

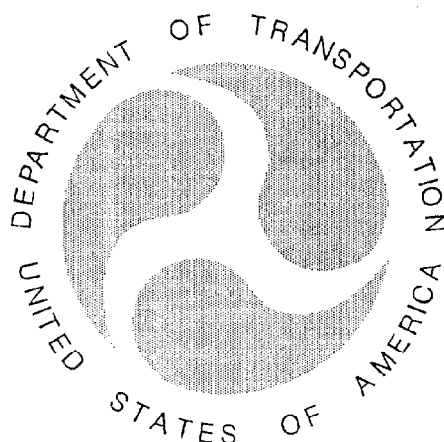
REPORT NO. KAR-97-04

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NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION
1997 CHEVROLET CAVALIER
4-DOOR SEDAN
NHTSA NO. MV0100

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



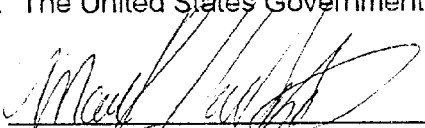
APRIL 17, 1997
FINAL REPORT

PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF MARKET INCENTIVES
ROOM NO. 5313 (NRM-22)
400 SEVENTH STREET, S.W.
WASHINGTON, D.C. 20590

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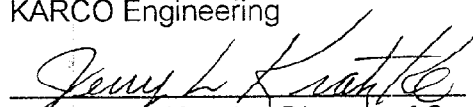
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Prepared by:


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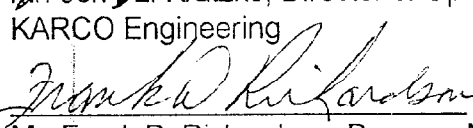
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Date: April 17, 1997

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Technical Report Documentation Page

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16. Abstract A 35 mph (56.3 kph) frontal barrier impact test was conducted on a 1997 Chevrolet Cavalier at KARCO Engineering on March 13, 1997. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The impact velocity was 56.25 kph. The ambient temperature at the barrier face at the time of impact was 21 degrees C. The vehicle's maximum post-test static crush was 500 mm. Type of occupant restraint system tested: A 3-point continuous webbing belt system at both seating positions with driver side and passenger side air bags. Occupant Injury response data summary is as follows: <table border="1"> <thead> <tr> <th>Injury Criteria</th> <th>Threshold Value</th> <th>Driver Dummy</th> <th>Passenger Dummy</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria</td> <td>HIC = 1000</td> <td>529.3</td> <td>747.1</td> </tr> <tr> <td>Chest Resultant 3 msec clip</td> <td>60 G's</td> <td>47.6</td> <td>52.9</td> </tr> <tr> <td>Left Femur Force</td> <td>10009 N</td> <td>4373.1</td> <td>4470.0</td> </tr> <tr> <td>Right Femur Force</td> <td>10009 N</td> <td>5407.4</td> <td>3231.4</td> </tr> </tbody> </table>				Injury Criteria	Threshold Value	Driver Dummy	Passenger Dummy	Head Injury Criteria	HIC = 1000	529.3	747.1	Chest Resultant 3 msec clip	60 G's	47.6	52.9	Left Femur Force	10009 N	4373.1	4470.0	Right Femur Force	10009 N	5407.4	3231.4
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SECTION 1.

PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MV0100

1.1 PURPOSE

This 35 mph (56.3 kph) frontal barrier impact test is part of the Composite FY' 97 New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract No. DTNH22-97-D-02007. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48 kph) FMVSS 208/212/219/301 requirements.

1.2 TEST PROCEDURE

This 35 mph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) Laboratory Indicant Test Procedure, dated 01 September, 1996 and corresponding KARCO Engineering Test Procedure KTP-001, dated September 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 vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap and shoulder belt tension. The vehicle specified impact velocity range was 55.5 to 57.1 kph.

The test vehicle contained two (2) part 572E 50th percentile adult male anthropomorphic test devices (ATDs). Both ATDs were instrumented with head, chest, pelvic and redundant head and chest triaxial accelerometers, left/right femur load cells and left/right lower leg sensors. In addition, chest displacement and six-axis neck transducers were utilized. The ATDs were positioned in the front outboard seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. Eighty-seven channels of data were recorded with a PC based (TDAS) on-board data acquisition system. The data is digitally sampled at 10,000 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The Driver ATD (serial No. 34) and the right-front passenger ATD (serial No. 35) were used in one previous test since their last calibration. Injury criteria were not exceeded in test MV0100.

The test was conducted at KARCO Engineering Automotive Research Center on March 13, 1997, at a speed of 56.25 kph. The frontal barrier impact event was documented by one (1) real-time camera 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.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

Eight (8) load cell barrier data channels were obtained in conducting this March 13, 1997, NCAP test. The barrier was impacted by a 1997 Chevrolet Cavalier at a velocity of 56.25 kph. The 1997 Chevrolet Cavalier was equipped with a 2.2 liter, four cylinder engine and a five speed manual transmission. The test weight, with two (2) 50th percentile male dummies, was 1441 kg.

The driver's Head Injury Criteria (HIC) was 529.3, the maximum chest deceleration over three (3) milliseconds was 47.6 g and the left and right femur loads were 4373.1 and 5407.4 Newtons, respectively.

The right front passenger's HIC was 747.1, maximum chest deceleration over three (3) milliseconds was 52.9 g, and the left and right femur loads were 4470.0 and 3231.4 Newtons respectively.

There was 100 percent windshield retention, no intrusion into the protected or unprotected zone of the windshield. No Stoddard solvent leakage occurred after impact or during any phase of the static rollover test.

The test vehicle sustained a maximum static crush of 500 mm at the vehicle centerline. The windshield was severely damaged but the vehicle glazing remained intact. The driver and passenger side doors opened without the aid of tools. The driver ATD's head, chest and abdomen contacted the airbag, both knees impacted the dash panel and steering column.

The passenger ATD's head, chest and abdomen contacted the airbag, both knees contacted the glove box.

Seat belt spoolout, measured by high-speed film analysis, was 82.55 mm for the driver ATD and 107.95 mm for the passenger ATD. On-board pullout potentiometers measured 93.9 mm for the driver ATD and 121.1 mm for the passenger ATD. Shoulder belt stretch was 0.31 mm for the driver ATD and 0.16 mm for the passenger ATD. Chest deflection for the driver ATD was -29.5 mm. Chest deflection for the passenger ATD was -34.1 mm.

1.4 GENERAL COMMENTS

The 1997 Chevrolet Cavalier 4-door sedan passed the requirements of 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. The dummy, vehicle and response data traces are presented in Appendix B. Appendix C is for load cell barrier data, eight channels were collected for this test. Appendix D contains the test equipment and instrument calibration data. Appendix E contains the dummy calibration data and Appendix F the owner's manual occupant restraint system instructions.

SECTION 2.

DATA SHEETS

TEST MODE: 35 MPH FRONTAL NCAP

CONVERSION FACTORS USED IN THIS REPORT:

2.2 lb = 1 kg

1 mi = 1.609 km

DATA SHEET NO. 1

CRASH TEST SUMMARY

VEHICLE MAKE/MODEL/BODY STYLE: CHEVROLET/ CAVALIER/ SEDANNHTSA NO.: MV0100TEST DATE: 03/13/97TIME: 3:40 PMBARRIER TEMPERATURE: 22 °CWINDSHIELD MOLDING TEMPERATURE: 21 °CVEHICLE TEST WEIGHT: 1441 kgVEHICLE/BARRIER IMPACT ANGLE: 90 °IMPACT VELOCITY: PRIMARY 56.25 kphSECONDARY 56.11 kph

VEHICLE REBOUND FROM BARRIER:

Left Side	690
Centerline	694
Right Side	700

MAXIMUM STATIC CRUSH:

	Pre-test	Post-test	Static Crush
Left Side	4245 mm	3988 mm	257 mm
Centerline	4610 mm	4110 mm	500 mm
Right Side	4245 mm	4012 mm	233 mm

DUMMIES:

DRIVER

PASSENGER

DUMMY TYPE

572E572E

SERIAL NUMBER

3435

RESTRAINT SYSTEM

TYPE IITYPE II

NO. DATA CHANNELS:

4434

NUMBER OF CAMERAS:

1 Real Time16 High Speed

DOOR OPENING DATA:

Jammed - Left FrontSlightly Jammed - Right Front

FRONT SEAT(S) DATA:

DRIVER

PASSENGER

Seat Track Failure (shift)-

0 mm13 mm

Seat Back Failure -

N/AN/A

VISIBLE DUMMY CONTACT POINTS:

DRIVER

PASSENGER

Head

AIRBAGAIRBAG

Chest

AIRBAGAIRBAG

Knees

DASH AND STEERING COLUMNGLOVE BOX

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: CHEVROLET/ CAVALIER/ SEDAN
NHTSA No.: MV0100 VIN: 1G1JC5247V7171344 Color: WHITE
Date Received: 02/27/97 Odometer Reading: 158 miles
Selling Dealer: Richard Hibbard Chevrolet, 191 S. Indian Hill Blvd., Claremont, California

ENGINE & DRIVE TRAIN DATA:

No. Cylinders: 4 Displacement: 2.2 litter
Placement: Longitudinal/In-line: Transverse/Lateral: X
Transmission Data:
Speeds: 5 Manual: X Automatic: Overdrive:
Final Drive: Rear Wheel: Front Wheel: X Four Wheel:

MAJOR OPTIONS:

Airconditioner: X Power Steering: X Power Brakes: X
Power Windows: Power Door Locks: Other: Rear Defroster, Console
Tinted Glass, Anti-lock Brakes, AM/FM Radio & Cassette, Clock

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: General Motors Corporation
Date of Manufacture: 10/96 VIN: 1G1JC5247V7171344
GVWR: 1638 kg GAWR FRONT: 887 kg GAWR REAR: 751 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 210 kPa REAR: 210 kPa

Recommended Tire Size: P195/65R15 Load Range: Standard

Recommended Cold Tire Pressure:

FRONT: 200 kPa REAR: 200 kPa

Size of Tires on Test Vehicle: P195/65R15 Manufacturer: BF Goodrich

Type of Spare Tire: Space Saver: T115/70D14 Standard:

Data Sheet No. 2 (Continued)

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench: _____ Bucket: X Split Bench:

Number of Occupants: Front 2 Rear 3 TOTAL 5

VEHICLE CAPACITY WEIGHT (VCW) = 400 kg

No. of Occupants x 68 kg. = 340 kg

Rated Cargo/Luggage Weight (RCLW) = 60 kg (Difference)

WEIGHT OF TEST VEHICLE AS RECEIVED AT LABORATORY: (with maximum fluids)

Right Front = 394 kg Right Rear = 221 kg

Left Front = 397 kg Left Rear = 229 kg

TOTAL FRONT = 791 kg TOTAL REAR = 450 kg

% Total Weight = 63.7 % % Total Weight = 36.3 %

TOTAL DELIVERED WEIGHT = 1241 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1241 kg

Rated Cargo/Luggage Weight = 60 kg

Weight of 2 P572 Dummies = 149 kg

TARGET TEST WEIGHT = 1450 kg (SUM)

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 61 kg OF CARGO (BALLAST):

Right Front = 437 kg Right Rear = 281 kg

Left Front = 447 kg Left Rear = 276 kg

TOTAL FRONT = 884 kg TOTAL REAR = 557 kg

% Total Weight = 61.3 % % Total Weight = 38.7 %

TOTAL TEST WEIGHT = 1441 kg

Weight of Ballast secured in cargo area = 61 kg (Includes cameras & instrumentation)

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

Data Sheet No. 2 (Continued)

TEST VEHICLE ATTITUDE: (all dimensions in mm)

AS DELIVERED: RF 693 LF 685 RR 720 LR 710

AS TESTED: RF 664 LF 659 RR 700 LR 698

Vehicle's Wheelbase = 2644 mm

Location of Vehicle's CG = (if required)

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 57.53 liters

Usable Capacity Figure Furnished by COTR = 57.50 liters

Test Volume Range (92 to 94% of Usable Capacity) = 52.90 to 54.05 liters

ACTUAL TEST VOLUME = 53.48 liters

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: Fuel tank is located beneath the rear seat floor pan. The fuel filler neck is connected to the rear-center of the tank and routed to the right rear quarter panel. The fuel lines exit at the upper rear area of the fuel tank and are routed along the driver side underbody, inside the frame rail.

DATA SHEET NO. 3

POST IMPACT DATA

TEST DATE: 03/13/97 TIME: 3:50 PM

TEMPERATURE: 22 °C

VEHICLE NHTSA NO.: MV0100 VIN: 1G1JC5247V7171344

REQUIRED IMPACT VELOCITY RANGE: 55.5 km/h to 57.1 km/h

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

Trap No. 1 = 56.25 km/h Trap No. 2 = 56.25 km/h Trap No. 3 = 56.11 km/h

Distance from vehicle to barrier - -

A. entering trap = 1829 mm

B. leaving trap = 610 mm

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

Vehicle Length - -

Pretest: Right = 4245 mm C/L = 4610 mm Left = 4245 mm

Post Test: Right = 4012 mm C/L = 4110 mm Left = 3988 mm

CRUSH: Right = 233 mm C/L = 500 mm Left = 257 mm

AVERAGE = 330 mm

VEHICLE REBOUND: (from rigid barrier only)

Distance from front of test vehicle to impact point (barrier)- -

Right = 700 mm C/L = 694 mm Left = 690 mm

AVERAGE = 693.3 mm

DATA SHEET NO. 4

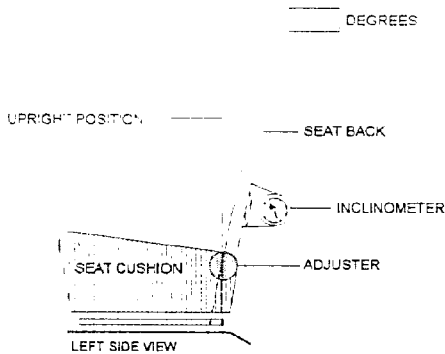
TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1997 Chevrolet

Vehicle Model & Body Style: Cavalier 4 Door

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"?).



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 4 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 = 29.0 °

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 4 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 = 28.0 °

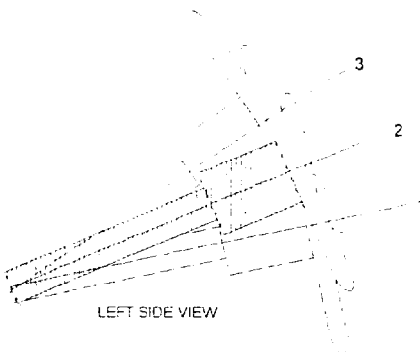
2. SEAT FORE & AFT POSITIONS -

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: 10 seating positions; set to 6th position from front.

Positioning of the passenger's seat: 10 seating positions; set to 6th position from front.

3. STEERING COLUMN ADJUSTMENTS:



STEERING COLUMN ASSEMBLY

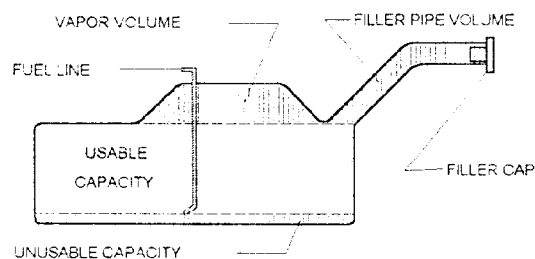
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions:

Position No. 1 is at	<u>20°</u>
Position No. 2 is at	<u>N/A</u>
Position No. 3 is at	<u>N/A</u>

4. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position:



VEHICLE FUEL TANK ASSEMBLY

Operational Instructions:

5.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 53.38 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.

Fuel pump is activated when ignition key is turned to the "ON" (operational) position.

5. FUEL TANK CAPACITY DATA

5.1 A. Usable Capacity" of standard equipment fuel tank = 57.53 liters.

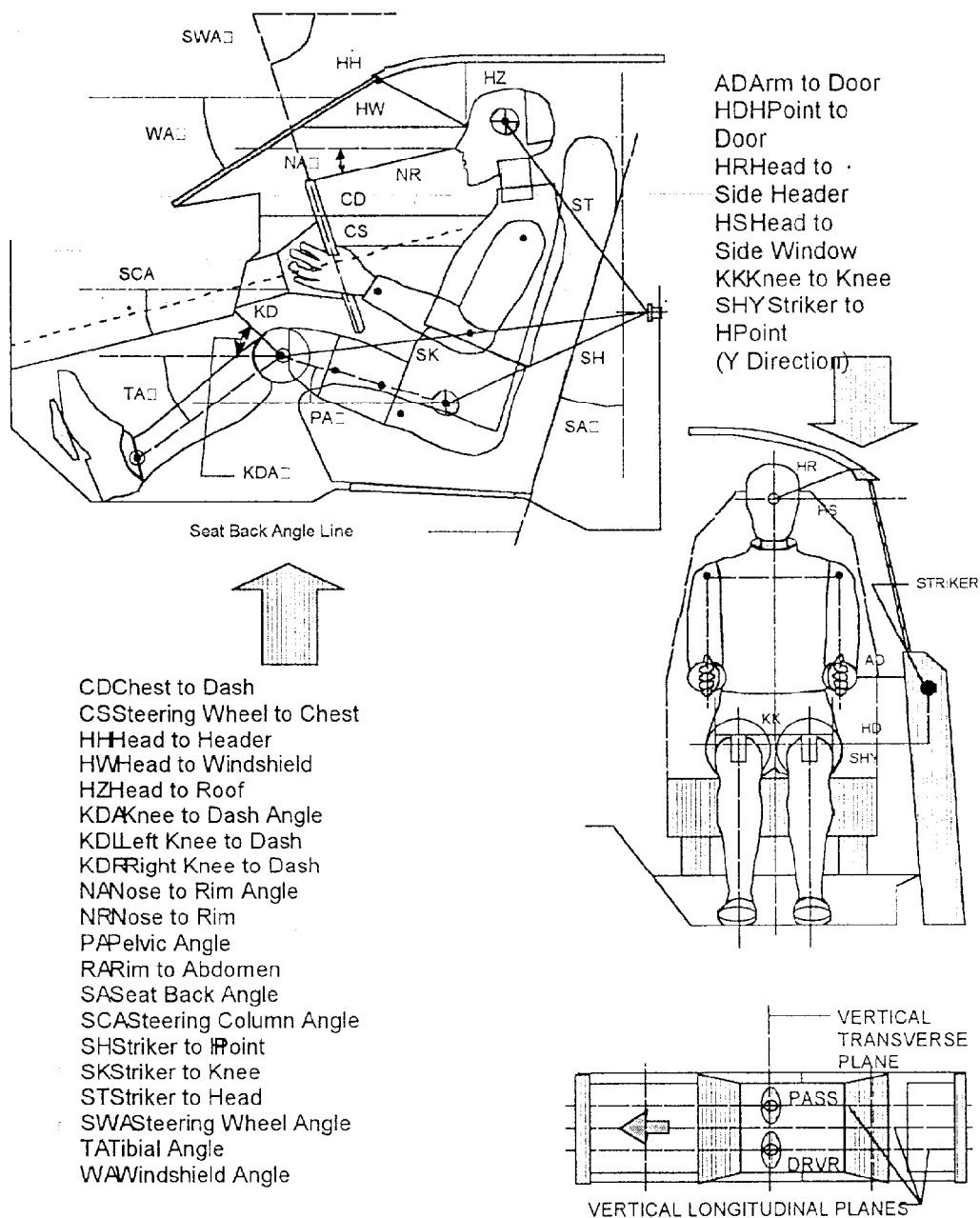
B. Usable Capacity" of optional equipment fuel tank = N/A liters.

C. Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 52.92 to 54.07 liters.

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



DUMMY POSITIONING IN VEHICLE
FRONT SEAT MEASUREMENT TABLE

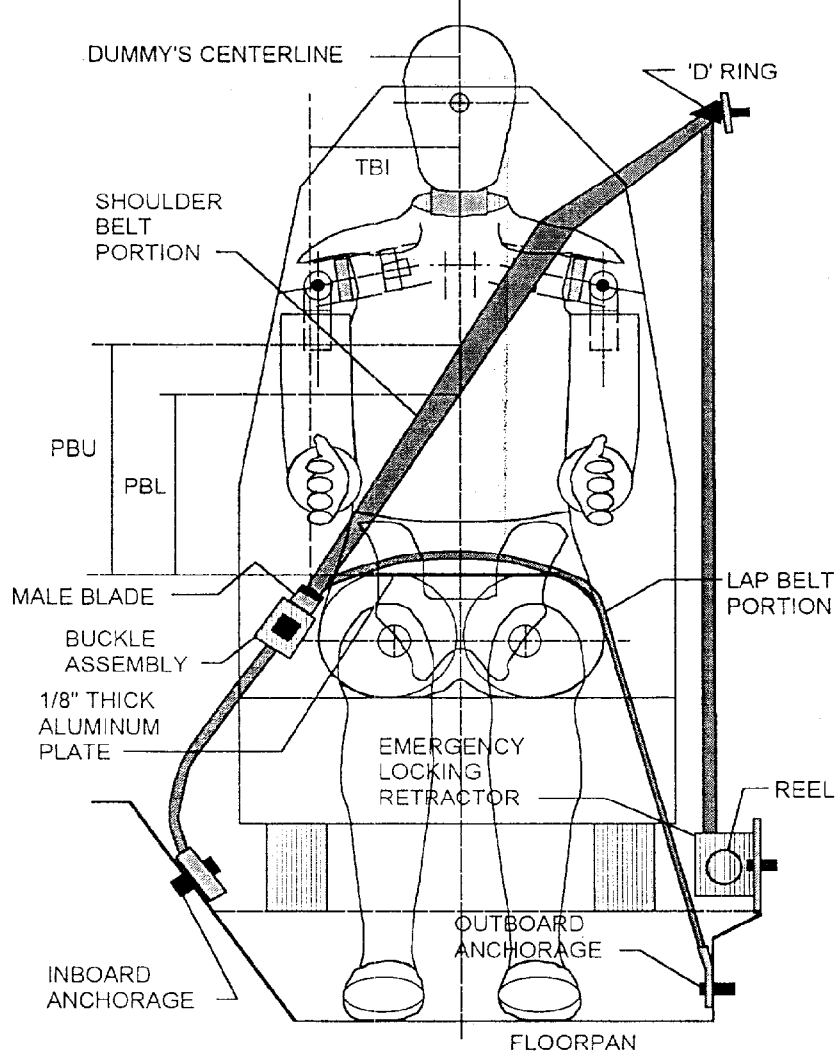
	DRIVER (Serial No. <u>35</u>)	PASS. (Serial No. <u>34</u>)
WA°	28°	
SWA°	21°	
SCA°	16°	
SA°	28.0°	28.0°
HZ	174.26 mm	170 mm
HH	441.96 mm	305 mm
HW	479.66 mm	482 mm
HR	193.04 mm	225 mm
NR	6°	-
CD	520.7 mm	450 mm
CS	29231 mm	-
RA	200.7 mm	-
KDL	193.04 mm	110 mm
KDR	182.88 mm	182.88 mm
PA°	25.0°	25.0°
TA°	34°	33°
KK	330.2 mm	254 mm
ST	533 mm @ 11.0°	550 mm
SK	609.6 mm @ 0°	600 mm
SH	165.1 mm @ 25.0°	125 mm
SHY	249 mm	280 mm
HS	254 mm	333 mm
HD	132 mm	128 mm
AD	127 mm	152 mm

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU--Top surface of aluminum plate to belt upper edge	274.32	289.56
PBL--Top surface of aluminum plate to belt lower edge	190.5	210.82

SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

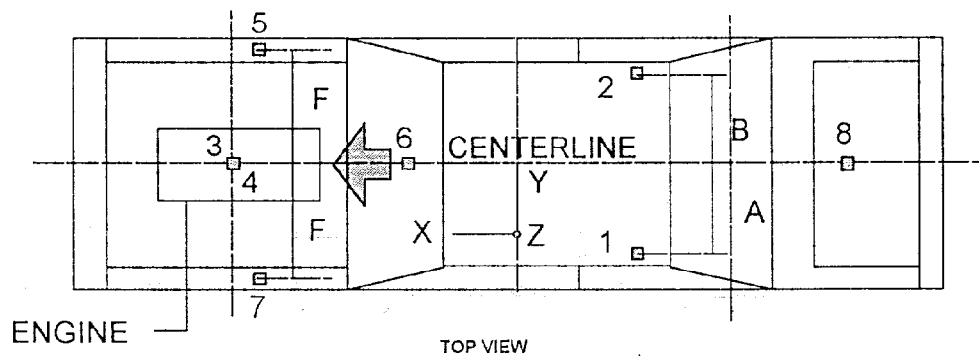
DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

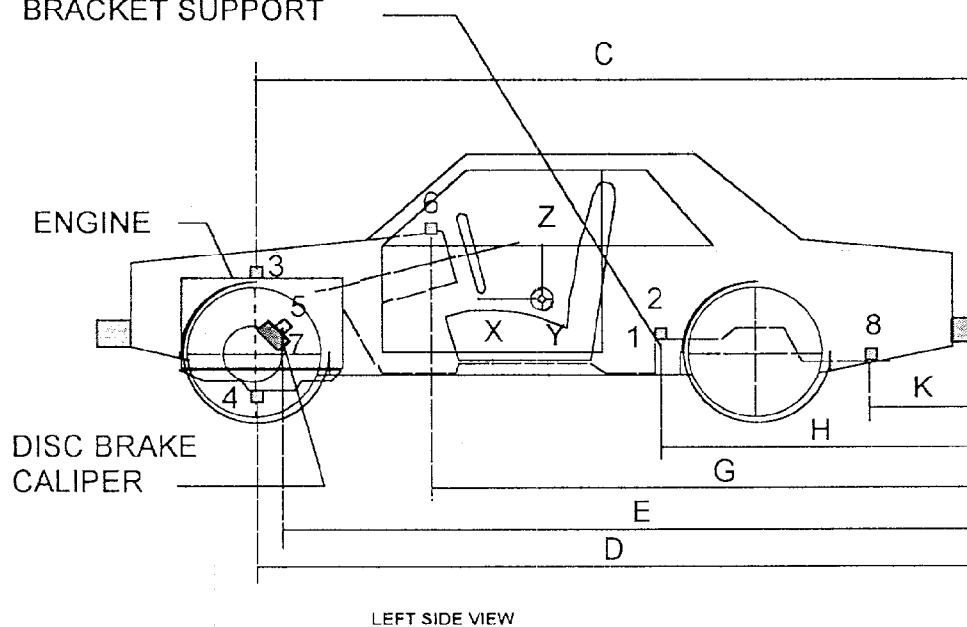
DIMENSION	LENGTH (mm)	
	PRETEST VALUES	POST TEST VALUES
A	600	600
B	590	590
C	3790	3859
D	3740	3502
E	2850	2838
F	610	610
G	2850	2741
H	1430	1430
K	1510	1510

LOCATION NO.	DESCRIPTION	MAXIMUM VALUE (G's)			
		Max.	msec.	Min.	msec.
1	Rear Seat X-Member @ Left Side	2.1	123.3	-33.2	63.8
2	Rear Seat X-Member @ Right Side	2.4	126.9	-40.8	58.8
3	Top of Engine Block	43.2	47.0	-136.0	36.7
4	Bottom of Engine	28.7	42.3	-109.8	32.2
5	Disc Brake Caliper @ Left Side	63.1	61.7	-103.3	37.2
6	Disc Brake Caliper @ Right Side	40.2	61.2	-170.6	43.4
7	Instrument Panel	44.5	36.6	-72.5	31.7
8	Left Rear, Redundant	2.1	139.1	-39.5	53.3
9	Right Rear, Redundant	0.0	0.0	0.0	0.0

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



DATA SHEET NO. 8

DUMMY INJURY CRITERIA VALUES

Vehicle Model Year & Make: 1997 Chevrolet Cavalier

NHTSA No.: MV0100

MAXIMUM HEAD ACCELERATIONS - PRIMARY (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Head CG - X	11.2	245.5	-56.3	78.3	6.9	293.4	-69.7	75.8
Head CG - Y	9.3	79.5	-7.2	46.0	3.3	36.4	-6.4	41.3
Head CG - Z	11.8	56.7	-30.2	84.5	26.4	58.3	-11.1	79.7
Head CG Resultant	61.6	81.8			70.5	75.8		

MAXIMUM CHEST ACCELERATIONS - PRIMARY (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Chest CG - X	7.0	176.1	-48.8	73.3	3.6	227.1	54.7	69.8
Chest CG - Y	2.6	214.3	-10.4	63.5	2.3	60.8	-4.8	90.9
Chest CG - Z	11.9	85.0	-7.8	50.9	15.9	81.1	-12.6	49.7
Chest CG Resultant	49.7	73.4			54.7	69.8		

MAXIMUM FORCE - FEMUR LOAD (Newtons)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Left Femur	359.3	89.2	-4373.1	56.7	771.1	89.4	-4470.0	52.5
Right femur	1190.7	84.7	-5407.4	57.1	249.7	149.3	-3231.4	56.5

MAXIMUM FORCE - SEAT BELT LOAD (Newtons)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Lap Belt	12511.2	65.0	-12.7	3.4	9106.8	58.2	-2.8	4.0
Shoulder Belt	9542.1	77.1	-35.7	145.9	8387.1	73.2	-17.9	258.4

HEAD INJURY CRITERIA (HIC)								
LOCATION	DRIVER				PASSENGER			
	HIC	T1 (msec)	T2 (msec)	Avg. Accel.	HIC	T1 (msec)	T2 (msec)	Avg. Accel.
Head CG Primary	529.3	59.0	94.9	45.06	747.1	57.2	91.9	54.04

CHEST CLIP (3 MSEC)						
LOCATION	DRIVER			PASSENGER		
	CLIP	T1 (msec)	T2 (msec)	CLIP	T1 (msec)	T2 (msec)
Chest CG Primary	47.6	10.2.2	105.2	52.9	98.5	101.5

NECK, CHEST, PELVIC, LOWER LEG AND FOOT DATA

UPPER NECK MAXIMUM FORCES (Newtons) & MOMENTS (Joules)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Neck Force 'X'	110.8	163.4	-1014.8	79.6	385.9	51.1	-824.8	70.3
Neck Force 'Y'	87.5	174.2	-177.9	43.3	113.5	82.0	-117.5	65.3
Neck Force 'Z'	1574.6	56.6	-196.9	0.9	1436.3	63.5	-130.9	37.5
Neck Force Resultant	1577.3	56.6			1534.0	71.9		
Neck Moment 'X'	6.4	141.0	-14.5	44.3	8.1	91.8	-4.0	40.0
Neck Moment 'Y'	41.1	79.0	-16.2	119.9	76.9	70.2	-20.5	53.2
Neck Moment 'Z'	2.5	128.4	-7.2	59.2	5.3	72.8	-2.1	196.7
Neck Moment Result.	41.7	79.0			77.1	70.2		

PEAK PELVIC ACCELERATIONS (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Pelvis 'X'	5.9	223.4	-55.1	57.7	4.5	224.8	-52.7	56.7
Pelvis 'Y'	5.6	89.2	-9.1	52.6	8.0	52.8	-8.5	66.5
Pelvis 'Z'	4.1	181.5	-22.4	69.4	4.5	49.2	-25.3	77.5
Pelvis Resultant	56.7	57.7			53.7	56.7		

TIBIA PEAK FORCES & MOMENTS (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Lt. Upper Moment 'Y'	133.3	60.5	-23.1	196.8	N/A	N/A	N/A	N/A
Left Lower Force 'Z'	3065.2	38.8	-168.4	180.7	N/A	N/A	N/A	N/A
Rt. Upper Moment 'Y'	186.2	51.9	-18.4	218.6	N/A	N/A	N/A	N/A
Right Lower Force 'Z'	5534.2	45.4	-192.2	217.7	N/A	N/A	N/A	N/A

N/A - Instrumentation not supplied by VRTC.

FOOT PEAK ACCELERATIONS (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Left Foot Aft	32.6	61.4	-66.8	61.0	23.8	58.4	-150.6	48.8
Left Foot Aft	123.9	60.3	-76.1	44.7	13.8	67.6	-129.8	50.5
Left Foot Fore	210.8	60.5	-94.1	44.7	22.3	60.5	-159.5	50.4
Right Foot Aft	141.6	53.3	-20.2	43.3	49.4	61.6	-108.4	49.1
Right Foot Aft	149.9	43.4	-141.0	43.9	20.6	64.4	-58.1	49.4
Right Foot Fore	112.8	43.6	-169.3	49.0	144.7	63.9	-160.4	50.2

REDUNDANT DUMMY INJURY CRITERIA VALUES

MAXIMUM HEAD ACCELERATIONS - REDUNDANT (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Head CG - X	11.3	249.2	-55.9	78.2	6.3	298.5	-68.6	76.1
Head CG - Y	9.1	79.9	-3.8	47.6	3.1	36.4	-3.0	41.4
Head CG - Z	15.7	57.3	-27.5	84.4	24.9	69.4	-10.4	79.8
Head CG Resultant	60.0	82.1			70.8	76.1		

MAXIMUM CHEST ACCELERATIONS - REDUNDANT (G's)								
LOCATION	DRIVER				PASSENGER			
	MAX.	TIME	MIN.	TIME	MAX.	TIME	MIN.	TIME
Chest CG - X	8.9	176.6	-49.2	73.4	4.4	227.3	-54.6	69.9
Chest CG - Y	5.1	52.3	-7.4	88.9	4.1	59.8	-4.3	90.8
Chest CG - Z	6.7	84.9	-9.8	51.0	12.3	81.2	-12.9	49.8
Chest CG Resultant	49.4	73.5			54.6	69.9		

REDUNDANT HEAD INJURY CRITERIA (HIC)								
LOCATION	DRIVER				PASSENGER			
	HIC	T1 (msec)	T2 (msec)	Avg. Accel.	HIC	T1 (msec)	T2 (msec)	Avg. Accel.
Head CG Redundant	513.7	58.5	94.4	45.41	725.3	61.6	90.9	57.54

REDUNDANT CHEST CLIP (3 MSEC)						
LOCATION	DRIVER			PASSENGER		
	CLIP	T1 (msec)	T2 (msec)	CLIP	T1 (msec)	T2 (msec)
Chest CG Redundant	47.6	102.3	105.3	53.1	98.8	101.8

DATA SHEET NO. 9

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Vehicle Model Year & Make: 1997 Chevrolet Cavalier NHTSA No.: MV0100

BELT LENGTH DATA (mm)	DRIVER	PASSENGER
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	2464	2464
Shoulder belt length as measured on Part 572 Dummy	812.8	812.8
Lap belt length as measured on Part 572 Dummy	304.8	304.8

SHOULDER BELT SPOOL-OFF DATA (mm)	DRIVER	PASSENGER
As determined by film analysis	82.55	107.95**
As determined mechanically	94.0	120.7
As determined electronically	93.9	121.1

BELT STRETCH DATA (mm)	DRIVER	PASSENGER
Measured electronically between shoulder belt load cell and the "D" ring	0.31	0.16
Measured mechanically	0.25	0.15

** Tape marks on passenger side belts were inadvertently marked at 1.25 inches instead of 1.00 inches.

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

Vehicle Model Year & Make: 1997 Chevrolet Cavalier NHTSA No.: MV0100

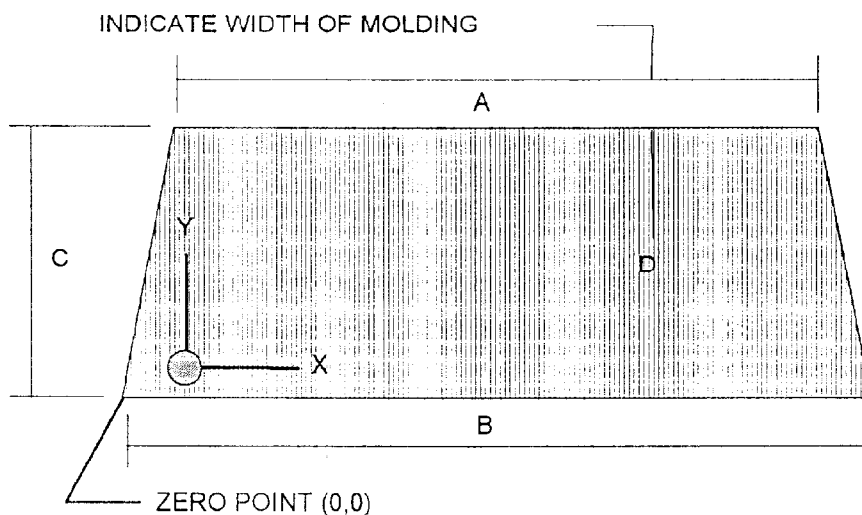
Details of windshield mounting (method of retention, type of trim, etc.):

Windshield glass is secured to the vehicle frame with a rubber adhesive 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 (mm)			
	PRETEST	POST TEST	PERCENT RETENTION
Right Side	815 mm	815 mm	100%
Left Side	815 mm	815 mm	100%
Total	1630 mm	1630 mm	100%

Indicate area of retention failure.



FRONT VIEW OF WINDSHIELD

Width of molding = Top & Side 20 mm, Bottom 32 mm.

Temperature of windshield molding during test = 21 °C

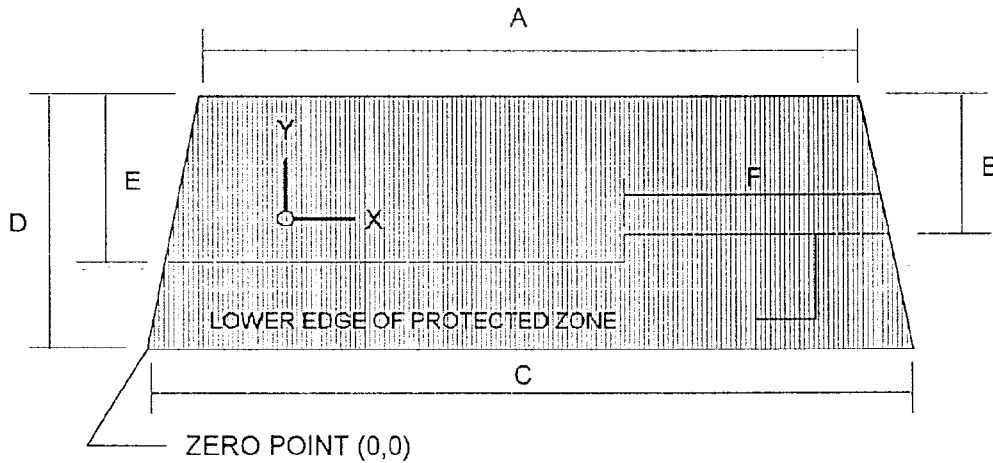
DATA SHEET NO. 11

WINDSHIELD ZONE INTRUSION FMVSS 219 DATA

Vehicle Model Year & Make: 1997 Chevrolet Cavalier NHTSA No.: MV0100

SKETCH OF FRONT VIEW OF WINDSHIELD:

Provide all dimensions necessary to reproduce the protected area.



FRONT VIEW OF WINDSHIELD

WINDSHIELD MEASUREMENTS:

A = 1055 mm

B = 370 mm

C = 1345 mm

D = 815 mm

E = 600 mm

F = 525 mm

Data Sheet No. 11 (Continued)

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

C. Record any windshield retention clips or brackets used to insure that the windshield would not disengage from the body.

DATA SHEET NO. 12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Vehicle Model Year & Make: 1997 Chevrolet

NHTSA No.: MV0100

Vehicle Model & Body Style: Cavalier Coupe

Test Date: 03/13/97

TYPE OF IMPACT: Frontal Barrier

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 solvent spillage occurred

DATA SHEET NO. 13

FMVSS 301 STATIC ROLLOVER DATA SHEET

A. TEST PHASE = 0° TO 90°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 20 seconds (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 20 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 min. from onset of rotation = 0 oz. (5 oz. allowed)

2. 6th minute = 0 oz. (1 oz. allowed)

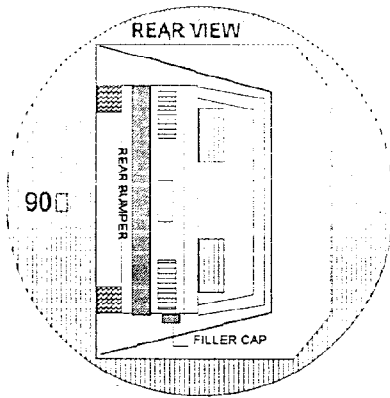
3. 7th minute = 0 oz. (1 oz. allowed)

4. 8th minute (if required) = N/A oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

Data Sheet No. 13 (Continued)

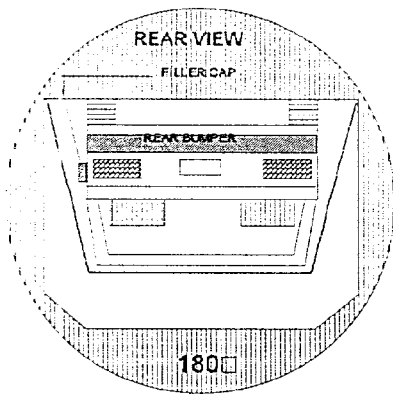


B. TEST PHASE = 90° TO 180°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 20 seconds (Specified Range is 1 to 3 minutes)
2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds
3. TOTAL = 6 minutes, 20 seconds
4. NEXT WHOLE MINUTE INTERVAL = 14.45 minutes

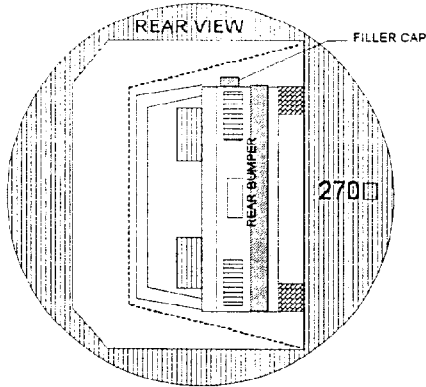
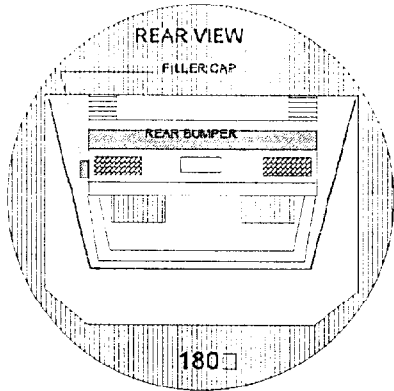
Actual Test Vehicle Stoddard Solvent Spillage:



1. First 5 min. from onset of rotation = 0 oz.
(5 oz. allowed)
2. 6th minute = 0 oz.
(1 oz. allowed)
3. 7th minute = 0 oz.
(1 oz. allowed)
4. 8th minute (if required) = N/A oz.
(1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.



C. TEST PHASE = 180° TO 270°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 20 seconds (Specified Range is 1 to 3 minutes)
2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds
3. TOTAL = 6 minutes, 20 seconds
4. NEXT WHOLE MINUTE INTERVAL = 21.05 minutes

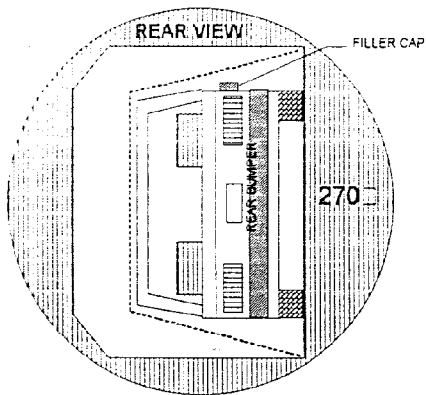
Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 min. from onset of rotation = 0 oz.
(5 oz. allowed)
2. 6th minute = 0 oz.
(1 oz. allowed)
3. 7th minute = 0 oz.
(1 oz. allowed)
4. 8th minute (if required) = N/A oz.
(1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

Data Sheet No. 13 (Continued)

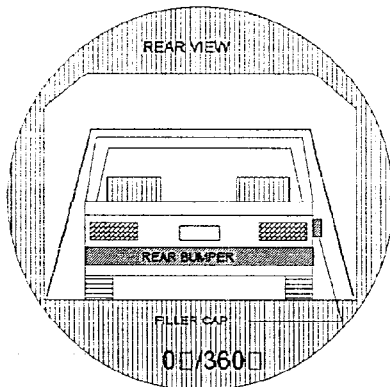


D. TEST PHASE = 270° TO 360°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 20 seconds (Specified Range is 1 to 3 minutes)
2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds
3. TOTAL = 6 minutes, 20 seconds
4. NEXT WHOLE MINUTE INTERVAL = 27.25 minutes

Actual Test Vehicle Stoddard Solvent Spillage:



1. First 5 min. from onset of rotation = 0 oz.
(5 oz. allowed)
2. 6th minute = 0 oz.
(1 oz. allowed)
3. 7th minute = 0 oz.
(1 oz. allowed)
4. 8th minute (if required) = N/A oz.
(1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations--

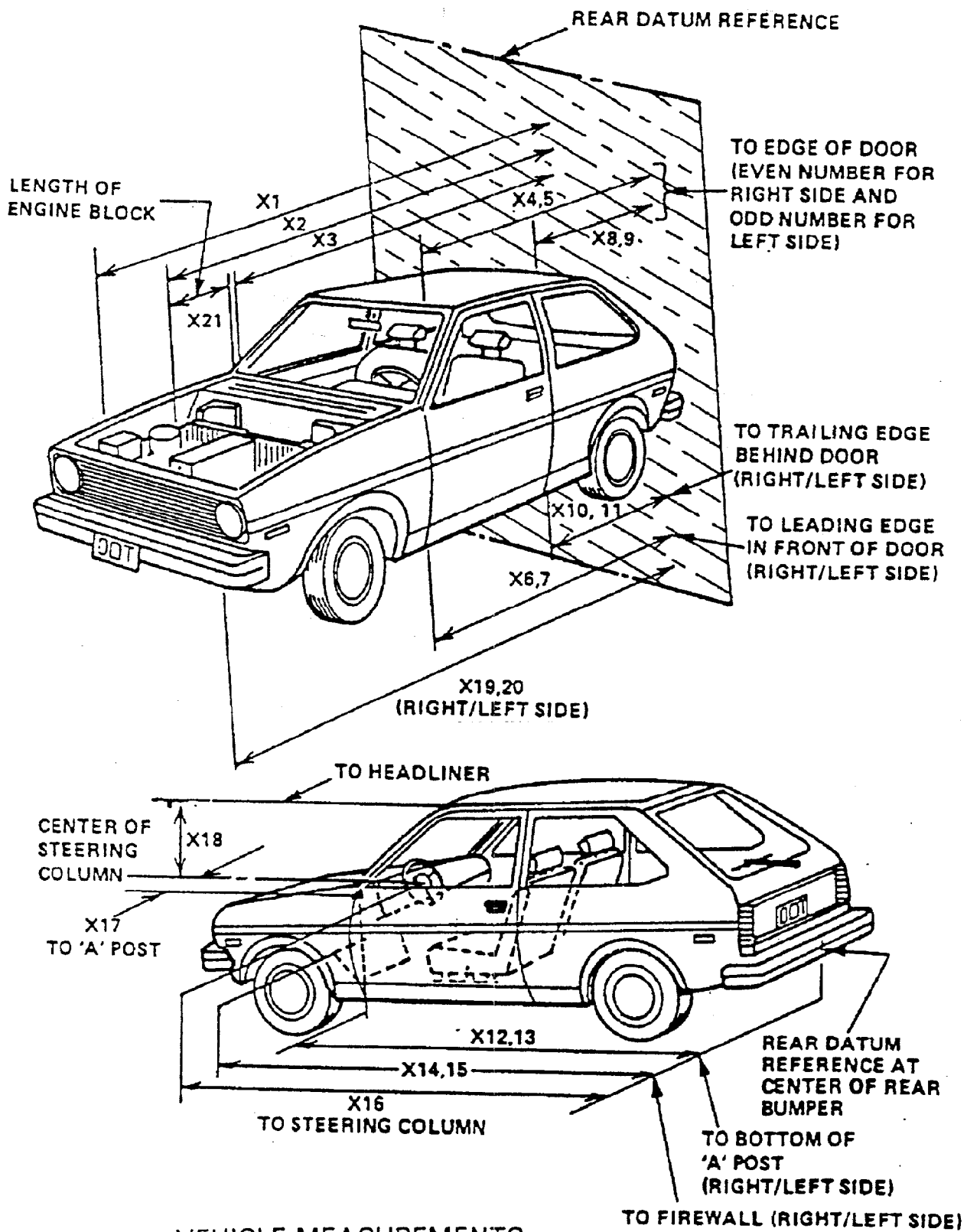
No solvent leakage occurred during rollover tests.

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Vehicle Model Year & Make: 1997 Chevrolet Cavalier

NHTSA No.: MV0100

NO.	MEASUREMENT DESCRIPTION	DIMENSIONS IN MM		
		PRE-TEST	POST-TEST	DIFFERENCE
1	Total length of vehicle at centerline	4610	4110	500
2	Rear surface of vehicle (RSOV) to front of engine	3870	3648	222
3	RSOV to firewall centerline	3480	3340	140
4	RSOV to leading edge of right door	3050	3037	13
5	RSOV to leading edge of left door	3050	3046	4
6	RSOV to lower leading edge of right door	3080	3077	3
7	RSOV to lower leading edge of left door	3075	3080	+5
8	RSOV to upper trailing edge of right door	2050	2040	10
9	RSOV to upper trailing edge of left door	2045	2046	+1
10	RSOV to lower trailing edge of right door	2045	2050	+5
11	RSOV to lower trailing edge of left door	2040	2041	+1
12	RSOV to bottom of right 'A' pillar	3093	3025	68
13	RSOV to bottom of left 'A' pillar	3090	3025	65
14	RSOV to firewall on right side	3480	3207	273
15	RSOV to firewall of left side	3480	3363	117
16	RSOV to steering column	2610	2692	+82
17	Center of steering column to left 'A' pillar	270	301	+31
18	Center of steering column to headlining	410	350	60
19	RSOV to right side of front bumper	4245	4012	233
20	RSOV to left side of front bumper	4245	3988	257
21	Length of engine block	450	450	0
22	Right side to dash panel	2790	2750	40
23	Center to dash panel	2790	2810	+20
24	Left side to dash panel	2825	2783	43



DATA SHEET NO. 15 CAMERA LOCATIONS

VEH. NHTSA No.: MV0100

TEST DATE: 03/13/97

TIME: 4:00 PM

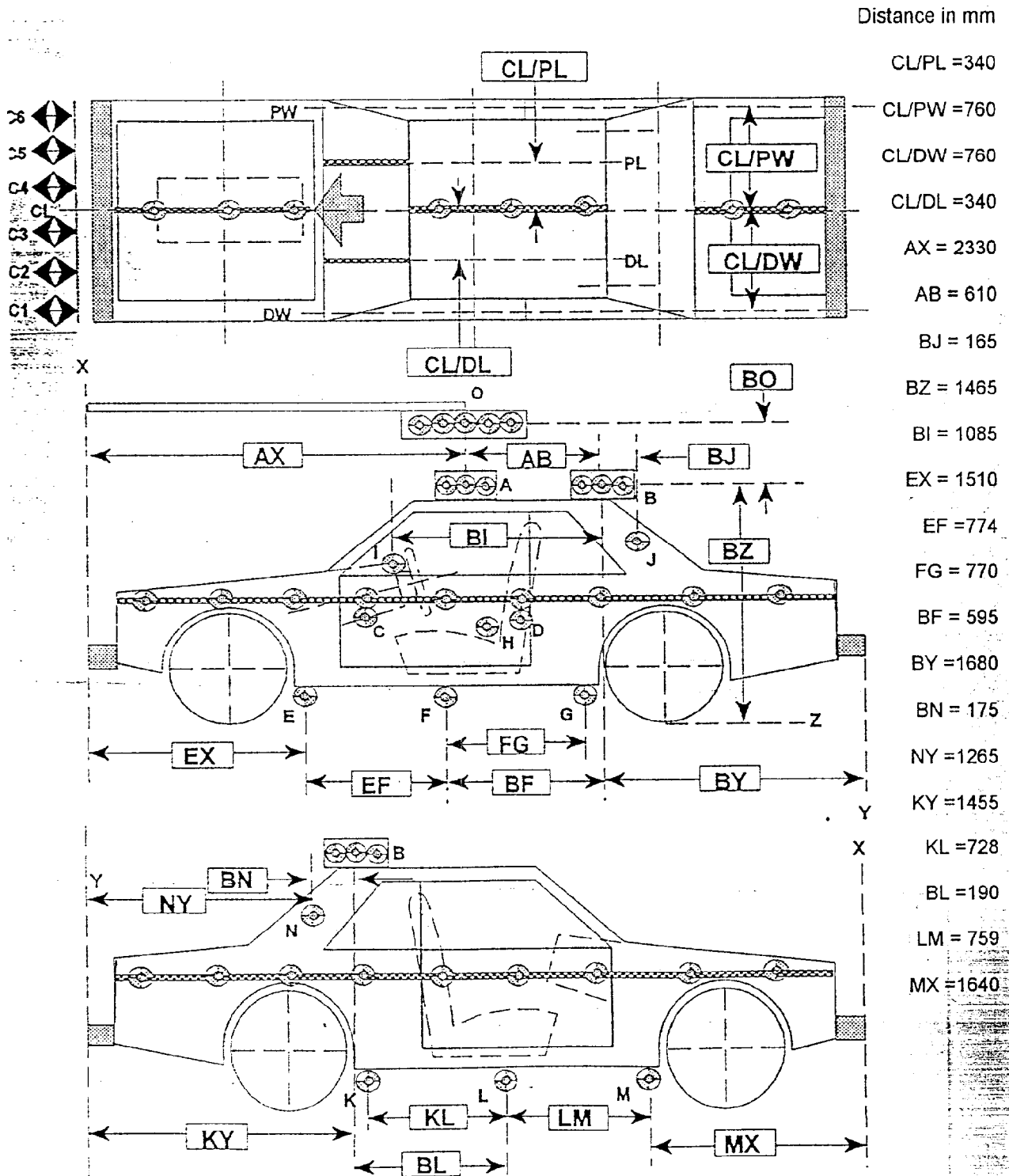
VEH. YEAR/MAKE/MODEL/BODY STYLE: 1997 Chevrolet Cavalier Coupe

CAMERA NO.	VIEW	CAMERA POSITIONS (mm) *			ANGLE (deg.)	FILM PLANE TO HEAD TARGET (mm)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Right Side View	3050	14500	1524	-2	14820	12-50 Zoom	24
2	Left Side View	1270	-8280	765	0	8225	25	970
3	Left Side View	1219	-11938	1308	-1	11446	80	920
4	Left Side View	3327	-2413	1994	-23	4117	19	990
5	Left Side View	2057	-8280	3073	-15	8164	25	1020
6	Left Side View	2057	-8280	2540	-13	8069	25	1010
7	Right Side View	1905	8204	1219	-3	7780	17	1100
8	Right Side View	3023	11608	914	0	11536	50	870
9	Right Side View	3429	2438	1905	-18	4228	19	850
10	Right Side View	991	9677	940	2	9172	50	820
11	Front View Windshield	-330	0	3531	-65	N/A	12.5	500
12	Front View Driver	-292	-318	2489	-44	N/A	19	1200
13	Front View Passenger	-368	318	2489	-41	N/A	19	1150
14	Pit Camera Engine View	559	0	1651	90	N/A	13	1/
15	Pit Camera Fuel Tank View	4394	0	1651	55	N/A	13	970
16	Driver Side Belt	3556	-152	610	4	83	13	840
17	Passenger Side Belt	3556	152	610	4	108	13	1000

X - film plane to barrier face Y - film plane to monorail centerline Z - film plane to ground

1/ - Torn perforation, lab could not process; Fix, check and reset alignment of film sprocket

DATA SHEET NO. 16
REFERENCE PHOTOGRAPH TARGETS



DATA SHEET NO. 17

ACCIDENT INVESTIGATION DIVISION DATA

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1997 Chevrolet Cavalier 4-Door Sedan

VEHICLE NHTSA NO.: MV0100

VIN: 1G1JC5247V7171344

WHEELBASE: 2644 mm

BUILD DATE: 10/96

TEST DATE: 03/13/97

VEH. SIZE CATEGORY: Sedan

TEST WEIGHT: 1441 kg

ACCELEROMETER DATA:

LOCATION: Left and right side passenger compartment

CALIBRATION PROCEDURE: 6 months/ drop test

LINEARITY: Good INTEGRATION ALGORITHM: NHTSA Standard

VEHICLE IMPACT SPEED: 56.25 kph

TIME OF SEPARATION: 74.1 msec

VELOCITY CHANGE: 74.9 kph

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

IMPACT MODE: Frontal

CRUSH DEPTH DIMENSIONS:

C1 = 262 mm

C2 = 380 mm

C3 = 486 mm

C4 = 489 mm

C5 = 364 mm

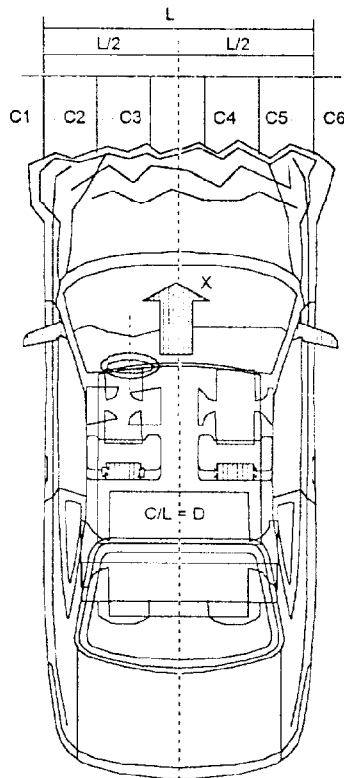
C6 = 243 mm

MIDPOINT OF DAMAGE: D = Vehicle centerline

(Vehicle Longitudinal Centerline)

LENGTH OF DAMAGE REGION:

L = 940 mm



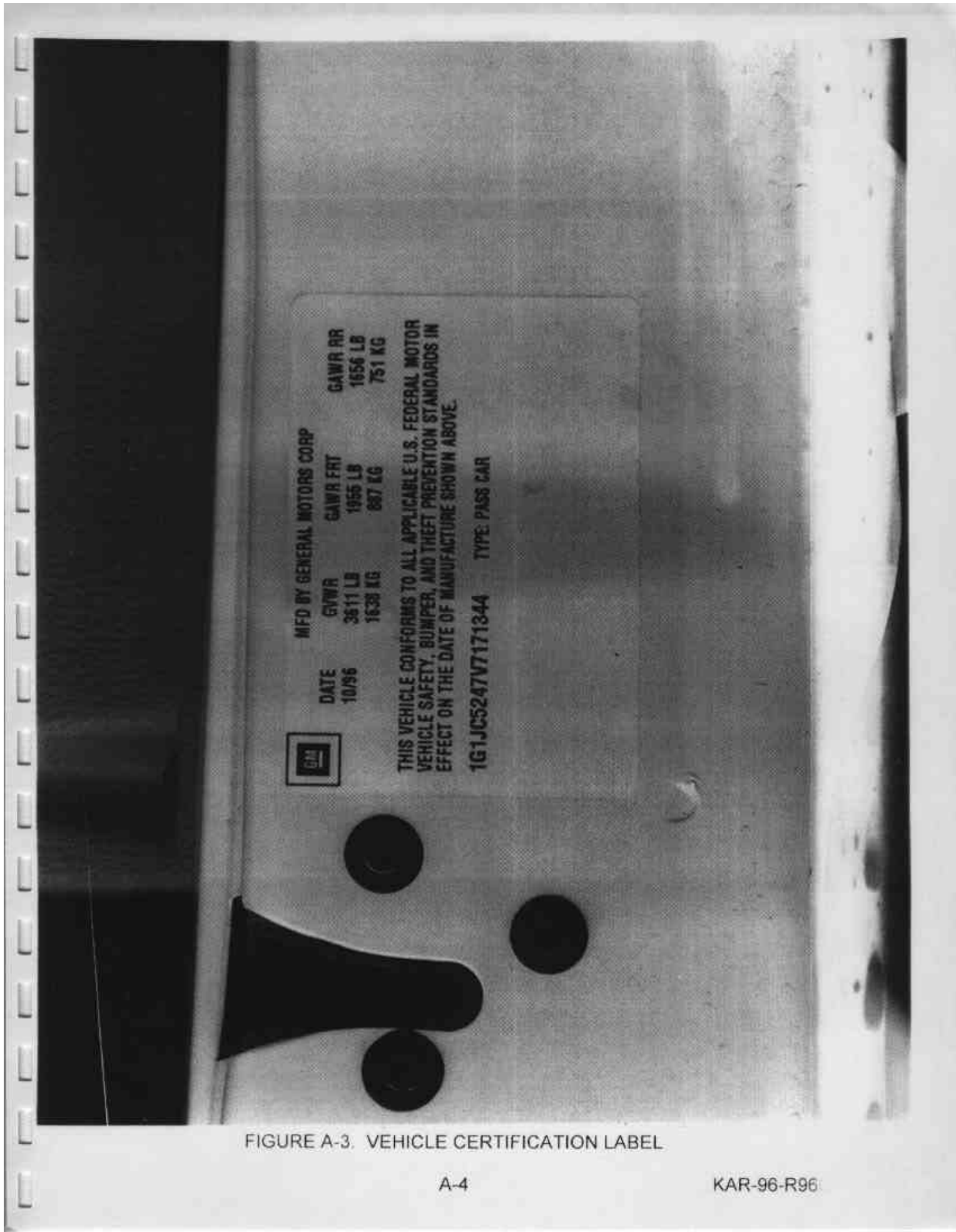
APPENDIX A
PHOTOGRAPHS



FIGURE A-1. RIGHT FRONT AS RECEIVED



FIGURE A-2. LEFT REAR AS RECEIVED



	MFD BY GENERAL MOTORS CORP		
	DATE	GVWR	GAWR RR
	10/96	3611 LB	1656 LB
		1638 KG	751 KG

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

1G1JC5247V7171344 TYPE: PASS CAR

FIGURE A-3. VEHICLE CERTIFICATION LABEL



TIRE - LOADING INFORMATION

OCCUPANTS			VEHICLE CAP. WT.		
FRT.	CTR.	RR.	TOTAL	LBS	KG
2	0	3	5	882	400

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.
1G1JC5247V7171344

MODEL: JC69 JAC

TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT P195/65R15	S	30/210 PSI/KPA
RR P195/65R15	S	30/210 PSI/KPA
SPA T115/70D14	M	60/420 PSI/KPA

IF TIRES ARE HOT, ADD 4 PSI / 28 KPA
SEE OWNER'S MANUAL FOR MORE INFORMATION

FIGURE A-4. VEHICLE TIRE PLACARD



FIGURE A-5. PRE-TEST FRONT VIEW

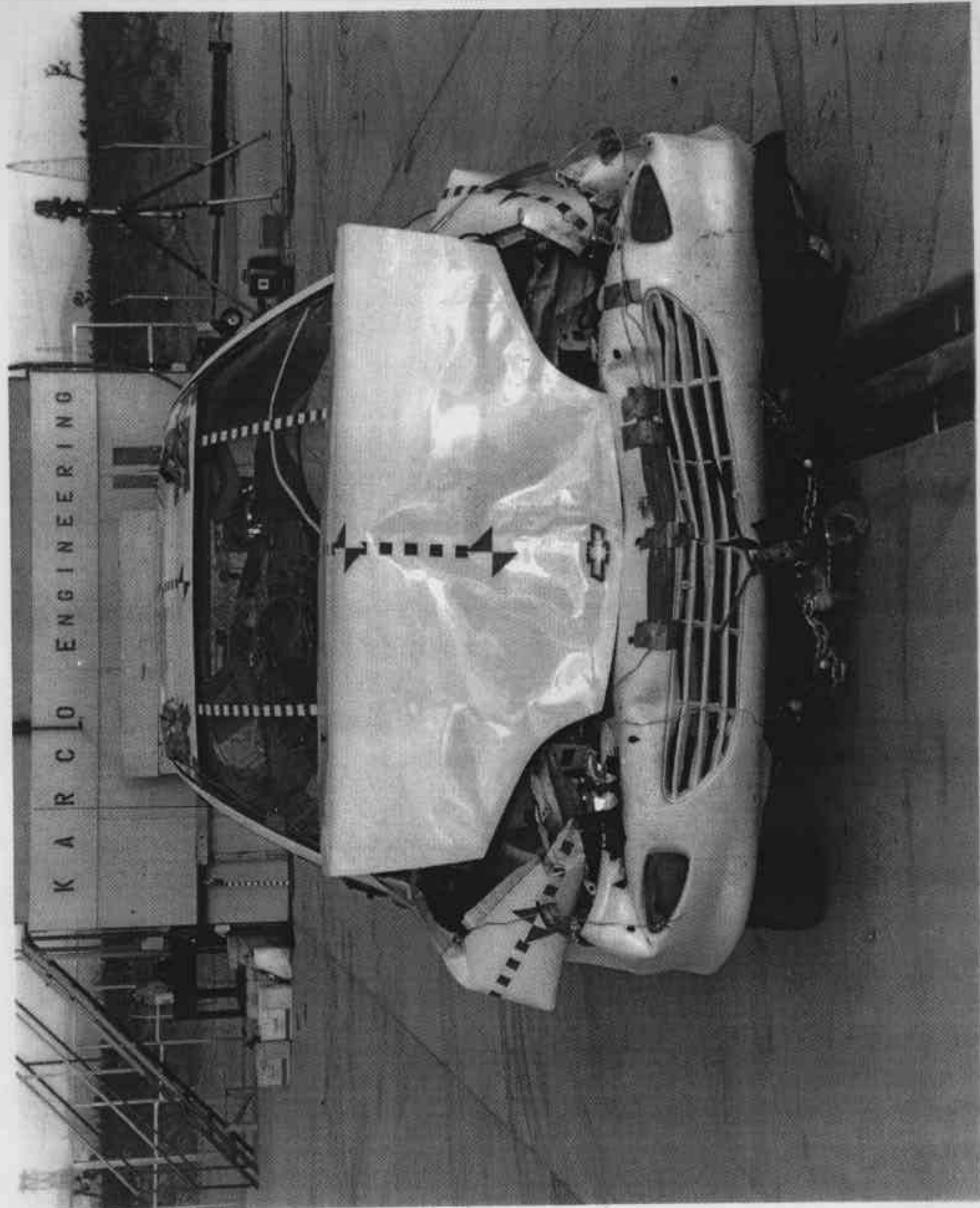


FIGURE A-6. POST-TEST FRONT VIEW

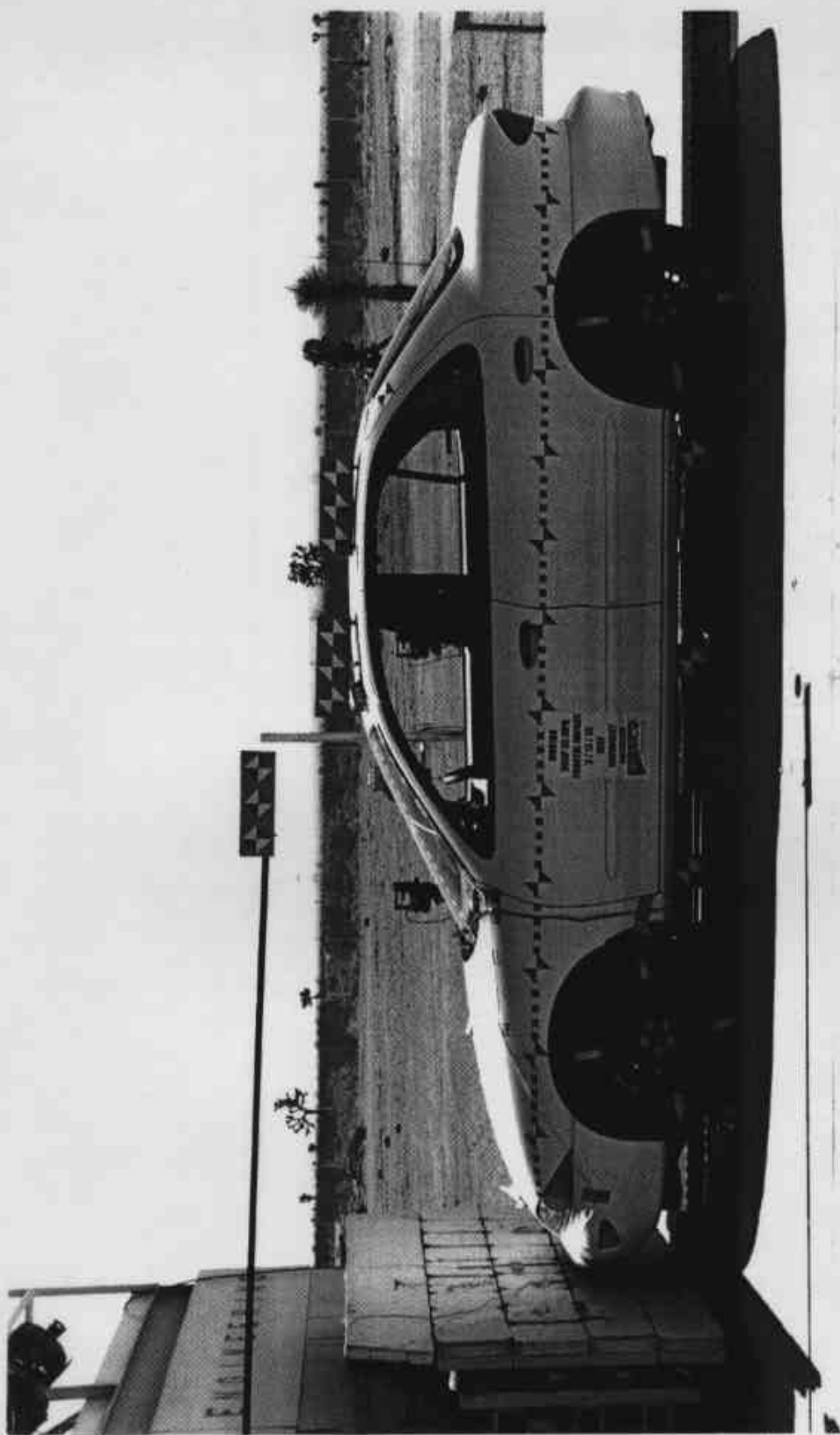


FIGURE A-7. PRE-TEST LEFT SIDE VIEW

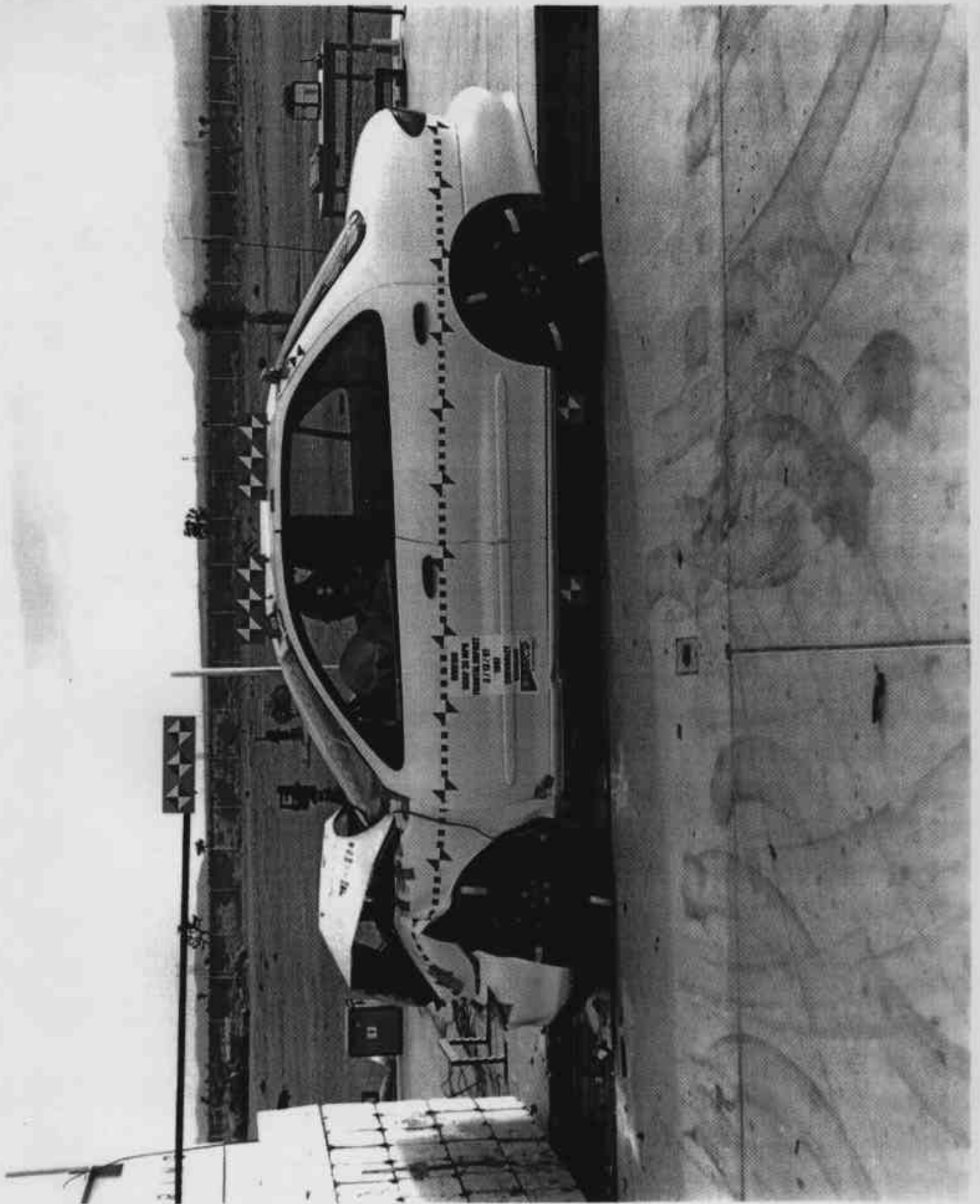


FIGURE A-8. POST-TEST LEFT SIDE VIEW

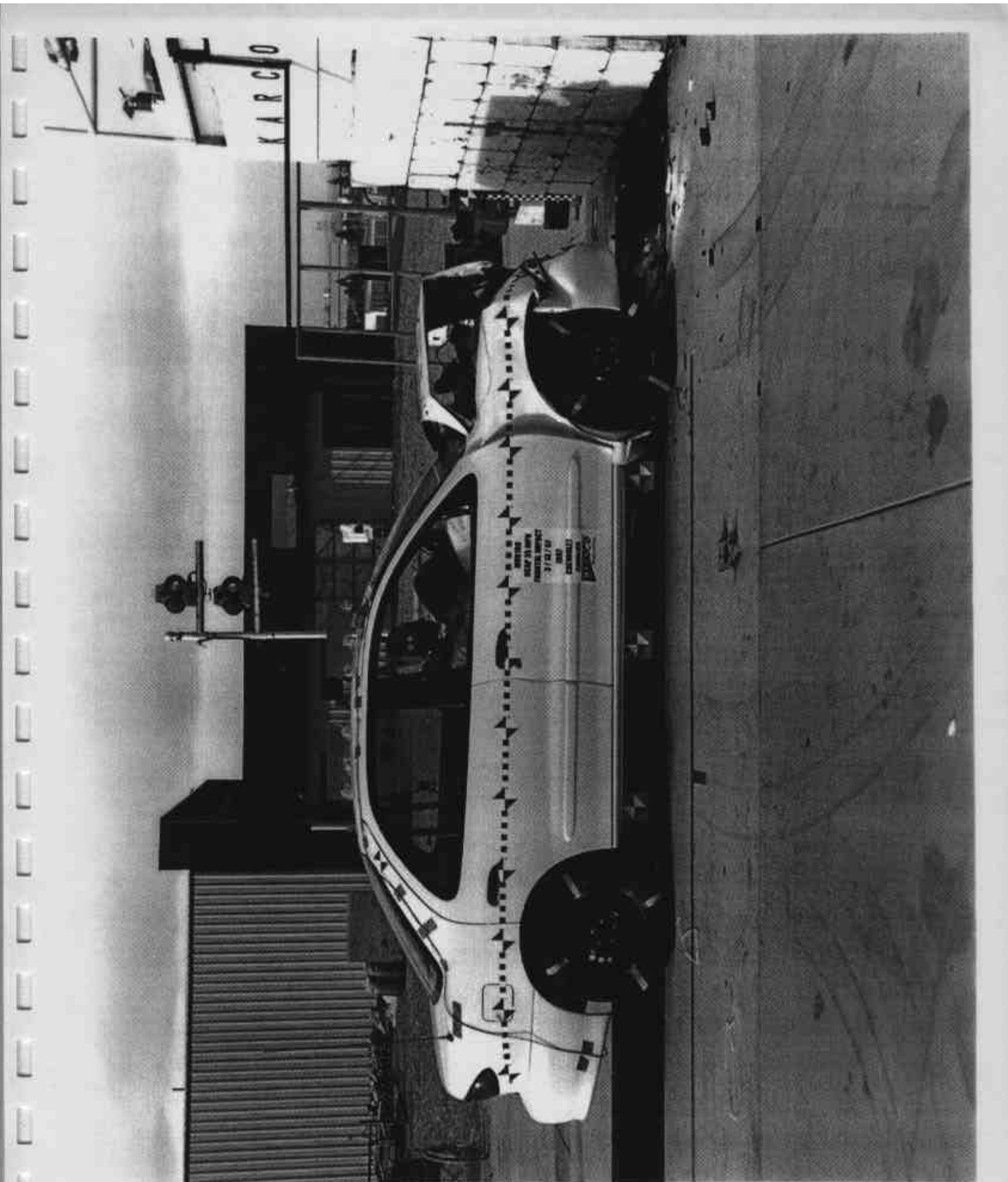


FIGURE A-10. POST-TEST RIGHT SIDE VIEW

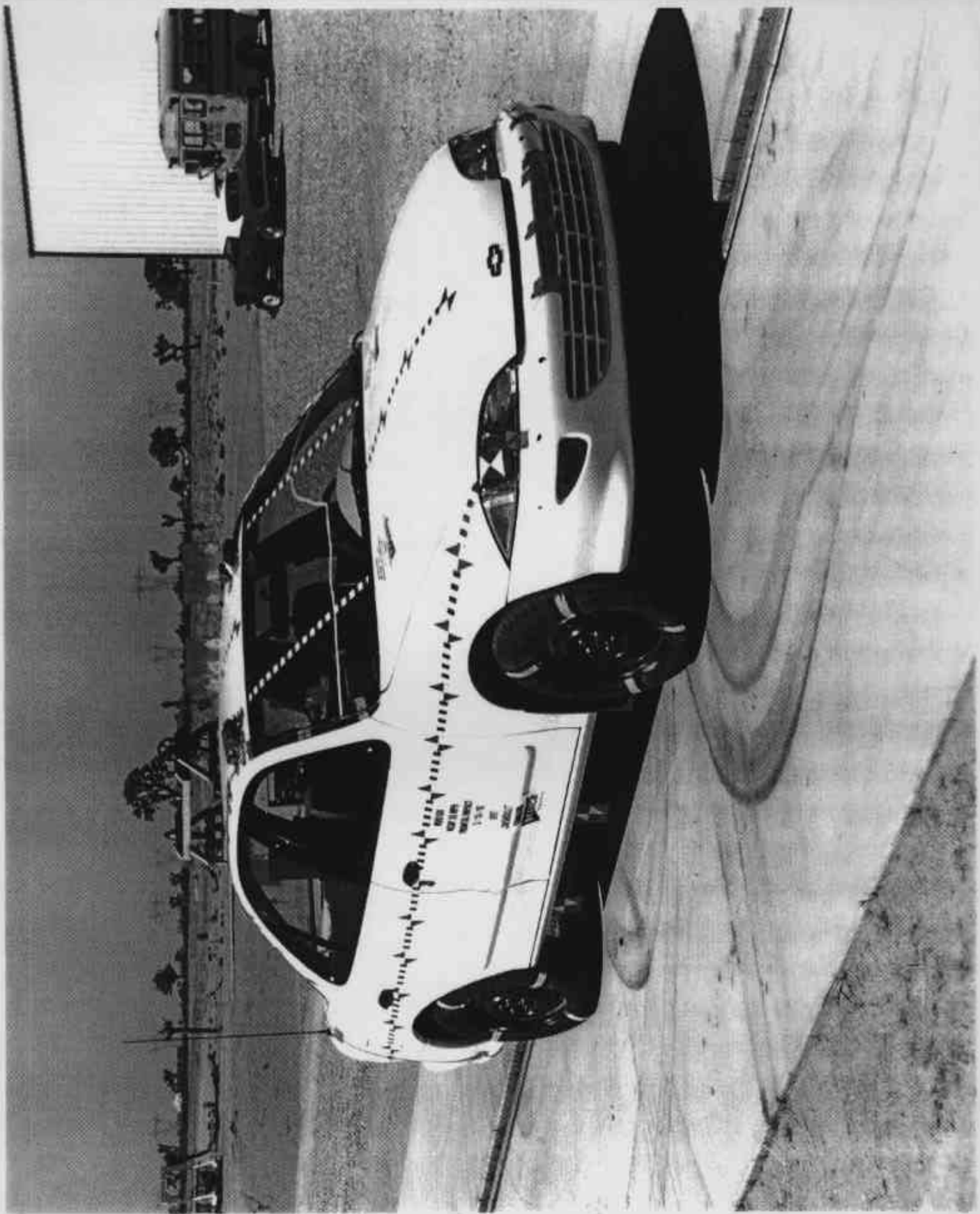


FIGURE A-11. PRE-TEST RIGHT FRONT 3/4 VIEW

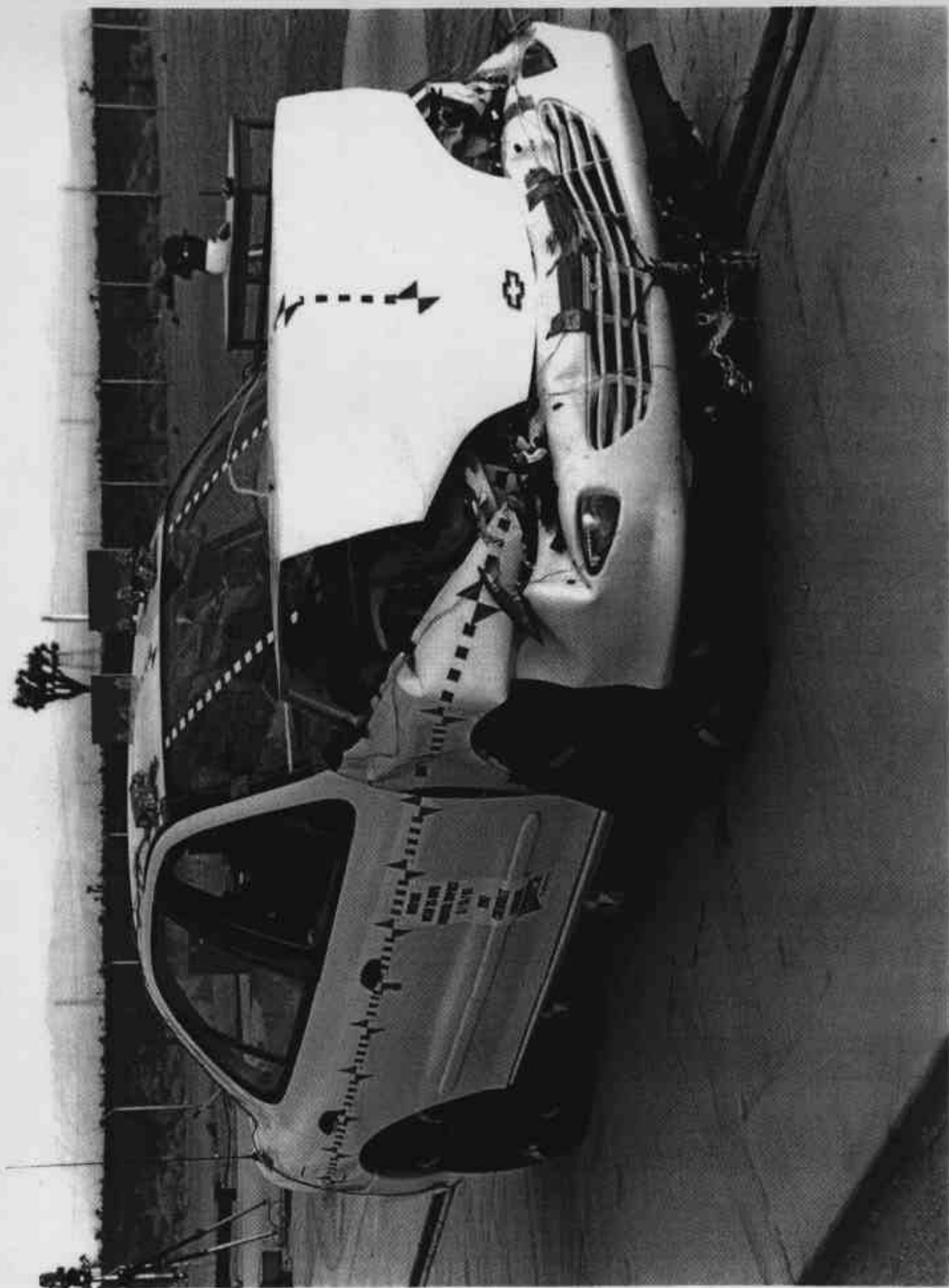


FIGURE A-12. POST-TEST RIGHT FRONT 3/4 VIEW



FIGURE A-13. PRE-TEST LEFT REAR 3/4 VIEW

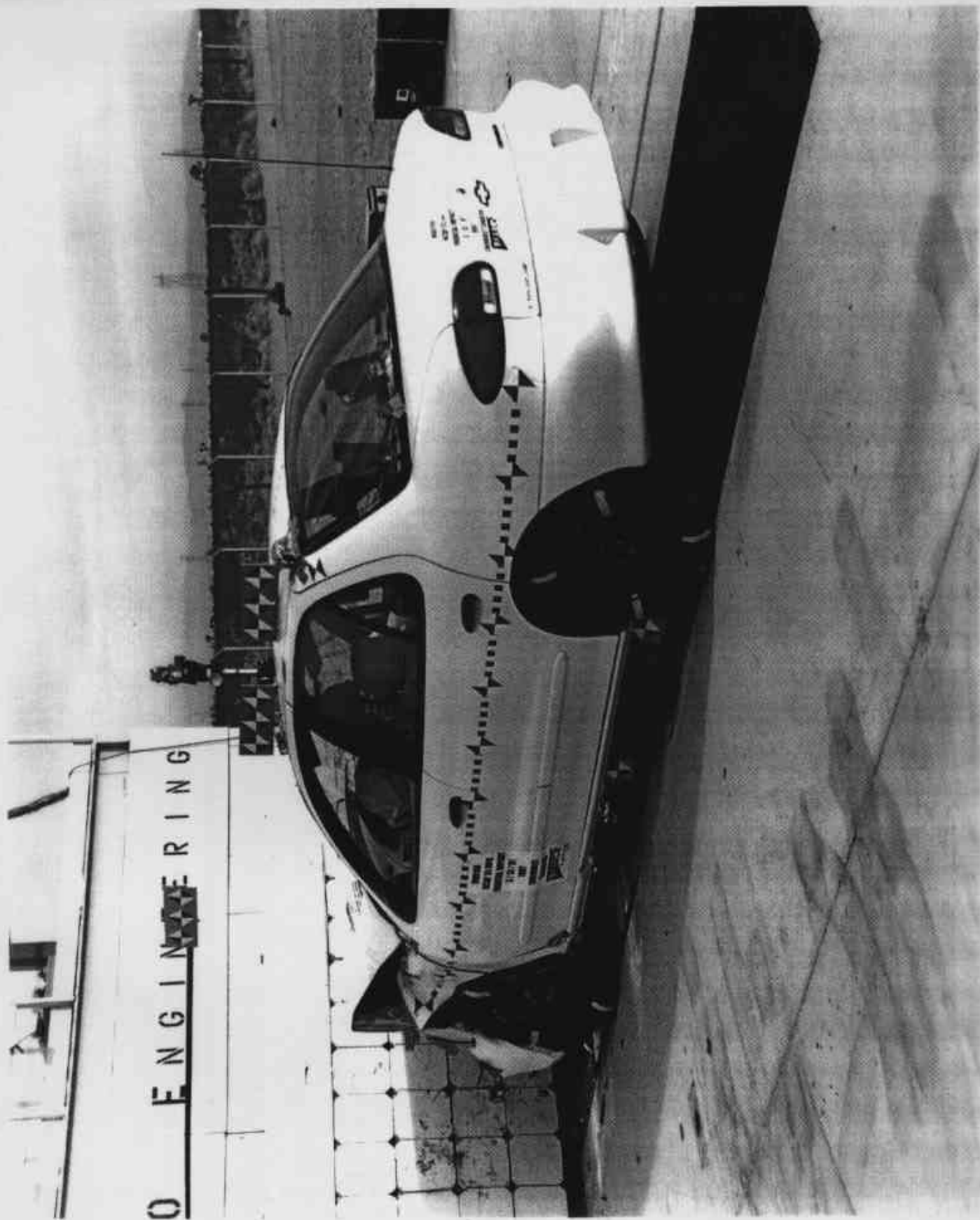


FIGURE A-14. POST-TEST LEFT REAR 3/4 VIEW

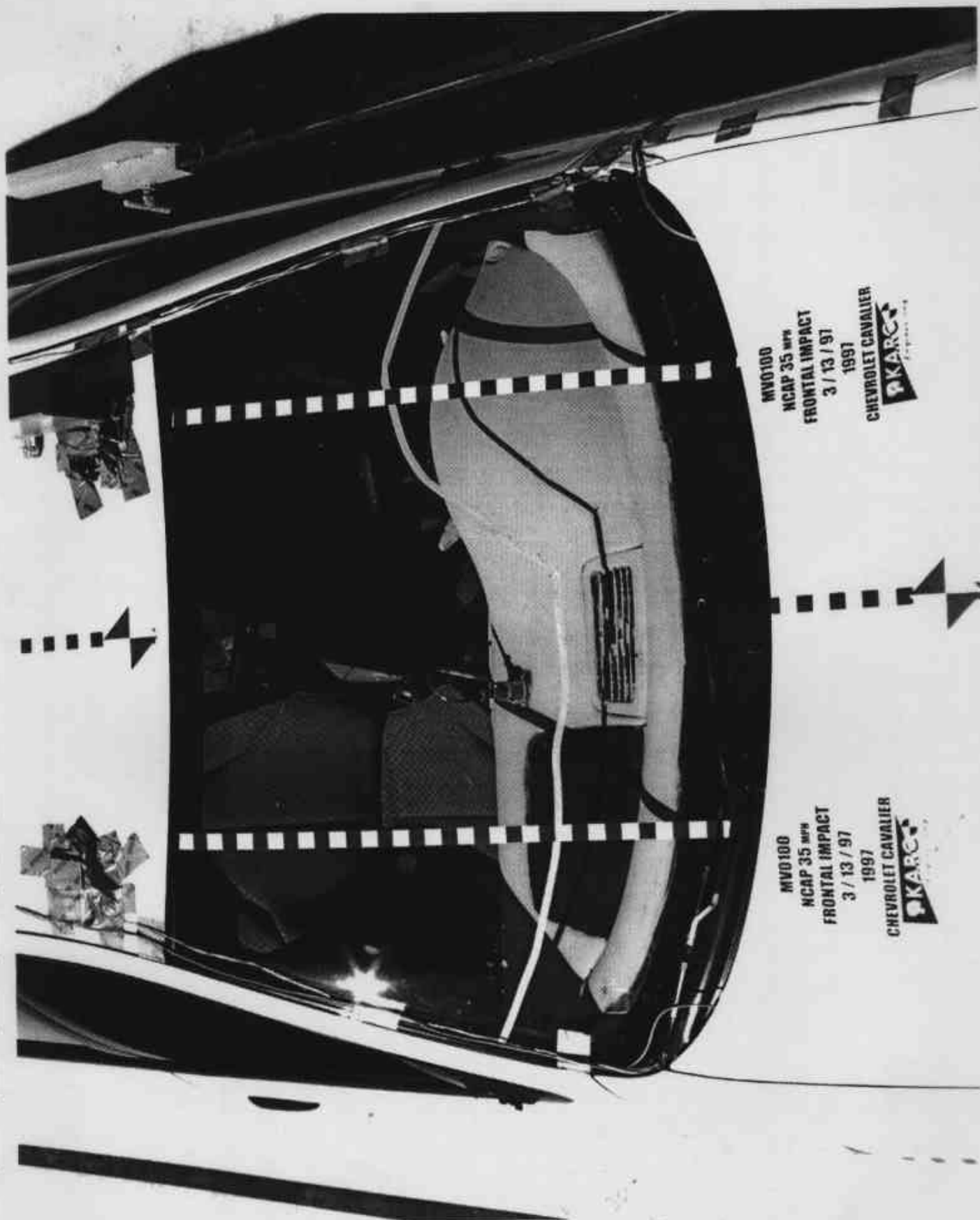


FIGURE A-15. PRE-TEST WINDSHIELD

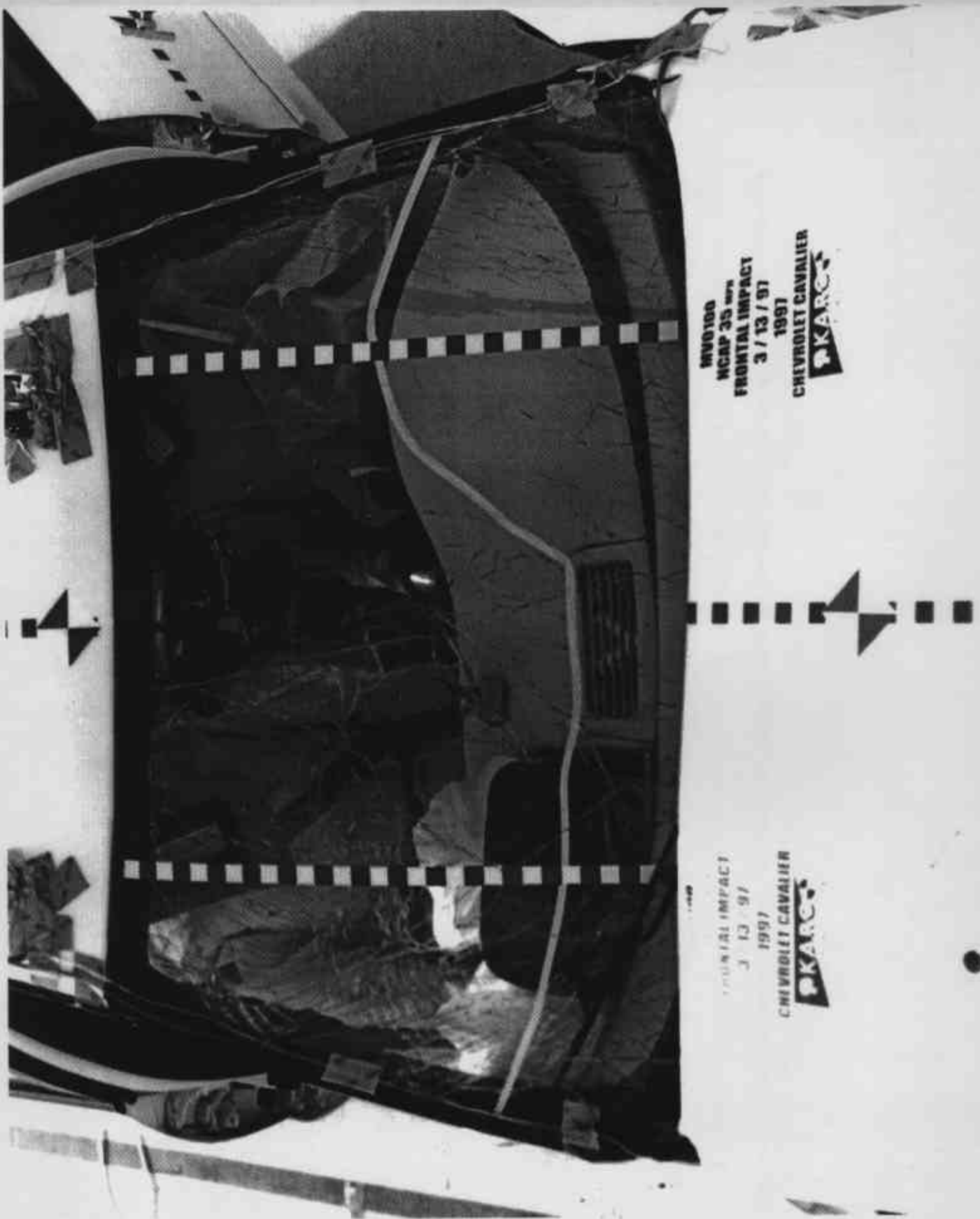


FIGURE A-16. POST-TEST WINDSHIELD

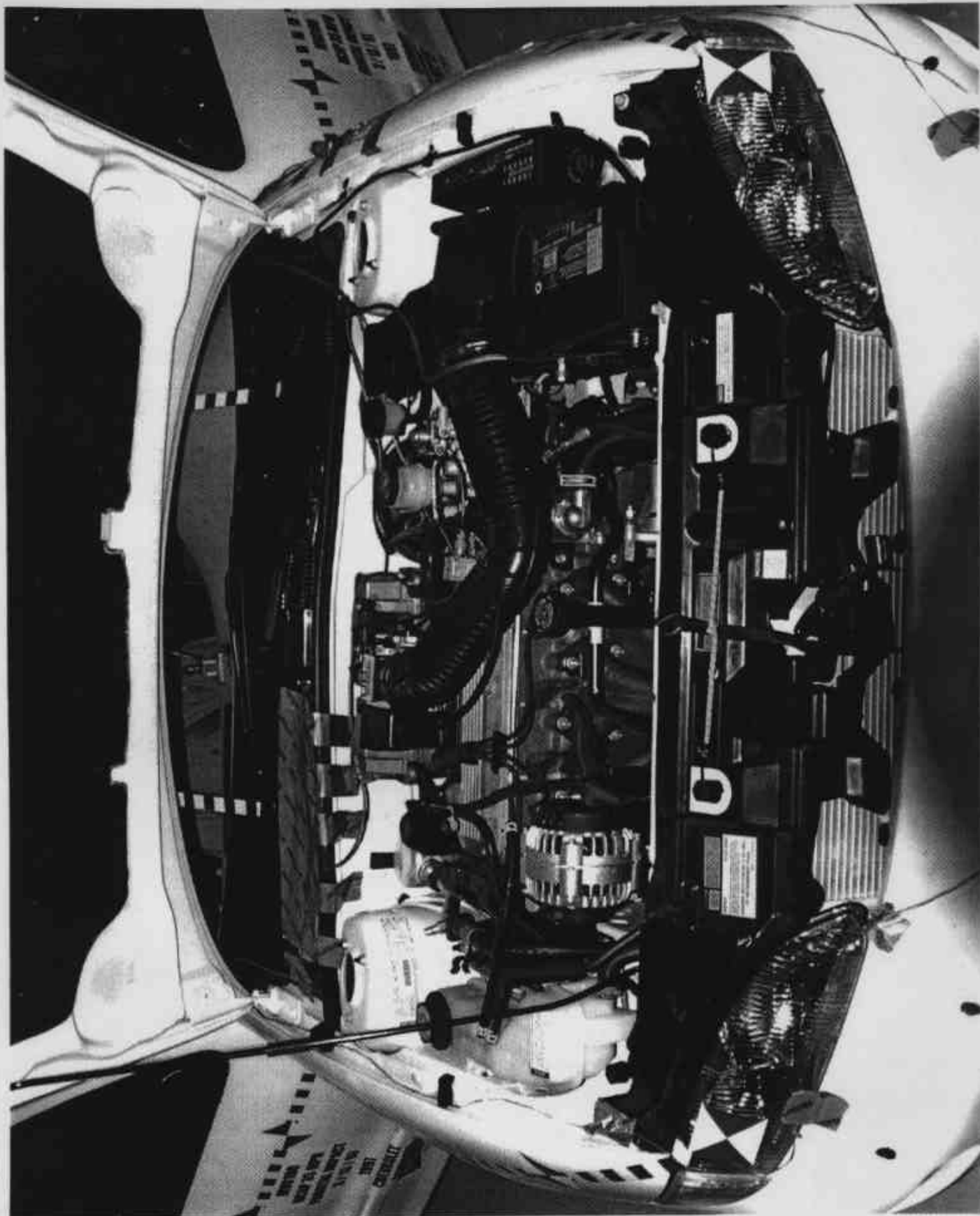


FIGURE A-17. PRE-TEST ENGINE COMPARTMENT

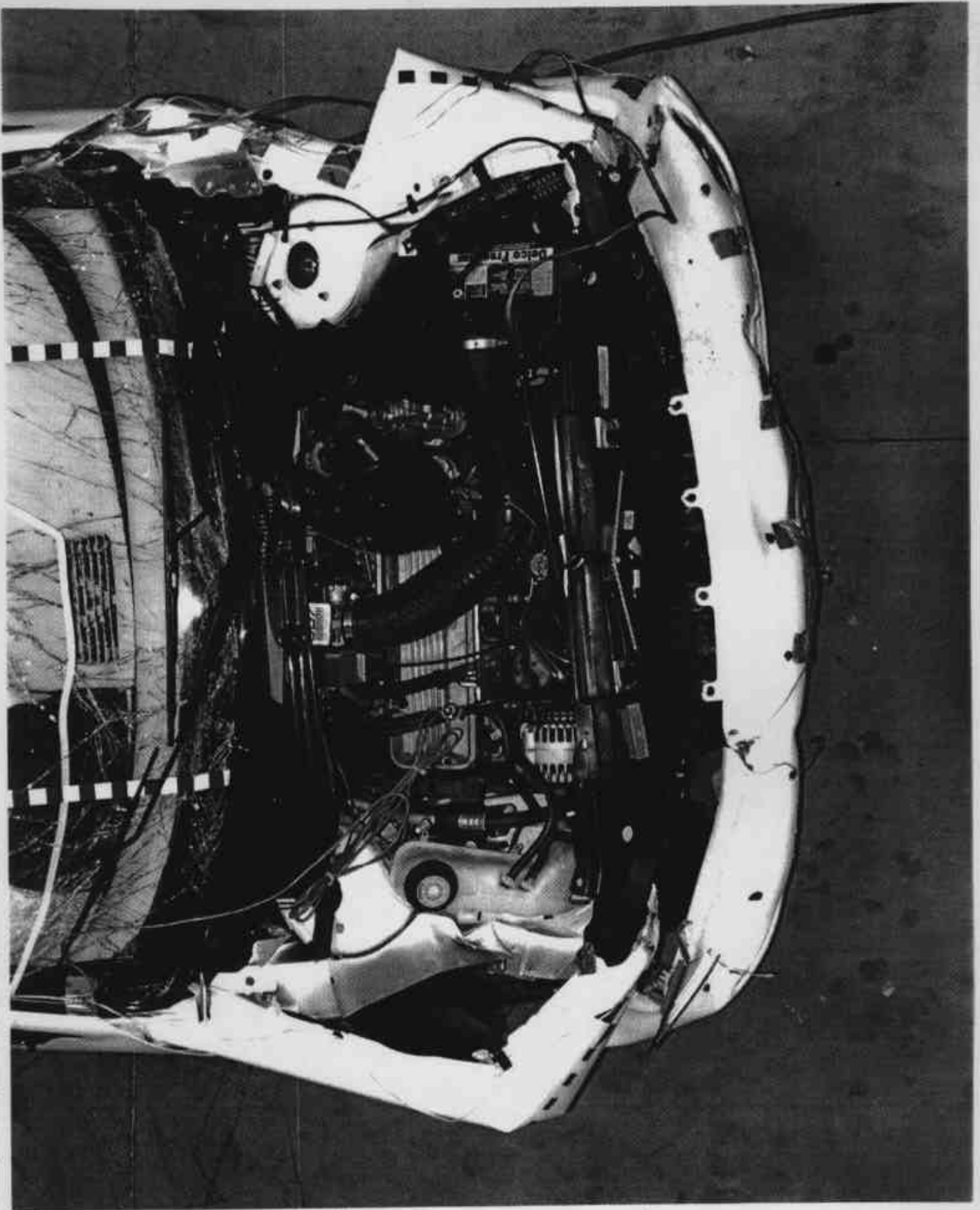


FIGURE A-18. POST-TEST ENGINE COMPARTMENT



FIGURE A-19. PRE-TEST FUEL FILLER CAP

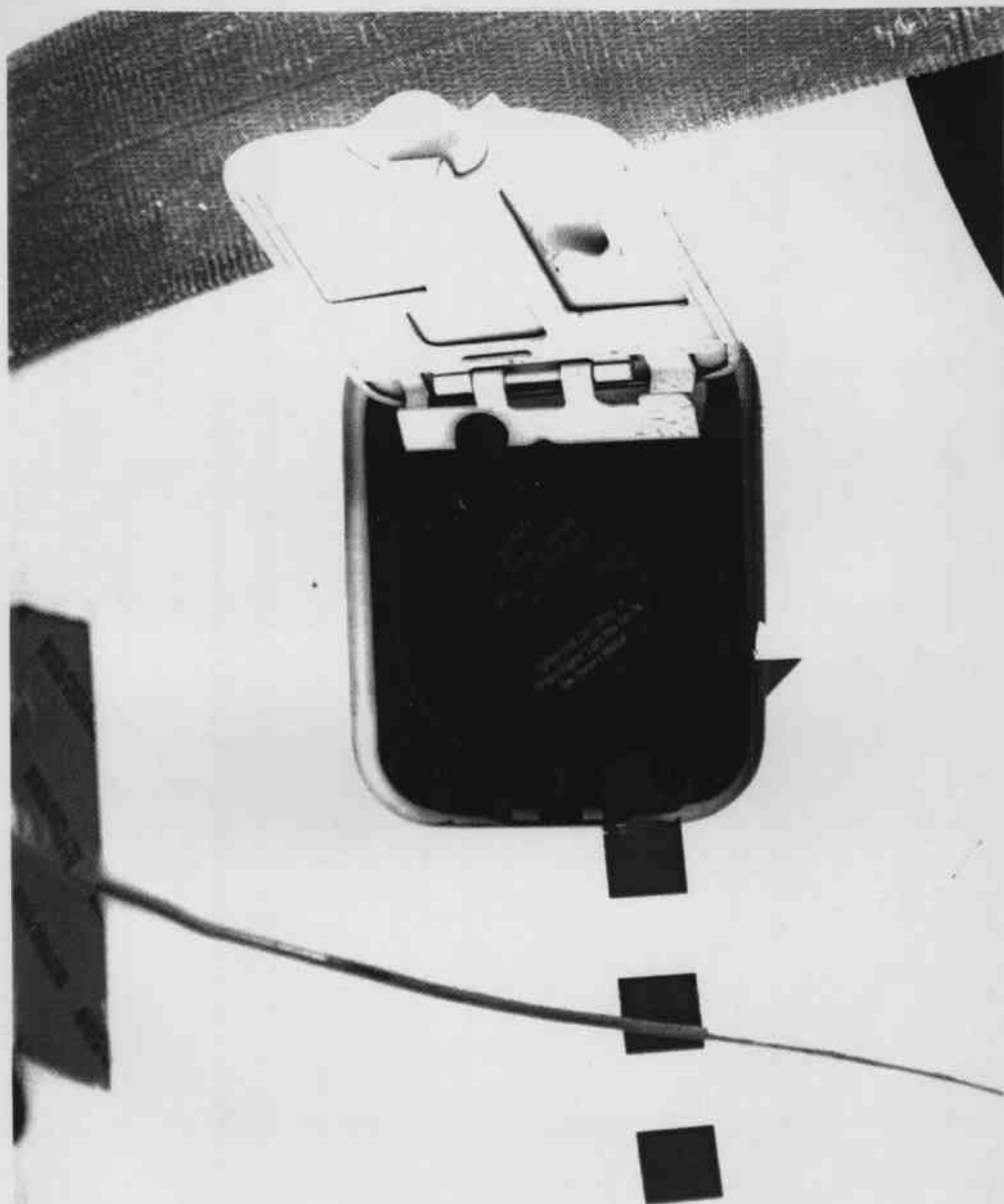


FIGURE A-20. POST-TEST FUEL FILLER CAP

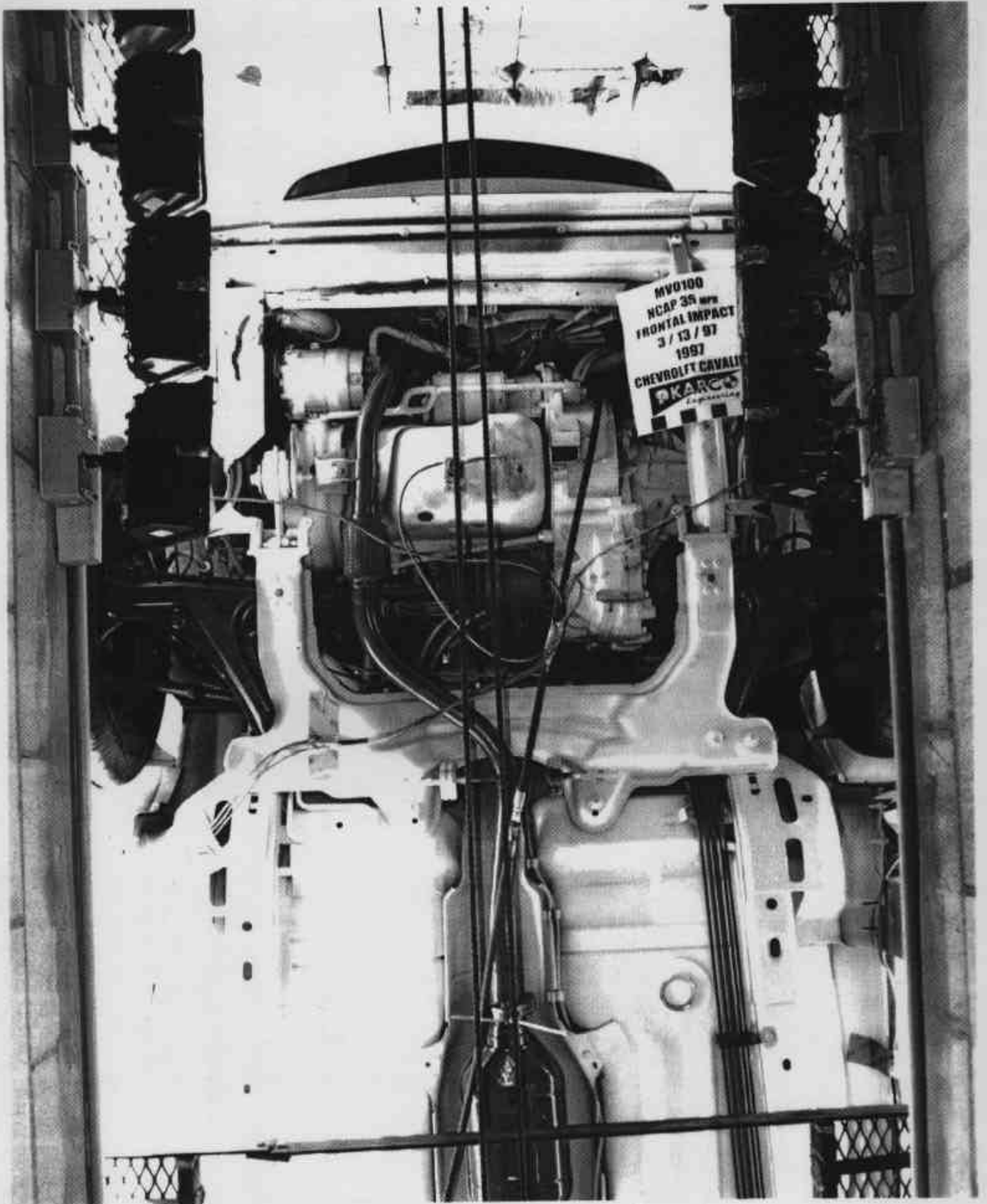


FIGURE A-21. PRE-TEST FRONT UNDERBODY

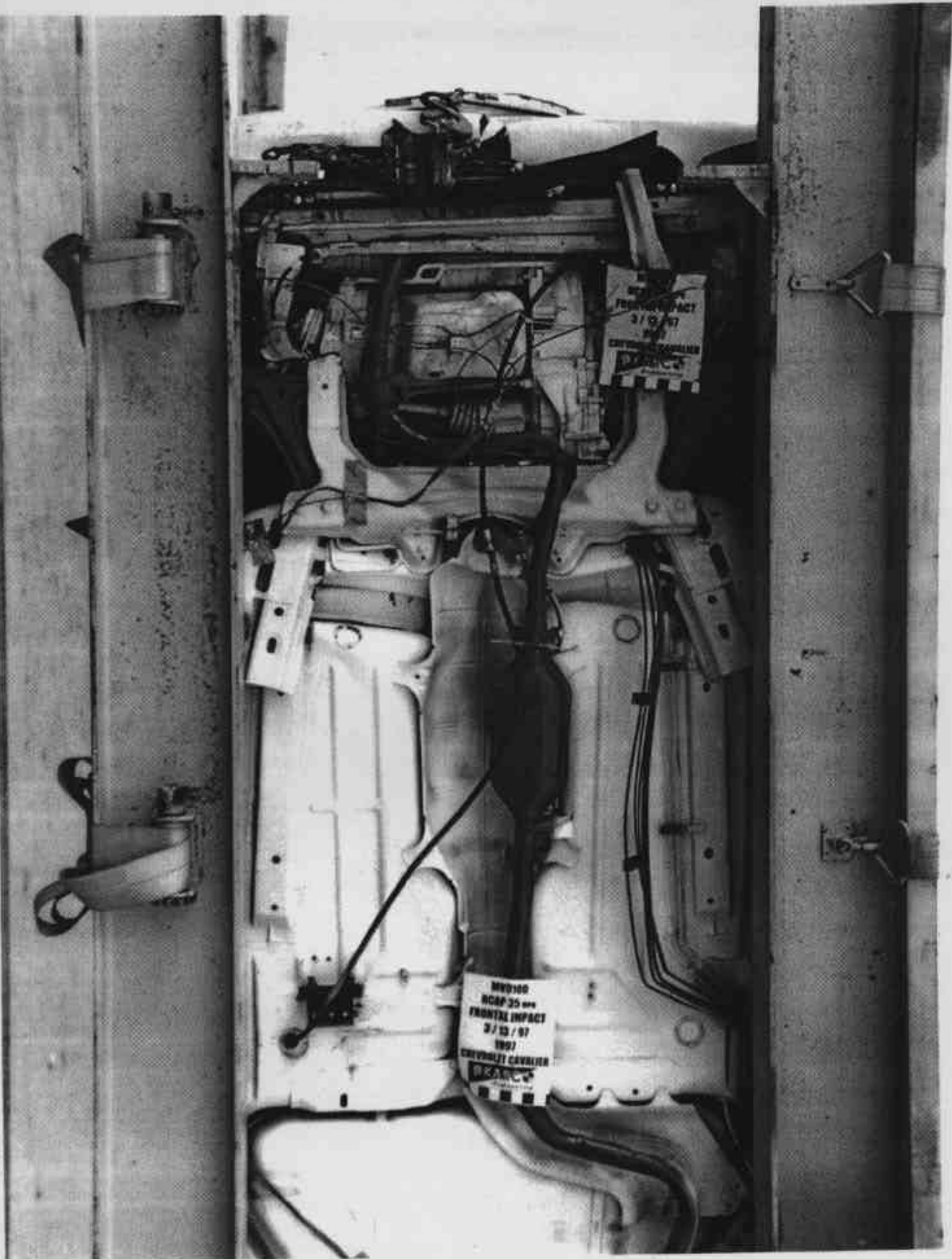


FIGURE A-22. POST-TEST FRONT UNDERBODY

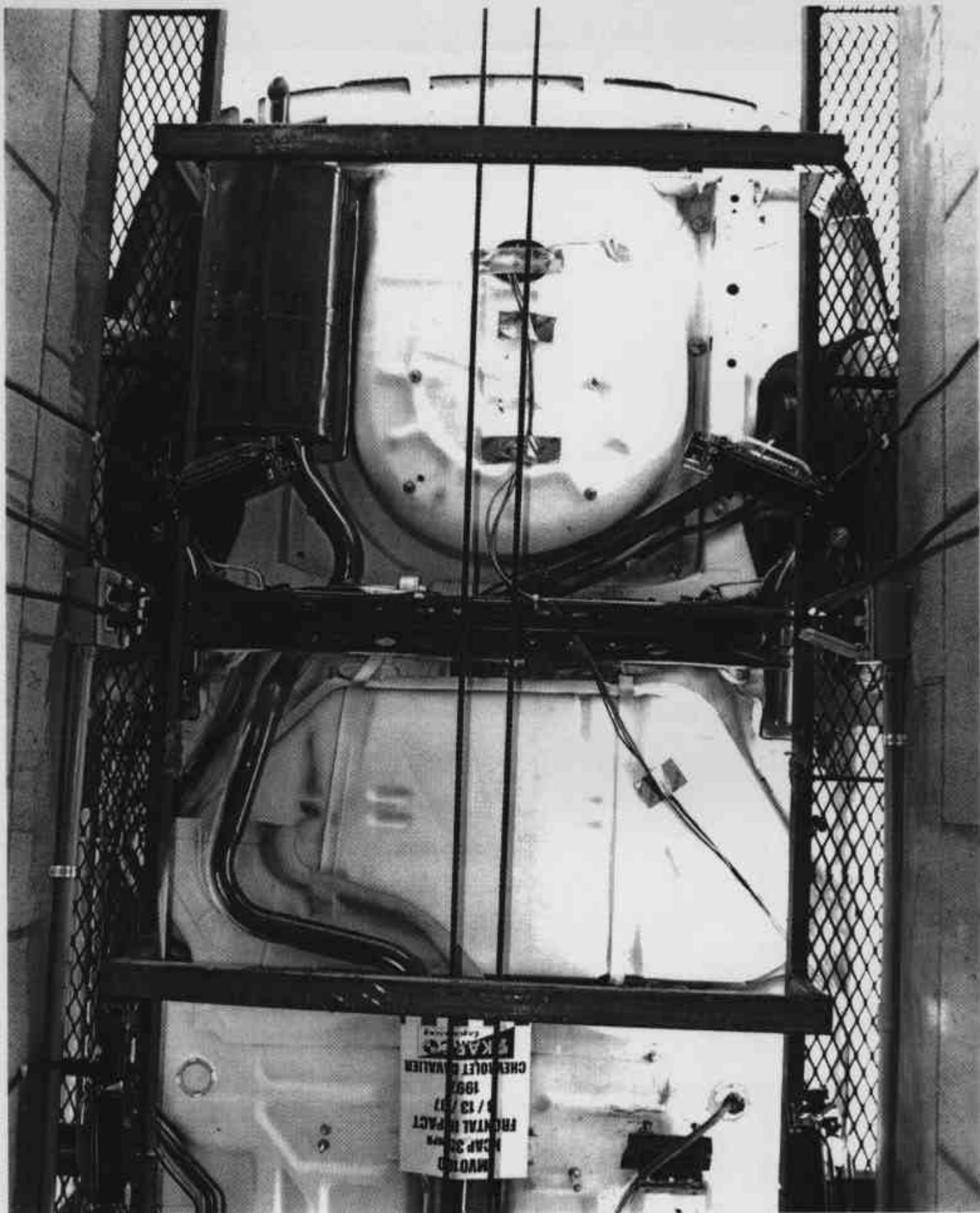


FIGURE A-23. PRE-TEST REAR UNDERBODY

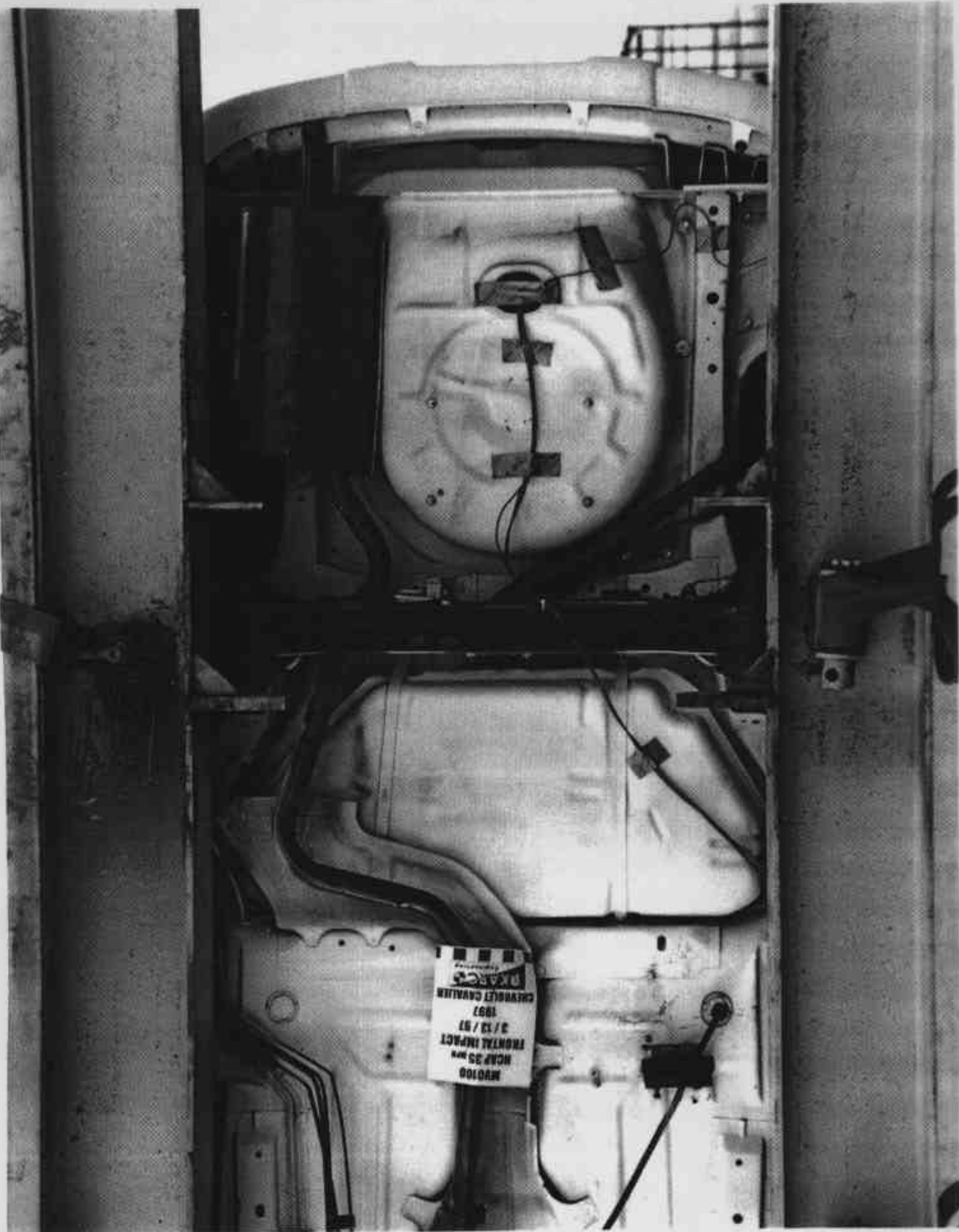
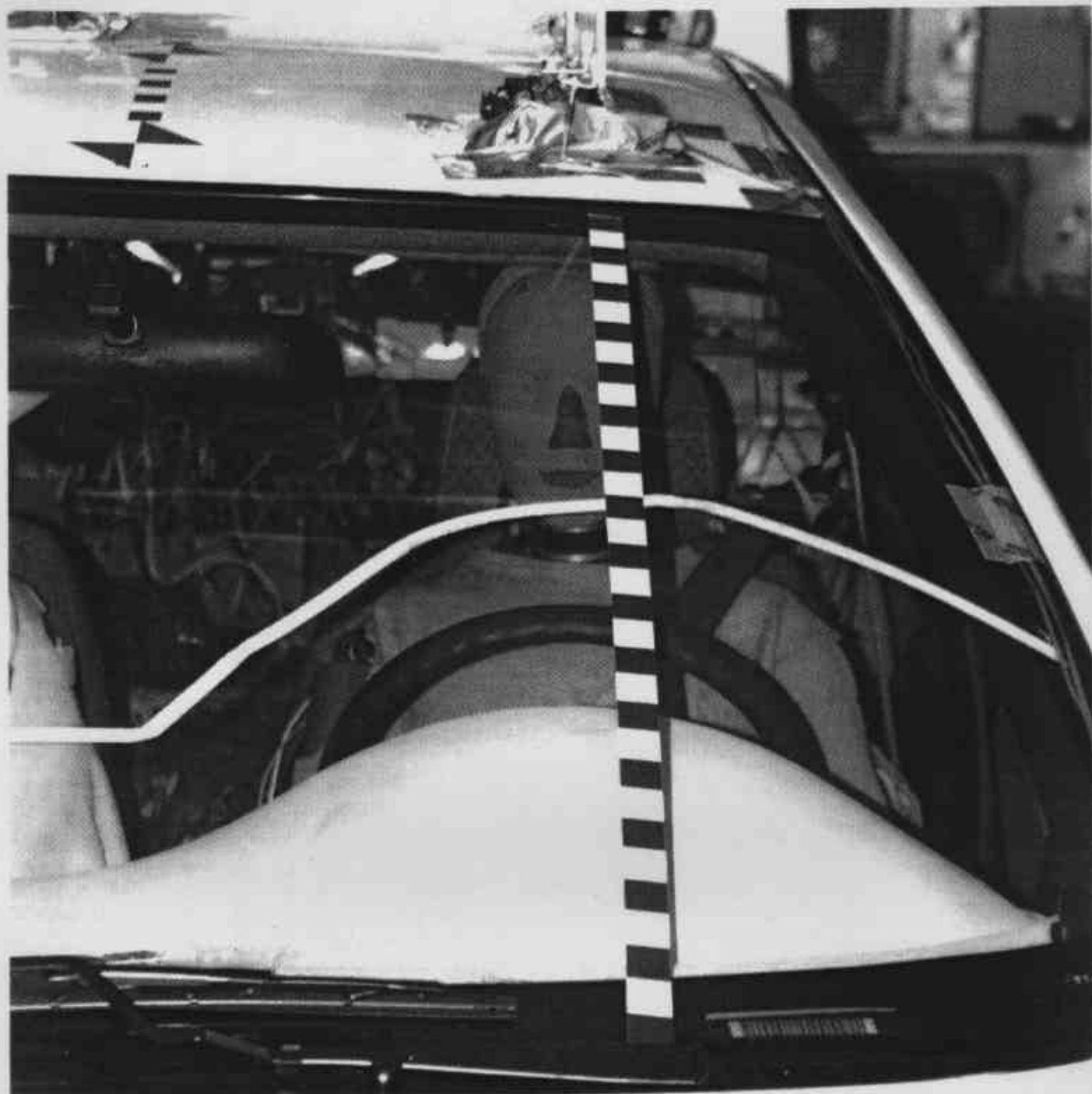


FIGURE A-24. POST-TEST REAR UNDERBODY



MV0100
NCAP 35 mph
FRONTAL IMPACT
3 / 13 / 91
1991
CHEVROLET CAMARO

FIGURE A-25. PRE-TEST DRIVER DUMMY (FRONT VIEW)

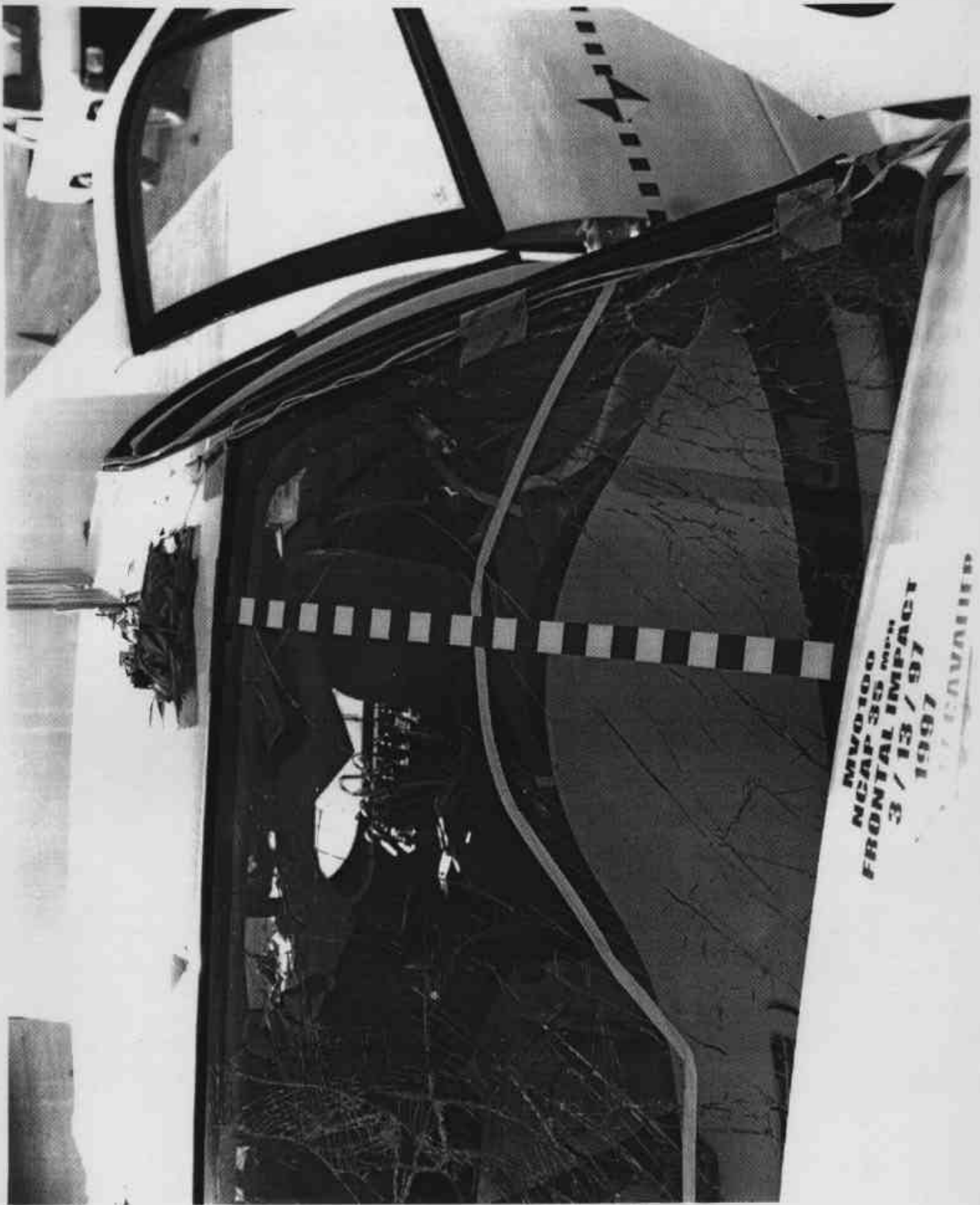


FIGURE A-26. POST TEST DRIVER DUMMY (FRONT VIEW)

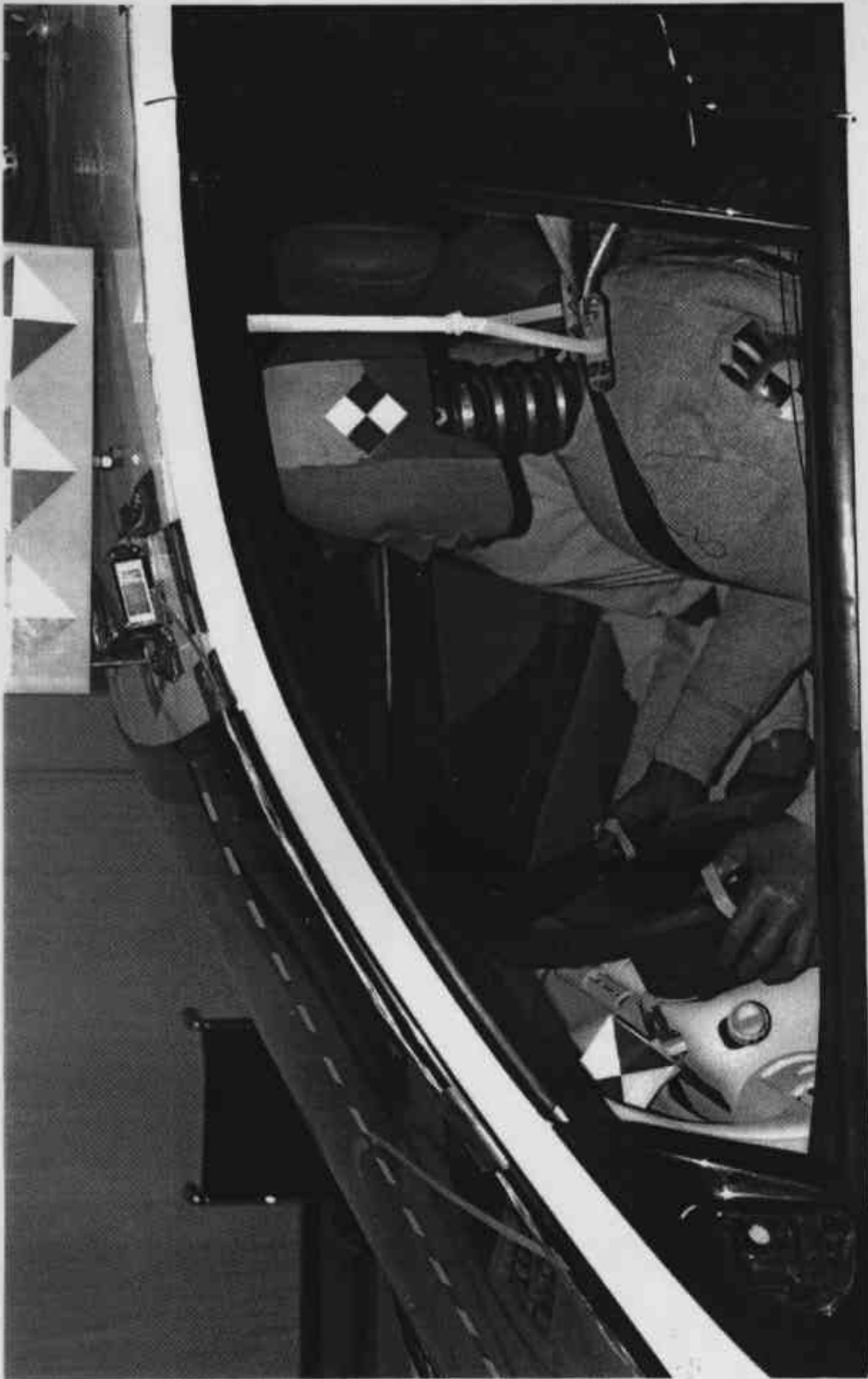


FIGURE A-27. PRE-TEST DRIVER DUMMY (THRU WINDOW)



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



FIGURE A-29. PRE-TEST DRIVER DUMMY (DOOR OPEN)



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



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



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



FIGURE A-33: POST-TEST DRIVER DUMMY CONTACT POINTS (1 OF 3)



FIGURE A-34. POST-TEST DRIVER DUMMY CONTACT POINTS (2 OF 3)



FIGURE A-35. POST-TEST DRIVER DUMMY CONTACT POINTS (3 OF 3)

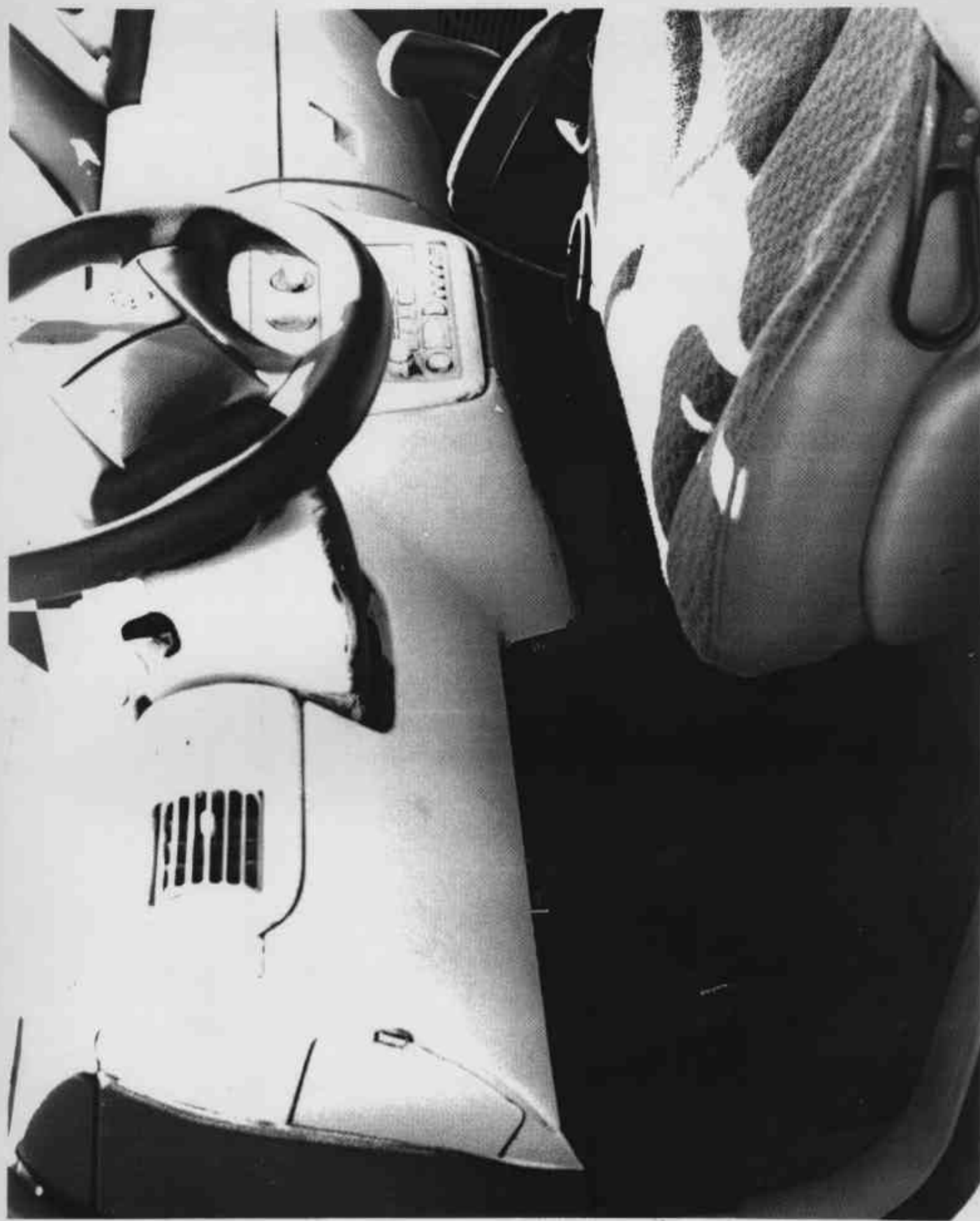
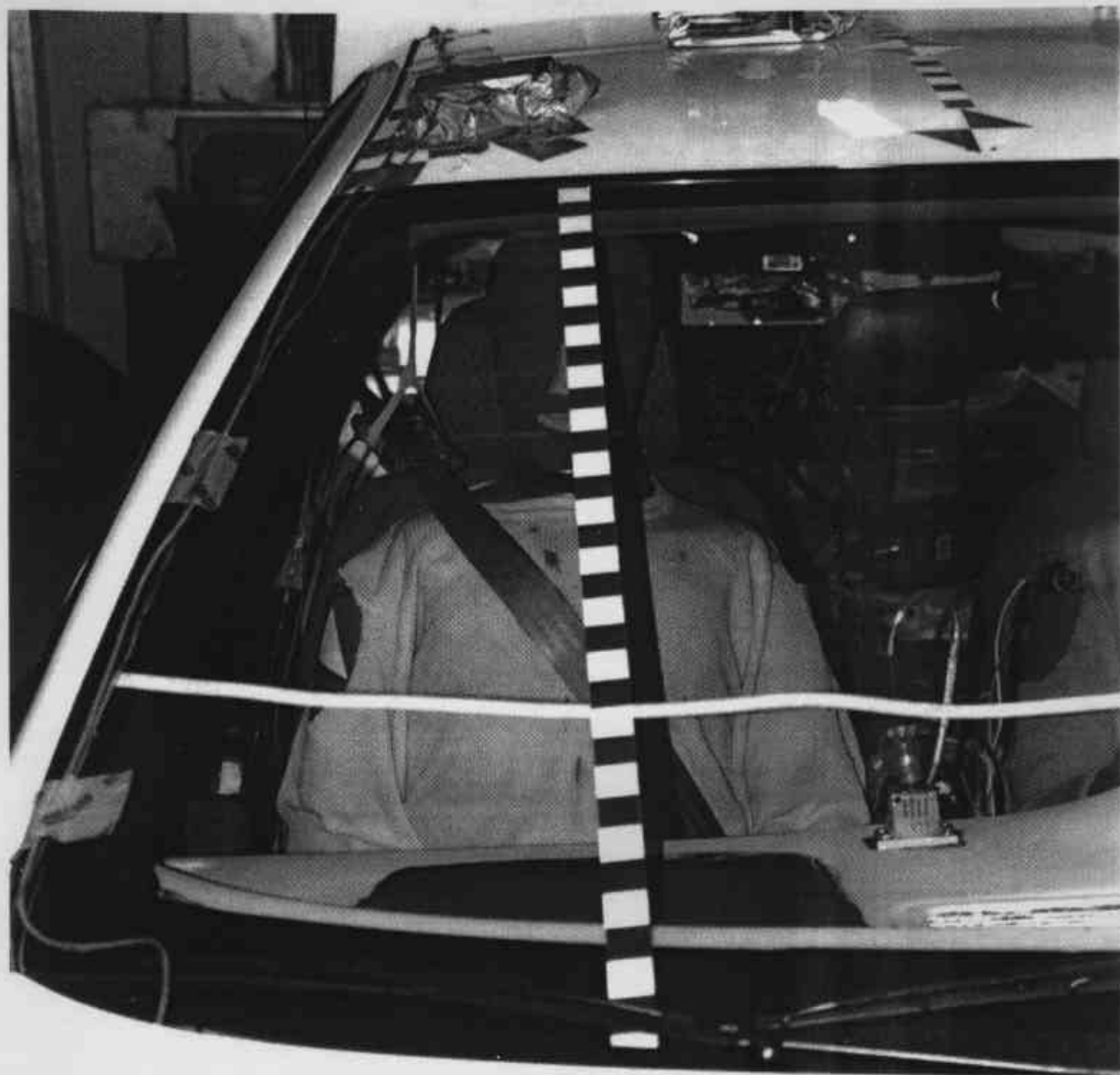


FIGURE A-36. PRE-TEST DRIVER SIDE KNEE BOLSTER



FIGURE A-37. POST-TEST DRIVER SIDE KNEE BOLSTER



MV0100
NCAP 35 MPH
FRONTAL IMPACT
3 / 13 / 97
1997
CHEVROLET CAVALIER
CRASH

FIGURE A-38. PRE-TEST PASSENGER DUMMY (FRONT VIEW)



IMPACT 35.5 MPH
FRONTAL IMPACT
3 / 13 / 97
1997
CHEVROLET CAVALIER
PKARC
Engineering, Inc.

FIGURE A-39. POST TEST PASSENGER DUMMY (FRONT VIEW)

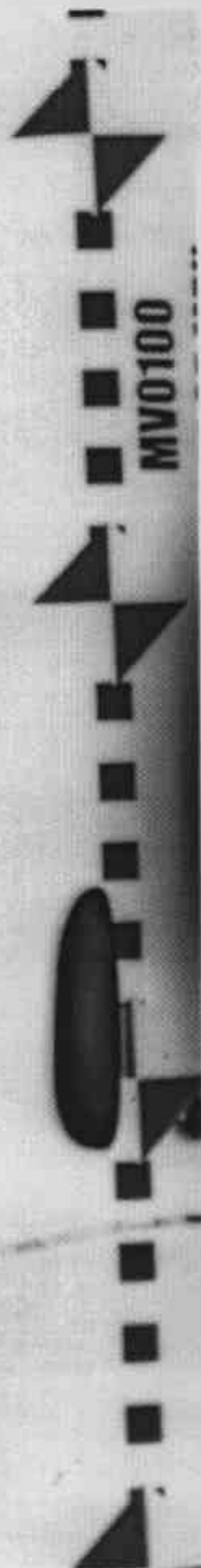


FIGURE A-40. PRE-TEST PASSENGER DUMMY (THRU WINDOW)



MV0100

FIGURE A-41. POST-TEST PASSENGER DUMMY (THRU WINDOW)



FIGURE A-42. PRE-TEST PASSENGER DUMMY (DOOR OPEN)



FIGURE A-43. POST-TEST PASSENGER DUMMY (DOOR OPEN)



FIGURE A-44. PRE-TEST PASSENGER DUMMY (90° TO VEHICLE)



FIGURE A-45. POST-TEST PASSENGER DUMMY (90° TO VEHICLE)



FIGURE A-46. POST-TEST PASSENGER DUMMY CONTACT POINTS (1 OF 3)



FIGURE A-47. POST-TEST PASSENGER DUMMY CONTACT POINTS (2 OF 3)



FIGURE A-48. POST-TEST PASSENGER DUMMY CONTACT POINTS (3 OF 3)



FIGURE A-49. PRE-TEST PASSENGER SIDE KNEE BOLSTER

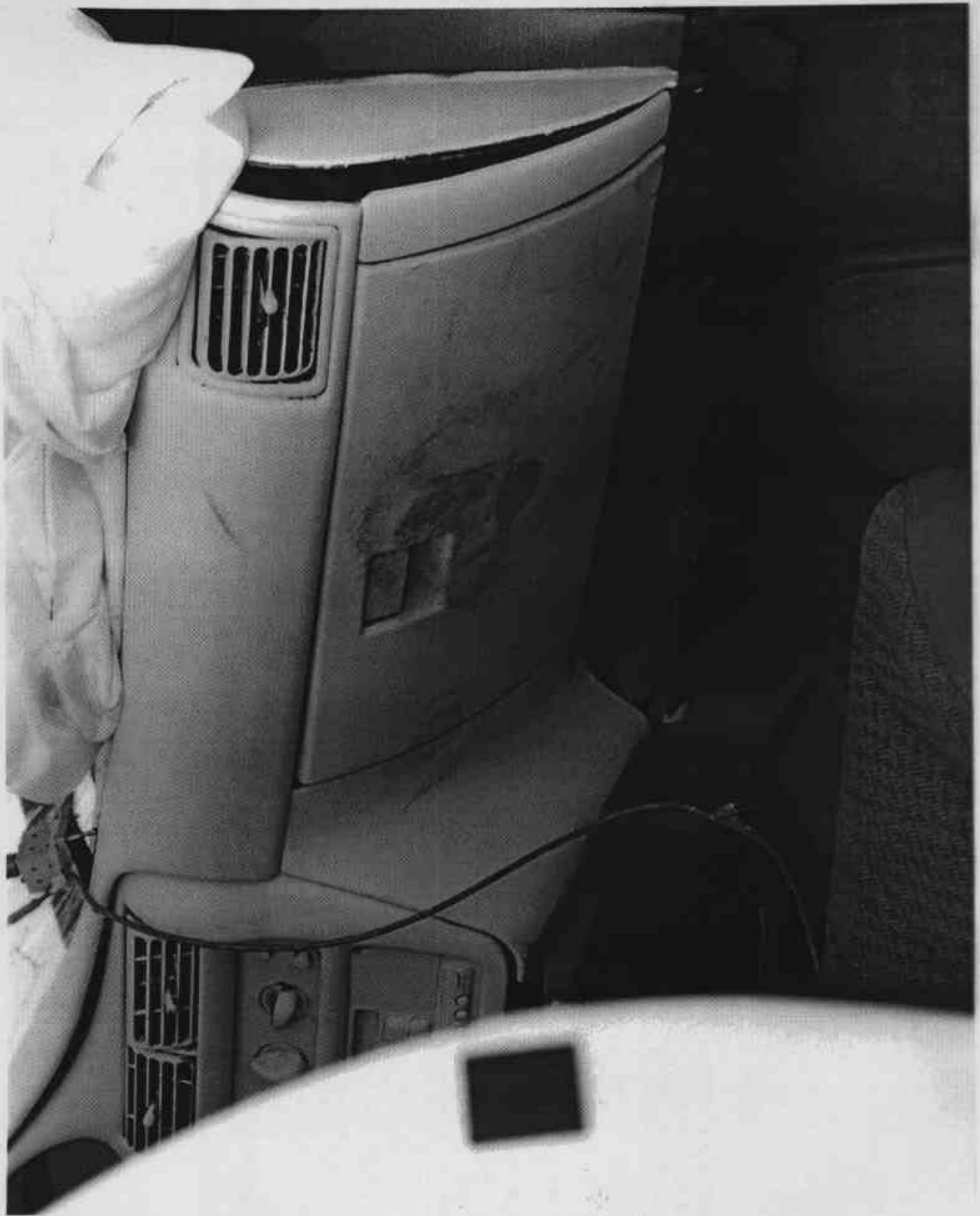


FIGURE A-50. POST-TEST PASSENGER SIDE KNEE BOLSTER

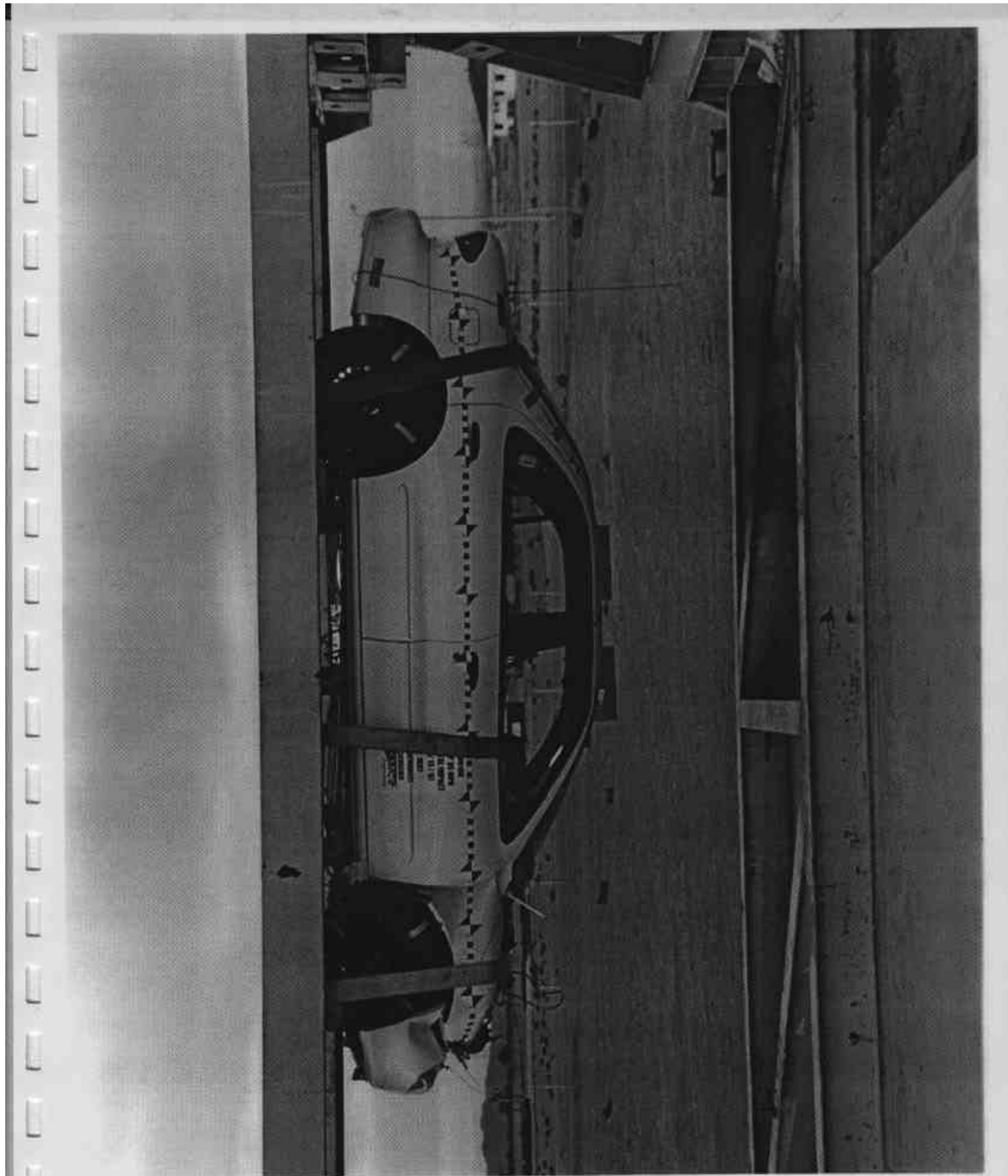
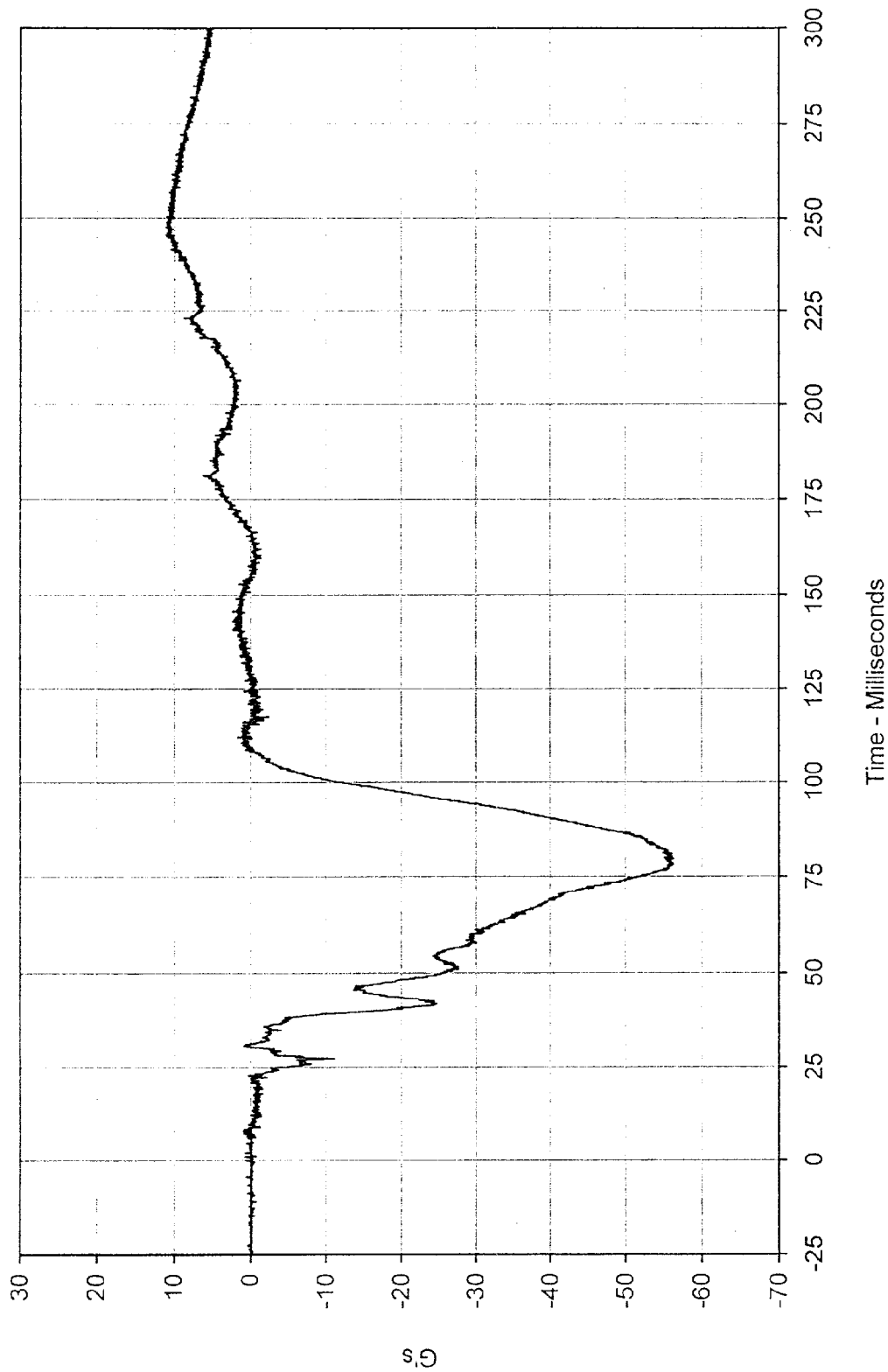


FIGURE A-51. VEHICLE ON STATIC ROLLOVER MACHINE

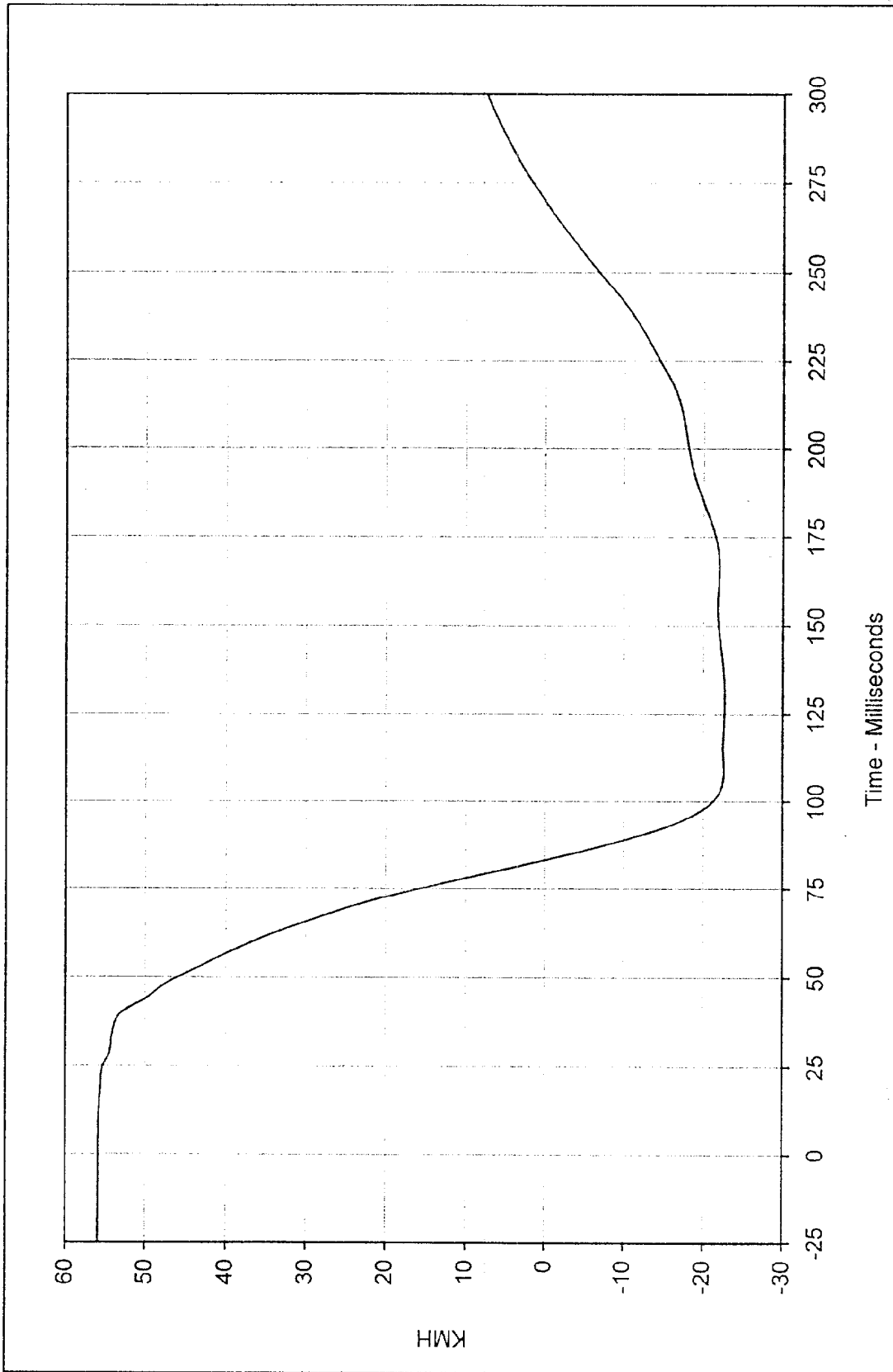
APPENDIX B

DUMMY, VEHICLE, AND RESPONSE DATA TRACES



Curve Description:	Driver Head Primary X		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	11.2	at 245.5	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-56.3	at 78.3			
SAE Filter Class:	1000				
Date of Test:	3/13/97				
Curve Number:	FIL-001				

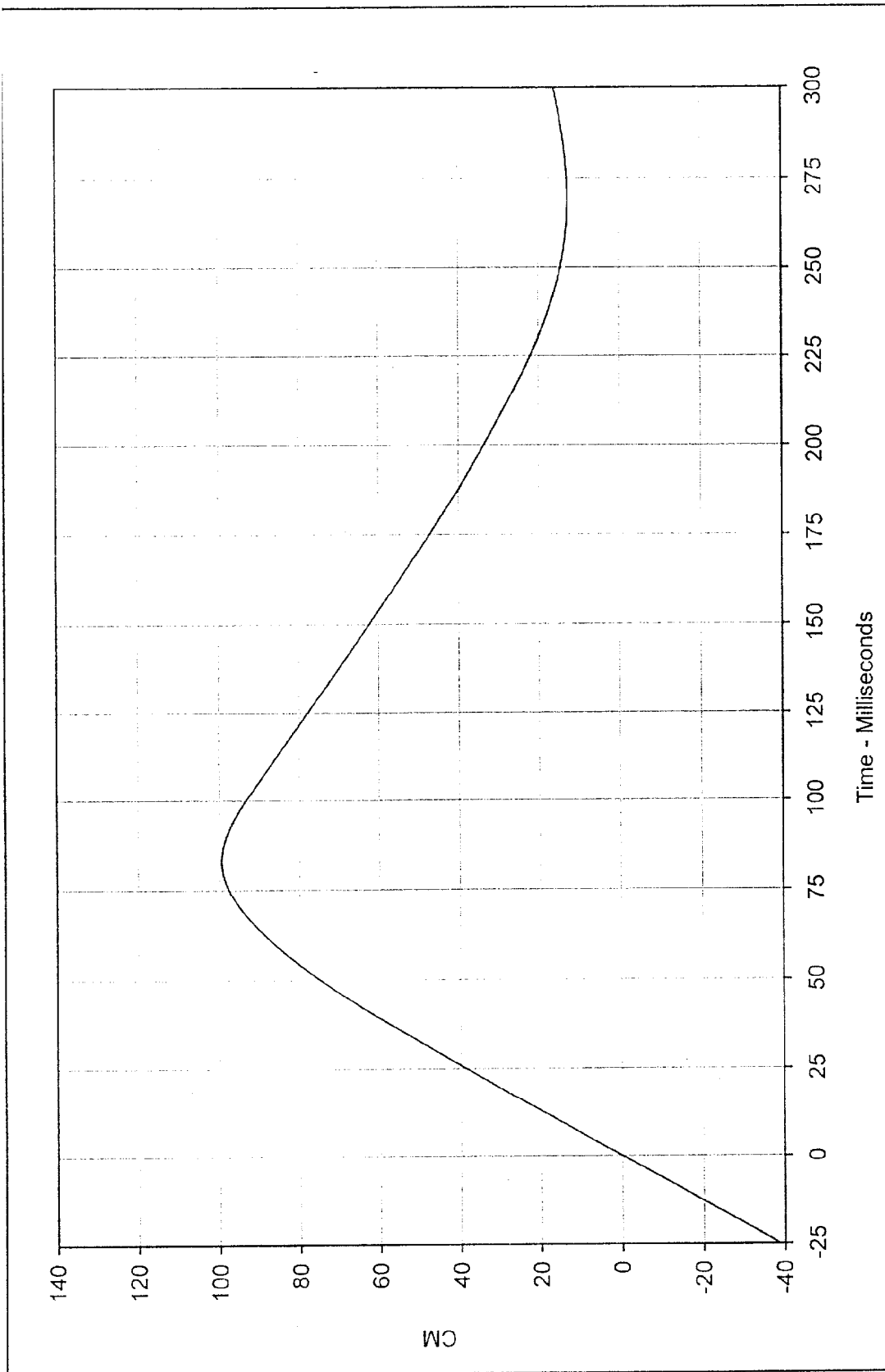




Curve Description: Driver Head Primary X Velocity
 Maximum Value: 55.8 at 8.5 Milliseconds
 Minimum Value: -22.7 at 128.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: IN1-001

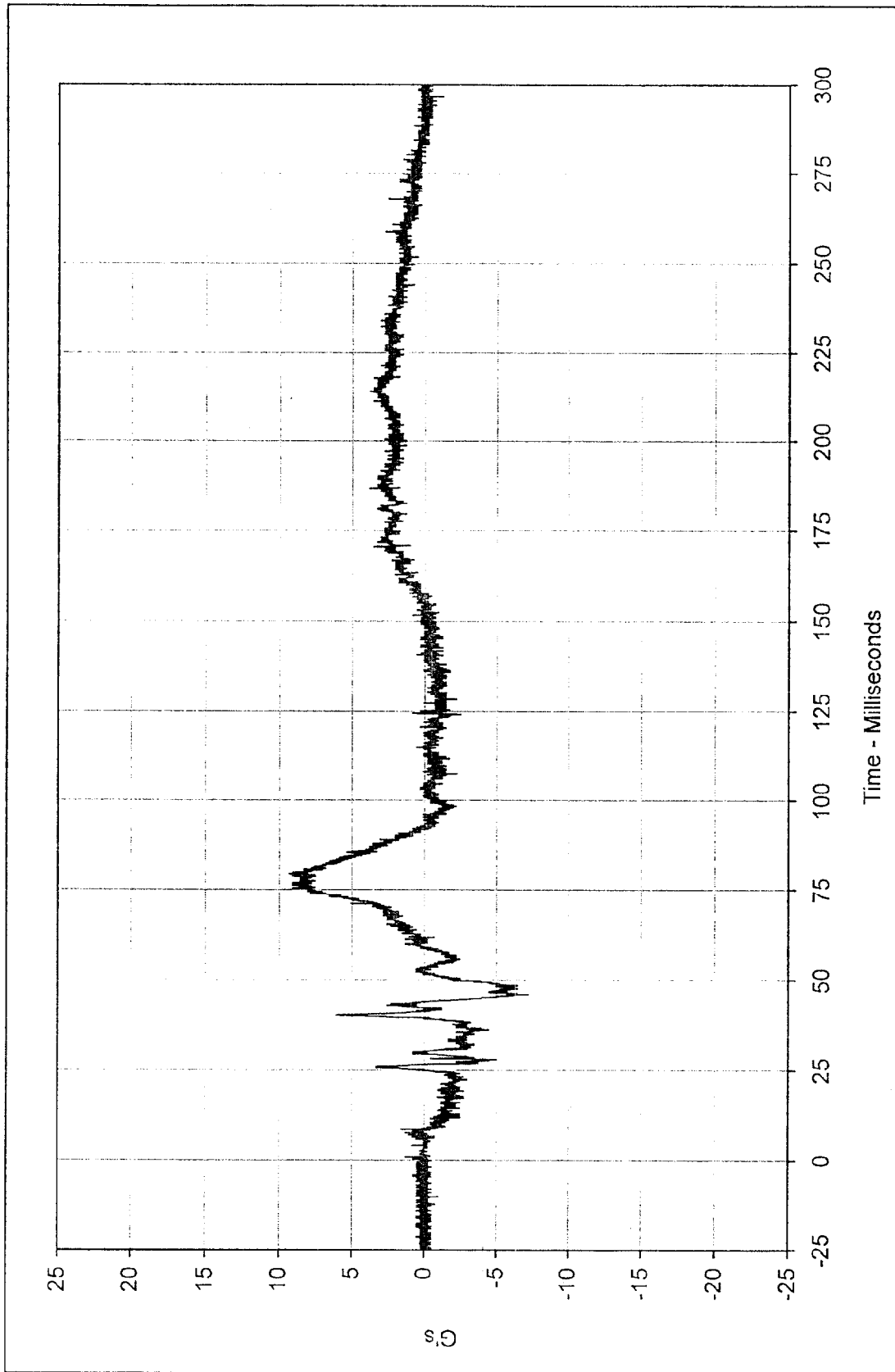
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:	Driver Head Primary X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	99.4 at 83.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.0 at 0.0 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-001		

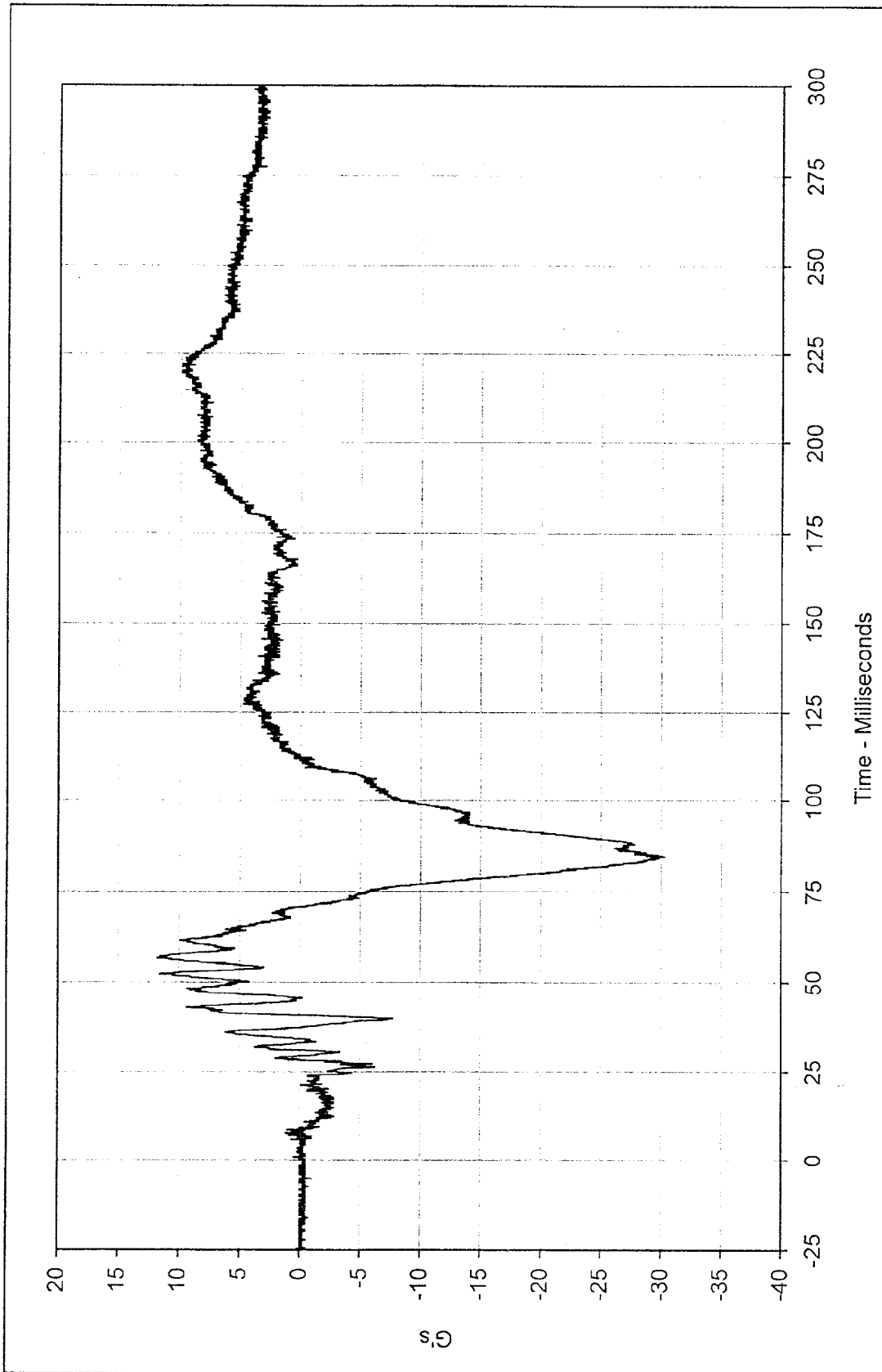




Curve Description: Driver Head Primary Y
Maximum Value: 9.3 at 79.5 Milliseconds
Minimum Value: -7.2 at 46 Milliseconds
SAE Filter Class: 1000
Date of Test: 3/13/97
Curve Number: FIL-002

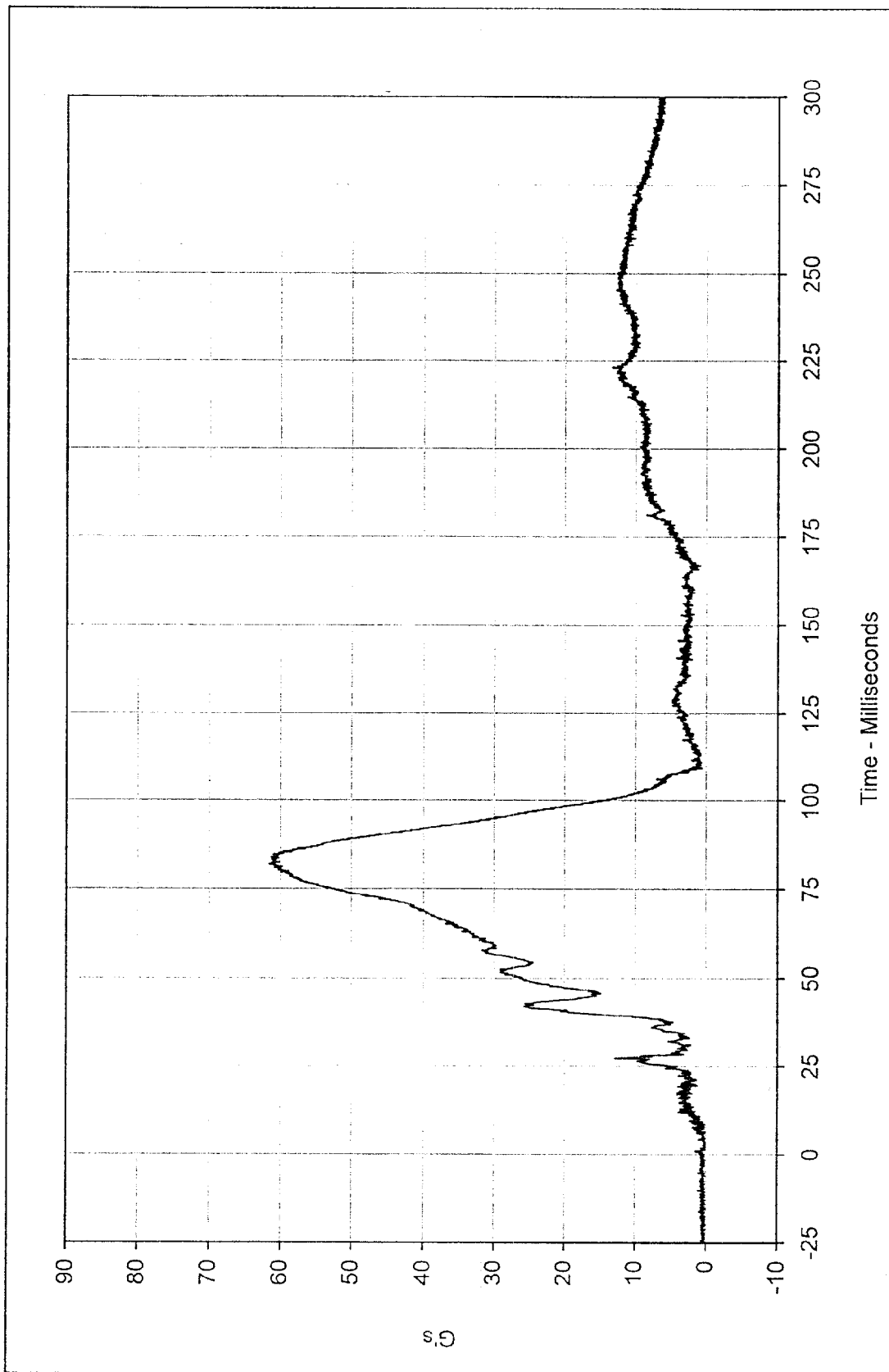
Testing Program: 1997 New Car Assessment Program
Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:	Driver Head Primary Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	11.8 at 56.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-30.2 at 84.5 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-003		

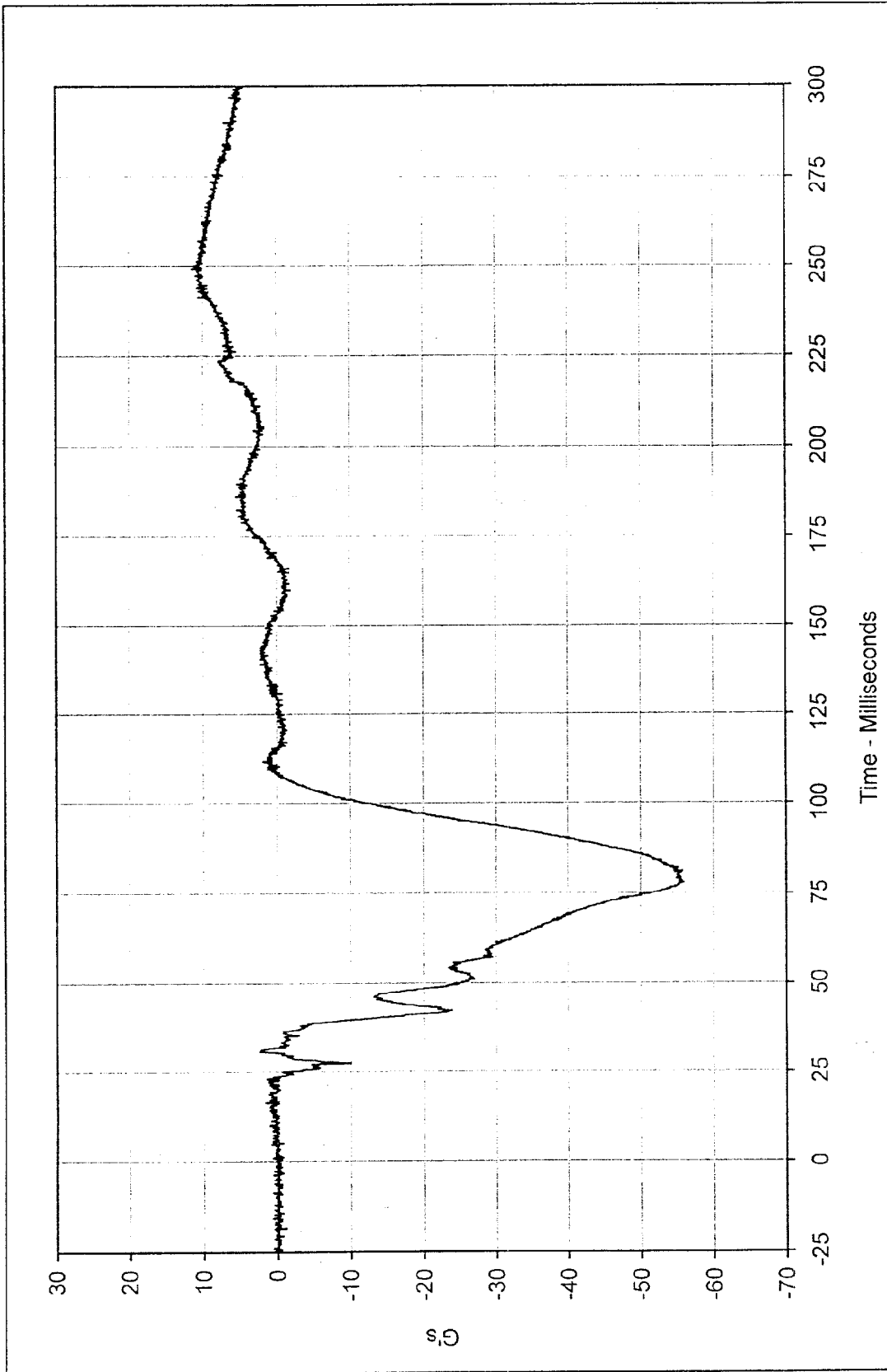




Curve Description:	Driver Head Resultant Primary				Testing Program:	1997 New Car Assessment Program	
Maximum Value:	61.6	at	81.8	Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	0.1	at	2.3	Milliseconds			
SAE Filter Class:	1000						
Date of Test:	3/13/97						
Curve Number:	RES-001						





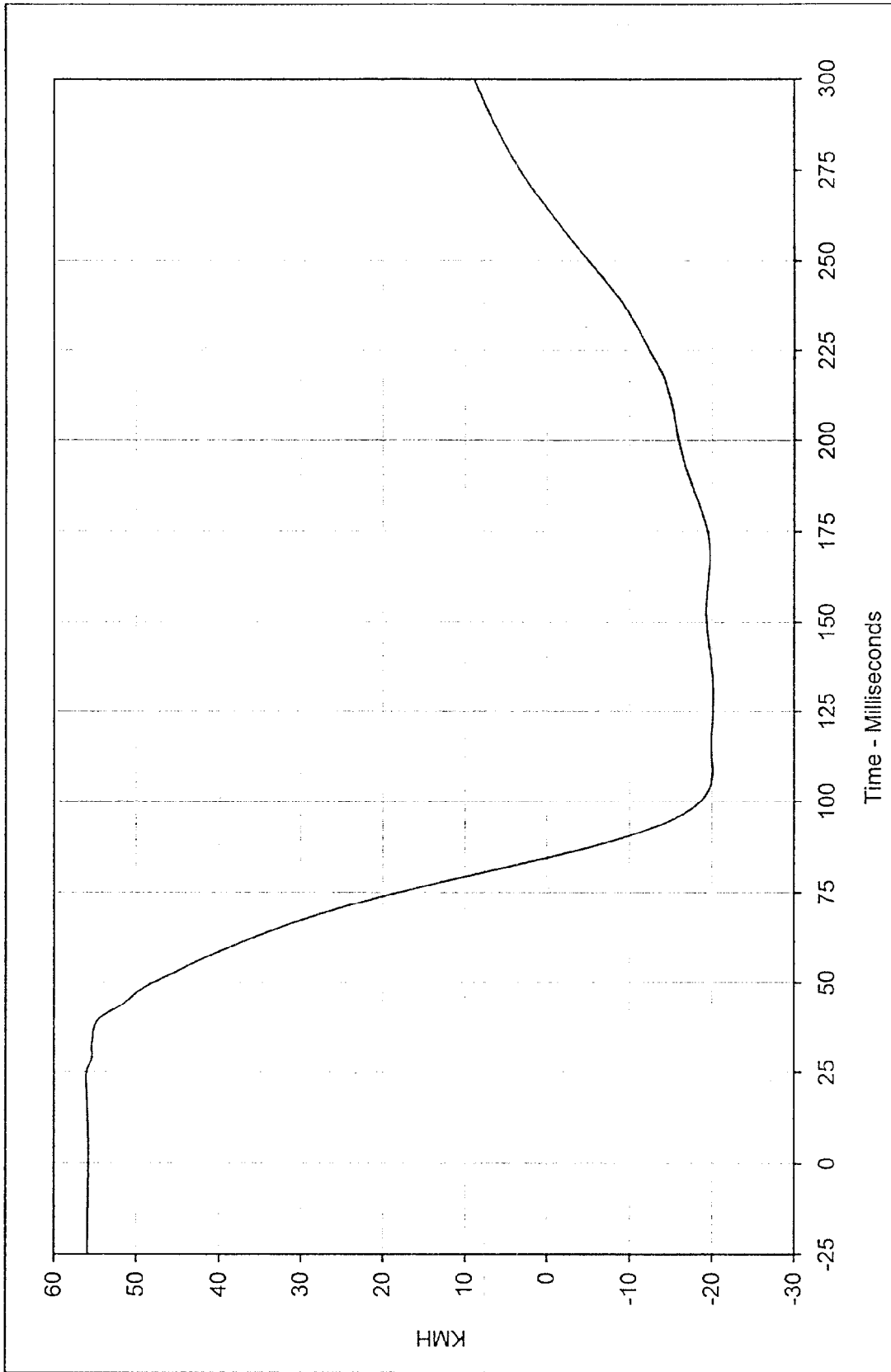


Curve Description: Driver Head Redundant X
 Maximum Value: 11.3 at 249.2 Milliseconds
 Minimum Value: -55.9 at 78.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-004

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Chevrolet Cavalier

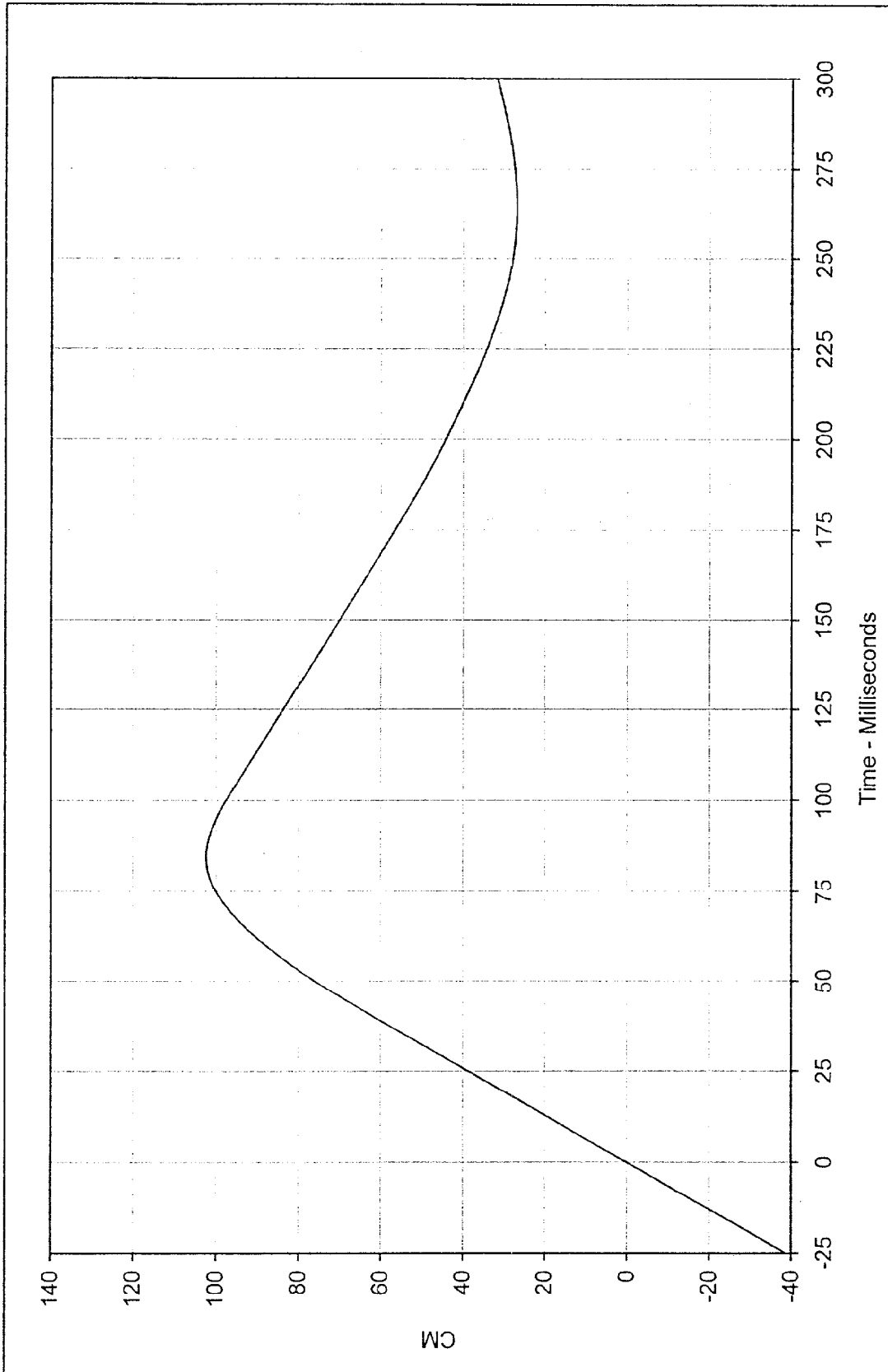




Curve Description:	Driver Head Redundant X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.1 at 23.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-20.2 at 129.4 Milliseconds		



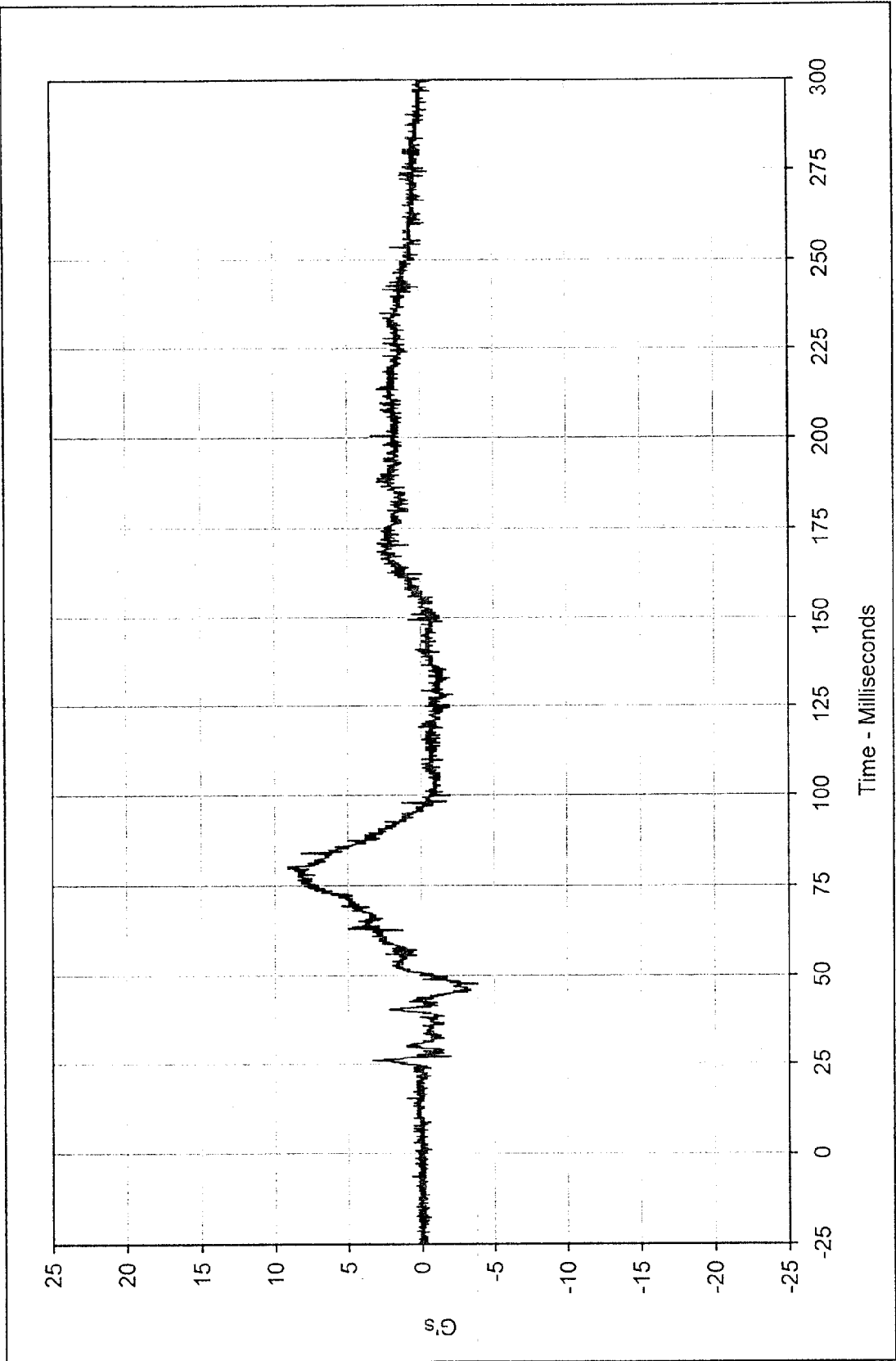
SAE Filter Class:	180
Date of Test:	3/13/97
Curve Number:	IN1-004



B9

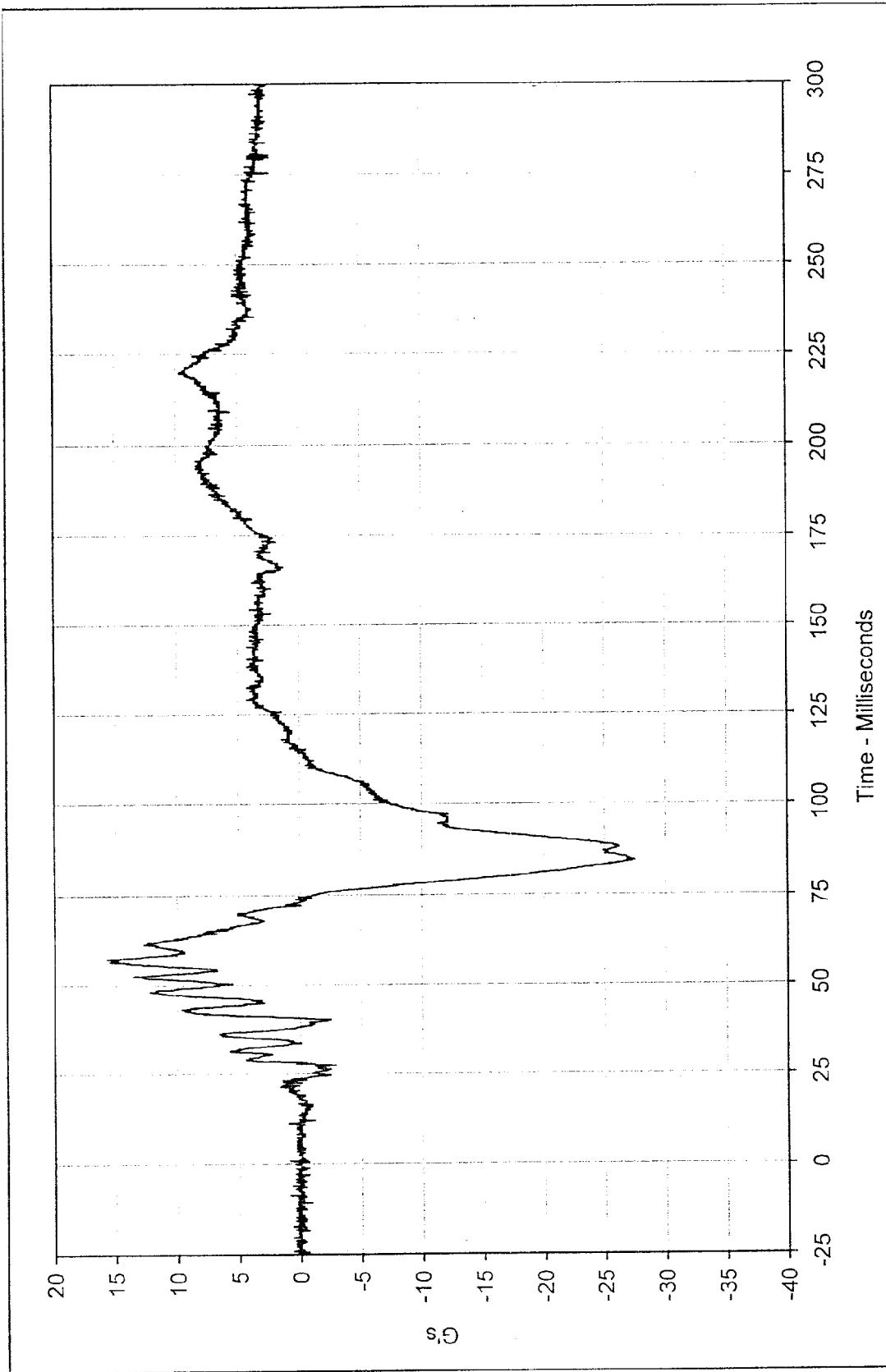
Curve Description:	Driver Head Redundant X Displ.		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	102.4	at 84.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	0.0	at 0.0 Milliseconds			
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	IN2-004				





Curve Description:	Driver Head Redundant Y	Testing Program:	1997 New Car Assessment Program
Maximum Value:	9.1 at 79.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-3.8 at 47.6 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-005		

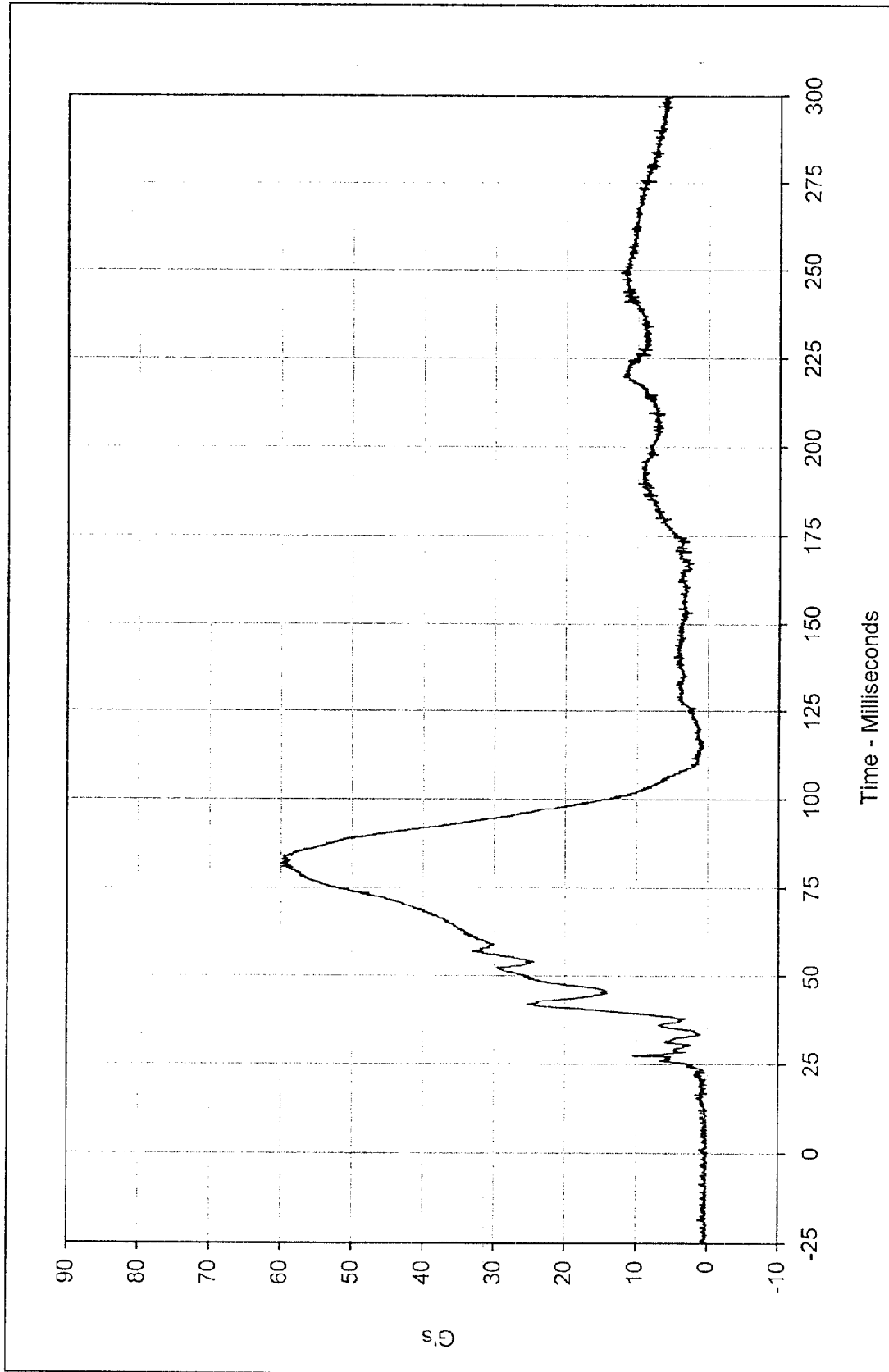




Curve Description: Driver Head Redundant Z
 Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

Maximum Value: 15.7 at 57.3 Milliseconds
 Minimum Value: -27.5 at 84.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-006



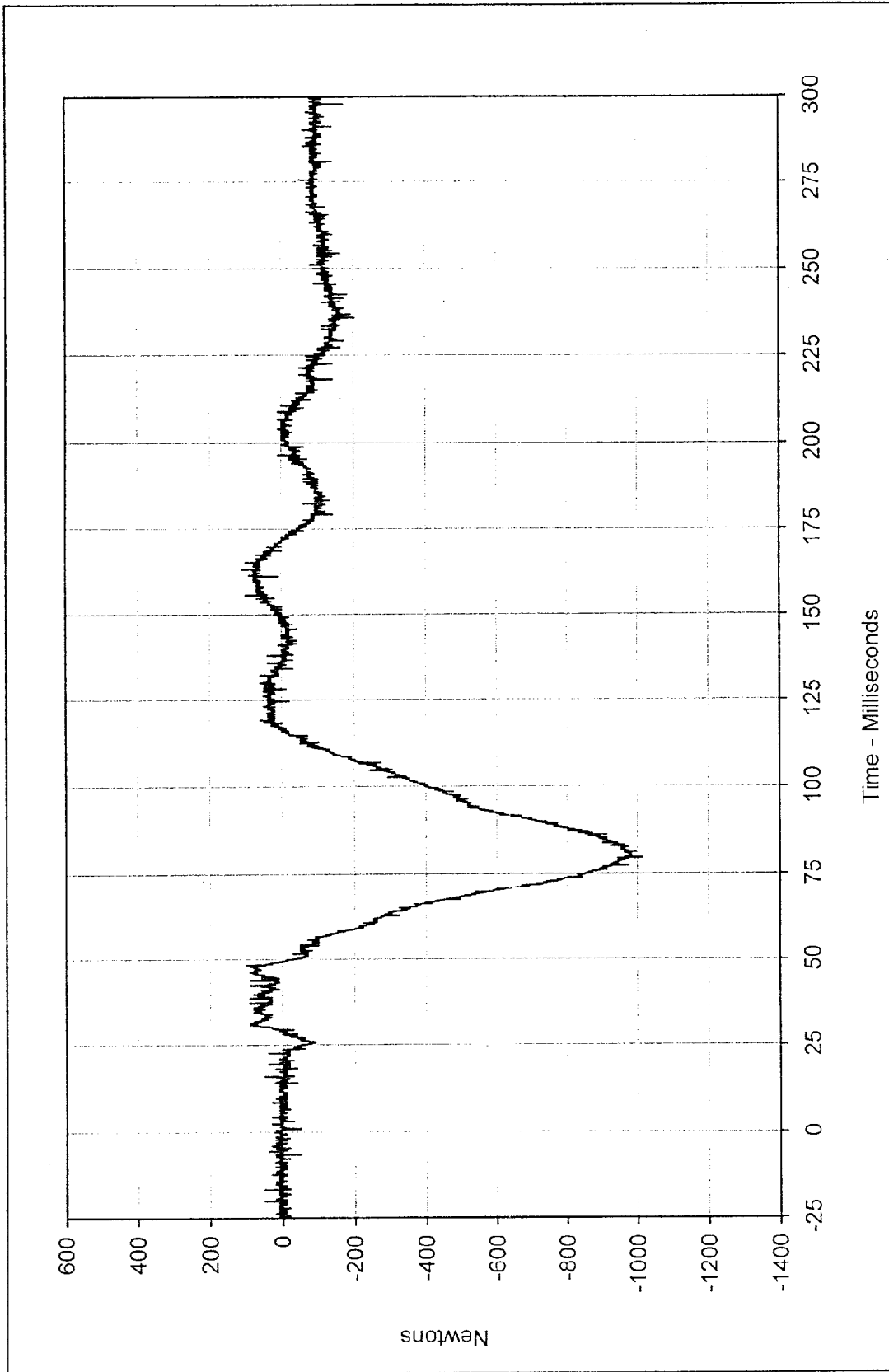


Curve Description: Driver Head Resultant Redundant
 Maximum Value: 60.0 at 82.1 Milliseconds
 Minimum Value: 0.0 at 0.2 Milliseconds

SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: RES-004

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

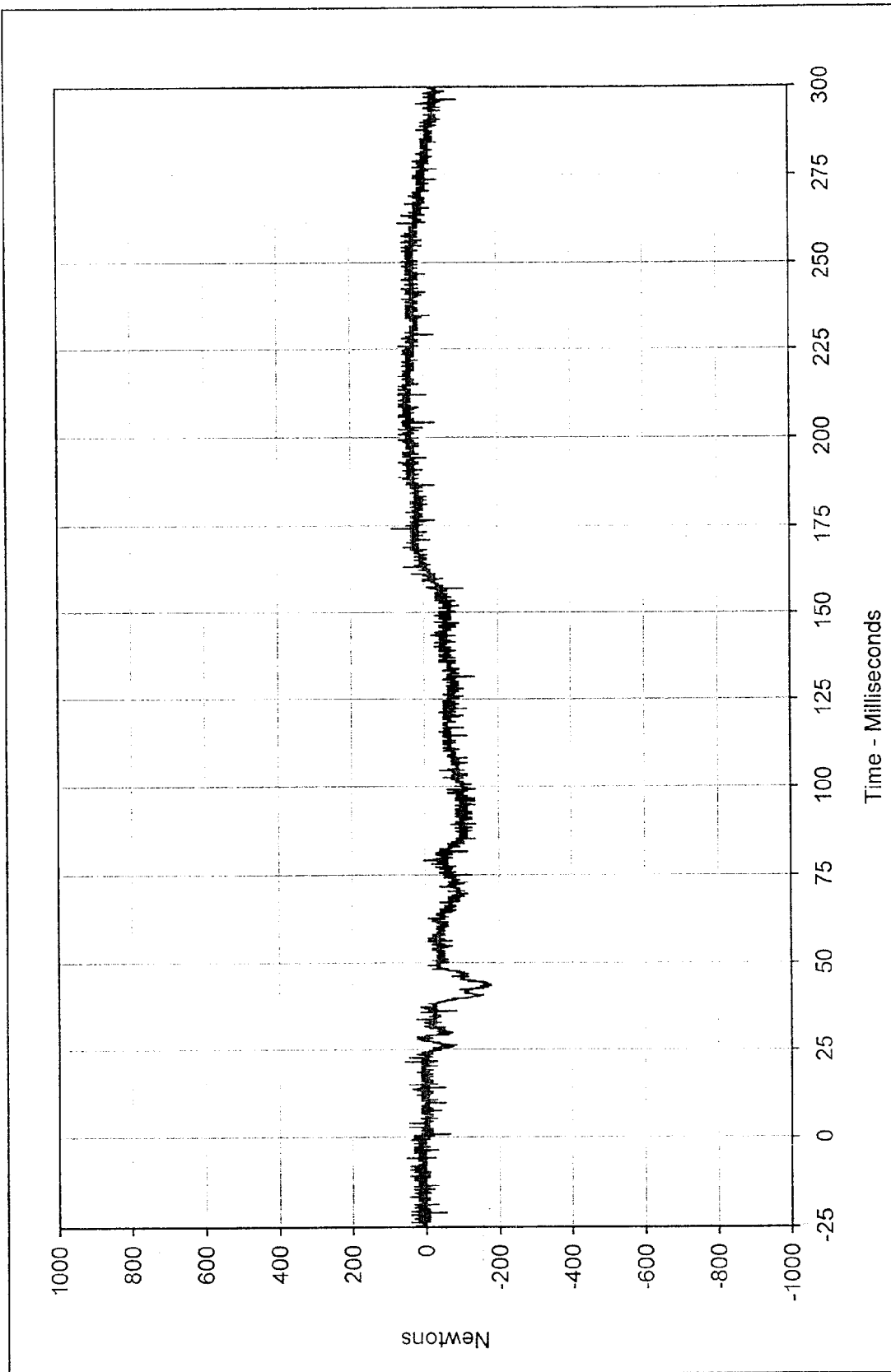




Curve Description: Driver Neck Force X
Maximum Value: 110.8 at 163.4 Milliseconds
Minimum Value: -1014.8 at 79.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 3/13/97
Curve Number: FIL-007

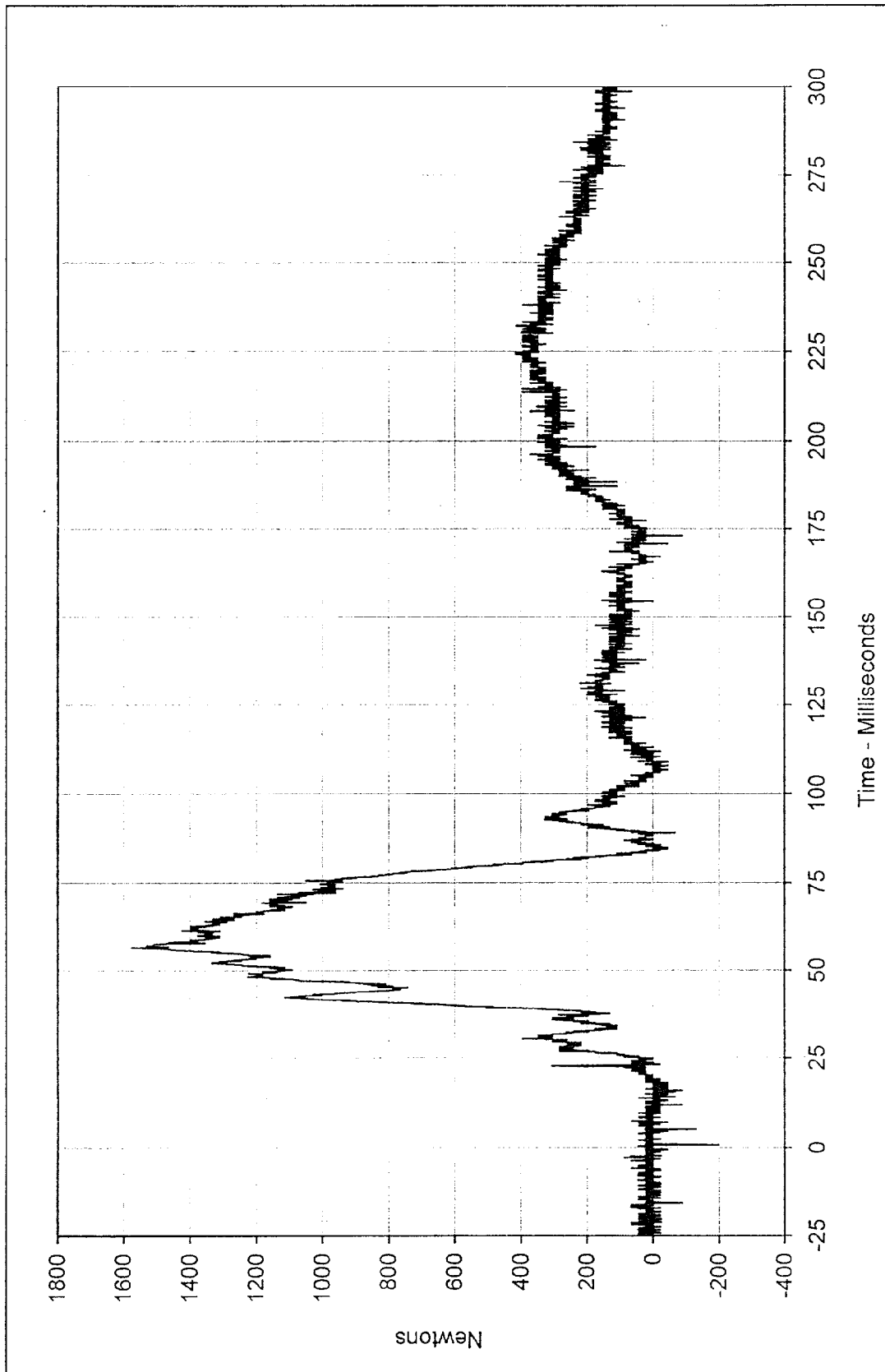
Testing Program: 1997 New Car Assessment Program
Test Vehicle: 1997 Chevrolet Cavalier





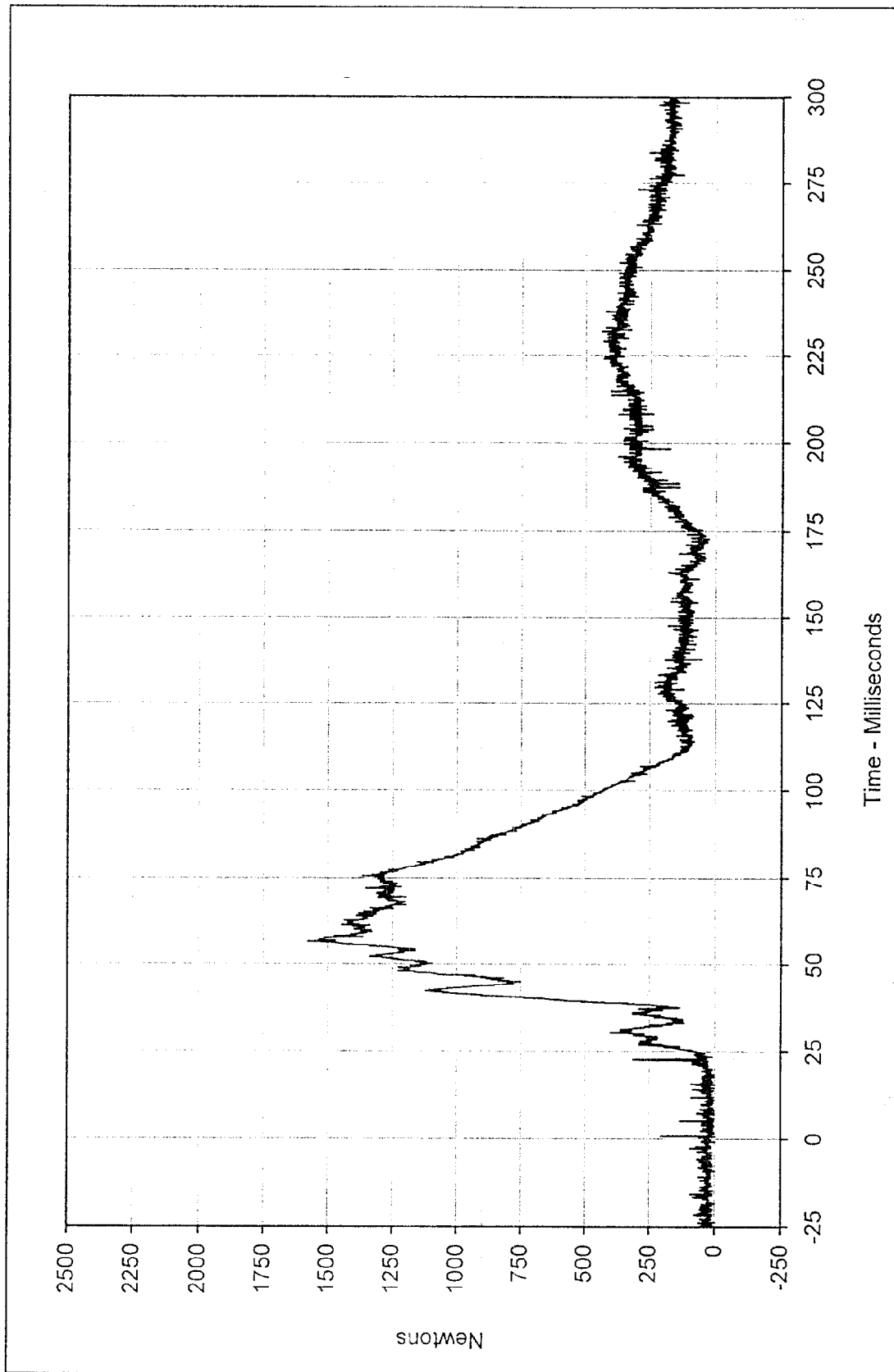
Curve Description: Driver Neck Force Y
 Testing Program: 1997 New Car Assessment Program
 Maximum Value: 87.5 at 174.2 Milliseconds
 Minimum Value: -177.9 at 43.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-008





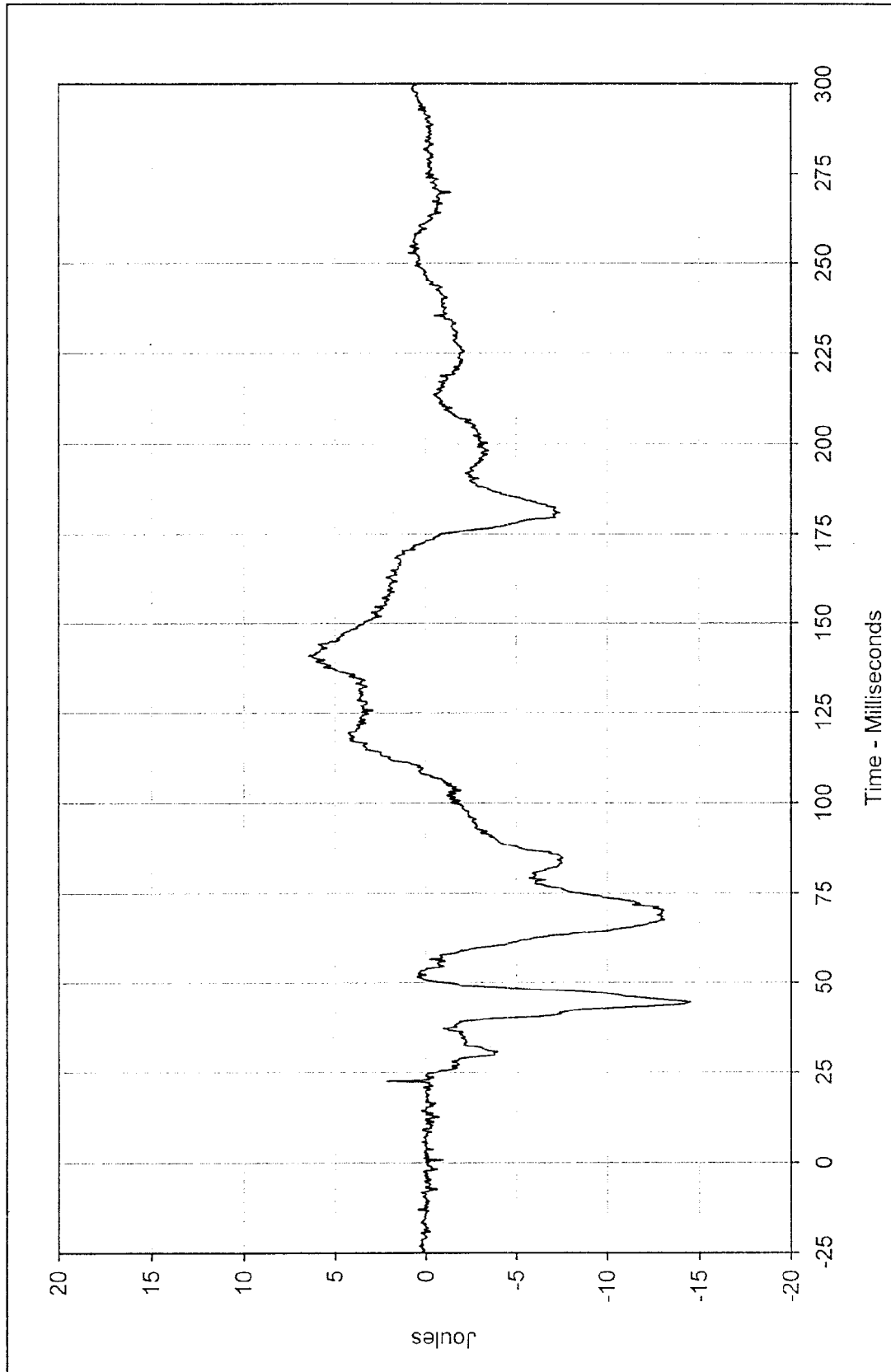
Curve Description:	Driver Neck Force Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	1574.6 at 56.6 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-196.9 at 0.9 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-009		





Curve Description:	Driver Neck Force Resultant	Testing Program:	1997 New Car Assessment Program
Maximum Value:	1577.3	at	56.6
Minimum Value:	0.0	at	-23.7
SAE Filter Class:	1000	Test Vehicle:	1997 Chevrolet Cavalier
Date of Test:	3/13/97		
Curve Number:	RES-007		



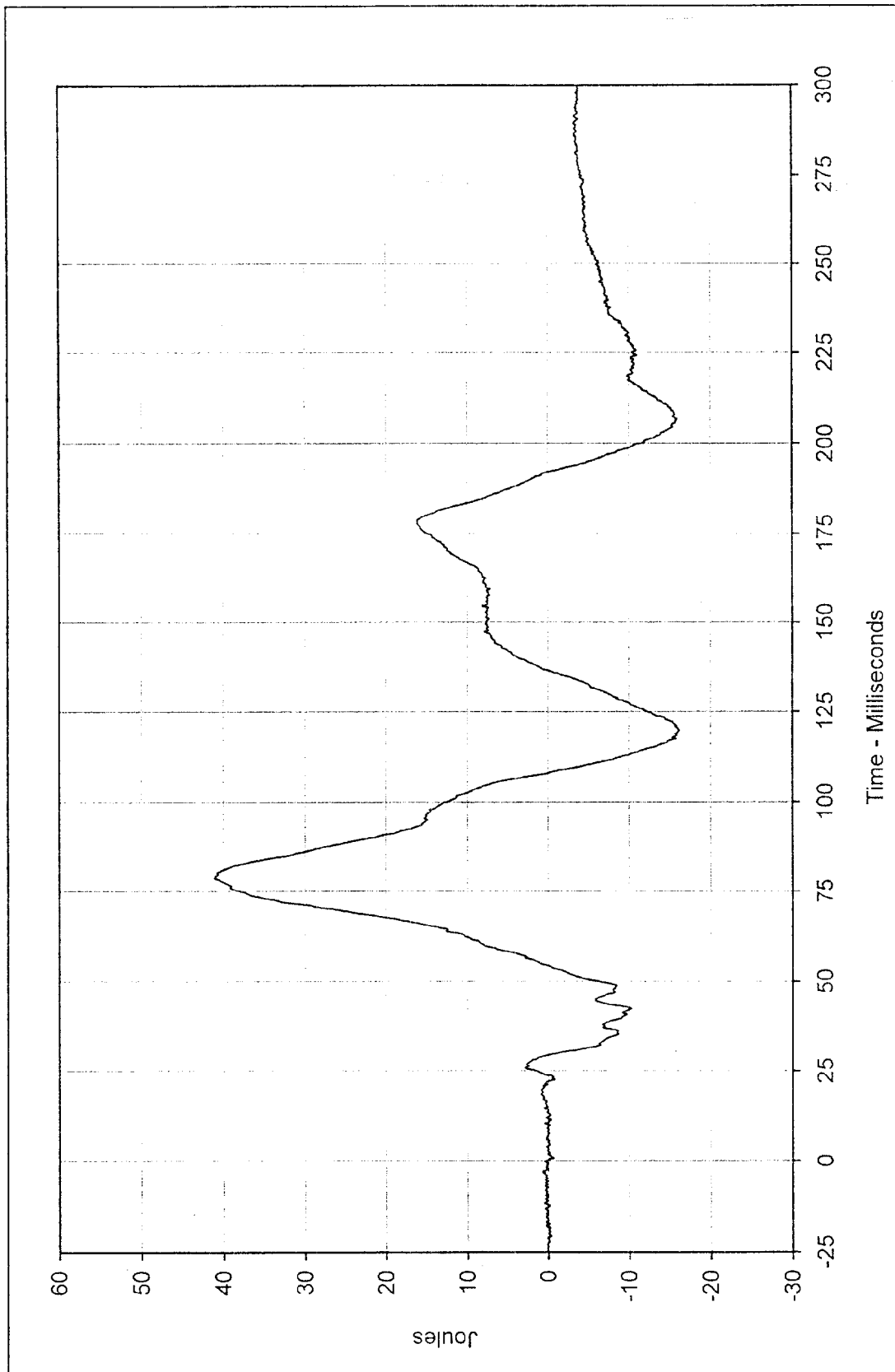


Curve Description: Driver Neck Moment X
 Maximum Value: 6.4 at 141 Milliseconds
 Minimum Value: -14.5 at 44.3 Milliseconds

SAE Filter Class: 600
 Date of Test: 3/13/97
 Curve Number: FIL-010

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

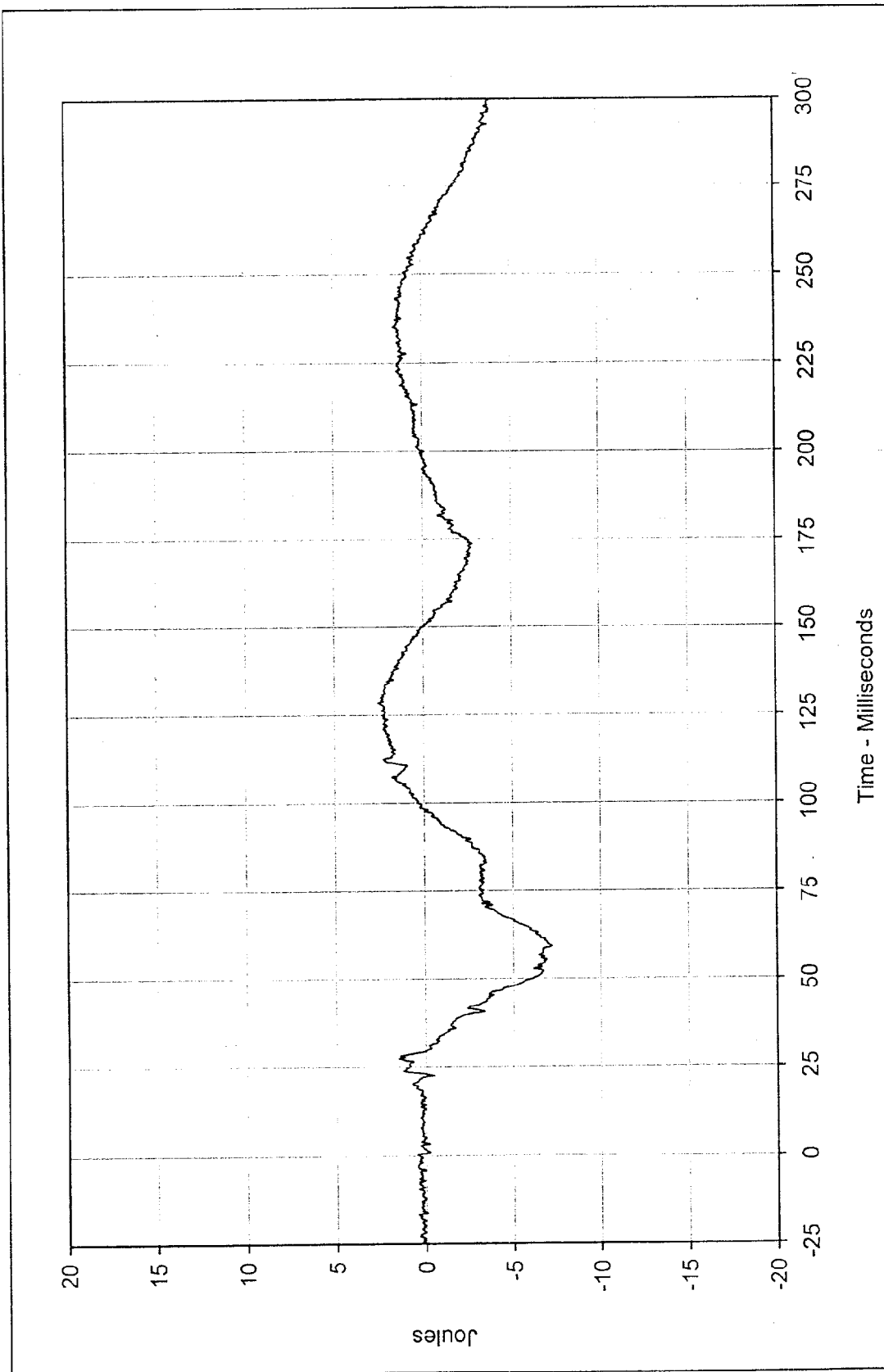




Curve Description: Driver Neck Moment Y
 Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

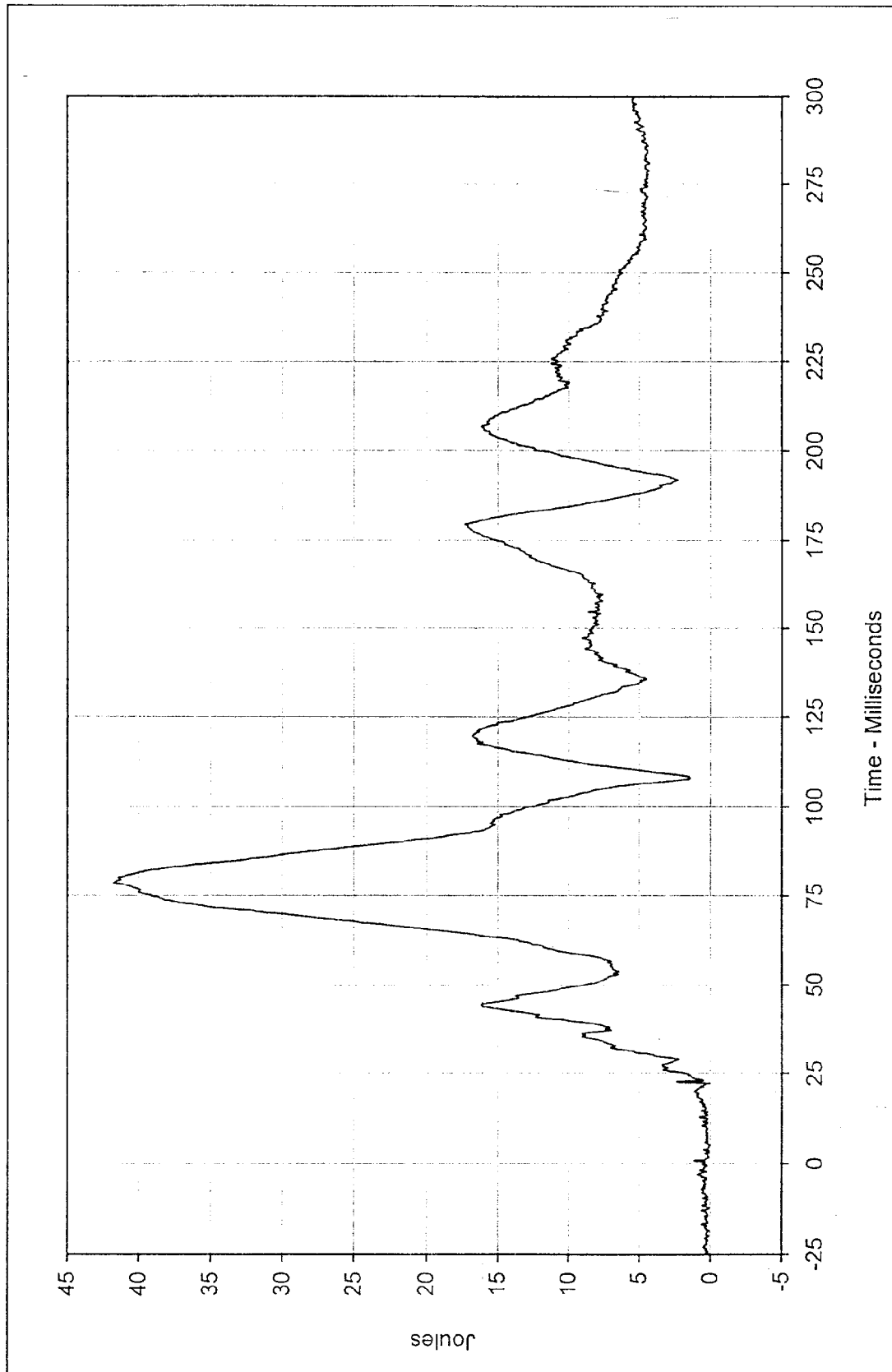
Maximum Value: 41.1 at 79 Milliseconds
 Minimum Value: -16.2 at 119.9 Milliseconds
 SAE Filter Class: 600
 Date of Test: 3/13/97
 Curve Number: FIL-011





Curve Description:	Driver Neck Moment Z		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	2.5	at 128.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-7.2	at 59.2 Milliseconds			
SAE Filter Class:	600				
Date of Test:	3/13/97				
Curve Number:	FIL-012				





B20

Curve Description: Driver Neck Moment Resultant

Testing Program: 1997 New Car Assessment Program

Maximum Value: 41.7 at 79.0 Milliseconds

Test Vehicle: 1997 Chevrolet Cavalier

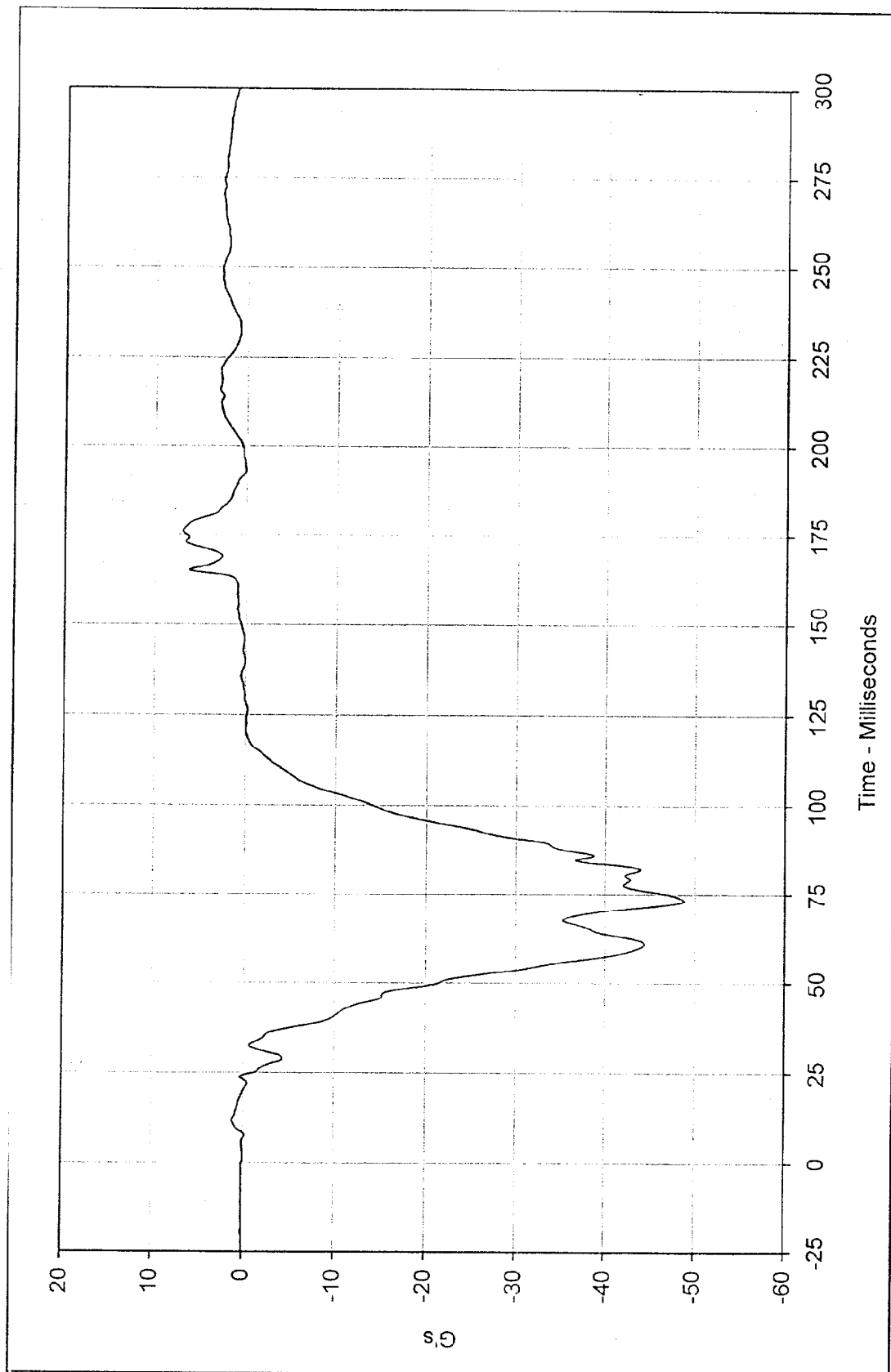
Minimum Value: 0.0 at 5.1 Milliseconds

SAE Filter Class: 600

Date of Test: 3/13/97

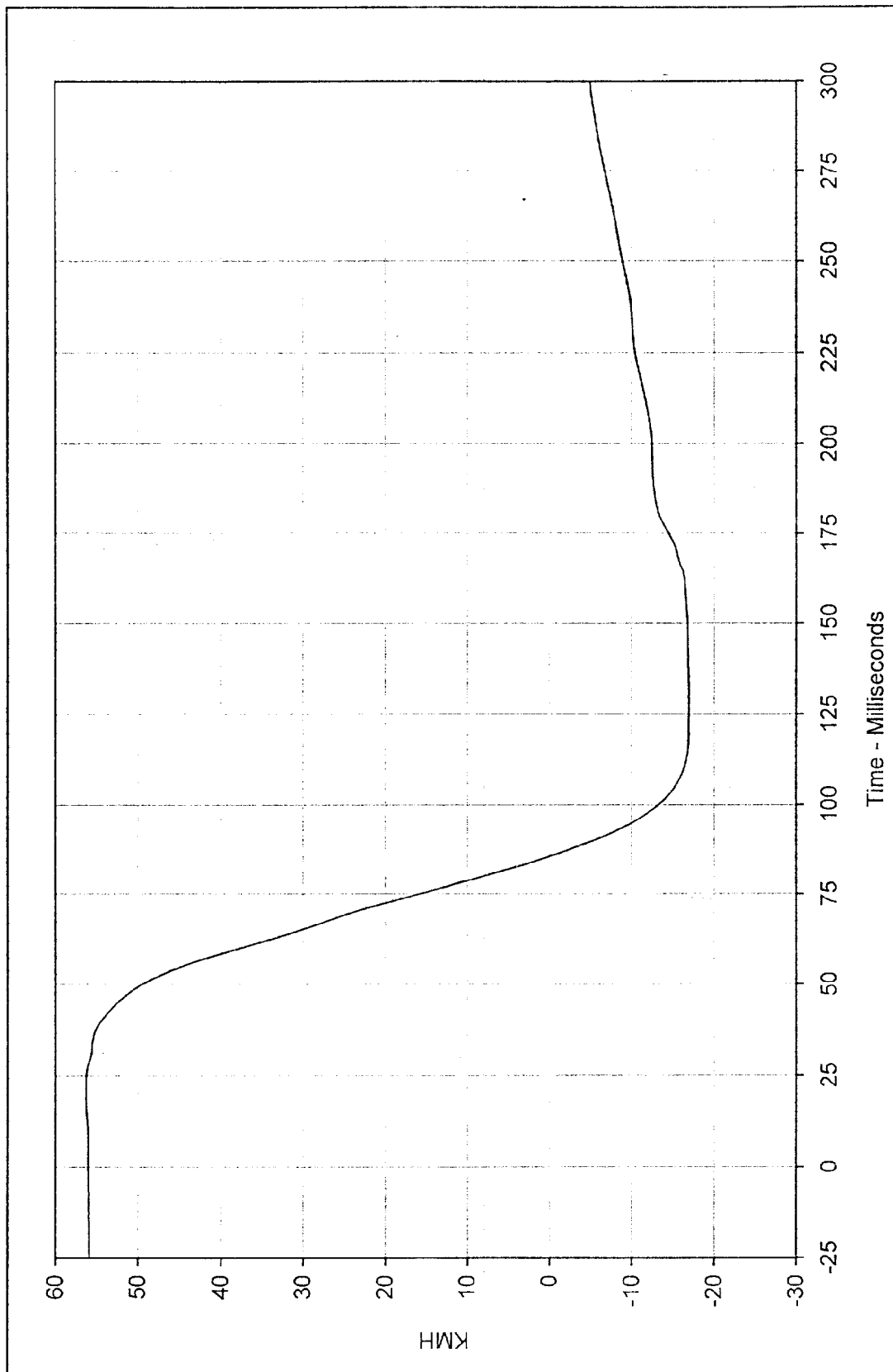
Curve Number: RES-010





Curve Description:	Driver Chest Primary X		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	7.0	at 176.1 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-48.8	at 73.3 Milliseconds			
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	FIL-013				



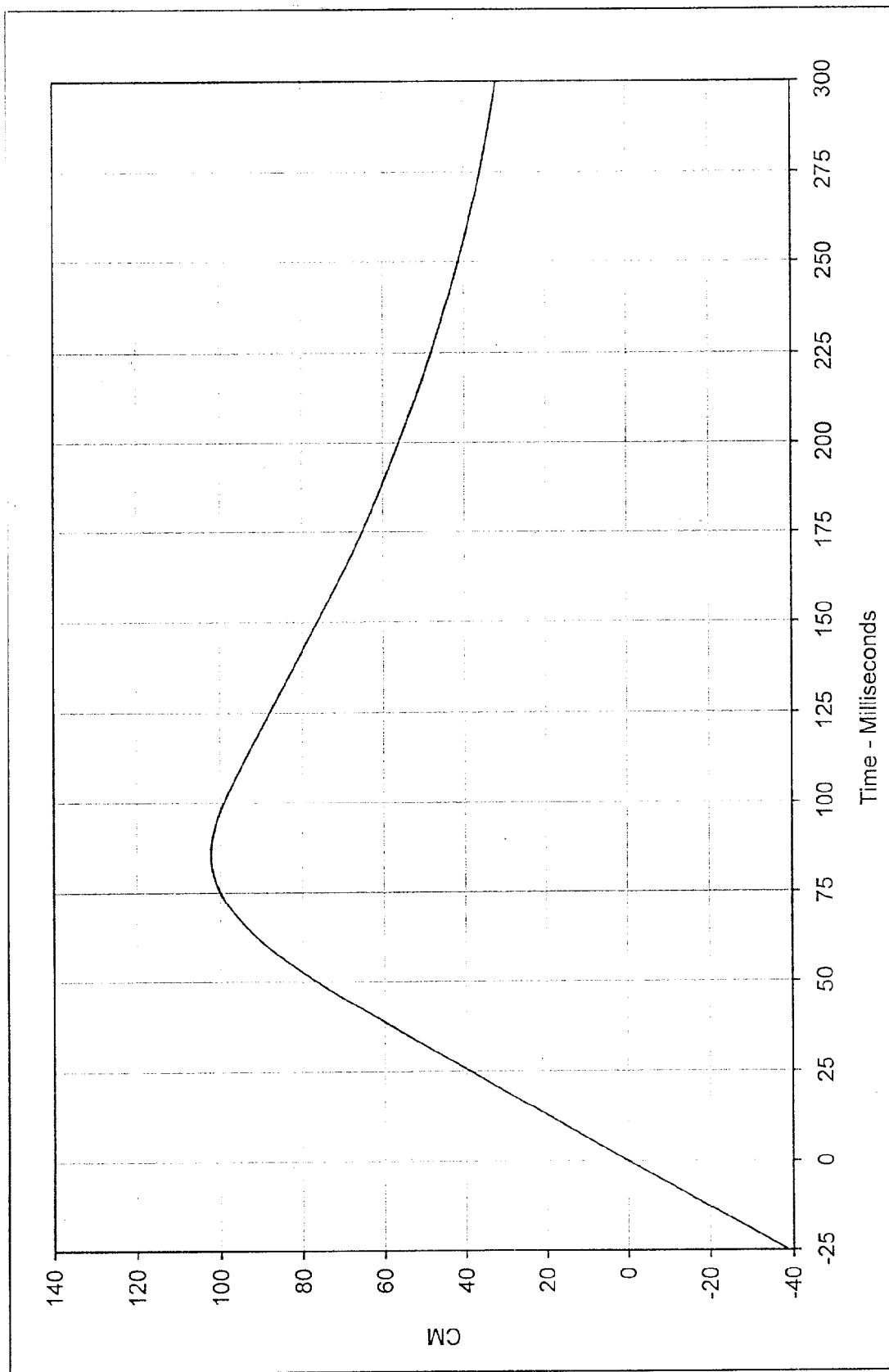


Curve Description: Driver Chest Primary X Velocity
 Maximum Value: 56.3 at 20.2 Milliseconds
 Minimum Value: -16.9 at 128.7 Milliseconds

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

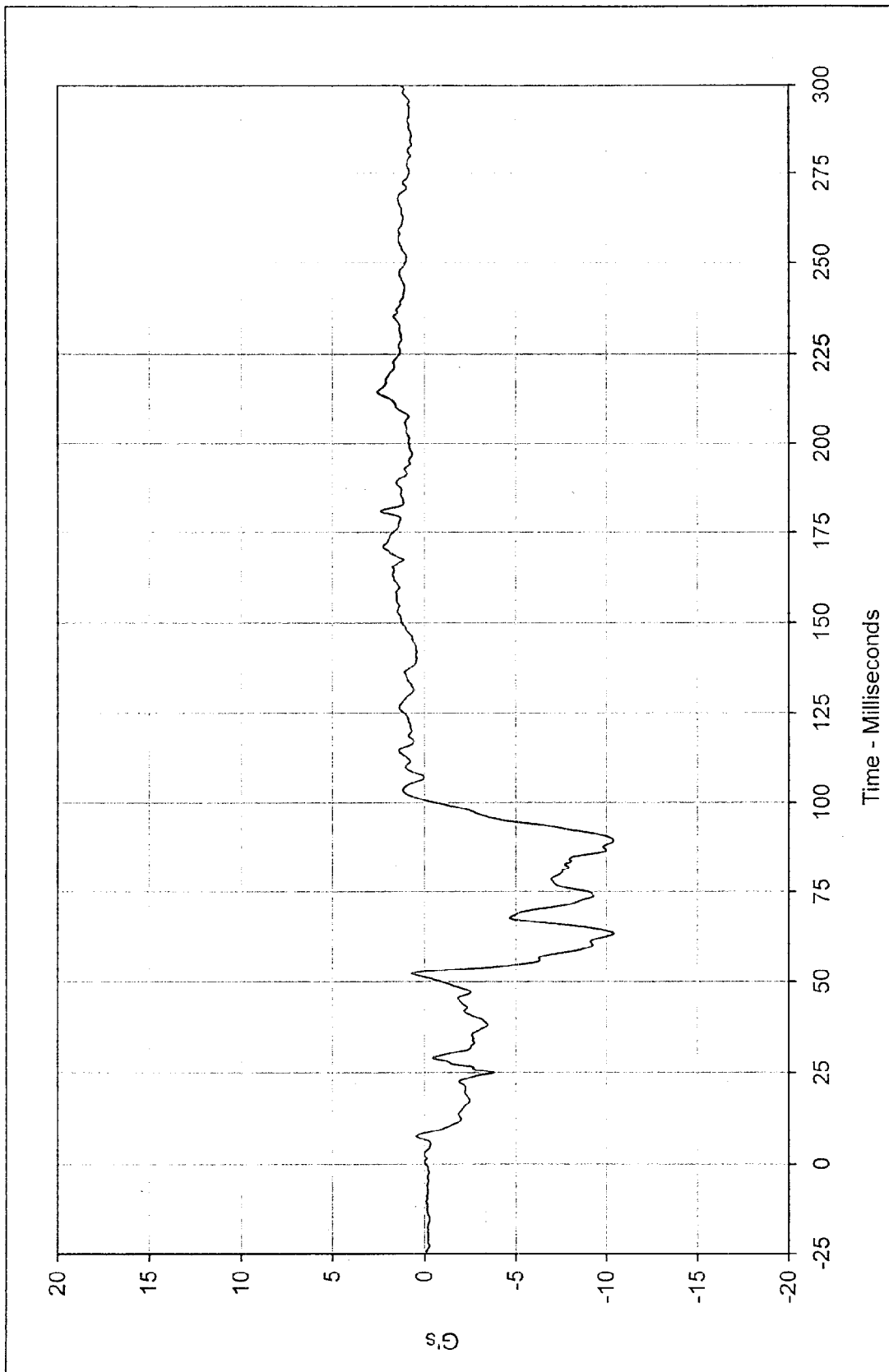
SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: IN1-013





Curve Description: <u>Driver Chest Primary X Displ.</u>		Testing Program: <u>1997 New Car Assessment Program</u>	
Maximum Value: <u>102.2</u>	at <u>85.6</u> Milliseconds	Test Vehicle: <u>1997 Chevrolet Cavalier</u>	
Minimum Value: <u>0.0</u>	at <u>0.0</u> Milliseconds		
SAE Filter Class: <u>180</u>			
Date of Test: <u>3/13/97</u>			
Curve Number: <u>IN2-013</u>			

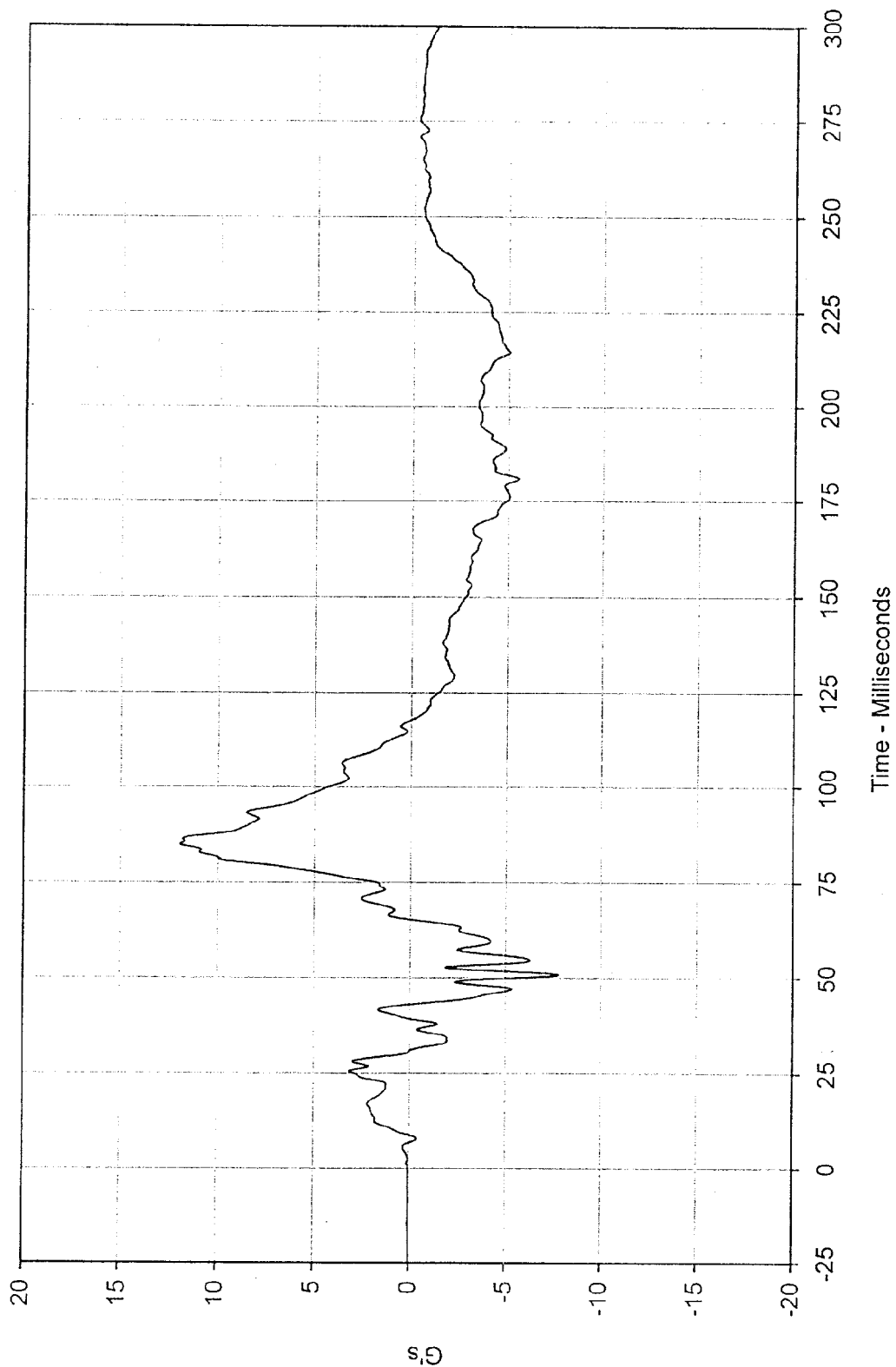




Curve Description: Driver Chest Primary Y
 Maximum Value: 2.6 at 214.3 Milliseconds
 Minimum Value: -10.4 at 63.5 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: FIL-014

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

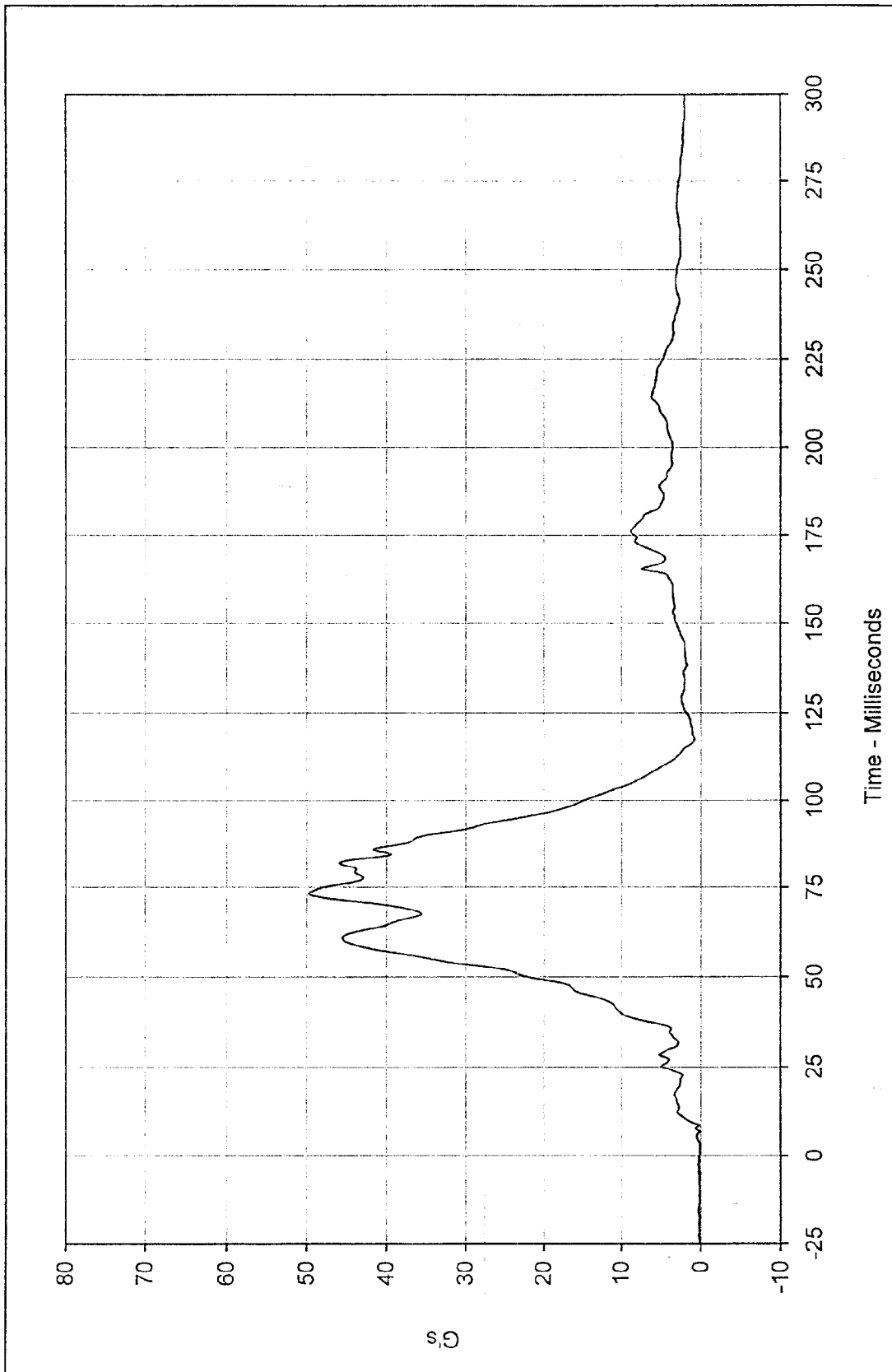




Curve Description: Driver Chest Primary Z
 Maximum Value: 11.9 at 85 Milliseconds
 Minimum Value: -7.8 at 50.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: FIL-015

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

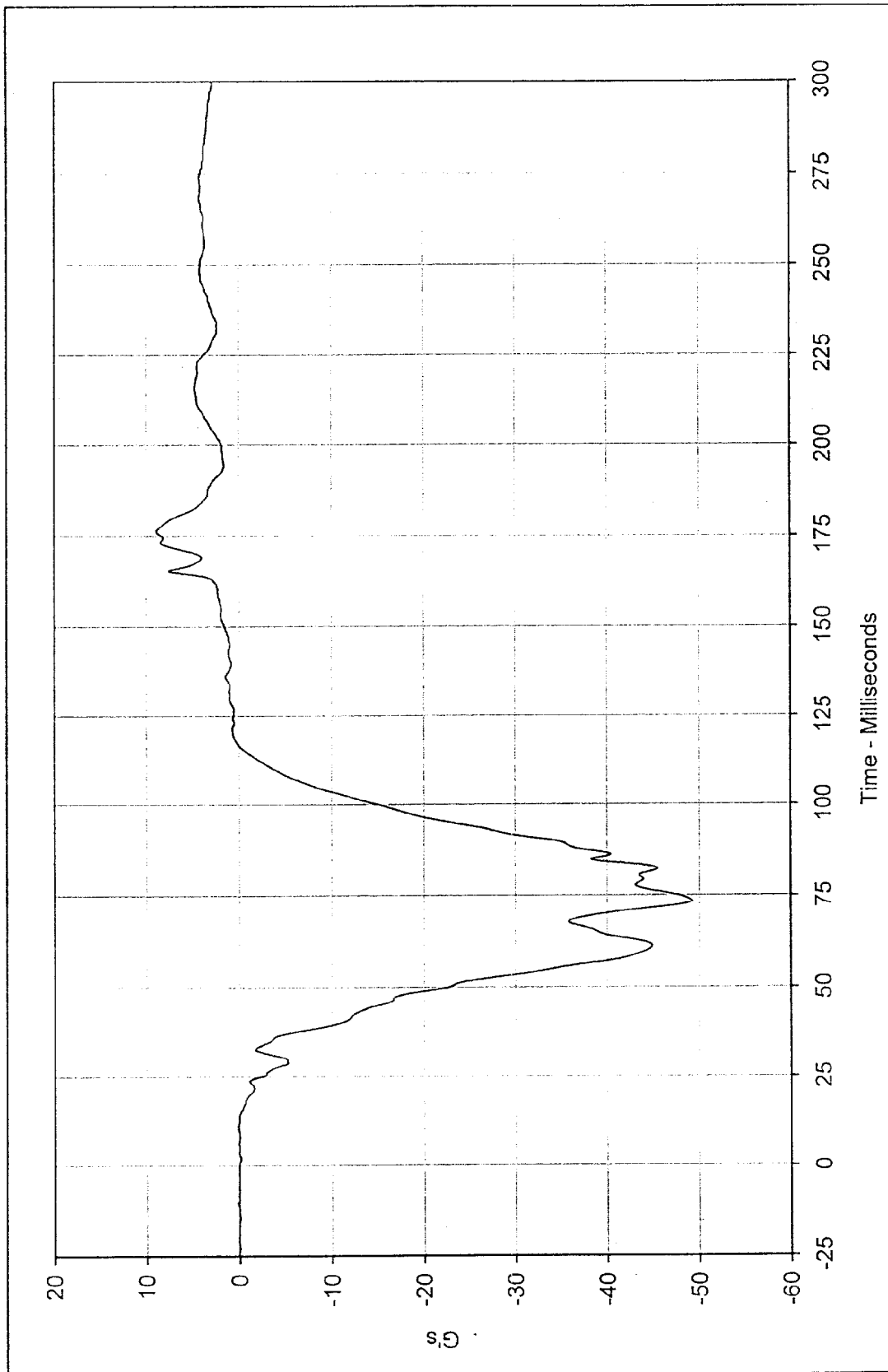




Curve Description: Driver Chest Resultant Primary Testing Program: 1997 New Car Assessment Program
Maximum Value: 49.7 at 73.4 Milliseconds Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value: 0.1 at 6.8 Milliseconds



SAE Filter Class: 180
Date of Test: 3/13/97
Curve Number: RES-013

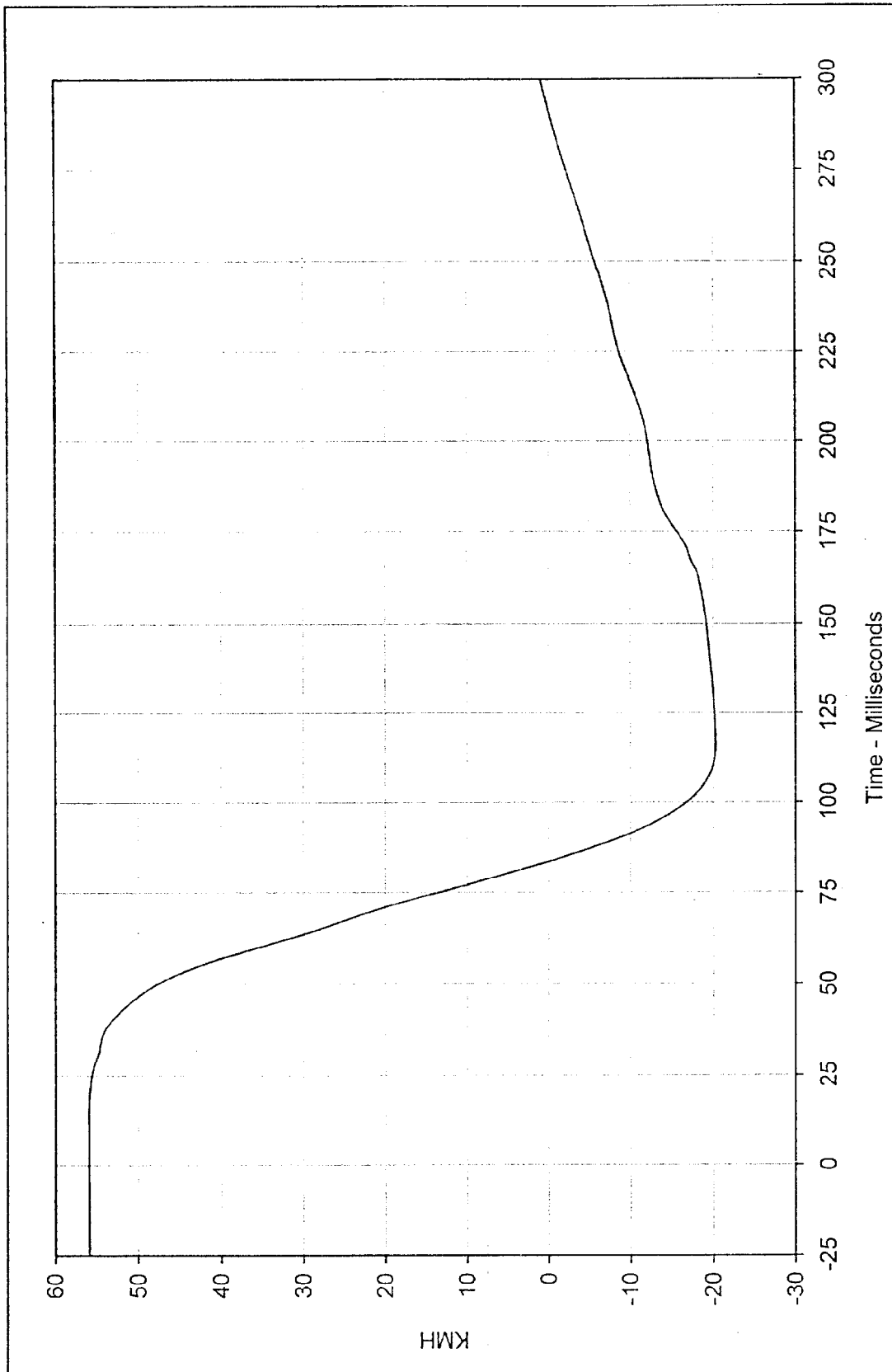


B27

Curve Description:	Driver Chest Redundant X		Testing Program:	1997 New Car Assessment Program
Maximum Value:	8.9	at 176.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-49.2	at 73.4 Milliseconds		
SAE Filter Class:	180			
Date of Test:	3/13/97			
Curve Number:	FIL-016			



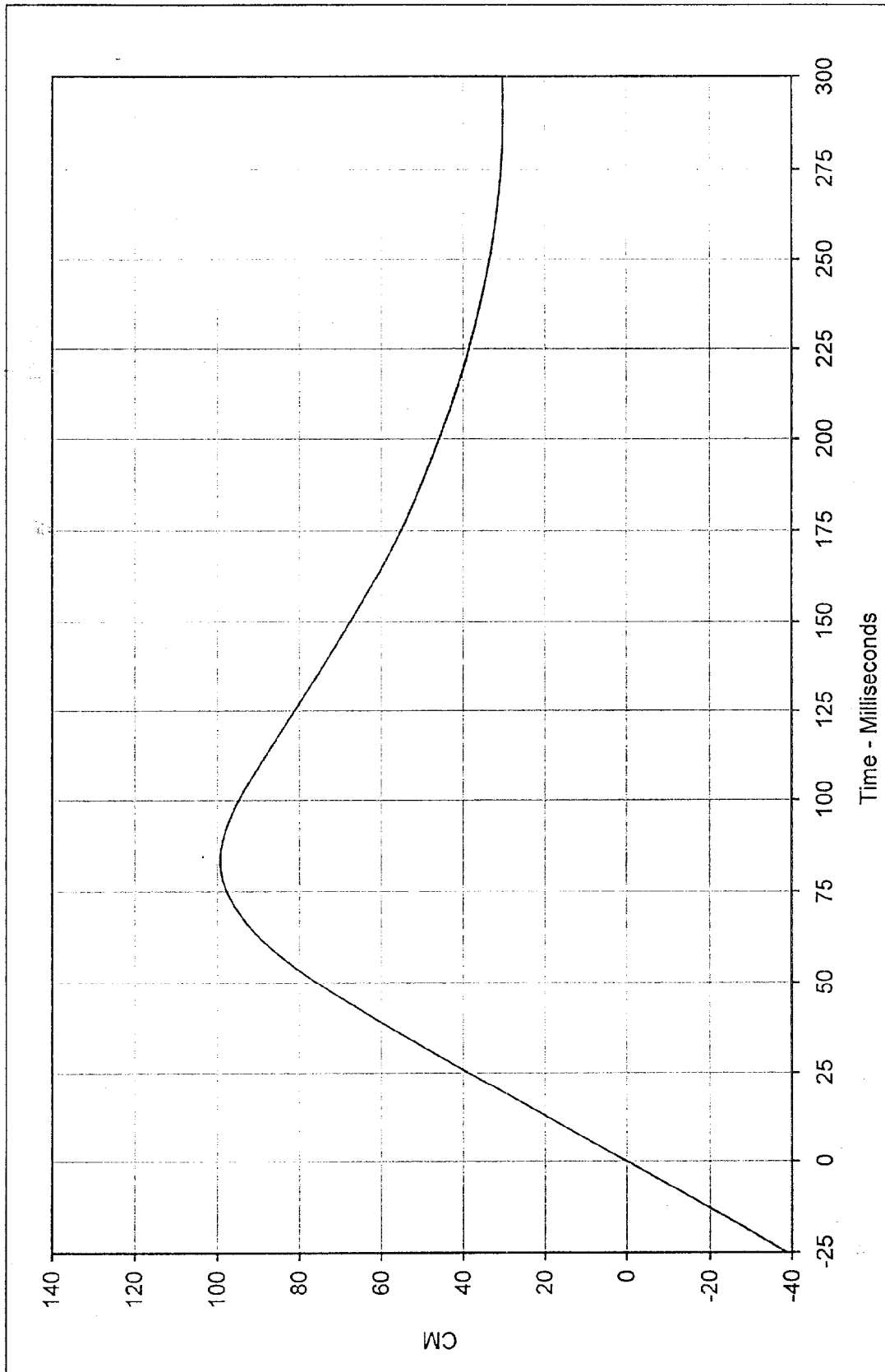




B28

Curve Description:	Driver Chest Redundant X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 14.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-20.3 at 116.6 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-016		



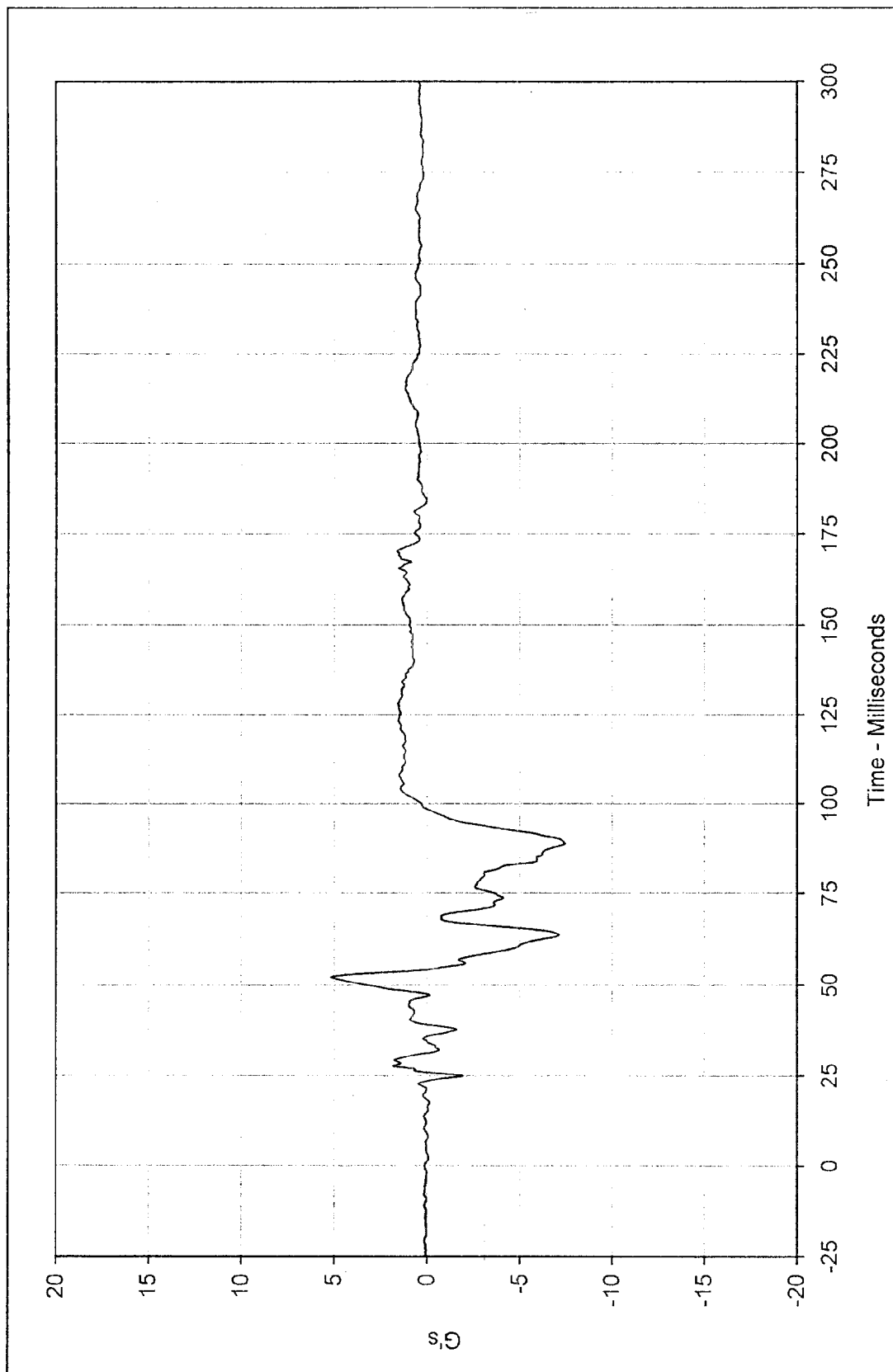


B29

Curve Description: Driver Chest Redundant X Displ.
 Maximum Value: 99.3 at 83.6 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: IN2-016

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

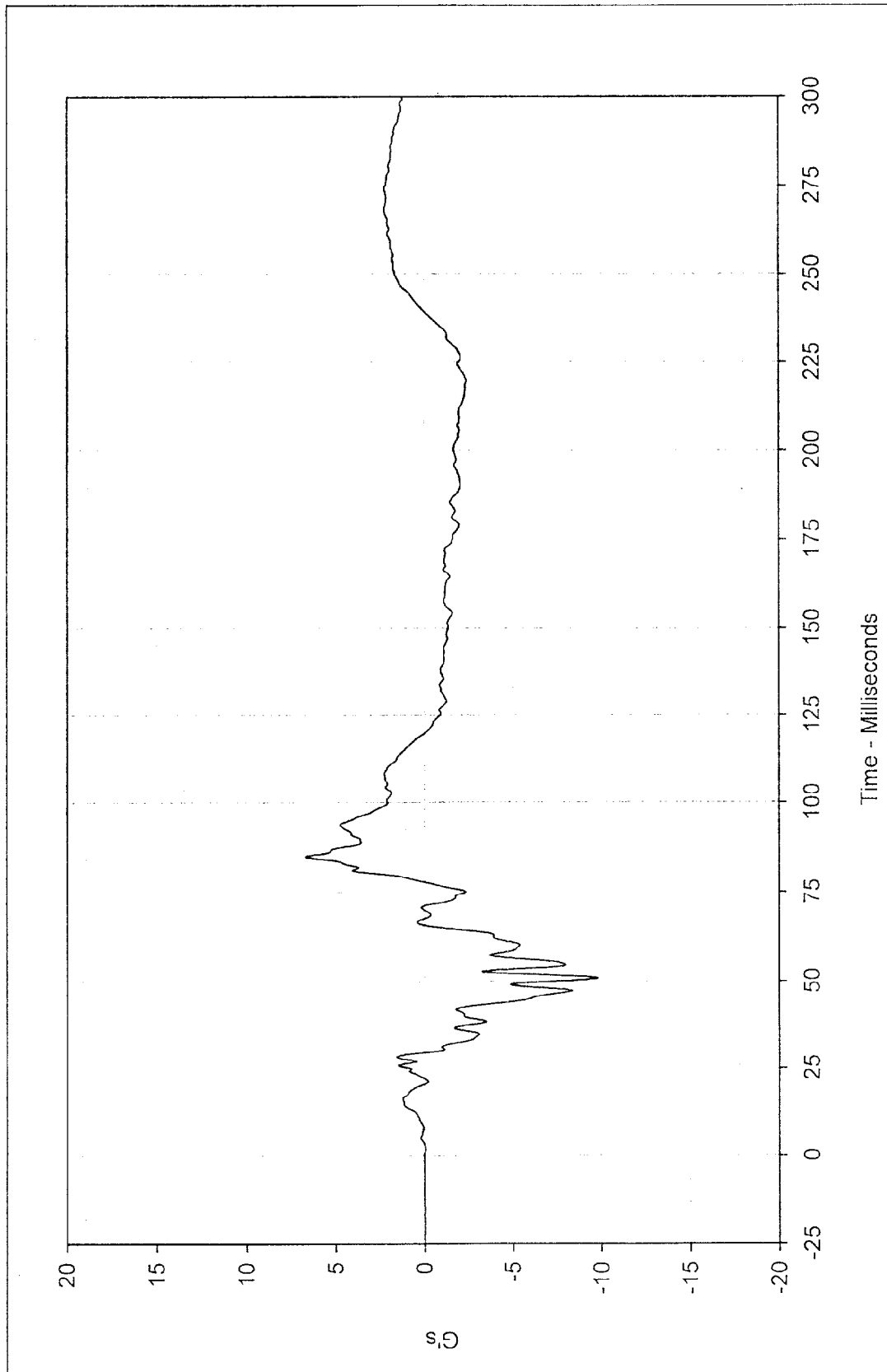




Curve Description: Driver Chest Redundant Y
 Maximum Value: 5.1 at 52.3 Milliseconds
 Minimum Value: -7.4 at 88.9 Milliseconds

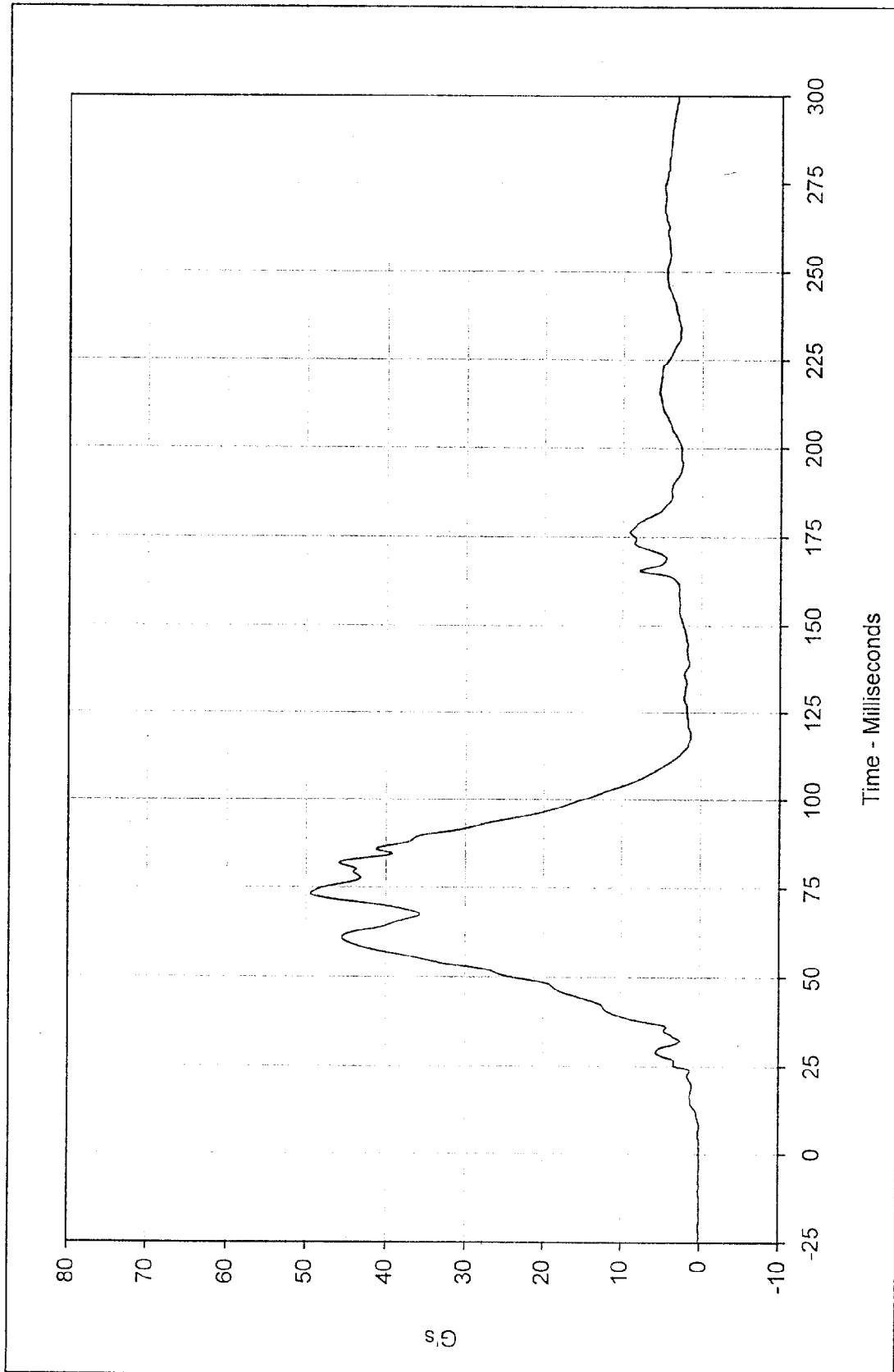


SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: FIL-017



Curve Description:	Driver Chest Redundant Z		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	6.7	at 84.9	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-9.8	at 51			
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	FIL-015				

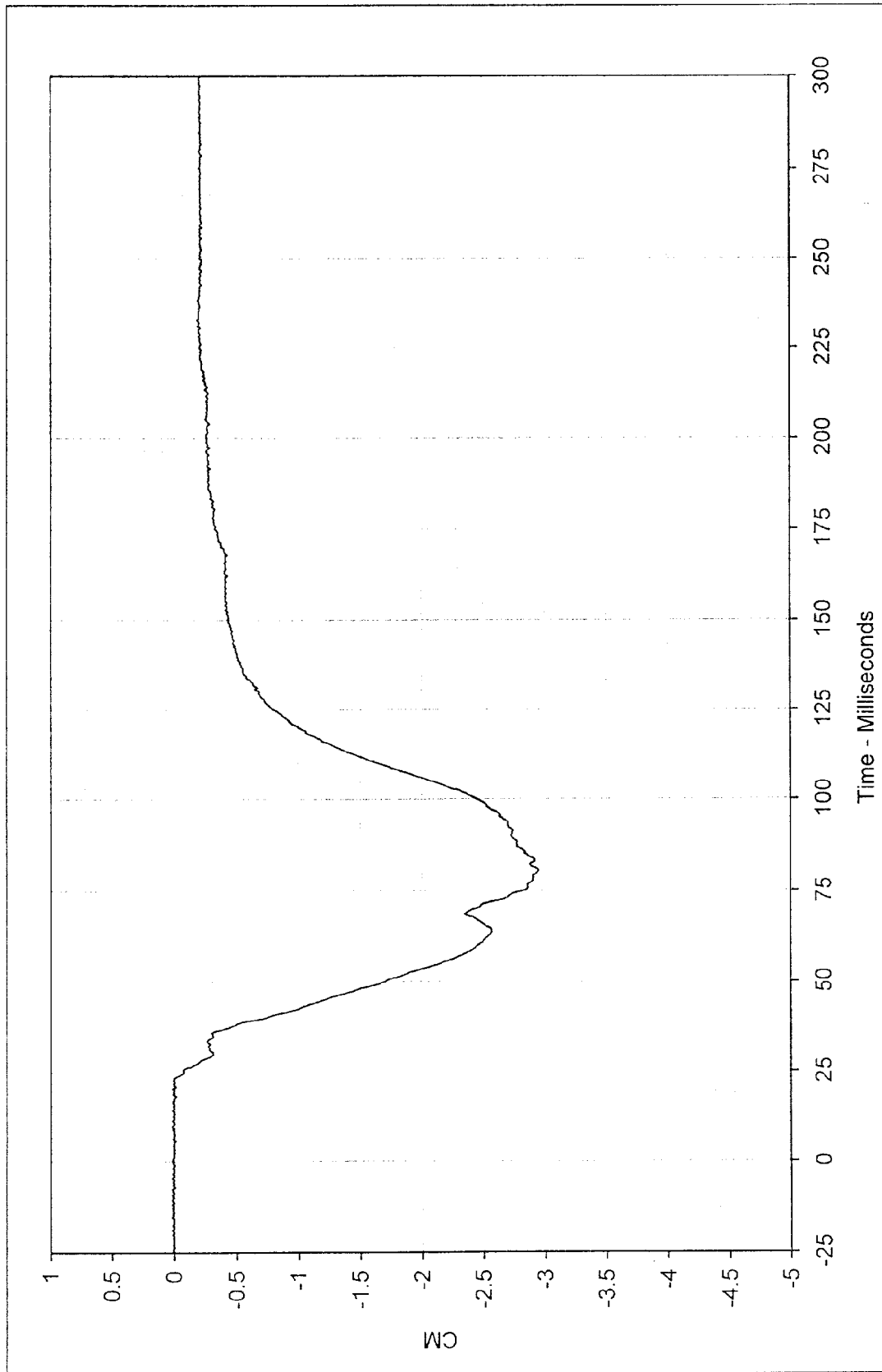




Curve Description: Driver Chest Resultant Redundant
 Maximum Value: 49.4 at 73.5 Milliseconds
 Minimum Value: 0.0 at 1.2 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: RES-016

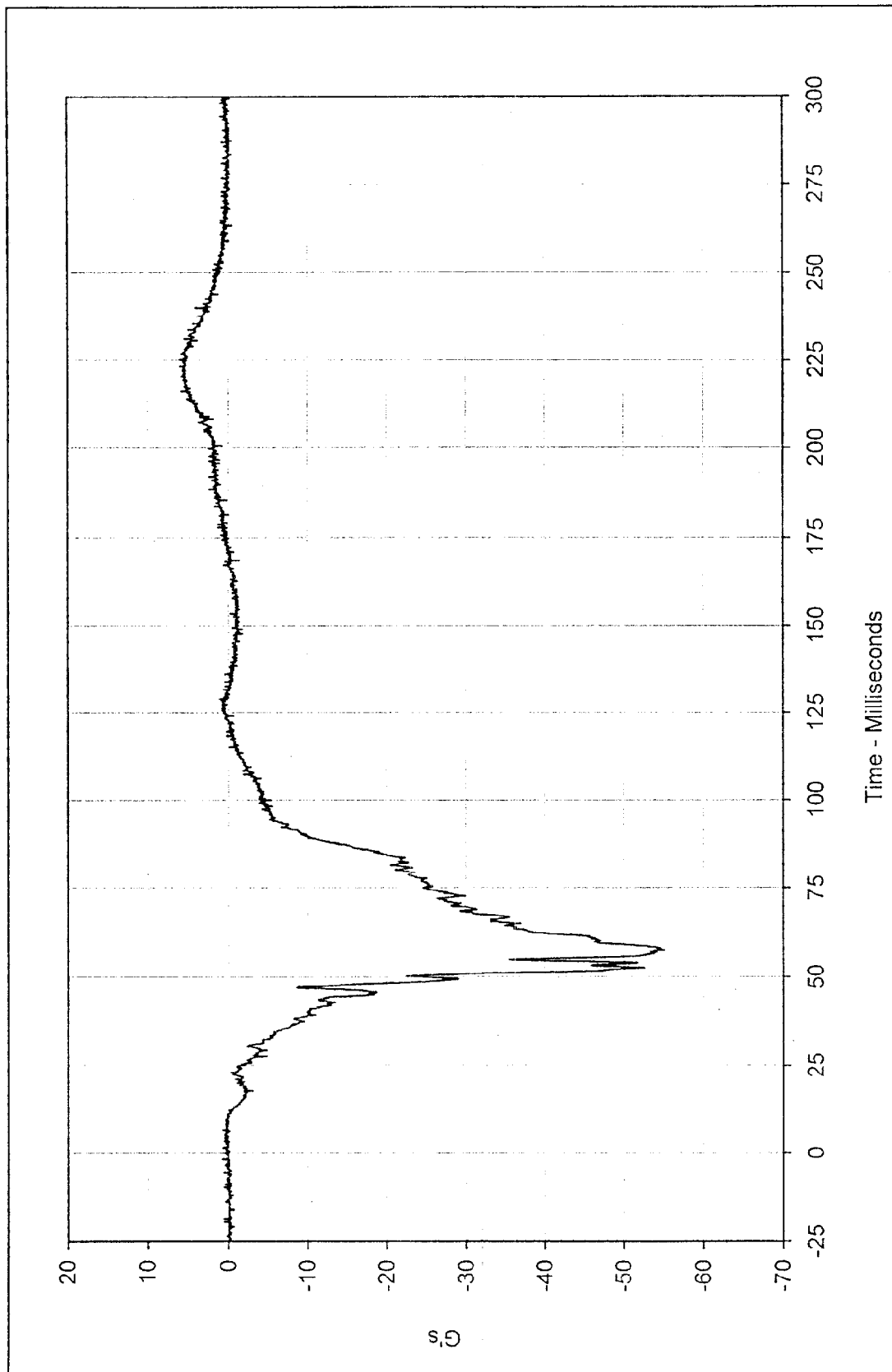
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:	Driver Chest Displacement	Testing Program:	1997 New Car Assessment Program
Maximum Value:	0.02 at 9.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-2.95 at 80.9 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-019		

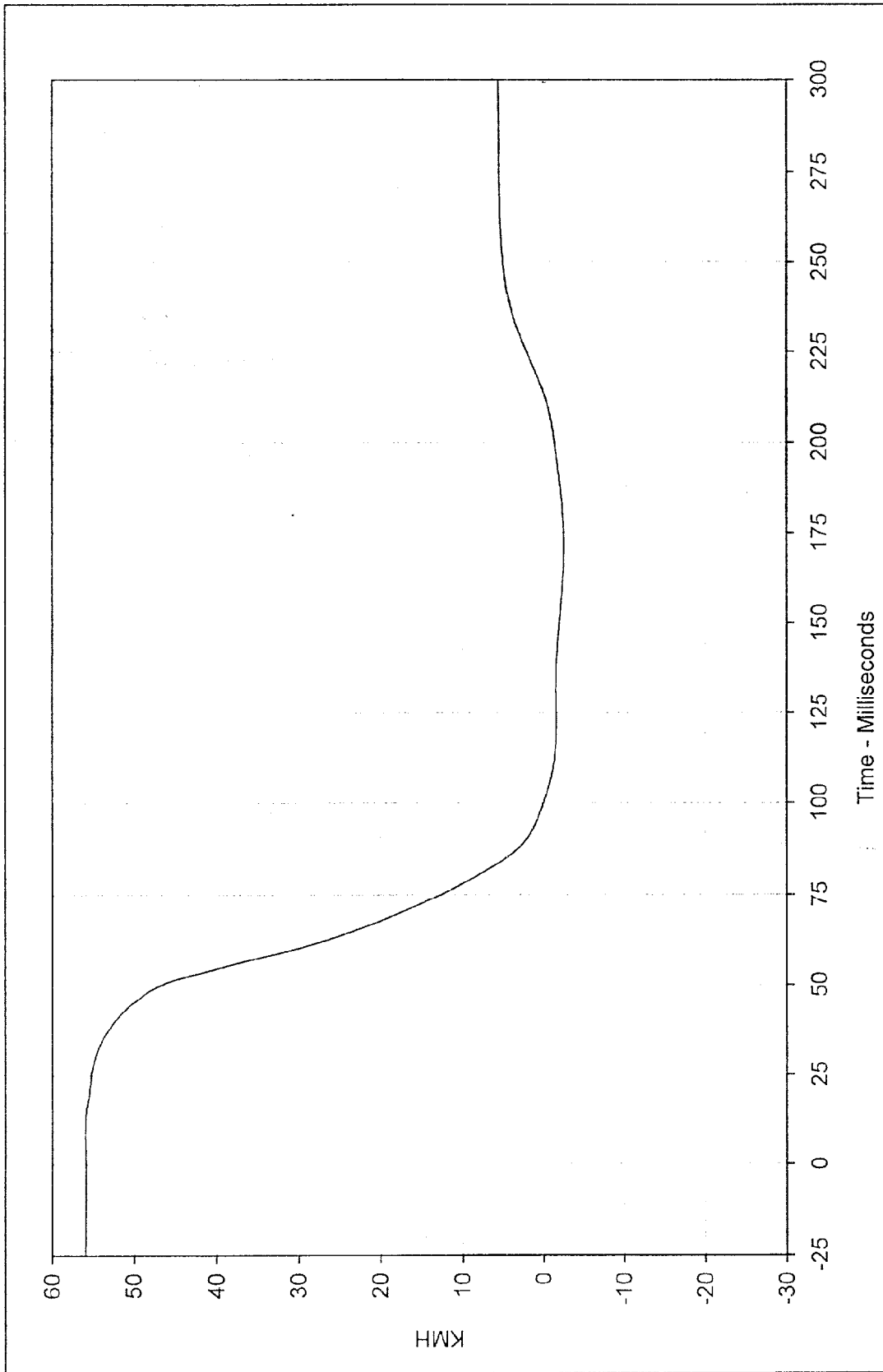




Curve Description: Driver Pelvis X
 Maximum Value: 5.9 at 223.4 Milliseconds
 Minimum Value: -55.1 at 57.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-020

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

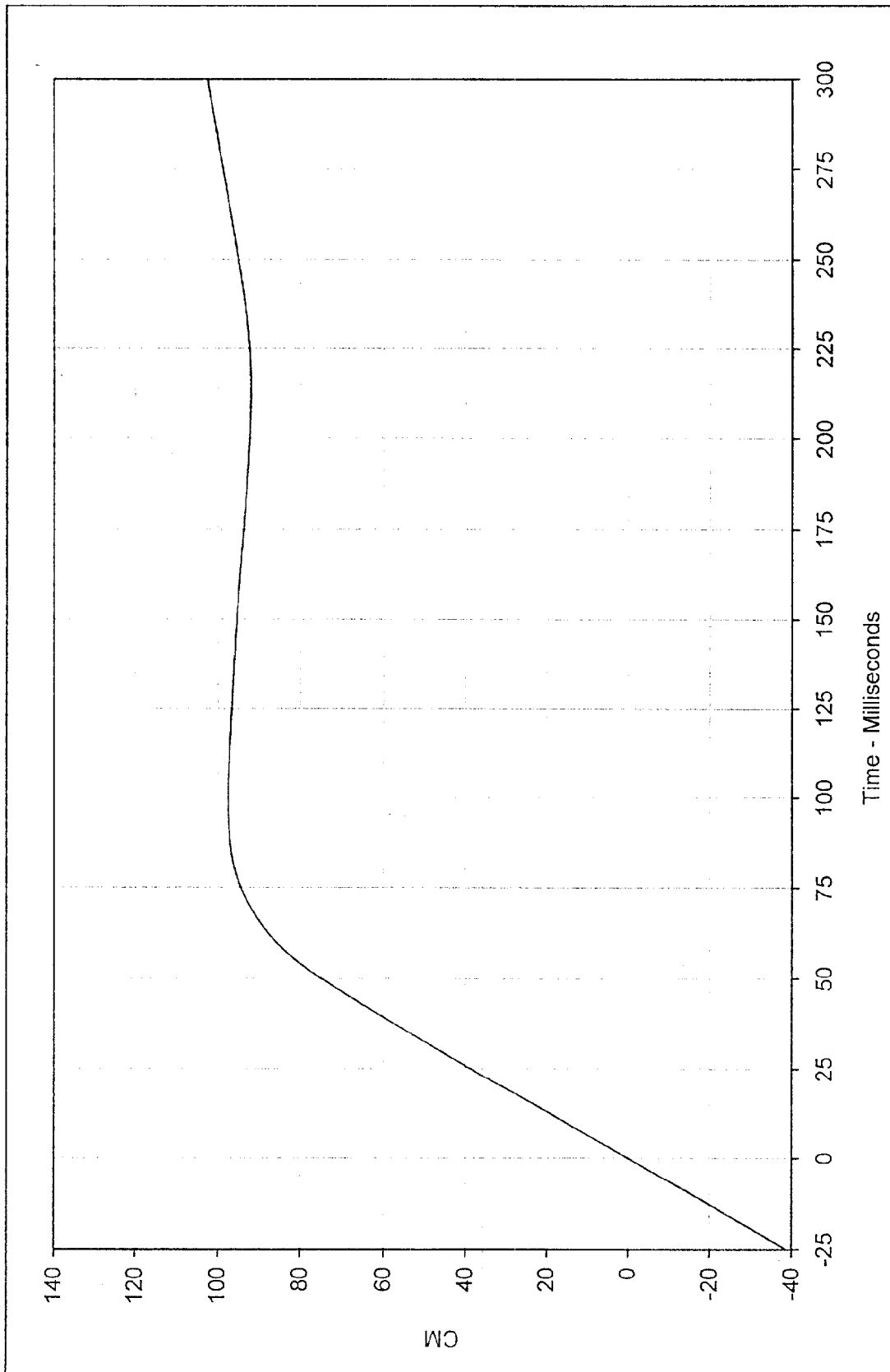




B35

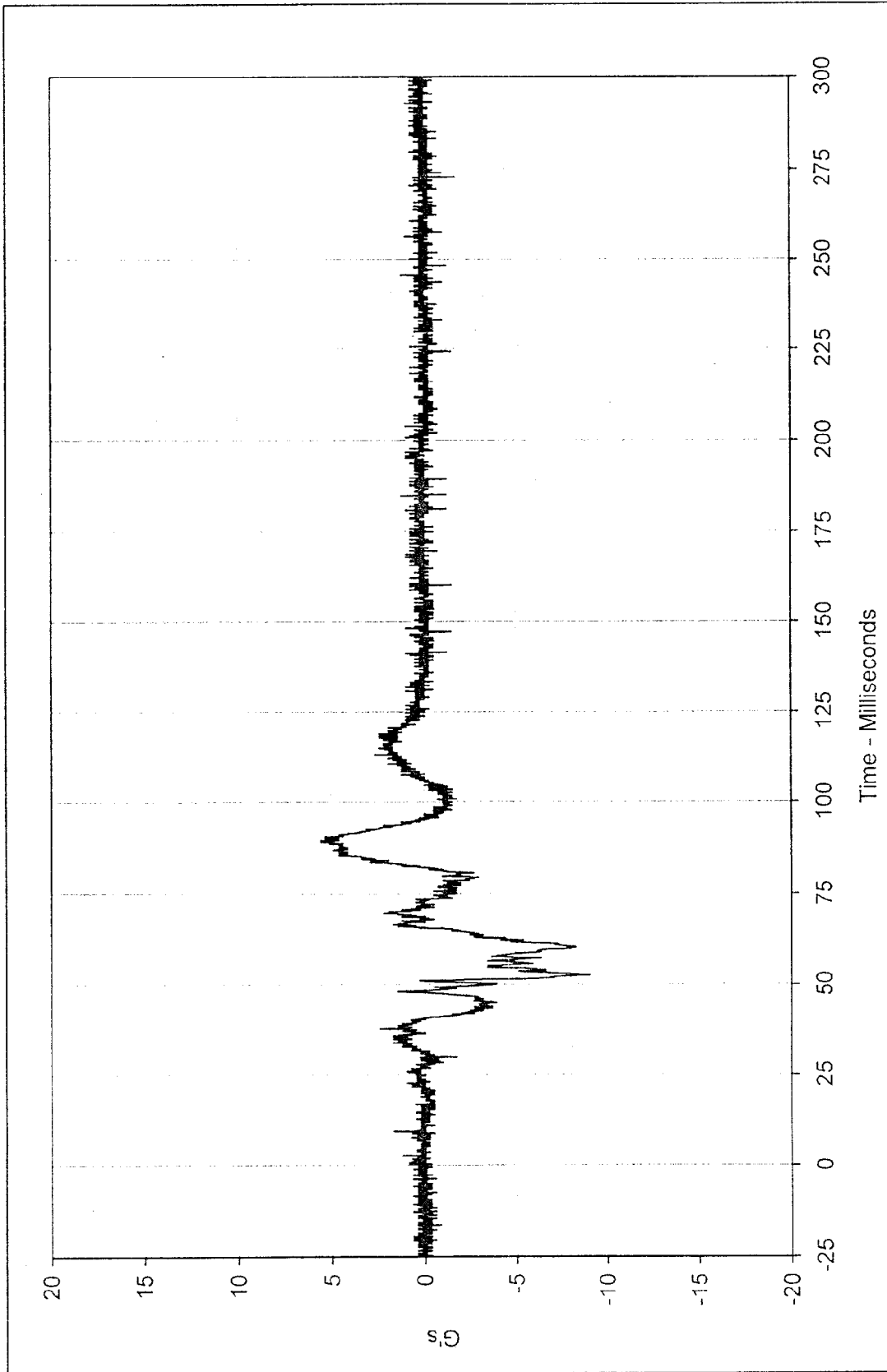
Curve Description:	Driver Pelvis X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	55.9 at 10.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-2.5 at 171.7 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-020		





Curve Description:	Driver Pelvis X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	102.6 at 299.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-0.1 at 0.0 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-020		

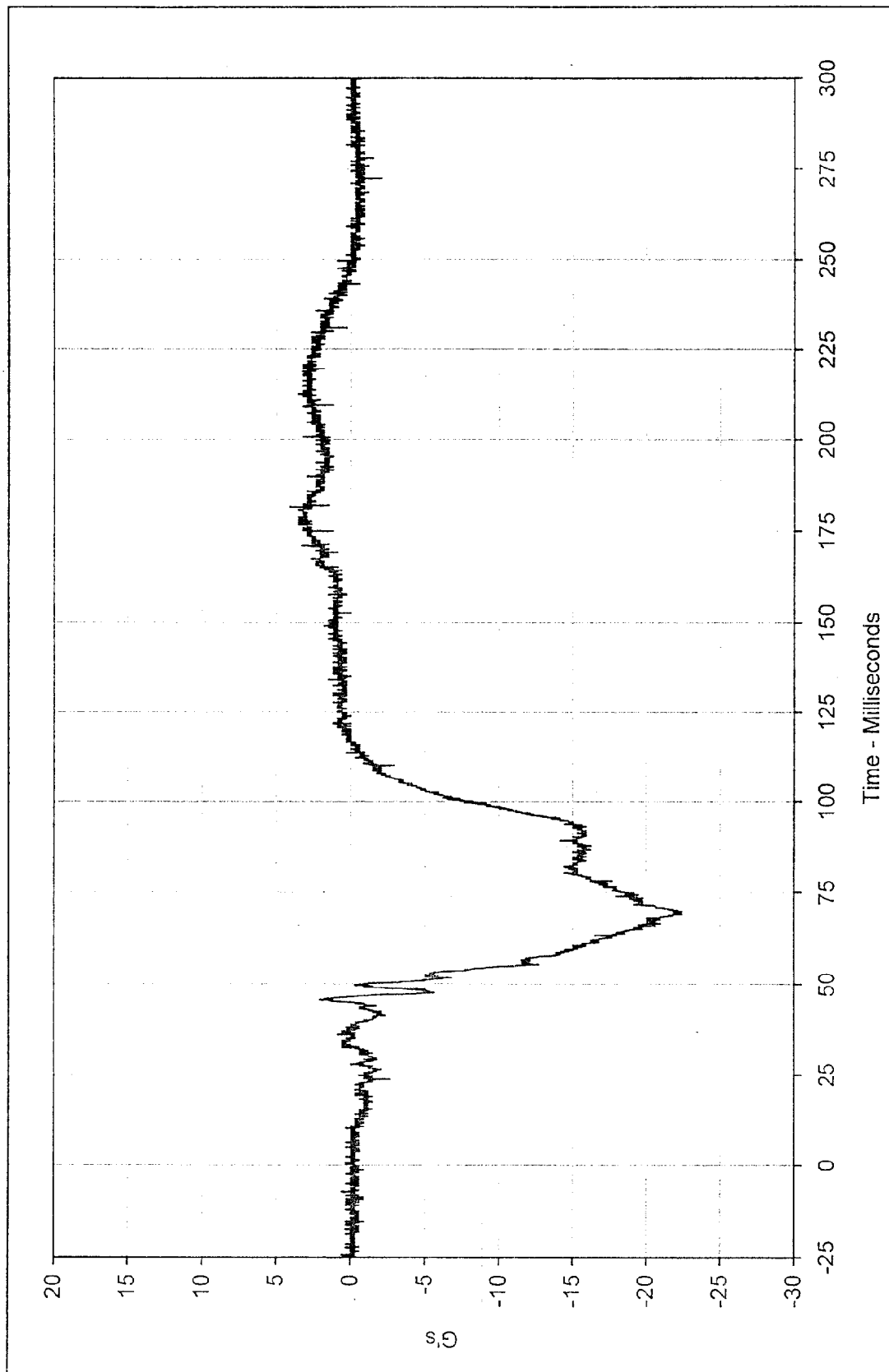




Curve Description: 1997 New Car Assessment Program
 Testing Program: 1997 Chevrolet Cavalier
 Test Vehicle:

Driver Pelvis Y
 Maximum Value: 5.6 at 89.2 Milliseconds
 Minimum Value: -9.1 at 52.6 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-021

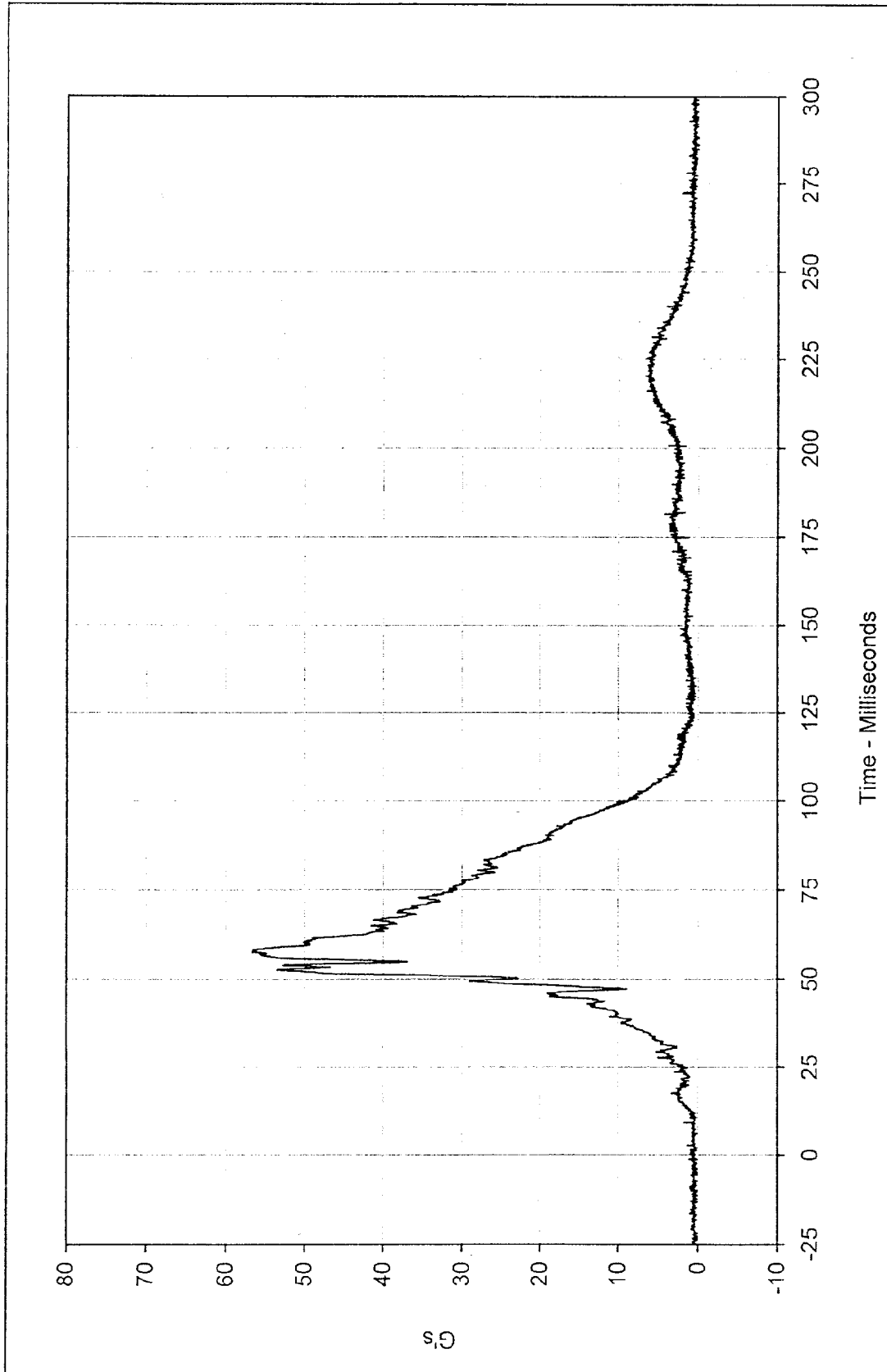




Curve Description: Driver Pelvis Z
 Maximum Value: 4.1 at 181.5 Milliseconds
 Minimum Value: -22.4 at 69.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-022

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

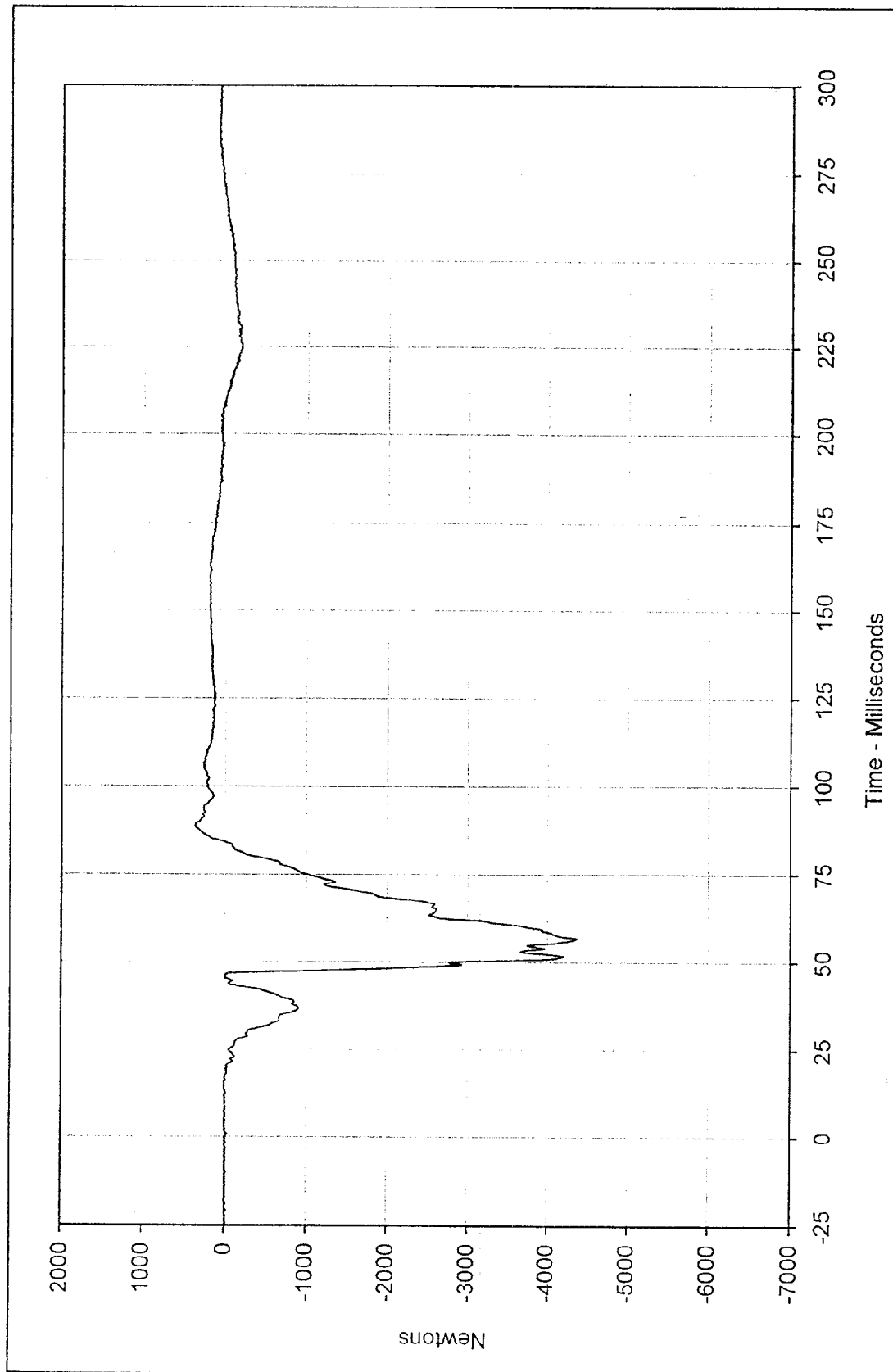




B39

Curve Description:	Driver Pelvis Resultant		Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.7	at 57.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.0	at 285.1 Milliseconds		
SAE Filter Class:	1000			
Date of Test:	3/13/97			
Curve Number:	RES-020			



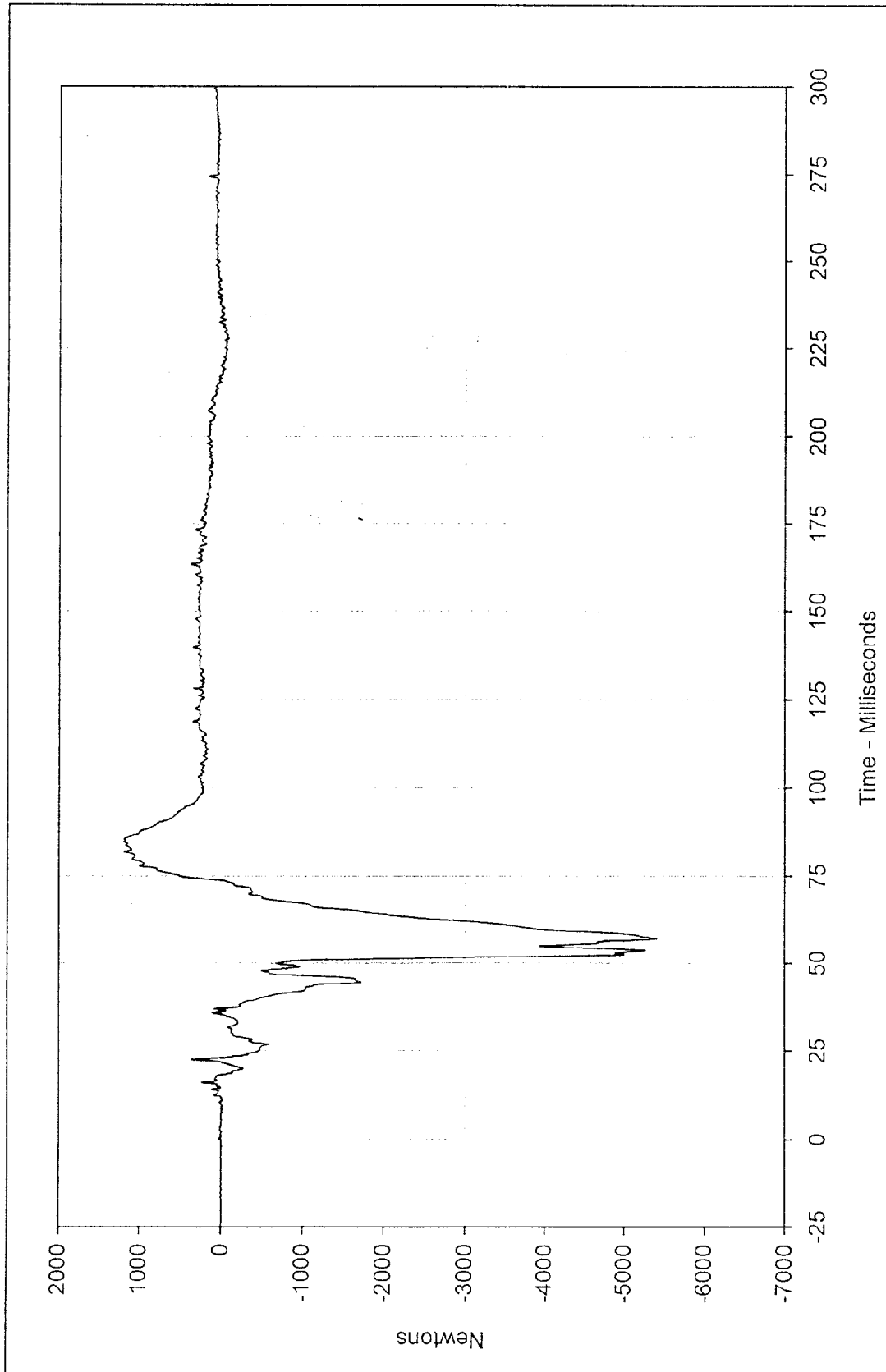


Curve Description:	Driver Left Femur Force		Testing Program:	1997 New Car Assessment Program
Maximum Value:	359.3	at 89.2	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-4373.1	at 56.7		
SAE Filter Class:	600			
Date of Test:	3/13/97			
Curve Number:	FIL-023			



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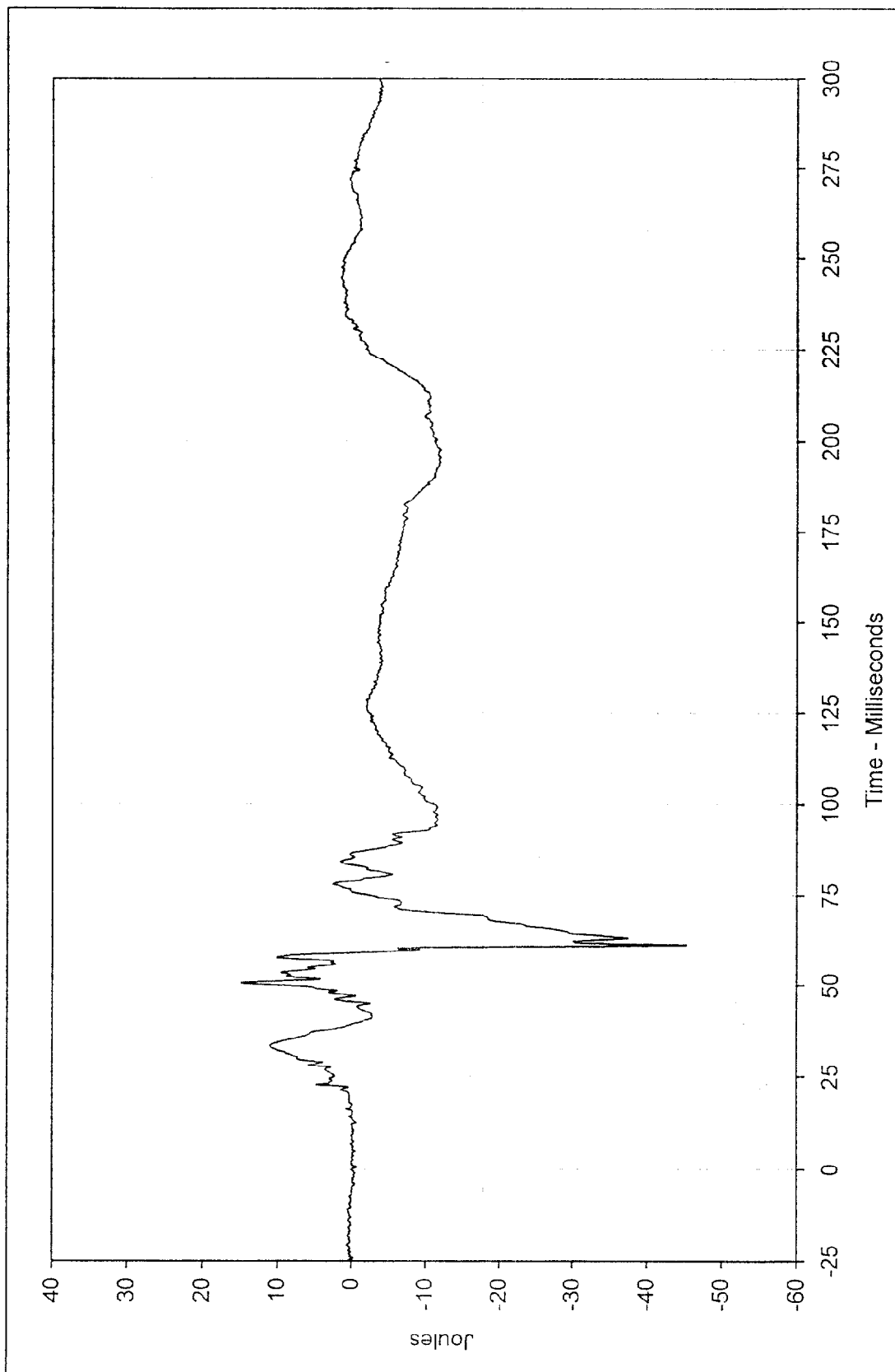


Curve Description:	Driver Right Femur Force		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	1190.7	at 84.7	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-5407.4	at 57.1			
SAE Filter Class:	600				
Date of Test:	3/13/97				
Curve Number:	FIL-024				



KARCO
Engineering

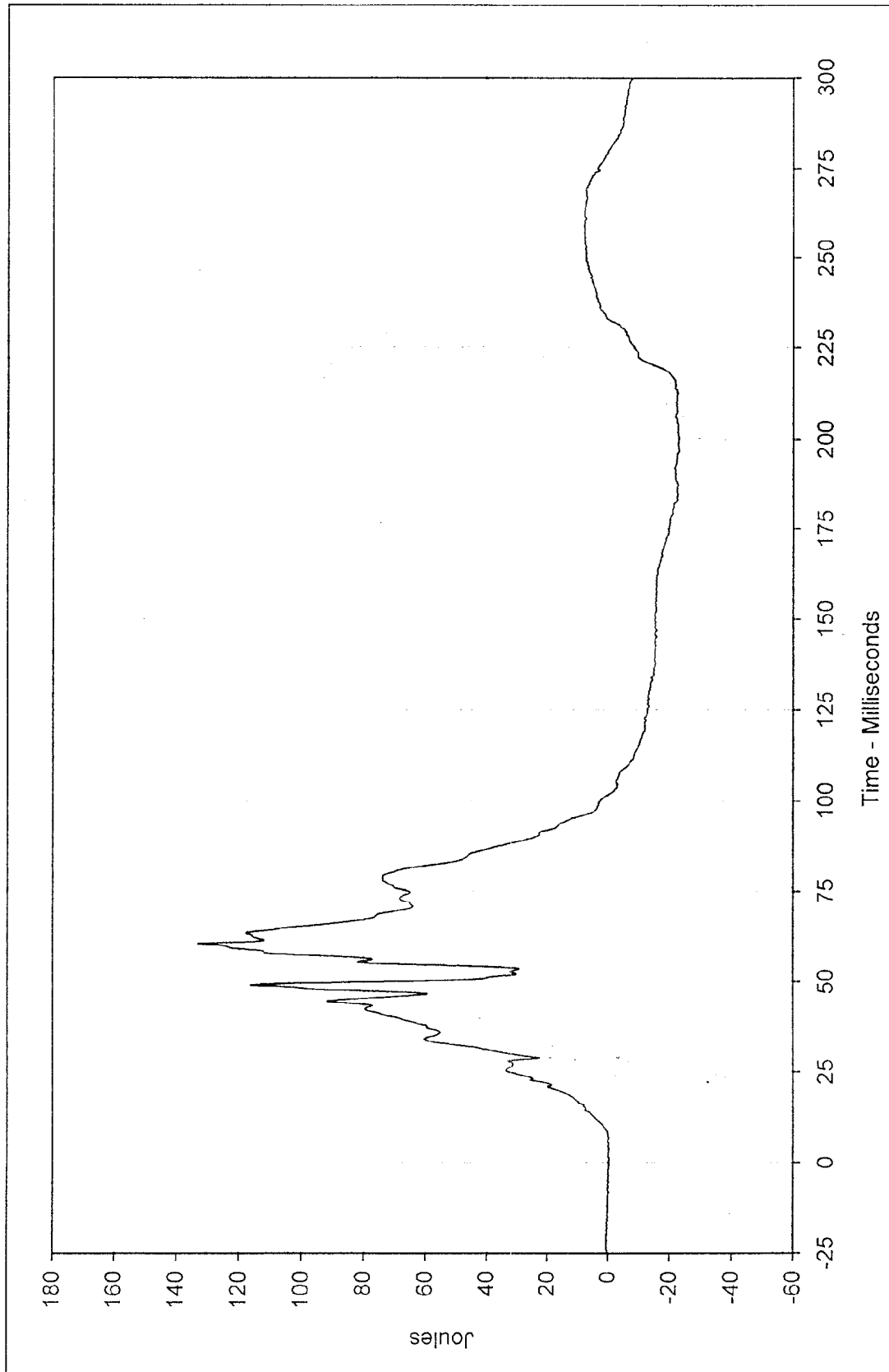




Curve Description: Driver Left Upper Tibia Moment X
 Maximum Value: 14.8 at 50.8 Milliseconds
 Minimum Value: -45.3 at 61.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 3/13/97
 Curve Number: FIL-025

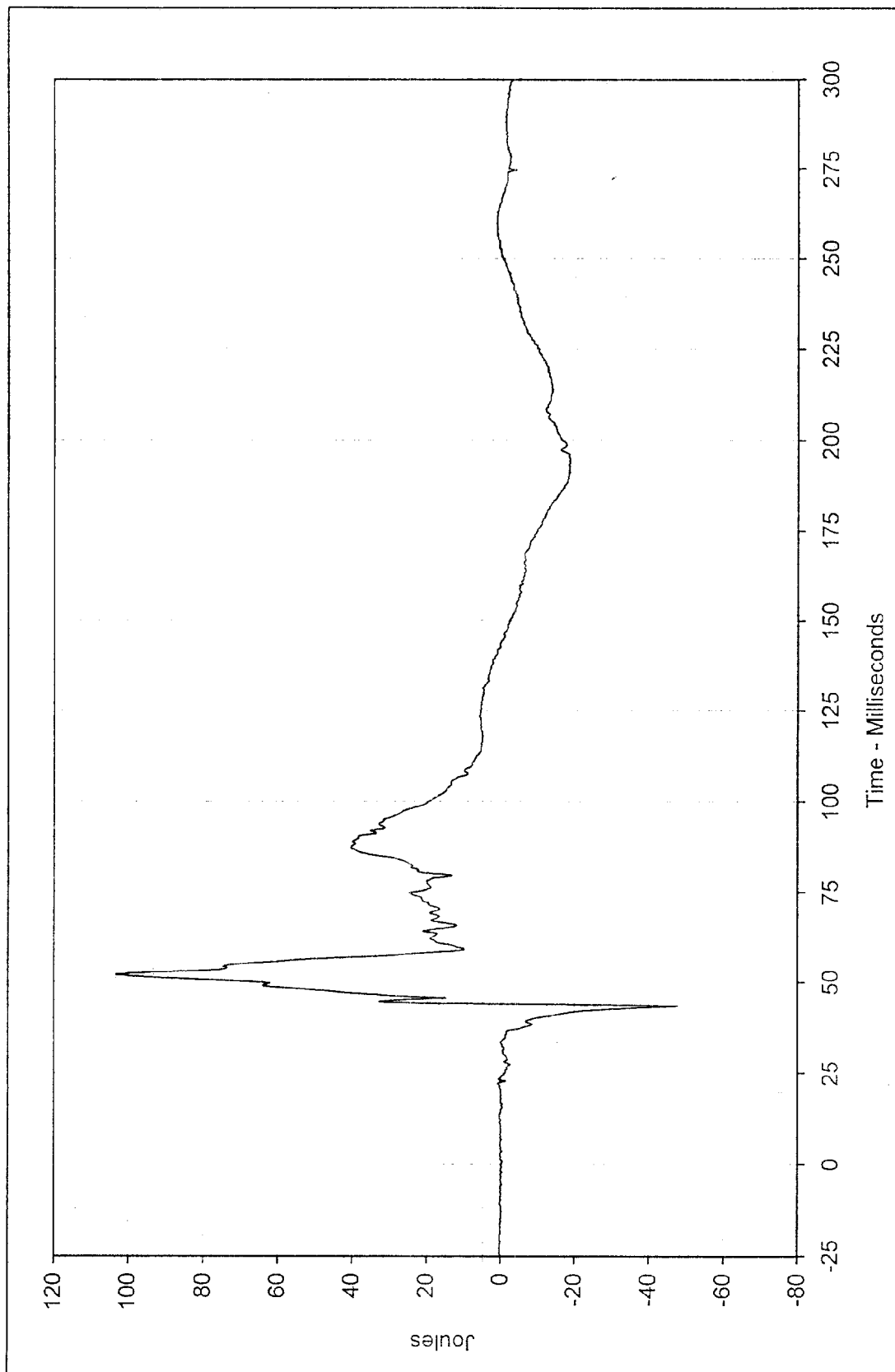
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





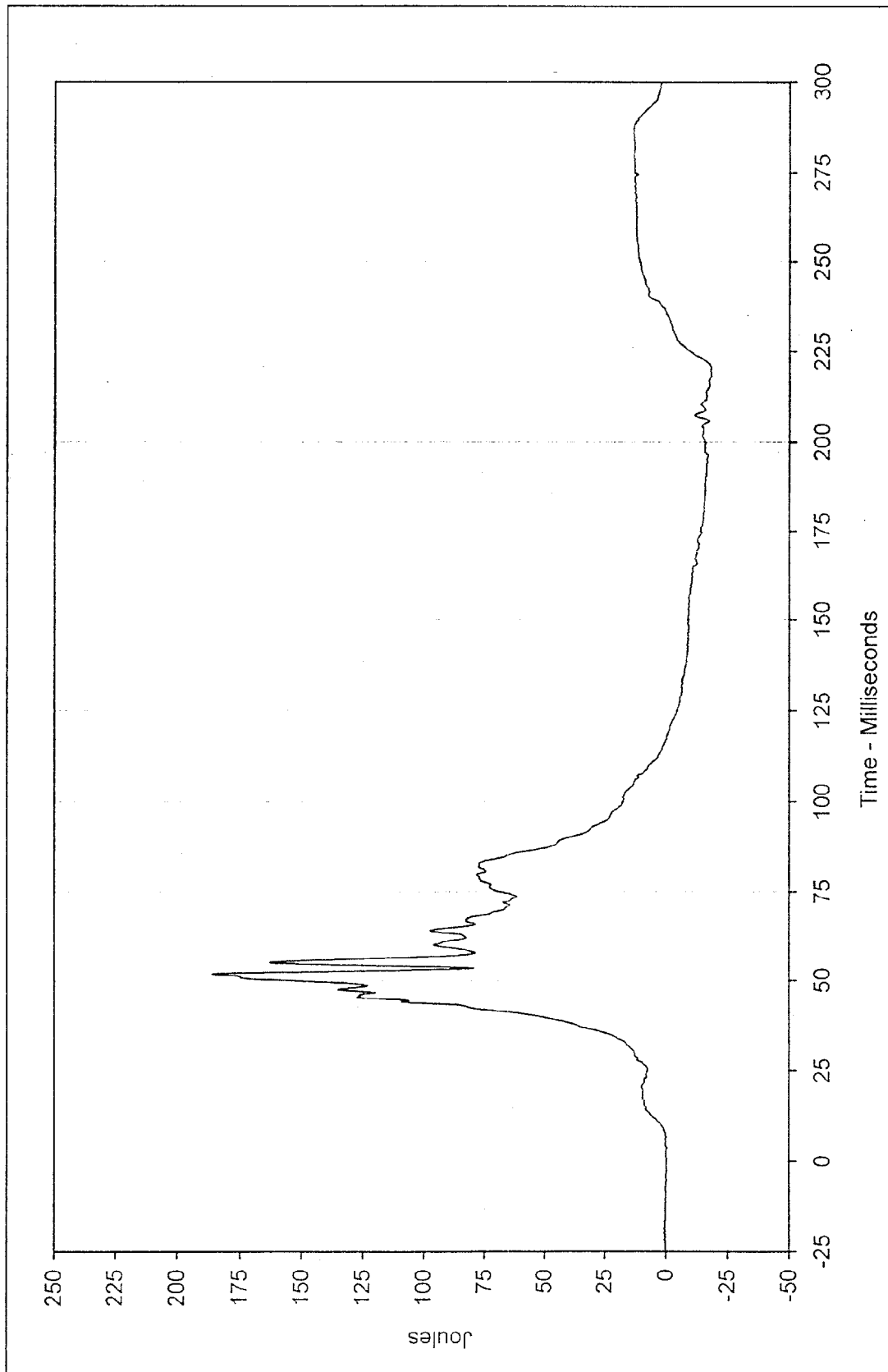
Curve Description:	Driver Left Upper Tibia Moment Y	Testing Program:	1997 New Car Assessment Program
Maximum Value:	133.3 at 60.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-23.1 at 196.8 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-026		





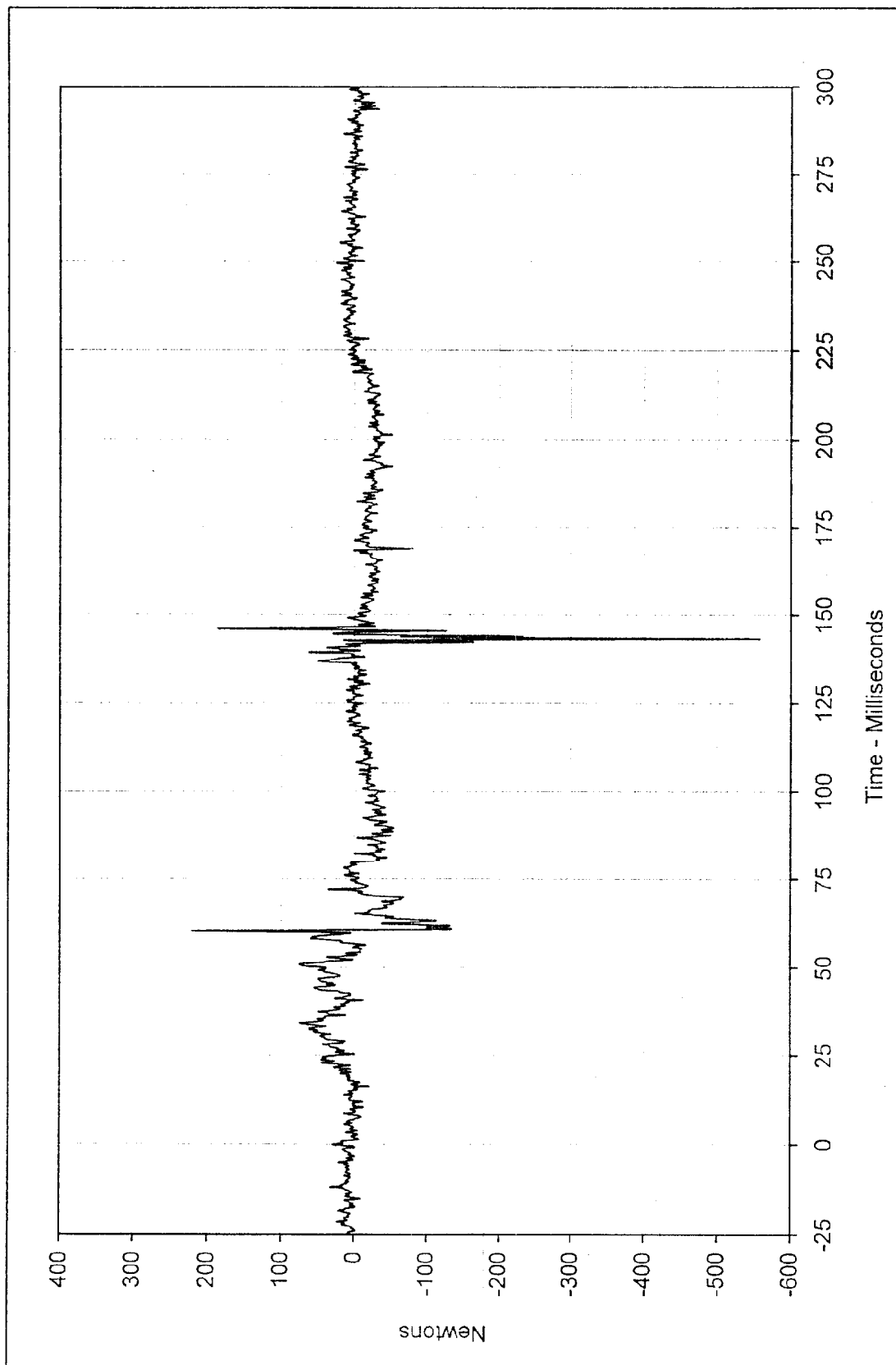
Curve Description:	Driver Right Upper Tibia Moment X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	103.3 at 52 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-47.8 at 43.6 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-027		





Curve Description:	Driver Right Upper Tibia Moment Y	Testing Program:	1997 New Car Assessment Program
Maximum Value:	186.2 at 51.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-18.4 at 218.6 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-028		

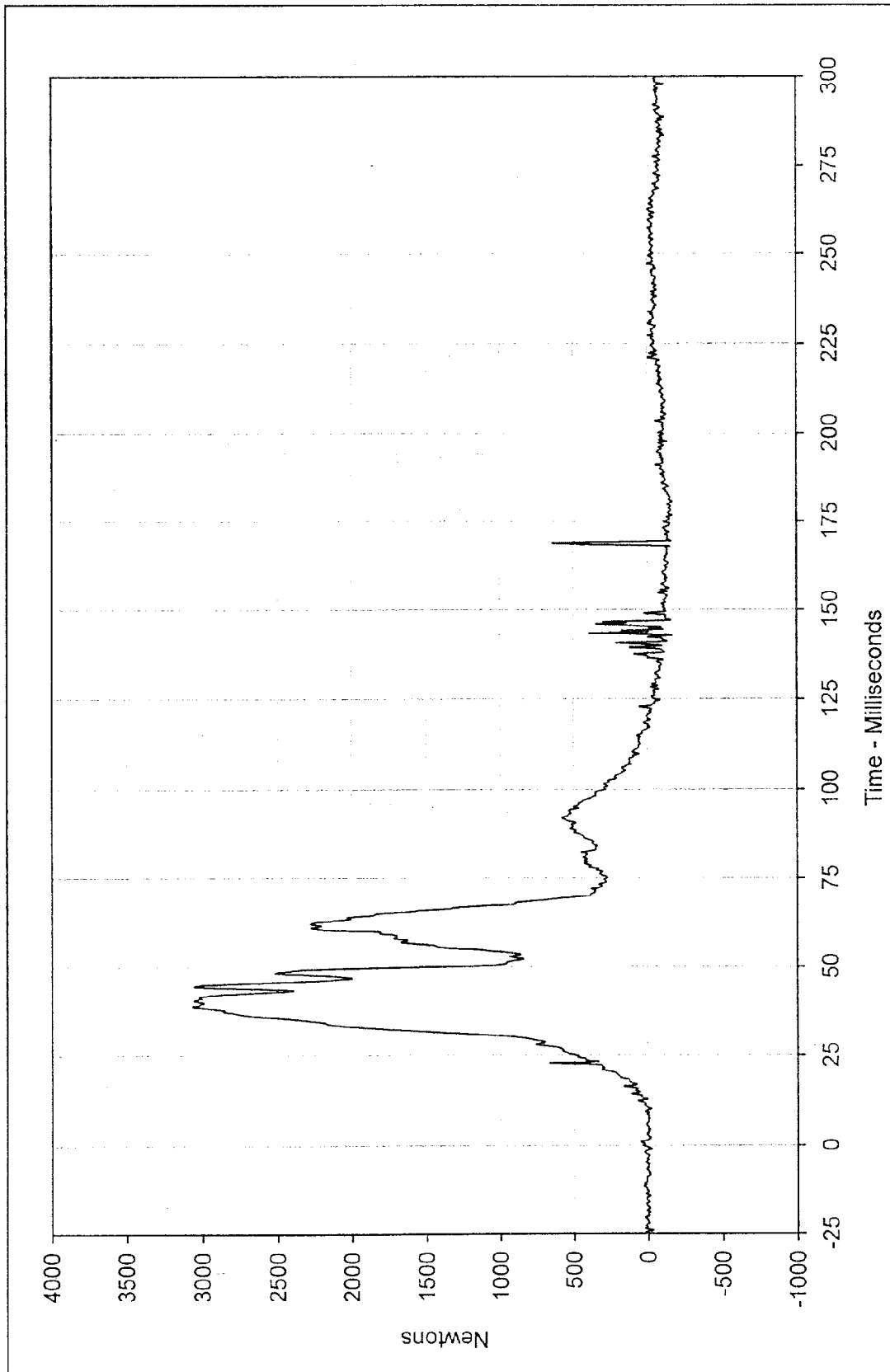




Curve Description:	Driver Left Lower Tibia Force Y		Testing Program:	1997 New Car Assessment Program
Maximum Value:	220.2	at 60.4	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-557.9	at 143.3		
SAE Filter Class:	600			
Date of Test:	3/13/97			
Curve Number:	FIL-029			

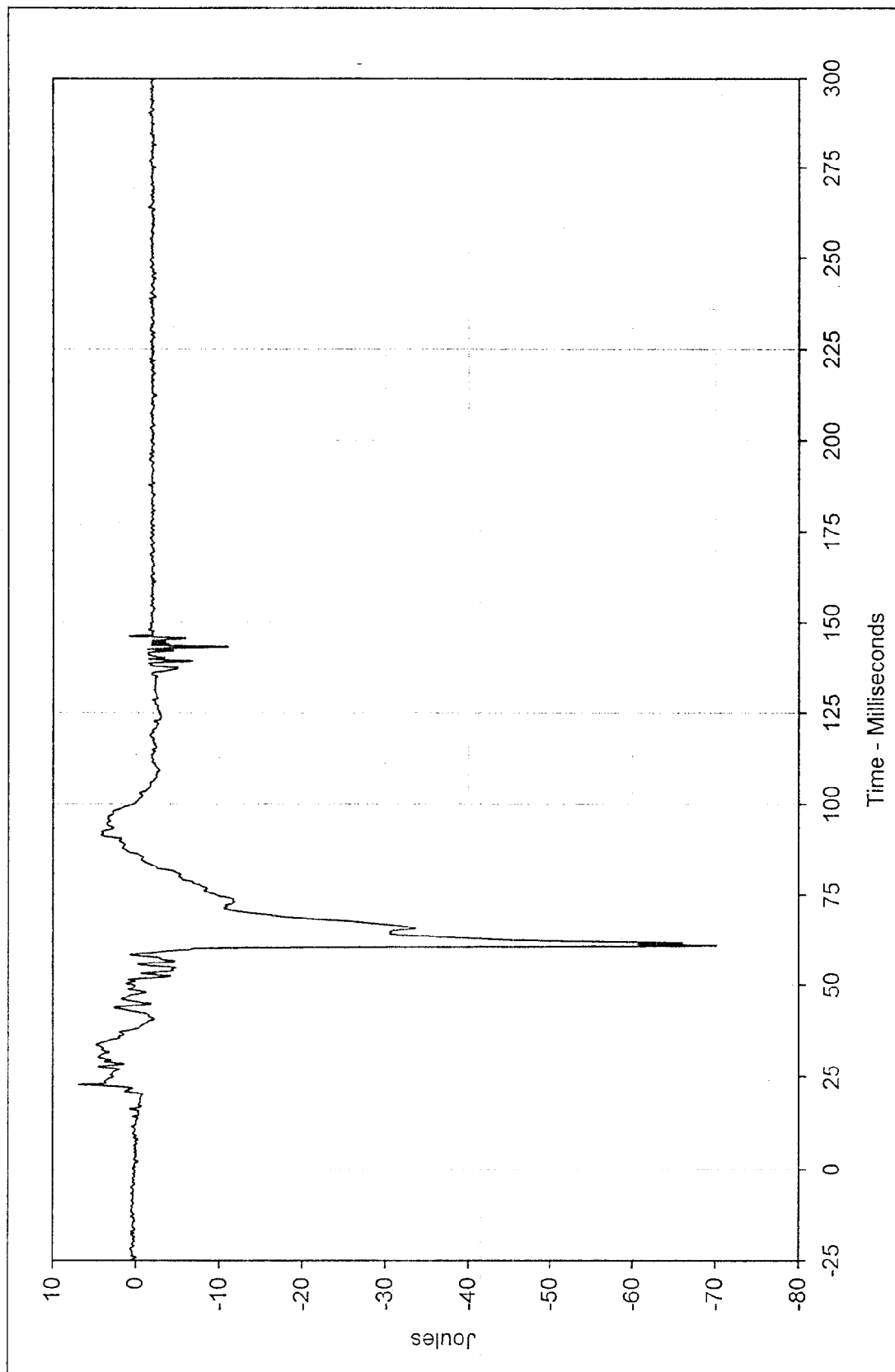






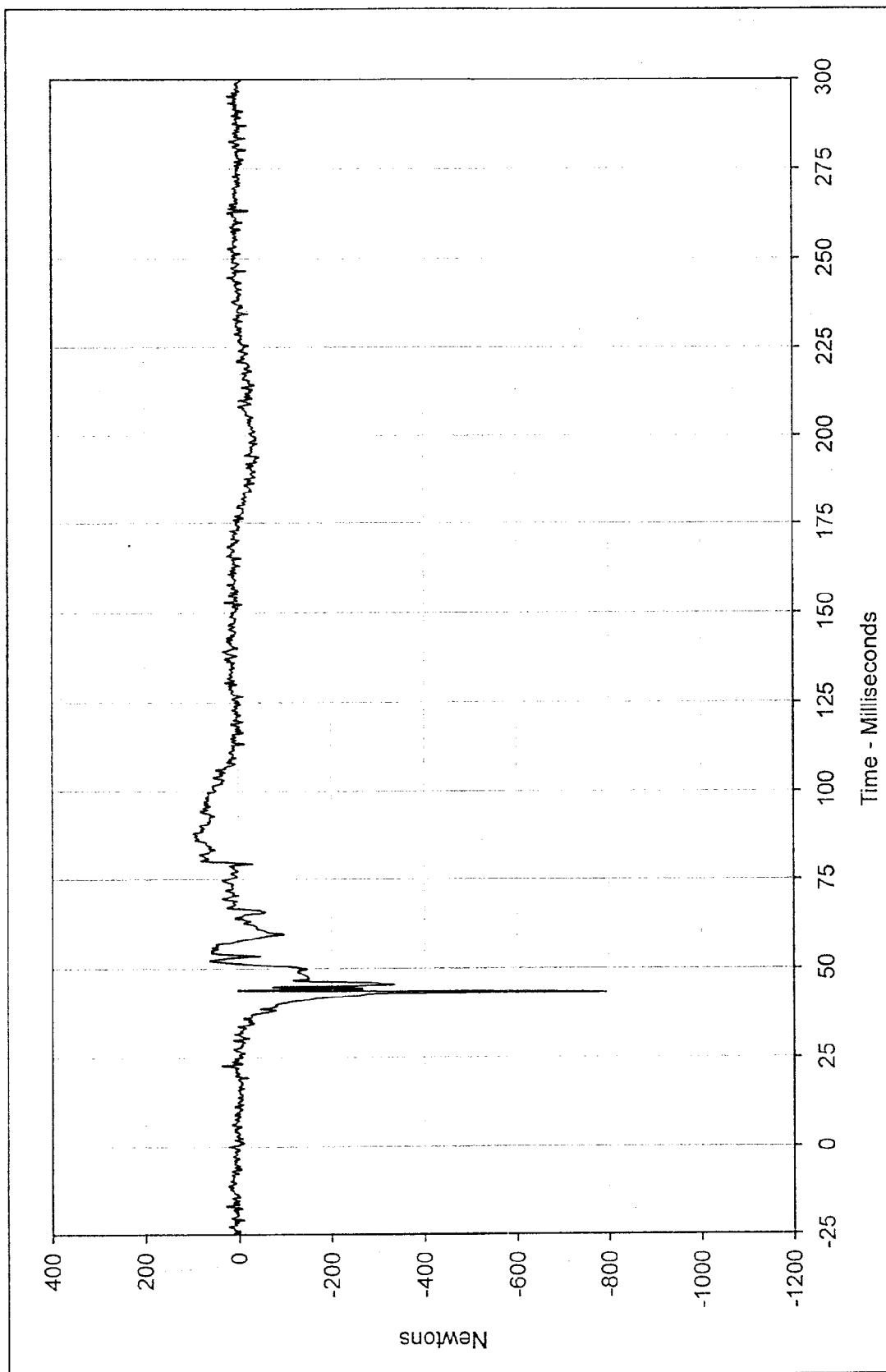
Curve Description:	Driver Left Lower Tibia Force Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	3065.2 at 38.8 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-168.4 at 180.7 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-030		





Curve Description:	Driver Left Lower Tibia Moment X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	6.9 at 22.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-70.2 at 61.0 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-031		

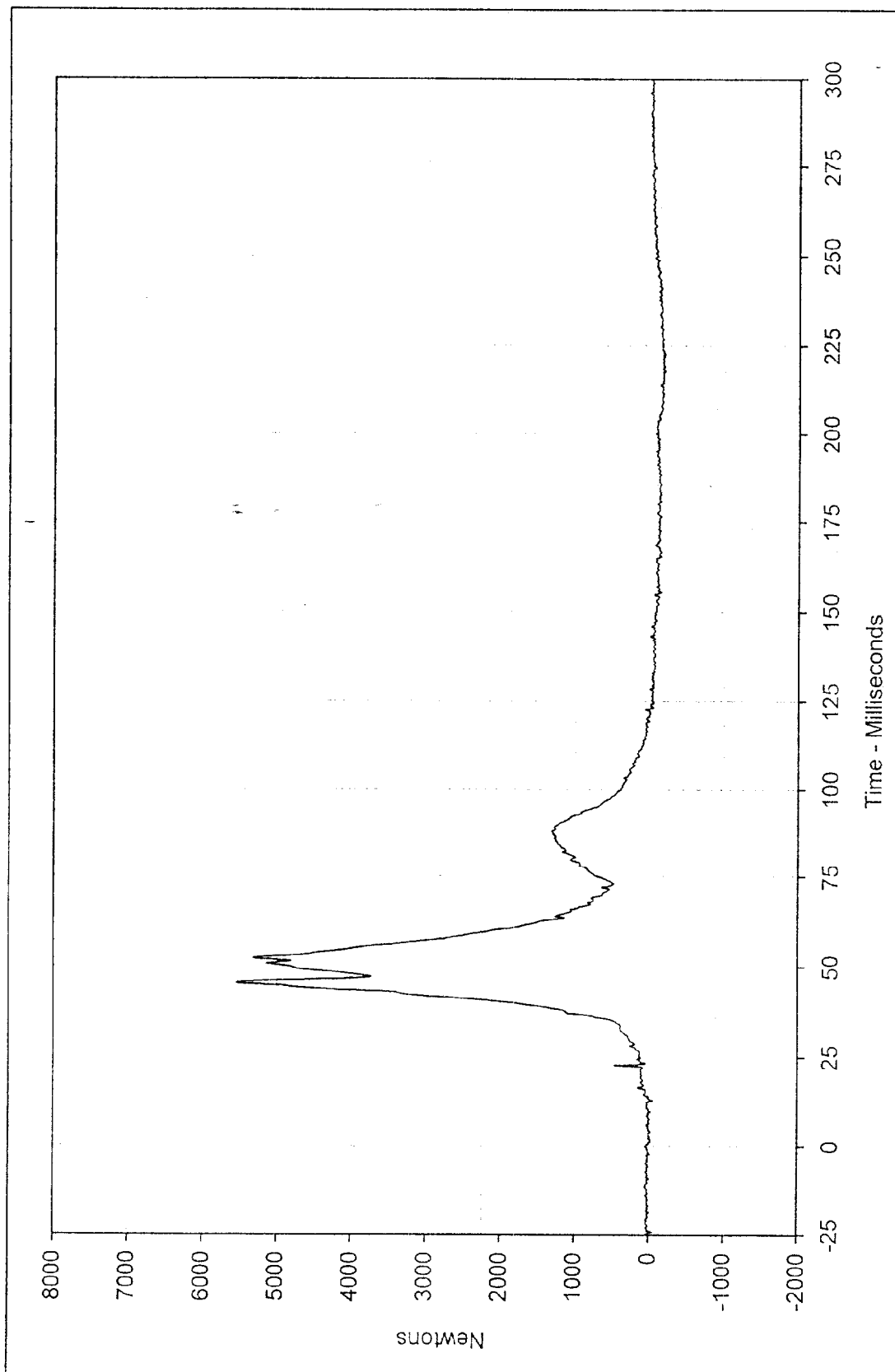




Curve Description: Driver Right Lower Tibia Force Y
 Maximum Value: 96.6 at 87.9 Milliseconds
 Minimum Value: -792.5 at 43.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 3/13/97
 Curve Number: FIL-032

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

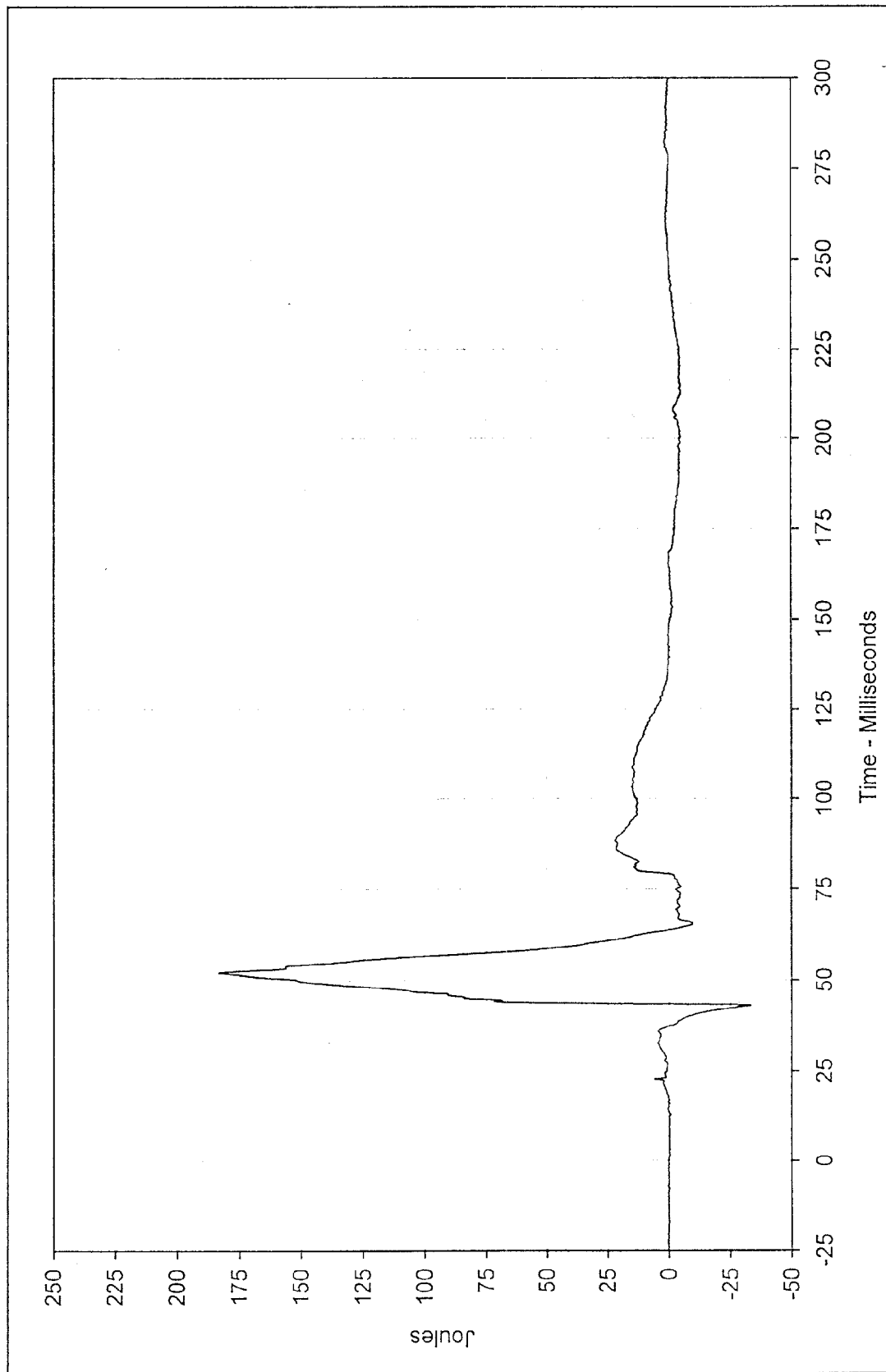




Curve Description:		Driver Right Lower Tibia Force Z		Testing Program:	1997 New Car Assessment Program
Maximum Value:	5534.2	at	45.4	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-192.2	at	217.7		
SAE Filter Class:	600				
Date of Test:	3/13/97				
Curve Number:	FIL-033				





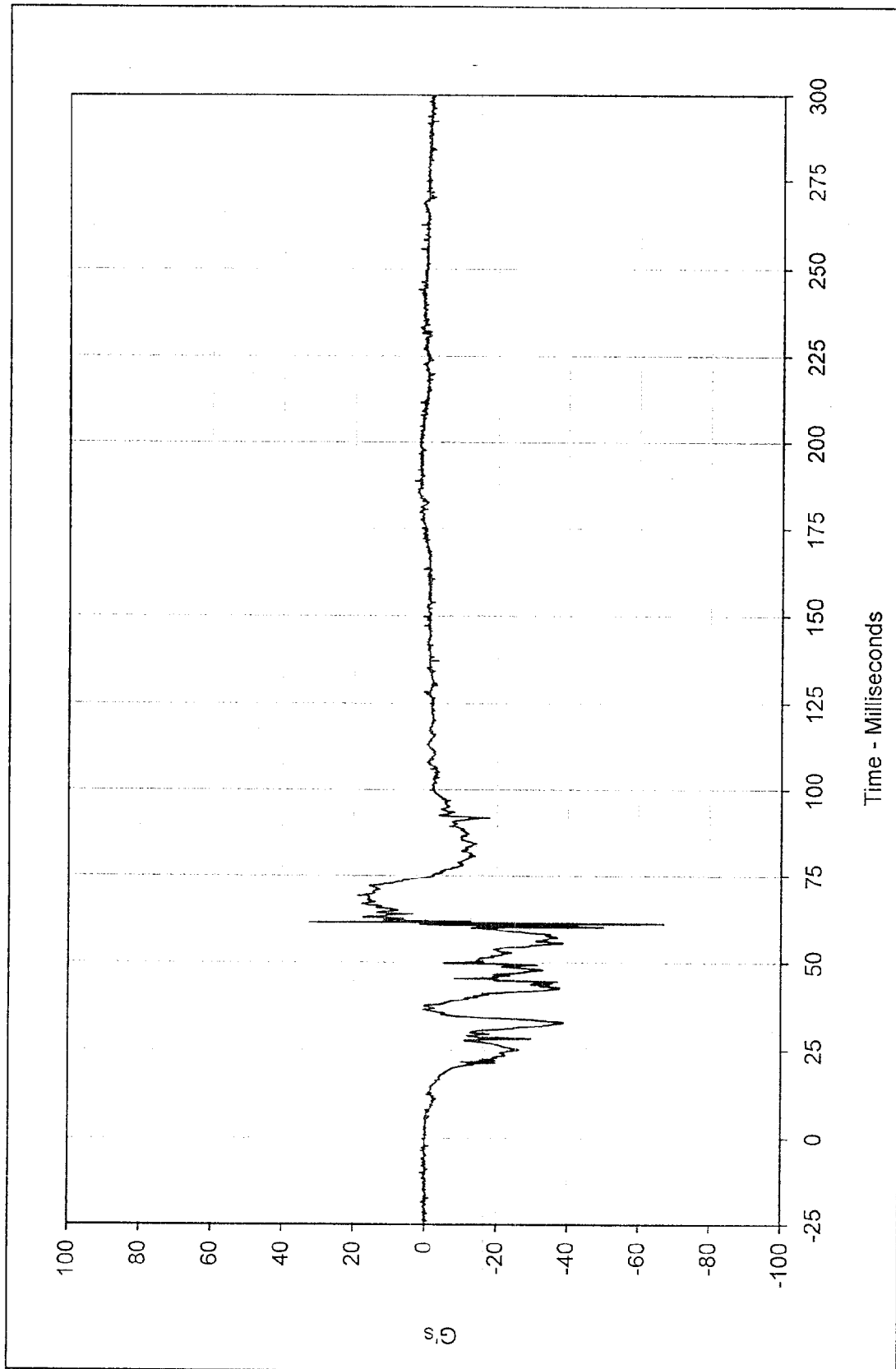


Curve Description: Driver Right Lower Tibia Moment X
 Maximum Value: 183.4 at 52.4 Milliseconds
 Minimum Value: -33.4 at 43 Milliseconds



SAE Filter Class: 600
 Date of Test: 3/13/97
 Curve Number: FIL-034

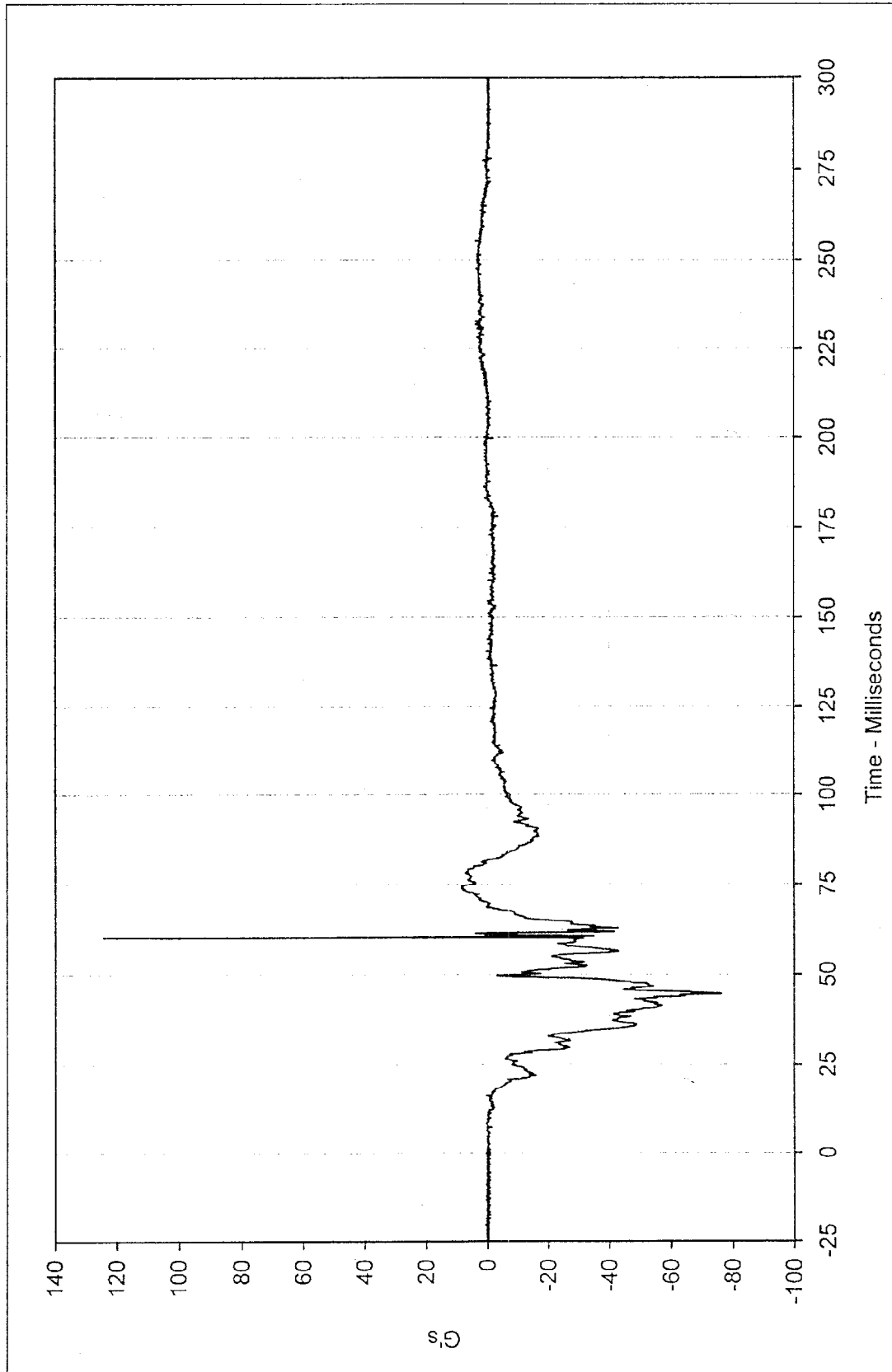
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier



Curve Description:	Driver Left Foot Aft X			Testing Program:	1997 New Car Assessment Program
Maximum Value:	32.6	at	61.4	Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value:	-66.8	at	61	Milliseconds	
SAE Filter Class:	1000				
Date of Test:	3/13/97				
Curve Number:	FIL-035				

The logo for KAPCO Engineering. It features a stylized lightbulb with a gear-like base, followed by the word "KAPCO" in large, bold, sans-serif capital letters. To the right of "KAPCO", the word "Engineering" is written in a smaller, italicized, sans-serif font. The entire logo is set against a dark, rectangular background.



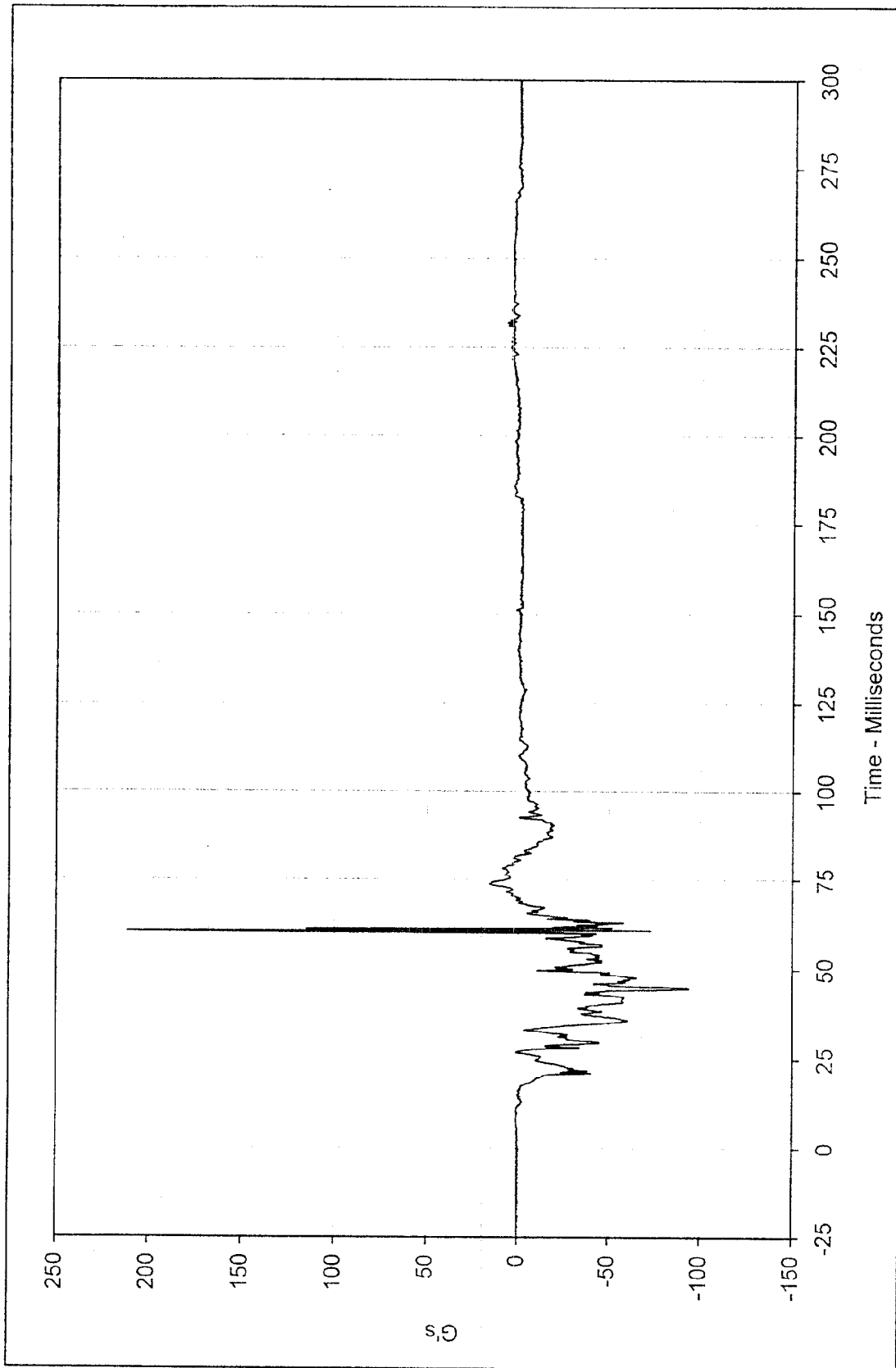


Curve Description: Driver Left Foot Aft Z
 Maximum Value: 123.9 at 60.3 Milliseconds
 Minimum Value: -76.1 at 44.7 Milliseconds

SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-036

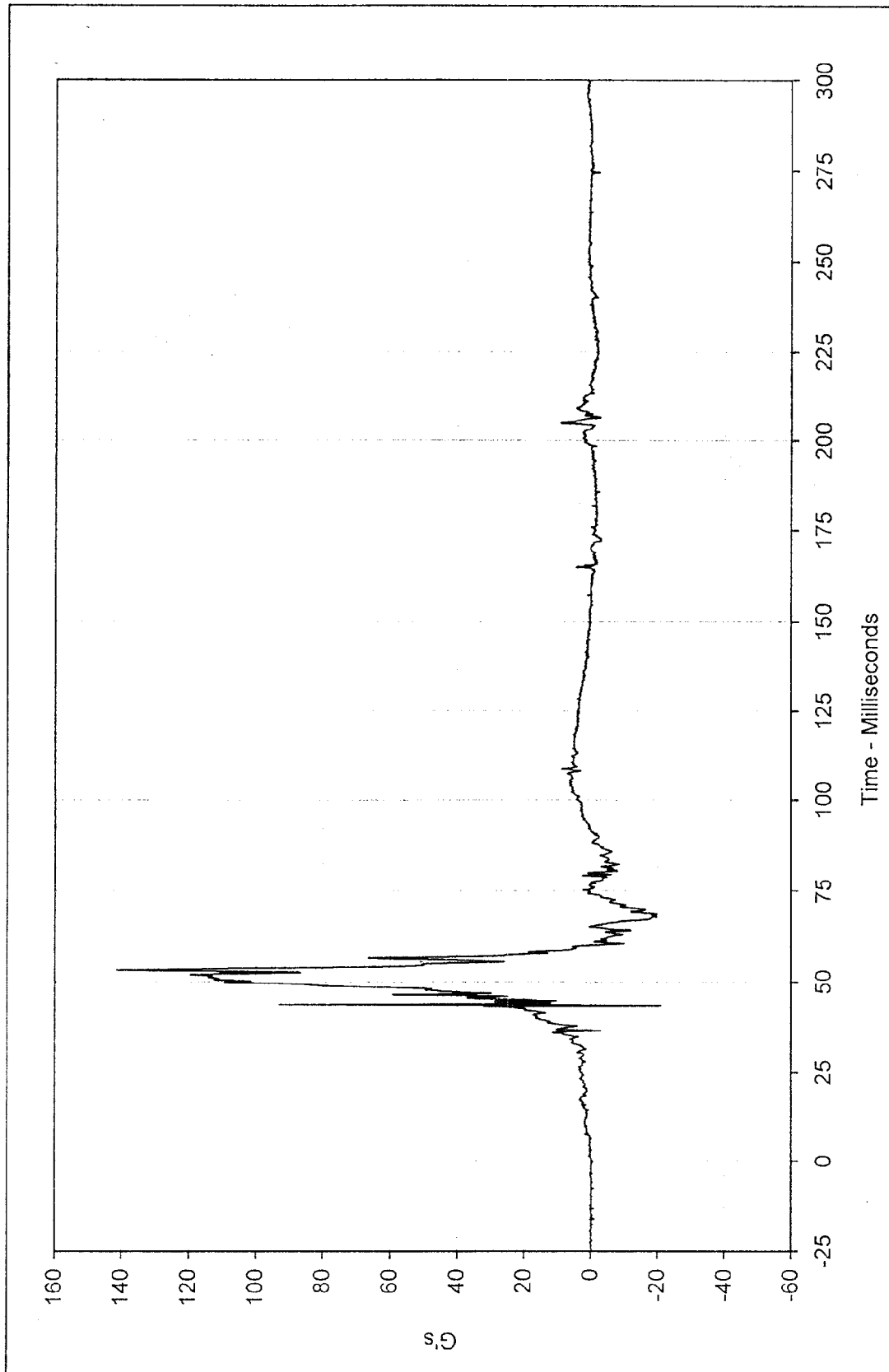
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





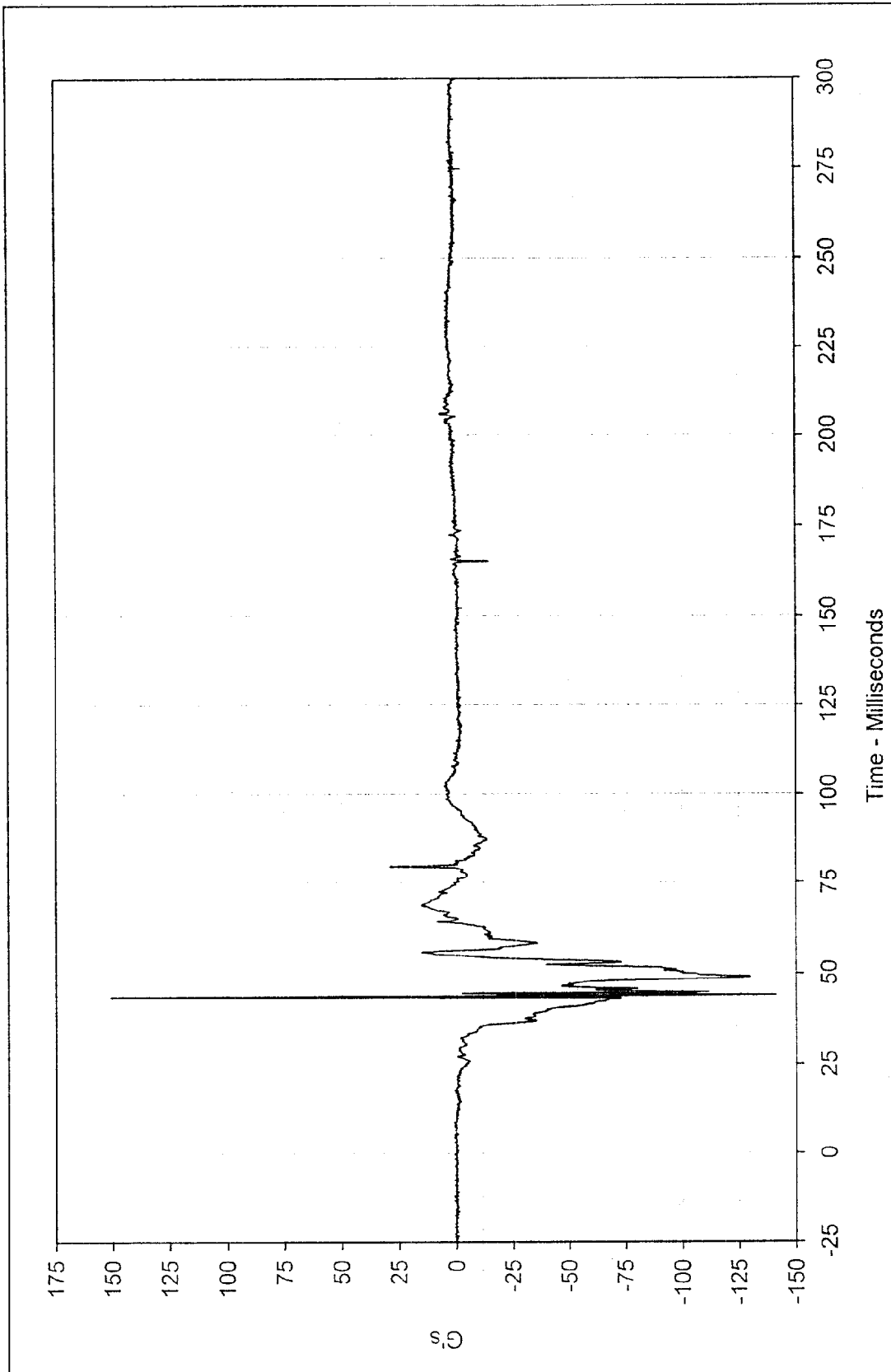
Curve Description:	Driver Left Foot Fore Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	210.8 at 60.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-94.1 at 44.7 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-037		





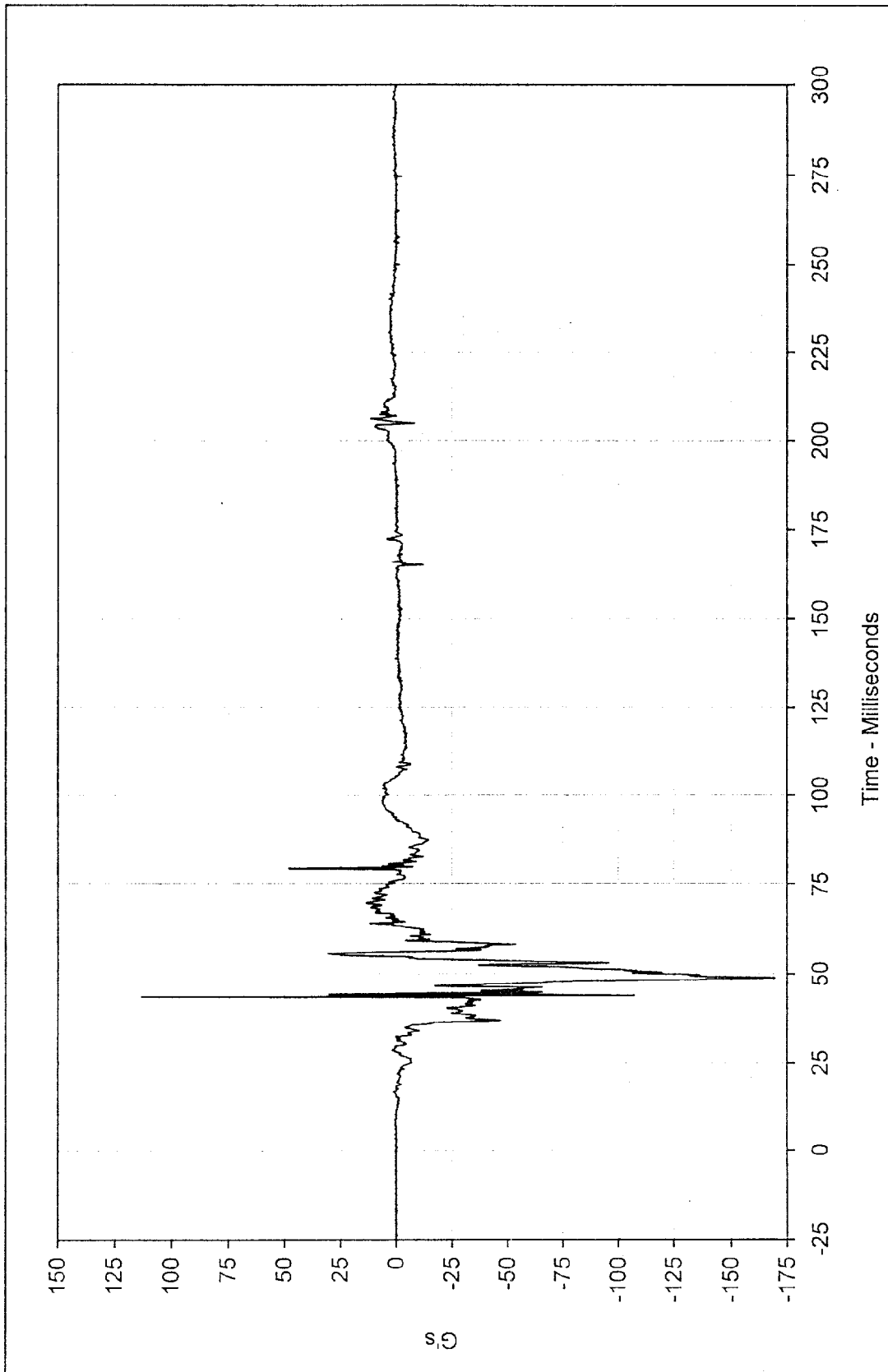
Curve Description:	Driver Right Foot Aft X		Testing Program:	1997 New Car Assessment Program
Maximum Value:	141.6	at 53.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-20.2	at 43.3 Milliseconds		
SAE Filter Class:	1000			
Date of Test:	3/13/97			
Curve Number:	FIL-038			





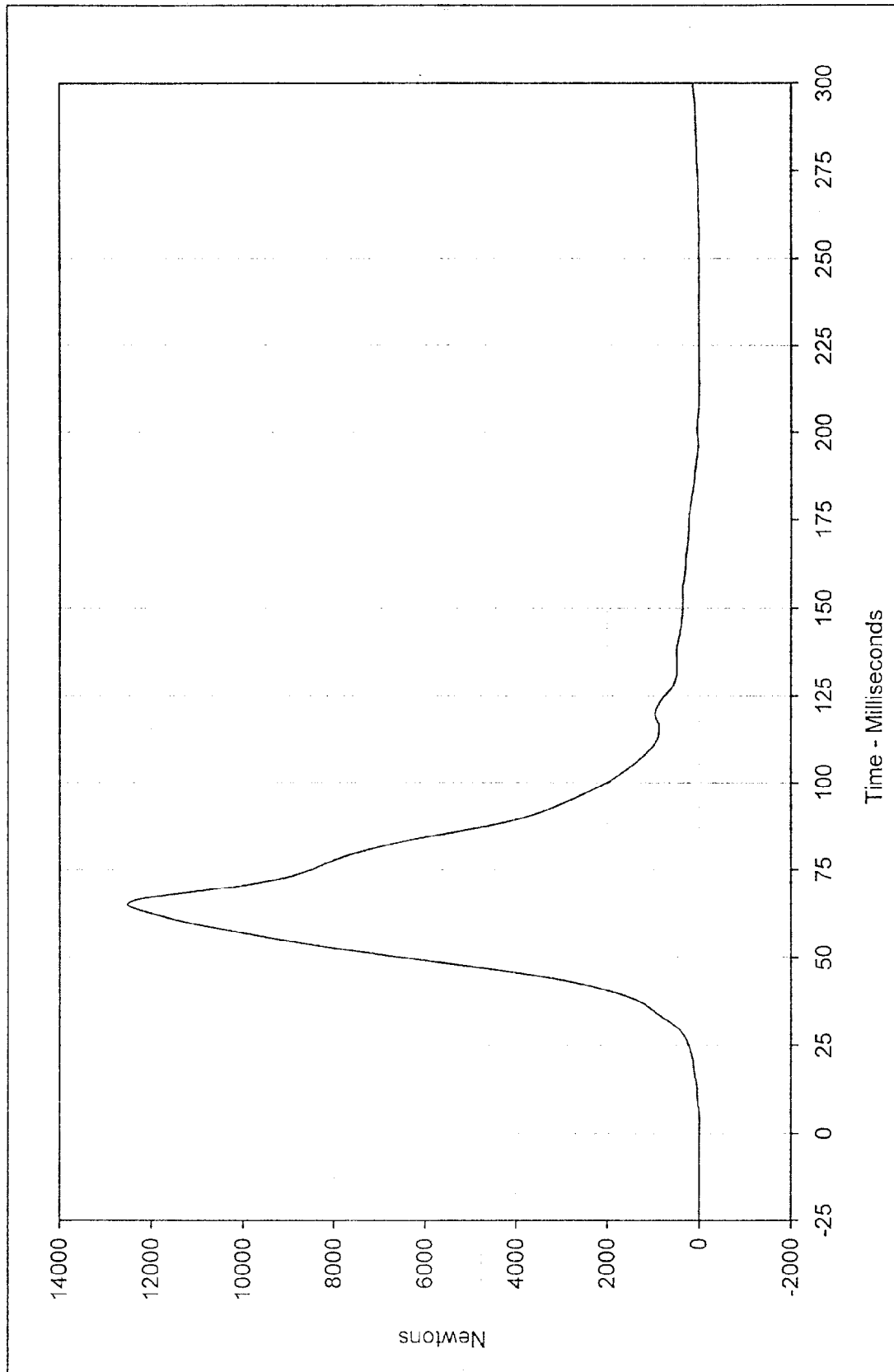
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





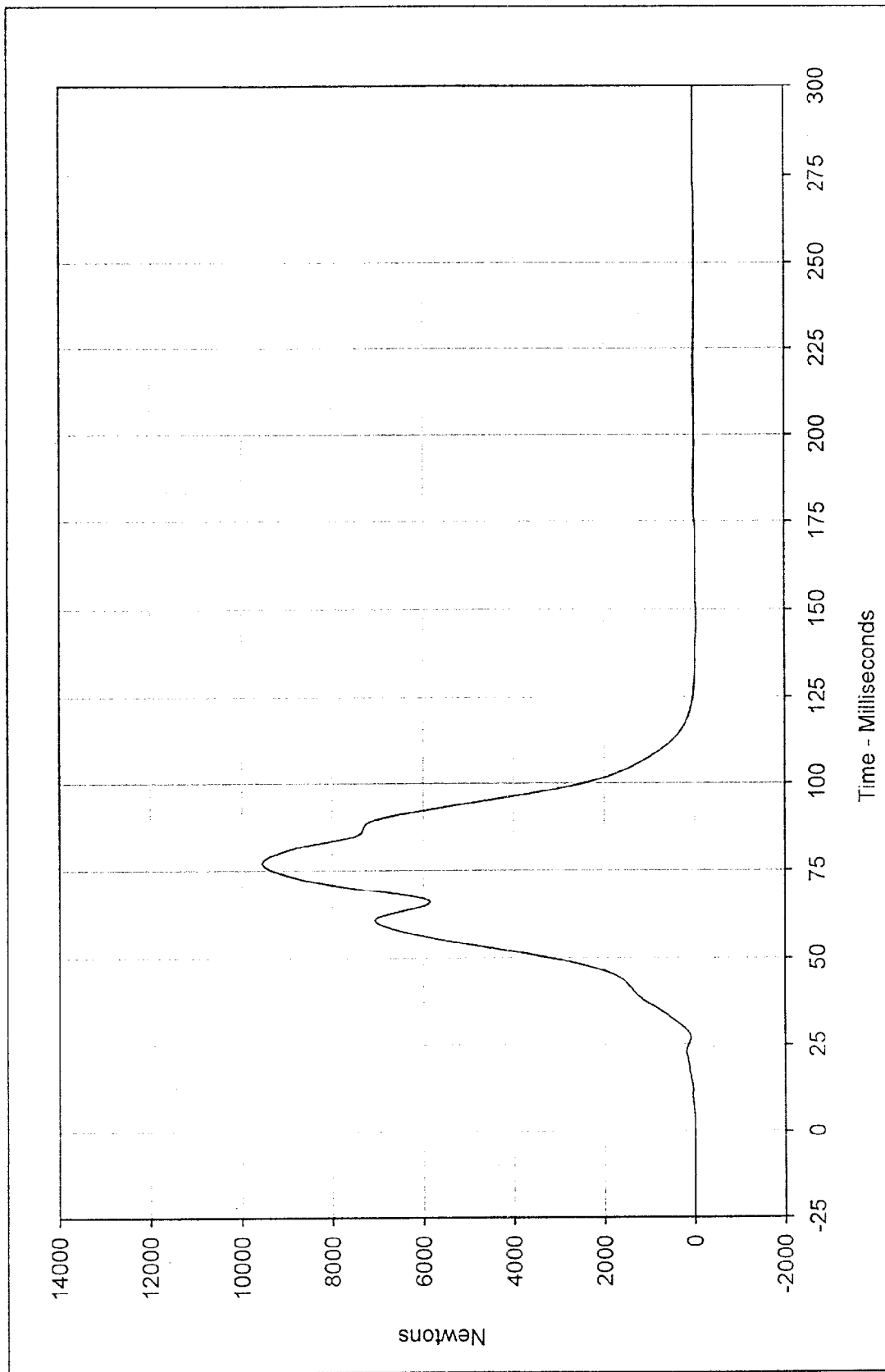
Curve Description:	Driver Right Foot Fore Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	112.8 at 43.6 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-169.3 at 49 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-040		





Curve Description:	Driver Lap Belt Force	Testing Program:	1997 New Car Assessment Program
Maximum Value:	12511.2 at 65 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-12.7 at 3.4 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-041		

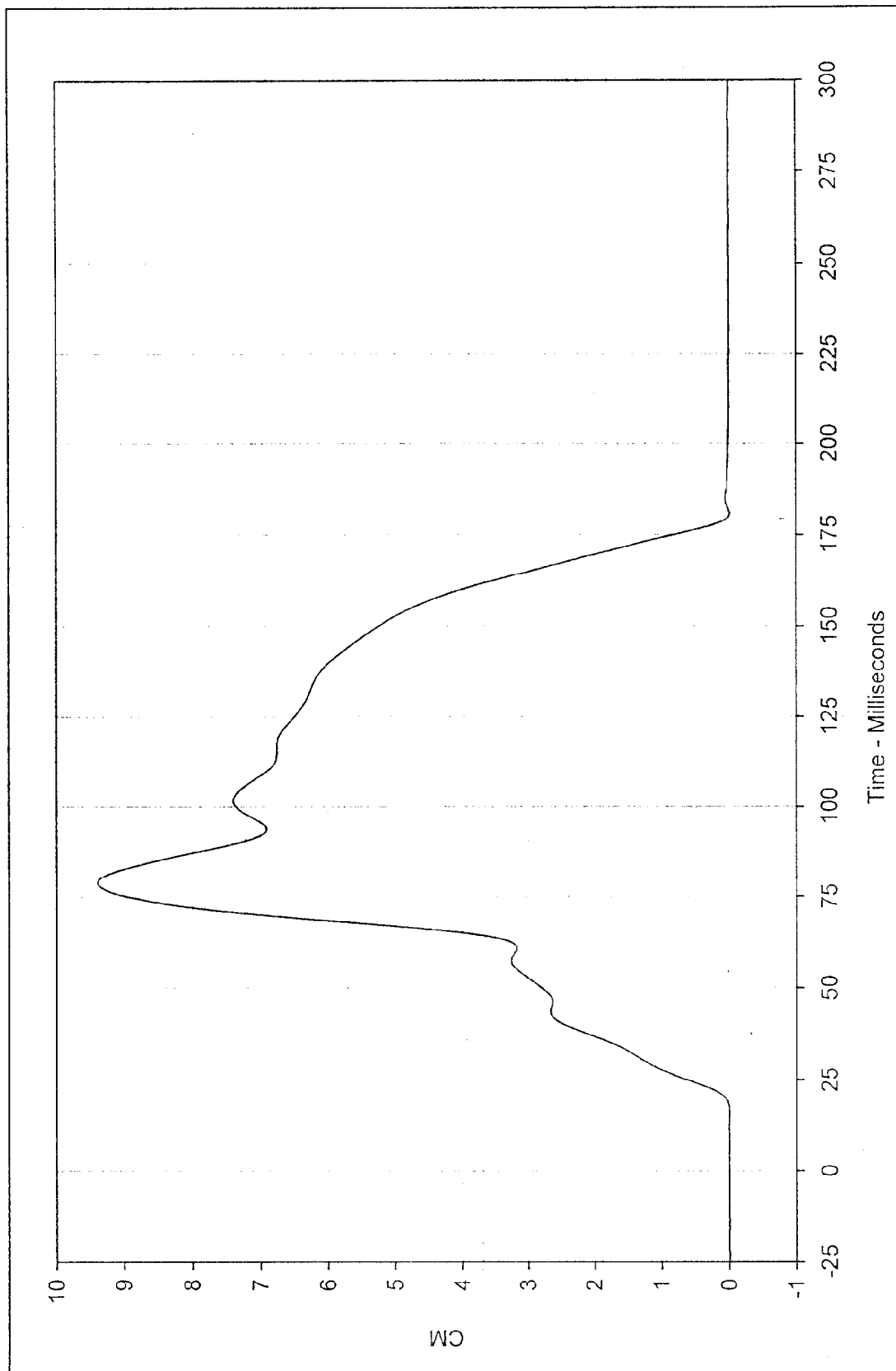




Curve Description: Driver Shoulder Belt Force
 Maximum Value: 9542.1 at 77.1 Milliseconds
 Minimum Value: -35.7 at 145.9 Milliseconds
 SAE Filter Class: 60
 Date of Test: 3/13/97
 Curve Number: FIL-042

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

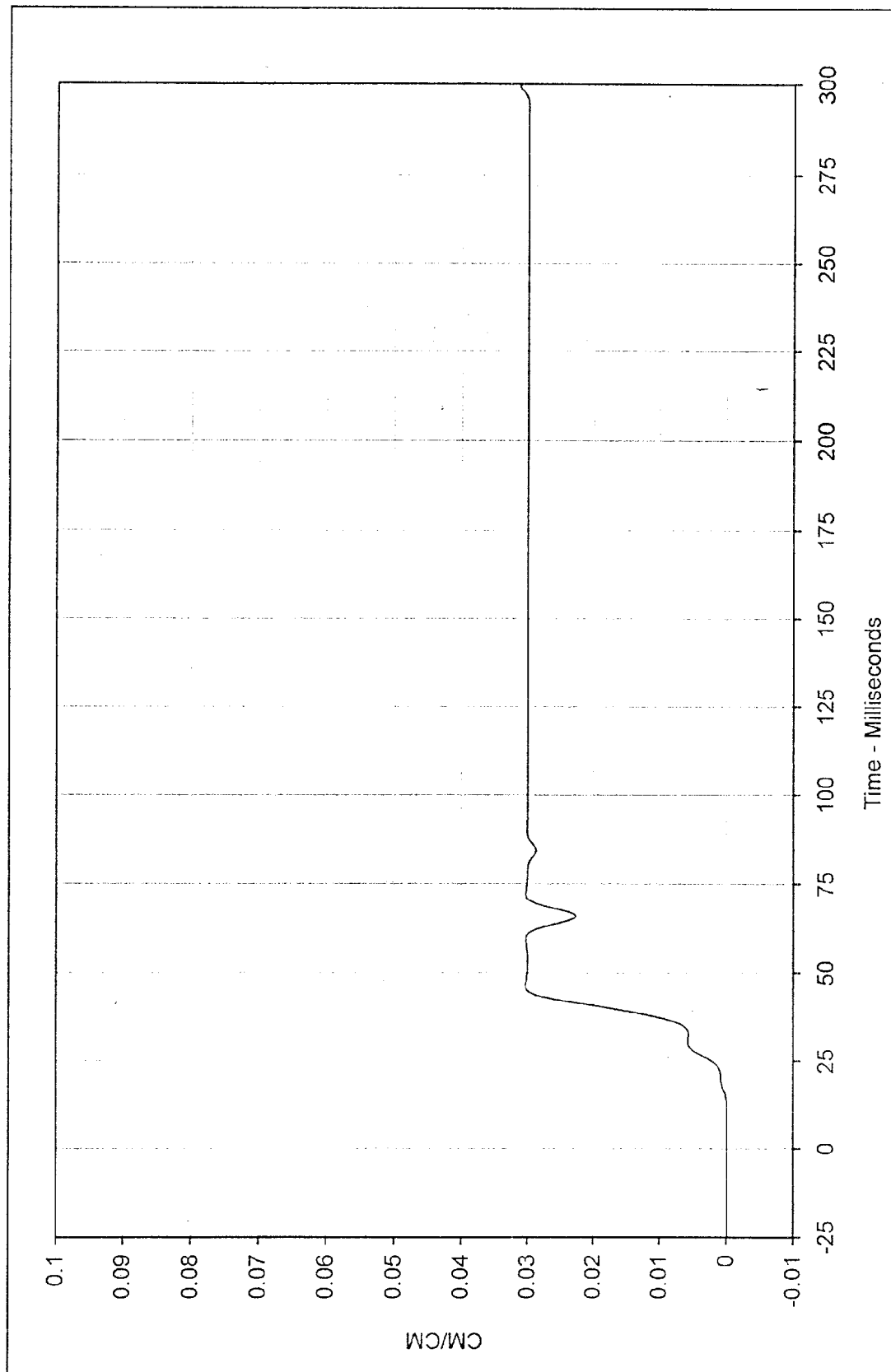




B60

Curve Description:	Driver Shoulder Belt Pullout	Testing Program:	1997 New Car Assessment Program
Maximum Value:	9.39 at 78.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-0.02 at -30 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-043		





Curve Description: Driver Shoulder Belt Elongation

Maximum Value: 0.031 at 299.3 Milliseconds

Minimum Value: 0.000 at 0.0 Milliseconds

SAE Filter Class: 60

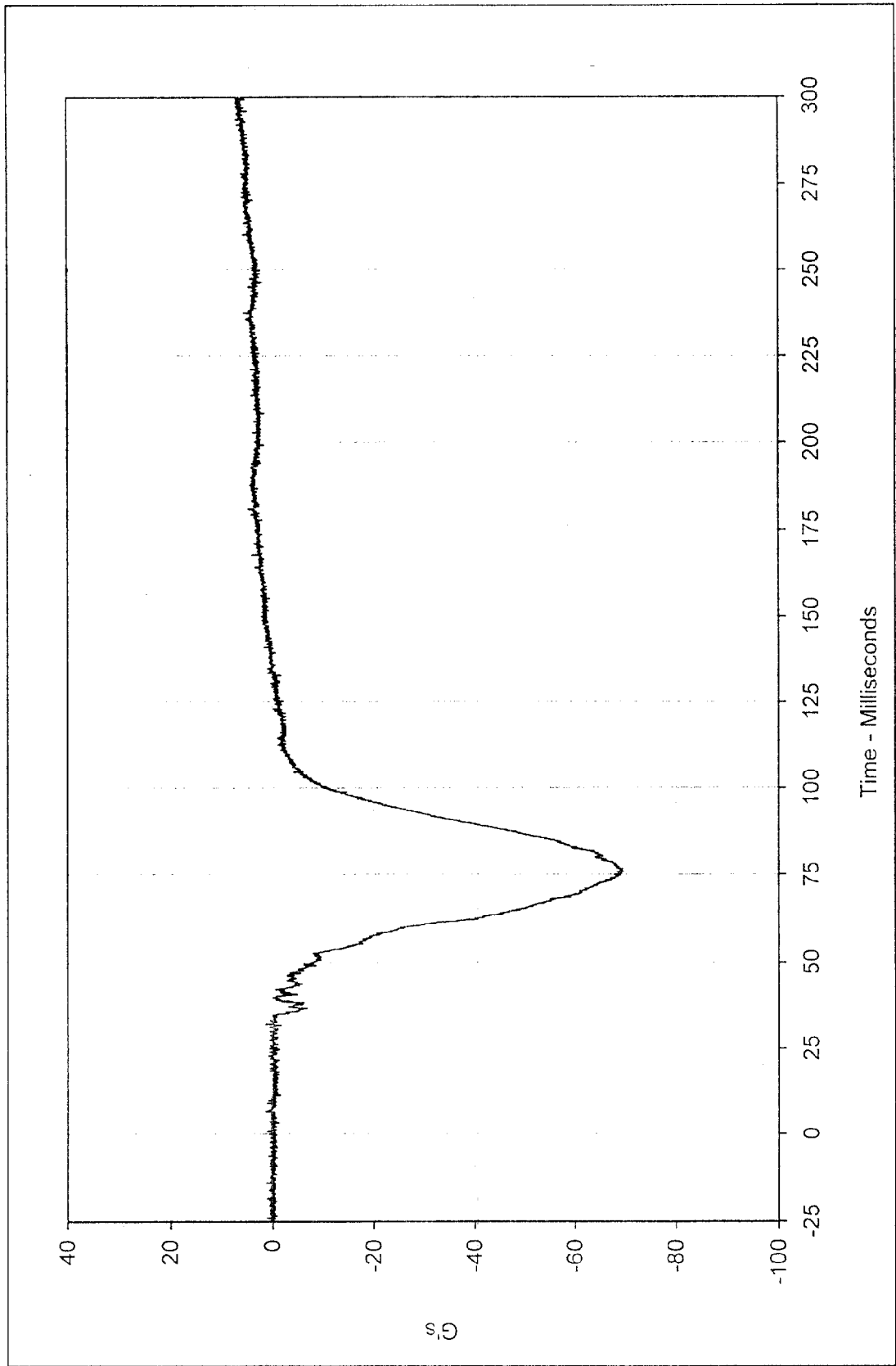
Date of Test: 3/13/97

Curve Number: FIL-044

Testing Program: 1997 New Car Assessment Program

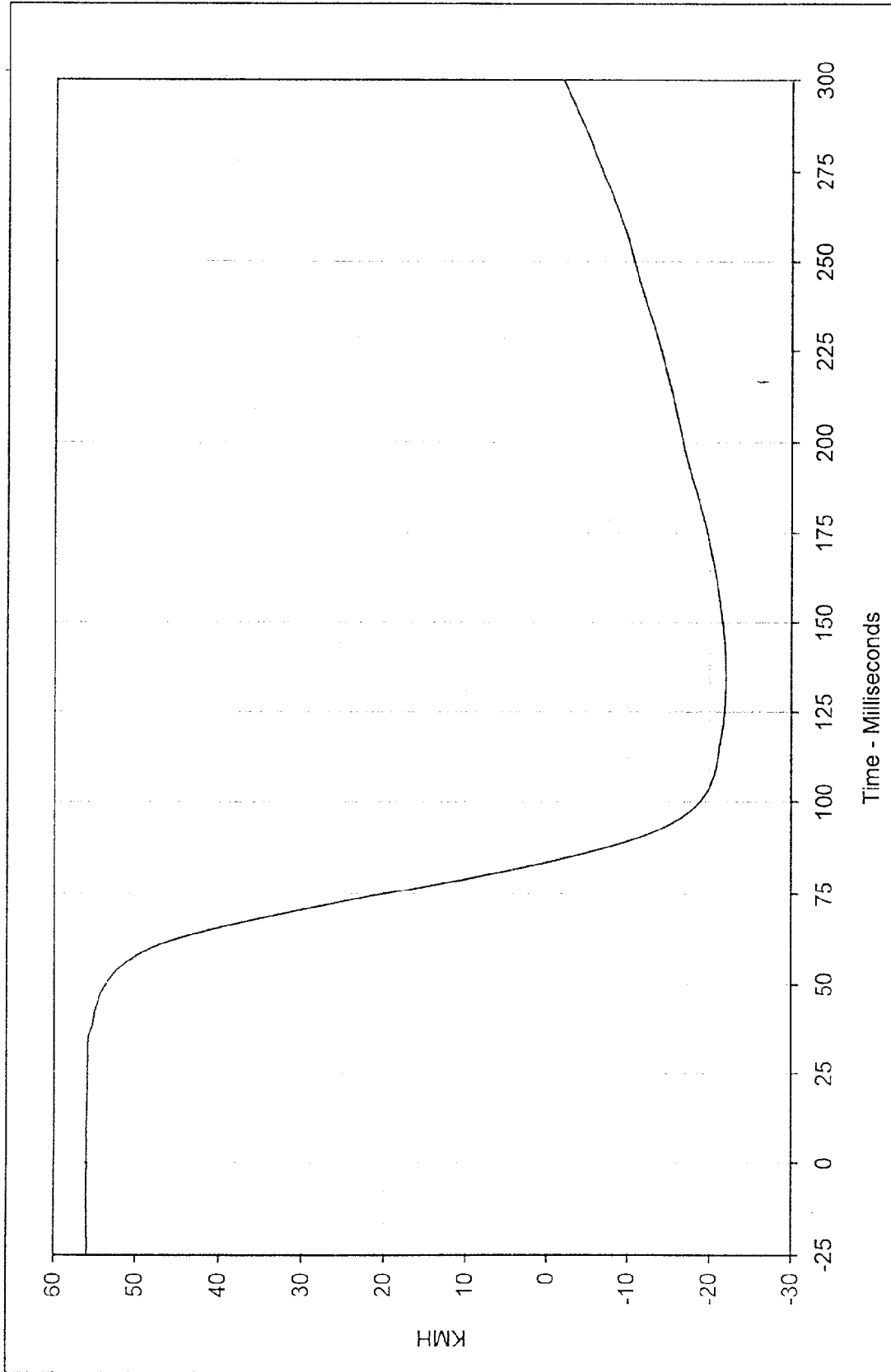
Test Vehicle: 1997 Chevrolet Cavalier





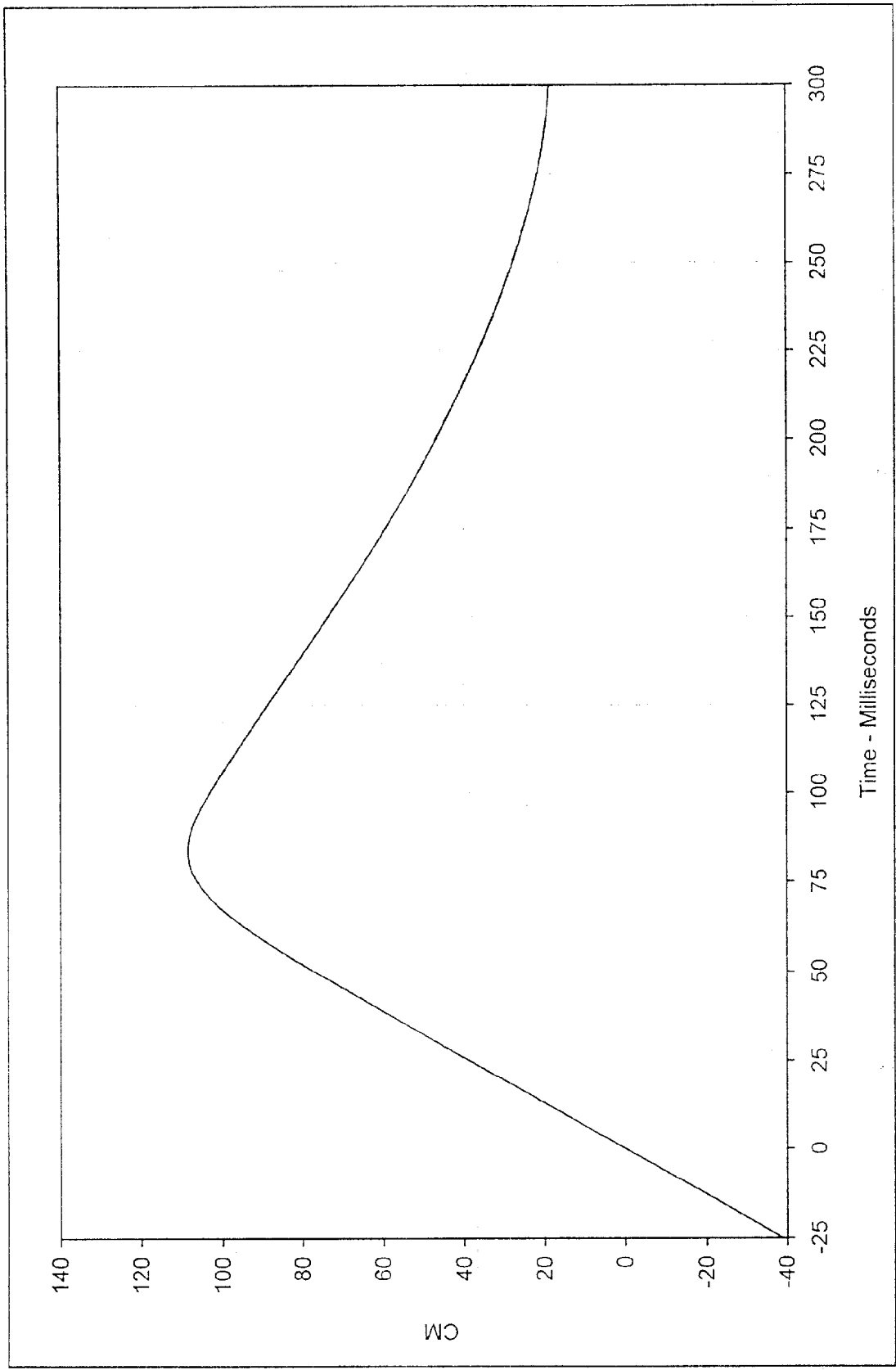
Curve Description:	Passenger Head Primary X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	6.9 at 293.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-69.7 at 75.8 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-045		





Curve Description:	Passenger Head Primary X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 10.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-22.0 at 133.6 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-045		

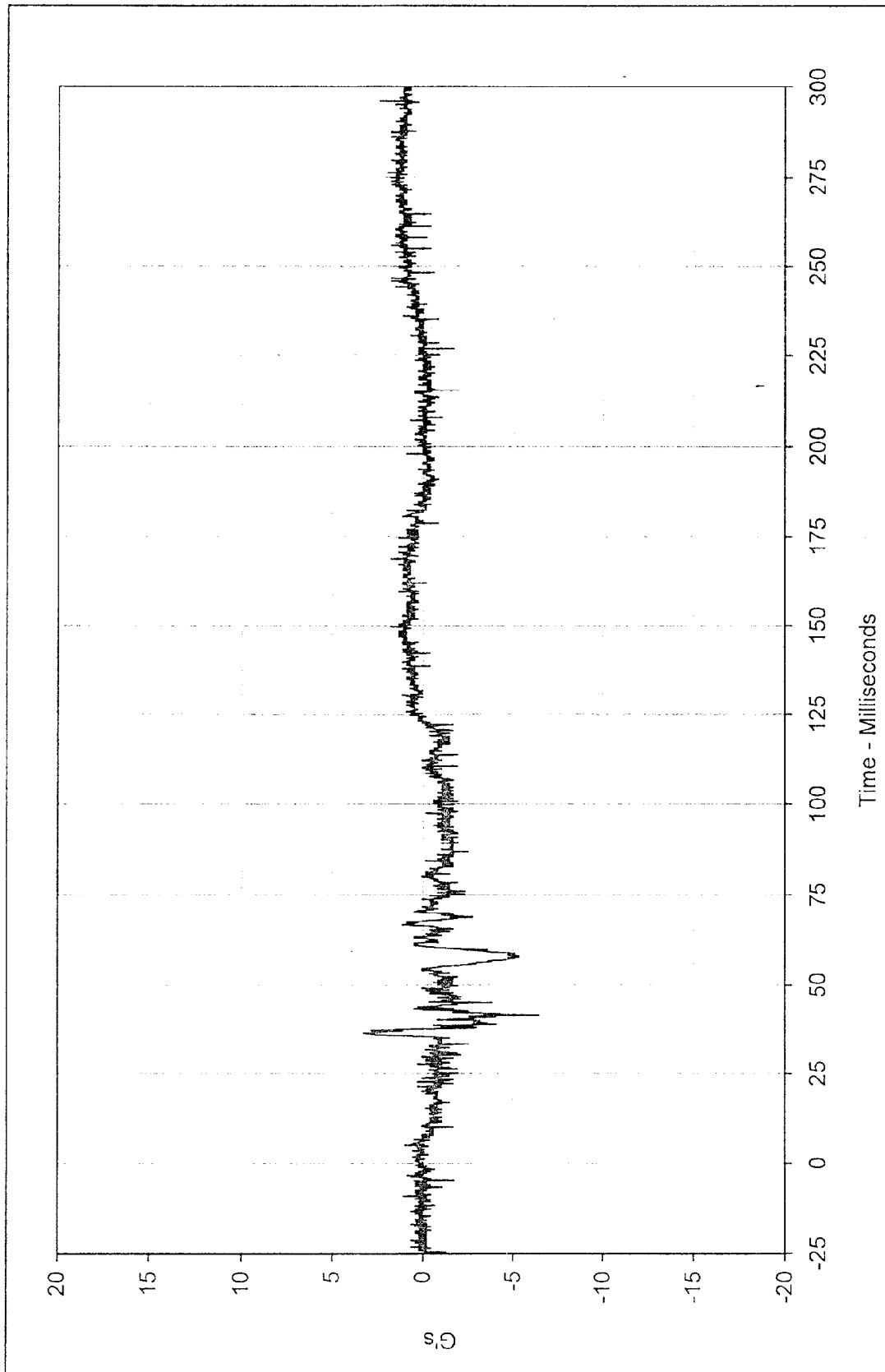




B64

Curve Description:	Passenger Head Primary X Displ.		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	108.5	at 83.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-0.1	at 0.0 Milliseconds			
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	IN2-045				

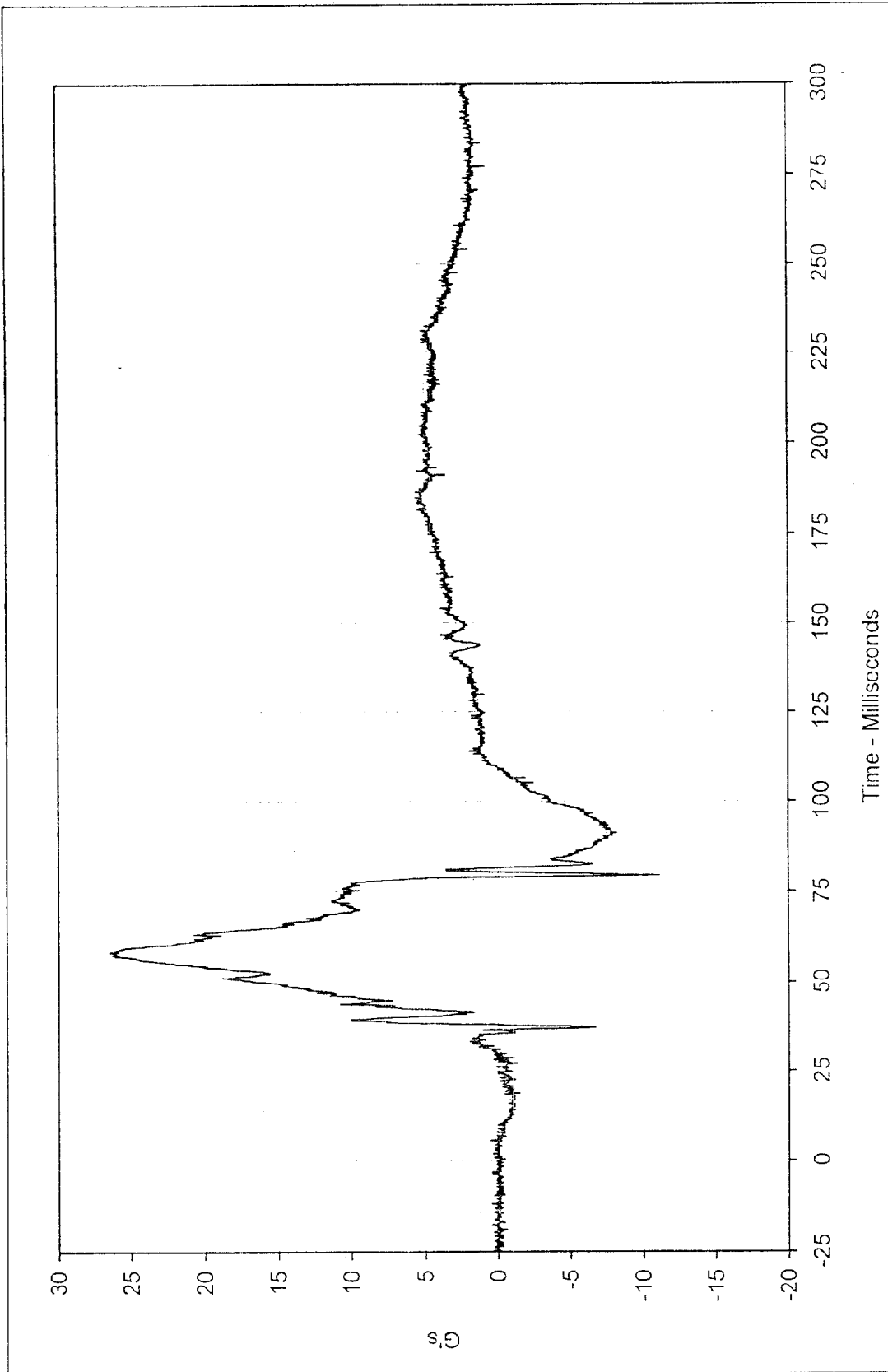




Curve Description: Passenger Head Primary Y
 Maximum Value: 3.3 at 36.4 Milliseconds
 Minimum Value: -6.4 at 41.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-046

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

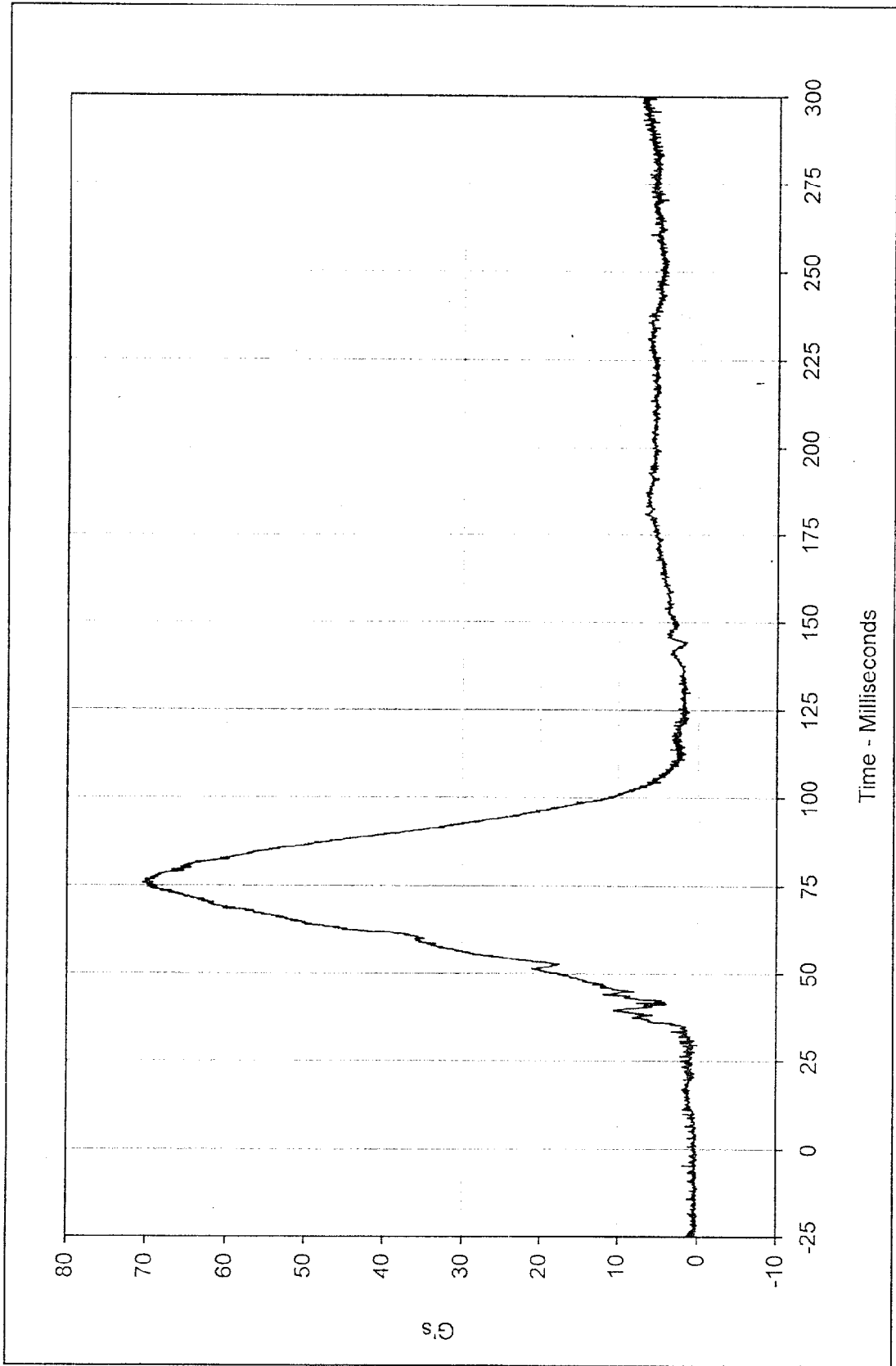




Curve Description: Passenger Head Primary Z
 Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

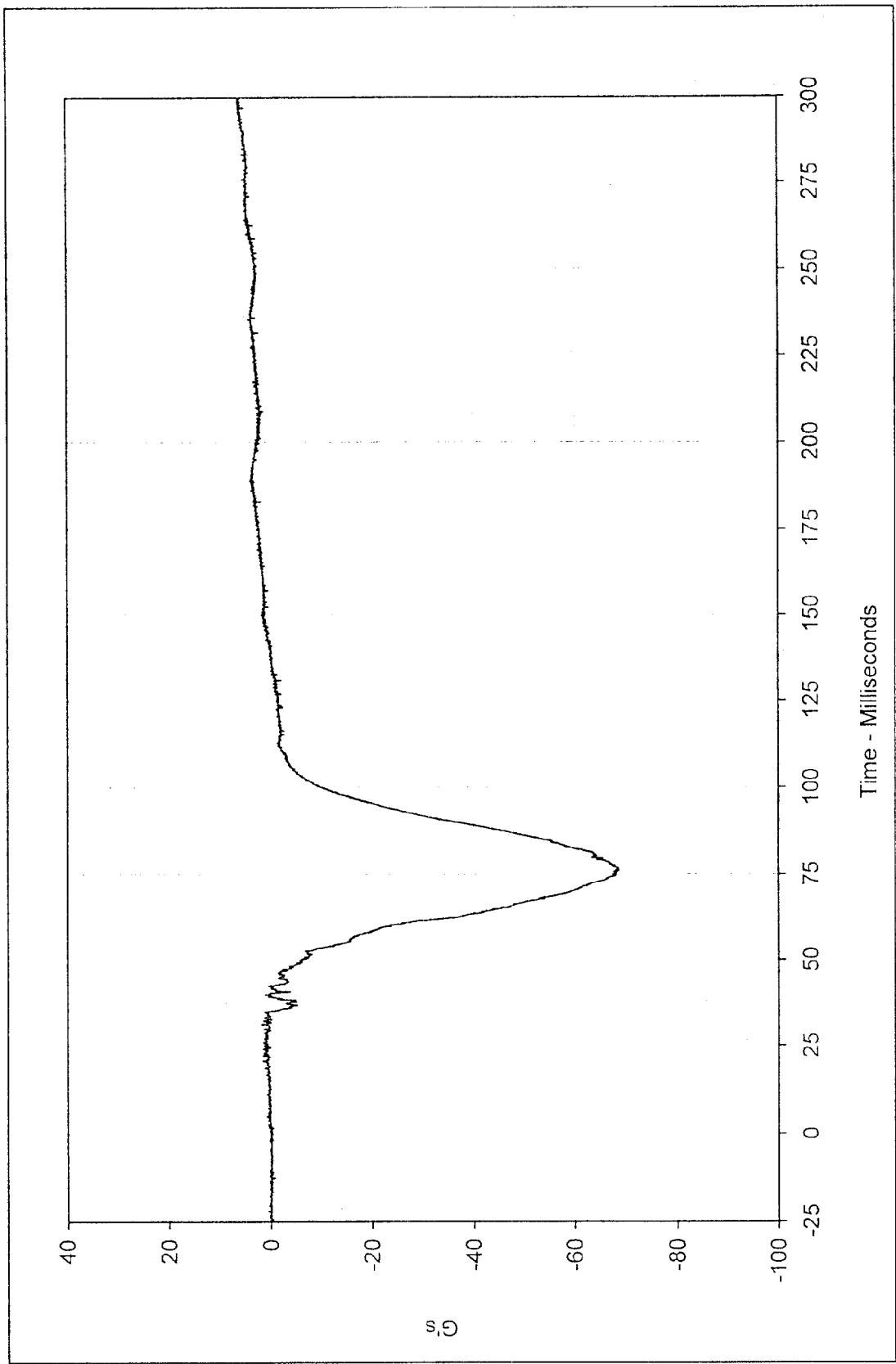
Maximum Value: 26.4 at 58.3 Milliseconds
 Minimum Value: -11.1 at 79.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-047





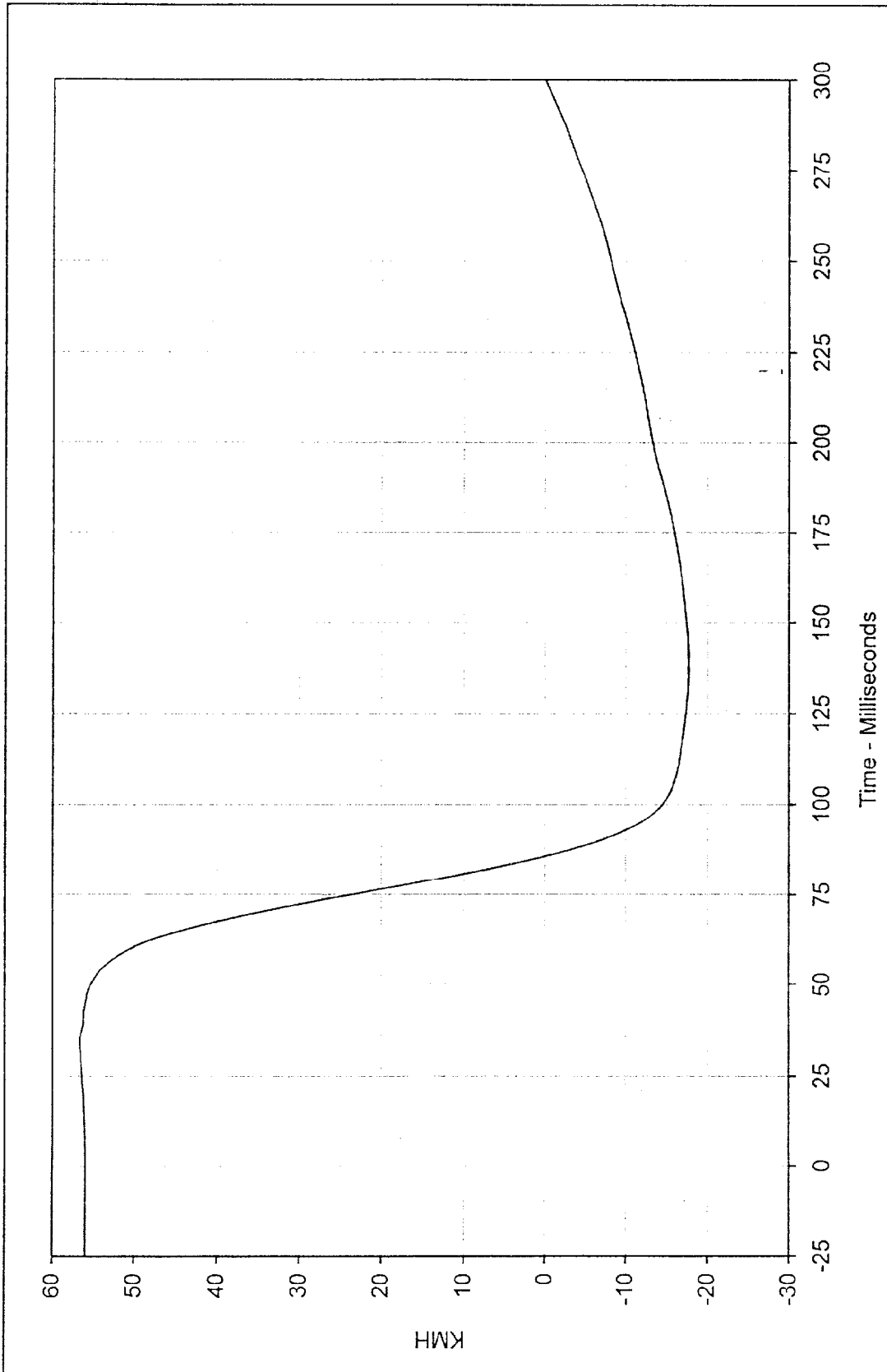
Curve Description:	Passenger Head Resultant Primary	Testing Program:	1997 New Car Assessment Program
Maximum Value:	70.5 at 75.8 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.1 at 29.6 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	RES-045		





Curve Description:	Passenger Head Redundant X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	6.3 at 298.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-68.6 at 76.1 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-048		

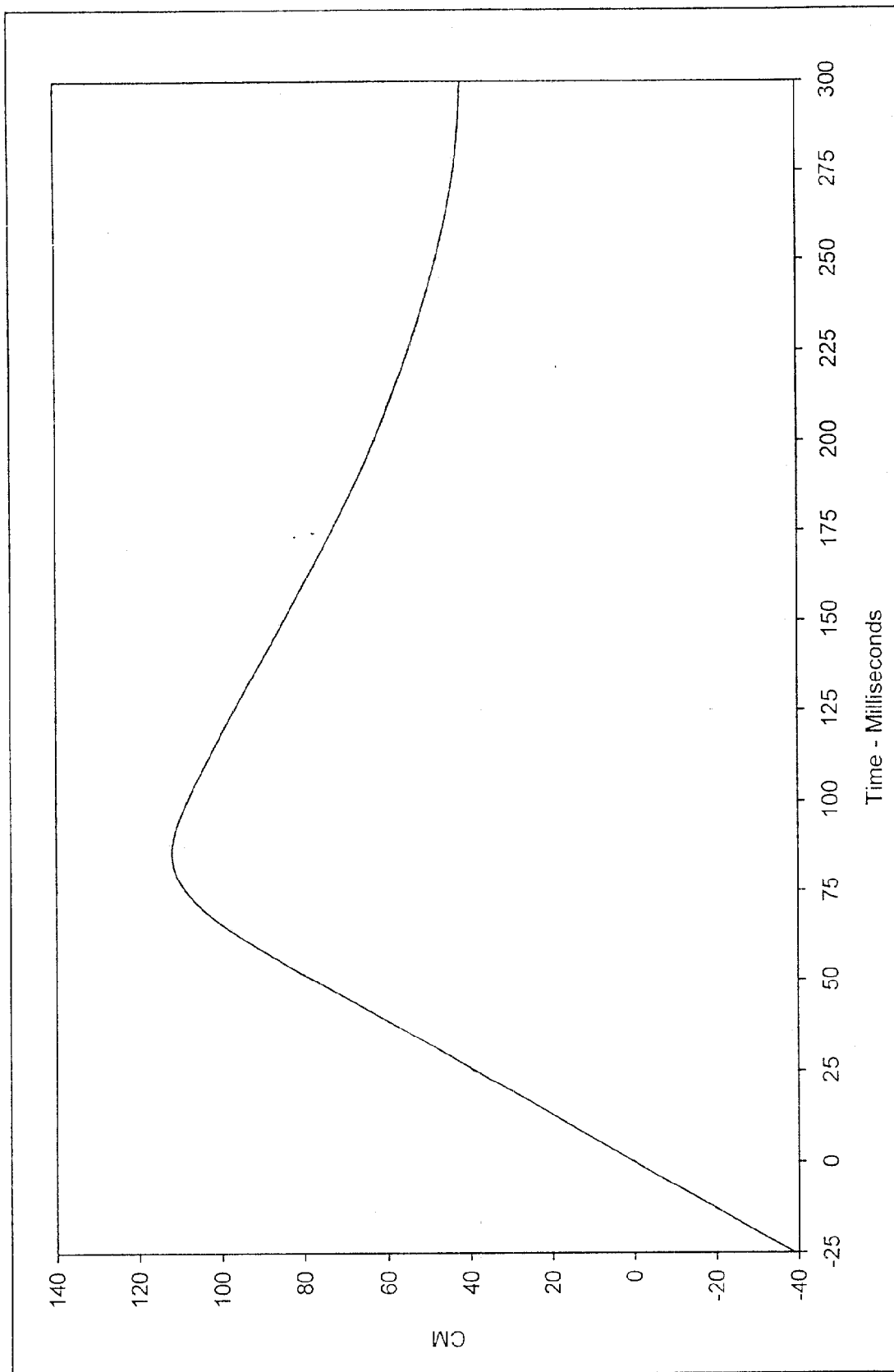




B69

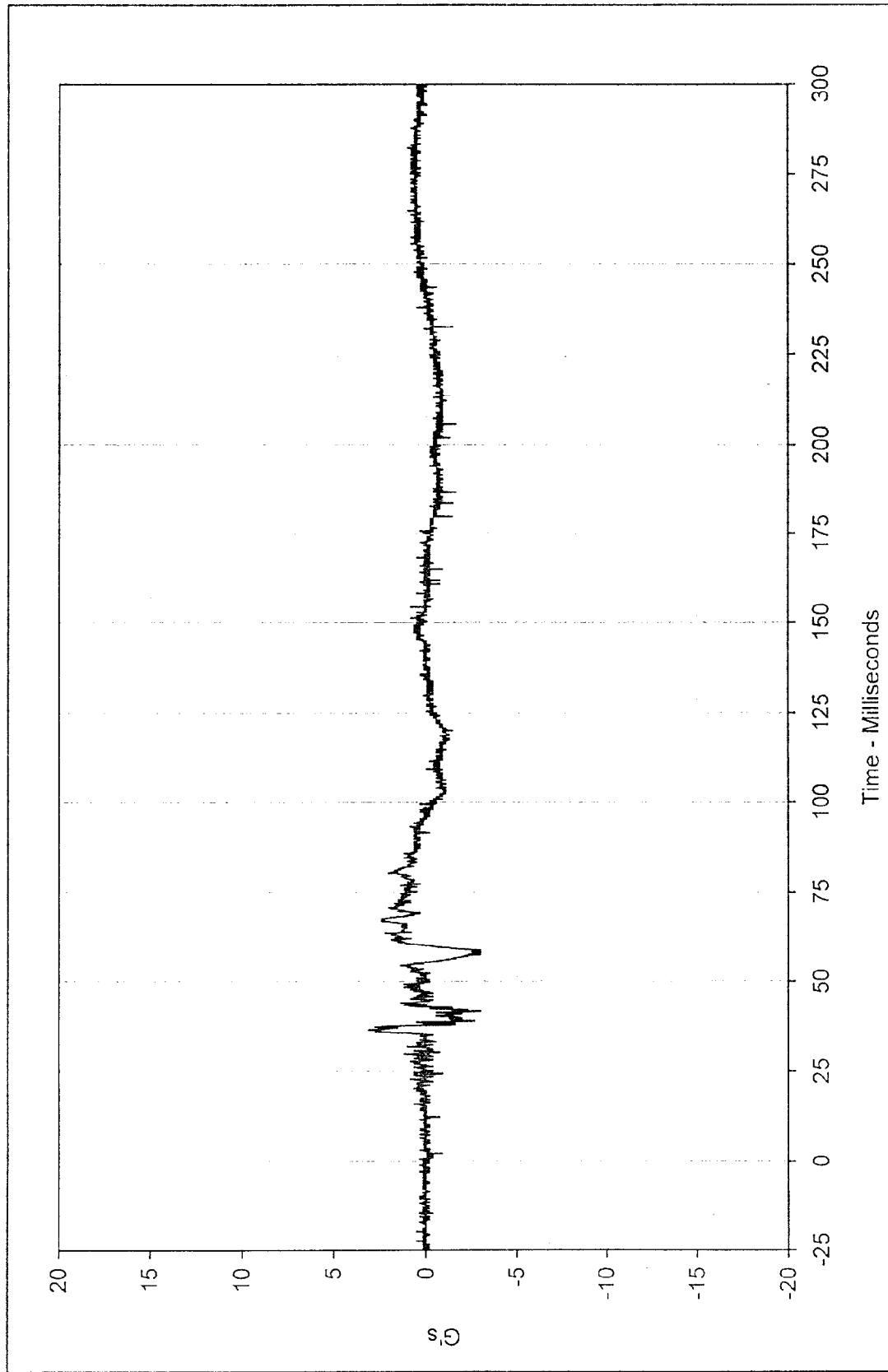
Curve Description:	Passenger Head Redundant X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.6 at 34.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-17.7 at 139.5 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-048		





Curve Description:	Passenger Head Redundant X Displ.		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	111.9	at 85.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-0.2	at 0.0 Milliseconds			
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	IN2-048				

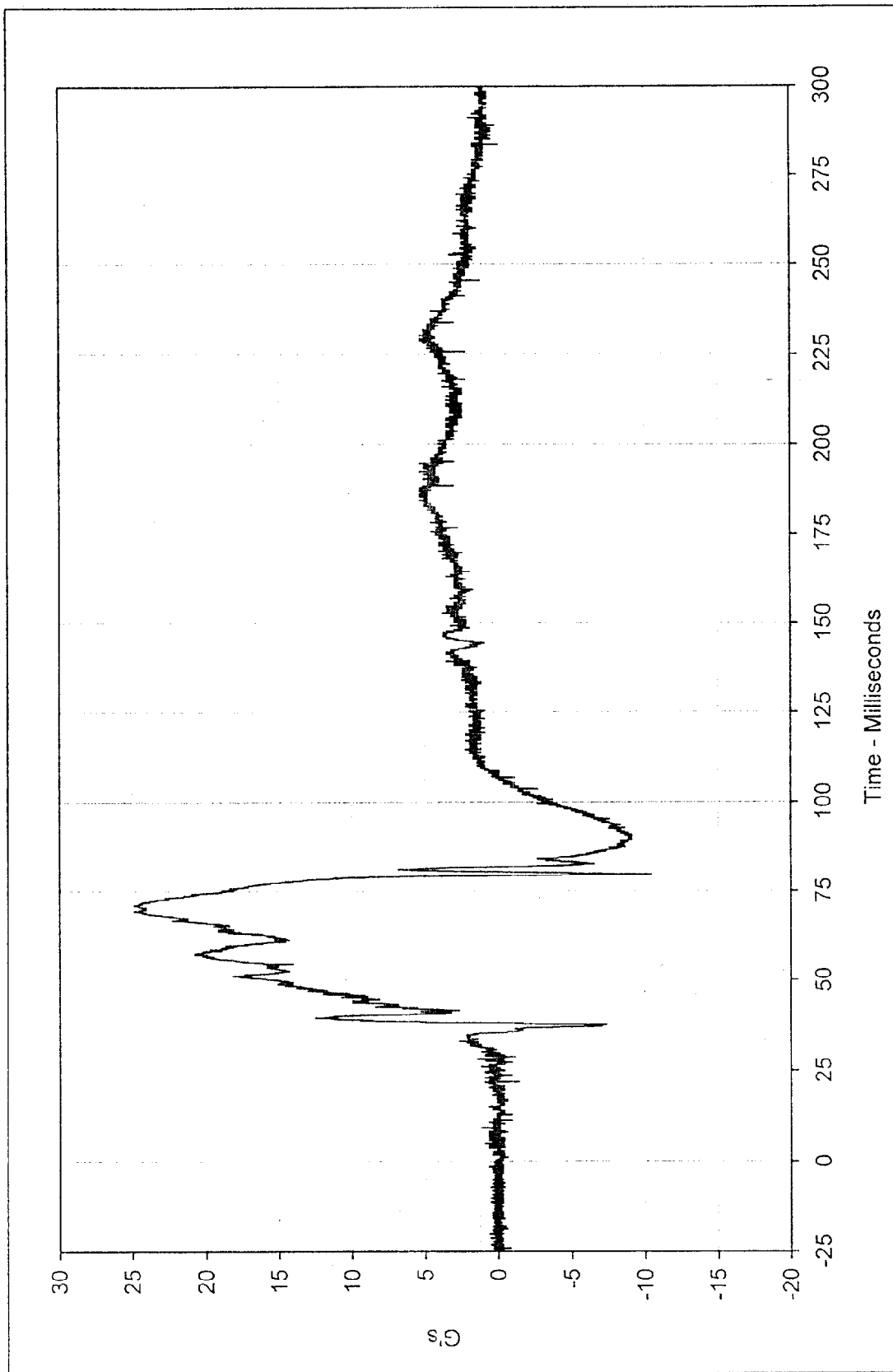




Curve Description:	Passenger Head Redundant Y			Testing Program:	1997 New Car Assessment Program
Maximum Value:	3.1	at	36.4	Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value:	-3.0	at	41.4	Milliseconds	
SAE Filter Class:	1000				
Date of Test:	3/13/97				
Curve Number:	FIL-049				

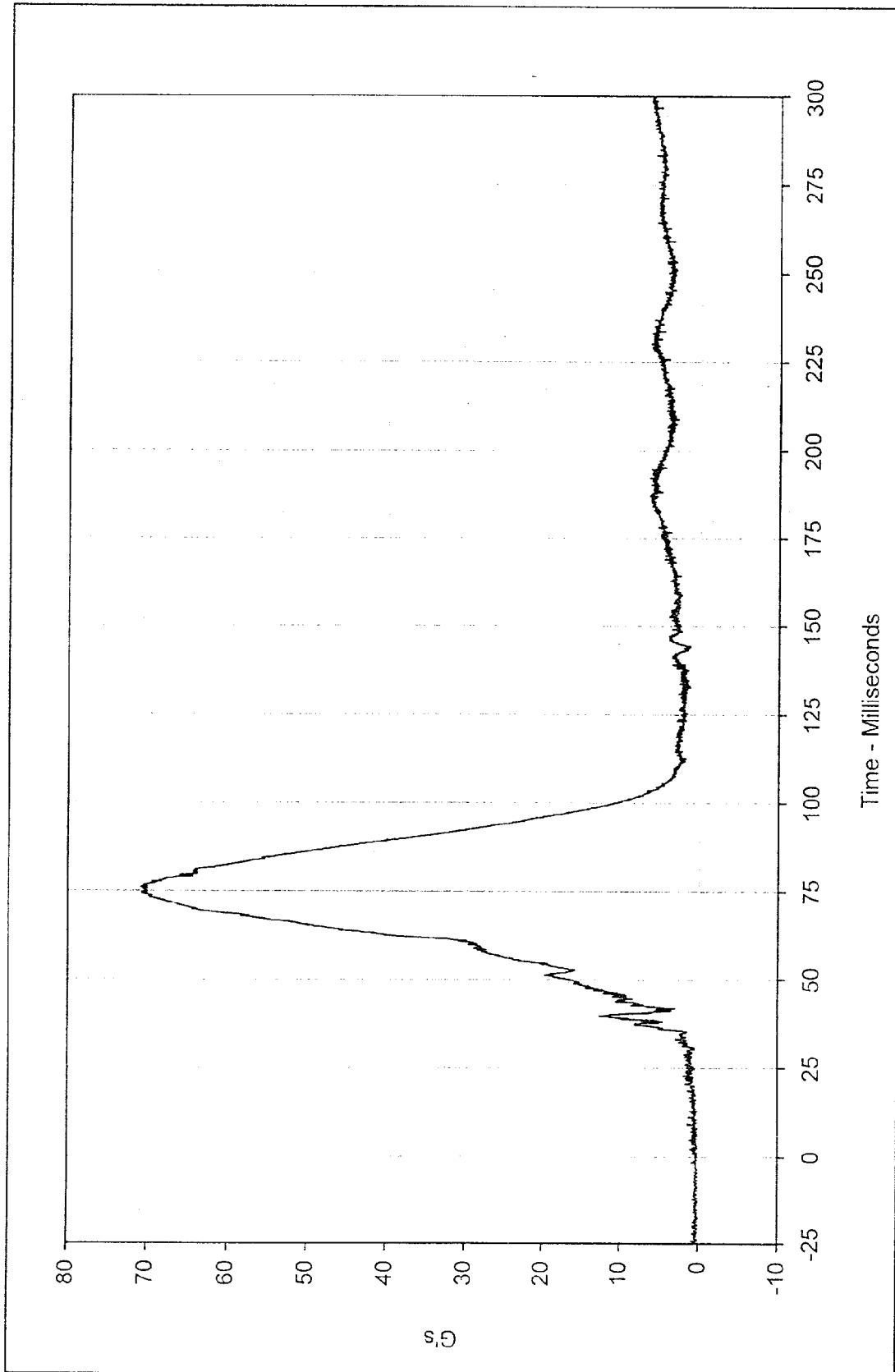
The logo for KARCO Engineering. It features the word "KARCO" in a large, bold, sans-serif font. To the left of the "K" is a stylized graphic of a lightbulb with a gear-like base. To the right of "KARCO" is the word "Engineering" in a smaller, italicized, sans-serif font. The entire logo is set against a dark, rectangular background.





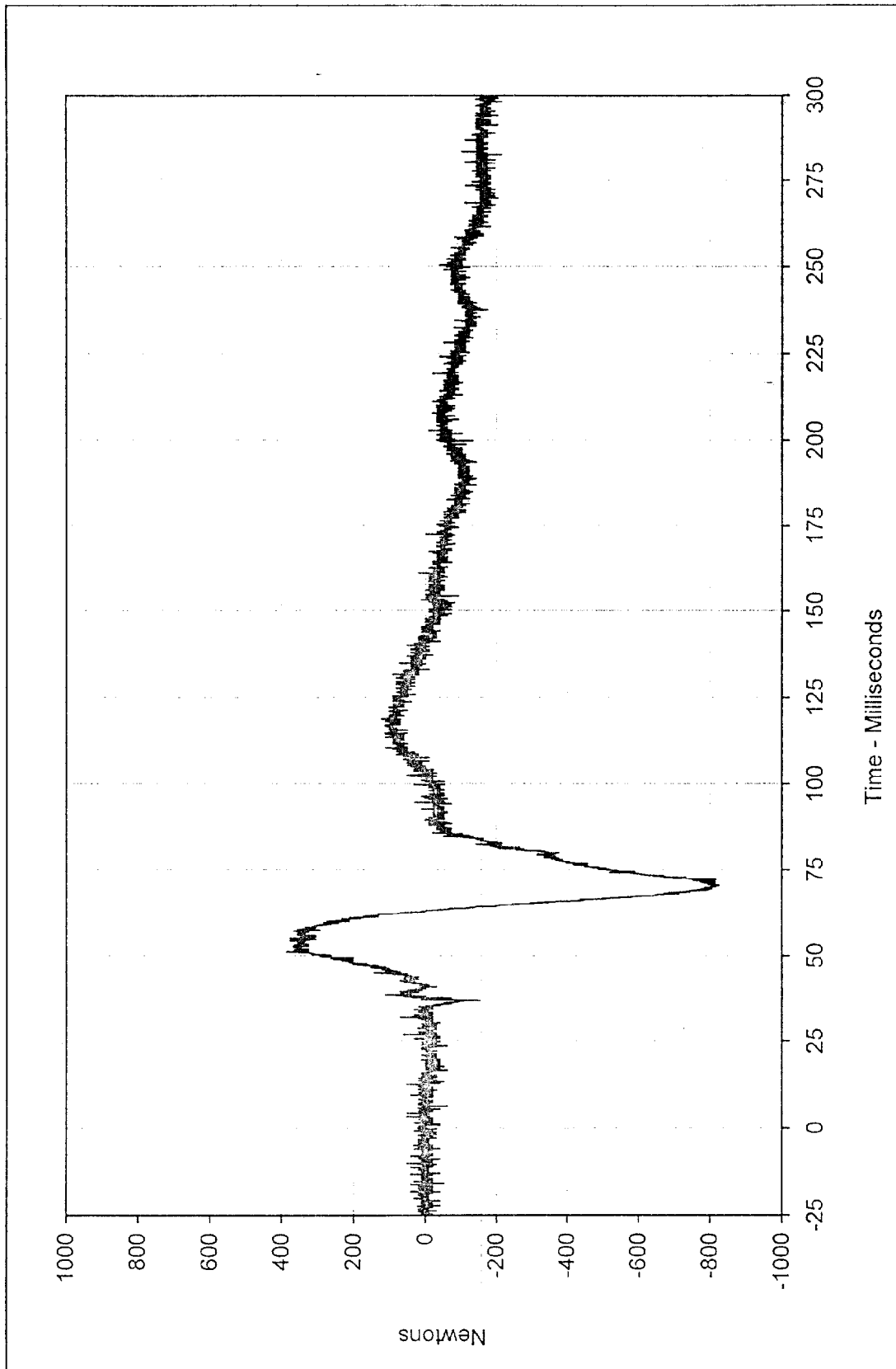
Curve Description:	Passenger Head Redundant Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	24.9 at 69.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-10.4 at 79.8 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-050		





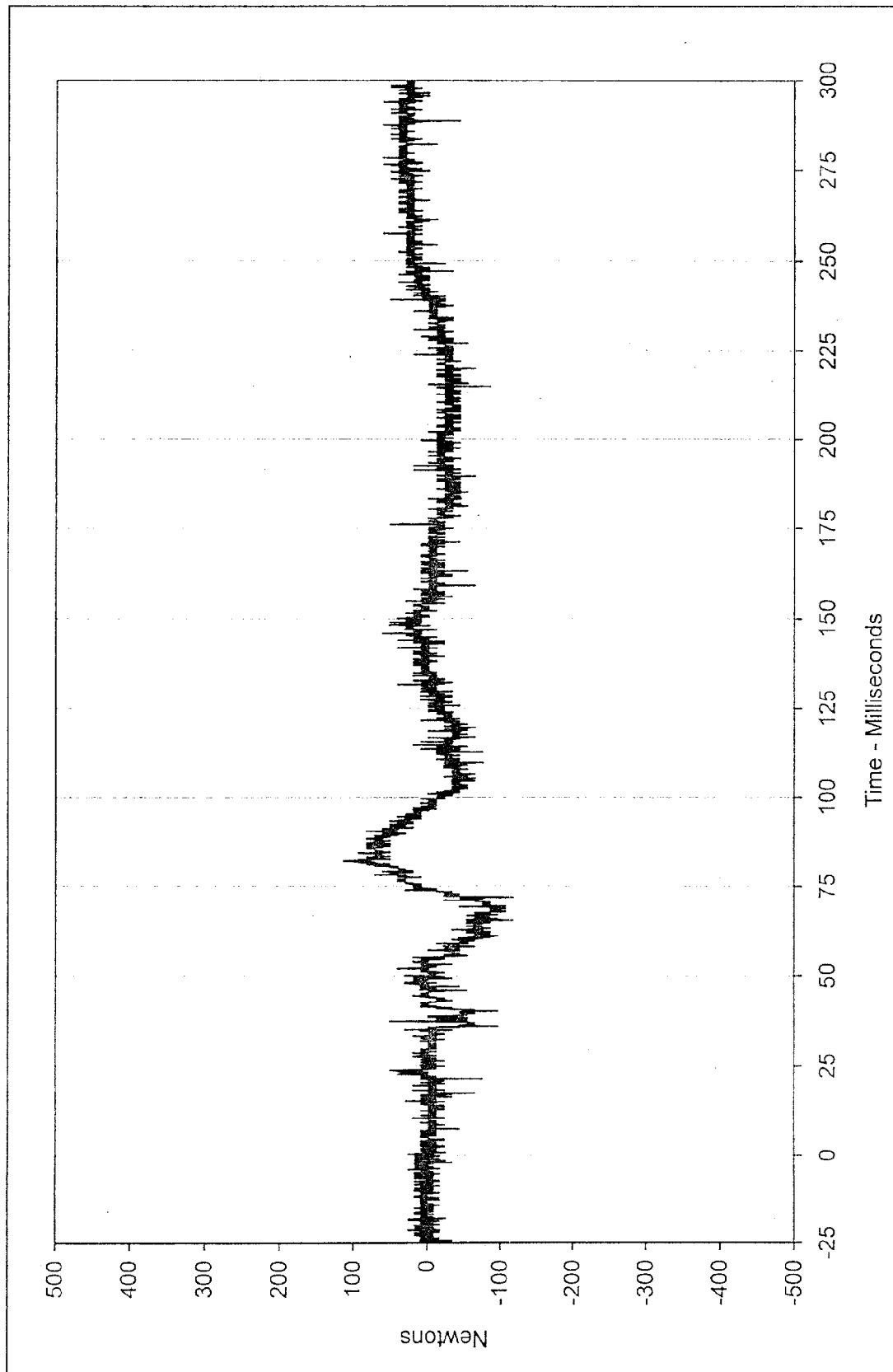
Curve Description:	Passenger Head Resultant Redundant	Testing Program:	1997 New Car Assessment Program
Maximum Value:	70.8 at 76.1 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.1 at 0.1 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	RES-048		





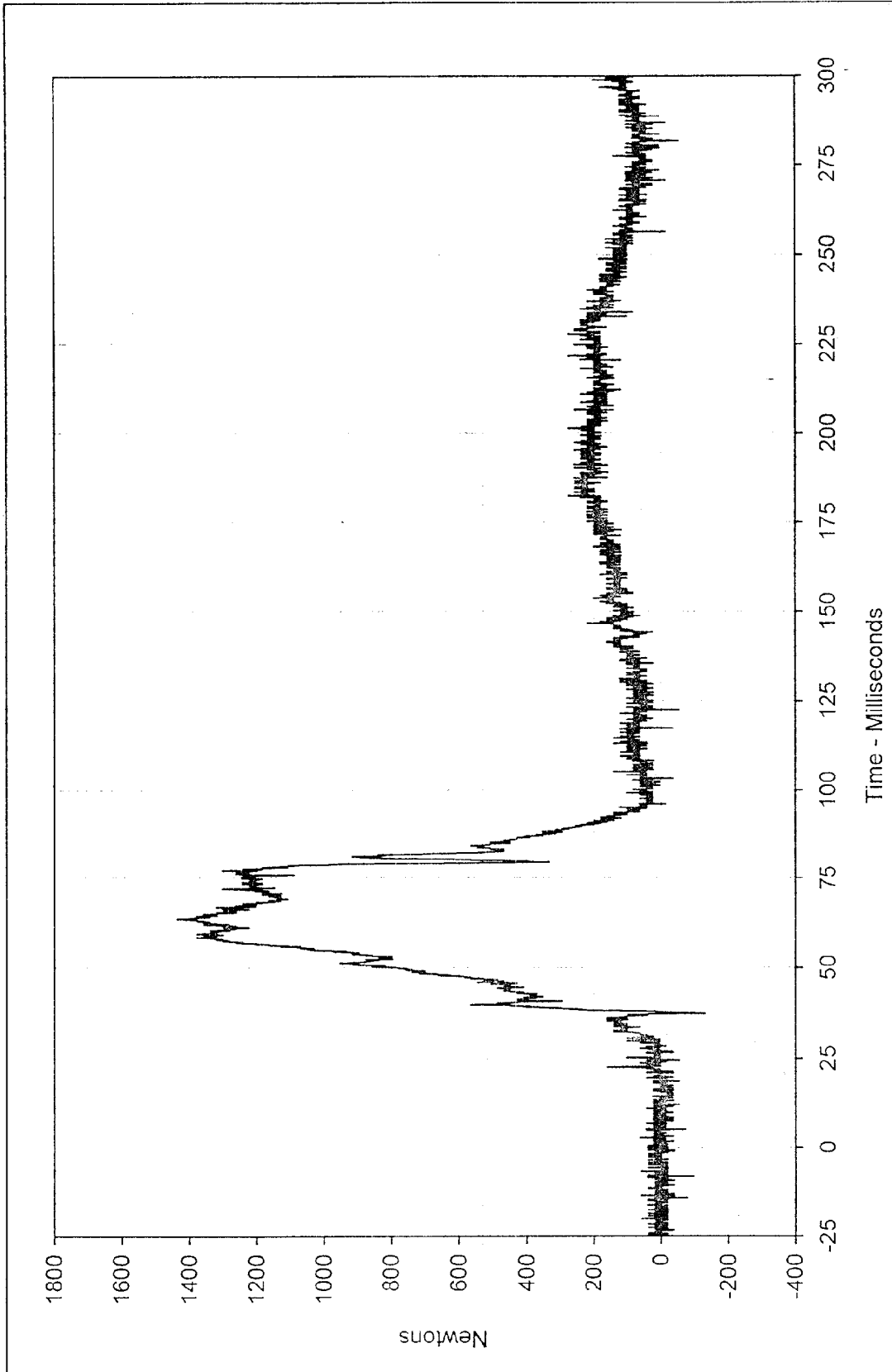
Curve Description:	Passenger Neck Force X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	385.9 at 51.1 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-824.8 at 70.3 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-051		





Curve Description:	Passenger Neck Force Y	Testing Program:	1997 New Car Assessment Program
Maximum Value:	113.5 at 82 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-117.5 at 65.3 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-052		

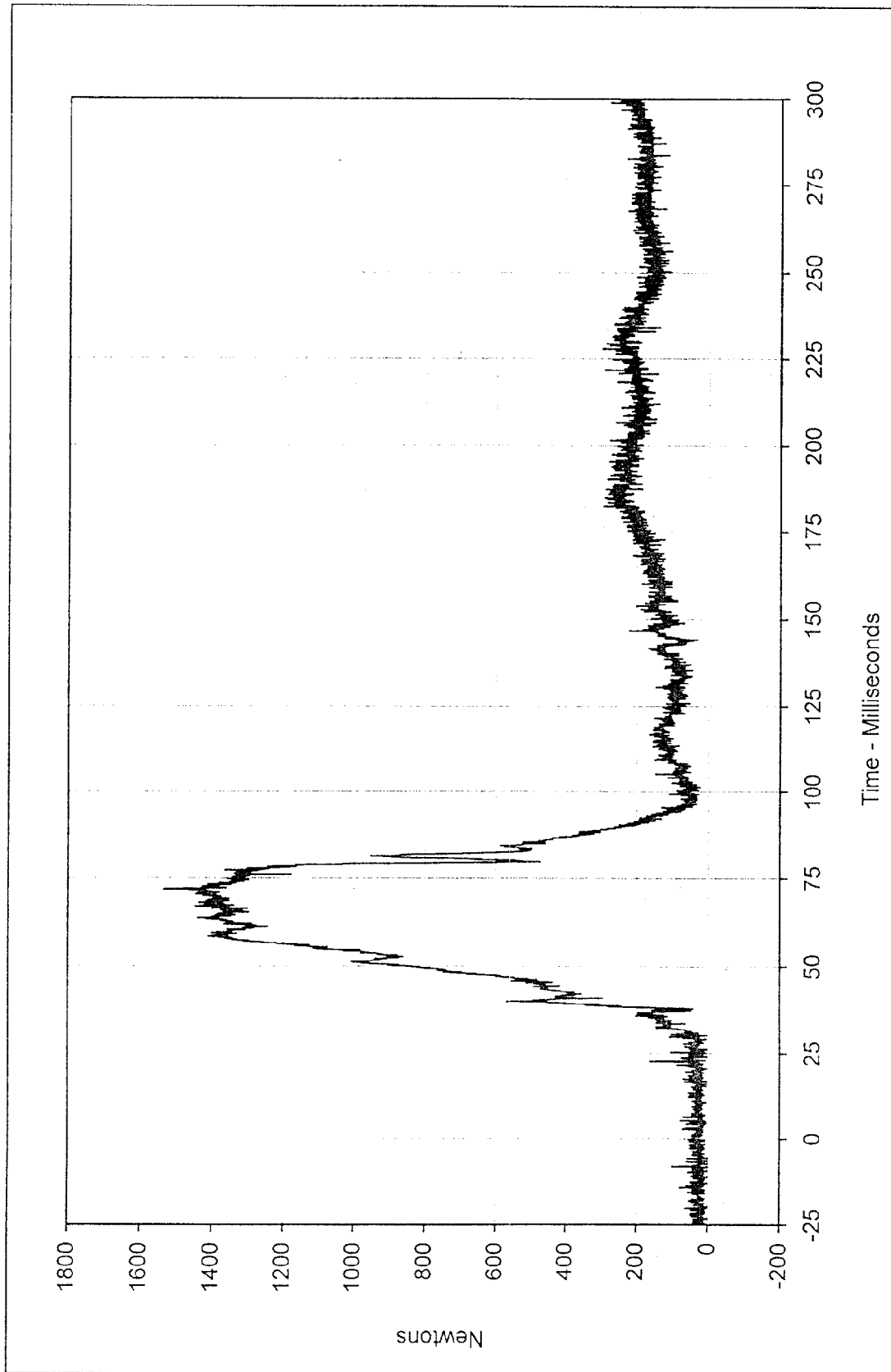




Curve Description:	Passenger Neck Force Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	1436.3 at 63.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-130.9 at 37.5 Milliseconds		



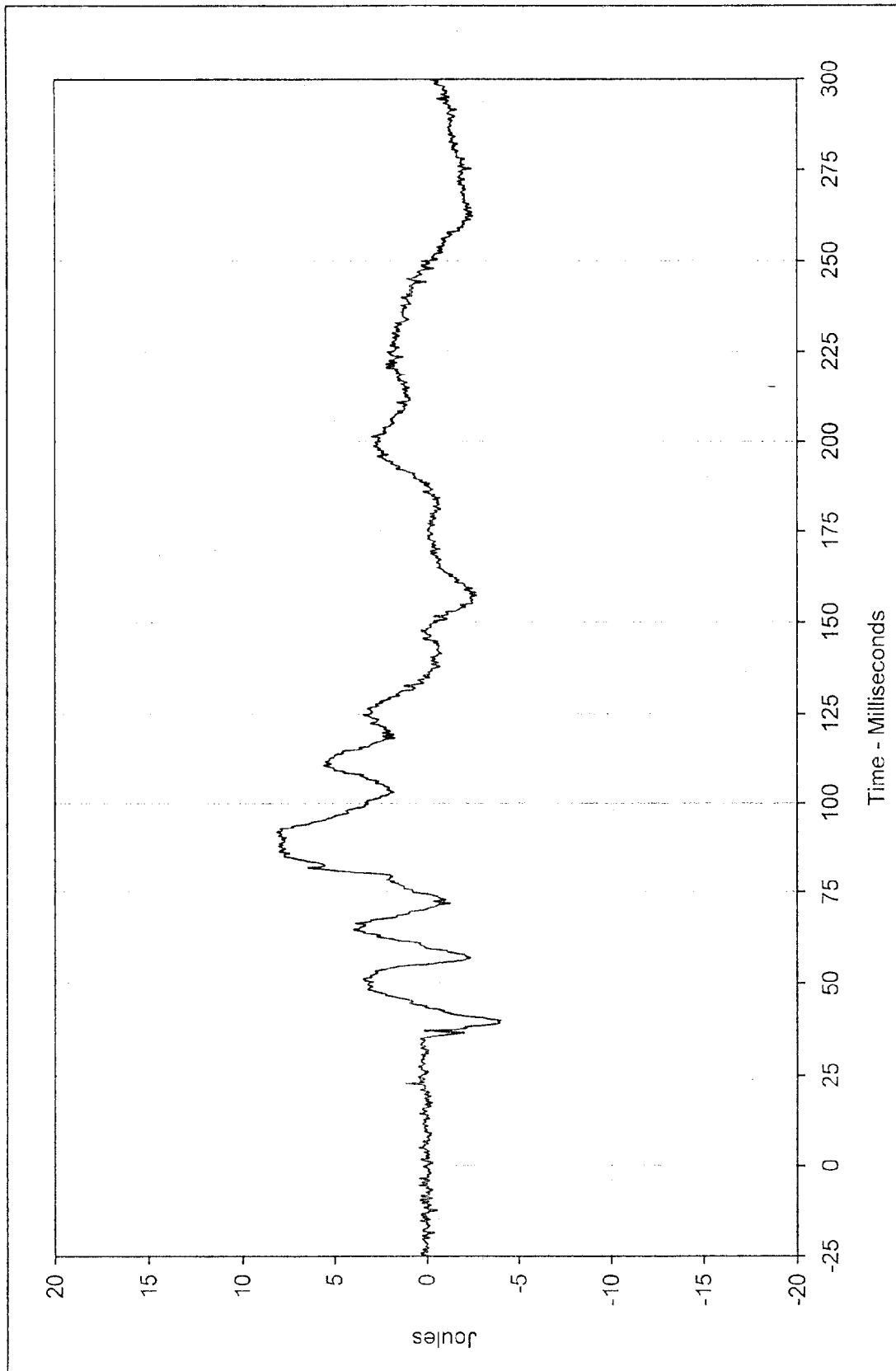
SAE Filter Class:	1000
Date of Test:	3/13/97
Curve Number:	FIL-053



Curve Description: Passenger Neck Force Resultant
Maximum Value: 1534.0 at 71.9 Milliseconds
Minimum Value: 5.0 at 4.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 3/13/97
Curve Number: RES-051

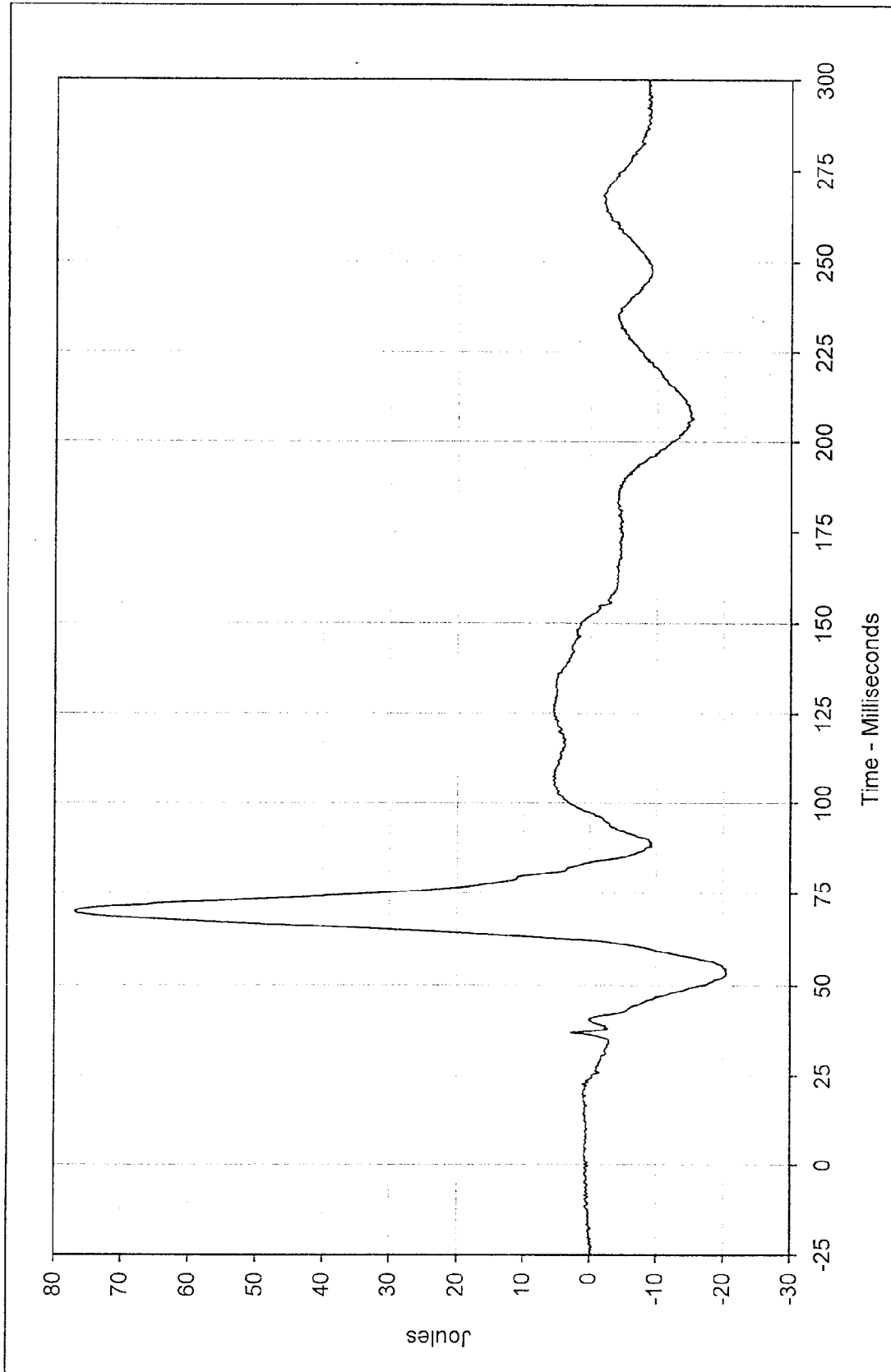
Testing Program: 1997 New Car Assessment Program
Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:	Passenger Neck Moment X		Testing Program:	1997 New Car Assessment Program
Maximum Value:	8.1	at 91.8	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-4.0	at 40.0		
SAE Filter Class:	600			
Date of Test:	3/13/97			
Curve Number:	FIL-054			

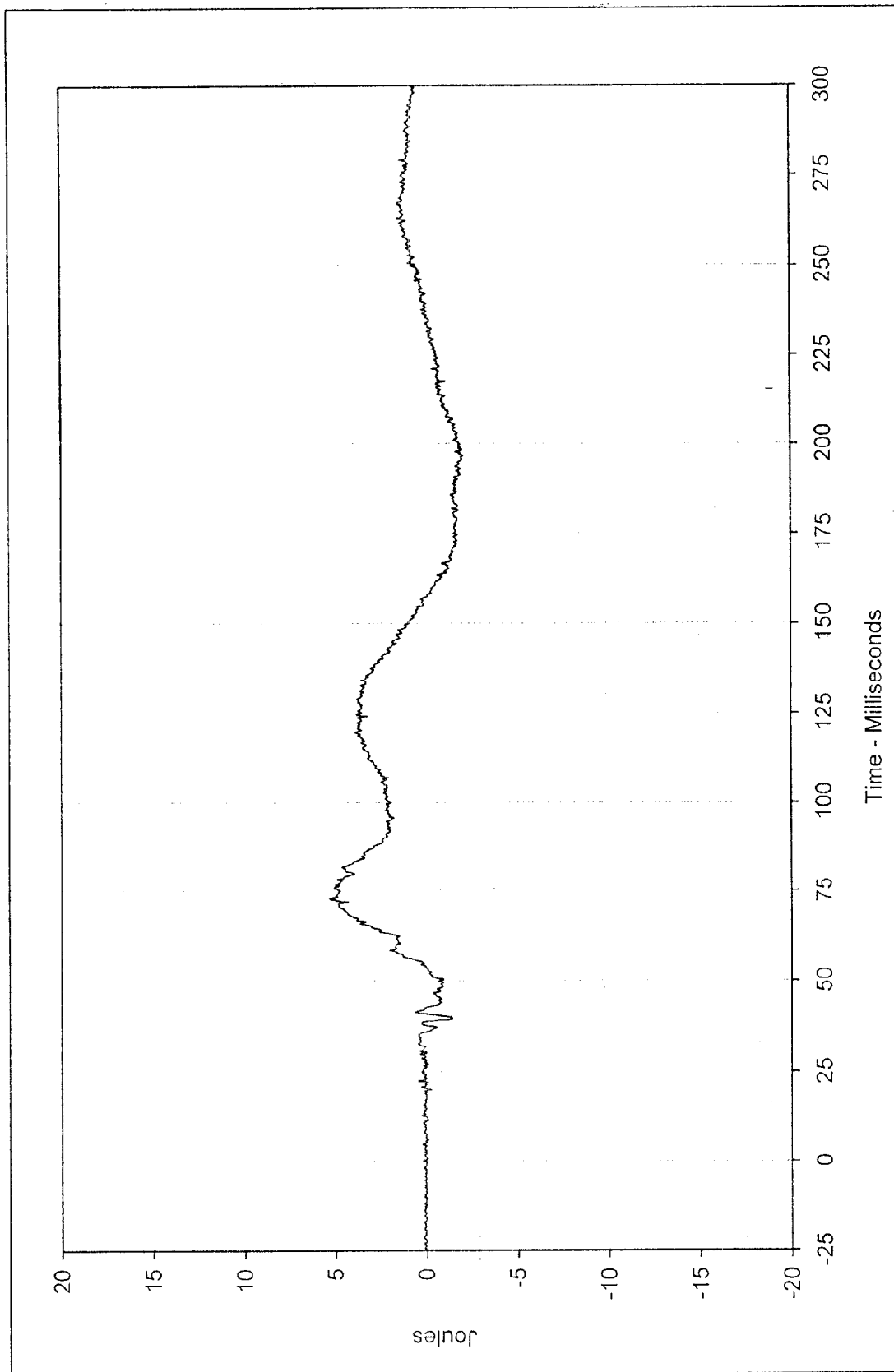




Curve Description: Passenger Neck Moment Y
Maximum Value: 76.9 at 70.2 Milliseconds
Minimum Value: -20.5 at 53.2 Milliseconds

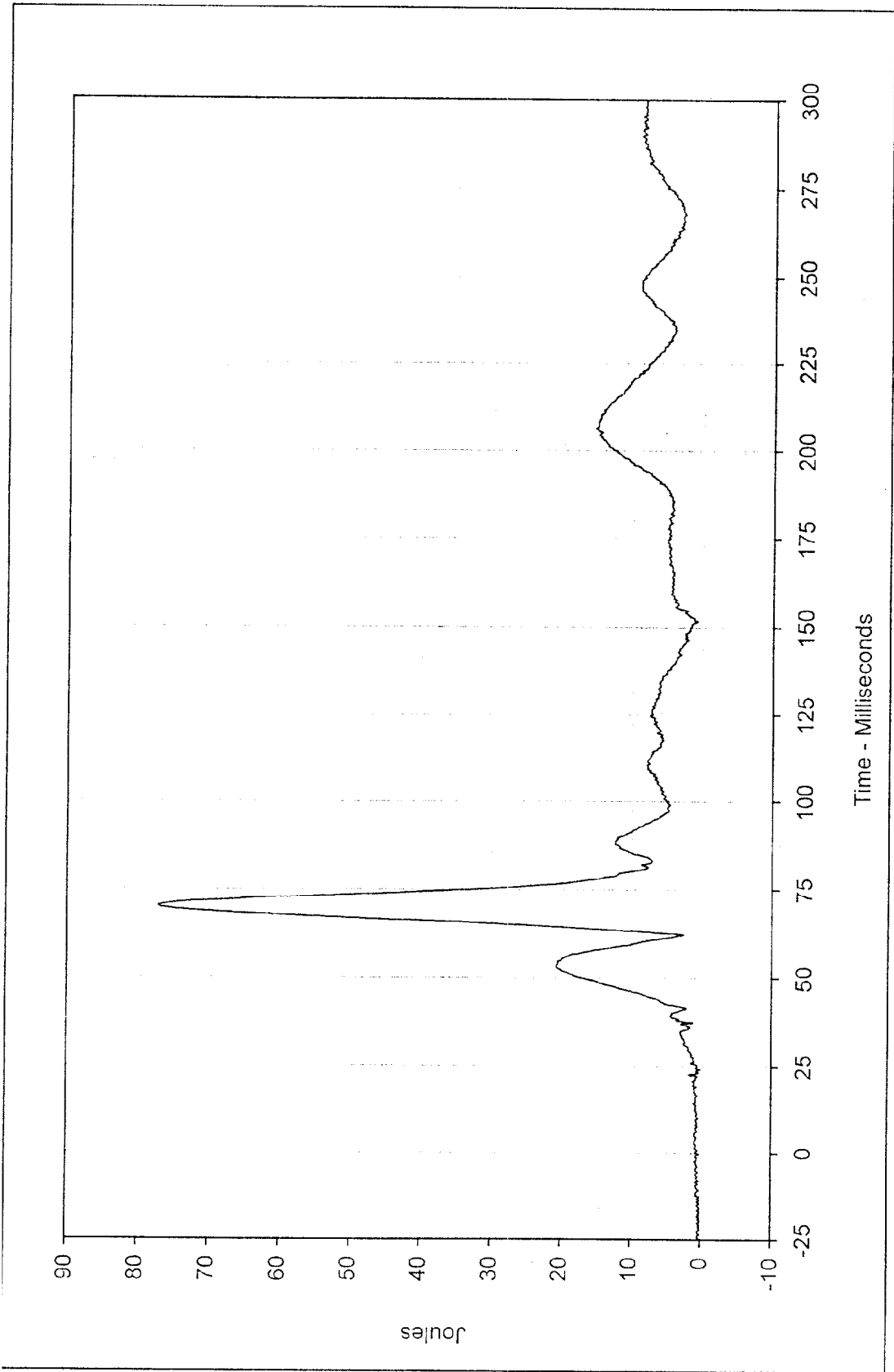


SAE Filter Class: 600
Date of Test: 3/13/97
Curve Number: FIL-055



Curve Description:	Passenger Neck Moment Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	5.3 at 72.8 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-2.1 at 196.7 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-056		

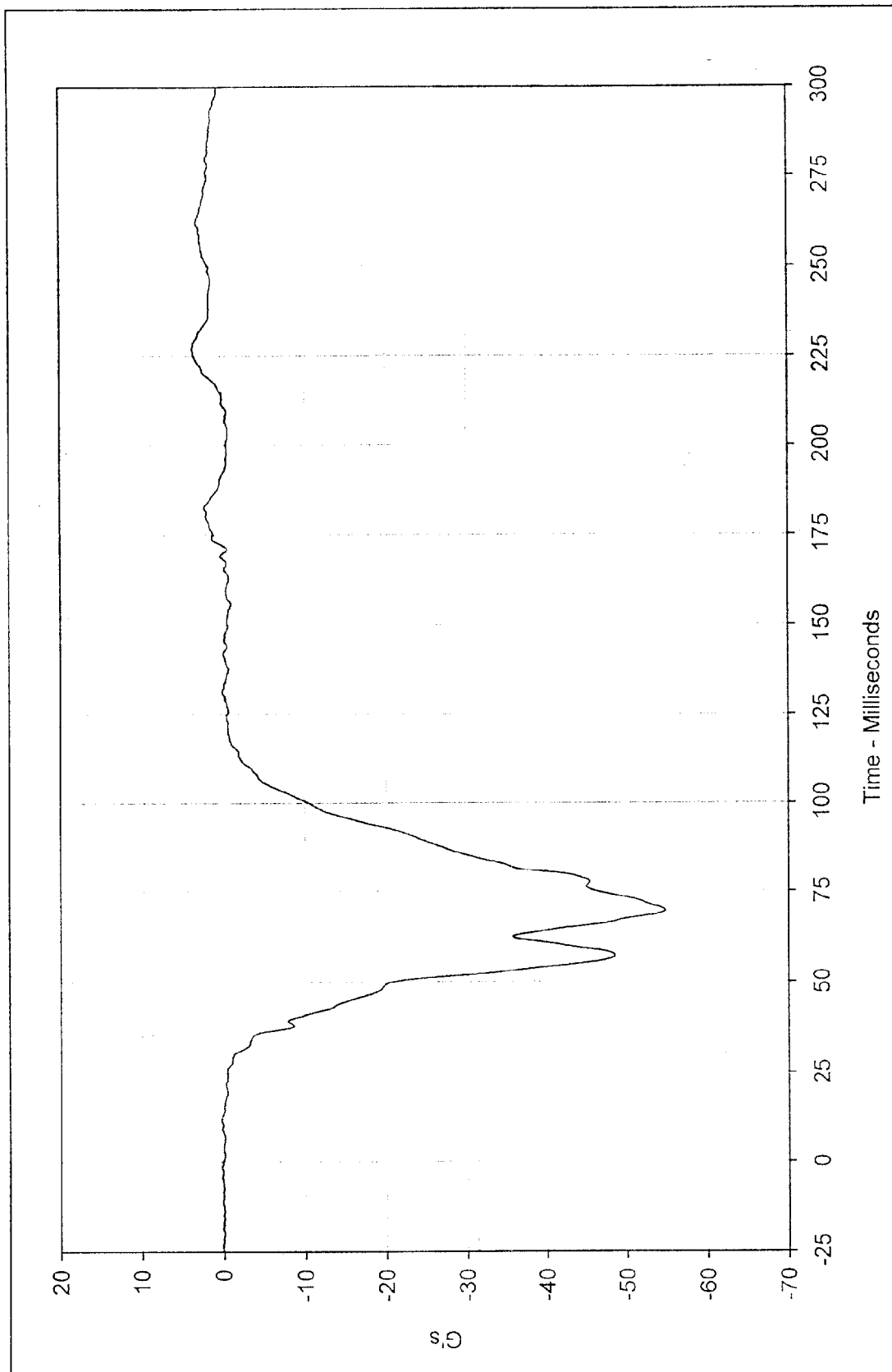




B81

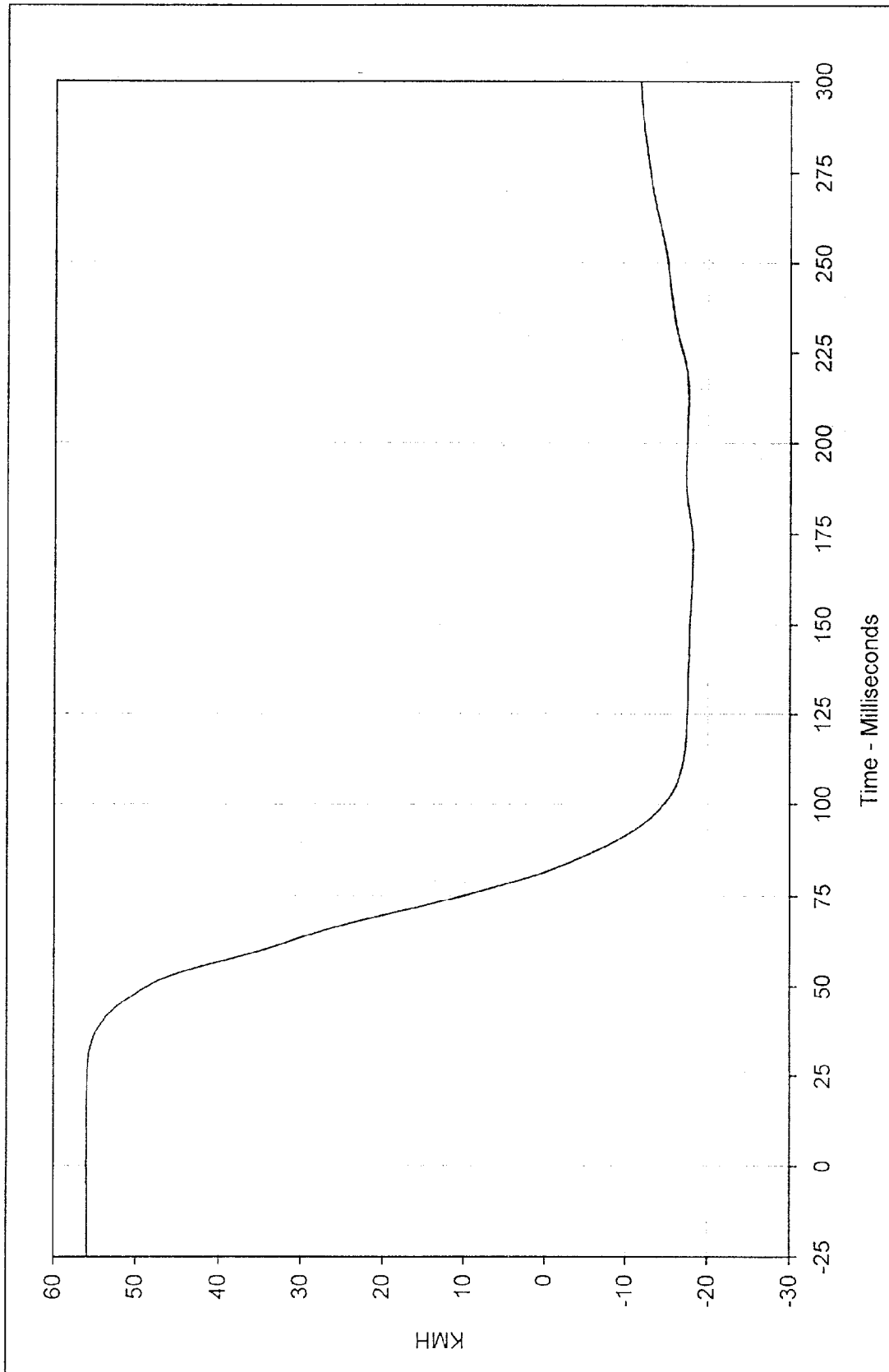
Curve Description:	Passenger Neck Moment Resultant	Testing Program:	1997 New Car Assessment Program
Maximum Value:	77.1 at 70.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.2 at 24.2 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	RES-054		





Curve Description:	Passenger Chest Primary X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	3.6 at 227.1 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-54.7 at 69.8 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	FIL-057		

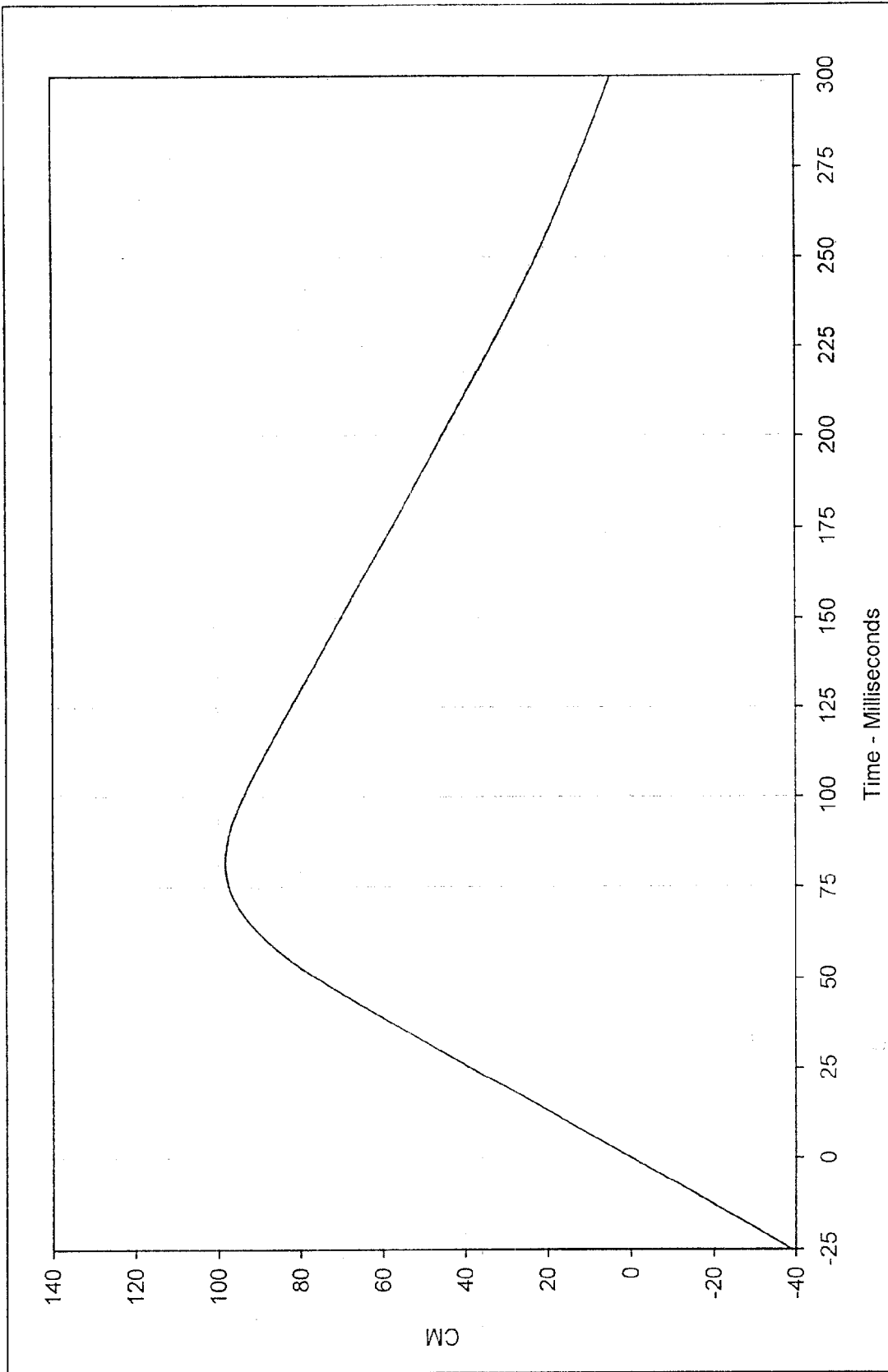




B83

Curve Description:	Passenger Chest Primary X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 13.8 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-18.2 at 172.1 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-057		



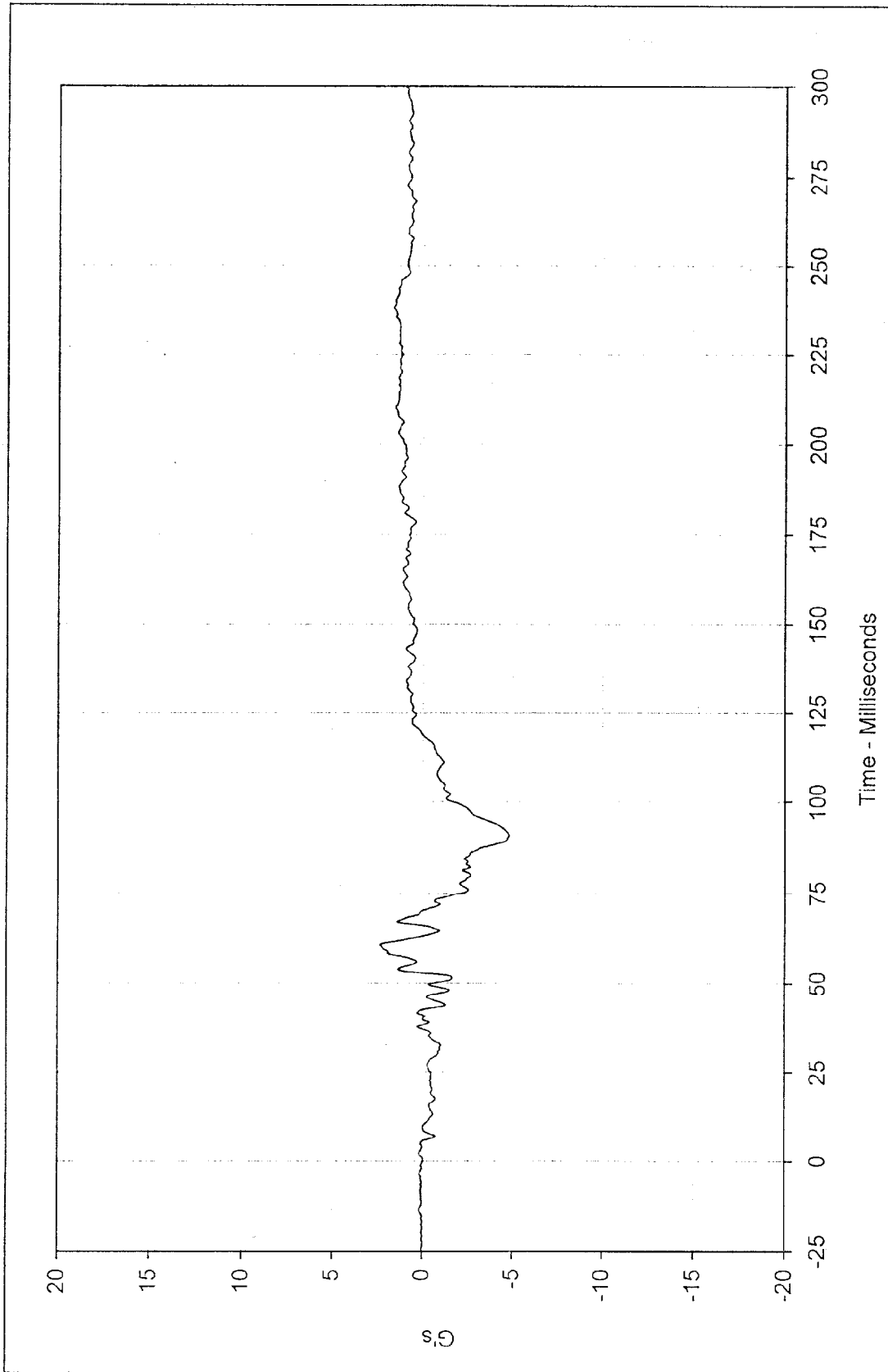


Curve Description: Passenger Chest Primary X Displ.
Maximum Value: 98.3 at 81.6 Milliseconds
Minimum Value: -0.2 at 0.0 Milliseconds

SAE Filter Class: 180
Date of Test: 3/13/97
Curve Number: IN2-057

Testing Program: 1997 New Car Assessment Program
Test Vehicle: 1997 Chevrolet Cavalier

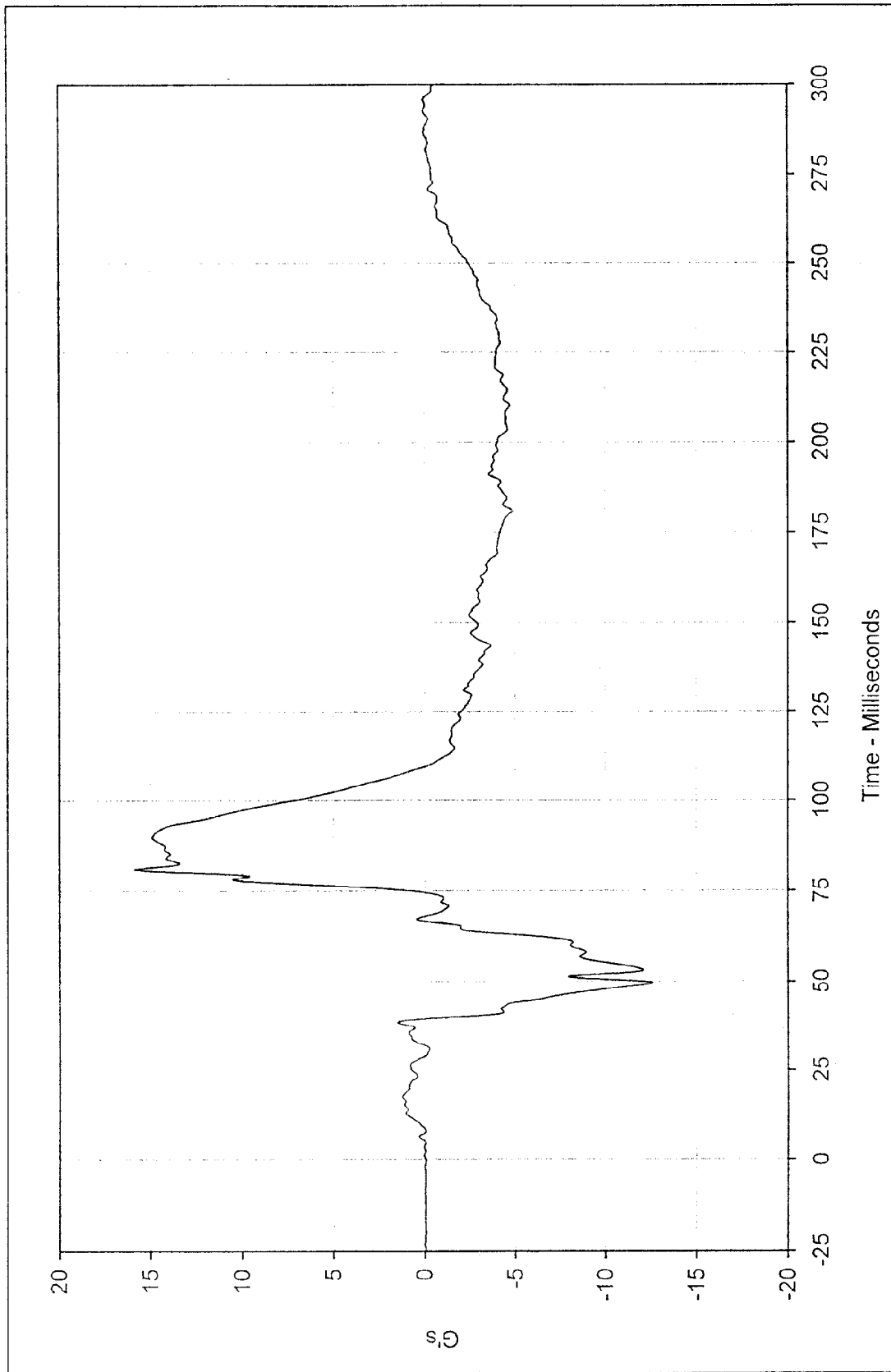




B85

Curve Description:		Passenger ChestPrimary Y		Testing Program: 1997 New Car Assessment Program	
Maximum Value:	2.3	at	60.8	Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value:	-4.8	at	90.9	Milliseconds	
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	FIL-058				

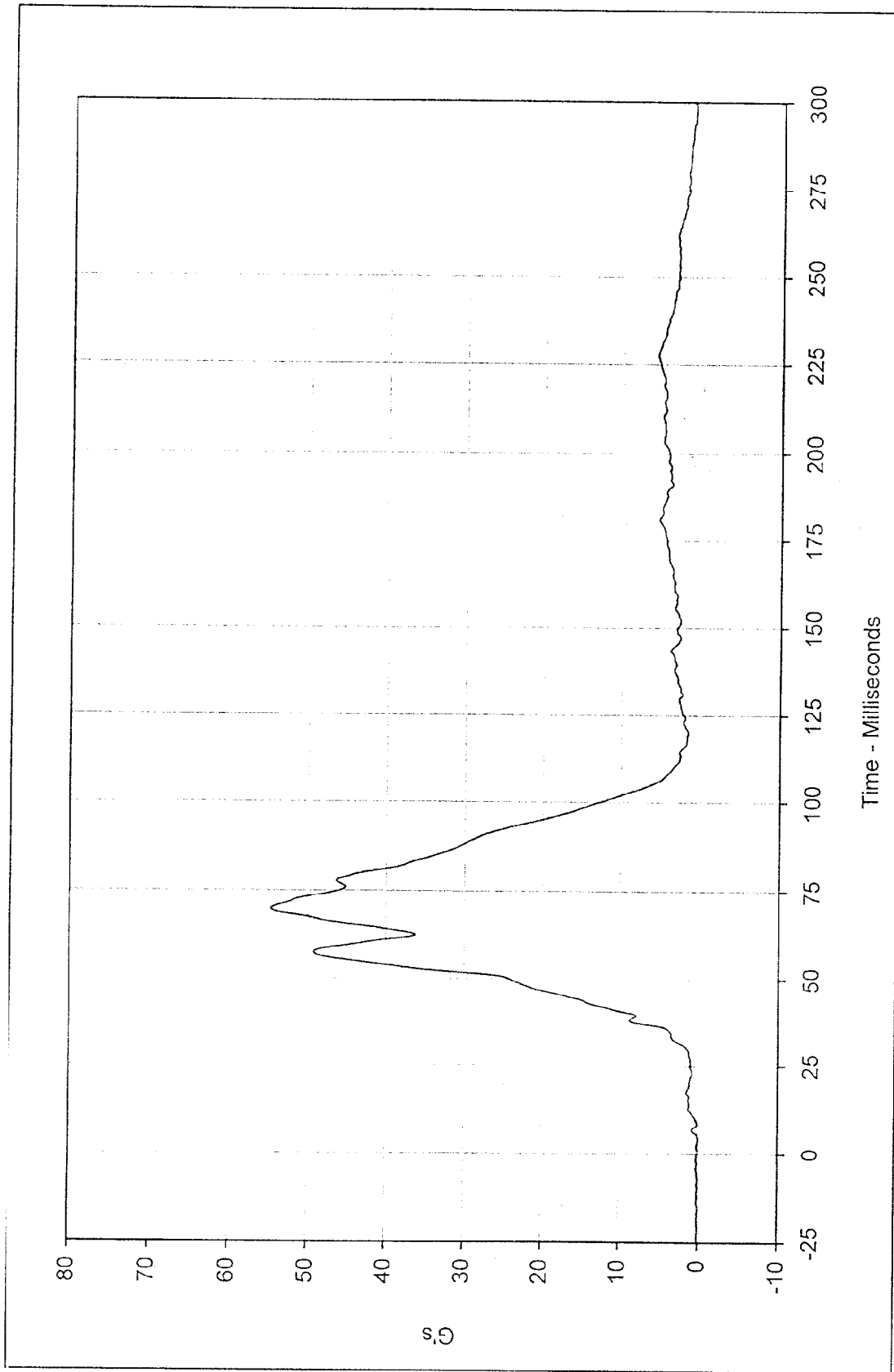




Curve Description: Passenger Chest Primary Z
 Maximum Value: 15.9 at 81.1 Milliseconds
 Minimum Value: -12.6 at 49.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: FIL-059

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

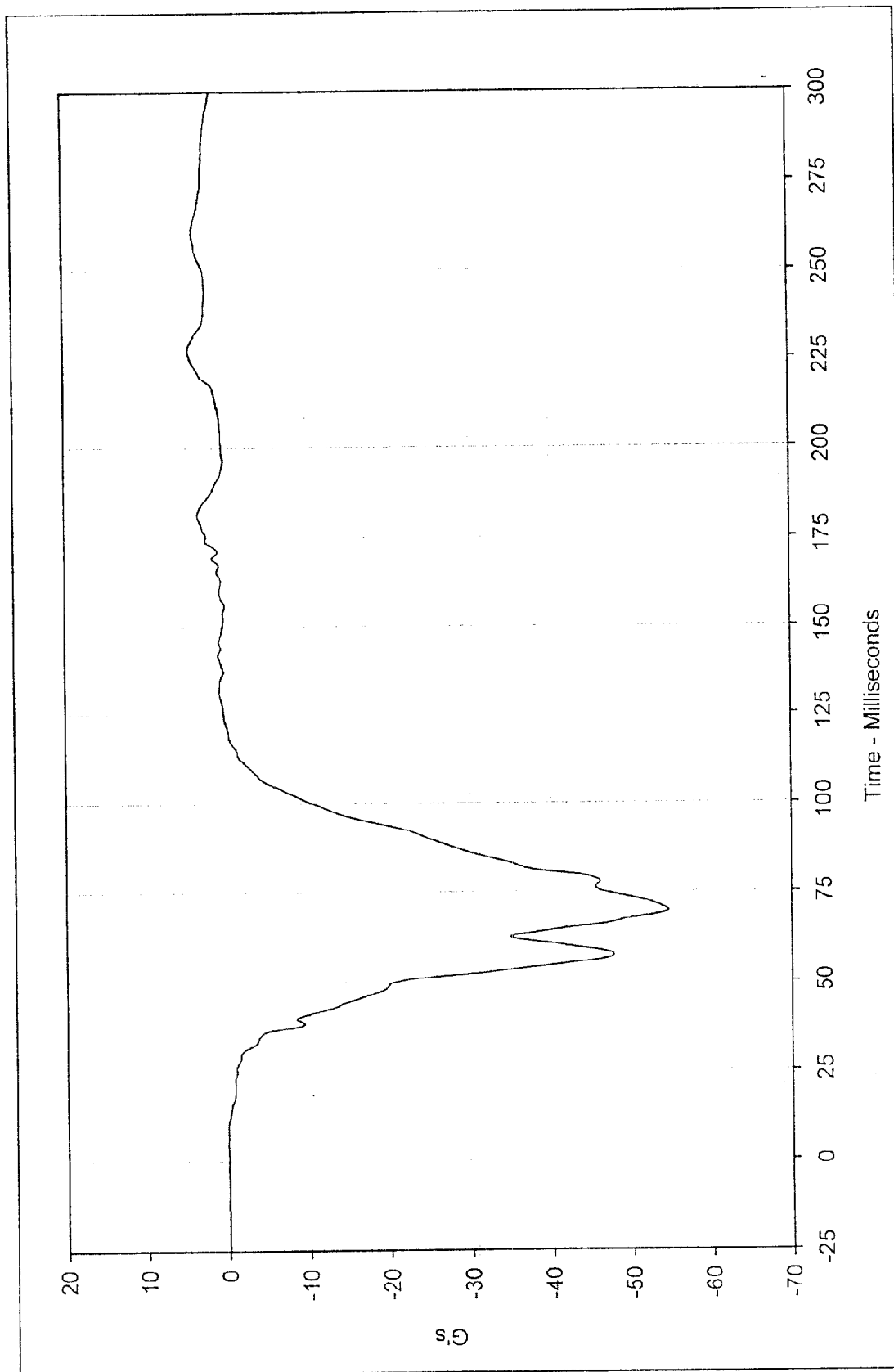




Curve Description: Passenger Chest Resultant Primary
 Maximum Value: 54.7 at 69.8 Milliseconds
 Minimum Value: 0.0 at 4.2 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: RES-057

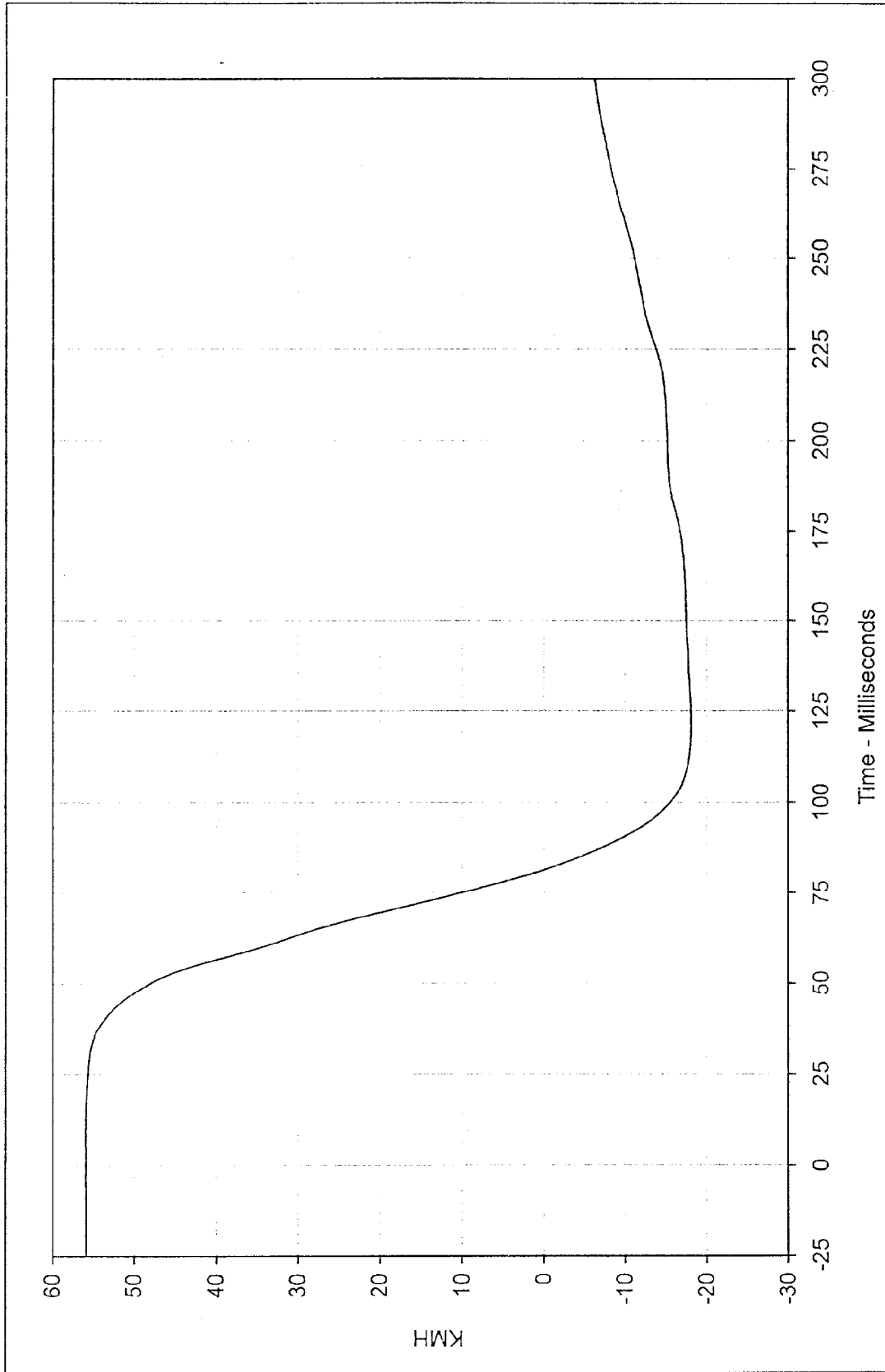
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:	Passenger Chest Redundant X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	4.4 at 227.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-54.6 at 69.9 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	FIL-060		

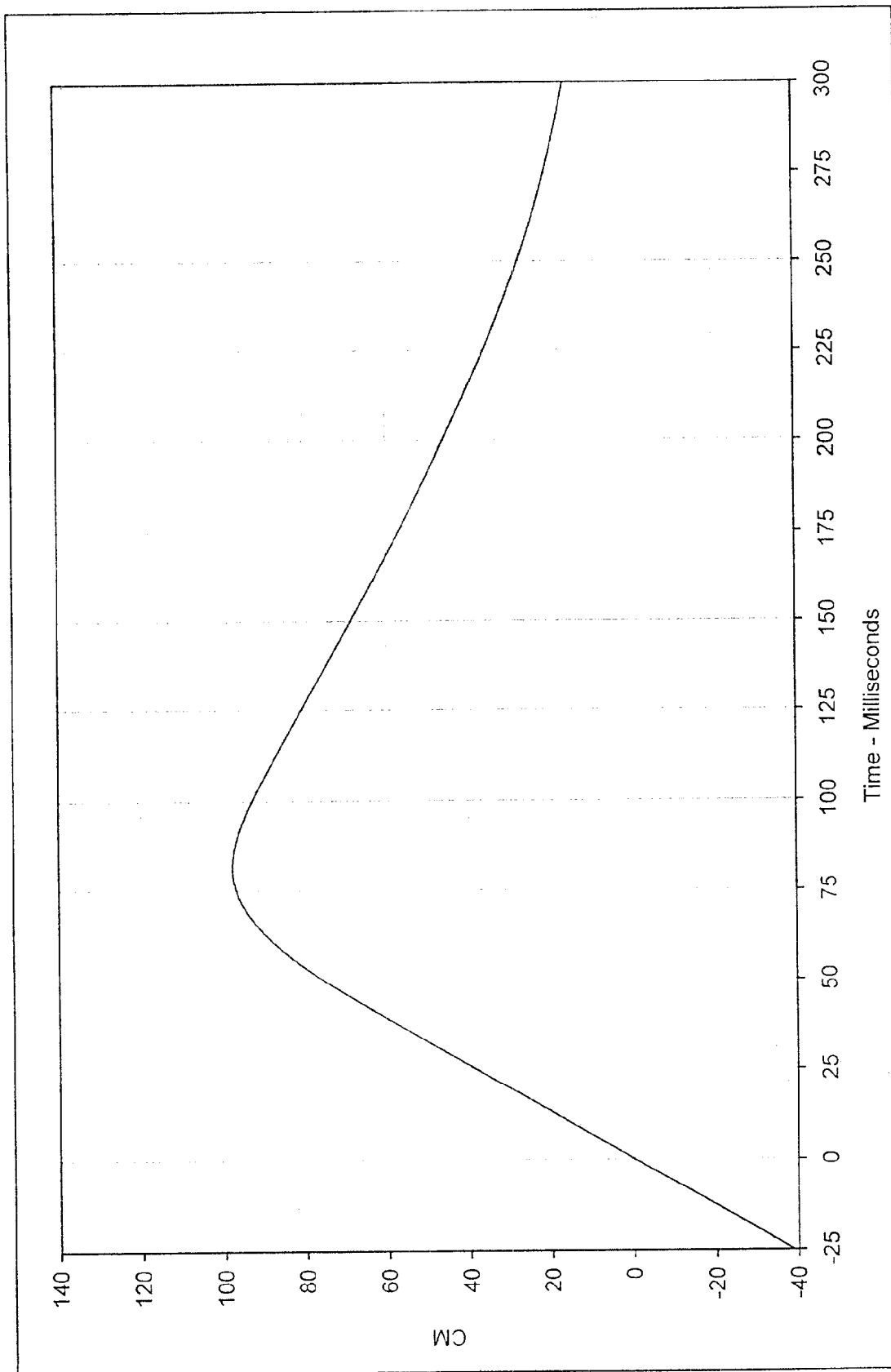




B89

Curve Description:	Passenger Chest Redundant X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 11.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-18.1 at 121.5 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-060		



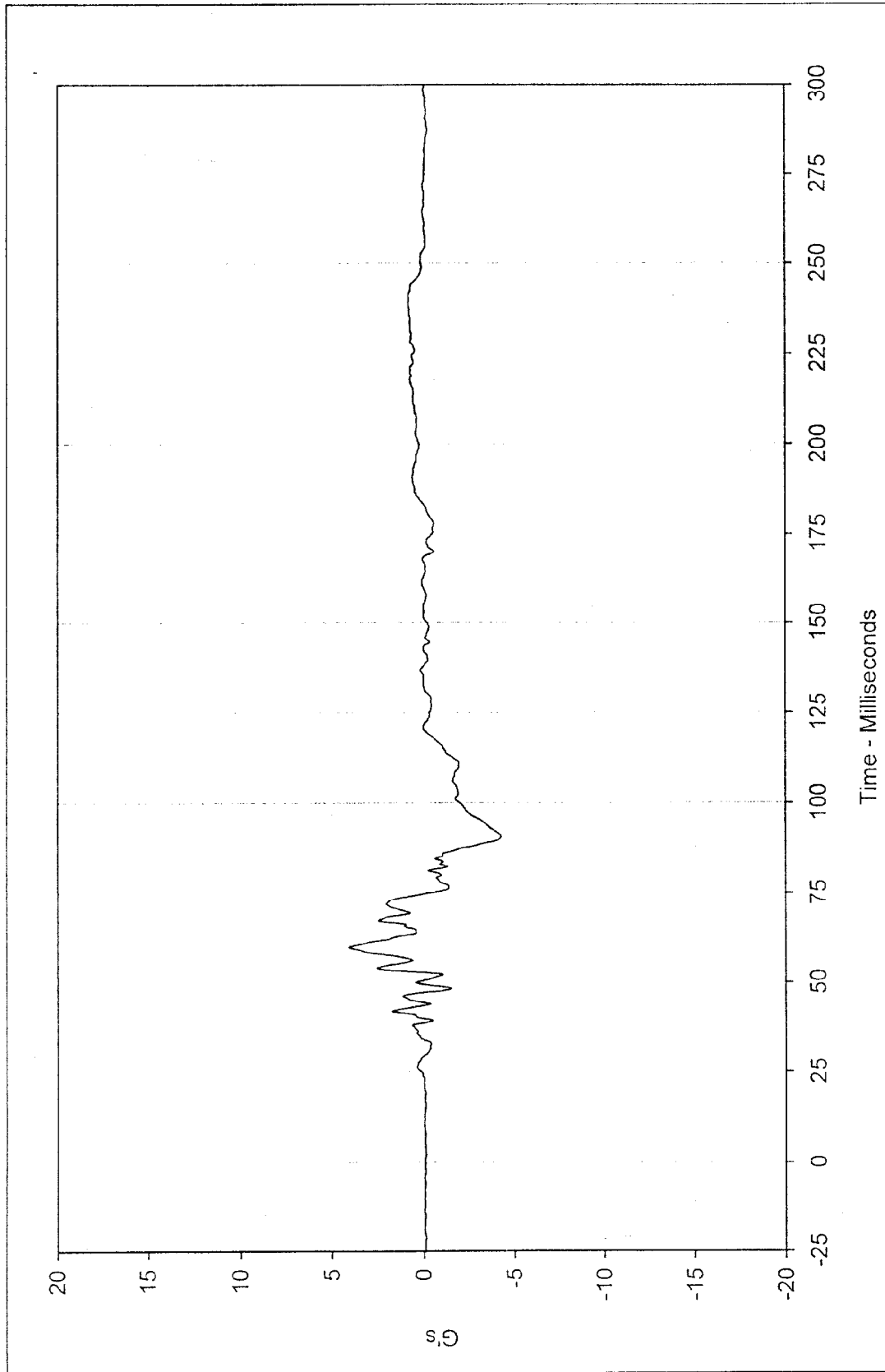


B90

Curve Description: Passenger Chest Redundant X Displ.
 Maximum Value: 97.8 at 81.4 Milliseconds
 Minimum Value: -0.2 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: IN2-060

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

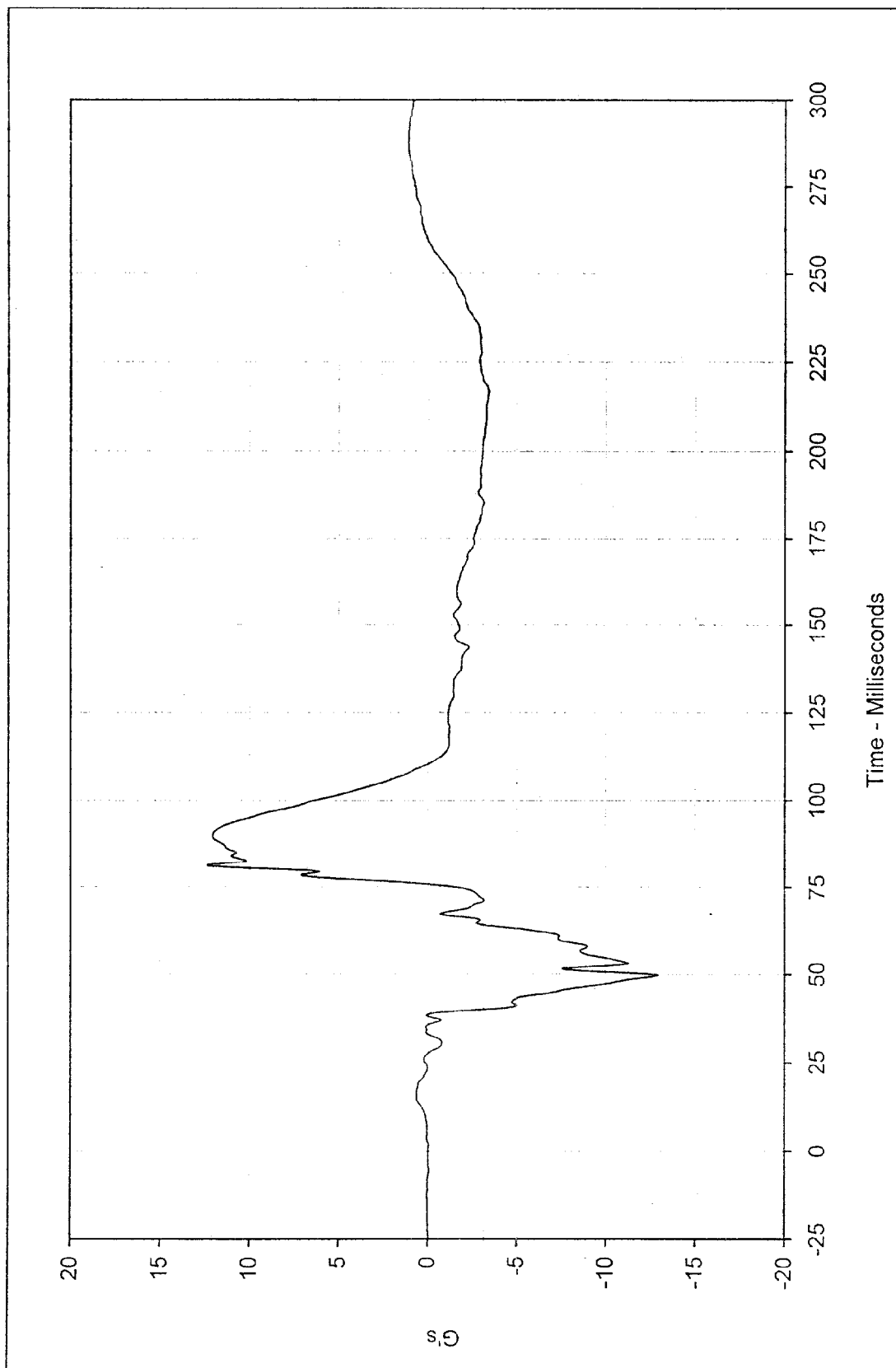




Curve Description: Passenger Chest Redundant Y
 Maximum Value: 4.1 at 59.8 Milliseconds
 Minimum Value: -4.3 at 90.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: FIL-061

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

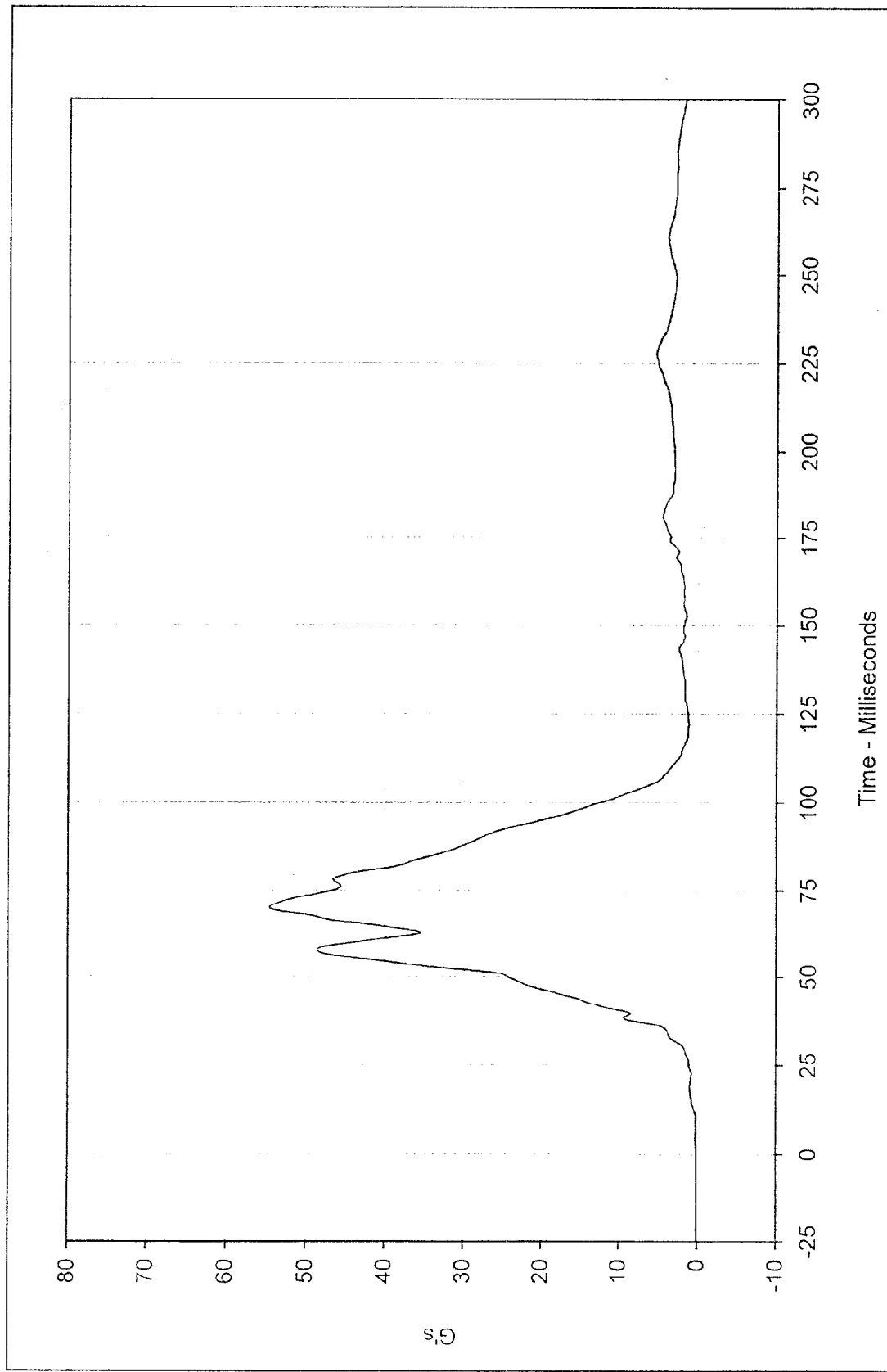




Curve Description: Passenger Chest Redundant Z
 Maximum Value: 12.3 at 81.2 Milliseconds
 Minimum Value: -12.9 at 49.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: FIL-062

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

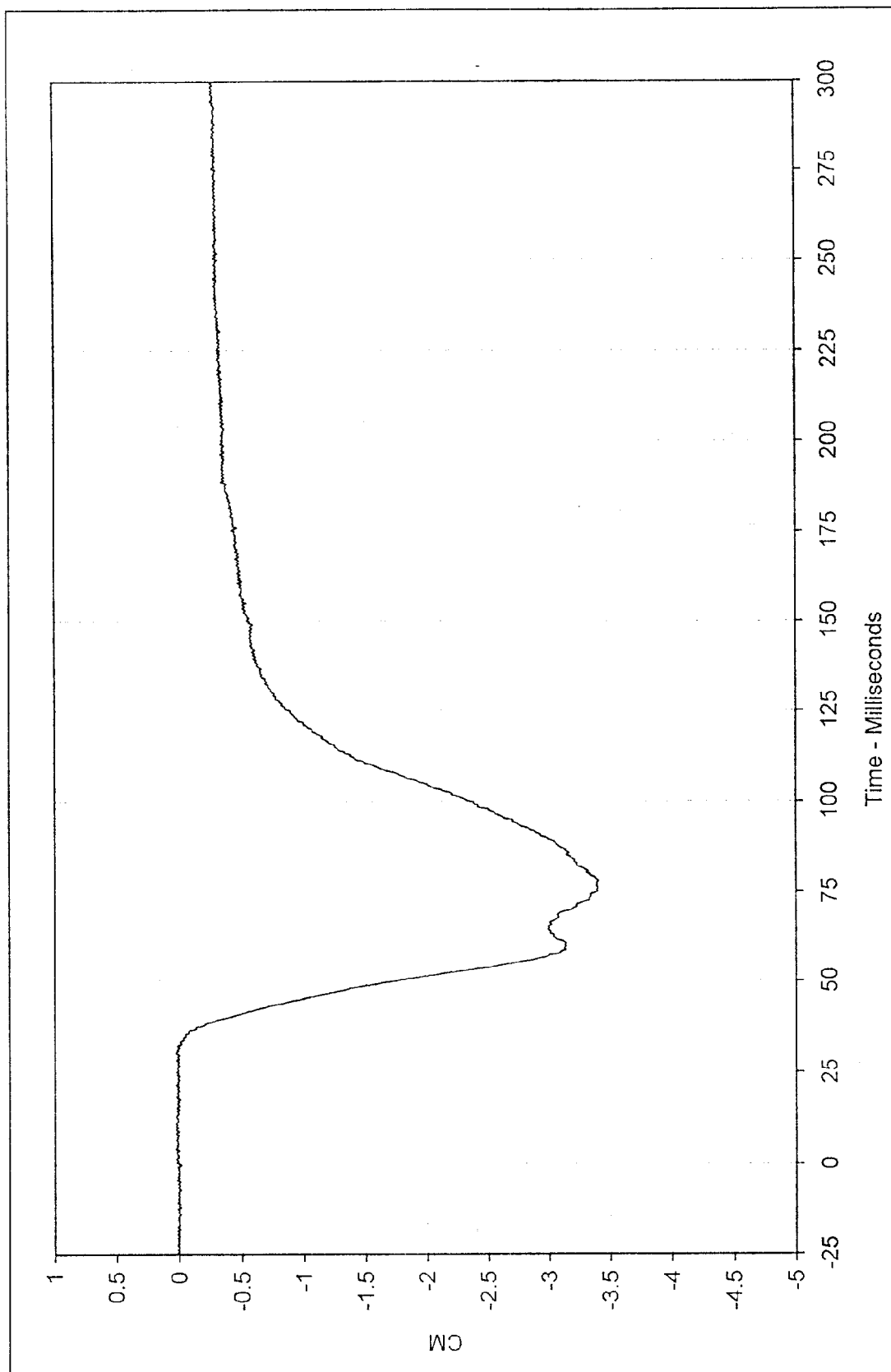




B93

Curve Description: Passenger Chest Resultant Redundant		Testing Program: 1997 New Car Assessment Program
Maximum Value: 54.6	at 69.9 Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value: 0.1	at 0.8 Milliseconds	
SAE Filter Class: 180		
Date of Test: 3/13/97		
Curve Number: RES-060		



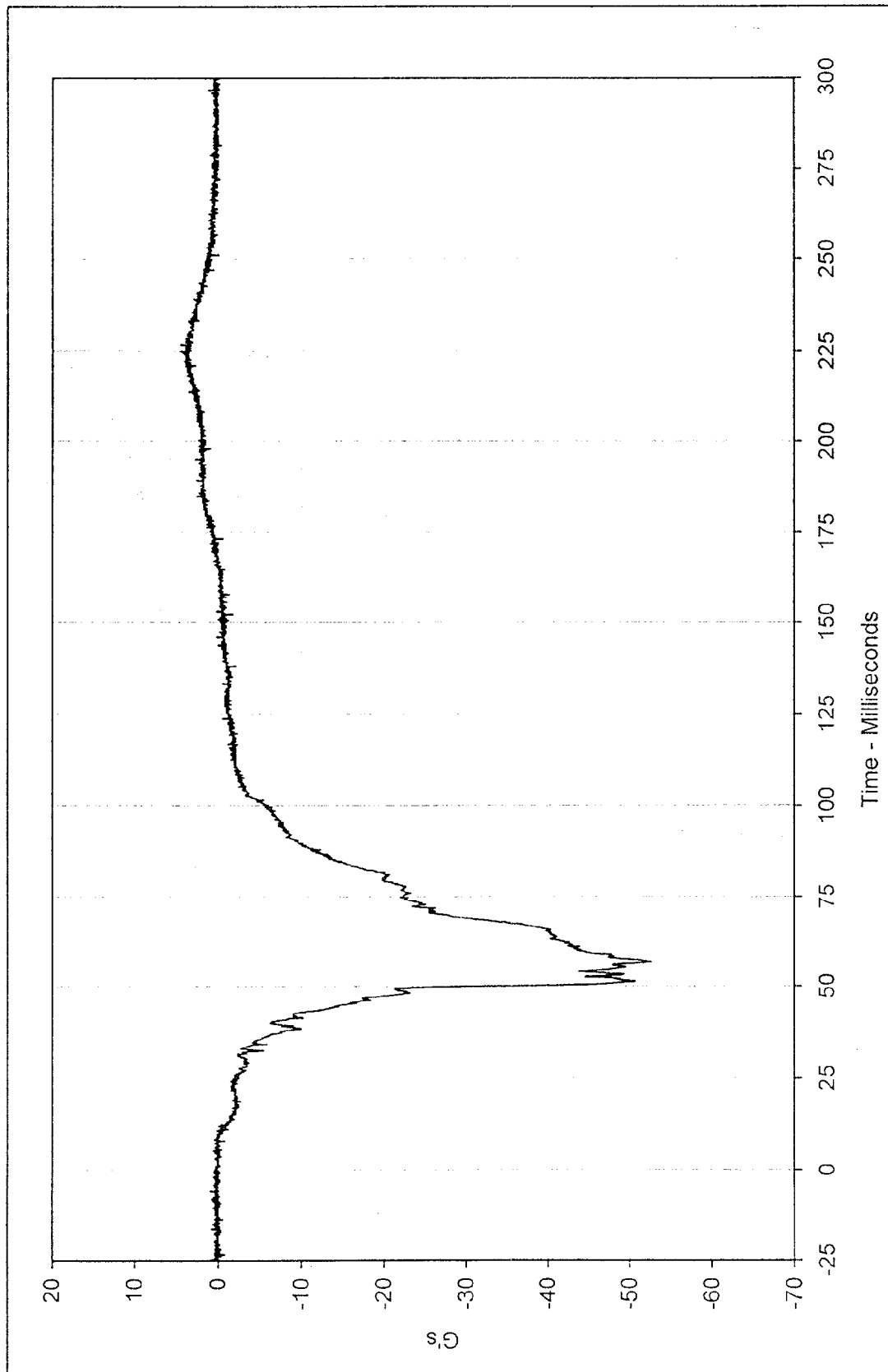


Curve Description: Passenger Chest Displacement
 Maximum Value: 0.03 at 4.2 Milliseconds
 Minimum Value: -3.41 at 77.9 Milliseconds
 SAE Filter Class: 600
 Date of Test: 3/13/97
 Curve Number: FIL-063

Testing Program: 1997 New Car Assessment Program

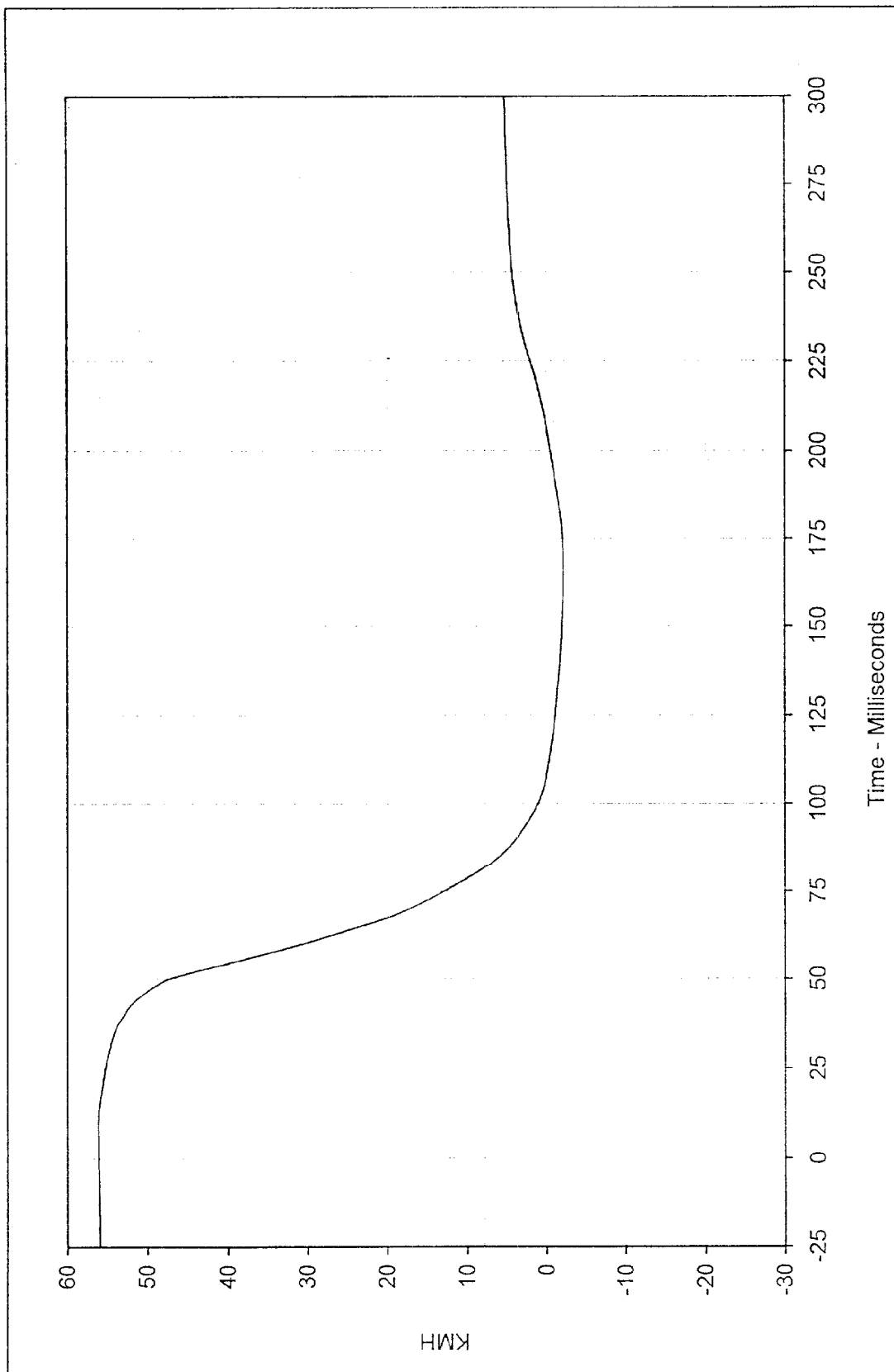
Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:		Passenger Pelvis X		Testing Program:	1997 New Car Assessment Program
Maximum Value:	4.5	at	224.8	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-52.7	at	56.7		
SAE Filter Class:	1000				
Date of Test:	3/13/97				
Curve Number:	FIL-064				



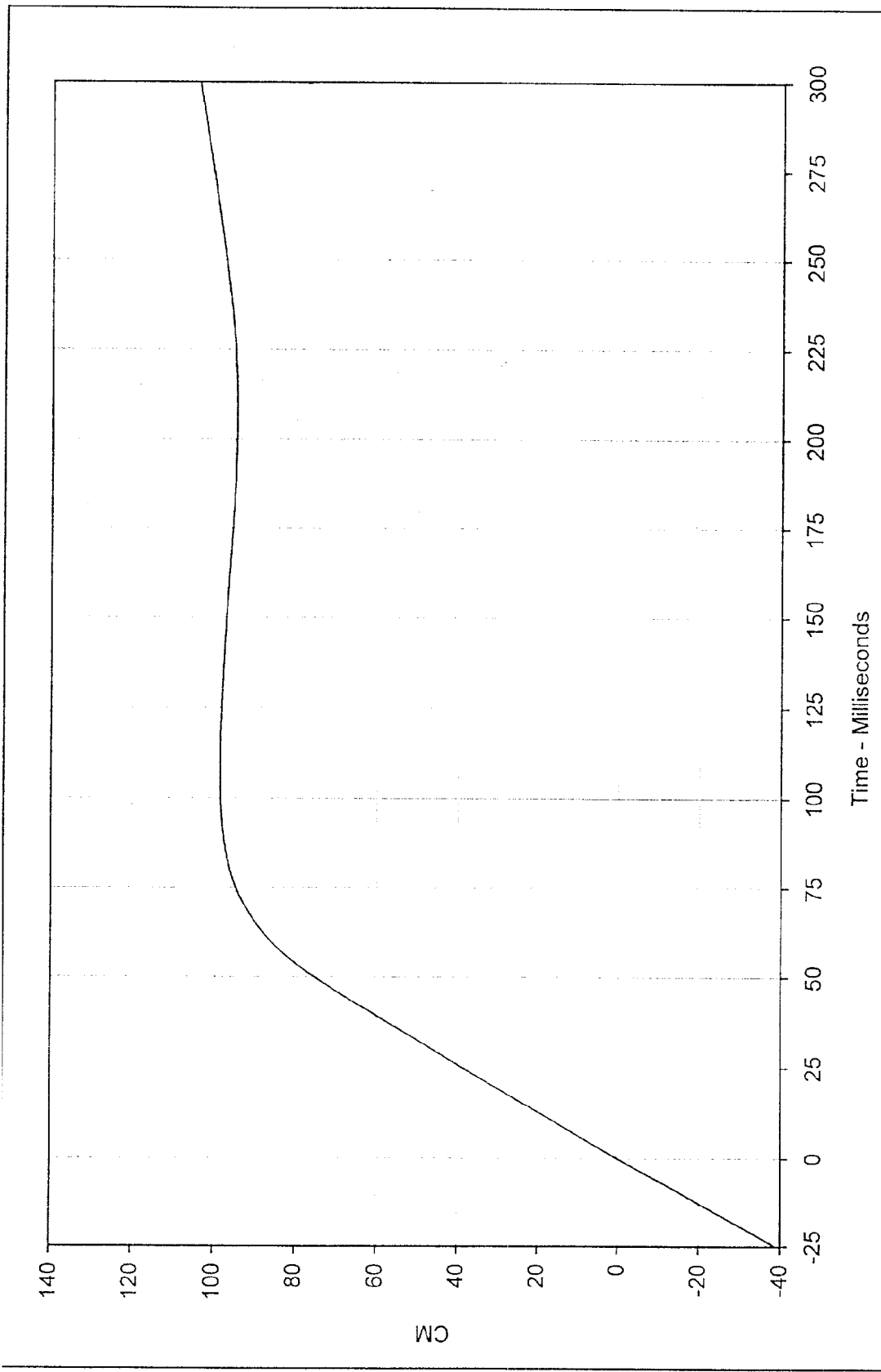


B96

Curve Description:	Passenger Pelvis X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.1 at 9.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-2.1 at 165.7 Milliseconds		



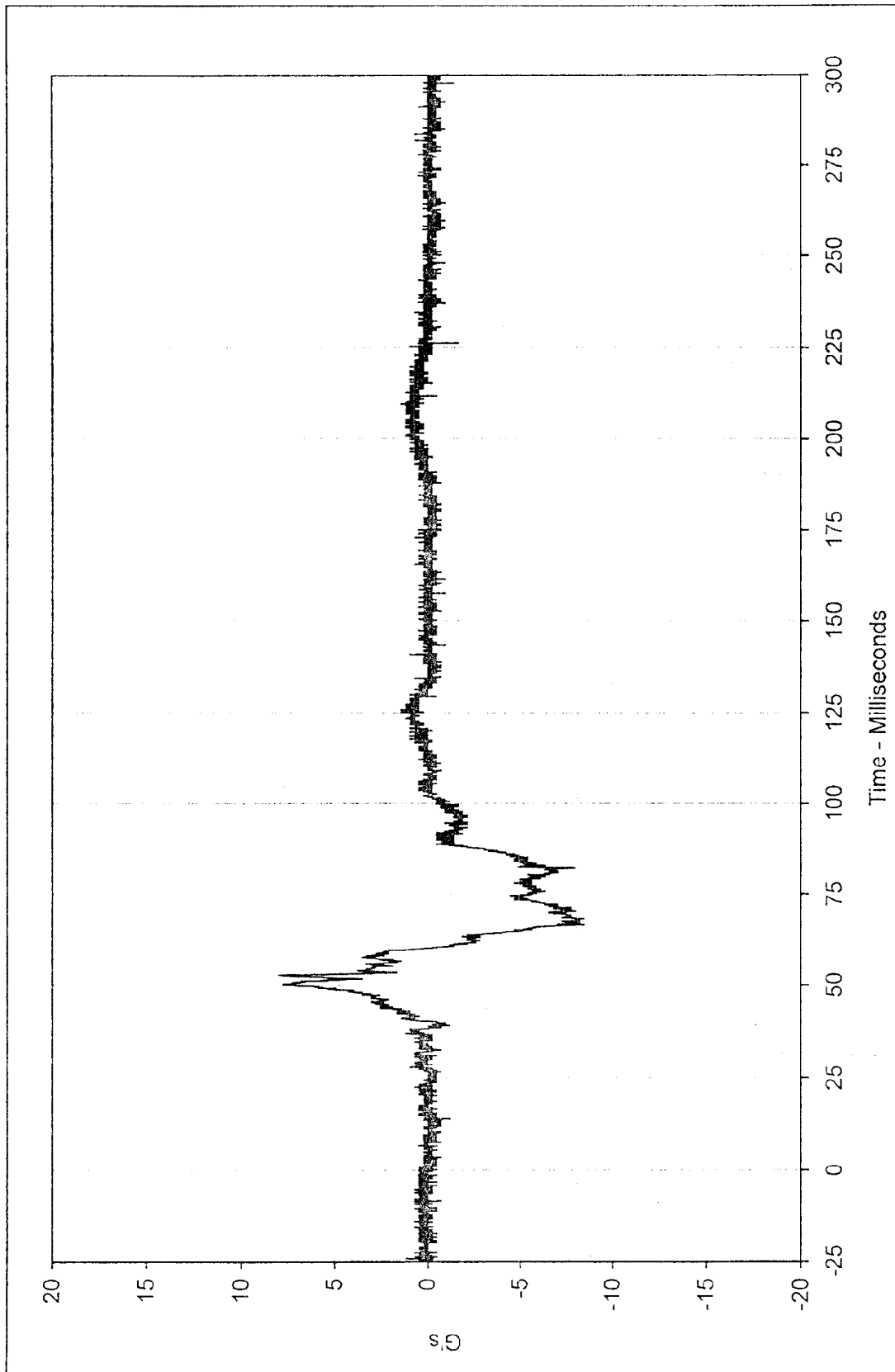
SAE Filter Class:	180
Date of Test:	3/13/97
Curve Number:	IN1-064



B97

Curve Description:	Passenger Pelvis X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	104.1 at 299.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-0.1 at 0.0 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-064		

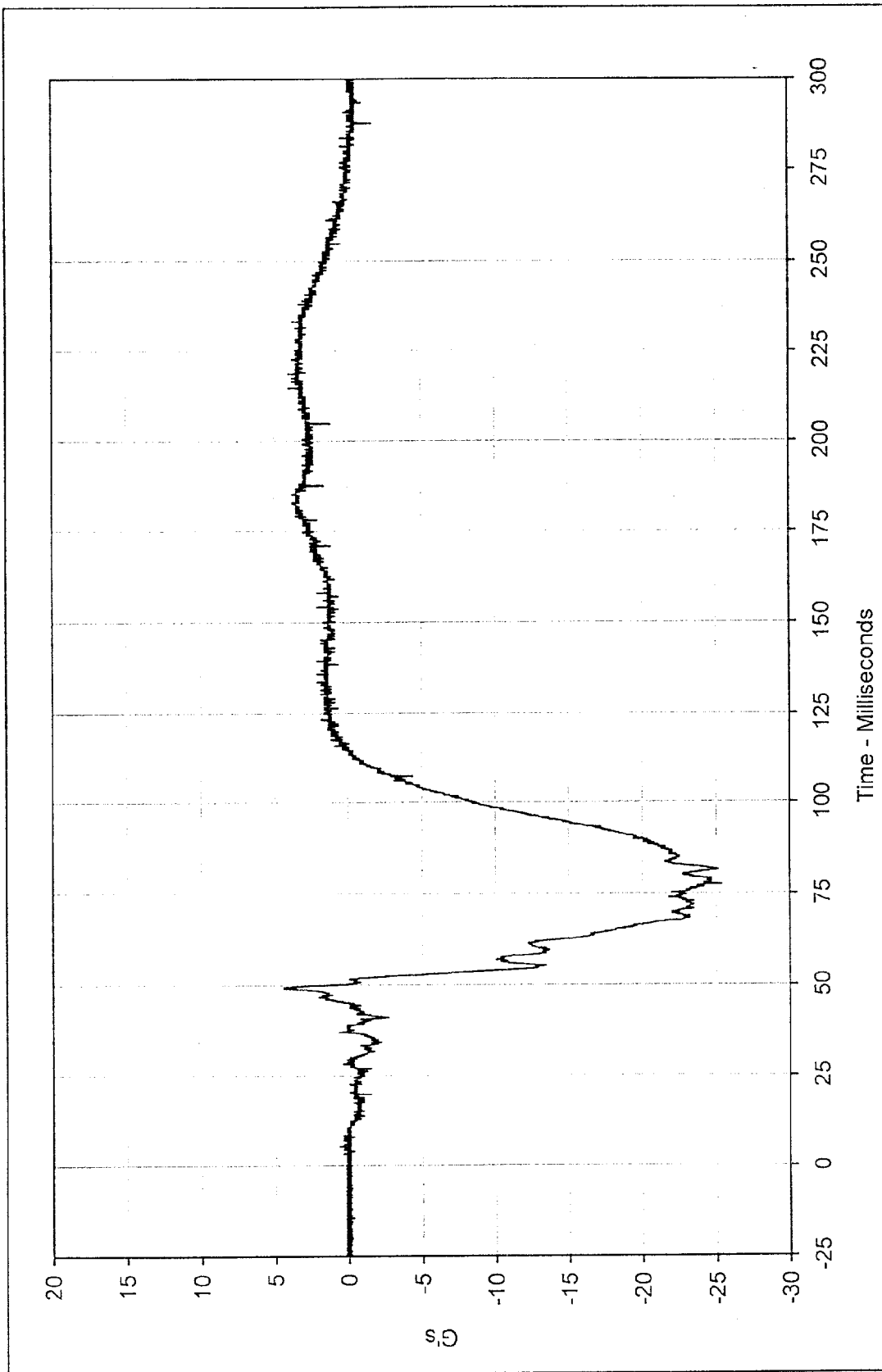




Curve Description: Passenger Pelvis Y
 Testing Program: 1997 New Car Assessment Program
 Maximum Value: 8.0 at 52.8 Milliseconds
 Minimum Value: -8.5 at 66.5 Milliseconds
 Test Vehicle: 1997 Chevrolet Cavalier

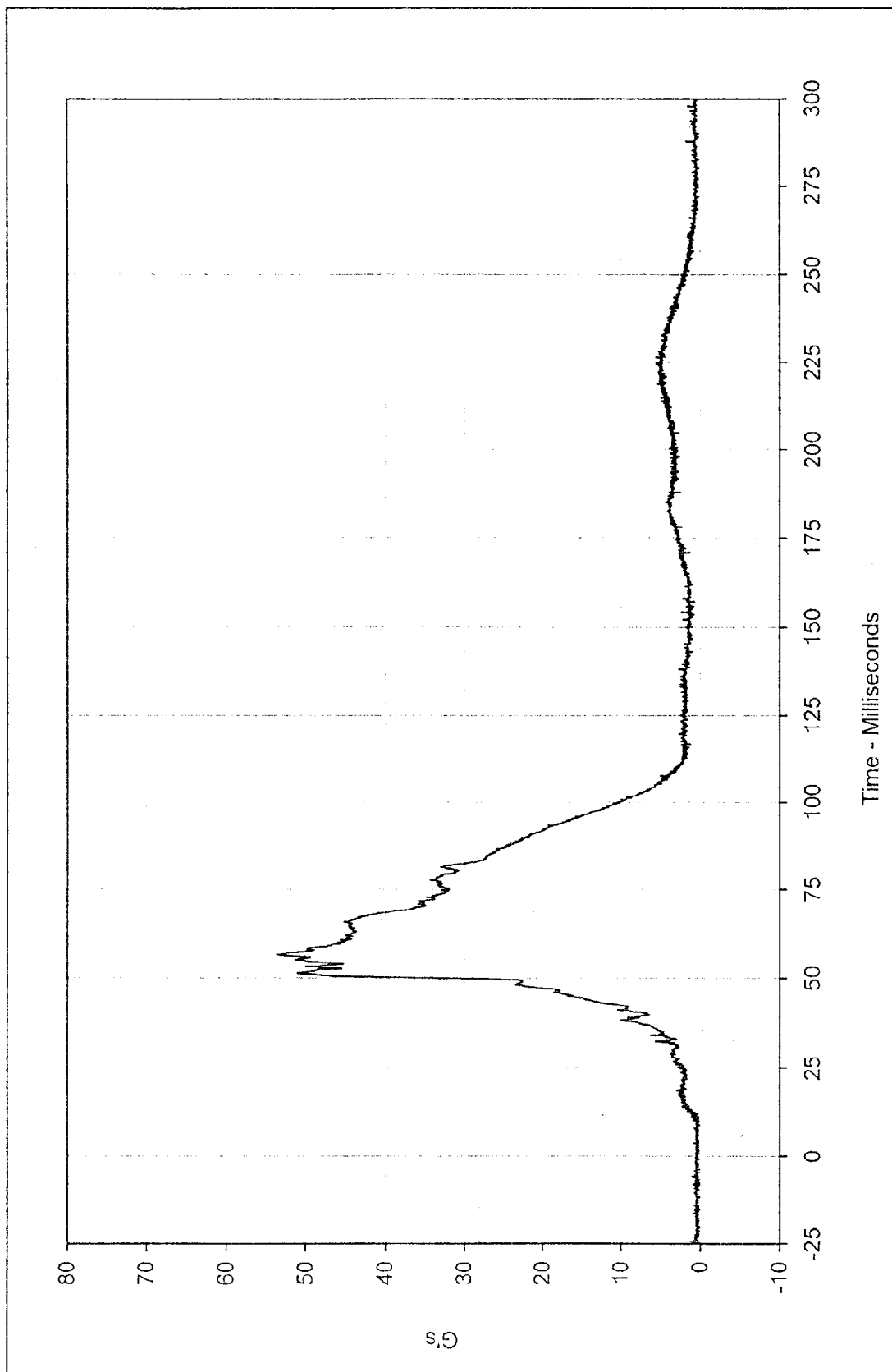


SAE Filter Class: 1000
 Date of Test: 3/13/97
 Curve Number: FIL-065



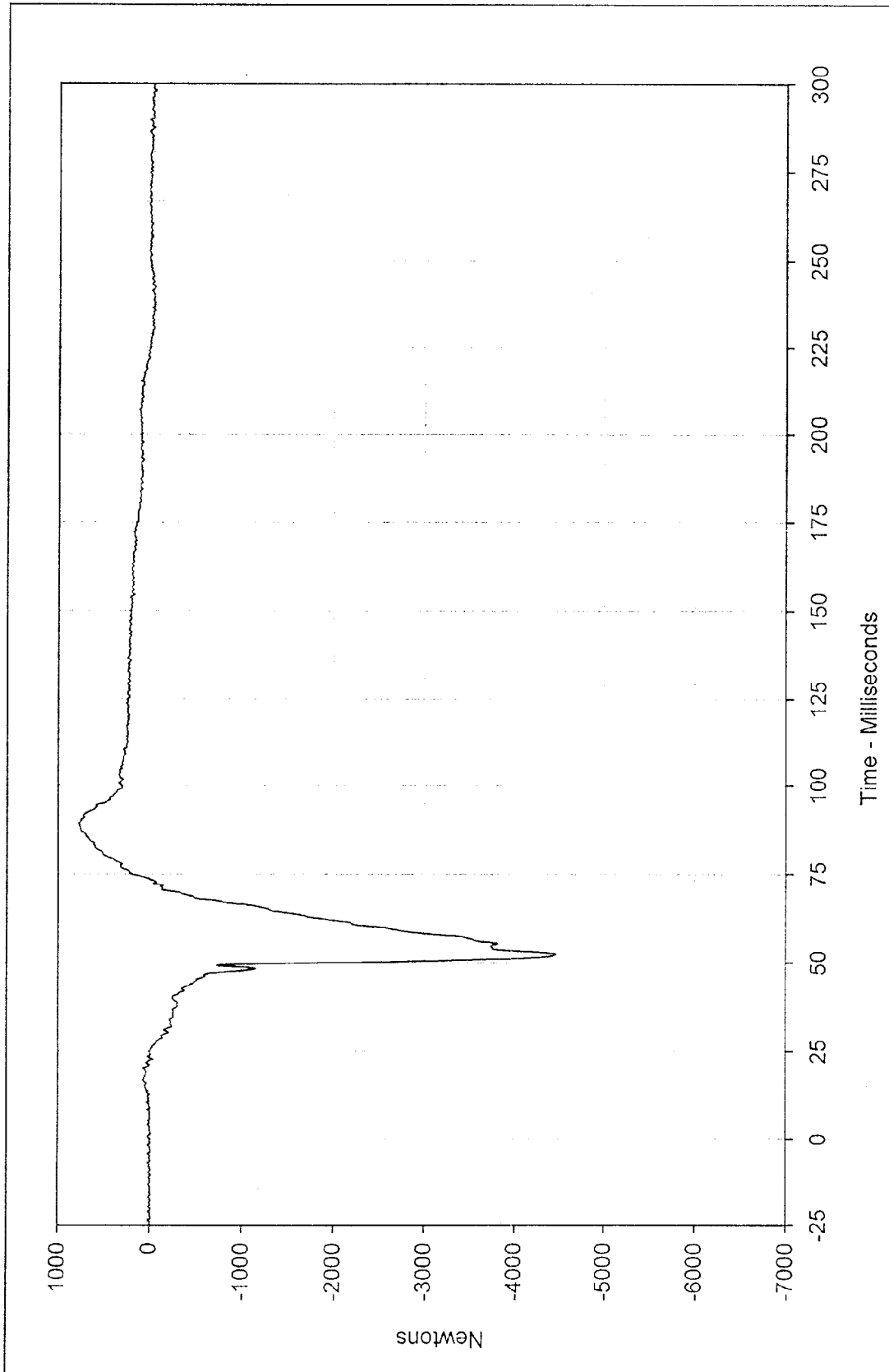
Curve Description:	Passenger Pelvis Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	4.5 at 49.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-25.3 at 77.5 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-066		





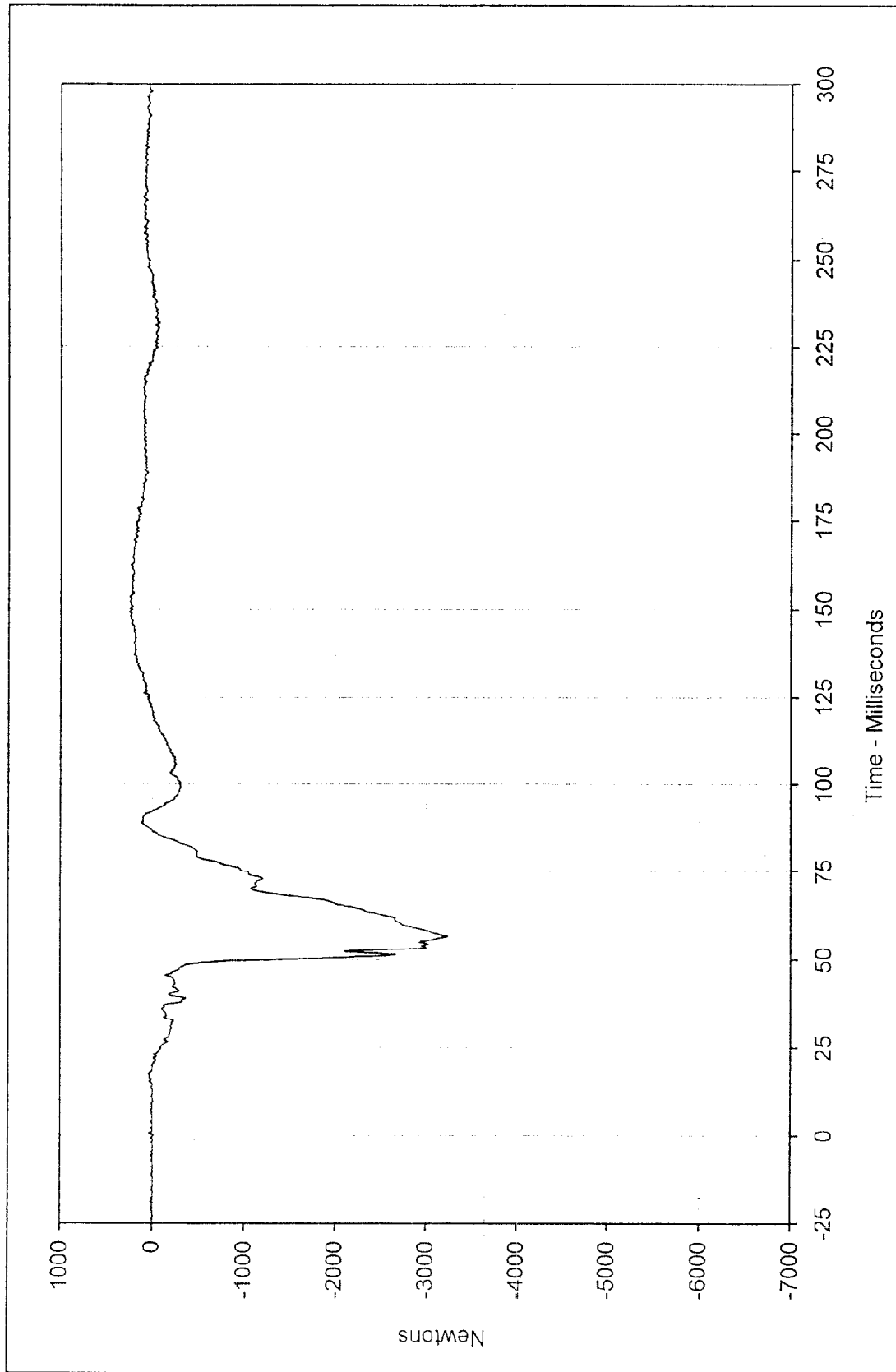
Curve Description:	Passenger Pelvis Resultant	Testing Program:	1997 New Car Assessment Program
Maximum Value:	53.7 at 56.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.1 at 8.9 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	RES-064		





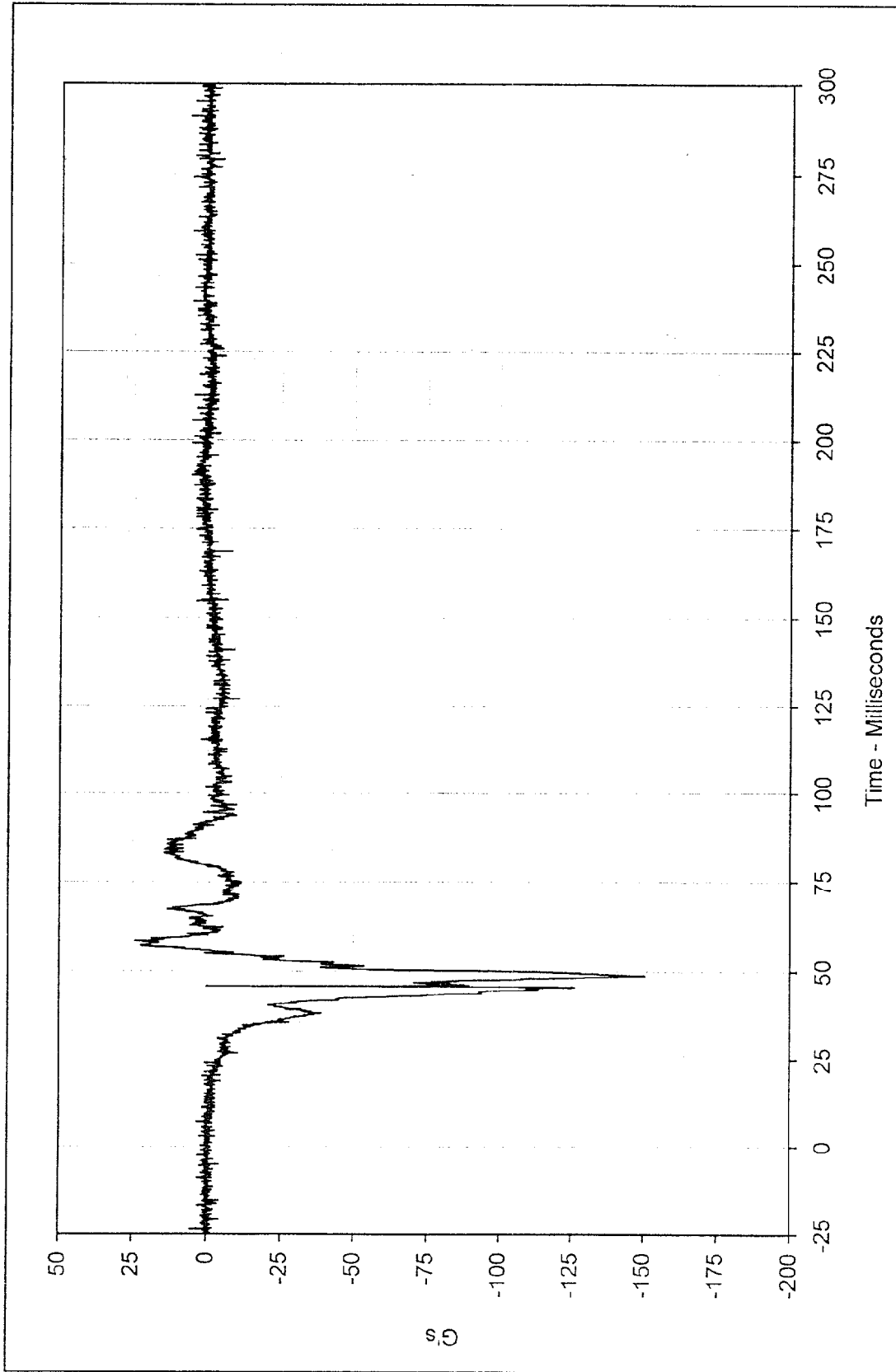
Curve Description:	Passenger Left Femur Force	Testing Program:	1997 New Car Assessment Program
Maximum Value:	771.1 at 89.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-4470.0 at 52.5 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-067		





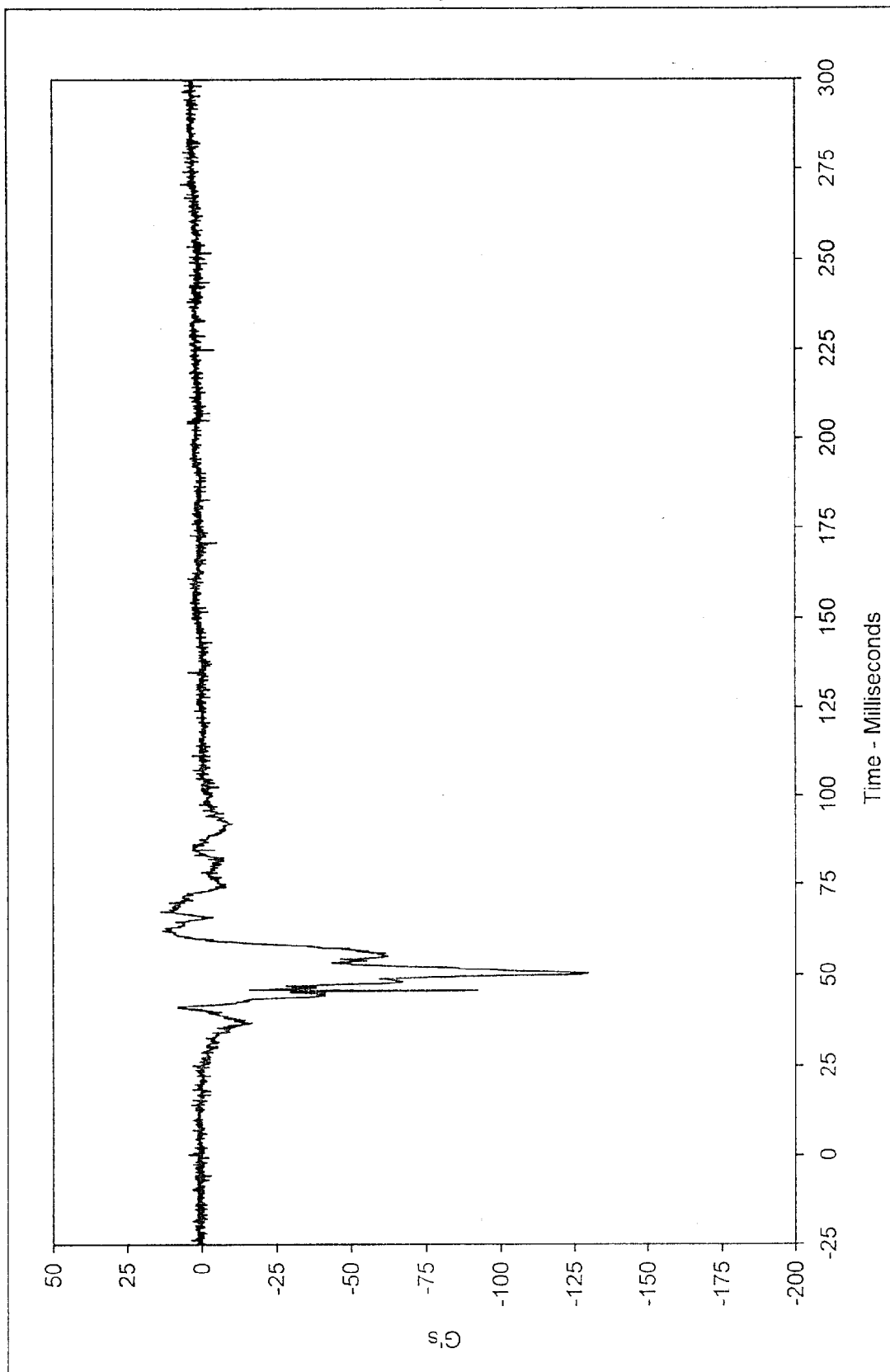
Curve Description:	Passenger Right Femur Force	Testing Program:	1997 New Car Assessment Program
Maximum Value:	249.7 at 149.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-3231.4 at 56.5 Milliseconds		
SAE Filter Class:	600		
Date of Test:	3/13/97		
Curve Number:	FIL-068		





Curve Description:	Passenger Left Foot Aft X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	23.8 at 58.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-150.6 at 48.8 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-079		

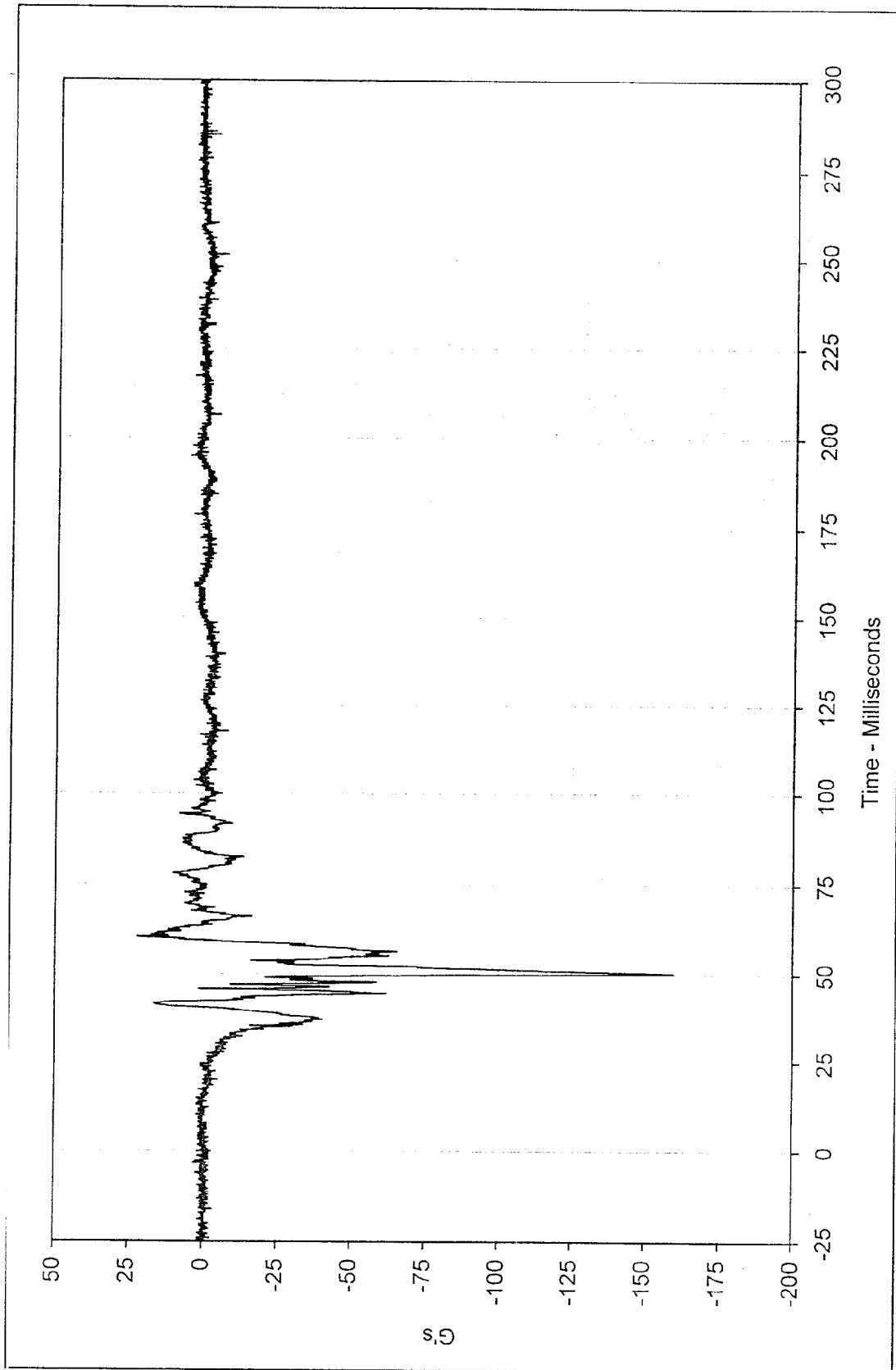




Curve Description:	Passenger Left Foot Aft Z				Testing Program:	1997 New Car Assessment Program	
Maximum Value:	13.8	at	67.6	Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-129.8	at	50.5	Milliseconds			
SAE Filter Class:	1000						
Date of Test:	3/13/97						
Curve Number:	FIL-080						

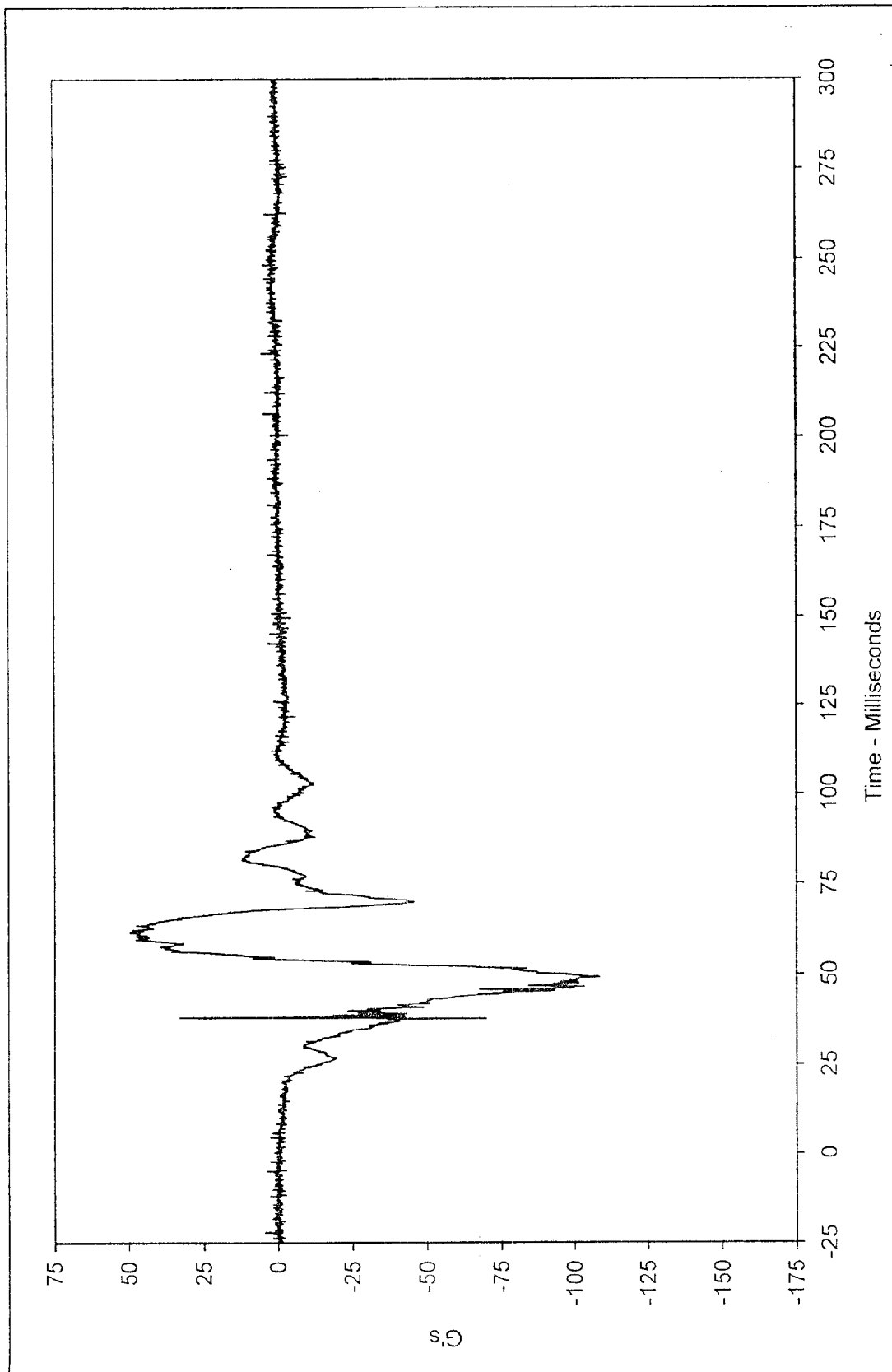
The logo for KARCO Engineering. It features the word "KARCO" in a large, bold, sans-serif font. To the left of the "K" is a circular icon containing a stylized lightbulb with a spiral filament. To the right of "KARCO" is the word "Engineering" in a smaller, italicized, sans-serif font. The entire logo is set against a dark, rectangular background.





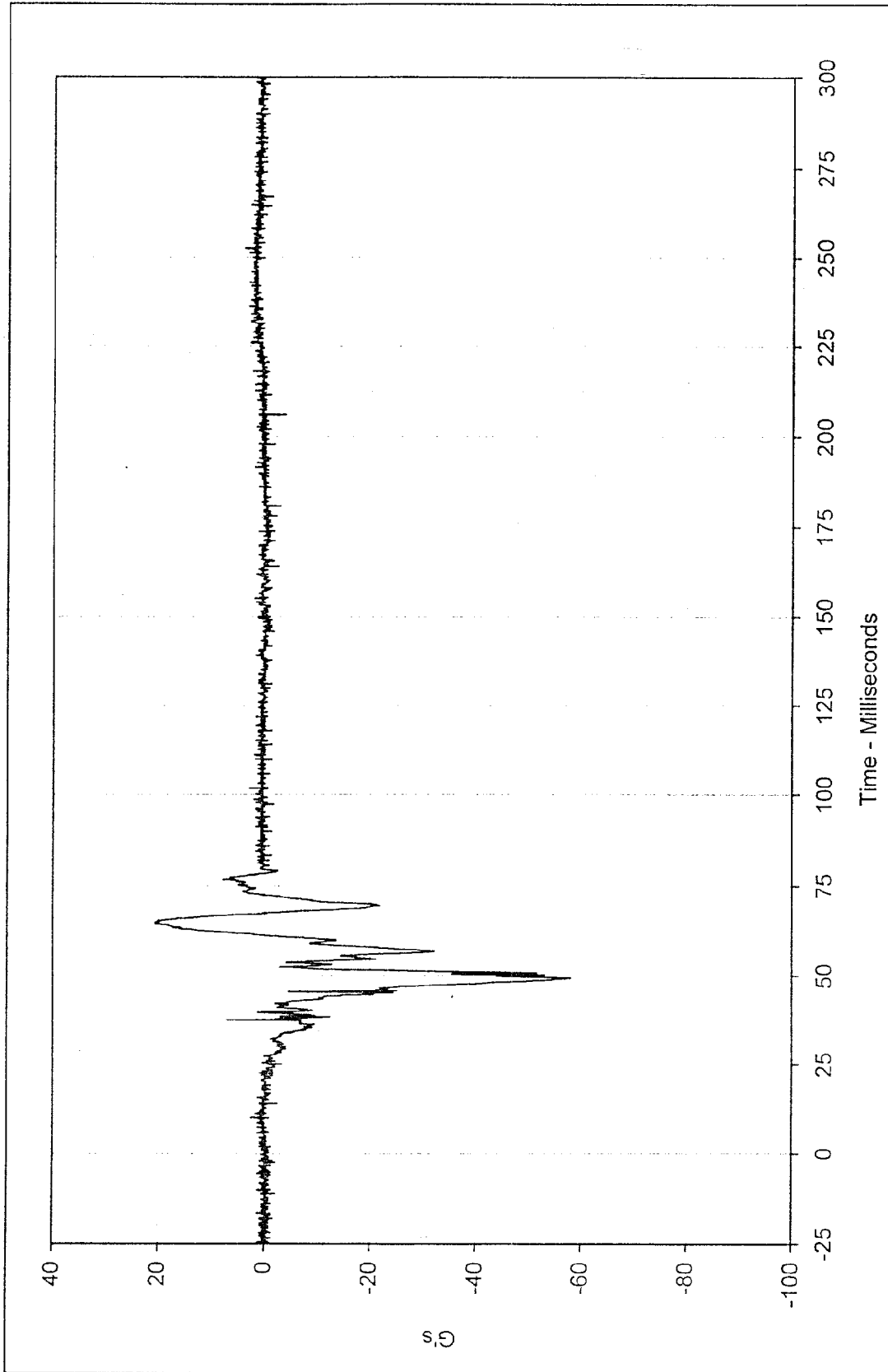
Curve Description:	Passenger Left Foot Fore Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	22.3 at 60.5 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-159.5 at 50.4 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-081		





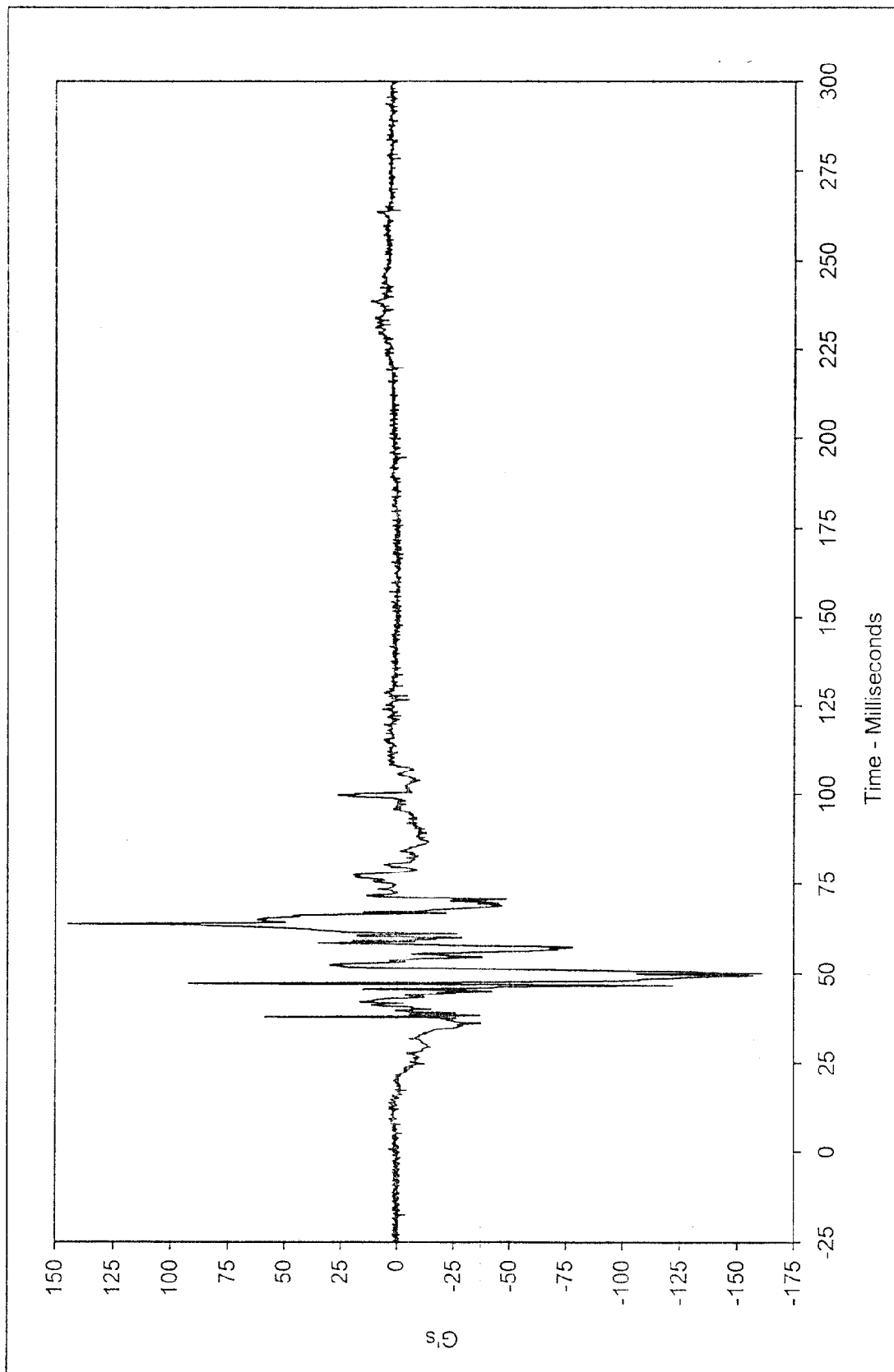
Curve Description:	Passenger Right Foot Aft X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	49.4 at 61.6 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-108.4 at 49.1 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-082		





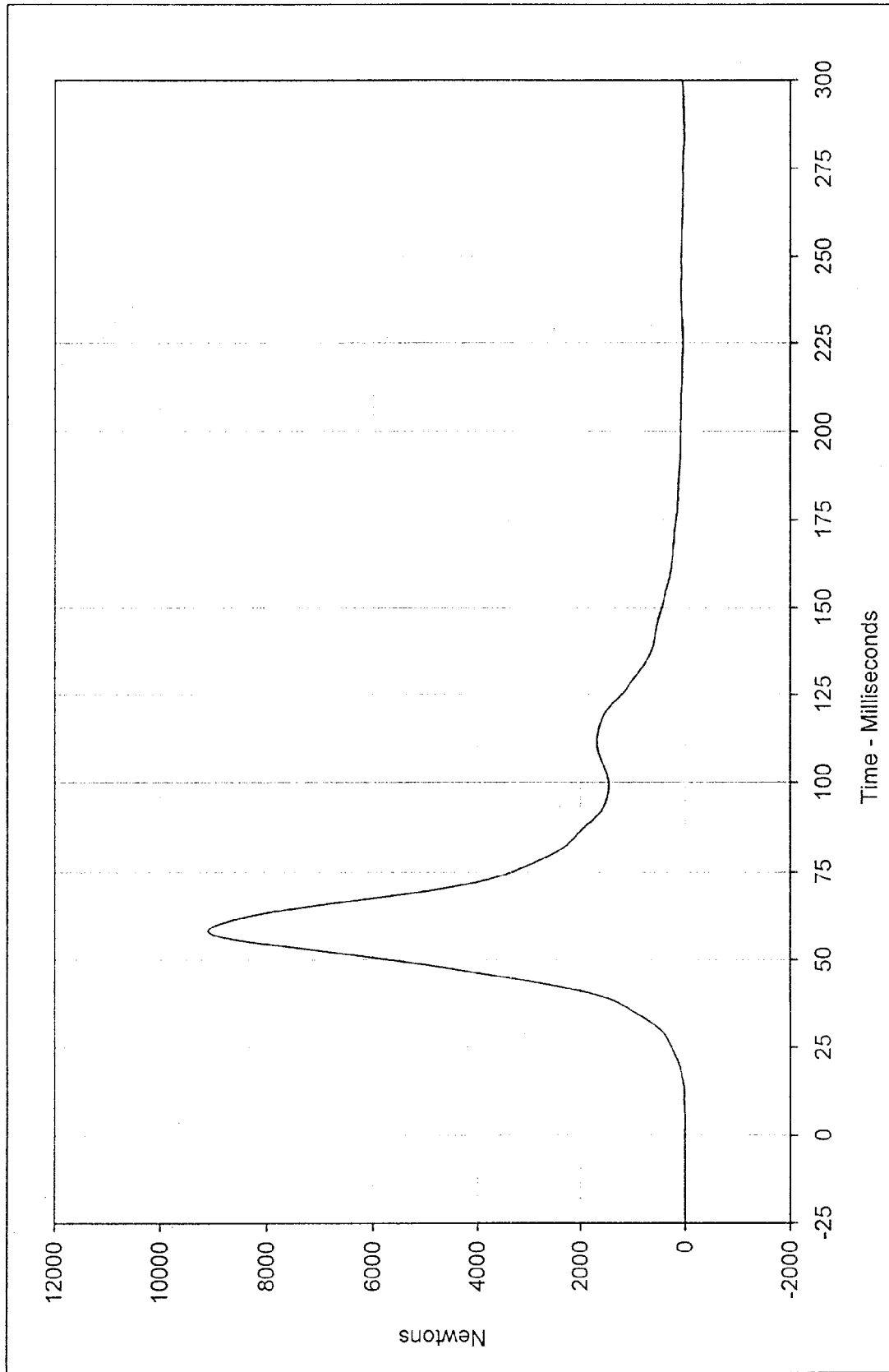
Curve Description:	Passenger Right Foot Aft Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	20.6 at 64.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-58.1 at 49.4 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-083		





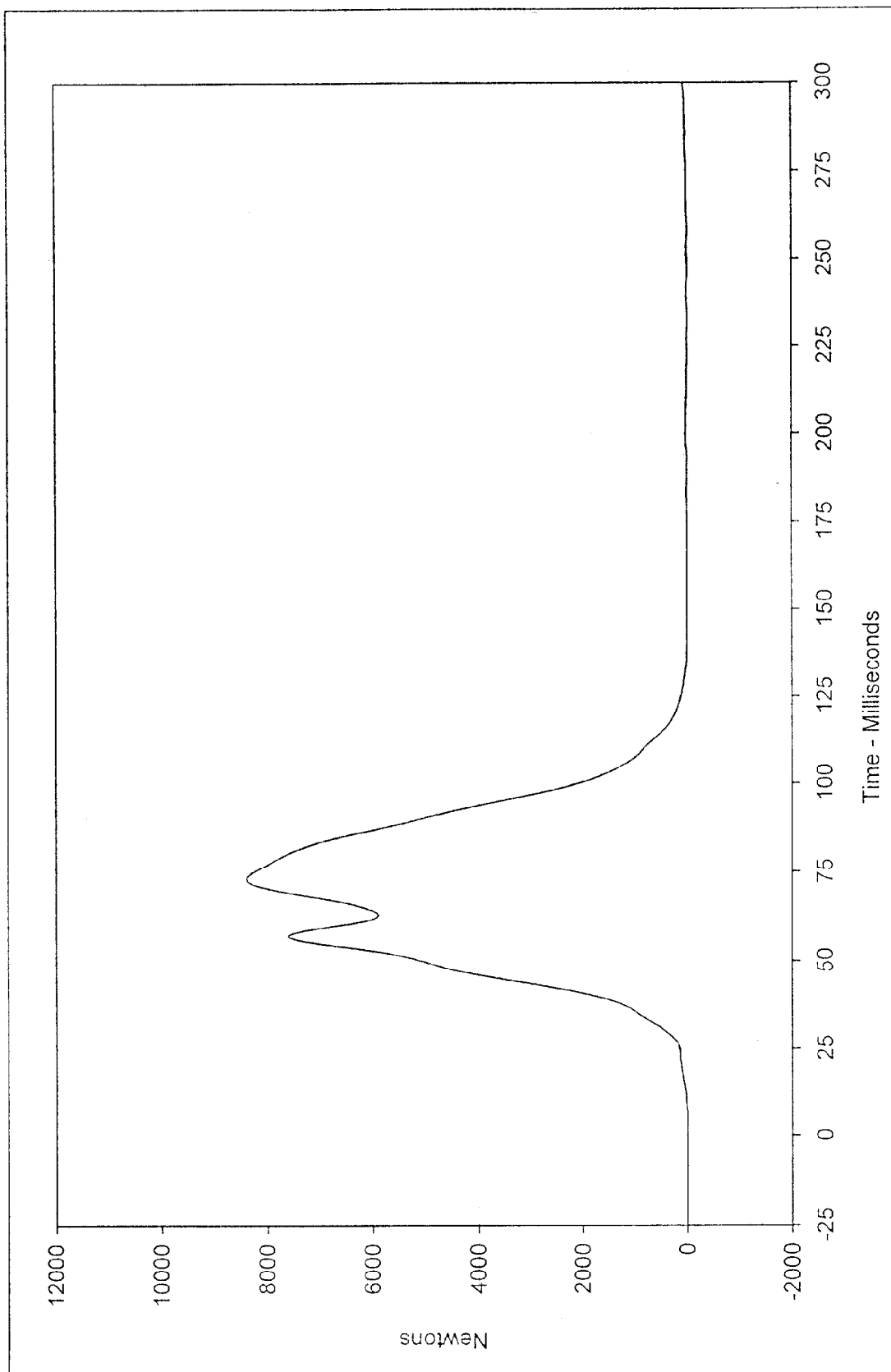
Curve Description:	Passenger Right Foot Fore Z	Testing Program:	1997 New Car Assessment Program
Maximum Value:	144.7 at 63.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-160.4 at 50.2 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	3/13/97		
Curve Number:	FIL-084		





Curve Description:	Passenger Lap Belt Force	Testing Program:	1997 New Car Assessment Program
Maximum Value:	9106.8 at 58.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-2.8 at 4 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-085		

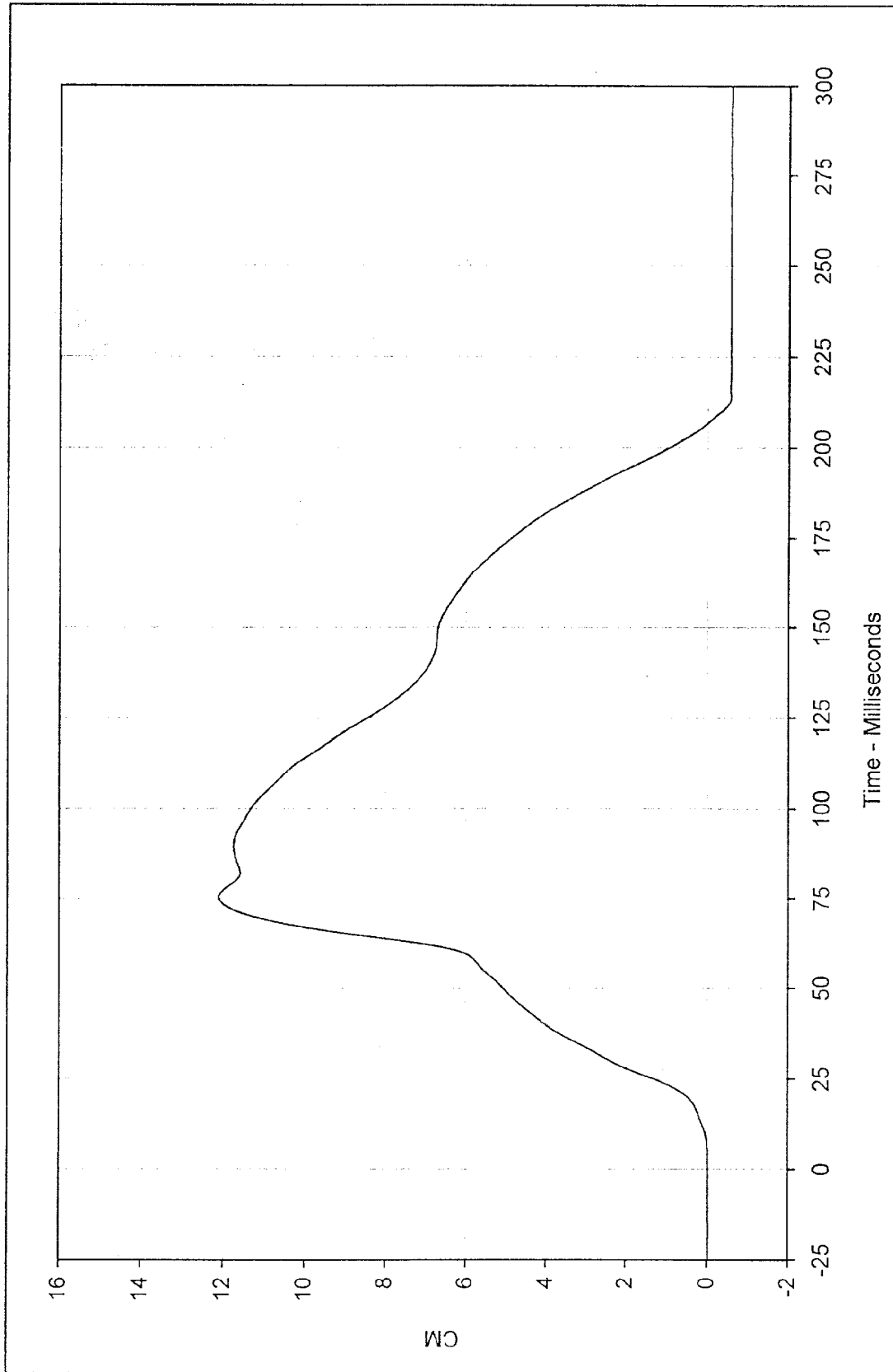




Curve Description: Passenger Shoulder Belt Force
 Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

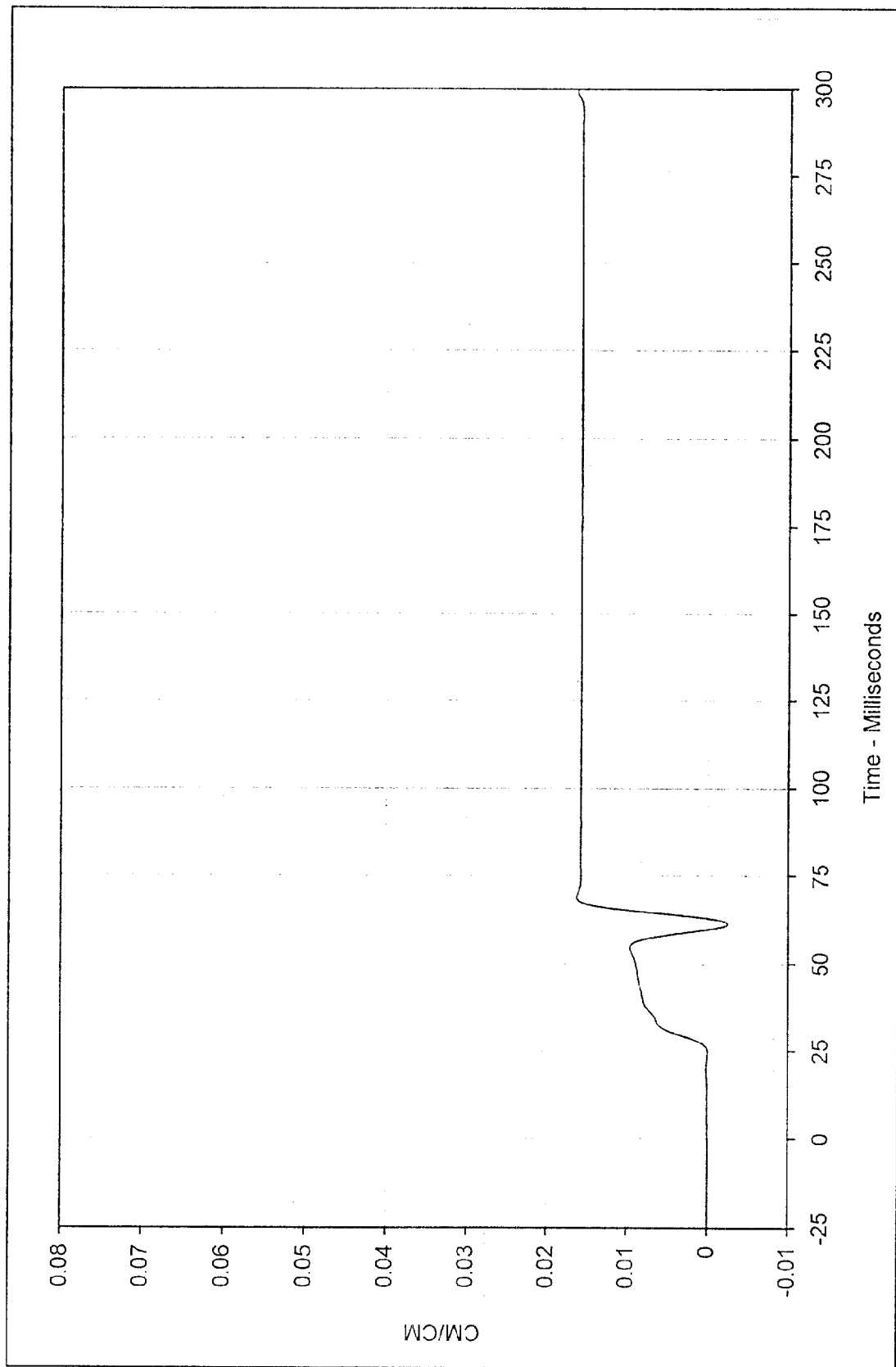
Maximum Value: 8387.1 at 73.2 Milliseconds
 Minimum Value: -17.9 at 258.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 3/13/97
 Curve Number: FIL-086





Curve Description:	Passenger Shoulder Belt Pullout	Testing Program:	1997 New Car Assessment Program
Maximum Value:	12.11 at 75.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-0.58 at 298.3 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-087		

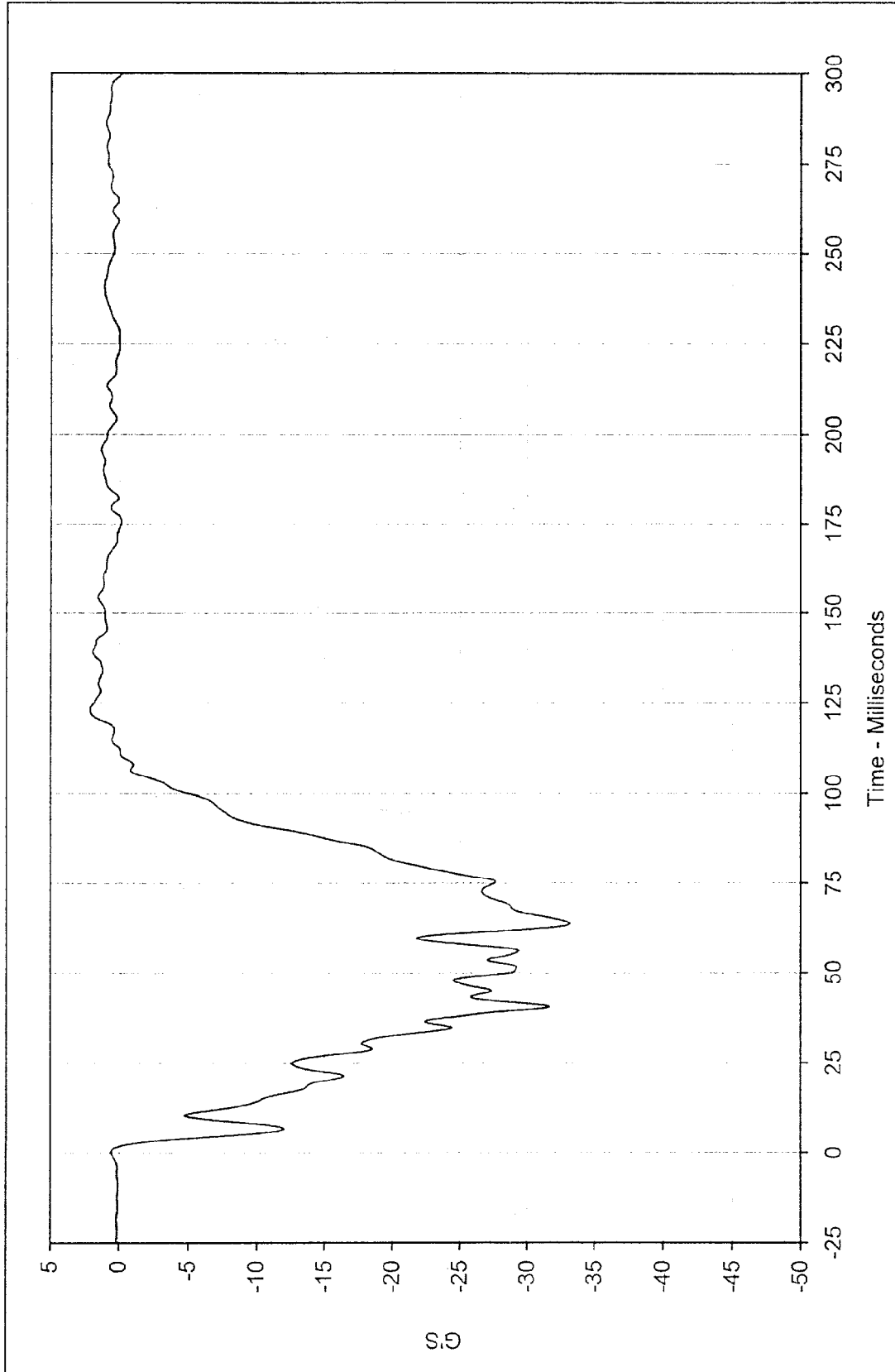




Curve Description: Passenger Shoulder Belt Elongation
 Maximum Value: 0.016 at 29.3 Milliseconds
 Minimum Value: -0.003 at 61.4 Milliseconds

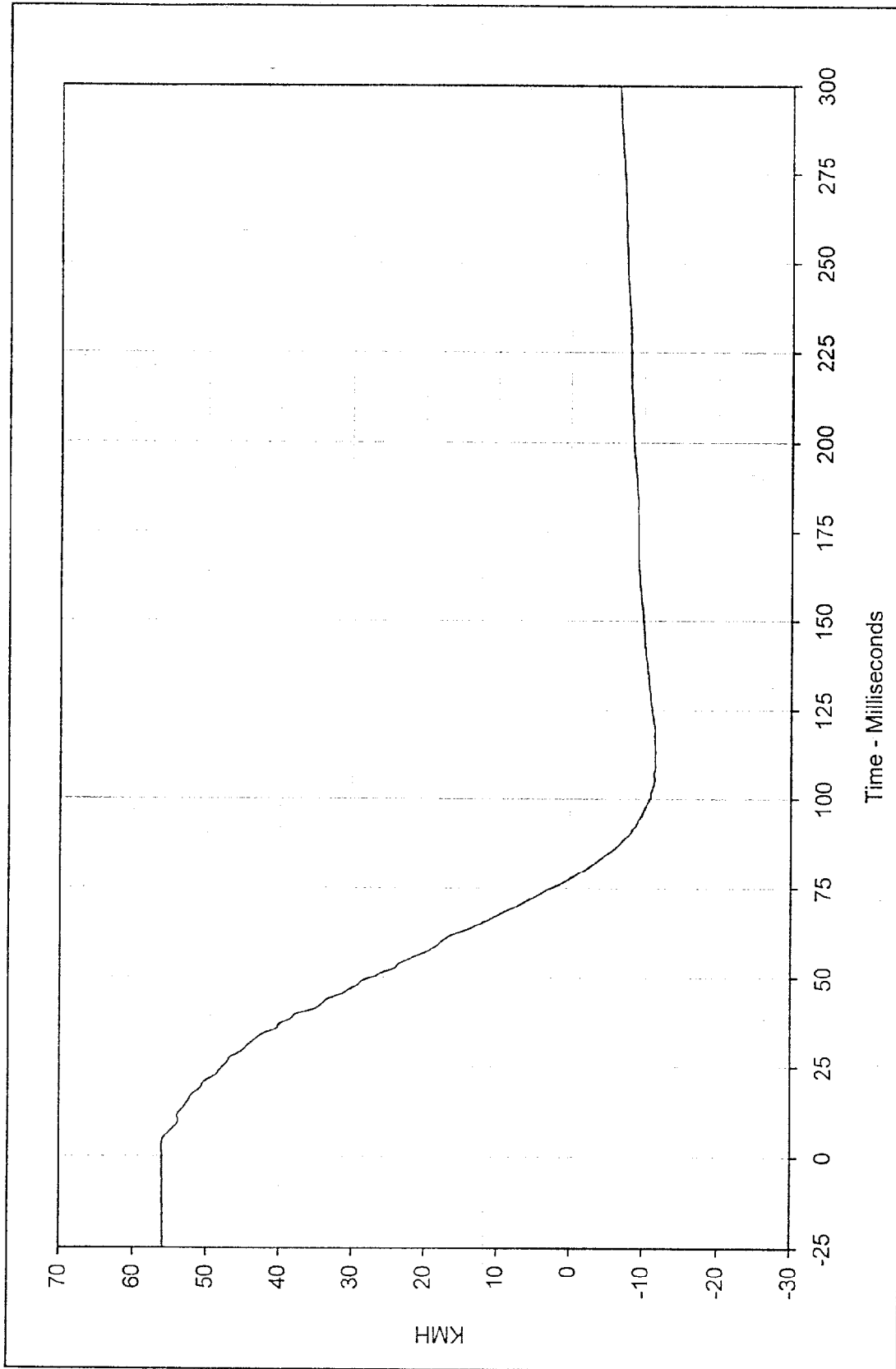
SAE Filter Class: 60
 Date of Test: 3/13/97
 Curve Number: FIL-088





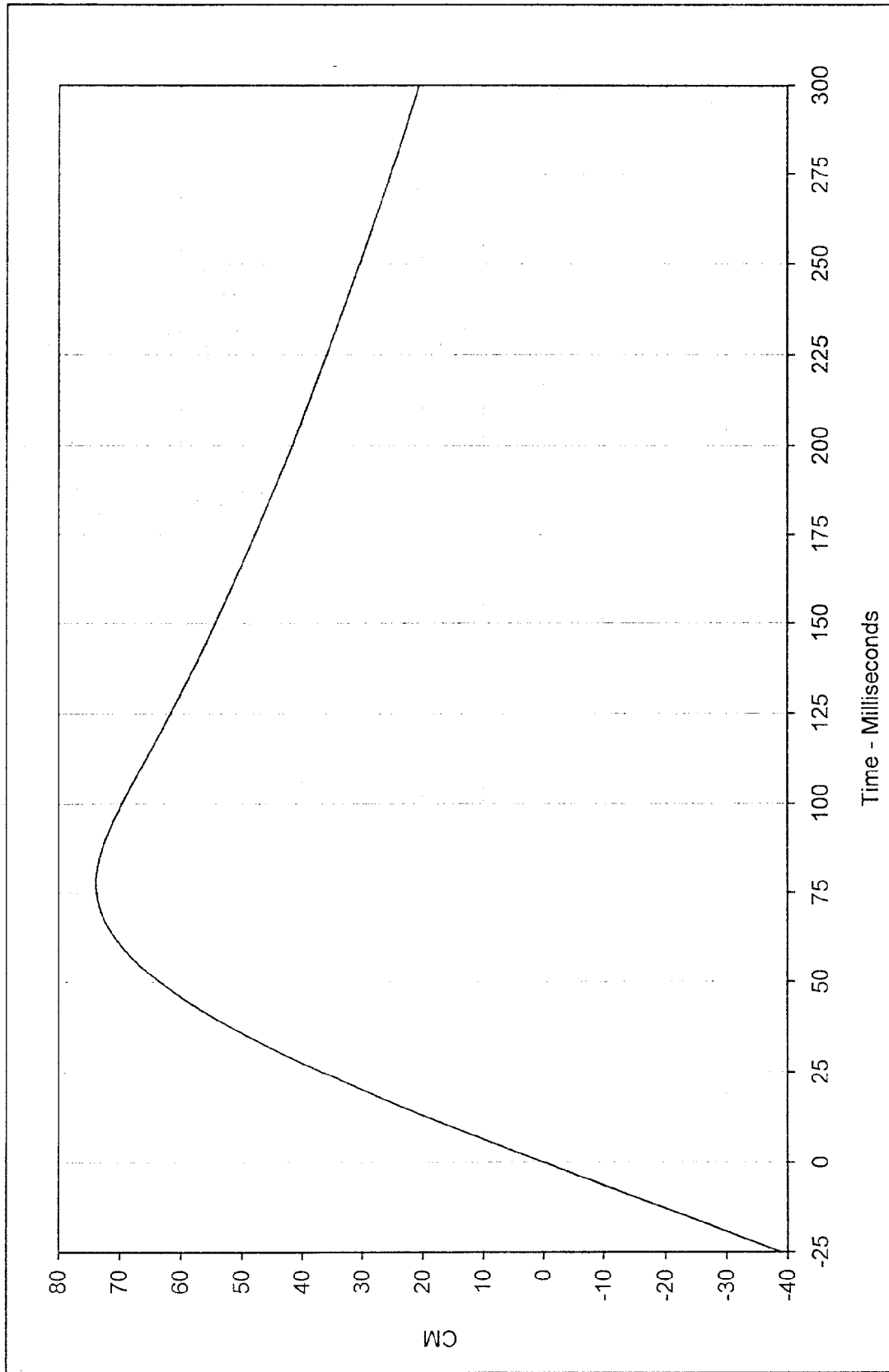
Curve Description:	Vehicle Left Rear Primary X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	2.1 at 123.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-33.2 at 63.8 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-089		





Curve Description:	Vehicle Left Rear Primary X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 3.6 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-11.7 at 109.5 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-089		

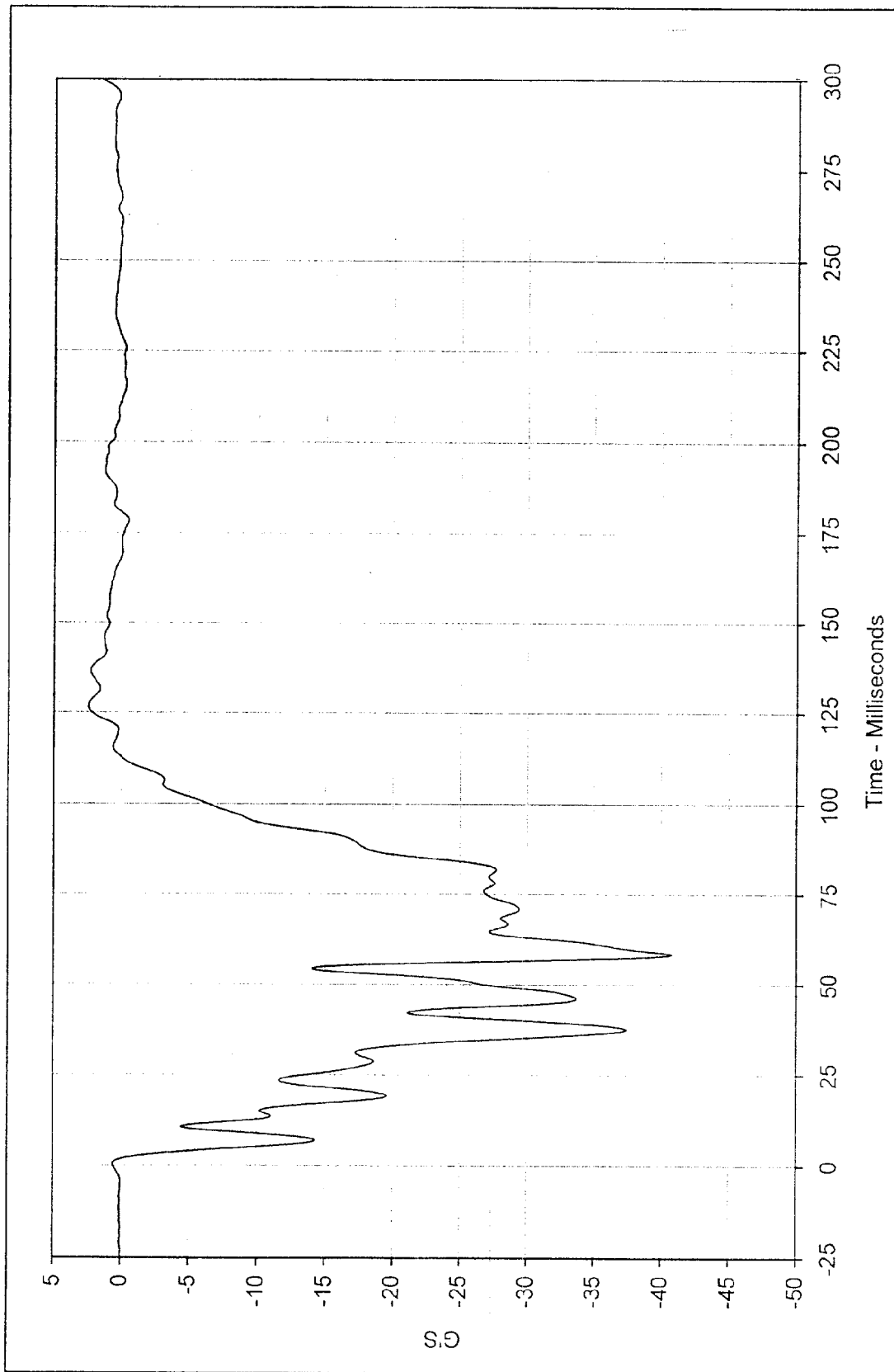




Curve Description: Vehicle Left Rear Primary X Displ.
 Maximum Value: 73.8 at 77.8 Milliseconds
 Minimum Value: -0.1 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: IN2-089

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

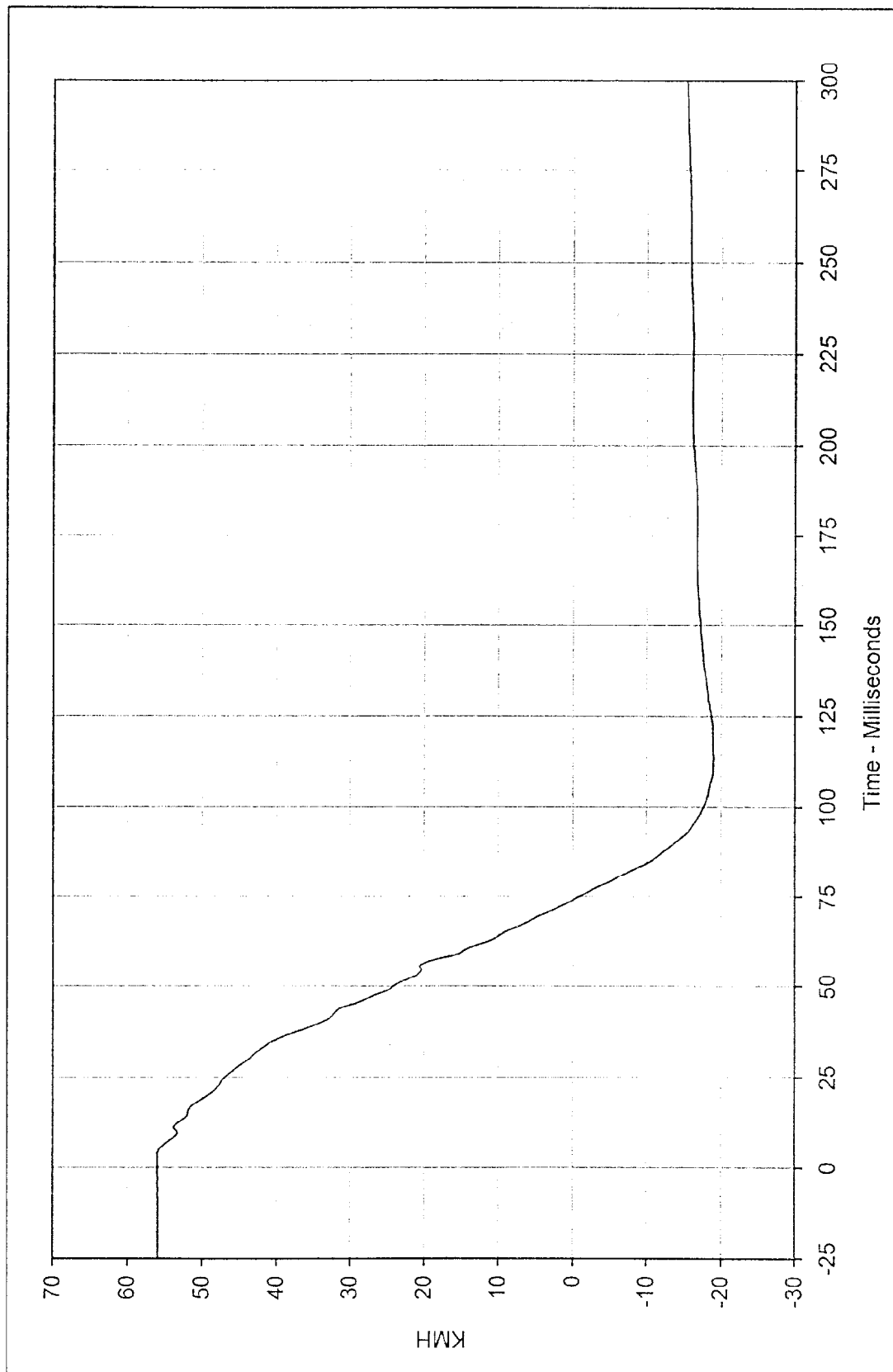




B126

Curve Description:	Vehicle Right Rear Primary X		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	2.4	at 126.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-40.8	at 58.6 Milliseconds			
SAE Filter Class:	60				
Date of Test:	3/13/97				
Curve Number:	FIL-090				



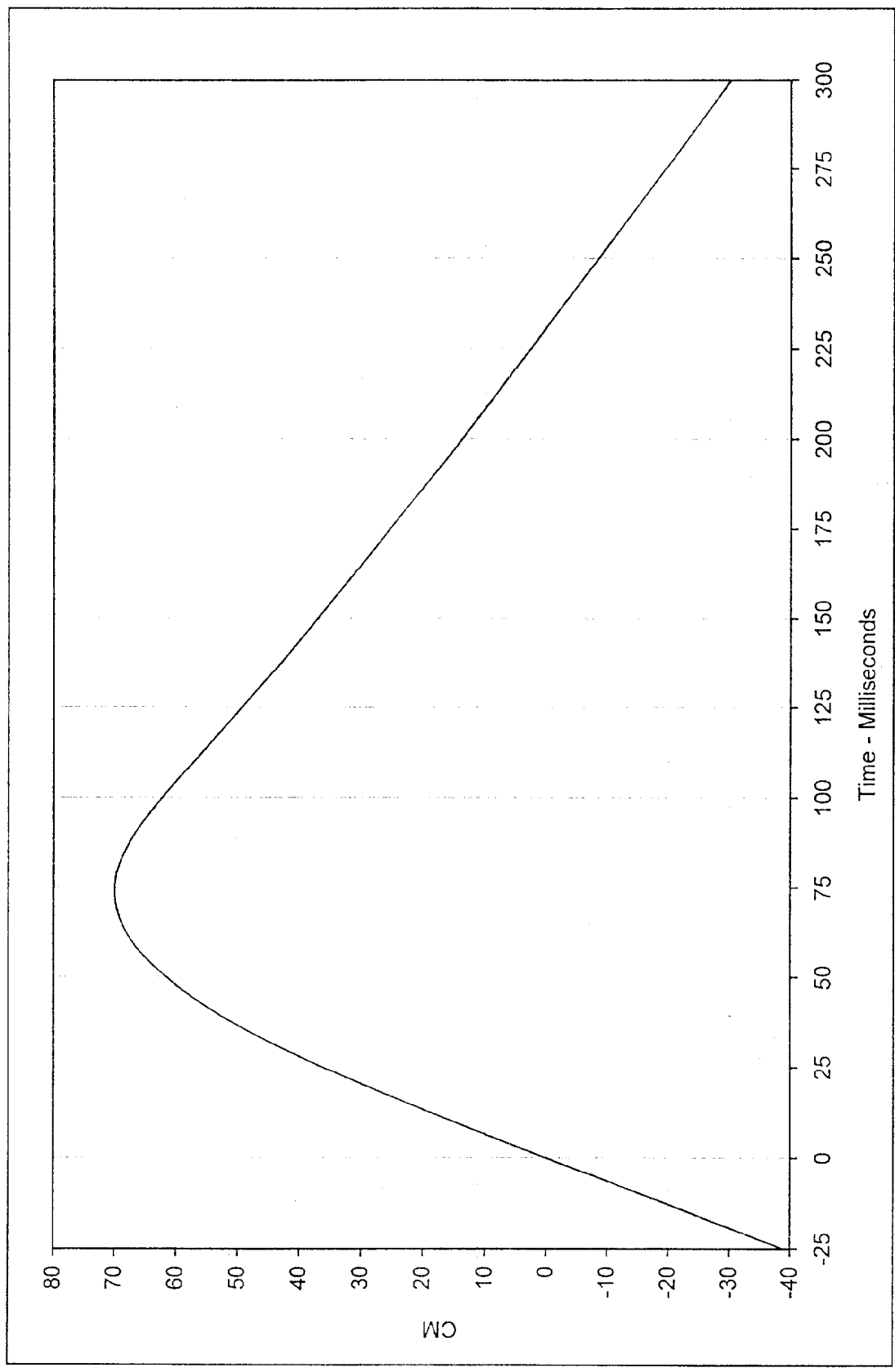


Curve Description: Vehicle Right Rear Primary X Velocity
 Maximum Value: 55.9 at 2.2 Milliseconds
 Minimum Value: -19.0 at 113.9 Milliseconds

SAE Filter Class: 180
 Date of Test: 3/13/97
 Curve Number: IN1-090

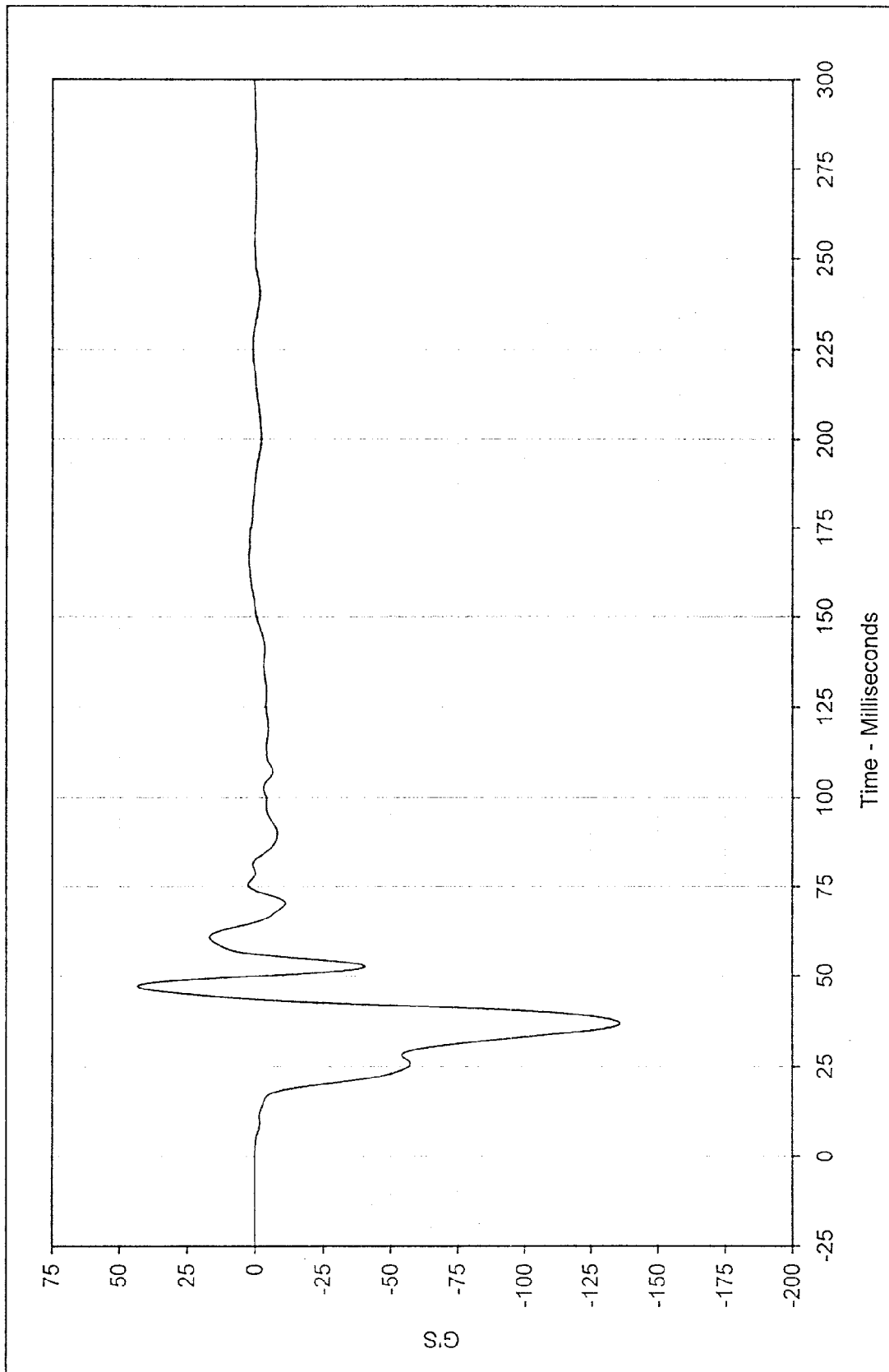
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





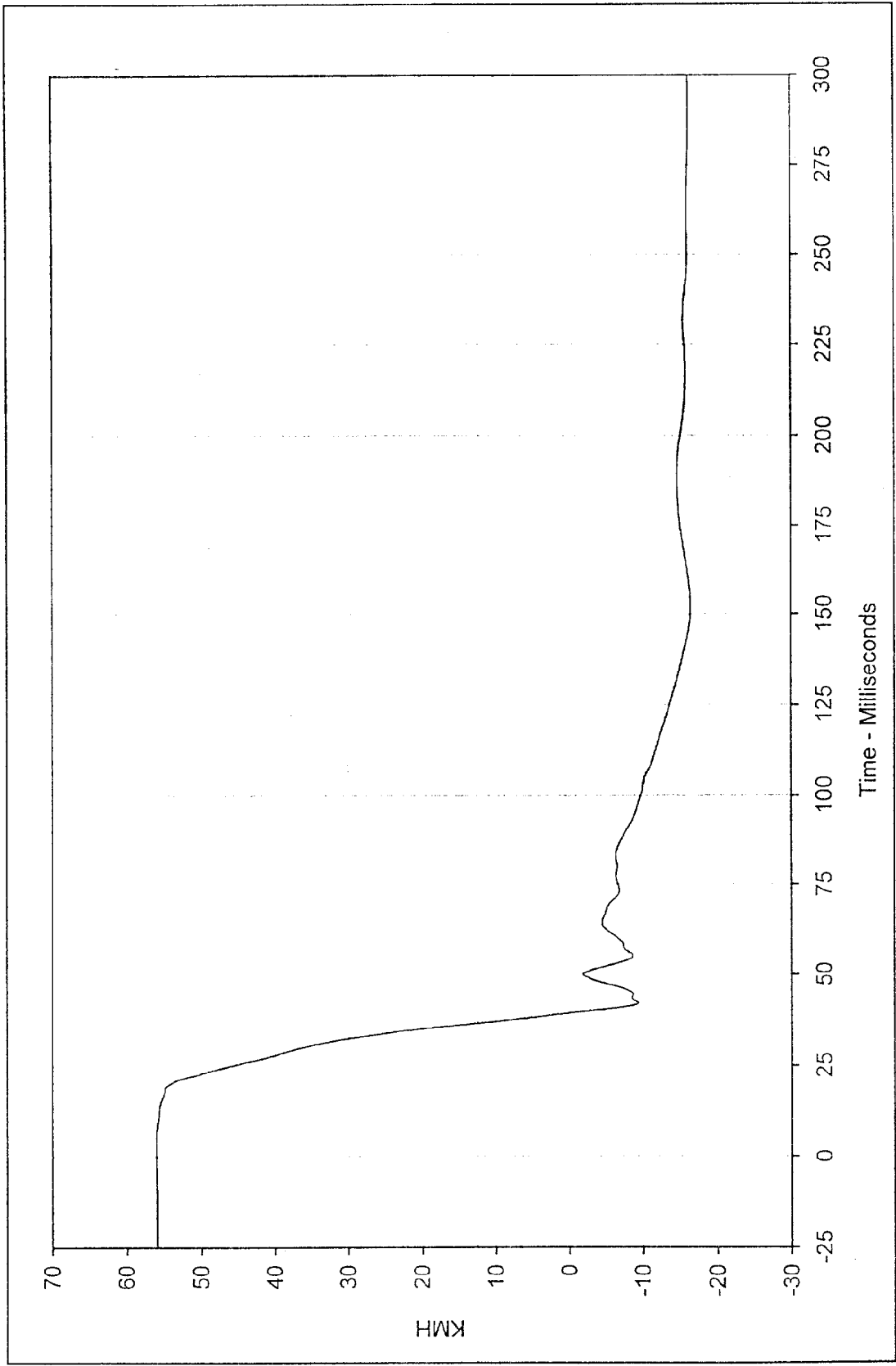
Curve Description:	Vehicle Right Rear Primary X Displ.		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	70.0	at 74.1 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-30.1	at 299.9 Milliseconds			
SAE Filter Class:	180				
Date of Test:	3/13/97				
Curve Number:	IN2-090				





Curve Description:	Vehicle Engine Top X		Testing Program:	1997 New Car Assessment Program	
Maximum Value:	43.2	at 47.0 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier	
Minimum Value:	-136.0	at 36.7 Milliseconds			
SAE Filter Class:	60				
Date of Test:	3/13/97				
Curve Number:	FIL-091				

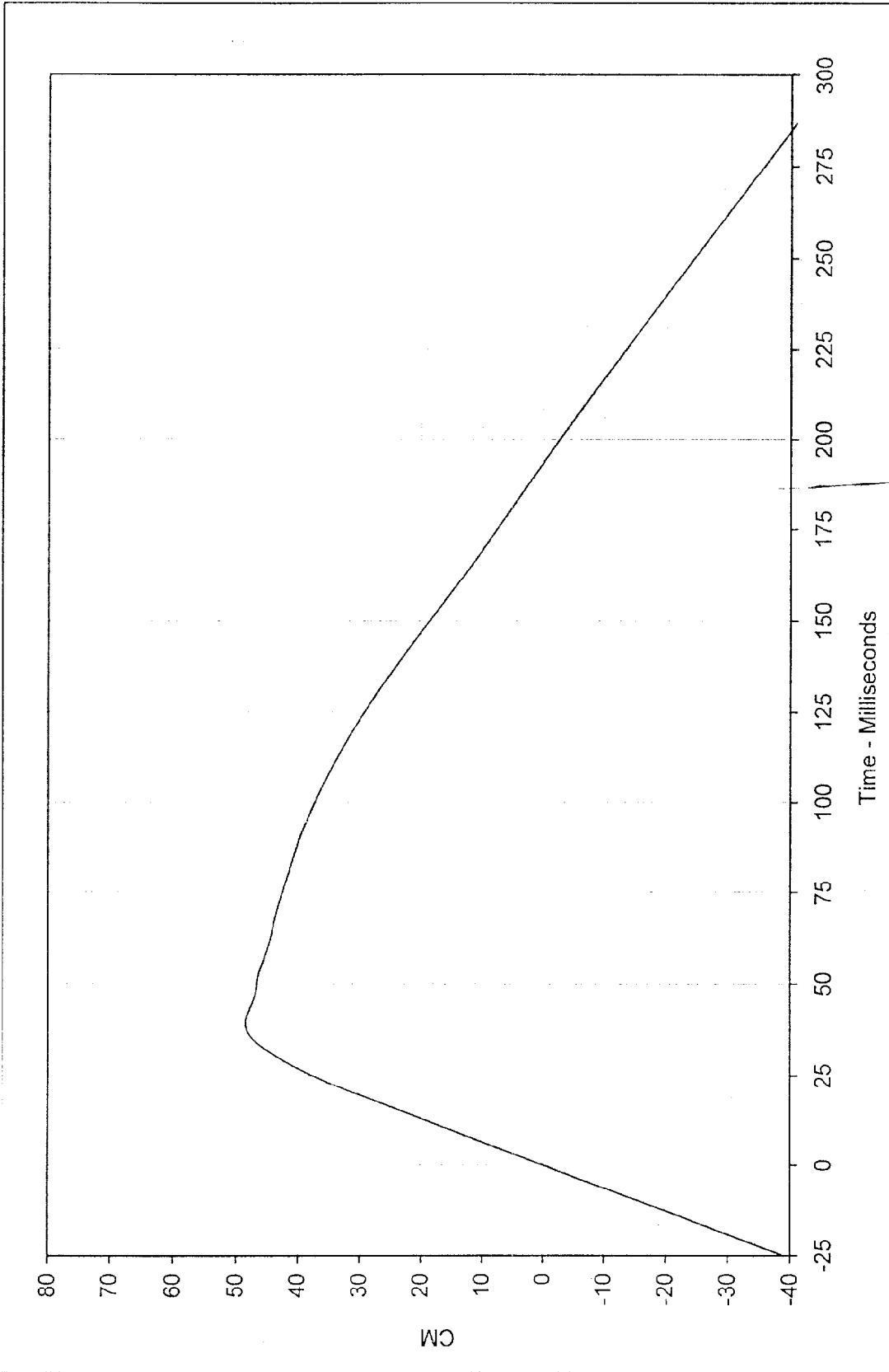




B130

Curve Description:	Vehicle Engine Top X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 1.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-16.4 at 151.5 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-091		

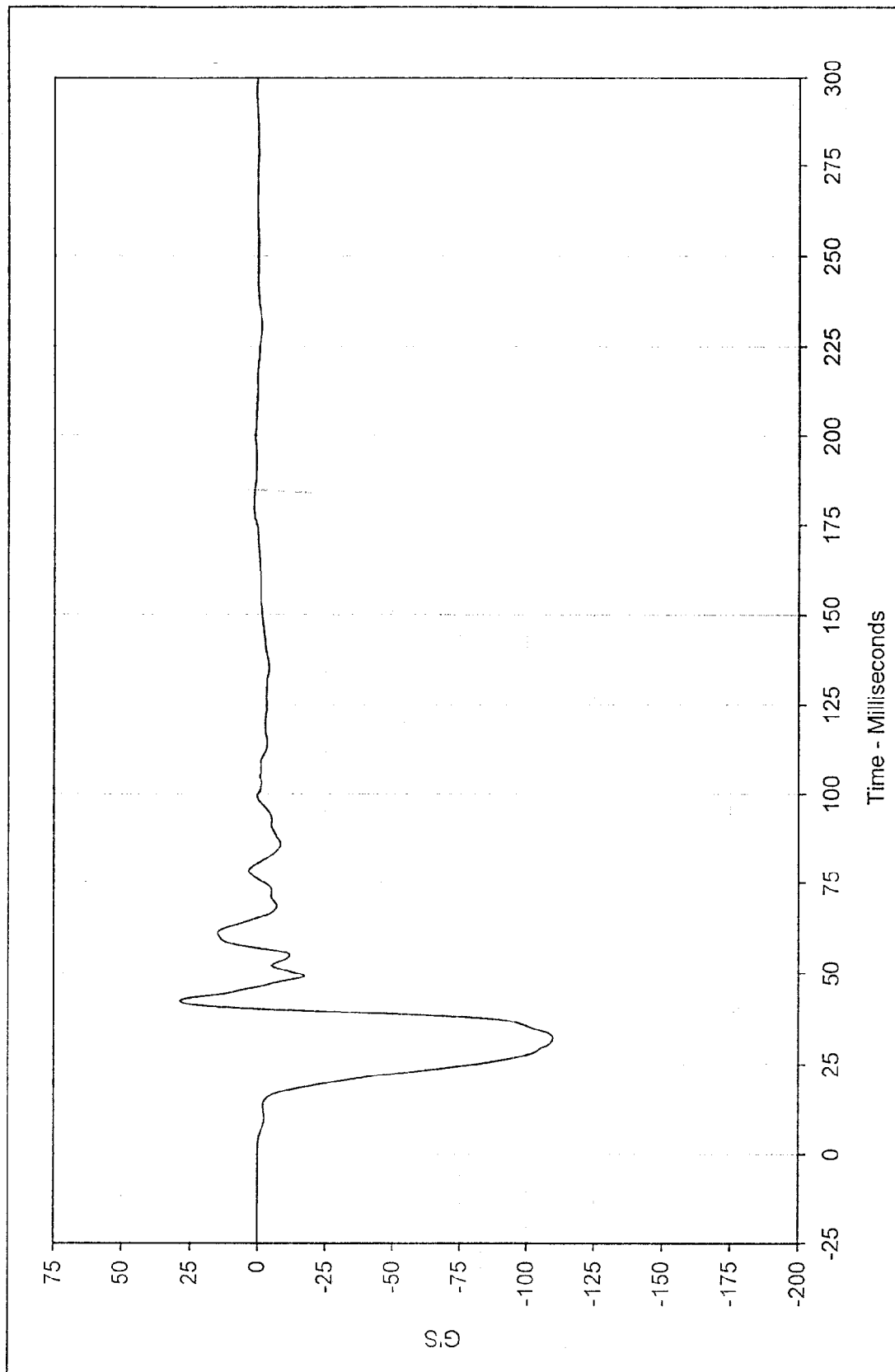




B131

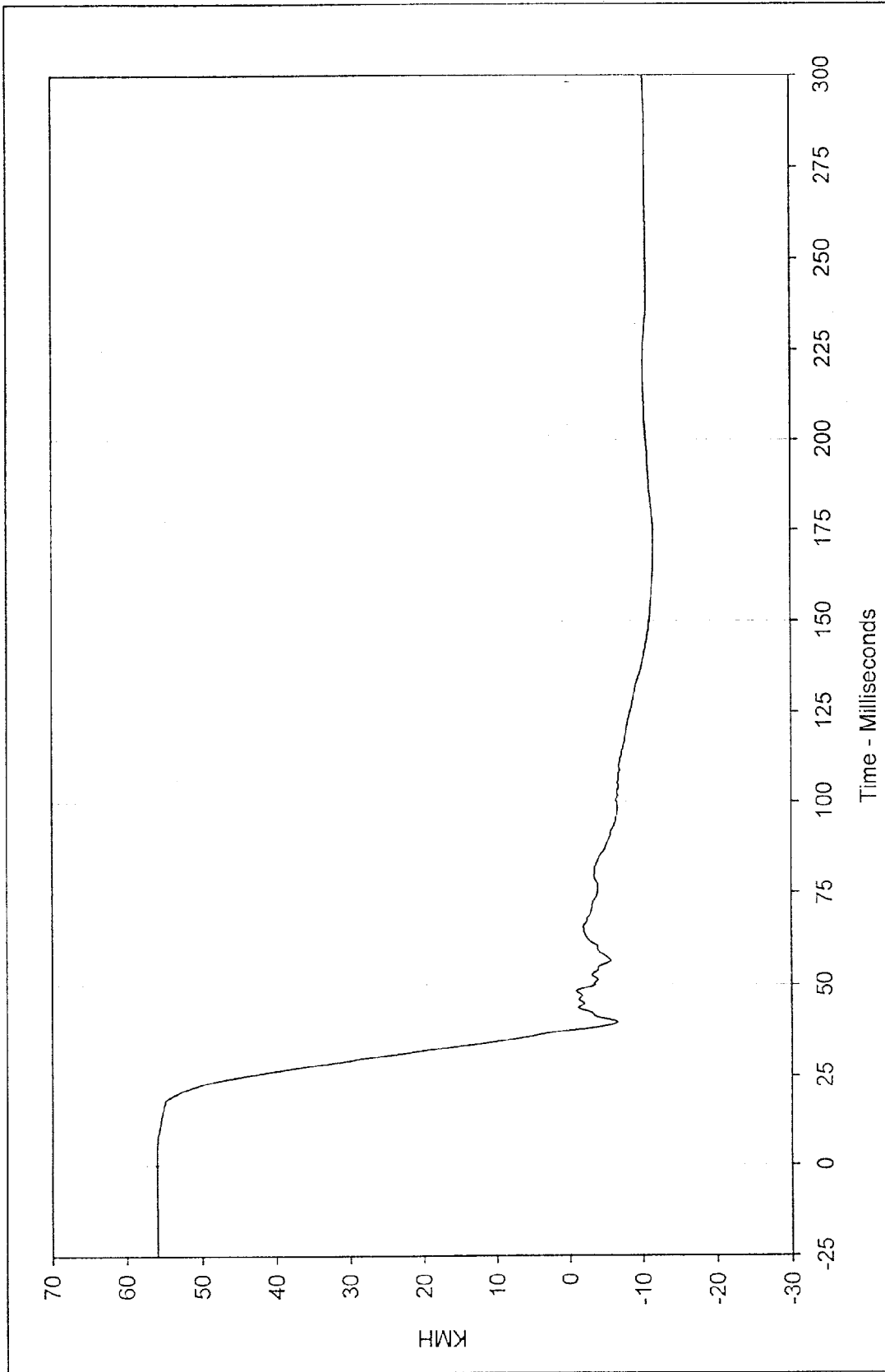
Curve Description:	Vehicle Engine Top X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	48.5 at 39.4 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-46.9 at 299.9 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-091		





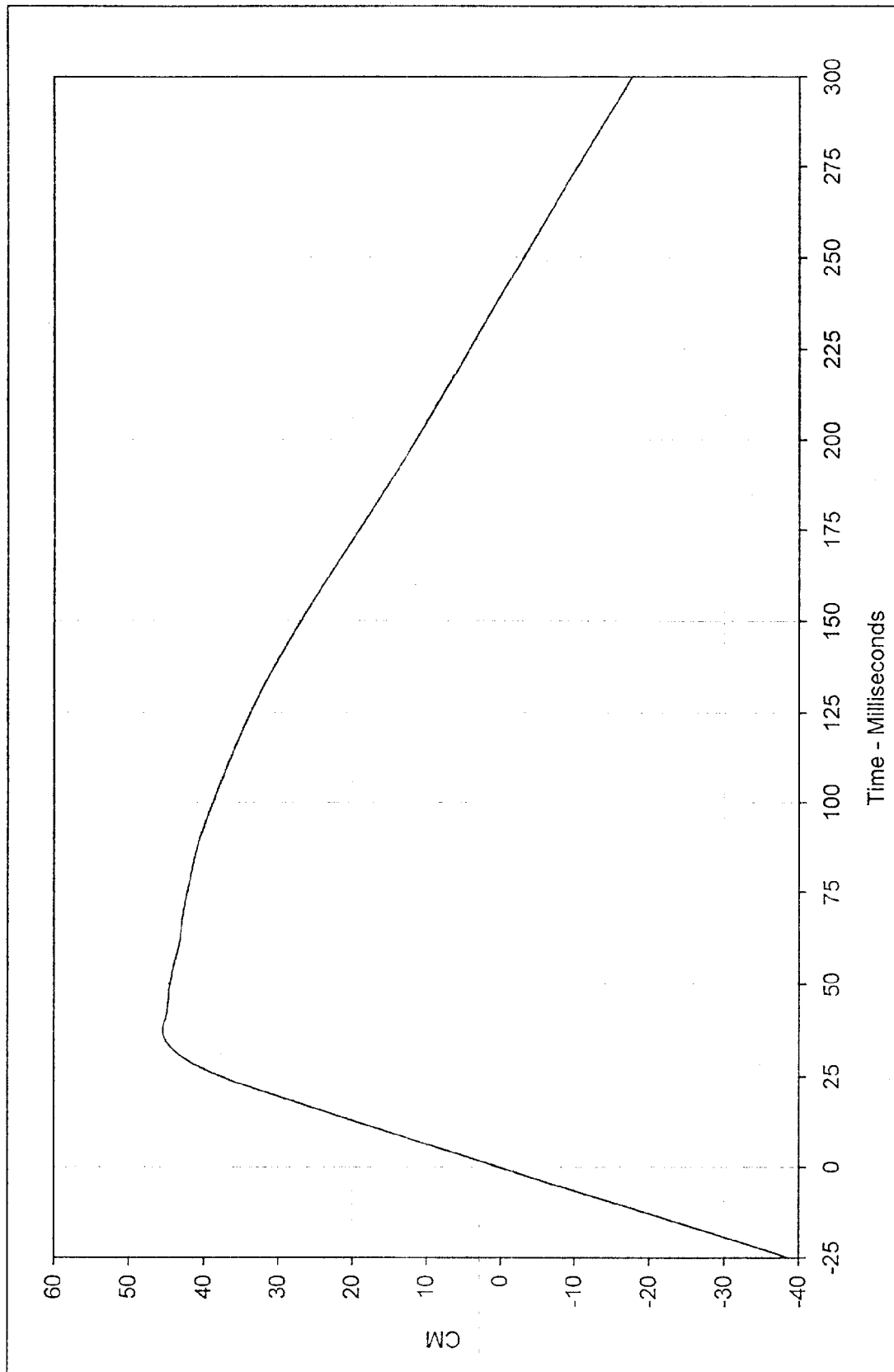
Curve Description:	Vehicle Engine Bottom X	Testing Program:	1997 New Car Assessment Program
Maximum Value:	28.7 at 42.3 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-109.8 at 32.2 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-092		





Curve Description:	Vehicle Engine Bottom X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.0 at 1.0 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-11.6 at 169.0 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-092		

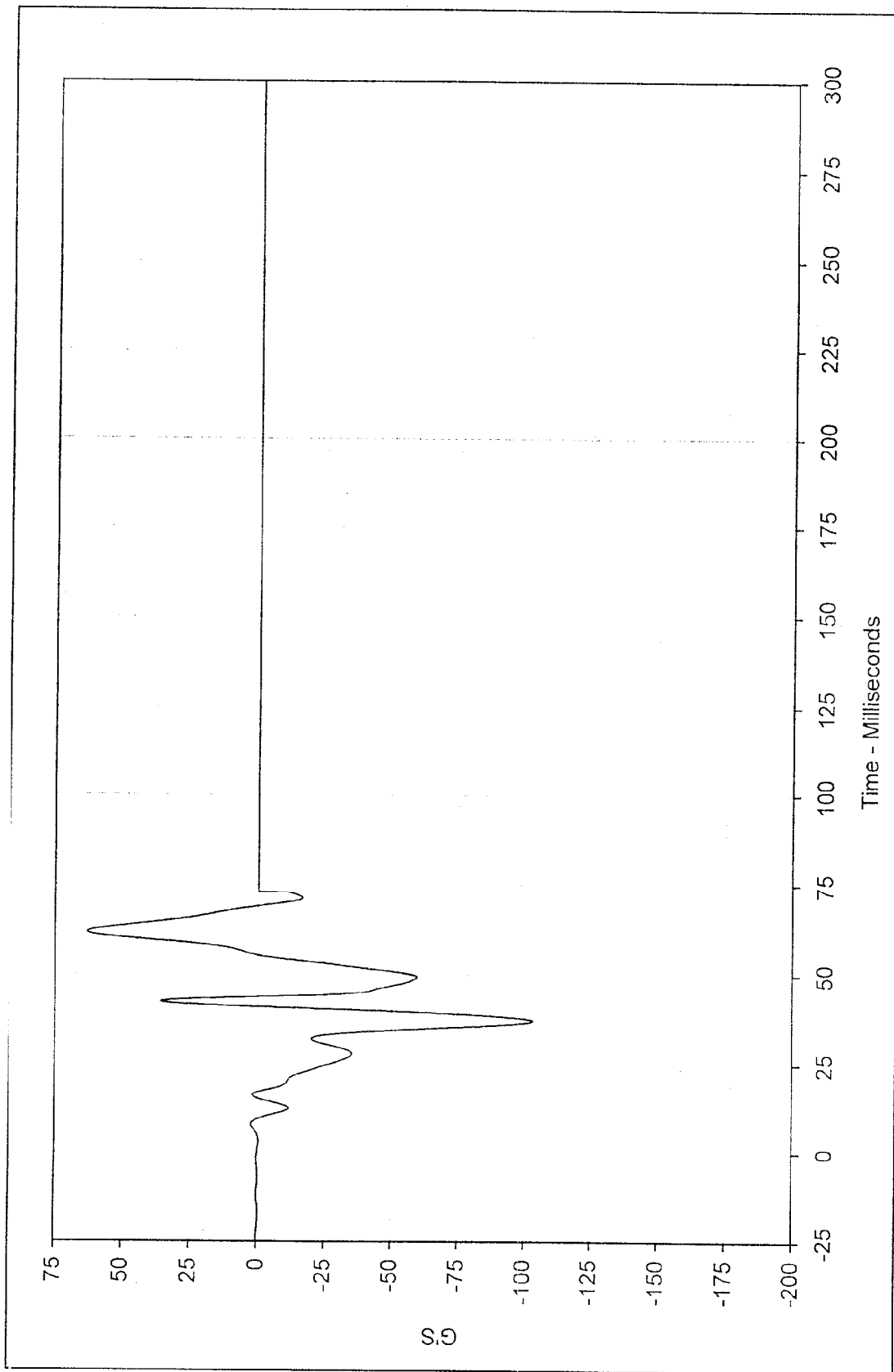




B134

Curve Description:	Vehicle Engine Bottom X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	45.5 at 37.6 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-17.6 at 299.9 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-092		

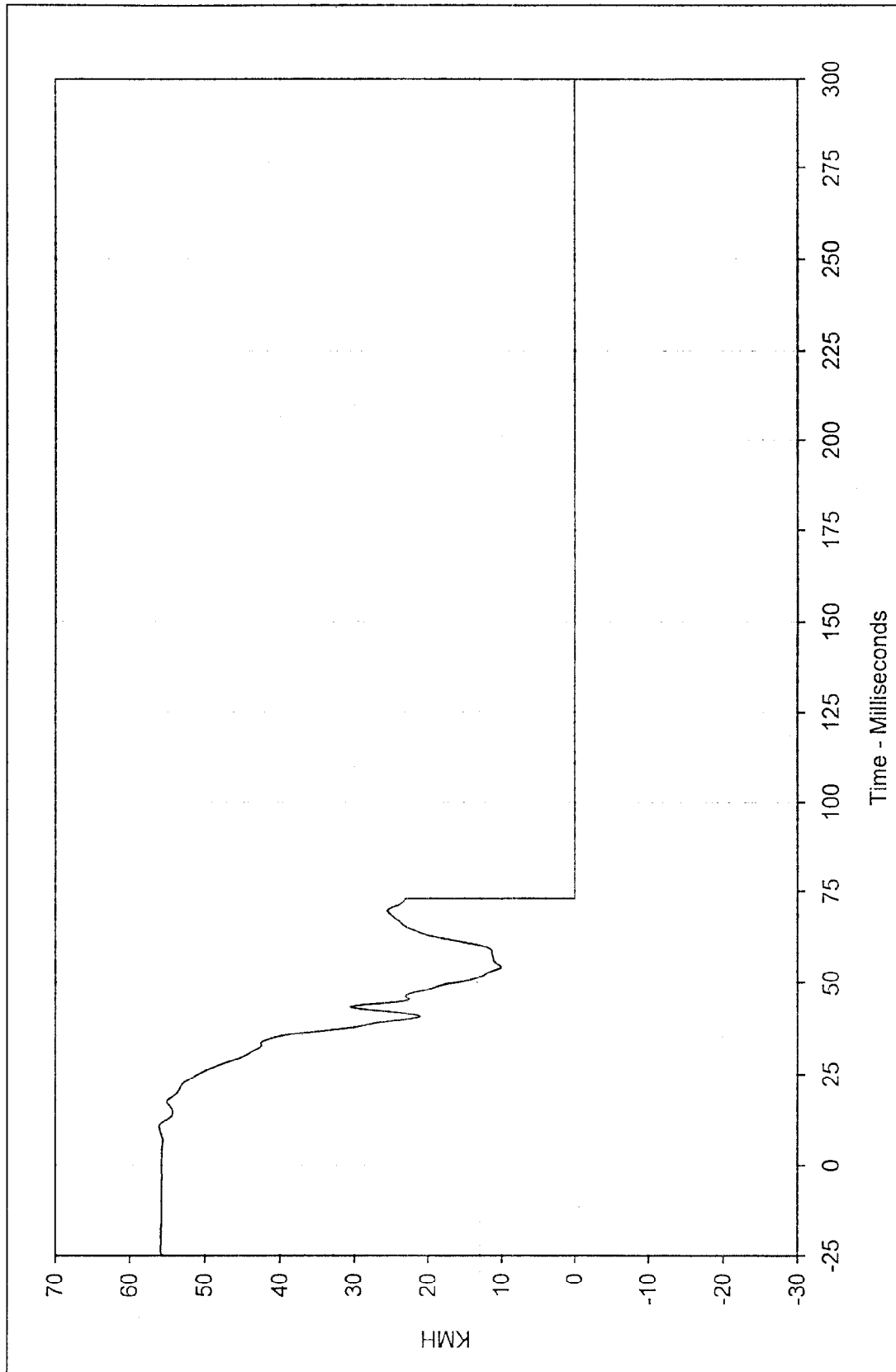




Curve Description:	Vehicle Left Brake Caliper X	*	Testing Program:	1997 New Car Assessment Program
Maximum Value:	63.1	at 61.7	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-103.3	at 37.2		
SAE Filter Class:	60			
Date of Test:	3/13/97			
Curve Number:	FIL-093			



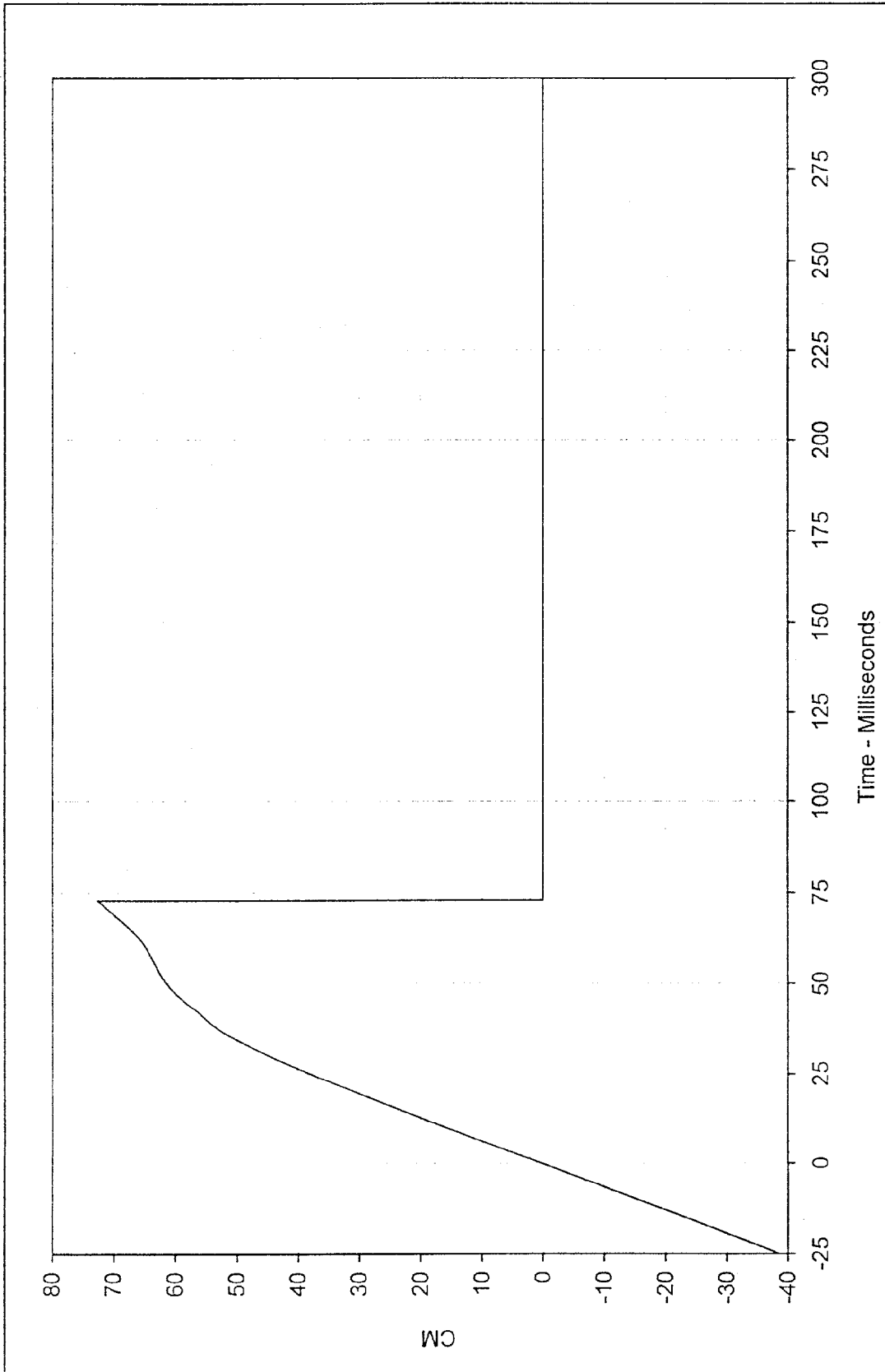
*Channel Failed at 73.0 Msec



Curve Description: Vehicle Left Brake Caliper X Velocity *		Testing Program: 1997 New Car Assessment Program
Maximum Value: 56.1	at 10.6 Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value: 0.0	at 73.0 Milliseconds	
SAE Filter Class: 180		
Date of Test: 3/13/97		
Curve Number: IN1-093		



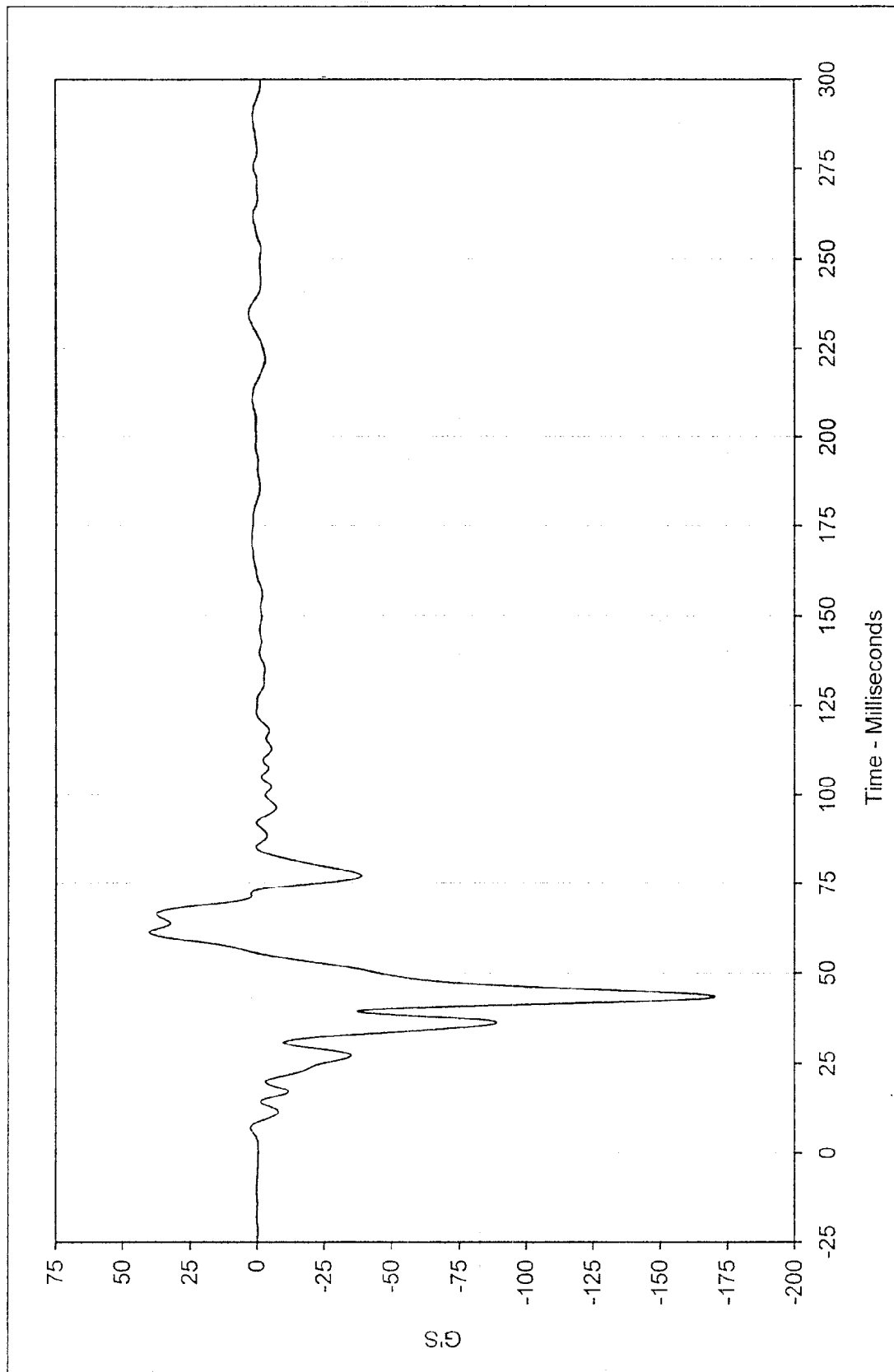
*Channel Failed at 73.0 Msec



Curve Description:	Vehicle Left Brake Caliper X Displ.	*	Testing Program:	1997 New Car Assessment Program
Maximum Value:	72.6	at 72.9 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.0	at 73.0 Milliseconds		
SAE Filter Class:	180			
Date of Test:	3/13/97			
Curve Number:	IN2-093			



*Channel Failed at 73.0 Msec

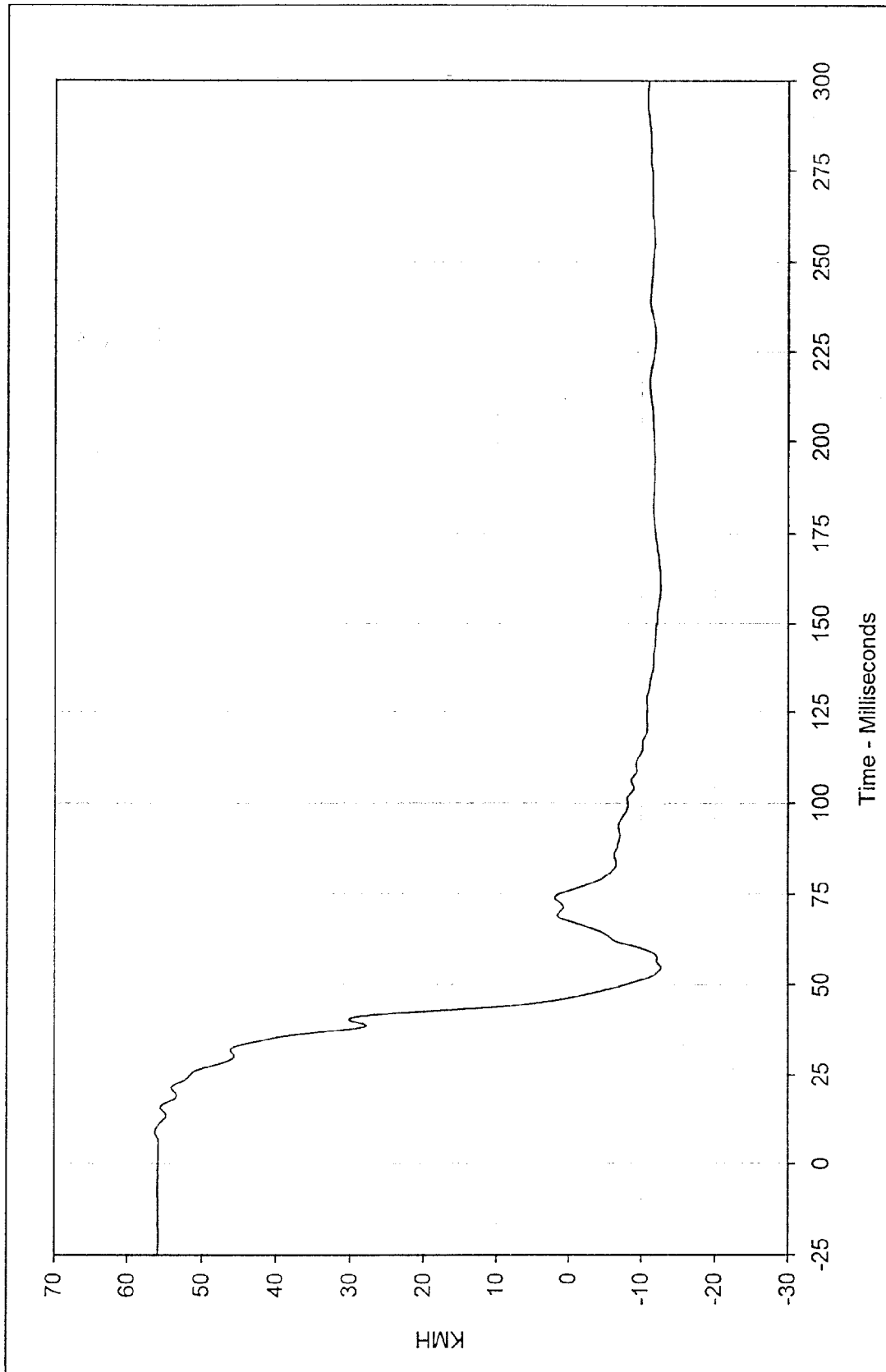


Curve Description:	Vehicle Right Brake Caliper X			Testing Program:	1997 New Car Assessment Program
Maximum Value:	40.2	at	61.2	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-170.6	at	43.4		
SAE Filter Class:	60				
Date of Test:	3/13/97				
Curve Number:	FIL-094				



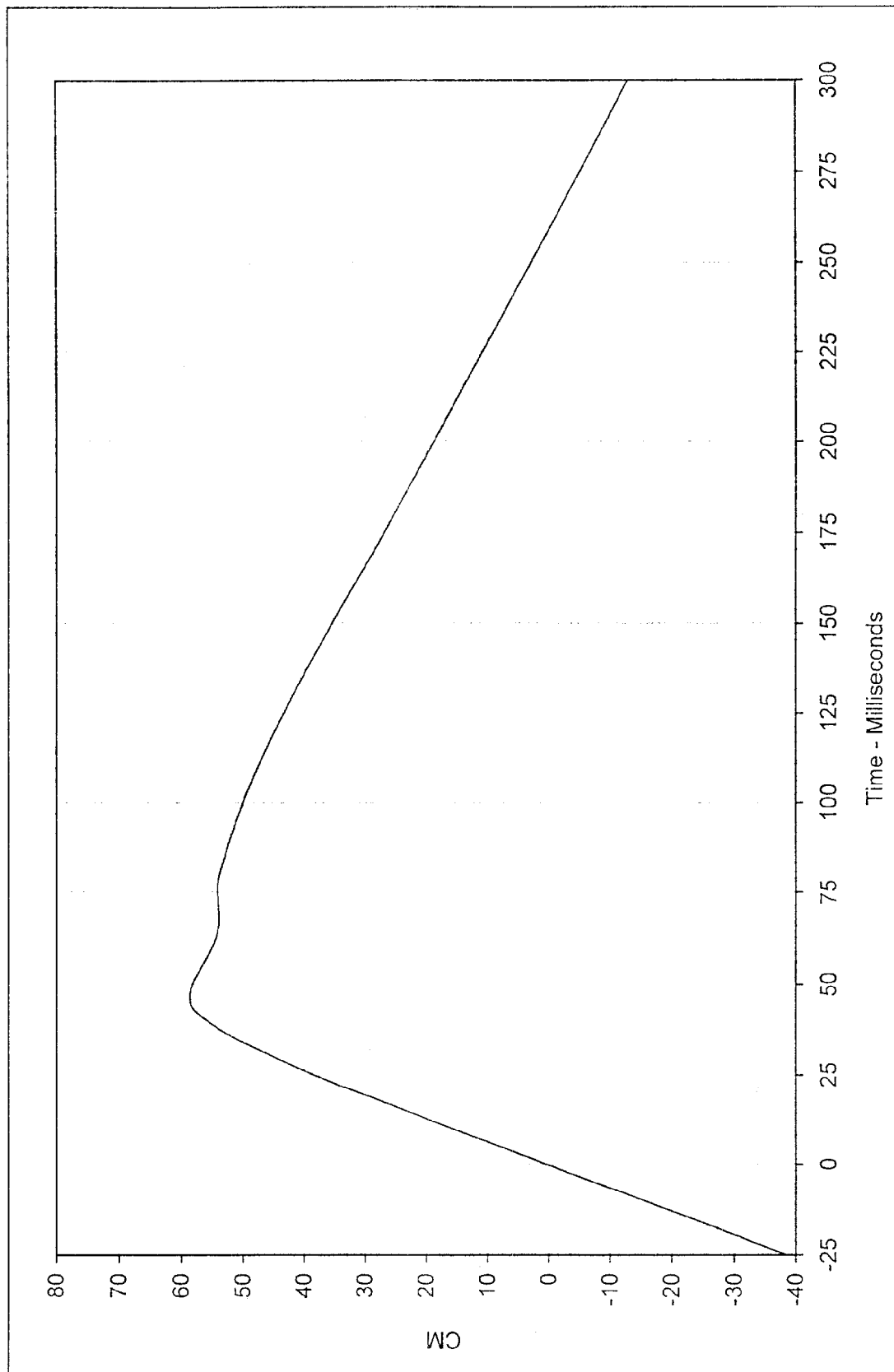
KARCO
Engineering





Curve Description:	Vehicle Right Brake Caliper X Velocity	Testing Program:	1997 New Car Assessment Program
Maximum Value:	56.3 at 9.0 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-12.7 at 55.1 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN1-094		

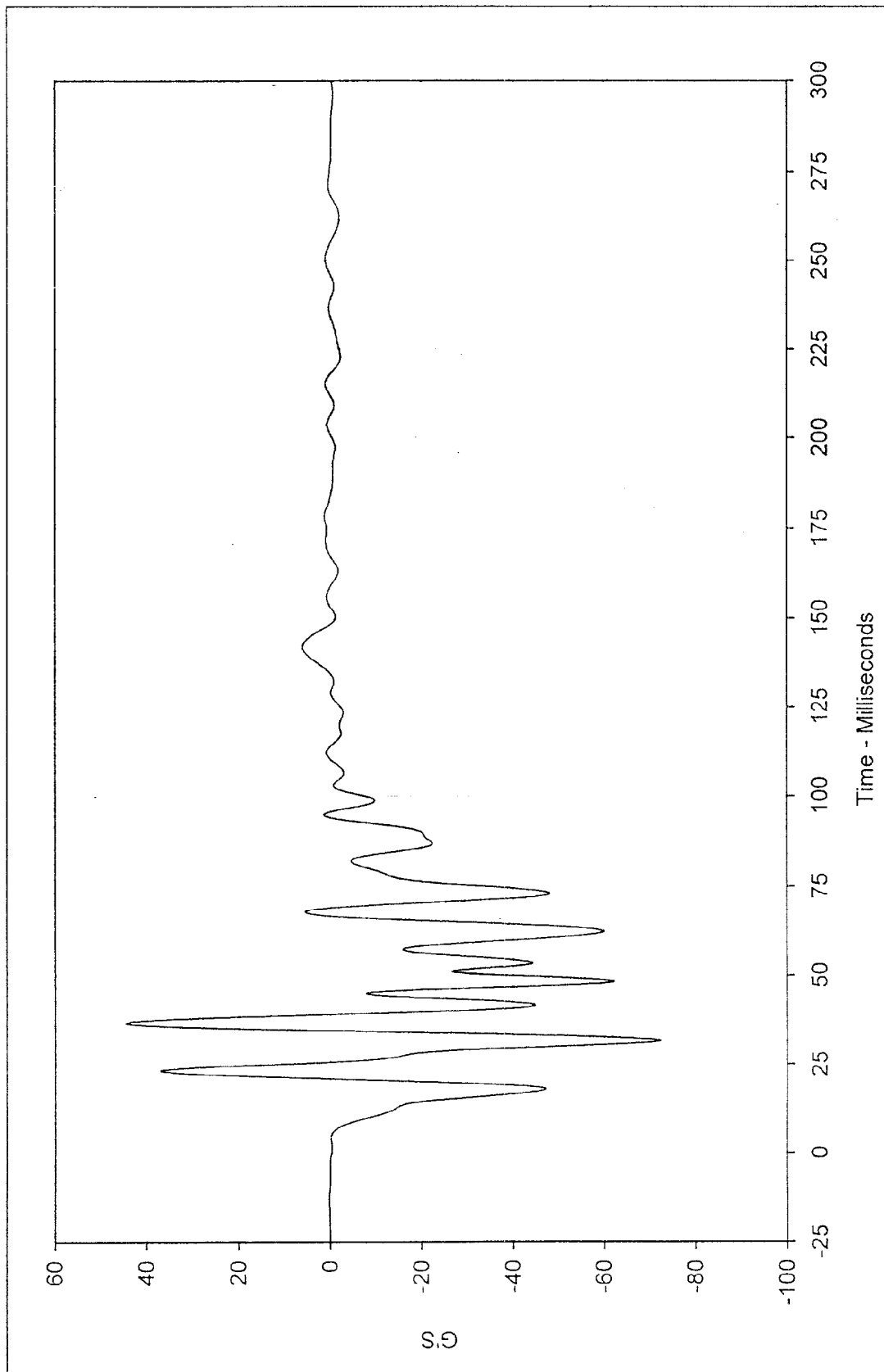




B140

Curve Description:	Vehicle Right Brake Caliper X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	58.6 at 46.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-12.9 at 299.9 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-094		

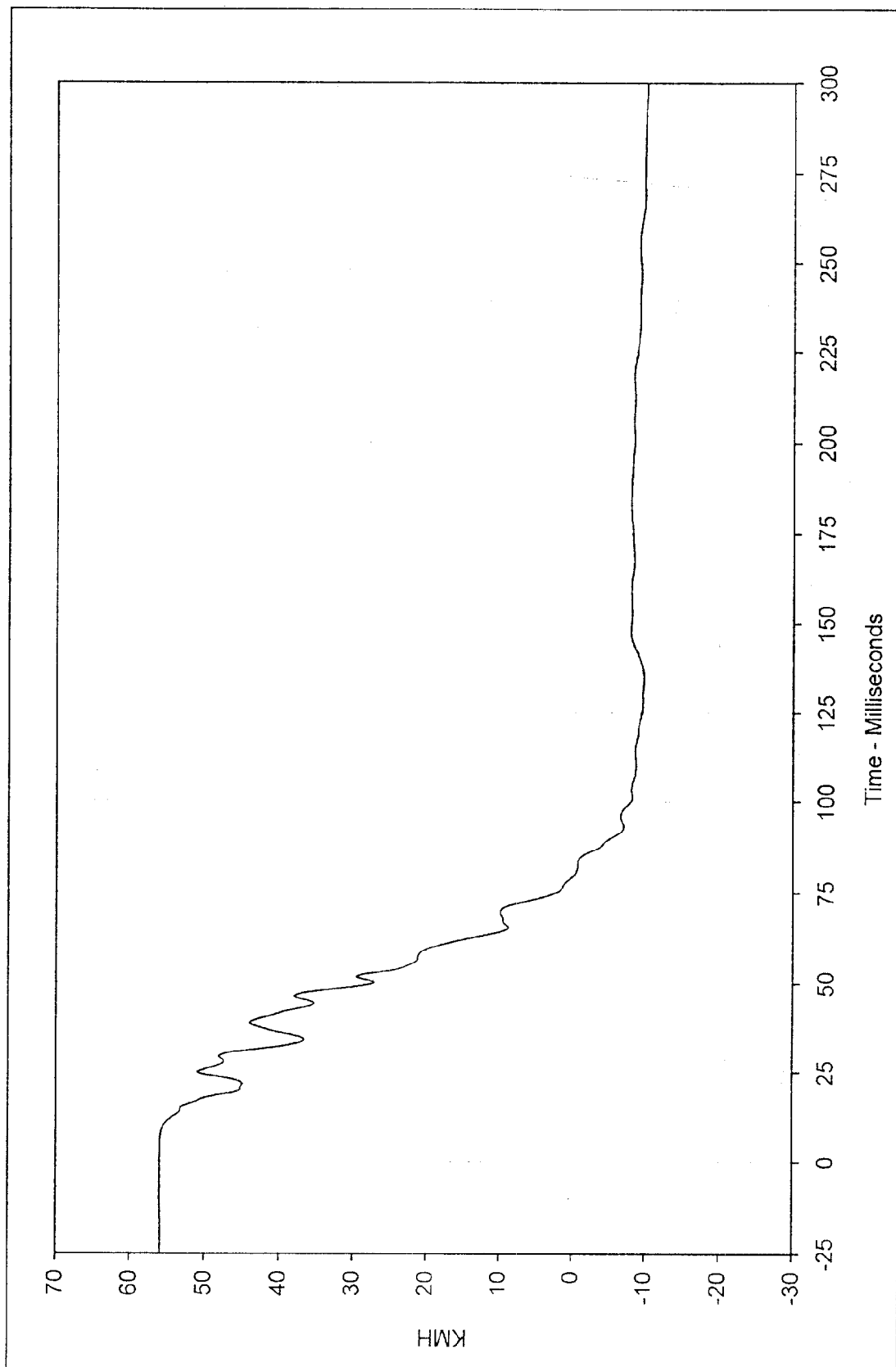




Curve Description: Vehicle Instrument Panel X
 Maximum Value: 44.5 at 36.6 Milliseconds
 Minimum Value: -72.5 at 31.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 3/13/97
 Curve Number: FIL-095

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier

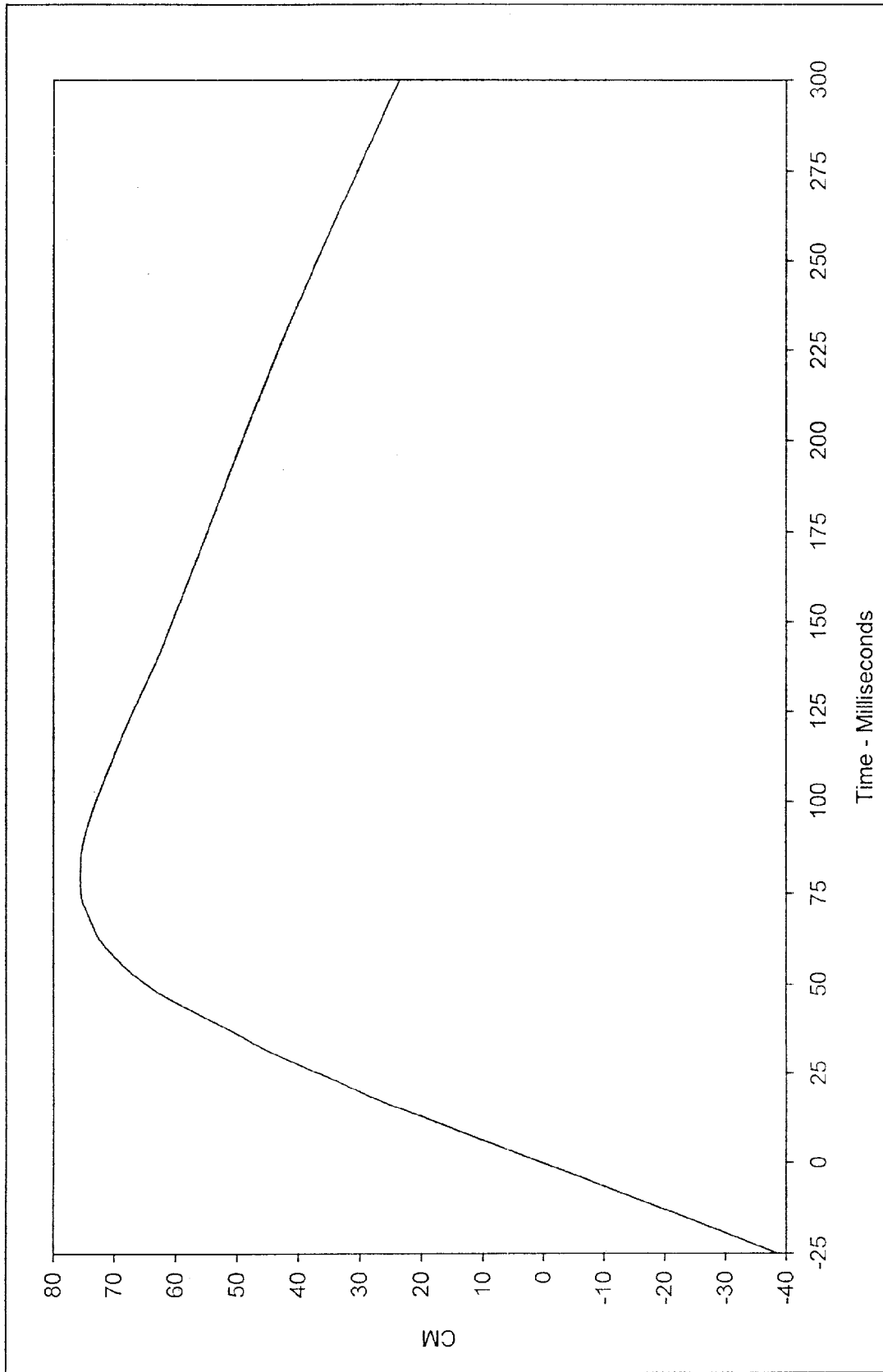




B142

Curve Description: Vehicle Instrument Panel X Velocity		Testing Program: 1997 New Car Assessment Program	
Maximum Value: 56.0	at 0.0	Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value: -10.2	at 299.9	Milliseconds	
SAE Filter Class: 180			
Date of Test: 3/13/97			
Curve Number: IN1-095			

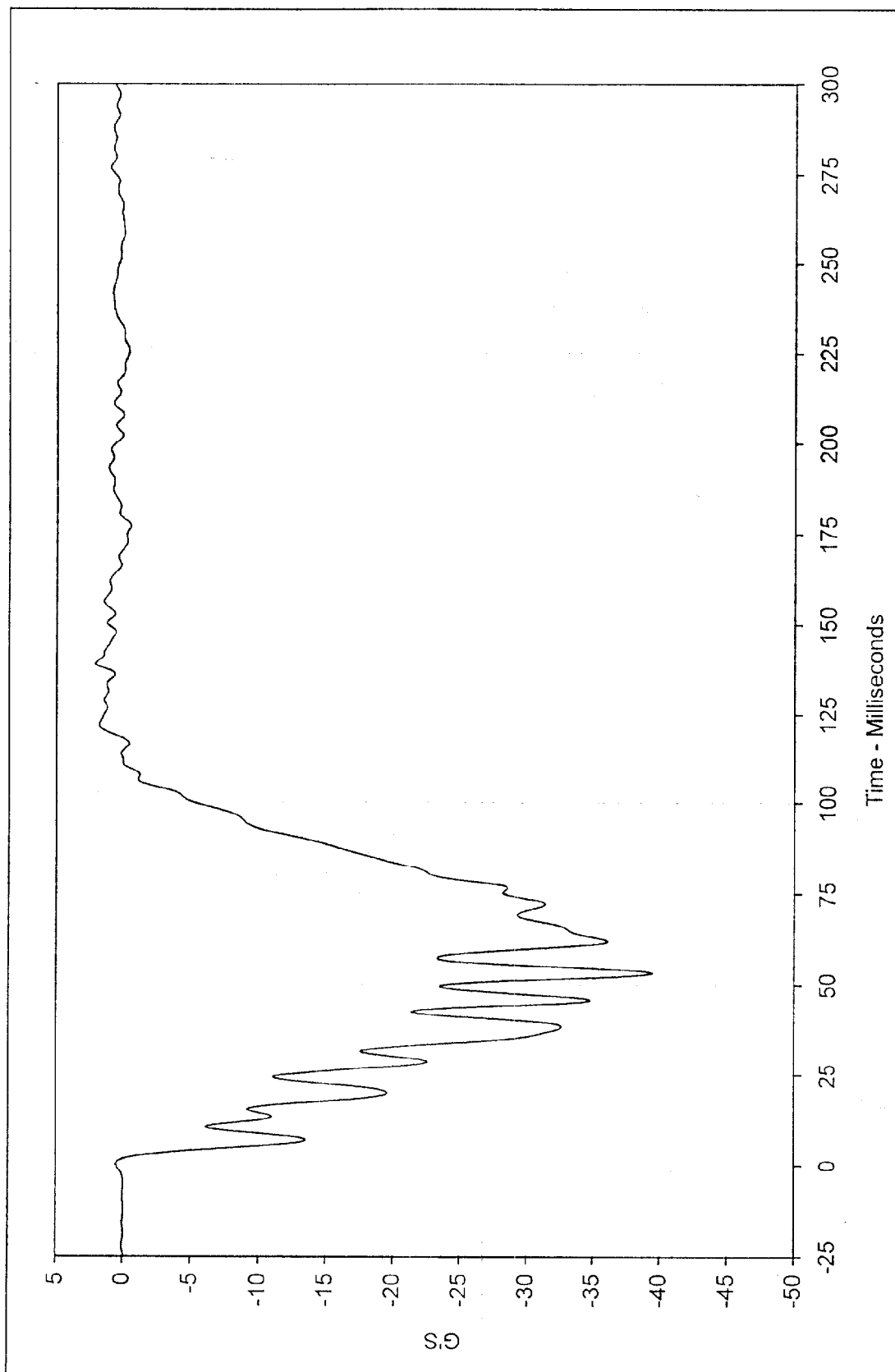




B143

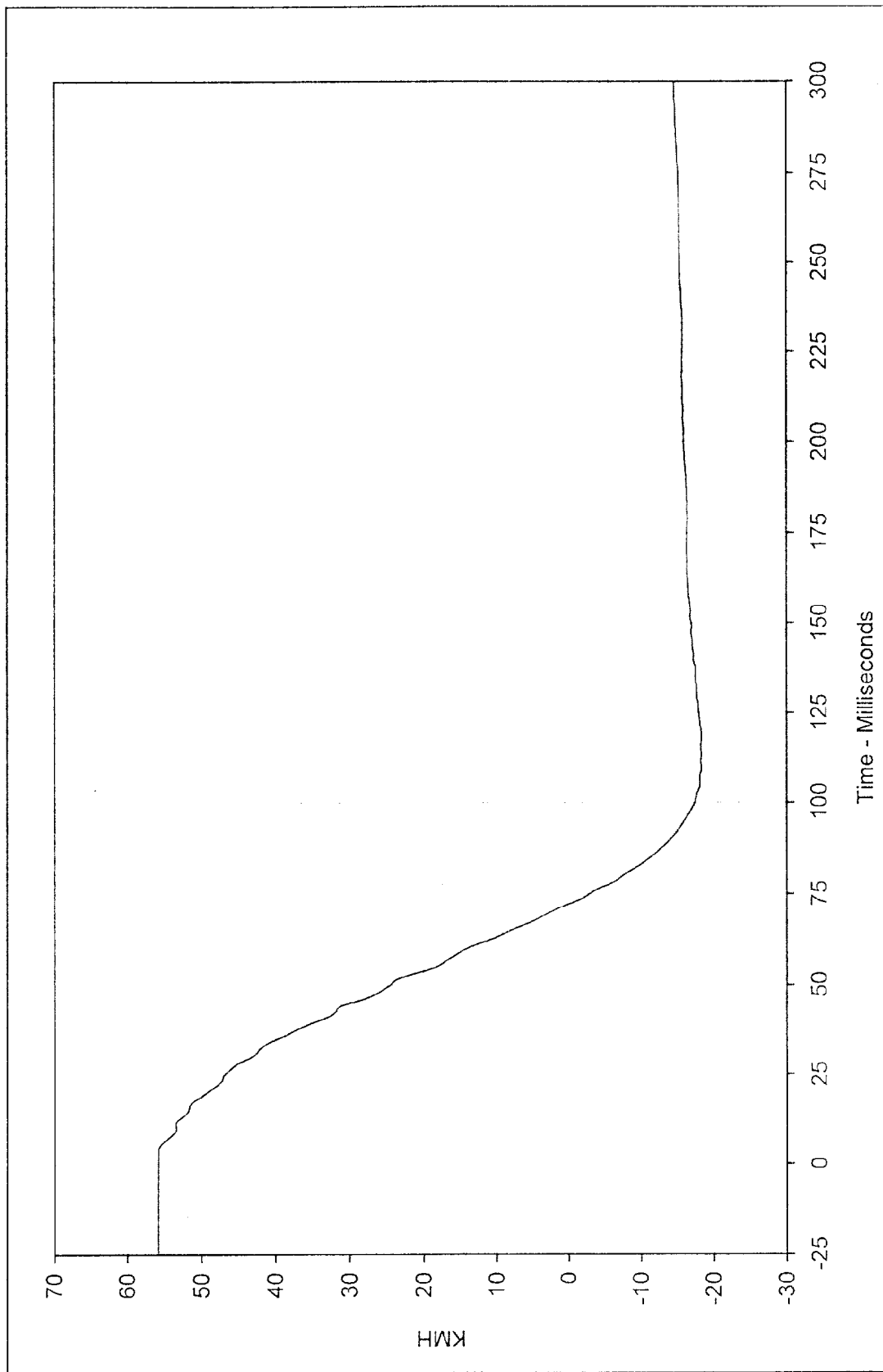
Curve Description:	Vehicle Instrument Panel X Displ.	Testing Program:	1997 New Car Assessment Program
Maximum Value:	75.6 at 79.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	0.1 at 0.0 Milliseconds		
SAE Filter Class:	180		
Date of Test:	3/13/97		
Curve Number:	IN2-095		





Curve Description:	Vehicle Left Rear Redundant X		Testing Program:	1997 New Car Assessment Program
Maximum Value:	2.1	at 139.1 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-39.5	at 53.3 Milliseconds		
SAE Filter Class:	60			
Date of Test:	3/13/97			
Curve Number:	FIL-096			





Curve Description: Vehicle Left Rear Redundant X Velocity

Testing Program: 1997 New Car Assessment Program

Maximum Value: 55.9 at 3.3 Milliseconds

Test Vehicle: 1997 Chevrolet Cavalier

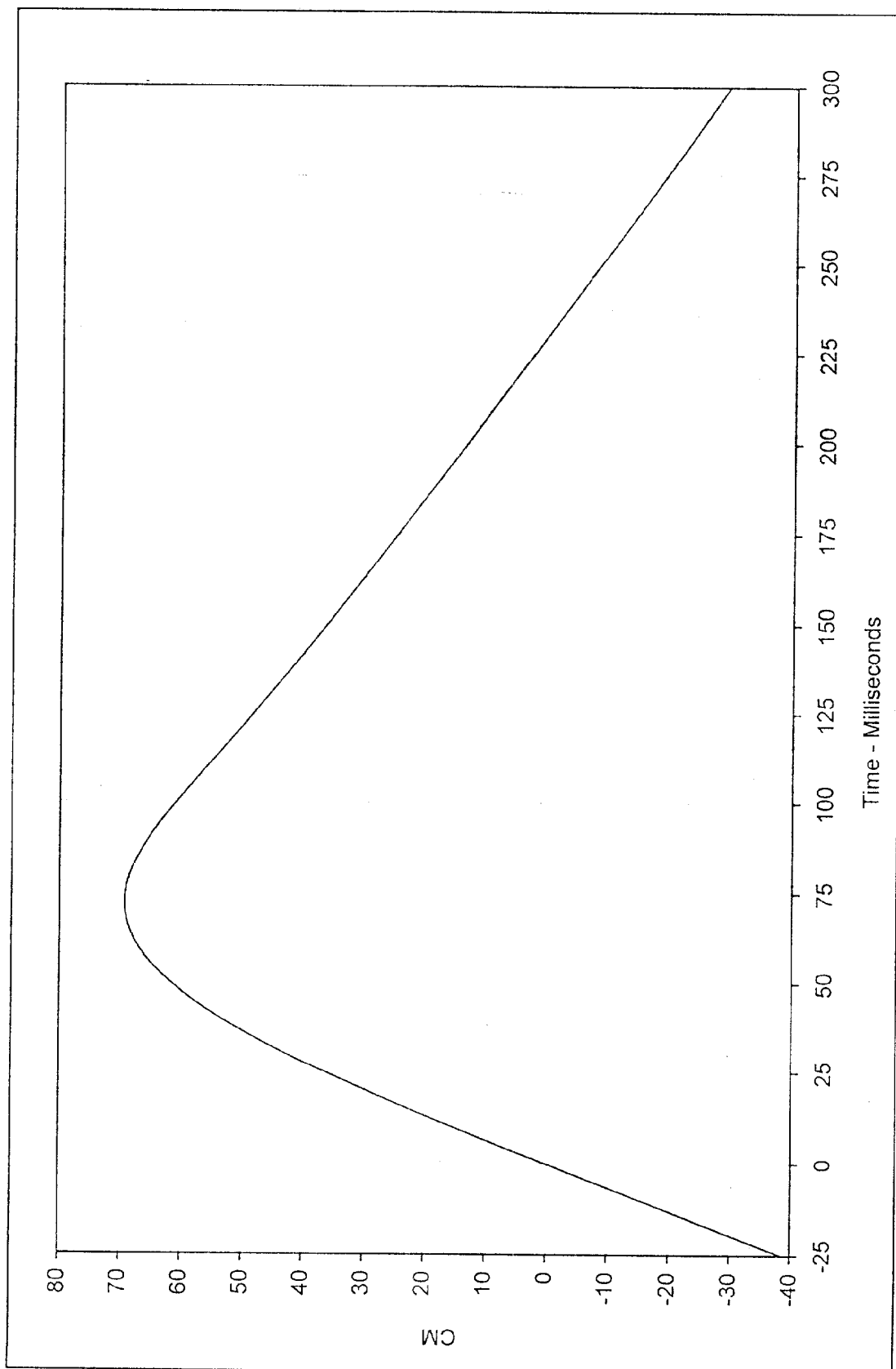
Minimum Value: -18.3 at 109.5 Milliseconds

SAE Filter Class: 180

Date of Test: 3/13/97

Curve Number: IN1-096





Curve Description: Vehicle Left Rear Redundant X Displ.

Maximum Value: 69.3 at 72.3 Milliseconds

Minimum Value: -28.9 at 299.9 Milliseconds

SAE Filter Class: 180

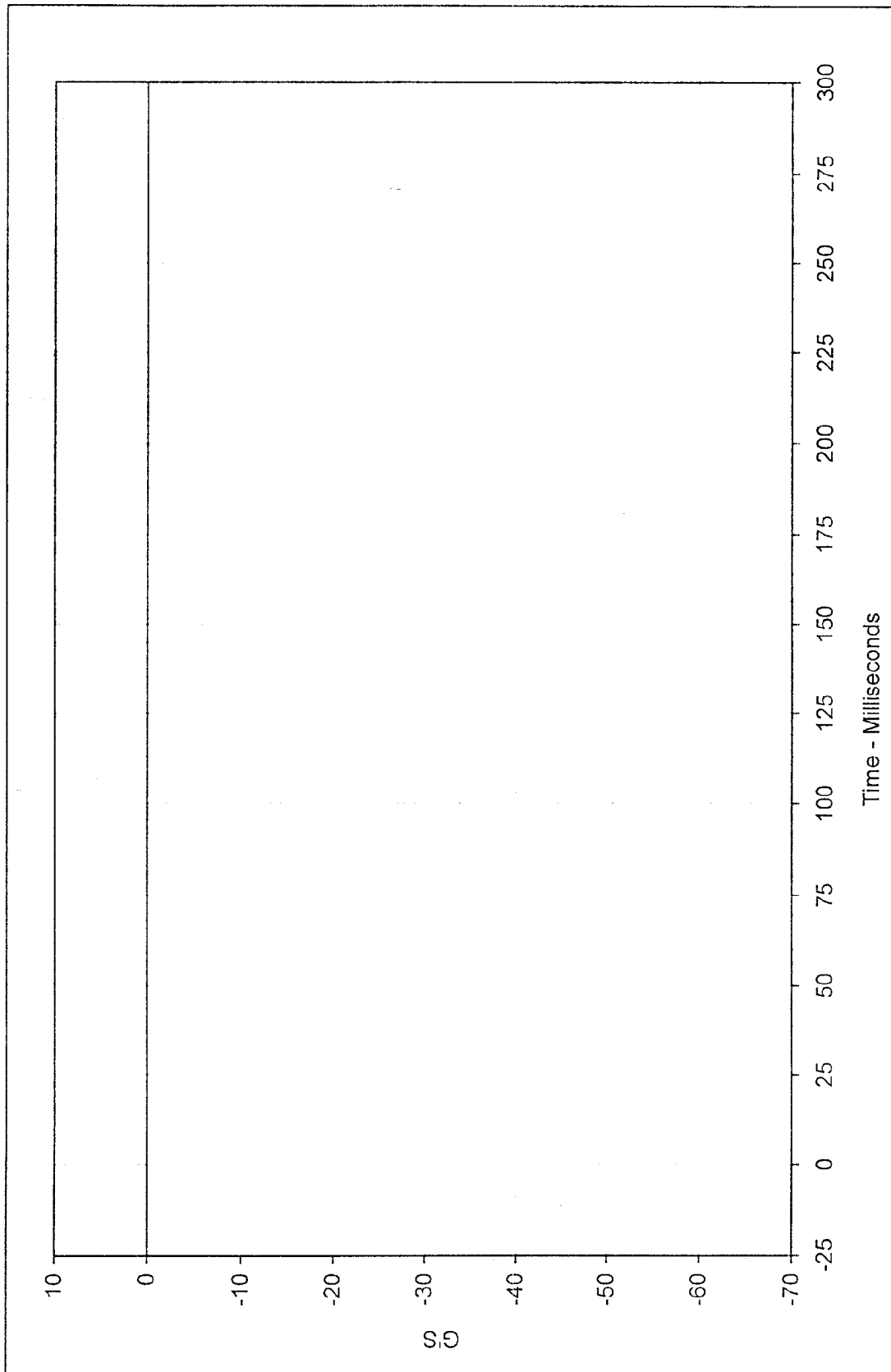
Date of Test: 3/13/97

Curve Number: IN2-096

Testing Program: 1997 New Car Assessment Program

Test Vehicle: 1997 Chevrolet Cavalier

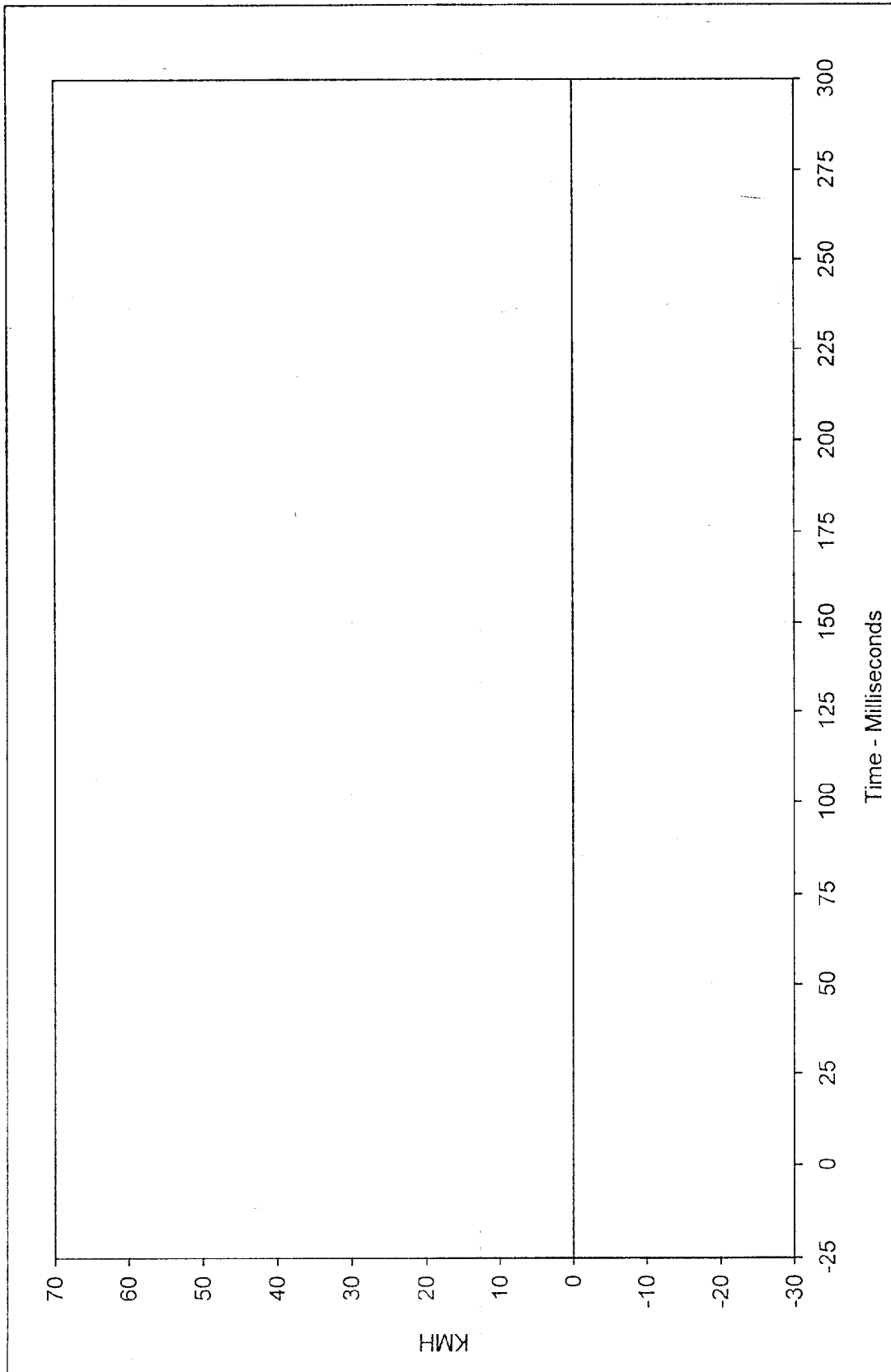




Curve Description:	Vehicle Right Rear Redundant X		* Testing Program:		1997 New Car Assessment Program
Maximum Value:	0.0	at	0.0	Milliseconds	Test Vehicle:
Minimum Value:	0.0	at	0.0	Milliseconds	1997 Chevrolet Cavalier
SAE Filter Class:	60				
Date of Test:	3/13/97				
Curve Number:	FIL-097				



*Channel failed, no data



B148

Curve Description: Vehicle Right Rear Redundant X Velocity *

Testing Program: 1997 New Car Assessment Program

Maximum Value: 0.0 at 0.0 Milliseconds

Test Vehicle: 1997 Chevrolet Cavalier

Minimum Value: 0.0 at 0.0 Milliseconds

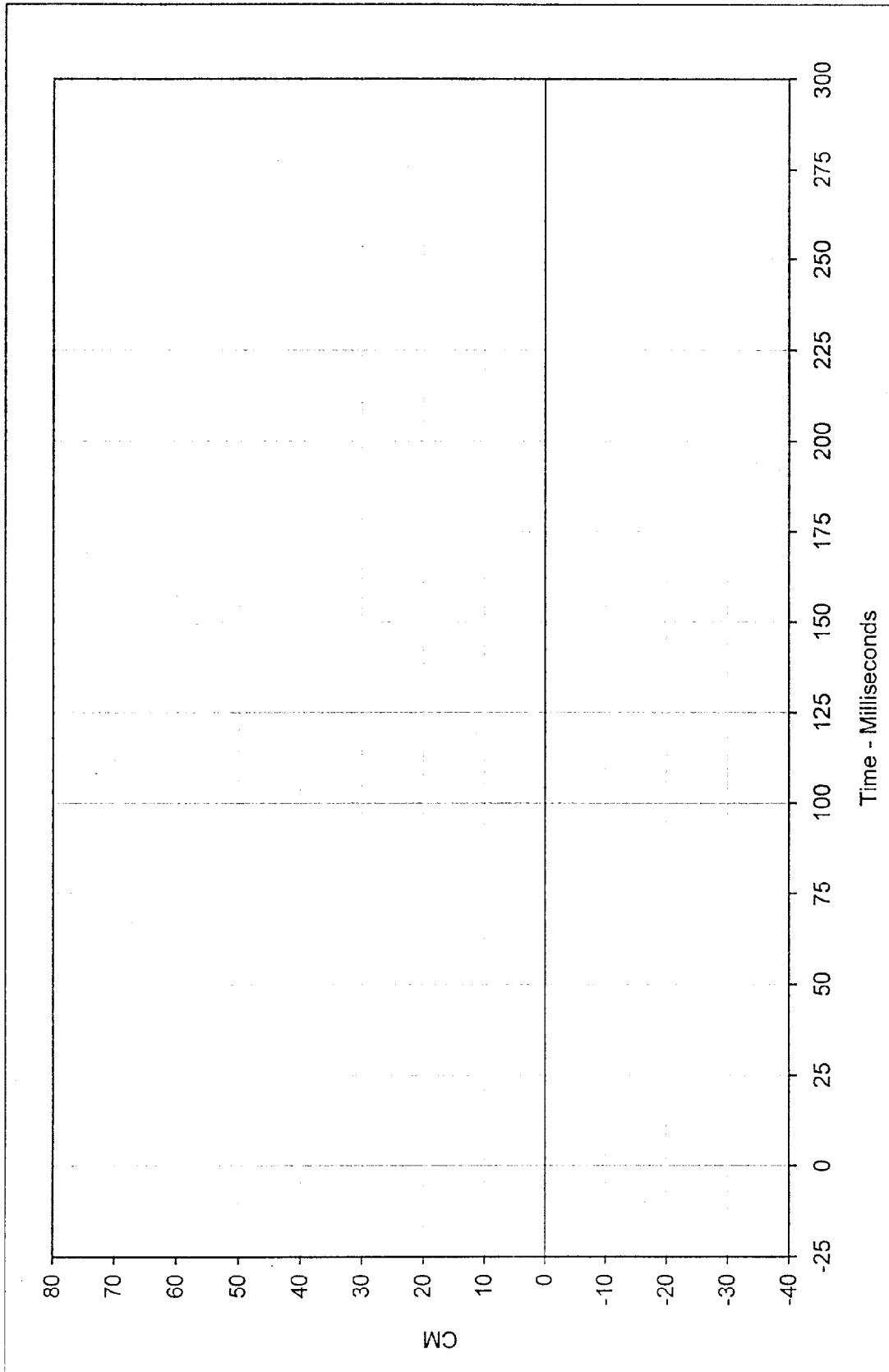
SAE Filter Class: 180

Date of Test: 3/13/97

Curve Number: IN1-097

*Channel Failed, No Data



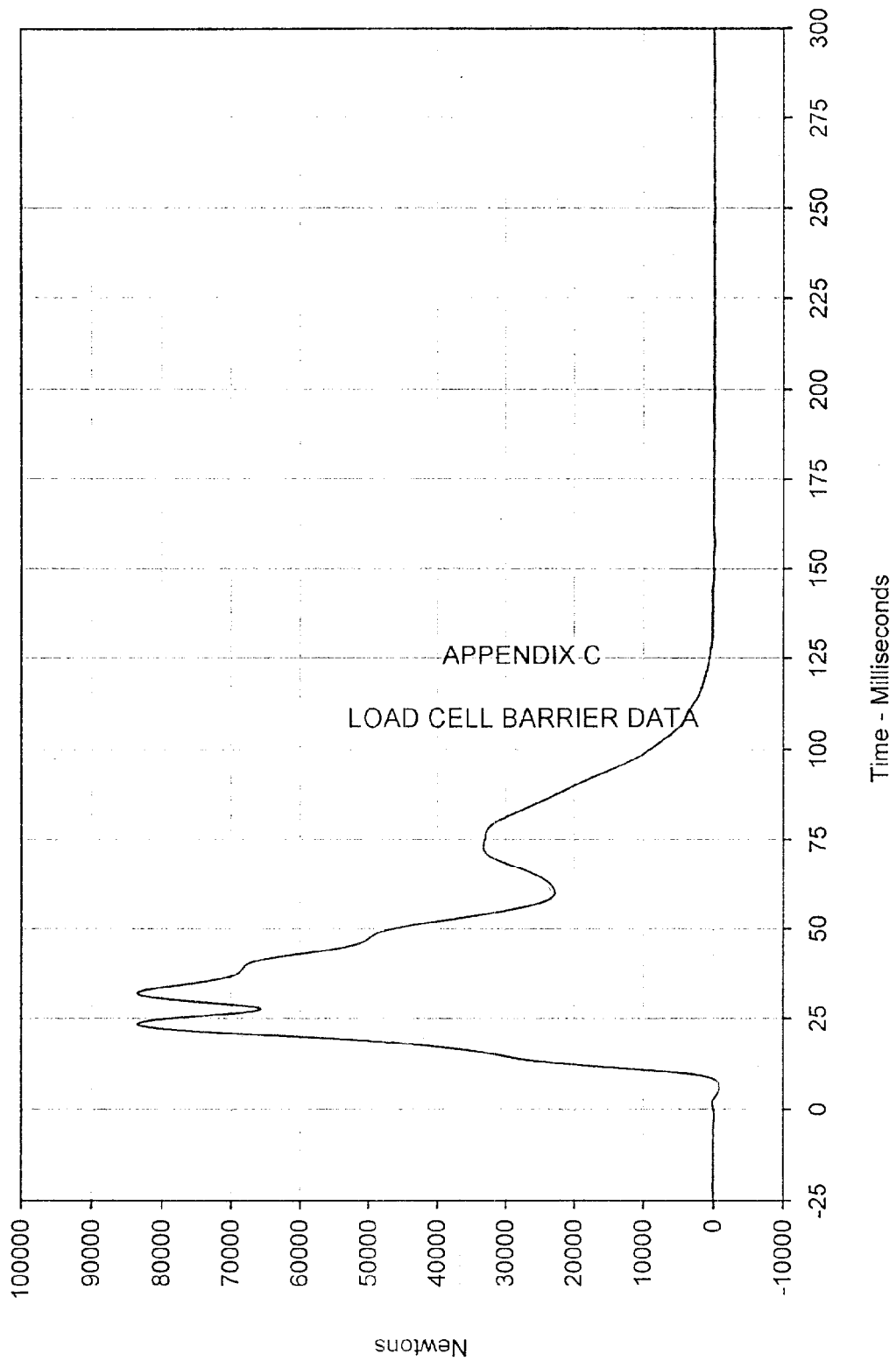


Curve Description: Vehicle Right Rear Redundant X Displ. *		Testing Program: 1997 New Car Assessment Program
Maximum Value:	0.0 at 0.0 Milliseconds	Test Vehicle: 1997 Chevrolet Cavalier
Minimum Value:	0.0 at 0.0 Milliseconds	
SAE Filter Class:	180	
Date of Test:	3/13/97	
Curve Number:	IN2-097	



*Channel Failed, No Data

APPENDIX C
LOAD CELL BARRIER DATA

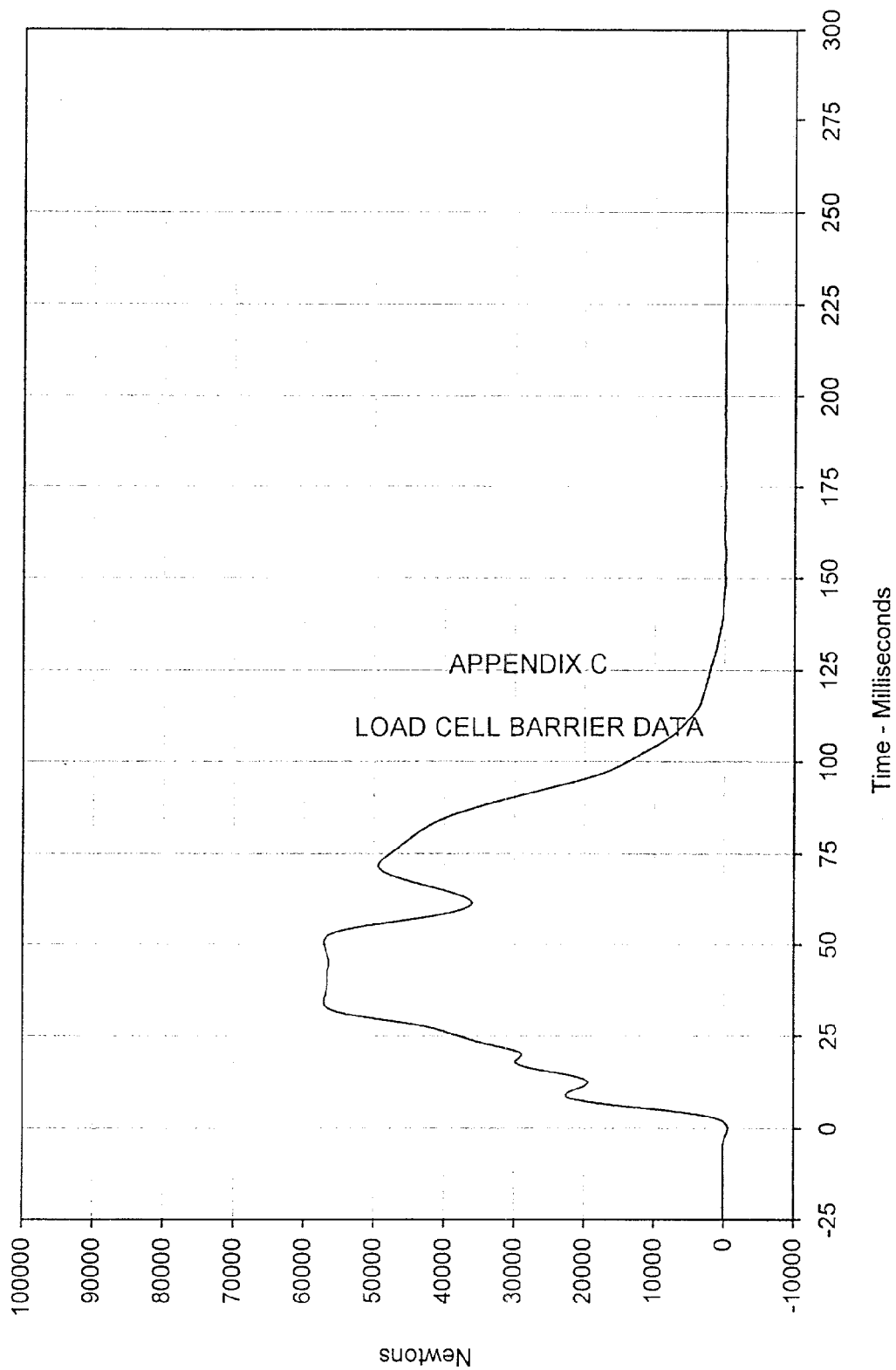


APPENDIX-C
LOAD CELL BARRIER DATA

Curve Description: Barrier Force B3
 Maximum Value: 83499 at 23.5 Milliseconds
 Minimum Value: -816 at 6.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 3/13/97
 Curve Number: FIL-109

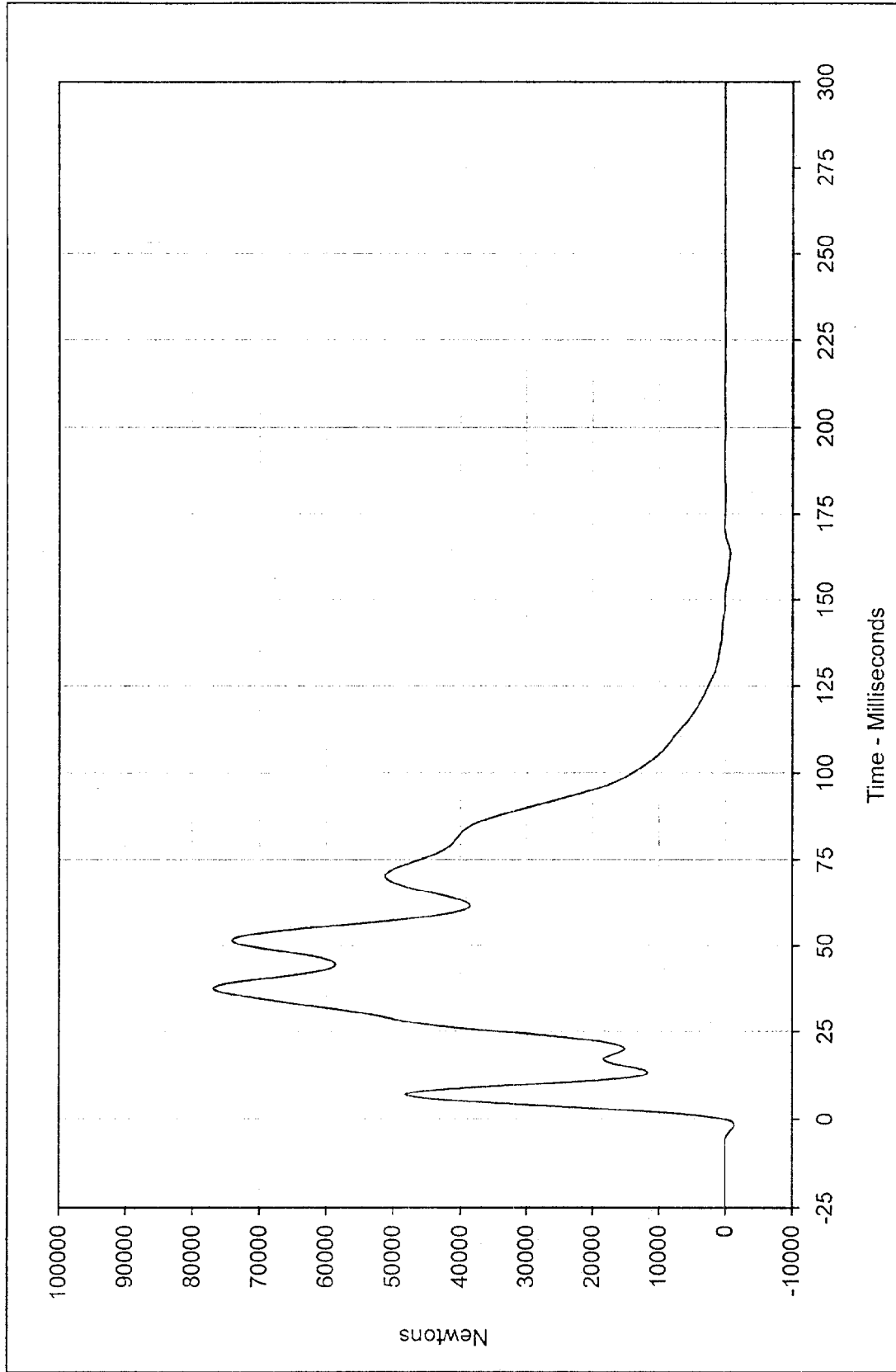
Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





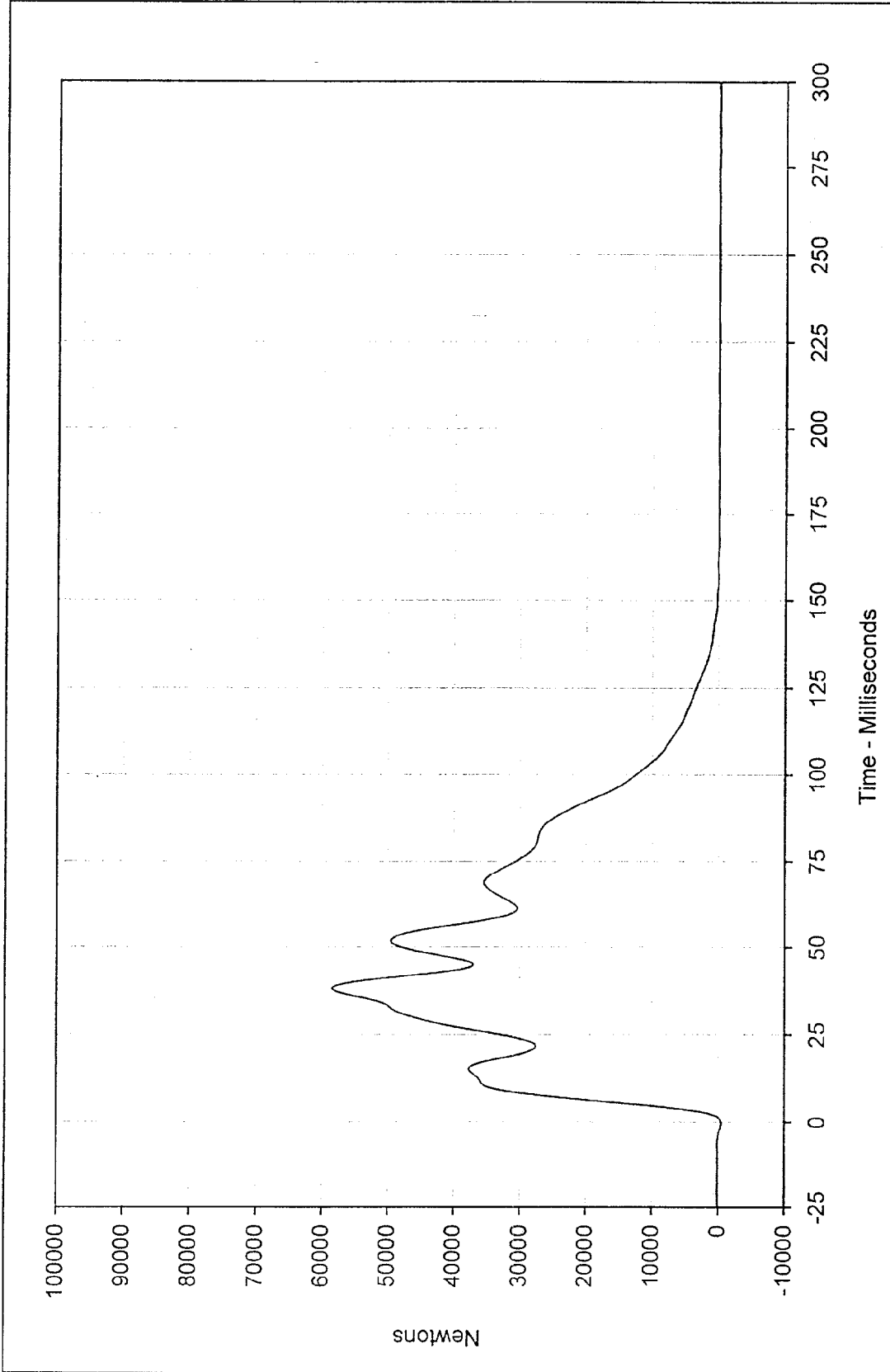
Curve Description:	Barrier Force B4	Testing Program:	1997 New Car Assessment Program
Maximum Value:	57162 at 34.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-568 at 0.1 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-110		





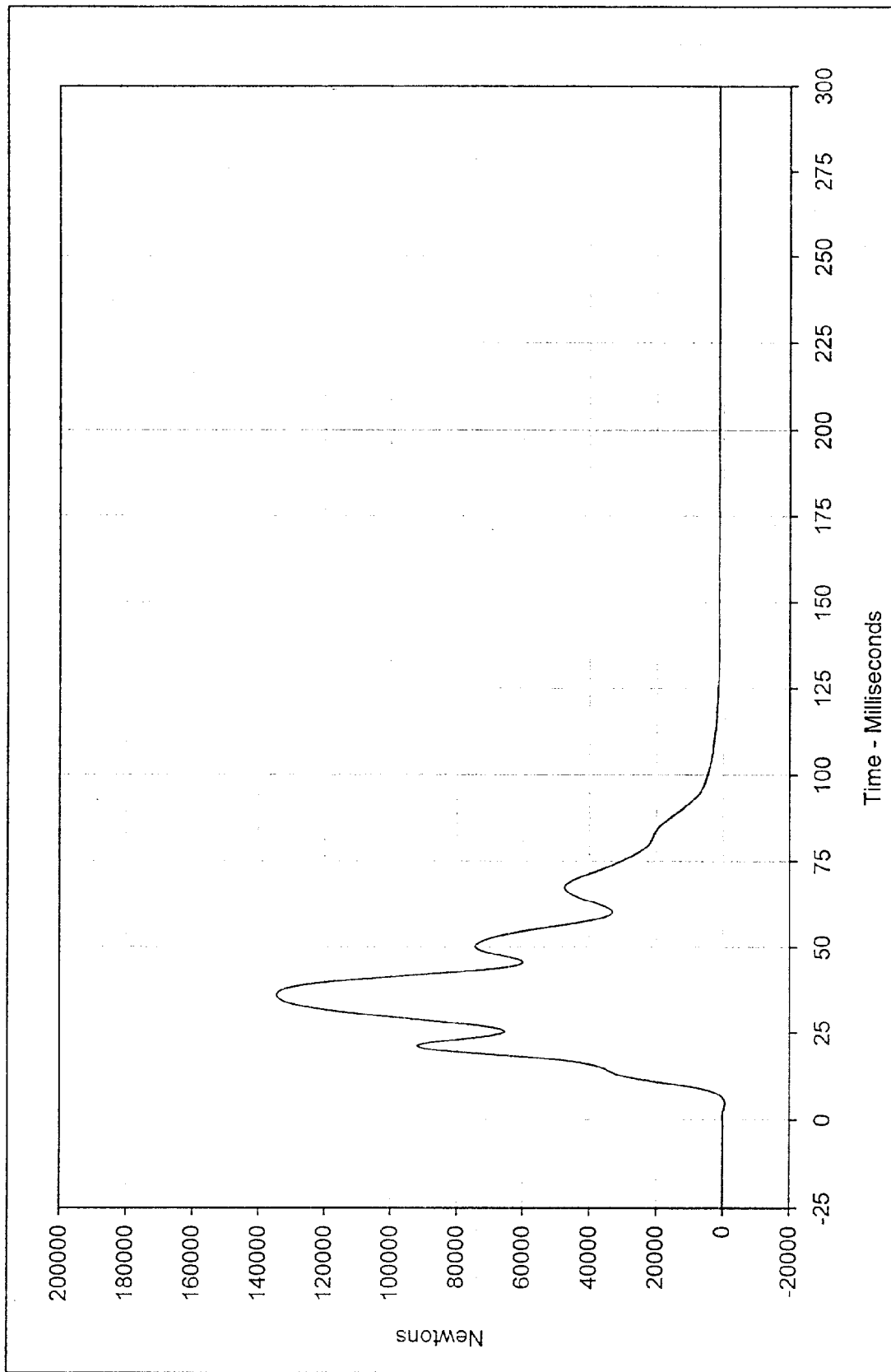
Curve Description:	Barrier Force B5	Testing Program:	1997 New Car Assessment Program
Maximum Value:	76909 at 37.7 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-1333 at -1.5 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-111		





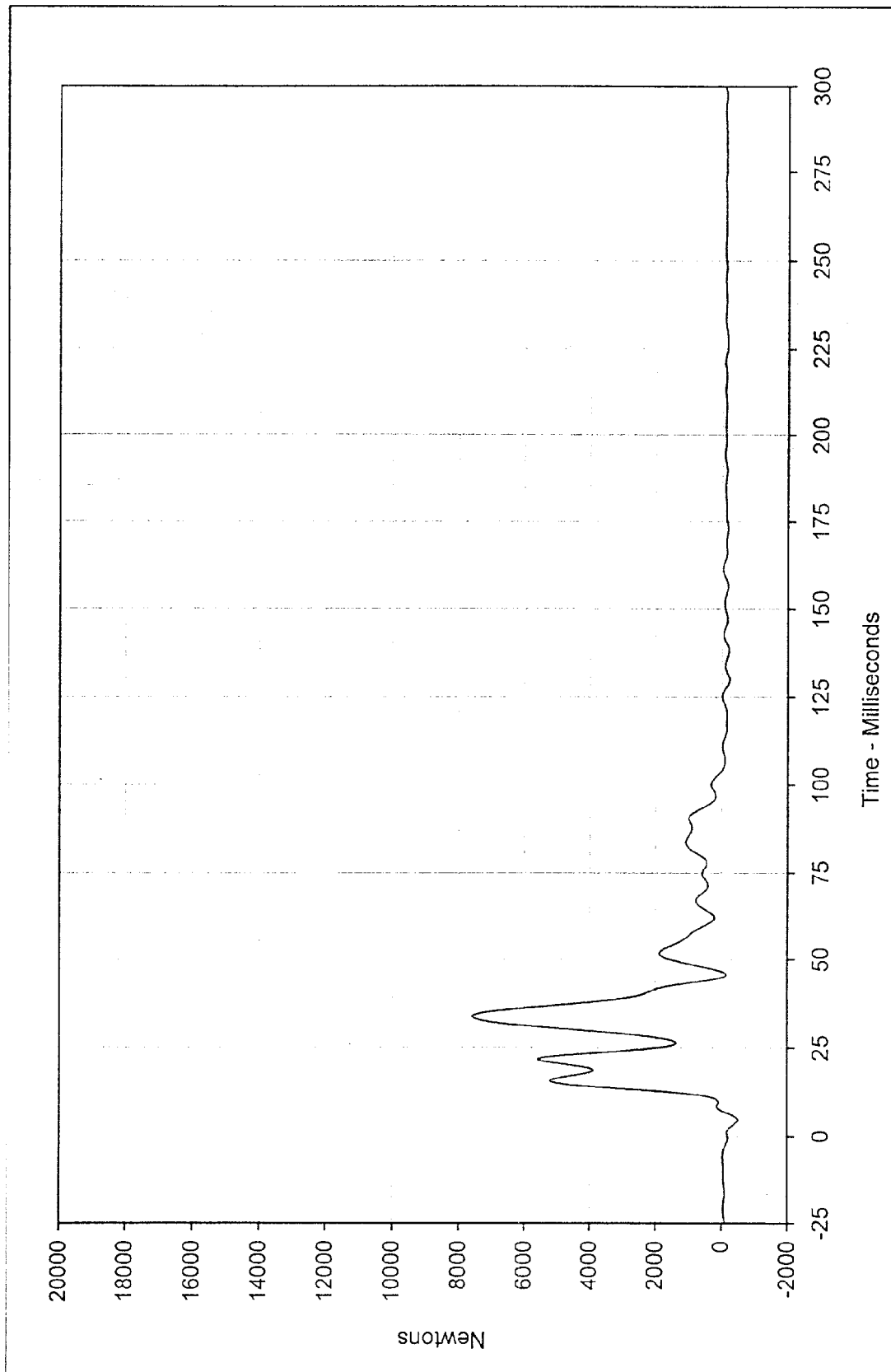
Curve Description:	Barrier Force B6	Testing Program:	1997 New Car Assessment Program
Maximum Value:	58447 at 38 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-524 at -0.4 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-112		





Curve Description:	Barrier Force B7	Testing Program:	1997 New Car Assessment Program
Maximum Value:	134421 at 36.2 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-678 at 5.2 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	FIL-113		





Curve Description:

Barrier Force C4

Testing Program: 1997 New Car Assessment Program

Maximum Value:

7584

at

33.7

Milliseconds

Minimum Value:

-493

at

4.7

Milliseconds

SAE Filter Class:

60

Date of Test:

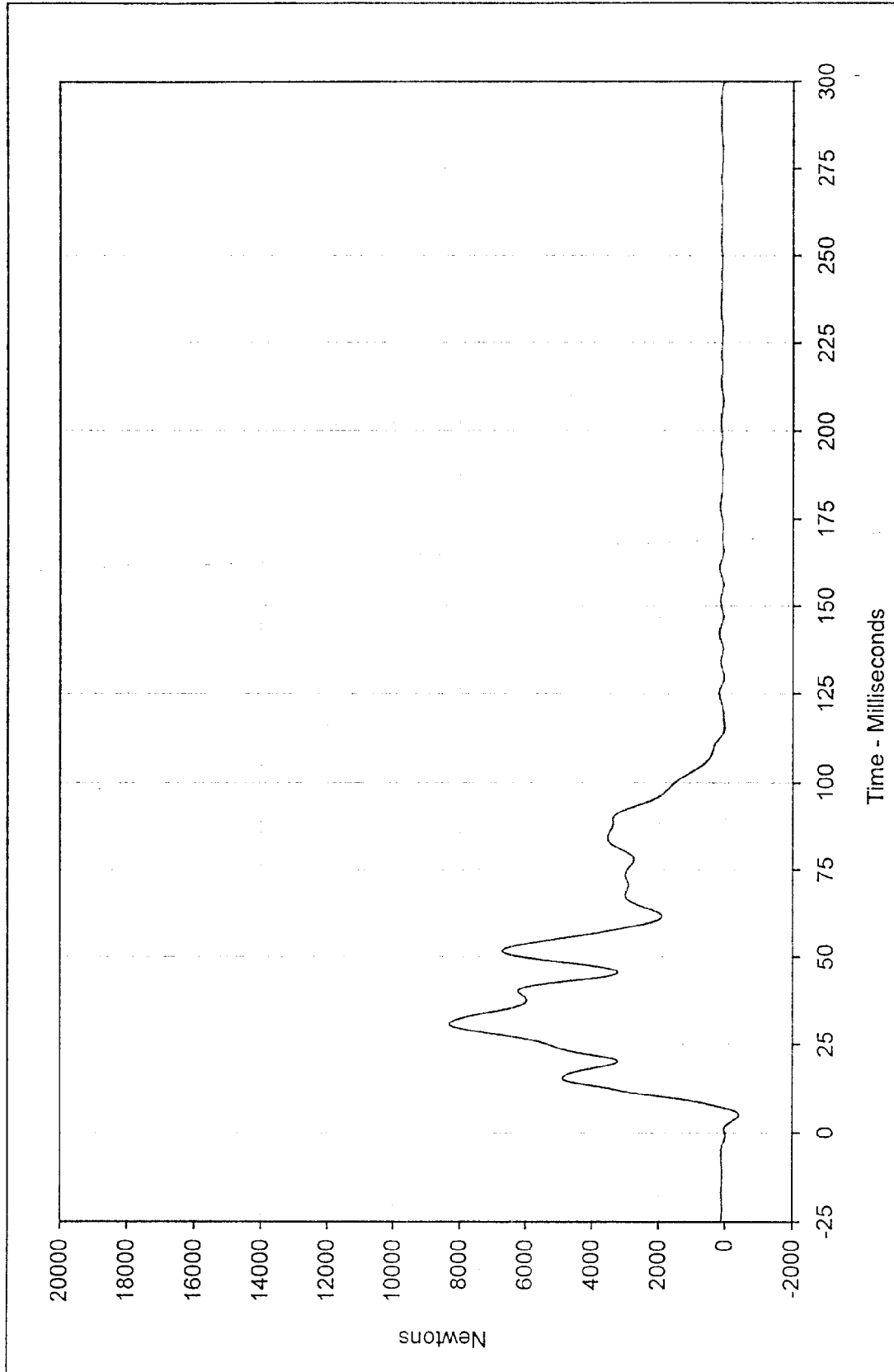
3/13/97

Curve Number:

FIL-119

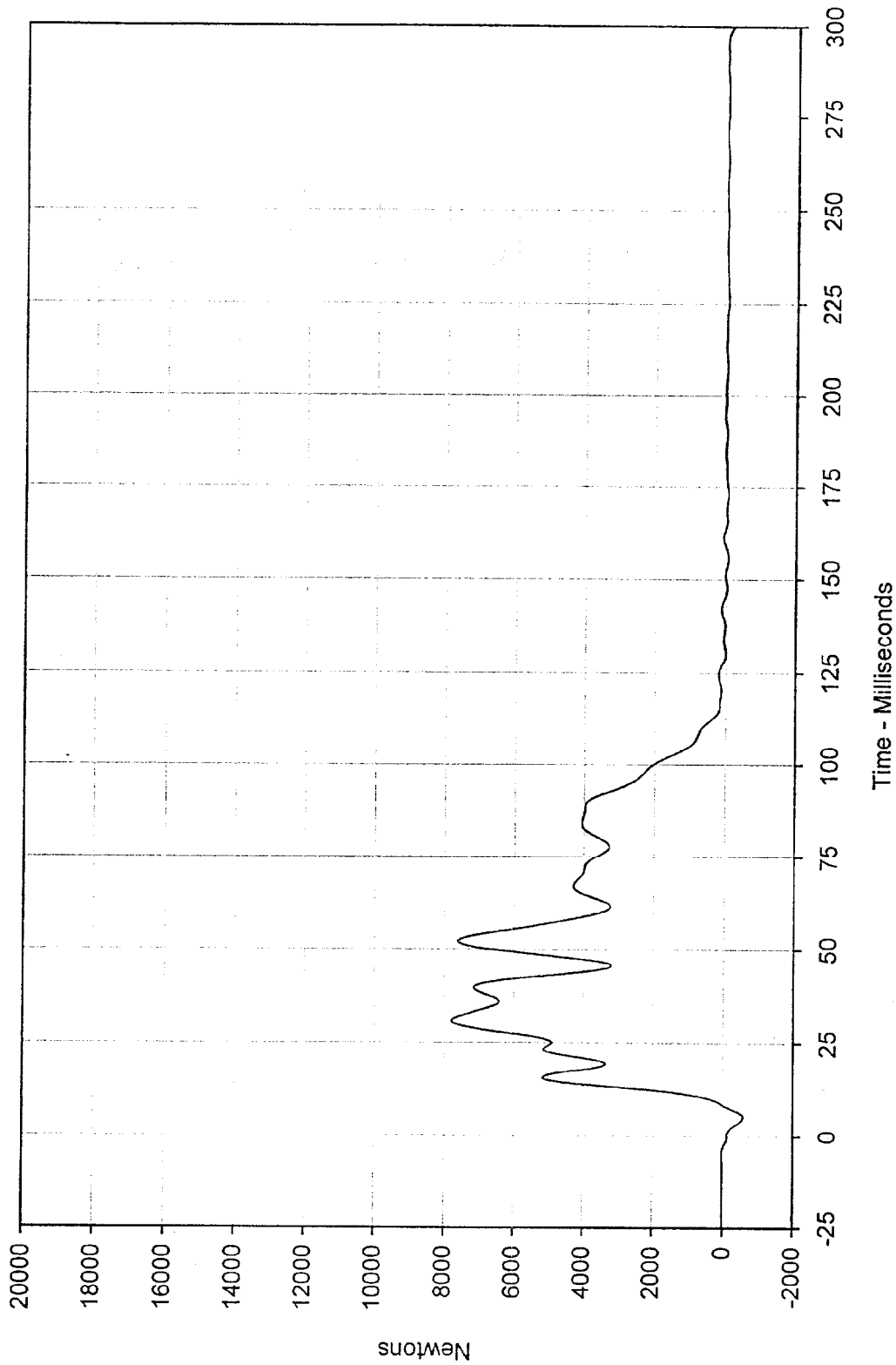
Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:		Barrier Force C5		Testing Program:	1997 New Car Assessment Program
Maximum Value:	8324	at	30.7	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-390	at	5		
SAE Filter Class:	60				
Date of Test:	3/13/97				
Curve Number:	FIL-120				

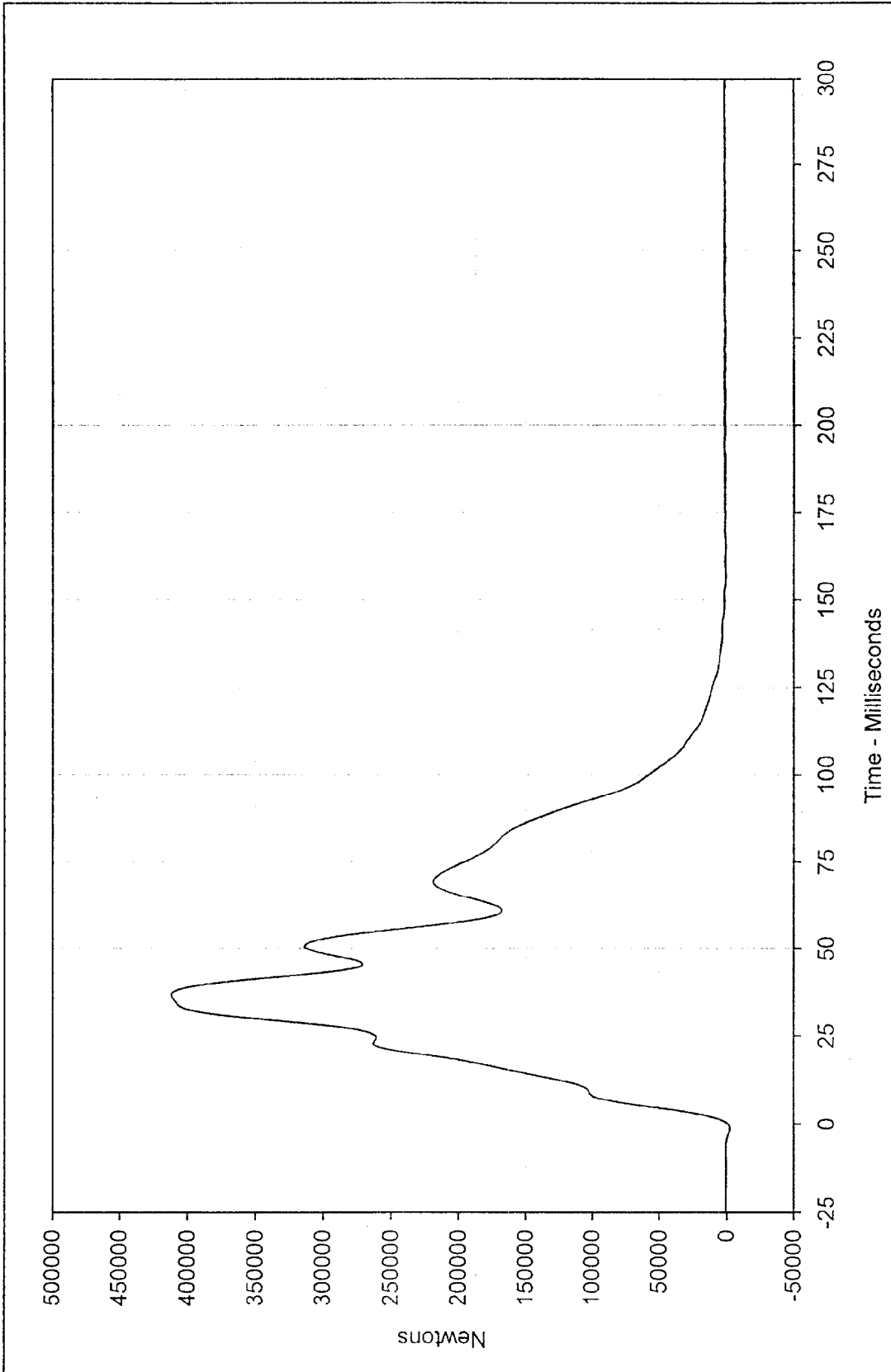




Curve Description: Barrier Force C6
 Maximum Value: 7800 at 30.8 Milliseconds
 Minimum Value: -582 at 5.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 3/13/97
 Curve Number: FIL-121

Testing Program: 1997 New Car Assessment Program
 Test Vehicle: 1997 Chevrolet Cavalier





Curve Description:	Barrier Force Partial Sum	Testing Program:	1997 New Car Assessment Program
Maximum Value:	411981 at 36.8 Milliseconds	Test Vehicle:	1997 Chevrolet Cavalier
Minimum Value:	-1143 at 0 Milliseconds		
SAE Filter Class:	60		
Date of Test:	3/13/97		
Curve Number:	SUM-007		



APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

New Car Assessment Program
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
Test Date: 3/13/97
Vehicle: 1997 Chevrolet Cavalier

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPLC001FX	Load cell, six axis neck	R. A. Denton	1716	N
8	NECK FORCE	Y	GPLC001FY	Load cell, six axis neck	R. A. Denton	1716	N
9	NECK FORCE	Z	GPLC001FZ	Load cell, six axis neck	R. A. Denton	1716	N
10	NECK MOMENT	X	GPLC001MX	Load cell, six axis neck	R. A. Denton	1716	J
11	NECK MOMENT	Y	GPLC001MY	Load cell, six axis neck	R. A. Denton	1716	J
12	NECK MOMENT	Z	GPLC001MZ	Load cell, six axis neck	R. A. Denton	1716	J
13	CHEST, PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST, PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST, PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST, REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
17	CHEST, REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
18	CHEST, REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
19	CHEST DISPLACEMENT	X	GNRP001	Potentiometer, Rotary	Servo	14CBI	CM
20	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
21	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
22	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
23	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	GPLC001	Load cell, Femur	G.S.E.	2430	N

New Car Assessment Program
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
Test Date: 3/13/97
Vehicle: 1997 Chevrolet Cavalier

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPOT01MX	2 ch., Upper tibia gage	R. A. Denton	1583	J
26	UP. TIBIA LEFT MOM.	Y	GPOT01MY	2 ch., Upper tibia gage	R. A. Denton	1583	J
27	UP. TIBIA RIGHT MOM.	X	GPOT02MX	2 ch., Upper tibia gage	R. A. Denton	1583	J
28	UP. TIBIA RIGHT MOM.	Y	GPOT02MY	2 ch., Upper tibia gage	R. A. Denton	1583	J
29	LWR. TIBIA LEFT FORCE	Y	GPLT02FY	3 ch., lower tibia gage	R. A. Denton	1584	N
30	LWR. TIBIA LEFT FORCE	Z	GPLT01FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
31	LWR. TIBIA LEFT MOM.	X	GPLT01MX	3 ch., lower tibia gage	R. A. Denton	1584	J
32	LWR. TIBIA RIGHT FORCE	Y	GPLT02FY	3 ch., lower tibia gage	R. A. Denton	1584	N
33	LWR. TIBIA RIGHT FORCE	Z	GPLT02FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
34	LWR. TIBIA RIGHT MOM.	X	GPLT02MX	3 ch., lower tibia gage	R. A. Denton	1584	J
35	FOOT LEFT	X	GPAC030	Accel., 1/2 bridge	Endevco	7264-2000	G
36	FOOT LEFT	Y	GPAC007	Accel., 1/2 bridge	Endevco	7264-2000	G
37	FOOT LEFT	Z	GPAC008	Accel., 1/2 bridge	Endevco	7264-2000	G
38	FOOT RIGHT	X	KEAC033	Accel., 1/2 bridge	Endevco	7264-2000	G
39	FOOT RIGHT	Y	GPAC016	Accel., 1/2 bridge	Endevco	7264-2000	G
40	FOOT RIGHT	Z	KEAC035	Accel., 1/2 bridge	Endevco	7264-2000	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	Celco	PTX101-0030	CM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	CM

New Car Assessment Program
Instrumentation Data Channel Assignments
Passenger A.T.D Serial Number 35
Test Date: 3/13/97
Vehicle: 1997 Chevrolet Cavalier

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	KEAC039	Accel., 1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	KEAC038	Accel., 1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	KEAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	KEAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	KEAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	KEAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPLC002FX	Load cell, six axis neck	R. A. Denton	1716	N
52	NECK FORCE	Y	GPLC002FY	Load cell, six axis neck	R. A. Denton	1716	N
53	NECK FORCE	Z	GPLC002FZ	Load cell, six axis neck	R. A. Denton	1716	N
54	NECK MOMENT	X	GPLC002MX	Load cell, six axis neck	R. A. Denton	1716	J
55	NECK MOMENT	Y	GPLC002MY	Load cell, six axis neck	R. A. Denton	1716	J
56	NECK MOMENT	Z	GPLC002MZ	Load cell, six axis neck	R. A. Denton	1716	J
57	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	KEAC023	Accel., 1/2 bridge	Endevco	7264-200	G
61	CHEST , REDUNDANT	Y	KEAC022	Accel., 1/2 bridge	Endevco	7264-200	G
62	CHEST , REDUNDANT	Z	KEAC024	Accel., 1/2 bridge	Endevco	7264-200	G
63	CHEST DISPLACEMENT	X	GPRP002	Potentiometer, Rotary	Servo	14CBI	CM
64	PELVIS, PRIMARY	X	GPAC009	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC017	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC018	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

New Car Assessment Program
Instrumentation Data Channel Assignments
Passenger A.T.D Serial Number 35
Test Date: 3/13/97
Vehicle: 1997 Chevrolet Cavalier

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	NOTE 1				
70	UP. TIBIA LEFT MOM.	Y	NOTE 1				
71	UP. TIBIA RIGHT MOM.	X	NOTE 1				
72	UP. TIBIA RIGHT MOM.	Y	NOTE 1				
73	LWR. TIBIA LEFT FORCE	Y	NOTE 1				
74	LWR. TIBIA LEFT FORCE	Z	NOTE 1				
75	LWR. TIBIA LEFT MOM.	X	NOTE 1				
76	LWR. TIBIA RIGHT FORCE	Y	NOTE 1				
77	LWR. TIBIA RIGHT FORCE	Z	NOTE 1				
78	LWR. TIBIA RIGHT MOM.	X	NOTE 1				
79	FOOT LEFT	X	KEAC019	Accel., 1/2 bridge	Endevco	7264-200	G
80	FOOT LEFT	Y	KEAC020	Accel., 1/2 bridge	Endevco	7264-200	G
81	FOOT LEFT	Z	KEAC021	Accel., 1/2 bridge	Endevco	7264-200	G
82	FOOT RIGHT	X	KEAC005	Accel., 1/2 bridge	Endevco	7264-200	G
83	FOOT RIGHT	Y	KEAC004	Accel., 1/2 bridge	Endevco	7264-200	G
84	FOOT RIGHT	Z	KEAC003	Accel., 1/2 bridge	Endevco	7264-200	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	CM

NOTE 1: Not provided by D.O.T., channel assignments will include "0" data to maintain channel identification conformity with subsequent tests.

New Car Assessment Program
Instrumentation Data Channel Assignments

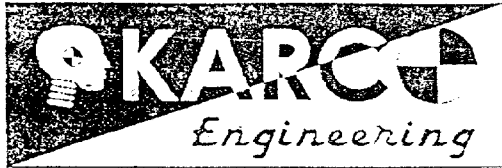
Vehicle Accelerometers

Test Date: 3/13/97

Vehicle: 1997 Chevrolet Cavalier

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	LEFT REAR, PRIMARY	X	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
90	RIGHT REAR, PRIMARY	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G'S
91	ENGINE TOP	X	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
92	ENGINE BOTTOM	X	KEVA002	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
93	LEFT BRAKE CALIPER	X	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
94	RIGHT BRAKE CALIPER	X	KEVA004	Accel., Vehicle block	I.C. Sensor	3031-500	G'S
95	INSTRUMENT PANEL	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-200	G'S
96	LEFT REAR, REDNT.	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G'S
97	RIGHT REAR, REDNT.	X	KEVA008	Accel., Vehicle block	I.C. Sensor	3031-200	G'S

APPENDIX E
DUMMY CALIBRATION



Hybrid III Calibration Data Knee Impact Test (Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

Left Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	21.5	Pass
Laboratory relative humidity	%	10 to 70	40	Pass
Probe Velocity	MPS	2.07 to 2.13	2.12	Pass
Peak Acceleration	G's	96.36 to 118.18	103.23	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	515.5	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

2/19/97
Test Date

Right Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	20.4	Pass
Laboratory relative humidity	%	10 to 70	34	Pass
Probe Velocity	MPS	2.07 to 2.13	2.11	Pass
Peak Acceleration	G's	96.36 to 118.18	111.55	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	557.1	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

2/19/97
Test Date

Michael Dunlap
Approved By

2/19/97
Date



Hybrid III Calibration Data Head Drop Test (Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

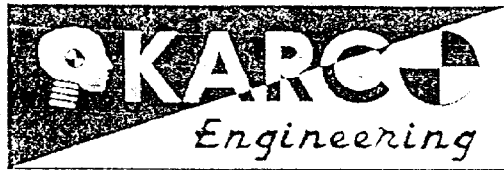
Head Drop Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	21.0	Pass
Laboratory relative humidity	%	10 to 70	46	Pass
Peak resultant acceleration	G's	225.0 to 275.0	227.7	Pass
Peak lateral acceleration	G's	15.0 Max.	3.6	Pass
Is acceleration unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

MD
Approved By

19-Feb-97
Test Date

2/19/97
Date



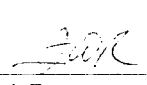
Hybrid III Calibration Data Thorax Impact Test (Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

Thorax Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.6 to 22.2	21.5	Pass
Laboratory relative humidity	%	10 to 70	41	Pass
Probe Velocity	MPS	6.58 to 6.83	6.70	Pass
Peak acceleration	G's	22.53 to 25.73	23.6	Pass
Pendulum Mass	Kgs	23.4	23.4	Pass
Peak resistive force	Kgs	526.6 to 601.6	552.5	Pass
Peak chest deflection	CM	6.35 to 7.26	6.57	Pass
Internal hysteresis	%	69 to 85	75.4	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

2/21/97
Test Date


Approved By

2/24/97
Date



Hybrid III Calibration Data Neck Flexion Test (Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

Neck Flexion Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	21.0	Pass
Laboratory relative humidity		%	10 to 70	38	Pass
Pendulum velocity		MPS	6.89 to 7.14	6.95	Pass
Peak deceleration	10 Msec	G's	22.5 to 27.5	24.38	Pass
	20 Msec	G's	17.6 to 22.6	19.99	Pass
	30 Msec	G's	12.5 to 18.5	15.07	Pass
Max. decel. above 30 Msec.		G's	29.0 maximum	14.02	Pass
Deceleration decay time to first cross 5 G's		Msec.	34.0 to 42.0	39.75	Pass
"D" plane rotation	maximum	Degrees	64.0 to 78.0	65.8	Pass
	Time	Msec.	57.0 to 64.0	62.9	Pass
Moment about Occipital Condyle	maximum	N.m	84.1 to 108.5	89.2	Pass
	Time	Msec.	47.0 to 58.0	56.6	Pass
Rotation angle decay time to cross zero		Msec.	113.0 to 128.0	127.9	Pass
Positive moment decay time to cross zero		Msec.	97.0 to 107.0	104.1	Pass
Overall Test Results					Pass

Michael Dunlap
Laboratory Technician

2/21/97
Test Date

[Signature]
Approved By

2/21/97
Date



Hybrid III Calibration Data Neck Extension Test (Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

Neck Extension Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	20.9	Pass
Laboratory relative humidity		%	10 to 70	38	Pass
Pendulum velocity		MPS	5.94 to 6.19	6.09	Pass
Peak deceleration	10 Msec	G's	17.2 to 21.2	20.00	Pass
	20 Msec	G's	14.0 to 19.0	17.50	Pass
	30 Msec	G's	11.0 to 16.0	15.30	Pass
Max. decel. above 30 Msec.		G's	22.0 maximum	13.90	Pass
Deceleration decay time to first cross 5 G's		Msec.	38.0 to 46.0	44.9	Pass
"D" plane rotation	maximum	Degrees	81.0 to 106.0	96.1	Pass
	Time	Msec.	72.0 to 82.0	75.9	Pass
Moment about Occipital Condyle	maximum	Mt. Kgs	-80.0 to -53.0	-75.5	Pass
	Time	Msec.	65.0 to 79.0	68.0	Pass
Rotation angle decay time to cross zero		Msec.	147.0 to 174.0	161.2	Pass
Negative moment decay time to cross zero		Msec.	120.0 to 148.0	133.5	Pass
Overall Test Results					Pass

Michael Dunlap
Laboratory Technician

2/21/97
Test Date

[Signature]
Approved By

[Signature]
Date



Hybrid III Calibration Data Configuration Verification Data (Metric units)

Part 572E ATD I.D. Number 34
Calibration Sequence 9701

External Measurement Data				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.7	Pass
Laboratory relative humidity	%	10 to 70	18	Pass
A - Total sitting height	mm	878.8 to 889.0	881.4	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	513.1	Pass
C - "H" point height	mm	83.8 to 88.9	83.8	Pass
D - "H" point from seat back	mm	134.6 to 139.7	137.2	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	91.4	Pass
F - Thigh clearance	mm	139.7 to 154.9	144.8	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	294.6	Pass
H - Skull cap to back line	mm	40.6 to 45.7	43.2	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	337.8	Pass
J - Elbow rest height	mm	190.5 to 210.8	198.1	Pass
K - Buttock to knee length	mm	579.1 to 604.5	596.9	Pass
L - Popliteal length	mm	429.3 to 454.7	436.9	Pass
M - Knee pivot height	mm	485.1 to 500.4	492.8	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	469.9	Pass
O - Chest depth	mm	213.4 to 228.6	215.9	Pass
P - Foot length	mm	251.5 to 266.7	259.1	Pass
V - Shoulder breadth	mm	421.6 to 436.9	426.7	Pass
W - Foot breadth	mm	91.4 to 106.7	106.7	Pass
Y - Chest circumference	mm	970.3 to 1000.8	980.4	Pass
Z - Waist circumference	mm	835.7 to 866.1	856.0	Pass
AA - Location for chest circ.	mm	429.3 to 434.3	431.8	Pass
BB - Location for waist circ.	mm	226.1 to 231.1	228.6	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

2/23/97
Test Date


Approved By

2/23/97
Date



Hybrid III Calibration Data Knee Impact Test (Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

Left Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	20.4	Pass
Laboratory relative humidity	%	10 to 70	36	Pass
Probe Velocity	MPS	2.07 to 2.13	2.10	Pass
Peak Acceleration	G's	96.36 to 118.18	97.56	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	487.2	Pass
Overall Test Results				Pass

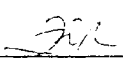
Michael Dunlap
Laboratory Technician

2/19/97
Test Date

Right Knee Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	20.4	Pass
Laboratory relative humidity	%	10 to 70	36	Pass
Probe Velocity	MPS	2.07 to 2.13	2.10	Pass
Peak Acceleration	G's	96.36 to 118.18	111.38	Pass
Pendulum Mass	Kgs	4.994	4.994	Pass
Peak Impact Force	Kgs	481.2 to 590.2	556.2	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

2/19/97
Test Date


Approved By

2/19/97
Date



Hybrid III Calibration Data Head Drop Test (Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

Head Drop Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	18.8 to 25.4	21.0	Pass
Laboratory relative humidity	%	10 to 70	58	Pass
Peak resultant acceleration	G's	225.0 to 275.0	254.9	Pass
Peak lateral acceleration	G's	15.0 Max.	5.9	Pass
Is acceleration unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

[Signature]
Approved By

2/19/97
Test Date

2/17/97
Date



Hybrid III Calibration Data Thorax Impact Test (Metric units)

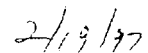
Part 572E ATD I.D. Number 35
Calibration Sequence 9701

Thorax Impact Test				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.6 to 22.2	21.5	Pass
Laboratory relative humidity	%	10 to 70	32	Pass
Probe Velocity	MPS	6.58 to 6.83	6.72	Pass
Peak acceleration	G's	22.53 to 25.73	24.1	Pass
Pendulum Mass	Kgs	23.4	23.4	Pass
Peak resistive force	Kgs	526.6 to 601.6	564.2	Pass
Peak chest deflection	CM	6.35 to 7.26	6.37	Pass
Internal hysteresis	%	69 to 85	76.1	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

12/19/96
Test Date


Approved By


Date



Hybrid III Calibration Data Neck Flexion Test (Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

Neck Flexion Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	21.0	Pass
Laboratory relative humidity		%	10 to 70	40	Pass
Pendulum velocity		MPS	6.89 to 7.14	6.98	Pass
Peak deceleration	10 Msec	G's	22.5 to 27.5	23.85	Pass
	20 Msec	G's	17.6 to 22.6	19.12	Pass
	30 Msec	G's	12.5 to 18.5	15.99	Pass
Max. decel. above 30 Msec.		G's	29.0 maximum	15.05	Pass
Deceleration decay time to first cross 5 G's		Msec.	34.0 to 42.0	41.10	Pass
"D" plane rotation	maximum	Degrees	64.0 to 78.0	70.8	Pass
	Time	Msec.	57.0 to 64.0	60.3	Pass
Moment about Occipital Condyle	maximum	N.m	84.1 to 108.5	92.0	Pass
	Time	Msec.	47.0 to 58.0	54.5	Pass
Rotation angle decay time to cross zero		Msec.	113.0 to 128.0	118.3	Pass
Positive moment decay time to cross zero		Msec.	97.0 to 107.0	99.9	Pass
Overall Test Results					Pass

Michael Dunlap
Laboratory Technician

2/21/97

Test Date

JM
Approved By

2/21/97

Date



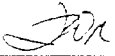
Hybrid III Calibration Data Neck Extension Test (Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

Neck Extension Test					
Tested Parameter		Units	Spec	Result	Pass/Fail
Laboratory temperature		°C	20.6 to 22.2	20.6	Pass
Laboratory relative humidity		%	10 to 70	38	Pass
Pendulum velocity		MPS	5.94 to 6.19	6.15	Pass
Peak deceleration	10 Msec	G's	17.2 to 21.2	20.55	Pass
	20 Msec	G's	14.0 to 19.0	18.38	Pass
	30 Msec	G's	11.0 to 16.0	15.60	Pass
Max. decel. above 30 Msec.		G's	22.0 maximum	14.99	Pass
Deceleration decay time to first cross 5 G's		Msec.	38.0 to 46.0	43.2	Pass
"D" plane rotation	maximum	Degrees	81.0 to 106.0	99.4	Pass
	Time	Msec.	72.0 to 82.0	73.1	Pass
Moment about Occipital Condyle	maximum	Mt. Kgs	-80.0 to -53.0	-77.8	Pass
	Time	Msec.	65.0 to 79.0	65.6	Pass
Rotation angle decay time to cross zero		Msec.	147.0 to 174.0	159.1	Pass
Negative moment decay time to cross zero		Msec.	120.0 to 148.0	126.8	Pass
Overall Test Results					Pass

Michael Dunlap
Laboratory Technician

2/21/97
Test Date


Approved By

2/21/97
Date



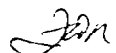
Hybrid III Calibration Data Configuration Verification Data (Metric units)

Part 572E ATD I.D. Number 35
Calibration Sequence 9701

External Measurement Data				
Tested Parameter	Units	Spec	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.7	Pass
Laboratory relative humidity	%	10 to 70	18	Pass
A - Total sitting height	mm	878.8 to 889.0	886.5	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	510.5	Pass
C - "H" point height	mm	83.8 to 88.9	88.9	Pass
D - "H" point from seat back	mm	134.6 to 139.7	139.7	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	88.9	Pass
F - Thigh clearance	mm	139.7 to 154.9	152.4	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	292.1	Pass
H - Skull cap to back line	mm	40.6 to 45.7	43.2	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	342.9	Pass
J - Elbow rest height	mm	190.5 to 210.8	190.5	Pass
K - Buttock to knee length	mm	579.1 to 604.5	596.9	Pass
L - Popliteal length	mm	429.3 to 454.7	444.5	Pass
M - Knee pivot height	mm	485.1 to 500.4	492.8	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	475.0	Pass
O - Chest depth	mm	213.4 to 228.6	215.9	Pass
P - Foot length	mm	251.5 to 266.7	256.5	Pass
V - Shoulder breadth	mm	421.6 to 436.9	436.9	Pass
W - Foot breadth	mm	91.4 to 106.7	104.1	Pass
Y - Chest circumference	mm	970.3 to 1000.8	975.4	Pass
Z - Waist circumference	mm	835.7 to 866.1	843.3	Pass
AA - Location for chest circ.	mm	429.3 to 434.3	431.8	Pass
BB - Location for waist circ.	mm	226.1 to 231.1	231.1	Pass
Overall Test Results				Pass

Michael Dunlap
Laboratory Technician

2/23/97
Test Date


Approved By

2/23/97
Date

APPENDIX F

VEHICLE OWNER'S MANUAL

OCCUPANT RESTRAINT INSTRUCTIONS

Here Are Questions Many People Ask About Safety Belts -- and the Answers

Q: Won't I be trapped in the vehicle after an accident if I'm wearing a safety belt?

A: You could be -- whether you're wearing a safety belt or not. But you can unbuckle a safety belt, even if you're upside down. And your chance of being conscious during and after an accident, so you *can* unbuckle and get out, is *much* greater if you are belted.

Q: If my vehicle has air bags, why should I have to wear safety belts?

A: Air bags are in many vehicles today and will be in most of them in the future. But they are supplemental systems only; so they work *with* safety belts -- not instead of them. Every air bag system ever offered for sale has required the use of safety belts. Even if you're in a vehicle that has air bags, you still have to buckle up to get the most protection. That's true not only in frontal collisions, but especially in side and other collisions.

Q: If I'm a good driver, and I never drive far from home, why should I wear safety belts?

A: You may be an excellent driver, but if you're in an accident -- even one that isn't your fault -- you and your passengers can be hurt. Being a good driver doesn't protect you from things beyond your control, such as bad drivers.

Most accidents occur within 25 miles (40 km) of home. And the greatest number of serious injuries and deaths occur at speeds of less than 40 mph (65 km/h).

Safety belts are for everyone.

1-12

How to Wear Safety Belts Properly

Adults

This part is only for people of adult size.

Be aware that there are special things to know about safety belts and children. And there are different rules for smaller children and babies. If a child will be riding in your Chevrolet, see the part of this manual called "Children." Follow those rules for everyone's protection.

First, you'll want to know which restraint systems your vehicle has.

We'll start with the driver position.

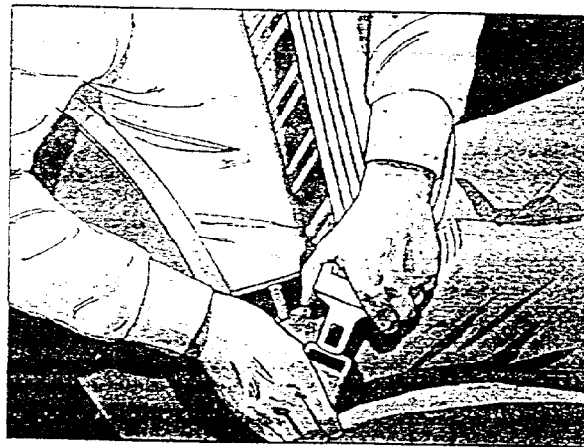
Driver Position

This part describes the driver's restraint system.

Lap-Shoulder Belt

The driver has a lap-shoulder belt. Here's how to wear it properly.

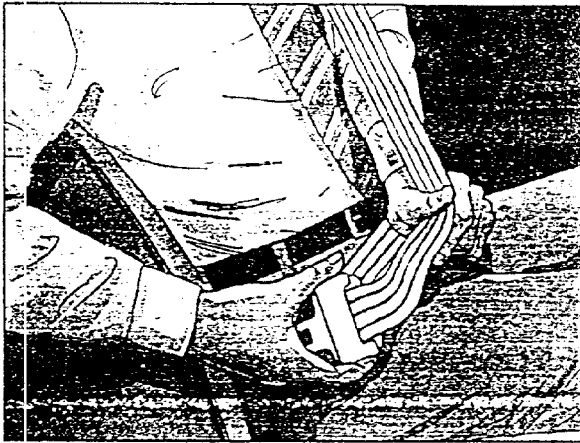
1. Close and lock the door.
2. Adjust the seat (to see how, see "Seats" in the Index) so you can sit up straight.



3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.

The shoulder belt may lock if you pull the belt across you very quickly. If this happens, let the belt go back slightly to unlock it. Then pull the belt across you more slowly.

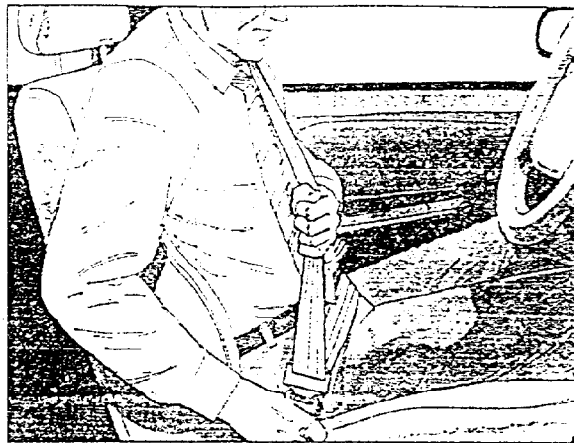
4. Push the latch plate into the buckle until it clicks.



If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle the belt.

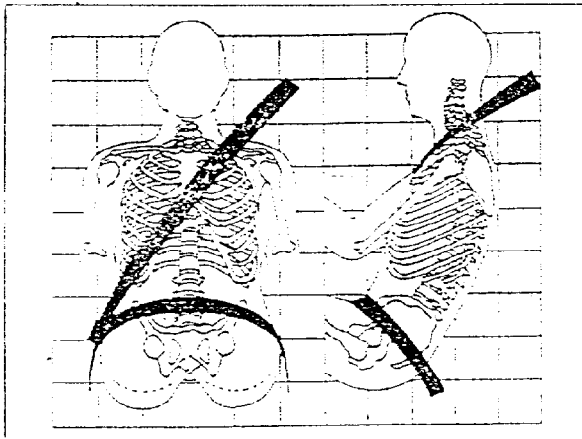
Pull up on the latch plate to make sure it is secure. If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.



5. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder belt.

1-14



The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks if there's a sudden stop or crash, or if you pull the belt very quickly out of the retractor.

Shoulder Belt Height Adjuster (4-Door Models)

Before you begin to drive, move the shoulder belt adjuster to the height that is right for you.

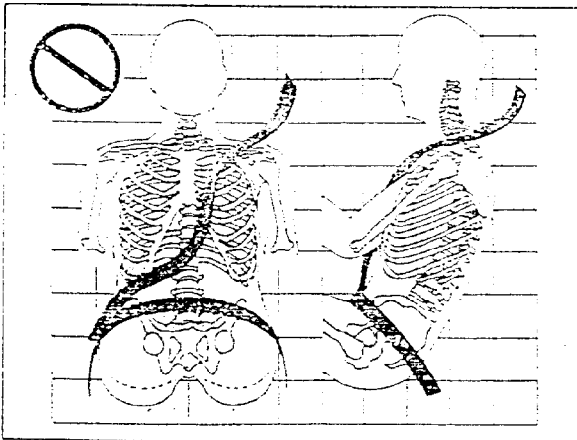


To move it down, squeeze the release button and move the adjuster to the desired position. You can move the adjuster up just by pushing up on the shoulder belt guide. After you move the adjuster to where you want it, try to move it down without squeezing the release button to make sure it has locked into position.

Adjust the height so that the shoulder portion of the belt is centered on your shoulder. The belt should be away from your face and neck, but not falling off your shoulder.

1-16

Q: What's wrong with this?

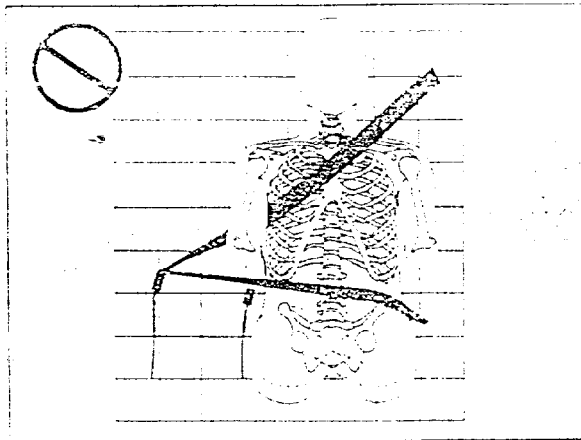


CAUTION:

You can be seriously hurt if your shoulder belt is too loose. In a crash, you would move forward too much, which could increase injury. The shoulder belt should fit against your body.

A: The shoulder belt is too loose. It won't give nearly as much protection this way.

Q: What's wrong with this?



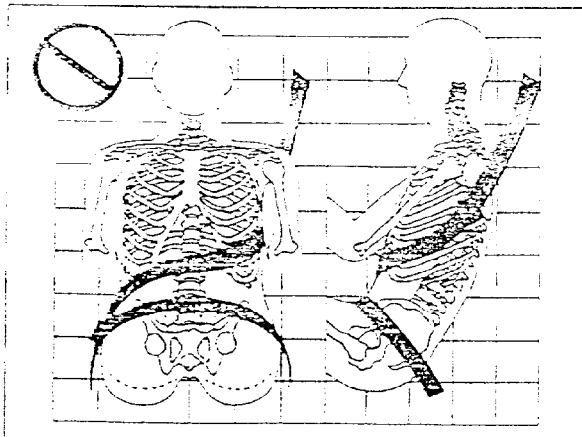
⚠ CAUTION:

You can be seriously injured if your belt is buckled in the wrong place like this. In a crash, the belt would go up over your abdomen. The belt forces would be there, not at the pelvic bones. This could cause serious internal injuries. Always buckle your belt into the buckle nearest you.

A: The belt is buckled in the wrong place.

1-18

Q: What's wrong with this?

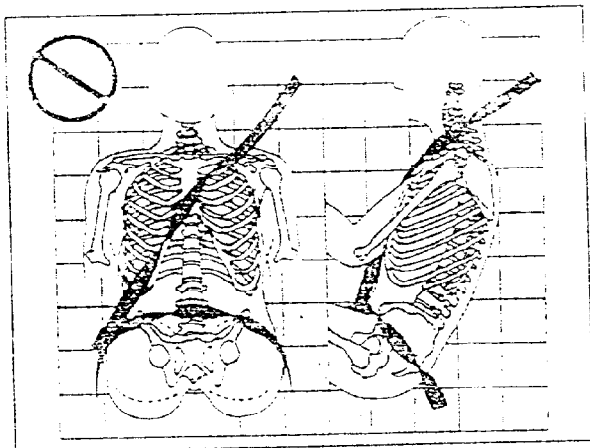


⚠ CAUTION:

You can be seriously injured if you wear the shoulder belt under your arm. In a crash, your body would move too far forward, which would increase the chance of head and neck injury. Also, the belt would apply too much force to the ribs, which aren't as strong as shoulder bones. You could also severely injure internal organs like your liver or spleen.

A: The shoulder belt is worn under the arm. It should be worn over the shoulder at all times.

Q: What's wrong with this?

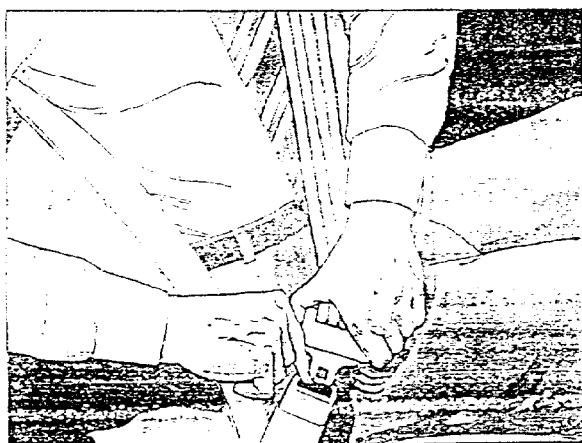


A: The belt is twisted across the body.

⚠ CAUTION:

You can be seriously injured by a twisted belt. In a crash, you wouldn't have the full width of the belt to spread impact forces. If a belt is twisted, make it straight so it can work properly, or ask your dealer to fix it.

1-20

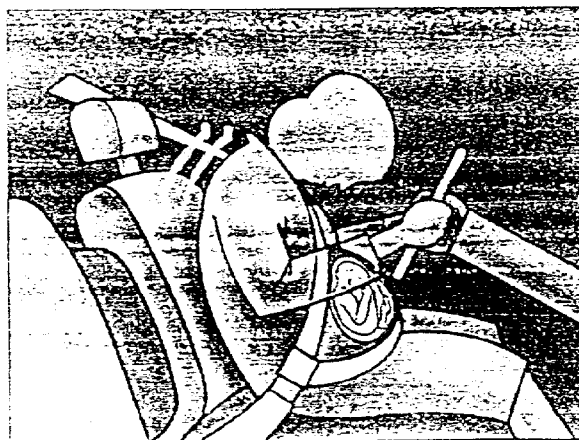


To unlatch the belt, just push the button on the buckle. The belt should go back out of the way.

Before you close the door, be sure the belt is out of the way. If you slam the door on it, you can damage both the belt and your vehicle.

Safety Belt Use During Pregnancy

Safety belts work for everyone, including pregnant women. Like all occupants, they are more likely to be seriously injured if they don't wear safety belts.



A pregnant woman should wear a lap-shoulder belt, and the lap portion should be worn as low as possible, below the rounding, throughout the pregnancy.

The best way to protect the fetus is to protect the mother. When a safety belt is worn properly, it's more likely that the fetus won't be hurt in a crash. For pregnant women, as for anyone, the key to making safety belts effective is wearing them properly.

Right Front Passenger Position

The right front passenger's safety belt works the same way as the driver's safety belt. See "Driver Position," earlier in this section.

Supplemental Restraint System (SRS)

This part explains the Supplemental Restraint System (SRS) or air bag system.

Your Chevrolet has two air bags -- one air bag for the driver and another air bag for the right front passenger.

Here are the most important things to know about the air bag system:

CAUTION:

You can be severely injured or killed in a crash if you aren't wearing your safety belt -- even if you have air bags. Wearing your safety belt during a crash helps reduce your chance of hitting things inside the vehicle or being ejected from it. Air bags are "supplemental restraints" to the safety belts. All air bags are designed to work with safety belts, but don't replace them. Air bags are designed to work only in moderate to severe crashes where the front of your vehicle hits something. They aren't designed to inflate at all in rollover, rear, side or low-speed frontal crashes. Everyone in your vehicle should wear a safety belt properly -- whether or not there's an air bag for that person.

1-22

CAUTION:

Air bags inflate with great force, faster than the blink of an eye. If you're too close to an inflating air bag, it could seriously injure you. Safety belts help keep you in position and protect you in a crash. Always wear your safety belt, even with air bags. The driver should sit as far back as possible while still maintaining control of the vehicle.

CAUTION:

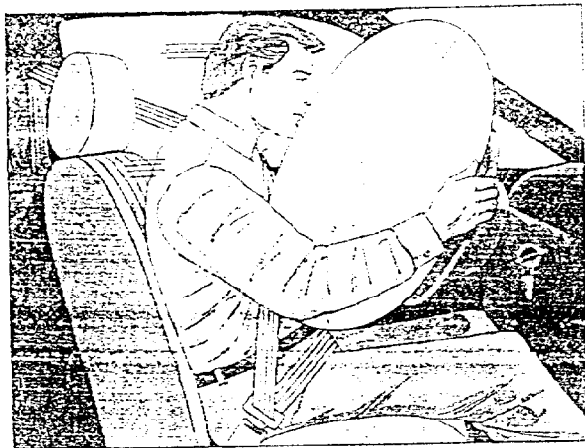
An inflating air bag can seriously injure small children. Always secure children properly in your vehicle. To read how, see the part of this manual called "Children" and the caution label on the right front passenger's safety belt.

AIR
BAG

There is an air bag readiness light on the instrument panel, which shows AIR BAG.

The system checks the air bag electrical system for malfunctions. The light tells you if there is an electrical problem. See "Air Bag Readiness Light" in the Index for more information.

How the Air Bag System Works



Where are the air bags?

The driver's air bag is in the middle of the steering wheel.



The right front passenger's air bag is in the instrument panel on the passenger's side.

1-24



CAUTION:

Don't attach anything to, or put anything between, an occupant and an air bag. If something is between an occupant and an air bag, the bag might not inflate properly or it might force the object into you and cause injury. The path of an inflating air bag must be kept clear, so don't attach or put anything on the steering wheel hub or on or near any air bag covering.

When should an air bag inflate?

An air bag is designed to inflate in a moderate to severe frontal or near-frontal crash. The air bag will inflate only if the impact speed is above the system's designed "threshold level." If your vehicle goes straight into a wall that doesn't move or deform, the threshold level is about 9 to 15 mph (4 to 24 km/h). The threshold level can vary, however, even with specific vehicle design, so that

it can be somewhat above or below this range. If your vehicle strikes something that will move or deform, such as a parked car, the threshold level will be higher. The air bag is not designed to inflate in rollovers, side impacts or rear impacts, because inflation would not help the occupant.

In a particular crash, your car might have an air bag that will not inflate simply because of the damage to a vehicle or because of what the repair costs were. Inflation is determined by the angle of the impact and how quickly the vehicle slows down in frontal or near-frontal impacts.

What makes an air bag inflate?

In an impact of sufficient severity, the air bag sensing system detects that the vehicle is in a crash. The sensing system triggers a release of gas from the inflator, which inflates the air bag. The inflator, air bag and related hardware are all part of the air bag modules inside the steering wheel, and in the instrument panel in front of, the right front passenger.

How does an air bag restrain?

In moderate to severe frontal or near-frontal collisions, even belted occupants can contact the steering wheel or the instrument panel. Air bags supplement the protection provided by safety belts. Air bags disperse the force of the impact more evenly over the occupant's upper body, stopping the occupant more gradually. But air bags would not help you in many types of collisions, including rollovers, rear impacts and side impacts, primarily because an occupant's motion is not toward those air bags. Air bags should never be regarded as anything more than a supplement to safety belts, and then only in moderate to severe frontal or near-frontal collisions.

What will you see after an air bag inflates?

After an air bag inflates, it quickly deflates, so quickly that some people may not even realize the air bag inflated. Some components of the air bag module in the steering wheel hub for the driver's air bag, or the instrument panel for the right front passenger's bag, will be hot for a short time. The parts of the bag that come into contact with you may be warm, but not too hot to touch. There will be some smoke and dust coming from vents in the deflated air bags. Air bag inflation doesn't prevent the driver from seeing or from being able to steer the vehicle, nor does it stop people from leaving the vehicle.

CAUTION:

When an air bag inflates, there is dust in the air. This dust could cause breathing problems for people with a history of asthma or other breathing trouble. To avoid this, everyone in the vehicle should get out as soon as it is safe to do so. If you have breathing problems but can't get out of the vehicle after an air bag inflates, then get fresh air by opening a window or door.

In many crashes severe enough to inflate an air bag, windshields are broken by vehicle deformation. Additional windshield breakage may also occur from the right front passenger air bag.

- Air bags are designed to inflate only once. After they inflate, you'll need some new parts for your air bag system. If you don't get them, the air bag system won't be there to help protect you in another crash. A new system will include air bag modules and possibly other parts. The service manual for your vehicle covers the need to replace other parts.

1-26

- Your vehicle is equipped with a crash sensing and diagnostic module, which records information about the air bag system. The module records information about the readiness of the system, when the sensors are activated and driver's safety belt usage at deployment.
- Let only qualified technicians work on your air bag system. Improper service can mean that your air bag system won't work properly. See your dealer for service.

NOTICE:

If you damage the covering for the driver's or the right front passenger's air bag, the bag may not work properly. You may have to replace the air bag module in the steering wheel or both the air bag module and the instrument panel for the right front passenger's air bag. Do not open or break the air bag coverings.

Servicing Your Air Bag-Equipped Chevrolet

Air bags affect how your Chevrolet should be serviced. There are parts of the air bag system in several places around your vehicle. You don't want the system to inflate while someone is working on your vehicle. Your Chevrolet dealer and the Cavalier Service Manual have information about servicing your vehicle and the air bag system. To purchase a service manual, see "Service and Owner Publications" in the Index.

CAUTION:

For up to 10 minutes after the ignition key is turned off and the battery is disconnected, an air bag can still inflate during improper service. You can be injured if you are close to an air bag when it inflates. Avoid wires wrapped with yellow tape or yellow connectors. They are probably part of the air bag system. Be sure to follow proper service procedures, and make sure the person performing work for you is qualified to do so.

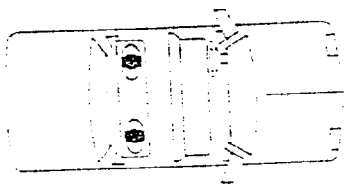
The air bag system does not need regular maintenance.

Rear Seat Passengers

It's very important for rear seat passengers to buckle up! Accident statistics show that unbelted people in the rear seat are hurt more often in crashes than those who are wearing safety belts.

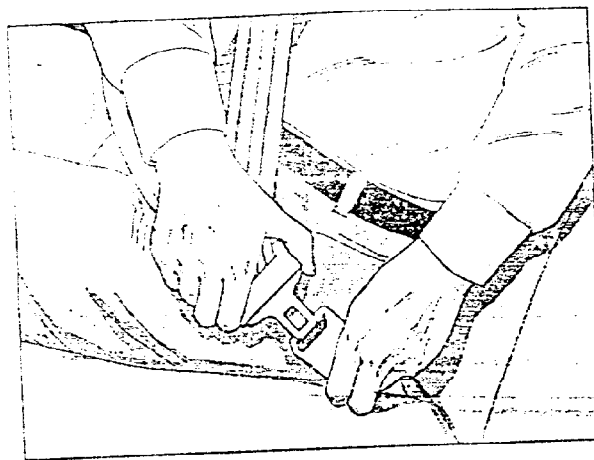
Rear passengers who aren't safety belted can be thrown out of the vehicle in a crash. And they can strike others in the vehicle who are wearing safety belts.

Rear Seat Outside Passenger Positions



Lap-Shoulder Belt

The positions next to the windows have lap-shoulder belts. Here's how to wear one properly.

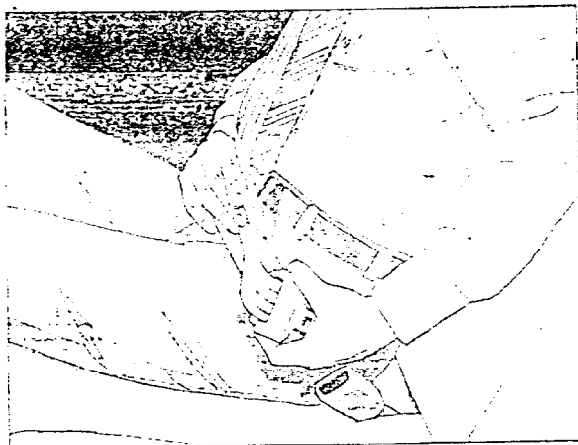


1. Pick up the latch plate and pull the belt across you. Don't let it get twisted.

The shoulder belt may lock if you pull the belt across you very quickly. If this happens, let the belt go back slightly to unlock it. Then pull the belt across you more slowly.

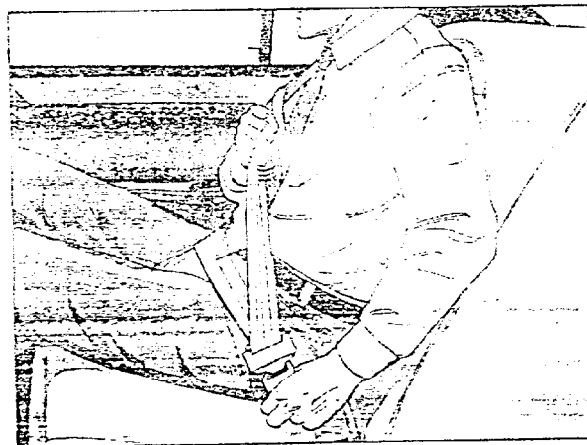
2. Push the latch plate into the buckle until it clicks.

1-28



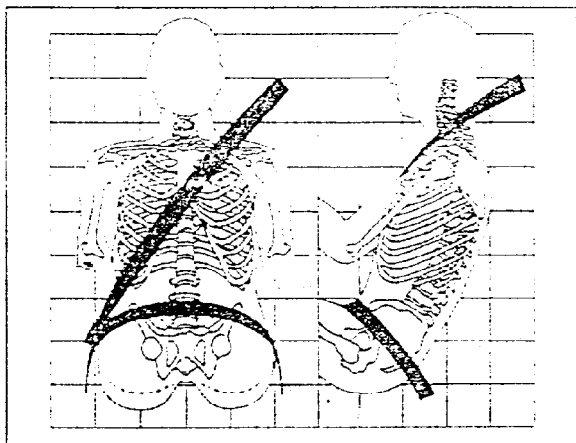
If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle it. Pull up on the latch plate to make sure it is secure.

If the belt is not long enough, see "Safety Belt Extender" at the end of this section. Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.



3. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder part.

1-29



The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies

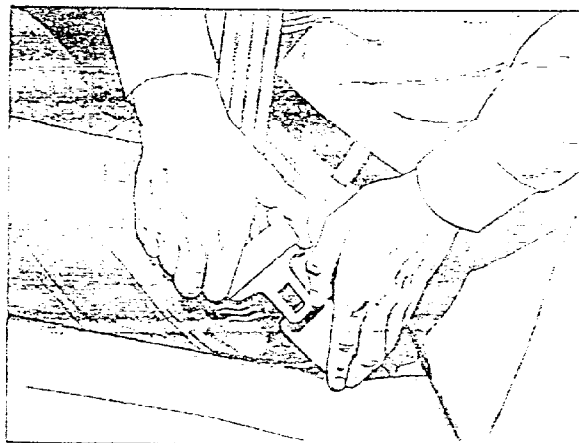
force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

The safety belt locks if there's a sudden stop or a crash, or if you pull the belt very quickly out of the retractor.

⚠ CAUTION:

You can be seriously hurt if your shoulder belt is too loose. In a crash, you would move forward too much, which could increase injury. The shoulder belt should fit against your body.

1-30

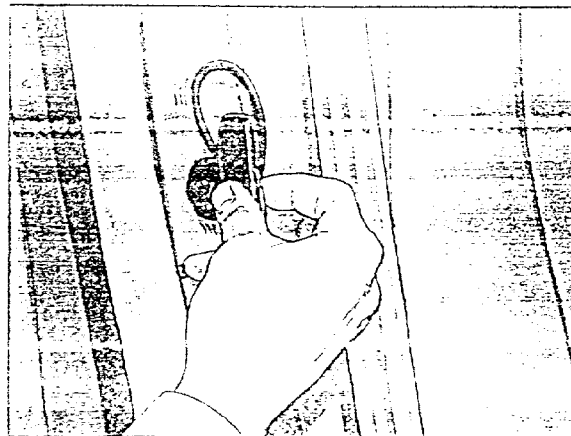


To unlatch the belt, just push the button on the buckle.

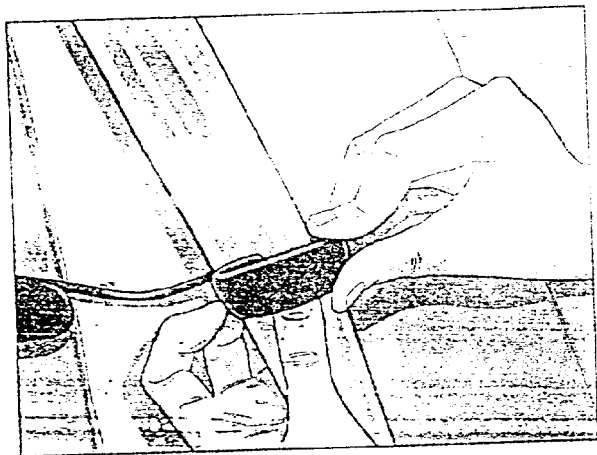
Rear Safety Belt Comfort Guides for Children and Small Adults

Rear shoulder belt comfort guides will provide added safety belt comfort for children who have outgrown child restraints and for small adults. When installed on a shoulder belt, the comfort guide pulls the belt away from the neck and head.

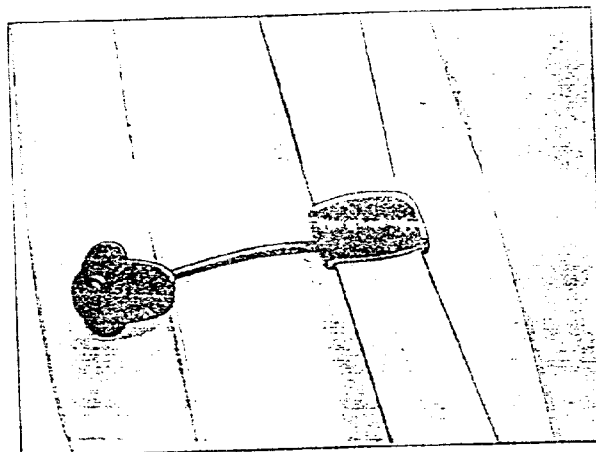
There is one guide for each outside passenger position in the rear seat. To provide added safety belt comfort for children who have outgrown child restraints and for smaller adults, the comfort guides may be installed on the shoulder belts. Here's how to install a comfort guide and use the safety belt:



1. Pull the elastic cord out from between the edge of the seatback and the interior body to remove the guide from its storage clip.

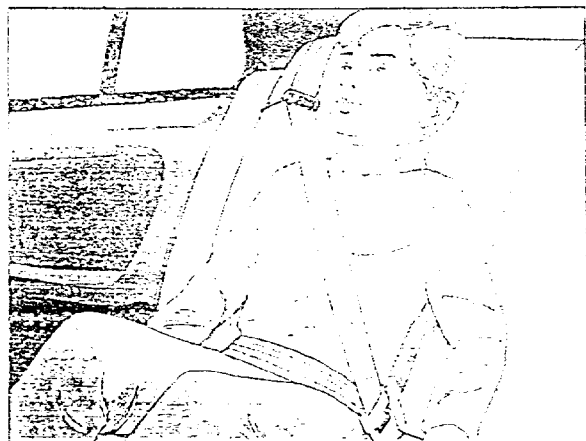


2. Slide the guide under and past the belt. The elastic cord must be under the belt. Then, place the guide over the belt, and insert the two edges of the belt into the slots of the guide.



3. Be sure that the belt is not twisted and it lies flat. The elastic cord must be under the belt and the guide on top.

1-32



4. Buckle, position and release the safety belt as described in "Rear Seat Outside Passenger Positions" earlier in this section. Make sure that the shoulder belt crosses the shoulder.

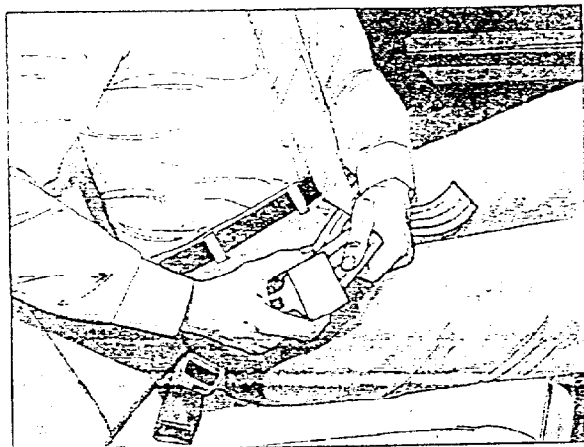
To remove and store the comfort guides, squeeze the belt edges together so that you can take them out from the guides. Pull the guide upward to expose its storage clip, and then slide the guide onto the clip. Rotate the guide and clip inward and in between the seatback and its interior clip, leaving only the loop of elastic cord exposed.

Center Passenger Position

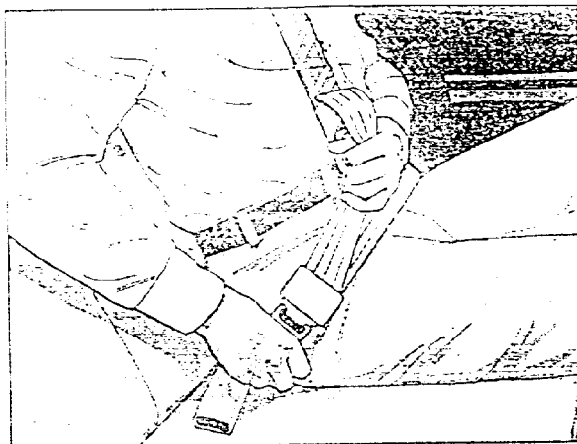


1-33

Lap Belt



When you sit in the center seating position, you have a lap safety belt, which has no retractor. To make the belt longer, tilt the latch plate and pull it along the belt.



To make the belt shorter, pull its free end as shown until the belt is snug.

Buckle, position and release it the same way as the lap part of a lap-shoulder belt. If the belt isn't long enough, see "Safety Belt Extension" at the end of this section.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

I-34

Children

Everyone in a vehicle needs protection! That includes infants and all children smaller than adult size. In fact, the law in every state in the United States, and in every Canadian province says children up to some age must be restrained while in a vehicle.

Smaller Children and Babies

CAUTION:

Smaller children and babies should always be restrained in a child or infant restraint. The instructions for the restraint will say whether it is the right type and size for your child.

CAUTION: (Continued)

CAUTION: (Continued)

A very young child's hip bones are so small that a regular belt might not stay low on the hips, as it should. Instead, the belt will likely be over the child's abdomen. In a crash, the belt would apply force right on the child's abdomen, which could cause serious or fatal injuries. So, be sure that any child small enough for one is always properly restrained in a child or infant restraint.



⚠ CAUTION:

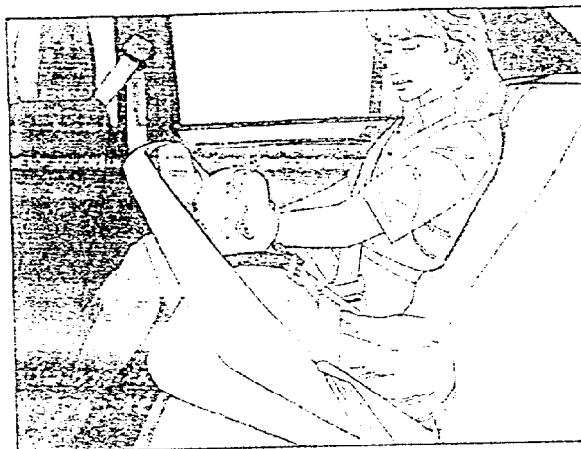
Never hold a baby in your arms while riding in a vehicle. A baby doesn't weigh much -- until a crash. During a crash a baby will become so

CAUTION: Continued

CAUTION: (Continued)

heavy you can't hold it. For example, in a crash at only 25 mph (40 km/h), a 12-lb. (5.5 kg) baby will suddenly become a 240-lb. (110 kg) force on your arms. The baby would be almost impossible to hold.

Secure the baby in an infant restraint.



1-36

Child Restraints

Be sure the child restraint is designed to be used in a vehicle. If it is, it will have a label saying that it meets Federal Motor Vehicle Safety Standards.

Then follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both. These restraints use the belt system in your vehicle, but the child also has to be secured within the restraint to help reduce the chance of personal injury. The instructions that come with the infant or child restraint will show you how to do that.

Where to Put the Restraint

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. We at General Motors therefore recommend that you put your child restraint in the rear seat. Never put a rear-facing child restraint in the front passenger seat. Here's why:

⚠ CAUTION:

A child in a rear-facing child restraint can be seriously injured if the right front passenger's air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in the rear seat.

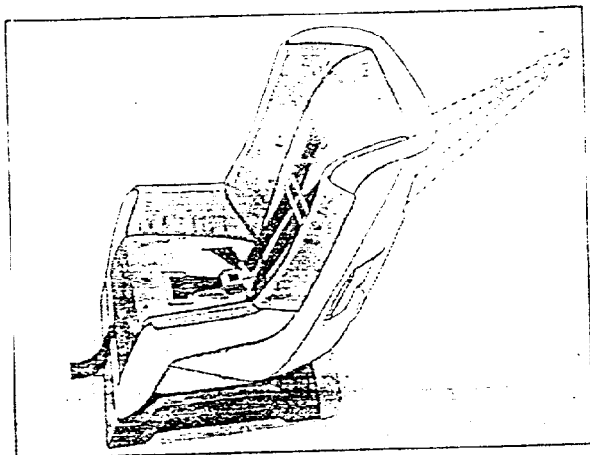
You may, however, secure a forward-facing child restraint in the right front seat. Before you secure a forward-facing child restraint, always move the front passenger seat as far back as it will go. Or, secure the child restraint in the rear seat.

Wherever you install it, be sure to secure the child restraint properly.

Keep in mind that an unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle. Be sure to properly secure any child restraint in your vehicle -- even when no child is in it.

1-37

Top Strap



If your child restraint has a top strap, it should be anchored. If you have a convertible, don't use a restraint

like that in your vehicle because the top strap anchor cannot be installed properly. You shouldn't use this type of restraint without anchoring the top strap.

If your vehicle is not a convertible and you need to have an anchor installed, you can ask your Chevrolet dealer to put one in for you. If you want to install an anchor yourself, your dealer can tell you how to do it.

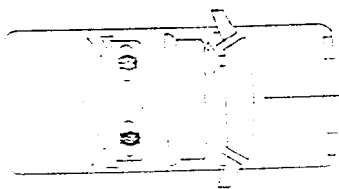
For cars first sold in Canada, child restraints with a top strap must be anchored according to Canadian law.

Your dealer can obtain the hardware kit and install it for you, or you may install it yourself using the instructions provided in the kit.

Use the tether hardware kit available from the dealer. The hardware and installation instructions were specifically designed for this vehicle.

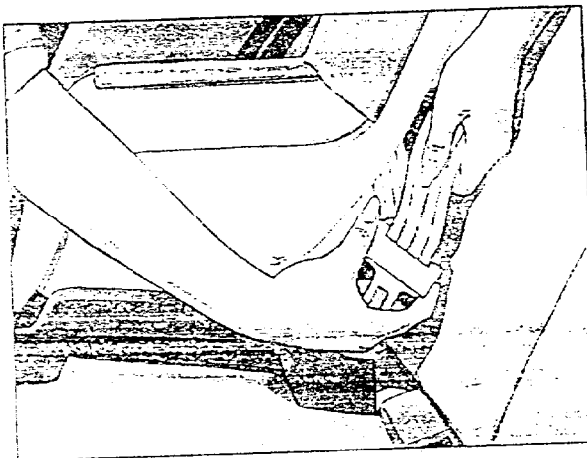
1-38

Securing a Child Restraint in a Rear Outside Seat Position



You'll be using the lap-shoulder belt. See the earlier part about the top strap if the child restraint has one.

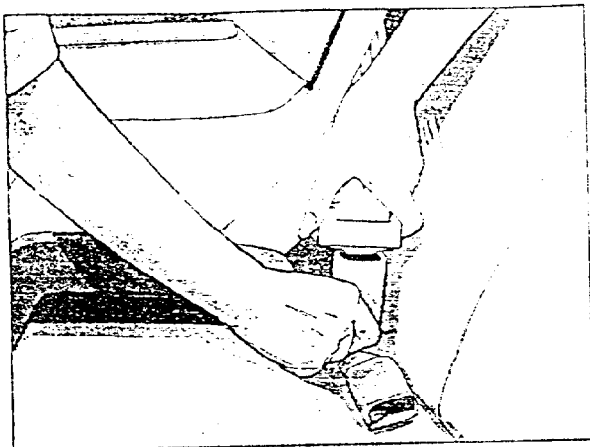
1. Put the restraint on the seat. Follow the instructions for the child restraint.
2. Secure the child in the child restraint as the instructions say.
3. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.



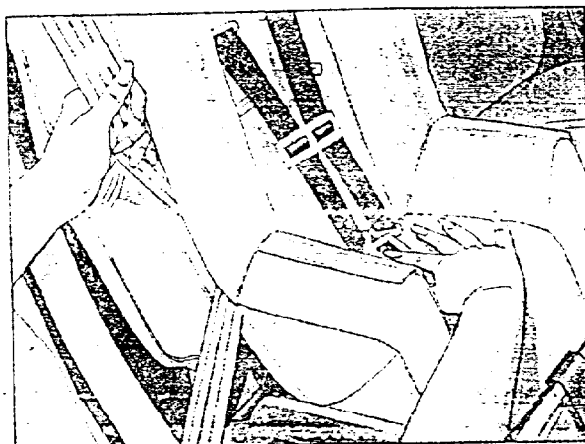
Tilt the latch plate to adjust the belt if needed.

If the shoulder belt goes in front of the child's face or neck, put it behind the child restraint.

1-39



4. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

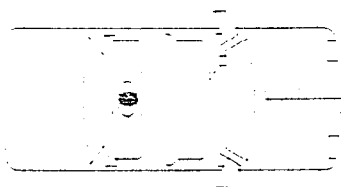


5. To tighten the belt, pull up on the shoulder belt while you push down on the child restraint.
6. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

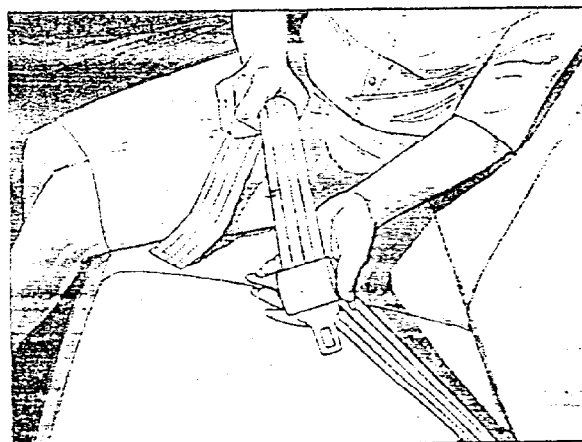
1-40

Securing a Child Restraint in the Center Rear Seat Position



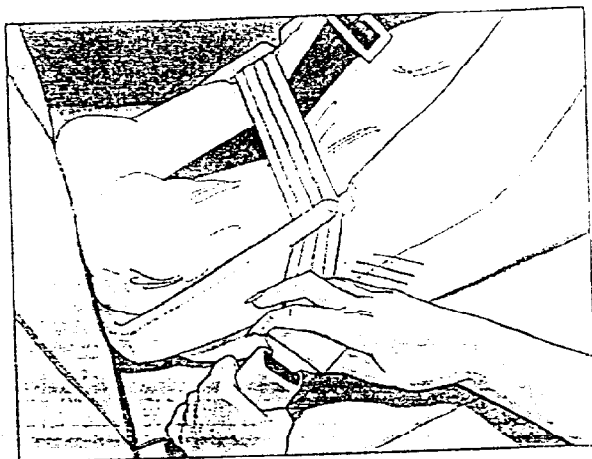
You'll be using the lap belt.

See the earlier part about the top strap if the child restraint has one.



1. Make the belt as long as possible by tilting the latch plate and pulling it along the belt.
2. Put the restraint on the seat. Follow the instructions for the child restraint.
3. Secure the child in the child restraint as the instructions say.
4. Run the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.

1-41

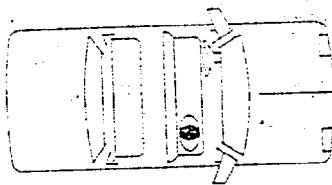


5. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.
6. To tighten the belt, pull its free end while you push down on the child restraint.

7. Push and pull the child restraint in different directions to be sure it is secure. If it isn't, secure the restraint in a different place in the vehicle and contact the child restraint maker for their advice about how to attach the child restraint properly.

To remove the child restraint, just unbuckle the vehicle's safety belt. It will be ready to work for an adult or larger child passenger.

Securing a Child Restraint in the Right Front Seat Position



Your vehicle has a right front passenger air bag. Never put a rear-facing child restraint in this seat. Here's why:

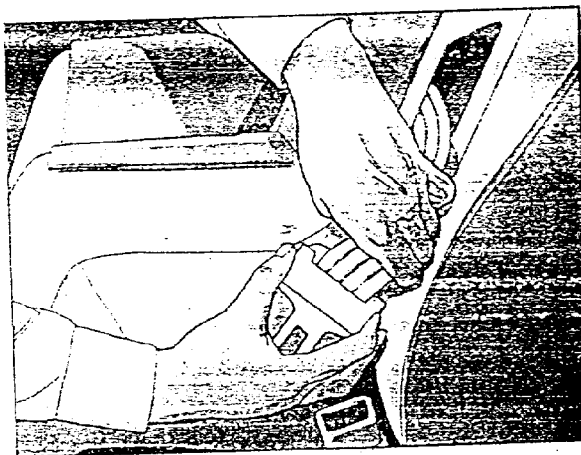
1-42

CAUTION:

A child in a rear-facing child restraint can be seriously injured if the right front passenger's air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in the rear seat.

You'll be using the lap-shoulder belt. See the earlier part about the top strap if the child restraint has one.

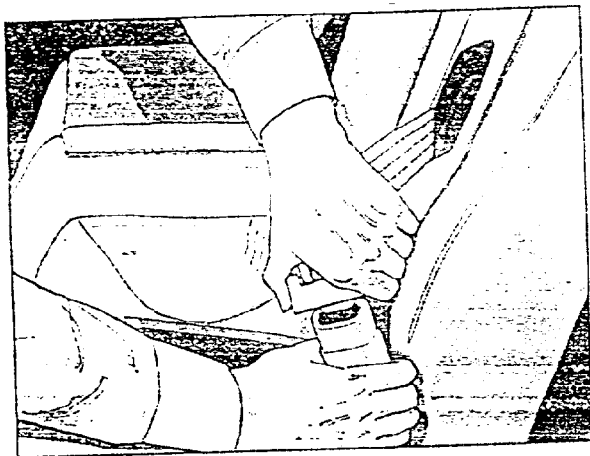
1. Because your vehicle has a right front passenger air bag, always move the seat as far back as it will go before securing a forward-facing child restraint. (See "Seats" in the Index.)
2. Put the restraint on the seat. Follow the instructions for the child restraint.
3. Secure the child in the child restraint as the instructions say.
4. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.



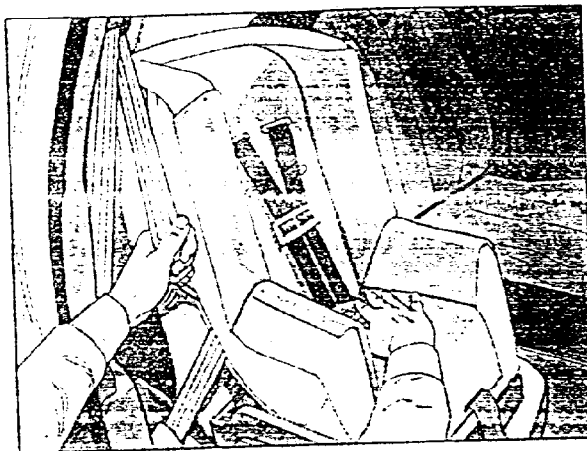
Tilt the latch plate to adjust the belt if needed.

If the shoulder belt goes in front of the child's face or neck, put it behind the child restraint.

1-43



5. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

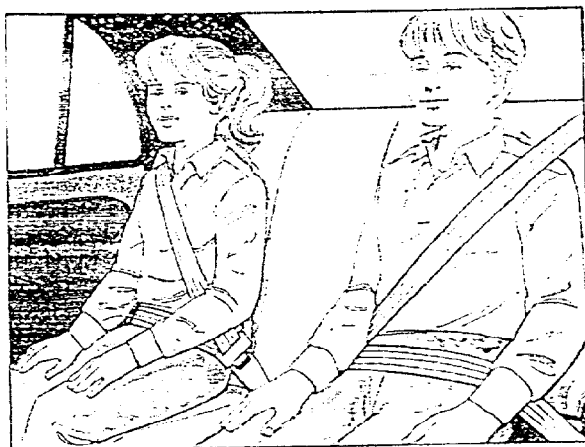


6. To tighten the belt, pull up on the shoulder belt while you push down on the child restraint.
7. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

1-44

Larger Children

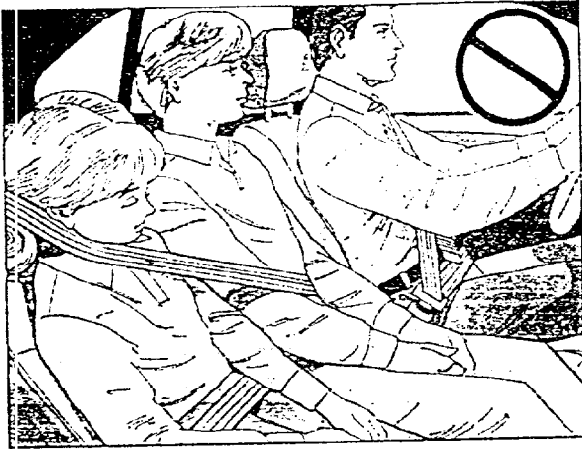


Children who have outgrown child restraints should wear the vehicle's safety belts.

If you have the choice, a child should sit next to a window so the child can wear a lap-shoulder belt and get the additional restraint a shoulder belt can provide.

Accident statistics show that children are safer if they are restrained in the rear seat. But they need to use the safety belts properly.

- Children who aren't buckled up can be thrown out in a crash.
- Children who aren't buckled up can strike other people who are.



⚠ CAUTION:

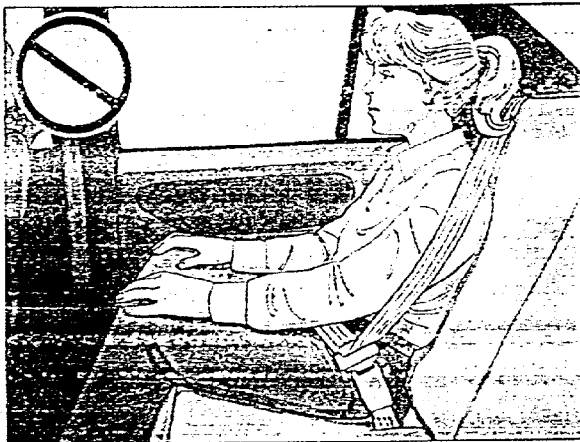
Never do this.

Here two children are wearing the same belt. The belt can't properly spread the impact forces. In a crash, the two children can be crushed together and seriously injured. A belt must be used by only one person at a time.

Q: What if a child is wearing a lap-shoulder belt, but the child is so small that the shoulder belt is very close to the child's face or neck?

A: Move the child toward the center of the vehicle, but be sure that the shoulder belt still is on the child's shoulder, so that in a crash the child's upper body would have the restraint that belts provide. If the child is sitting in a rear seat outside position, see "Rear Safety Belt Comfort Guides" in the Index. If the child is so small that the shoulder belt is still very close to the child's face or neck, you might want to place the child in the center seat position, the one that has only a lap belt.

1-46



⚠ CAUTION:

Never do this.

Here a child is sitting in a seat that has a lap-shoulder belt, but the shoulder part is behind the child. If the child wears the belt in this way, in a crash the child might slide under the belt. The belt's force would then be applied right on the child's abdomen. That could cause serious or fatal injuries.

Wherever the child sits, the lap portion of the belt should be worn low and snug on the hips, just touching the child's thighs. This applies belt force to the child's pelvic bones in a crash.

1-47

Safety Belt Extender

If the vehicle's safety belt will fasten around you, you should use it.

But if a safety belt isn't long enough to fasten, your dealer will order you an extender. It's free. When you go in to order it, take the heaviest coat you will wear, so the extender will be long enough for you. The extender will be just for you, and just for the seat in your vehicle that you choose. Don't let someone else use it, and use it only for the seat it is made to fit. To wear it, just attach it to the regular safety belt.

Checking Your Restraint Systems

Now and then, make sure the safety belt reminder light and all your belts, buckles, latch plates, retractors and anchorages are working properly. Look for any other loose or damaged safety belt system parts. If you see anything that might keep a safety belt system from doing its job, have it repaired.

Torn or frayed safety belts may not protect you in a crash. They can rip apart under impact forces. If a belt is torn or frayed, get a new one right away.

Also look for any opened or broken air bag covers, and have them repaired or replaced. (The air bag system does not need regular maintenance.)

Replacing Restraint System Parts After a Crash

If you've had a crash, do you need new belts?

After a very minor collision, nothing may be necessary. But if the belts were stretched, as they would be if worn during a more severe crash, then you need new belts.

If belts are cut or damaged, replace them. Collision damage also may mean you will need to have safety belt or seat parts repaired or replaced. New parts and repairs may be necessary even if the belt wasn't being used at the time of the collision.

If an air bag inflates, you'll need to replace air bag system parts. See the part on the air bag system earlier in this section.



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