

REPORT NO. KAR-99-12

V3006

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
1999 FORD EXPEDITION XLT SUV
NHTSA NO. MX0200

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



FEBRUARY 15, 1999
FINAL REPORT

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16. <i>Abstract</i> A 35 mph (56.3 km/h) frontal barrier impact test was conducted on a 1999 FORD EXPEDITION XLT SUV at KARCO Engineering on January 26, 1999. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301 and footwell intrusion performance. The impact velocity was 56.9 km/h. The ambient temperature at the barrier face at the time of impact was 7.77°C. The vehicle's maximum post-test static crush was 760 mm, located at the vehicle centerline. The test vehicle was equipped with a 3-point continuous belt system and second generation supplemental airbags at both frontal outboard-seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" the occupant injury response data summary is as follows:																							
<table border="1"> <thead> <tr> <th><u>Injury Criteria</u></th> <th><u>Threshold Value</u></th> <th><u>Driver Dummy</u></th> <th><u>Passenger Dummy</u></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>1000</td> <td>582.6</td> <td>679.9</td> </tr> <tr> <td>Chest Resultant Peak 3 msec clip</td> <td>60 G's</td> <td>46.7</td> <td>43.7</td> </tr> <tr> <td>Left Femur Force</td> <td>10009 N</td> <td>-5005.2</td> <td>-3064.8</td> </tr> <tr> <td>Right Femur Force</td> <td>10009 N</td> <td>-4033.5</td> <td>-2854.6</td> </tr> </tbody> </table>				<u>Injury Criteria</u>	<u>Threshold Value</u>	<u>Driver Dummy</u>	<u>Passenger Dummy</u>	Head Injury Criteria (HIC)	1000	582.6	679.9	Chest Resultant Peak 3 msec clip	60 G's	46.7	43.7	Left Femur Force	10009 N	-5005.2	-3064.8	Right Femur Force	10009 N	-4033.5	-2854.6
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SECTION 1

PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MX0200

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 was to obtain vehicle crashworthiness, occupant restraint system performance data and lower leg data for frontal barrier impacts. The velocity used in this test was in excess of the current 30 mph (48 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 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 26, 1999 at a speed of 56.9 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 sixteen (16) 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/right femur load cells, left/right lower leg sensors and left/right foot accelerometers. In addition, chest displacement and neck six-axis load 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-six 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 calibrated two tests prior to this NCAP test. Injury criteria were not exceeded by either ATD during this frontal barrier impact test.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

An immovable barrier was impacted by a 1999 FORD EXPEDITION XLT SUV at a velocity of 56.9 km/h. The test weight, with two (2) 50th percentile male ATDs, was 2497 kg. Twenty four (24) load cell barrier data channels were obtained in conducting the January 26, 1999 NCAP test. The test vehicle was equipped with a longitudinally mounted 4.6 liter, 8 cyl. engine and a 4-speed automatic transmission.

The driver's Head Injury Criteria (HIC) was 582.6, the maximum chest deceleration over three (3) milliseconds was 46.7 g and the left and right femur loads were -5005.2 and -4033.5 Newtons, respectively. Chest deflection for the driver ATD was -31.3 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 was 679.9, maximum chest deceleration over three (3) milliseconds was 43.7 g and the left and right femur loads were -3064.8 and -2854.6 Newtons respectively. Chest deflection for the passenger ATD was -32.7 mm. The passenger ATD head contacted the airbag, and headrest, the chest and abdomen contacted the airbag and both knees contacted the glove box.

Seat belt spoolout, measured by on-board pullout potentiometers was 51.3 mm for the driver ATD and 62.6 mm for the passenger ATD. Shoulder belt stretch was 0.524 mm/cm for the driver ATD and 0.0 mm/cm for the passenger ATD. Channel failed for the passenger, no data available.

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

The test vehicle sustained a maximum static crush of 760 mm located to the right of the vehicle centerline. Both the driver side doors and the passenger side doors opened without the aid of tools.

1.4 GENERAL COMMENTS

The 1999 FORD EXPEDITION XLT SUV 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, vehicle and 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 restraint systems.

SECTION 2.

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

CONVERSION FACTORS USED IN THIS REPORT:

2.2 pounds (lb.) = 1 kilogram (kg)

1 mile (mi.) = 1.609 kilometer (km)

1 gallon (gal.) = 3.785 liters (L)

1 pound/square inch (psi) = 7000 Pascal (7 kPa)

DATA SHEET NO. 1

CRASH TEST SUMMARY

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

VEHICLE REBOUND

Measurements in mm	Left	Center	Right
Vehicle Rebound	760	758	886

VEHICLE STATIC CRUSH

Measurements in mm	Left	Center	Right
Pre-test Measurements	4893	5188	4893
Post-test Measurements	4378	4428	4377
Static Crush	515	-760	-516
Average	-597		

DOOR OPENING AND SEAT TRACK INFORMATION

	Driver	Passenger
Door Opening (Front)	JAMMED	JAMMED
Door Opening (Rear)	JAMMED	OPENED
Seat Track Shift (mm of shift)	NONE	NONE
Seat Back Failure	NONE	NONE

DUMMY INFORMATION

	Driver	Passenger
Dummy Type/No.	50% Male Hybrid III (S/N 35)	50% Male Hybrid III (S/N 34)
Data Channels	44	44
Visible Contact Points		
Head	AIR BAG/HEADREST	AIR BAG/HEADREST
Chest	AIR BAG	AIRBAG
Abdomen	AIRBAG	AIRBAG
Left Knee	KNEE BOLSTER	GLOVE BOX
Right Knee	KNEE BOLSTER	GLOVE BOX

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

TEST VEHICLE INFORMATION			
Manufacturer	FORD MOTOR COMPANY	VIN	1FMRU1761XLA78268
Manufacturing Date	12/98	Delivery Date	1/19/99
Dealer	SUNLAND FORD	NHTSA NO.	MX0200
Odometer Reading	26.3 mi	Fuel Type	UNLEADED
Engine Displacement	4.6 Liters	Cylinders	8
Transmission	AUTOMATIC	Final Drive	REAR/4WD
Engine Placement	LONGITUDINAL	Color	MAROON/BURGUNDY
Tire Press./Max. Cap. Front	210 kpa	Cold Tire Press. Front	210 kpa
Tire Press./Max. Cap. Rear	241 kpa	Cold Tire Press. Rear	241 kpa
Recommend Tire Size	P225/70/R16SL	Type of Spare	P225/70/R16SL
Tire Size on Vehicle	P225/70/R16SL	Manufacturer	GENERAL
GVWR	3039 kg	Cargo Capacity	136 kg
GAWR Front	1383 kg	GAWR Rear	1769 kg
Air Conditioning	YES	Power Steering	YES
Power Brakes	YES	AM/FM/Cassette	YES
Disc Brakes (Front)	YES	Disc Brakes (Rear)	YES
Power Windows	YES	Tilt Steering	YES
Anti-lock Brakes (ABS)	YES	Power Seats	YES
Driver Airbag	YES	Passenger Airbag	YES

VEHICLE CAPACITY DATA: TYPE OF FRONT SEATS BUCKET SEATS

TOTAL NUMBER OF OCCUPANTS 8 OCCUPANTS x 68 kg. 544 kg

WEIGHT OF VEHICLE AS RECEIVED AT KARCO (with maximum fluids) 2218 kg

Data Sheet No. 2... (Continued)

VEHICLE CAPACITY WEIGHT (kg):
 Vehicle Capacity Weight 680 kg
 Occupant Weight 544 kg
 Rated Cargo/Luggage Weight (RCLW) 136 kg

	FRONT	REAR	TOTAL
Right	555	550	1105
Left	575	538	1113
Total	1130	1088	2218
Percent of Total	50.9	49.1	100%

CALCULATION OF TEST TARGET WEIGHT (kg):

Total Delivered Weight 2218 kg
 RCLW 136 kg
 Weight of 2 P572 ATDs 152 kg
 TARGET TEST WEIGHT 2506 kg

TEST WEIGHT OF VEHICLE WITH 2 ATDs AND BALLAST

	FRONT	REAR	TOTAL
Right	568	648	1216
Left	621	660	1281
Total	1189	1308	2497
Percent of Total	60.0	40.0	100%

Weight of Ballast secured in cargo area: 84 kg Does not include cameras, instrumentation, and brake abort system.

Vehicle Components Removed For Weight Reduction: Side mirrors, jack, tools, spare tire and paneling.

TEST VEHICLE ATTITUDE (mm)

	LF	RF	LR	RR
As Delivered	873	868	887	884
As Tested	839	837	850	852

Vehicle Wheelbase: 3030 mm

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 98.4 liters

Usable Capacity Figure Furnished by COTR = N/A liters

Test Volume Range (92 to 94% of Usable Capacity) = 90.5 to 92.5 liters

ACTUAL TEST VOLUME = 91.5 liters (With entire fuel system filled)

Test Fluid Type = Stoddard Solvent Specific Gravity = 0.764

Kinematic Viscosity = as per ASTM Standard D484-71 Color = Red

Type of Fuel Pump = Electric X Mechanical _____

Does electric pump operate with ignition switch "ON" & engine "OFF"? Yes X No _____

DETAILS OF FUEL SYSTEM: Key operated w/automatic shut off after a few seconds.

DATA SHEET NO. 3

POST IMPACT DATA

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

REQUIRED IMPACT VELOCITY RANGE: 55.51 km/h to 57.11 km/h

BARRIER IMPACT VELOCITY: (speed traps within 5 feet of impact plane)

Trap No. 1 = 56.9 km/h Trap No. 2 = 57.0 km/h

Distance from vehicle to barrier - -

A. entering trap = 1524 mm

B. leaving trap = 305 mm

VEHICLE STATIC CRUSH: (for Frontal and Rear Impacts Only)

Vehicle Length	Left	Center	Right
Pre-test Measurements (mm)	4893	5188	4893
Post-test Measurements (mm)	4378	4428	4377
Static Crush (mm)	-515	-760	-516

VEHICLE REBOUND: (from rigid barrier with rotational movement offsets only)

Measurements in mm	Left Front	Right Front	Left Rear	Right Rear
Vehicle Rebound X axis	N/A	N/A	N/A	N/A
Vehicle Rebound Y axis	N/A	N/A	N/A	N/A
Average X axis	N/A			
Average Y axis	N/A			

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

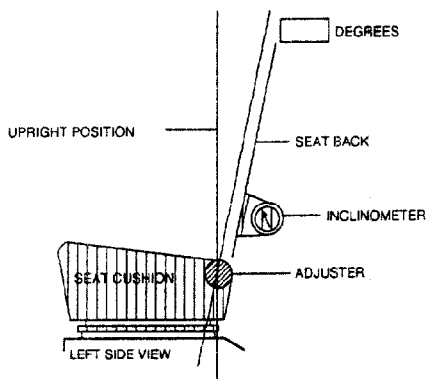
NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

1. NOMINAL DESIGN RIDING POSITION -

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable. Indicate, if applicable, how the detents are numbered (Is the first detent "0" or "1"?).



FRONT SEAT ASSEMBLY

Measurement Instructions: A special application tool with pointed probes was inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly approximately 13 inches above the pivot point of the seat back. The inclinometer was placed against the flat surface of the tool and the seat back angle was measured directly from the dial face. For reference purposes the first detent from the front of the seat was identified as number "1".

Seat back angle for driver's seat = 25° w/seated dummy, taken at seat back cushion.

Measurement Instructions: A special application tool with pointed probes was inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly approximately 13 inches above the pivot point of the seat back. The inclinometer was placed against the flat surface of the tool and the seat back angle was measured directly from the dial face. For reference purposes the first detent from the front of the seat was identified as number "1".

Seat back angle for passenger's seat = 25° w/seated dummy, taken at seat back cushion.

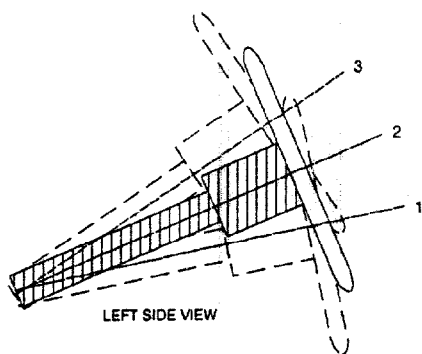
2. SEAT FORE & AFT POSITIONS:

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat: Power seating, total travel was 202mm seat set at 101mm.

Positioning of the passenger's seat (if applicable): 19 seating positions, set to 10th detent from the front.

3. STEERING COLUMN ADJUSTMENTS:



STEERING COLUMN ASSEMBLY

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 driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions:

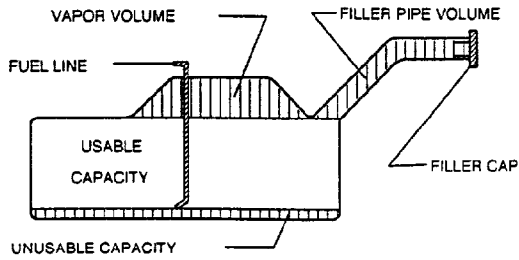
- Position No. 1 is at 13°
- Position No. 2 is at 21°
- Position No. 3 is at 30°

4. SEAT BELT UPPER ANCHORAGE:

5 Positions, set at the mid position #3.

DATA SHEET NO. 4 (continued)

5. FUEL TANK CAPACITY DATA



5.1 A. "Usable Capacity" of standard equipment fuel tank = n/a liters.

B. "Usable Capacity" of optional equipment fuel tank = N/A liters.

C. "Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 90.5 to 92.5 liters.

VEHICLE FUEL TANK ASSEMBLY

Operational Instructions:

5.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 91.5 liters

5.3 Is vehicle equipped with electric fuel pump?

Yes X No

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.
Key operated w/automatic shut off after a few seconds.

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

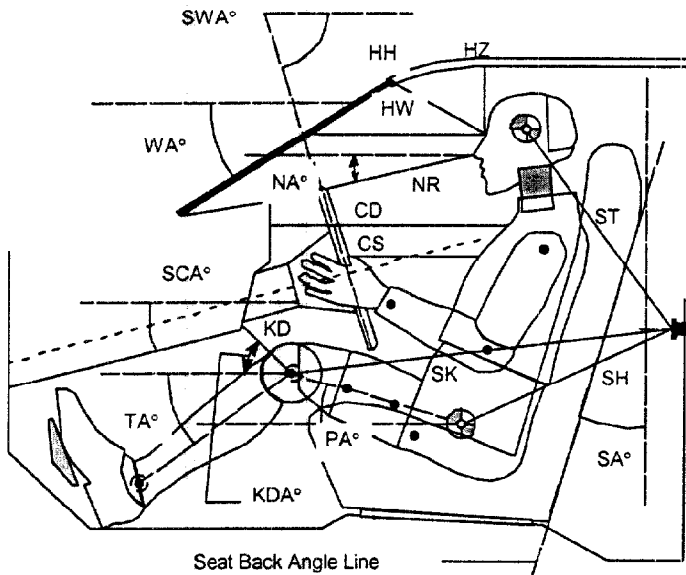
Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

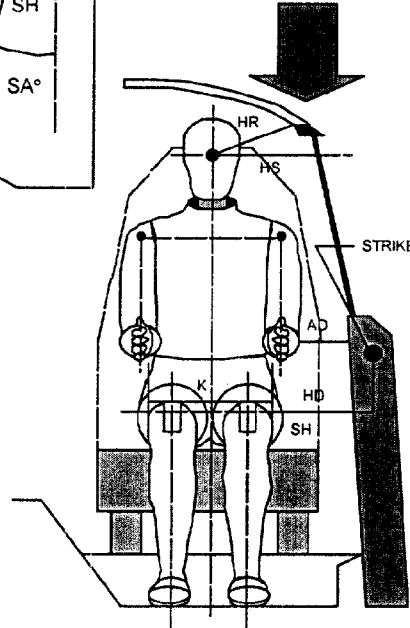
Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

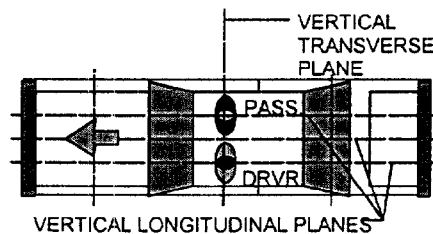
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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



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



DATA SHEET NO. 5...(continued)

DUMMY POSITIONING IN VEHICLE

FRONT SEAT MEASUREMENT TABLE

	DRIVER (Serial No. <u>35</u>)		PASS. (Serial No. <u>34</u>)	
	DISTANCE (mm)	ANGLE (°)	DISTANCE (mm)	ANGLE (°)
WA°		36		
SWA°		68		
SCA°		22		
SA°		21		26.5
HZ	272	90	227	90
HH	440	0	412	0
HW	680	0	646	0
HR	290		260	
NR	419	9		
CD	600		577	
CS	330	0		
RA	216	0		
KDL	160	32	184	
KDR	160		185	20
PA°		22.5		23
TA°		50		56
KK	268		207	
ST	660	79	680	88
SH	225	9	225	2
SHY	265		252	
HS	325		290	
HD	182		130	
AD	115		50	

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

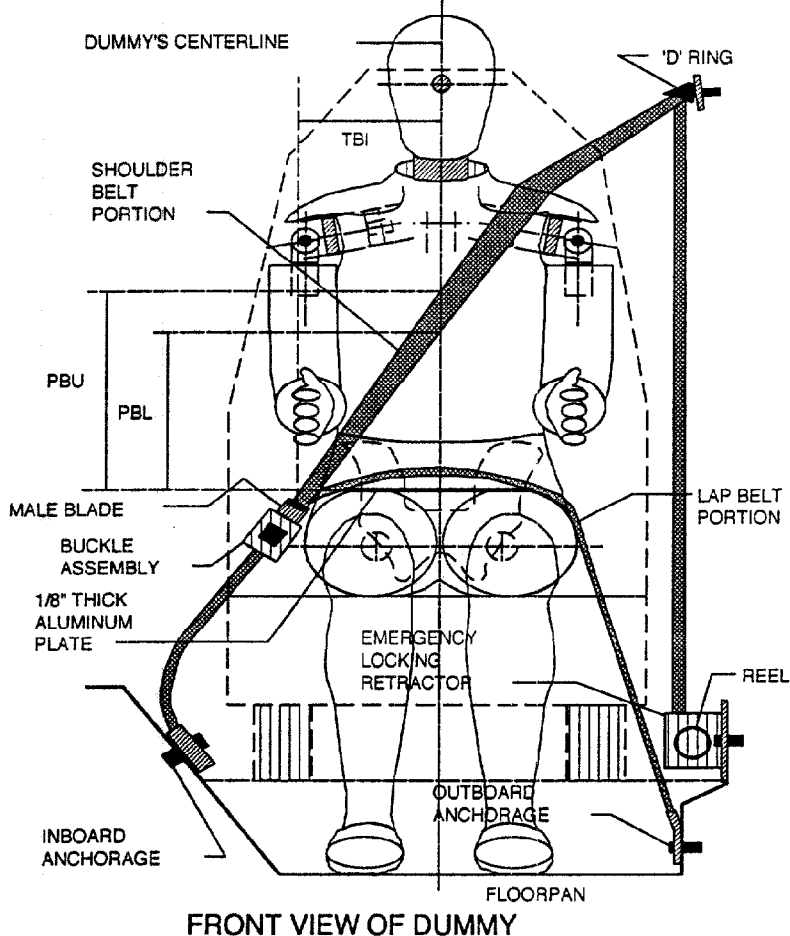
Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

SEAT BELT PLACEMENT MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TCI - Dummy centerline to shoulder bolt	mm	170	171
PBU - Top surface of reference to belt upper edge	mm	310	310
PBL - Top surface of reference to belt lower edge	mm	240	225
Lap Belt tension	Newtons	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

SEAT BELT POSITIONING DATA



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

TEST VEHICLE: 1999 FORD EXPEDITION XLT SUV NHTSA No.: MX0200

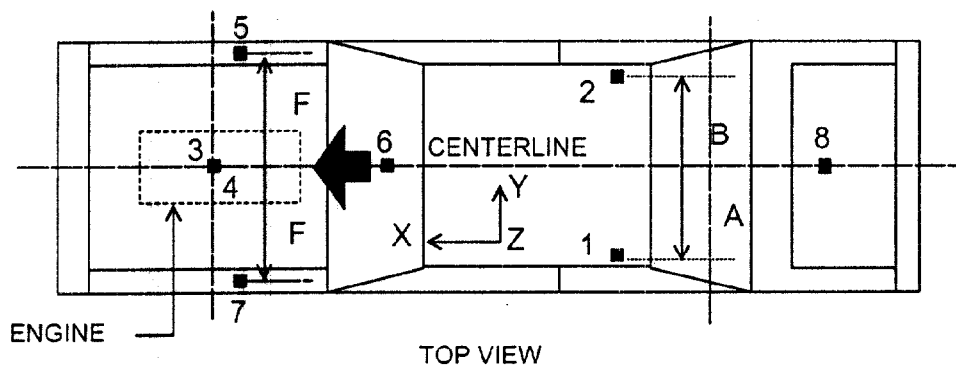
TEST PROGRAM: 1999 NHTSA 35 MPH NCAP TEST DATE: 1/26/99

VEHICLE X-AXIS ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

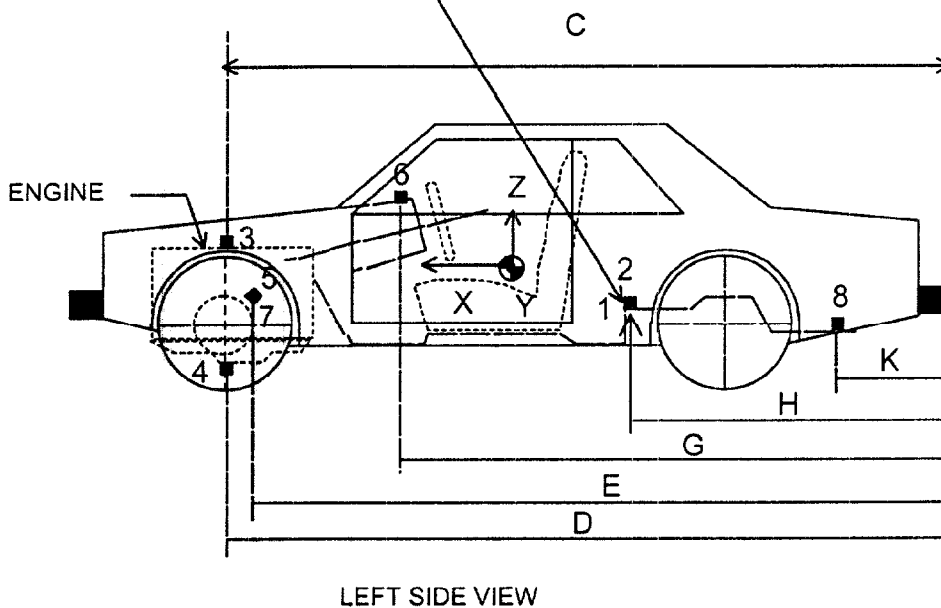
No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member (Pri.)	2230	-672	566	G's	5.2	129.1	-31.3	73.5
2	Right Rear X-Member (Pri.)	2390	642	578	G's	3.9	131.5	-28.5	51.4
3	Engine Top	4124	-302	812	G's	10.0	68.6	-66.0	42.4
4	Engine Bottom	3890	0	225	G's	11.3	69.3	-45.6	59.7
5	Left Brake Caliper	4035	-707	333	G's	32.1	31.4	-70.6	24.4
6	Right Brake Caliper	4030	707	336	G's	38.9	20.5	-102.3	47.0
7	Instrument Panel	3232	0	1031	G's	31.1	60.2	-69.8	65.8
8	Left Rear X-Member (Rednt.)	2167	-672	569	G's	2.5	128.9	-30.0	73.4

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

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



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

TEST VEHICLE: 1999 FORD EXPEDITION XLT SUV NHTSA No.: MX0200

TEST PROGRAM: 1999 NHTSA 35 MPH NCAP TEST DATE: 1/26/99

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	31.0	228.2	-57.5	83.6	26.5	229.6	-62.0	89.9
Head CG	Y	G's	7.1	185.0	-25.6	92.0	19.6	229.2	-7.6	106.3
Head CG	Z	G's	28.2	62.7	-12.8	136.0	31.6	77.8	-9.4	139.5
Head CG Resultant	N/A	G's	64.2	84.3			63.4	91.1		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	6.8	177.1	-45.0	73.0	7.5	183.3	-43.1	83.7
Chest CG	Y	G's	6.3	133.6	-5.7	70.5	7.3	88.7	-6.2	131.5
Chest CG	Z	G's	16.1	62.7	-14.3	136.4	17.9	59.1	-12.9	143.0
Chest CG Resultant	N/A	G's	47.6	72.9			45.2	69.7		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	882.0	50.9	-5005.2	58.6	945.1	52.7	-3064.8	77.6
Right Femur	Z	Newtons	1406.9	52.4	-4033.5	60.5	947.1	51.4	-2854.6	64.1

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	6846.9	61.8	-14.2	138.2	7682.8	60.6	6.1	127.7
Shoulder Belt Force	N/A	Newtons	6232.5	76.4	-20.2	144.6	9900.2	74.4	-11.3	177.1
Shoulder Belt Spoolout	N/A	MM	51.3	64.1	-11.1	299.9	62.6	85.1	-0.2	14.2
Shoulder Belt Stretch	N/A	MM/CM	0.524	80.8	0.001	13.3	0.000	0.0	0.000	0.0*

* No data collected on passenger belt stretch.

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Primary	582.6	48.3	63.9	99.8	679.9	51.3	69.5	105.4

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	46.7	71.6	74.6	43.7	68.4	71.4

DATA SHEET NO. 8...(continued)

TEST VEHICLE: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

TEST PROGRAM: 1999 NHTSA 35 MPH NCAP

TEST DATE: 1/26/99

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	6.9	151.8	-73.3	60.4	9.3	124.7	-57.0	64.4
Pelvis	Y	G's	9.3	117.9	-17.9	60.4	12.6	68.1	-7.8	106.2
Pelvis	Z	G's	5.5	51.9	-17.5	126.0	4.5	52.1	-14.2	87.9

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	506.4	90.1	-248.0	61.4	138.9	239.0	-613.1	75.1
Neck Force	Y	Newtons	228.5	201.2	-143.0	136.0	252.6	72.0	-251.2	175.6
Neck Force	Z	Newtons	2223.6	77.6	-726.5	137.1	1906.4	78.0	-423.6	139.0
Neck Moment	X	N·m	16.3	183.3	-16.6	88.4	11.3	145.4	-14.1	188.1
Neck Moment	Y	N·m	34.5	167.7	-14.9	56.5	33.3	176.4	-32.9	72.3
Neck Moment	Z	N·m	33.6	108.3	-15.4	172.0	15.1	83.0	-7.2	252.2

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	13.1	233.2	-99.0	56.7	12.4	72.4	-220.6	55.4
Left Foot Aft	Z	G's	22.1	89.4	-31.5	48.0	14.2	76.1	-36.7	58.6
Left Foot Fore	Z	G's	81.5	52.6	-121.5	47.6	7.0	40.6	-46.1	50.7*
Right Foot Aft	X	G's	23.9	68.6	-155.7	51.7	29.3	114.4	-262.5	53.7
Right Foot Aft	Z	G's	11.7	97.6	-167.0	50.8	46.4	53.0	-77.9	53.8
Right Foot Fore	Z	G's	168.5	58.6	-418.9	51.1	106.7	54.1	-231.5	53.7

* Passenger side failed, check plot for time of failure

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	9.8	60.4	-13.4	71.3	12.1	55.2	-6.9	121.8
Left Lower Moment	Y	N·m	12.8	166.7	-66.2	51.7	19.3	95.7	-89.4	56.6
Left Lower Force	Z	Newtons	997.9	51.8	-974.8	106.2	425.5	63.7	-1824.0	54.7
Left Upper Moment	X	N·m	25.9	60.0	-30.3	100.4	18.1	91.1	-17.3	63.8
Left Upper Moment	Y	N·m	19.7	165.1	-124.3	60.5	25.7	95.7	-120.9	56.3
Right Lower Moment	X	N·m	15.6	71.1	-17.8	76.0	20.5	57.7	-15.6	67.8
Right Lower Moment	Y	N·m	277.6	69.4	-149.4	52.4	154.0	55.0	-16.7	50.5
Right Lower Force	Z	Newtons	180.9	46.3	-2211.2	61.3	1027.8	53.7	-802.5	123.5
Right Upper Moment	X	N·m	27.4	59.6	-33.7	100.5	16.2	56.8	-60.2	68.4
Right Upper Moment	Y	N·m	22.9	163.8	-165.6	52.5	249.4	54.0	-34.0	50.4

DATA SHEET NO. 8...(continued)

TEST VEHICLE: 1999 FORD EXPEDITION XLT SUV NHTSA No.: MX0200

TEST PROGRAM: 1999 NHTSA 35 MPH NCAP TEST DATE: 1/26/99

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.2	4.8	-31.3	85.4	0.2	8.9	-32.7	89.4

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	28.5	228.0	-55.8	84.9	28.0	229.6	-61.7	91.0
Head CG	Y	G's	6.8	182.0	-23.3	94.9	20.1	229.8	-7.1	102.5
Head CG	Z	G's	29.0	73.0	-16.5	138.0	31.5	77.9	-11.4	139.2
Head CG Resultant	N/A	G's	61.8	84.9			63.7	91.3		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	7.2	176.1	-44.2	73.2	7.3	181.1	-43.6	83.9
Chest CG	Y	G's	5.7	133.4	-6.4	64.8	11.8	88.9	-5.9	131.2
Chest CG	Z	G's	13.8	73.1	-14.0	131.5	16.1	59.2	-11.3	142.6
Chest CG Resultant	N/A	G's	46.4	73.2			45.1	83.8		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Redundant	539.9	46.8	64.7	100.6	672.6	51.1	70.0	105.9

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	45.3	72.6	75.6	42.9	83.0	86.0

DATA SHEET NO. 9

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to 'D' ring	mm	650	650
Shoulder belt length as measured on ATD	mm	820	800
Lap belt length as measured on ATD	mm	800	810
Remainder of belt on reel	mm	930	925
Total belt length for continuous webbing systems	mm	3200	3185

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	68.0	50.0
As determined electronically	mm	51.3	62.6

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically from shoulder belt load cell and "D" ring	mm/cm	0.52	no data
Mechanically	mm/cm	10.00	3.00

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

Details of windshield mounting (method of retention, type of trim, etc.):

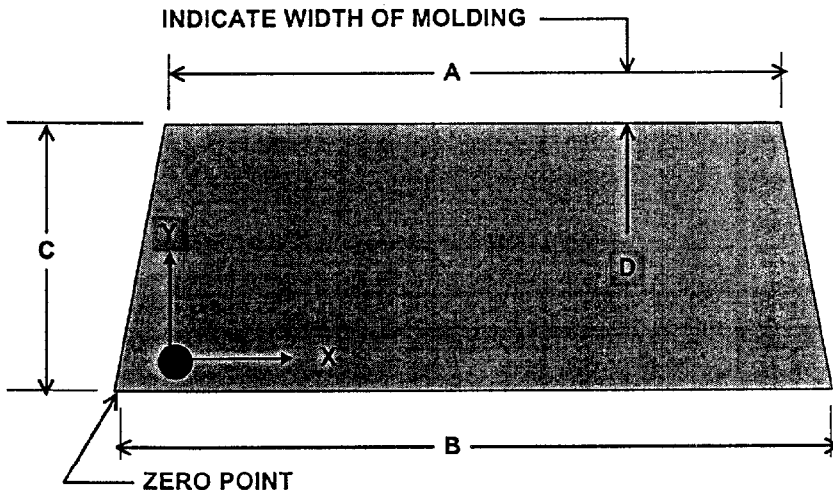
Windshield glass is secured to the vehicle frame with a rubber type adhesive, with rubber molding along the top and sides with rubber and plastic molding along the bottom.

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.

WINDSHIELD PERIPHERY MEASUREMENTS

	Units	Left Side	Right Side	Total
Pre-Test	mm	2271.5	2271.5	100%
Post-Test	mm	2271.5	2271.5	100%
Percent of retention	Percent	100%	100%	

Indicate area of retention failure.



FRONT VIEW OF WINDSHIELD

Width of molding: Top: 30 mm, Sides: 22 mm, Bottom: 12 mm

Temperature of windshield molding during test: 21.1 °C

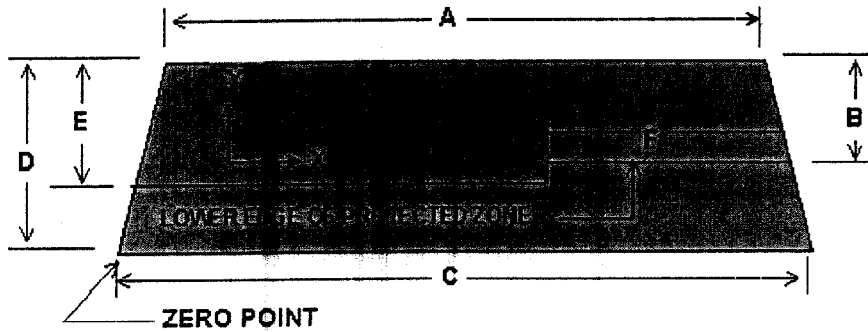
**DATA SHEET NO. 11
WINDSHIELD ZONE INTRUSION FMVSS 219 (PARTIAL) DATA**

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1370
B	mm	412
C	mm	1733
D	mm	720
E	mm	606
F	mm	920

Provide all dimensions necessary to reproduce the protected area.

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 which 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 template 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: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

Test Time: 1:55 PM Temperature at Time of Impact: 7.7° C

STODDARD SOLVENT SPILLAGE MEASUREMENT:

- A. From impact until vehicle motion ceases - -
Actual = 0.0 oz. (Maximum Allowable = 1 ounce)
- B. For 5 minute period after vehicle motion ceases - -
Actual = 0.0 oz. (Maximum Allowable = 5 ounces)
- C. For next 25 minutes - -
Actual = 0.0 oz. (Maximum Allowable = 1 oz./minute)
- D. Provide Spillage Details: No leakage occurred.

DATA SHEET NO. 13

FMVSS 301 STATIC ROLLOVER DATA SHEET

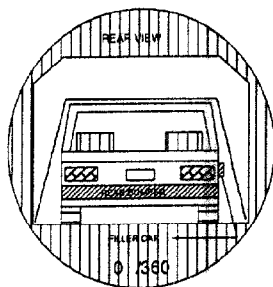
Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

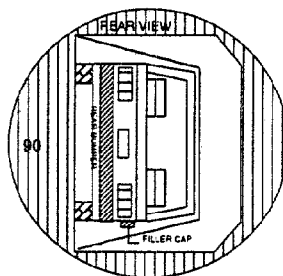
Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

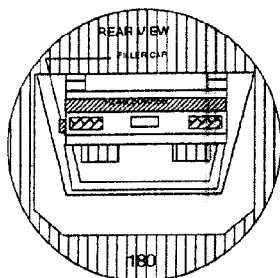
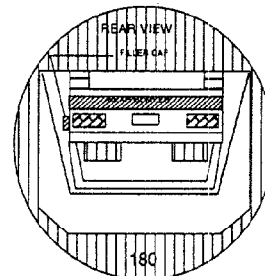
Time: 1:55 PM Temperature: 7.7 °C



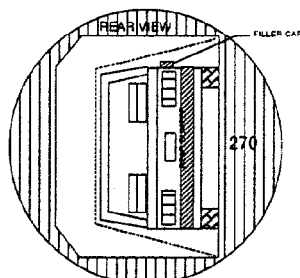
0° TO 90°



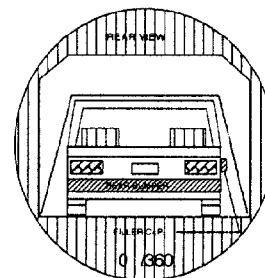
90° TO 180°



180° TO 270°



270° TO 360°



1. The specified fixture rollover rate for each 90° of rotation = 60 to 120 seconds.
2. The position hold time at each position = 300 seconds (minimum).
3. Provide details of Stoddard Solvent spillage locations:
No solvent leakage occurred during rollover testing.

TEST PHASE	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° TO 90°	79	300	0.0
90° TO 180°	80	300	0.0
180° TO 270°	79	300	0.0
270° TO 360°	82	300	0.0

DATA SHEET NO. 14

VEHICLE MEASUREMENTS

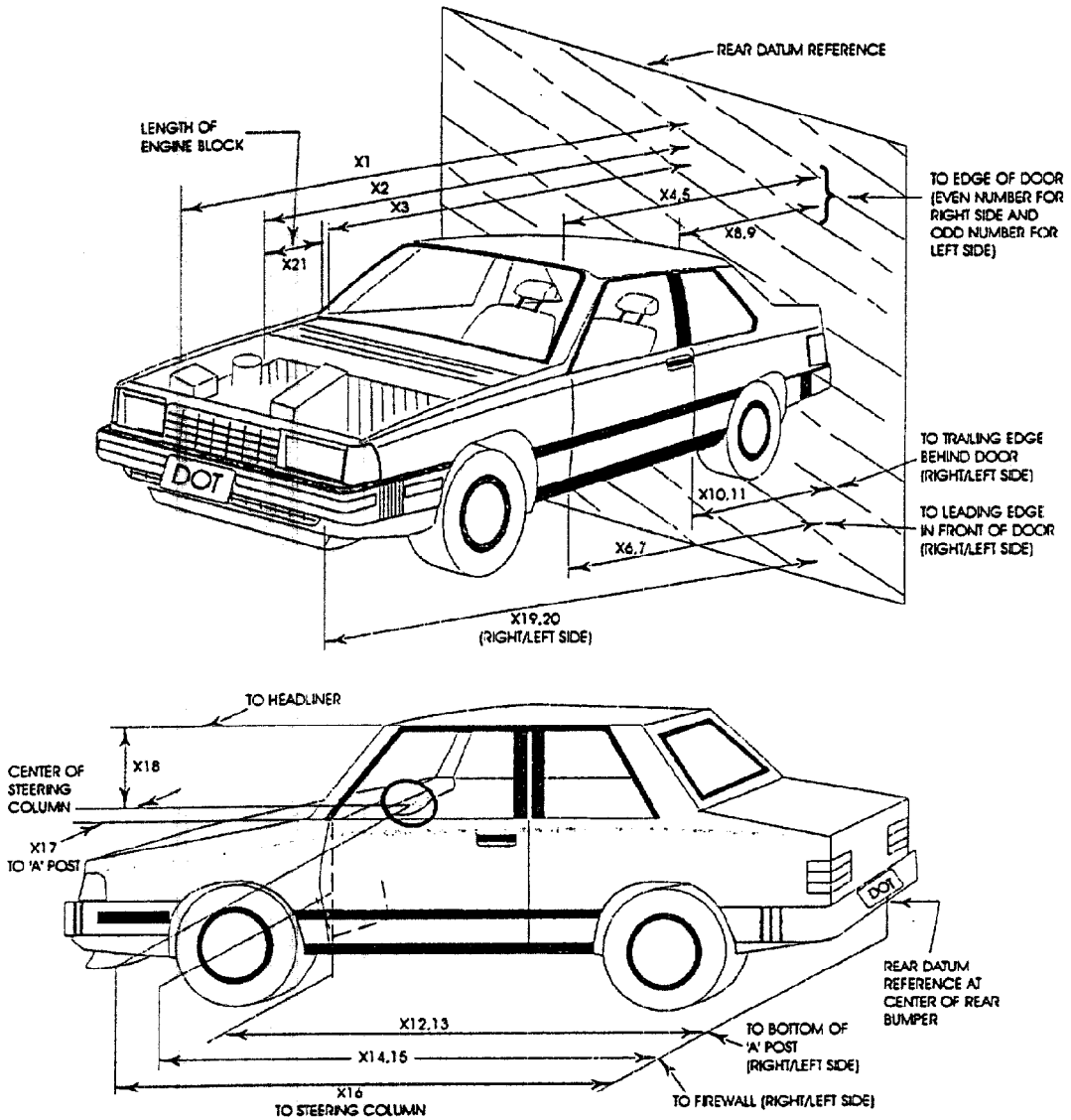
Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	5188	4428	-760
2	RSOV to front of engine	mm	4358	4343	-15
3	RSOV to firewall centerline	mm	4006	3652	-354
4	RSOV to leading edge of right door	mm	3605	3633	28
5	RSOV to leading edge of left door	mm	3607	3606	-1
6	RSOV to lower leading edge of right door	mm	3525	3525	0
7	RSOV to lower leading edge of left door	mm	3526	3515	-11
8	RSOV to upper trailing edge of right door	mm	2481	2512	31
9	RSOV to upper trailing edge of left door	mm	2483	2506	23
10	RSOV to lower trailing edge of right door	mm	2461	2465	4
11	RSOV to lower trailing edge of left door	mm	2462	2455	-7
12	RSOV to bottom of right 'A' pillar	mm	3560	3575	15
13	RSOV to bottom of left 'A' pillar	mm	3560	3580	20
14	RSOV to firewall on right side	mm	3980	3736	-244
15	RSOV to firewall of left side	mm	3979	3868	-111
16	RSOV to steering column	mm	3115	3135	20
17	Center of steering column to left 'A' pillar	mm	404	386	-18
18	Center of steering column to headlining	mm	484	480	-4
19	RSOV to right side of front bumper	mm	4893	4377	-516
20	RSOV to left side of front bumper	mm	4893	4378	-515
21	Length of engine block	mm	500	500	0
RD	RSOV to right side of dash panel	mm	3366	3345	-21
CD	RSOV to center of dash panel	mm	3325	3263	-62
LD	RSOV to left side of dash panel	mm	3228	3200	-28



DATA SHEET NO. 15

CAMERA LOCATIONS

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

No.	Camera View	Location (mm)			Angle (°)	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	2250	8450	1222	3	7750	13	950
3	Left Side, No. 2	1225	6408	1680	2	6220	25	990
4	Left Side, No. 3	3400	2900	2160	14	2950	19	960
5	Left Side, No. 4	2250	8455	3073	12	7560	19	930
6	Left Side, No. 5	2250	8455	2590	9	7950	19	950
7	Right Side, No. 1	1550	8200	880	4	7740	19	1000
8	Right Side, No. 2	1800	8250	1525	1	7750	40	*
9	Right Side, No. 3	3600	3200	2070	12	3120	19	980
10	Right Side, No. 4	2450	7550	1515	0	7240	35	910
11	Overhead Overall	1100	0	5791	90	N/A	13	*
12	Front View Driver	-305	420	2705	36	N/A	13	950
13	Front View, Passenger	-305	420	2705	44	N/A	13	1000
14	Pit Camera, Engine	700	0	-1585	88	N/A	10	760
15	Pit Camera, Fuel Tank	4900	0	-1850	43	N/A	12	*
16	Onboard, Driver	3725	275	1595	15	1370	13	520
17	Onboard, Passenger	3725	275	1595	14	1380	13	380

X - Barrier Face Y - Monorail Centerline Z - Ground

* FILM BROKE

**DATA SHEET NO. 16
REFERENCE PHOTOGRAPH TARGETS**

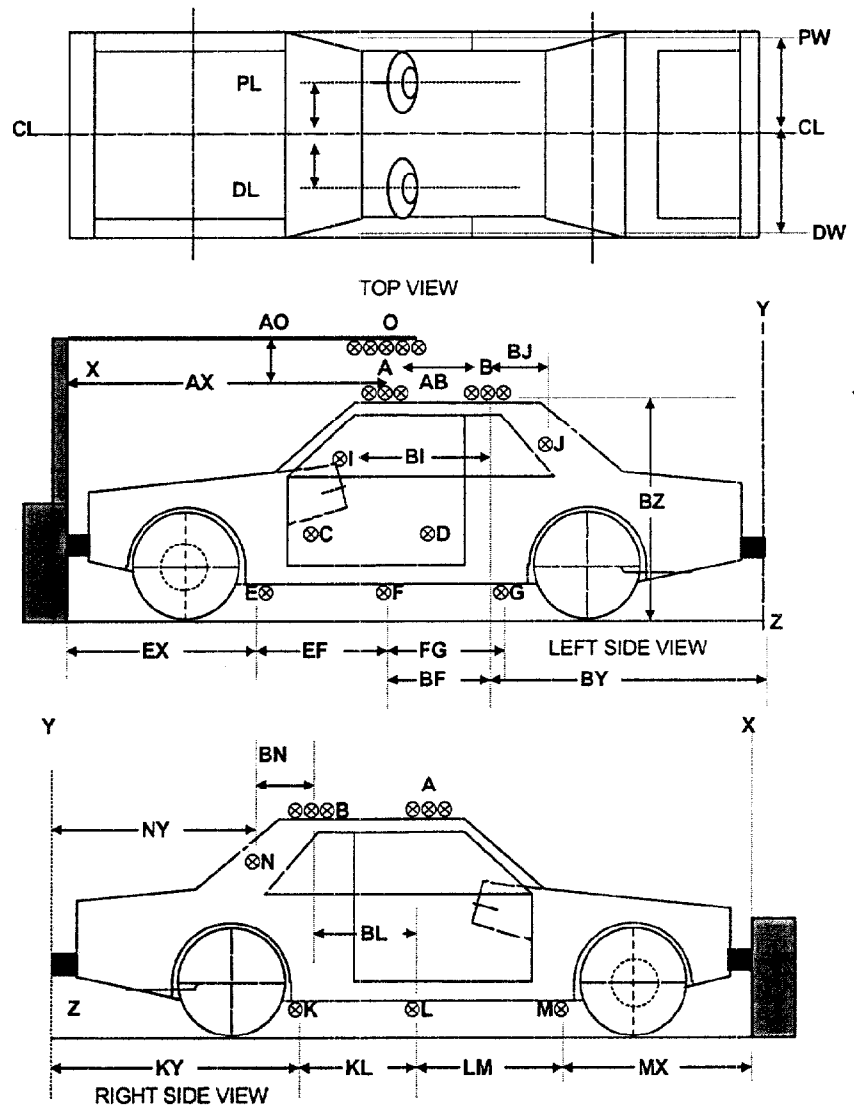
Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

Item	Value
AX	2570
AB	605
AO	155
BJ	510
BI	1262
BZ	1933
EX	1539
EF	96
FG	96
BF	660
BY	2020
NY	1495
BN	530
KY	1722
KL	96
BL	640
LM	96
MX	1541
CL/PL	430
CL/PW	880
CL/DL	430
CL/DW	880



DATA SHEET NO. 17

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

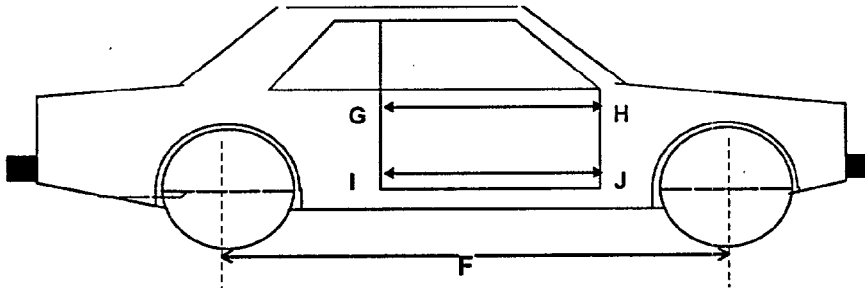
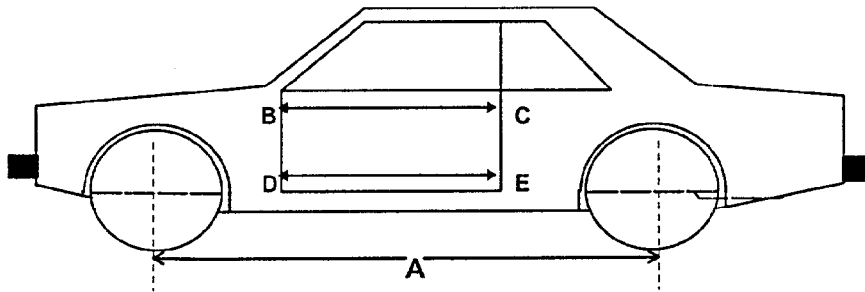
Test Date: 1/26/99

DOOR OPENING WIDTH

UNITS (mm)	LEFT SIDE		RIGHT SIDE	
	BC	DE	GH	IJ
PRE-TEST	1006	952	1005	955
POST-TEST	971	935	968	935
DIFFERENCE	-35	-17	-37	-20

VEHICLE WHEELBASE CHANGE

UNITS (mm)	A = LEFT SIDE WHEELBASE	F = RIGHT SIDE WHEELBASE
PRE-TEST	3030	3030
POST-TEST	2900	2890
DIFFERENCE	-130	-140



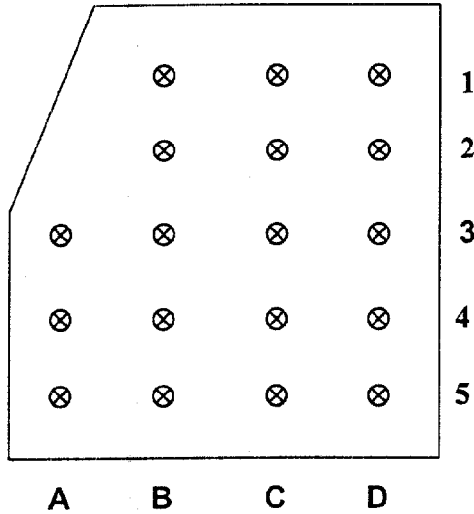
Data Sheet No. 17(Continued)

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

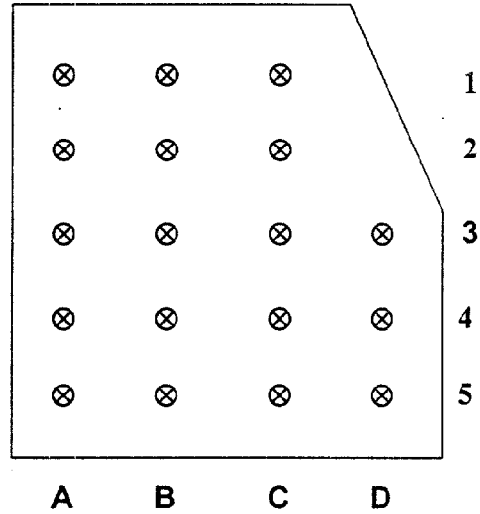
Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99



⊕ X
LEFT FRONT SEAT ANCHOR BOLT
↓
TO RSOV REFERENCE

DRIVER SIDE FLOOR PLAN



⊕ X
RIGHT FRONT SEAT ANCHOR BOLT
↓
TO RSOV REFERENCE

PASSENGER SIDE FLOORPAN

(Data Sheet No. 17Continued)

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

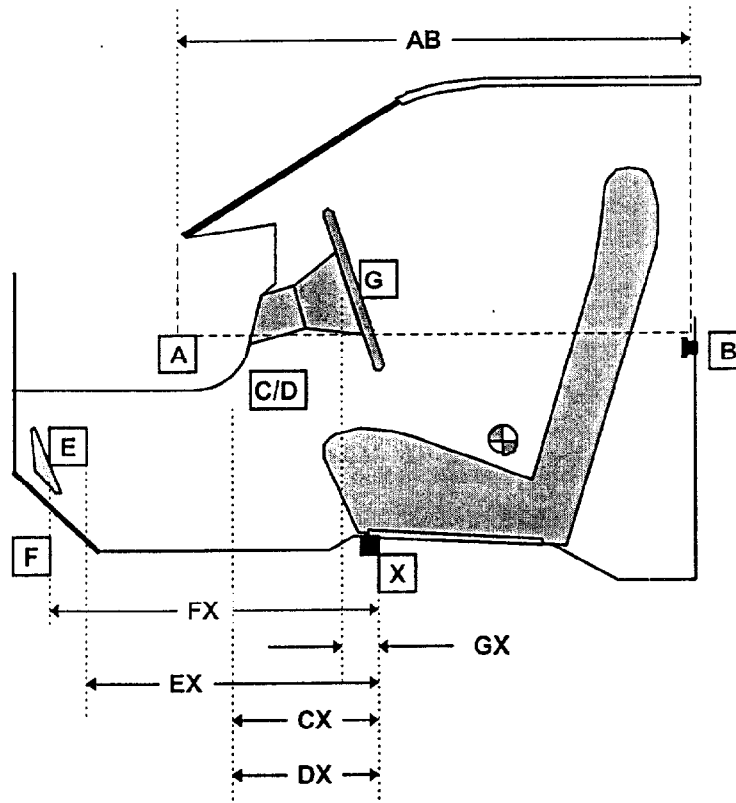
Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

DRIVER COMPARTMENT INTRUSION (Distances in mm)

REF.	DESCRIPTION	PRE-TEST	POST-TEST
AB	DOOR OPENING (INSIDE WINDOW JAM)	1006	971
CX	LOWER LEFT KNEE BOLSTER TO X	280	305
DX	LOWER RIGHT KNEE BOLSTER TO X	335	394
EX	BRAKE PEDAL TO X	570	430
FX	FOOT REST TO X	560	N/A
GX	STEERING COLUMN HUB (CENTER) TO X	100	95

X = LEFT FRONT SEAT ANCHOR BOLT



DRIVER COMPARTMENT

(Data Sheet No. 17Continued)

DRIVER SIDE "X"

	A			B			C			D		
	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.
1				725	677	-48	724	648	-76	725	622	-103
2				616	617	1	615	612	-3	617	603	-14
3	522	522	0	520	523	3	520	514	-6	521	518	-3
4	422	424	2	421	420	-1	420	418	-2	421	414	-7
5	324	324	0	325	323	-2	326	321	-5	325	315	-10

DRIVER SIDE "Z"

	A			B			C			D		
	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.
1				70	60	-10	71	54	-17	75	60	-15
2				-26	-43	-17	-26	-32	-6	-24	-20	4
3	-67	-82	-15	-64	-83	-19	-68	-80	-12	-68	-77	-9
4	-68	-90	-22	-72	-86	-14	-71	-108	-37	-64	-112	-48
5	-68	-90	-22	-68	-84	-16	-65	-99	-34	-64	-122	-58

PASSENGER SIDE "X"

	A			B			C			D		
	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.
1	715	644	-71	714	651	-63	696	685	-11			
2	623	586	-37	620	593	-27	621	619	-2			
3	521	500	-21	520	503	-17	520	510	-10	523	511	-12
4	420	409	-11	419	410	-9	420	416	-4	422	418	-4
5	320	314	-6	320	314	-6	320	318	-2	320	317	-3

PASSENGER SIDE "Z"

	A			B			C			D		
	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.	PRE-TEST	POST-TEST	DIFF.
1	45	89	44	39	73	34	27	41	14			
2	-32	3	35	-36	-5	31	-34	-29	5			
3	-75	-61	14	-76	-78	-2	-75	-92	-17	-74	-90	-16
4	-77	-98	-21	-77	-99	-22	-75	-98	-23	-75	-97	-22
5	-77	-94	-17	-76	-104	-28	-76	-105	-29	-69	-94	-25

RSOV to anchor bolt
Ground level to anchor bolt

DRIVER		
PRE	POST	DIFF.
3015	3006	-9
N/A	N/A	

PASSENGER		
PRE	POST	DIFF.
3015	3015	0
N/A	N/A	

DATA SHEET NO. 18

OFFSET BARRIER ORIENTATION

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

NOT APPLICABLE TO THIS TEST

A = VEHICLE WIDTH MEASURED AT WIDEST POINT N/A mm
B = 40% OFFSET FROM LEFT EDGE OF VEHICLE N/A mm
ACTUAL OFFSET DURING TEST N/A mm = N/A

DATA SHEET NO. 19

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99

VIN: 1FMRU1761XLA78268 Wheelbase: 3030 mm Test Weight: 2497 kg

Vehicle Size Category: FORD EXPEDITON XLT SUV

ACCELEROMETER DATA:

LOCATION: Left and right rear floor pans

CALIBRATION PROCEDURE: 6 months/ drop test

LINEARITY: Good

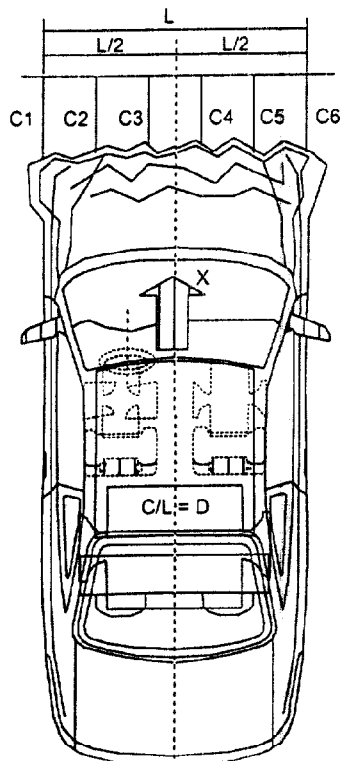
INTEGRATION ALGORITHM: NHTSA Standard

VEHICLE IMPACT SPEED: 56.9 km/h

TIME OF SEPARATION: 87.8 msec

VELOCITY CHANGE: 66.62 km/h

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: F (frontal)



IMPACT MODE: Full Frontal

CRUSH DEPTH DIMENSIONS:

C1 = 515 mm

C2 = 640 mm

C3 = 732 mm

C4 = 732 mm

C5 = 648 mm

C6 = 516 mm

MIDPOINT OF DAMAGE: Vehicle Centerline

LENGTH OF DAMAGE REGION: 1735 mm

DATA SHEET NO. 20

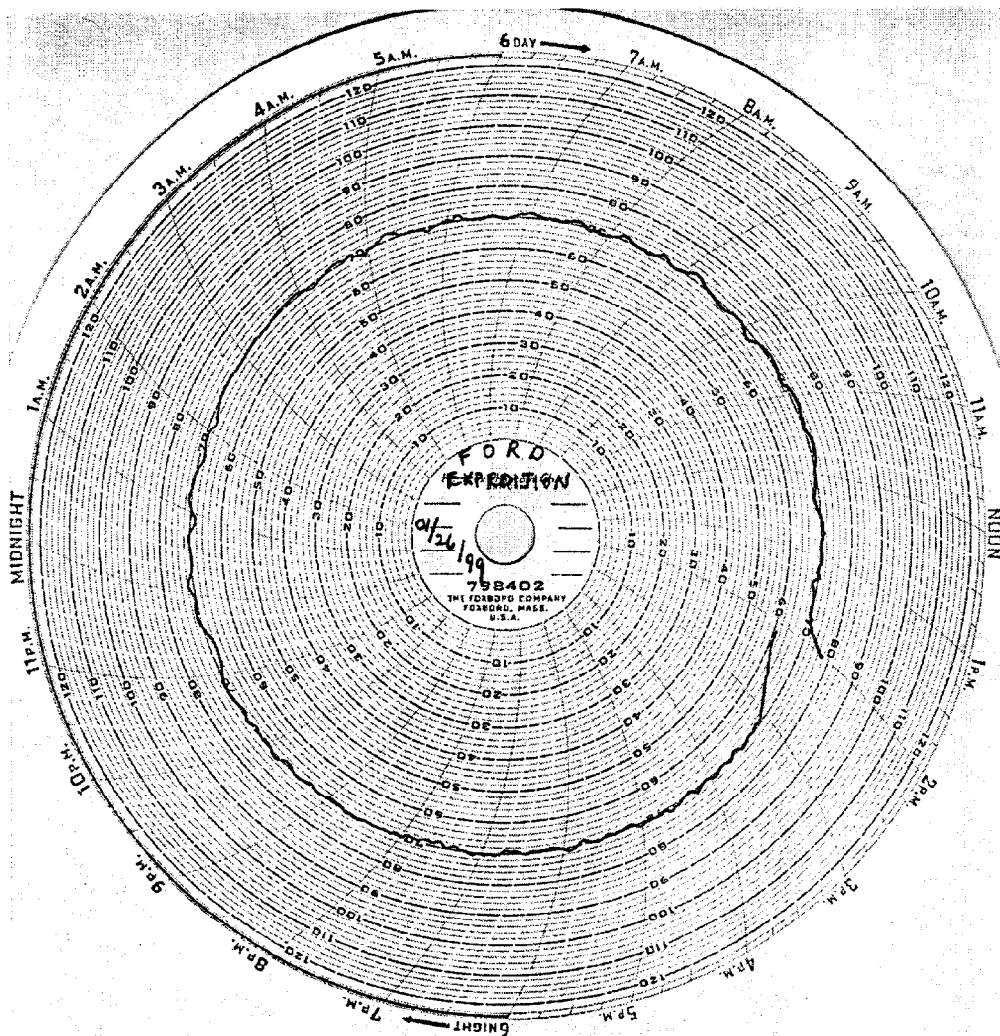
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

Test Program: 1999 35 MPH FRONTAL IMPACT

Test Date: 1/26/99



APPENDIX A
PHOTOGRAPHS

KAR99001-12

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FIGURE A-1. RIGHT FRONT AS RECEIVED

A-1

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KARENDA 13

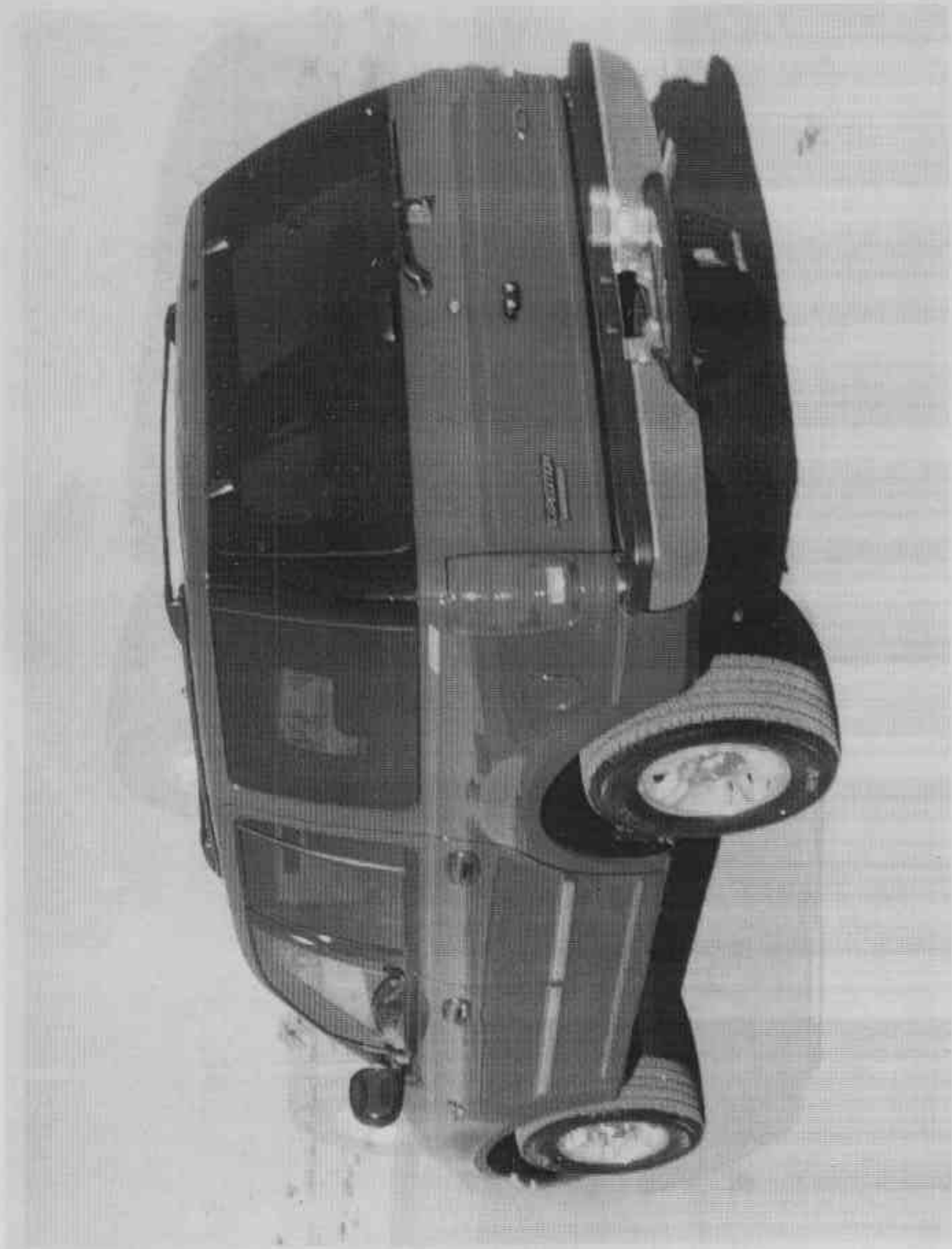


FIGURE A-2. LEFT REAR AS RECEIVED

A-2

KAR99001-12

ST-1000000000



FIGURE A-5. PRETEST FRONT VIEW

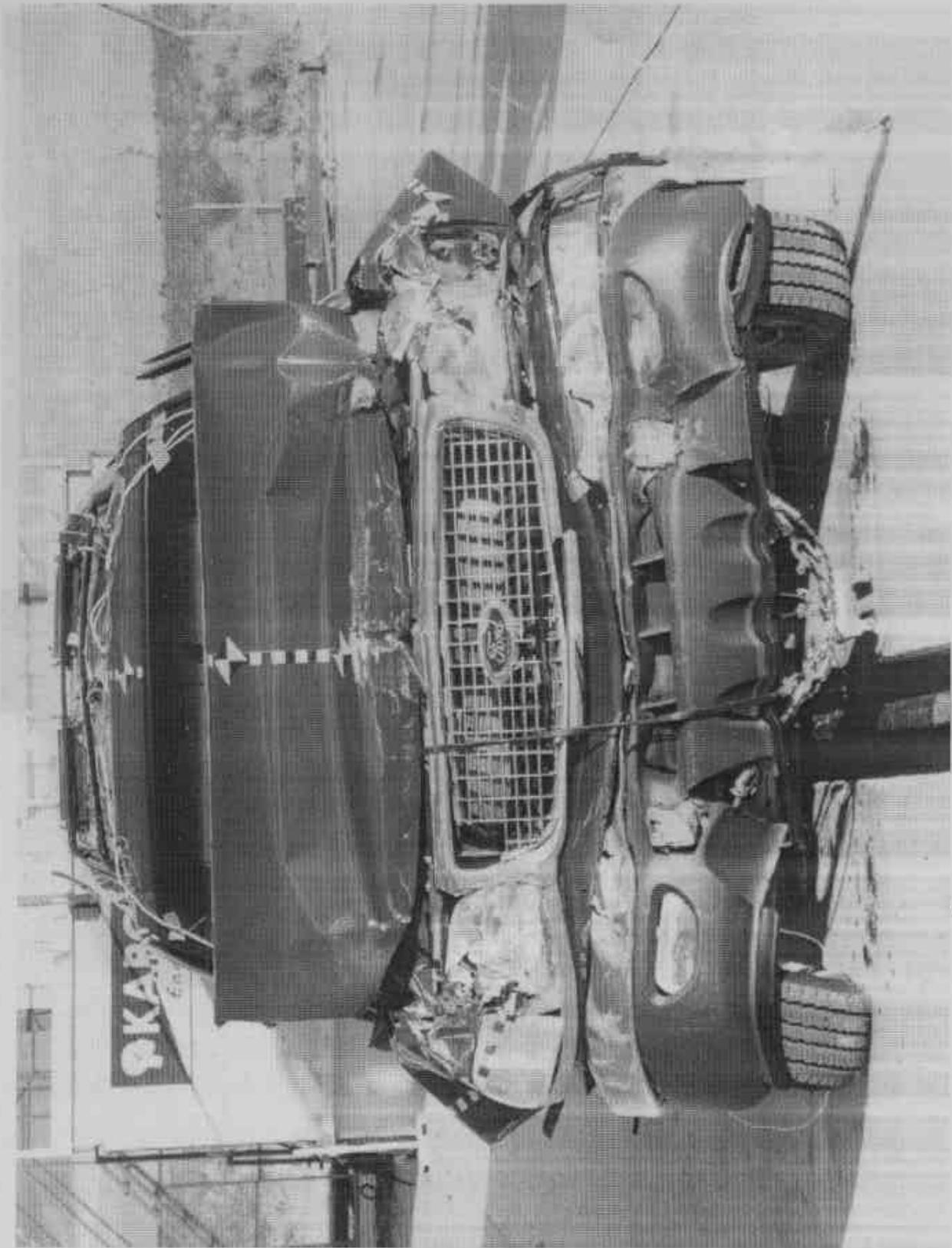


FIGURE A-6. POST TEST FRONT VIEW

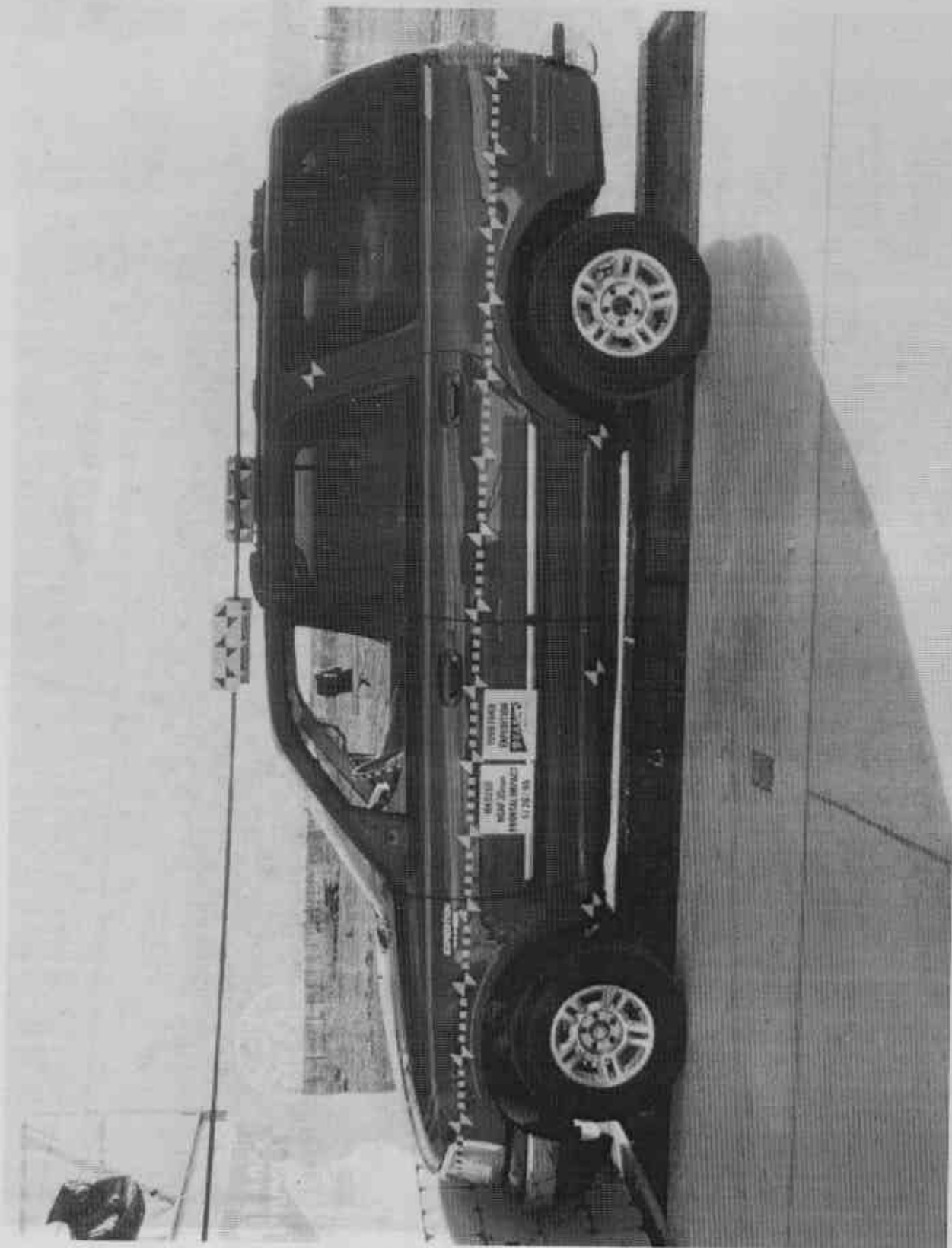


FIGURE A-7. PRETEST LEFT SIDE VIEW

SF-100002A1

A-7

KAR99001-12

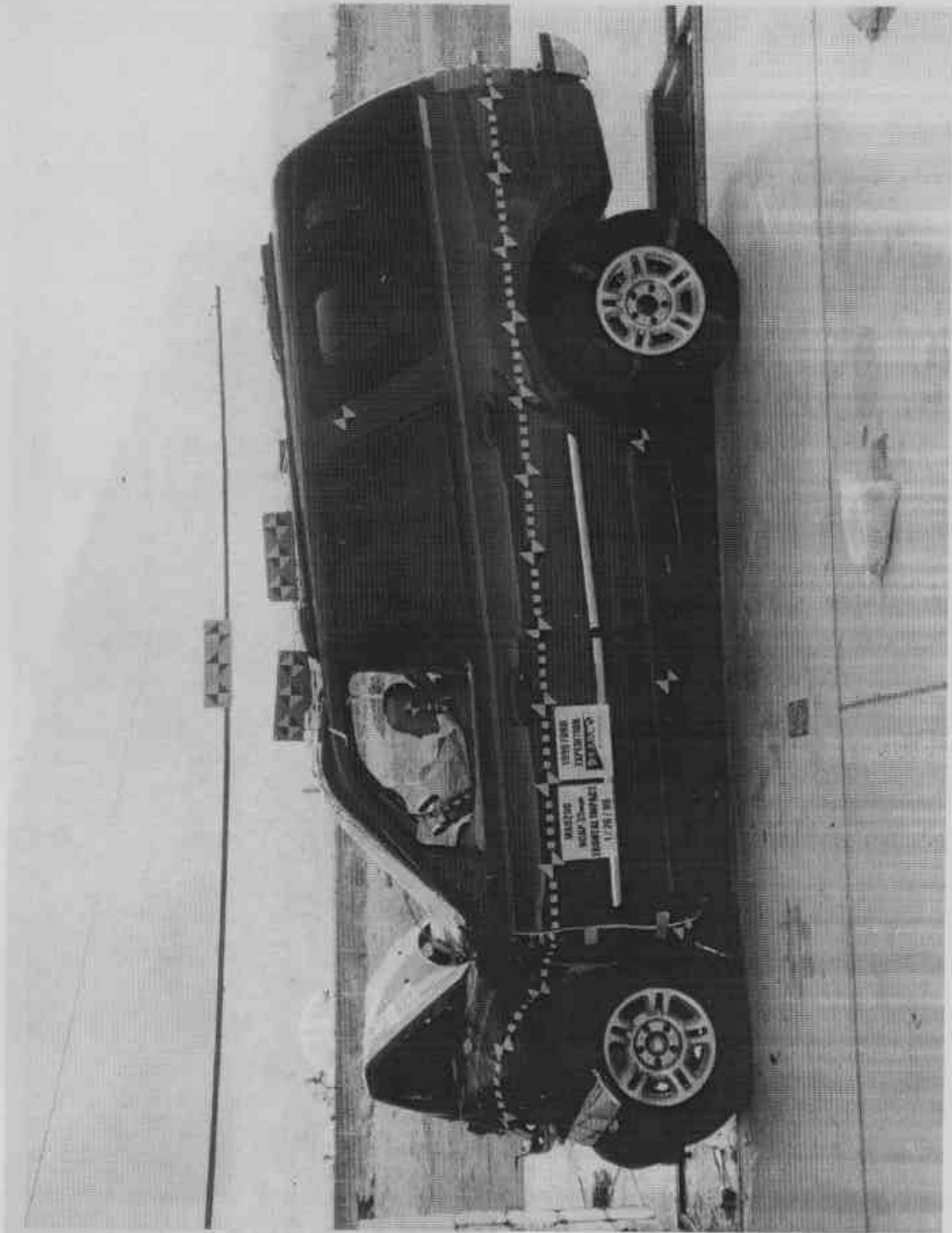


FIGURE A-8. POST TEST LEFT SIDE VIEW

A-8

KAR99001-12

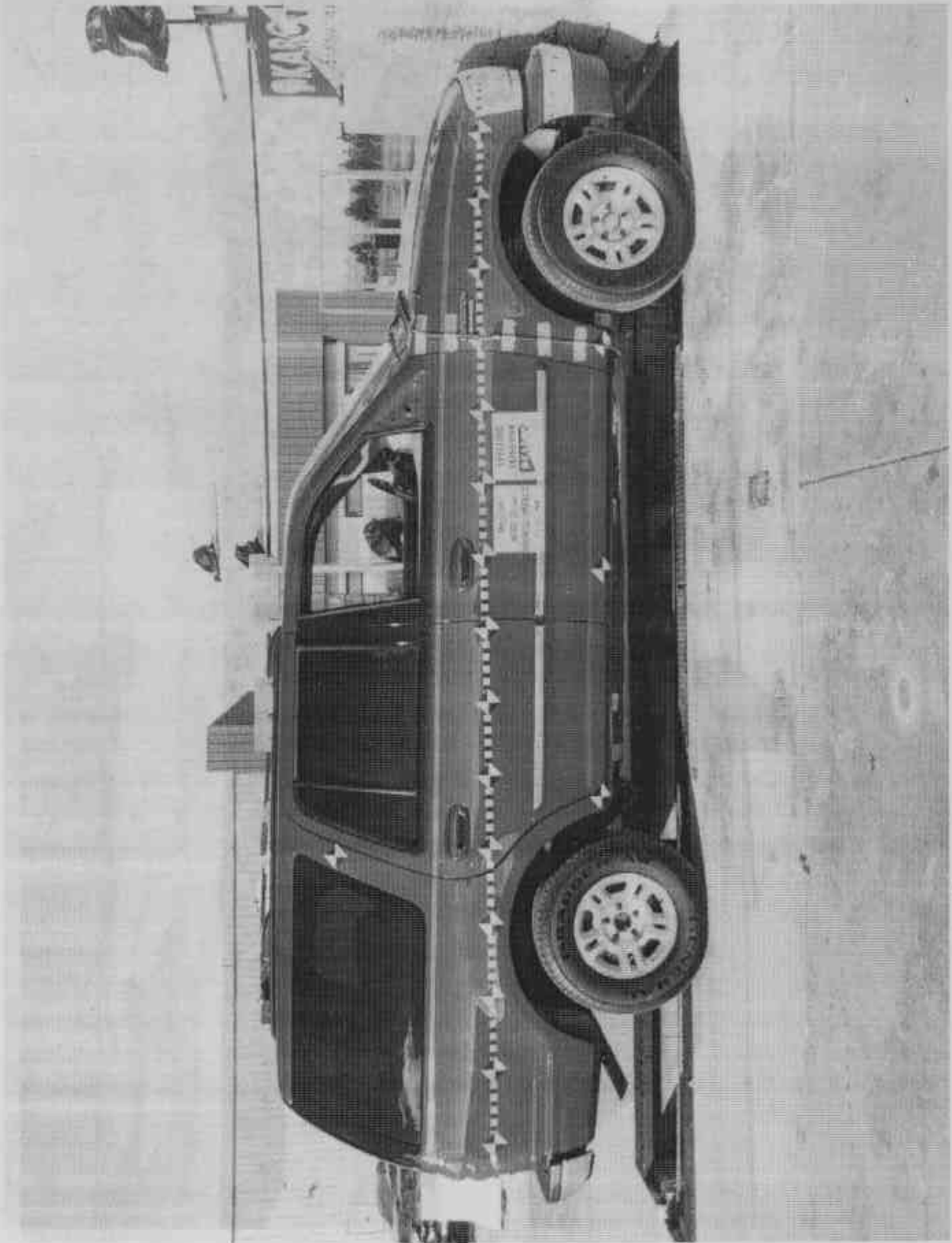


FIGURE A-9. PRETEST RIGHT SIDE VIEW

KAR99001-12

A-9

KAR99001-12



FIGURE A-10. POST TEST RIGHT SIDE VIEW

A-10

KAR99001-12

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FIGURE A-11. PRETEST RIGHT FRONT VIEW

A-11

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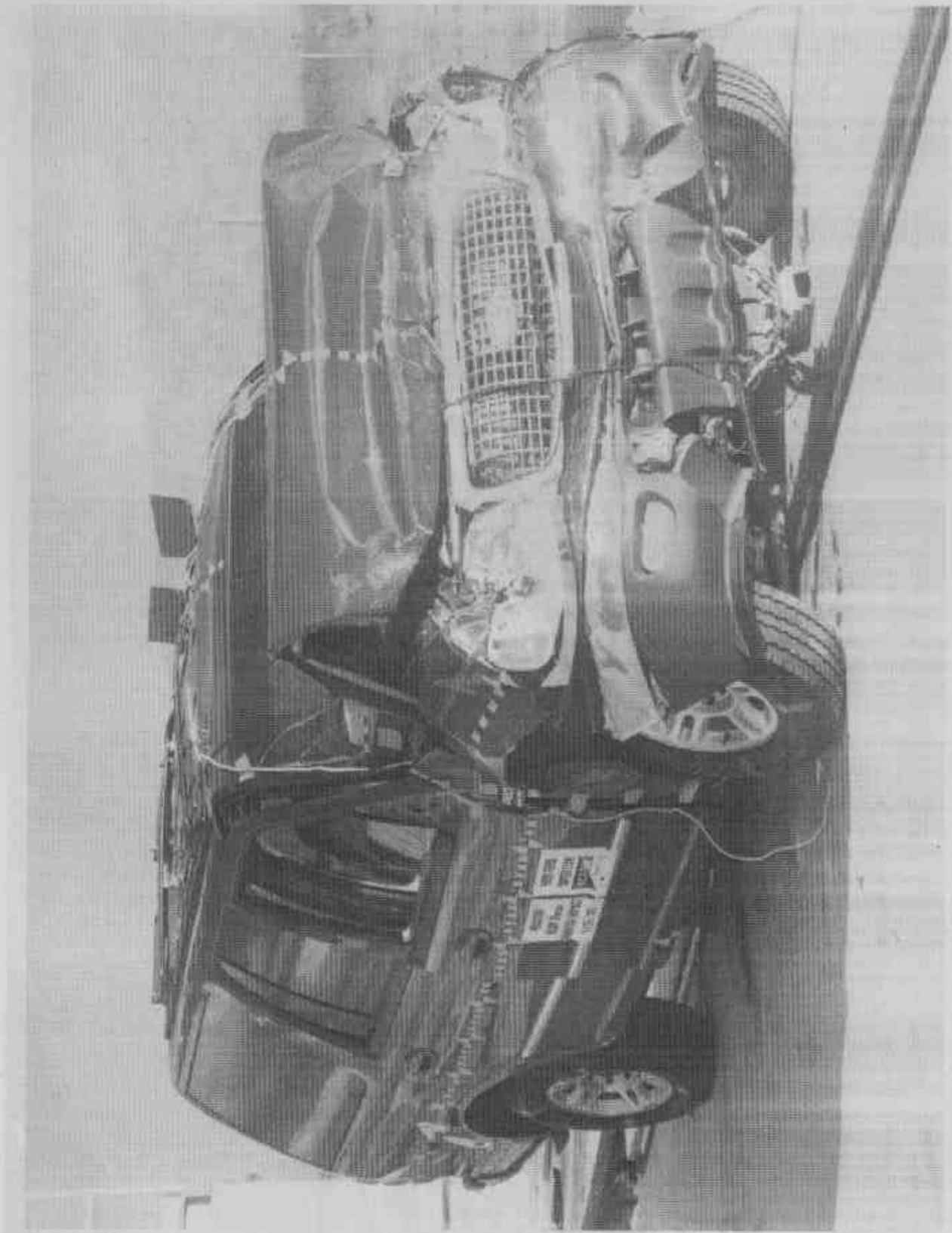


FIGURE A-12. POST TEST RIGHT FRONT VIEW

A-12

KAR99001-12

57-10003101



FIGURE A-13. PRETEST LEFT REAR VIEW



FIGURE A-14. POST TEST LEFT REAR VIEW

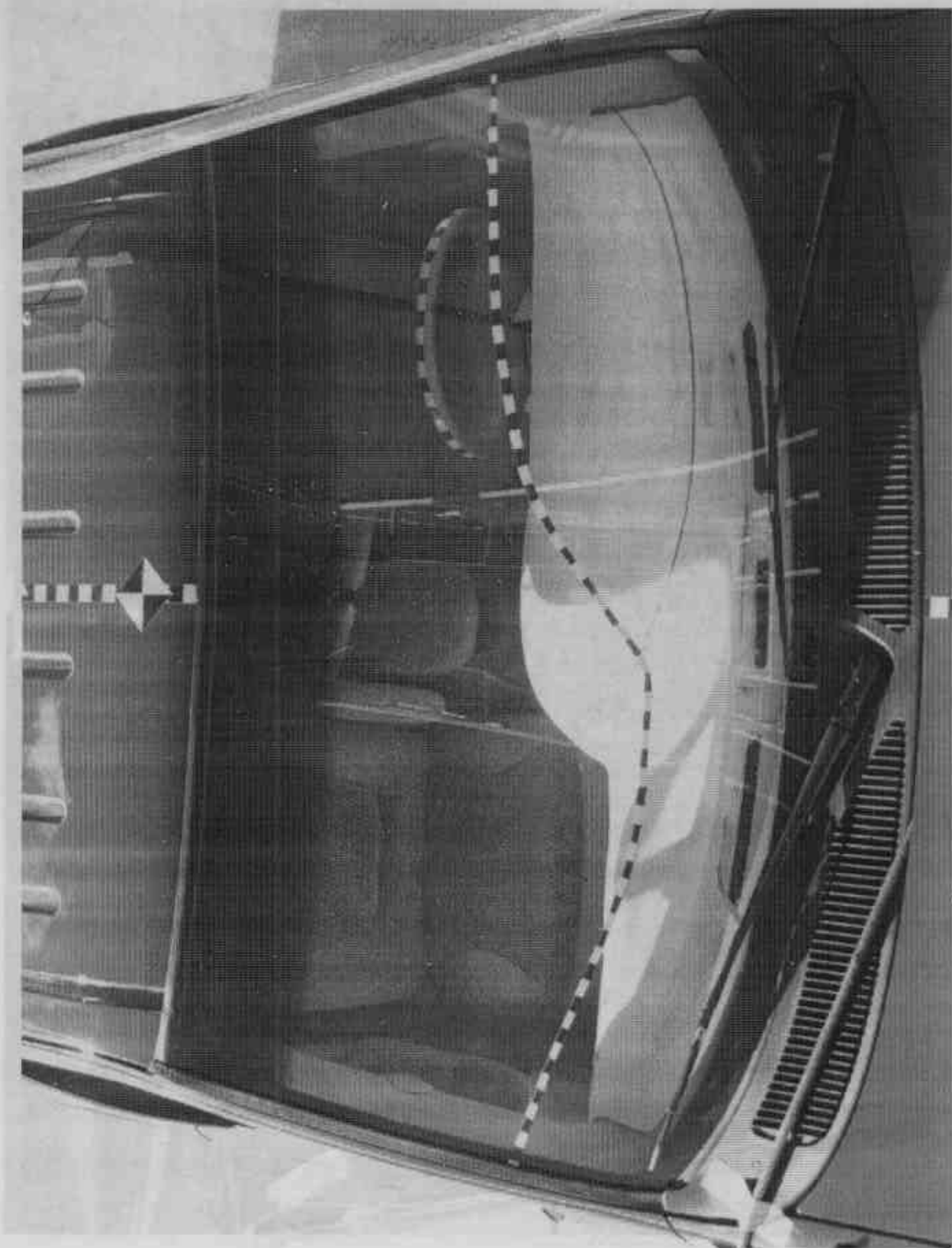


FIGURE A-15. PRETEST WINDSHIELD

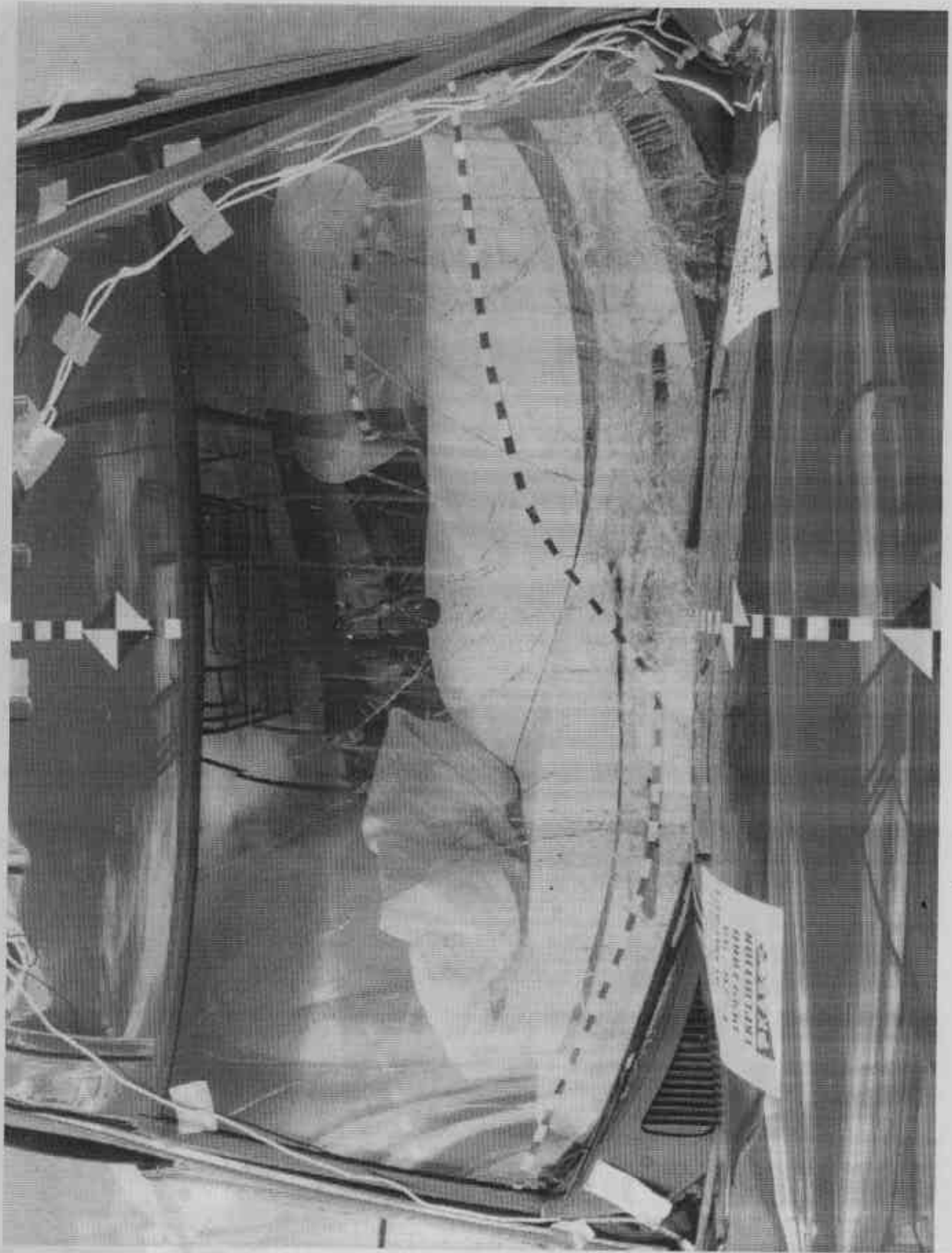


FIGURE A-16. POST TEST WINDSHIELD

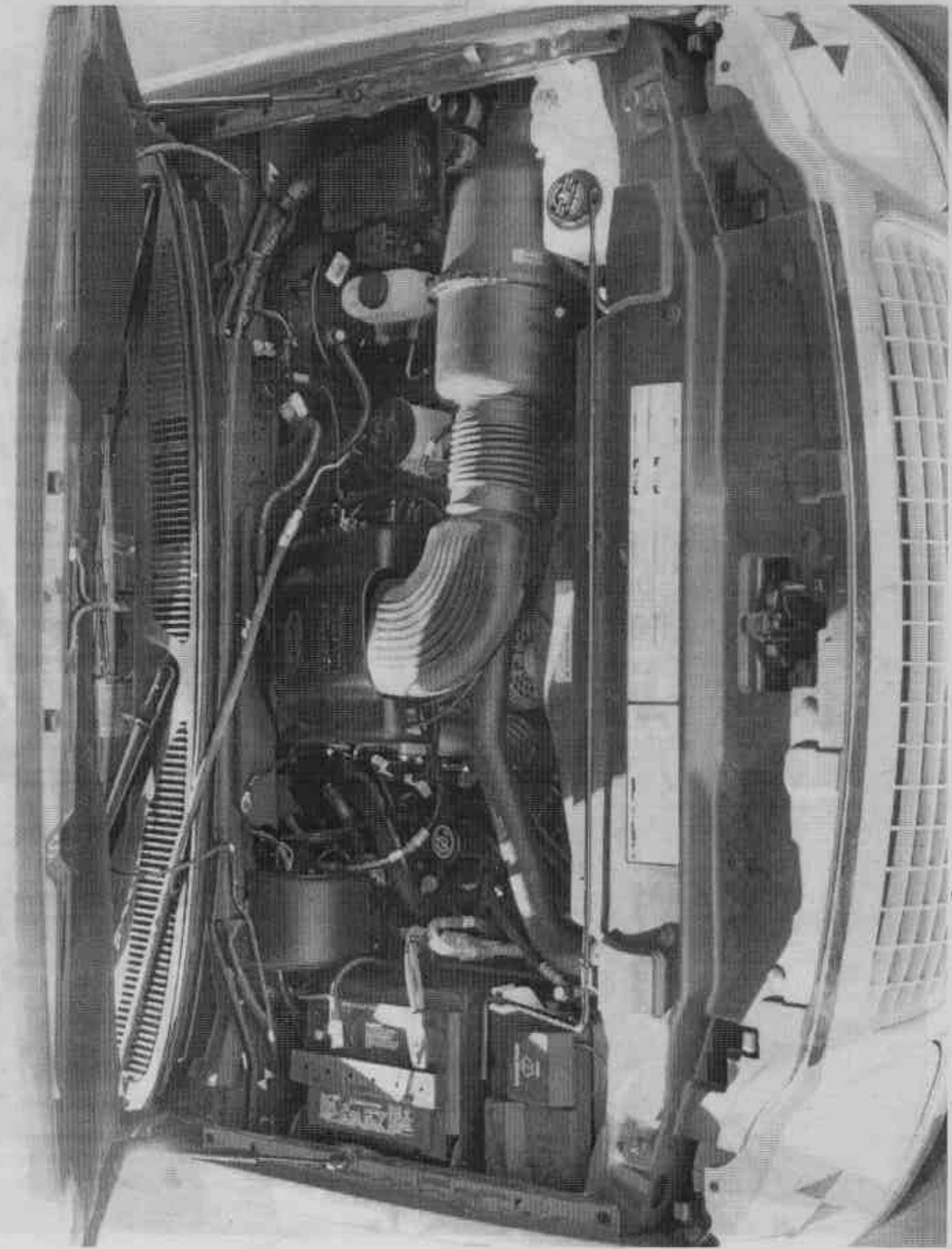


FIGURE A-17. PRETEST ENGINE COMPARTMENT

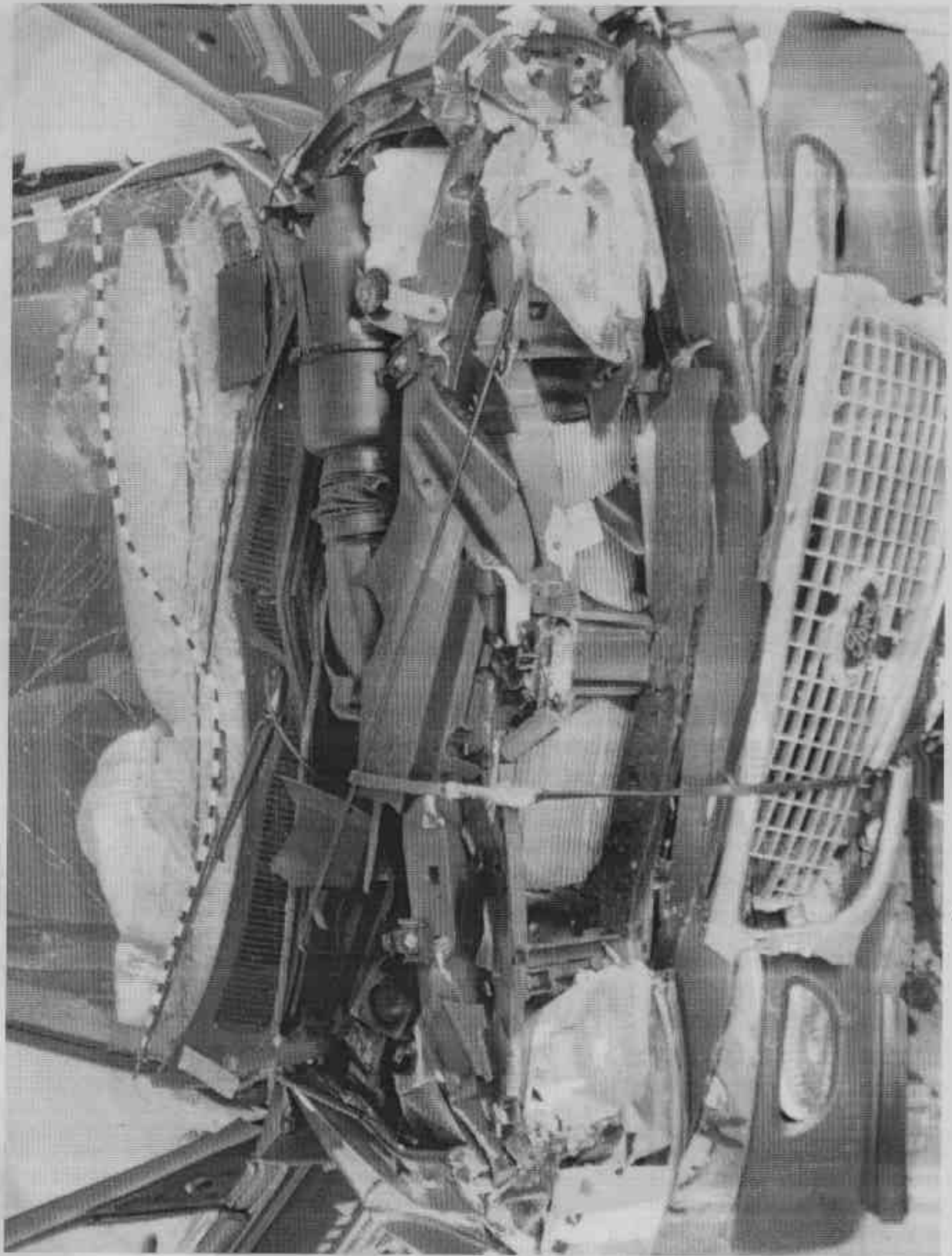


FIGURE A-18. POST TEST ENGINE COMPARTMENT

A-18

KAR99001-12

KAR99001-12

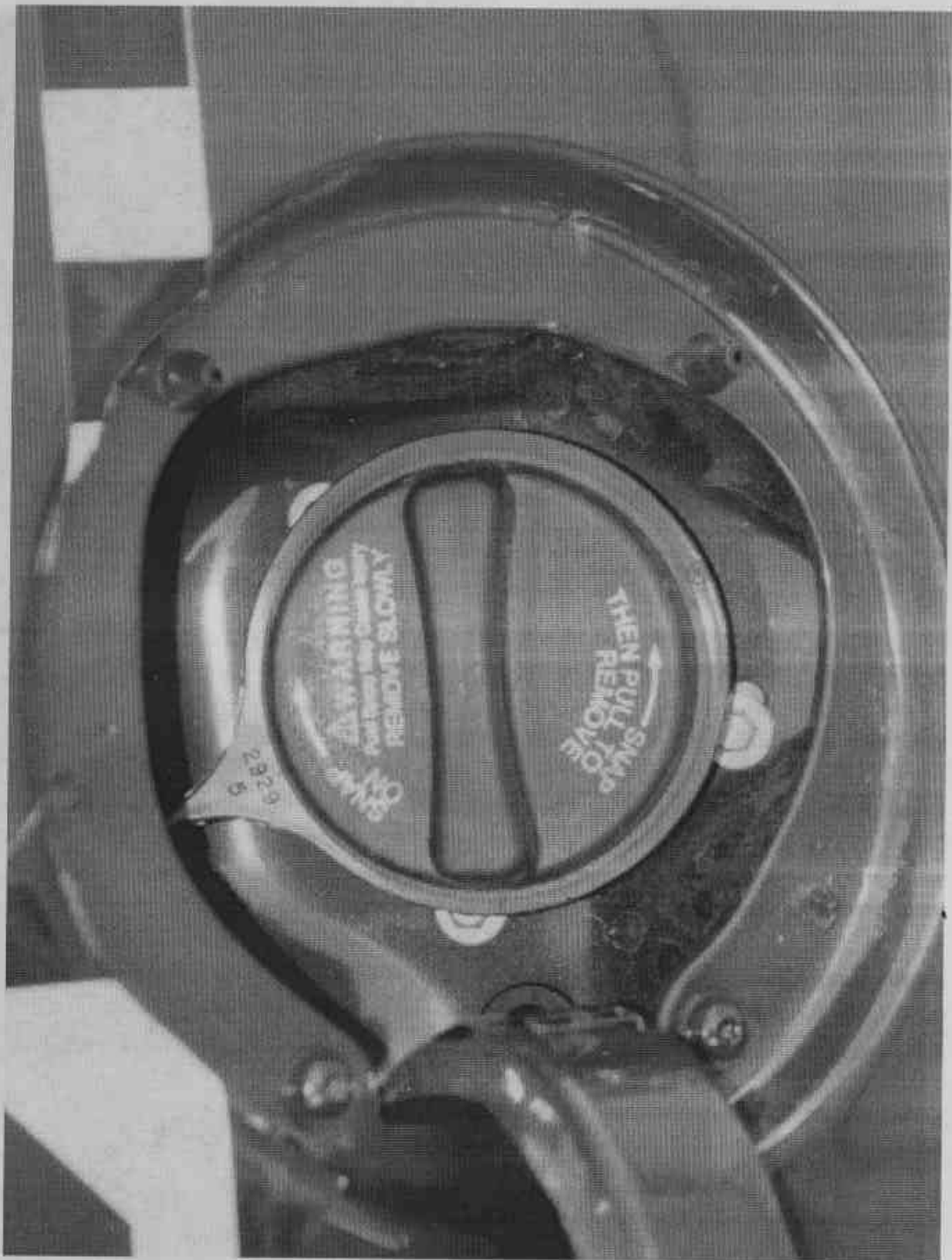


FIGURE A-20. POST TEST FUEL CAP

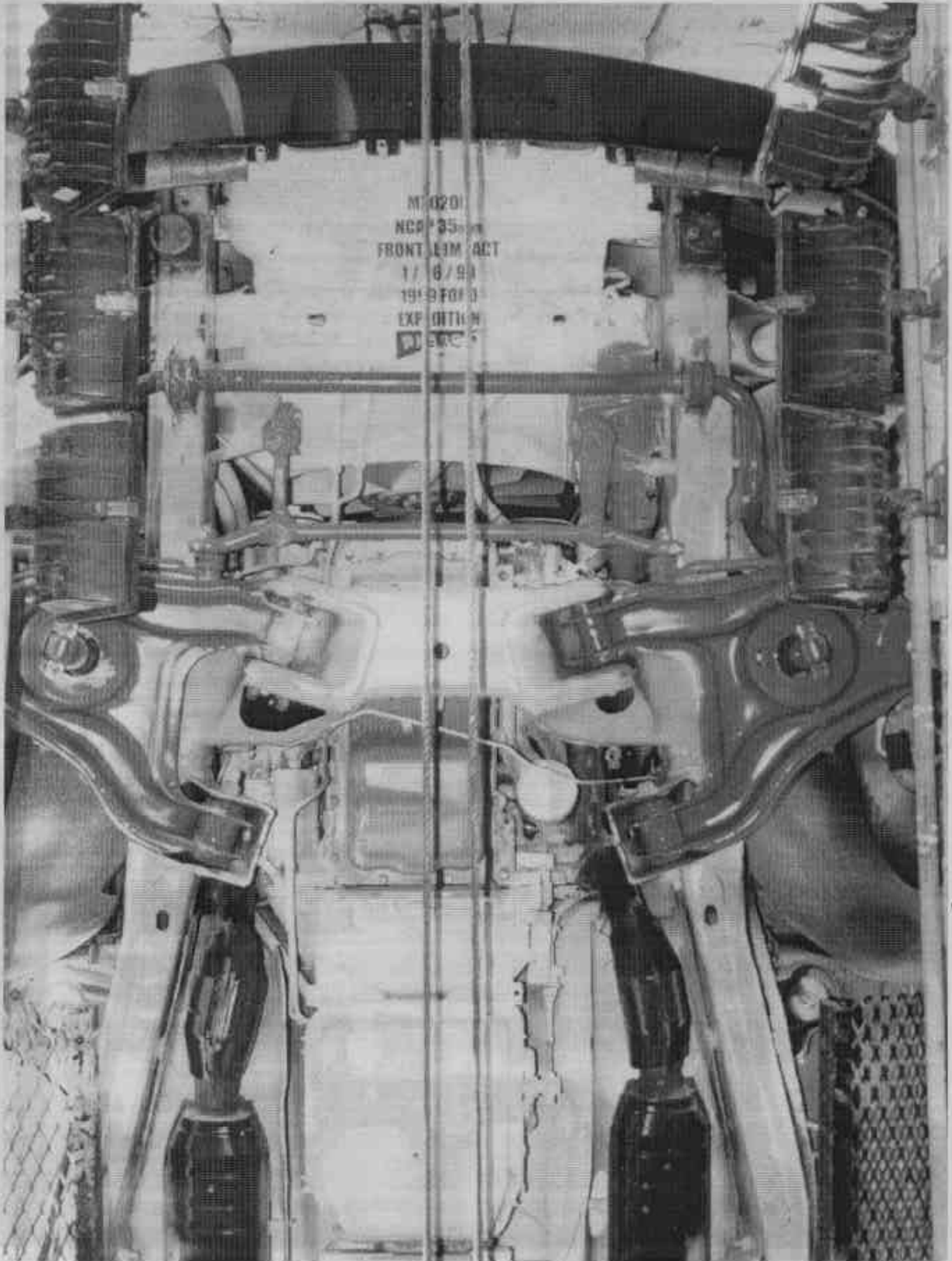


FIGURE A-21. PRETEST FRONT UNDERSIDE

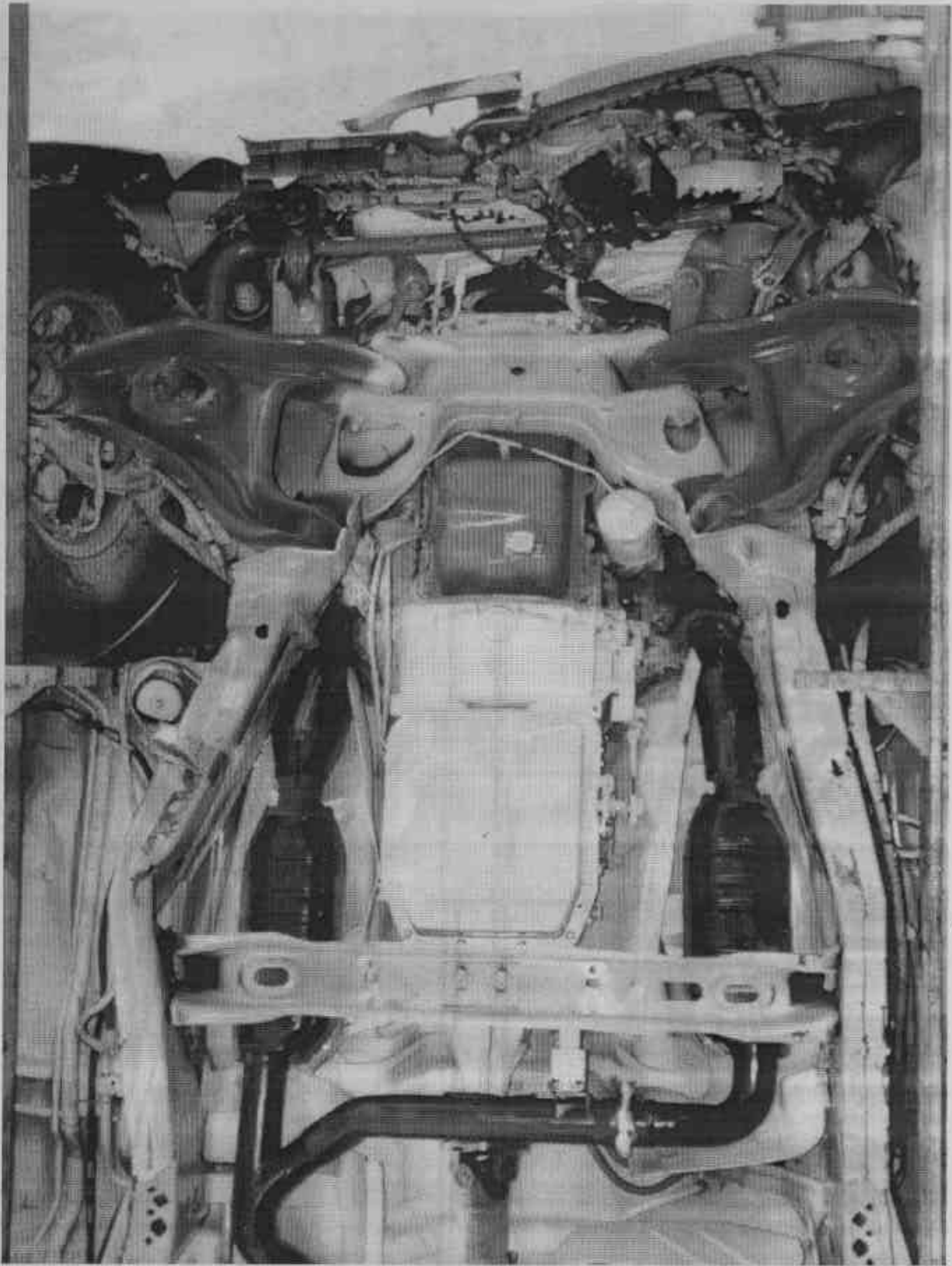


FIGURE A-22. POST TEST FRONT UNDERSIDE

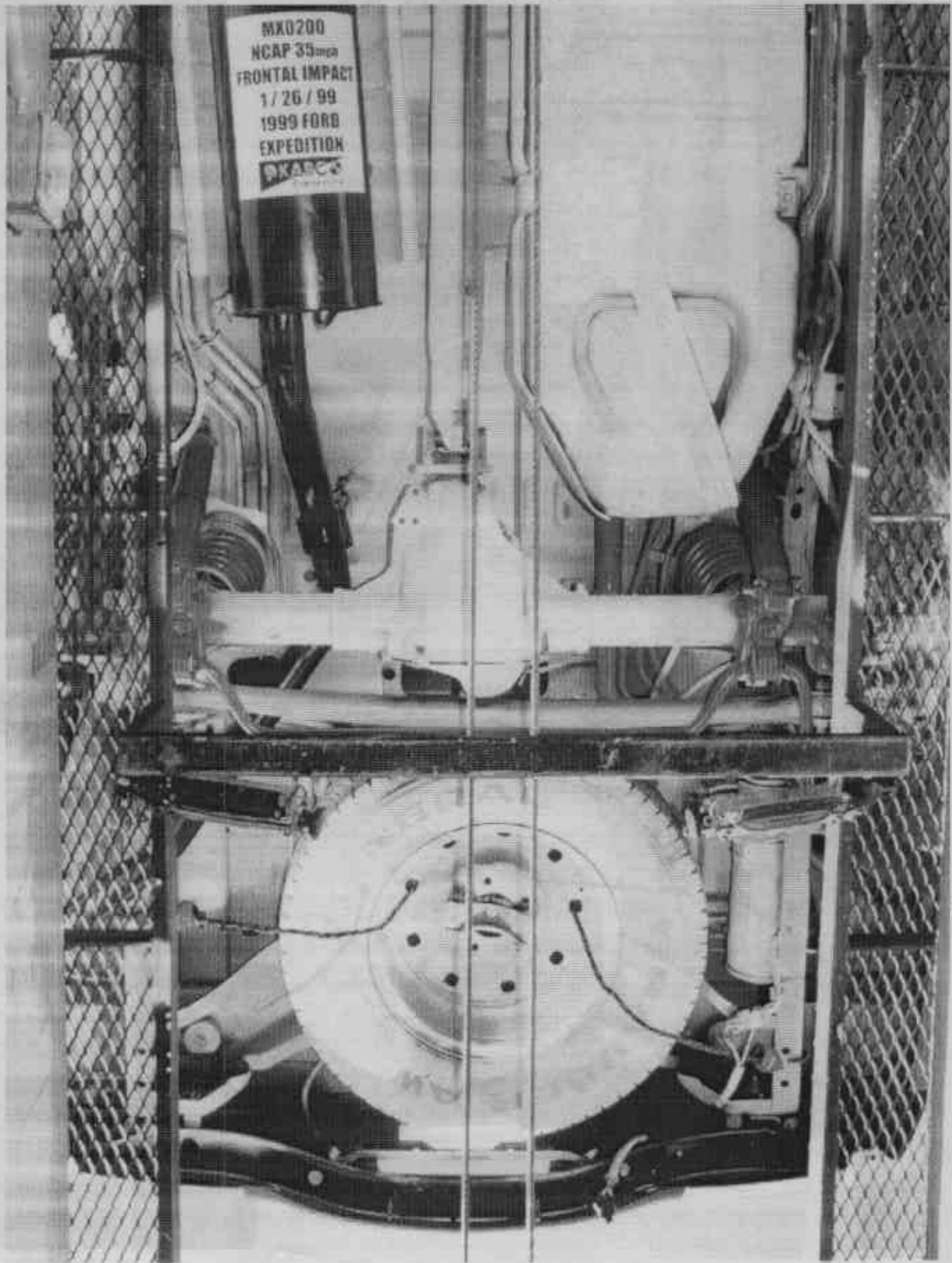


FIGURE A-23. PRETEST REAR UNDERSIDE

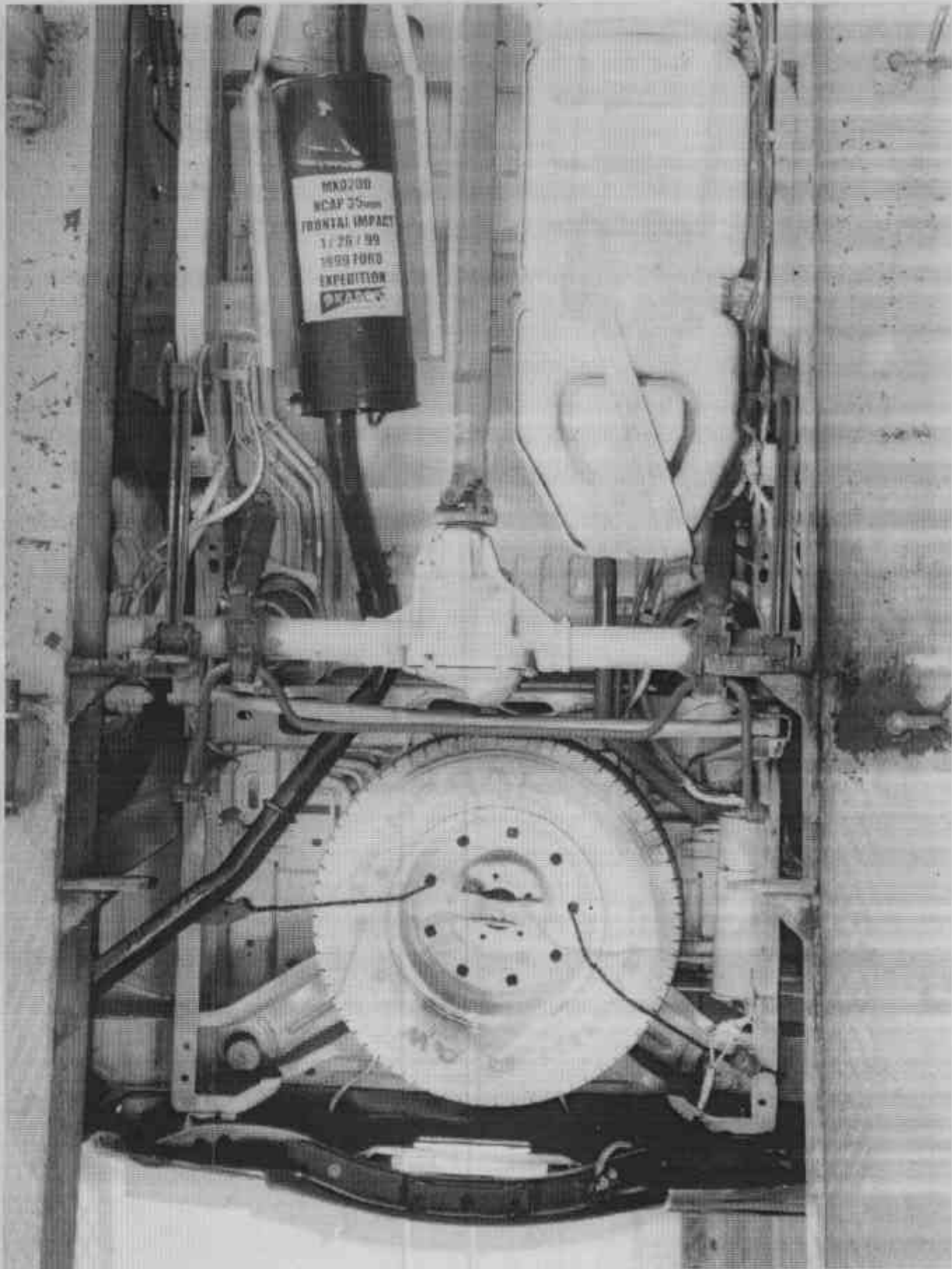


FIGURE A-24. POST TEST REAR UNDERSIDE

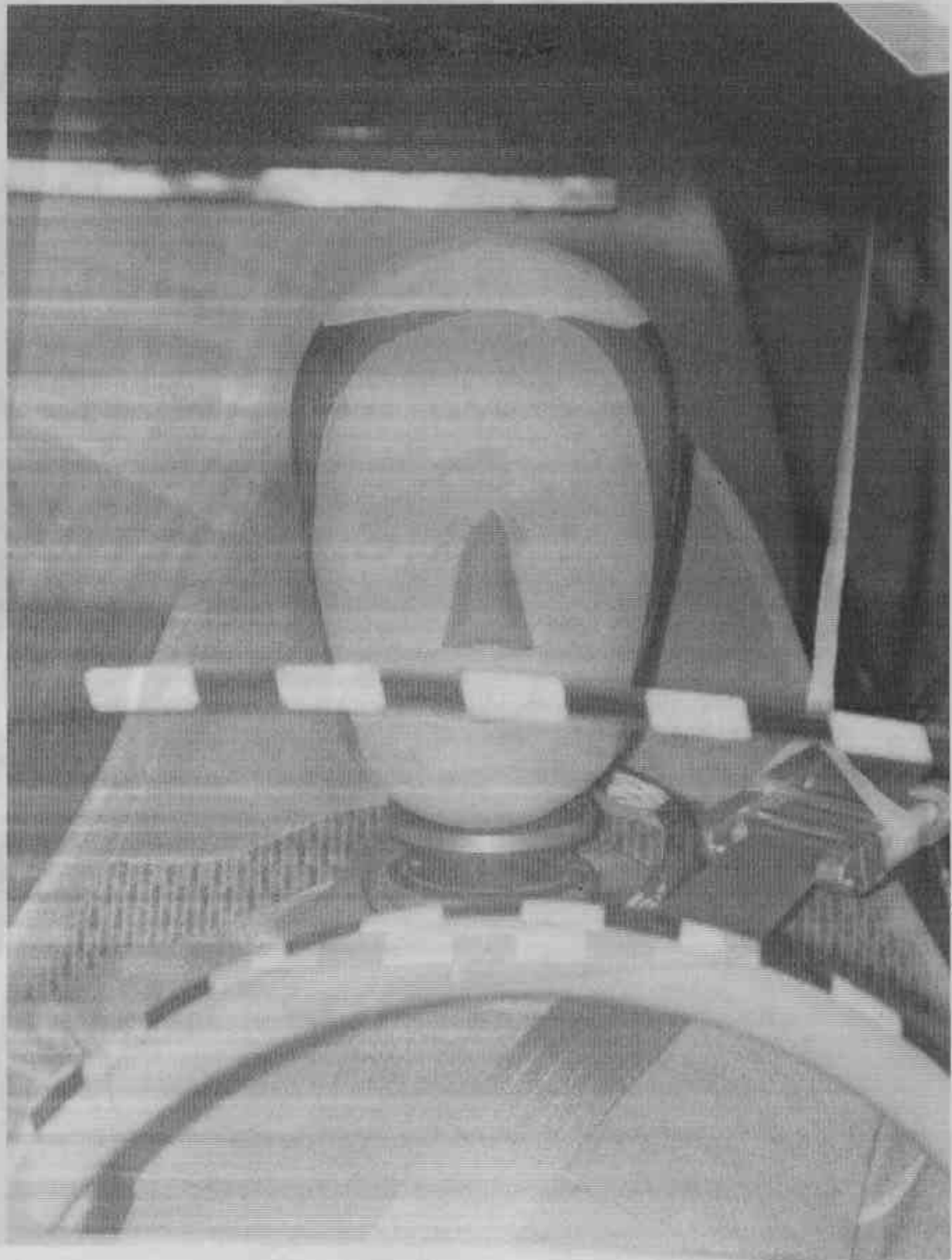


FIGURE A-25. PRETEST DRIVER DUMMY (FRONT VIEW)



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

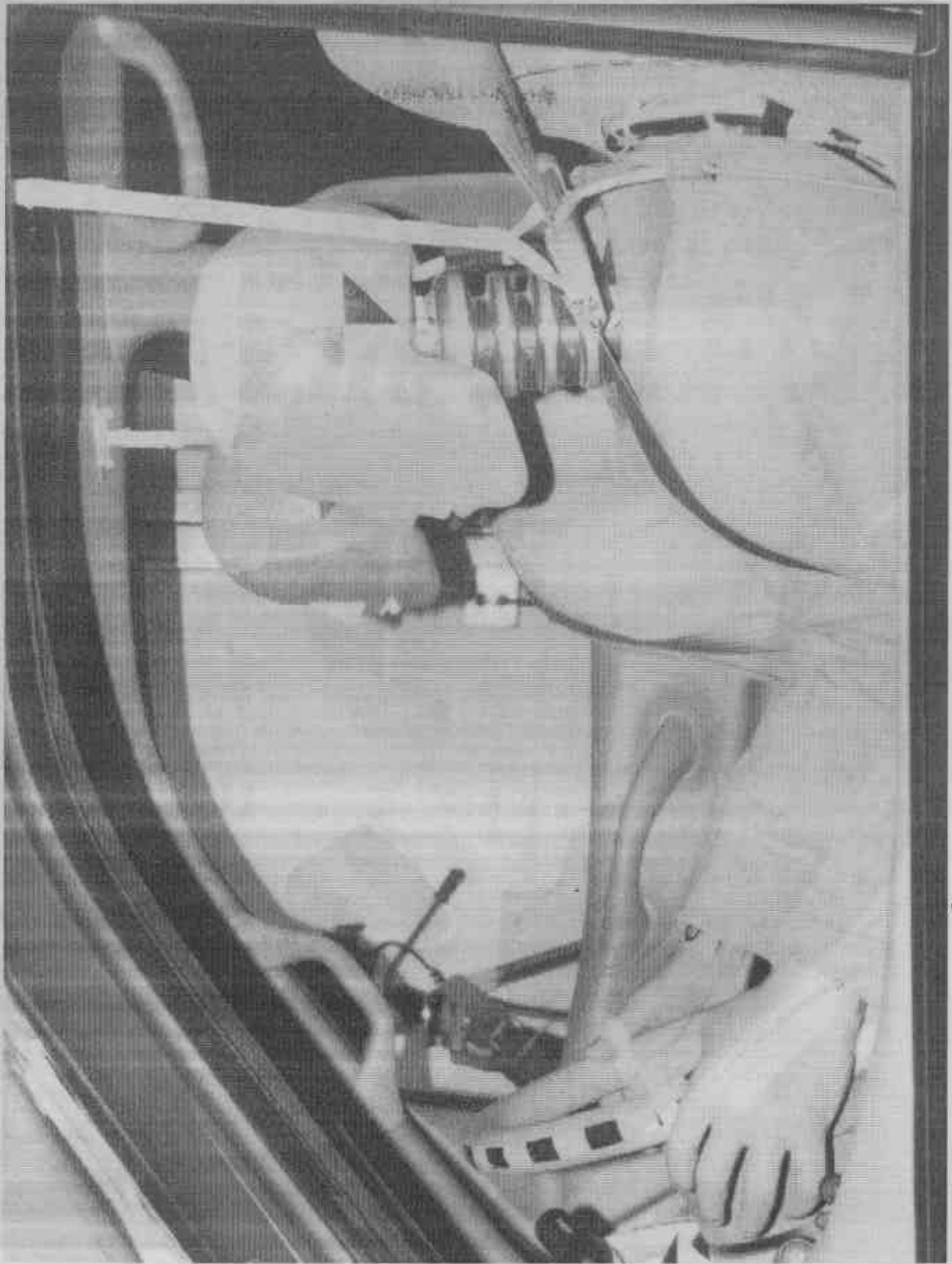


FIGURE A-27. PRETEST DRIVER DUMMY (THRU WINDOW)



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



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

KAR99001-12

A-29

KAR99001-12



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



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

SI-YOUWRAH



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

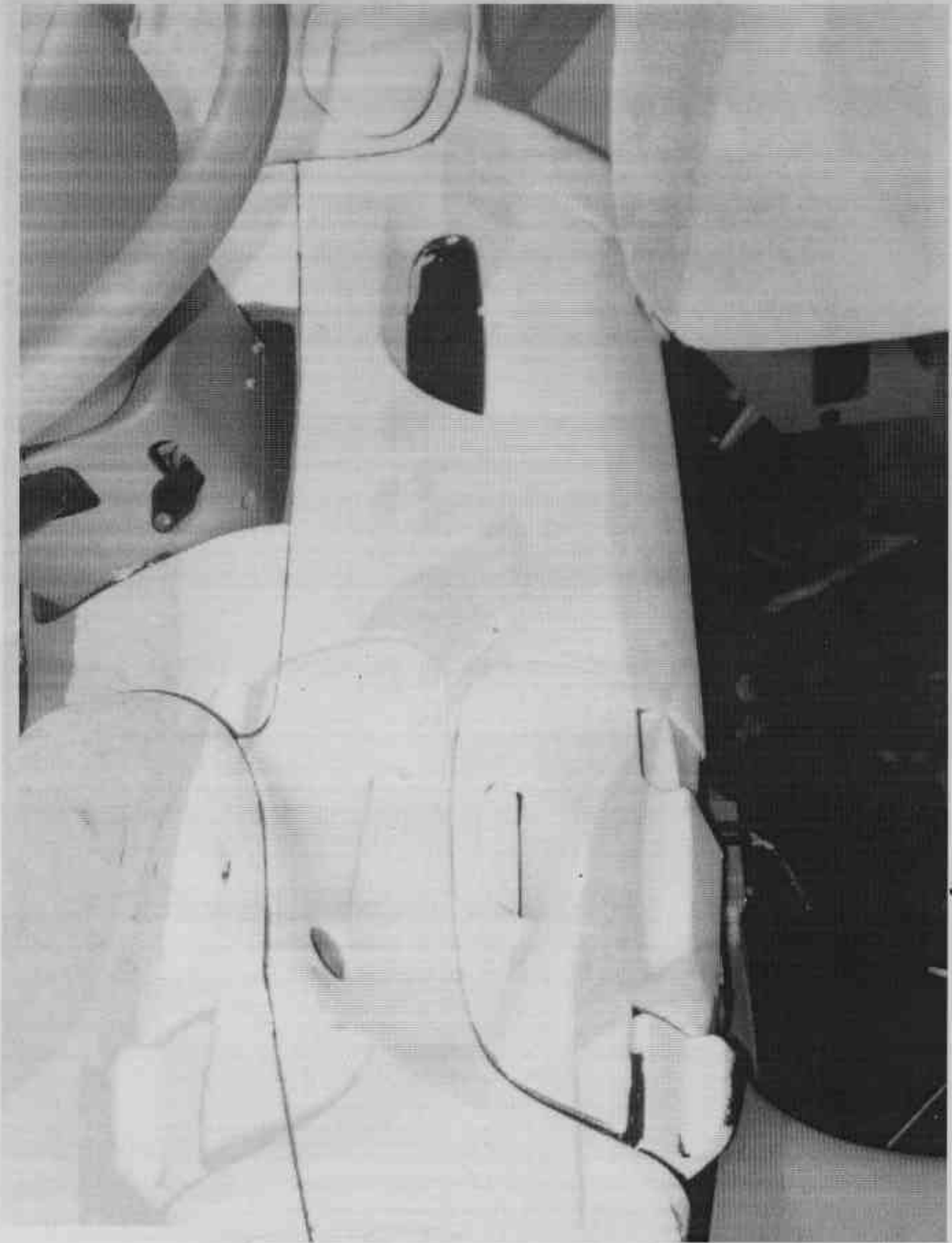


FIGURE A-35. PRETEST DRIVER KNEE BOLSTER

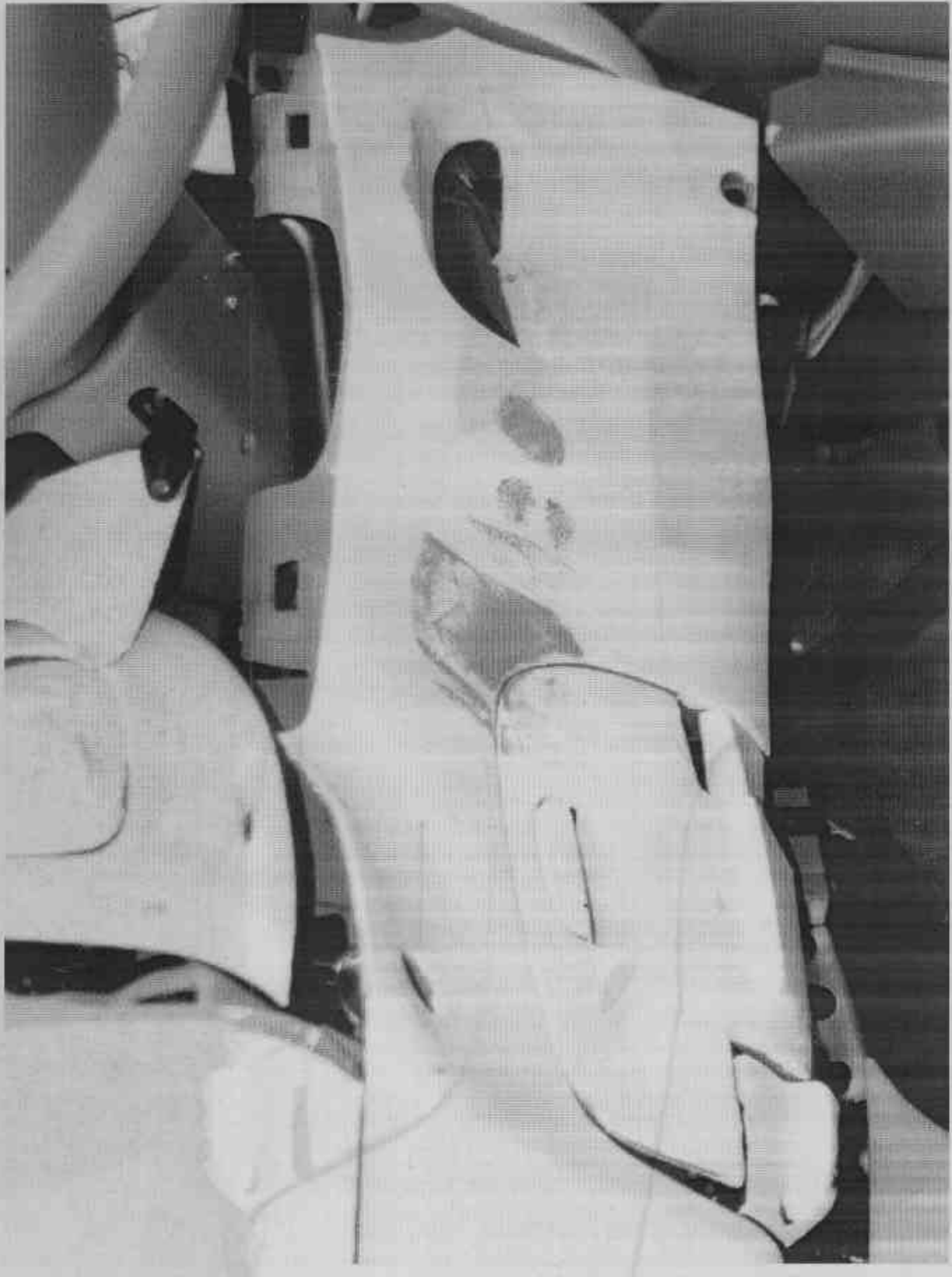


FIGURE A-36. POST TEST DRIVER KNEE BOLSTER

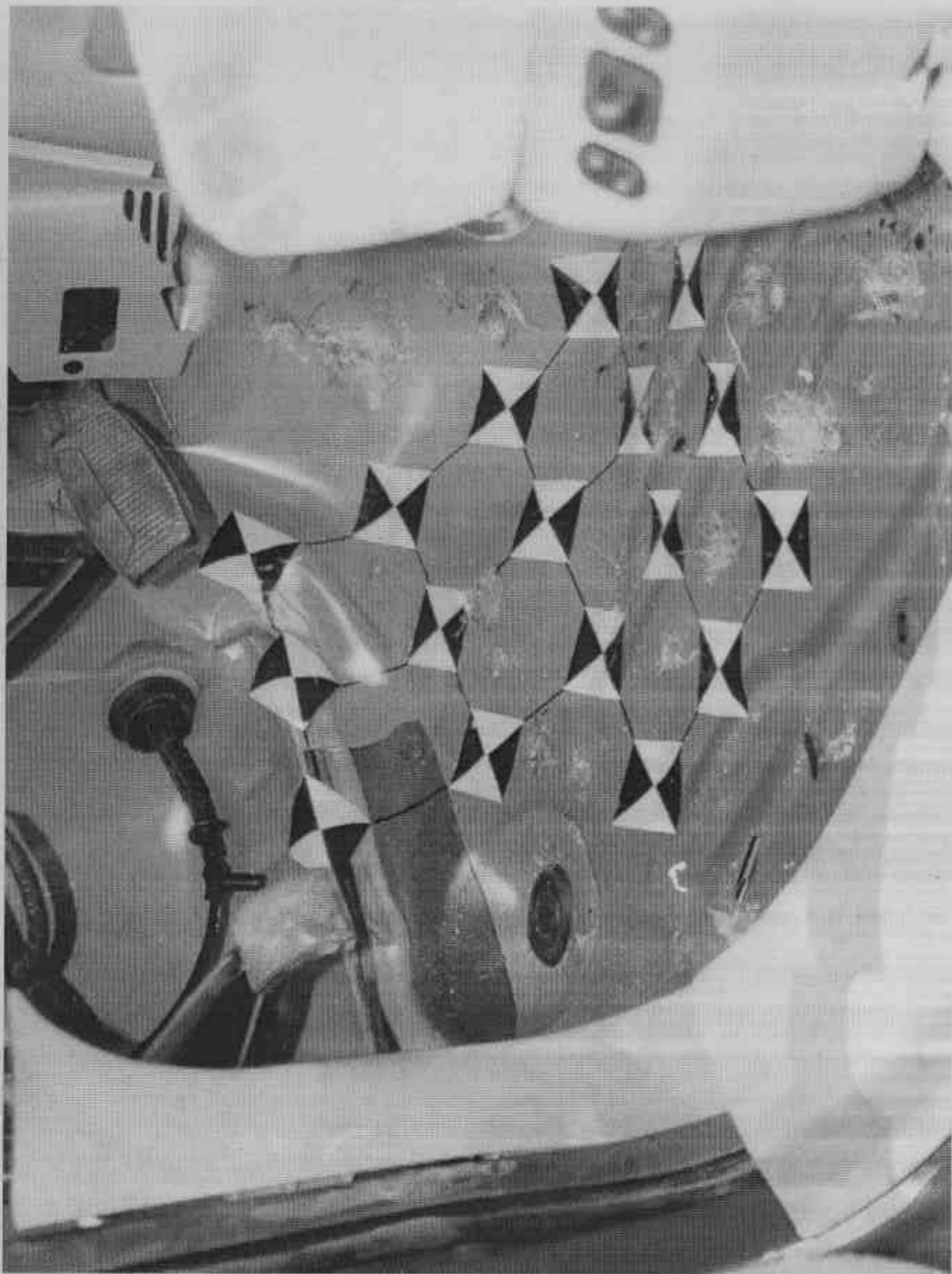


FIGURE A-38. POST TEST DRIVER SIDE FLOOR PAN



FIGURE A-39. POST TEST DRIVER HEAD

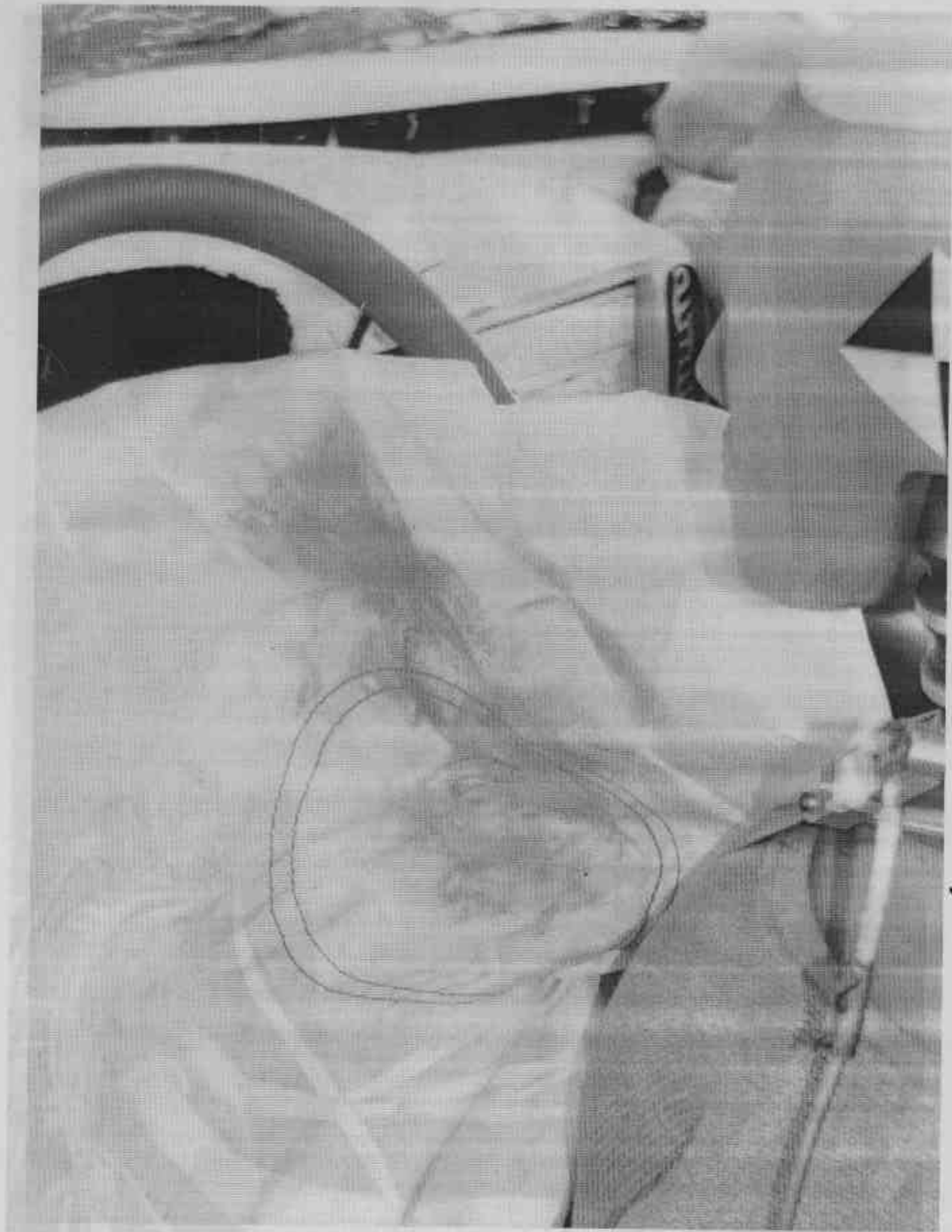


FIGURE A-40. POST TEST DRIVER DUMMY CONTACT



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



FIGURE A-43. PRETEST PASSENGER DUMMY (THRU WINDOW)

SI-FDDKGRAN

A-43

KAR99001-12



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



FIGURE A-45. PRETEST PASSENGER DUMMY (DOOR OPEN)

SF-10089A21

A-45

KAR99001-12



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

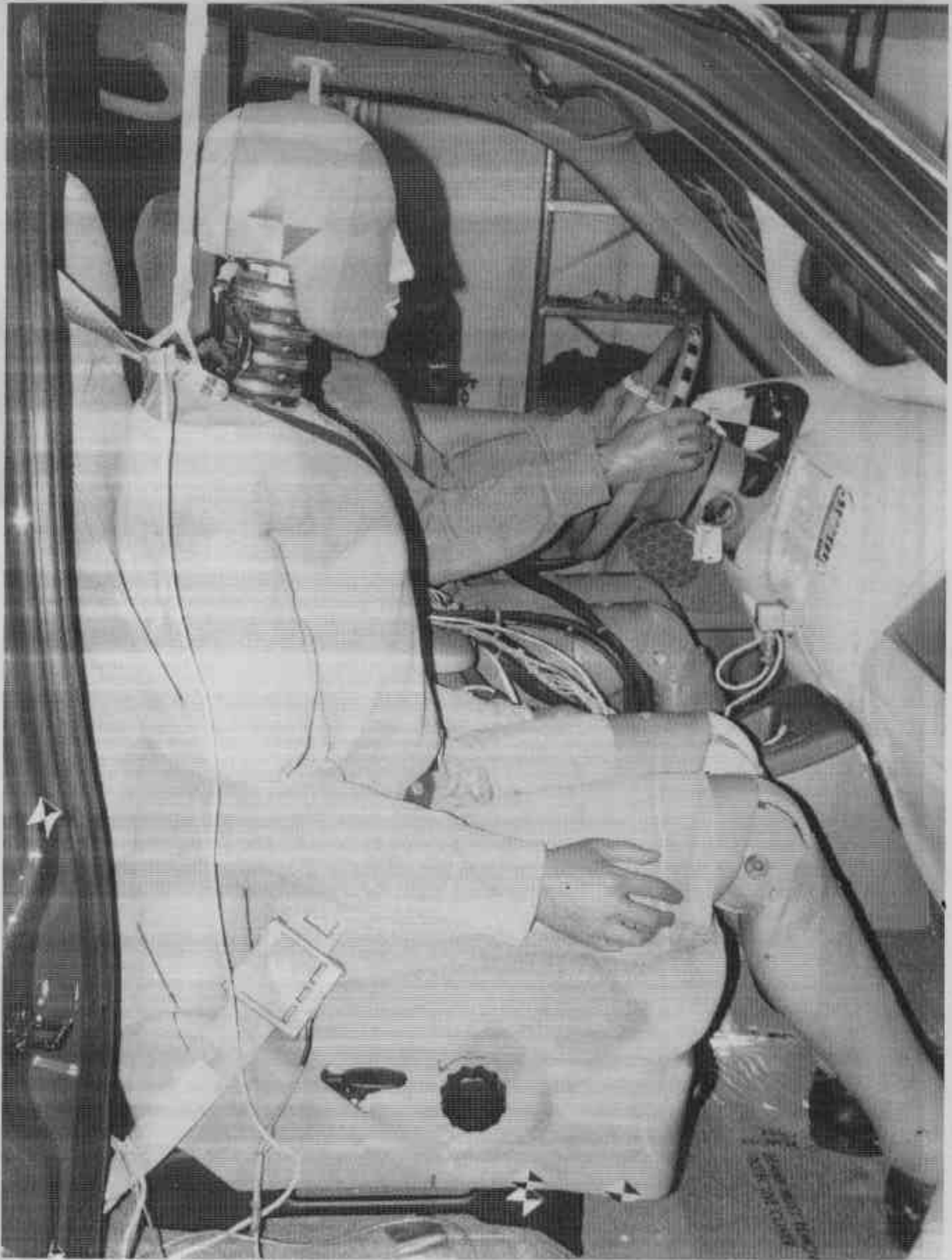


FIGURE A-47. PRETEST PASSENGER DUMMY (90° TO VEHICLE)

KAR99001-12

A-47

KAR99001-12



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

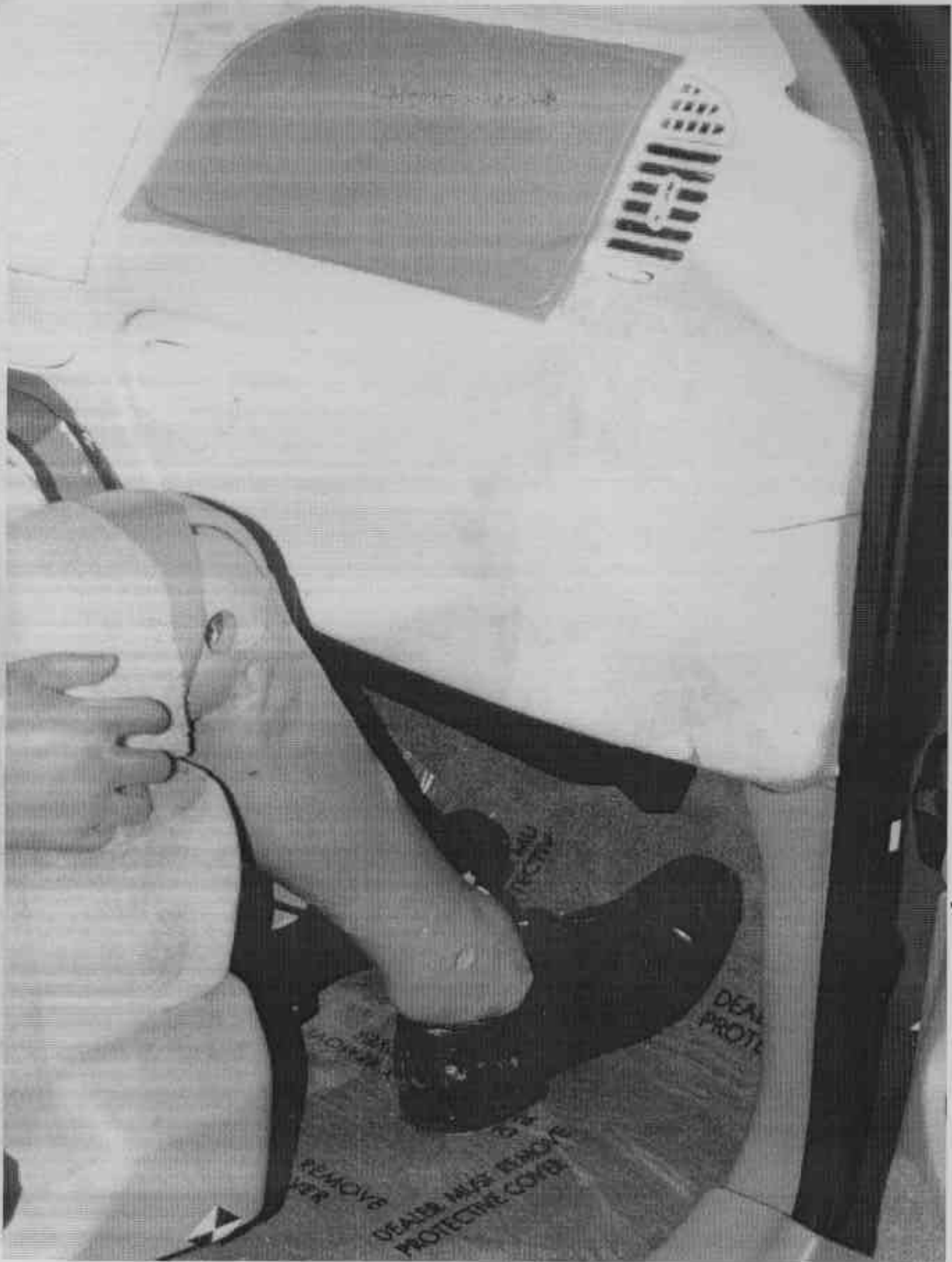


FIGURE A-49. PRETEST PASSENGER DUMMY FEET



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

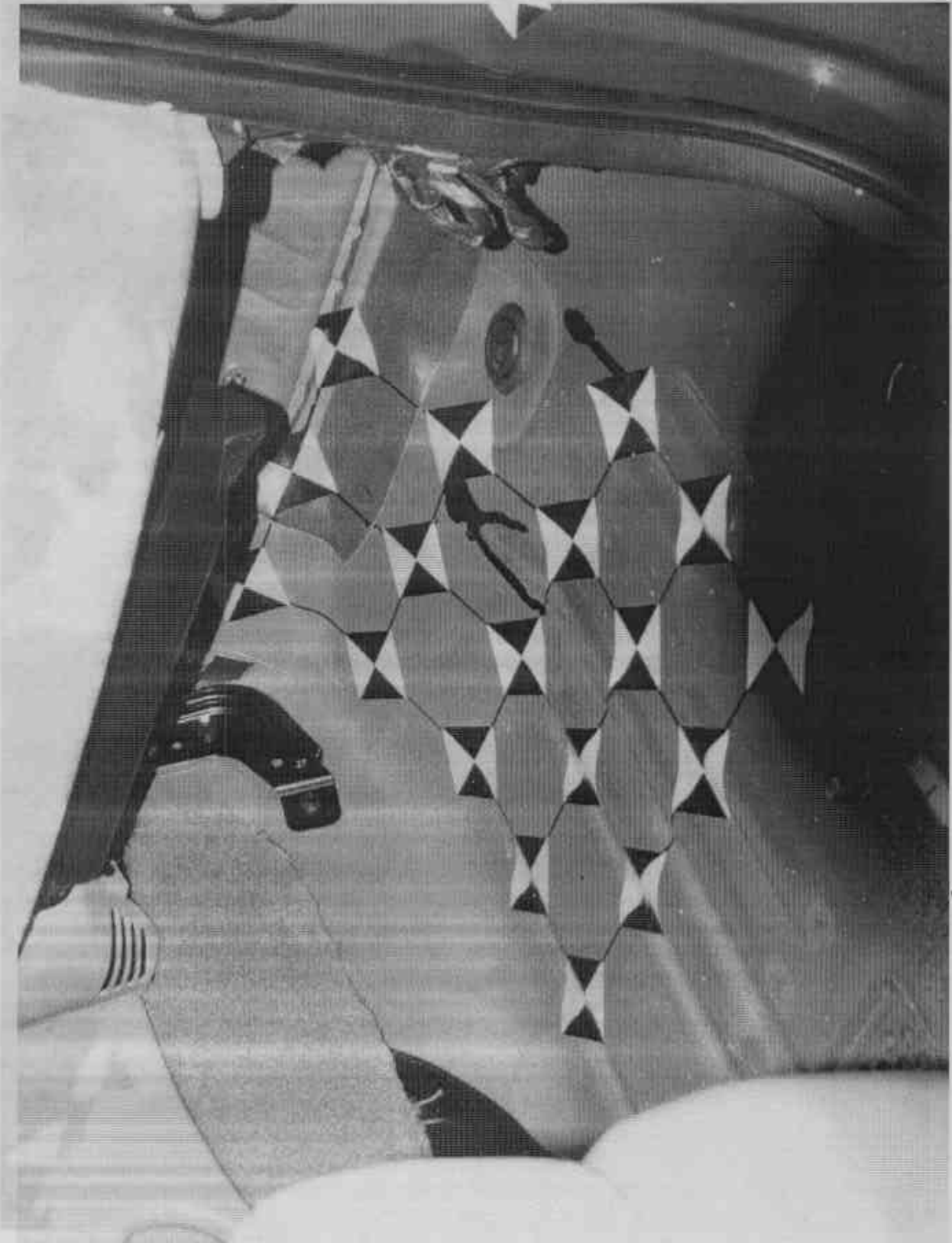


FIGURE A-51. PRETEST PASSENGER SIDE FLOOR PAN

21-10012RAN

A-51

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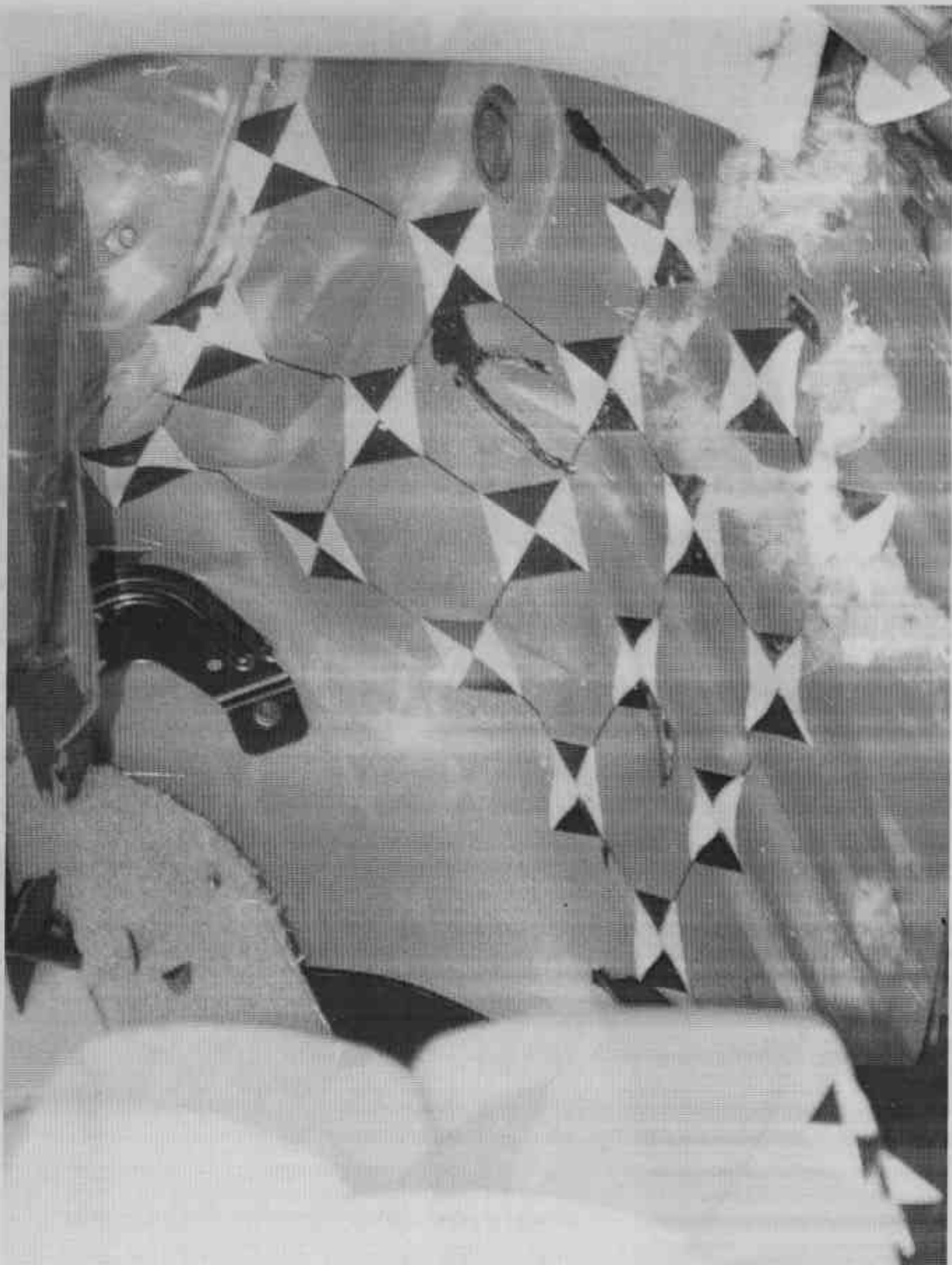


FIGURE A-52. POST TEST PASSENGER SIDE FLOOR PAN

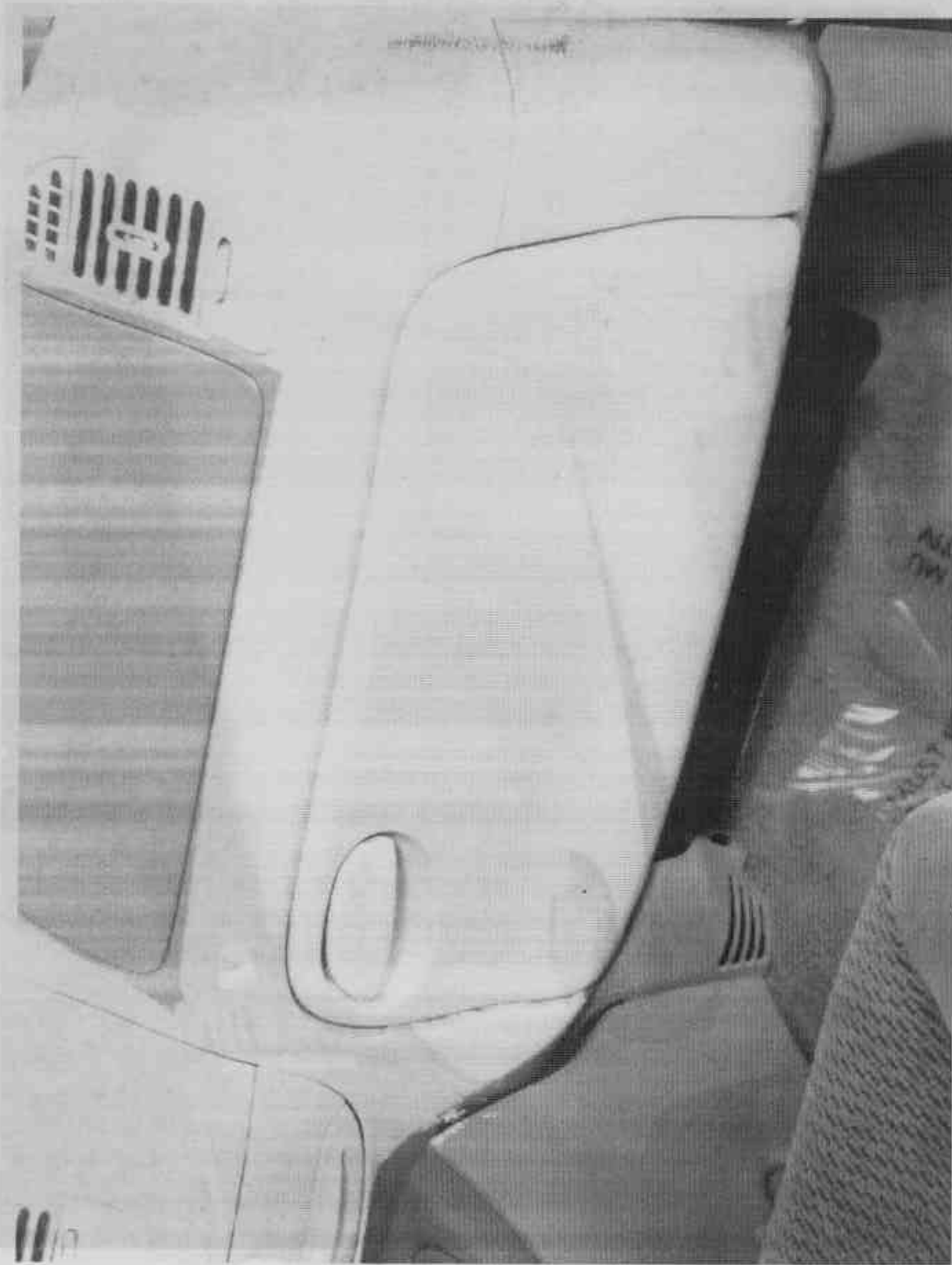


FIGURE A-53. PRETEST PASSENGER SIDE KNEE BOLSTER

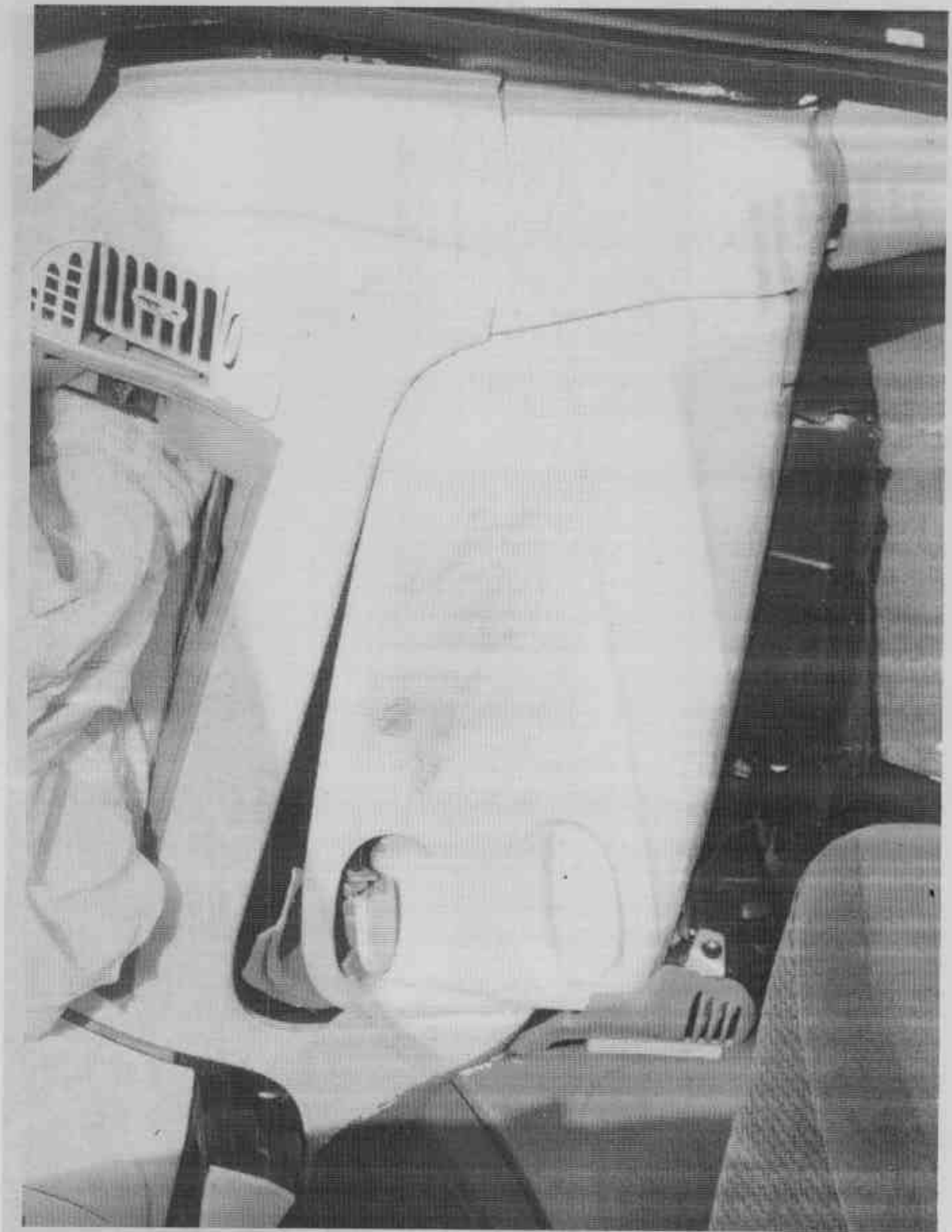


FIGURE A-54. POST TEST PASSENGER SIDE KNEE BOLSTER AND DUMMY CONTACT

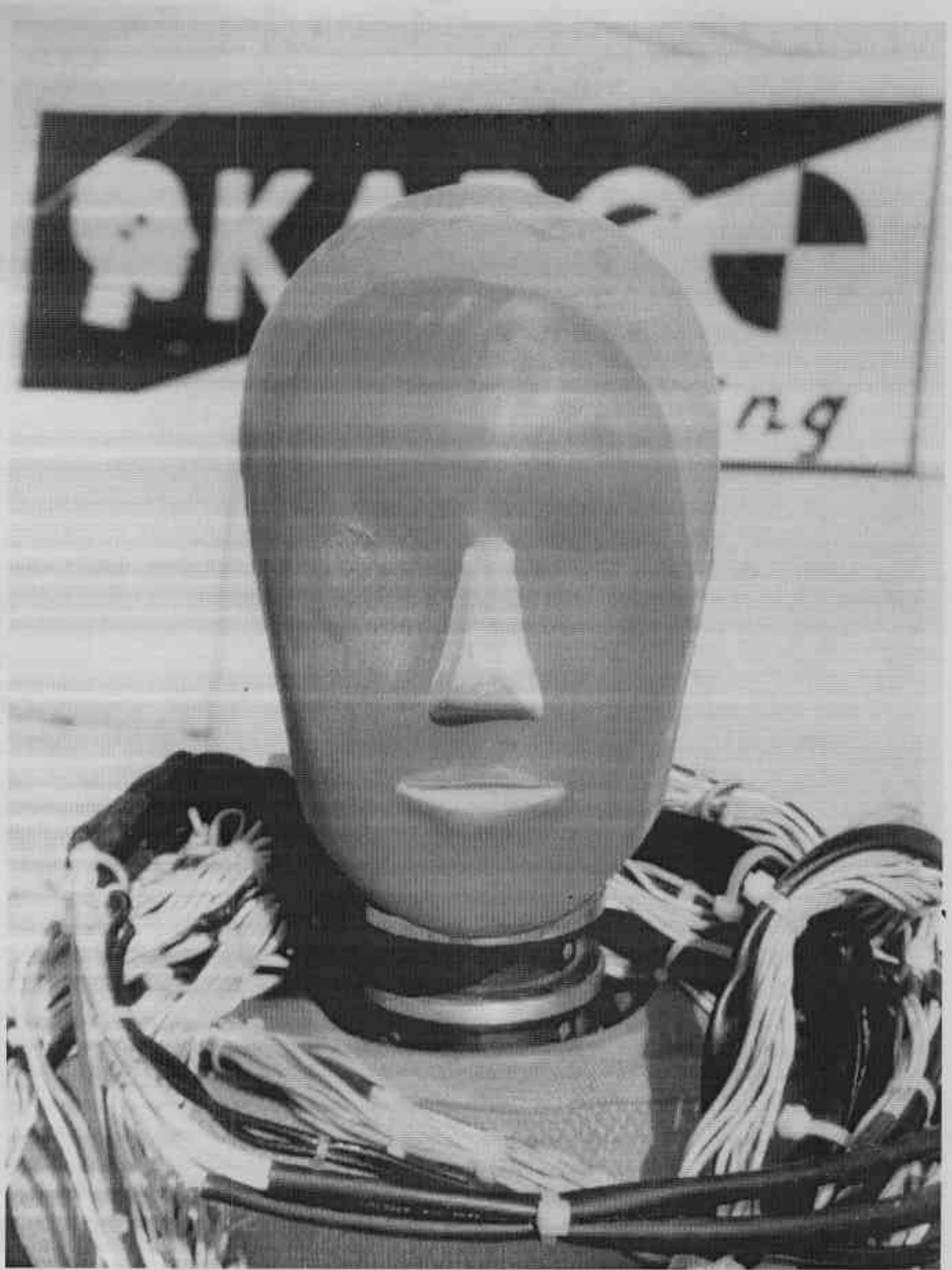


FIGURE A-55. POST TEST PASSENGER HEAD

A-55

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FIGURE A-56. POST TEST PASSENGER DUMMY CONTACT

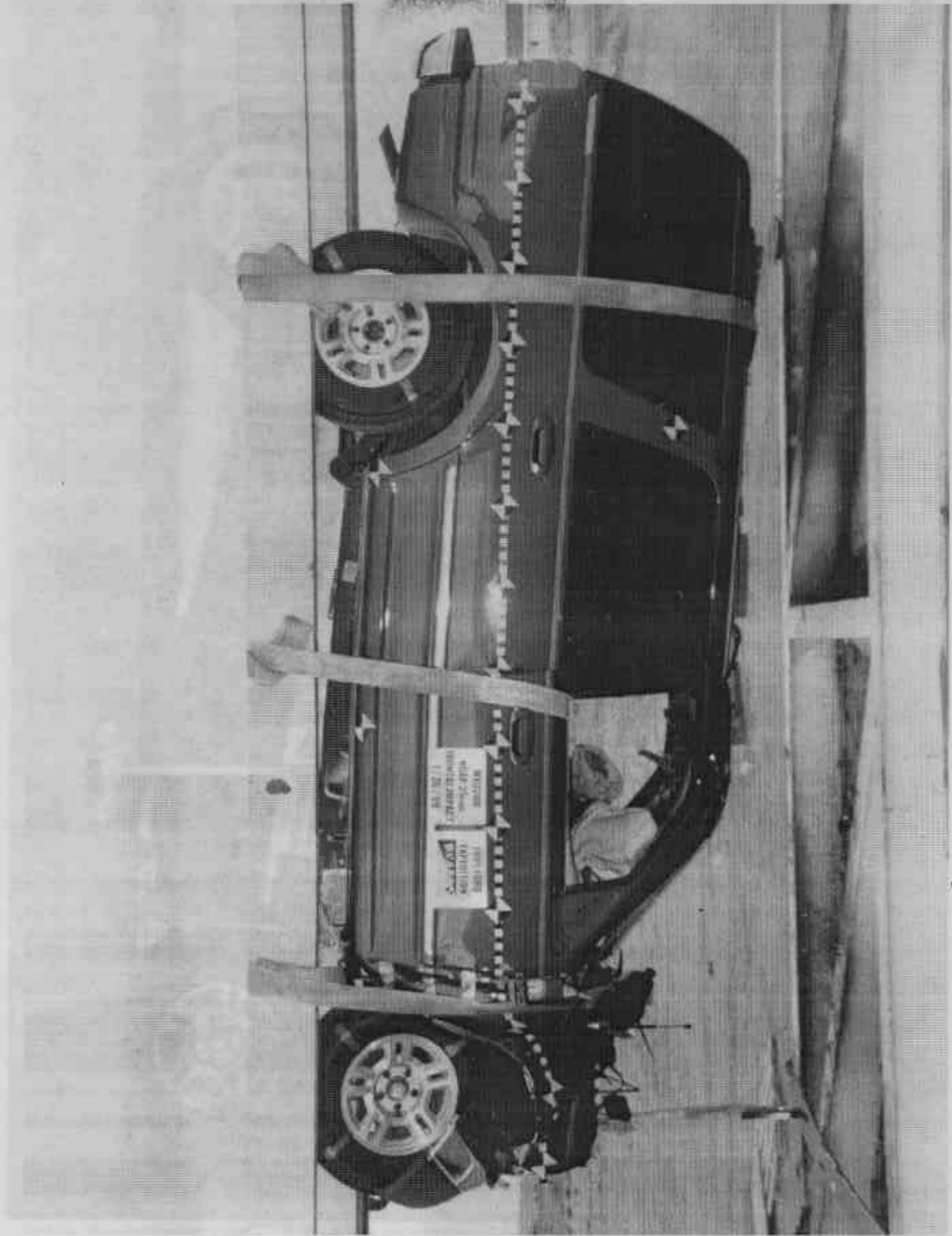


FIGURE A-57. VEHICLE ON ROLLOVER



FIGURE A-58. VEHICLE DURING IMPACT

APPENDIX B
DUMMY AND VEHICLE RESPONSE DATA TRACES

KAR99001-12

LIST OF DATA PLOTS

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B-7	Driver Head Redundant X	B-7
B-8	Driver Head Redundant X Velocity	B-8
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B-28	Driver Chest Redundant X Velocity	B-28
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B-30	Driver Chest Redundant Y	B-30
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B-43	Driver Left Upper Tibia Moment Y	B-43
B-44	Driver Right Upper Tibia Moment X	B-44
B-45	Driver Right Upper Tibia Moment Y	B-45
B-46	Driver Left Lower Tibia Moment X	B-46
B-47	Driver Left Lower Tibia Moment Y	B-47
B-48	Driver Left Lower Tibia Force Z	B-48
B-49	Driver Right Lower Tibia Moment X	B-49
B-50	Driver Right Lower Tibia Moment Y	B-50
B-51	Driver Right Lower Tibia Force Z	B-51
B-52	Driver Left Foot Aft X	B-52
B-53	Driver Left Foot Aft Z	B-53
B-54	Driver Left Foot Fore Z	B-54
B-55	Driver Right Foot Aft X	B-55
B-56	Driver Right Foot Aft Z	B-56
B-57	Driver Right Foot Fore Z	B-57
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B-61	Driver Shoulder Belt Elongation	B-61
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B-63	Passenger Head Primary X Velocity	B-63
B-64	Passenger Head Primary X Displacement	B-64
B-65	Passenger Head Primary Y	B-65
B-66	Passenger Head Primary Z	B-66
B-67	Passenger Head Resultant Primary	B-67
B-68	Passenger Head Redundant X	B-68
B-69	Passenger Head Redundant X Velocity	B-69
B-70	Passenger Head Redundant X Displacement	B-70

LIST OF DATA PLOTS...(Continued)

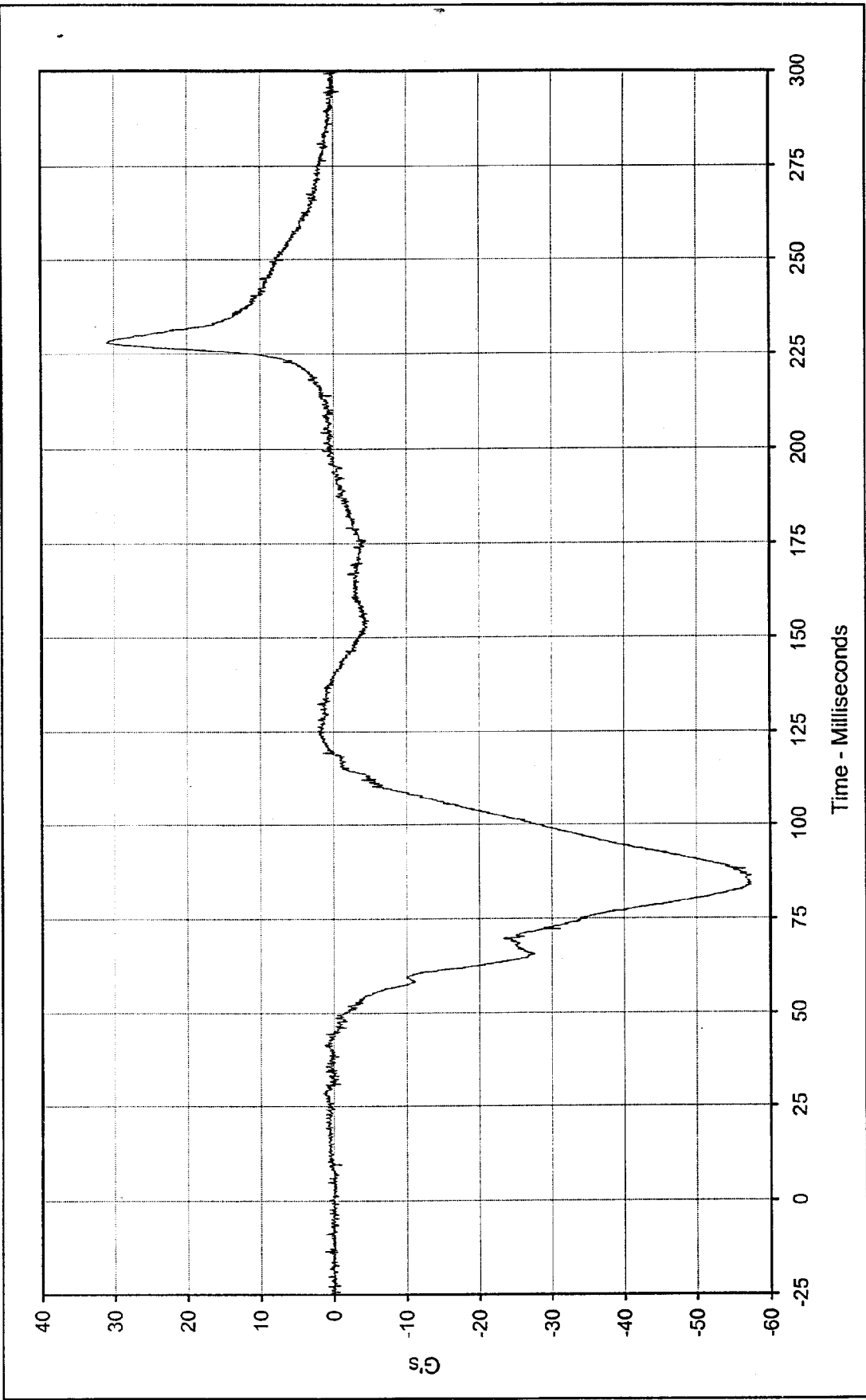
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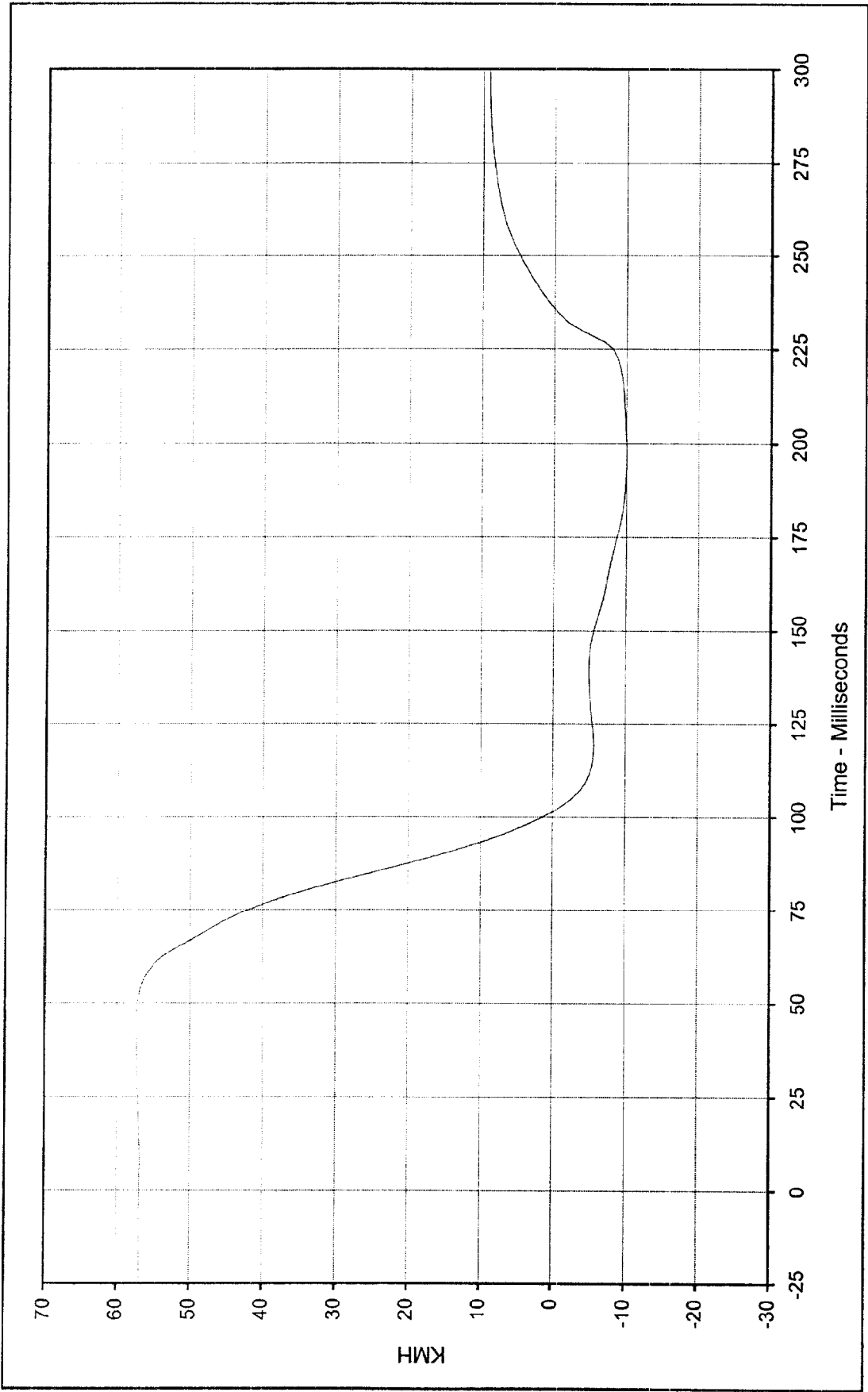
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Curve Description: Driver Head Primary X
 Maximum Value: 31.0 at 228.2 Milliseconds
 Minimum Value: -57.5 at 83.6 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-001

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Head Primary X Velocity Testing Program 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 57.4 at 44.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

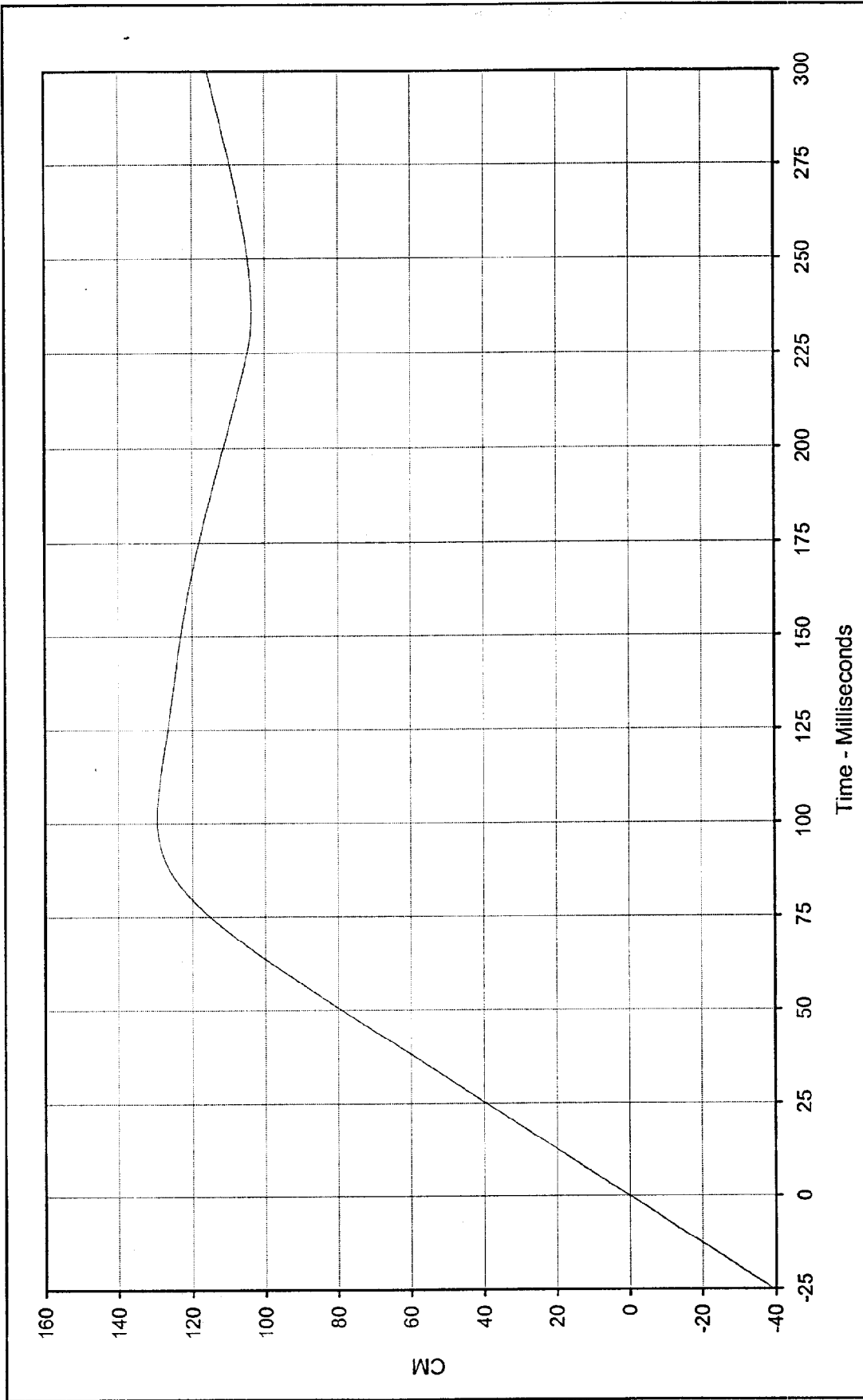
Minimum Value: -10.0 at 195.9 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN1-001

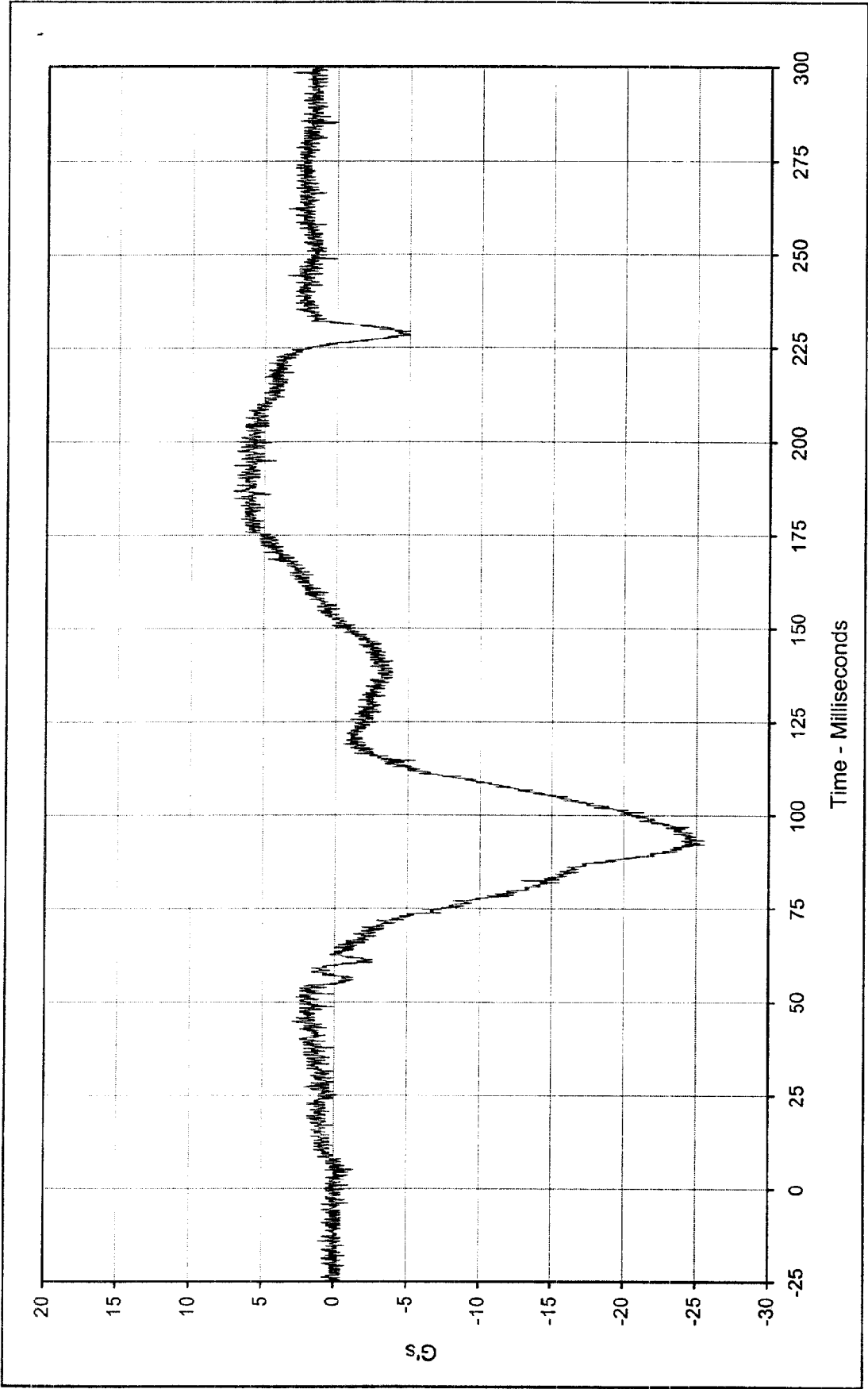




Curve Description: Driver Head Primary X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 129.5 at 101.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds

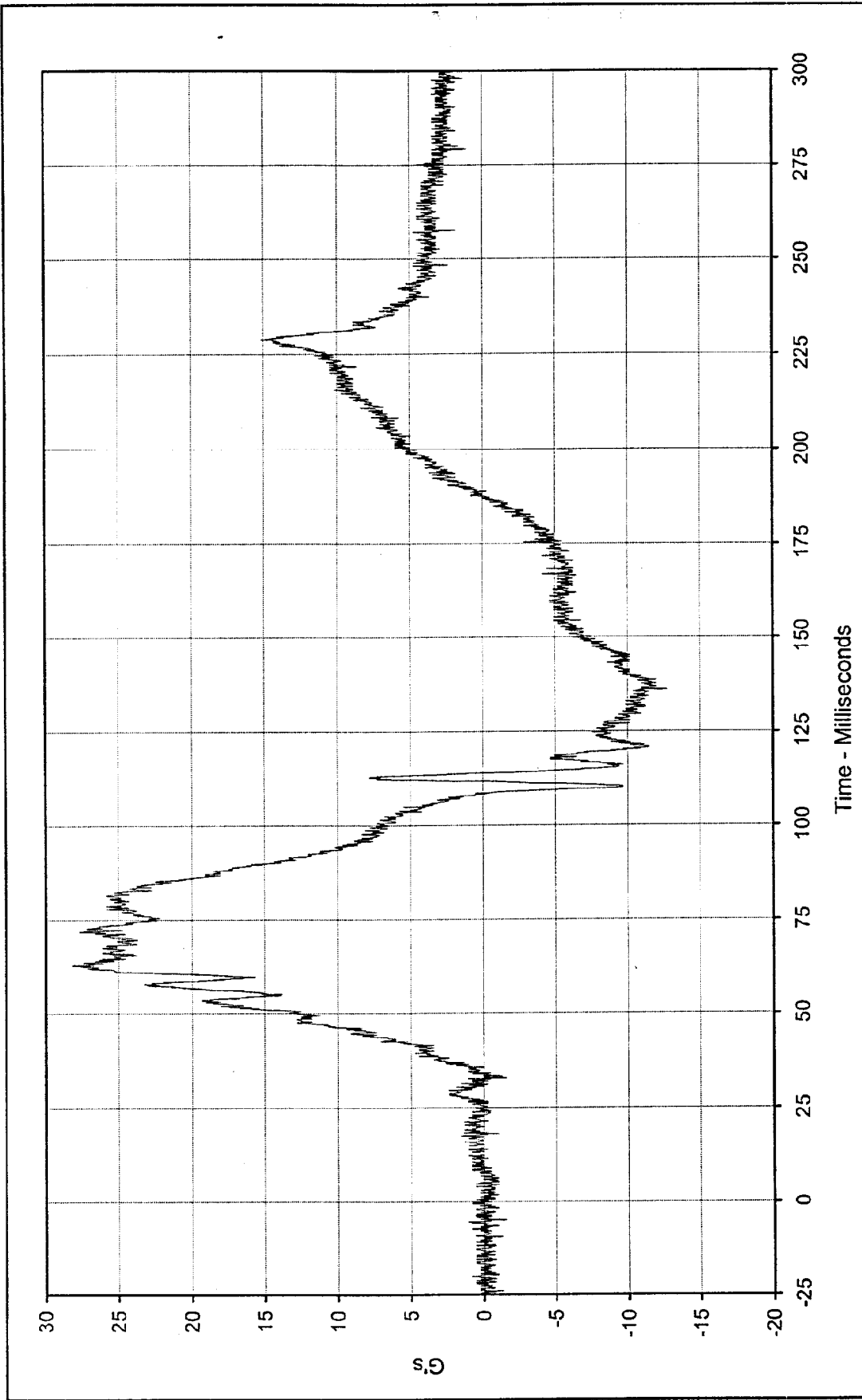


SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-001



Curve Description: Driver Head Primary Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 7.1 at 185.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -25.6 at 92.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-002

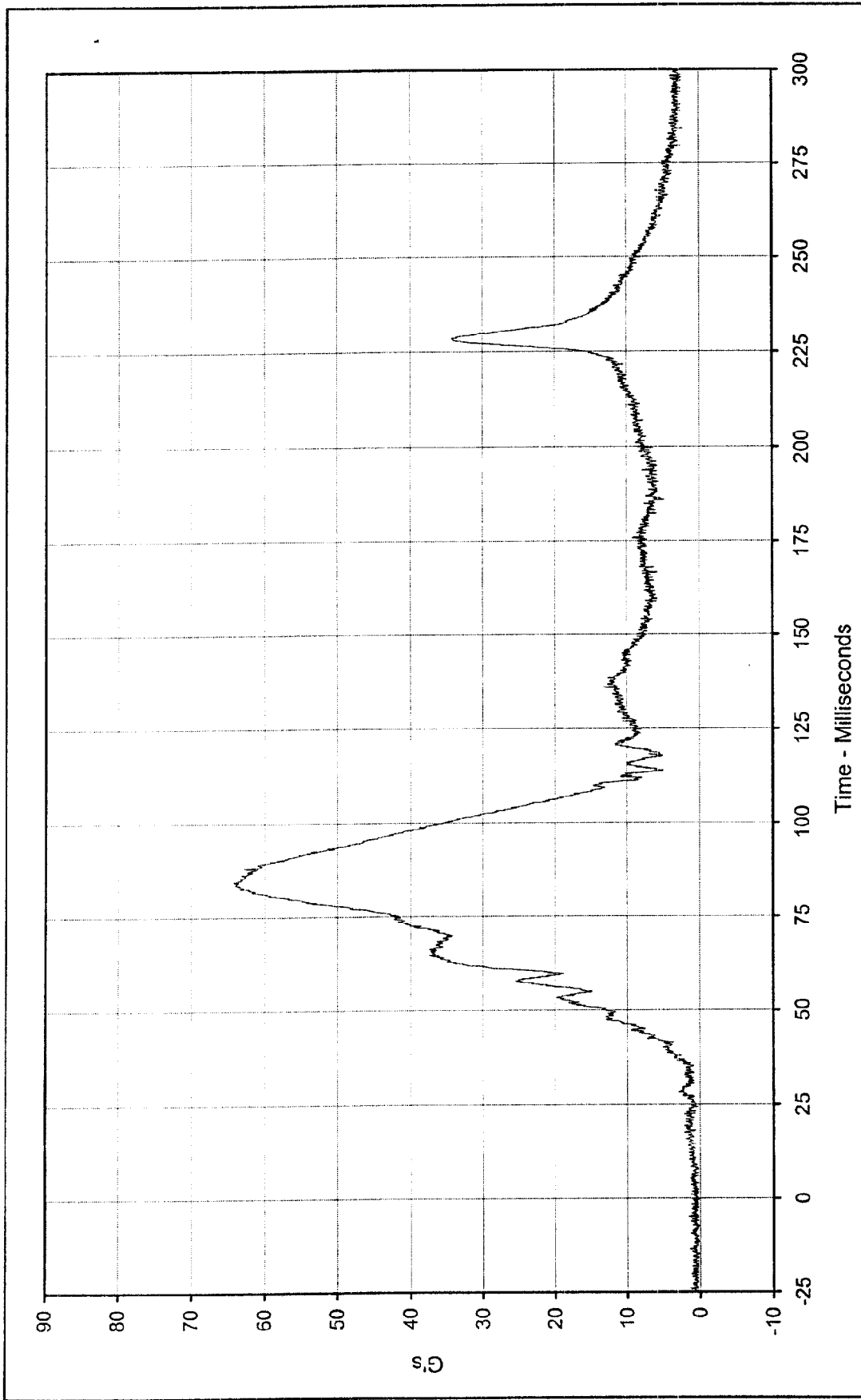




Curve Description: Driver Head Primary Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 28.2 at 62.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -12.8 at 136.0 Milliseconds



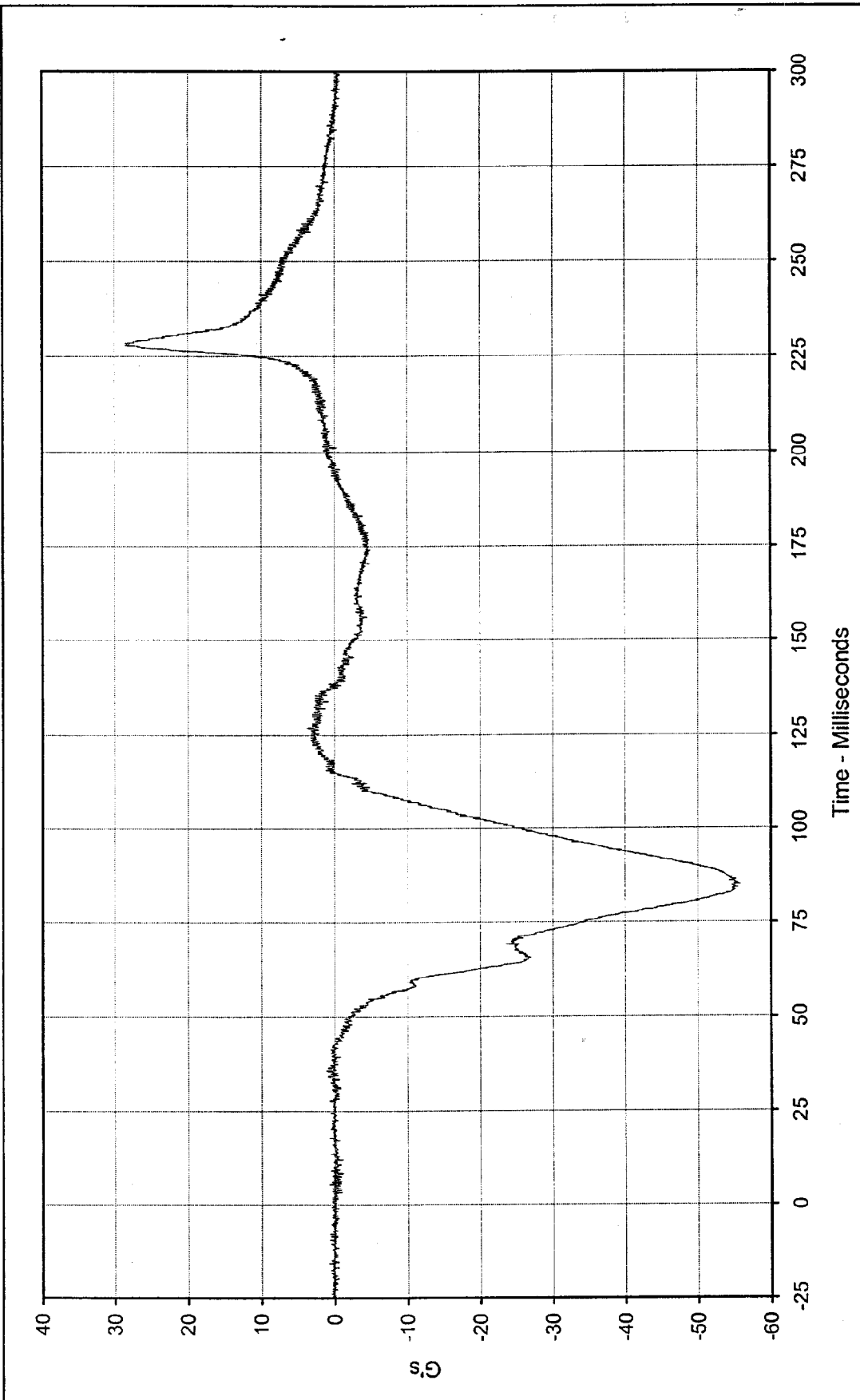
SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-003



Curve Description: Driver Head Resultant Primary
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 64.2 at 84.3 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.2 at 1.6 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-001

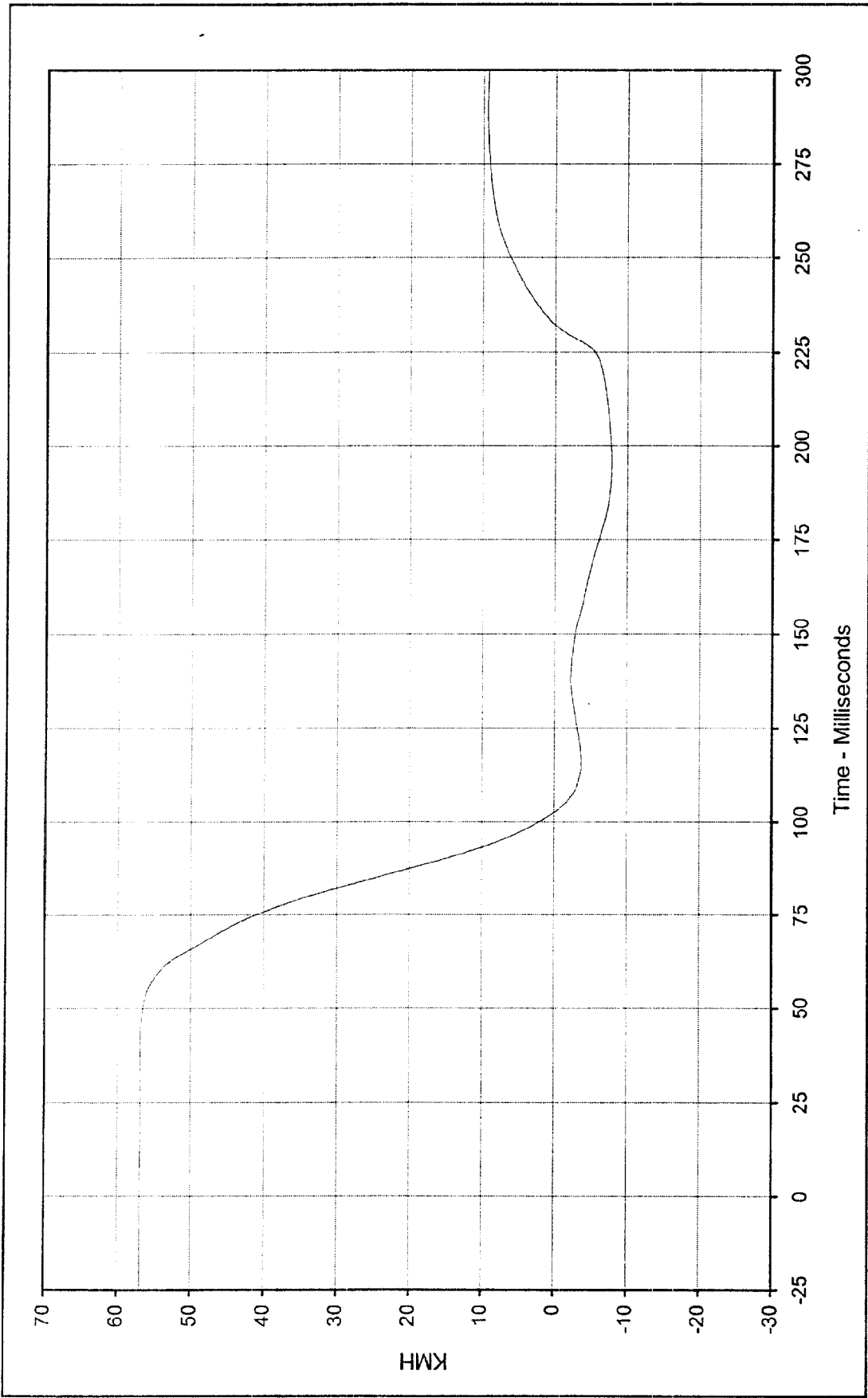




Curve Description: Driver Head Redundant X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 28.5 at 228.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -55.8 at 84.9 Milliseconds

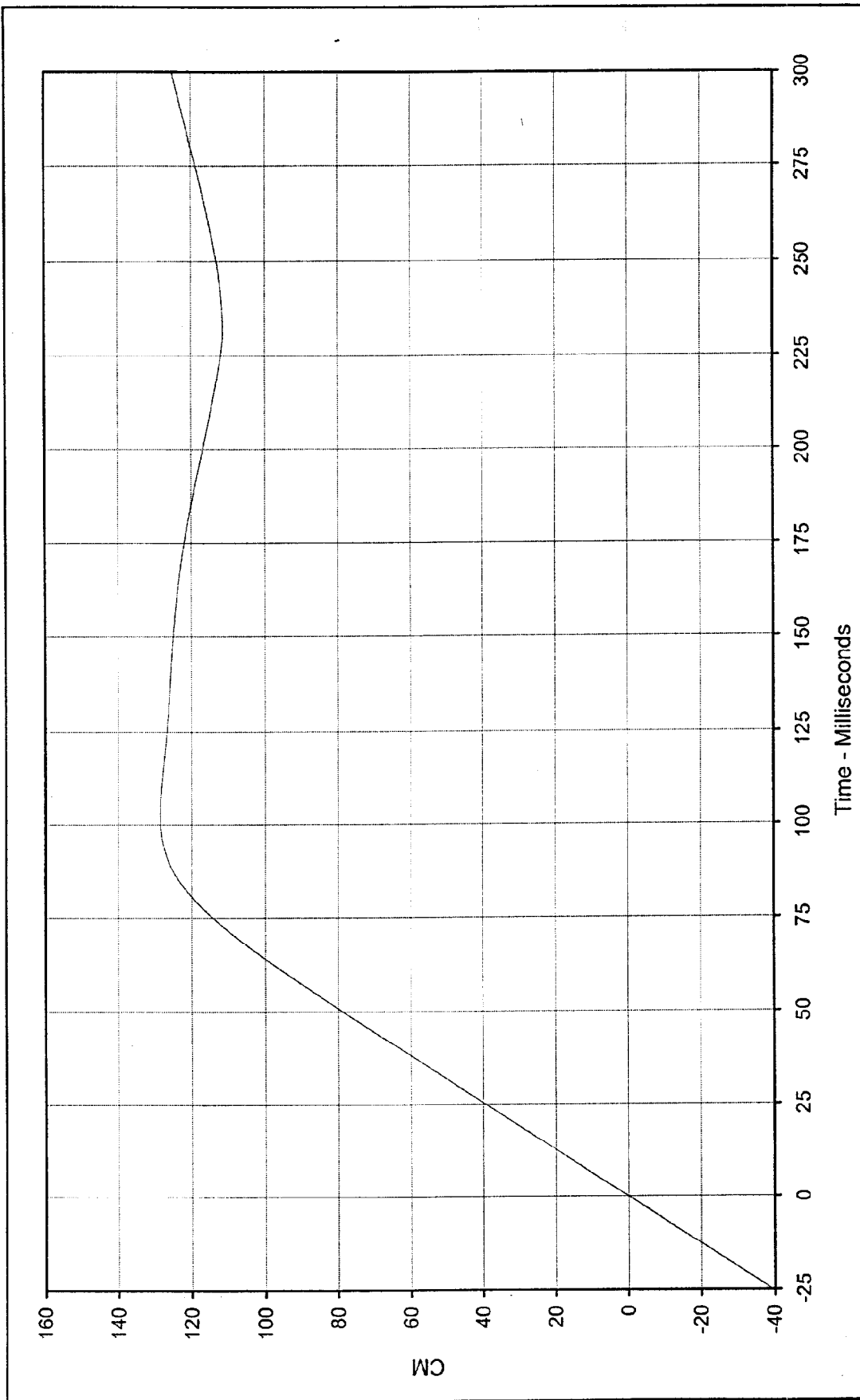


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-004



Curve Description: Driver Head Redundant X Velocity Testing Program 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 56.9 at 1.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -7.8 at 195.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-004





Curve Description: Driver Head Redundant X Displ.

Maximum Value: 128.5 at 102.6 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

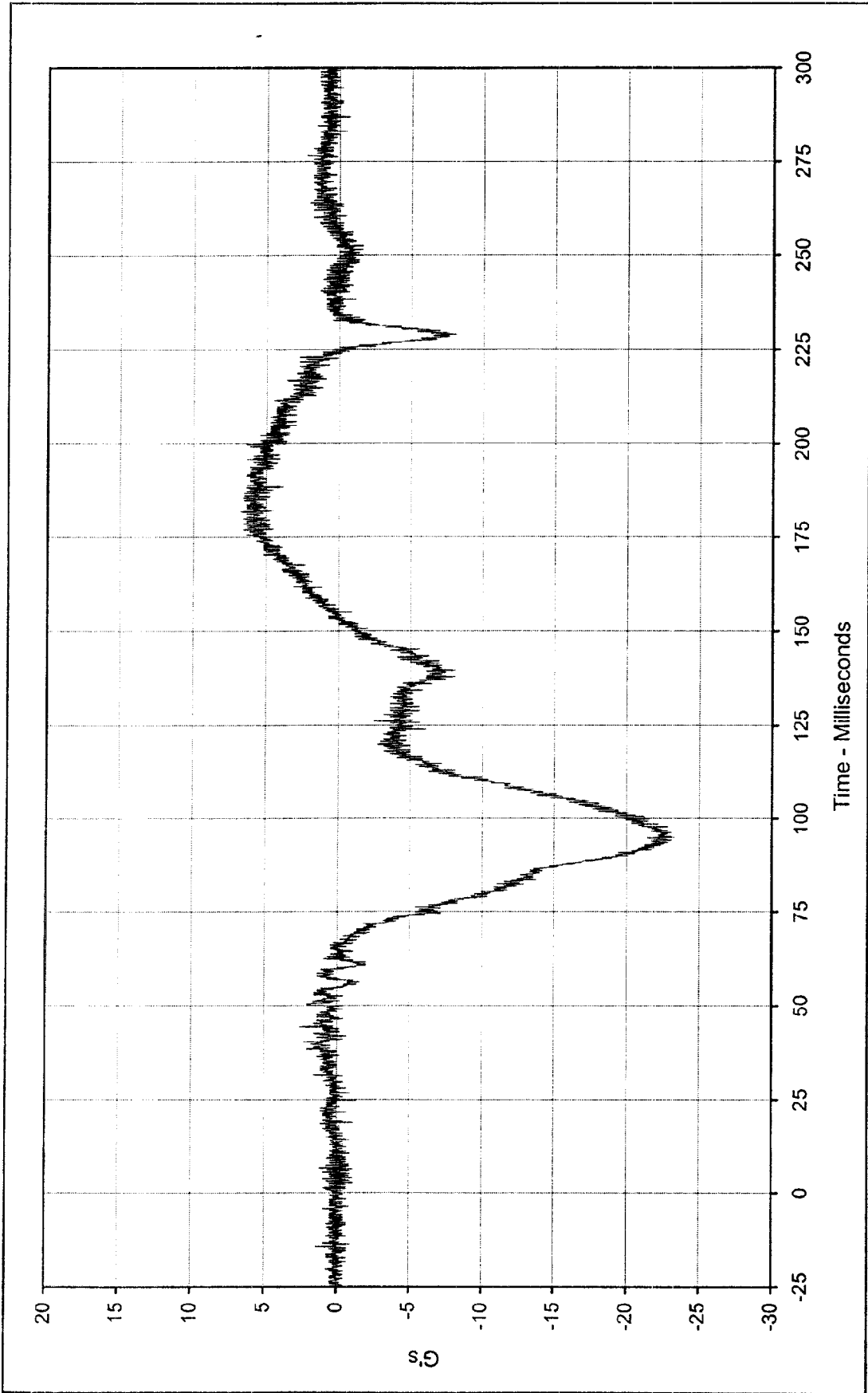
Date of Test: 1/26/99

Curve Number: IN2-004

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

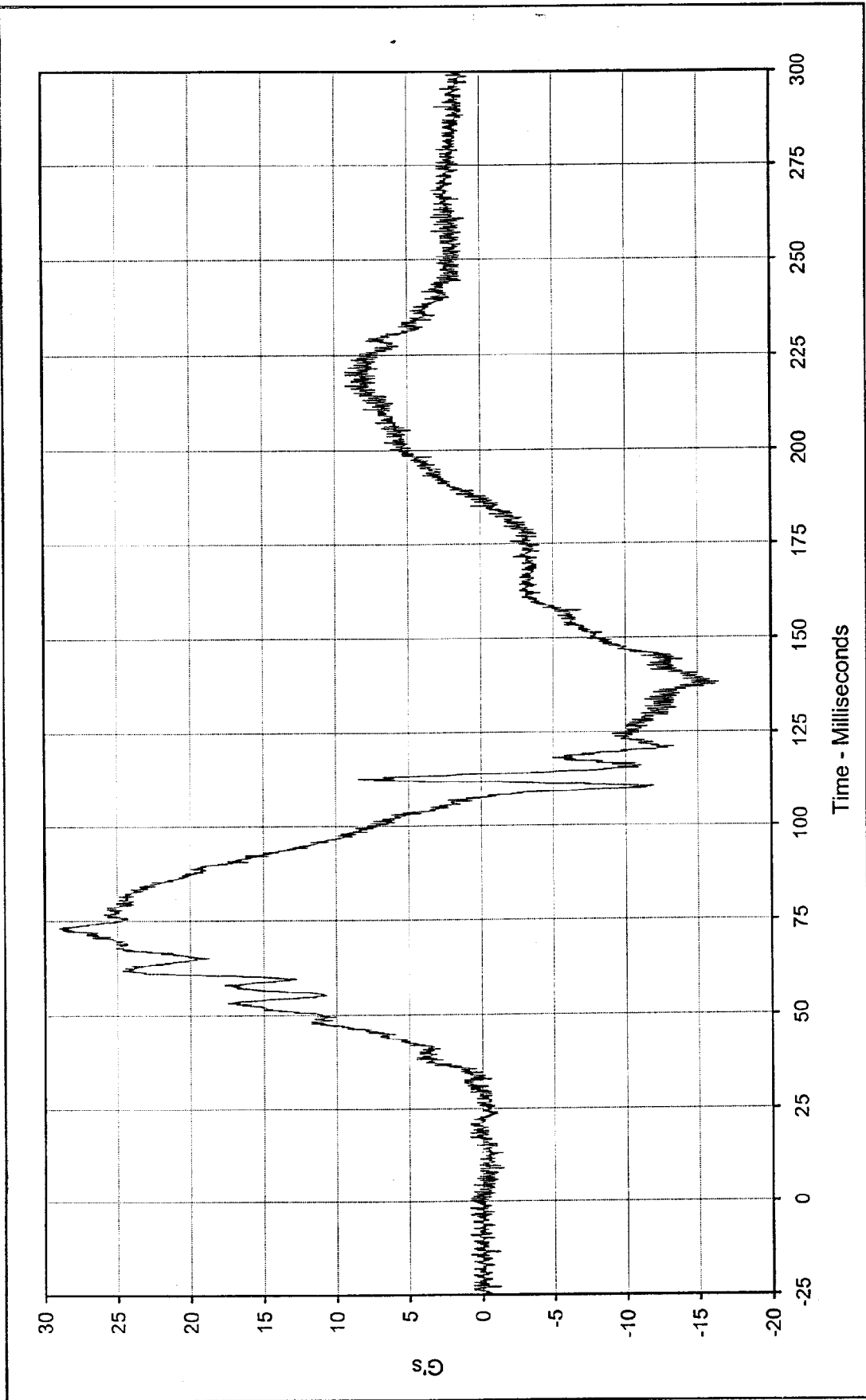
Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Head Redundant Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 6.8 at 182.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -23.3 at 94.9 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-005

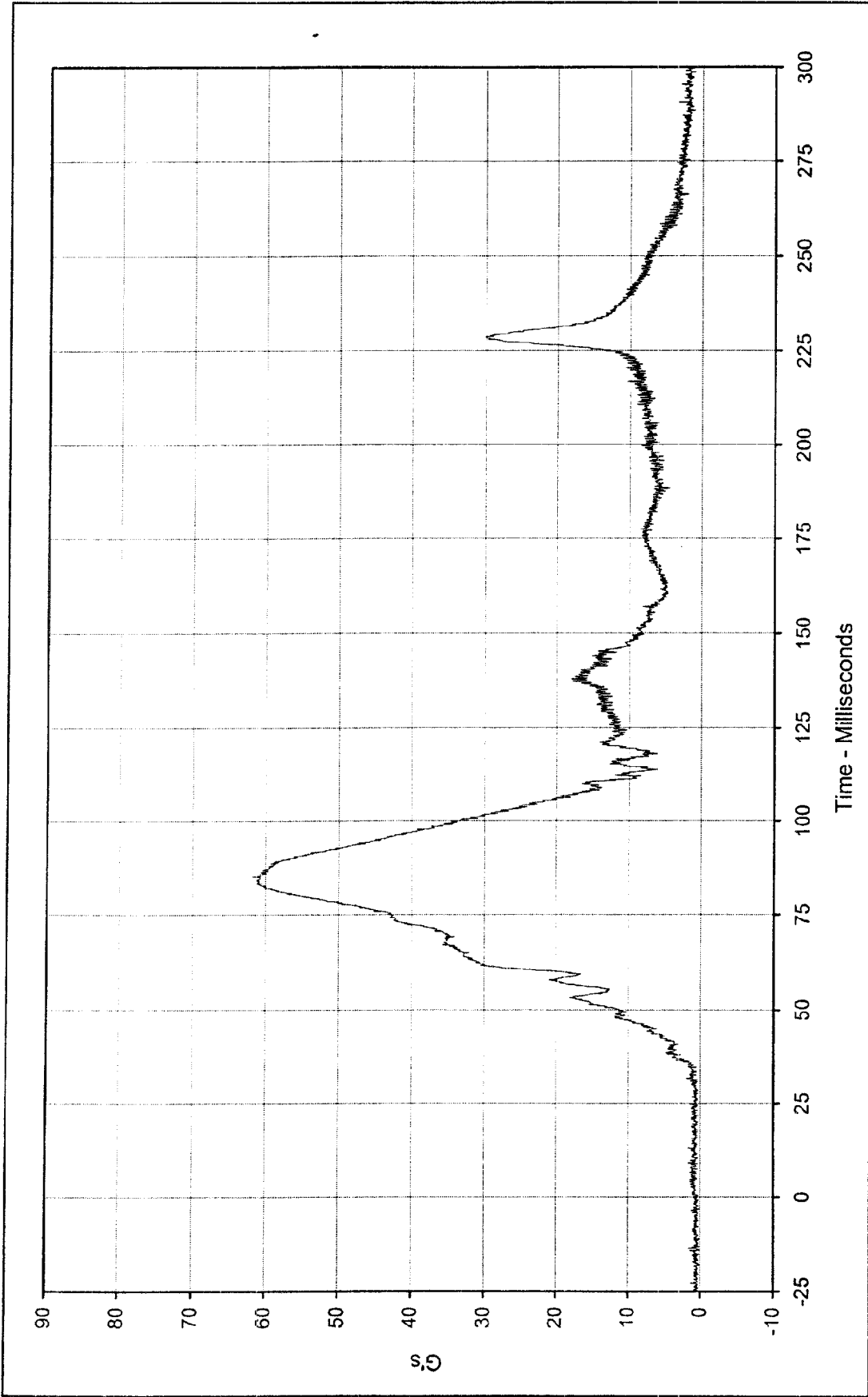




Curve Description: Driver Head Redundant Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 29.0 at 73.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -16.5 at 138.0 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-006

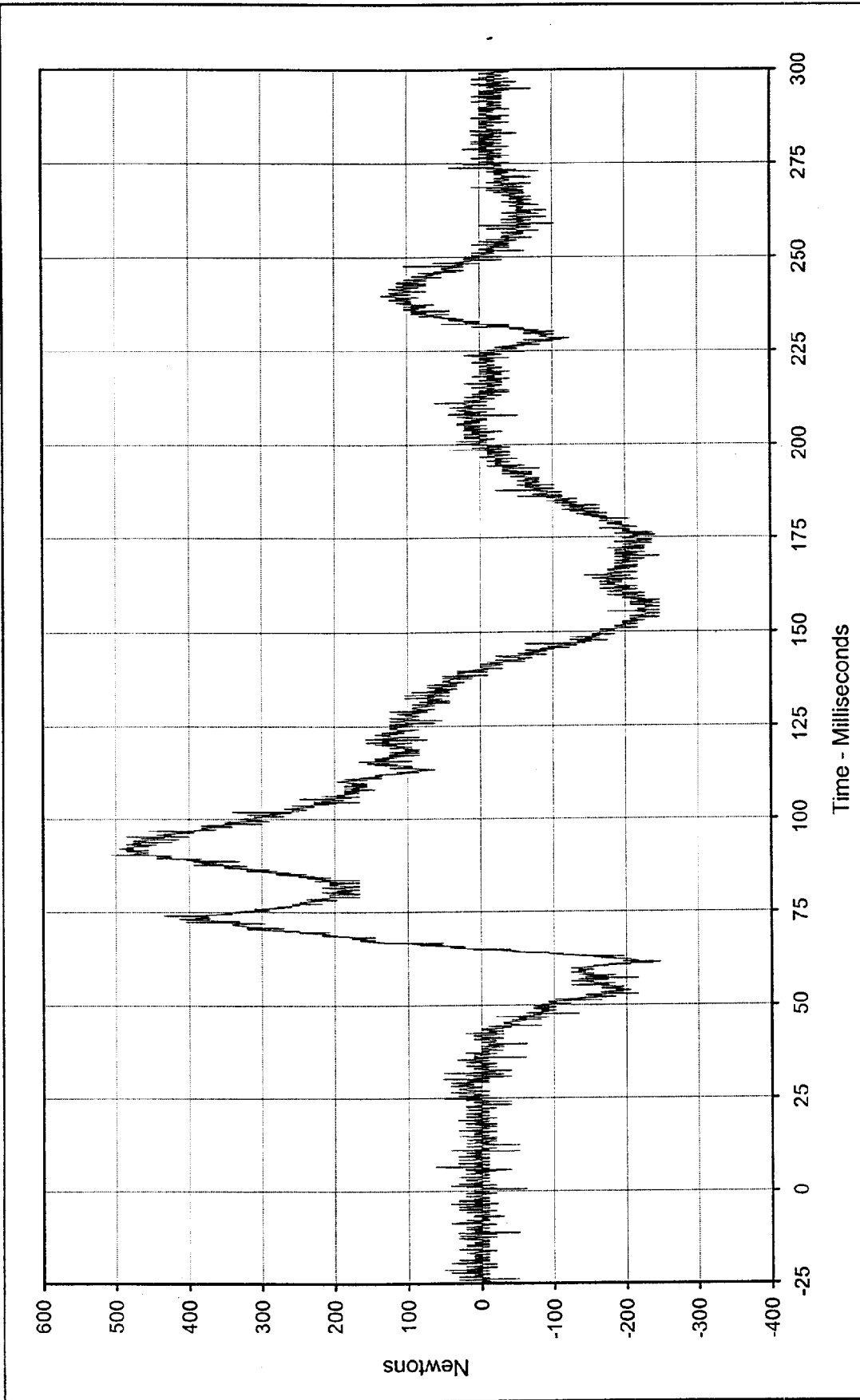




Curve Description: Driver Head Resultant Redundant
 Maximum Value: 61.8 at 84.9 Milliseconds
 Minimum Value: 0.2 at 0.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-004

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

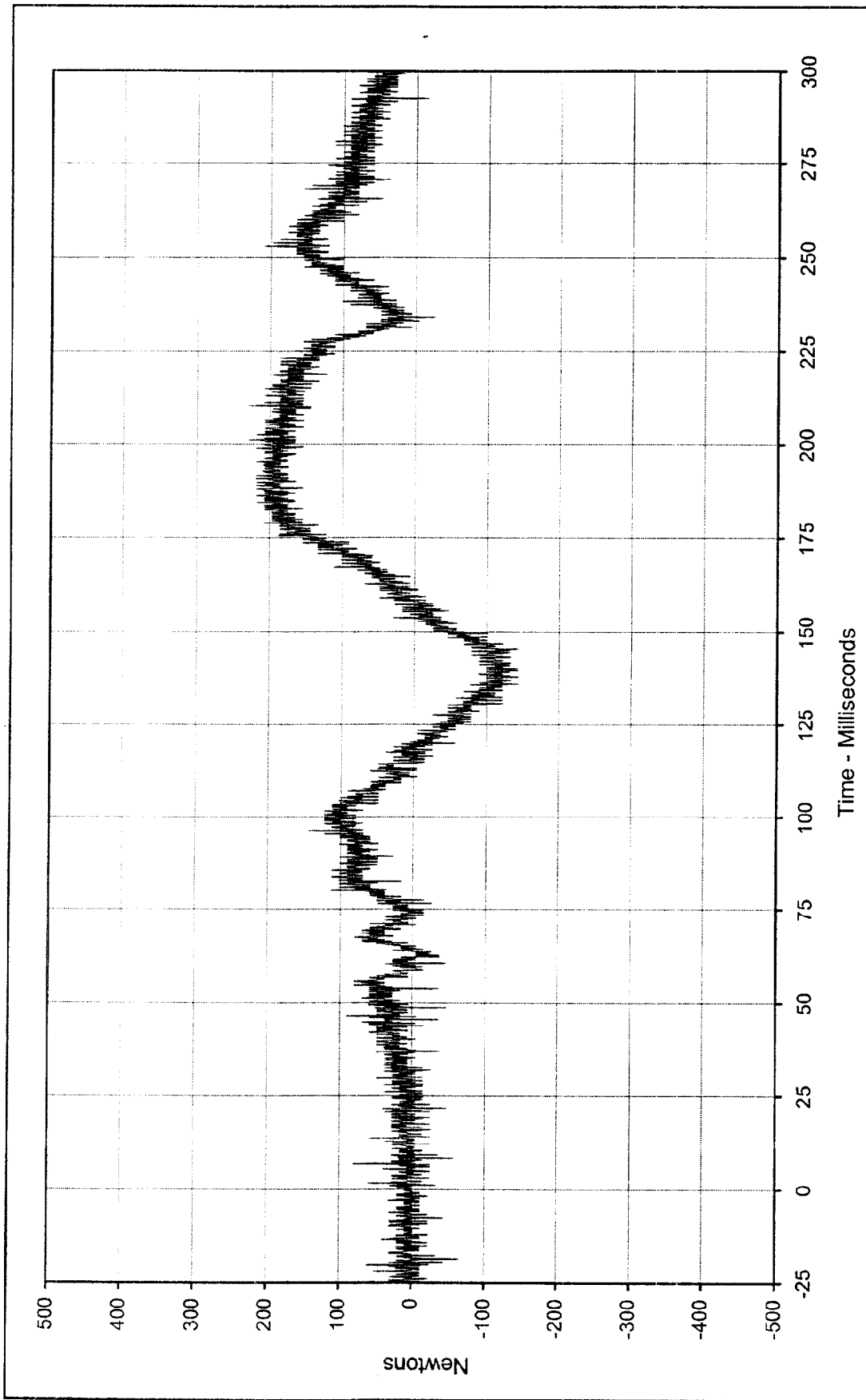




Curve Description: Driver Neck Force X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 506.4 at 90.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -248.0 at 61.4 Milliseconds

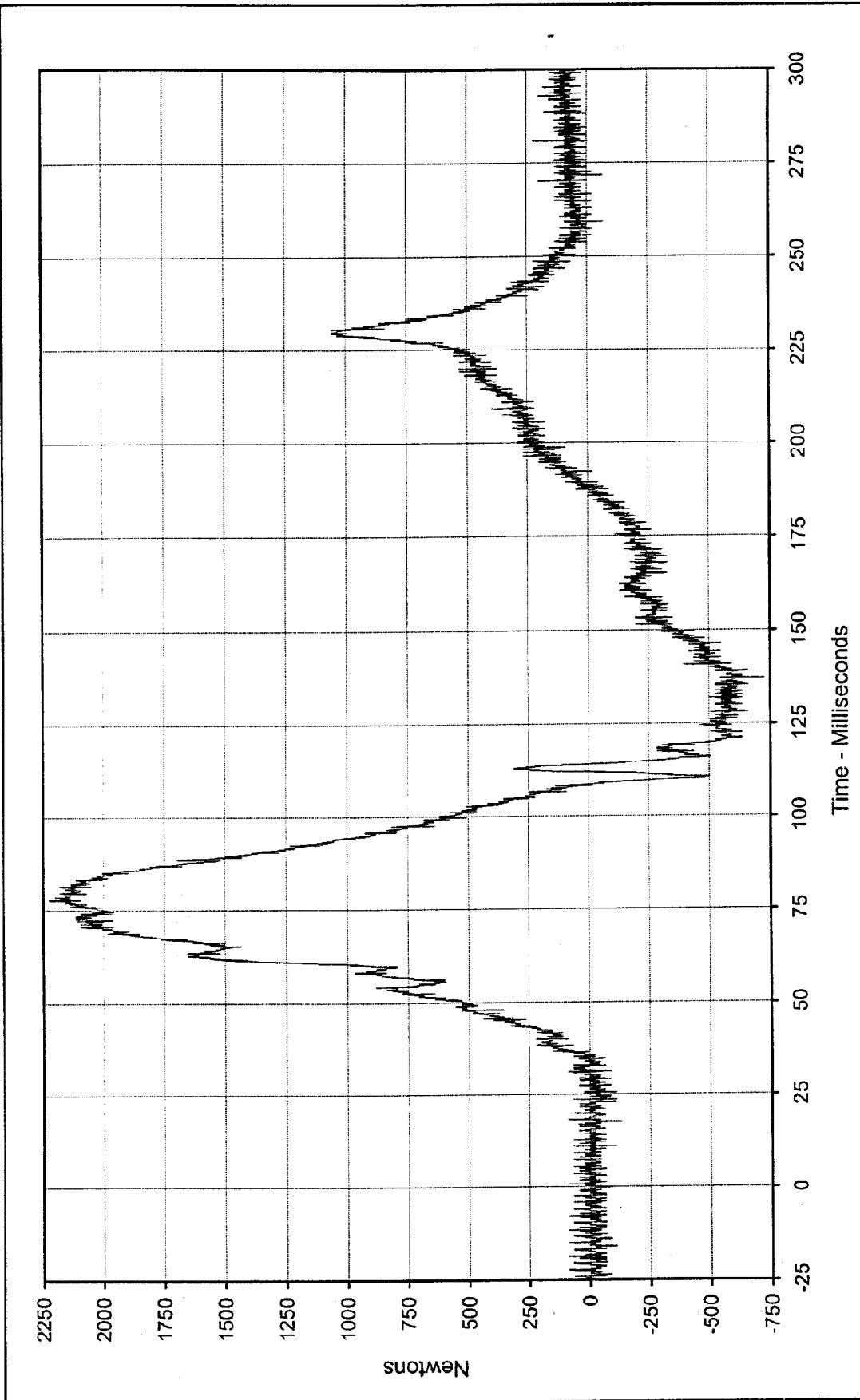


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-007



Curve Description:	Driver Neck Force Y	Test Program:	1999 NHTSA 35 mph NCAP No.: MX0200
Maximum Value:	228.5 at 201.2 Milliseconds	Test Vehicle:	1999 Ford Expedition XLT SUV
Minimum Value:	-143.0 at 136.0 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	1/26/99		
Curve Number:	FIL-008		

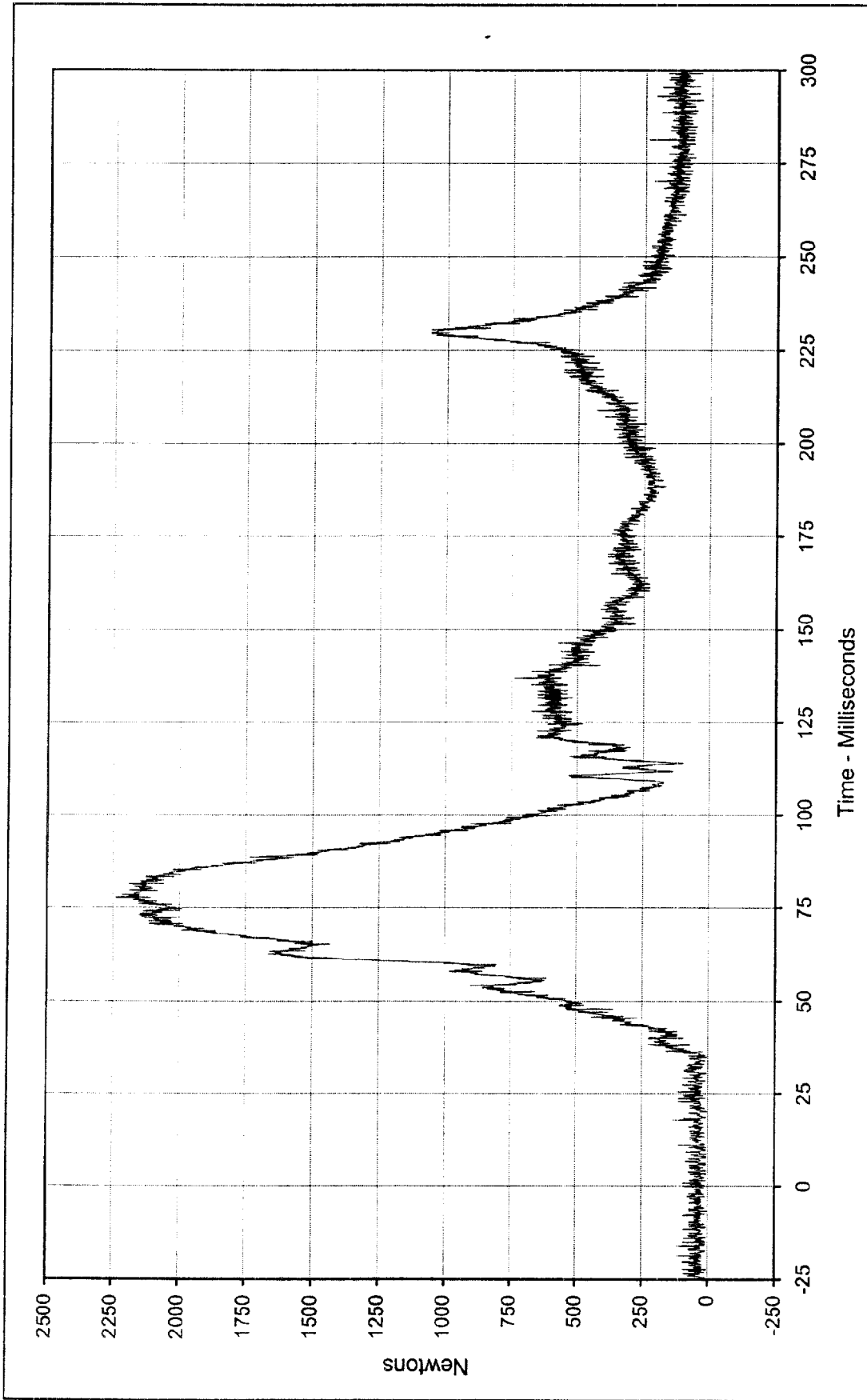




Curve Description: Driver Neck Force Z
 Maximum Value: 2223.6 at 77.6 Milliseconds
 Minimum Value: -726.5 at 137.1 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-009

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Neck Force Resultant Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 2236.5 at 77.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

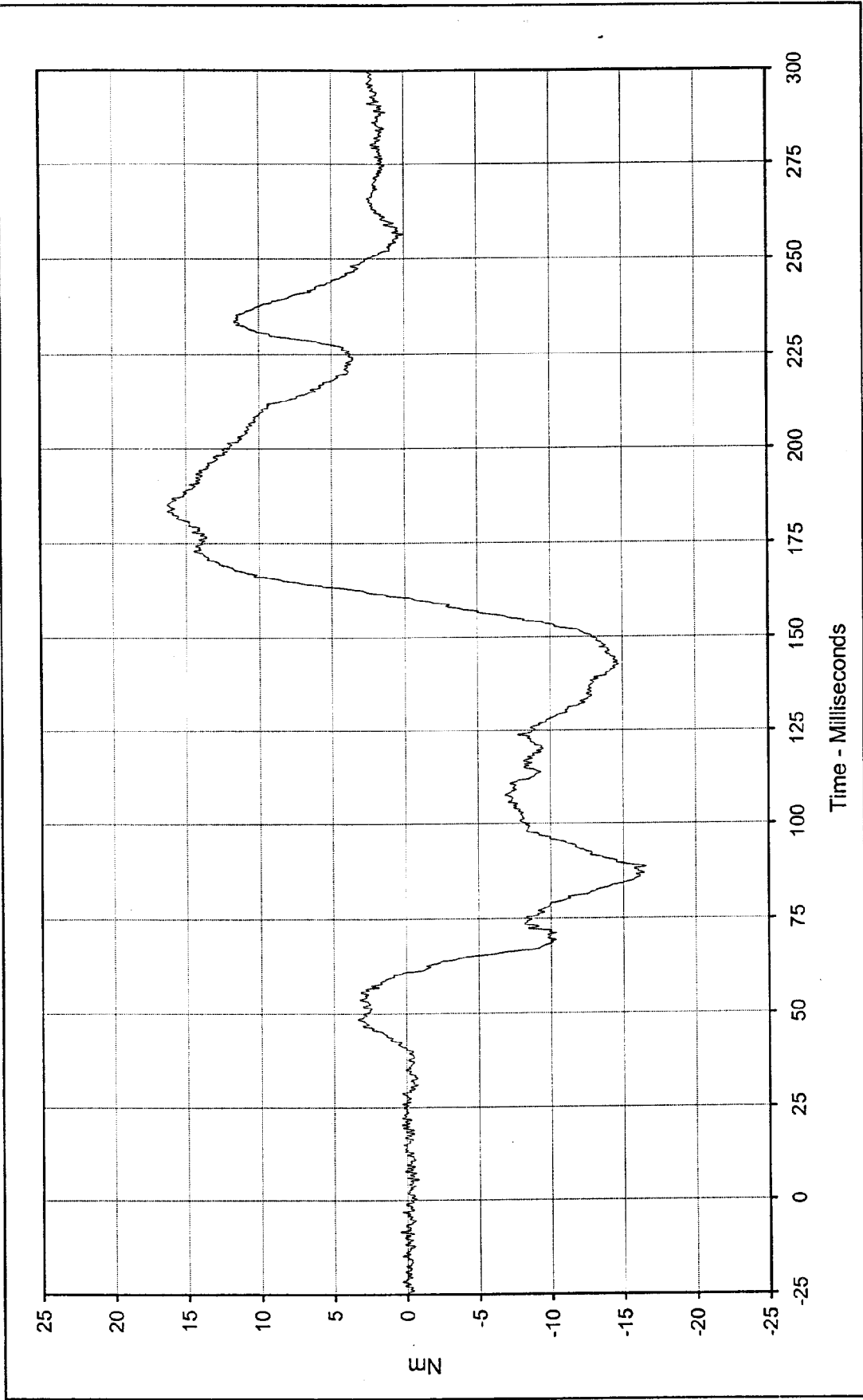
Minimum Value: 5.0 at 8.5 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

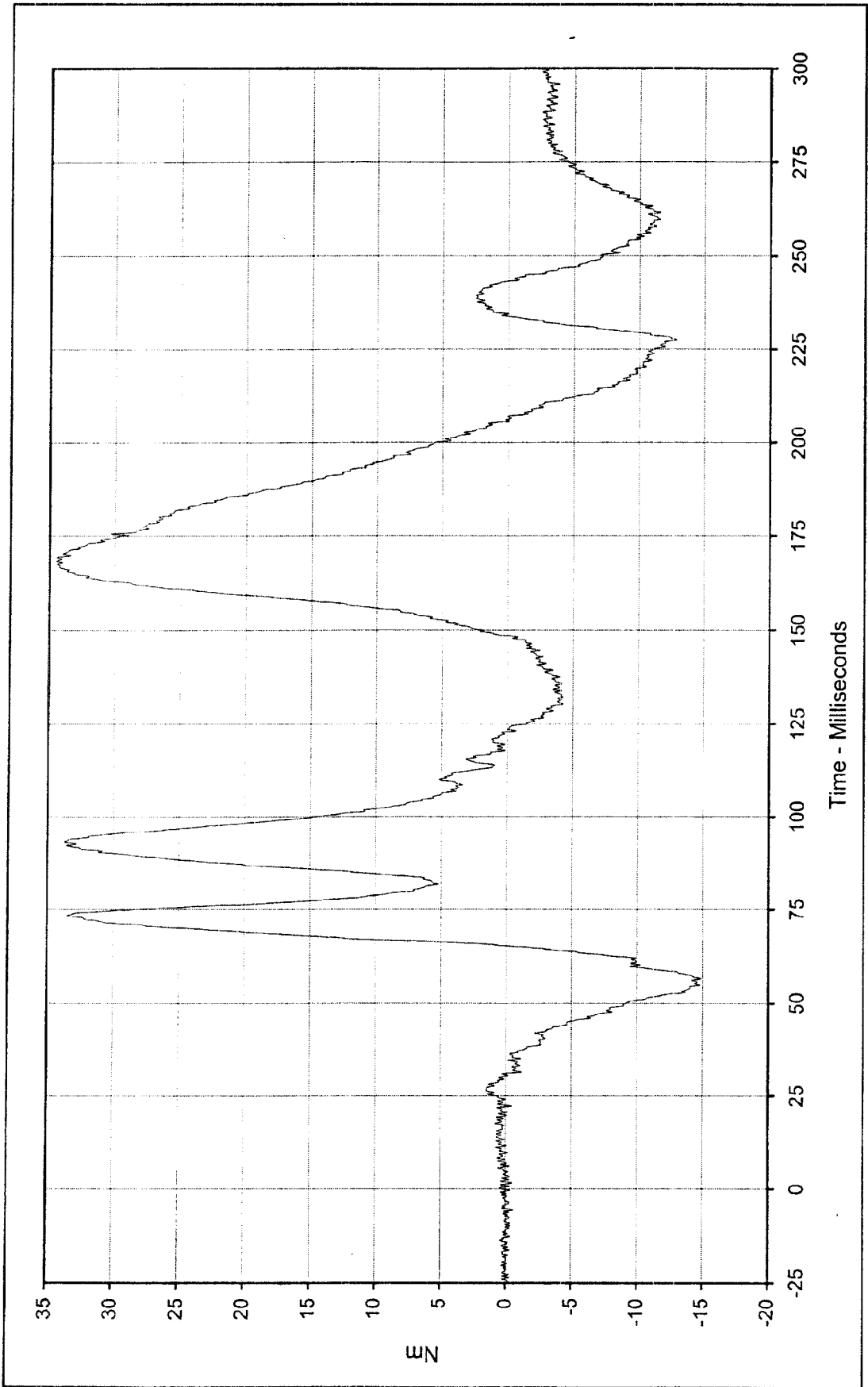
Curve Number: RES-007





Curve Description: Driver Neck Moment X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 16.3 at 183.3 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -16.6 at 88.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-010

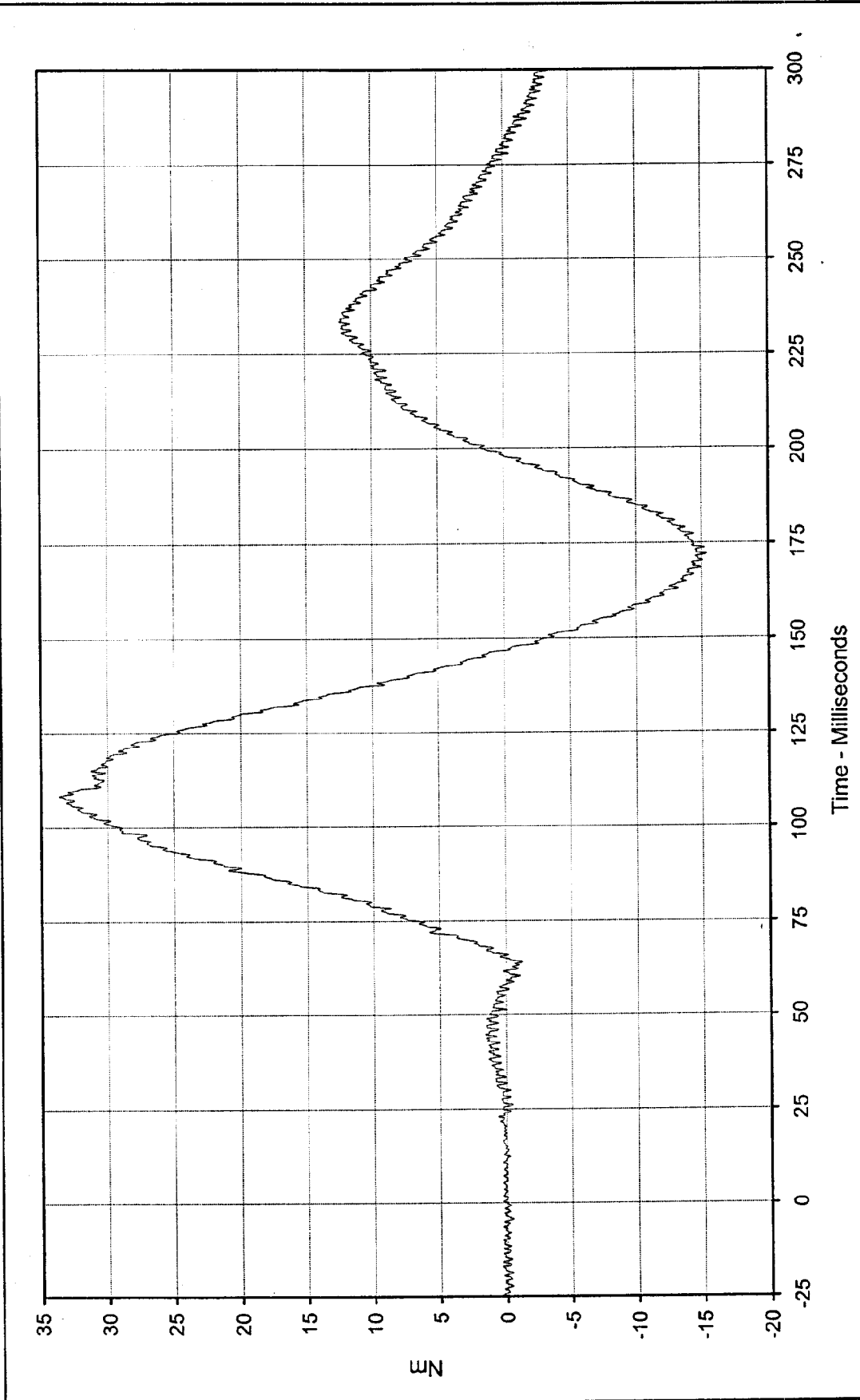




Curve Description: Driver Neck Moment Y
 Maximum Value: 34.5 at 167.7 Milliseconds
 Minimum Value: -14.9 at 56.5 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-011

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

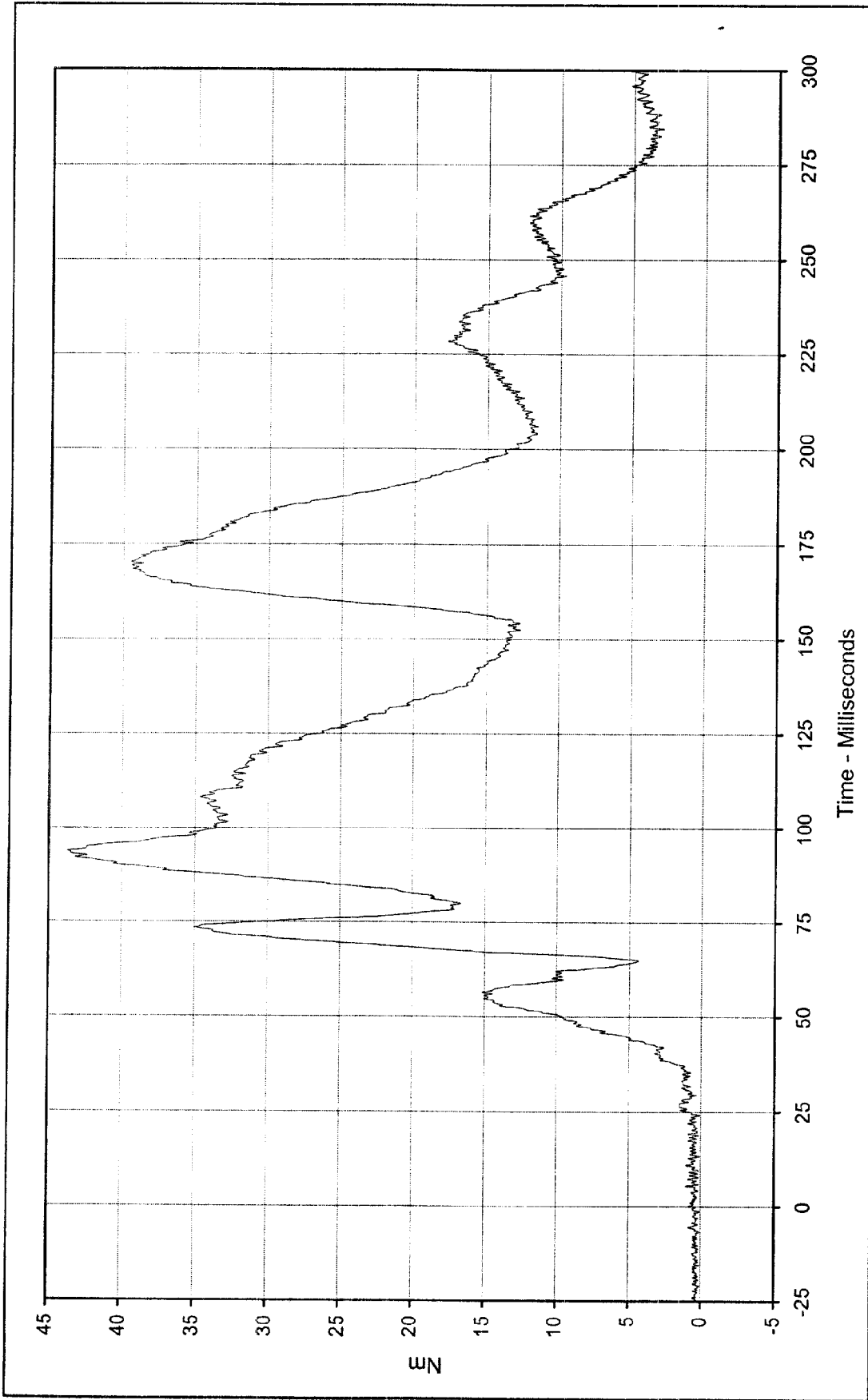




Curve Description: Driver Neck Moment Z
 Maximum Value: 33.6 at 108.3 Milliseconds
 Minimum Value: -15.4 at 172.0 Milliseconds

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-012

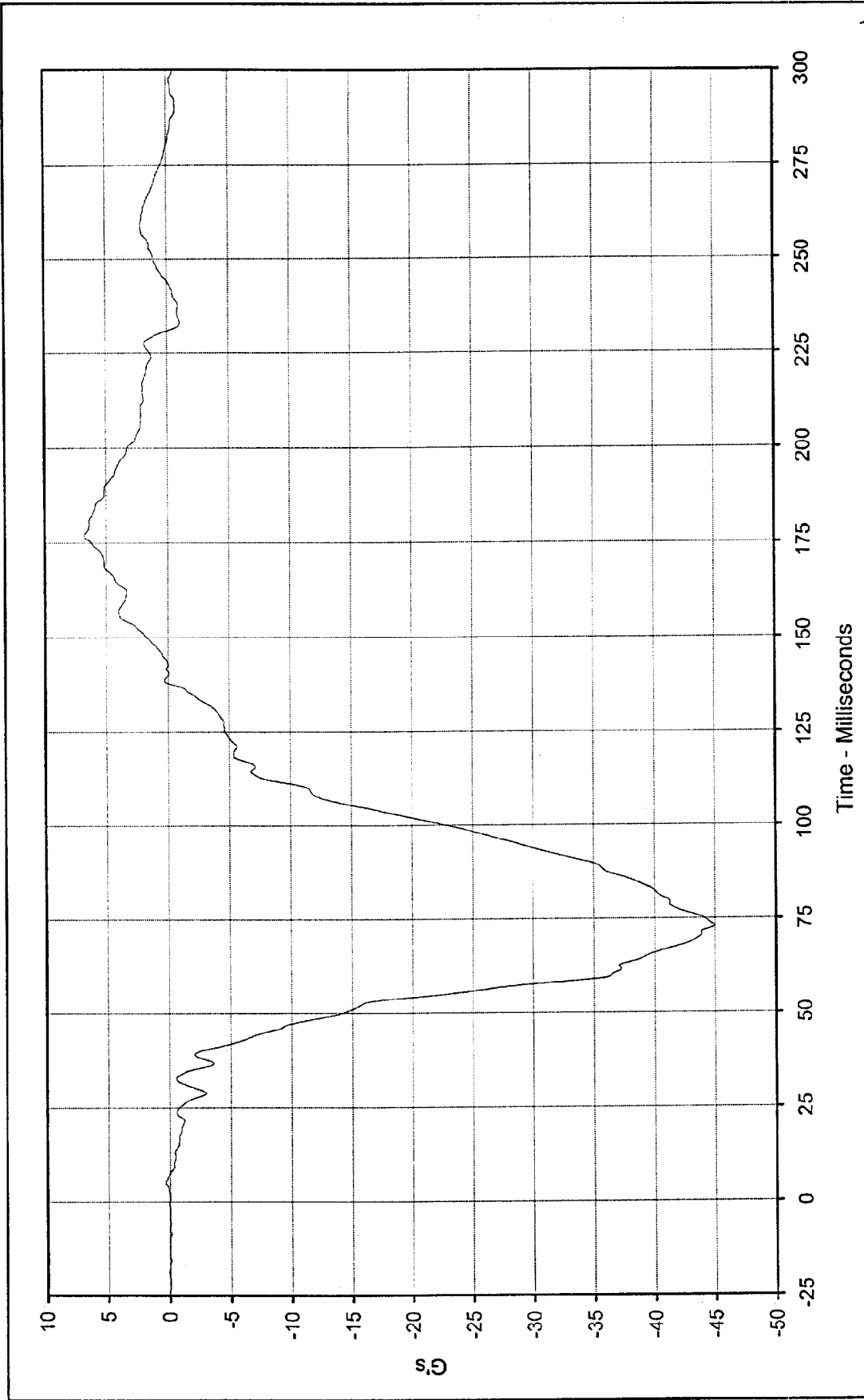




Curve Description: Driver Neck Moment Resultant
 Maximum Value: 43.7 at 93.8 Milliseconds
 Minimum Value: 0.1 at 24.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: RES-010

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Chest Primary X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 6.8 at 177.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

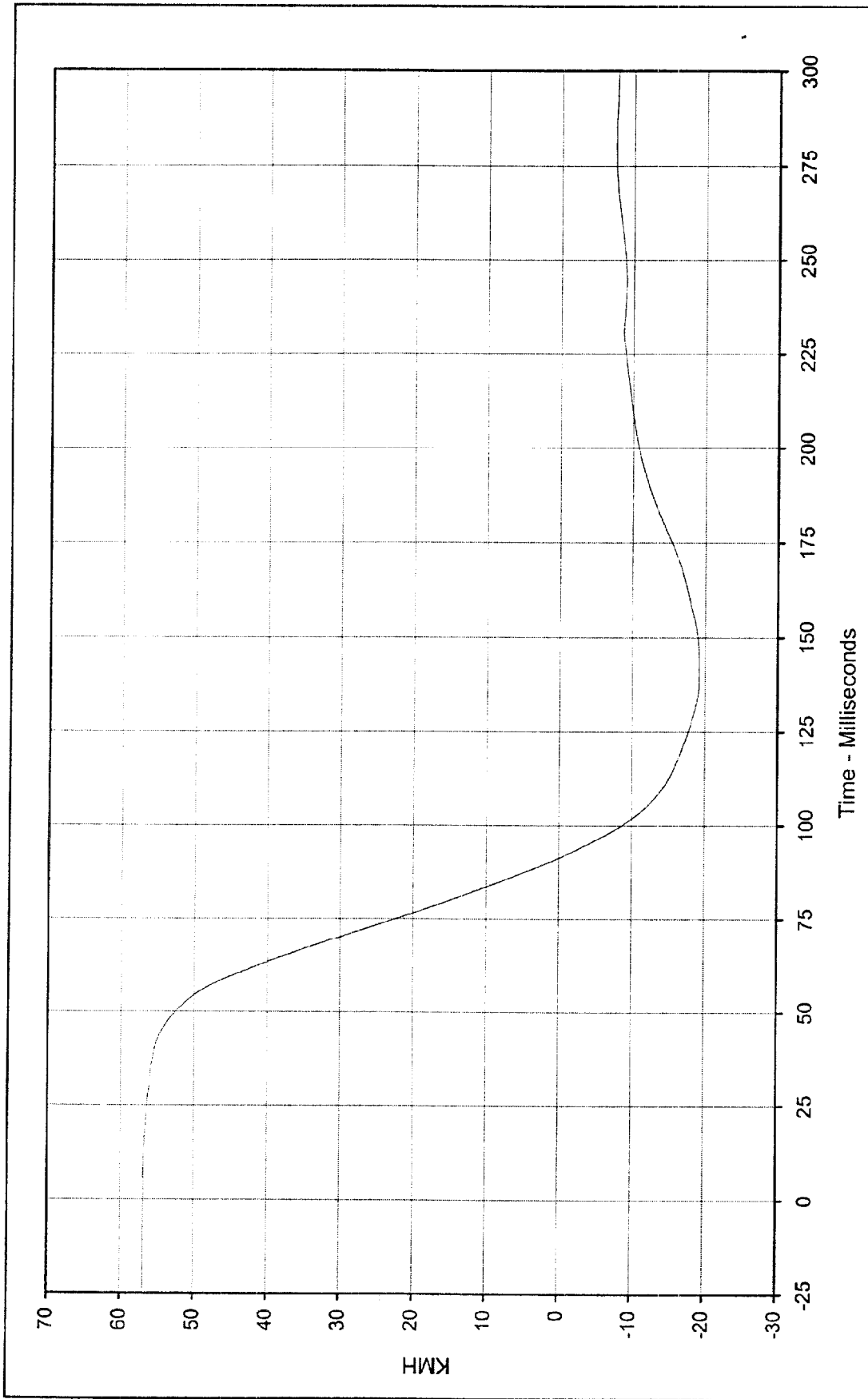
Minimum Value: -45.0 at 73.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: FIL-013





Curve Description: Driver Chest Primary X Velocity Testing Program 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 56.9 at 7.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

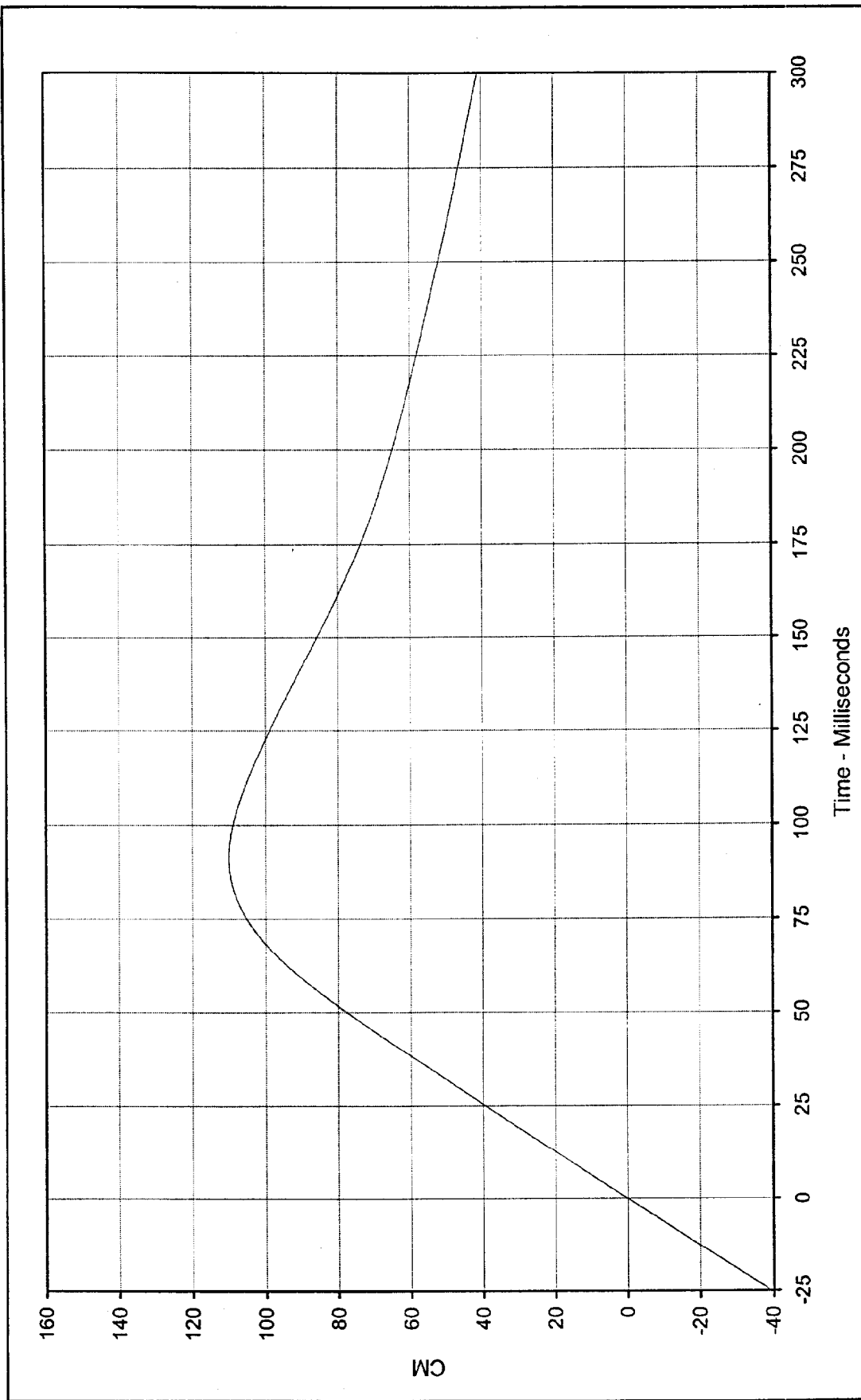
Minimum Value: -19.2 at 137.9 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN1-013





Curve Description: Driver Chest Primary X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 110.0 at 91.2 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

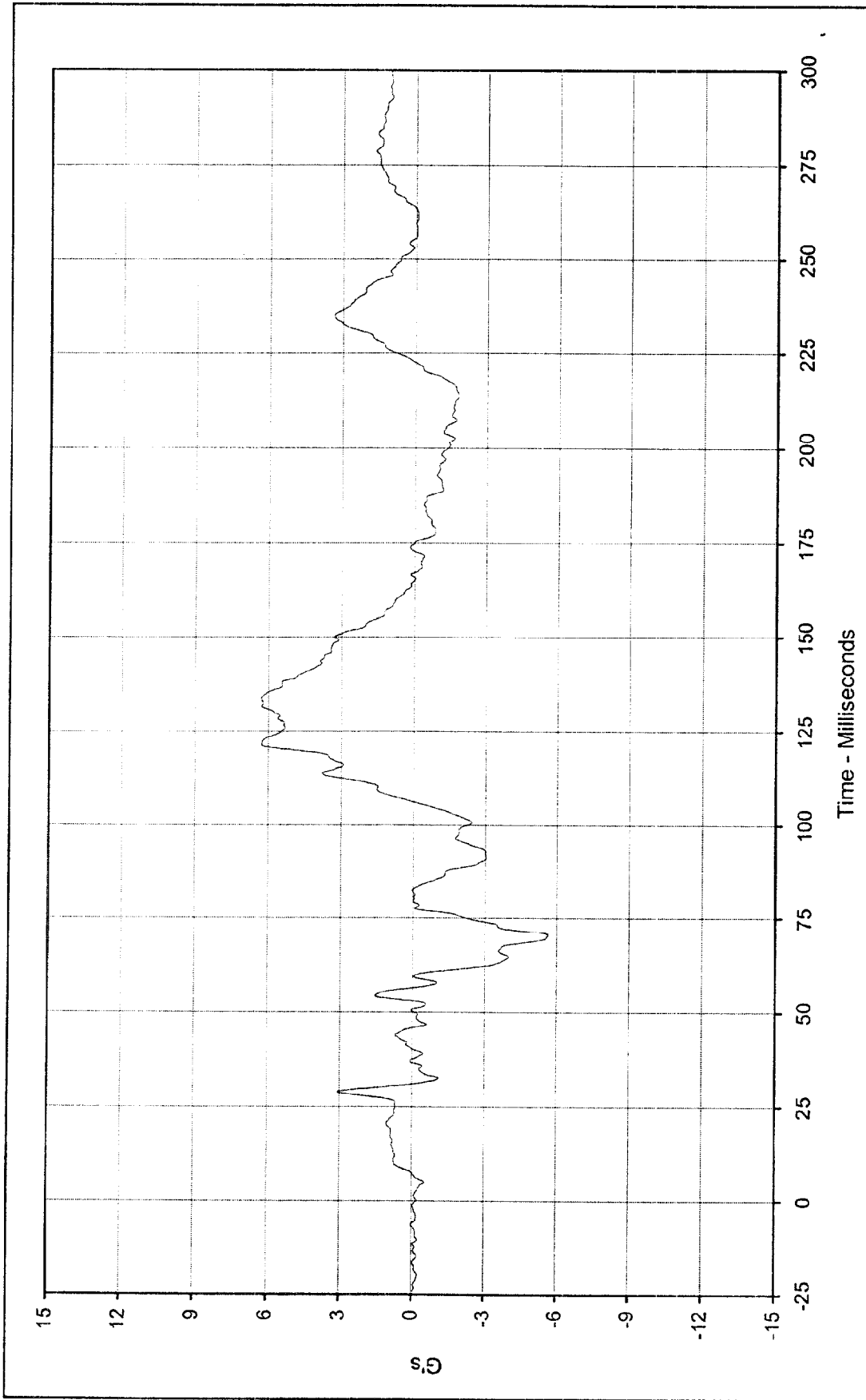
Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

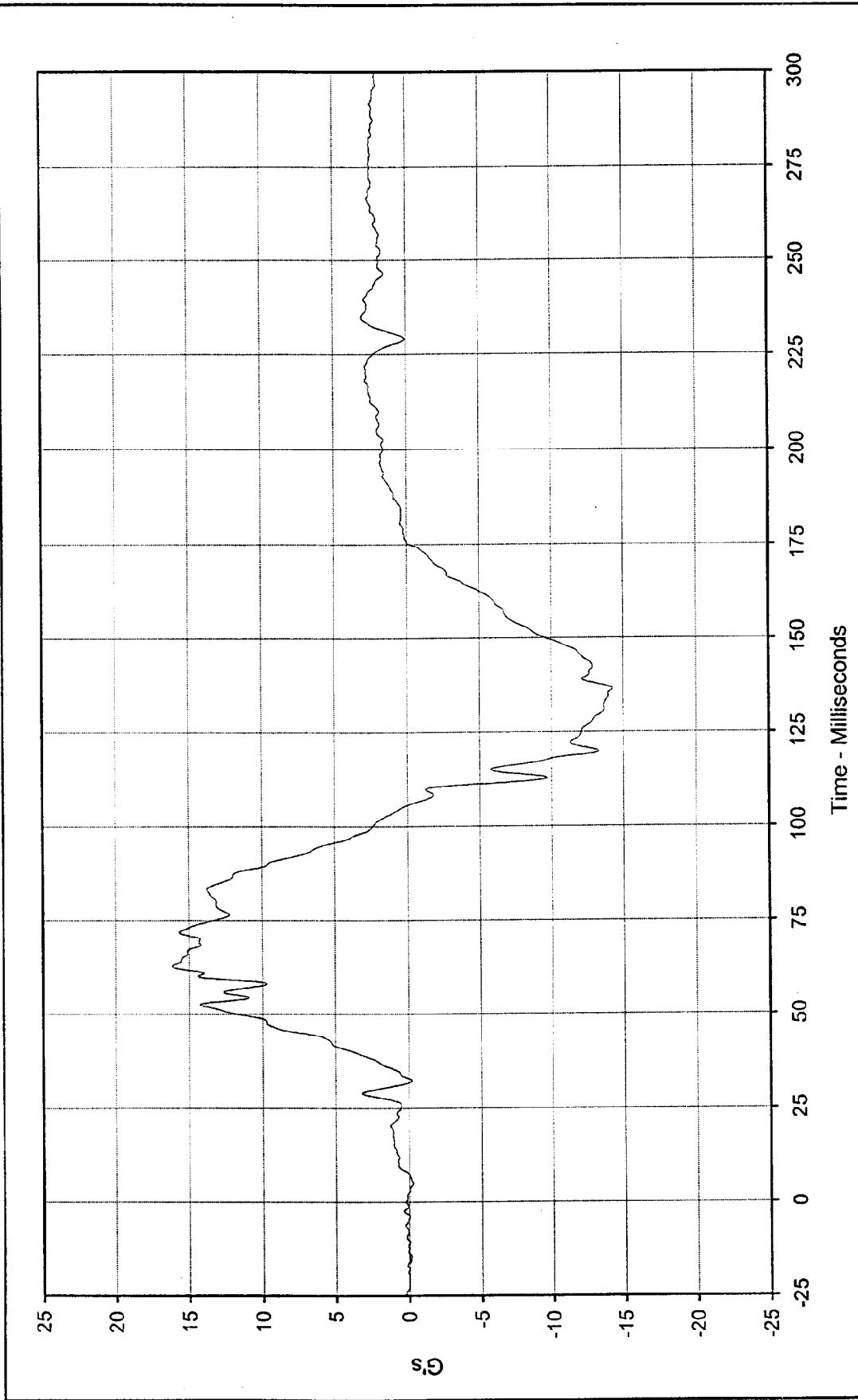
Curve Number: IN2-013





Curve Description: Driver Chest Primary Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 6.3 at 133.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -5.7 at 70.5 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-014

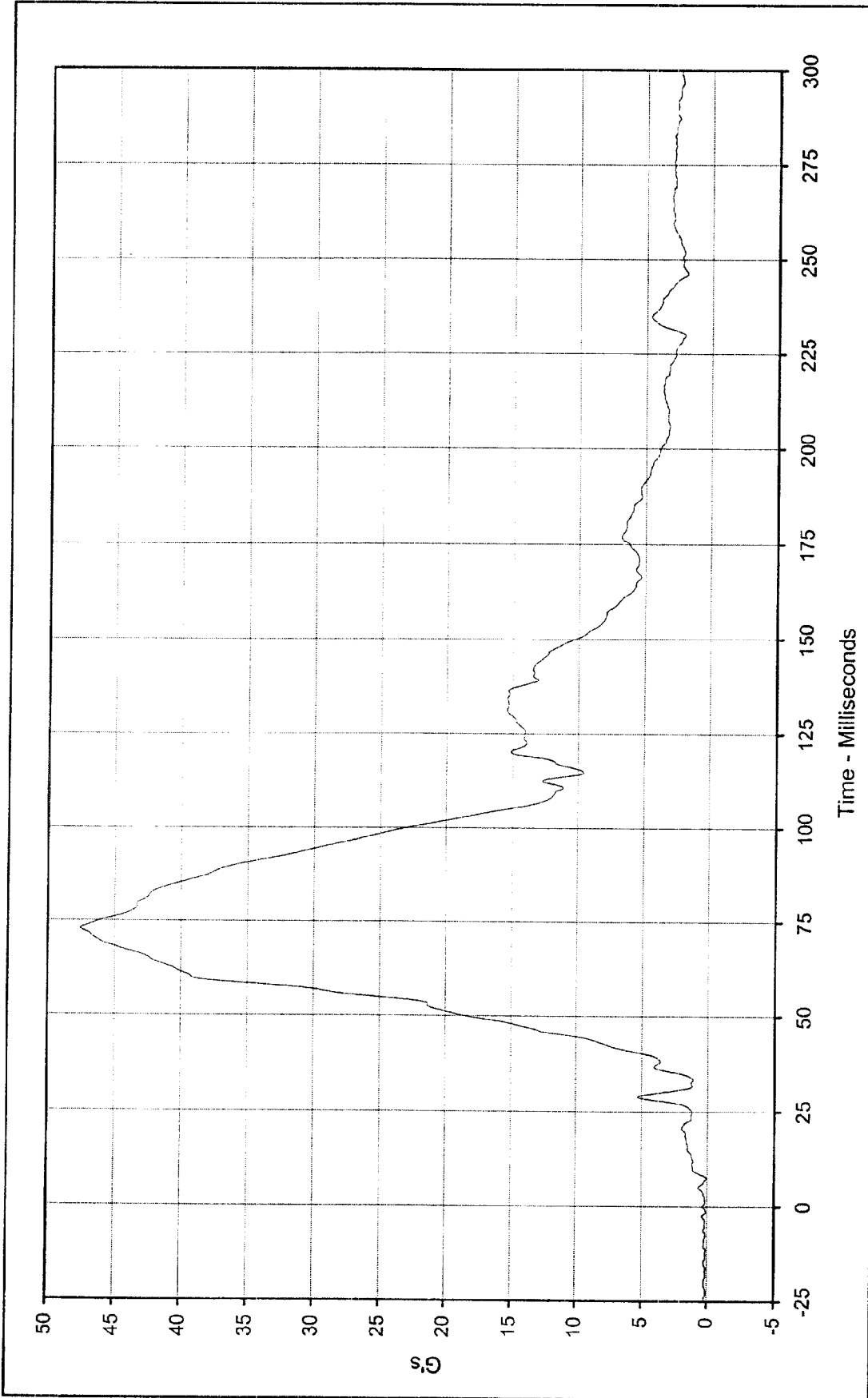




Curve Description: Driver Chest Primary Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 16.1 at 62.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -14.3 at 136.4 Milliseconds



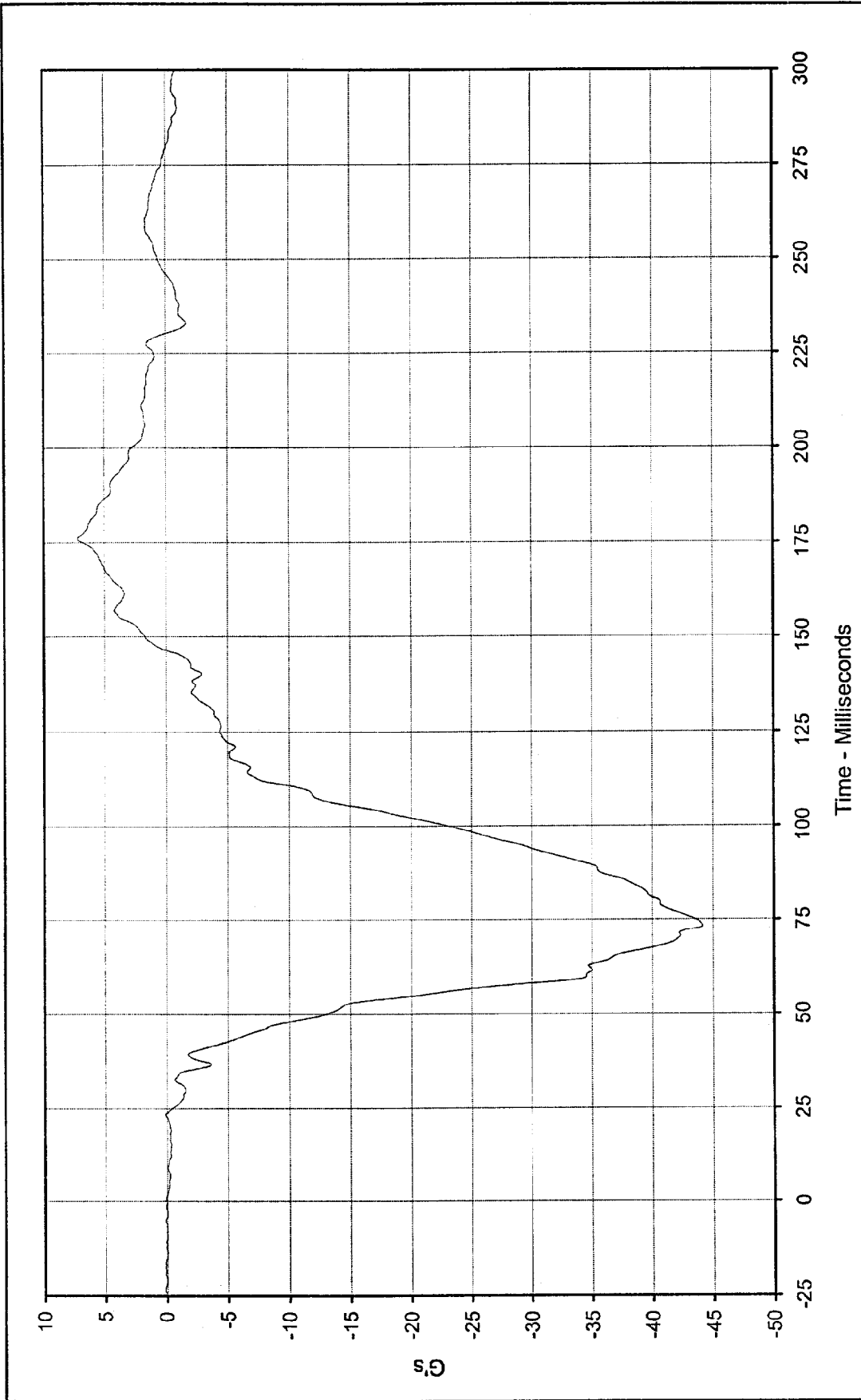
SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-015



Curve Description: Driver Chest Resultant Primary
 Maximum Value: 47.6 at 72.9 Milliseconds
 Minimum Value: 0.0 at 7.5 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: RES-013

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

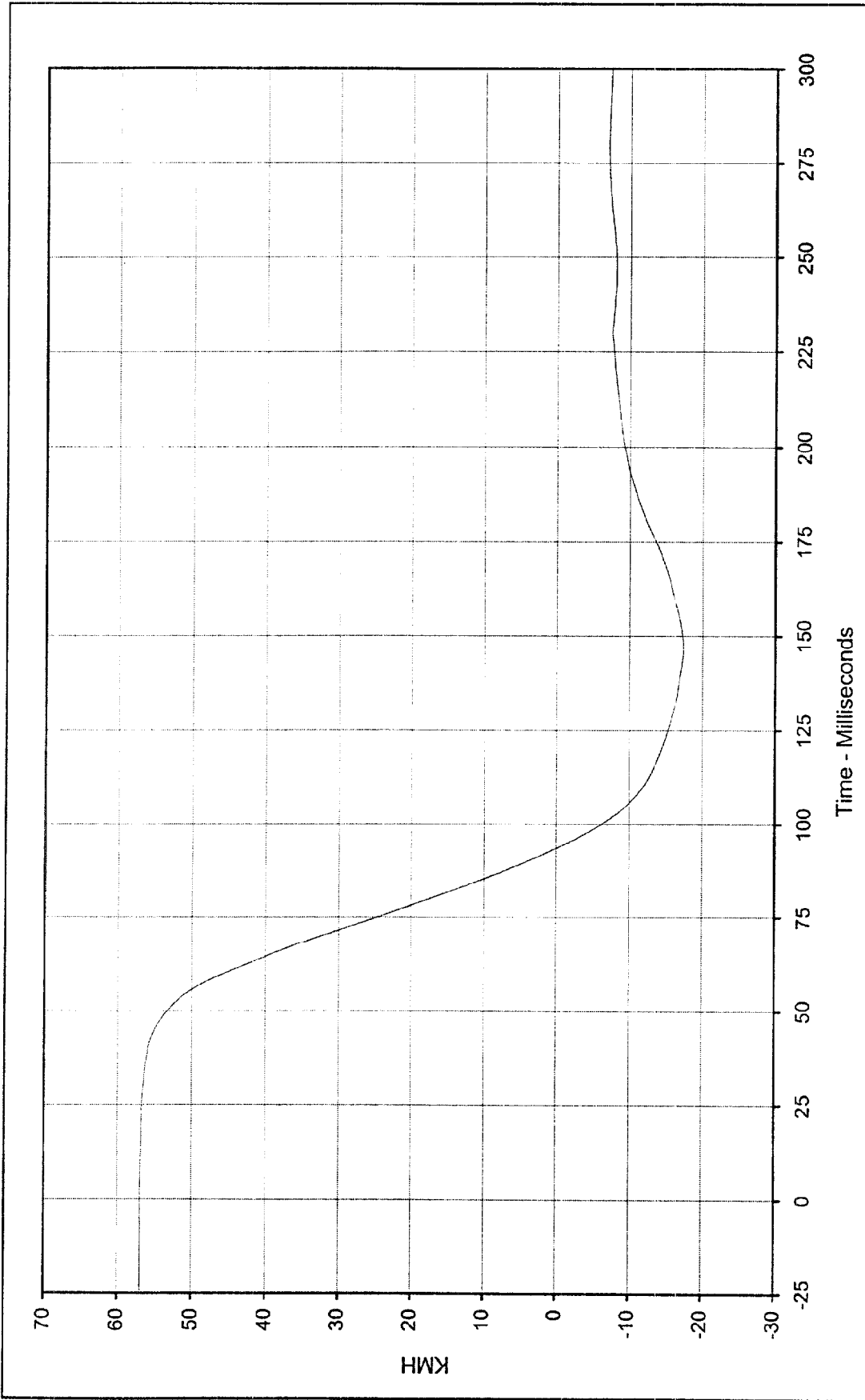




Curve Description: Driver Chest Redundant X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 7.2 at 176.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -44.2 at 73.2 Milliseconds

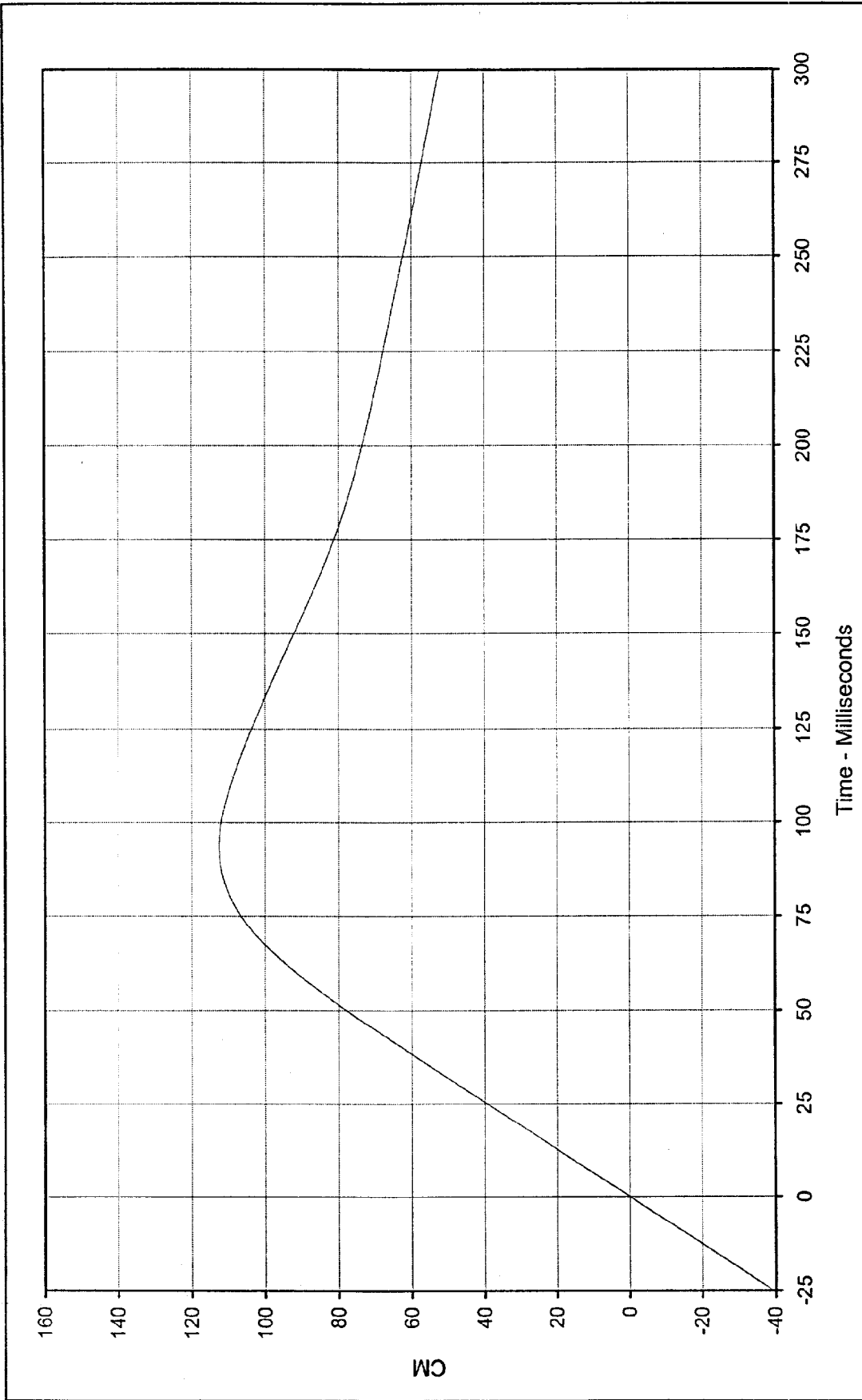


SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-016



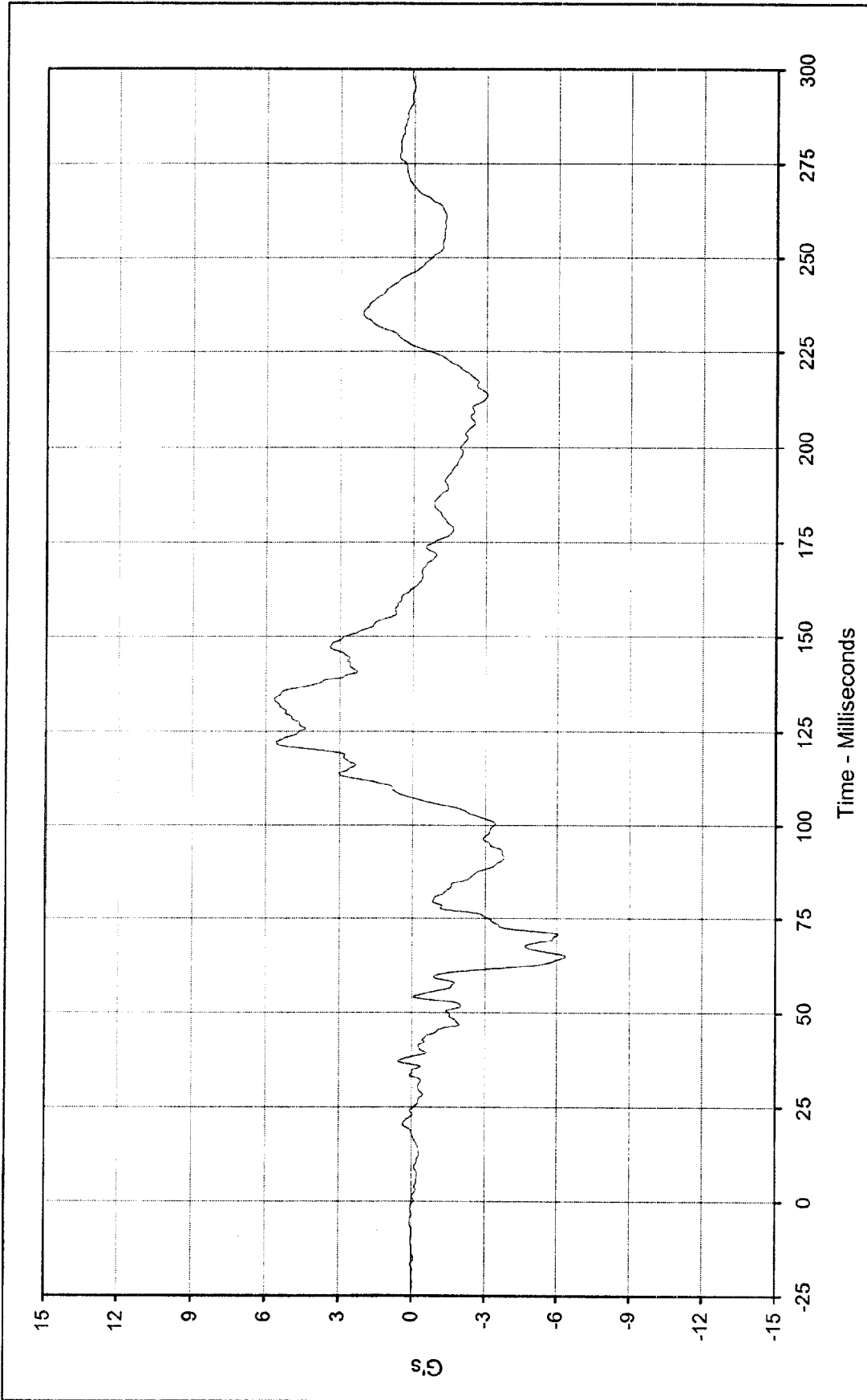
Curve Description: Driver Chest Redundant X Velocity Testing Program 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 56.9 at 1.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -17.4 at 146.4 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-016





Curve Description: Driver Chest Redundant X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 112.6 at 93.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-016





Curve Description: Driver Chest Redundant Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 5.7 at 133.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

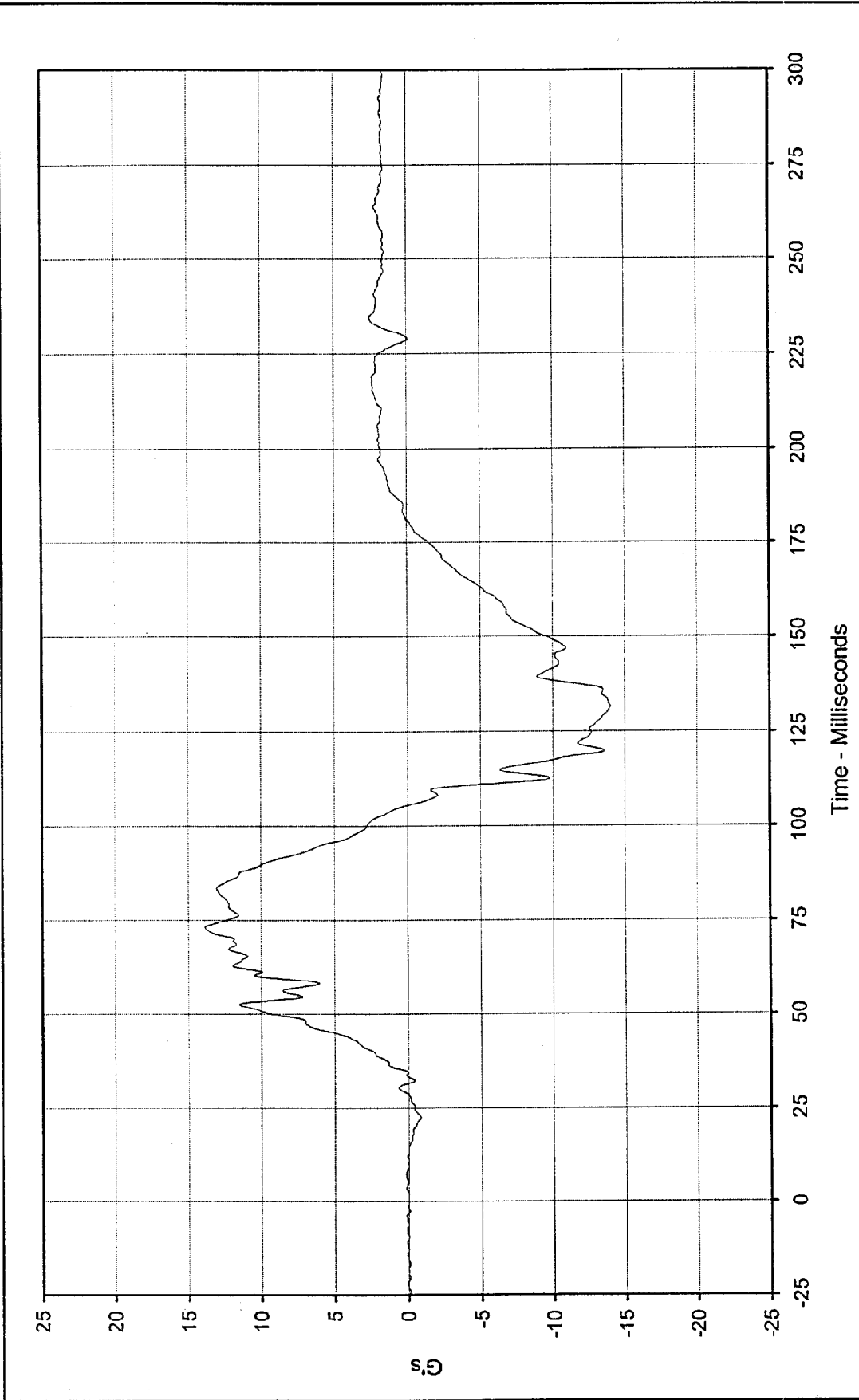
Minimum Value: -6.4 at 64.8 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: FIL-017

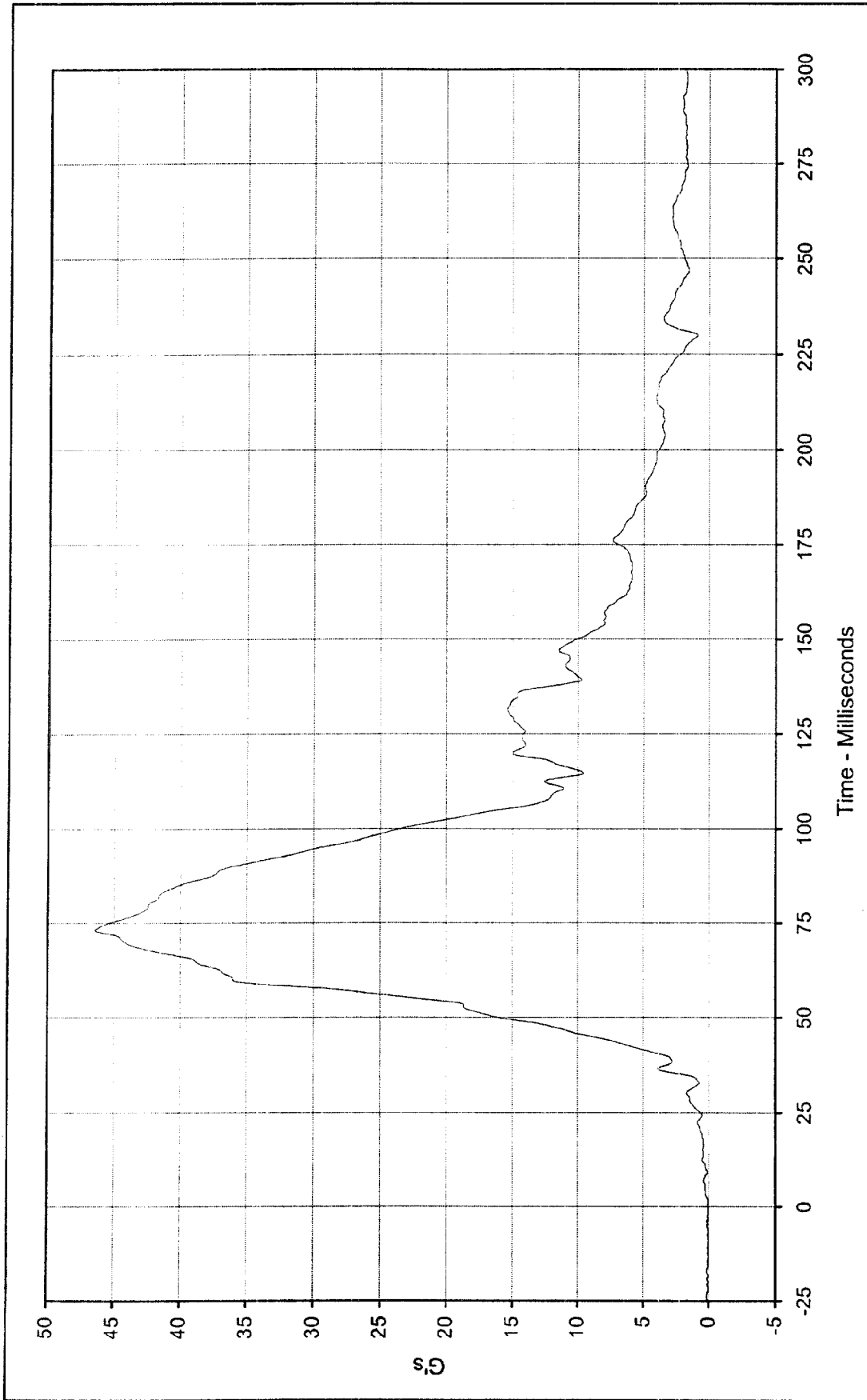




Curve Description: Driver Chest Redundant Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 13.8 at 73.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -14.0 at 131.5 Milliseconds



SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-018



Curve Description: Driver Chest Resultant Redundant
 Maximum Value: 46.4 at 73.2 Milliseconds
 Minimum Value: 0.1 at 1.5 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: RES-016

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

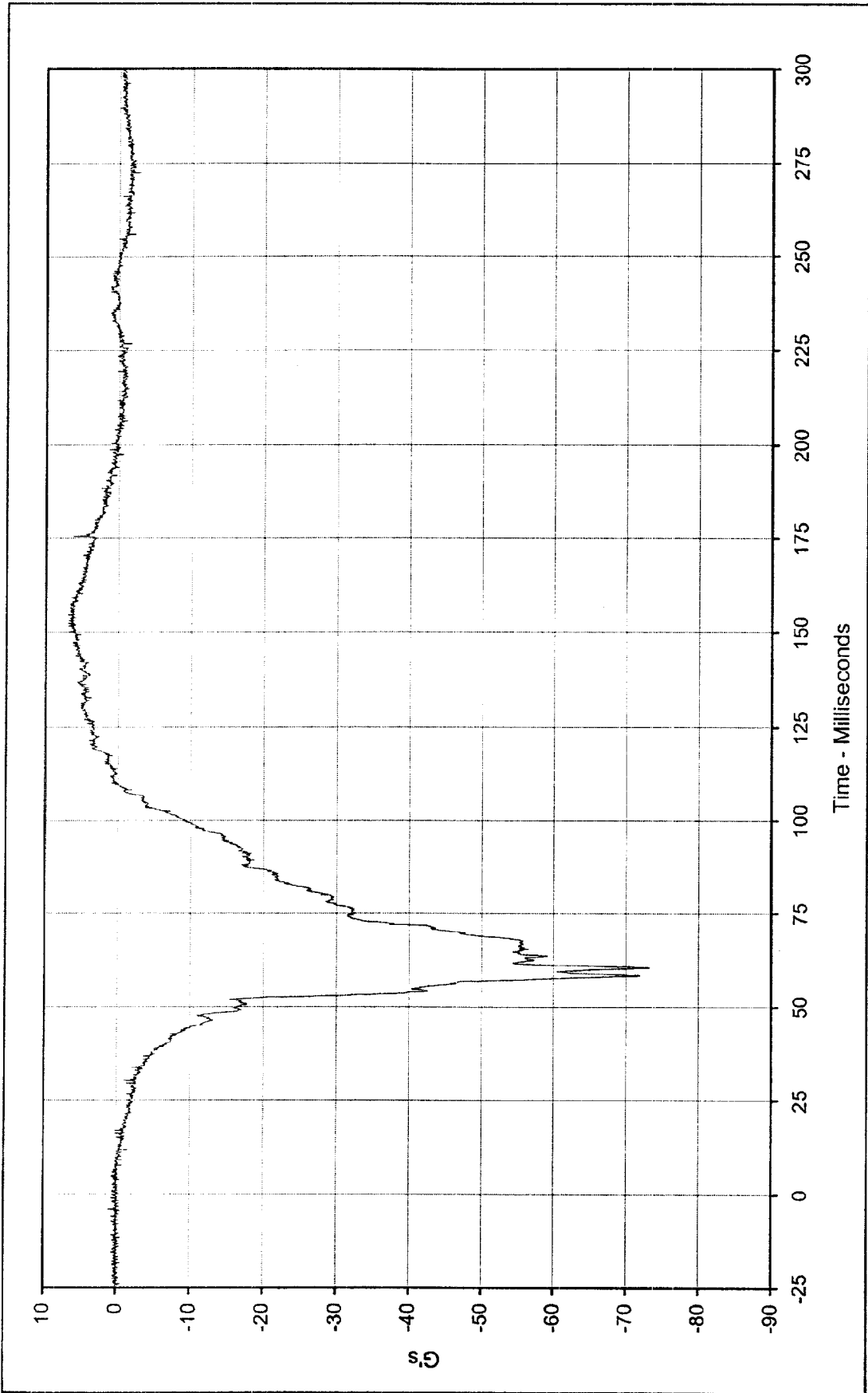




Curve Description: Driver Chest Displacement X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 0.2 at 4.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -31.3 at 85.4 Milliseconds

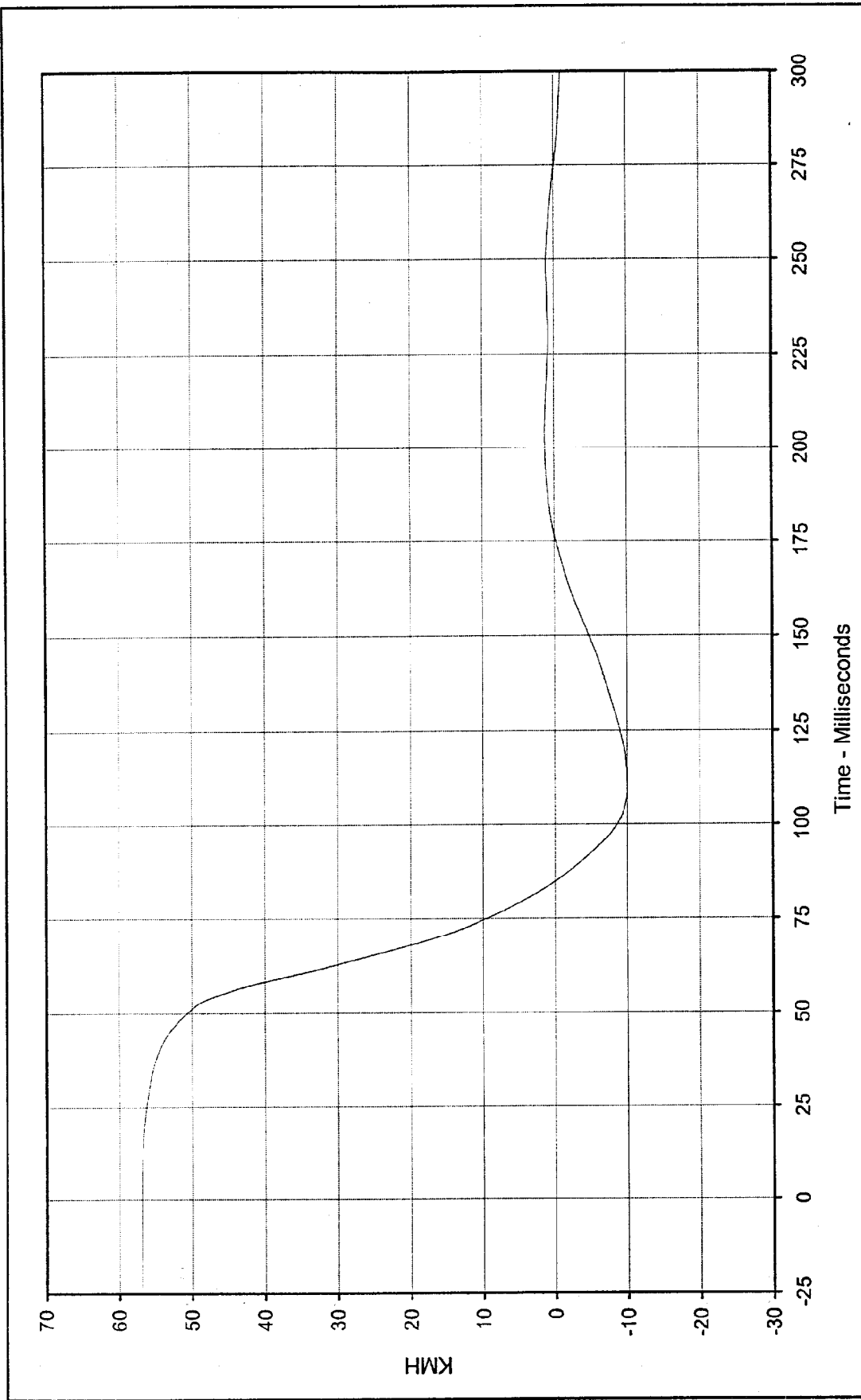


SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-019



Curve Description: Driver Pelvis X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 6.9 at 151.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -73.3 at 60.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-020

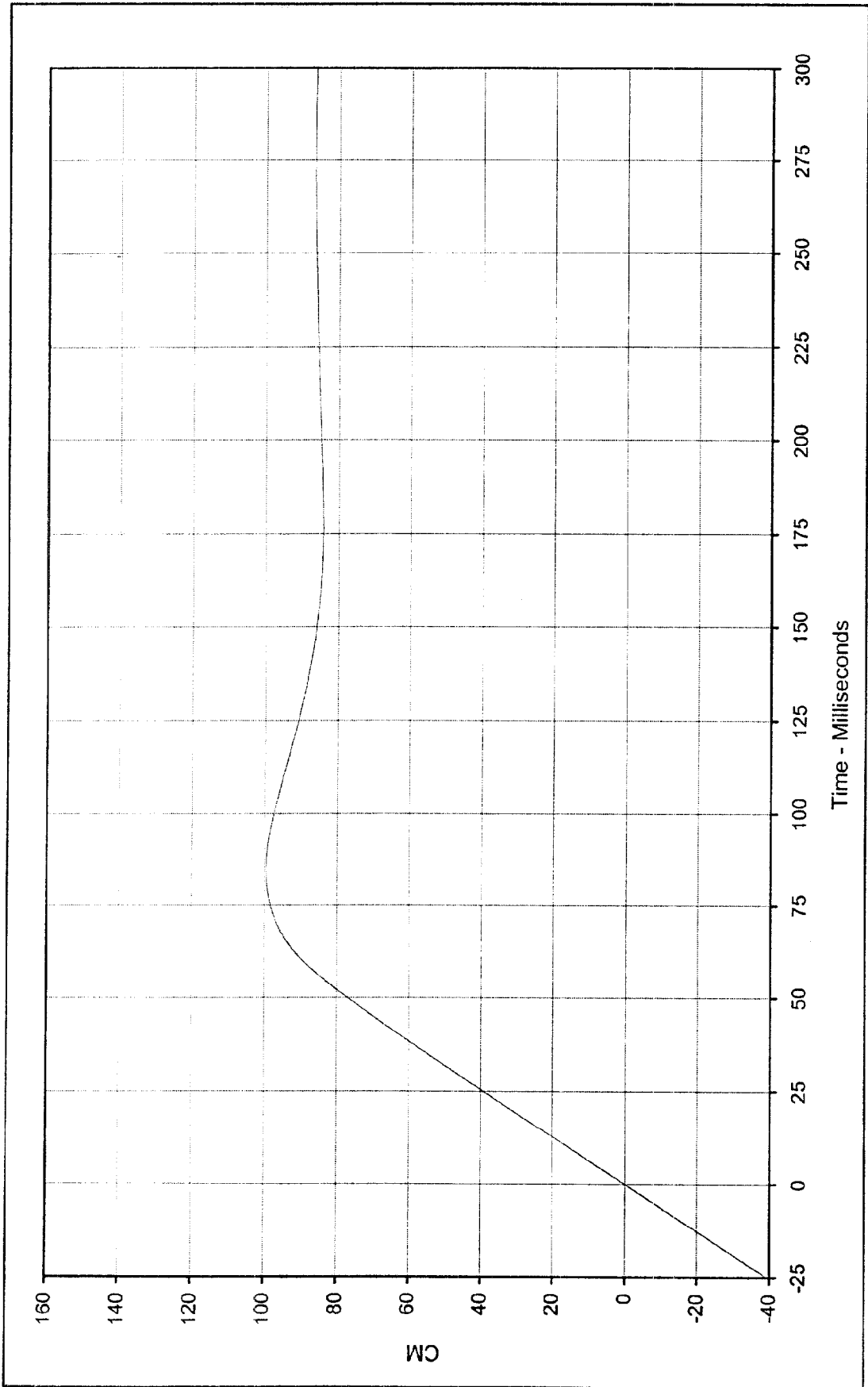




Curve Description: Driver Pelvis X Velocity
 Testing Program 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

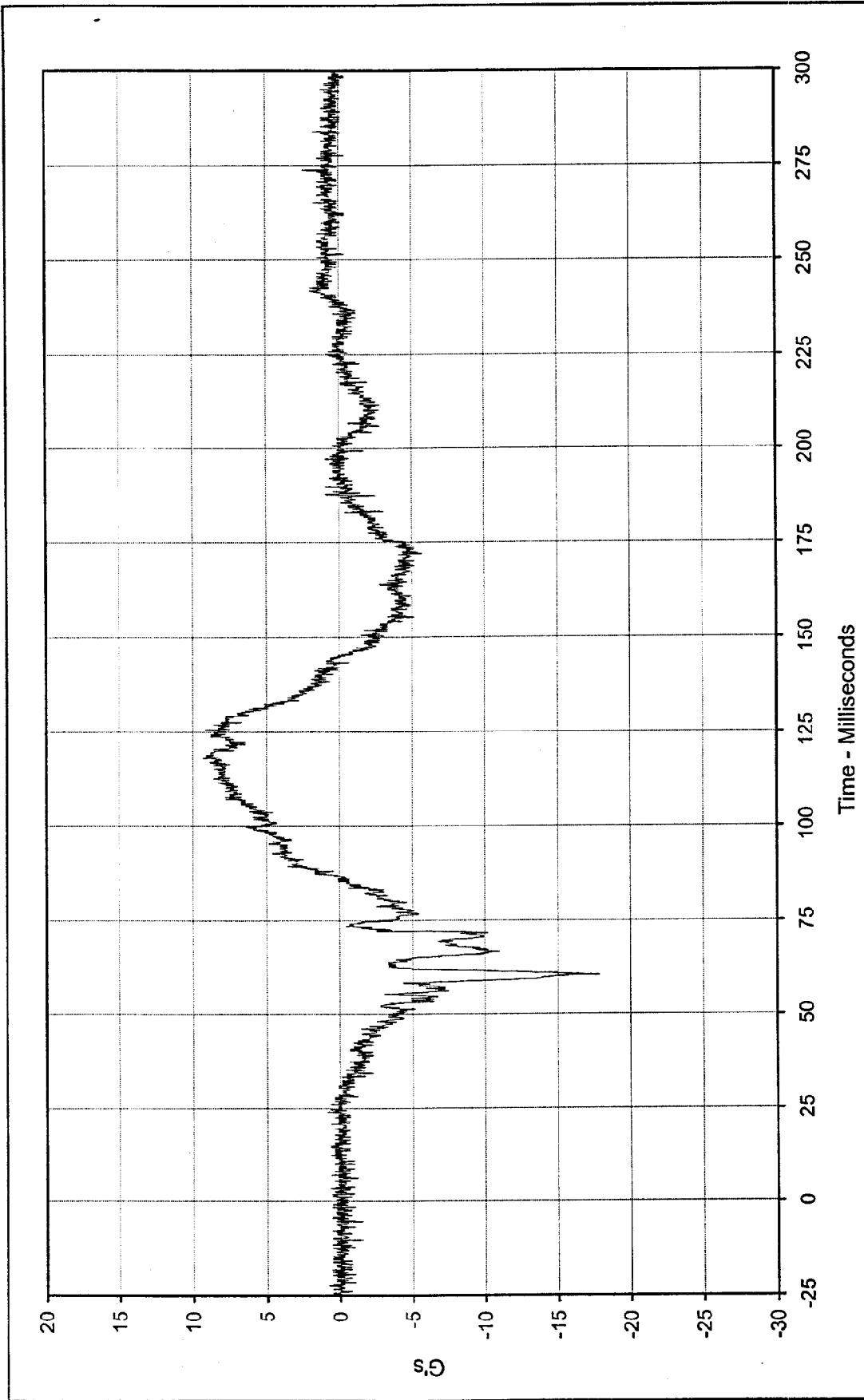
Maximum Value: 56.9 at 6.1 Milliseconds
 Minimum Value: -10.0 at 109.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-020





Curve Description: Driver Pelvis X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 99.5 at 84.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-020

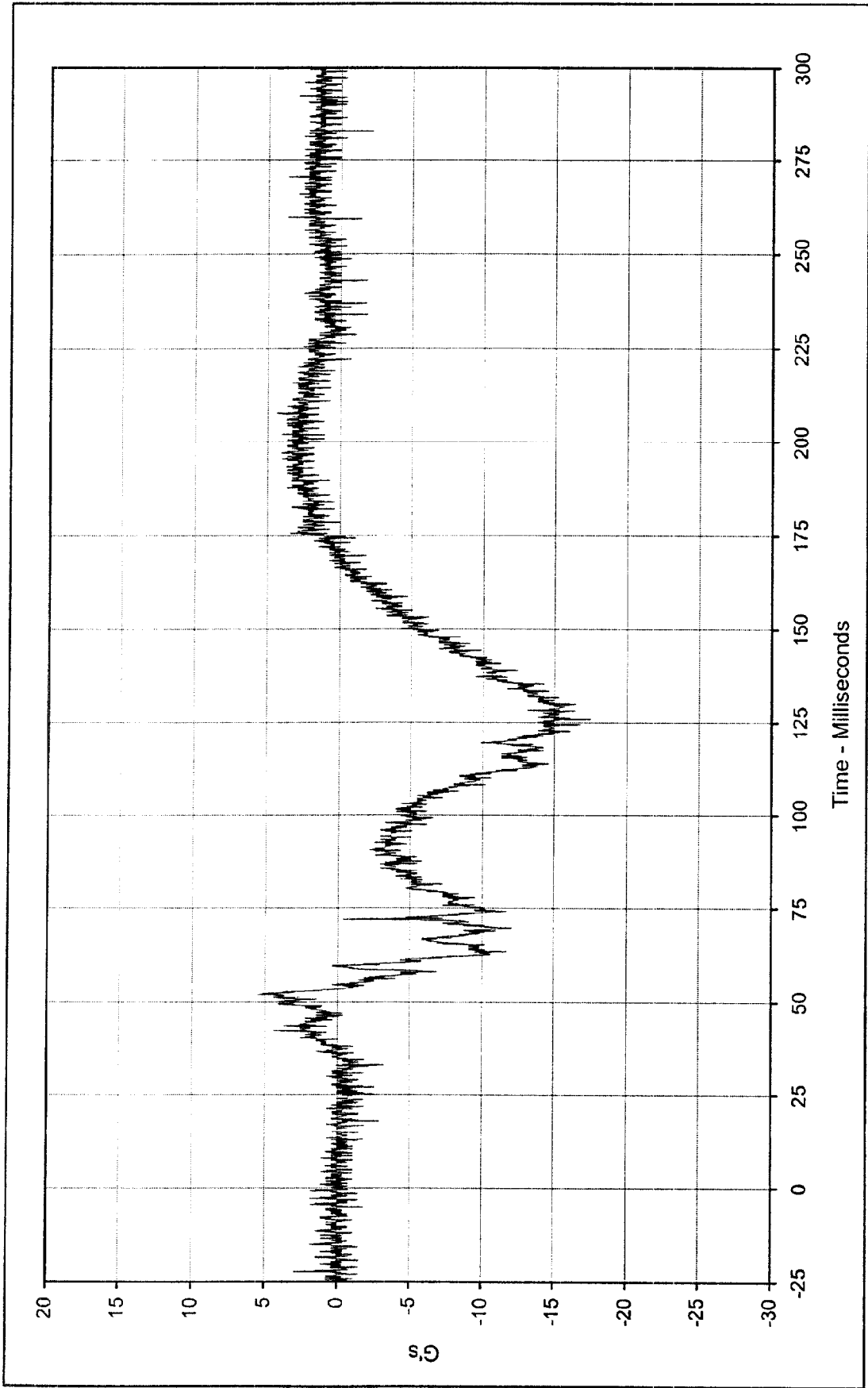




Curve Description: Driver Pelvis Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 9.3 at 117.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -17.9 at 60.4 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-021





Curve Description: Driver Pelvis Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 5.5 at 51.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

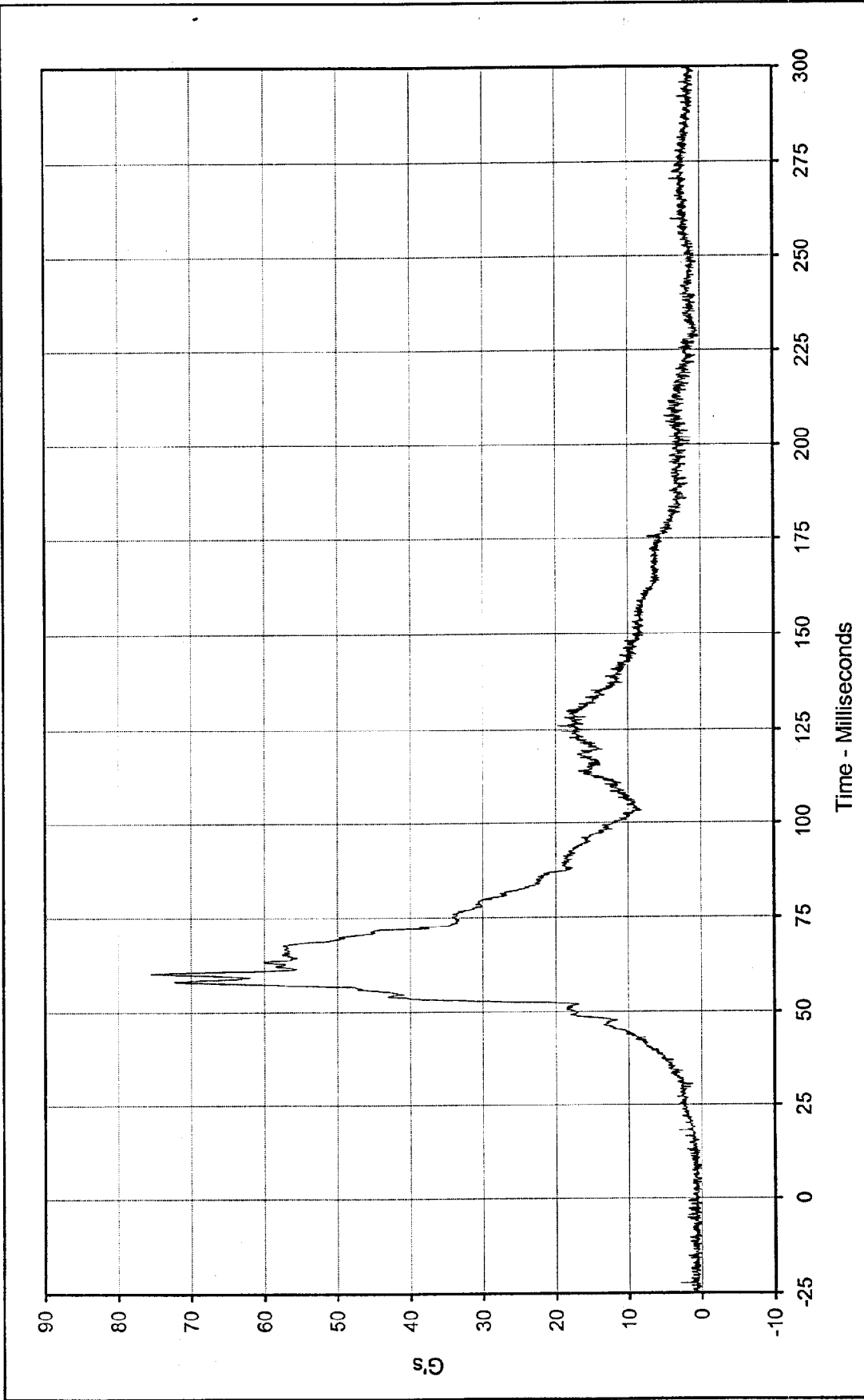
Minimum Value: -17.5 at 126.0 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

Curve Number: FIL-022

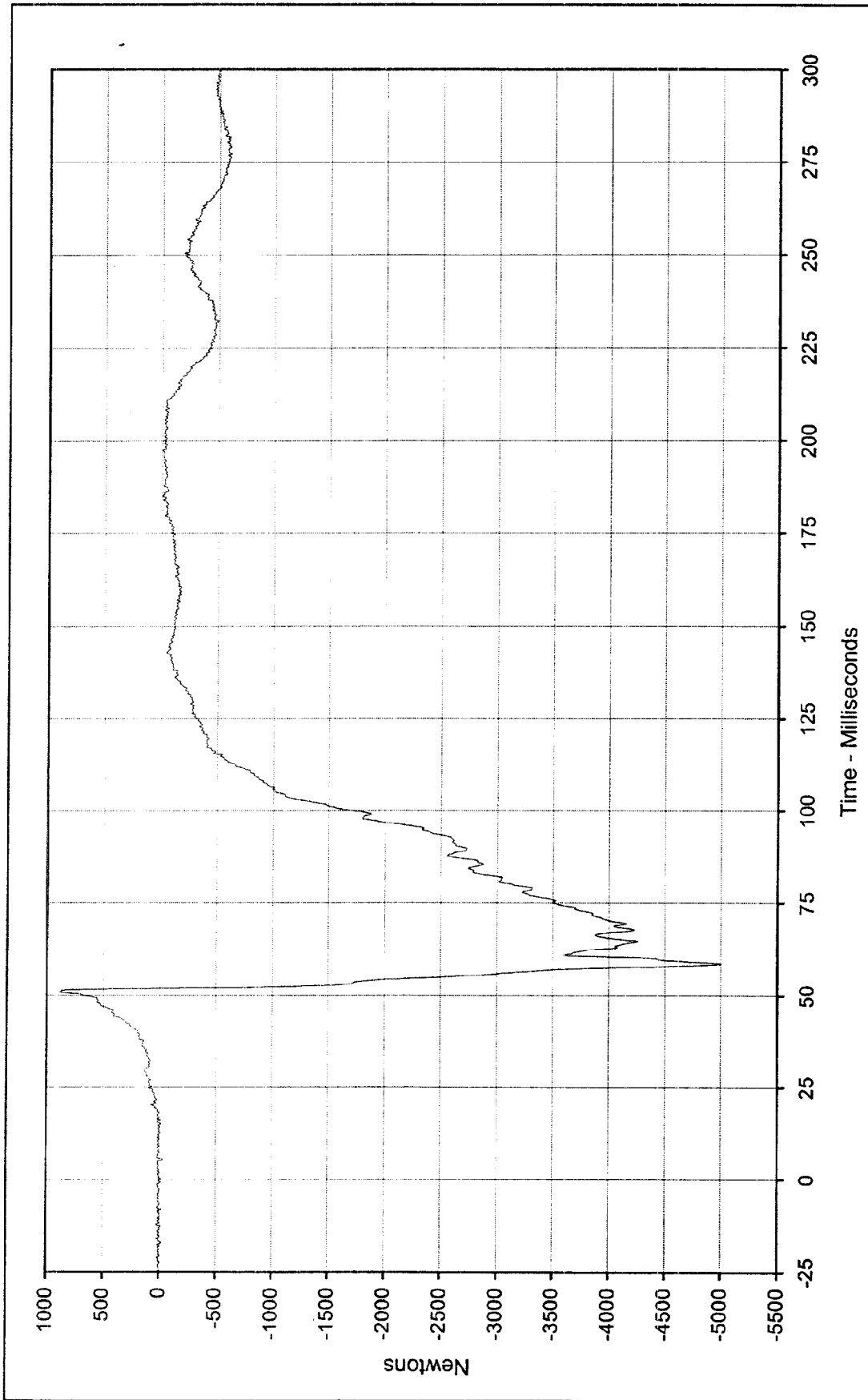




Curve Description: Driver Pelvis Resultant
 Maximum Value: 75.5 at 60.4 Milliseconds
 Minimum Value: 0.1 at 2.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-020

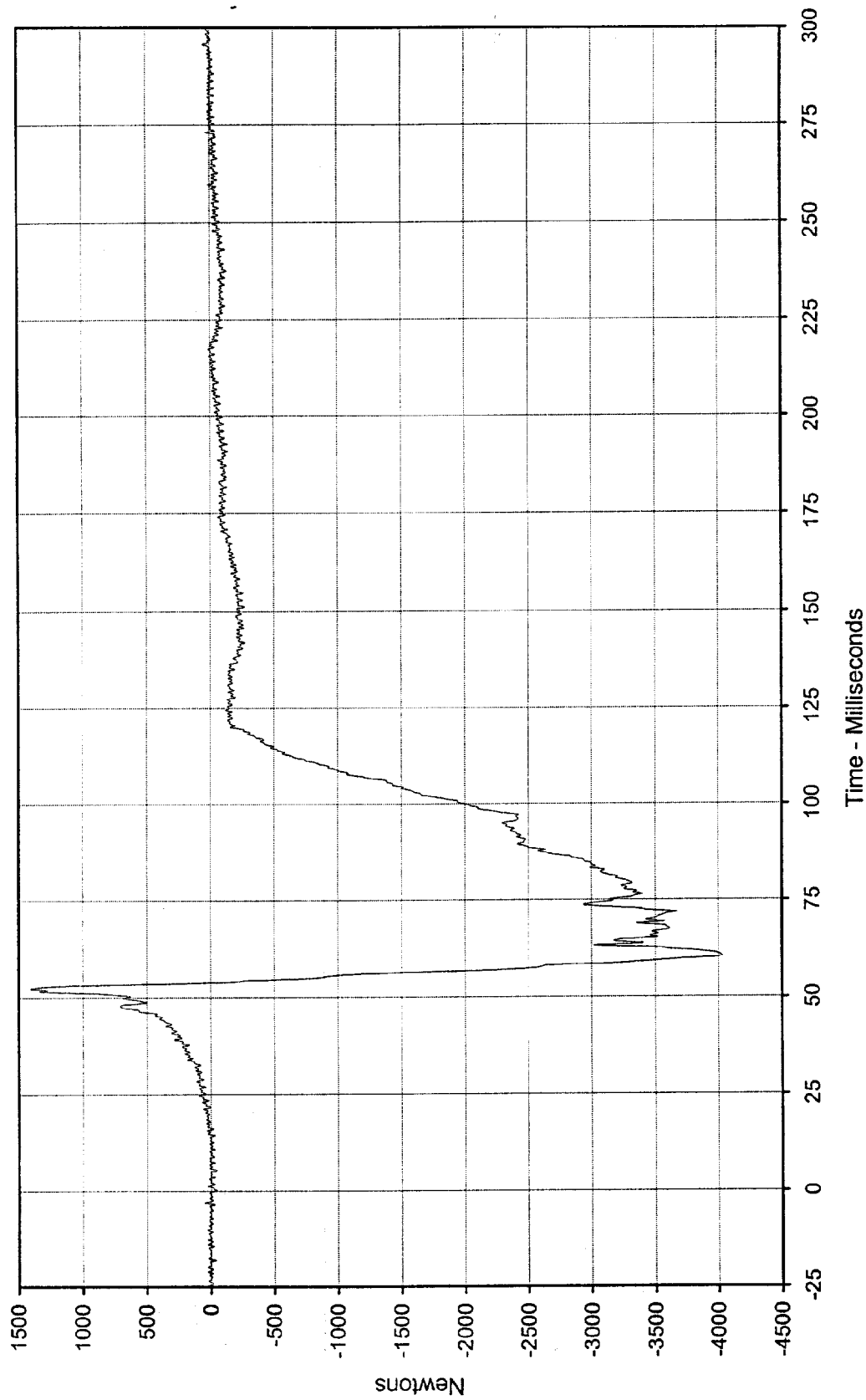
Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Left Femur Force Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 882.0 at 50.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -5005.2 at 58.6 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-023

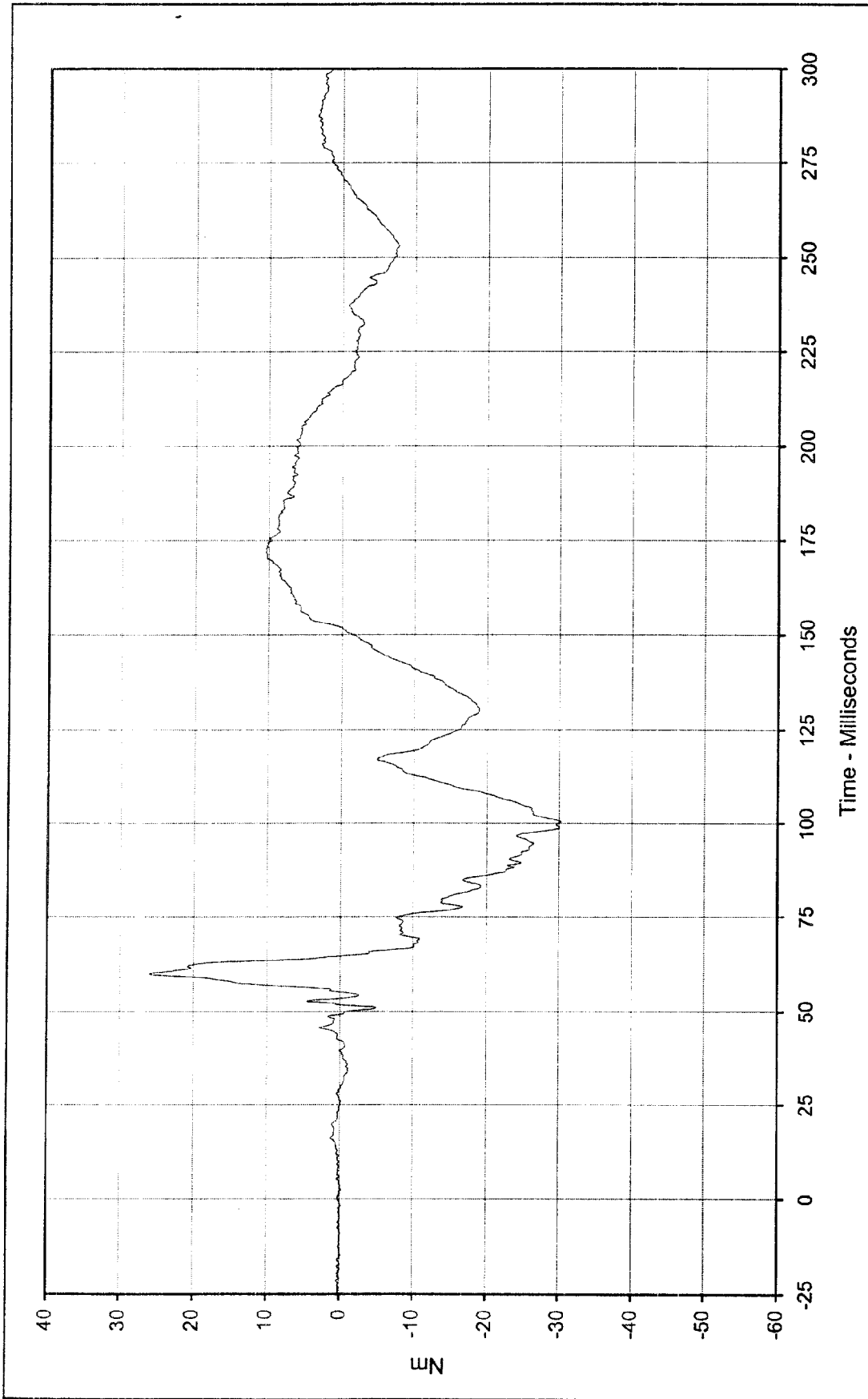




Curve Description: Driver Right Femur Force
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 1406.9 at 52.4 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -4033.5 at 60.5 Milliseconds

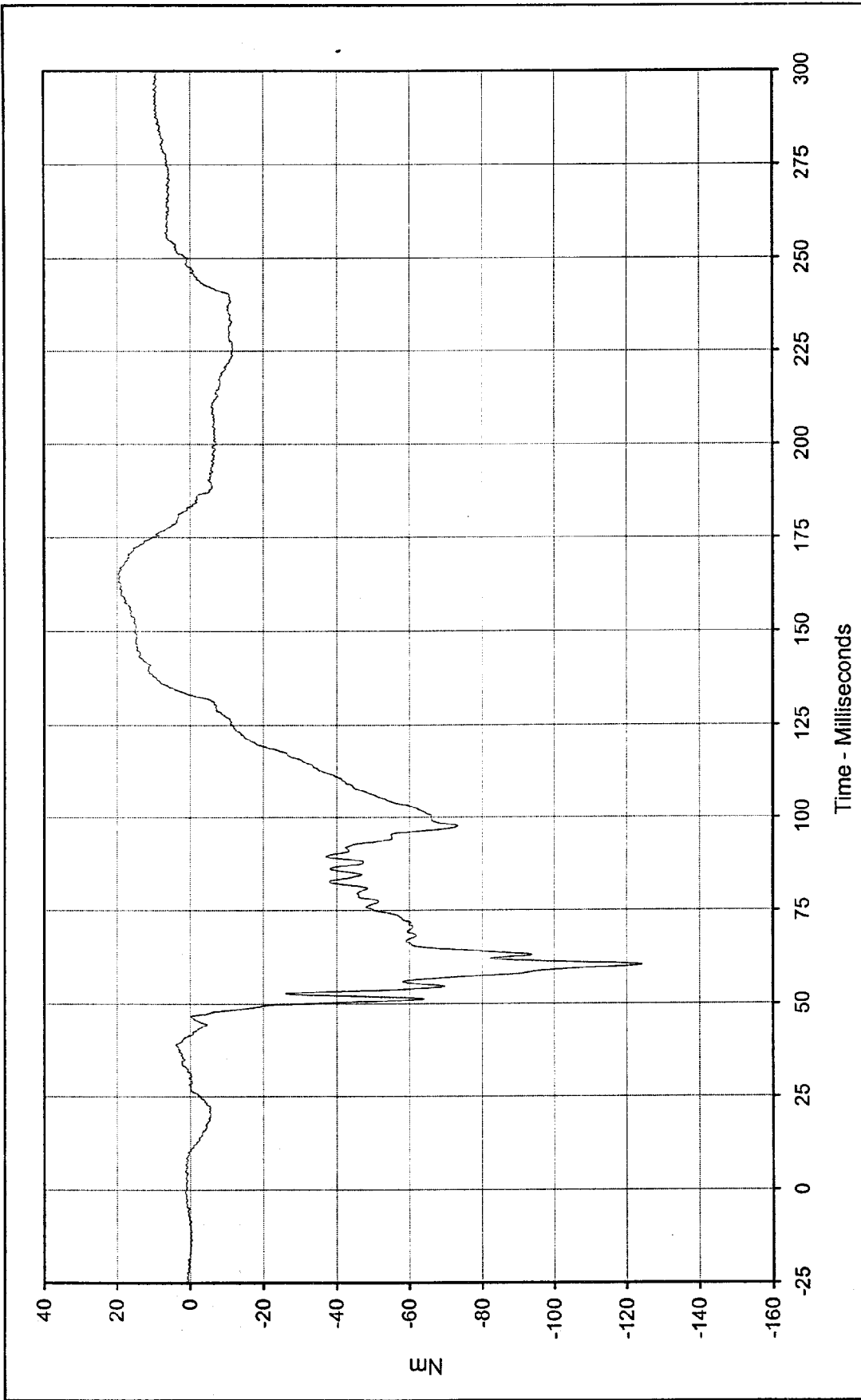


SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-024



Curve Description: Driver Left Upper Tibia Moment X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 25.9 at 60.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -30.3 at 100.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-025

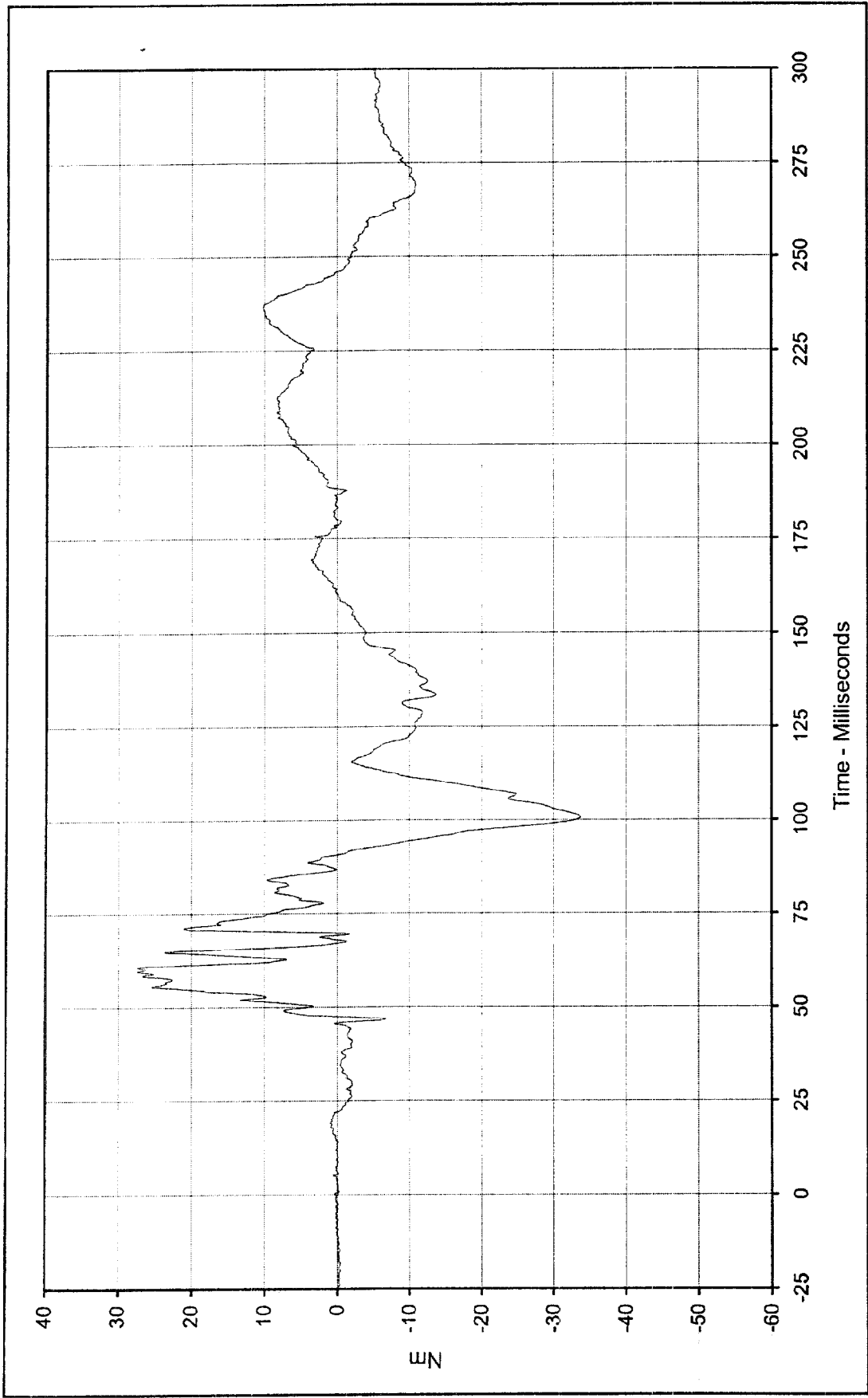




Curve Description: Driver Left Upper Tibia Moment Y
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 19.7 at 165.1 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -124.3 at 60.5 Milliseconds

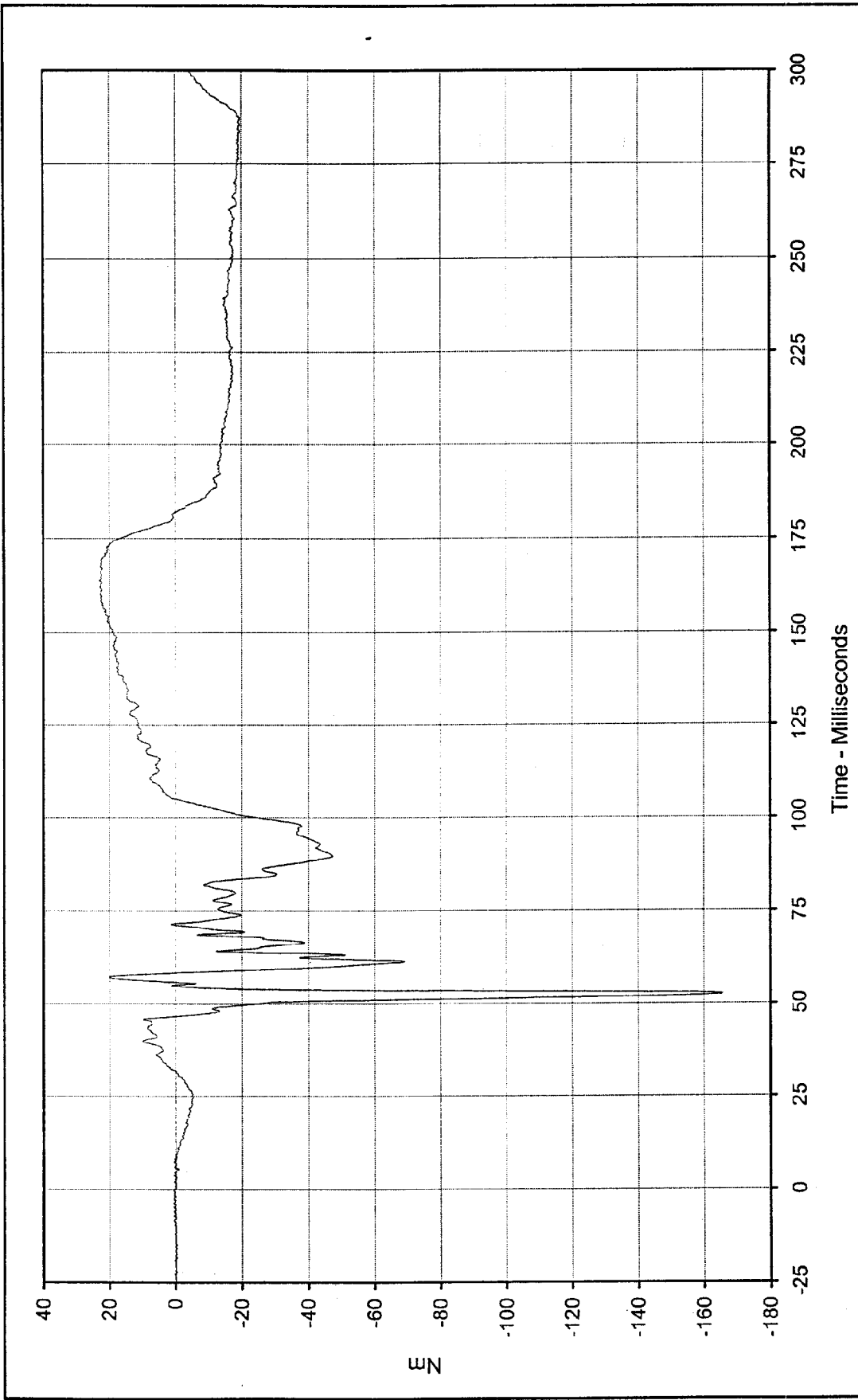


SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-026



Curve Description: Driver Right Upper Tibia Moment X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 27.4 at 59.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -33.7 at 100.5 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-027

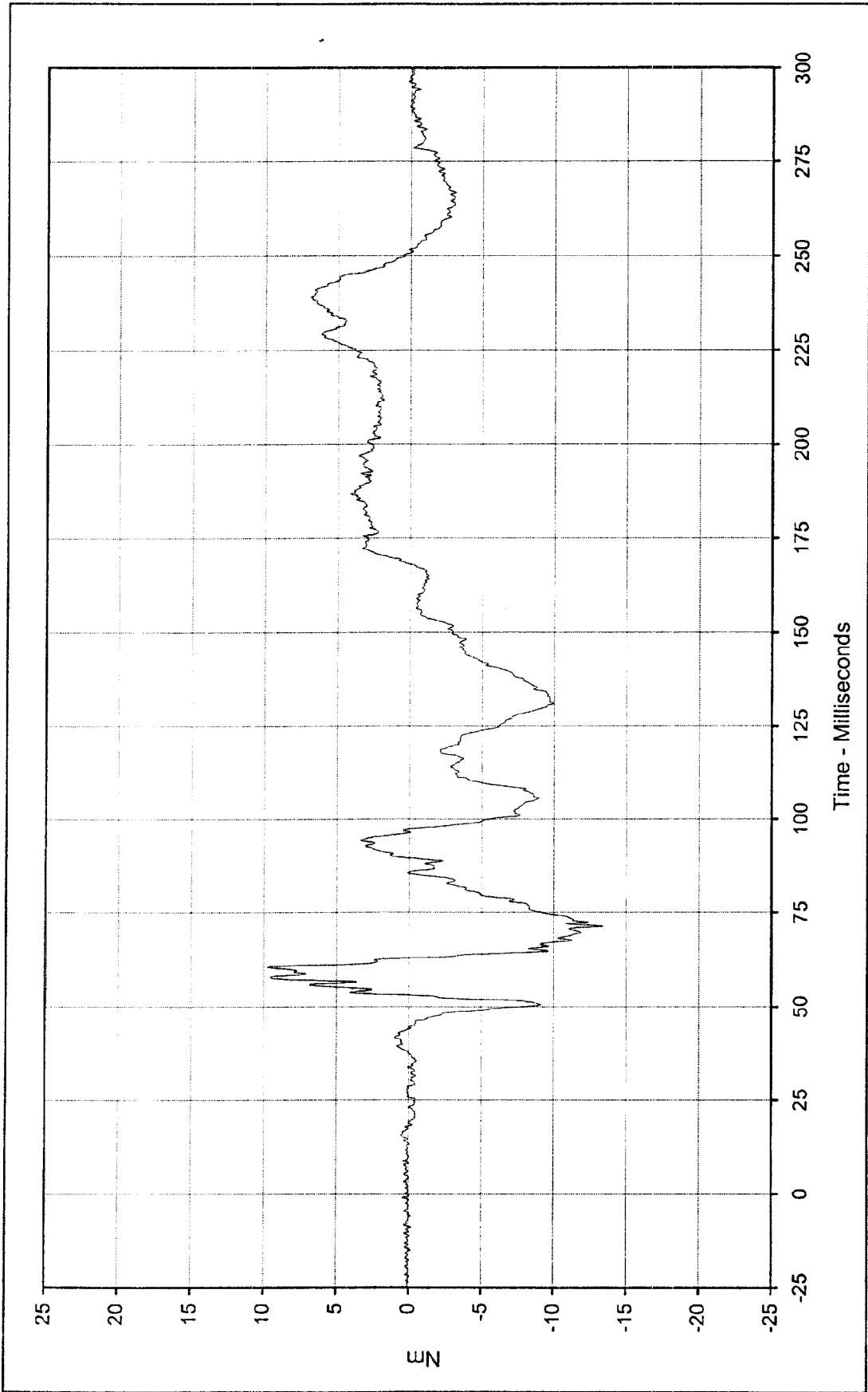




Curve Description: Driver Right Upper Tibia Moment Y
 Maximum Value: 22.9 at 163.8 Milliseconds
 Minimum Value: -165.6 at 52.5 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-028

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

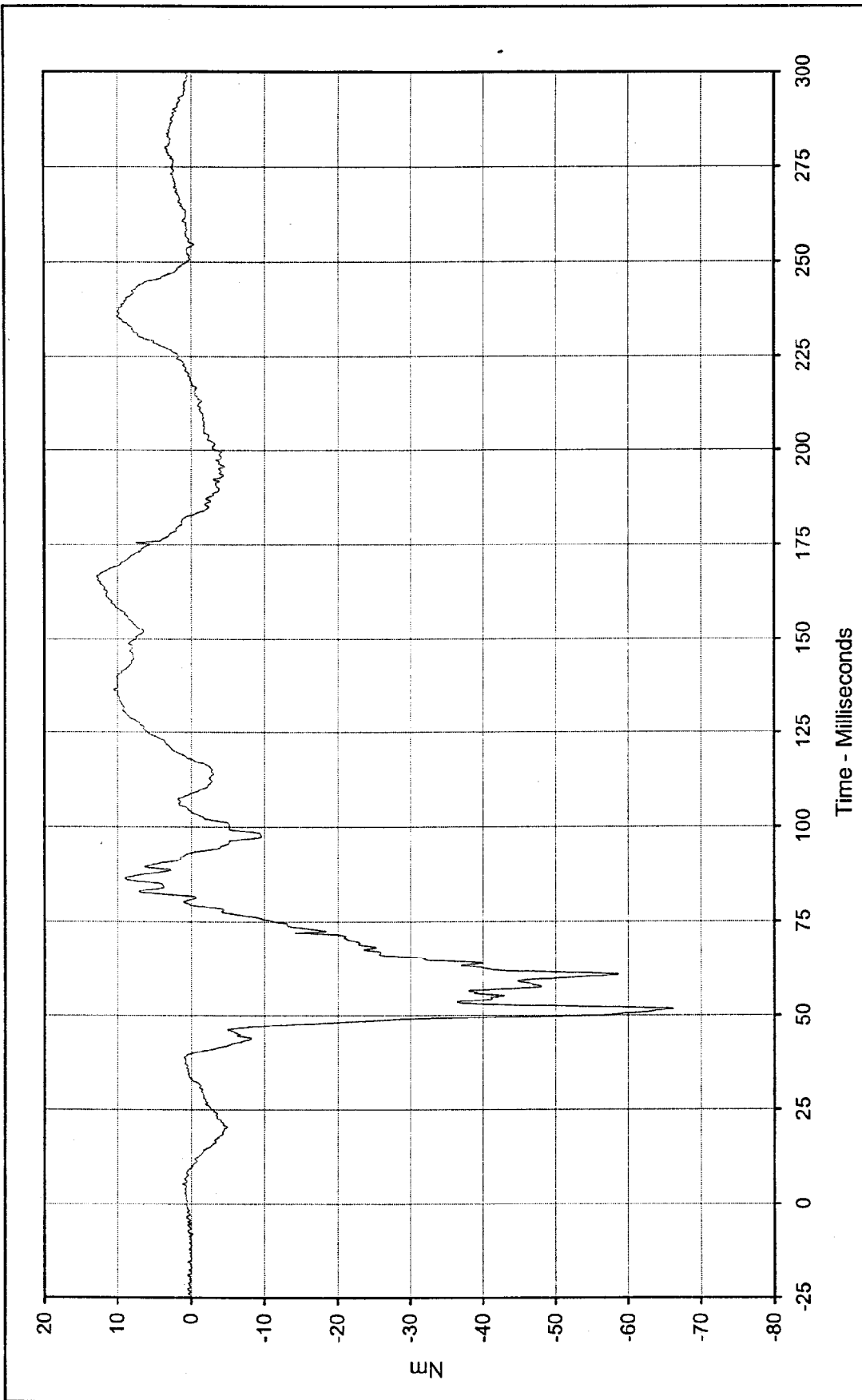




Curve Description: Driver Left Lower Tibia Moment X
 Maximum Value: 9.8 at 60.4 Milliseconds
 Minimum Value: -13.4 at 71.3 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-029

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

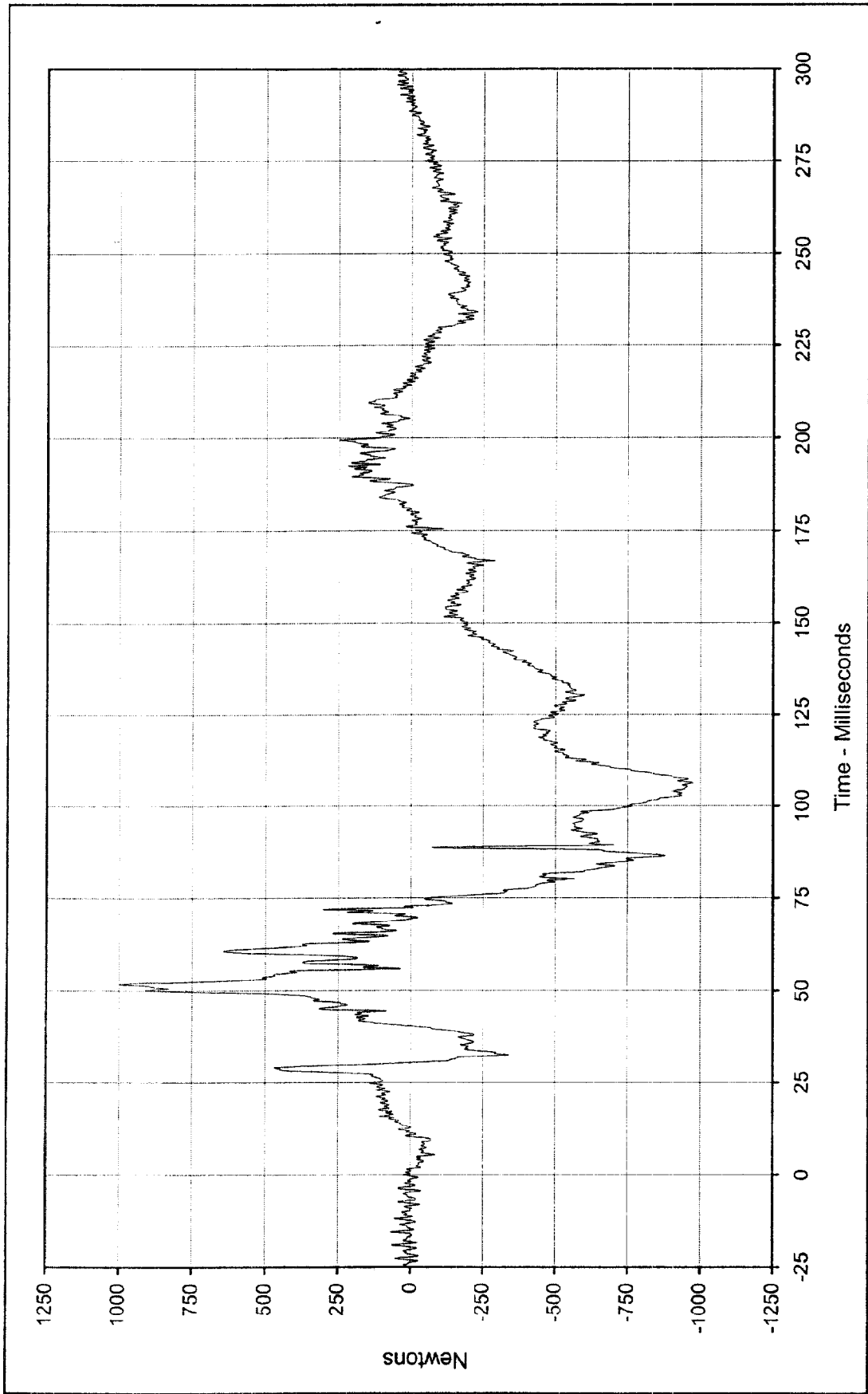




Curve Description: Driver Left Lower Tibia Moment Y
 Maximum Value: 12.8 at 166.7 Milliseconds
 Minimum Value: -66.2 at 51.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-030

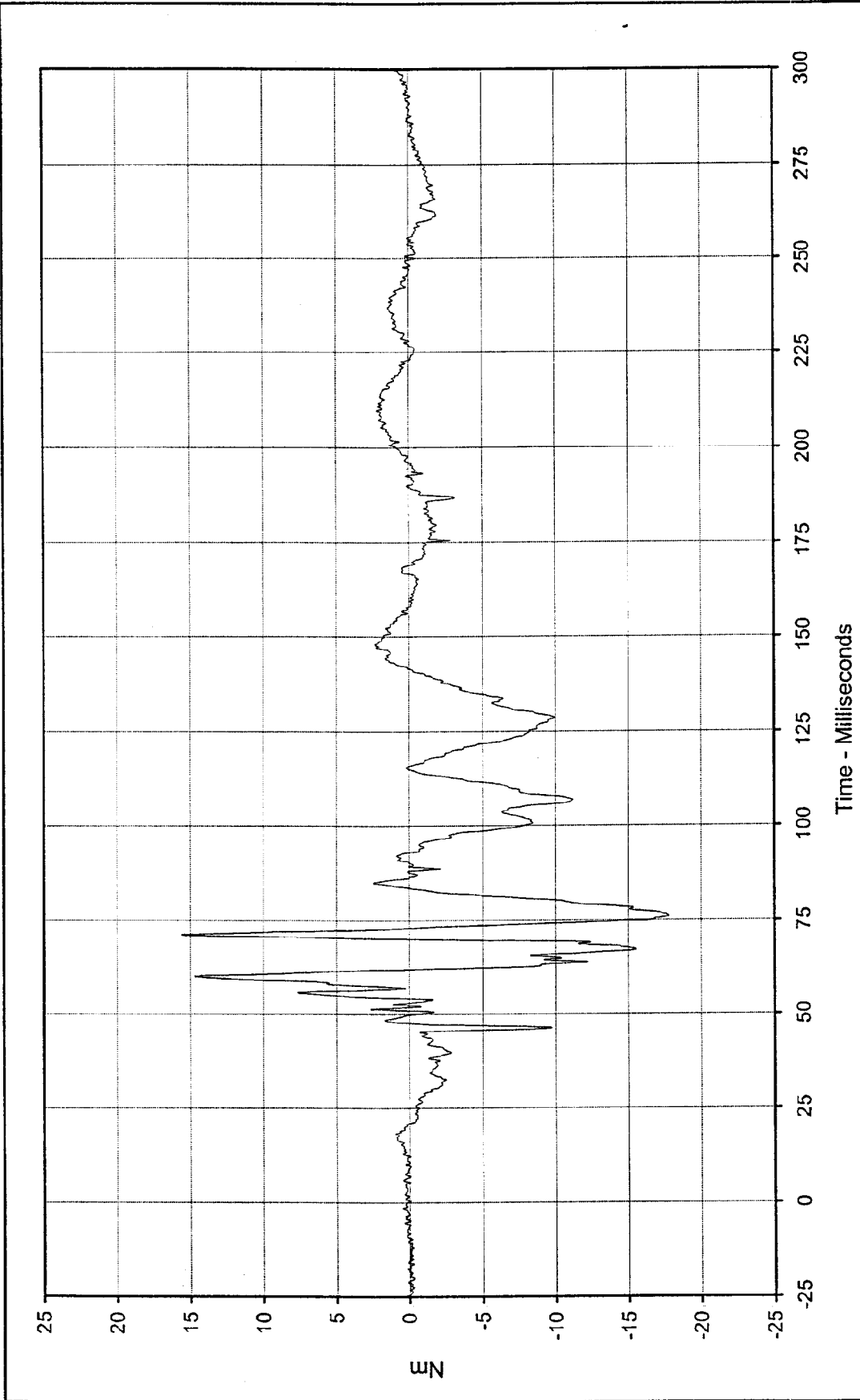
Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Left Lower Tibia Force Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 997.9 at 51.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -974.8 at 106.2 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-031

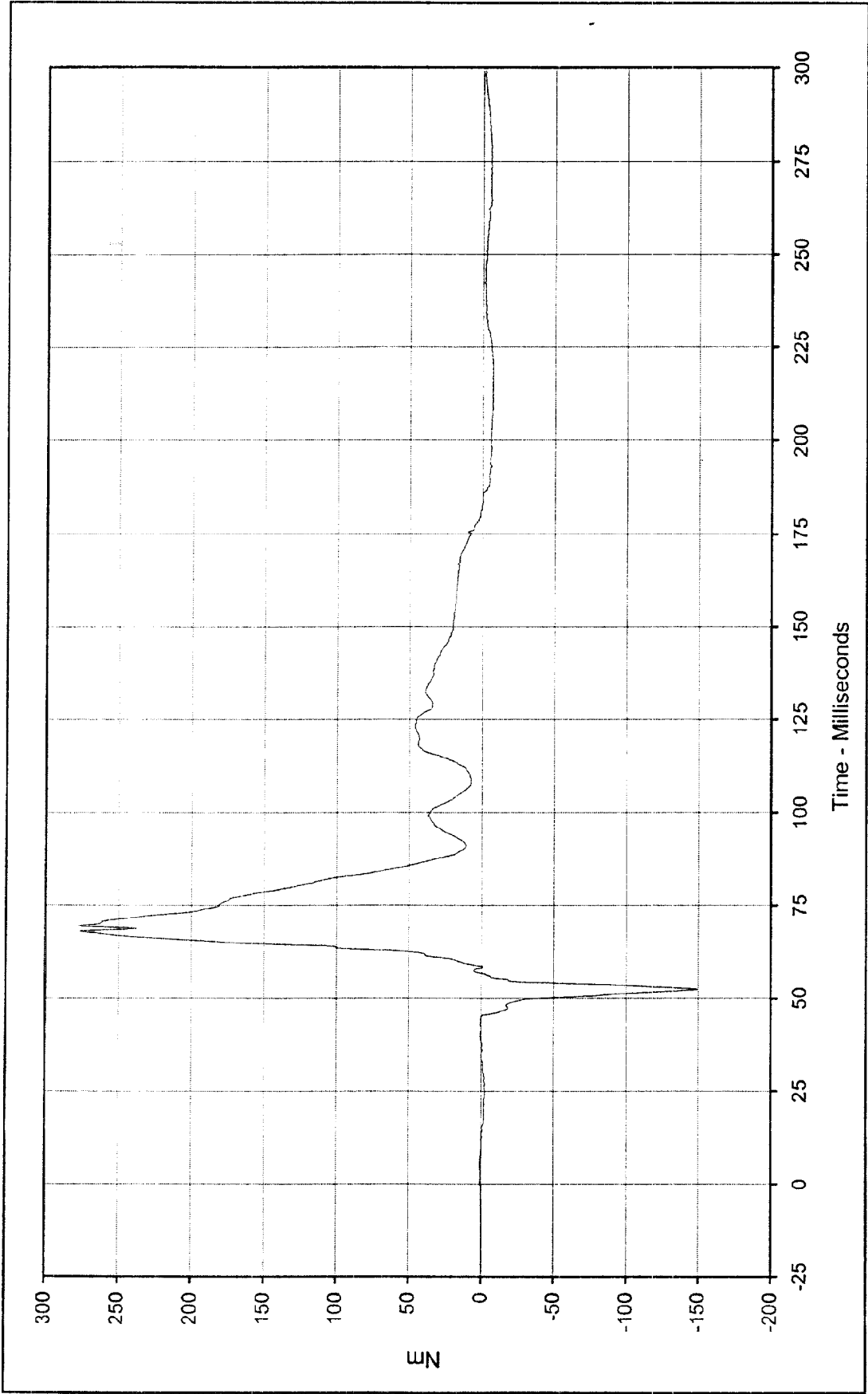




Curve Description: Driver Right Lower Tibia Moment X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 15.6 at 71.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -17.8 at 76.0 Milliseconds



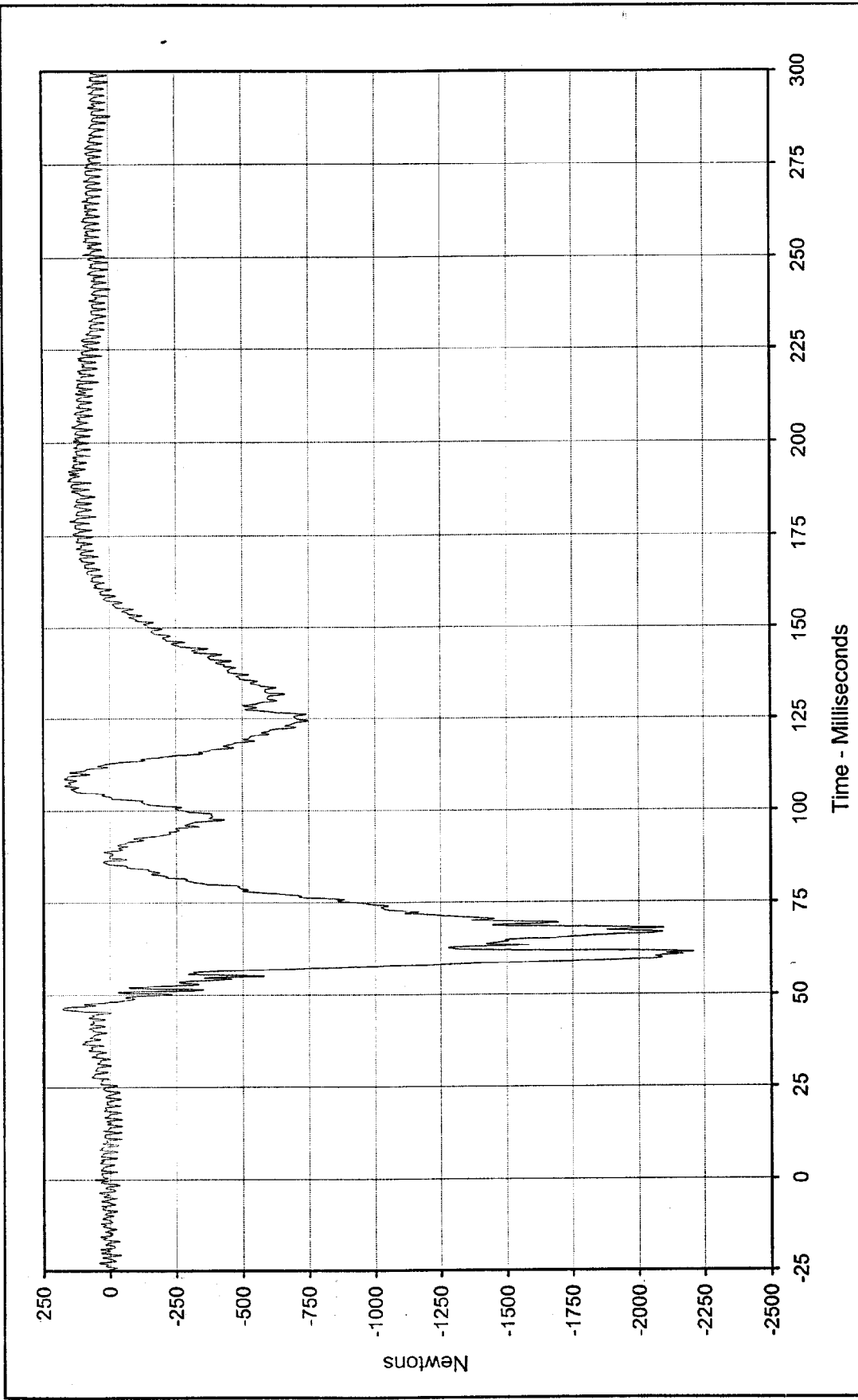
SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-032



Curve Description: Driver Right Lower Tibia Moment Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 277.6 at 69.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -149.4 at 52.4 Milliseconds

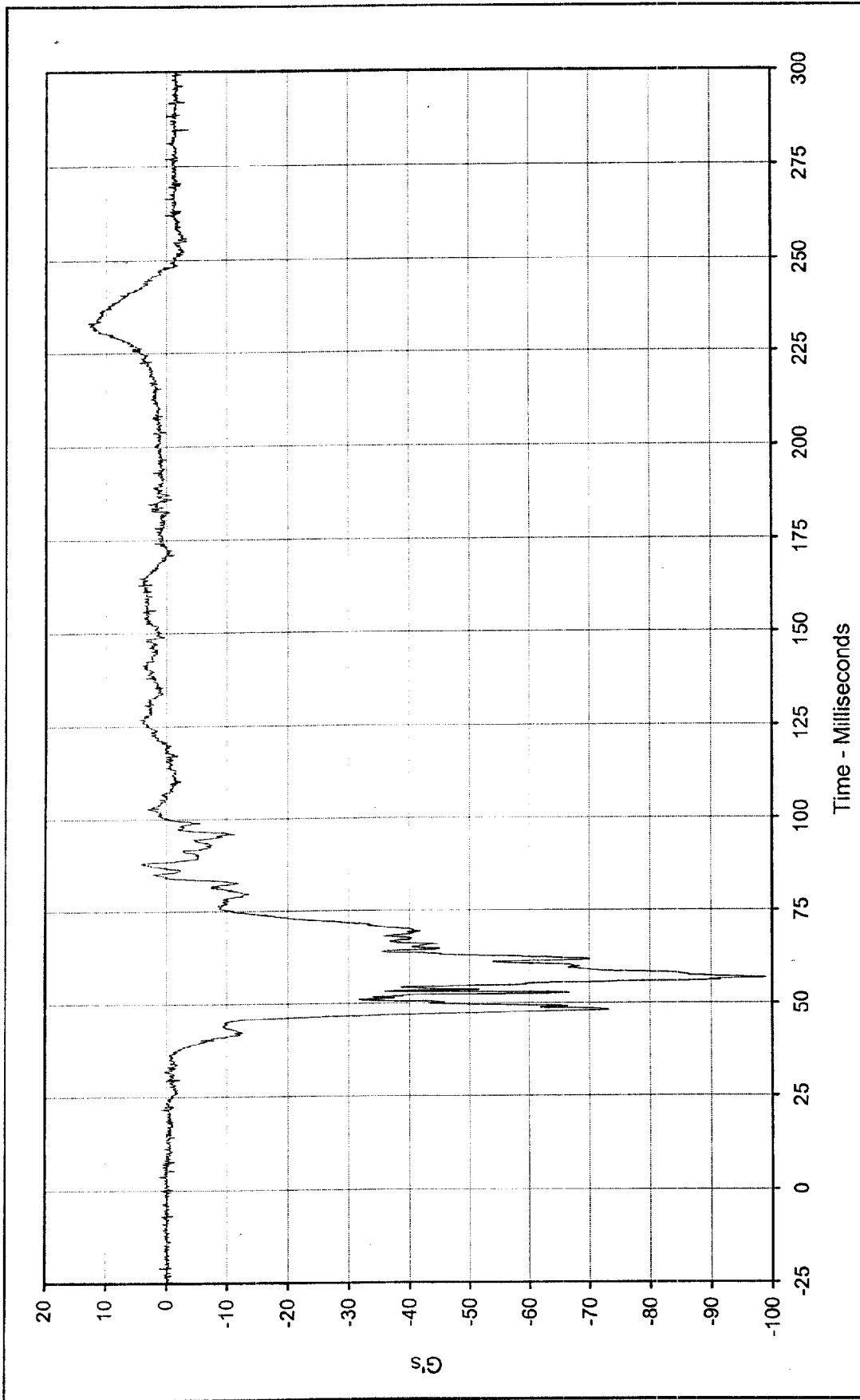


SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-033



Curve Description: Driver Right Lower Tibia Force Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 180.9 at 46.3 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -2211.2 at 61.3 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-034

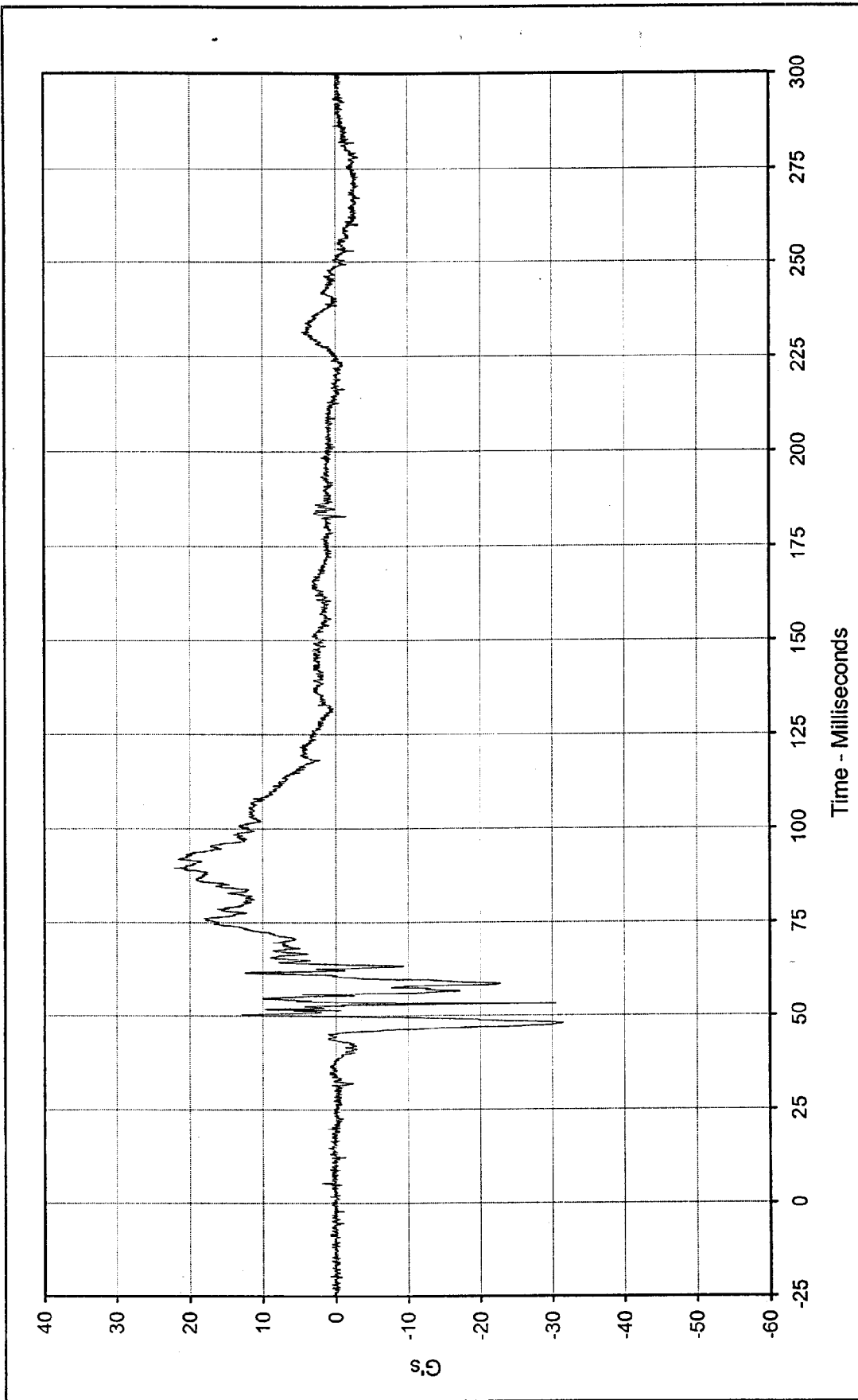




Curve Description: Driver Left Foot Aft X
 Maximum Value: 13.1 at 233.2 Milliseconds
 Minimum Value: -99.0 at 56.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-035

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

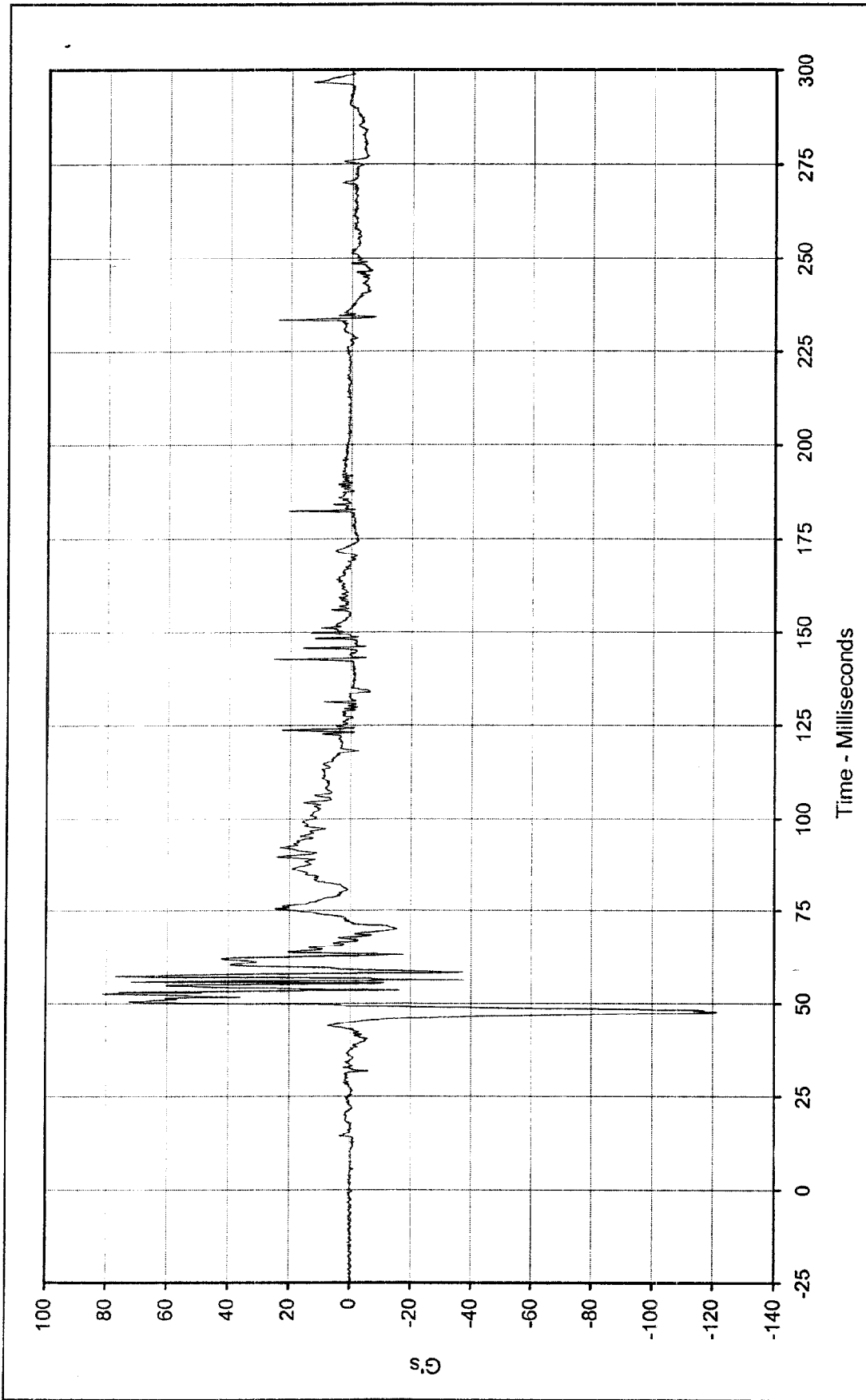




Curve Description: Driver Left Foot Aft Z
 Maximum Value: 22.1 at 89.4 Milliseconds
 Minimum Value: -31.5 at 48.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-036

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Driver Left Foot Fore Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 81.5 at 52.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

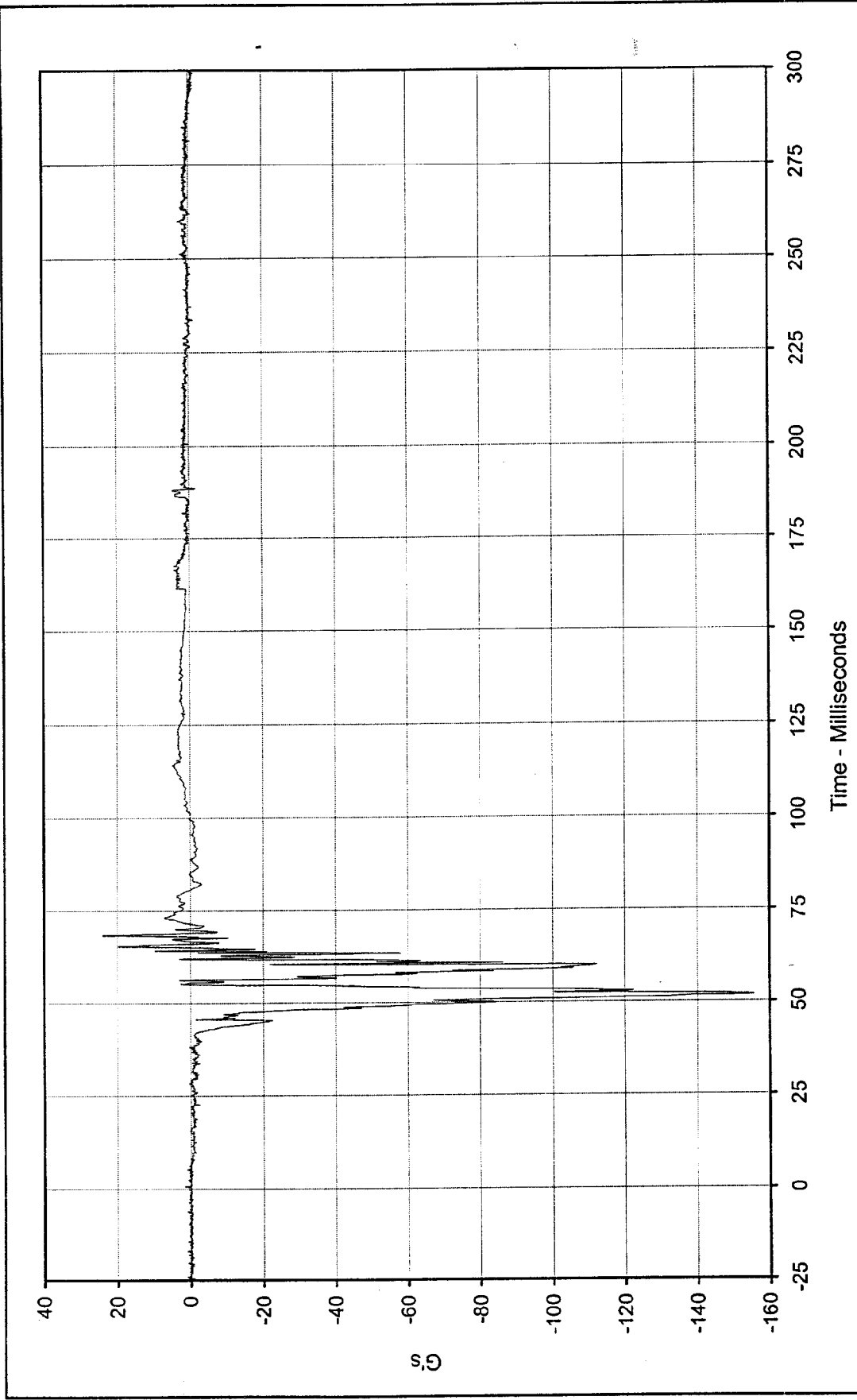
Minimum Value: -121.5 at 47.6 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

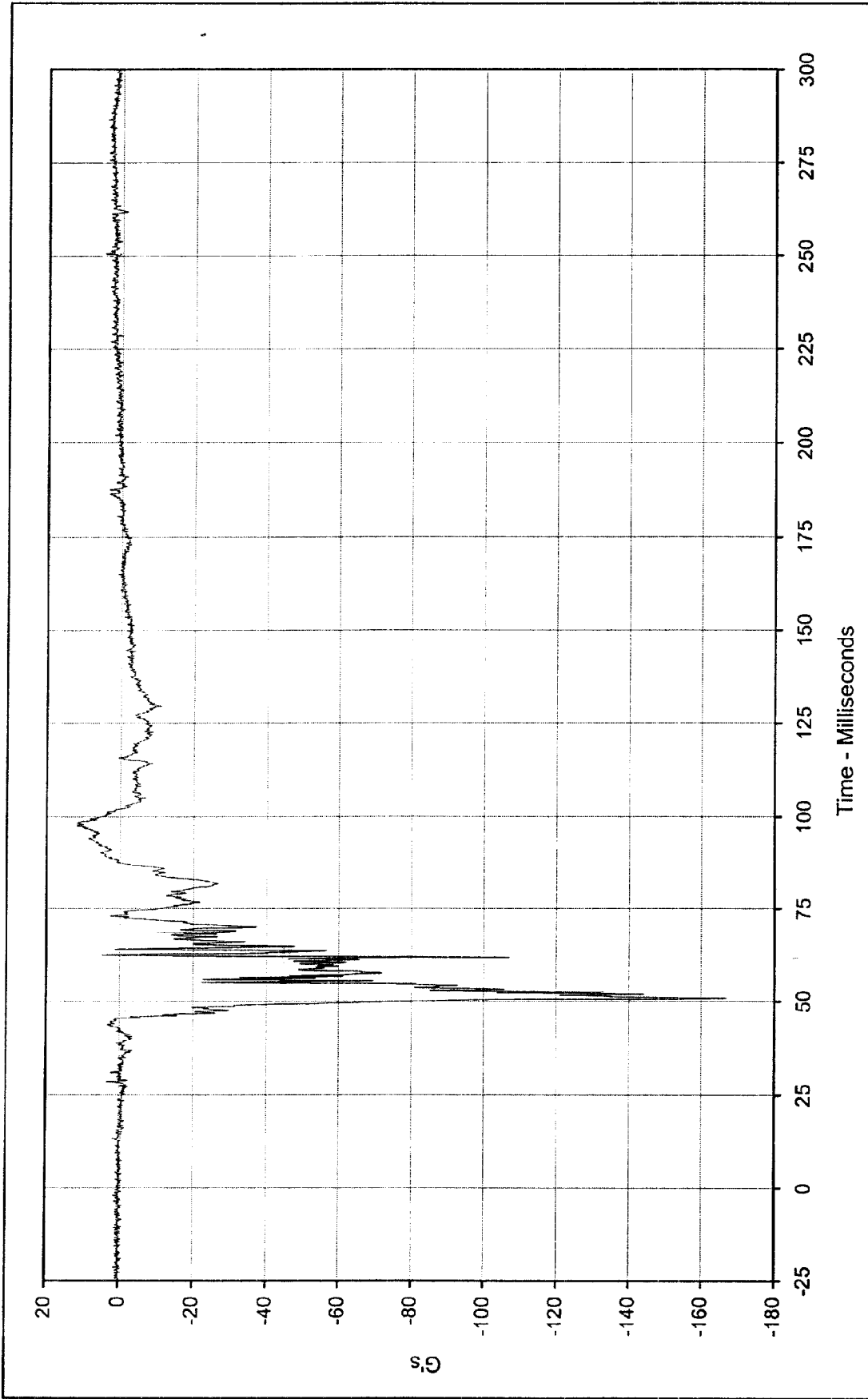
Curve Number: FIL-037





Curve Description: Driver Right Foot Aft X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 23.9 at 68.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -155.7 at 51.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-038

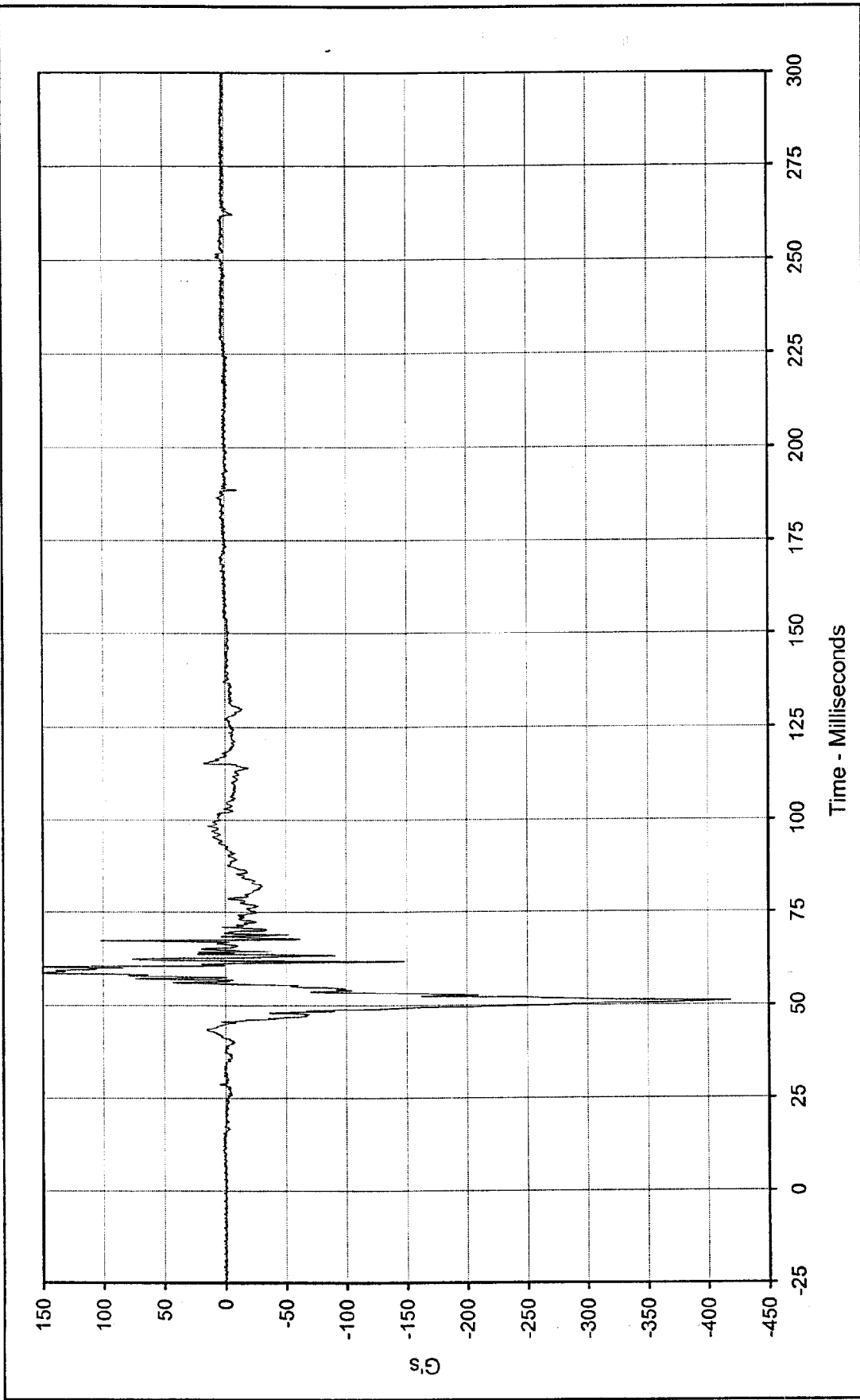




Curve Description: Driver Right Foot Aft Z
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 11.7 at 97.6 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -167.0 at 50.8 Milliseconds

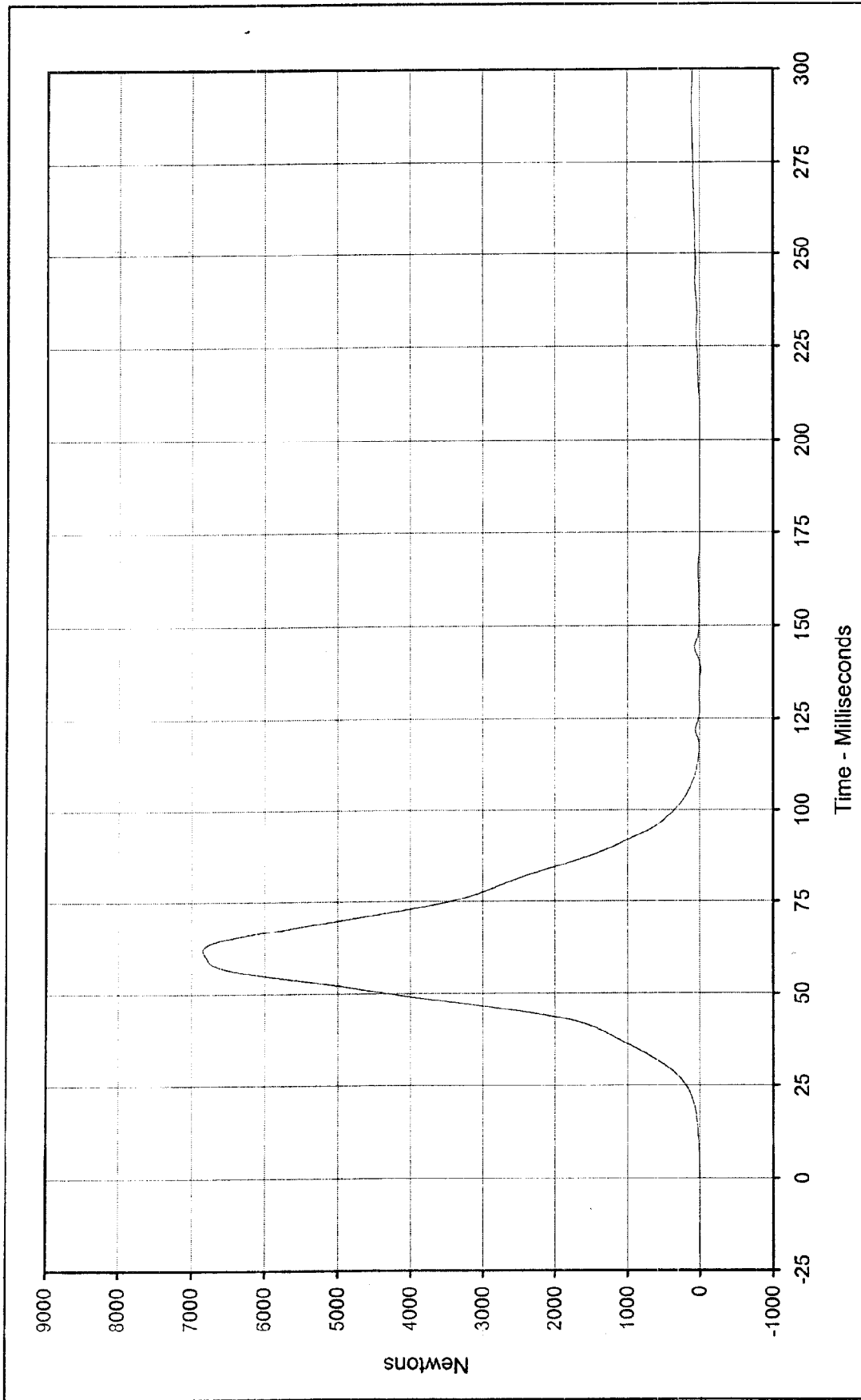


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-039



Curve Description: Driver Right Foot Fore Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 168.5 at 58.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -418.9 at 51.1 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-040

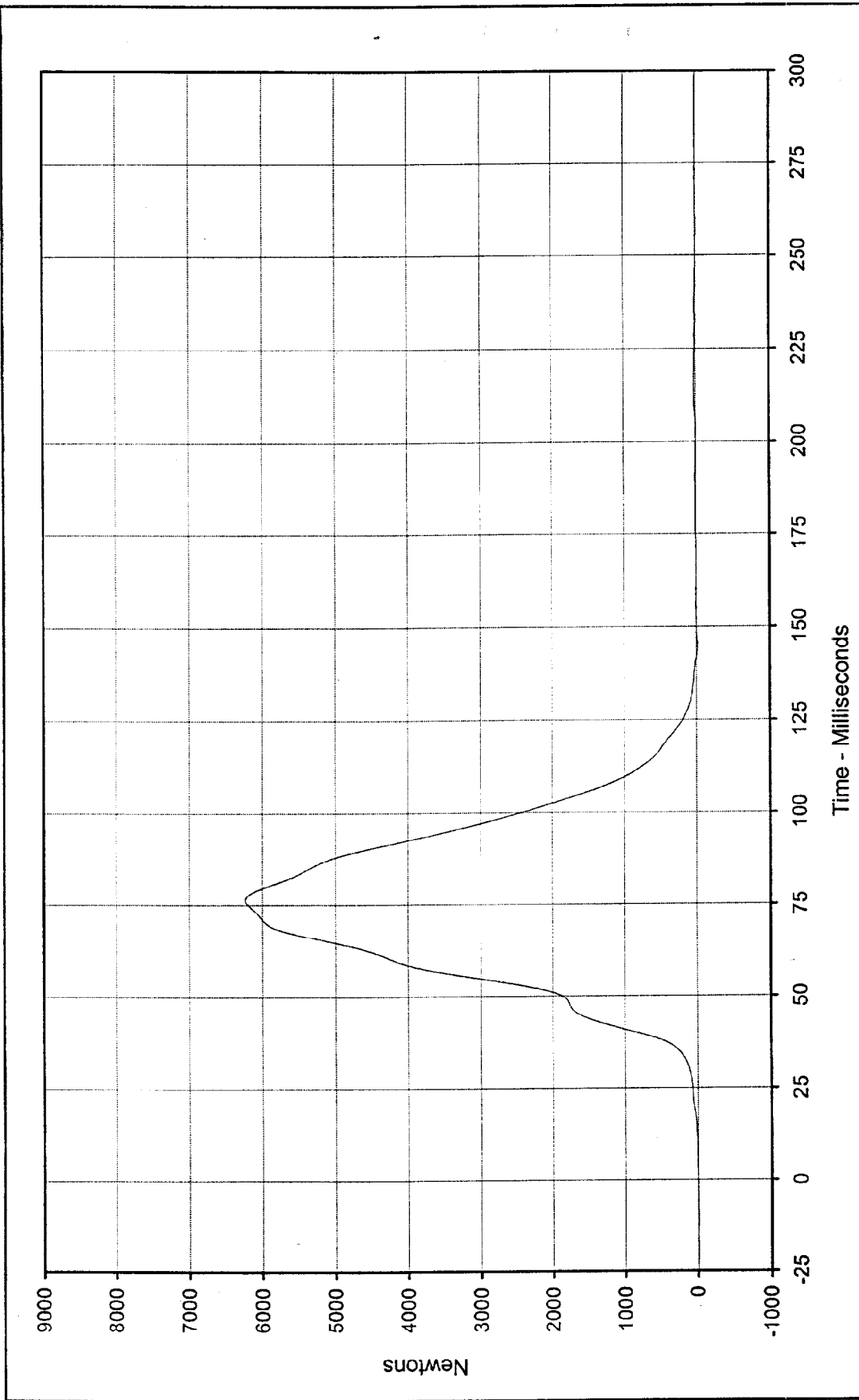




Curve Description: Driver Lap Belt Force
 Maximum Value: 6846.9 at 61.8 Milliseconds
 Minimum Value: -14.2 at 138.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-041

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

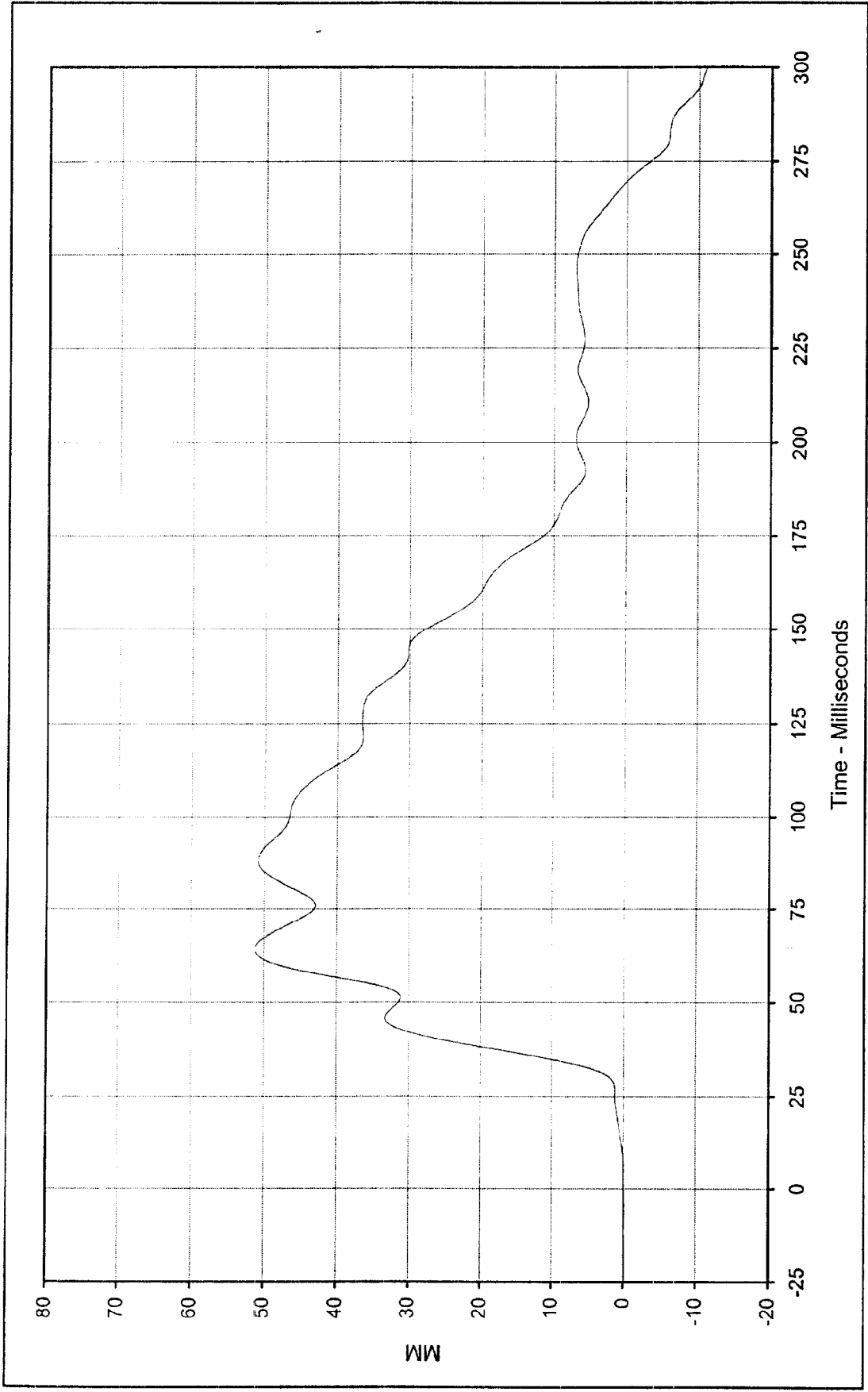




Curve Description: Driver Shoulder Belt Force Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 6232.5 at 76.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -20.2 at 144.6 Milliseconds



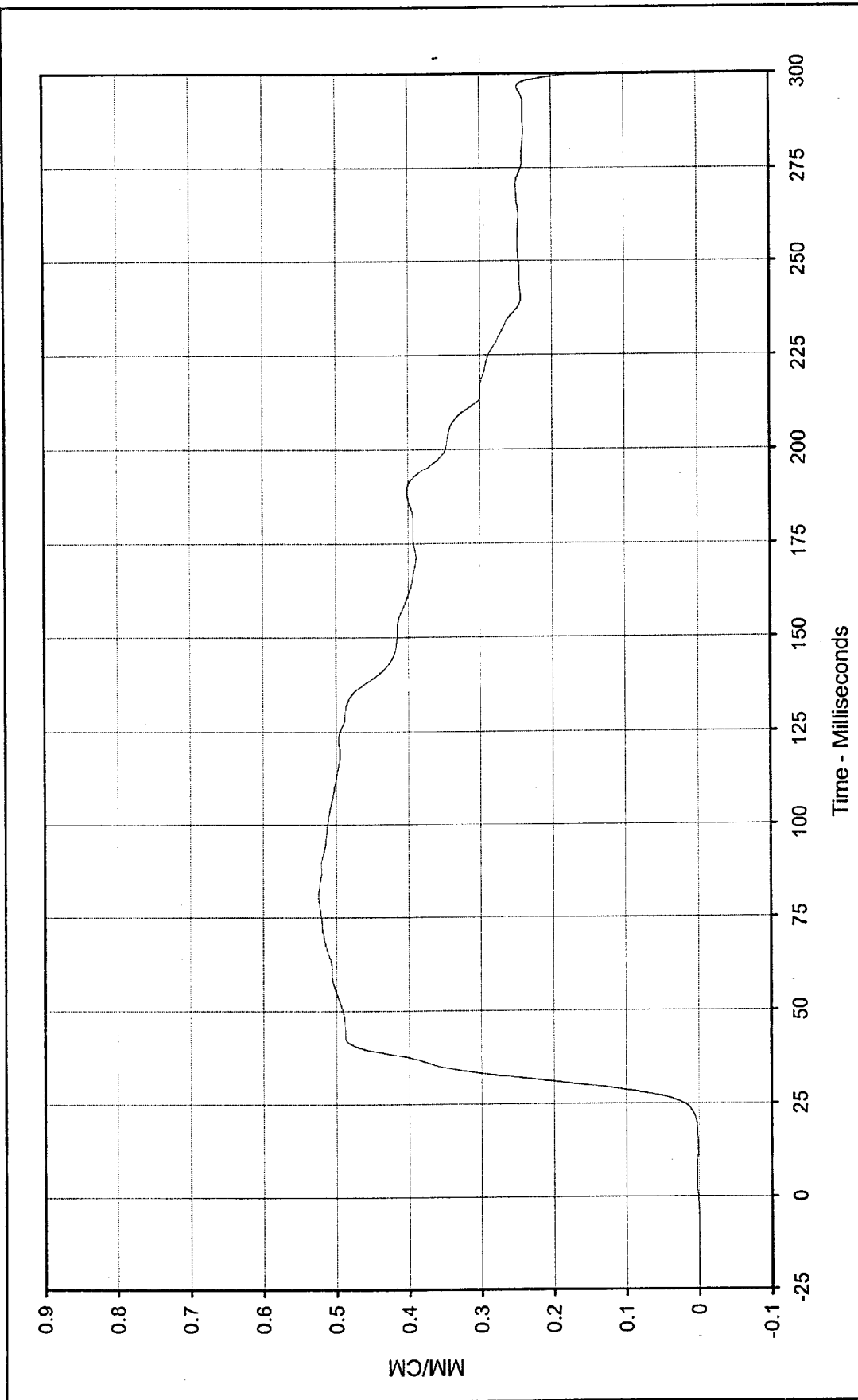
SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-042



Curve Description: Driver Shoulder Belt Pullout
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 51.3 at 64.1 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -11.1 at 299.9 Milliseconds



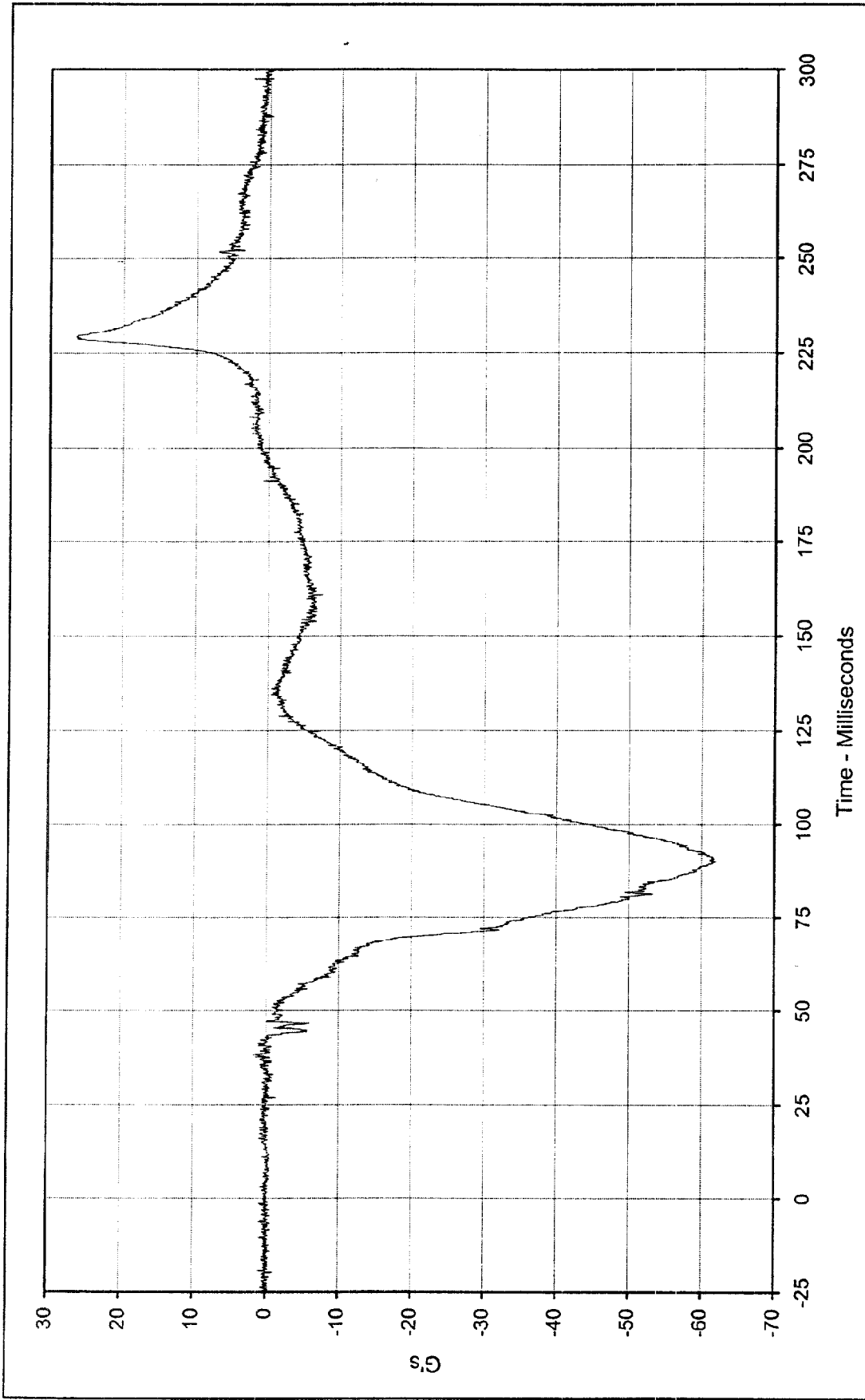
SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-043



Curve Description: Driver Shoulder Belt Elongation
 Maximum Value: 0.52 at 80.8 Milliseconds
 Minimum Value: 0.00 at 13.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-044

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Passenger Head Primary X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 26.5 at 229.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

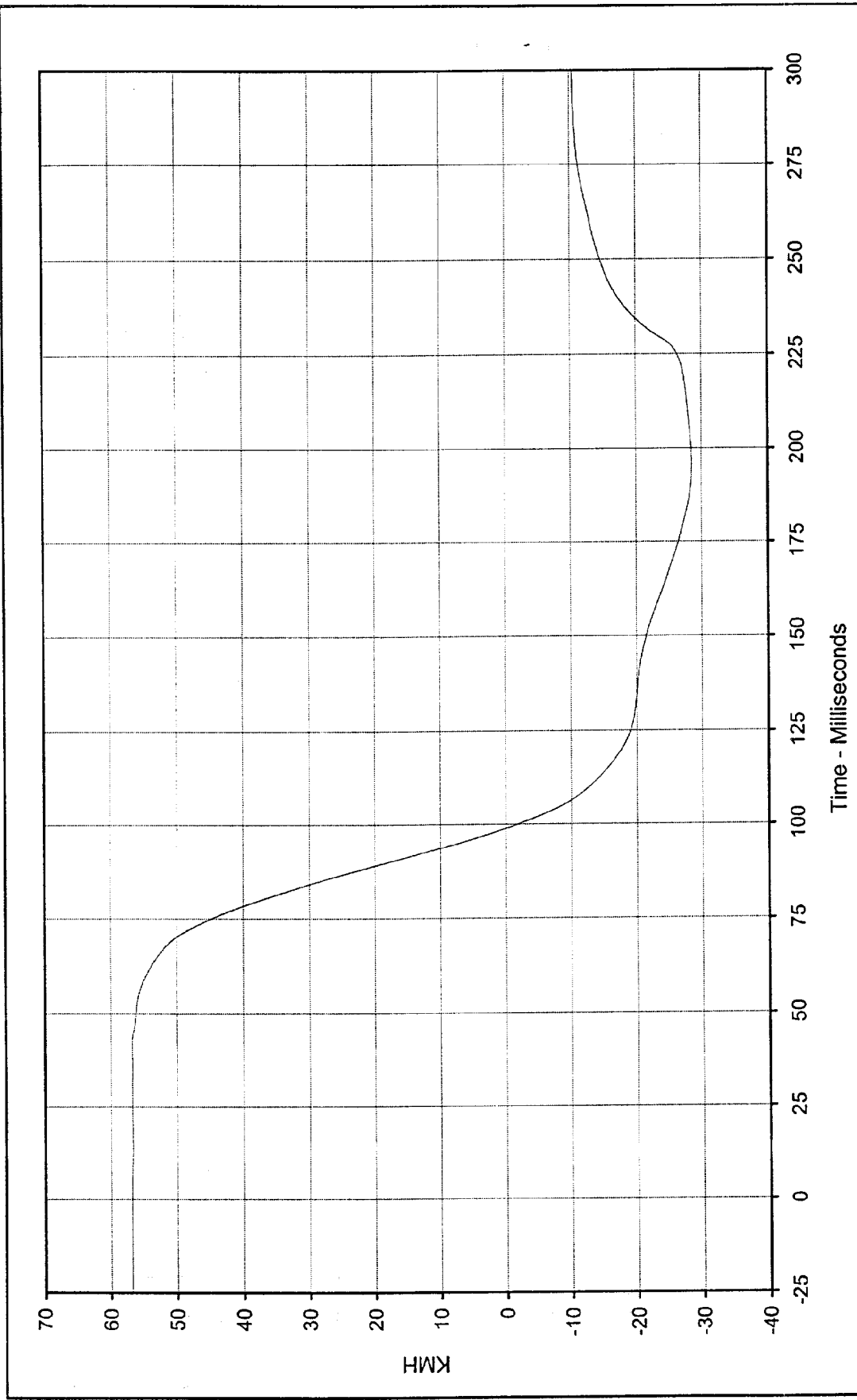
Minimum Value: -62.0 at 89.9 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

Curve Number: FIL-045





Curve Description: Passenger Head Primary X Velocity

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 56.8 at 4.1 Milliseconds

Test Vehicle: 1999 Ford Expedition XLT SUV

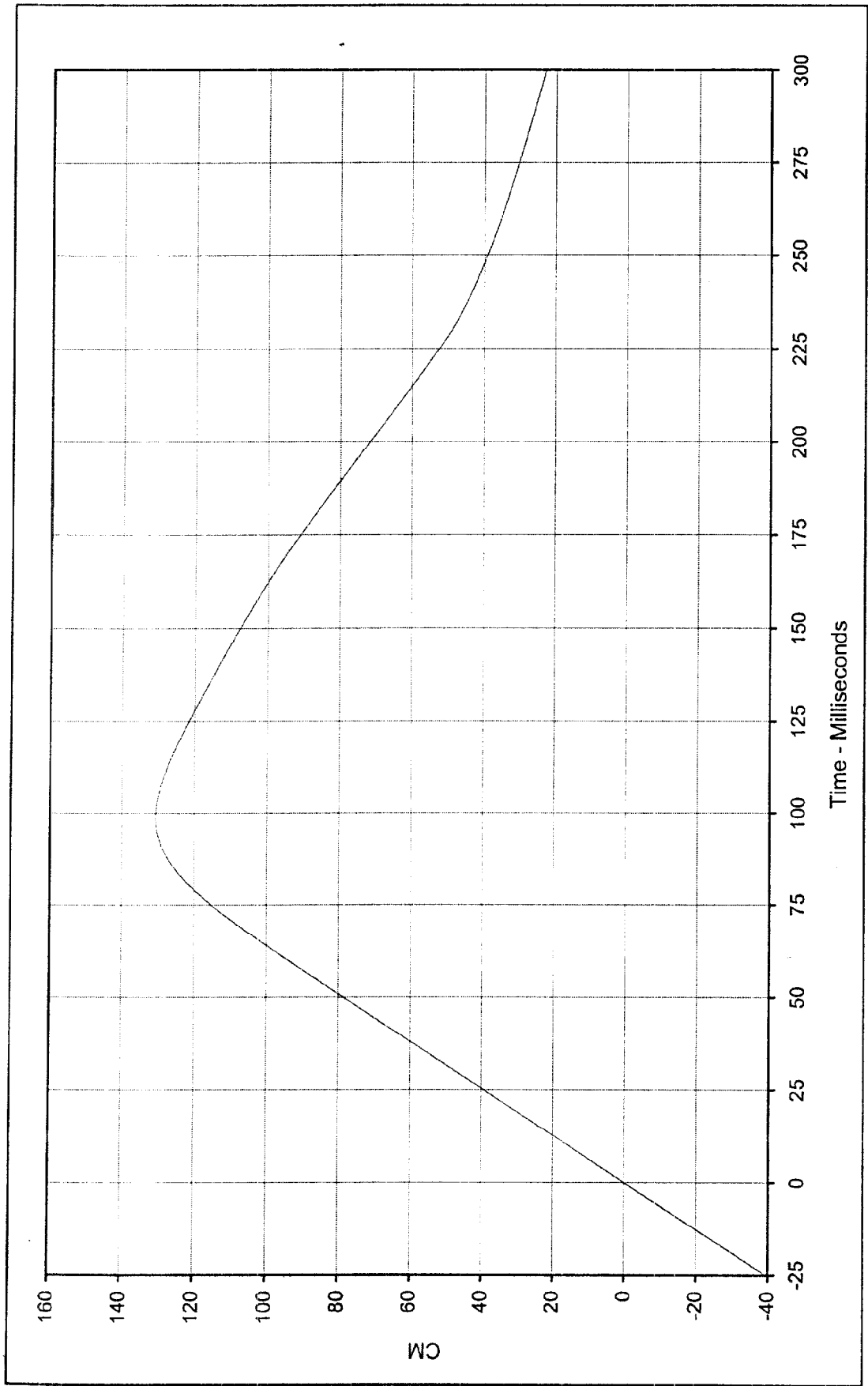
Minimum Value: -28.5 at 195.7 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN1-045





Curve Description: Passenger Head Primary X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 130.7 at 98.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

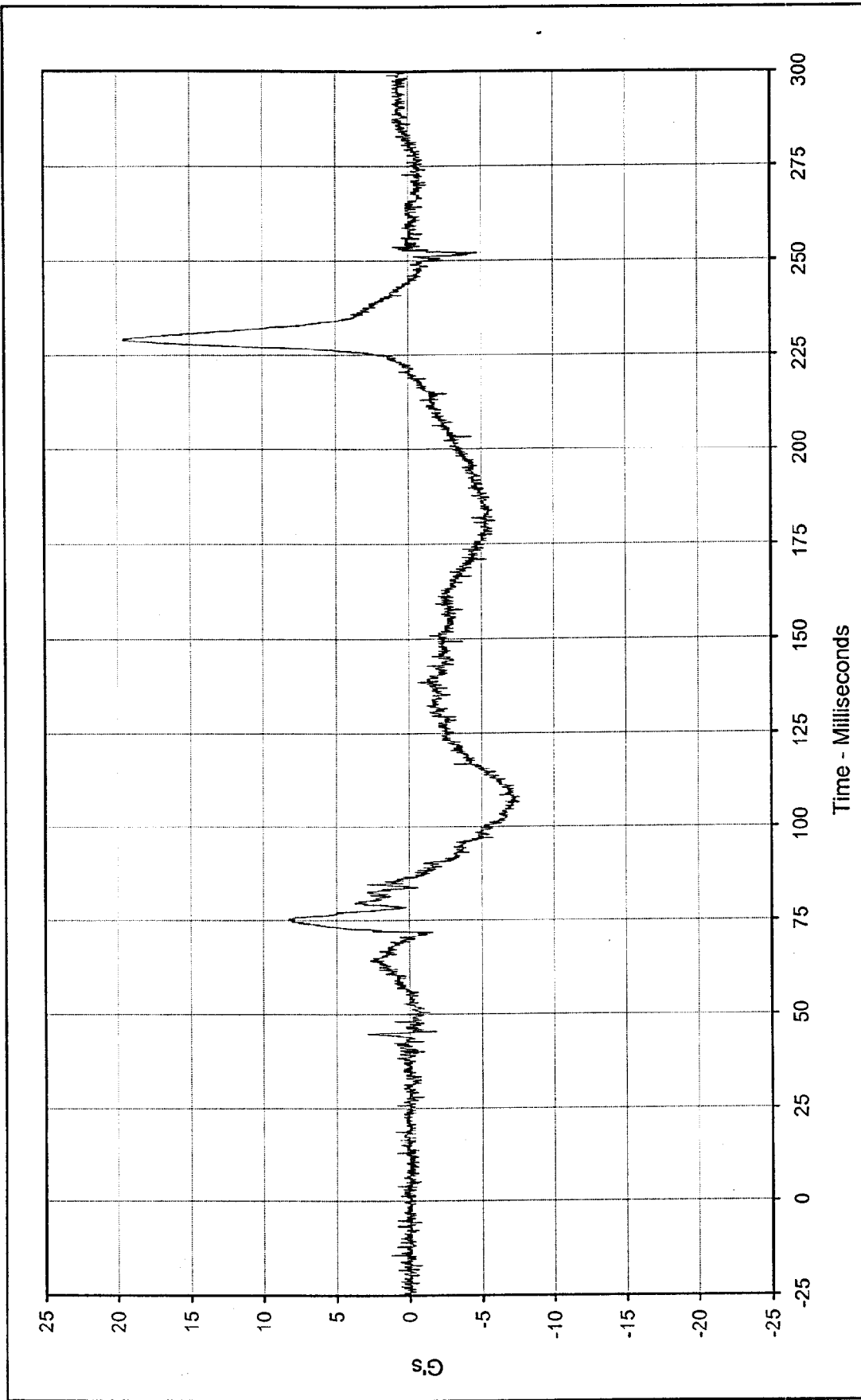
Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN2-045

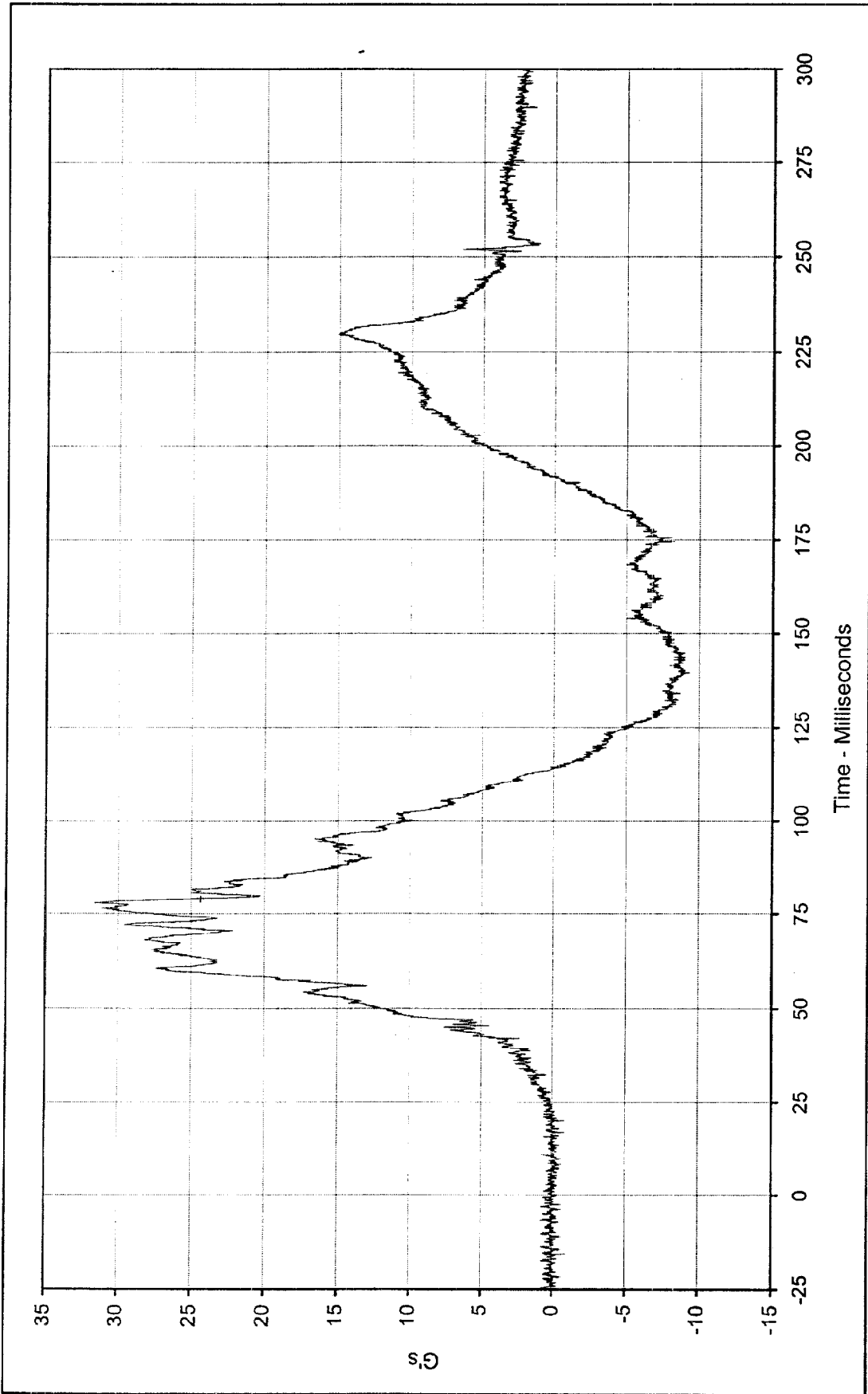




Curve Description: Passenger Head Primary Y
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 19.6 at 229.2 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -7.6 at 106.3 Milliseconds

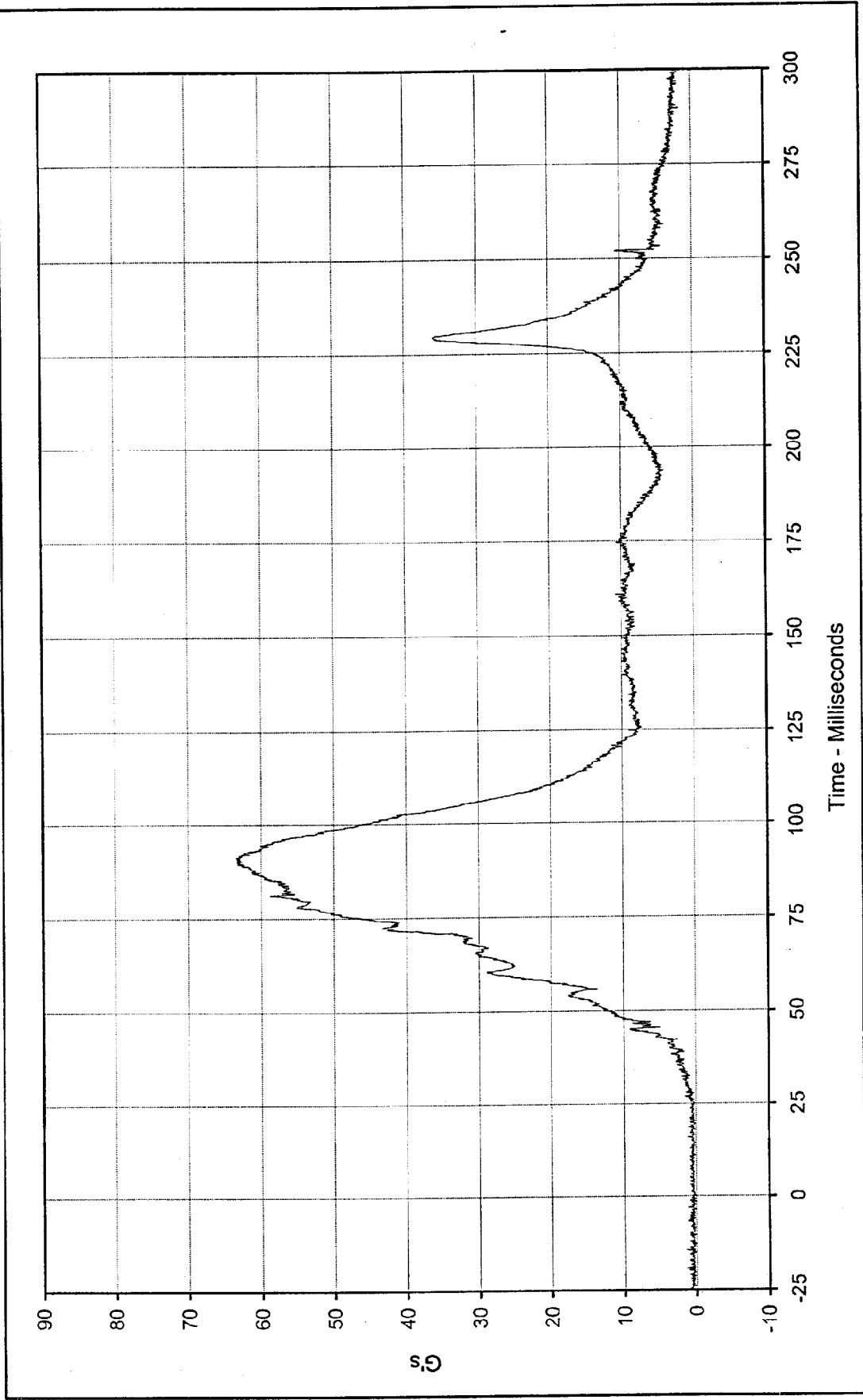


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-046



Curve Description: Passenger Head Primary Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 31.6 at 77.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -9.4 at 139.5 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-047

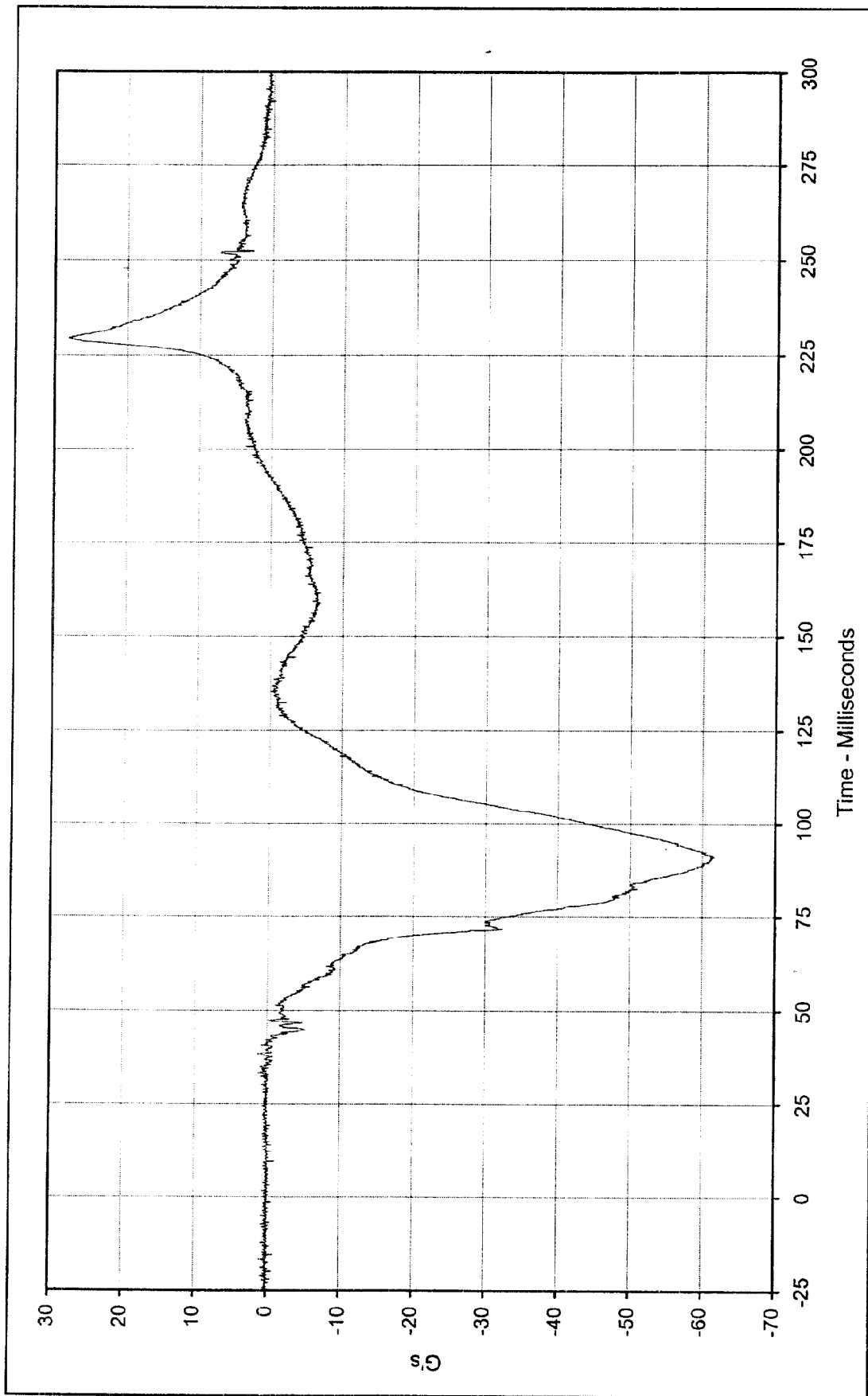




Curve Description: Passenger Head Resultant Primary Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 63.4 at 91.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.1 at 0.2 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-045





Curve Description: Passenger Head Redundant X

Maximum Value: 28.0 at 229.6 Milliseconds

Minimum Value: -61.7 at 91.0 Milliseconds

SAE Filter Class: 1000

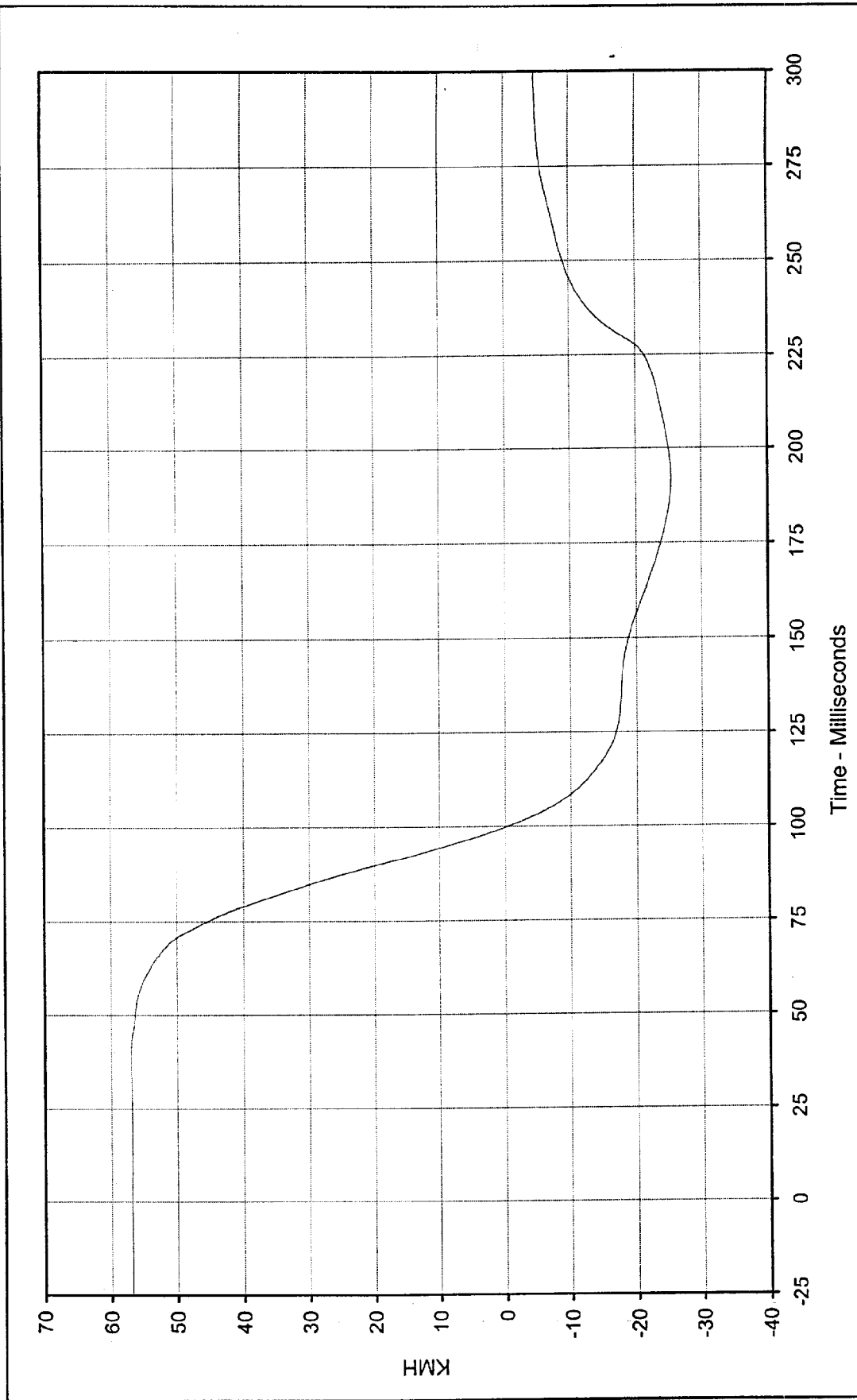
Date of Test: 1/26/99

Curve Number: FIL-048

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Passenger Head Redundant X Velocity

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 57.0 at 35.5 Milliseconds

Test Vehicle: 1999 Ford Expedition XLT SUV

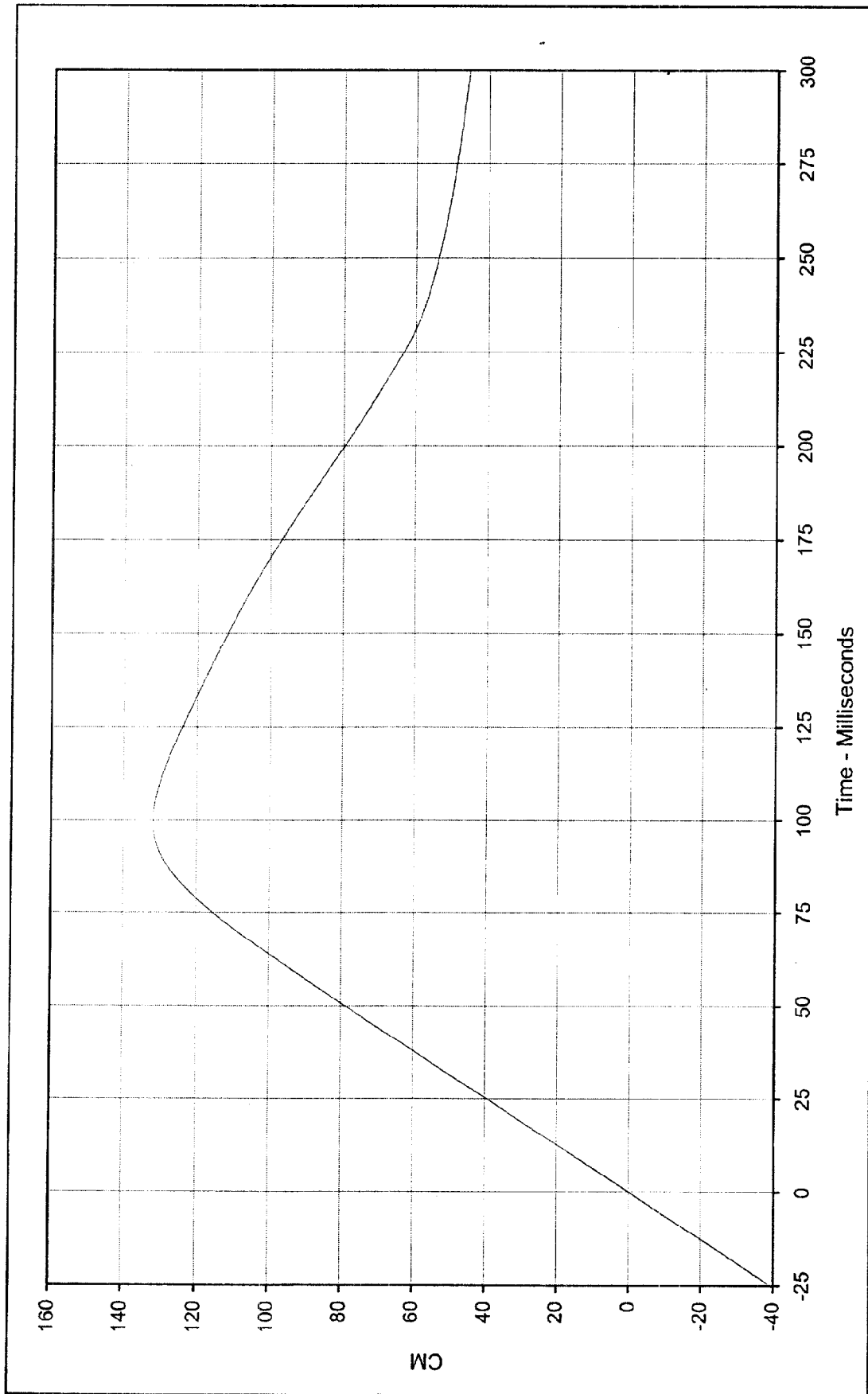
Minimum Value: -25.4 at 191.9 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN1-048





Curve Description: Passenger Head Redundant X Displ.

Maximum Value: 131.9 at 99.8 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

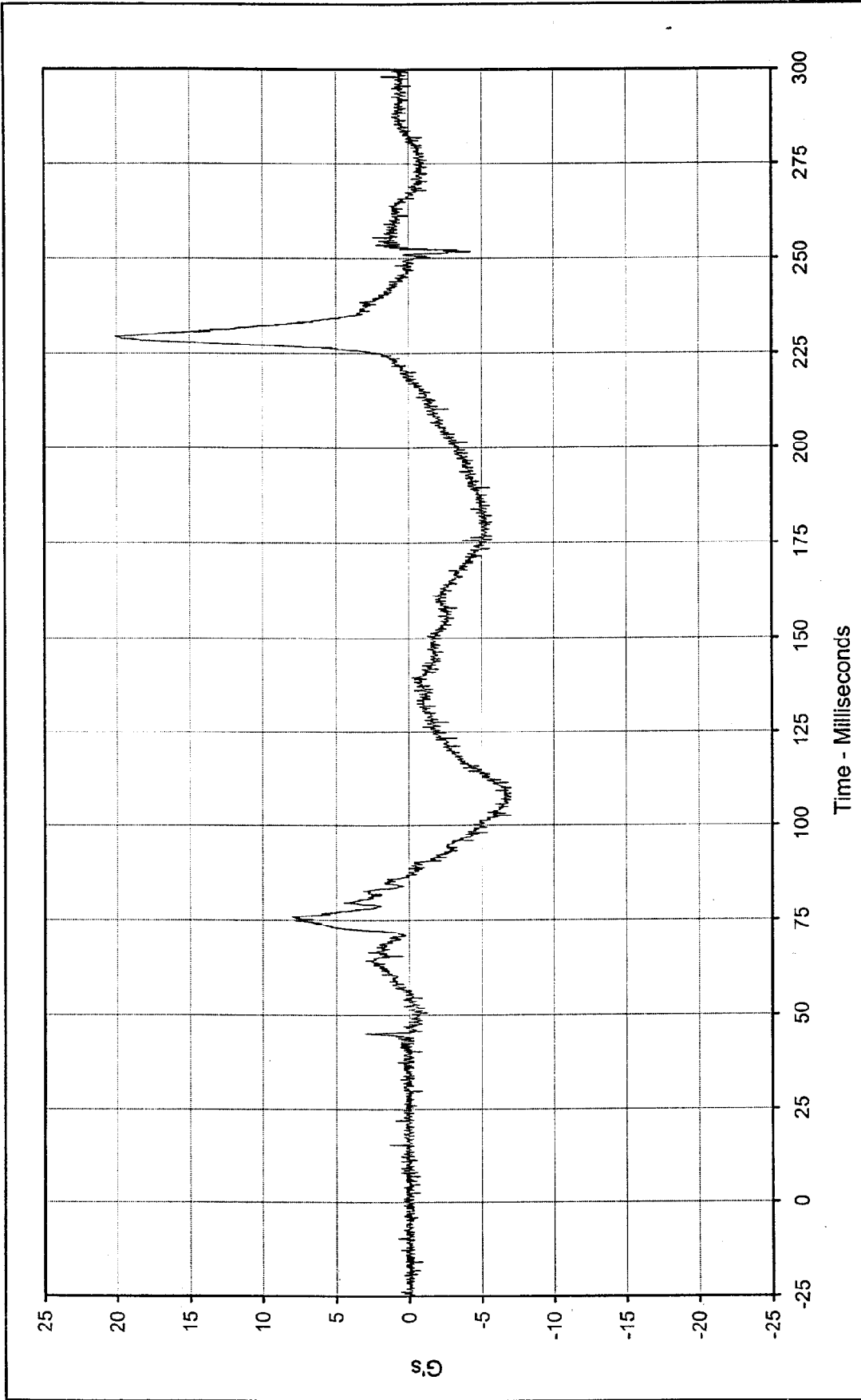
Date of Test: 1/26/99

Curve Number: IN2-048

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Passenger Head Redundant Y

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 20.1 at 229.8 Milliseconds

Test Vehicle: 1999 Ford Expedition XLT SUV

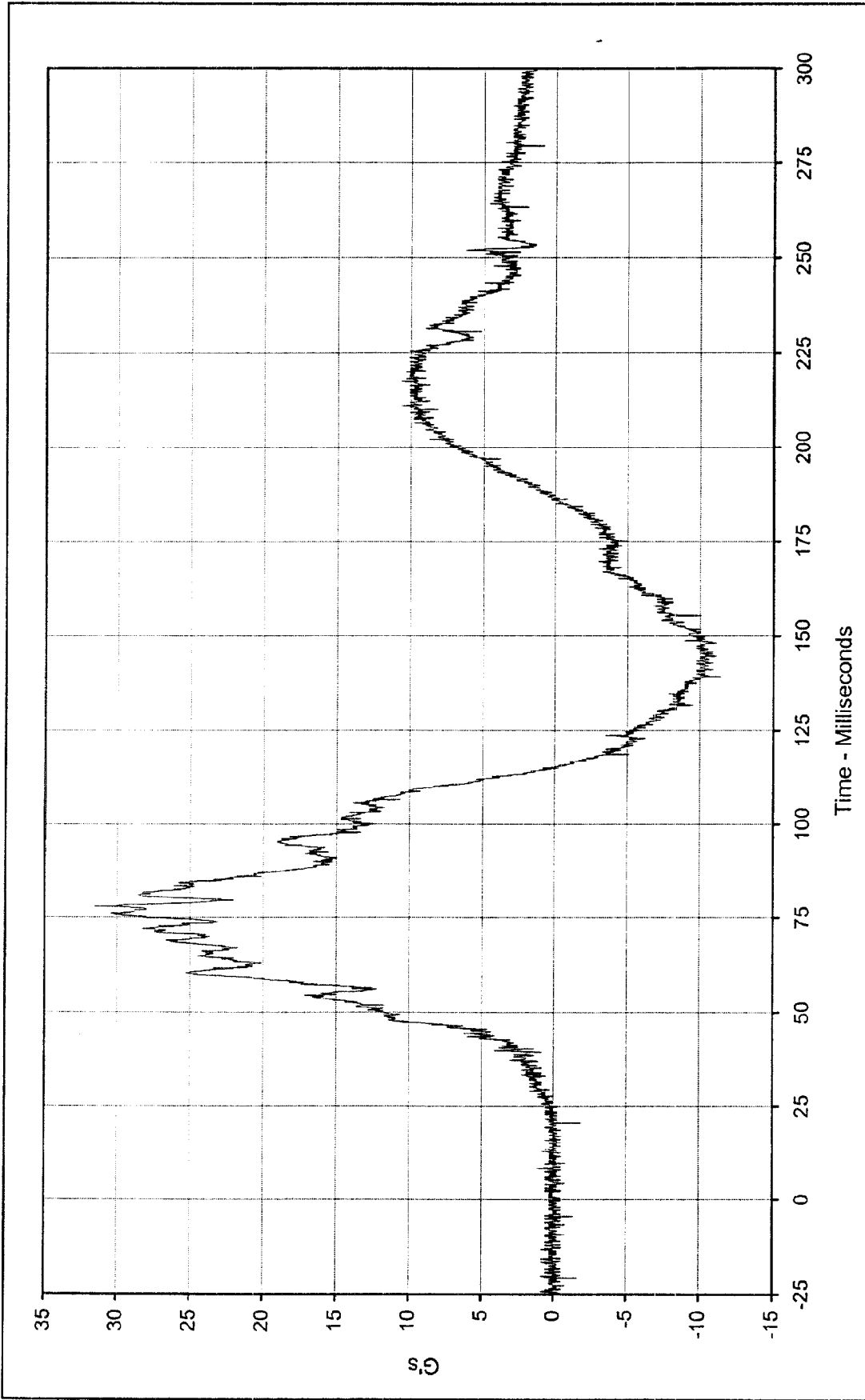
Minimum Value: -7.1 at 102.5 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

Curve Number: FIL-049





Curve Description: Passenger Head Redundant Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 31.5 at 77.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

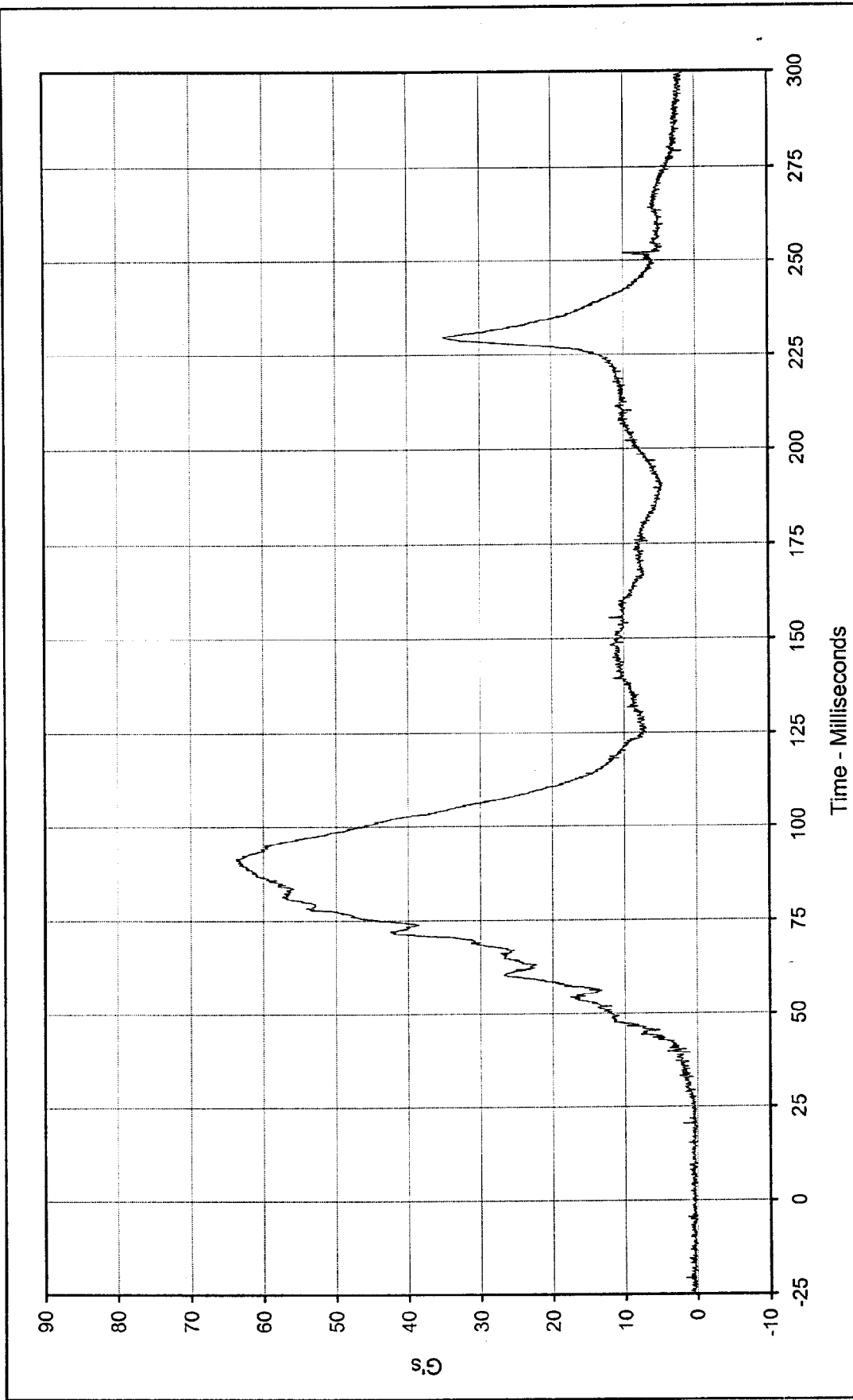
Minimum Value: -11.4 at 139.2 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

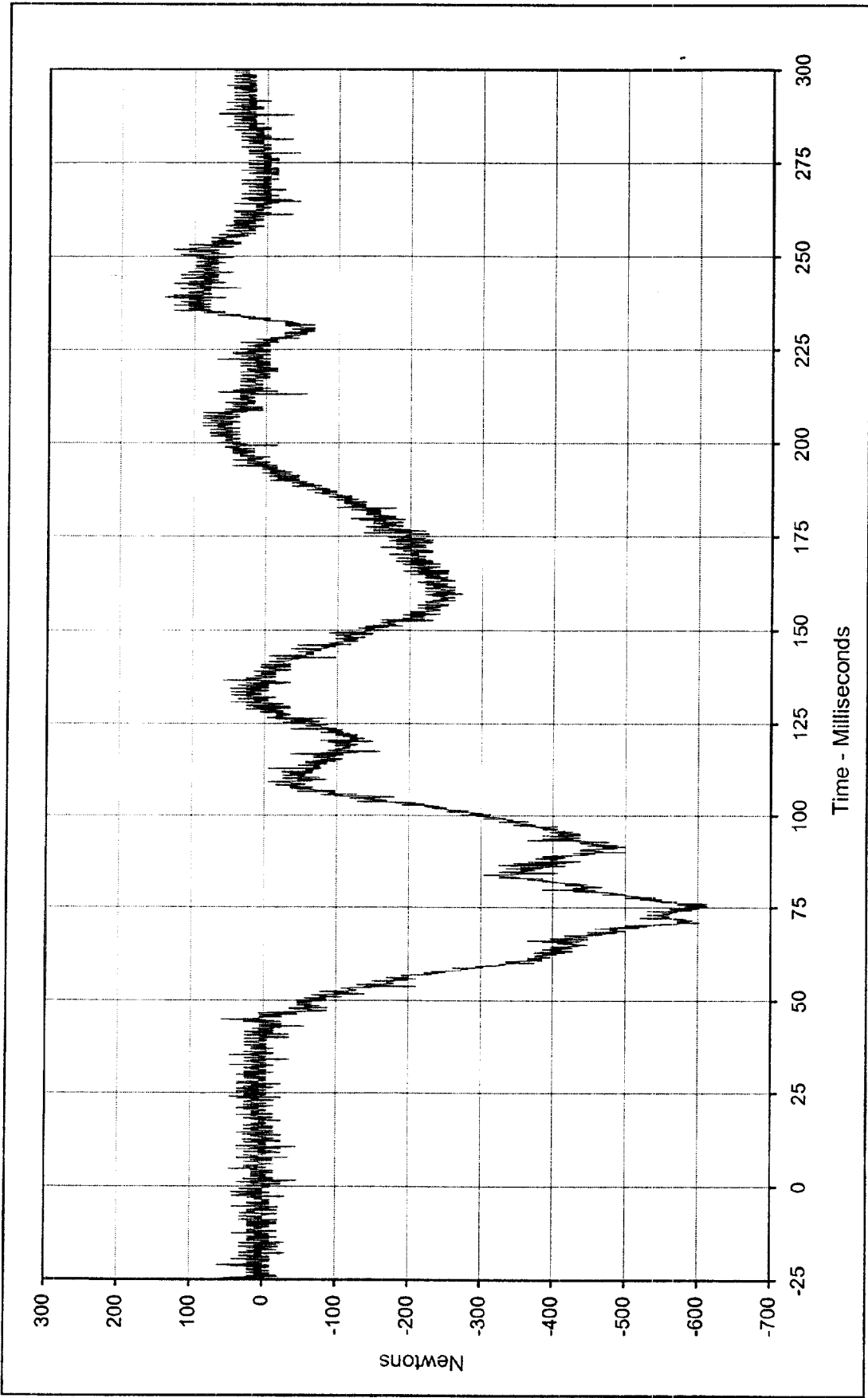
Curve Number: FIL-050





Curve Description: Passenger Head Resultant Redundant Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 63.7 at 91.3 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-048

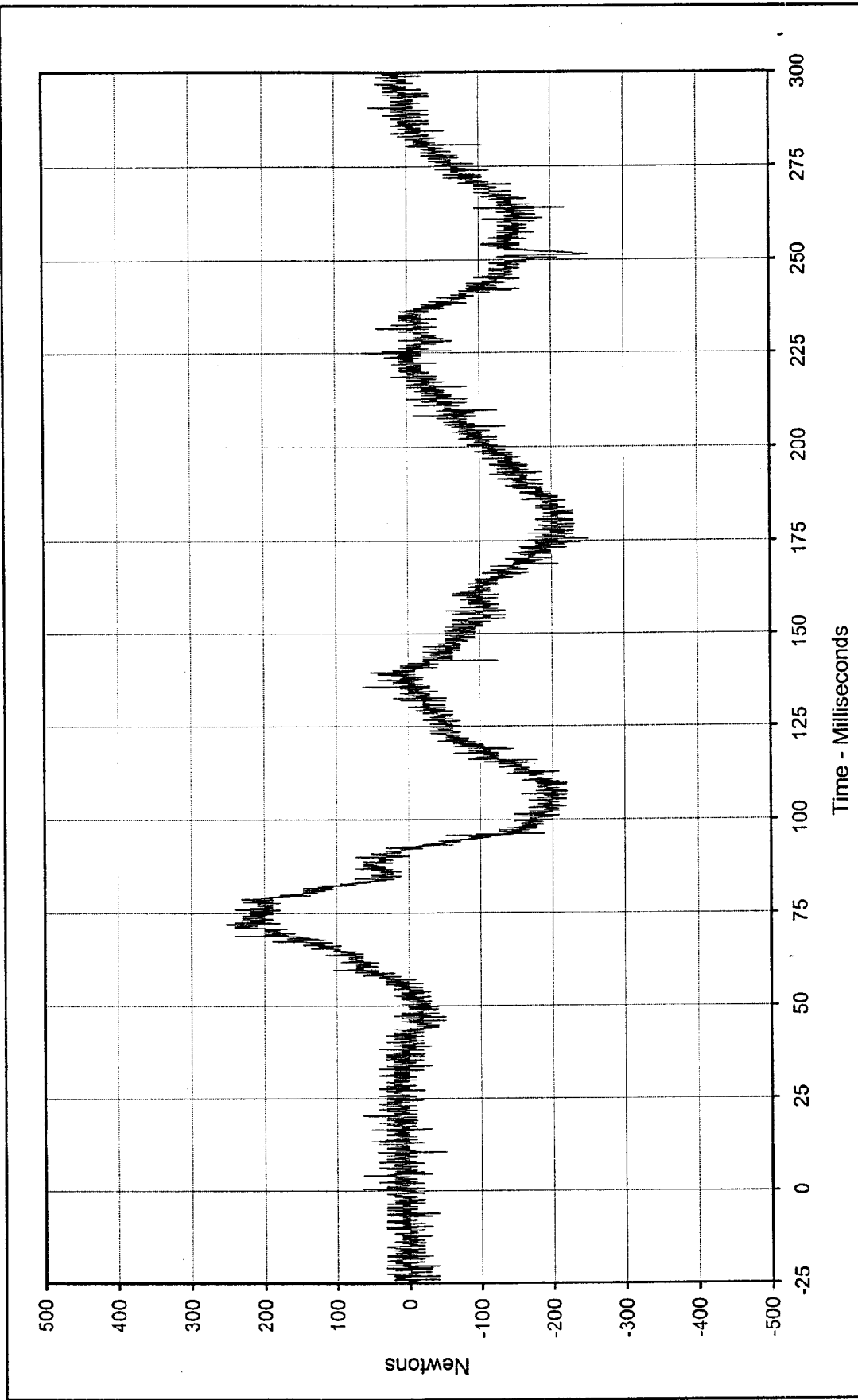




Curve Description: Passenger Neck Force X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 138.9 at 239.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -613.1 at 75.1 Milliseconds

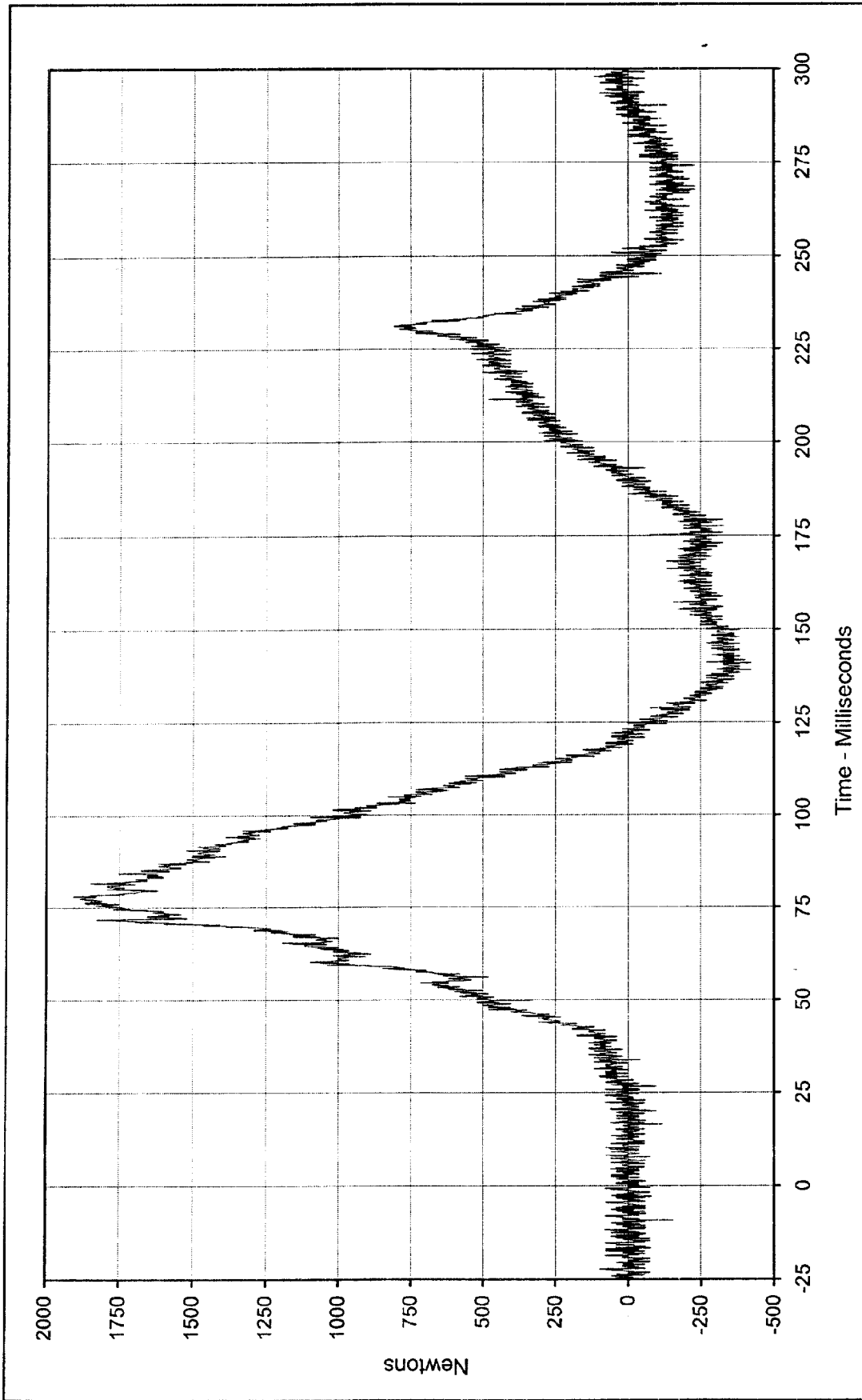


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-051



Curve Description:	Passenger Neck Force Y	Test Program:	1999 NHTSA 35 mph NCAP	No.:	MX0200	
Maximum Value:	252.6	at	72.0	Milliseconds	Test Vehicle:	1999 Ford Expedition XLT SUV
Minimum Value:	-251.2	at	175.6	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	1/26/99					
Curve Number:	FIL-052					

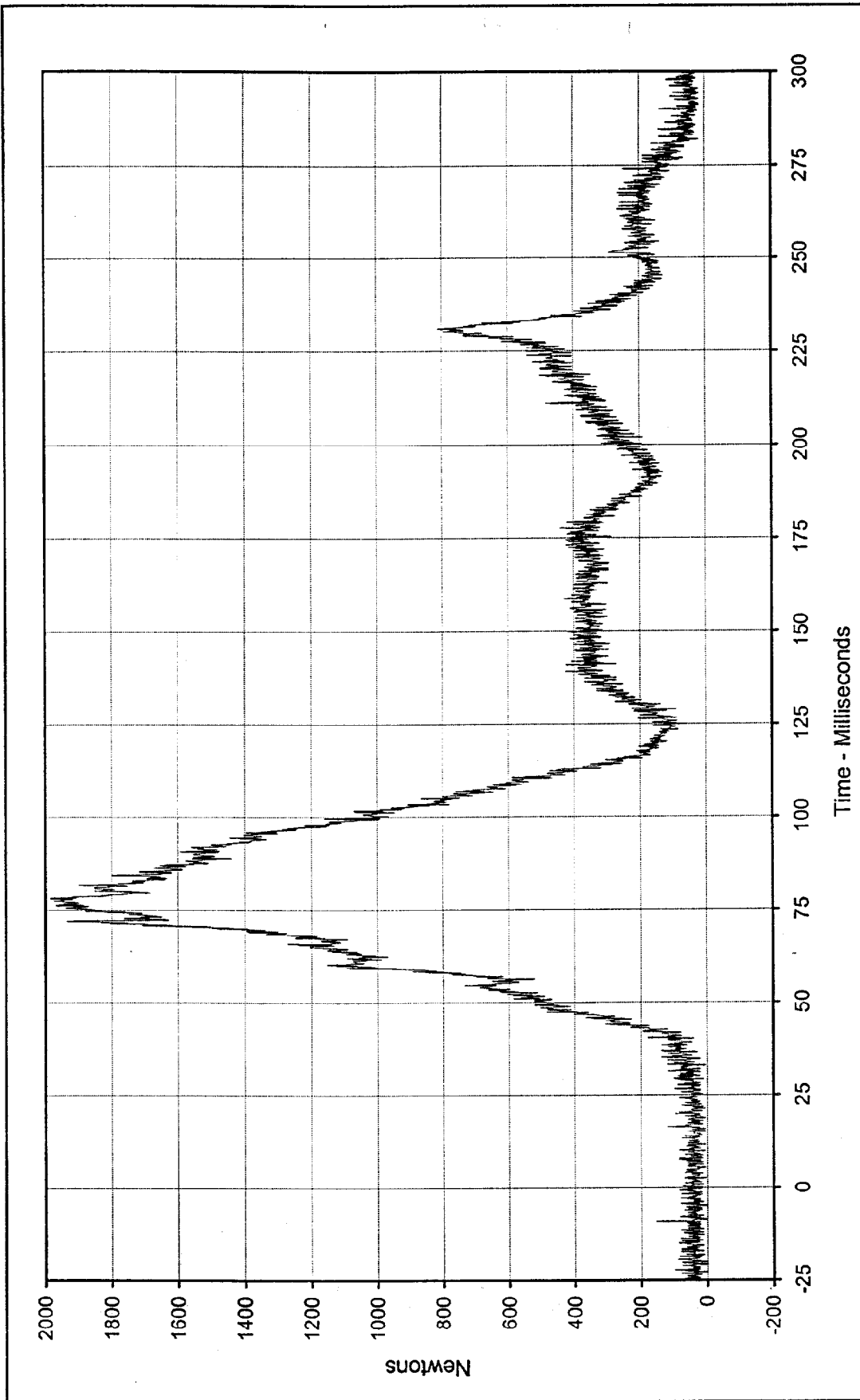




Curve Description: Passenger Neck Force Z
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Maximum Value: 1906.4 at 78.0 Milliseconds
 Minimum Value: -423.6 at 139.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-053

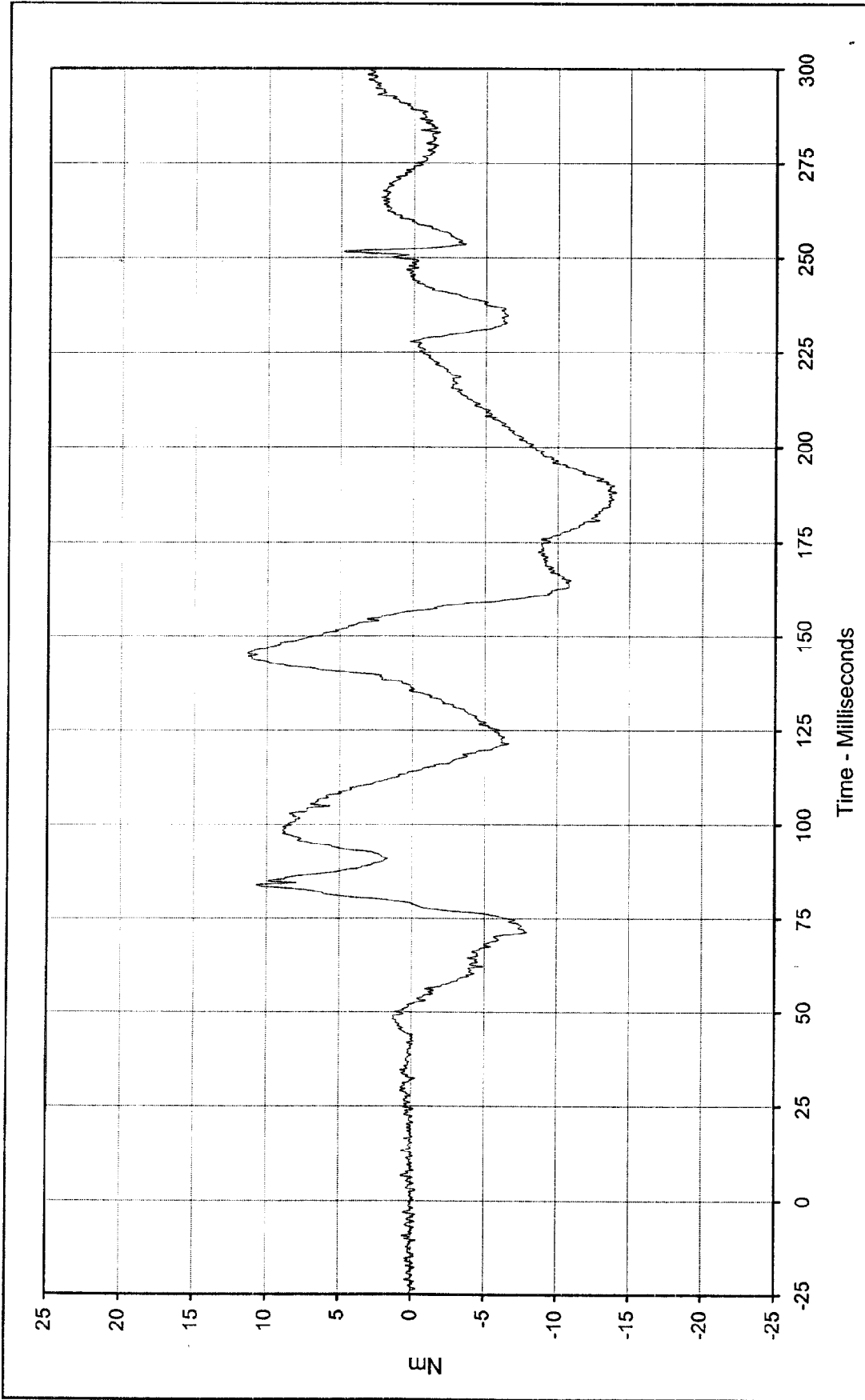




Curve Description: Passenger Neck Force Resultant
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 1986.1 at 78.0 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 5.0 at 2.7 Milliseconds

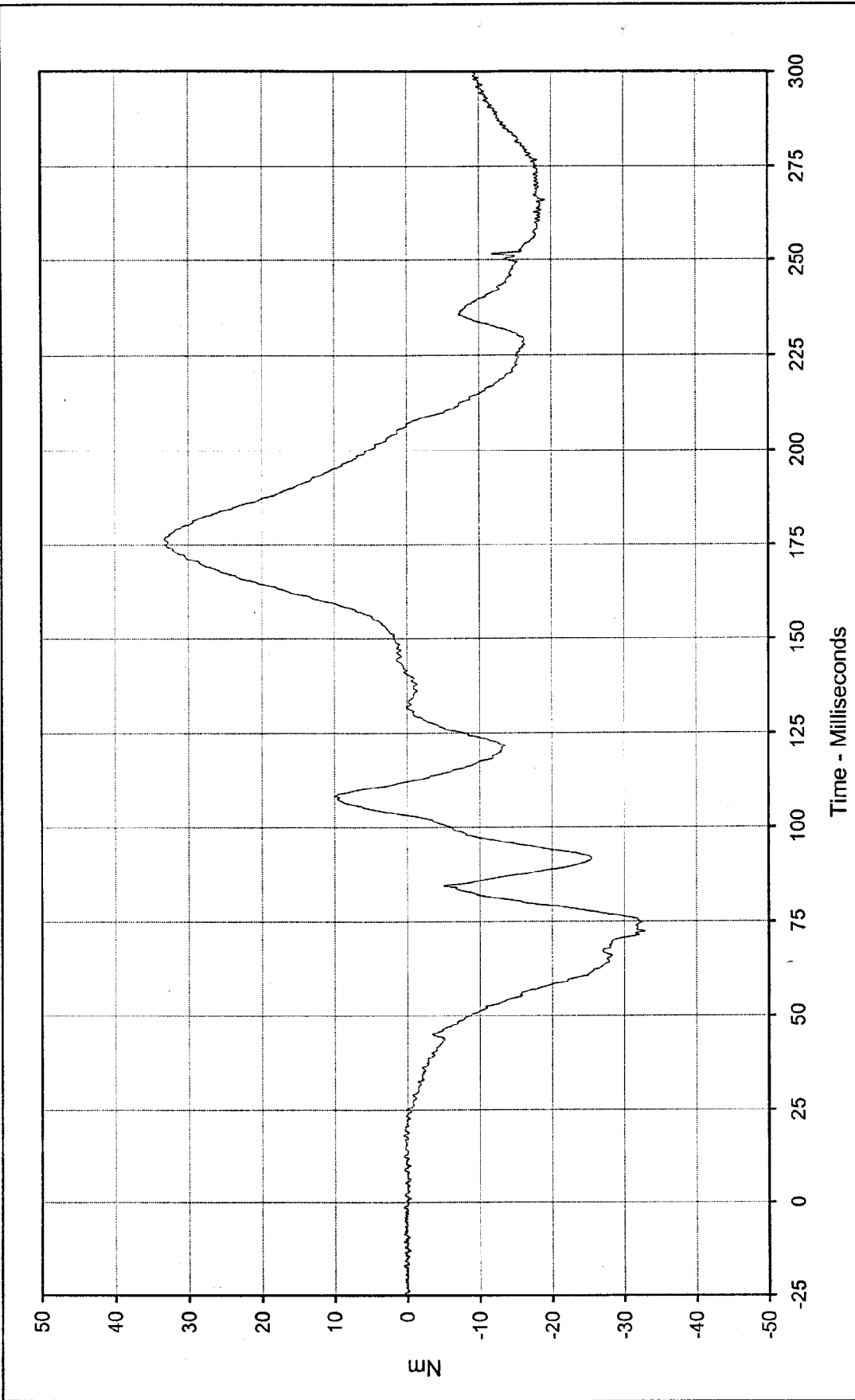


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-051



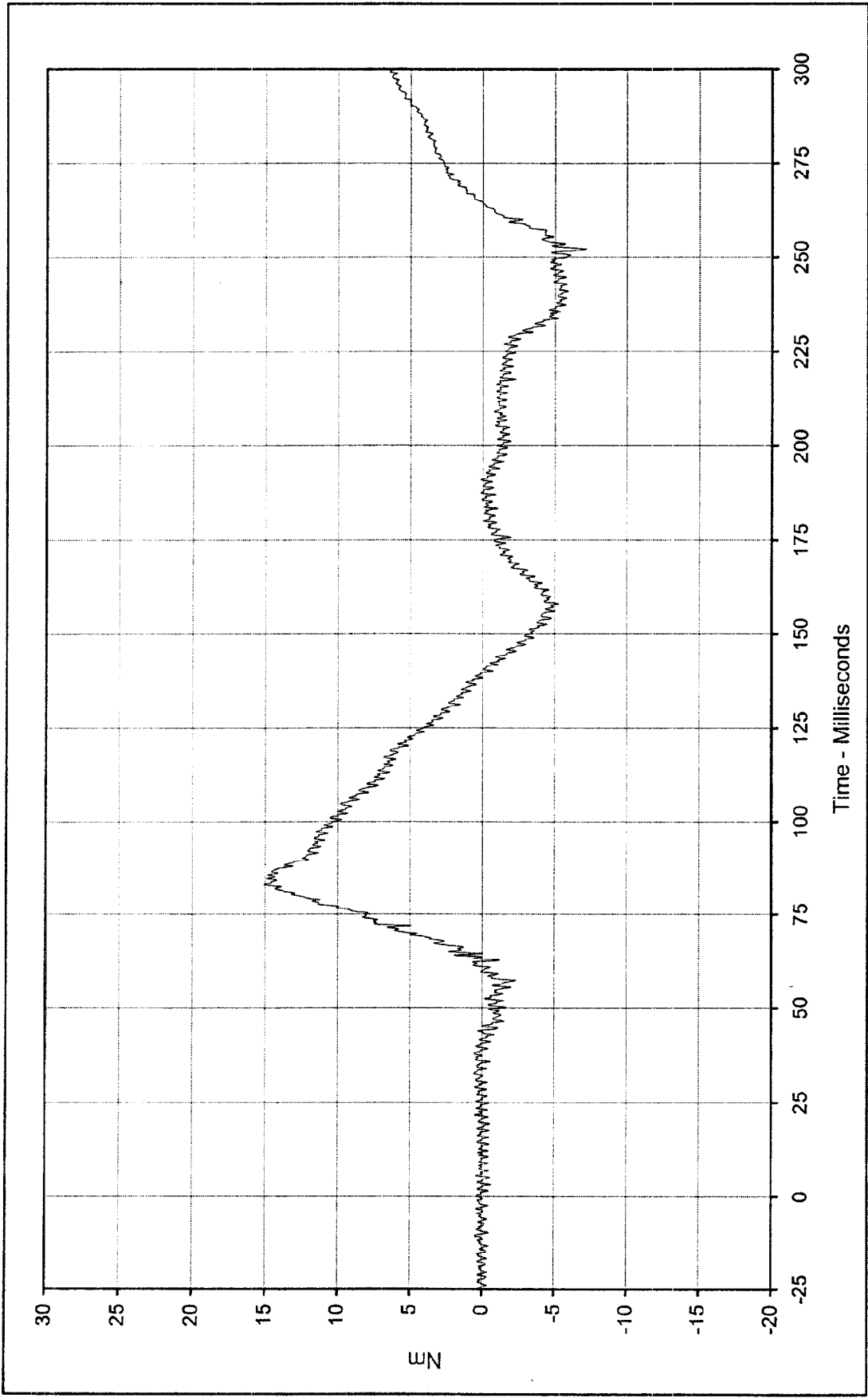
Curve Description: Passenger Neck Moment X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 11.3 at 145.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -14.1 at 188.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-054





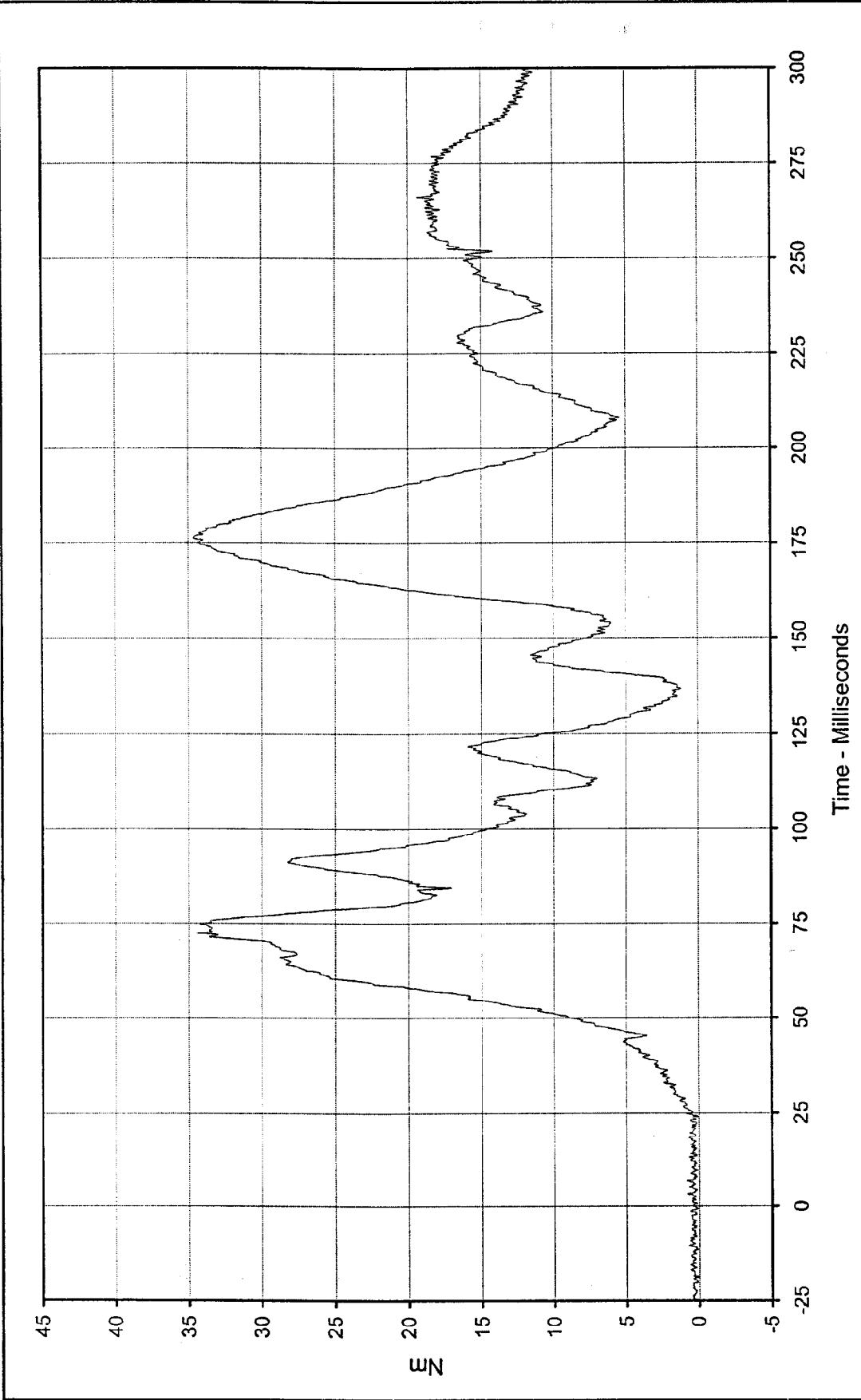
Curve Description: Passenger Neck Moment Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 33.3 at 176.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -32.9 at 72.3 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-055





Curve Description: Passenger Neck Moment Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 15.1 at 83.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -7.2 at 252.2 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-056





Curve Description: Passenger Neck Moment Resultant

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 34.6 at 176.4 Milliseconds

Test Vehicle: 1999 Ford Expedition XLT SUV

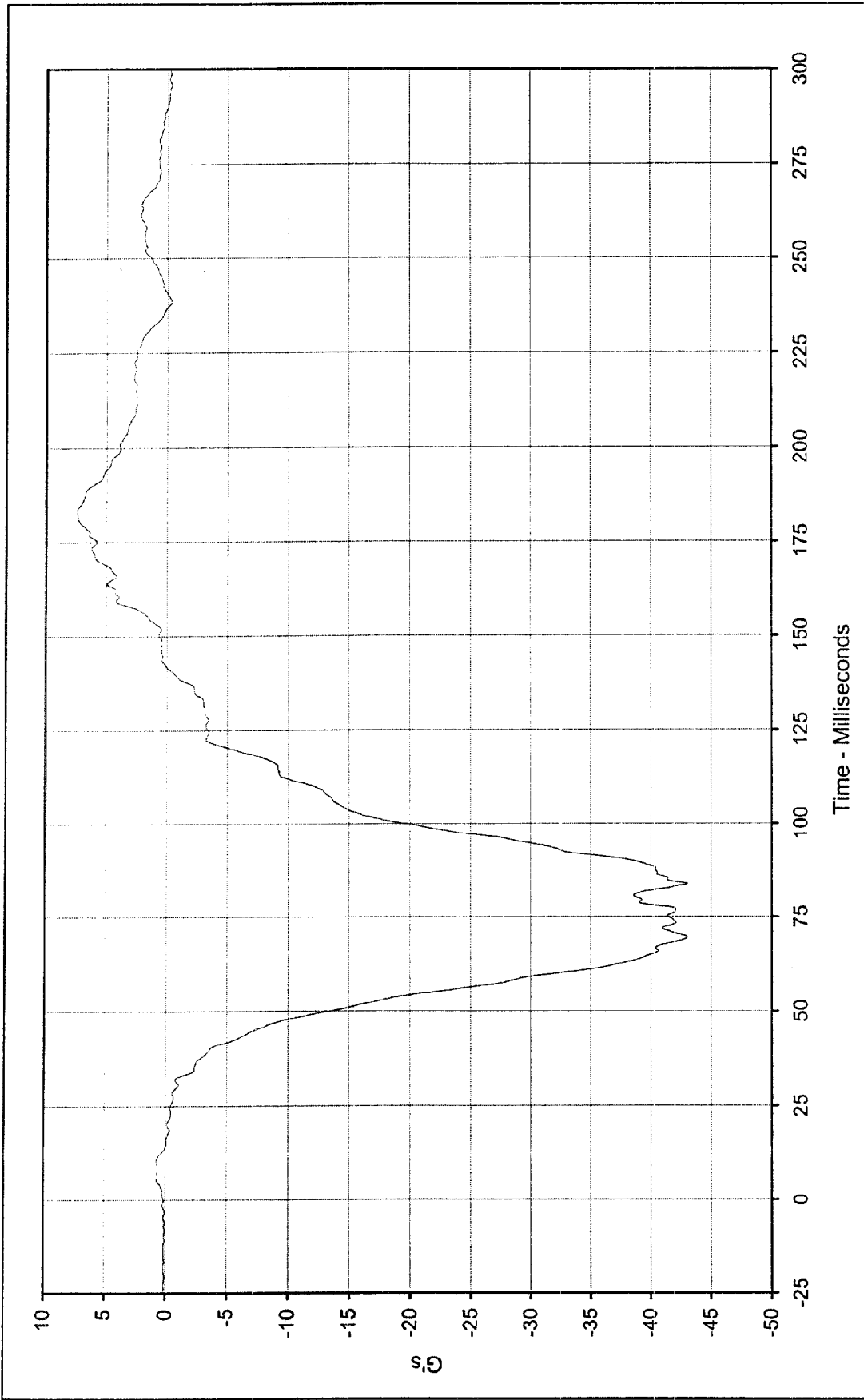
Minimum Value: 0.1 at 24.1 Milliseconds

SAE Filter Class: 600

Date of Test: 1/26/99

Curve Number: RES-054

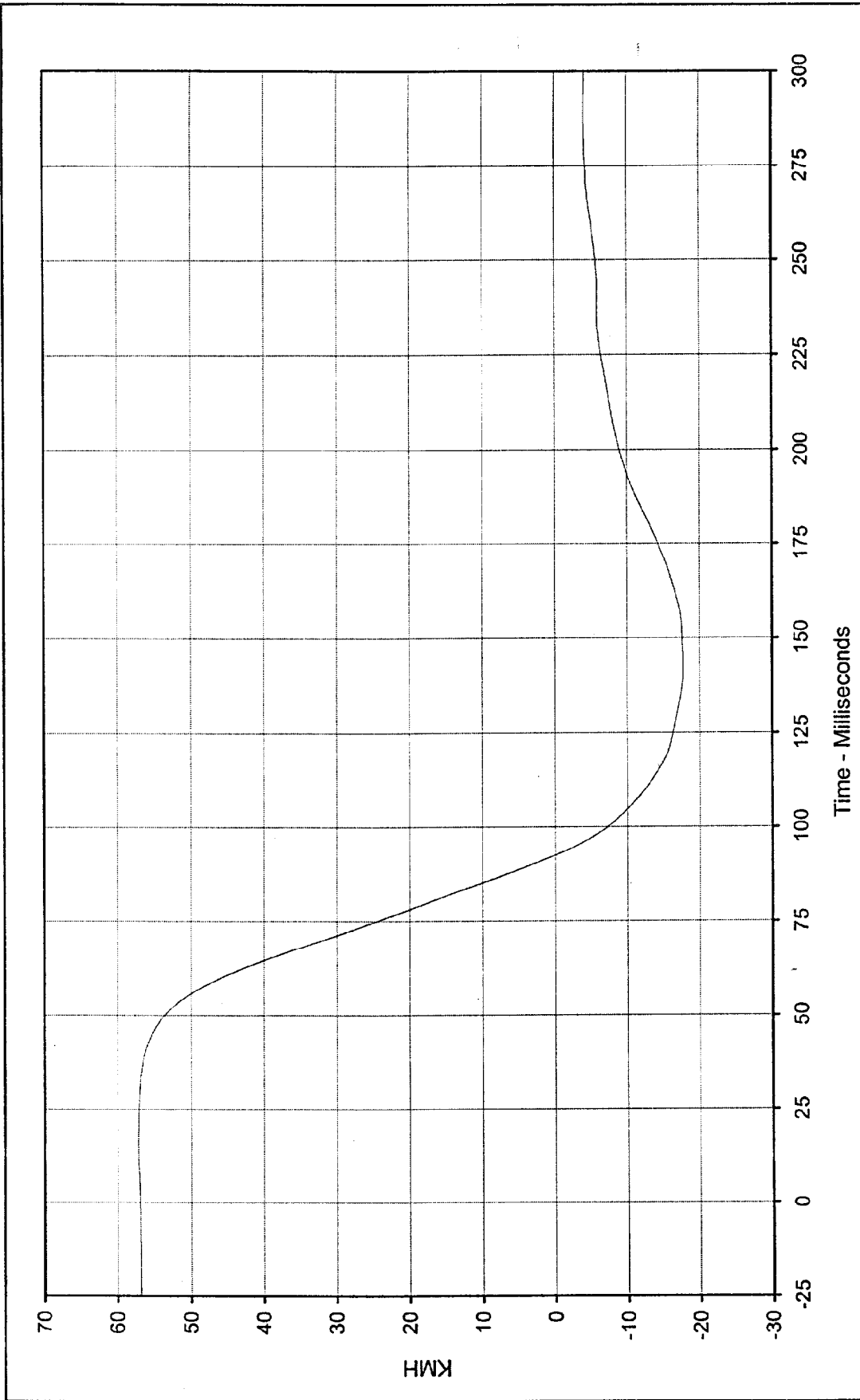




Curve Description: Passenger Chest Primary X
 Maximum Value: 7.5 at 183.3 Milliseconds
 Minimum Value: -43.1 at 83.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-057

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

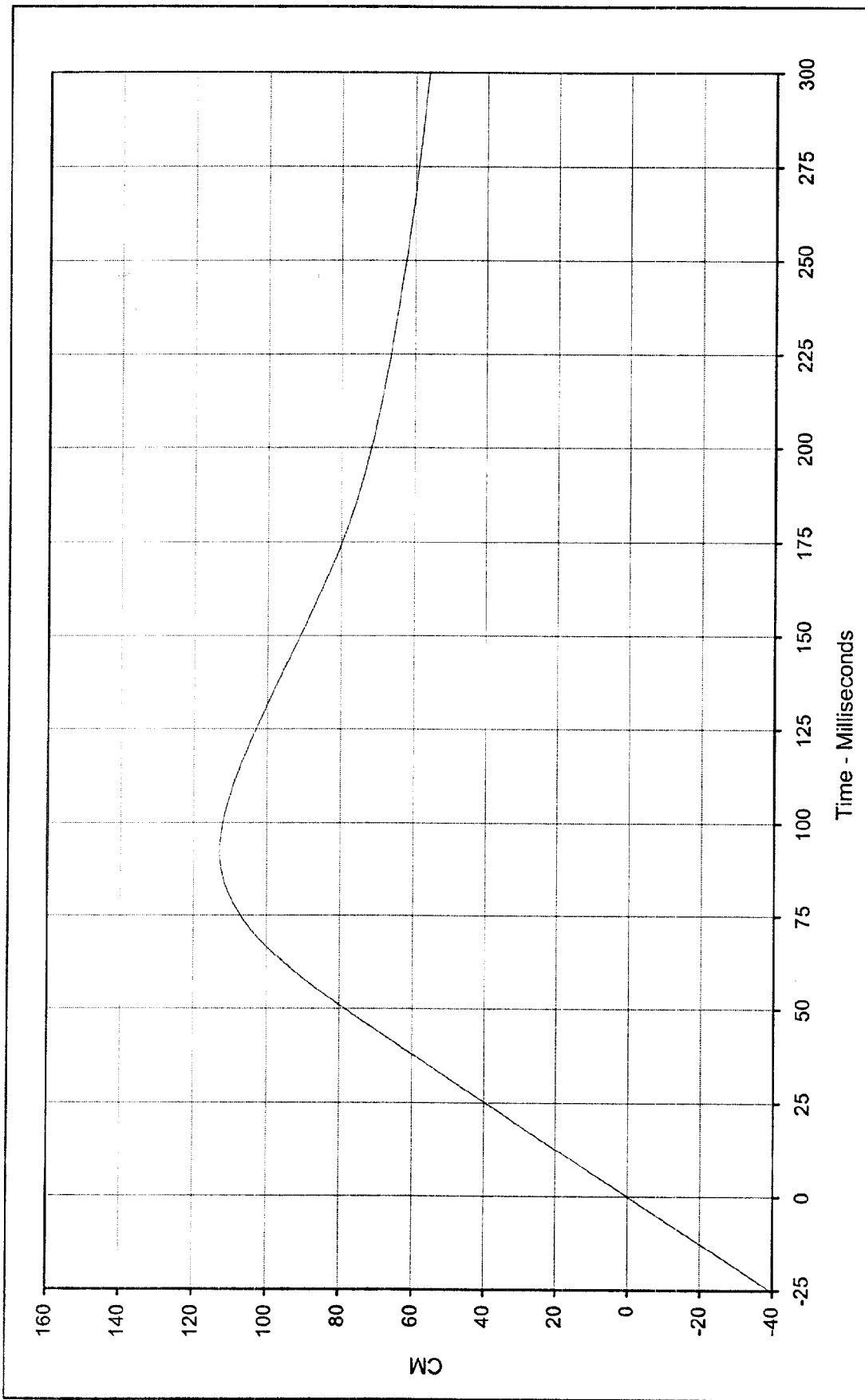




Curve Description: Passenger Chest Primary X Velocity
 Maximum Value: 57.2 at 14.2 Milliseconds
 Minimum Value: -17.7 at 141.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-057

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Passenger Chest Primary X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 112.9 at 92.3 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

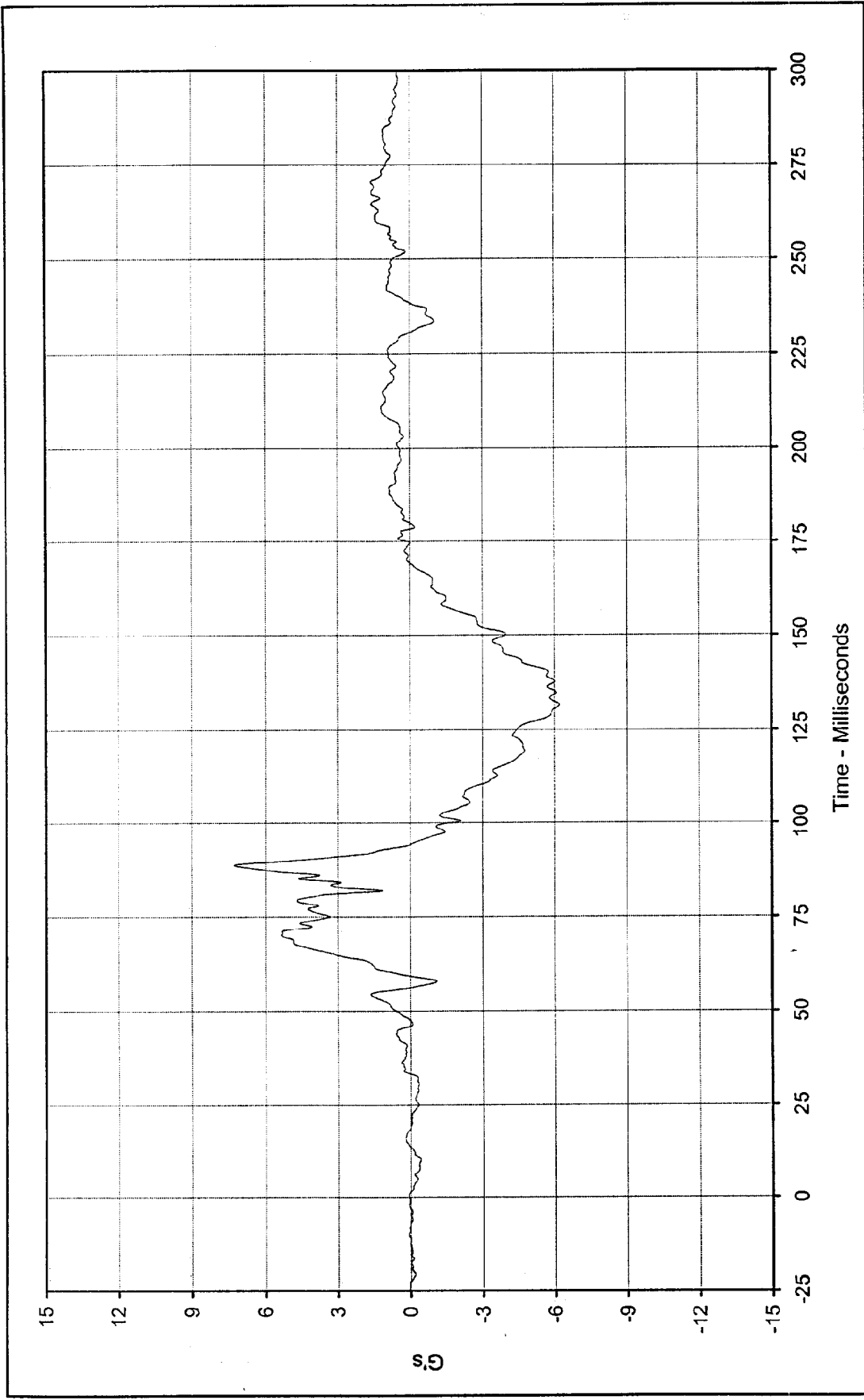
Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

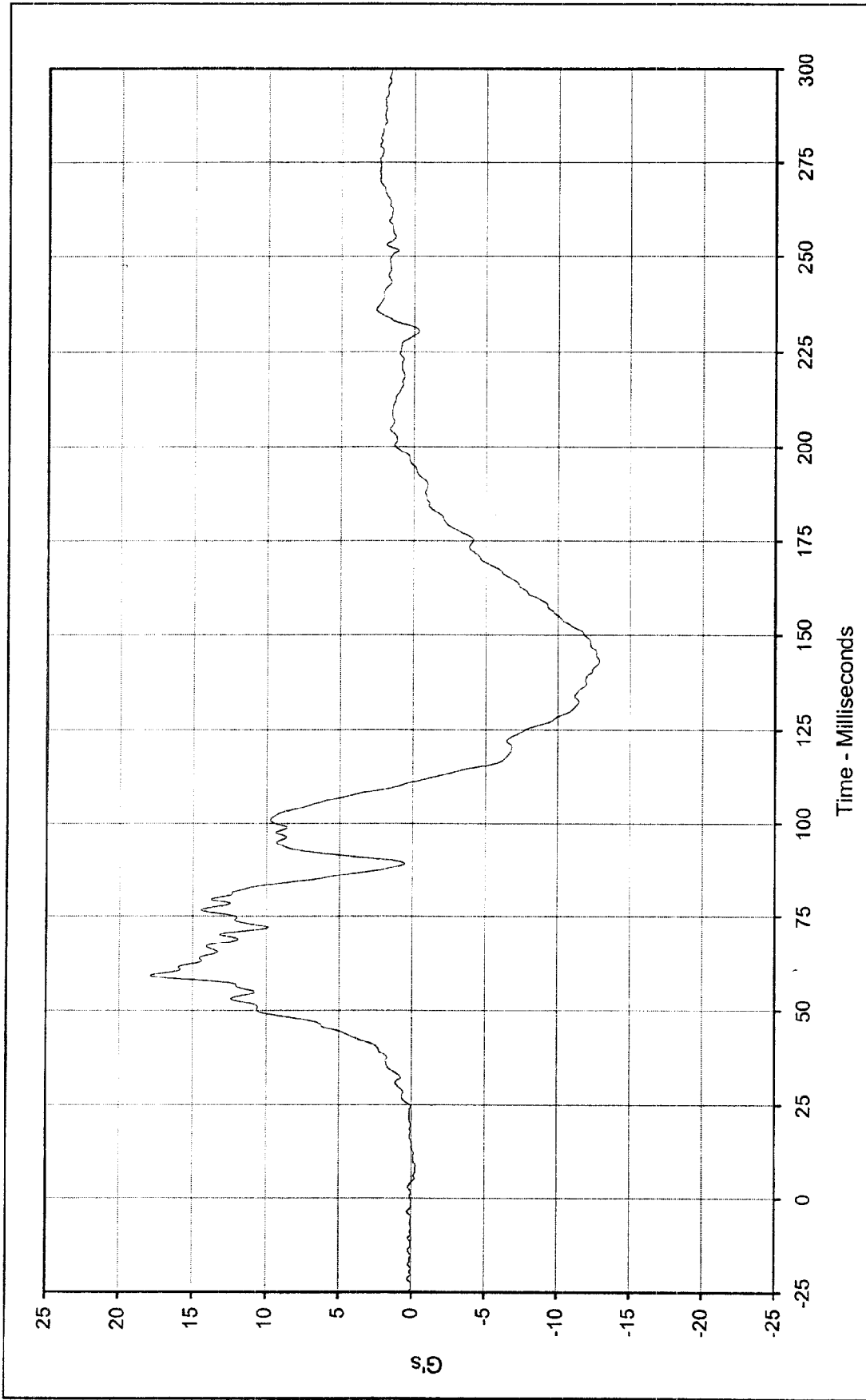
Curve Number: IN2-057





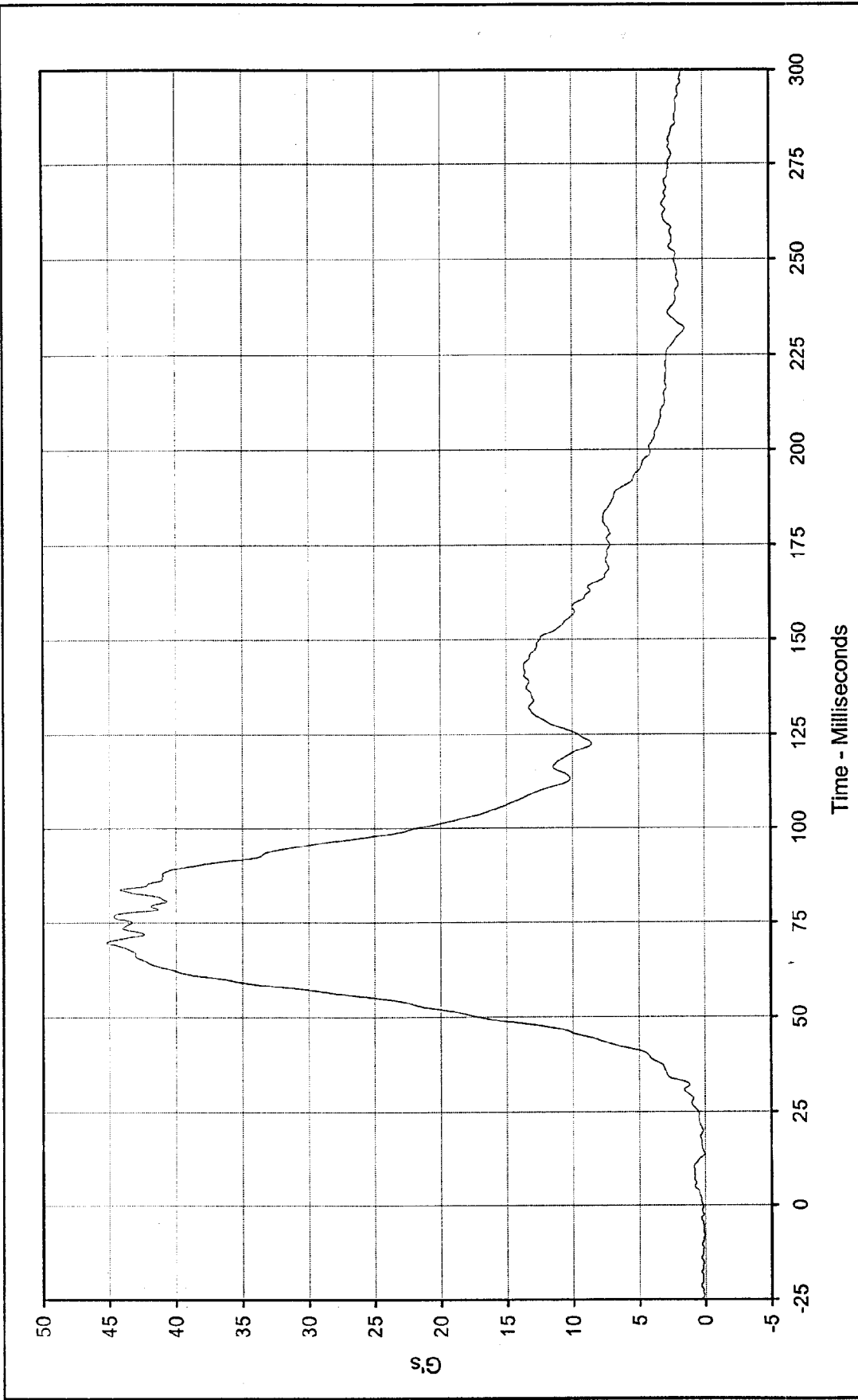
Curve Description: Passenger Chest Primary Y Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 7.3 at 88.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -6.2 at 131.5 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-058





Curve Description: Passenger Chest Primary Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 17.9 at 59.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -12.9 at 143.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-059

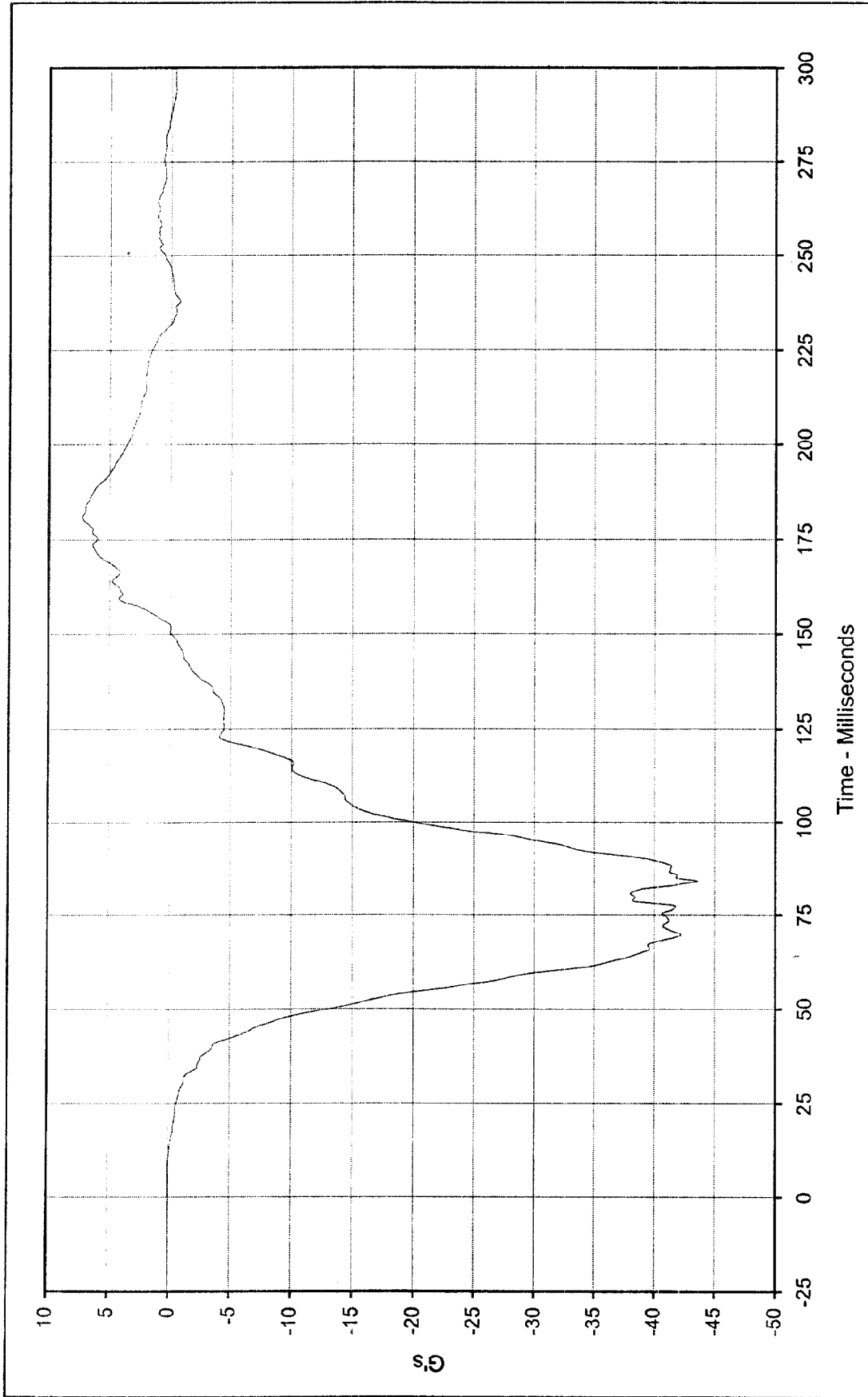




Curve Description: Passenger Chest Resultant Primary
 Maximum Value: 45.2 at 69.7 Milliseconds
 Minimum Value: 0.0 at 13.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: RES-057

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

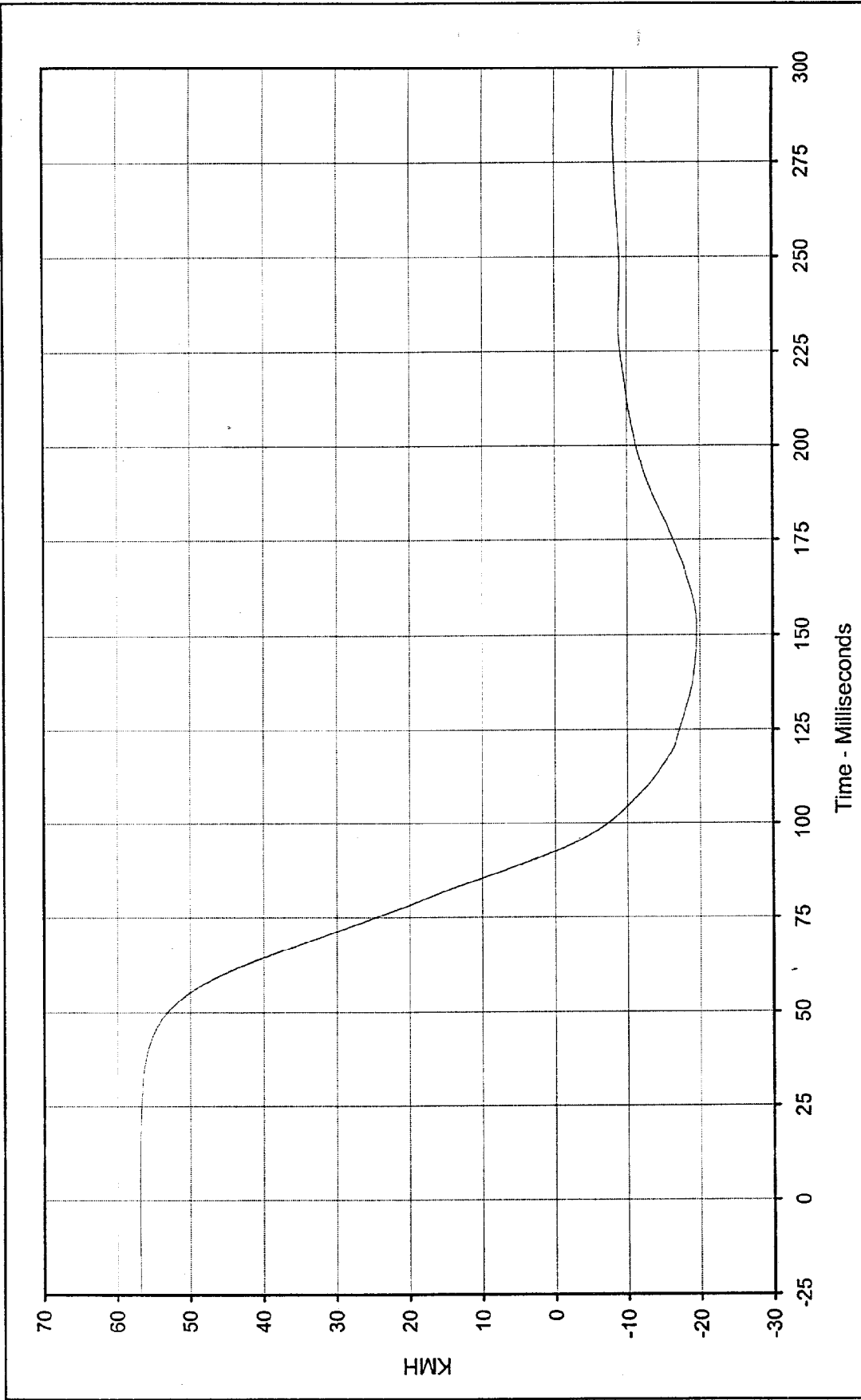




Curve Description: Passenger Chest Redundant X
 Maximum Value: 7.3 at 181.1 Milliseconds
 Minimum Value: -43.6 at 83.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-060

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Passenger Chest Redundant X Velocity

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 56.9 at 10.2 Milliseconds

Test Vehicle: 1999 Ford Expedition XLT SUV

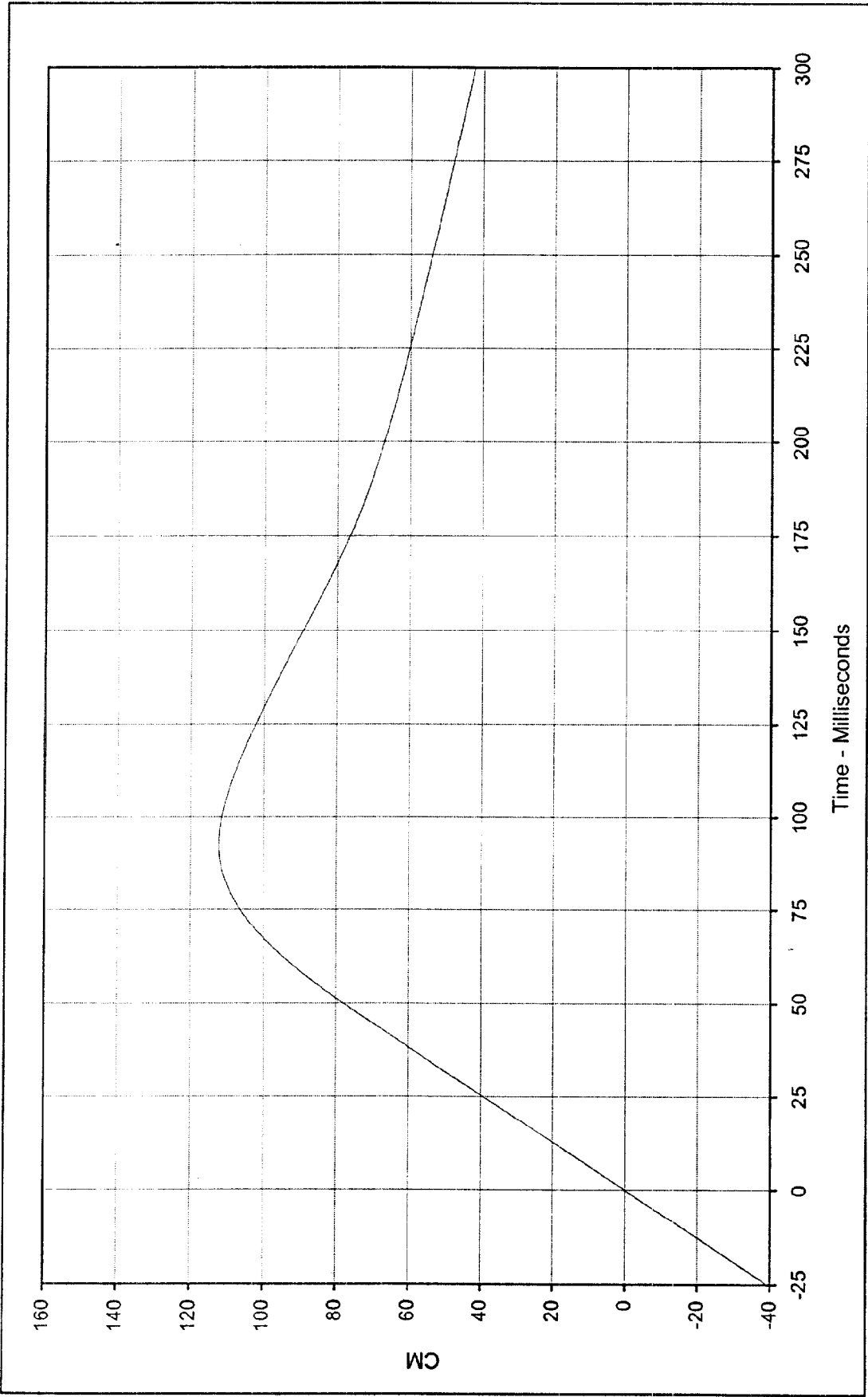
Minimum Value: -19.6 at 152.6 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN1-060





Curve Description: Passenger Chest Redundant X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 112.3 at 92.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

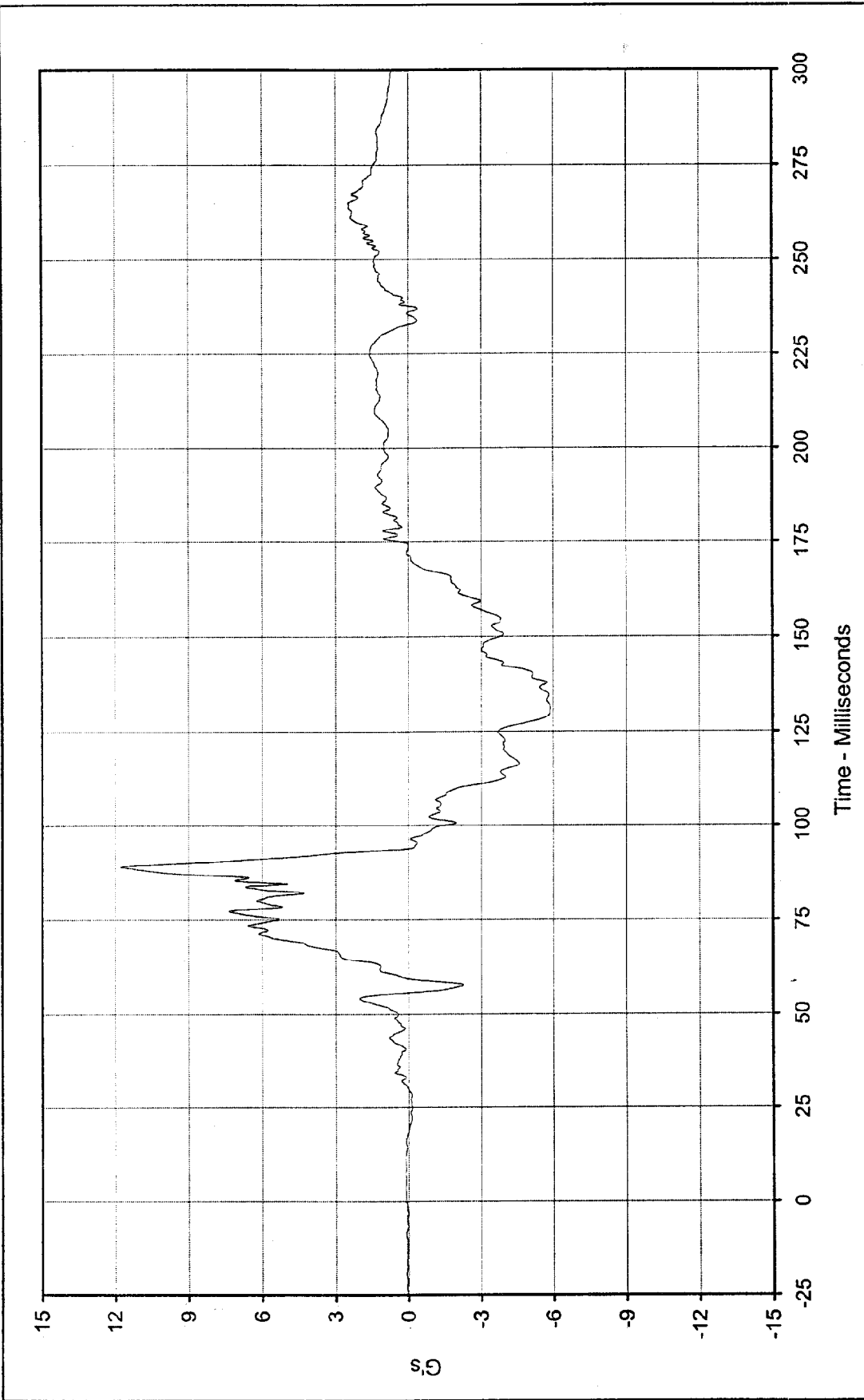
Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN2-060

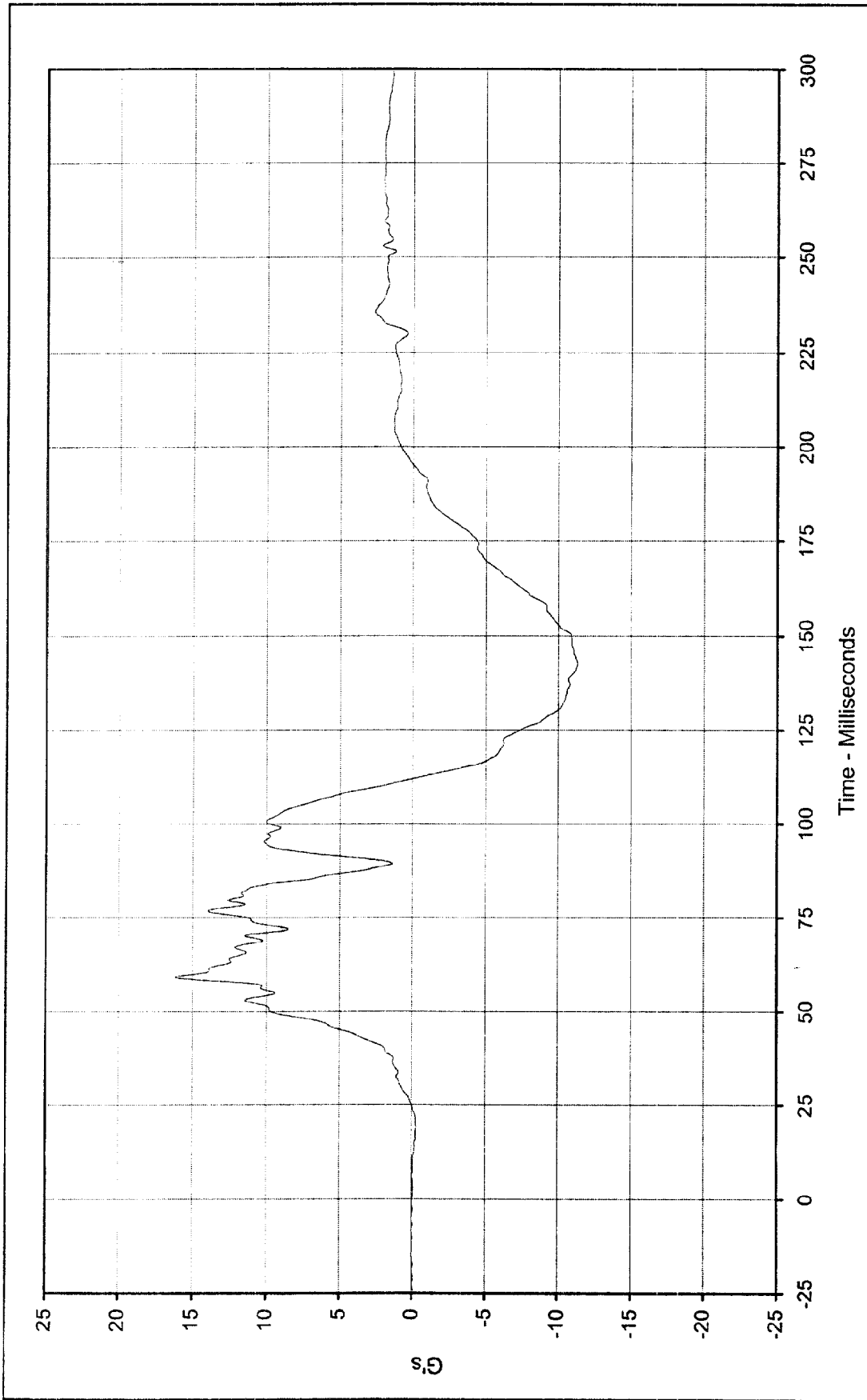




Curve Description: Passenger Chest Redundant Y
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 11.8 at 88.9 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -5.9 at 131.2 Milliseconds



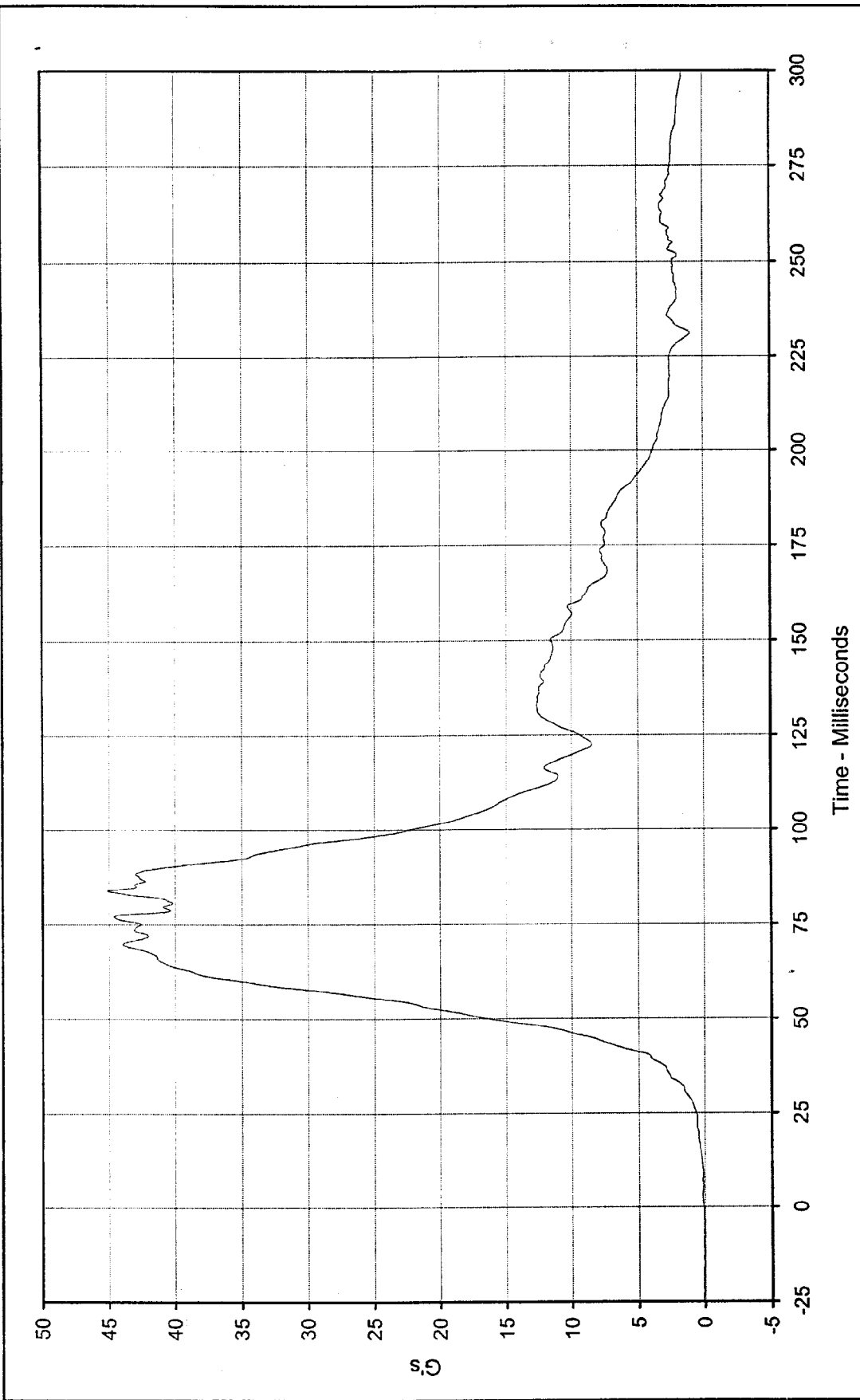
SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-061



Curve Description: Passenger Chest Redundant Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 16.1 at 59.2 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -11.3 at 142.6 Milliseconds



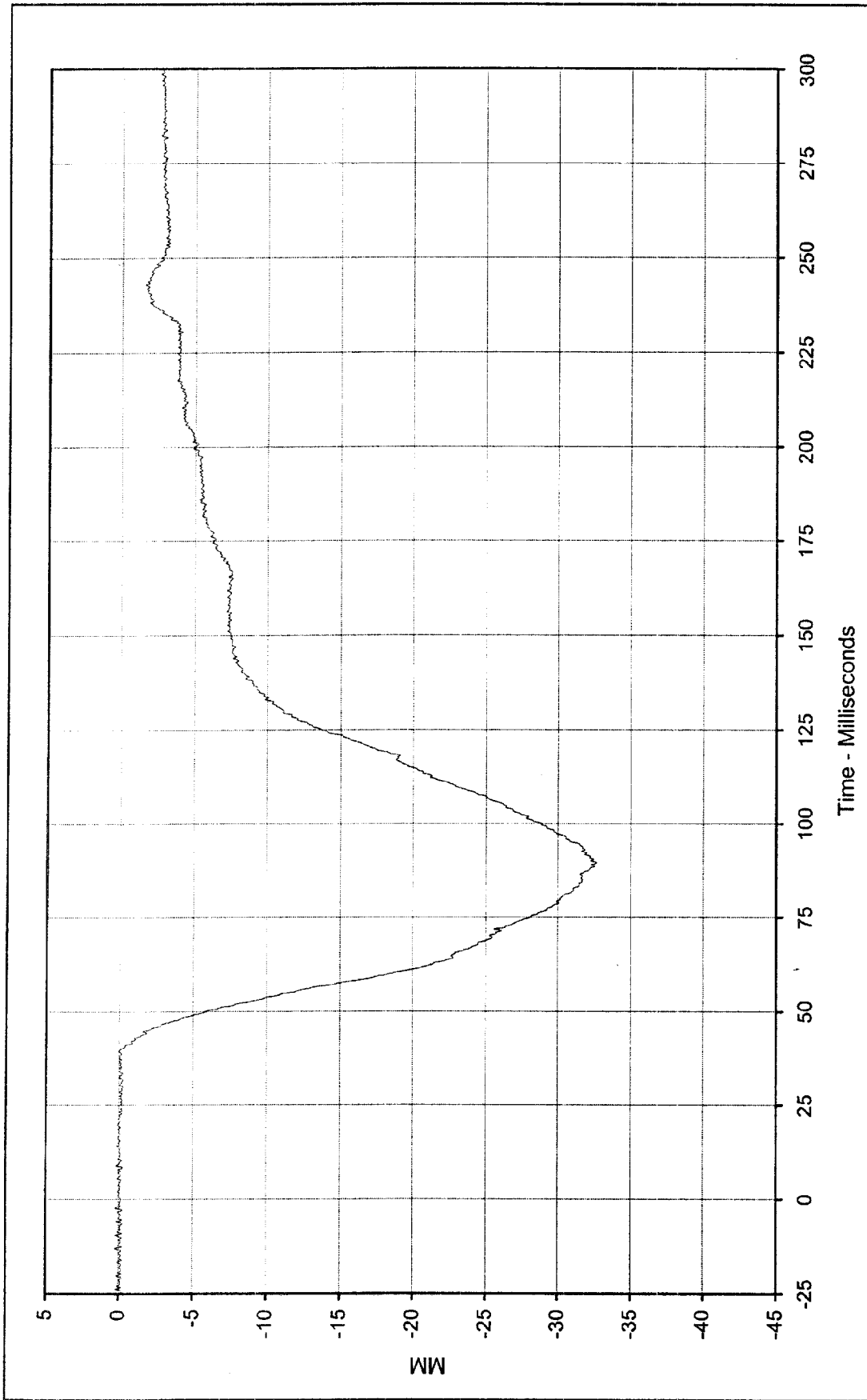
SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: FIL-062



Curve Description: Passenger Chest Resultant Redundant
 Maximum Value: 45.1 at 83.8 Milliseconds
 Minimum Value: 0.1 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: RES-060

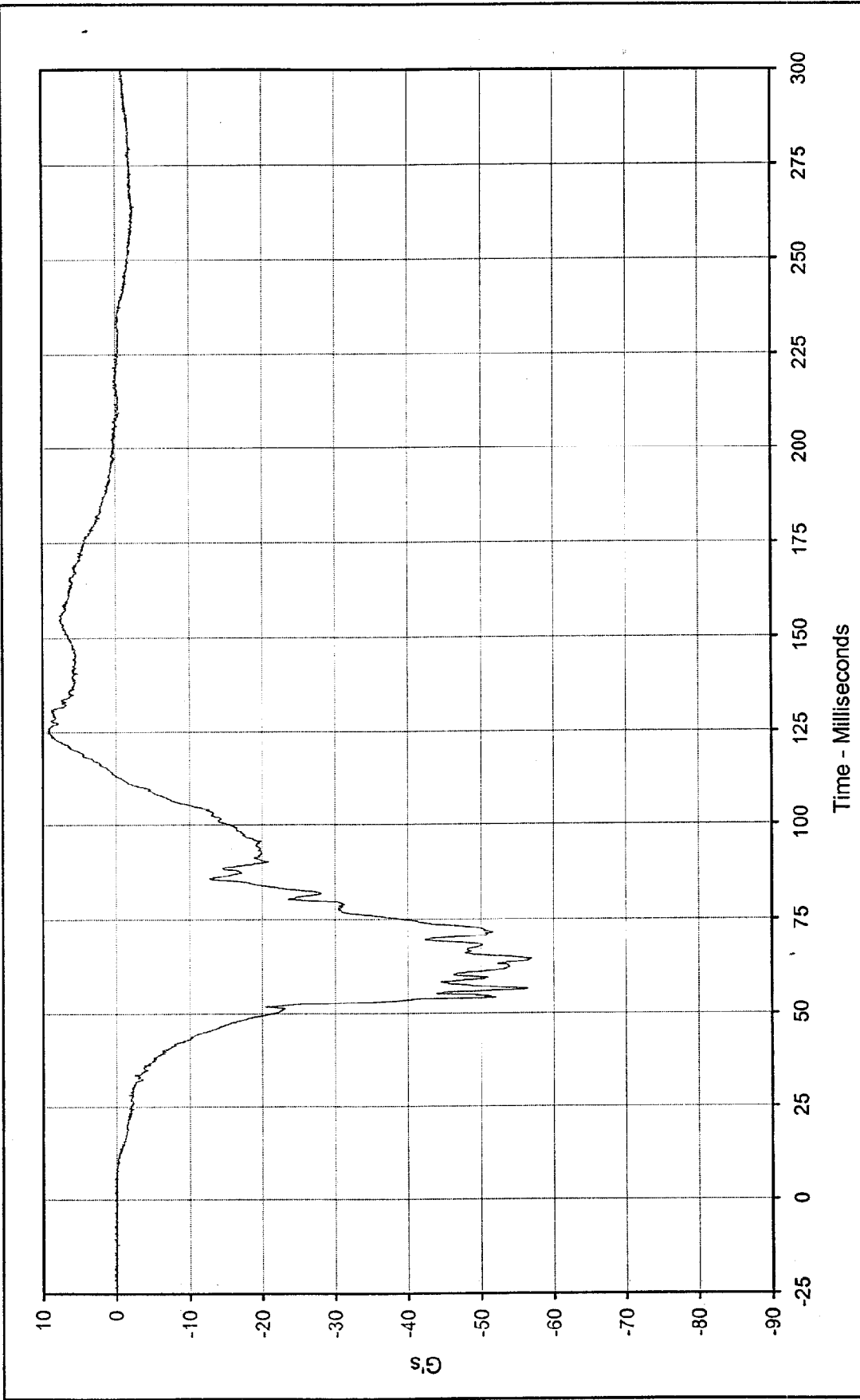
Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





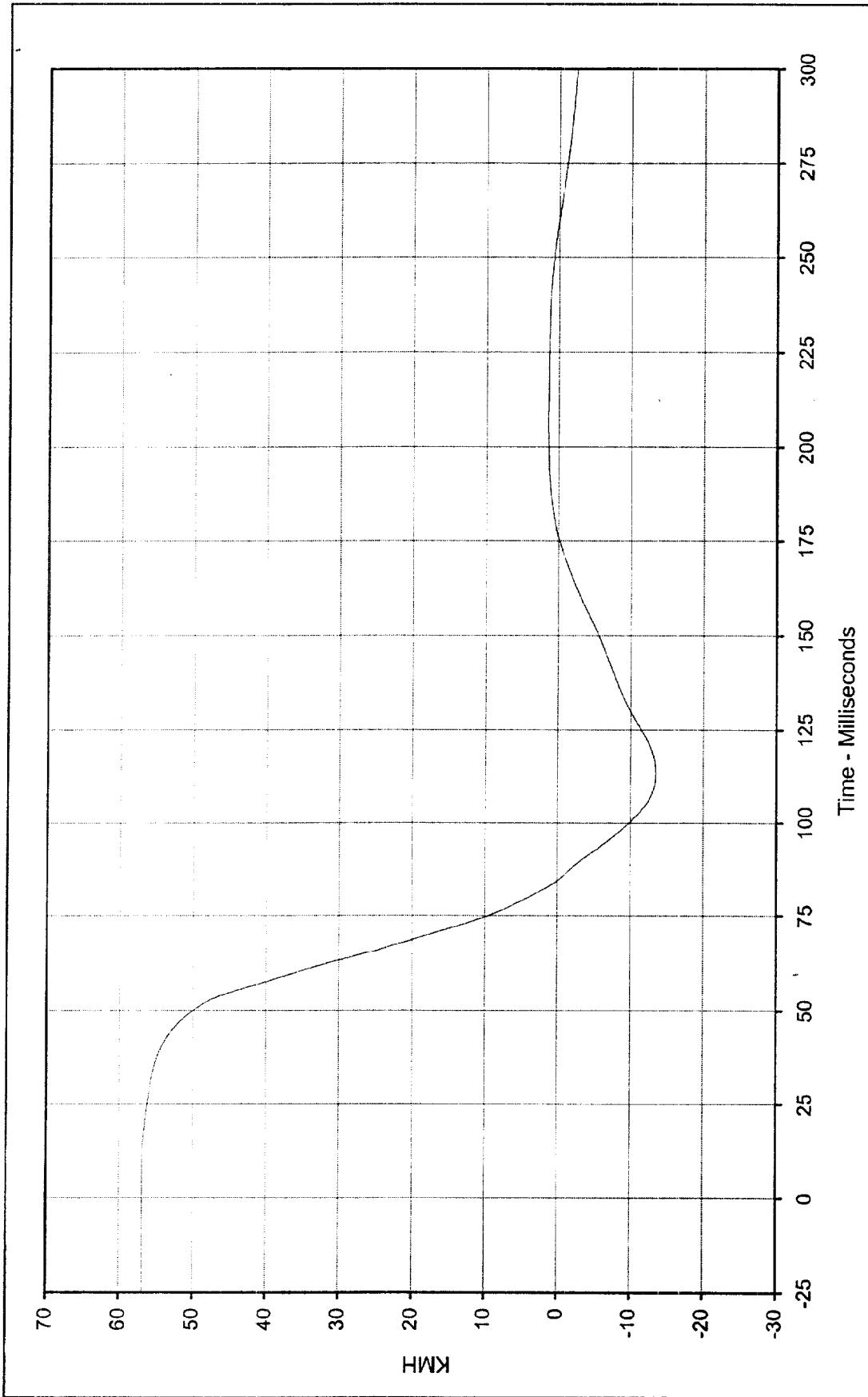
Curve Description: Passenger Chest Displacement X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 0.2 at 8.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -32.7 at 89.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-063





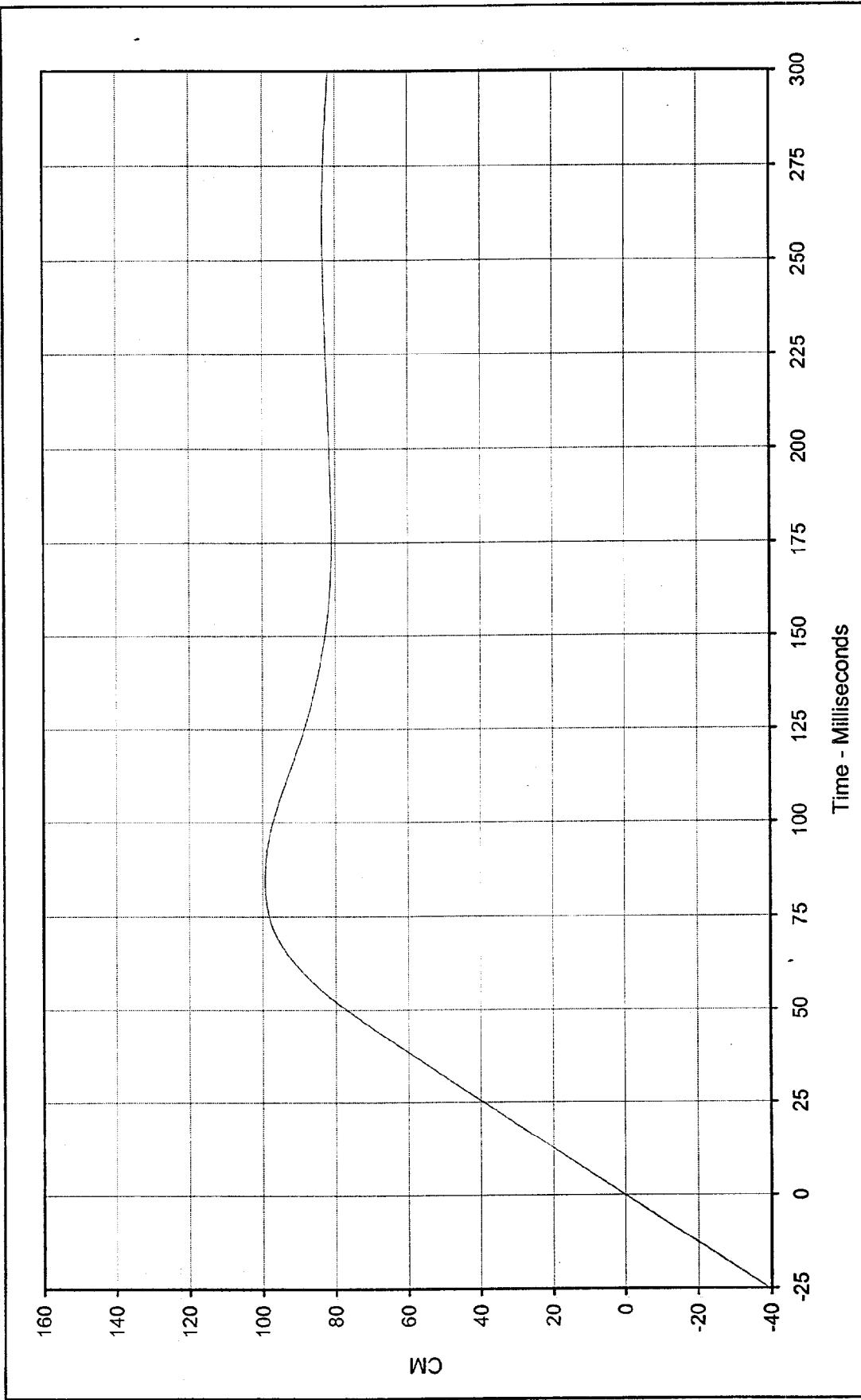
Curve Description: Passenger Pelvis X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 9.3 at 124.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -57.0 at 64.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-064





Curve Description: Passenger Pelvis X Velocity Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 56.9 at 5.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -13.5 at 113.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-064

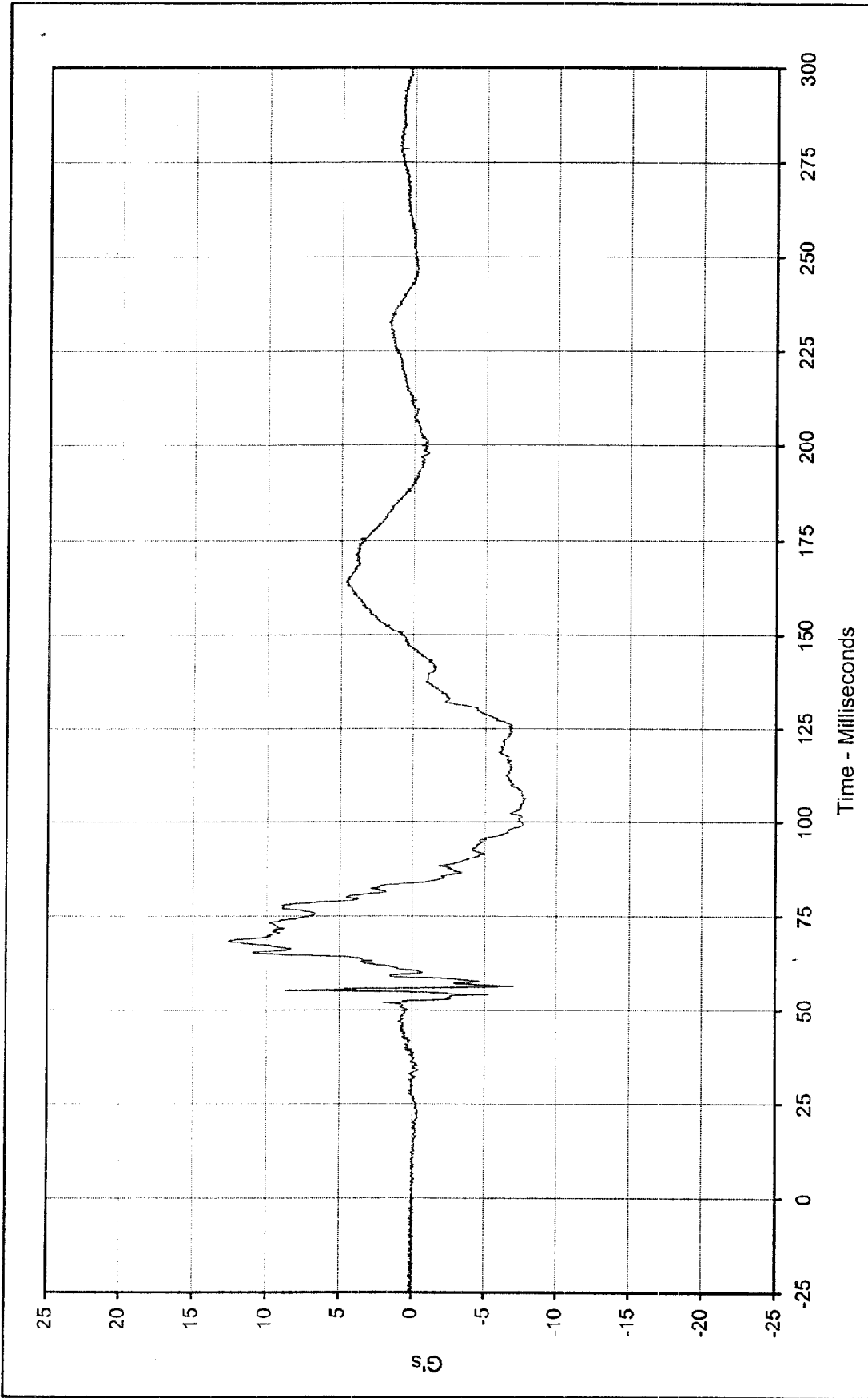




Curve Description: Passenger Pelvis X Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 99.3 at 84.2 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds

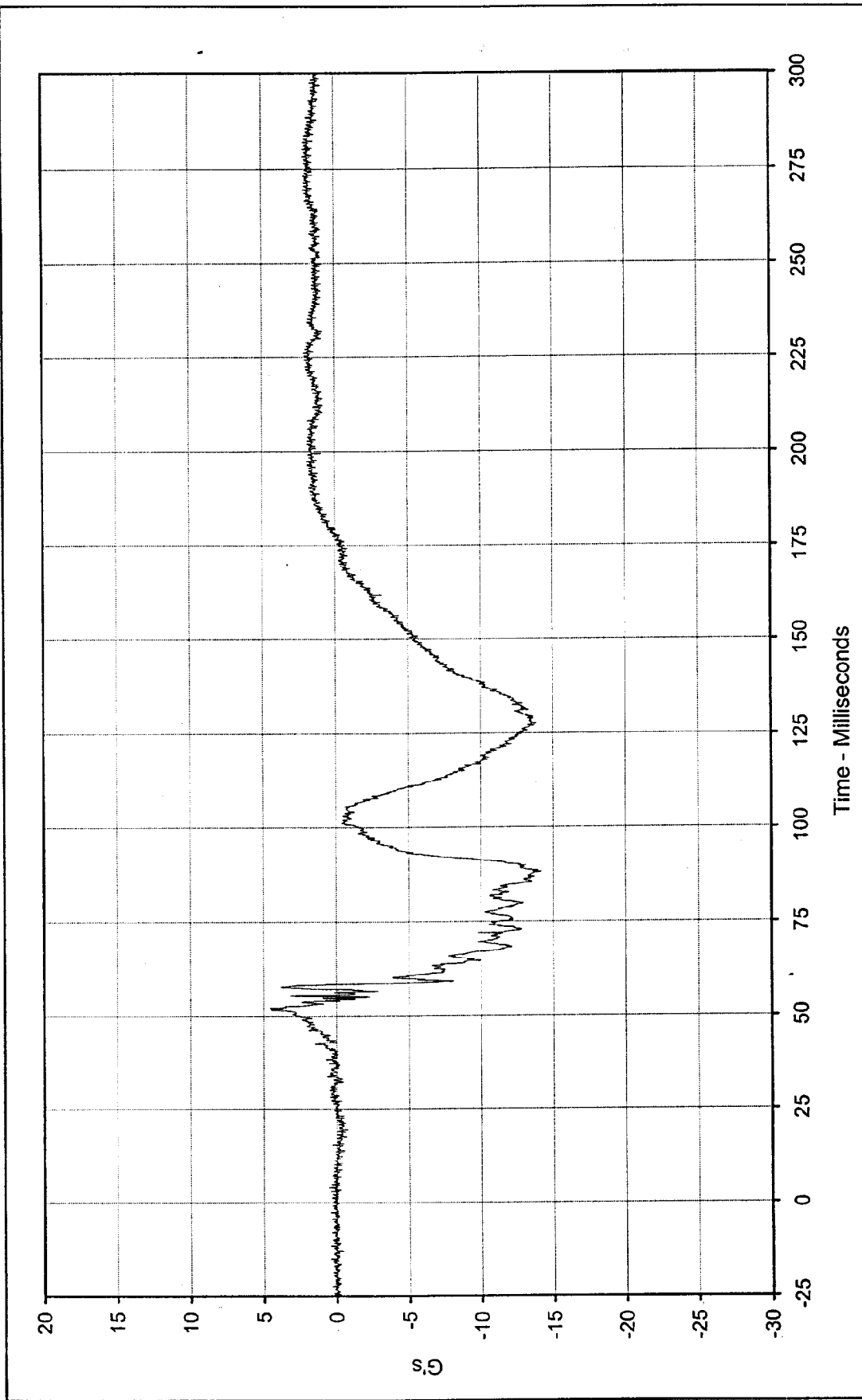


SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-064



Curve Description: Passenger Pelvis Y
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 12.6 at 68.1 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -7.8 at 106.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-065

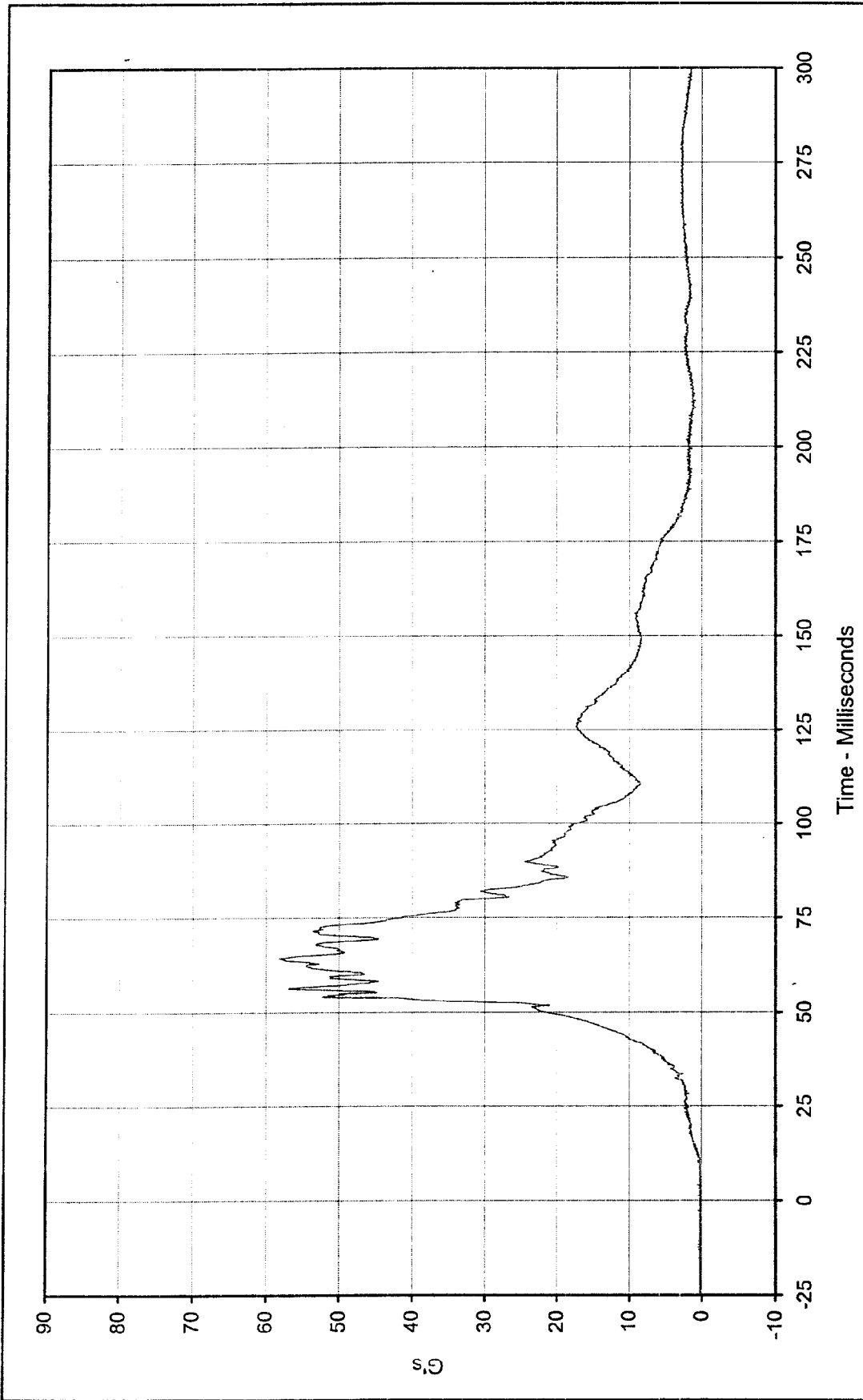




Curve Description: Passenger Pelvis Z
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Maximum Value: 4.5 at 52.1 Milliseconds
 Minimum Value: -14.2 at 87.9 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-066



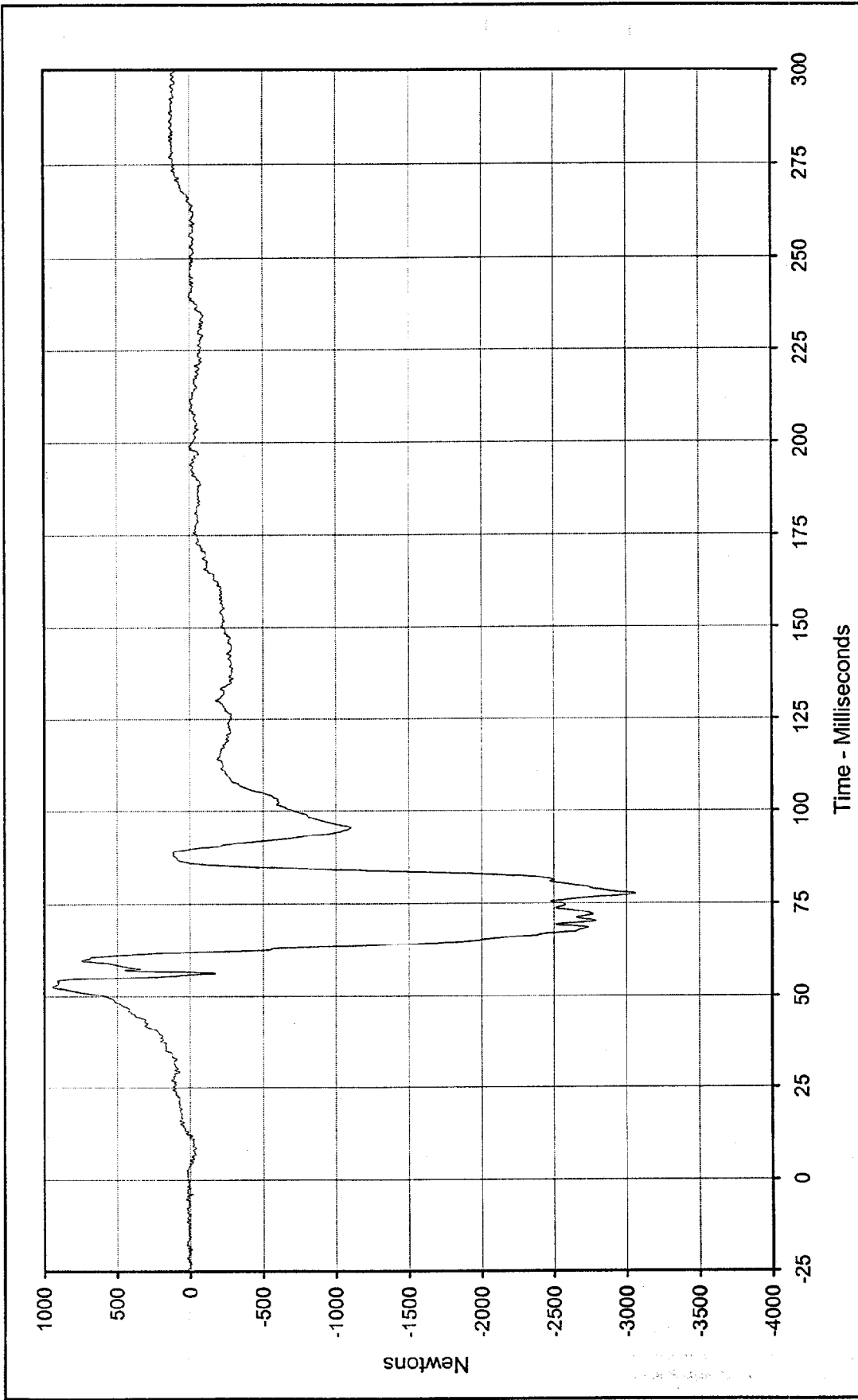


Curve Description: Passenger Pelvis Resultant
 Maximum Value: 58.2 at 64.5 Milliseconds
 Minimum Value: 0.0 at 3.9 Milliseconds

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV



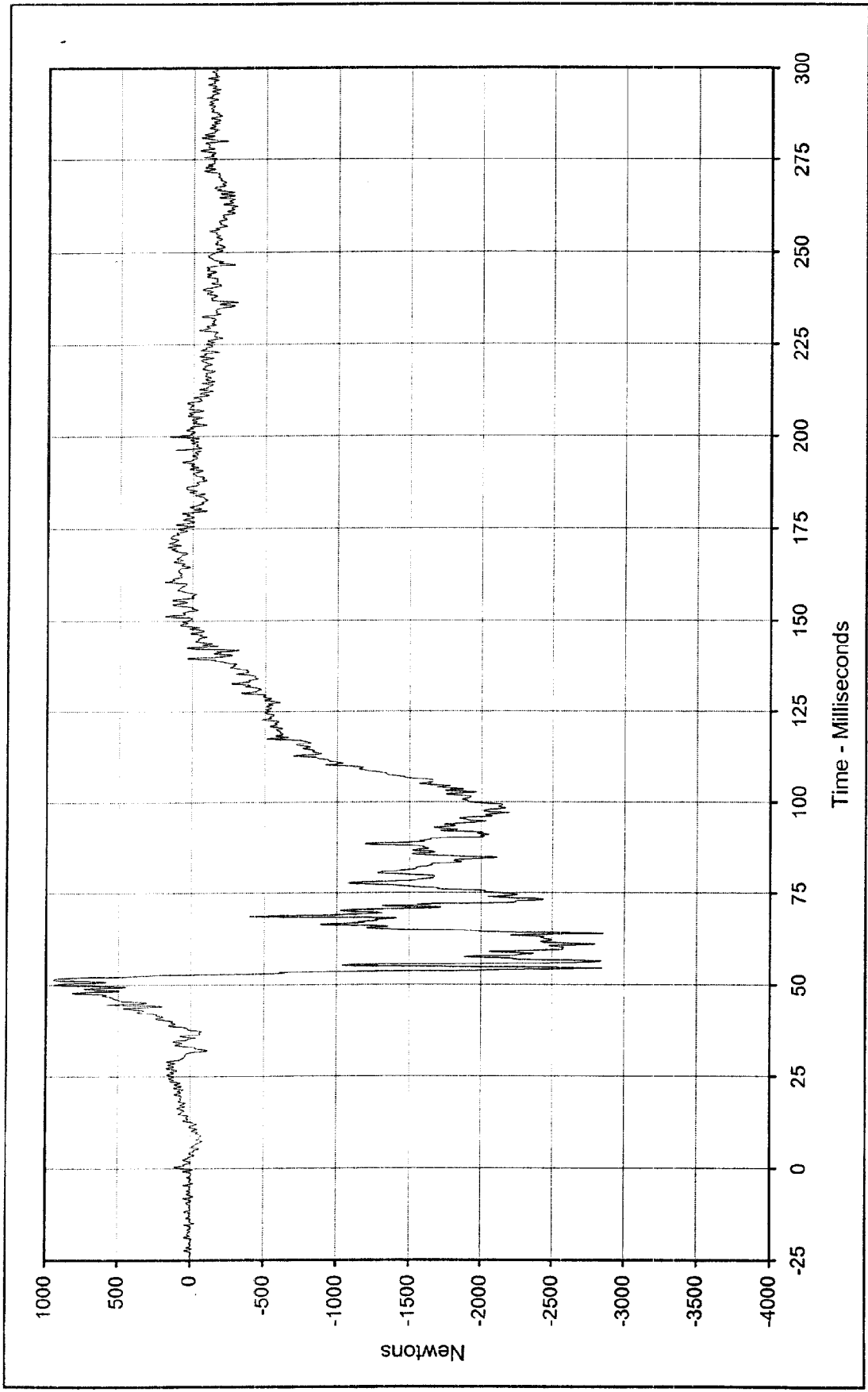
SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: RES-064



Curve Description: Passenger Left Femur Force
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 945.1 at 52.7 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -3064.8 at 77.6 Milliseconds

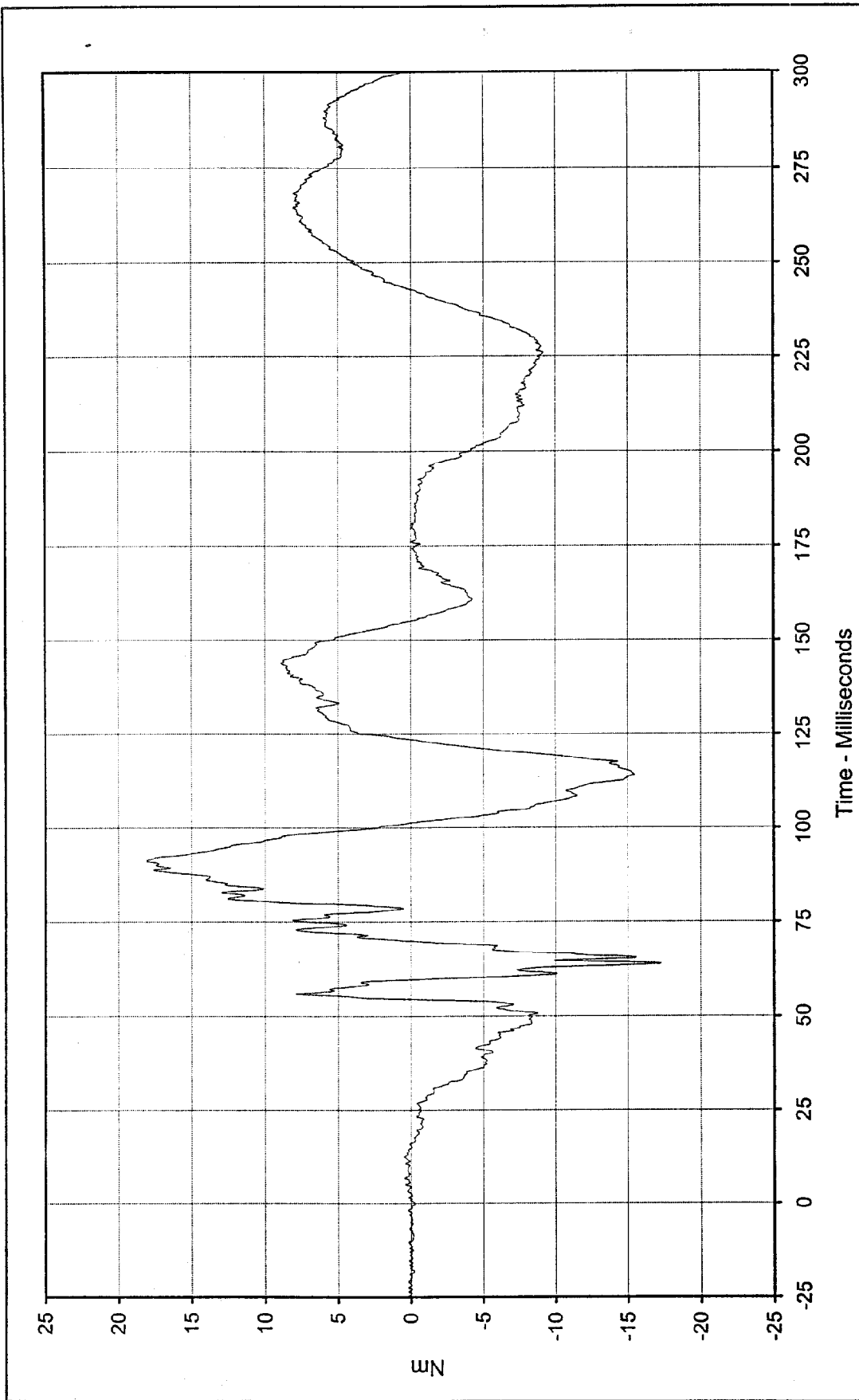


SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-067



Curve Description: Passenger Right Femur Force Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 947.1 at 51.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -2854.6 at 64.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-068

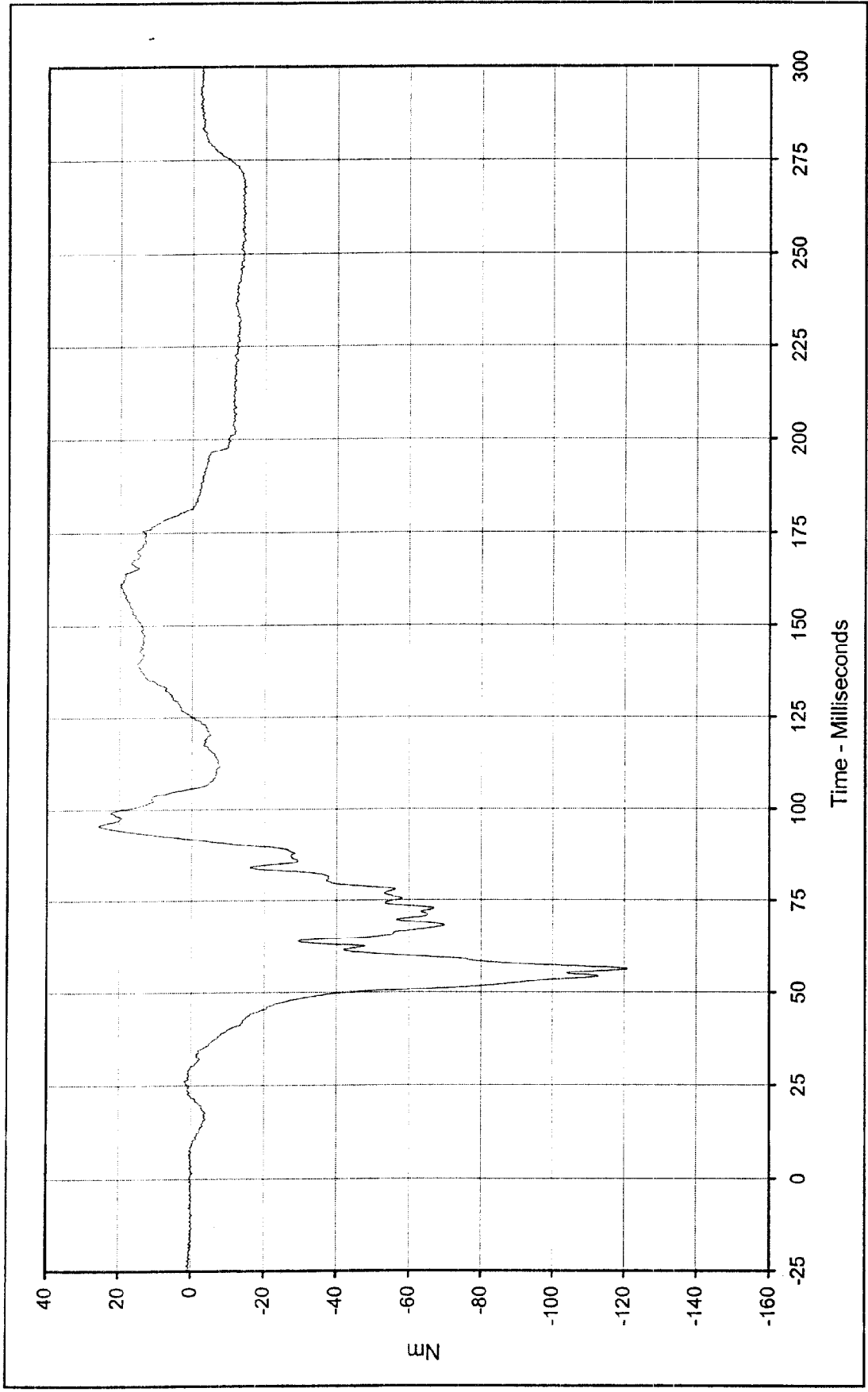




Curve Description: Passenger Left Upper Tibia Moment X
 Maximum Value: 18.1 at 91.1 Milliseconds
 Minimum Value: -17.3 at 63.8 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-069

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

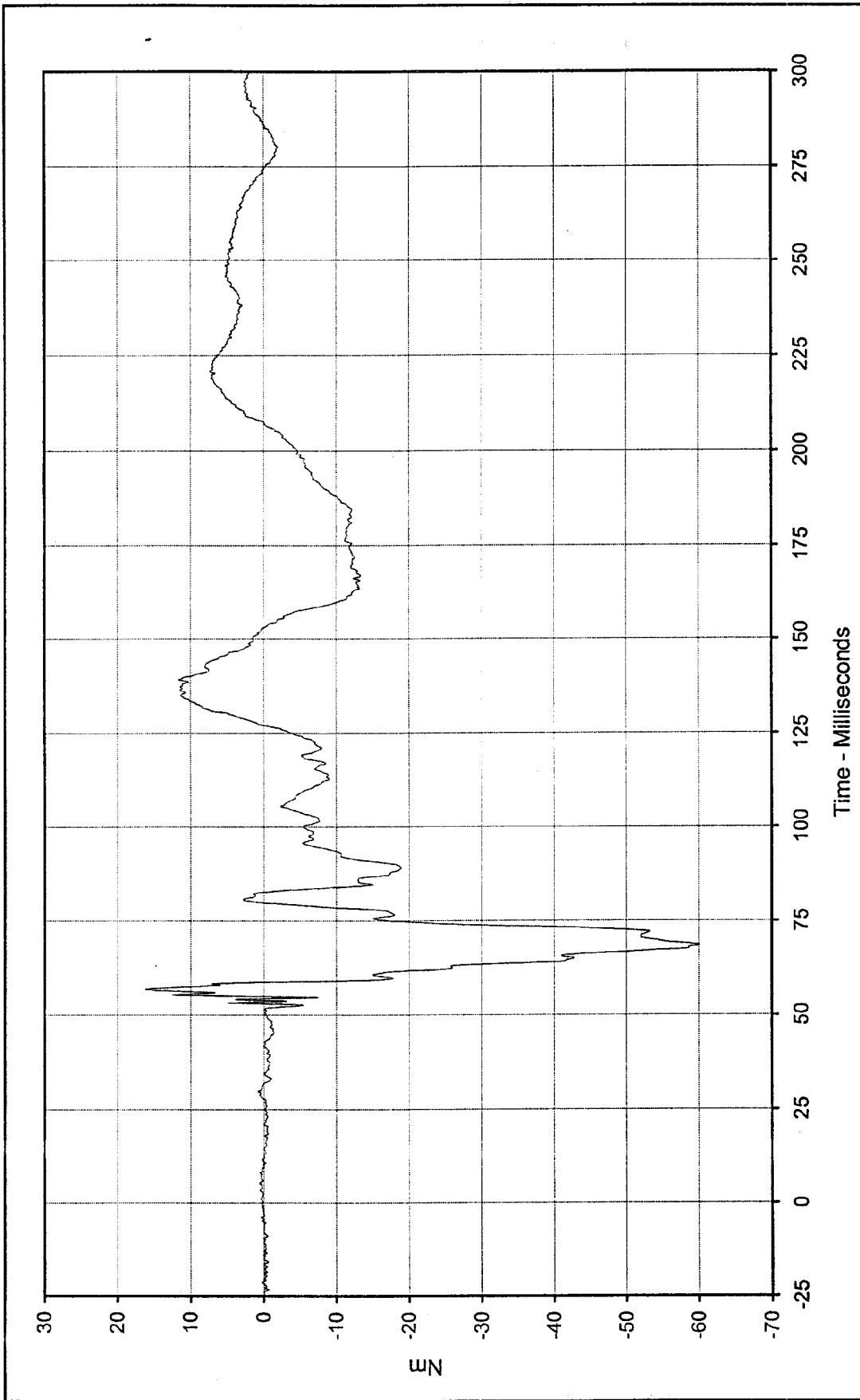




Curve Description: Passenger Left Upper Tibia Moment Y
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 25.7 at 95.7 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -120.9 at 56.3 Milliseconds



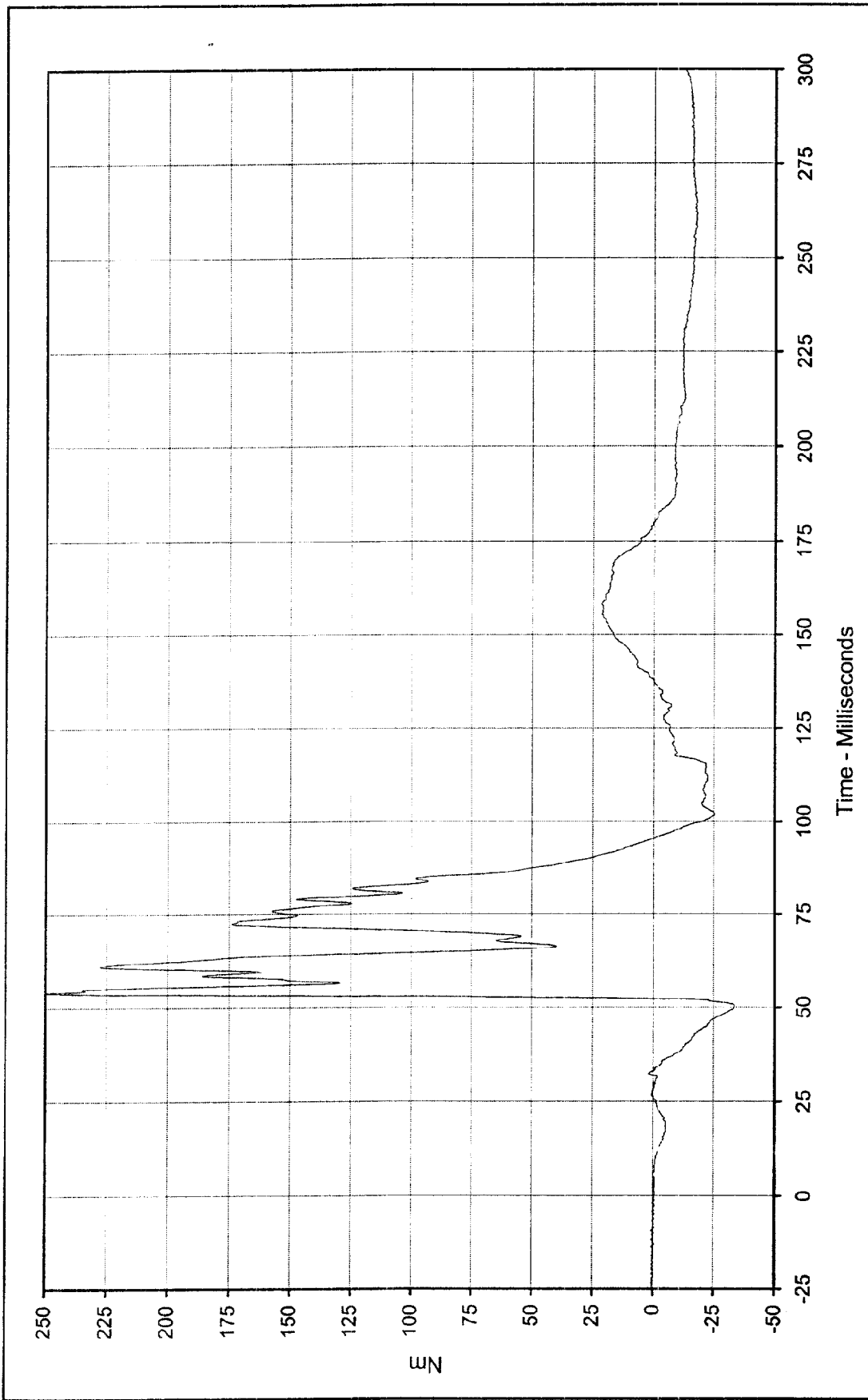
SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-070



Curve Description: Passenger Right Upper Tibia Moment X
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 16.2 at 56.8 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -60.2 at 68.4 Milliseconds



SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-071



Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Curve Description: Passenger Right Upper Tibia Moment Y

Maximum Value: 249.4 at 54.0 Milliseconds

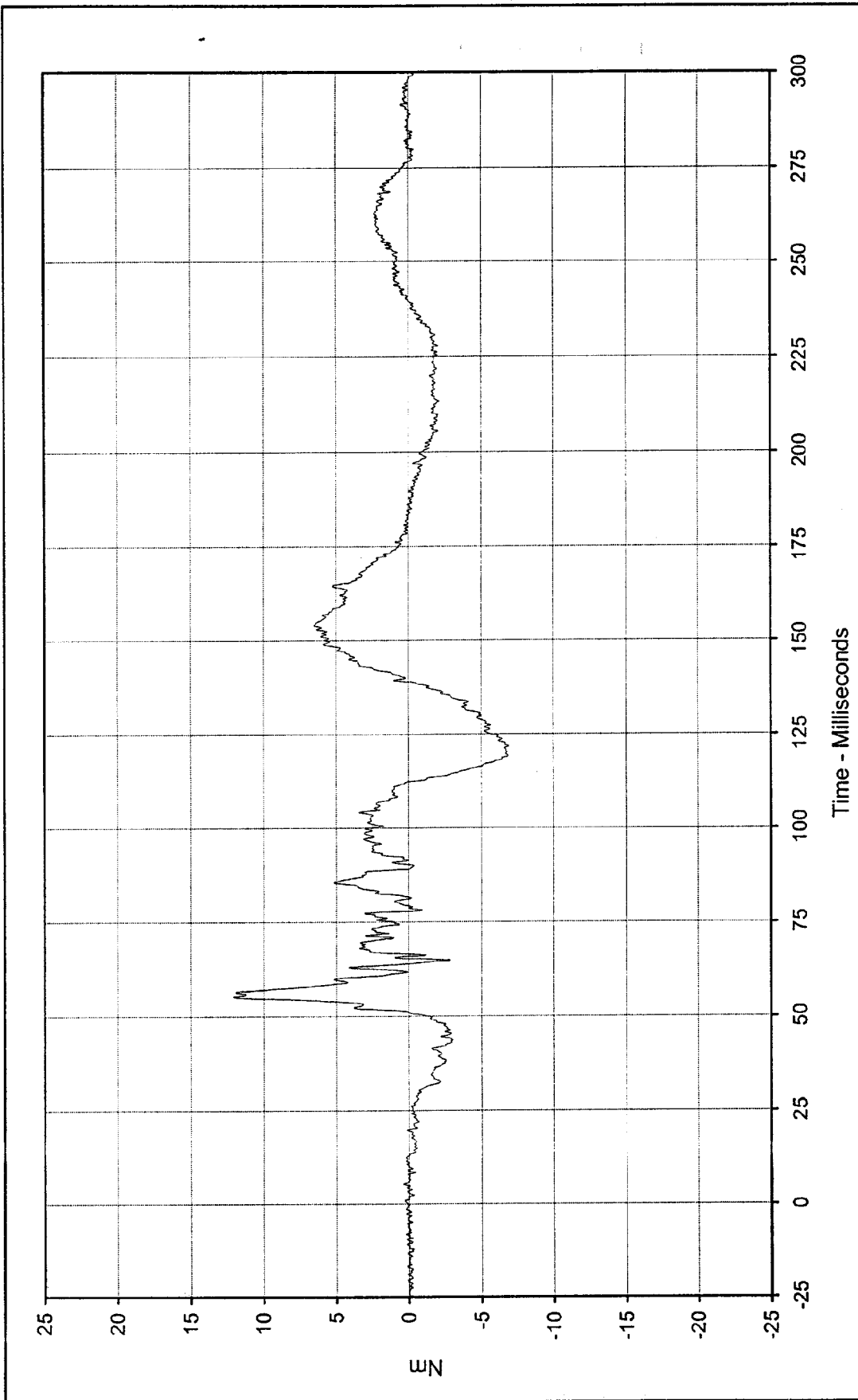
Minimum Value: -34.0 at 50.4 Milliseconds

SAE Filter Class: 600

Date of Test: 1/26/99

Curve Number: FIL-072

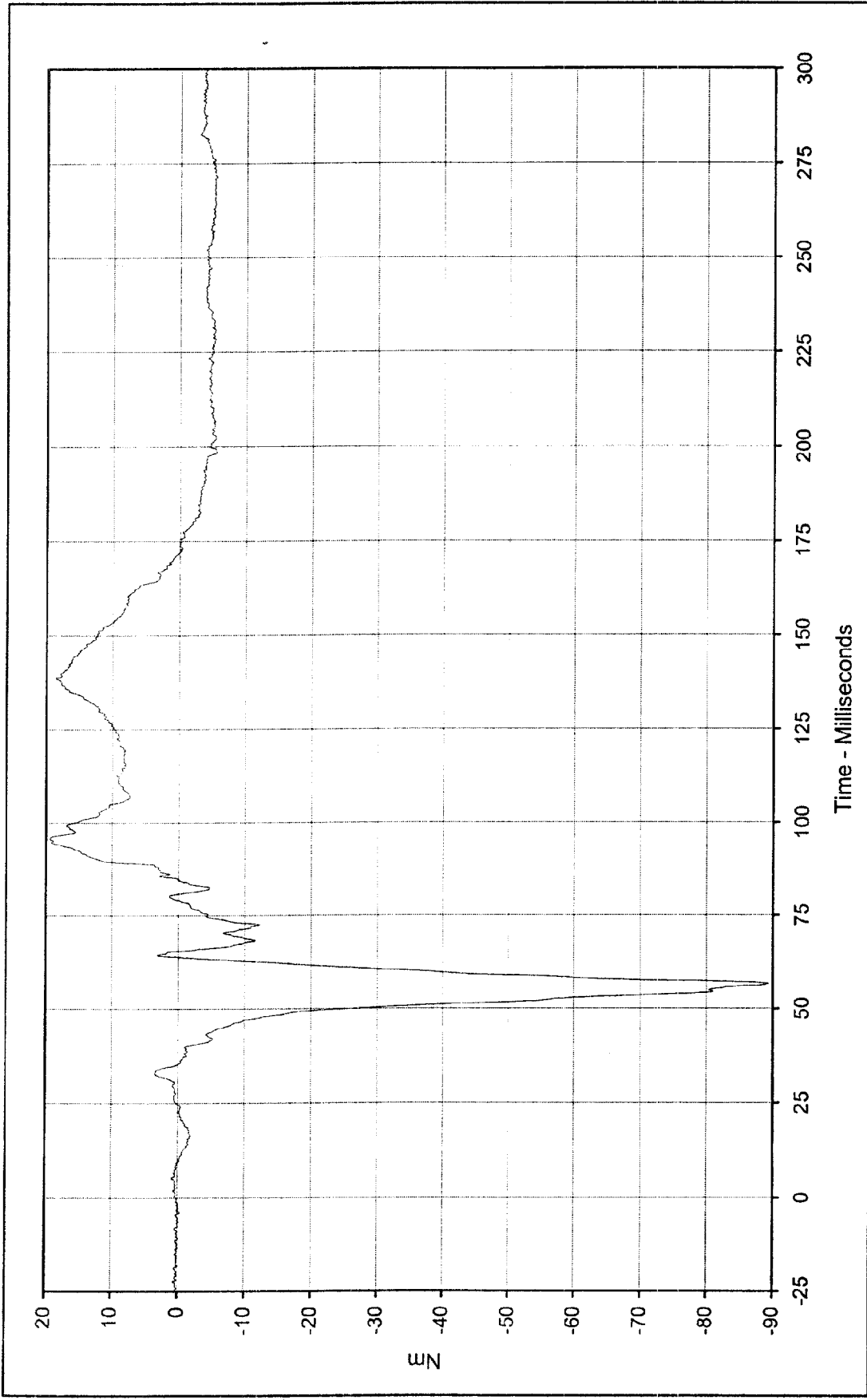




Curve Description: Passenger Left Lower Tibia Moment X
 Maximum Value: 12.1 at 55.2 Milliseconds
 Minimum Value: -6.9 at 121.8 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-073

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

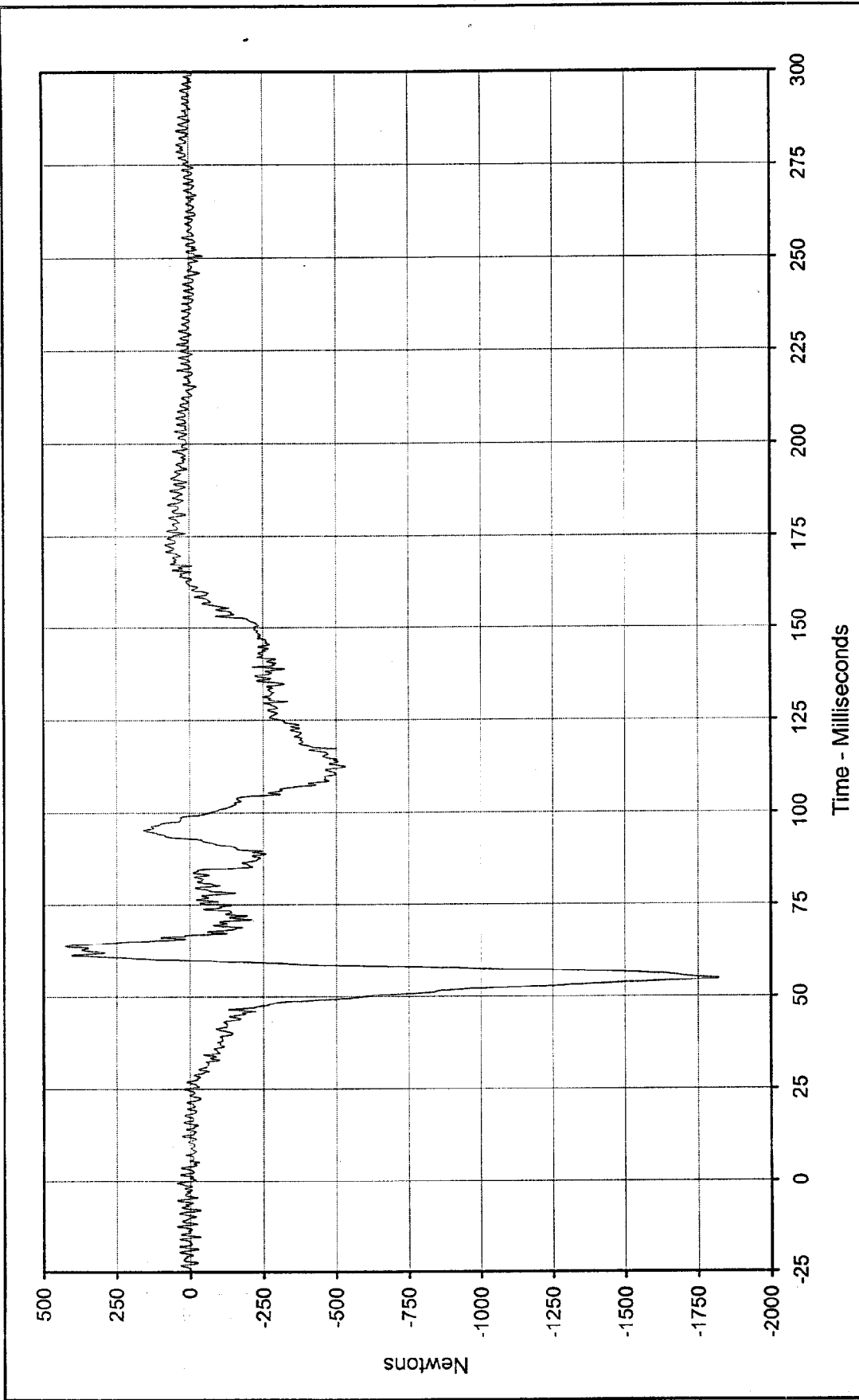




Curve Description: Passenger Left Lower Tibia Moment Y
 Maximum Value: 19.3 at 95.7 Milliseconds
 Minimum Value: -89.4 at 56.6 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-074

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

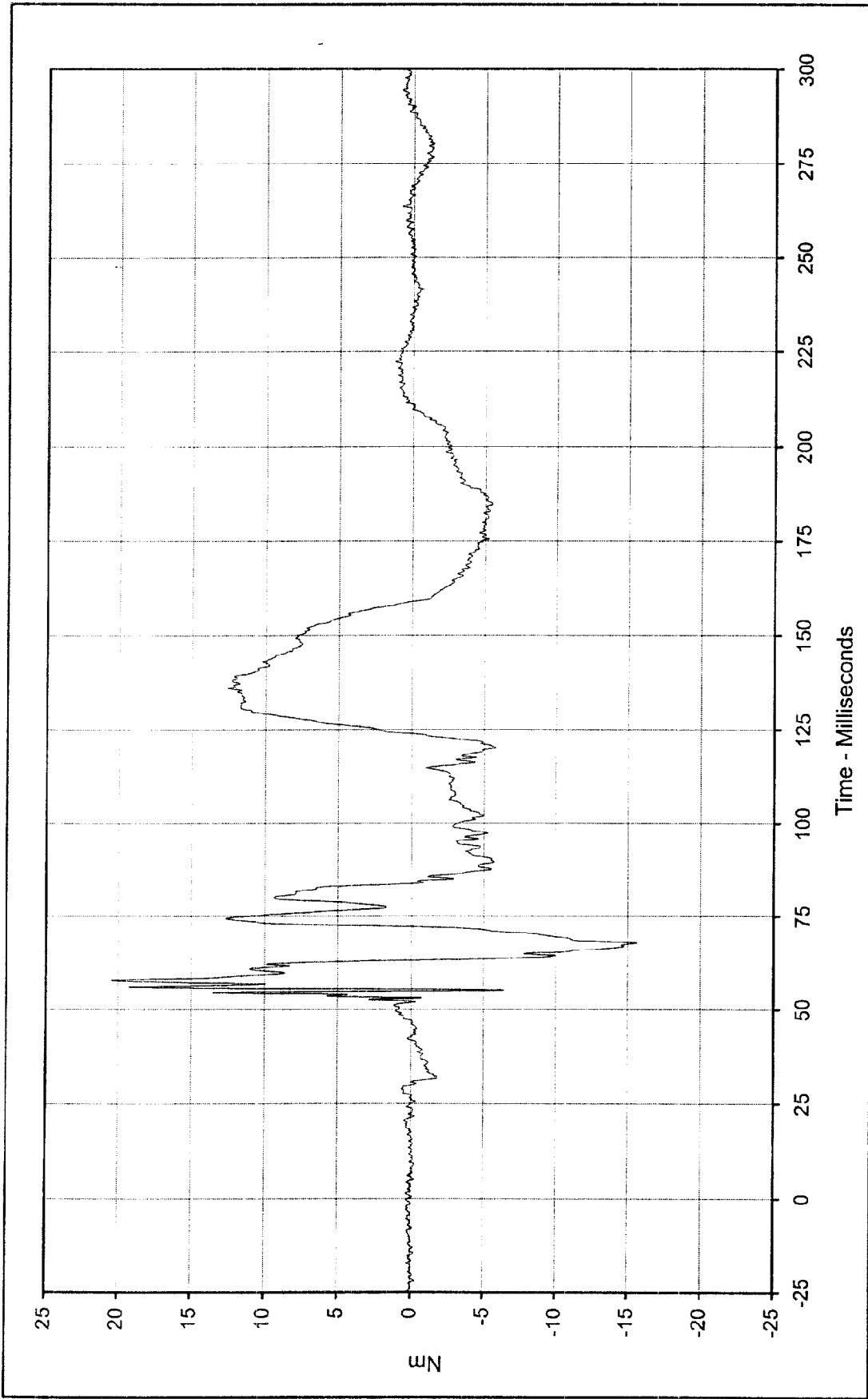




Curve Description: Passenger Left Lower Tibia Force Z
 Maximum Value: 425.5 at 63.7 Milliseconds
 Minimum Value: -1824.0 at 54.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-075

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Passenger Right Lower Tibia Moment X

Maximum Value: 20.5 at 20.5 Milliseconds

Minimum Value: -15.6 at 67.8 Milliseconds

SAE Filter Class: 600

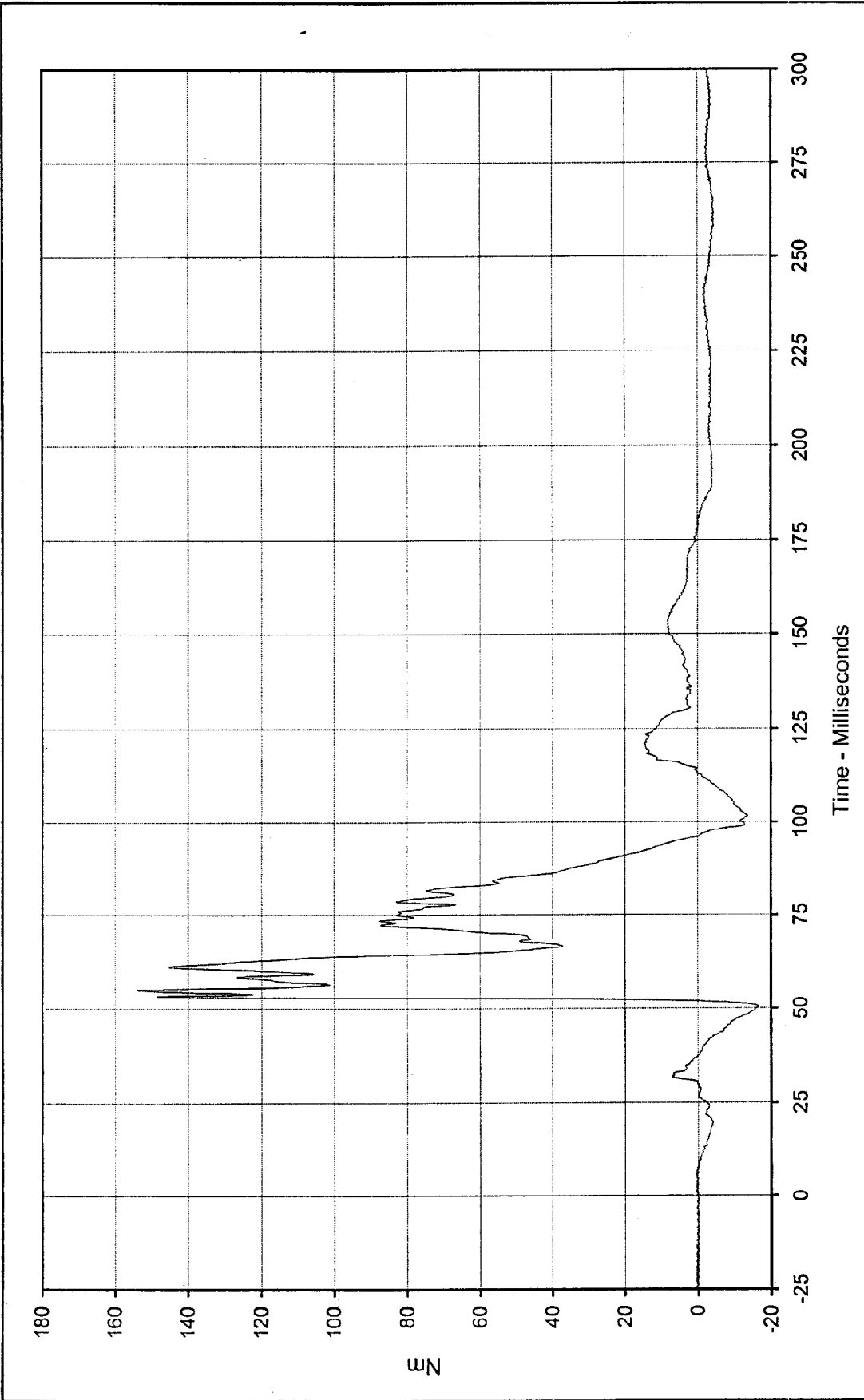
Date of Test: 1/26/99

Curve Number: FIL-076

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Test Vehicle: 1999 Ford Expedition XLT SUV



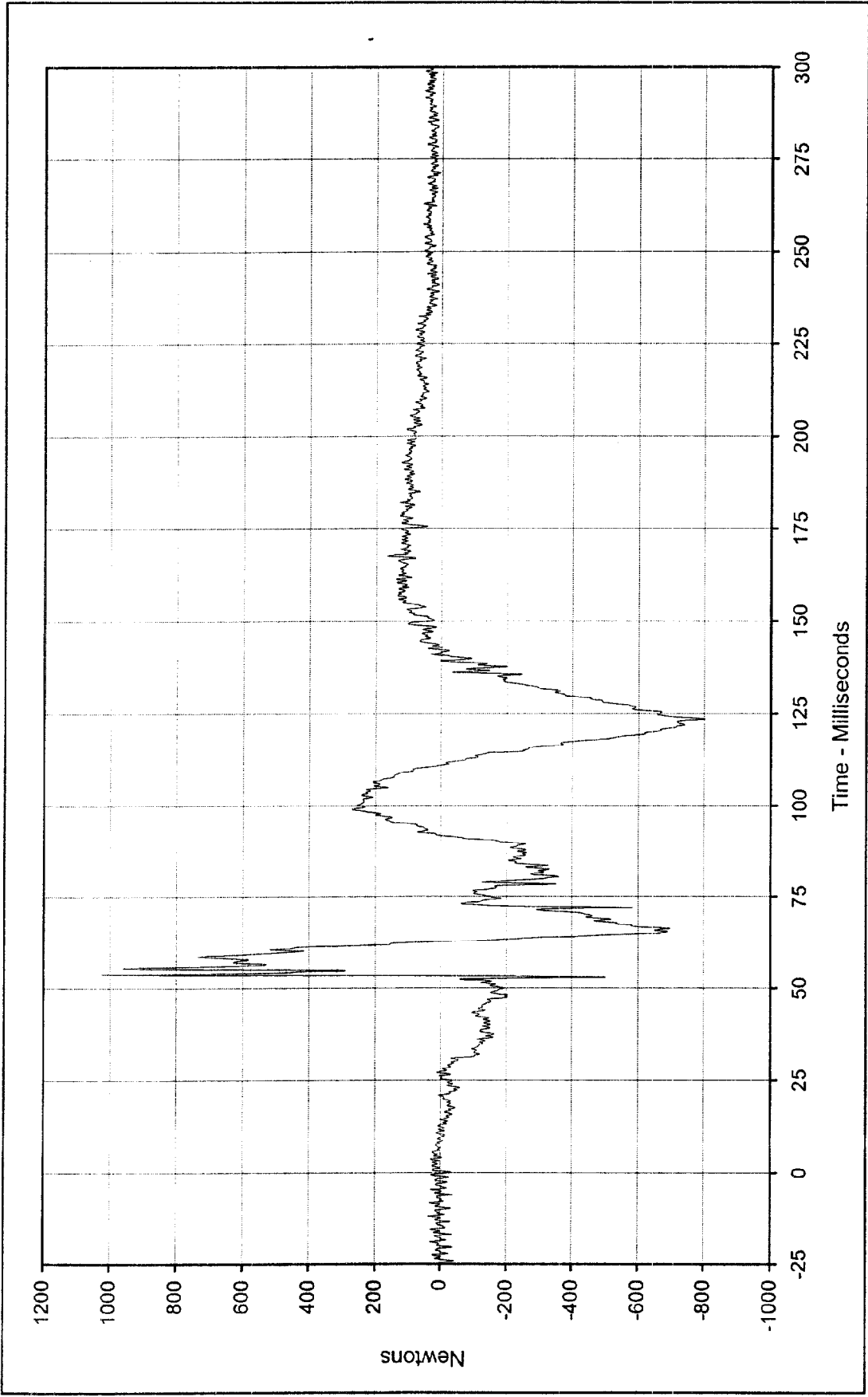


Curve Description: Passenger Right Lower Tibia Moment Y
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Maximum Value: 154.0 at 55.0 Milliseconds
 Minimum Value: -16.7 at 50.5 Milliseconds

SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-077

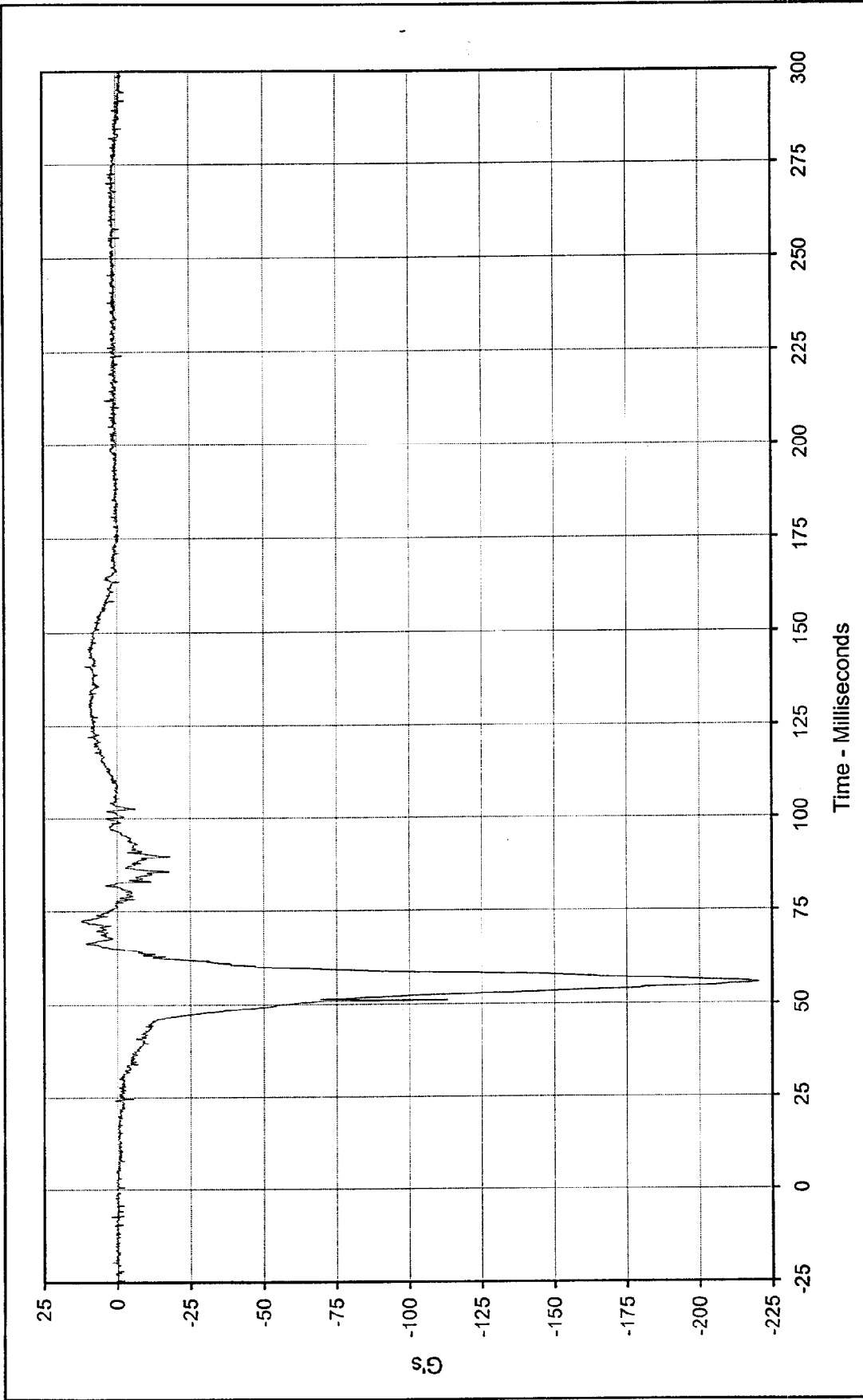




Curve Description: Passenger Right lower Tibia Force Z
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 1027.8 at 53.7 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -802.5 at 123.5 Milliseconds

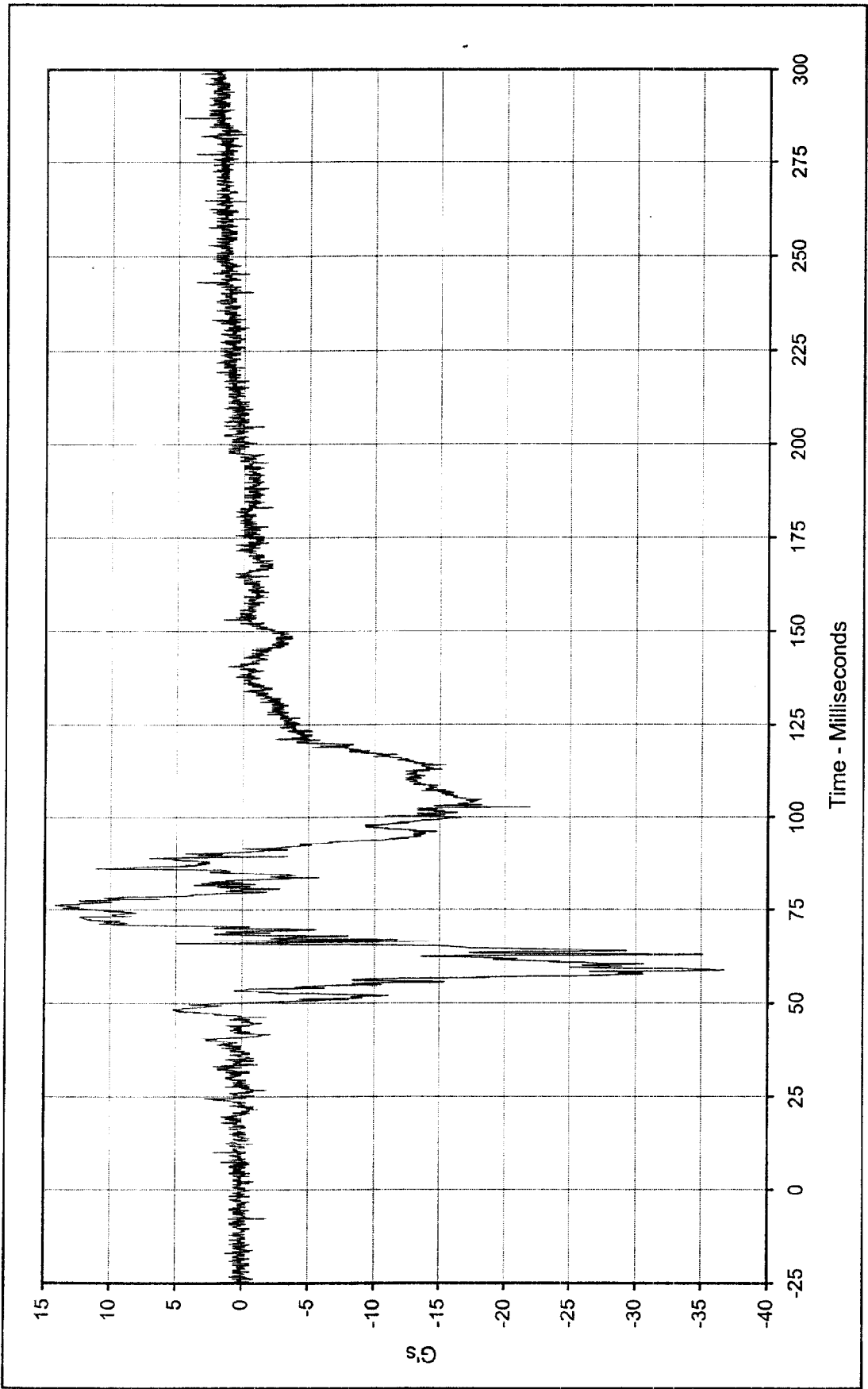


SAE Filter Class: 600
 Date of Test: 1/26/99
 Curve Number: FIL-078



Curve Description: Passenger Left Foot Aft X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 12.4 at 72.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -220.6 at 55.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-079

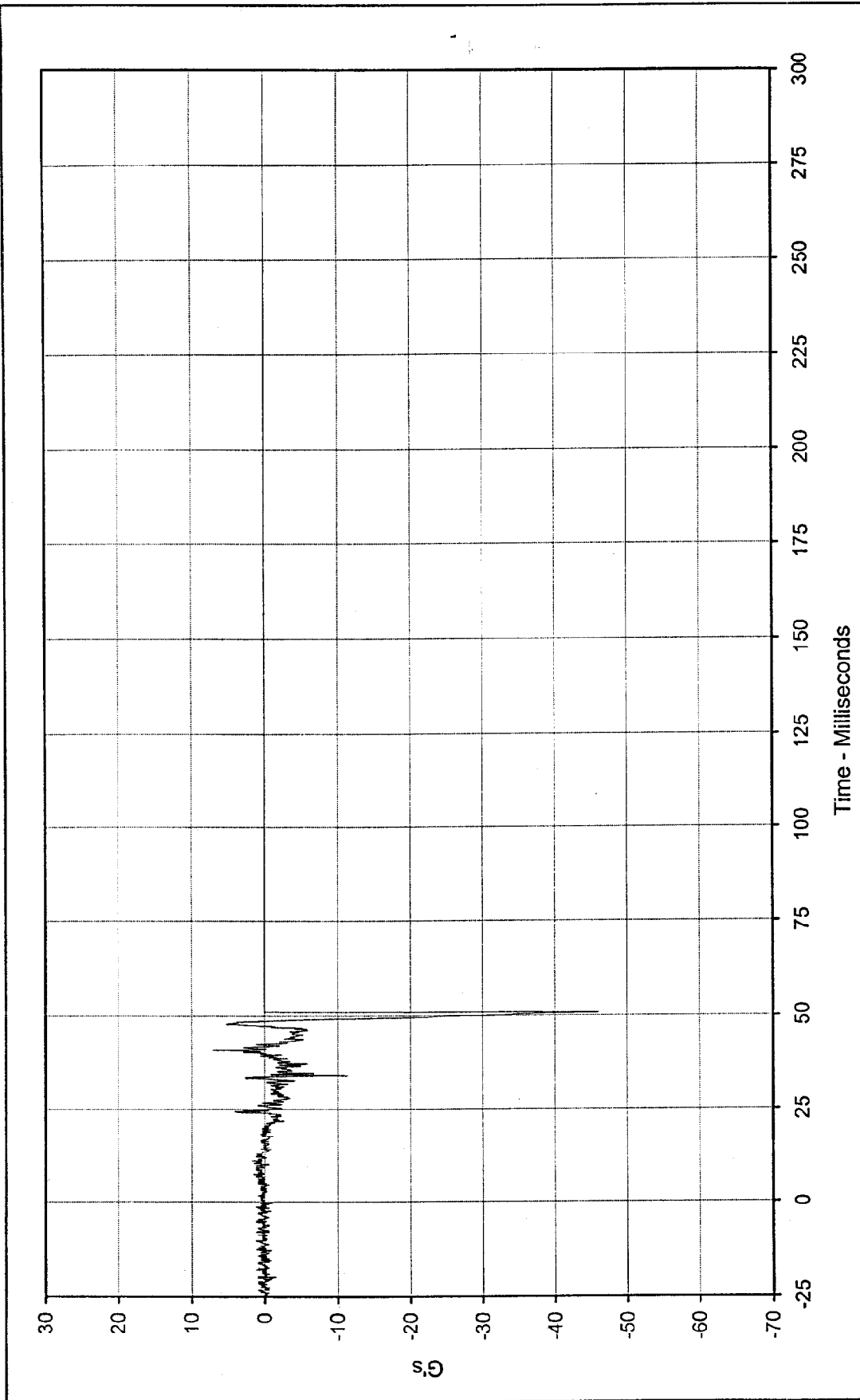




Curve Description: Passenger Left Foot Aft Z
 Maximum Value: 14.2 at 76.1 Milliseconds
 Minimum Value: -36.7 at 58.6 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-080

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV



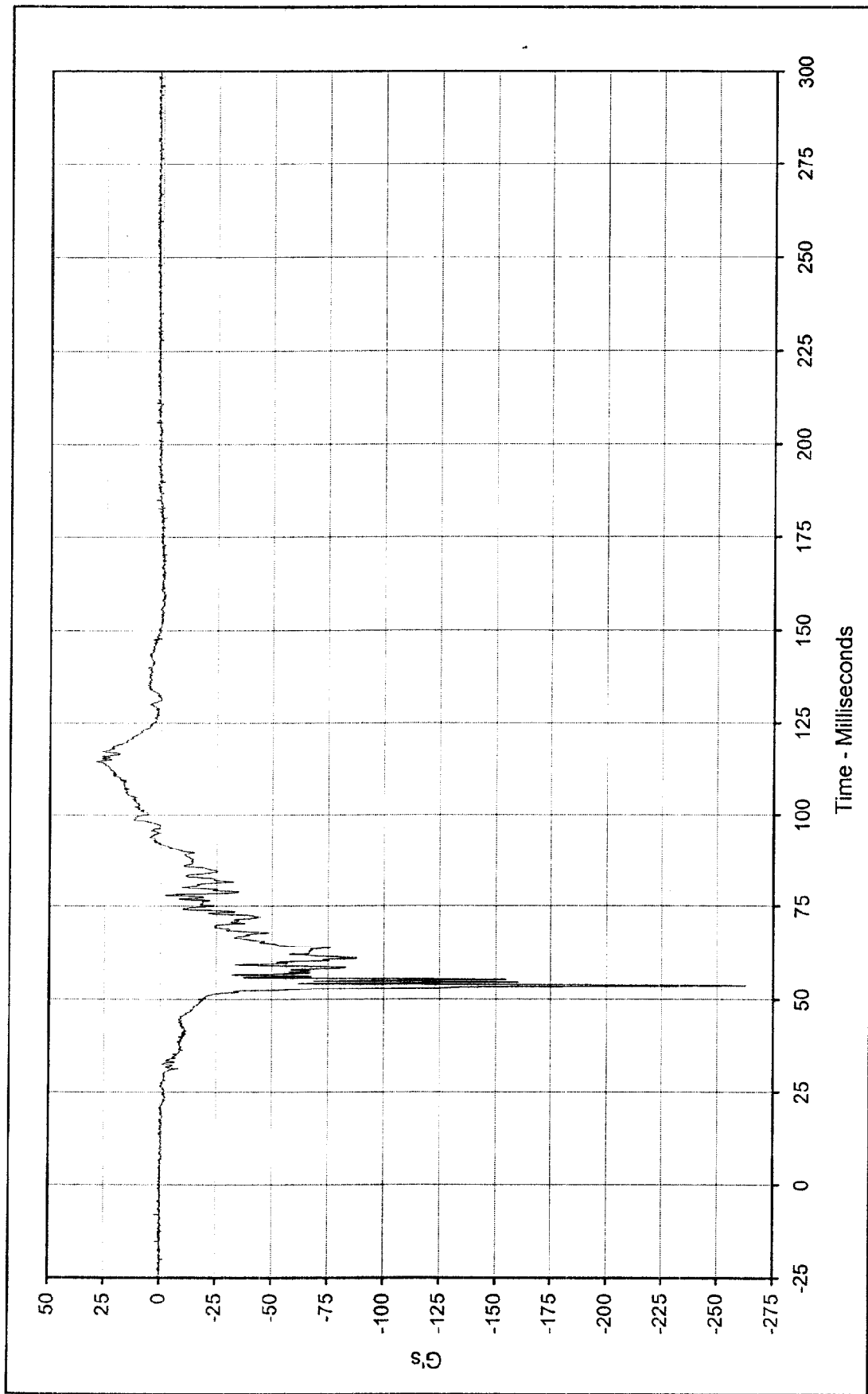


Curve Description: Passenger Left Foot Fore Z * Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 7.0 at 40.6 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -46.1 at 50.7 Milliseconds



SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-081

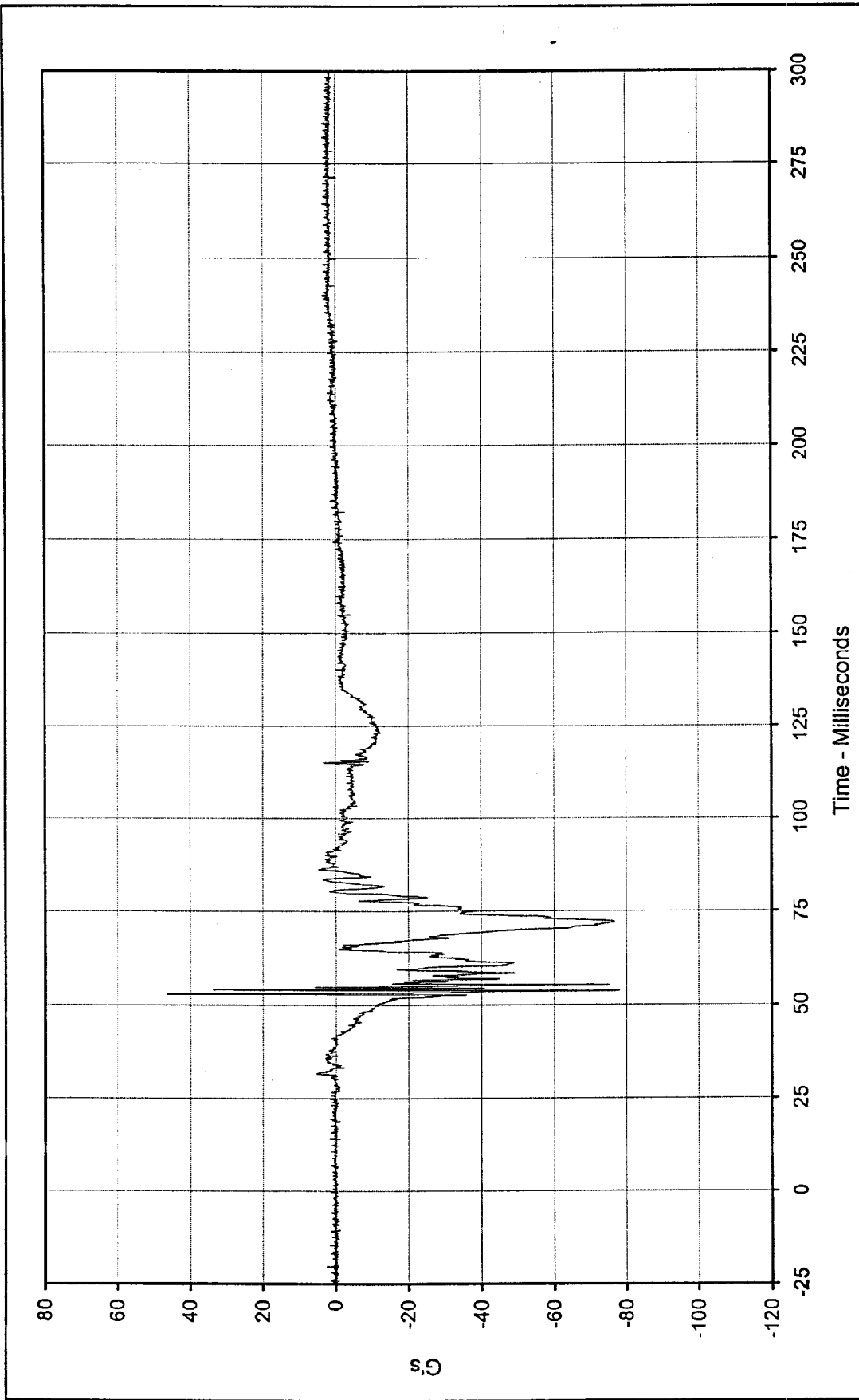
* Channel Failed at 51.0 Msec.



Curve Description: Passenger Right Foot Aft X Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 29.3 at 114.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -262.5 at 53.7 Milliseconds

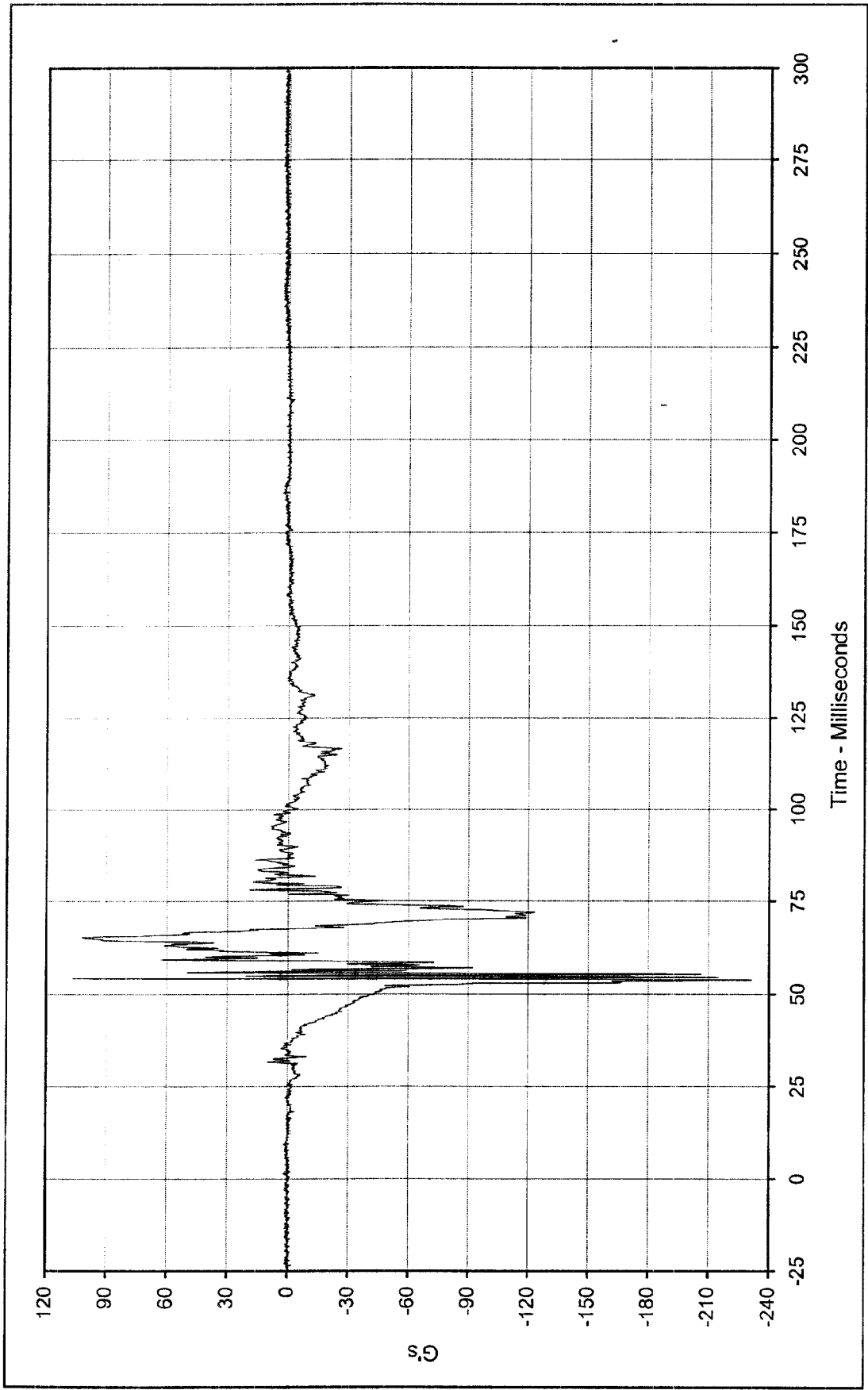


SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-082



Curve Description: Passenger Right Foot Aft Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 46.4 at 53.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -77.9 at 53.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/26/99
 Curve Number: FIL-083





Curve Description: Passenger Right Foot Fore Z Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 106.7 at 54.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

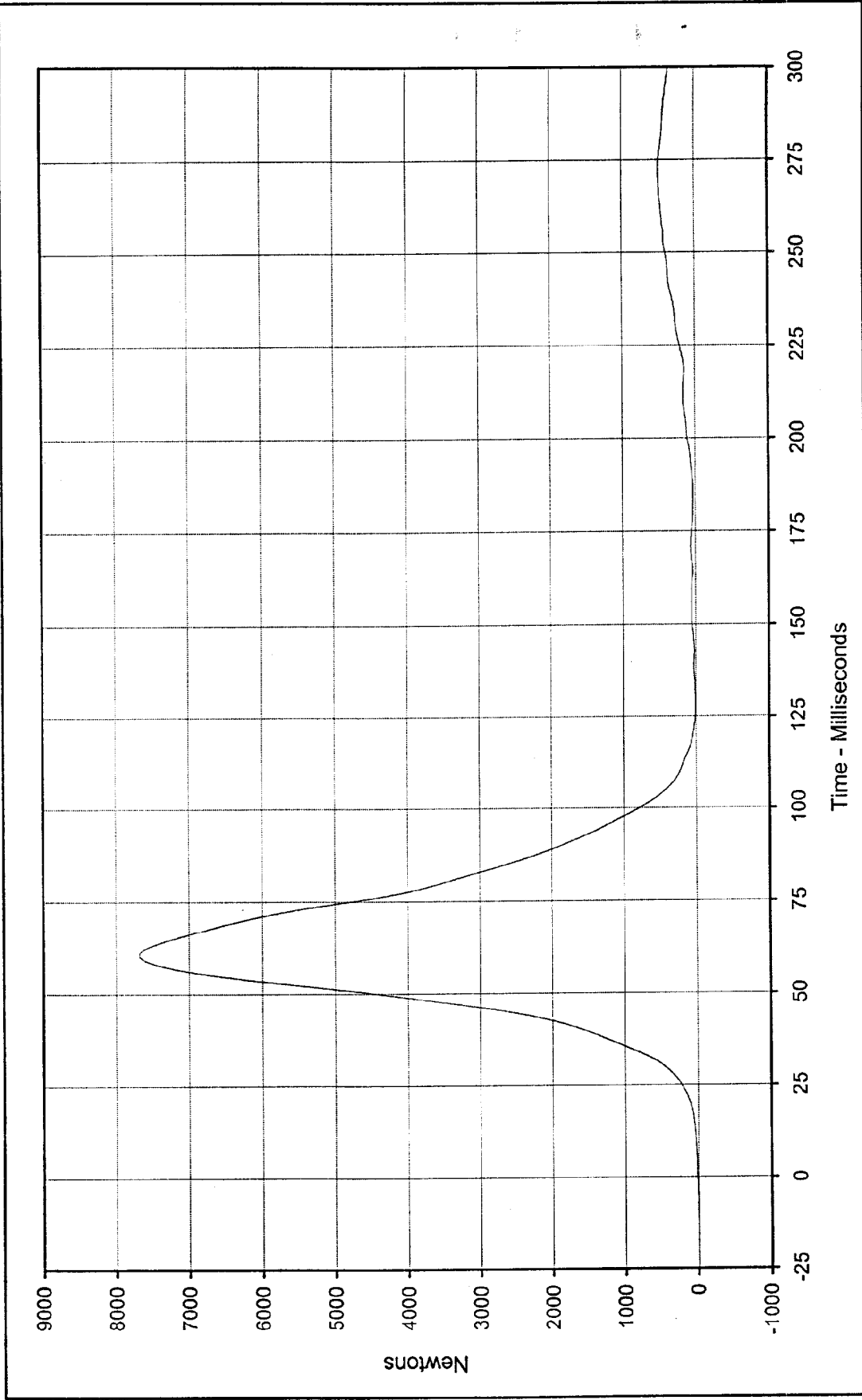
Minimum Value: -231.5 at 53.7 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/26/99

Curve Number: FIL-084

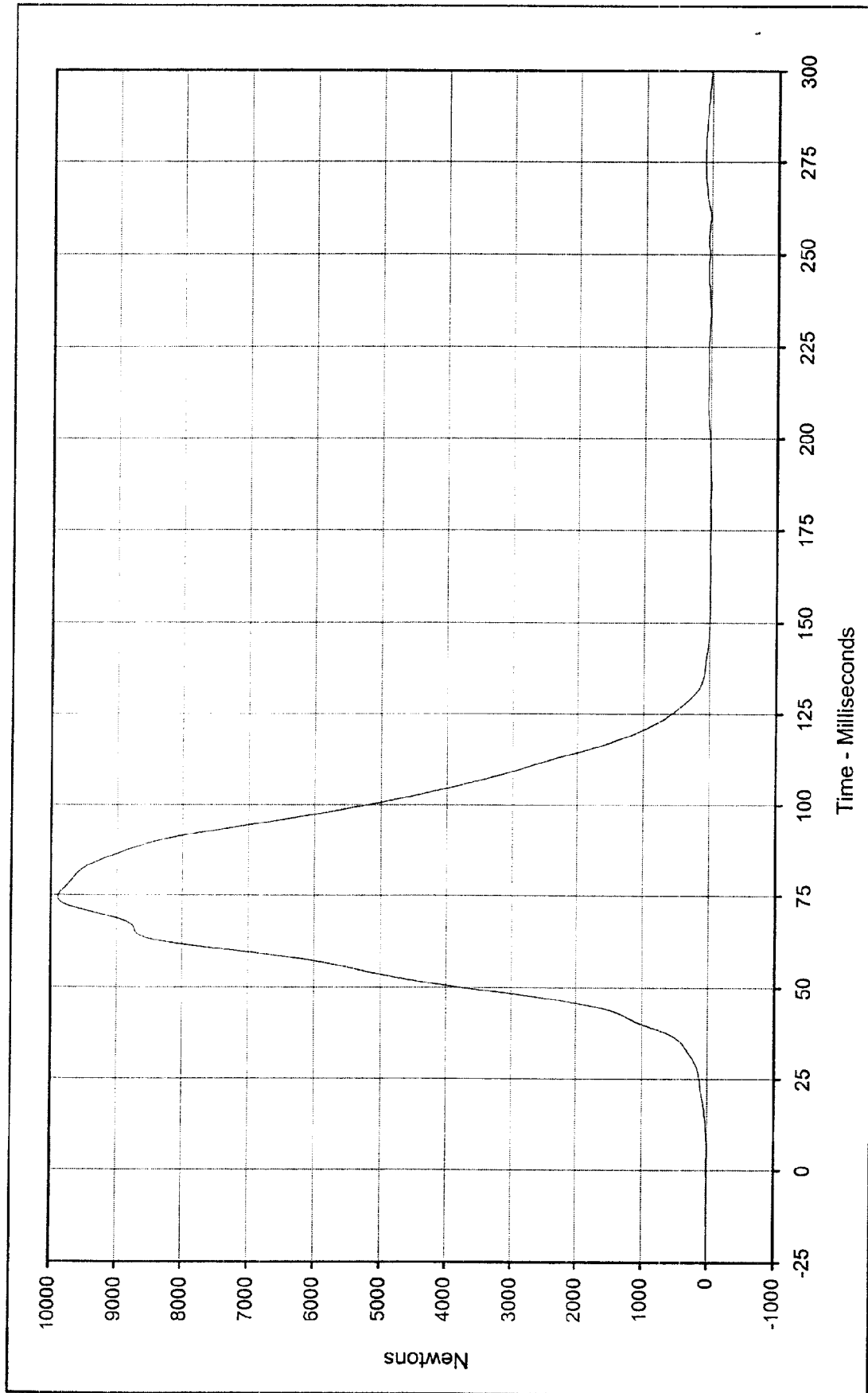




Curve Description: Passenger Lap Belt Force
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 7682.8 at 60.6 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 6.1 at 127.7 Milliseconds



SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-085



Curve Description: Passenger Shoulder Belt Force Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 9900.2 at 74.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

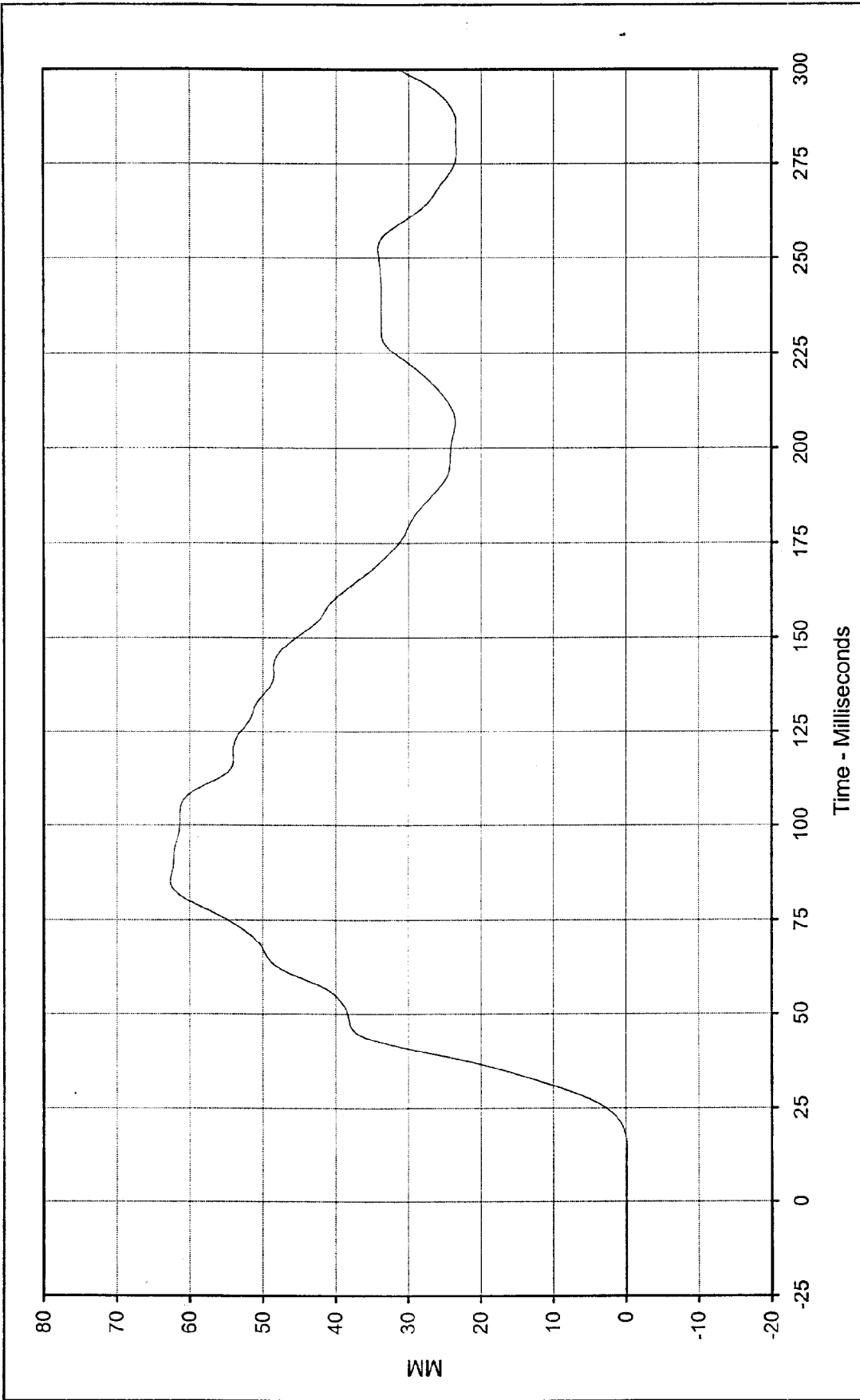
Minimum Value: -11.3 at 177.1 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

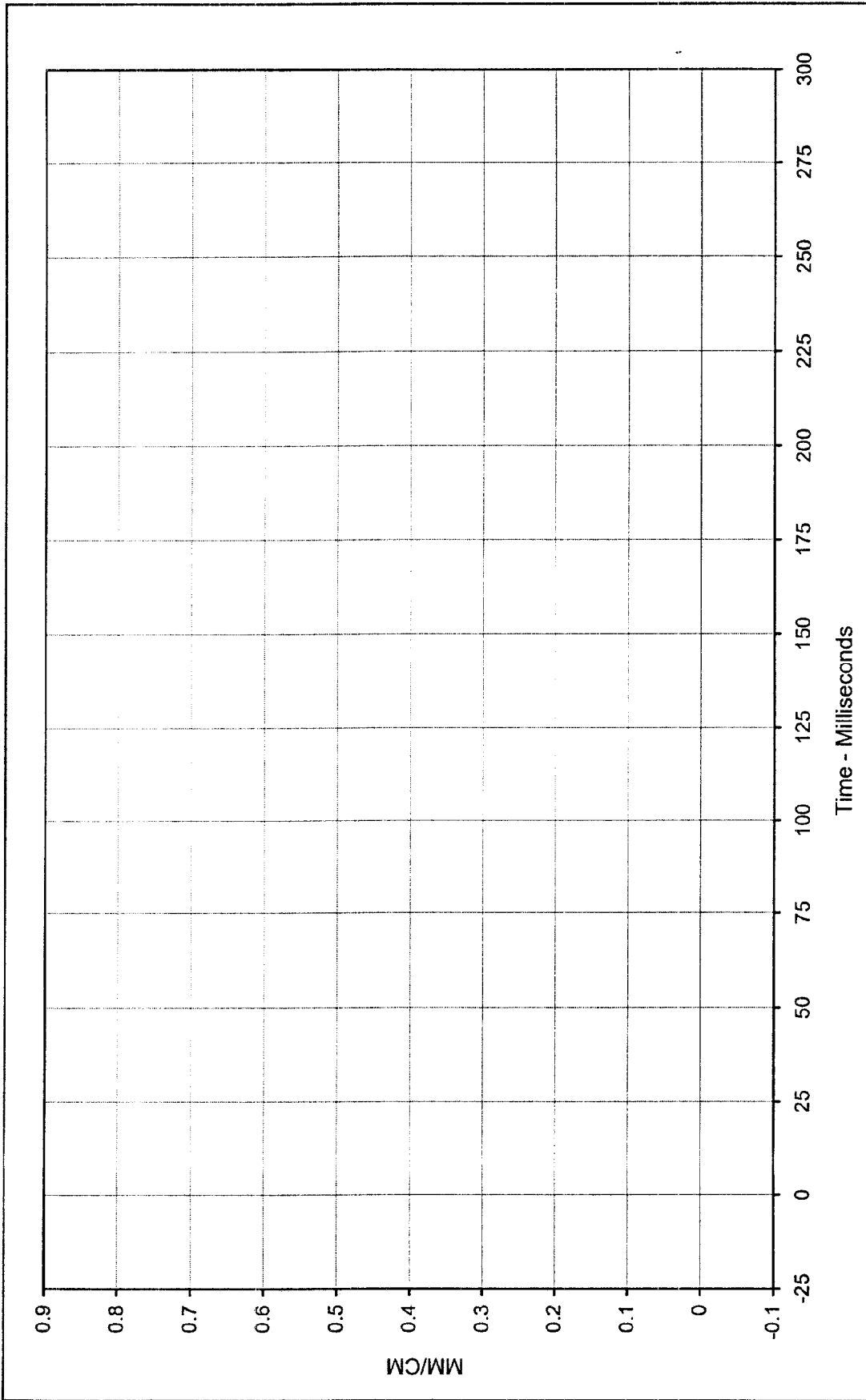
Curve Number: FIL-086





Curve Description: Passenger Shoulder Belt Pullout Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 62.6 at 85.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -0.2 at 14.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-087



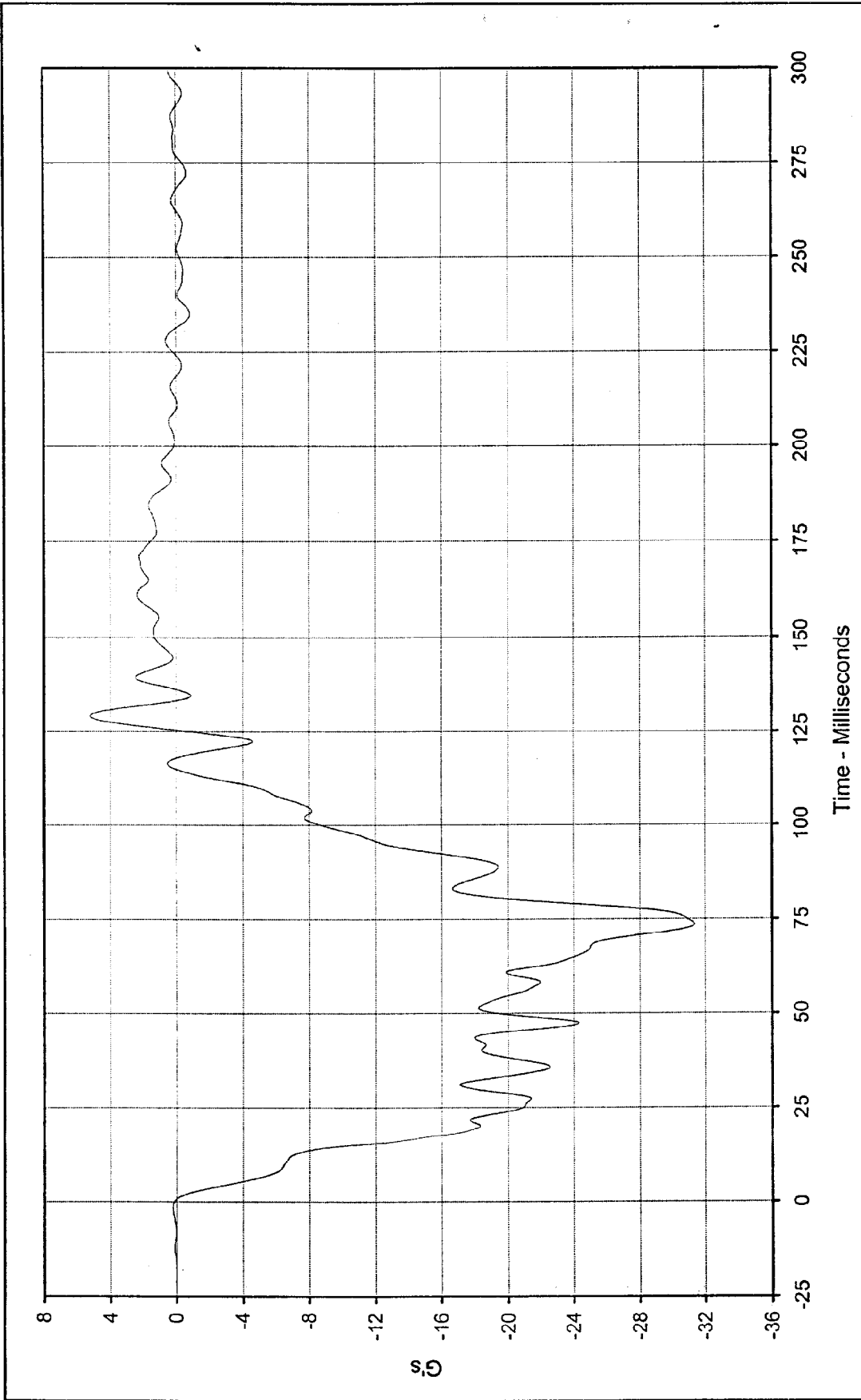


Curve Description: Passenger Shoulder Belt Elongation * Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 0.00 at 0.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.00 at 0.0 Milliseconds



SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-088

* Channel Failed, No Data



Curve Description: Vehicle Left Rear Primary Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 5.2 at 129.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

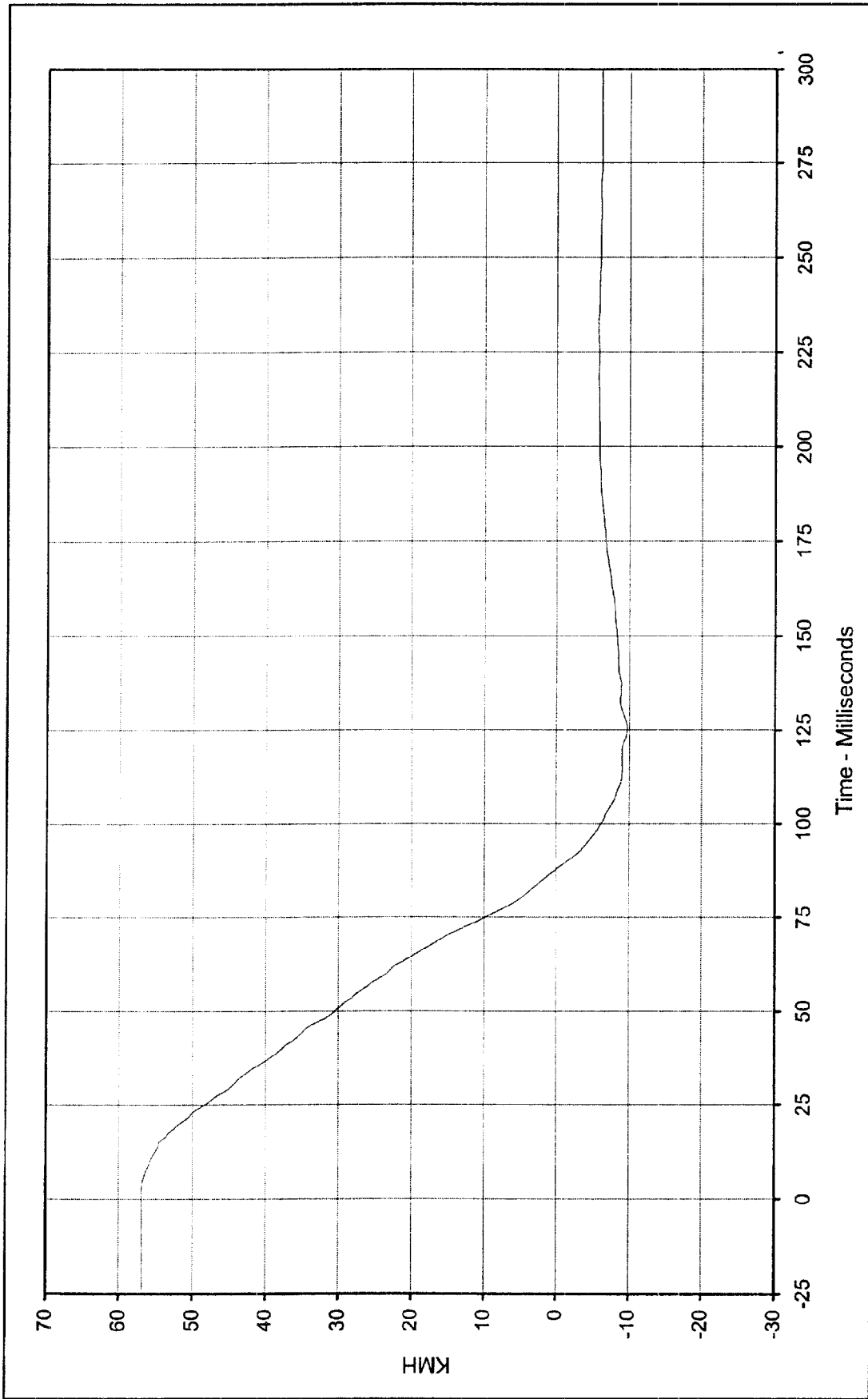
Minimum Value: -31.3 at 73.5 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-089

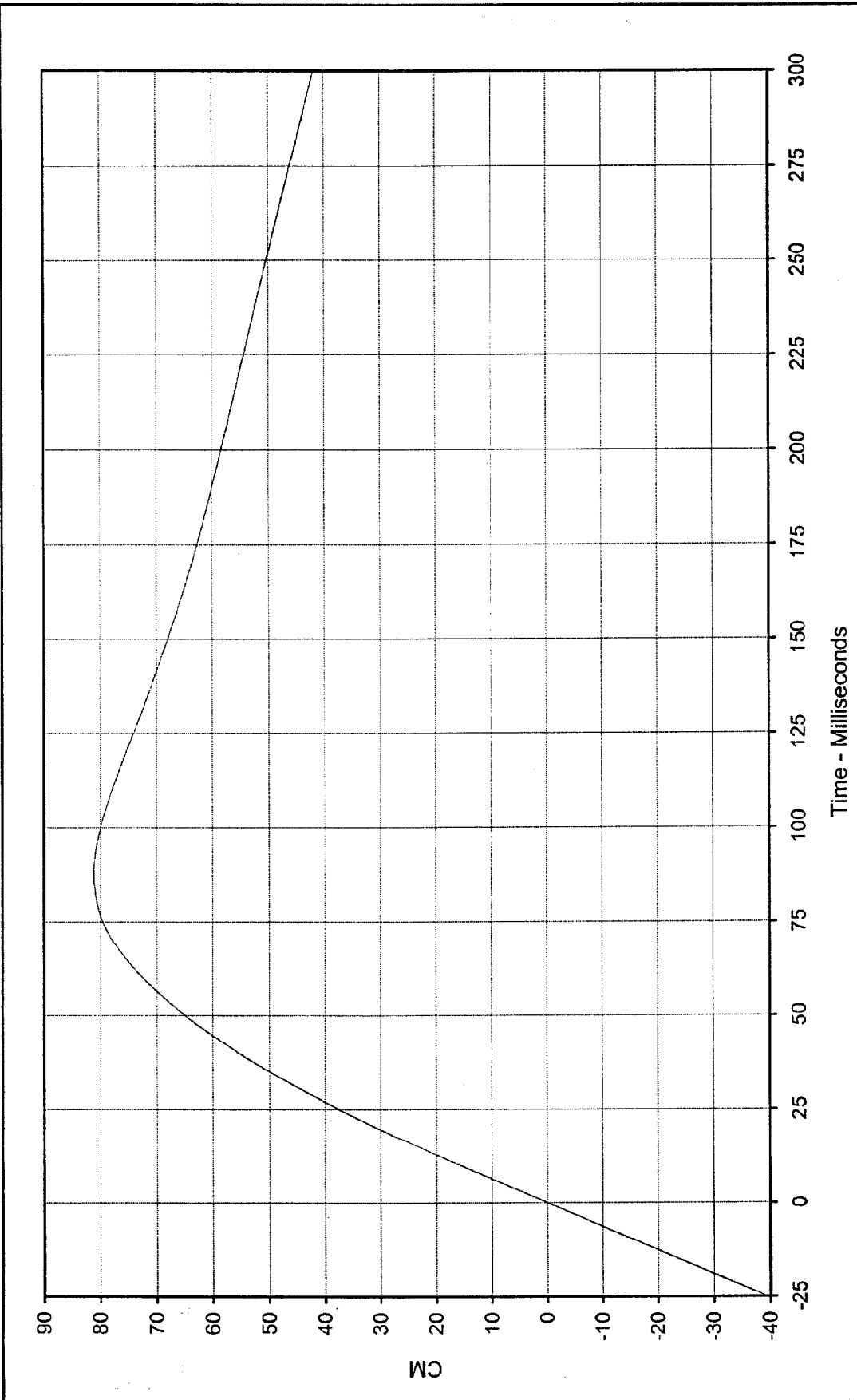




Curve Description: Vehicle Left Rear Primary Velocity
 Maximum Value: 56.9 at 1.4 Milliseconds
 Minimum Value: -9.7 at 125.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-089

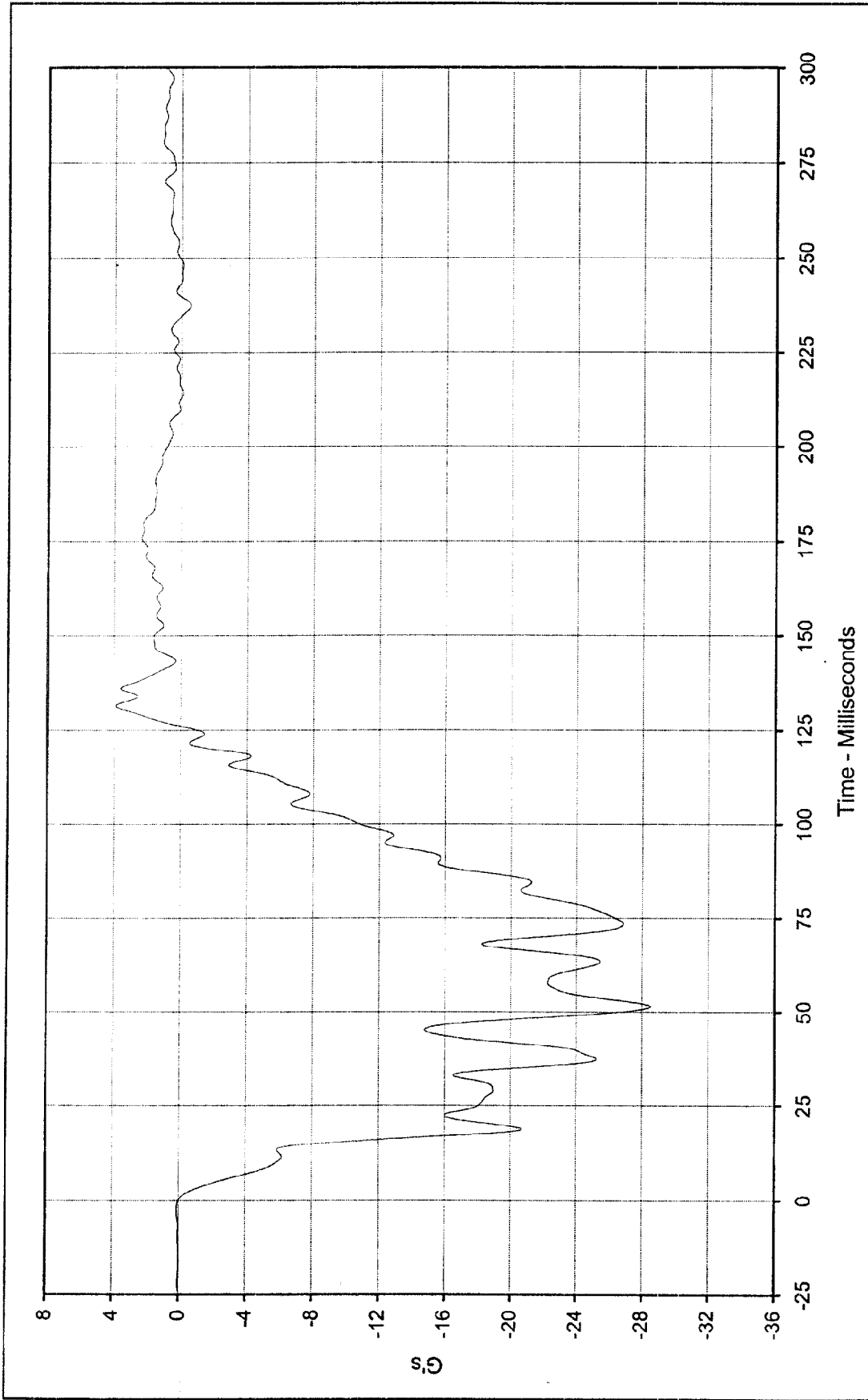
Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Vehicle Left Rear Primary Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 81.1 at 87.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-089

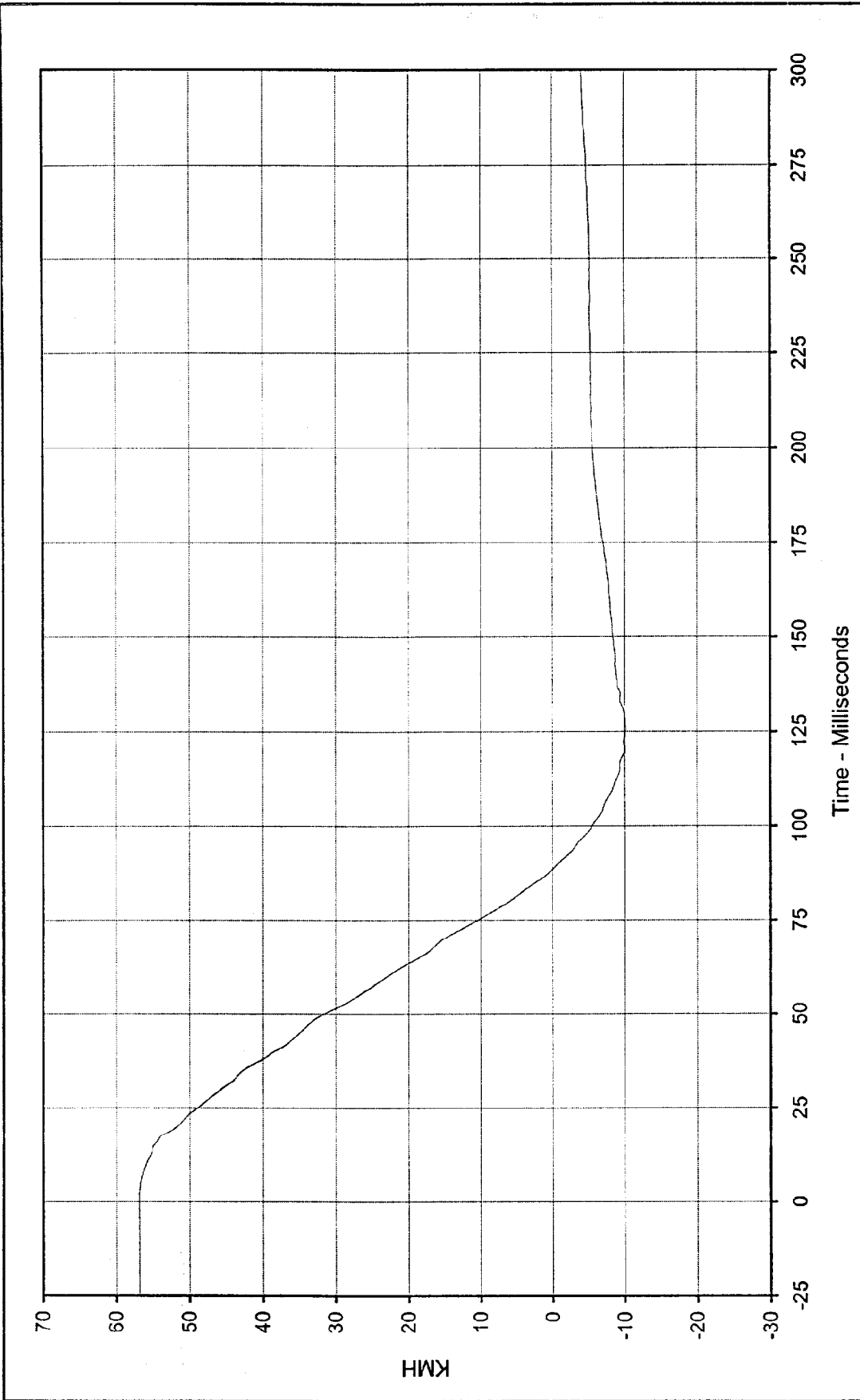




Curve Description: Vehicle Right Rear Primary Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 3.9 at 131.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -28.5 at 51.4 Milliseconds



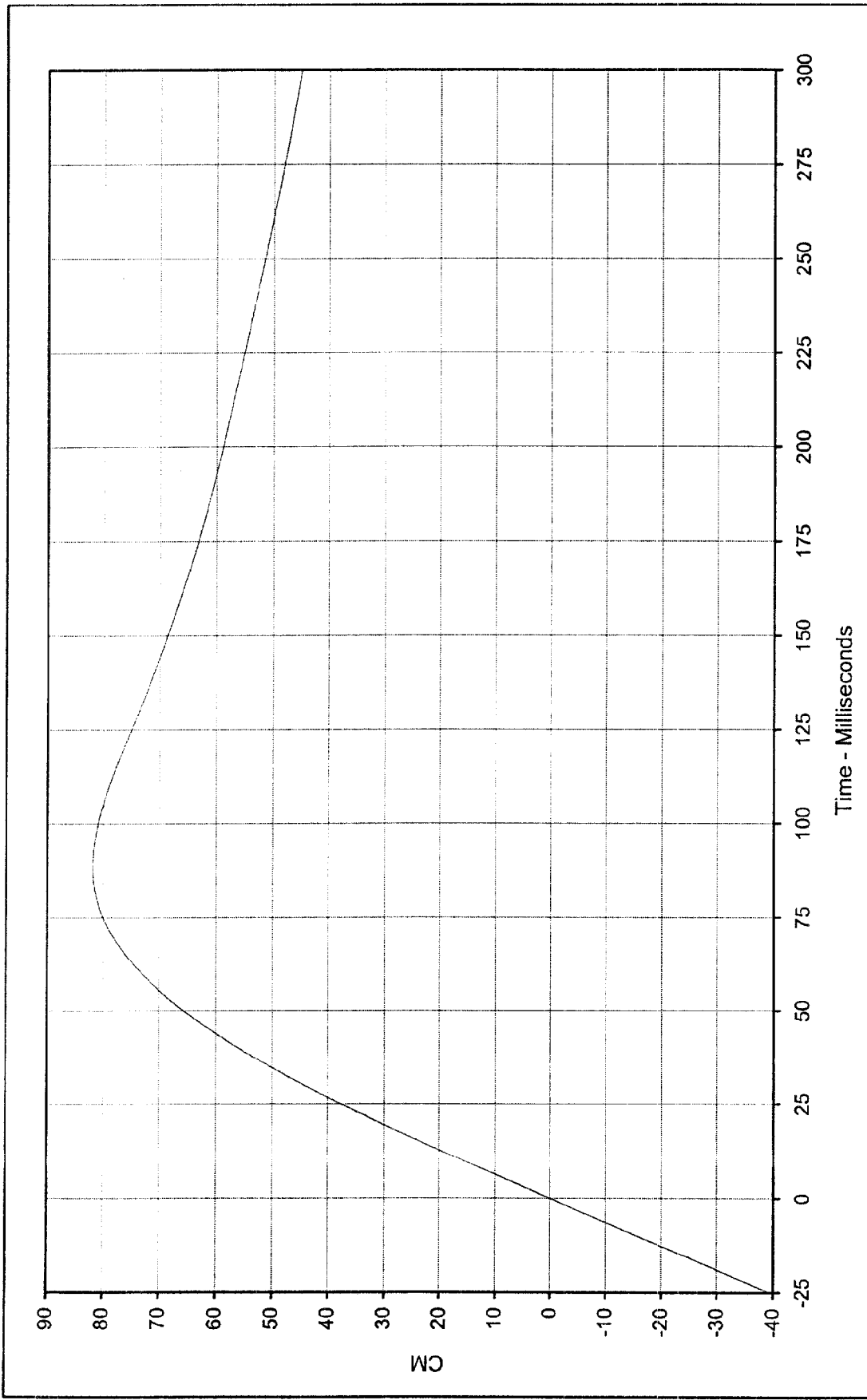
SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-090



Curve Description: Vehicle Right Rear Primary Velocity
 Maximum Value: 56.9 at 0.6 Milliseconds
 Minimum Value: -10.2 at 125.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-090

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

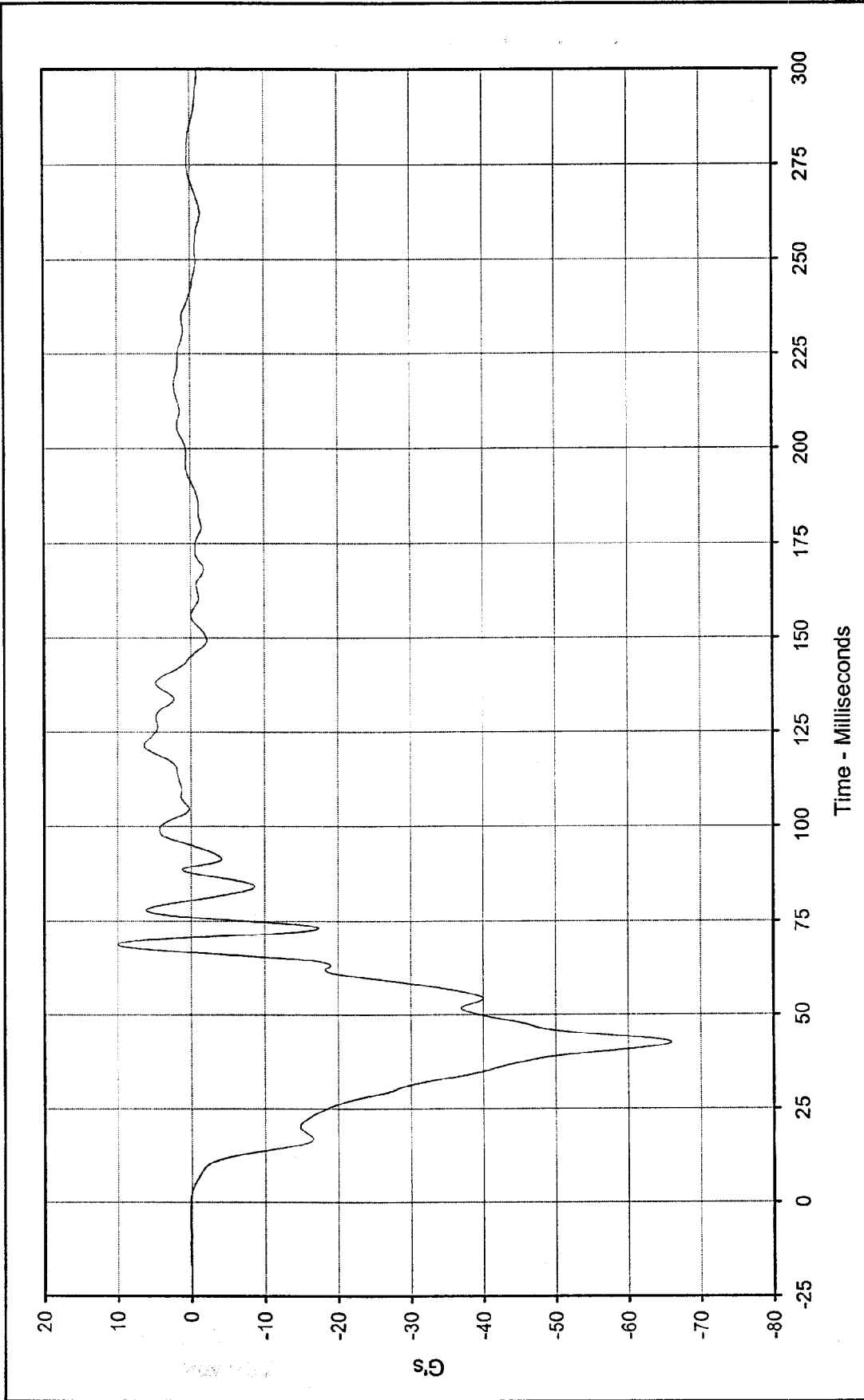




Curve Description: Vehicle Right Rear Primary Displ.
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 81.9 at 88.5 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds



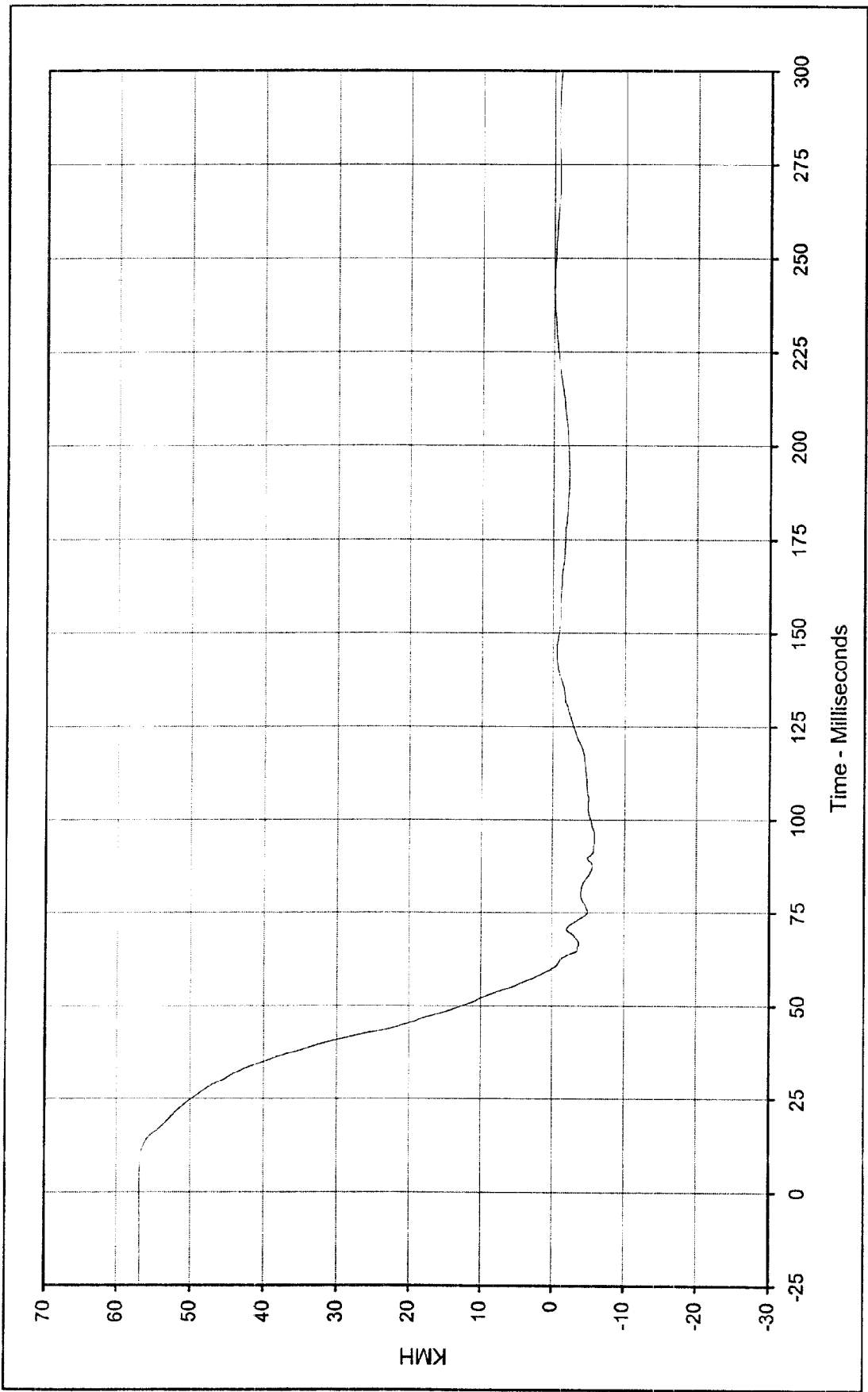
SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-090



Curve Description: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Program: 1999 Ford Expedition XLT SUV
 Test Vehicle: 1999 Ford Expedition XLT SUV

Curve Description: Vehicle Engine Top
 Maximum Value: 10.0 at 68.6 Milliseconds
 Minimum Value: -66.0 at 42.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-091

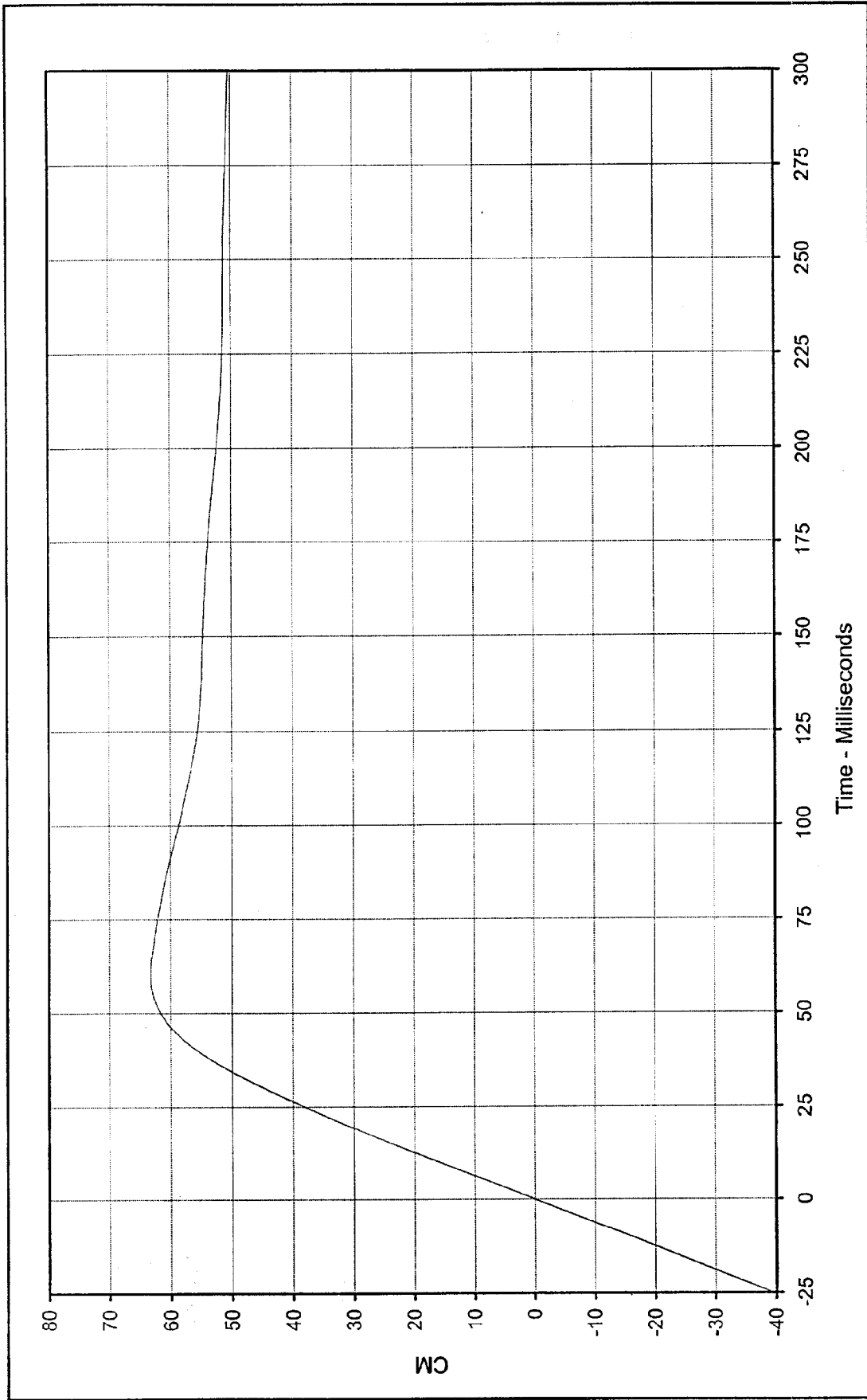




Curve Description: Vehicle Engine Top Velocity
 Maximum Value: 56.9 at 2.4 Milliseconds
 Minimum Value: -5.9 at 96.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-091

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: 1999 NHTSA 35 mph NCAP Test Program: No.: MX0200

Maximum Value: 63.3 at 60.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

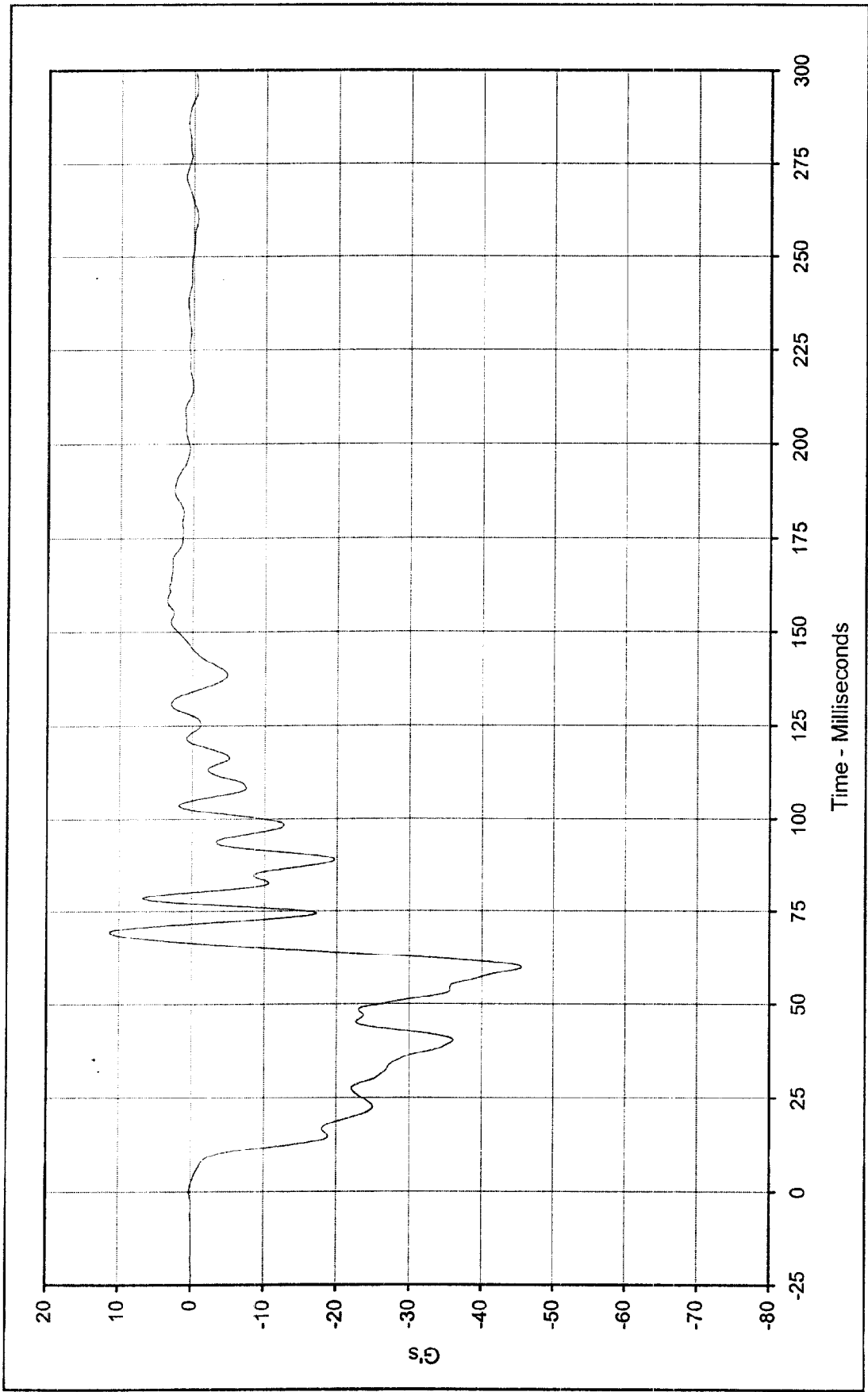
Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 1/26/99

Curve Number: IN2-091

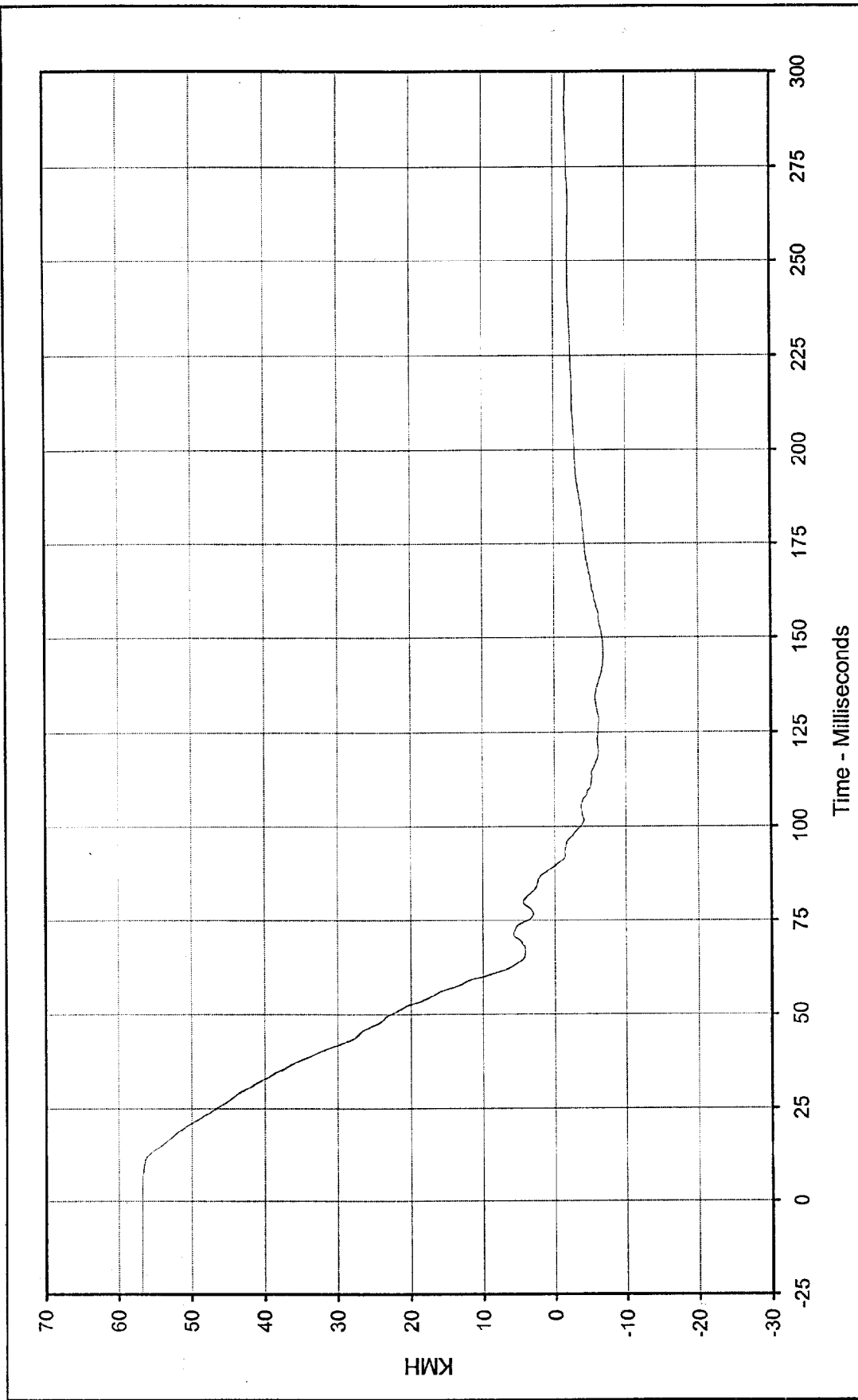




Curve Description: Vehicle Engine Bottom
 Maximum Value: 11.3 at 69.3 Milliseconds
 Minimum Value: -45.6 at 59.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-092

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

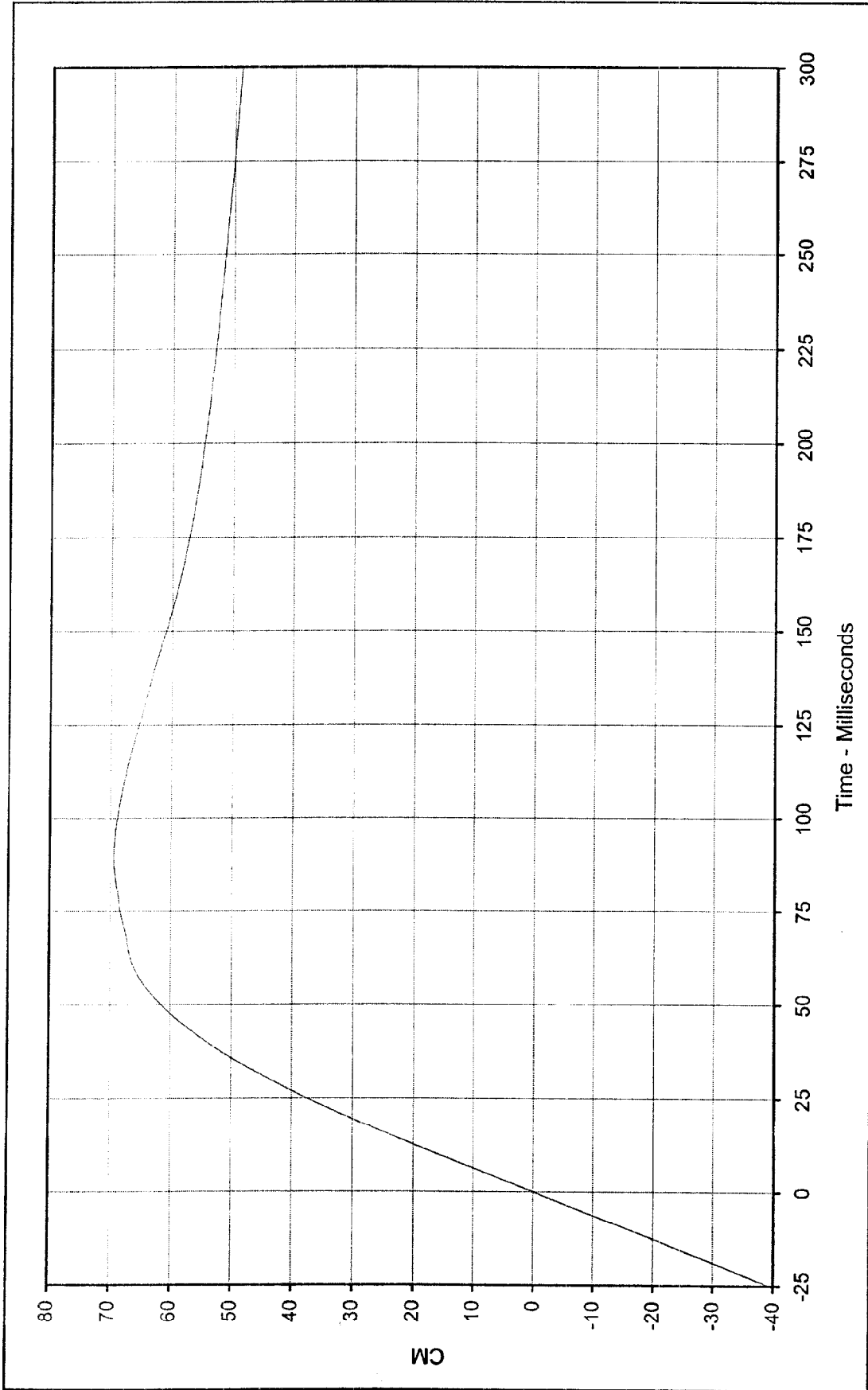




Curve Description: Vehicle Engine Bottom Velocity
 Maximum Value: 56.8 at 2.0 Milliseconds
 Minimum Value: -6.9 at 145.4 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: INT-092

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

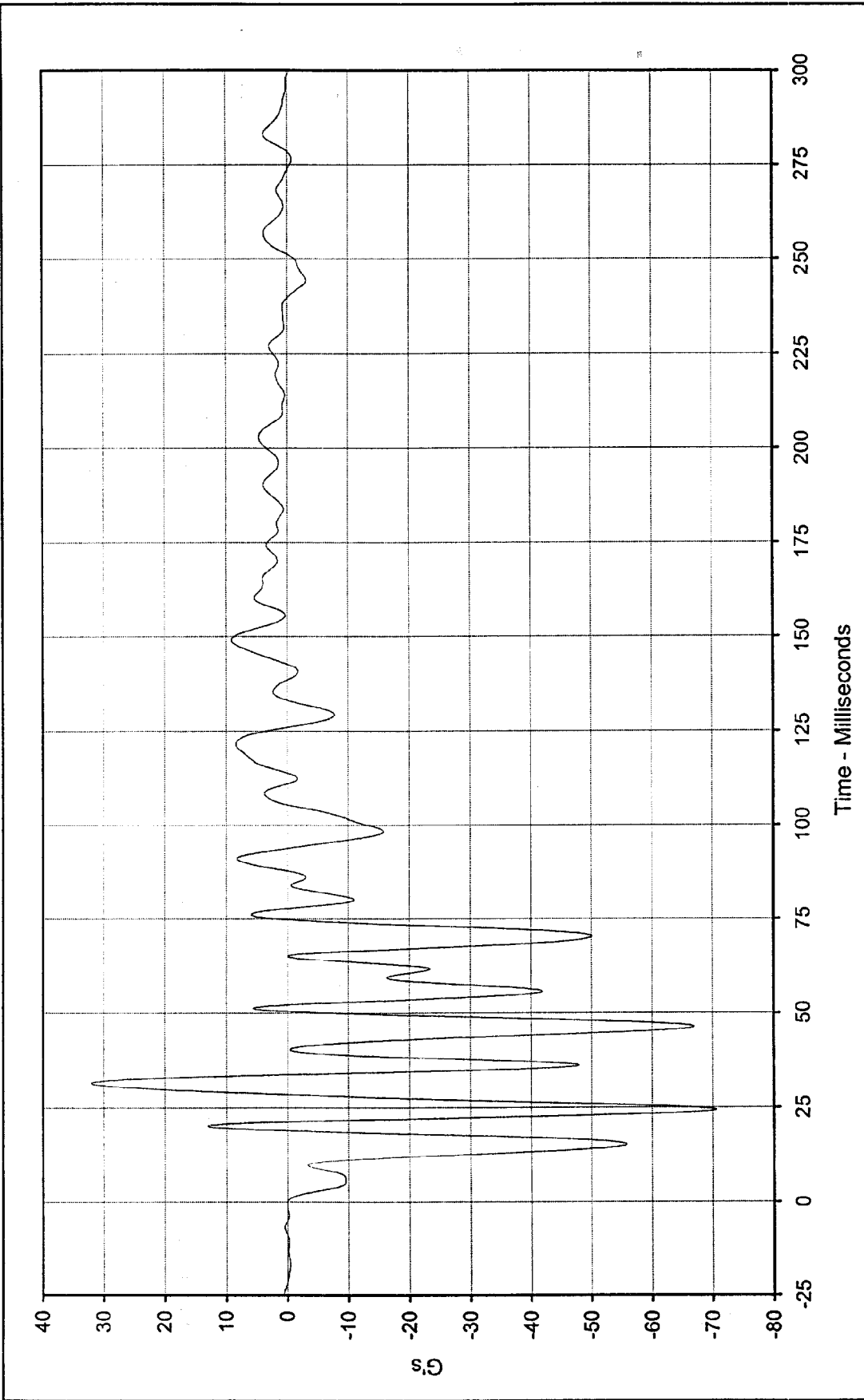




Curve Description: Vehicle Engine Bottom Displ.
 Maximum Value: 69.5 at 89.3 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-092

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

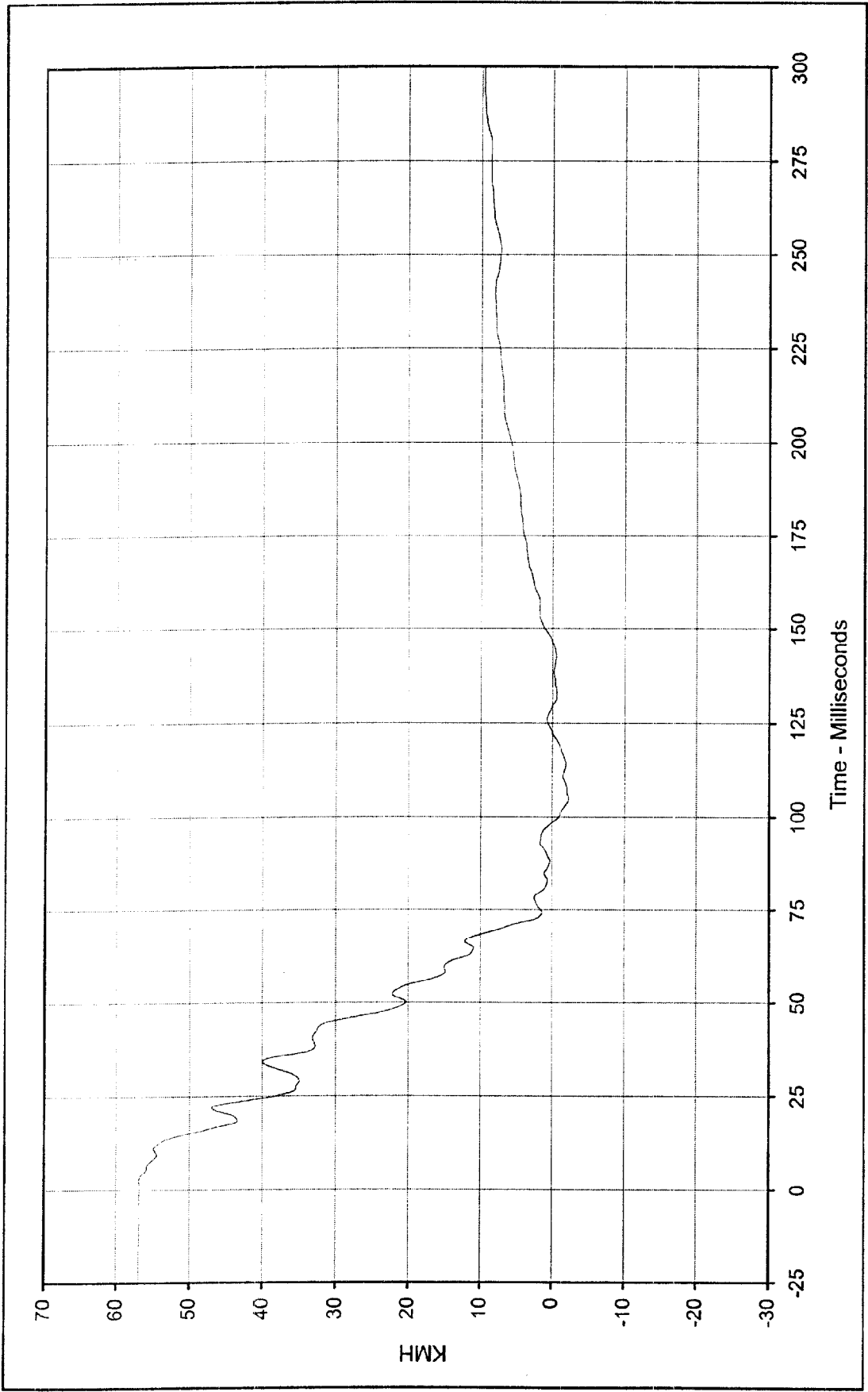




Curve Description: Vehicle Left Brake Caliper
 Maximum Value: 32.1 at 31.4 Milliseconds
 Minimum Value: -70.6 at 24.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-093

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

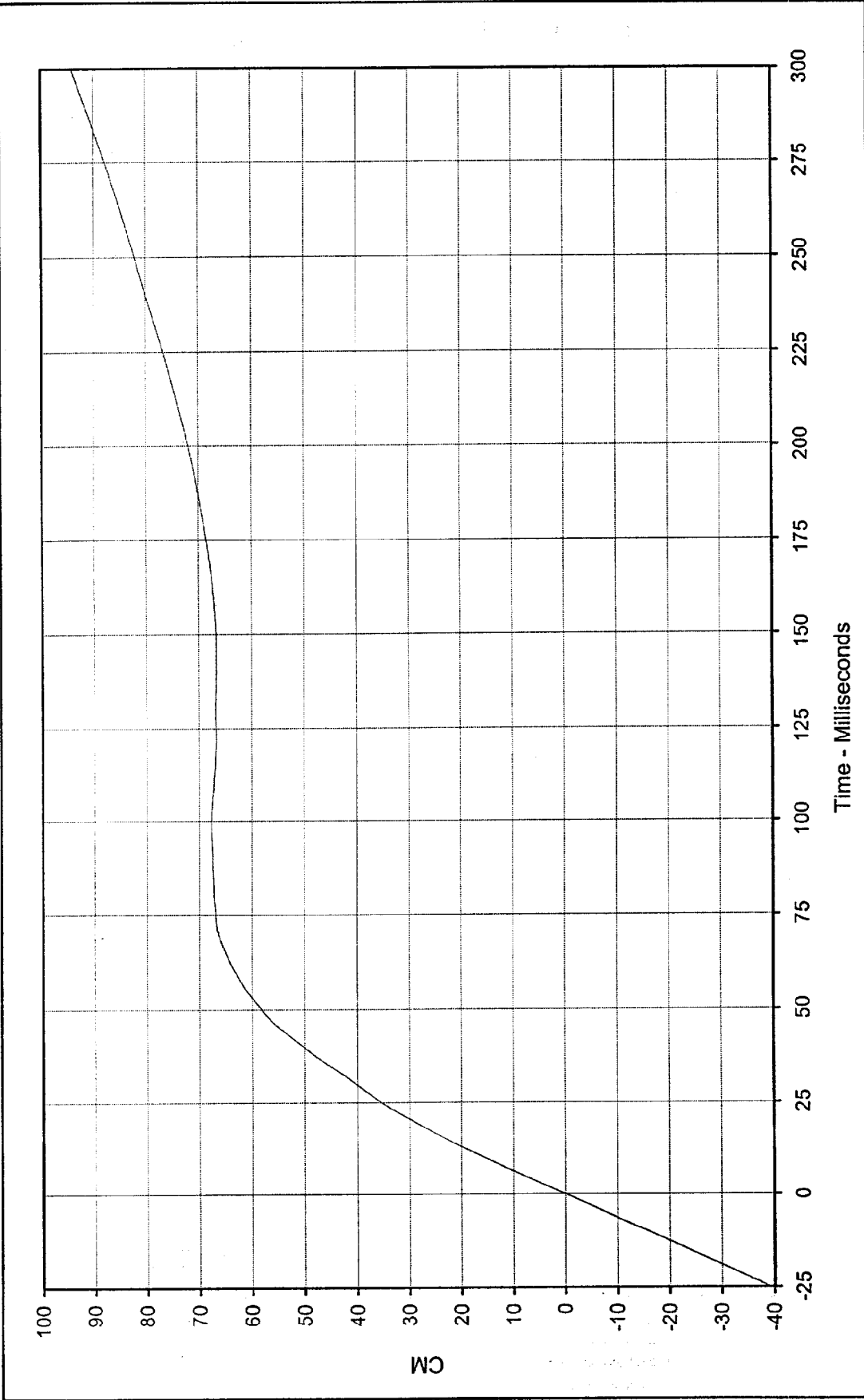




Curve Description: Vehicle Left Brake Caliper Velocity
 Maximum Value: 56.9 at 2.6 Milliseconds
 Minimum Value: -2.2 at 104.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-093

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

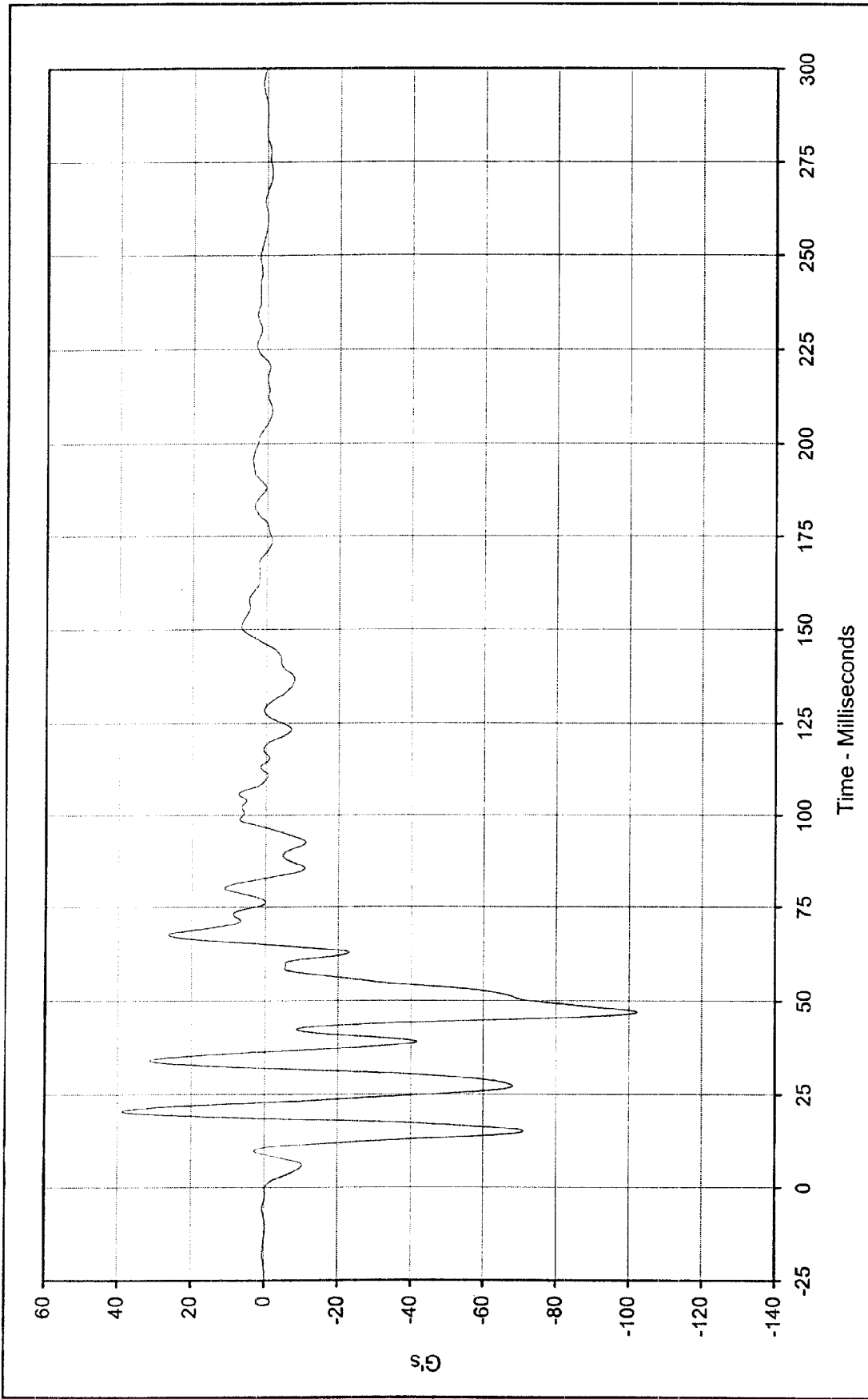




Curve Description: Vehicle Left Brake Caliper Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 94.1 at 299.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds



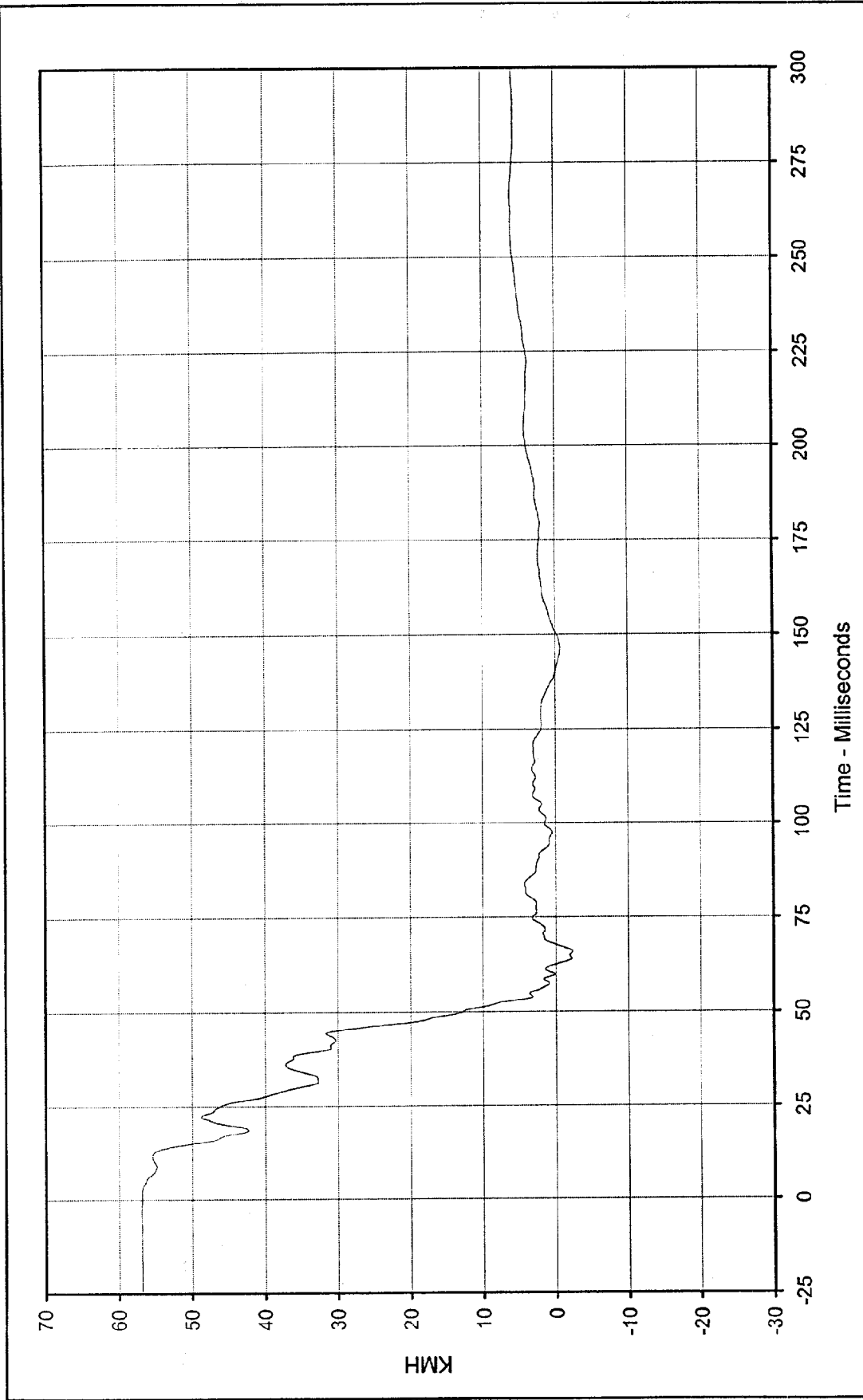
SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-093



Curve Description: Vehicle Right Brake Caliper
 Maximum Value: 38.9 at 20.5 Milliseconds
 Minimum Value: -102.3 at 47.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-094

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

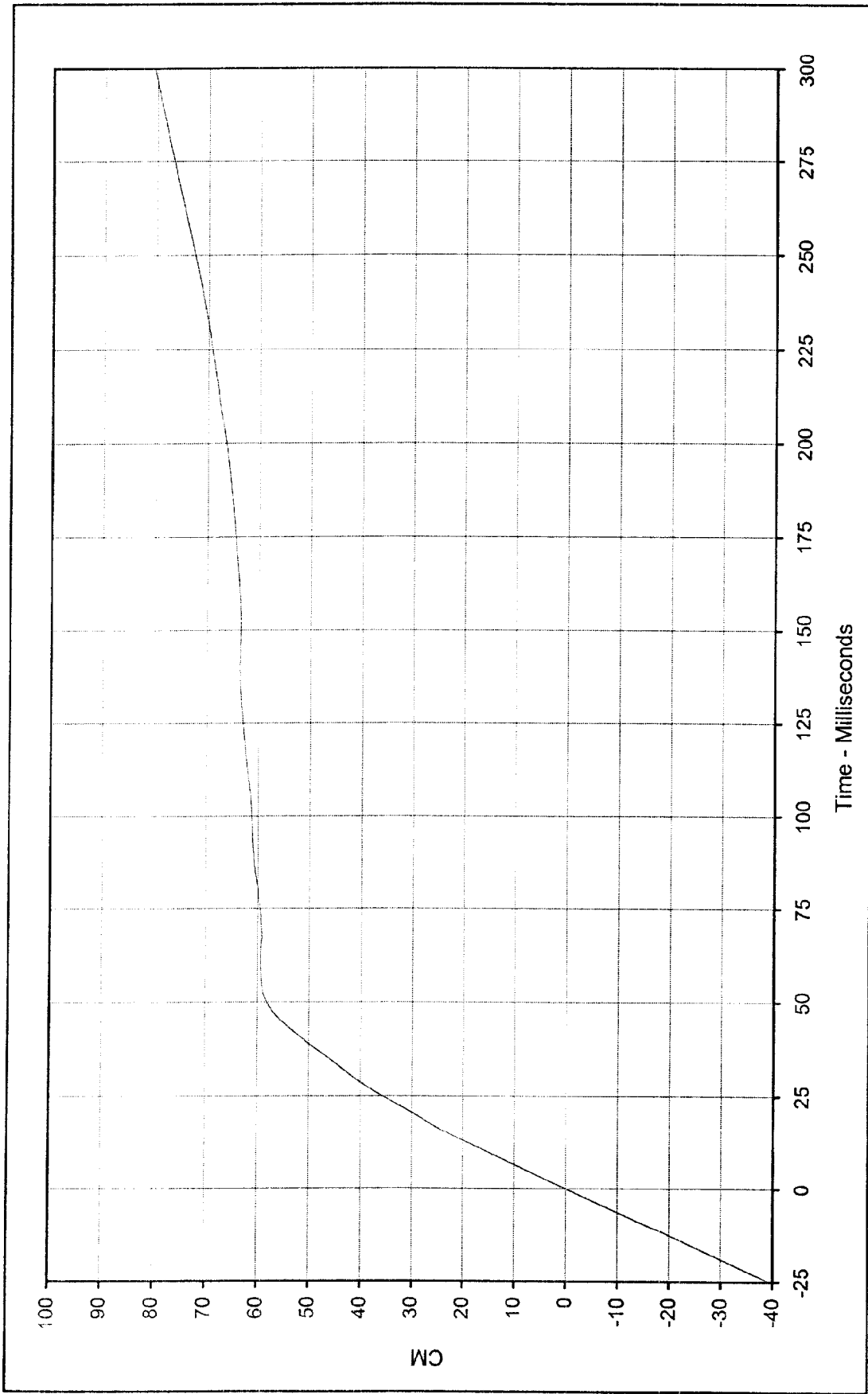




Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Curve Description: Vehicle Right Brake Caliper Velocity
 Maximum Value: 56.9 at 0.9 Milliseconds
 Minimum Value: -2.3 at 65.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-094

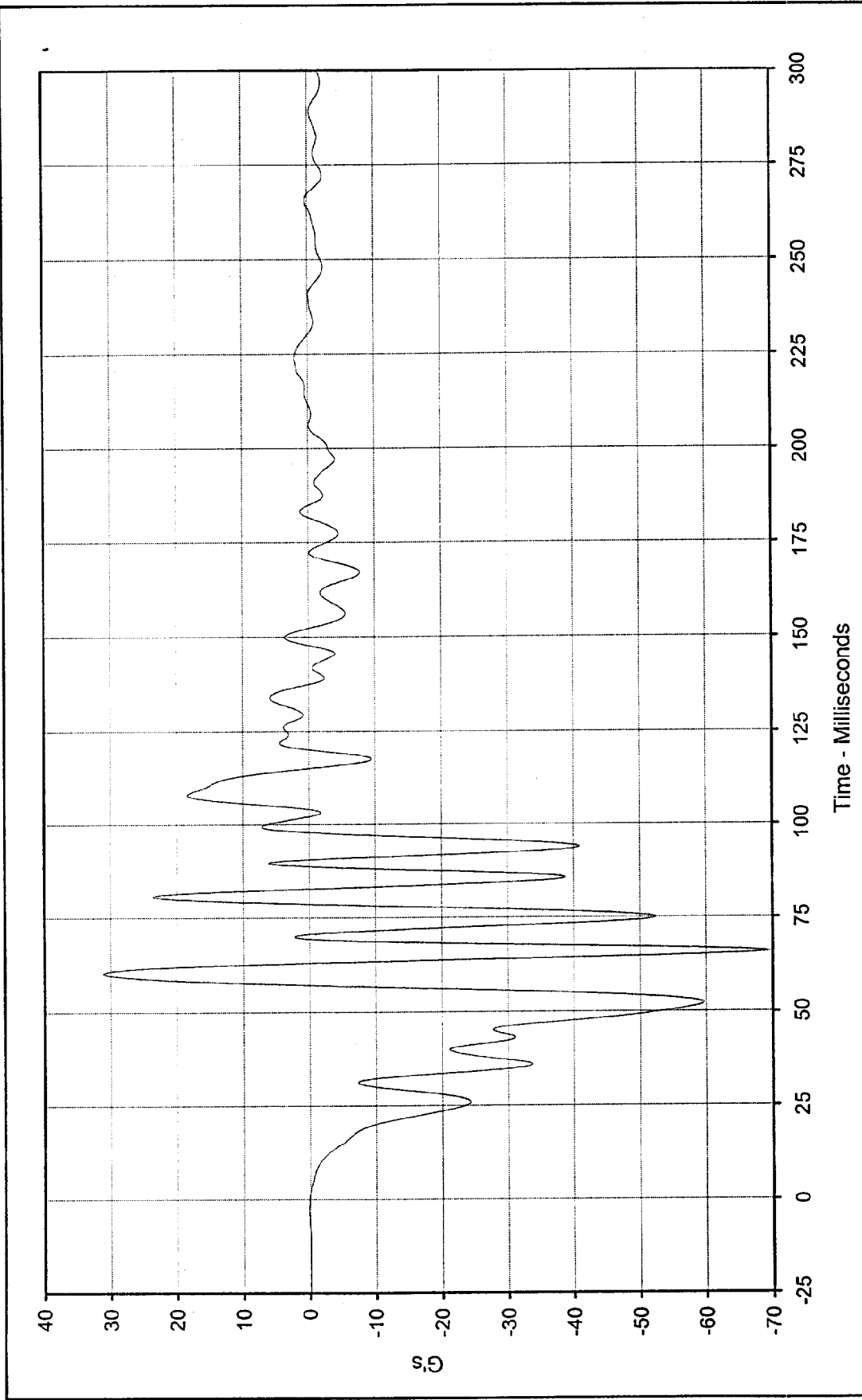




Curve Description: Vehicle Right Brake Caliper Displ.
 Maximum Value: 80.5 at 299.9 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-094

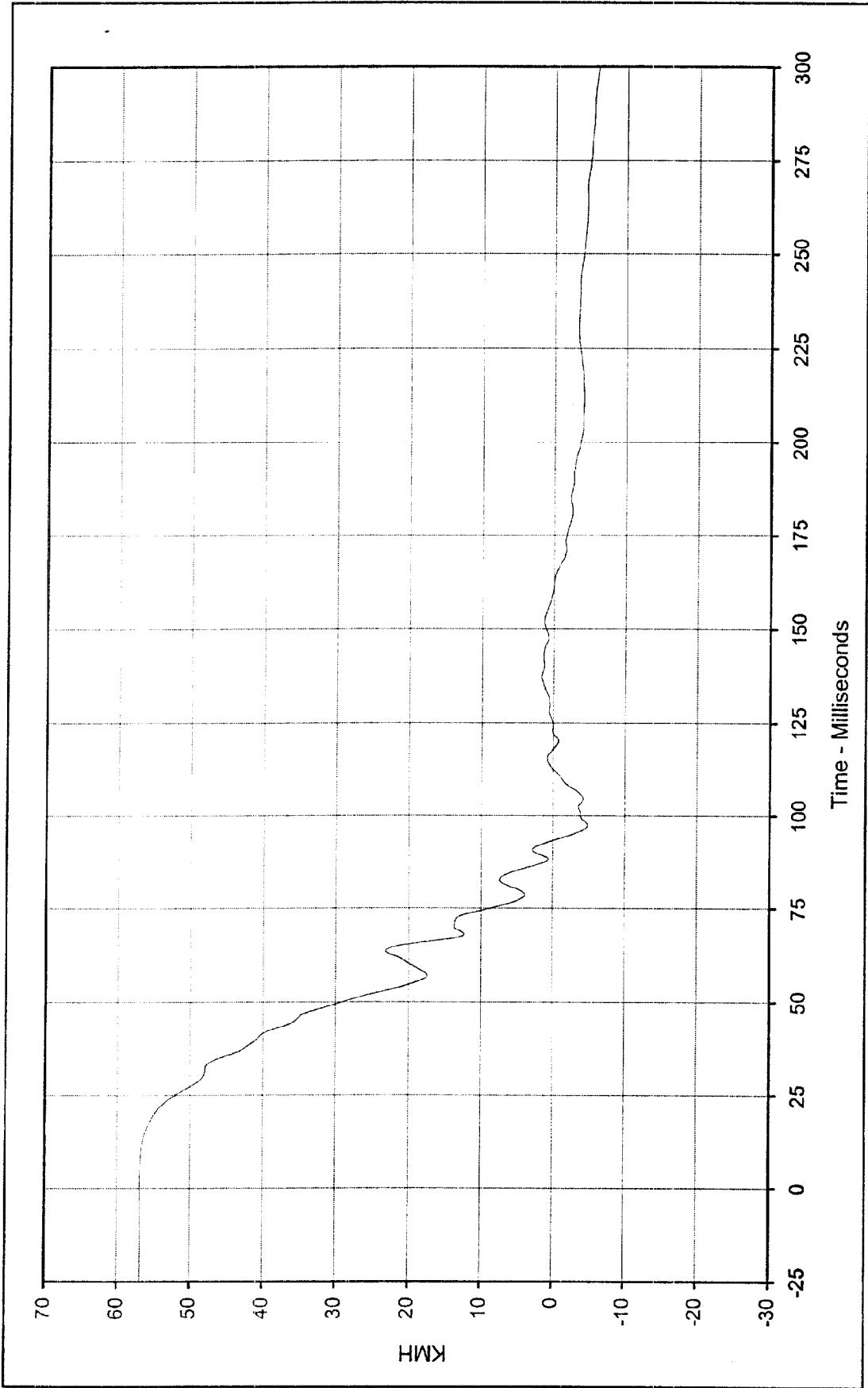
Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description:	Vehicle Instrument Panel	Test Program:	1999 NHTSA 35 mph NCAP	No.:	MX0200
Maximum Value:	31.1 at 60.2 Milliseconds	Test Vehicle:	1999 Ford Expedition XLT SUV		
Minimum Value:	-69.8 at 65.8 Milliseconds				
SAE Filter Class:	60				
Date of Test:	1/26/99				
Curve Number:	FIL-095				

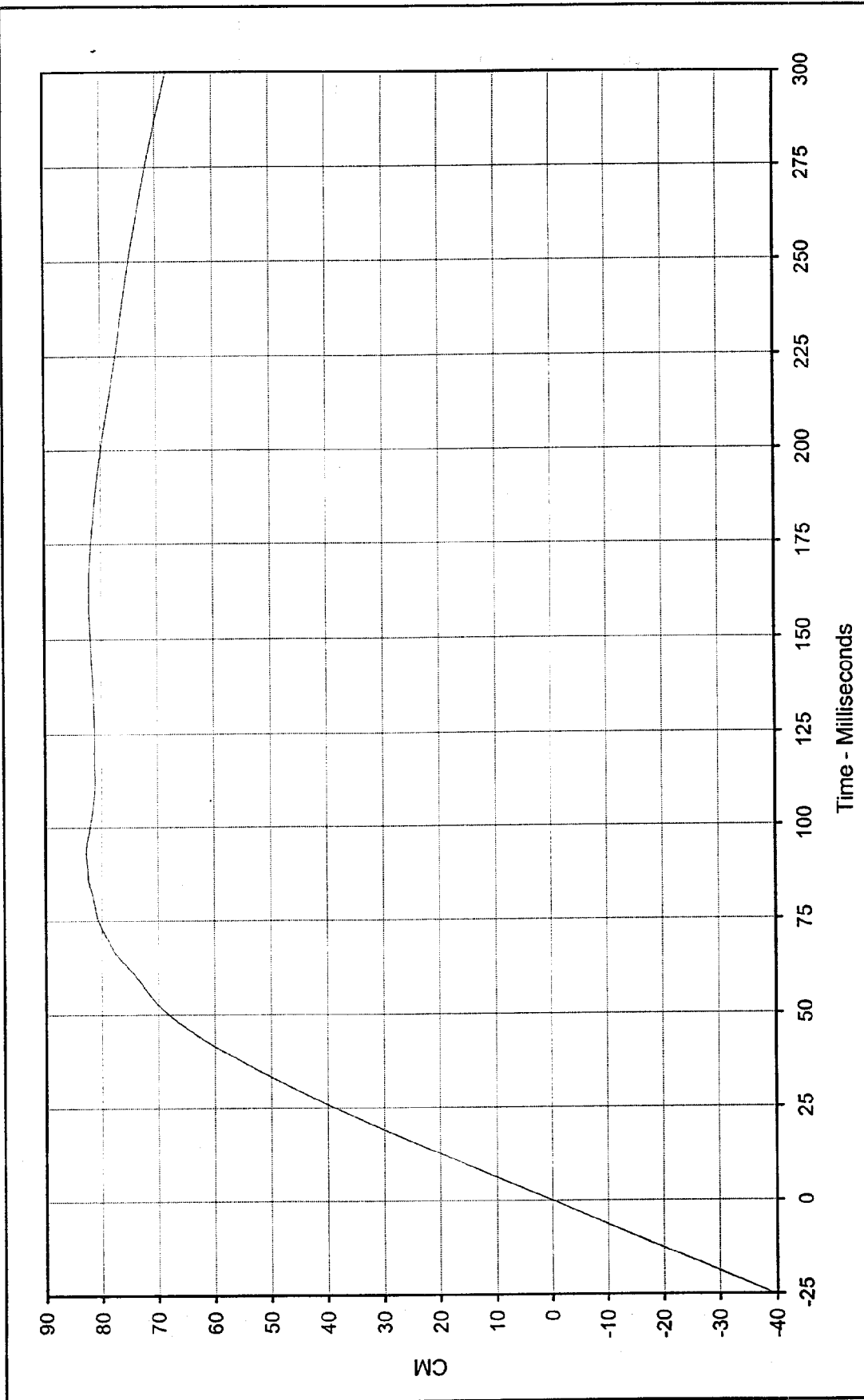




Curve Description: Vehicle Instrument Panel Velocity
 Maximum Value: 56.9 at 2.4 Milliseconds
 Minimum Value: -6.0 at 299.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-095

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

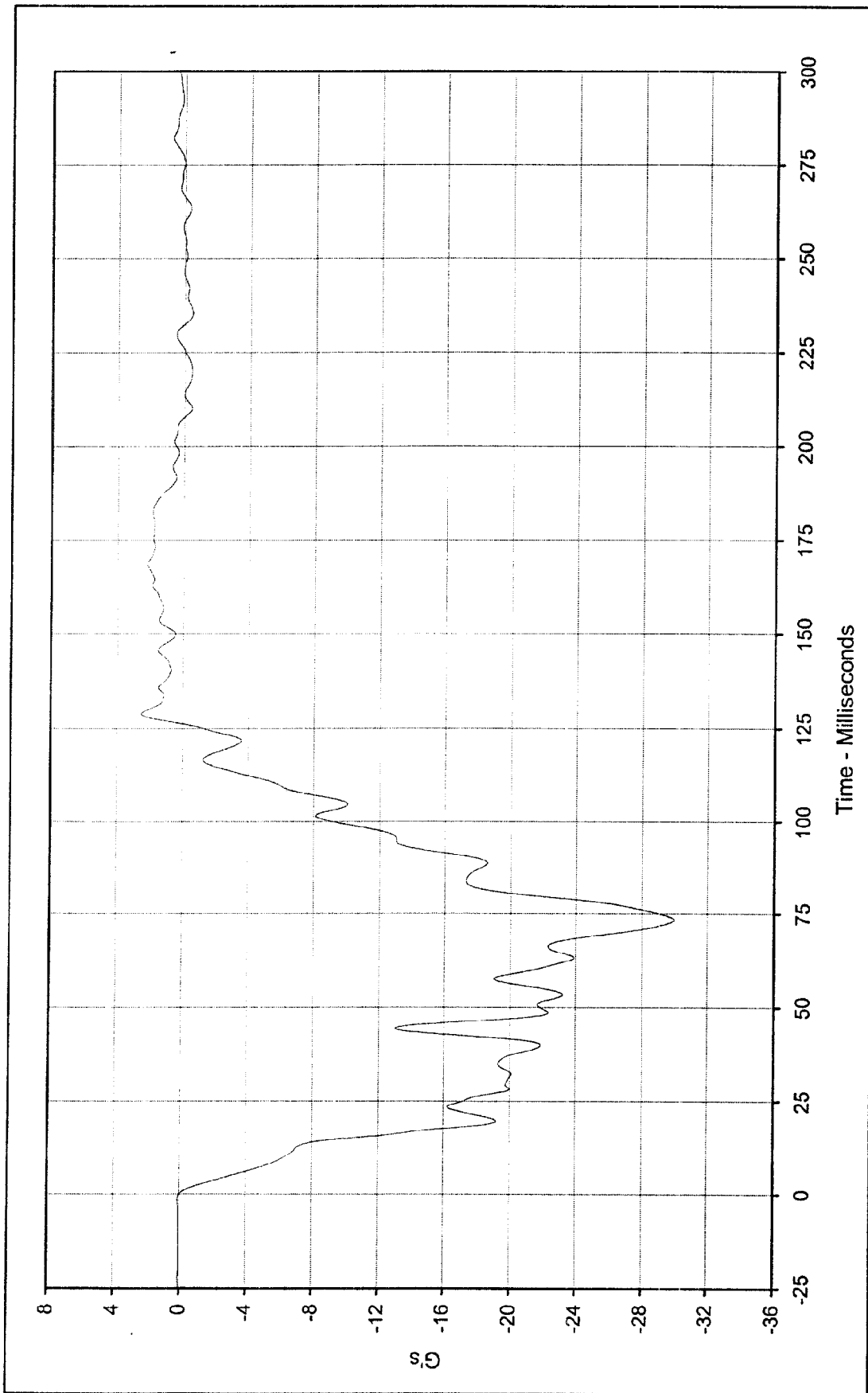




Curve Description: Vehicle Instrument Panel Displ. Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 82.8 at 93.1 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: 0.0 at 0.0 Milliseconds



SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-095



Curve Description: Vehicle Left Rear Redundant Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 2.5 at 128.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

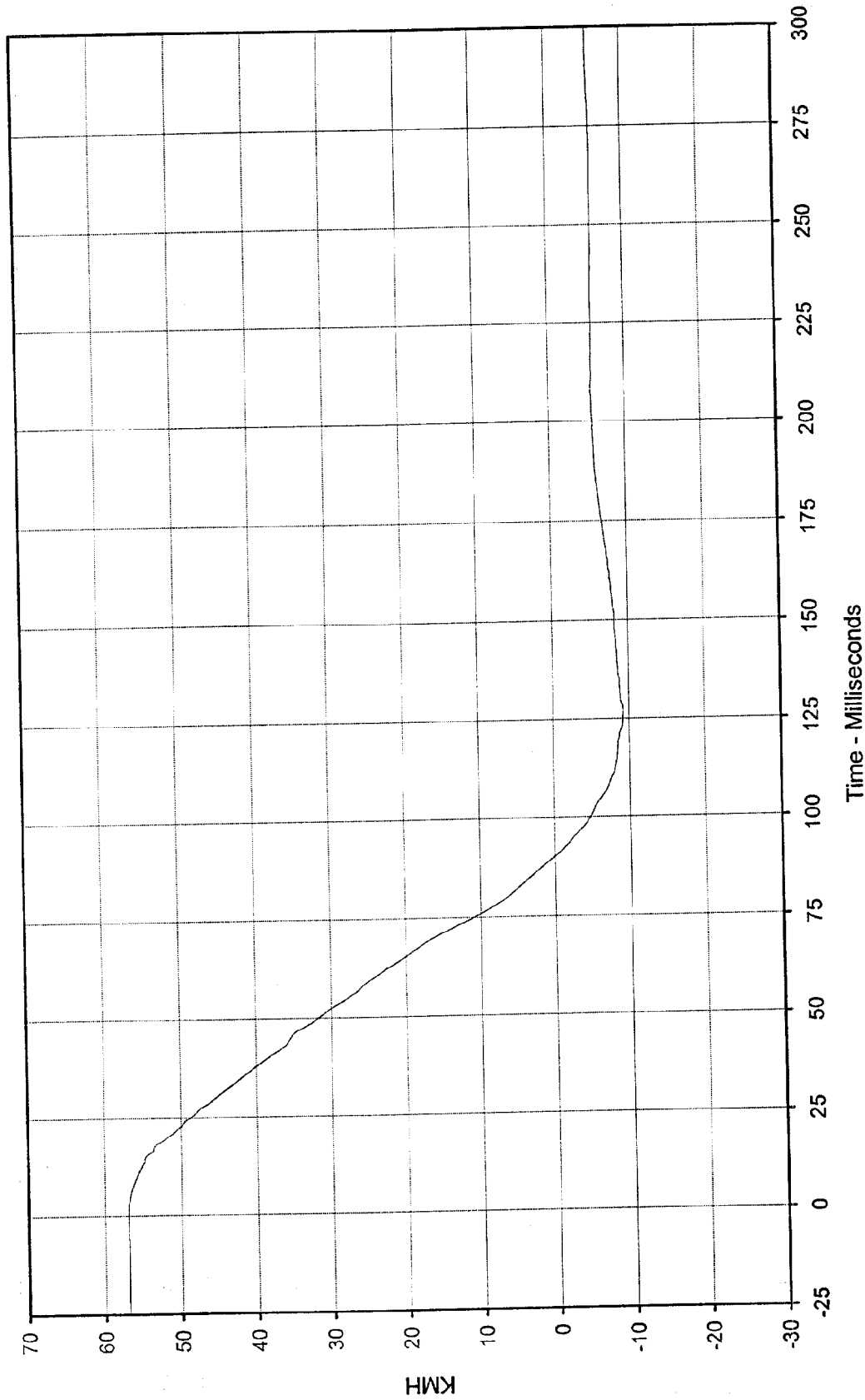
Minimum Value: -30.0 at 73.4 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-096

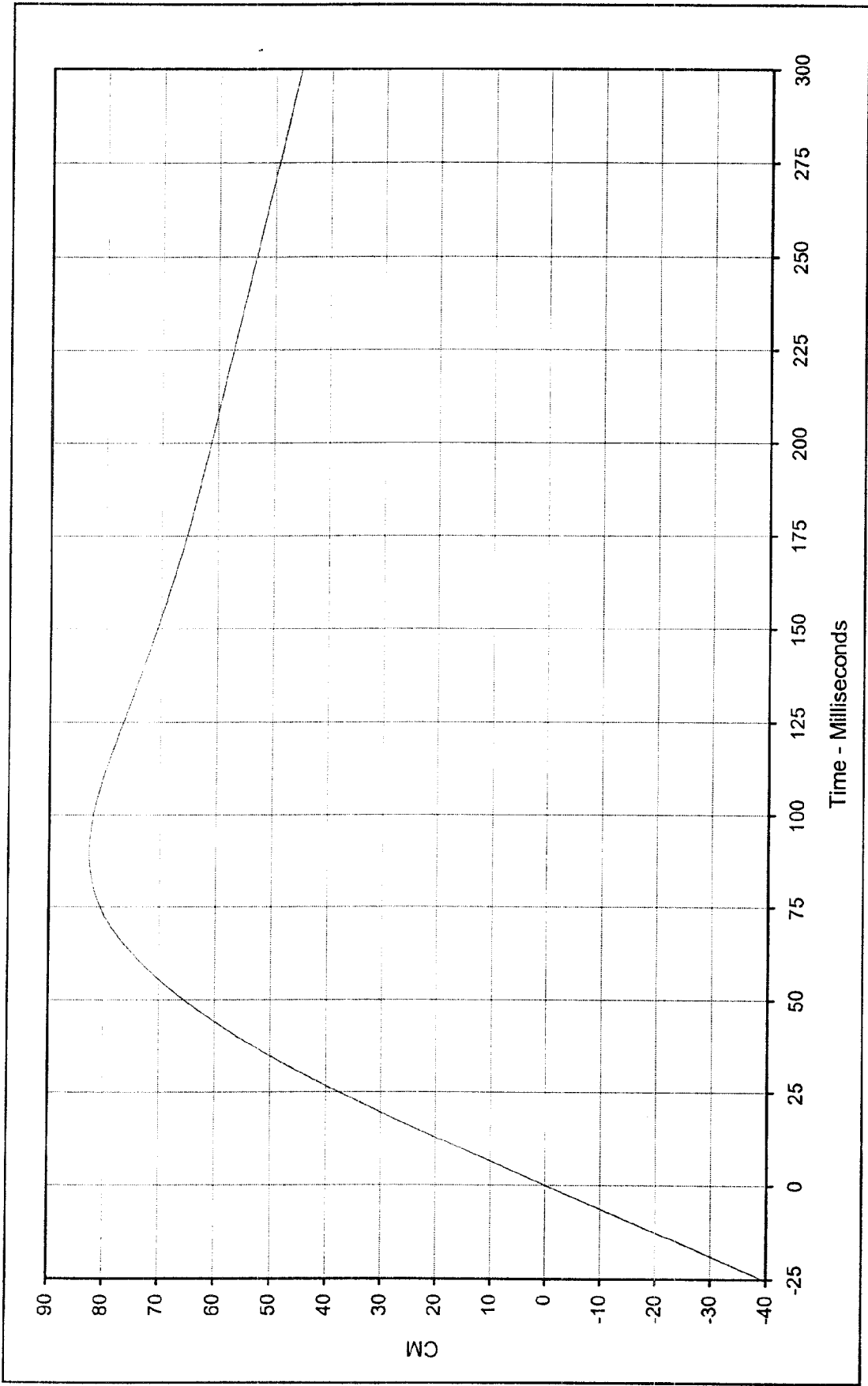




Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Curve Description: Vehicle Left Rear Redundant Velocity
 Maximum Value: 56.9 at 1.1 Milliseconds
 Minimum Value: -9.3 at 127.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN1-096





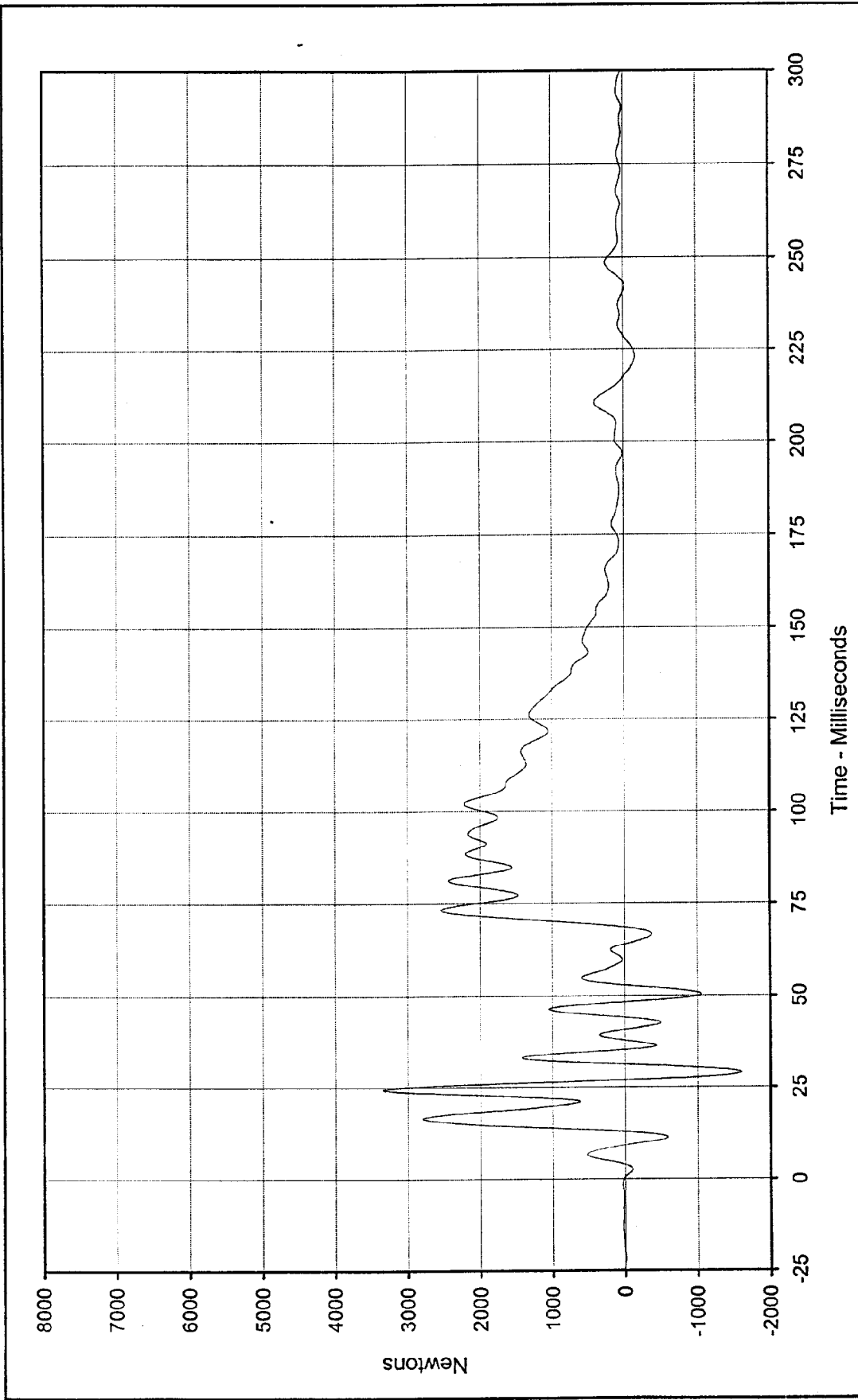
Curve Description: Vehicle Left Rear Redundant Displ.
 Maximum Value: 82.7 at 89.9 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/26/99
 Curve Number: IN2-096

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV



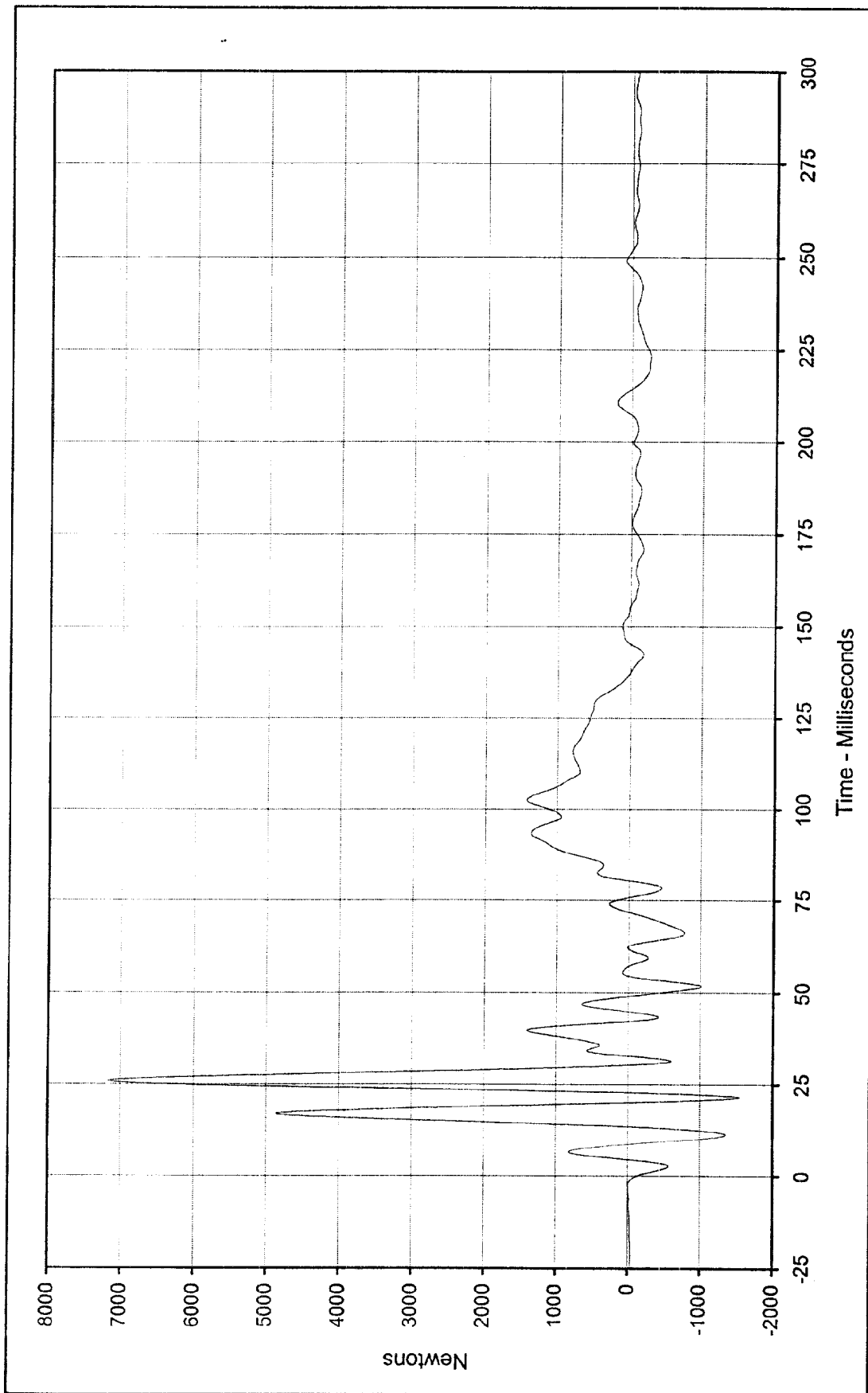
APPENDIX C
LOAD CELL BARRIER INFORMATION

KAR99001-12



Curve Description:	Barrier Force A2	Test Program:	1999 NHTSA 35 mph NCAP	No.: MX0200
Maximum Value:	3339.2 at 24.4 Milliseconds	Test Vehicle:	1999 Ford Expedition XLT SUV	
Minimum Value:	-1607.8 at 29.0 Milliseconds			
SAE Filter Class:	60			
Date of Test:	1/26/99			
Curve Number:	FIL-099			

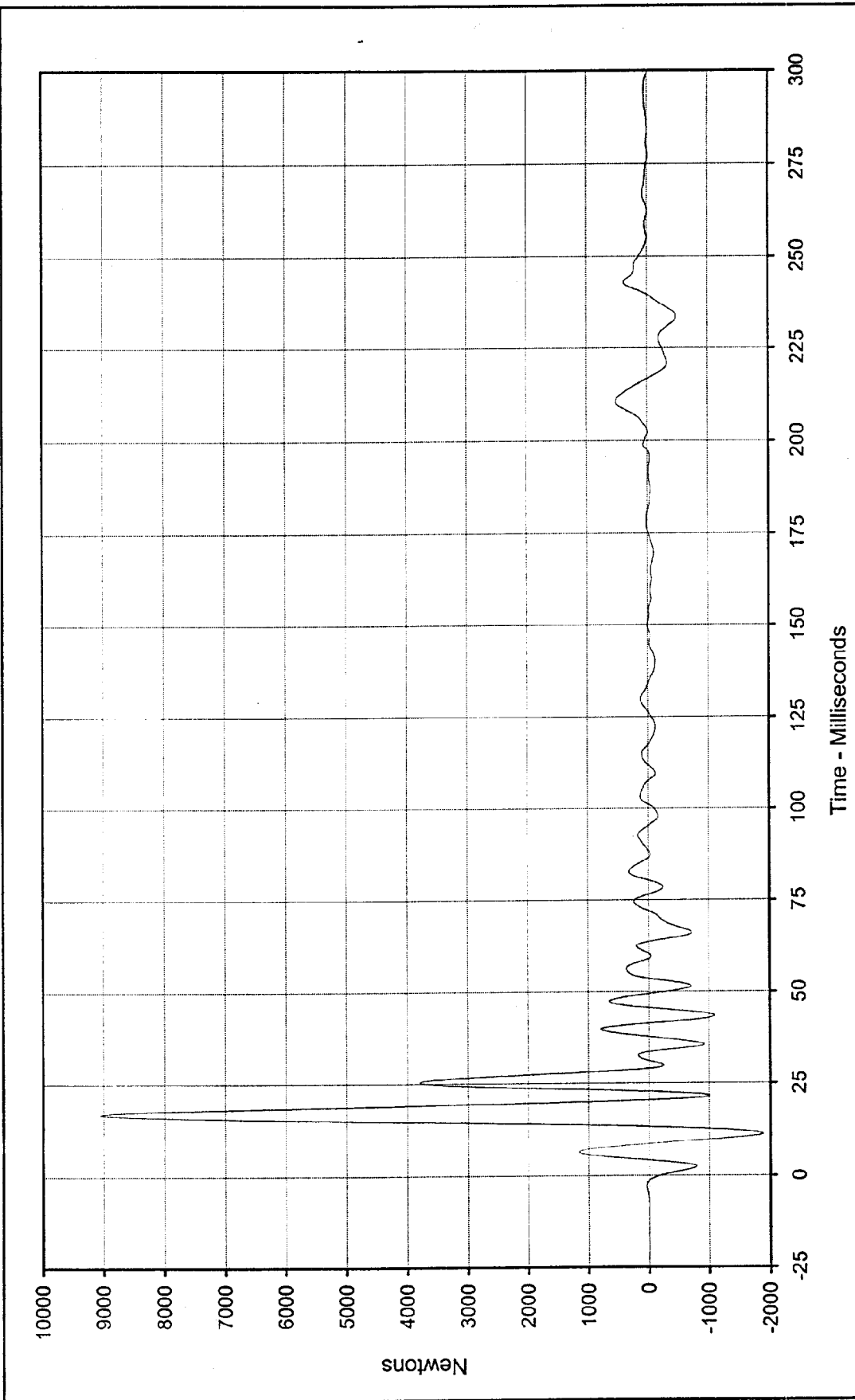




Curve Description: Barrier Force A3 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 7170.4 at 25.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -1546.7 at 21.4 Milliseconds



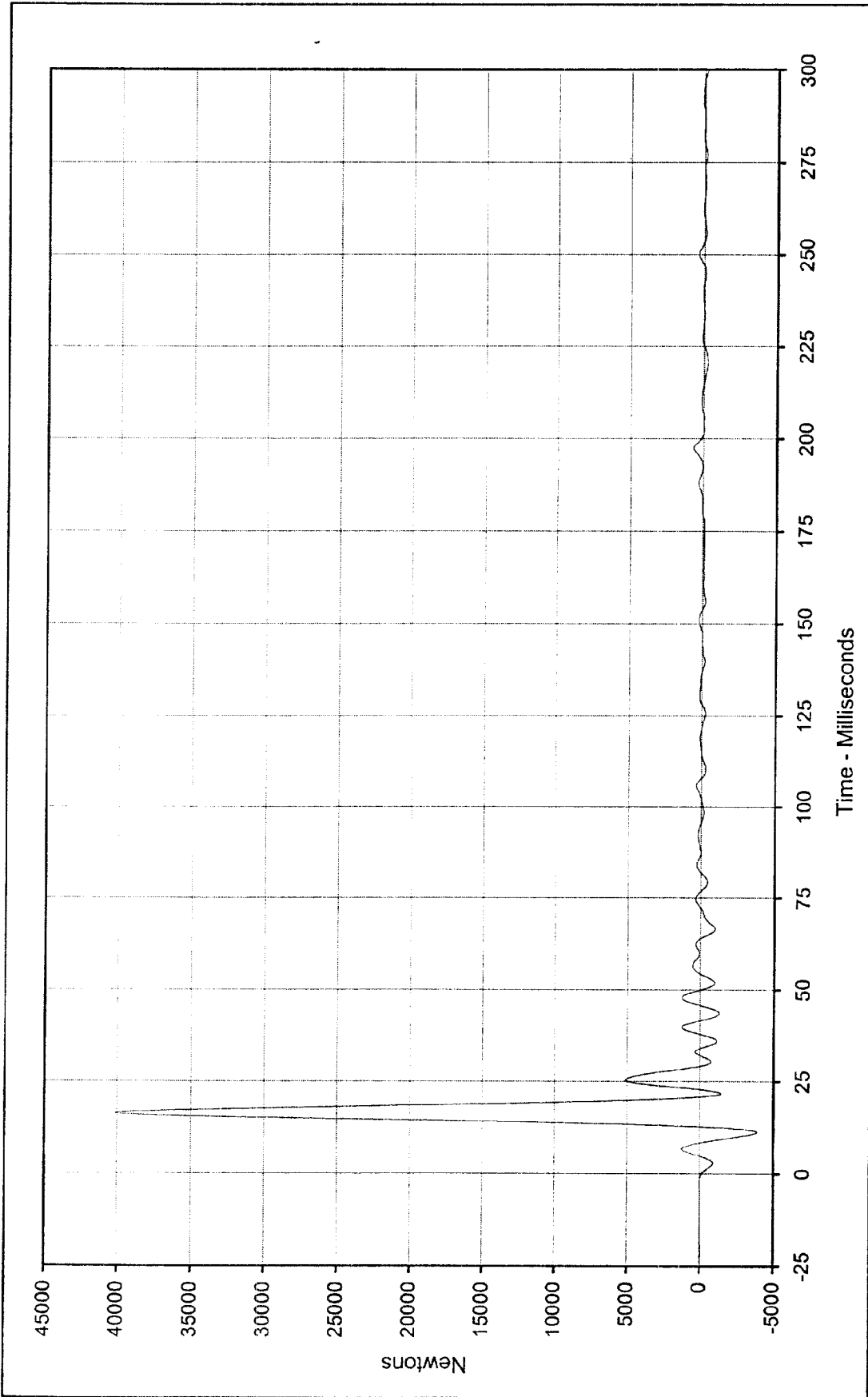
SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-100



Curve Description: Barrier Force A4
 Maximum Value: 9055.9 at 16.9 Milliseconds
 Minimum Value: -1884.0 at 11.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-101

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

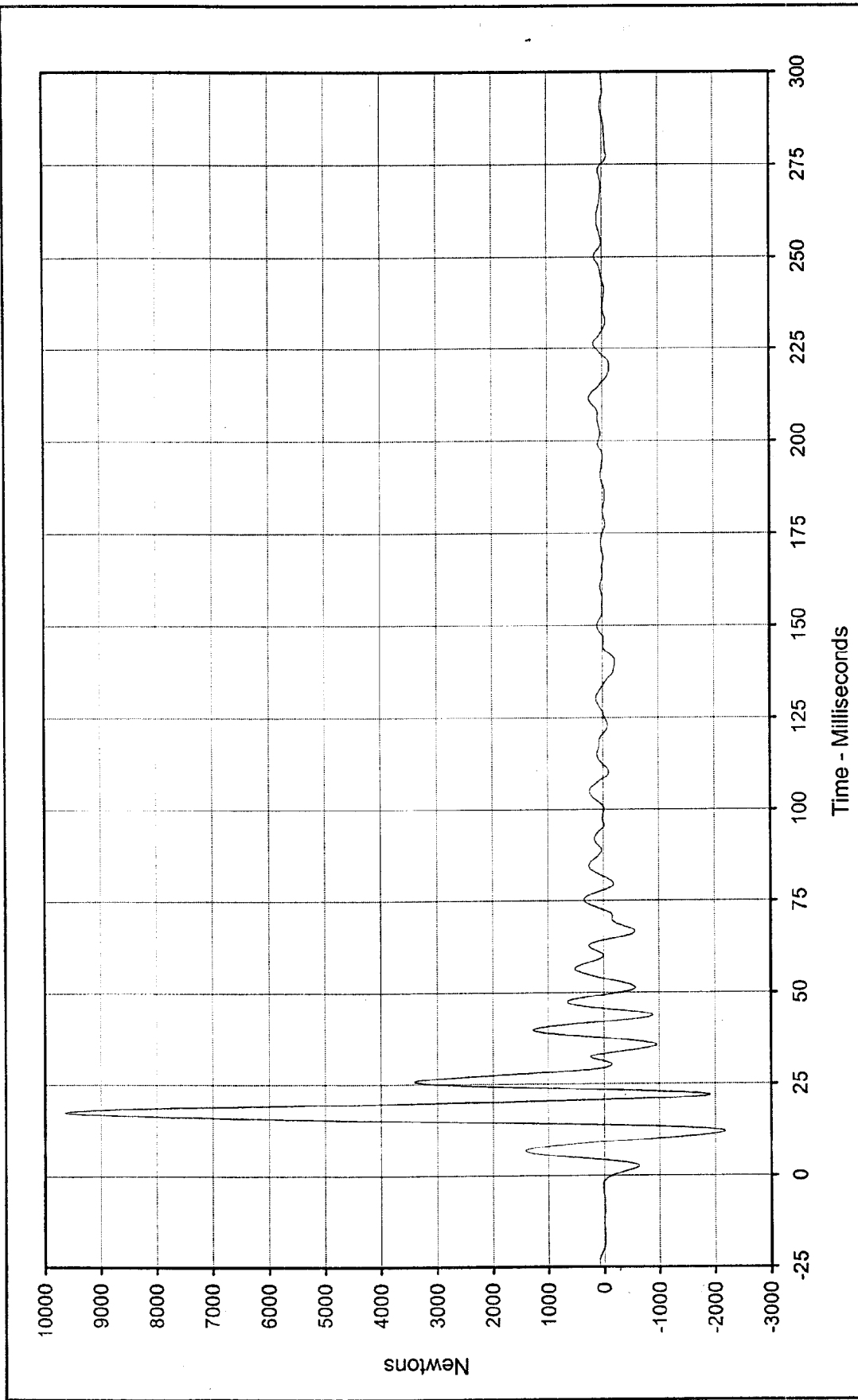




Curve Description: Barrier Force A5
 Maximum Value: 40132.8 at 16.4 Milliseconds
 Minimum Value: -3899.8 at 11.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-102

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

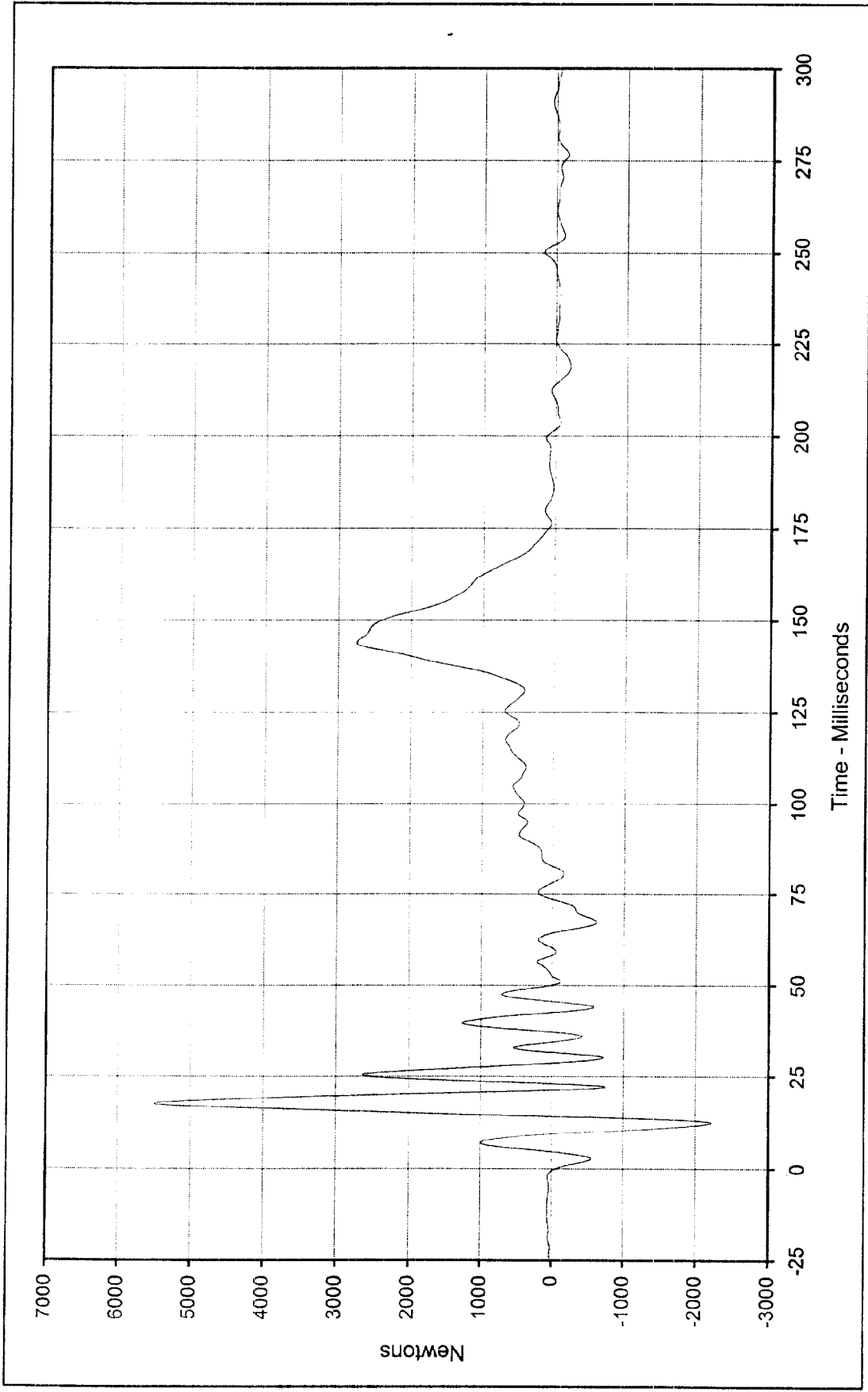




Curve Description: Barrier Force A6
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 9640.6 at 17.4 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -2186.3 at 12.1 Milliseconds

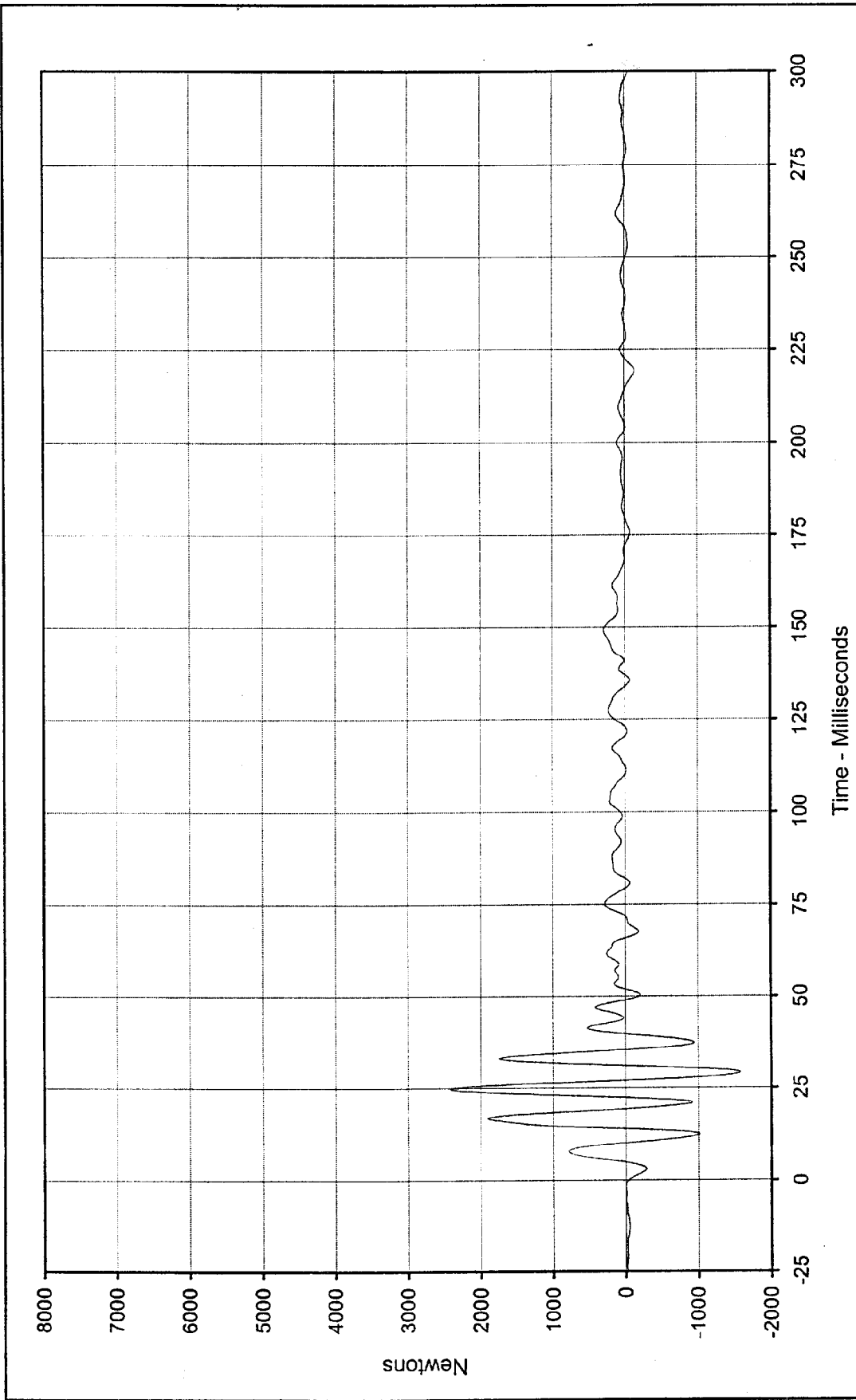


SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-103



Curve Description: Barrier Force A7 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 5493.2 at 17.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -2227.6 at 12.5 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-104

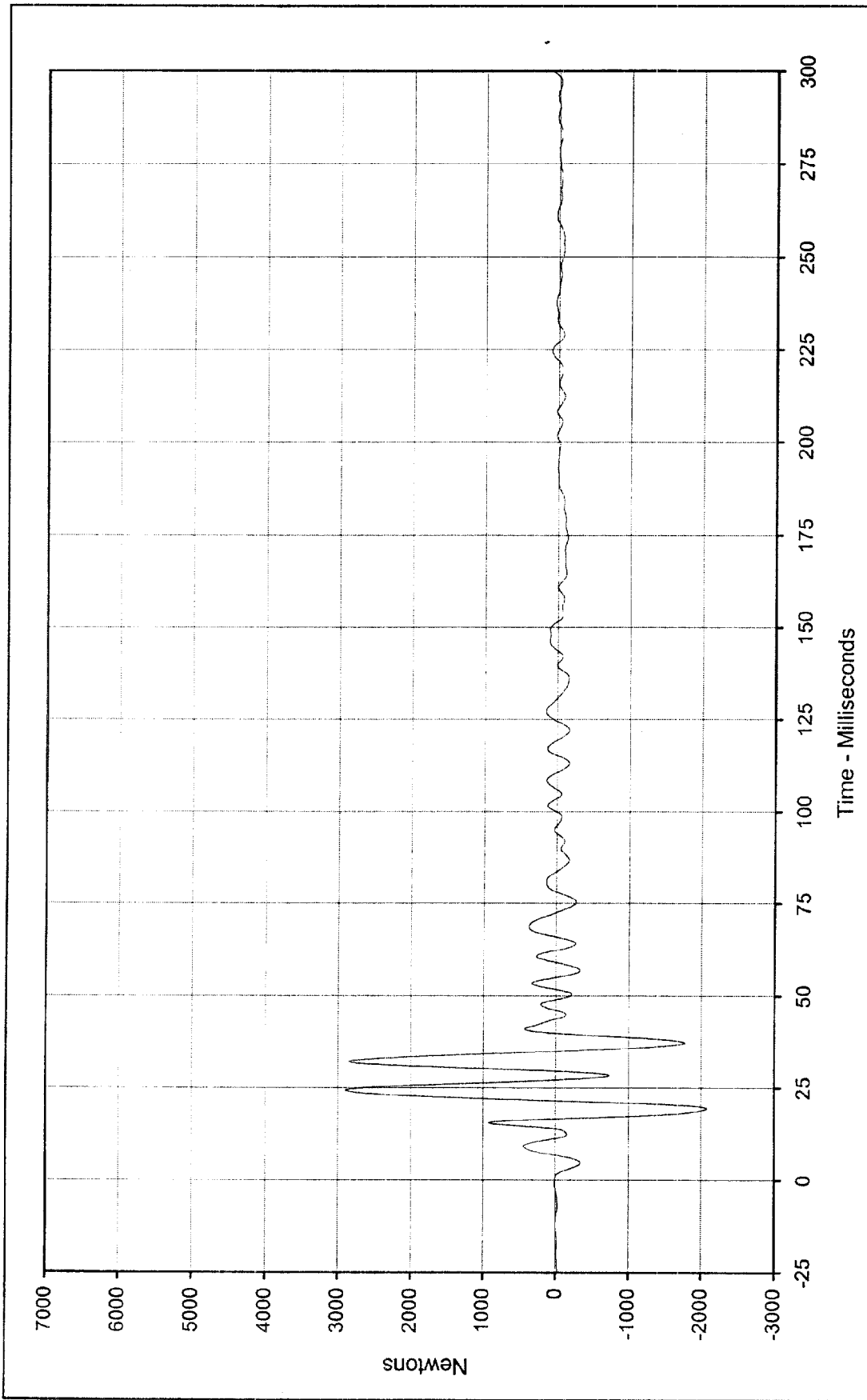




Curve Description: Barrier Force A8 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 2406.7 at 24.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -1580.7 at 29.1 Milliseconds

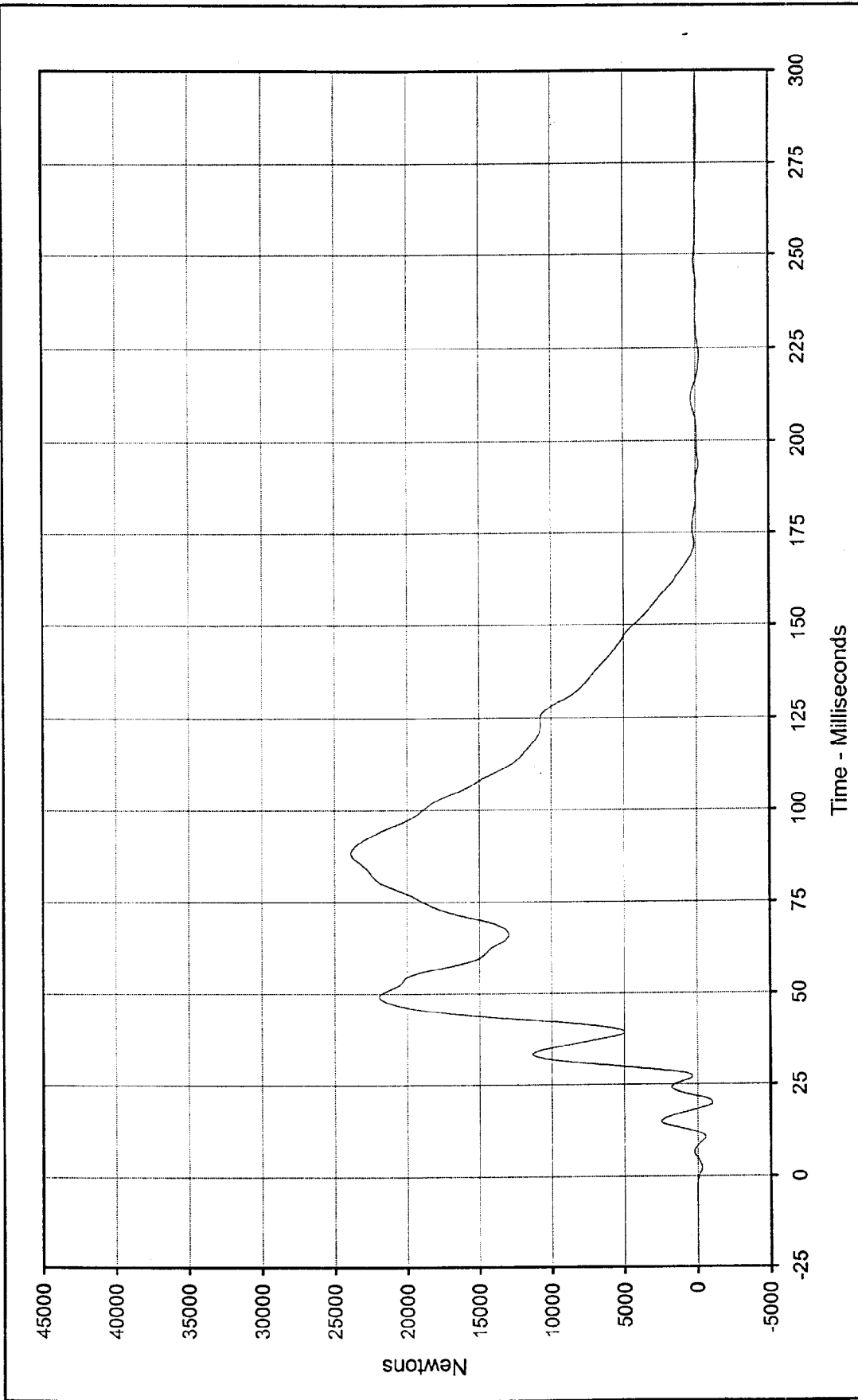


SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-105



Curve Description: Barrier Force A9 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 2893.8 at 24.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -2078.0 at 19.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-106

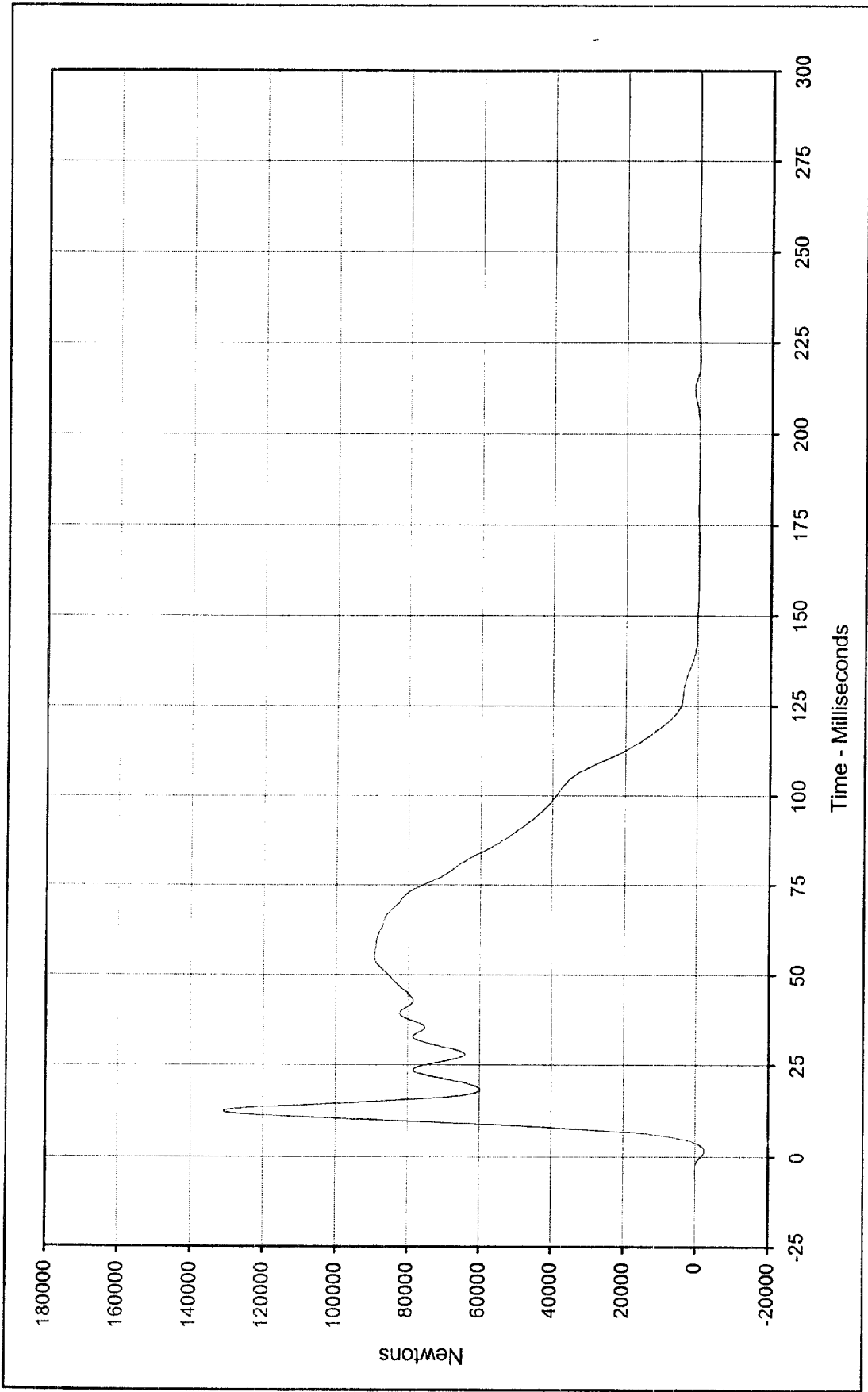




Curve Description: Barrier Force B2
 Maximum Value: 23873.4 at 88.2 Milliseconds
 Minimum Value: -1039.5 at 19.9 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-108

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

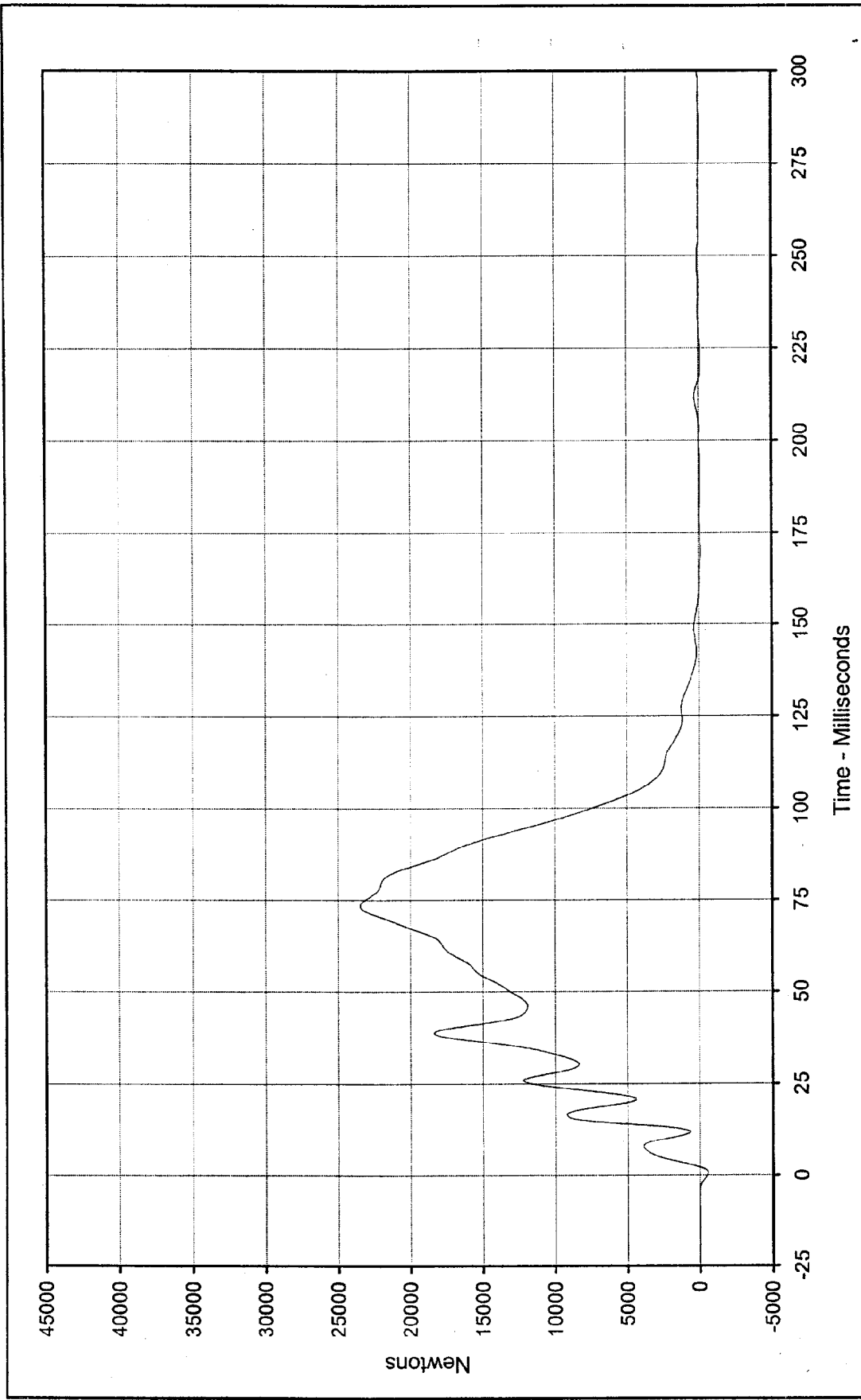




Curve Description: Barrier Force B3
 Maximum Value: 130975.5 at 12.6 Milliseconds
 Minimum Value: -2549.8 at 1.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-109

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

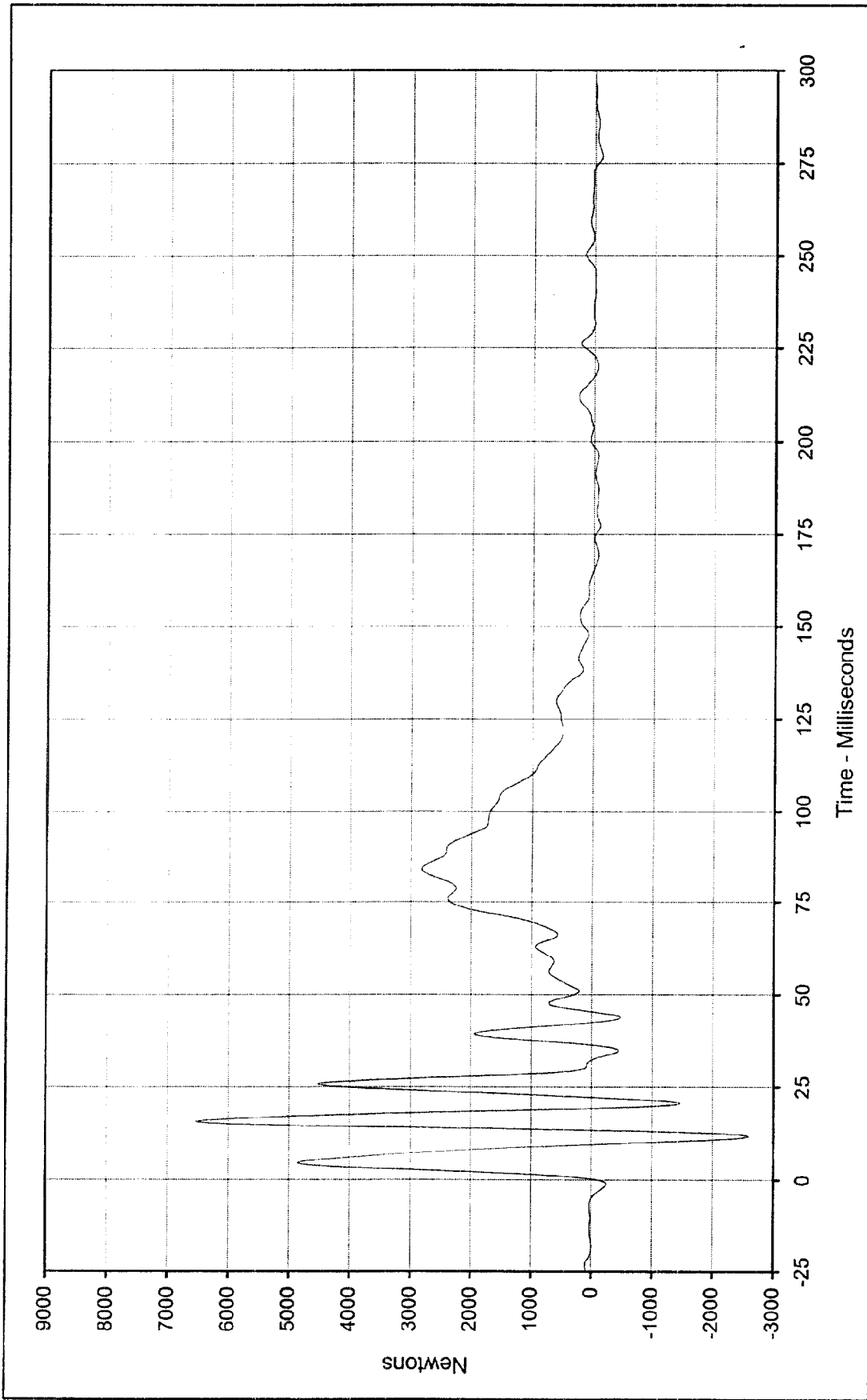




Curve Description: Barrier Force B4
 Maximum Value: 23473.5 at 73.4 Milliseconds
 Minimum Value: -569.8 at 0.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-110

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Barrier Force B5 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 6523.8 at 15.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

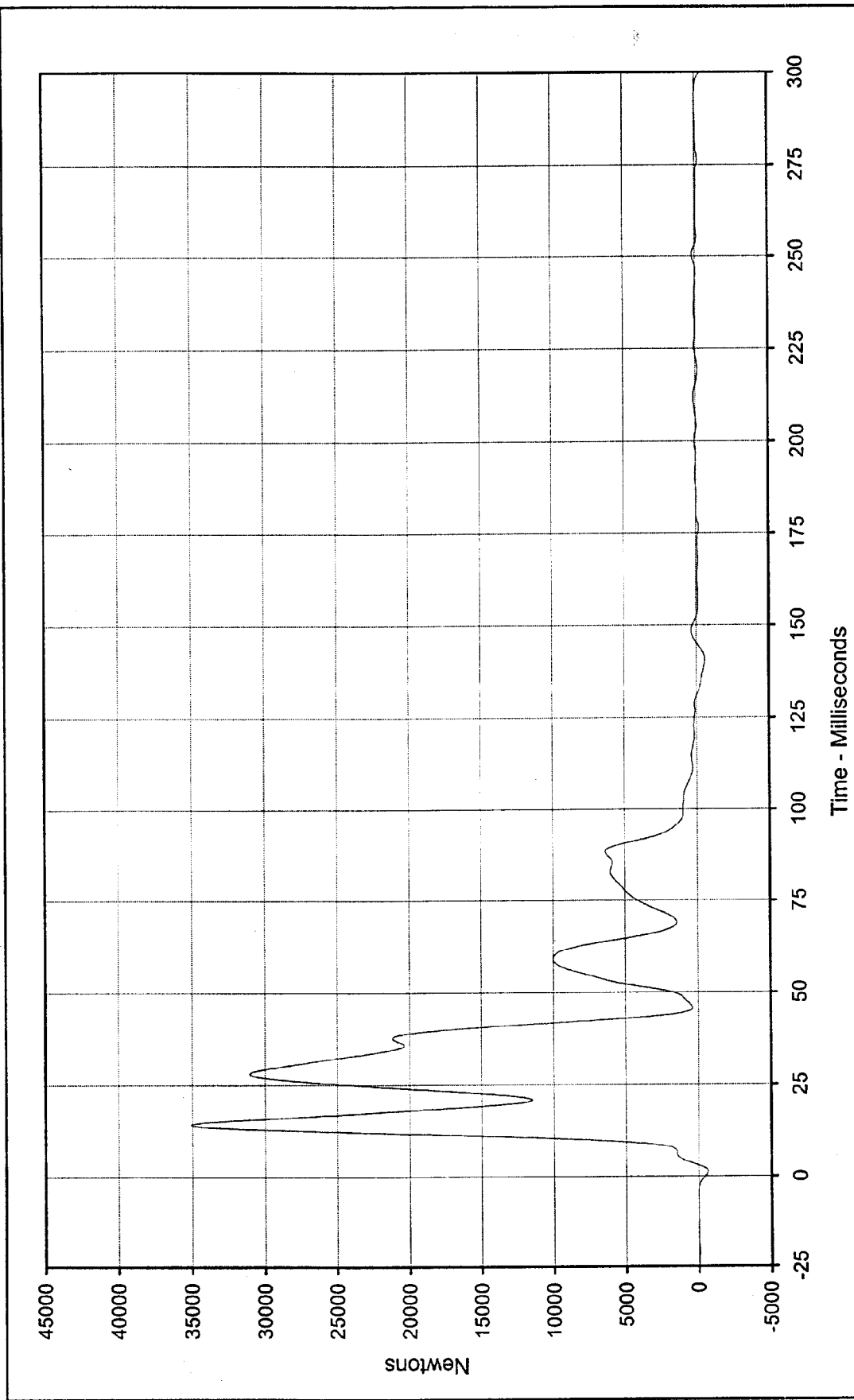
Minimum Value: -2597.2 at 11.8 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-111





Curve Description: Barrier Force B6 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 35059.8 at 14.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

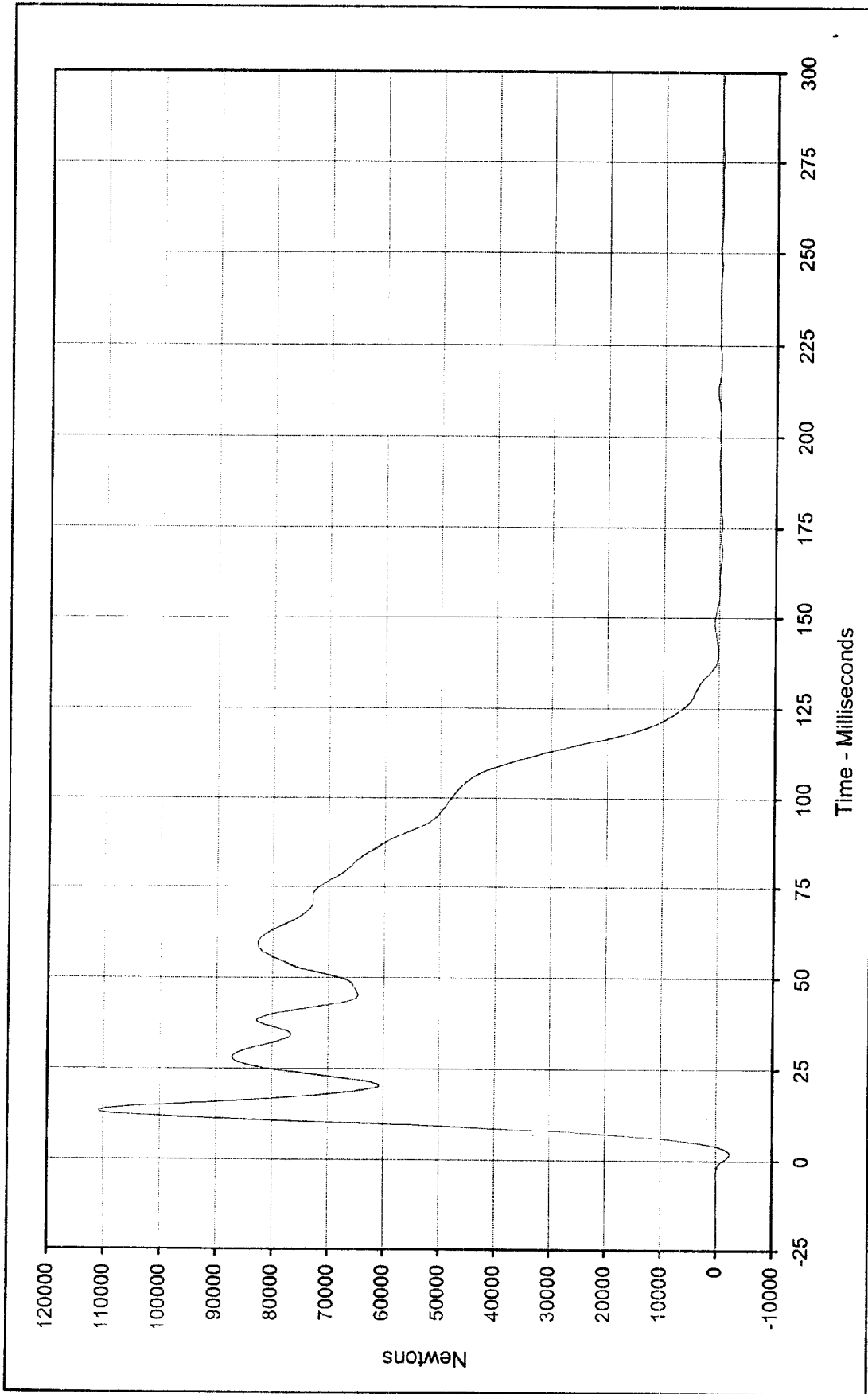
Minimum Value: -647.5 at 1.3 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-112





Curve Description: Barrier Force B7 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 110880.1 at 13.5 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

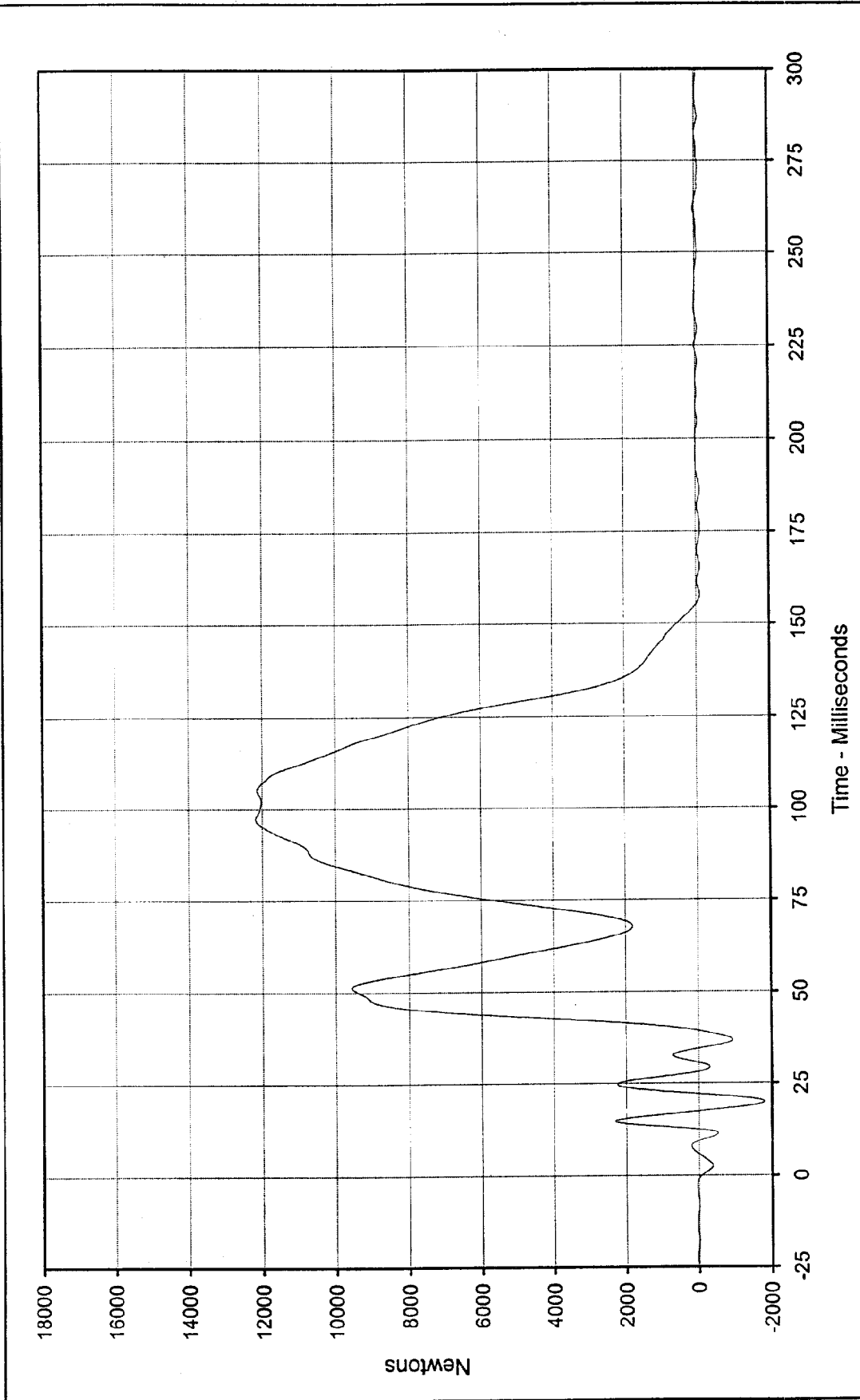
Minimum Value: -2499.4 at 1.9 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-113

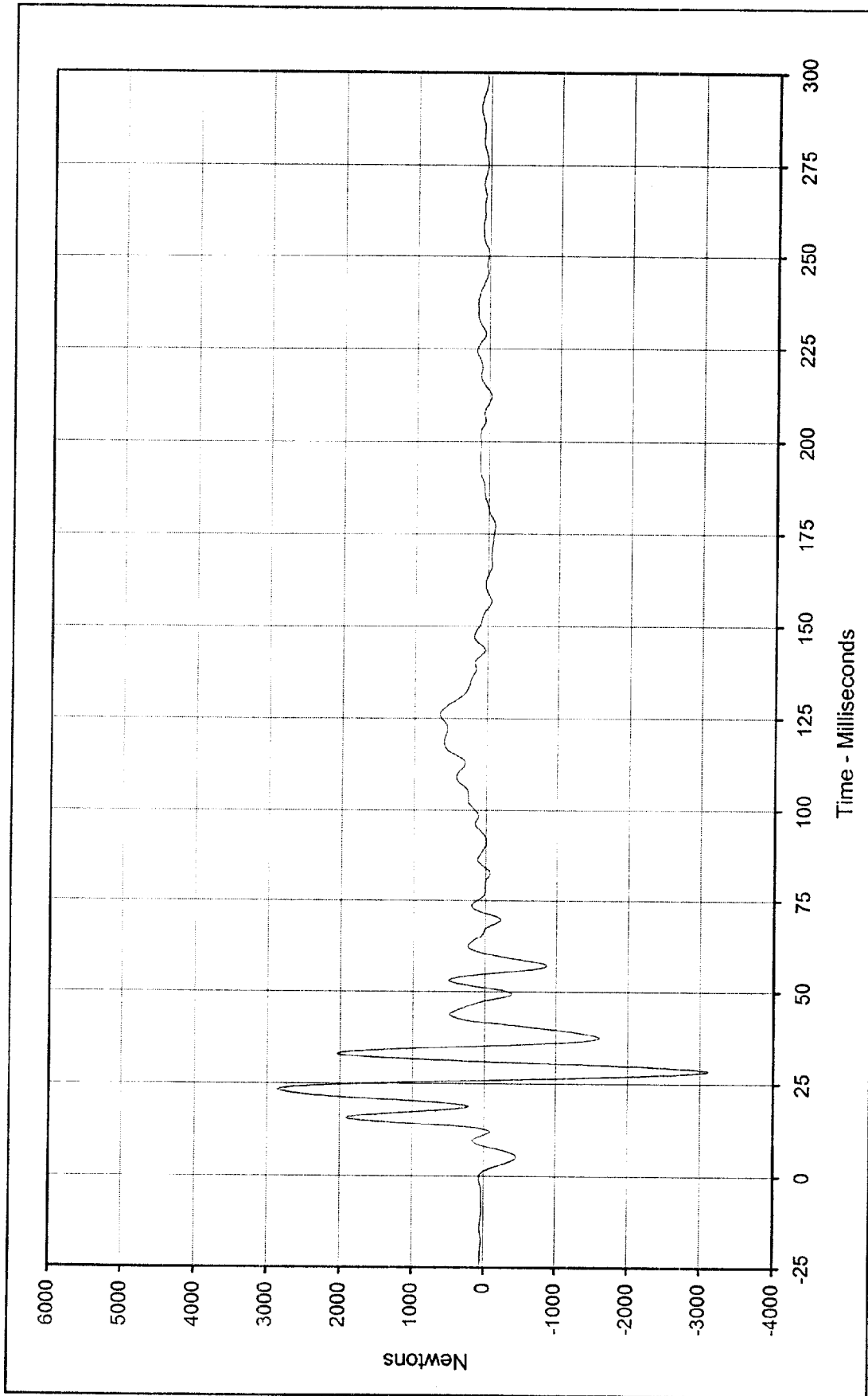




Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Curve Description: Barrier Force B8
 Maximum Value: 12176.0 at 97.3 Milliseconds
 Minimum Value: -1795.5 at 20.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-114





Curve Description: Barrier Force B9 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 2854.9 at 23.4 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

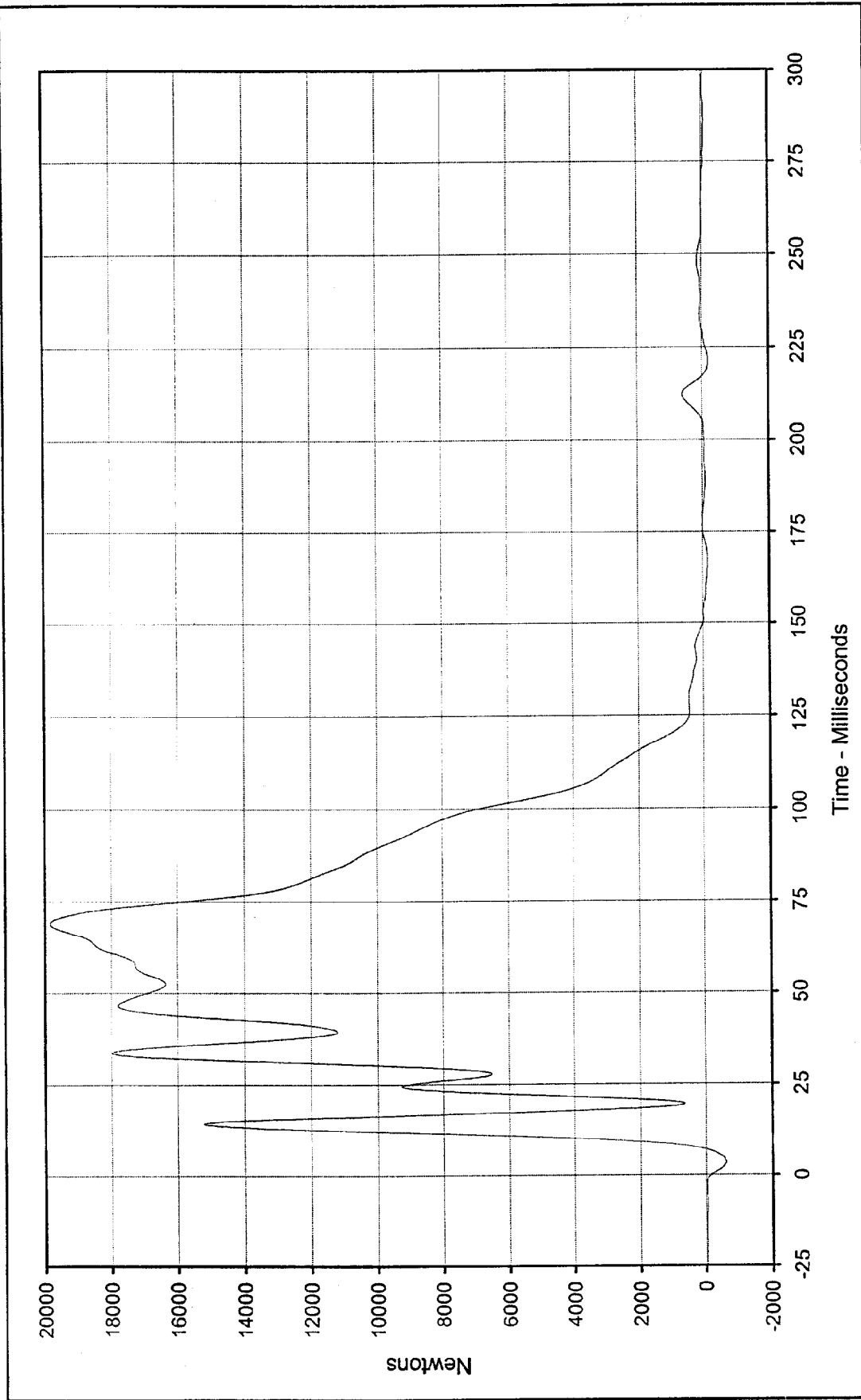
Minimum Value: -3116.1 at 28.4 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-115

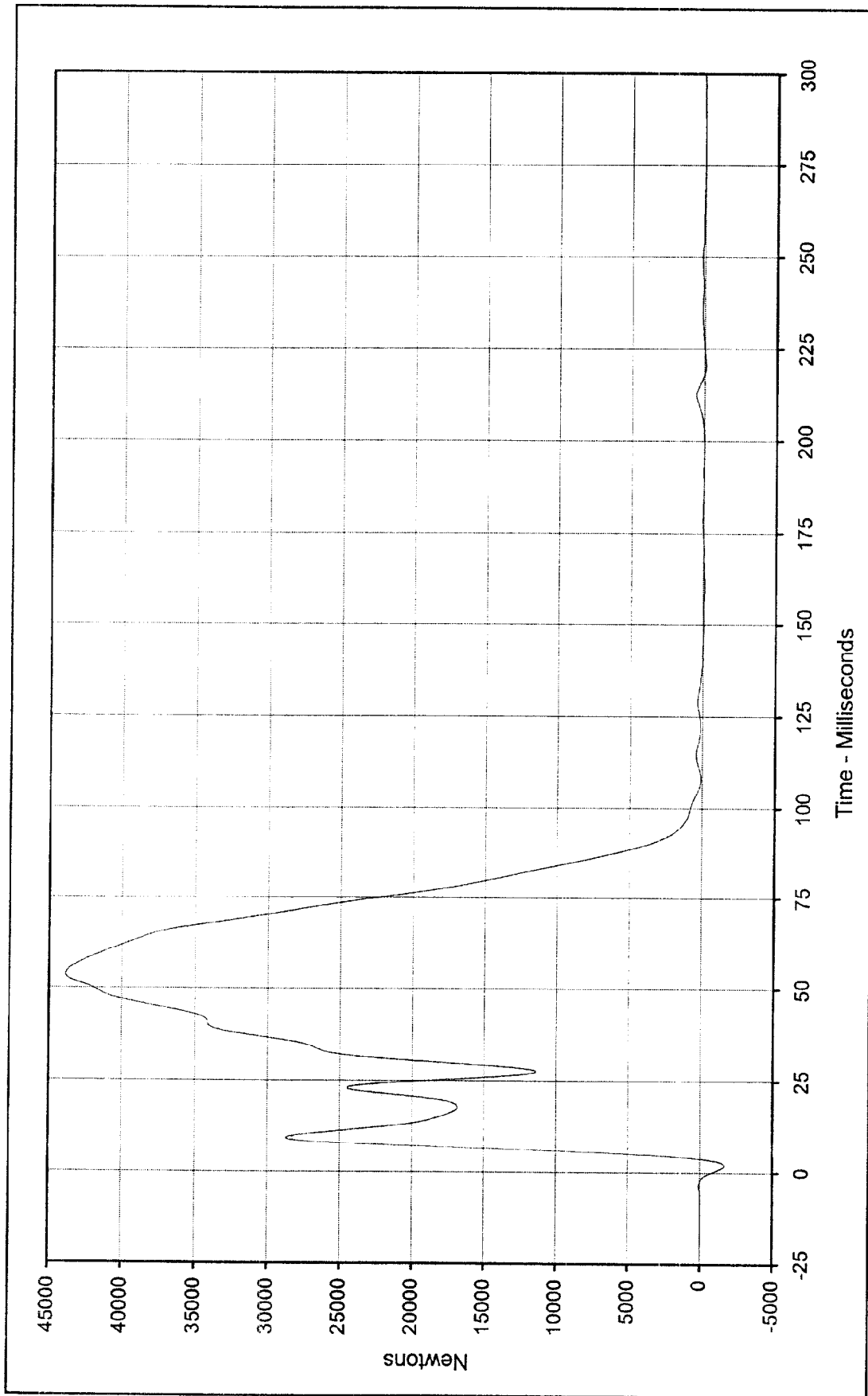




Curve Description: Barrier Force C2 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 19841.4 at 68.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -604.9 at 3.5 Milliseconds



SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-117



Curve Description: Barrier Force C3 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 43861.6 at 53.8 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

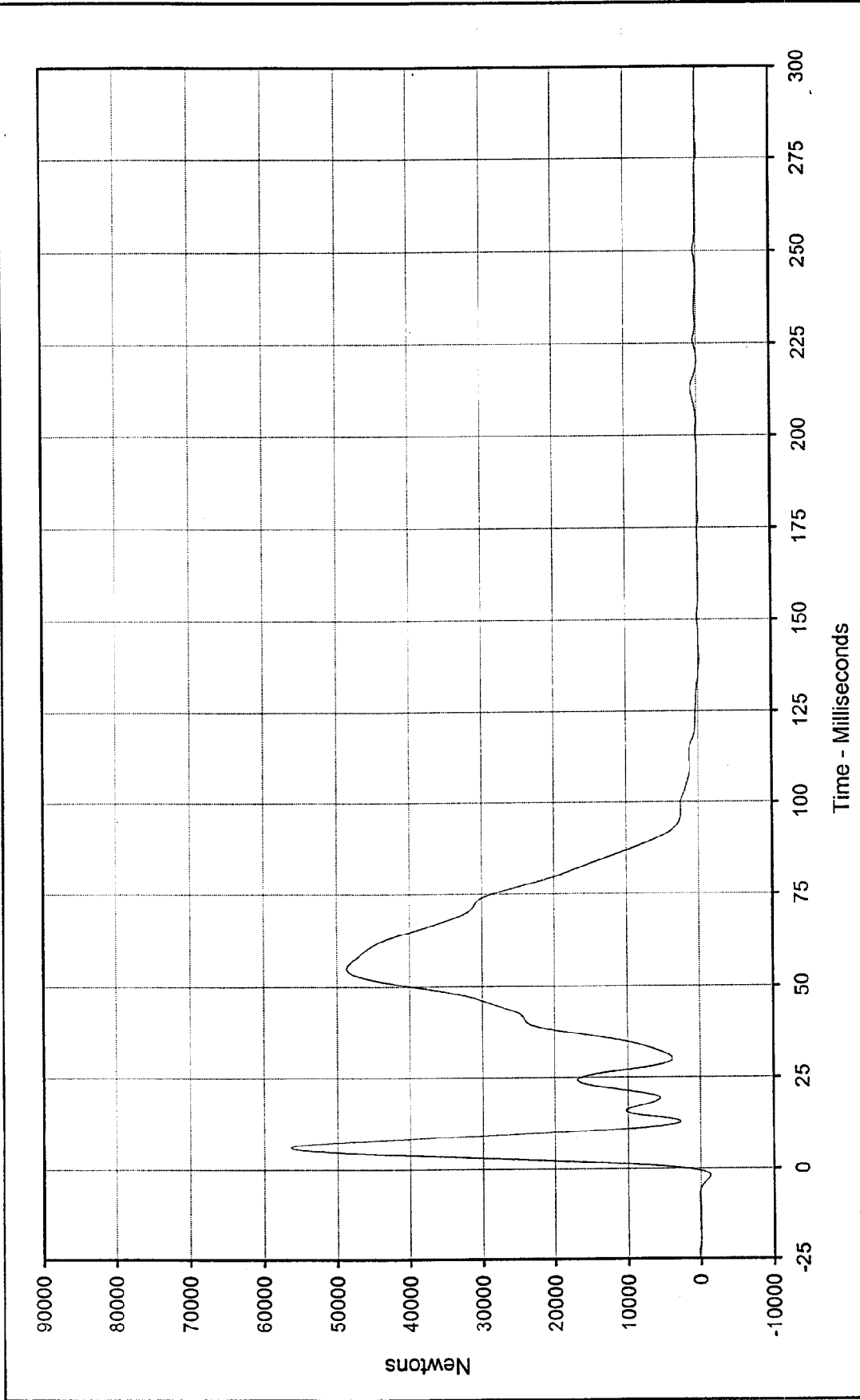
Minimum Value: -1699.4 at 2.0 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: FIL-118

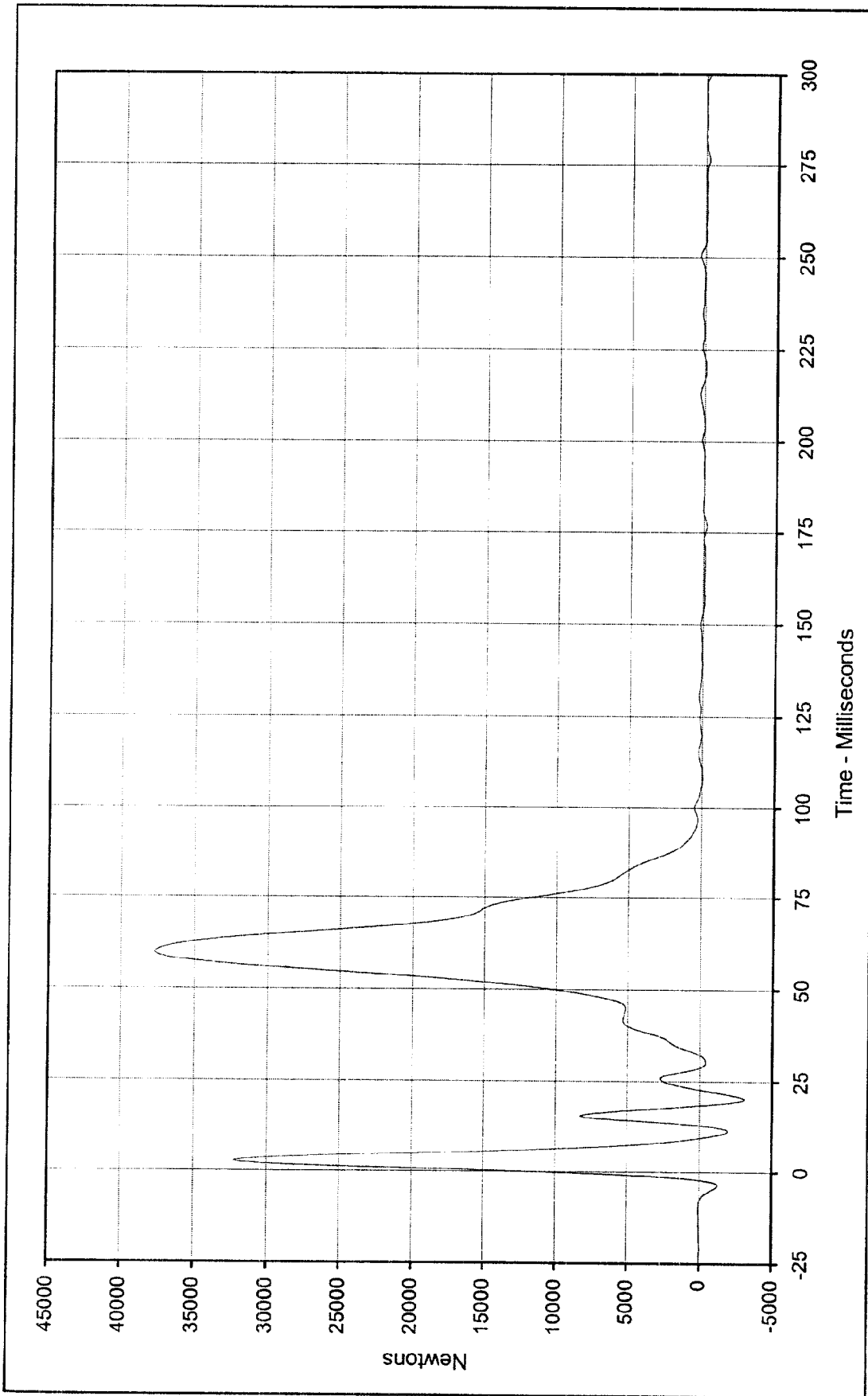




Curve Description: Barrier Force C4
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 56360.4 at 5.9 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -244.7 at 138.9 Milliseconds



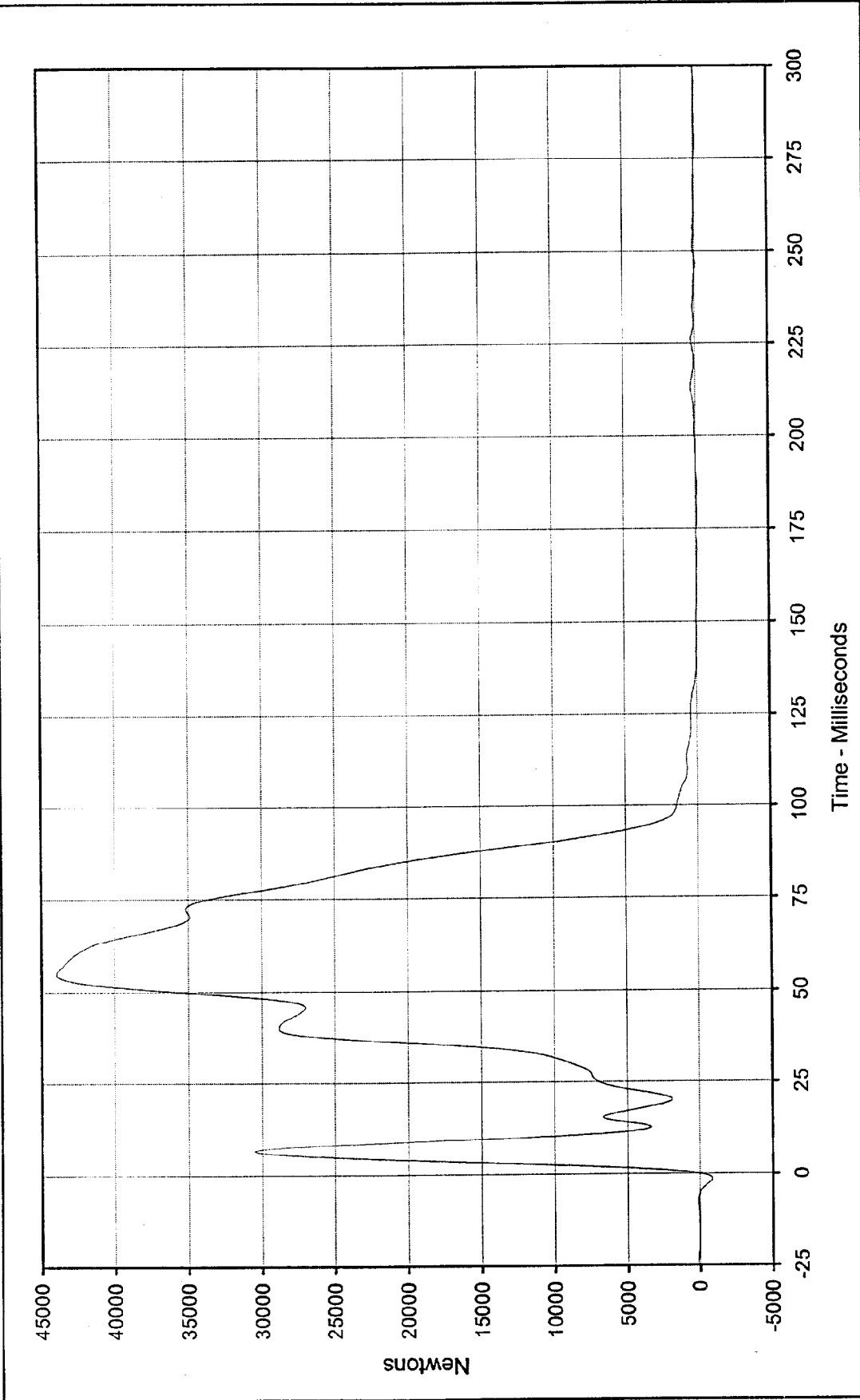
SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-119



Curve Description: Barrier Force C5
 Maximum Value: 37687.9 at 59.9 Milliseconds
 Minimum Value: -3124.1 at 20.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-120

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

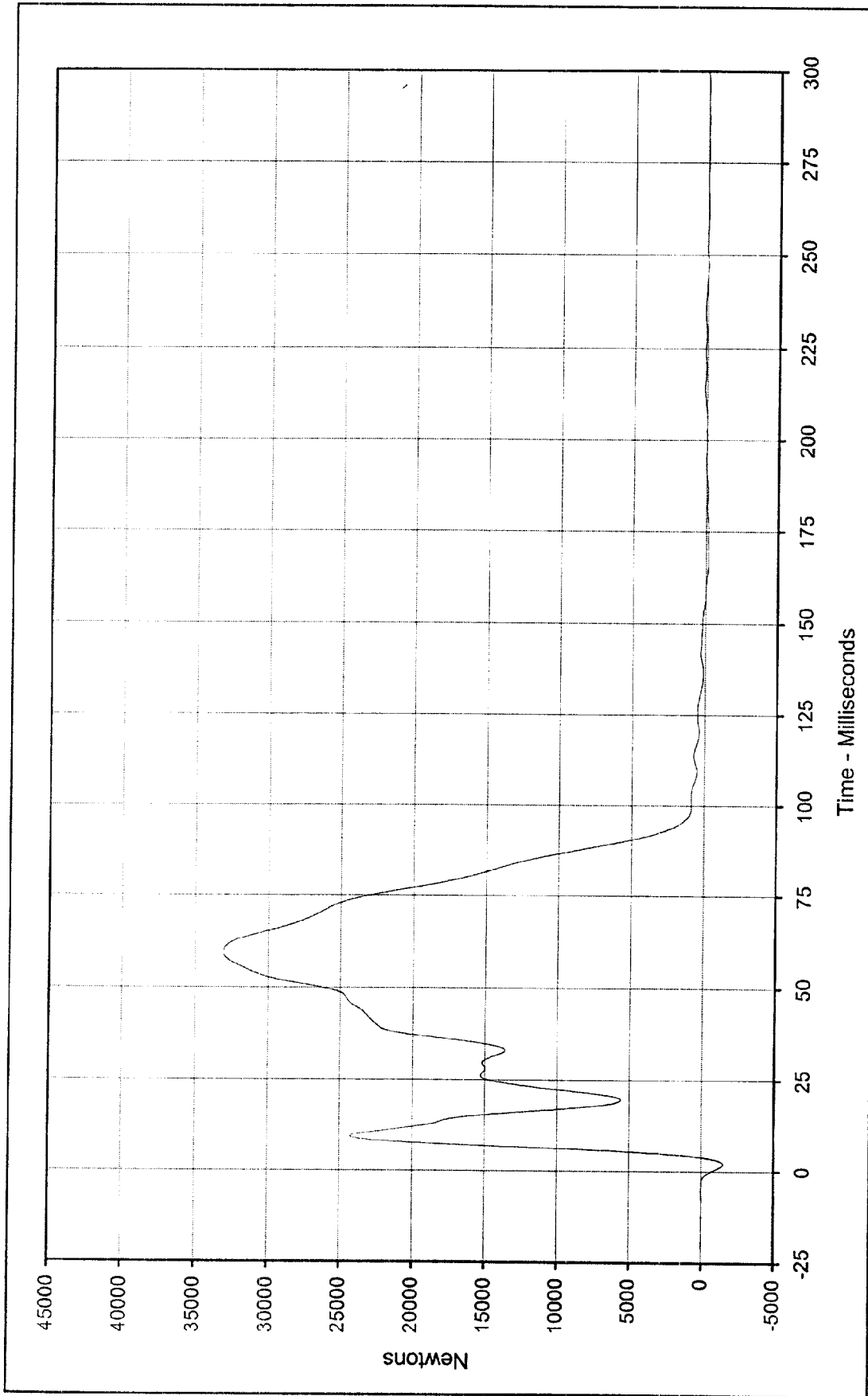




Curve Description: Barrier Force C6
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 43964.5 at 54.9 Milliseconds
 Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -96.0 at 177.6 Milliseconds

SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-121

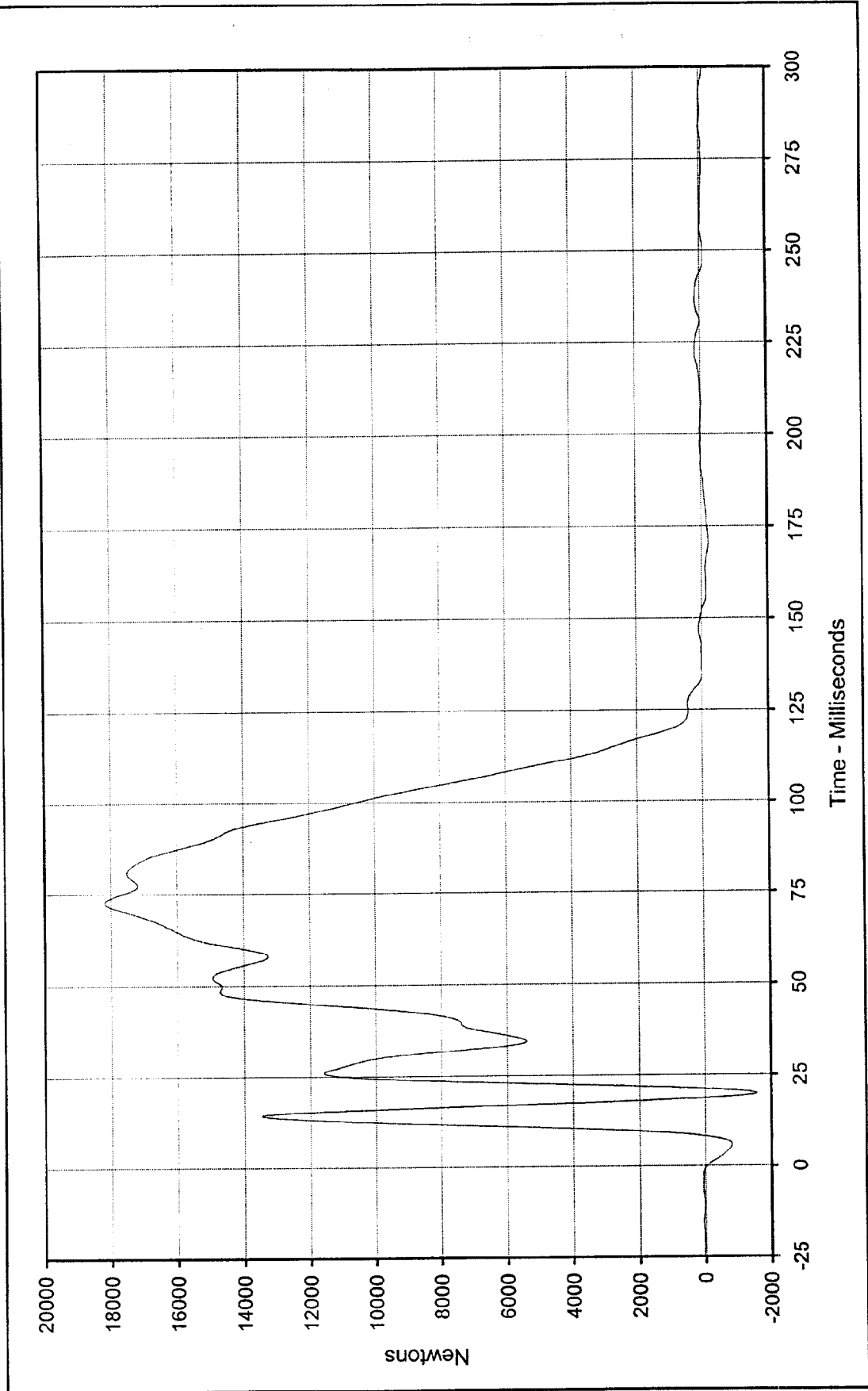




Curve Description: Barrier Force C7
 Maximum Value: 33086.6 at 59.3 Milliseconds
 Minimum Value: -1515.3 at 2.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-122

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

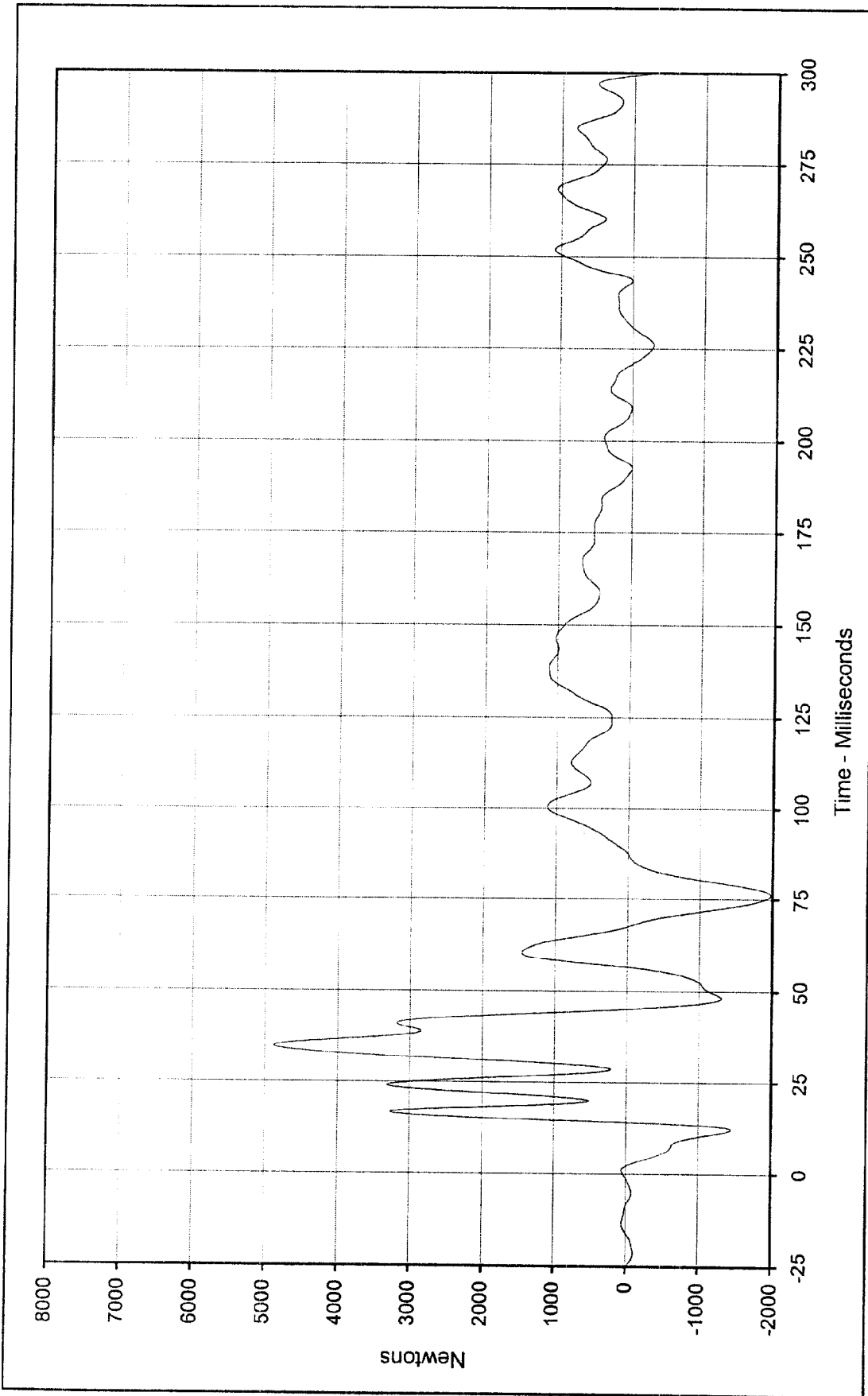




Curve Description: Barrier Force C8
 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

Maximum Value: 18182.6 at 72.7 Milliseconds
 Minimum Value: -1561.6 at 19.9 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: FIL-123

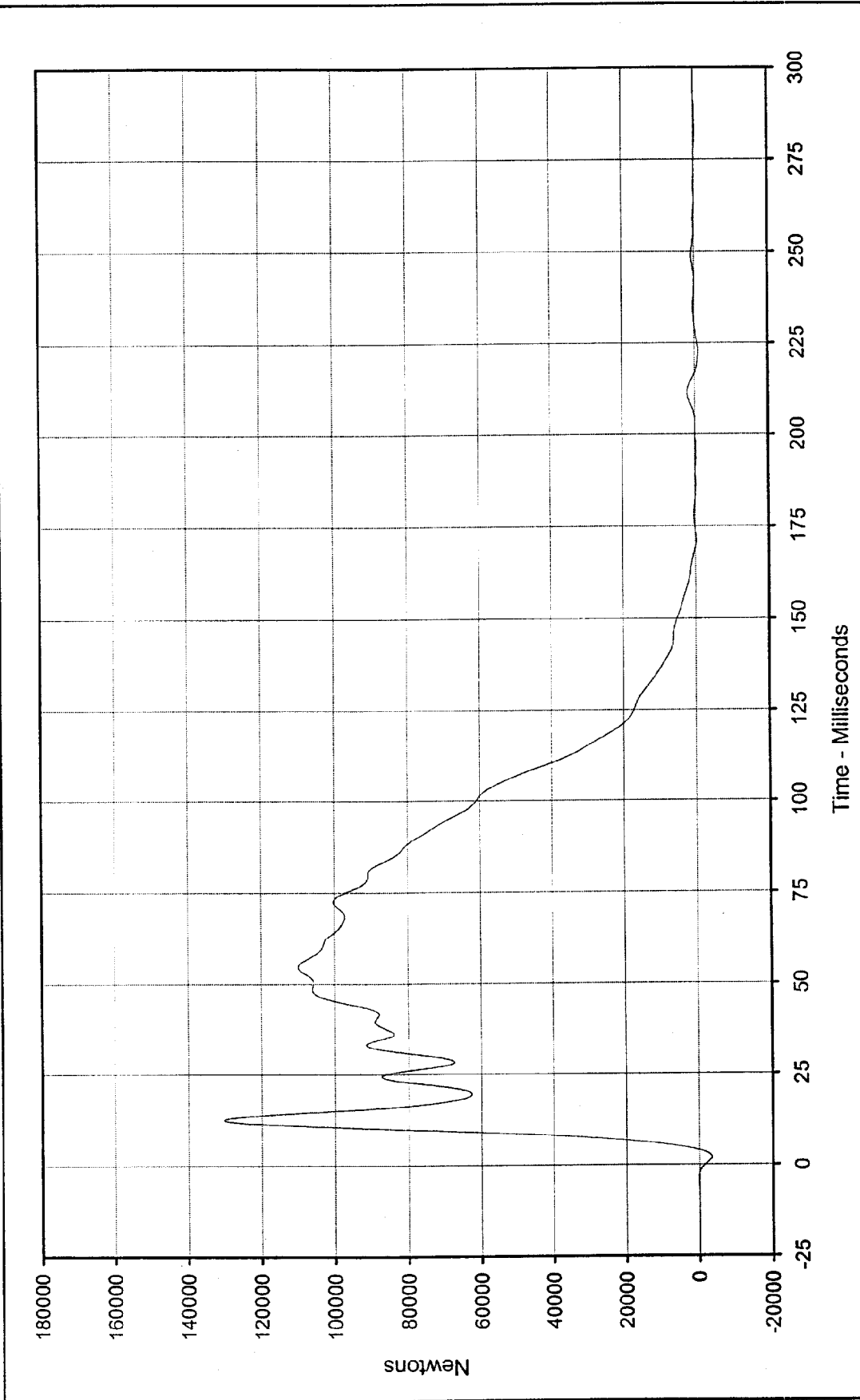




Curve Description: Barrier Force C9 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 4872.6 at 34.9 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -1979.0 at 76.1 Milliseconds
 SAE Filter Class: 60



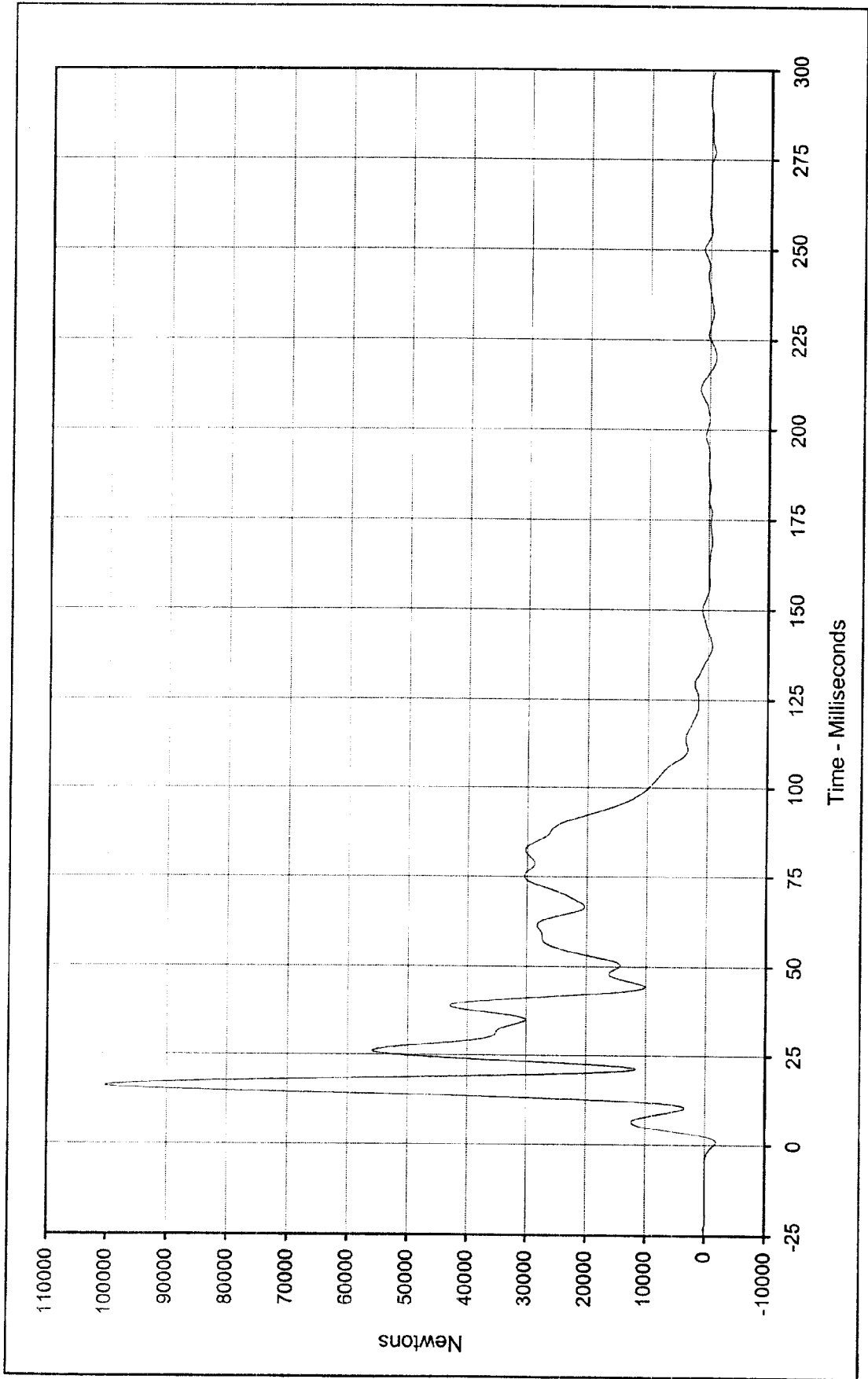
Date of Test: 1/26/99
 Curve Number: FIL-124



Curve Description: Barrier Force Sum No.1 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 130345.9 at 12.7 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -3370.9 at 1.9 Milliseconds

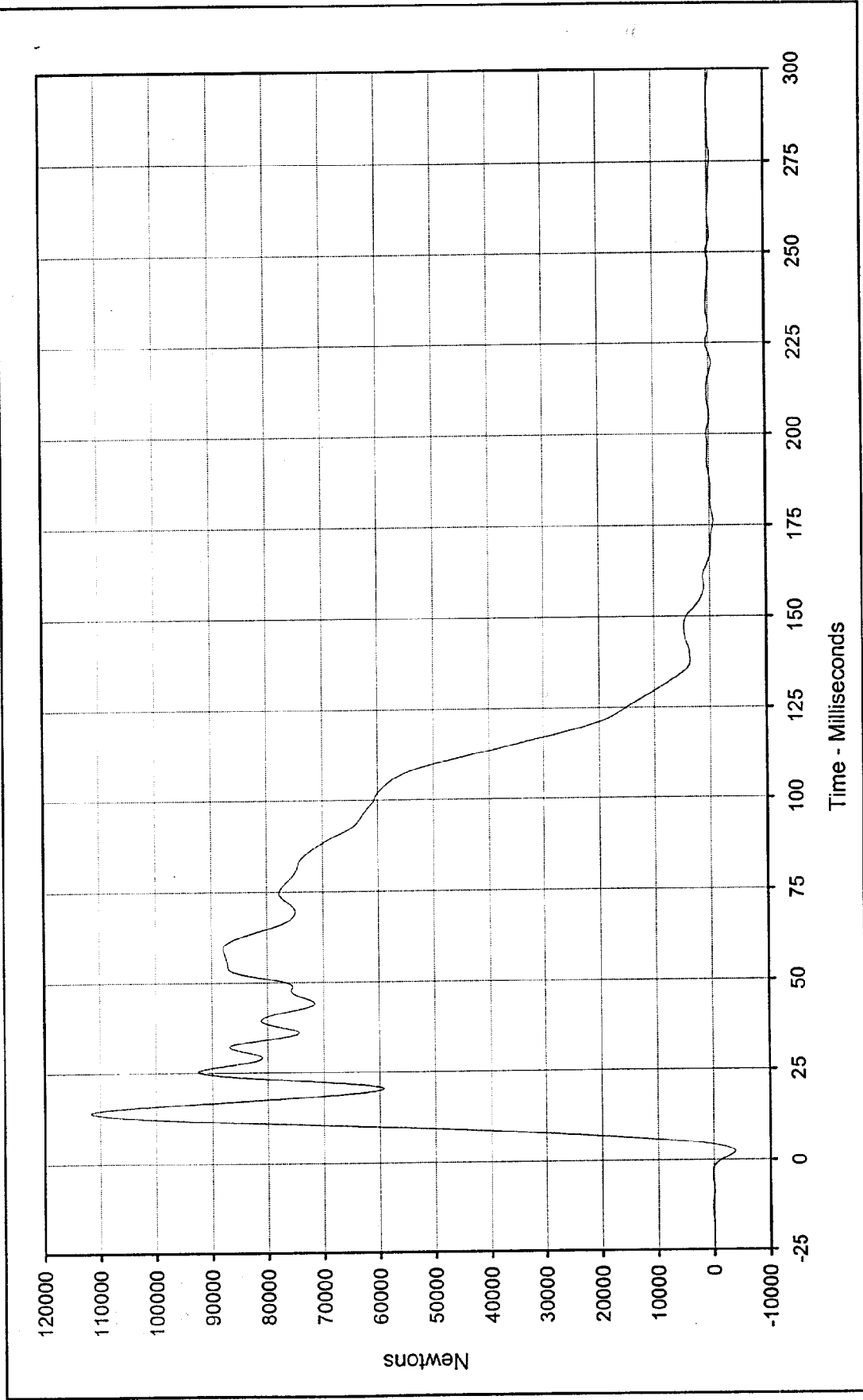


SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: SUM-001



Curve Description: Barrier Force Sum No.2 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 100193.0 at 16.3 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -1875.9 at 0.9 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: SUM-002





Curve Description: Barrier Force Sum No.3 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200

Maximum Value: 111715.2 at 14.2 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV

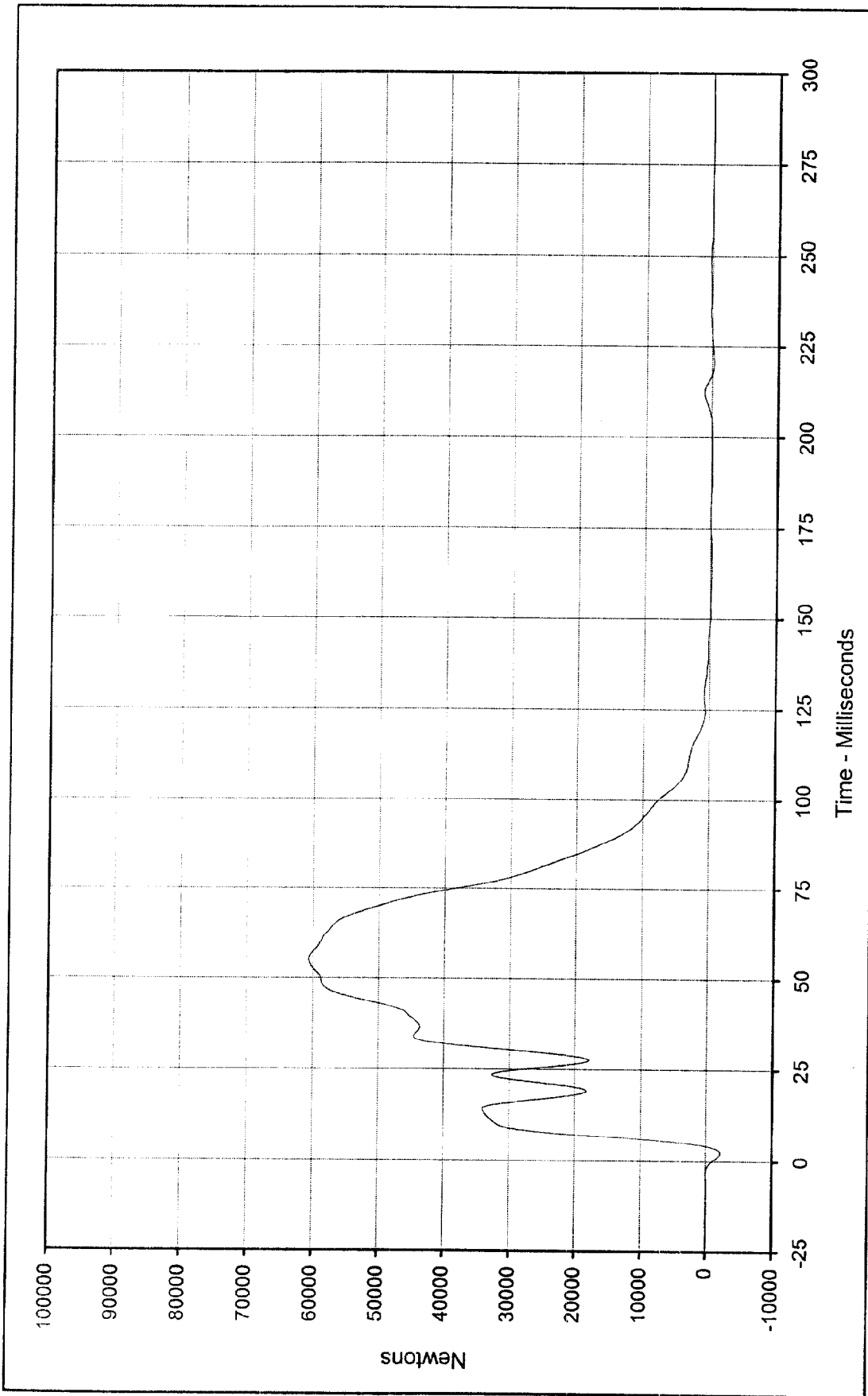
Minimum Value: -3705.8 at 2.3 Milliseconds

SAE Filter Class: 60

Date of Test: 1/26/99

Curve Number: SUM-003

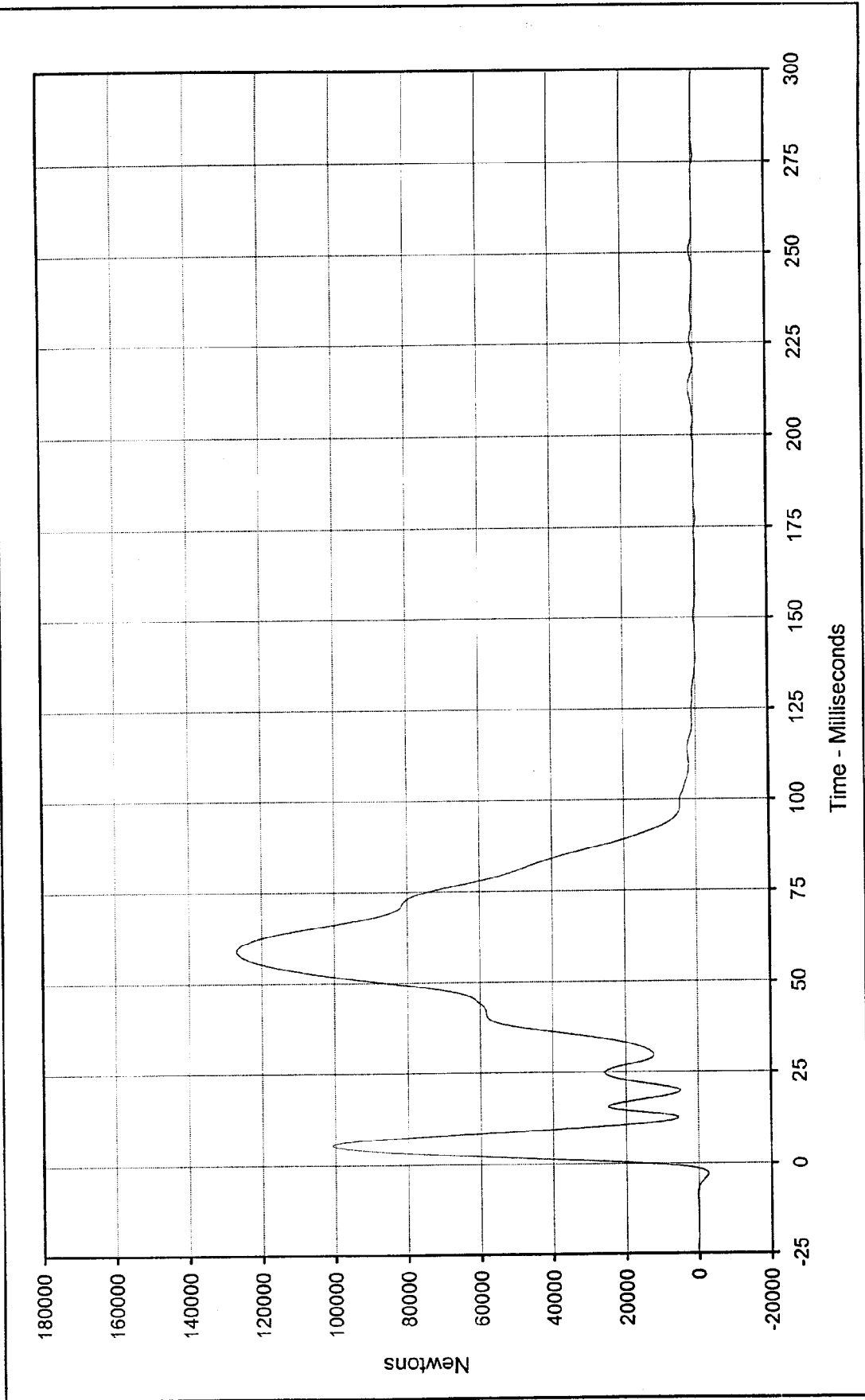




Curve Description: Barrier Force Sum No.4
 Maximum Value: 60645.1 at 55.2 Milliseconds
 Minimum Value: -2209.4 at 2.1 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: SUM-004

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

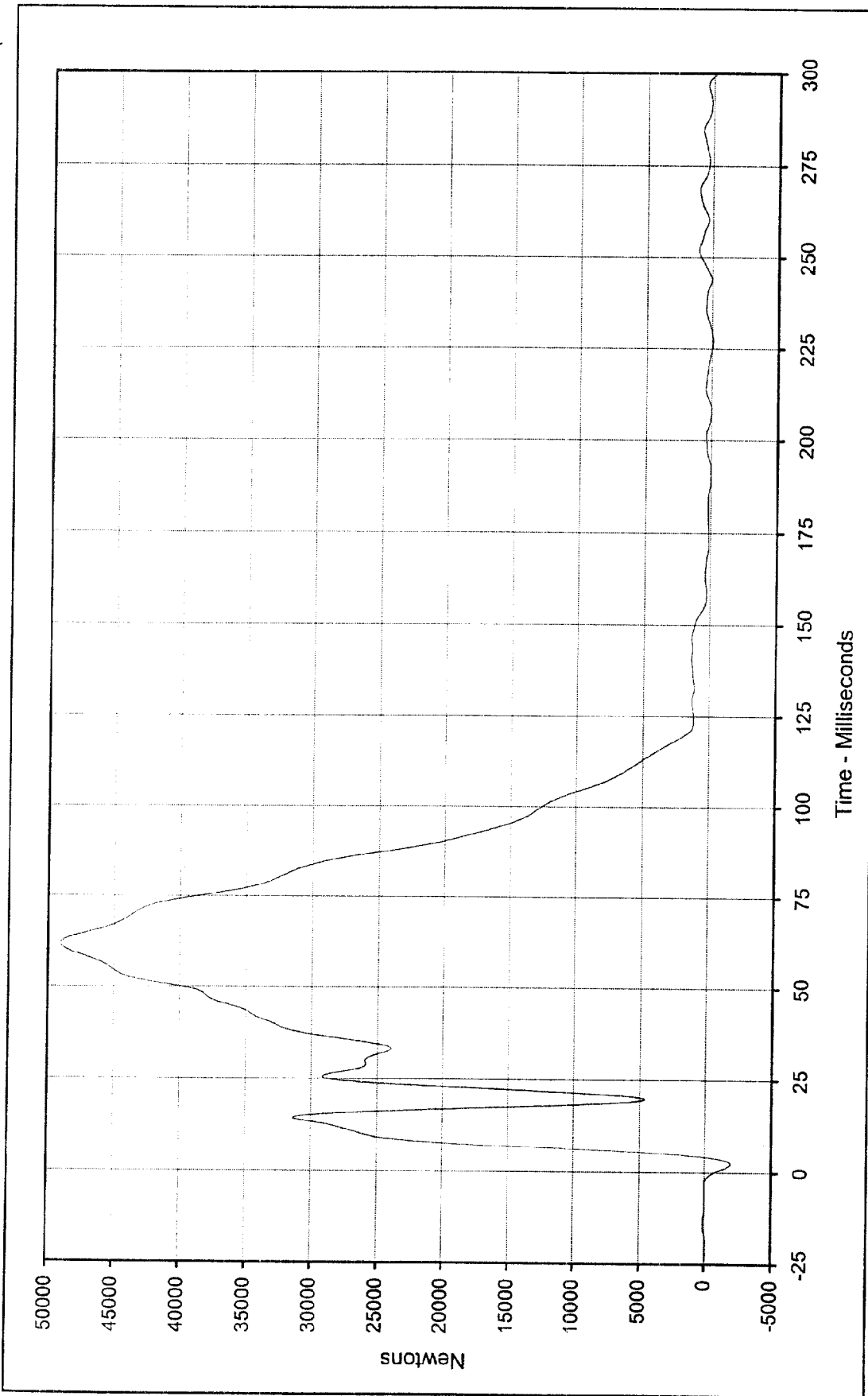




Curve Description: Barrier Force Sum No.5 Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Maximum Value: 126874.6 at 59.0 Milliseconds Test Vehicle: 1999 Ford Expedition XLT SUV
 Minimum Value: -545.4 at 276.7 Milliseconds

SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: SUM-005

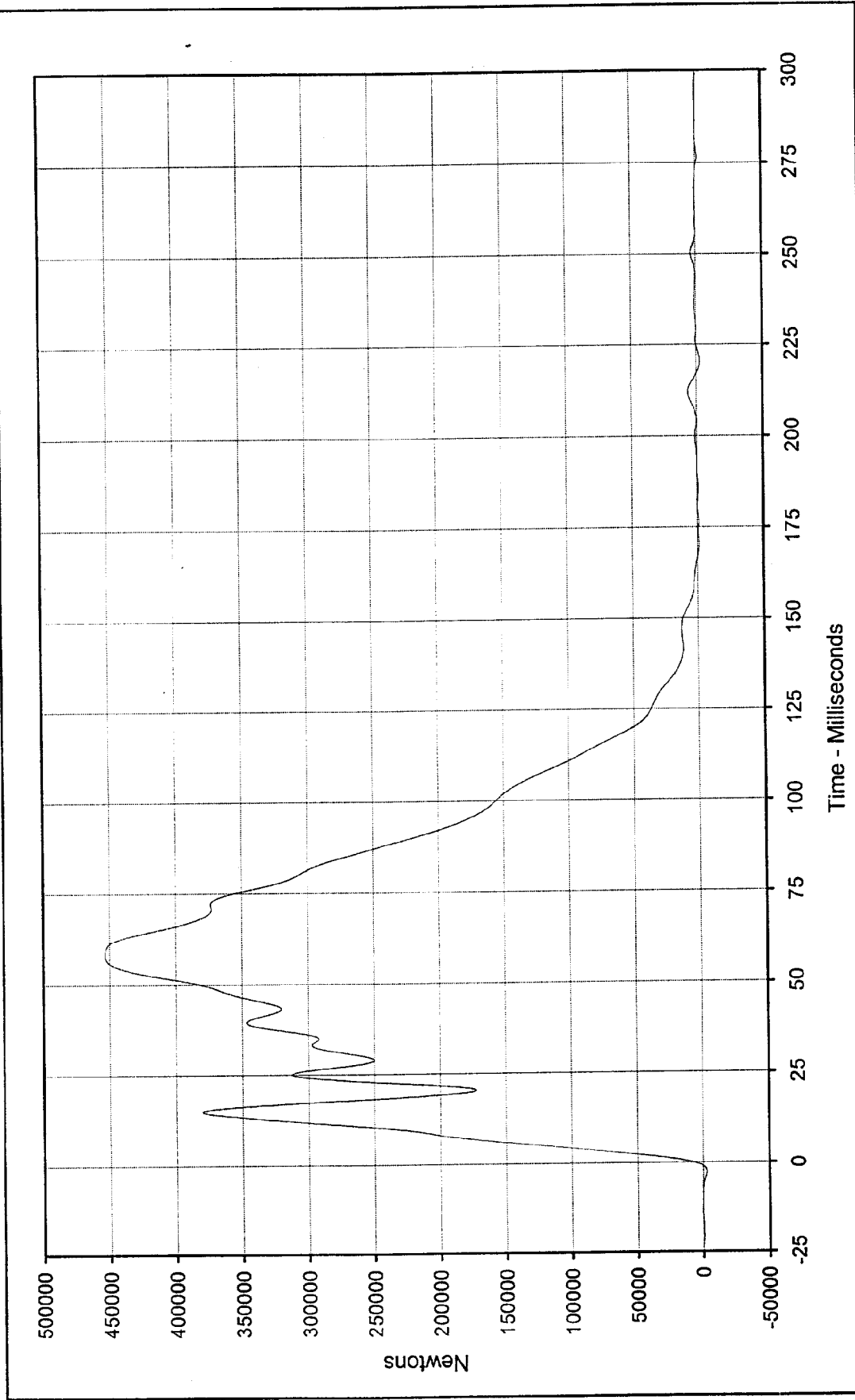




Curve Description: Barrier Force Sum No.6
 Maximum Value: 49062.2 at 61.9 Milliseconds
 Minimum Value: -1939.1 at 2.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: SUM-006

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV

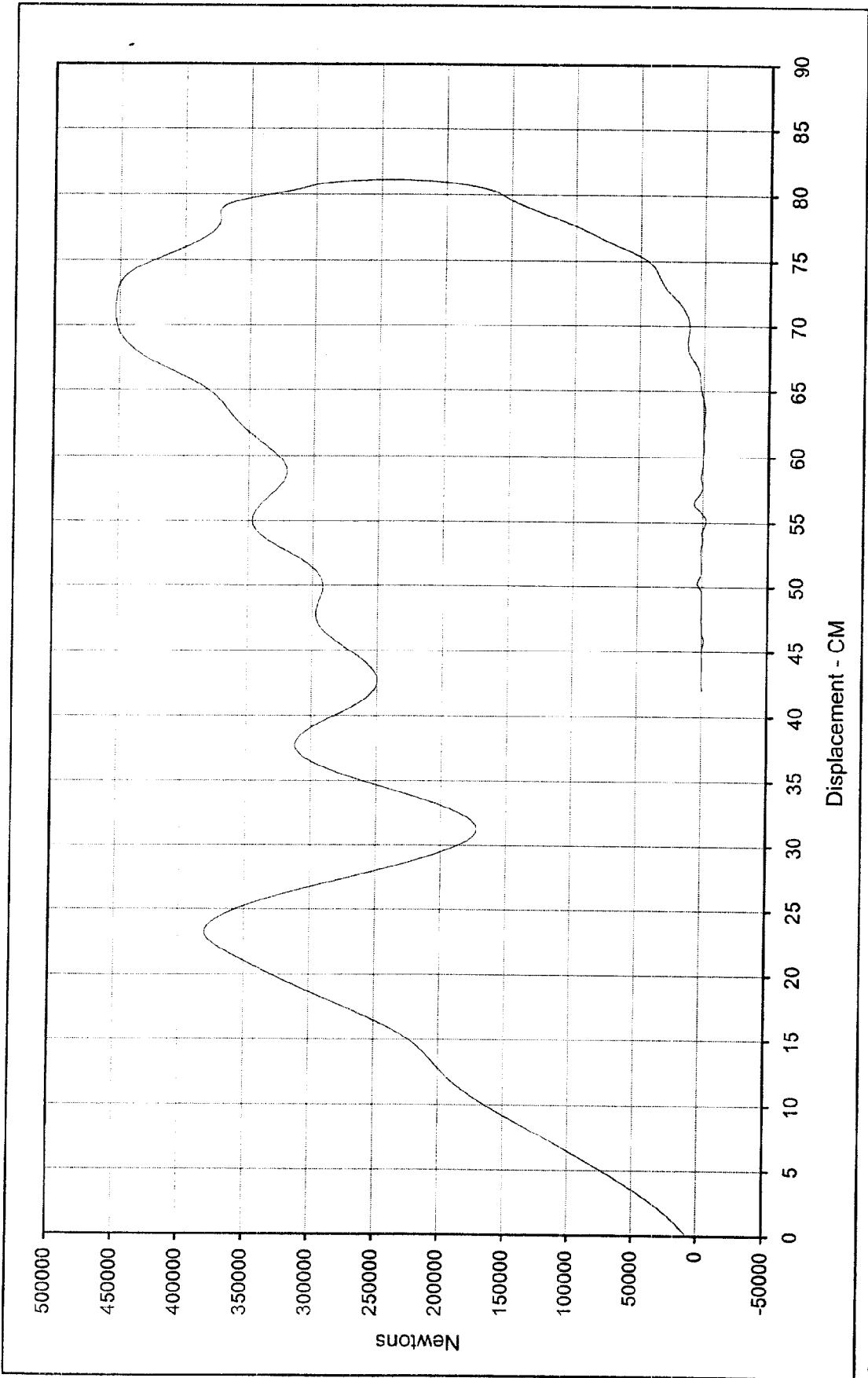




Curve Description: Barrier Force Sum Total
 Maximum Value: 453337.6 at 57.9 Milliseconds
 Minimum Value: -2417.0 at 220.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/26/99
 Curve Number: SUM-007

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV





Curve Description: Sum Force Total vs. Dynamic Crush
 Maximum Displ.: 81.1 at 87.8 Milliseconds
 Maximum Force: 453337.6 at 57.9 Milliseconds
 SAE Filter Class: N/A
 Date of Test: 1/26/99
 Curve Number: XVY-001

Test Program: 1999 NHTSA 35 mph NCAP No.: MX0200
 Test Vehicle: 1999 Ford Expedition XLT SUV



BARRIER LOAD CELL SUMMARY DATA

TEST VEHICLE: 1999 FORD EXPEDITION XLT SUV

NHTSA No.: MX0200

TEST PROGRAM: 1999 NHTSA 35 MPH NCAP

TEST DATE: 1/26/99

BARRIER LOAD CELL PEAK FORCES

Location	Units	Max	Time	Min	Time
Barrier Force A2	Newtons	3339.2	24.4	-1607.8	29.0
Barrier Force A3	Newtons	7170.4	25.9	-1546.7	21.4
Barrier Force A4	Newtons	9055.9	16.9	-1884.0	11.3
Barrier Force A5	Newtons	40132.8	16.4	-3899.8	11.3
Barrier Force A6	Newtons	9640.6	17.4	-2186.3	12.1
Barrier Force A7	Newtons	5493.2	17.5	-2227.6	12.5
Barrier Force A8	Newtons	2406.7	24.8	-1580.7	29.1
Barrier Force A9	Newtons	2893.8	24.4	-2078.0	19.4
Barrier Force B2	Newtons	23873.4	88.2	-1039.5	19.9
Barrier Force B3	Newtons	130975.5	12.6	-2549.8	1.7
Barrier Force B4	Newtons	23473.5	73.4	-569.8	0.7
Barrier Force B5	Newtons	6523.8	15.8	-2597.2	11.8
Barrier Force B6	Newtons	35059.8	14.4	-647.5	1.3
Barrier Force B7	Newtons	110880.1	13.5	-2499.4	1.9
Barrier Force B8	Newtons	12176.0	97.3	-1795.5	20.0
Barrier Force B9	Newtons	2854.9	23.4	-3116.1	28.4
Barrier Force C2	Newtons	19841.4	68.9	-604.9	3.5
Barrier Force C3	Newtons	43861.6	53.8	-1699.4	2.0
Barrier Force C4	Newtons	56360.4	5.9	-244.7	138.9
Barrier Force C5	Newtons	37687.9	59.9	-3124.1	20.2
Barrier Force C6	Newtons	43964.5	54.9	-96.0	177.6
Barrier Force C7	Newtons	33086.6	59.3	-1515.3	2.0
Barrier Force C8	Newtons	18182.6	72.7	-1561.6	19.9
Barrier Force C9	Newtons	4872.6	34.9	-1979.0	76.1
Barrier Force Sum No.1	Newtons	130345.9	12.7	-3370.9	1.9
Barrier Force Sum No.2	Newtons	100193.0	16.3	-1875.9	0.9
Barrier Force Sum No.3	Newtons	111715.2	14.2	-3705.8	2.3
Barrier Force Sum No.4	Newtons	60645.1	55.2	-2209.4	2.1
Barrier Force Sum No.5	Newtons	126874.6	59.0	-545.4	276.7
Barrier Force Sum No.6	Newtons	49062.2	61.9	-1939.1	2.4
Barrier Force Sum Total	Newtons	453337.6	57.9	-2417.0	220.3

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

APPENDIX D
INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

KAR99001-12

1999 NHTSA 35 mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 35
1/26/99
1999 Ford Expedition XLT SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC039	Accel., 1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	KEAC038	Accel., 1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	KEAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	KEAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	KEAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	KEAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
8	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
9	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
11	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
12	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	CHEST, PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST, PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST, PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST, REDUNDANT	X	KEAC023	Accel., 1/2 bridge	Endevco	7264-200	G
17	CHEST, REDUNDANT	Y	KEAC022	Accel., 1/2 bridge	Endevco	7264-200	G
18	CHEST, REDUNDANT	Z	KEAC024	Accel., 1/2 bridge	Endevco	7264-200	G
19	CHEST DISPLACEMENT	X	GPCP001	Rotary Pot Chest	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	KEAC019	Accel., 1/2 bridge	Endevco	7264-200	G
21	PELVIS, PRIMARY	Y	KEAC020	Accel., 1/2 bridge	Endevco	7264-200	G
22	PELVIS, PRIMARY	Z	KEAC021	Accel., 1/2 bridge	Endevco	7264-200	G
23	LEFT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N

1999 NHTSA 35 mph NCAP
Instrumentation Data Channel Assignments

Driver A.T.D Serial Number 35
1/26/99

1999 Ford Expedition XLT SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
26	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
27	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
28	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
29	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
30	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
31	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
32	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
33	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
34	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
35	FOOT LEFT	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT	Y	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT	Y	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT	Z	KEIC004Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
41	LAP BELT FORCE	X	KELC001	Load cell, Seat belt	Lebow	3371	N
42	SHOULDER BELT FORCE	X	KELC002	Load cell, Seat belt	Lebow	3371	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

1999 NHTSA 35 mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
1/26/99

1999 Ford Expedition XLT SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
52	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
53	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
54	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
55	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
56	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
57	CHEST, PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST, PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST, PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST, REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
61	CHEST, REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
62	CHEST, REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
63	CHEST DISPLACEMENT	X	GPCP002	Rotary Pot Chest	Servo	14CBI	MM
64	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	GPLC001	Load cell, Femur	G.S.E.	2430	N

1999 NHTSA 35 mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
1/26/99

1999 Ford Expedition XLT SUV

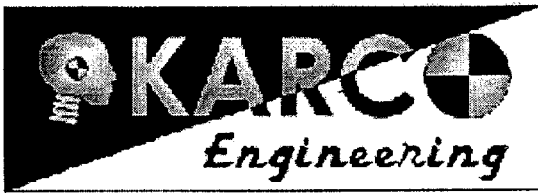
CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
70	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
71	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
72	UP. 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	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT	Y	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT	Y	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT	Z	KEIC001Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
85	LAP BELT FORCE	X	KELC003	Load cell, Seat belt	Lebow	3371	N
86	SHOULDER BELT FORCE	X	KELC004	Load cell, Seat belt	Lebow	3371	N
87	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	CM
88	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

1999 NHTSA 35 mph NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
1/26/99
1999 Ford Expedition XLT SUV

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	Left Rear X-Member (Pri.)	X	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G
90	Right Rear X-Member (Pri.)	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
91	Engine Top	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	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	KEVA009	Accel., Vehicle block	I.C. Sensor	3031-500	G
95	Instrument Panel	X	KEVA004	Accel., Vehicle block	I.C. Sensor	3031-500	G
96	Left Rear X-Member (Rednt.)	X	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-200	G

APPENDIX E
DUMMY CALIBRATION DATA

KAR99001-12



Hybrid III Calibration Data Sheet

50TH Percentile Male

Left Knee Impact Test

ATD Serial No.: 34

Part Serial No.: N/A

Test I.D.: KI02C

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	2.091	Pass
Peak Probe Force	Newtons	4715 to 5782	5292.5	Pass
Overall Test Results				Pass

Laboratory Technician

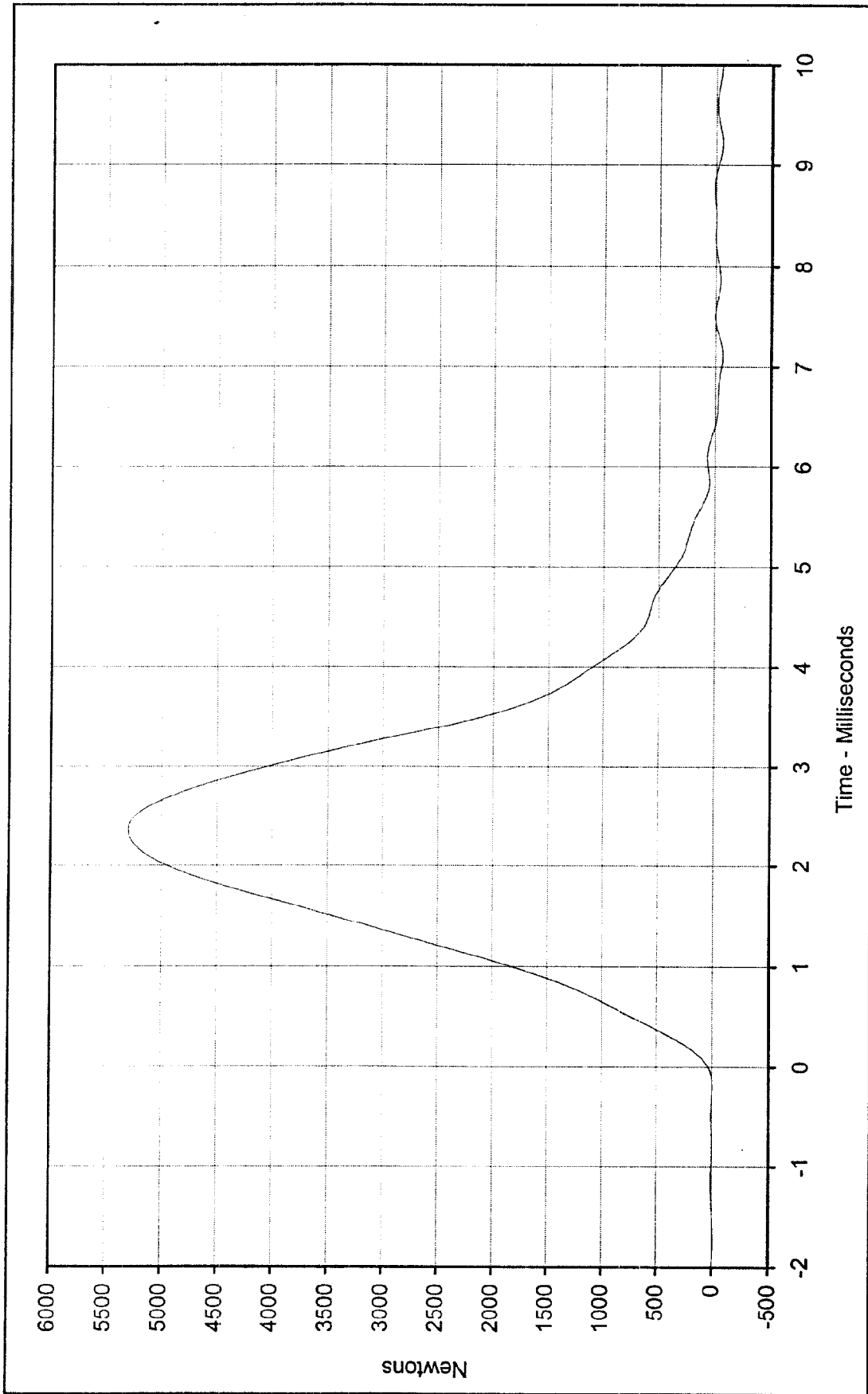
January 23, 1999

Test Date

Approved By

1/20/99

Date



Testing Program: Hybrid III Left Knee Impact Test
 Test Information: Part S/N: N/A Test I.D.: KI02C



Curve Description: Probe Force
 Maximum Value: 5292.5 at 2.4 Milliseconds
 Minimum Value: -67.0 at 7.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/99
 ATD Serial No.: 34



Hybrid III Calibration Data Sheet
50TH Percentile Male
Right Knee Impact Test

ATD Serial No.: 34

Part Serial No.: N/A

Test I.D.: KI02D

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	2.087	Pass
Peak Probe Force	Newtons	4715 to 5782	5480.7	Pass
Overall Test Results				Pass

 Laboratory Technician

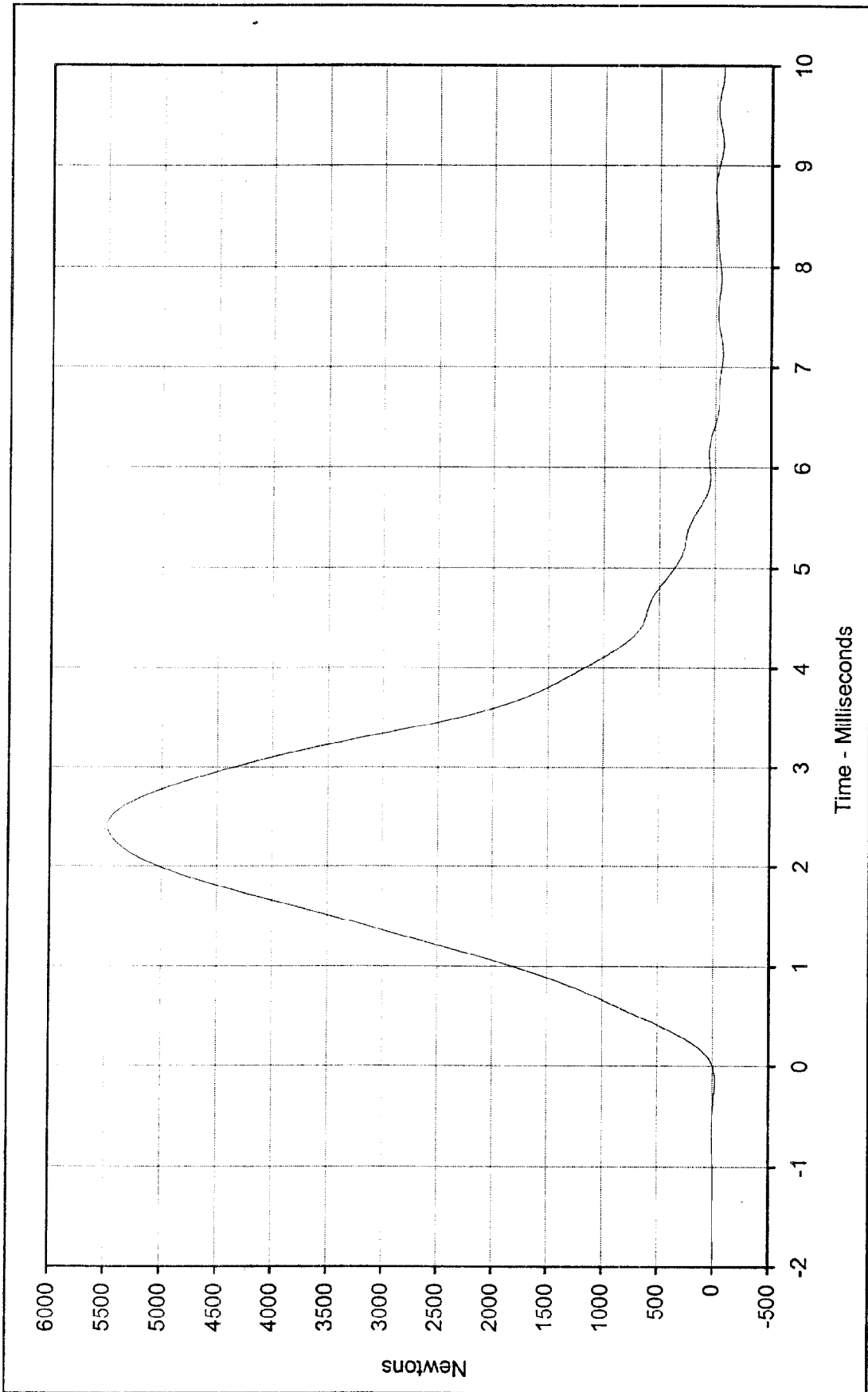
January 23, 1999

Test Date

James E. Smith
 Approved By

1/26/99

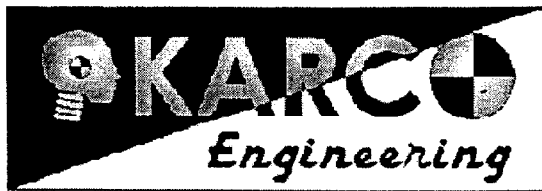
Date



Curve Description: Hybrid III Right Knee Impact Test
 Testing Program: Part S/N: N/A Test I.D.: KI02D

Probe Force
 Maximum Value: 5480.7 at 2.4 Milliseconds
 Minimum Value: -65.2 at 7.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/99
 ATD Serial No.: 34





Hybrid III Calibration Data Sheet

50TH Percentile Male

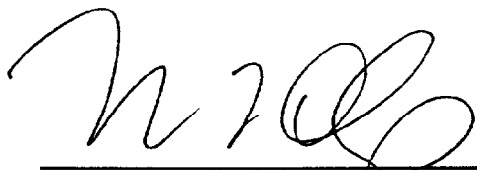
Head Drop Calibration

ATD Serial No.: 034

Part Serial No.: N/A

Test I.D.: HD01D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	242.9	Pass
Peak Lateral Acceleration	G's	≤15.0	2.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



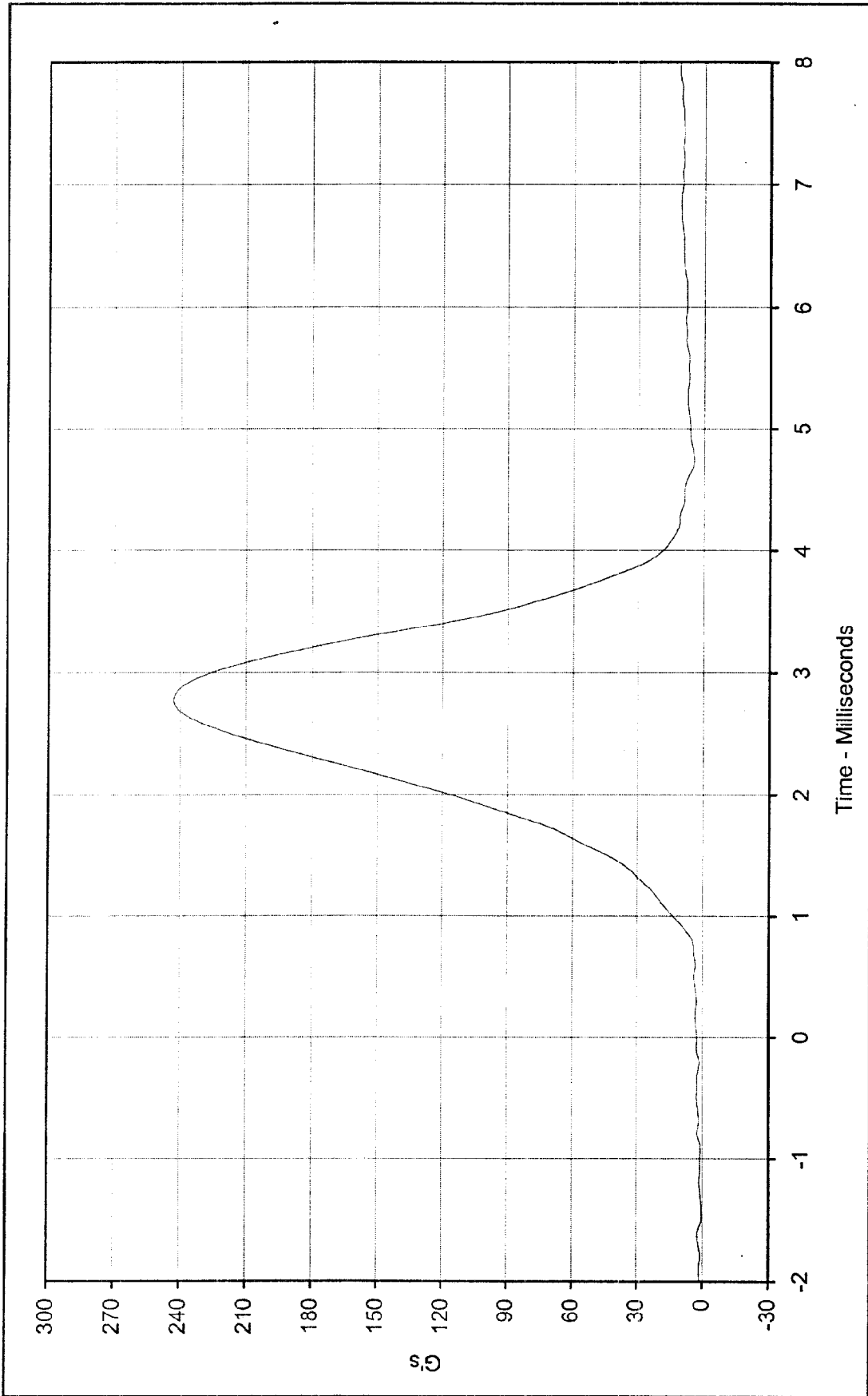
Laboratory Technician

January 23, 1999
Test Date



Approved By

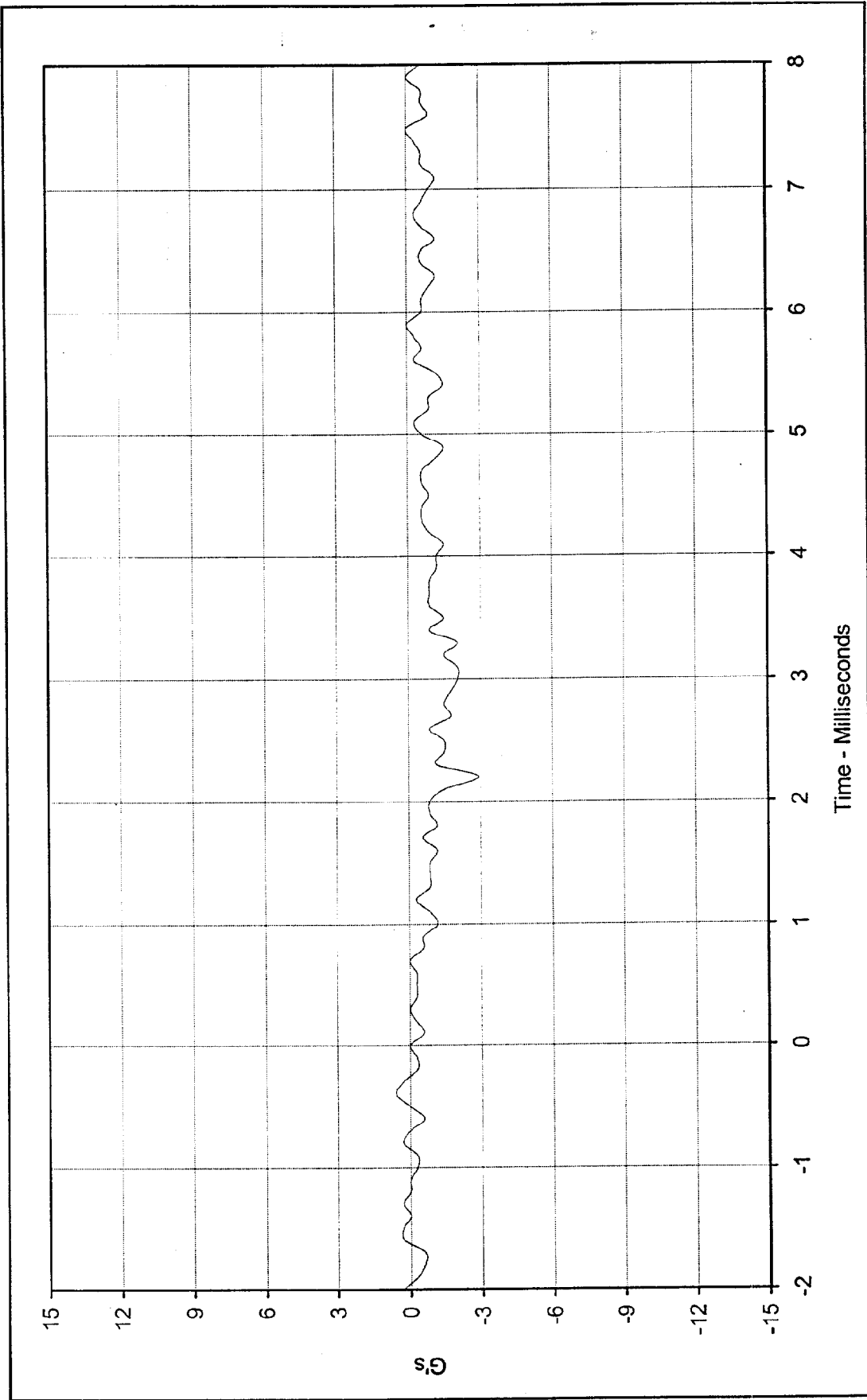
1/26/99
Date



Testing Program: Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: N/A Test I.D.: HD01D

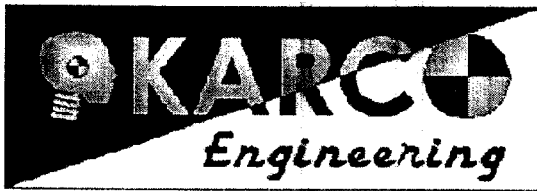


Curve Description: Head Resultant Acceleration
 Maximum Value: 242.9 at 2.8 Milliseconds
 Minimum Value: 0.4 at -1.5 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/99
 ATD Serial No.: 034



Curve Description: Hybrid III Head Drop Calibration (Male)
 Testing Program: Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: N/A Test I.D.: HD01D
 Head Acceleration Y Axis
 Maximum Value: 0.6 at -0.4 Milliseconds
 Minimum Value: -2.9 at 2.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/99
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male


Thorax Impact Test

ATD Serial No.: 034

Part Serial No.: N/A

Test I.D.: CH02F

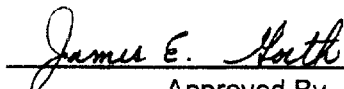
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5358	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.55	Pass
Internal Hysteresis	%	69 to 85	73.6	Pass
Overall Test Results				Pass



Laboratory Technician

January 24, 1999

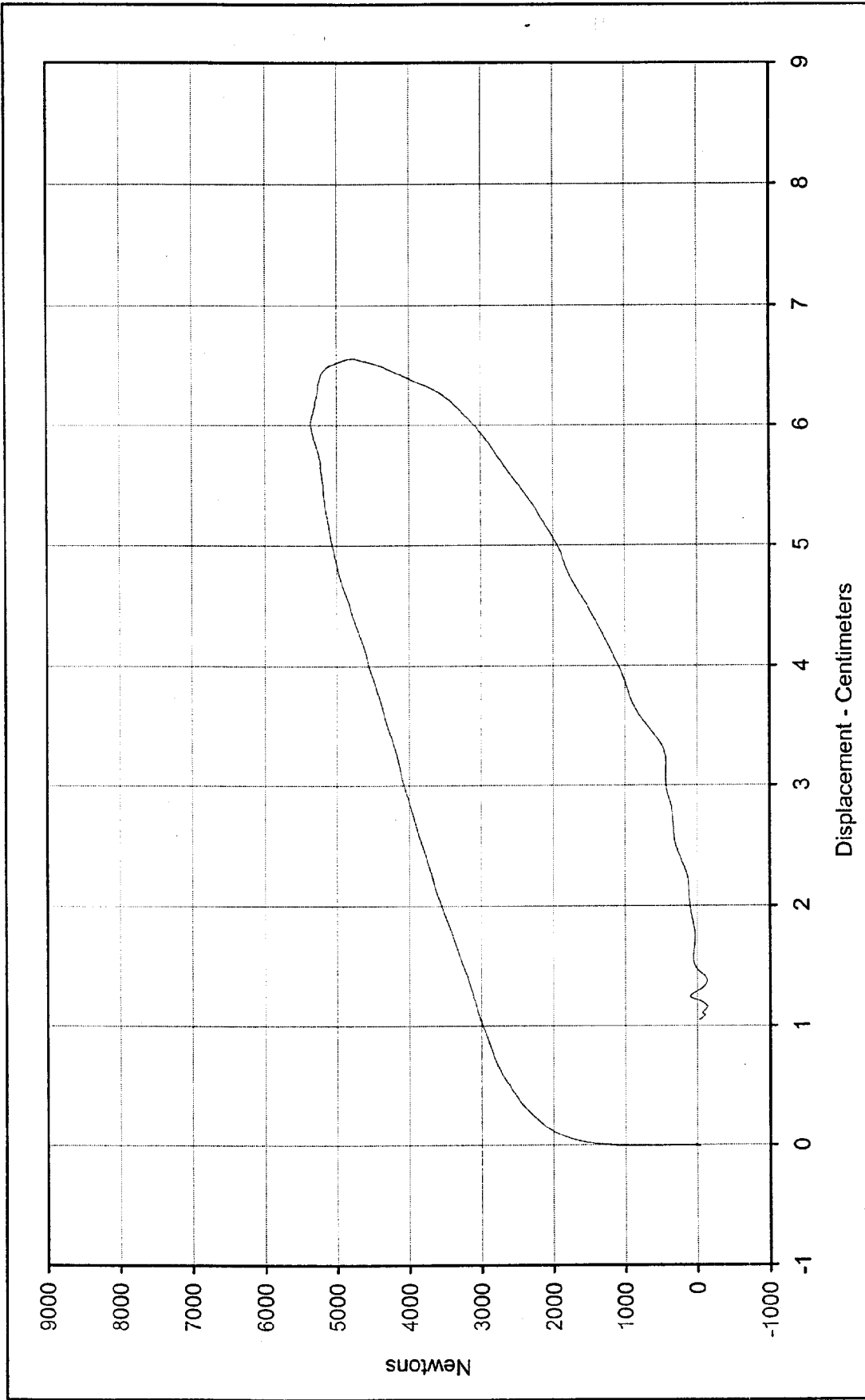
Test Date



Approved By

1/26/99

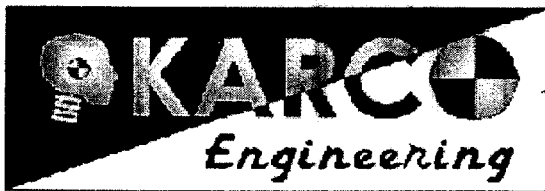
Date



Curve Description: Probe Force vs. Chest Displacement Testing Program: Hybrid III Thorax Impact Test
 Probe Force: 5358.3 Newtons Test Information: S/N of Part: N/A Test I.D.: CH02F

Chest Displ.: 6.55 Centimeters
 SAE Filter Class: 180
 Date of Test: 1/24/99
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

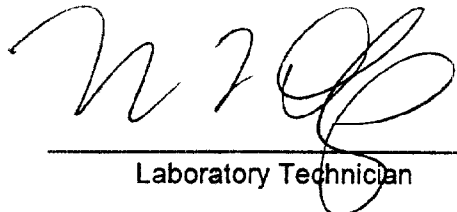
Neck Flexion Test

ATD Serial No.: 034

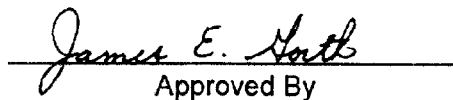
Part Serial No.: N/A

Test I.D.: NF01C

Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass	
Laboratory Relative Humidity	%	10 to 70	39	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.90	Pass	
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.7	Pass
	20 Msec.	G's	17.6 to 22.6	19.7	Pass
	30 Msec.	G's	12.5 to 18.5	18.1	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 29.0	18.3	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	34.0 to 42.0	38.4	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	68.3	Pass
	Time	Msec.	57.0 to 64.0	63.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	113.0 to 128.0	113.6	Pass	
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	89.3	Pass
	Time	Msec.	47.0 to 58.0	53.1	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	97.0 to 107.0	99.3	Pass	
Overall Test Results				Pass	



Laboratory Technician



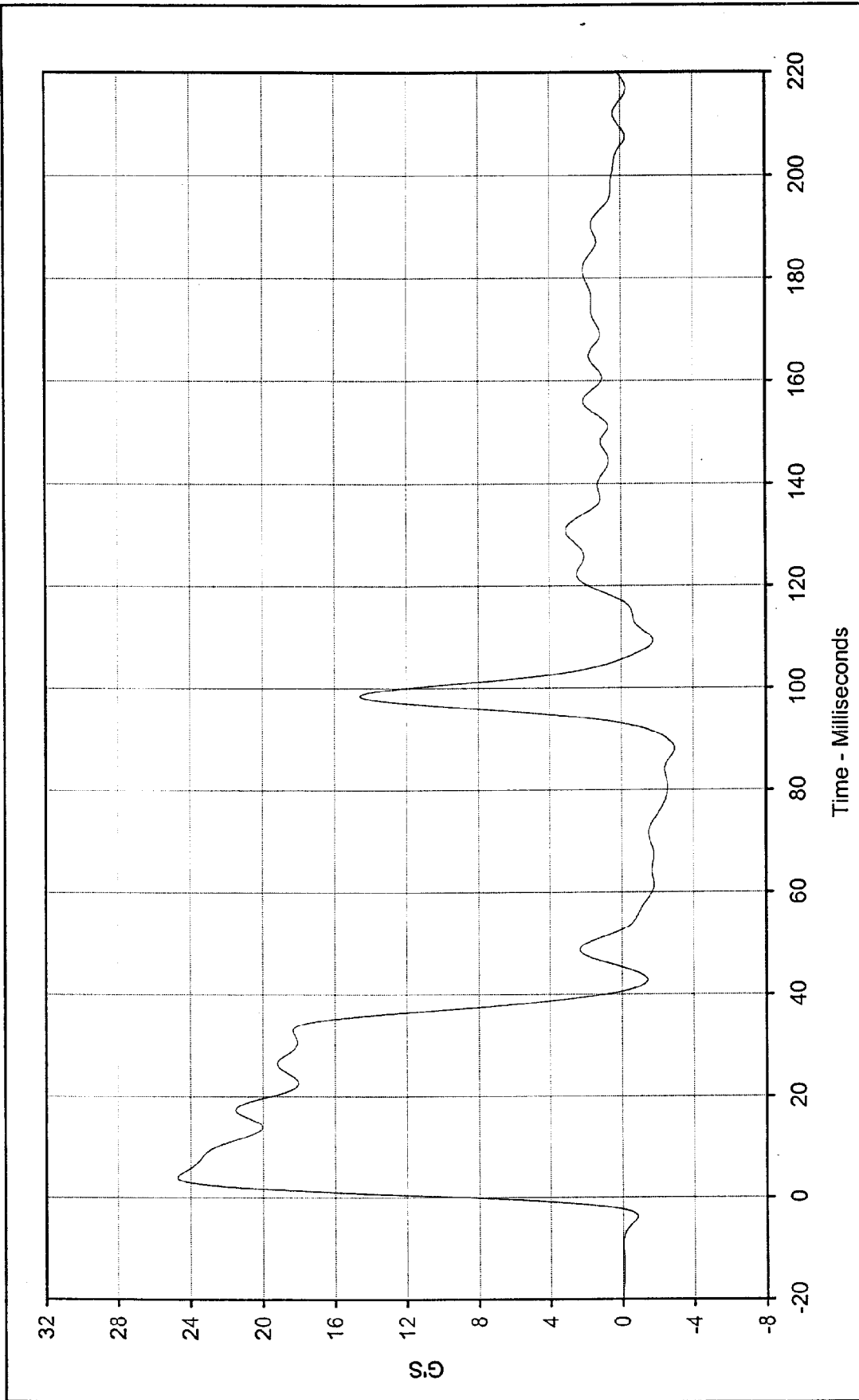
Approved By

January 24, 1999

Test Date

1/26/99

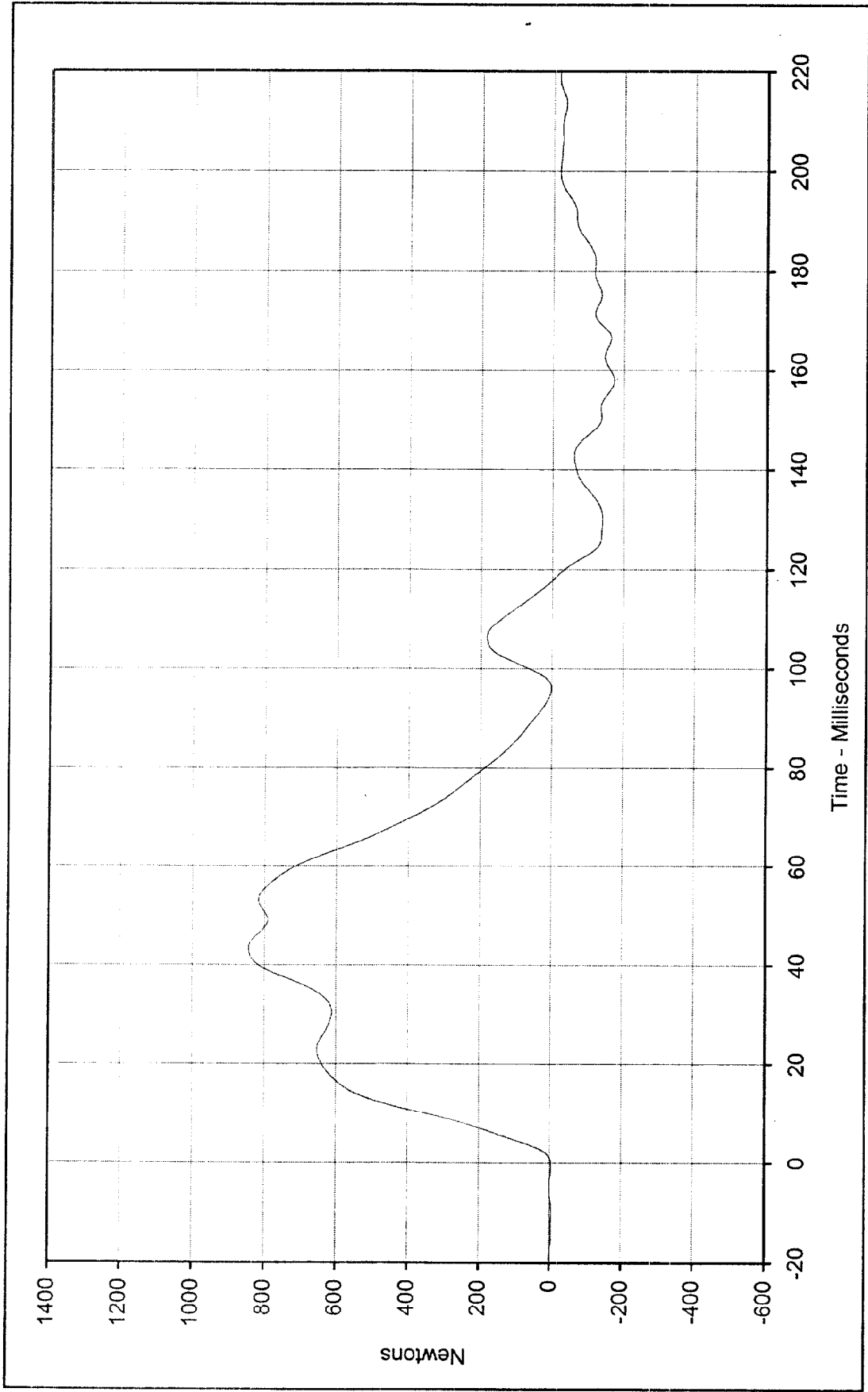
Date



Curve Description: Hybrid III Neck Flexion Test (Male)
 Testing Program: SIN of Part: N/A Test I.D.: NF01C

Pendulum Deceleration
 Maximum Value: 24.7 at 4.0 Milliseconds
 Minimum Value: -2.9 at 88.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 034





Curve Description: Neck Force X Testing Program: Hybrid III Neck Flexion Test (Male)

Maximum Value: 843.9 at 43.3 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NF01C

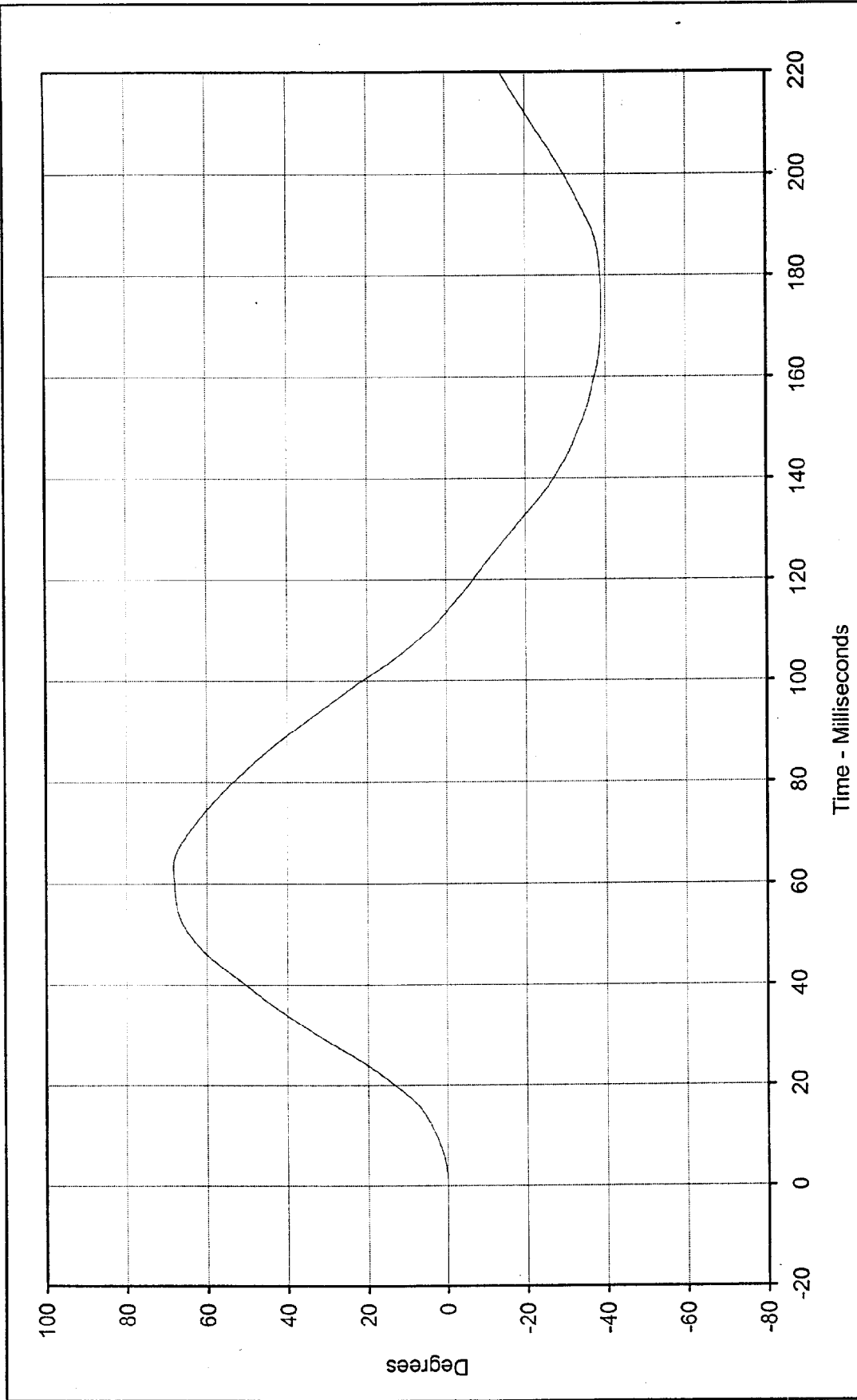
Minimum Value: -172.3 at 158.0 Milliseconds

SAE Filter Class: 60

Date of Test: 1/24/99

ATD Serial No.: 034

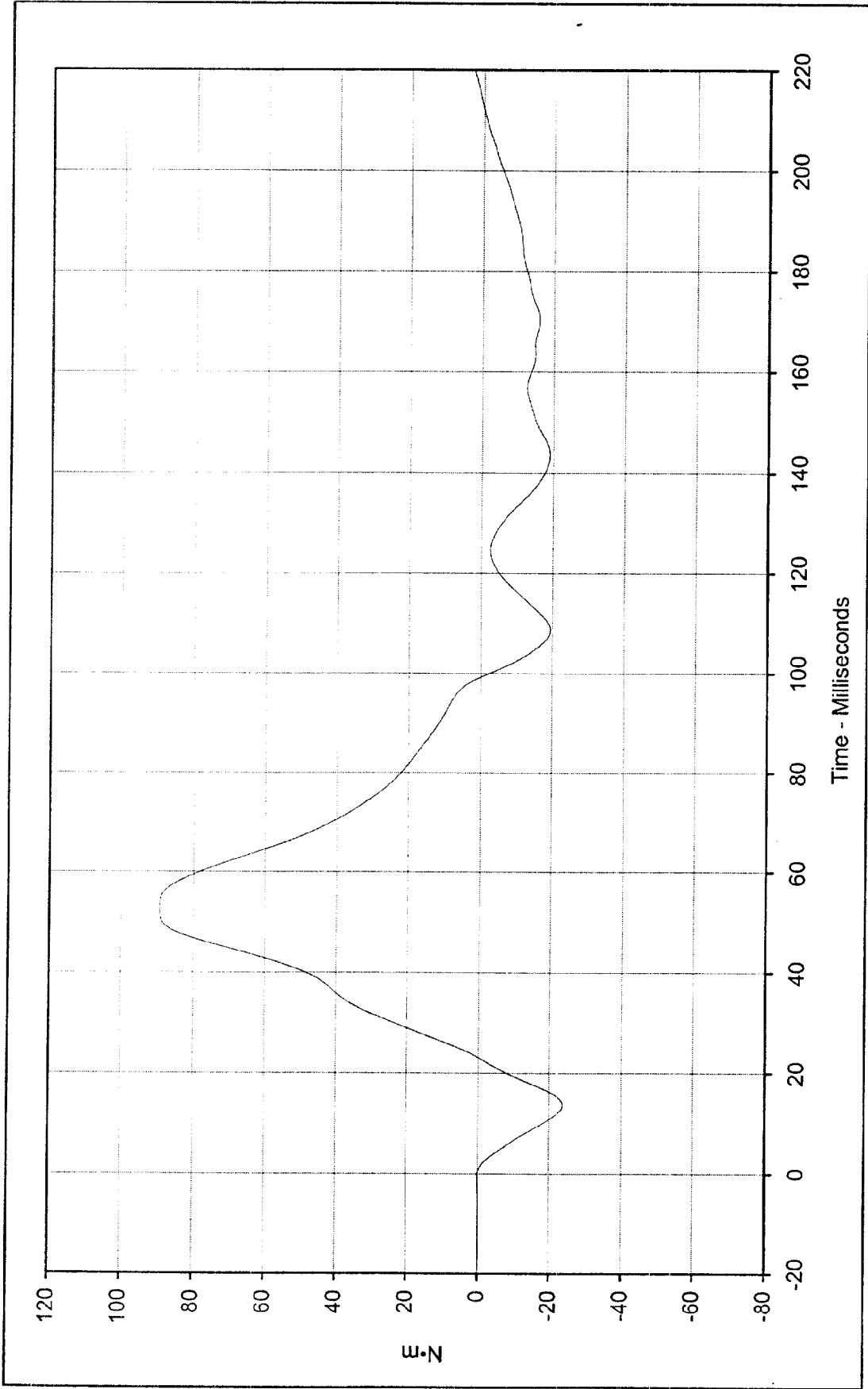




Curve Description: "D" Plane Rotation
 Maximum Value: 68.3 at 63.2 Milliseconds
 Minimum Value: -39.1 at 174.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 034

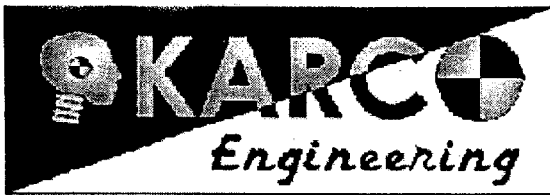
Testing Program: Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: N/A Test I.D.: NF01C





Curve Description: Moment About Occipital Condyles Testing Program Hybrid III Neck Flexion Test (Male)
 Maximum Value: 89.3 at 53.1 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NF01C
 Minimum Value: -23.7 at 13.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

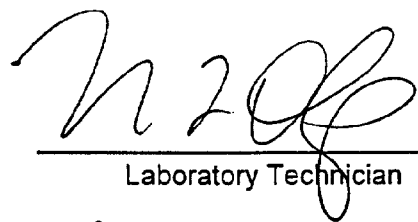
Neck Extension Test

ATD Serial No.: 034

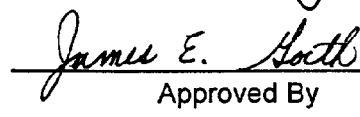
Part Serial No.: N/A

Test I.D.: NE01D

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	6.18	Pass	
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.7	Pass
	20 Msec.	G's	14.0 to 19.0	18.2	Pass
	30 Msec.	G's	11.0 to 16.0	14.7	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 22.0	14.7	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	38.0 to 46.0	42.8	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.8	Pass
	Time	Msec.	72.0 to 82.0	74.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	147.0 to 174.0	153.2	Pass	
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-69.4	Pass
	Time	Msec.	65.0 to 79.0	68.1	Pass
Negative Moment Decay, Time To Zero Crossing	Msec.	120.0 to 148.0	140.9	Pass	
Overall Test Results				Pass	



 Laboratory Technician



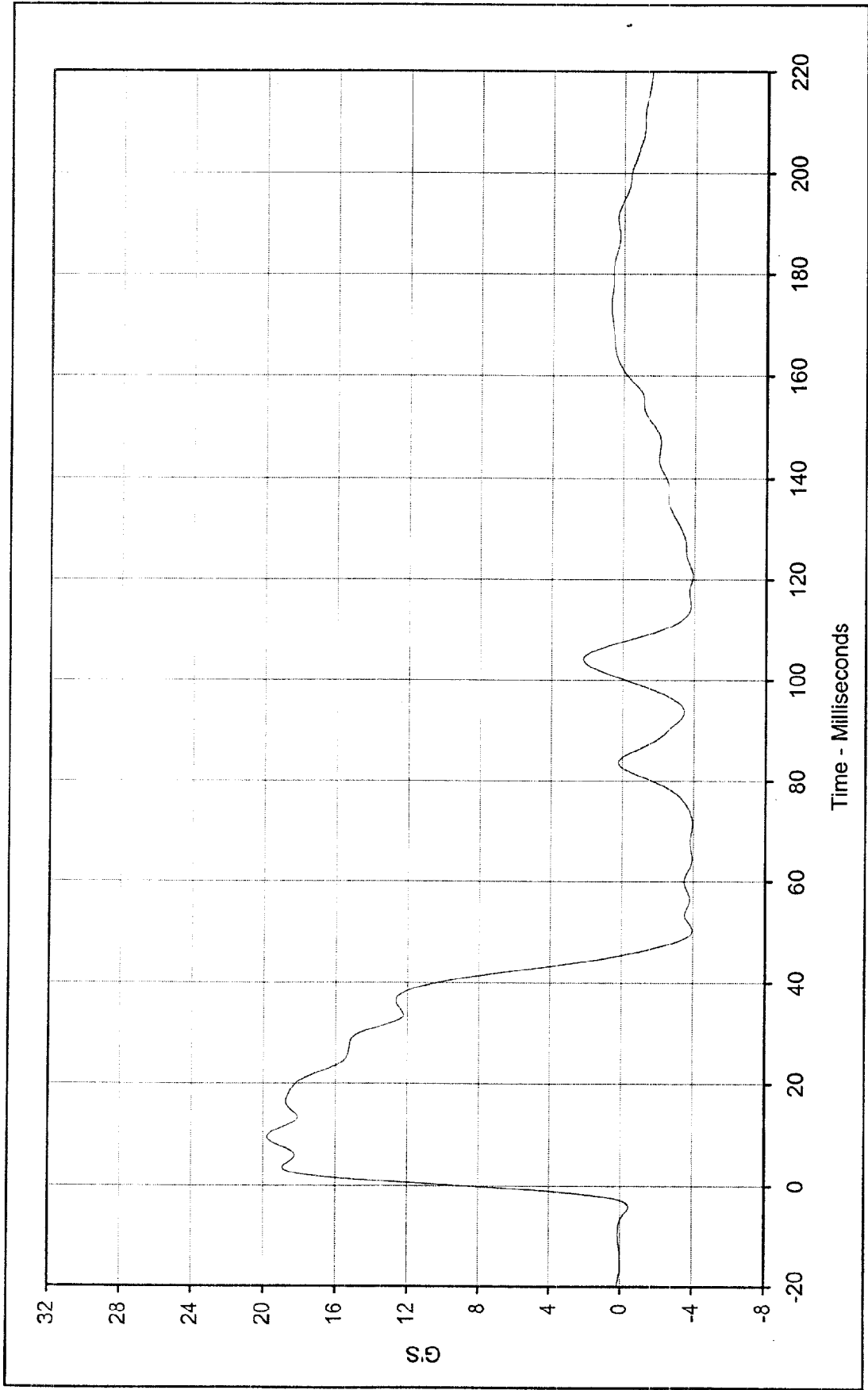
 Approved By

January 24, 1999

 Test Date

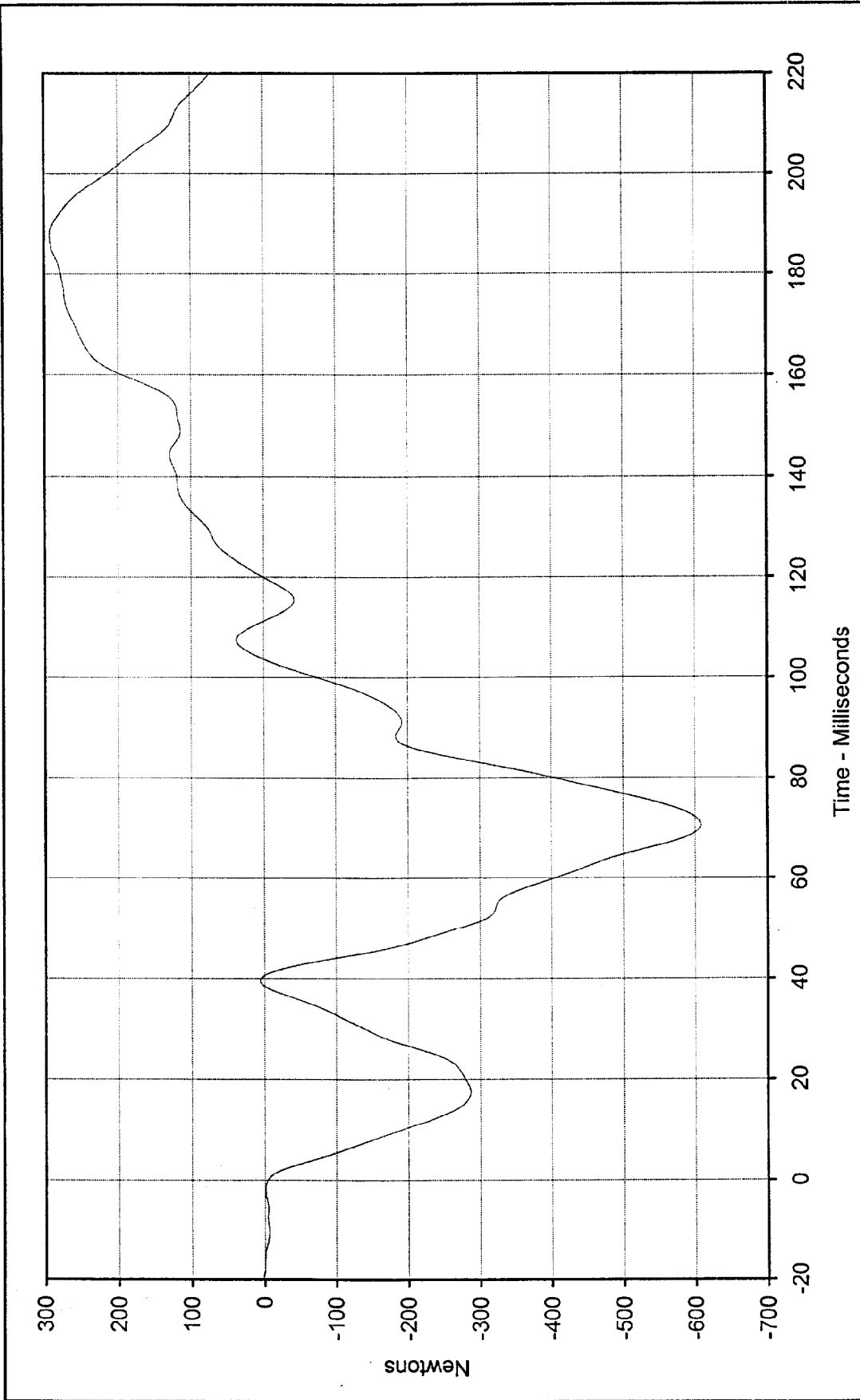
1/26/99

 Date



Curve Description: Pendulum Deceleration Testing Program Hybrid III Neck Extension Test (Male)
 Maximum Value: 19.8 at 9.5 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NE01D
 Minimum Value: -4.0 at 50.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 034

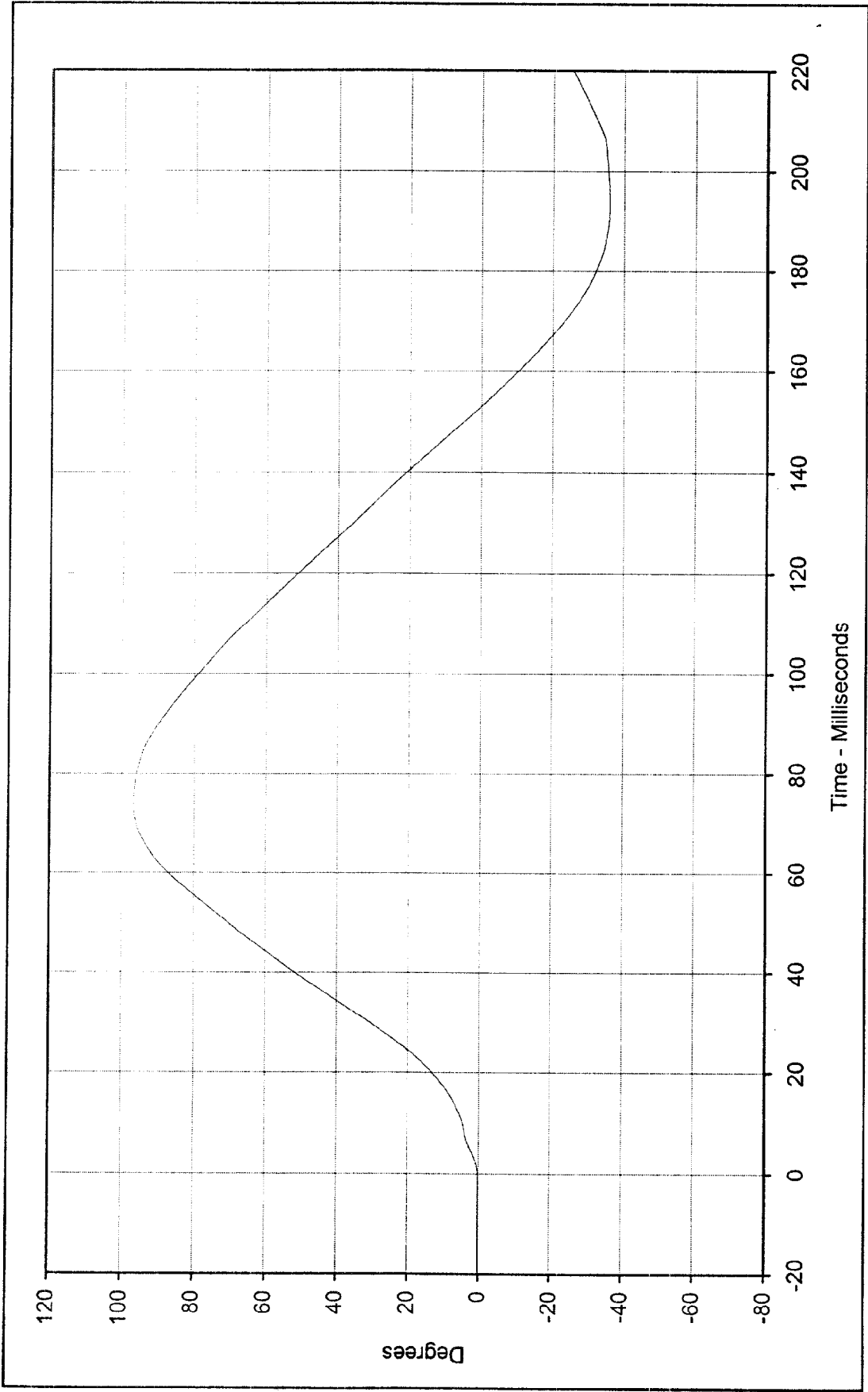




Curve Description: Neck Force X
 Maximum Value: 292.4 at 187.8 Milliseconds
 Minimum Value: -607.9 at 70.6 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: N/A Test I.D.: NE01D





Curve Description: "D" Plane Rotation Testing Program Hybrid III Neck Extension Test (Male)
 Maximum Value: 96.8 at 74.5 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NE01D
 Minimum Value: -35.8 at 193.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

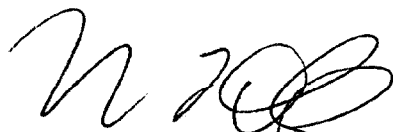
External Measurements

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	21.9	Pass
Laboratory relative humidity	%	10 to 70	35	Pass
A - Total sitting height	mm	878.8 to 889.0	885.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	510.0	Pass
C - "H" point height	mm	83.8 to 88.9	84.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	138.5	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	85.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	152.0	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	335.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	209.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	581.0	Pass
L - Popliteal length	mm	429.3 to 454.7	444.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	491.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	465.0	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	434.0	Pass
W - Foot breadth	mm	91.4 to 106.7	98.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	995.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	850.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	435.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	228.0	Pass
Overall Test Results				Pass



 Laboratory Technician



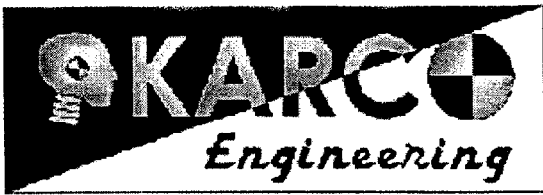
 Approved By

January 25, 1999

 Test Date

1/26/99

 Date



Hybrid III Calibration Data Sheet

50TH Percentile Male

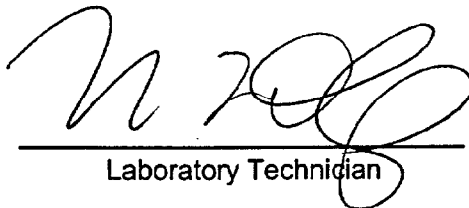
Left Knee Impact Test

ATD Serial No.: 35

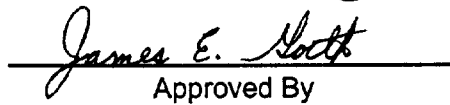
Part Serial No.: n/a

Test I.D.: KI02A

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	2.076	Pass
Peak Probe Force	Newtons	4715 to 5782	5139.3	Pass
Overall Test Results				Pass



Laboratory Technician



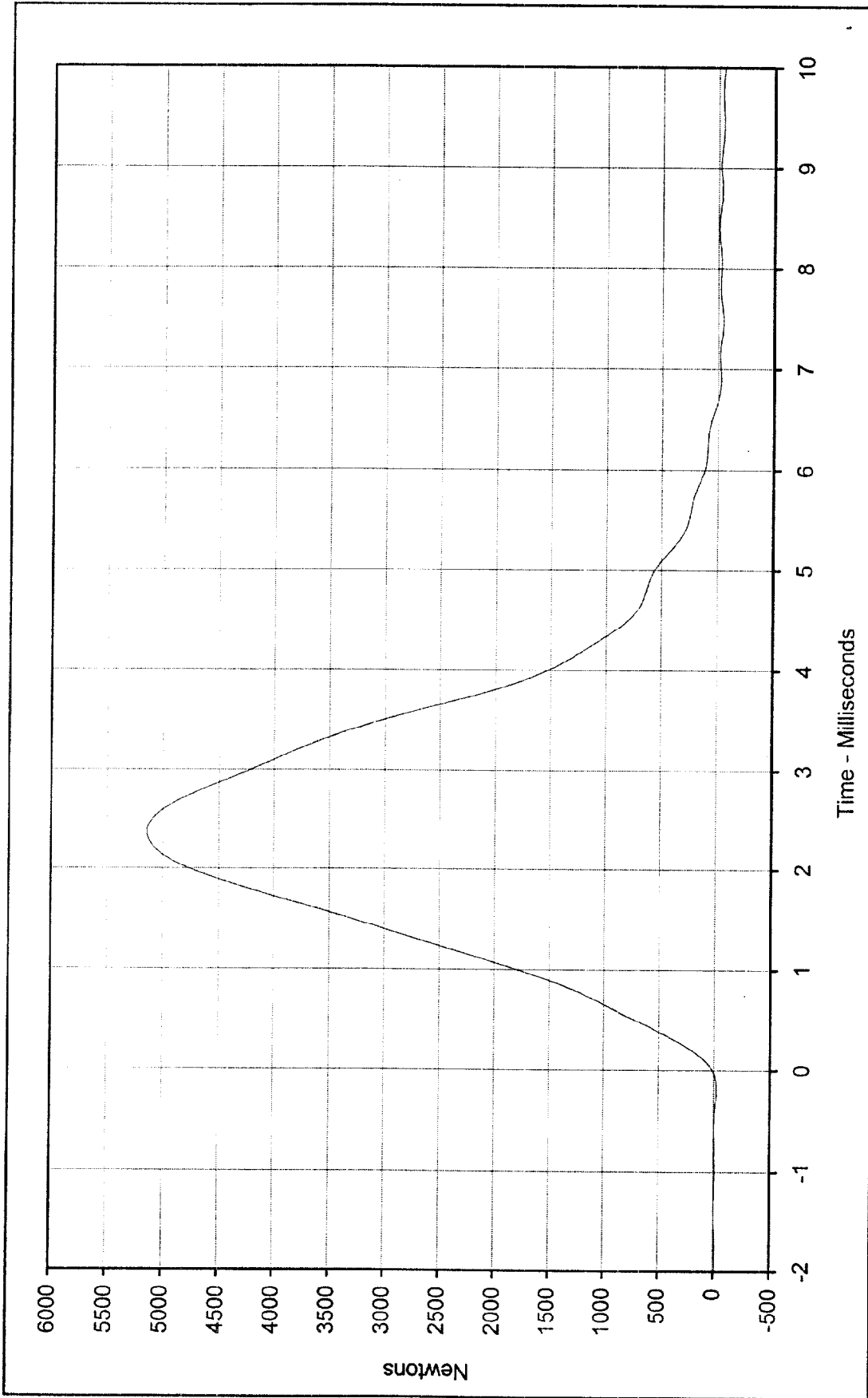
Approved By

January 23, 1999

Test Date

1/26/99

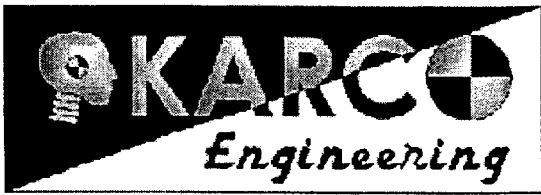
Date



Curve Description:	Testing Program	Hybrid III Left Knee Impact Test
Maximum Value:	Part S/N:	n/a
Minimum Value:	Test I.D.:	K102A
SAE Filter Class:		
Date of Test:		
ATD Serial No.:		

Probe Force	
Maximum Value:	5139.3
at	2.4
Minimum Value:	-46.1
at	7.5
SAE Filter Class:	600
Date of Test:	1/23/99
ATD Serial No.:	35





Hybrid III Calibration Data Sheet

50TH Percentile Male

Right Knee Impact Test

ATD Serial No.: 35

Part Serial No.: N/A

Test I.D.: KI02B

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	2.092	Pass
Peak Probe Force	Newtons	4715 to 5782	5643.7	Pass
Overall Test Results				Pass

Laboratory Technician

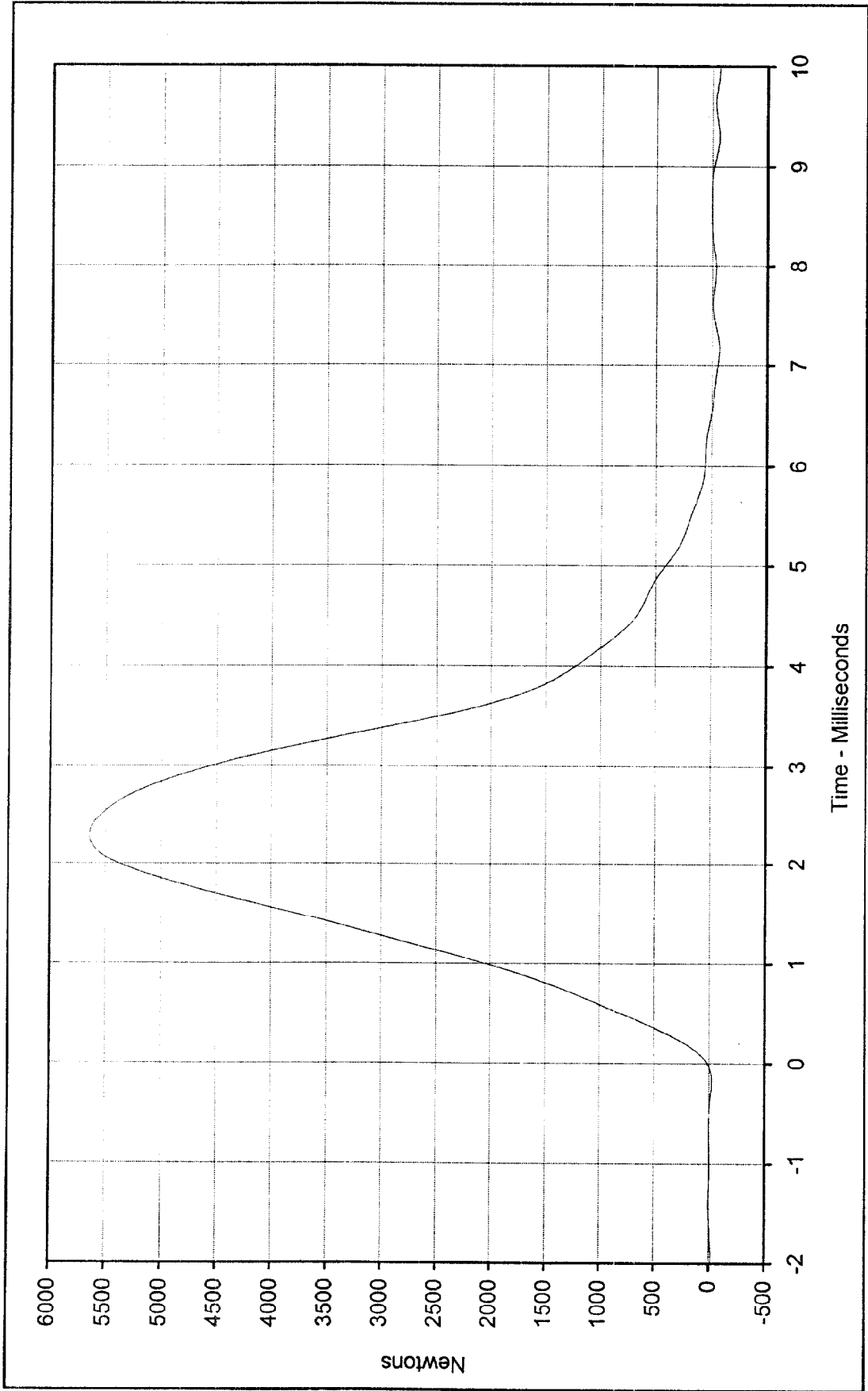
Approved By

January 23, 1999

Test Date

1/26/99

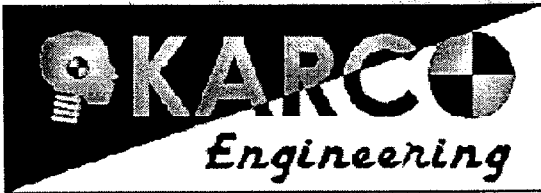
Date



Curve Description: Hybrid III Right Knee Impact Test
 Testing Program: Hybrid III Right Knee Impact Test
 Maximum Value: 5643.7 at 2.3 Milliseconds
 Test Information: Part S/N: N/A Test I.D.: KI02B
 Minimum Value: -68.0 at 7.2 Milliseconds



SAE Filter Class: 600
 Date of Test: 1/23/99
 ATD Serial No.: 35



Hybrid III Calibration Data Sheet

50TH Percentile Male


Head Drop Calibration

ATD Serial No.: 035

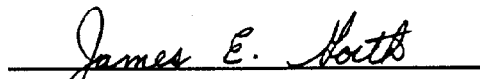
Part Serial No.: N/A

Test I.D.: HD01C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	261.2	Pass
Peak Lateral Acceleration	G's	≤15.0	4.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Laboratory Technician



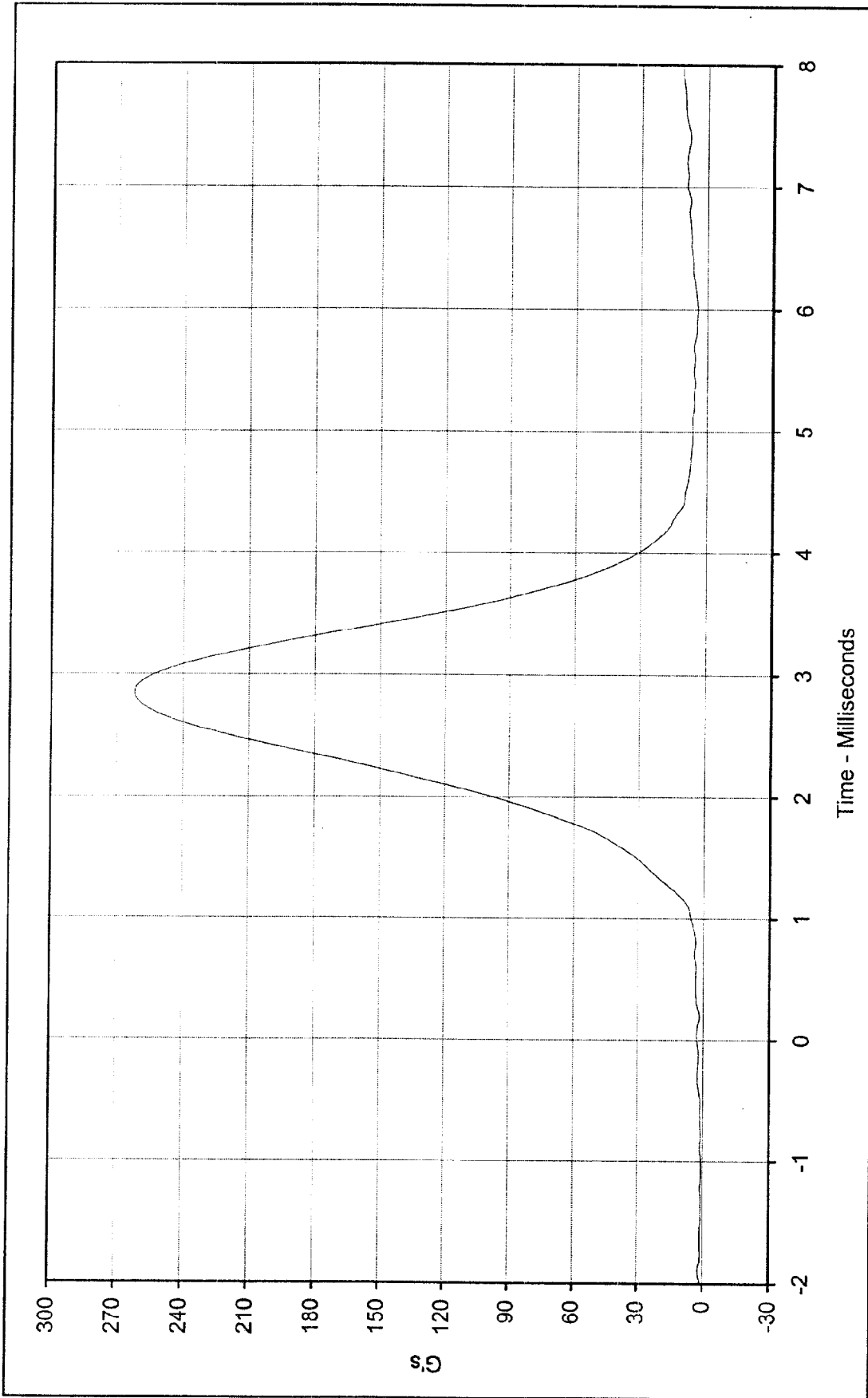
Approved By

January 23, 1999

Test Date

1/26/99

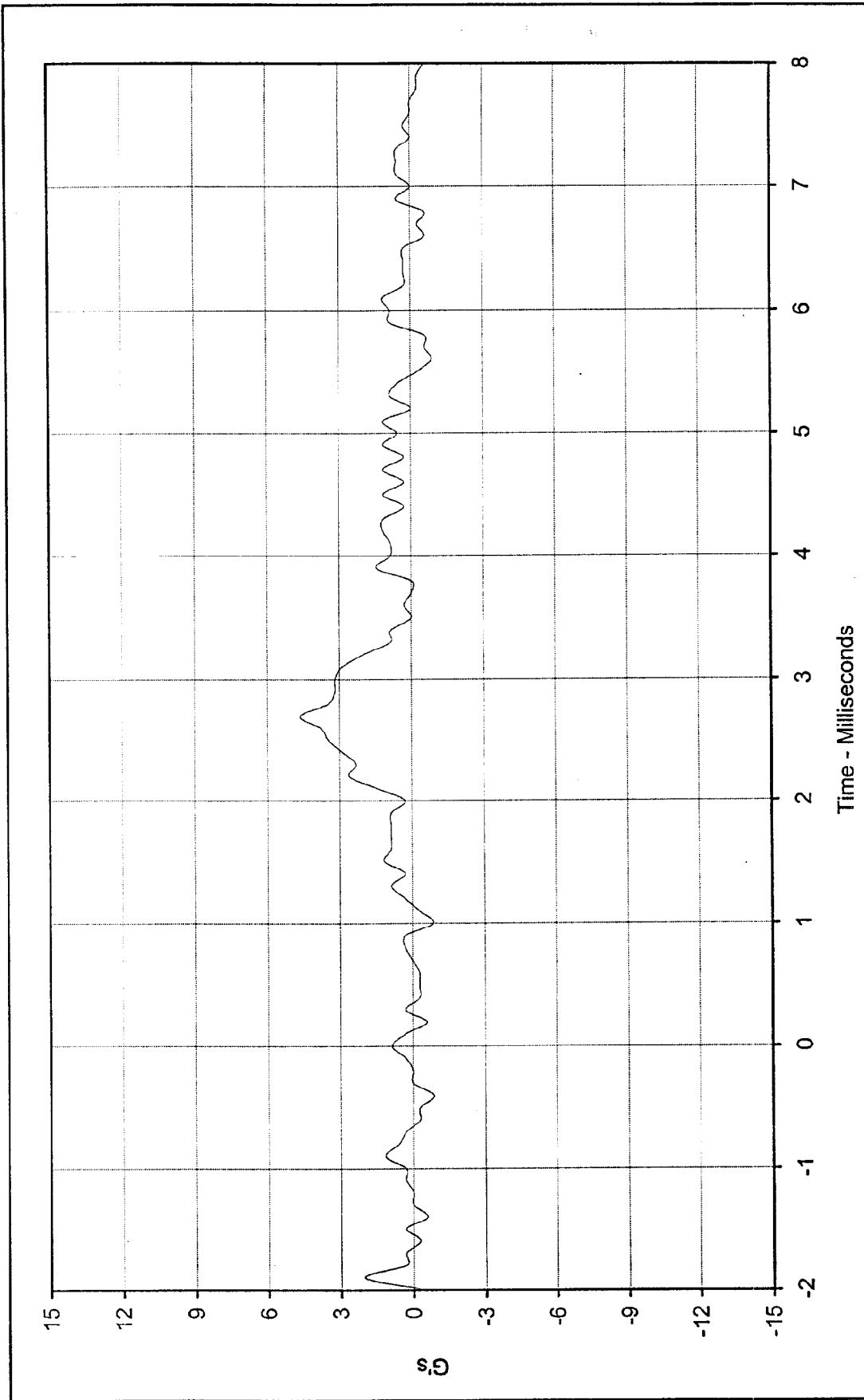
Date



Curve Description: Head Resultant Acceleration
 Testing Program: Hybrid III Head Drop Calibration (Male)
 Maximum Value: 261.2 at 2.9 Milliseconds
 Test Information: S/N of Part: N/A Test I.D.: HD01C
 Minimum Value: 0.9 at -1.0 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/23/99
 ATD Serial No.: 035

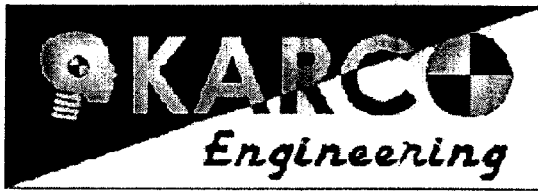




Curve Description: Head Acceleration Y Axis
 Maximum Value: 4.6 at 2.7 Milliseconds
 Minimum Value: -0.9 at -0.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/99
 ATD Serial No.: 035

Testing Program: Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: N/A Test I.D.: HD01C





Hybrid III Calibration Data Sheet

50TH Percentile Male

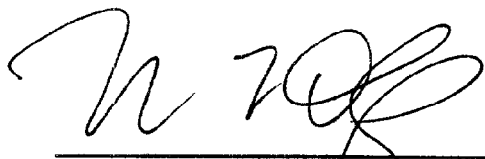
Thorax Impact Test

ATD Serial No.: 035

Part Serial No.: N/A

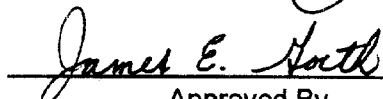
Test I.D.: CH02B

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	6.65	Pass
Peak Probe Force	Newtons	5159 to 5893	5374	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.39	Pass
Internal Hysteresis	%	69 to 85	73.9	Pass
Overall Test Results				Pass



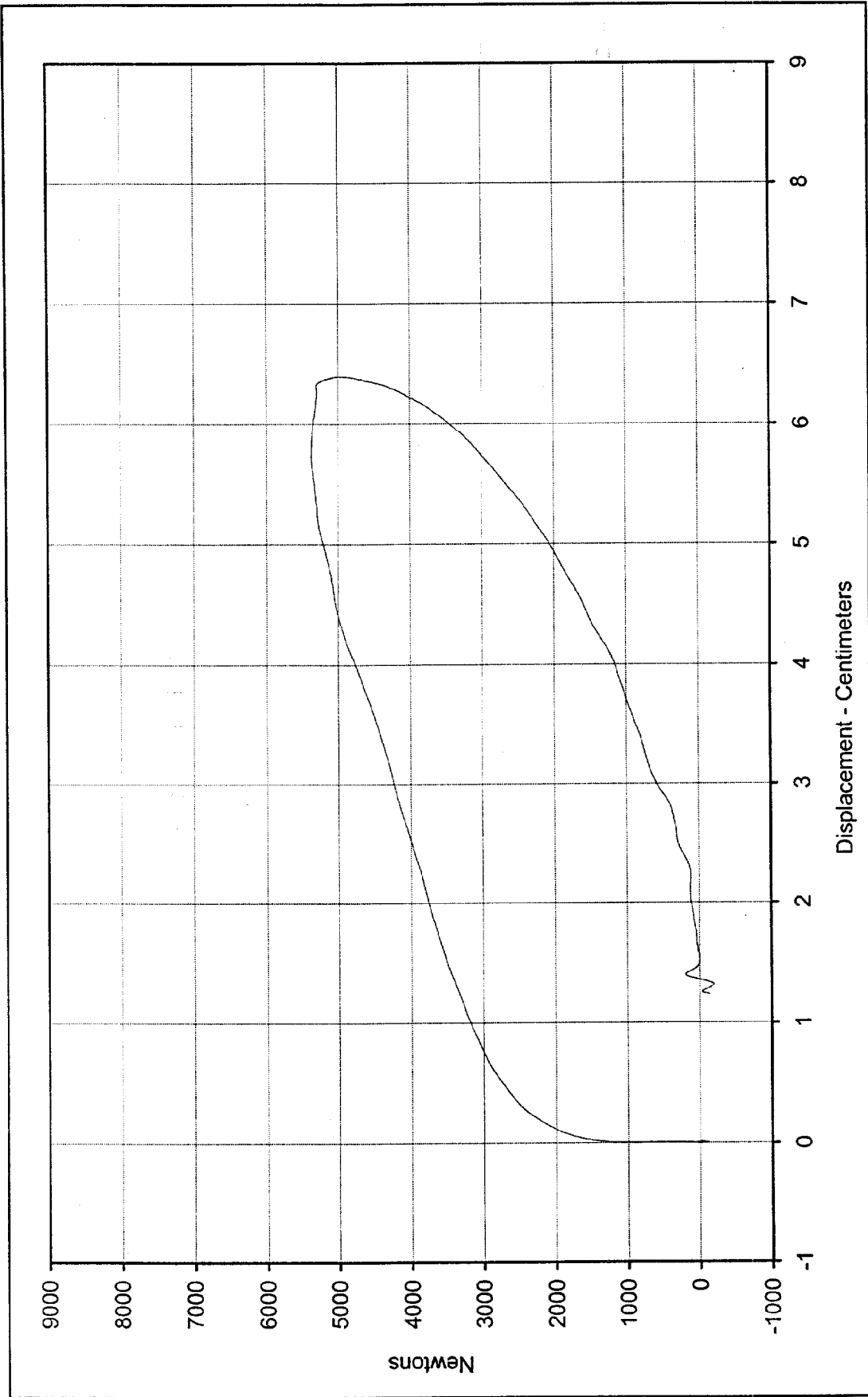
Laboratory Technician

January 24, 1999
Test Date



Approved By

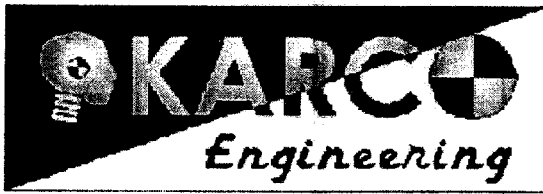
1/26/99
Date



Curve Description: Probe Force vs. Chest Displacement Testing Program: Hybrid III Thorax Impact Test
 Probe Force: 5374.2 Newtons Test Information: S/N of Part: N/A Test I.D.: CH02B

Chest Displ.: 6.39 Centimeters
 SAE Filter Class: 180
 Date of Test: 1/24/99
 ATD Serial No.: 035





Hybrid III Calibration Data Sheet

50TH Percentile Male

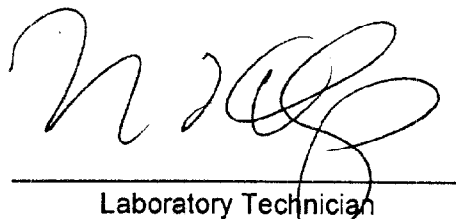
Neck Flexion Test

ATD Serial No.: 035

Part Serial No.: N/A

Test I.D.: NF01D

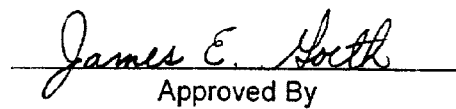
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass	
Laboratory Relative Humidity	%	10 to 70	39	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.94	Pass	
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	26.2	Pass
	20 Msec.	G's	17.6 to 22.6	22.3	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 29.0	18.4	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	34.0 to 42.0	38.7	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	72.0	Pass
	Time	Msec.	57.0 to 64.0	60.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	113.0 to 128.0	118.9	Pass	
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	88.8	Pass
	Time	Msec.	47.0 to 58.0	56.6	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	97.0 to 107.0	102.1	Pass	
Overall Test Results				Pass	



Laboratory Technician

January 24, 1999

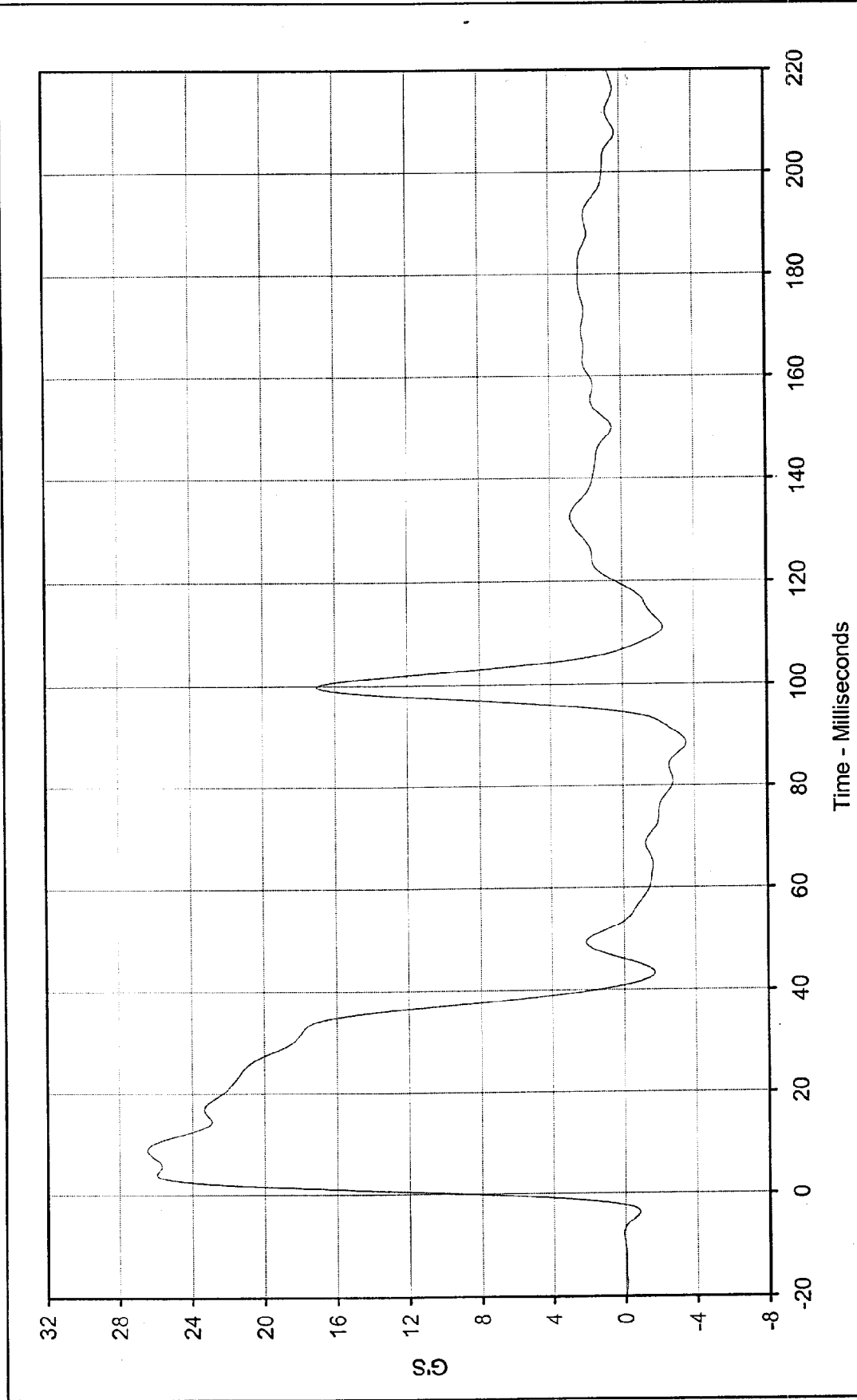
Test Date



Approved By

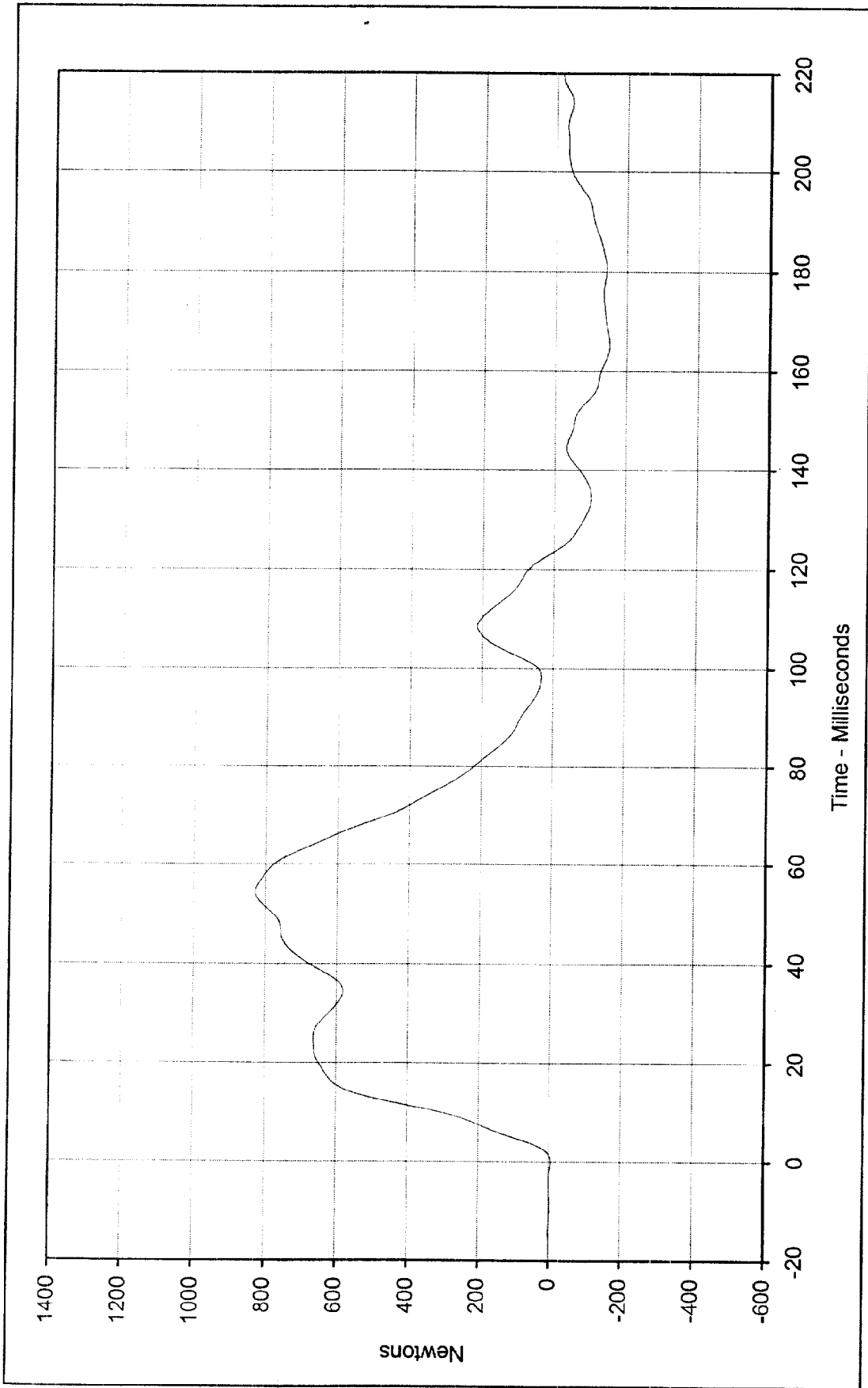
1/26/99

Date



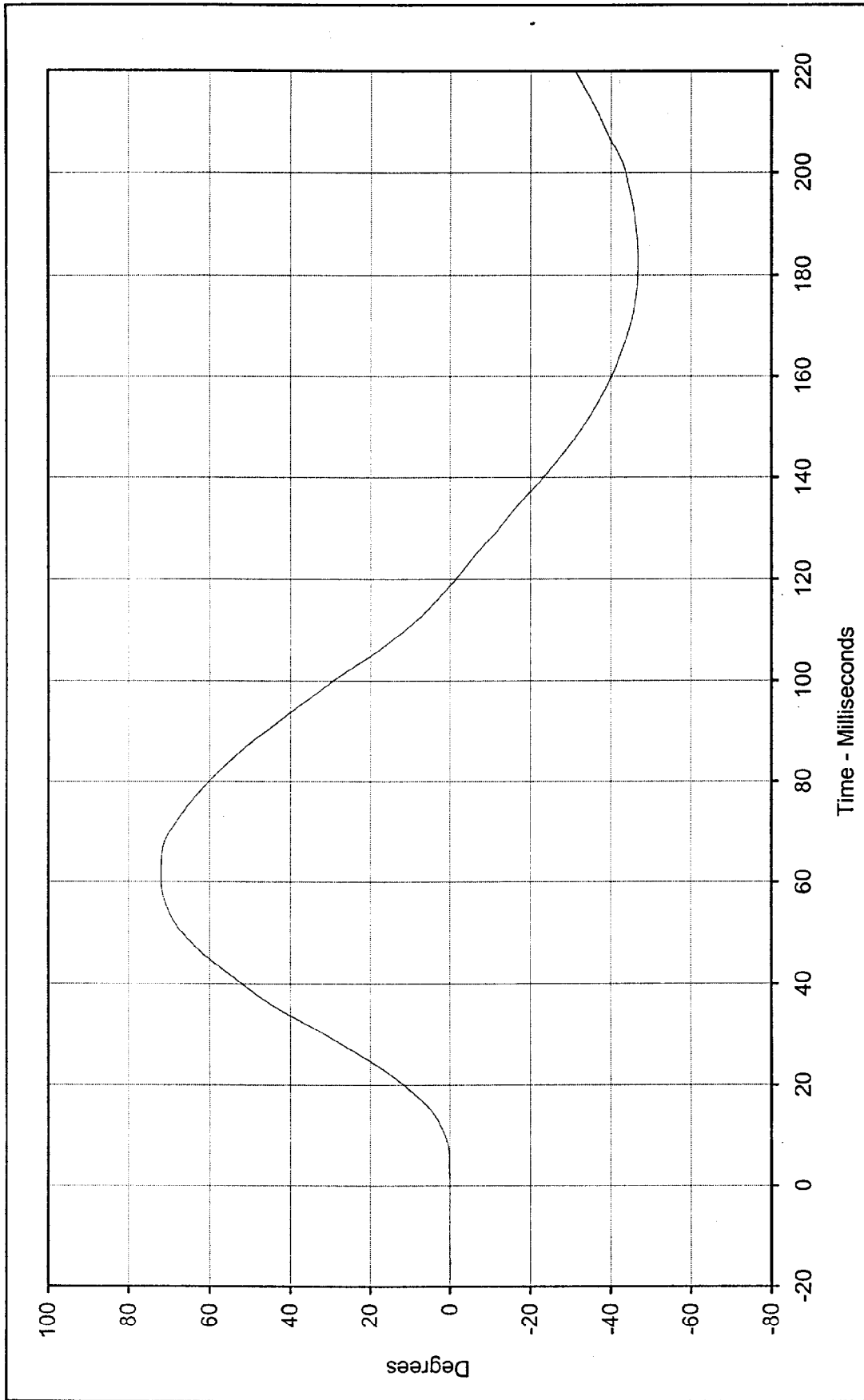
Curve Description: Pendulum Deceleration Testing Program: Hybrid III Neck Flexion Test (Male)
 Maximum Value: 26.5 at 8.9 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NF01D
 Minimum Value: -3.5 at 88.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 035





Curve Description: Neck Force X Testing Program: Hybrid III Neck Flexion Test (Male)
 Maximum Value: 828.0 at 54.4 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NF01D
 Minimum Value: -151.7 at 165.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 035





Curve Description: "D" Plane Rotation

Maximum Value: 72.0 at 60.9 Milliseconds

Minimum Value: -46.7 at 182.9 Milliseconds

SAE Filter Class: 60

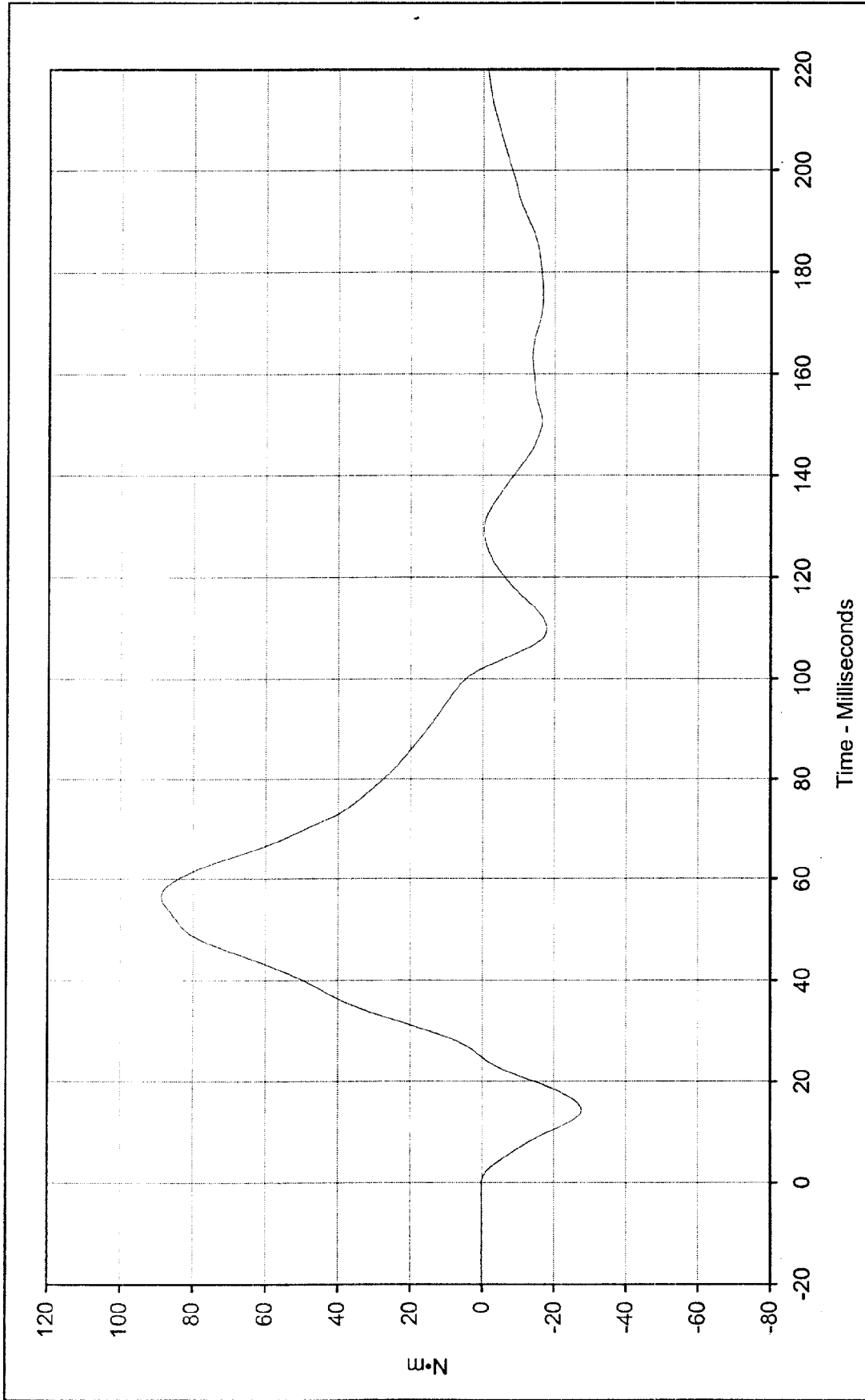
Date of Test: 1/24/99

ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: N/A Test I.D.: NF01D





E-34

Curve Description: Moment About Occipital Condyles Testing Program: Hybrid III Neck Flexion Test (Male)

Maximum Value: 88.8 at 56.6 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NF01D

Minimum Value: -27.6 at 14.4 Milliseconds

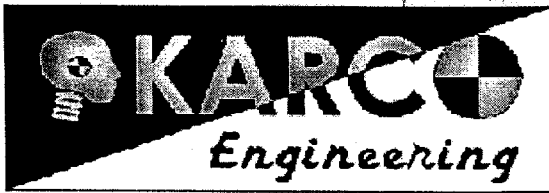
SAE Filter Class: 60

Date of Test: 1/24/99

ATD Serial No.: 035



KAR99001-12



Hybrid III Calibration Data Sheet

50TH Percentile Male


Neck Extension Test

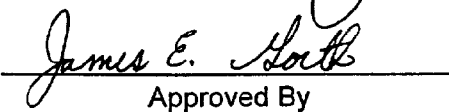
ATD Serial No.: 035

Part Serial No.: N/A

Test I.D.: NE01C

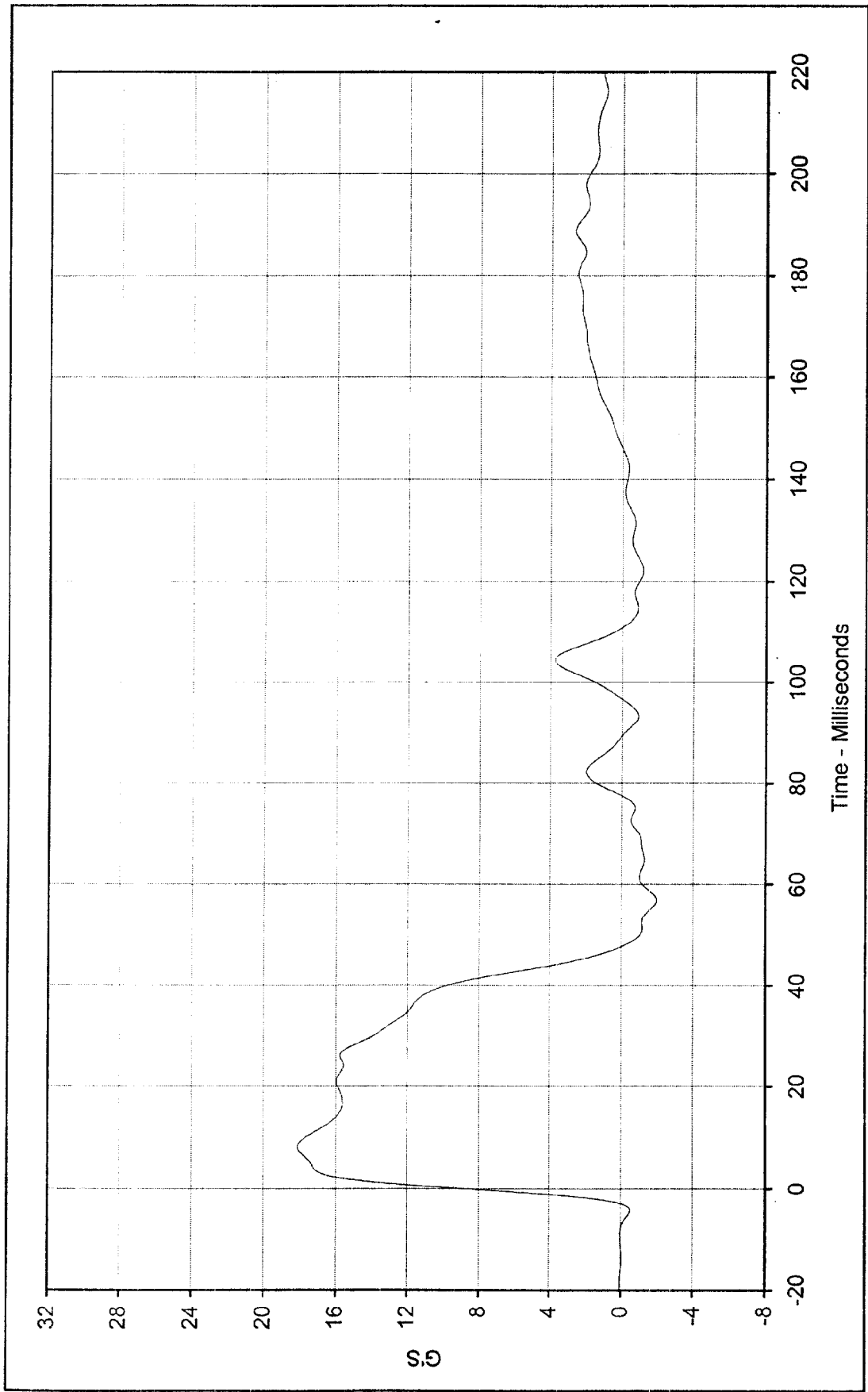
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass	
Laboratory Relative Humidity	%	10 to 70	36	Pass	
Pendulum Velocity	m/s	5.95 to 6.19	6.12	Pass	
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.7	Pass
	20 Msec.	G's	14.0 to 19.0	15.9	Pass
	30 Msec.	G's	11.0 to 16.0	13.9	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 22.0	13.9	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	38.0 to 46.0	43.3	Pass	
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	101.0	Pass
	Time	Msec.	72.0 to 82.0	79.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	147.0 to 174.0	158.2	Pass	
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-72.0	Pass
	Time	Msec.	65.0 to 79.0	69.9	Pass
Negative Moment Decay, Time To Zero Crossing	Msec.	120.0 to 148.0	141.0	Pass	
Overall Test Results				Pass	


 Laboratory Technician


 Approved By

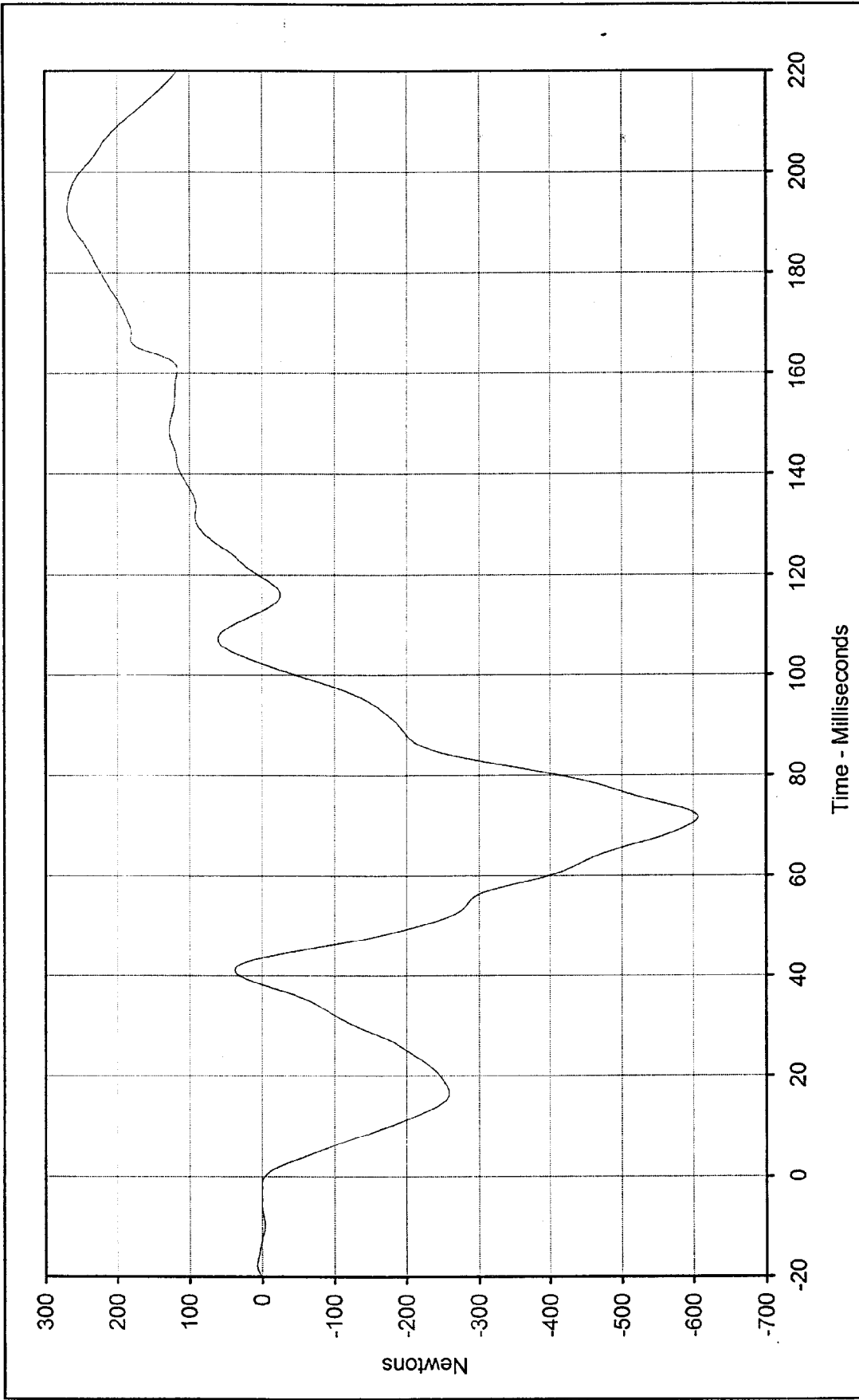
January 24, 1999
 Test Date

1/26/99
 Date



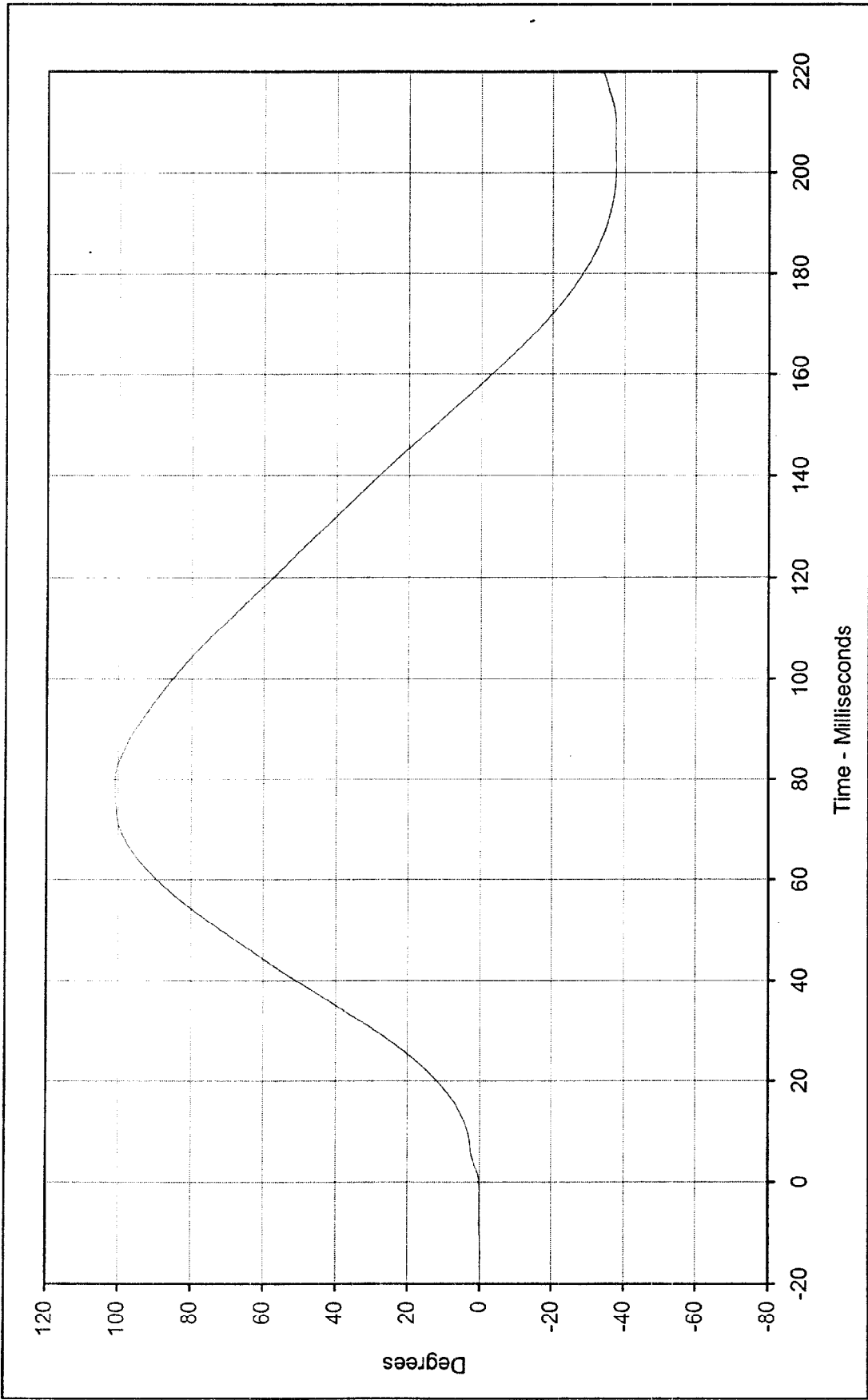
Curve Description: Pendulum Deceleration Testing Program Hybrid III Neck Extension Test (Male)
 Maximum Value: 18.1 at 8.1 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NE01C
 Minimum Value: -2.0 at 56.8 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/24/99
 ATD Serial No.: 035





Curve Description:	Neck Force X	Testing Program	Hybrid III Neck Extension Test (Male)
Maximum Value:	269.8 at 192.8 Milliseconds	Test Information:	S/N of Part: N/A Test I.D.: NE01C
Minimum Value:	-606.3 at 71.6 Milliseconds		
SAE Filter Class:	60		
Date of Test:	1/24/99		
ATD Serial No.:	035		





Curve Description: "D" Plane Rotation Testing Program: Hybrid III Neck Extension Test (Male)

Maximum Value: 101.0 at 79.5 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NE01C

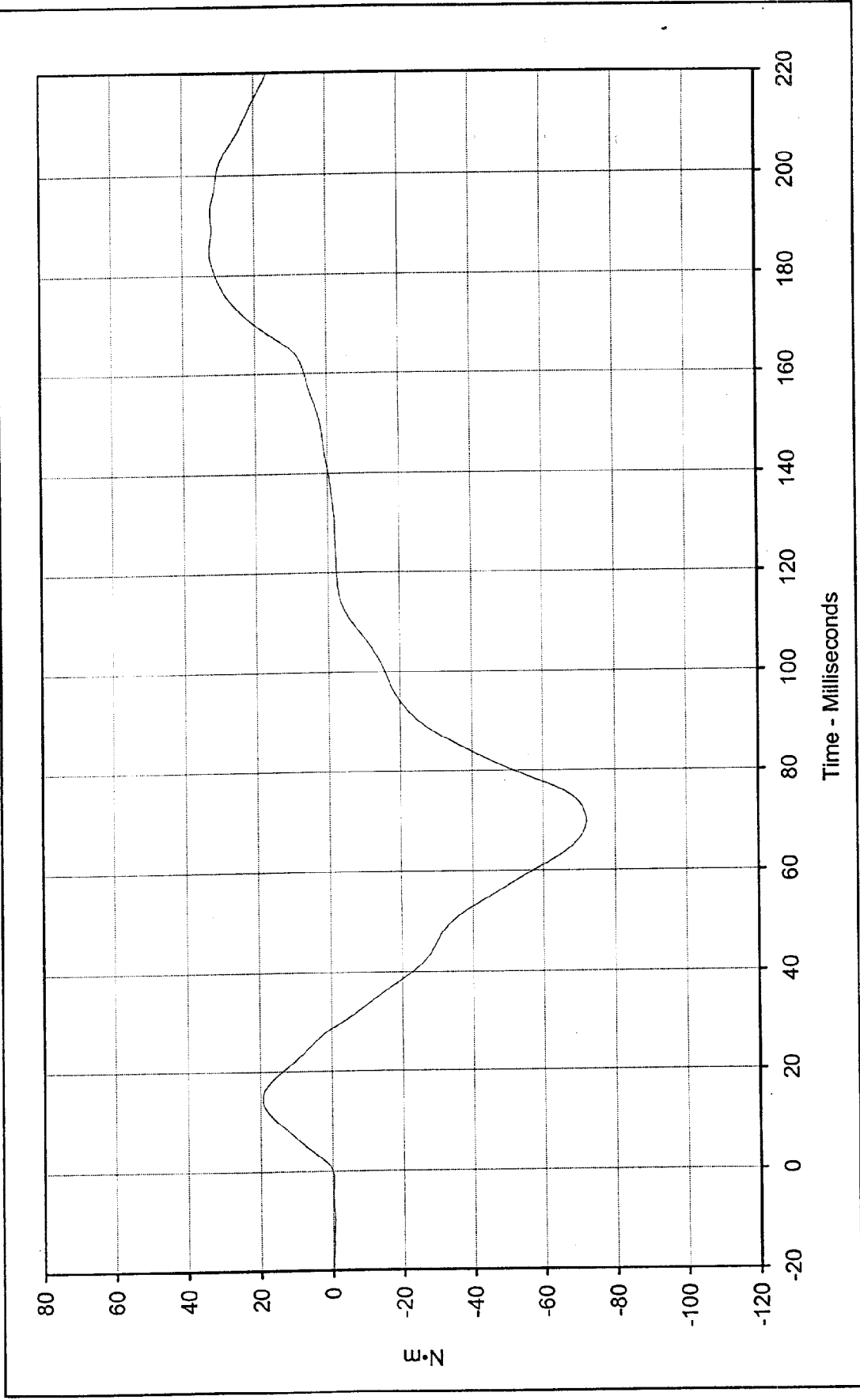
Minimum Value: -37.5 at 201.6 Milliseconds

SAE Filter Class: 60

Date of Test: 1/24/99

ATD Serial No.: 035





E-39

Curve Description: Moment About Occipital Condyles Testing Program Hybrid III Neck Extension Test (Male)

Maximum Value: 32.5 at 184.9 Milliseconds Test Information: S/N of Part: N/A Test I.D.: NE01C

Minimum Value: -72.0 at 69.9 Milliseconds

SAE Filter Class: 60

Date of Test: 1/24/99

ATD Serial No.: 035



KAR99001-12



Hybrid III Calibration Data Sheet

50TH Percentile Male

External Measurements

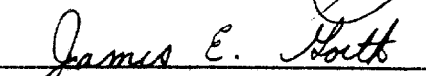
ATD Serial No.: 035

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	21.9	Pass
Laboratory relative humidity	%	10 to 70	35	Pass
A - Total sitting height	mm	878.8 to 889.0	885.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	510.0	Pass
C - "H" point height	mm	83.8 to 88.9	84.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	138.5	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	85.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	152.0	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	335.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	208.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	600.0	Pass
L - Popliteal length	mm	429.3 to 454.7	444.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	491.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	470.0	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	434.0	Pass
W - Foot breadth	mm	91.4 to 106.7	100.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	995.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	860.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	435.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	228.0	Pass
Overall Test Results				Pass


 Laboratory Technician


 Approved By

January 25, 1999

Test Date

1/26/99

Date

APPENDIX F
VEHICLE OWNER'S MANUAL
OCCUPANT RESTRAINT INSTRUCTIONS

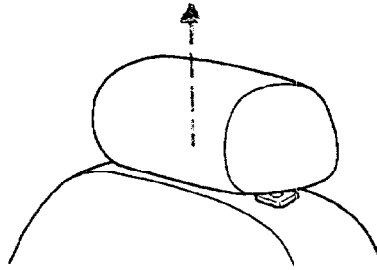
KAR99001-12

SEATING

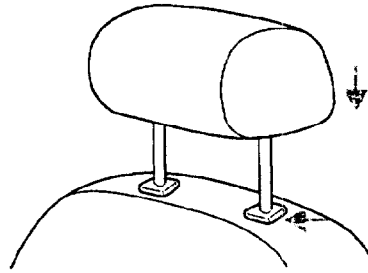
Adjustable head restraints

Your vehicle's seats may be equipped with head restraints which are vertically adjustable. The purpose of these head restraints is to help limit head motion in the event of a rear collision. To properly adjust your head restraints, lift the head restraint so that it is located directly behind your head or as close to that position as possible. Refer to the following to raise and lower the head restraints.

The head restraints can be moved up and down.



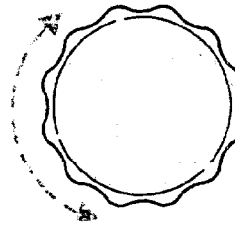
Push control to lower head restraint.



Using the manual lumbar support




Turn the lumbar support control toward the front of vehicle to increase firmness.

Turn the lumbar support control toward the rear of vehicle to increase softness.

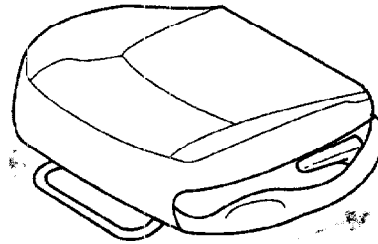


Seating and safety restraints

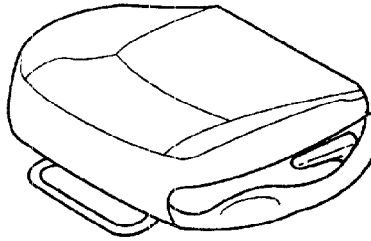
Adjusting the front manual seat

-  Never adjust the driver's seat or seatback when the vehicle is moving.
-  Do not pile cargo higher than the seatbacks to avoid injuring people in a collision or sudden stop.
-  Always drive and ride with your seatback upright and the lap belt snug and low across the hips.


Lift handle to move seat forward or backward.



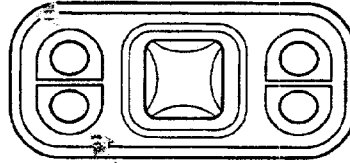
Pull lever up to adjust seatback.



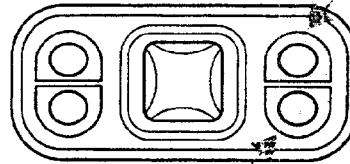
Seating and safety restraints

 Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

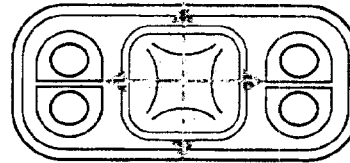
Press to raise or lower the front portion of the seat cushion.



Press to raise or lower the rear portion of the seat cushion.




Press the control to move the seat forward, backward, up or down.





Seating and safety restraints


SAFETY RESTRAINTS


Safety restraints precautions


-  Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

-  To prevent the risk of injury, make sure children sit where they can be properly restrained,

-  Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

-  All occupants of the vehicle, including the driver should always properly wear their safety belts, even when an air bag SRS is provided.

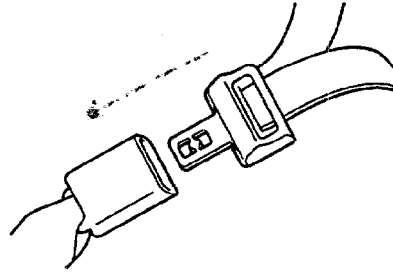
-  It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed. Do not allow people to ride in any area of your vehicle that is not equipped with seats and safety belts. Be sure everyone in your vehicle is in a seat and using a safety belt properly.

-  Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair, 1) Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. 2) Never swing the safety belt around your neck over the inside shoulder. 3) Never use a single belt for more than one person.

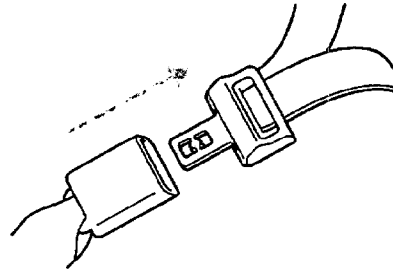
Seating and safety restraints

Combination lap and shoulder belts

1. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.



2. To unfasten, push the release button and remove the tongue from the buckle.



The front and rear outboard safety restraints in the vehicle are combination lap and shoulder belts. The front and rear seat passenger outboard safety belts have two types of locking modes described below:

Vehicle sensitive mode

The vehicle sensitive mode is the normal retractor mode, allowing free shoulder belt length adjustment to your movements and locking in response to vehicle movement. For example, if the driver brakes suddenly or turns a corner sharply, or the vehicle receives an impact of 8 km/h (5 mph) or more, the combination safety belts will lock to help reduce forward movement of the driver and passengers.

Automatic locking mode

In this mode, the shoulder belt is automatically pre-locked. The belt will still retract to remove any slack in the shoulder belt.

The automatic locking mode is not available on the driver safety belt.

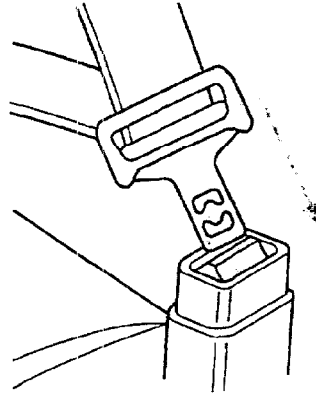
Seating and safety restraints

When to use the automatic locking mode

- When a tight lap/shoulder fit is desired.
- **Anytime** a child safety seat is installed in a passenger front or outboard rear seating position (if equipped). Refer to *Safety Restraints for Children* or *Safety Seats for Children* later in this chapter.

How to use the automatic locking mode

- Buckle the combination lap and shoulder belt.



- Grasp the shoulder portion and pull downward until the entire belt is extracted.



- Allow the belt to retract. As the belt retracts, you will hear a clicking sound. This indicates the safety belt is now in the automatic locking mode.

Seating and safety restraints


How to disengage the automatic locking mode

Disconnect the combination lap/shoulder belt and allow it to retract completely to disengage the automatic locking mode and activate the vehicle sensitive (emergency) locking mode.

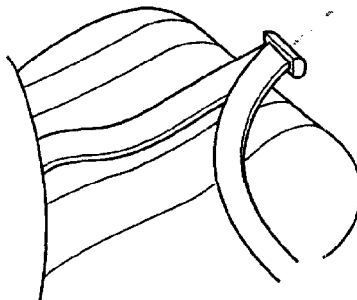
Lap belts

Adjusting the lap belt

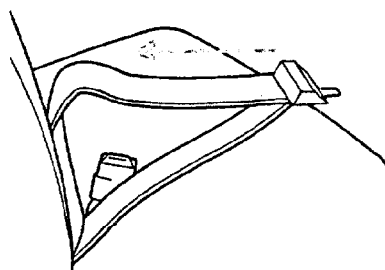
The lap belt does not adjust automatically.

 The lap belts should fit snugly and as low as possible around the hips, not around the waist.

Insert the tongue into the correct buckle (the buckle closest to the direction the tongue is coming from). To lengthen the belt, turn the tongue at a right angle to the belt and pull across your lap until it reaches the buckle. To tighten the belt, pull the loose end of the belt through the tongue until it fits snugly across the hips.



Shorten and fasten the belt when not in use.




Seating and safety restraints

Front and second row safety belt height adjustment

Your vehicle has safety belt height adjustments for the driver, front passenger and second row passengers. Adjust the height of the shoulder belt so the belt rests across the middle of your shoulder.

To lower the shoulder belt height, push the button and slide the height control down. To raise the height of the shoulder belt, slide the height adjuster up. Pull down on the height adjustment assembly to make sure it is locked in place.



 Position the shoulder belt height adjuster so that the belt rests across the middle of your shoulder. Failure to adjust the safety belt properly could reduce the effectiveness of the safety belt and increase the risk of injury in a collision.

Safety belt extension assembly

If the safety belt assembly is too short, even when fully extended, 20 cm (8 inches) can be added to the safety belt assembly by adding a safety belt extension assembly (part number 61 1C22). Safety belt extension assemblies can be obtained from your dealer at no cost.

Use only extensions manufactured by the same supplier as the safety belt. Manufacturer identification is located at the end of the webbing on the label. Also, use the safety belt extension only if the safety belt is too short for you when fully extended. Do not use extensions to change the fit of the shoulder belt across the torso.

Safety belt warning light and indicator chime

The seat belt warning light illuminates in the instrument cluster and a chime sounds to remind the occupants to fasten their safety belts.


Seating and safety restraints

Conditions of operation

If...	Then...
The driver's safety belt is not buckled before the ignition switch is turned to the ON position..	The safety belt warning light illuminates for one to two minutes and the warning chime sounds for four to eight seconds.
The driver's safety belt is buckled while the indicator light is illuminated and the warning chime is sounding...	The safety belt warning light and warning chime turn off.
The driver's safety belt is buckled before the ignition switch is turned to the ON position..	The safety belt warning light and indicator chime remain off.

Safety belt maintenance

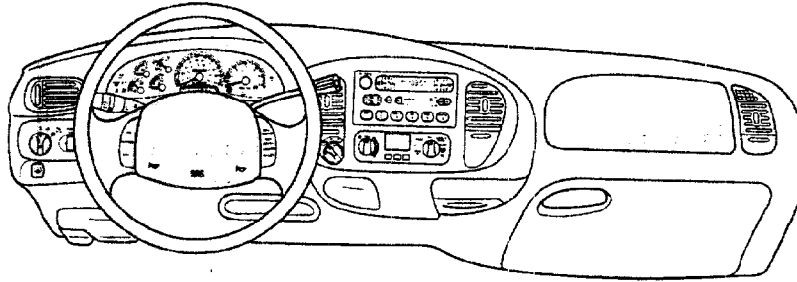
Inspect the safety belt systems periodically to make sure they work properly and are not damaged. Inspect the safety belts to make sure there are no nicks, wears or cuts, replacing if necessary. All safety belt assemblies, including retractors, buckles, front seat belt buckle assemblies (slide bar)(if equipped), shoulder belt height adjusters (if equipped), child safety seat tether bracket assemblies (if equipped), and attaching hardware, should be inspected after a collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

 Failure to inspect and if necessary replace the safety belt assembly under the above conditions could result in severe personal injuries in the event of a collision.

Refer to *Cleaning and maintaining the safety belts* in the *Maintenance and care* section.

Seating and safety restraints

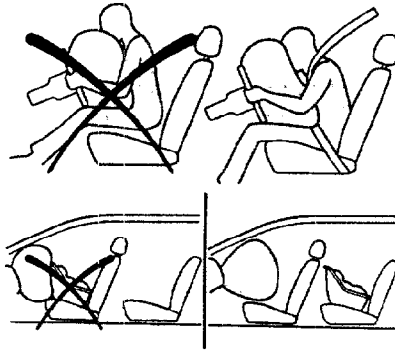
AIR BAG SUPPLEMENTAL RESTRAINT SYSTEM (SRS)






Important supplemental restraint system (SRS) precautions

The supplemental restraint system is designed to work with the safety belt to help protect the driver and right front passenger from certain upper body injuries.

Air bags DO NOT inflate slowly or gently and the risk of injury from a deploying air bag is greatest close to the trim covering the air bag module.





-  All occupants of the vehicle including the driver should always properly wear their safety belts even when air bag SRS is provided.
-  Always transport children 12 years old and under in the back seat and always use appropriate child restraints.
-  NHTSA recommends a minimum distance of at least 25 cm (ten [10] inches) between an occupant's chest and the air bag module.

Seating and safety restraints

Steps you can take to properly position yourself away from the airbag:

- Move your seat to the rear as far as you can while still reaching the pedals comfortably.
- Recline the seat slightly (one or two degrees) from the upright position.


 Do not put anything on or over the air bag module. Placing objects on or over the air bag inflation area may cause those objects to be propelled by the air bag into your face and torso causing serious injury.

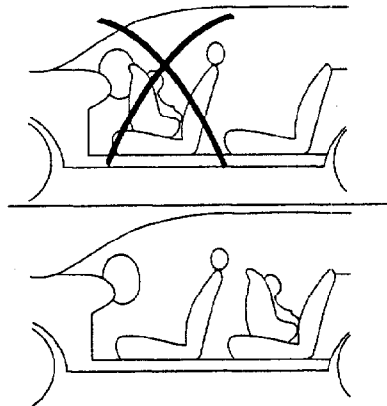
 Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System or its fuses. See your Ford or Lincoln-Mercury dealer.

Children and air bags

For additional important safety information, read all information on safety restraints in this guide.

Children must always be properly restrained. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating position. Failure to follow these instructions may increase the risk of injury in a collision.

 Air bags can kill or injure a child in a child seat. **NEVER** place a rear-facing child seat in front of an active air bag. If you must use a forward-facing child seat in the front seat, move the seat all the way back.



Seating and safety restraints

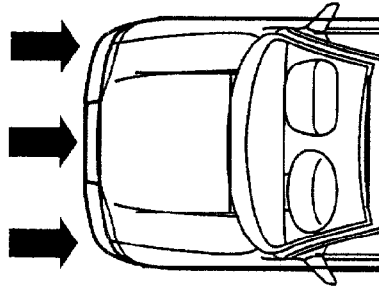
How does the air bag supplemental restraint system work?

The air bag SRS is designed to activate when the vehicle sustains sufficient longitudinal deceleration sufficient to cause the sensors to close an electrical circuit that initiates air bag inflation.


The fact that the air bags did not inflate in a collision does not mean that something is wrong with the system. Rather, it means the forces were not of the type sufficient to cause activation. Air bags are designed to inflate in frontal and near-frontal collisions, not rollover, side-impact, or rear-impacts.


The air bags inflate and deflate rapidly upon activation. After air bag deployment, it is normal to notice a smoke-like, powdery residue or smell the burnt propellant. This may consist of cornstarch, talcum powder (to lubricate the bag) or sodium compounds (e.g., baking soda) that result from the combustion process that inflates the air bag. Small amounts of sodium hydroxide may be present which may irritate the skin and eyes, but none of the residue is toxic.

While the system is designed to help reduce serious injuries, it may also cause minor burns, abrasions, swelling or temporary hearing loss. Because air bags must inflate rapidly and with considerable force, there is the risk of death or serious injuries such as fractures, facial and eye injuries or internal injuries, particularly to occupants who are not properly restrained or are otherwise out of position at the time of air bag deployment. Thus, it is extremely important that occupants be properly restrained as far away from the air bag module as possible while maintaining vehicle control.



Seating and safety restraints

 Several air bag system components get hot after inflation. Do not touch them after inflation.

 If the air bag is deployed, the air bag will not function again and must be replaced immediately. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

The SRS consists of:

- driver and passenger air bag modules (which include the inflators and air bags),
- one or more impact and safing sensors,
- a readiness light and tone
- and the electrical wiring which connects the components.

The diagnostic module monitors its own internal circuits and the supplemental air bag electrical system warning (including the impact sensors), the system wiring, the air bag system readiness light, the air bag back up power and the air bag ignitors.

Determining if the system is operational

The SRS uses a readiness light in the instrument cluster or a tone to indicate the condition of the system. Refer to the *Air bag readiness* section in the *Instrumentation* chapter. Routine maintenance of the air bag is not required.

A difficulty with the system is indicated by one or more of the following:

- The readiness light will either flash or stay lit.
- The readiness light will not illuminate immediately after ignition is turned on.
- A series of five beeps will be heard. The tone pattern will repeat periodically until the problem and light are repaired.



If any of these things happen, even intermittently, have the SRS serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.