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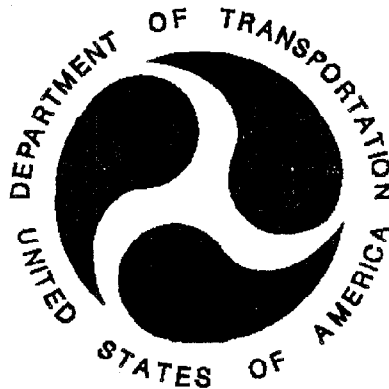
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2003

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

GENERAL MOTORS OF CANADA LIMITED
1998 CHEVROLET CAMARO 2-DOOR COUPE
NHTSA NO. MW0119

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



FEBRUARY 9, 1998
FINAL REPORT

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Date of Acceptance

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16. <i>Abstract</i> A 35 mph (56.3 km/h) frontal barrier impact test was conducted on a 1998 CHEVROLET CAMARO 2-DOOR COUPE at KARCO Engineering on January 23, 1998. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301 and footwell intrusion performance. The impact velocity was 56.78 km/h. The ambient temperature at the barrier face at the time of impact was 16.7°C. The vehicle's maximum post-test static crush was 544 mm, located at the centerline of the vehicle. The test vehicle was equipped with a 3-point continuous belt system and second generation supplemental airbags at both frontal outboard-seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" the occupant injury response data summary is as follows: <table border="1"> <thead> <tr> <th><u>Injury Criteria</u></th> <th><u>Threshold Value</u></th> <th><u>Driver Dummy</u></th> <th><u>Passenger Dummy</u></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>1000</td> <td>468.8</td> <td>328.0</td> </tr> <tr> <td>Chest Resultant Peak 3 msec clip</td> <td>60 G's</td> <td>44.6</td> <td>38.1</td> </tr> <tr> <td>Left Femur Force</td> <td>10009 N</td> <td>-2795.7</td> <td>-2842.1</td> </tr> <tr> <td>Right Femur Force</td> <td>10009 N</td> <td>-2831.8</td> <td>-2602.2</td> </tr> </tbody> </table>						<u>Injury Criteria</u>	<u>Threshold Value</u>	<u>Driver Dummy</u>	<u>Passenger Dummy</u>	Head Injury Criteria (HIC)	1000	468.8	328.0	Chest Resultant Peak 3 msec clip	60 G's	44.6	38.1	Left Femur Force	10009 N	-2795.7	-2842.1	Right Femur Force	10009 N	-2831.8	-2602.2
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SECTION 1

PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MW0119

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the FY' 98 New Car Assessment Program (NCAP) frontal barrier crash worthiness evaluation program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract Number DTNH22-97-D-02007. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for frontal barrier impacts at a speed in excess of the current 30 mph (48 km/h) FMVSS 208/212/219/301 requirements.

1.2 TEST PROCEDURE

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

The test was conducted at KARCO Engineering on January 23, 1998, at a speed of 56.78 km/h. The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap and shoulder belt tension. The specified impact velocity range was 55.5 to 57.1 km/h. The frontal barrier impact event was documented by one (1) real-time panning motion picture camera and seventeen (17) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

The Driver ATD (serial No. 34) and the right-front passenger ATD (serial No. 35) were re-instrumented and calibrated for this test. Injury criteria were not exceeded by either ATD during this NCAP frontal impact test.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

An immovable barrier was impacted by a 1998 Chevrolet Camaro 2-Door Coupe at a velocity of 56.78 km/h. The test weight, with two (2) 50th percentile male ATDs, was 1703 kg.

The driver's Head Injury Criteria (HIC) was 468.8, the maximum chest deceleration over three (3) milliseconds was 44.6 g and the left and right femur loads were -2795.7 and -2831.8 Newtons, respectively. Chest deflection for the driver ATD was -32.0 mm. The driver ATD head contacted the airbag and headrest, its chest and abdomen contacted the airbag, and both knees contacted the lower dash knee bolster, with the right knee contacting the steering column.

The right front passenger's HIC was 328.0, maximum chest deceleration over three (3) milliseconds was 38.1 g and the left and right femur loads were -2842.1 and -2602.2 Newtons respectively. Chest deflection for the passenger ATD was -23.1 mm. The passenger ATD head contacted the airbag and headrest, the chest and abdomen contacted the airbag and both knees contacted the knee bolster.

Seat belt spoolout, measured by on-board pullout potentiometers was 91.0 mm for the driver ATD and 86.0 mm for the passenger ATD. Shoulder belt stretch was 0.70 mm/cm for the driver ATD and 0.81 mm/cm for the passenger ATD.

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

The test vehicle sustained a maximum static crush of 544 mm at the vehicle centerline. All doors on both the driver side and the passenger side opened without the aid of tools.

1.4 GENERAL COMMENTS

The 1998 Chevrolet Camaro 2-Door Coupe 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. Appendix B contains the dummy, vehicle and response data traces. Appendix C contains Load Cell Barrier information, which is not applicable to this test. Appendix D contains the instrumentation data channel assignments. Appendix E contains the dummy calibration data and Appendix F contains the owner's manual instructions for the occupant restraint systems.

SECTION 2.

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

TEST MODE: 56.3 km/h New Car Assessment Program (NCAP) Frontal Barrier Impact

CONVERSION FACTORS USED IN THIS REPORT:

2.2 pounds (lb.)	=	1 kilogram (kg)
1 mile (mi.)	=	1.609 kilometer (km)
1 gallon (gal.)	=	3.785 liters (L)
1 pound/square inch (psi)	=	7000 Pascal (7 kPa)

DATA SHEET NO. 1**CRASH TEST SUMMARY**TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPENHTSA NO. MW0119TEST MODE: 56.3 km/h NCAP Frontal Barrier ImpactTEST DATE: January 23, 1998TIME: 1:15 PMTEMPERATURE: 16.7° CTEST WEIGHT: 1703 kgIMPACT VELOCITY: 56.78 km/h**VEHICLE REBOUND AT CENTER OF EACH WHEEL; REBOUND ANGLE = 0°**

Measurements in mm	Left Side	Centerline	Right Side
Vehicle Rebound	774	530	810

VEHICLE STATIC CRUSH

Measurements in mm	Left	Center	Right
Pre-test Measurements	4534	4714	4479
Post-test Measurements	4154	4170	4082
Static Crush	-380	-544	-397

DOOR OPENING AND SEAT TRACK INFORMATION

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

DUMMY INFORMATION

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

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

TEST VEHICLE INFORMATION			
Manufacturer	GENERAL MOTORS OF CANADA LIMITED	VIN	2G1FP22K8W2105904
Manufacturing Date	8/97	Delivery Date	1/19/98
Dealer	CREST CHEVROLET/GEO	NHTSA NO.	MW0119
Odometer Reading	000411 MI.	Fuel Type	UNLEADED
Engine Displacement	3.8 Liter	Cylinders	6
Transmission	5-Speed Manual	Final Drive	FRONT
Engine Placement	Longitudinal	Color	RED
Tire Press./Max. Cap. Front	210 kPa	Cold Tire Press. Front	210 kPa
Tire Press./Max. Cap. Rear	210 kPa	Cold Tire Press. Rear	210 kPa
Recommend Tire Size	P235/55R16	Type of Spare	TEMPORARY T135/60R16
Tire Size on Vehicle	P235/55R16	Manufacturer	GOODYEAR
GVWR	1845kg	Cargo Capacity	46kg
GAWR Front	924kg	GAWR Rear	921kg
Air Conditioning	YES	Power Steering	YES
Power Brakes	YES	AM/FM/Cassette	YES
Disc Brakes (Front)	YES	Disc Brakes (Rear)	YES
Power Windows	YES	Tilt Steering	YES
Anti-lock Brakes (ABS)	YES	Power Seats	NO
Driver Airbag	YES	Passenger Airbag	YES

VEHICLE CAPACITY DATA:

TYPE OF FRONT SEATS Bucket Seats

TOTAL NUMBER OF OCCUPANTS 4 OCCUPANTS x 68 kg. 272 kg

WEIGHT OF VEHICLE AS RECEIVED AT KARCO (with maximum fluids): 1513 kg

Data Sheet No. 2... (Continued)

VEHICLE CAPACITY WEIGHT (kg):

Vehicle Capacity Weight 318 kg
 Occupant Weight 272 kg
 Rated Cargo/Luggage Weight (RCLW) 46 kg

	FRONT	REAR	TOTAL
Right	427	334	761
Left	422	330	752
Total	849	664	1513
Percent of Total	56.1	43.9	100%

**CALCULATION OF TEST
 TARGET WEIGHT (kg):**

Total Delivered Weight 1513 kg
 RCLW 46 kg
 Weight of 2 P572 ATDs 152 kg
TARGET TEST WEIGHT 1711 kg

TEST WEIGHT OF VEHICLE WITH 2 ATDs AND BALLAST

	FRONT	REAR	TOTAL
Right	449	405	854
Left	457	392	849
Total	906	797	1703
Percent of Total	53.2	46.8	100%

Weight of Ballast secured in cargo area: 0 kg

Includes cameras, instrumentation, brake abort and bags containing lead shot secured in the right and left rear fender wells.

Vehicle Components Removed For Weight Reduction:

Side mirrors, jack, tools, rear seat assembly, spare tire and paneling.

TEST VEHICLE ATTITUDE (mm)

ATTITUDE	LF	RF	LR	RR
As Delivered	695	687	725	715
As Tested	673	675	680	680

Vehicle Wheelbase: 2560 mm

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 58.7 liters

Usable Capacity Figure Furnished by COTR = 53.9 liters

Test Volume Range (92 to 94% of Usable Capacity) = 49.6 to 50.7 liters

ACTUAL TEST VOLUME = 50.6 liters (With entire fuel system filled)

Test Fluid Type = Stoddard Solvent

Specific Gravity = 0.764

Kinematic Viscosity = as per ASTM Standard D484-71

Color = Red

Type of Fuel Pump = Electric X Mechanical

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

DETAILS OF FUEL SYSTEM: With ignition on and adequate oil pressure.

DATA SHEET NO. 3

POST IMPACT DATA

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

TEST MODE: 56.3 km/h New Car Assessment Program (NCAP) Frontal Barrier Impact

TEST DATE: January 23, 1998

TIME: 1:15 PM

TEMPERATURE: 16.7 ° C

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

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

Trap No. 1 = 56.77 km/h Trap No. 2 = 56.78 km/h

Distance from vehicle to barrier - -

A. entering trap = 1524 mm

B. leaving trap = 305 mm

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

Vehicle Length	Left	Center	Right
Pre-test Measurements (mm)	4534	4714	4479
Post-test Measurements (mm)	4154	4170	4082
Static Crush (mm)	-380	-544	-397
Average	-440		

VEHICLE REBOUND: (from rigid barrier with rotational movement)

VEHICLE REBOUND AT CENTER OF EACH WHEEL: REBOUND ANGLE = 0°

Measurements in mm	Left Side	Centerline	Right Side
Vehicle Rebound	774	530	810

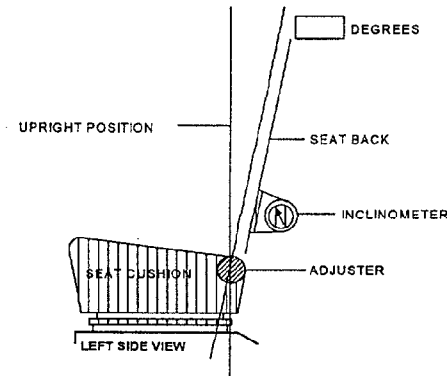
DATA SHEET NO. 4

TEST VEHICLE INFORMATION

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

1. NOMINAL DESIGN RIDING POSITION -



FRONT SEAT ASSEMBLY

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 13 inches above the pivot point of the seat back. The inclinometer was placed against the flat surface of the tool and the seat back angle was measured directly from the dial face. For reference purposes the first detent from the front of the seat was identified as number "1".

Seat back angle for driver's seat = 25°

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

Seat back angle for passenger's seat = 25°

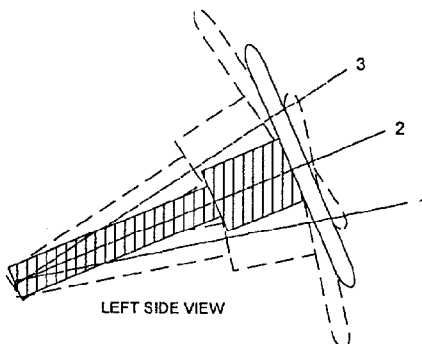
2. SEAT FORE & AFT POSITIONS -

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: 21 seating positions, set to 11th position, per manufacturers specifications.

Positioning of the passenger's seat (if applicable): 8 seating positions, set to the 5th position, per manufacturers specifications.

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 9°

Position No. 2 is at 19°

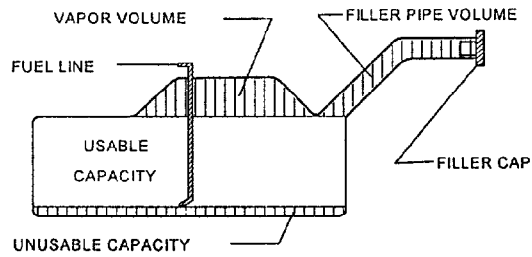
Position No. 3 is at 29°

4. SEAT BELT UPPER ANCHORAGE:

Set to mid-position

DATA SHEET NO. 4 (continued)

5. FUEL TANK CAPACITY DATA



- 5.1 A. "Usable Capacity" of standard equipment fuel tank = 54.9 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 = 54.04 to 55.20 liters.

VEHICLE FUEL TANK ASSEMBLY

Operational Instructions:

5.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 54.9 liters

5.3 Is vehicle equipped with electric fuel pump?

Yes X No

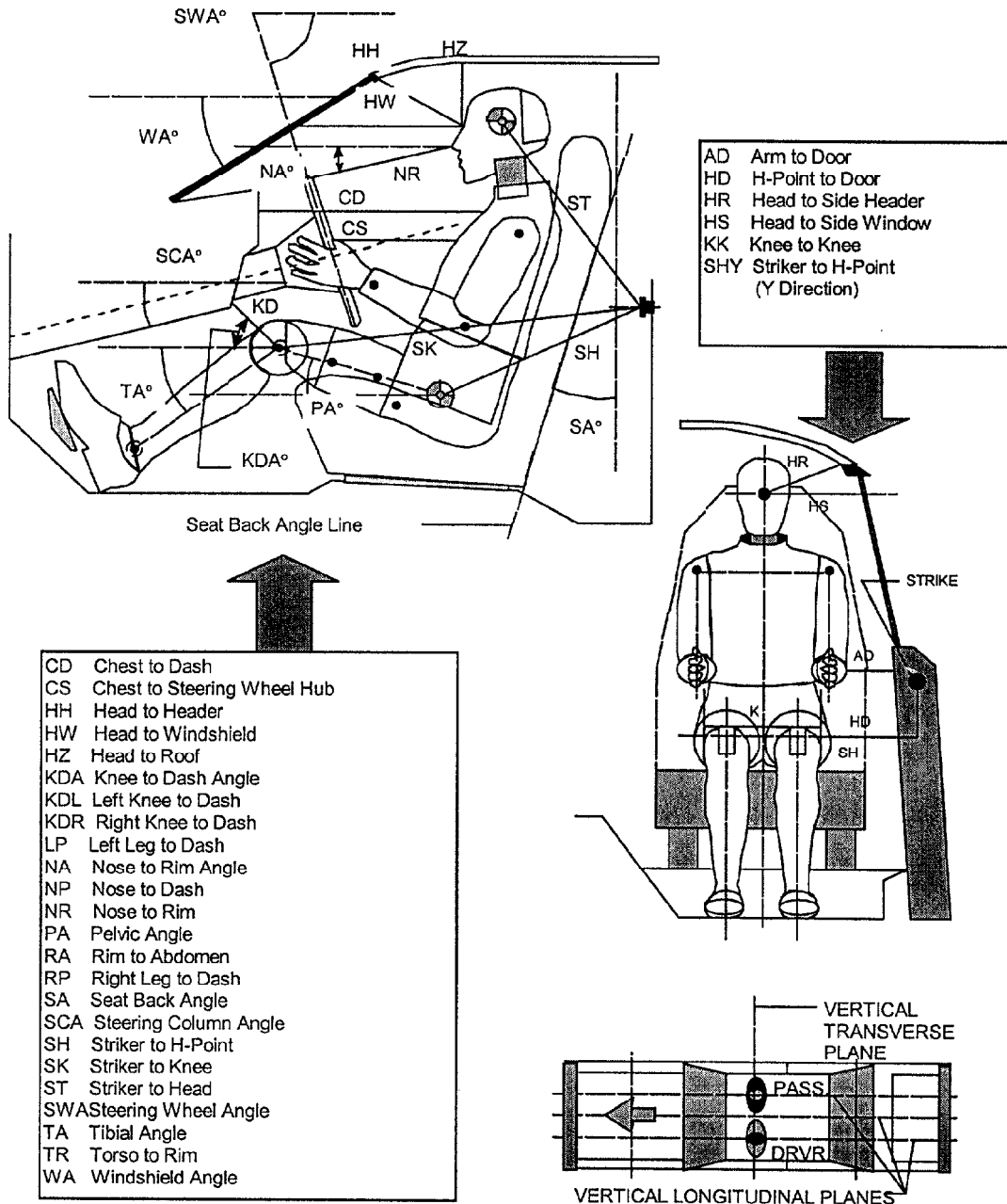
If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

With ignition on and adequate oil pressure.

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



DATA SHEET NO. 5...(continued)

DUMMY POSITIONING IN VEHICLE

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

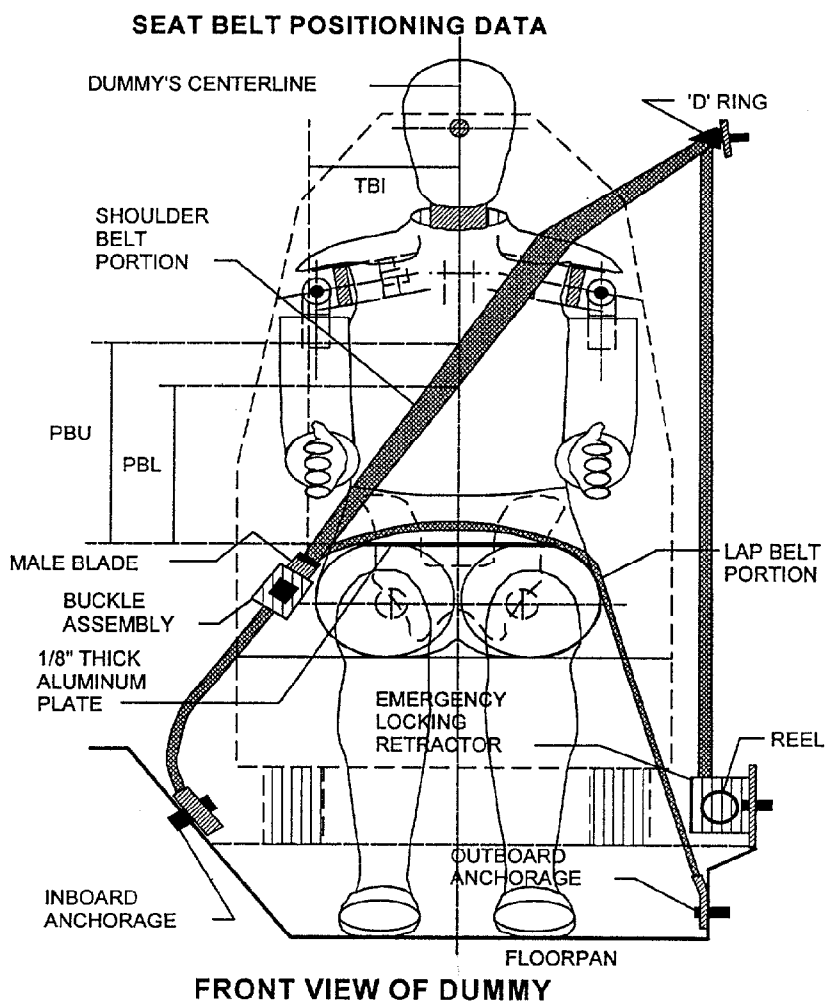
FRONT SEAT MEASUREMENT TABLE

	DRIVER (Serial No. <u>34</u>)		PASS. (Serial No. <u>35</u>)	
	DISTANCE (mm)	ANGLE (°)	DISTANCE (mm)	ANGLE (°)
WA°		20		
SWA°		71		
SCA°		15		
SA°		25		25
HZ	160	90	170	90
HH	310	0	320	0
HW	620	0	570	0
HR	150		140	
NR	350	12		
CD	484		480	
CS	240	0		
RA	150	0		
KDL	145	45	200	
KDR	120		205	90
PA°		25		25
TA°		28		34
KK	280		190	
ST	590	45	610	45
SH	540	25	520	22
SHY	260		240	
HS	290		300	
HD	190		190	
AD	95		10	

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

SEATING POSITION	DRIVER	PASSENGER
TCI -- Dummy centerline to shoulder bolt	200	200
PBU--Top surface of aluminum plate to belt upper edge	310	320
PBL--Top surface of aluminum plate to belt lower edge	240	260
Lap Belt tension	10 Newtons	10 Newtons
Shoulder Belt tension	Retractor	Retractor



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

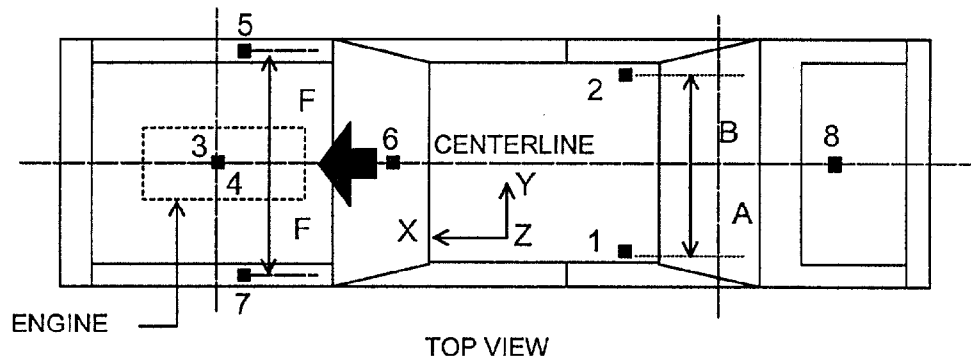
TEST VEHICLE: 1998 CHEVROLET CAMARO 2 DOOR COUPE NHTSA No.: MW0119
 TEST PROGRAM: 1998 NHTSA 35 MPH NCAP TEST DATE: 1/23/98

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

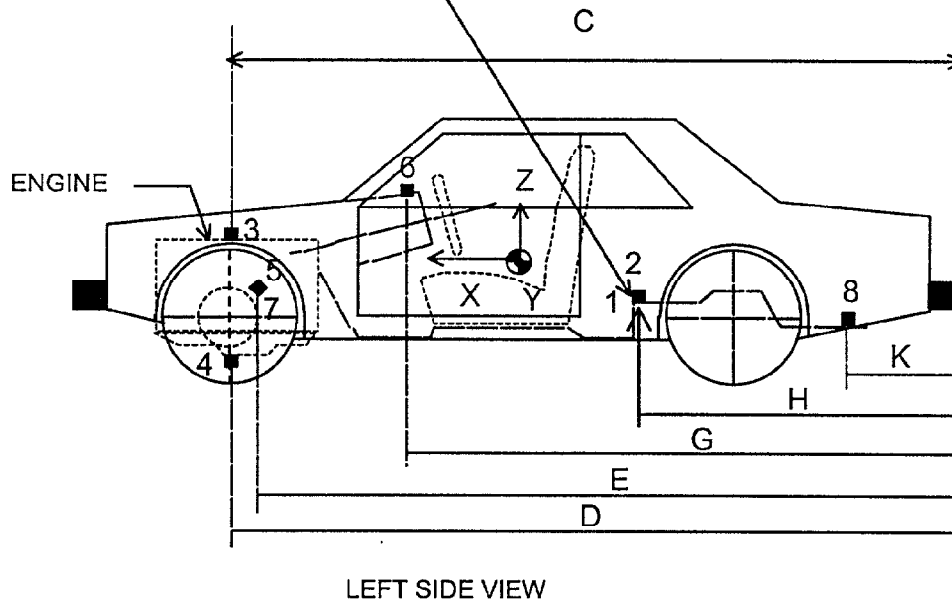
No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member (Pri.)	1882	-532	310	G's	1.4	156.6	-36.1	68.6
2	Right Rear X-Member (Pri.)	1882	532	310	G's	1.5	171.4	-37.2	66.3
3	Engine Top	3759	-182	715	G's	14.2	85.6	-65.6	53.5
4	Engine Bottom	3689	0	137	G's	0.0	0.0	0.0	0.0
5	Left Brake Caliper	3789	-699	223	G's	0.0	0.0	0.0	0.0
6	Right Brake Caliper	3789	699	223	G's	0.0	0.0	0.0	0.0
7	Instrument Panel	2856	0	900	G's	0.0	0.0	0.0	0.0
8	Left Rear X-Member (Rednt.)	1770	-541	310	G's	1.1	156.1	-34.0	66.5

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

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



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

TEST VEHICLE: 1998 CHEVROLET CAMARO 2 DOOR COUPE

NHTSA No.: MW0119

TEST PROGRAM: 1998 NHTSA 35 MPH NCAP

TEST DATE: 1/23/98

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	28.9	188.6	-52.0	85.7	13.5	251.4	-32.1	89.7
Head CG	Y	G's	4.4	71.7	-8.8	107.0	6.4	96.1	-4.7	37.8
Head CG	Z	G's	15.5	85.8	-11.9	127.7	38.2	73.1	-11.8	117.7
Head CG Resultant	N/A	G's	54.3	85.7			46.5	73.3		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	5.4	181.7	-42.7	81.4	4.2	291.4	-38.0	83.3
Chest CG	Y	G's	3.5	111.7	-3.7	152.7	1.3	236.4	-11.2	100.7
Chest CG	Z	G's	15.9	84.6	-16.1	122.0	17.9	73.3	-24.0	124.6
Chest CG Resultant	N/A	G's	44.8	82.2			39.9	83.4		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	499.1	58.0	-2795.7	64.8	368.3	52.9	-2842.1	62.2
Right Femur	Z	Newtons	490.3	54.6	-2831.8	61.6	389.8	53.7	-2602.2	95.3

SEAT BELT PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt	N/A	Newtons	9984.4	70.0	-47.2	138.5	5973.9	61.8	-21.3	299.7
Shoulder Belt	N/A	Newtons	8586.7	84.9	-57.9	154.8	10188.3	90.1	-12.1	236.4

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Primary	468.8	44.2	66.2	102.1	328.0	38.4	67.1	103.0

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	44.6	80.2	83.2	38.1	81.9	84.9

DATA SHEET NO. 8...(continued)

TEST VEHICLE: 1998 CHEVROLET CAMARO 2 DOOR COUPE

NHTSA No.: MW0119

TEST PROGRAM: 1998 NHTSA 35 MPH NCAP

TEST DATE: 1/23/98

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	8.8	105.3	-50.4	64.1	13.2	116.7	-51.1	70.1
Pelvis	Y	G's	9.9	100.6	-7.3	61.7	6.8	60.2	-9.3	104.6
Pelvis	Z	G's	3.3	180.1	-19.1	114.4	3.4	250.4	-21.1	115.7

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	758.6	71.0	-132.4	192.4	772.7	135.1	-214.2	40.1
Neck Force	Y	Newtons	81.0	67.0	-192.0	214.9	105.8	213.8	-213.1	95.4
Neck Force	Z	Newtons	2372.2	81.7	-347.3	136.8	1999.7	84.5	-436.5	118.2
Neck Moment	X	Joules	15.6	123.9	-10.3	58.2	11.4	141.3	-11.4	95.5
Neck Moment	Y	Joules	26.8	155.2	-49.5	64.7	54.1	146.9	-26.1	250.5
Neck Moment	Z	Joules	10.3	104.0	-11.7	215.4	6.8	85.0	-2.7	299.9

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	40.1	67.5	-5.6	59.9	65.4	69.1	-23.4	103.3 *
Left Foot Aft	Z	G's	8.0	73.5	-34.6	67.2	16.9	86.2	-46.5	72.1 *
Left Foot Fore	Z	G's	11.3	73.9	-49.0	72.4	5.7	54.1	-39.3	108.9 *
Right Foot Aft	X	G's	49.9	61.5	-1.3	4.3	41.3	69.6	-30.7	106.7 *
Right Foot Aft	Z	G's	31.5	72.1	-44.7	64.5	3.0	162.8	-33.7	68.4 *
Right Foot Fore	Z	G's	31.0	73.1	-146.1	73.8	9.3	84.5	-40.0	67.8 *

* Driver foot channels failed at 74.0 Msec.

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Lower Force	X	Newtons	124.7	138.5	-681.6	79.3	168.4	89.4	-309.0	66.5
Left Lower Force	Z	Newtons	142.4	156.4	-2136.9	67.9	320.3	160.9	-1944.7	106.3
Left Lower Moment	Y	Joules	21.7	76.6	-49.7	101.2	34.0	66.7	-31.2	105.1
Left Upper Moment	X	Joules	46.2	63.0	-32.8	117.1	26.8	120.0	-32.4	60.3
Left Upper Moment	Y	Joules	104.2	62.5	-25.5	137.3	69.9	80.4	-15.0	139.8
Right Lower Force	X	Newtons	57.0	132.6	-721.7	65.4	106.8	251.6	-524.3	71.3
Right Lower Force	Z	Newtons	356.3	88.9	-2230.8	65.1	141.9	90.2	-1750.7	108.7
Right Lower Moment	Y	Joules	38.6	62.7	-67.8	123.7	45.6	70.1	-20.5	110.1
Right Upper Moment	X	Joules	80.5	68.0	-1.1	3.7	15.1	89.0	-22.3	146.7
Right Upper Moment	Y	Joules	106.0	65.9	-4.0	5.4	88.0	71.8	-18.5	142.9

DATA SHEET NO. 8...(continued)

TEST VEHICLE: 1998 CHEVROLET CAMARO 2 DOOR COUPE

NHTSA No.: MW0119

TEST PROGRAM: 1998 NHTSA 35 MPH NCAP

TEST DATE: 1/23/98

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.2	18.2	-32.0	88.5	0.2	31.7	-23.1	94.8

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	25.2	188.5	-51.3	85.7	13.7	251.7	-33.5	88.5
Head CG	Y	G's	5.7	106.1	-2.4	52.8	6.2	95.7	-2.5	37.8
Head CG	Z	G's	16.6	85.7	-11.7	122.5	32.2	84.0	-10.0	117.9
Head CG Resultant	N/A	G's	53.9	85.7			44.6	87.3		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	6.2	181.6	-43.3	81.4	3.0	295.3	-37.8	83.4
Chest CG	Y	G's	3.7	76.8	-3.9	147.8	3.3	65.0	-8.2	100.6
Chest CG	Z	G's	13.4	121.6	-14.3	84.6	16.5	75.7	-19.0	116.9
Chest CG Resultant	N/A	G's	45.0	82.2			39.8	83.4		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Redundant	469.8	44.3	67.6	103.5	307.7	37.4	66.9	102.8

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	44.8	80.2	83.2	37.9	81.9	84.9

DATA SHEET NO. 9**SEAT BELT PERFORMANCE ASSESSMENT TEST DATA**TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPENHTSA NO. MW0119

BELT LENGTH DATA (mm)	DRIVER	PASSENGER
Total belt length for continuous webbing systems.	2380	2380
Retractor reel to 'D' ring	300	350
Shoulder belt length as measured on Part 572 Dummy	810	780
Lap belt length as measured on Part 572 Dummy	750	620
Remainder of belt on reel	520	630

SHOULDER BELT SPOOL-OFF DATA (mm)	DRIVER	PASSENGER
As determined mechanically	70	37
As determined electronically	91	86

BELT STRETCH DATA (mm/cm)	DRIVER	PASSENGER
Measured electronically between shoulder belt load cell and the "D" ring	.70	.81
Measured mechanically	.28	.47

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

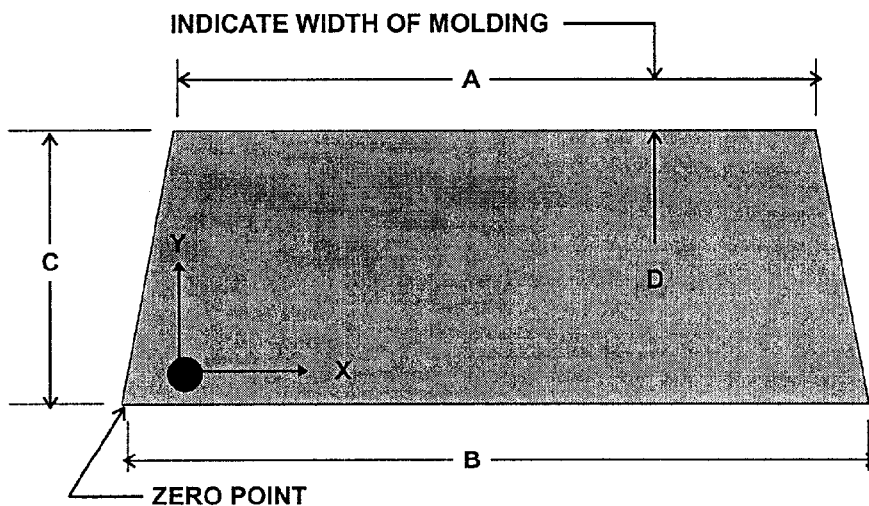
Details of windshield mounting (method of retention, type of trim, etc.):

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

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

WINDSHIELD PERIPHERY MEASUREMENTS (mm)			
	PRETEST	POST TEST	PERCENT RETENTION
Right Side	2120	2120	100%
Left Side	2120	2120	100%
Total	4240	4240	100%

Indicate area of retention failure.



FRONT VIEW OF WINDSHIELD

Width of molding = Top 10 mm , Sides 10 mm, Bottom 45 mm.

Temperature of windshield molding during test = 21.1 °C

DATA SHEET NO. 11

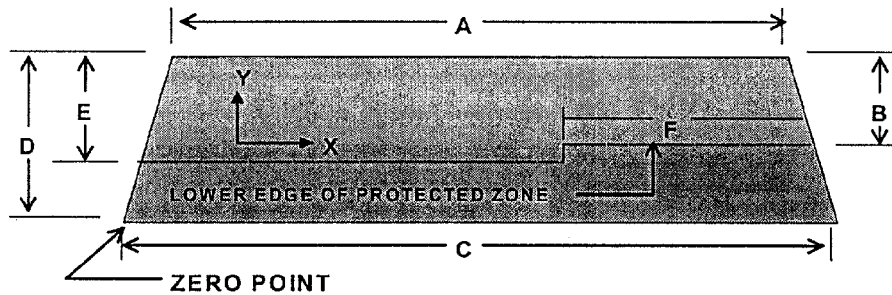
WINDSHIELD ZONE INTRUSION FMVSS 219 (PARTIAL) DATA

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

SKETCH OF FRONT VIEW OF WINDSHIELD:

Provide all dimensions necessary to reproduce the protected area.



	DIMENSION mm
A	1280
B	640
C	1580
D	840
E	380
F	620

FRONT VIEW OF WINDSHIELD

AREA OF PROTECTED ZONE FAILURES:

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

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

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

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

DATA SHEET NO. 12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

TEST MODE: 56.3 km/h New Car Assessment Program (NCAP) Frontal Barrier Impact

TEST DATE: January 23, 1998 TIME: 1:15 PM TEMPERATURE 16.7 C

STODDARD SOLVENT SPILLAGE MEASUREMENT:

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

DATA SHEET NO. 13

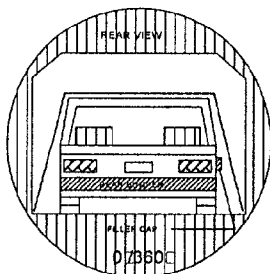
FMVSS 301 STATIC ROLLOVER DATA SHEET

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

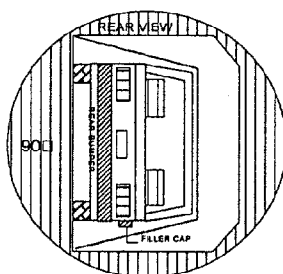
NHTSA NO. MW0119

TEST MODE: 56.3 km/h New Car Assessment Program (NCAP) Frontal Barrier Impact

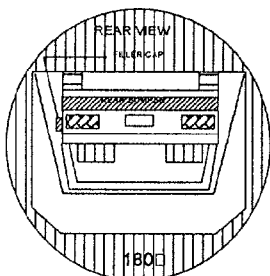
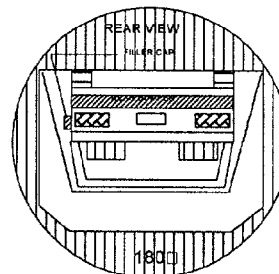
TEST DATE: January 23, 1998 TIME: 1:15 PM TEMPERATURE: 16.7C



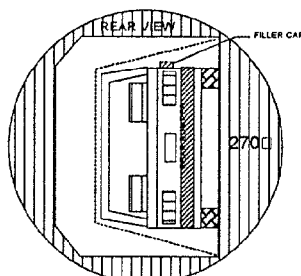
0° TO 90°



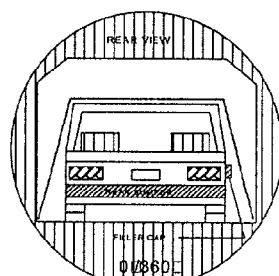
90° TO 180°



180° TO 270°



270° TO 0°



1. The specified fixture rollover rate for each 90° of rotation = 1 to 3 minutes.
2. The position hold time at each position = 5 minutes (minimum)

TEST PHASE	ROTATION TIME (sec.)	POSITION HOLD TIME (sec)	STODDARD SPILLAGE (oz.)
0° TO 90°	81	308	0
90° TO 180°	80	300	0
180° TO 270°	80	301	0
270° TO 360°	80	301	0

3. Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

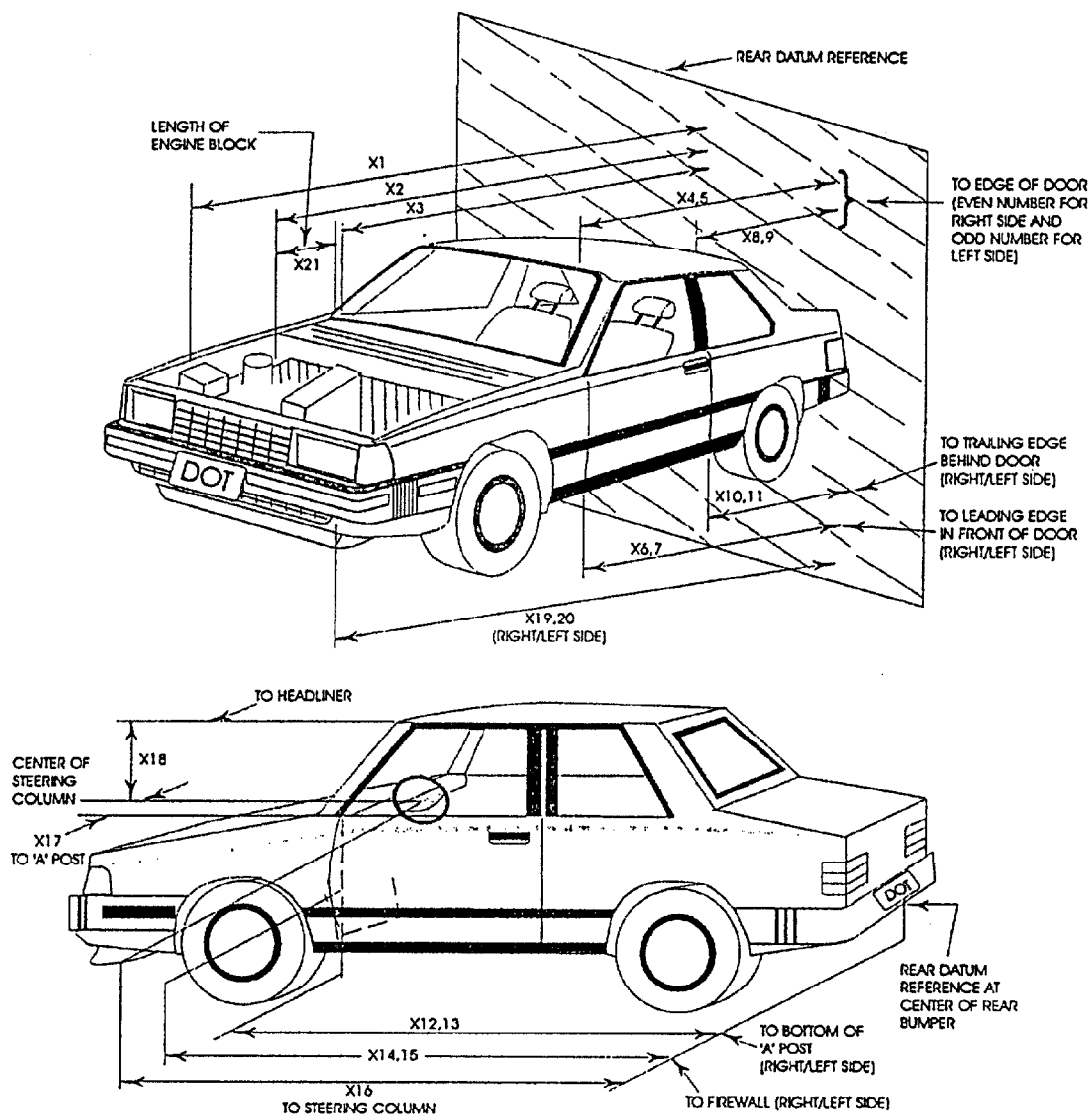
DATA SHEET NO. 14

VEHICLE MEASUREMENTS

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

NO.	MEASUREMENT DESCRIPTION	DIMENSIONS IN MM		
		PRE-TEST	POST-TEST	DIFFERENCE
1	Total length of vehicle at centerline	4714	4170	-544
2	Rear surface of vehicle (RSOV) to front of engine	3830	3778	-52
3	RSOV to firewall centerline	3340	3286	-54
4	RSOV to leading edge of right door	3090	3083	-7
5	RSOV to leading edge of left door	3080	3071	-9
6	RSOV to lower leading edge of right door	3076	3051	-25
7	RSOV to lower leading edge of left door	3099	3060	-39
8	RSOV to upper trailing edge of right door	1730	1727	-3
9	RSOV to upper trailing edge of left door	1711	1729	+18
10	RSOV to lower trailing edge of right door	1742	1729	-13
11	RSOV to lower trailing edge of left door	1752	1731	-21
12	RSOV to bottom of right 'A' pillar	3064	3063	-1
13	RSOV to bottom of left 'A' pillar	3044	3032	-12
14	RSOV to firewall on right side	3300	3258	-42
15	RSOV to firewall of left side	3448	3218	-230
16	RSOV to steering column	2666	2582	-84
17	Center of steering column to left 'A' pillar	345	346	+1
18	Center of steering column to headlining	406	422	-16
19	RSOV to right side of front bumper	4479	3959	-520
20	RSOV to left side of front bumper	4534	4004	-530
21	Length of engine block	445	445	0
22	RSOV to right side of dash panel	2789	2784	-5
23	RSOV to center of dash panel	2799	2780	-19
24	RSOV to left side of dash panel	2810	2754	-56



DATA SHEET NO. 15

CAMERA LOCATIONS

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

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-Real Time	2083	8331	914	0	1651	Zoom	24
2A	Left Side View No. 1	1321	-8382	864	0	7747	13	200
2B	Left Side View No. 2	1499	-9855	1270	0	8001	25	960
3	Left Side View No. 3	991	-10,566	1486	3	10,211	50	1040
4	Left Side View No. 4	3835	3150	2083	19	3302	19	1000
5	Left Side View No. 5	1905	-8306	2515	16	8153	25	1030
6	Left Side View No. 6	1880	-8382	1092	9	8052	25	1010
7	Right Side View No. 1	1295	10,160	1168	0	7925	13	1080
8	Right Side View No. 2	1219	10,770	1346	0	10,363	50	1210
9	Right Side View No. 3	6832	11,633	1321	10	11,963	80	940
10	Right Side View No. 4	3251	11,633	1346	0	11,176	50	1110
11	Overhead Windshield	914	0	5715	90	N/A	13	1230
12	Front View No. 1 Driver	-356	356	2540	42	3454	19	1070
13	Front View No. 2 Passenger	-356	508	2540	42	3454	19	920
14	Pit Camera Engine View	610	0	-660	89	N/A	13	900
15	Pit Camera Fuel Tank View	1524	0	432	51	N/A	19	800
16	Driver Side Onboard	3353	305	1499	5	1270	13	510
17	Passenger Side Onboard	3353	305	1499	5	1270	13	440

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

DATA SHEET NO. 16

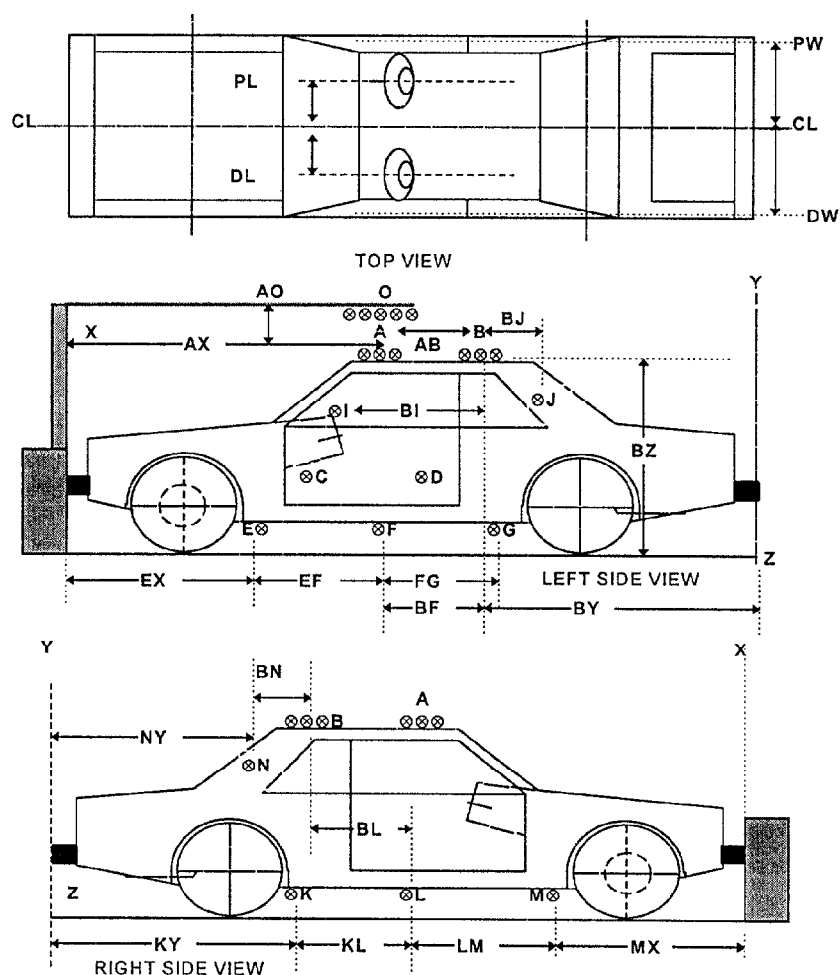
REFERENCE PHOTOGRAPH TARGETS

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

ITEM	DESCRIPTION	VALUE	ITEM	DESCRIPTION	VALUE
AX	TARGET A TO BARRIER	2520	NY	TARGET N TO REAR BUMPER	1630
AB	TARGET A TO TARGET B	610	BN	TARGET B TO TARGET N	140
AO	VERTICAL DISTANCE A TO O	150	KY	TARGET K TO REAR BUMPER	1700
BJ	TARGET B TO TARGET J	140	KL	TARGET K TO TARGET L	745
BI	TARGET B TO STEERING COLUMN	1030	BL	TARGET B TO TARGET L	800
BZ	TARGET B TO GROUND LEVEL	1370	LM	TARGET L TO TARGET M	730
EX	TARGET E TO BARRIER	1640	MX	TARGET M TO BARRIER	1640
EF	TARGET E TO TARGET F	730	CL/PL	VEHICLE CENTERLINE TO PASSENGER	380
FG	TARGET F TO TARGET G	745	CL/PW	VEHICLE CENTERLINE TO RIGHT SILL	800
BF	TARGET B TO TARGET F	800	CL/DL	VEHICLE CENTERLINE TO DRIVER	380
BY	TARGET B TO REAR BUMPER	1770	CL/DW	VEHICLE CENTERLINE TO LEFT SILL	800

Distances in mm



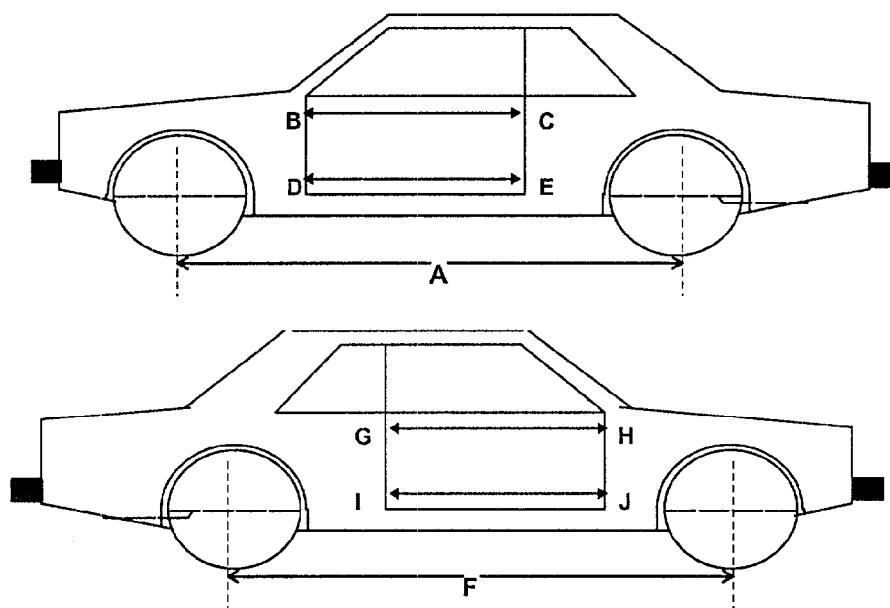
DATA SHEET NO. 17

VEHICLE INTRUSION MEASUREMENTS

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

DOOR OPENING WIDTH



UNITS (mm)	LEFT SIDE		RIGHT SIDE	
MEASUREMENT	BC	DE	GH	IJ
PRE-TEST	1369	1347	1360	1334
POST-TEST	1342	1329	1356	1322
DIFFERENCE	-27	-18	-4	-12

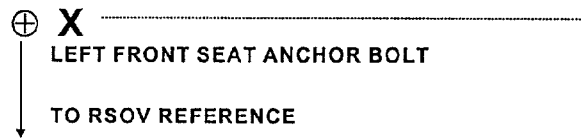
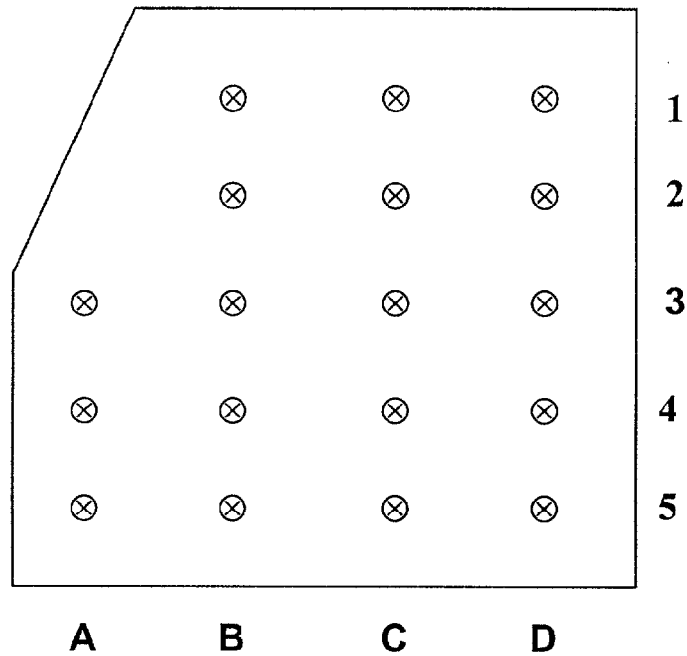
VEHICLE WHEELBASE CHANGE

UNITS (mm)	A = LEFT SIDE WHEELBASE	F = RIGHT SIDE WHEELBASE
PRE-TEST	2560	2560
POST-TEST	2498	2498
DIFFERENCE	-62	-62

Data Sheet No. 17(Continued)

FLOOR PAN INTRUSION (Distances in mm)

TARGET COLUMN	A		B		C		D	
TARGET ROW	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
1	N/A	N/A	763	648	763	673	N/A	N/A
2	N/A	N/A	610	582	610	577	610	555
3	458	473	458	445	458	467	458	468
4	305	314	305	297	305	314	305	322
5	153	155	153	150	153	152	153	155
REF. POINT	RSOV TO ANCHOR BOLT (PRE-TEST)		2598		RSOV TO ANCHOR BOLT (POST-TEST)		2598	

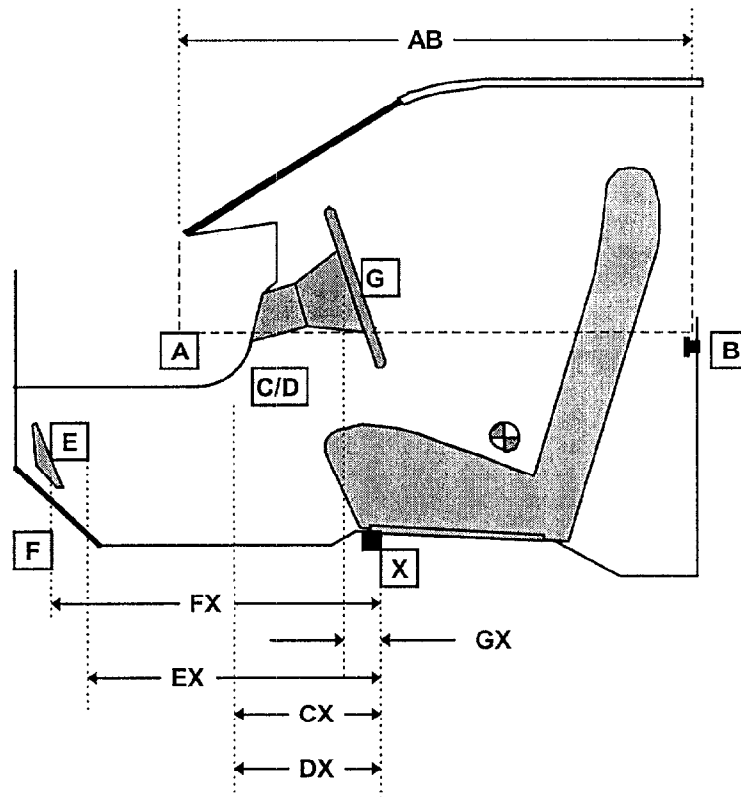


DRIVER SIDE FLOOR PLAN

DRIVER COMPARTMENT INTRUSION (Distances in mm)

REF.	DESCRIPTION	PRE-TEST	POST-TEST
AB	DOOR OPENING (INSIDE WINDOW JAM)	1300	1300
CX	LOWER LEFT KNEE BOLSTER TO X	300	268
DX	LOWER RIGHT KNEE BOLSTER TO X	324	274
EX	BRAKE PEDAL TO X	511	389
FX	FOOT REST TO X	600	571
GX	STEERING COLUMN HUB (CENTER) TO X	-46	-94

X = LEFT FRONT SEAT ANCHOR BOLT

**DRIVER COMPARTMENT**

DATA SHEET NO. 18

OFFSET BARRIER ORIENTATION

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

A = VEHICLE WIDTH MEASURED AT WIDEST POINT N/A mm

B = 40% OFFSET FROM LEFT EDGE OF VEHICLE N/A mm

ACTUAL OFFSET DURING TEST N/A mm = N/A %

(NO OFFSET REQUIRED FOR THIS TEST)

DATA SHEET NO. 19

ACCIDENT INVESTIGATION DIVISION DATA

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

VIN: 4S2CM58W8W4316355

TEST DATE: 1/23/98

WHEELBASE: 2560 mm

TEST WEIGHT: 1703 kg

VEHICLE SIZE CATEGORY: 2-DOOR COUPE

ACCELEROMETER DATA:

LOCATION: Left and right rear floor pans

CALIBRATION PROCEDURE: 6 months/ drop test

LINEARITY: Good

INTEGRATION ALGORITHM: NHTSA Standard

VEHICLE IMPACT SPEED: 56.78 km/h

TIME OF SEPARATION: 88.4 msec

VELOCITY CHANGE: 67.49 km/h

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

IMPACT MODE: Full Frontal

CRUSH DEPTH DIMENSIONS:

C1 = 380 mm

C2 = 458 mm

C3 = 505 mm

C4 = 540 mm

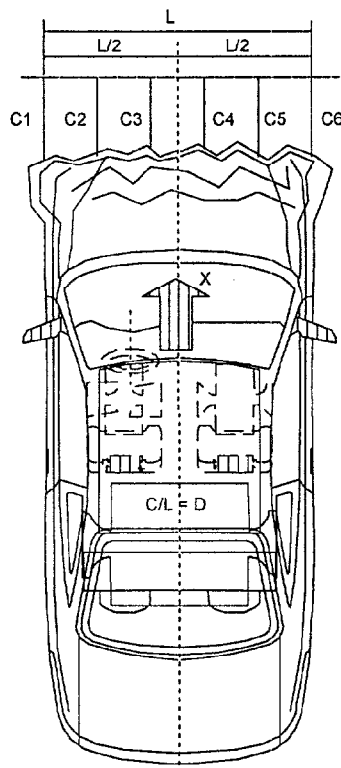
C5 = 526 mm

C6 = 396 mm

MIDPOINT OF DAMAGE: D = vehicle centerline 800 MM

LENGTH OF DAMAGE REGION:

L = 1600 mm



DATA SHEET NO. 20

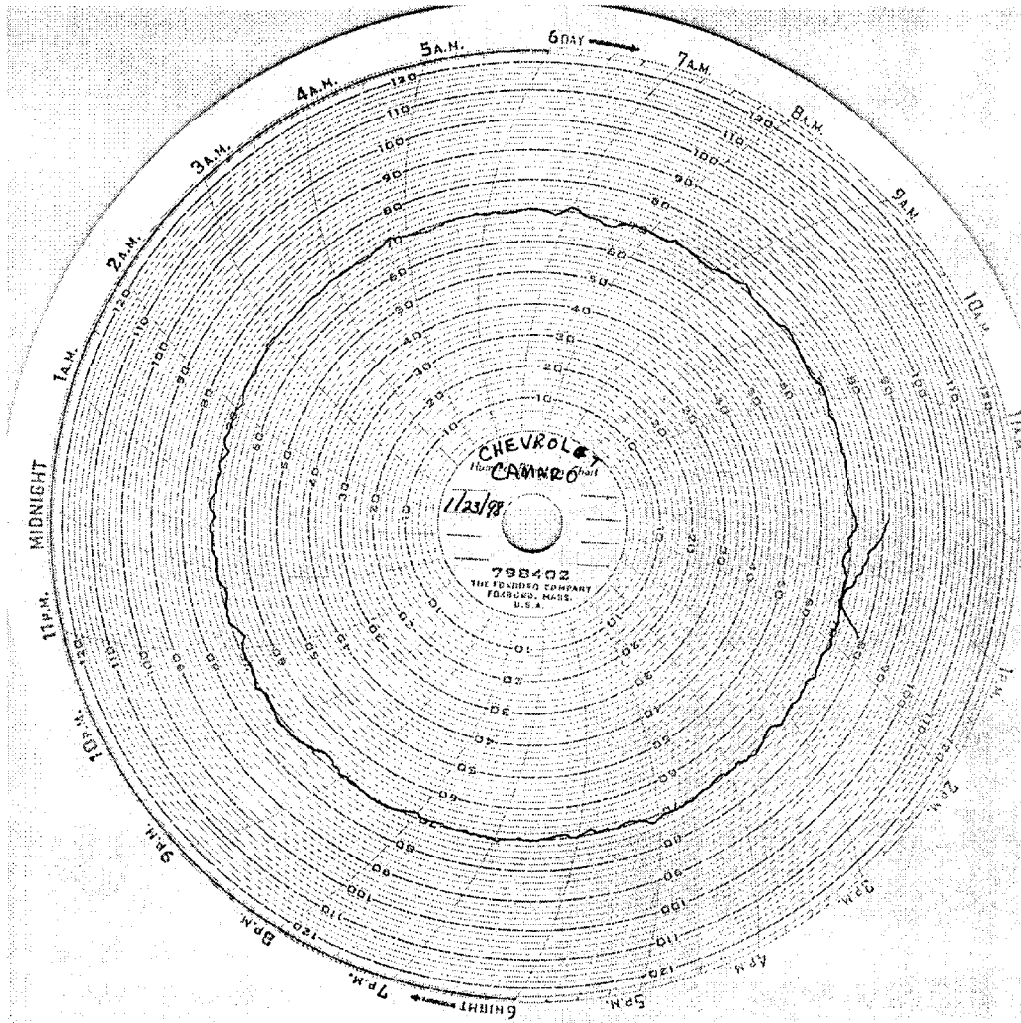
DUMMY/VEHICLE TEMPERATURE STABILIZATION

TEST VEHICLE: 1998 CHEVROLET CAMARO 2-DOOR COUPE

NHTSA NO. MW0119

VIN: 4S2CM58W8W4316355

TEST DATE: 1/23/98



APPENDIX A
PHOTOGRAPHS

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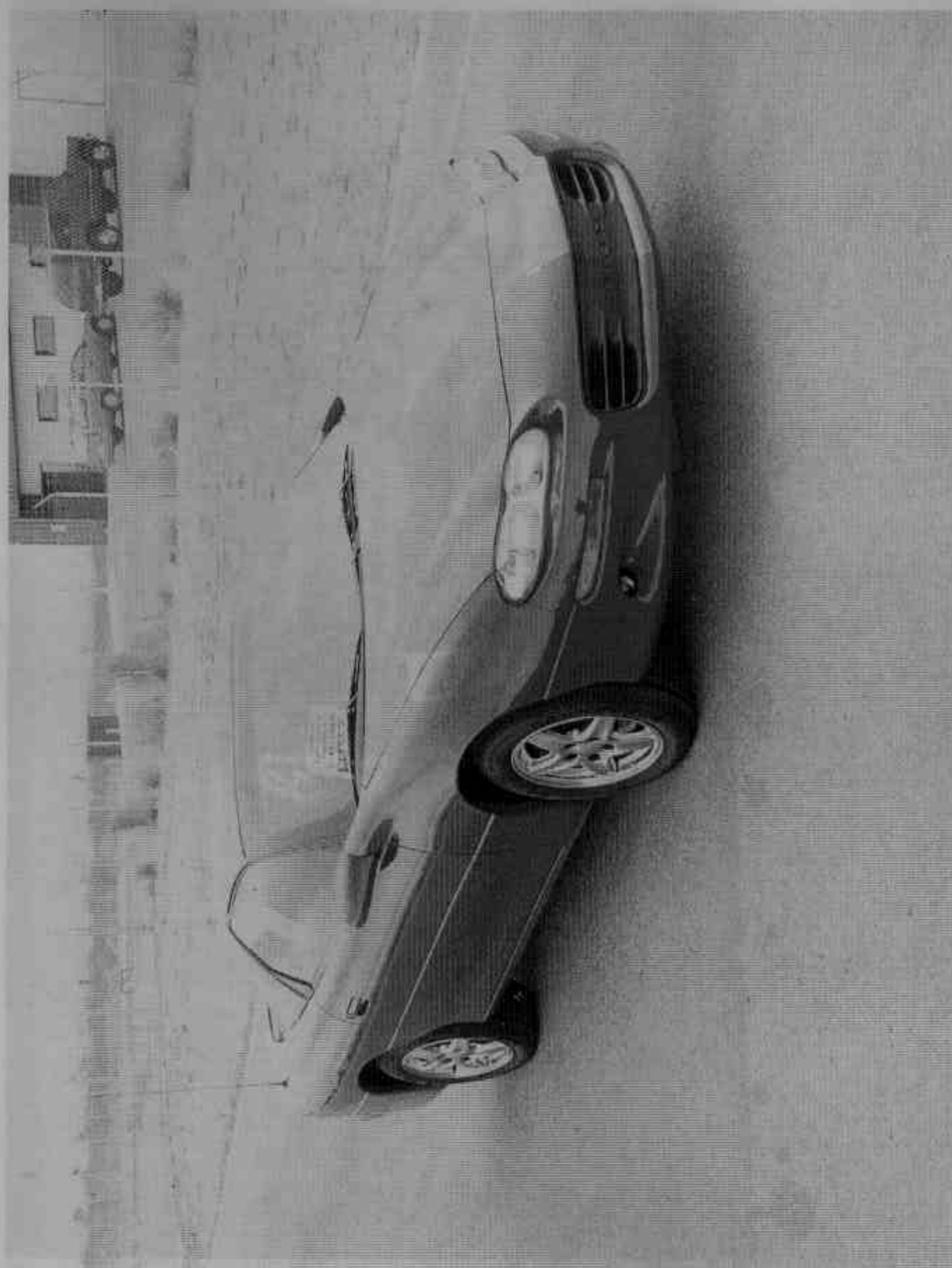


FIGURE A-1. RIGHT FRONT AS RECEIVED

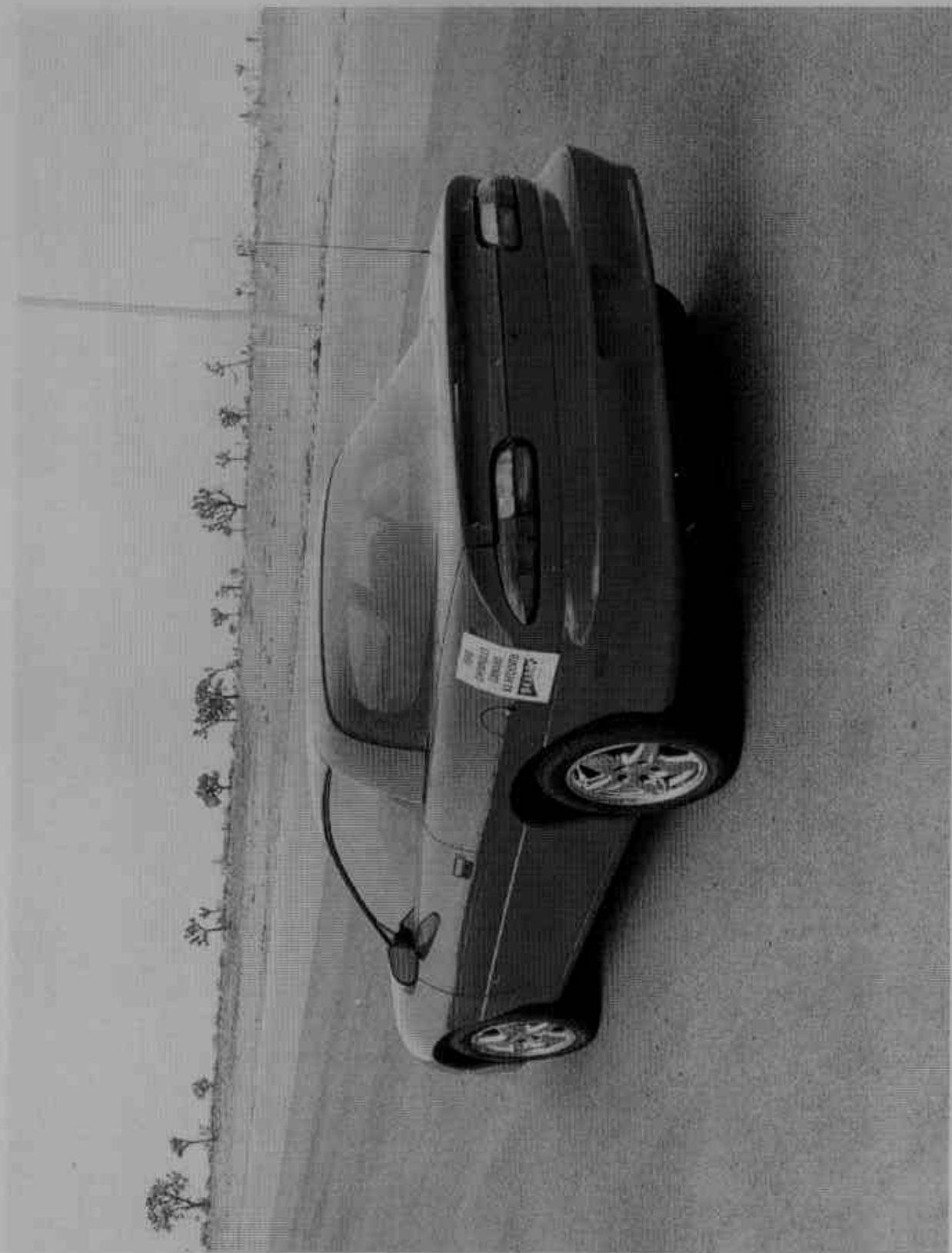


FIGURE A-2. LEFT REAR AS RECEIVED

MFD BY GENERAL MOTORS OF CANADA LTD.			
DATE	GVWR	GAWR FRT	GAWR RR
08/97	1845 KG	924 KG	921 KG
	4067 LB	2037 LB	2030 LB

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.

2G1FP22K8W2105904 TYPE: PASS CAR

TIRE - LOADING INFORMATION					
OCCUPANTS				VEHICLE CAP. WT.	
FRT.	CTR.	RR.	TOTAL	KG	LBS
2	0	2	4	318	701

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.

2G1FP22K8W2105904

MODEL: FP87 FAS

	TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT	P235/55R16	T	210KPA(30PSI)
RR	P235/55R16	T	210KPA(30PSI)
SPA	T135/60R16	M	420KPA(60PSI)

IF TIRES ARE HOT, ADD 28KPA(4LBS)

See Owner's Manual for tire pressure needed at 160 Km/H (100 mph) or higher speeds, where legal, and for additional tire information.

FIGURE A-3. VEHICLE CERTIFICATION LABEL



MFD BY GENERAL MOTORS OF CANADA LTD.

DATE	GVWR	GAWR FRT	GAWR RR
08/97	1845 KG	924 KG	921 KG
	4067 LB	2037 LB	2030 LB

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.

2G1FP22K8W2105904 TYPE: PASS CAR



TIRE-LOADING INFORMATION

OCCUPANTS				VEHICLE CAP. WT.	
FRT.	CTR.	RR.	TOTAL	KG	LBS
2	0	2	4	318	701

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.
2G1FP22K8W2105904

MODEL: FP87 FAS

	TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT	P235/55R16	T	210KPA(30PSI)
RR	P235/55R16	T	210KPA(30PSI)
SPA	T135/60R16	M	420KPA(60PSI)

IF TIRES ARE HOT, ADD 28KPA(4LBS)

See Owner's Manual for tire pressure needed at 160 Km/H (100 mph) or higher speeds, where legal, and for additional tire information.

FIGURE A-4. VEHICLE TIRE PLACARD



FIGURE A-5. PRETEST FRONT VIEW

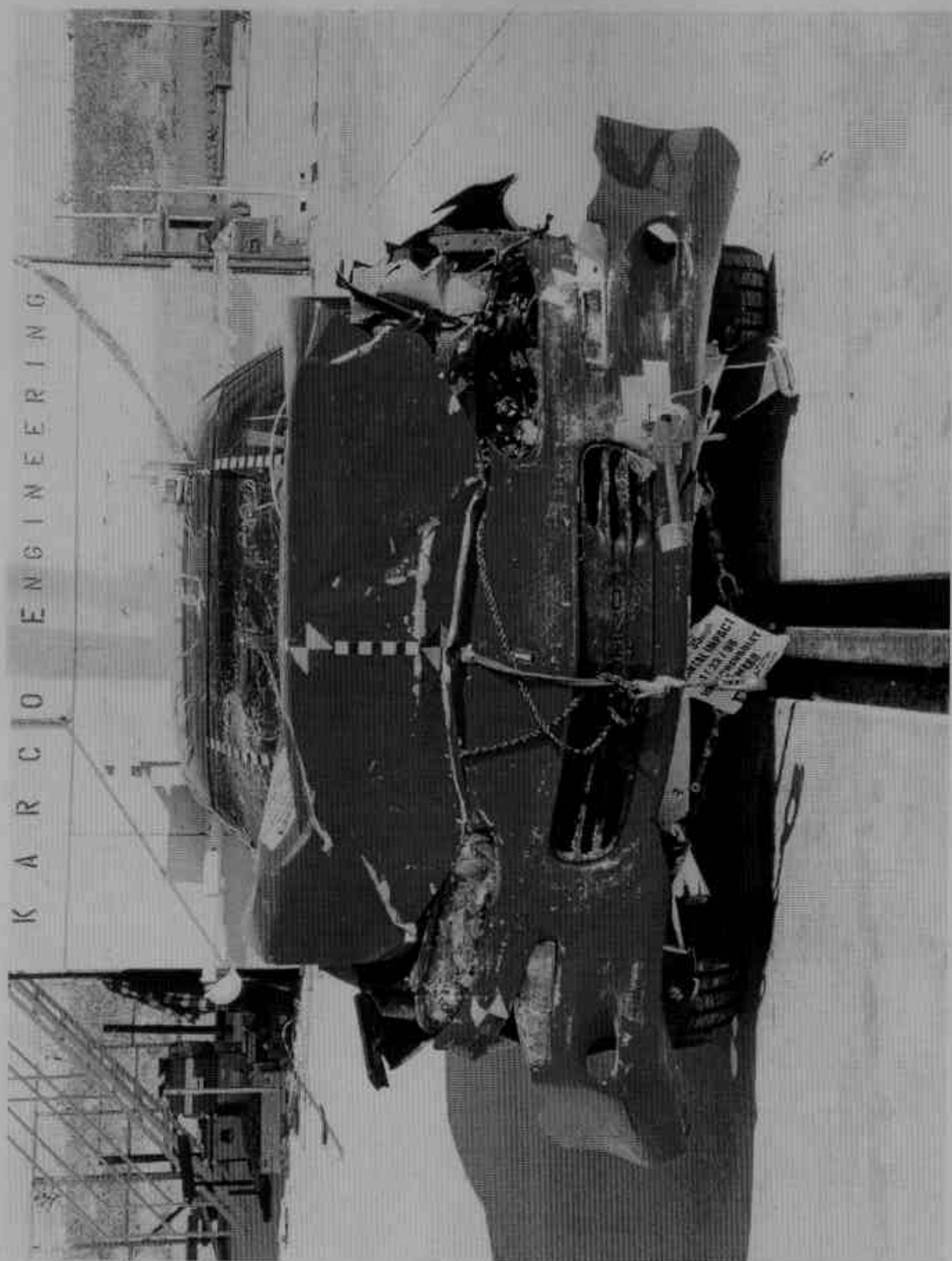


FIGURE A-6. POST TEST FRONT VIEW

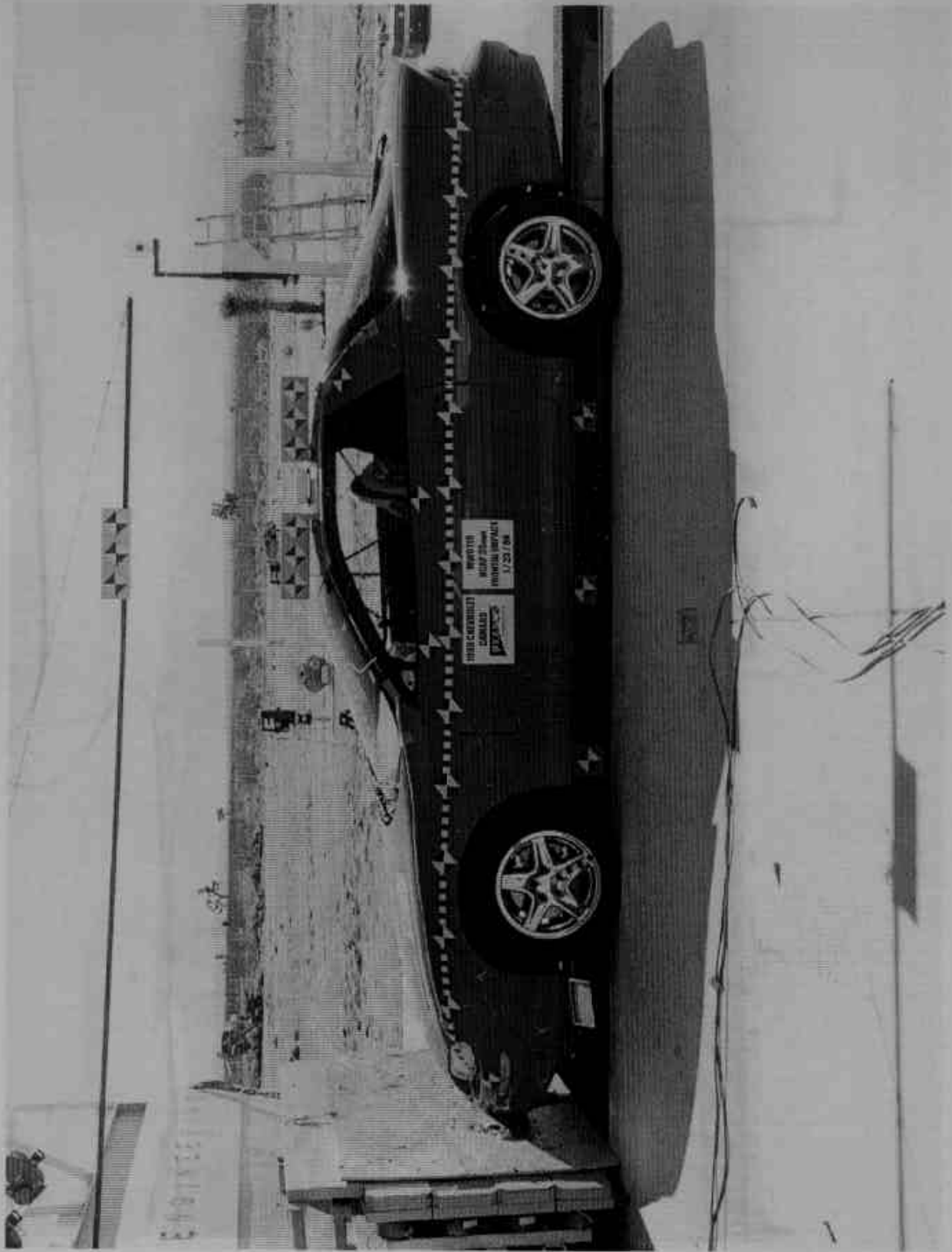


FIGURE A-7. PRETEST LEFT SIDE VIEW



FIGURE A-8. POST TEST LEFT SIDE VIEW



FIGURE A-9. PRETEST RIGHT SIDE VIEW



FIGURE A-10. POST TEST RIGHT SIDE VIEW



FIGURE A-11. PRETEST RIGHT FRONT VIEW

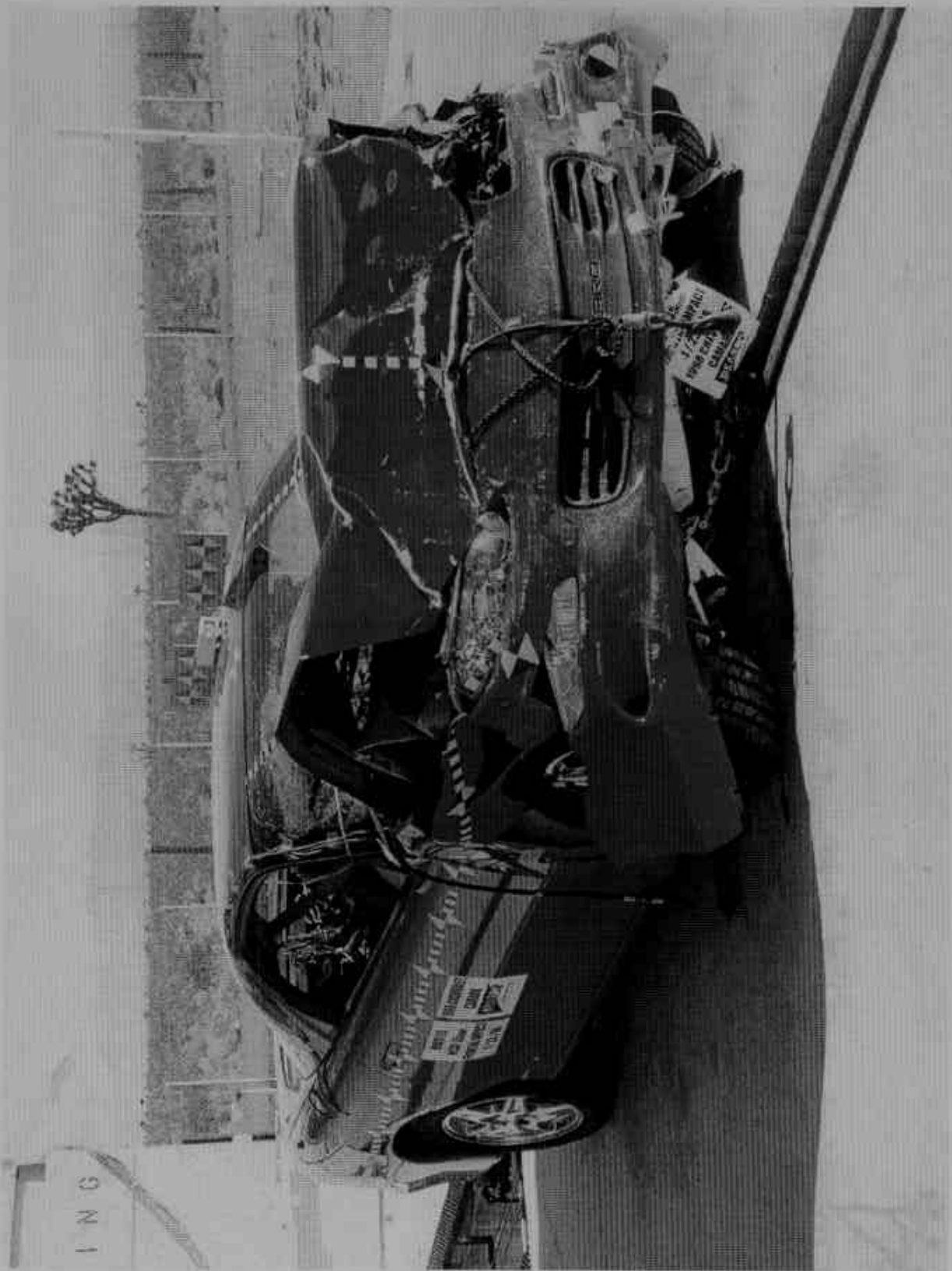


FIGURE A-12. POST TEST RIGHT FRONT VIEW

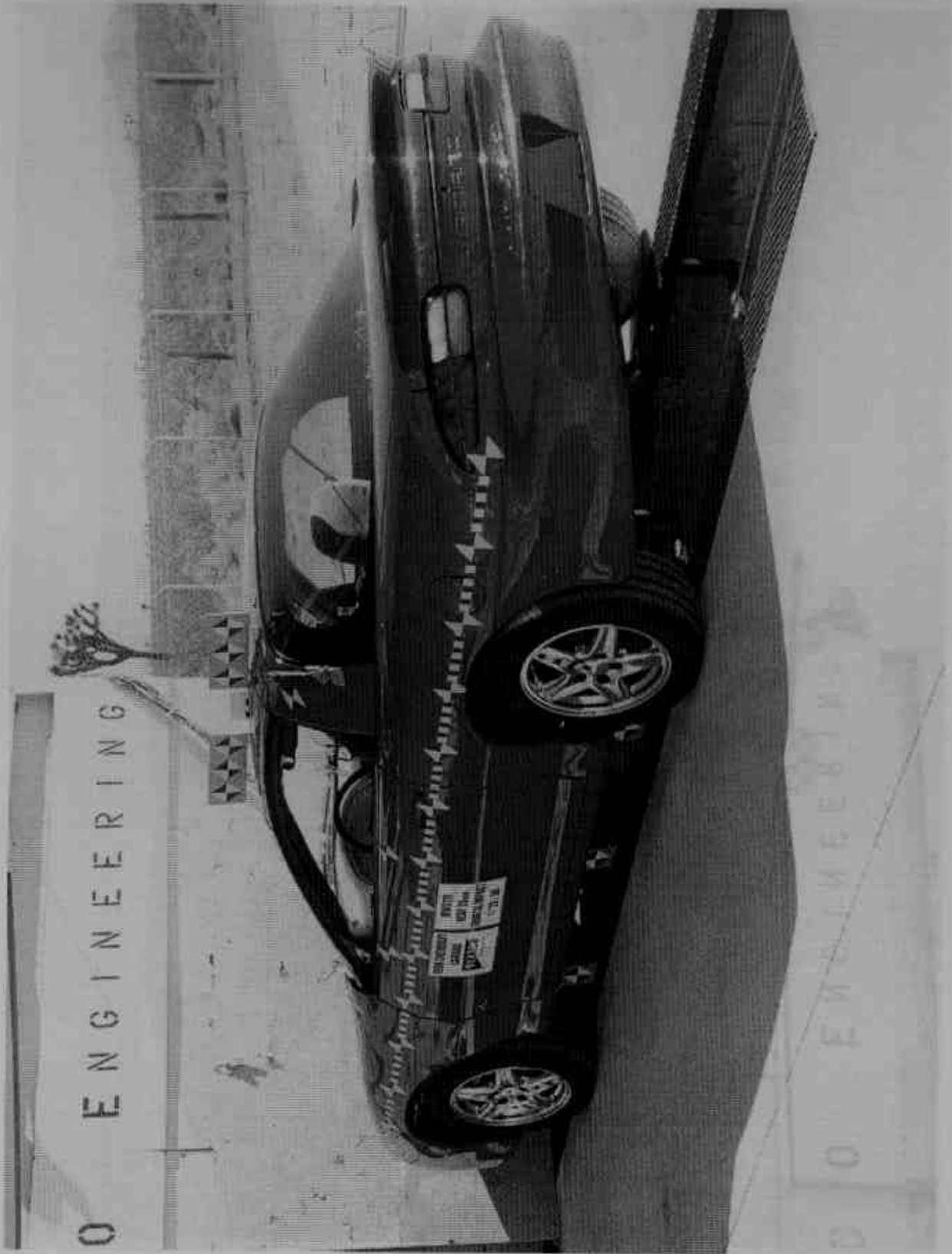


FIGURE A-13. PRETEST LEFT REAR VIEW

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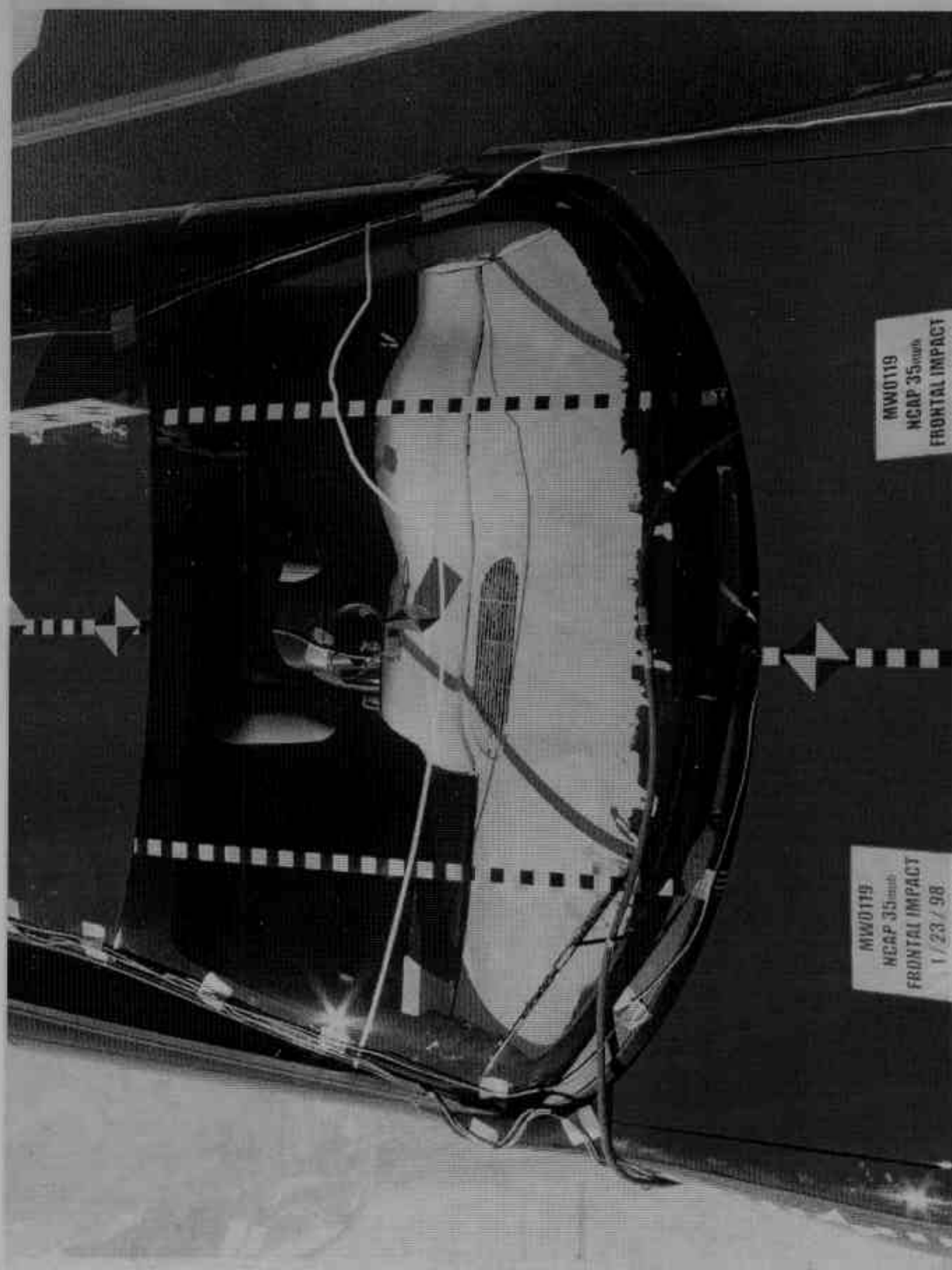


FIGURE A-15. PRETEST WINDSHIELD

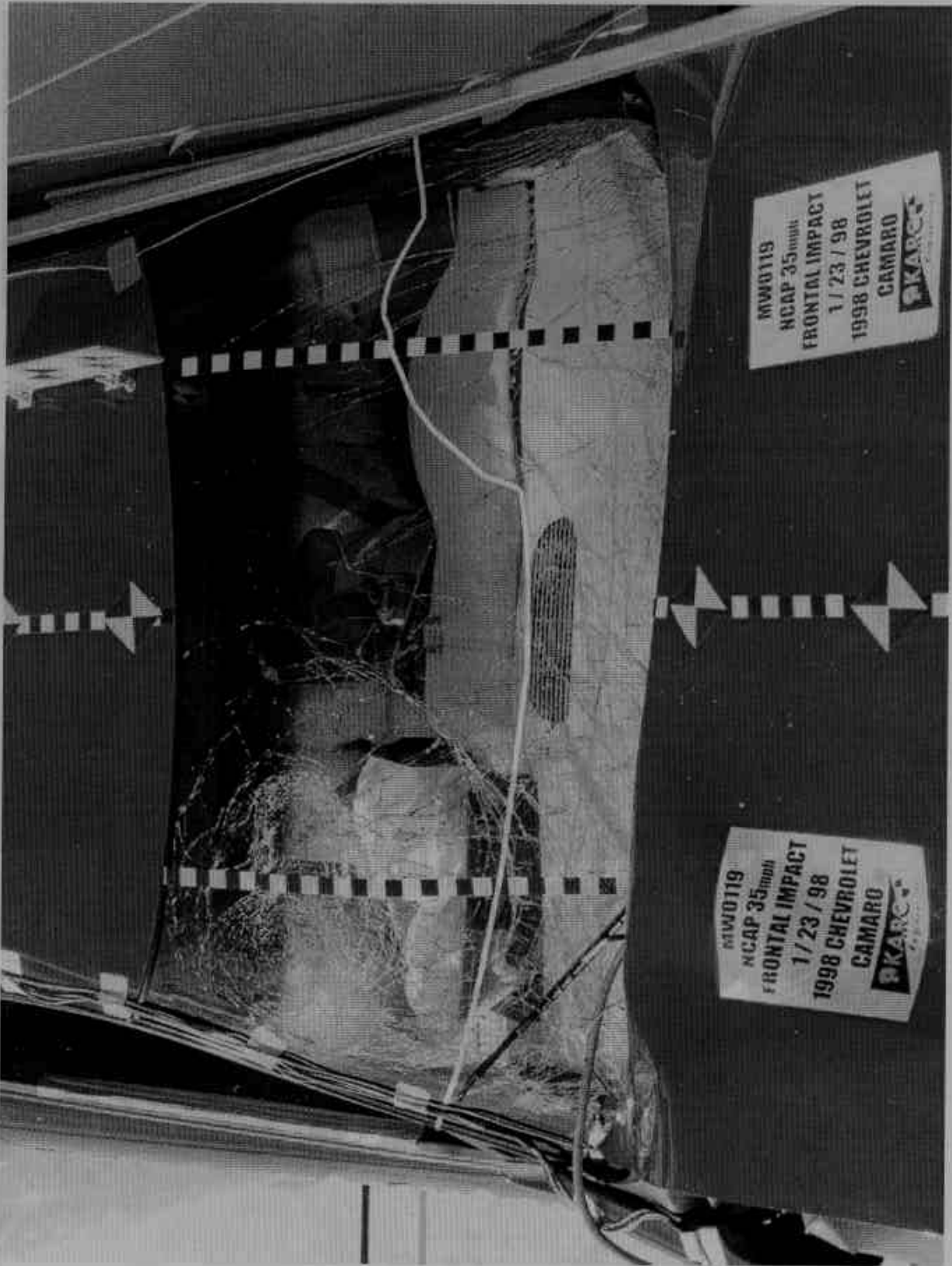


FIGURE A-16. POST TEST WINDSHIELD

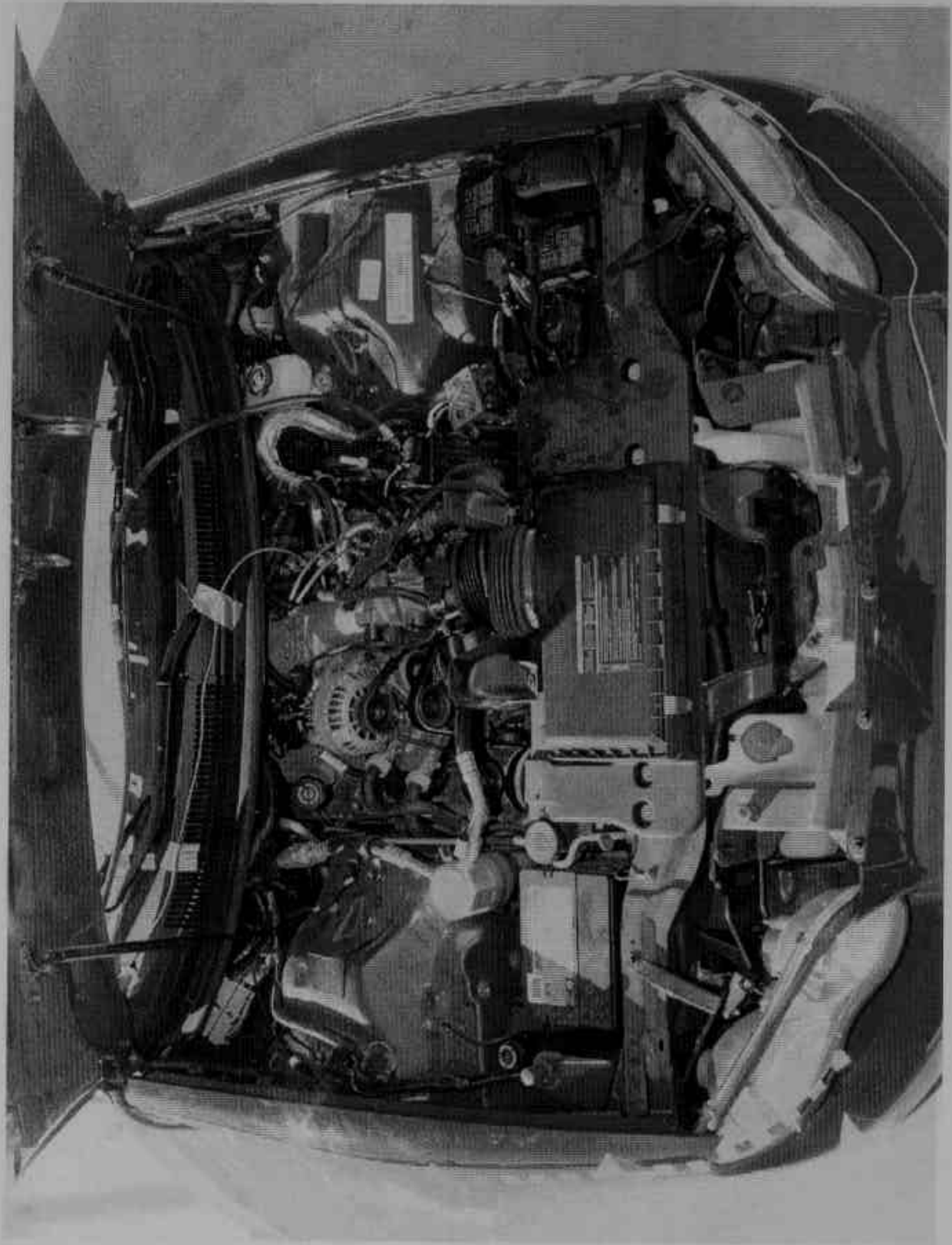


FIGURE A-17. PRETEST ENGINE COMPARTMENT

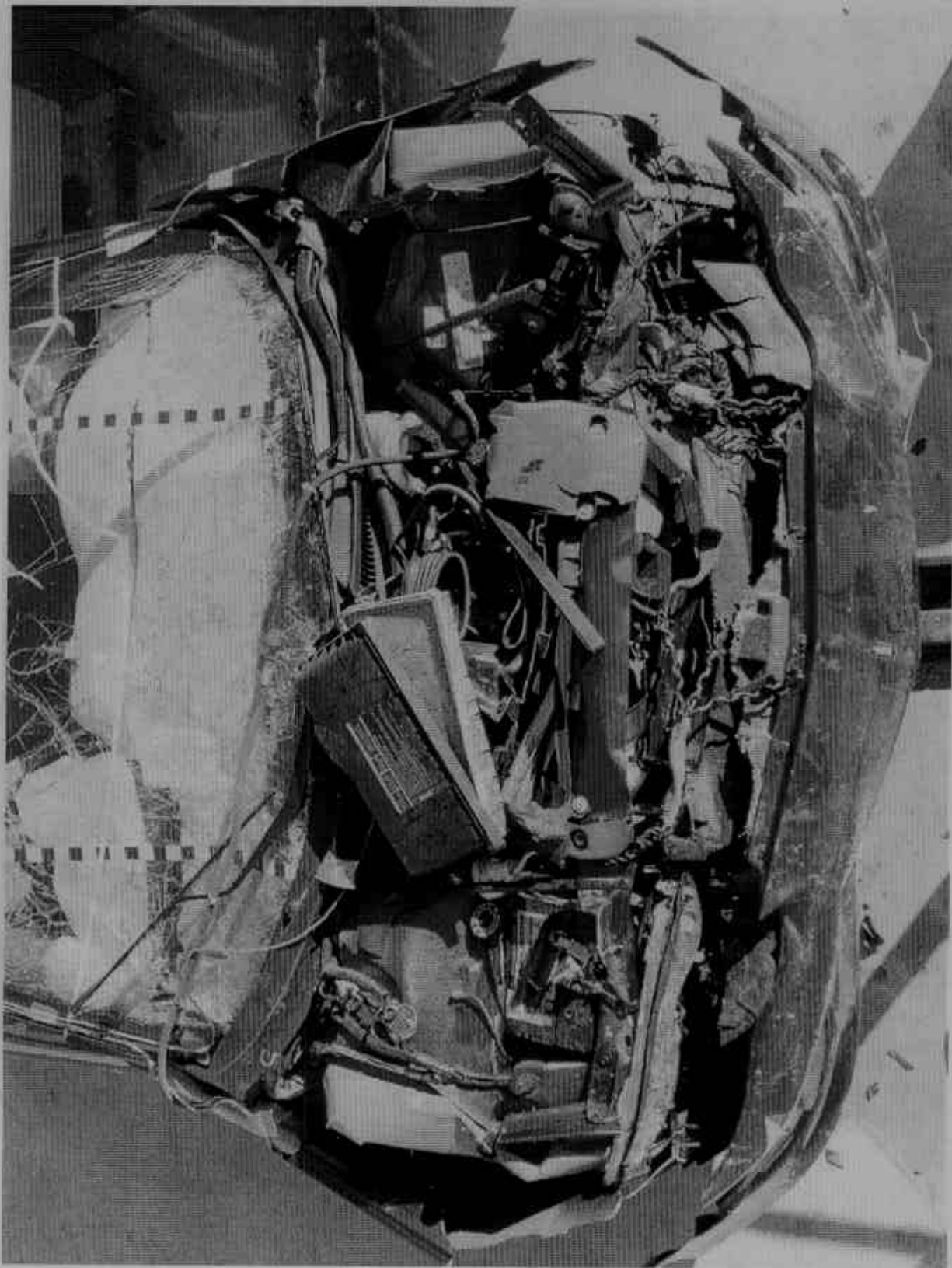


FIGURE A-18. POST TEST ENGINE COMPARTMENT

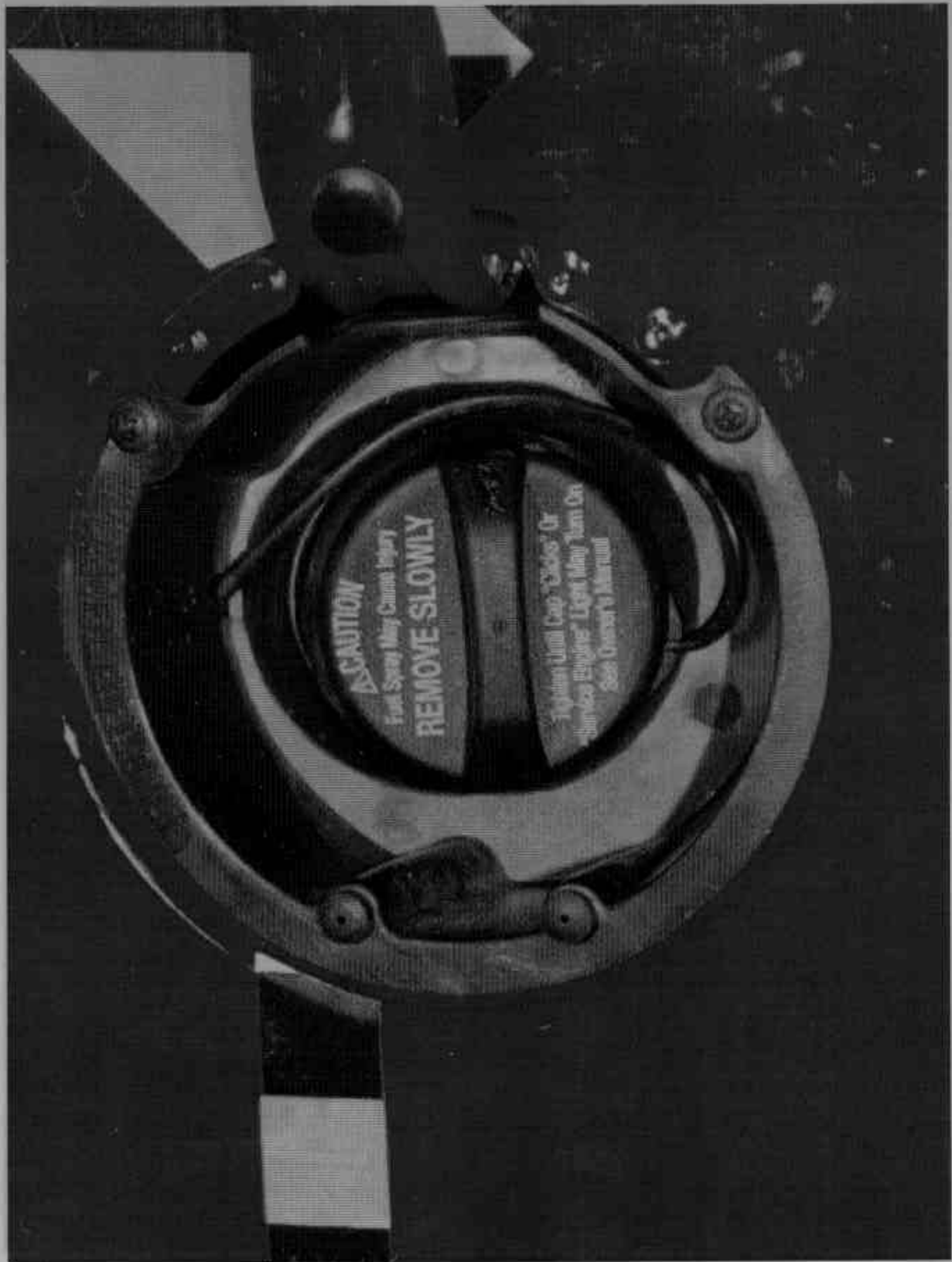


FIGURE A-19. PRETEST FUEL CAP



FIGURE A-20. POST TEST FUEL CAP

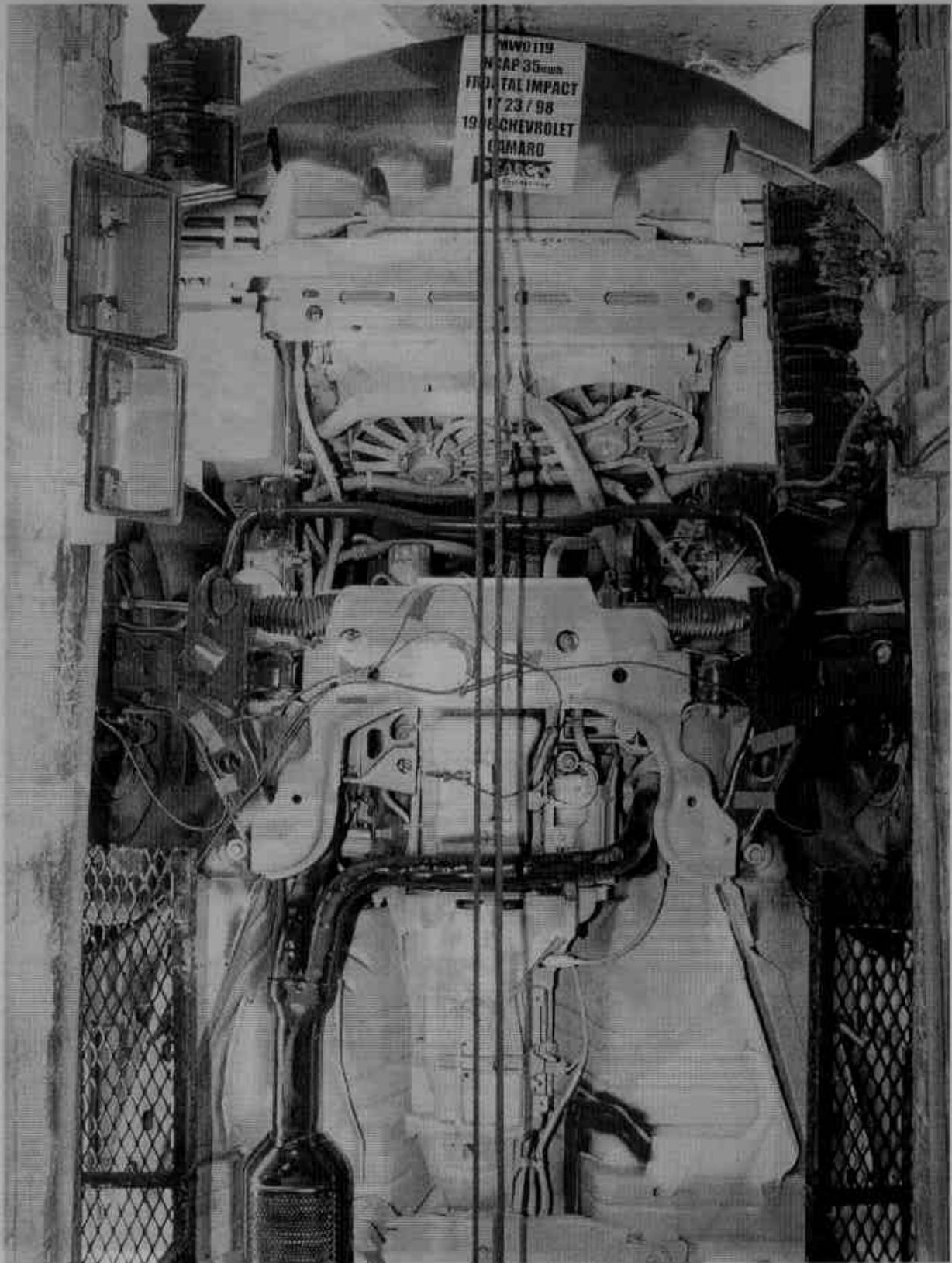


FIGURE A-21. PRETEST FRONT UNDERSIDE

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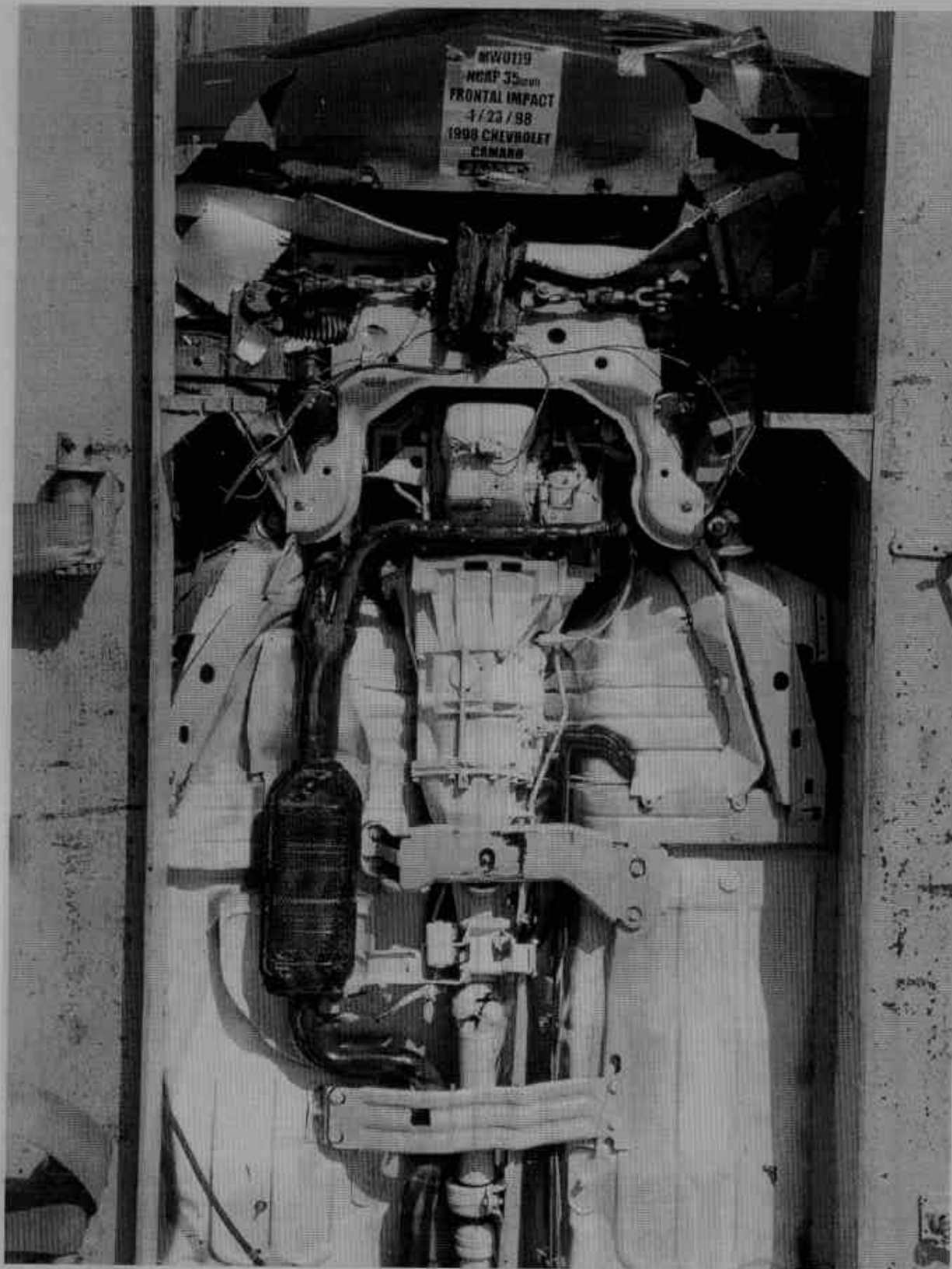


FIGURE A-22. POST TEST FRONT UNDERSIDE

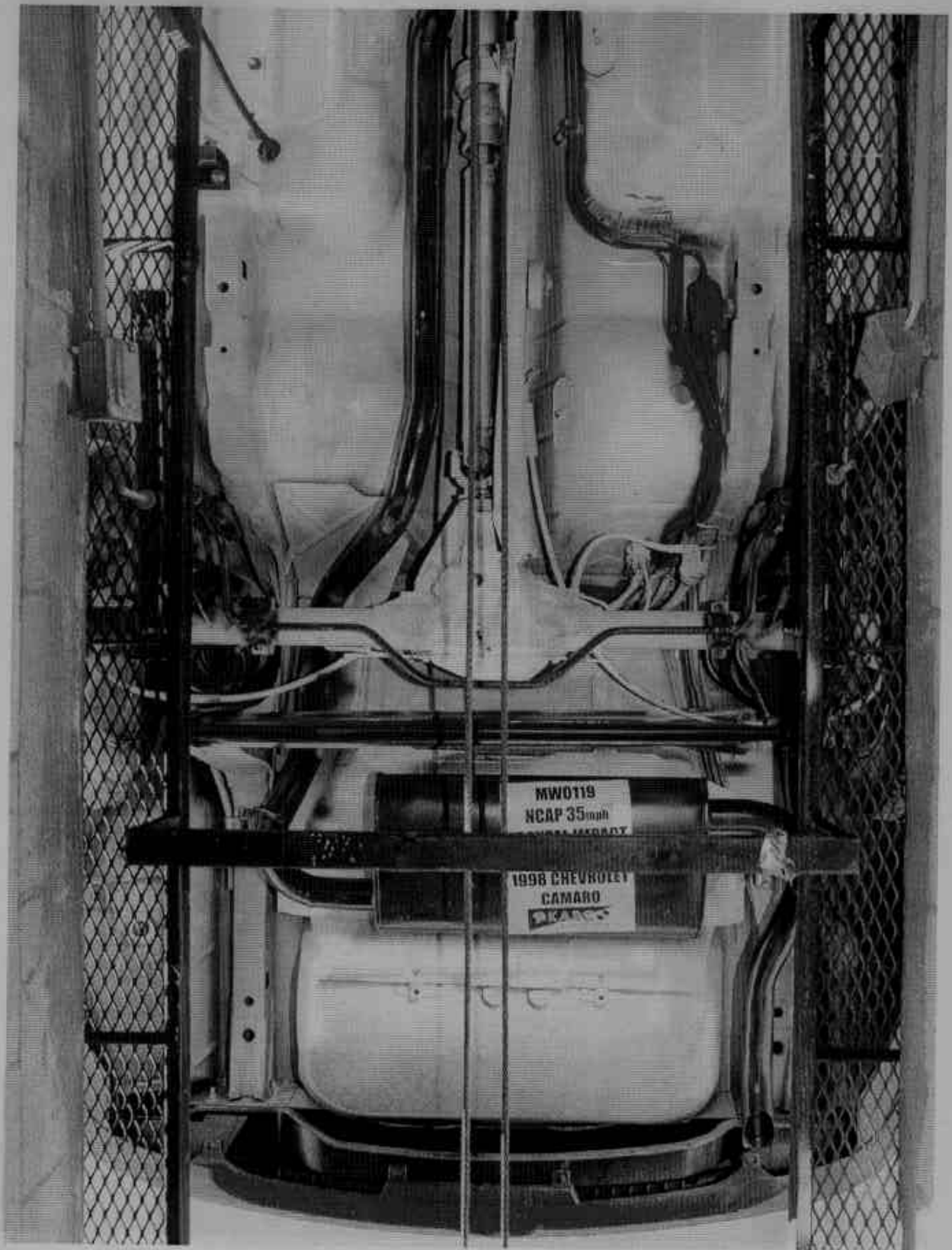


FIGURE A-23. PRETEST REAR UNDERSIDE

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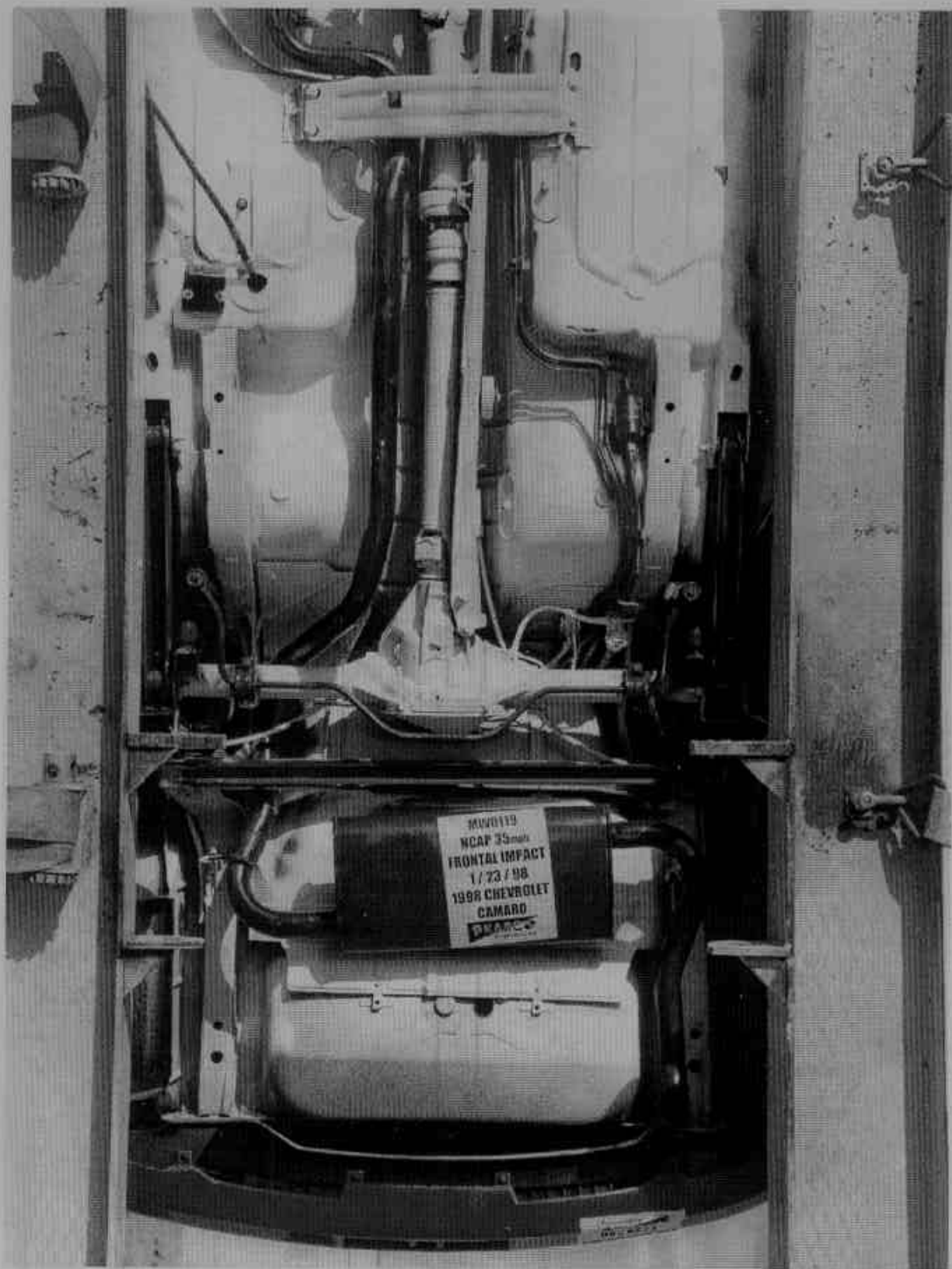


FIGURE A-24. POST TEST REAR UNDERSIDE



FIGURE A-25. PRETEST DRIVER FLOOR PAN



FIGURE A-26. POST TEST DRIVER FLOOR PAN

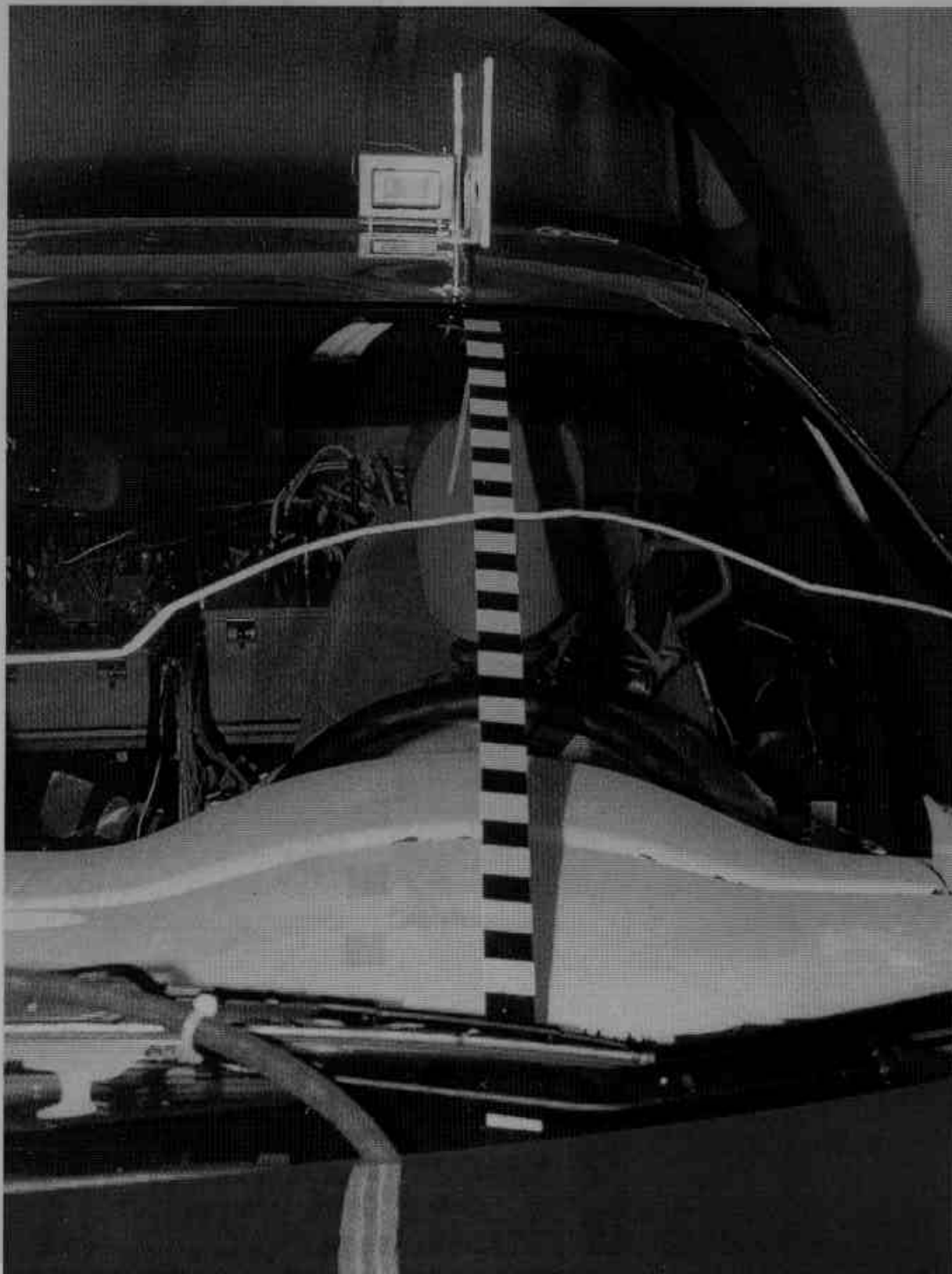


FIGURE A-27. PRETEST DRIVER DUMMY (FRONT VIEW)



FIGURE A-28. POST TEST DRIVER DUMMY (FRONT VIEW)

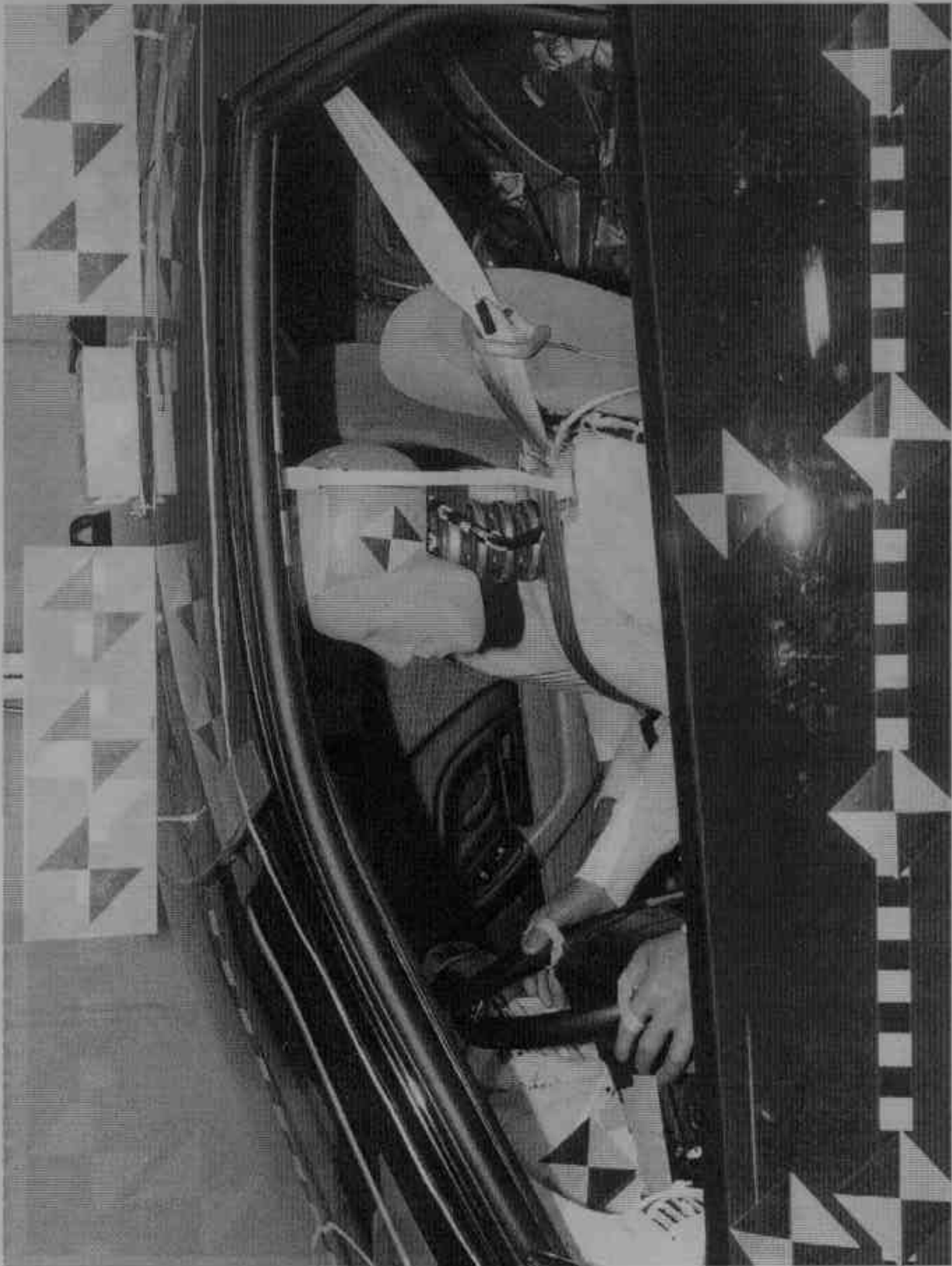


FIGURE A-29. PRETEST DRIVER DUMMY (THRU WINDOW)



FIGURE A-30. POST TEST DRIVER DUMMY (THRU WINDOW)

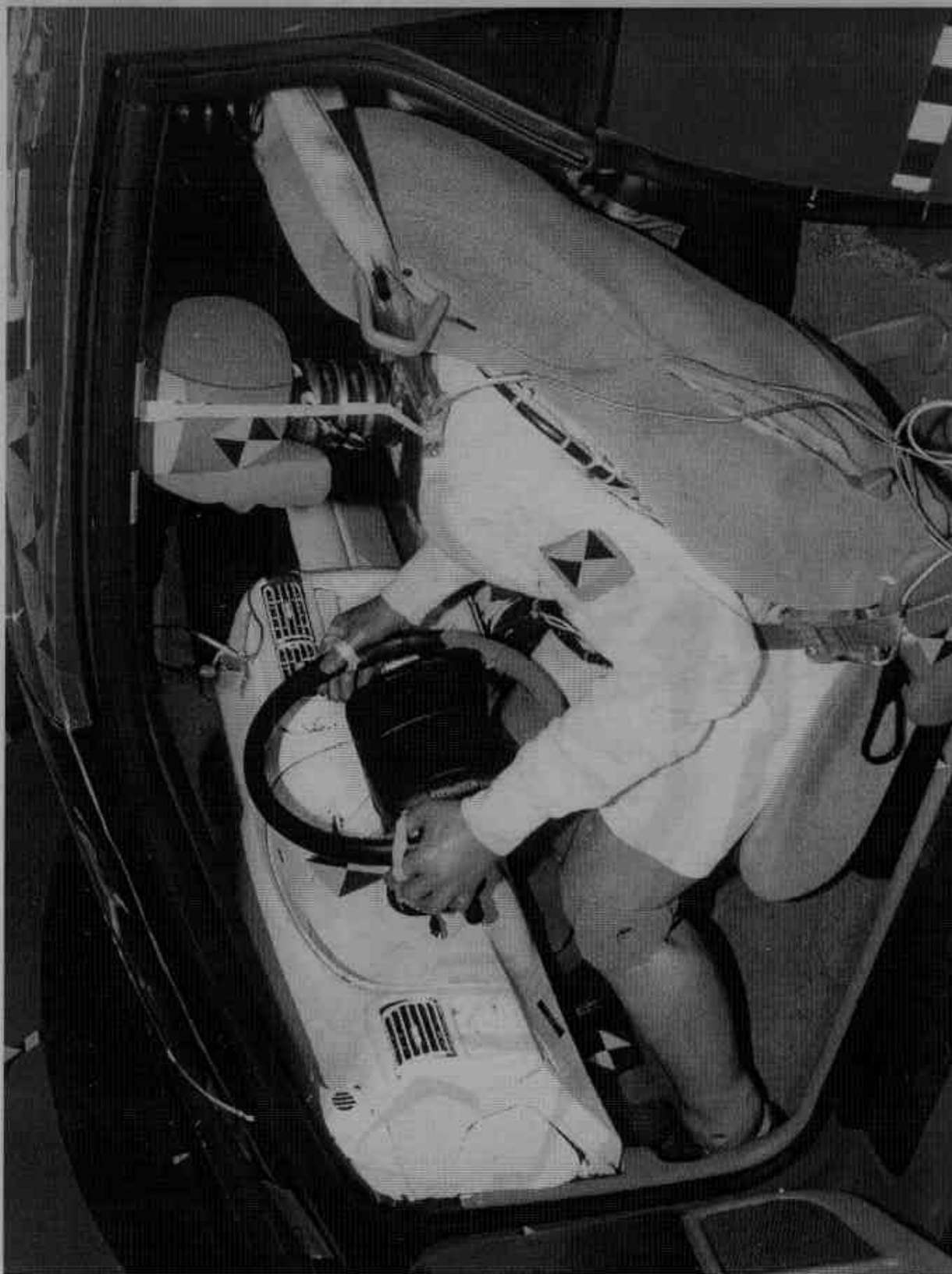


FIGURE A-31. PRETEST DRIVER DUMMY (DOOR OPEN)



FIGURE A-32. POST TEST DRIVER DUMMY (DOOR OPEN)



FIGURE A-33. PRE TEST DRIVER DUMMY (90° TO VEHICLE)



FIGURE A-34. POST TEST DRIVER DUMMY (90° TO VEHICLE)



FIGURE A-35. POST TEST DRIVER DUMMY HEAD

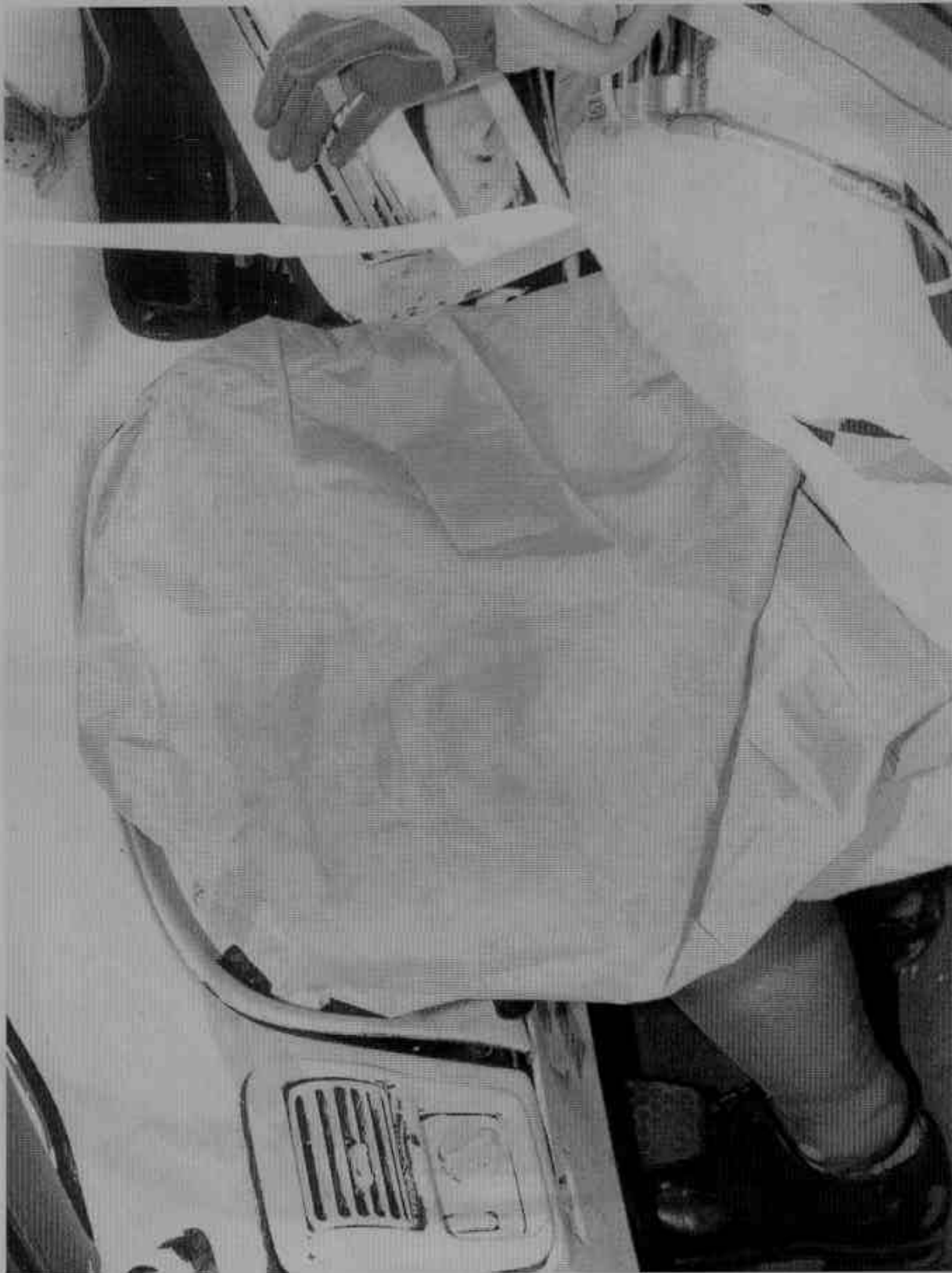


FIGURE A-36. POST TEST DRIVER DUMMY CONTACT POINT



FIGURE A-37. POST TEST DRIVER DUMMY CONTACT POINT

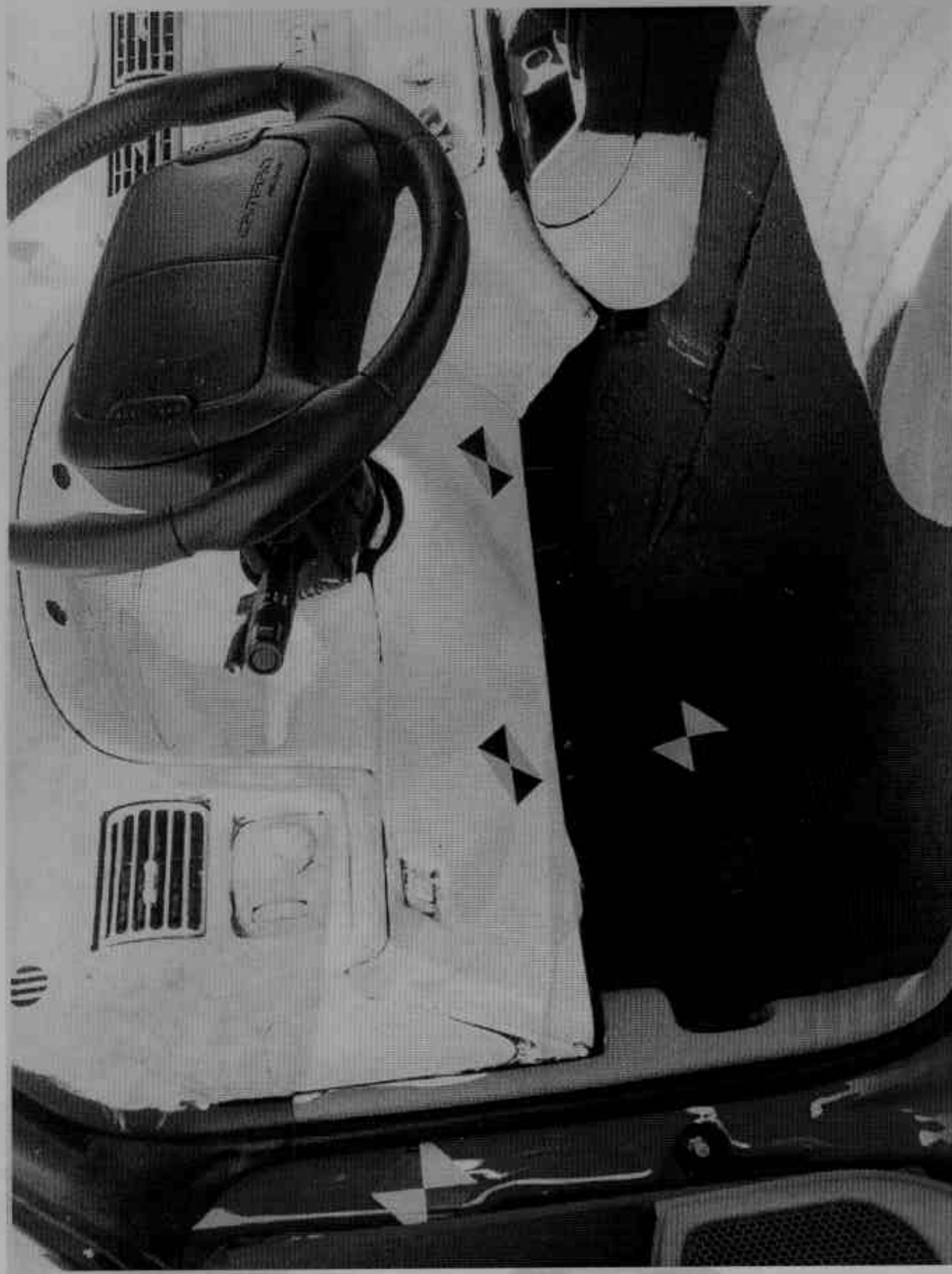


FIGURE A-38. PRETEST DRIVER SIDE KNEE BOLSTER

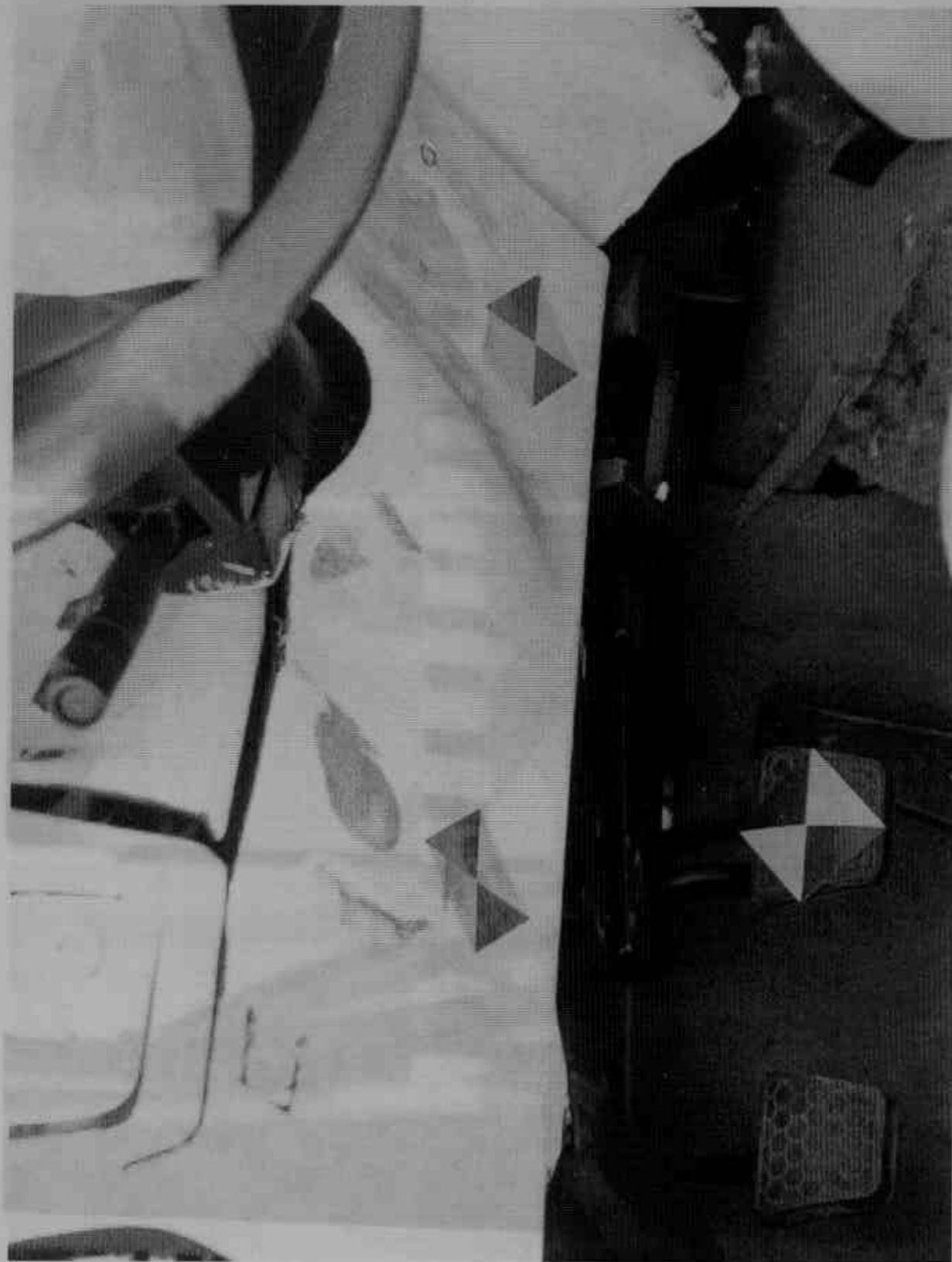


FIGURE A-39. POST TEST DRIVER KNEE BOLSTER

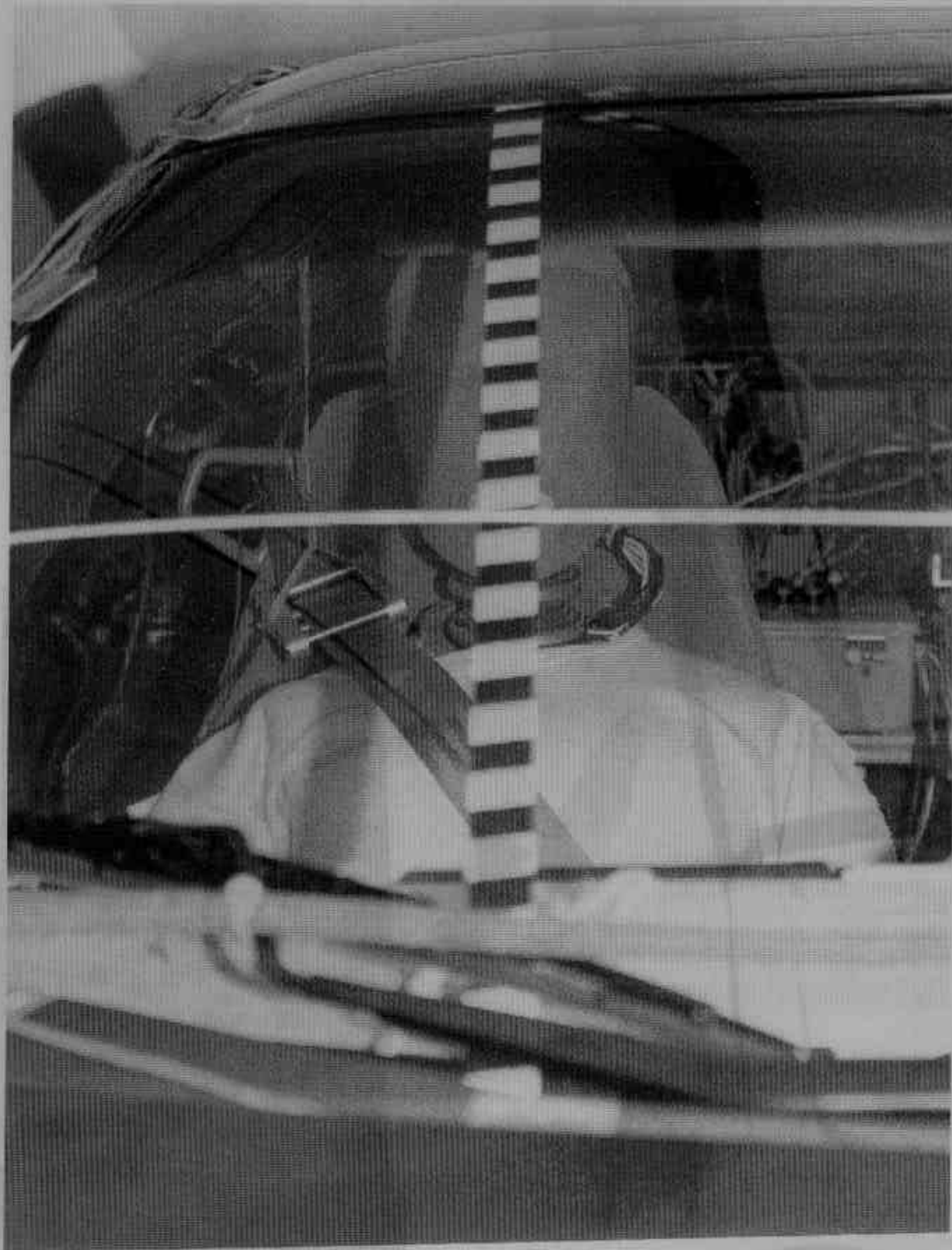


FIGURE A-40. PRETEST PASSENGER DUMMY (FRONT VIEW)



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

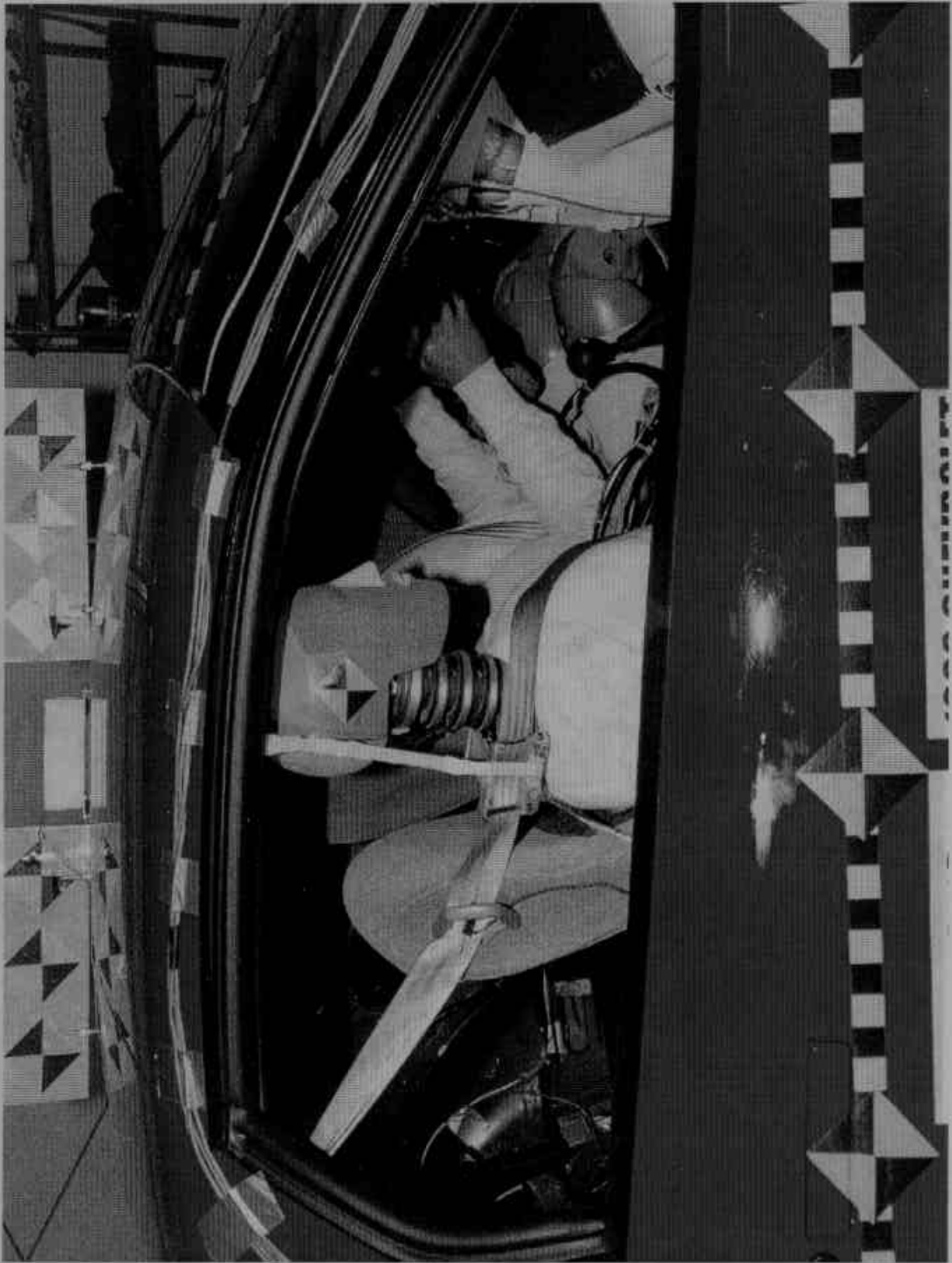


FIGURE A-42. PRETEST PASSENGER DUMMY (THRU WINDOW)



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

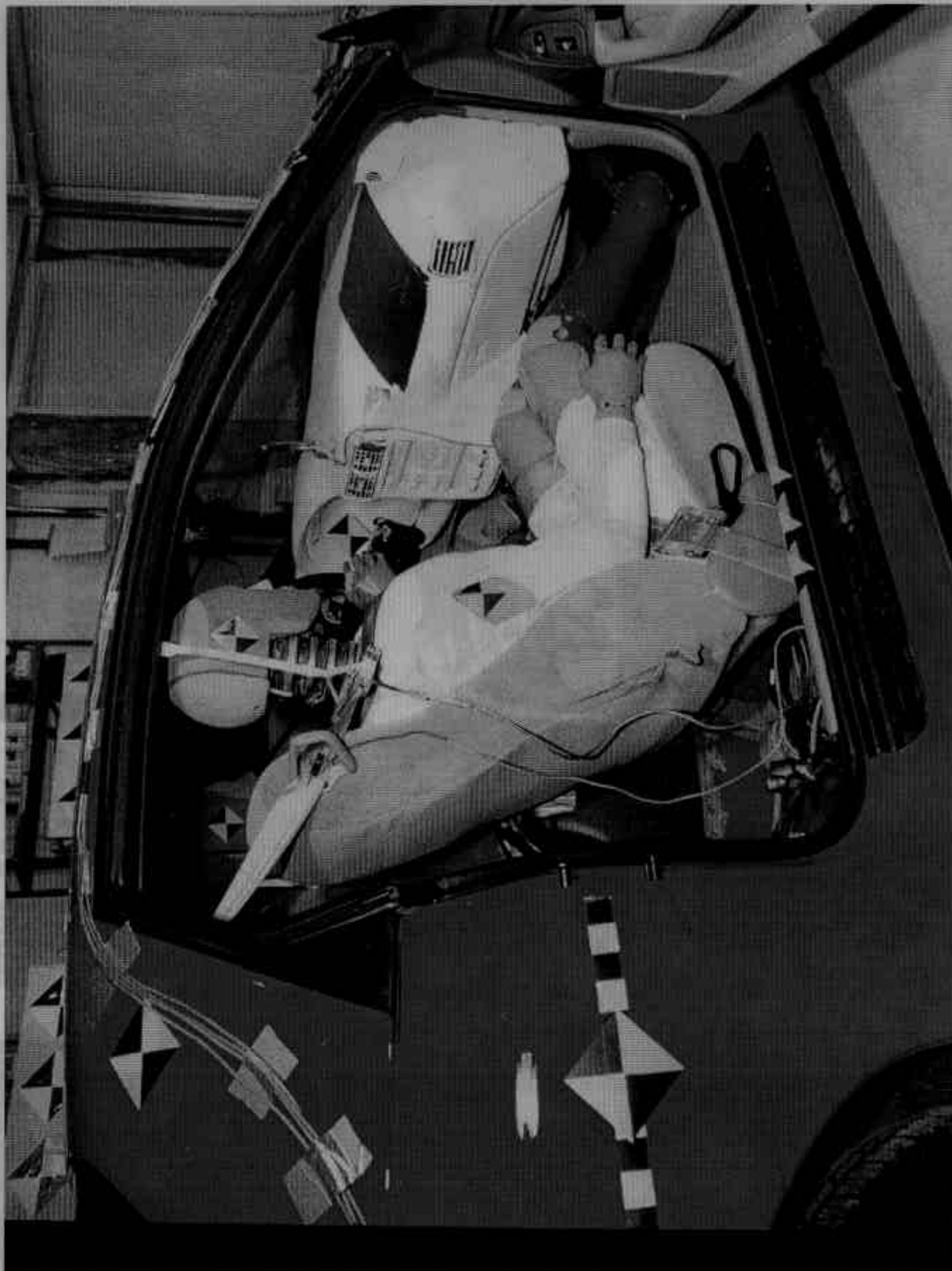


FIGURE A-44. PRETEST PASSENGER DUMMY (DOOR OPEN)



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



FIGURE A-46. PRETEST PASSENGER DUMMY (90° TO VEHICLE)



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

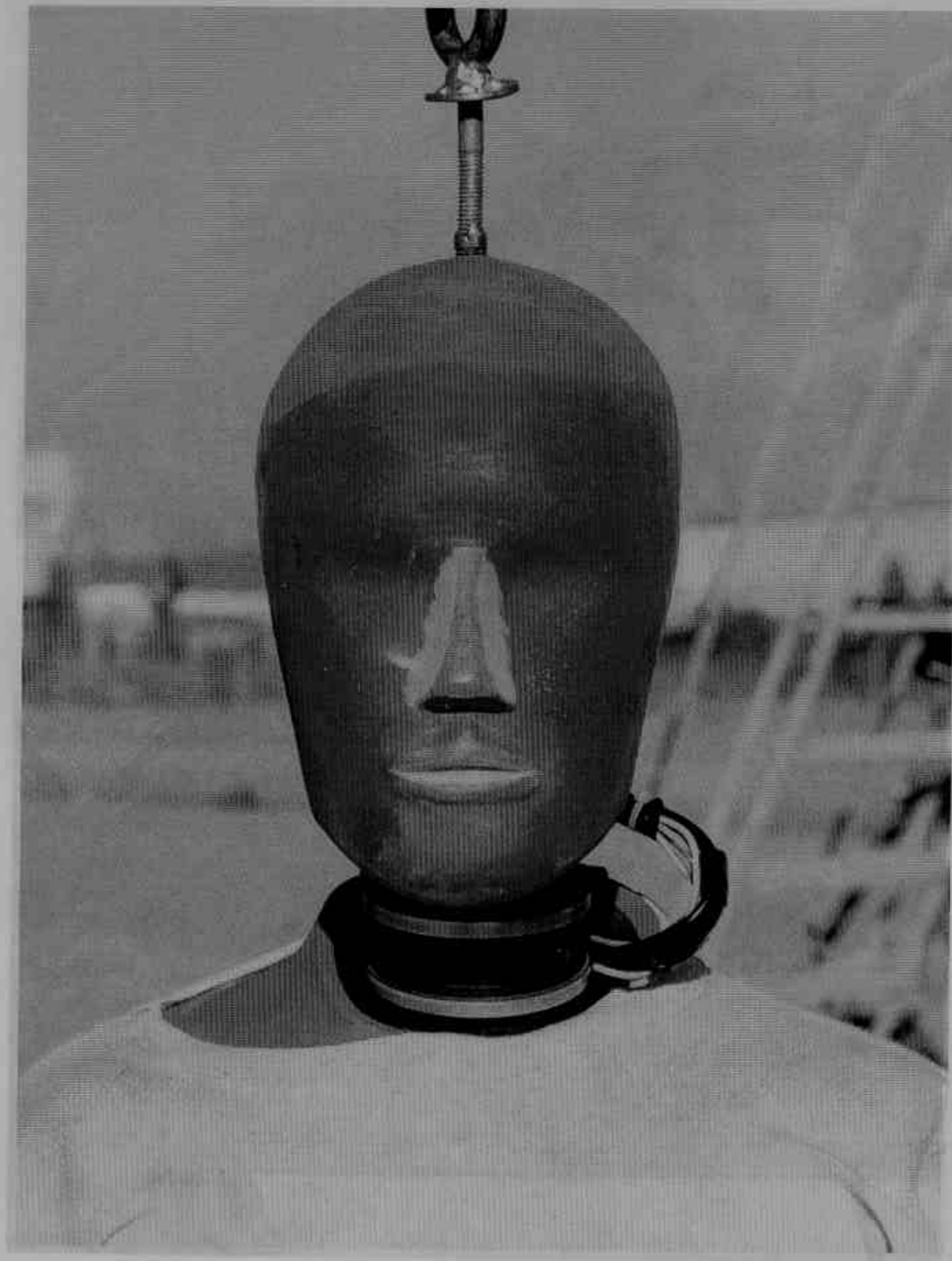


FIGURE A-48. POST TEST PASSENGER DUMMY HEAD

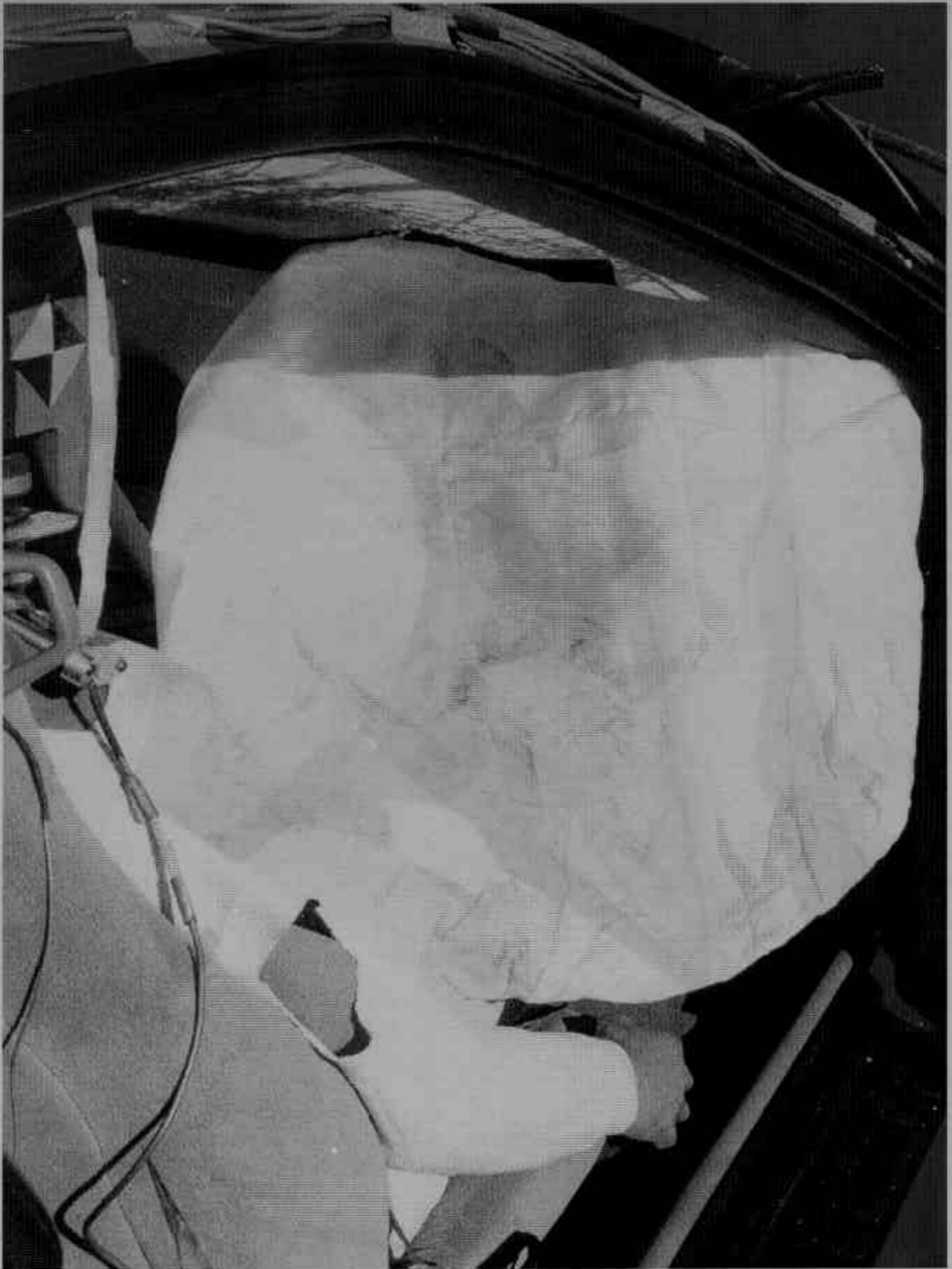


FIGURE A-49. POST TEST PASSENGER DUMMY CONTACT POINT



FIGURE A-50. POST TEST PASSENGER DUMMY CONTACT POINT

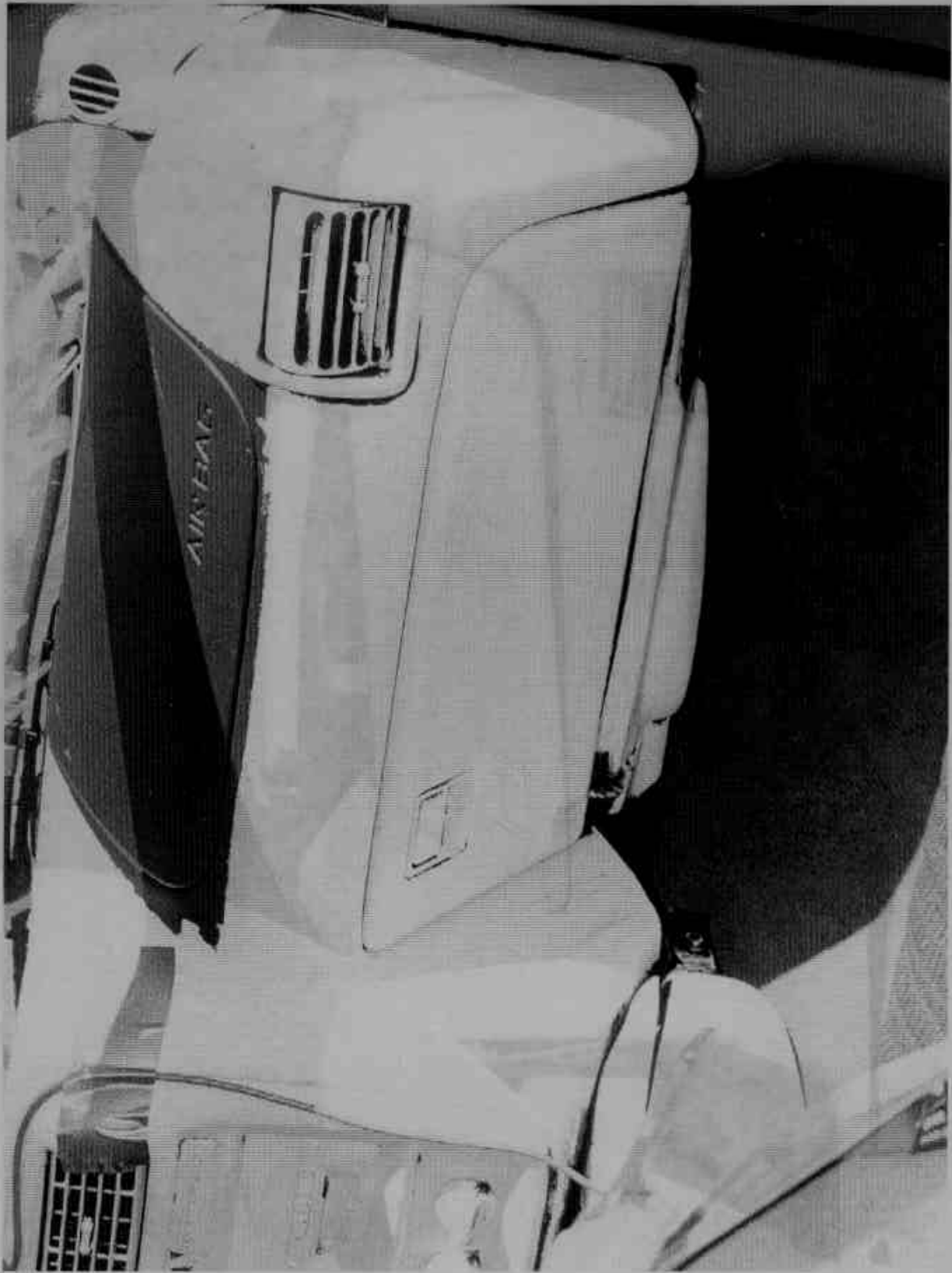


FIGURE A-51. PRETEST PASSENGER SIDE KNEE BOLSTER

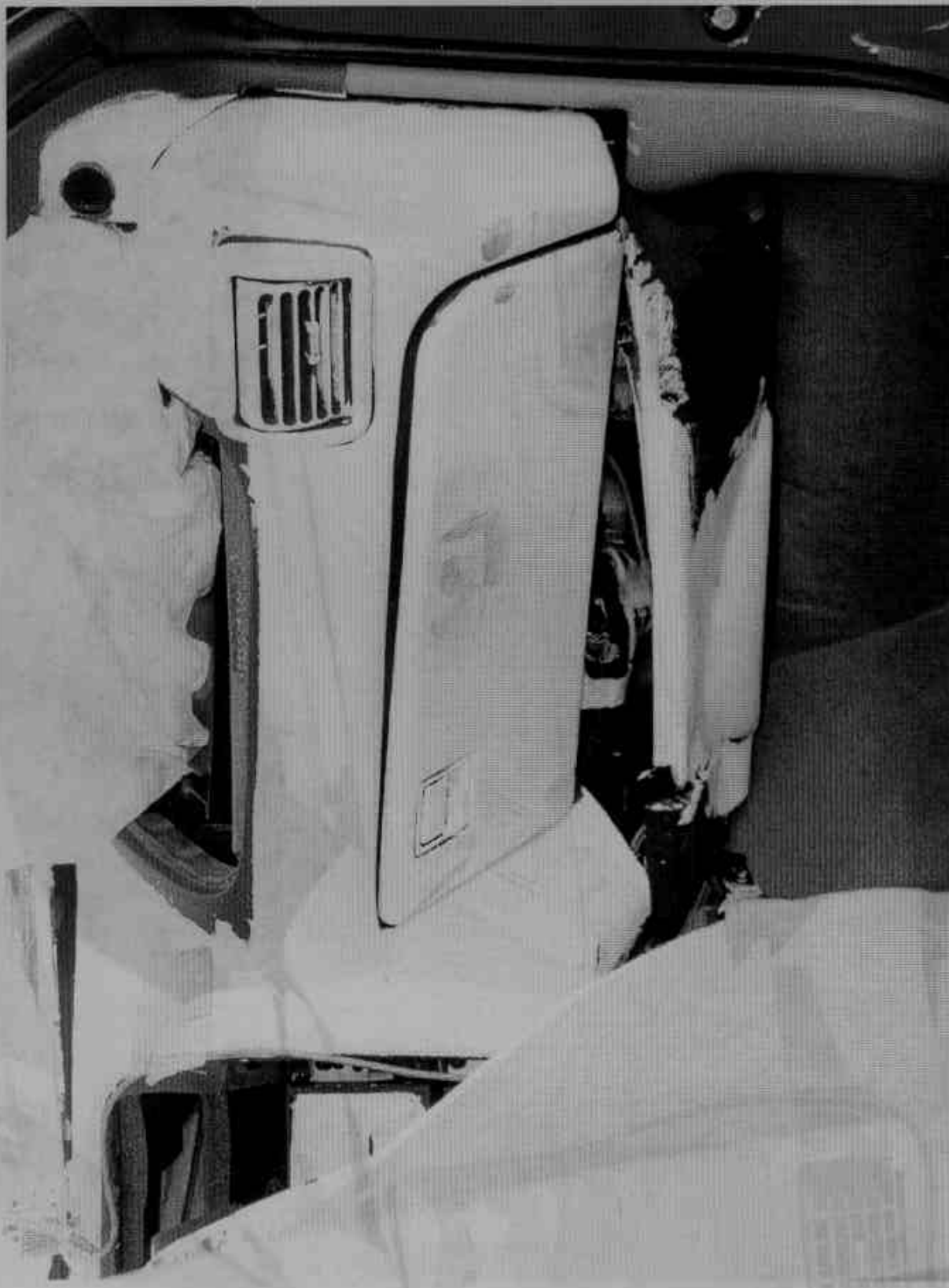


FIGURE A-52. POST TEST PASSENGER SIDE KNEE BOLSTER

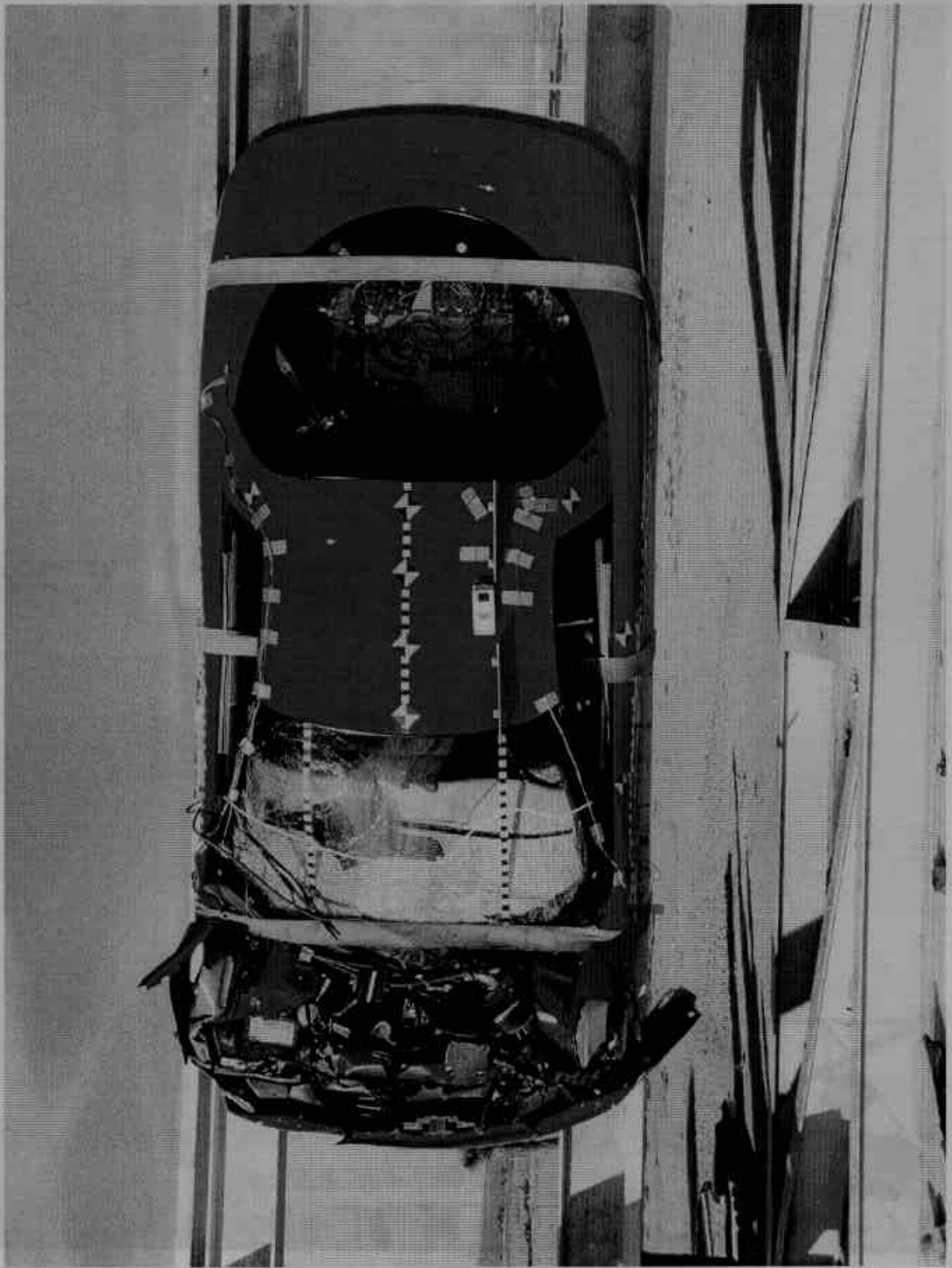


FIGURE A-53. VEHICLE ON ROLLOVER

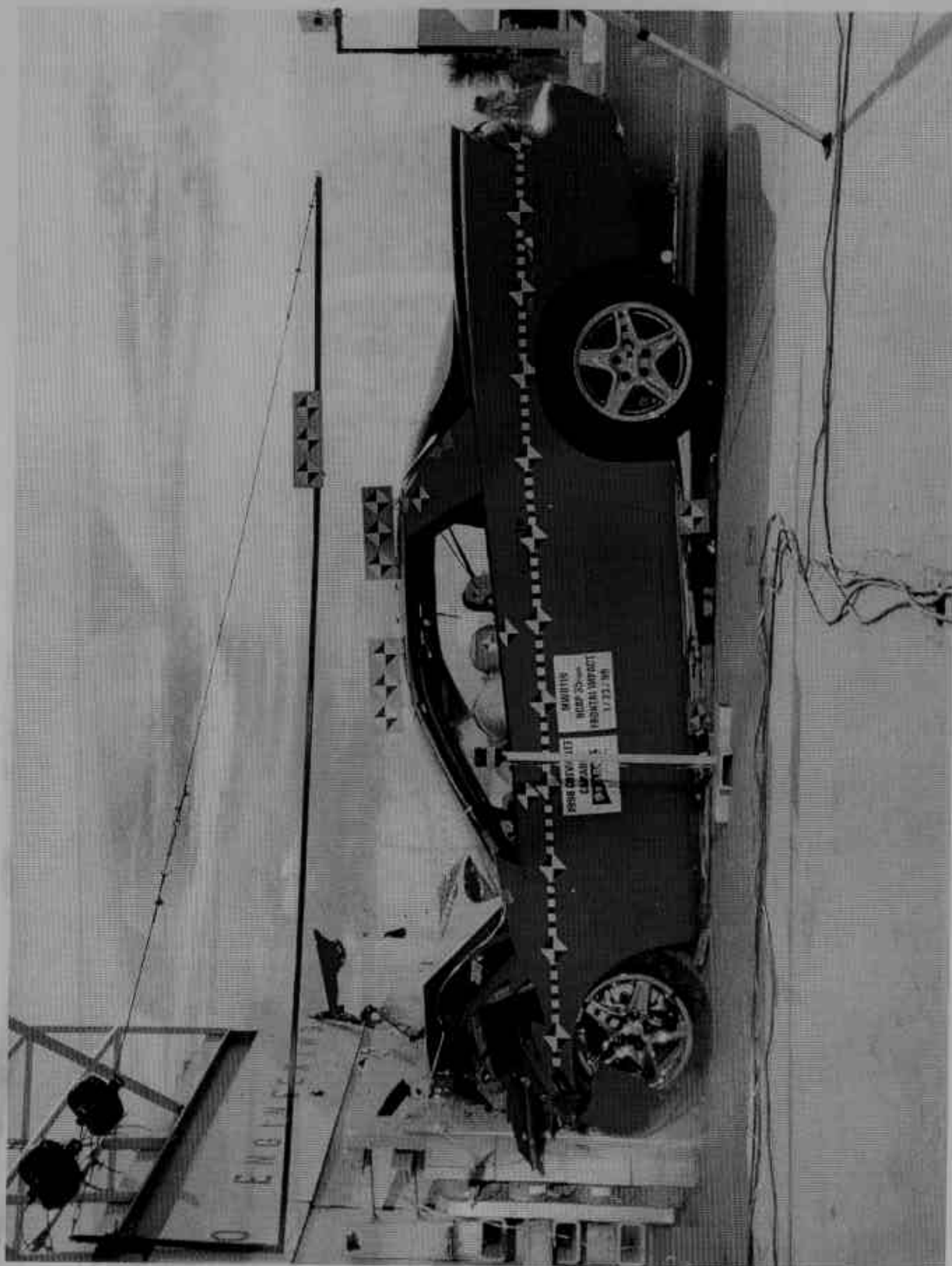


FIGURE A-54. VEHICLE DURING IMPACT

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FIGURE A-55. POST TEST WINDSHIELD CLOSE-UP

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APPENDIX B
DUMMY, VEHICLE AND RESPONSE DATA TRACES

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B-48	Driver Left Lower Tibia Moment Y	B-48
B-49	Driver Right Lower Tibia Force X	B-49
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B-57	Driver Right Foot Fore Z	B-57
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LIST OF DATA PLOTS...(Continued)

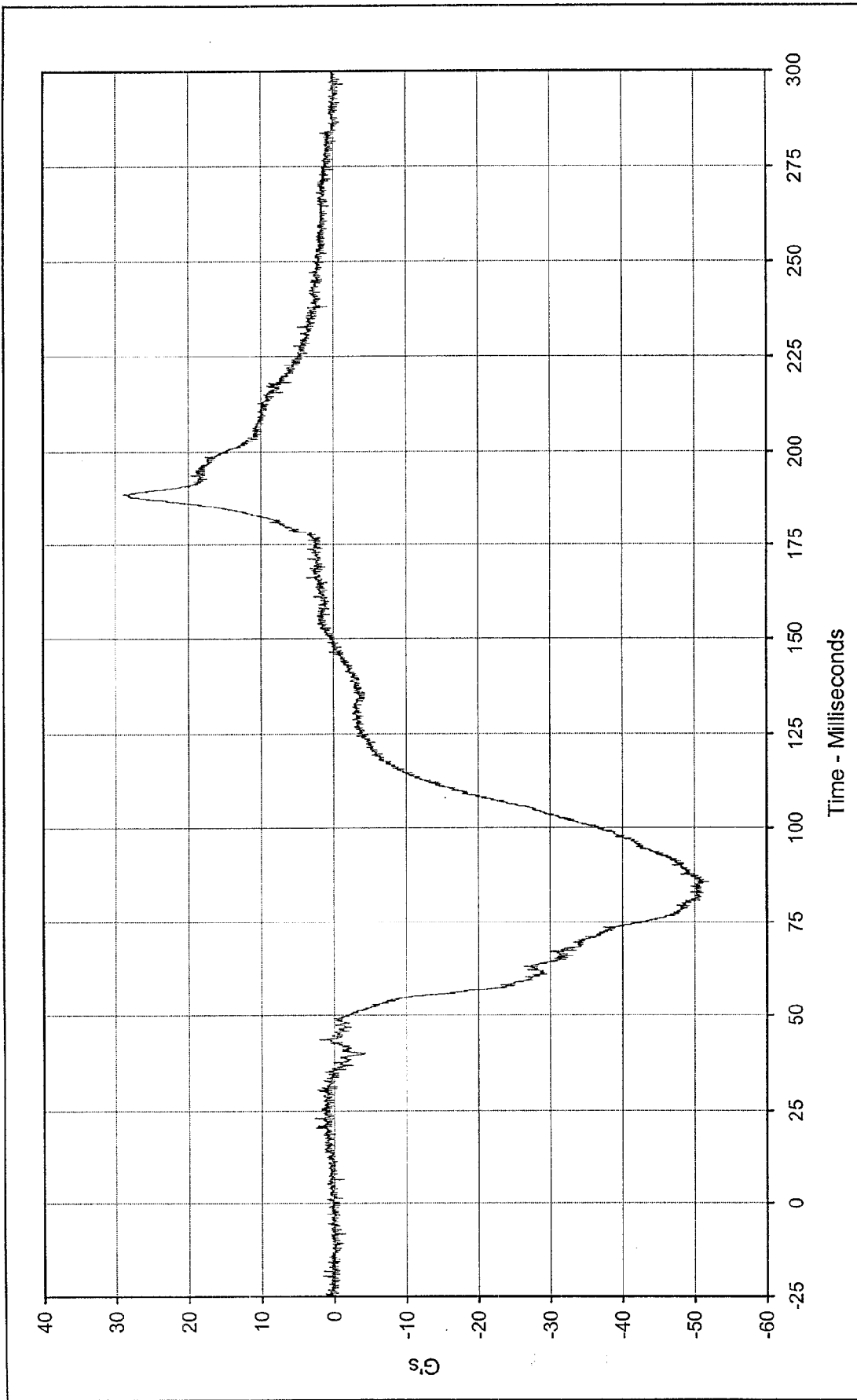
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B-131	Vehicle Engine Top Displacement	B-131
B-132	Vehicle Engine Bottom X	B-132
B-133	Vehicle Engine Bottom Velocity X	B-133
B-134	Vehicle Engine Bottom Displacement	B-134
B-135	Vehicle Left Brake Caliper X	B-135
B-136	Vehicle Left Brake Caliper Velocity X	B-136
B-137	Vehicle Left Brake Caliper Displacement	B-137
B-138	Vehicle Right Brake Caliper X	B-138
B-139	Vehicle Right Brake Caliper Velocity X	B-139
B-140	Vehicle Right Brake Caliper Displacement	B-140

LIST OF DATA PLOTS...(Continued)

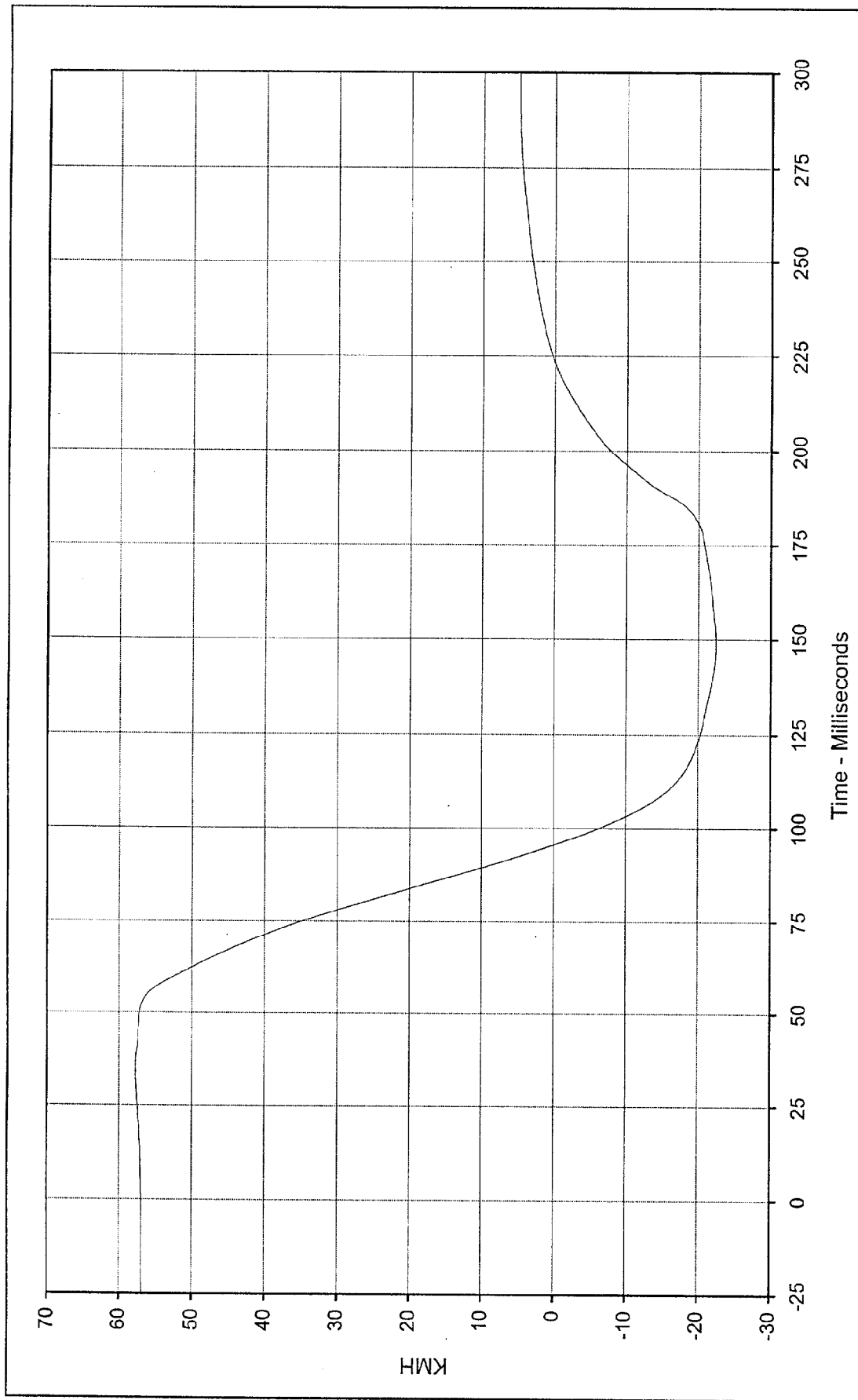
Data Plot		Page
B-141	Vehicle Instrument Panel X	B-141
B-142	Vehicle Instrument Panel Velocity X	B-142
B-143	Vehicle Instrument Panel Displacement	B-143
B-144	Vehicle Left Rear Redundant X	B-144
B-145	Vehicle Left Rear Redundant Velocity X	B-145
B-146	Vehicle Left Rear Redundant Displacement	B-146



Curve Description: Driver Head Primary X
 Maximum Value: 28.9 at 188.6 Milliseconds
 Minimum Value: -52.0 at 85.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-001

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

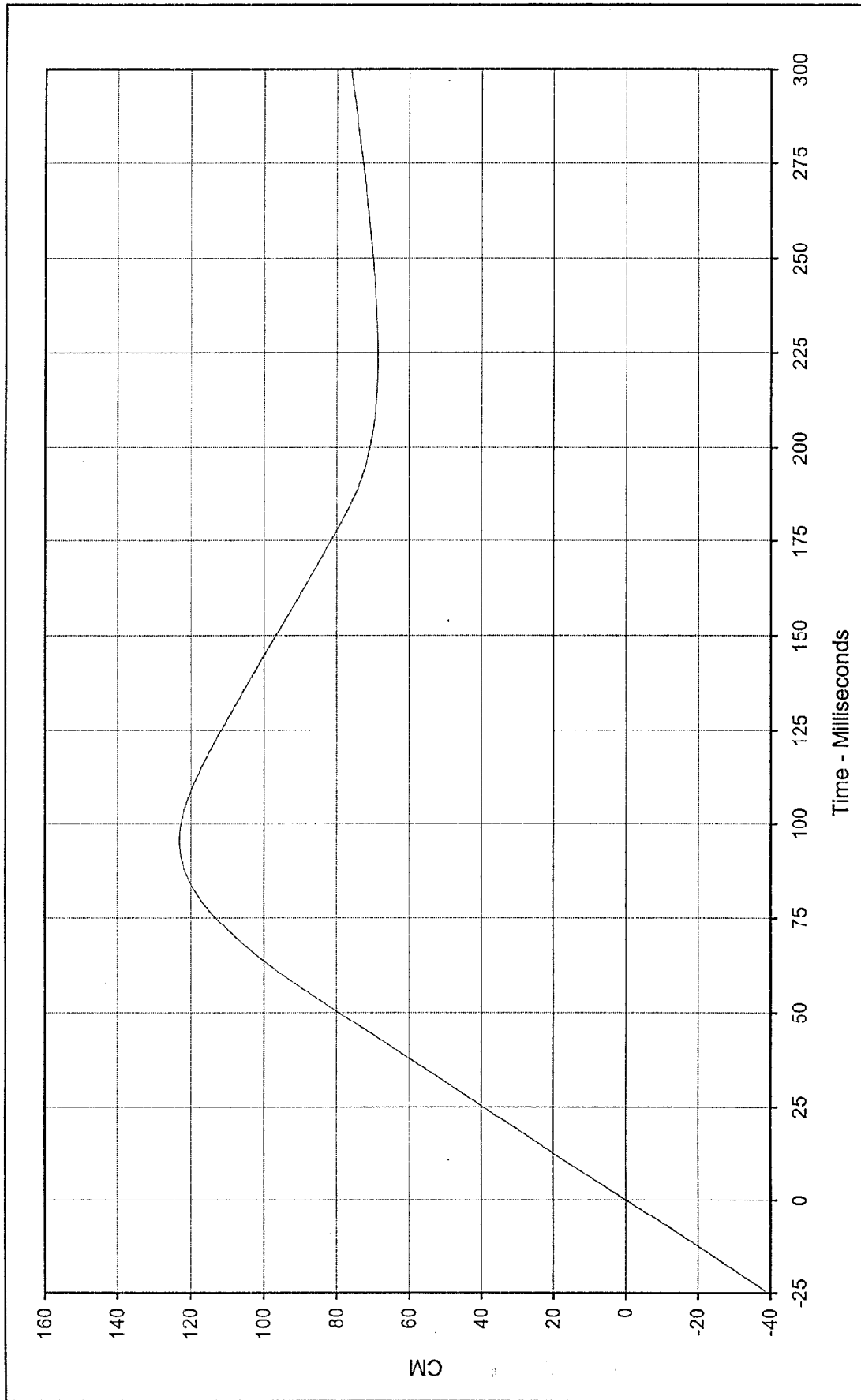




Curve Description: Driver Head Primary X Velocity
 Maximum Value: 57.8 at 35.5 Milliseconds
 Minimum Value: -22.5 at 148.5 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-001

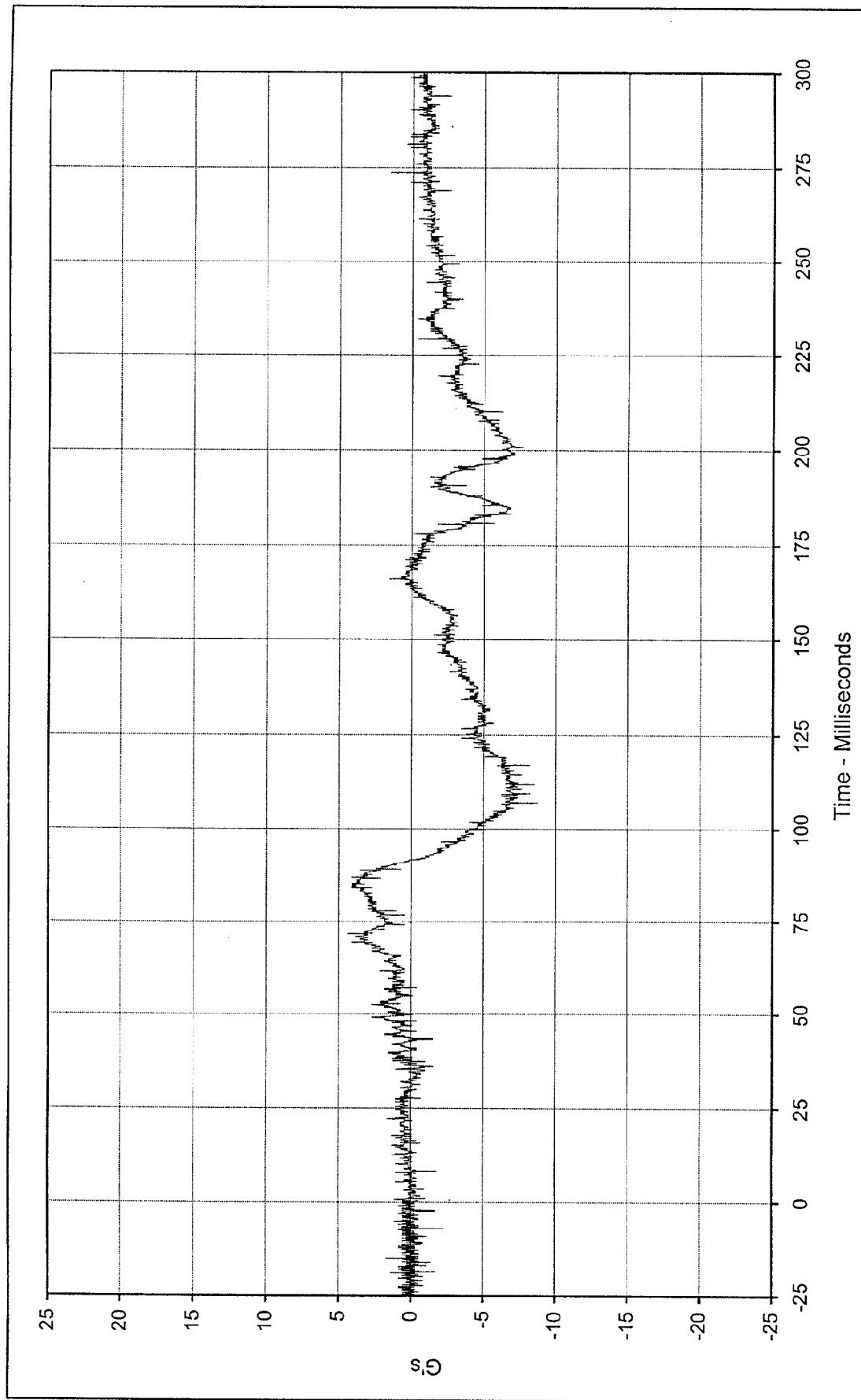
Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





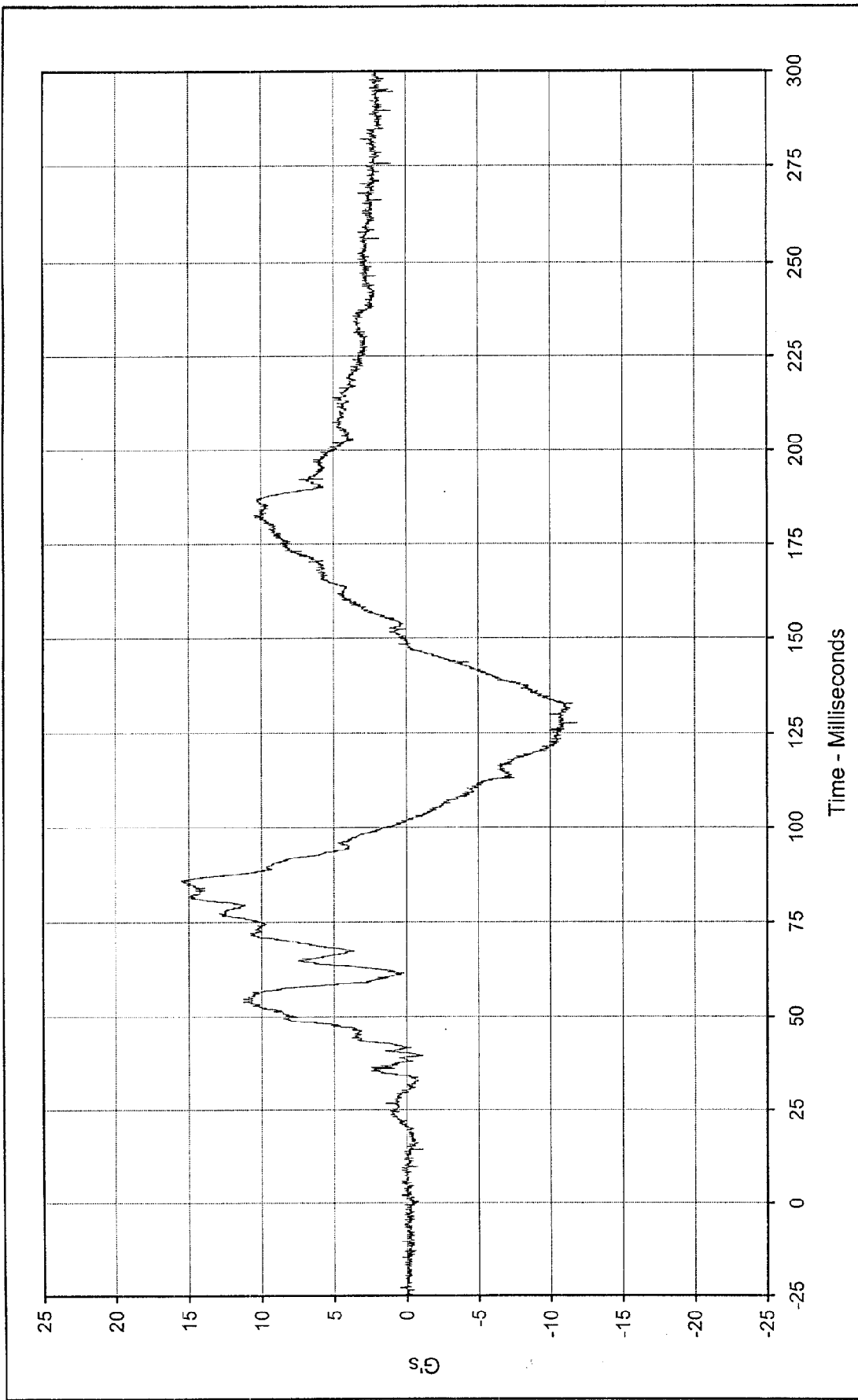
Curve Description:	Driver Head Primary X Displ.	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	123.1	at	95.6	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/23/98	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Curve Number:	IN2-001			





Curve Description: Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 4.4 at 71.7 Milliseconds
 Minimum Value: -8.8 at 107.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-002

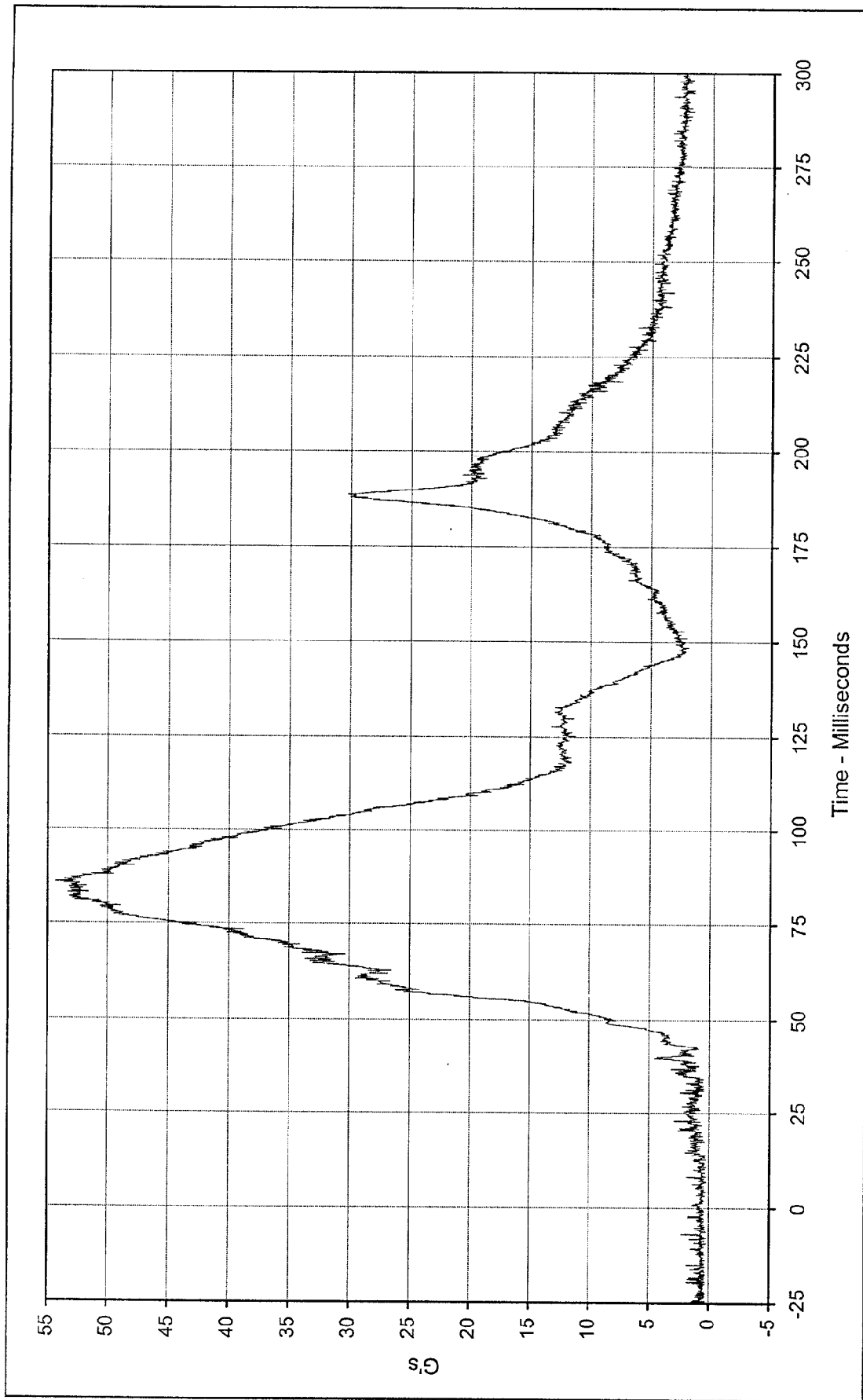




Curve Description: Driver Head Primary Z
 Maximum Value: 15.5 at 85.8 Milliseconds
 Minimum Value: -11.9 at 127.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-003

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

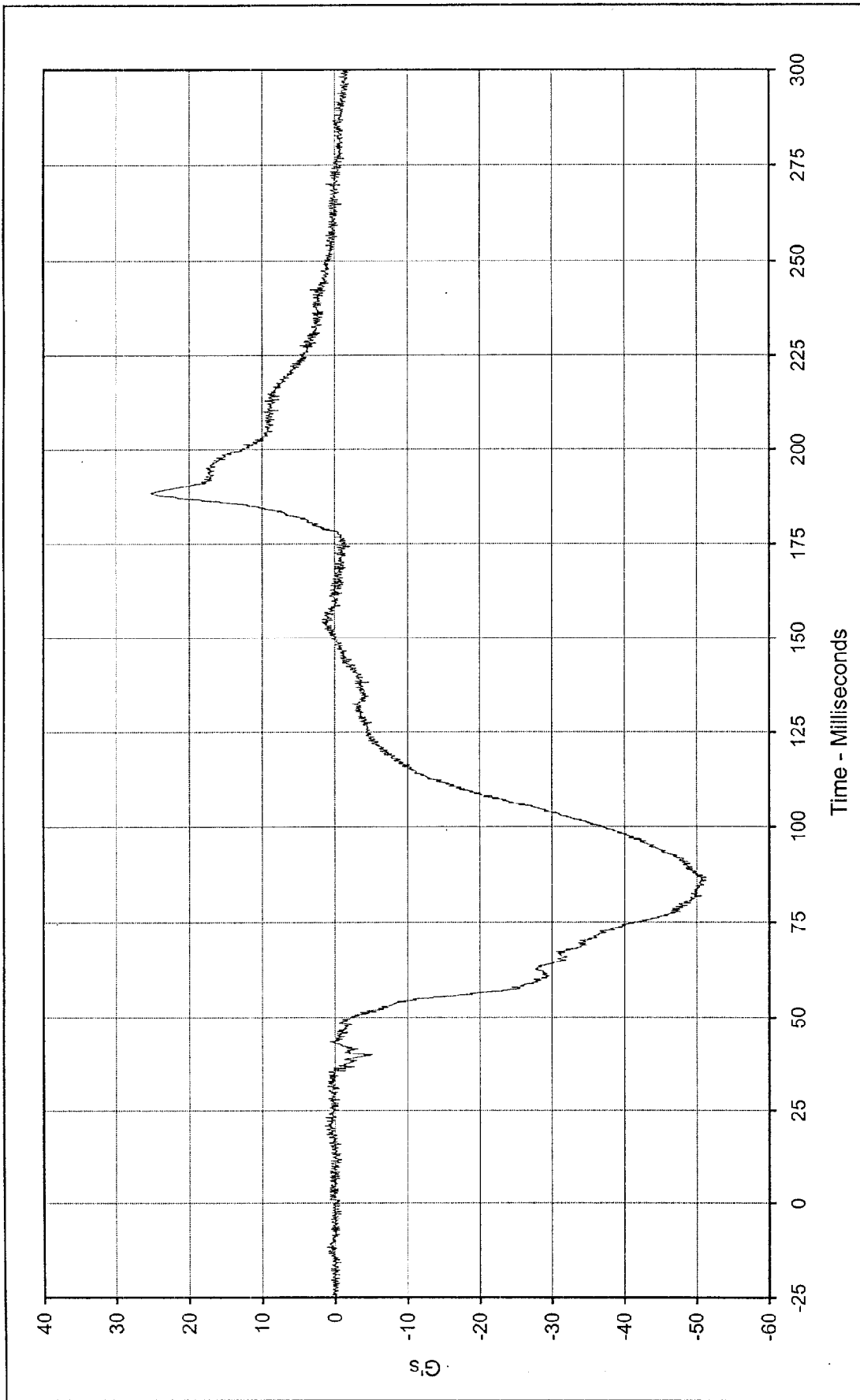




Curve Description: Driver Head Resultant Primary
 Maximum Value: 54.3 at 85.7 Milliseconds
 Minimum Value: 0.2 at 6.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: RES-001

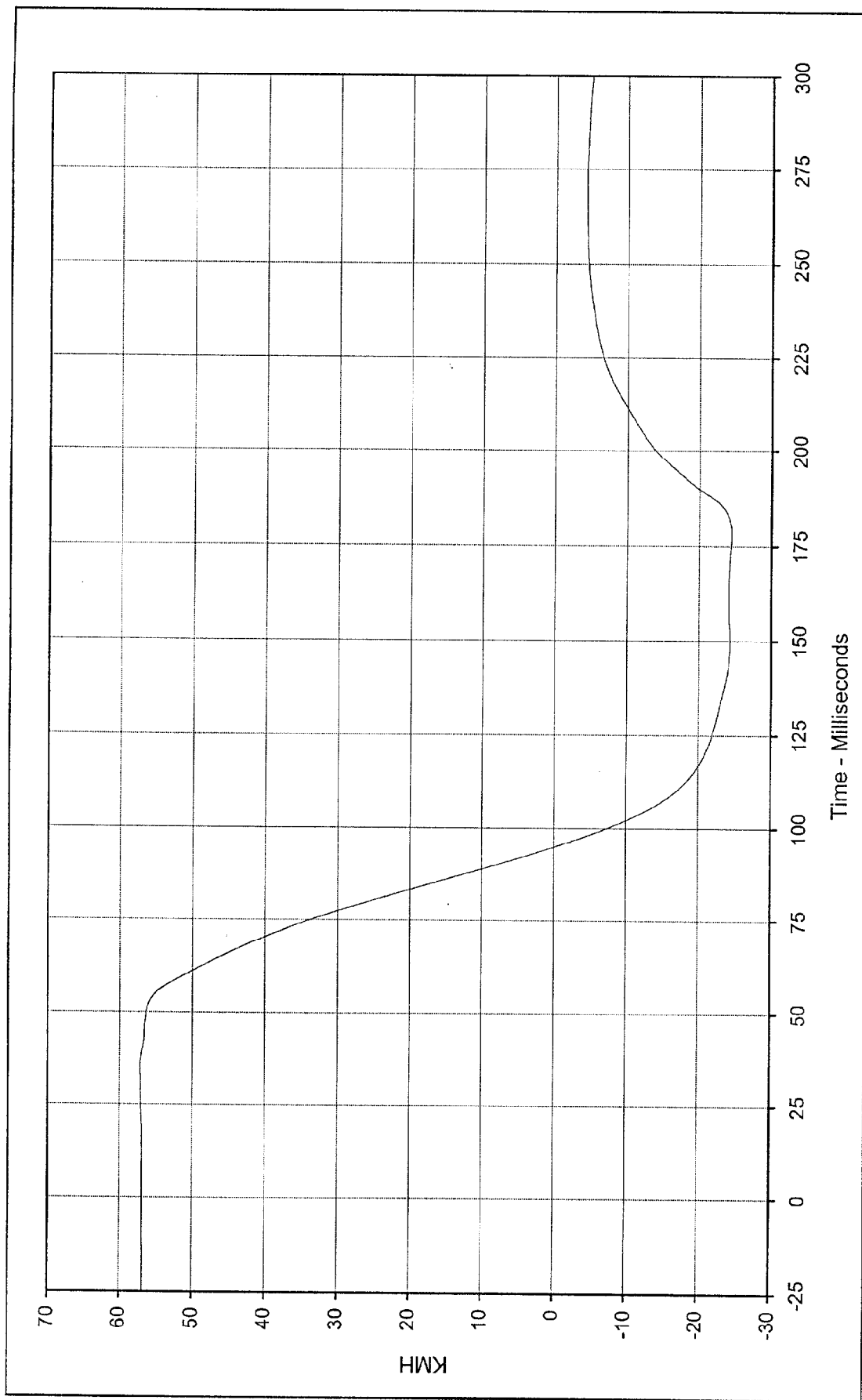
Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Driver Head Redundant X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	25.2 at 188.5 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-51.3 at 85.7 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	FIL-004			

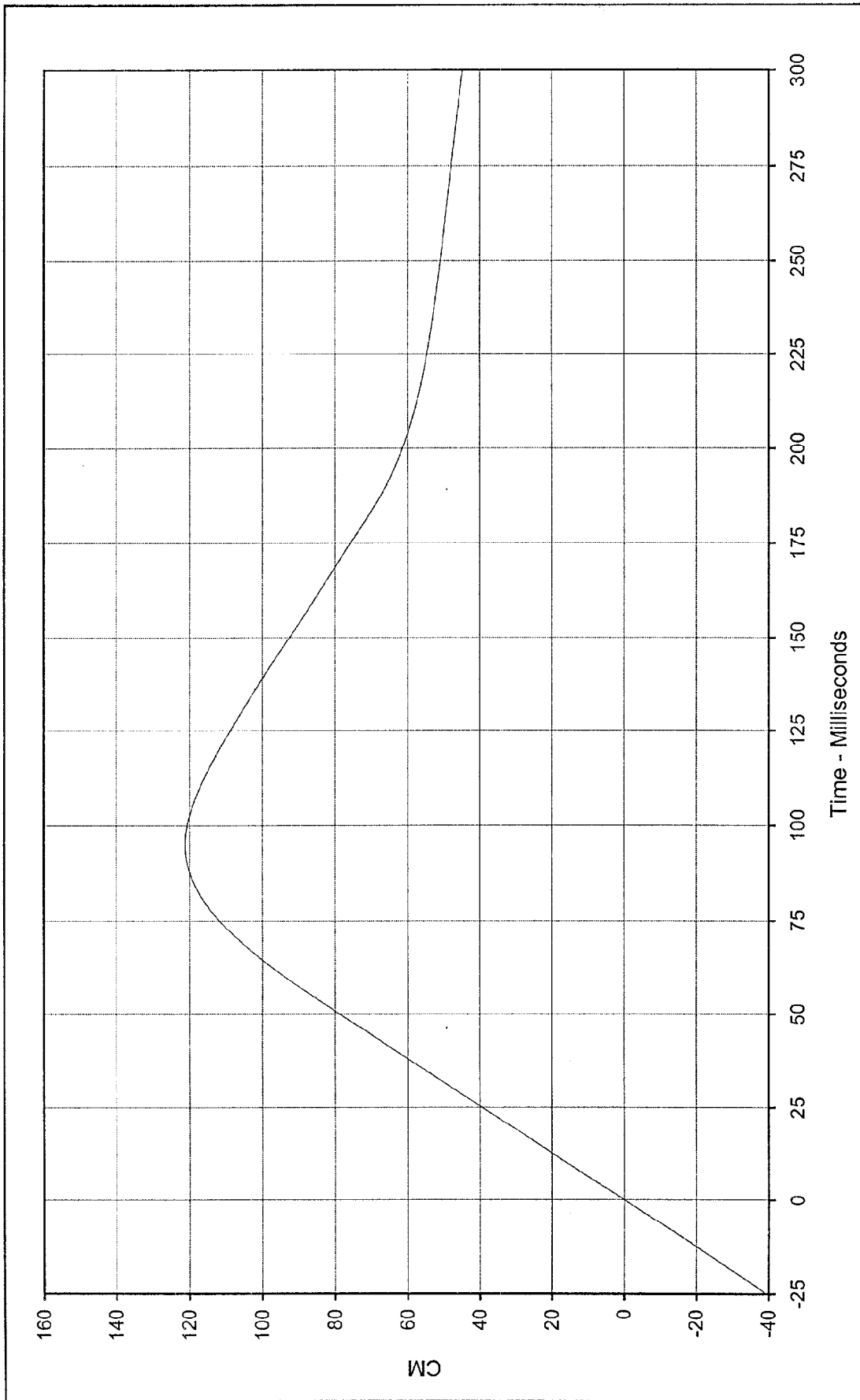




Curve Description: Driver Head Redundant X Velocity
 Maximum Value: 57.1 at 35.4 Milliseconds
 Minimum Value: -24.5 at 178.2 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-004

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

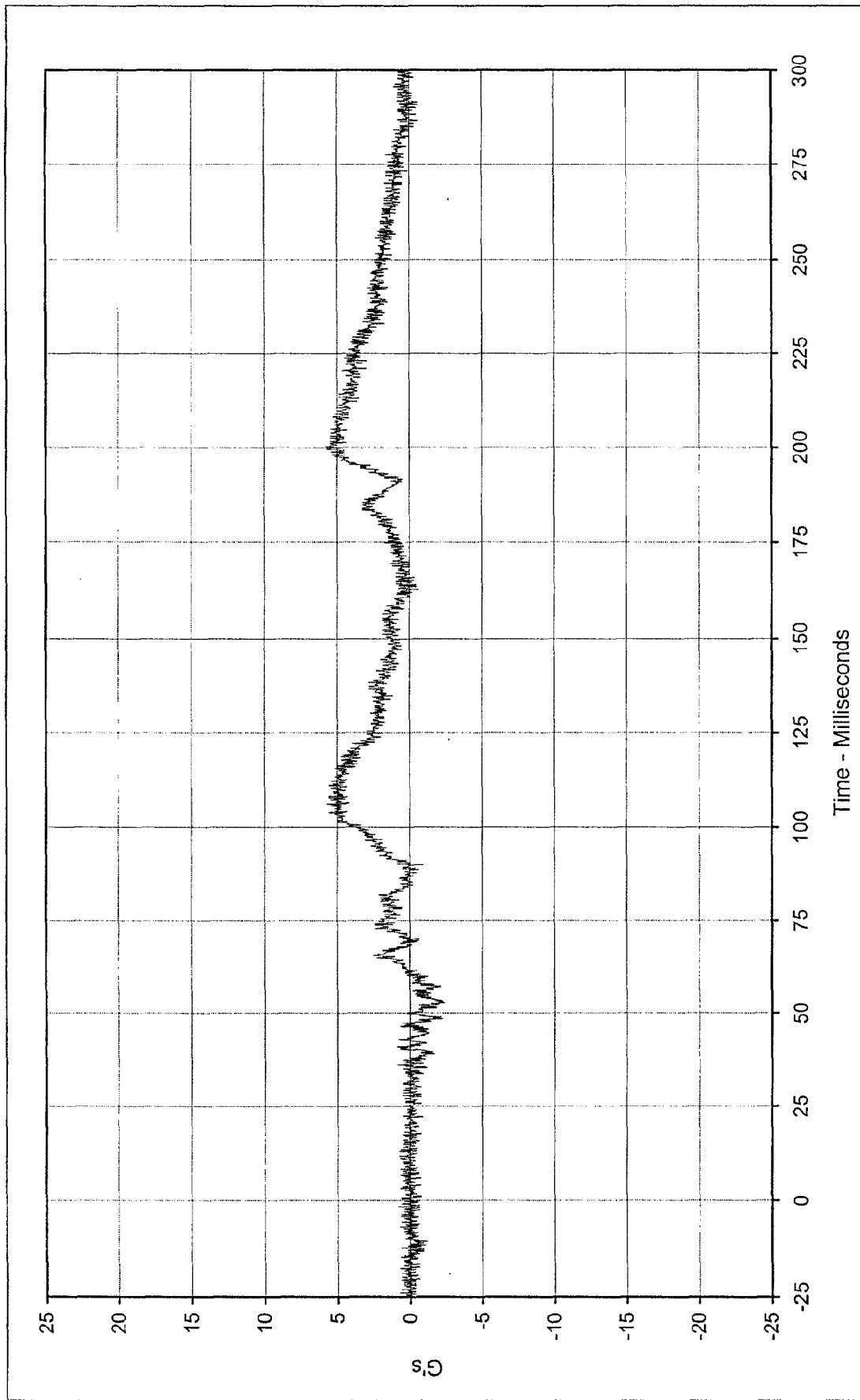




Curve Description: Driver Head Redundant X Displ.
Maximum Value: 121.1 at 94.9 Milliseconds
Minimum Value: -0.1 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 1/23/98
Curve Number: IN2-004

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

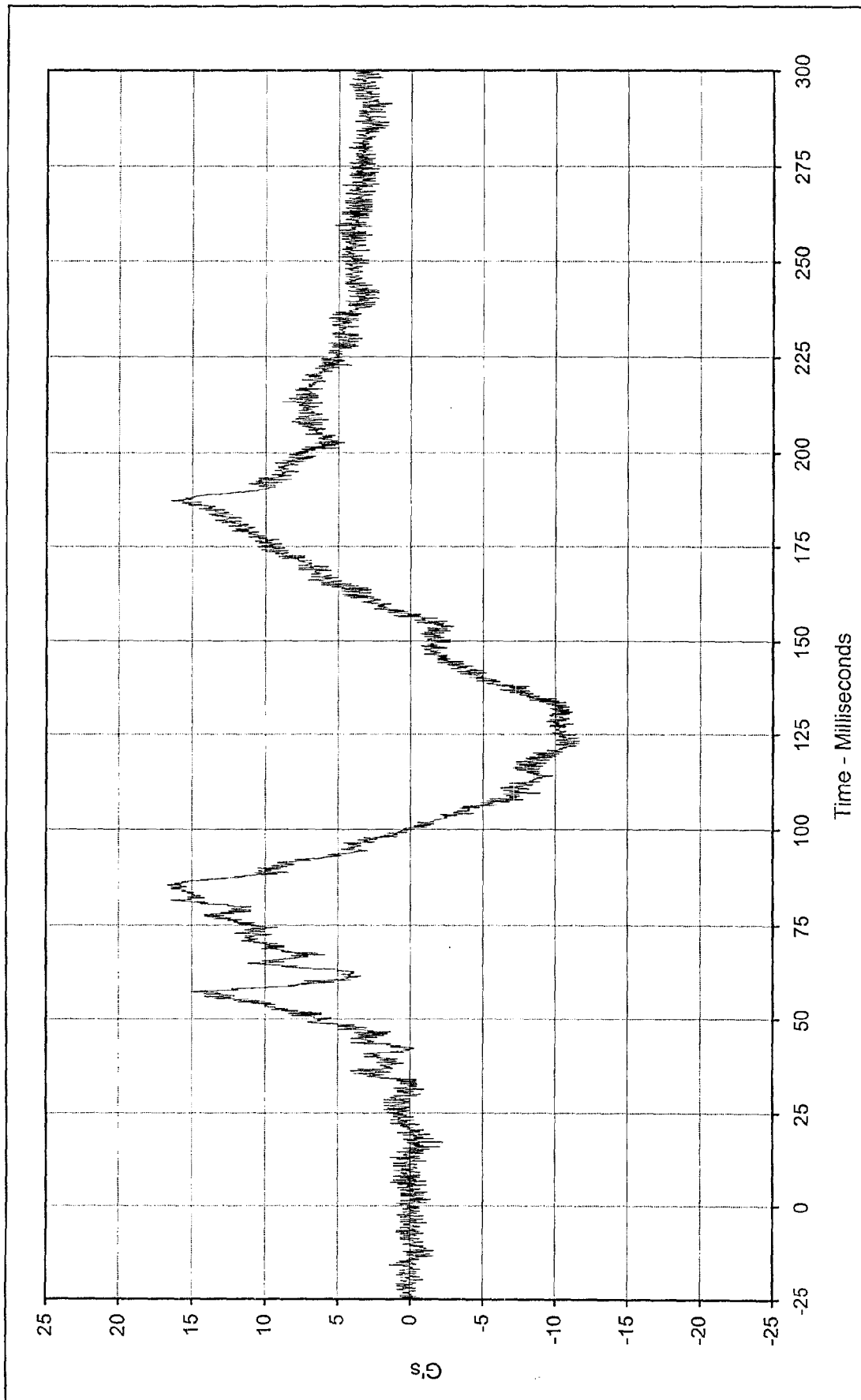




Curve Description: Driver Head Redundant Y
 Maximum Value: 5.7 at 106.1 Milliseconds
 Minimum Value: -2.4 at 52.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-005

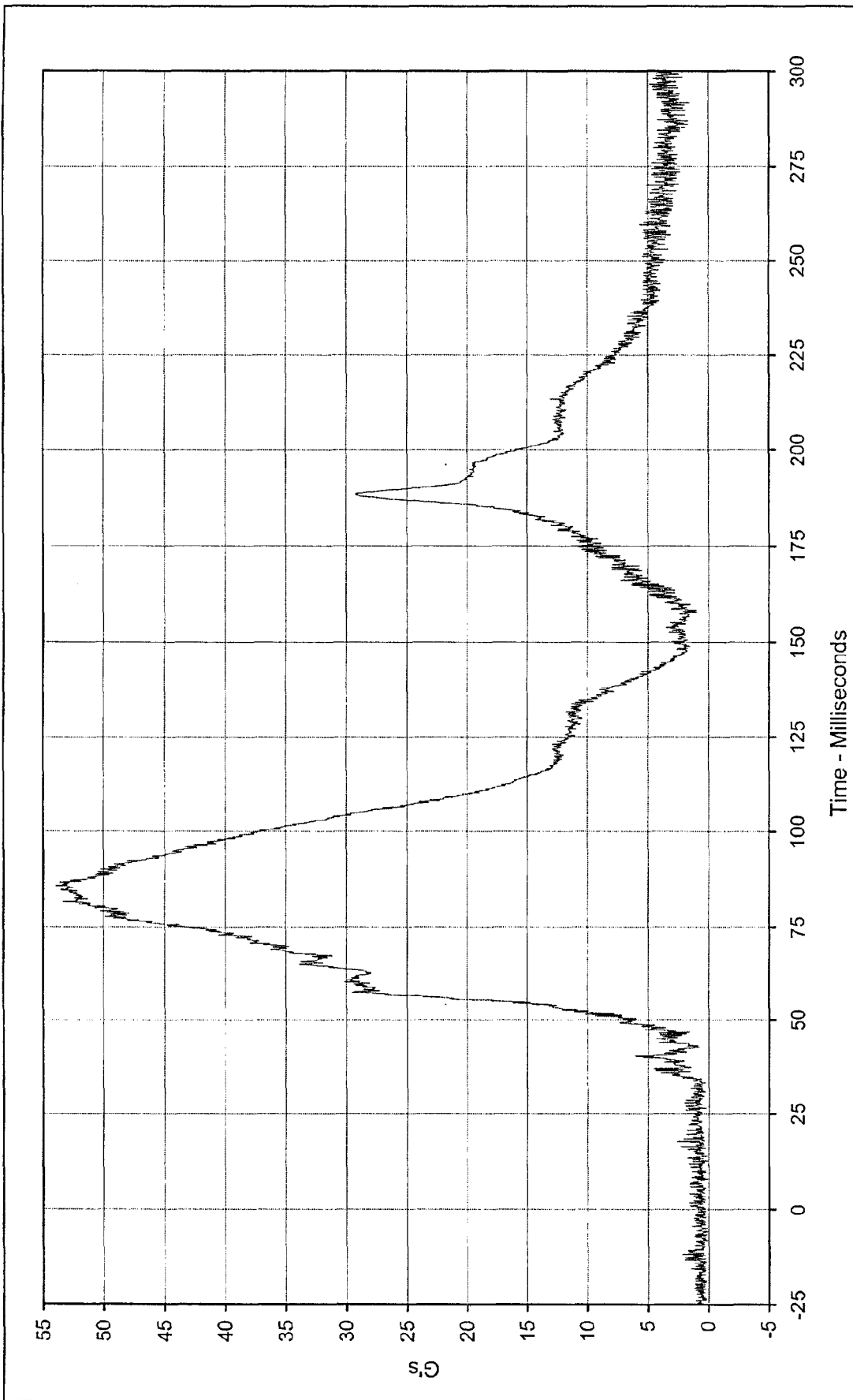
Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Driver Head Redundant Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	16.6 at 85.7 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-11.7 at 122.5 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	FIL-006			

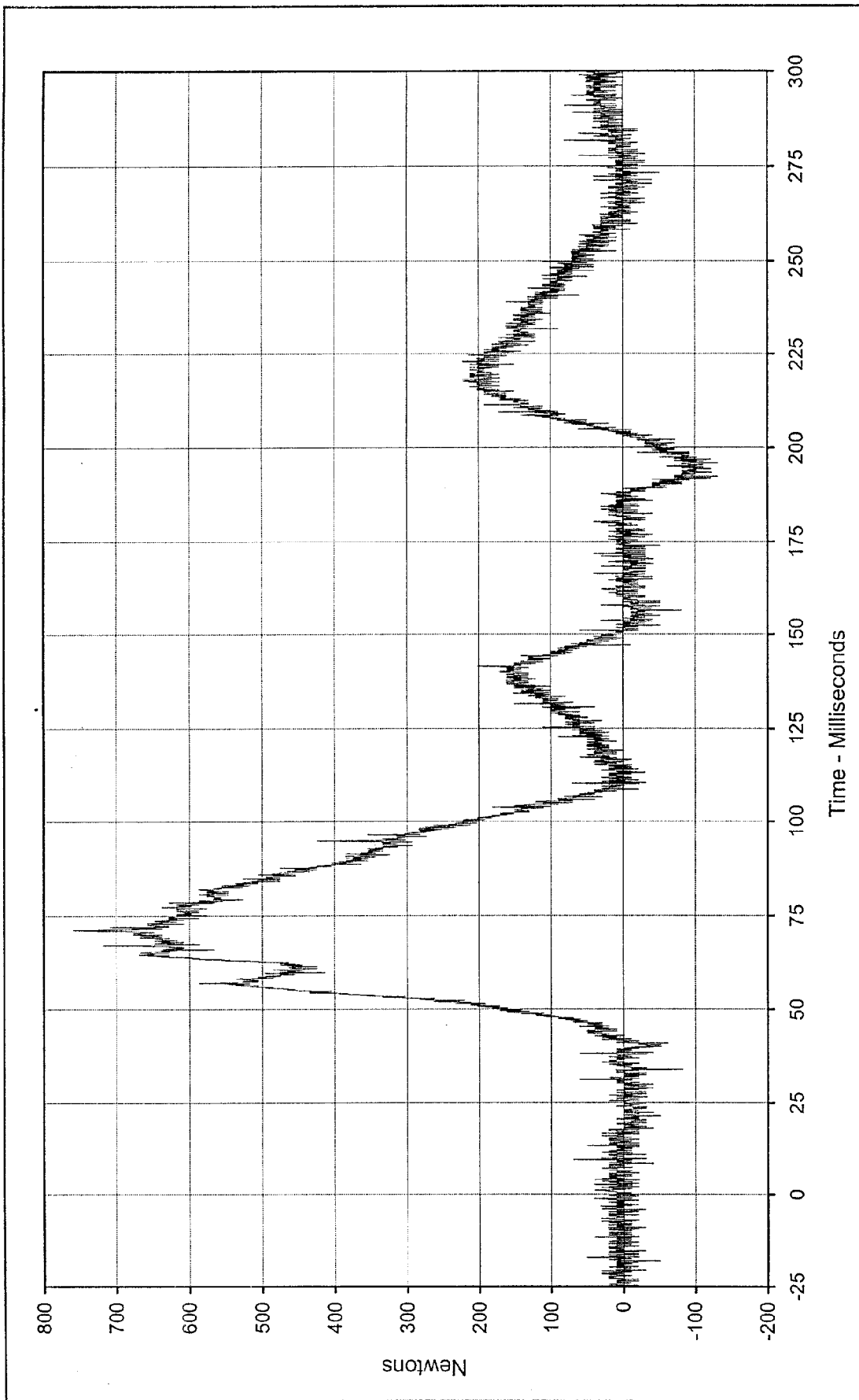




Curve Description: Driver Head Resultant Redundant
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Maximum Value: 53.9 at 85.7 Milliseconds
 Minimum Value: 0.1 at 12.5 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: RES-004

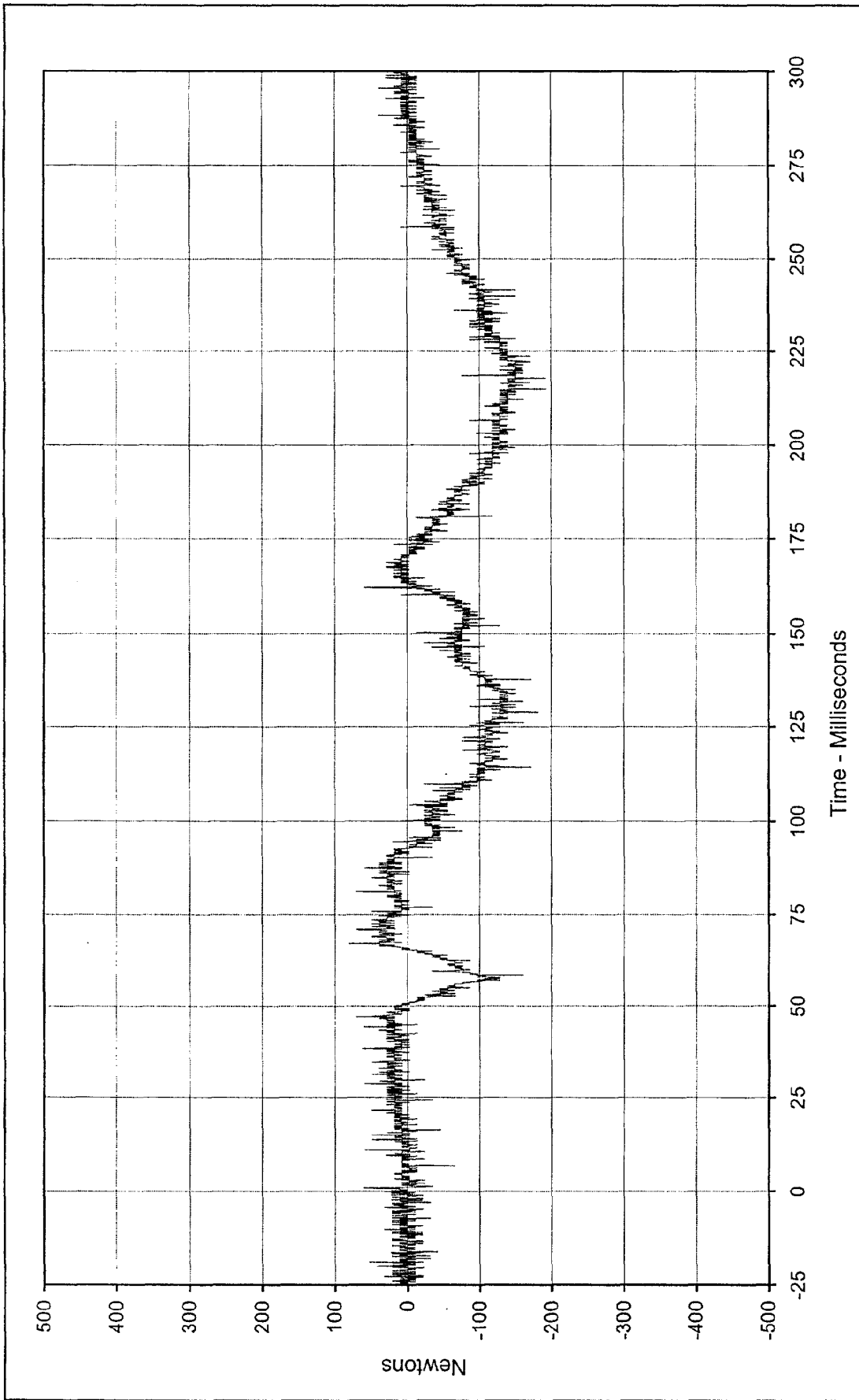




Curve Description: Driver Neck Force X
 Maximum Value: 758.6 at 71.0 Milliseconds
 Minimum Value: -132.4 at 192.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-007

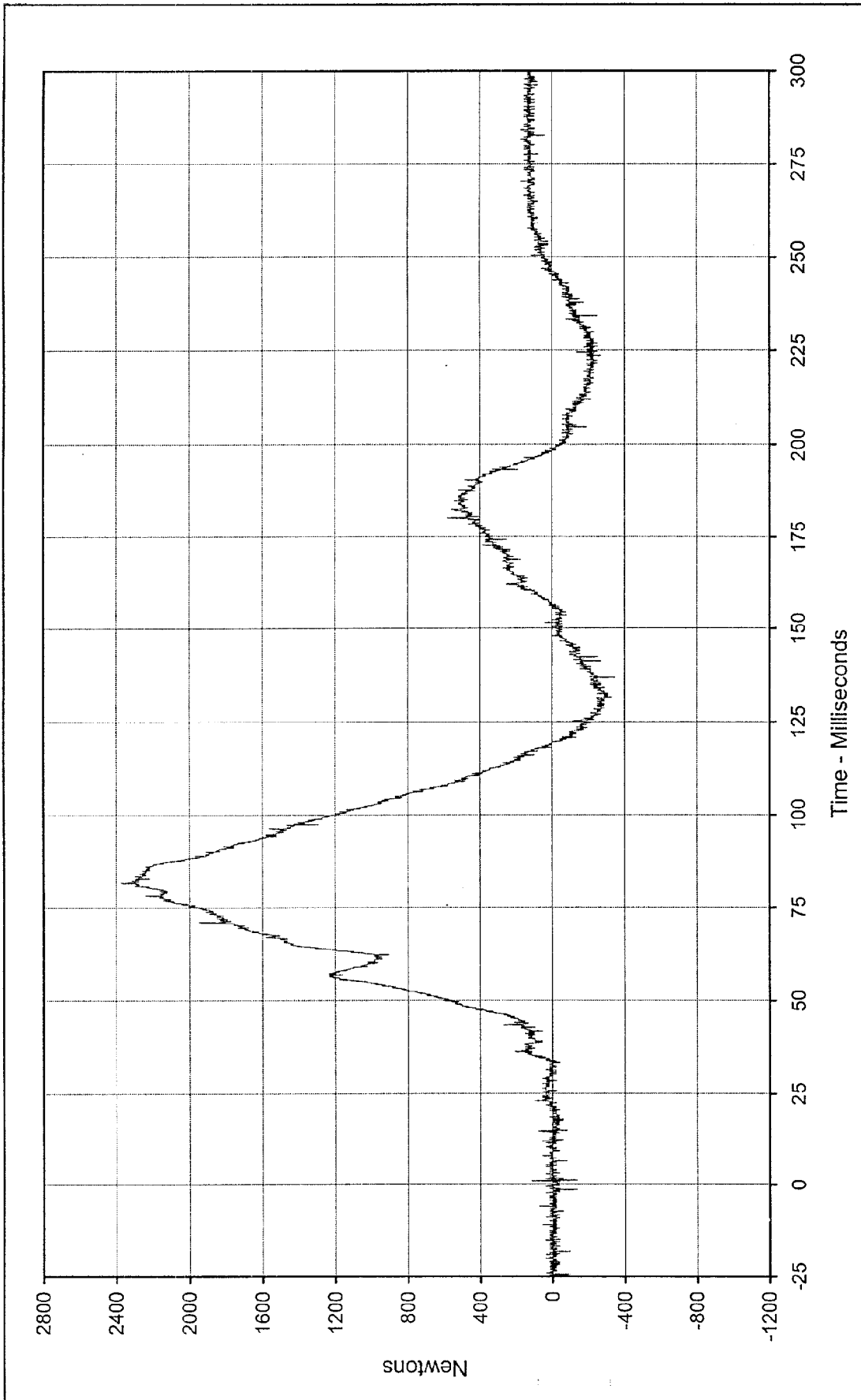
Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Driver Neck Force Y	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	81.0 at 67.0 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-192.0 at 214.9 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	FIL-008			

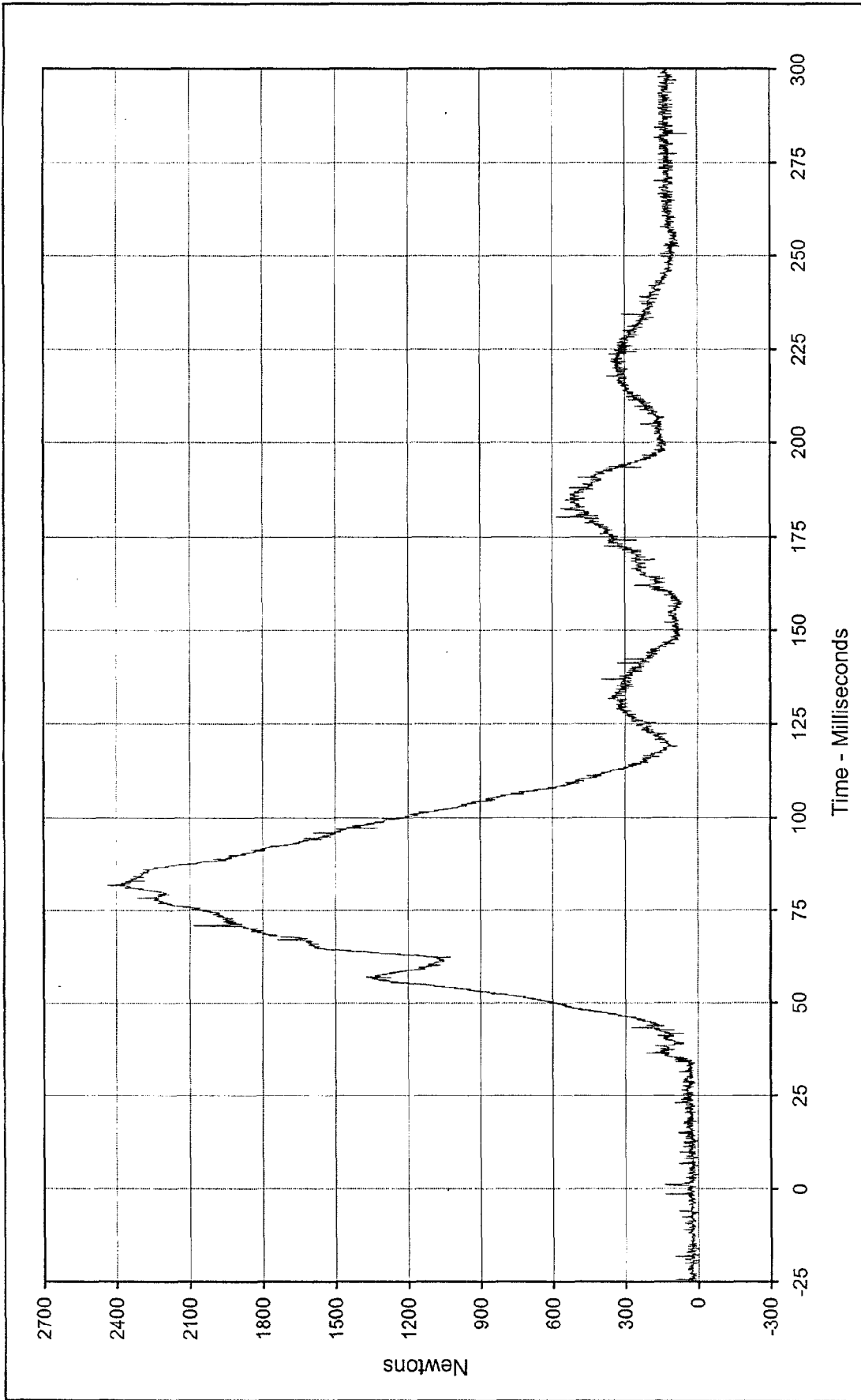




Curve Description: Driver Neck Force Z
 Maximum Value: 2372.2 at 81.7 Milliseconds
 Minimum Value: -347.3 at 136.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-009

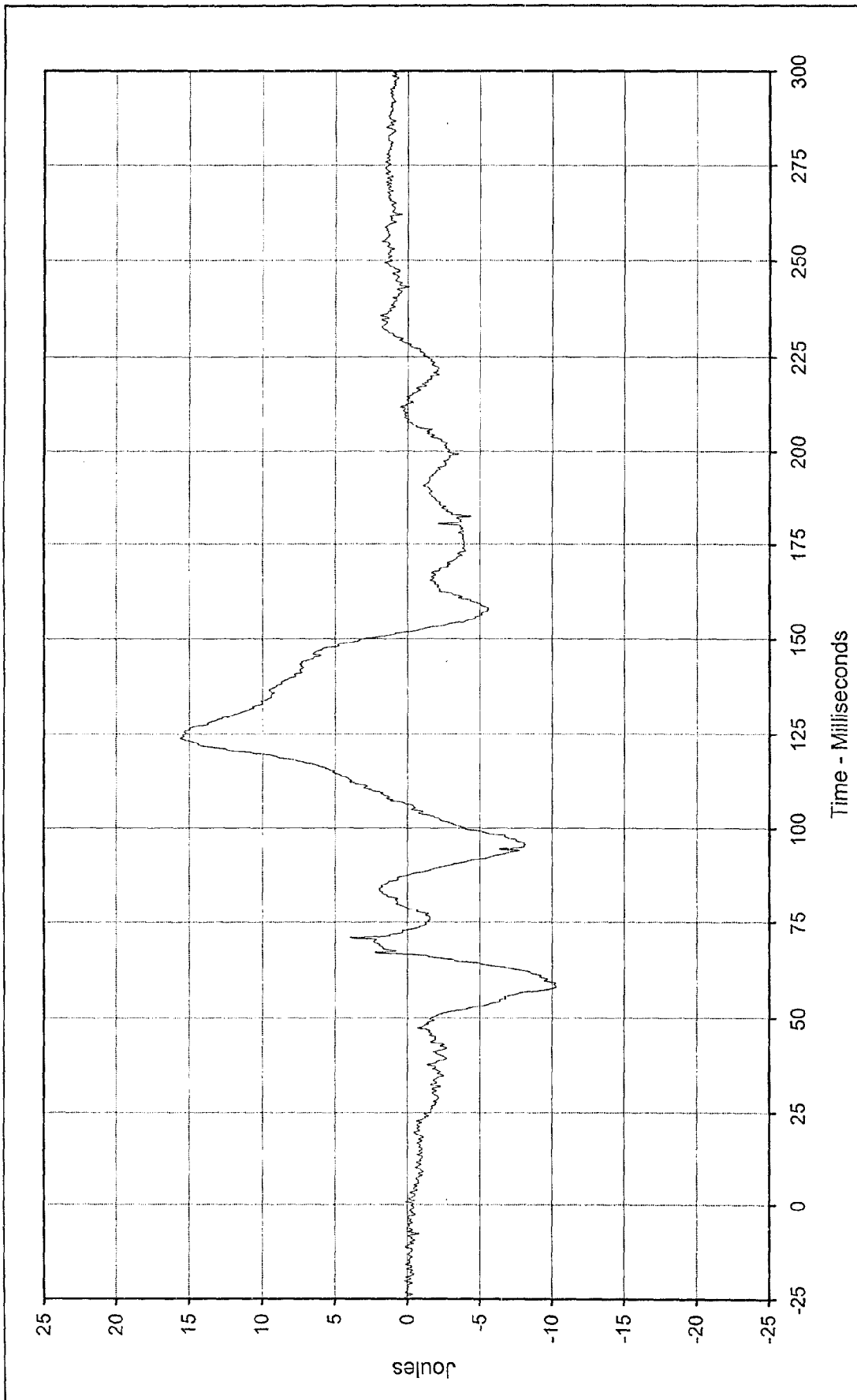
Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Driver Neck Force Resultant	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	2439.0 at 81.7 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	3.1 at 3.6 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	RES-007			

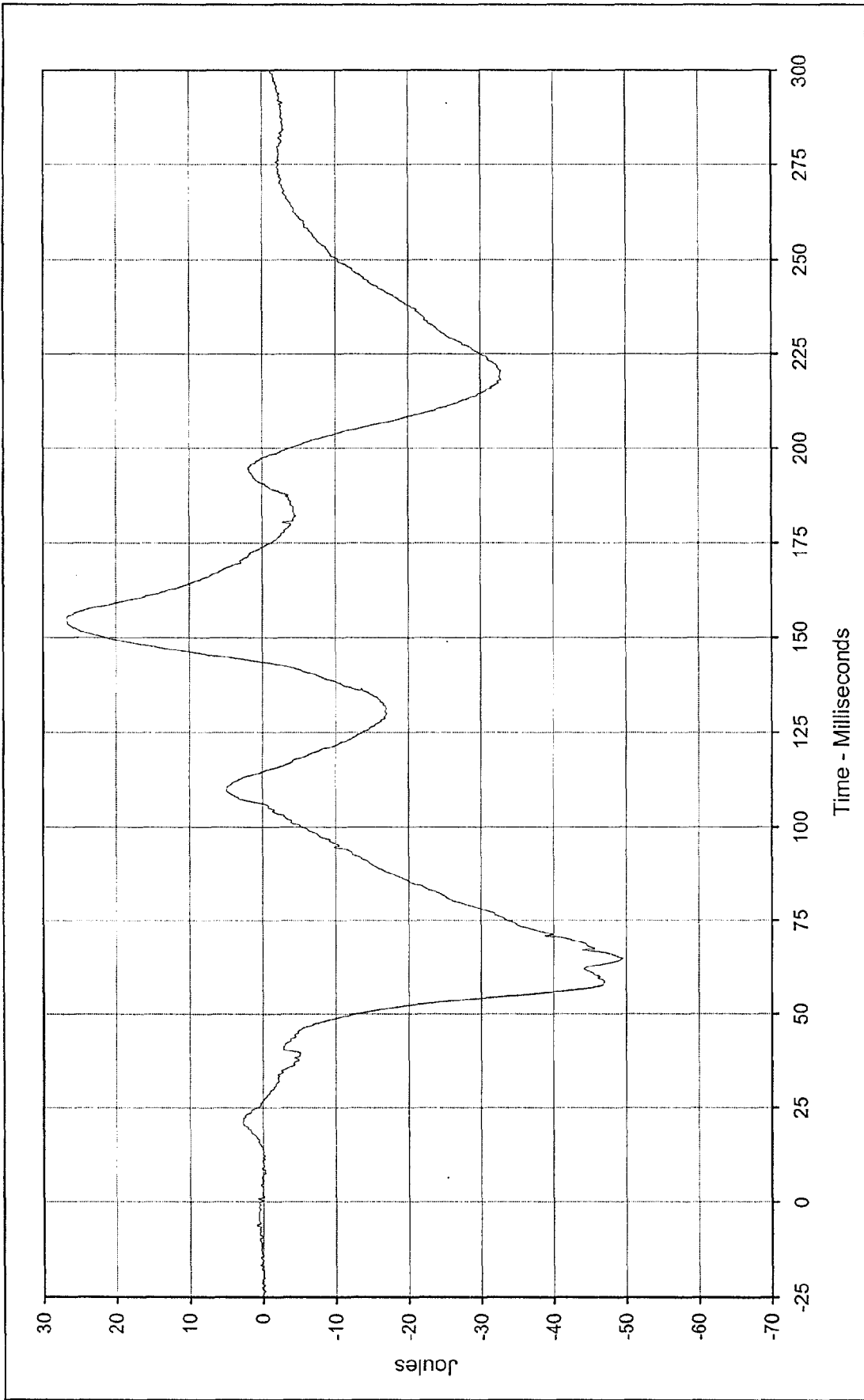




Curve Description:	Driver Neck Moment X		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	15.6	at 123.9	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-10.3	at 58.2			
SAE Filter Class:	600				
Date of Test:	1/23/98				
Curve Number:	FIL-010				

The logo for KARCO Engineering. It features the word "KARCO" in a large, bold, sans-serif font. To the left of the letters "K" and "A" 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 enclosed in a rectangular border.

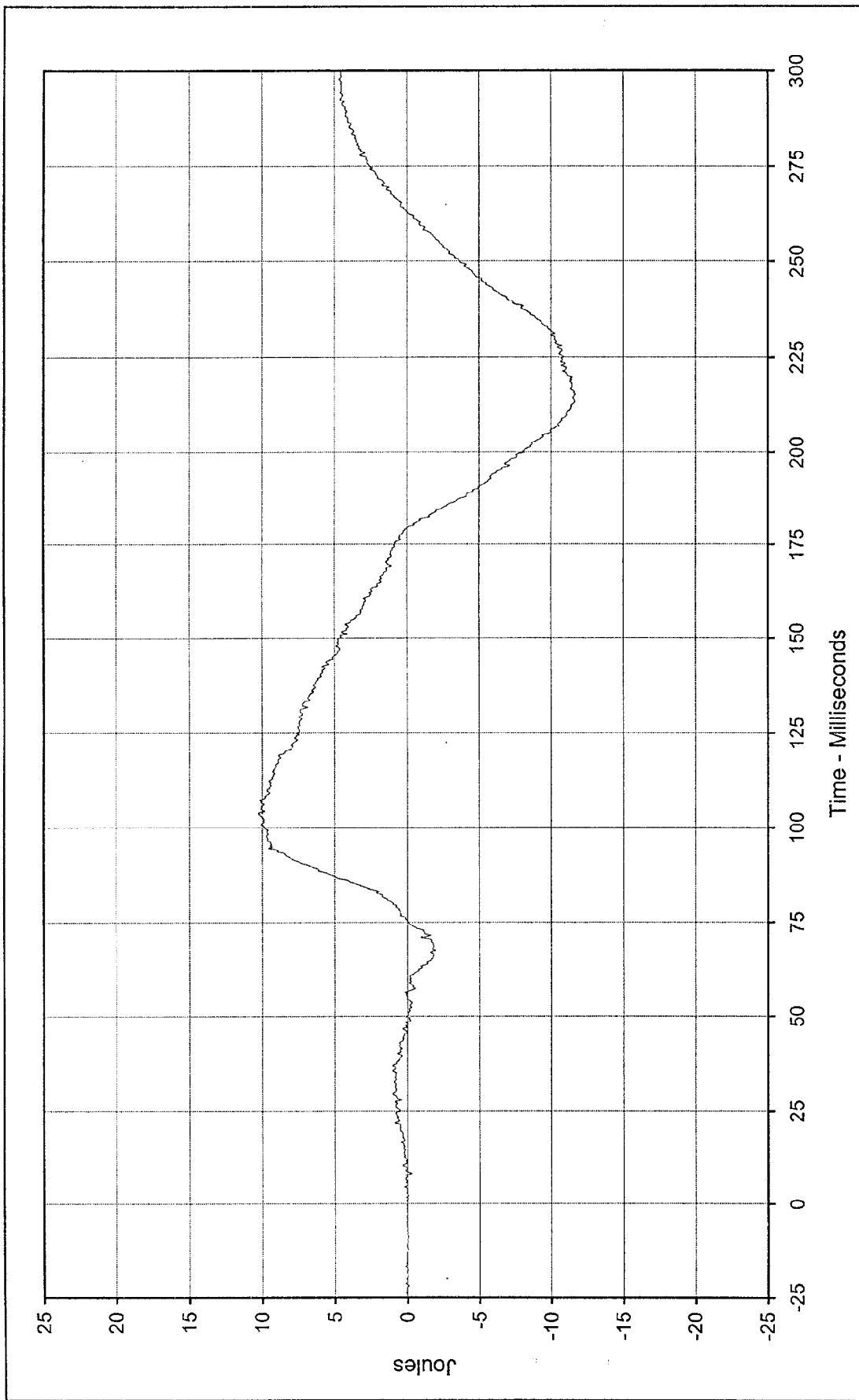




Curve Description: Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

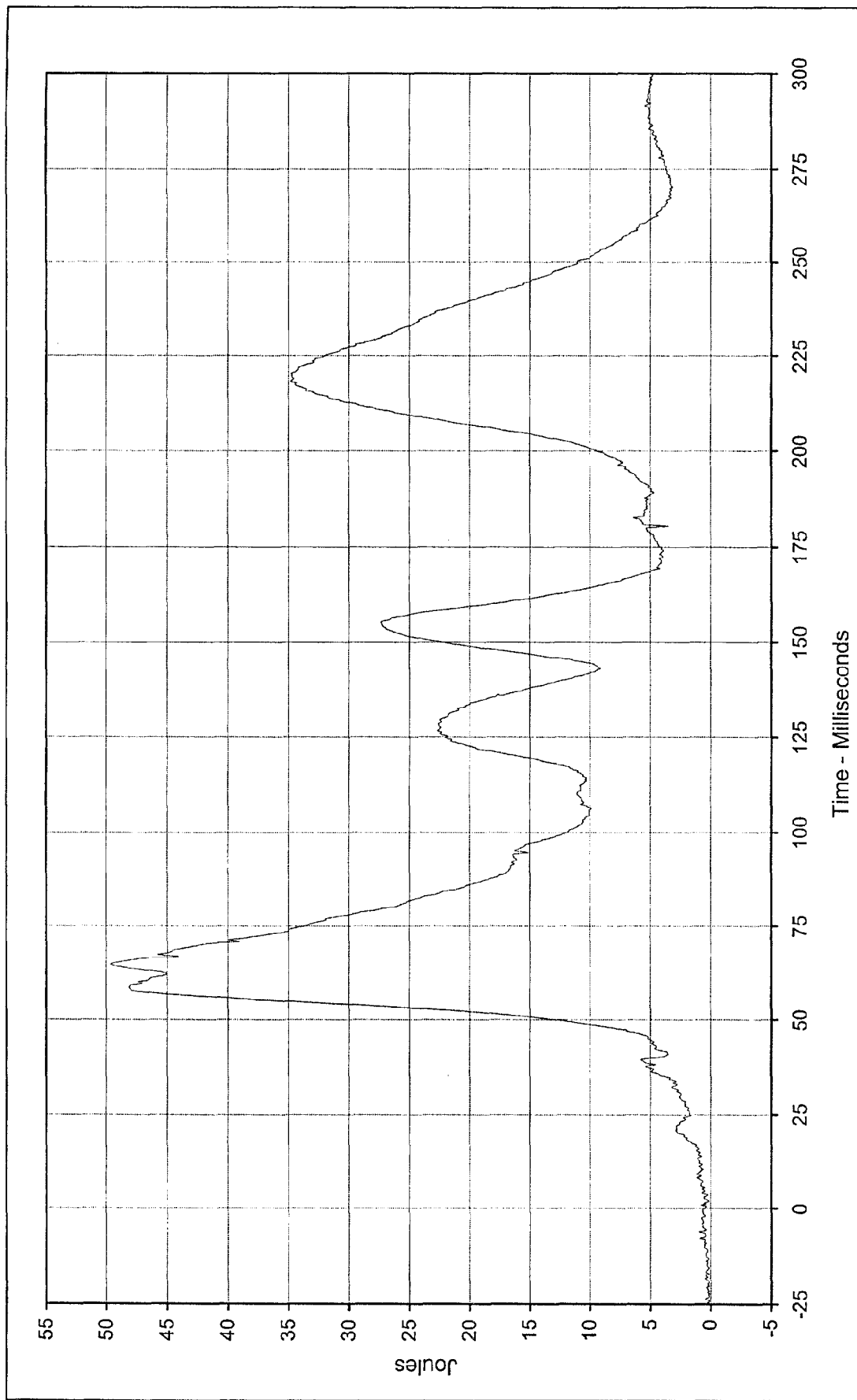
Maximum Value: 26.8 at 155.2 Milliseconds
 Minimum Value: -49.5 at 64.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-011





Curve Description:	Driver Neck Moment Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	10.3 at 104.0 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-11.7 at 215.4 Milliseconds			
SAE Filter Class:	600			
Date of Test:	1/23/98			
Curve Number:	FIL-012			





Curve Description: Driver Neck Moment Resultant

Maximum Value: 49.7 at 64.7 Milliseconds

Minimum Value: 0.1 at 1.9 Milliseconds

SAE Filter Class: 600

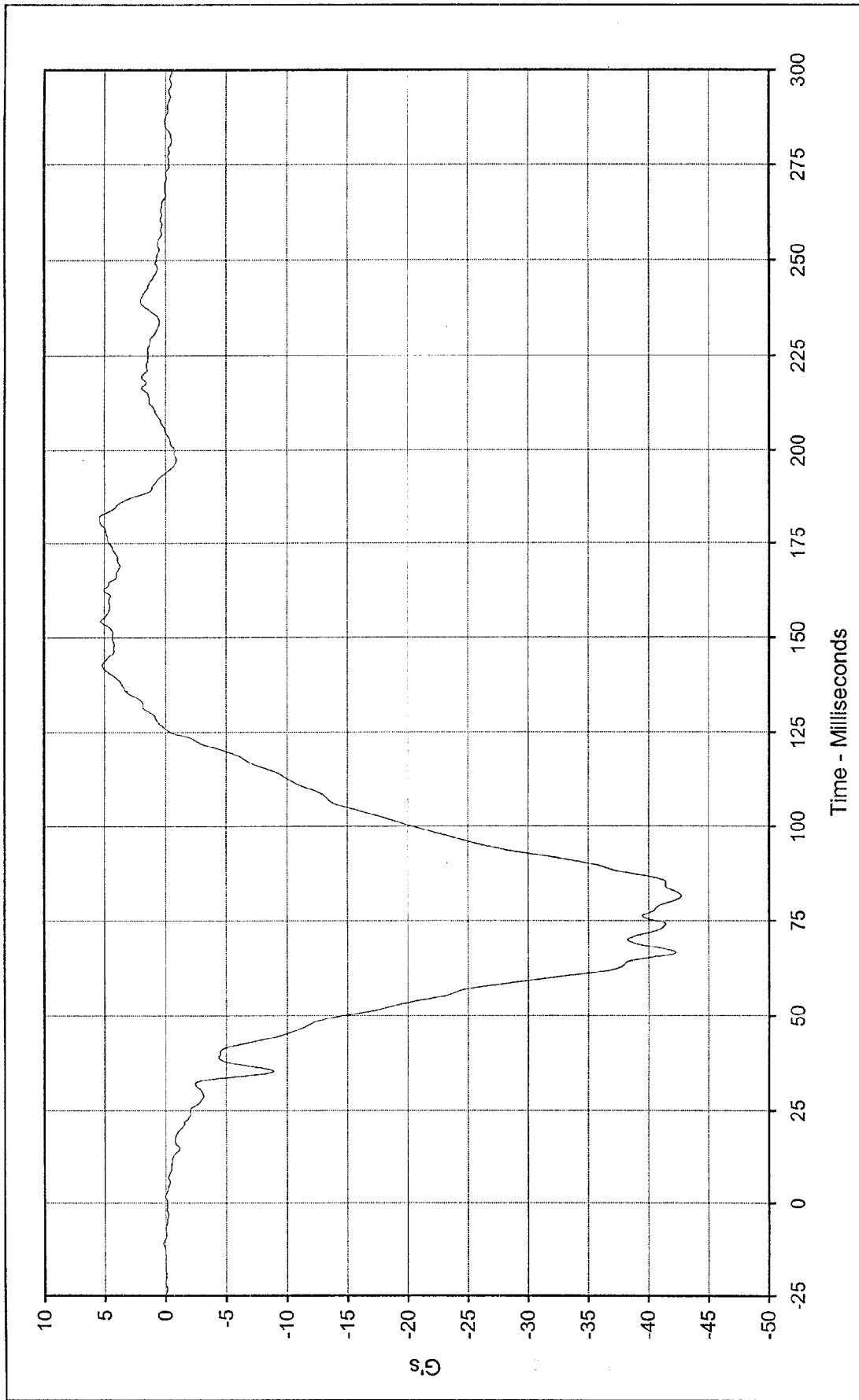
Date of Test: 1/23/98

Curve Number: RES-010

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Driver Chest Primary X Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Maximum Value: 5.4 at 181.7 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

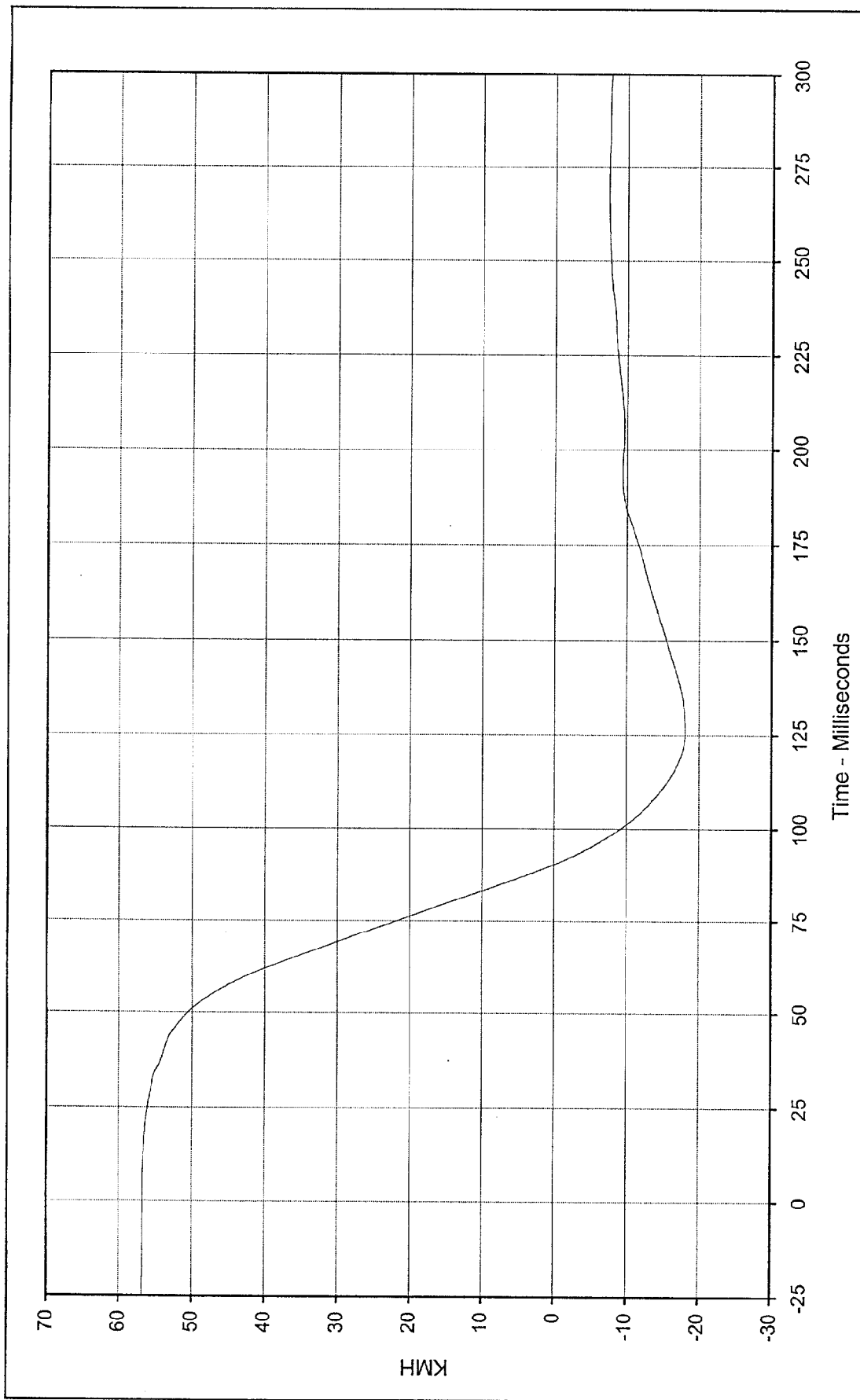
Minimum Value: -42.7 at 81.4 Milliseconds

SAE Filter Class: 180

Date of Test: 1/23/98

Curve Number: FIL-013

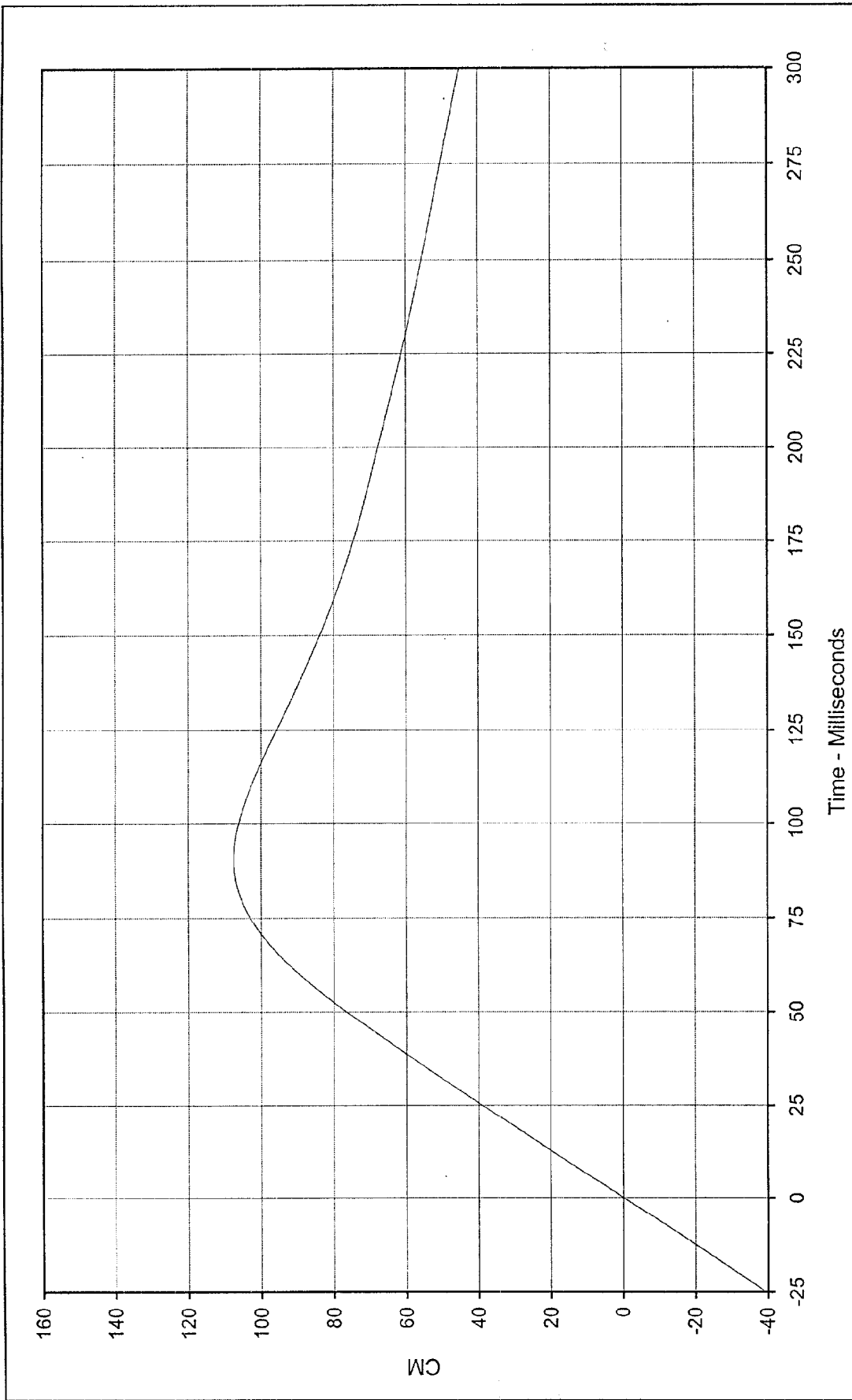




Curve Description: Driver Chest Primary X Velocity
 Maximum Value: 56.8 at 0.0 Milliseconds
 Minimum Value: -18.1 at 126.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-013

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Driver Chest Primary X Displ.

Maximum Value: 107.5 at 90.3 Milliseconds

Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180

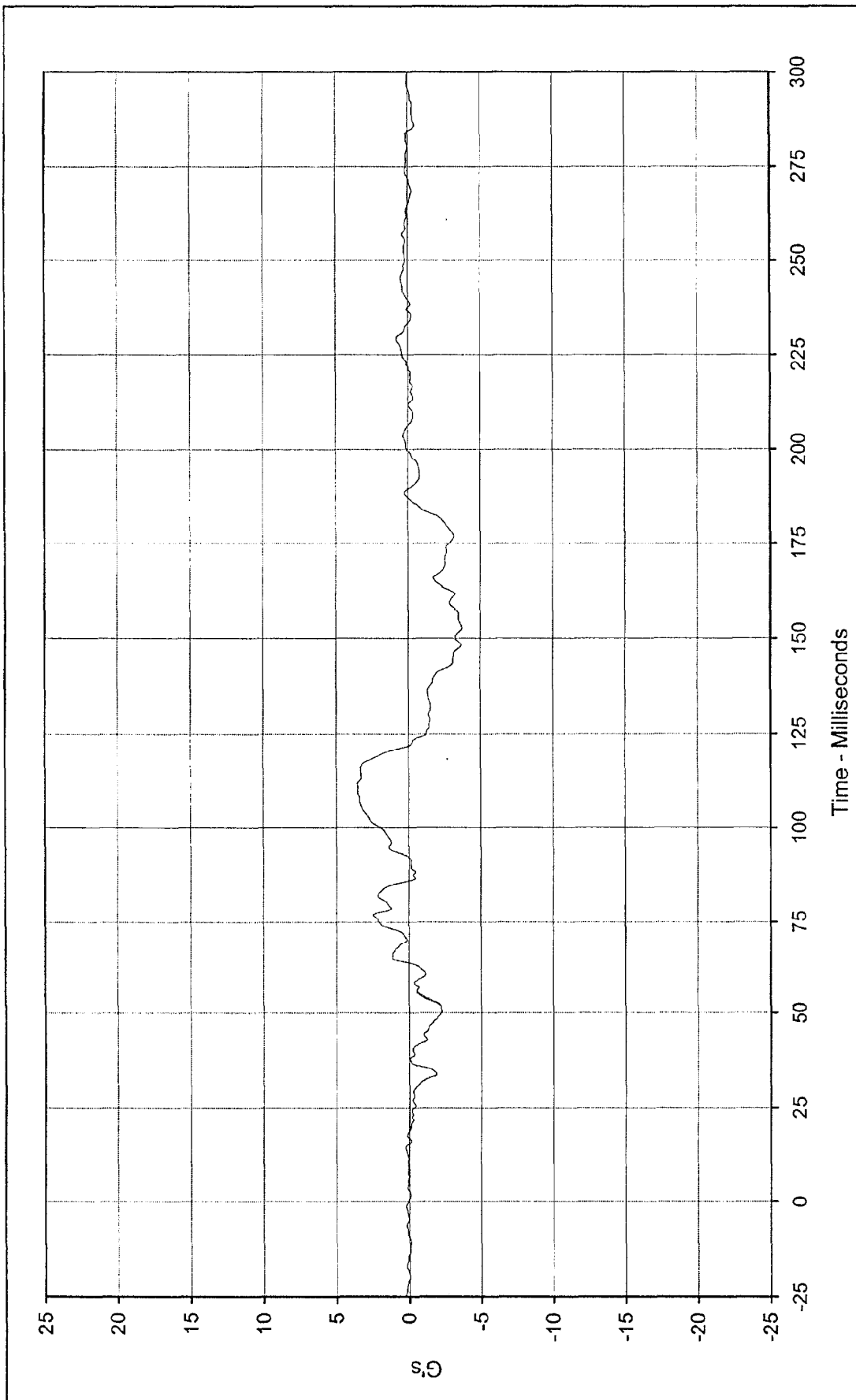
Date of Test: 1/23/98

Curve Number: IN2-013

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

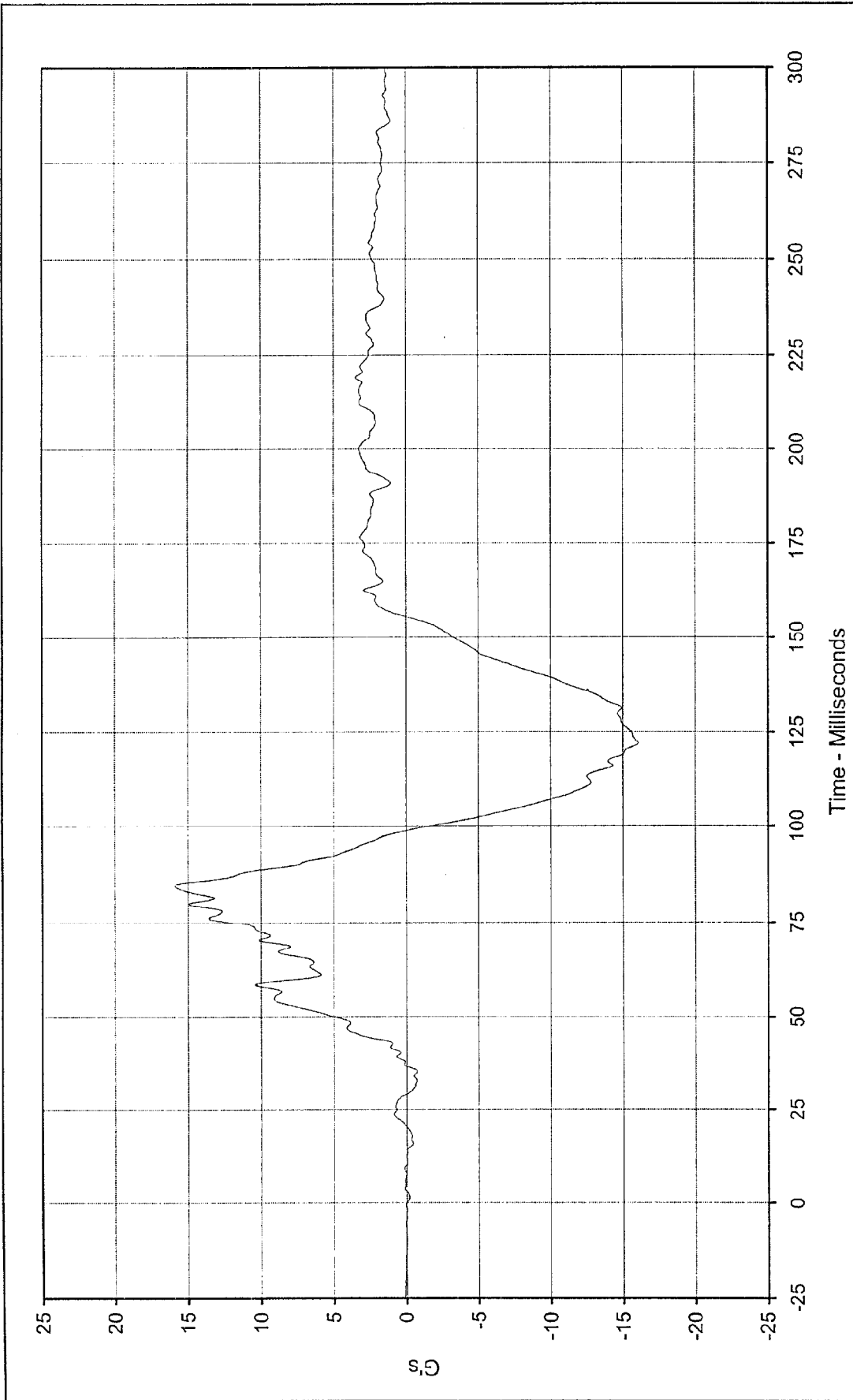
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 3.5 at 111.7 Milliseconds
 Minimum Value: -3.7 at 152.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-014

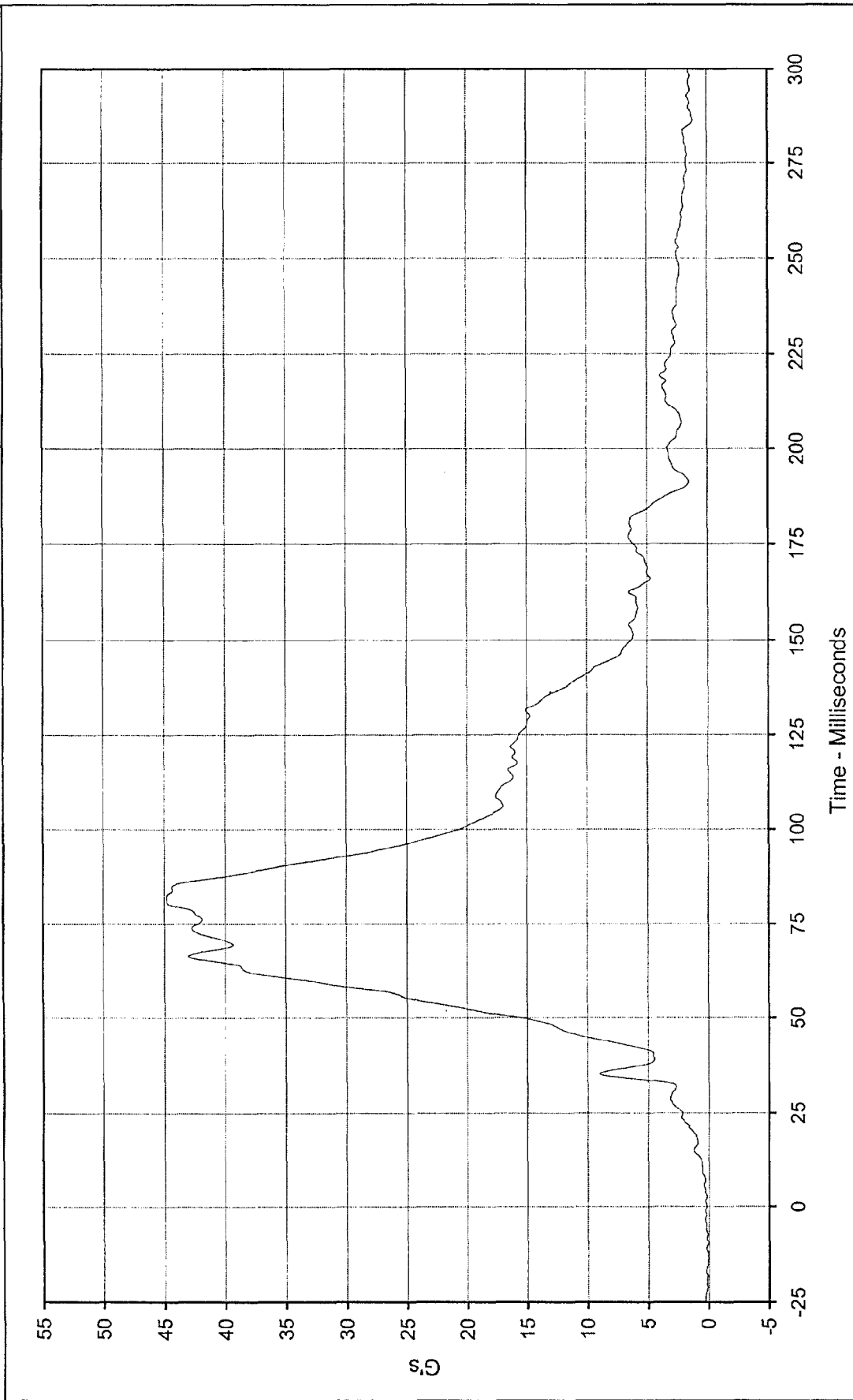




Curve Description: Driver Chest Primary Z
 Maximum Value: 15.9 at 84.6 Milliseconds
 Minimum Value: -16.1 at 122.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-015

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

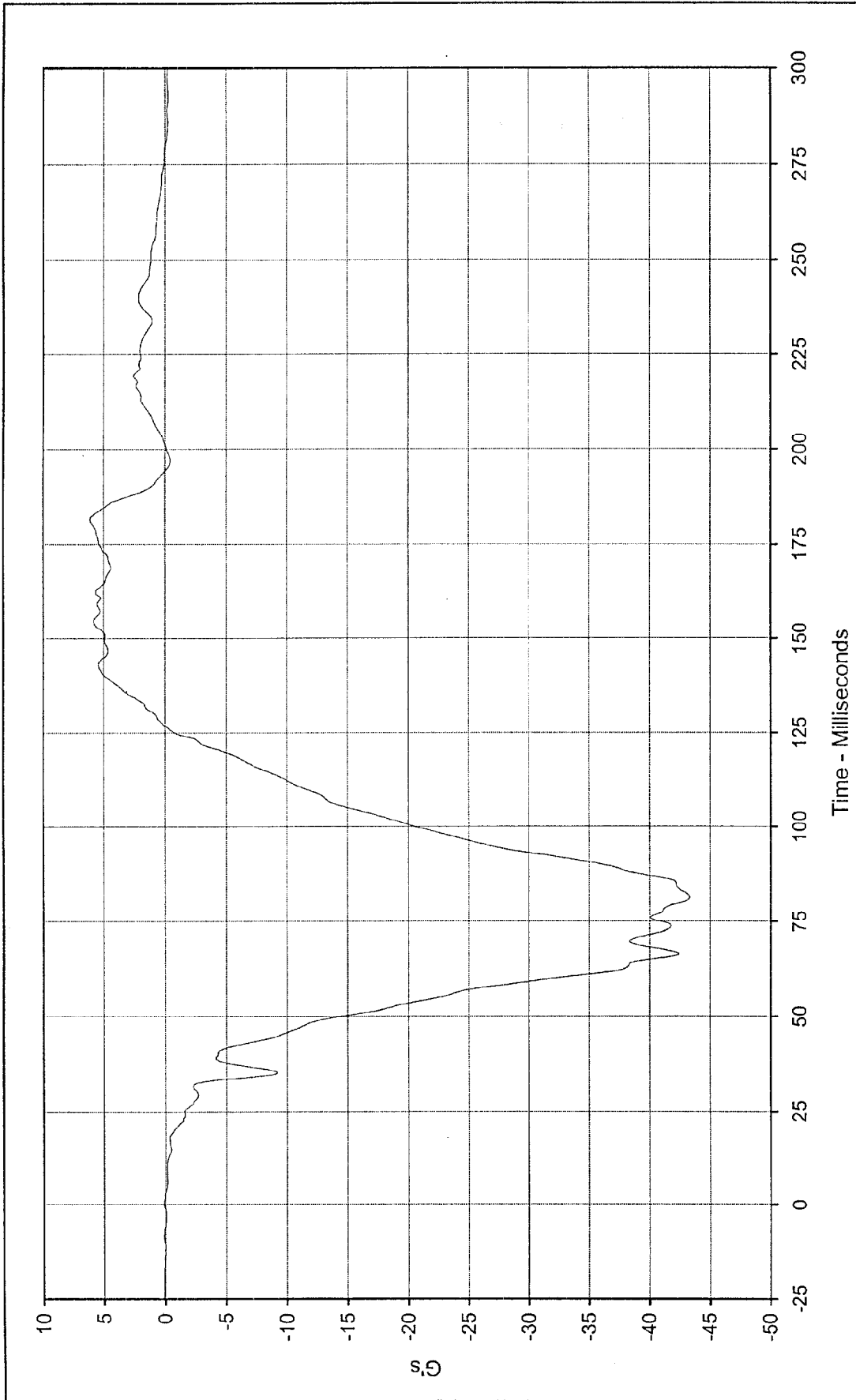




Curve Description: Driver Chest Resultant Primary
 Maximum Value: 44.8 at 82.2 Milliseconds
 Minimum Value: 0.1 at 2.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: RES-013

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

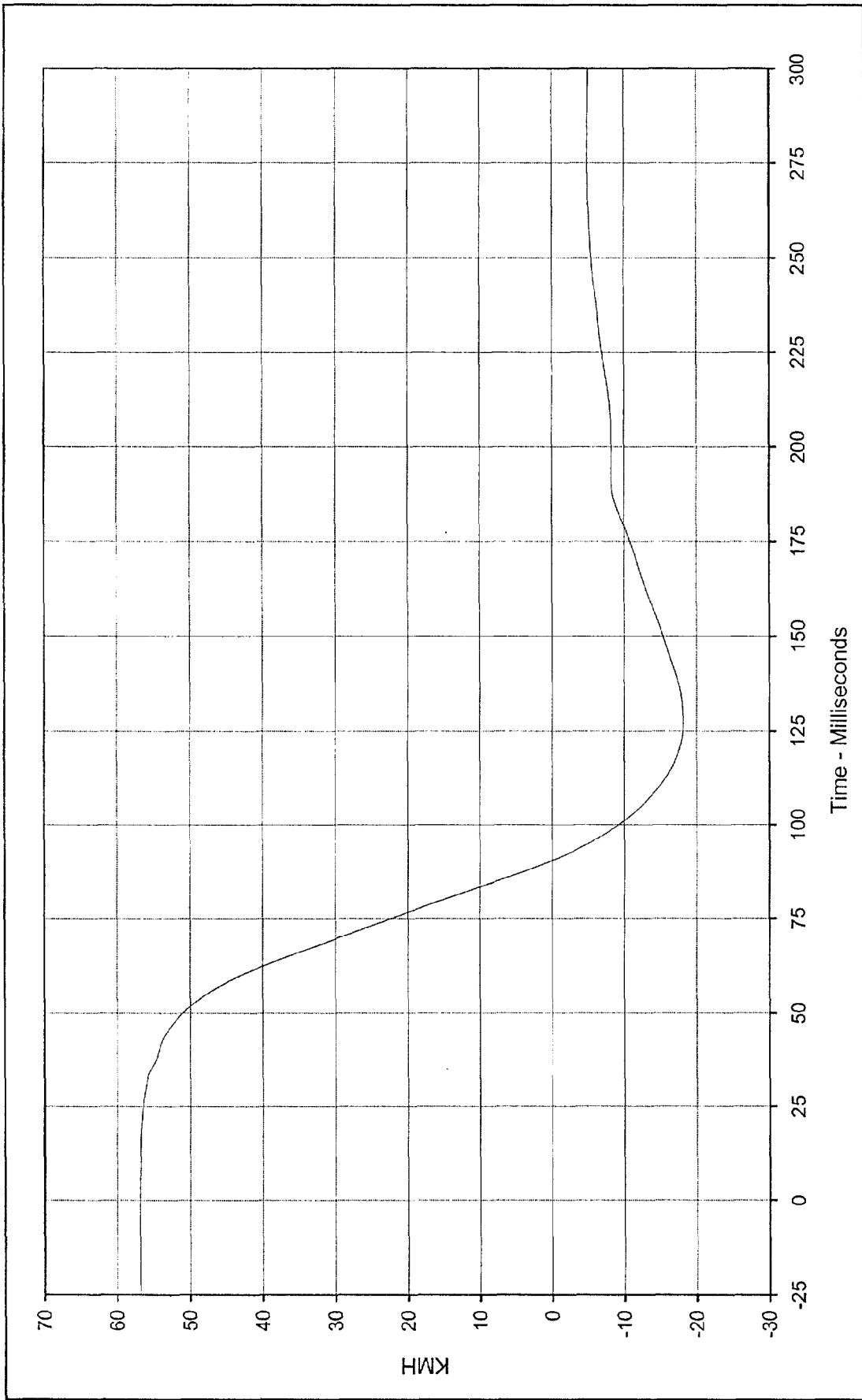




Curve Description: Driver Chest Redundant X
 Maximum Value: 6.2 at 181.6 Milliseconds
 Minimum Value: -43.3 at 81.4 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-016

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

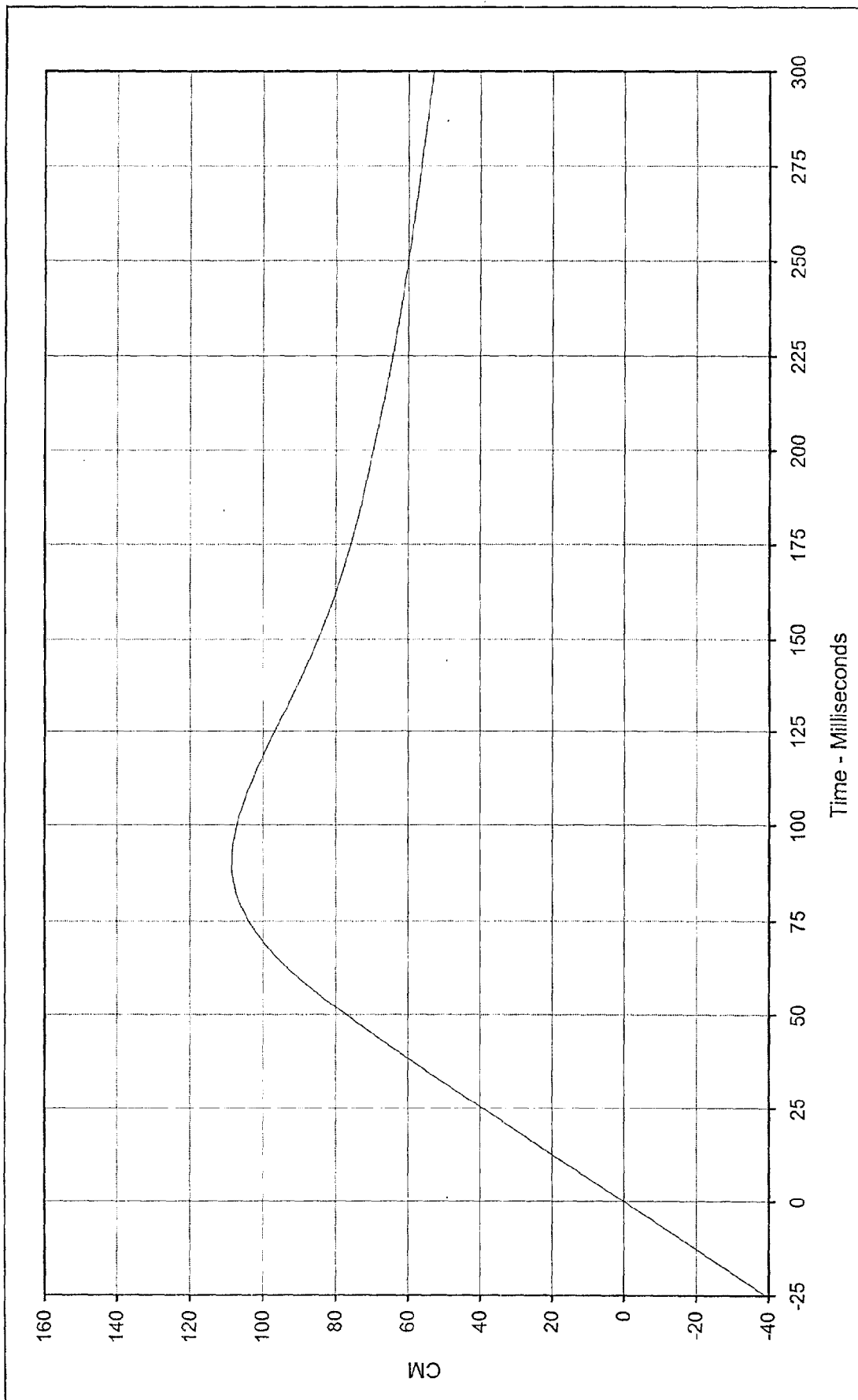




Curve Description: Driver Chest Redundant X Velocity
 Maximum Value: 56.8 at 3.1 Milliseconds
 Minimum Value: -18.2 at 127.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: iN1-016

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Driver Chest Redundant X Displ.

Maximum Value: 108.5 at 90.4 Milliseconds

Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180

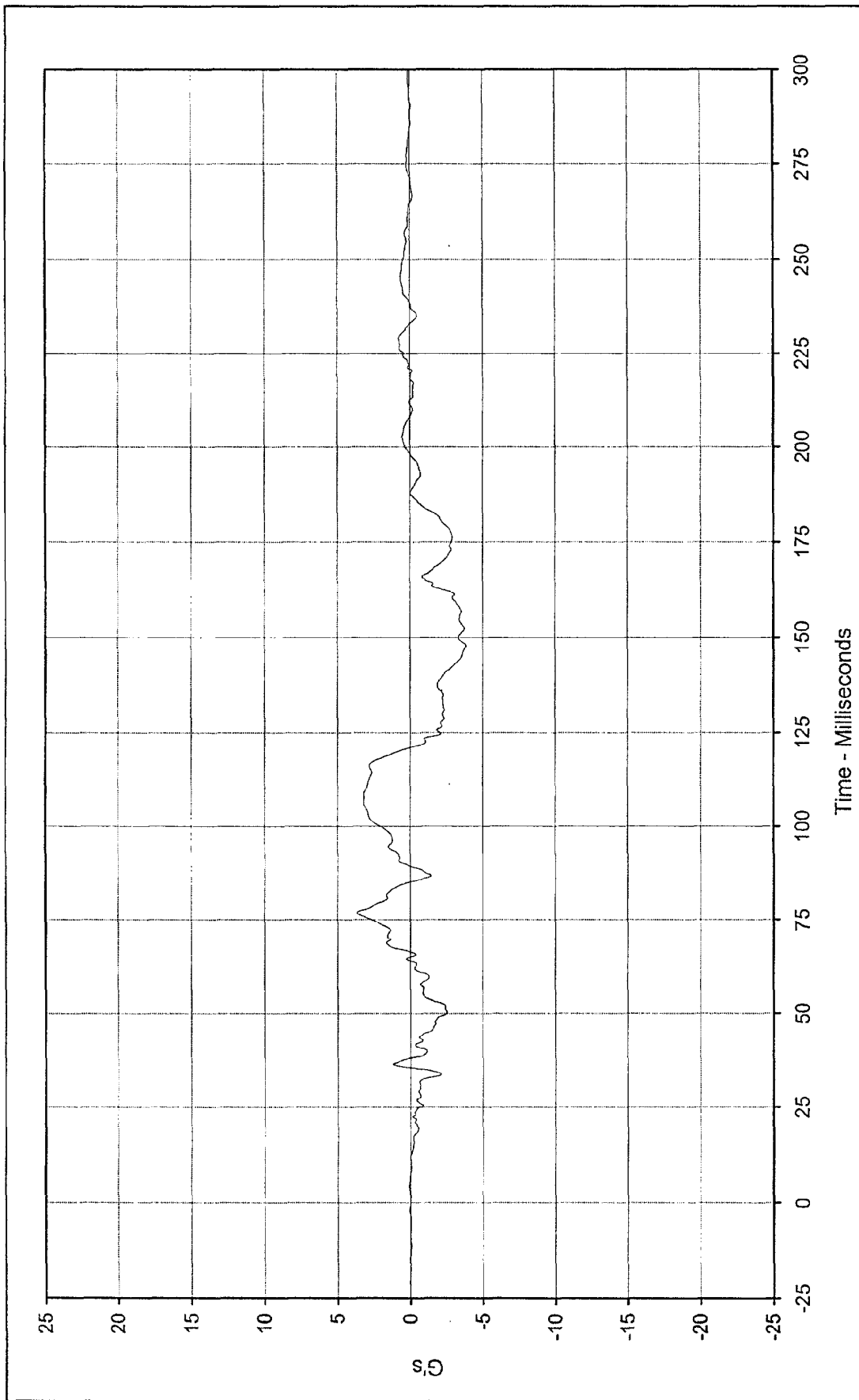
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Curve Number: IN2-016

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

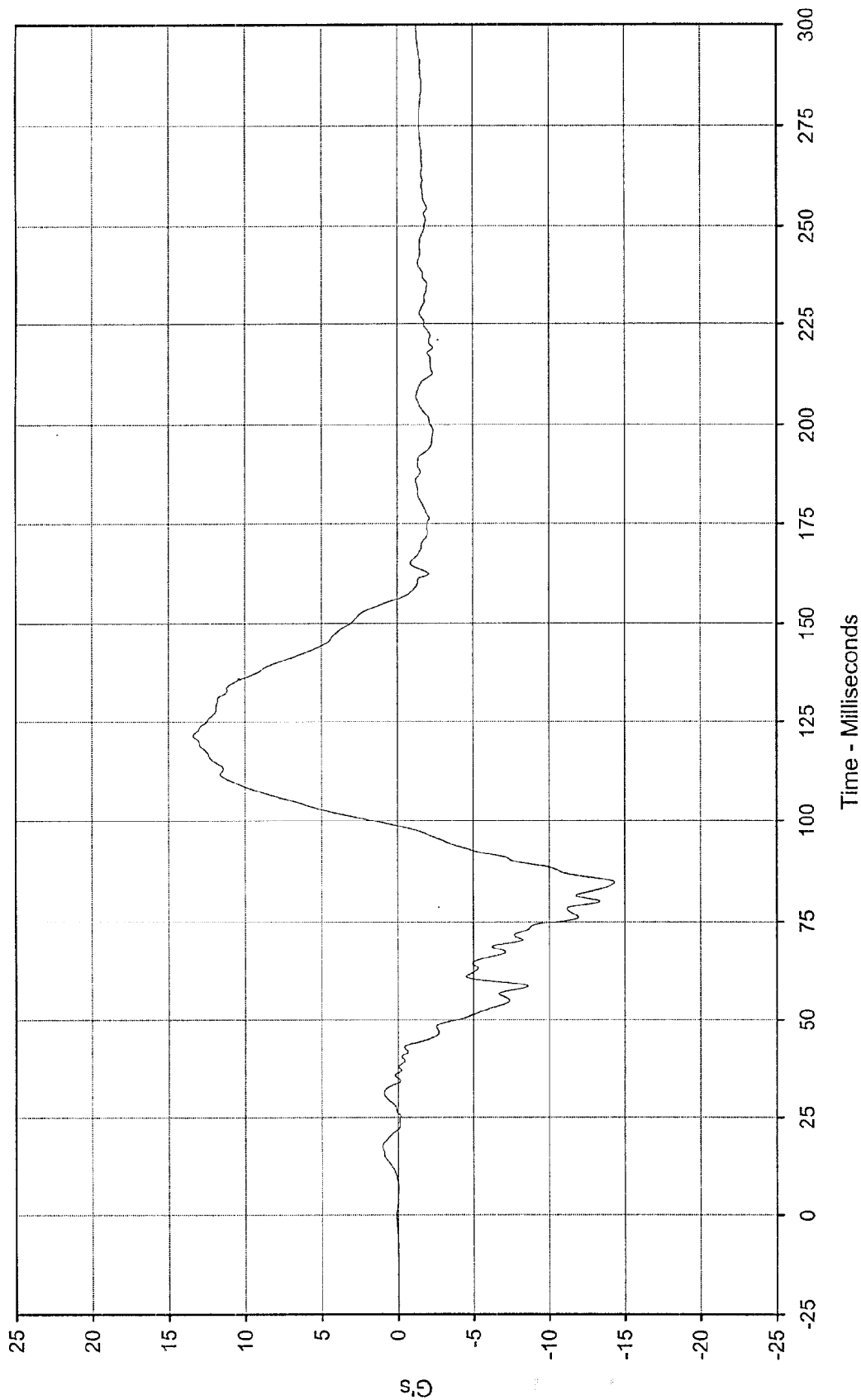




Curve Description: Driver Chest Redundant Y
 Maximum Value: 3.7 at 76.8 Milliseconds
 Minimum Value: -3.9 at 147.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-017

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

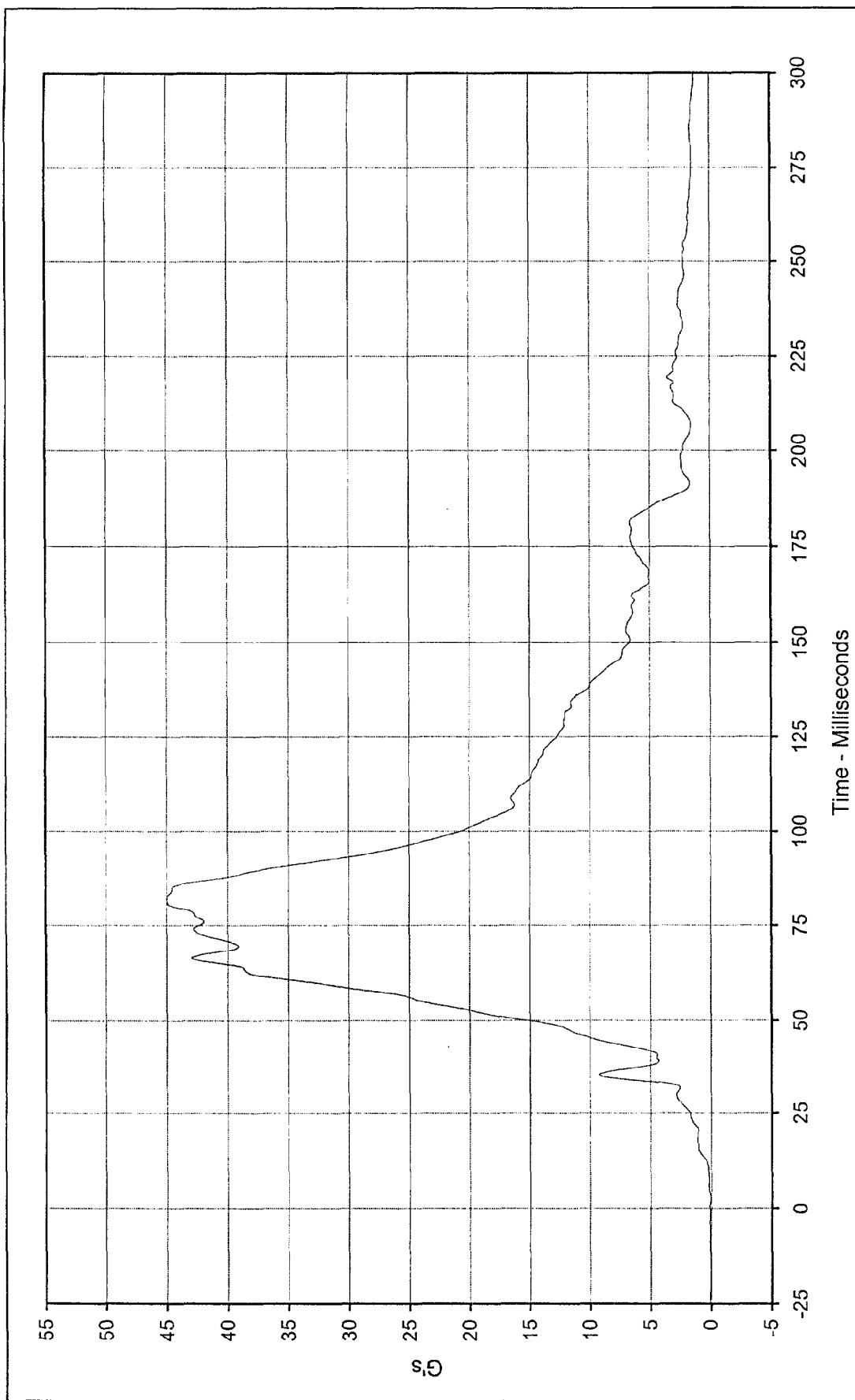




Curve Description: Driver Chest Redundant Z
 Maximum Value: 13.4 at 121.6 Milliseconds
 Minimum Value: -14.3 at 84.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-018

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

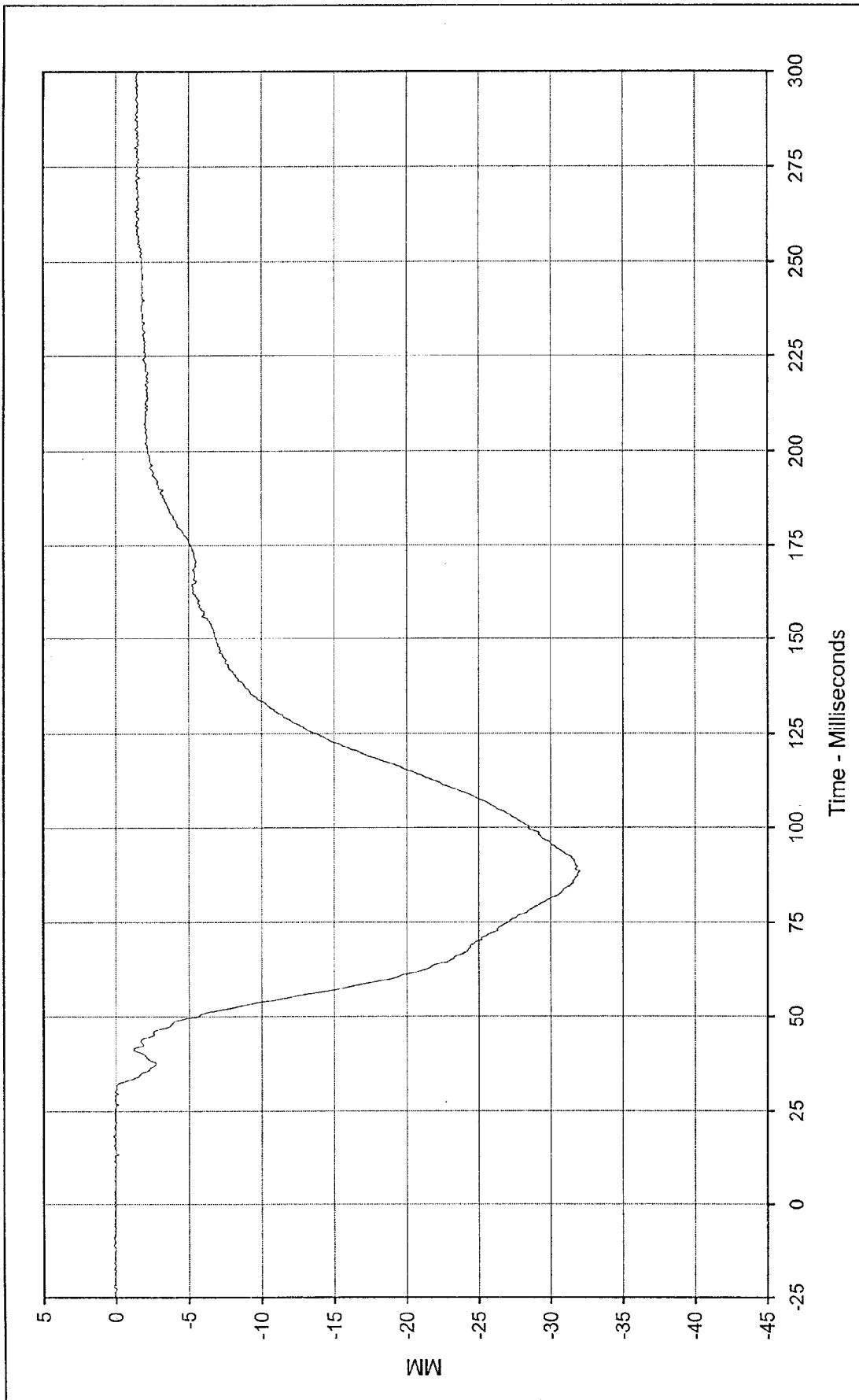




Curve Description: Driver Chest Resultant Redundant
 Maximum Value: 45.0 at 82.2 Milliseconds
 Minimum Value: 0.0 at 3.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: RES-016

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

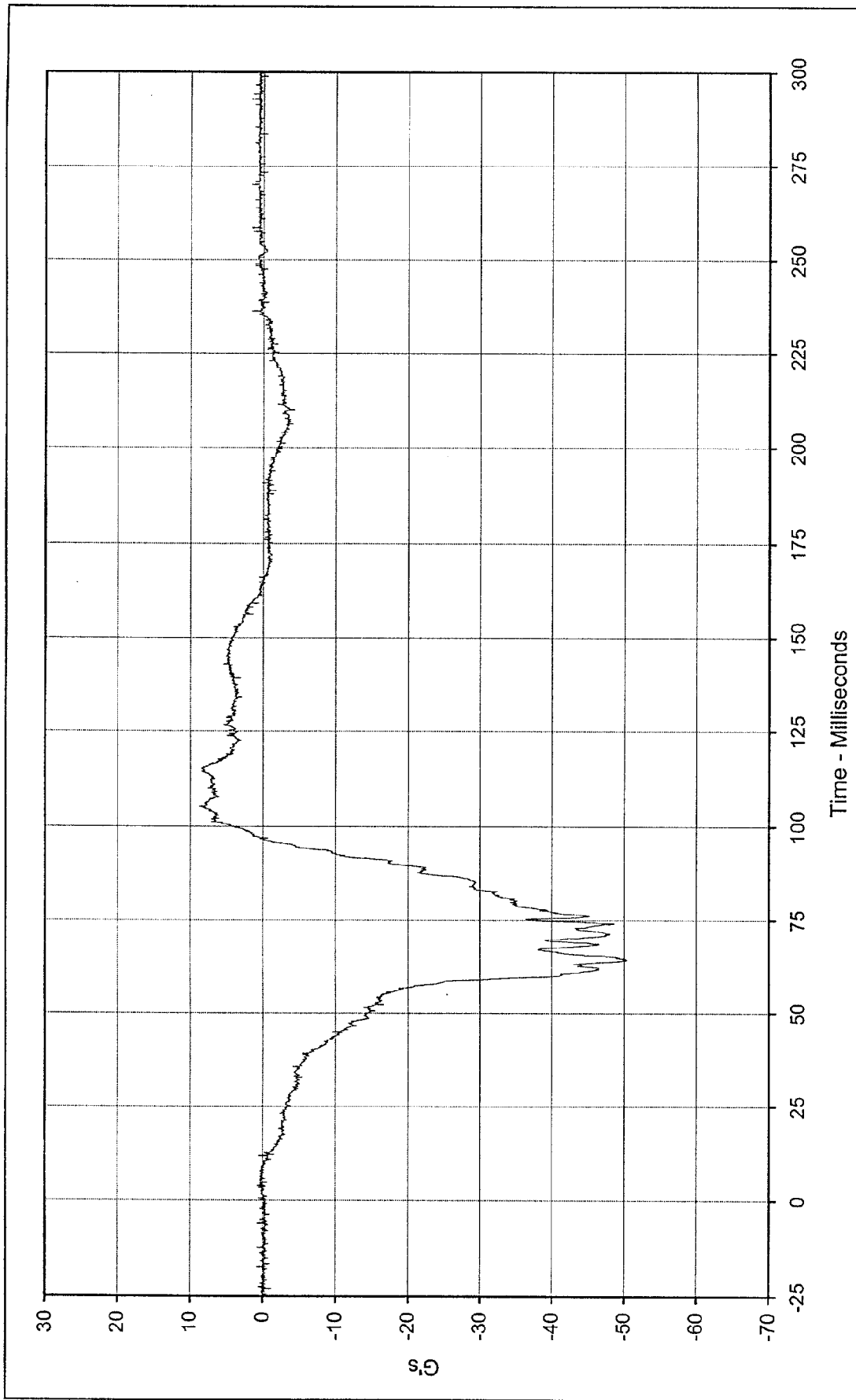




Curve Description: Driver Chest Displacement X
 Maximum Value: 0.2 at 18.2 Milliseconds
 Minimum Value: -32.0 at 88.5 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-019

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

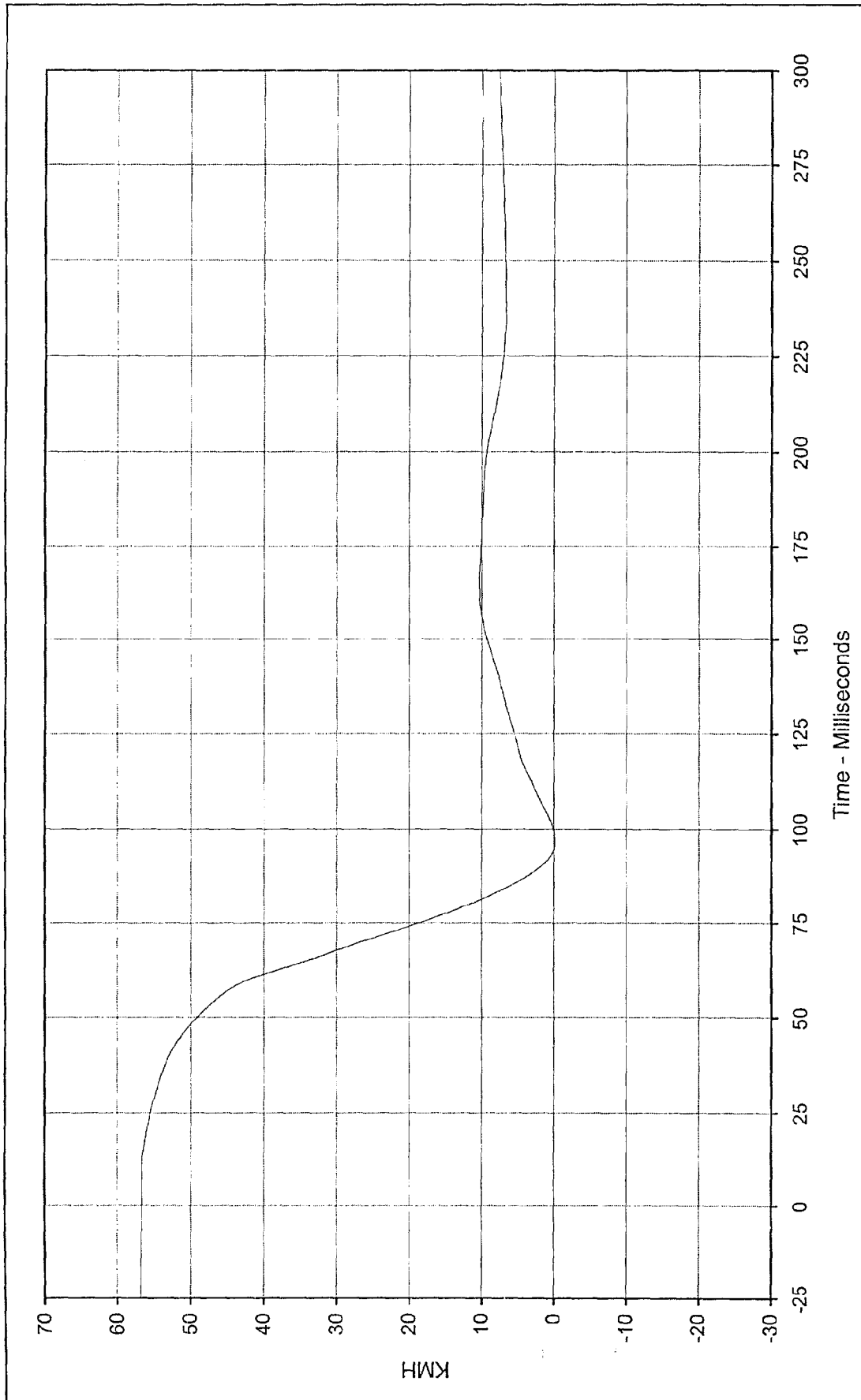




Curve Description:		Driver Pelvis X		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	8.8	at	105.3	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-50.4	at	64.1			
SAE Filter Class:	1000					
Date of Test:	1/23/98					
Curve Number:	FIL-020					

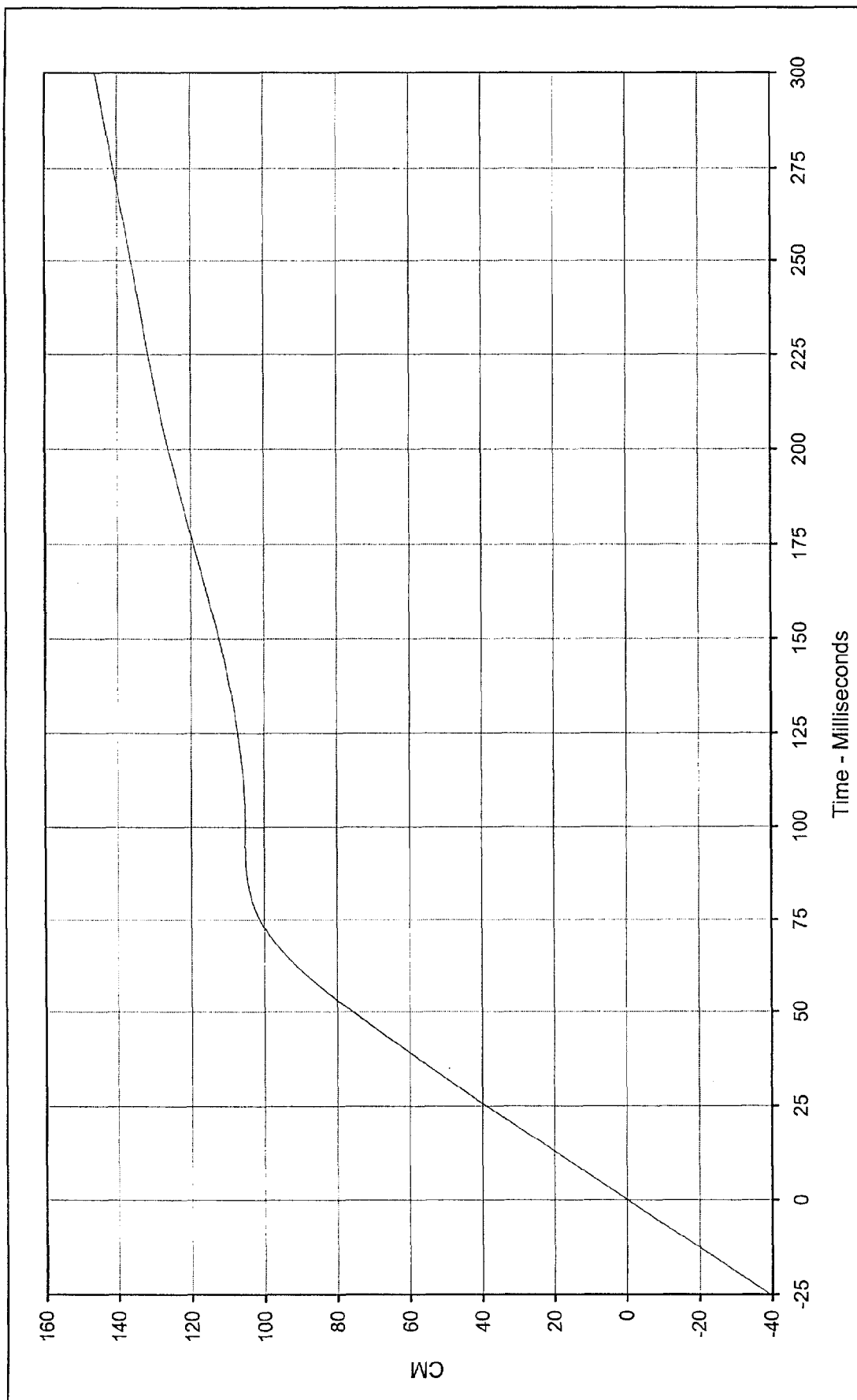
The logo for KARCO Engineering. It features a stylized lightbulb with a gear-like base, followed by the word "KARCO" in large, bold, sans-serif capital letters. To the right of "KARCO", the word "Engineering" is written in a smaller, italicized, sans-serif font. The entire logo is set against a dark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





Curve Description:	Driver Pelvis X Velocity	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	56.7	at	8.9	Milliseconds
Minimum Value:	-0.2	at	96.8	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/23/98			
Curve Number:	IN1-020	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	

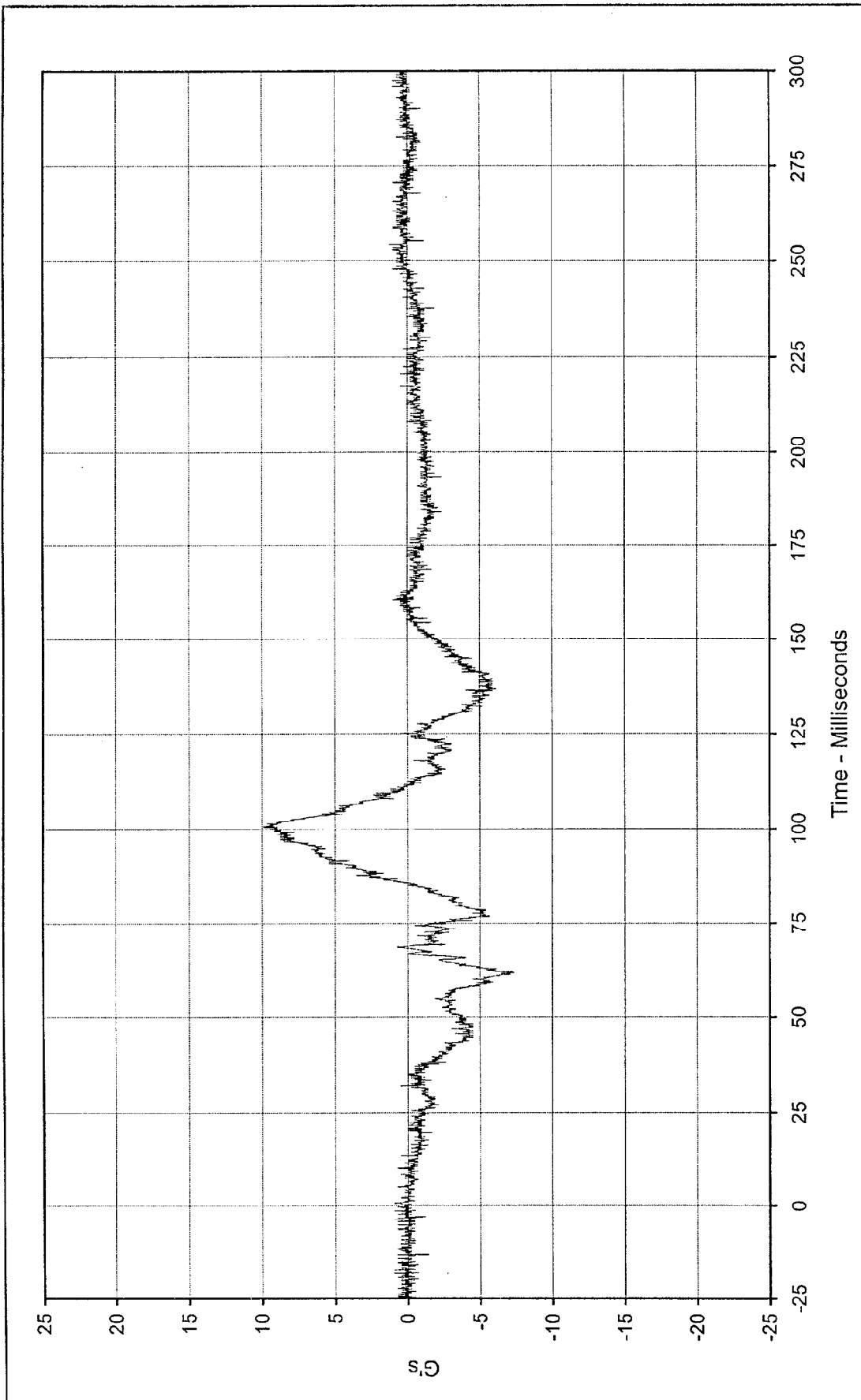




Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Curve Description: Driver Pelvis X Displ.
 Maximum Value: 146.1 at 299.9 Milliseconds
 Minimum Value: -0.1 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-020

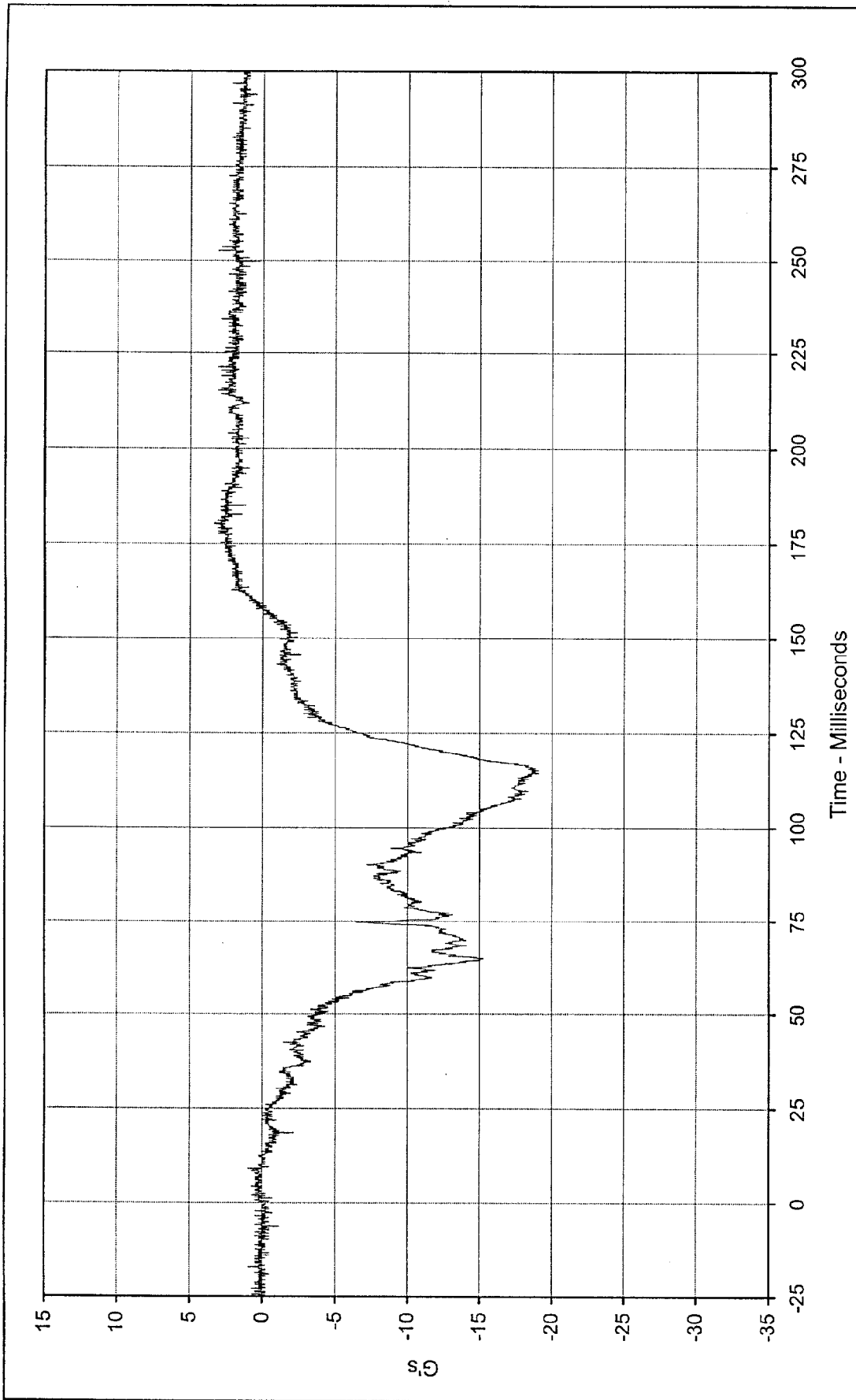




Curve Description: Driver Pelvis Y
 Maximum Value: 9.9 at 100.6 Milliseconds
 Minimum Value: -7.3 at 61.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-021

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Driver Pelvis Z

Maximum Value: 3.3 at 180.1 Milliseconds

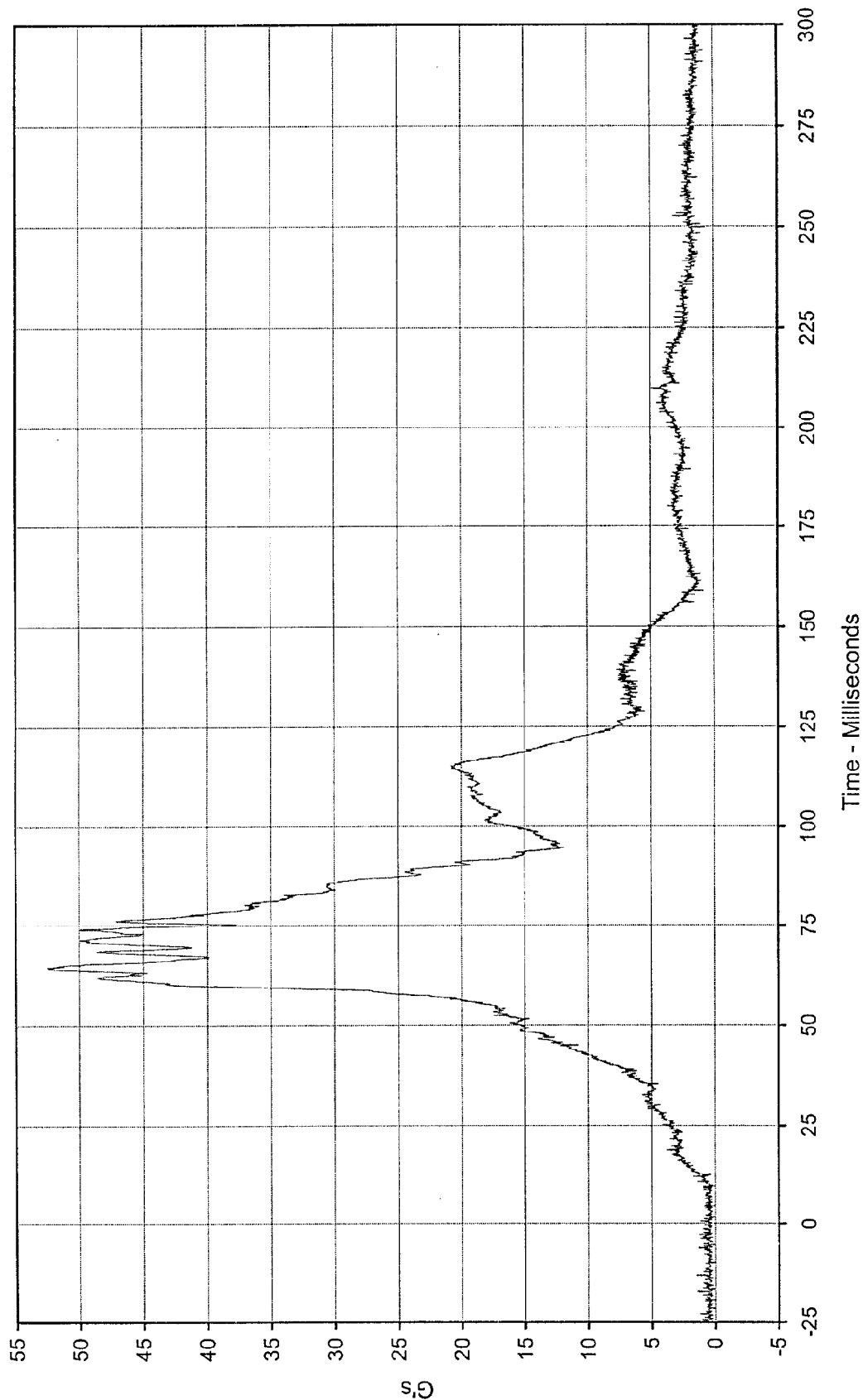
Minimum Value: -19.1 at 114.4 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/23/98

Curve Number: FIL-022

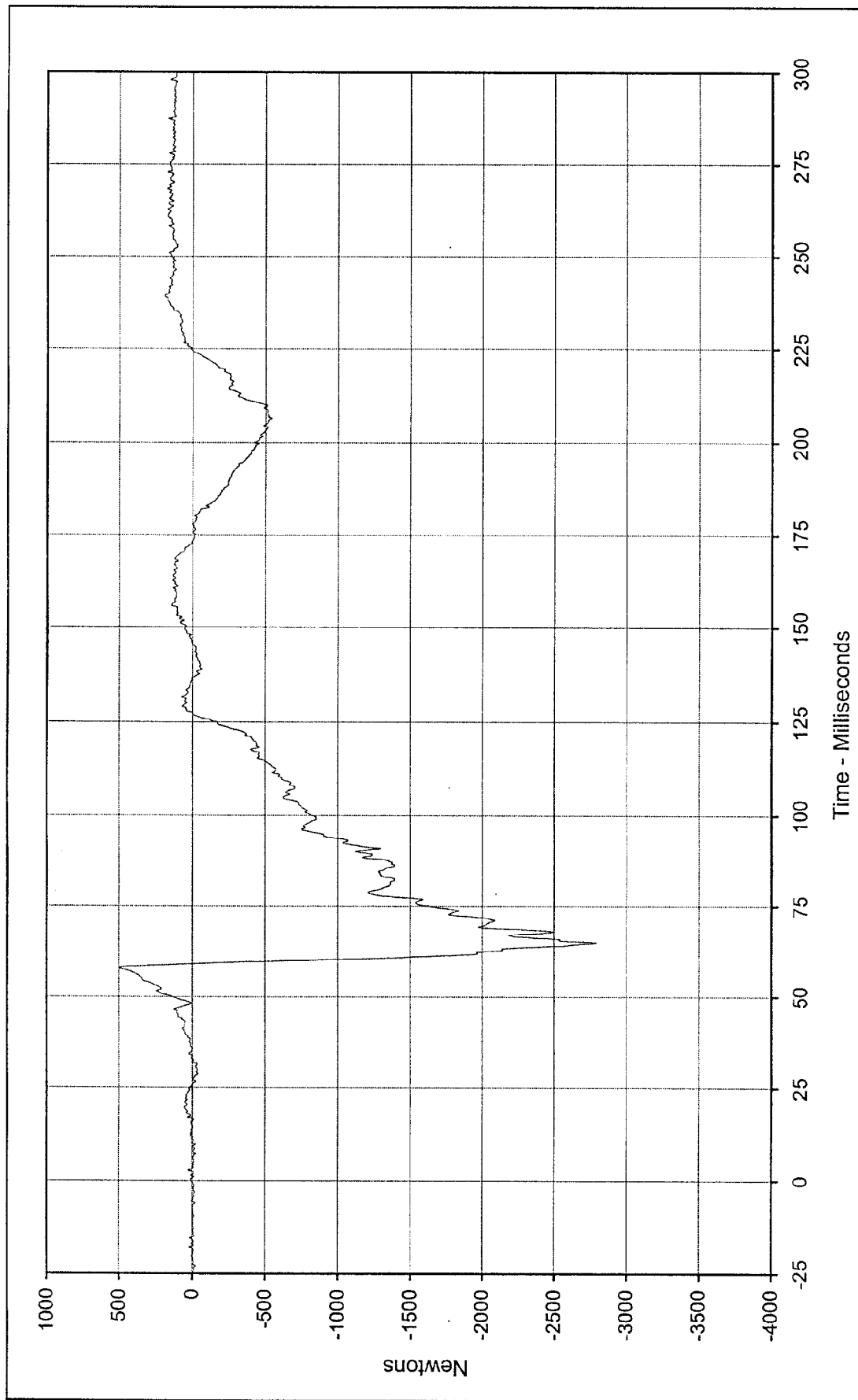




Curve Description: Driver Pelvis Resultant
 Maximum Value: 52.5 at 64.4 Milliseconds
 Minimum Value: 0.0 at 1.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: RES-020

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: 1998 NHTSA 35 mph NCAP No.: MW0119

Maximum Value: 499.1 at 58.0 Milliseconds

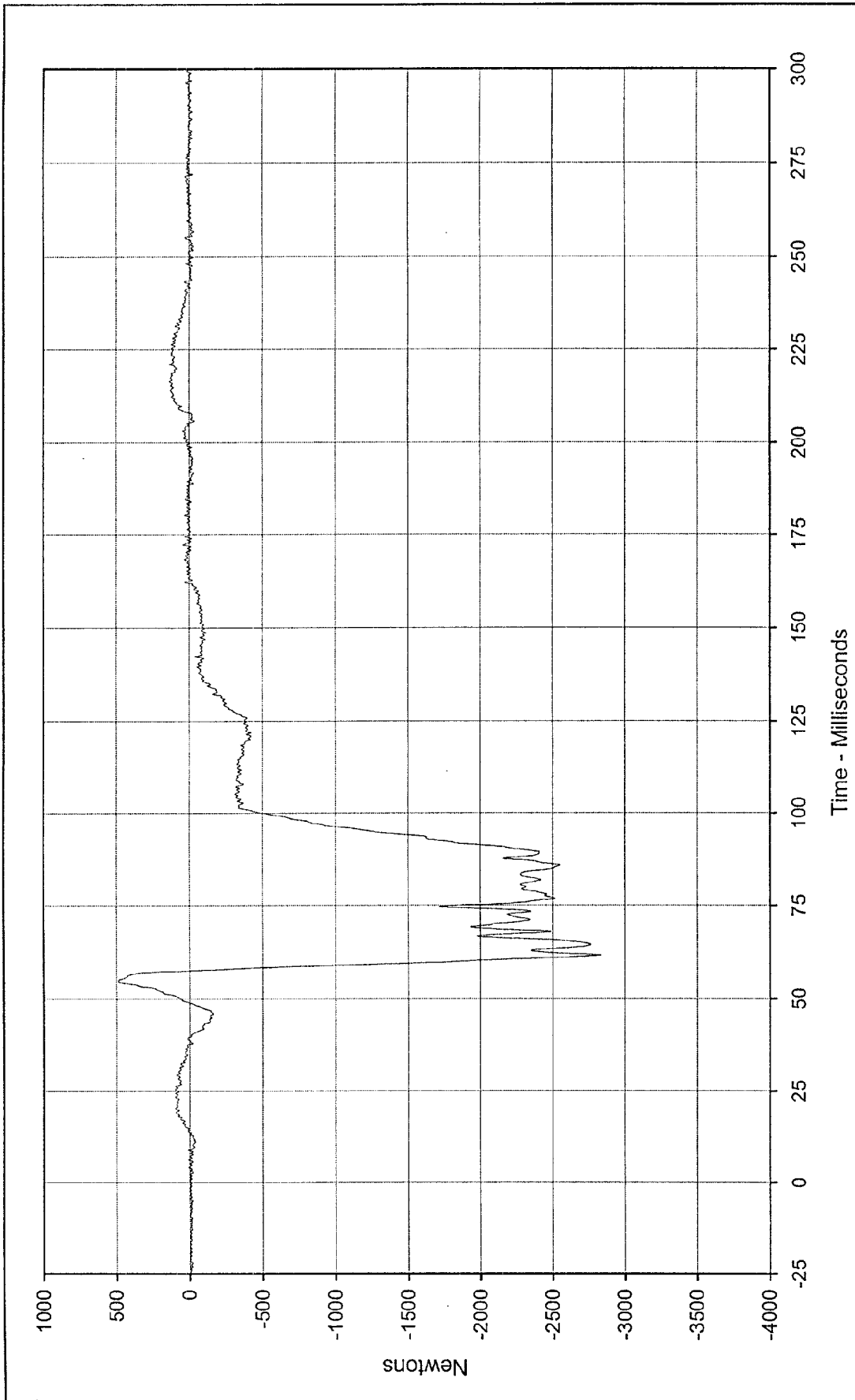
Minimum Value: -2795.7 at 64.8 Milliseconds

SAE Filter Class: 600

Date of Test: 1/23/98

Curve Number: FIL-023

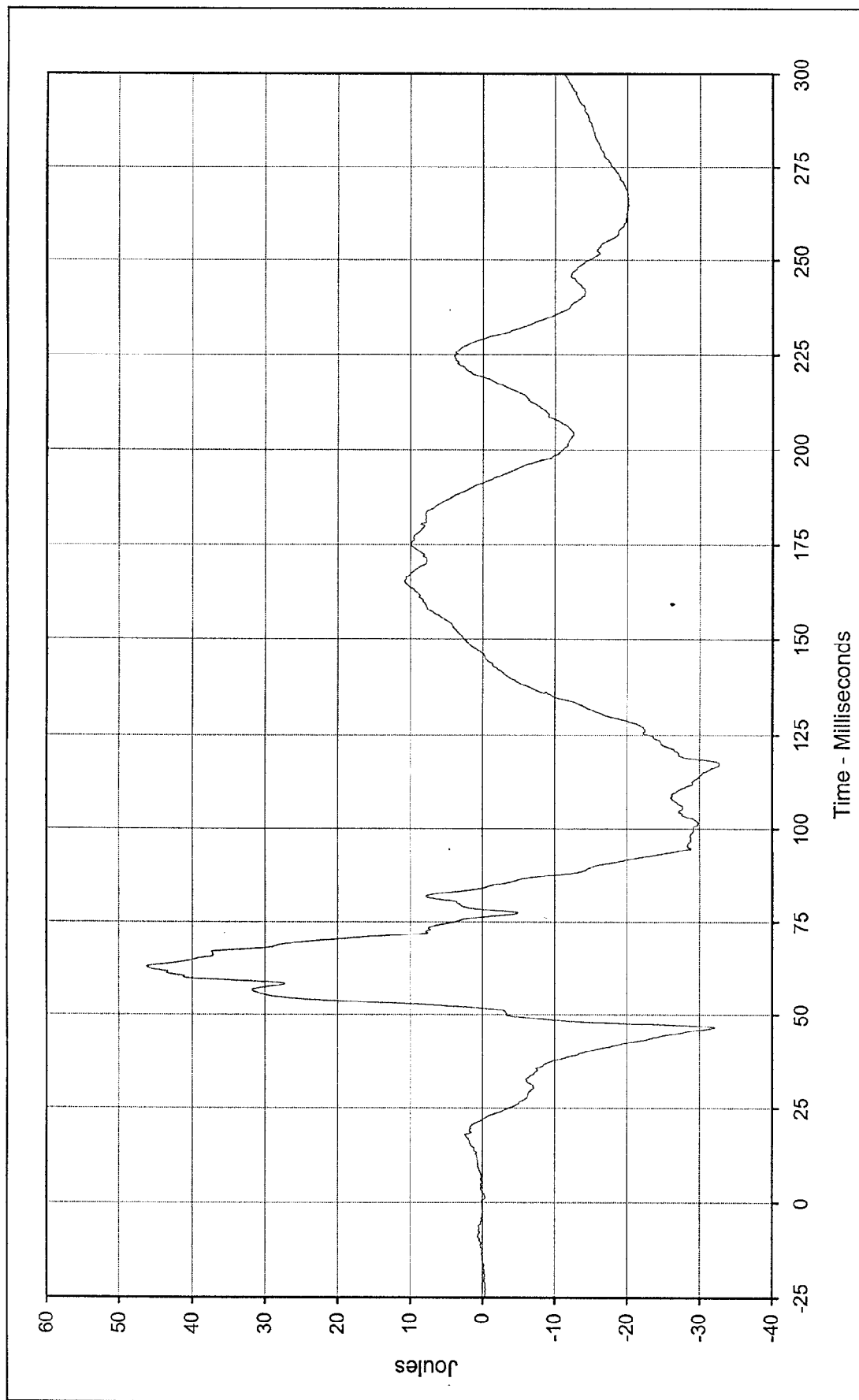




Curve Description: Driver Right Femur Force
 Maximum Value: 490.3 at 54.6 Milliseconds
 Minimum Value: -2831.8 at 61.6 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-024

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

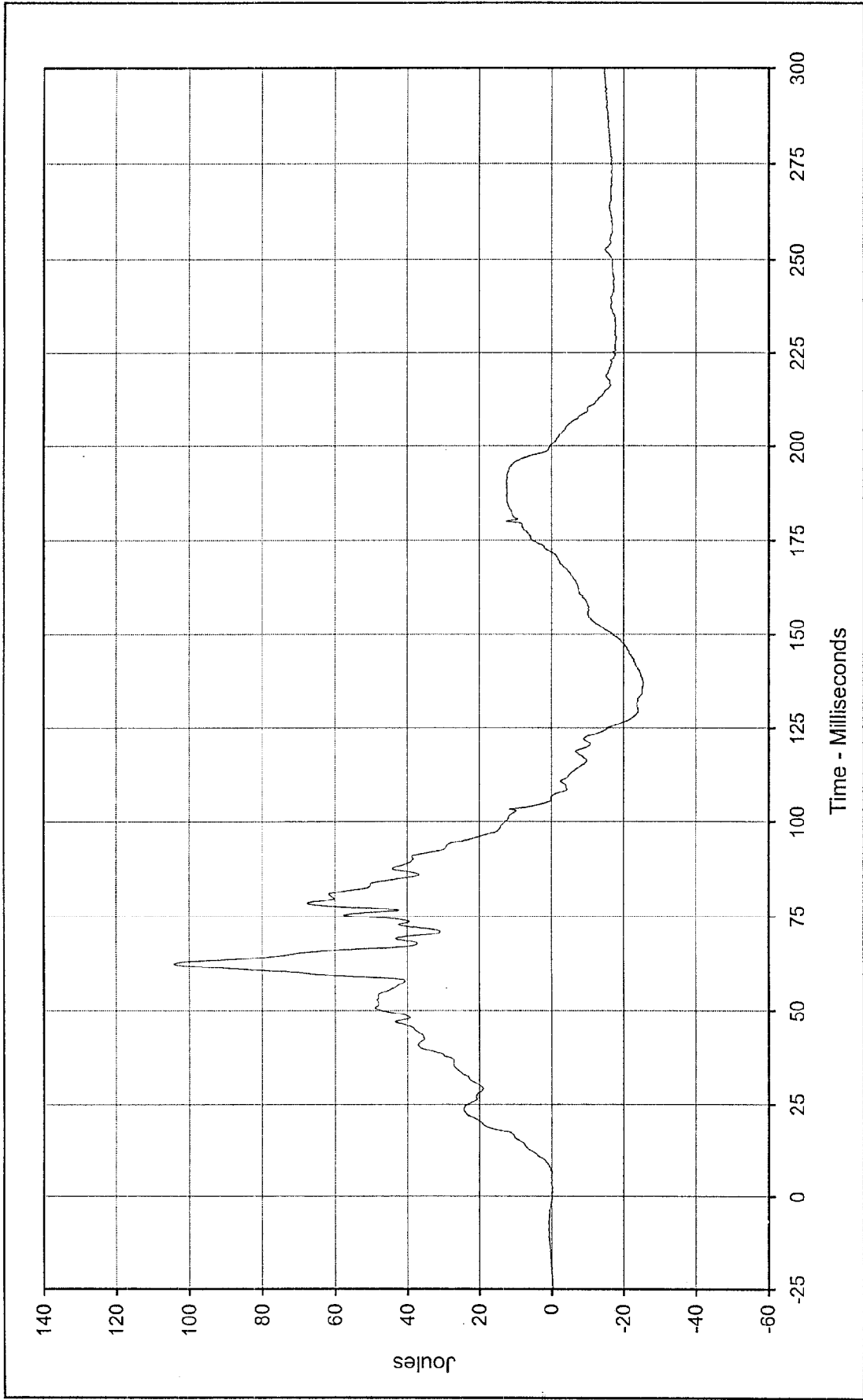




Curve Description: Driver Left Upper Tibia Moment X
 Maximum Value: 46.2 at 63.0 Milliseconds
 Minimum Value: -32.8 at 117.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-025

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

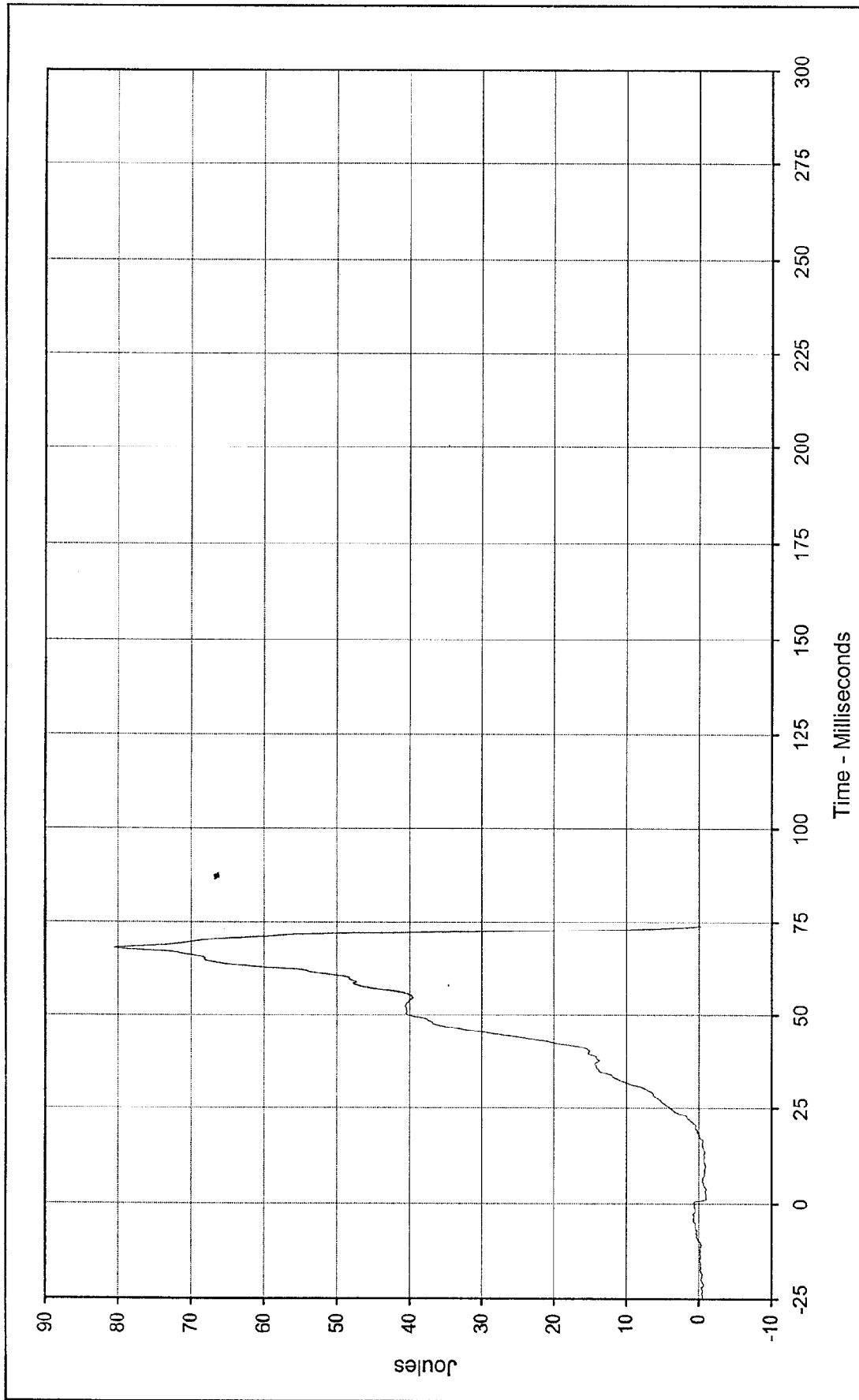




Curve Description: Driver Left Upper Tibia Moment Y
Maximum Value: 104.2 at 62.5 Milliseconds
Minimum Value: -25.5 at 137.3 Milliseconds
SAE Filter Class: 600
Date of Test: 1/23/98
Curve Number: FIL-026

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

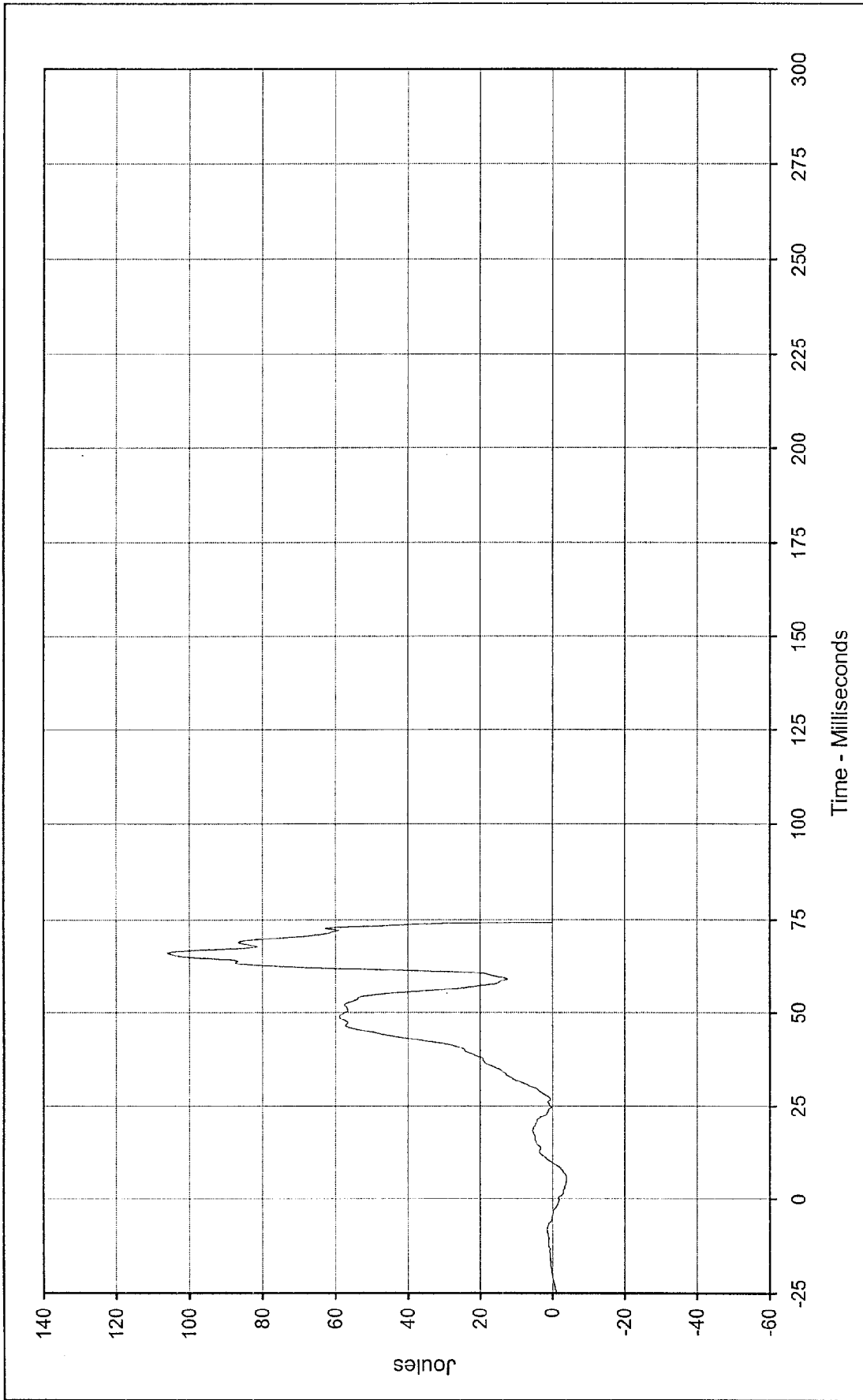




Curve Description: Driver Right Upper Tibia Moment X * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Maximum Value: 80.5 at 68.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
Minimum Value: -1.1 at 3.7 Milliseconds
SAE Filter Class: 600
Date of Test: 1/23/98
Curve Number: FIL-027



* Channel Failed at 74.0 Msec.

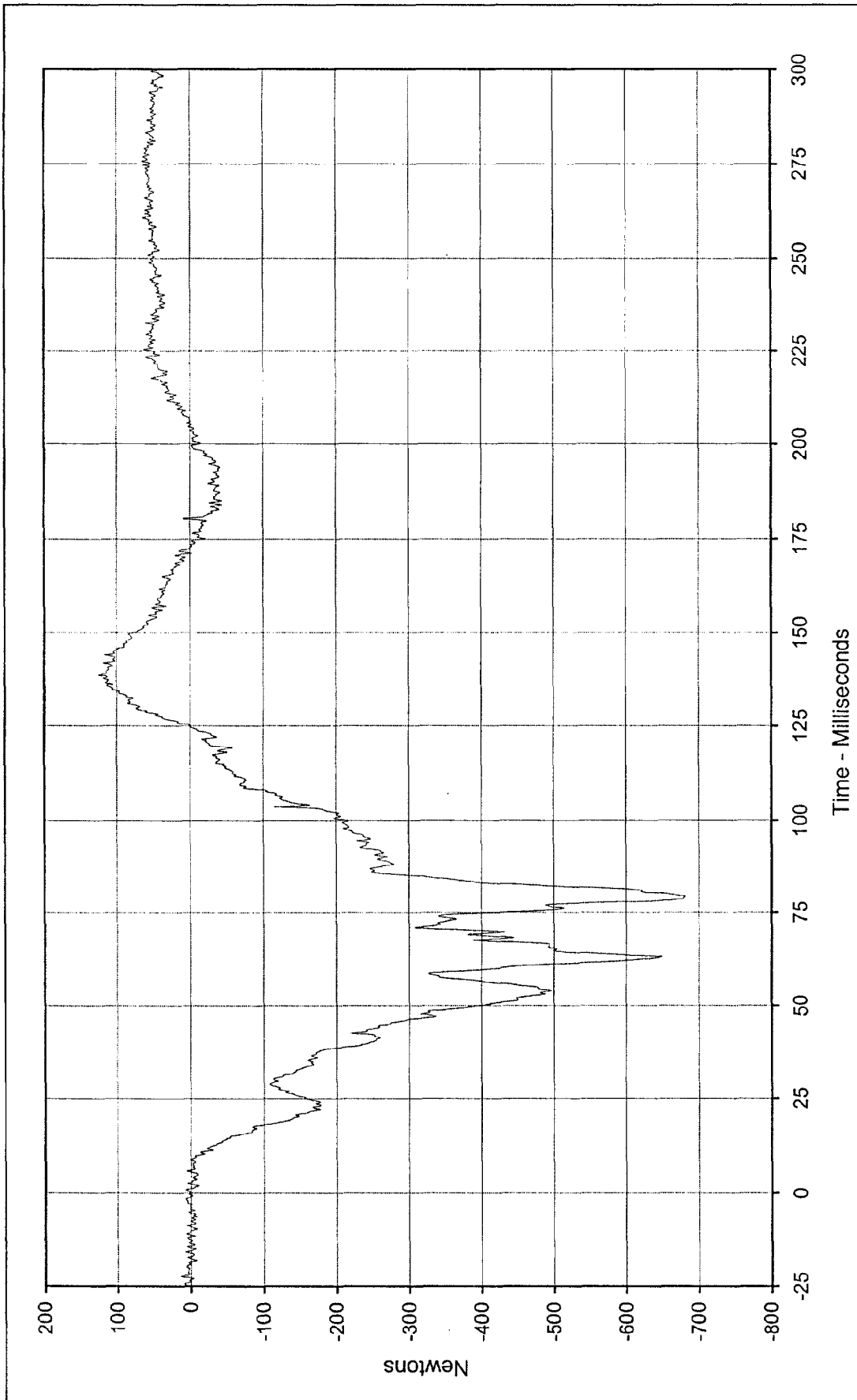


Curve Description: Driver Right Upper Tibia Moment Y *
 Maximum Value: 106.0 at 65.9 Milliseconds
 Minimum Value: -4.0 at 5.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-028

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe



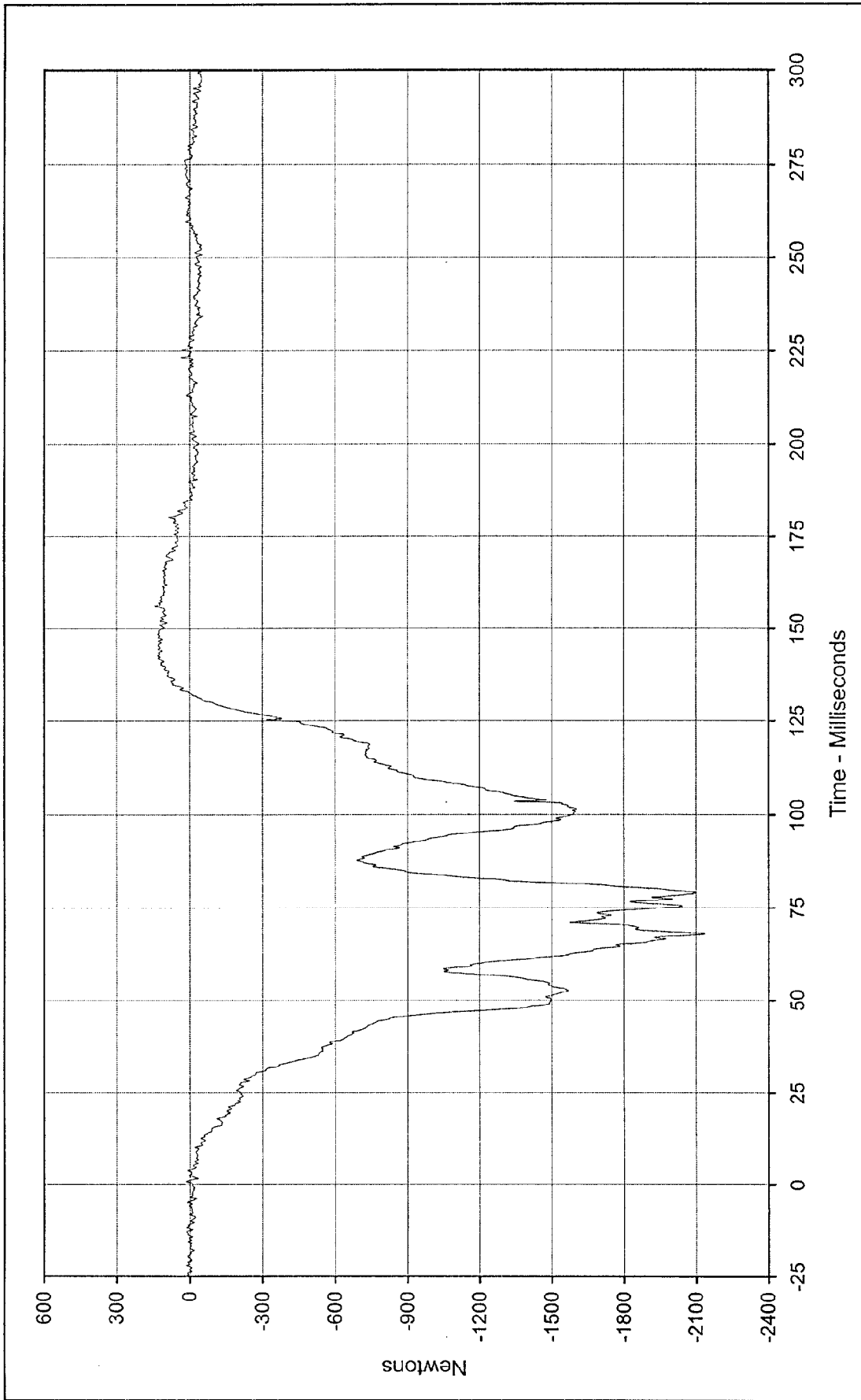
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Curve Description: Driver Left Lower Tibia Force X
 Maximum Value: 124.7 at 138.5 Milliseconds
 Minimum Value: -681.6 at 79.3 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-029

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

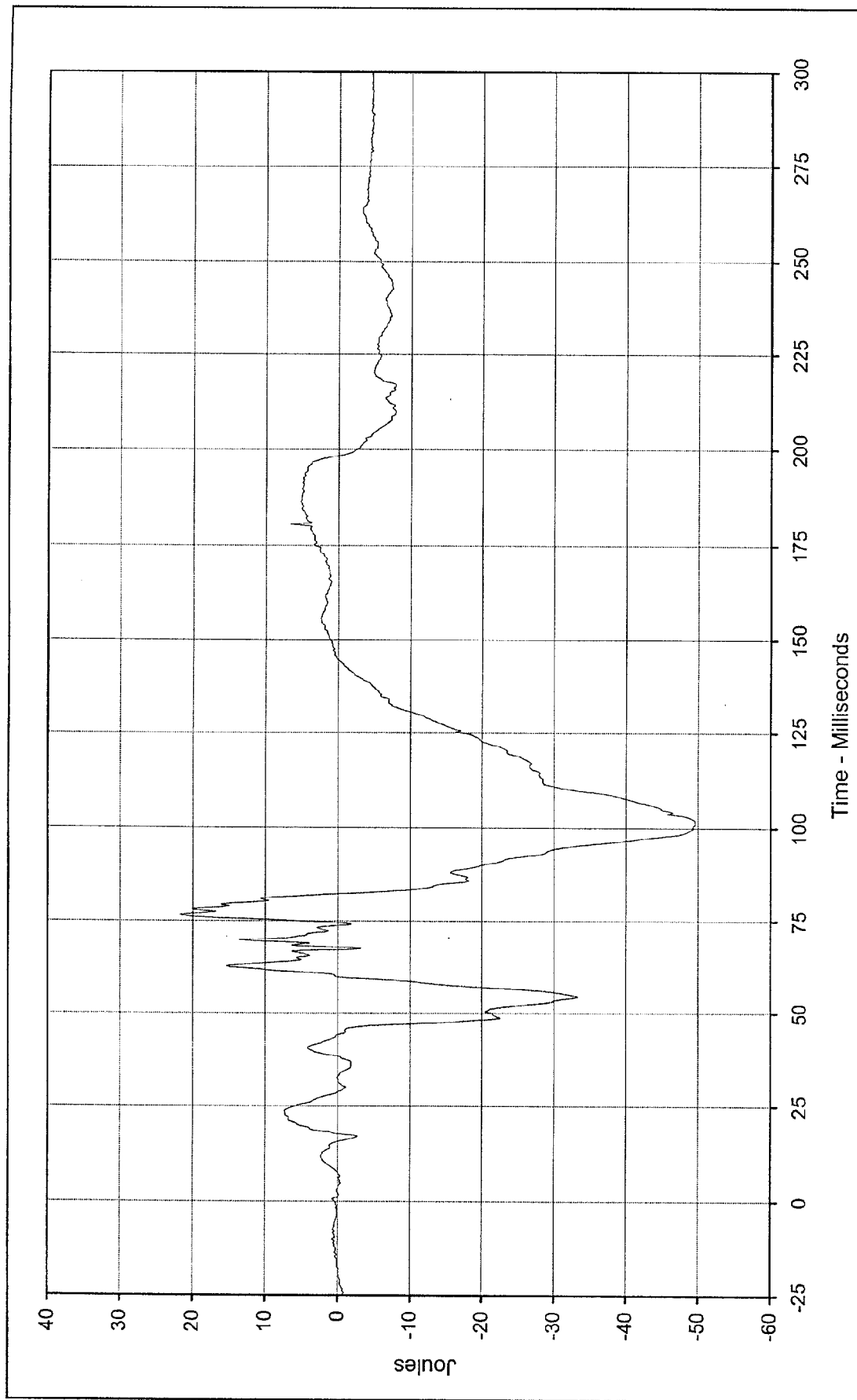




Curve Description: Driver Left Lower Tibia Force Z
 Maximum Value: 142.4 at 156.4 Milliseconds
 Minimum Value: -2136.9 at 67.9 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-030

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

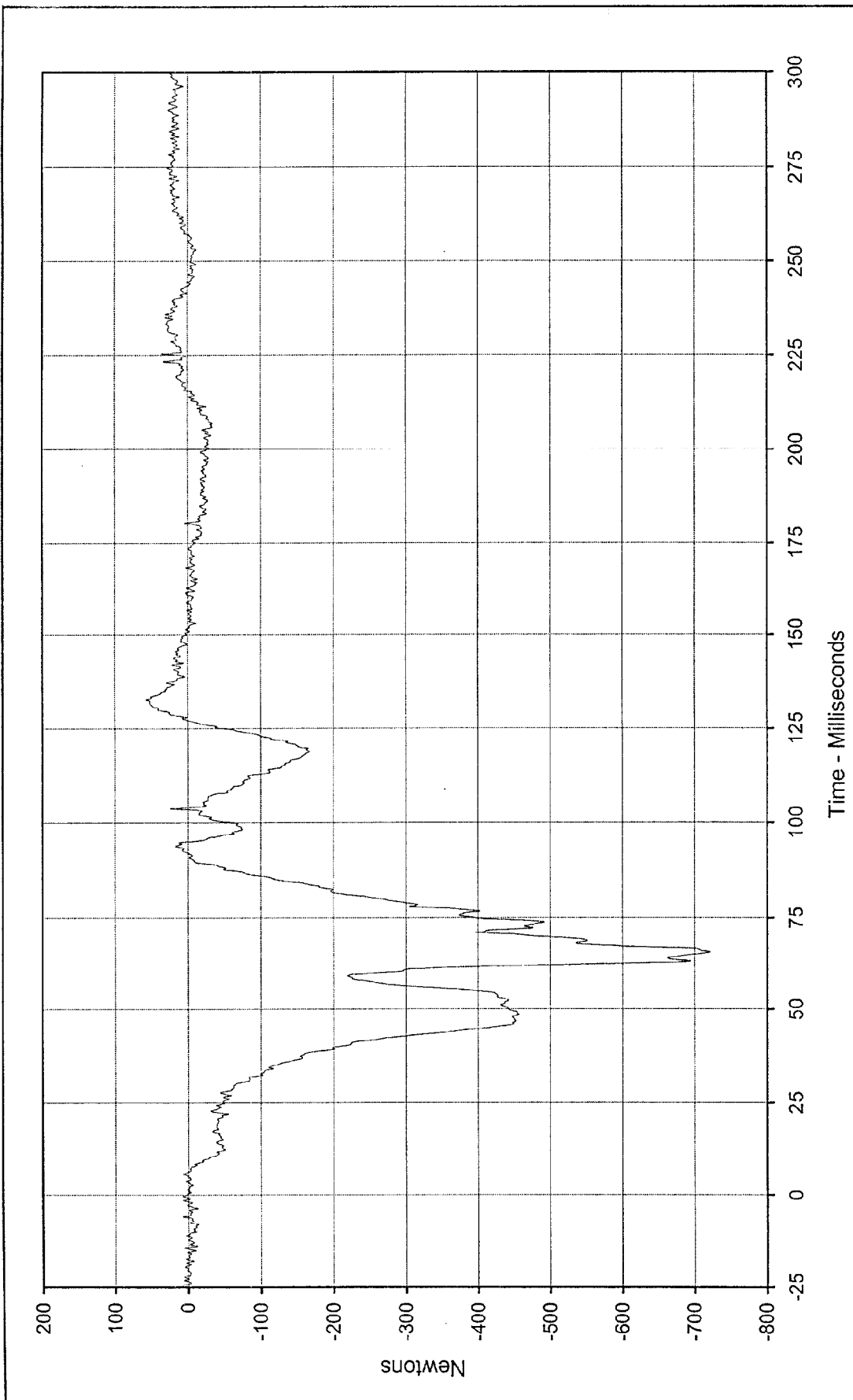




Curve Description: Driver Left Lower Tibia Moment Y
 Maximum Value: 21.7 at 76.6 Milliseconds
 Minimum Value: -49.7 at 101.2 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-031

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

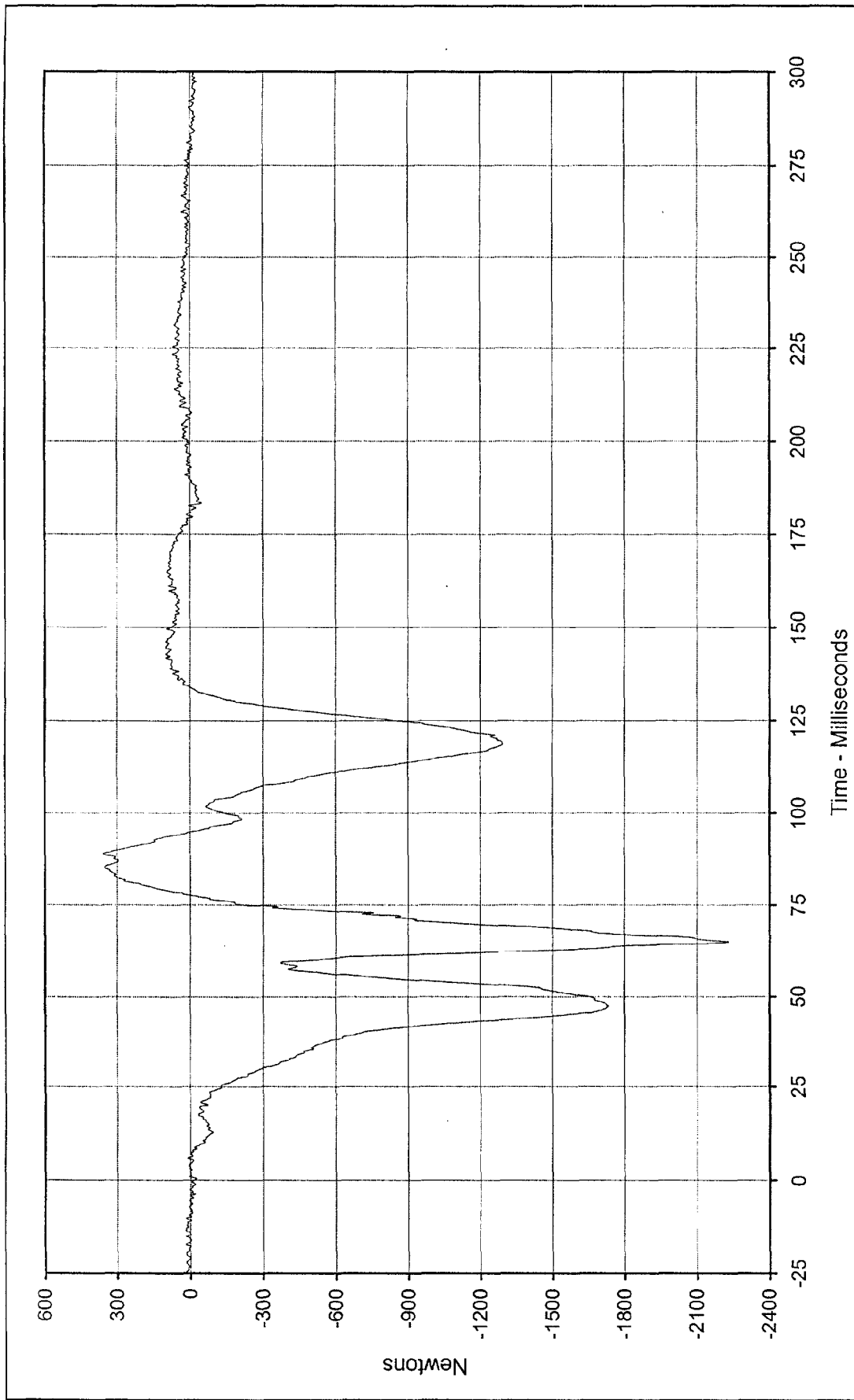




Curve Description: Driver Right Lower Tibia Force X
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Maximum Value: 57.0 at 132.6 Milliseconds
 Minimum Value: -721.7 at 65.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-032





Curve Description: Driver Right Lower Tibia Force Z

Maximum Value: 356.3 at 88.9 Milliseconds

Minimum Value: -2230.8 at 65.1 Milliseconds

SAE Filter Class: 600

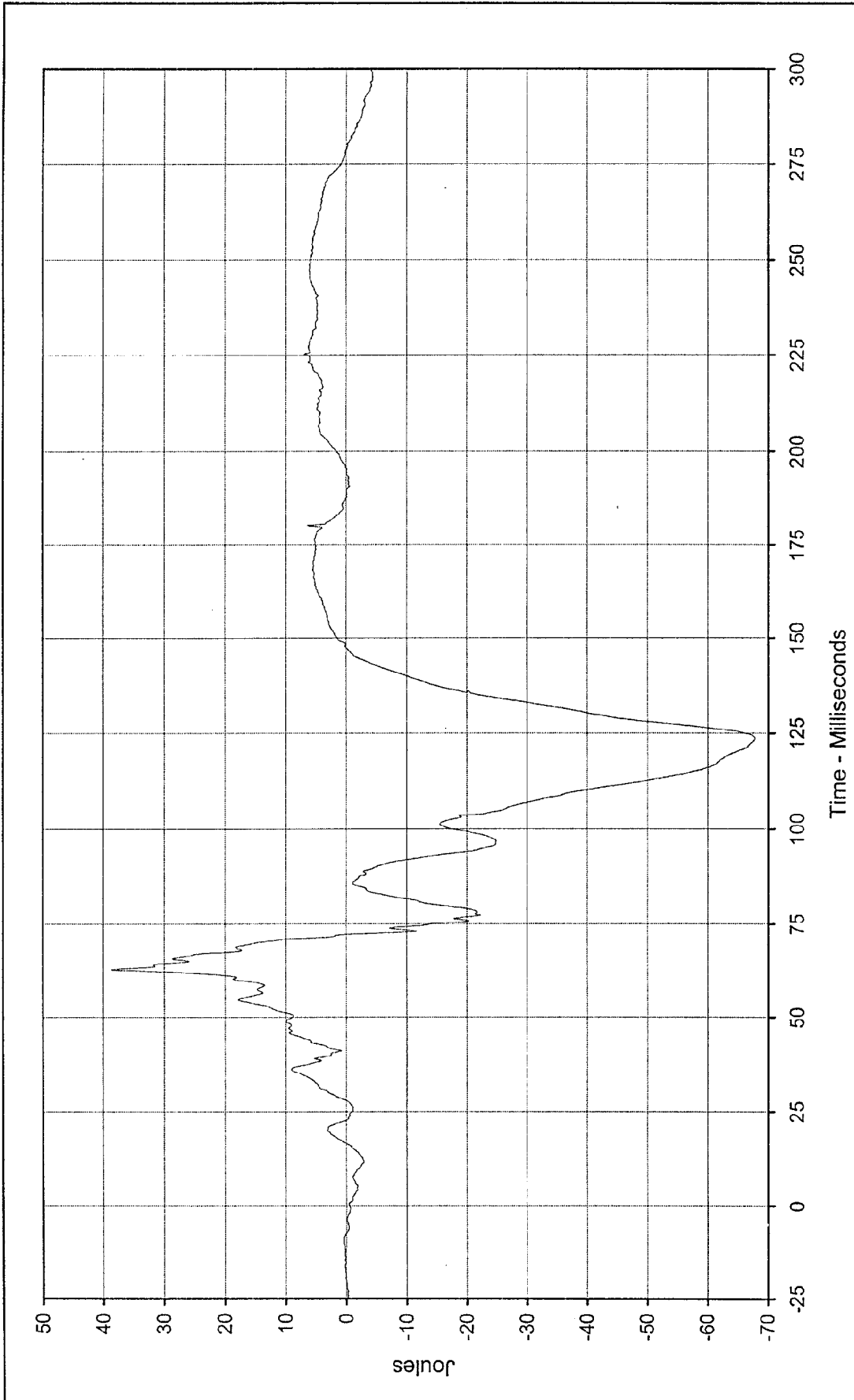
Date of Test: 1/23/98

Curve Number: FIL-033

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

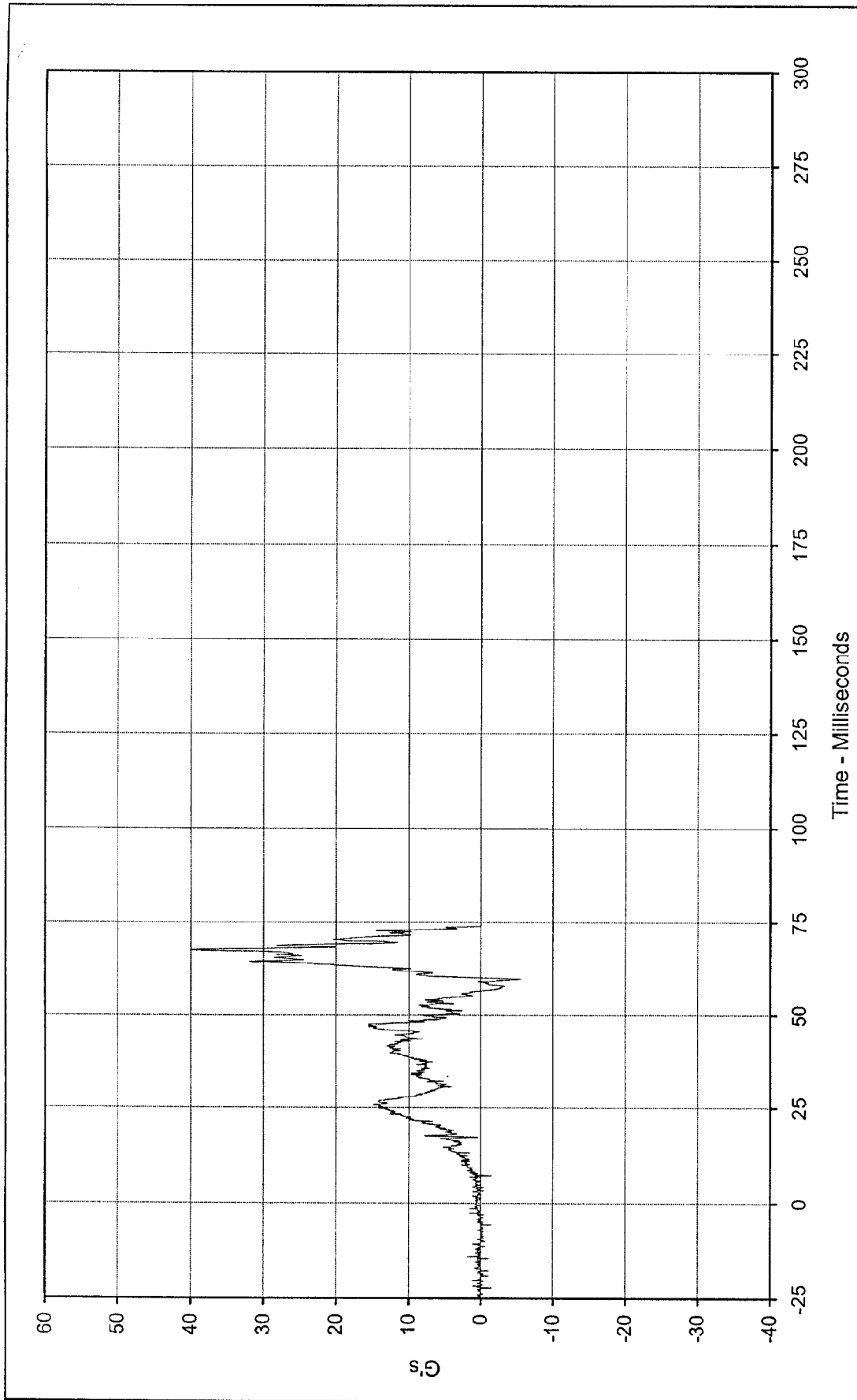




Curve Description: Driver Right Lower Tibia Moment Y
 Maximum Value: 38.6 at 62.7 Milliseconds
 Minimum Value: -67.8 at 123.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-034

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

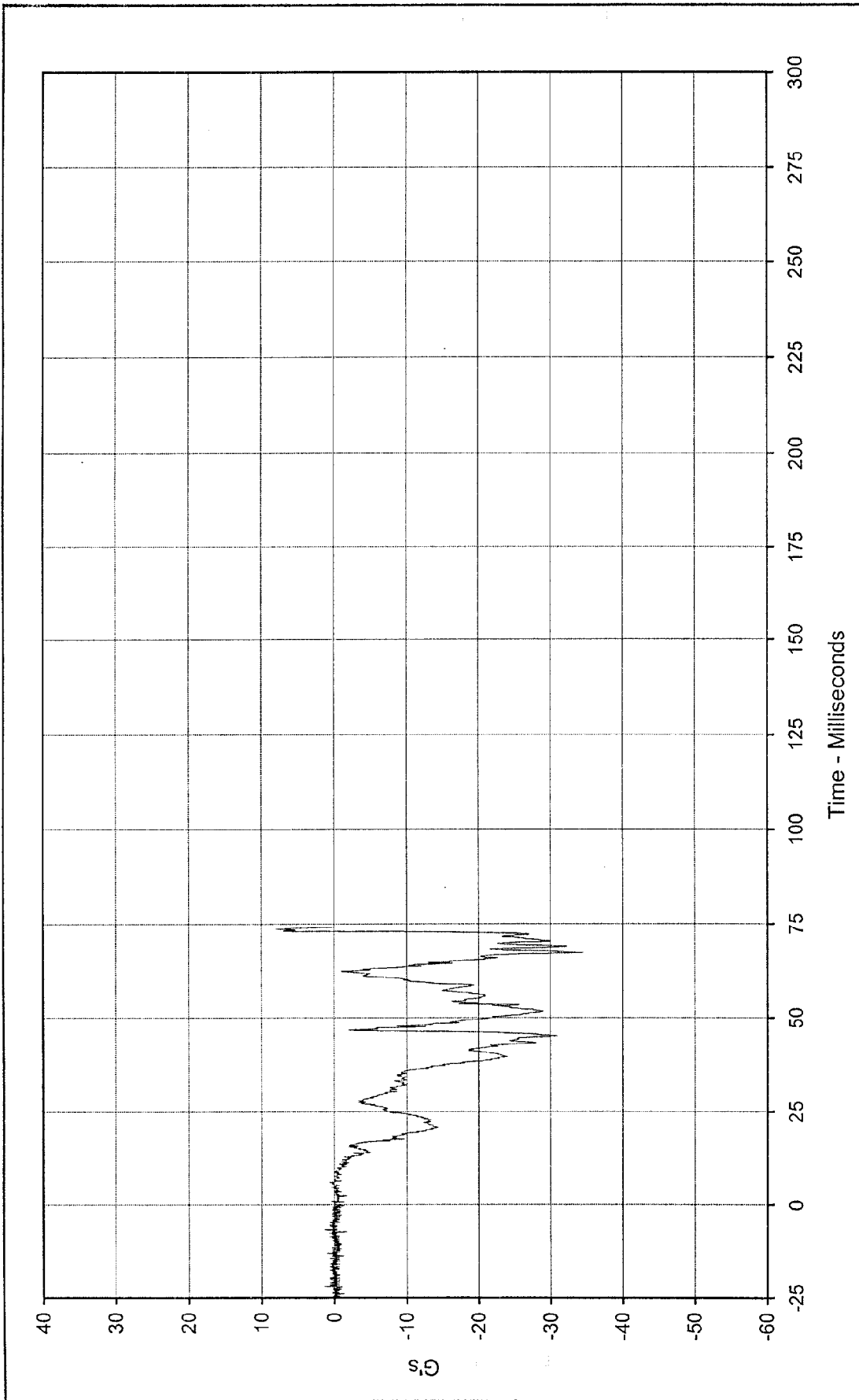




Curve Description: Driver Left Foot Aft X * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 40.1 at 67.5 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: -5.6 at 59.9 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-035



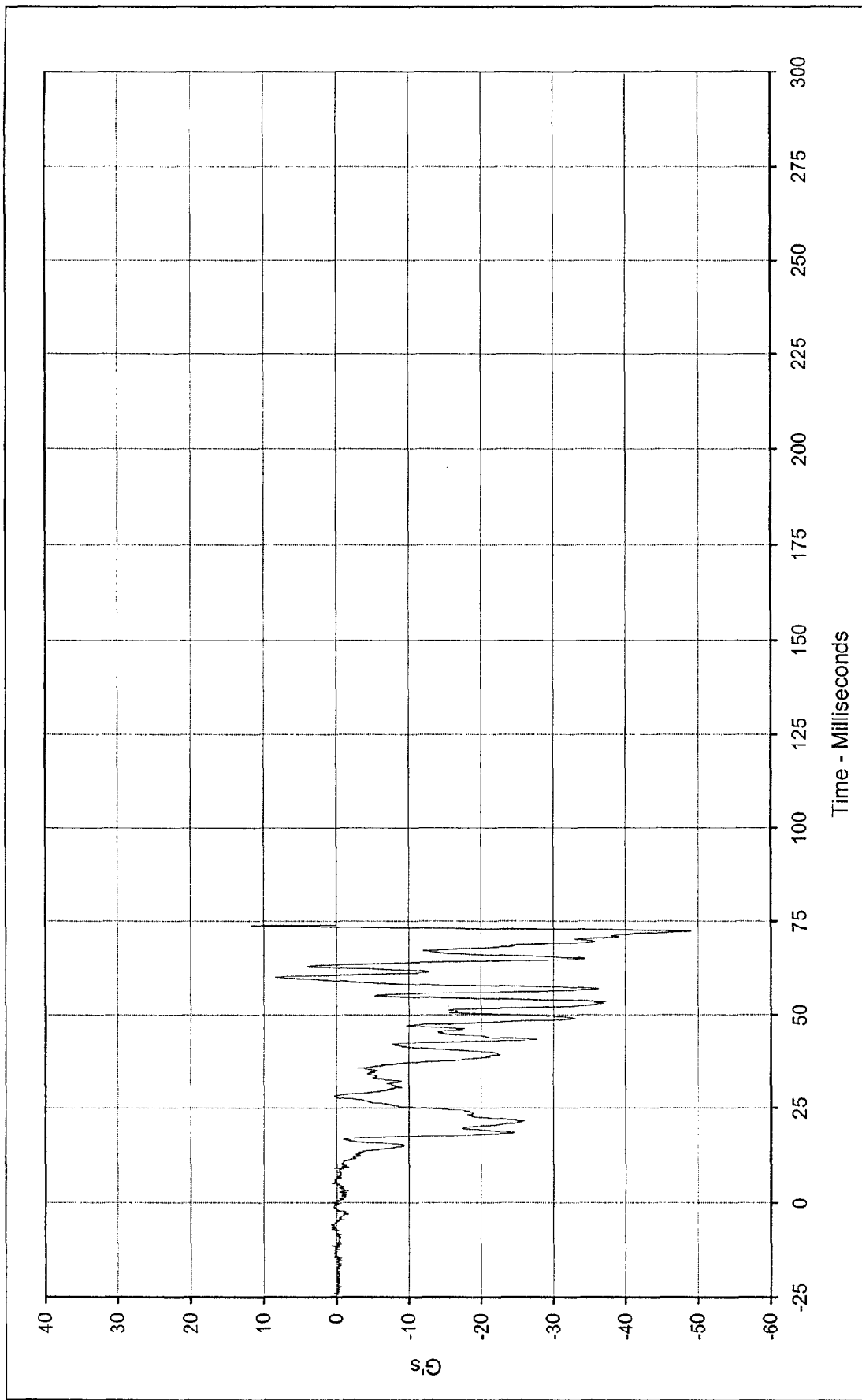
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Curve Description: Driver Left Foot Aft Z * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 8.0 at 73.5 Milliseconds
 Minimum Value: -34.6 at 67.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-036



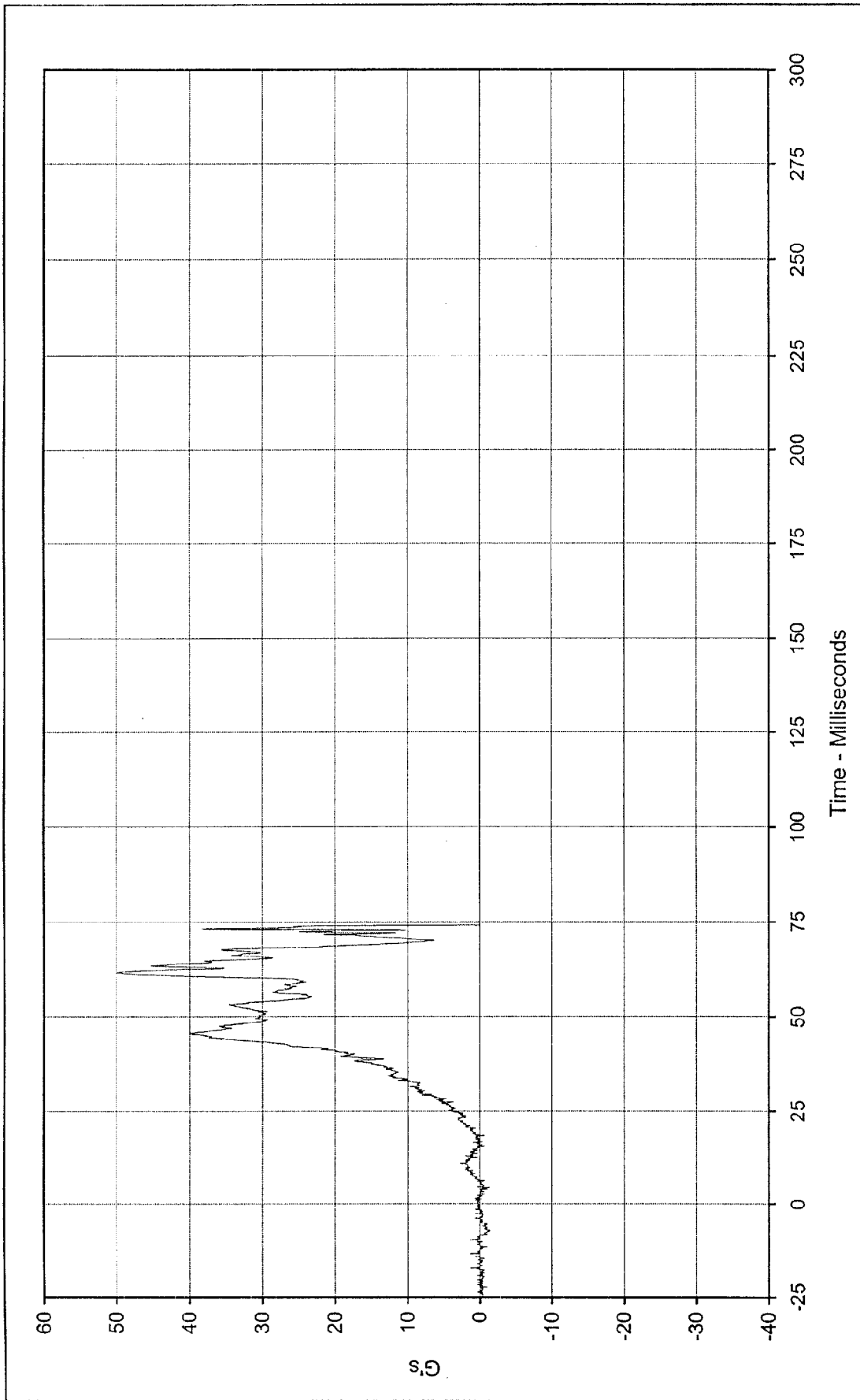
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Curve Description:	Driver Left Foot Fore Z	*	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	11.3	at 73.9	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-49.0	at 72.4			
SAE Filter Class:	1000				
Date of Test:	1/23/98				
Curve Number:	FIL-037				



* Channel Failed at 74.0 Msec.

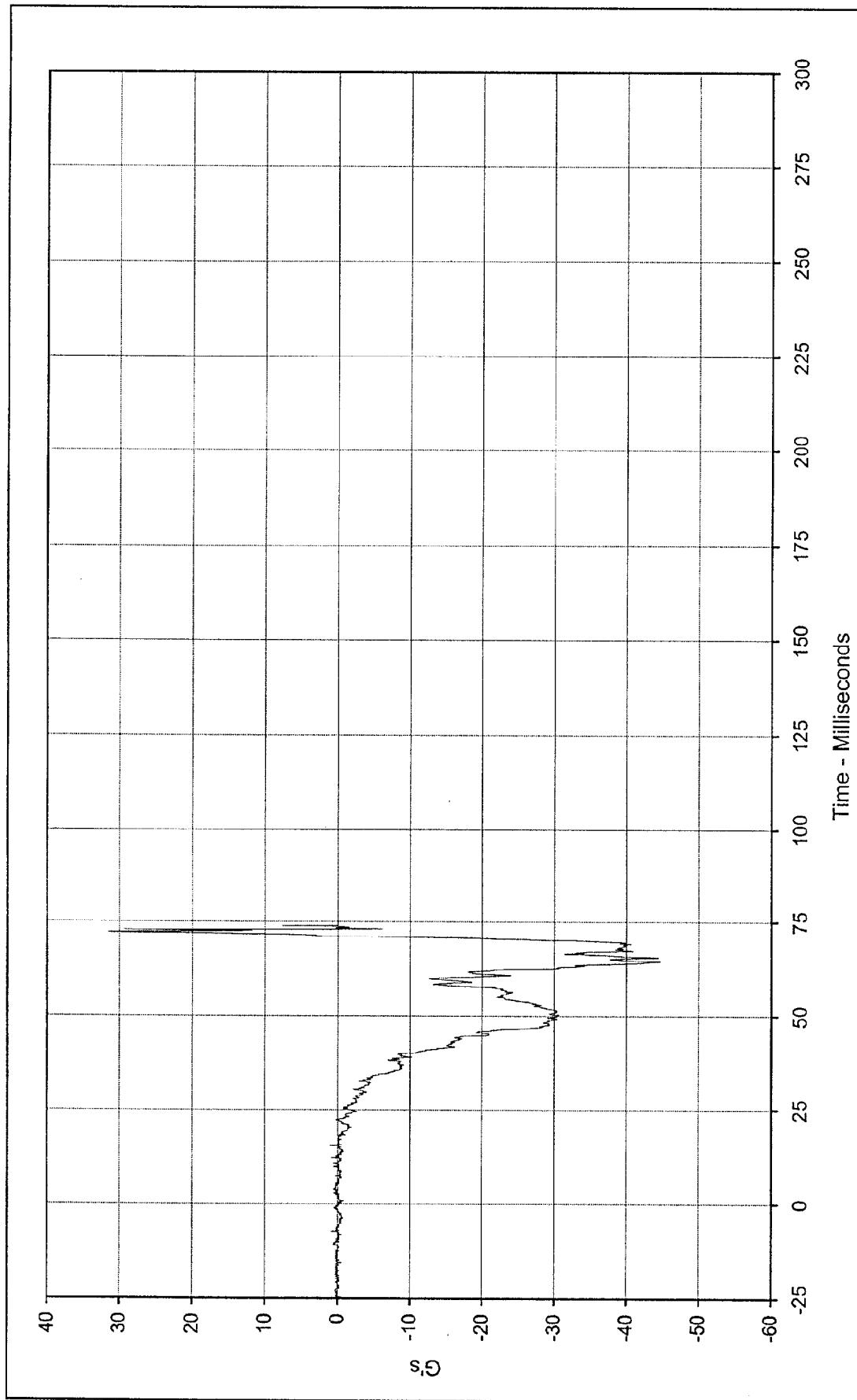


Curve Description: Driver Right Foot Aft X * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 49.9 at 61.5 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: -1.3 at 4.3 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-038



* Channel Failed at 74.0 Msec.

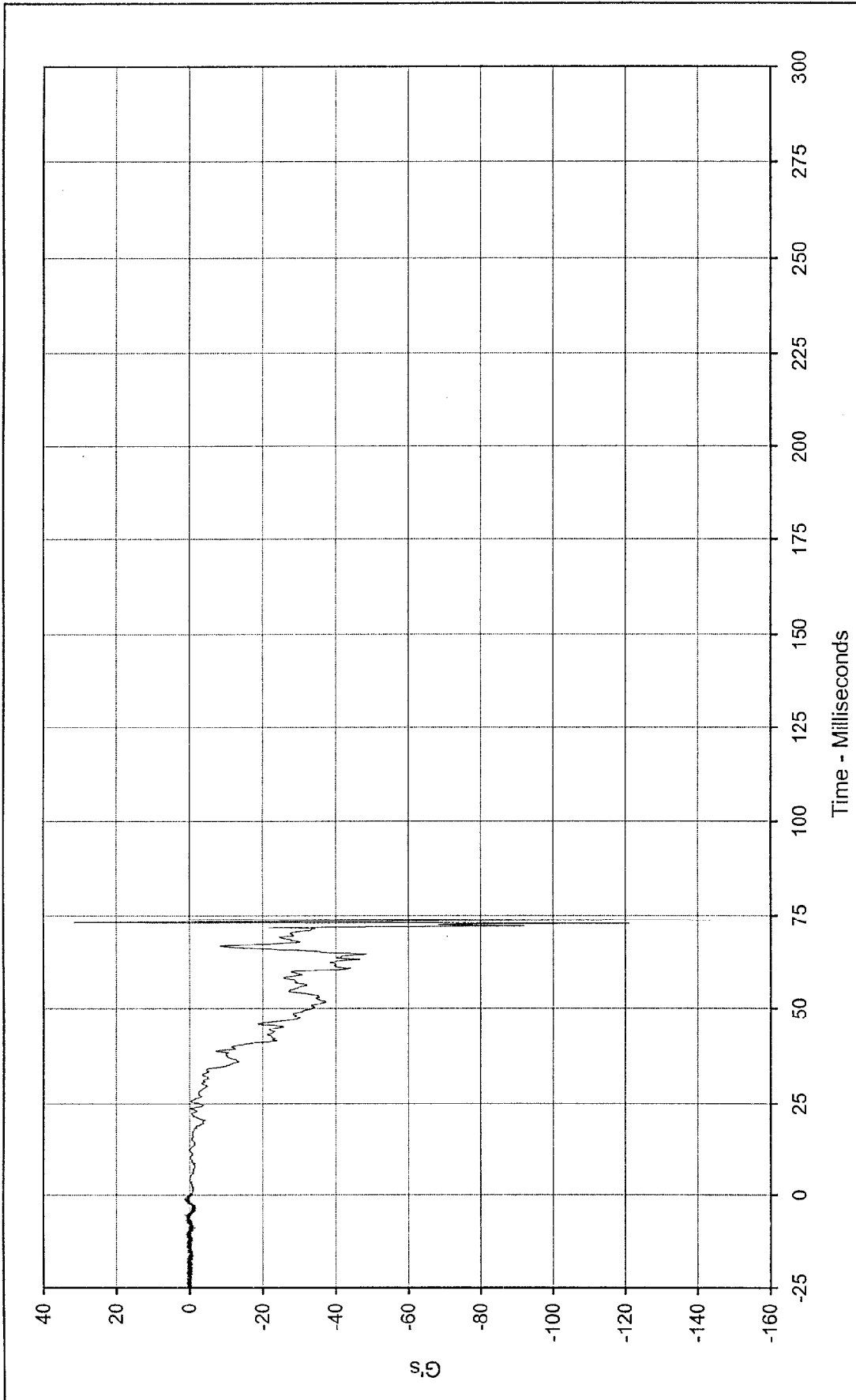


Curve Description: Driver Right Foot Aft Z *
 Maximum Value: 31.5 at 72.1 Milliseconds
 Minimum Value: -44.7 at 64.5 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-039

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe



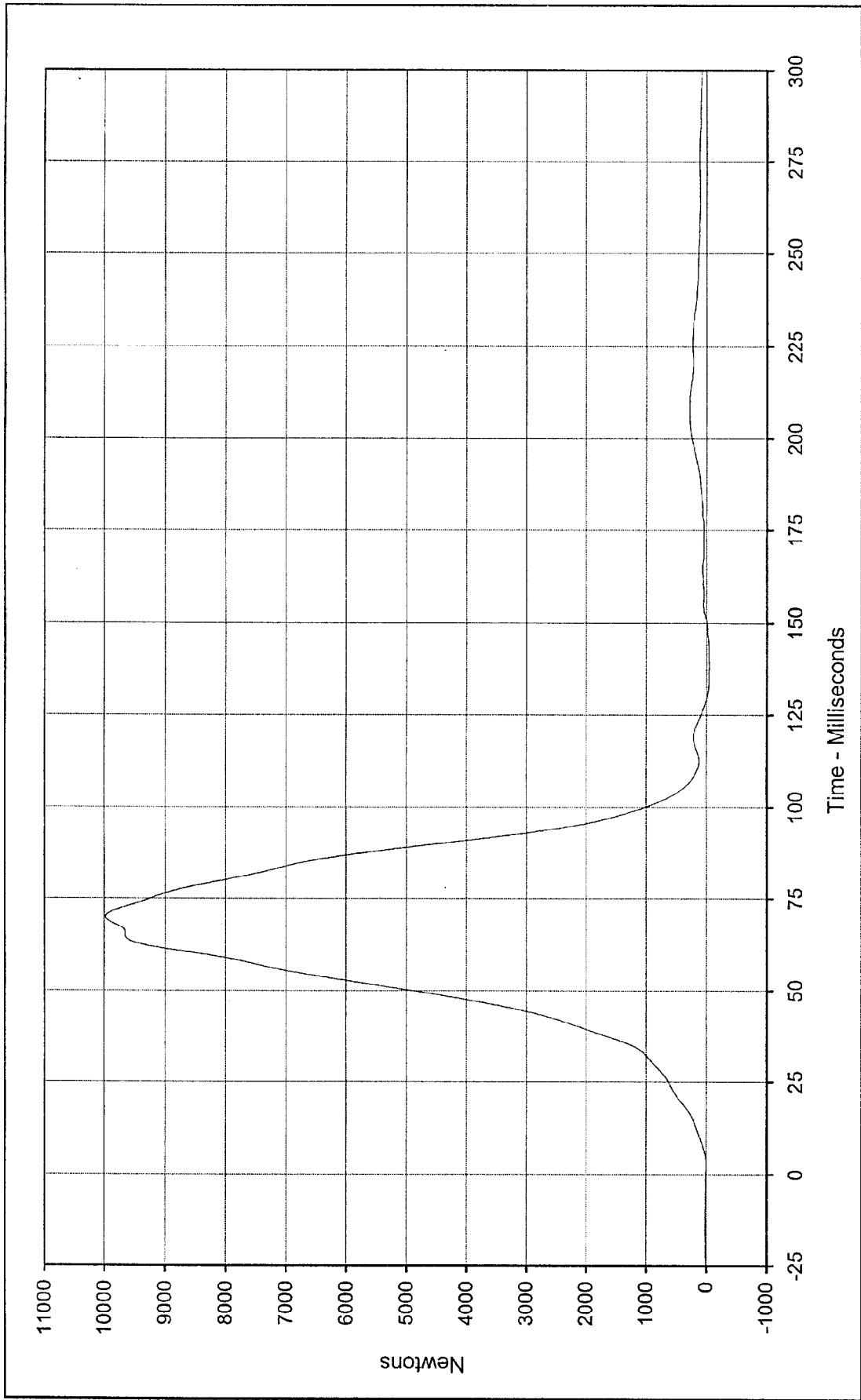
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Curve Description: Driver Right Foot Fore Z * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Maximum Value: 31.0 at 73.1 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
Minimum Value: -146.1 at 73.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 1/23/98
Curve Number: FIL-040



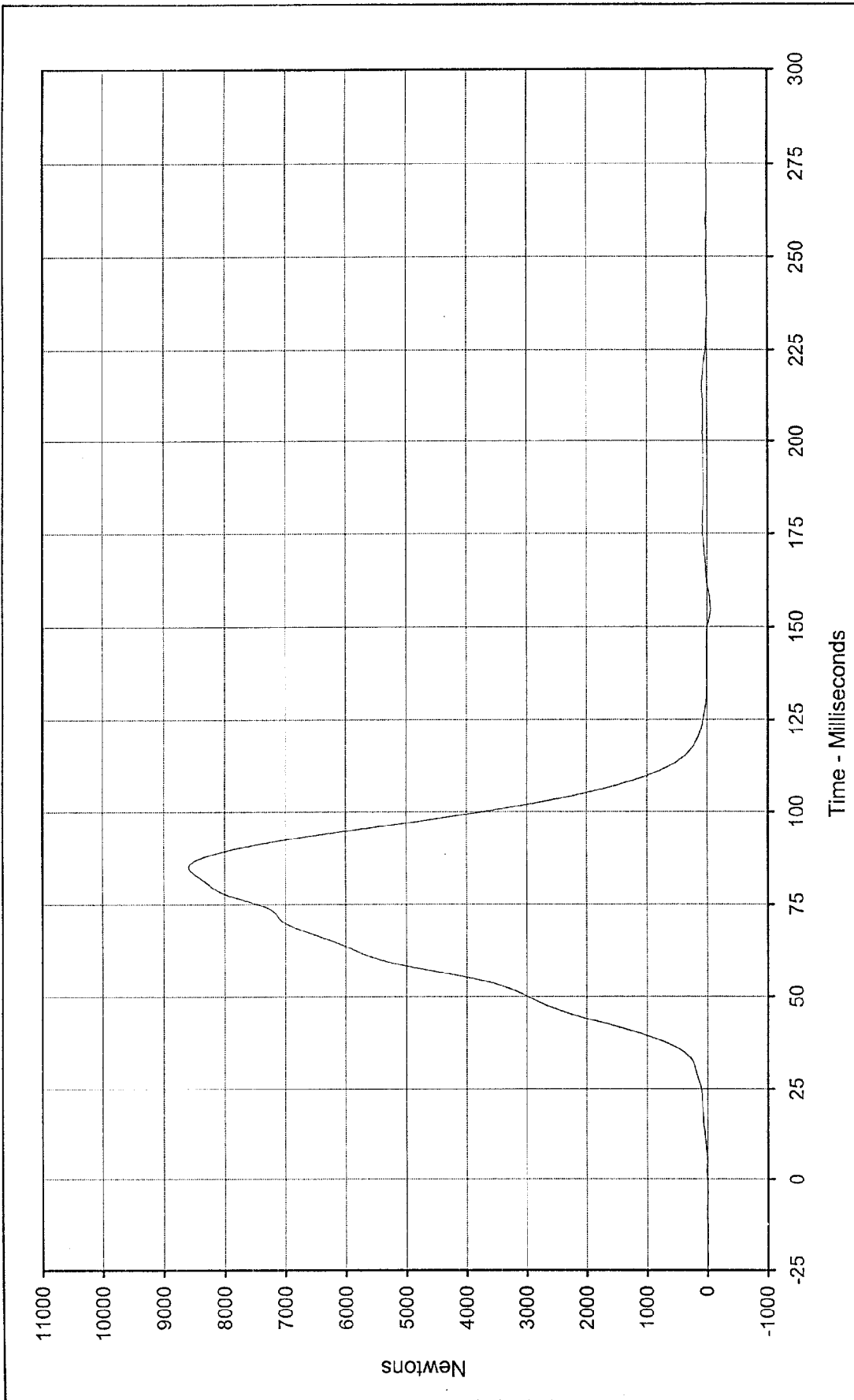
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Curve Description: Driver Lap Belt Force
 Maximum Value: 9984.4 at 70.0 Milliseconds
 Minimum Value: -47.2 at 138.5 Milliseconds

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 SAE Filter Class: 60
 Date of Test: 1/23/98
 Curve Number: FIL-041

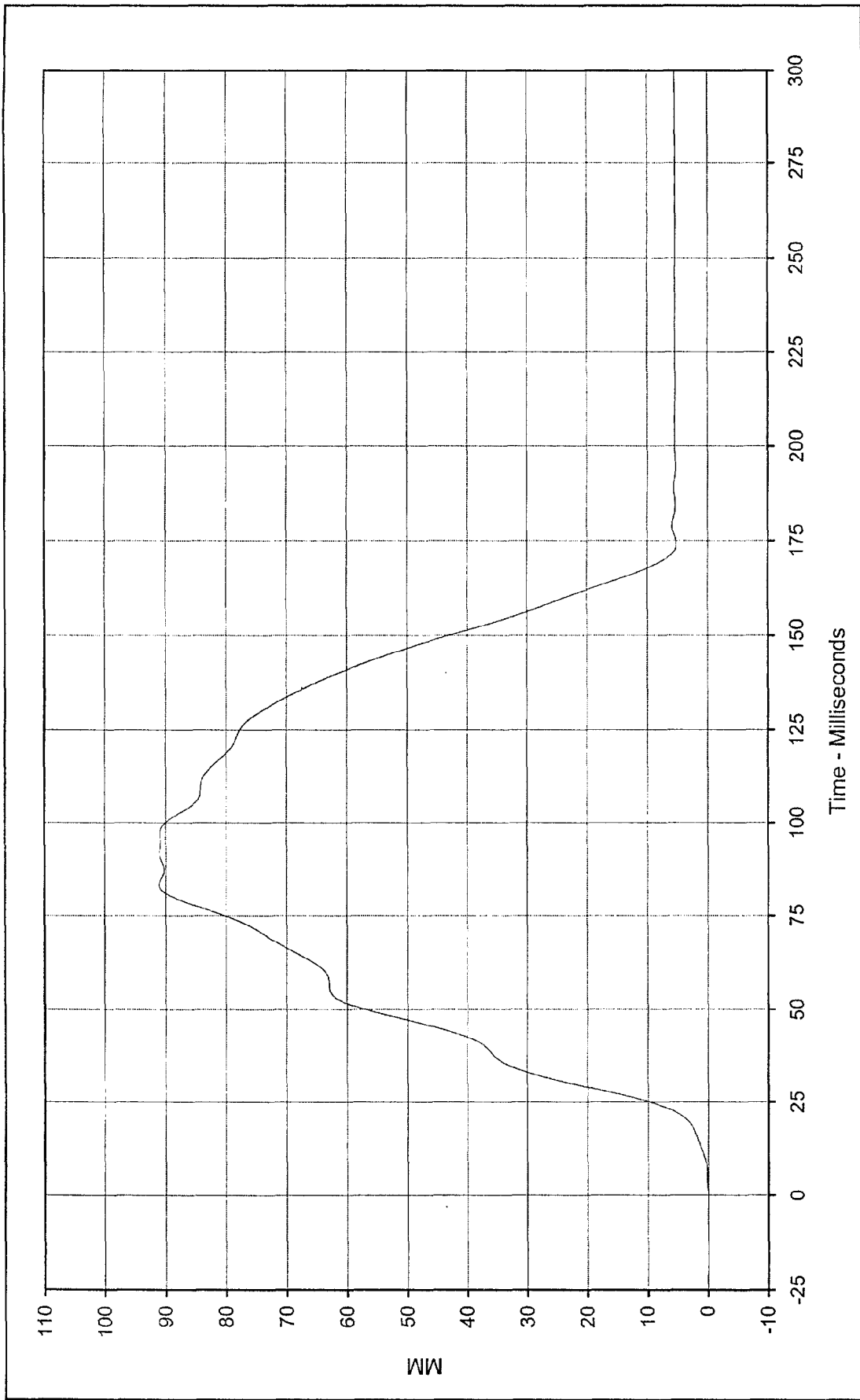




Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Curve Description: Driver Shoulder Belt Force
 Maximum Value: 8586.7 at 84.9 Milliseconds
 Minimum Value: -57.9 at 154.8 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/23/98
 Curve Number: FIL-042

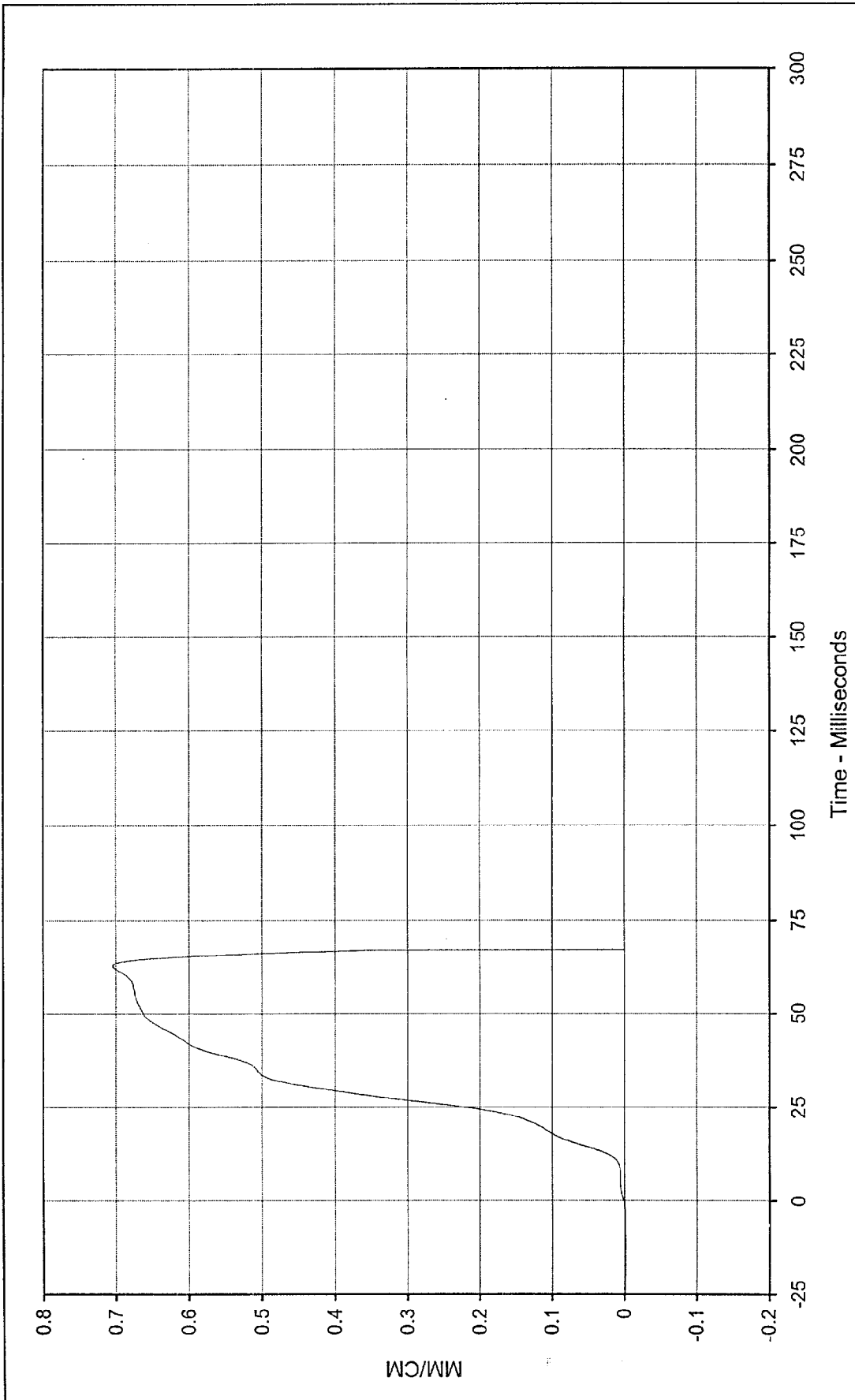




Curve Description: Driver Shoulder Belt Pullout
Maximum Value: 91.0 at 83.1 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 60
Date of Test: 1/23/98
Curve Number: FIL-043

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

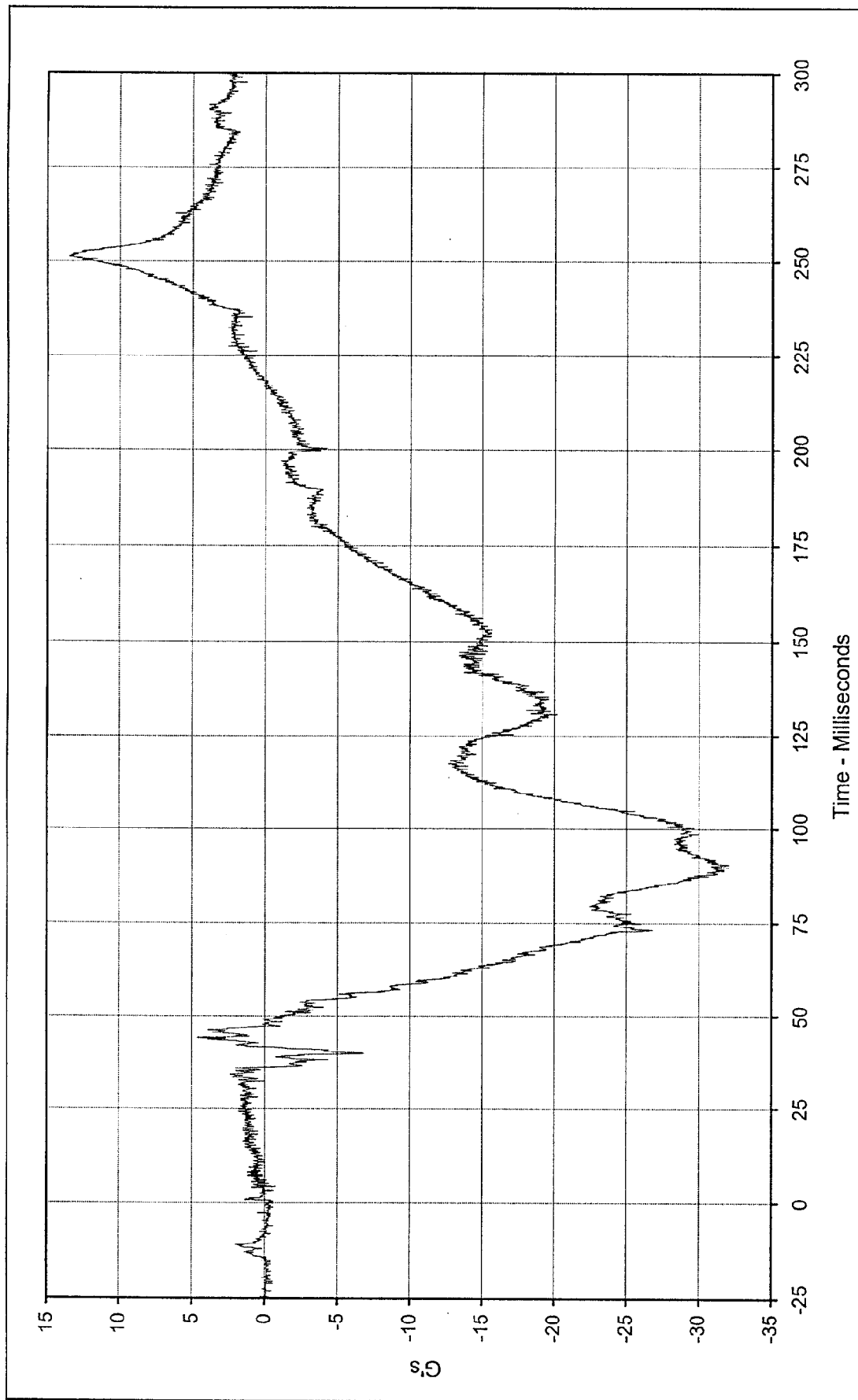




Curve Description: Driver Shoulder Belt Elongation *
 Maximum Value: 0.70 at 62.8 Milliseconds
 Minimum Value: 0.00 at 67.0 Milliseconds
 SAE Filter Class: 50
 Date of Test: 1/23/98
 Curve Number: FIL-044

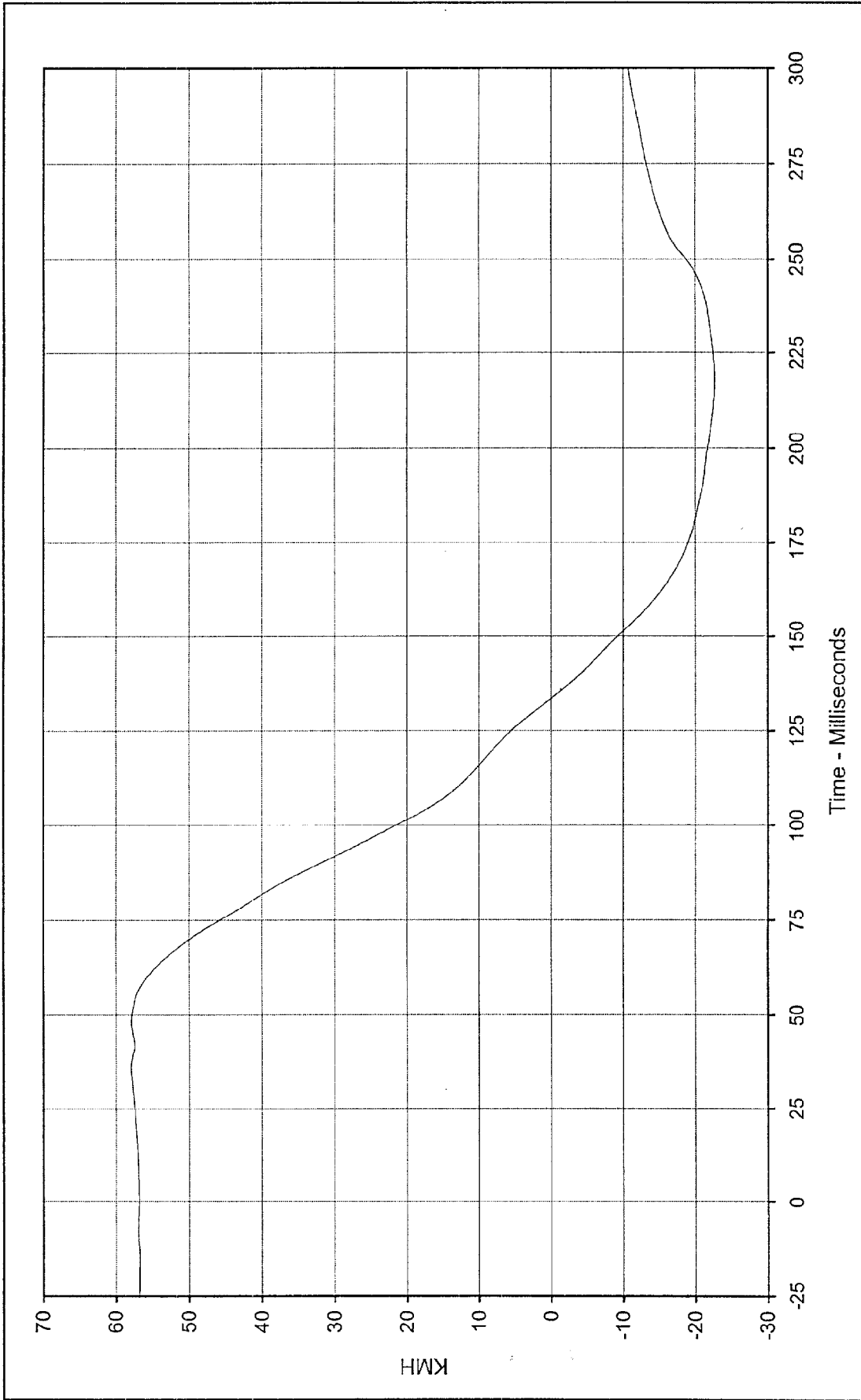


* Channel Failed at 67.0 Msec.



Curve Description:	Passenger Head Primary X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	13.5 at 251.4 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-32.1 at 89.7 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	FIL-045			

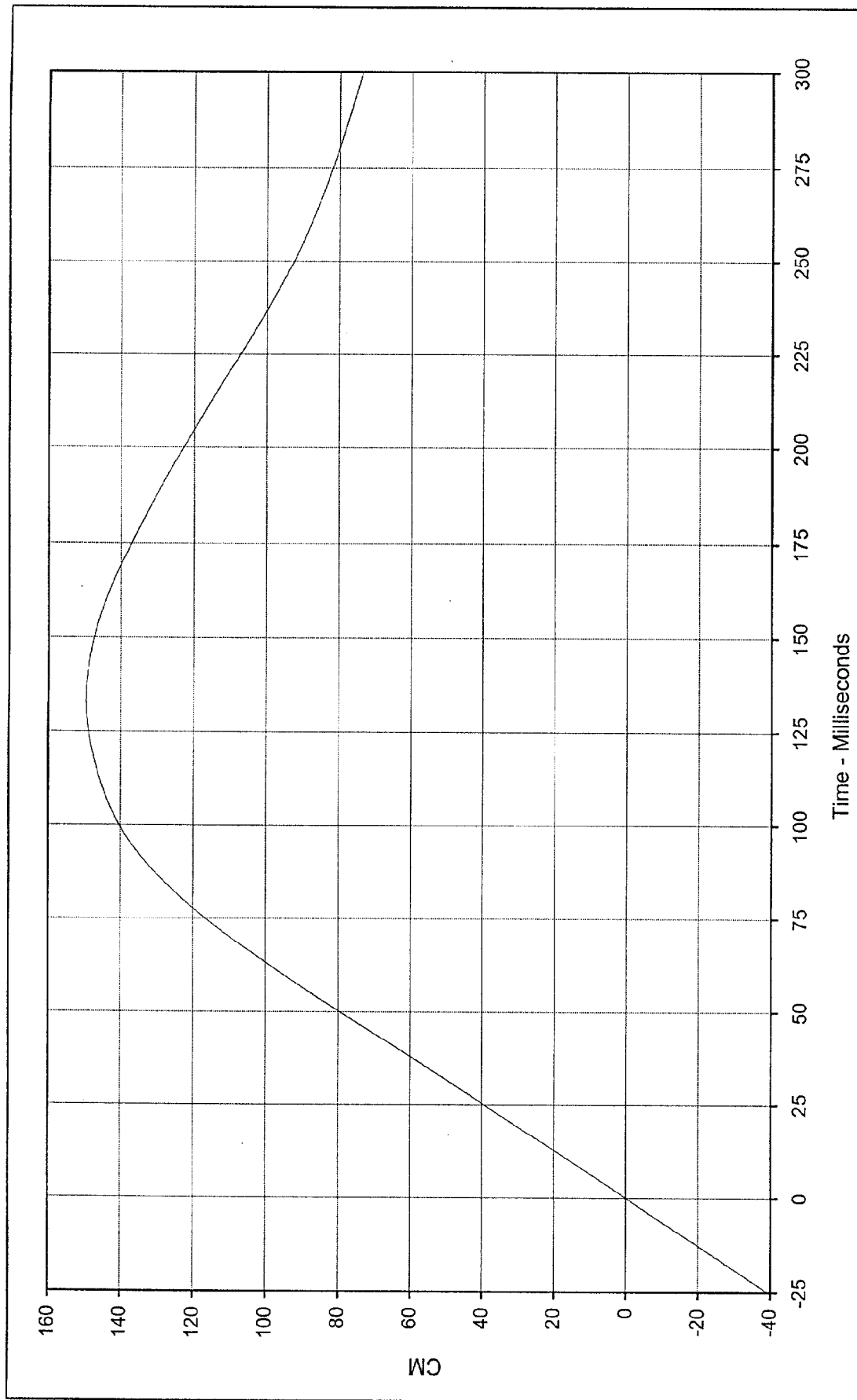




Curve Description: Passenger Head Primary X Velocity
 Maximum Value: 58.0 at 36.0 Milliseconds
 Minimum Value: -22.7 at 217.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-045

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

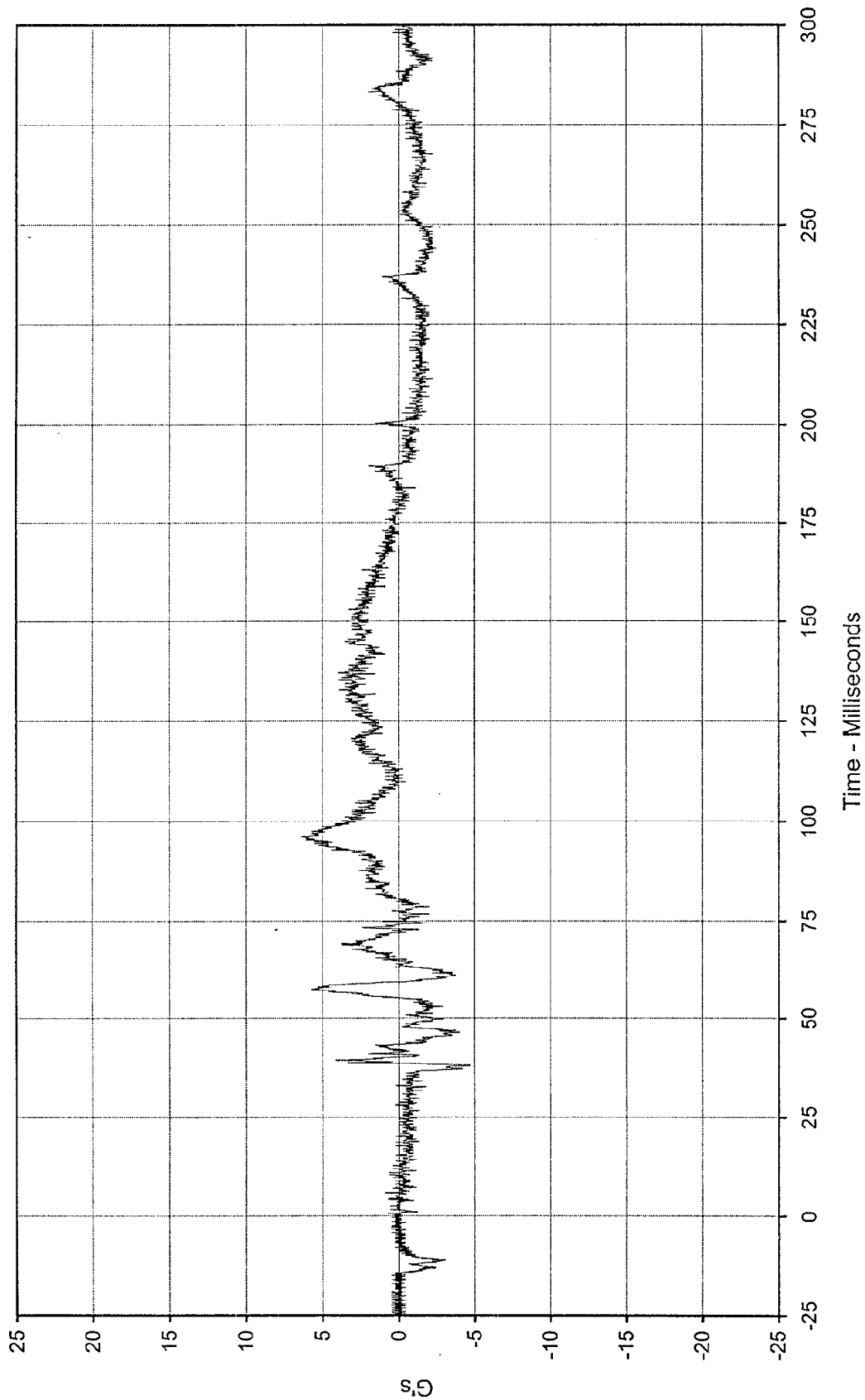




Curve Description: Passenger Head Primary X Displ.
 Maximum Value: 149.5 at 133.6 Milliseconds
 Minimum Value: -0.1 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-045

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

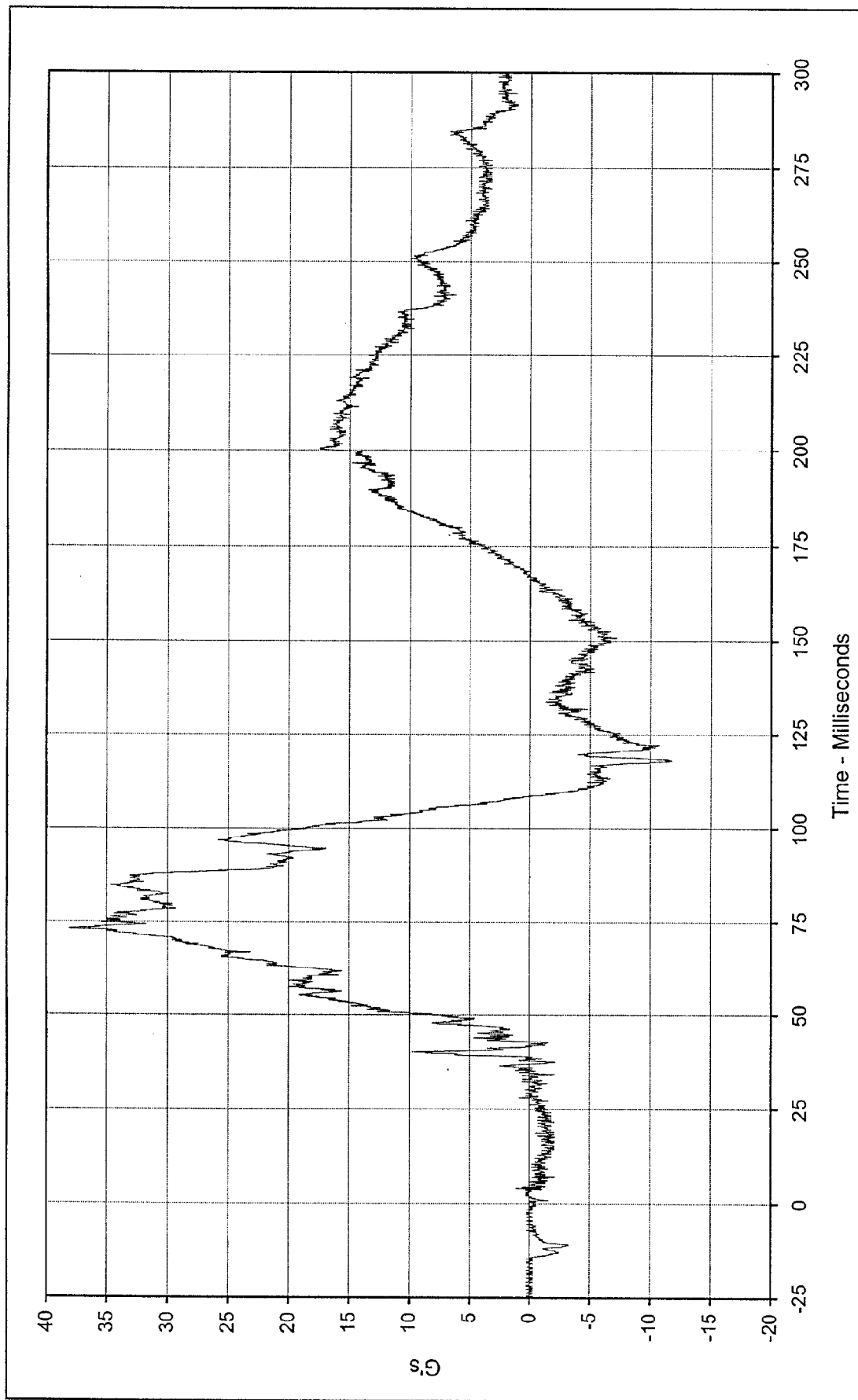




Curve Description: Passenger Head Primary Y
 Maximum Value: 6.4 at 96.1 Milliseconds
 Minimum Value: -4.7 at 37.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-046

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

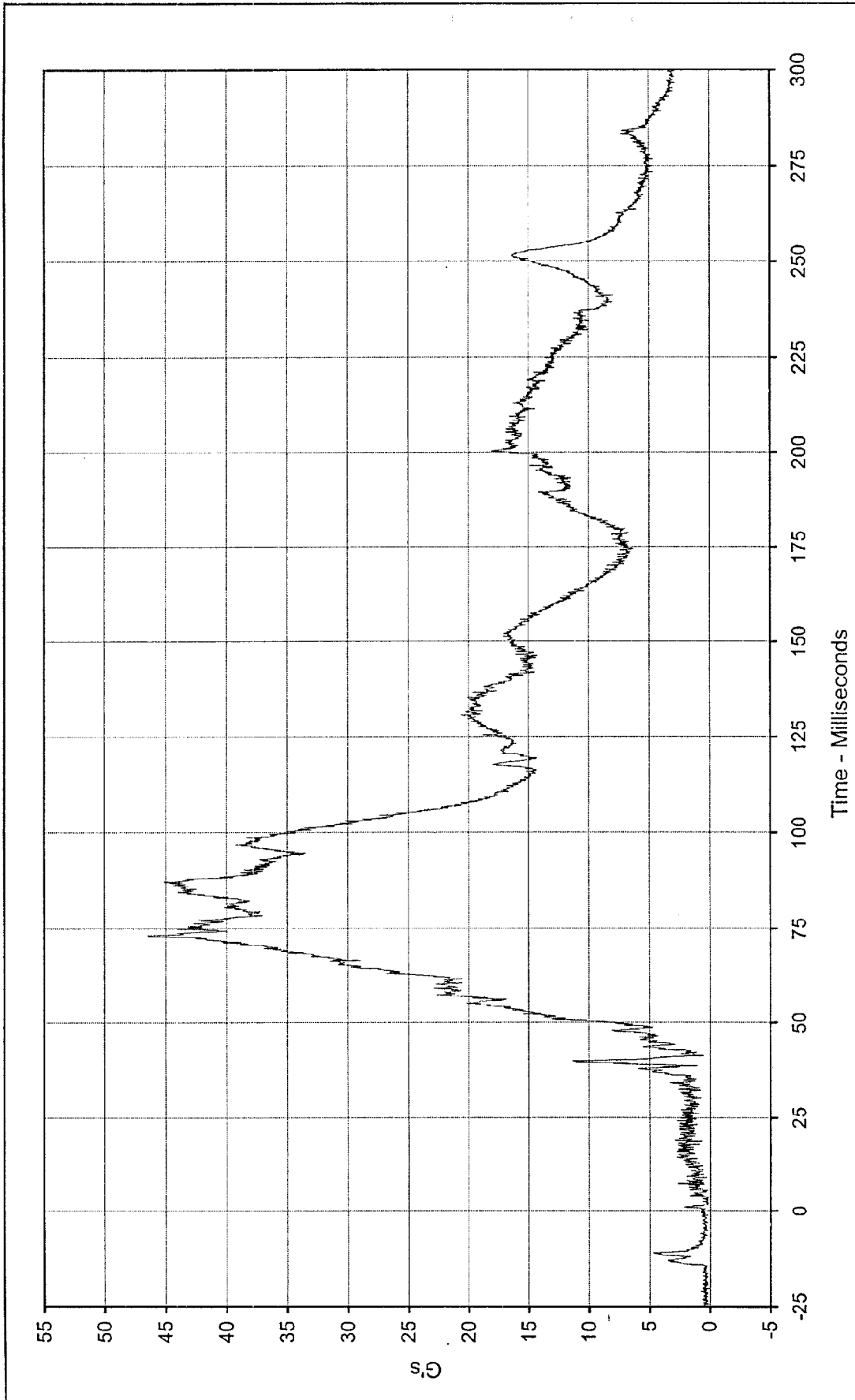




Curve Description: Passenger Head Primary Z
 Maximum Value: 38.2 at 73.1 Milliseconds
 Minimum Value: -11.8 at 117.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-047

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

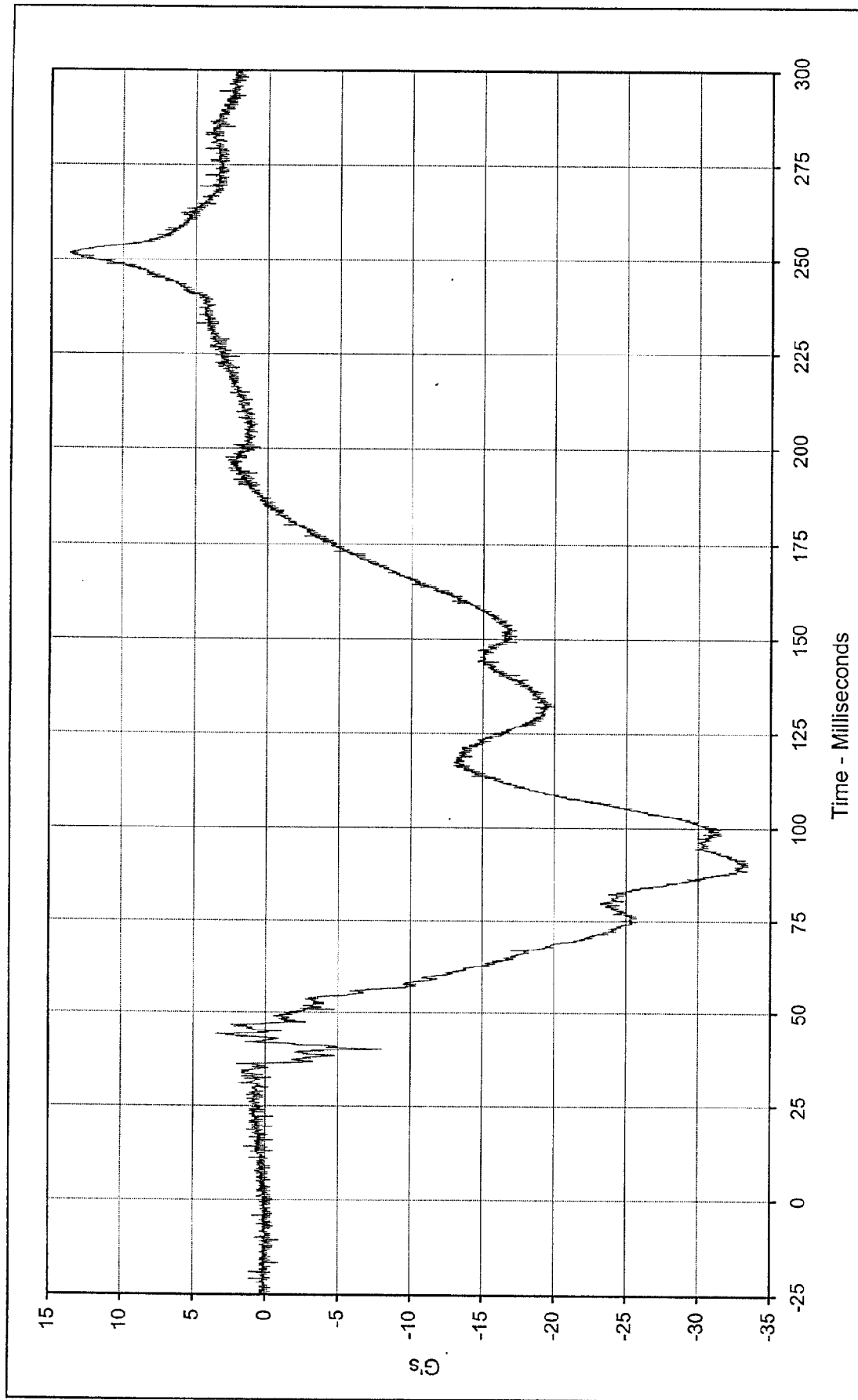




Curve Description: Passenger Head Resultant Primary
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

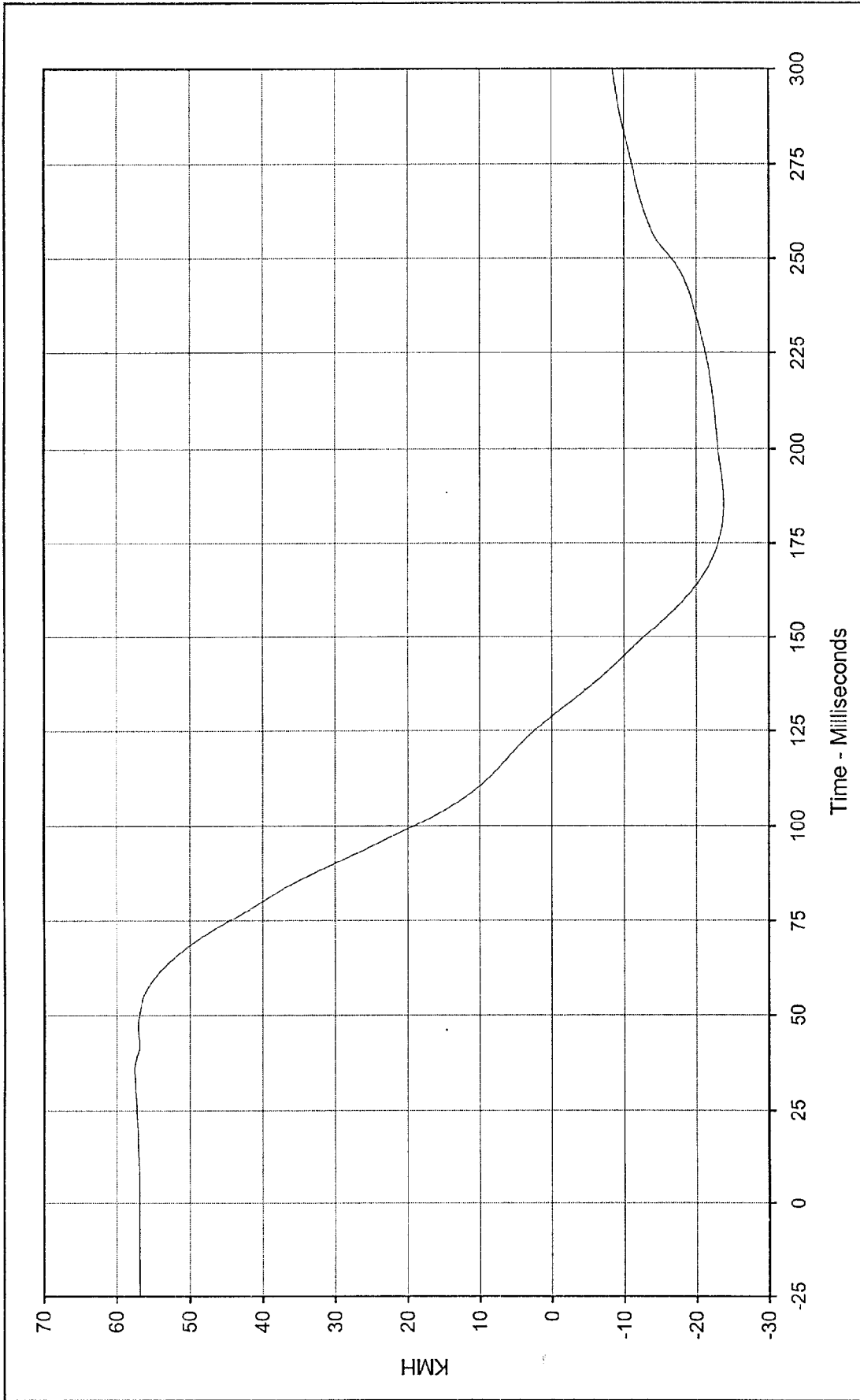
Maximum Value: 46.5 at 73.3 Milliseconds
 Minimum Value: 0.1 at 2.1 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: RES-045





Curve Description:	Passenger Head Redundant X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	13.7	at	251.7	Milliseconds
Minimum Value:	-33.5	at	88.5	Milliseconds
SAE Filter Class:	1000	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Date of Test:	1/23/98			
Curve Number:	FIL-048			





Curve Description: Passenger Head Redundant X Velocity

Maximum Value: 57.5 at 35.7 Milliseconds

Minimum Value: -23.8 at 185.1 Milliseconds

SAE Filter Class: 180

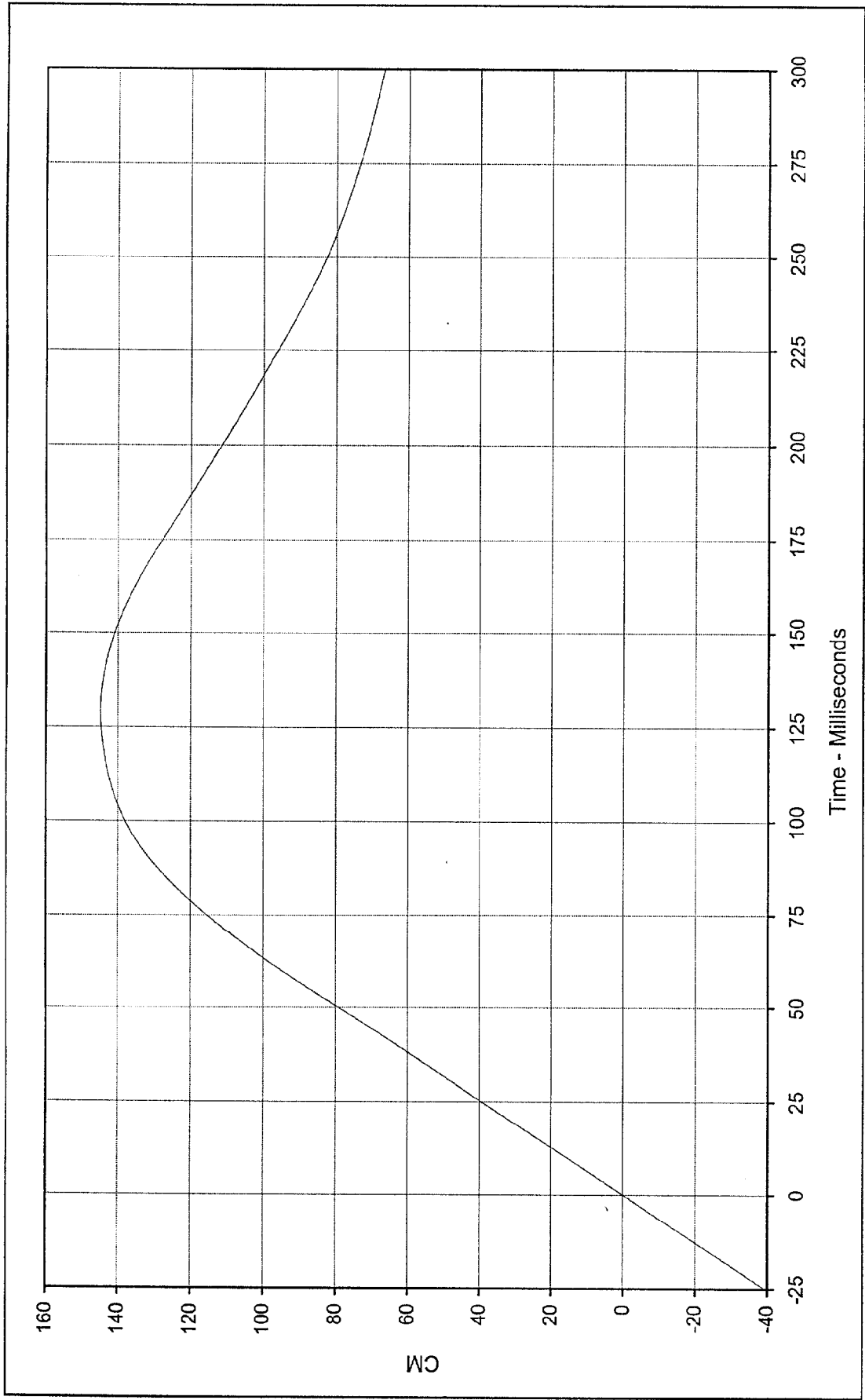
Date of Test: 1/23/98

Curve Number: IN1-048

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

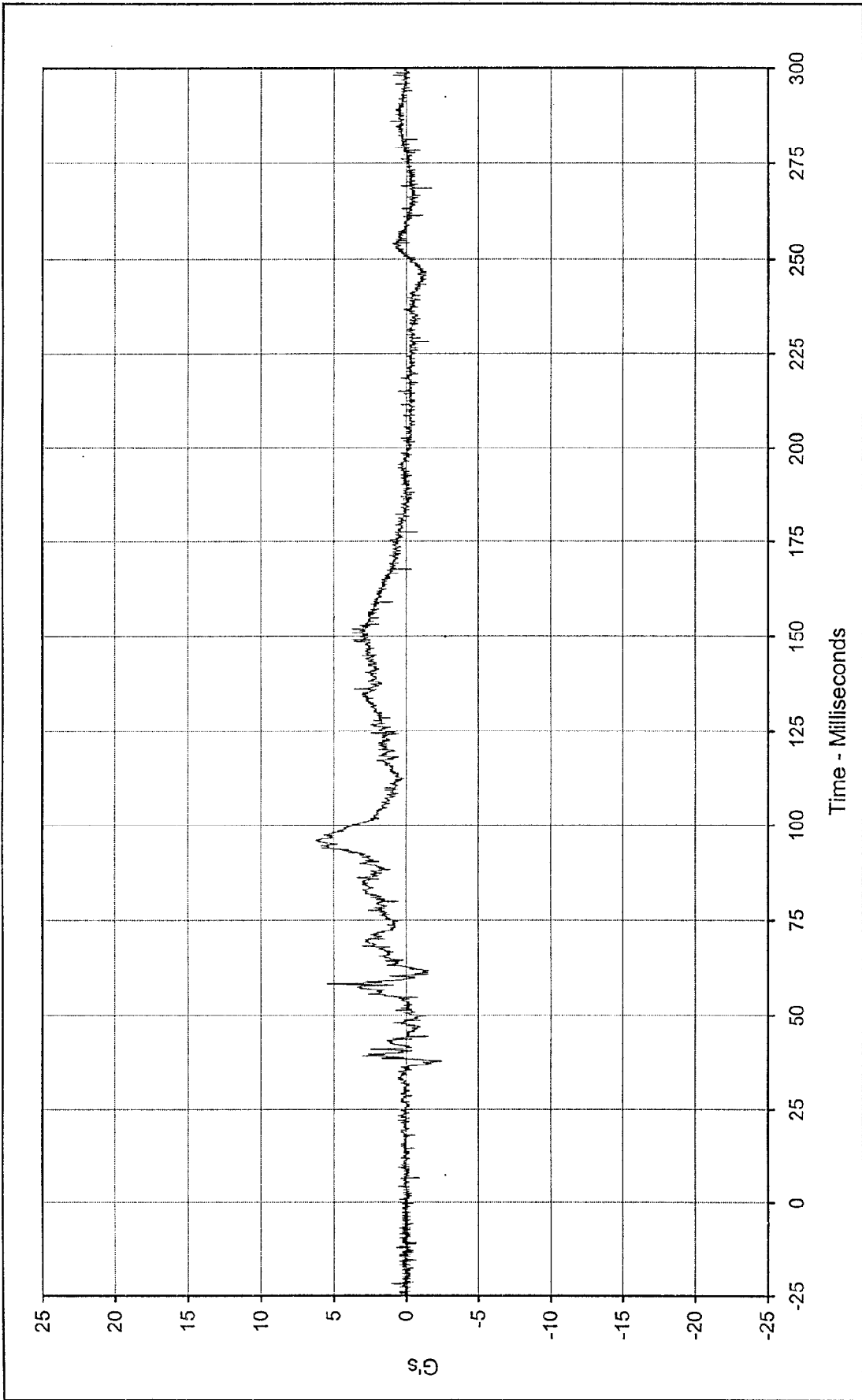




Curve Description: Passenger Head Redundant X Displ.
Maximum Value: 144.8 at 129.0 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 1/23/98
Curve Number: IN2-048

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

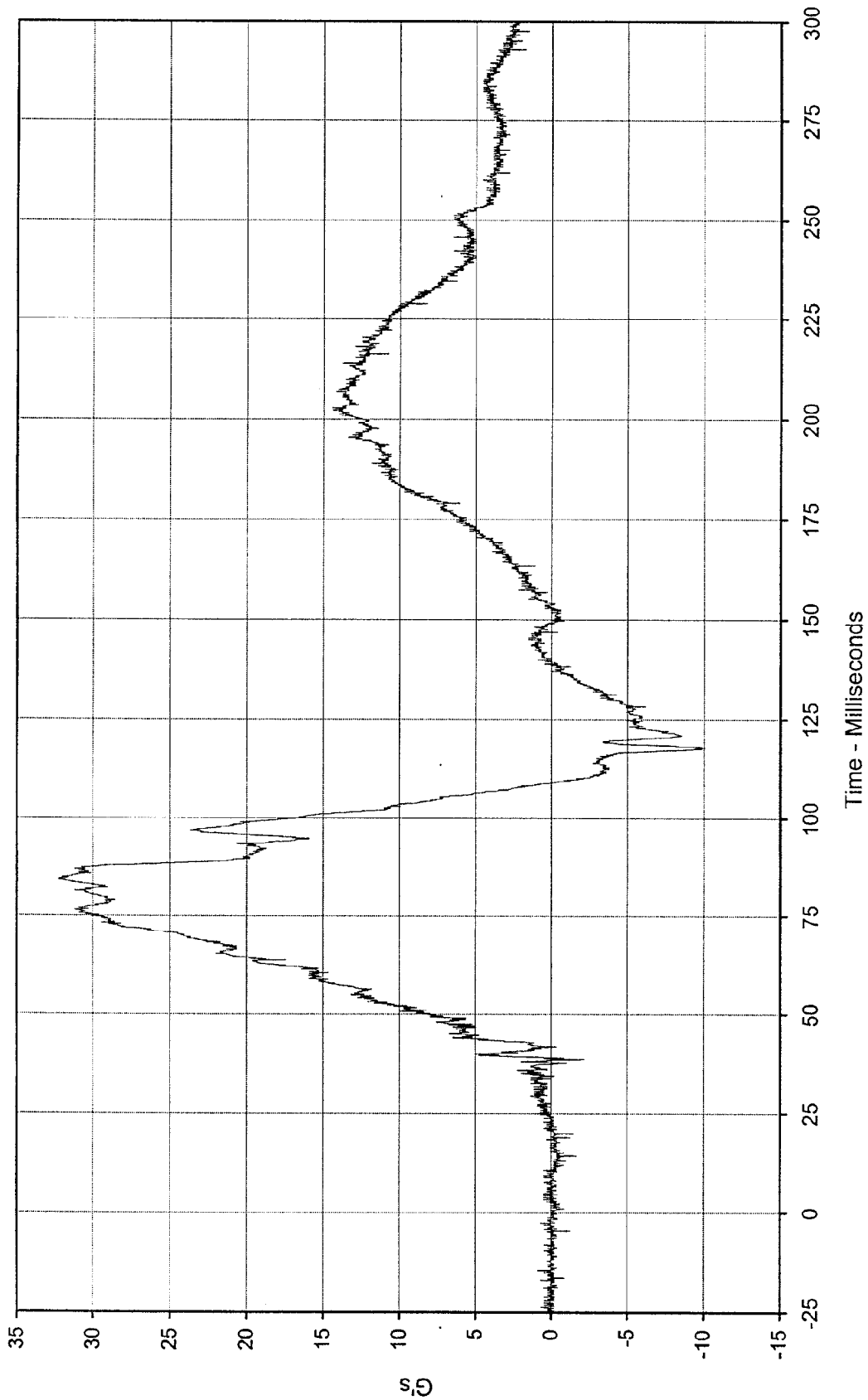




Curve Description: Passenger Head Redundant Y
 Maximum Value: 6.2 at 95.7 Milliseconds
 Minimum Value: -2.5 at 37.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-049

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

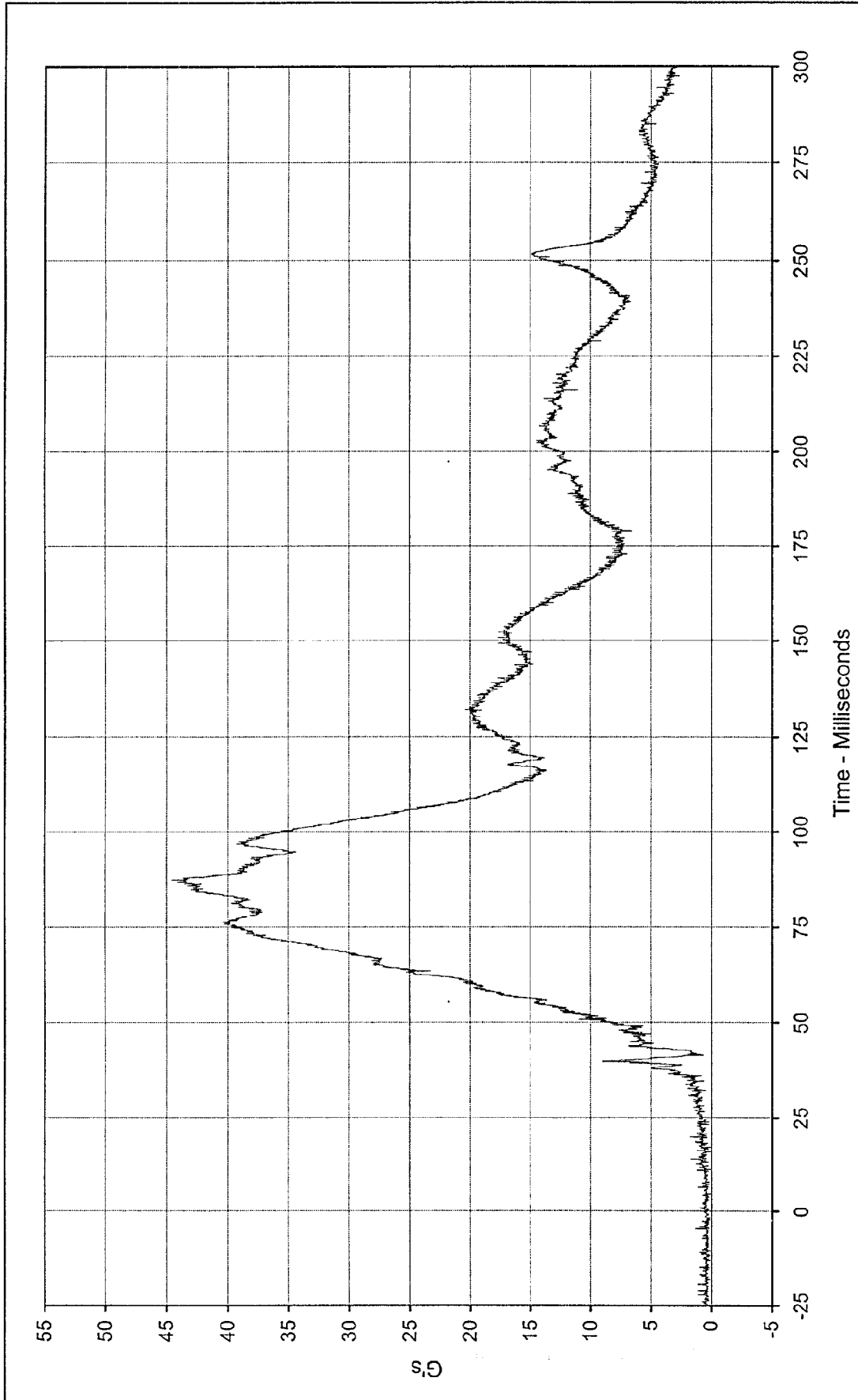




Curve Description: Passenger Head Redundant Z
 Maximum Value: 32.2 at 84.0 Milliseconds
 Minimum Value: -10.0 at 117.9 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-050

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Passenger Head Resultant Redundant

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Maximum Value: 44.6 at 87.3 Milliseconds

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

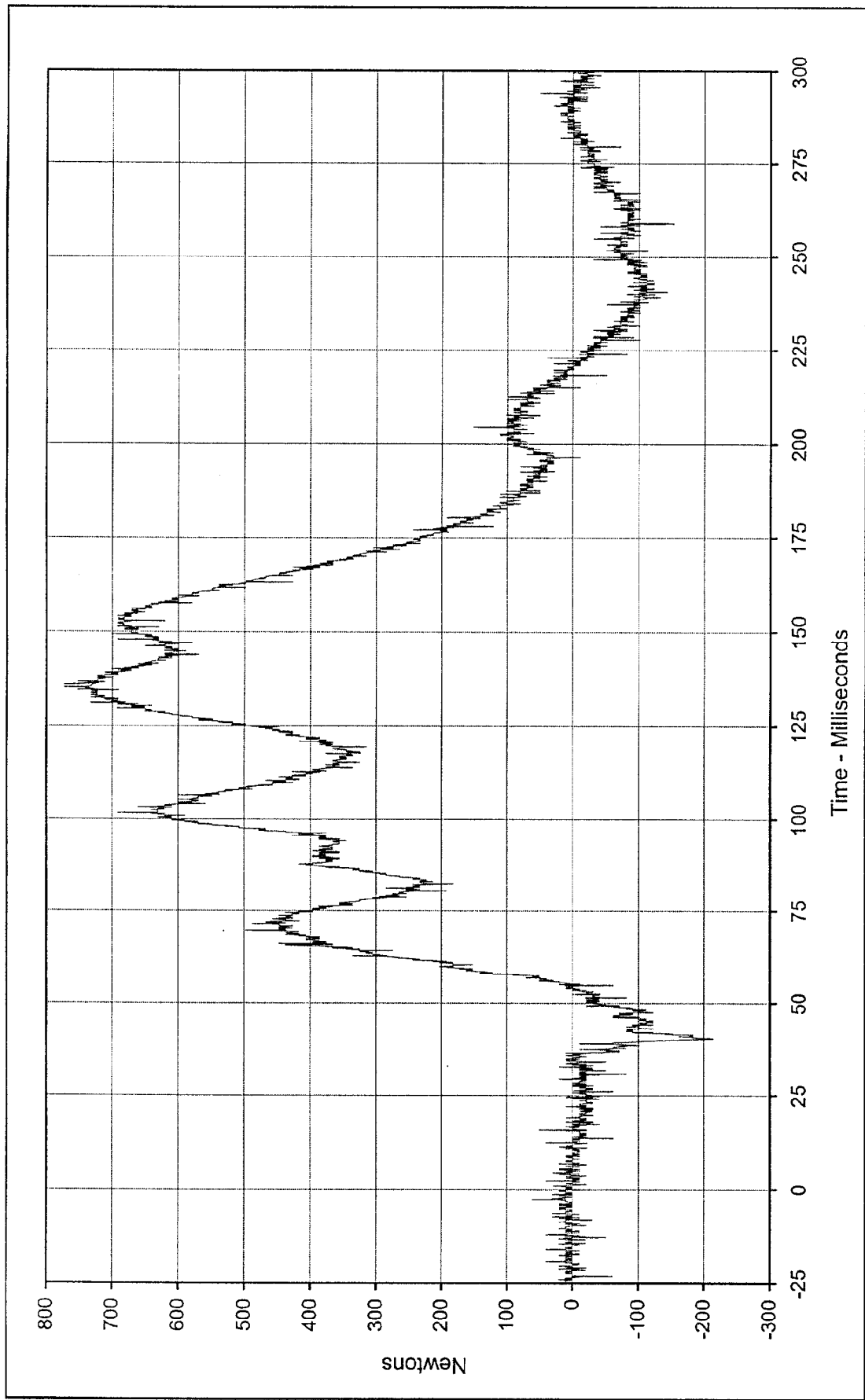
Minimum Value: 0.1 at 4.7 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/23/98

Curve Number: RES-048

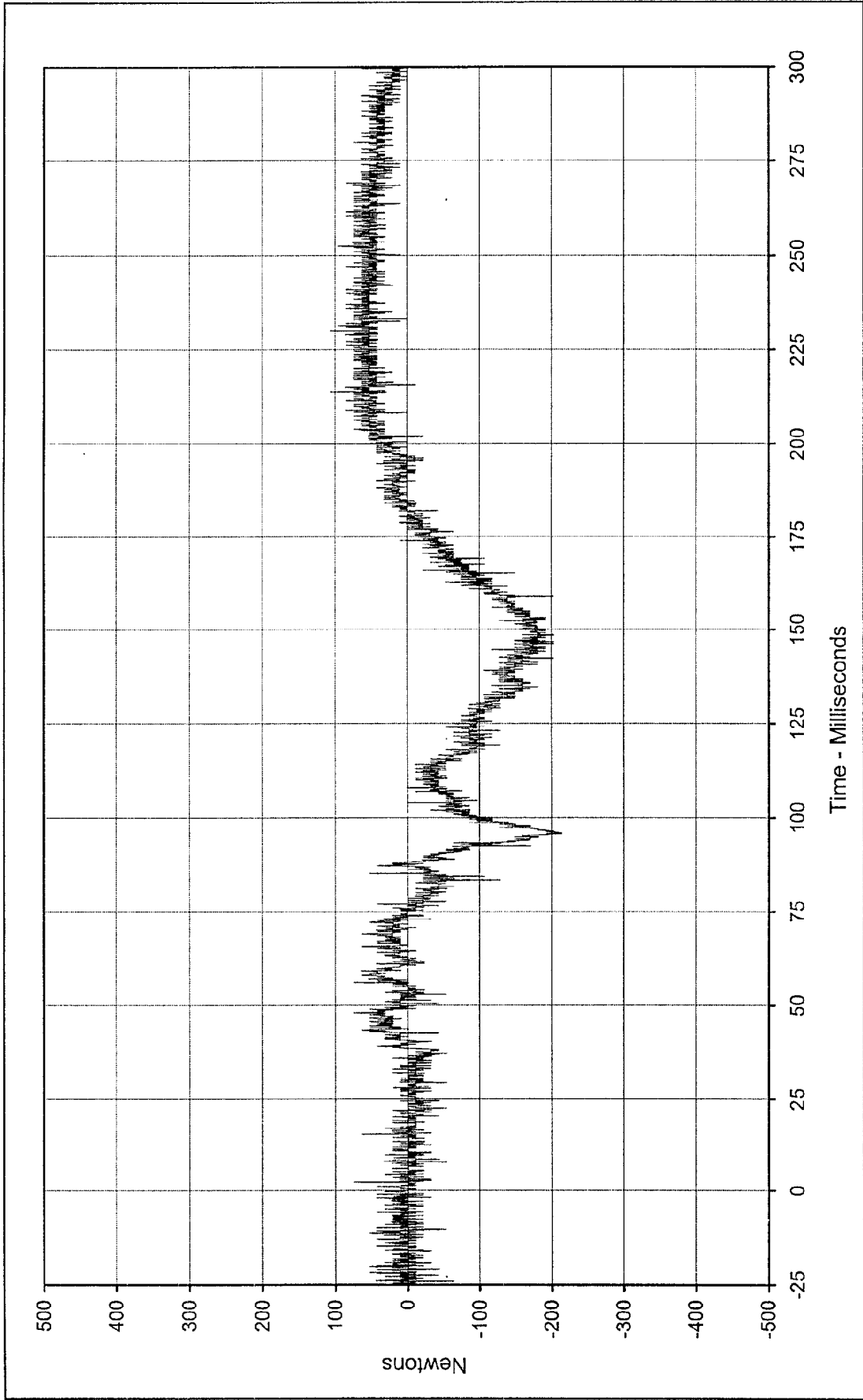




Curve Description:	Passenger Neck Force X		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	772.7	at 135.1	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-214.2	at 40.1			
SAE Filter Class:	1000				
Date of Test:	1/23/98				
Curve Number:	FIL-051				

The logo for KARCO Engineering. It features the word "KARCO" in a large, bold, sans-serif font. The letter "K" is stylized with a checkered flag pattern. To the right of "KARCO" is the word "Engineering" in a smaller, italicized, sans-serif font. The entire logo is set against a black background with a white diagonal stripe.

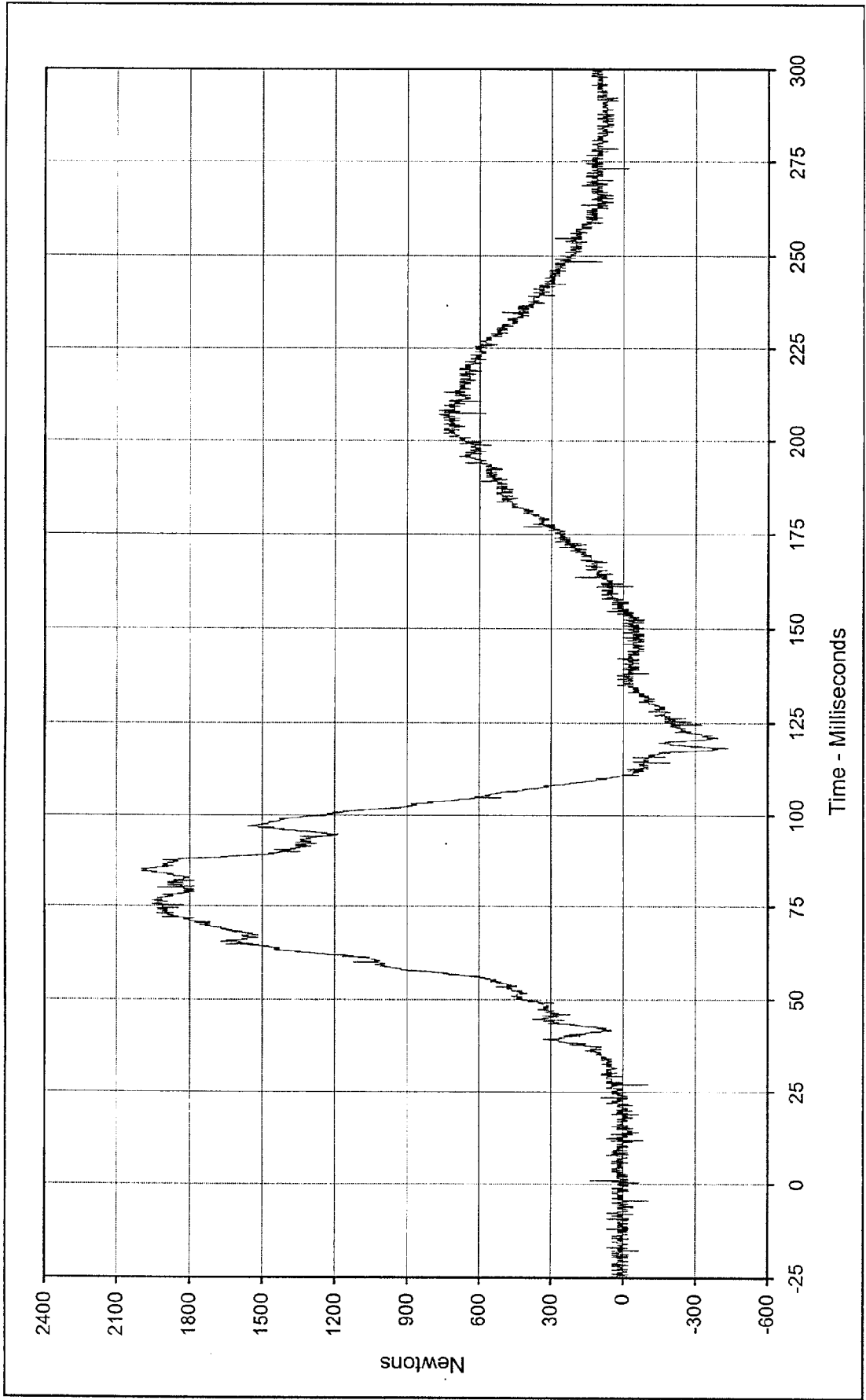




Curve Description: Passenger Neck Force Y
 Maximum Value: 105.8 at 213.8 Milliseconds
 Minimum Value: -213.1 at 95.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-052

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

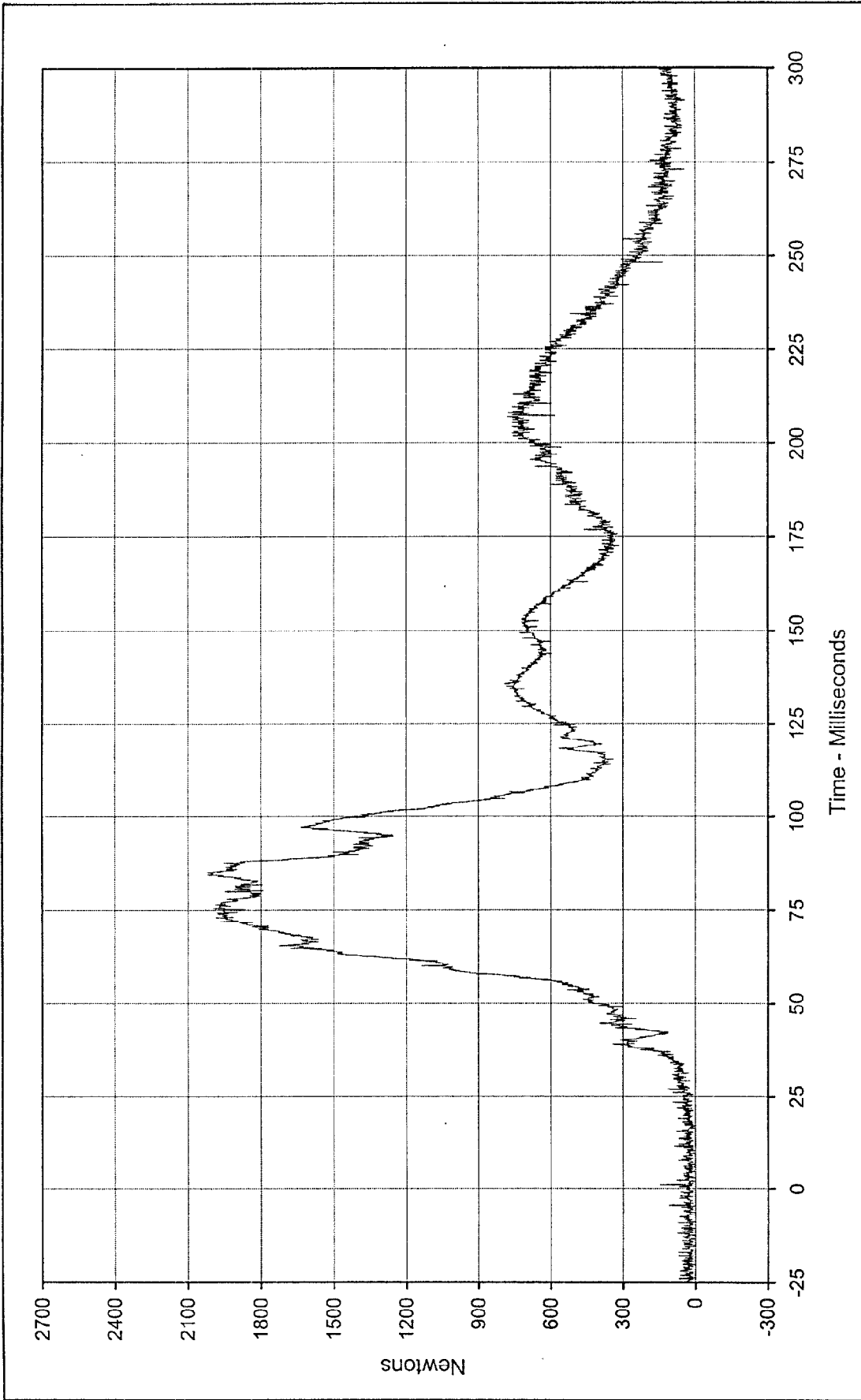




Curve Description:	Passenger Neck Force Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	1999.7	at	84.5	Milliseconds
Minimum Value:	-436.5	at	118.2	Milliseconds
SAE Filter Class:	1000	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Date of Test:	1/23/98			
Curve Number:	FIL-053			

The logo for KARCO Engineering. It features the word "KARCO" in a large, bold, sans-serif font. A stylized lightbulb with a checkered pattern inside is positioned to the left of the "K". To the right of "KARCO", the word "Engineering" is written in a smaller, italicized, sans-serif font. The entire logo is set against a black background with a white diagonal line running from the bottom left to the top right.

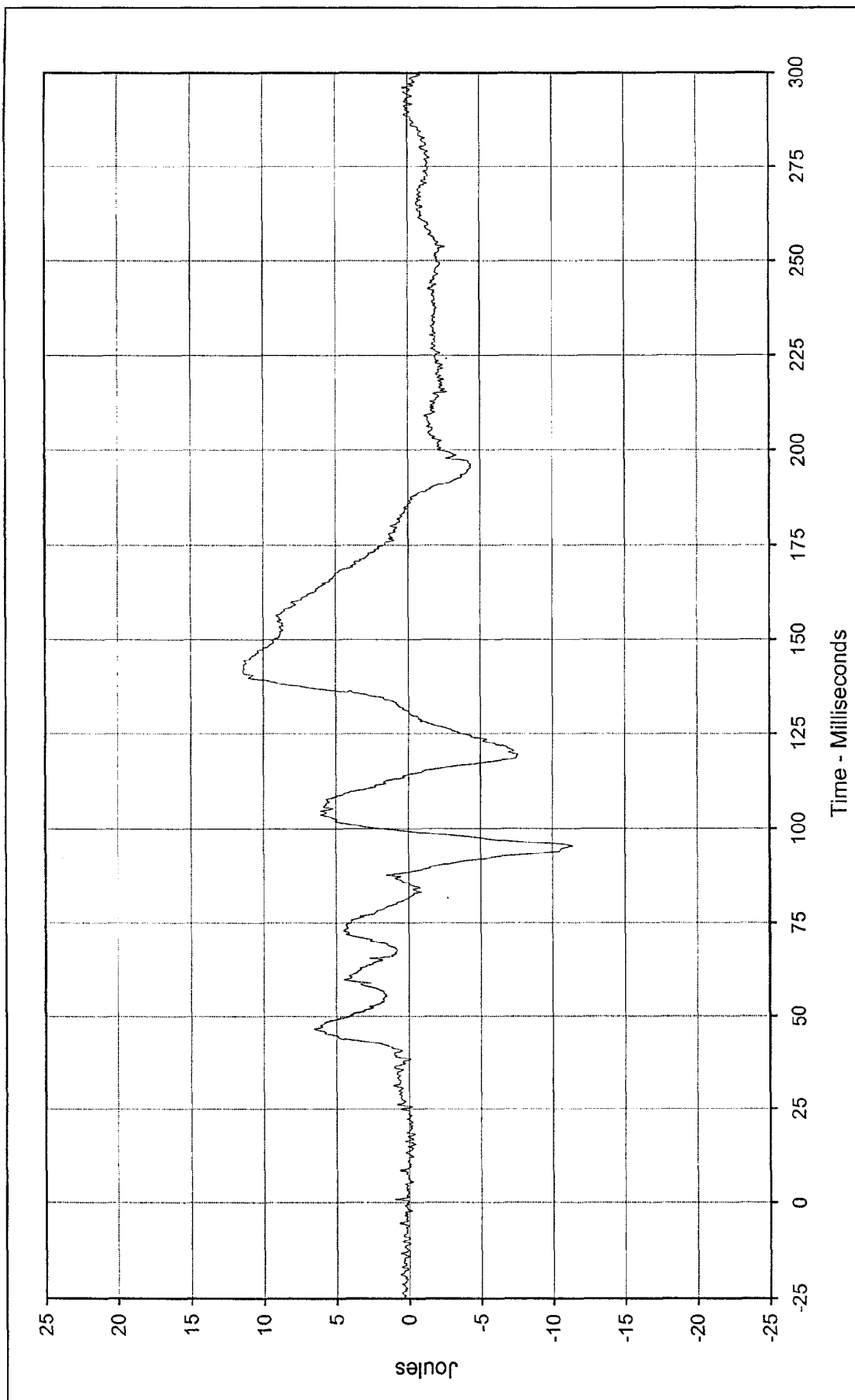




Curve Description: Passenger Neck Force Resultant
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Maximum Value: 2020.5 at 85.0 Milliseconds
 Minimum Value: 2.6 at 1.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: RES-051





Curve Description: Passenger Neck Moment X

Maximum Value: 11.4 at 141.3 Milliseconds

Minimum Value: -11.4 at 95.5 Milliseconds

SAE Filter Class: 600

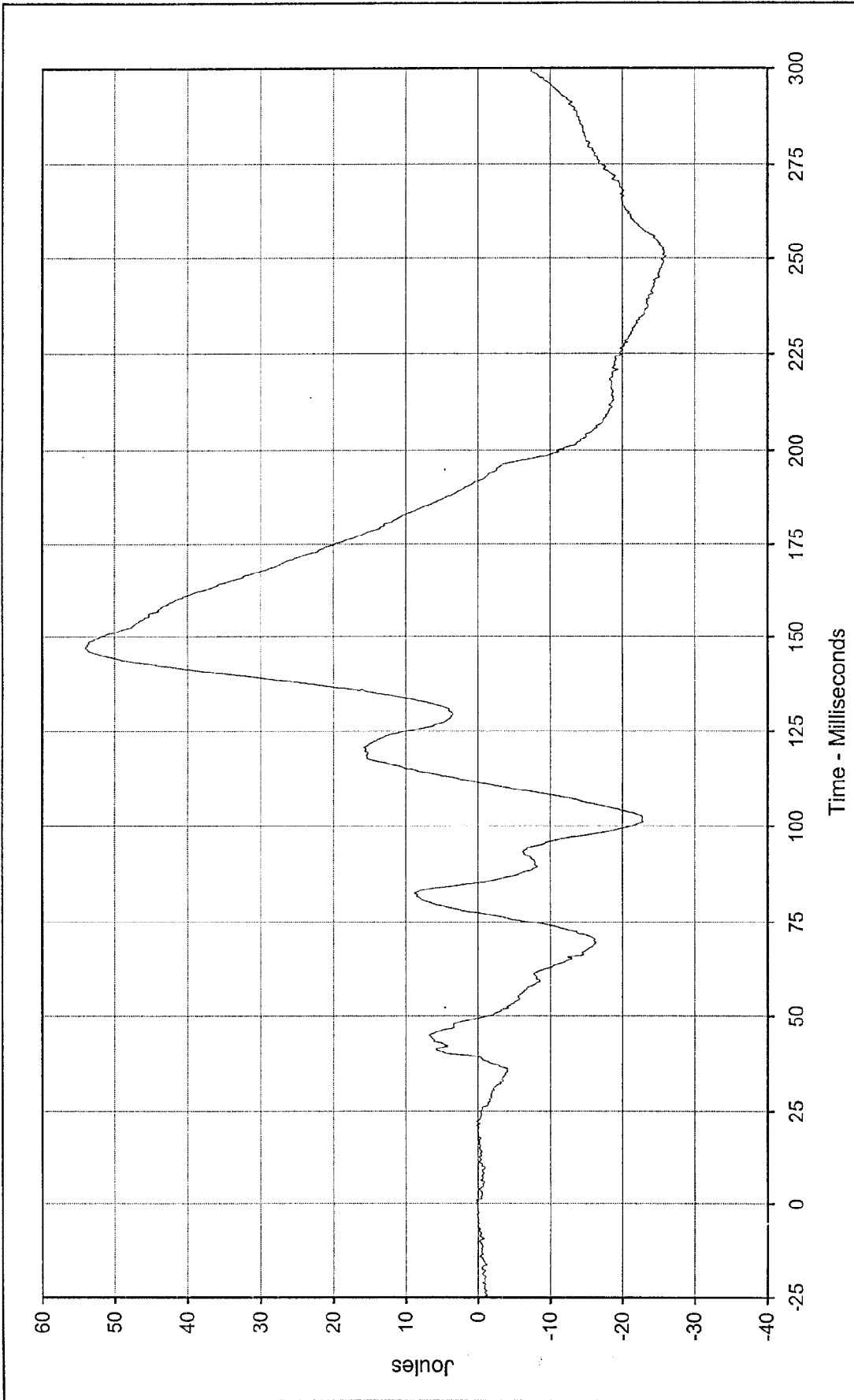
Date of Test: 1/23/98

Curve Number: FIL-054

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

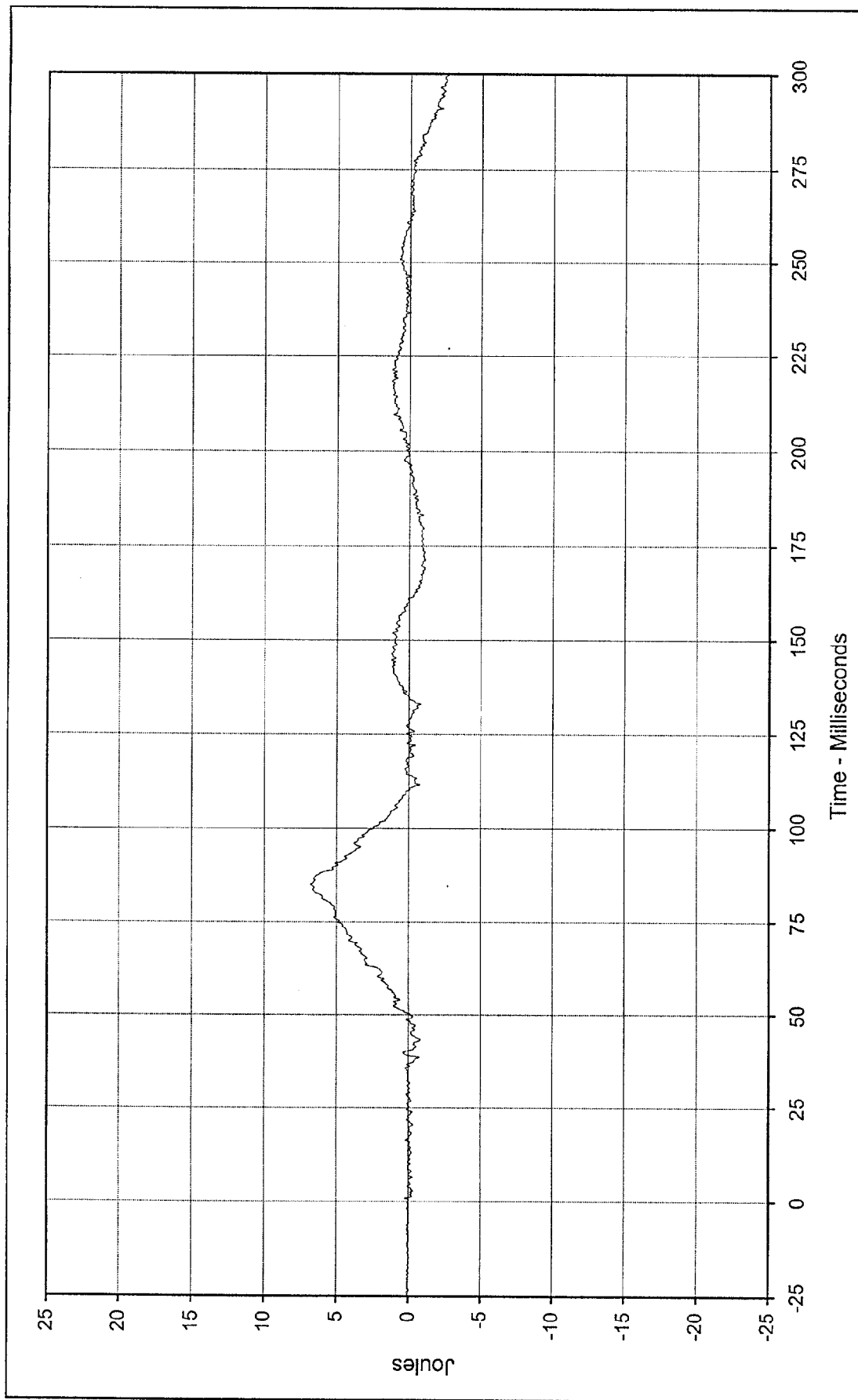




Curve Description: Passenger Neck Moment Y
 Maximum Value: 54.1 at 146.9 Milliseconds
 Minimum Value: -26.1 at 250.5 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-055

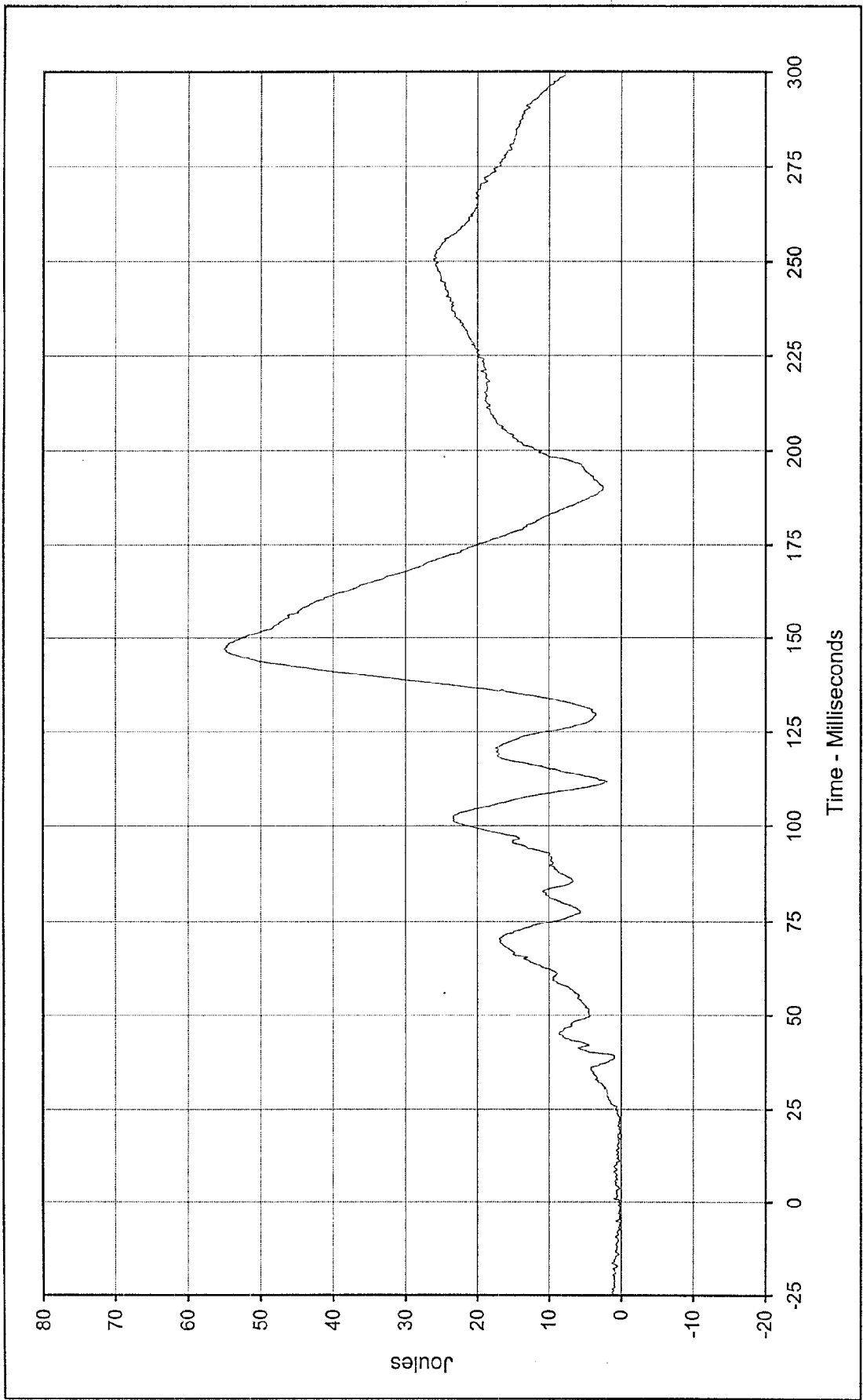
Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Passenger Neck Moment Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	6.8	at	85.0	Milliseconds
Minimum Value:	-2.7	at	299.9	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/23/98	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Curve Number:	FIL-056			

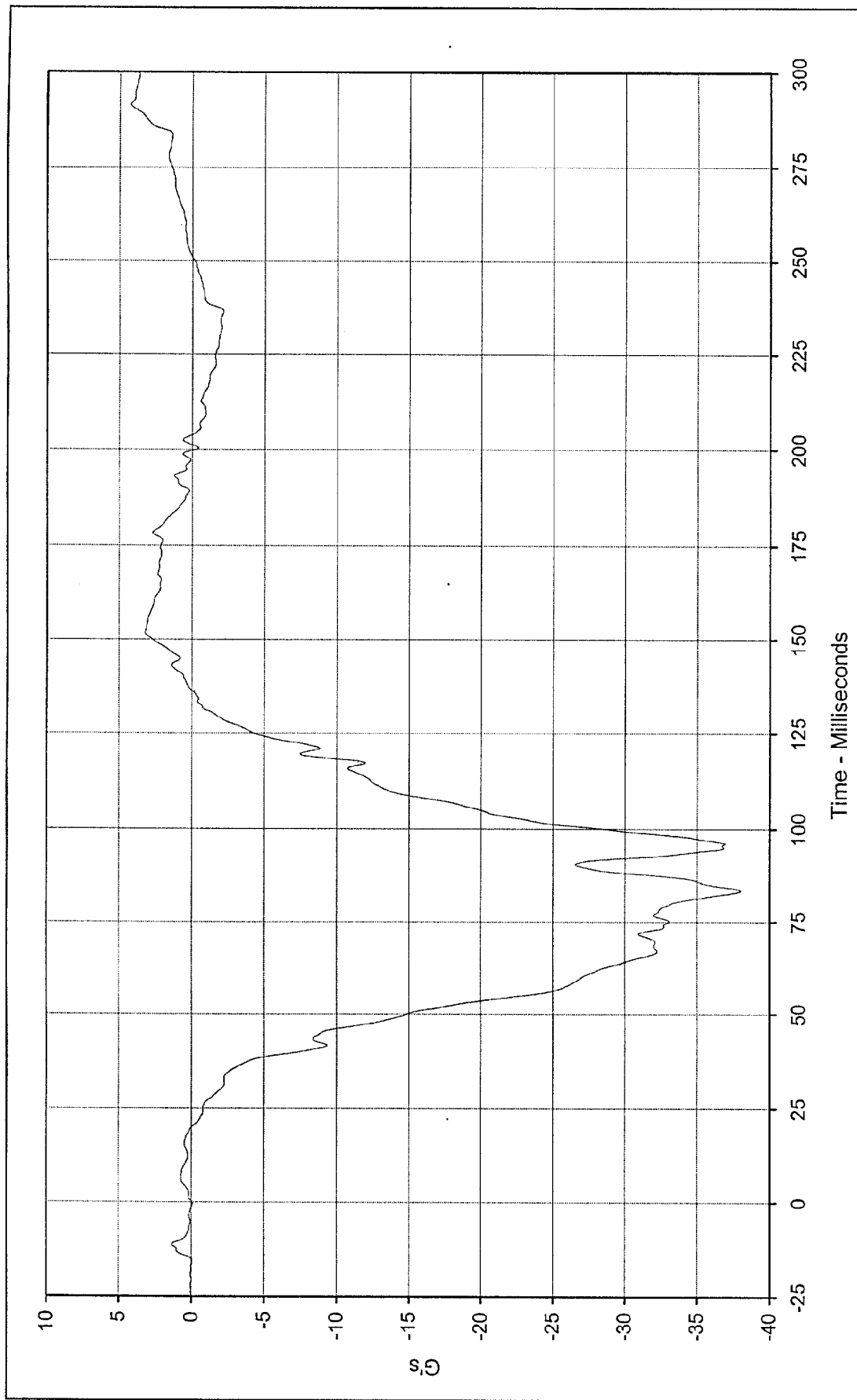




Curve Description: Passenger Neck Moment Resultant
Maximum Value: 55.1 at 146.9 Milliseconds
Minimum Value: 0.1 at 22.5 Milliseconds
SAE Filter Class: 600
Date of Test: 1/23/98
Curve Number: RES-054

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

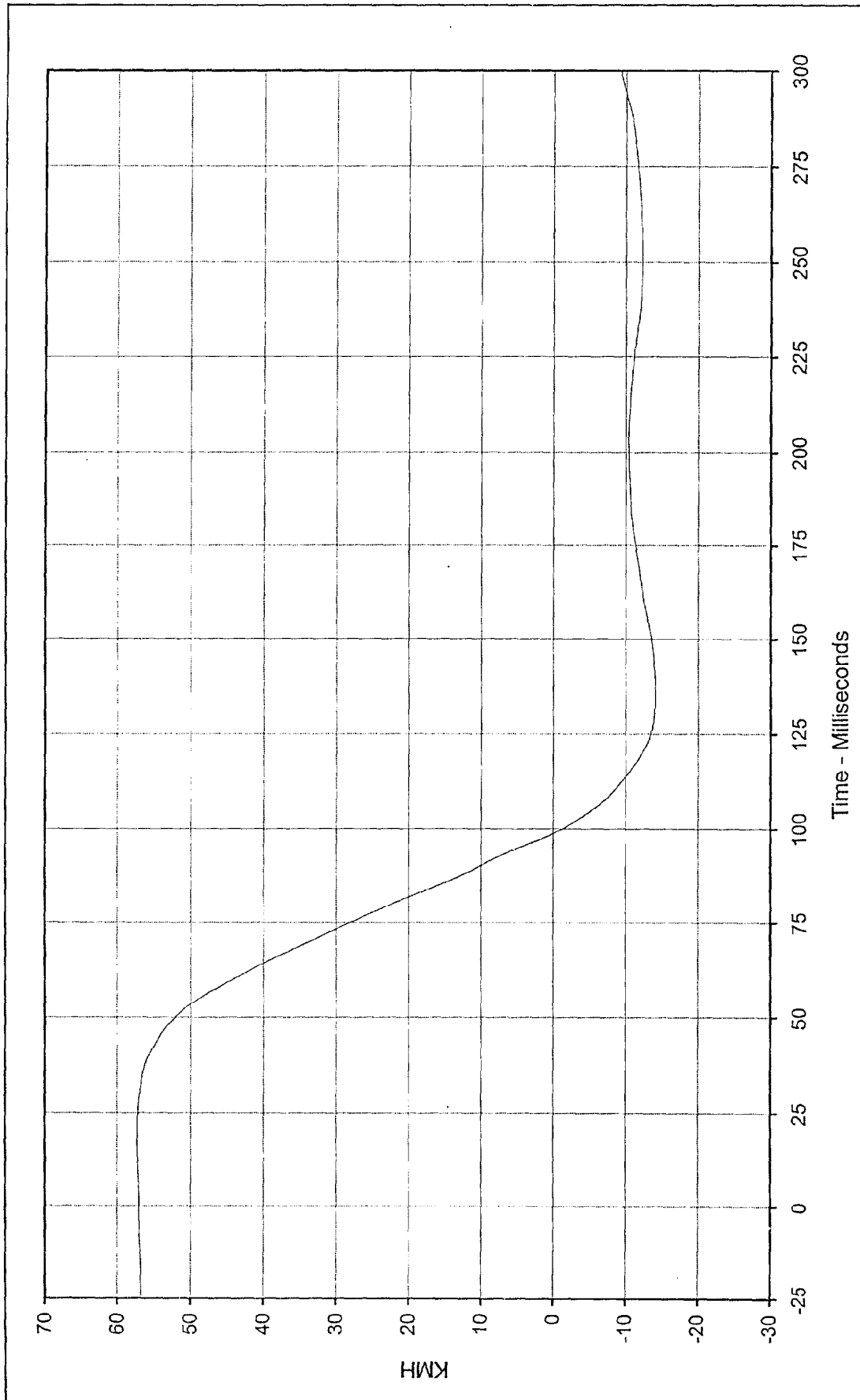




Curve Description: Passenger Chest Primary X
 Maximum Value: 4.2 at 291.4 Milliseconds
 Minimum Value: -38.0 at 83.3 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-057

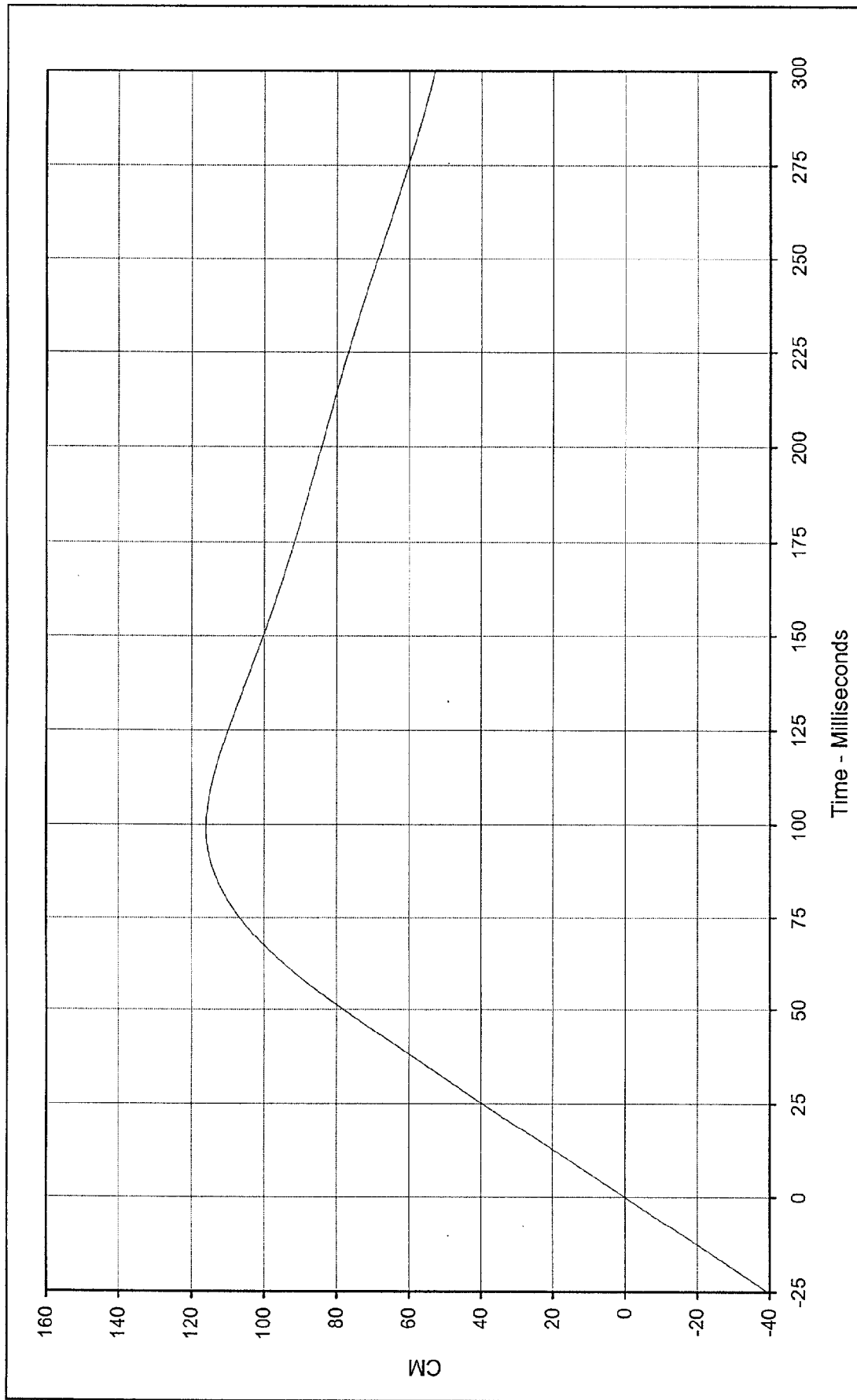
Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Passenger Chest Primary X Velocity	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	57.3 at 19.9 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-14.1 at 136.3 Milliseconds			
SAE Filter Class:	180			
Date of Test:	1/23/98			
Curve Number:	IN1-057			

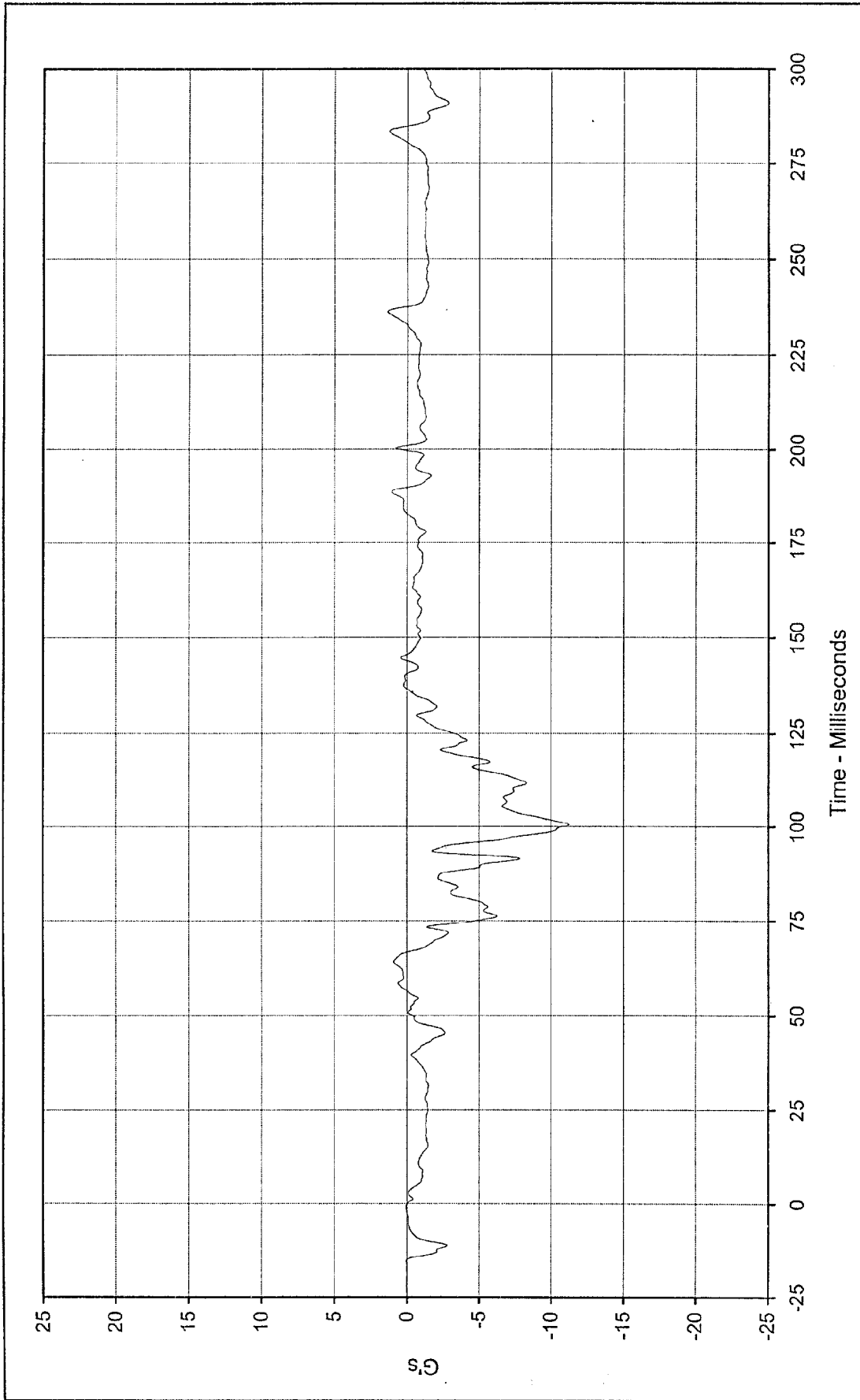




Curve Description: Passenger Chest Primary X Displ.
 Maximum Value: 116.0 at 98.8 Milliseconds
 Minimum Value: 0.0 at 180 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-057

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

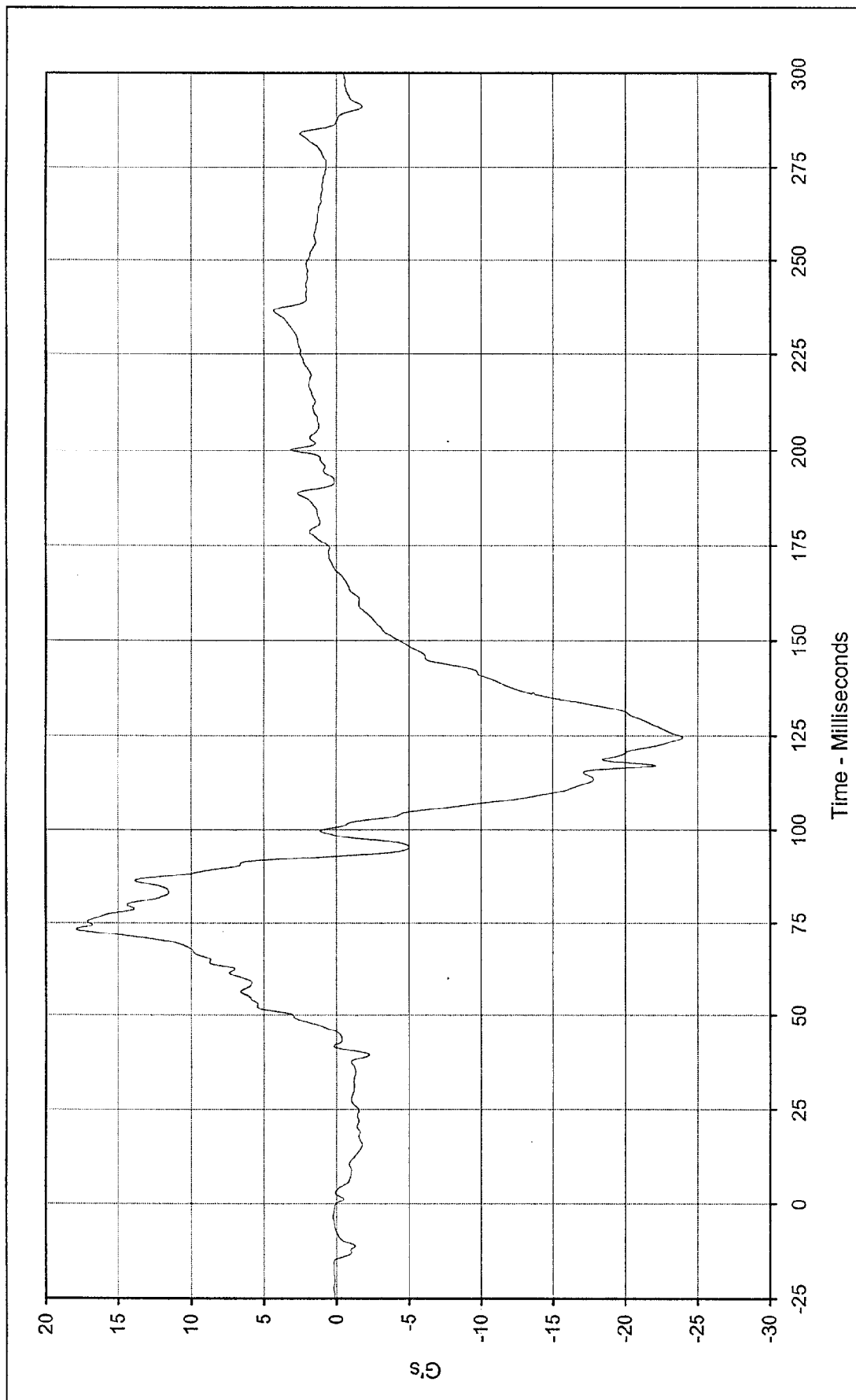




Curve Description: Passenger Chest Primary Y
 Maximum Value: 1.3 at 236.4 Milliseconds
 Minimum Value: -11.2 at 100.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-058

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

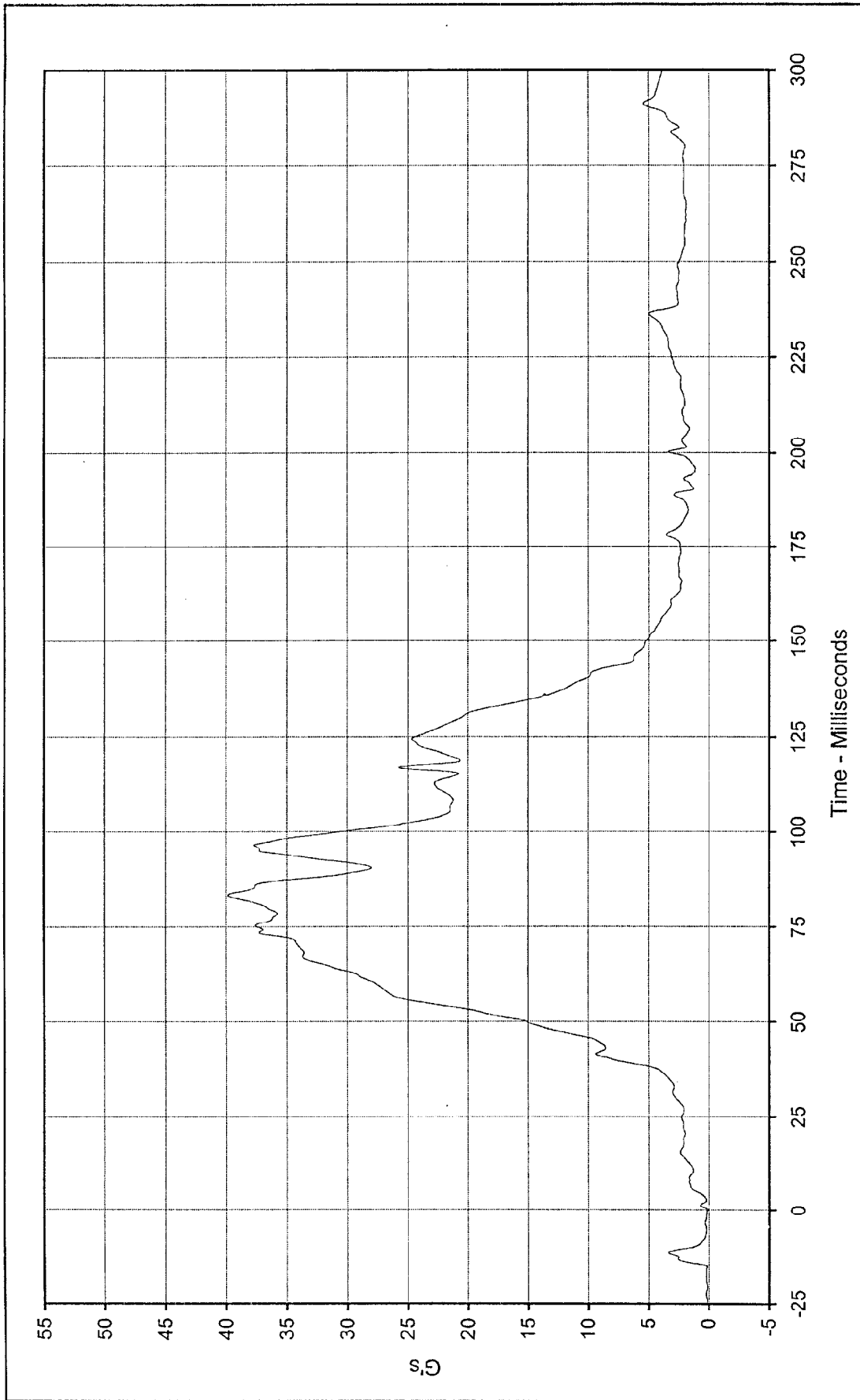




Curve Description: Passenger Chest Primary Z
 Maximum Value: 17.9 at 73.3 Milliseconds
 Minimum Value: -24.0 at 124.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-059

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

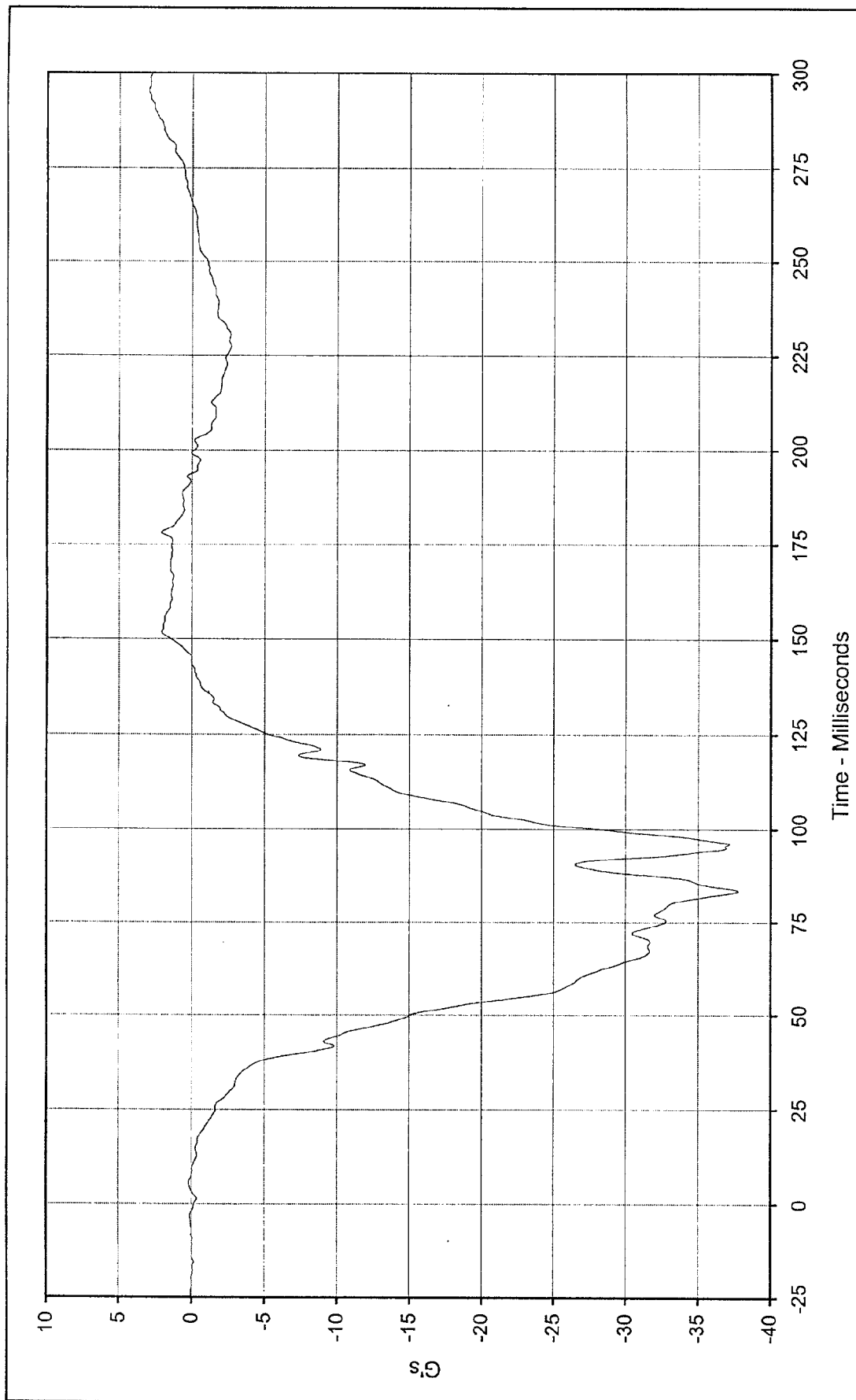




Curve Description: Passenger Chest Resultant Primary
 Maximum Value: 39.9 at 83.4 Milliseconds
 Minimum Value: 0.1 at 0.2 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: RES-057

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

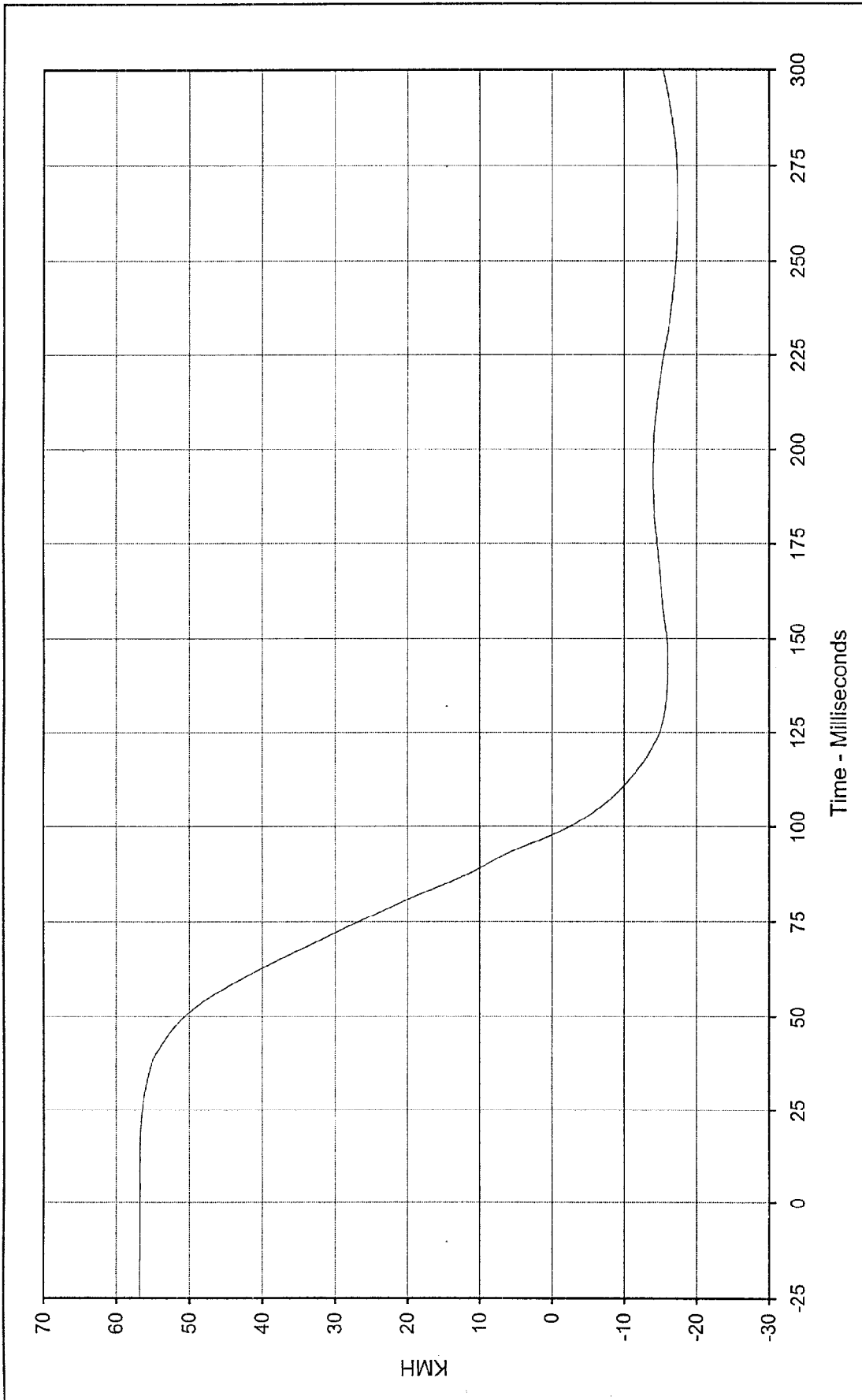




Curve Description: Passenger Chest Redundant X
 Maximum Value: 3.0 at 295.3 Milliseconds
 Minimum Value: -37.8 at 83.4 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-060

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

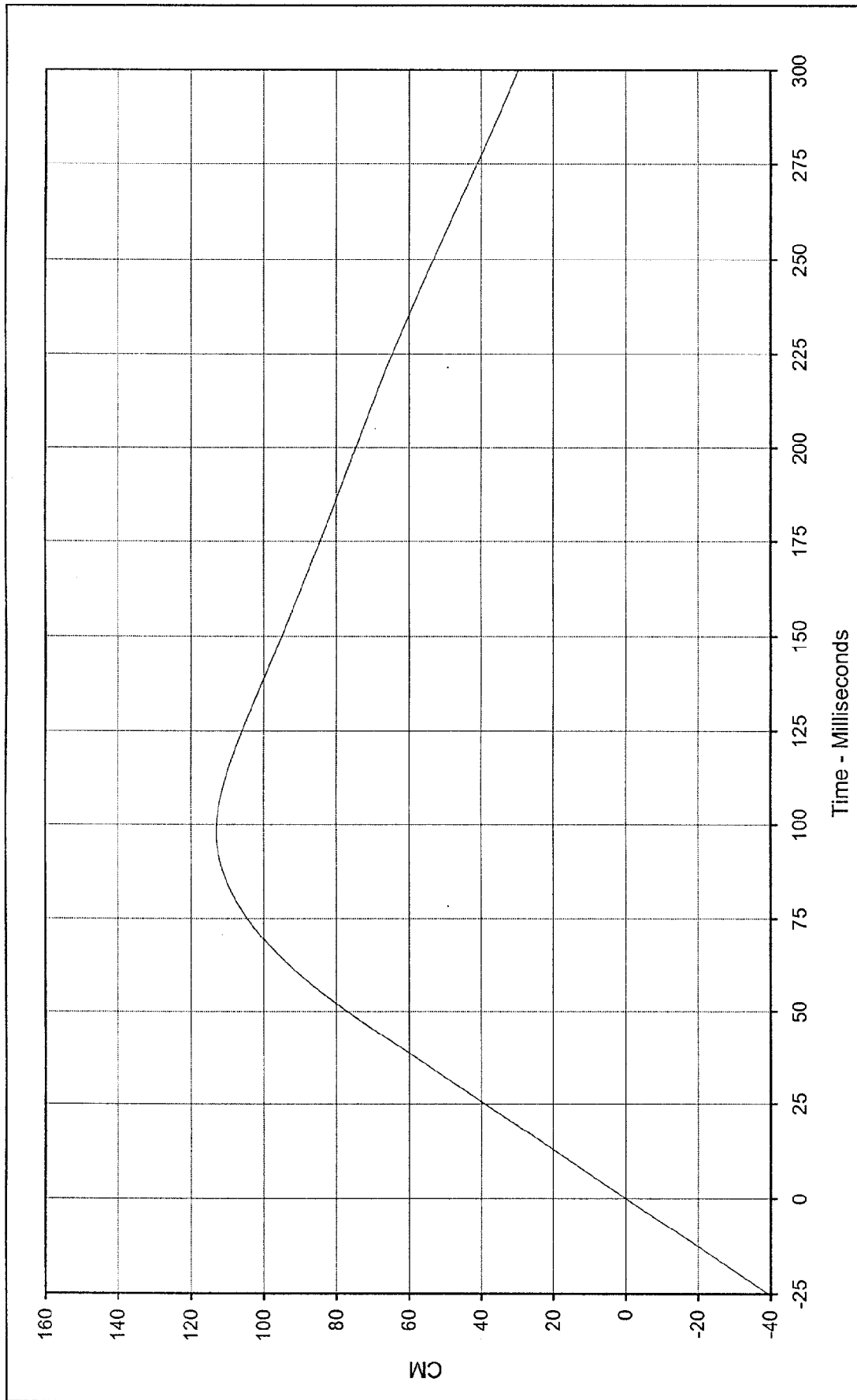




Curve Description: Passenger Chest Redundant X Velocity Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Maximum Value: 56.8 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
Minimum Value: -17.4 at 265.0 Milliseconds



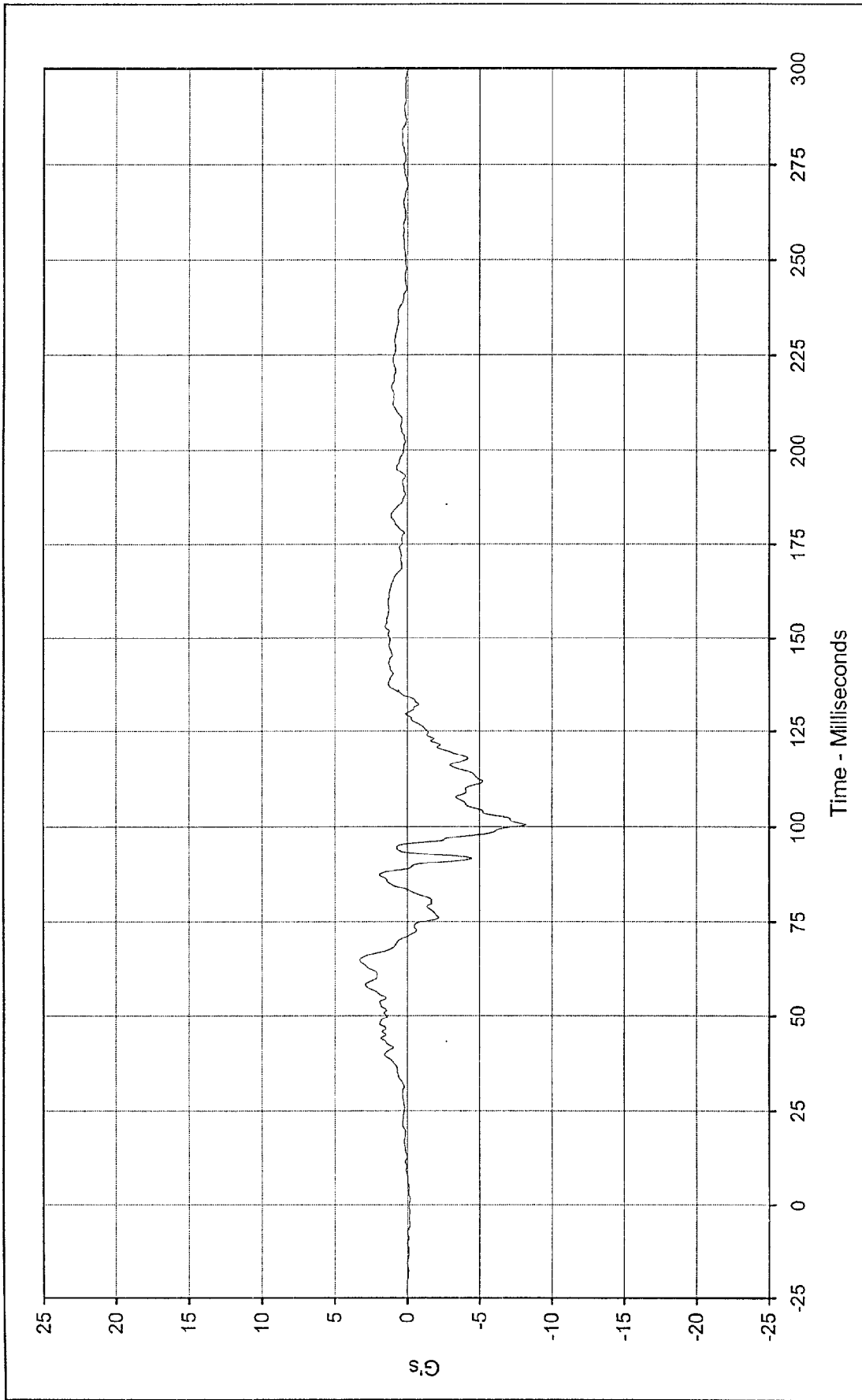
SAE Filter Class: 180
Date of Test: 1/23/98
Curve Number: IN1-060



Curve Description: Passenger Chest Redundant X Displ.
 Maximum Value: 113.0 at 97.8 Milliseconds
 Minimum Value: -0.1 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: iN2-060

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

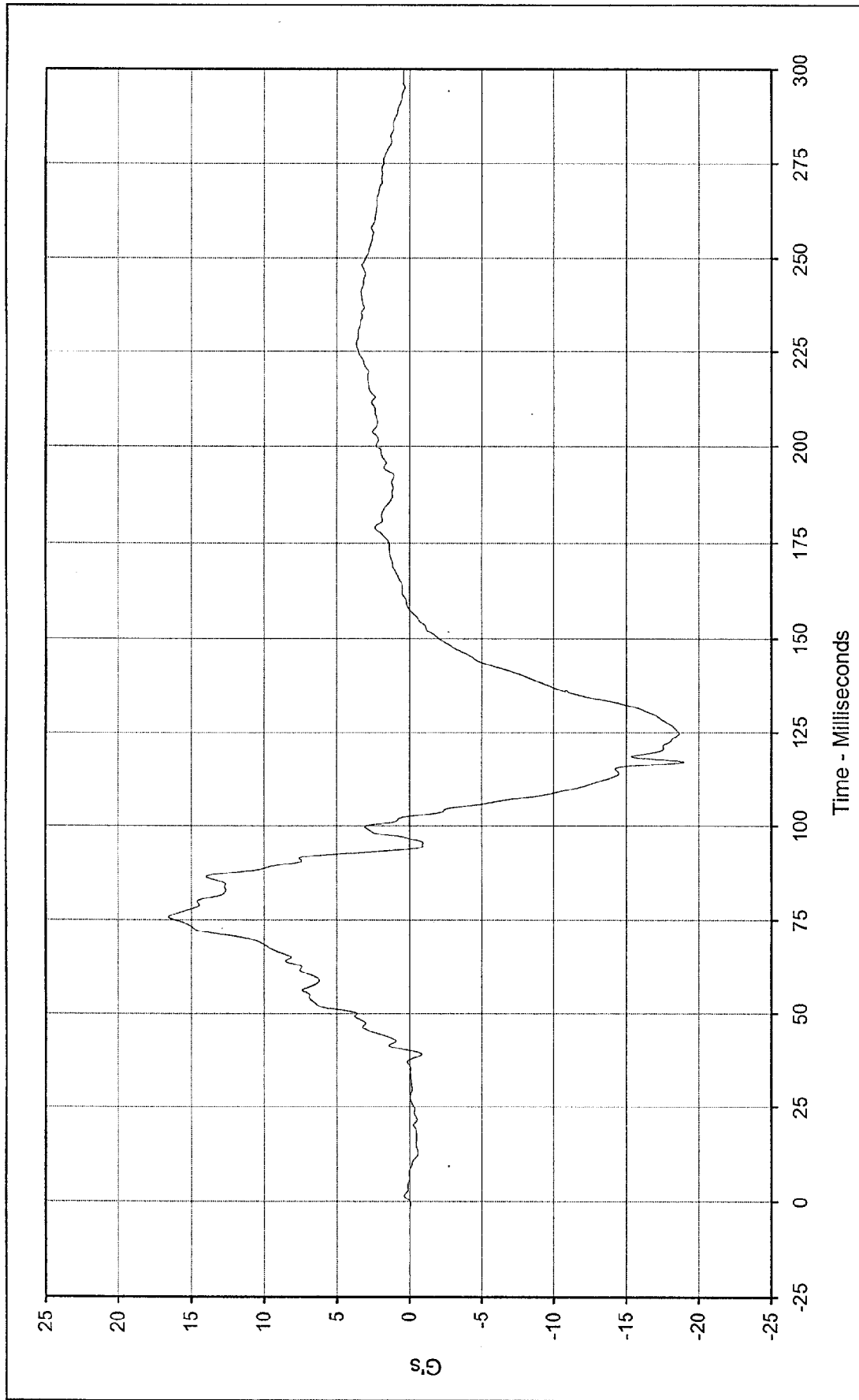




Curve Description: Passenger Chest Redundant Y
 Maximum Value: 3.3 at 65.0 Milliseconds
 Minimum Value: -8.2 at 100.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-061

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

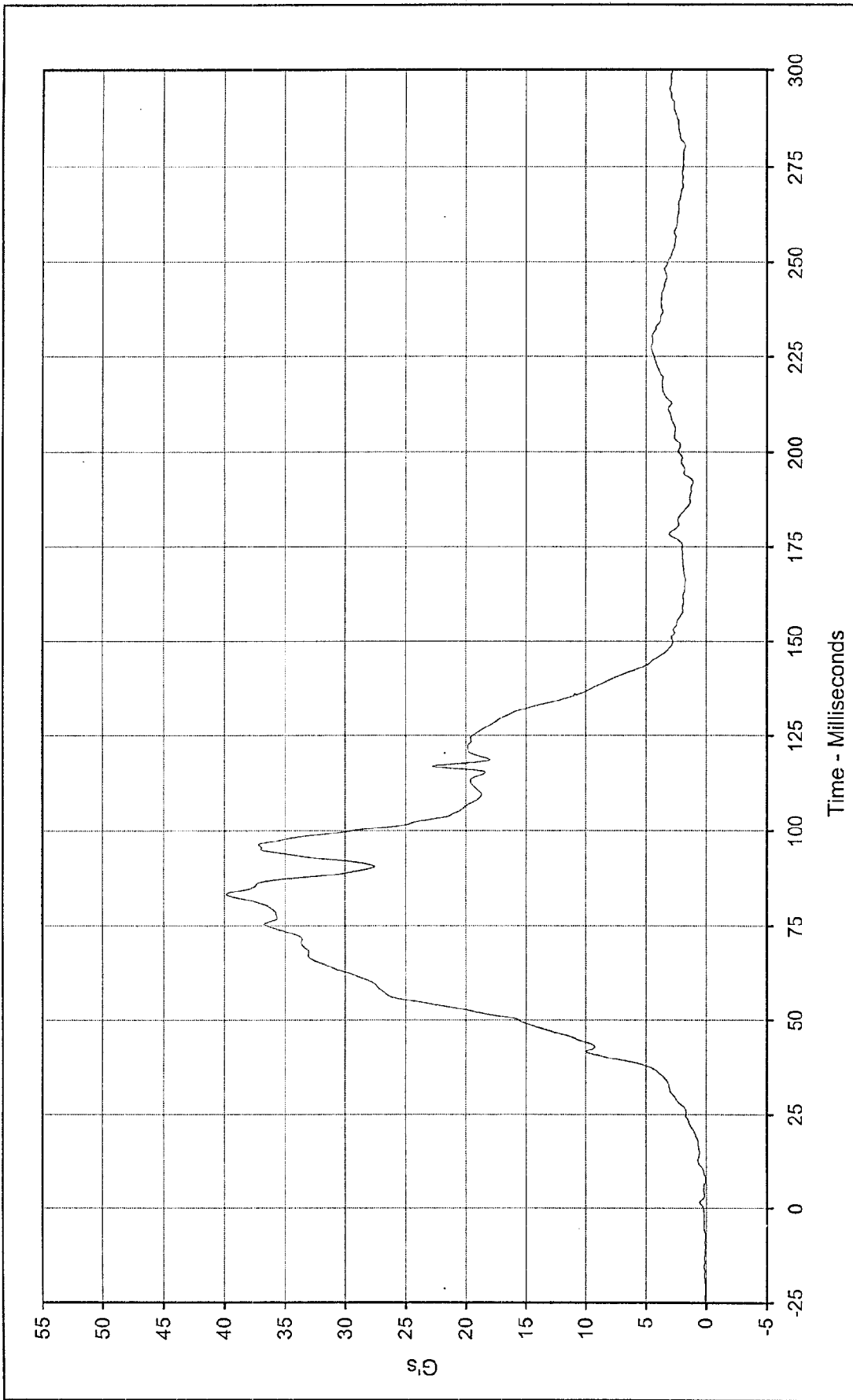




Curve Description: Passenger Chest Redundant Z
 Maximum Value: 16.5 at 75.7 Milliseconds
 Minimum Value: -19.0 at 116.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: FIL-062

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

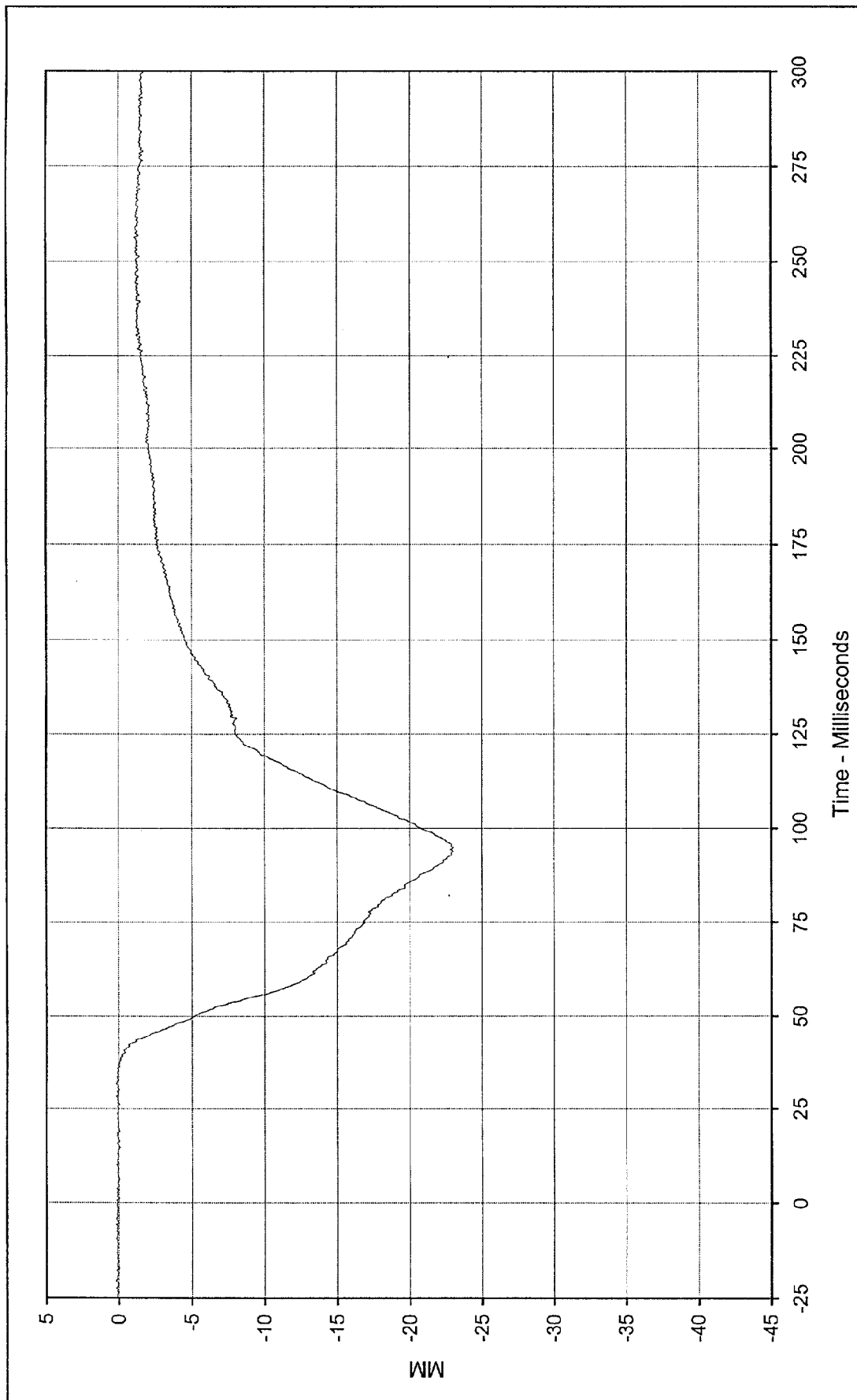




Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Curve Description: Passenger Chest Resultant Redundant
 Maximum Value: 39.8 at 83.4 Milliseconds
 Minimum Value: 0.0 at 7.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: RES-060

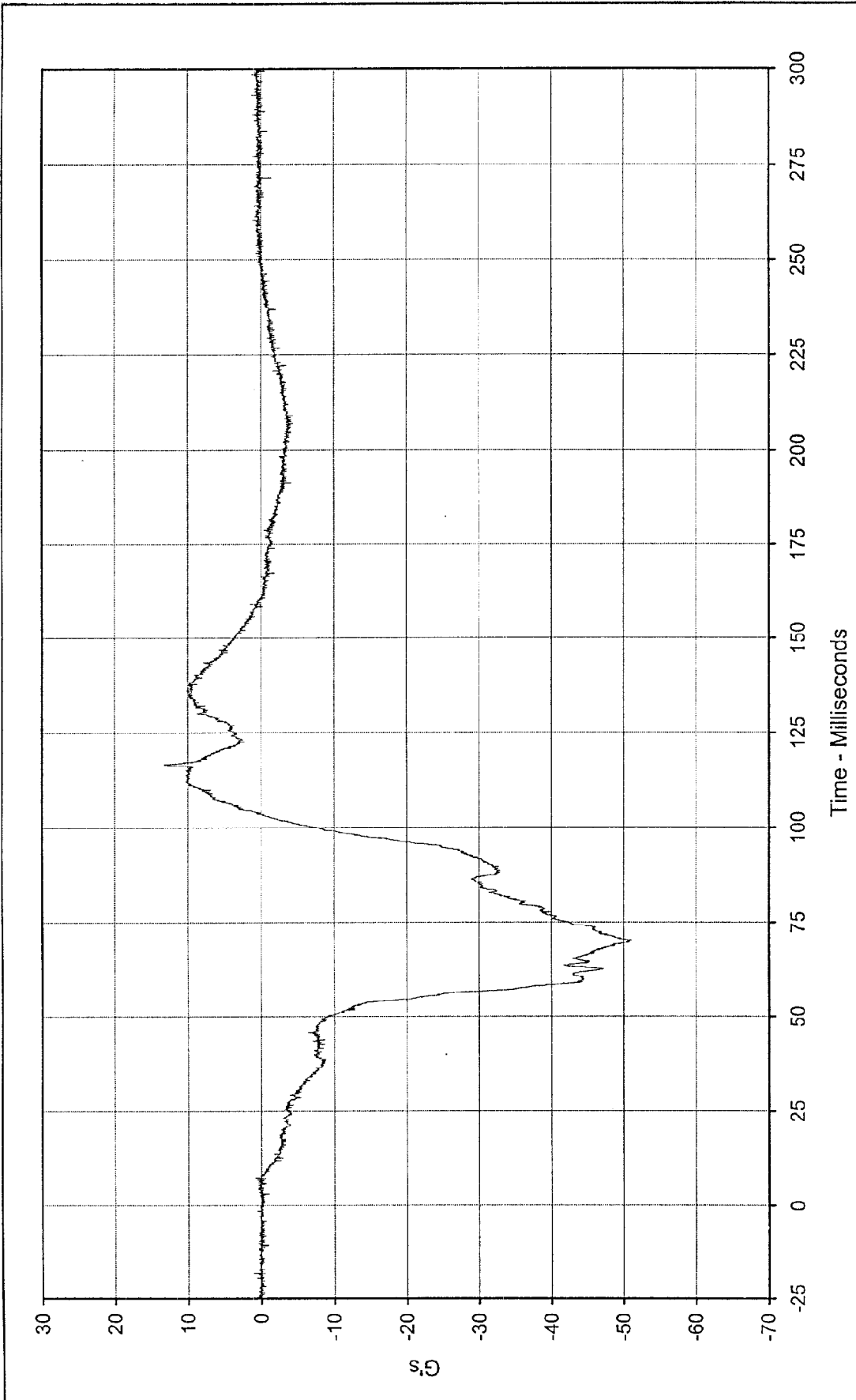




Curve Description: Passenger Chest Displacement X
 Maximum Value: 0.2 at 31.7 Milliseconds
 Minimum Value: -23.1 at 94.8 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-063

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

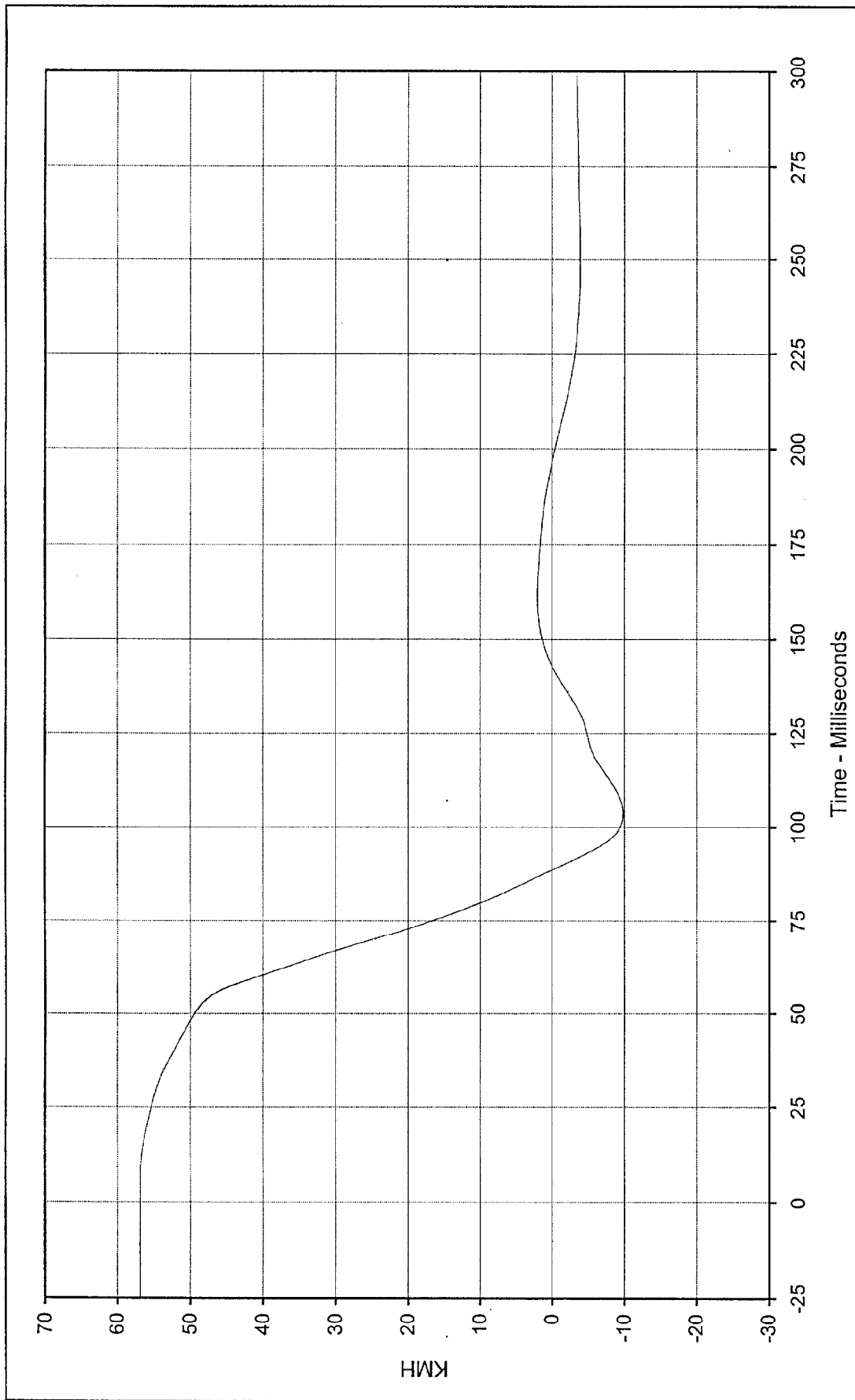




Curve Description: Passenger Pelvis X
 Maximum Value: 13.2 at 116.7 Milliseconds
 Minimum Value: -51.1 at 70.1 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-064

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Passenger Pelvis X Velocity

Maximum Value: 56.9 at 0.0 Milliseconds

Minimum Value: -9.8 at 103.7 Milliseconds

SAE Filter Class: 180

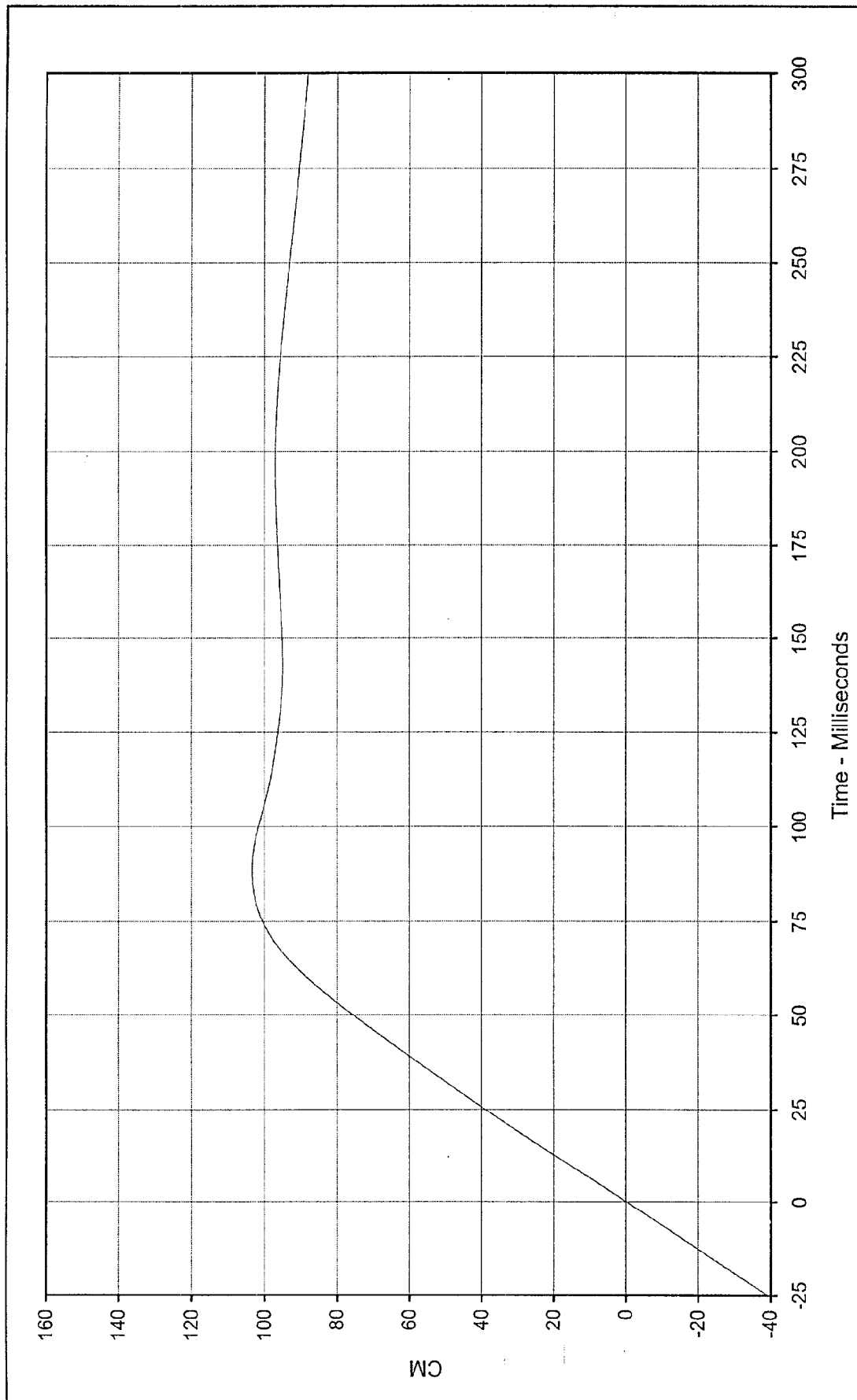
Date of Test: 1/23/98

Curve Number: in 1-064

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

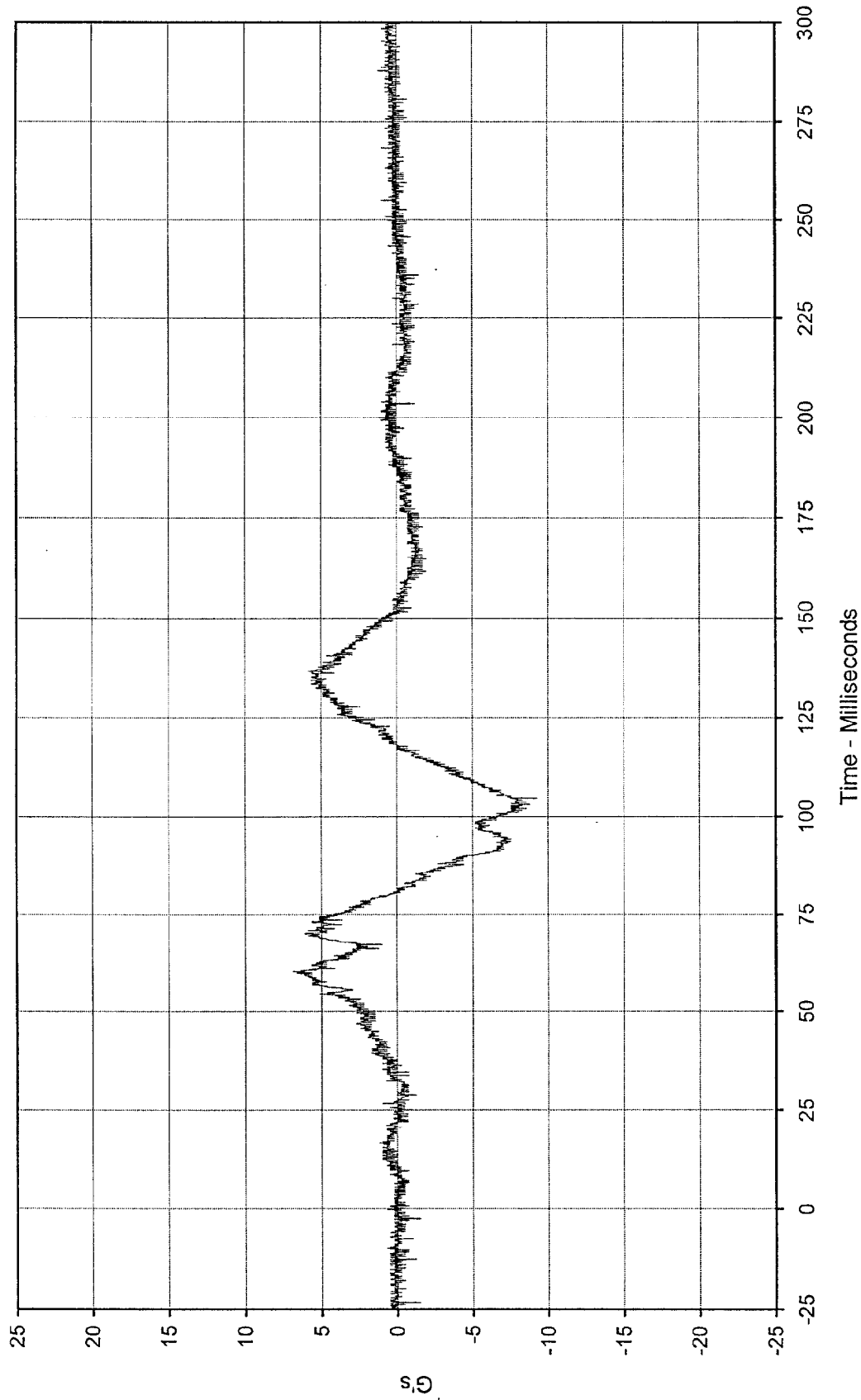




Curve Description: Passenger Pelvis X Displ. Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Maximum Value: 103.4 at 88.6 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
Minimum Value: -0.1 at 0.0 Milliseconds



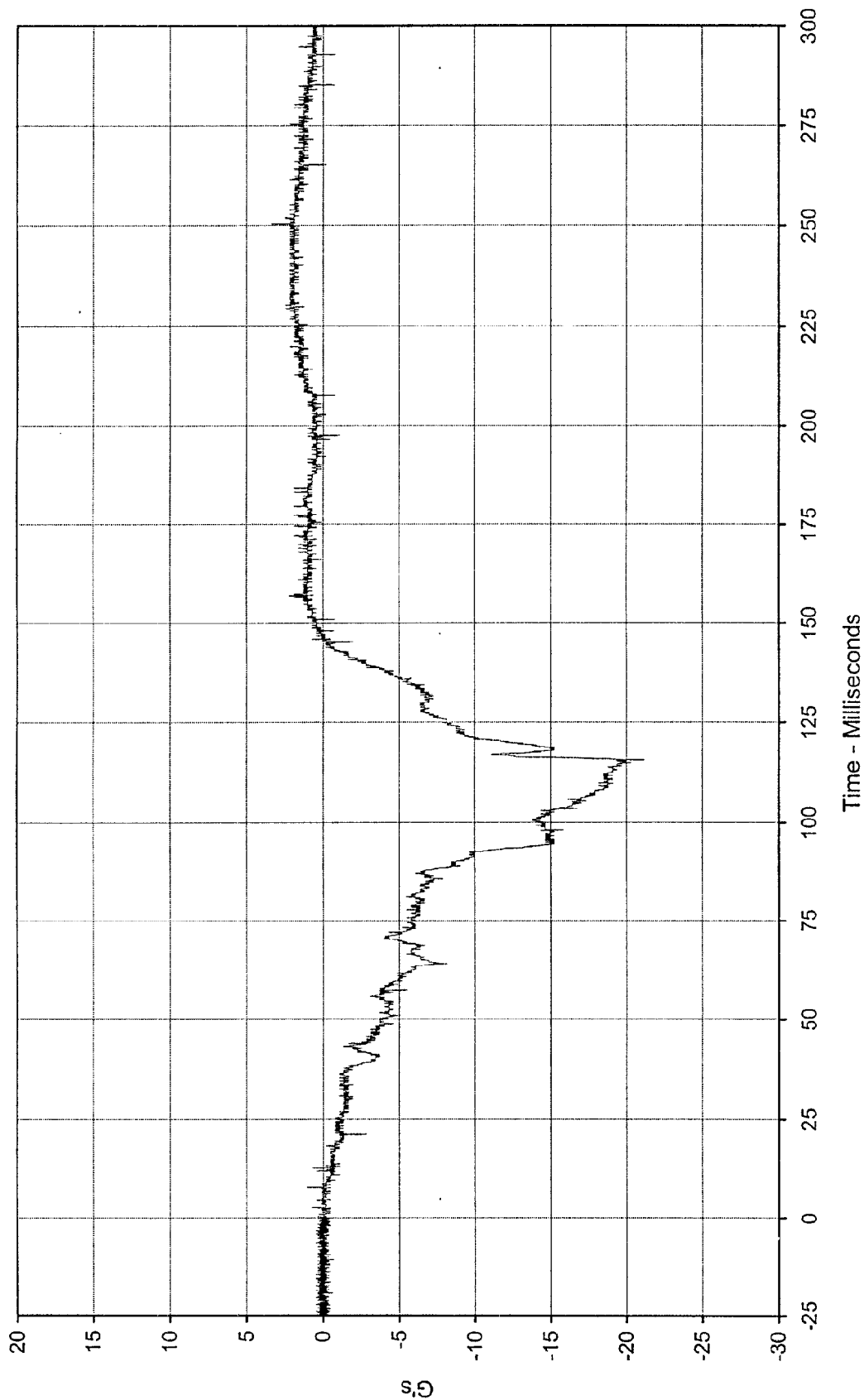
SAE Filter Class: 180
Date of Test: 1/23/98
Curve Number: IN2-064



Curve Description: Passenger Pelvis Y
 Maximum Value: 6.8 at 60.2 Milliseconds
 Minimum Value: -9.3 at 104.6 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-065

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Passenger Pelvis Z

Maximum Value: 3.4 at 250.4 Milliseconds

Minimum Value: -21.1 at 115.7 Milliseconds

SAE Filter Class: 1000

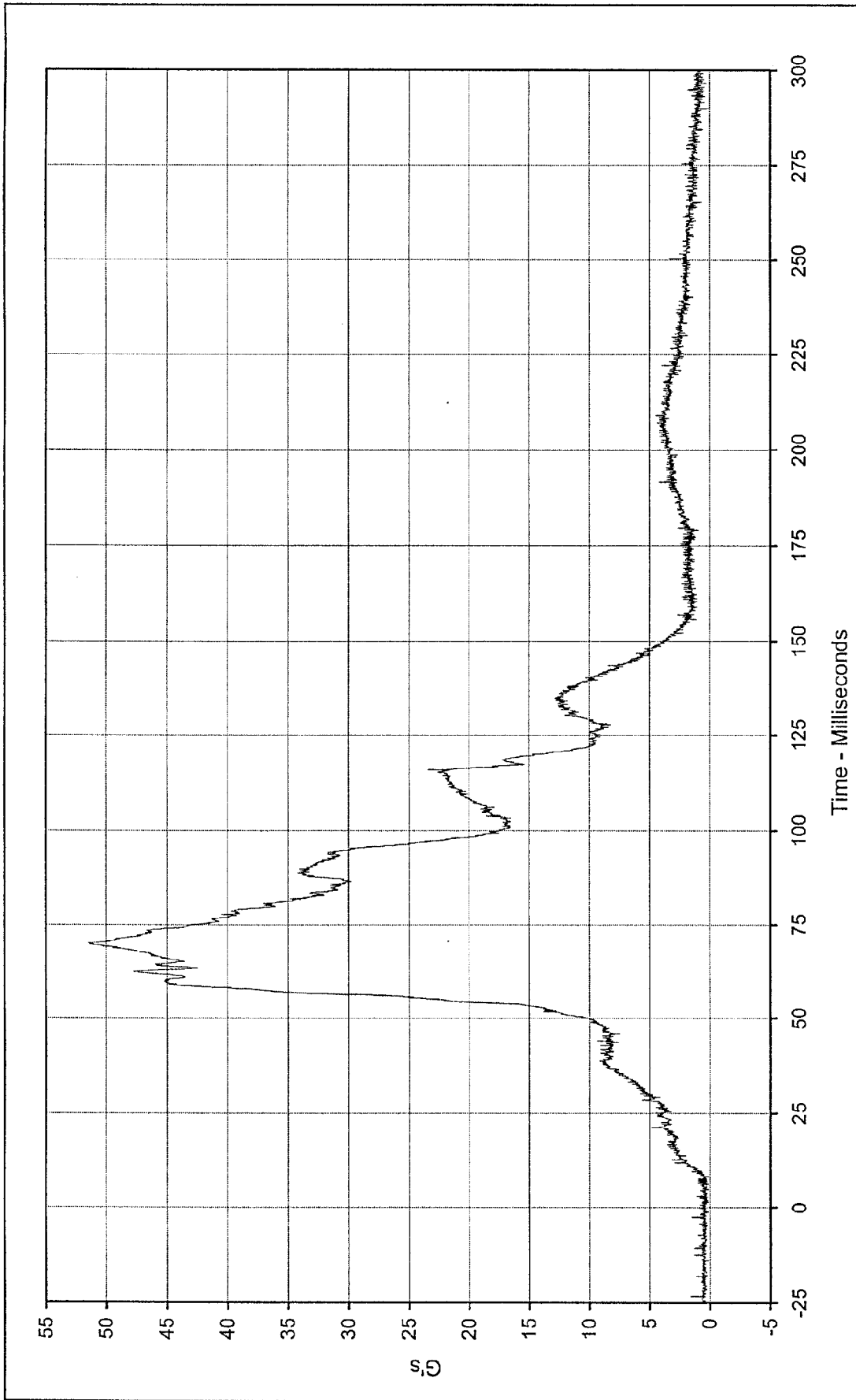
Date of Test: 1/23/98

Curve Number: FIL-066

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

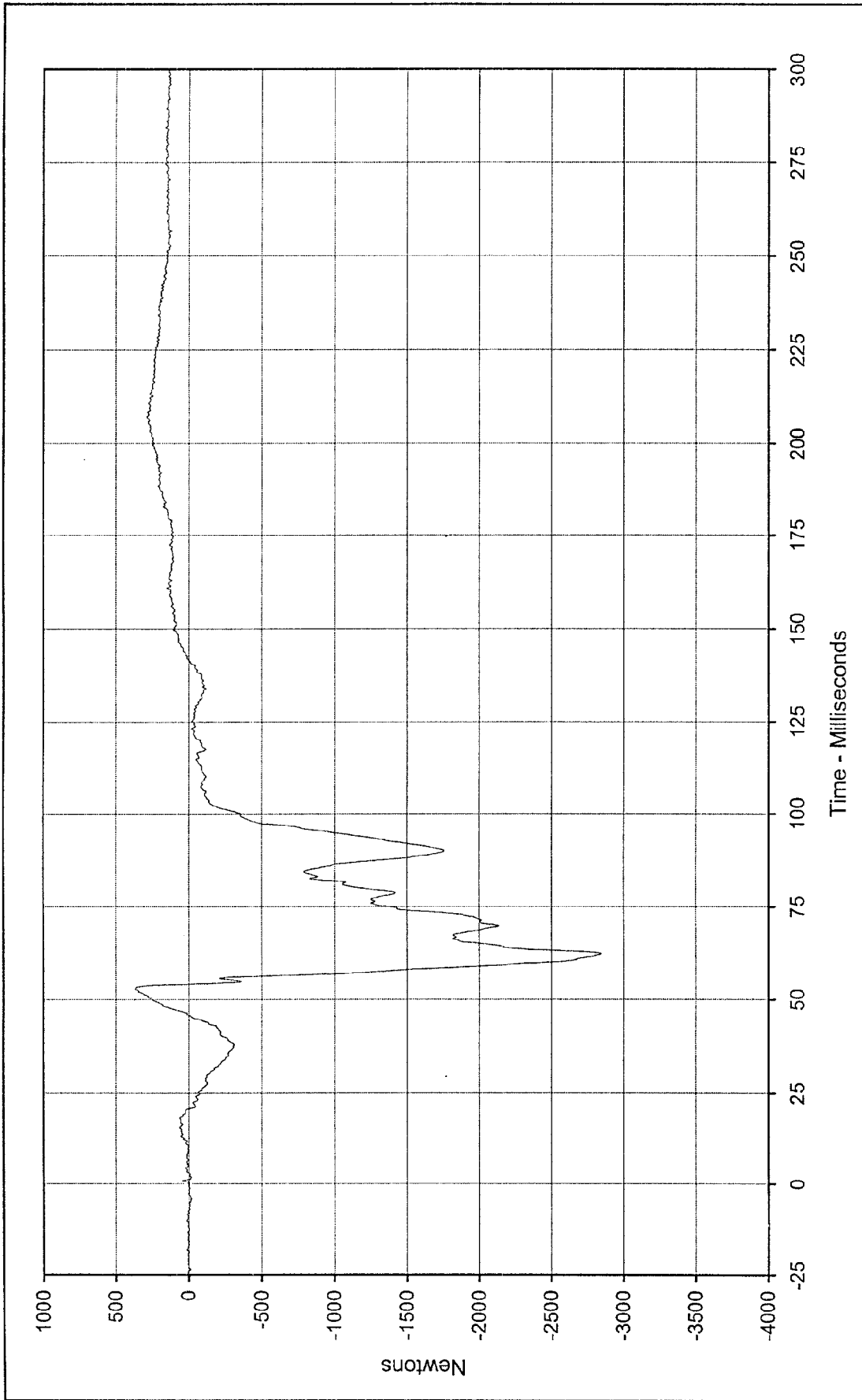
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Passenger Pelvis Resultant	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	51.5 at 70.1 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	0.1 at 1.4 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	RES-064			

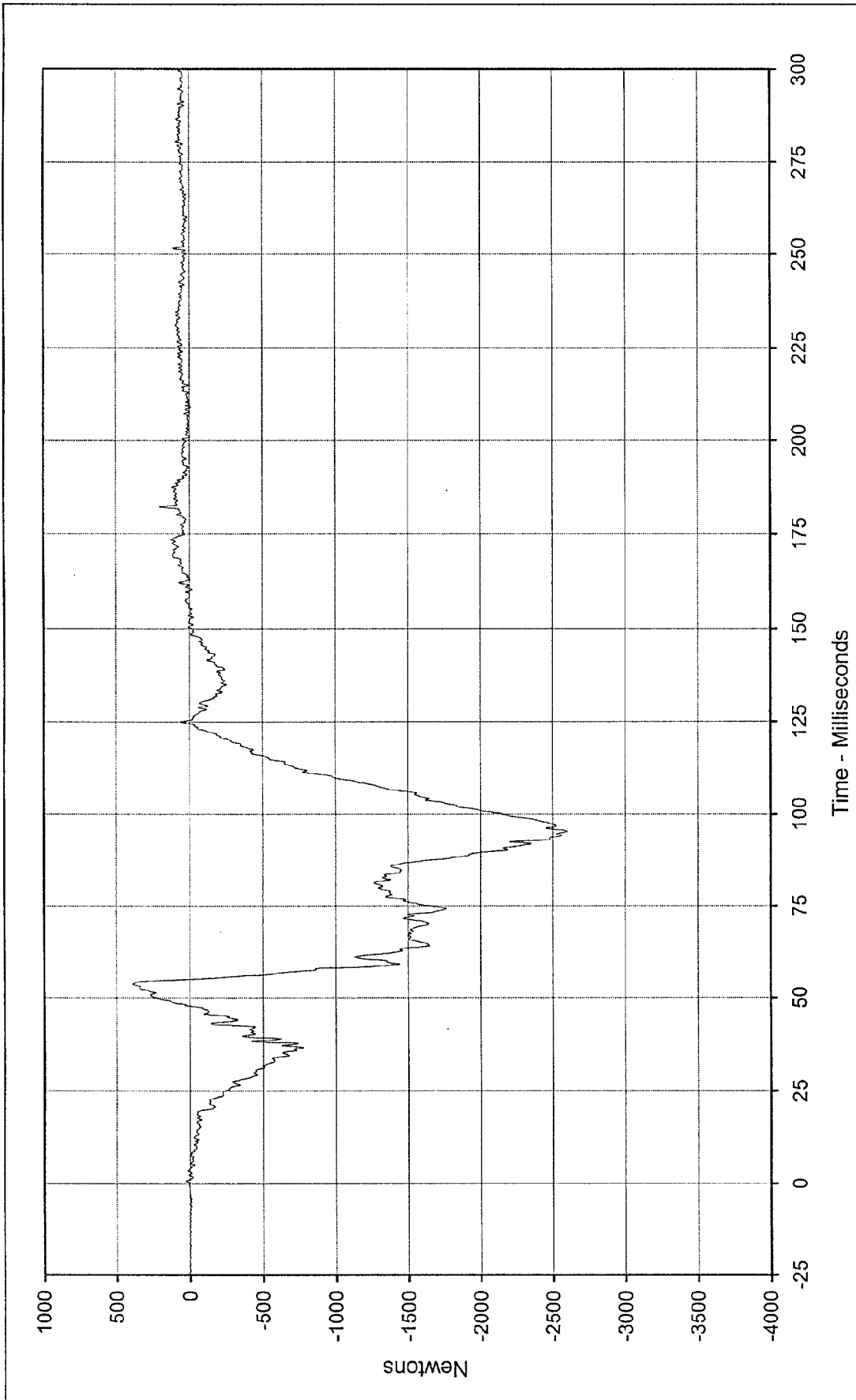




Curve Description: Passenger Left Femur Force
 Maximum Value: 368.3 at 52.9 Milliseconds
 Minimum Value: -2842.1 at 62.2 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-067

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

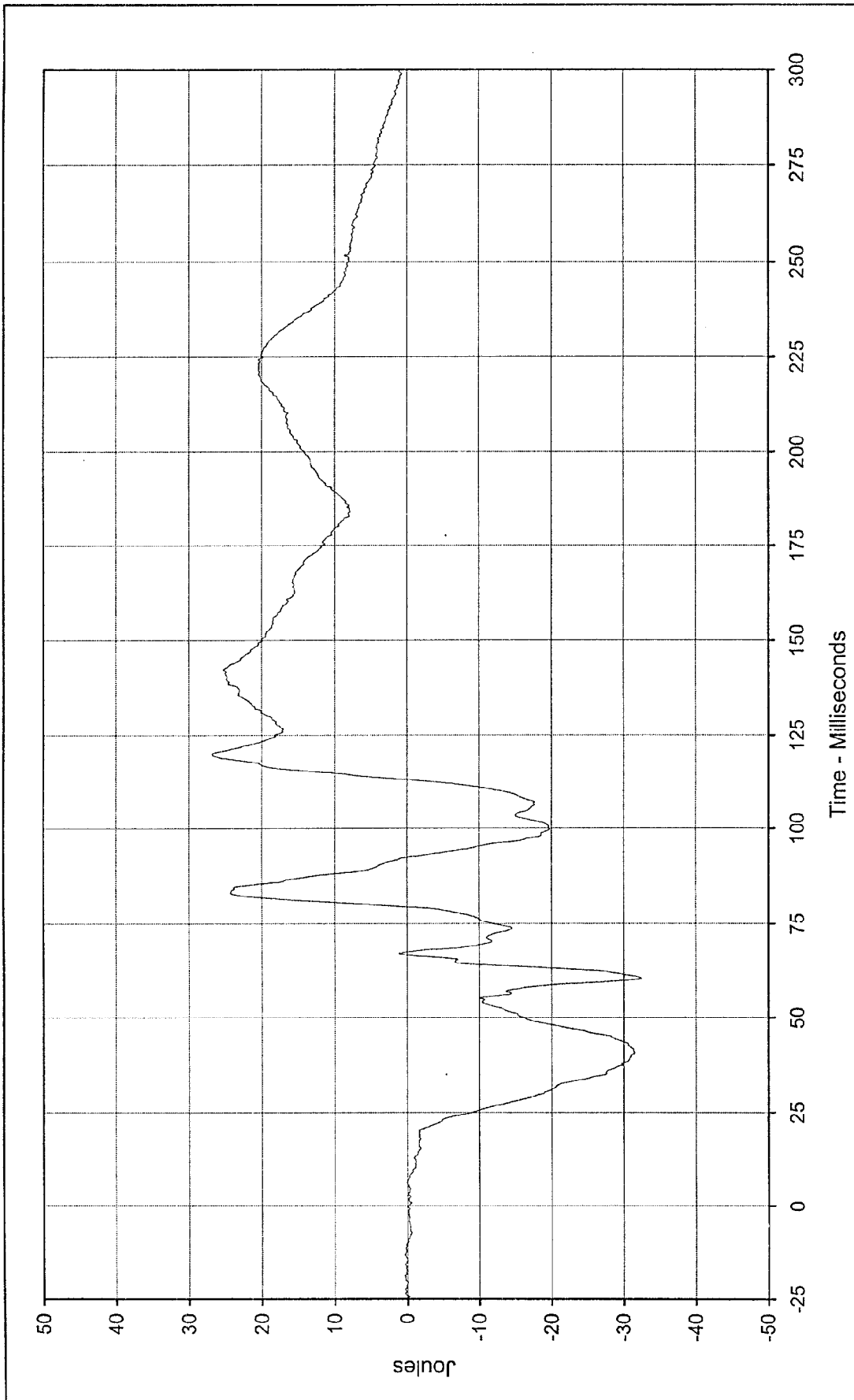




Curve Description:	Passenger Right Femur Force	Testing Program	1998 NHTSA 35 mph NCAP	No.:	MW0119
Maximum Value:	389.8	at	53.7	Milliseconds	Test Vehicle:
Minimum Value:	-2602.2	at	95.3	Milliseconds	
SAE Filter Class:	600				
Date of Test:	1/23/98				
Curve Number:	FIL-069				

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 lightbulb icon. To the right of "KARCO" is the word "Engineering" in a smaller, italicized, sans-serif font. The entire logo is set against a dark background with a diagonal line.





Curve Description: Passenger Left Upper Tibia Moment X

Maximum Value: 26.8 at 120.0 Milliseconds

Minimum Value: -32.4 at 60.3 Milliseconds

SAE Filter Class: 600

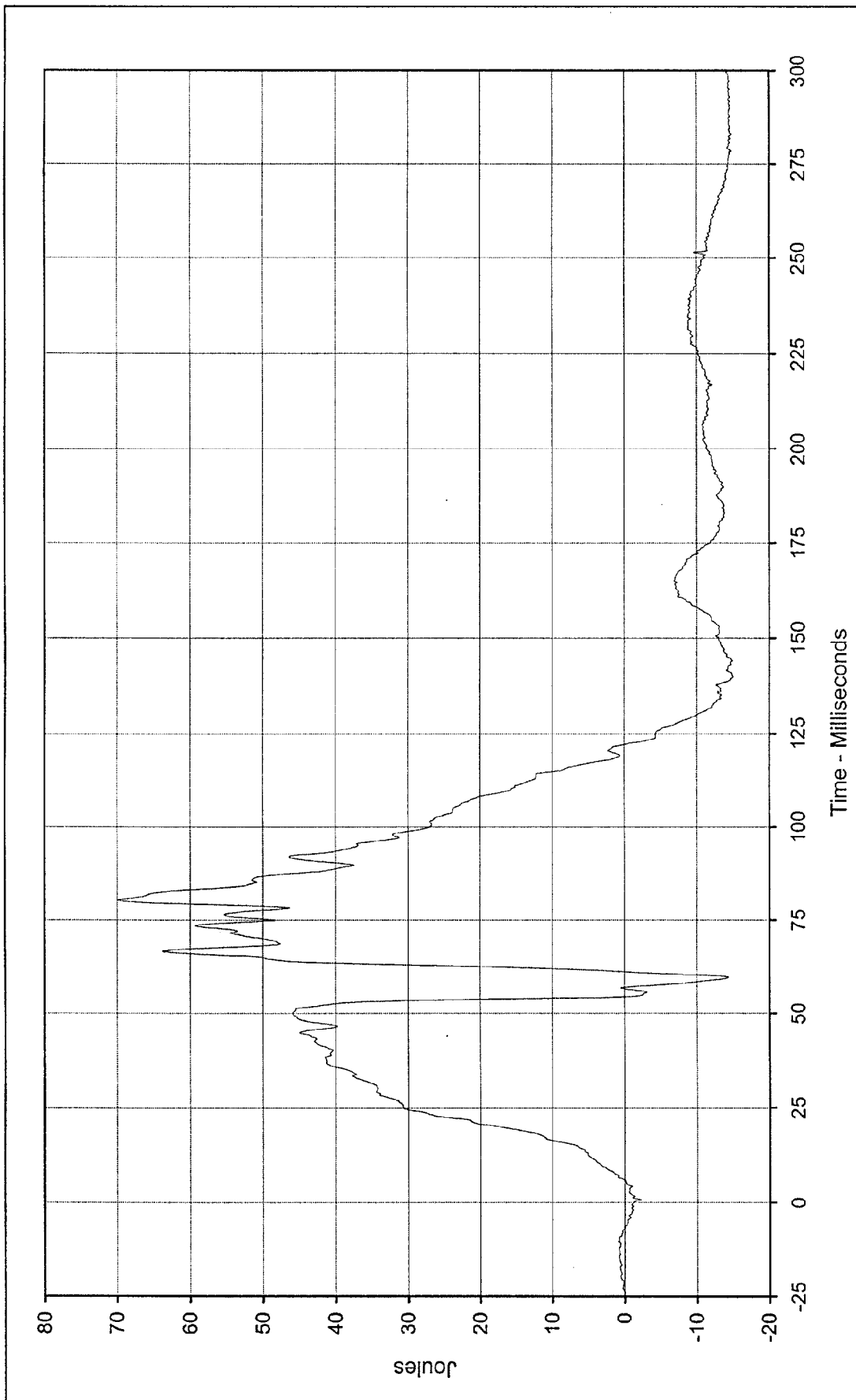
Date of Test: 1/23/98

Curve Number: FIL-069

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

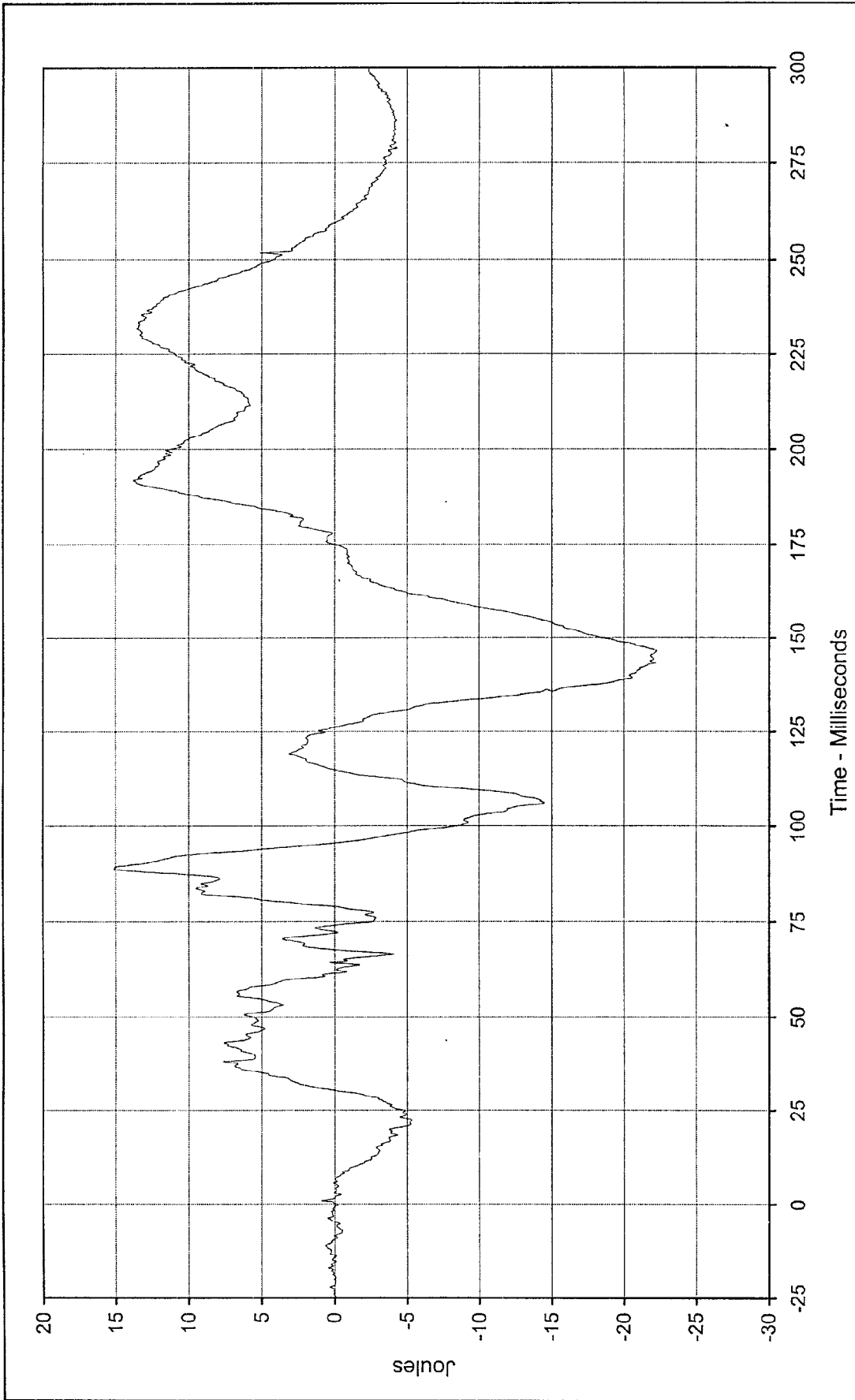
Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Passenger Left Upper Tibia Moment Y	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	69.9 at 80.4 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-15.0 at 139.8 Milliseconds			
SAE Filter Class:	600			
Date of Test:	1/23/98			
Curve Number:	FIL-070			





Curve Description: Passenger Right Upper Tibia Moment X

Maximum Value: 15.1 at 89.0 Milliseconds

Minimum Value: -22.3 at 146.7 Milliseconds

SAE Filter Class: 600

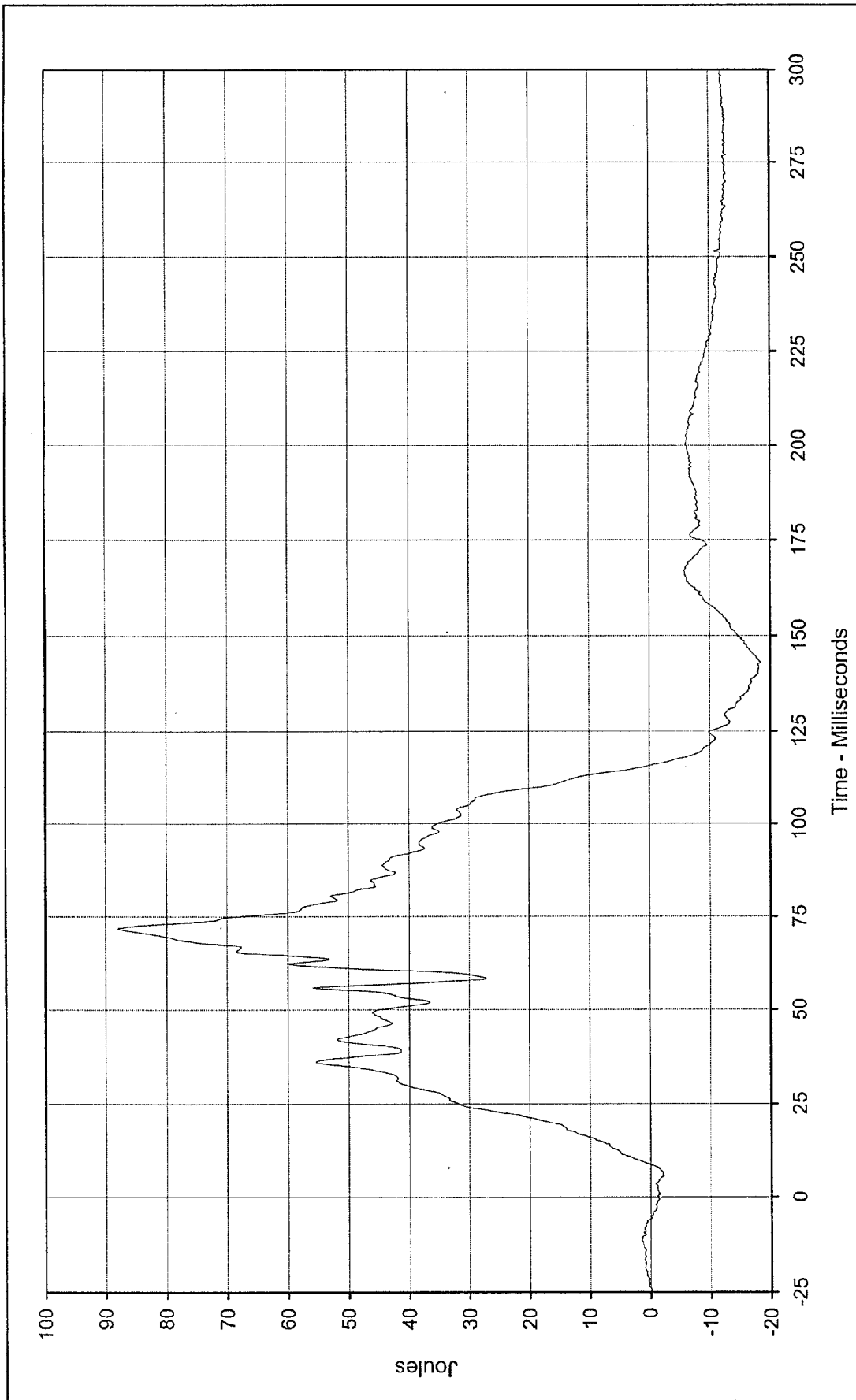
Date of Test: 1/23/98

Curve Number: FIL-071

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Passenger Right Upper Tibia Moment Y

Maximum Value: 88.0 at 71.8 Milliseconds

Minimum Value: -18.5 at 142.9 Milliseconds

SAE Filter Class: 600

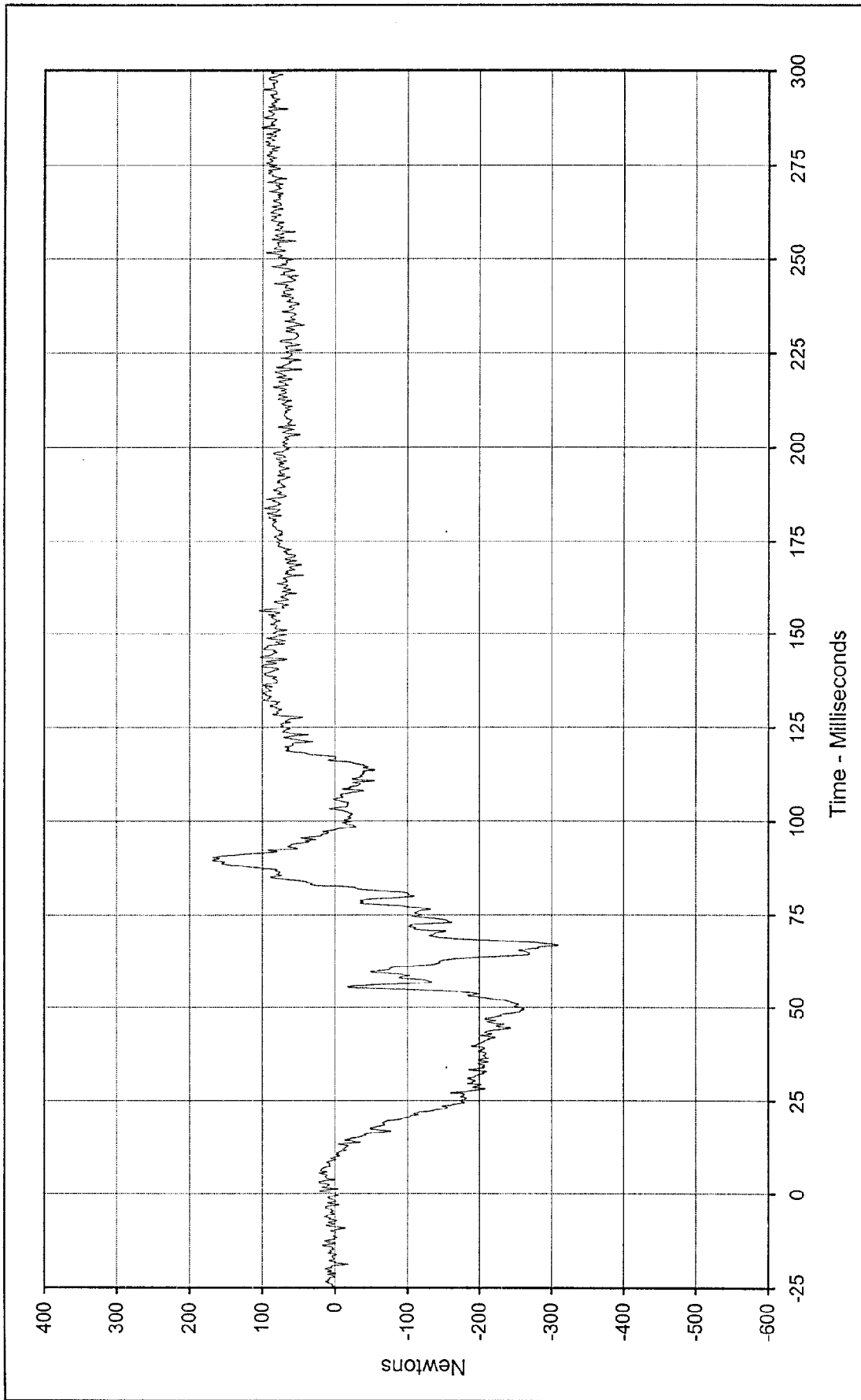
Date of Test: 1/23/98

Curve Number: FIL-072

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





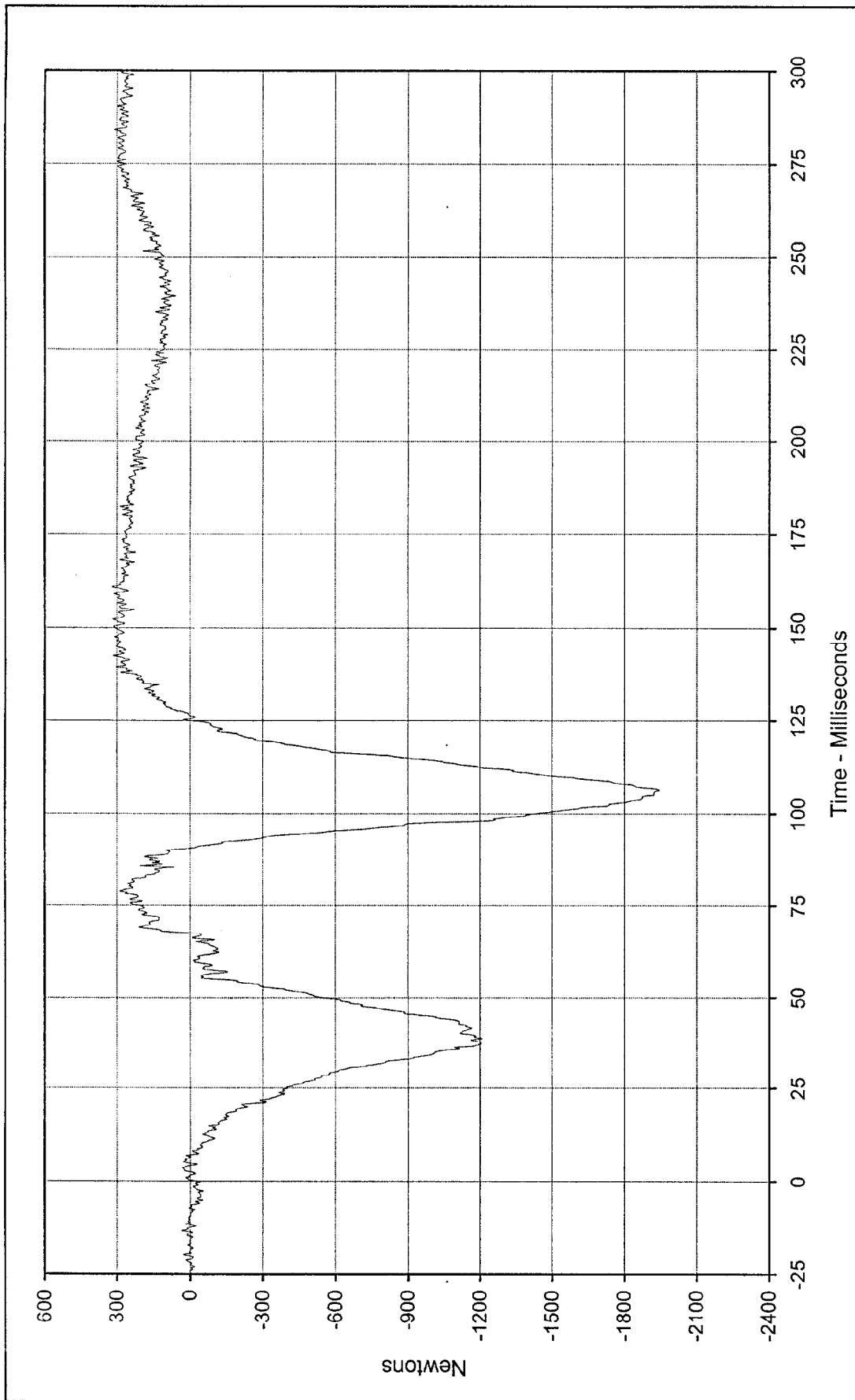
Curve Description: Passenger Left Lower Tibia Force X

Maximum Value:	168.4	at	89.4	Milliseconds
Minimum Value:	-309.0	at	66.5	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/23/98			
Curve Number:	FIL-073			

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

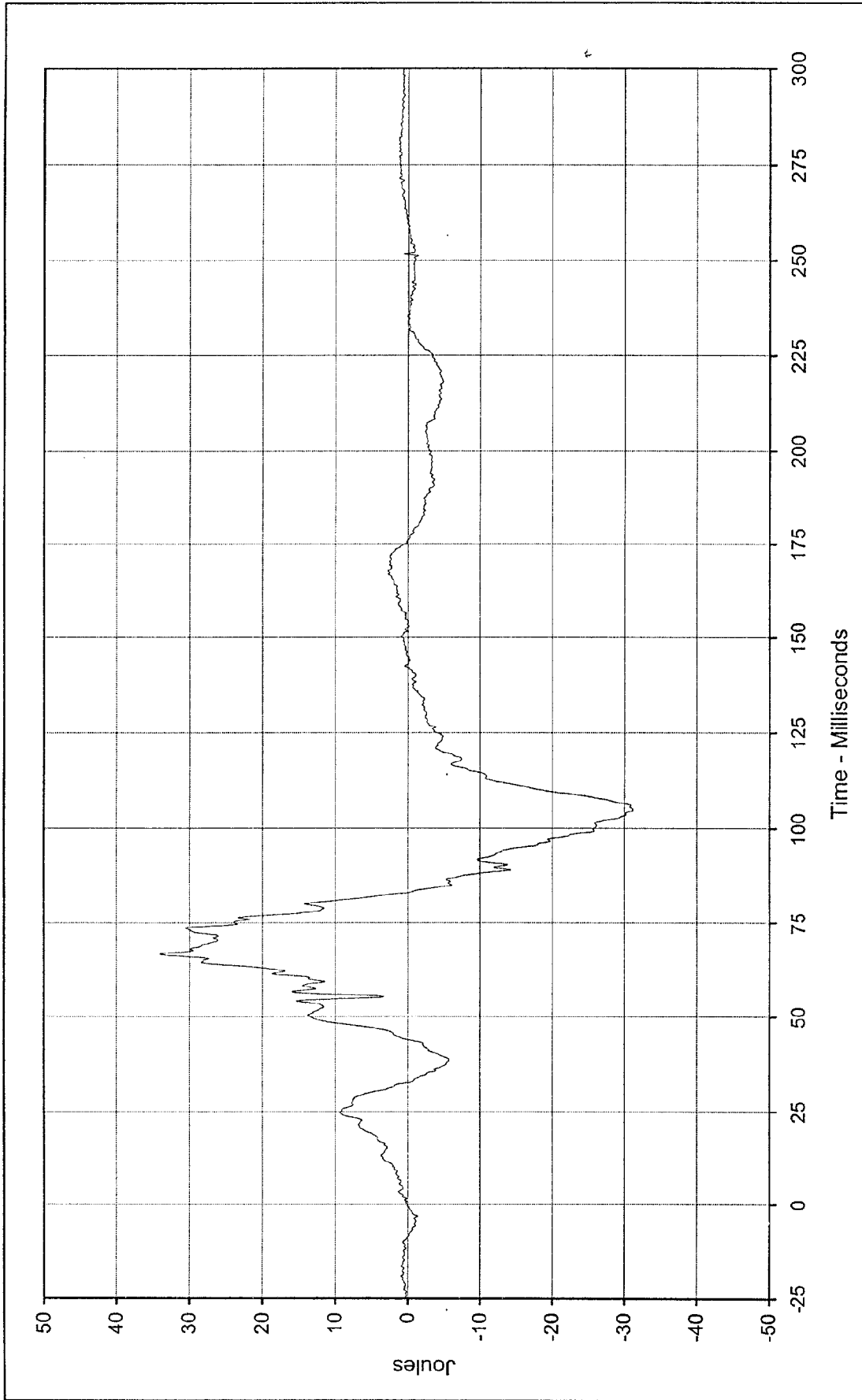




Curve Description: Passenger Left Lower Tibia Force Z
 Maximum Value: 320.3 at 160.9 Milliseconds
 Minimum Value: -1944.7 at 106.3 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: Fil-074

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

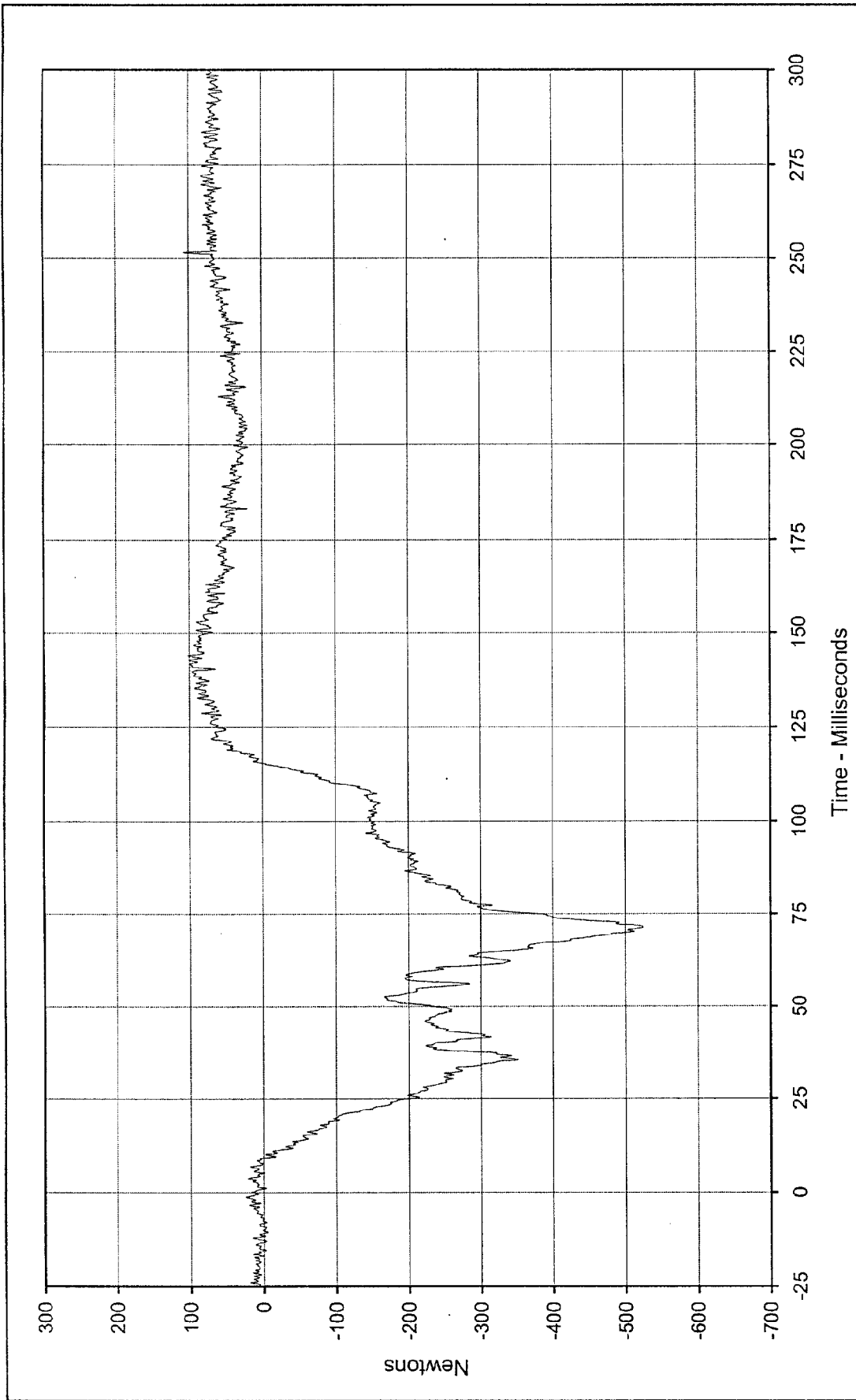




Curve Description: Passenger Left Lower Tibia Moment Y
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

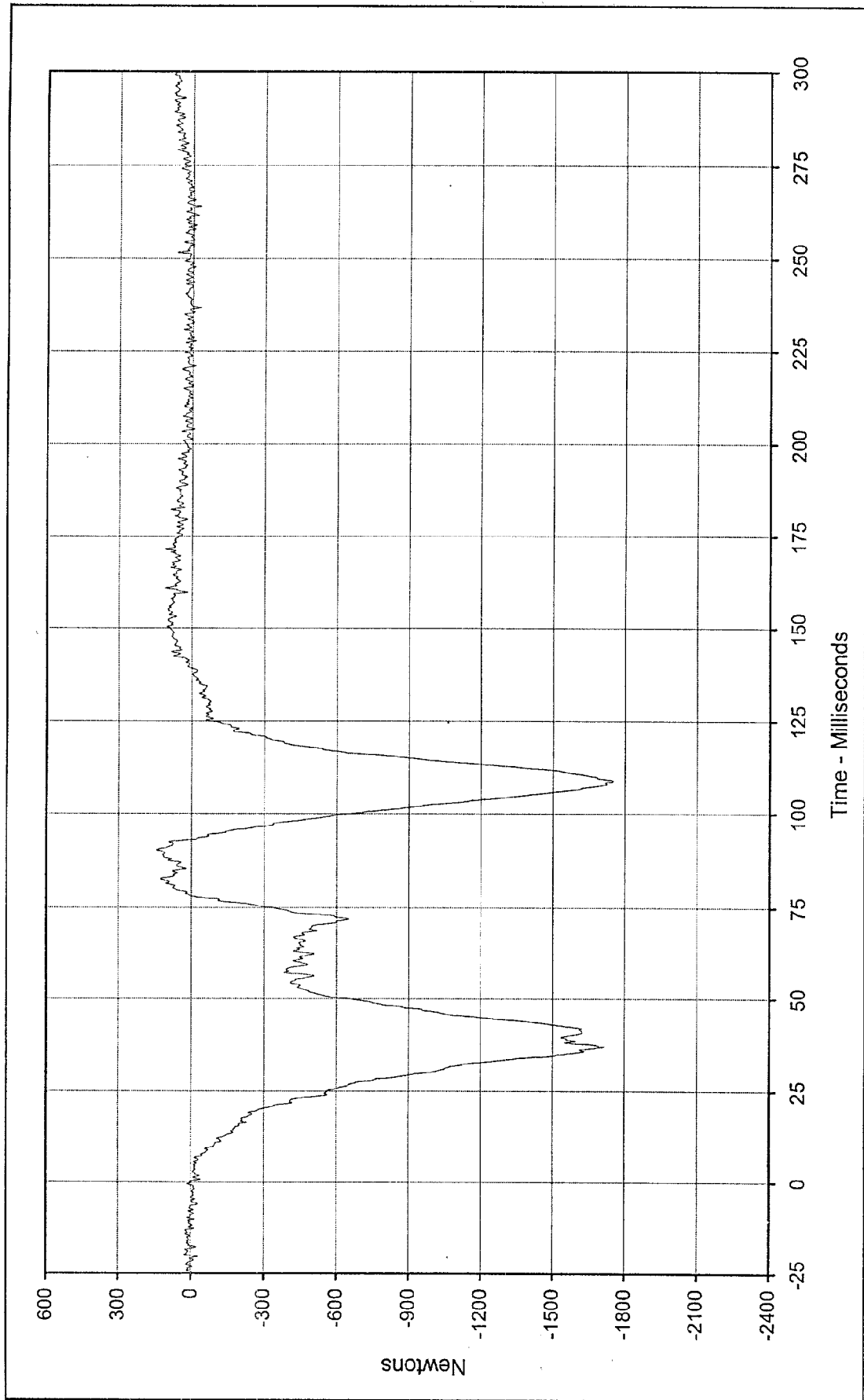
Maximum Value: 34.0 at 66.7 Milliseconds
 Minimum Value: -31.2 at 105.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/23/98
 Curve Number: FIL-075





Curve Description:	Passenger Right Lower Tibia Force X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	106.8	at	251.6	Milliseconds
Minimum Value:	-524.3	at	71.3	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/23/98			
Curve Number:	FIL-076	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	





Curve Description: Passenger Right Lower Tibia Force Z

Maximum Value: 141.9 at 90.2 Milliseconds

Minimum Value: -1750.7 at 108.7 Milliseconds

SAE Filter Class: 600

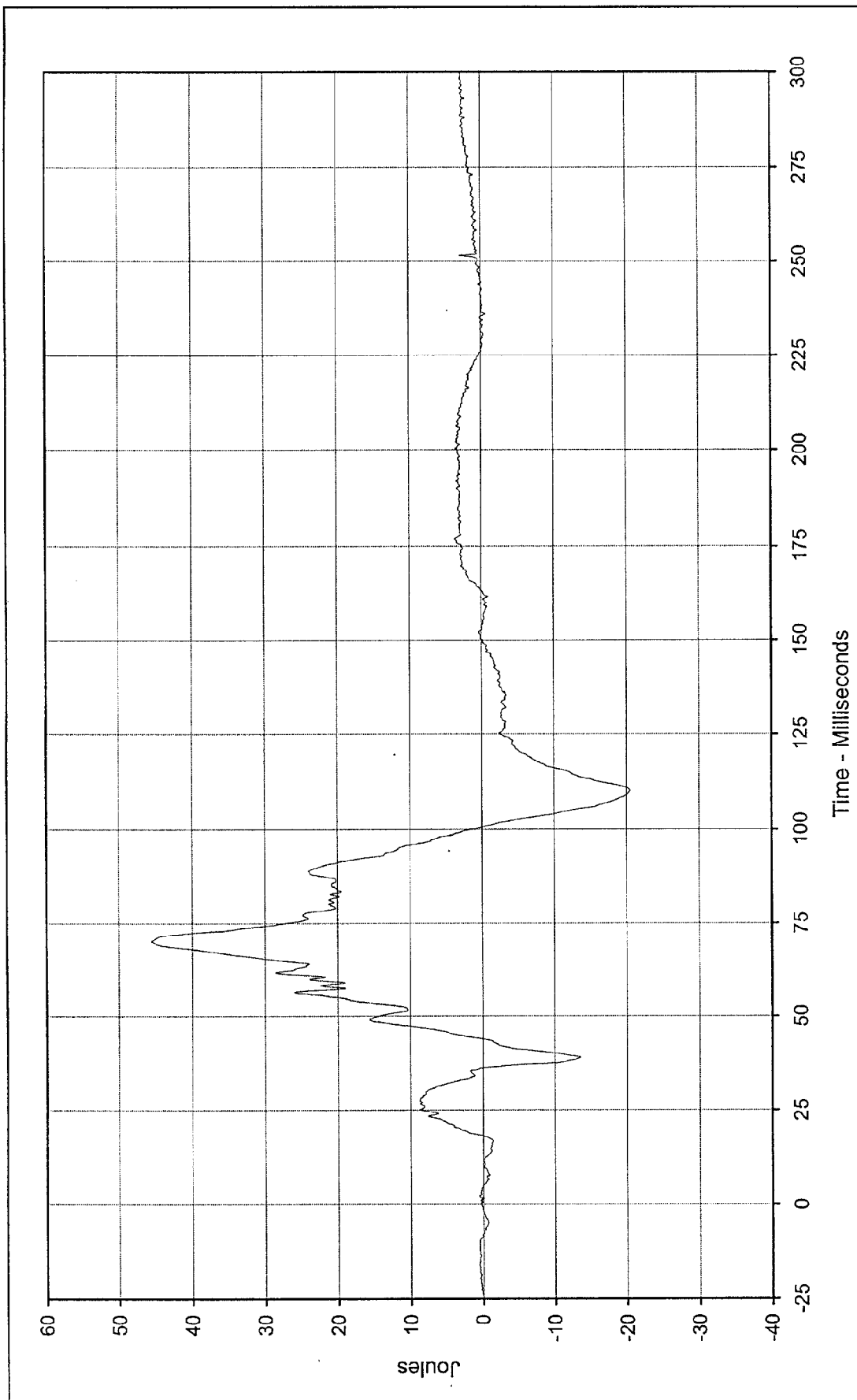
Date of Test: 1/23/98

Curve Number: FIL-077

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Passenger Right lower Tibia Moment Y

Maximum Value: 45.6 at 70.1 Milliseconds

Minimum Value: -20.5 at 110.1 Milliseconds

SAE Filter Class: 600

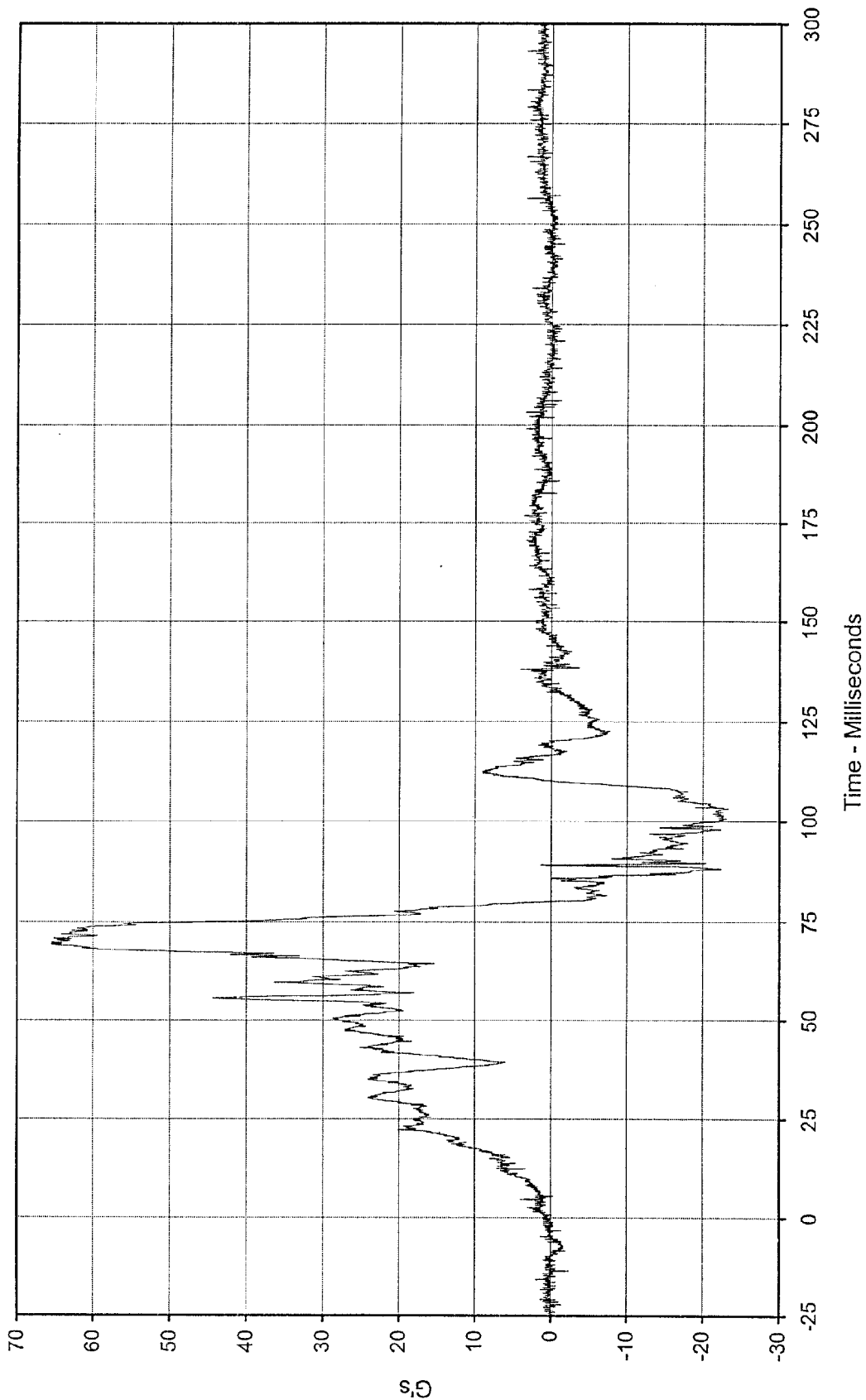
Date of Test: 1/23/98

Curve Number: FIL-078

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

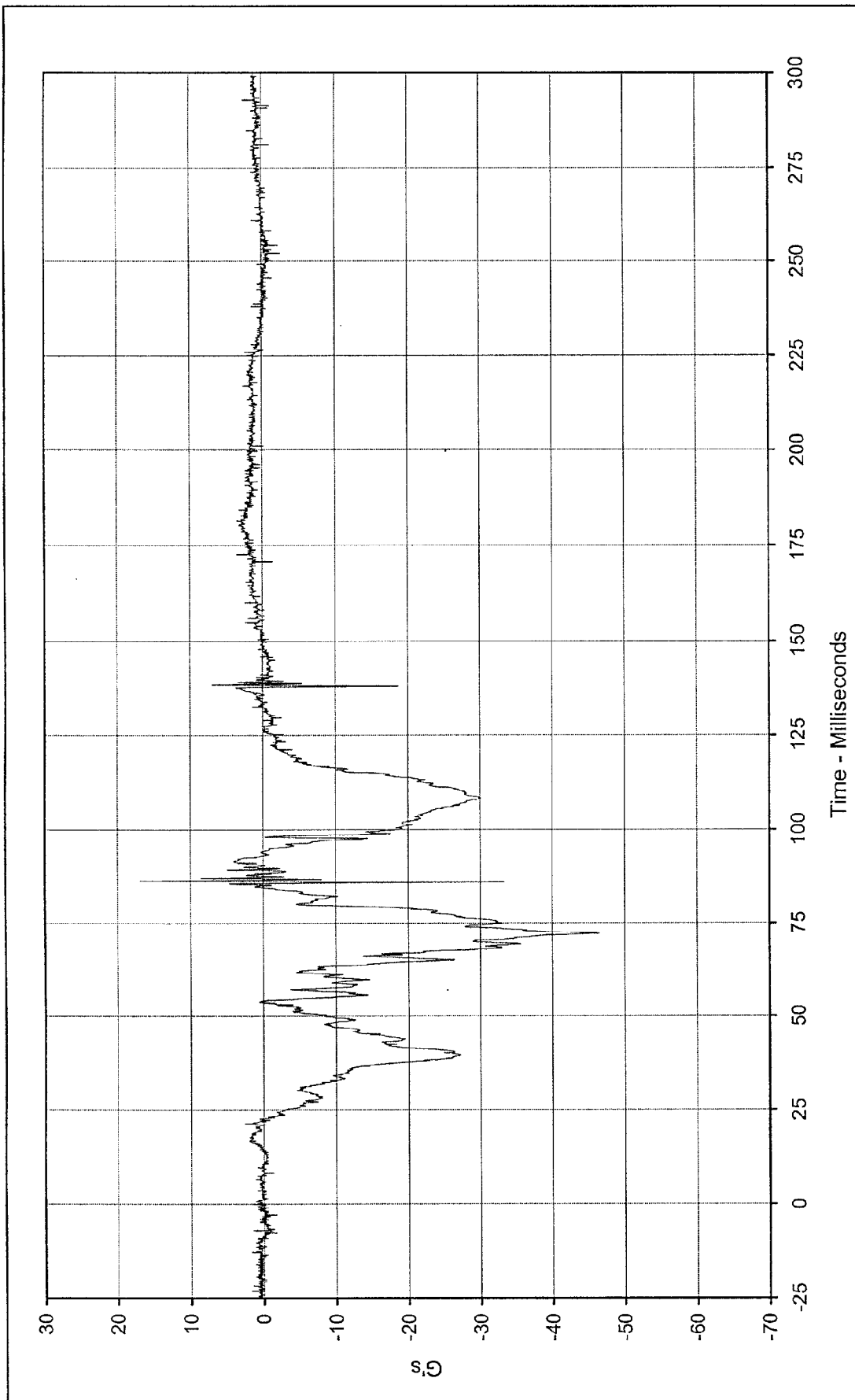




Curve Description: Passenger Left Foot Aft X
 Maximum Value: 65.4 at 69.1 Milliseconds
 Minimum Value: -23.4 at 103.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-079

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

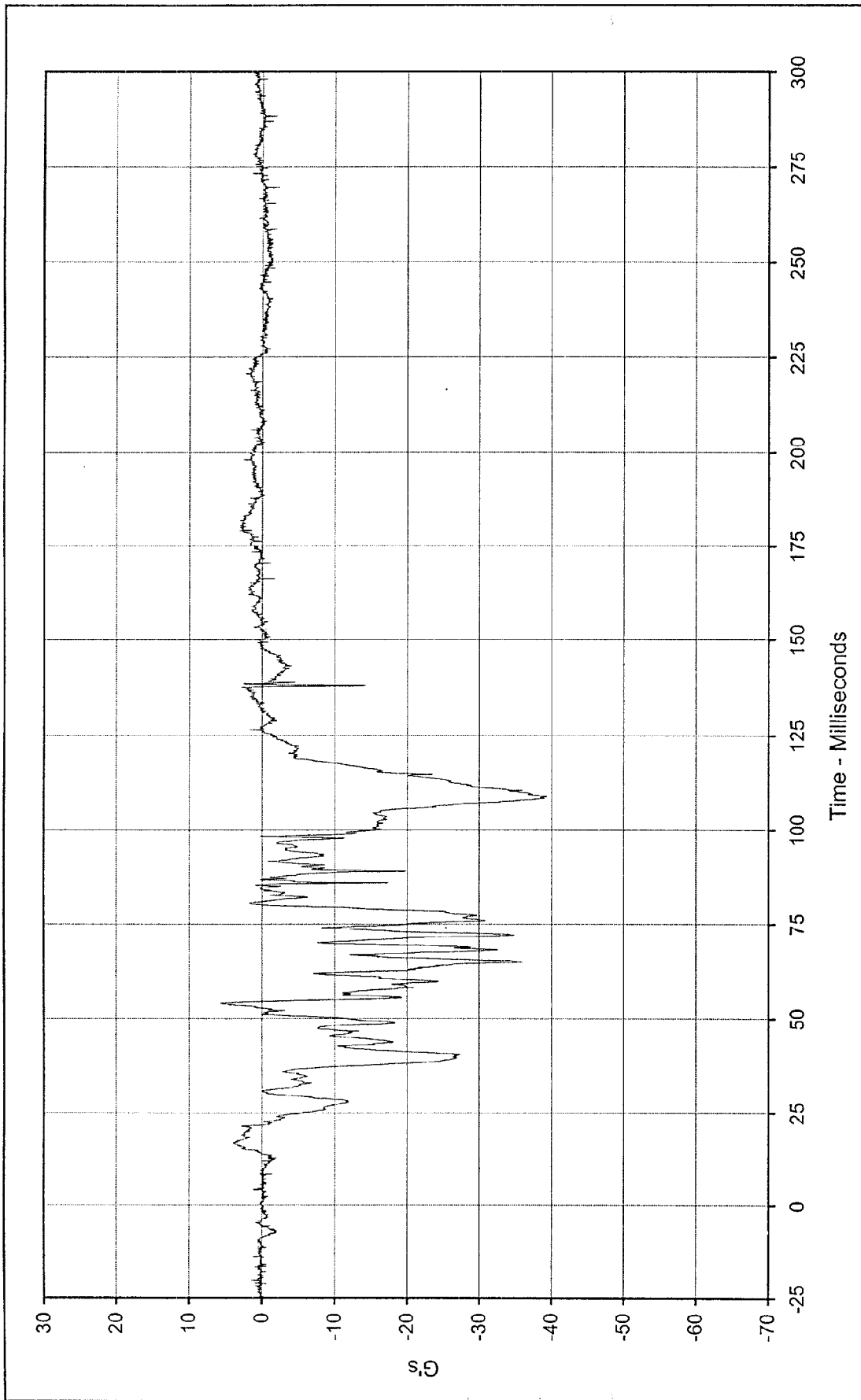




Curve Description:	Passenger Left Foot Aft Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	16.9 at 86.2 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-46.5 at 72.1 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	1/23/98			
Curve Number:	FIL-080			

The logo for KAPCO Engineering features a stylized lightbulb icon with a filament, positioned to the left of the word "KAPCO" in a large, bold, sans-serif font. Below "KAPCO", the word "Engineering" is written in a smaller, italicized, sans-serif font. The entire logo is enclosed within a rectangular border.

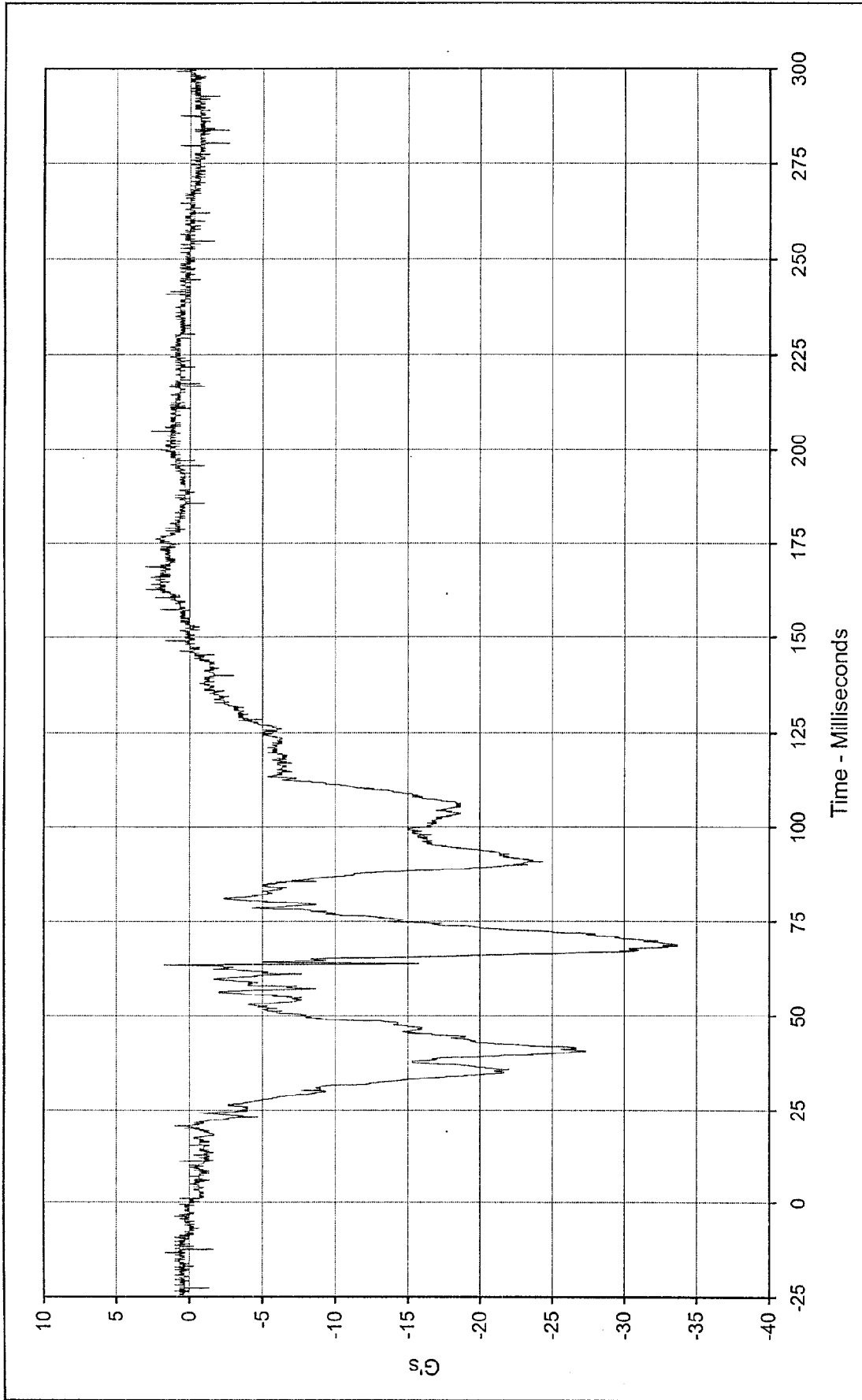




Curve Description: Passenger Left Foot Fore Z Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 5.7 at 54.1 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: -39.3 at 108.9 Milliseconds

SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-081

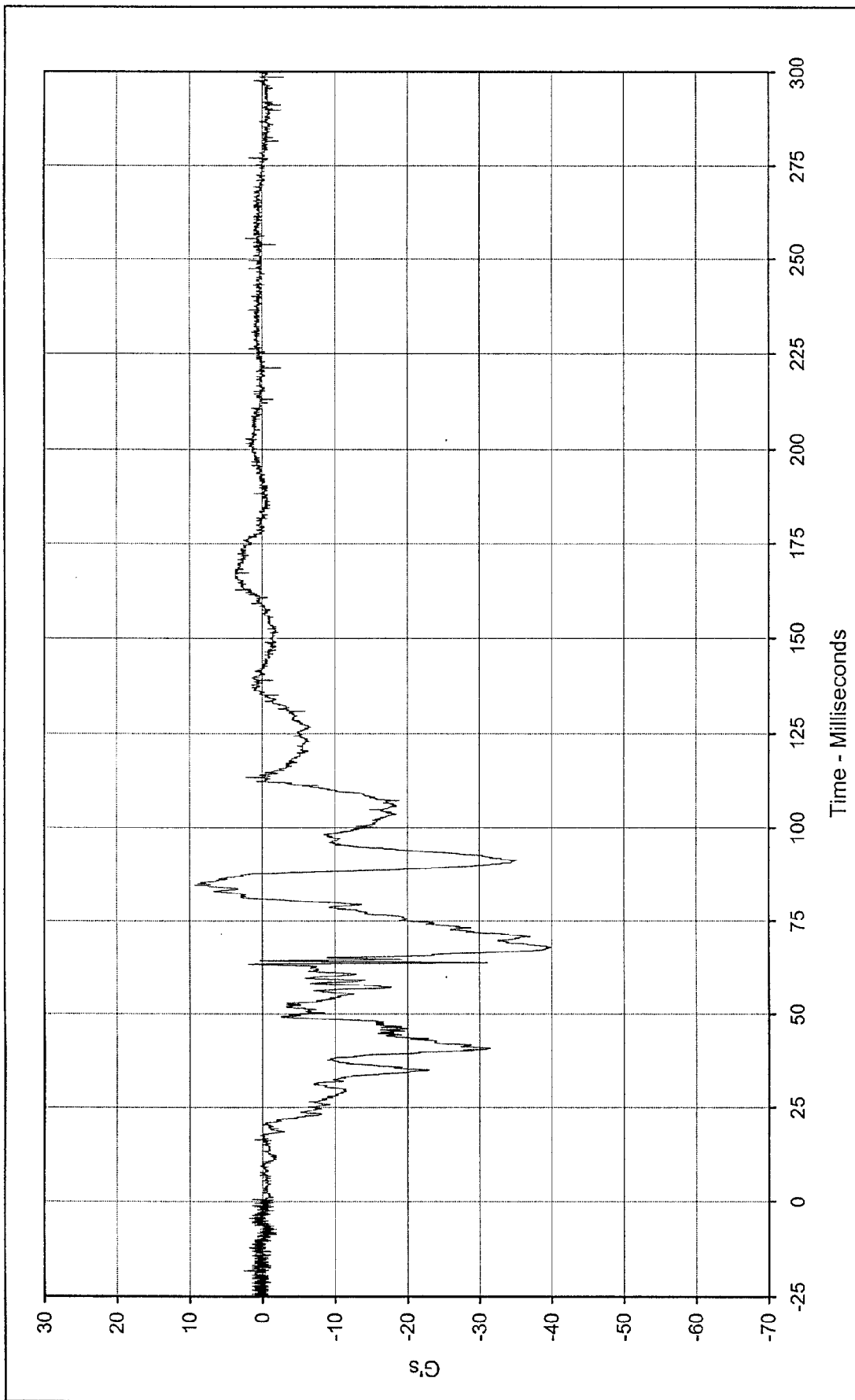




Curve Description: Passenger Right Foot Aft Z
 Maximum Value: 3.0 at 162.8 Milliseconds
 Minimum Value: -33.7 at 68.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/23/98
 Curve Number: FIL-083

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Passenger Right Foot Fore Z

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Maximum Value: 9.3 at 84.5 Milliseconds

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

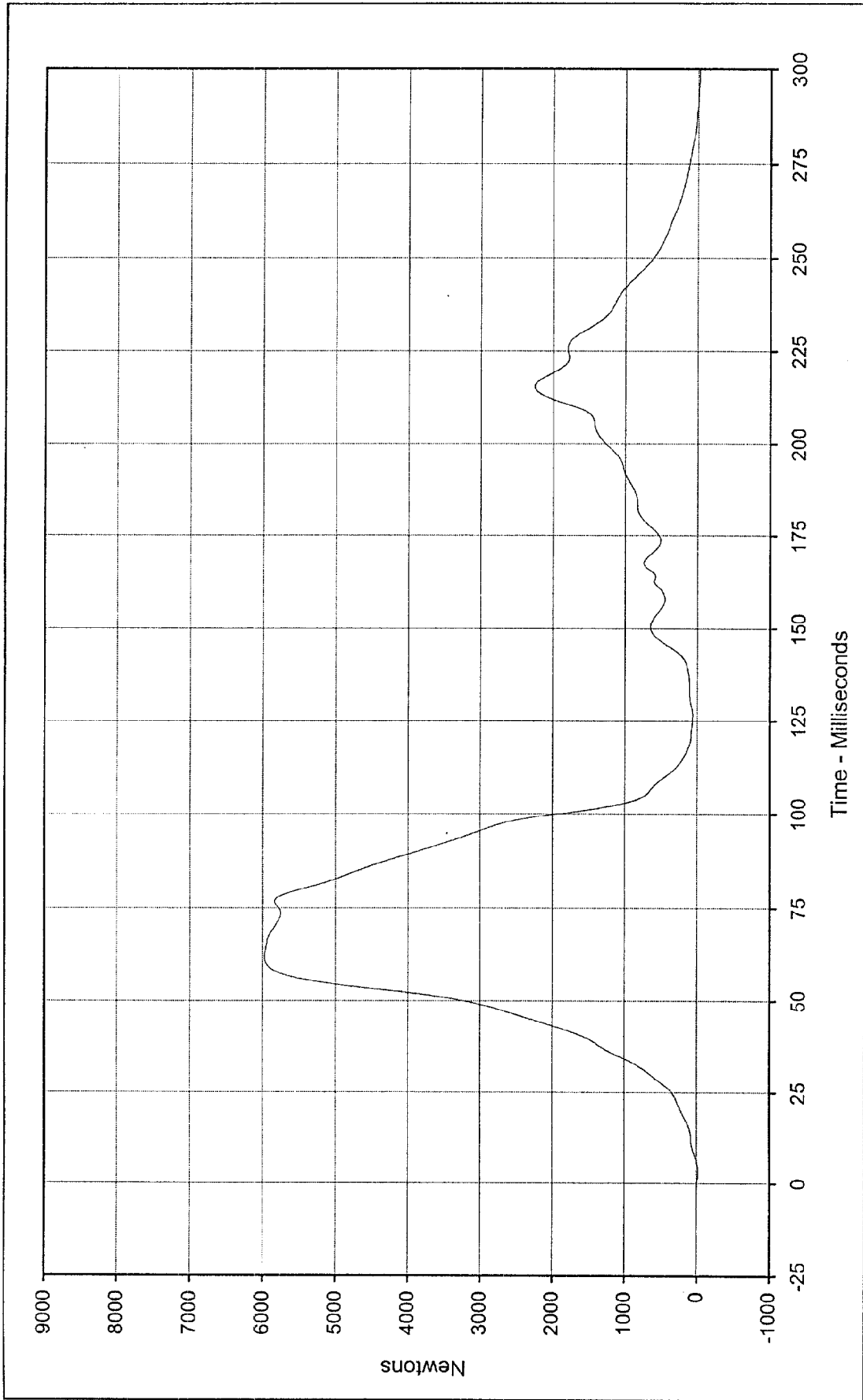
Minimum Value: -40.0 at 67.8 Milliseconds

SAE Filter Class: 1000

Date of Test: 1/23/98

Curve Number: FIL-084

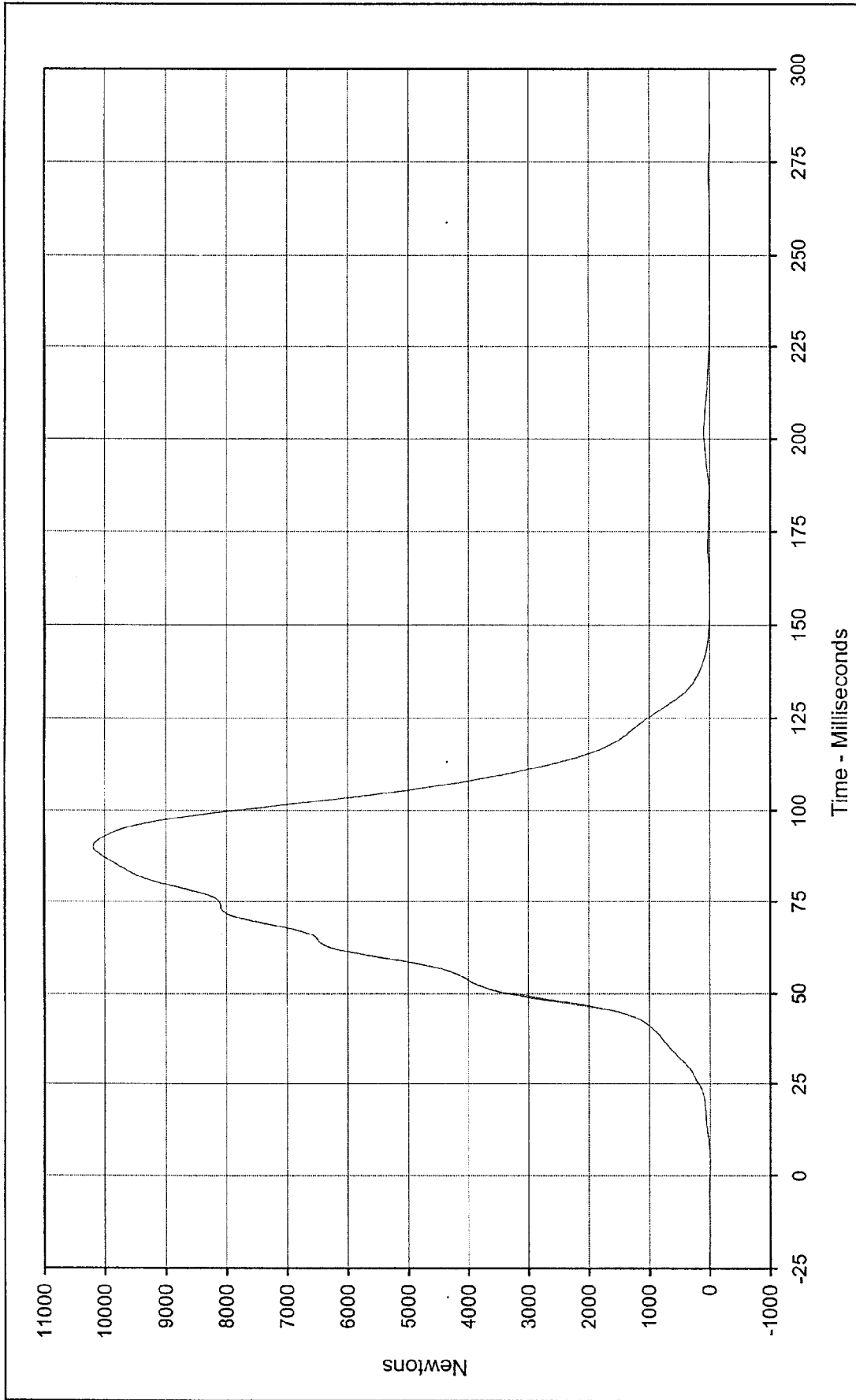




Curve Description: Passenger Lap Belt Force
 Maximum Value: 5973.9 at 61.8 Milliseconds
 Minimum Value: -21.3 at 299.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/23/98
 Curve Number: FIL-085

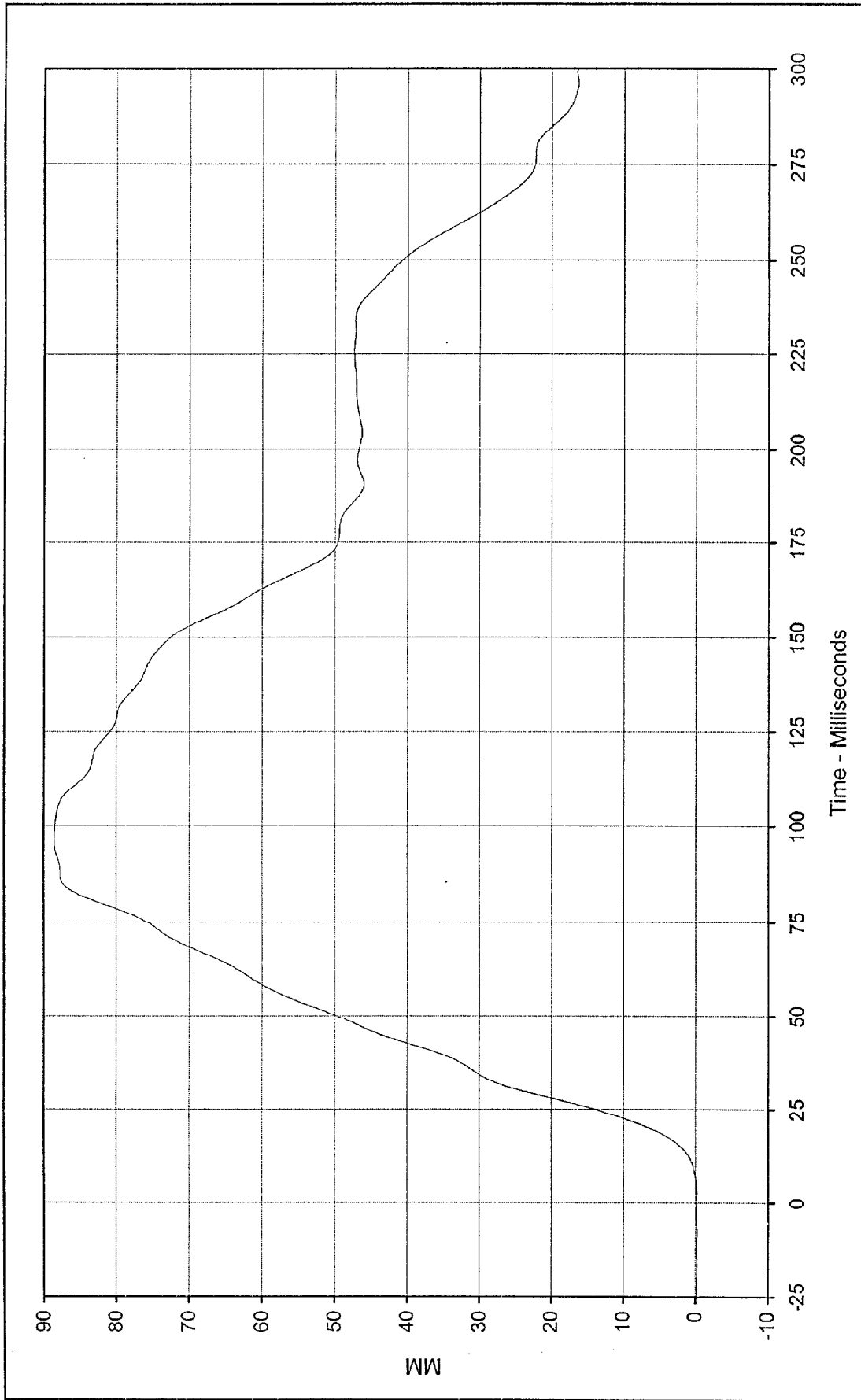
Testing Program: 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Passenger Shoulder Belt Force	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	10188.3 at 90.1 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-12.1 at 236.4 Milliseconds			
SAE Filter Class:	60			
Date of Test:	1/23/98			
Curve Number:	FIL-086			





Curve Description: Passenger Shoulder Belt Pullout

Maximum Value: 88.5 at 96.6 Milliseconds

Minimum Value: -0.2 at 1.4 Milliseconds

SAE Filter Class: 60

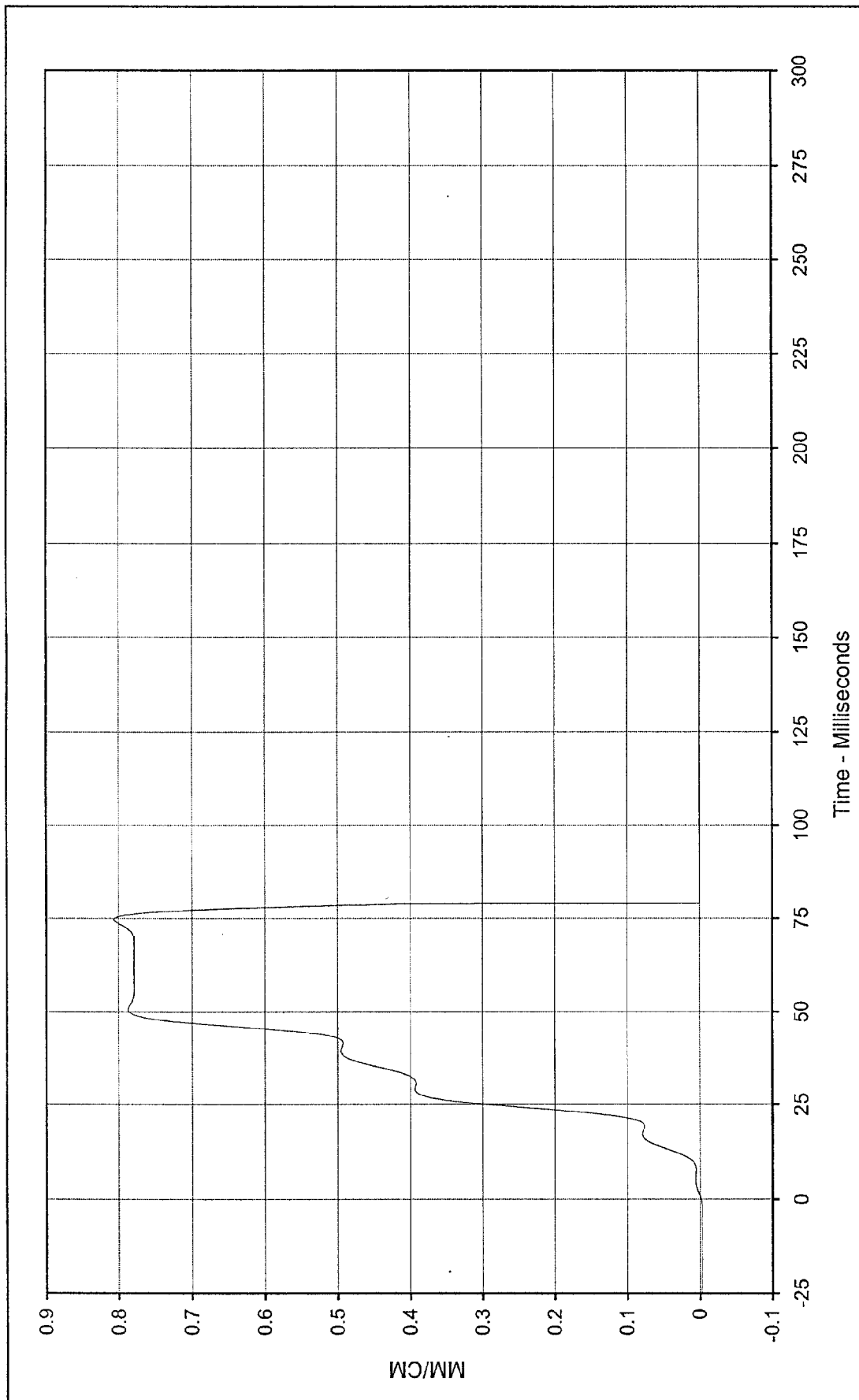
Date of Test: 1/23/98

Curve Number: FIL-087

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe



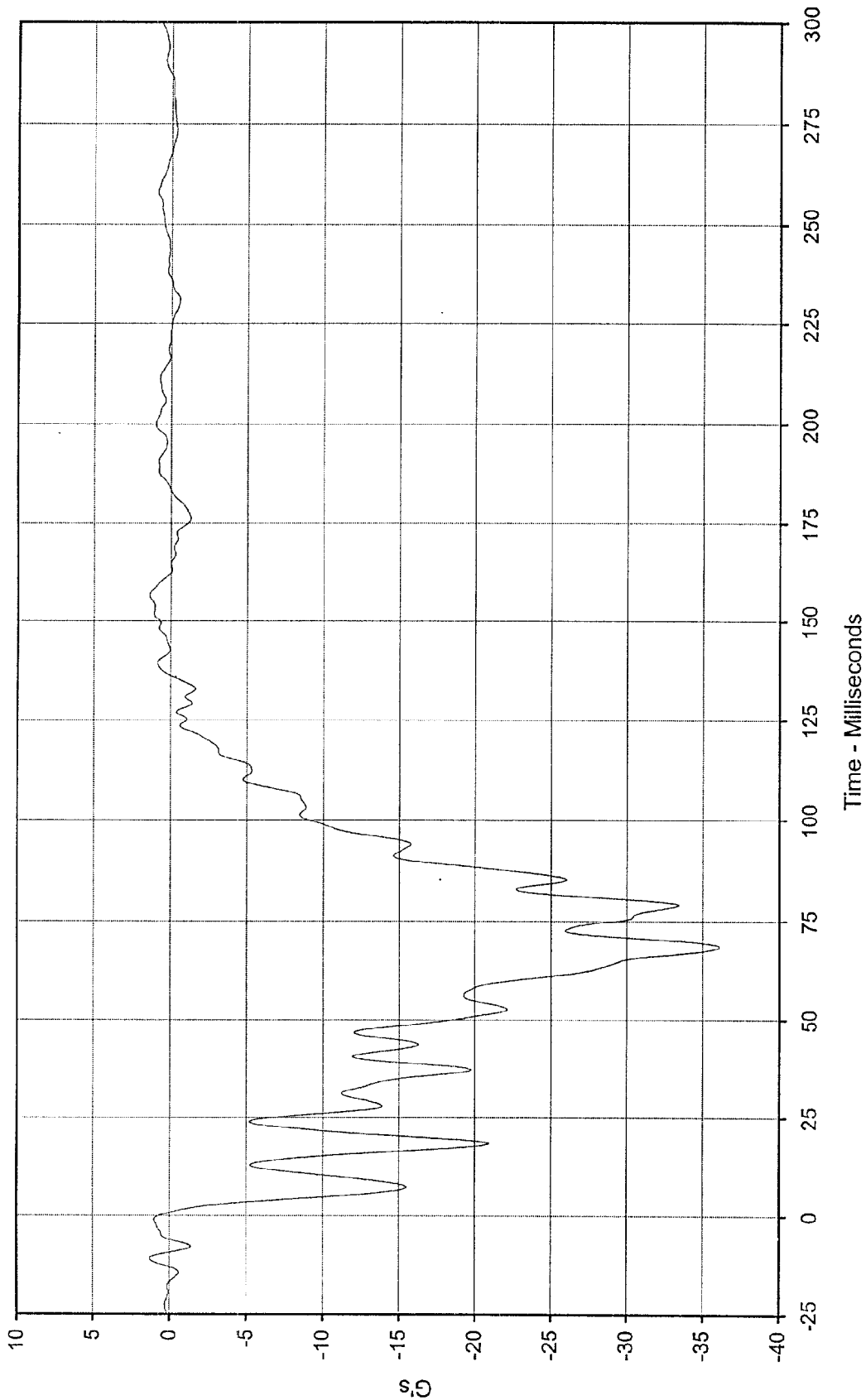


Curve Description: Passenger Shoulder Belt Elongation *
 Maximum Value: 0.81 at 74.7 Milliseconds
 Minimum Value: 0.00 at 0.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/23/98
 Curve Number: FIL-088

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe



* Channel Failed at 79.0 Msec.



Curve Description: Vehicle Left Rear Primary

Maximum Value: 1.4 at 156.6 Milliseconds

Minimum Value: -36.1 at 68.6 Milliseconds

SAE Filter Class: 60

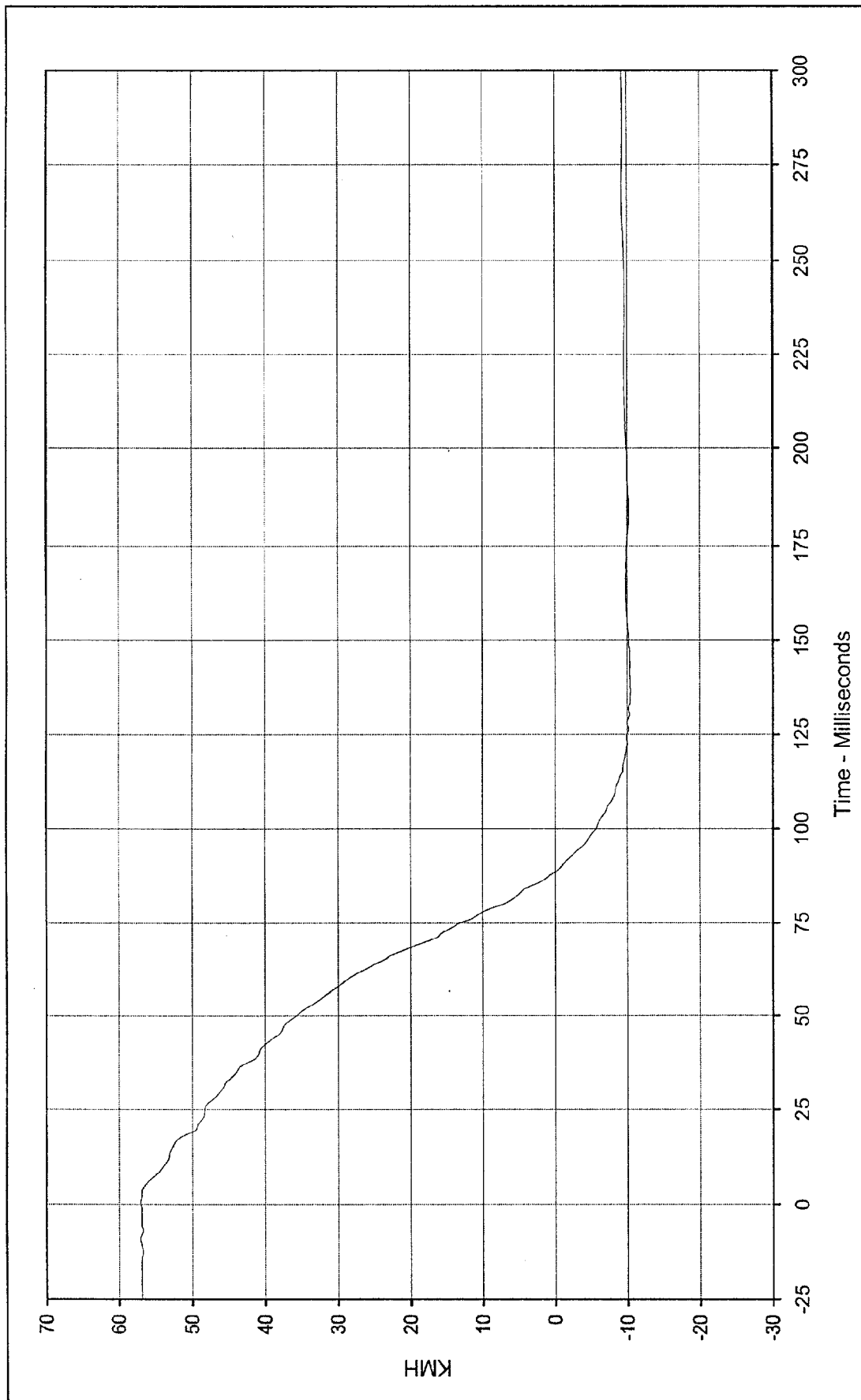
Date of Test: 1/23/98

Curve Number: FIL-089

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Vehicle Left Rear Primary Velocity

Maximum Value: 57.0 at 0.5 Milliseconds

Minimum Value: -10.4 at 136.4 Milliseconds

SAE Filter Class: 180

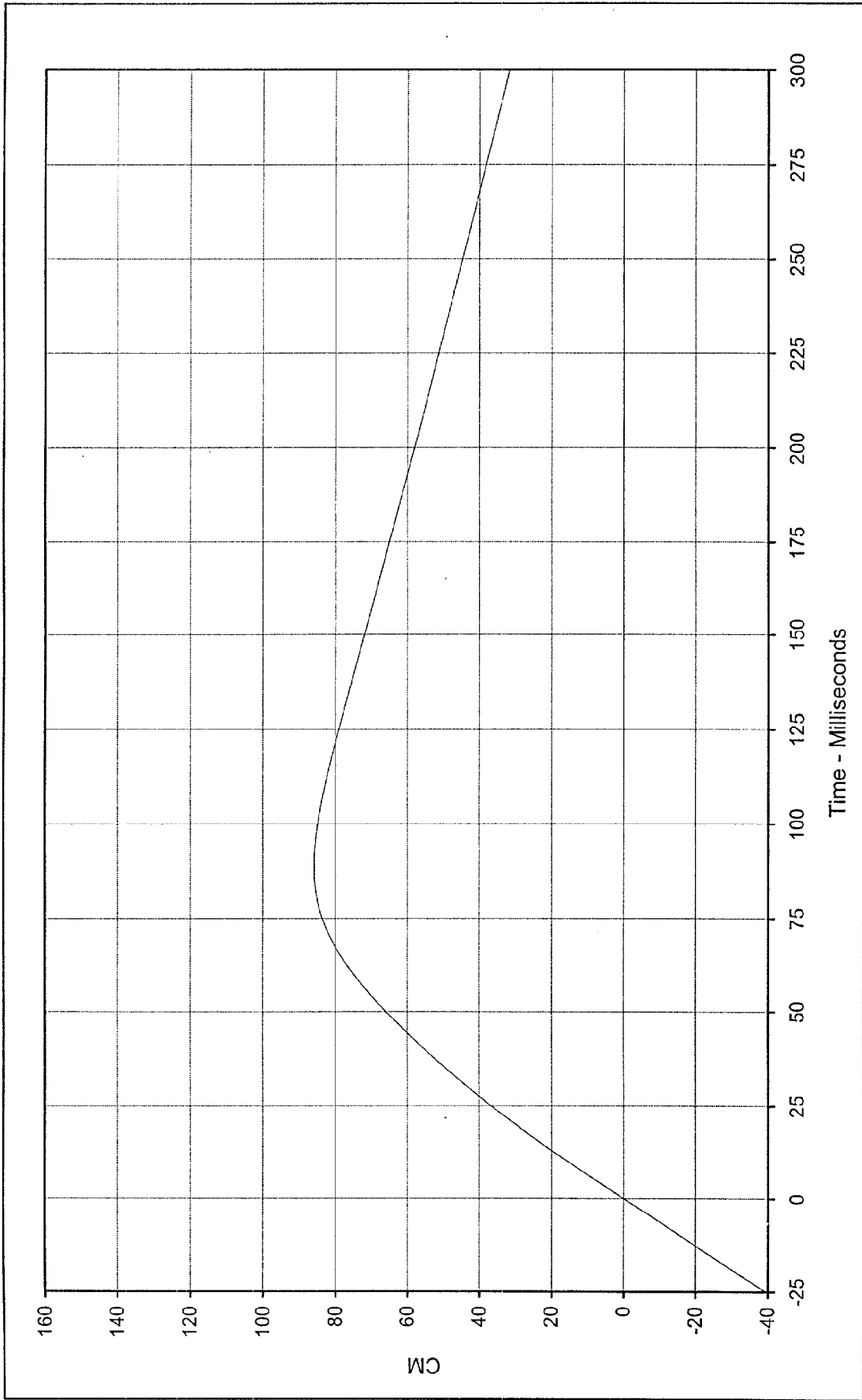
Date of Test: 1/23/98

Curve Number: IN1-089

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

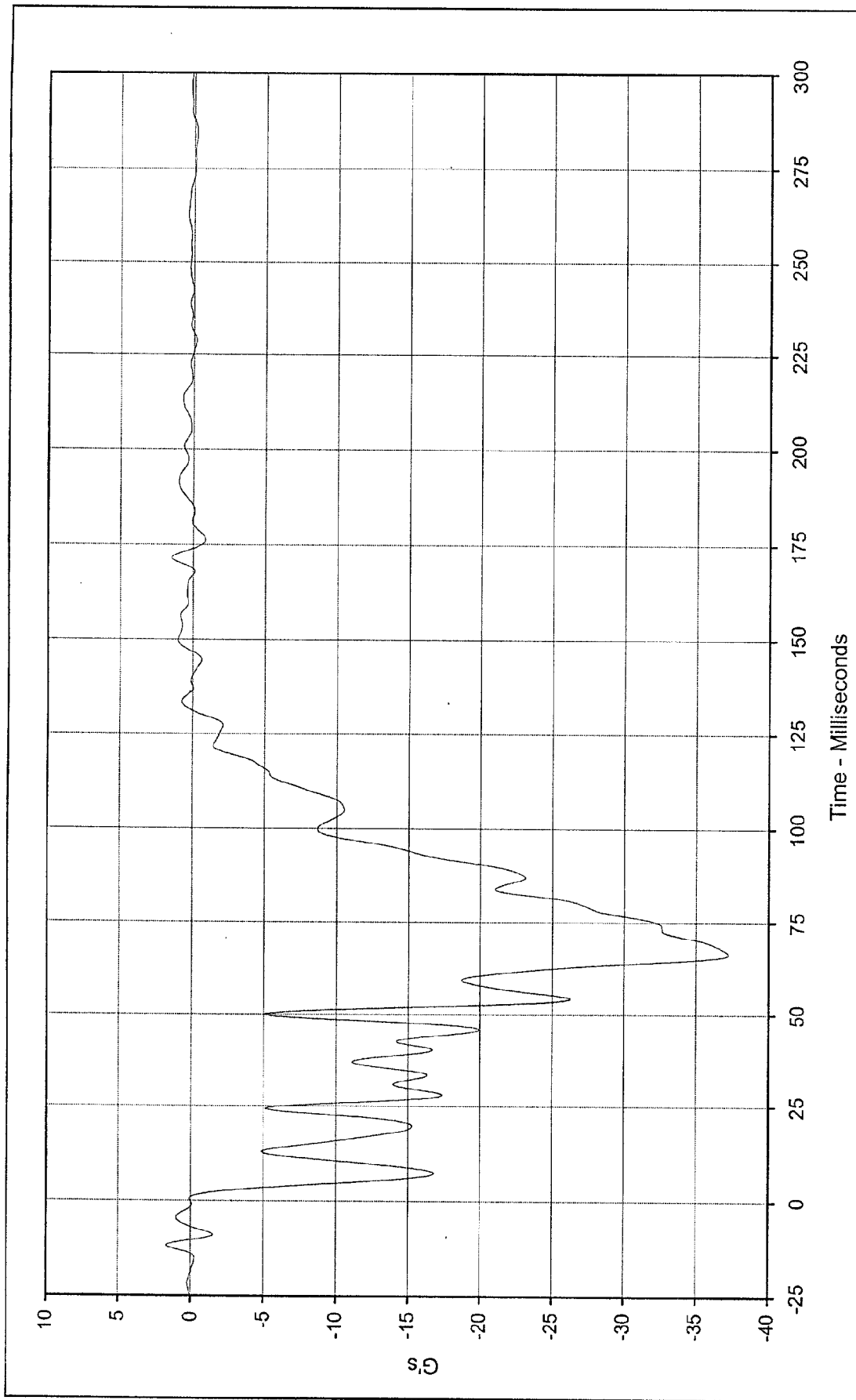




Curve Description: Vehicle Left Rear Primary Displ. .
 Maximum Value: 85.9 at 88.5 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-089

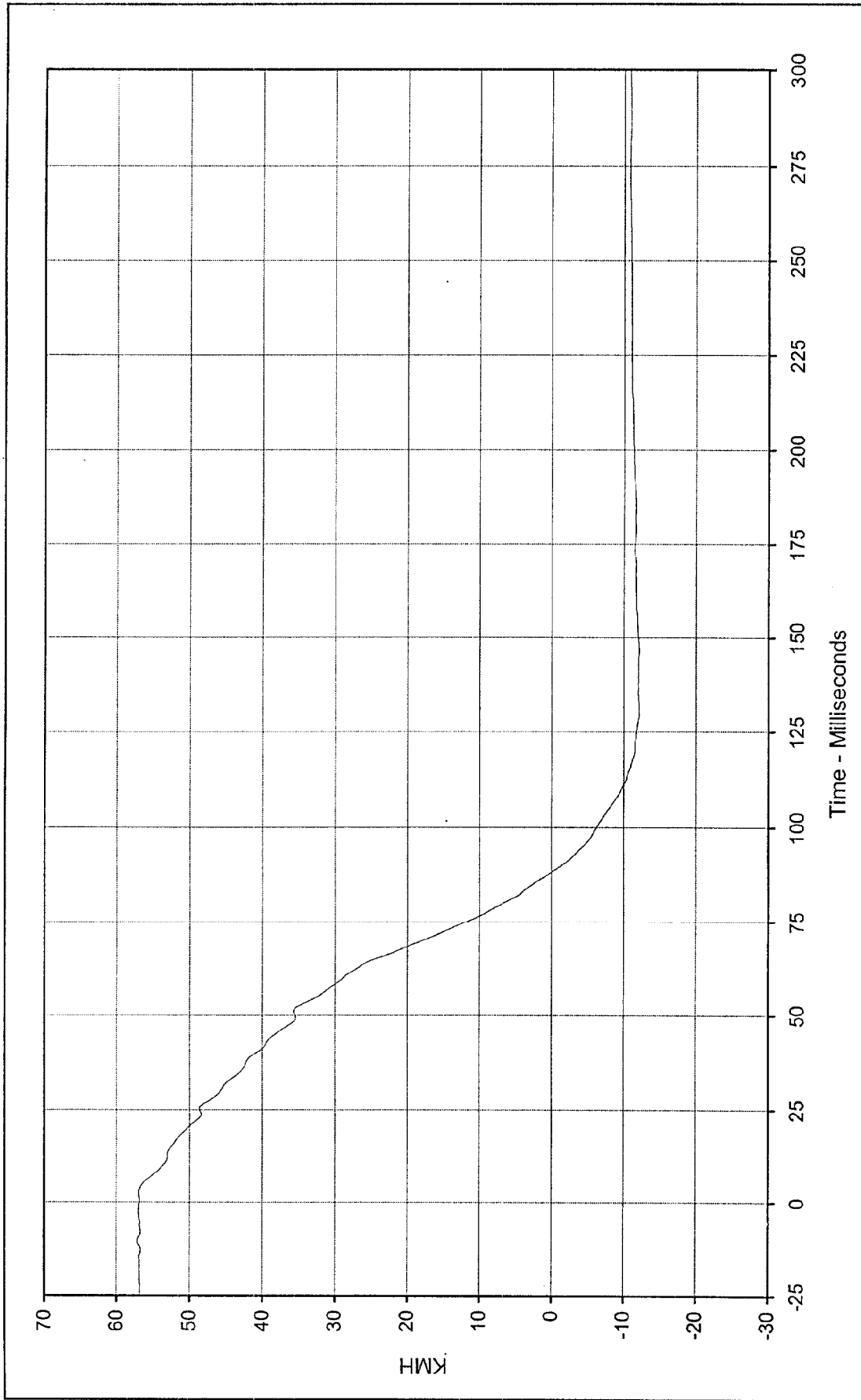
Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description:	Vehicle Right Rear Primary	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	1.5 at 171.4 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-37.2 at 66.3 Milliseconds			
SAE Filter Class:	60			
Date of Test:	1/23/98			
Curve Number:	FIL-090			





Curve Description: Vehicle Right Rear Primary Velocity

Maximum Value: 56.9 at 2.6 Milliseconds

Minimum Value: -12.1 at 129.6 Milliseconds

SAE Filter Class: 180

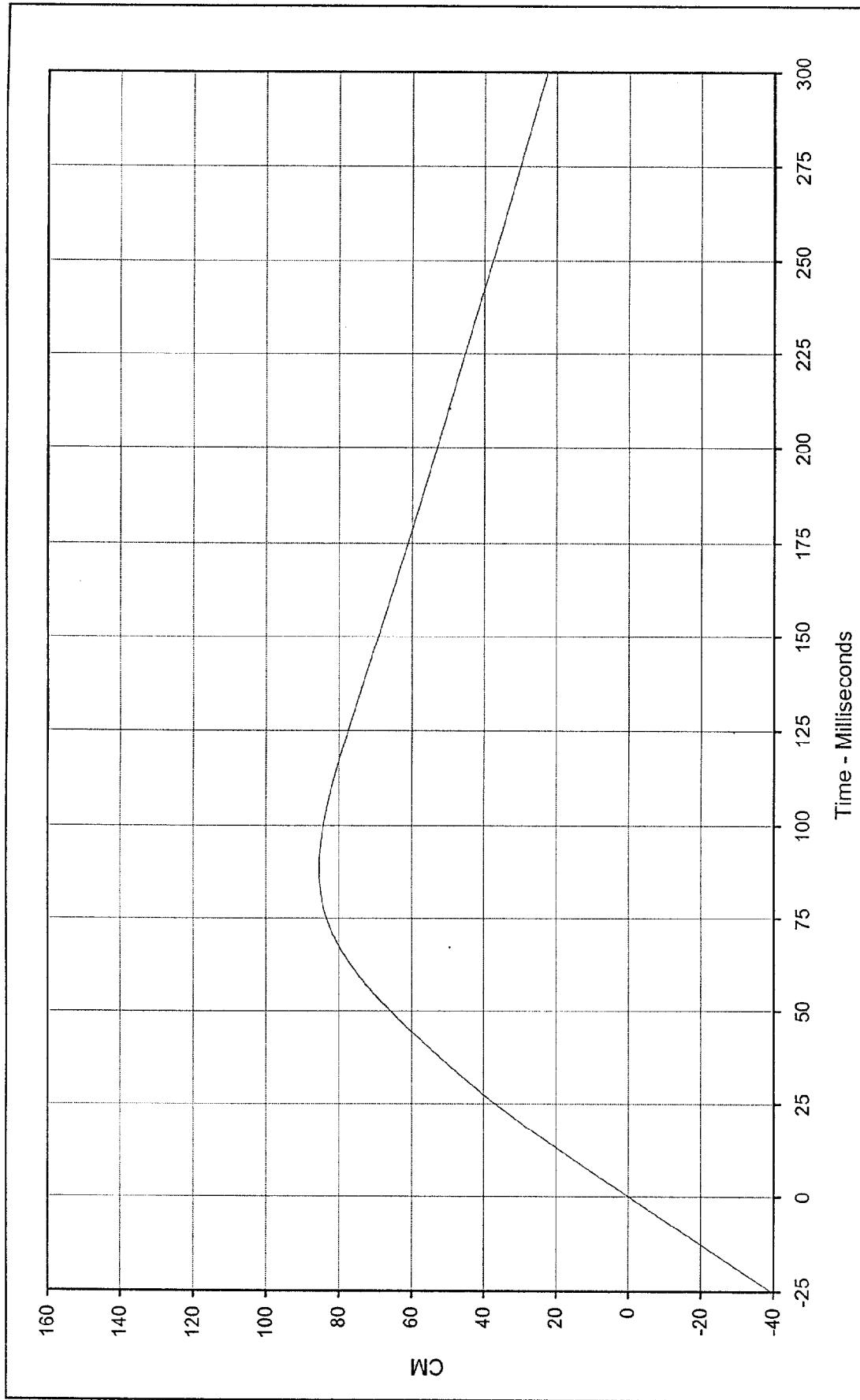
Date of Test: 1/23/98

Curve Number: IN1-090

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

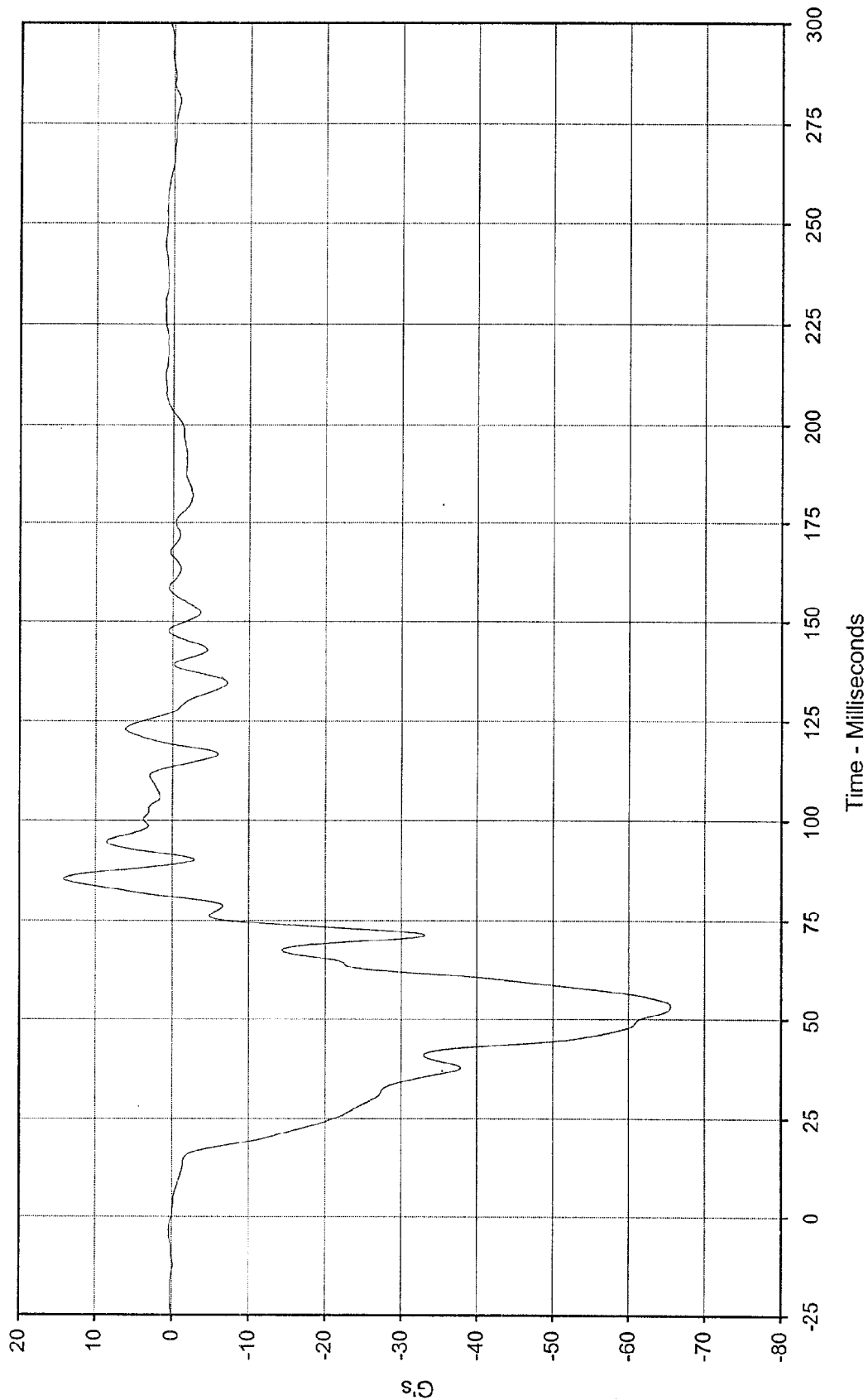




Curve Description: Vehicle Right Rear Primary Displ. Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 85.5 at 88.3 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: -0.1 at 0.0 Milliseconds



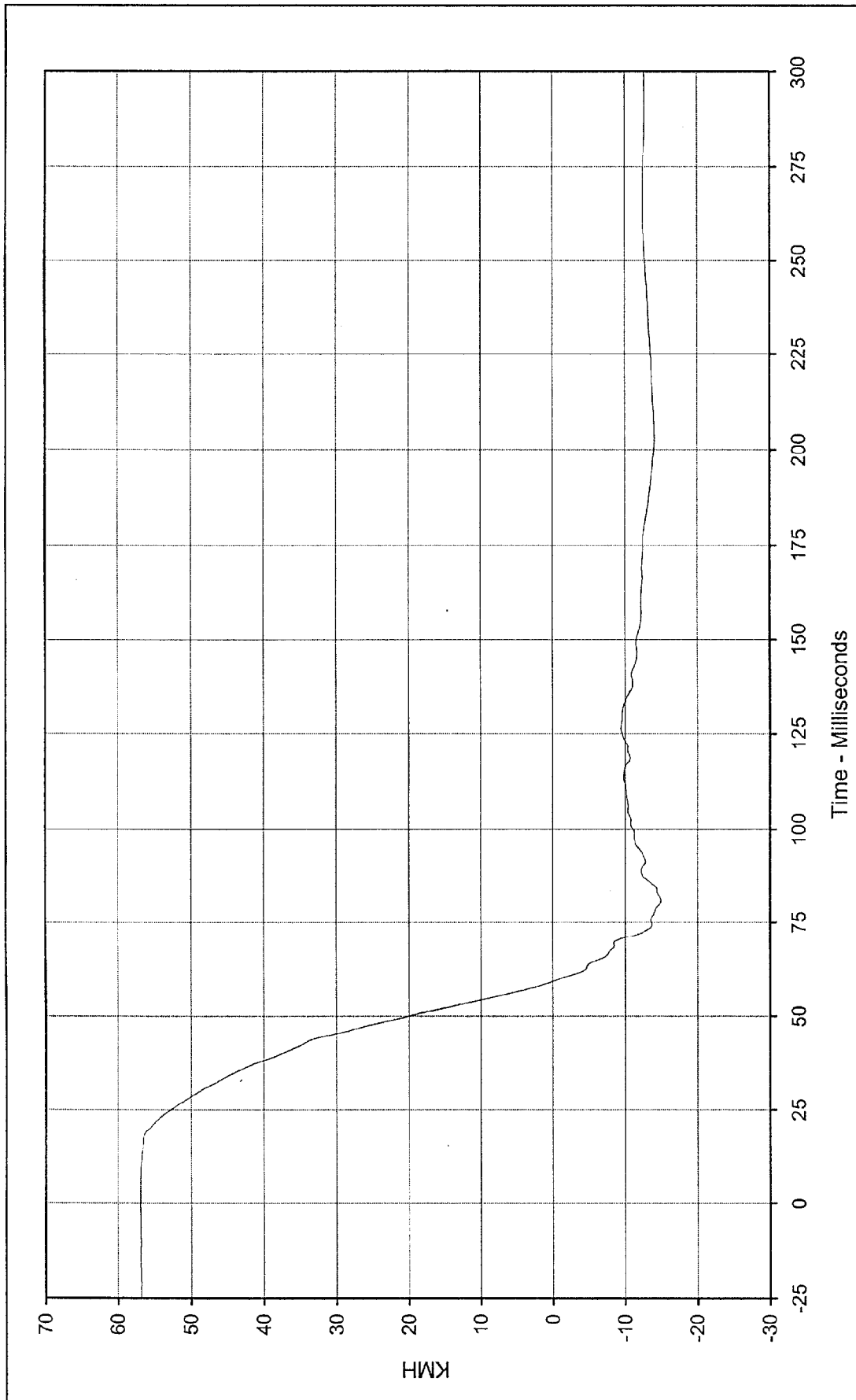
SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-090



Curve Description:	Vehicle Engine Top			Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	14.2	at	85.6	Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe
Minimum Value:	-65.6	at	53.5	Milliseconds		
SAE Filter Class:	60					
Date of Test:	1/23/98					
Curve Number:	FIL-091					



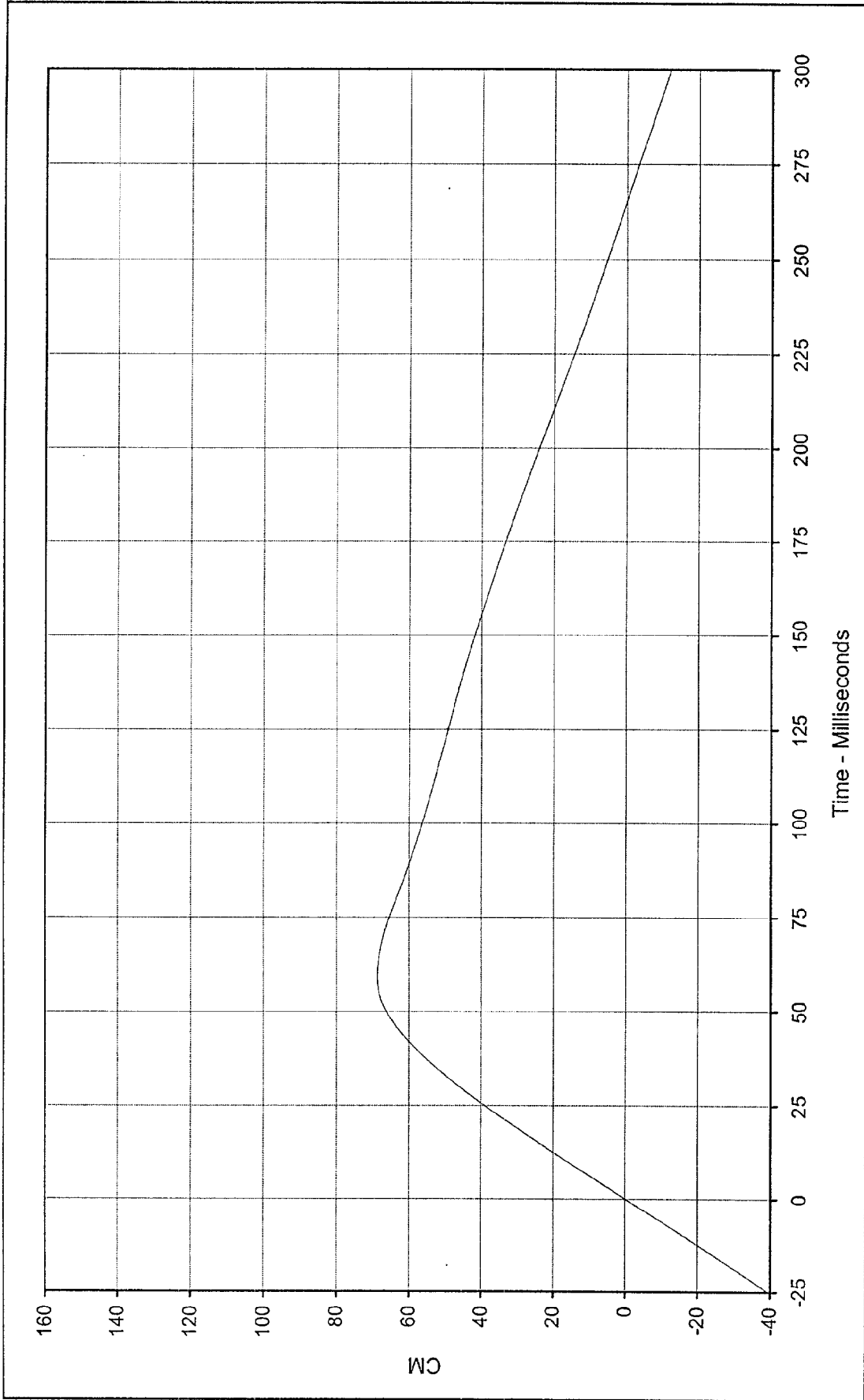




Curve Description: 1998 NHTSA 35 mph NCAP No.: MW0119
 Testing Program
 Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

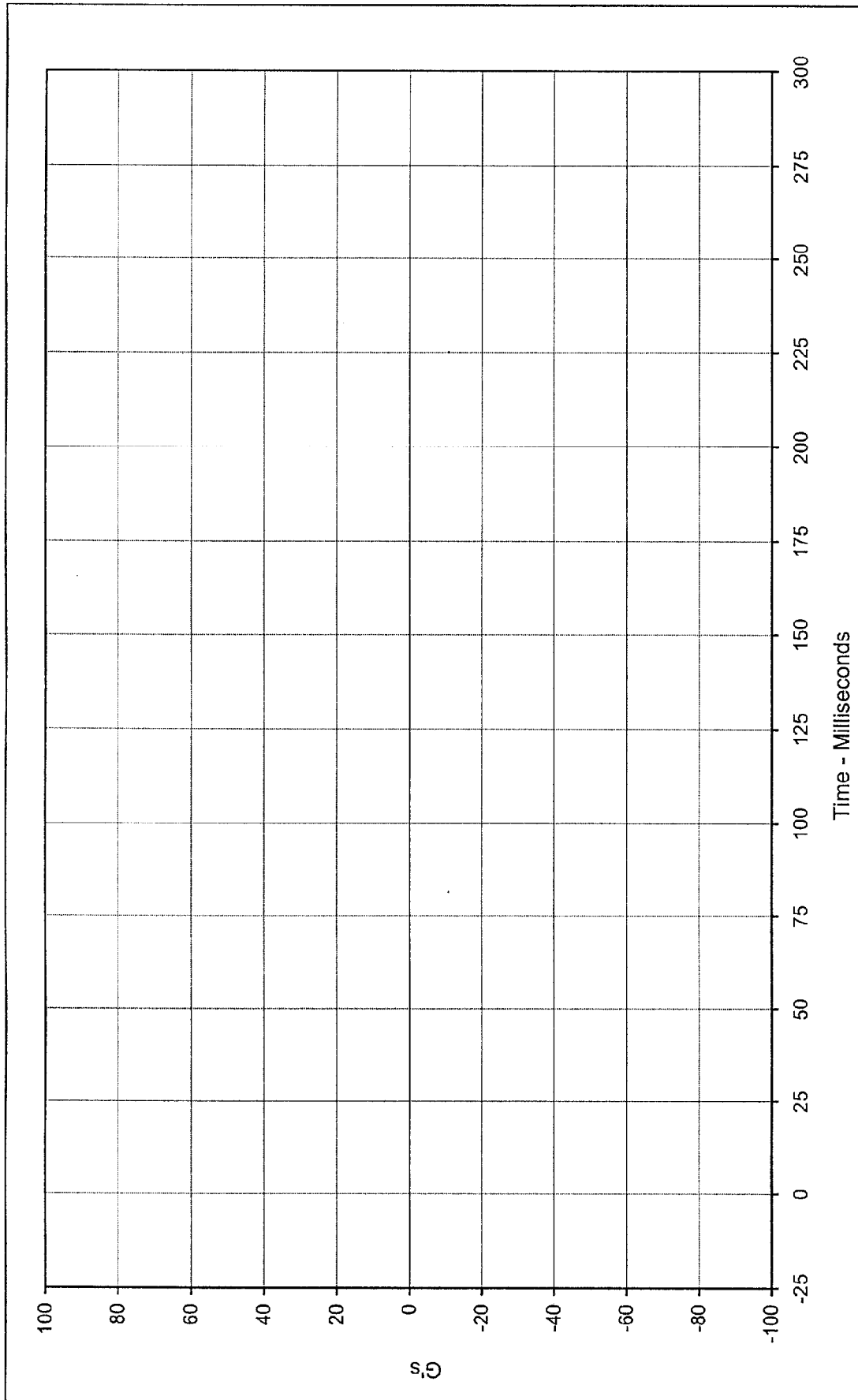
Vehicle Engine Top Velocity
 Maximum Value: 57.0 at 0.0 Milliseconds
 Minimum Value: -15.0 at 80.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-091





Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 68.7 at 59.4 Milliseconds
 Minimum Value: -12.0 at 299.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-091



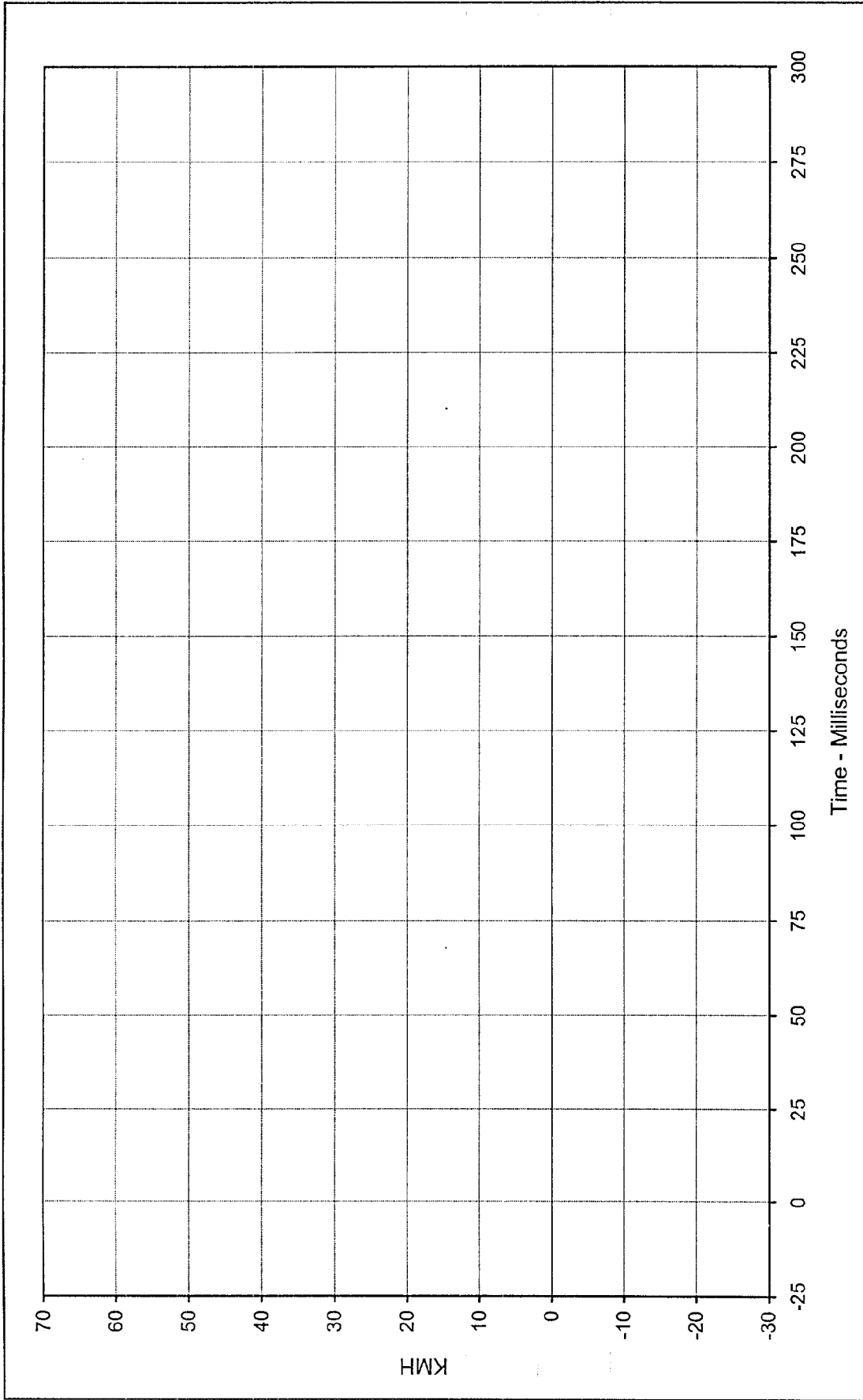


Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: 0.0 at 0.0 Milliseconds



SAE Filter Class: 60
 Date of Test: 1/23/98
 Curve Number: FIL-092

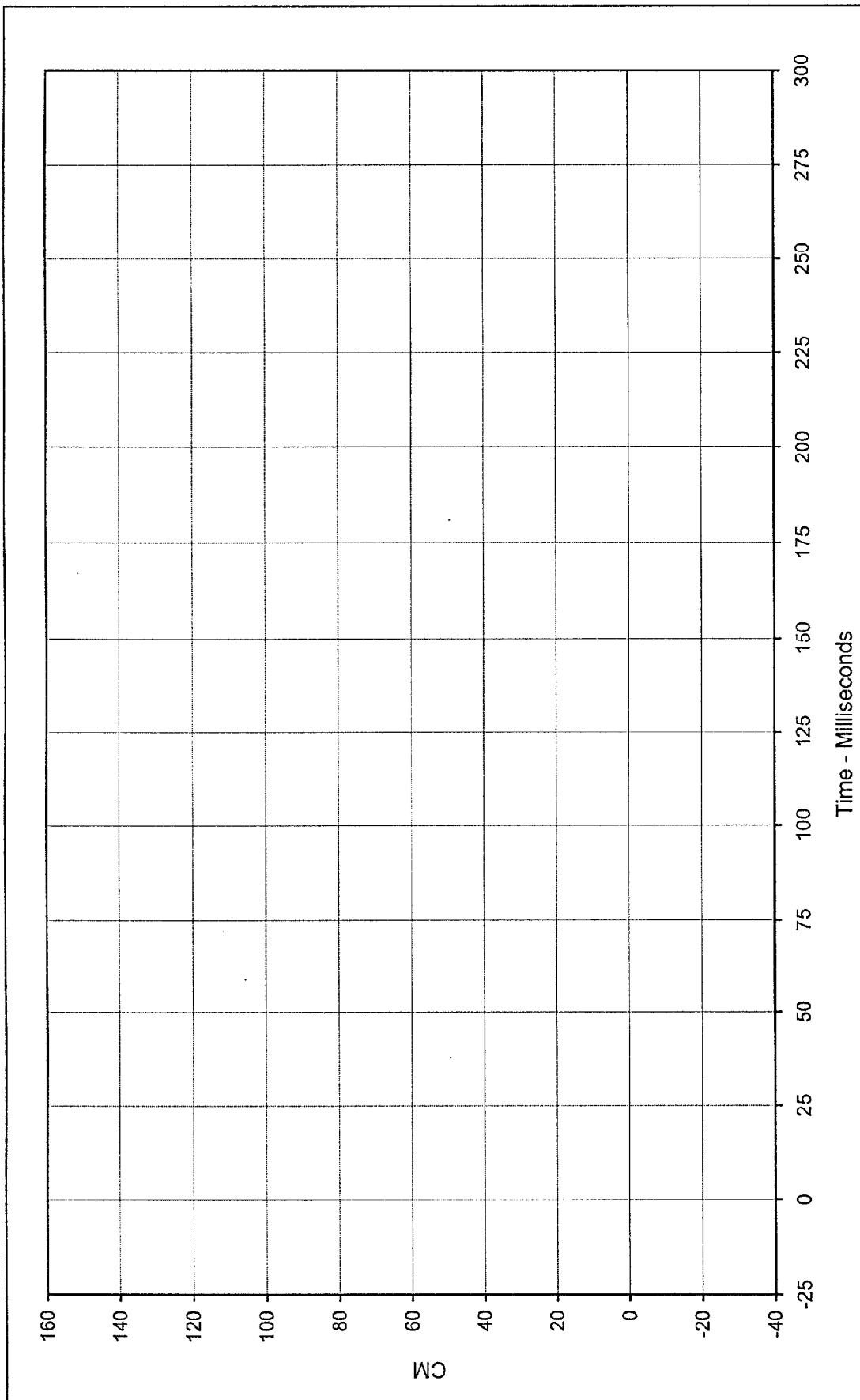
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Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 0.0 at 0.0 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-092



* Channel Failed, No Data

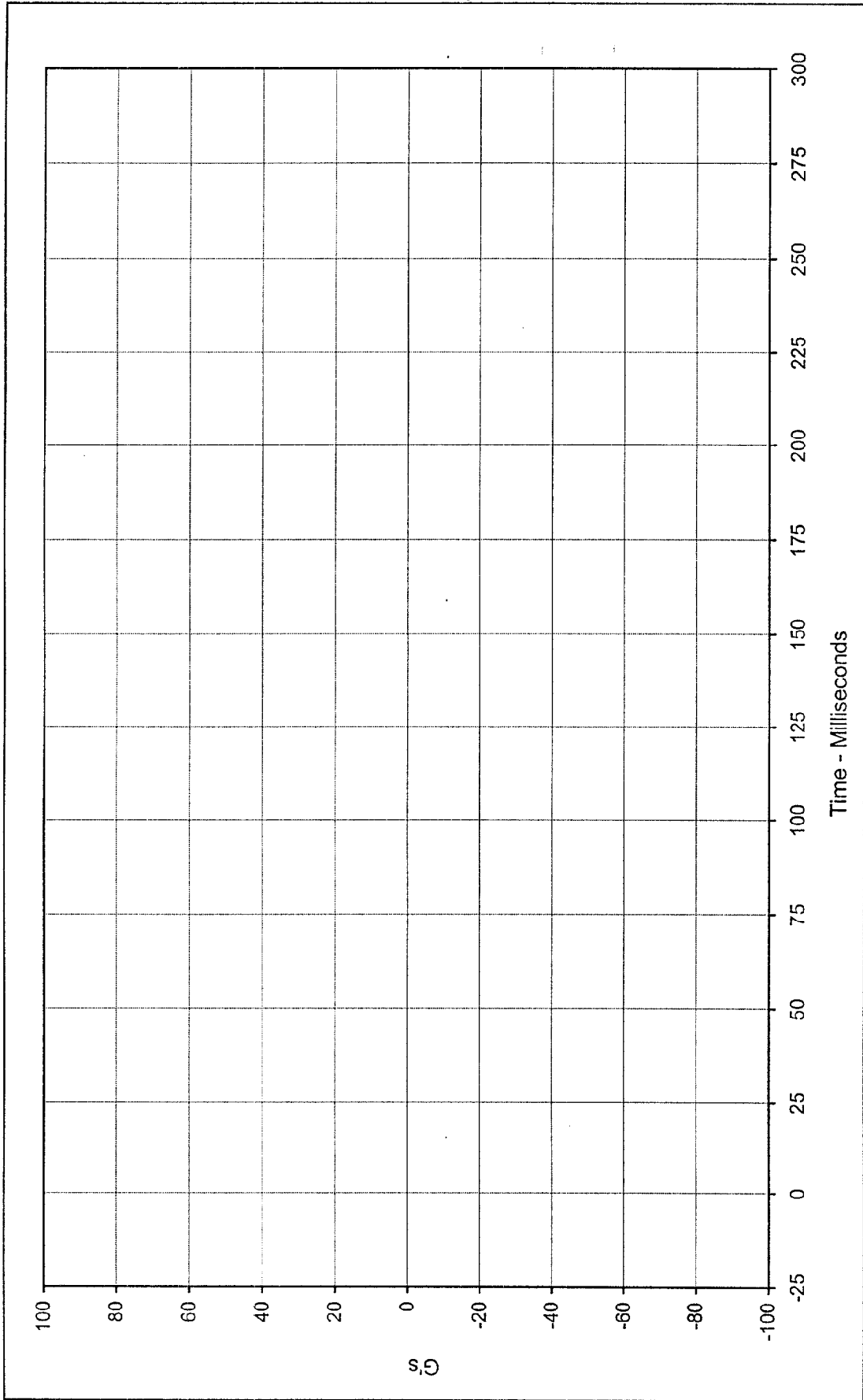


Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: 0.0 at 0.0 Milliseconds



SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-092

* Channel Failed, No Data

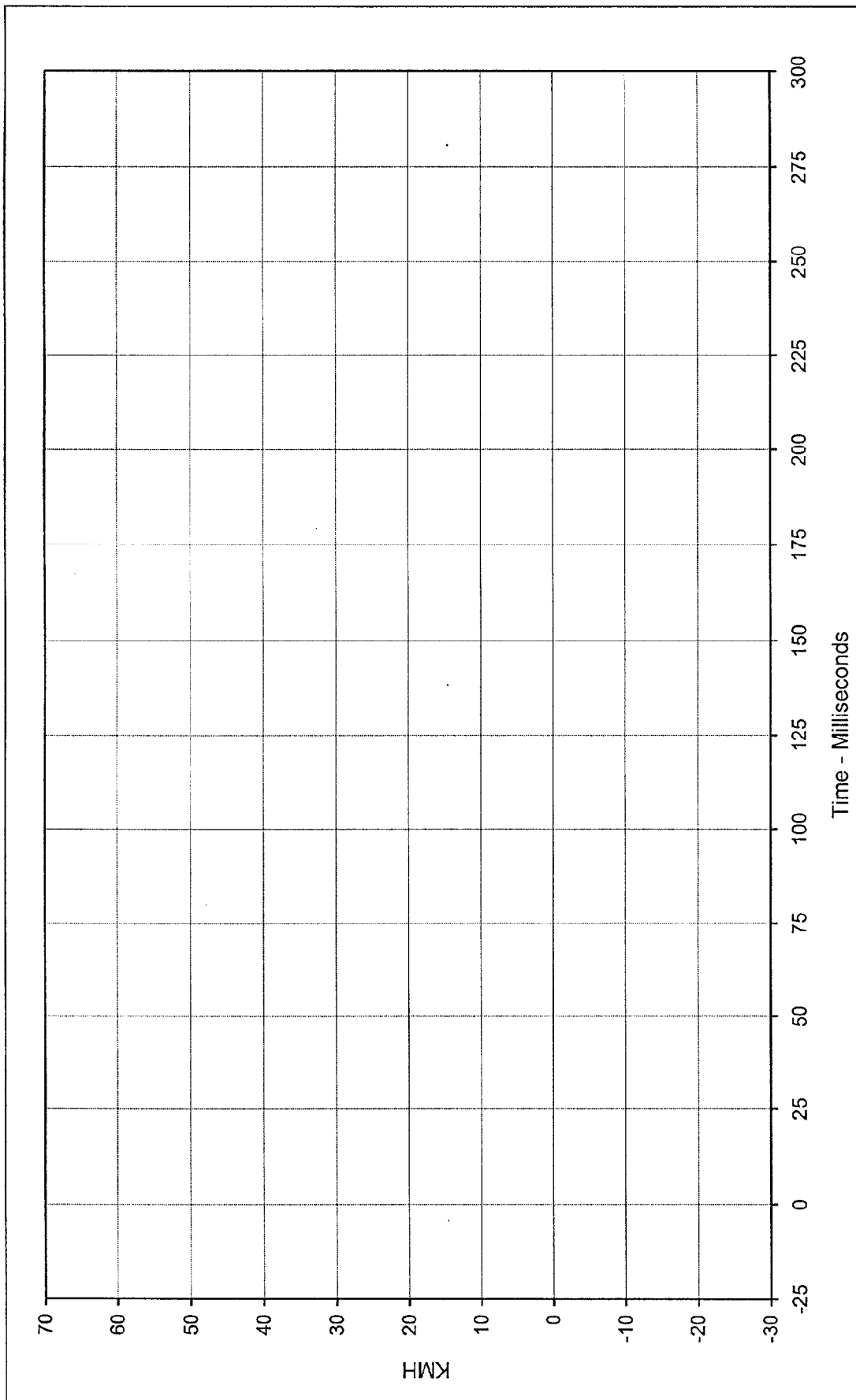


Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 60

Date of Test: 1/23/98
 Curve Number: FIL-093



* Channel Failed, No Data

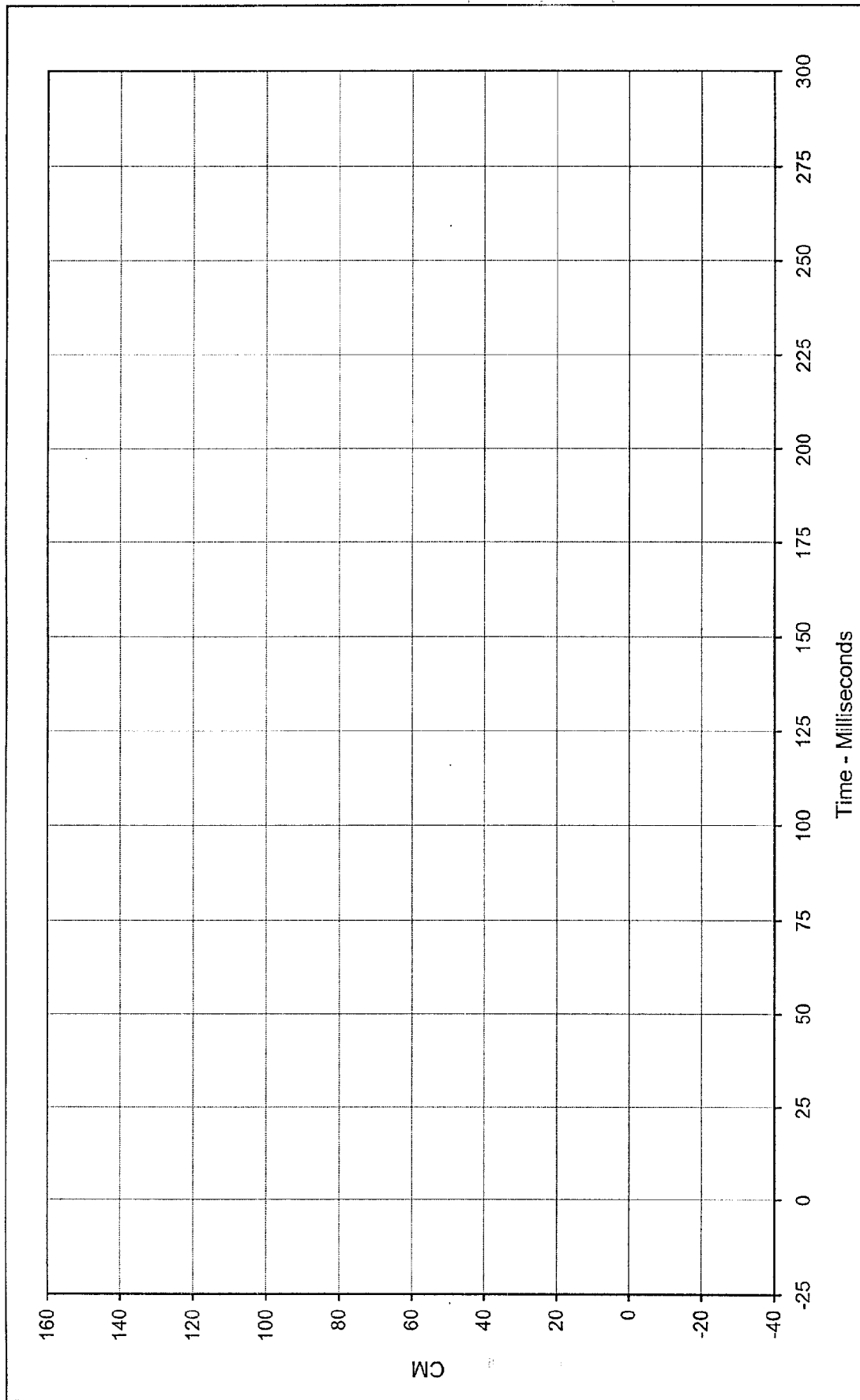


Curve Description: Vehicle Left Brake Caliper Velocity * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
Minimum Value: 0.0 at 0.0 Milliseconds



SAE Filter Class: 180
Date of Test: 1/23/98
Curve Number: IN1-093

* Channel Failed, No Data

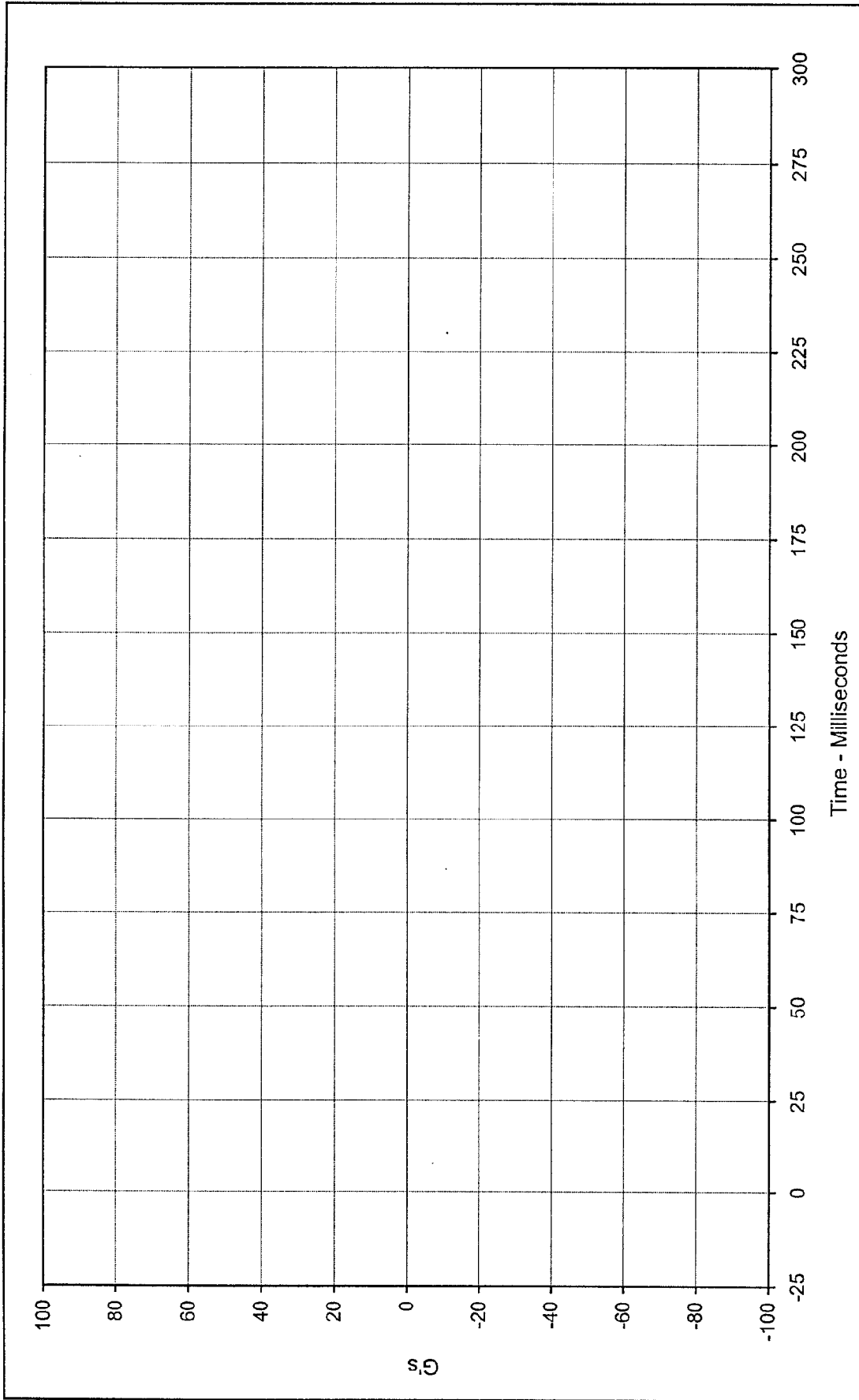


Curve Description: Vehicle Left Brake Caliper Displ. * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
Minimum Value: 0.0 at 0.0 Milliseconds



SAE Filter Class: 180
Date of Test: 1/23/98
Curve Number: IN2-093

* Channel Failed, No Data



Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Minimum Value: 0.0 at 0.0 Milliseconds

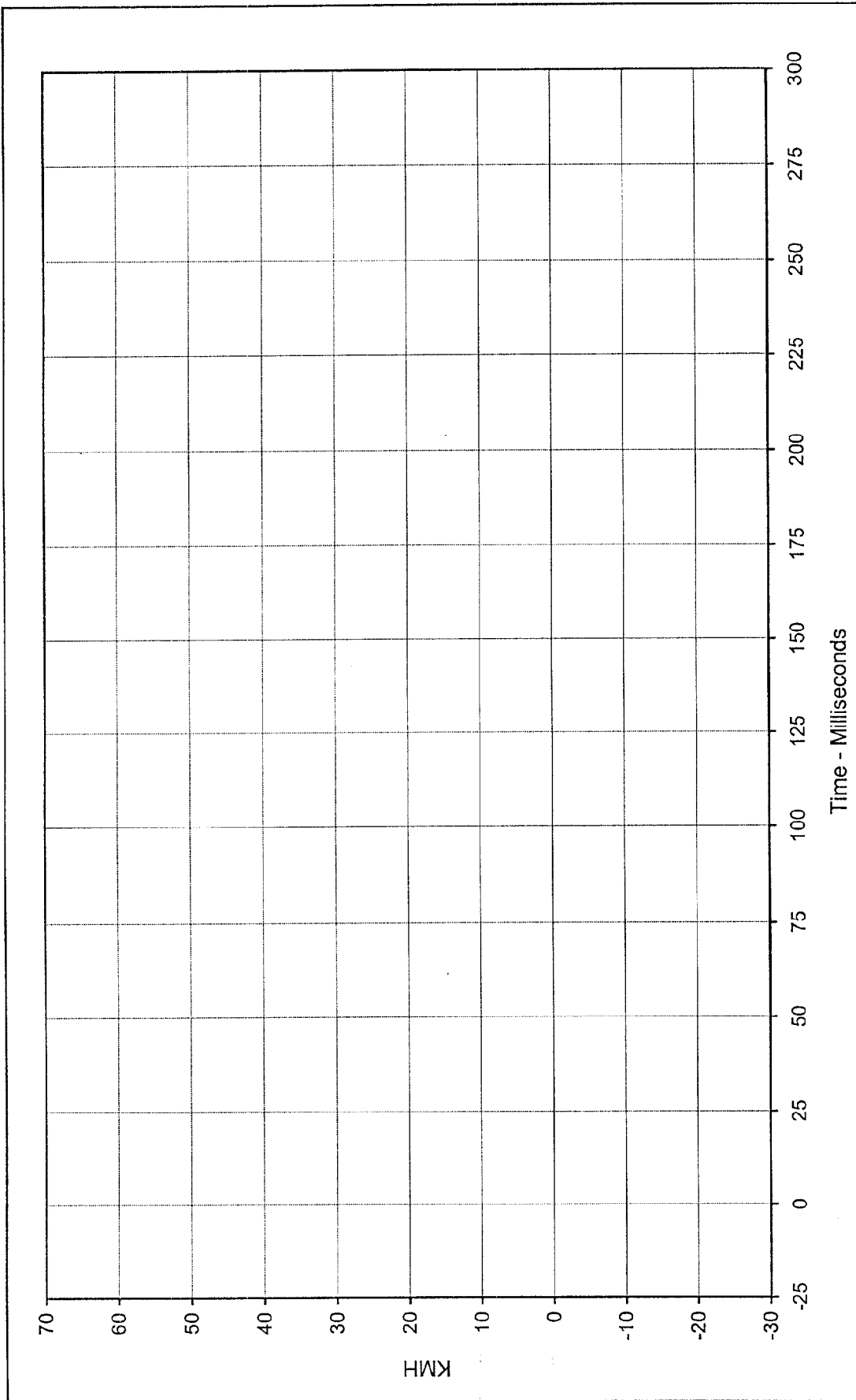
SAE Filter Class: 60

Date of Test: 1/23/98

Curve Number: FIL-094

* Channel Failed, No Data



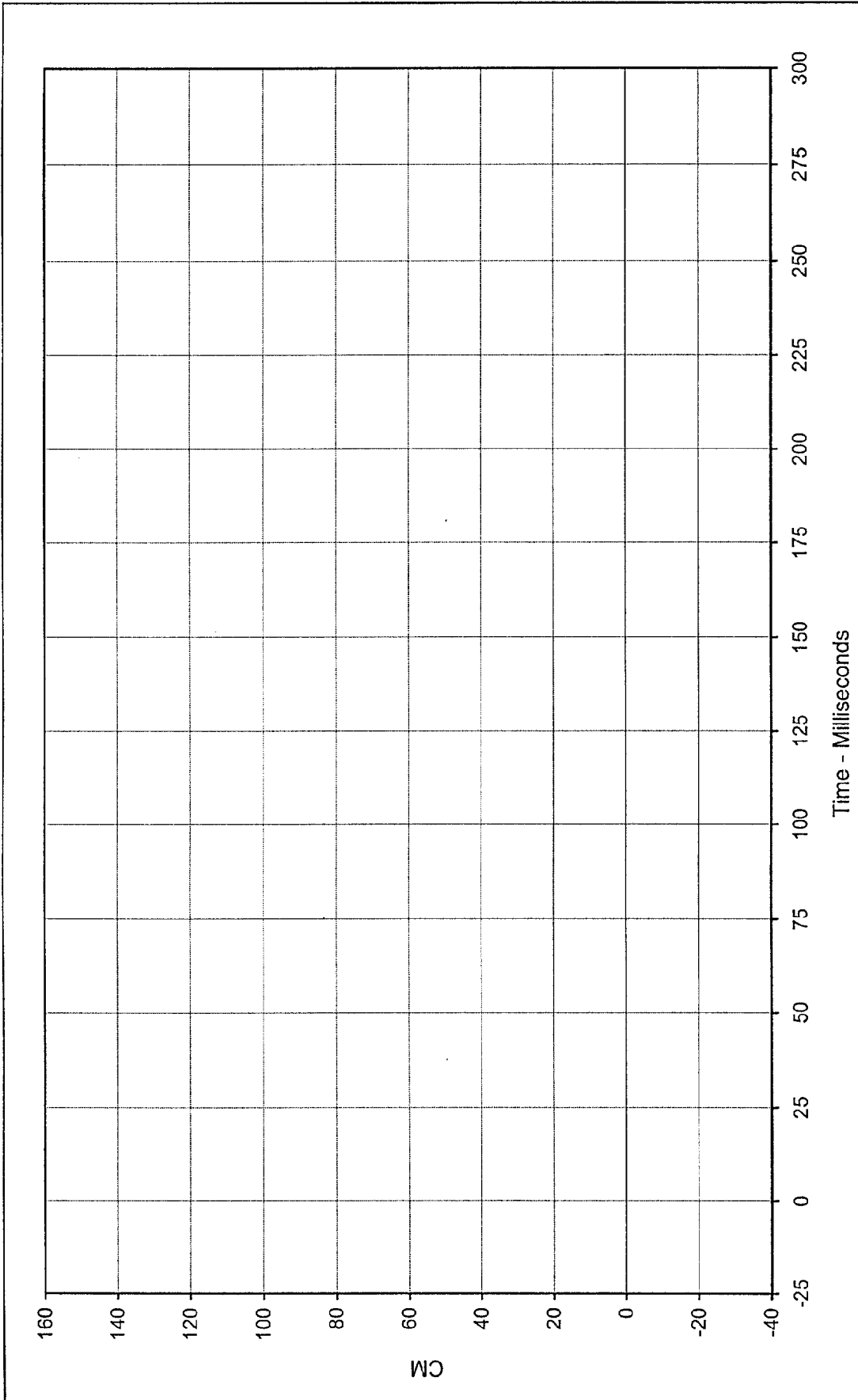


Curve Description: Vehicle Right Brake Caliper Velocity * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN1-094



* Channel Failed, No Data



Curve Description: Vehicle Right Brake Caliper Displ. * Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe

Minimum Value: 0.0 at 0.0 Milliseconds

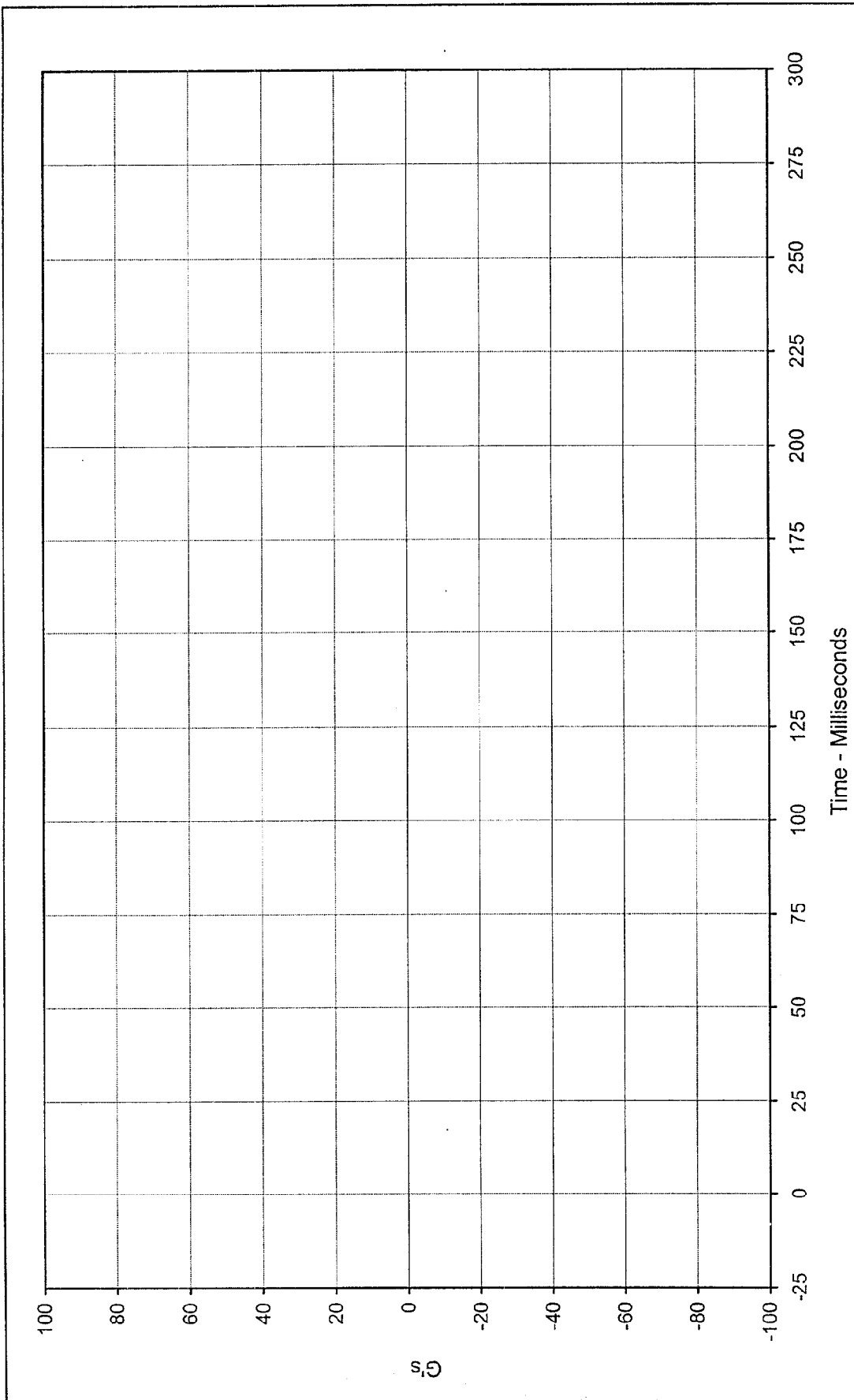
SAE Filter Class: 180

Date of Test: 1/23/98

Curve Number: IN2-094



* Channel Failed, No Data

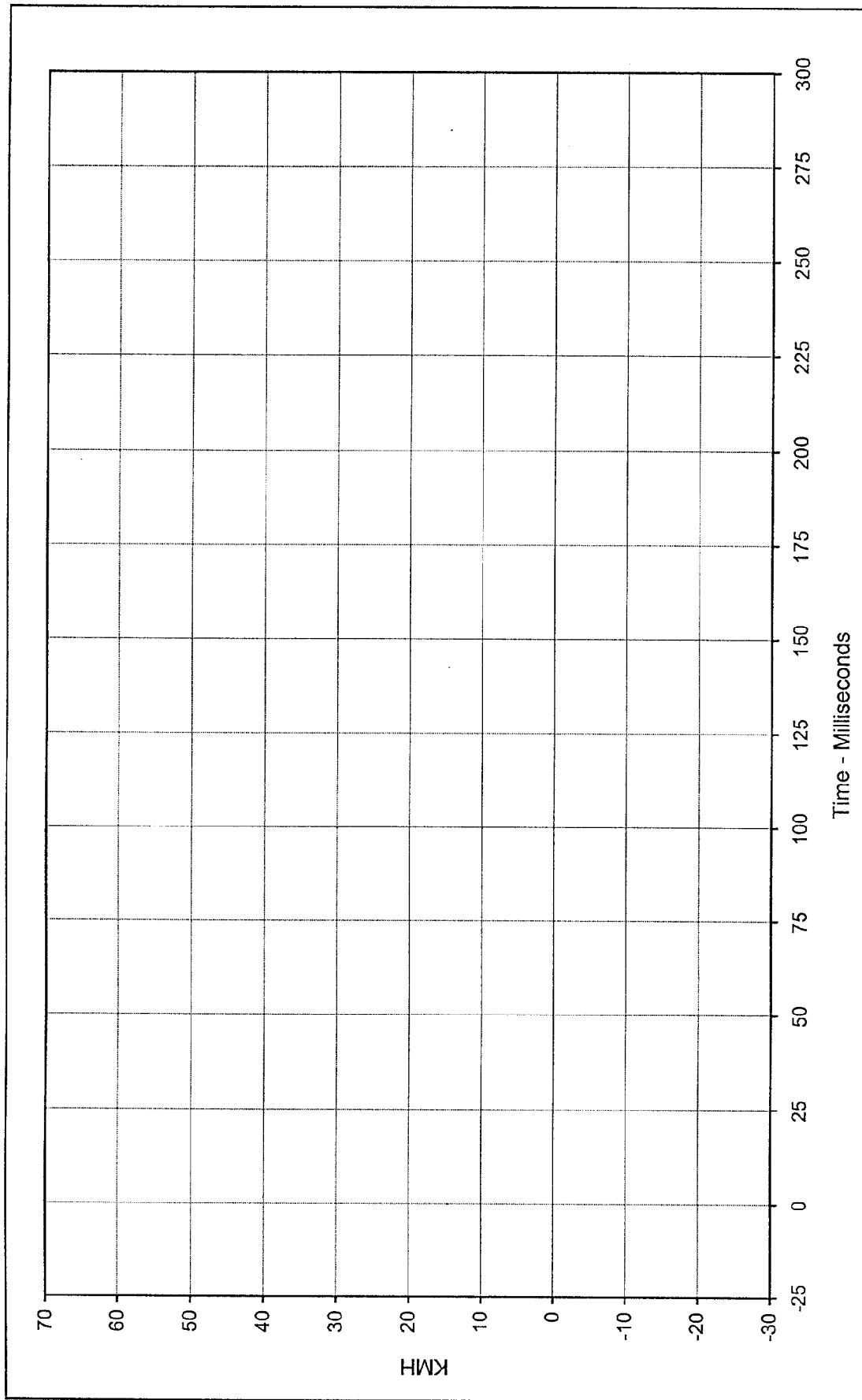


Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 0.0 at 0.0 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: 0.0 at 0.0 Milliseconds



SAE Filter Class: 60
 Date of Test: 1/23/98
 Curve Number: FIL-095

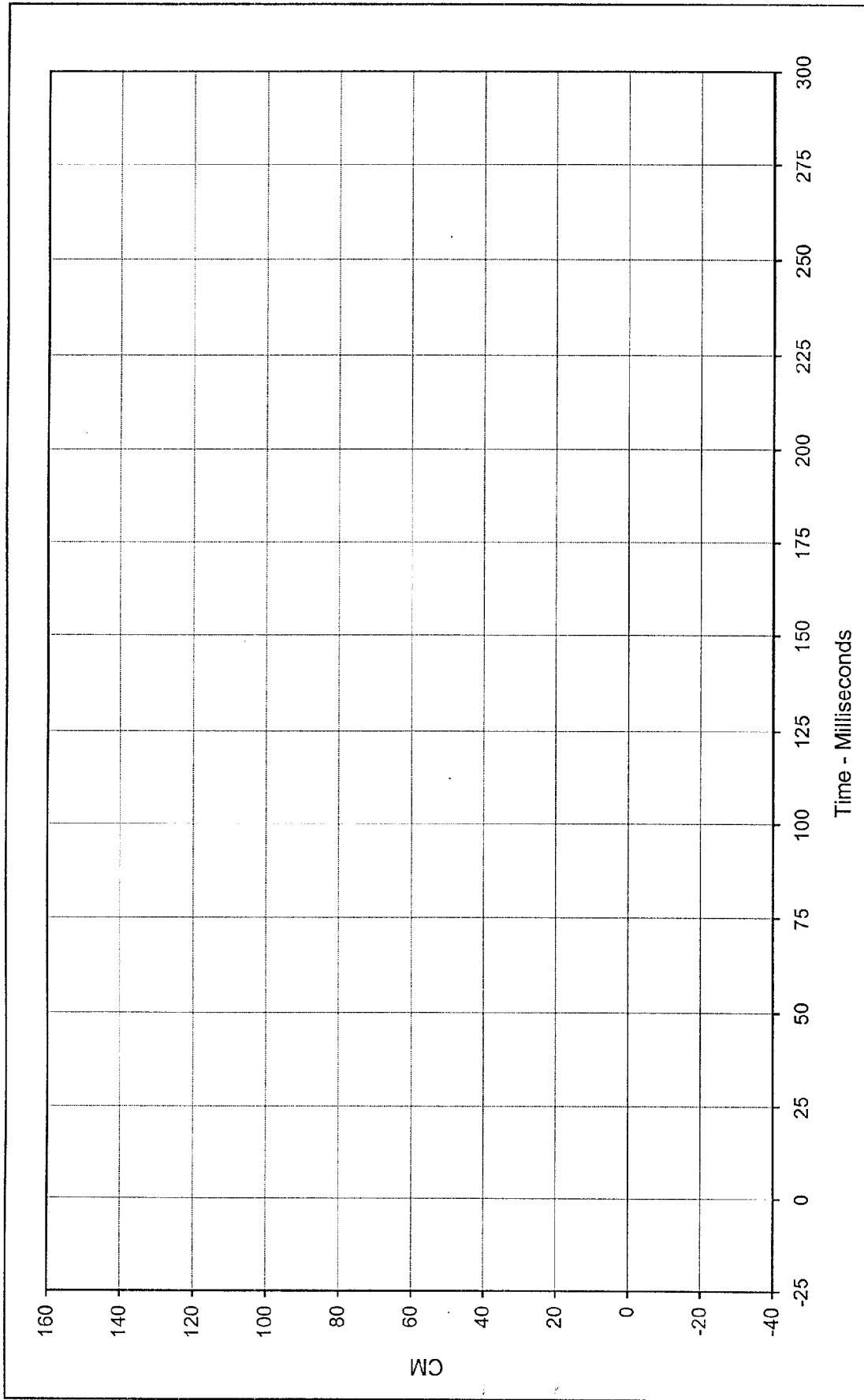
* Channel Failed, No Data



Curve Description:		Vehicle Instrument Panel Velocity *		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	0.0	at	0.0	Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe
Minimum Value:	0.0	at	0.0	Milliseconds		
SAE Filter Class:	180					
Date of Test:	1/23/98					
Curve Number:	IN1-095					



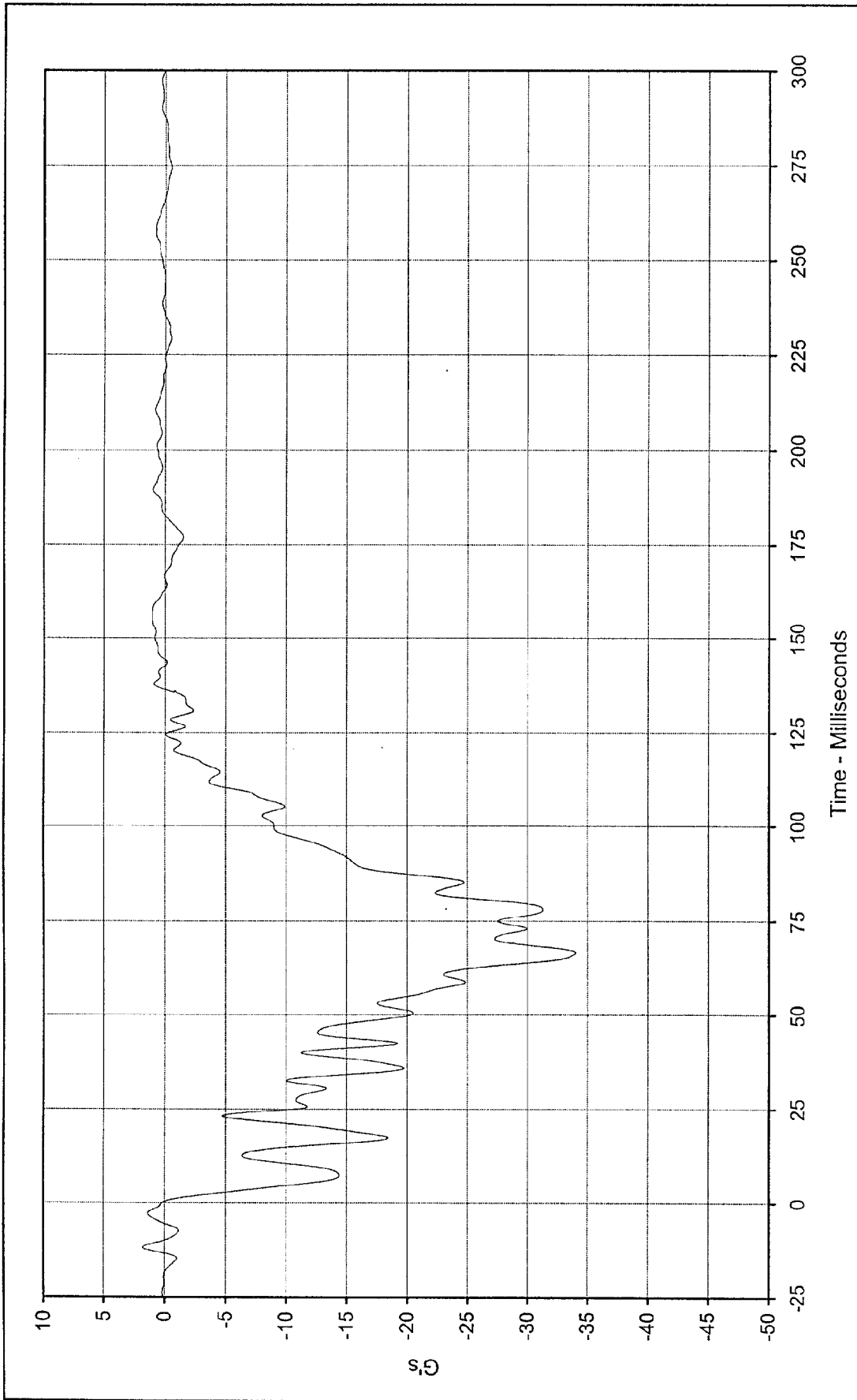
* Channel Failed, No Data



Curve Description:	Vehicle Instrument Panel Displ.	*	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	0.0	at 0.0	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	0.0	at 0.0			
SAE Filter Class:	180				
Date of Test:	1/23/98				
Curve Number:	IN2-095				

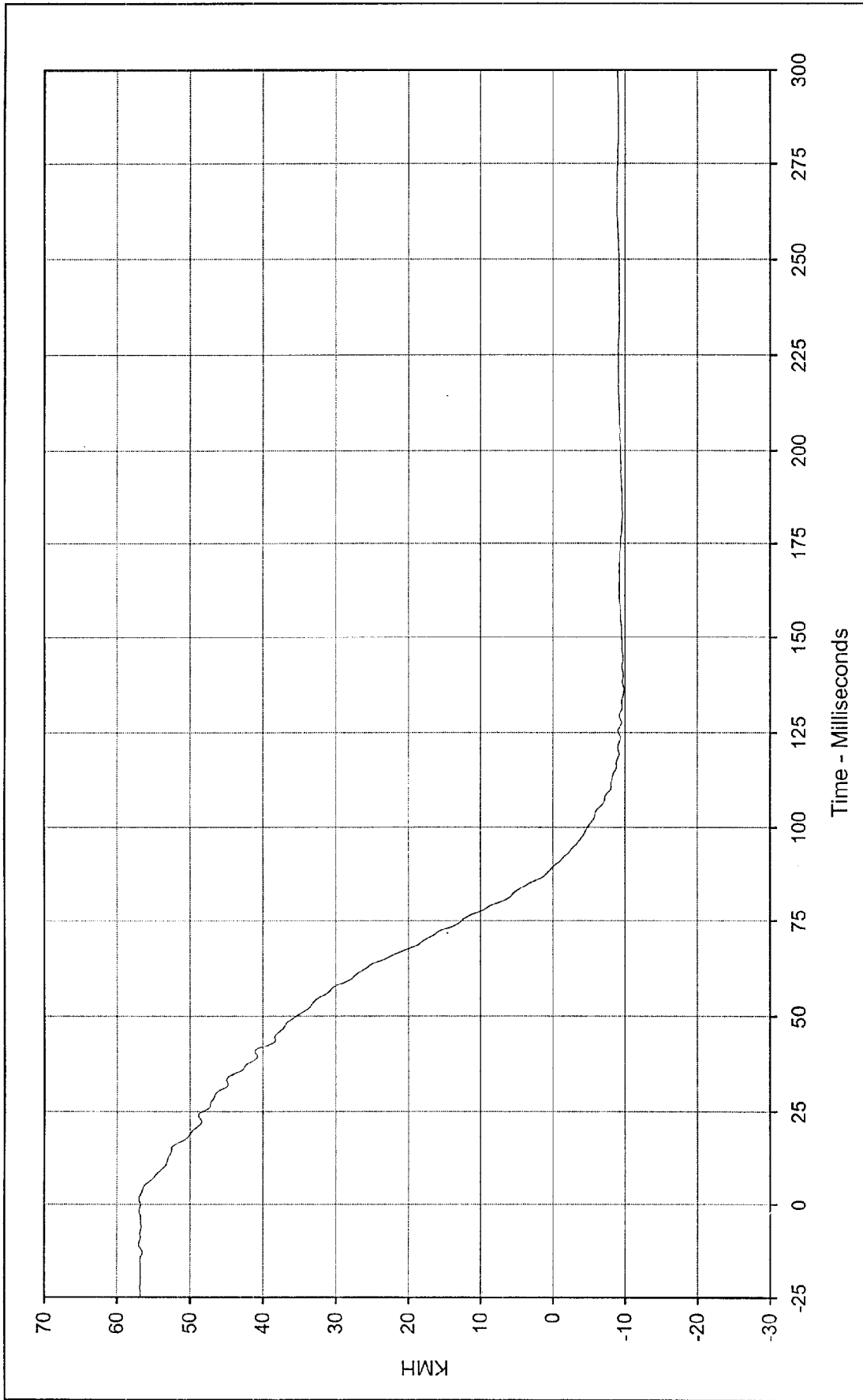


* Channel Failed, No Data



Curve Description:	Vehicle Left Rear Redundant	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW0119
Maximum Value:	1.1 at 156.1 Milliseconds	Test Vehicle:	1998 Chevrolet Camaro 2 Door Coupe	
Minimum Value:	-34.0 at 66.5 Milliseconds			
SAE Filter Class:	60			
Date of Test:	1/23/98			
Curve Number:	FIL-096			





Curve Description: Vehicle Left Rear Redundant Velocity

Maximum Value: 57.0 at 1.5 Milliseconds

Minimum Value: -9.9 at 136.6 Milliseconds

SAE Filter Class: 180

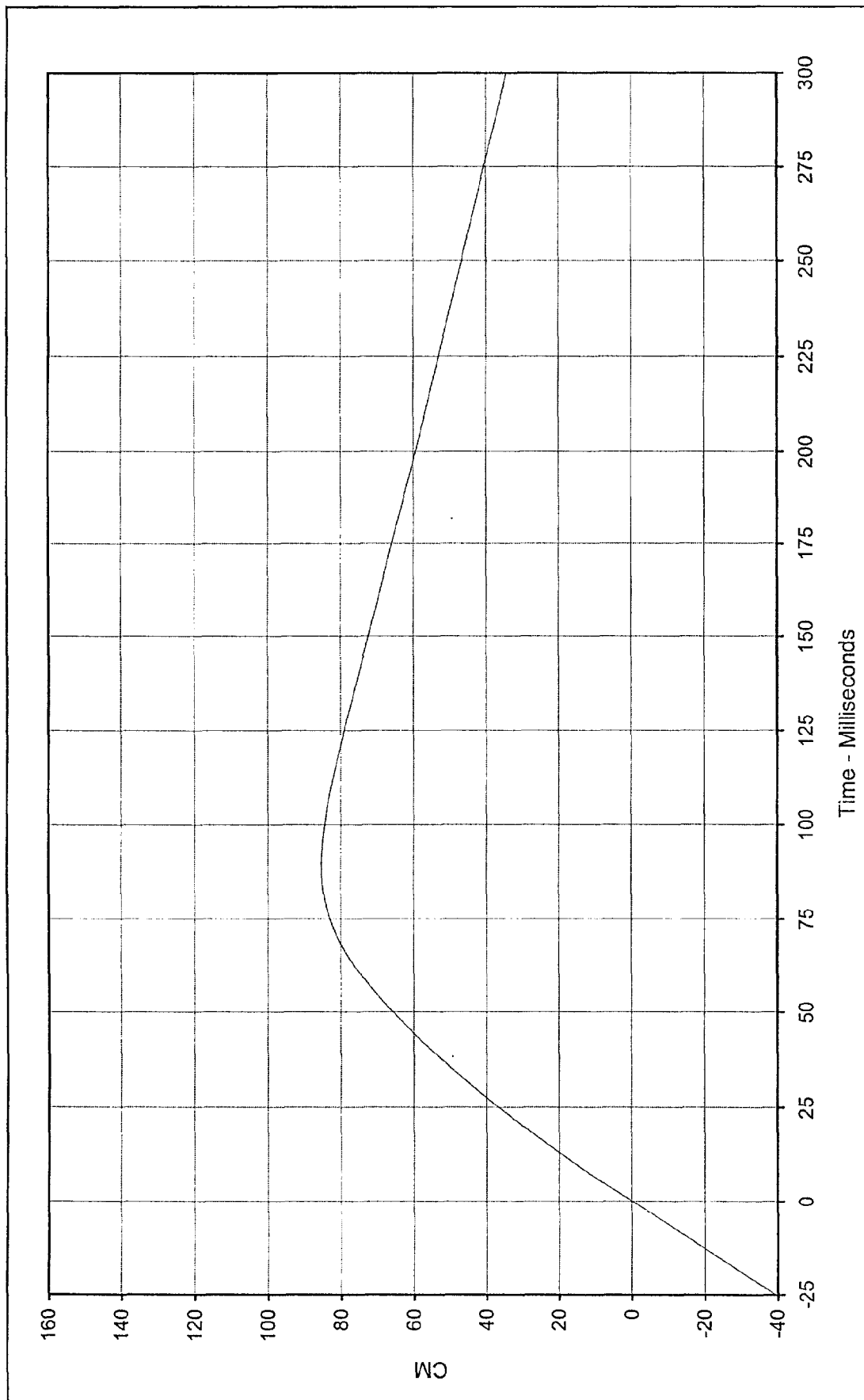
Date of Test: 1/23/98

Curve Number: IN1-096

Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119

Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe





Curve Description: Vehicle Left Rear Redundant Displ. Testing Program 1998 NHTSA 35 mph NCAP No.: MW0119
 Maximum Value: 85.3 at 89.4 Milliseconds Test Vehicle: 1998 Chevrolet Camaro 2 Door Coupe
 Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180
 Date of Test: 1/23/98
 Curve Number: IN2-096



APPENDIX C
LOAD CELL BARRIER INFORMATION (NOT APPLICABLE FOR THIS TEST)

APPENDIX D
INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

**Ncap Test With Hybrid III Male 50th Percentile ATD
Instrumentation Data Channel Assignments**

Driver A.T.D Serial Number 34

Test Date: 1/23/98

Vehicle: 1998 Chevrolet Camaro

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC039	Accel., 1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	KEAC038	Accel., 1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	KEAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	KEAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	KEAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	KEAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
8	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
9	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	N.m
11	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	N.m
12	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	N.m
13	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST , REDUNDANT	X	KEAC023	Accel., 1/2 bridge	Endevco	7264-200	G
17	CHEST , REDUNDANT	Y	KEAC022	Accel., 1/2 bridge	Endevco	7264-200	G
18	CHEST , REDUNDANT	Z	KEAC024	Accel., 1/2 bridge	Endevco	7264-200	G
19	CHEST DISPLACEMENT	X	GPRP002	Potentiometer, Rotary	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	GPAC009	Accel., 1/2 bridge	Endevco	7264-2000	G
21	PELVIS, PRIMARY	Y	GPAC017	Accel., 1/2 bridge	Endevco	7264-2000	G
22	PELVIS, PRIMARY	Z	GPAC018	Accel., 1/2 bridge	Endevco	7264-2000	G
23	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

Ncap Test With Hybrid III Male 50th Percentile ATD

Instrumentation Data Channel Assignments

Driver A.T.D Serial Number 34

Test Date: 1/23/98

Vehicle: 1998 Chevrolet Camaro

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPUT03MX	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
26	UP. TIBIA LEFT MOM.	Y	GPUT03MY	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
27	UP. TIBIA RIGHT MOM.	X	GPUT04MX	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
28	UP. TIBIA RIGHT MOM.	Y	GPUT04MY	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
29	LWR. TIBIA LEFT FORCE	Y	GPUT03FY	3 ch., lower tibia gage	R. A. Denton	1584	N
30	LWR. TIBIA LEFT FORCE	Z	GPUT03FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
31	LWR. TIBIA LEFT MOM.	X	GPUT03MX	3 ch., lower tibia gage	R. A. Denton	1584	N.m
32	LWR. TIBIA RIGHT FORCE	Y	GPUT04FY	3 ch., lower tibia gage	R. A. Denton	1584	N
33	LWR. TIBIA RIGHT FORCE	Z	GPUT04FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
34	LWR. TIBIA RIGHT MOM.	X	GPUT04MX	3 ch., lower tibia gage	R. A. Denton	1584	N.m
35	FOOT LEFT	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT	Y	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT	Y	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT	Z	KEIC004Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
41	LAP BELT FORCE	X	KELC003	Load cell, Seat belt	Lebow	3371	N
42	SHOULDER BELT FORCE	X	KELC004	Load cell, Seat belt	Lebow	3371	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celisco	PTX101-0030	MM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

Ncap Test With Hybrid III Male 50th Percentile ATD

Instrumentation Data Channel Assignments

Passenger A.T.D Serial Number 35

Test Date: 1/23/98

Vehicle: 1998 Chevrolet Camaro

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
52	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
53	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
54	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	N.m
55	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	N.m
56	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	N.m
57	CHEST , PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
61	CHEST , REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
62	CHEST , REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
63	CHEST DISPLACEMENT	X	GPRP001	Potentiometer, Rotary	Servo	14CBI	MM
64	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	GPLC001	Load cell, Femur	G.S.E.	2430	N

Ncap Test With Hybrid III Male 50th Percentile ATD

Instrumentation Data Channel Assignments

Passenger A.T.D Serial Number 35

Test Date: 1/23/98

Vehicle: 1998 Chevrolet Camaro

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPUT01MX	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
70	UP. TIBIA LEFT MOM.	Y	GPUT01MY	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
71	UP. TIBIA RIGHT MOM.	X	GPUT02MX	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
72	UP. TIBIA RIGHT MOM.	Y	GPUT02MY	2 ch., Upper tibia gage	R. A. Denton	1583	N.m
73	LWR. TIBIA LEFT FORCE	Y	GPUT01FY	3 ch., lower tibia gage	R. A. Denton	1584	N
74	LWR. TIBIA LEFT FORCE	Z	GPUT01FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
75	LWR. TIBIA LEFT MOM.	X	GPUT01MX	3 ch., lower tibia gage	R. A. Denton	1584	N.m
76	LWR. TIBIA RIGHT FORCE	Y	GPUT02FY	3 ch., lower tibia gage	R. A. Denton	1584	N
77	LWR. TIBIA RIGHT FORCE	Z	GPUT02FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
78	LWR. TIBIA RIGHT MOM.	X	GPUT02MX	3 ch., lower tibia gage	R. A. Denton	1584	N.m
79	FOOT LEFT	X	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT	Y	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT	Y	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT	Z	KEIC001Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
85	LAP BELT FORCE	X	KELC001	Load cell, Seat belt	Lebow	3371	N
86	SHOULDER BELT FORCE	X	KELC002	Load cell, Seat belt	Lebow	3371	N
87	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
88	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

**Ncap Test With Hybrid III Male 50th Percentile ATD
Instrumentation Data Channel Assignments**

Vehicle Accelerometers

Test Date: 1/23/98

Vehicle: 1998 Chevrolet Camaro

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	LEFT REAR PRIMARY	X	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G
90	RIGHT REAR PRIMARY	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
91	ENGINE TOP	X	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G
92	ENGINE BOTTOM	X	KEVA009	Accel., Vehicle block	I.C. Sensor	3031-500	G
93	LEFT BRAKE CALIPER	X	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-500	G
94	RIGHT BRAKE CALIPER	X	KEVA004	Accel., Vehicle block	I.C. Sensor	3031-500	G
95	INSTUMENT PANEL	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-200	G
96	LEFT REAR REDUNDANT	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G

APPENDIX E
DUMMY CALIBRATION DATA



Hybrid III Calibration Data Sheet

50TH Percentile Male

Left Knee Impact Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: MK001

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Probe Velocity	m/s	2.073 to 2.134	2.119	Pass
Peak Probe Force	Newtons	4715 to 5782	5185.0	Pass
Overall Test Results				Pass

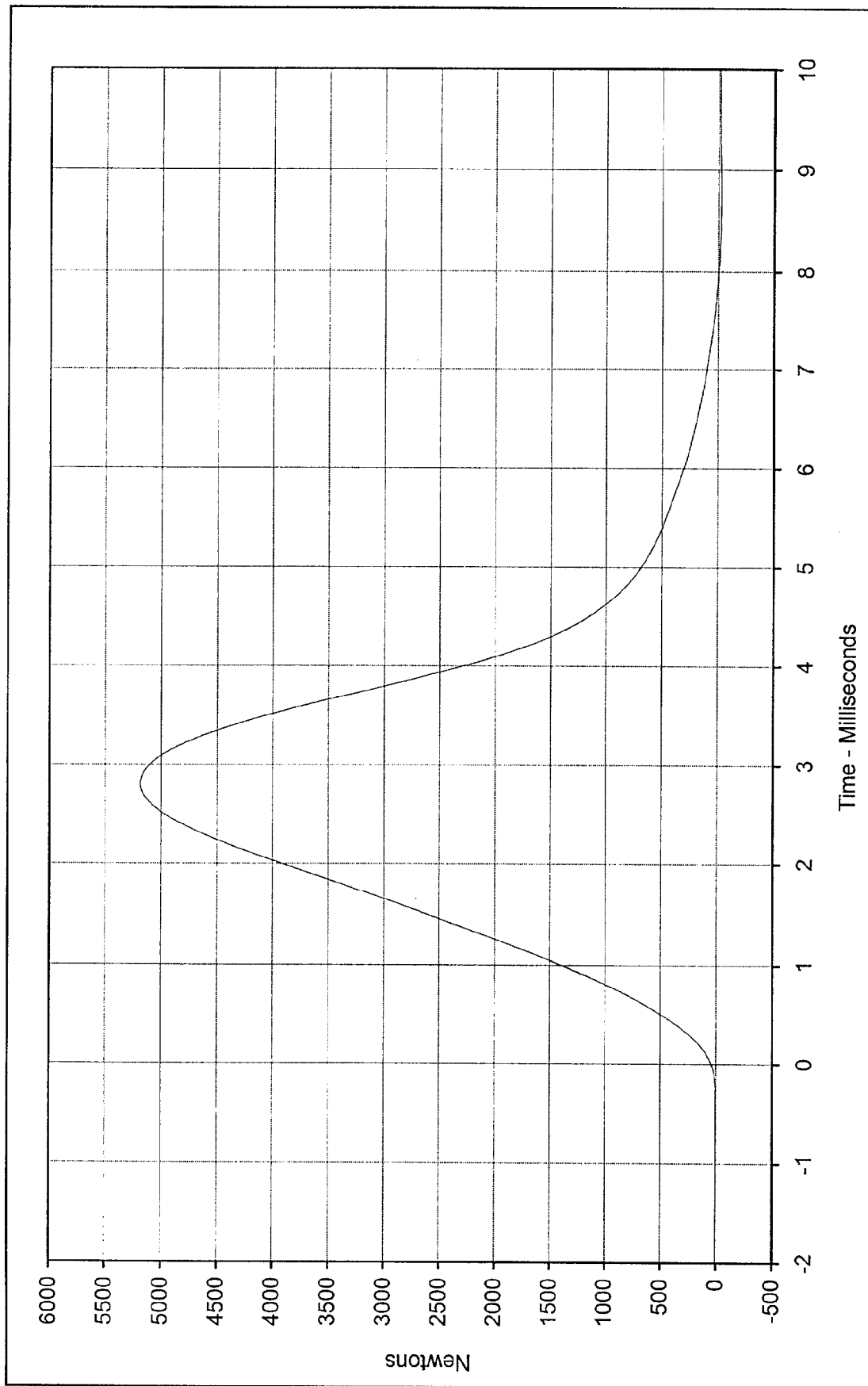
Laboratory Technician

Approved By

January 16, 1998

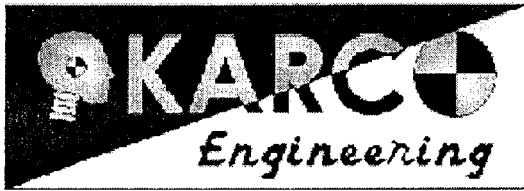
Test Date

Date



Curve Description: Testing Program Hybrid III Left Knee Impact Test
 Maximum Value: 5185.0 at 2.8 Milliseconds
 Minimum Value: -3.8 at 8.0 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/16/98
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

Right Knee Impact Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: MK002

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.119	Pass
Peak Probe Force	Newtons	4715 to 5782	5434.3	Pass
Overall Test Results				Pass

N209p
Laboratory Technician

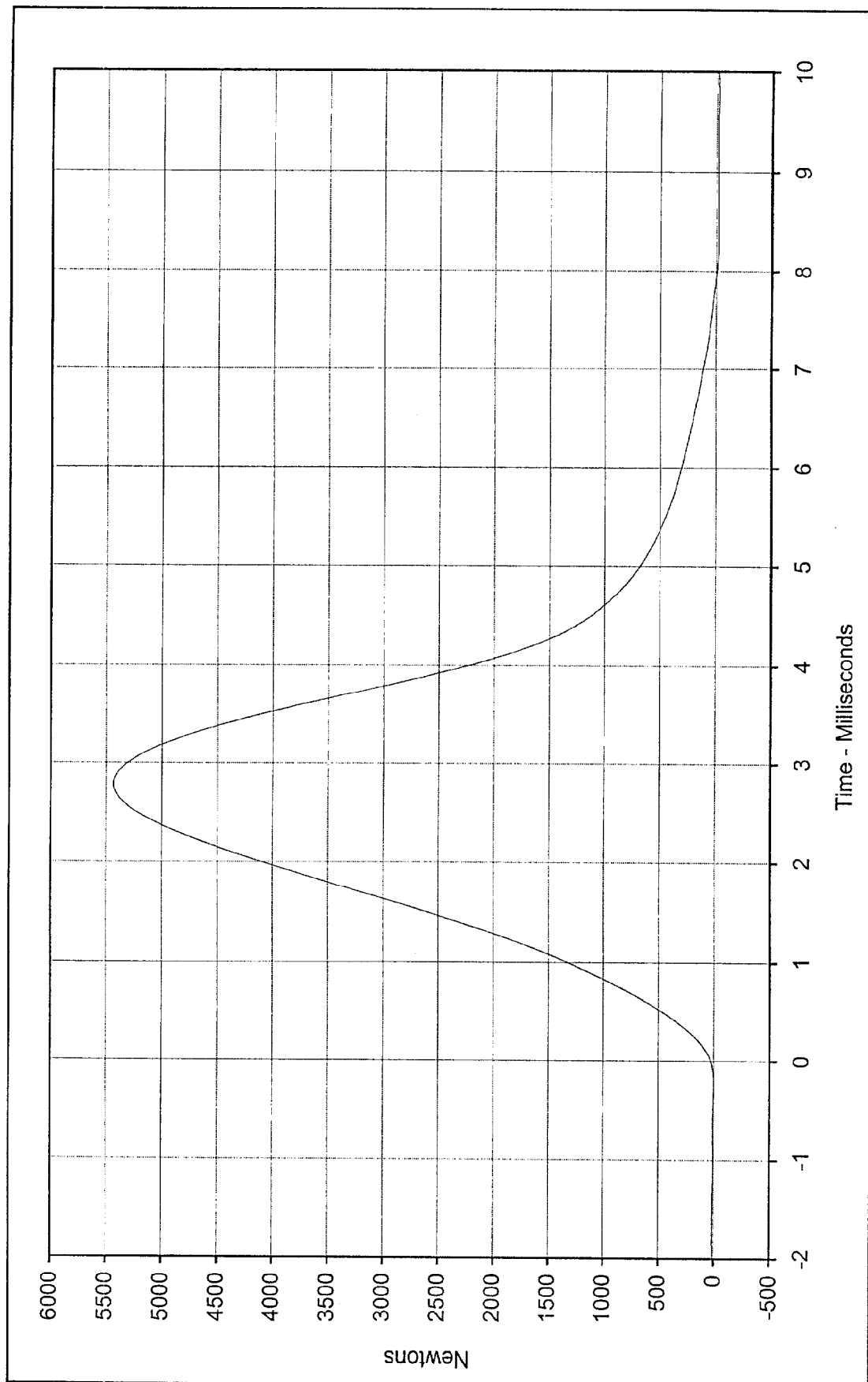
JW Richardson
Approved By

January 16, 1998

Test Date

1/16/98

Date



Curve Description: _____ Testing Program: Hybrid III Right Knee Impact Test
 Maximum Value: 5434.3 at 2.8 Milliseconds
 Minimum Value: -7.6 at 8.0 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/16/98
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

Head Drop Calibration

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: HD050

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	236.2	Pass
Peak Lateral Acceleration	G's	≤15.0	6.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

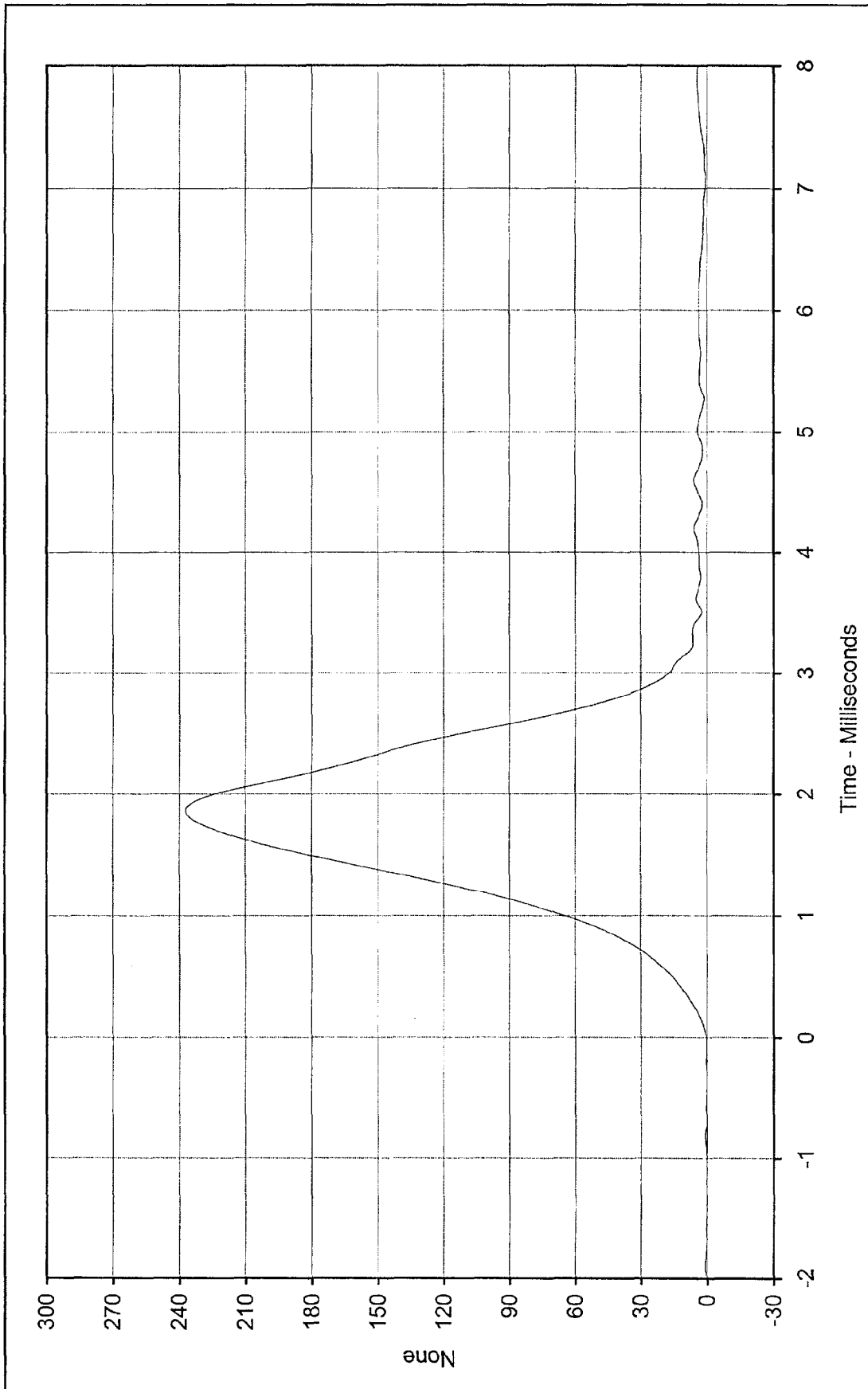
Laboratory Technician

Approved By

January 16, 1998

Test Date

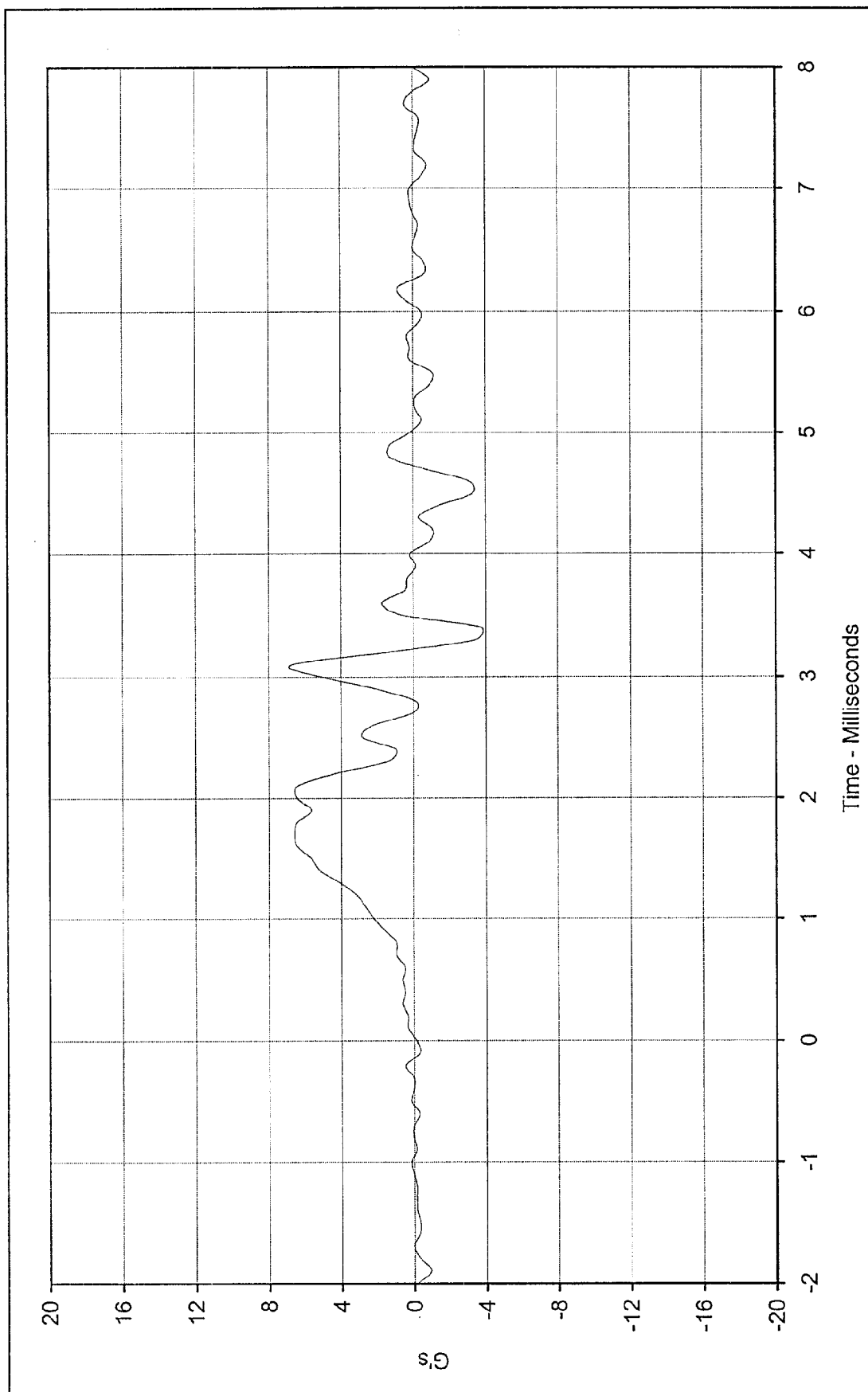
Date



Testing Program Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: n/a Test I.D.: HD050

Curve Description: Head Resultant Acceleration
 Maximum Value: 236.2 at 1.9 Milliseconds
 Minimum Value: 0.1 at -0.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/16/98
 ATD Serial No.: 034





Curve Description:	Head Acceleration Y Axis	Testing Program	Hybrid III Head Drop Calibration (Male)
Maximum Value:	6.7 at 3.1 Milliseconds	Test Information:	S/N of Part: n/a Test I.D.: HD050
Minimum Value:	-3.7 at 3.4 Milliseconds		
SAE Filter Class:	1000		
Date of Test:	1/16/98		
ATD Serial No.:	034		





Hybrid III Calibration Data Sheet

50TH Percentile Male

Thorax Impact Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: C5000

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	Newtons	5159 to 5893	5436	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.54	Pass
Internal Hysteresis	%	69 to 85	75.0	Pass
Overall Test Results				Pass

N209p

Laboratory Technician

John H. Anderson

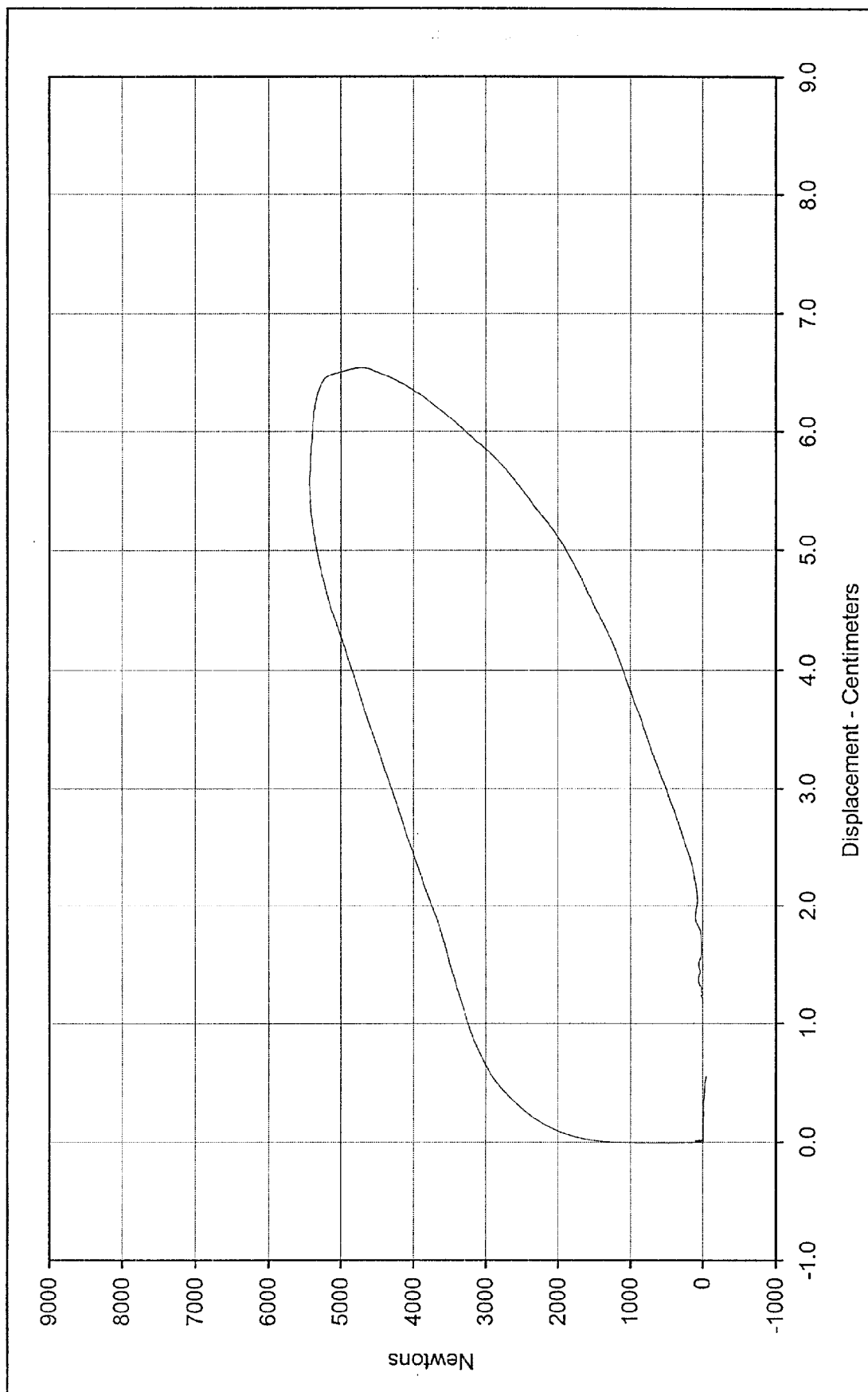
Approved By

January 19, 1998

Test Date

1/19/98

Date



Curve Description:	Probe Force vs. Chest Displacement	Testing Program	Hybrid III Thorax Impact Test
Probe Force:	5436.3 Newtons	Test Information:	S/N of Part: n/a Test I.D.: C5000
Chest Displ.:	6.54 Centimeters		
SAE Filter Class:	180		
Date of Test:	1/19/98		
ATD Serial No.:	034		





Hybrid III Calibration Data Sheet

50TH Percentile Male

Neck Flexion Test

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: NK100

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.94	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	20.8	Pass
	30 Msec.	G's	12.5 to 18.5	17.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	38.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	74.8	Pass
	Time	Msec.	57.0 to 64.0	60.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	121.3	Pass
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	86.4	Pass
	Time	Msec.	47.0 to 58.0	53.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	102.8	Pass
Overall Test Results				Pass	

N 2 Q9p
Laboratory Technician

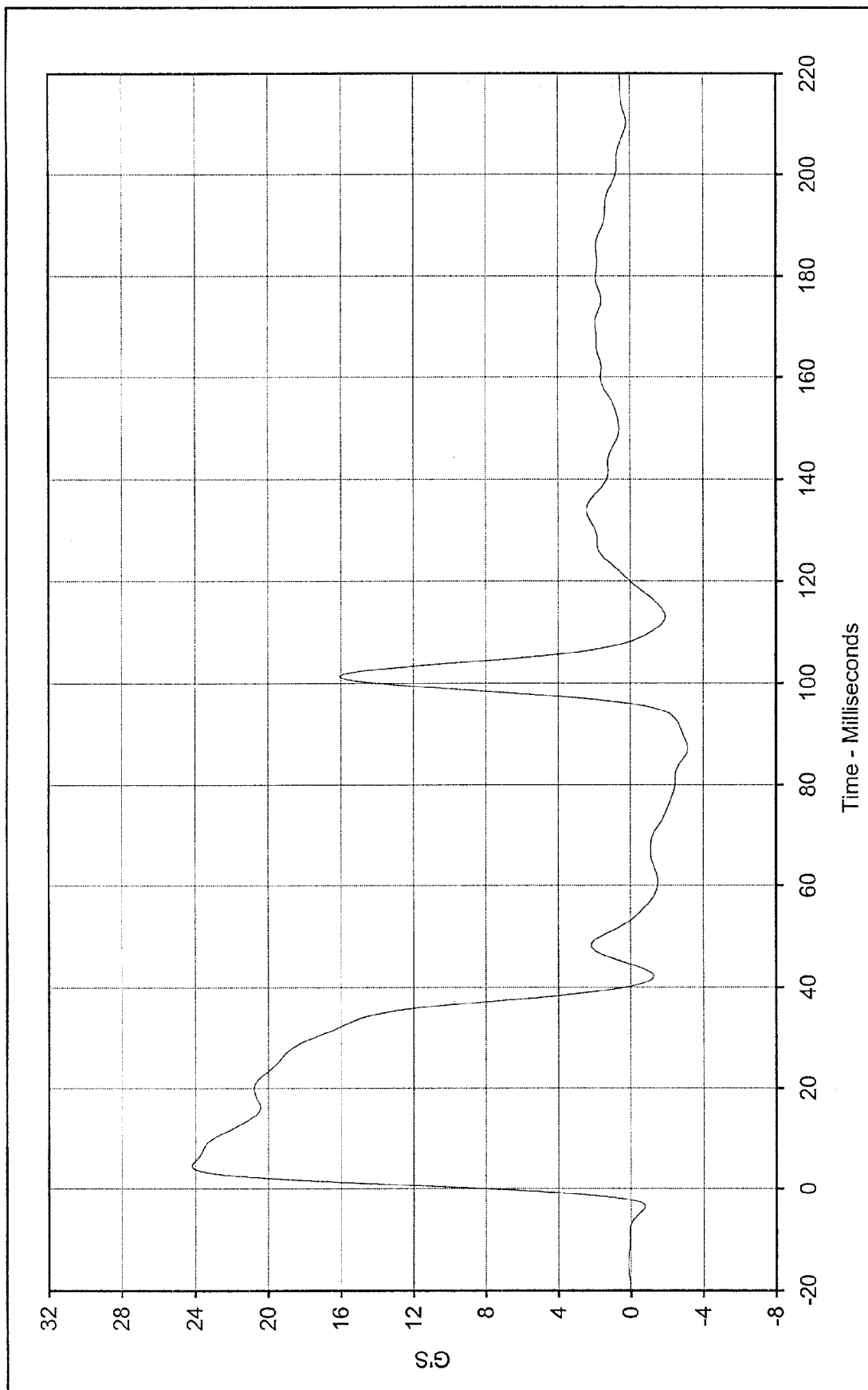
JARubens
Approved By

January 17, 1998

Test Date

1/17/98

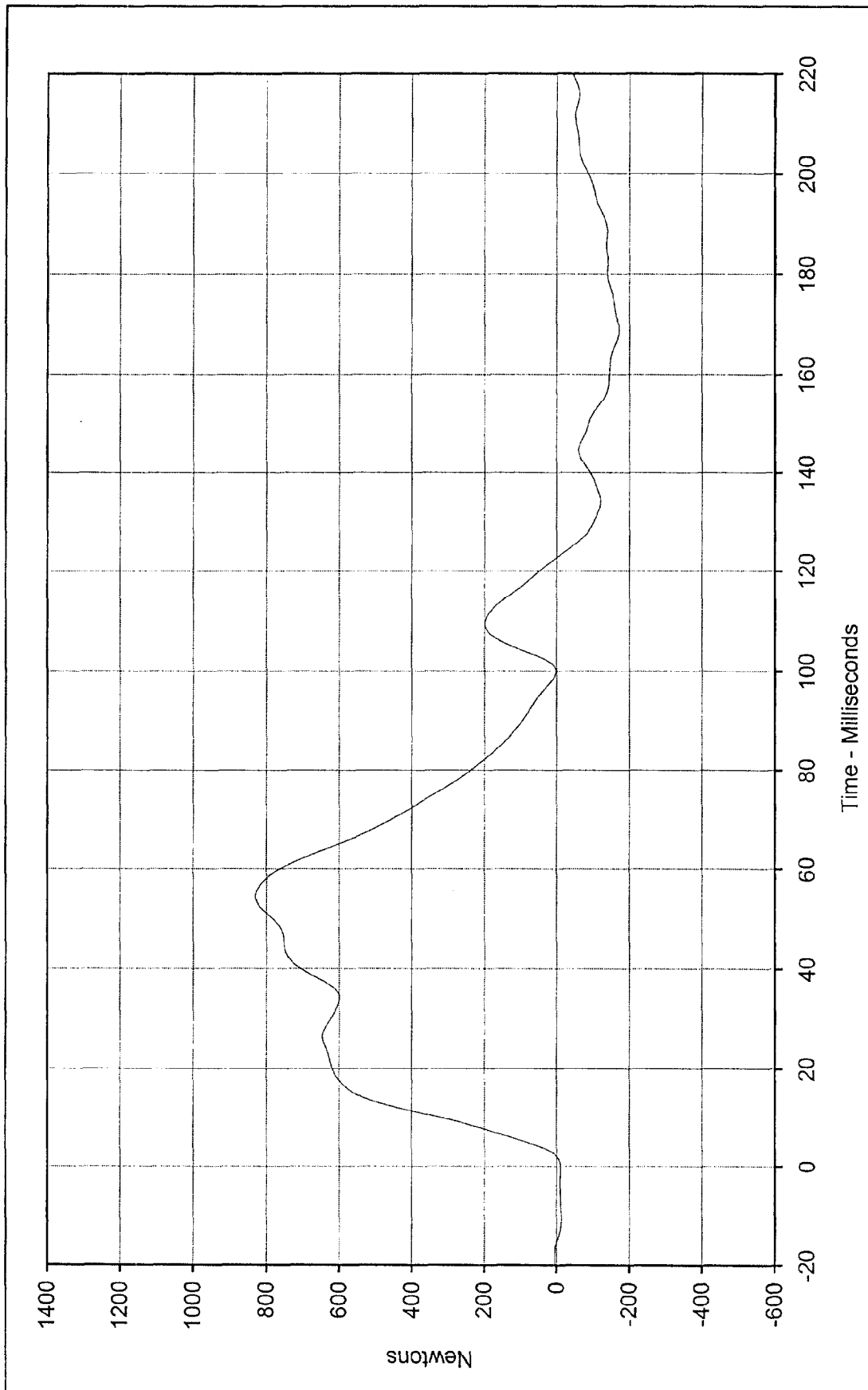
Date



Curve Description: Pendulum Deceleration
 Maximum Value: 24.2 at 4.4 Milliseconds
 Minimum Value: -3.2 at 87.1 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 034

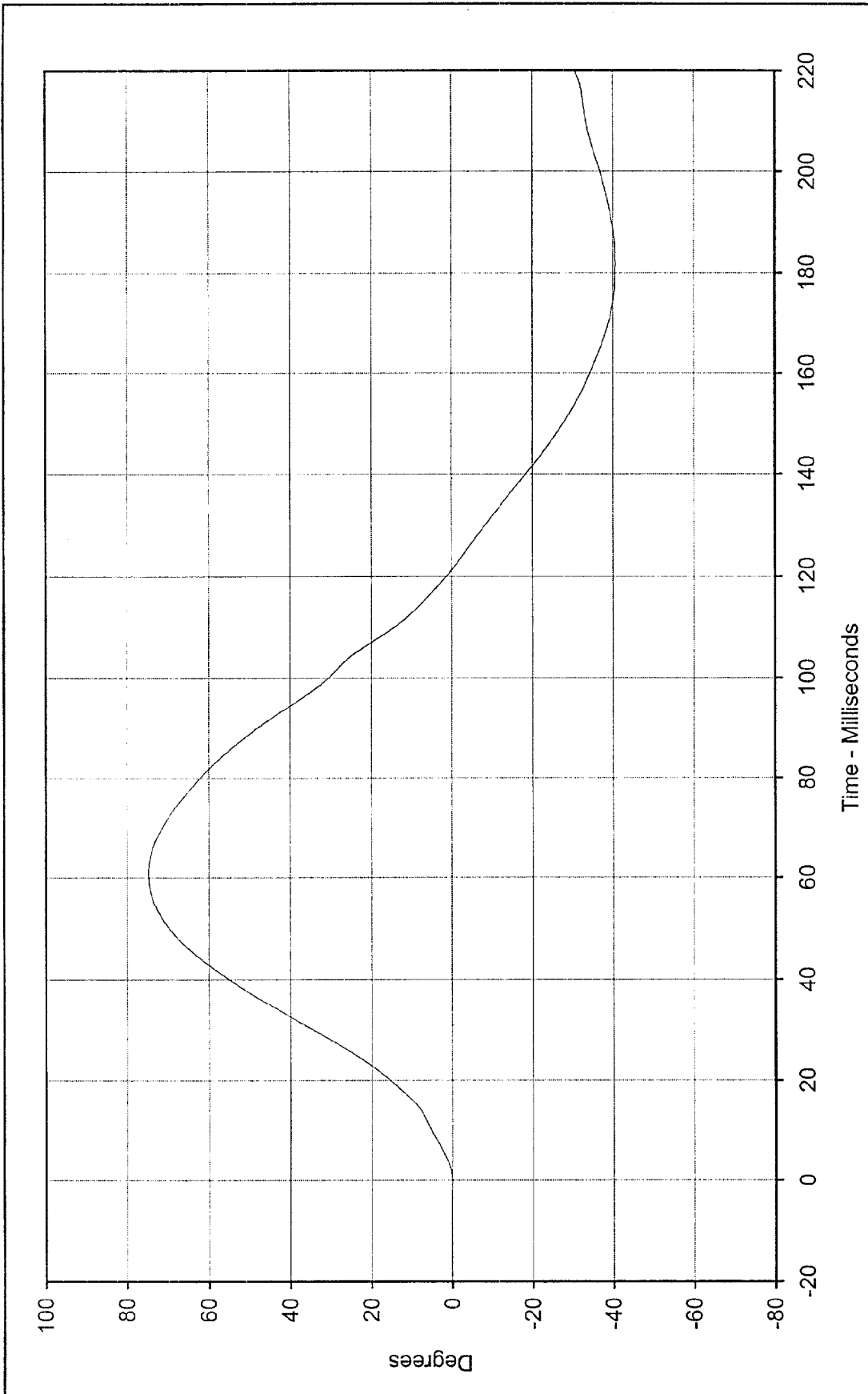
Testing Program: Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NK100





Curve Description: Hybrid III Neck Flexion Test (Male)
 Maximum Value: 829.4 at 54.6 Milliseconds
 Minimum Value: -171.5 at 168.8 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 034





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

Maximum Value: 74.8 at 60.9 Milliseconds Test Information: S/N of Part: n/a Test I.D.: NK100

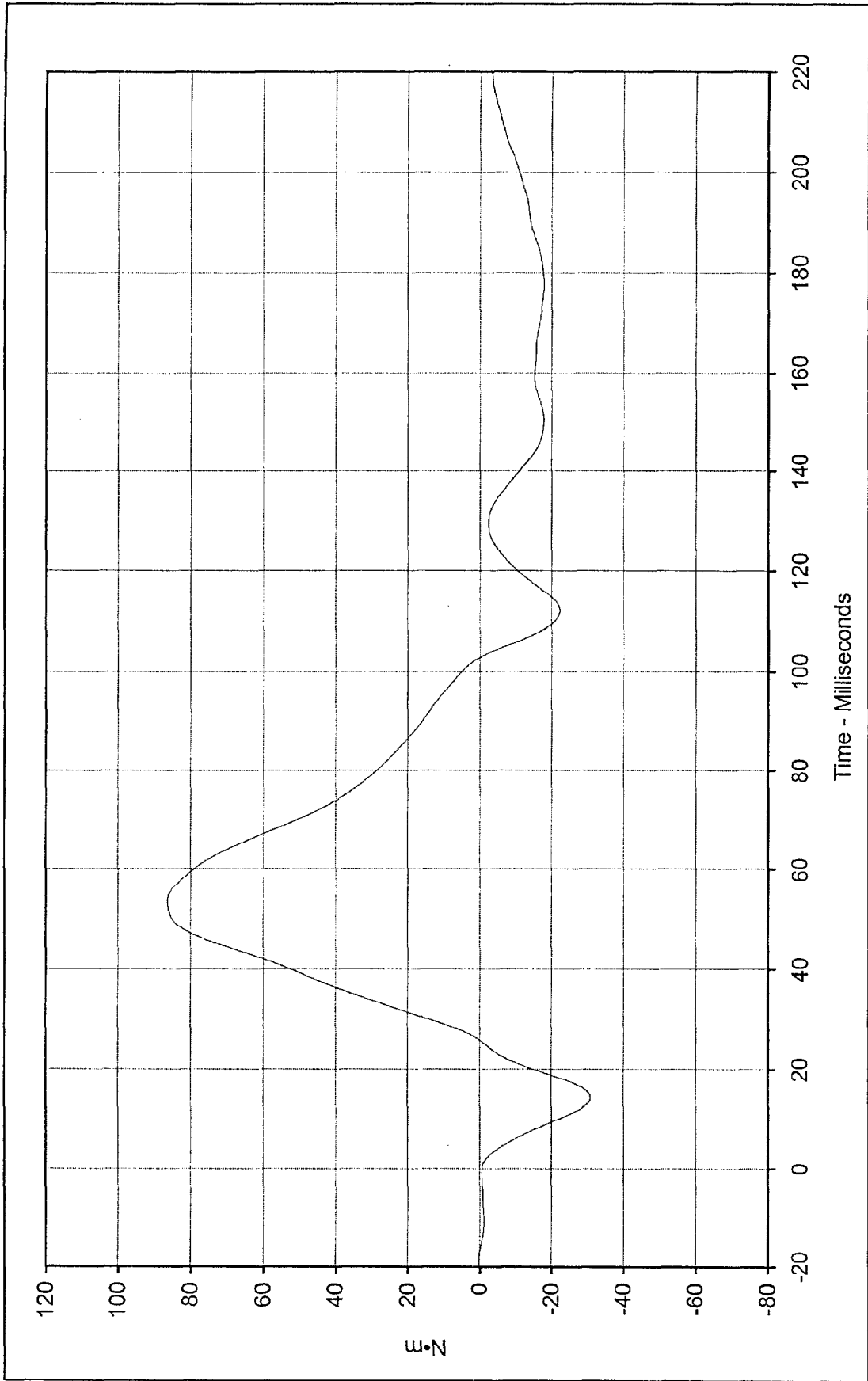
Minimum Value: -40.6 at 181.9 Milliseconds



SAE Filter Class: 60

Date of Test: 1/17/98

ATD Serial No.: 034



Curve Description: Moment About Occipital Condyles

Maximum Value:	86.4	at	53.3	Milliseconds
Minimum Value:	-30.9	at	14.3	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/17/98			
ATD Serial No.:	034			

Testing Program Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NK100





Hybrid III Calibration Data Sheet

50TH Percentile Male

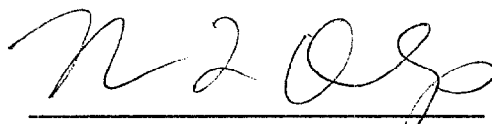
Neck Extension Test

ATD Serial No.: 034

Part Serial No.: n/a

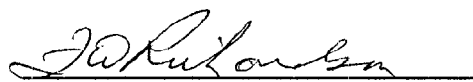
Test I.D.: NE600

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.11	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.9	Pass
	20 Msec.	G's	14.0 to 19.0	16.4	Pass
	30 Msec.	G's	11.0 to 16.0	15.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	101.5	Pass
	Time	Msec.	72.0 to 82.0	80.1	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	158.7	Pass
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-79.1	Pass
	Time	Msec.	65.0 to 79.0	66.8	Pass
Negative Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	145.1	Pass
Overall Test Results					Pass


 Laboratory Technician

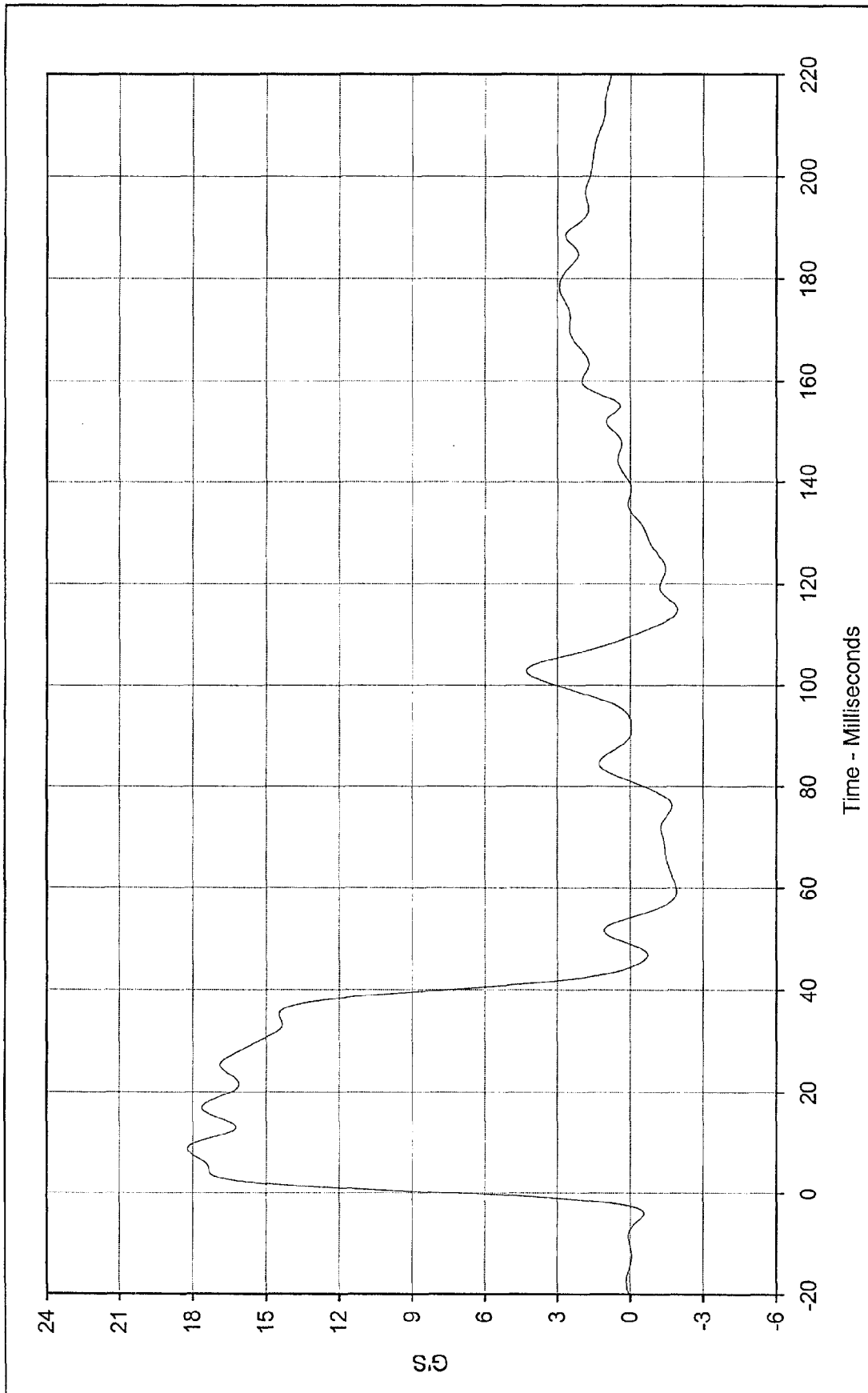
January 17, 1998

Test Date


 Approved By

1/17/98

Date



Curve Description: Hybrid III Neck Extension Test (Male)

Maximum Value: 18.2 at 8.7 Milliseconds

Minimum Value: -1.9 at 114.7 Milliseconds

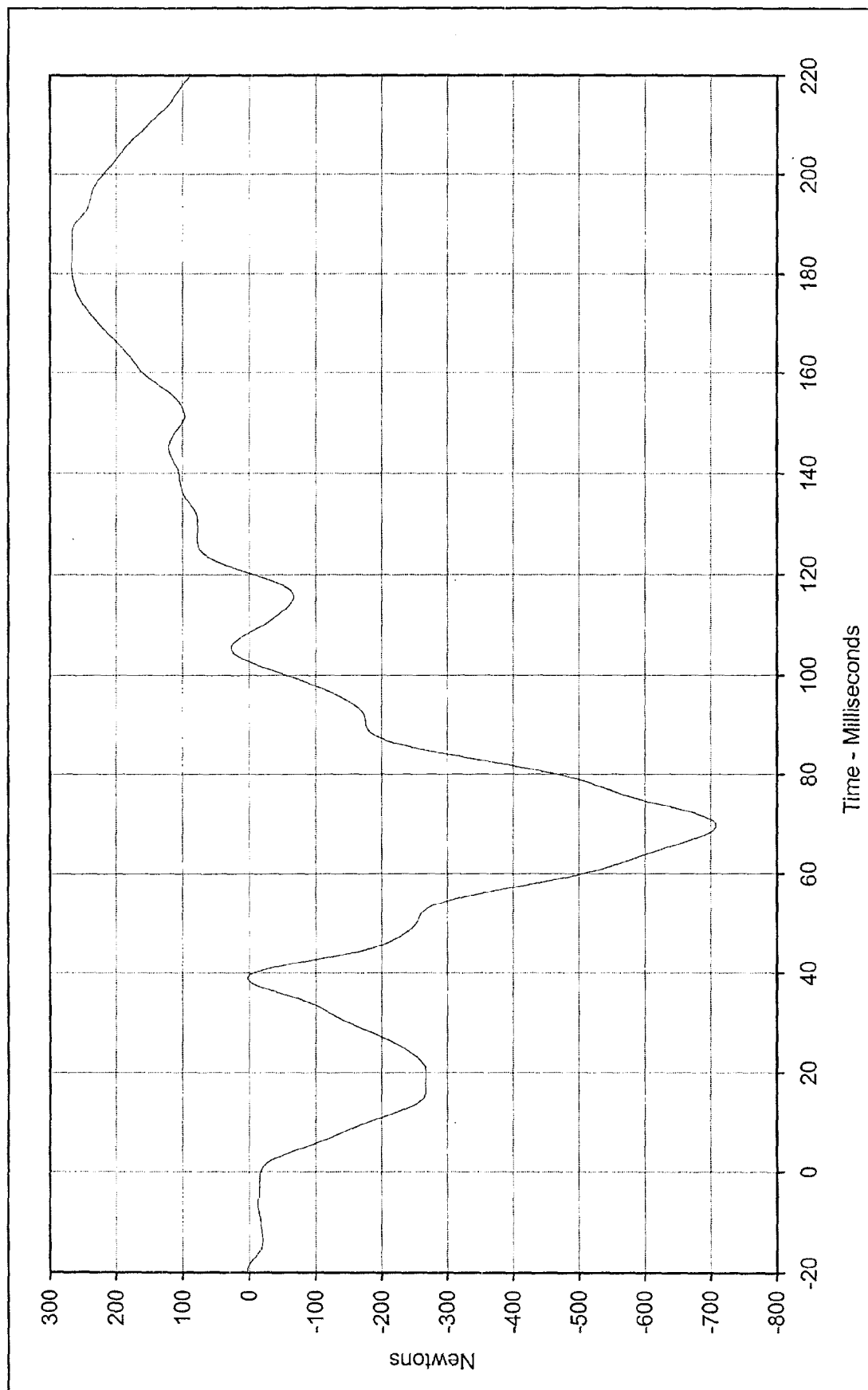
SAE Filter Class: 60

Date of Test: 1/17/98

ATD Serial No.: 034

Testing Program: S/N of Part: n/a Test I.D.: NE600

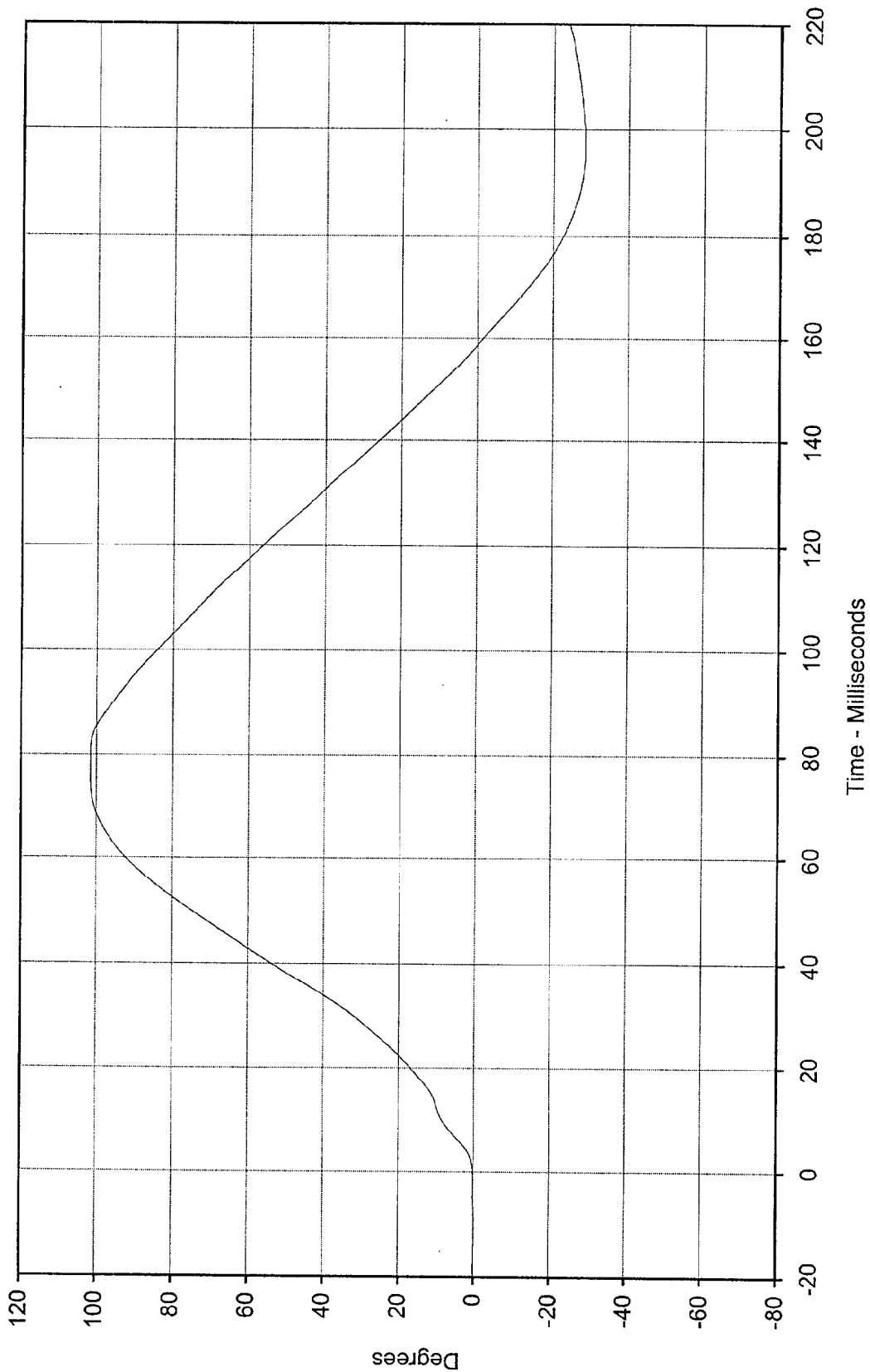




Curve Description: Neck Force X
 Maximum Value: 267.4 at 182.9 Milliseconds
 Minimum Value: -708.4 at 69.6 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE600





Curve Description: "D" Plane Rotation

Maximum Value: 101.5 at 80.1 Milliseconds

Minimum Value: -28.4 at 197.2 Milliseconds

SAE Filter Class: 60

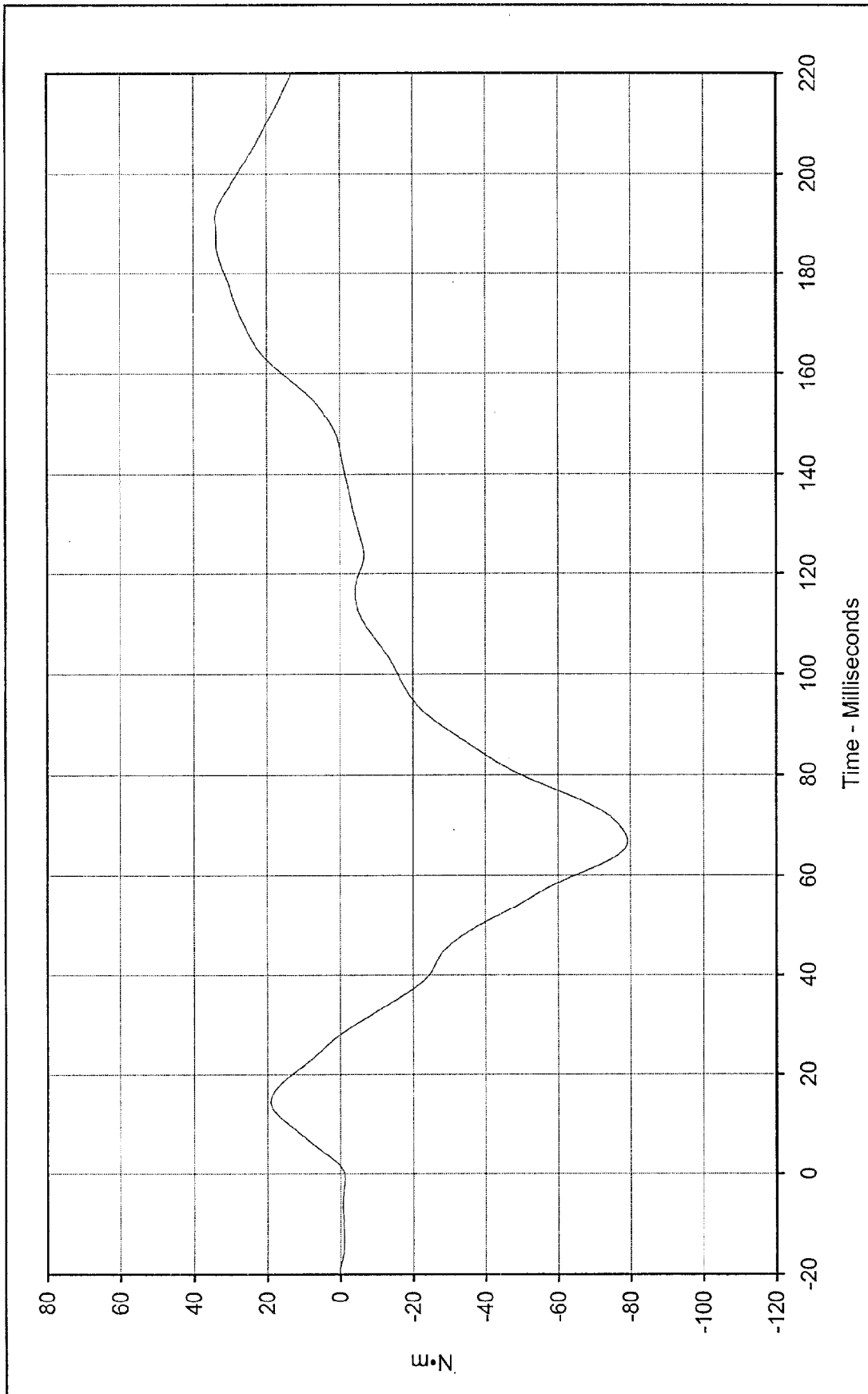
Date of Test: 1/17/98

ATD Serial No.: 034

Testing Program: Hybrid III Neck Extension Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NE600





Testing Program Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE600



Curve Description: Moment About Occipital Condyles
 Maximum Value: 34.0 at 191.1 Milliseconds
 Minimum Value: -79.1 at 66.8 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 034



Hybrid III Calibration Data Sheet

50TH Percentile Male

External Measurements

ATD Serial No.: 034

Part Serial No.: N/A

Test I.D.: N/A

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43.0	Pass
A - Total sitting height	mm	878.8 to 889.0	883.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	516.0	Pass
C - "H" point height	mm	83.8 to 88.9	87.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	137.0	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	86.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	151.0	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	301.0	Pass
H - Skull cap to back line	mm	40.6 to 45.7	45.0	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	344.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	208.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	591.0	Pass
L - Popliteal length	mm	429.3 to 454.7	441.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	495.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	470.0	Pass
O - Chest depth	mm	213.4 to 228.6	220.0	Pass
P - Foot length	mm	251.5 to 266.7	261.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	435.0	Pass
W - Foot breadth	mm	91.4 to 106.7	100.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	1000.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	865.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	431.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	230.0	Pass
Overall Test Results				Pass

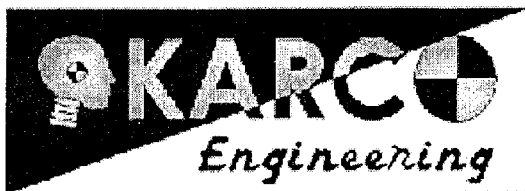
N 202p
Laboratory Technician

J. A. Robinson
Approved By

January 19, 1998

Test Date

1/19/98
Date



Hybrid III Calibration Data Sheet

50TH Percentile Male

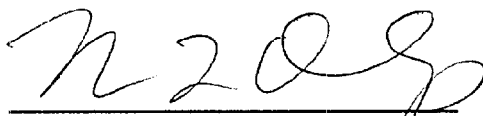
Left Knee Impact Test

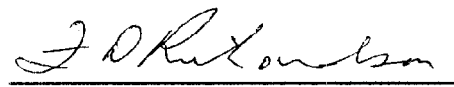
ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: H3K01

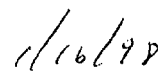
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Probe Velocity	m/s	2.073 to 2.134	2.118	Pass
Peak Probe Force	Newtons	4715 to 5782	5733.8	Pass
Overall Test Results				Pass


Laboratory Technician

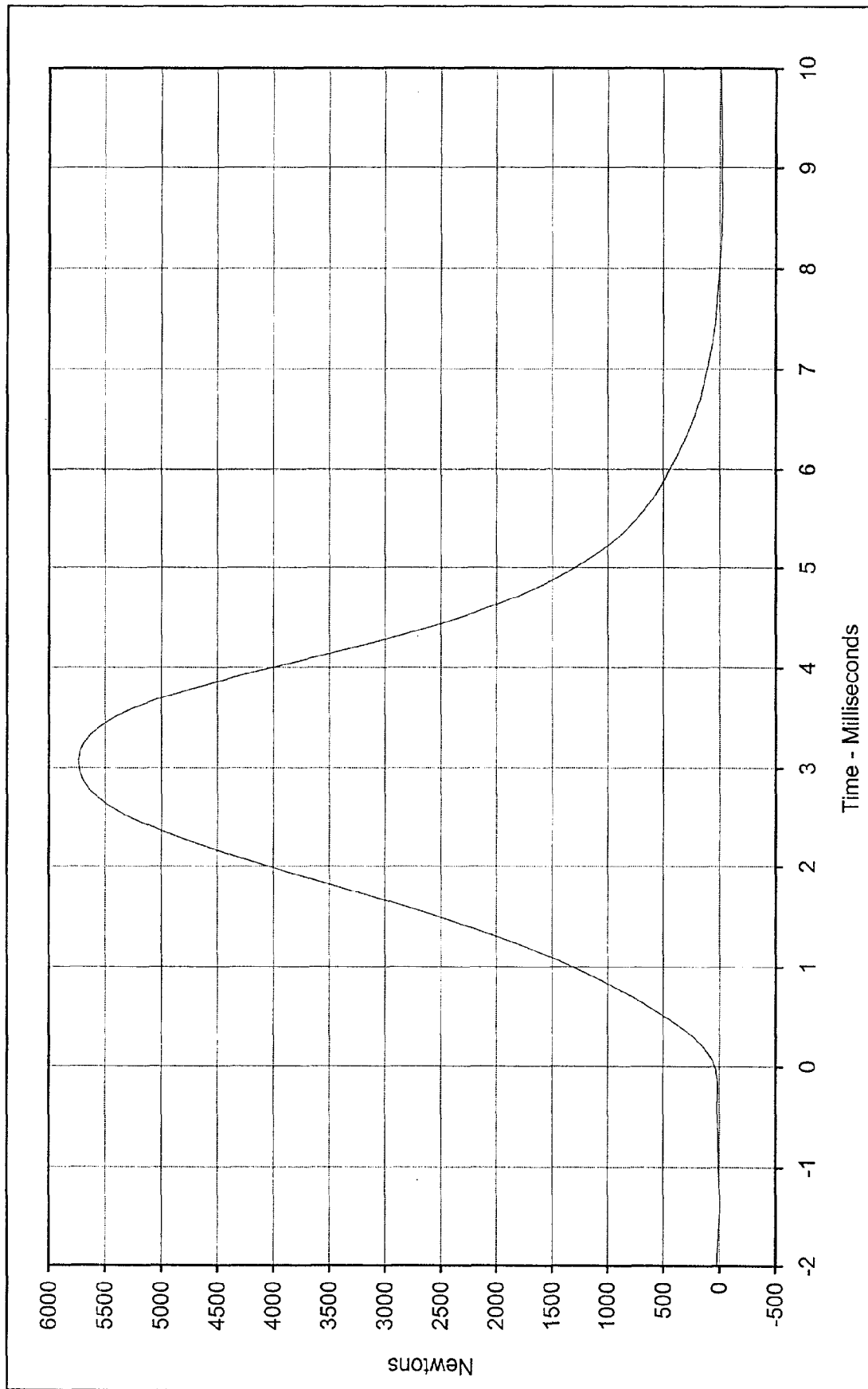

Approved By

January 16, 1998

Test Date



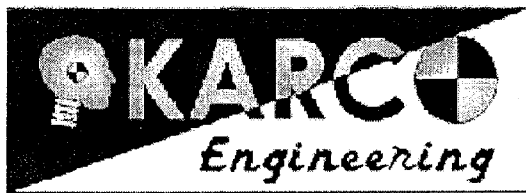
Date



Curve Description: Hybrid III Left Knee Impact Test
 Testing Program: Part S/N: n/a Test I.D.: H3K01

Probe Force
 Maximum Value: 5733.8 at 3.1 Milliseconds
 Minimum Value: -1.3 at -1.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/16/98
 ATD Serial No.: 035





Hybrid III Calibration Data Sheet

50TH Percentile Male

Right Knee Impact Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: H3K02

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.132	Pass
Peak Probe Force	Newtons	4715 to 5782	5683.4	Pass
Overall Test Results				Pass

N202g
Laboratory Technician

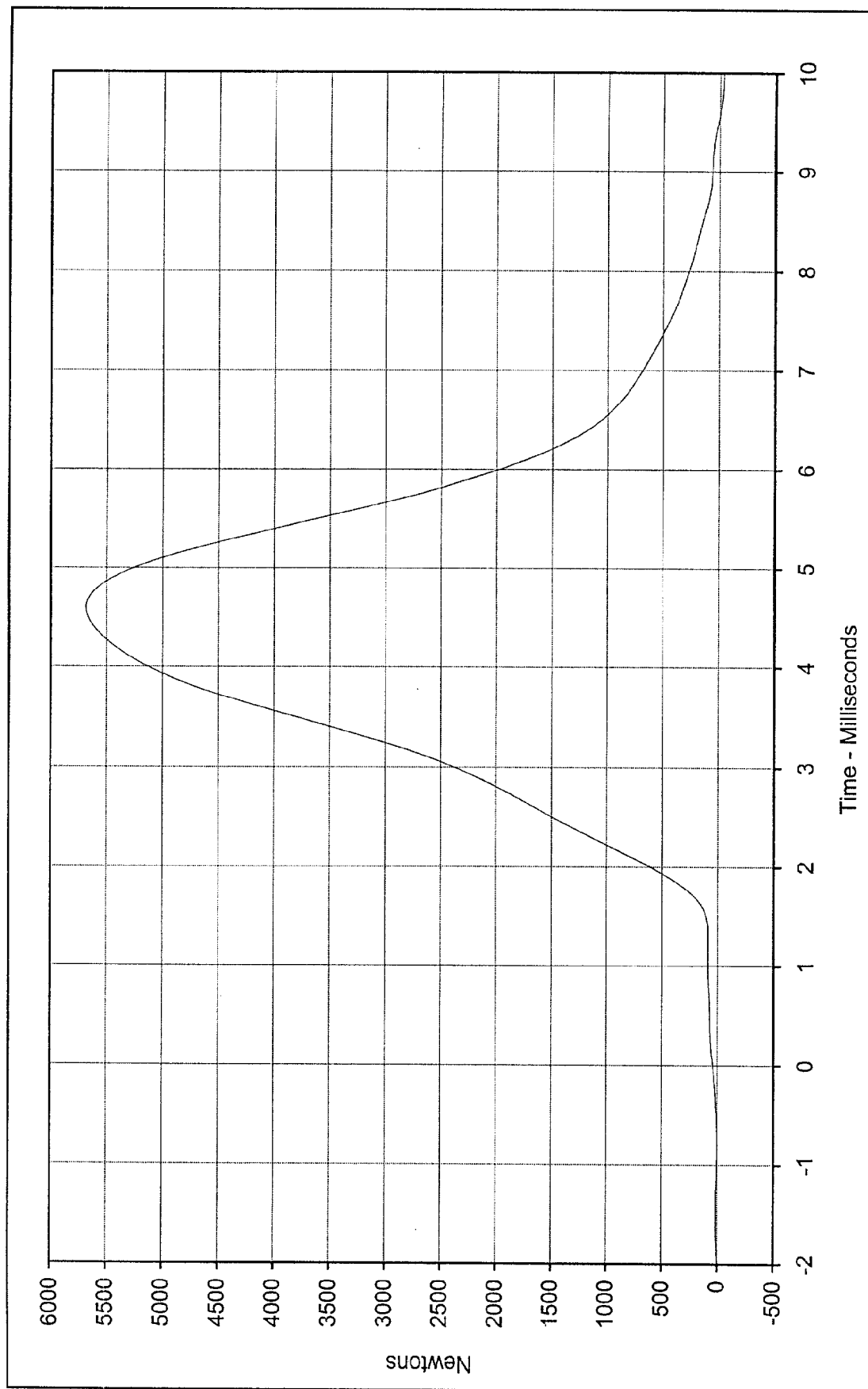
T. H. Kowen
Approved By

January 16, 1998

Test Date

1/16/98

Date



Testing Program Hybrid III Right Knee Impact Test
 Test Information: Part S/N: n/a Test I.D.: H3K02

Curve Description: Probe Force
 Maximum Value: 5683.4 at 4.6 Milliseconds
 Minimum Value: -0.6 at -0.8 Milliseconds
 SAE Filter Class: 600
 Date of Test: 1/16/98
 ATD Serial No.: 035





Hybrid III Calibration Data Sheet

50TH Percentile Male

Head Drop Calibration

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: HD051

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	246.1	Pass
Peak Lateral Acceleration	G's	≤15.0	5.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

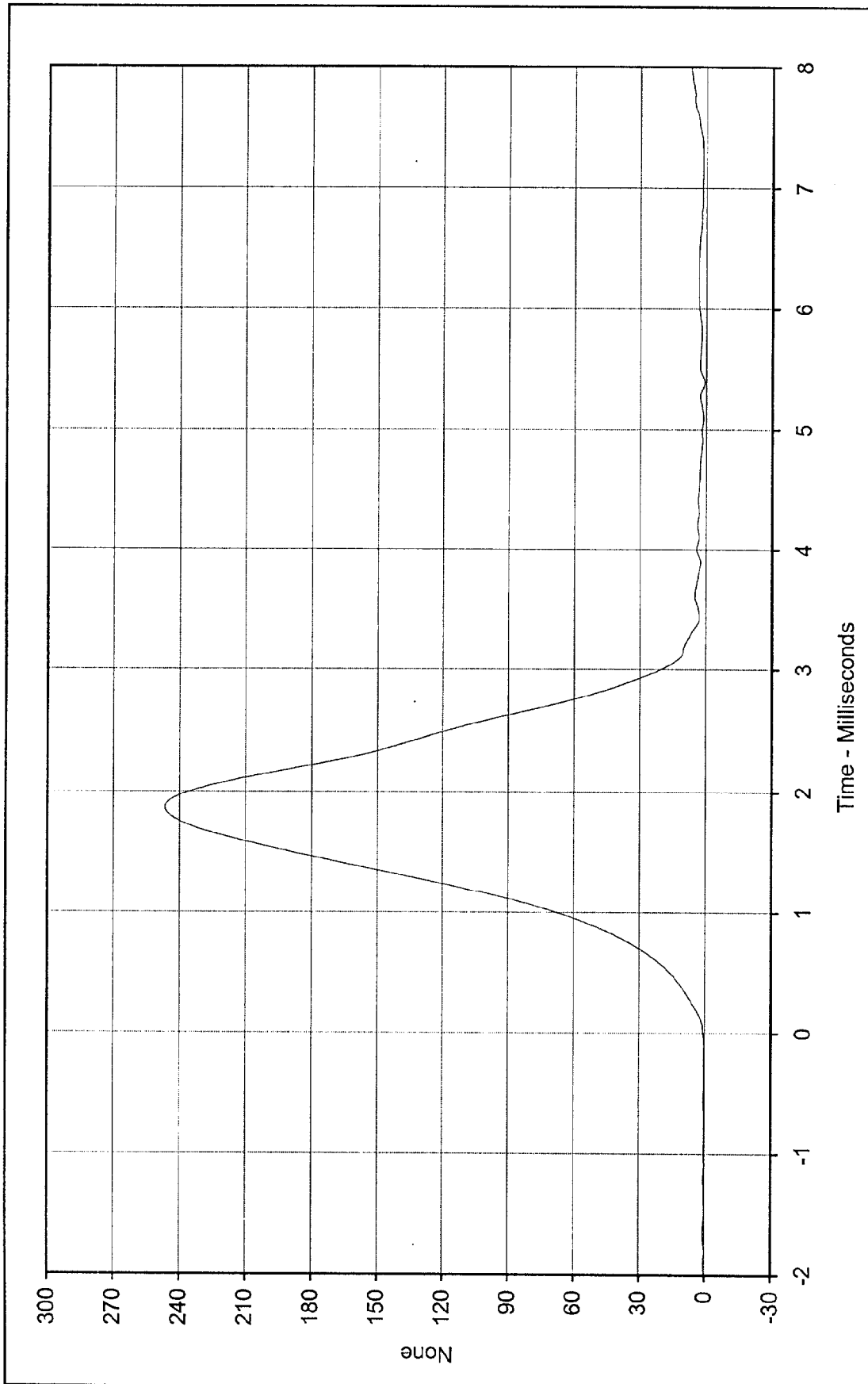
Laboratory Technician

Approved By

January 16, 1998

Test Date

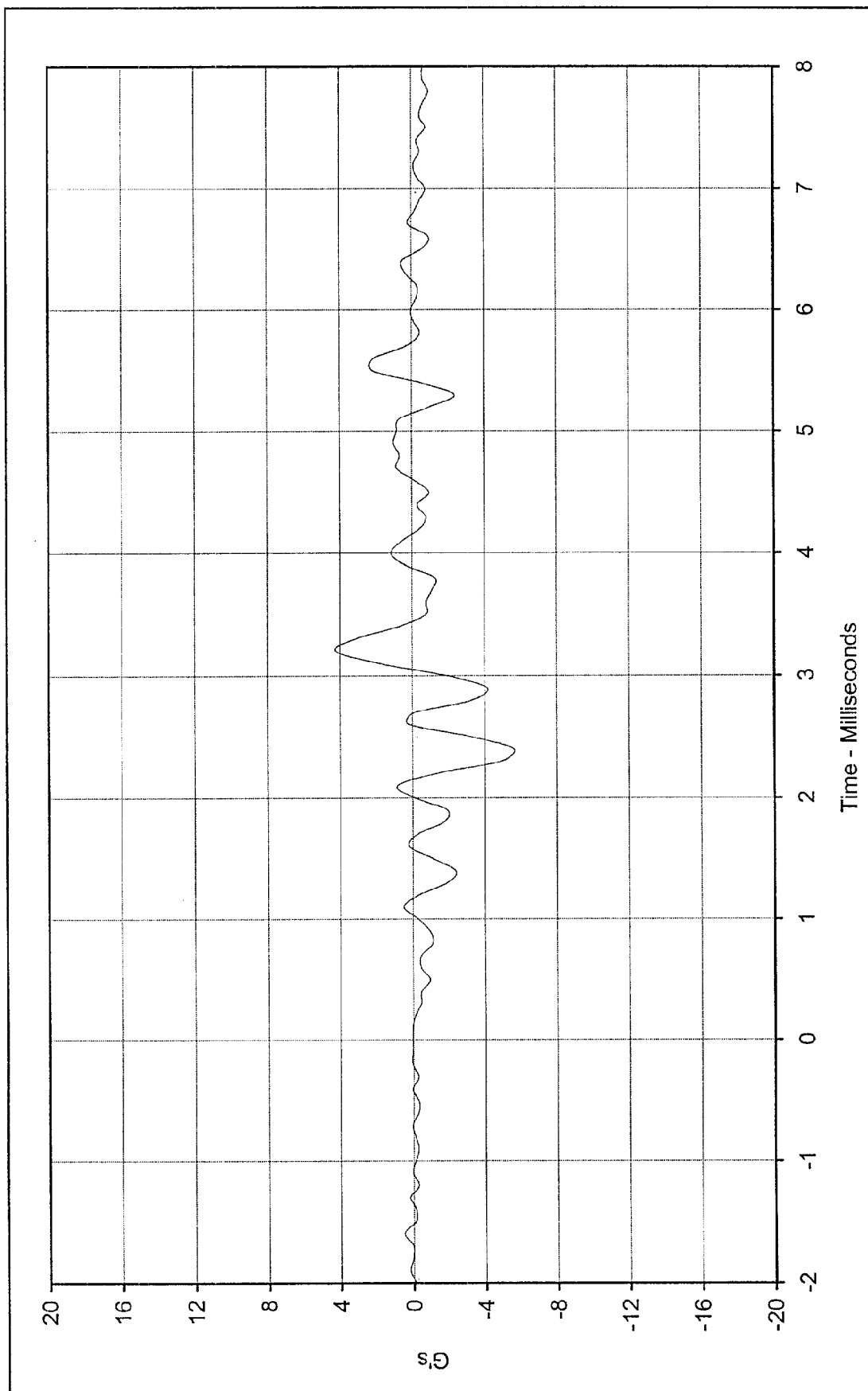
Date



Testing Program Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: n/a Test I.D.: HD051

Curve Description: Head Resultant Acceleration
 Maximum Value: 246.1 at 1.9 Milliseconds
 Minimum Value: 0.1 at -1.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/16/98
 ATD Serial No.: 035





Curve Description: Head Acceleration Y Axis
 Maximum Value: 4.2 at 3.2 Milliseconds
 Minimum Value: -5.6 at 2.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 1/16/98
 ATD Serial No.: 035

Testing Program Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: n/a Test I.D.: HD051





Hybrid III Calibration Data Sheet

50TH Percentile Male

Thorax Impact Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: C6000

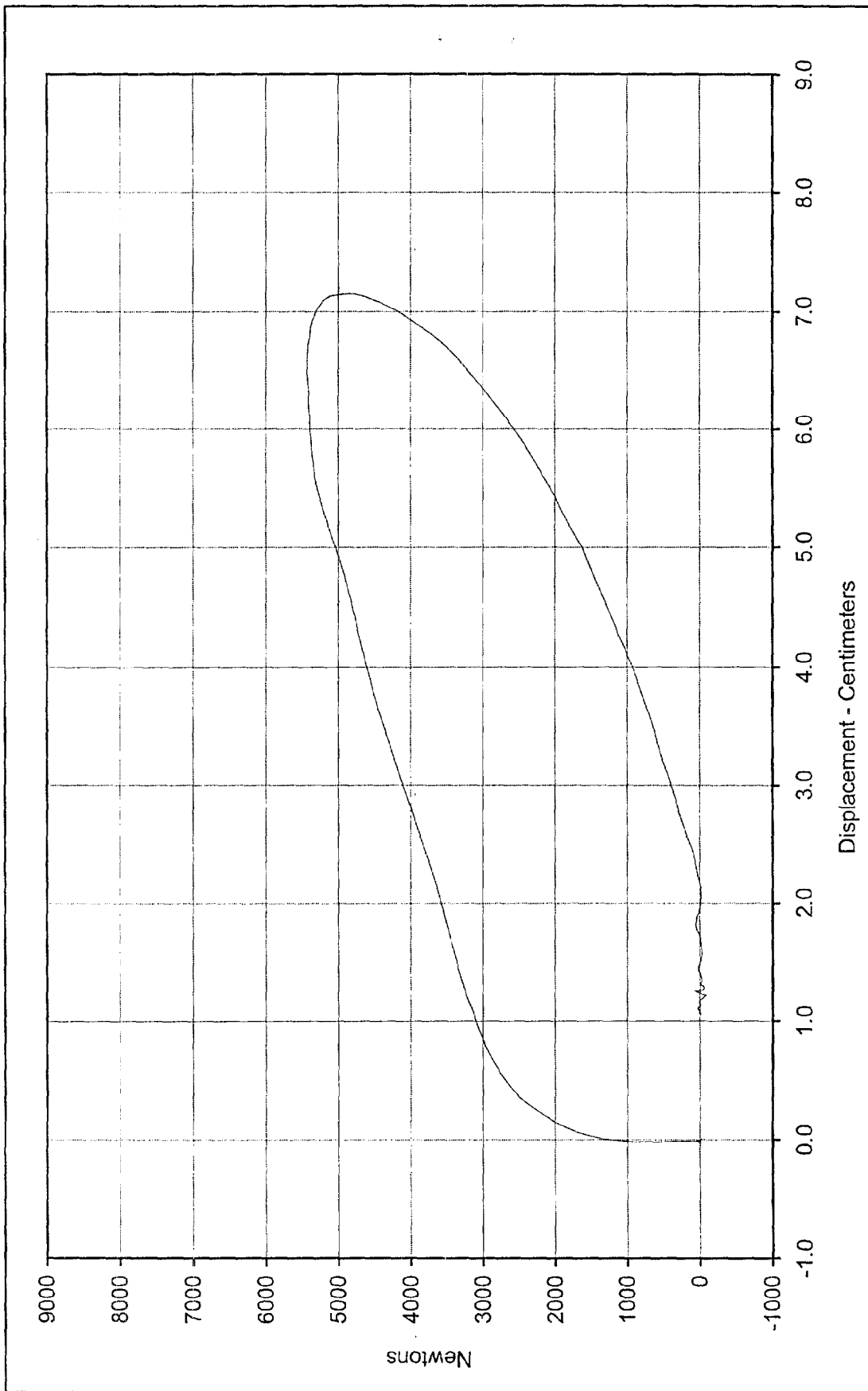
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	Newtons	5159 to 5893	5427	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	7.15	Pass
Internal Hysteresis	%	69 to 85	73.4	Pass
Overall Test Results				Pass

N20ep
Laboratory Technician

J. A. K. L. L. L.
Approved By

January 19, 1998
Test Date

1/19/98
Date



Curve Description:	Probe Force vs. Chest Displacement	Testing Program	Hybrid III Thorax Impact Test
Probe Force:	5426.9 Newtons	Test Information:	S/N of Part: n/a Test I.D.: C6000
Chest Displ.:	7.15 Centimeters		
SAE Filter Class:	180		
Date of Test:	1/19/98		
ATT Serial No.:	035		





Hybrid III Calibration Data Sheet

50TH Percentile Male

Neck Flexion Test

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: NF500

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.93	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.2	Pass
	20 Msec.	G's	17.6 to 22.6	20.4	Pass
	30 Msec.	G's	12.5 to 18.5	18.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	74.3	Pass
	Time	Msec.	57.0 to 64.0	60.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	120.5	Pass
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	87.2	Pass
	Time	Msec.	47.0 to 58.0	48.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	101.2	Pass
Overall Test Results					Pass

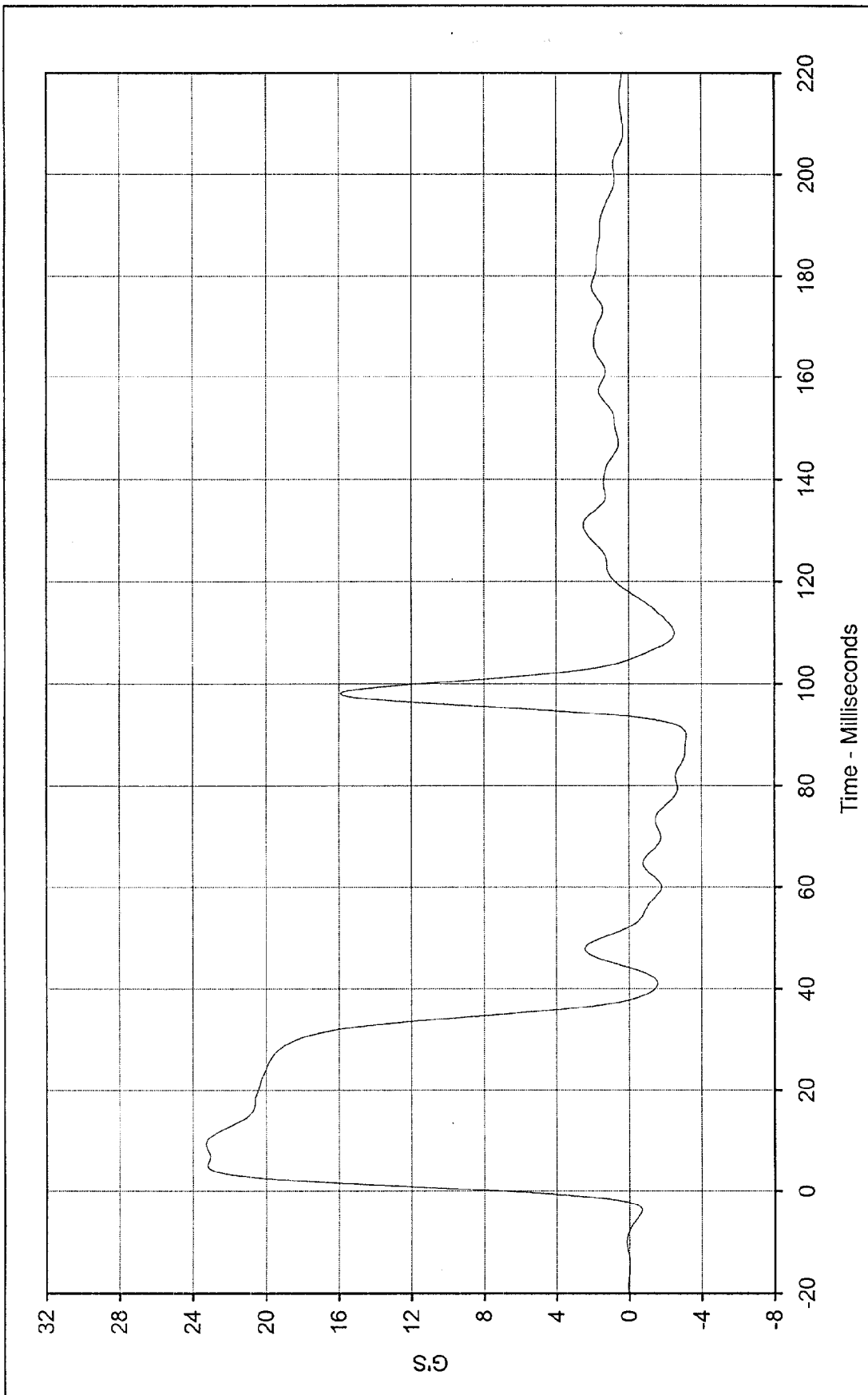
NZO
Laboratory Technician

20 Ruben
Approved By

January 17, 1998

Test Date

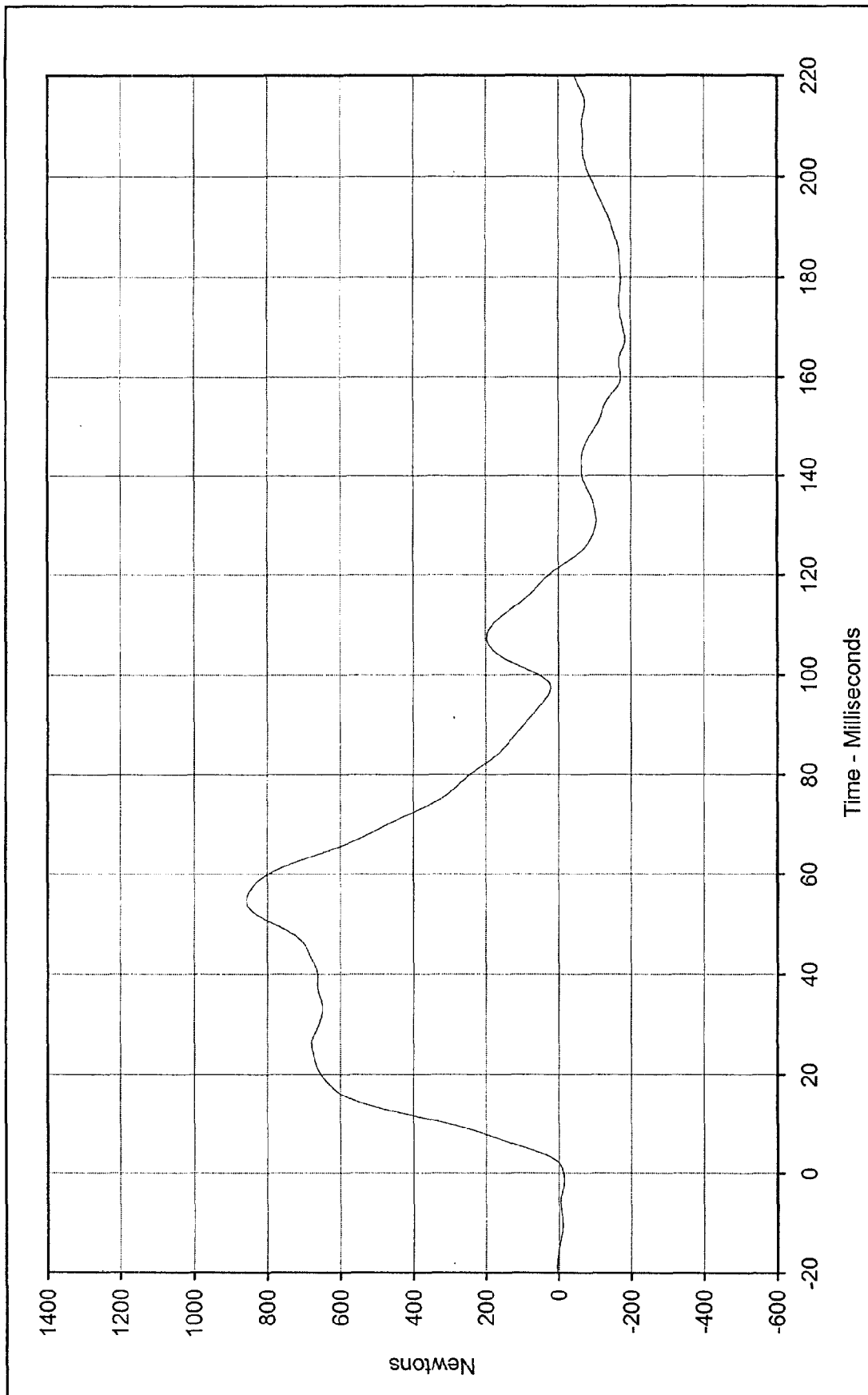
1/17/98
Date



Curve Description: Pendulum Deceleration Testing Program Hybrid III Neck Flexion Test (Male)
Maximum Value: 23.3 at 9.2 Milliseconds Test Information: S/N of Part: n/a Test I.D.: NF500
Minimum Value: -3.2 at 89.8 Milliseconds



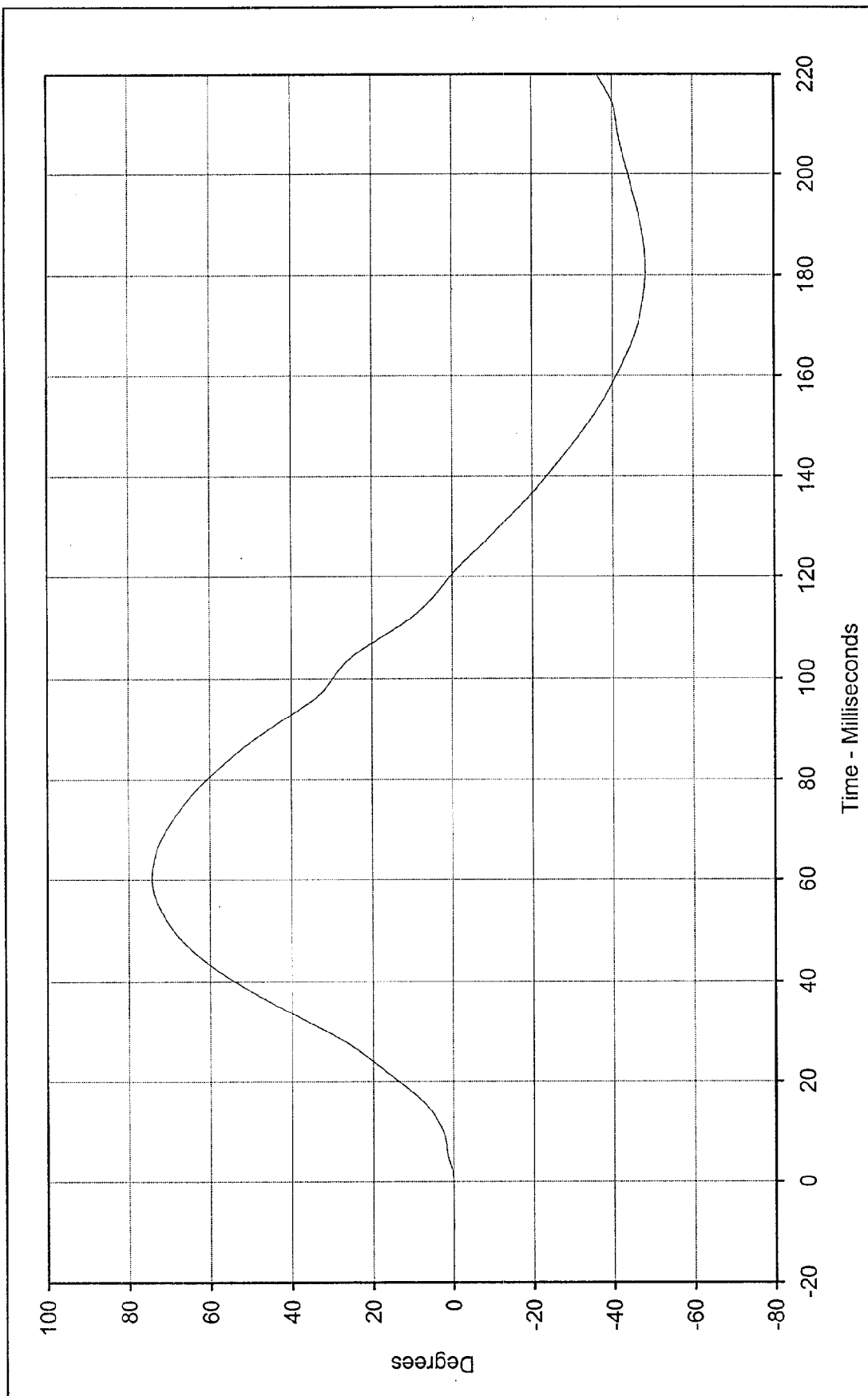
SAE Filter Class: 60
Date of Test: 1/17/98
ATD Serial No.: 035



Curve Description: Neck Force X
 Maximum Value: 857.7 at 54.6 Milliseconds
 Minimum Value: -183.5 at 167.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NF500

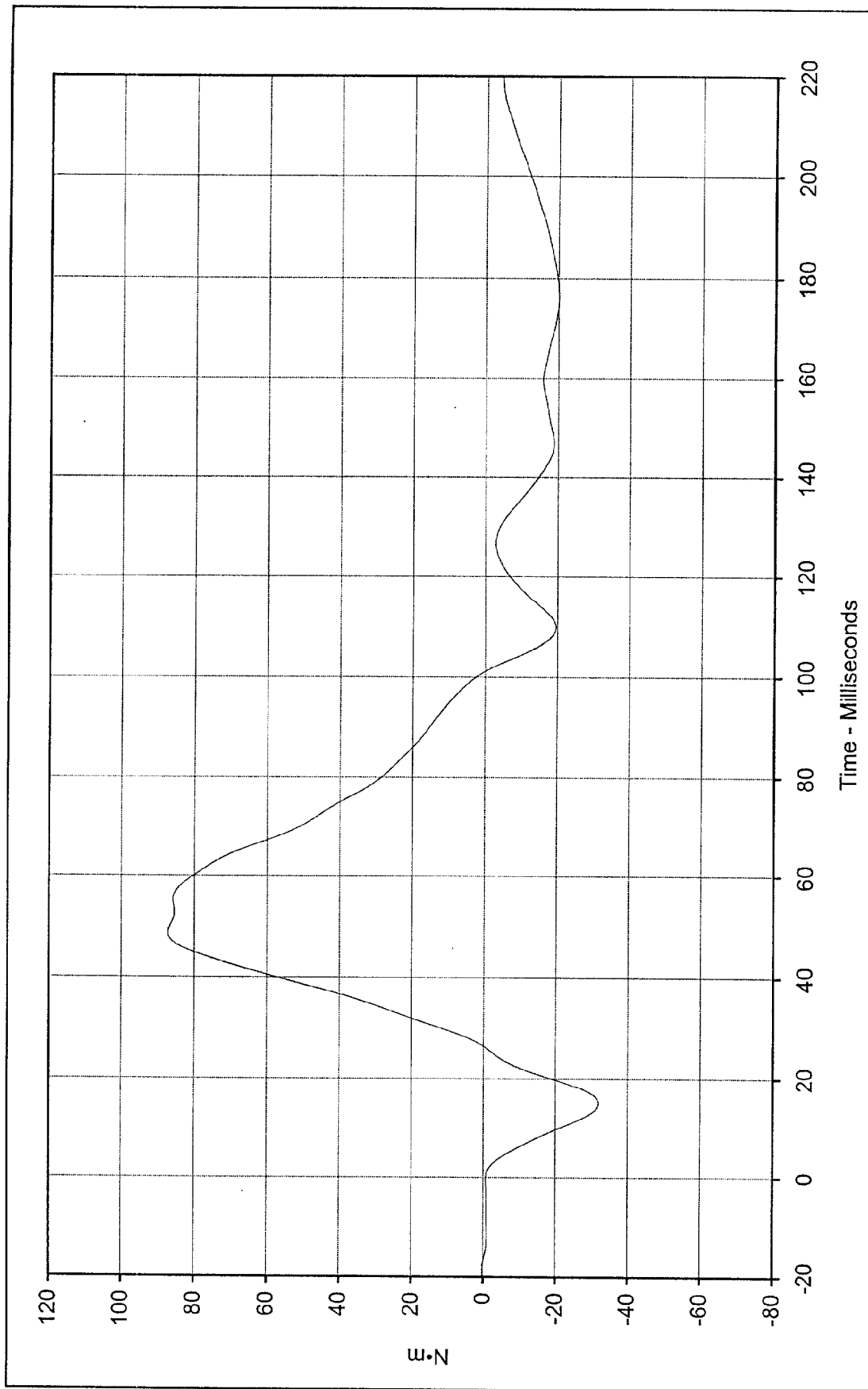




Curve Description: Hybrid III Neck Flexion Test (Male)
 Testing Program: S/N of Part: n/a Test I.D.: NF500

"D" Plane Rotation
 Maximum Value: 74.3 at 60.3 Milliseconds
 Minimum Value: -48.2 at 181.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 035





Curve Description: Moment About Occipital Condyles

Maximum Value: 87.2 at 48.4 Milliseconds

Minimum Value: -31.9 at 15.0 Milliseconds

SAE Filter Class: 60

Date of Test: 1/17/98

ATD Serial No.: 035

Testing Program Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF500





Hybrid III Calibration Data Sheet

50TH Percentile Male

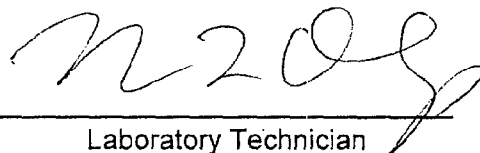
Neck Extension Test

ATD Serial No.: 035

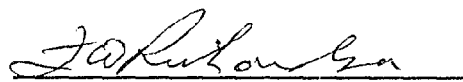
Part Serial No.: n/a

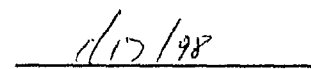
Test I.D.: NE700

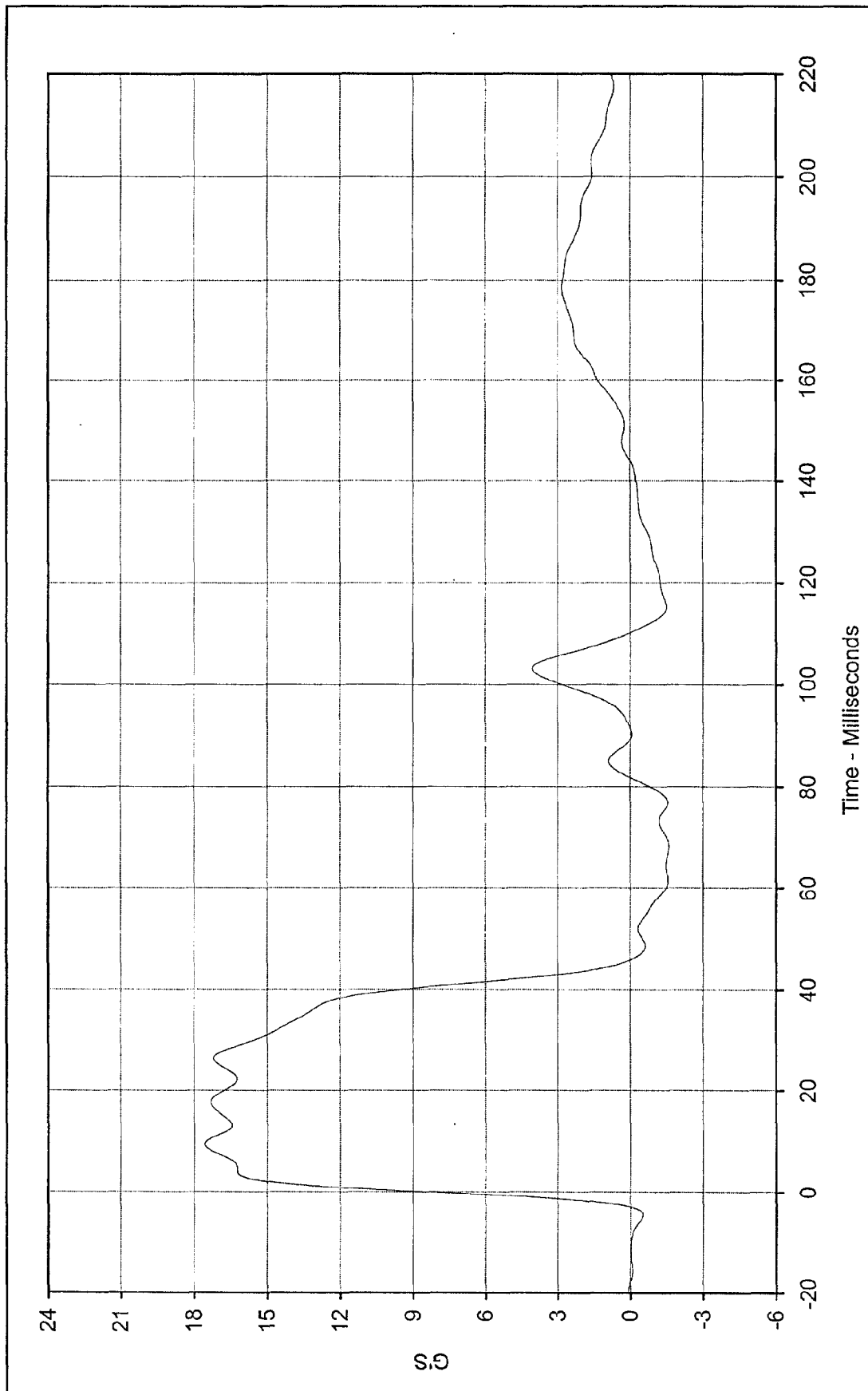
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.15	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.5	Pass
	20 Msec.	G's	14.0 to 19.0	16.8	Pass
	30 Msec.	G's	11.0 to 16.0	15.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	42.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	97.1	Pass
	Time	Msec.	72.0 to 82.0	77.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	158.4	Pass
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-72.4	Pass
	Time	Msec.	65.0 to 79.0	66.5	Pass
Negative Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	145.6	Pass
Overall Test Results					Pass


Laboratory Technician

January 17, 1998
Test Date

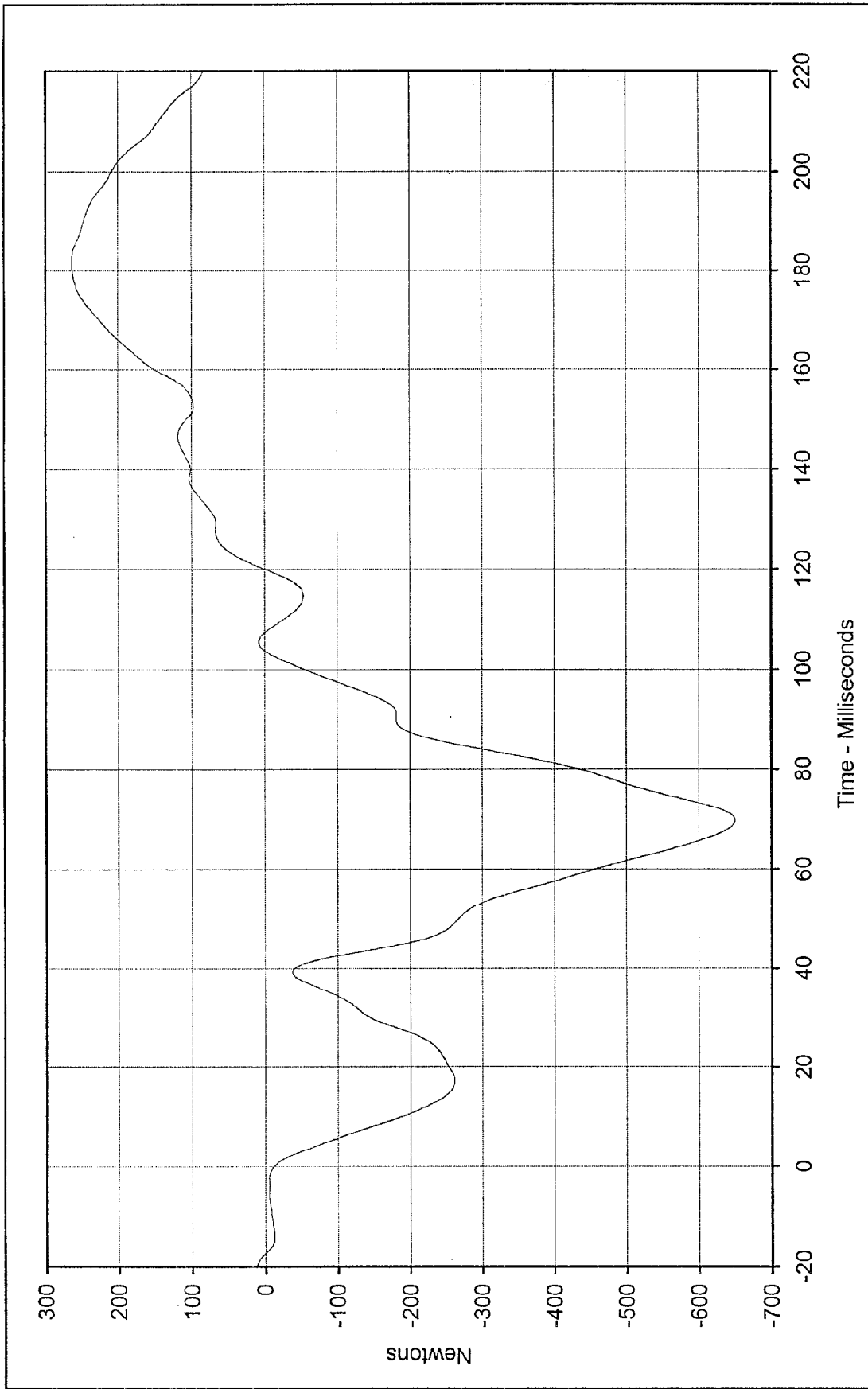

Approved By


Date



Curve Description: _____ Testing Program: Hybrid III Neck Extension Test (Male)
 Maximum Value: 17.6 at 9.3 Milliseconds
 Minimum Value: -1.6 at 68.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 035

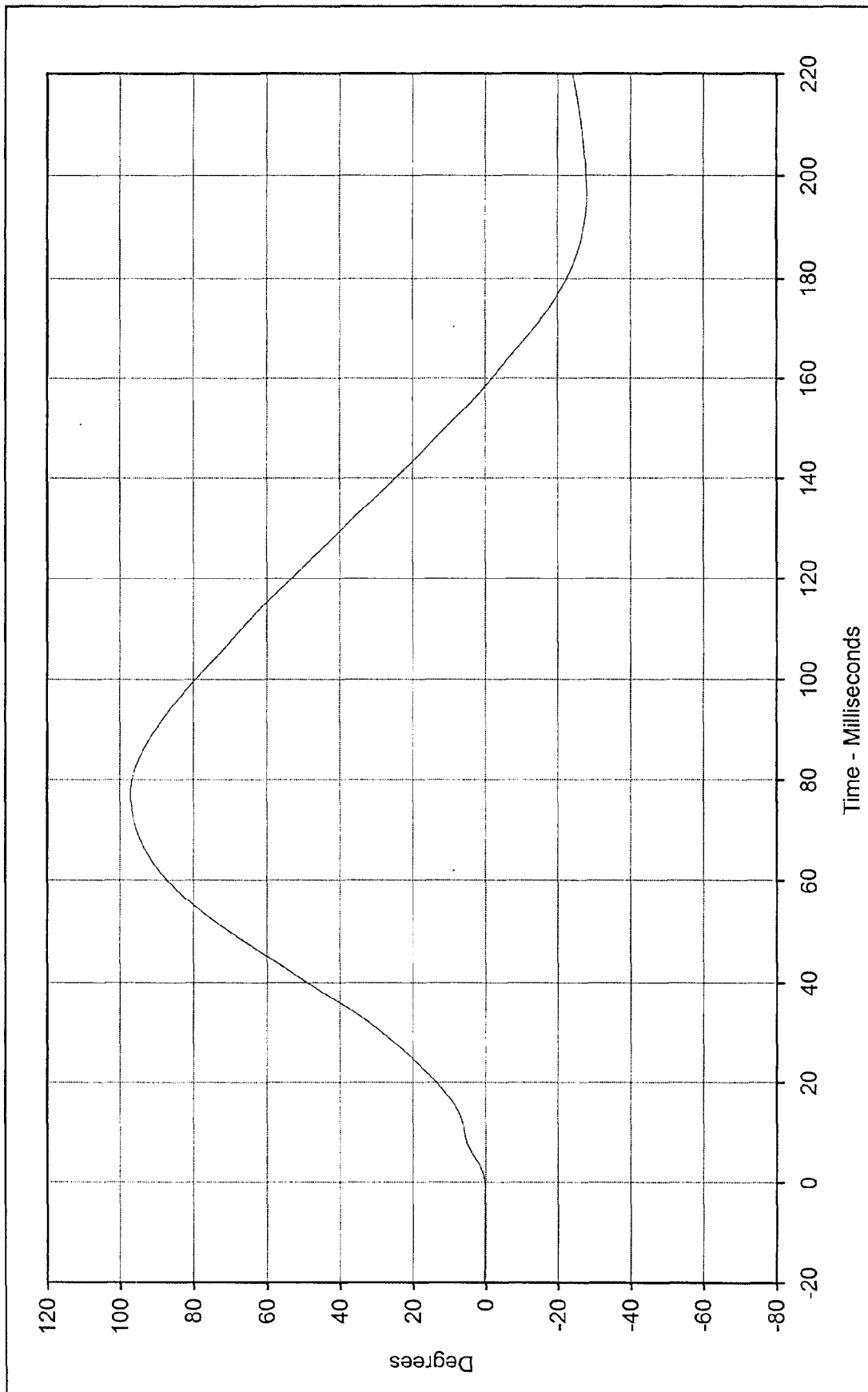




Testing Program Hybrid III Neck Extension Test (Male)
Test Information: S/N of Part: n/a Test I.D.: NE700

Curve Description: Neck Force X
Maximum Value: 263.3 at 181.1 Milliseconds
Minimum Value: -650.4 at 69.7 Milliseconds
SAE Filter Class: 60
Date of Test: 1/17/98
ATD Serial No.: 035

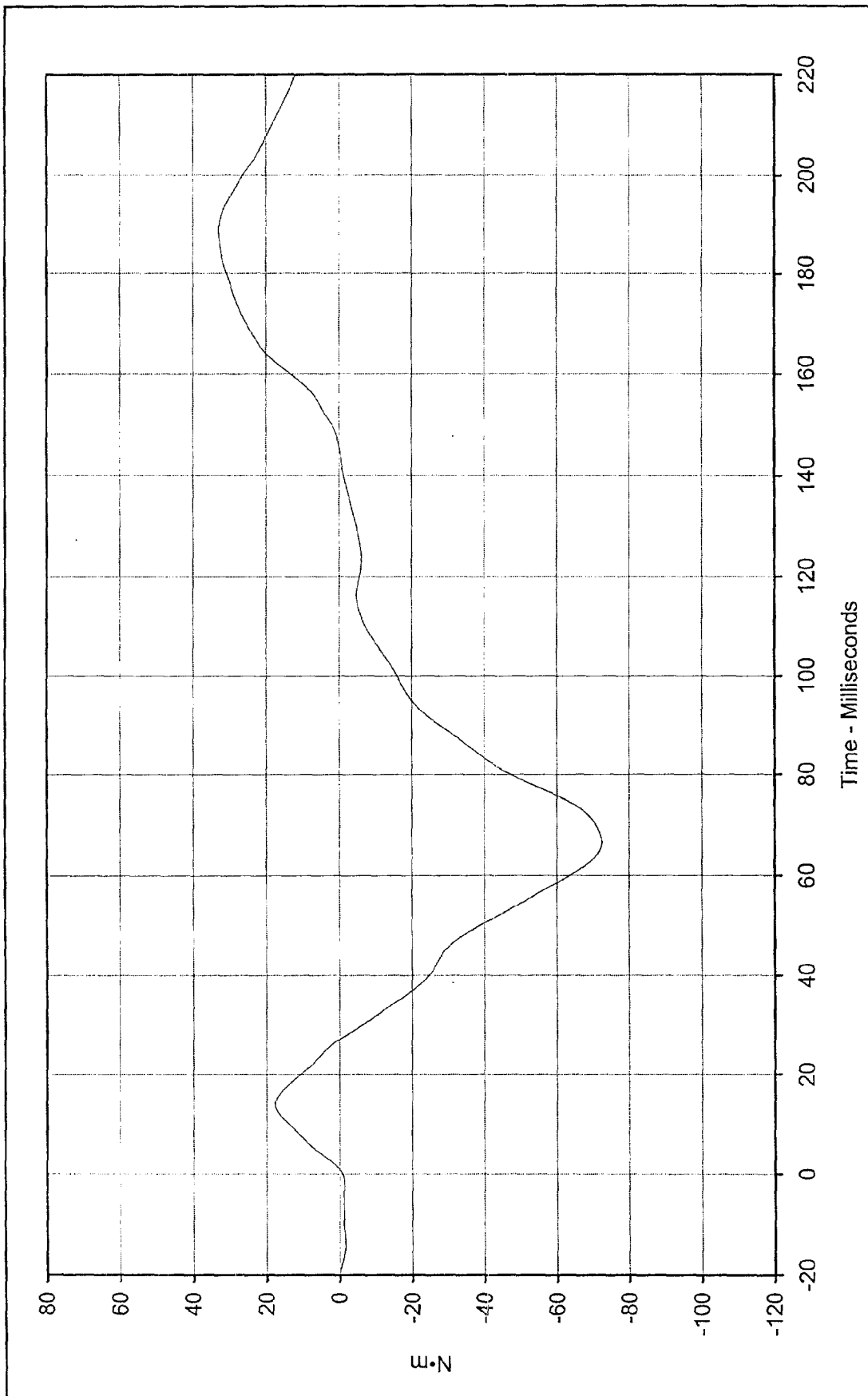




Testing Program Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE700



Curve Description: "D" Plane Rotation
 Maximum Value: 97.1 at 77.2 Milliseconds
 Minimum Value: -28.0 at 195.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 1/17/98
 ATD Serial No.: 035



Curve Description:	Moment About Occipital Condyles	Testing Program	Hybrid III Neck Extension Test (Male)
Maximum Value:	32.9 at 188.7 Milliseconds	Test Information:	S/N of Part: n/a Test I.D.: NE700
Minimum Value:	-72.4 at 66.5 Milliseconds		
SAE Filter Class:	60		
Date of Test:	1/17/98		
ATD Serial No.:	035		





Hybrid III Calibration Data Sheet

50TH Percentile Male

External Measurements

ATD Serial No.: 035

Part Serial No.: N/A

Test I.D.: N/A

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43.0	Pass
A - Total sitting height	mm	878.8 to 889.0	884.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	516.0	Pass
C - "H" point height	mm	83.8 to 88.9	88.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	138.0	Pass
E - Shoulder pivot from back	mm	83.8 to 94.0	86.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	151.0	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	302.0	Pass
H - Skull cap to back line	mm	40.6 to 45.7	44.0	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	330.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	209.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	600.0	Pass
L - Popliteal length	mm	429.3 to 454.7	450.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	486.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	475.0	Pass
O - Chest depth	mm	213.4 to 228.6	225.0	Pass
P - Foot length	mm	251.5 to 266.7	265.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	434.0	Pass
W - Foot breadth	mm	91.4 to 106.7	105.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	980.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	860.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	433.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	229.0	Pass
Overall Test Results				Pass

N 20 Sp

Laboratory Technician

January 19, 1998

Test Date

John R. Lounsbury

Approved By

1/19/98

Date

APPENDIX F
VEHICLE OWNER'S MANUAL
OCCUPANT RESTRAINT INSTRUCTIONS

Seats and Seat Controls

This section tells you about the seats -- how to adjust them, and also about reclining front seatbacks, seatback latches and the folding rear seatback.

Manual Front Seat

CAUTION:

You can lose control of the vehicle if you try to adjust a manual driver's seat while the vehicle is moving. The sudden movement could startle and confuse you, or make you push a pedal when you don't want to. Adjust the driver's seat only when the vehicle is not moving.

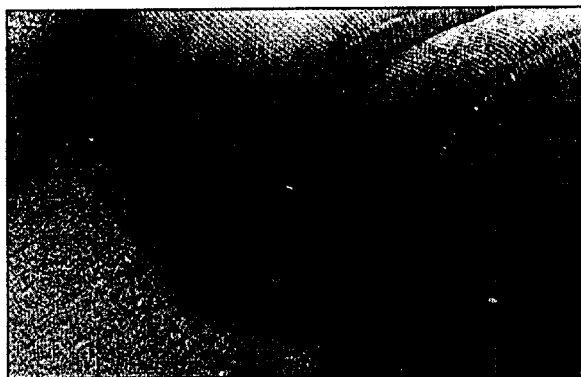


Move the lever under the passenger's front seat to unlock it.

Slide the seat to where you want it. Then release the lever and try to move the seat with your body to make sure the seat is locked into place. Be sure the lever returns to its original position after moving the seat.

1-2

4-Way Manual Seat

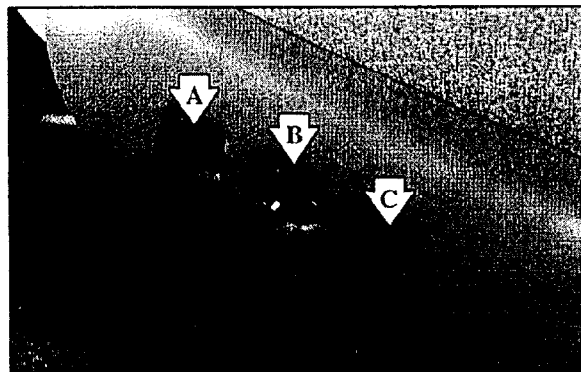


There are two levers at the front of the driver's seat. The left lever adjusts the seat forward and rearward. The right lever adjusts the angle of the front of the seat.

To adjust the seats forward and rearward, lift the lever under the left front of the seat. Slide the seat to where you want it. Then release the lever and try to move the seat with your body to make sure the seat is locked into place.

To raise or lower the front of the seat, lift the right lever and lean forward or backward.

6-Way Power Seat (If Equipped)



The driver's seat has three controls on the left side.

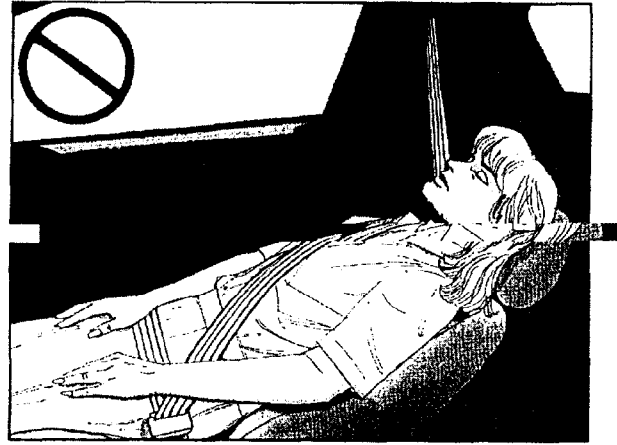
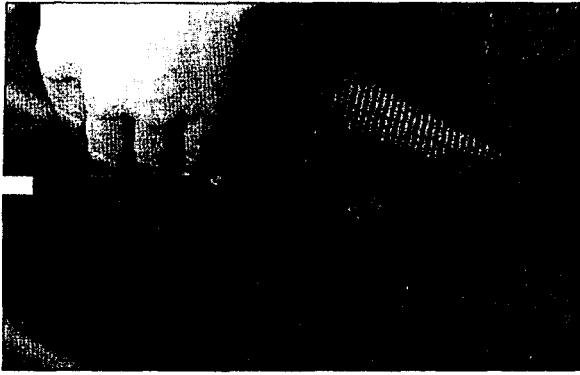
A: The front control makes the front of the seat go up and down.

B: The back control makes the back of the seat go up and down.

C: The center control makes the whole seat go up and down or forward and backward.

1-3

Reclining Front Seatbacks



To adjust the seatback, lift the lever on the outer side of the seat. Release the lever to lock the seatback where you want it. Pull on the lever and the seat will go to its original upright position.

But don't have a seatback reclined if your vehicle is moving.

1-4

CAUTION:

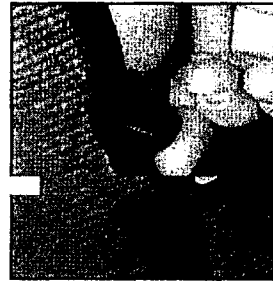
Sitting in a reclined position when your vehicle is in motion can be dangerous. Even if you buckle up, your safety belts can't do their job when you're reclined like this.

The shoulder belt can't do its job. In a crash you could go into it, receiving neck or other injuries.

The lap belt can't do its job either. In a crash the belt could go up over your abdomen. The belt forces would be there, not at your pelvic bones. This could cause serious internal injuries.

For proper protection when the vehicle is in motion, have the seatback upright. Then sit well back in the seat and wear your safety belt properly.

Front Seatback Latches



The front seatbacks fold forward to let people get into the back seat.

To fold a seatback forward, lift the latch located on the lower backside of the seatback. Then the seatback will fold forward.

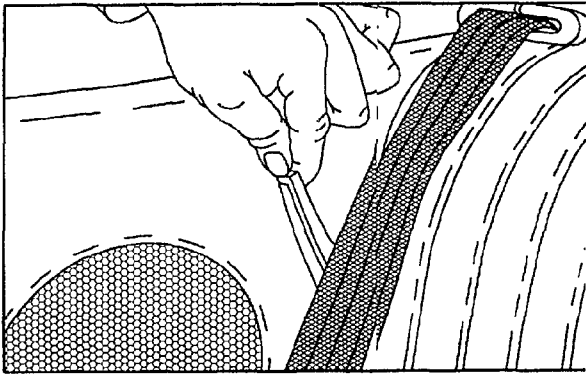
When you return the seatback to its original position, make sure the seatback is locked. The latch must be pushed rearward to work properly.

CAUTION:

If the seatback isn't locked, it could move forward in a sudden stop or crash. That could cause injury to the person sitting there. Always press rearward on the seatback to be sure it is locked.

1-5

Folding Rear Seatback



The rear seatback in your vehicle folds down to provide more storage space.

To fold the seatback down:

1. Pull forward on both levers.
2. Fold the seatback down.

To raise the seatback:

1. Pull it up to the locked, upright position.
2. Be sure both latches hold the seatback in place. Have them fixed if they don't.

1-6

Safety Belts: They're for Everyone

This part of the manual tells you how to use safety belts properly. It also tells you some things you should not do with safety belts.

And it explains the air bag system.

CAUTION:

Don't let anyone ride where he or she can't wear a safety belt properly. If you are in a crash and you're not wearing a safety belt, your injuries can be much worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be if you are buckled up. Always fasten your safety belt, and check that your passengers' belts are fastened properly too.

CAUTION:

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



Your vehicle has a light that comes on as a reminder to buckle up. (See "Safety Belt Reminder Light" in the Index.)

In most states and Canadian provinces, the law says to wear safety belts. Here's why: *They work.*

You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

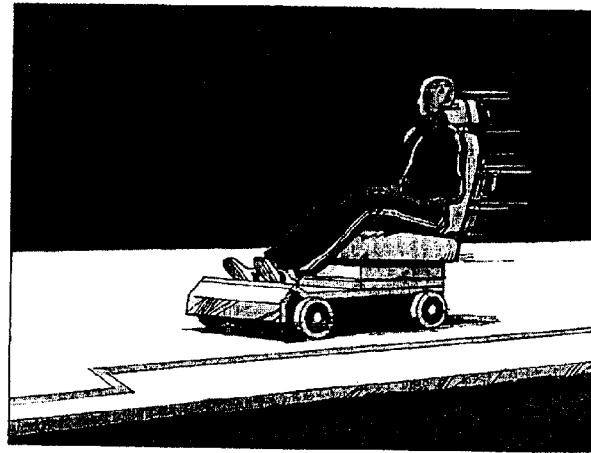
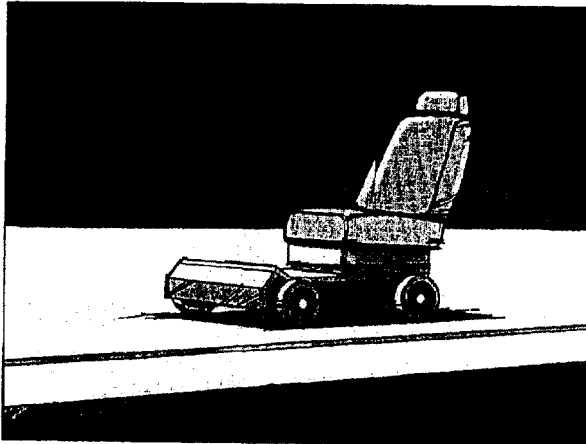
A few crashes are mild, and some crashes can be so serious that even buckled up a person wouldn't survive. But most crashes are in between. In many of them, people who buckle up can survive and sometimes walk away. Without belts they could have been badly hurt or killed.

After more than 30 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter . . . a lot!

1-7

Why Safety Belts Work

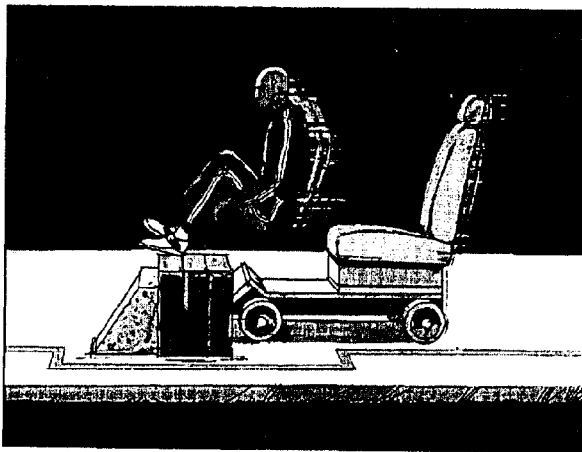
When you ride in or on anything, you go as fast as it goes.



Put someone on it.

Take the simplest vehicle. Suppose it's just a seat on wheels.

1-8

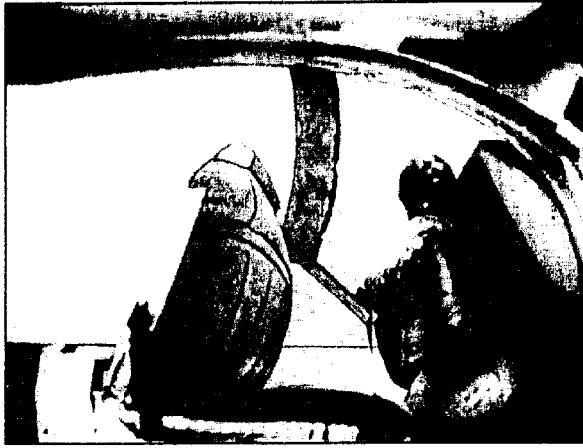


Get it up to speed. Then stop the vehicle. The rider doesn't stop.

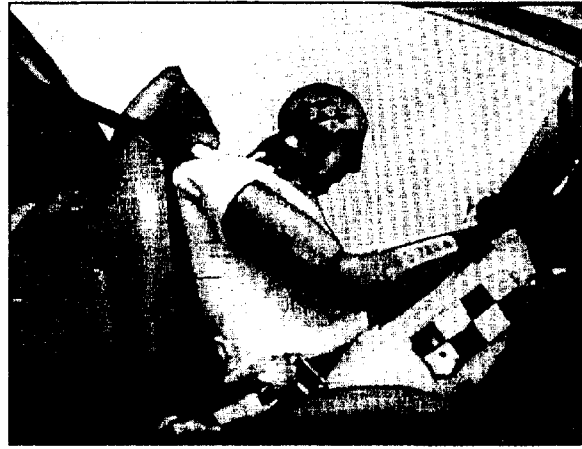


The person keeps going until stopped by something. In a real vehicle, it could be the windshield . . .

1-9



or the instrument panel . . .



or the safety belts !

With safety belts, you slow down as the vehicle does. You get more time to stop. You stop over more distance, and your strongest bones take the forces. That's why safety belts make such good sense.

1-10

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.

1-11

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 vehicle, 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.

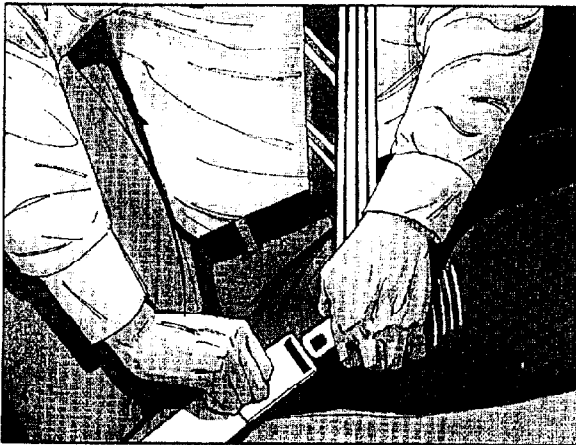
Lap-Shoulder Belt

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.



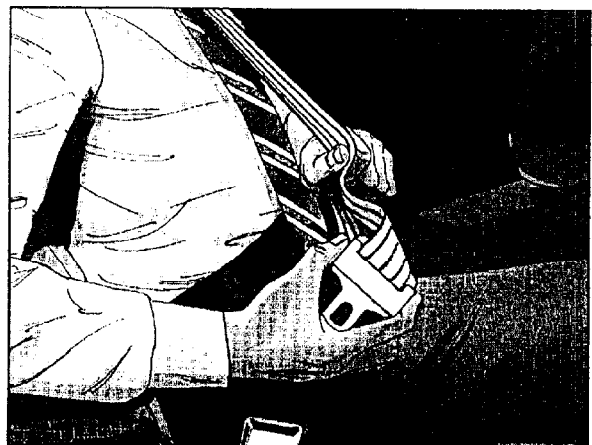
I-12



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

On convertible models, 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.

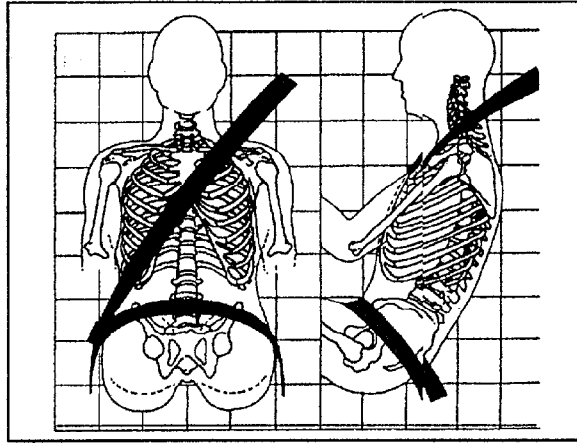
Pull up on the latch plate to make sure it is secure. If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

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.

1-13



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

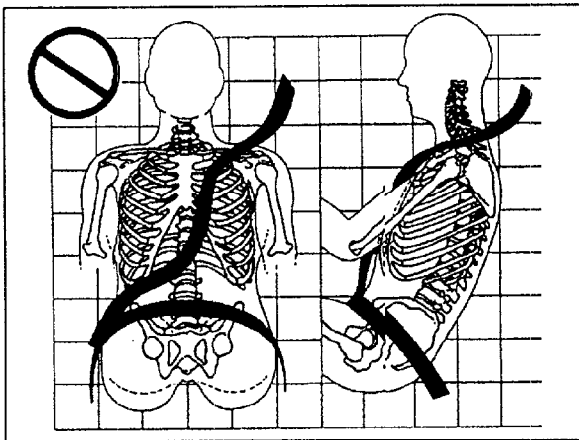


The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even 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. On convertible models, the safety belt also locks if you pull the belt very quickly out of the retractor.

1-14

Q: What's wrong with this?



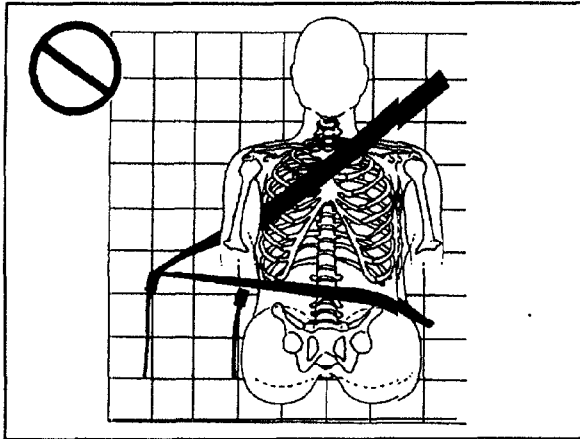
⚠ CAUTION:

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.

1-15

Q: What's wrong with this?



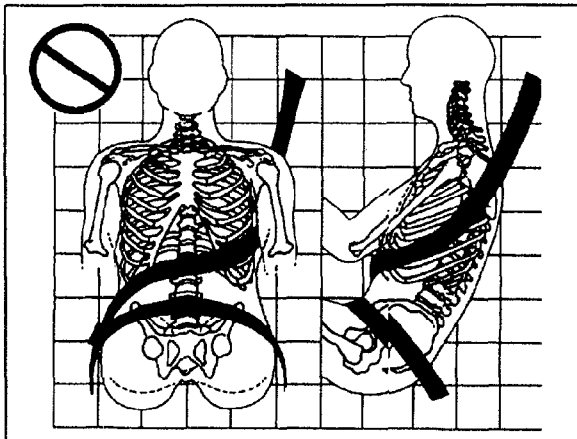
⚠ CAUTION:

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.

1-16

Q: What's wrong with this?



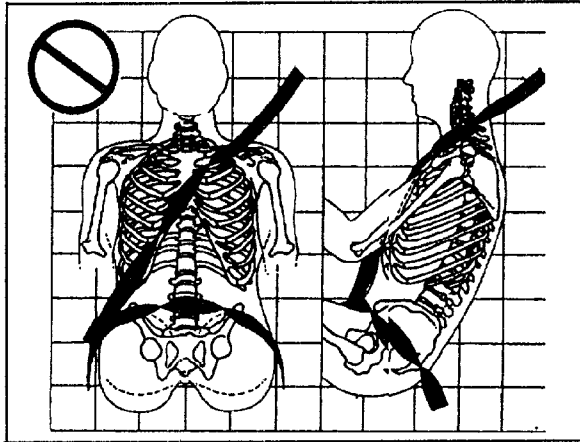
⚠ CAUTION:

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.

1-17

Q: What's wrong with this?

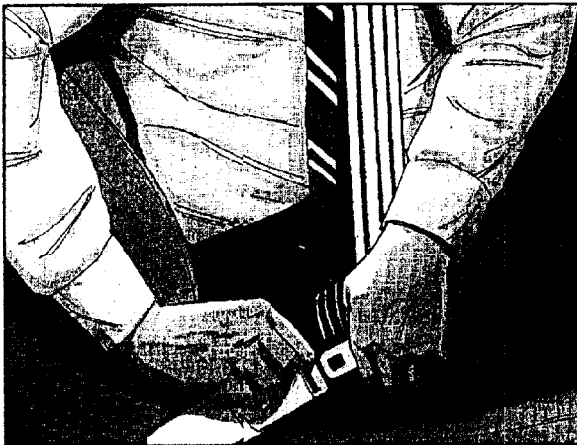


⚠ CAUTION:

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.

A: The belt is twisted across the body.

1-18

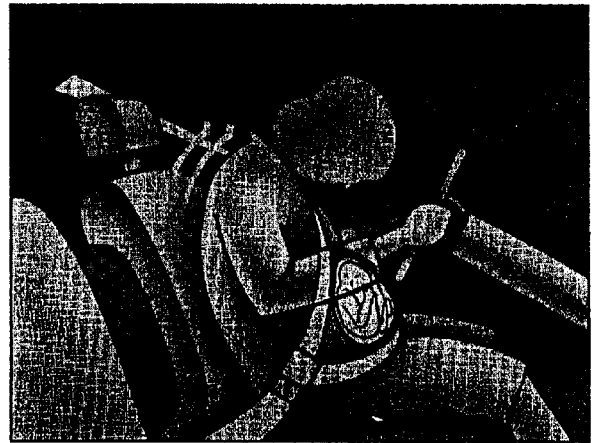


To unlatch the belt, just push the button on the buckle. The belt should go back out of the way.

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.

1-19

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.

Air Bag System

This part explains the airbag system.

Your vehicle 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.

1-20

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 before and during 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:

Children who are up against, or very close to, an air bag when it inflates can be seriously injured or killed. Air bags plus lap-shoulder belts offer the best protection for adults and older children, but not for young children and infants. Neither the vehicle's safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide. Always secure children properly in your vehicle. To read how, see the part of this manual called "Children" and see the caution labels on the sunvisors and the right front passenger's safety belt.

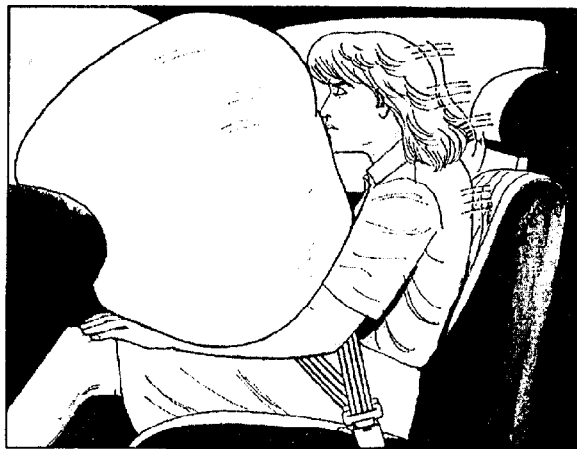
AIR
BAG

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

1-21

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



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

Where are the air bags?

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

1-22

CAUTION:

If something is between an occupant and an air bag, the bag might not inflate properly or it might force the object into that person. The path of an inflating air bag must be kept clear. Don't put anything between an occupant and an air bag, and don't attach or put anything on the steering wheel hub or on or near any other 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 (14 to 24 km/h). The threshold level can vary, however, 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 any particular crash, no one can say whether an air bag should have inflated 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.

1-23

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 distribute 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 -- 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.

1-24

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.
- 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 Vehicle

Air bags affect how your vehicle 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 dealer and the 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.

1-25

⚠ CAUTION:

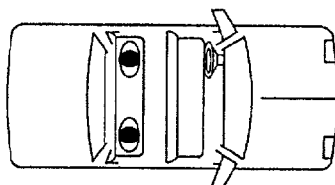
For up to 10 minutes after the ignition key is turned off and the battery is disconnected, an air bag can still inflate during improper service. You can be injured if you are close to an air bag when it inflates. Avoid wires wrapped with yellow tape or yellow connectors. They are probably part of the 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.

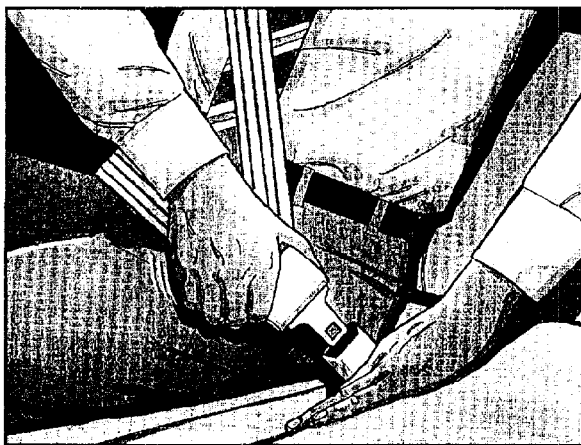
Rear passengers who aren't safety belted can be thrown out of the vehicle in a crash. And they can strike others in the vehicle who are wearing safety belts.



Lap-Shoulder Belt

The rear seats have lap-shoulder belts. Here's how to wear one properly.

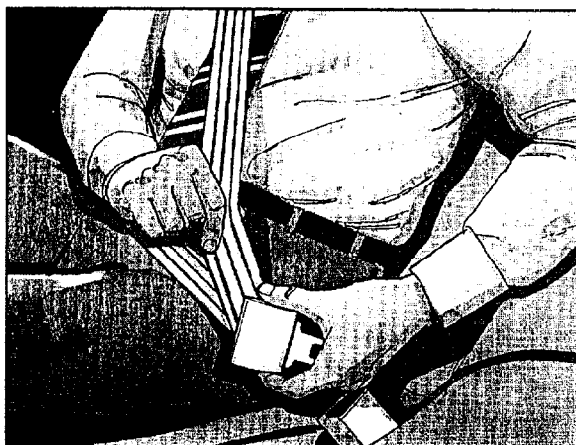
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1. Pick up the latch plate and pull the belt across you. Don't let it get twisted.

On convertible models, 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.

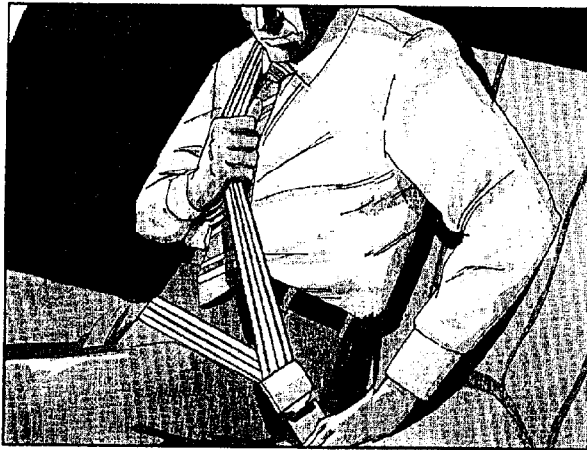


If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle it.

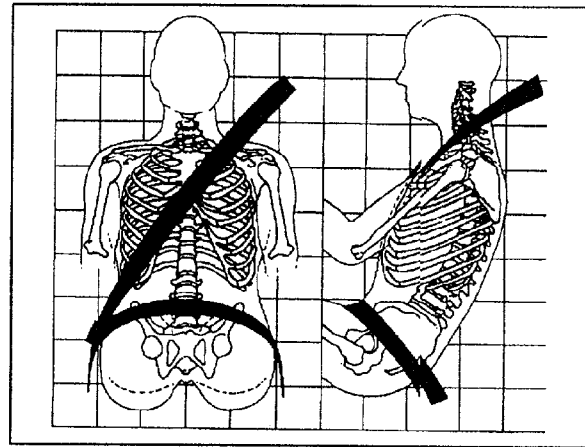
Pull up on the latch plate to make sure it is secure.

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.

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



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.

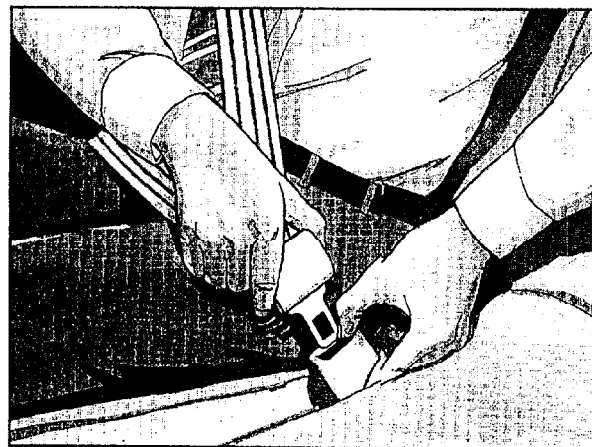
The safety belt locks if there's a sudden stop or a crash.

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On convertible models, the safety belt also locks 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.



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

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