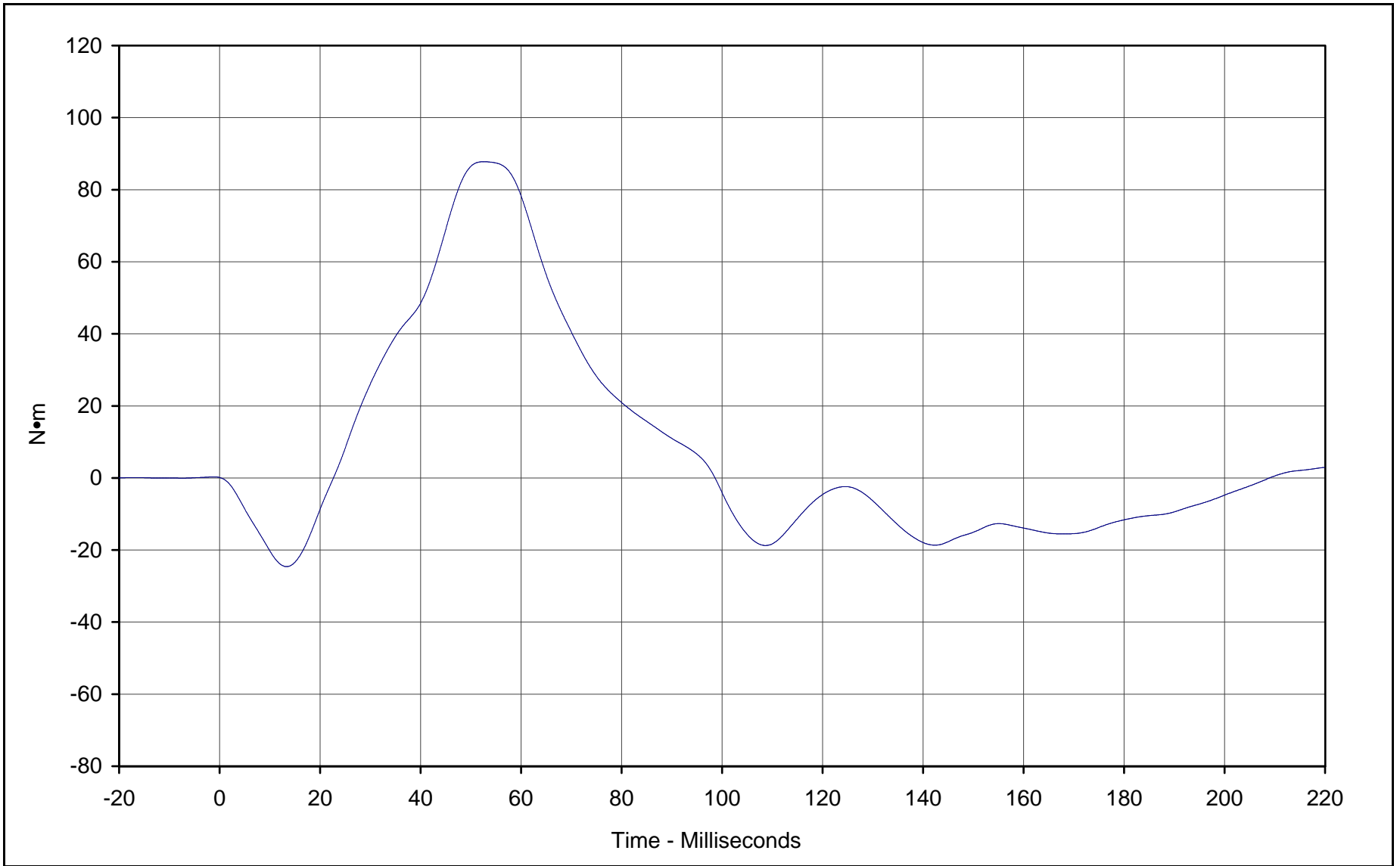
ATD Serial No.: 034

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF00B



E-14



Curve Description: Moment About Occipital Condyles  
Maximum Value: 87.8 at 52.6 Milliseconds  
Minimum Value: -24.6 at 13.3 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 034

Testing Program: Hybrid III Neck Flexion Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NF00B



KARR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Neck Extension Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: NE00A

Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass	
Laboratory Relative Humidity	%	10 to 70	36	Pass	
Pendulum Velocity	m/s	5.95 to 6.19	6.09	Pass	
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.7	Pass
	20 Msec.	G's	14.0 to 19.0	16.4	Pass
	30 Msec.	G's	11.0 to 16.0	15.1	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 22.0	15.1	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	38.0 to 46.0	44.8	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	91.4	Pass
	Time	Msec.	72.0 to 82.0	79.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	147.0 to 174.0	153.4	Pass	
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-65.1	Pass
	Time	Msec.	65.0 to 79.0	66.8	Pass
Negative Moment Decay, Time To Zero Crossing	Msec.	120.0 to 148.0	139.0	Pass	
Overall Test Results				Pass	

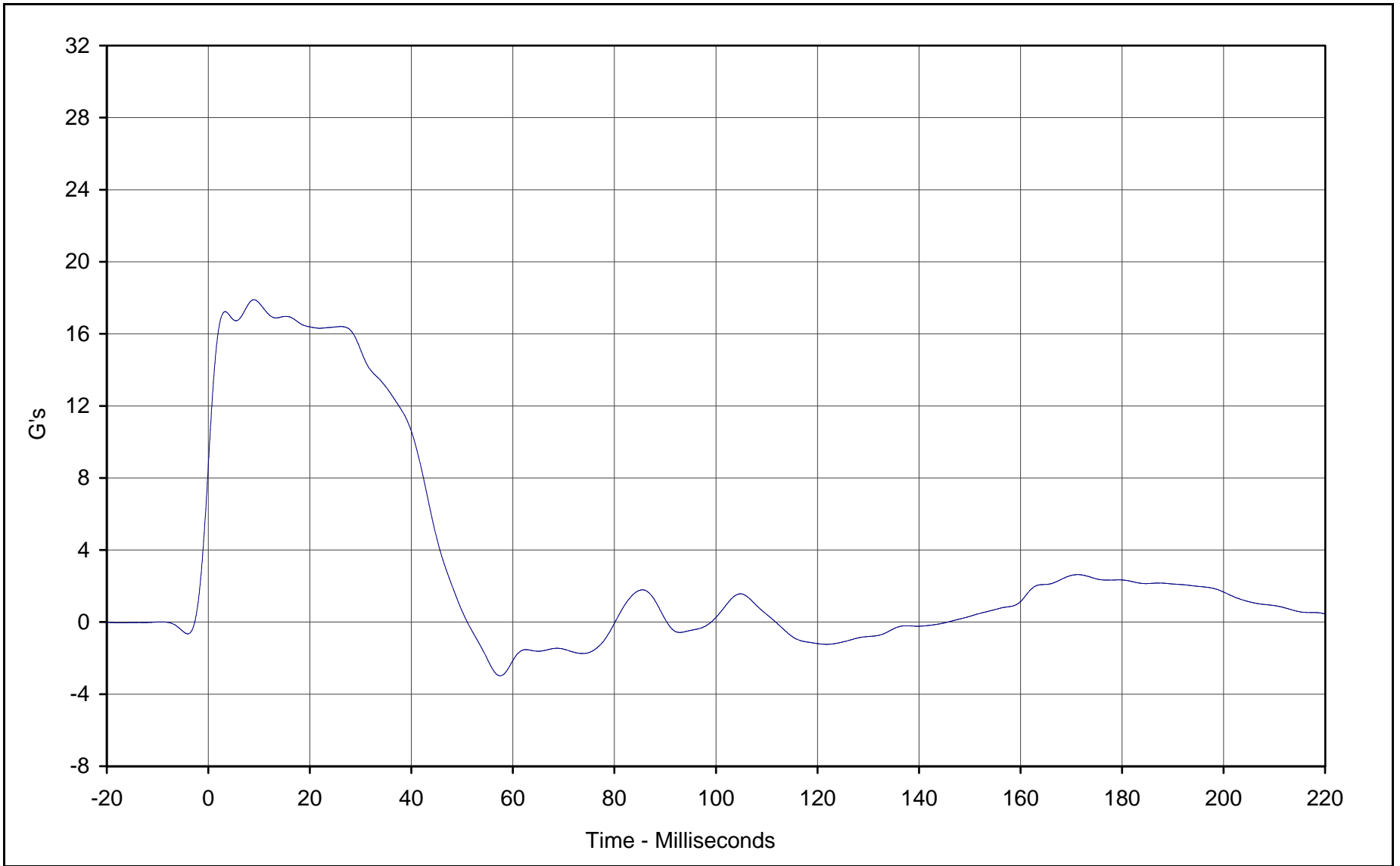
\_\_\_\_\_  
Laboratory Technician

\_\_\_\_\_  
January 5, 2000  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-16



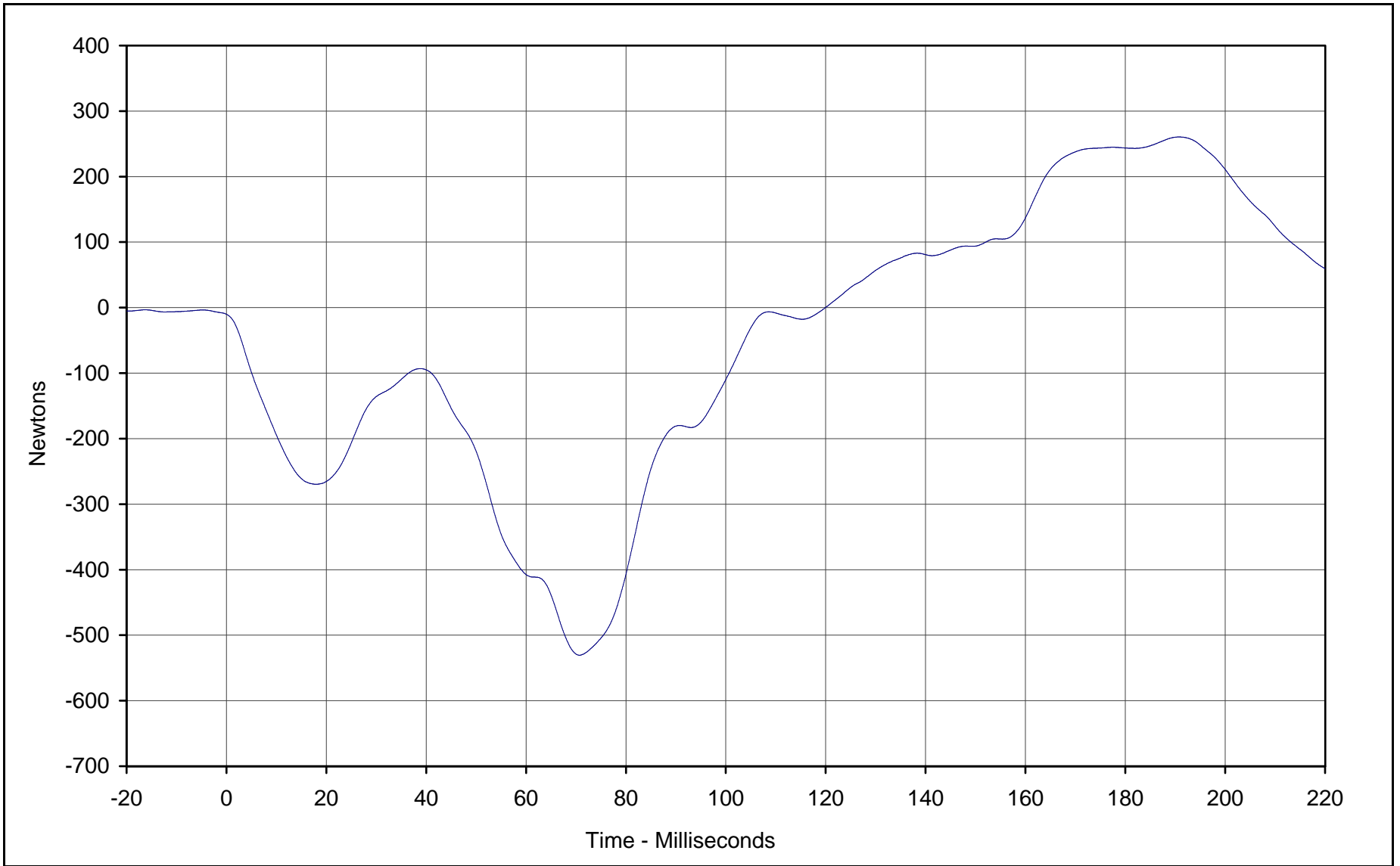
Curve Description: Pendulum Deceleration  
Maximum Value: 17.9 at 9.0 Milliseconds  
Minimum Value: -3.0 at 57.5 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NE00A



KAR20001-08

E-17

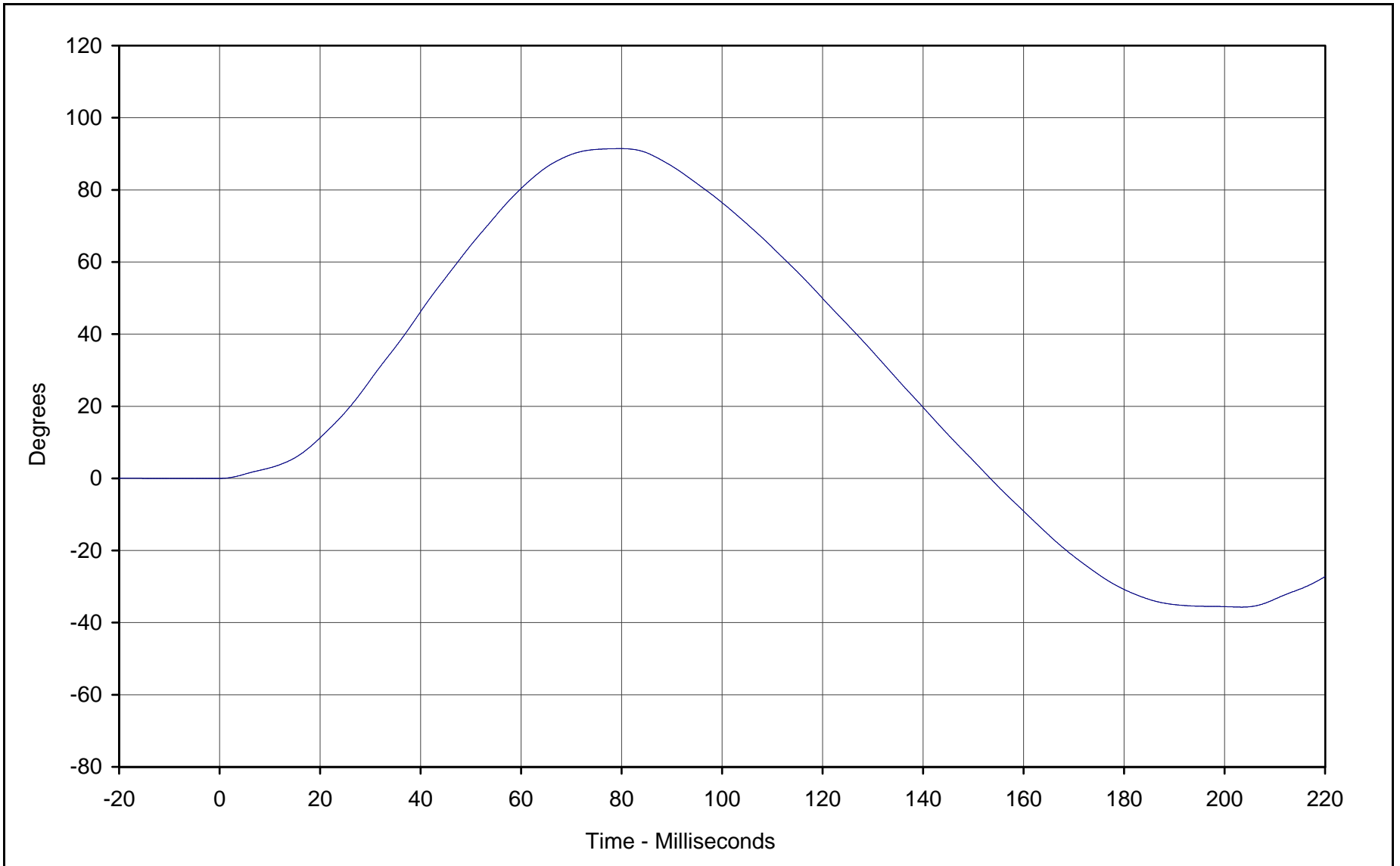


Curve Description: Neck Force X  
Maximum Value: 260.5 at 190.8 Milliseconds  
Minimum Value: -530.6 at 70.7 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NE00A

KARR20001-08

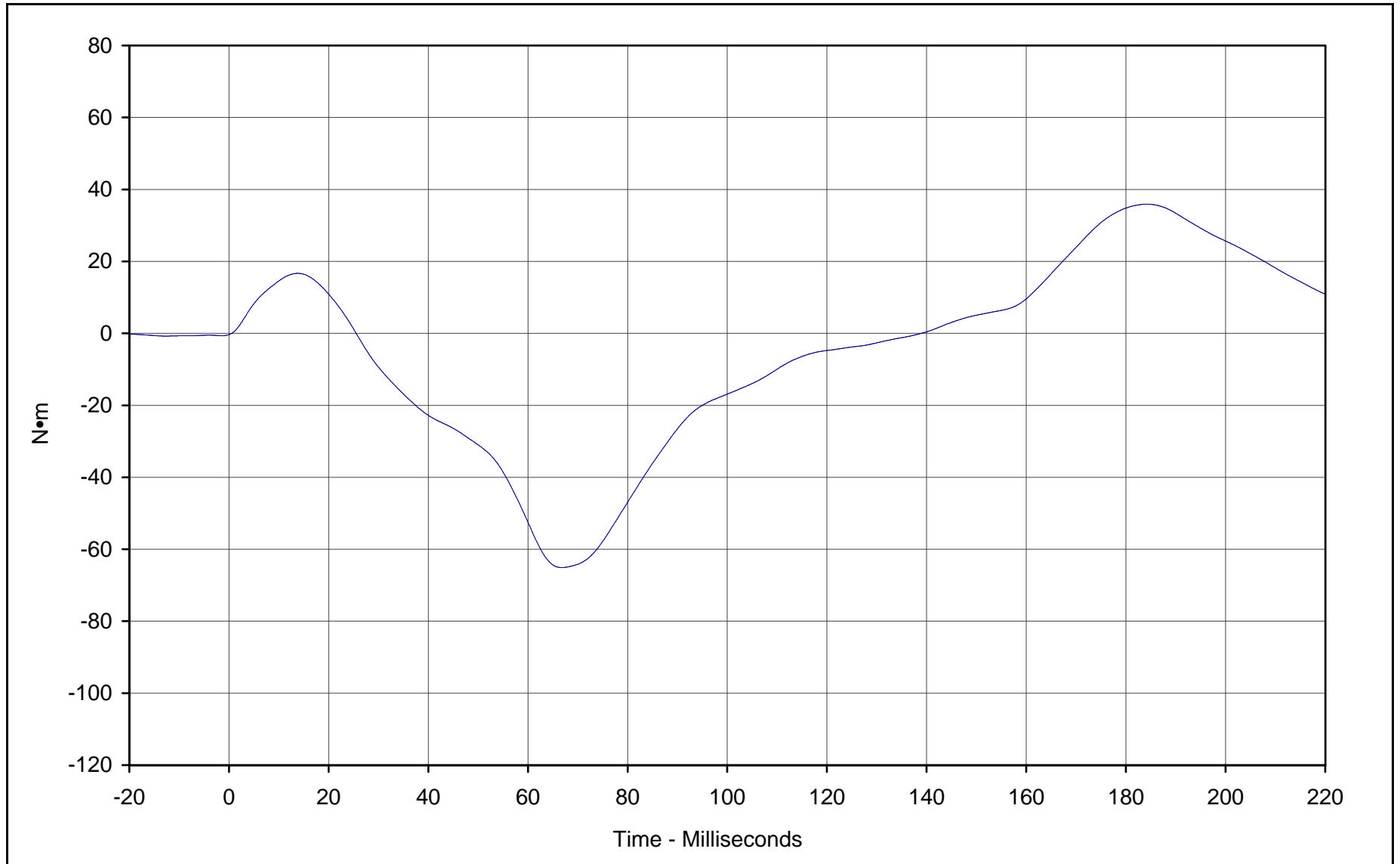




Curve Description: "D" Plane Rotation  
 Maximum Value: 91.4 at 79.7 Milliseconds  
 Minimum Value: -35.7 at 203.4 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/5/00  
 ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)  
 Test Information: S/N of Part: n/a Test I.D.: NE00A





Curve Description: Moment About Occipital Condyles  
 Maximum Value: 35.9 at 184.3 Milliseconds  
 Minimum Value: -65.1 at 66.8 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/5/00  
 ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NE00A





# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### External Measurements

ATD Serial No.: 034

Part Serial No.: N/A

Test I.D.: N/A

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43	Pass
A - Total sitting height	mm	878.8 to 889.0	885.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	502.0	Pass
C - "H" point height	mm	83.8 to 88.9	87.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	135.0	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	92.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	150.0	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	300.0	Pass
H - Skull cap to back line	mm	40.6 to 45.7	43.0	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	342.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	204.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	585.0	Pass
L - Popliteal length	mm	429.3 to 454.7	434.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	492.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	470.0	Pass
O - Chest depth	mm	213.4 to 228.6	215.0	Pass
P - Foot length	mm	251.5 to 266.7	260.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	431.0	Pass
W - Foot breadth	mm	91.4 to 106.7	102.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	986.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	850.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	433.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	229.0	Pass
Overall Test Results				Pass

\_\_\_\_\_  
Laboratory Technician

January 12, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Left Knee Impact Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: KN00C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.128	Pass
Peak Probe Force	Newtons	4715 to 5782	5585.2	Pass
Overall Test Results				Pass

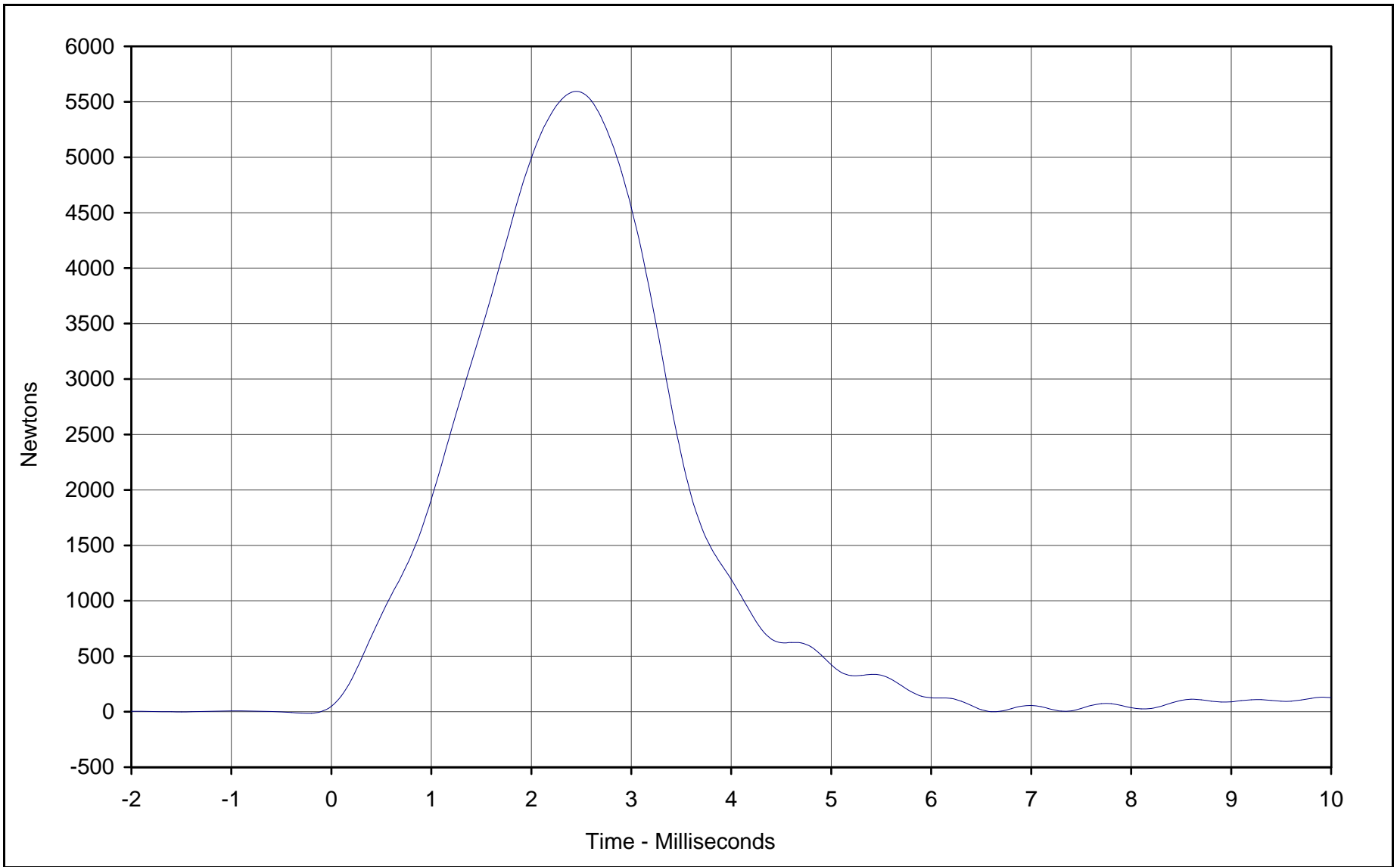
\_\_\_\_\_  
Laboratory Technician

January 6, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-22



Curve Description: Probe Force  
Maximum Value: 5585.2 at 2.5 Milliseconds  
Minimum Value: -13.7 at -0.2 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/6/00  
ATD Serial No.: 035

Testing Program: Hybrid III Left Knee Impact Test  
Test Information: Part S/N: n/a Test I.D.: KN00C



KAR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Right Knee Impact Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: KN00D

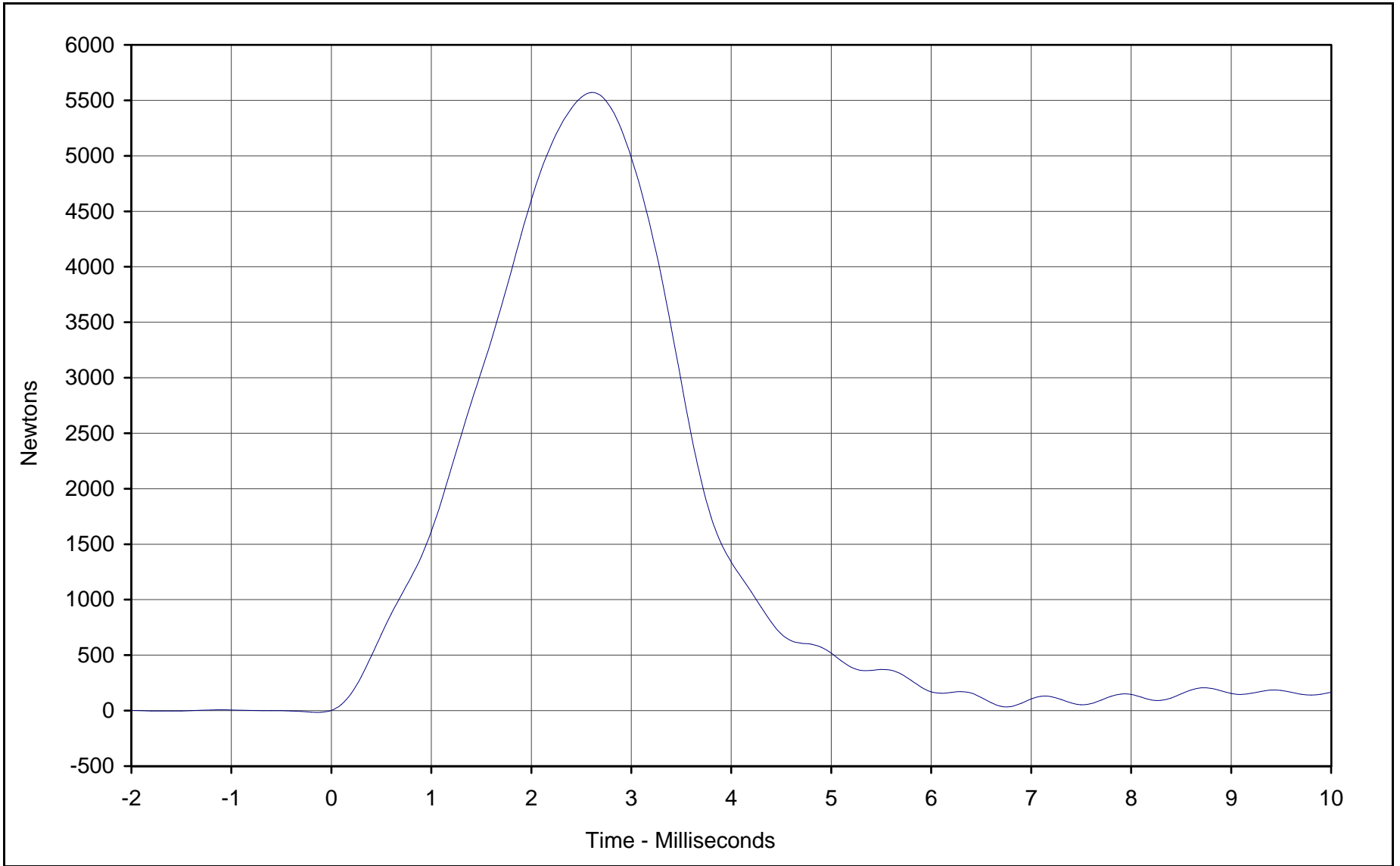
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.106	Pass
Peak Probe Force	Newtons	4715 to 5782	5570.4	Pass
Overall Test Results				Pass

\_\_\_\_\_  
Laboratory Technician

January 6, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date



Curve Description: Probe Force  
Maximum Value: 5570.4 at 2.6 Milliseconds  
Minimum Value: -14.8 at -0.1 Milliseconds  
SAE Filter Class: 600  
Date of Test: 1/6/00  
ATD Serial No.: 035

Testing Program: Hybrid III Right Knee Impact Test  
Test Information: Part S/N: n/a Test I.D.: KN00D





# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Head Drop Calibration

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: HD00A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	244.7	Pass
Peak Lateral Acceleration	G's	≤15.0	3.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

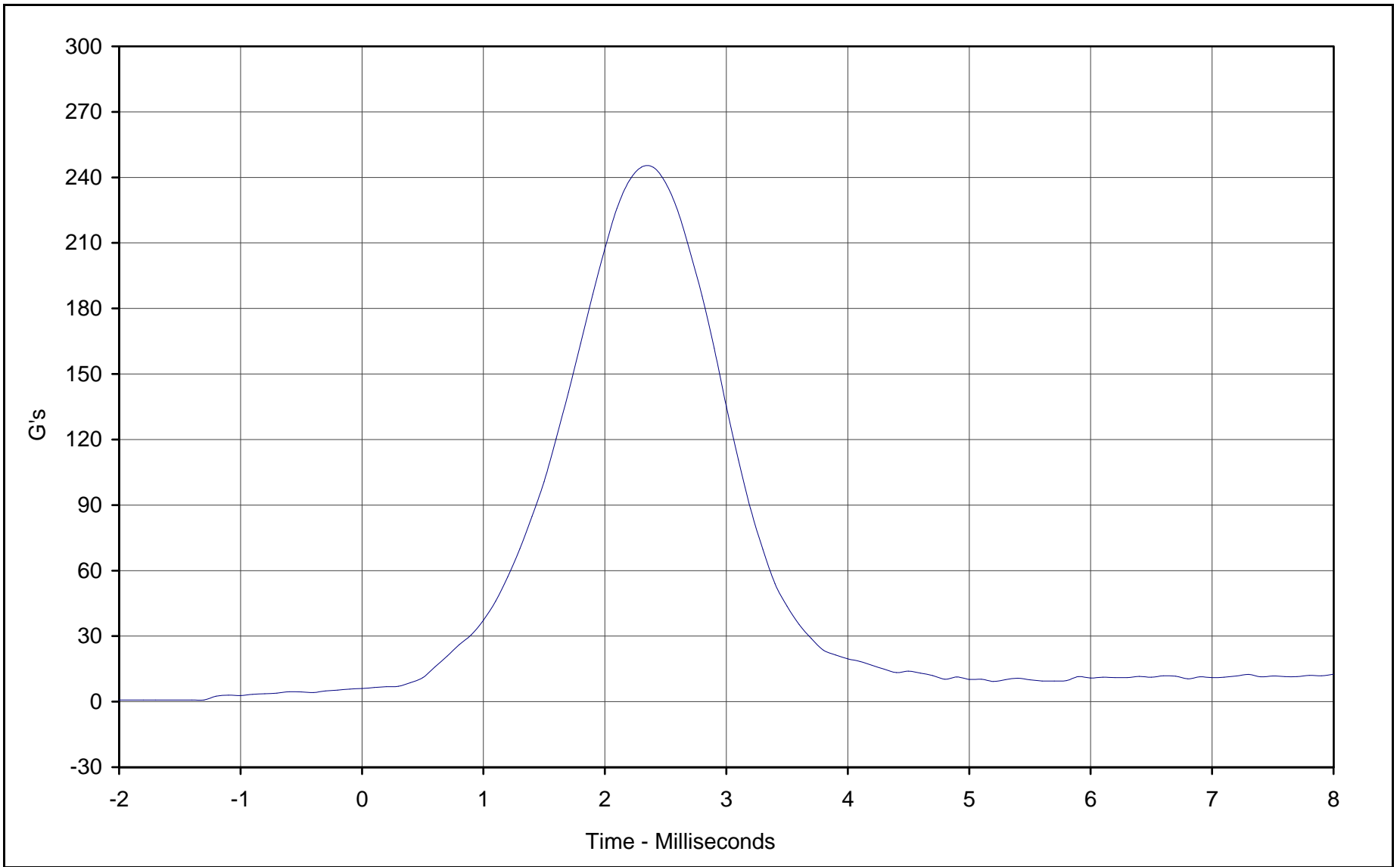
\_\_\_\_\_  
Laboratory Technician

January 4, 2000  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-26



Curve Description: Head Resultant Acceleration

Maximum Value: 244.7 at 2.3 Milliseconds

Minimum Value: 0.8 at -2.0 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/4/00

ATD Serial No.: 035

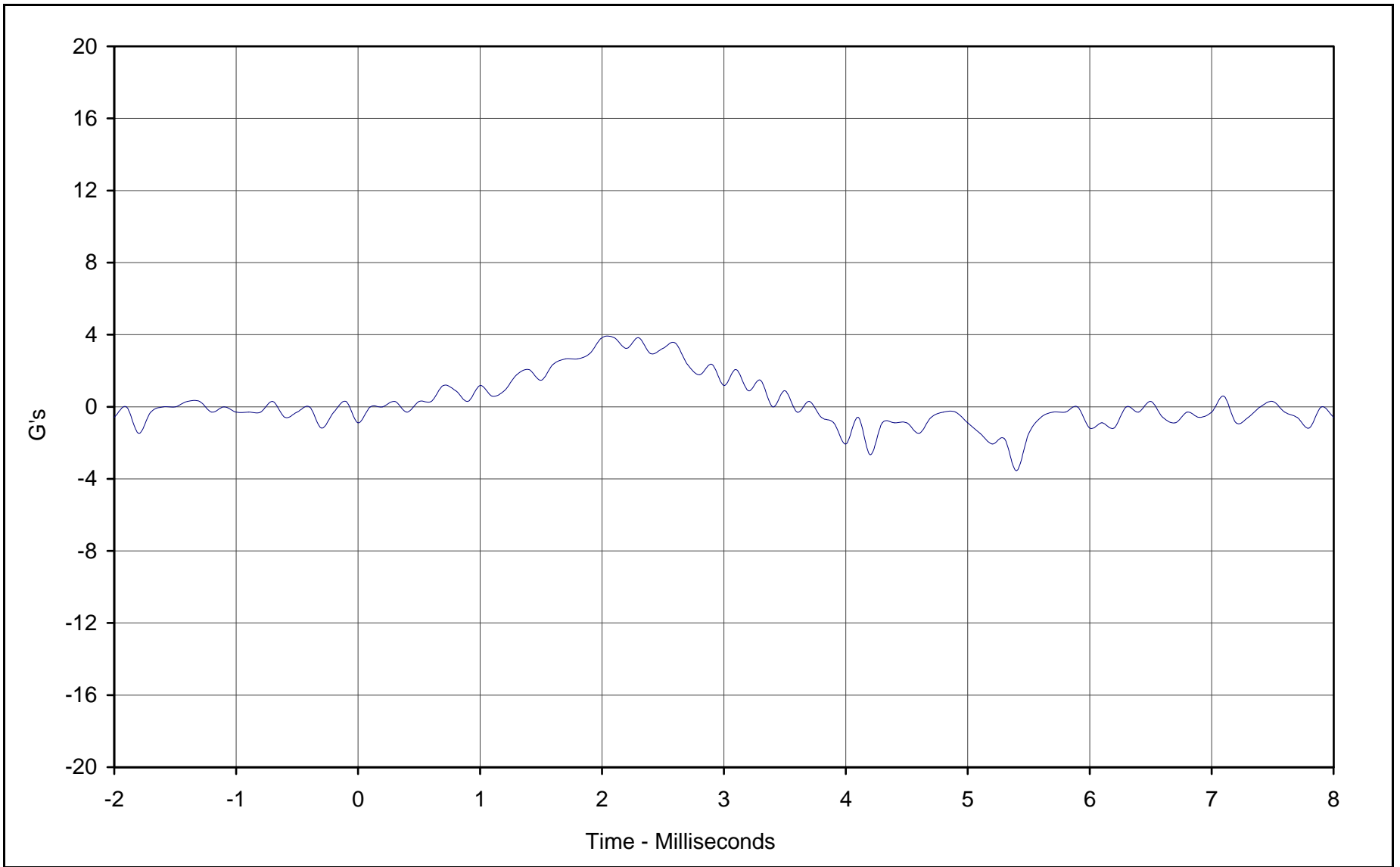
Testing Program: Hybrid III Head Drop Calibration (Male)

Test Information: S/N of Part: n/a Test I.D.: HD00A



KAR20001-08

E-27



Curve Description: Head Acceleration Y Axis

Maximum Value: 3.8 at 2.0 Milliseconds

Minimum Value: -3.5 at 5.4 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/4/00

ATD Serial No.: 035

Testing Program: Hybrid III Head Drop Calibration (Male)

Test Information: S/N of Part: n/a Test I.D.: HD00A



KAR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Thorax Impact Test

ATD Serial No.: 035

Part Serial No.: N/A

Test I.D.: CH00B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	Newtons	5159 to 5893	5665	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.59	Pass
Internal Hysteresis	%	69 to 85	76.6	Pass
Overall Test Results				Pass

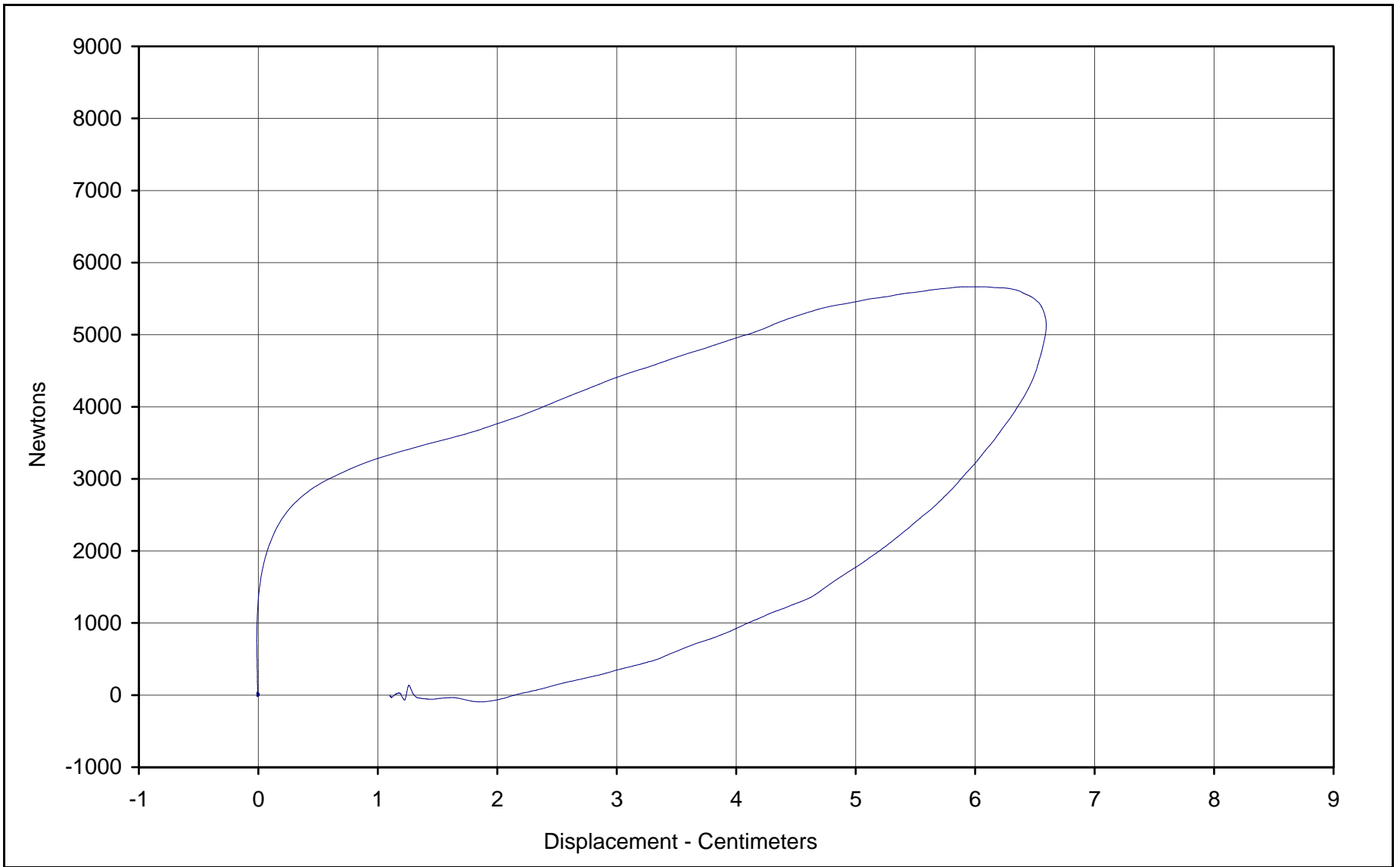
\_\_\_\_\_  
Laboratory Technician

January 6, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-29



Curve Description: Probe Force vs. Chest Displacement

Testing Program: Hybrid III Thorax Impact Test

Probe Force: 5665.2 Newtons

Test Information: S/N of Part: N/A Test I.D.: CH00B

Chest Displ.: 6.59 Centimeters

SAE Filter Class: 180

Date of Test: 1/6/00

ATD Serial No.: 035



KAR20001-08



# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Neck Flexion Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: NF00A

Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass	
Laboratory Relative Humidity	%	10 to 70	40	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	7.00	Pass	
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.3	Pass
	20 Msec.	G's	17.6 to 22.6	19.6	Pass
	30 Msec.	G's	12.5 to 18.5	16.0	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 29.0	16.0	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	34.0 to 42.0	41.3	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	66.5	Pass
	Time	Msec.	57.0 to 64.0	63.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	113.0 to 128.0	124.1	Pass	
Moment About Occipital Condyle	Maximum	N•m	84.1 to 108.5	87.8	Pass
	Time	Msec.	47.0 to 58.0	57.2	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	97.0 to 107.0	101.5	Pass	
Overall Test Results				Pass	

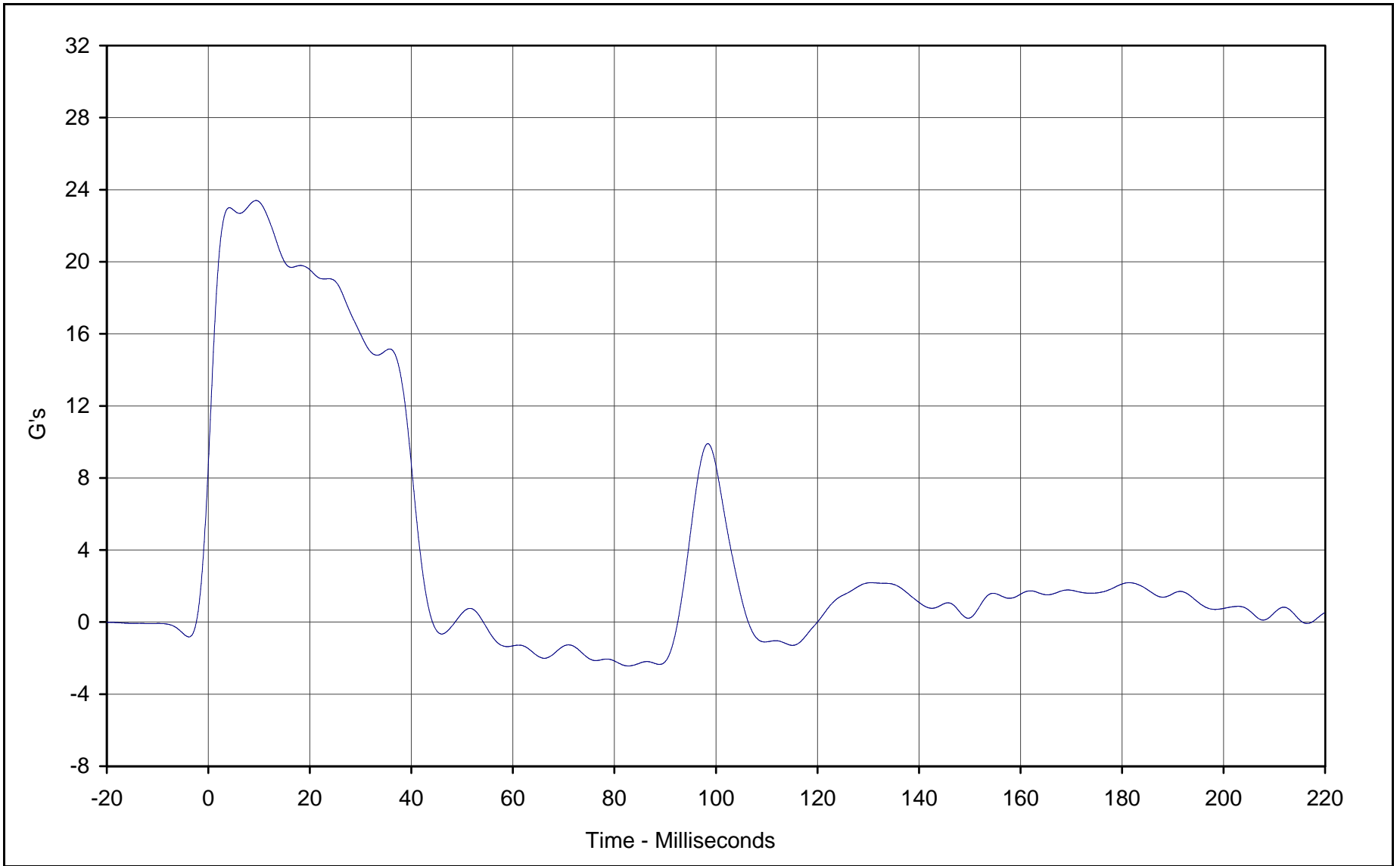
\_\_\_\_\_  
Laboratory Technician

January 5, 2000  
\_\_\_\_\_  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-31

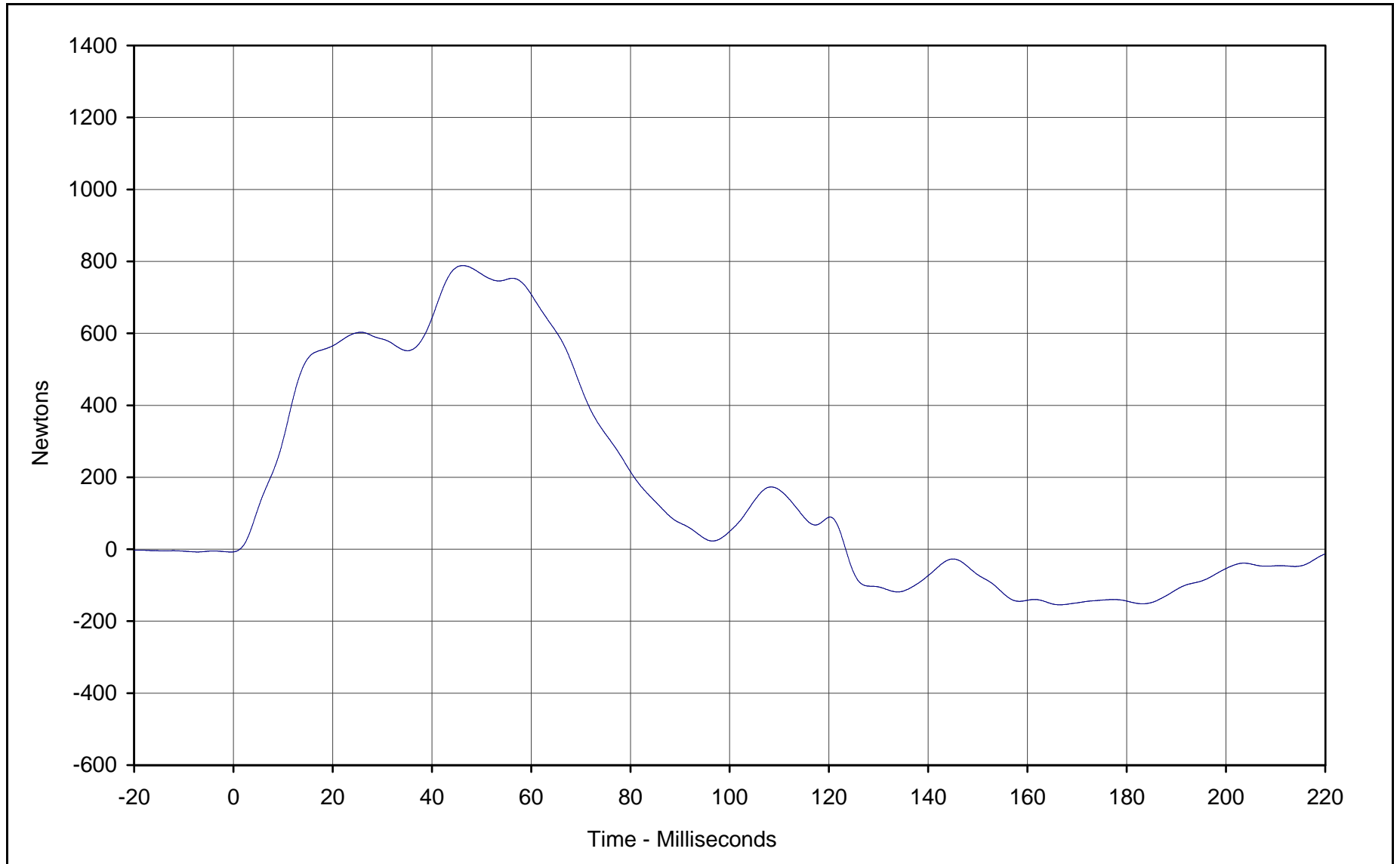


Curve Description: Pendulum Deceleration  
Maximum Value: 23.4 at 9.4 Milliseconds  
Minimum Value: -2.4 at 82.8 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NF00A



KAR20001-08



Curve Description: Neck Force X

Maximum Value: 788.3 at 46.2 Milliseconds

Minimum Value: -154.5 at 166.5 Milliseconds

SAE Filter Class: 60

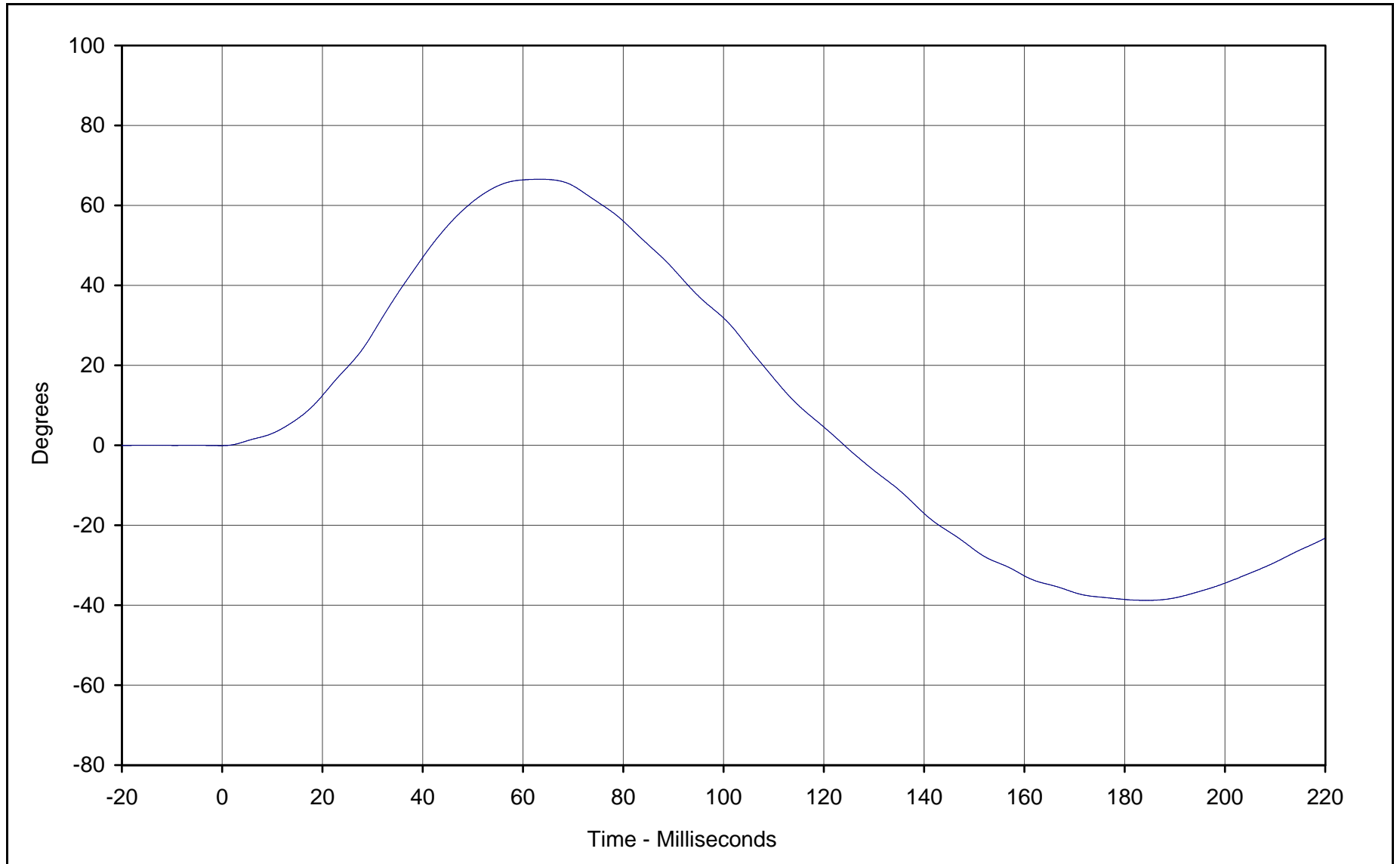
Date of Test: 1/5/00

ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF00A

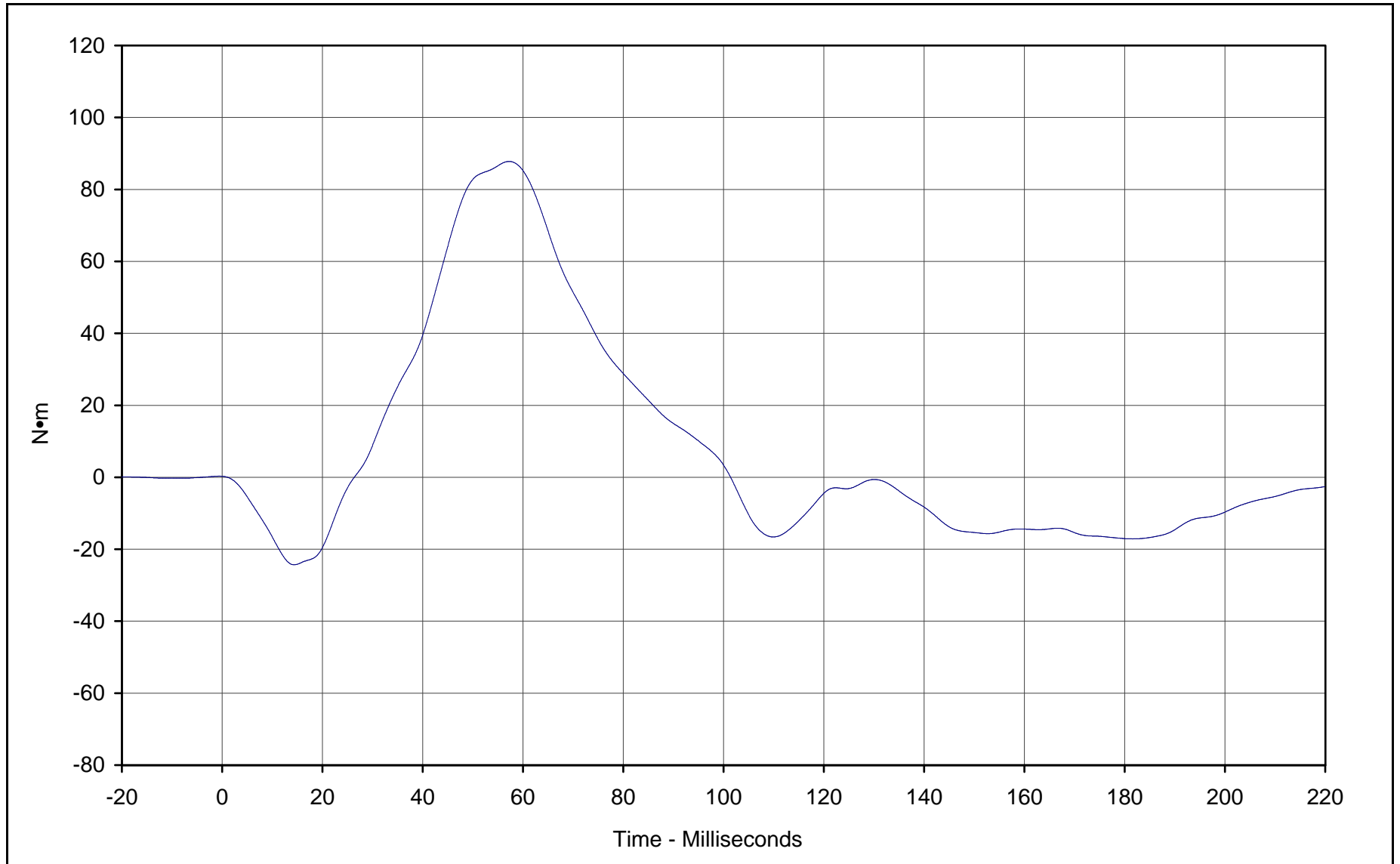




Curve Description: "D" Plane Rotation  
 Maximum Value: 66.5 at 63.4 Milliseconds  
 Minimum Value: -38.8 at 184.4 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/5/00  
 ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)  
 Test Information: S/N of Part: n/a Test I.D.: NF00A





Curve Description: Moment About Occipital Condyles  
 Maximum Value: 87.8 at 57.2 Milliseconds  
 Minimum Value: -24.3 at 14.4 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/5/00  
 ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF00A





# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### Neck Extension Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: NE00B

Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass	
Laboratory Relative Humidity	%	10 to 70	36	Pass	
Pendulum Velocity	m/s	5.95 to 6.19	6.08	Pass	
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.3	Pass
	20 Msec.	G's	14.0 to 19.0	17.0	Pass
	30 Msec.	G's	11.0 to 16.0	15.7	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 22.0	15.7	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	38.0 to 46.0	45.0	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	92.2	Pass
	Time	Msec.	72.0 to 82.0	78.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	147.0 to 174.0	158.6	Pass	
Moment About Occipital Condyle	Maximum	N•m	-52.9 to- 79.9	-70.0	Pass
	Time	Msec.	65.0 to 79.0	68.2	Pass
Negative Moment Decay, Time To Zero Crossing	Msec.	120.0 to 148.0	136.9	Pass	
Overall Test Results				Pass	

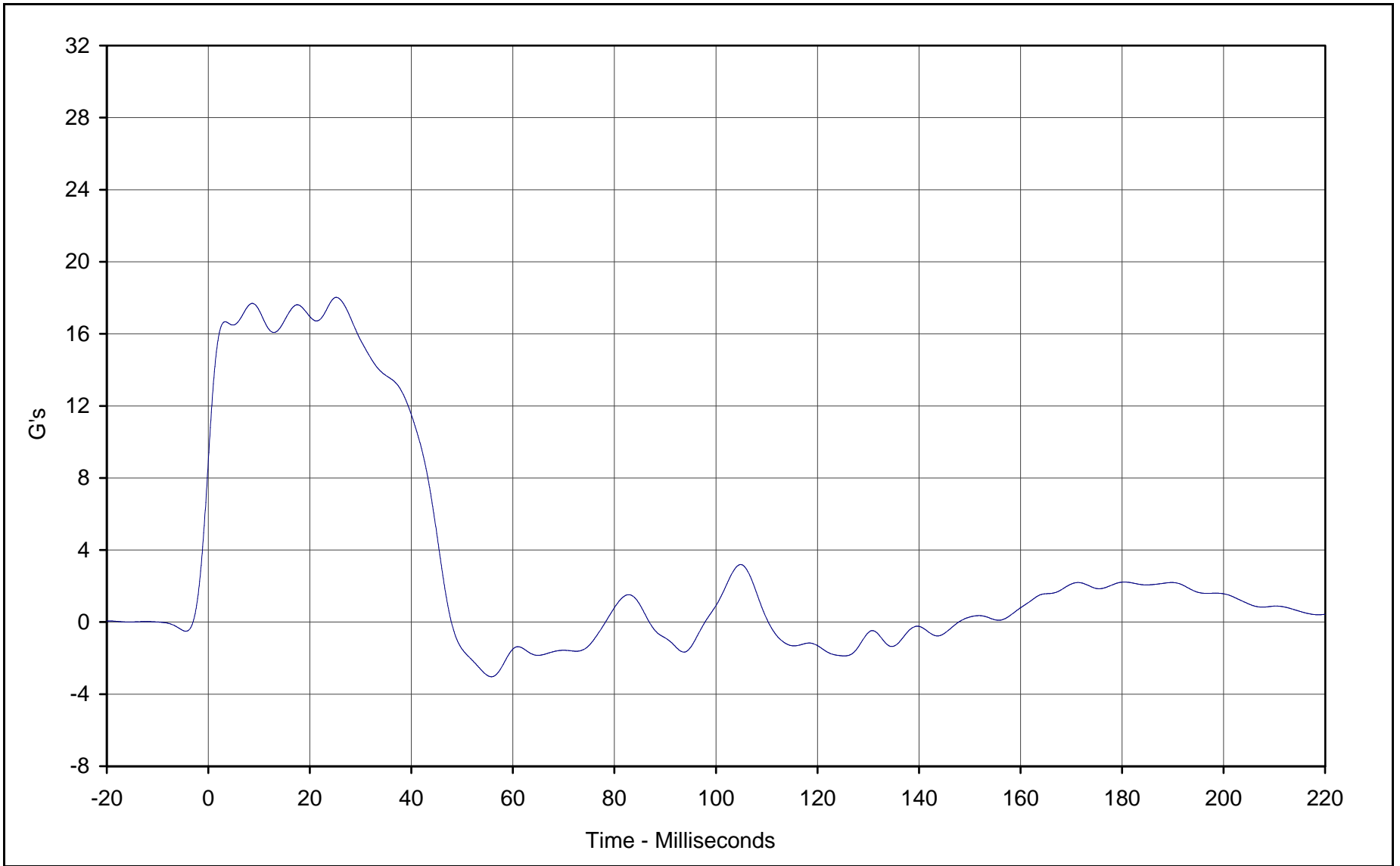
\_\_\_\_\_  
Laboratory Technician

\_\_\_\_\_  
January 5, 2000  
Test Date

\_\_\_\_\_  
Approved By

\_\_\_\_\_  
Date

E-36



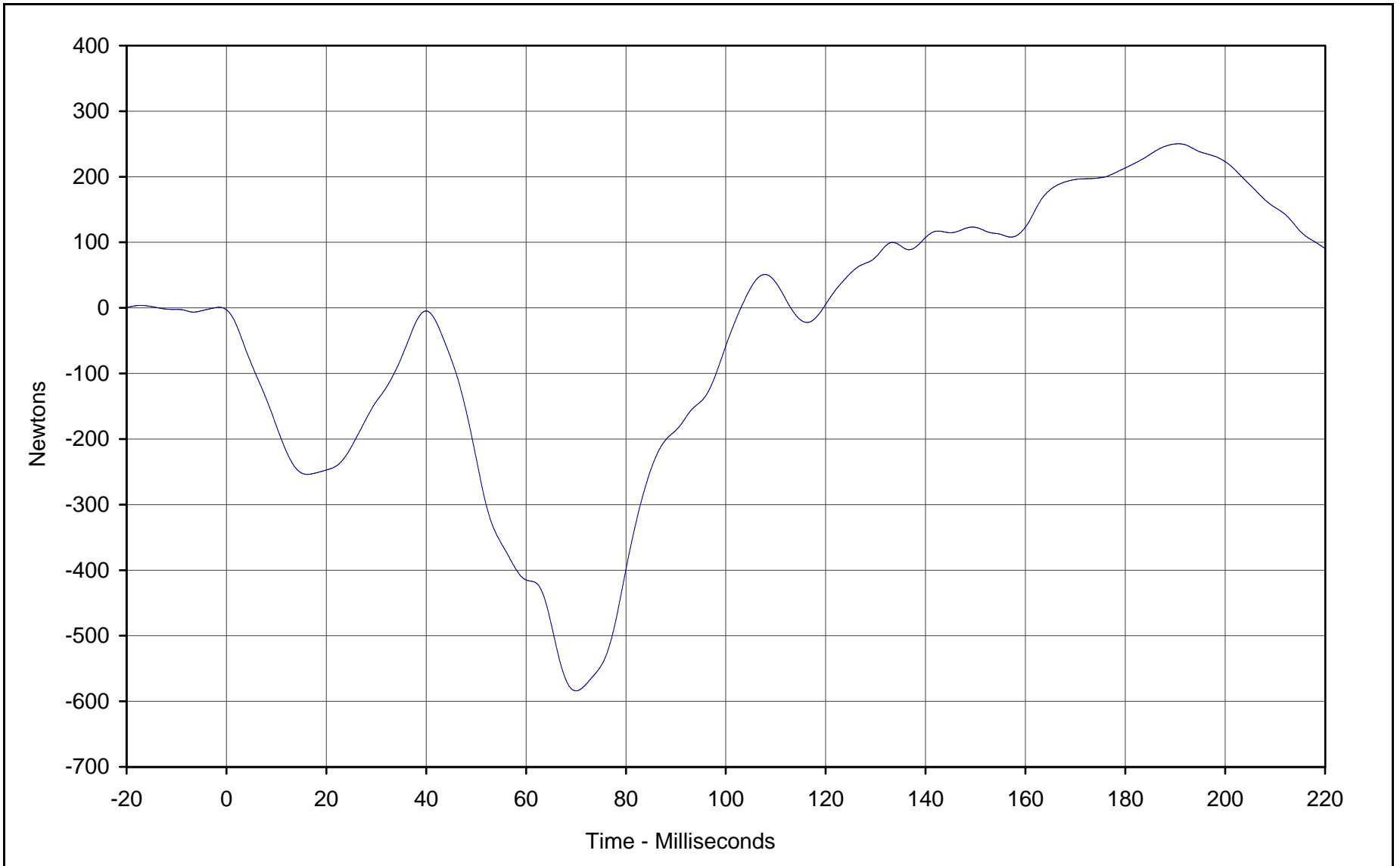
Curve Description: Pendulum Deceleration  
Maximum Value: 18.0 at 25.2 Milliseconds  
Minimum Value: -3.0 at 55.8 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 035

Testing Program: Hybrid III Neck Extension Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NE00B



KAR20001-08

E-37

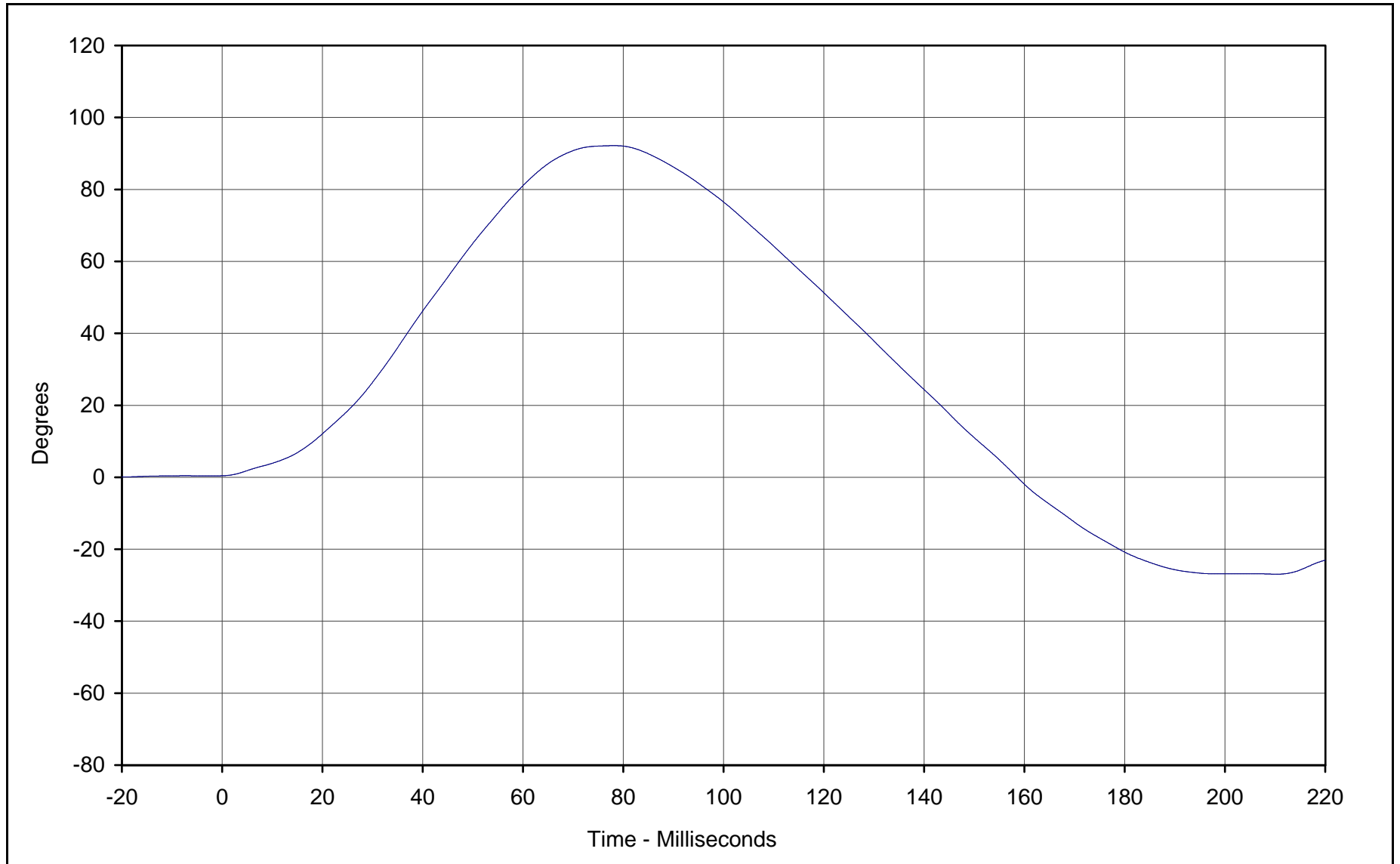


Curve Description: Neck Force X  
Maximum Value: 250.3 at 190.6 Milliseconds  
Minimum Value: -584.0 at 70.0 Milliseconds  
SAE Filter Class: 60  
Date of Test: 1/5/00  
ATD Serial No.: 035

Testing Program: Hybrid III Neck Extension Test (Male)  
Test Information: S/N of Part: n/a Test I.D.: NE00B



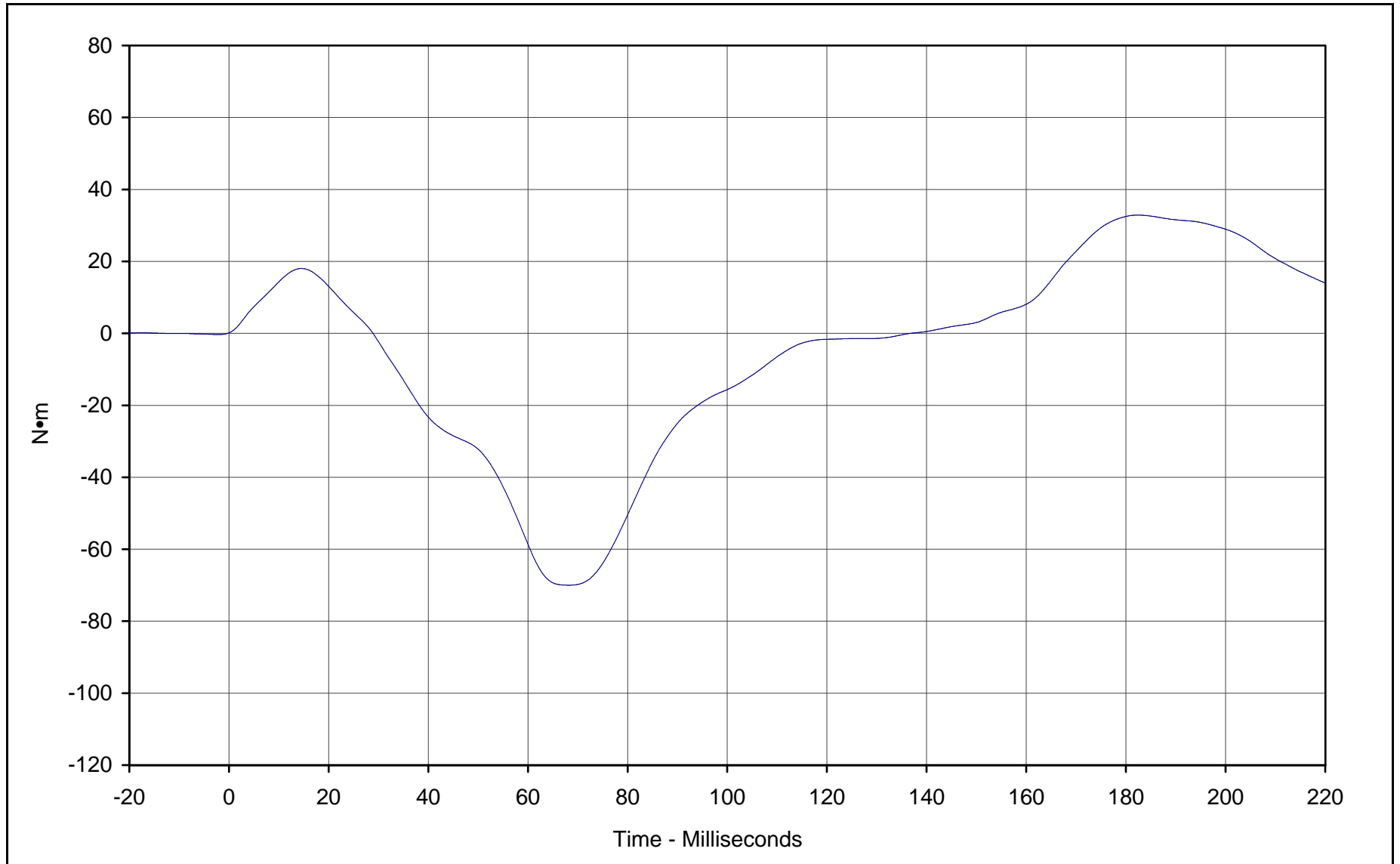
KARR20001-08



Curve Description: "D" Plane Rotation  
 Maximum Value: 92.2 at 78.2 Milliseconds  
 Minimum Value: -26.9 at 210.4 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/5/00  
 ATD Serial No.: 035

Testing Program: Hybrid III Neck Extension Test (Male)  
 Test Information: S/N of Part: n/a Test I.D.: NE00B





Curve Description: Moment About Occipital Condyles  
 Maximum Value: 32.9 at 182.4 Milliseconds  
 Minimum Value: -70.0 at 68.2 Milliseconds  
 SAE Filter Class: 60  
 Date of Test: 1/5/00  
 ATD Serial No.: 035

Testing Program: Hybrid III Neck Extension Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NE00B





# Hybrid III Calibration Data Sheet

## 50<sup>TH</sup> Percentile Male

### External Measurements

ATD Serial No.: 035

Part Serial No.: N/A

Test I.D.: N/A

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43	Pass
A - Total sitting height	mm	878.8 to 889.0	887.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	501.0	Pass
C - "H" point height	mm	83.8 to 88.9	86.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	137.0	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	91.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	145.0	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	290.0	Pass
H - Skull cap to back line	mm	40.6 to 45.7	42.0	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	340.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	207.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	590.0	Pass
L - Popliteal length	mm	429.3 to 454.7	435.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	491.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	472.0	Pass
O - Chest depth	mm	213.4 to 228.6	221.0	Pass
P - Foot length	mm	251.5 to 266.7	260.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	440.0	Pass
W - Foot breadth	mm	91.4 to 106.7	104.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	999.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	860.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	432.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	228.0	Pass
Overall Test Results				Pass

\_\_\_\_\_  
Laboratory Technician


January 12, 2000  
\_\_\_\_\_  
Test Date

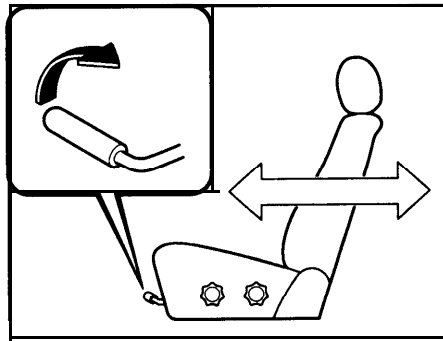
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Approved By

\_\_\_\_\_  
Date

**APPENDIX F**  
**VEHICLE OWNER'S MANUAL**  
**OCCUPANT RESTRAINT INSTRUCTIONS**


Front Seats

 <b>WARNING</b>
<b><u>Securing the Front Seats:</u></b> Adjustable seats and seatbacks that are not securely latched are dangerous. In a sudden stop or collision, the seat or seatback could move, causing injury. Make sure the adjustable components of the seat are locked in place.

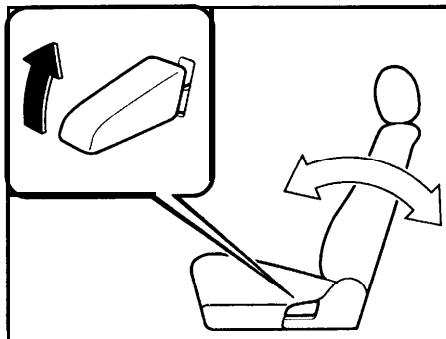


■ Seat Slide

To move each individual front seat forward or backward, raise the lever and slide the seat to the desired position.

 <b>WARNING</b>
<b><u>Driver's Seat Adjustment:</u></b> Adjusting the driver's seat while the vehicle is moving is dangerous. The driver could lose control of the vehicle and have an accident. Adjust the driver's seat only when the vehicle is stopped.


2-2




■ Seat Recline

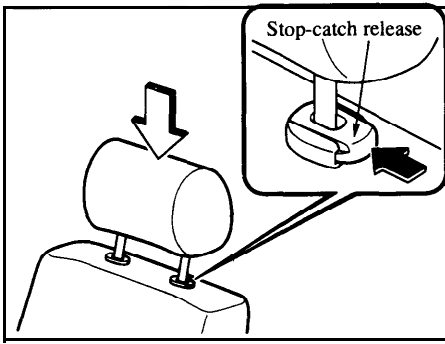
To change each individual seatback angle, lean forward slightly while raising the lever. Then lean back to the desired position and release the lever.

Make sure the lever returns to its original position.

 <b>WARNING</b>
<b><u>Reclining:</u></b> Sitting in a reclined position while the vehicle is moving is dangerous because you don't get the full protection from seat belts. During sudden braking or a collision, you can slide under the lap belt and suffer serious internal injuries. For maximum protection, sit well back and upright.

■ Head Restraint

 <b>WARNING</b>
<b><u>Head Restraints Adjustment:</u></b> Driving with the head restraints adjusted too low or removed is dangerous. With no support behind your head, your neck could be seriously injured in a collision. Always drive with the head restraints inserted when seats are being used and make sure they are properly adjusted.

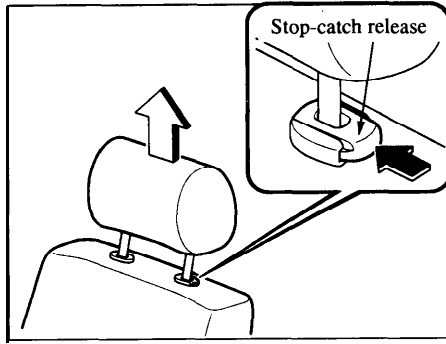


▼ Height adjustment

To raise a head restraint, pull it up to the desired position.

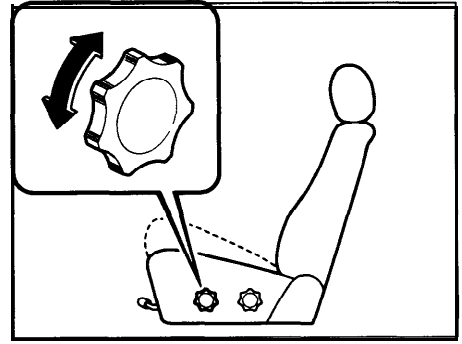
To lower the head restraint, press the stop-catch release, then push the head restraint down.

Adjust the head restraint so that the top parallels the top of the passenger's ears, never the passenger's neck.



▼ Removal

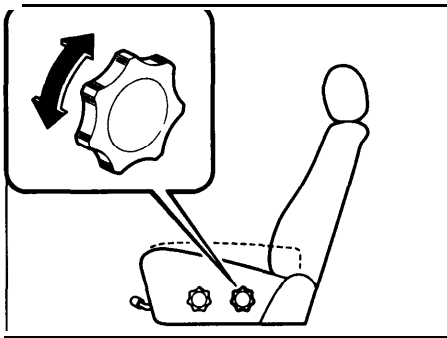
To remove the head restraint, press the stop-catch release, then pull up on the head restraint.



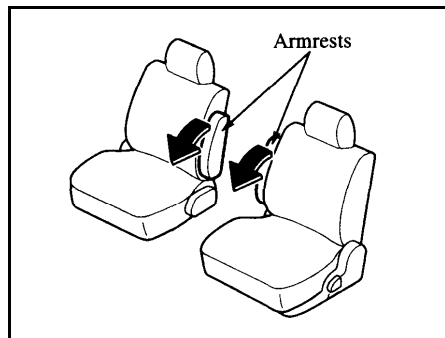
■ Seat Tilt (Driver's Seat)\*

The seat-bottom angle can be adjusted by rotating the dial. The front dial tilts the front of the seat bottom upward.

2-4 \*Some models.



The seat-bottom angle can be adjusted by rotating the dial. The rear dial tilts the rear of the seat bottom upward.



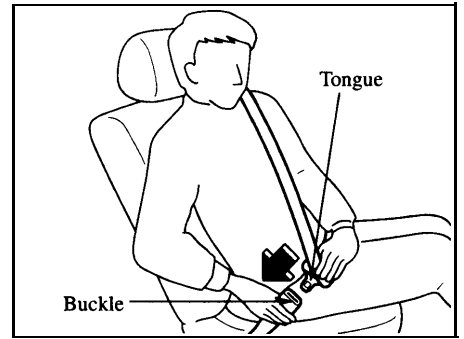
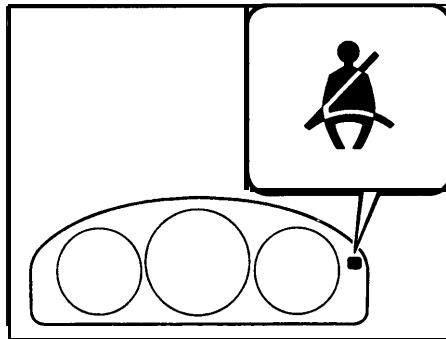
■ Armrest

The armrests can be used or placed upright.

**⚠ WARNING**

**Twisted Seat Belts:**

Twisted seat belts can cause injury. In a collision, the full width of the belt isn't available to absorb the impact. This puts more force on the bones beneath the belt, which could break them or cause other serious injury or death. Don't wear twisted seat belts.



■ **Seat Belt Warning Light/Beep**

If the driver's seat belt is not fastened when the ignition switch is turned to the ON position, a beep will sound for about 6 seconds and the seat belt warning light will remain on until the belt is fastened.

If the system does not operate correctly, consult an Authorized Mazda Dealer.

■ **Front Seat Belts**

To fasten:

1. Grasp the buckle and tongue.
2. Slowly pull out the lap/shoulder belt.
3. Insert the tongue into the buckle until you hear a click.
4. Make sure the shoulder belt is snugly fitted against your body.

**⚠ WARNING**

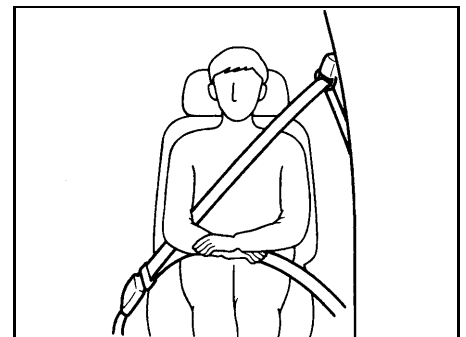
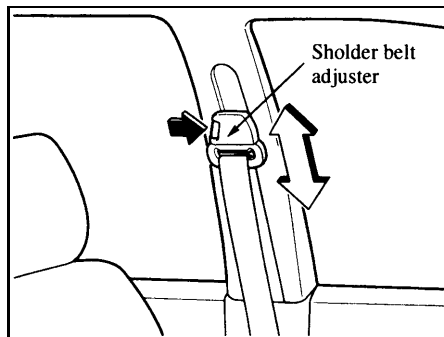
**One Belt. One Passenger:**

Using one seat belt for more than one person at a time is dangerous. A seat belt used in this way can't spread the impact forces properly and the two passengers could be crushed together and seriously injured or even killed. Never use one belt for more than one person at a time.

**⚠ WARNING**

**Positioning the Shoulder Portion of the Seat Belt:**

Improper positioning of the shoulder portion of the seat belt is dangerous. An improperly positioned belt will provide little or no protection in a collision. Always make sure the shoulder portion of the seat belt is positioned across your shoulder and near your neck, but never under your arm, on your neck, or on your upper arm.



This adjusts the shoulder belt angle for a more comfortable fit. Simply push the button, move it to the desired position, and then release it. Make sure the adjuster is locked.