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REPORT NO. KAR-98-13

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

TOYOTA MOTOR CORPORATION
1998 TOYOTA RAV 4 SUV
NHTSA NO. MW5110

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



MARCH 27, 1998
FINAL REPORT

PREPARED FOR:
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16. <i>Abstract</i> A 35 mph (56.3 km/h) frontal barrier impact test was conducted on a 1998 Toyota Rav 4 SUV at KARCO Engineering on February 26, 1998. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301 and footwell intrusion performance. The impact velocity was 55.6 km/h. The ambient temperature at the barrier face at the time of impact was 15.5°C. The vehicle's maximum post-test static crush was 529 mm, located at the right side 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>434.2</td><td>354.8</td></tr> <tr> <td>Chest Resultant Peak 3 msec clip</td><td>60 G's</td><td>48.7</td><td>46.3</td></tr> <tr> <td>Left Femur Force</td><td>10009 N</td><td>-2655.5</td><td>-3291.6</td></tr> <tr> <td>Right Femur Force</td><td>10009 N</td><td>-3399.8</td><td>-3220.9</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	434.2	354.8	Chest Resultant Peak 3 msec clip	60 G's	48.7	46.3	Left Femur Force	10009 N	-2655.5	-3291.6	Right Femur Force	10009 N	-3399.8	-3220.9
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SECTION 1

PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MW5110

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 February 26, 1998, at a speed of 55.6 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 Toyota Rav 4 SUV at a velocity of 55.6 km/h. The test weight, with two (2) 50th percentile male ATDs, was 1599 kg.

The driver's Head Injury Criteria (HIC) was 434.2, the maximum chest deceleration over three (3) milliseconds was 48.7 g and the left and right femur loads were -2655.5 and -3399.8 Newtons, respectively. Chest deflection for the driver ATD was -46.1 mm. The driver ATD head contacted the airbag and headrest, its chest and abdomen contacted the airbag, the left knee contacted the knee bolster, with the right knee contacting the knee bolster and the steering column.

The right front passenger's HIC was 354.8, maximum chest deceleration over three (3) milliseconds was 46.3 g and the left and right femur loads were -3291.6 and -3220.9 Newtons respectively. Chest deflection for the passenger ATD was -30.5 mm. The passenger ATD head contacted the airbag, headrest and hand hold, the chest and abdomen contacted the airbag, the left knee contacted the glove box and dashboard, with the right knee contacting the glove box.

Seat belt spoolout, measured by on-board pullout potentiometers was 83.8 mm for the driver ATD and 105.2 mm for the passenger ATD. Shoulder belt stretch was 0 mm/cm for the driver ATD and 0 mm/cm for the passenger ATD. Note: Driver and Passenger belt stretch were not recorded due to the pre-tensioners on the seat belt system

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 529 mm at the right side of the vehicle. Both the driver side and the passenger side doors opened without the aid of tools.

1.4 GENERAL COMMENTS

The 1998 Toyota Rav 4 SUV 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 TOYOTA RAV 4 SUV

NHTSA NO. MW5110

TEST MODE: 56.3 km/h NCAP Frontal Barrier Impact

TEST DATE: February 26, 1998

TIME: 12:03 PM

TEMPERATURE: 15.5° C

TEST WEIGHT: 1599 kg

IMPACT VELOCITY: 55.6 km/h

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

Measurements in mm	Left Side	Centerline	Right Side
Vehicle Rebound	1075	1000	1075

VEHICLE STATIC CRUSH

Measurements in mm	Left	Center	Right
Pre-test Measurements	3794	3977	3790
Post-test Measurements	3500	3510	3261
Static Crush	-294	-467	-529

DOOR OPENING AND SEAT TRACK INFORMATION

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

DUMMY INFORMATION

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

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE: 1998 TOYOTA RAV 4 SUV

NHTSA NO. MW5110

TEST VEHICLE INFORMATION			
Manufacturer	TOYOTA MOTOR CORPORATION	VIN	JT3HP10V8W0171088
Manufacturing Date	12/97	Delivery Date	2/12/98
Dealer	TOYOTA OF RIVERSIDE	NHTSA NO.	MW5110
Odometer Reading	000066 Mi.	Fuel Type	UNLEADED
Engine Displacement	2.0 Liter	Cylinders	4
Transmission	5 Speed Manual	Final Drive	FRONT
Engine Placement	Transverse	Color	BLACK
Tire Press./Max. Cap. Front	196 kPa	Cold Tire Press. Front	196 kPa
Tire Press./Max. Cap. Rear	182 kPa	Cold Tire Press. Rear	182 kPa
Recommend Tire Size	215/70R16	Type of Spare	CONVENTIONAL 215/70R16
Tire Size on Vehicle	212/70R16	Manufacturer	DUNLOP
GVWR	1791 kg	Cargo Capacity	136 kg
GAWR Front	910 kg	GAWR Rear	990 kg
Air Conditioning	YES	Power Steering	YES
Power Brakes	YES	AM/FM/Cassette	YES
Disc Brakes (Front)	YES	Disc Brakes (Rear)	NO
Power Windows	NO	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 5 OCCUPANTS x 68 kg. 340 kg

WEIGHT OF VEHICLE AS RECEIVED AT KARCO (with maximum fluids): 1319 kg

Data Sheet No. 2... (Continued)

VEHICLE CAPACITY WEIGHT (kg):

Vehicle Capacity Weight 476 kg
 Occupant Weight 340 kg
 Rated Cargo/Luggage Weight (RCLW) 136 kg

	FRONT	REAR	TOTAL
Right	385	277	662
Left	380	277	657
Total	765	554	1319
Percent of Total	57.9	42.1	100%

CALCULATION OF TEST TARGET WEIGHT (kg):

Total Delivered Weight 1319 kg
 RCLW 136 kg
 Weight of 2 P572 ATDs 152 kg
 TARGET TEST WEIGHT 1607 kg

TEST WEIGHT OF VEHICLE WITH 2 ATDs AND BALLAST

	FRONT	REAR	TOTAL
Right	413	390	803
Left	406	390	796
Total	819	780	1599
Percent of Total	51.2	48.8	100%

Weight of Ballast secured in cargo area: 55 kg

Includes cameras, instrumentation, brake
 abort and bags containing lead shot secured
 in the cargo area.

Vehicle Components Removed For Weight Reduction:

Side mirrors, jack, tools, spare tire
 and paneling.

TEST VEHICLE ATTITUDE (mm)

ATTITUDE	LF	RF	LR	RR
As Delivered	890	890	780	780
As Tested	882	880	770	773

Vehicle Wheelbase: 2450 mm

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 57.9 liters

Usable Capacity Figure Furnished by COTR = 57.9 liters

Test Volume Range (92 to 94% of Usable Capacity) = 53.28 to 54.44 liters

ACTUAL TEST VOLUME = 54.40 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 No X

DETAILS OF FUEL SYSTEM: Pump operates only when engine is running.

DATA SHEET NO. 3**POST IMPACT DATA**TEST VEHICLE: 1998 TOYOTA RAV 4 SUVNHTSA NO. MW5110TEST MODE: 56.3 km/h New Car Assessment Program (NCAP) Frontal Barrier ImpactTEST DATE: February 26, 1998TIME: 12:03 PMTEMPERATURE: 15.5 ° CREQUIRED 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 = 55.6 km/hTrap No. 2 = 55.5 km/h

Distance from vehicle to barrier - -

A. entering trap = 1524 mmB. leaving trap = 305 mm

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

Vehicle Length	Left	Center	Right
Pre-test Measurements (mm)	3794	3977	3790
Post-test Measurements (mm)	3500	3510	3261
Static Crush (mm)	-294	-467	-529
Average	-430		

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	1075	1000	1075

DATA SHEET NO. 4

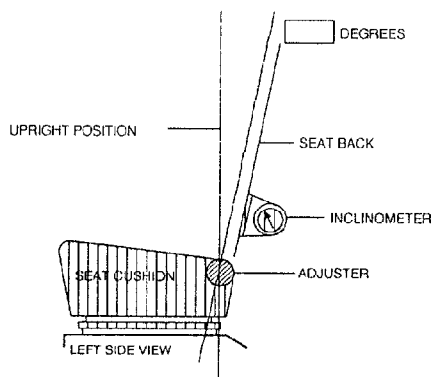
TEST VEHICLE INFORMATION

TEST VEHICLE: 1998 TOYOTA RAV 4 SUV

NHTSA NO. MW5110

1. NOMINAL DESIGN RIDING POSITION -

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



Measurement Instructions: A special application tool with pointed probes was inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly approximately 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 = 20°

FRONT SEAT ASSEMBLY

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

Seat back angle for passenger's seat = 20°

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: 16 seating positions, set to 9th from front.

Positioning of the passenger's seat (if applicable): 12 seating positions, set to 7th from front.

3. STEERING COLUMN ADJUSTMENTS:

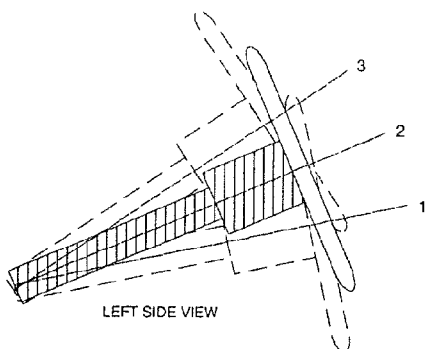
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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

Operational Instructions:

Position No. 1 is at 26°

Position No. 2 is at 28°

Position No. 3 is at 30°

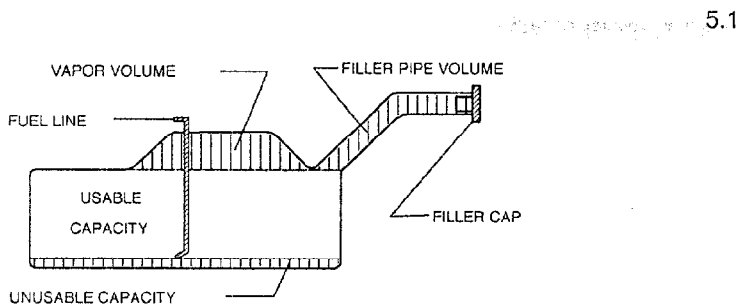


STEERING COLUMN ASSEMBLY

4. SEAT BELT UPPER ANCHORAGE:

Second position from the most upper position.

5. FUEL TANK CAPACITY DATA



A. "Usable Capacity" of standard equipment fuel tank = 57.9 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 = 53.2 to 54.4 liters.

VEHICLE FUEL TANK ASSEMBLY

Operational Instructions:

5.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 54.4 liters

5.3 Is vehicle equipped with electric fuel pump?

Yes X No

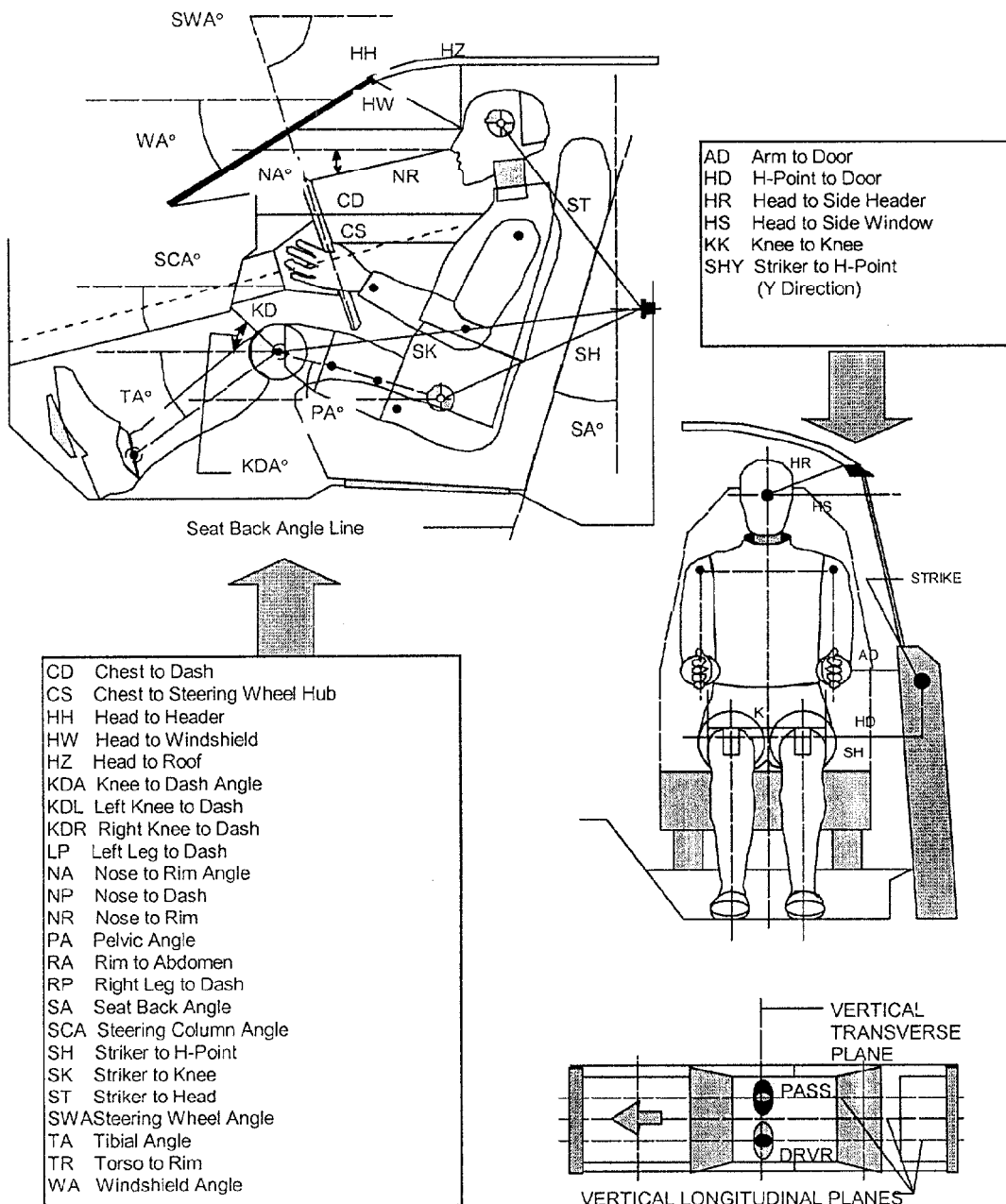
If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

Pump operates only when engine is running.

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 TOYOTA RAV 4 SUV

NHTSA NO. MW5110

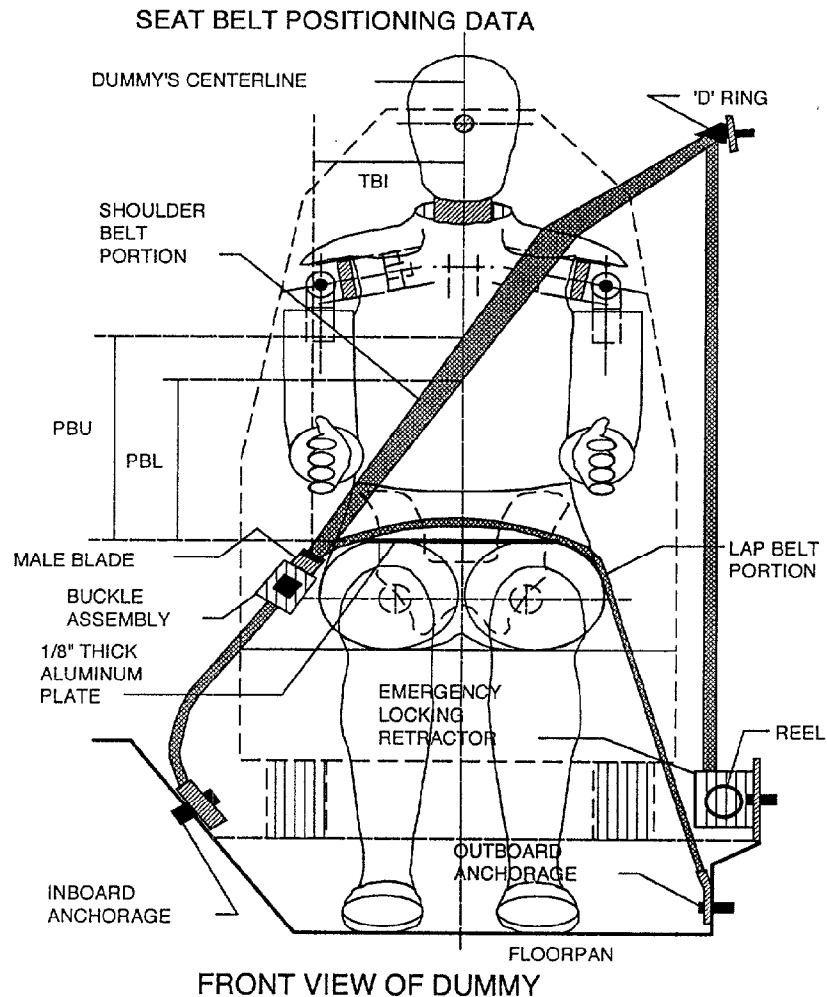
FRONT SEAT MEASUREMENT TABLE

	DRIVER (Serial No. <u>34</u>)		PASS. (Serial No. <u>35</u>)	
	DISTANCE (mm)	ANGLE (°)	DISTANCE (mm)	ANGLE (°)
WA°		39		
SWA°		63		
SCA°		29		
SA°		20		20
HZ	203	90	215	90
HH	346	0	360	0
HW	534	0	550	0
HR	245		180	
NR	380	18		
CD	510		515	
CS	288	0		
RA	176	0		
KDL	143	23	136	
KDR	140		150	26
PA°		22.5		23
TA°		48		38
KK	265		210	
ST	660	5	610	1
SH	85	0	605	0
SHY	245		235	
HS	305		248	
HD	185		172	
AD	92		105	

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

SEATING POSITION	DRIVER	PASSENGER
TCI -- Dummy centerline to shoulder bolt	260	261
PBU--Top surface of aluminum plate to belt upper edge	320	340
PBL--Top surface of aluminum plate to belt lower edge	255	270
Lap Belt tension	10 Newtons	10 Newtons
Shoulder Belt tension	Retractor	Retractor



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

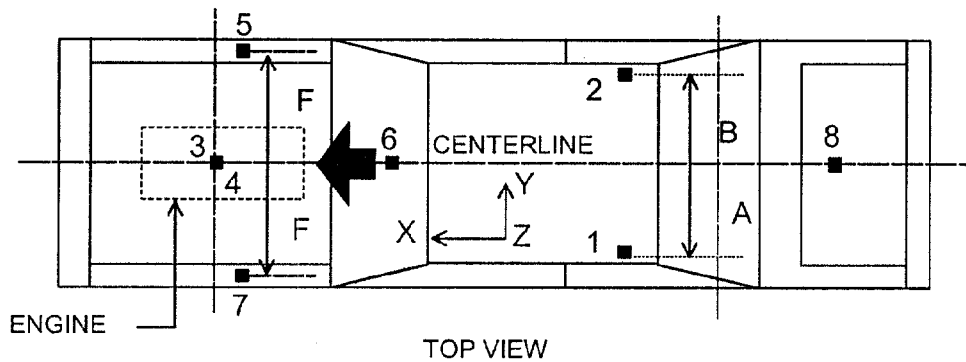
TEST VEHICLE: 1998 TOYOTA RAV-4 SUV NHTSA No.: MW5110
 TEST PROGRAM: 1998 NHTSA 35 MPH NCAP TEST DATE: 2/26/98

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

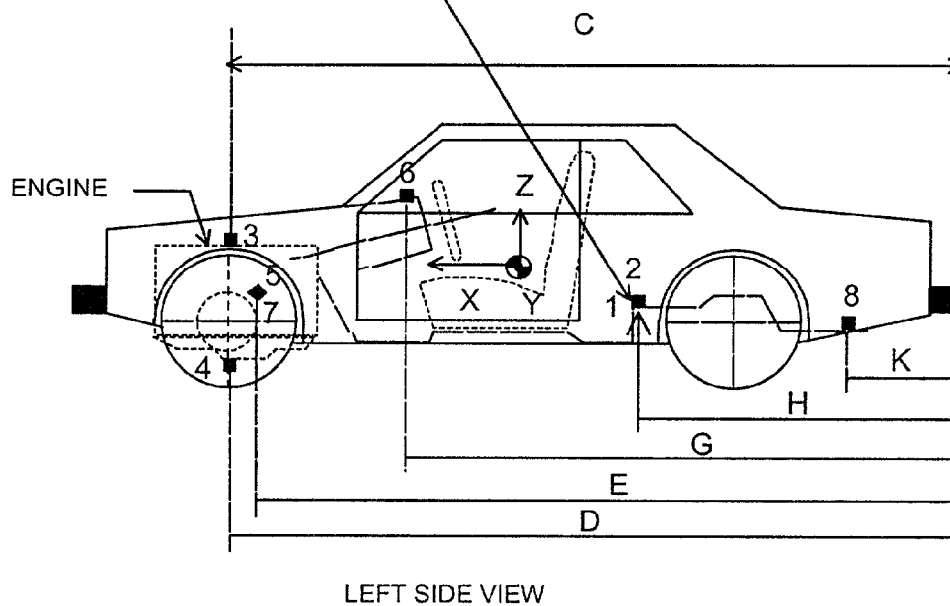
No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member (Pri.)	1568	-610	449	G's	2.0	120.1	-55.8	36.3
2	Right Rear X-Member (Pri.)	1588	631	440	G's	1.7	133.8	-49.9	36.9
3	Engine Top	3327	85	934	G's	53.6	34.7	-152.7	21.8
4	Engine Bottom	3468	289	264	G's	43.8	30.1	-182.3	23.8
5	Left Brake Caliper	3343	-668	276	G's	33.0	52.9	-131.3	36.5
6	Right Brake Caliper	3342	668	277	G's	53.4	55.4	-118.6	34.2
7	Instrument Panel	3379	-17	1119	G's	87.5	30.5	-82.3	25.9
8	Left Rear X-Member (Rednt.)	1493	-572	448	G's	1.8	118.1	-61.1	36.4

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

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



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

TEST VEHICLE: 1998 TOYOTA RAV-4 SUV

NHTSA No.: MW5110

TEST PROGRAM: 1998 NHTSA 35 MPH NCAP

TEST DATE: 2/26/98

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	24.4	202.6	-52.6	68.9	11.7	207.9	-34.1	74.3
Head CG	Y	G's	6.3	74.3	-11.9	102.7	23.0	84.3	-9.3	25.7
Head CG	Z	G's	23.6	64.3	-10.1	96.7	32.1	71.4	-2.4	142.6
Head CG Resultant	N/A	G's	56.1	67.5			49.7	76.0		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.5	168.5	-49.2	74.4	2.1	159.3	-48.2	60.8
Chest CG	Y	G's	2.2	106.4	-6.4	75.8	2.9	45.5	-6.1	93.3
Chest CG	Z	G's	16.8	95.3	-15.4	46.1	12.3	46.4	-16.4	104.8
Chest CG Resultant	N/A	G's	50.1	74.4			48.6	60.8		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	807.6	40.9	-2655.5	57.3	439.4	41.6	-3291.6	59.6
Right Femur	Z	Newtons	836.0	40.3	-3399.8	53.7	591.8	37.9	-3220.9	55.4

SEAT BELT PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt	N/A	Newtons	13540.7	53.6	6.4	1.1	14198.7	55.3	-15.5	1.8
Shoulder Belt	N/A	Newtons	9066.7	65.7	-37.0	136.4	8659.3	67.2	-41.9	8.2

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	434.2	41.8	59.4	95.3	354.8	38.5	54.7	90.6

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	48.7	72.8	75.8	46.3	58.6	61.6

DATA SHEET NO. 8...(continued)

TEST VEHICLE:	1998 TOYOTA RAV-4 SUV	NHTSA No.: MW5110
TEST PROGRAM:	1998 NHTSA 35 MPH NCAP	TEST DATE: 2/26/98

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	6.5	112.3	-65.3	54.0	9.3	115.5	-77.4	56.3
Pelvis	Y	G's	11.1	85.4	-9.2	66.9	6.4	39.1	-6.0	51.7
Pelvis	Z	G's	6.9	40.5	-16.7	61.4	3.7	256.4	-16.9	66.5

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	485.9	143.3	-518.1	66.1	704.4	130.9	-214.1	60.5
Neck Force	Y	Newtons	146.1	226.1	-295.6	121.3	404.4	69.5	-298.4	116.7
Neck Force	Z	Newtons	1564.3	64.6	-270.9	98.5	1660.8	74.3	-361.6	250.4
Neck Moment	X	Joules	22.2	79.4	-7.7	219.2	27.9	54.6	-12.0	29.6
Neck Moment	Y	Joules	40.6	141.7	-33.0	243.6	45.7	141.4	-40.8	244.8
Neck Moment	Z	Joules	8.2	113.5	-7.4	80.9	34.3	84.7	-13.3	140.4

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	140.5	40.2	-43.2	71.5	21.8	83.3	-194.5	38.6
Left Foot Aft	Z	G's	17.3	51.6	-141.0	41.3	25.9	35.2	-61.0	38.7
Left Foot Fore	Z	G's	25.6	35.3	-169.1	42.2	69.5	34.8	-87.3	37.3
Right Foot Aft	X	G's	29.8	68.4	-185.2	43.4	131.4	39.6	-27.0	78.2
Right Foot Aft	Z	G's	158.2	42.3	-26.0	51.2	15.4	71.0	-60.7	42.1
Right Foot Fore	Z	G's	292.0	41.1	-73.6	39.8	25.2	51.0	-84.6	39.9

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	42.4	127.9	-1376.2	40.8	743.1	52.6	-1037.6	37.9
Left Lower Force	Z	Newtons	97.8	122.5	-2994.7	39.9	686.0	45.7	-2359.7	38.0
Left Lower Moment	Y	Joules	73.5	40.7	-219.9	70.8	91.6	38.2	-53.0	43.6
Left Upper Moment	X	Joules	38.4	48.9	-21.9	82.2	15.5	142.1	-68.6	67.7
Left Upper Moment	Y	Joules	160.7	40.5	-11.1	239.7	157.6	37.8	-115.2	52.1
Right Lower Force	X	Newtons	103.0	117.8	-1275.7	44.9	520.0	52.6	-671.2	40.4
Right Lower Force	Z	Newtons	146.7	64.8	-2172.6	46.3	393.6	53.6	-2195.5	81.6
Right Lower Moment	Y	Joules	98.9	44.5	-122.8	52.7	71.5	40.0	-82.0	76.3
Right Upper Moment	X	Joules	47.0	46.7	-32.2	83.7	51.1	76.1	-32.7	66.8
Right Upper Moment	Y	Joules	150.7	45.0	-28.9	71.1	74.3	40.3	-88.2	52.8

DATA SHEET NO. 8...(continued)

TEST VEHICLE: 1998 TOYOTA RAV-4 SUV

NHTSA No.: MW5110

TEST PROGRAM: 1998 NHTSA 35 MPH NCAP

TEST DATE: 2/26/98

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.1	10.4	-46.1	75.4	0.1	3.9	-30.5	71.7

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	21.8	215.7	-53.3	68.2	16.5	208.0	-34.1	74.3
Head CG	Y	G's	5.4	58.5	-5.8	97.9	23.6	87.0	-5.8	25.7
Head CG	Z	G's	21.3	63.8	-11.5	93.4	30.9	71.8	-1.7	15.4
Head CG Resultant	N/A	G's	56.8	68.2			48.4	75.8		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.7	168.2	-50.1	74.5	2.7	159.4	-47.0	60.8
Chest CG	Y	G's	2.6	106.3	-6.0	76.1	2.9	45.3	-5.0	91.0
Chest CG	Z	G's	16.3	93.9	-13.3	41.8	9.5	46.4	-14.6	105.3
Chest CG Resultant	N/A	G's	51.1	74.5			47.2	60.8		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Redundant	432.5	40.8	61.6	97.5	358.0	38.5	54.6	90.5

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	49.5	73.0	76.0	45.1	58.6	61.6

DATA SHEET NO. 9

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

BELT LENGTH DATA (mm)	DRIVER	PASSENGER
Total belt length for continuous webbing systems.	2864	2864
Retractor reel to 'D' ring	695	695
Shoulder belt length as measured on Part 572 Dummy	746	780
Lap belt length as measured on Part 572 Dummy	728	757
Remainder of belt on reel	695	632

SHOULDER BELT SPOOL-OFF DATA (mm)	DRIVER	PASSENGER
As determined mechanically	60	60
As determined electronically	83.8	105.2

* NOTE: Driver and passenger belt stretch were not recorded due to the pre-tensioner seat belt system.

BELT STRETCH DATA (mm/cm)	DRIVER	PASSENGER
Measured electronically between shoulder belt load cell and the "D" ring	.0*	.0*
Measured mechanically	.0	.5

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

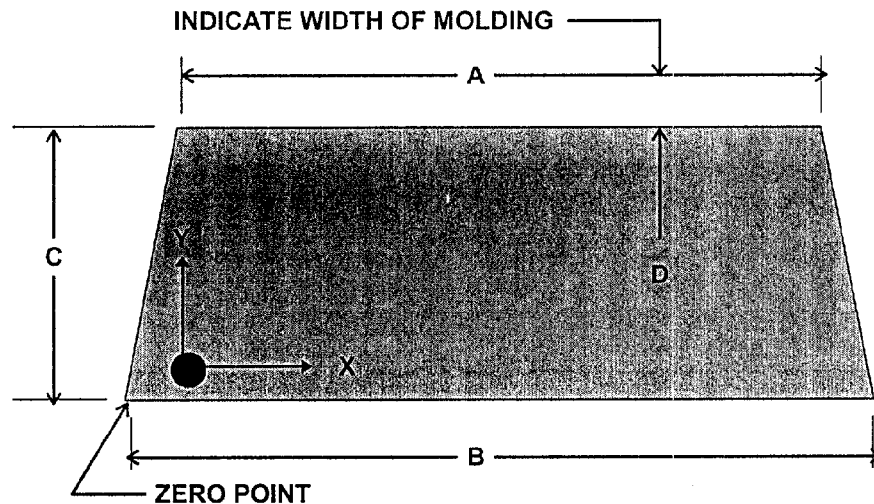
Details of windshield mounting (method of retention, type of trim, etc.):

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	1859	1859	100%
Left Side	1859	1859	100%
Total	3718	3718	100%

Indicate area of retention failure.



FRONT VIEW OF WINDSHIELD

Width of molding = Top 24 mm , Sides 45 mm, Bottom 31 mm.

Temperature of windshield molding during test = 21.1 °C

DATA SHEET NO. 11

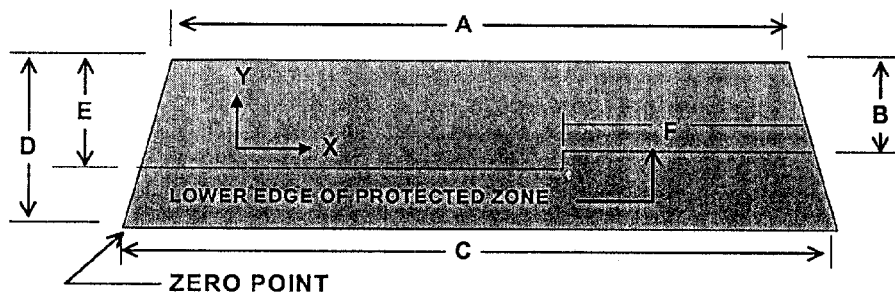
WINDSHIELD ZONE INTRUSION FMVSS 219 (PARTIAL) DATA

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

SKETCH OF FRONT VIEW OF WINDSHIELD:

Provide all dimensions necessary to reproduce the protected area.



	DIMENSION mm
A	1064
B	388
C	1393
D	630
E	492
F	497

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 TOYOTA RAV4 SUV

NHTSA NO. MW5110

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

TEST DATE: February 26, 1998 TIME: 12:03 PM TEMPERATURE 15.5 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

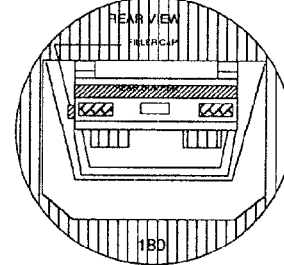
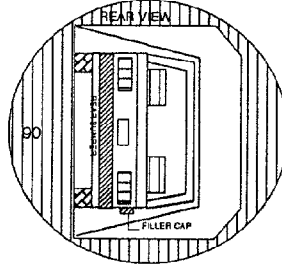
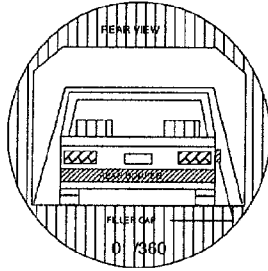
FMVSS 301 STATIC ROLLOVER DATA SHEET

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

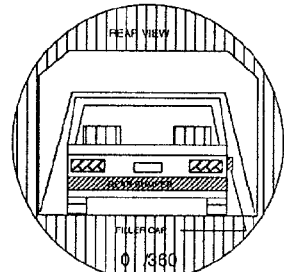
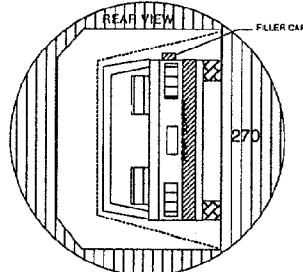
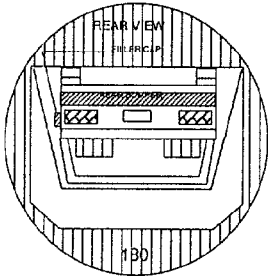
TEST MODE: 56.3 km/h New Car Assessment Program (NCAP) Frontal Barrier Impact

TEST DATE: February 26, 1998 TIME: 12:03 PM TEMPERATURE: 15.5C



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°	82	300	0
90° TO 180°	82	300	0
180° TO 270°	82	300	0
270° TO 360°	81	300	0

3. Provide Details of Stoddard Solvent Spillage Locations--

No solvent leakage occurred during rollover tests.

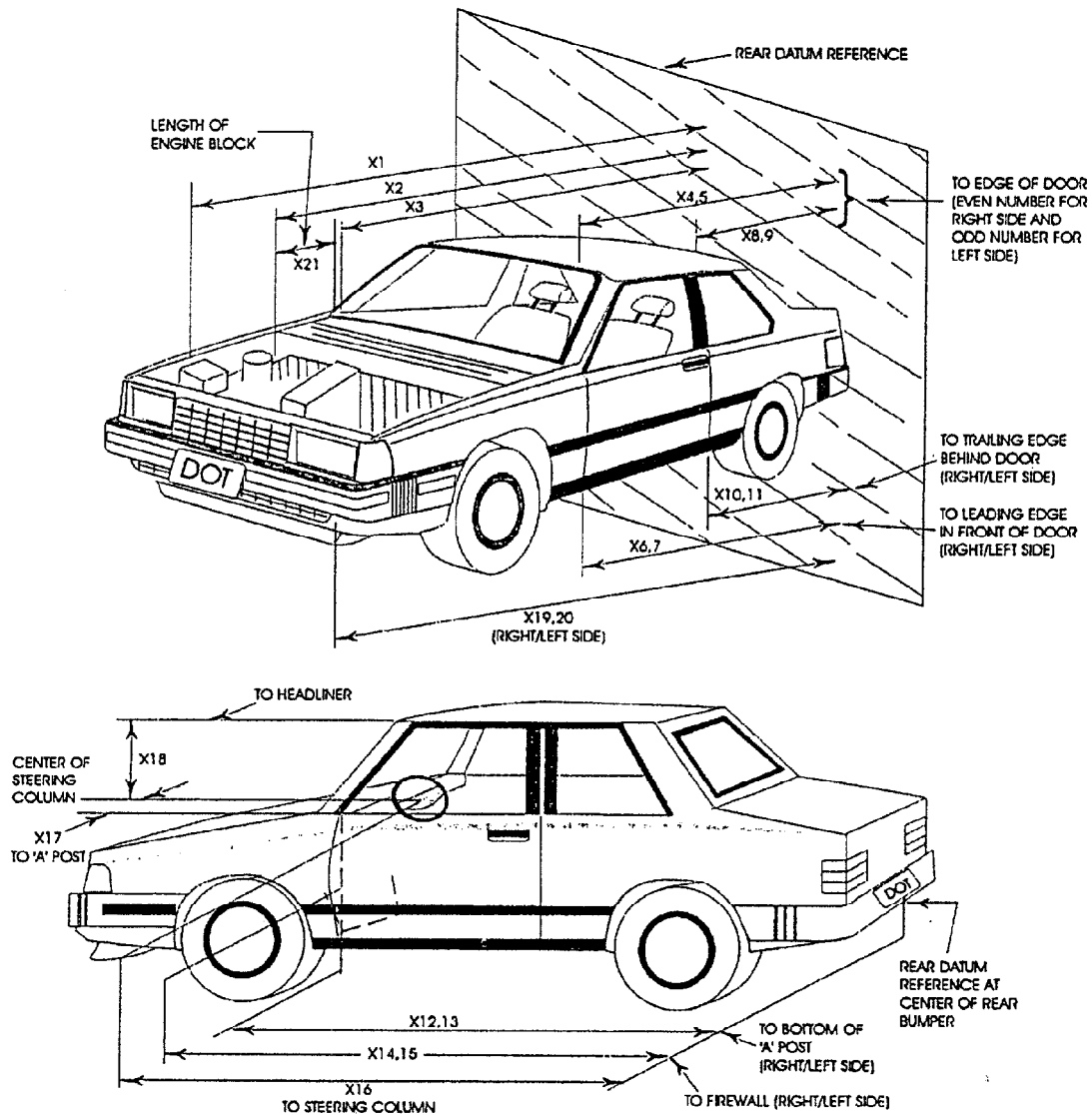
DATA SHEET NO. 14

VEHICLE MEASUREMENTS

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

NO.	MEASUREMENT DESCRIPTION	DIMENSIONS IN MM		
		PRE-TEST	POST-TEST	DIFFERENCE
1	Total length of vehicle at centerline	3977	3510	-467
2	Rear surface of vehicle (RSOV) to front of engine	3417	3210	-207
3	RSOV to firewall centerline	2954	3020	+66
4	RSOV to leading edge of right door	2617	2630	+13
5	RSOV to leading edge of left door	2593	2620	+27
6	RSOV to lower leading edge of right door	2646	2635	-11
7	RSOV to lower leading edge of left door	2640	2655	+15
8	RSOV to upper trailing edge of right door	1756	1770	+14
9	RSOV to upper trailing edge of left door	1758	1770	+12
10	RSOV to lower trailing edge of right door	1748	1740	-8
11	RSOV to lower trailing edge of left door	1742	1750	+8
12	RSOV to bottom of right 'A' pillar	2710	2630	-80
13	RSOV to bottom of left 'A' pillar	2631	2635	+4
14	RSOV to firewall on right side	2895	2785	-110
15	RSOV to firewall of left side	2886	2900	+14
16	RSOV to steering column	2305	2270	-35
17	Center of steering column to left 'A' pillar	382	320	-62
18	Center of steering column to headlining	431	420	-11
19	RSOV to right side of front bumper	3790	3261	-529
20	RSOV to left side of front bumper	3794	3500	-294
21	Length of engine block	404	404	0
22	RSOV to right side of dash panel	2540	2550	+10
23	RSOV to center of dash panel	2534	3540	+6
24	RSOV to left side of dash panel	2546	2525	-21



DATA SHEET NO. 15

CAMERA LOCATIONS

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

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	3	7849	13	200
2B	Left Side View No. 2	1499	-9855	1270	0	8001	25	950
3	Left Side View No. 3	813	-5309	1626	2	8103	50	1040
4	Left Side View No. 4	2489	3150	2108	19	2819	19	1000
5	Left Side View No. 5	1905	-8306	2515	20	8230	25	980
6	Left Side View No. 6	1880	-8382	1092	11	8052	25	700
7	Right Side View No. 1	1295	10,160	1168	3	7925	13	1100
8	Right Side View No. 2	1295	9652	1346	0	9220	50	1120
9	Right Side View No. 3	6832	11,633	1321	7	12,268	80	870
10	Right Side View No. 4	2870	10,719	1372	0	12,370	50	1110
11	Overhead Windshield	914	0	5715	90	9754	13	1130
12	Front View No. 1 Driver	-356	356	2540	45	2845	19	1030
13	Front View No. 2 Passenger	-356	508	2540	45	2845	19	930
14	Pit Camera Engine View	610	0	-660	90	N/A	13	890
15	Pit Camera Fuel Tank View	5029	0	406	45	N/A	19	800
16	Driver Side Onboard	3200	203	1473	10	1270	13	500
17	Passenger Side Onboard	3200	203	1473	10	1270	13	500

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

DATA SHEET NO. 16

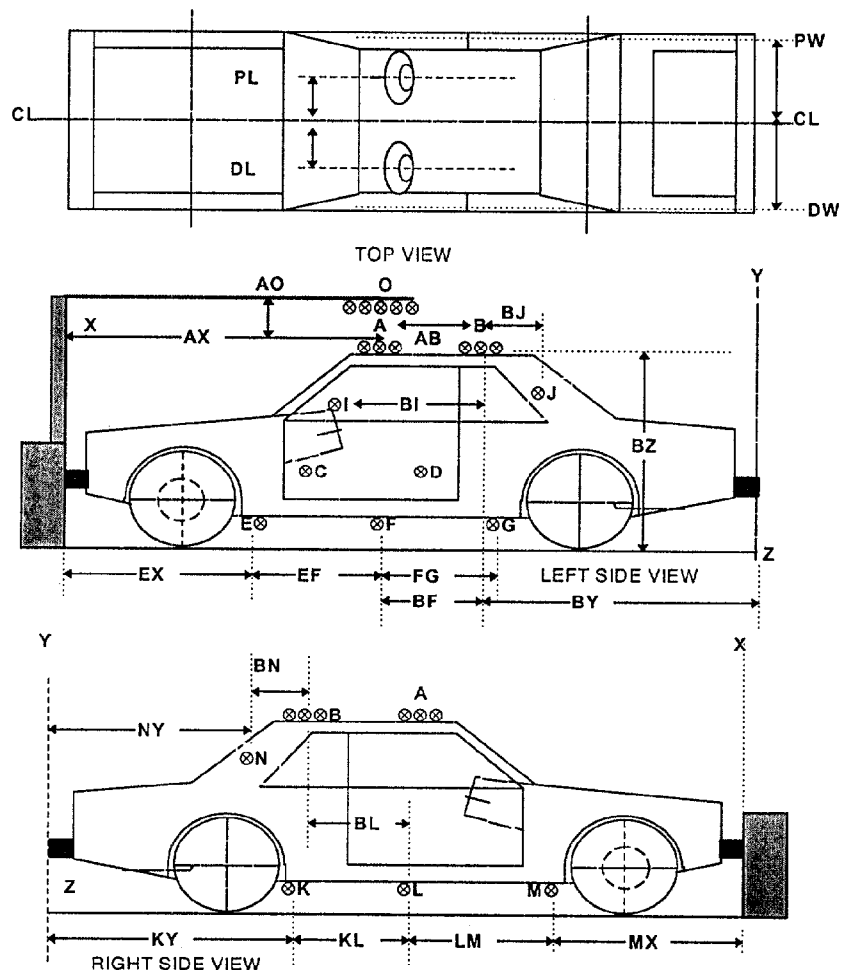
REFERENCE PHOTOGRAPH TARGETS

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

ITEM	DESCRIPTION	VALUE	ITEM	DESCRIPTION	VALUE
AX	TARGET A TO BARRIER	2430	NY	TARGET N TO REAR BUMPER	410
AB	TARGET A TO TARGET B	608	BN	TARGET B TO TARGET N	530
AO	VERTICAL DISTANCE A TO O	152	KY	TARGET K TO REAR BUMPER	1326
BJ	TARGET B TO TARGET J	540	KL	TARGET K TO TARGET L	700
BI	TARGET B TO STEERING COLUMN	1560	BL	TARGET B TO TARGET L	1135
BZ	TARGET B TO GROUND LEVEL	1720	LM	TARGET L TO TARGET M	750
EX	TARGET E TO BARRIER	1235	MX	TARGET M TO BARRIER	1270
EF	TARGET E TO TARGET F	750	CL/PL	VEHICLE CENTERLINE TO PASSENGER	340
FG	TARGET F TO TARGET G	750	CL/PW	VEHICLE CENTERLINE TO RIGHT SILL	720
BF	TARGET B TO TARGET F	1140	CL/DL	VEHICLE CENTERLINE TO DRIVER	340
BY	TARGET B TO REAR BUMPER	990	CL/DW	VEHICLE CENTERLINE TO LEFT SILL	720

Distances in mm



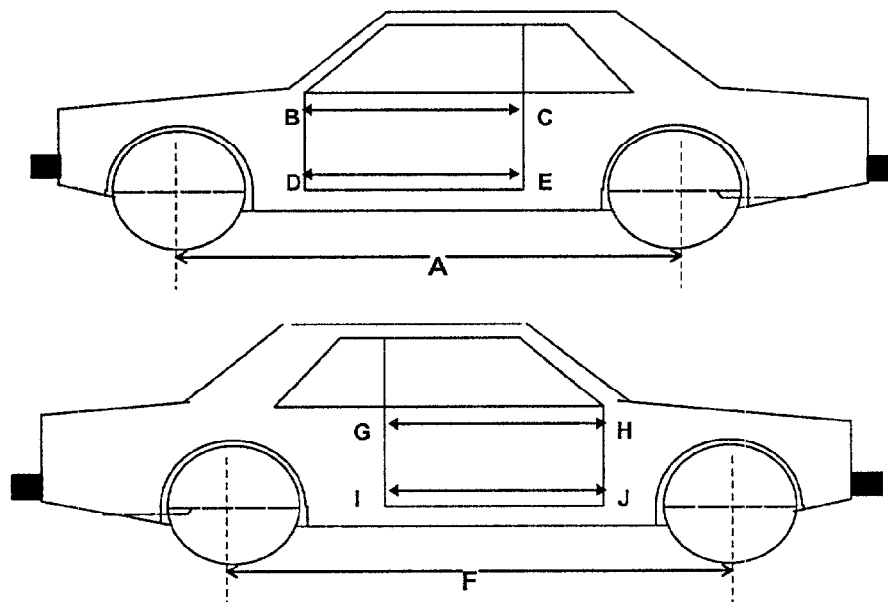
DATA SHEET NO. 17

VEHICLE INTRUSION MEASUREMENTS

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

DOOR OPENING WIDTH



UNITS (mm)	LEFT SIDE		RIGHT SIDE	
MEASUREMENT	BC	DE	GH	IJ
PRE-TEST	835	898	861	898
POST-TEST	850	905	860	895
DIFFERENCE	+15	+7	-1	-3

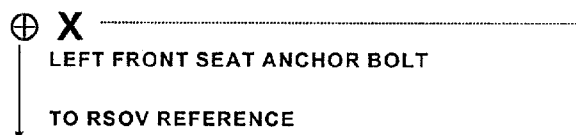
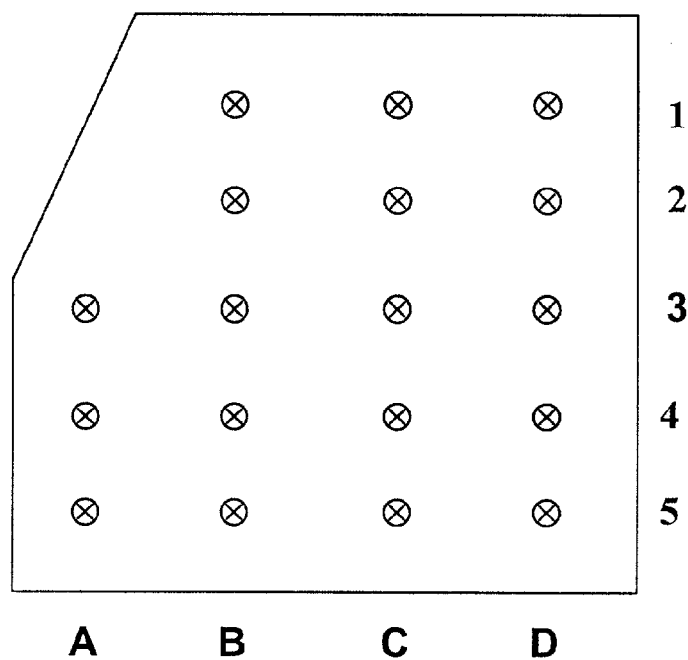
VEHICLE WHEELBASE CHANGE

UNITS (mm)	A = LEFT SIDE WHEELBASE	F = RIGHT SIDE WHEELBASE
PRE-TEST	2450	2450
POST-TEST	2350	2315
DIFFERENCE	-100	-135

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	650	580	650	549	650	559
2	N/A	N/A	520	471	520	472	520	467
3	390	392	390	373	390	349	390	354
4	260	264	260	258	260	232	260	248
5	130	121	130	124	130	121	130	123
REF. POINT	RSOV TO ANCHOR BOLT (PRE-TEST)		2290		RSOV TO ANCHOR BOLT (POST-TEST)		2275	



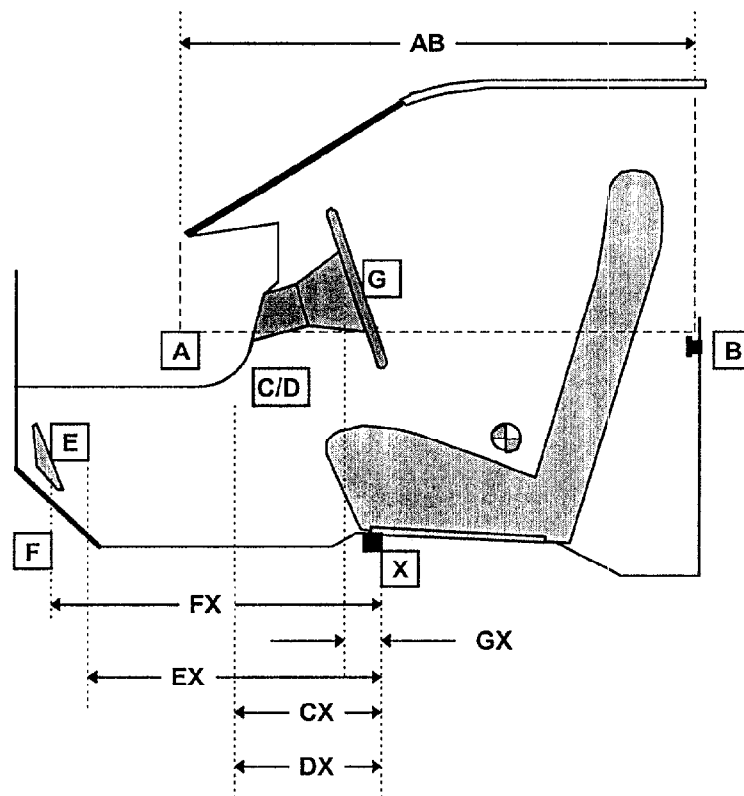
DRIVER SIDE FLOOR PLAN

(Data Sheet No. 17Continued)

DRIVER COMPARTMENT INTRUSION (Distances in mm)

REF.	DESCRIPTION	PRE-TEST	POST-TEST
AB	DOOR OPENING (INSIDE WINDOW JAM)	847	843
CX	LOWER LEFT KNEE BOLSTER TO X	245	268
DX	LOWER RIGHT KNEE BOLSTER TO X	245	280
EX	BRAKE PEDAL TO X	480	325
FX	FOOT REST TO X	556	520
GX	STEERING COLUMN HUB (CENTER) TO X	0	10

X = LEFT FRONT SEAT ANCHOR BOLT



DRIVER COMPARTMENT

DATA SHEET NO. 18

OFFSET BARRIER ORIENTATION

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

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)

ACCIDENT INVESTIGATION DIVISION DATA

TEST VEHICLE: 1998 TOYOTA RAV4 SUVNHTSA NO. MW5110VIN: JT3HP10V8W0171088TEST DATE: 2/26/98WHEELBASE: 2450 mmTEST WEIGHT: 1599 kgVEHICLE SIZE CATEGORY: TOYOTA SUV

ACCELEROMETER DATA:

LOCATION: Left and right rear floor pansCALIBRATION PROCEDURE: 6 months/ drop testLINEARITY: GoodINTEGRATION ALGORITHM: NHTSA StandardVEHICLE IMPACT SPEED: 55.6 km/hTIME OF SEPARATION: 64.92 msecVELOCITY CHANGE: 66.20 km/h

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

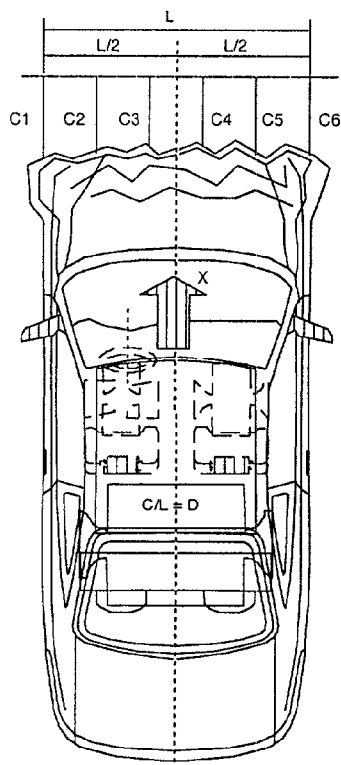
IMPACT MODE: Full Frontal

CRUSH DEPTH DIMENSIONS:

C1 = 480 mmC2 = 410 mmC3 = 450 mmC4 = 483 mmC5 = 515 mmC6 = 529 mm

MIDPOINT OF DAMAGE: D = vehicle centerline 731.5 MM

LENGTH OF DAMAGE REGION:

L = 1463 mm

DATA SHEET NO. 20

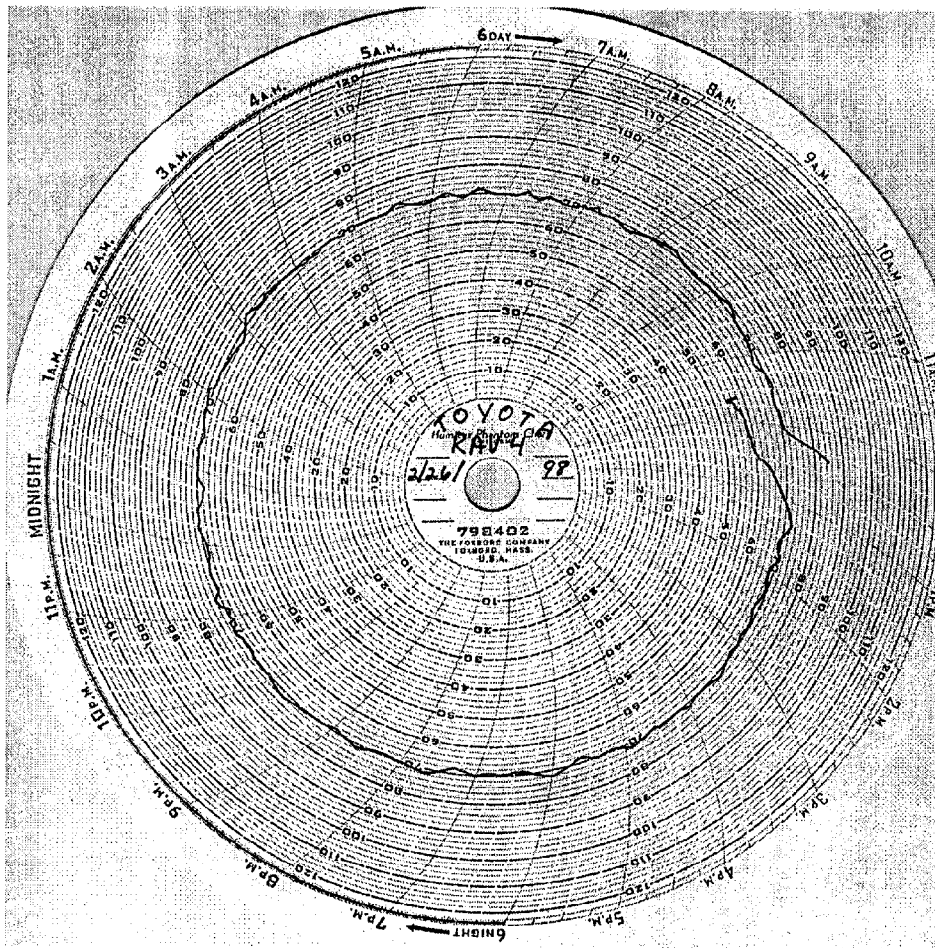
DUMMY/VEHICLE TEMPERATURE STABILIZATION

TEST VEHICLE: 1998 TOYOTA RAV4 SUV

NHTSA NO. MW5110

VIN: JT3HP10V8W0171099

TEST DATE: 2/26/98



APPENDIX A

PHOTOGRAPHS

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FIGURE A-1. RIGHT FRONT AS RECEIVED

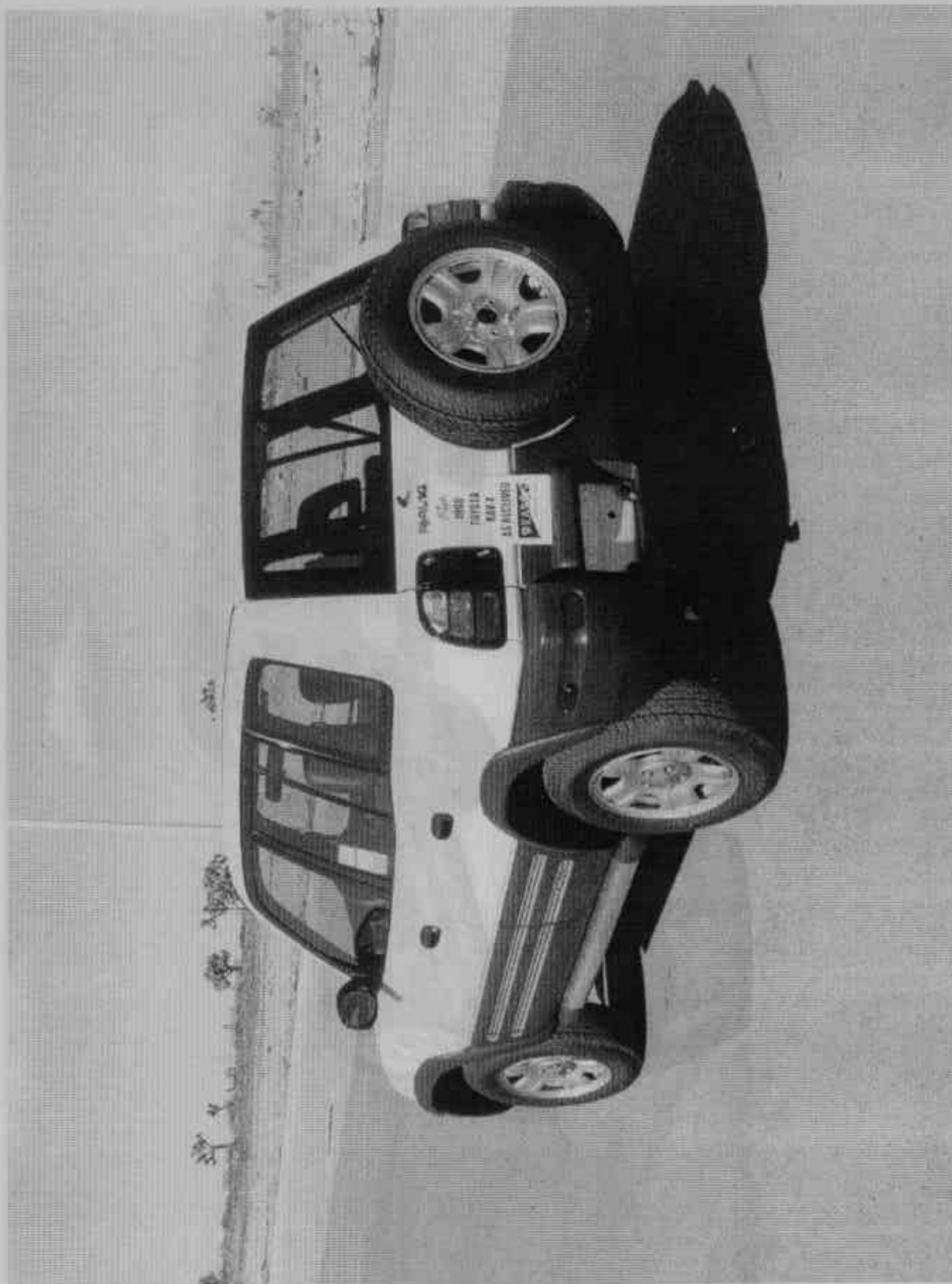


FIGURE A-2. LEFT REAR AS RECEIVED

MFD BY TOYOTA MOTOR CORPORATION DATE 12/97
GVWR (LBS) 3948
GAWR (LBS) FRT 2006 WITH 215/70R16 TIRES
16X6J RIMS AT 28 PSI COLD
RR 2183 WITH 215/70R16 TIRES
16X6J RIMS AT 26 PSI COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDER-
AL MOTOR VEHICLE SAFETY AND THEFT PREVENTION
STANDARDS IN EFFECT ON THE DATE OF MANUFAC-
TURE SHOWN ABOVE JT3HP10V8W0171088 MPV



TOYOTA FX11-A TM 101A-2250F SYA11L-AWMSKA
NO. 020 MADE IN JAPAN

FIGURE A-3. VEHICLE CERTIFICATION LABEL

MFD BY TOYOTA MOTOR CORPORATION DATE 12/97
GVWR (LBS) 3948
GAWR (LBS) FRT 2006 WITH 215/70R16 TIRES
16X6J RIMS AT 28 PSI COLD
RR 2183 WITH 215/70R16 TIRES
16X6J RIMS AT 26 PSI COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDER-
AL MOTOR VEHICLE SAFETY AND THEFT PREVENTION
STANDARDS IN EFFECT ON THE DATE OF MANUFAC-
TURE SHOWN ABOVE JT3HP10V8WD171088 MPV



C TR DES FK11 A TM -014-8250F SX411L-AWNGKA
NO 020 MADE IN JAPAN

FIGURE A-4. VEHICLE TIRE PLACARD

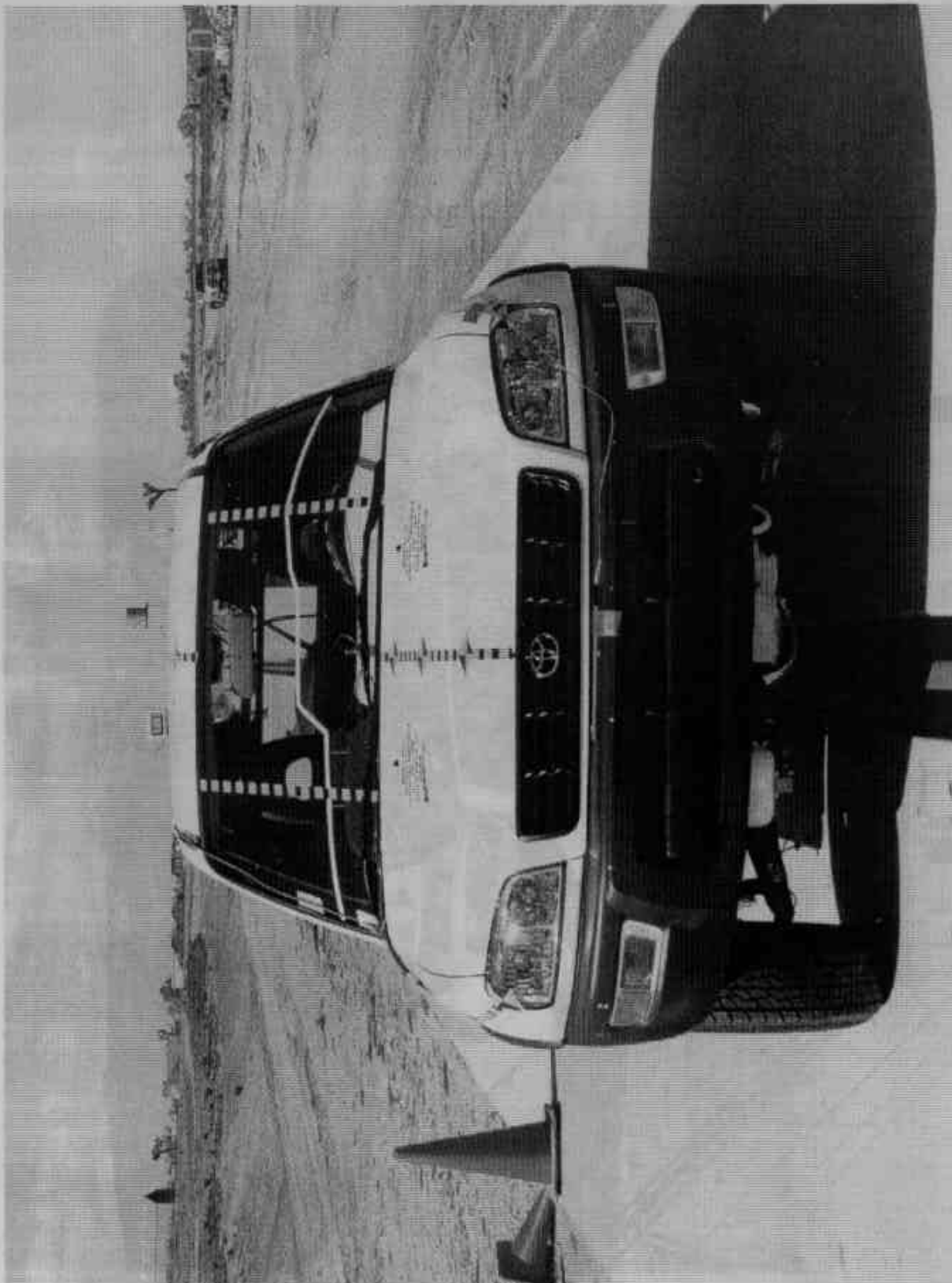


FIGURE A-5. PRETEST FRONT VIEW

07-000001-000001

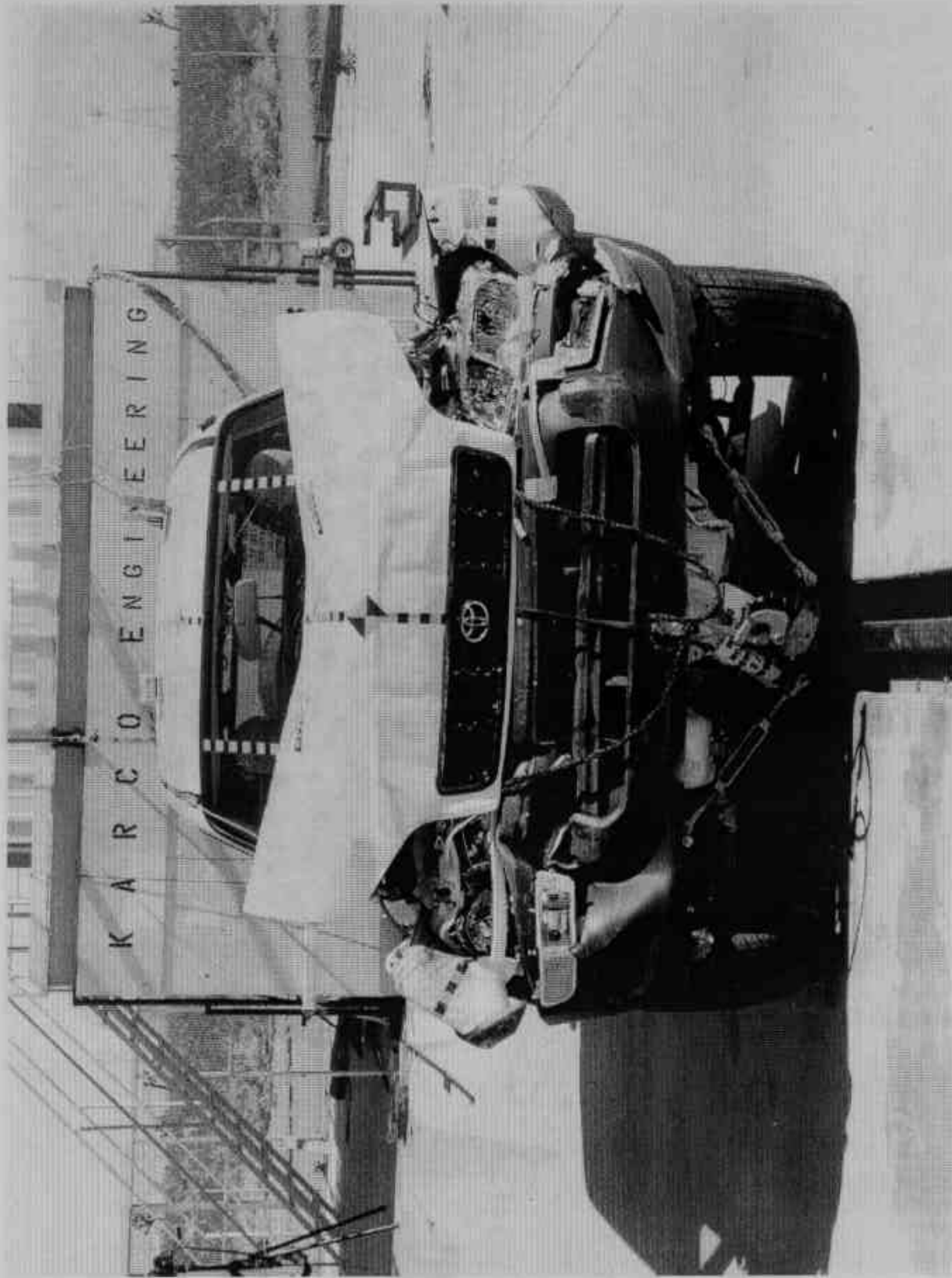


FIGURE A-6. POST TEST FRONT VIEW

A-6

KAR-98-R98050-13

CT-020804-00-PAK

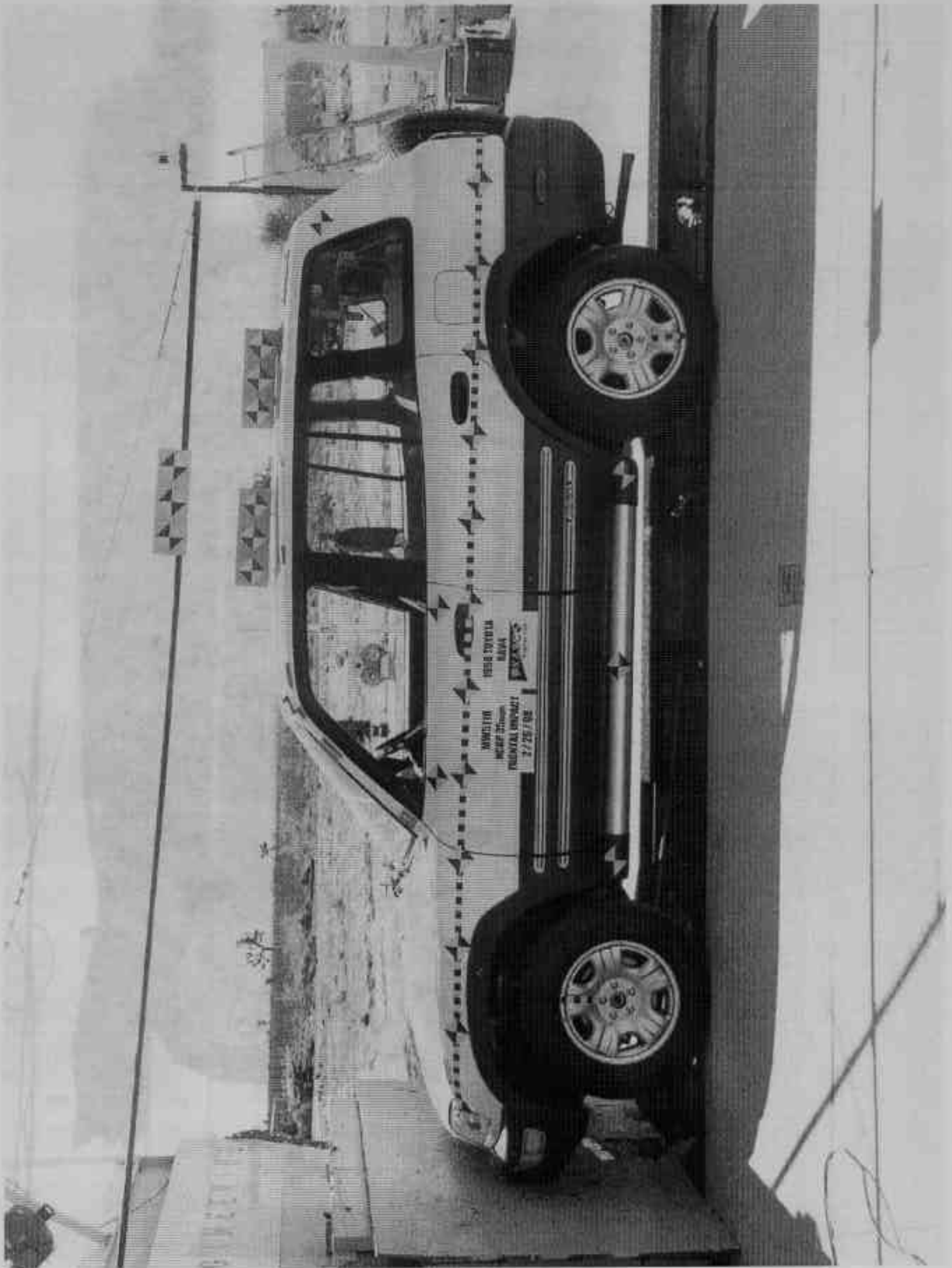


FIGURE A-7. PRETEST LEFT SIDE VIEW

11-080802R-00-RA01

A-7

KAR-98-R98050-13

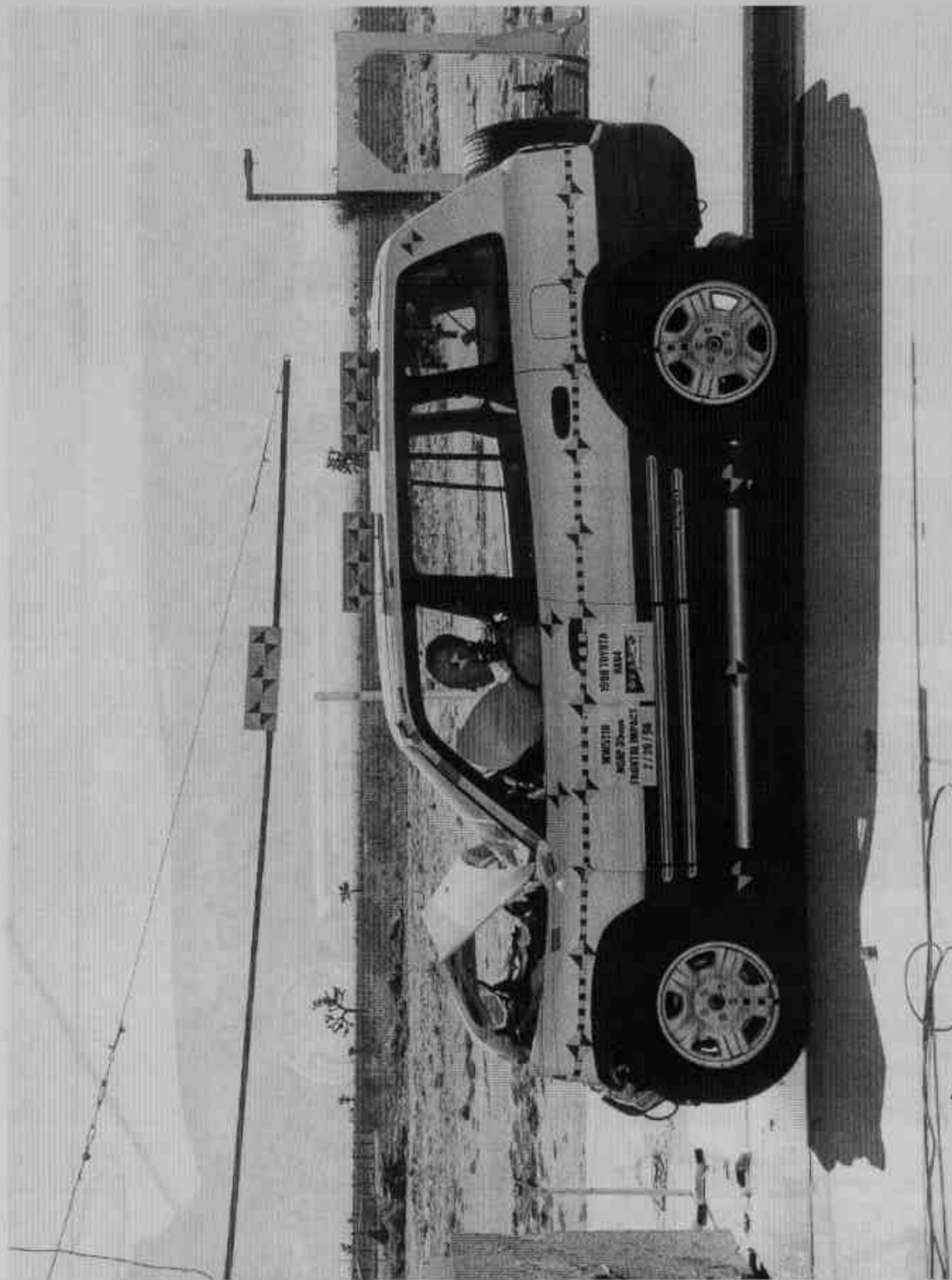


FIGURE A-8. POST TEST LEFT SIDE VIEW



FIGURE A-9. PRETEST RIGHT SIDE VIEW



FIGURE A-10. POST TEST RIGHT SIDE VIEW



FIGURE A-11. PRETEST RIGHT FRONT VIEW

01-020809-00-F-01

A-11

KAR-98-R98050-13



FIGURE A-12. POST TEST RIGHT FRONT VIEW



FIGURE A-13. PRETEST LEFT REAR VIEW



FIGURE A-14. POST TEST LEFT REAR VIEW

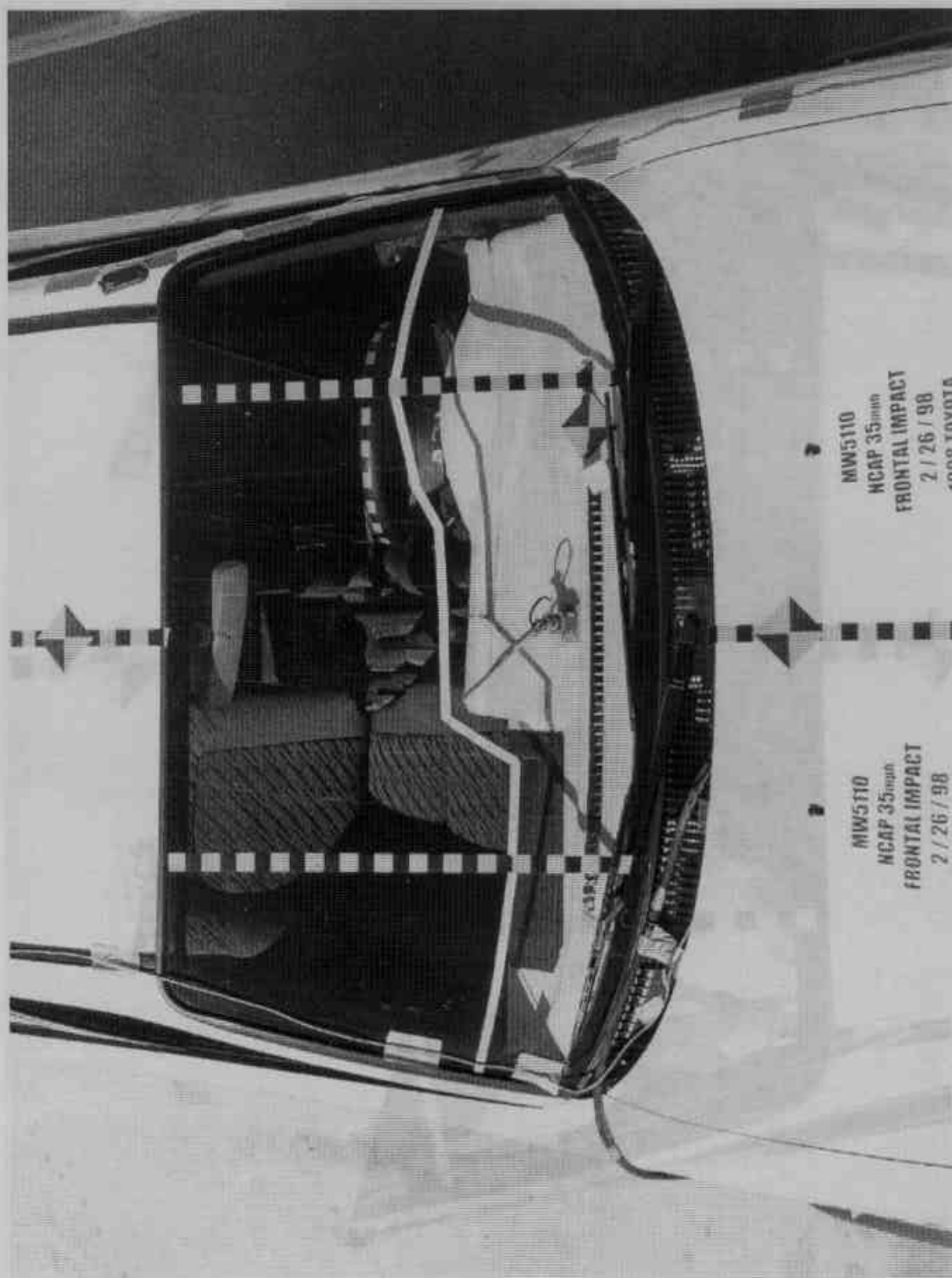


FIGURE A-15. PRETEST WINDSHIELD

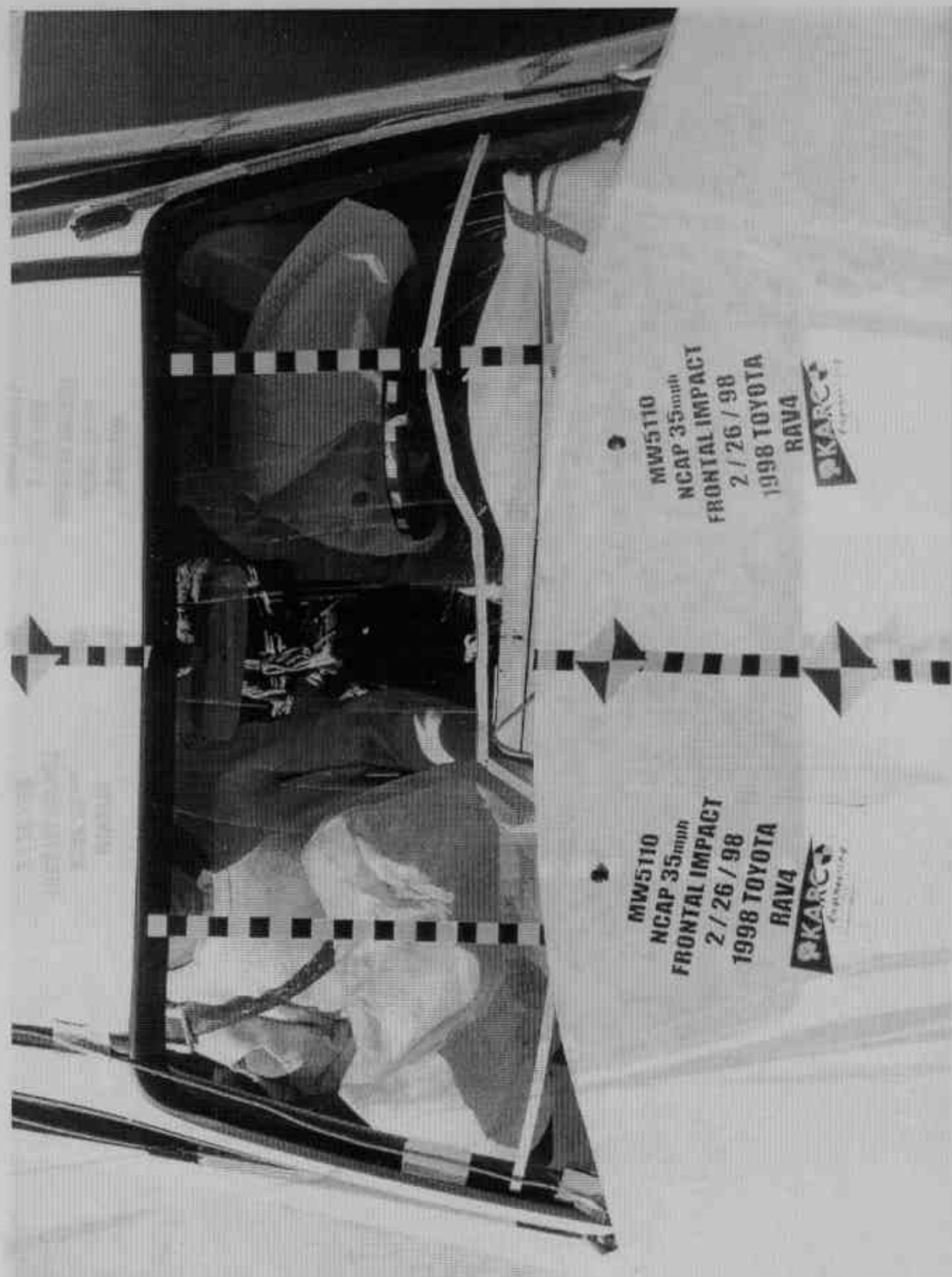


FIGURE A-16. POST TEST WINDSHIELD

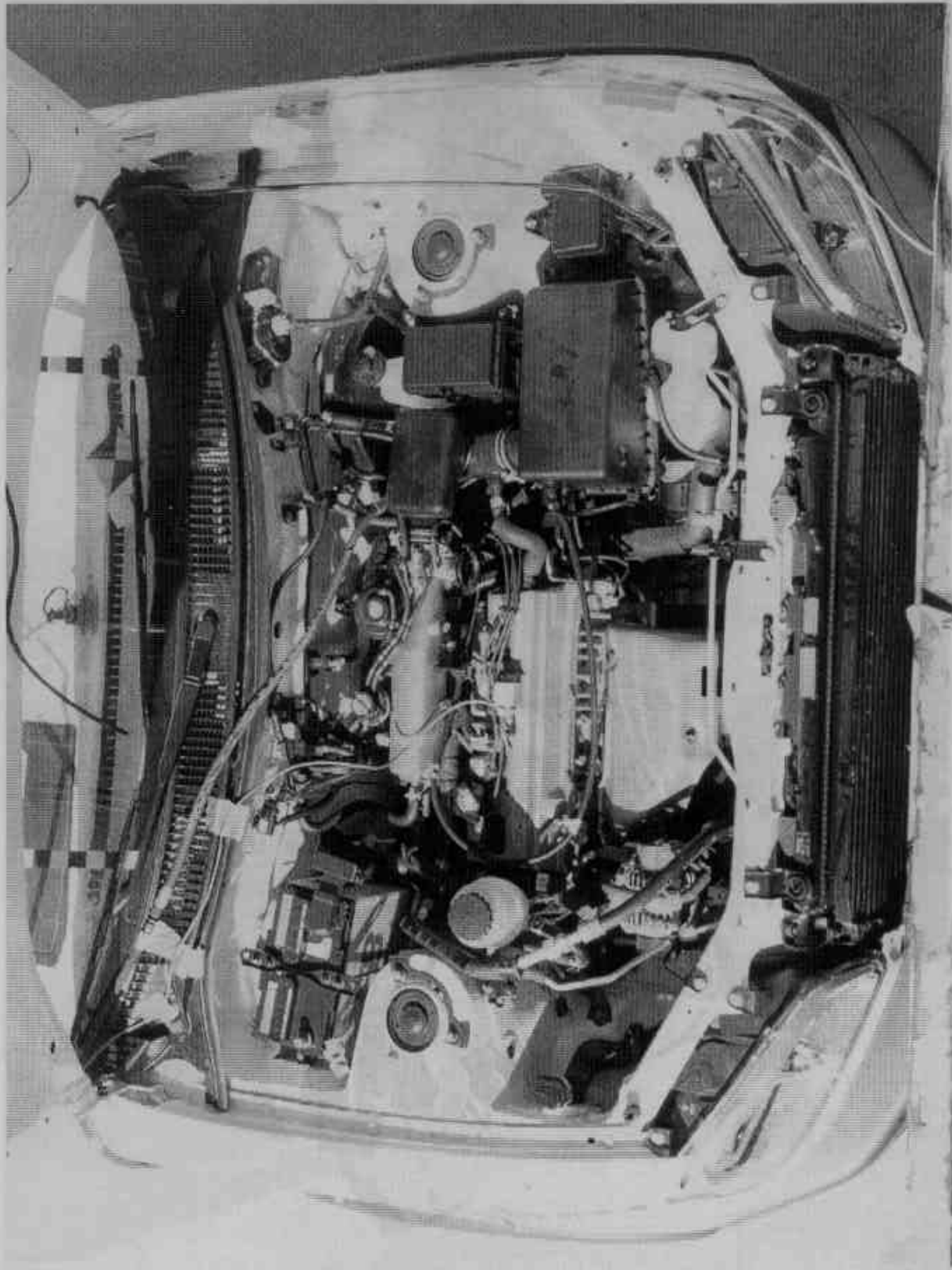


FIGURE A-17. PRETEST ENGINE COMPARTMENT

CI-000007-26-RAX

A-17

KAR-98-R98050-13

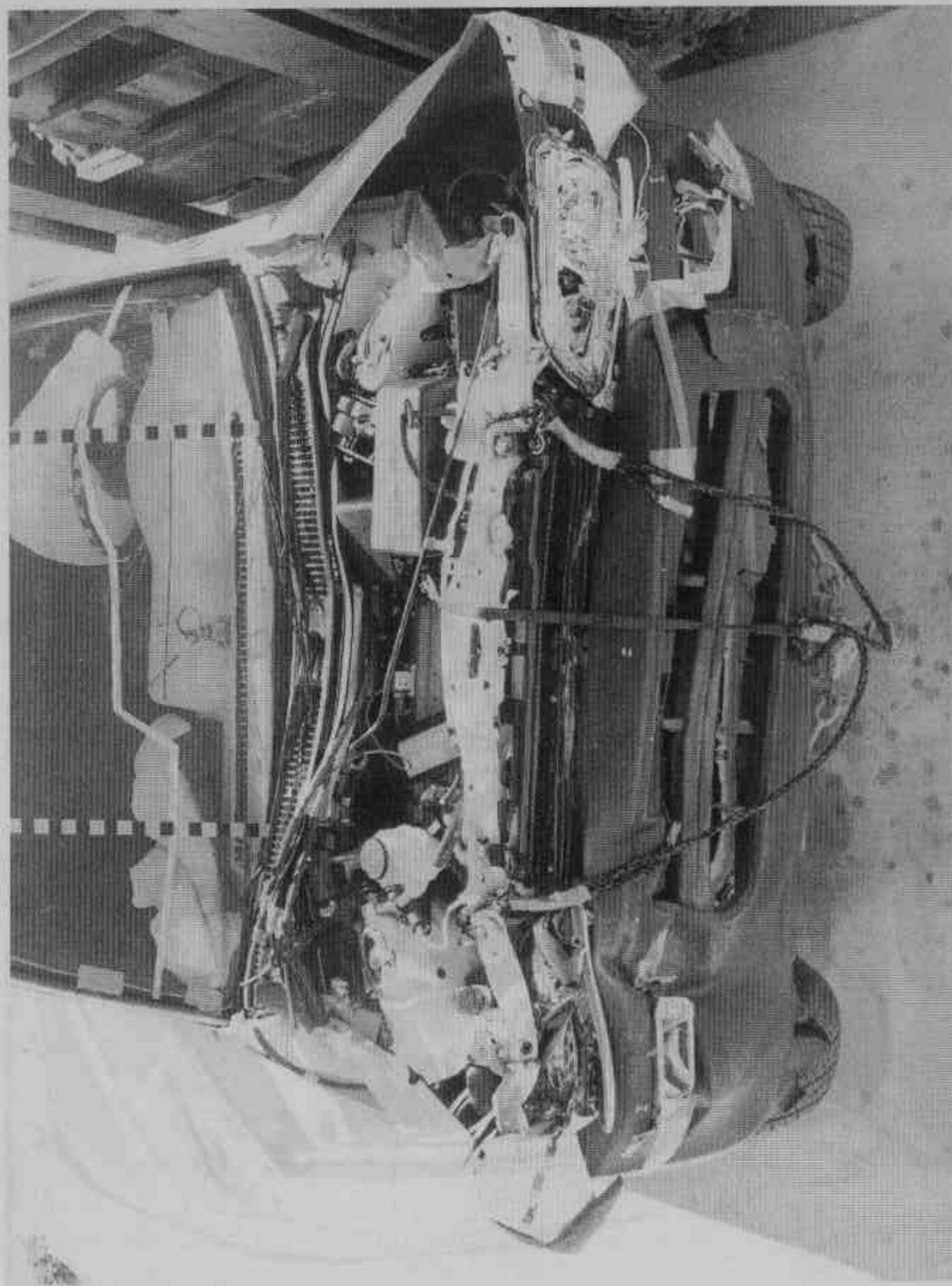


FIGURE A-18. POST TEST ENGINE COMPARTMENT

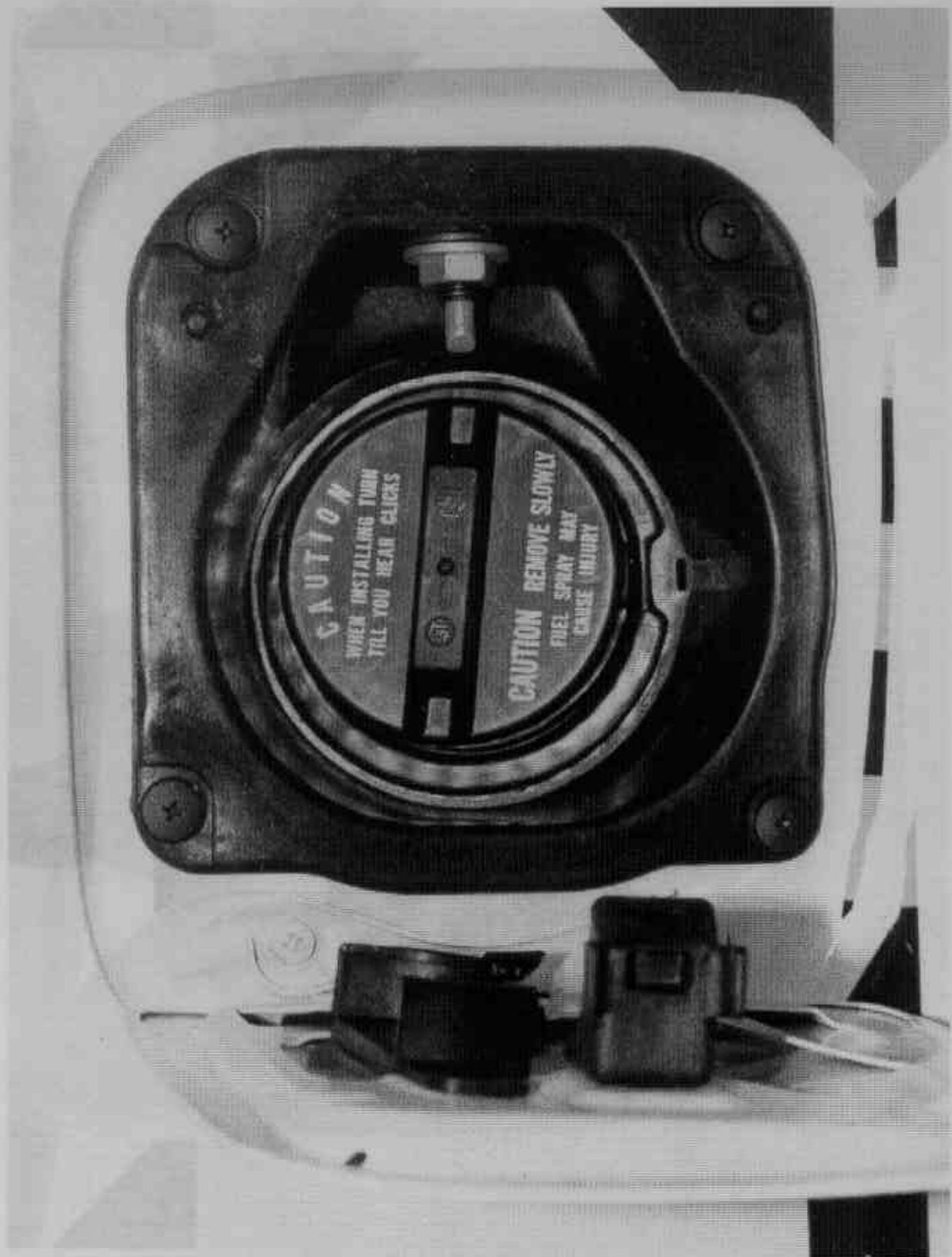


FIGURE A-19. PRETEST FUEL CAP

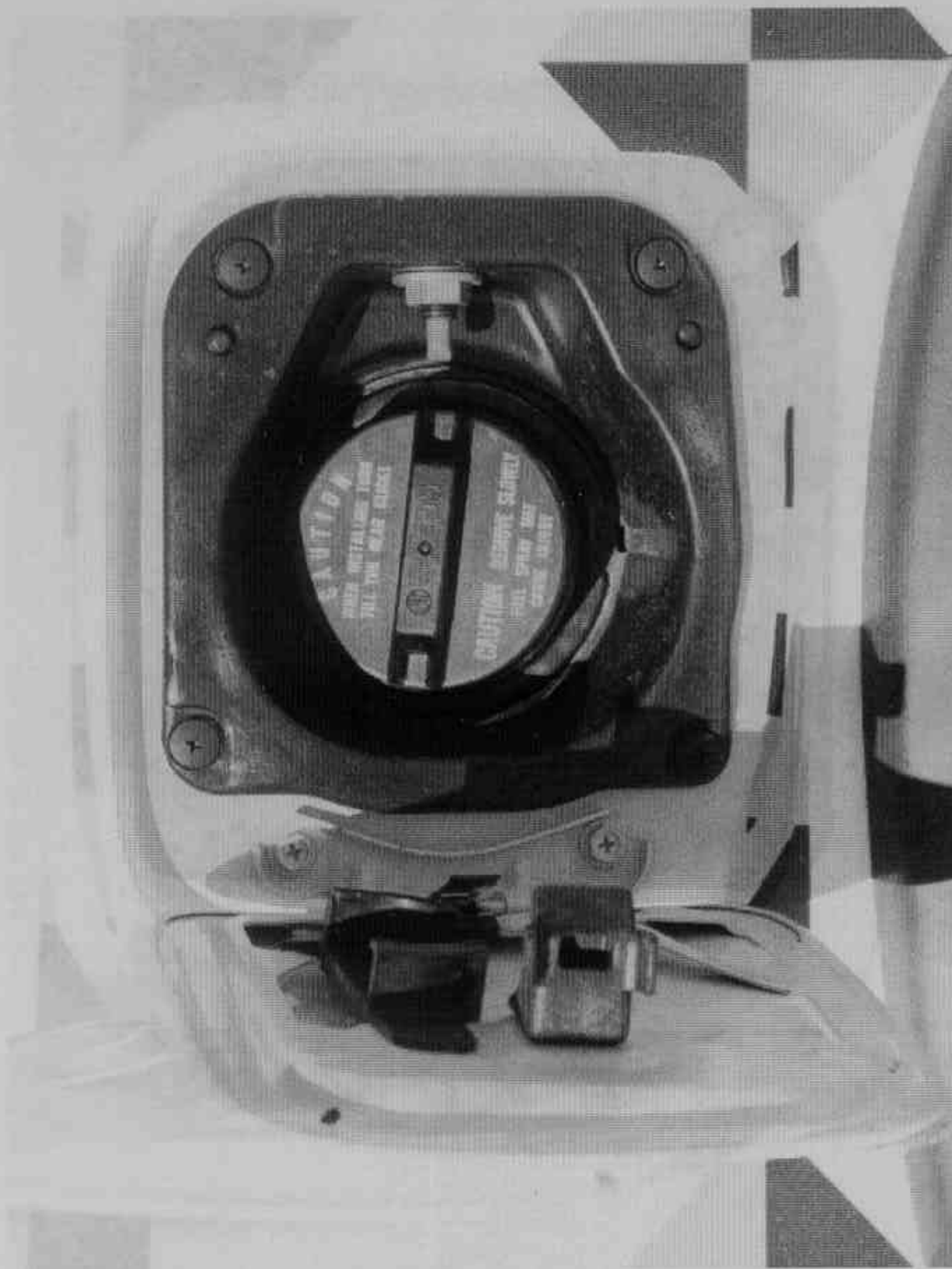


FIGURE A-20. POST TEST FUEL CAP

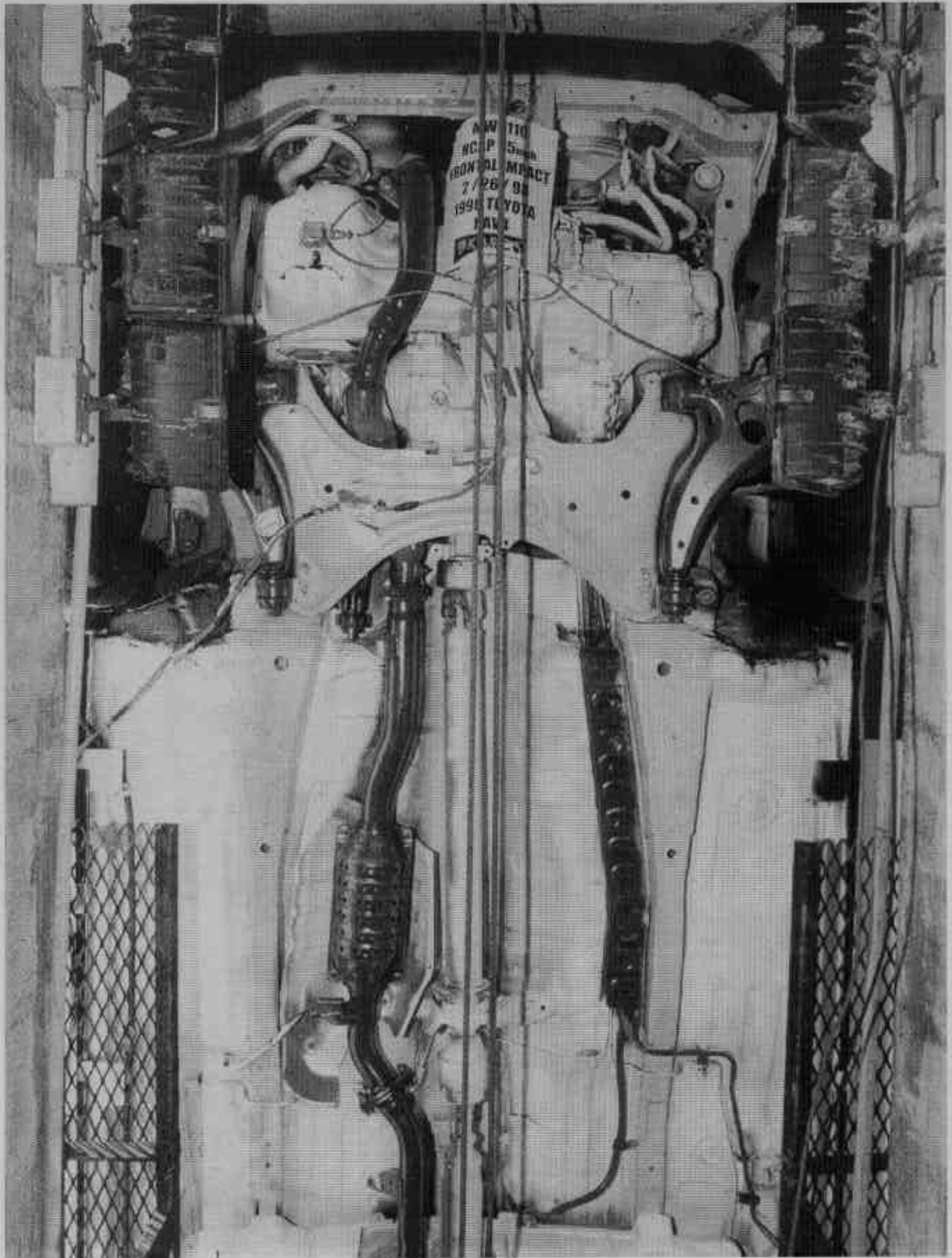


FIGURE A-21. PRETEST FRONT UNDERSIDE

ET-000005-80-PAV

A-21

KAR-98-R98050-13

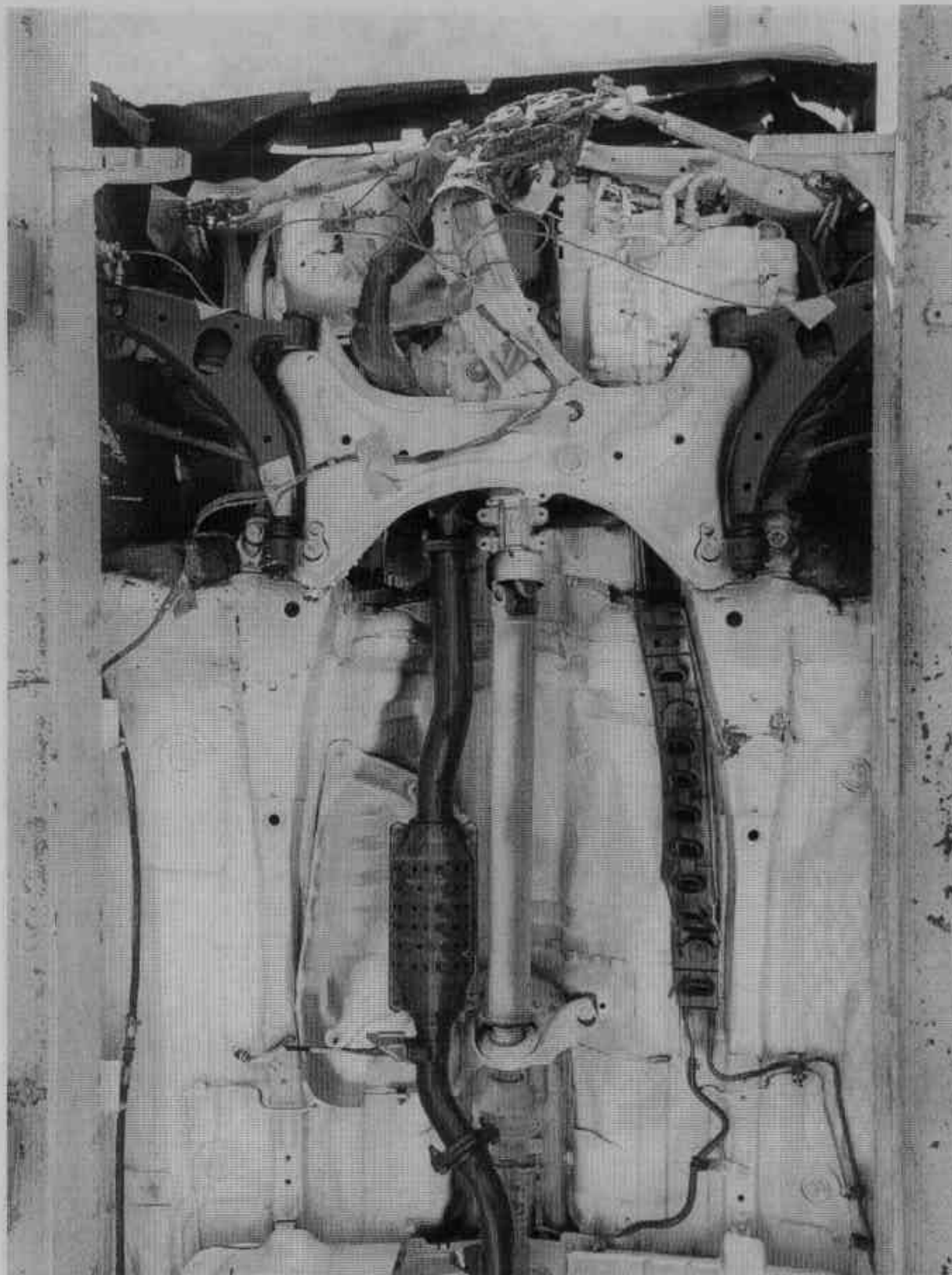


FIGURE A-22. POST TEST FRONT UNDERSIDE

KAR-98-R98050-13

A-22

KAR-98-R98050-13

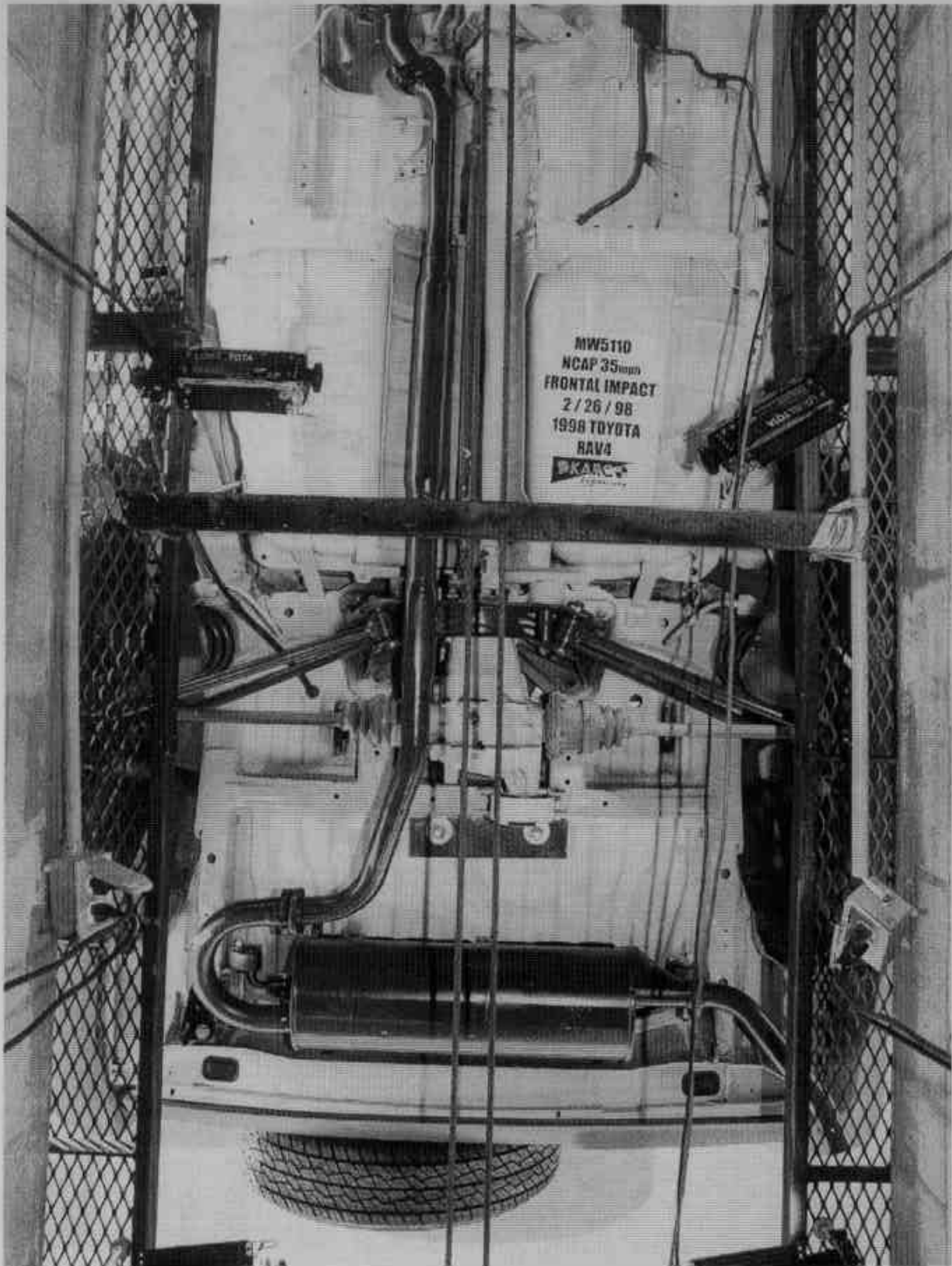


FIGURE A-23. PRETEST REAR UNDERSIDE

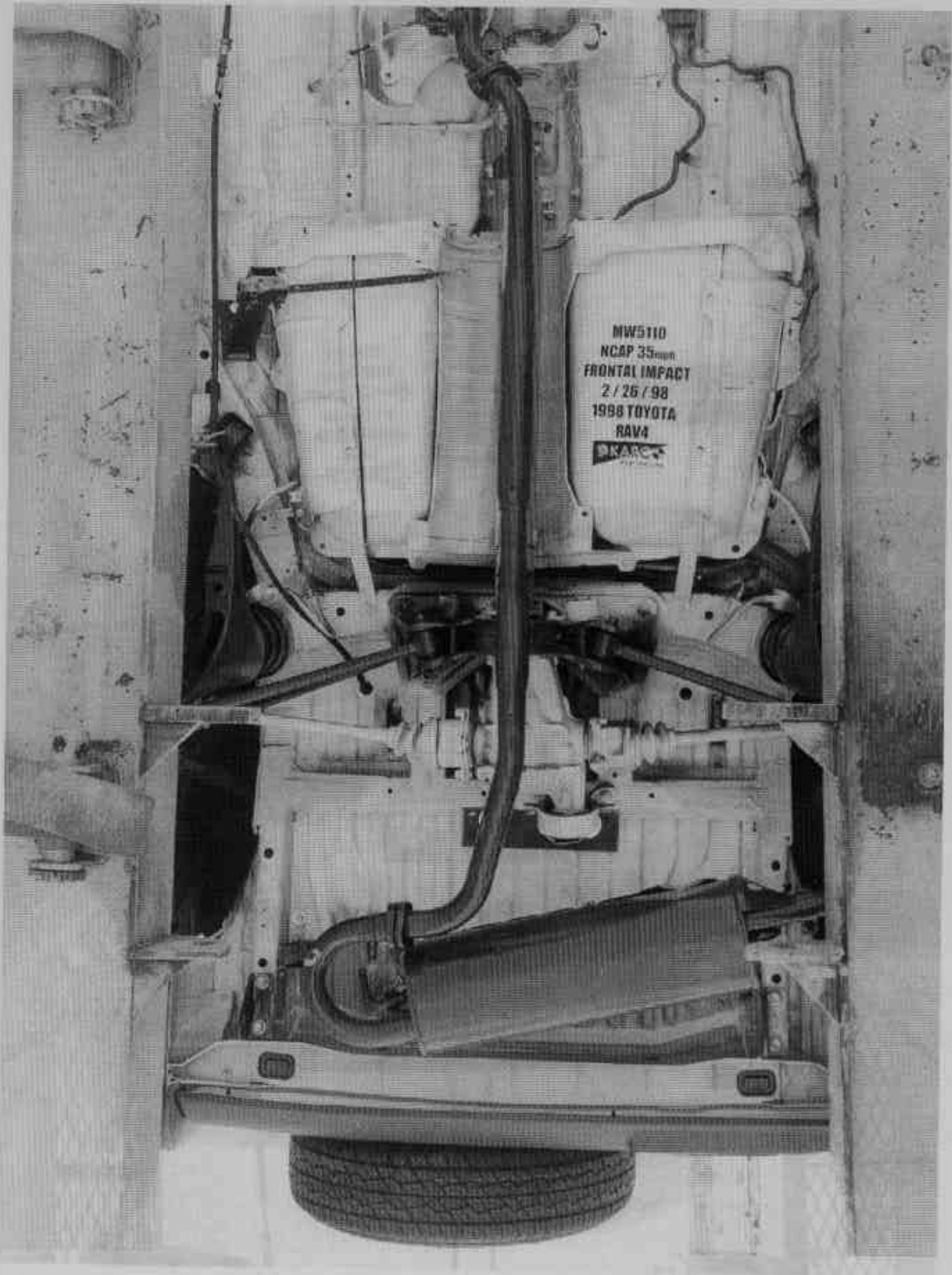


FIGURE A-24. POST TEST REAR UNDERSIDE



FIGURE A-25. PRETEST DRIVER FLOOR PAN



FIGURE A-26. POST TEST DRIVER FLOOR PAN

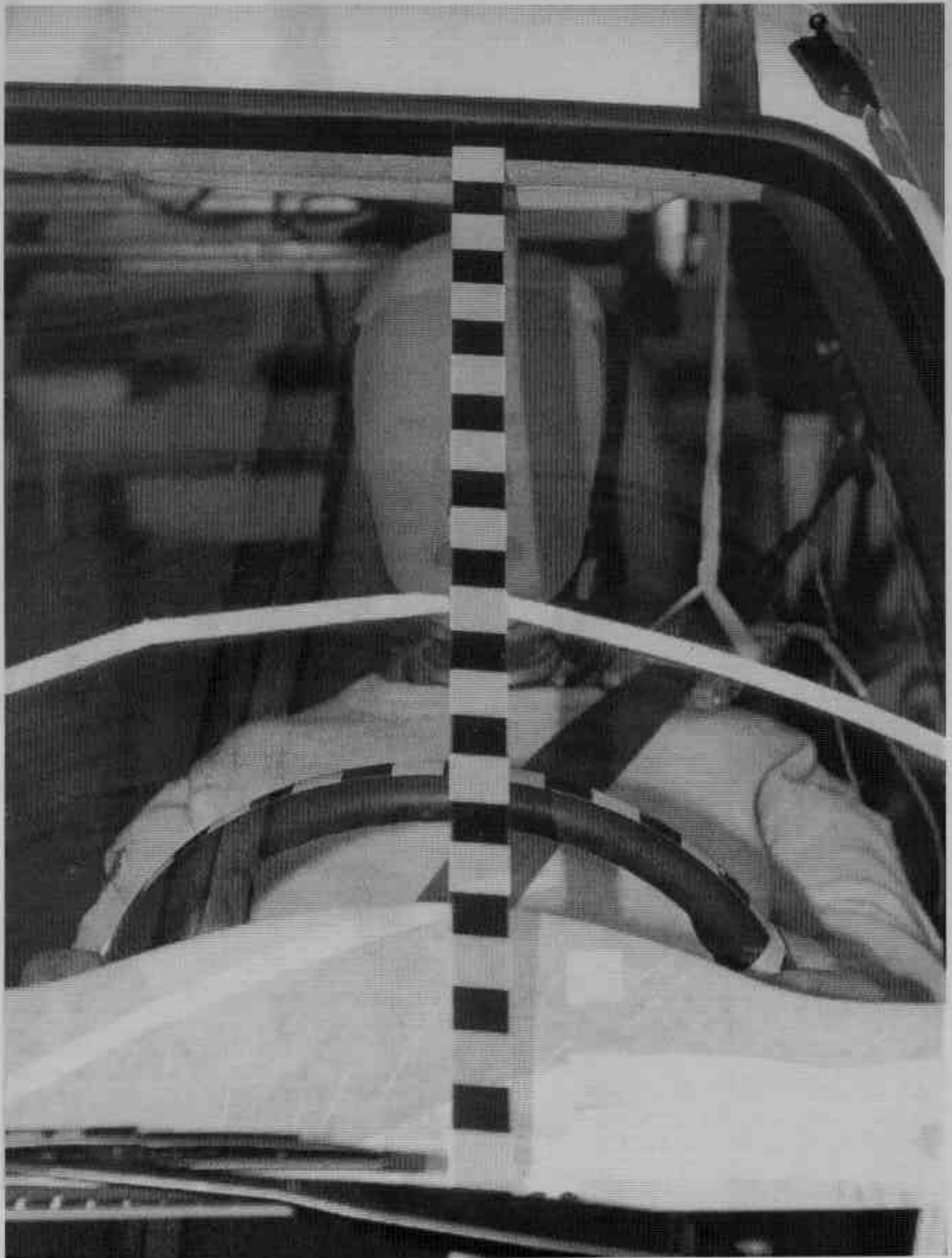


FIGURE A-27. PRETEST DRIVER DUMMY (FRONT VIEW)

31-000507-89-5A21



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

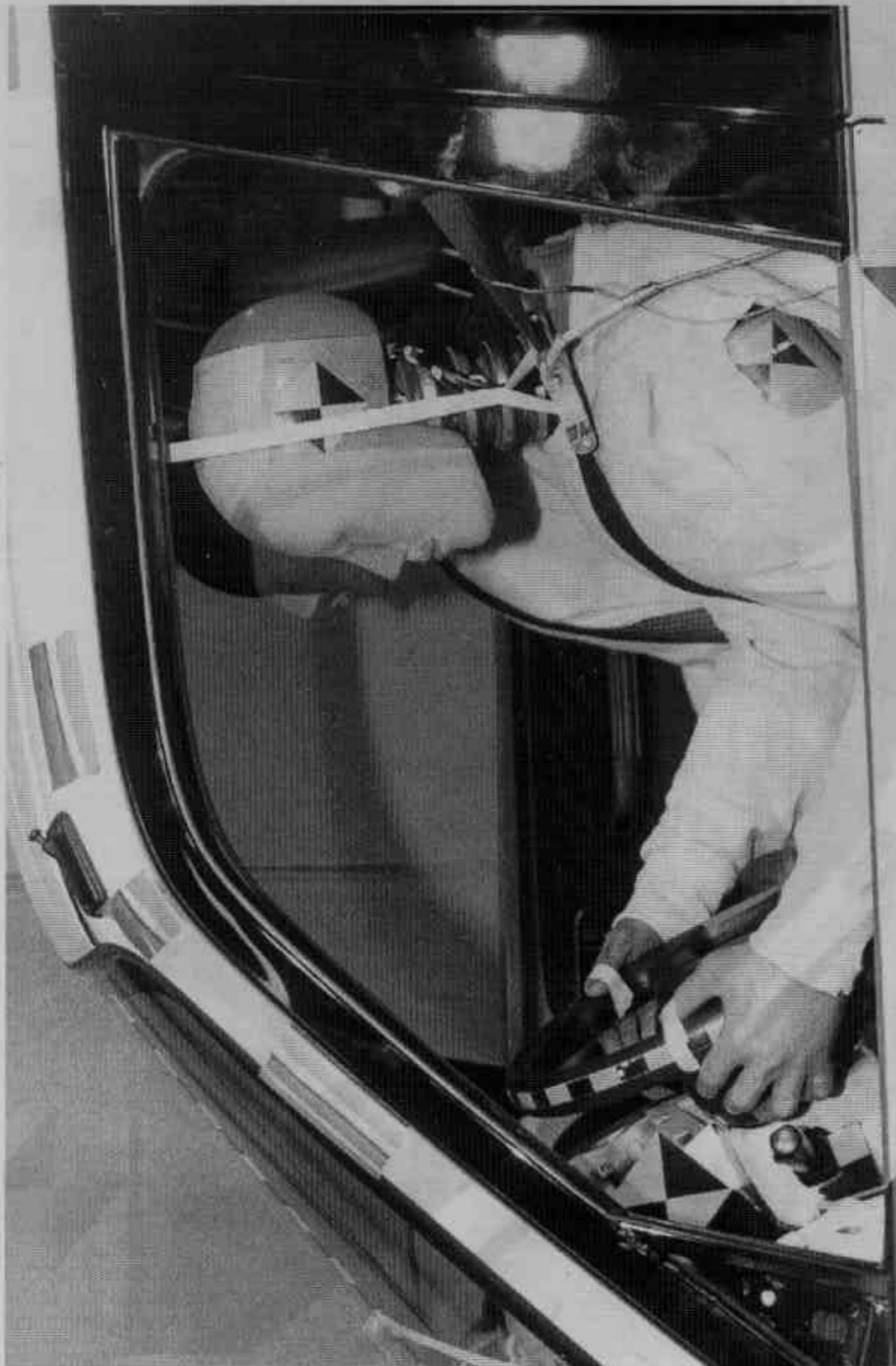


FIGURE A-29. PRETEST DRIVER DUMMY (THRU WINDOW)

CH-0209001-88-PAD

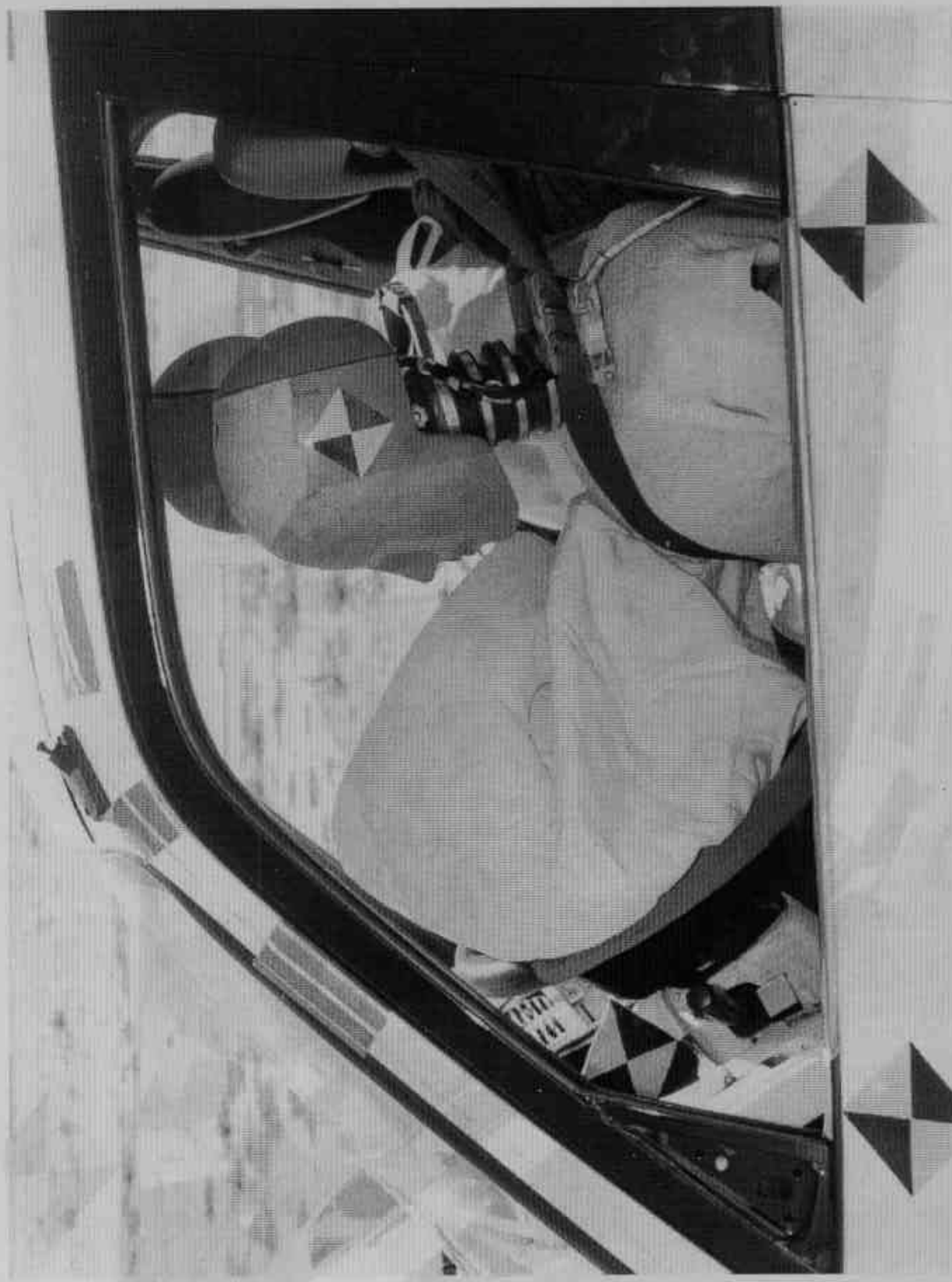


FIGURE A-30. POST TEST DRIVER DUMMY (THRU WINDOW)



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

ET-000823-8C-RAY

A-31

KAR-98-R98050-13

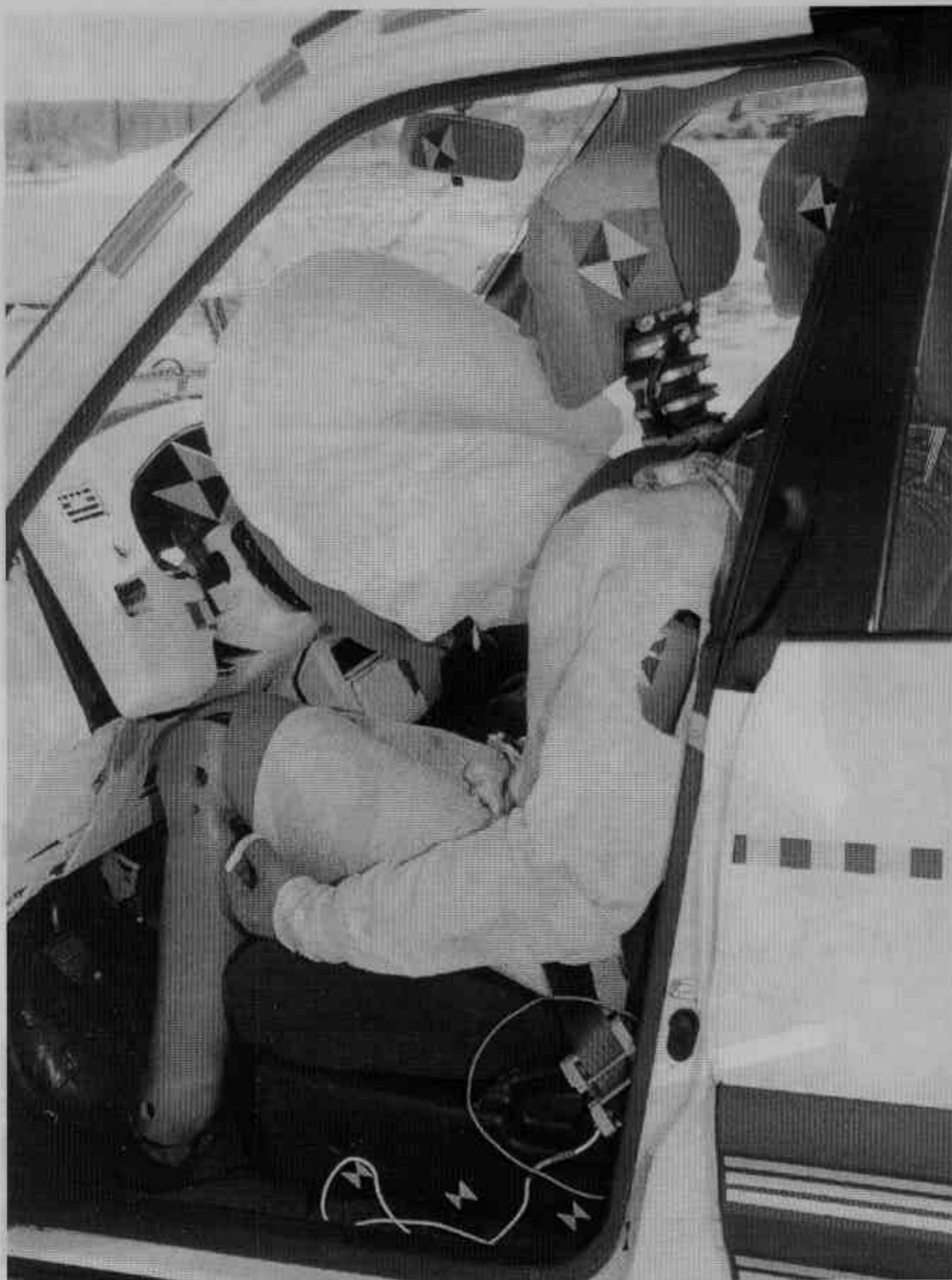


FIGURE A-32. POST TEST DRIVER DUMMY (DOOR OPEN)



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

CF-030001-05-RAY

A-33

KAR-98-R98050-13



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



FIGURE A-35. POST TEST DRIVER DUMMY HEAD

A-35

KAR-98-R98050-13

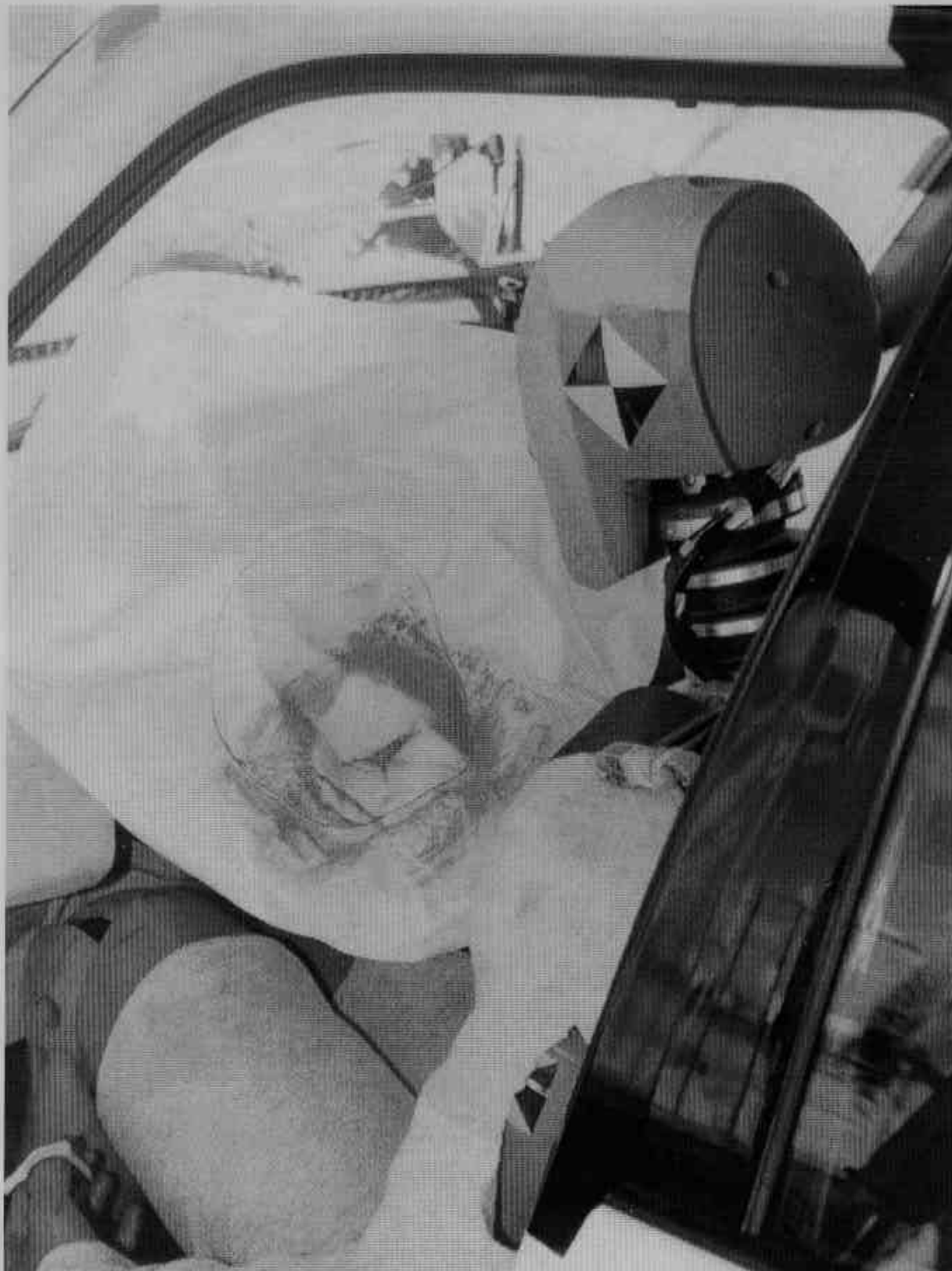


FIGURE A-36. POST TEST DRIVER DUMMY CONTACT POINT

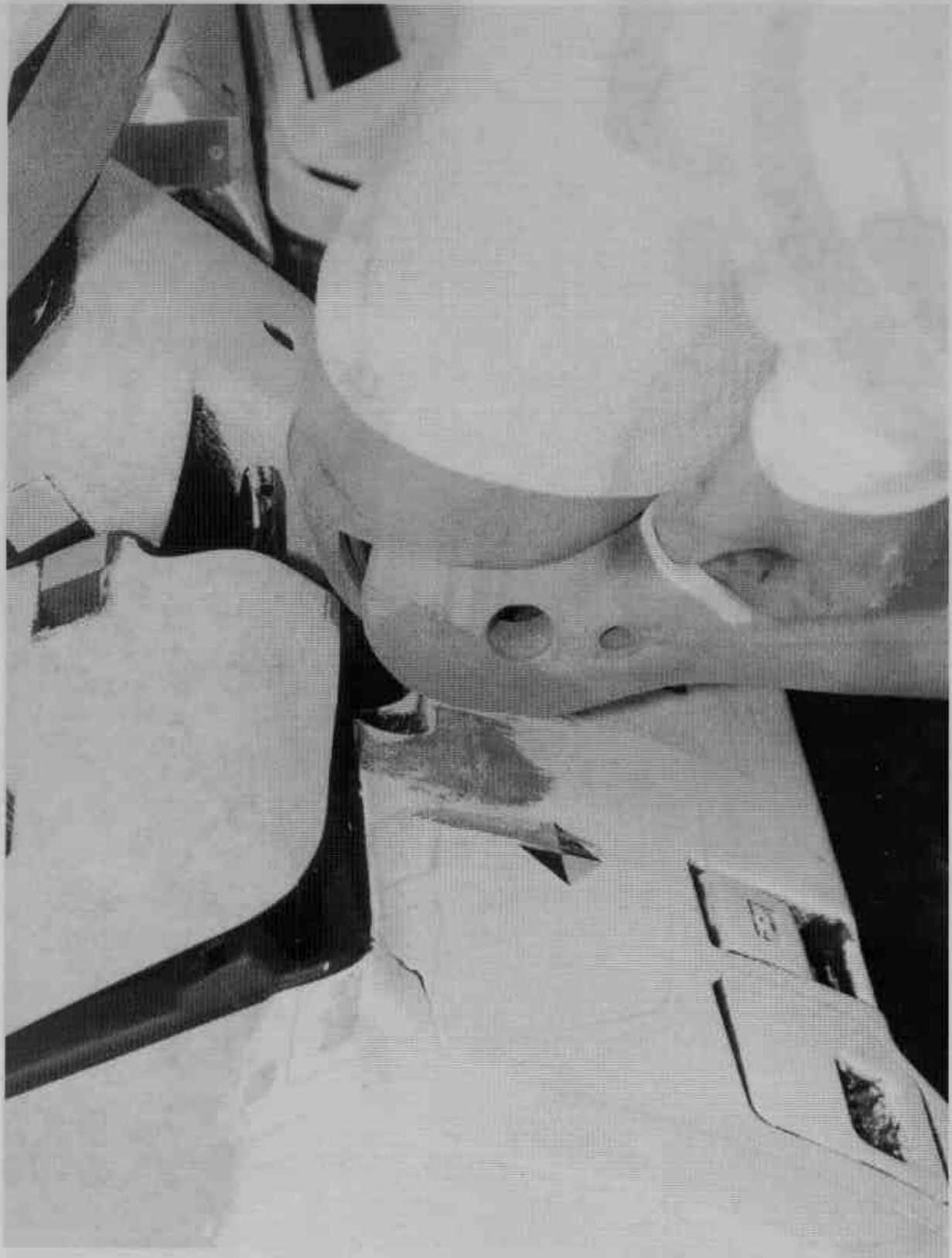


FIGURE A-37. POST TEST DRIVER DUMMY CONTACT POINT

KAR-98-R98050-13

A-37

KAR-98-R98050-13

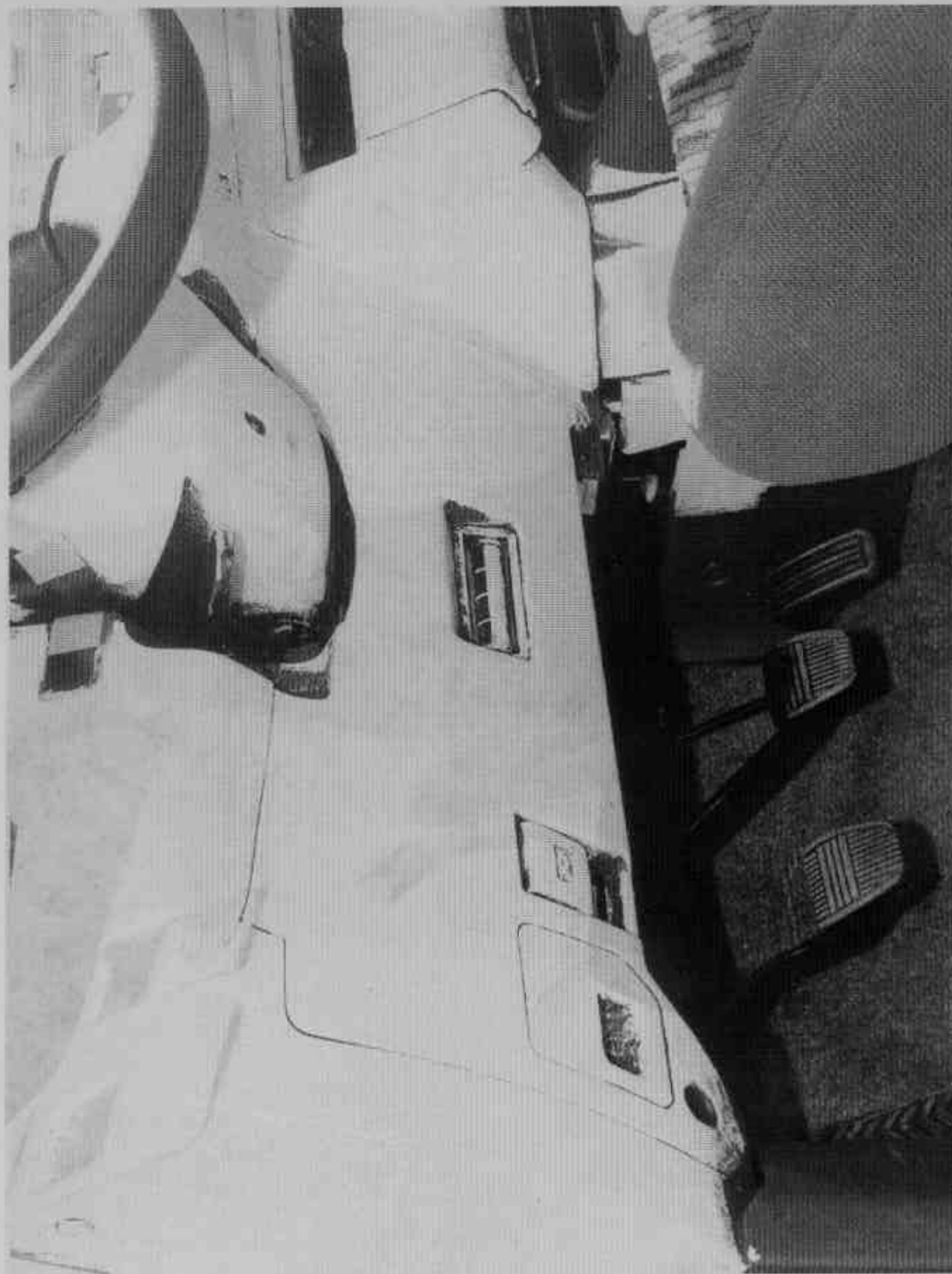


FIGURE A-38. PRETEST DRIVER SIDE KNEE BOLSTER

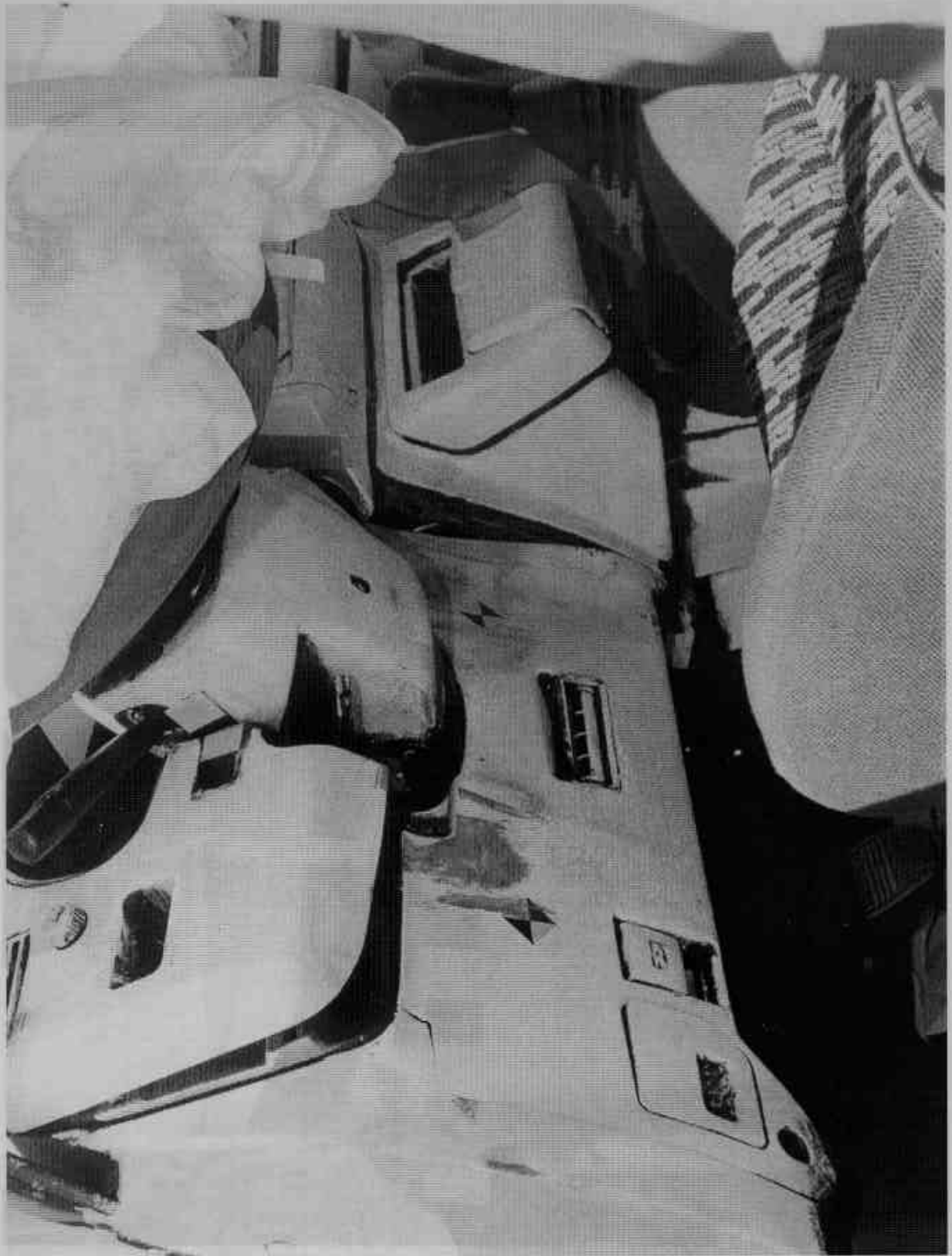


FIGURE A-39. POST TEST DRIVER KNEE BOLSTER



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

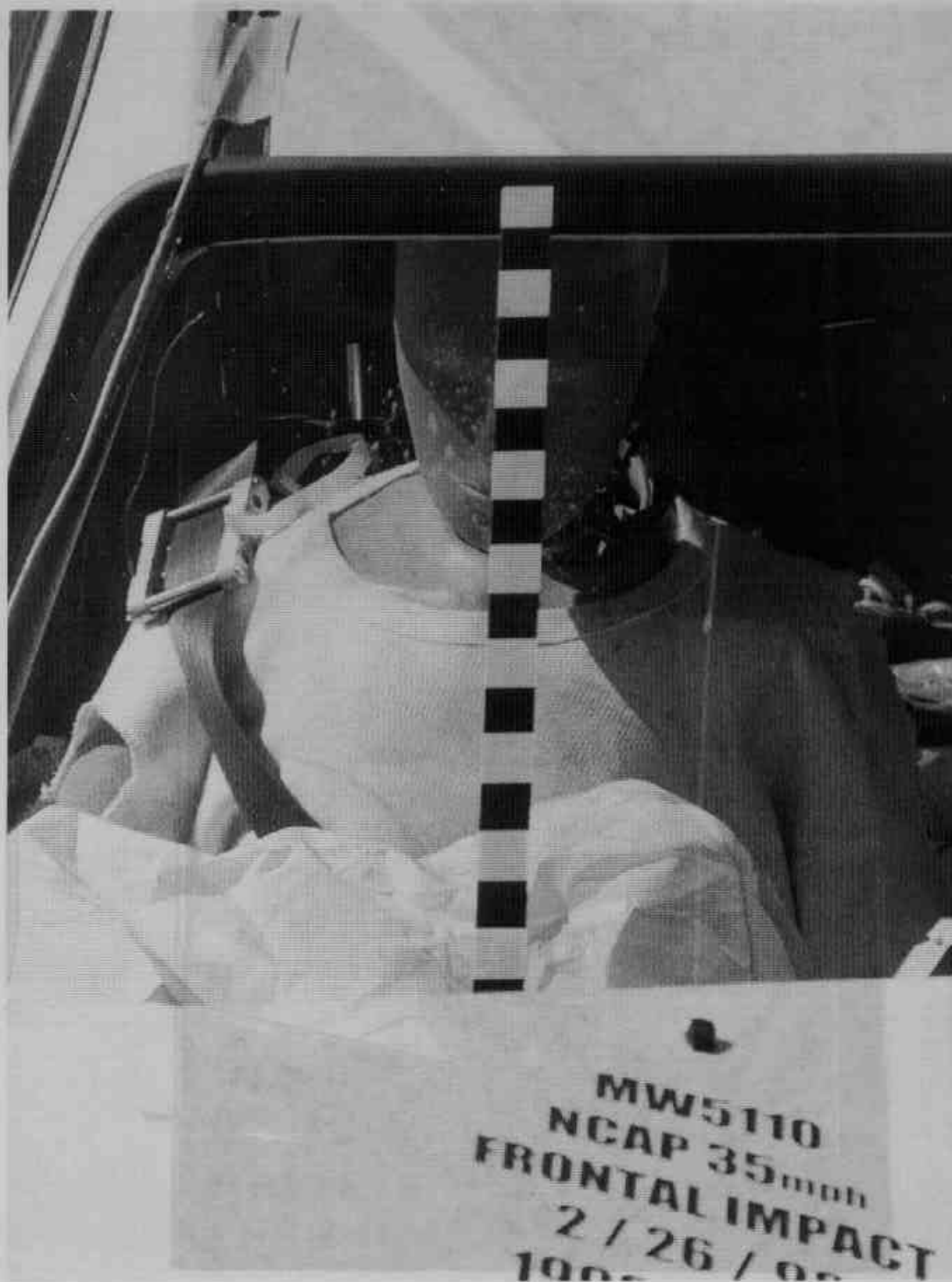


FIGURE A-41. POST TEST PASSENGER DUMMY (FRONT VIEW)

01-030805-00-0001

A-41

KAR-98-R98050-13



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

KAR-98-R98050-13

A-42

KAR-98-R98050-13



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

KAR-98-R98050-13

A-43

KAR-98-R98050-13



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

KAR-98-R98050-13

A-44

KAR-98-R98050-13



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

A-48

KAR-98-R98050-13



FIGURE A-49. POST TEST PASSENGER DUMMY CONTACT POINT

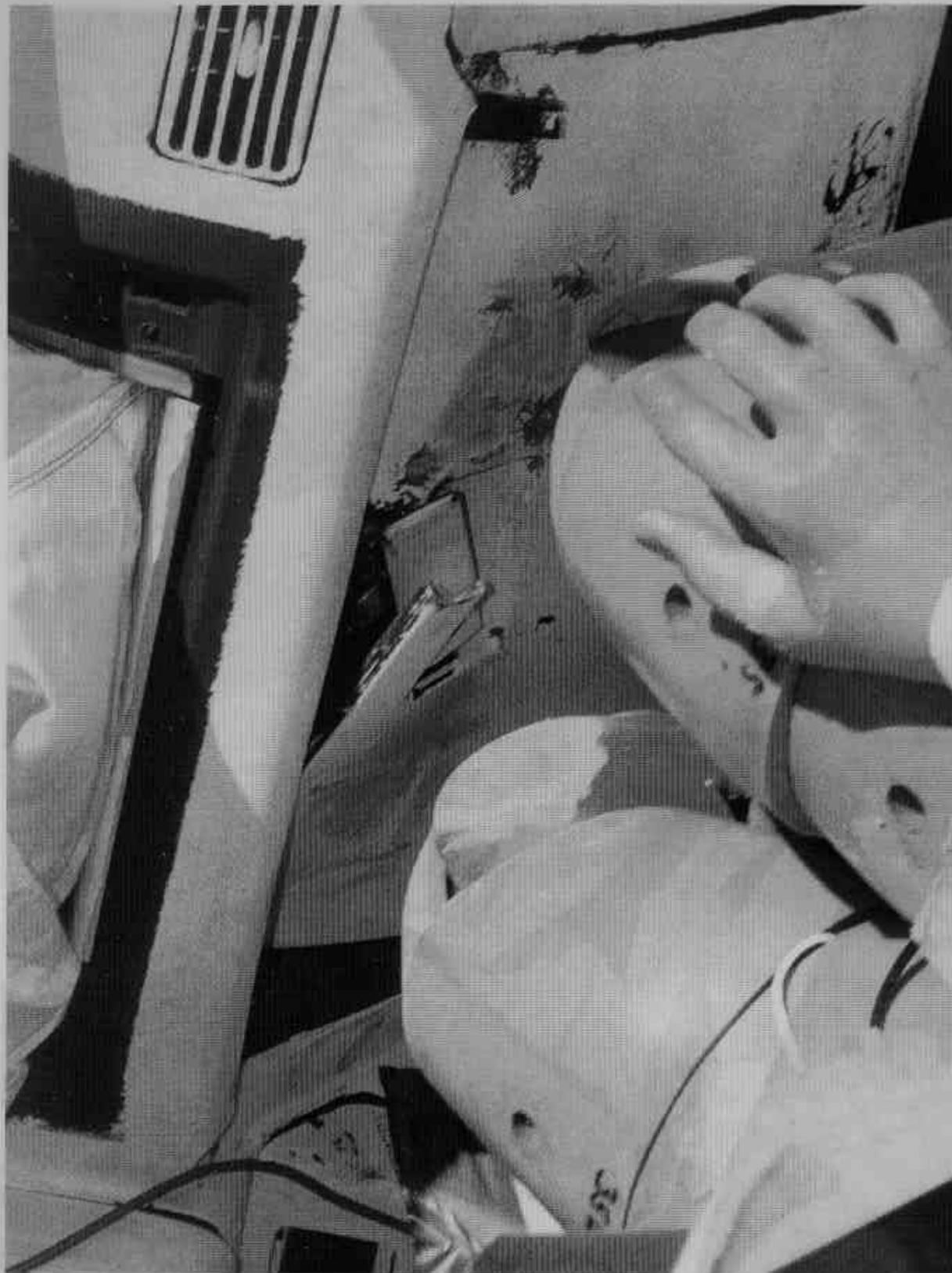


FIGURE A-50. POST TEST PASSENGER DUMMY CONTACT POINT

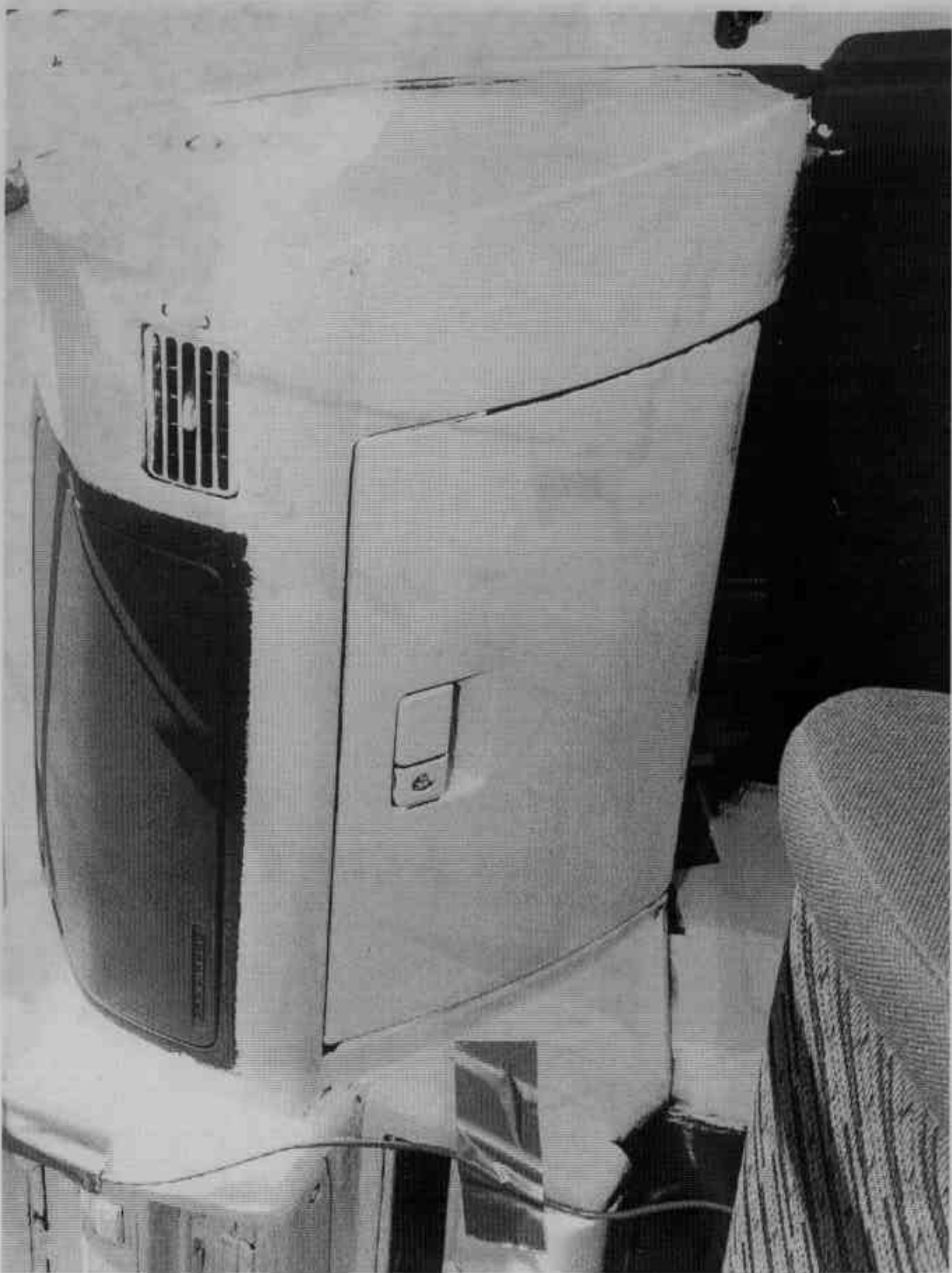


FIGURE A-51. PRETEST PASSENGER SIDE KNEE BOLSTER

KAR-98-R98050-13

A-51

KAR-98-R98050-13

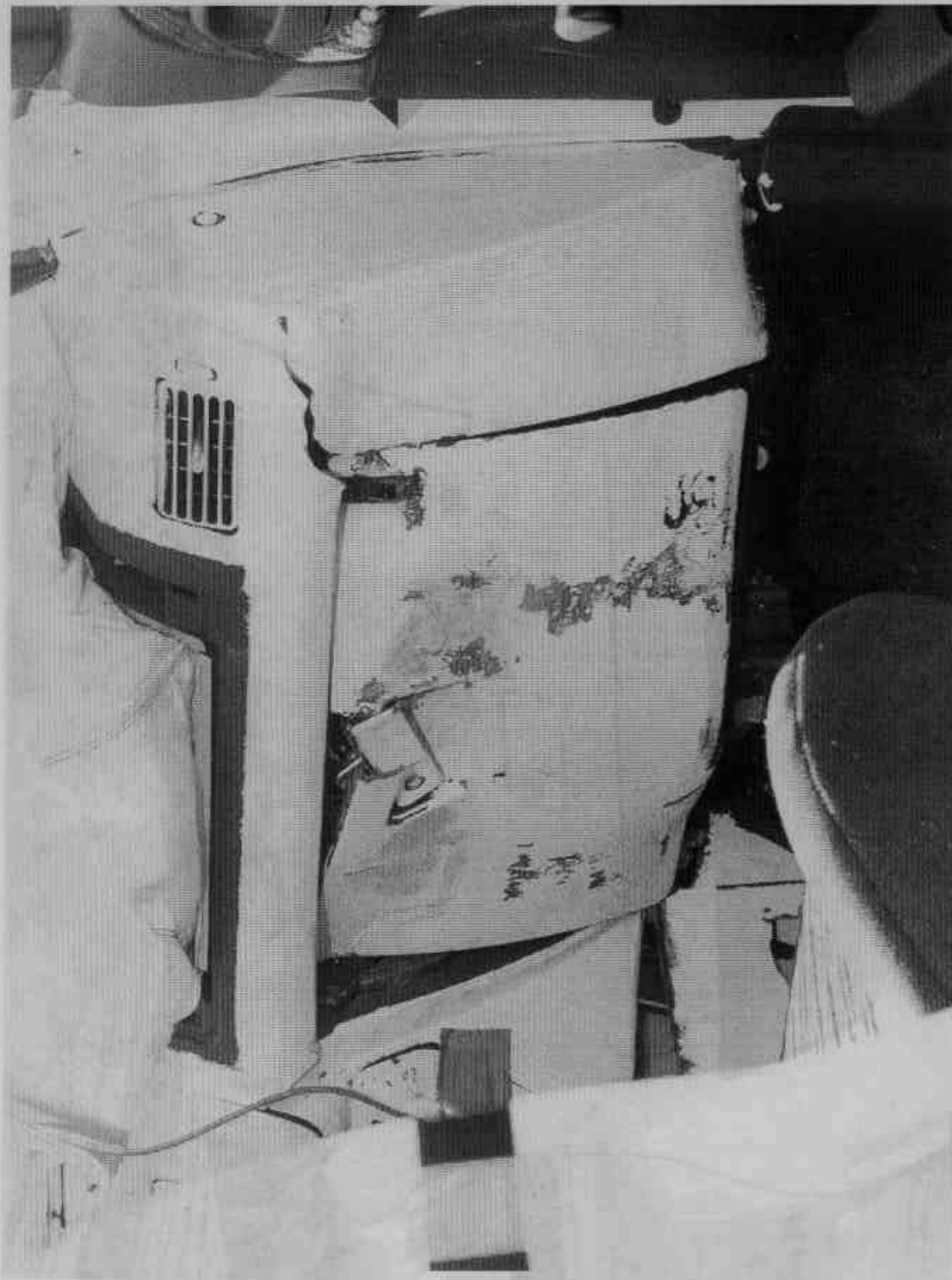


FIGURE A-52. POST TEST PASSENGER SIDE KNEE BOLSTER

A-52

KAR-98-R98050-13

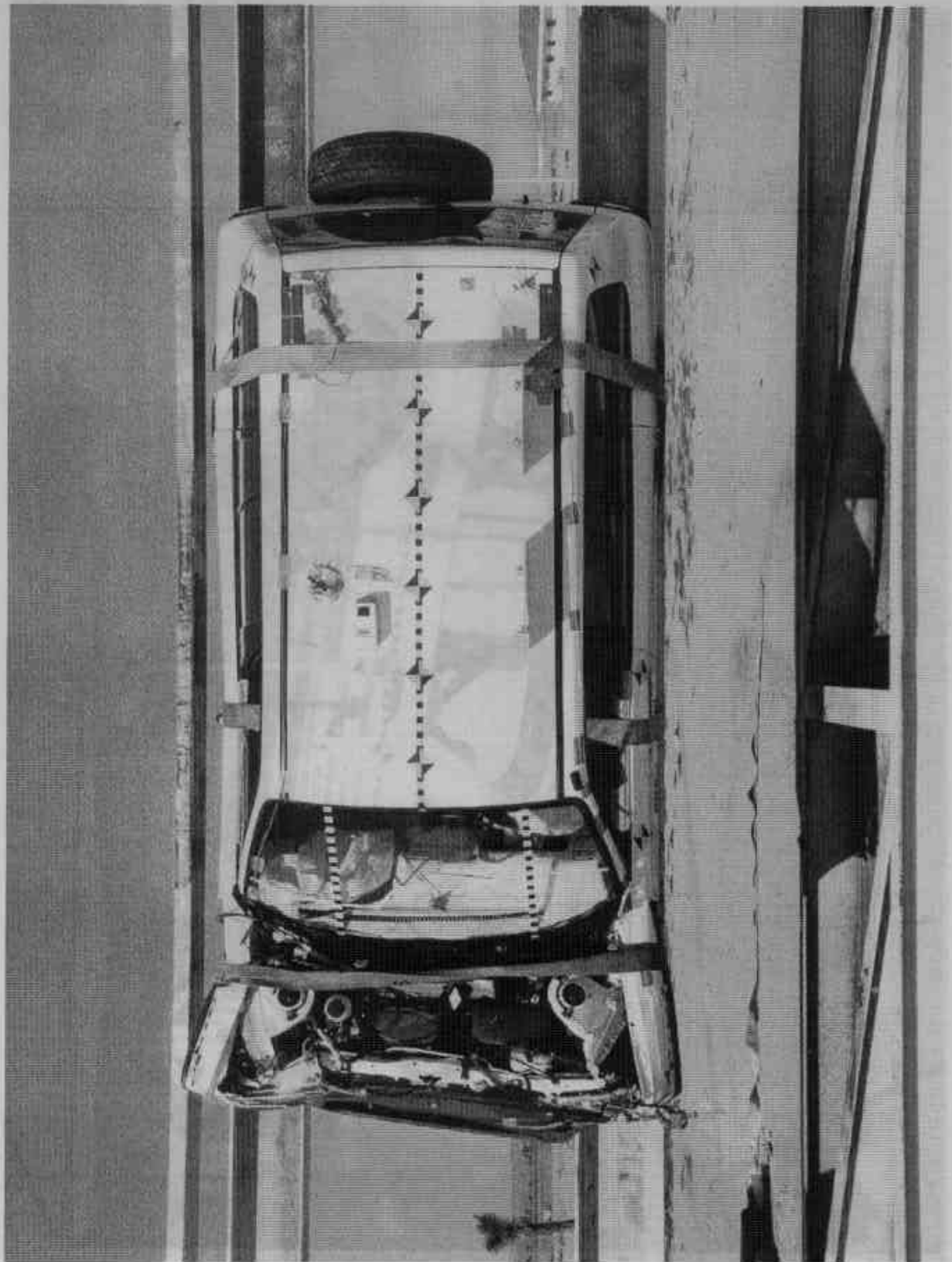


FIGURE A-53. VEHICLE ON ROLLOVER

KAR-98-R98050-13

A-53

KAR-98-R98050-13

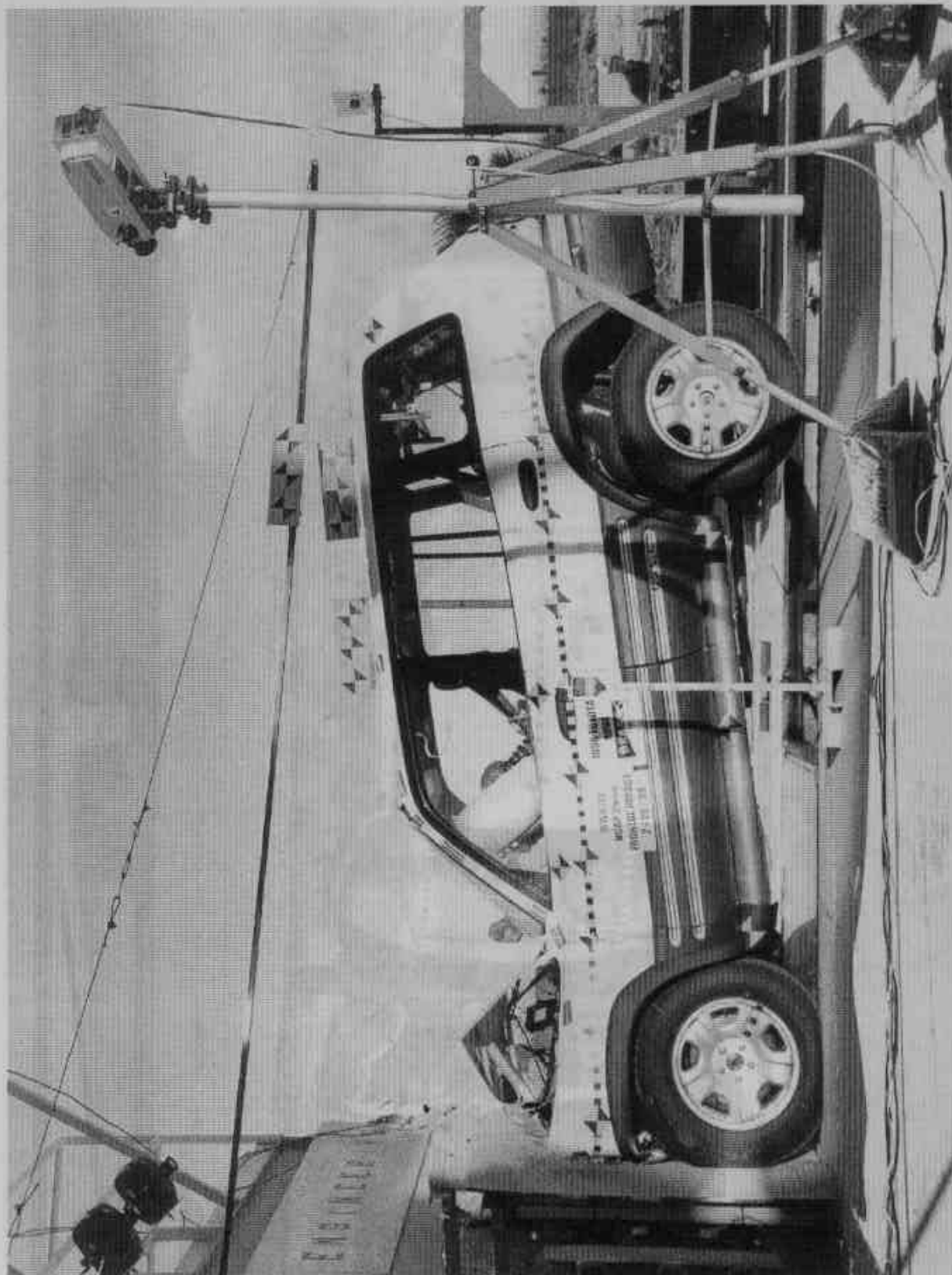


FIGURE A-54. VEHICLE DURING IMPACT

A-54

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APPENDIX B

DUMMY, VEHICLE AND RESPONSE DATA TRACES

KAR-98-R98050-13

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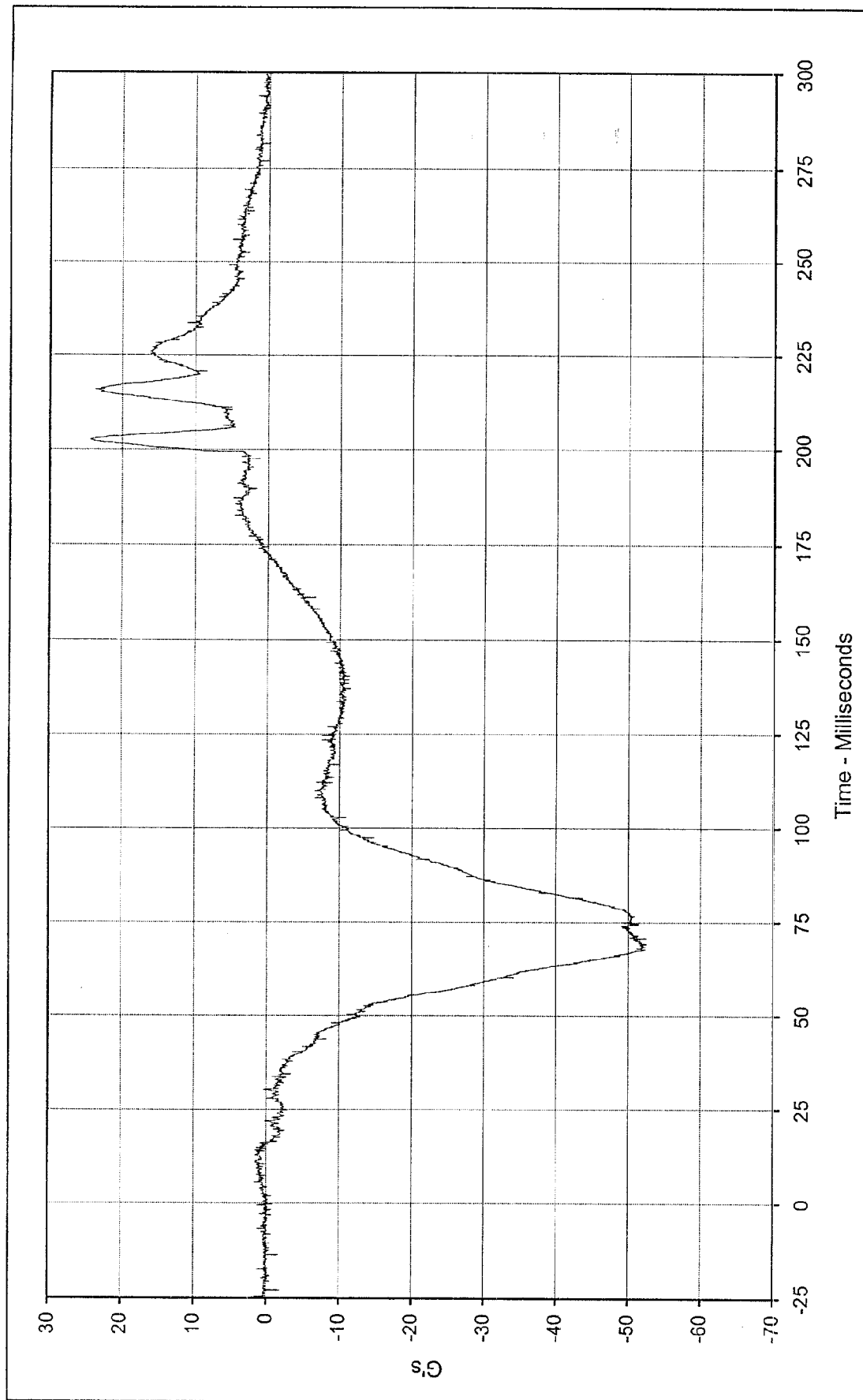
LIST OF DATA PLOTS...(Continued)		
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B-85	Passenger Chest Primary Y	B-85
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B-87	Passenger Chest Primary Resultant	B-87
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B-125	Vehicle Left Rear Primary Displacement	B-125
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B-139	Vehicle Right Brake Caliper Velocity X	B-139
B-140	Vehicle Right Brake Caliper Displacement	B-140

LIST OF DATA PLOTS...(Continued)

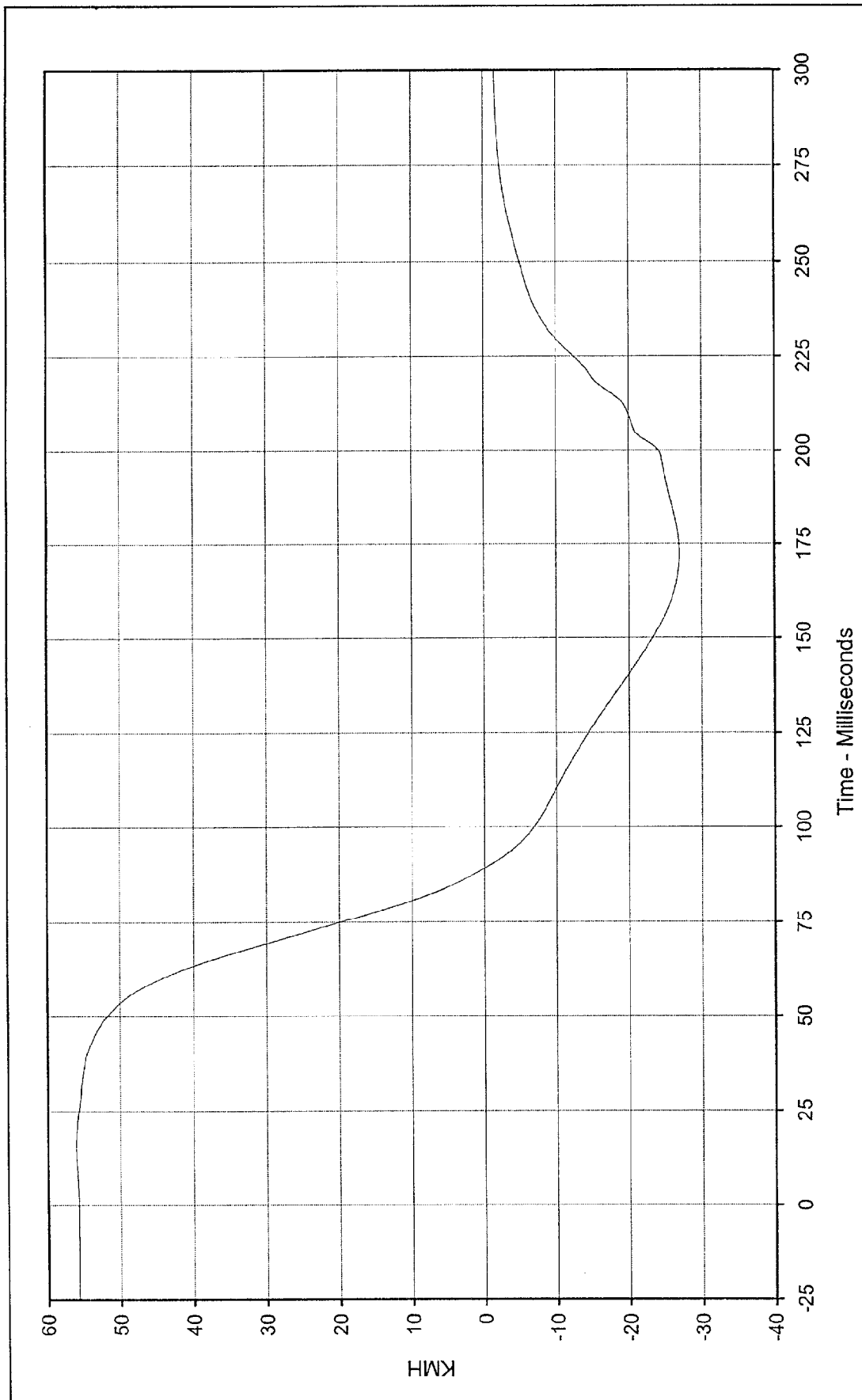
Data Plot		Page
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B-143	Vehicle Instrument Panel Displacement	B-143
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B-145	Vehicle Left Rear Redundant Velocity X	B-145
B-146	Vehicle Left Rear Redundant Displacement	B-146



Curve Description: Driver Head Primary X
 Maximum Value: 24.4 at 202.6 Milliseconds
 Minimum Value: -52.6 at 68.9 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-001

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Head Primary X Velocity

Maximum Value: 56.1 at 16.1 Milliseconds

Minimum Value: -26.9 at 172.5 Milliseconds

SAE Filter Class: 180

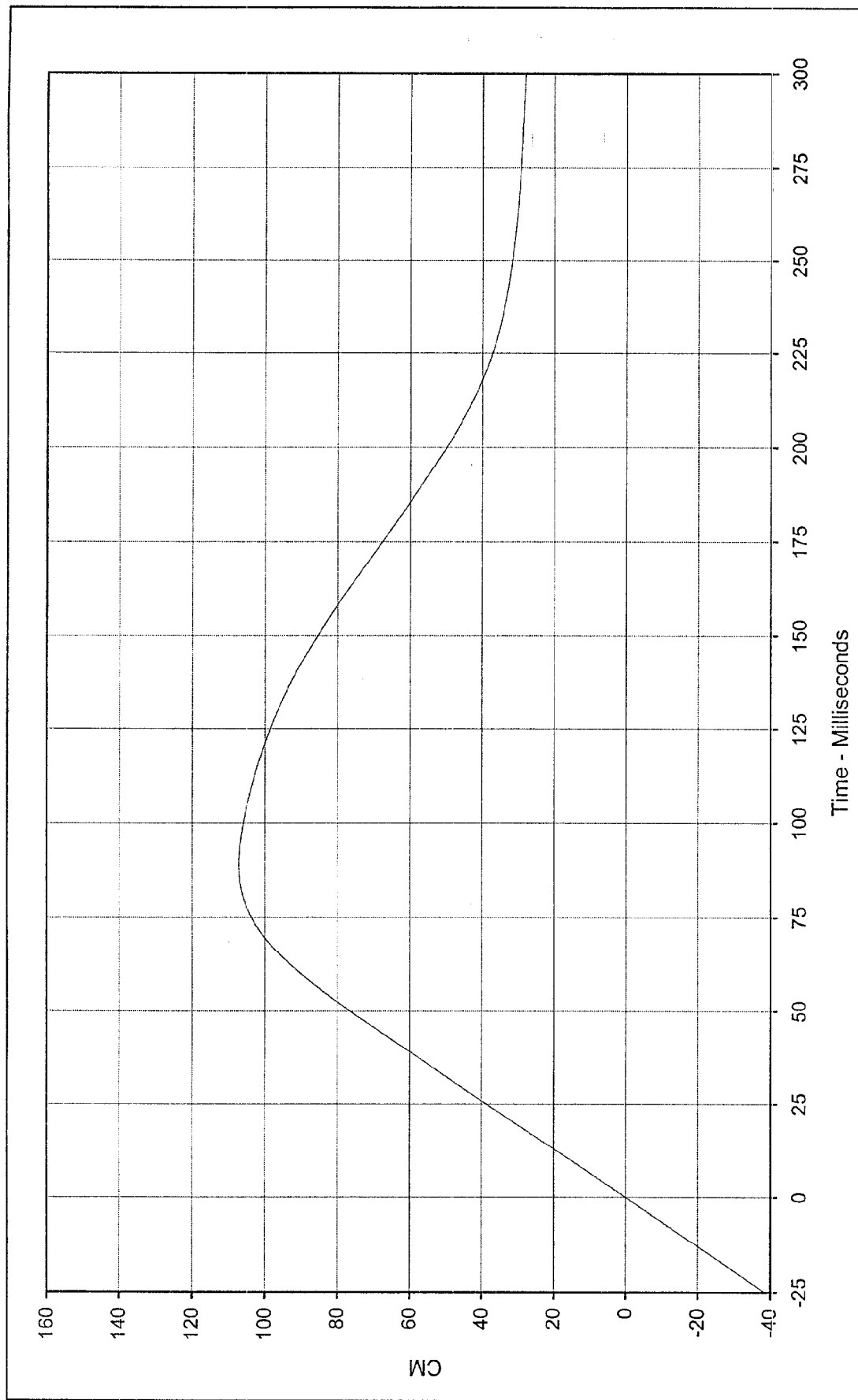
Date of Test: 2/26/98

Curve Number: IN1-001

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

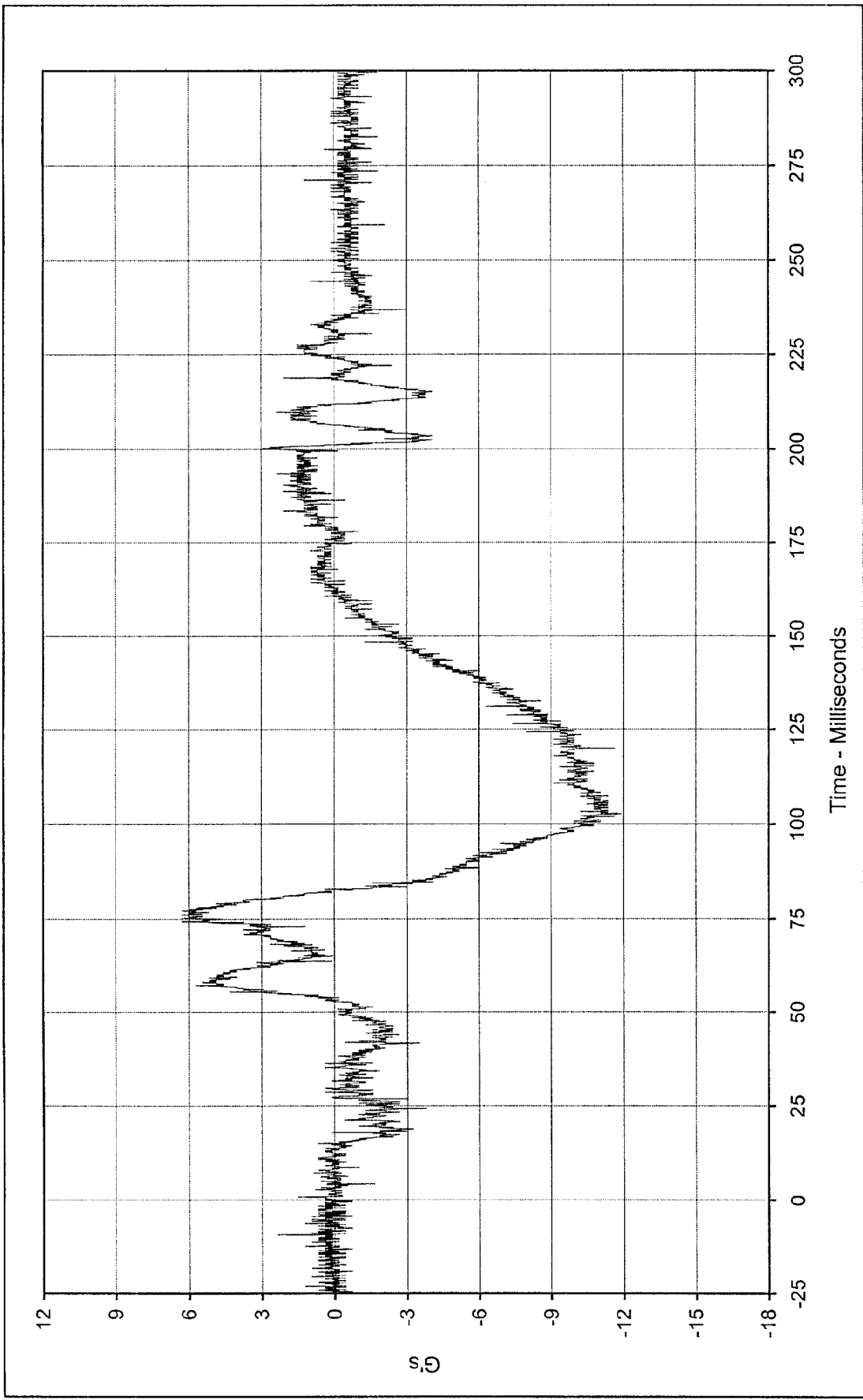




Curve Description: Driver Head Primary X Displ.
 Maximum Value: 107.1 at 89.0 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN2-001

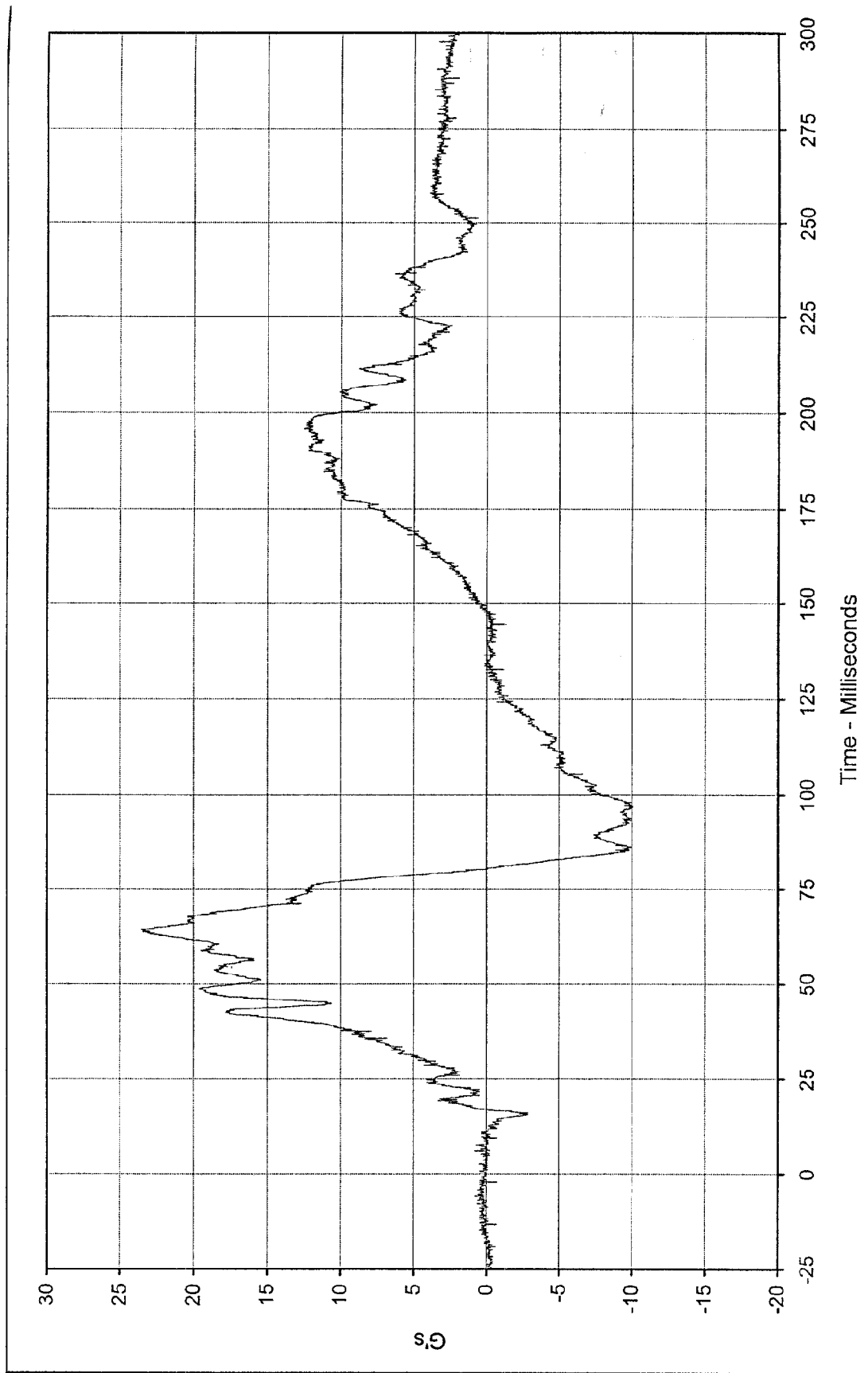
Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Driver Head Primary Y	Testing Program	1998 NHTSA 35 mph NCAP	No.:	MW5110
Maximum Value:	6.3 at 74.3 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV		
Minimum Value:	-11.9 at 102.7 Milliseconds				
SAE Filter Class:	1000				
Date of Test:	2/26/98				
Curve Number:	FIL-002				





Curve Description: Driver Head Primary Z

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 23.6 at 64.3 Milliseconds

Test Vehicle: 1998 Toyota RAV-4 SUV

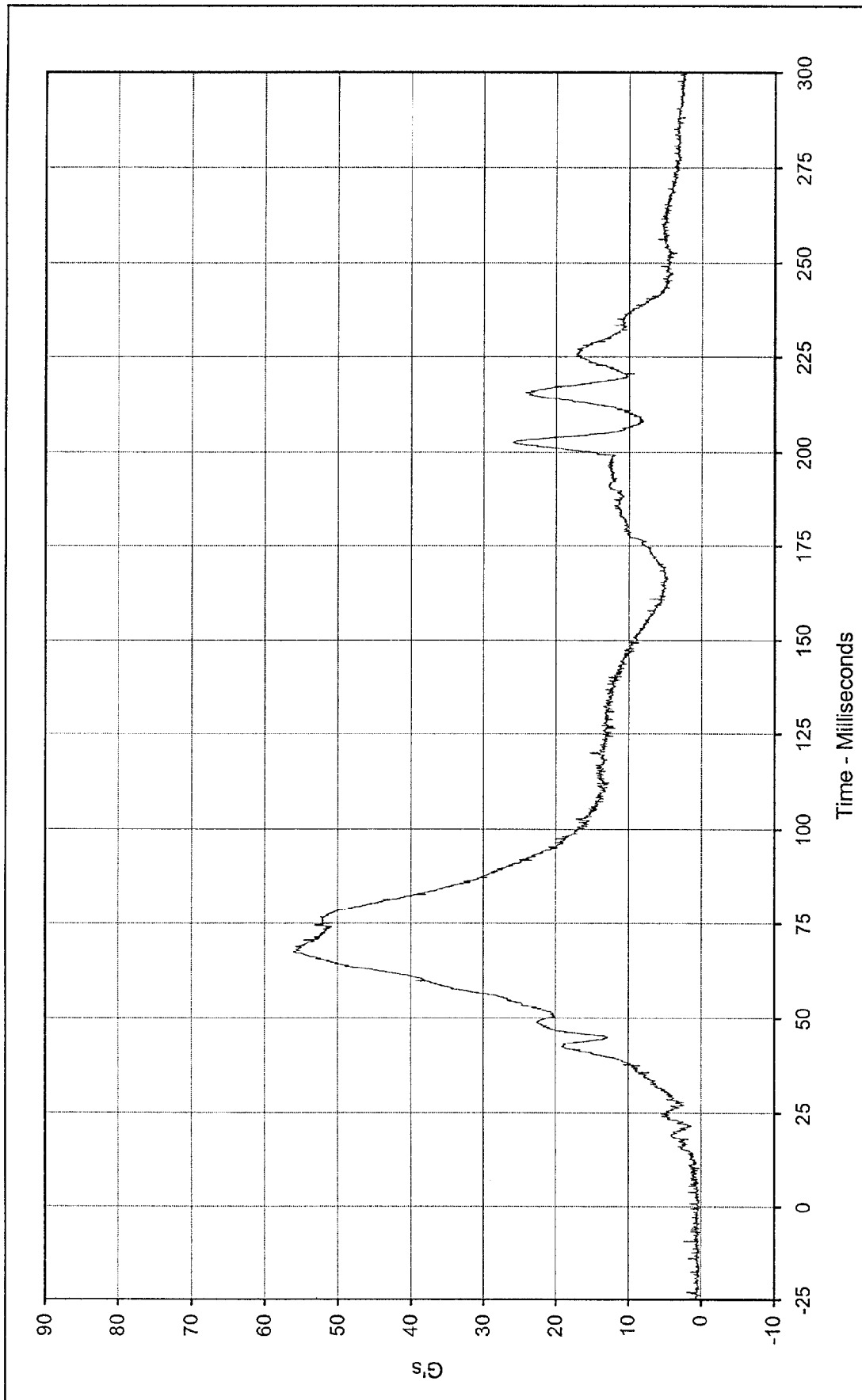
Minimum Value: -10.1 at 96.7 Milliseconds

SAE Filter Class: 1000

Date of Test: 2/26/98

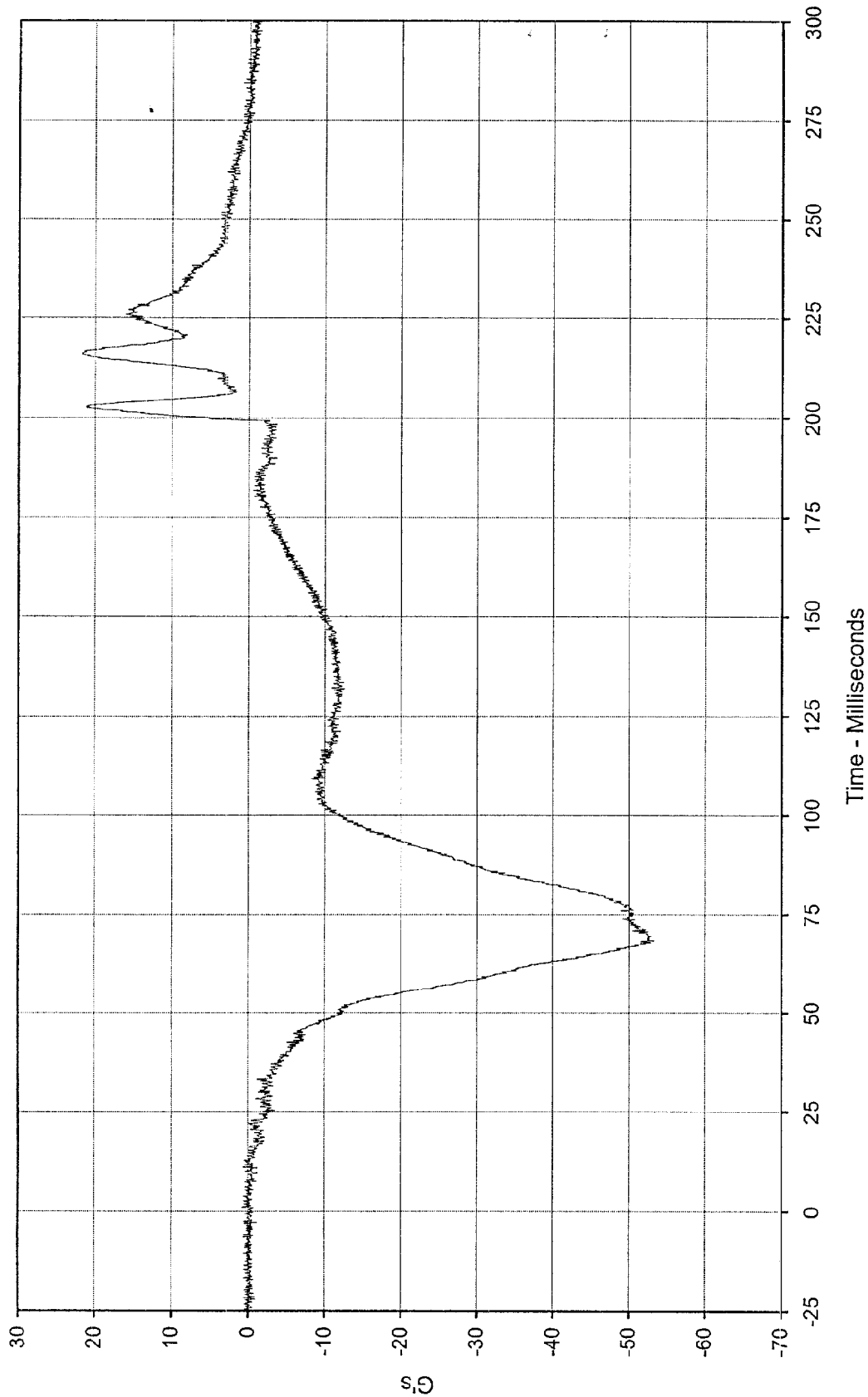
Curve Number: FIL-003





Curve Description:	Driver Head Resultant Primary	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	56.1 at 67.5 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	0.1 at 1.9 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	2/26/98			
Curve Number:	RES-001			

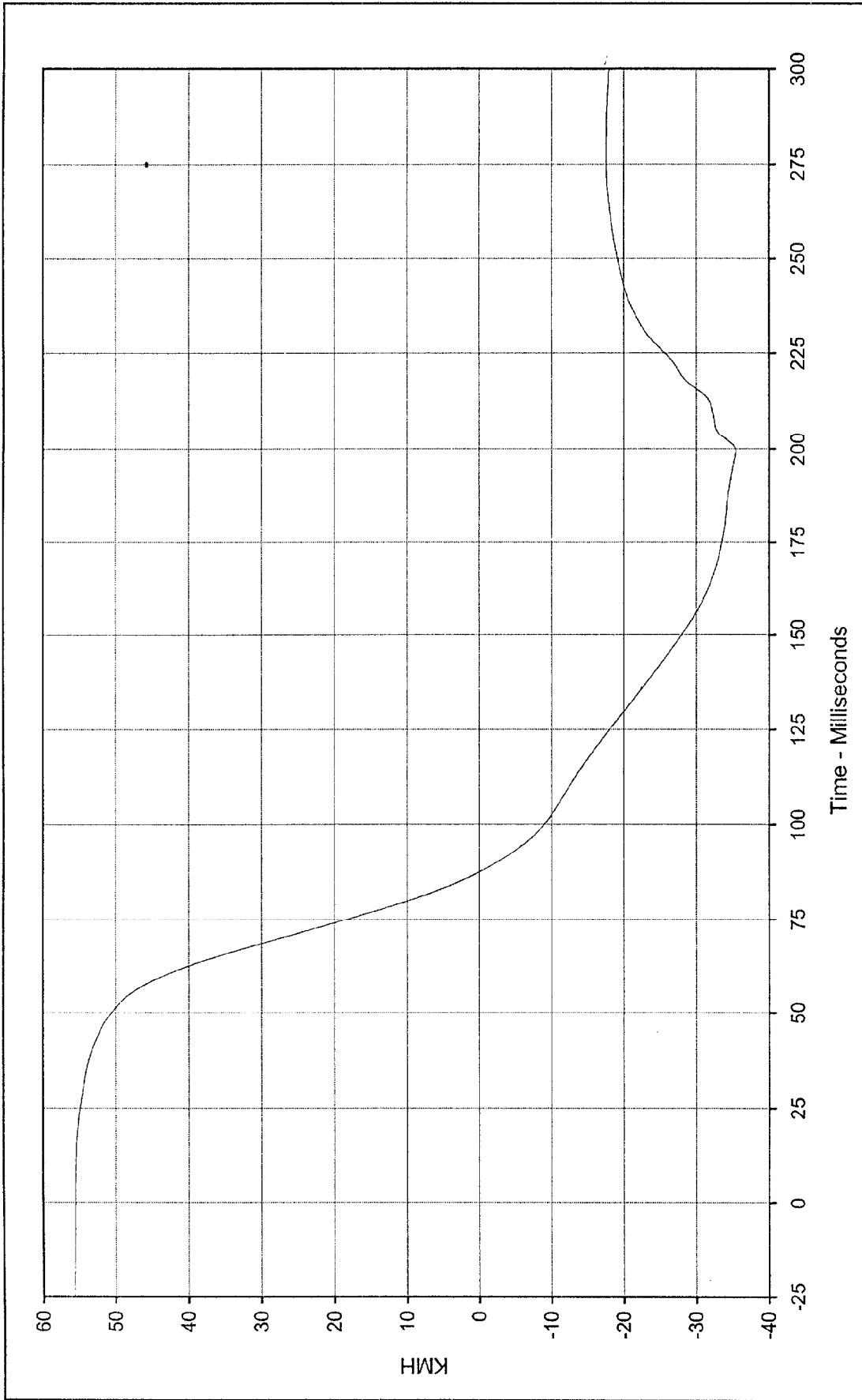




Curve Description: Driver Head Redundant X
 Maximum Value: 21.8 at 215.7 Milliseconds
 Minimum Value: -53.3 at 68.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-004

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

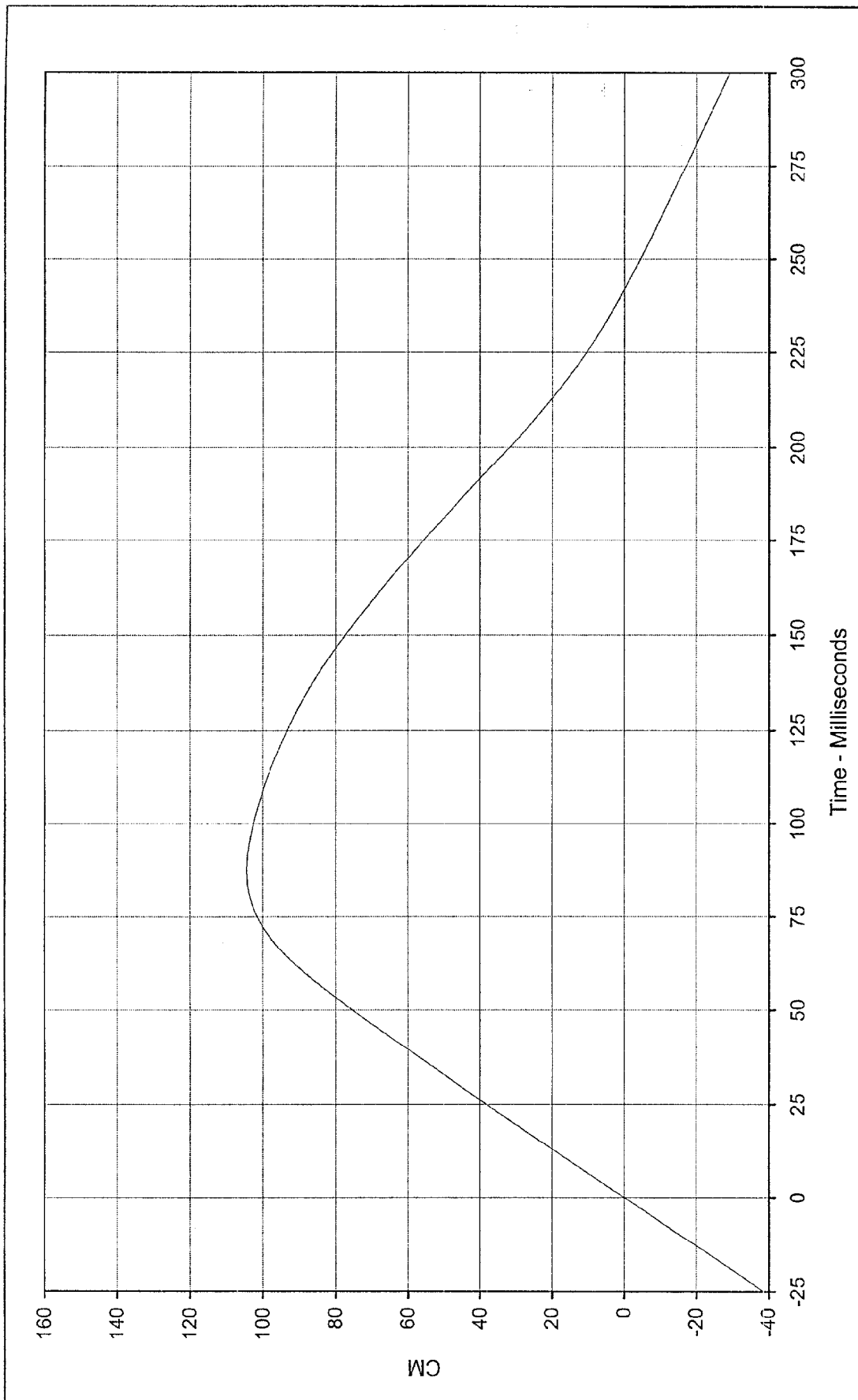




Curve Description: Driver Head Redundant X Velocity
 Maximum Value: 55.5 at 0.0 Milliseconds
 Minimum Value: -35.4 at 199.3 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN1-004

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

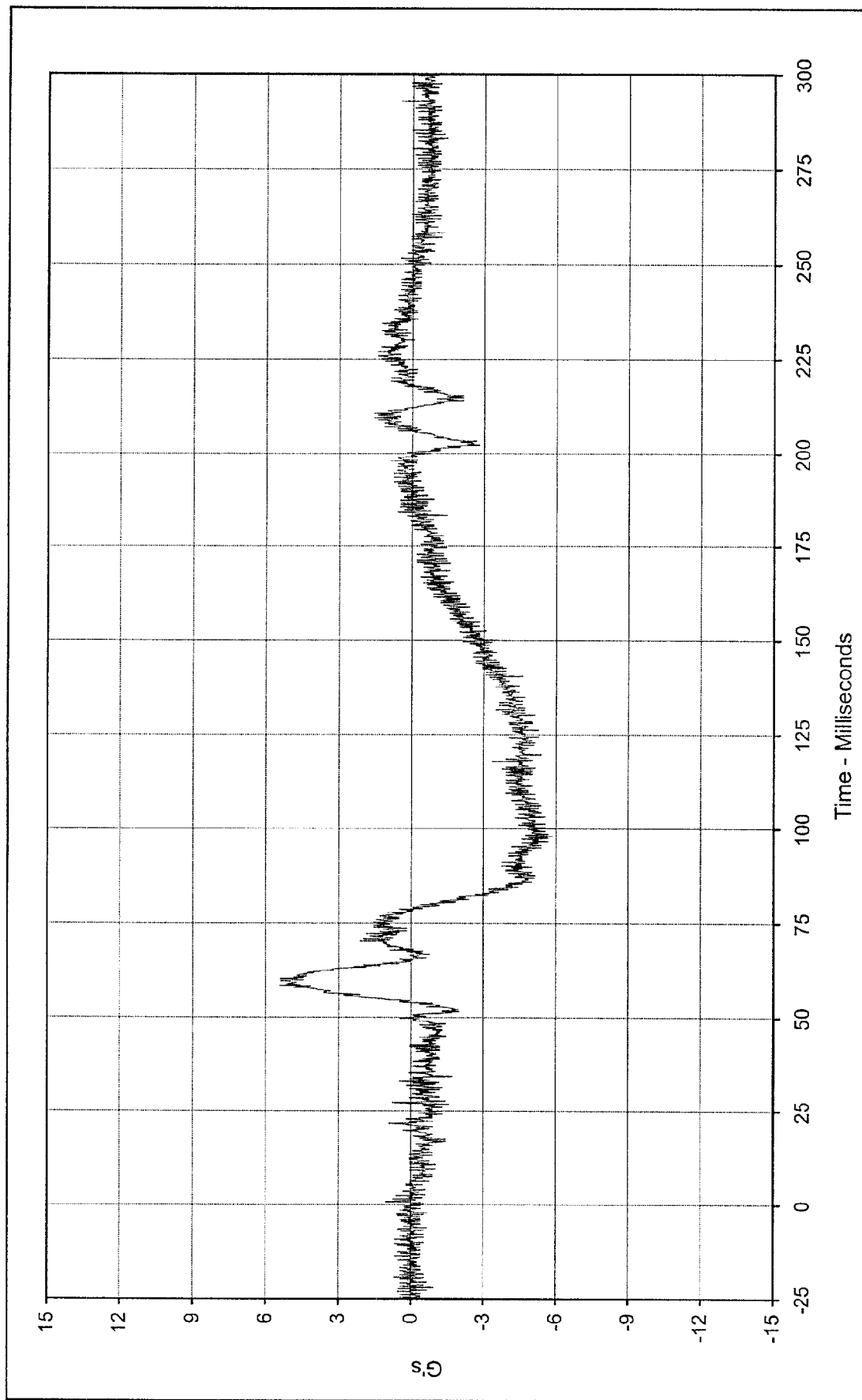




Curve Description: Driver Head Redundant X Displ.
Maximum Value: 104.4 at 87.4 Milliseconds
Minimum Value: -29.2 at 299.9 Milliseconds
SAE Filter Class: 180
Date of Test: 2/26/98
Curve Number: IN2-004

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV

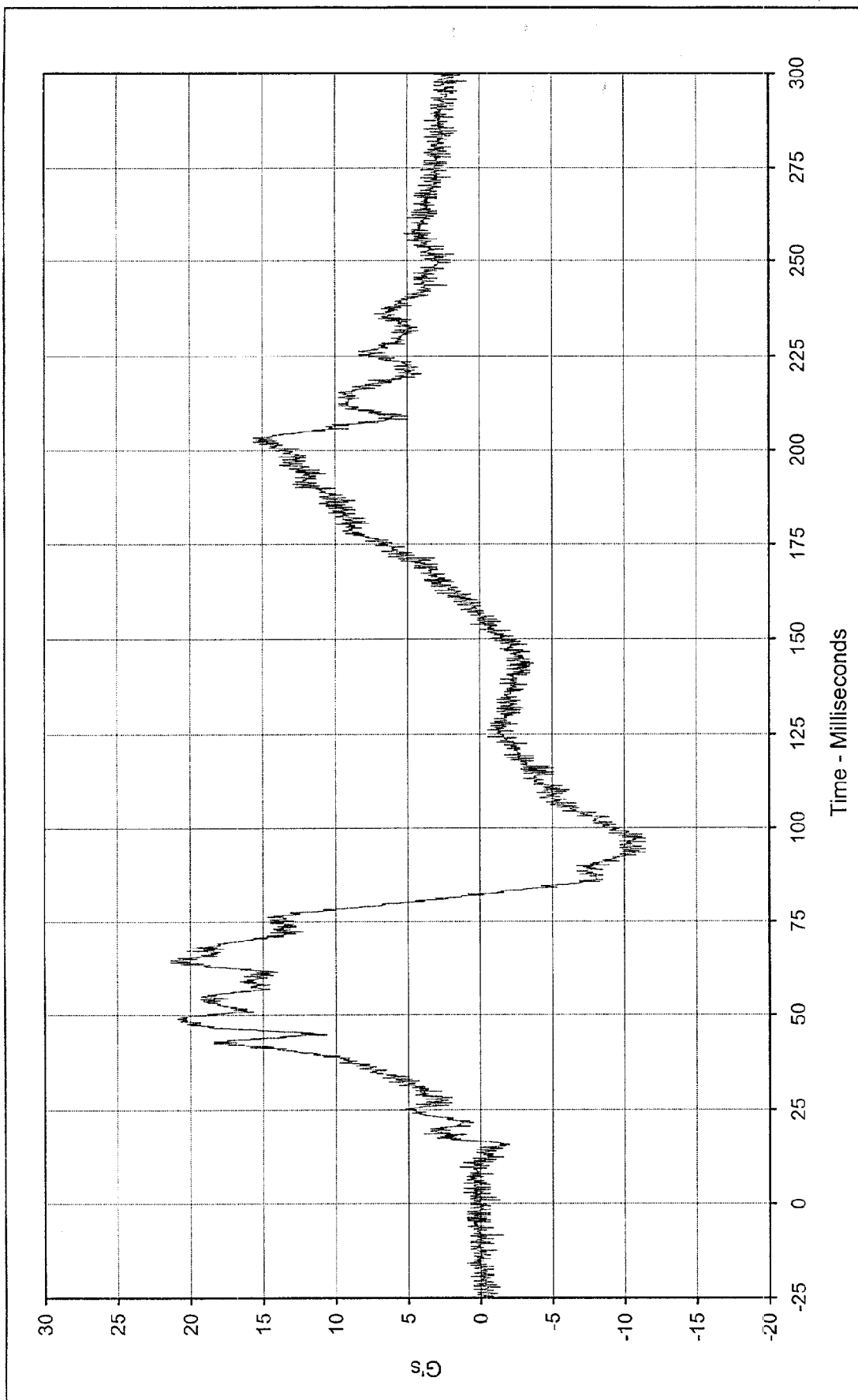




Curve Description:		Driver Head Redundant Y		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	5.4	at	58.5	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-5.8	at	97.9			
SAE Filter Class:	1000					
Date of Test:	2/26/98					
Curve Number:	FIL-005					

The logo for KARCO Engineering features the word "KARCO" in a large, bold, sans-serif font. To the left of the letters "A" and "R" is a circular icon containing a stylized gear or cog. To the right of "KARCO" is the word "Engineering" in a smaller, italicized, sans-serif font. The entire logo is set against a dark, rectangular background.





Curve Description: Driver Head Redundant Z

Maximum Value: 21.3 at 63.8 Milliseconds

Minimum Value: -11.5 at 93.4 Milliseconds

SAE Filter Class: 1000

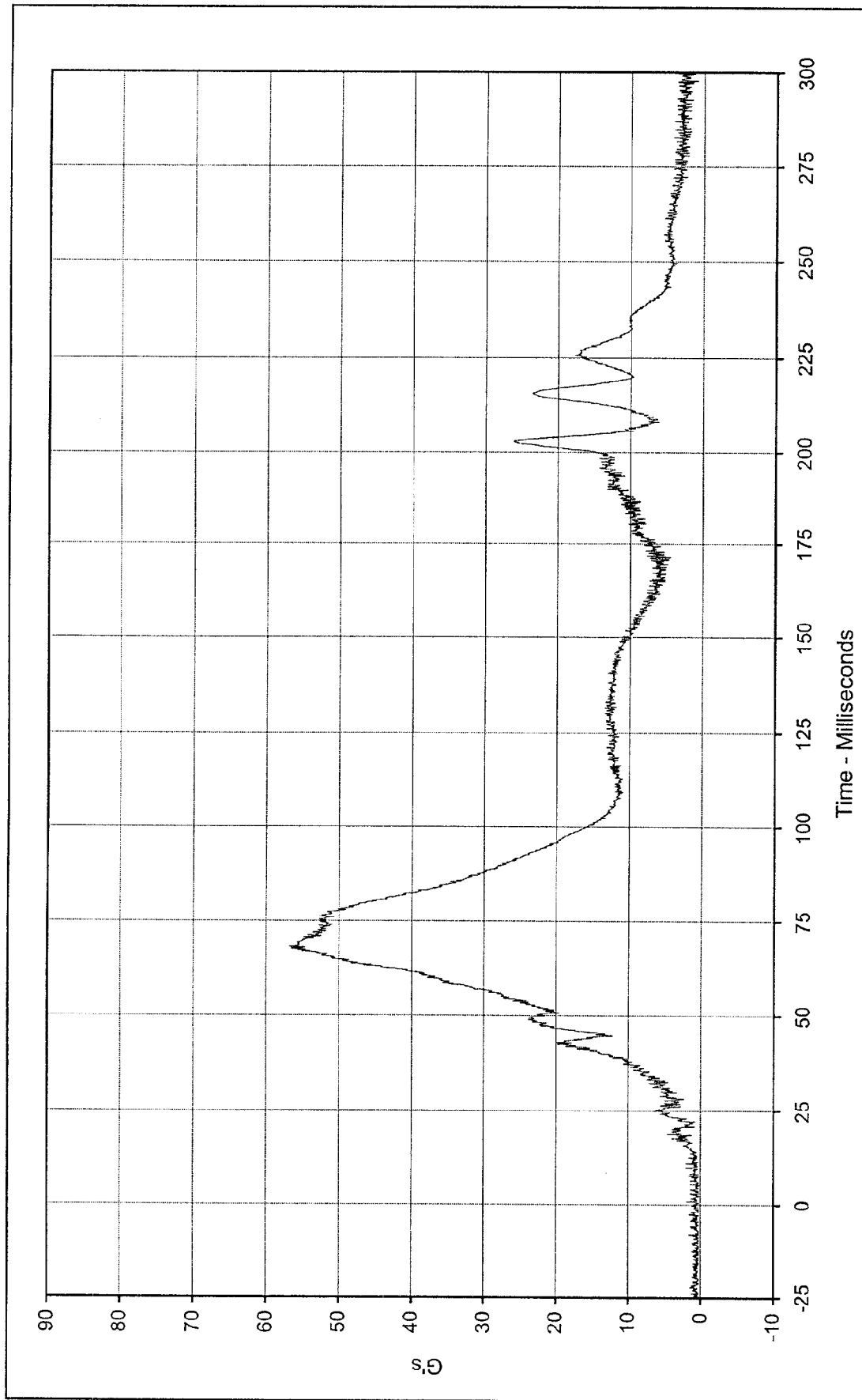
Date of Test: 2/26/98

Curve Number: FIL-006

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

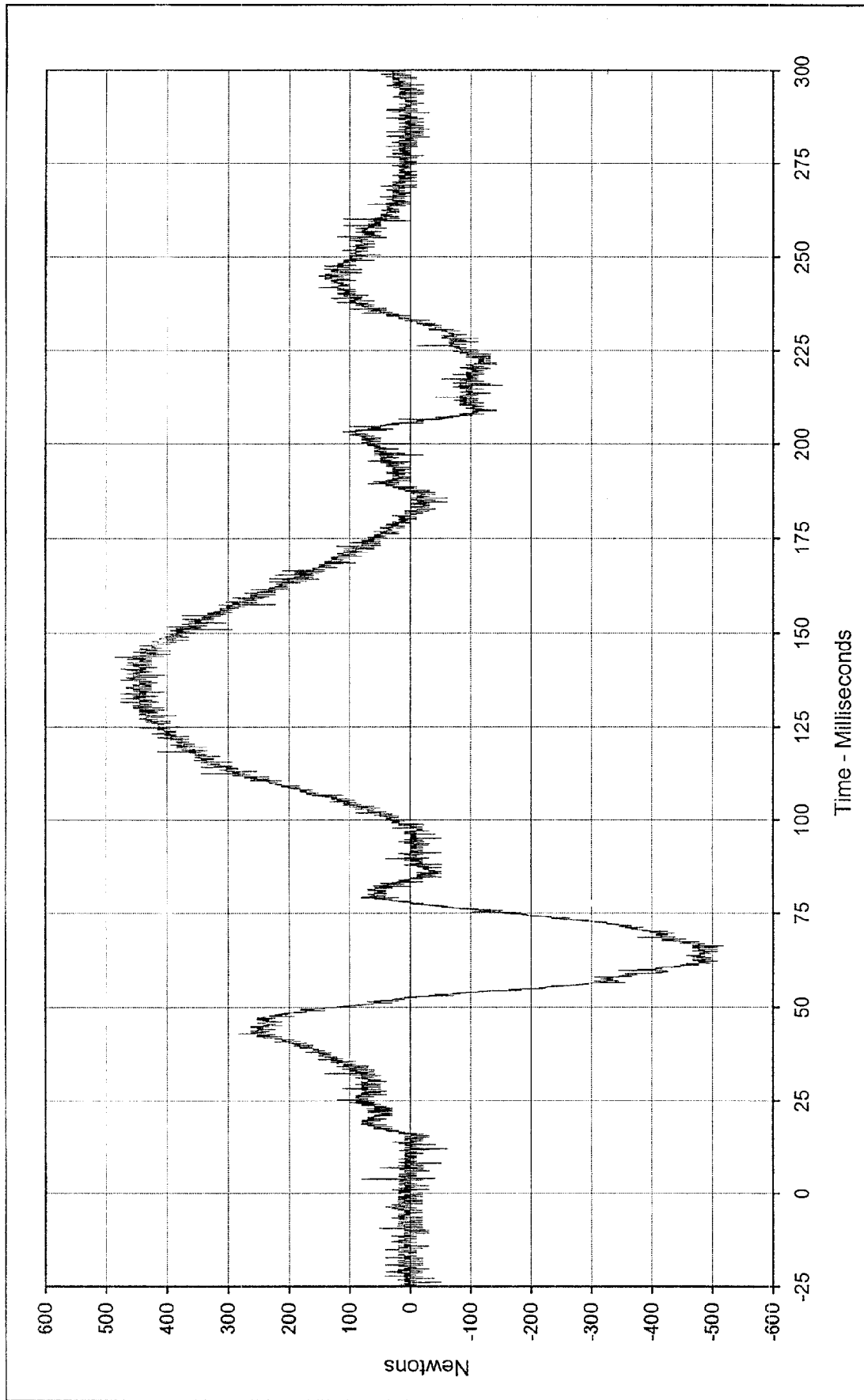




Curve Description: Driver Head Resultant Redundant
 Maximum Value: 56.8 at 68.2 Milliseconds
 Minimum Value: 0.1 at 5.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: RES-004

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 485.9 at 143.3 Milliseconds

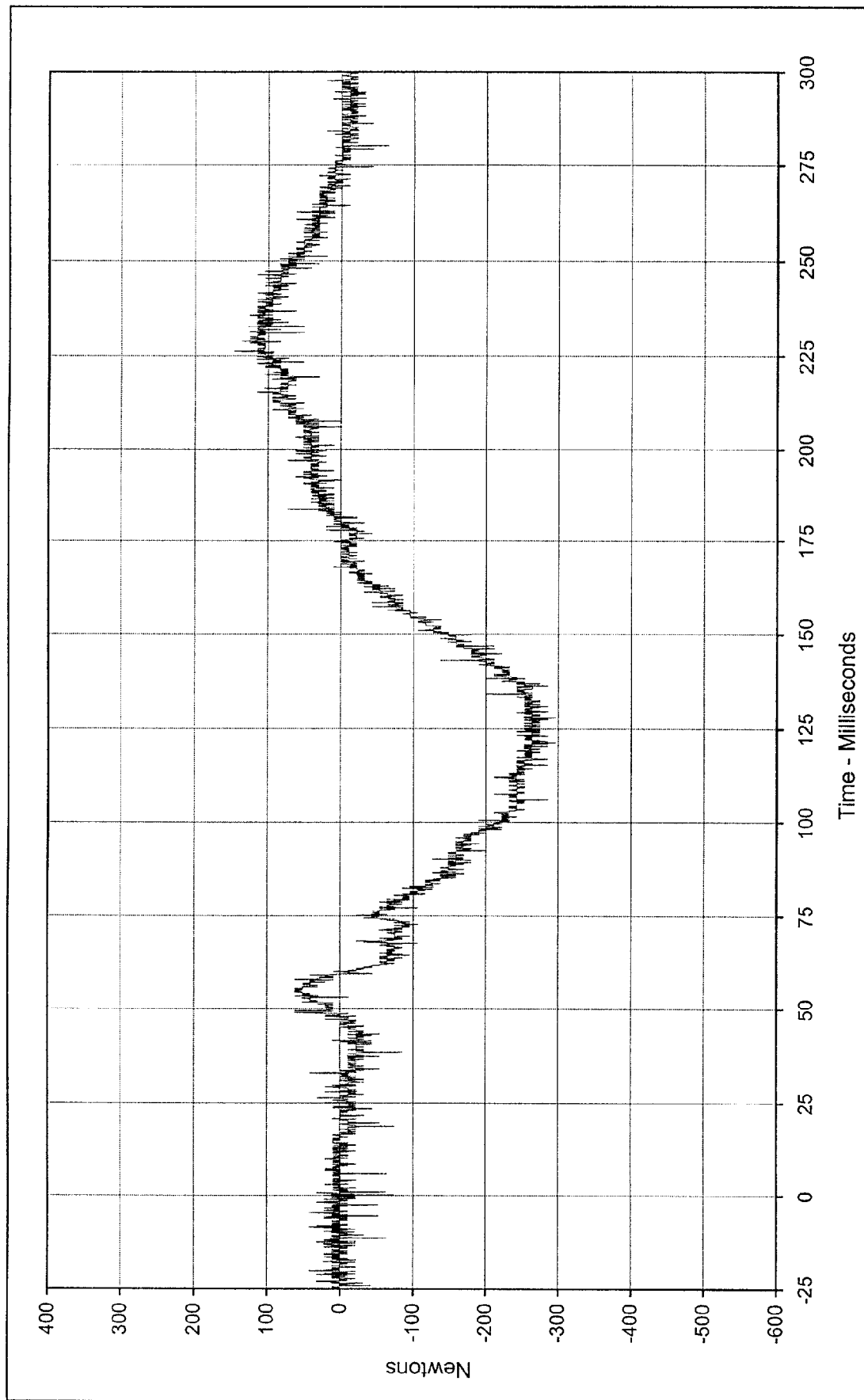
Minimum Value: -518.1 at 66.1 Milliseconds

SAE Filter Class: 1000

Date of Test: 2/26/98

Curve Number: FIL-007

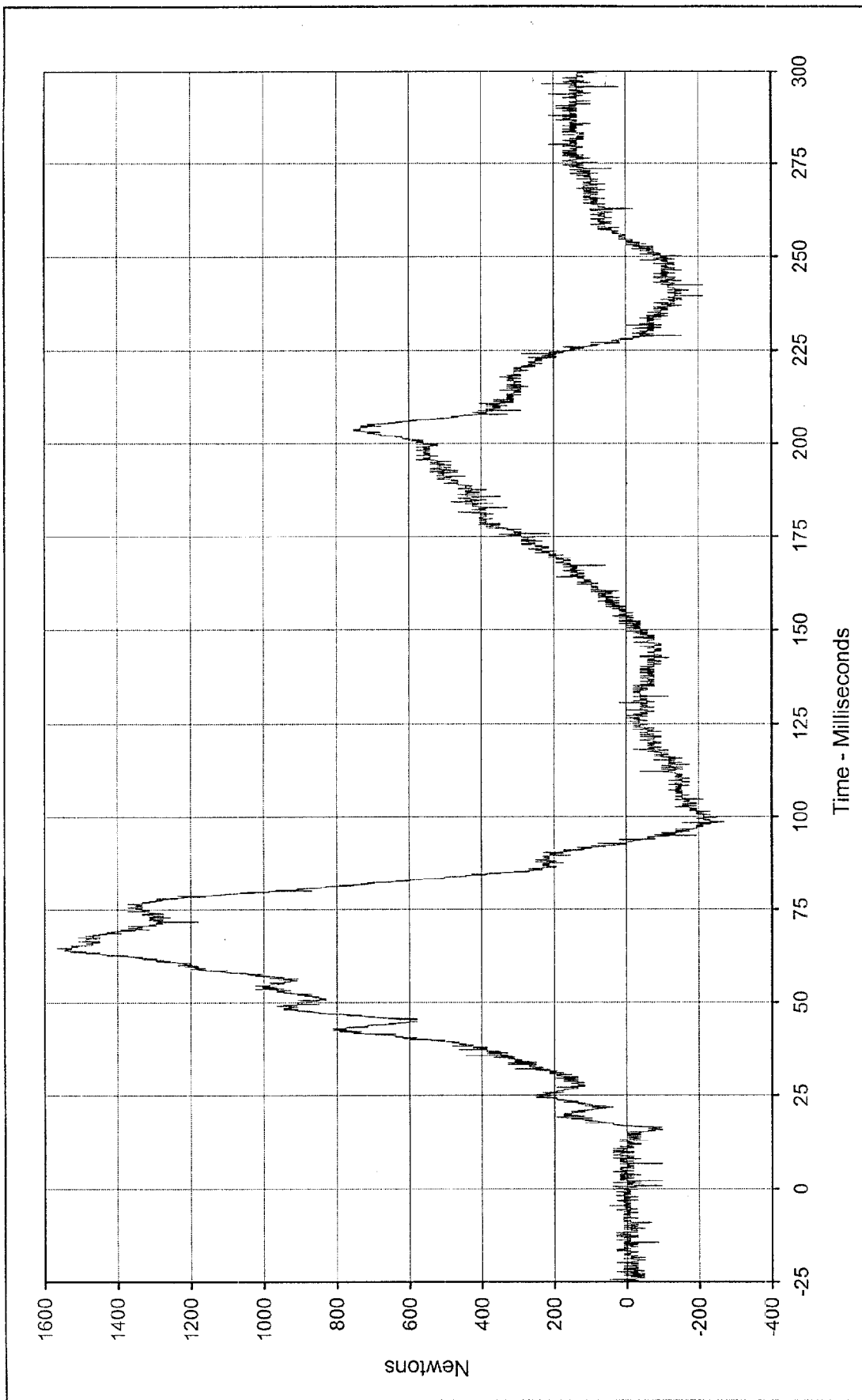




Curve Description: Driver Neck Force Y
 Maximum Value: 146.1 at 226.1 Milliseconds
 Minimum Value: -295.6 at 121.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-008

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

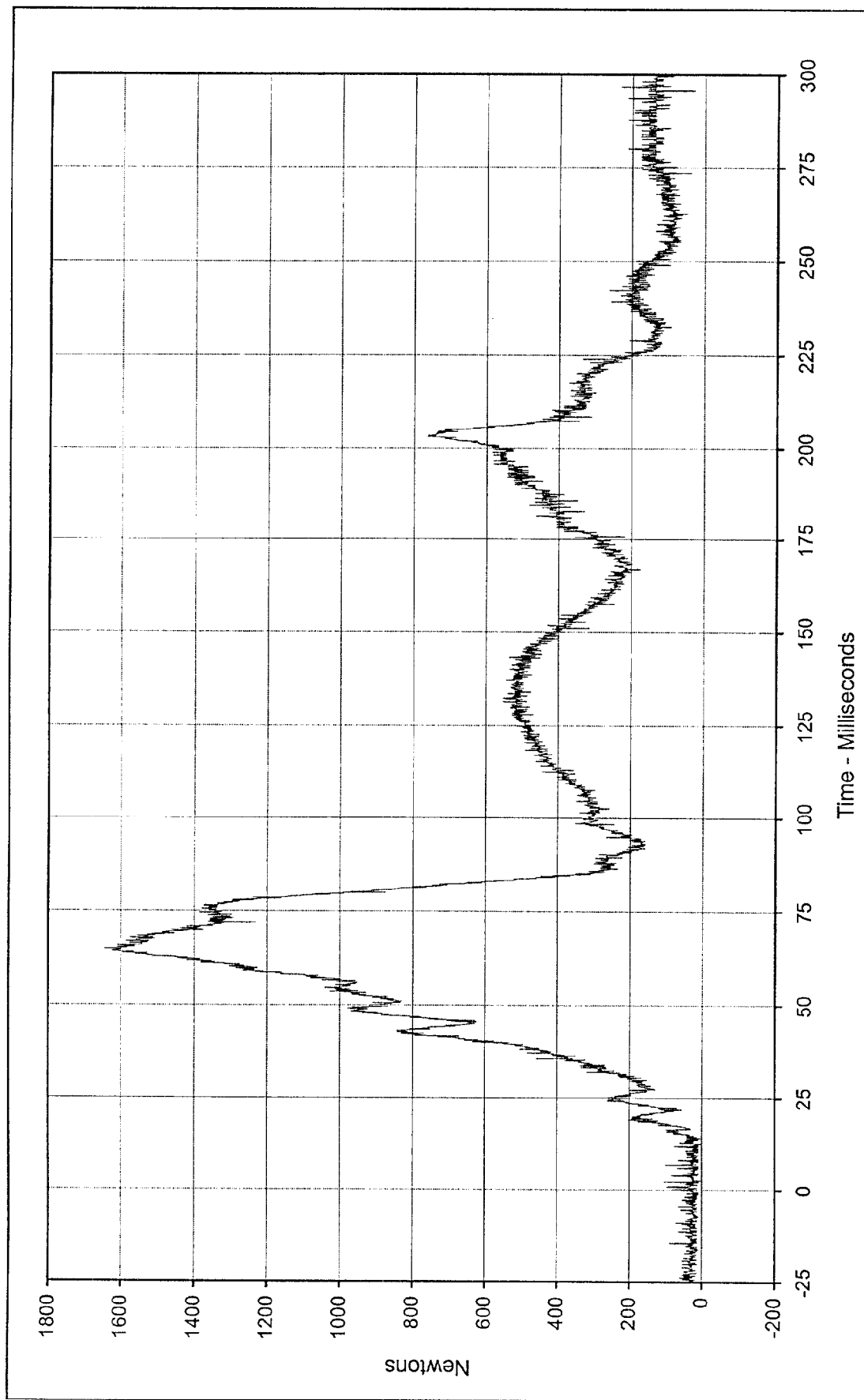




Curve Description: Driver Neck Force Z
 Maximum Value: 1564.3 at 64.6 Milliseconds
 Minimum Value: -270.9 at 98.5 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-009

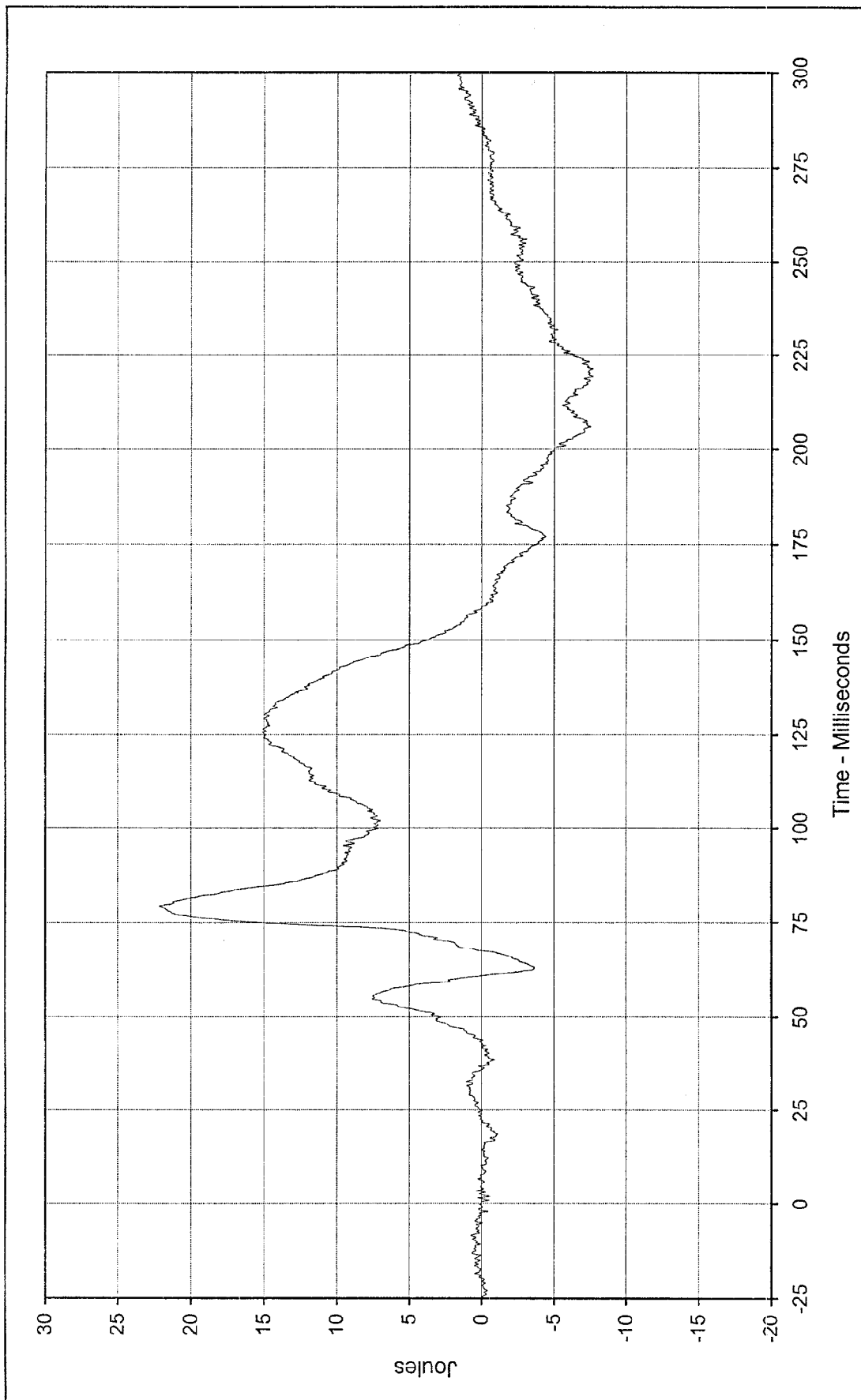
Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Driver Neck Force Resultant		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	1645.9	at 64.6	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	1.5	at 2.5			
SAE Filter Class:	1000				
Date of Test:	2/26/98				
Curve Number:	RES-007				



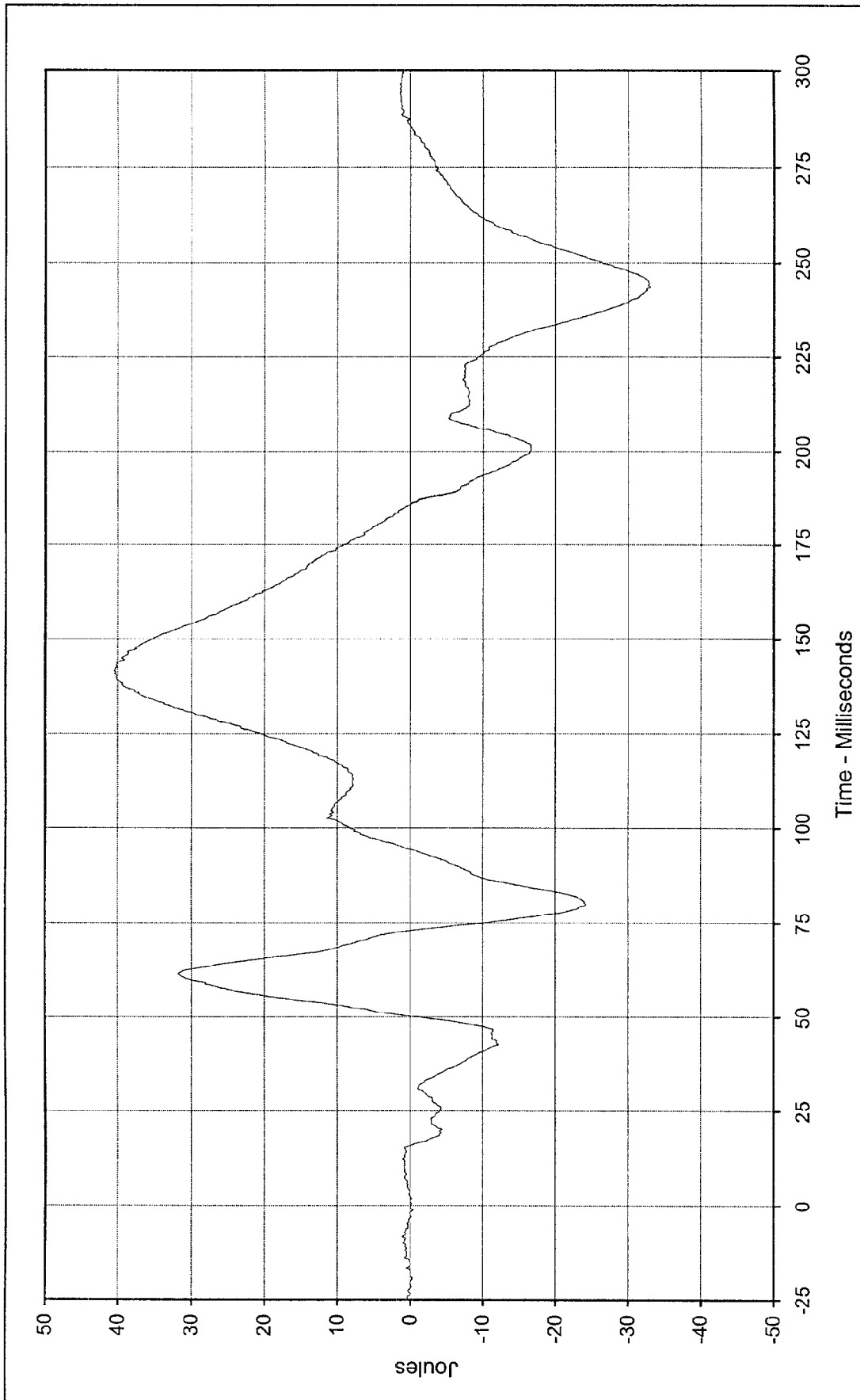


Curve Description:	Driver Neck Moment X			Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	22.2	at	79.4	Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV
Minimum Value:	-7.7	at	219.2	Milliseconds		
SAE Filter Class:	600					
Date of Test:	2/26/98					
Curve Number:	FIL-010					



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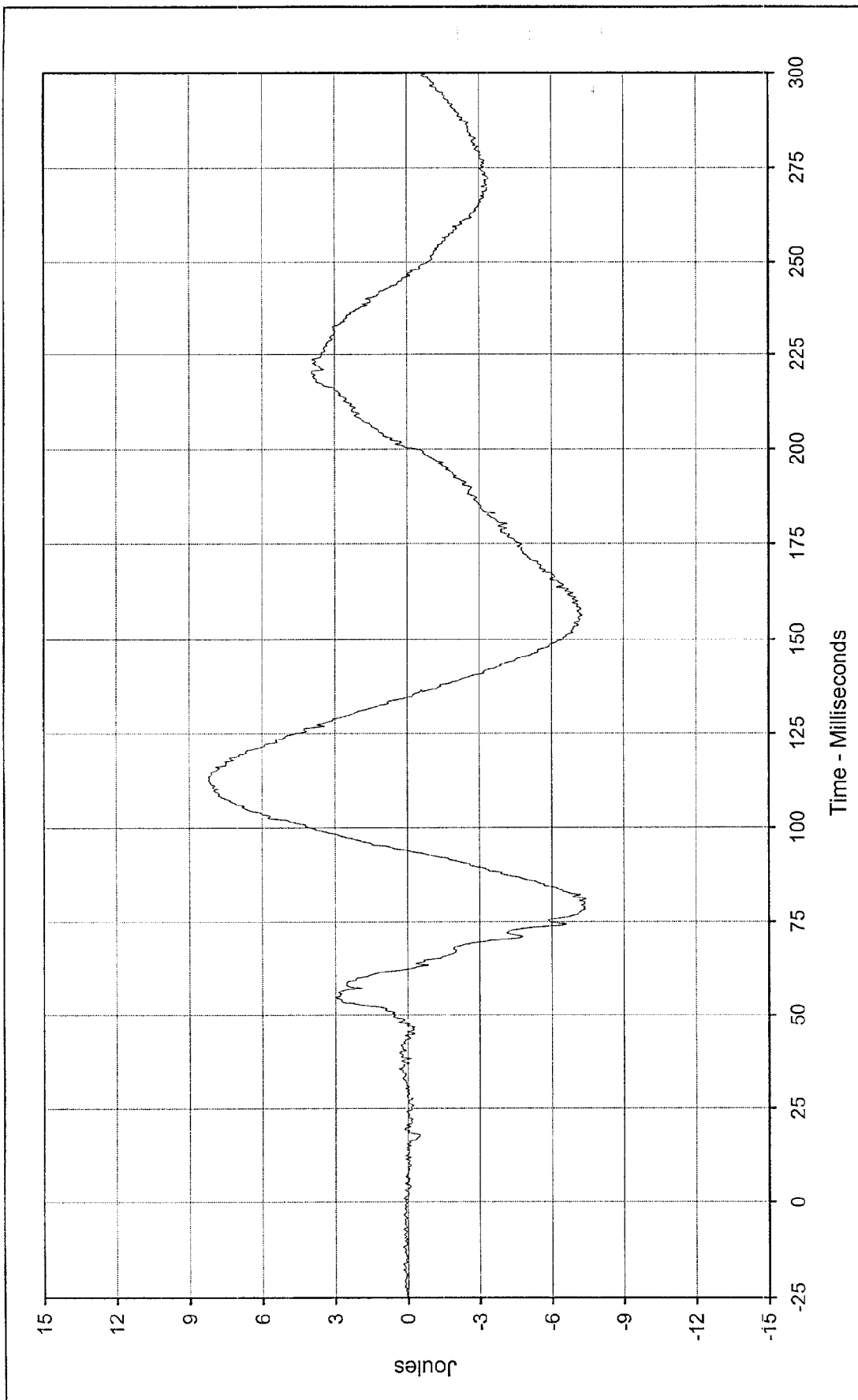




Curve Description: Driver Neck Moment Y
 Maximum Value: 40.6 at 141.7 Milliseconds
 Minimum Value: -33.0 at 243.6 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-011

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

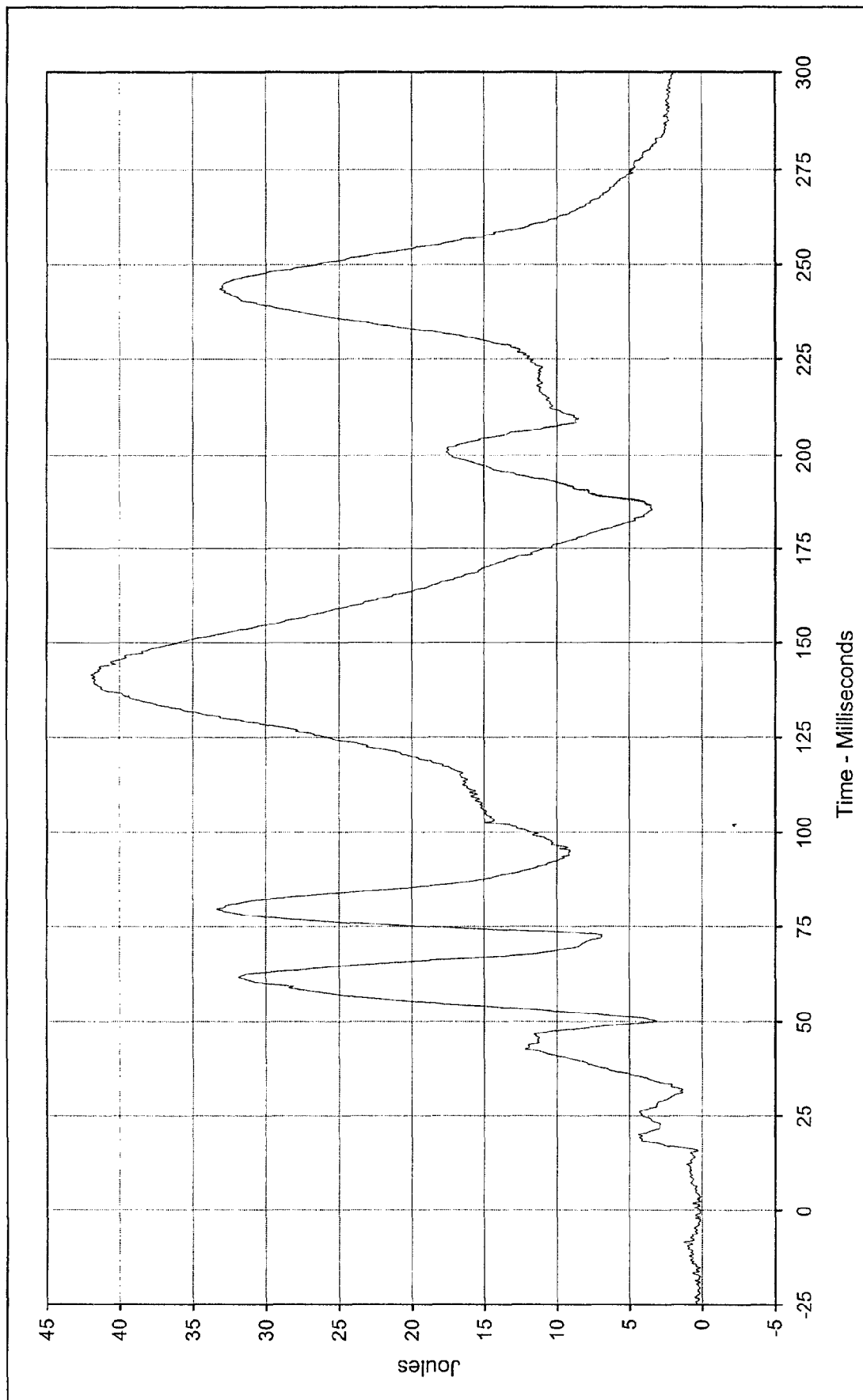




Curve Description: Driver Neck Moment Z
 Maximum Value: 8.2 at 113.5 Milliseconds
 Minimum Value: -7.4 at 80.9 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-012

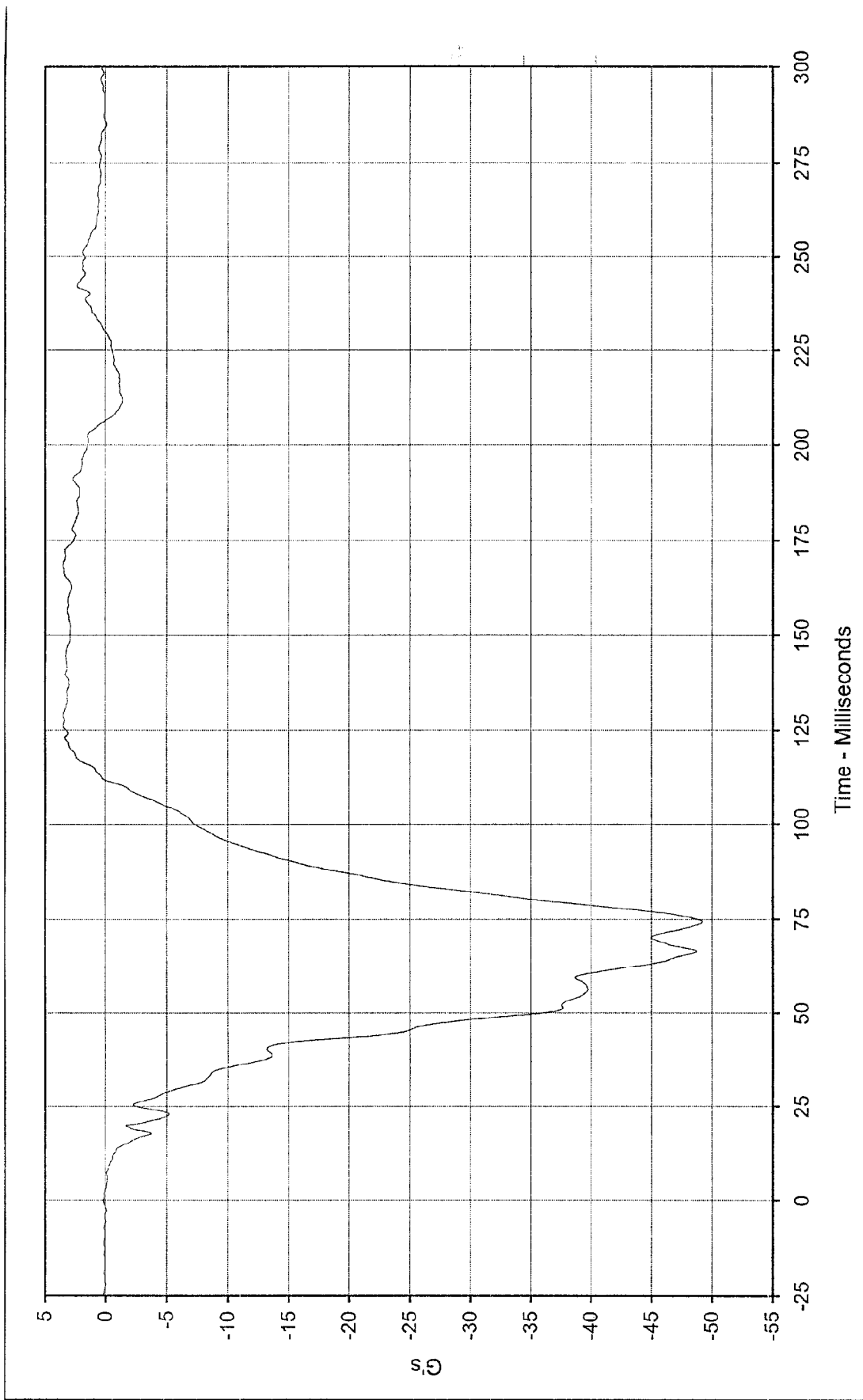
Testing Program: 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





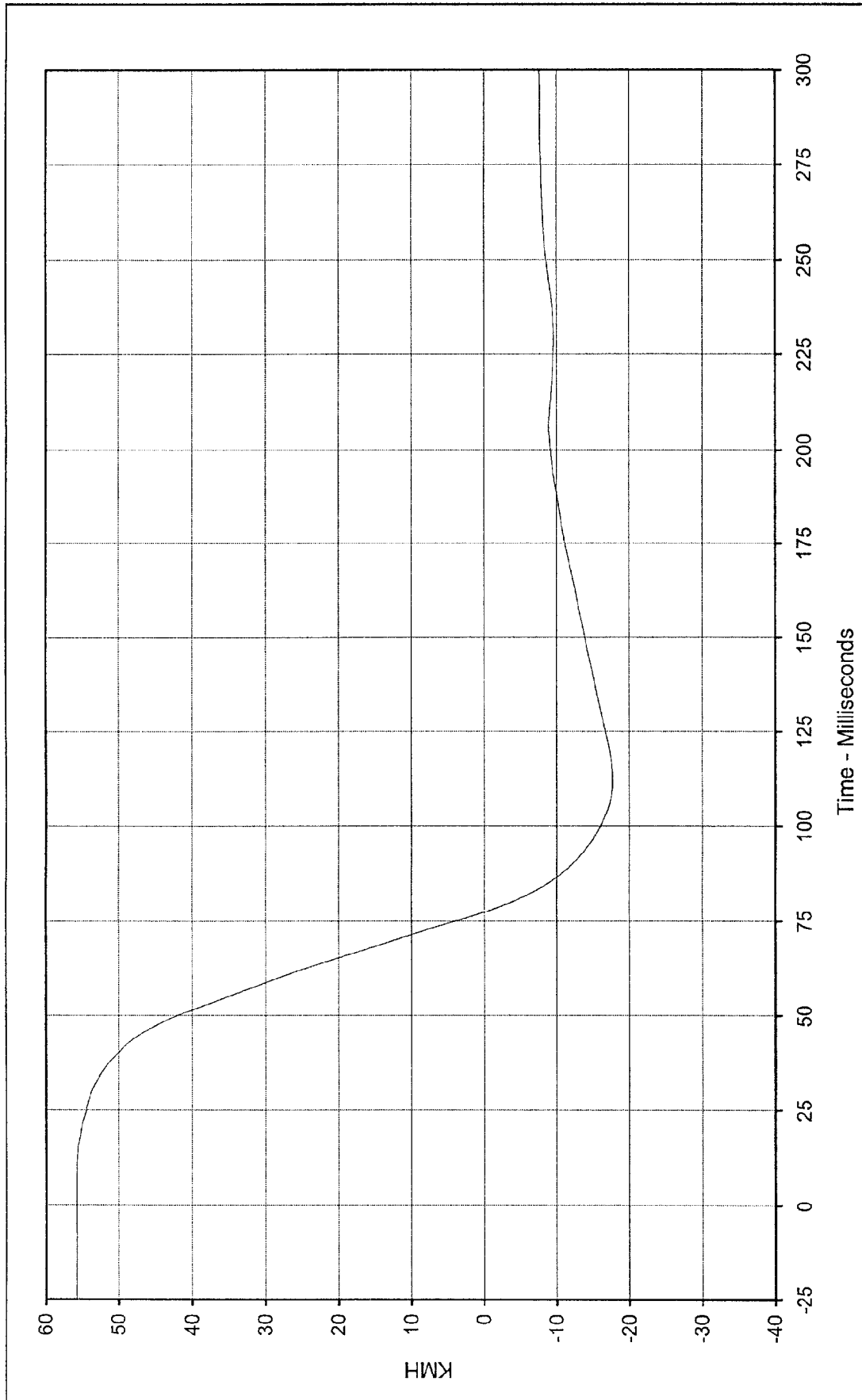
Curve Description:	Driver Neck Moment Resultant	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	41.9	at	141.7	Milliseconds
Minimum Value:	0.1	at	2.5	Milliseconds
SAE Filter Class:	600	Test Vehicle:	1998 Toyota RAV-4 SUV	
Date of Test:	2/26/98			
Curve Number:	RES-010			





Curve Description:	Driver Chest Primary X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	3.5	at	168.5	Milliseconds
Minimum Value:	-49.2	at	74.4	Milliseconds
SAE Filter Class:	180			
Date of Test:	2/26/98	Test Vehicle:	1998 Toyota RAV-4 SUV	
Curve Number:	FIL-013			

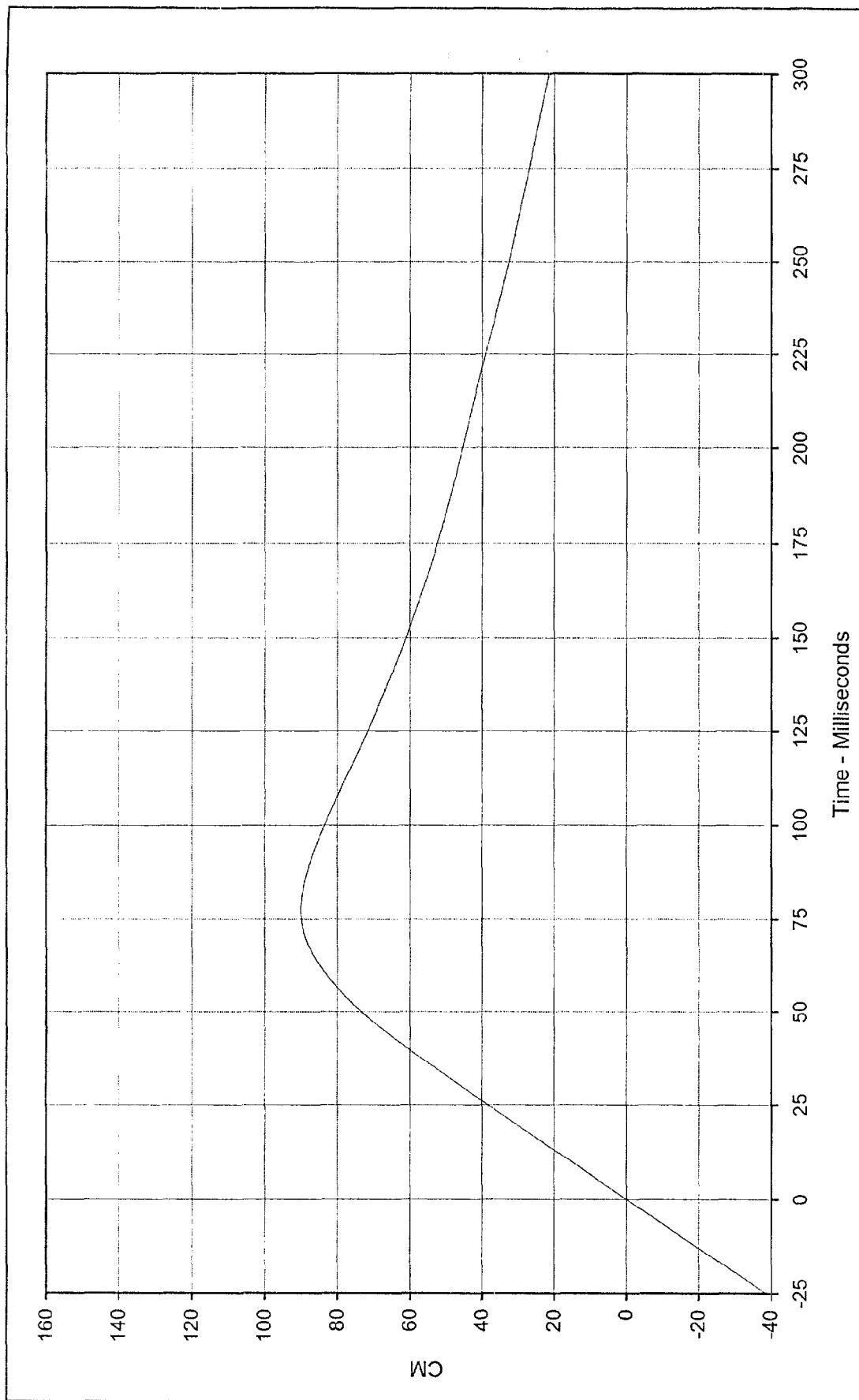




Curve Description: Driver Chest Primary X Velocity
 Maximum Value: 55.8 at 2.8 Milliseconds
 Minimum Value: -17.7 at 111.6 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN1-013

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

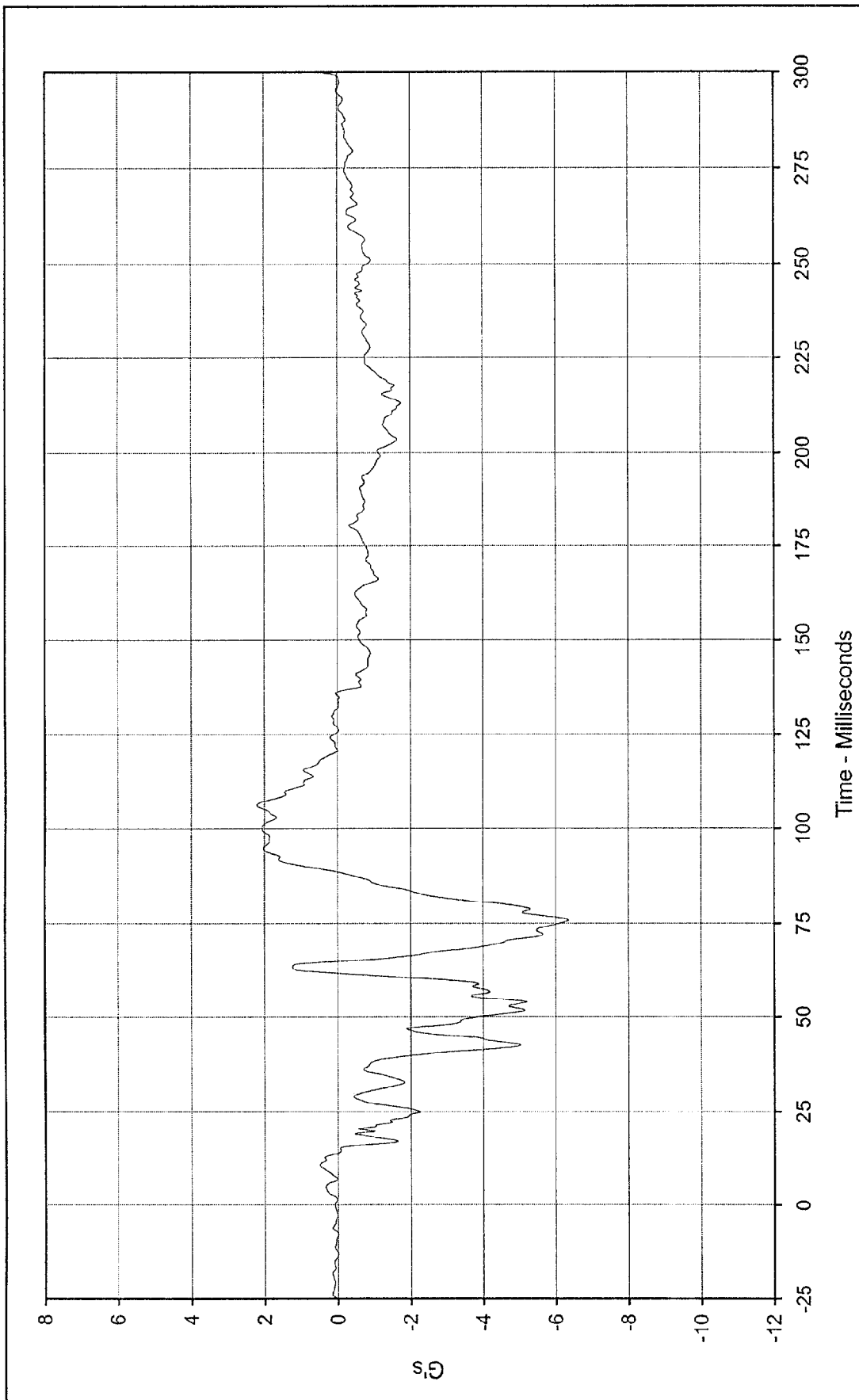




Curve Description: Driver Chest Primary X Displ.
 Maximum Value: 90.1 at 77.4 Milliseconds
 Minimum Value: 0.0 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN2-013

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

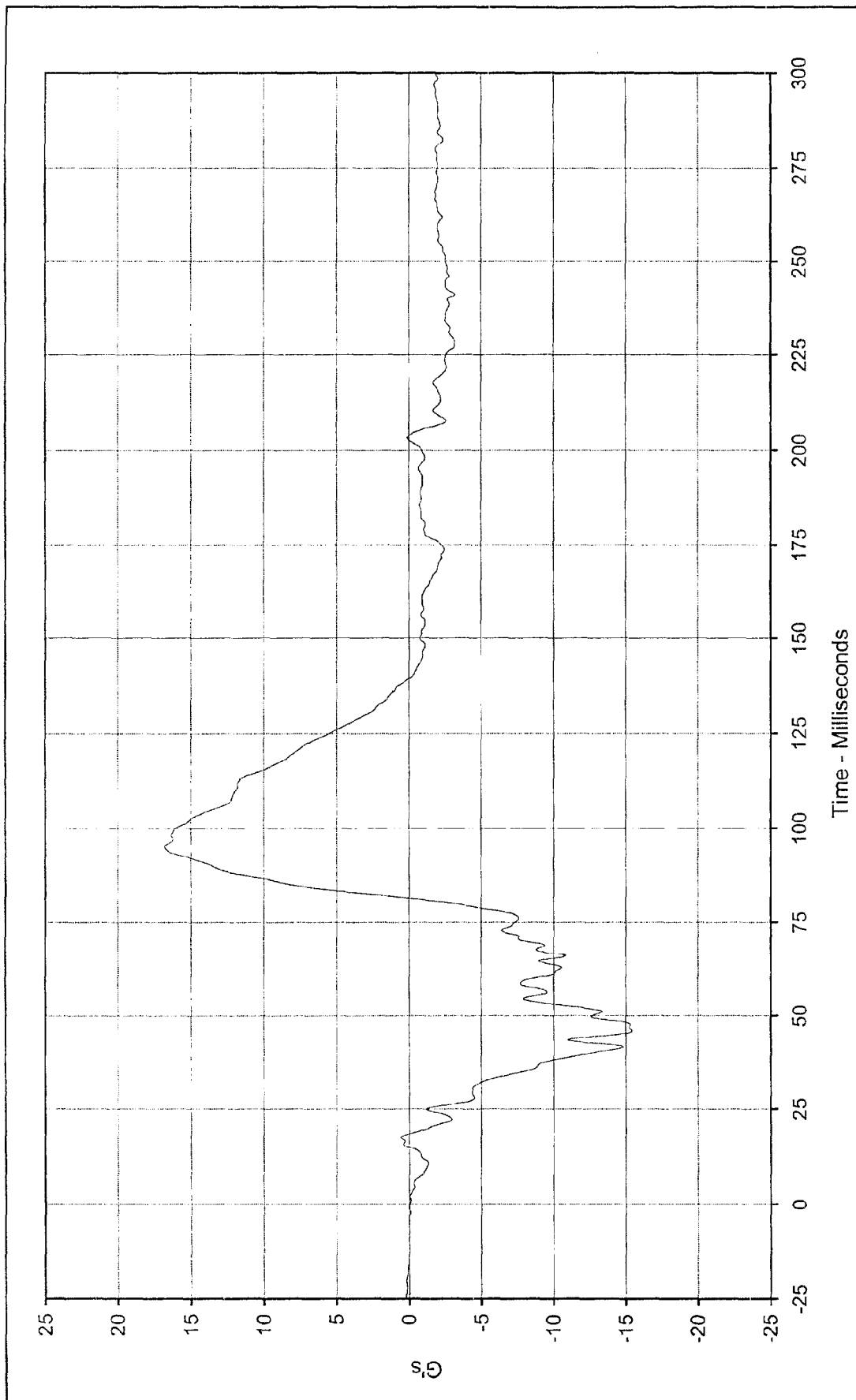




Curve Description: Driver Chest Primary Y
 Maximum Value: 2.2 at 106.4 Milliseconds
 Minimum Value: -6.4 at 75.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-014

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

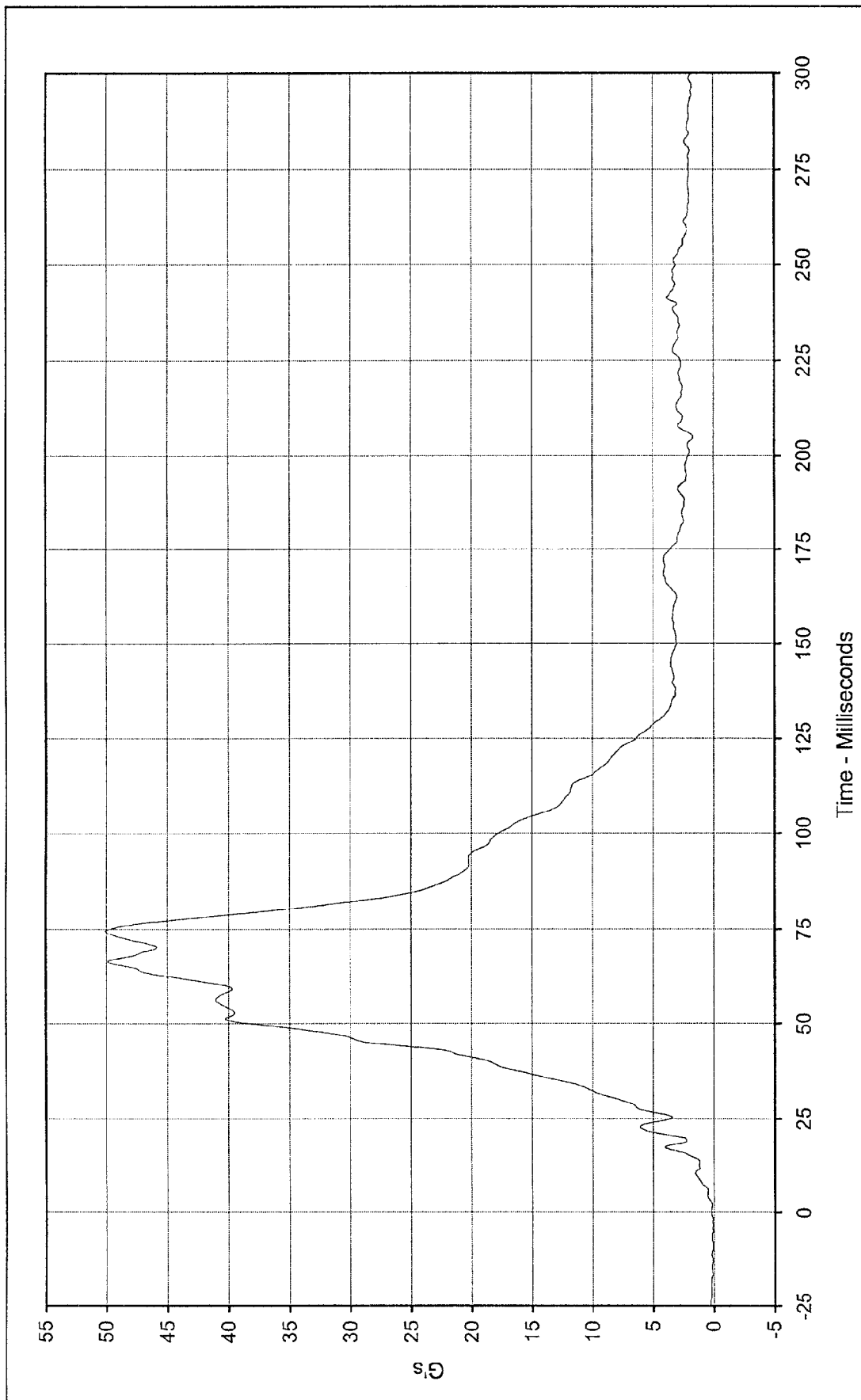




Curve Description: Driver Chest Primary Z
 Maximum Value: 16.8 at 95.3 Milliseconds
 Minimum Value: -15.4 at 46.1 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-015

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Chest Resultant Primary

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 50.1 at 74.4 Milliseconds

Test Vehicle: 1998 Toyota RAV-4 SUV

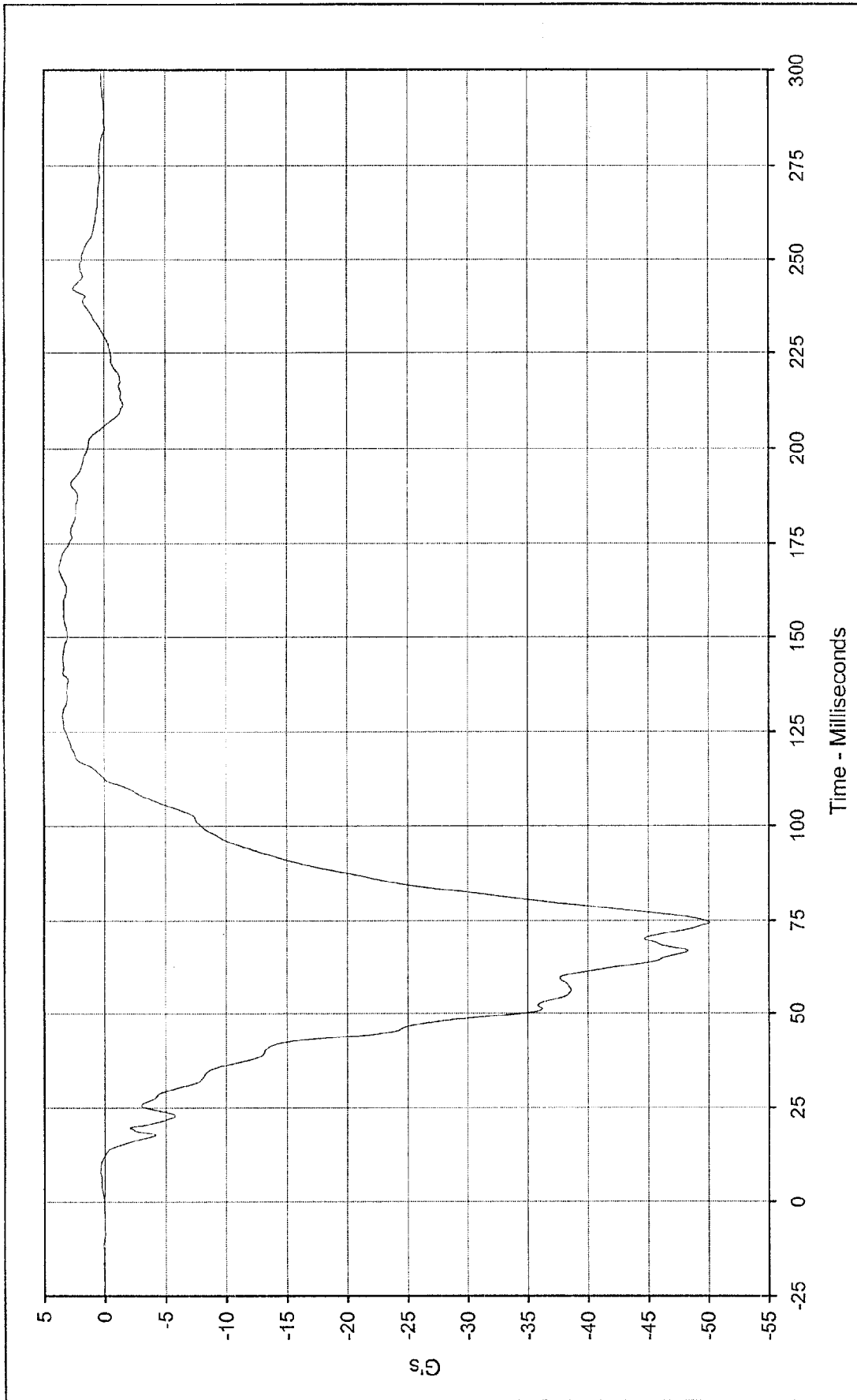
Minimum Value: 0.1 at 2.1 Milliseconds

SAE Filter Class: 180

Date of Test: 2/26/98

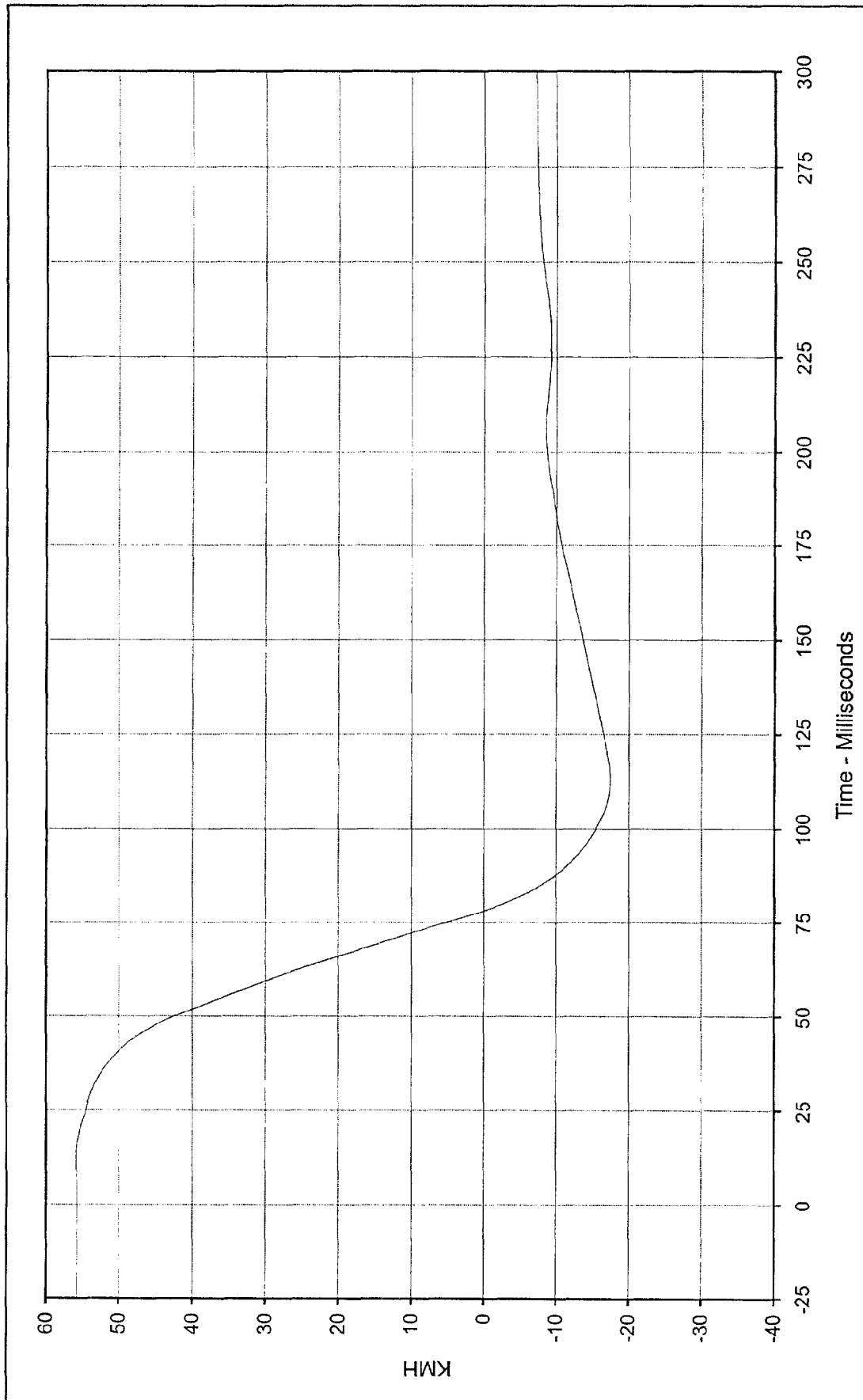
Curve Number: RES-013





Curve Description:	Driver Chest Redundant X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	3.7 at 168.2 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-50.1 at 74.5 Milliseconds			
SAE Filter Class:	180			
Date of Test:	2/26/98			
Curve Number:	FIL-016			





Curve Description: Driver Chest Redundant X Velocity

Maximum Value: 55.8 at 12.2 Milliseconds

Minimum Value: -17.4 at 112.7 Milliseconds

SAE Filter Class: 180

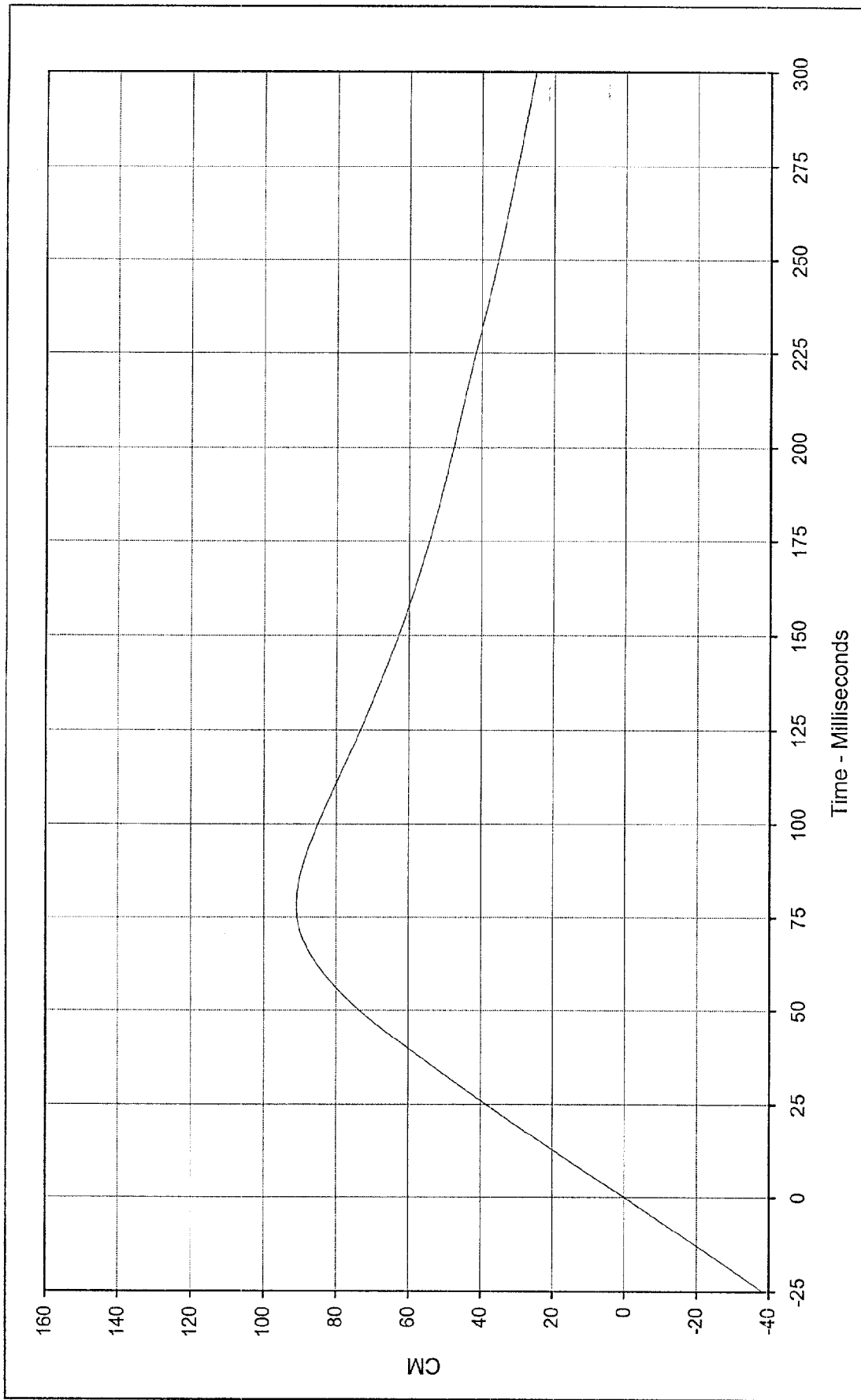
Date of Test: 2/26/98

Curve Number: IN1-016

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Chest Redundant X Displ.

Maximum Value: 91.0 at 78.1 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

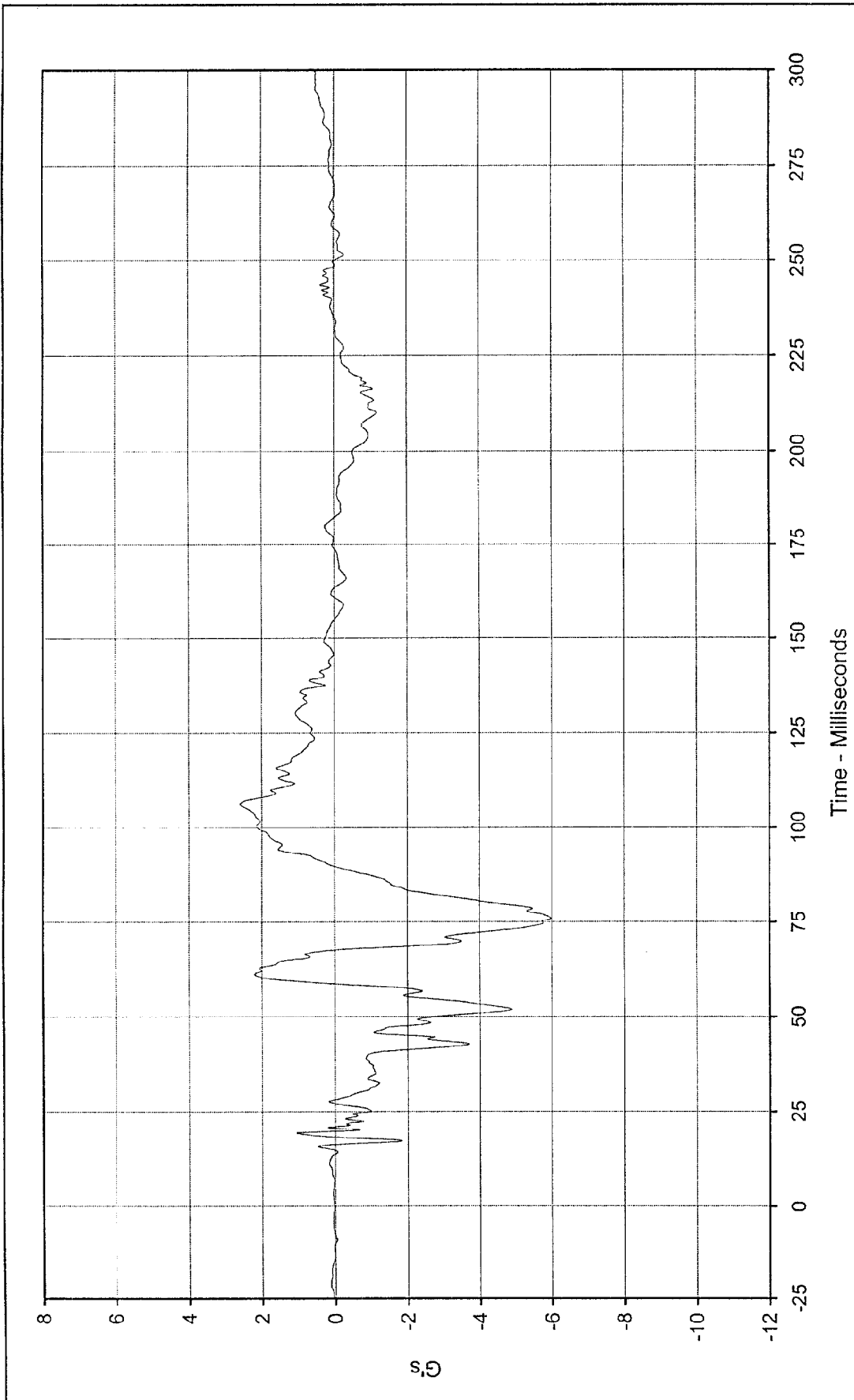
Date of Test: 2/26/98

Curve Number: IN2-016

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Chest Redundant Y Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 2.6 at 106.3 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

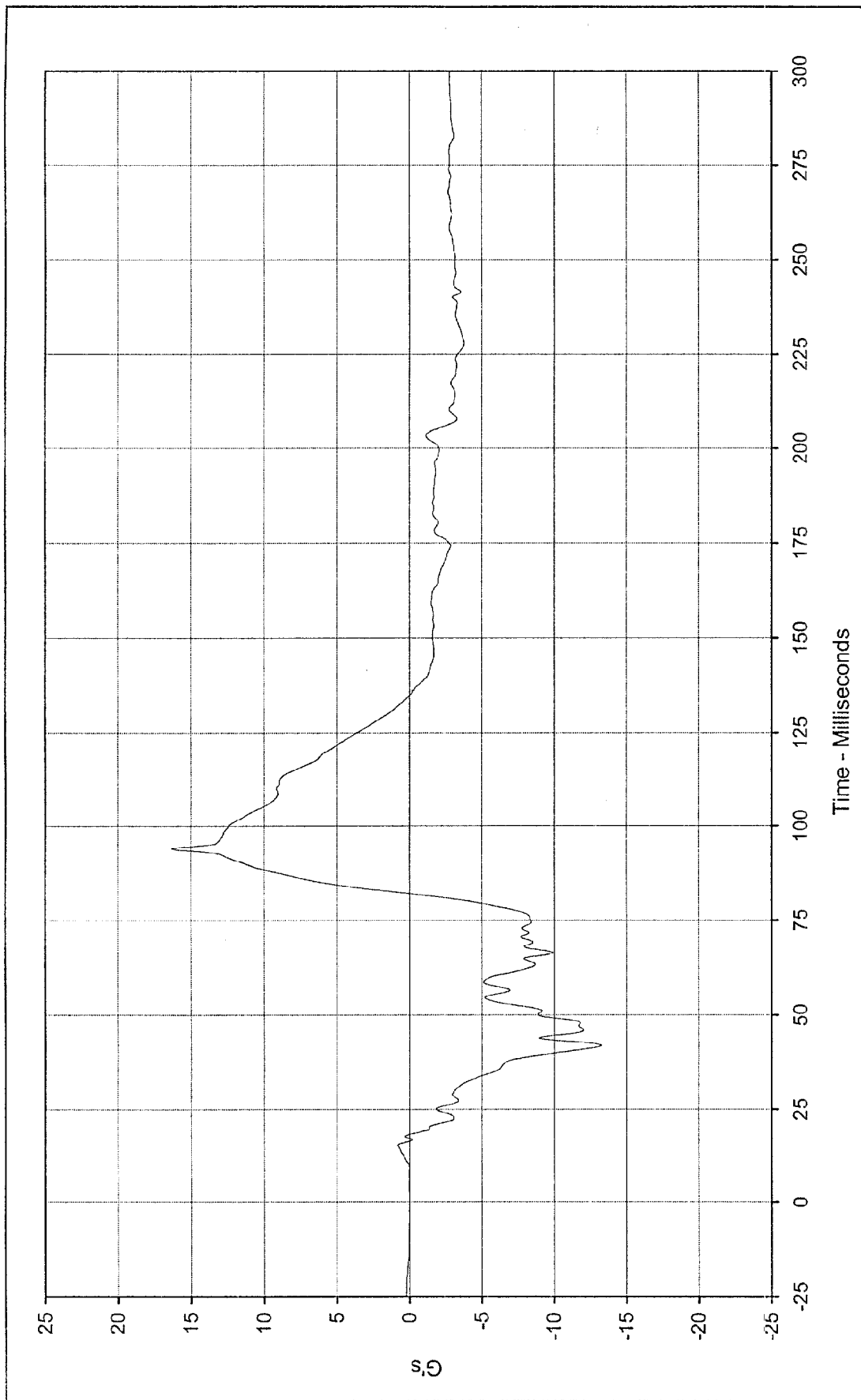
Minimum Value: -6.0 at 76.1 Milliseconds

SAE Filter Class: 180

Date of Test: 2/26/98

Curve Number: FIL-017

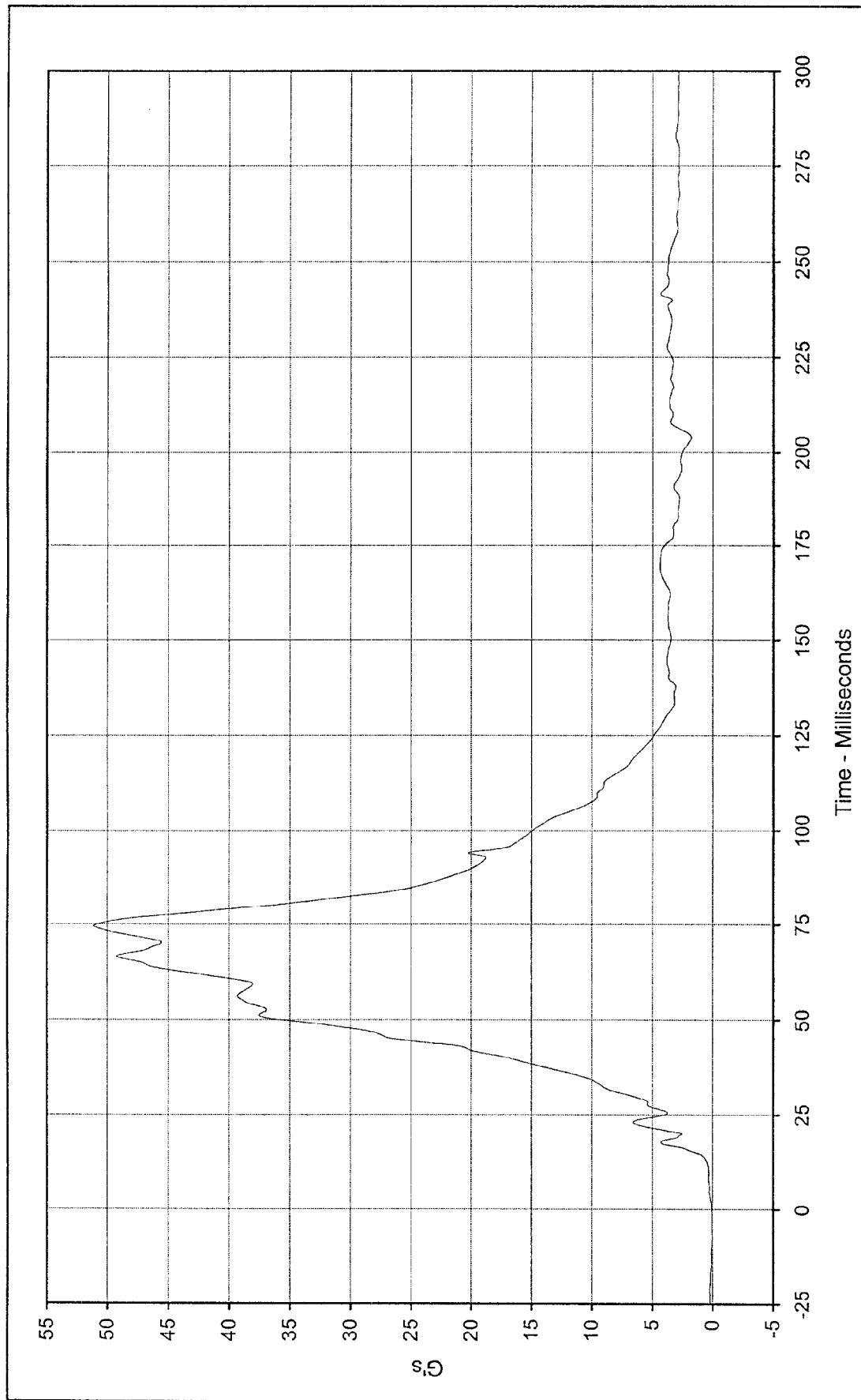




Curve Description: Driver Chest Redundant Z
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

Maximum Value: 16.3 at 93.9 Milliseconds
 Minimum Value: -13.3 at 41.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-018





Curve Description: Driver Chest Resultant Redundant

Maximum Value: 51.1 at 74.5 Milliseconds

Minimum Value: 0.1 at 0.0 Milliseconds

SAE Filter Class: 180

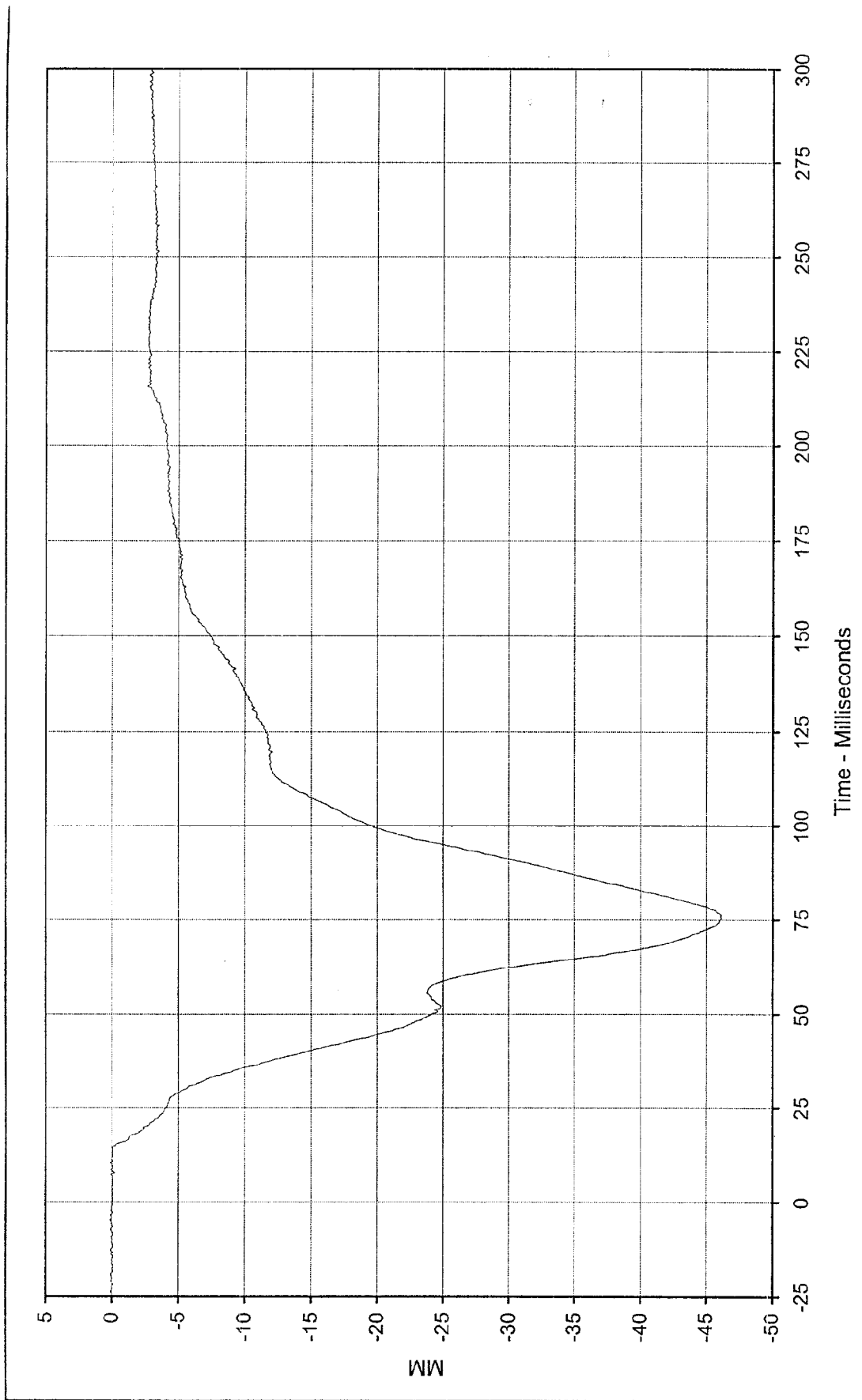
Date of Test: 2/26/98

Curve Number: RES-016

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

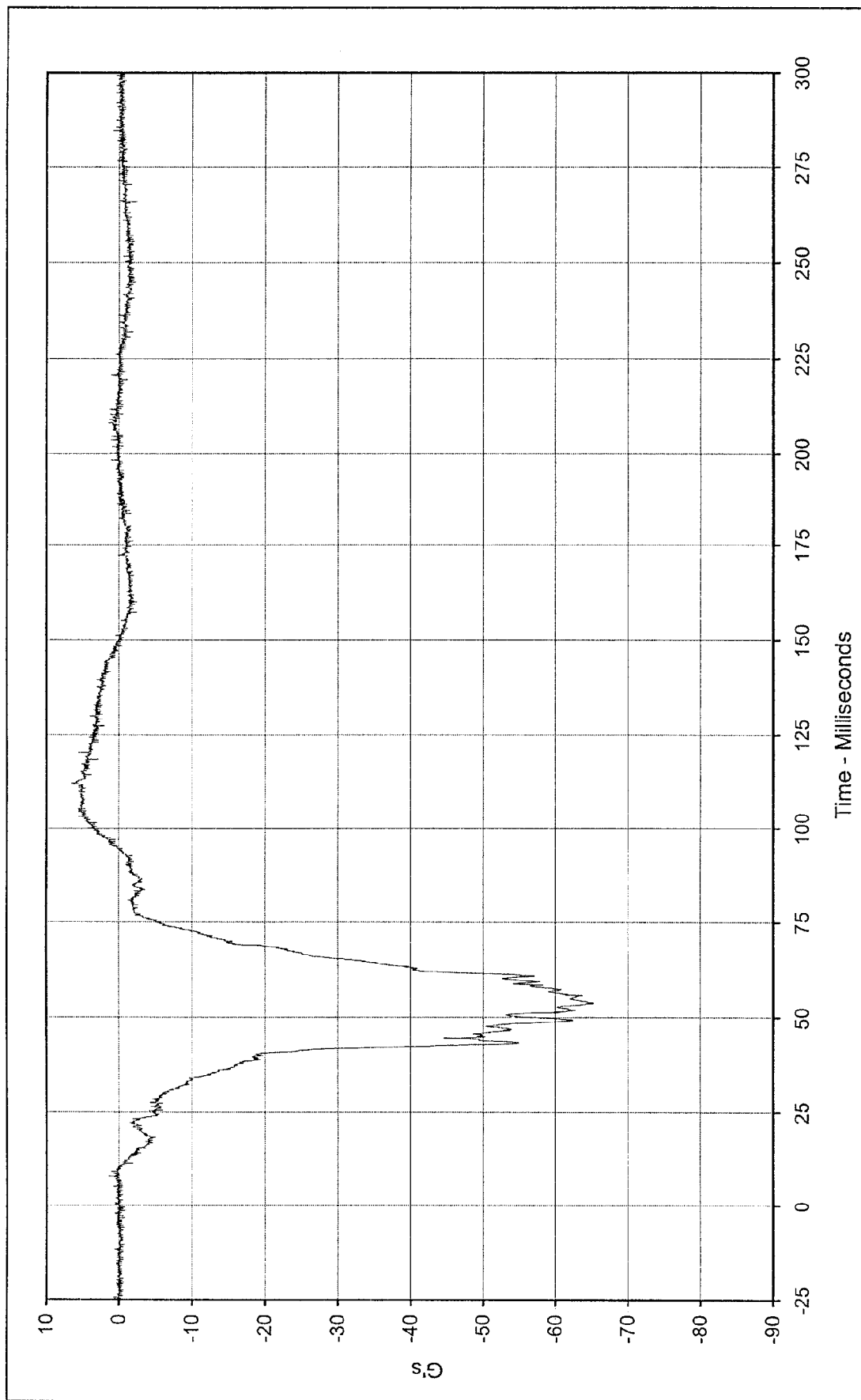
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Driver Chest Displacement X	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	0.1	at	10.4	Milliseconds
Minimum Value:	-46.1	at	75.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	2/26/98	Test Vehicle:	1998 Toyota RAV-4 SUV	
Curve Number:	FIL-019			

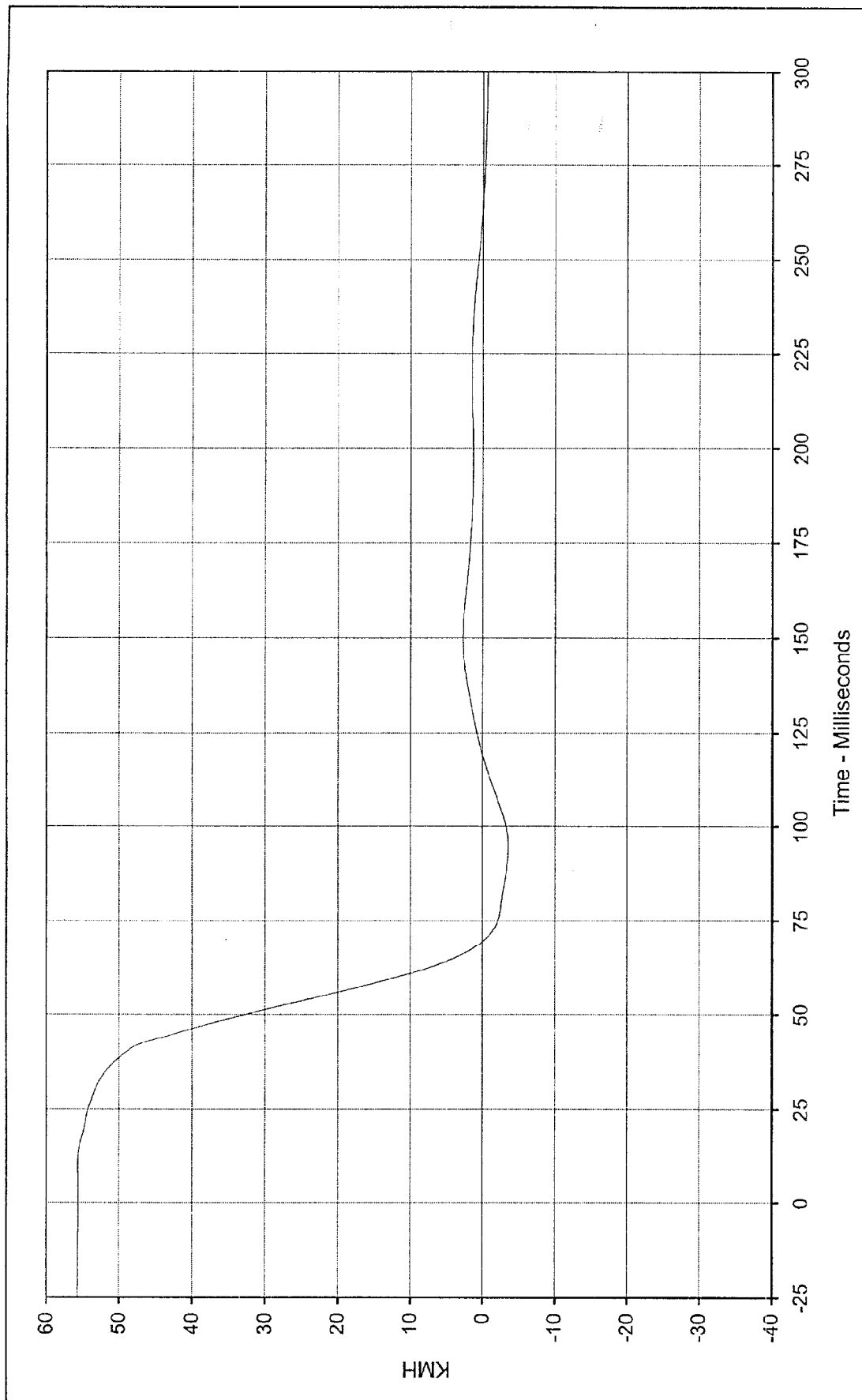




Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV4 SUV



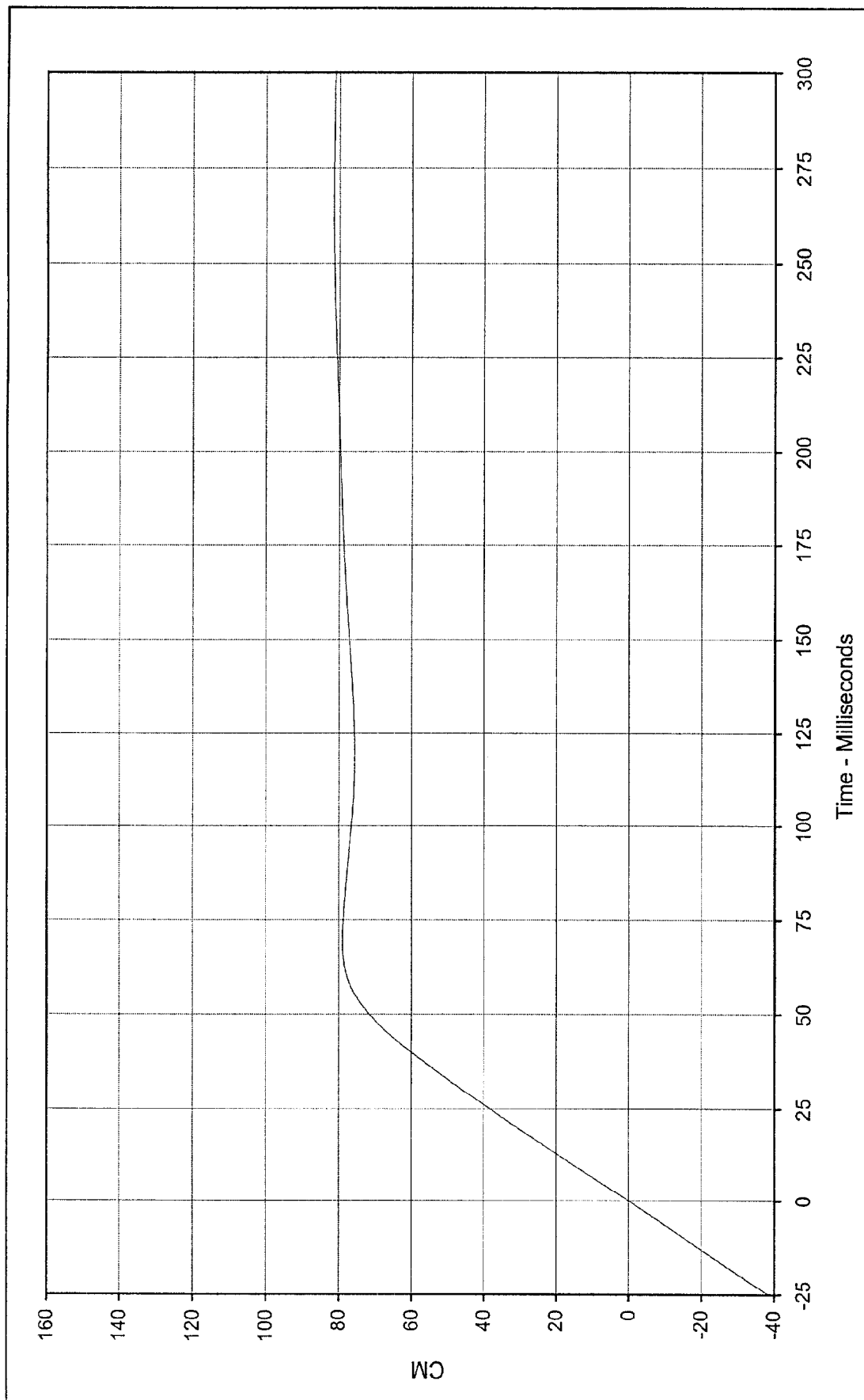
Curve Description: Driver Pelvis X
 Maximum Value: 6.5 at 112.3 Milliseconds
 Minimum Value: -65.3 at 54.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-020



Curve Description:	Driver Pelvis X Velocity		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	55.7	at 10.2	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-3.6	at 94.4			
SAE Filter Class:	180				
Date of Test:	2/26/98				
Curve Number:	IN1-020				

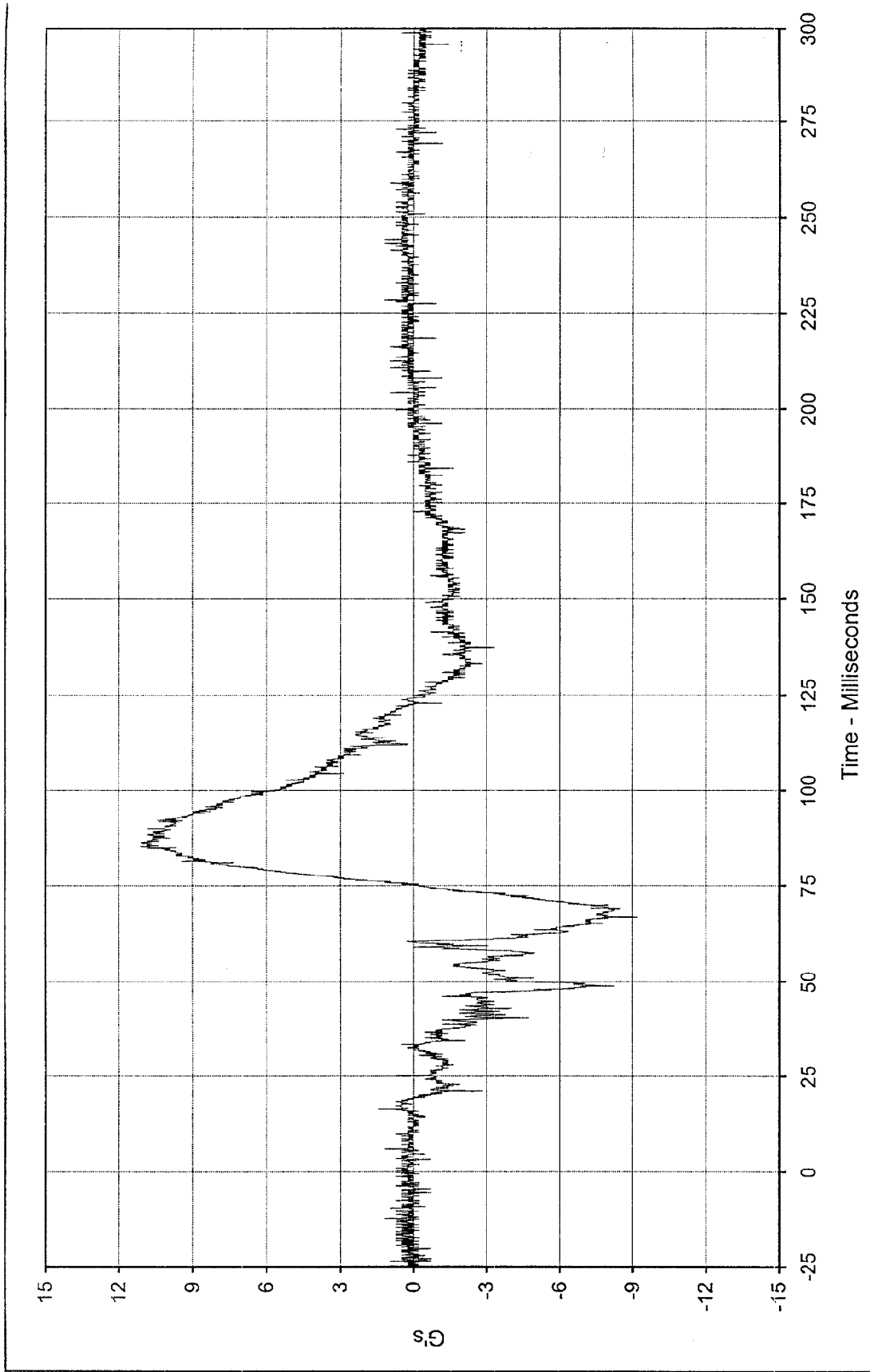
The logo for KARCO Engineering features a stylized lightbulb with a filament that forms the letter 'K'. To the right of the lightbulb, the word 'KARCO' is written in a bold, sans-serif font. Below 'KARCO', the word 'Engineering' is written in a script font. The entire logo is enclosed in a rectangular border.





Curve Description:	Driver Pelvis X Displ.	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	81.5	at	263.3	Milliseconds
Minimum Value:	-0.1	at	0.0	Milliseconds
SAE Filter Class:	180	Test Vehicle:	1998 Toyota RAV-4 SUV	
Date of Test:	2/26/98			
Curve Number:	IN2-020			





Curve Description:

Driver Pelvis Y

Maximum Value: 11.1 at 85.4 Milliseconds

Minimum Value: -9.2 at 66.9 Milliseconds

SAE Filter Class: 1000

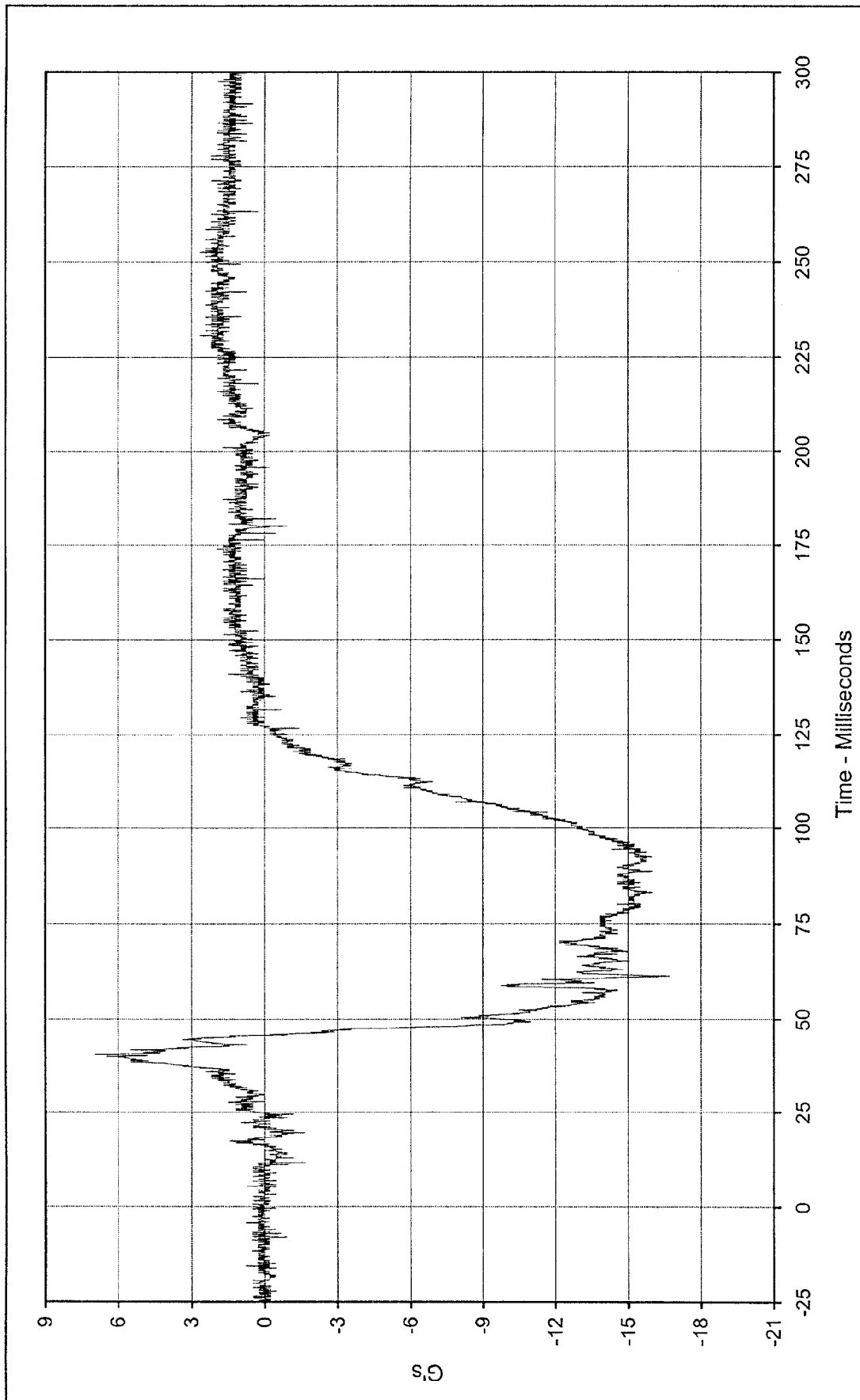
Date of Test: 2/26/98

Curve Number: FIL-021

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

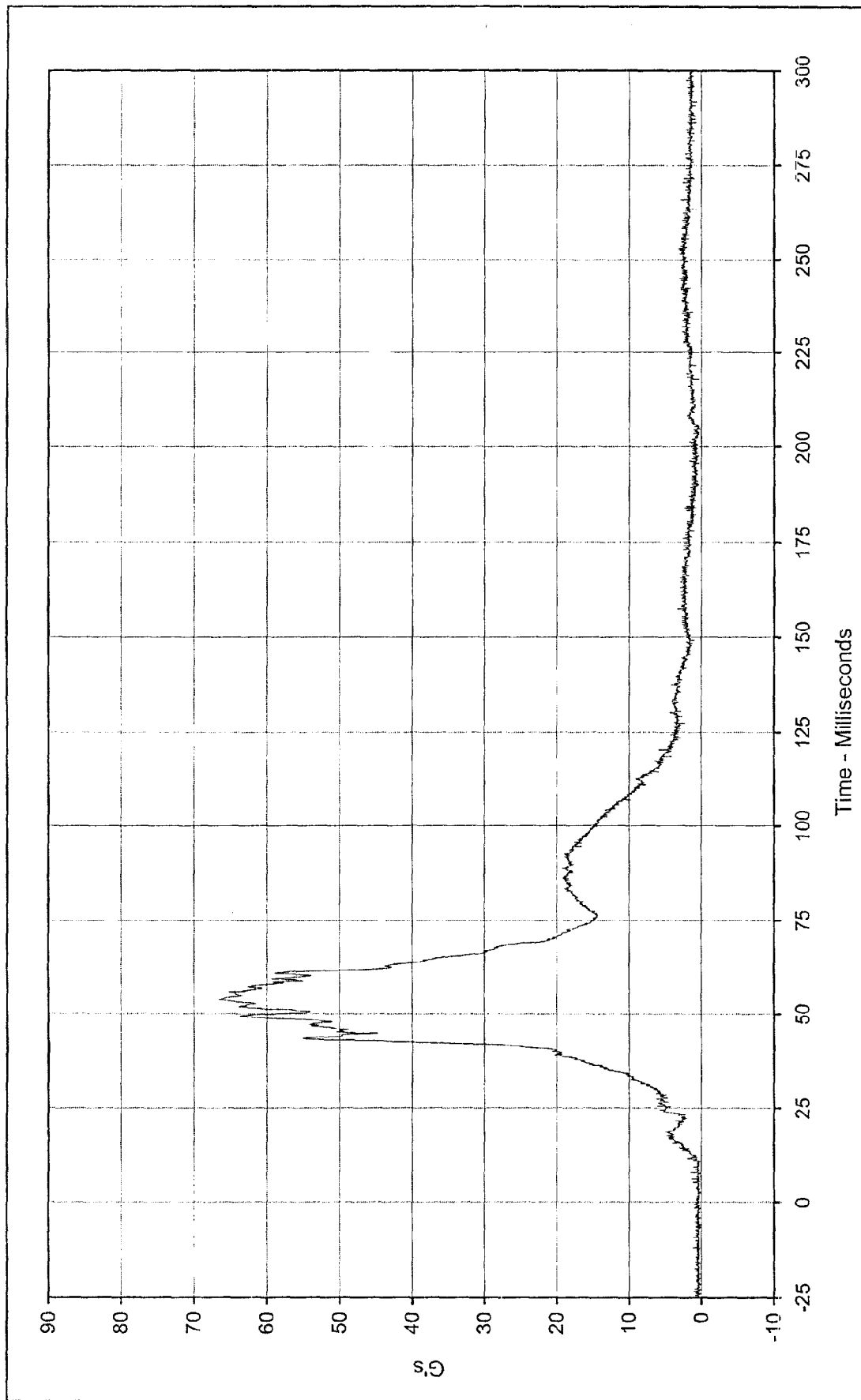
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	6.9	at	40.5	Milliseconds
Minimum Value:	-16.7	at	61.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	2/26/98			
Curve Number:	FIL-022			
Test Vehicle:		1998 Toyota RAV-4 SUV		





Curve Description: Driver Pelvis Resultant

Maximum Value: 66.6 at 54.0 Milliseconds

Minimum Value: 0.1 at 2.4 Milliseconds

SAE Filter Class: 1000

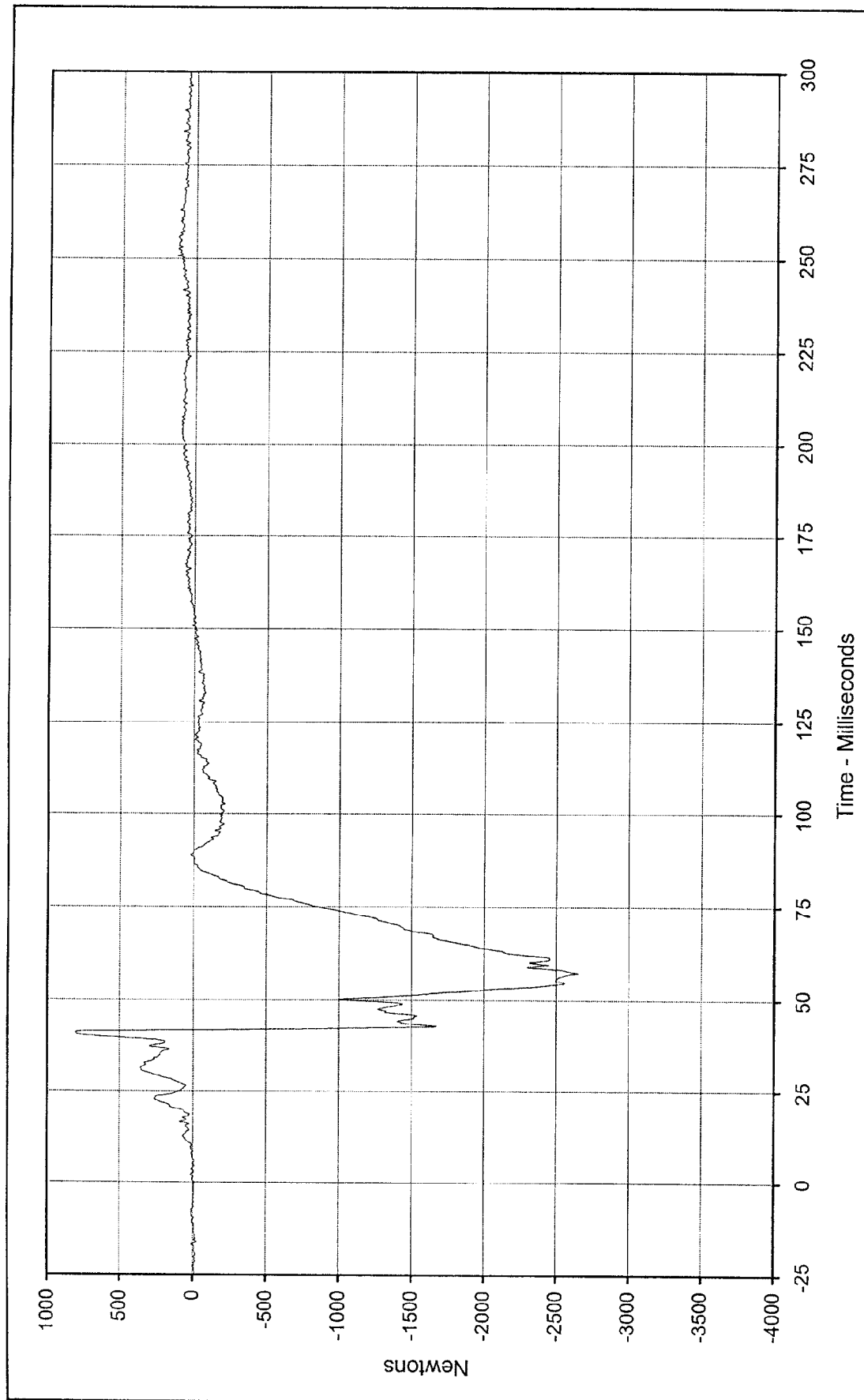
Date of Test: 2/26/98

Curve Number: RES-020

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

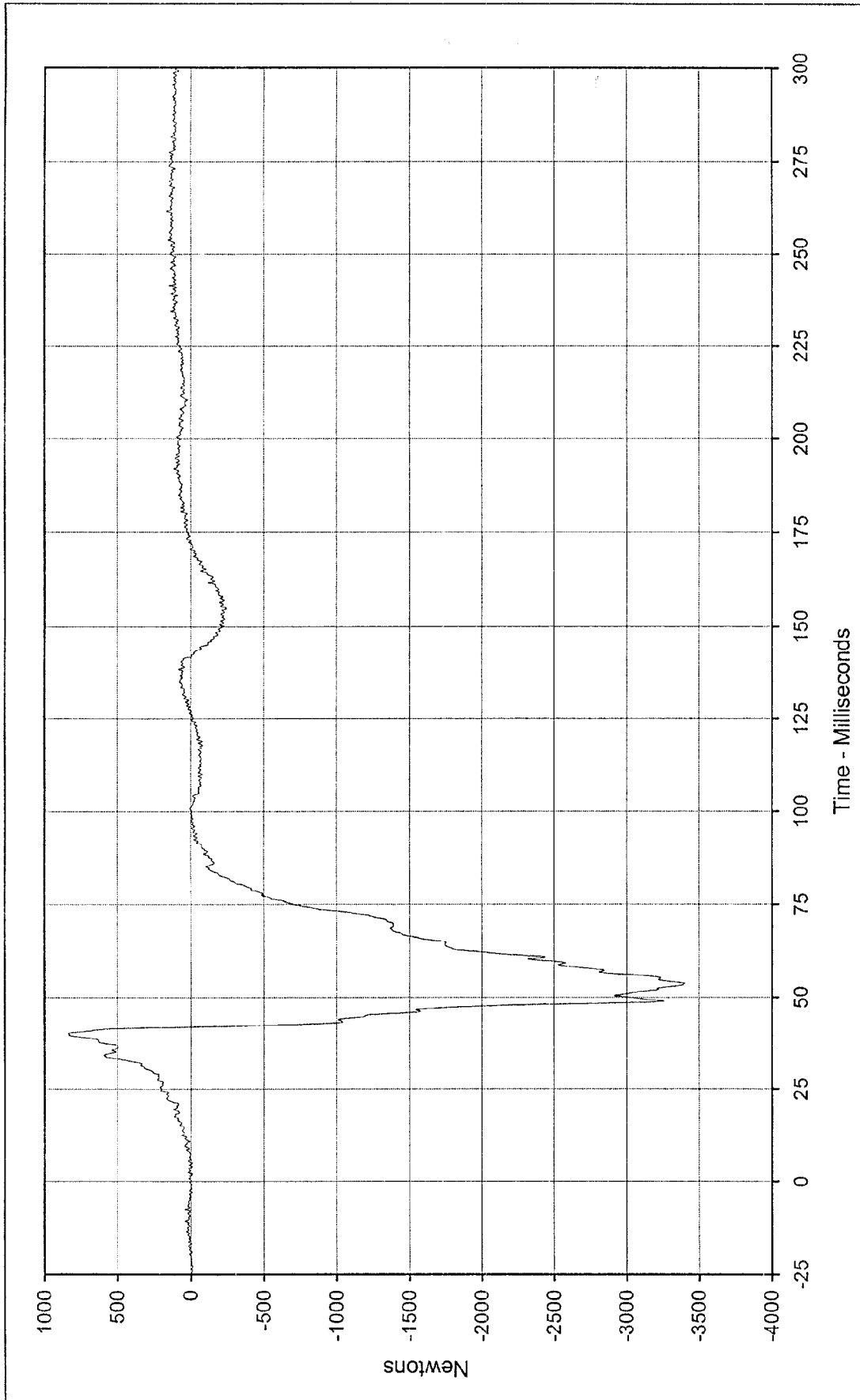




Curve Description: Driver Left Femur Force
Maximum Value: 807.6 at 40.9 Milliseconds
Minimum Value: -2655.5 at 57.3 Milliseconds
SAE Filter Class: 600
Date of Test: 2/26/98
Curve Number: FIL-023

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV



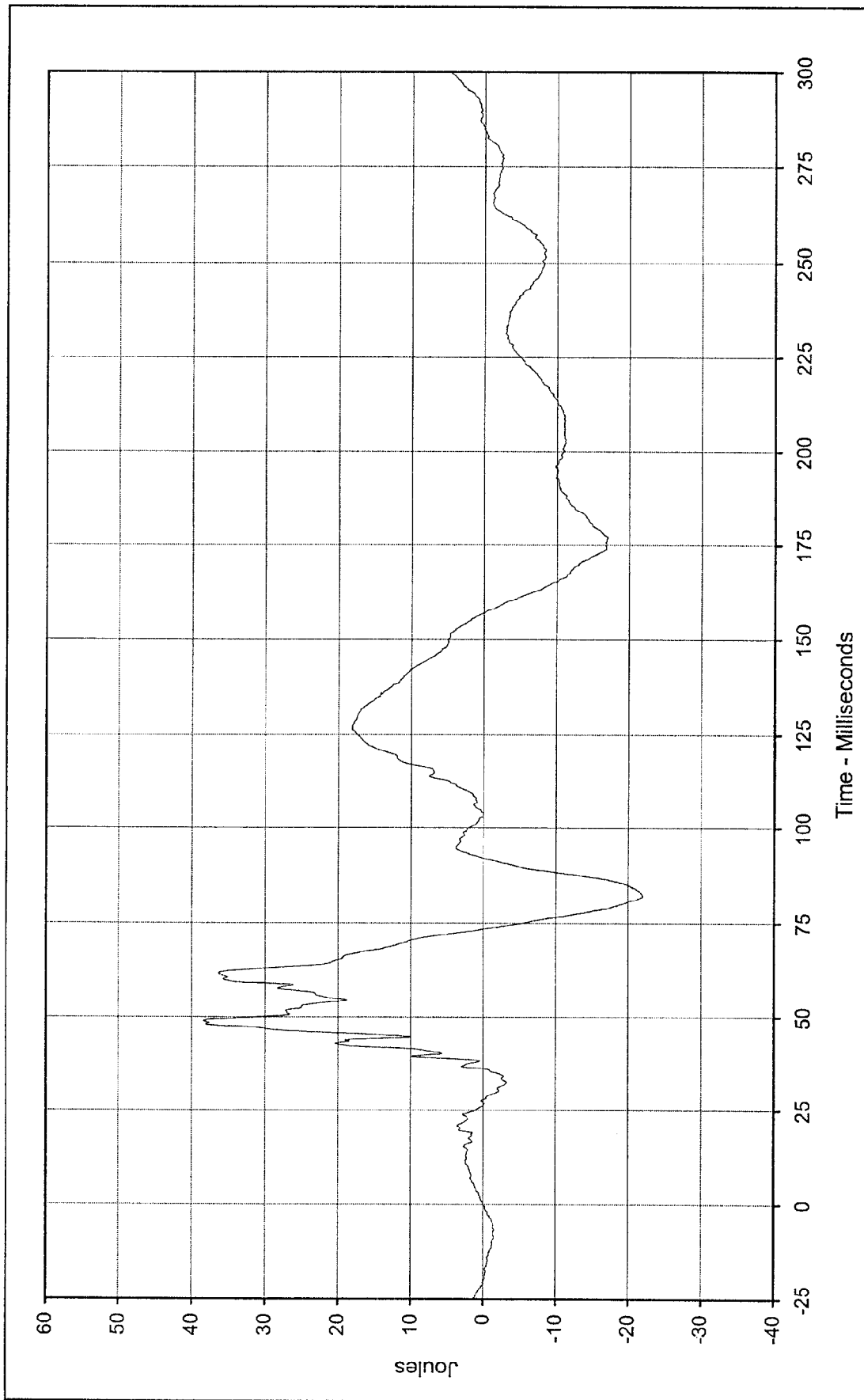


Curve Description:	Driver Right Femur Force	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	836.0 at 40.3 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-3399.8 at 53.7 Milliseconds			
SAE Filter Class:	600			
Date of Test:	2/26/98			
Curve Number:	FIL-024			



KARCO
Engineering





Curve Description: Driver Left Upper Tibia Moment X

Maximum Value: 38.4 at 48.9 Milliseconds

Minimum Value: -21.9 at 82.2 Milliseconds

SAE Filter Class: 600

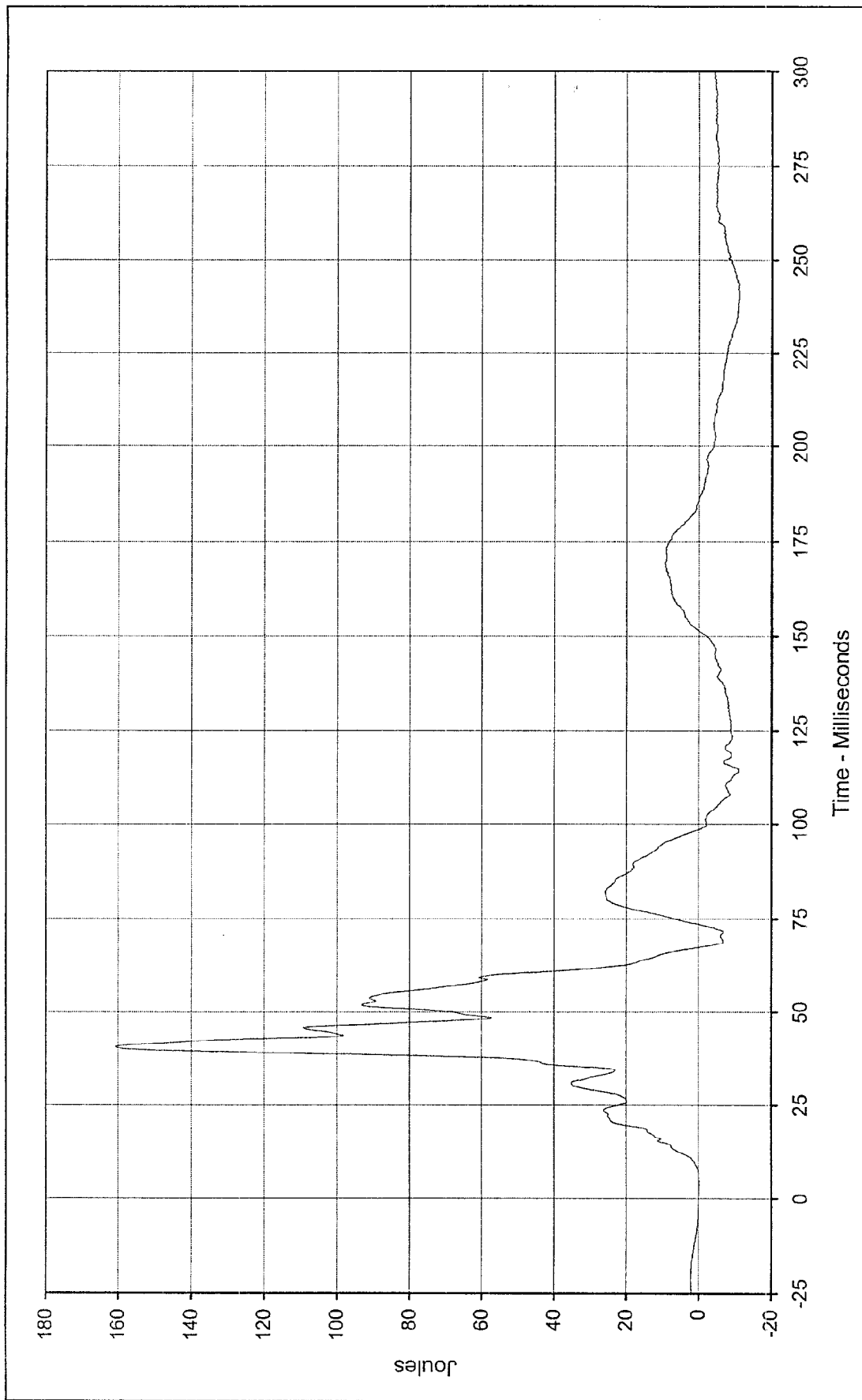
Date of Test: 2/26/98

Curve Number: FIL-025

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

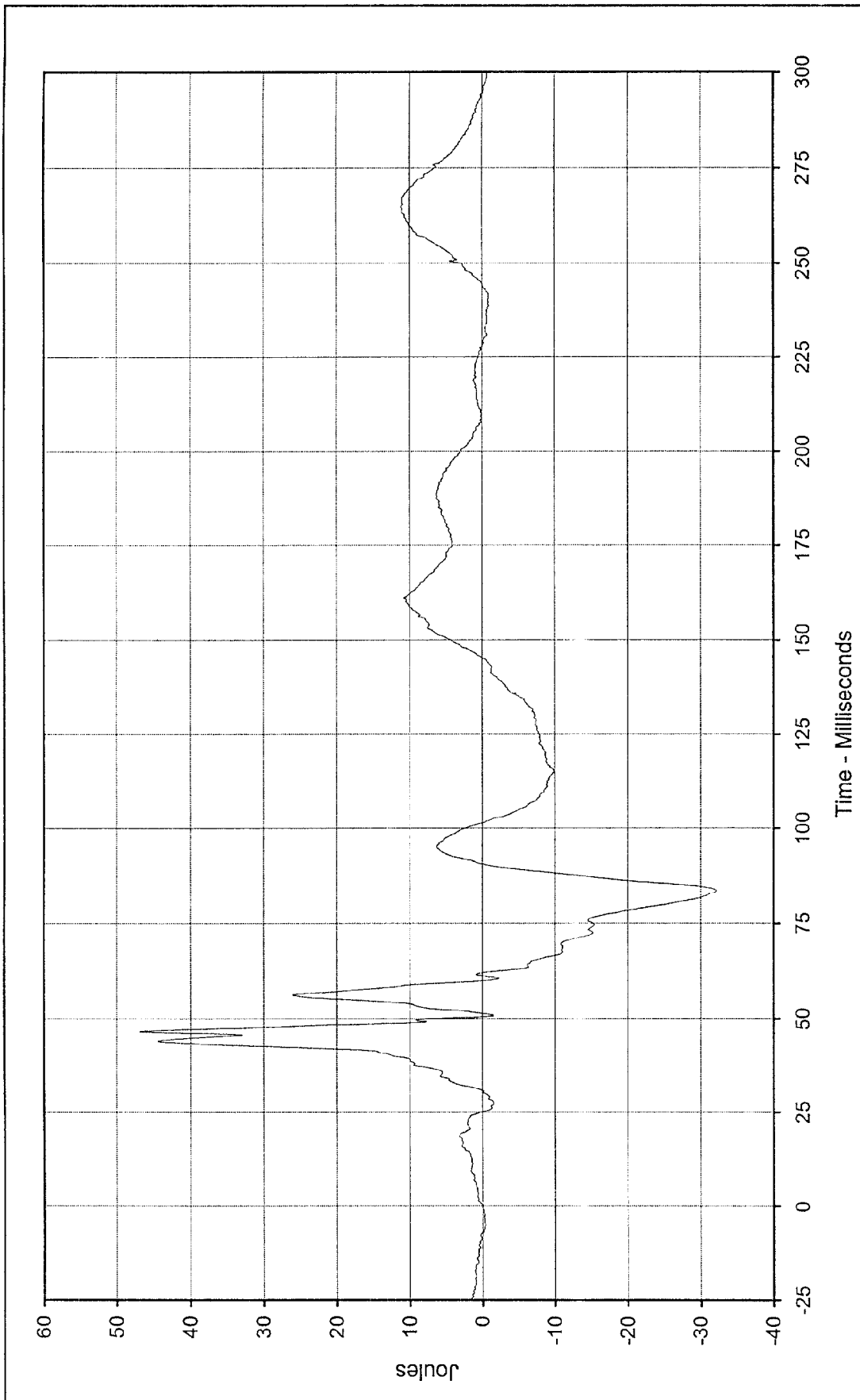




Curve Description: Driver Left Upper Tibia Moment Y
 Maximum Value: 160.7 at 40.5 Milliseconds
 Minimum Value: -11.1 at 239.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-026

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Right Upper Tibia Moment X

Maximum Value: 47.0 at 46.7 Milliseconds

Minimum Value: -32.2 at 83.7 Milliseconds

SAE Filter Class: 600

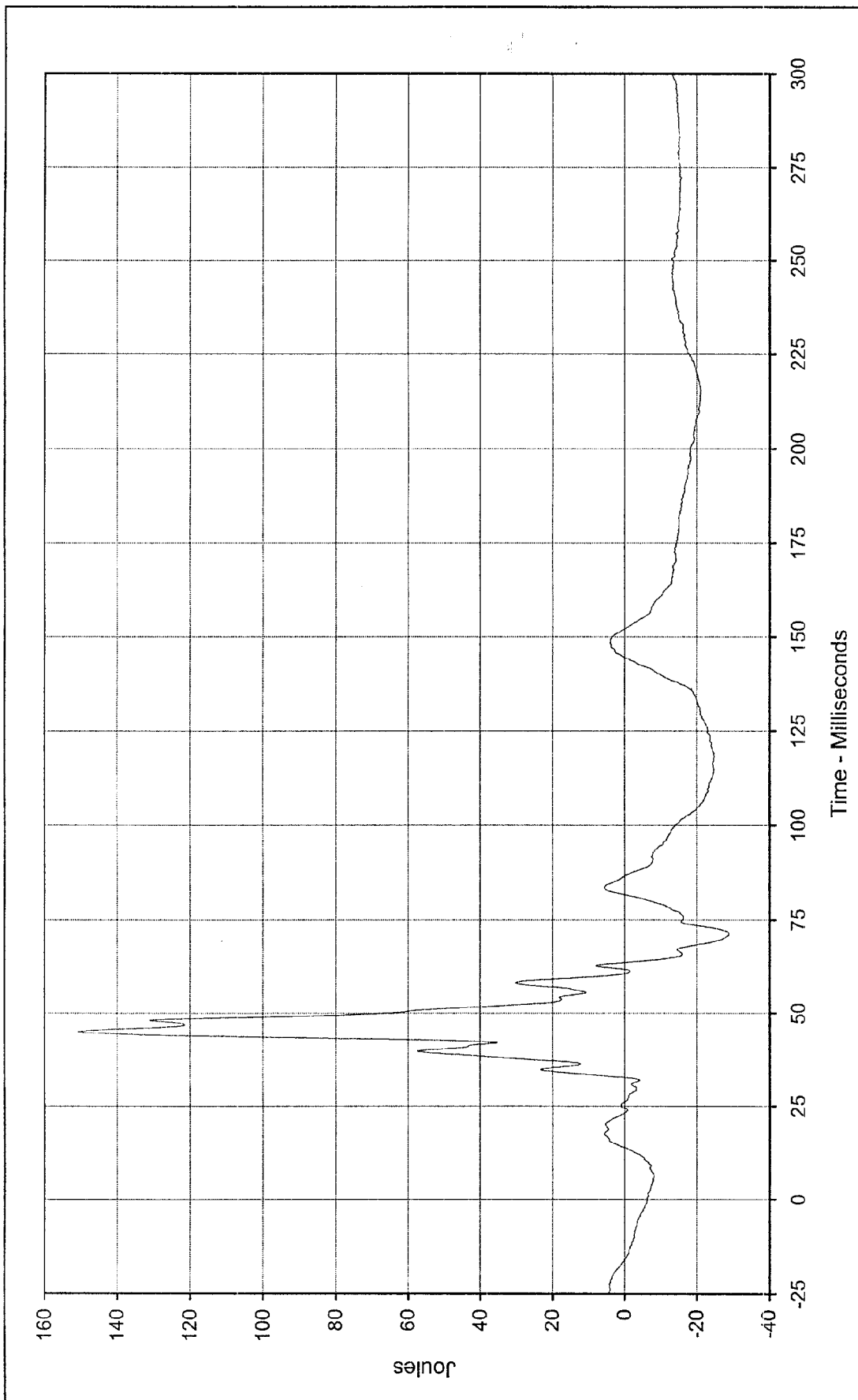
Date of Test: 2/26/98

Curve Number: FIL-027

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

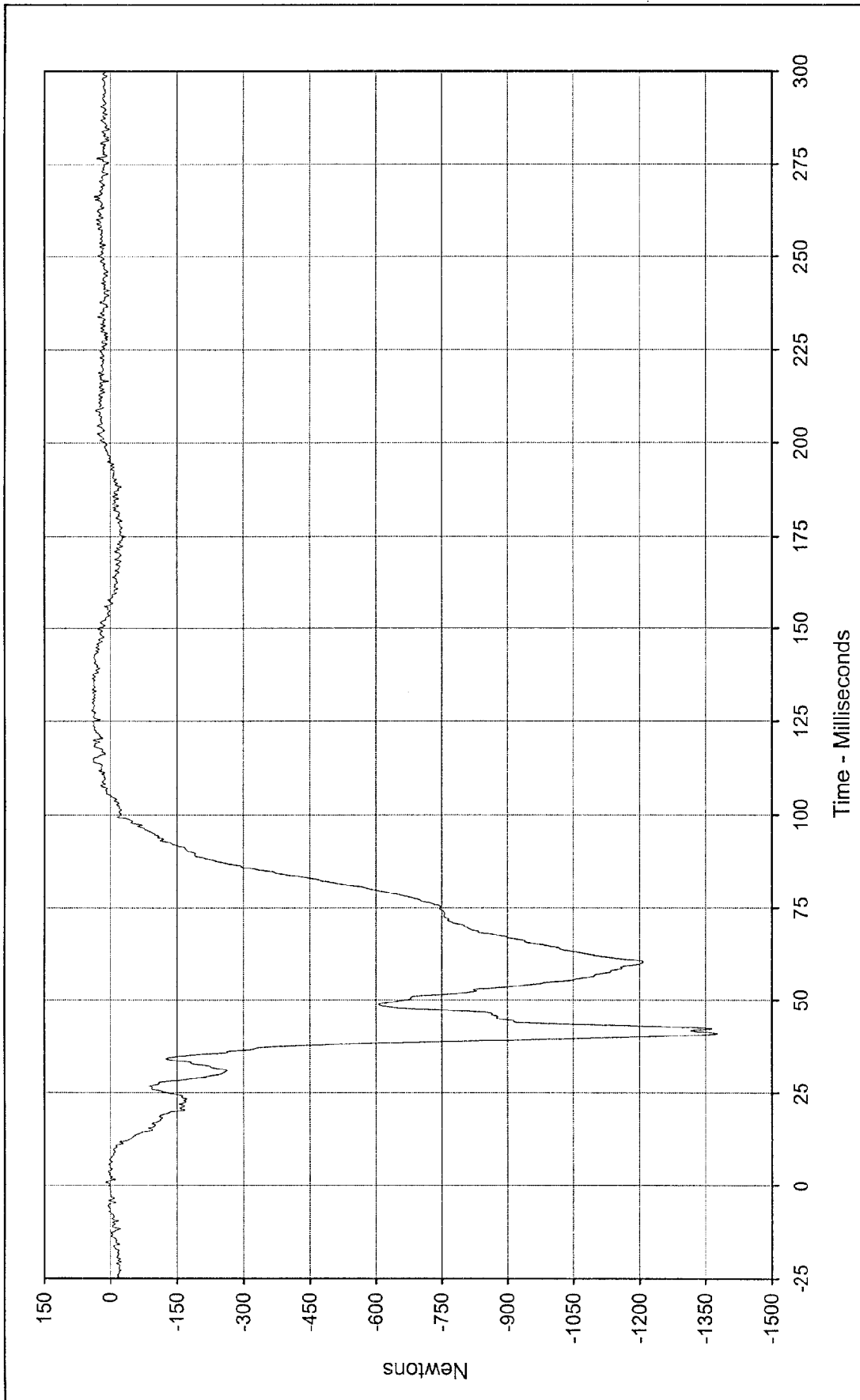
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Driver Right Upper Tibia Moment Y	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	150.7	at	45.0	Milliseconds
Minimum Value:	-28.9	at	71.1	Milliseconds
SAE Filter Class:	600			
Date of Test:	2/26/98	Test Vehicle:	1998 Toyota RAV-4 SUV	
Curve Number:	FIL-028			





Curve Description: Driver Left Lower Tibia Force X

Maximum Value: 42.4 at 127.9 Milliseconds

Minimum Value: -1376.2 at 40.8 Milliseconds

SAE Filter Class: 600

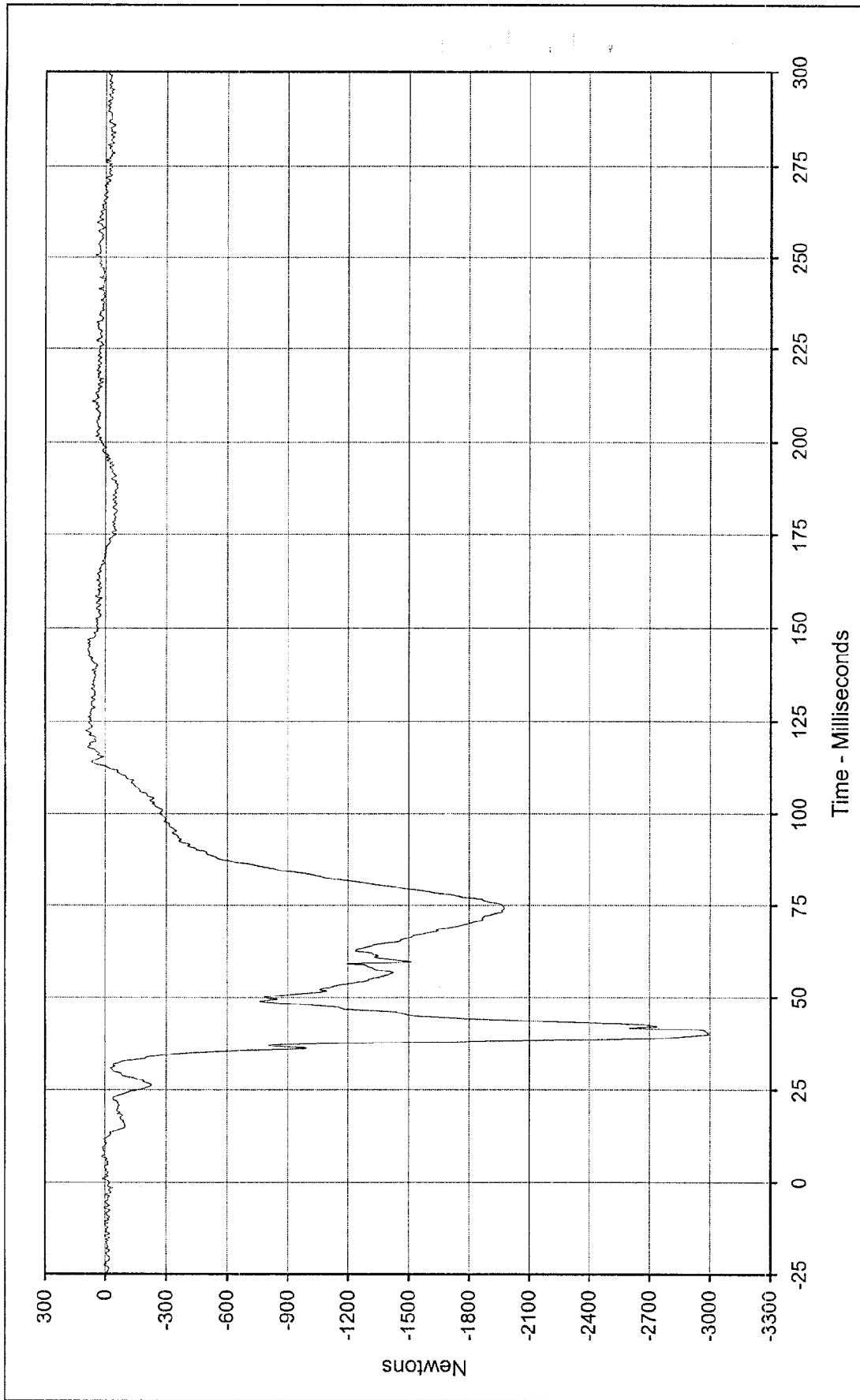
Date of Test: 2/26/98

Curve Number: FIL-029

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

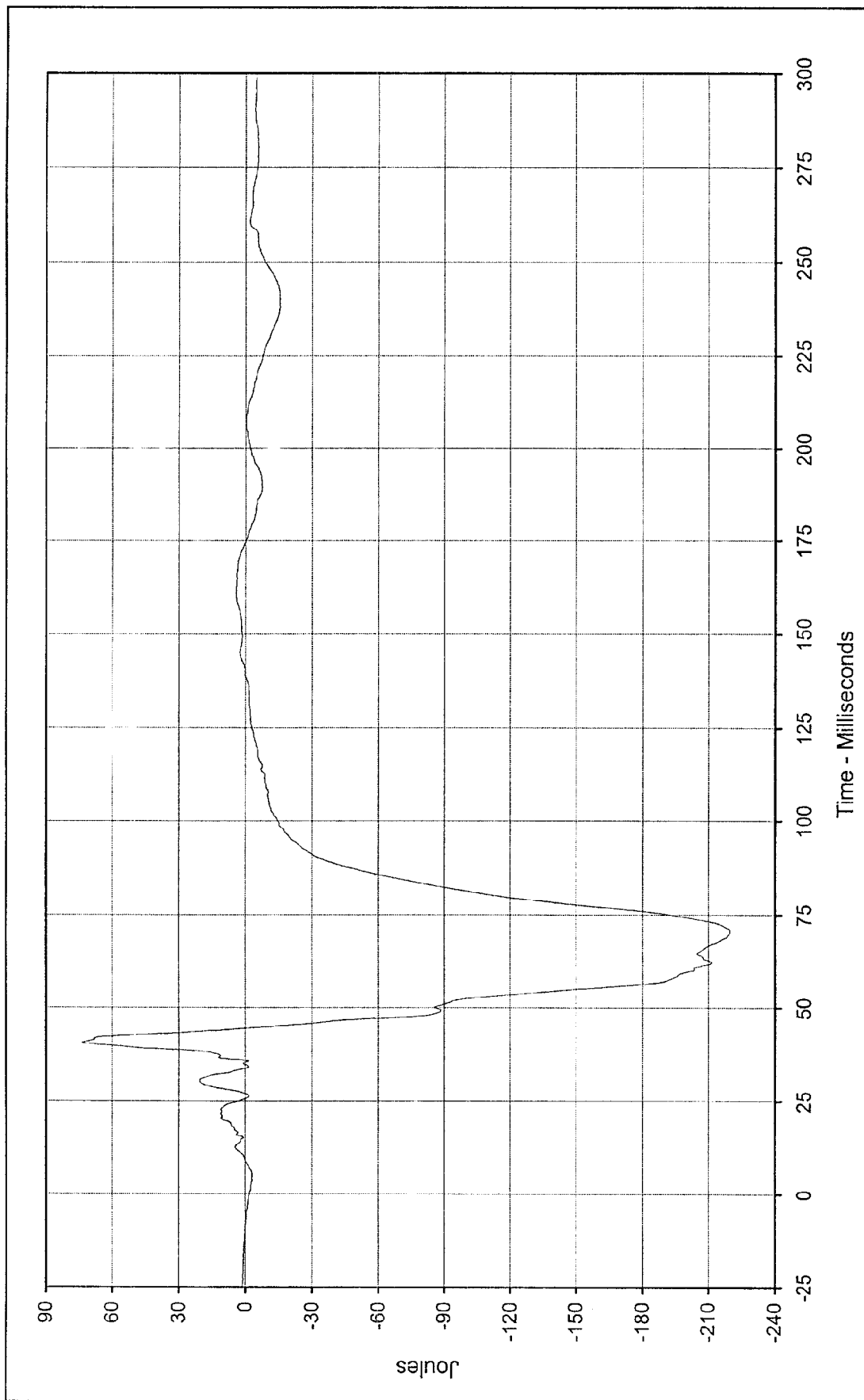
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Driver Left Lower Tibia Force Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	97.8	at	122.5	Milliseconds
Minimum Value:	-2994.7	at	39.9	Milliseconds
SAE Filter Class:	600			
Date of Test:	2/26/98	Test Vehicle:	1998 Toyota RAV-4 SUV	
Curve Number:	FIL-030			





Curve Description: Driver Left Lower Tibia Moment Y Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 73.5 at 40.7 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

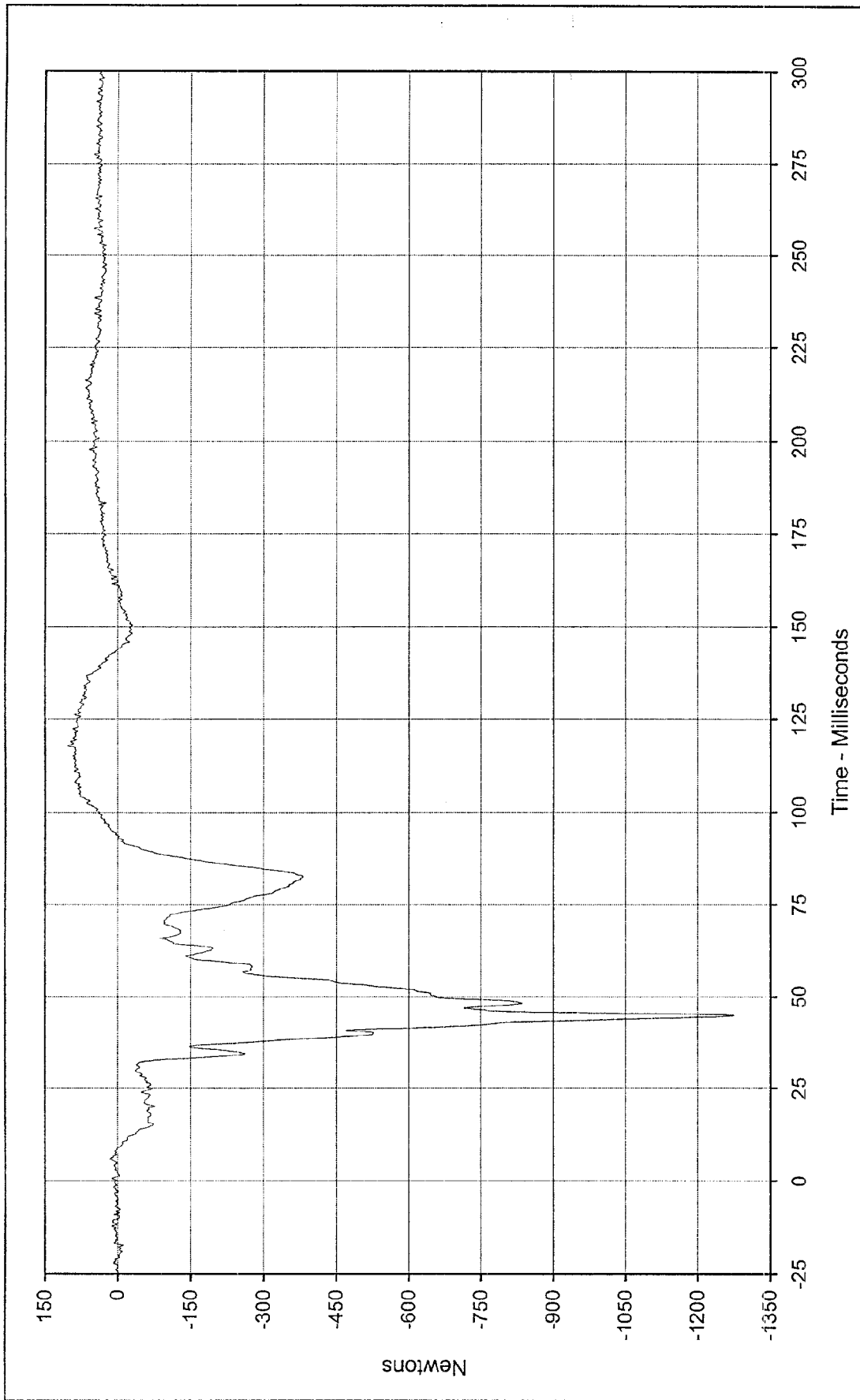
Minimum Value: -219.9 at 70.8 Milliseconds

SAE Filter Class: 600

Date of Test: 2/26/98

Curve Number: FIL-031

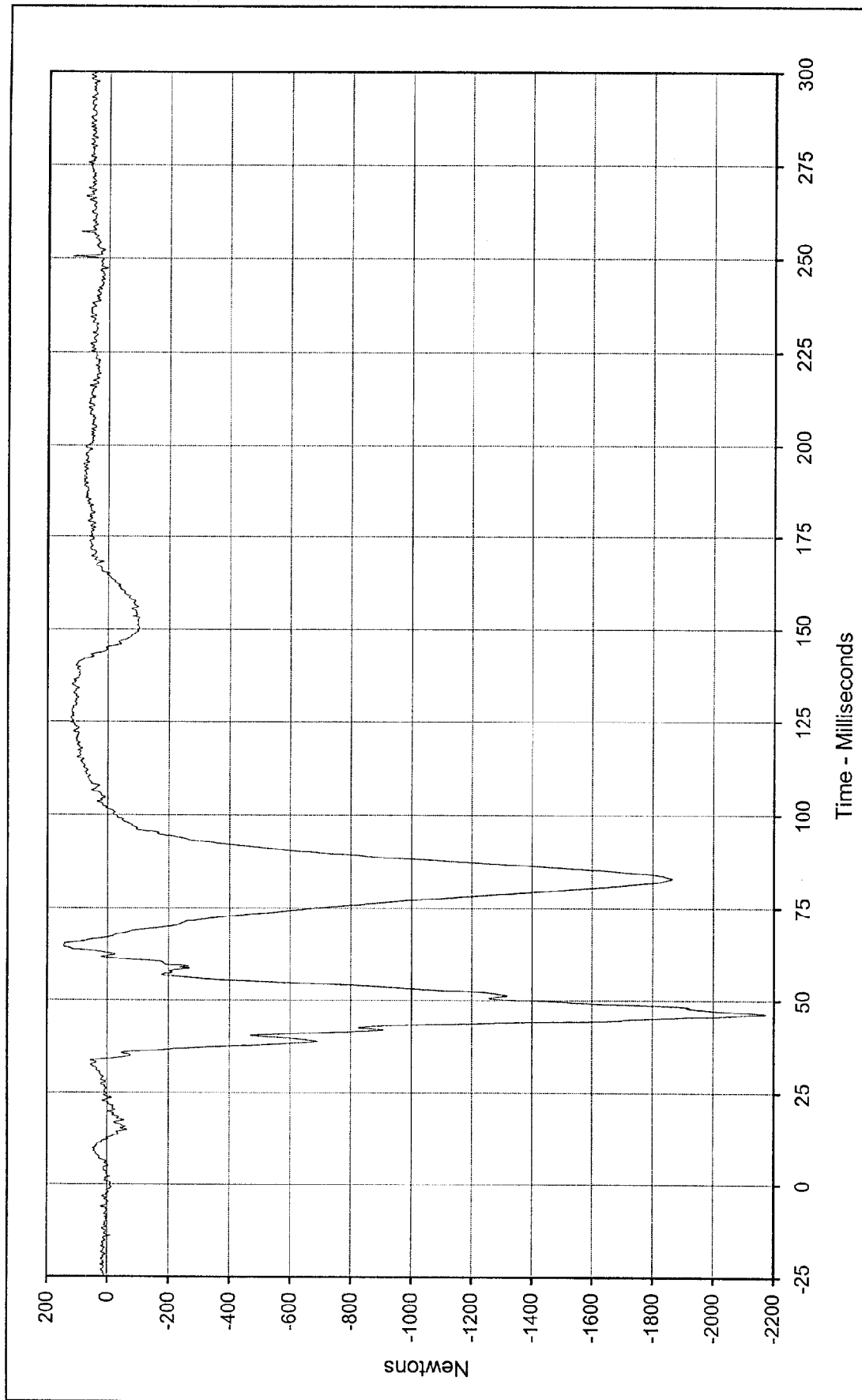




Curve Description: Driver Right Lower Tibia Force X
 Maximum Value: 103.0 at 117.8 Milliseconds
 Minimum Value: -1275.7 at 44.9 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-032

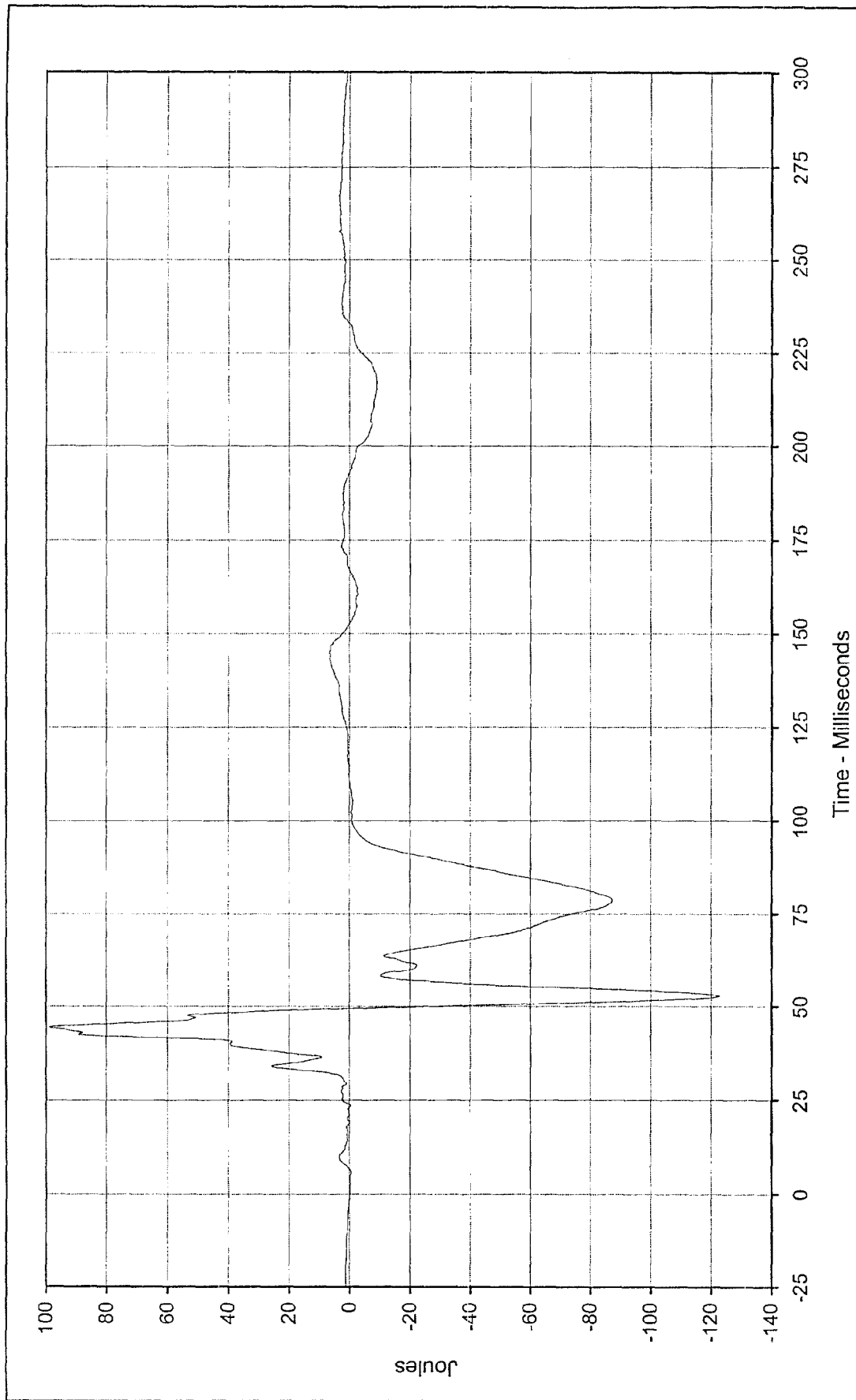
Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Driver Right Lower Tibia Force Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	146.7	at	64.8	Milliseconds
Minimum Value:	-2172.6	at	46.3	Milliseconds
SAE Filter Class:	600	Test Vehicle:	1998 Toyota RAV-4 SUV	
Date of Test:	2/26/98			
Curve Number:	FIL-033			

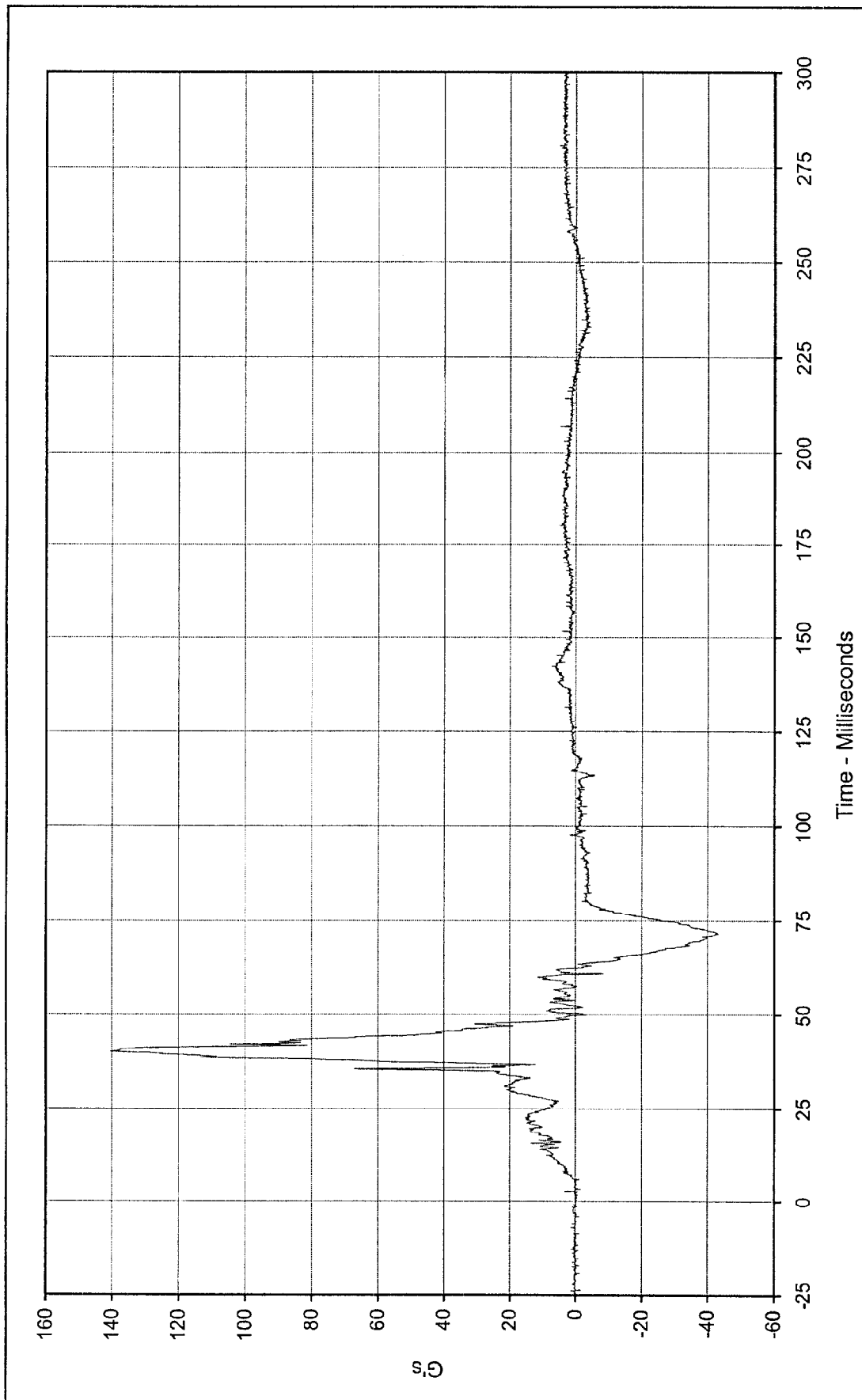




Curve Description: Driver Right Lower Tibia Moment Y
 Testing Program: 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

Maximum Value: 98.9 at 44.5 Milliseconds
 Minimum Value: -122.8 at 52.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-034

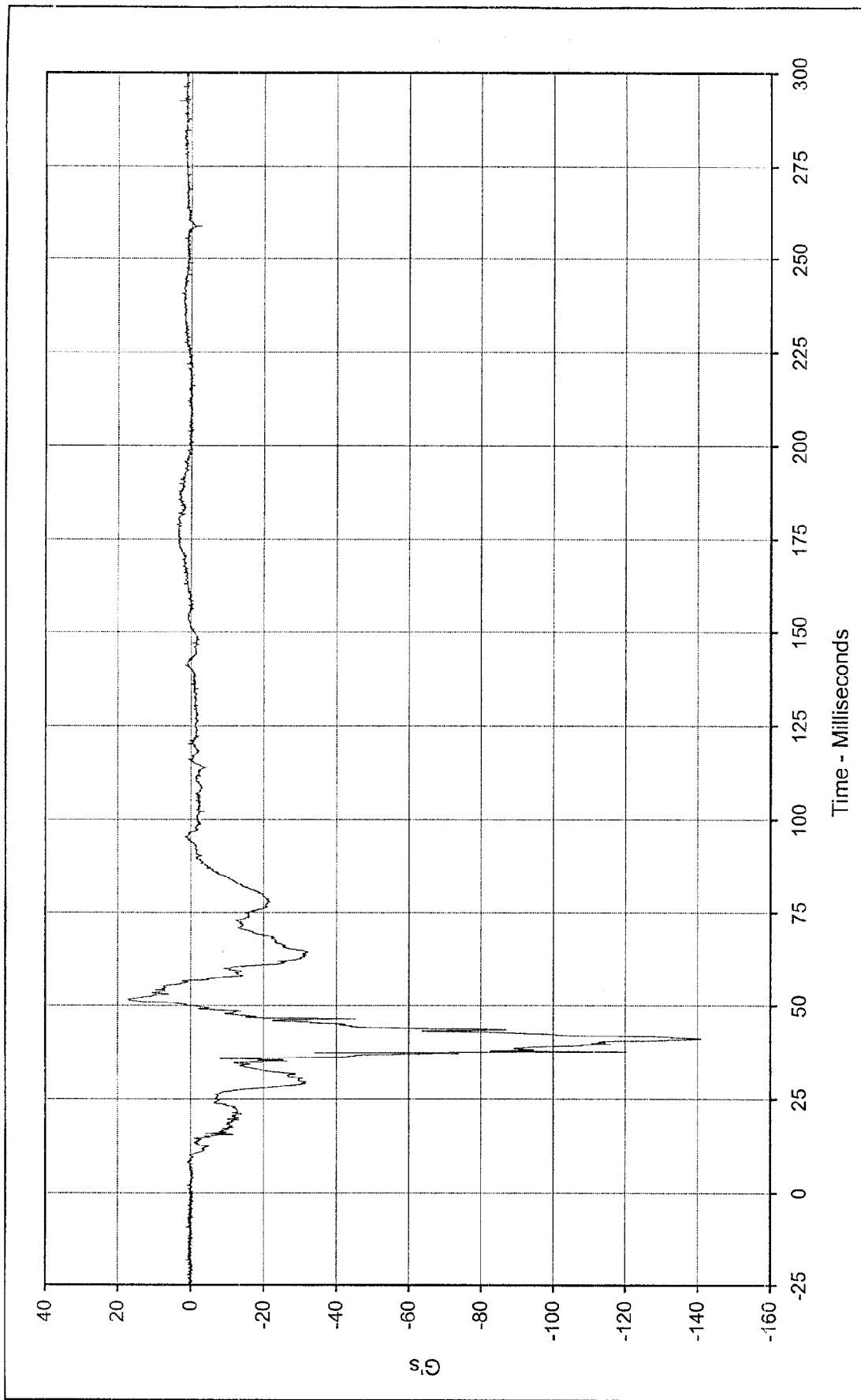




Curve Description: Driver Left Foot Aft X
 Maximum Value: 140.5 at 40.2 Milliseconds
 Minimum Value: -43.2 at 71.5 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-035

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Left Foot Aft Z

Maximum Value: 17.3 at 51.6 Milliseconds

Minimum Value: -141.0 at 41.3 Milliseconds

SAE Filter Class: 1000

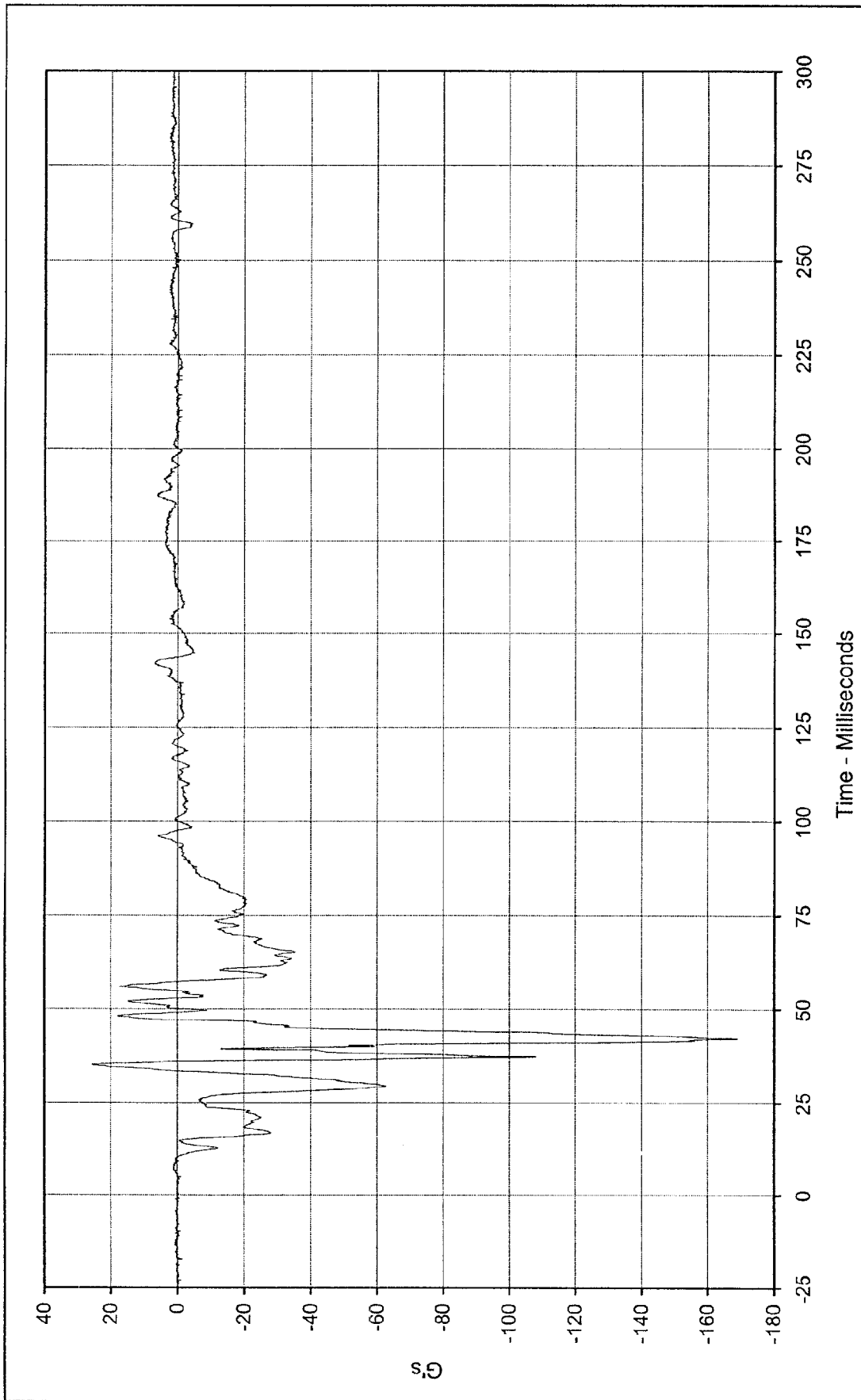
Date of Test: 2/26/98

Curve Number: FIL-036

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Left Foot Fore Z

Maximum Value: 25.6 at 35.3 Milliseconds

Minimum Value: -169.1 at 42.2 Milliseconds

SAE Filter Class: 1000

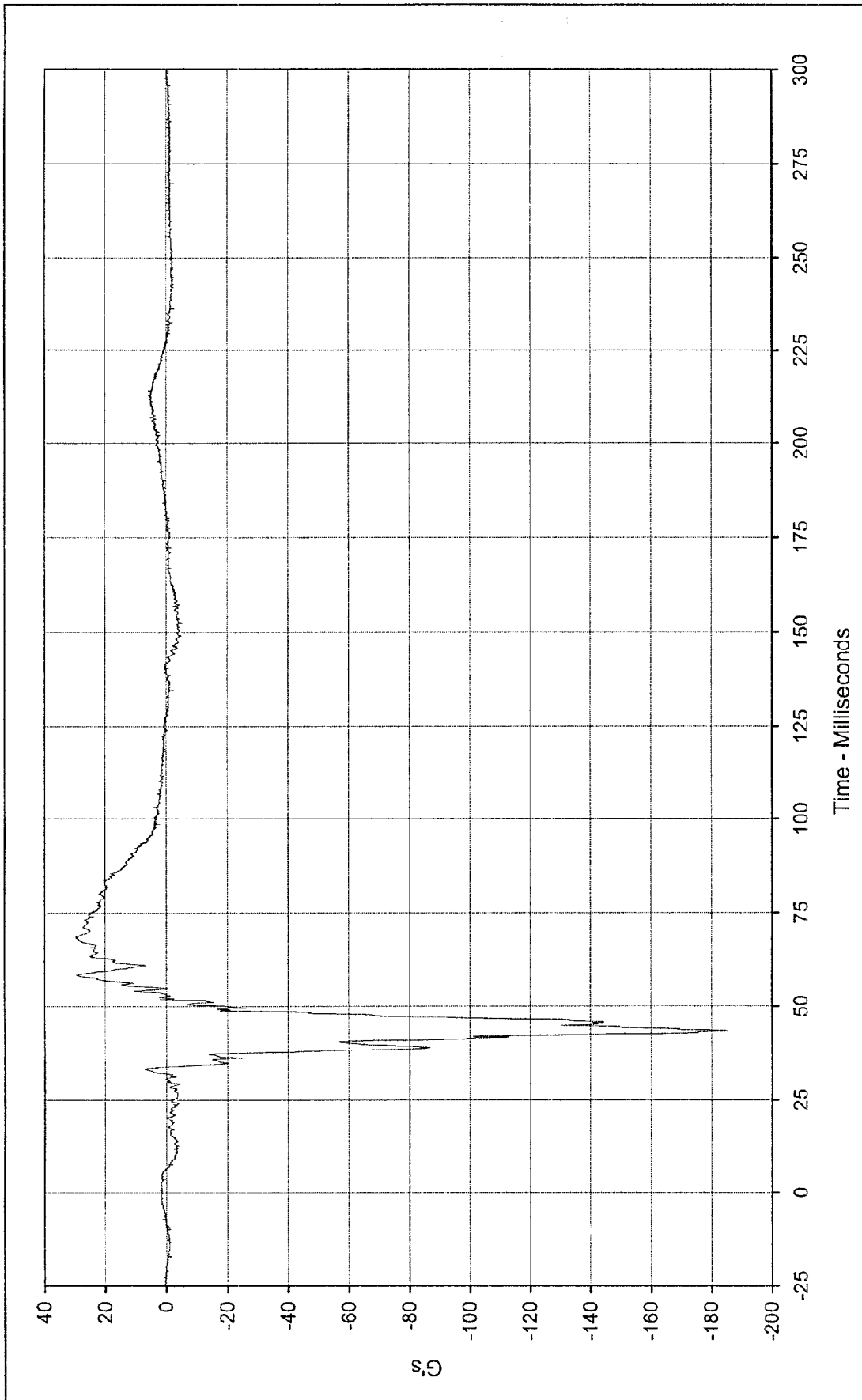
Date of Test: 2/26/98

Curve Number: FIL-037

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

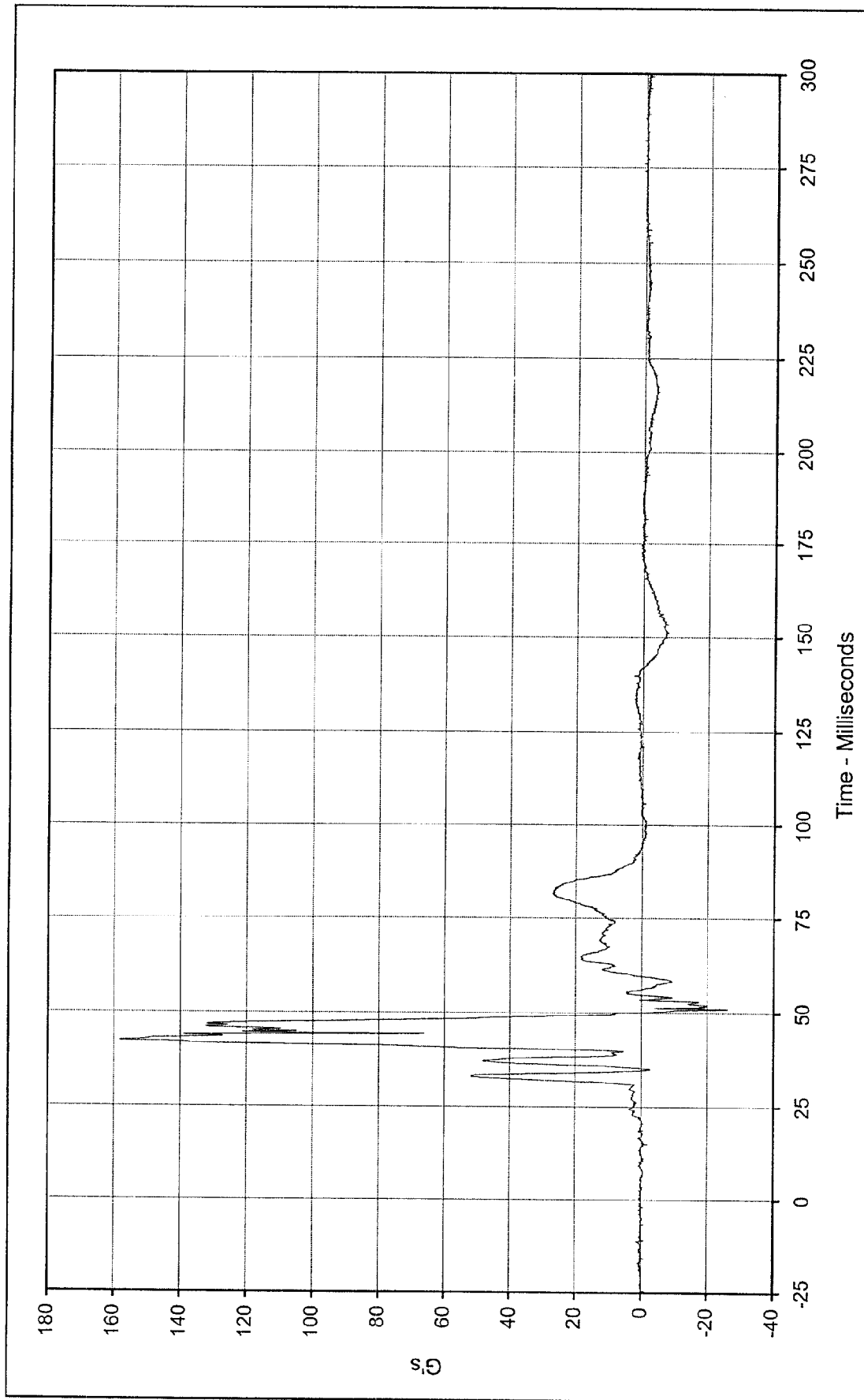




Curve Description:	Driver Right Foot Aft X		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	29.8	at 68.4	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-185.2	at 43.4			
SAE Filter Class:	1000				
Date of Test:	2/26/98				
Curve Number:	FIL-038				

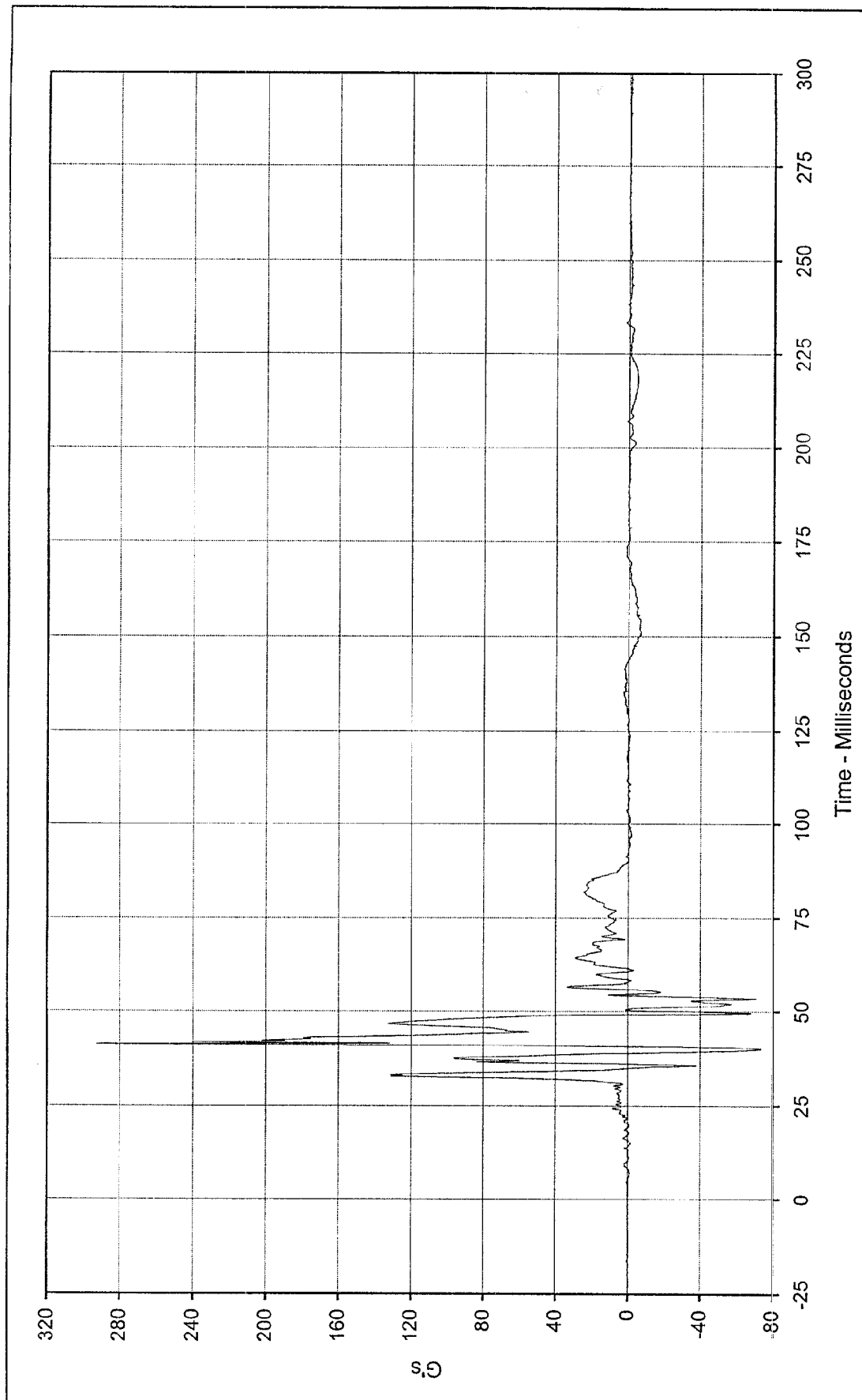






Curve Description:	Driver Right Foot Aft Z	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	158.2 at 42.3 Milliseconds	Test Vehicle:	1998 Toyota RAV 4 SUV	
Minimum Value:	-26.0 at 51.2 Milliseconds			
SAE Filter Class:	1000			
Date of Test:	2/26/98			
Curve Number:	FIL-039			

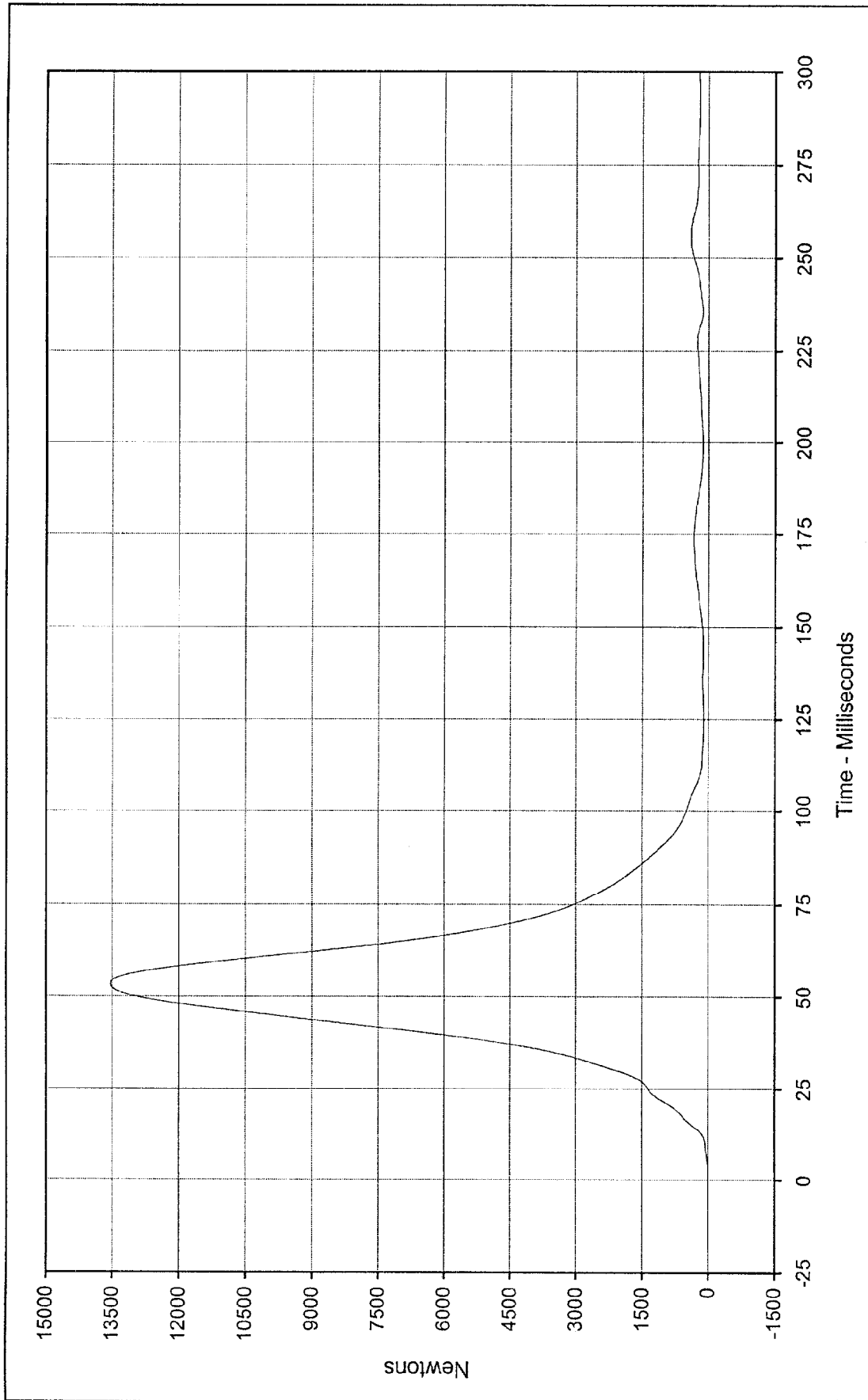




Curve Description: Driver Right Foot Fore Z
 Maximum Value: 292.0 at 41.1 Milliseconds
 Minimum Value: -73.6 at 39.8 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-040

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Driver Lap Belt Force Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 13540.7 at 53.6 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

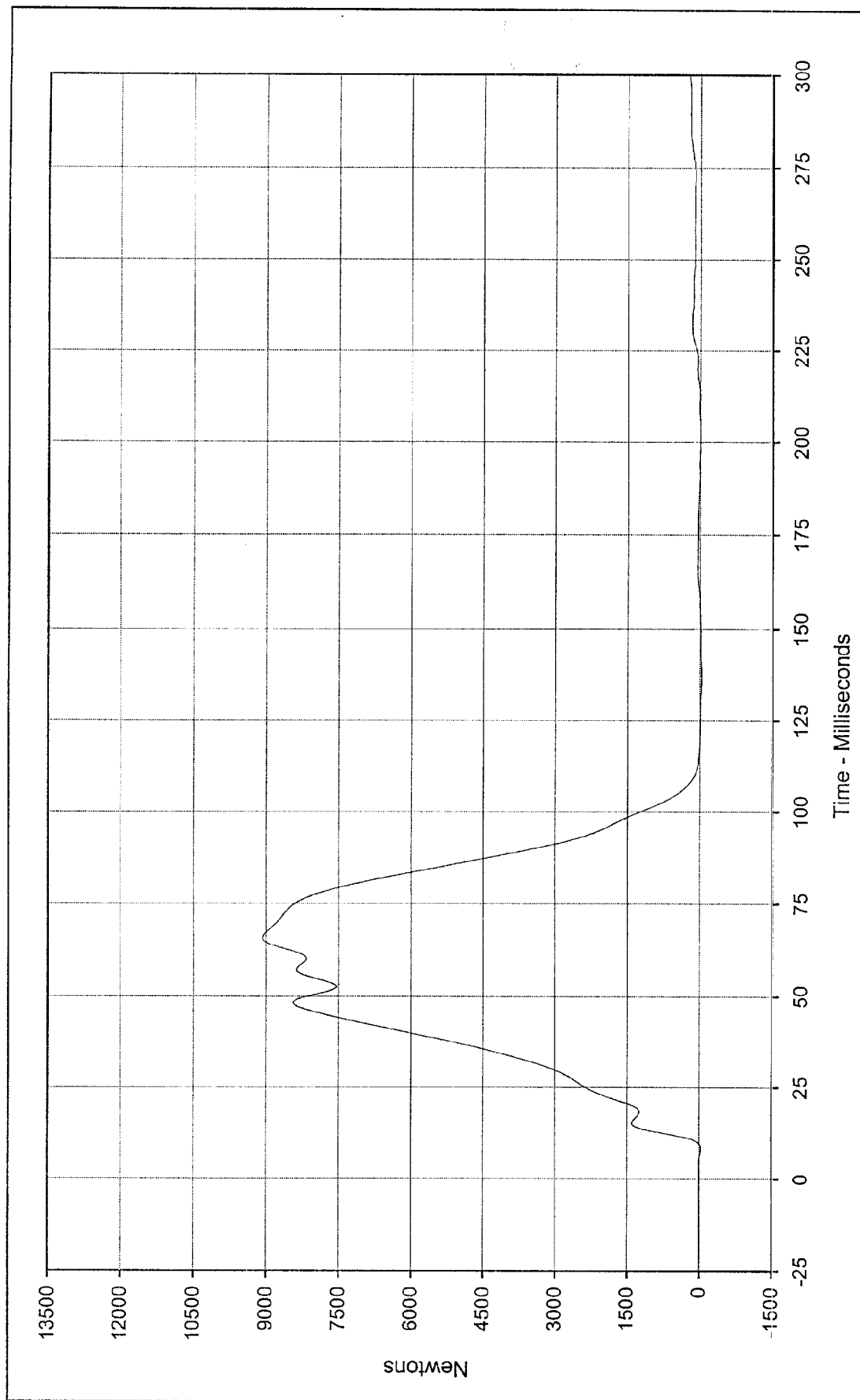
Minimum Value: 6.4 at 1.1 Milliseconds

SAE Filter Class: 60

Date of Test: 2/26/98

Curve Number: FIL-041

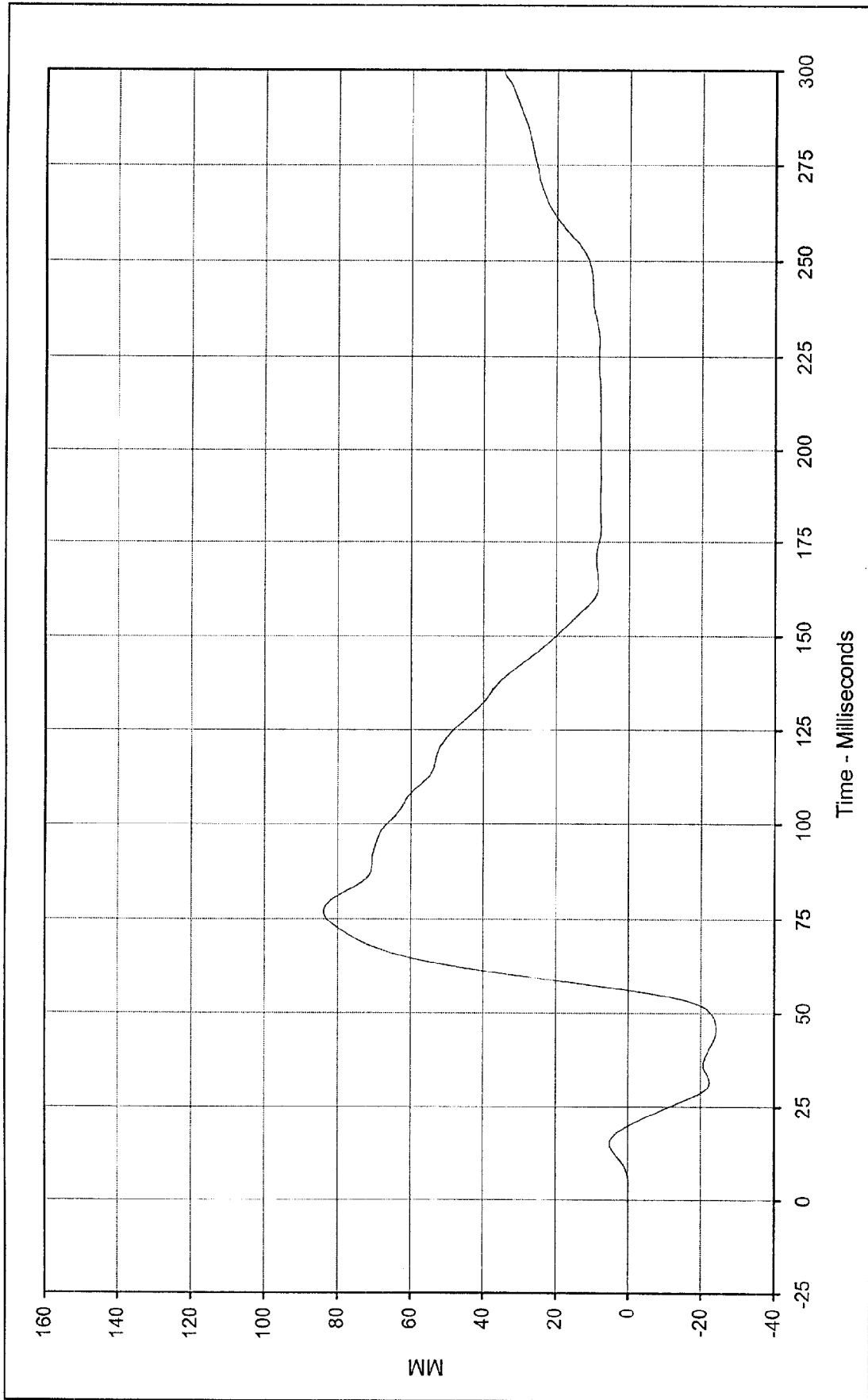




Curve Description: Driver Shoulder Belt Force
 Maximum Value: 9066.7 at 65.7 Milliseconds
 Minimum Value: -37.0 at 136.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/26/98
 Curve Number: FIL-042

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

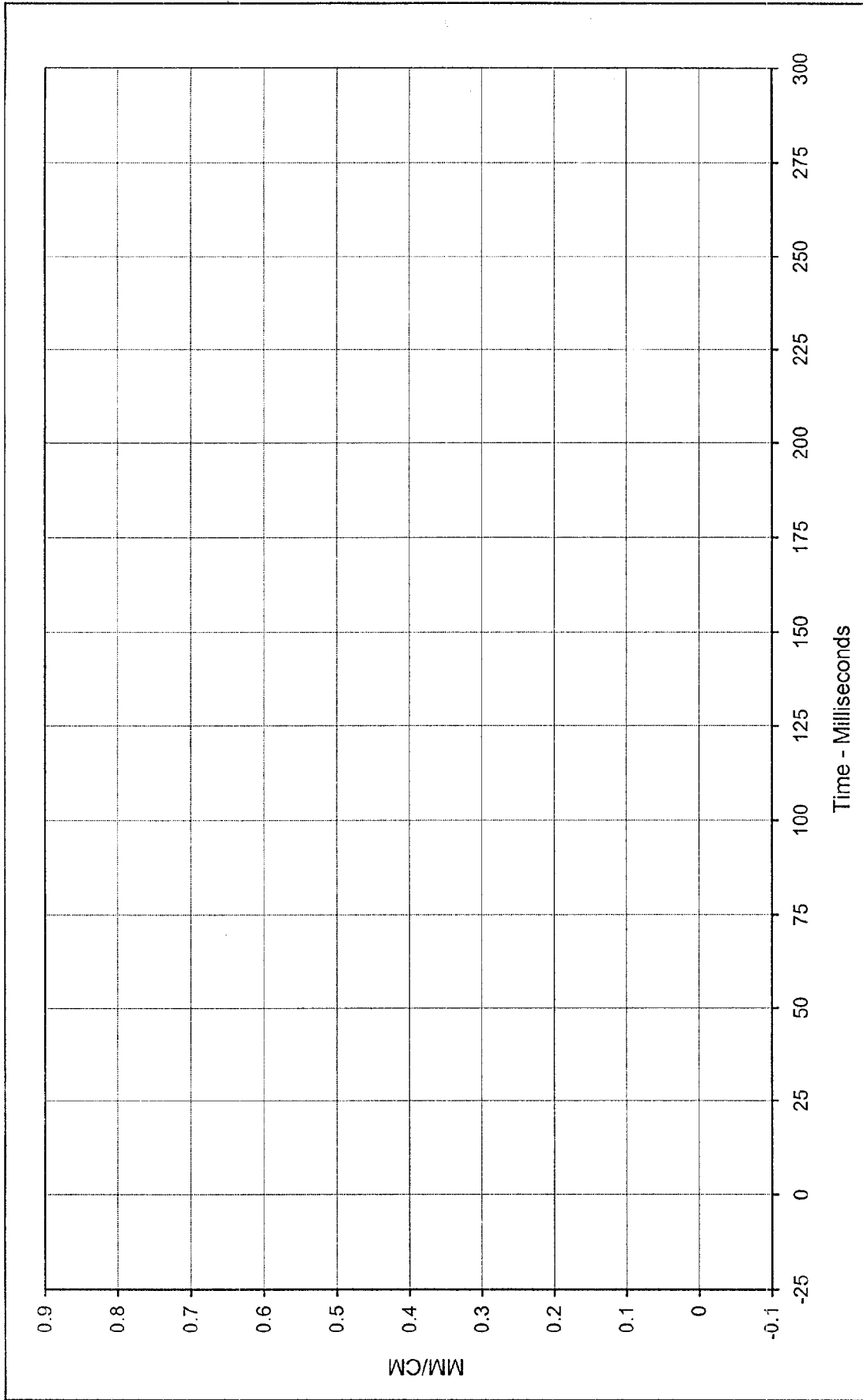




Curve Description: Driver Shoulder Belt Pullout Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Maximum Value: 83.8 at 76.9 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV
Minimum Value: -24.2 at 45.6 Milliseconds



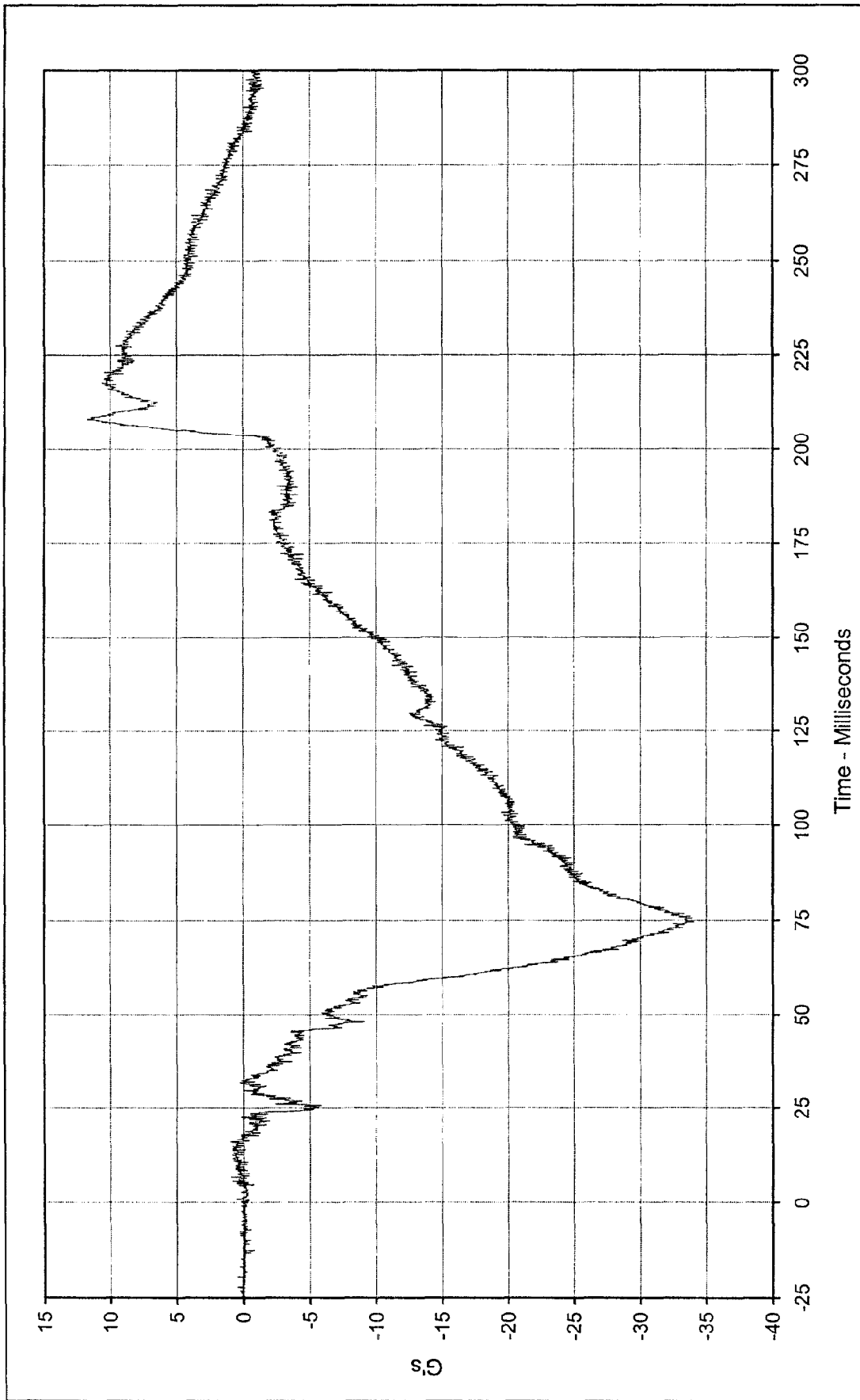
SAE Filter Class: 60
Date of Test: 2/26/98
Curve Number: FIL-043



Curve Description:	Driver Shoulder Belt Elongation	*	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	0.00	at 0.0	Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV
Minimum Value:	0.00	at 0.0	Milliseconds		
SAE Filter Class:	60				
Date of Test:	2/26/98				
Curve Number:	FIL-044				



*Channel Failed



Curve Description: Passenger Head Primary X

Maximum Value: 11.7 at 207.9 Milliseconds

Minimum Value: -34.1 at 74.3 Milliseconds

SAE Filter Class: 1000

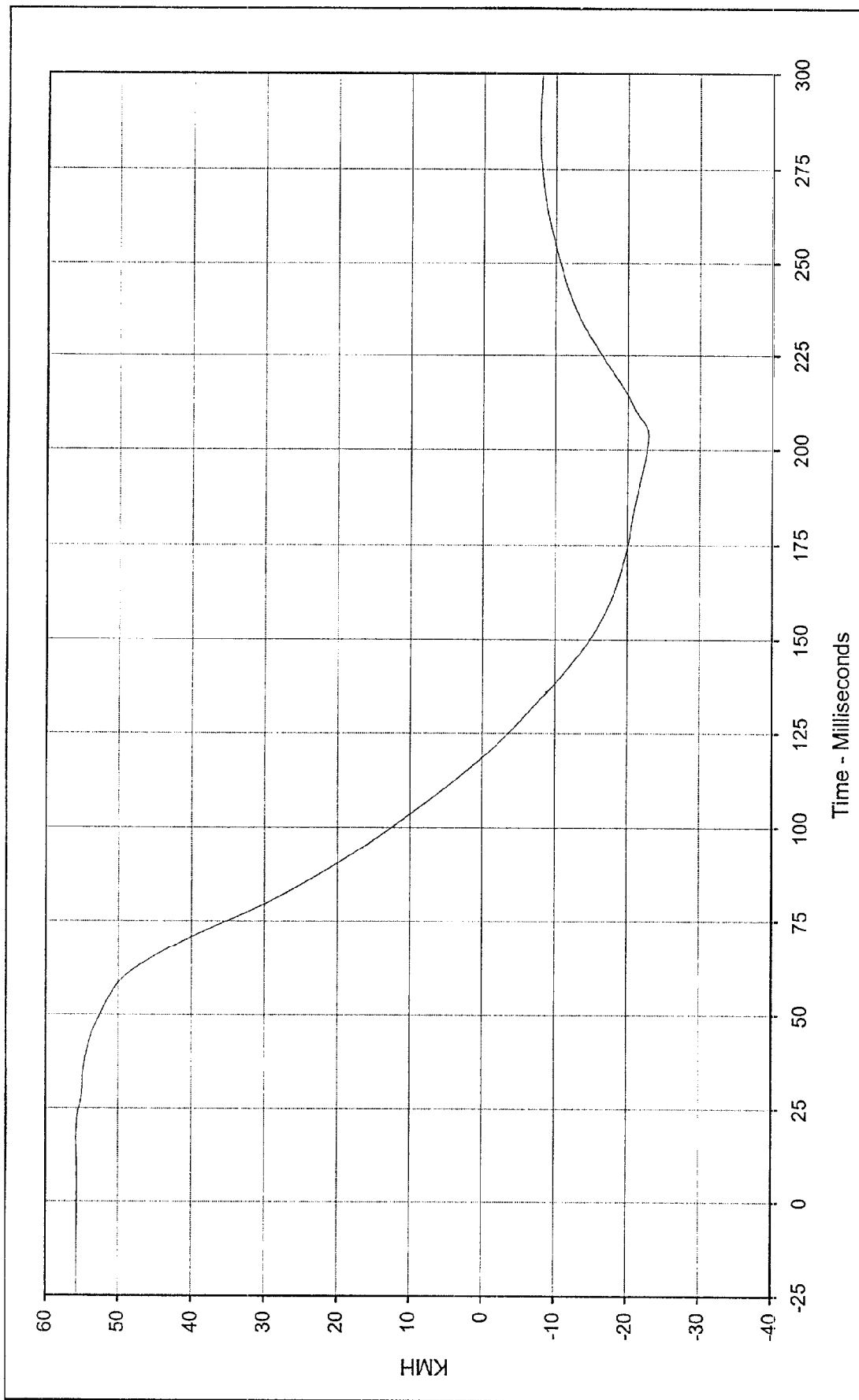
Date of Test: 2/26/98

Curve Number: FIL-045

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

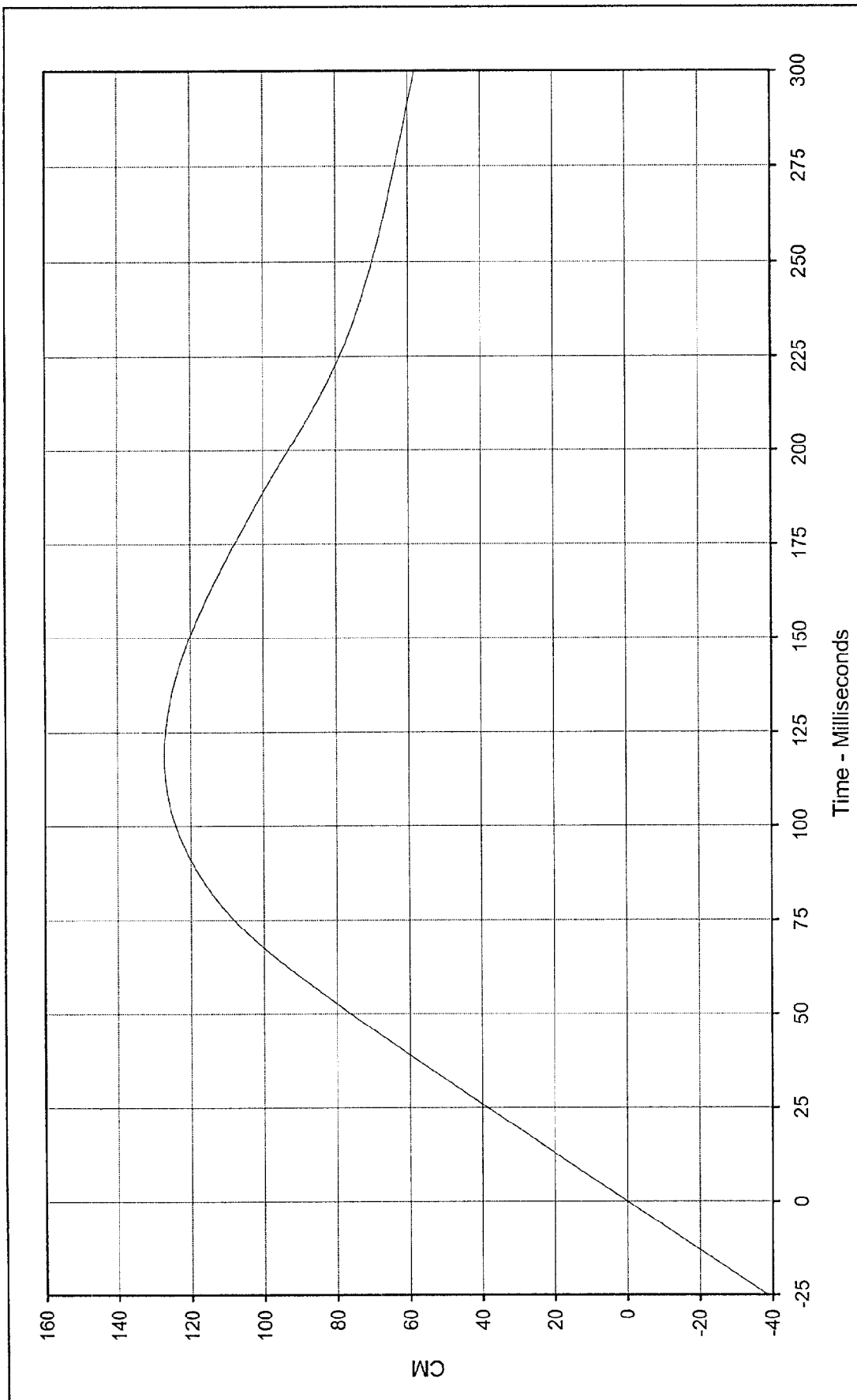




Curve Description: Passenger Head Primary X Velocity
 Maximum Value: 55.8 at 17.0 Milliseconds
 Minimum Value: -22.9 at 203.7 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN1-045

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Head Primary X Displ.

Maximum Value: 127.2 at 118.5 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

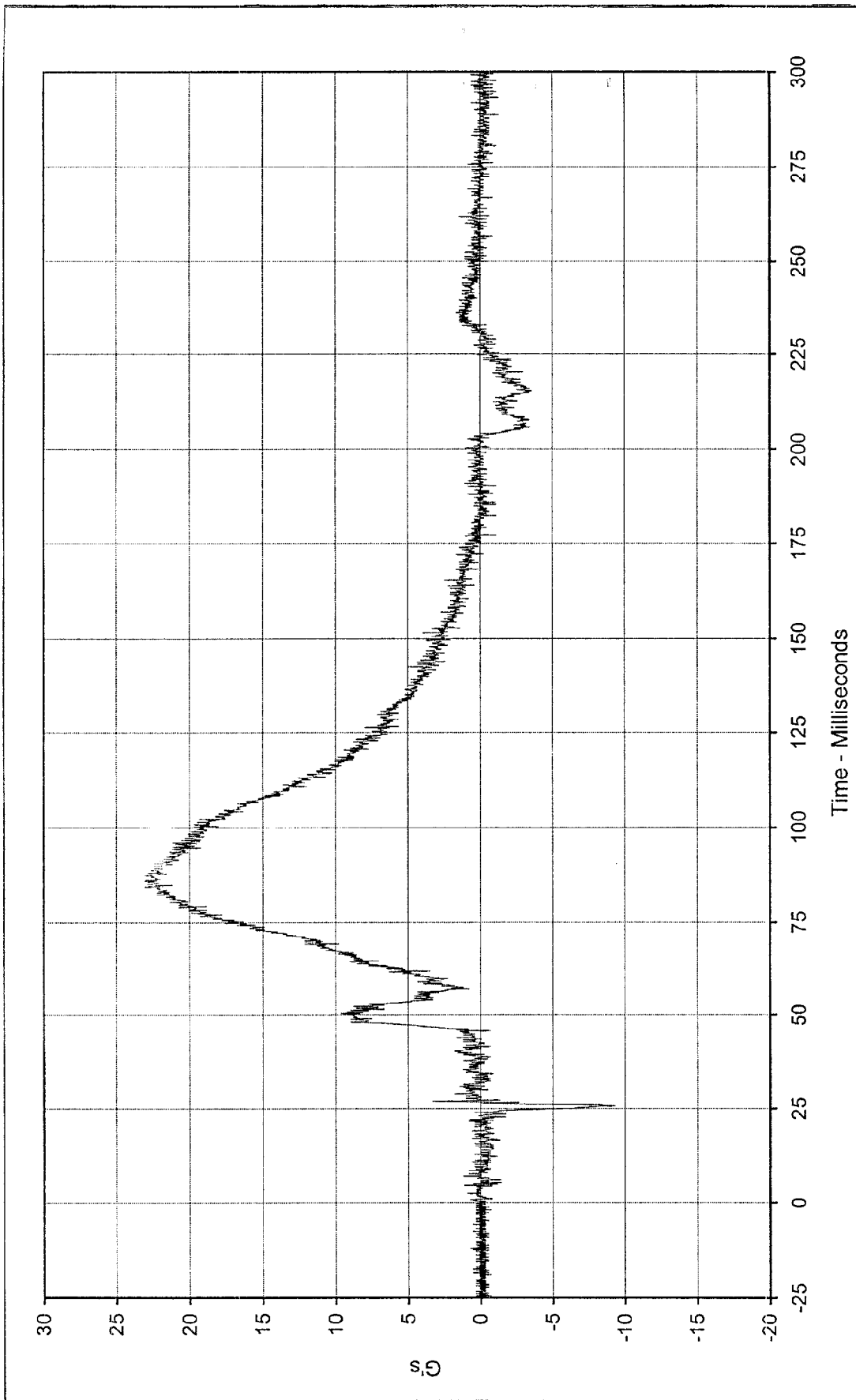
Date of Test: 2/26/98

Curve Number: IN2-045

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Head Primary Y Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 23.0 at 84.3 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

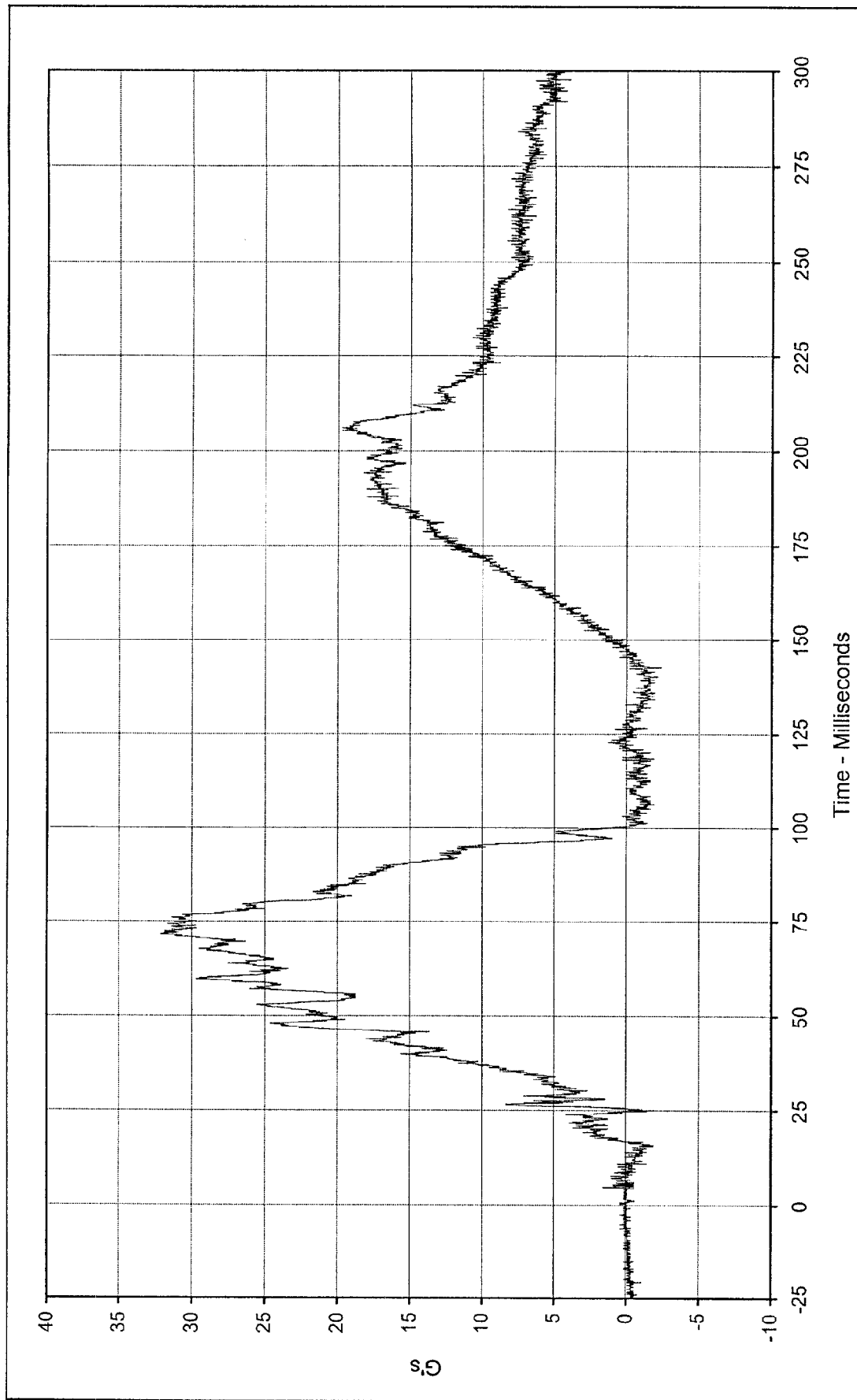
Minimum Value: -9.3 at 25.7 Milliseconds

SAE Filter Class: 1000

Date of Test: 2/26/98

Curve Number: FIL-046

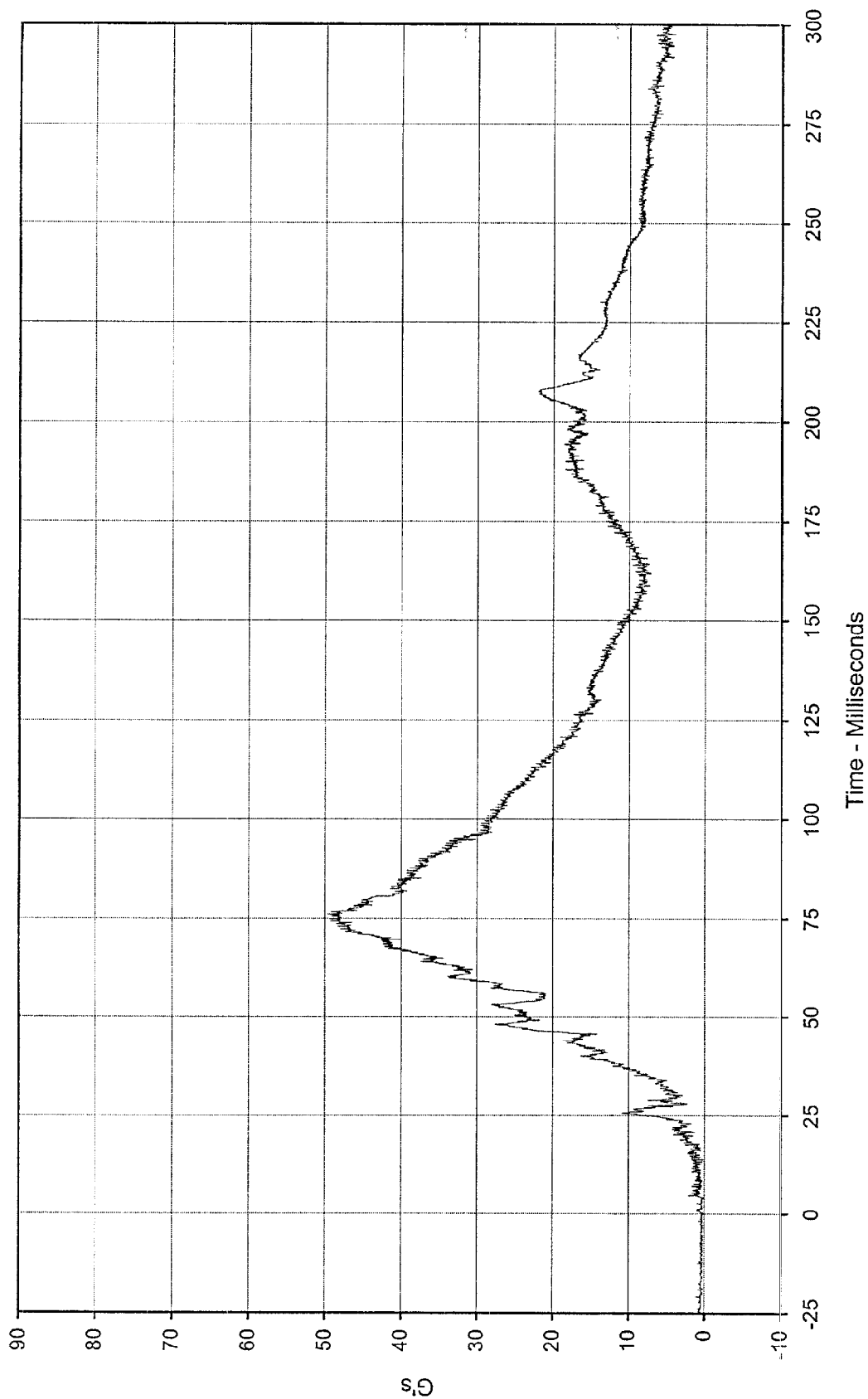




Curve Description: Passenger Head Primary Z
 Maximum Value: 32.1 at 71.4 Milliseconds
 Minimum Value: -2.4 at 142.6 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-047

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Head Resultant Primary

Maximum Value: 49.7 at 76.0 Milliseconds

Minimum Value: 0.1 at 3.2 Milliseconds

SAE Filter Class: 1000

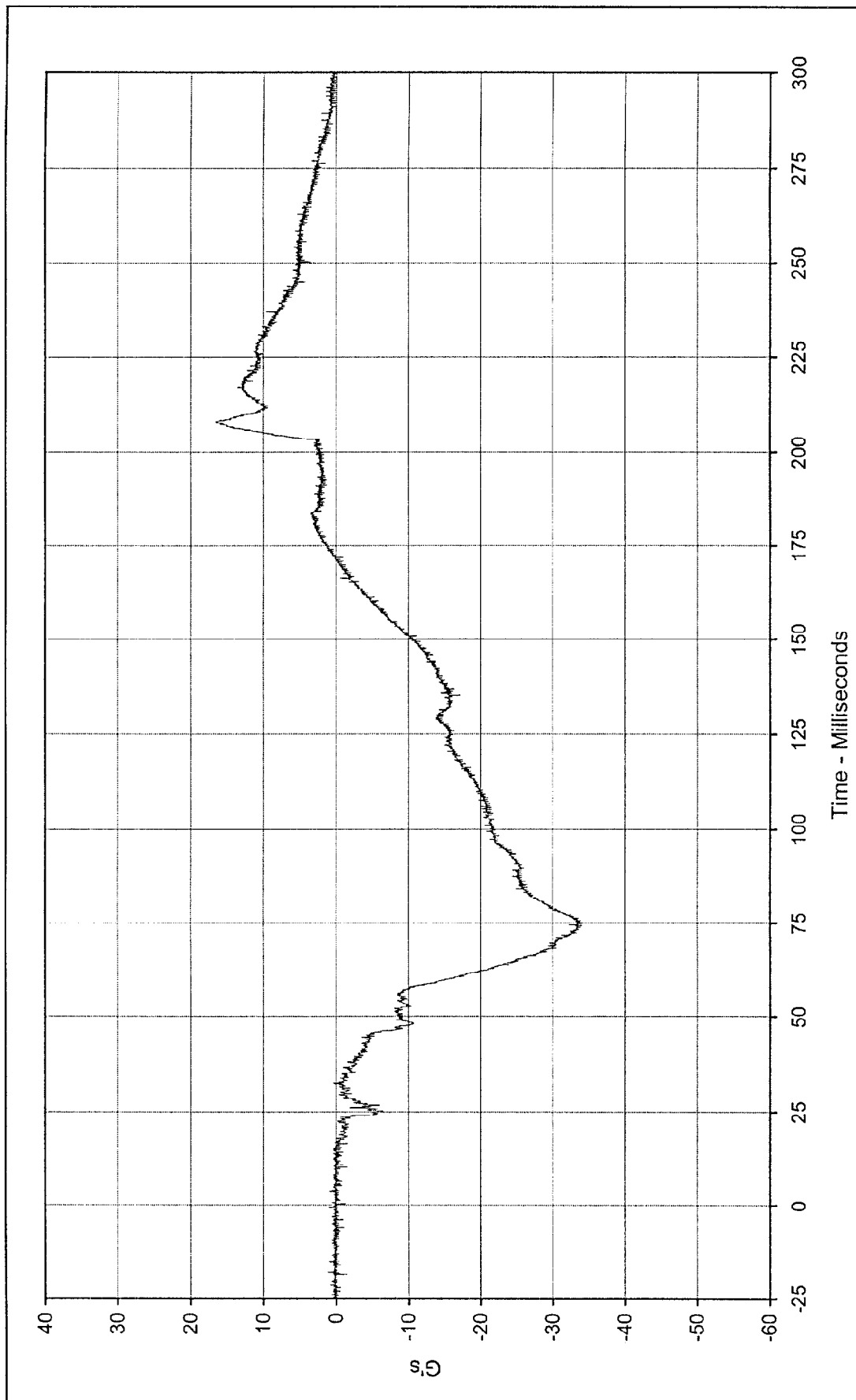
Date of Test: 2/26/98

Curve Number: RES-045

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

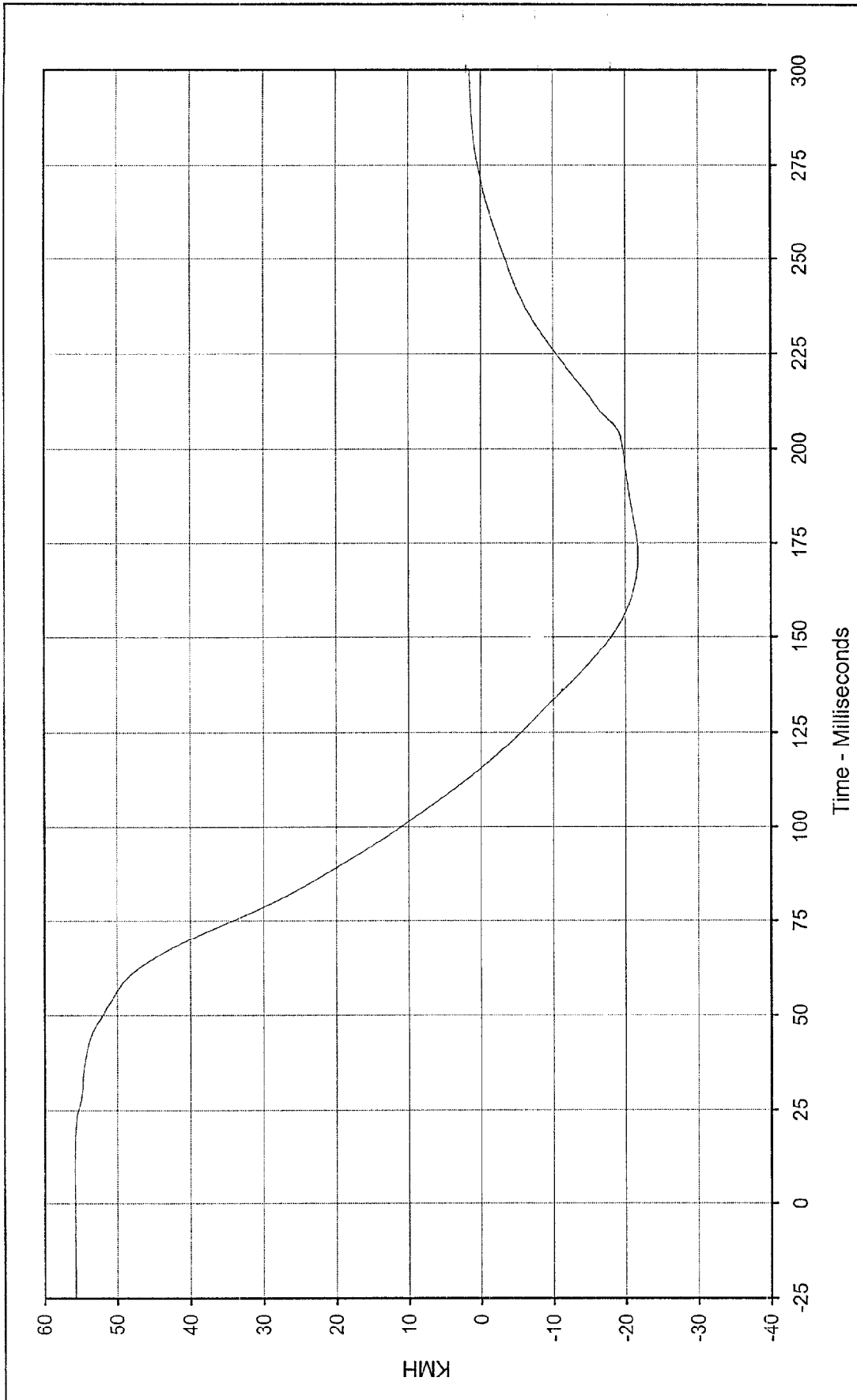




Curve Description: Passenger Head Redundant X
 Maximum Value: 16.5 at 208.0 Milliseconds
 Minimum Value: -34.1 at 74.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-048

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Head Redundant X Velocity

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 55.8 at 9.5 Milliseconds

Test Vehicle: 1998 Toyota RAV-4 SUV

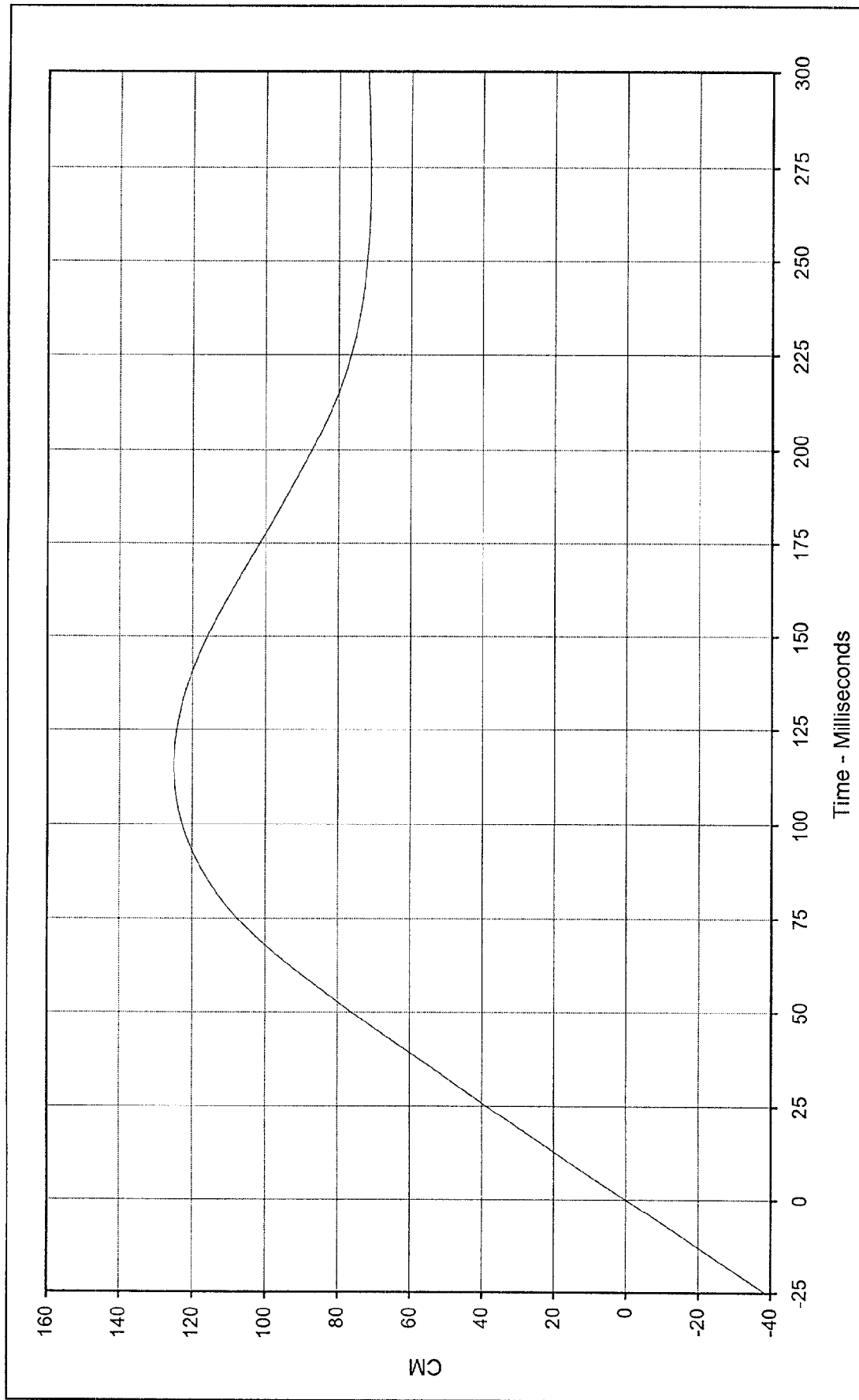
Minimum Value: -21.7 at 171.6 Milliseconds

SAE Filter Class: 180

Date of Test: 2/26/98

Curve Number: IN1-048





Curve Description: Passenger Head Redundant X Displ.

Maximum Value: 125.0 at 115.5 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

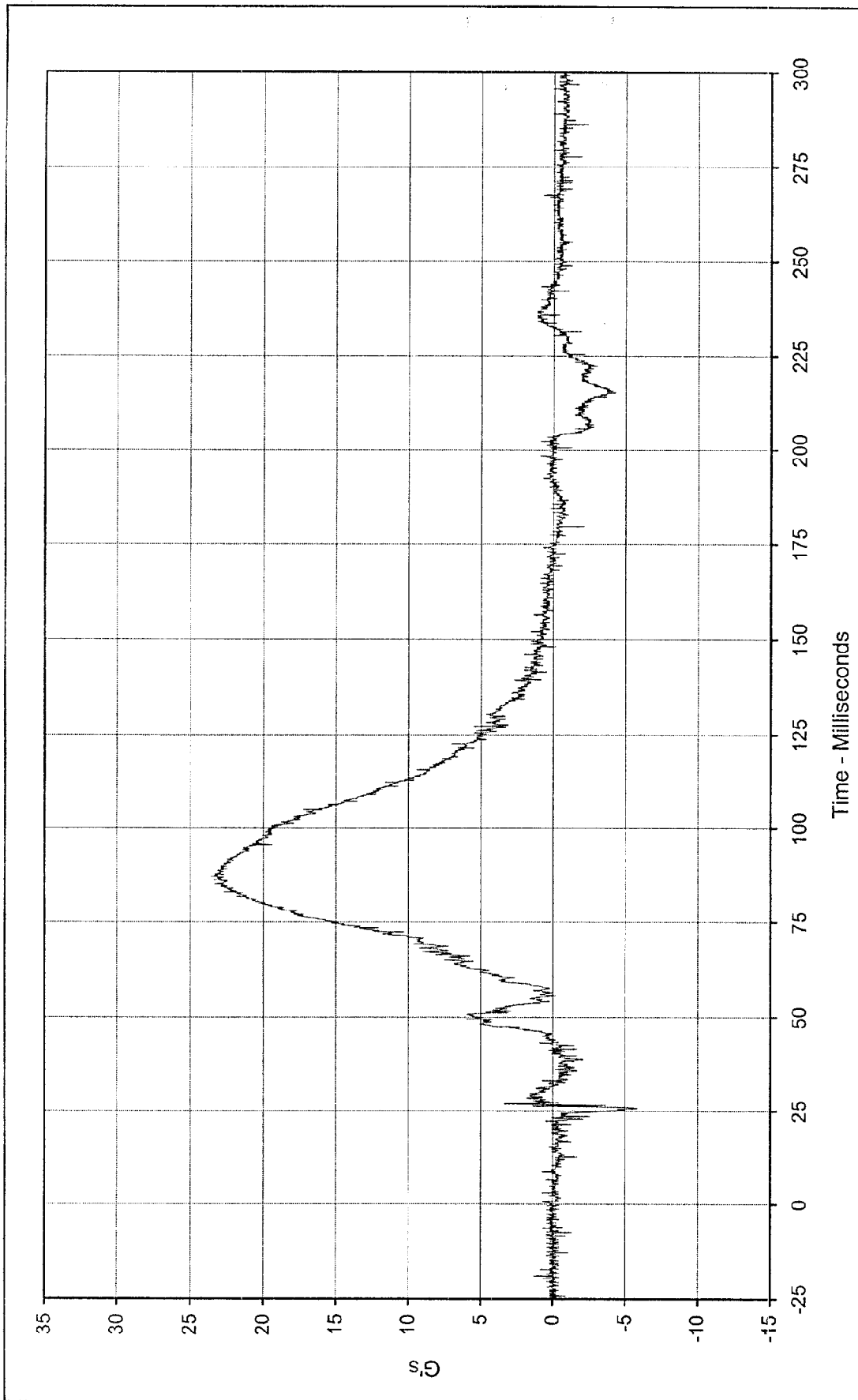
Date of Test: 2/26/98

Curve Number: IN2-048

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

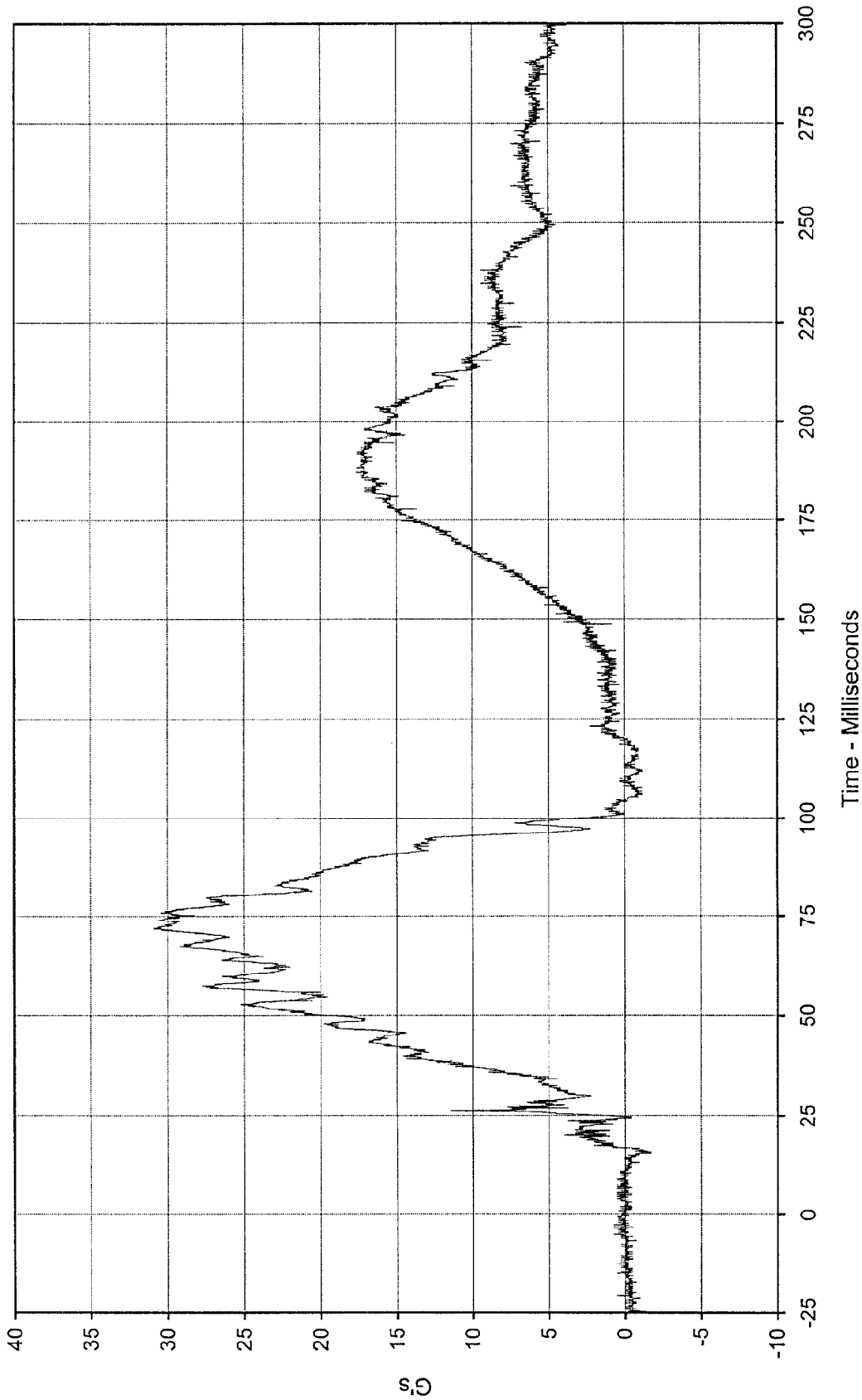




Curve Description: Passenger Head Redundant Y
 Maximum Value: 23.6 at 87.0 Milliseconds
 Minimum Value: -5.8 at 25.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-049

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

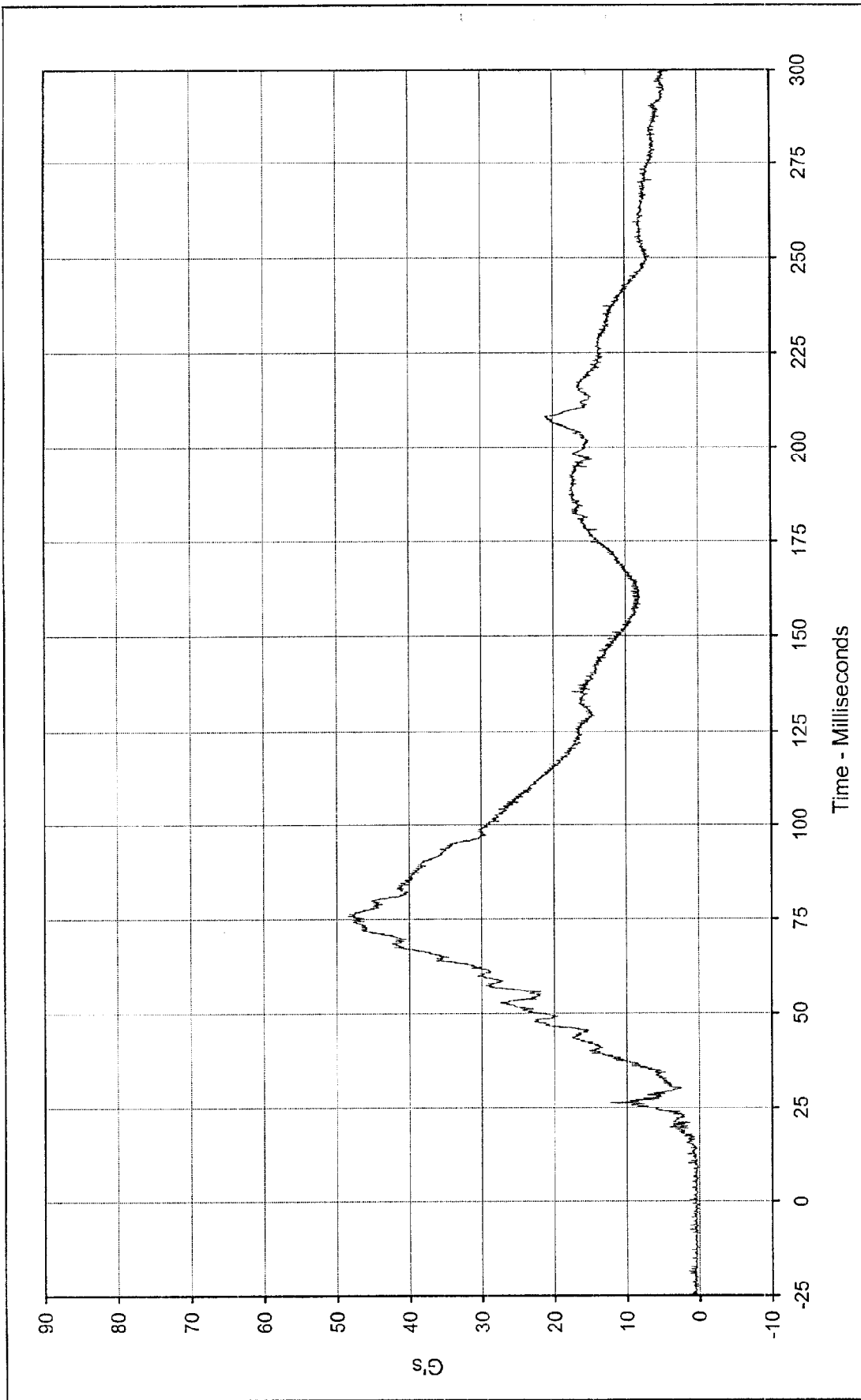




Curve Description: Passenger Head Redundant Z
 Maximum Value: 30.9 at 71.8 Milliseconds
 Minimum Value: -1.7 at 15.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-050

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

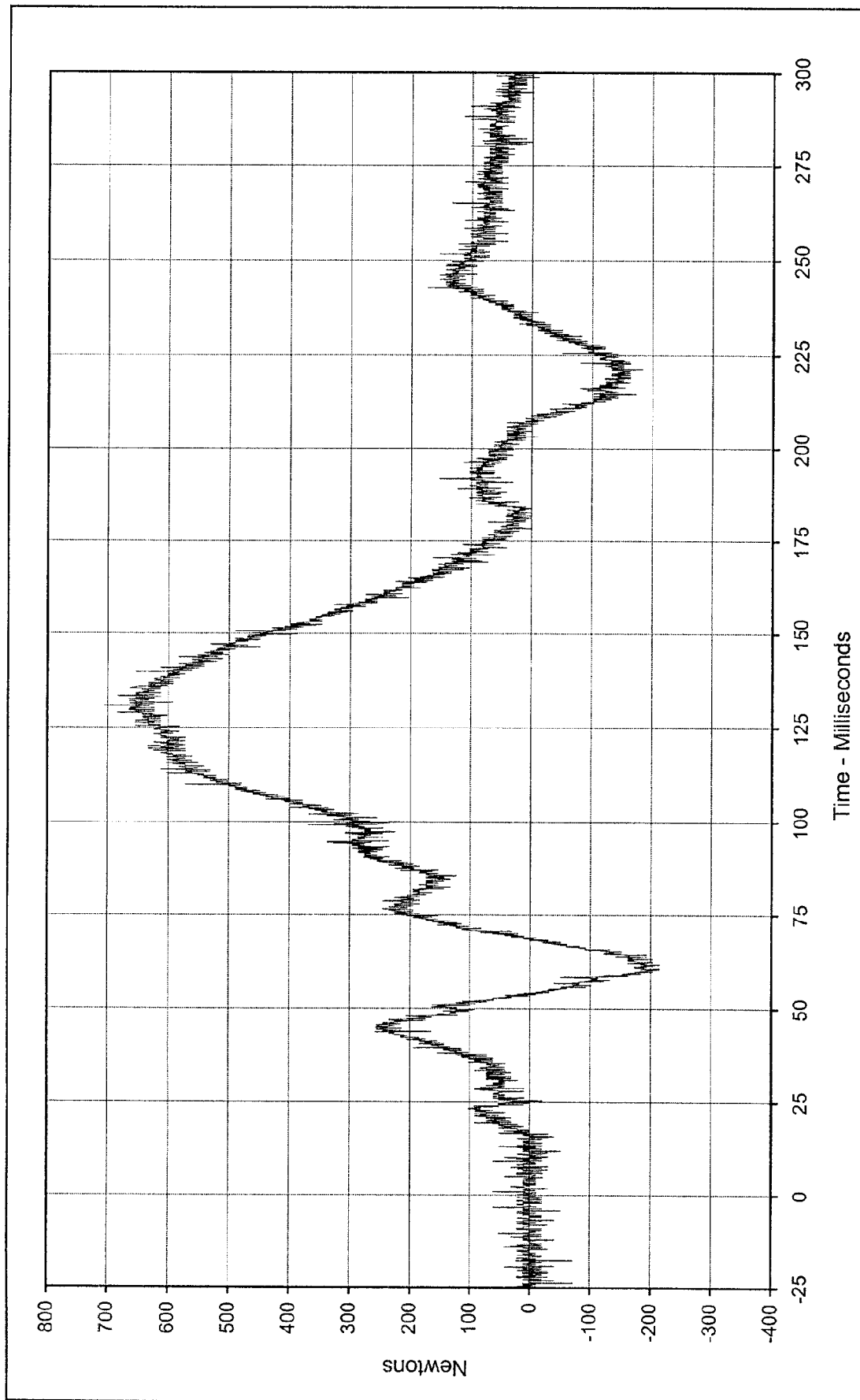




Curve Description: Passenger Head Resultant Redundant
 Maximum Value: 48.4 at 75.8 Milliseconds
 Minimum Value: 0.1 at 6.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: RES-048

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Neck Force X

Maximum Value: 704.4 at 130.9 Milliseconds

Minimum Value: -214.1 at 60.5 Milliseconds

SAE Filter Class: 1000

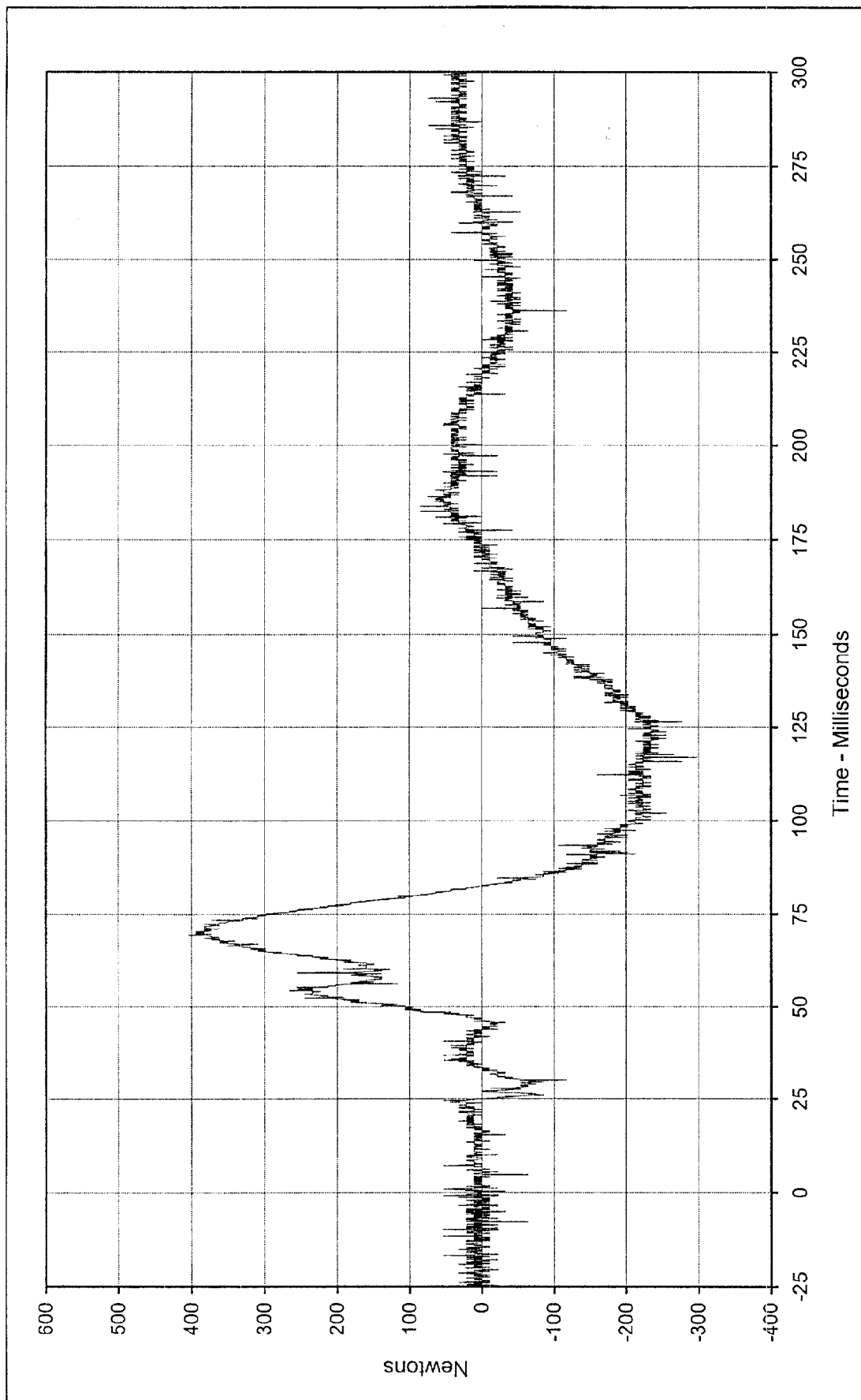
Date of Test: 2/26/98

Curve Number: FIL-051

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

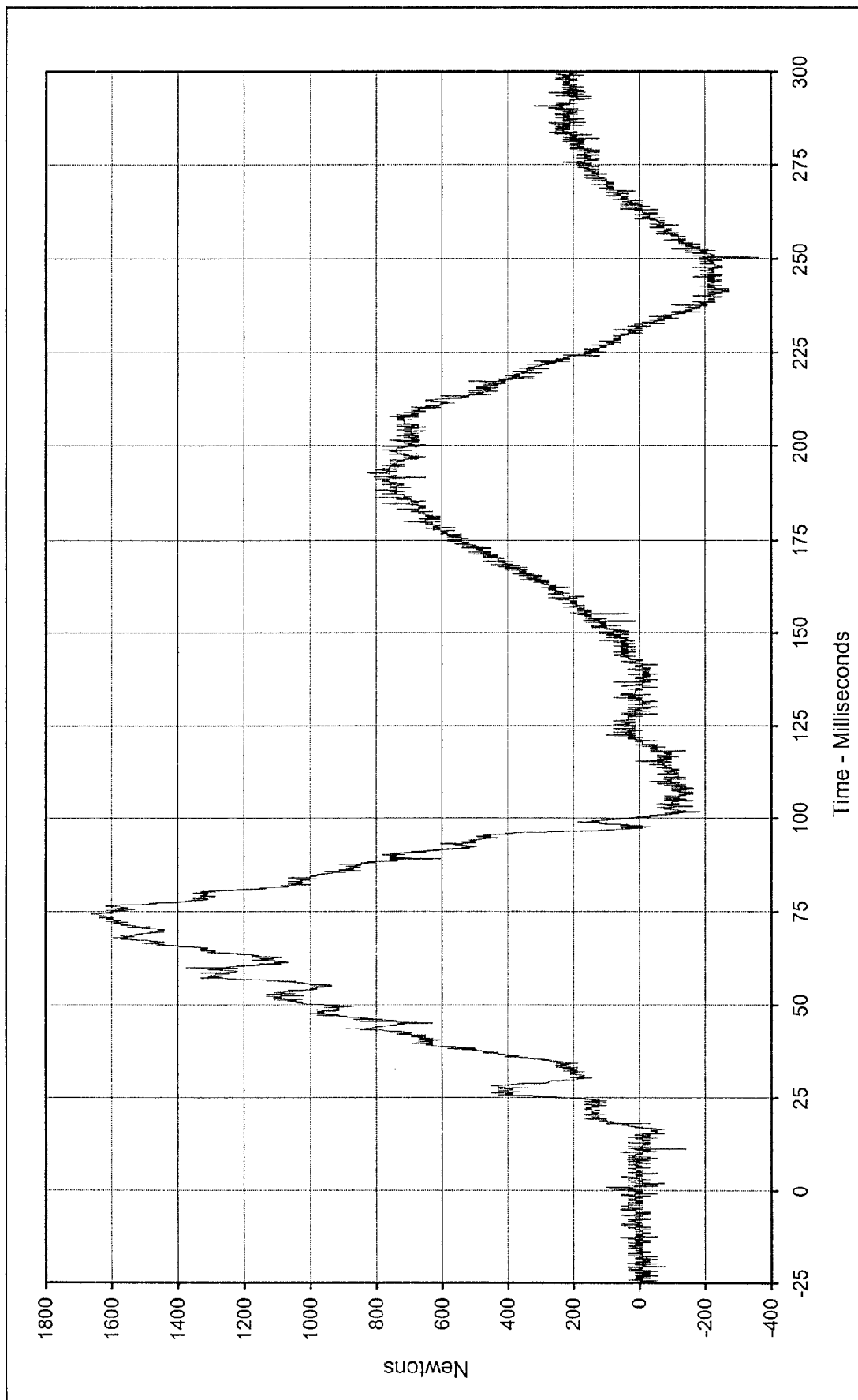




Curve Description: Passenger Neck Force Y
 Maximum Value: 404.4 at 69.5 Milliseconds
 Minimum Value: -298.4 at 116.7 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-052

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Neck Force Z

Maximum Value: 1660.8 at 74.3 Milliseconds

Minimum Value: -361.6 at 250.4 Milliseconds

SAE Filter Class: 1000

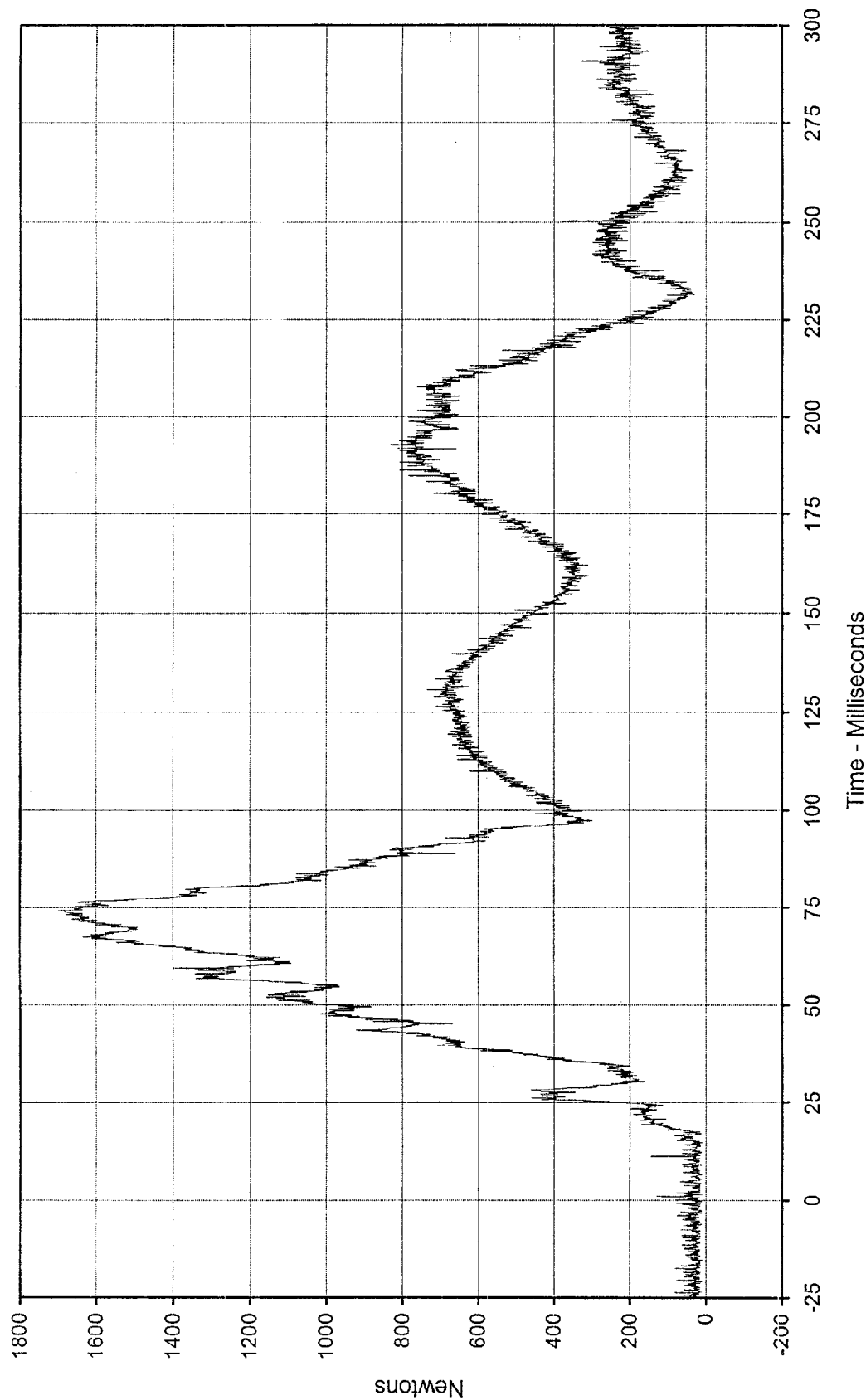
Date of Test: 2/26/98

Curve Number: FIL-053

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

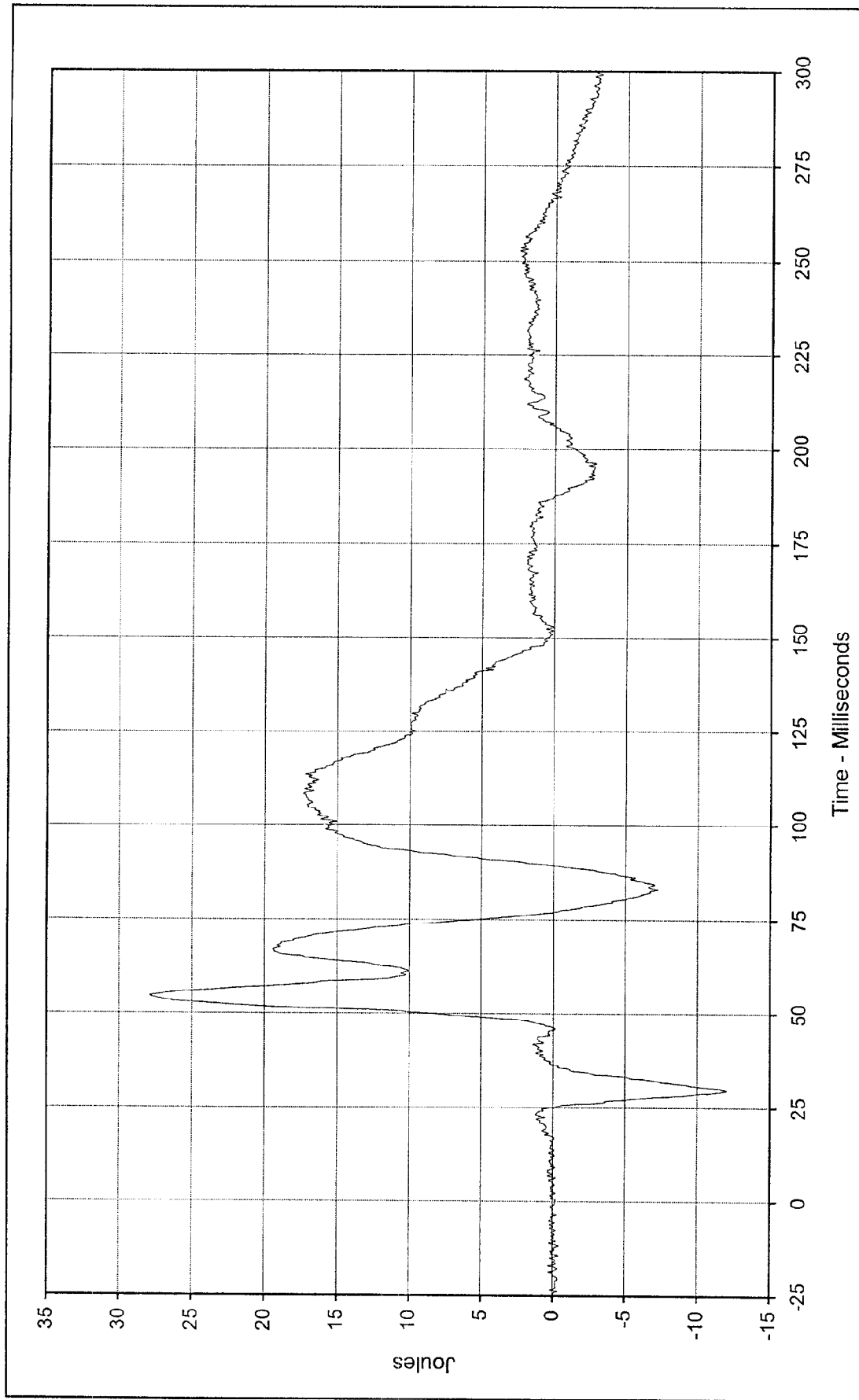




Curve Description: Passenger Neck Force Resultant
 Maximum Value: 1697.1 at 74.3 Milliseconds
 Minimum Value: 9.9 at 1.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: RES-051

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

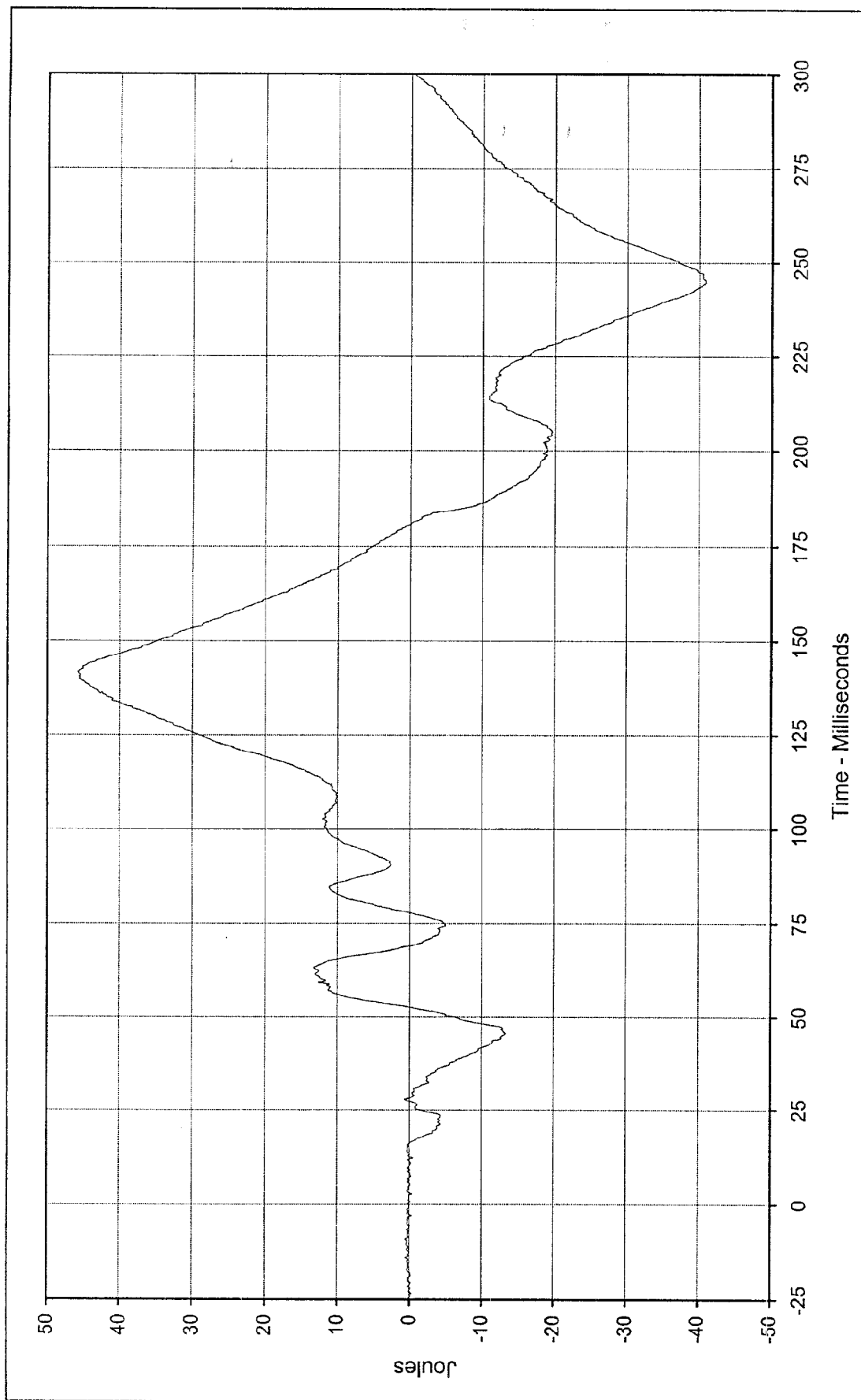




Curve Description: Passenger Neck Moment X
Maximum Value: 27.9 at 54.6 Milliseconds
Minimum Value: -12.0 at 29.6 Milliseconds
SAE Filter Class: 600
Date of Test: 2/26/98
Curve Number: FIL-054

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Neck Moment Y Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 45.7 at 141.4 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

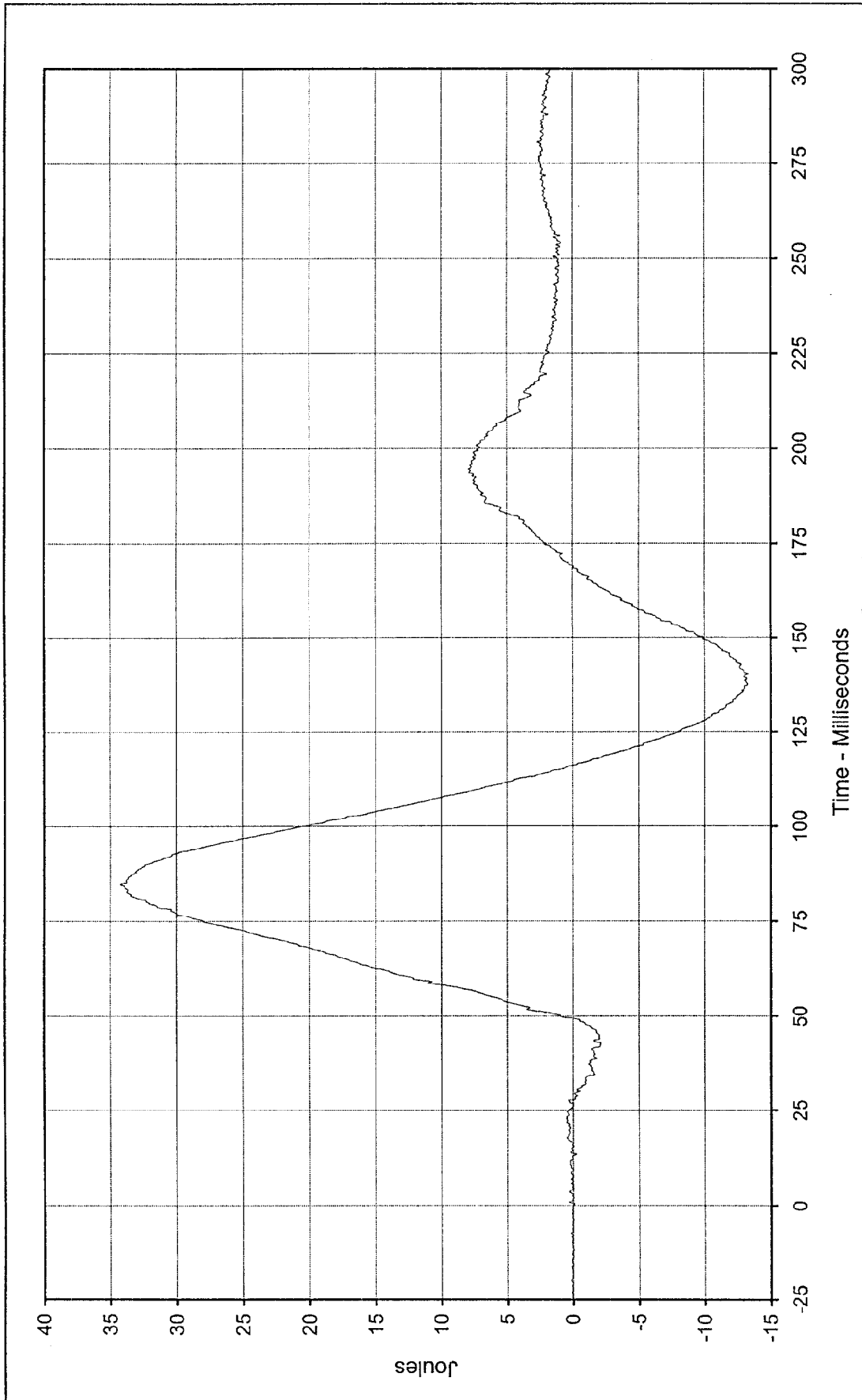
Minimum Value: -40.8 at 244.8 Milliseconds

SAE Filter Class: 600

Date of Test: 2/26/98

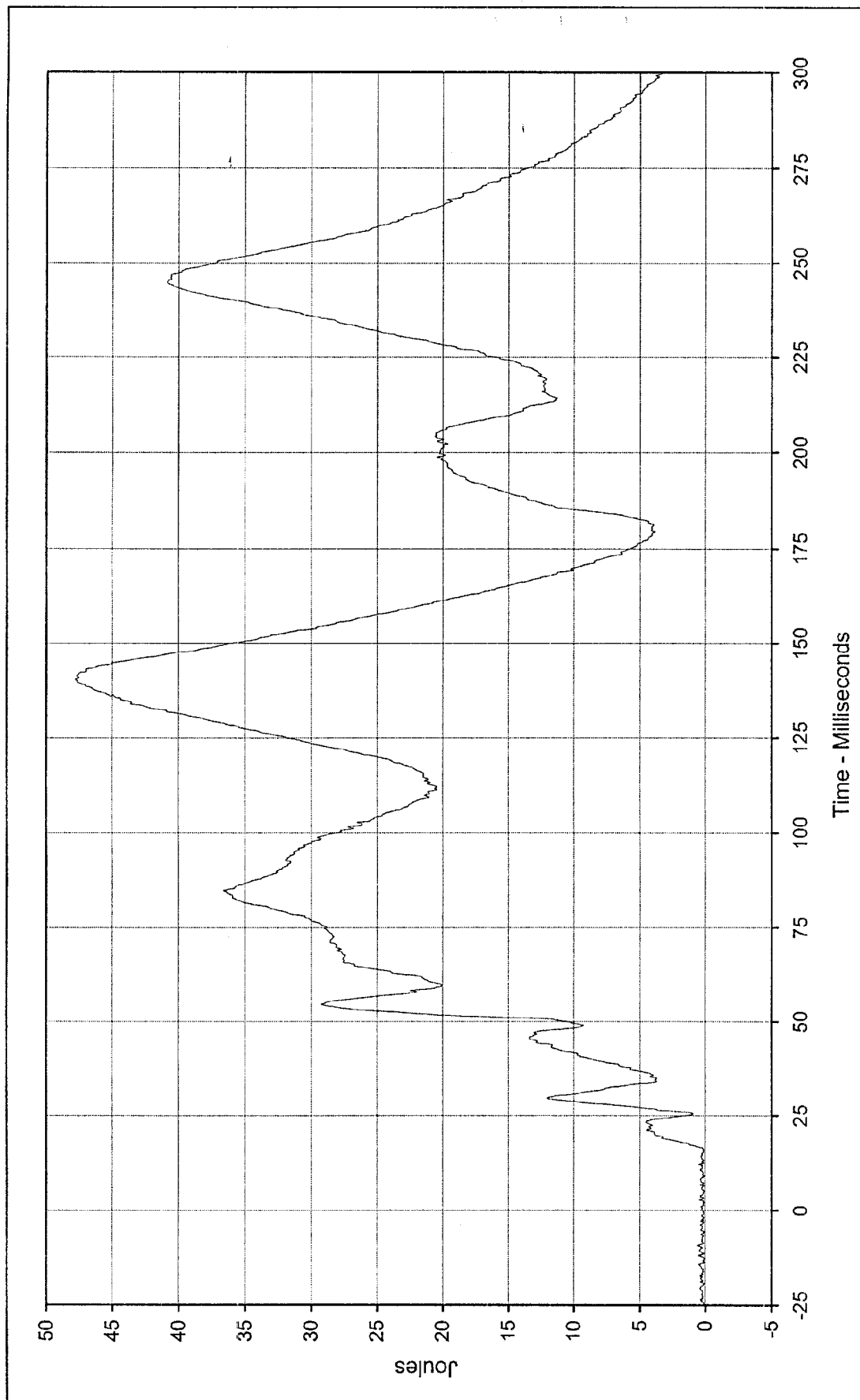
Curve Number: FIL-055





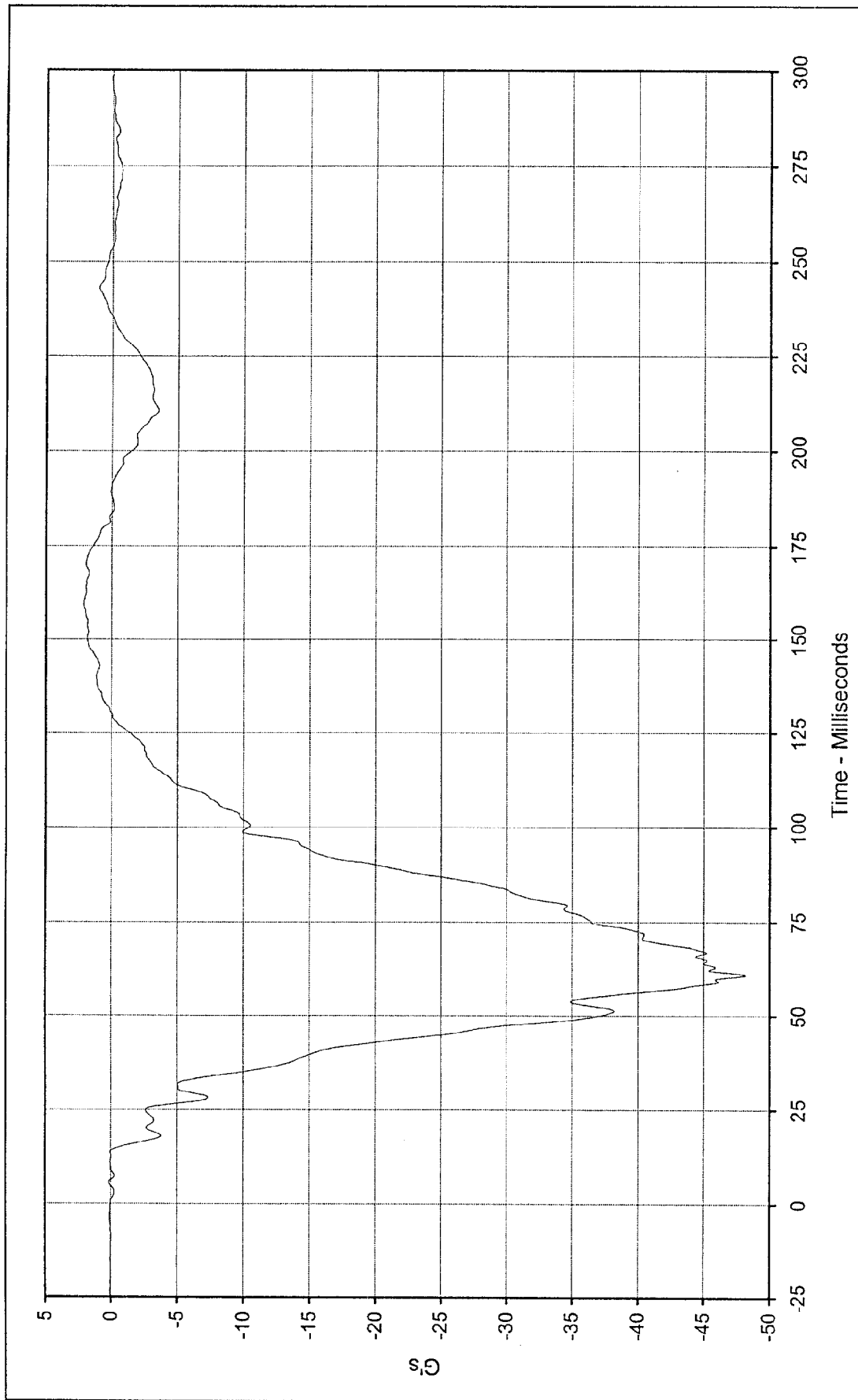
Curve Description: Passenger Neck Moment Z Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Maximum Value: 34.3 at 84.7 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV
Minimum Value: -13.3 at 140.4 Milliseconds
SAE Filter Class: 600
Date of Test: 2/26/98
Curve Number: FIL-056





Curve Description:	Passenger Neck Moment Resultant	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	47.8	at	140.3	Milliseconds
Minimum Value:	0.0	at	9.2	Milliseconds
SAE Filter Class:	600			
Date of Test:	2/26/98	Test Vehicle:	1998 Toyota RAV-4 SUV	
Curve Number:	RES-054			

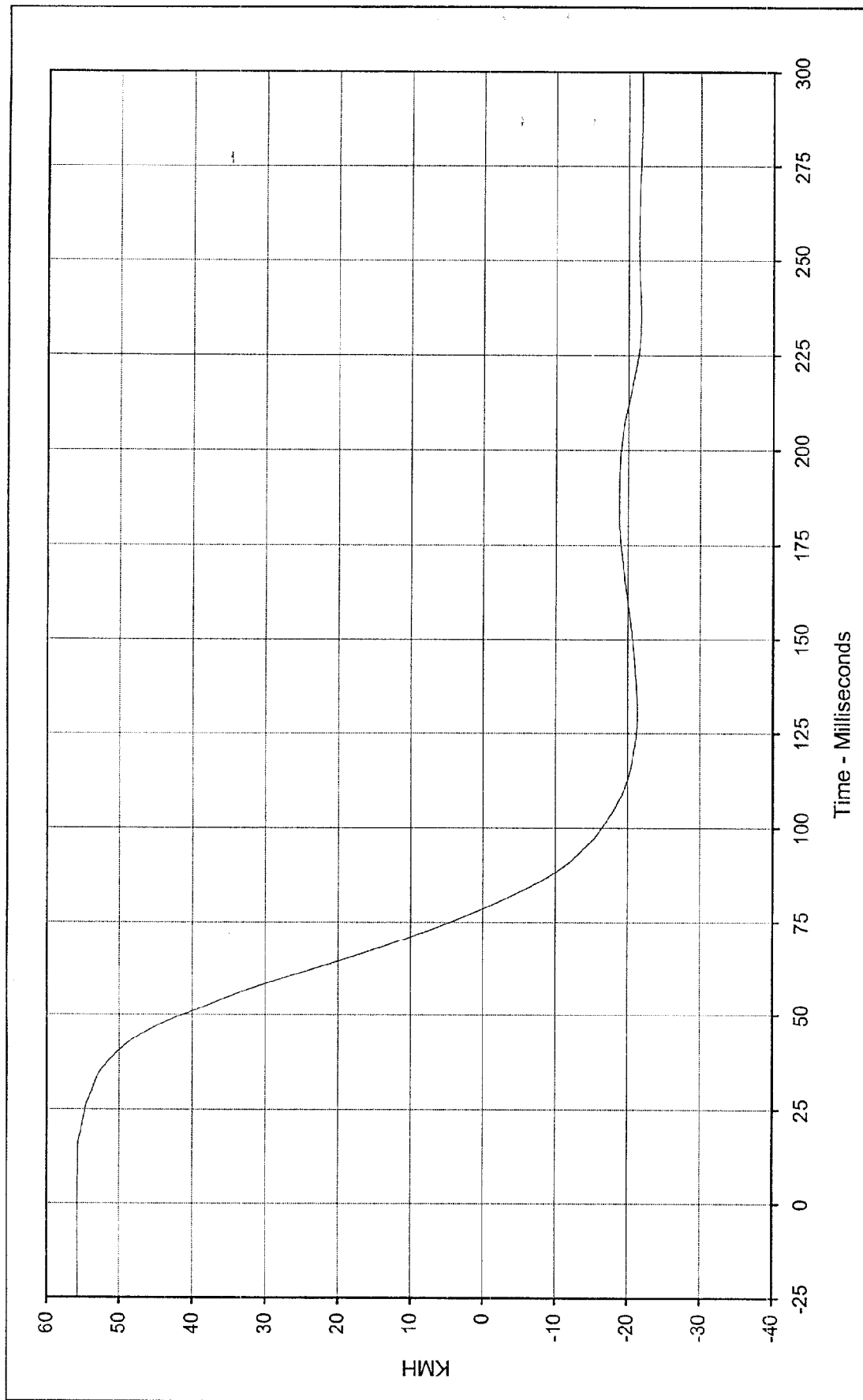




Curve Description: Passenger Chest Primary X
 Maximum Value: 2.1 at 159.3 Milliseconds
 Minimum Value: -48.2 at 60.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-057

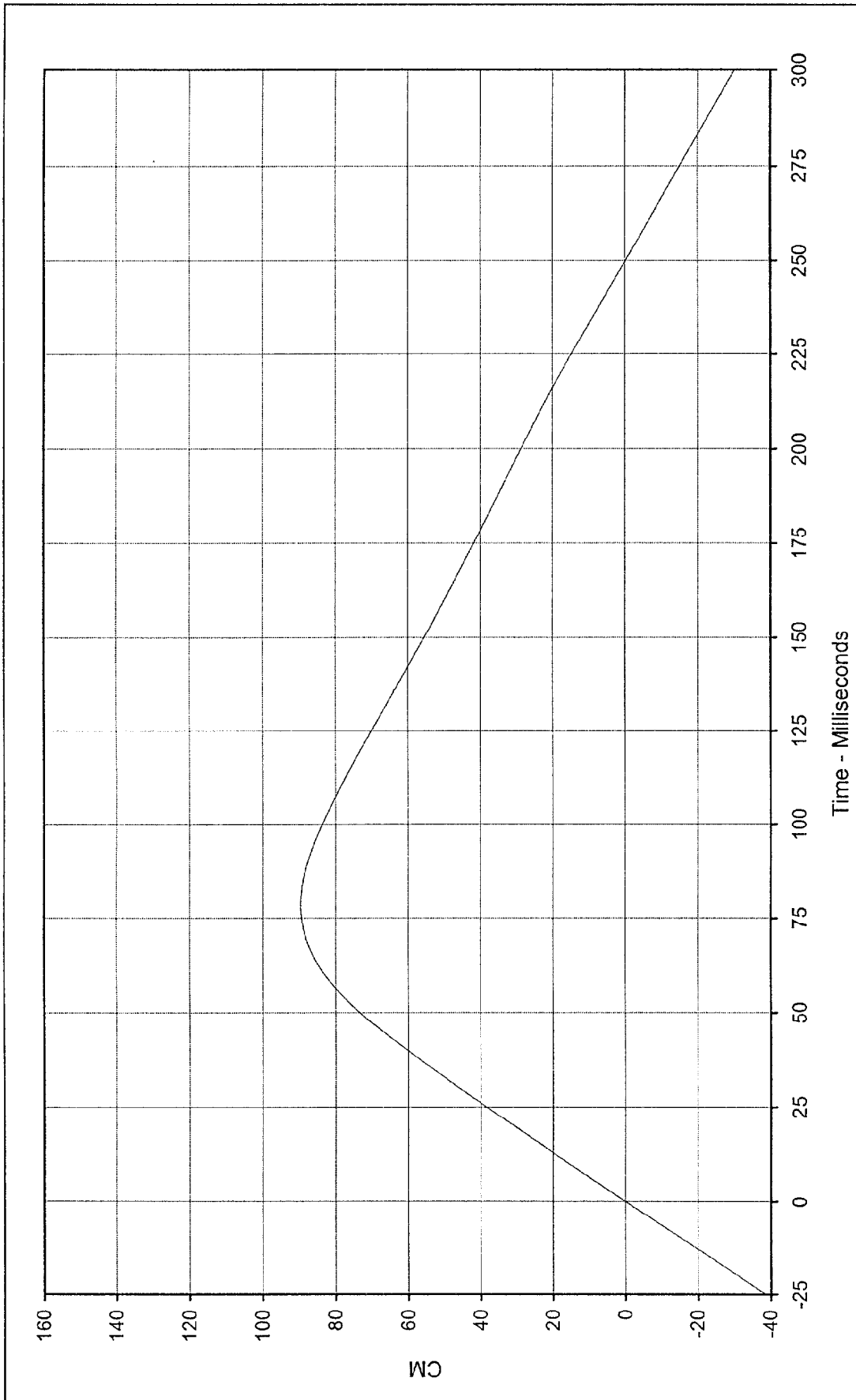
Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Passenger Chest Primary X Velocity	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	55.7	at	1.0	Milliseconds
Minimum Value:	-21.9	at	294.4	Milliseconds
SAE Filter Class:	180	Test Vehicle:	1998 Toyota RAV-4 SUV	
Date of Test:	2/26/98			
Curve Number:	IN1-057			





Curve Description: Passenger Chest Primary X Displ.

Maximum Value: 89.5 at 78.6 Milliseconds

Minimum Value: -30.1 at 299.9 Milliseconds

SAE Filter Class: 180

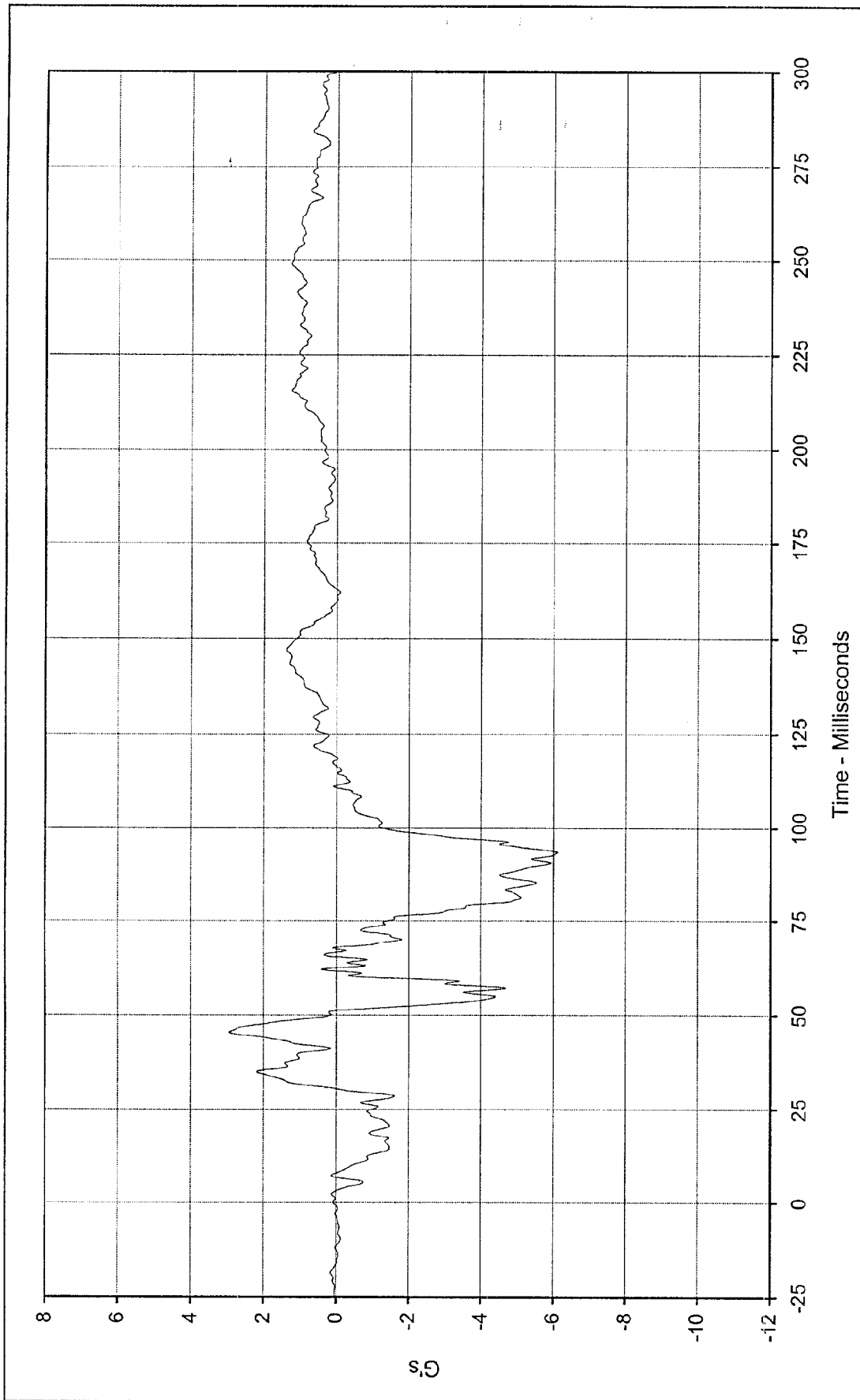
Date of Test: 2/26/98

Curve Number: IN2-057

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

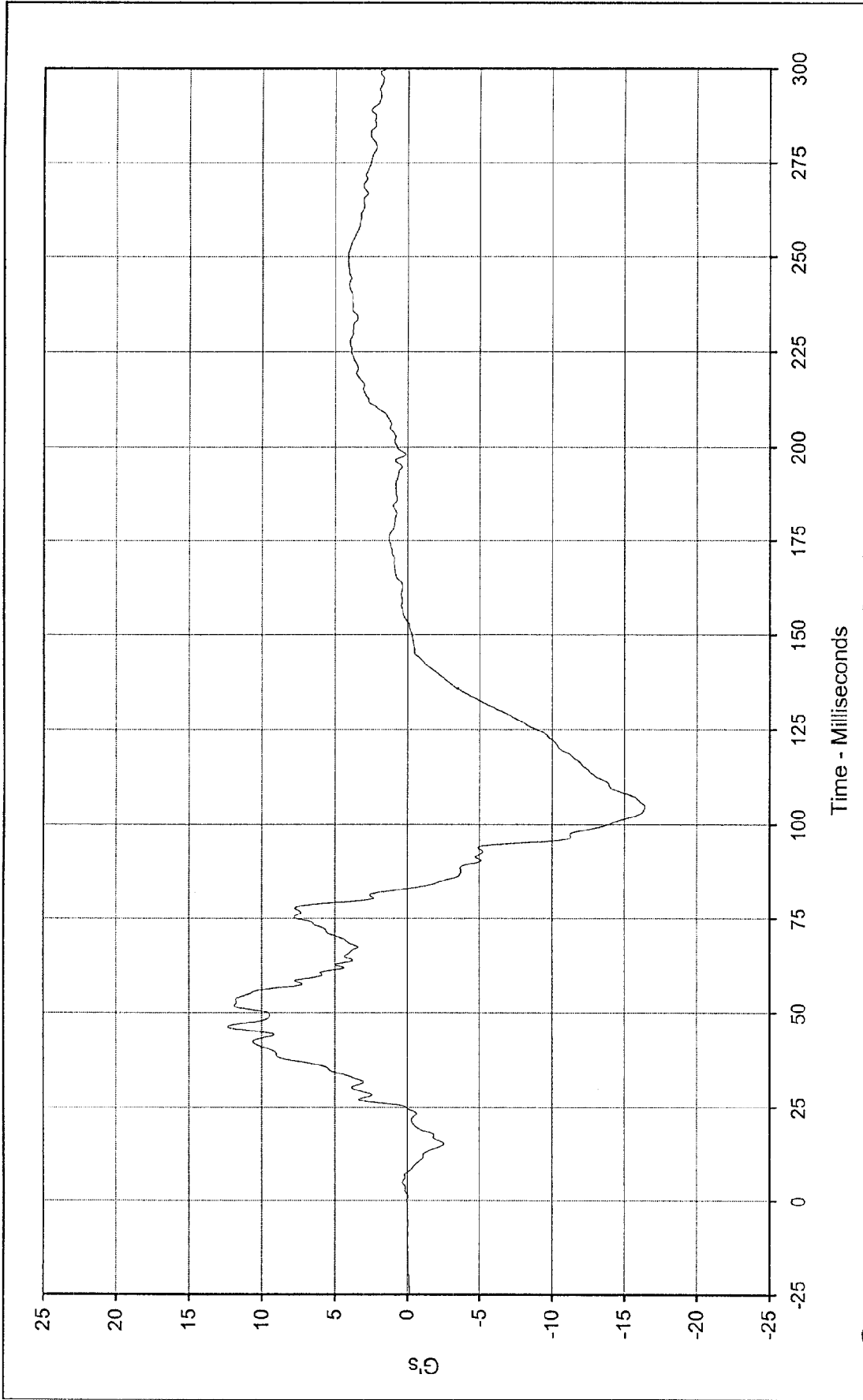




Curve Description: Passenger Chest Primary Y
 Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

Maximum Value: 2.9 at 45.5 Milliseconds
 Minimum Value: -6.1 at 93.3 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-058

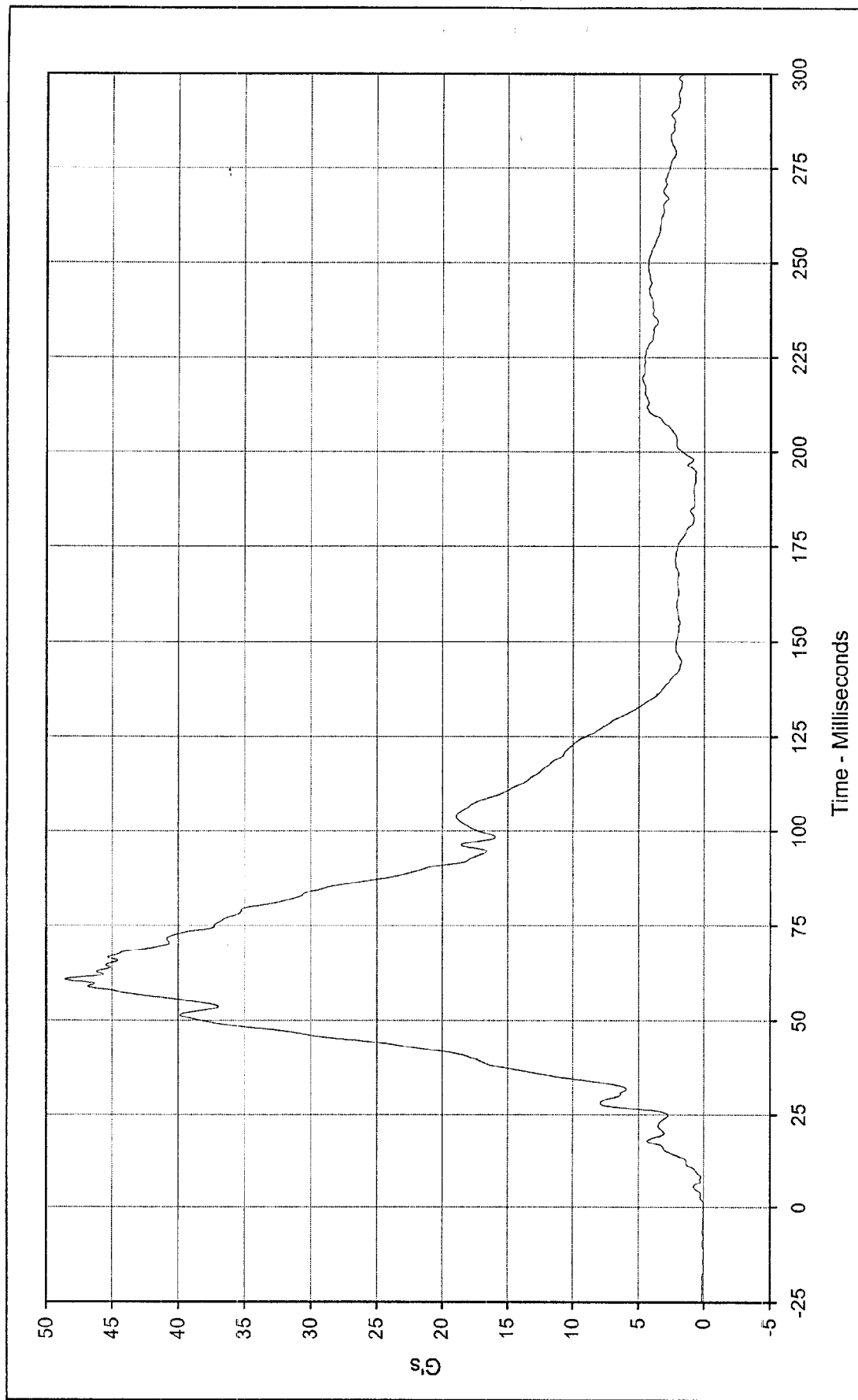




Curve Description: Passenger Chest Primary Z
 Maximum Value: 12.3 at 46.4 Milliseconds
 Minimum Value: -16.4 at 104.8 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-059

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Chest Resultant Primary

Maximum Value: 48.6 at 60.8 Milliseconds

Minimum Value: 0.0 at 0.8 Milliseconds

SAE Filter Class: 180

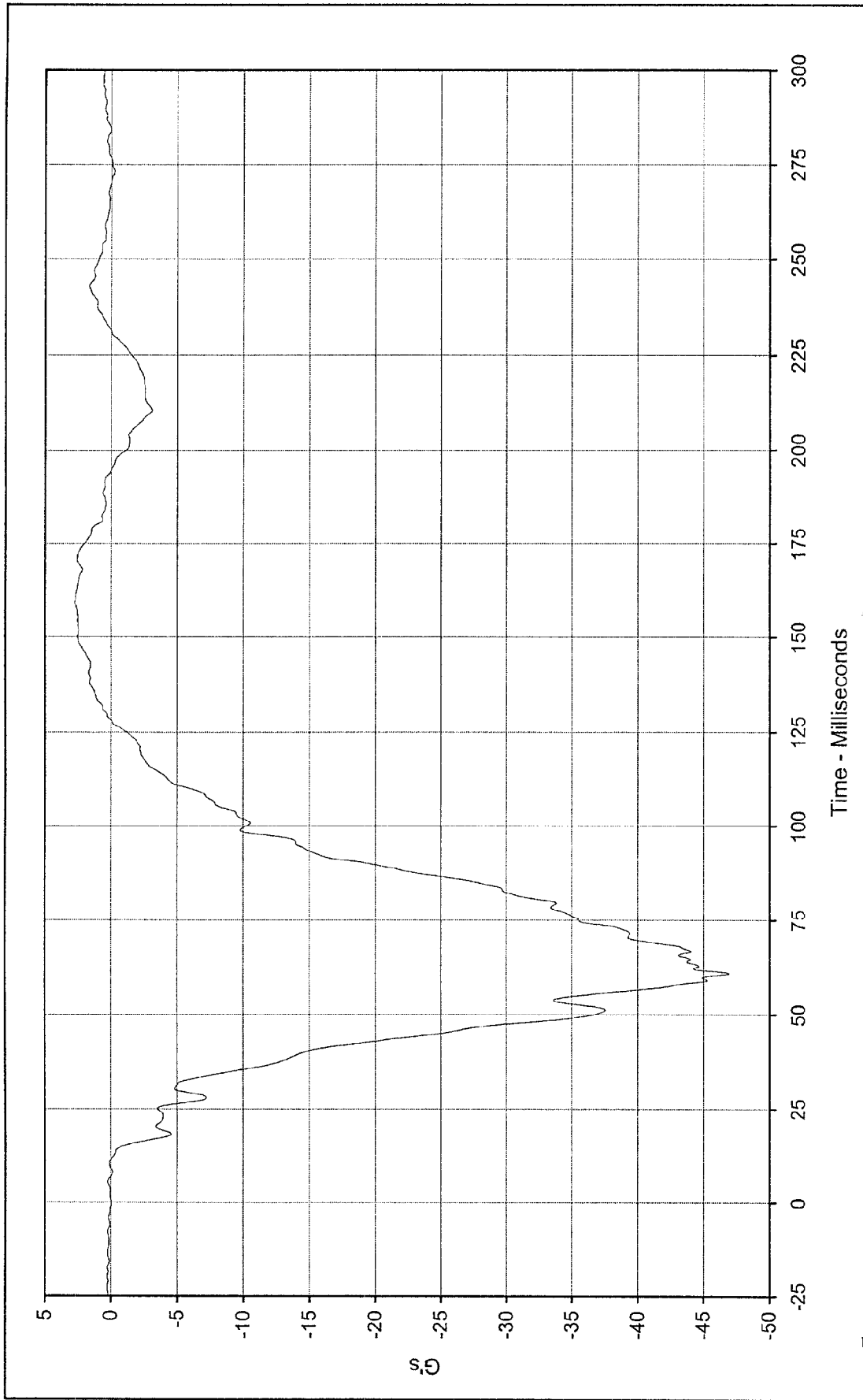
Date of Test: 2/26/98

Curve Number: RES-057

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

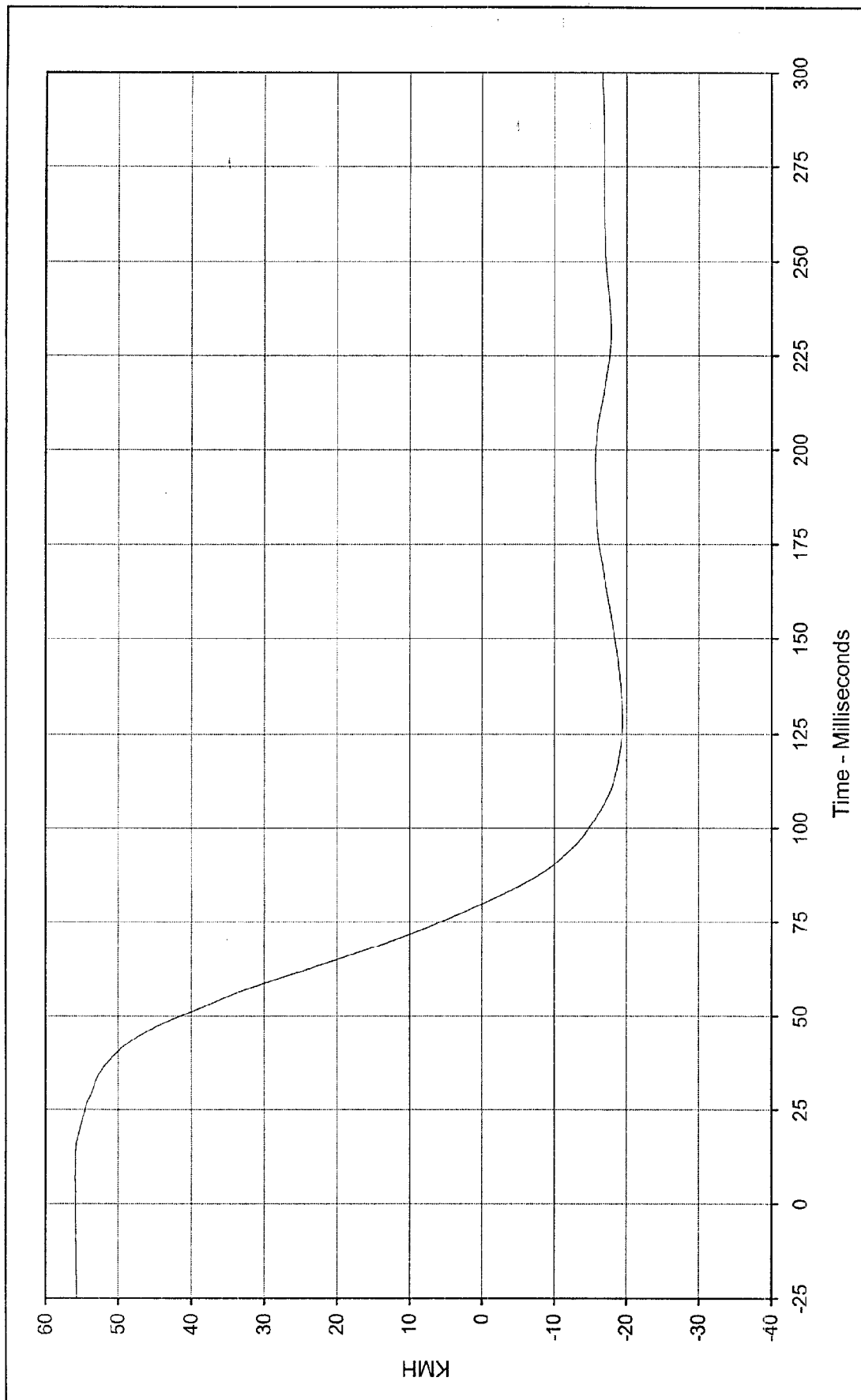
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Chest Redundant X Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Maximum Value: 2.7 at 159.4 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV
Minimum Value: -47.0 at 60.8 Milliseconds
SAE Filter Class: 180
Date of Test: 2/26/98
Curve Number: FIL-060





Curve Description: Passenger Chest Redundant X Velocity

Maximum Value: 55.9 at 6.9 Milliseconds

Minimum Value: -19.5 at 128.4 Milliseconds

SAE Filter Class: 180

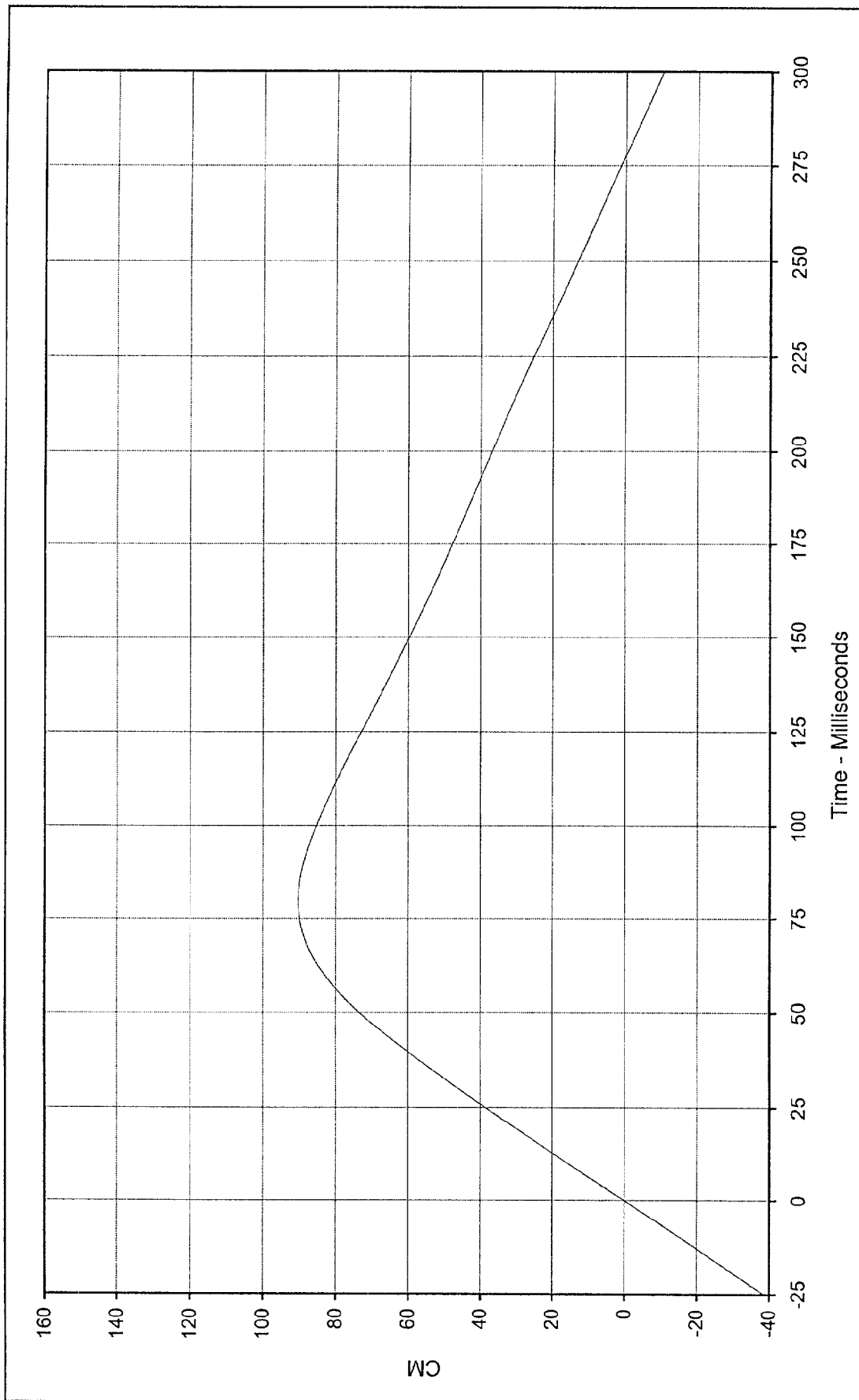
Date of Test: 2/26/98

Curve Number: IN1-060

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Chest Redundant X Displ.

Maximum Value: 90.3 at 79.7 Milliseconds

Minimum Value: -10.2 at 299.9 Milliseconds

SAE Filter Class: 180

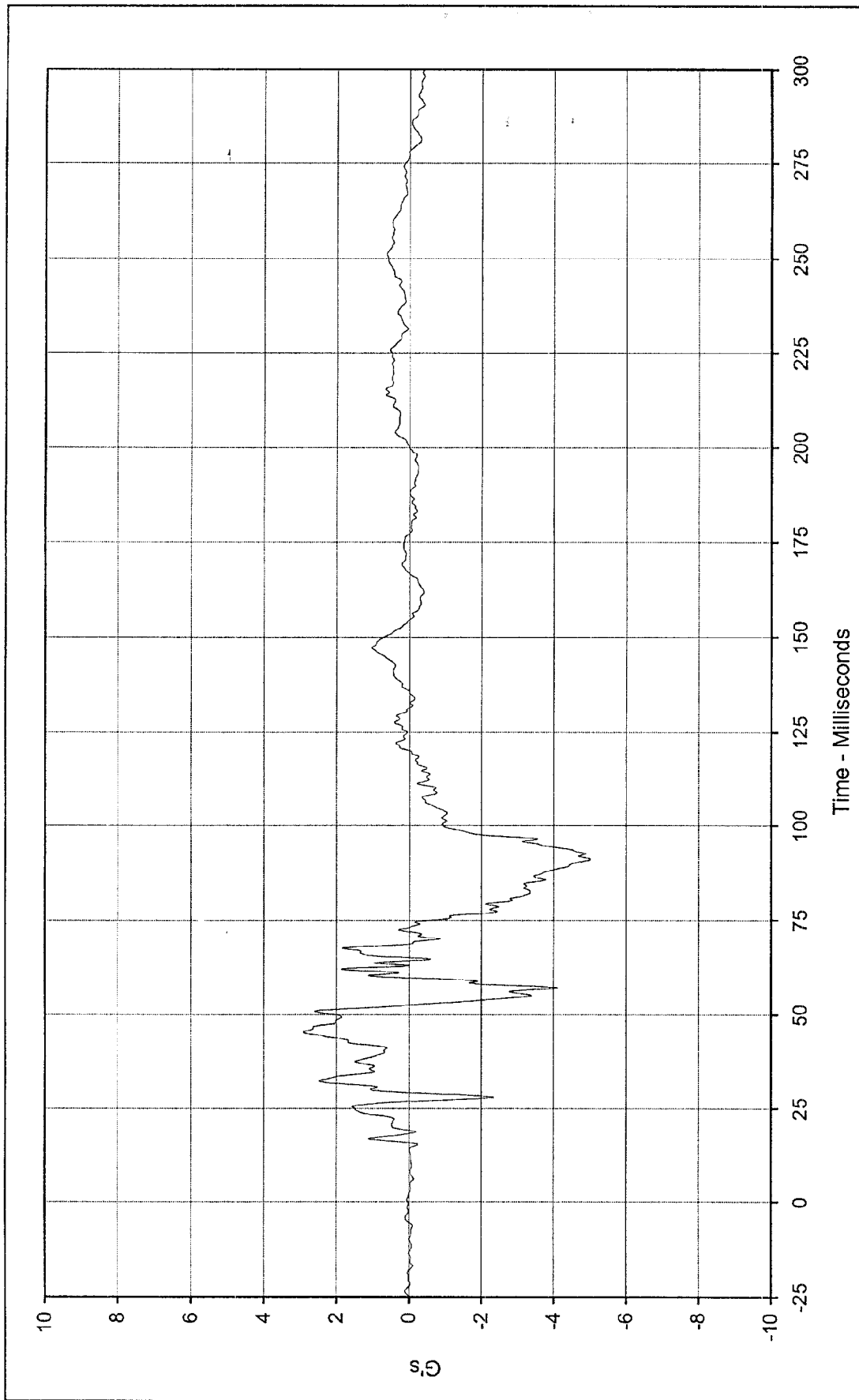
Date of Test: 2/26/98

Curve Number: IN2-060

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

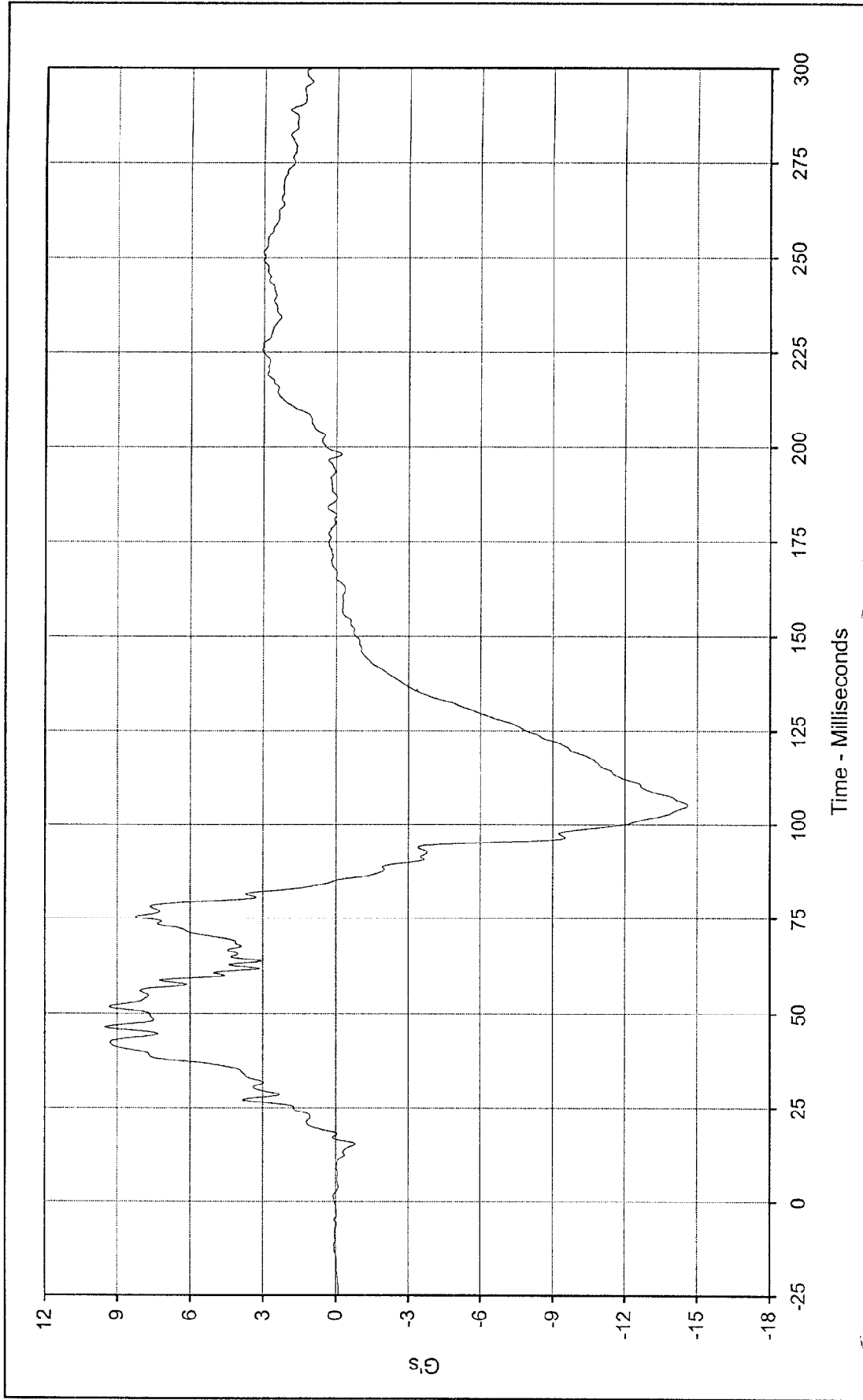




Curve Description: Passenger Chest Redundant Y
 Maximum Value: 2.9 at 45.3 Milliseconds
 Minimum Value: -5.0 at 91.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: FIL-061

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Chest Redundant Z

Maximum Value: 9.5 at 46.4 Milliseconds

Minimum Value: -14.6 at 105.3 Milliseconds

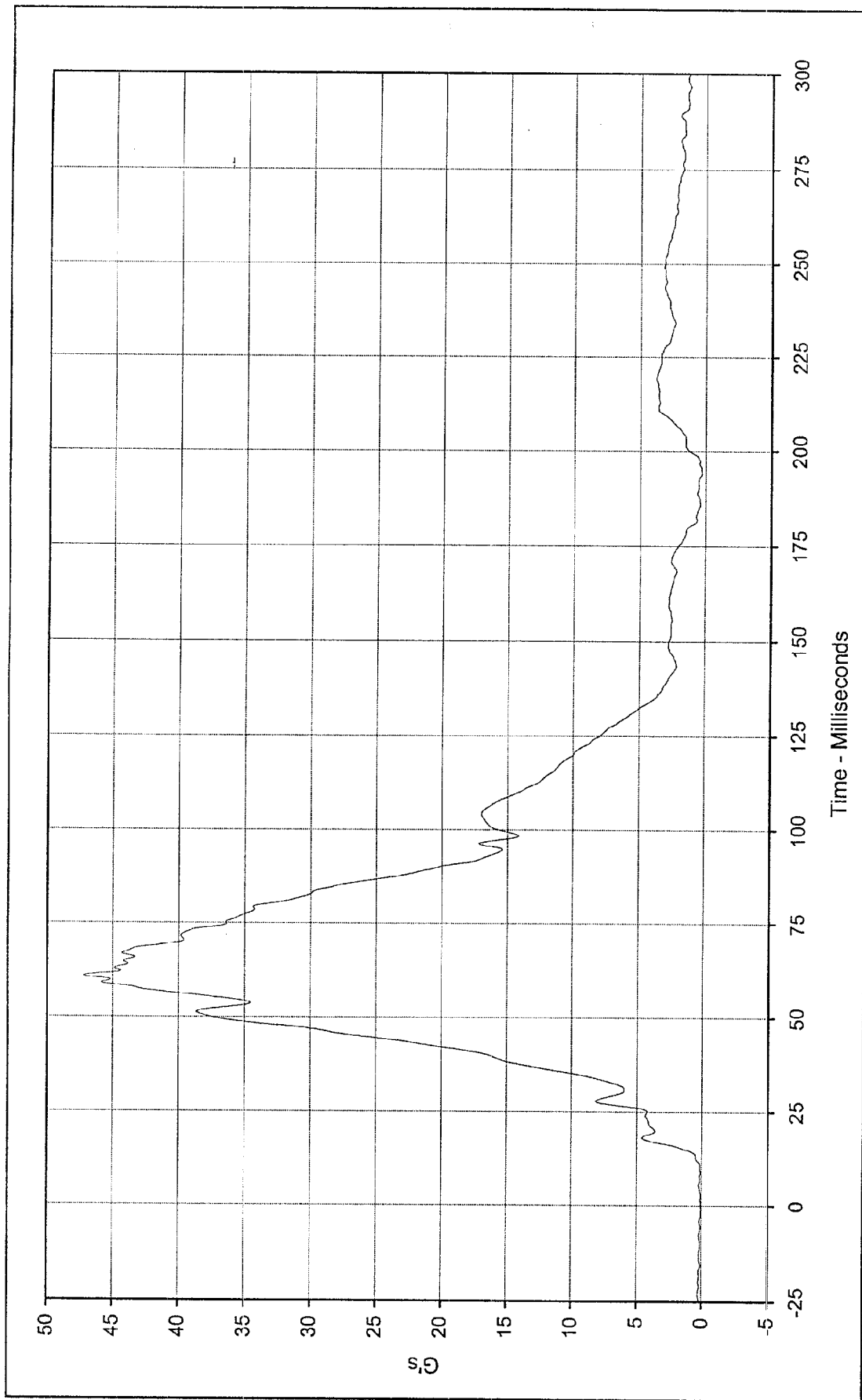
SAE Filter Class: 180

Date of Test: 2/26/98

Curve Number: FIL-062

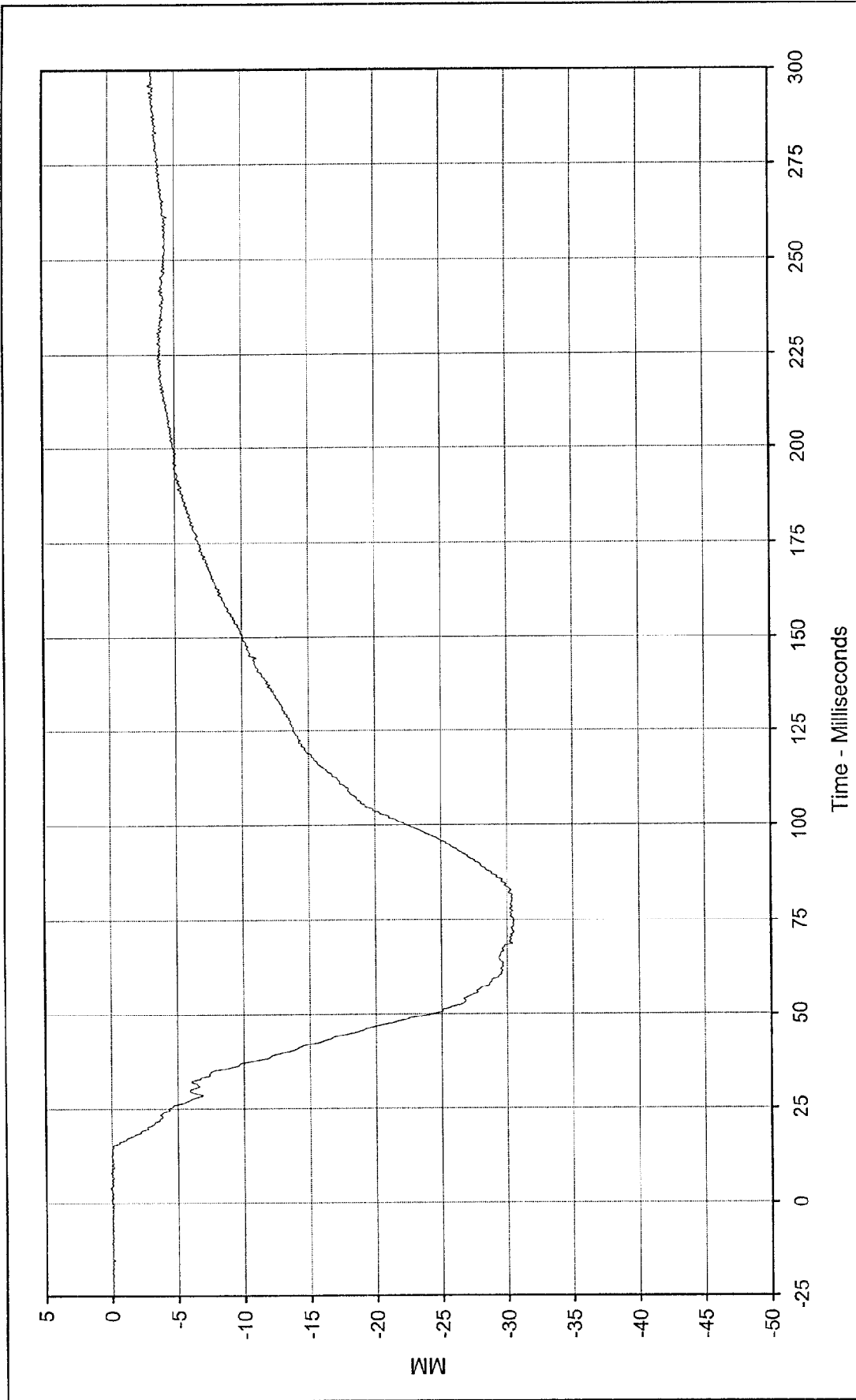
Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110





Curve Description:	Passenger Chest Resultant Redundant	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	47.2	at	60.8	Milliseconds
Minimum Value:	0.1	at	2.8	Milliseconds
SAE Filter Class:	180			
Date of Test:	2/26/98	Test Vehicle:	1998 Toyota RAV-4 SUV	
Curve Number:	RES-060			





Curve Description: Passenger Chest Displacement X

Maximum Value: 0.1 at 3.9 Milliseconds

Minimum Value: -30.5 at 71.7 Milliseconds

SAE Filter Class: 600

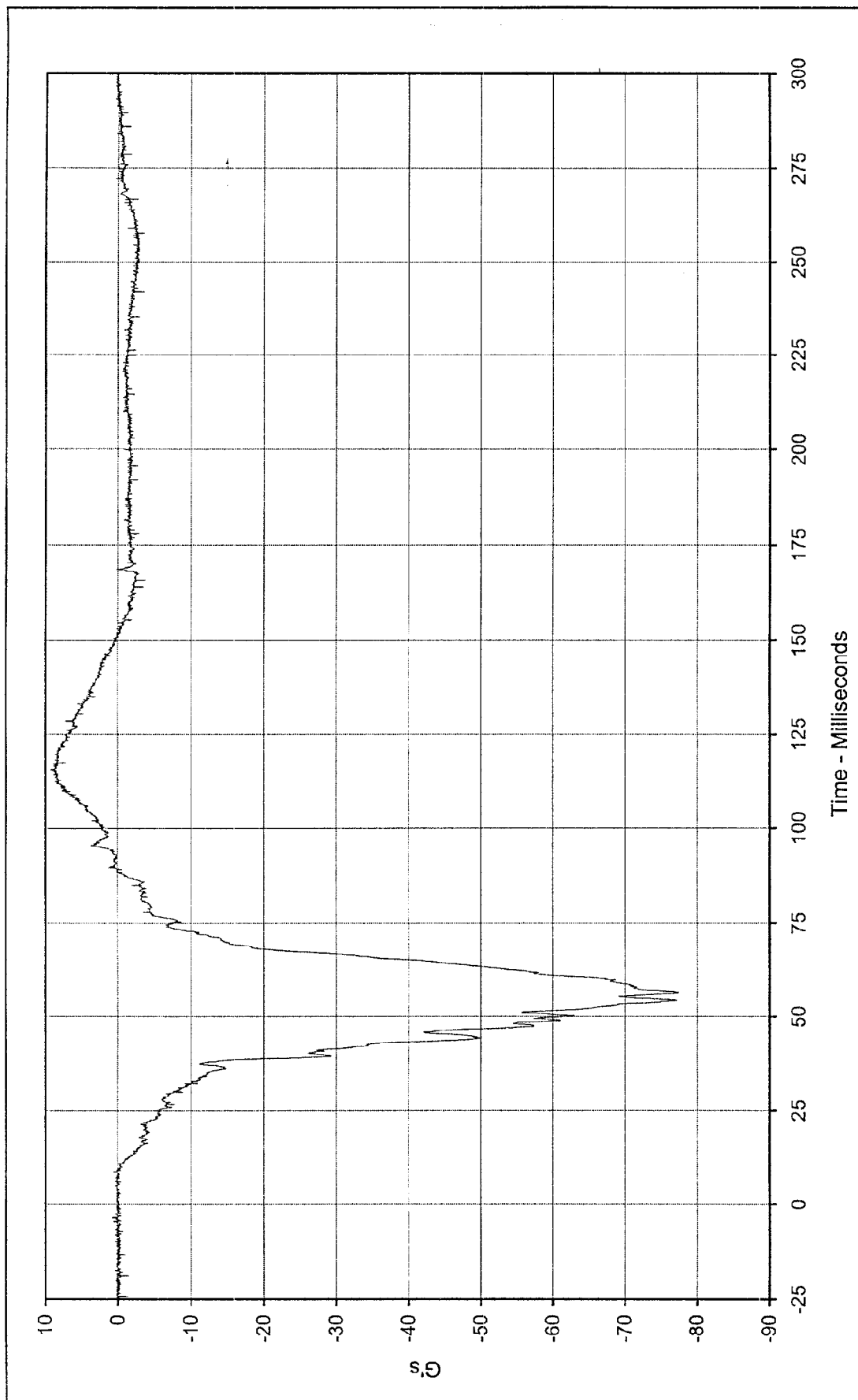
Date of Test: 2/26/98

Curve Number: FIL-063

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

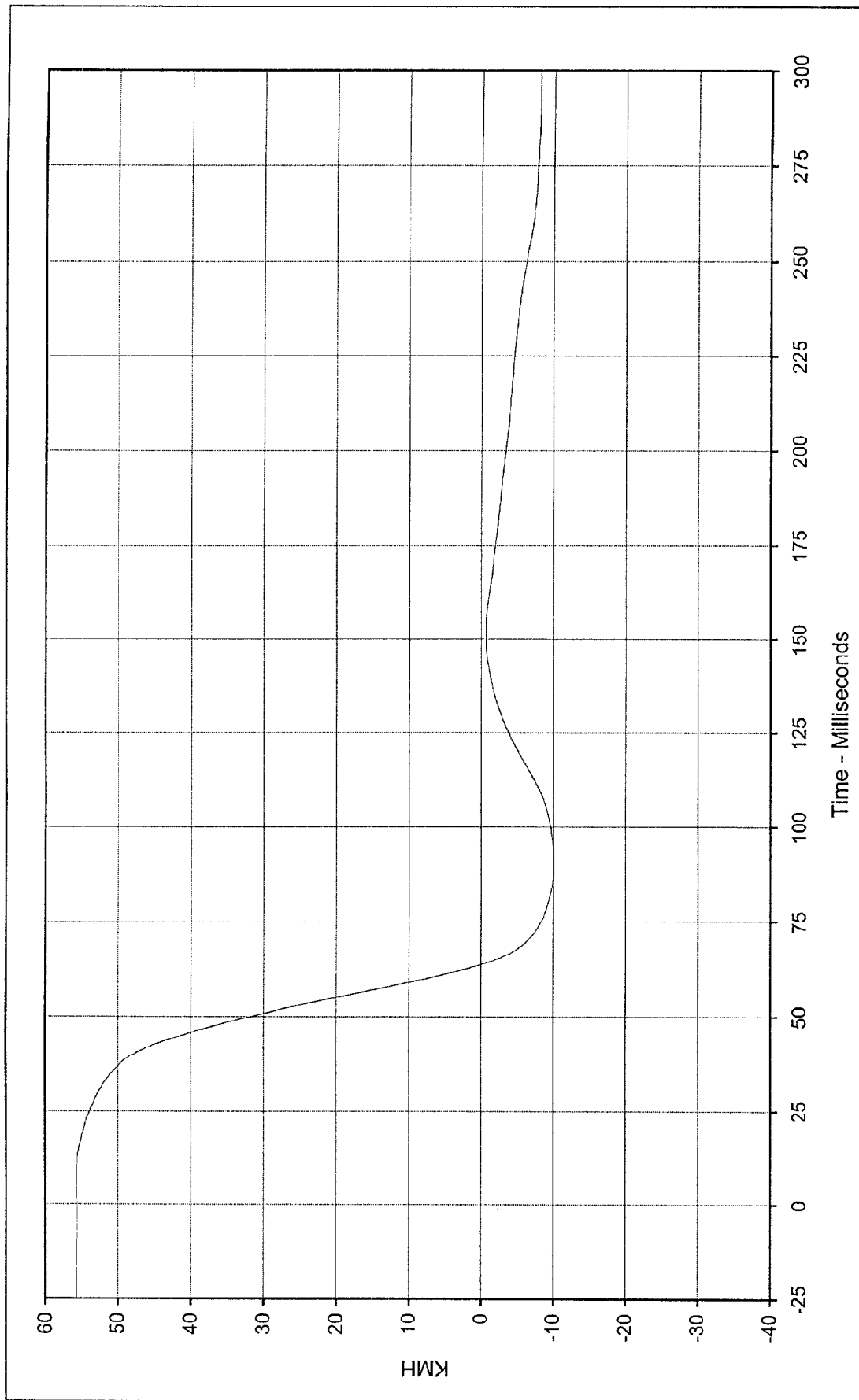




Curve Description: Passenger Pelvis X
 Maximum Value: 9.3 at 115.5 Milliseconds
 Minimum Value: -77.4 at 56.3 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-064

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV4 SUV





Curve Description: Passenger Pelvis X Velocity

Maximum Value: 55.6 at 8.9 Milliseconds

Minimum Value: -10.1 at 88.7 Milliseconds

SAE Filter Class: 180

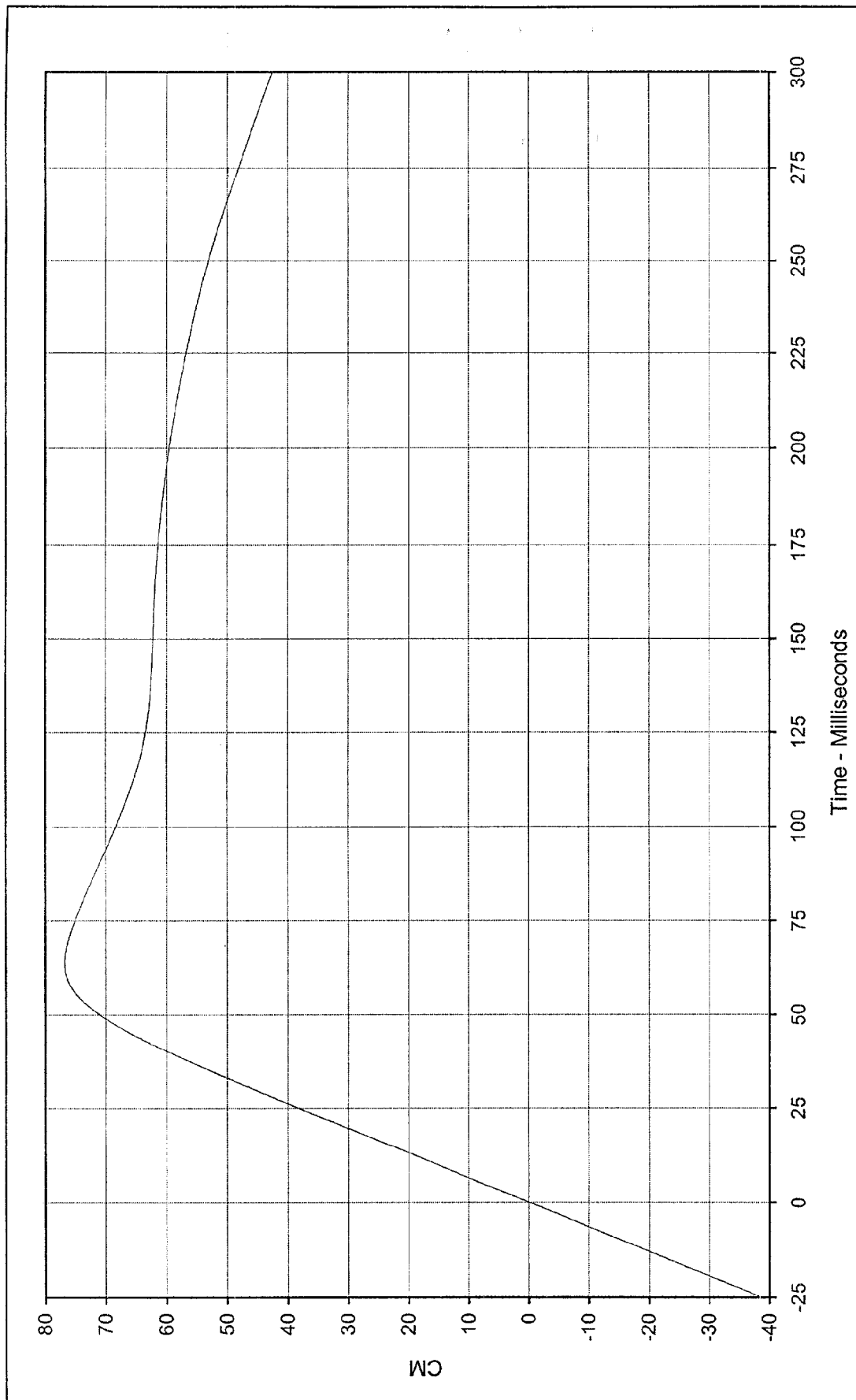
Date of Test: 2/26/98

Curve Number: IN1-064

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

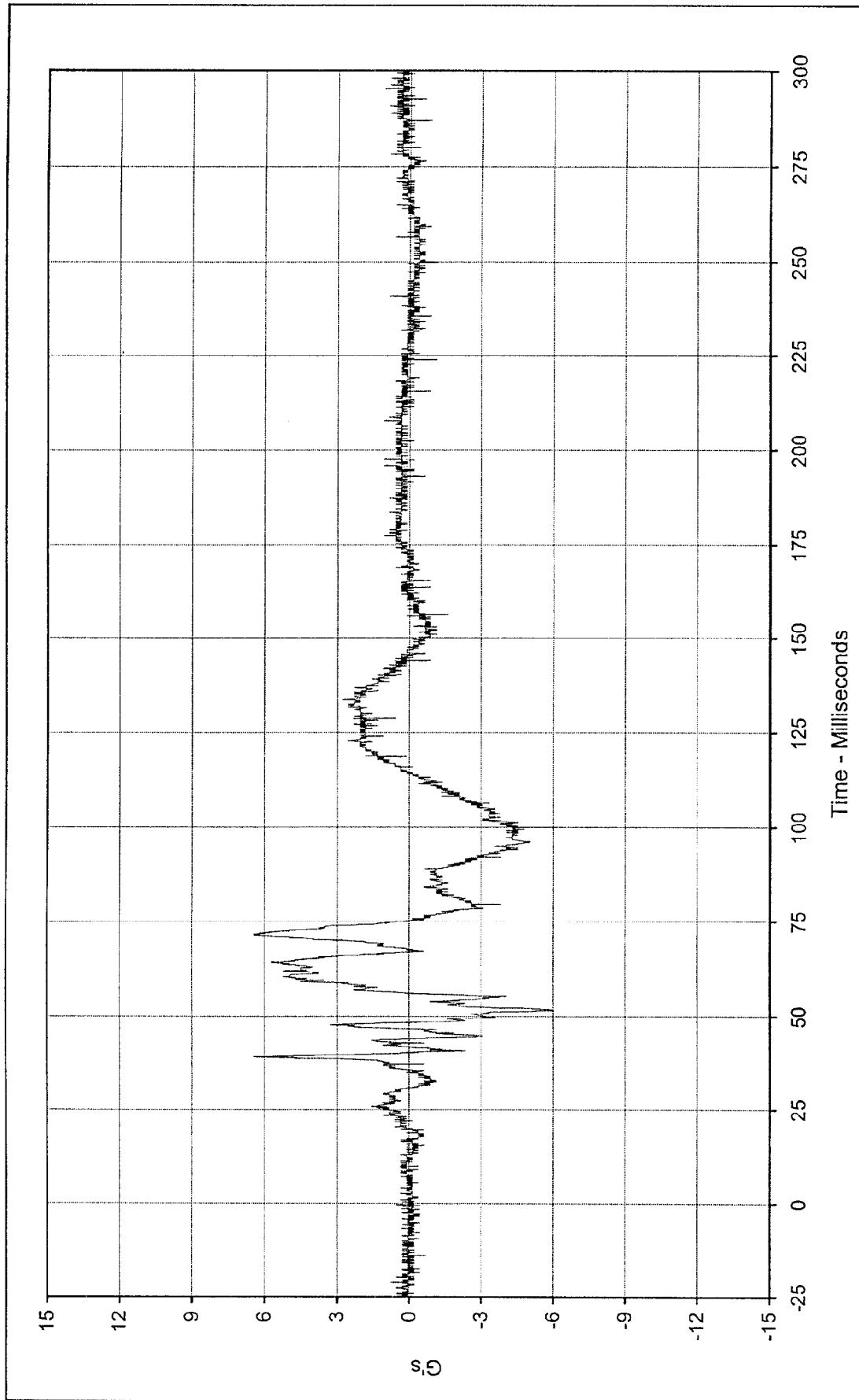




Curve Description: Passenger Pelvis X Displ.
 Maximum Value: 76.8 at 63.7 Milliseconds
 Minimum Value: -0.1 at 0.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN2-064

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

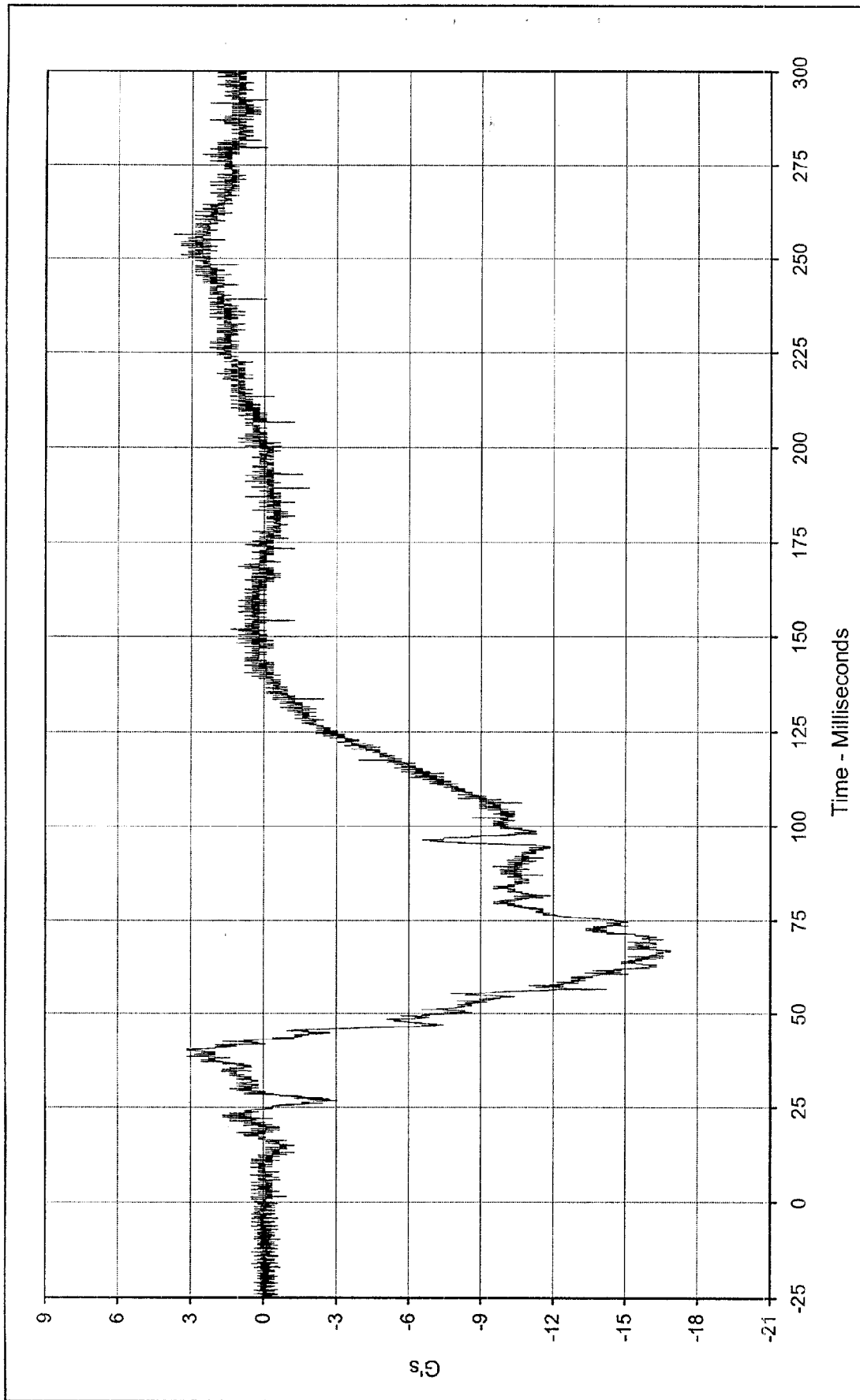




Curve Description:		Passenger Pelvis Y		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	6.4	at	39.1	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-6.0	at	51.7			
SAE Filter Class:	1000					
Date of Test:	2/26/98					
Curve Number:	FIL-065					

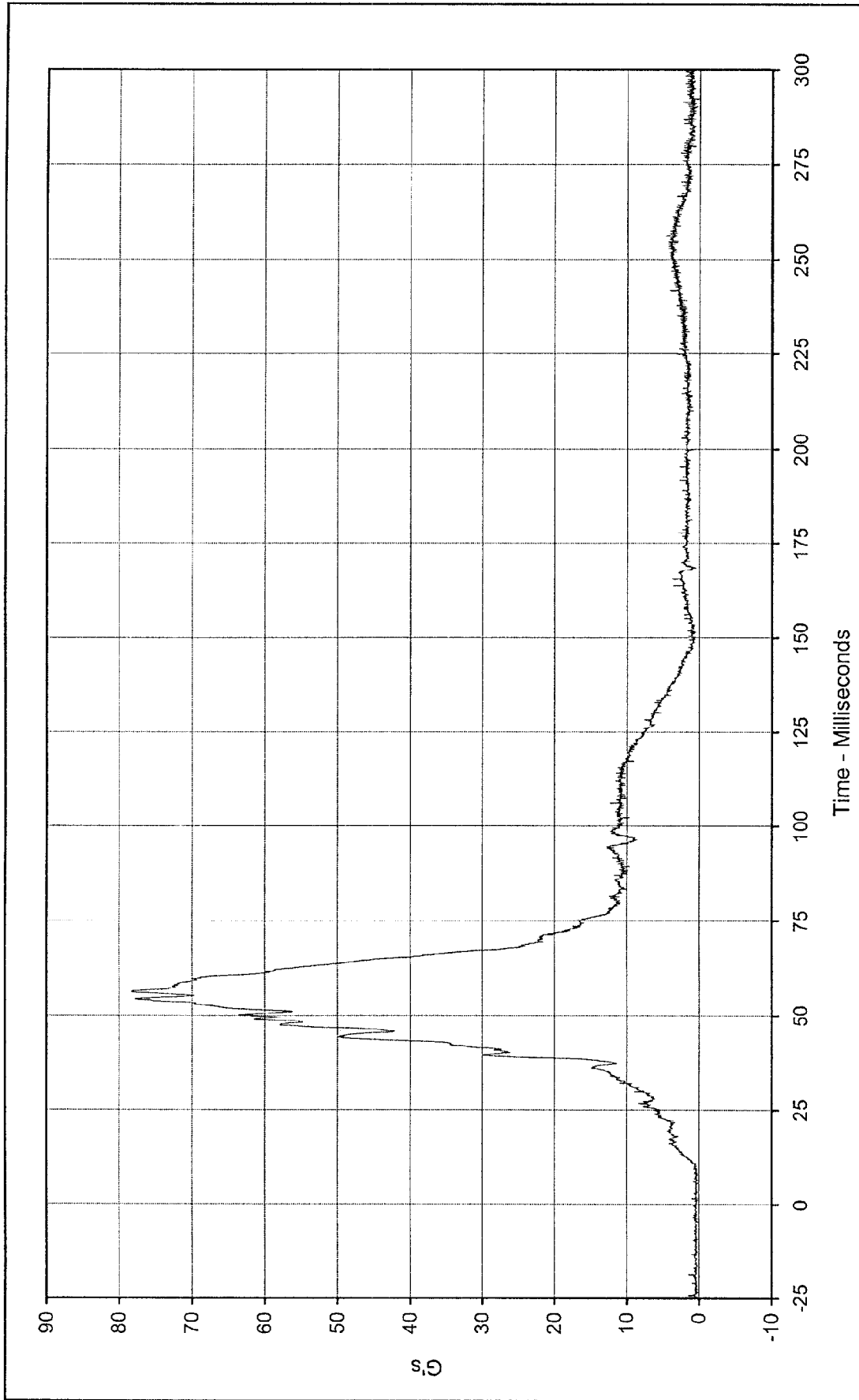






Curve Description:		Passenger Pelvis Z		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	3.7	at	256.4	Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV
Minimum Value:	-16.9	at	66.5	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	2/26/98					
Curve Number:	FIL-066					





Curve Description: Passenger Pelvis Resultant

Maximum Value: 78.3 at 56.3 Milliseconds

Minimum Value: 0.1 at 3.3 Milliseconds

SAE Filter Class: 1000

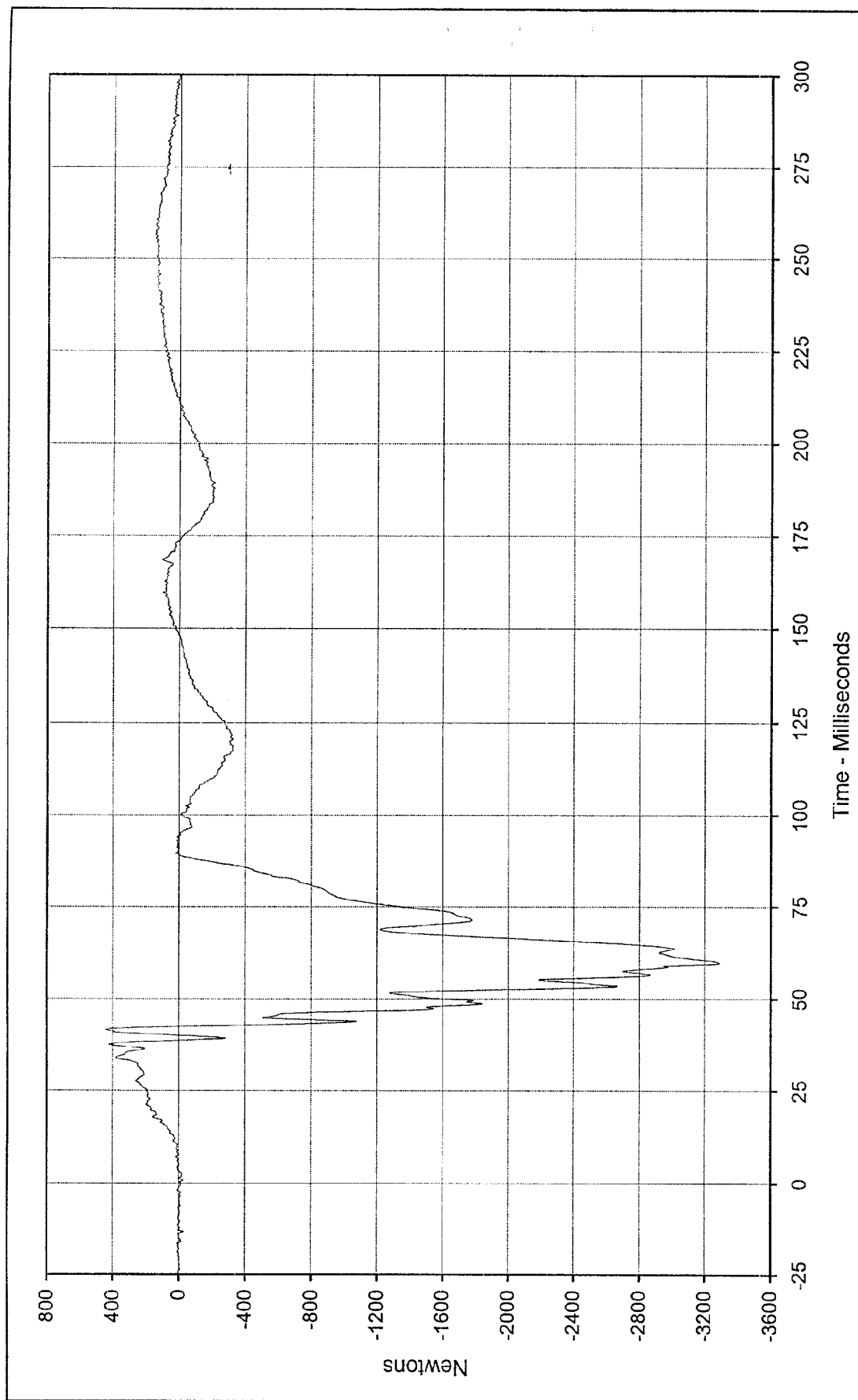
Date of Test: 2/26/98

Curve Number: RES-064

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

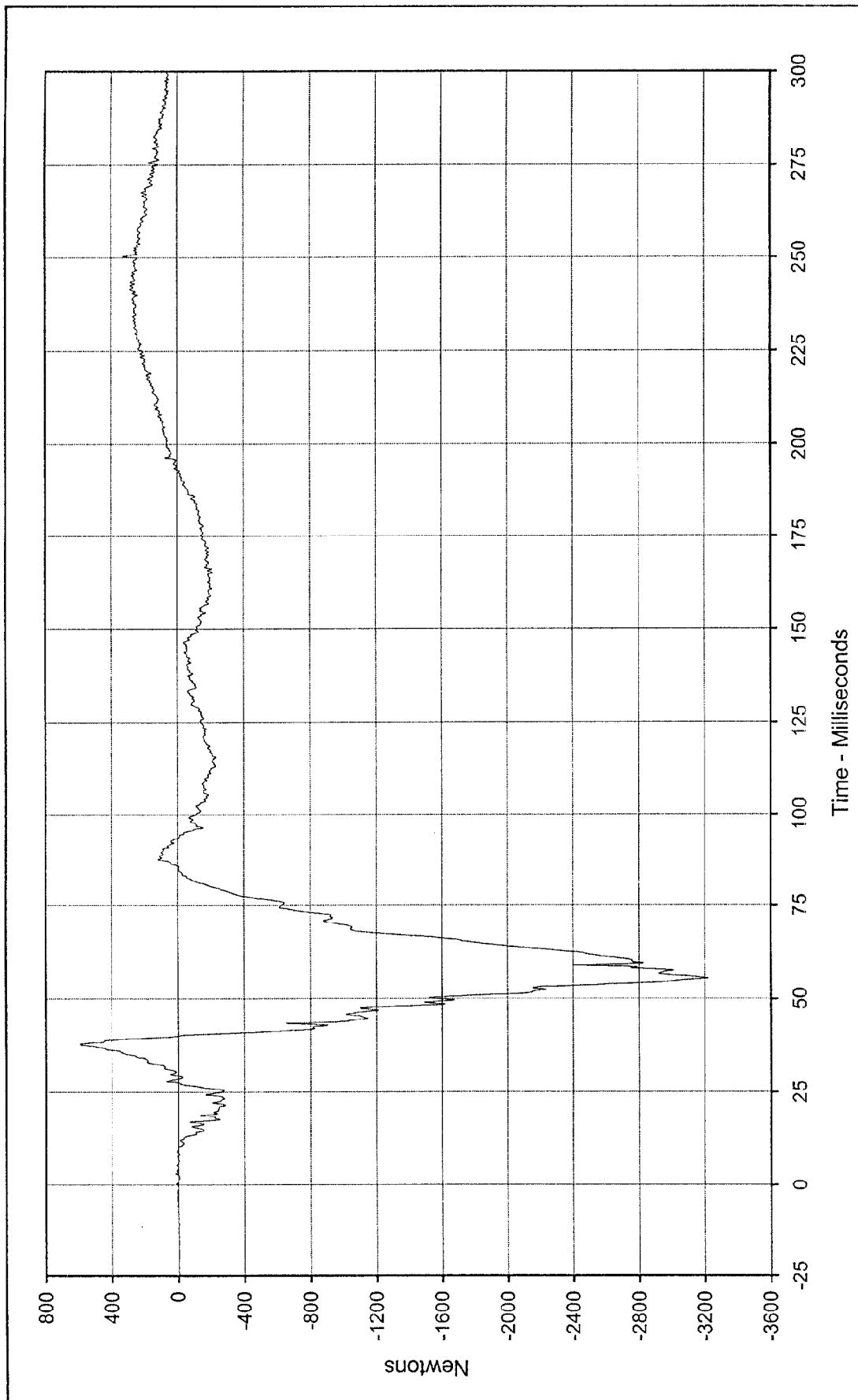




Curve Description: Passenger Left Femur Force
 Maximum Value: 439.4 at 41.6 Milliseconds
 Minimum Value: -3291.6 at 59.6 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-067

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

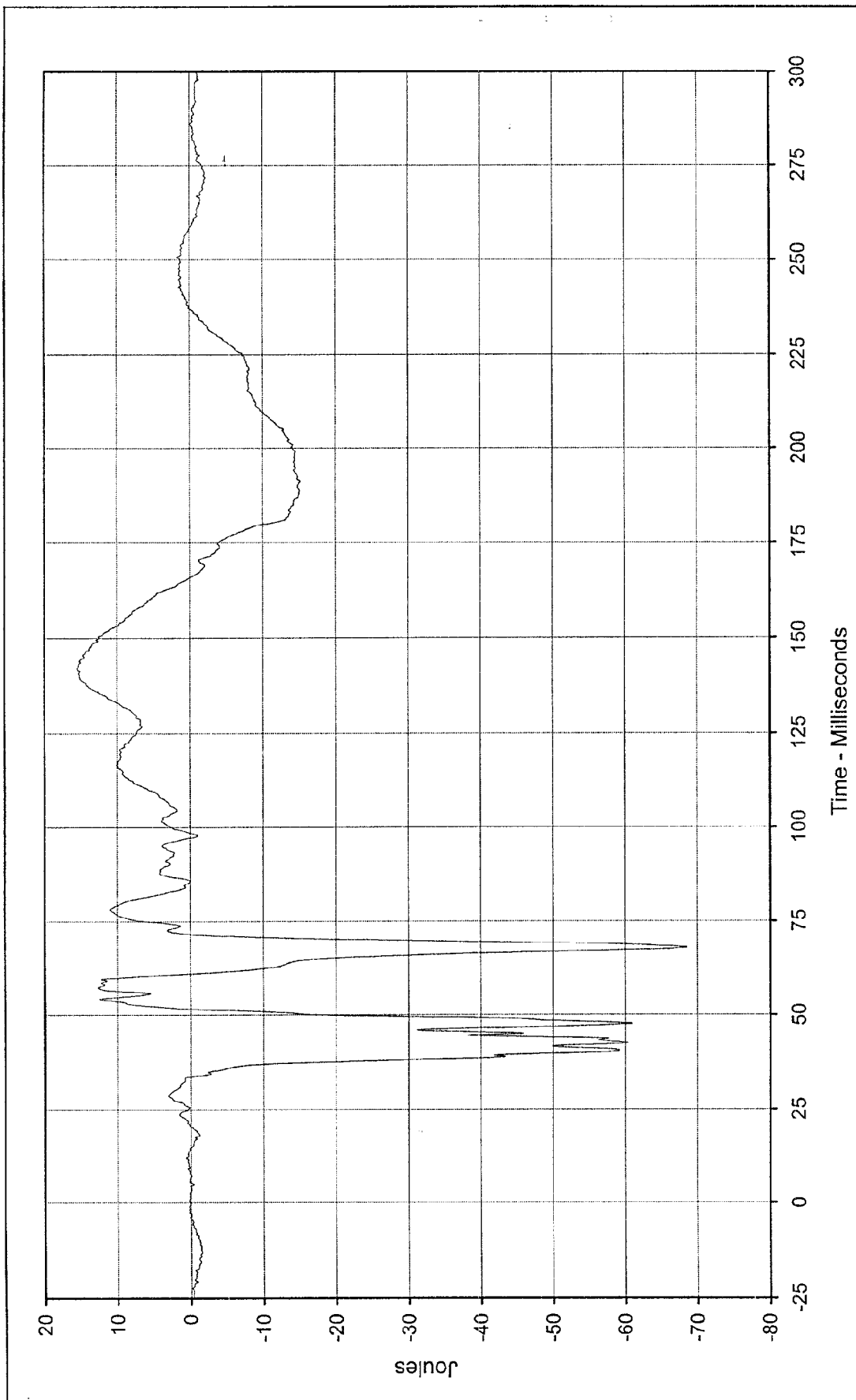




Curve Description: Passenger Right Femur Force
 Maximum Value: 591.8 at 37.9 Milliseconds
 Minimum Value: -3220.9 at 55.4 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-068

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

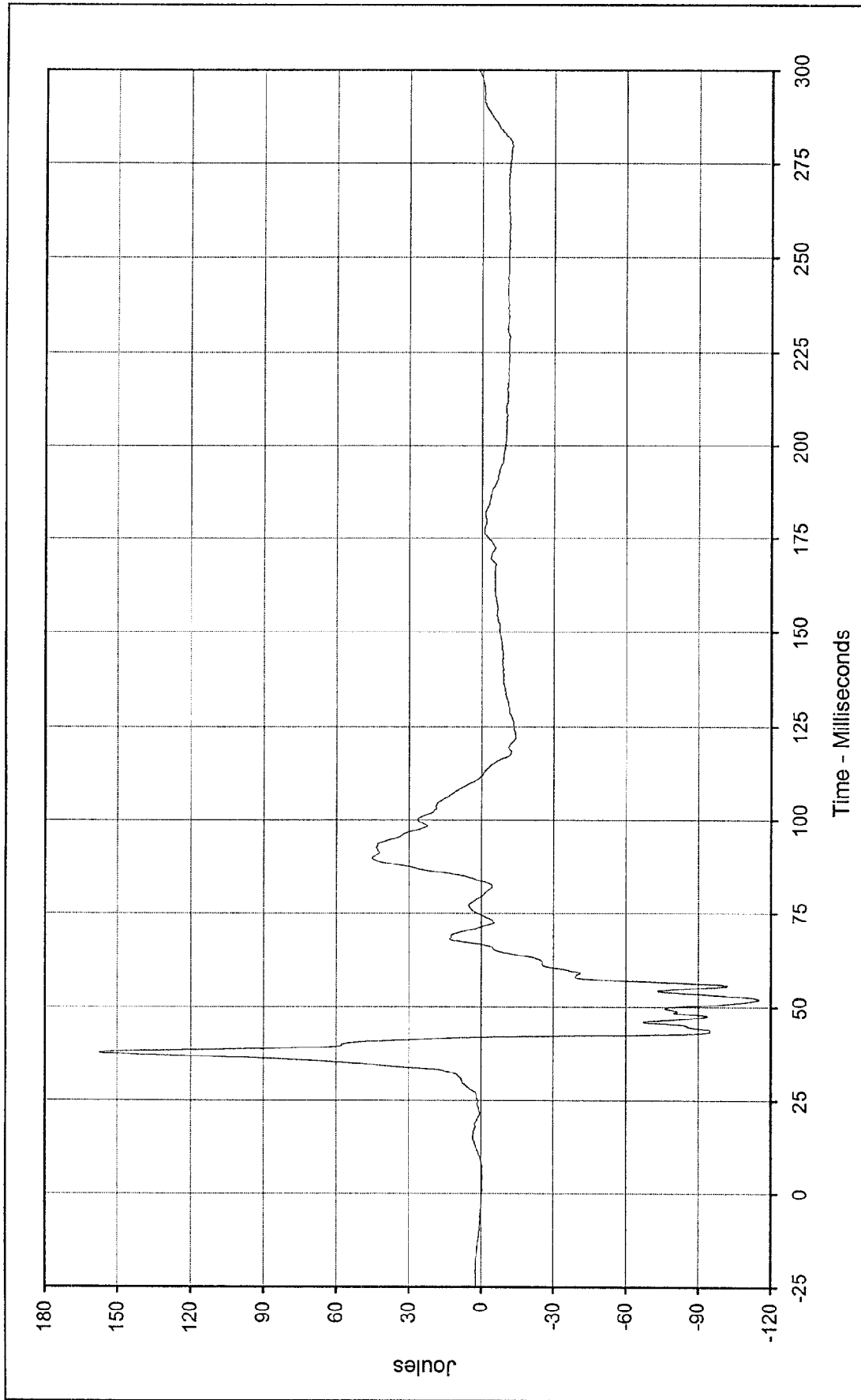




Curve Description: Passenger Left Upper Tibia Moment X
 Maximum Value: 15.5 at 142.1 Milliseconds
 Minimum Value: -68.6 at 67.7 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-069

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

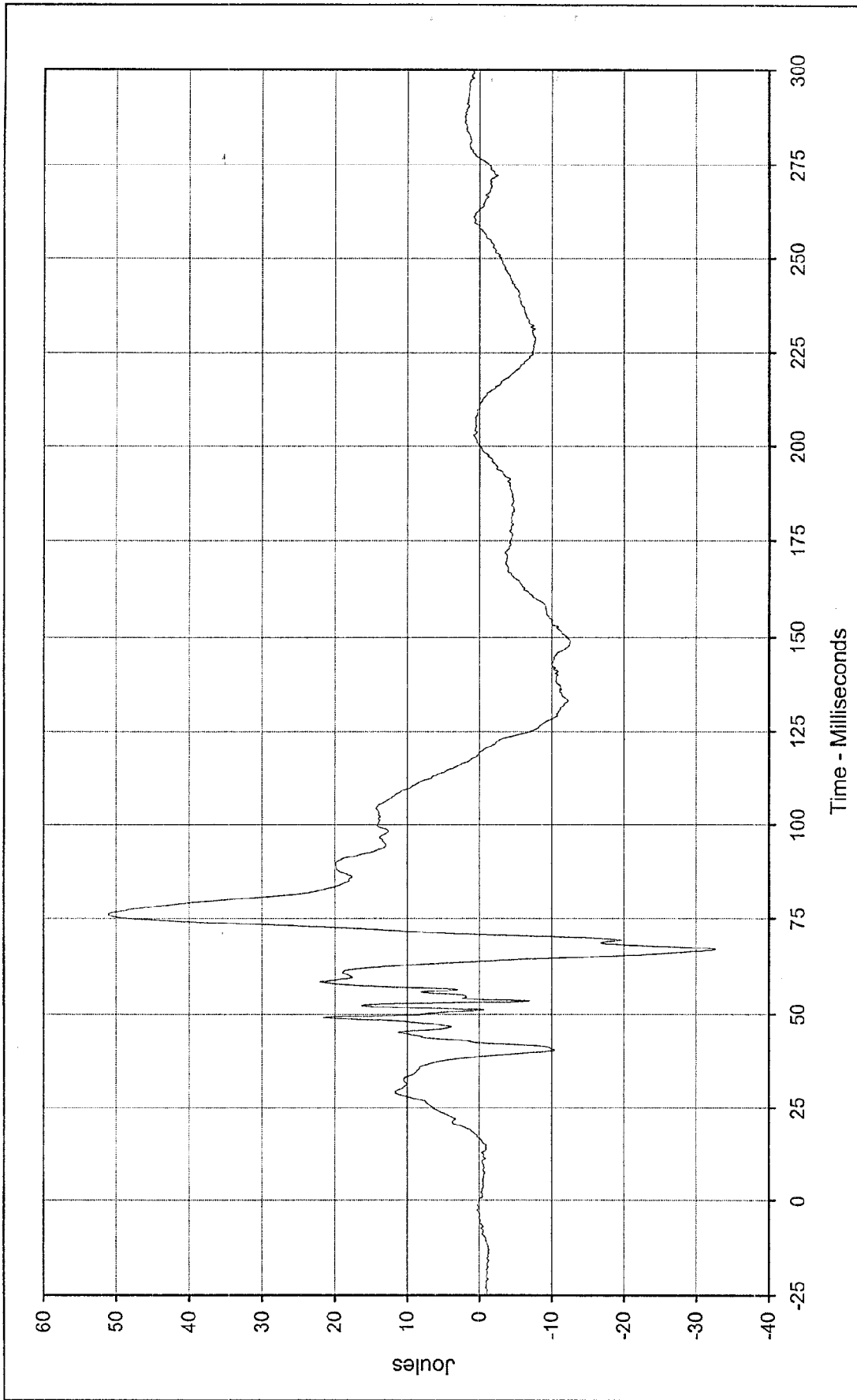




Curve Description: Passenger Left Upper Tibia Moment Y
 Maximum Value: 157.6 at 37.8 Milliseconds
 Minimum Value: -115.2 at 52.1 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-070

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

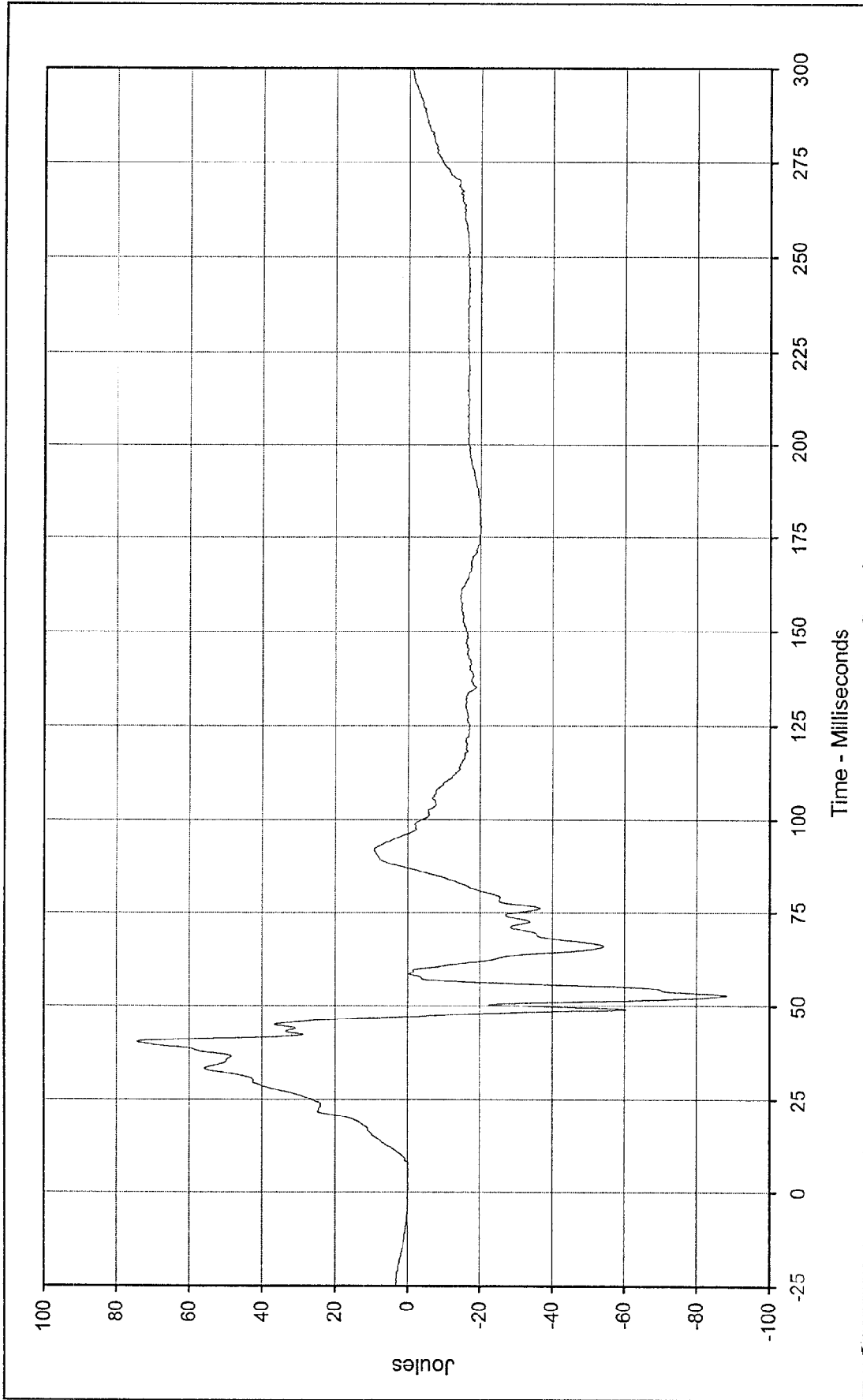




Curve Description: Passenger Right Upper Tibia Moment X
Maximum Value: 51.1 at 76.1 Milliseconds
Minimum Value: -32.7 at 66.8 Milliseconds
SAE Filter Class: 600
Date of Test: 2/26/98
Curve Number: FIL-071

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Right Upper Tibia Moment Y

Maximum Value: 74.3 at 40.3 Milliseconds

Minimum Value: -88.2 at 52.8 Milliseconds

SAE Filter Class: 600

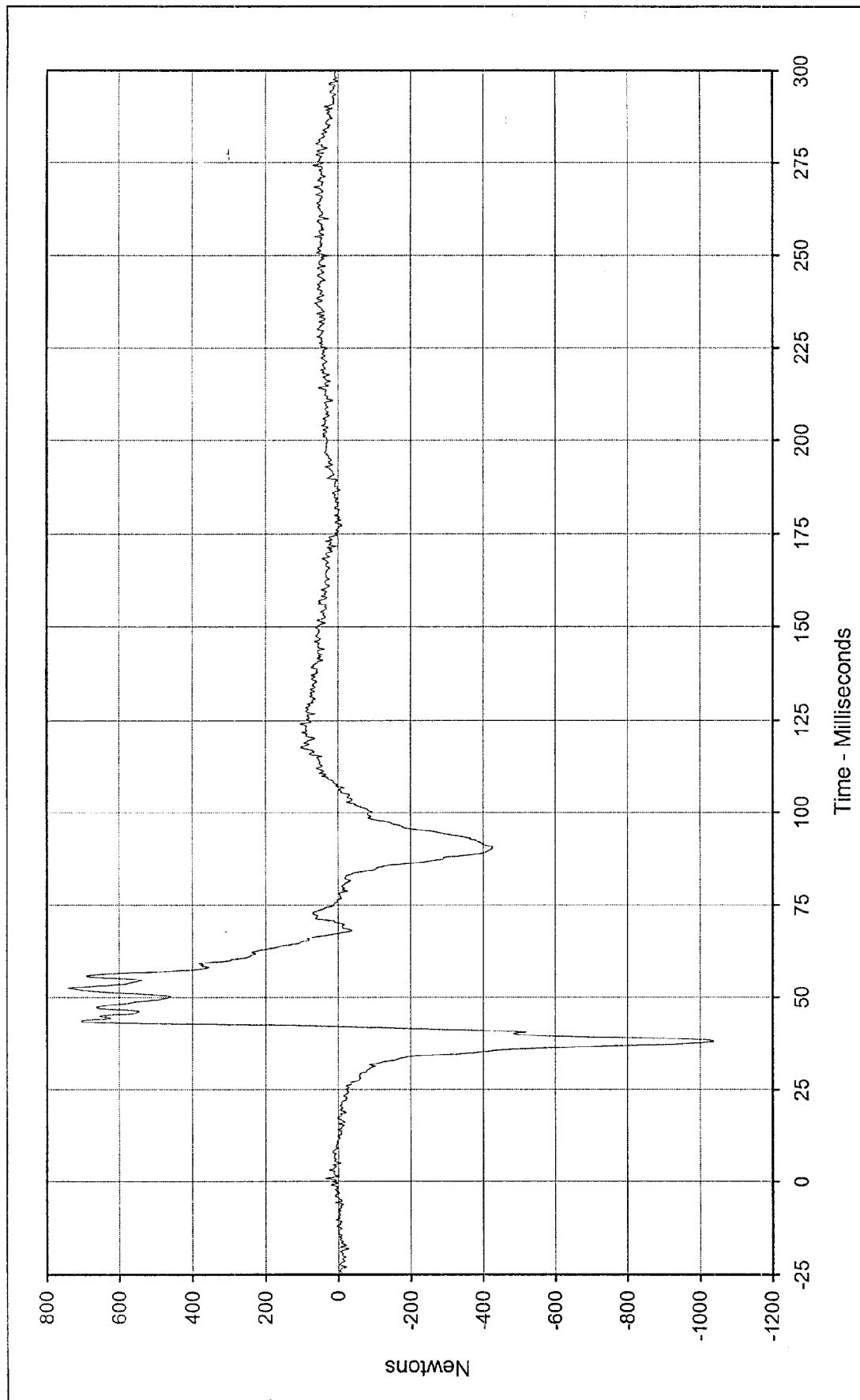
Date of Test: 2/26/98

Curve Number: FIL-072

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Left Lower Tibia Force X

Maximum Value: 743.1 at 52.6 Milliseconds

Minimum Value: -1037.6 at 37.9 Milliseconds

SAE Filter Class: 600

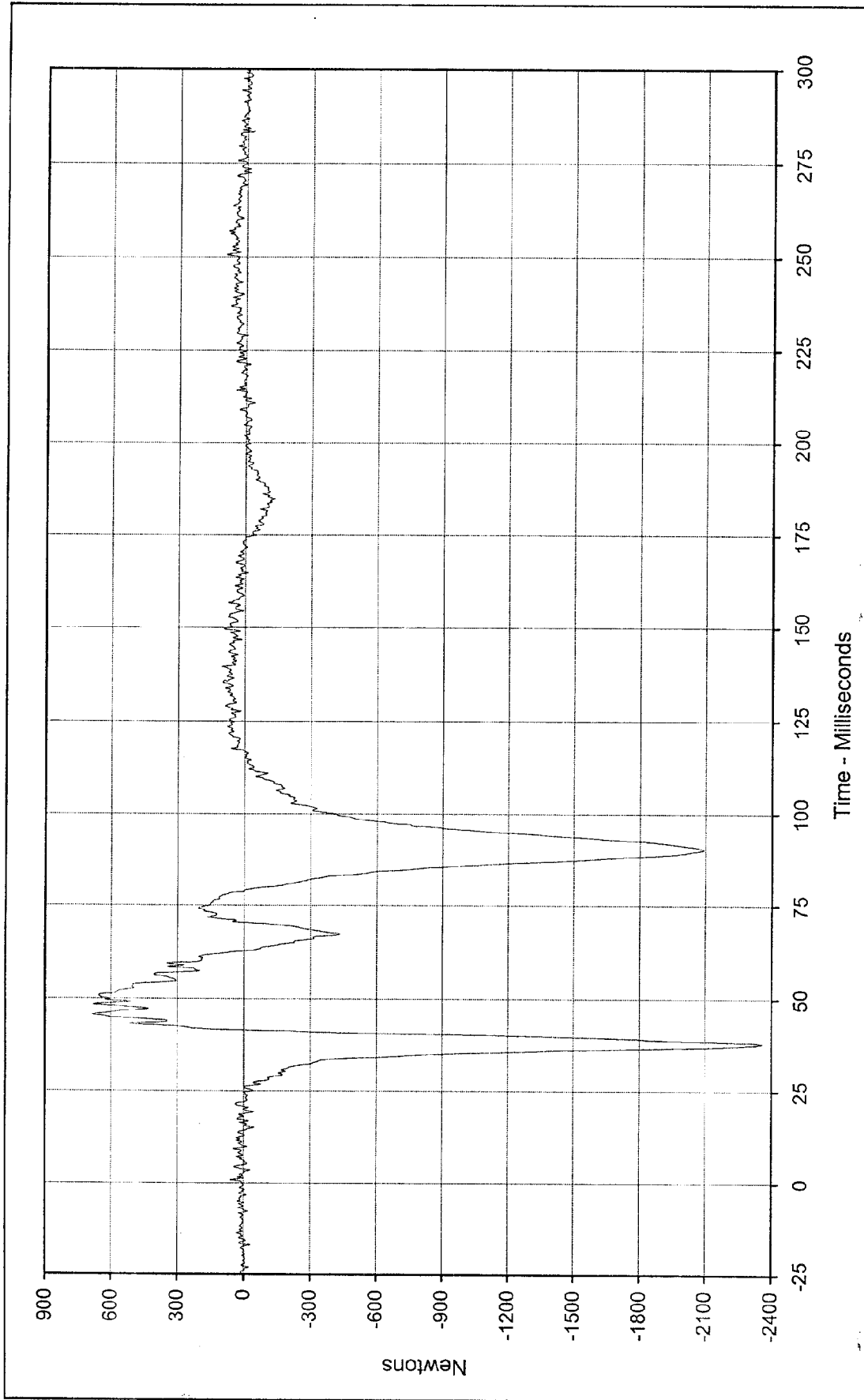
Date of Test: 2/26/98

Curve Number: FIL-073

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

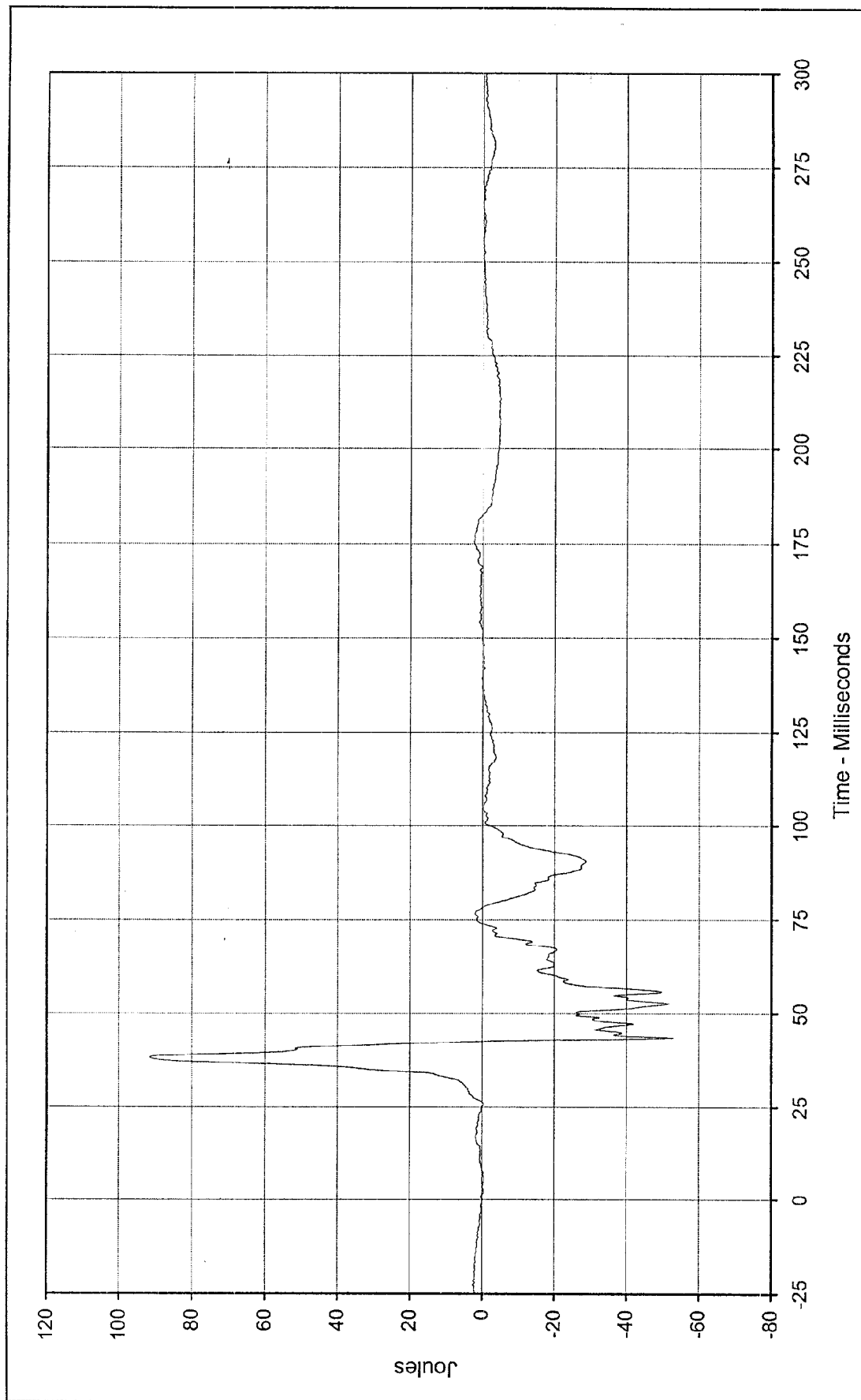




Curve Description: Passenger Left Lower Tibia Force Z
 Maximum Value: 686.0 at 45.7 Milliseconds
 Minimum Value: -2359.7 at 38.0 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/26/98
 Curve Number: FIL-074

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Left Lower Tibia Moment Y Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 91.6 at 38.2 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

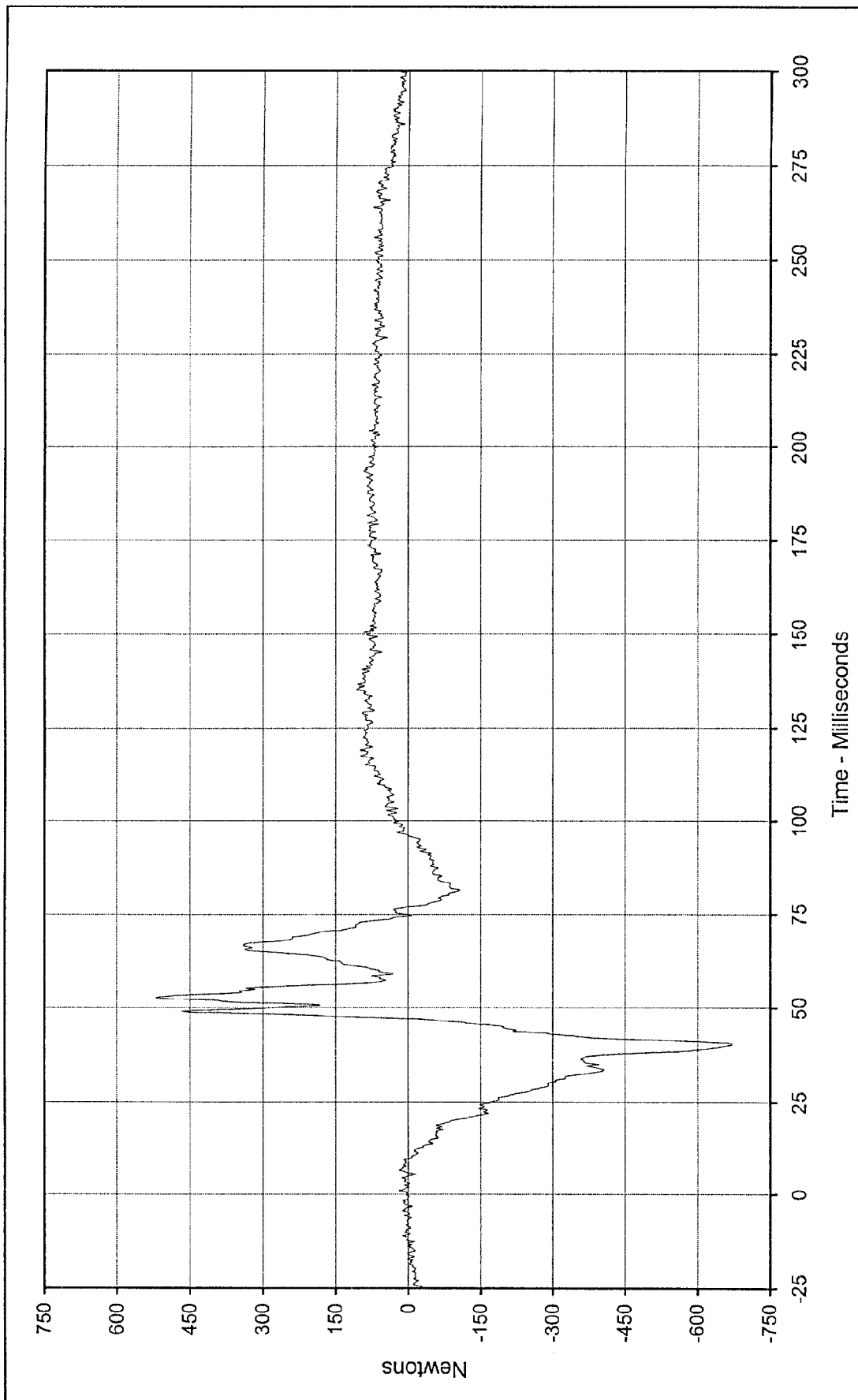
Minimum Value: -53.0 at 43.6 Milliseconds

SAE Filler Class: 600

Date of Test: 2/26/98

Curve Number: FIL-075

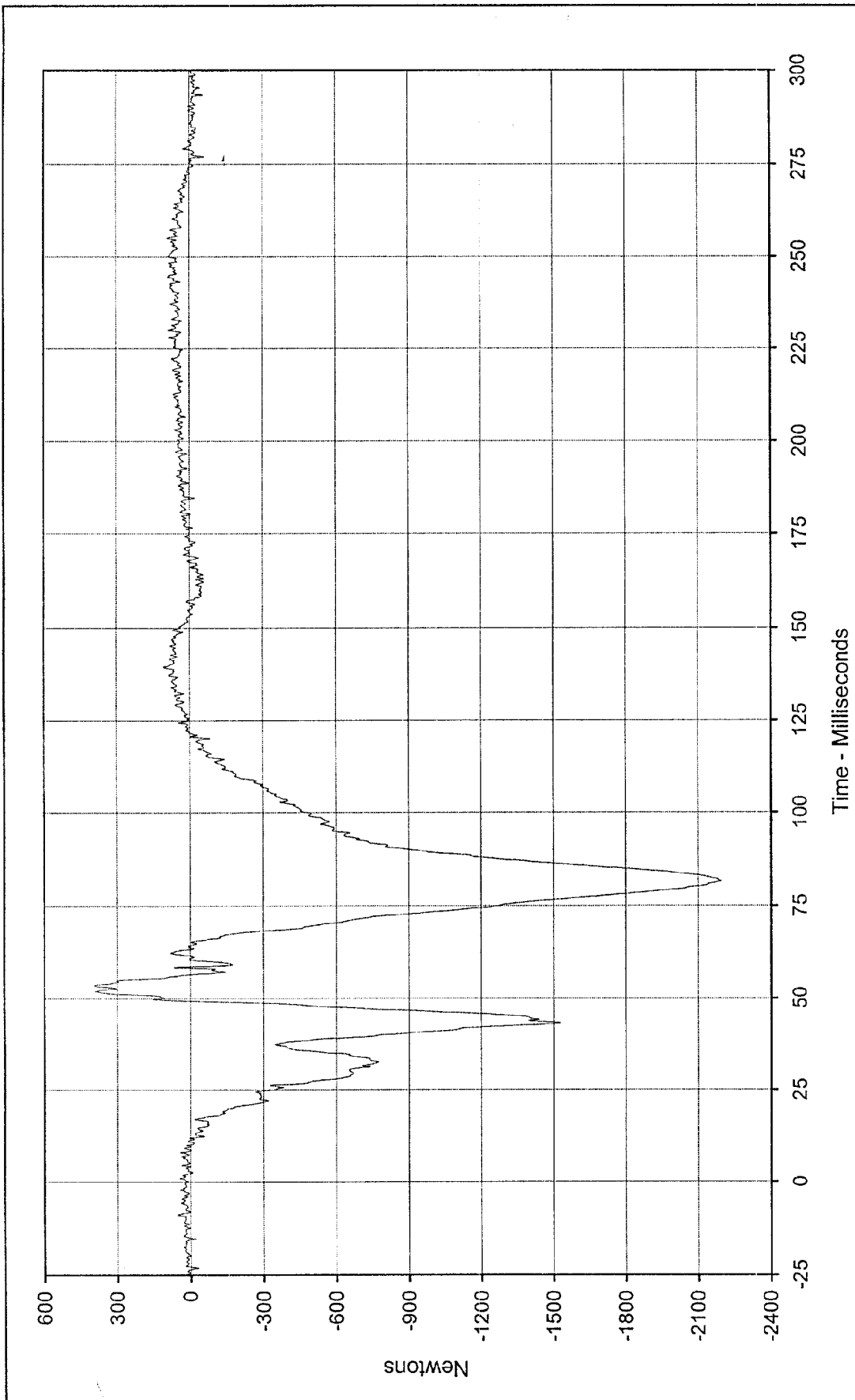




Curve Description: Passenger Right Lower Tibia Force X
Maximum Value: 520.0 at 52.6 Milliseconds
Minimum Value: -671.2 at 40.4 Milliseconds
SAE Filter Class: 600
Date of Test: 2/26/98
Curve Number: FIL-076

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV





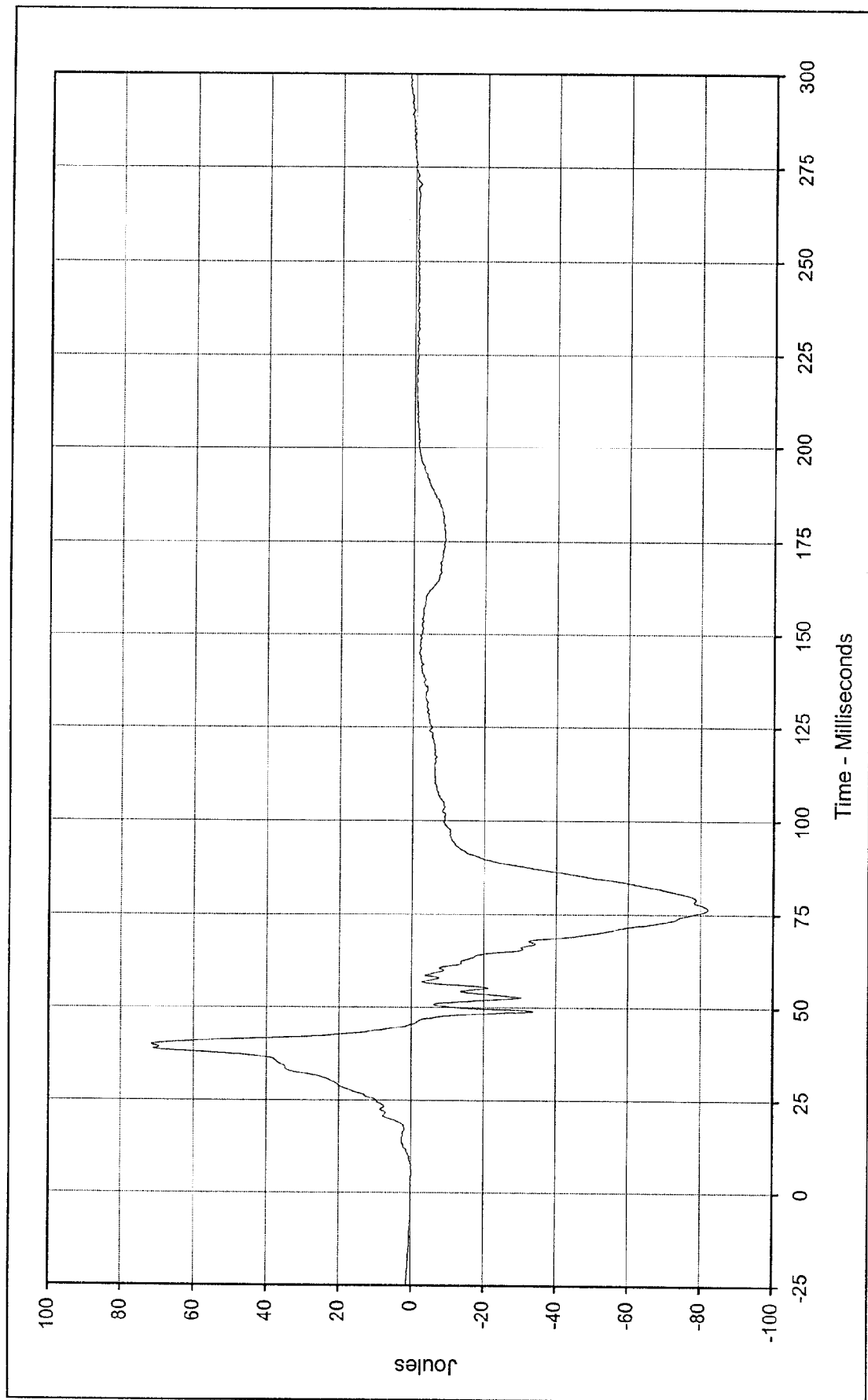
Curve Description: Passenger Right Lower Tibia Force Z

Maximum Value:	393.6	at	53.6	Milliseconds
Minimum Value:	-2195.5	at	81.6	Milliseconds
SAE Filter Class:	600			
Date of Test:	2/26/98			
Curve Number:	FIL-077			

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

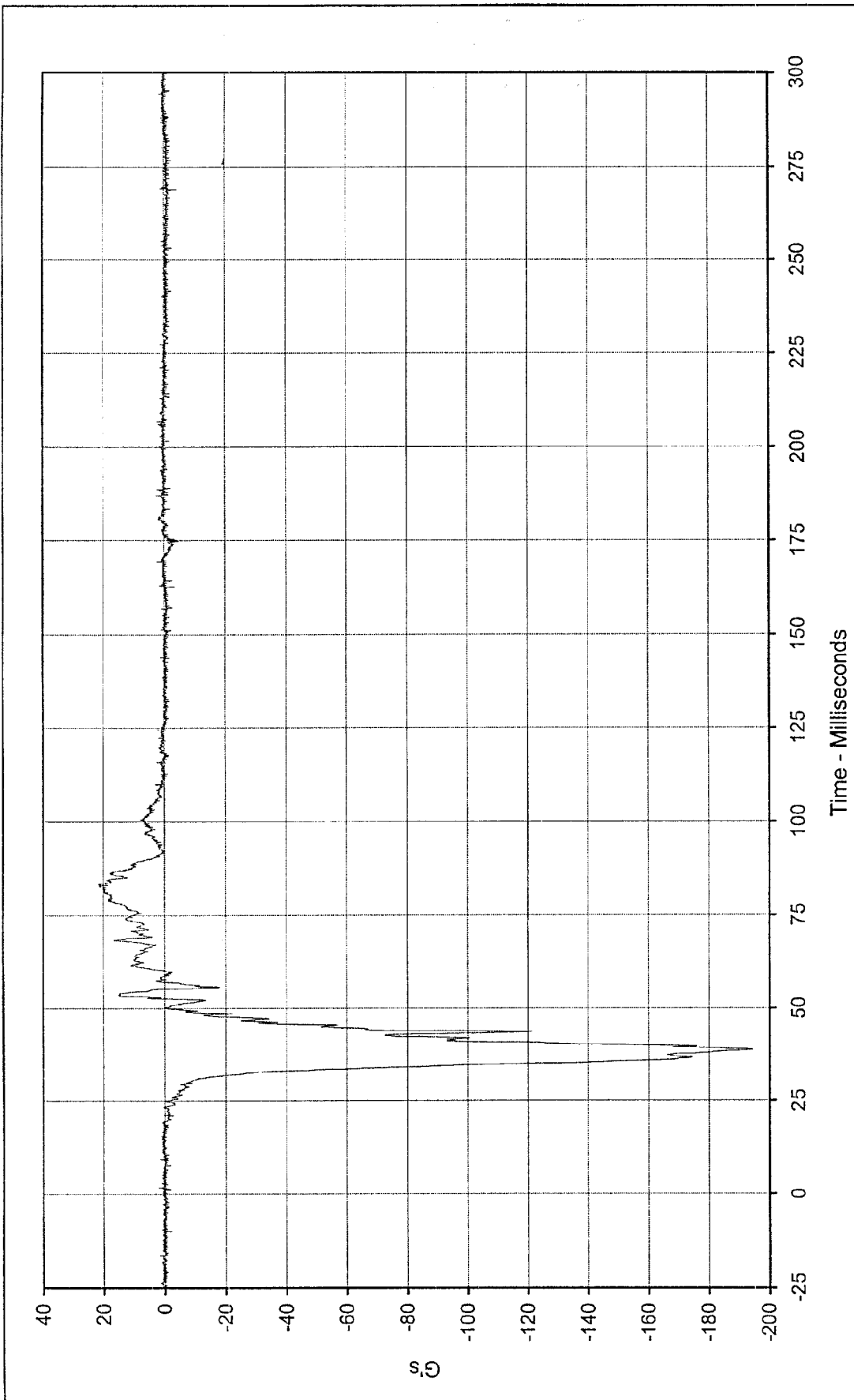




Curve Description: Passenger Right lower Tibia Moment Y
Maximum Value: 71.5 at 40.0 Milliseconds
Minimum Value: -82.0 at 76.3 Milliseconds
SAE Filter Class: 600
Date of Test: 2/26/98
Curve Number: FIL-078

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV

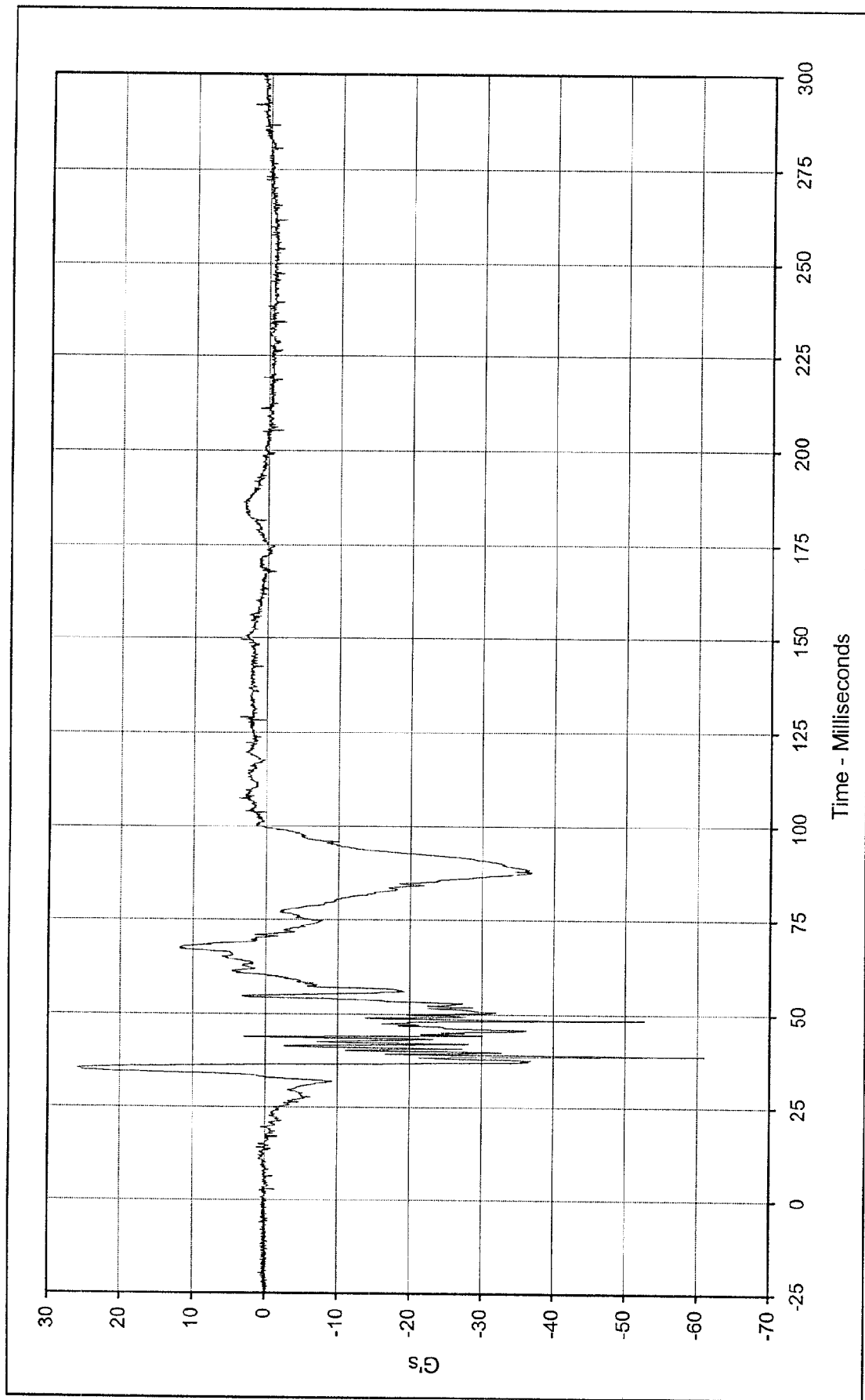




Curve Description: Passenger Left Foot Aft X
 Maximum Value: 21.8 at 83.3 Milliseconds
 Minimum Value: -194.5 at 38.6 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-079

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV4 SUV





Curve Description: Passenger Left Foot Aft Z

Maximum Value: 25.9 at 35.2 Milliseconds

Minimum Value: -61.0 at 38.7 Milliseconds

SAE Filter Class: 1000

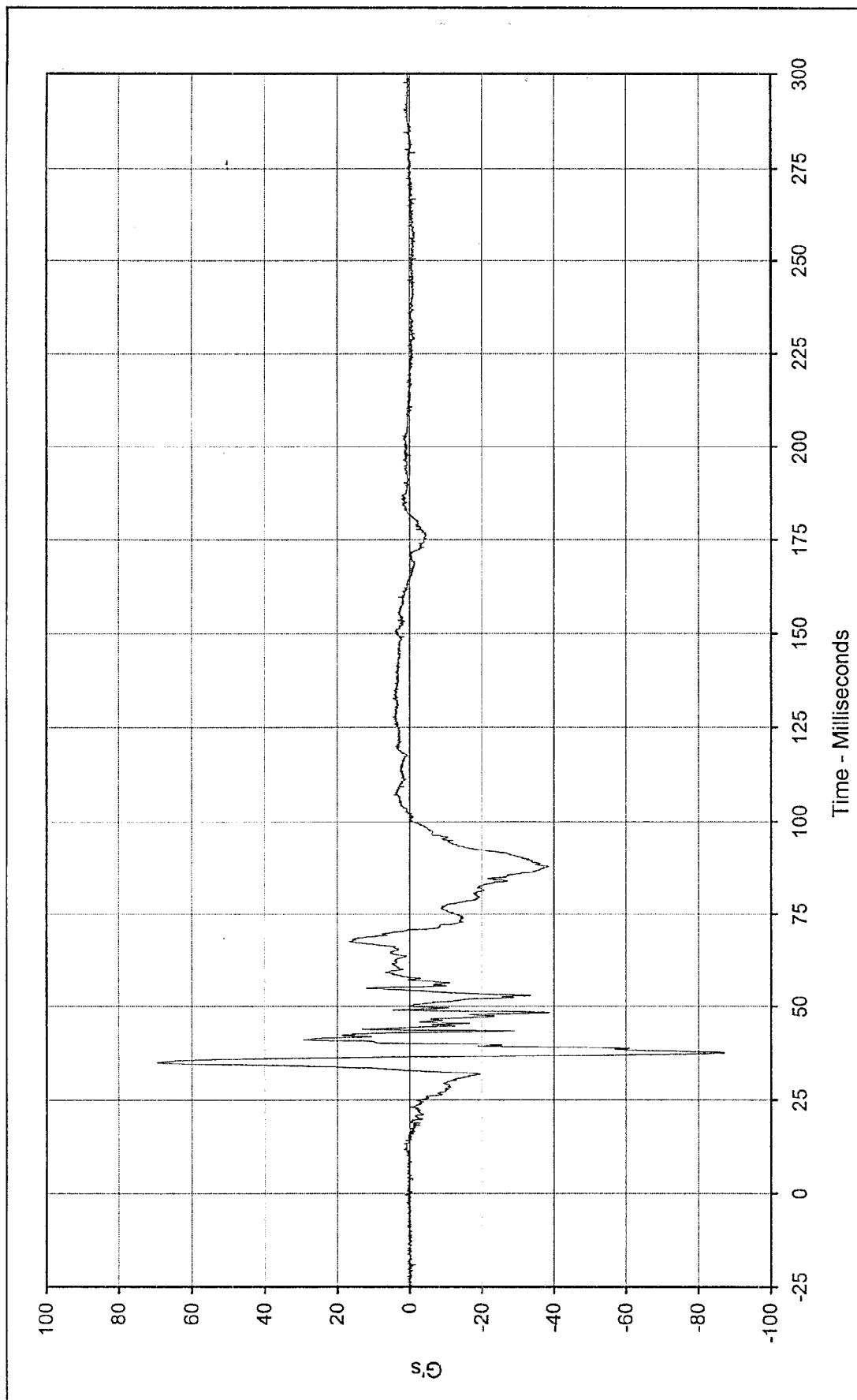
Date of Test: 2/26/98

Curve Number: FIL-080

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

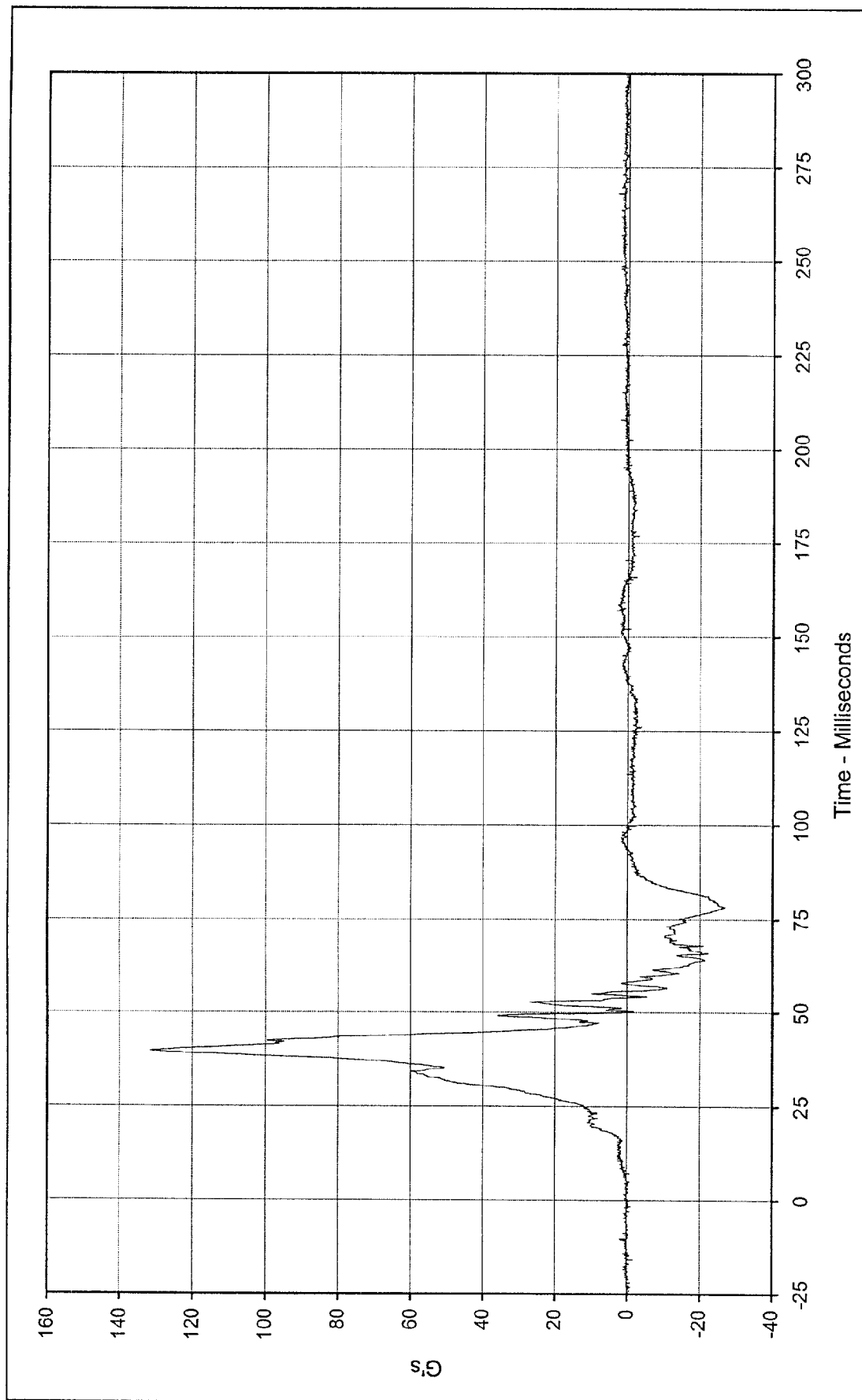




Curve Description:	Passenger Left Foot Fore Z			Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	69.5	at	34.8	Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV
Minimum Value:	-87.3	at	37.3	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	2/26/98					
Curve Number:	FIL-081					



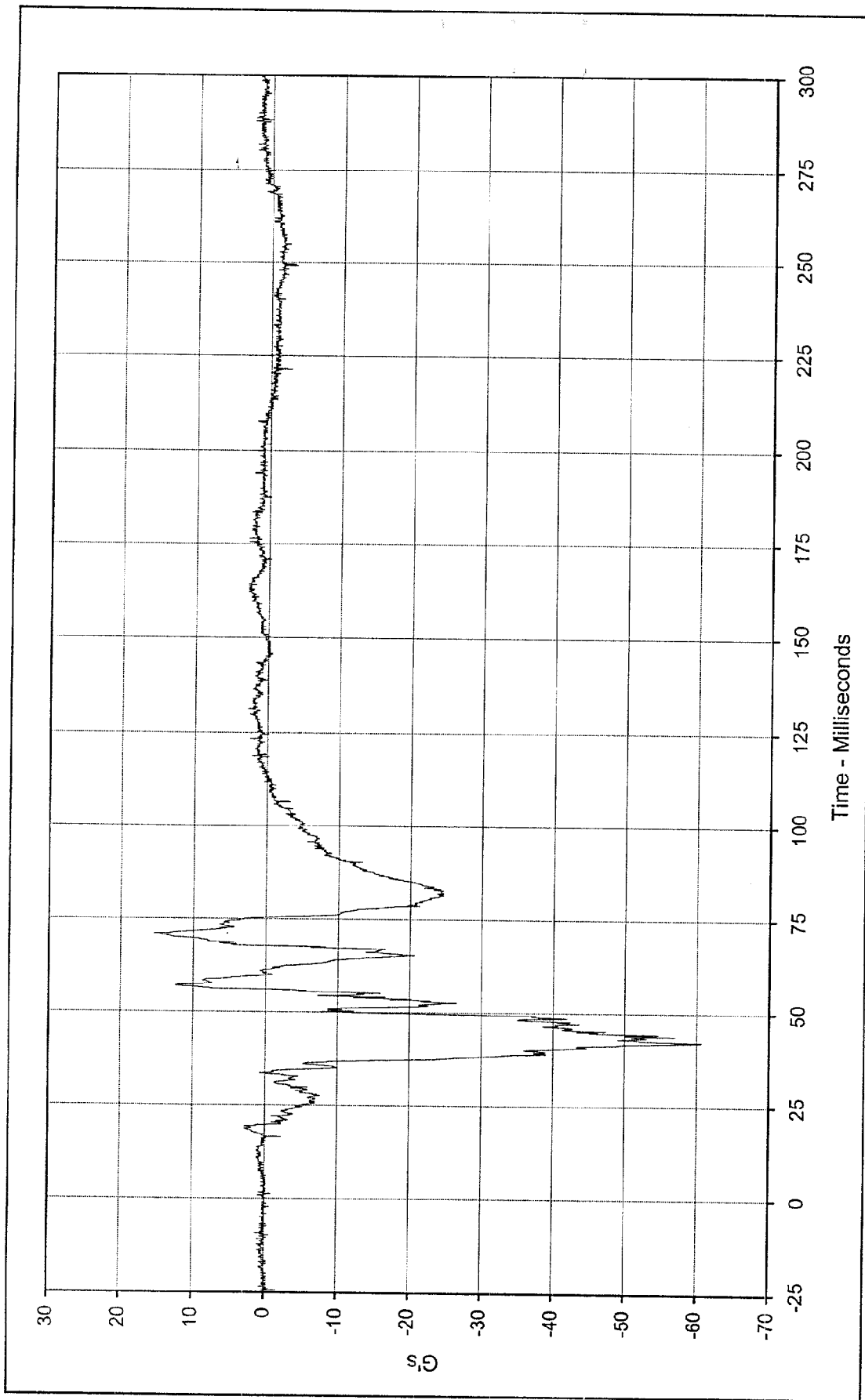




Curve Description: Passenger Right Foot Aft X Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Maximum Value: 131.4 at 39.6 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV
 Minimum Value: -27.0 at 78.2 Milliseconds



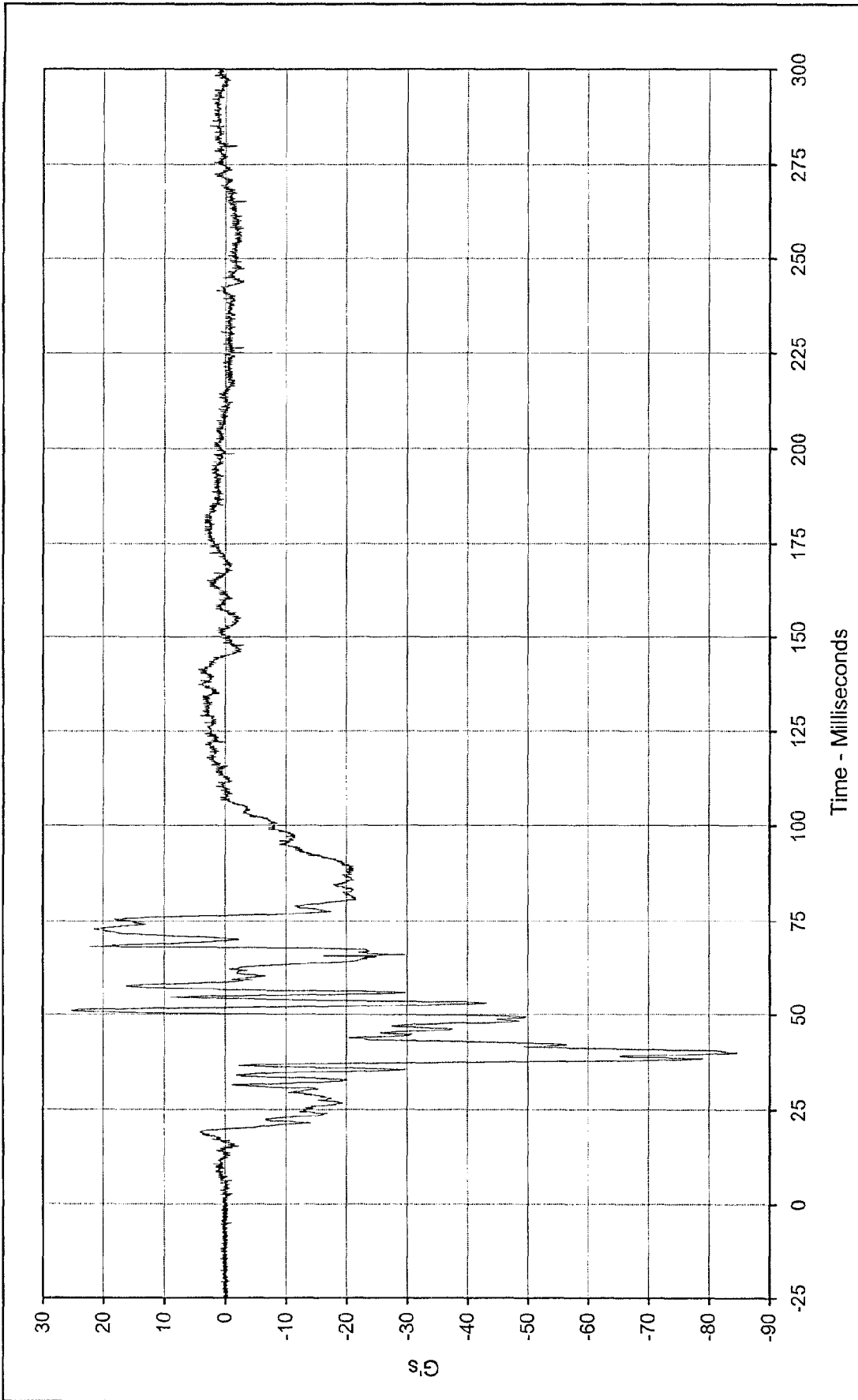
SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-082



Curve Description: Passenger Right Foot Aft Z
 Maximum Value: 15.4 at 71.0 Milliseconds
 Minimum Value: -60.7 at 42.1 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-083

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

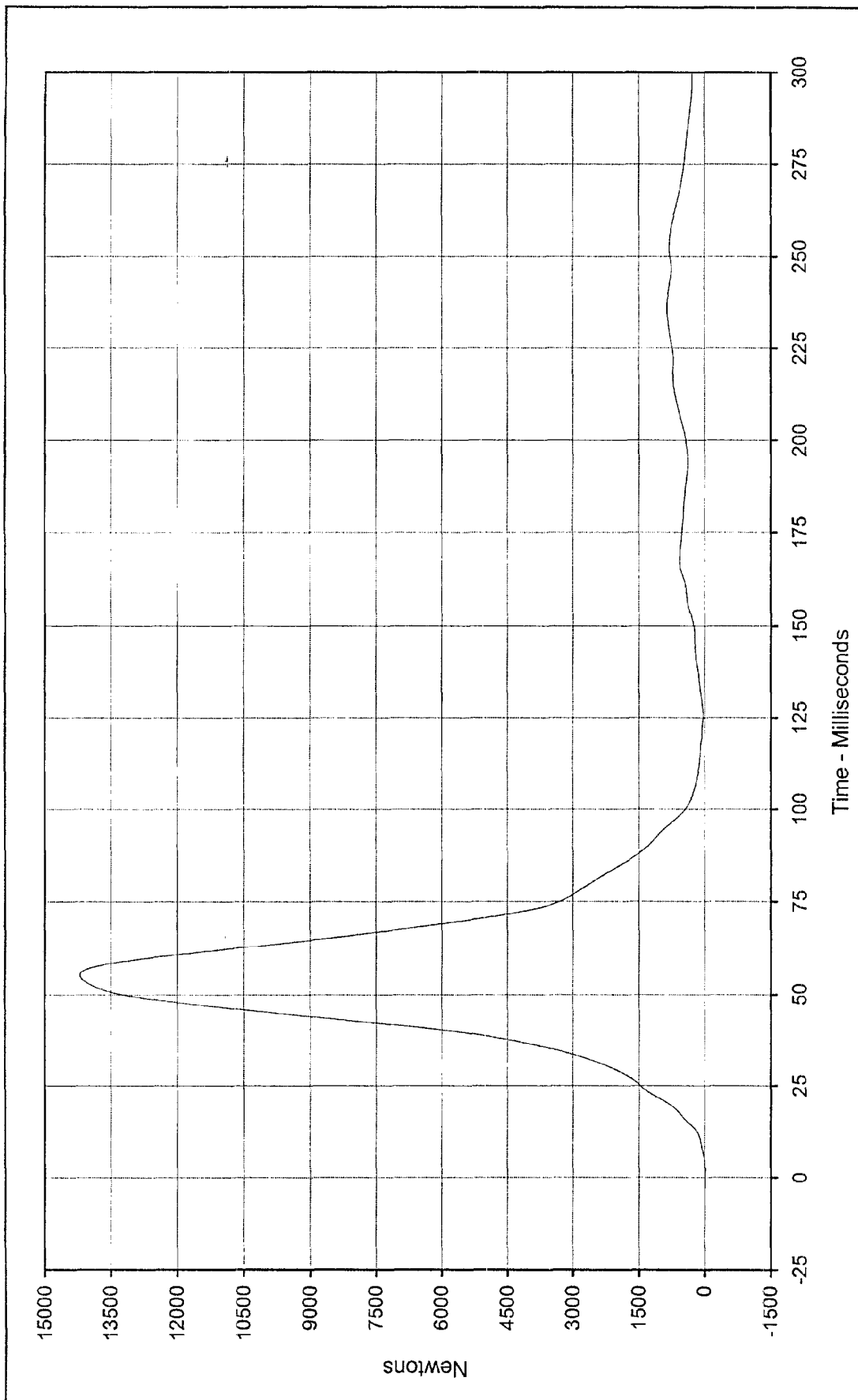




Curve Description: Passenger Right Foot Fore Z
 Maximum Value: 25.2 at 51.0 Milliseconds
 Minimum Value: -84.6 at 39.9 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/26/98
 Curve Number: FIL-084

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV



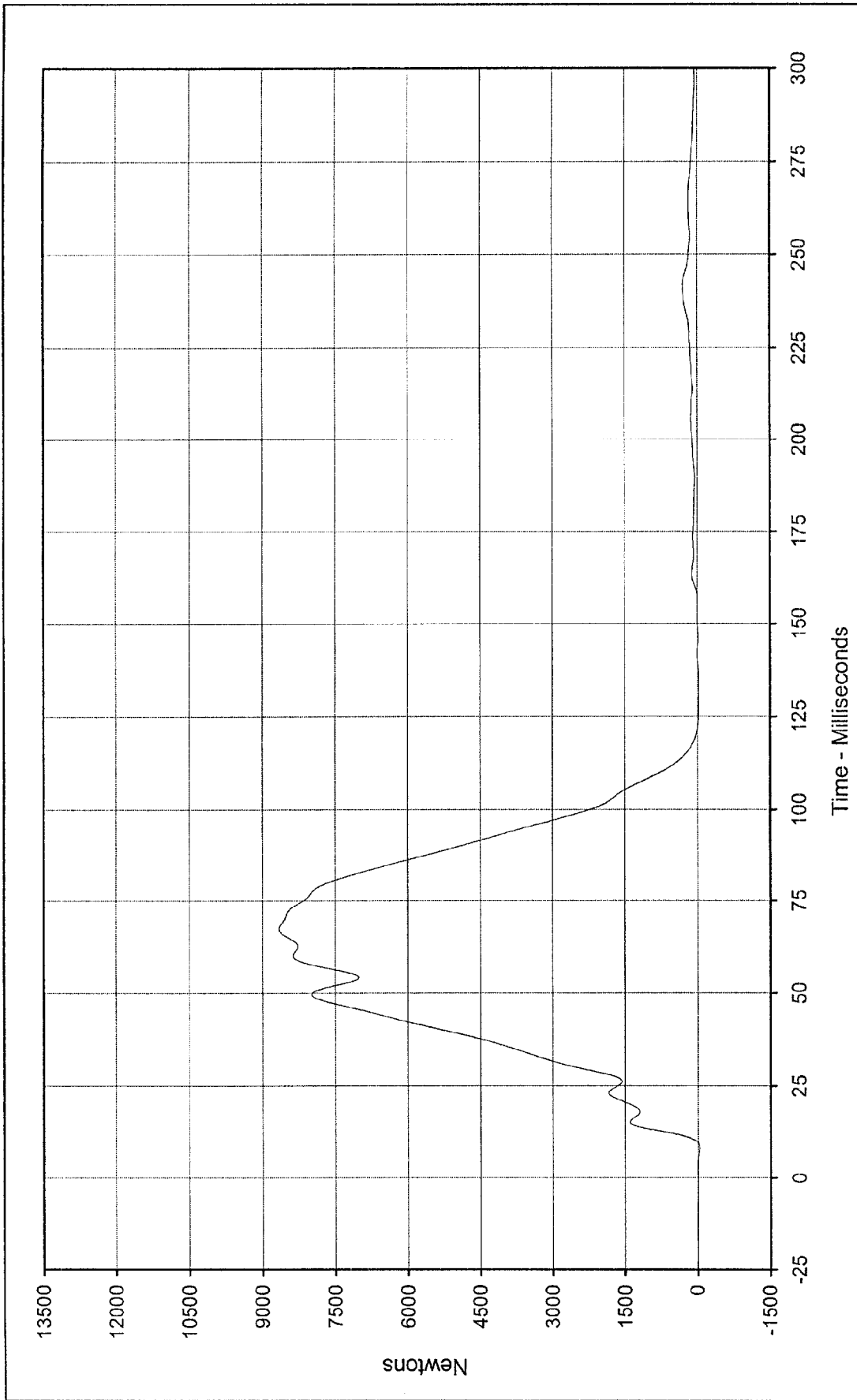


Curve Description: Passenger Lap Belt Force
 Maximum Value: 14198.7 at 55.3 Milliseconds
 Minimum Value: -15.5 at 1.8 Milliseconds

SAE Filter Class: 60
 Date of Test: 2/26/98
 Curve Number: FIL-085

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

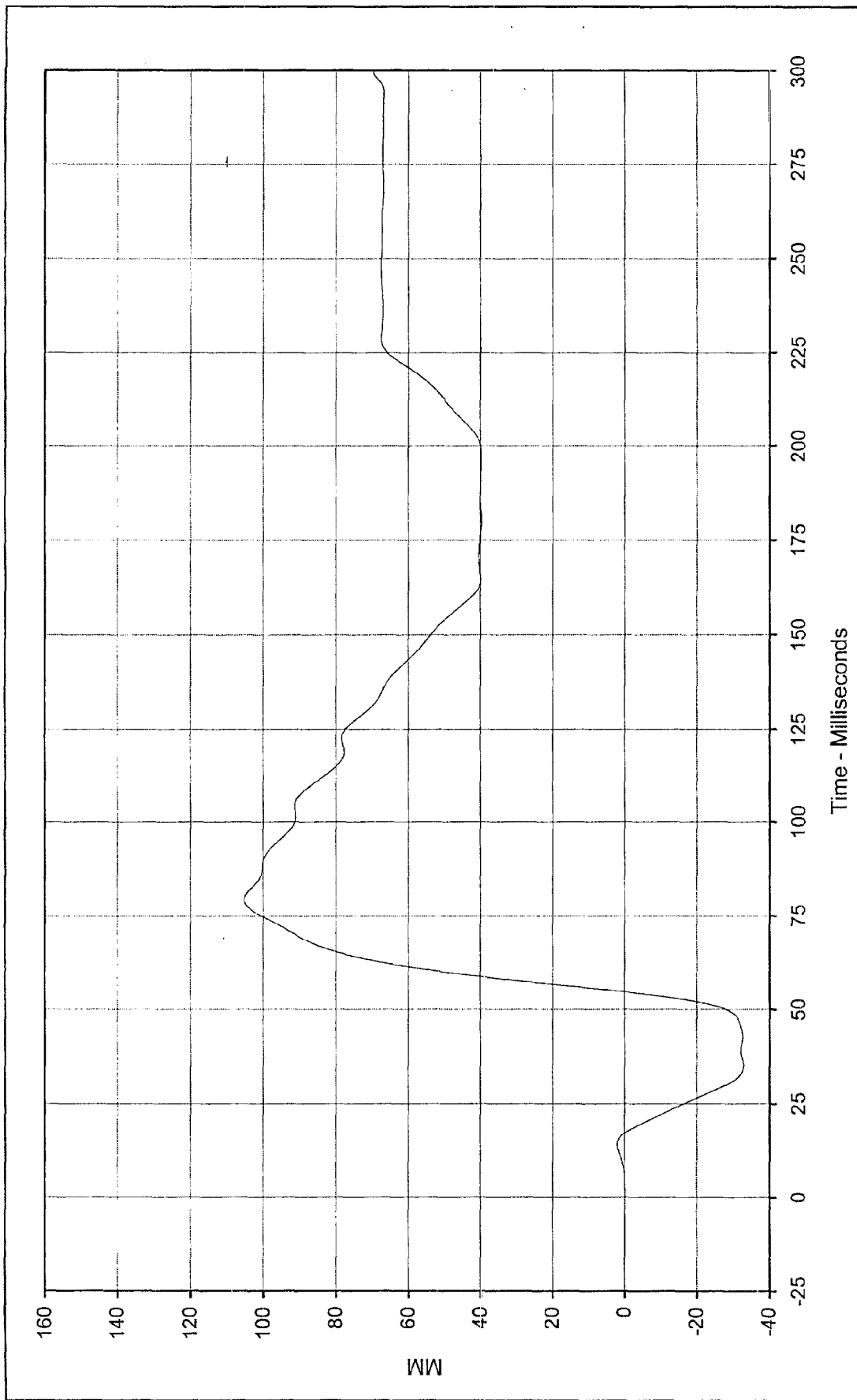




Curve Description: Passenger Shoulder Belt Force
 Maximum Value: 8659.3 at 67.2 Milliseconds
 Minimum Value: -41.9 at 8.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/26/98
 Curve Number: FIL-086

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV

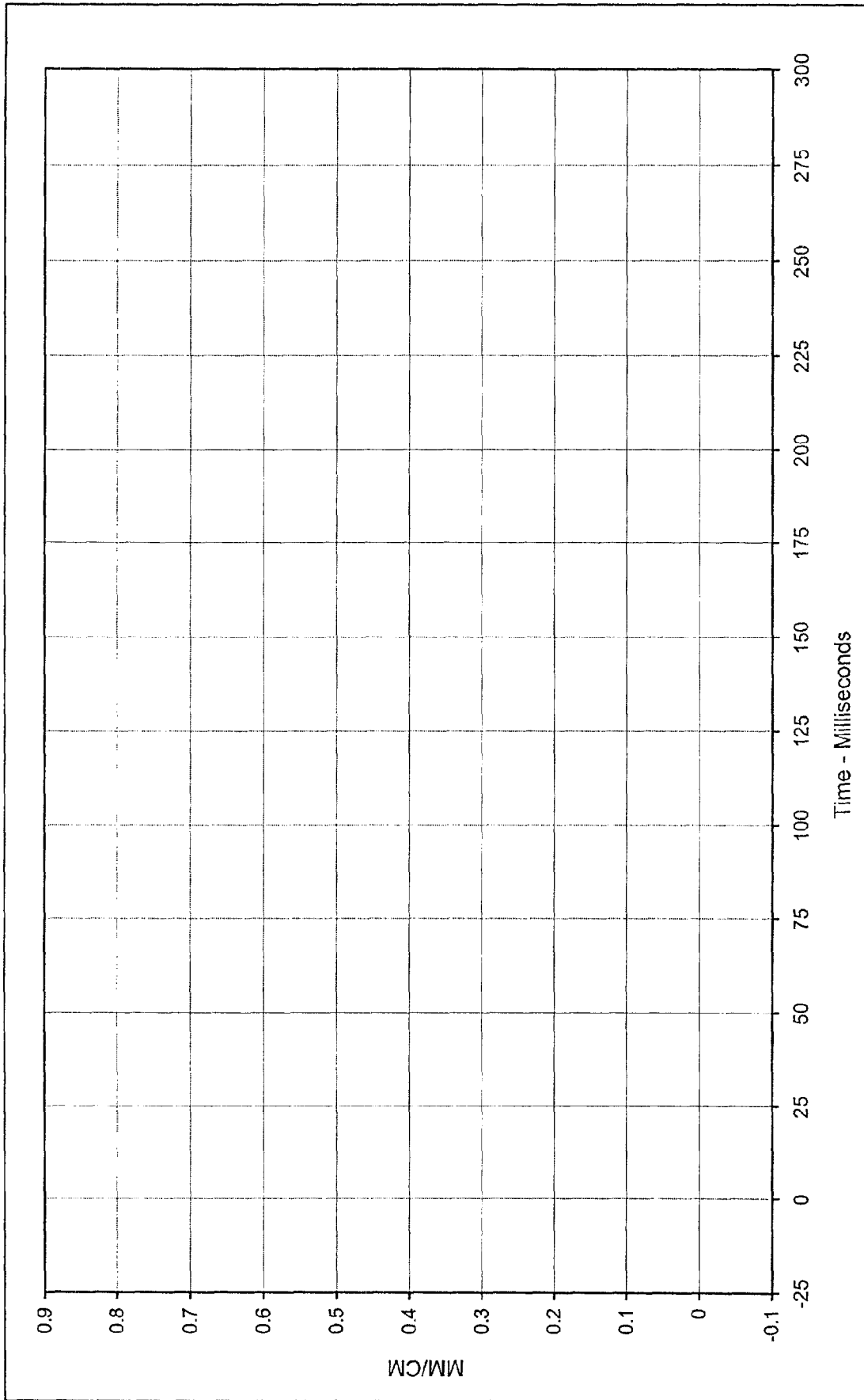




Curve Description: Passenger Shoulder Belt Pullout
Maximum Value: 105.2 at 79.3 Milliseconds
Minimum Value: -32.9 at 34.8 Milliseconds
SAE Filter Class: 60
Date of Test: 2/26/98
Curve Number: FIL-087

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Passenger Shoulder Belt Elongation * Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Maximum Value: 0.00 at 0.0 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV
 Minimum Value: 0.00 at 0.0 Milliseconds

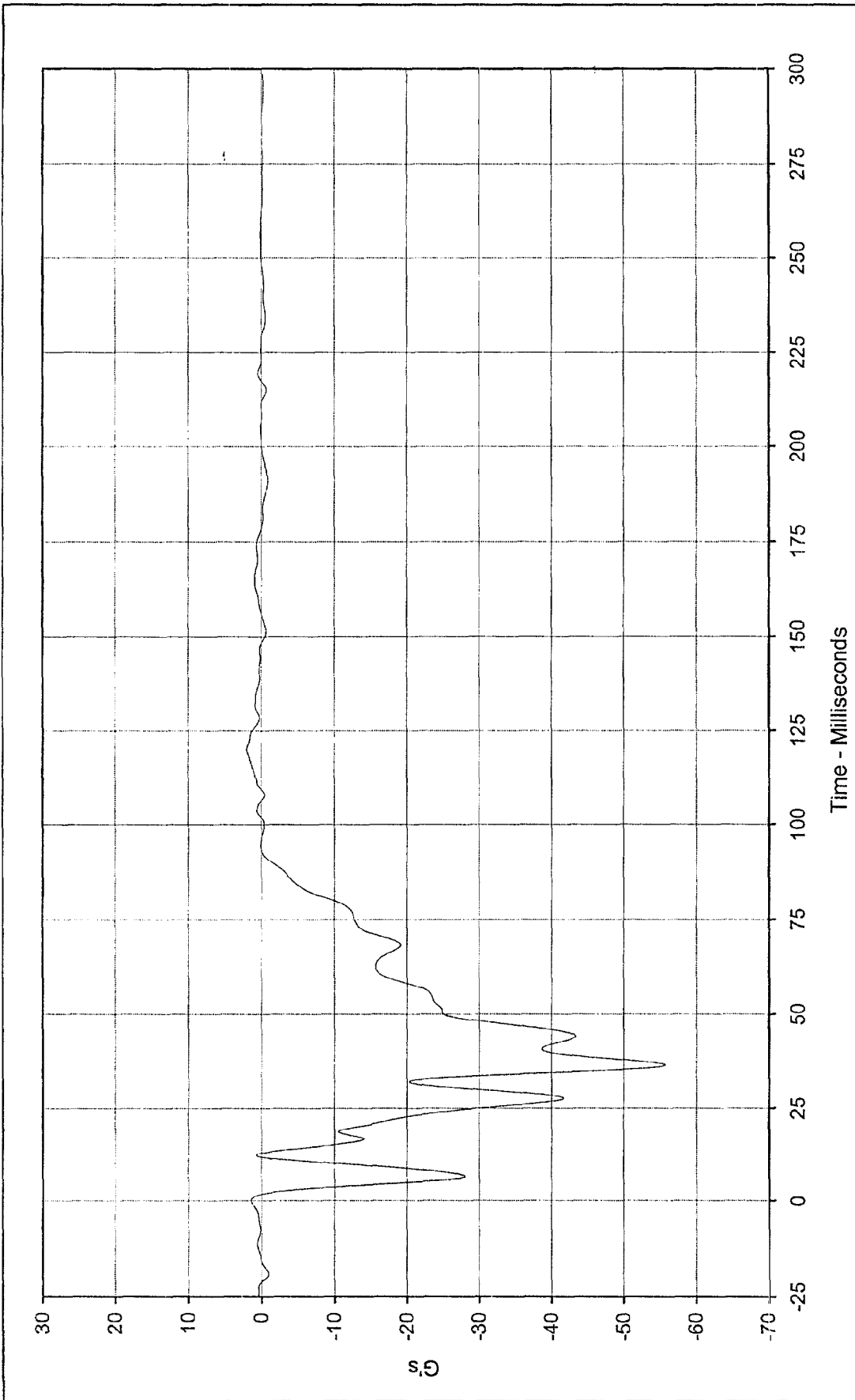
SAE Filter Class: 60

Date of Test: 2/26/98

Curve Number: FIL-088



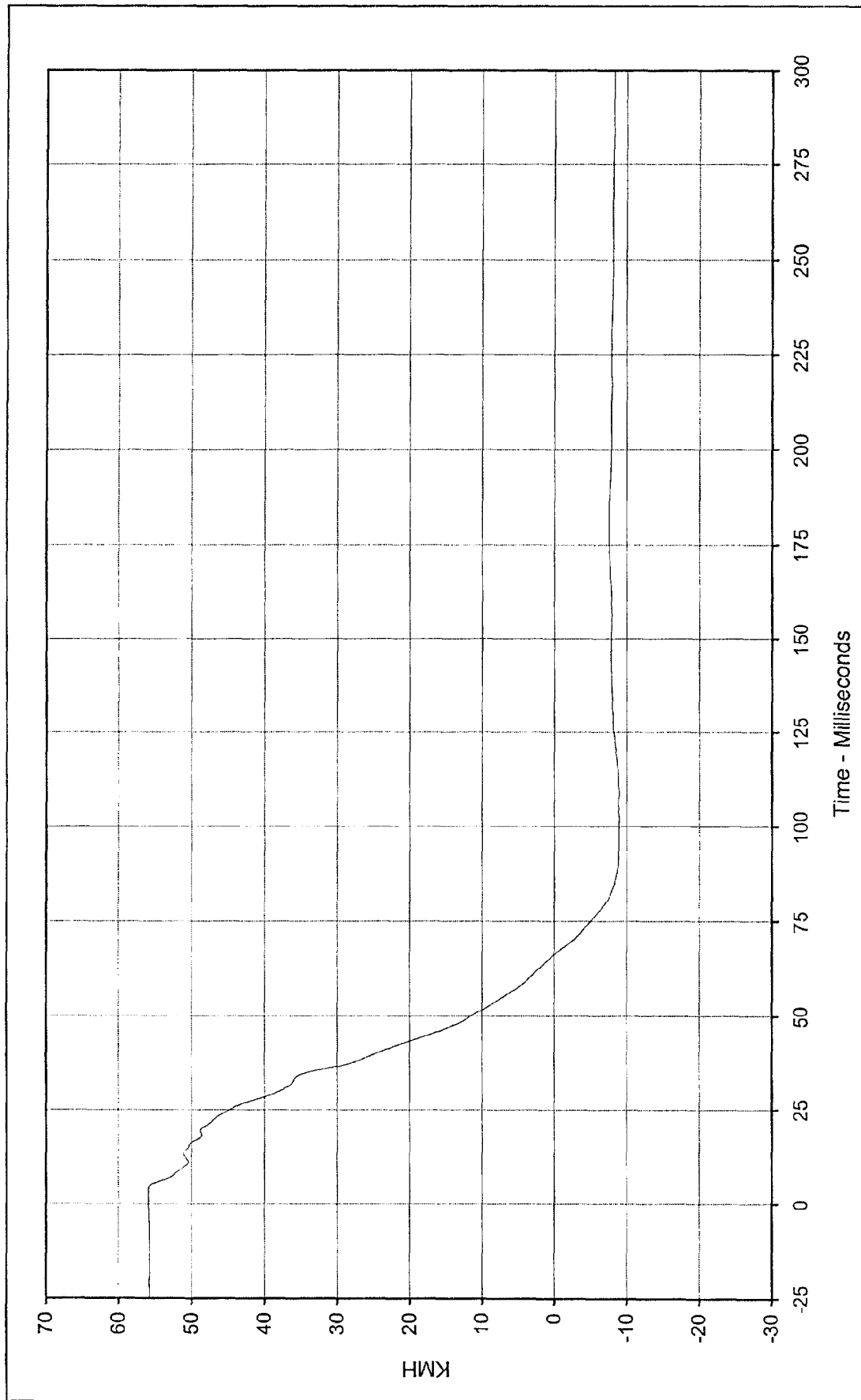
*Channel Failed



Curve Description: Vehicle Left Rear Primary
 Maximum Value: 2.0 at 120.1 Milliseconds
 Minimum Value: -55.8 at 36.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/26/98
 Curve Number: FIL-089

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Left Rear Primary Velocity

Maximum Value: 55.9 at 1.1 Milliseconds

Minimum Value: -9.0 at 102.2 Milliseconds

SAE Filter Class: 180

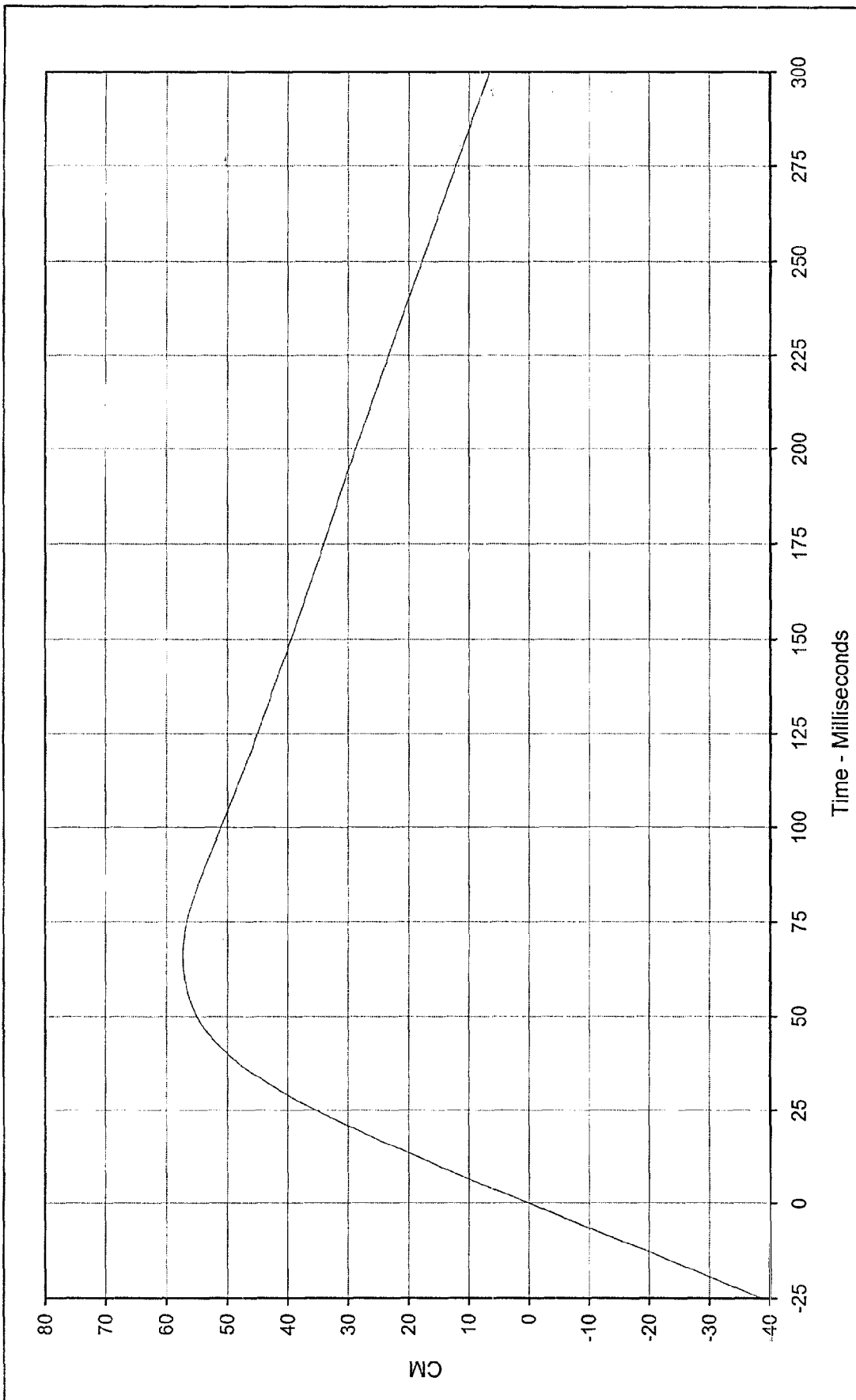
Date of Test: 2/26/98

Curve Number: IN1-089

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Left Rear Primary Displ.

Maximum Value: 57.3 at 66.3 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

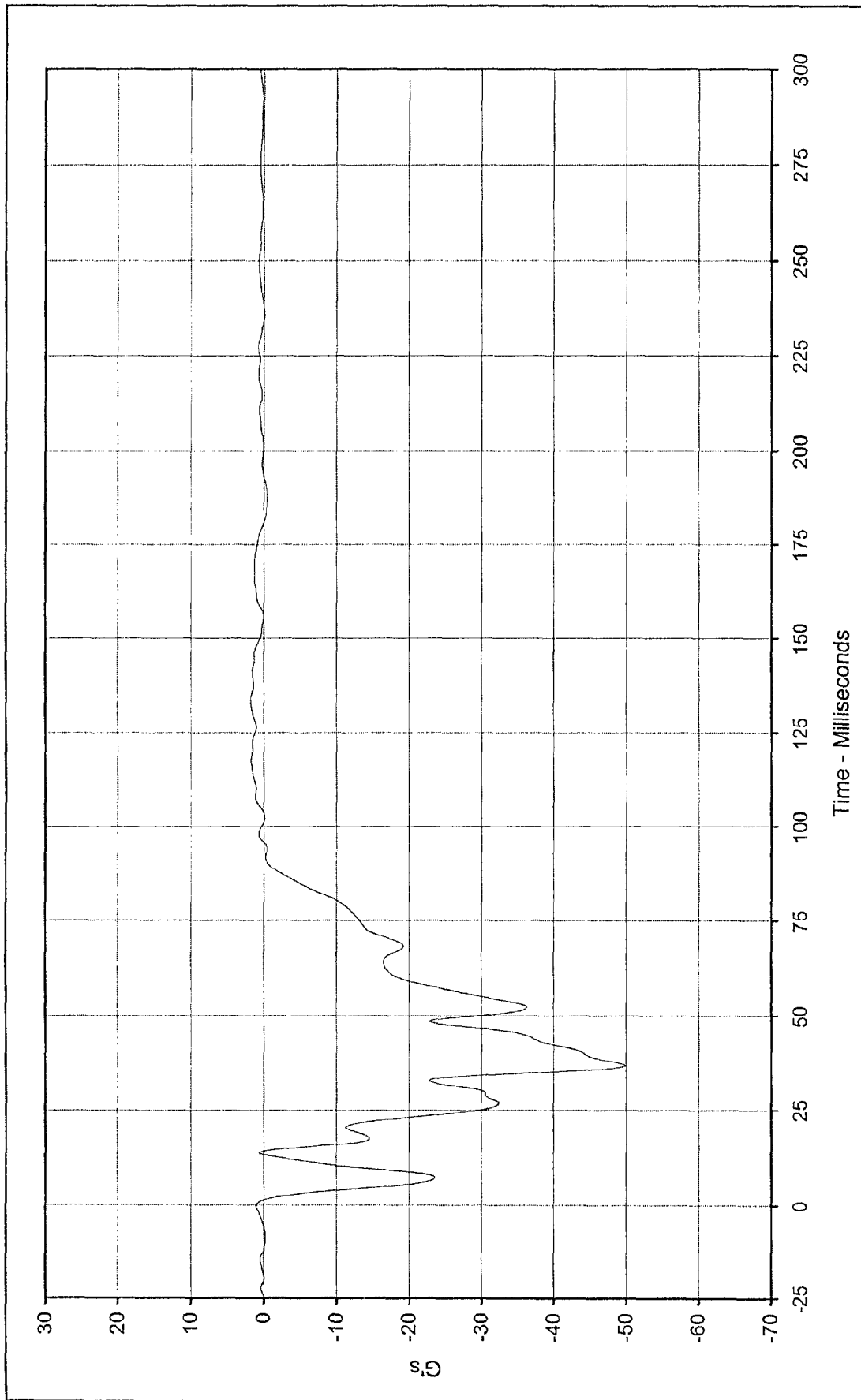
Date of Test: 2/26/98

Curve Number: IN2-089

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Right Rear Primary Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 1.7 at 133.8 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

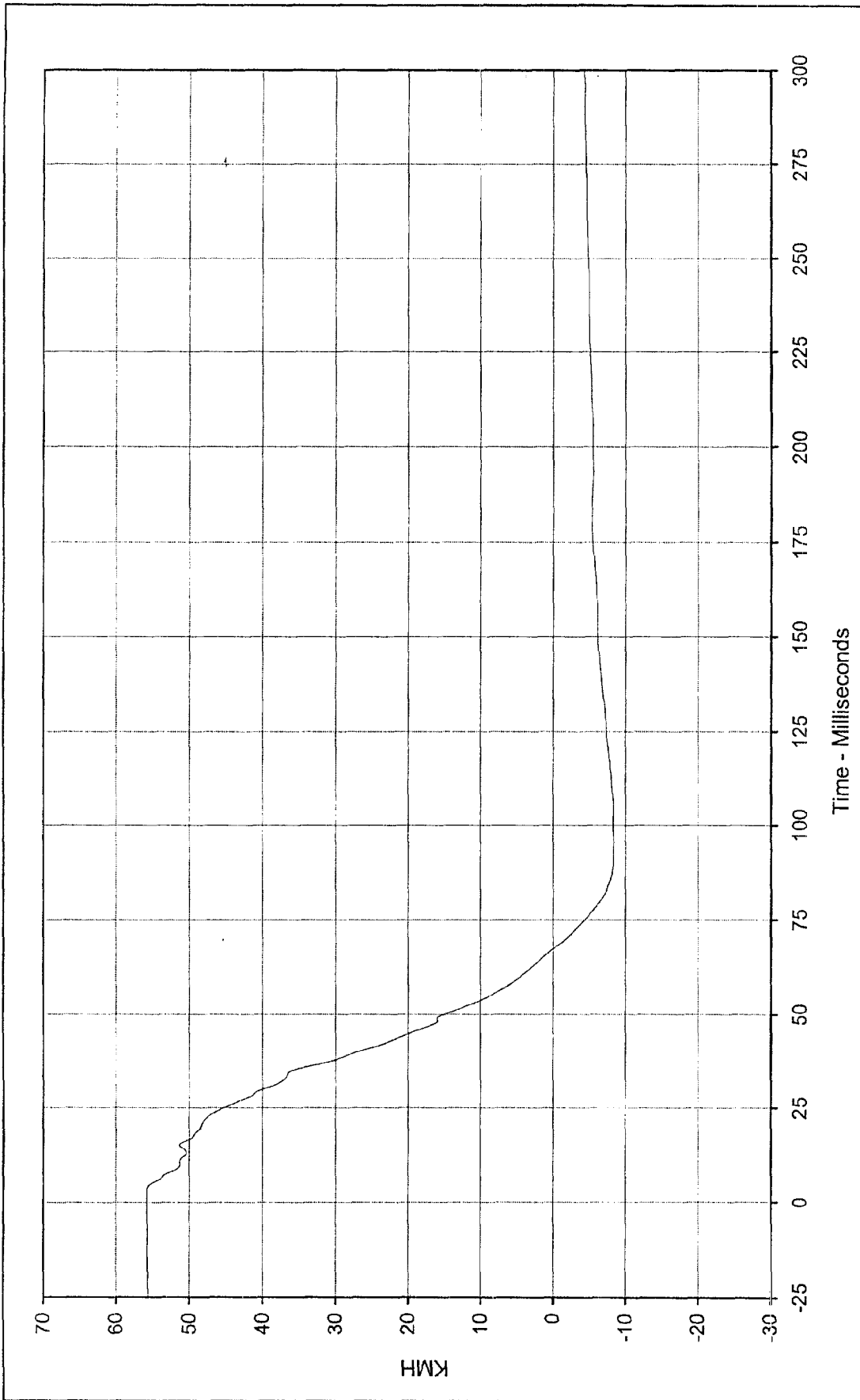
Minimum Value: -49.9 at 36.9 Milliseconds

SAE Filter Class: 60

Date of Test: 2/26/98

Curve Number: FIL-090

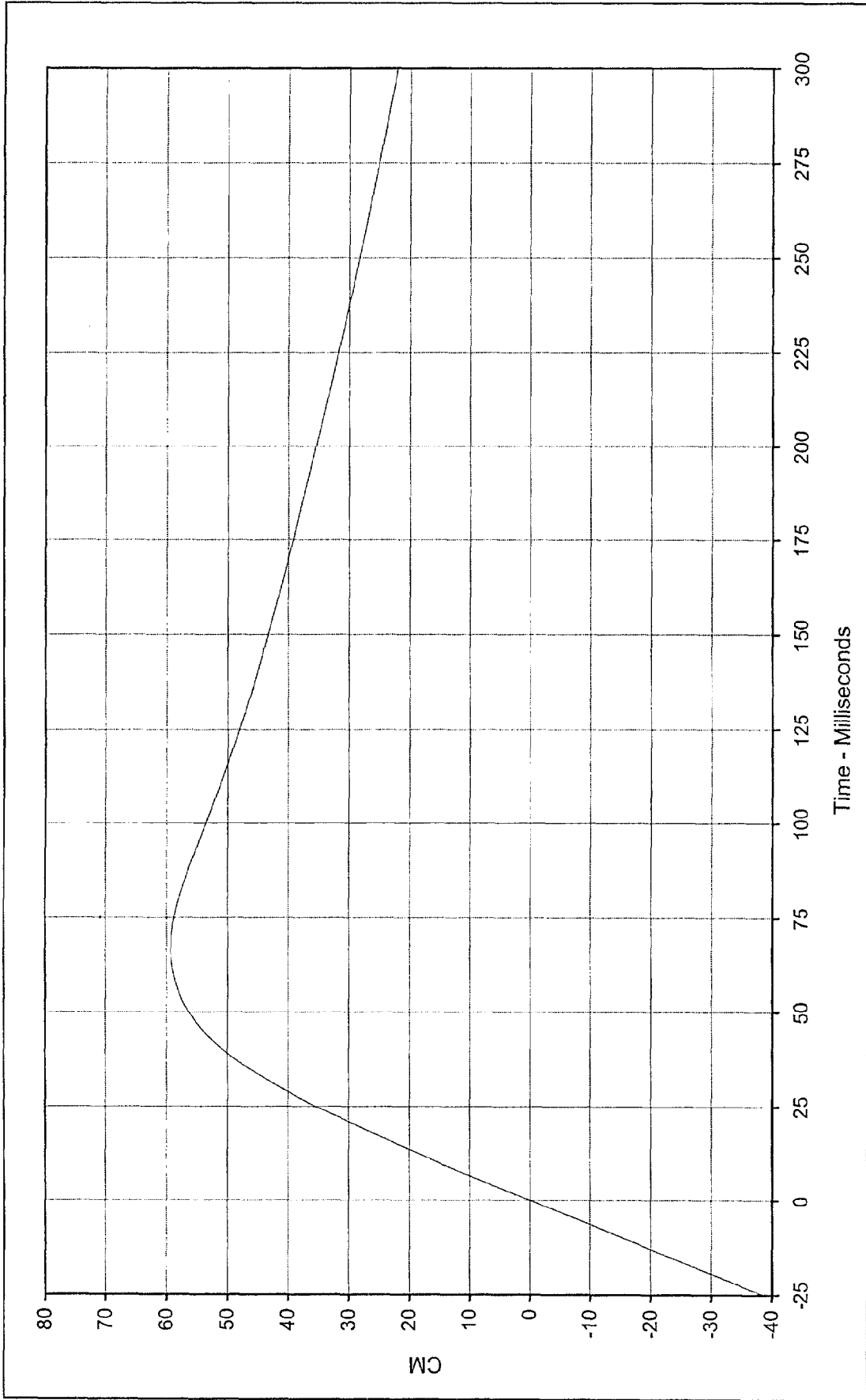




Curve Description: Vehicle Right Rear Primary Velocity
 Maximum Value: 55.8 at 2.6 Milliseconds
 Minimum Value: -8.4 at 96.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN1-090

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Right Rear Primary Displ.

Maximum Value: 59.3 at 67.4 Milliseconds

Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180

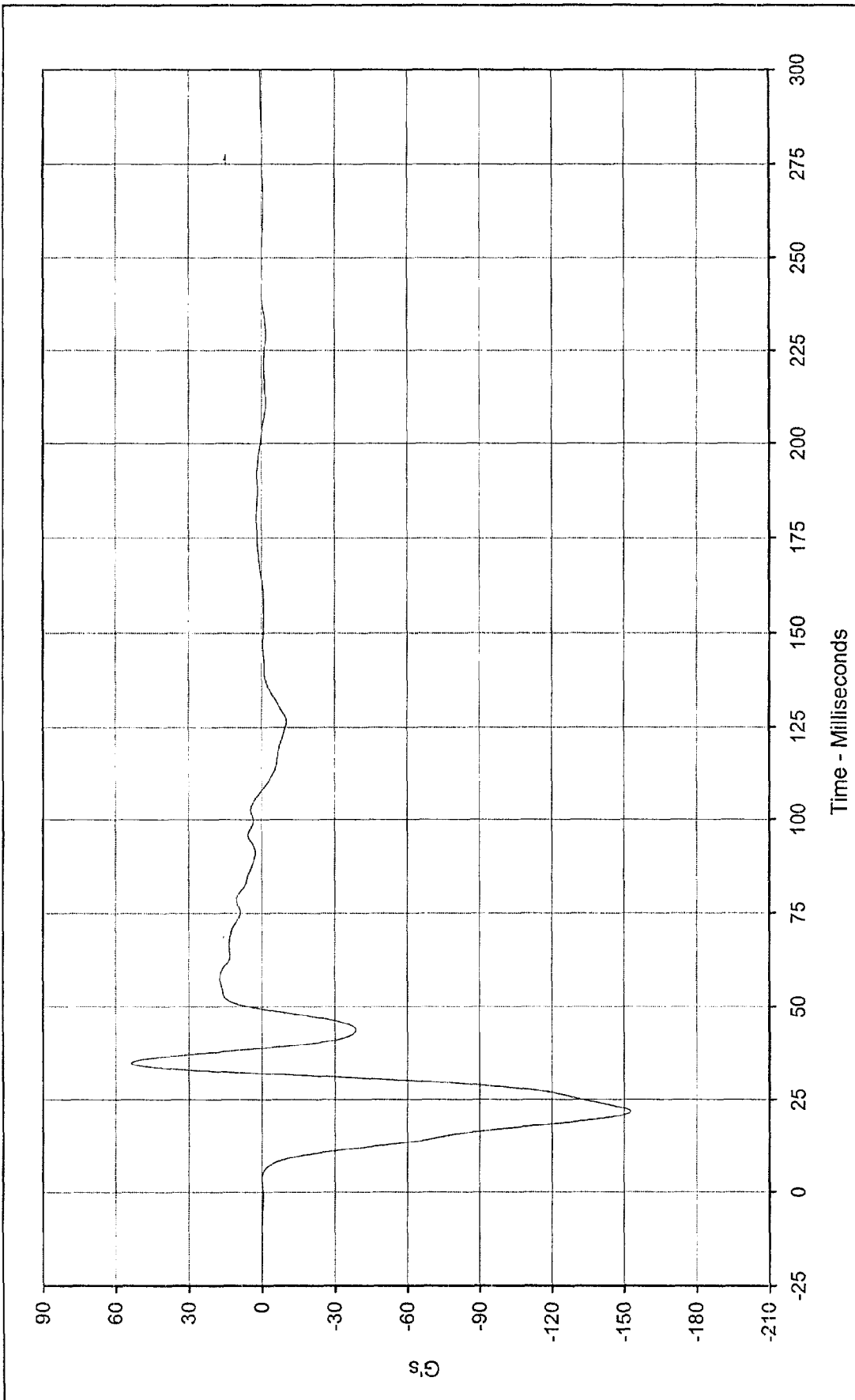
Date of Test: 2/26/98

Curve Number: IN2-090

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

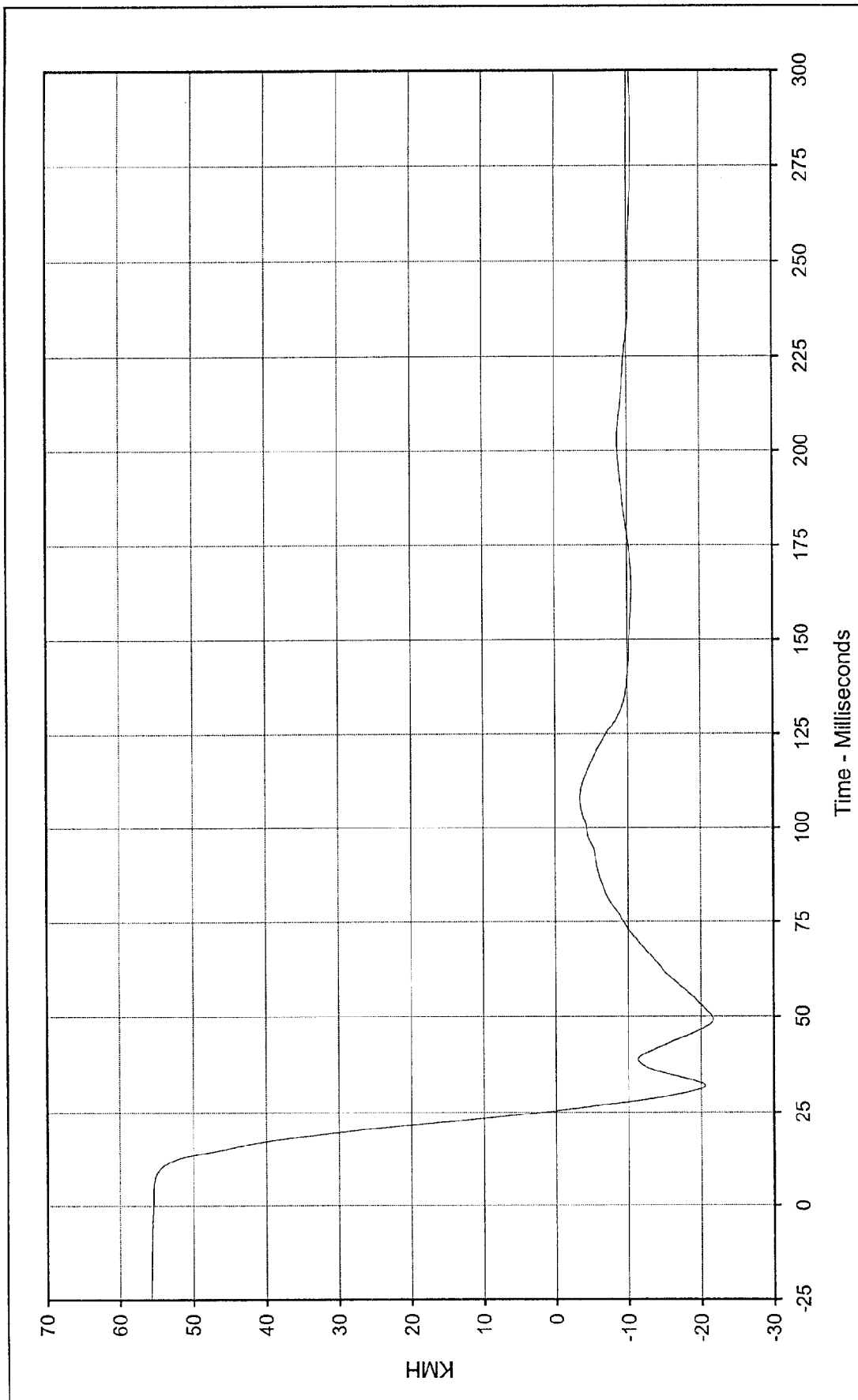




Curve Description: Vehicle Engine Top
 Maximum Value: 53.6 at 34.7 Milliseconds
 Minimum Value: -152.7 at 21.8 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/26/98
 Curve Number: FIL-091

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 55.4 at 0.0 Milliseconds

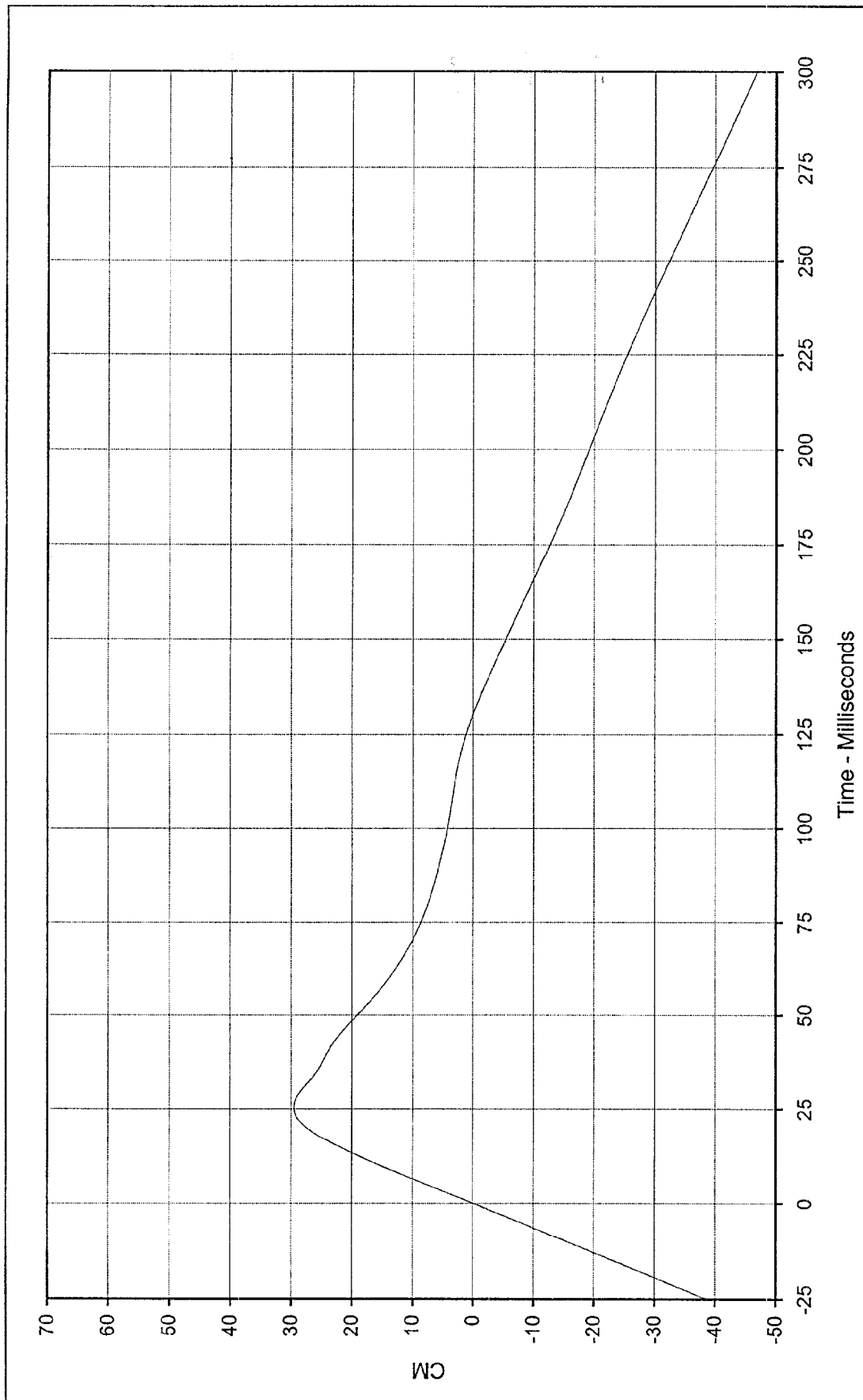
Minimum Value: -21.7 at 49.1 Milliseconds

SAE Filter Class: 180

Date of Test: 2/26/98

Curve Number: IN1-091





Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 29.6 at 25.4 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

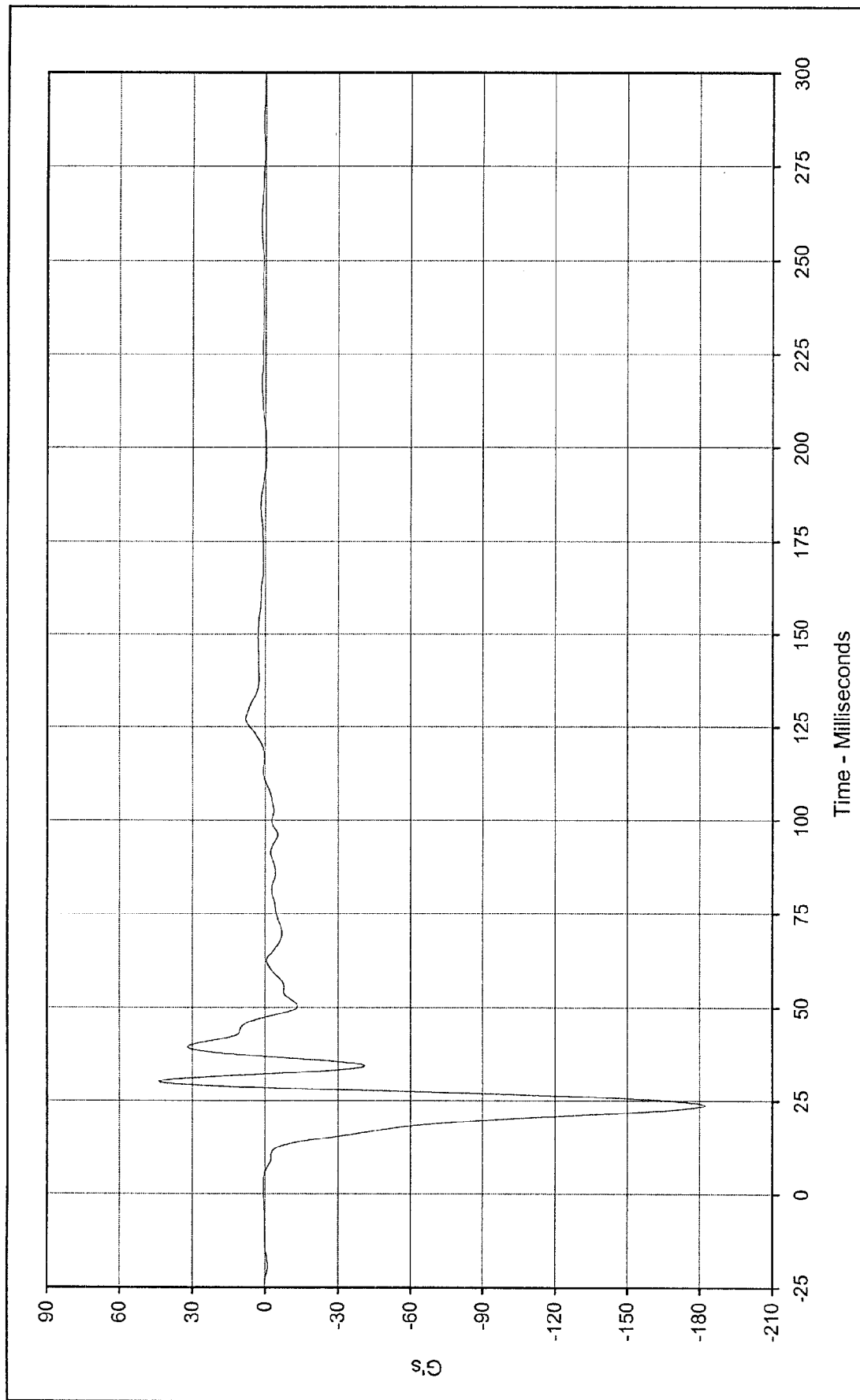
Minimum Value: -46.8 at 299.9 Milliseconds

SAE Filter Class: 180

Date of Test: 2/26/98

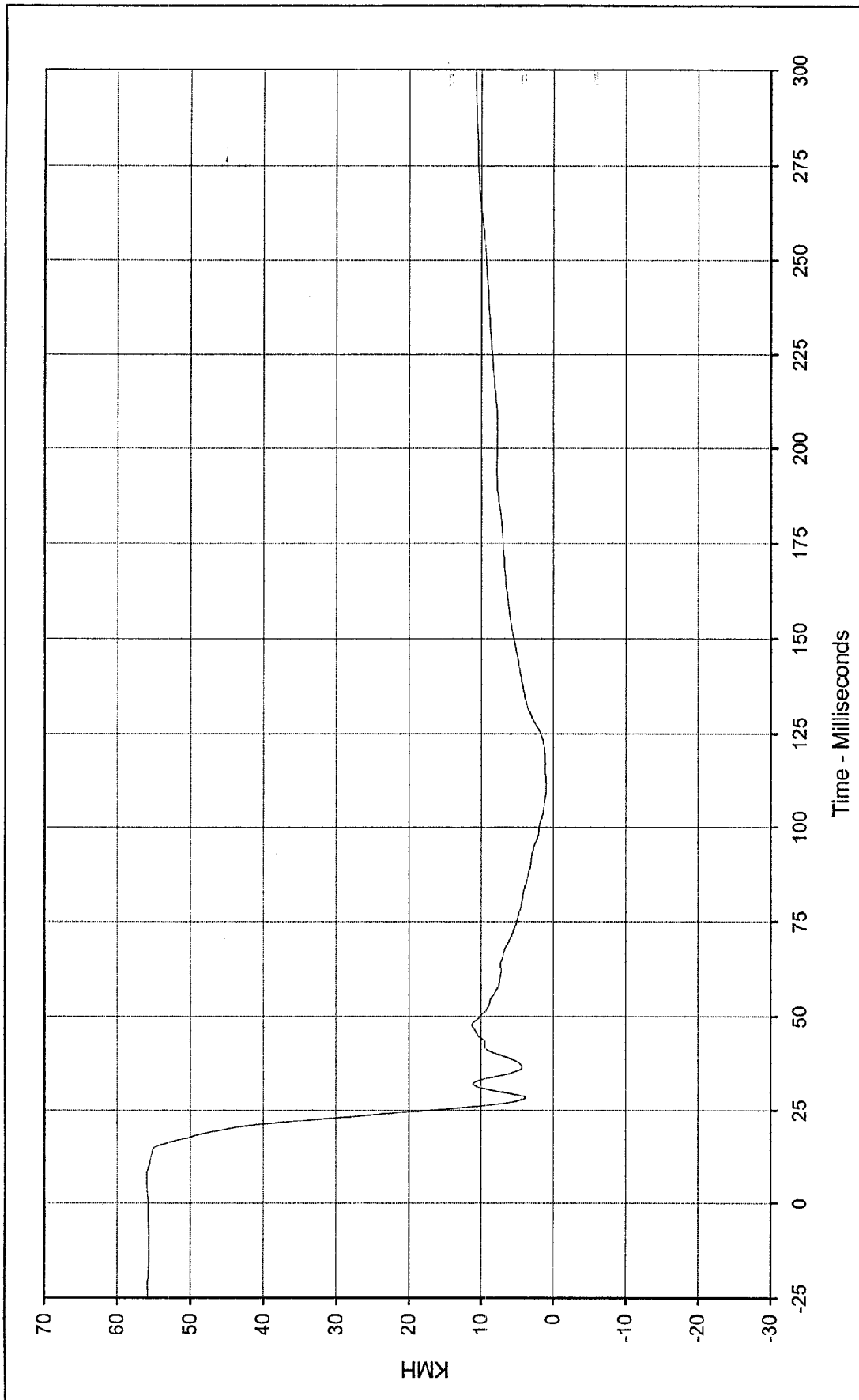
Curve Number: IN2-091





Curve Description:		Vehicle Engine Bottom		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	43.8	at	30.1	Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV
Minimum Value:	-182.3	at	23.8	Milliseconds		
SAE Filter Class:	60					
Date of Test:	2/26/98					
Curve Number:	FIL-092					





Curve Description: Vehicle Engine Bottom Velocity Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Maximum Value: 55.9 at 7.5 Milliseconds Test Vehicle: 1998 Toyota RAV-4 SUV

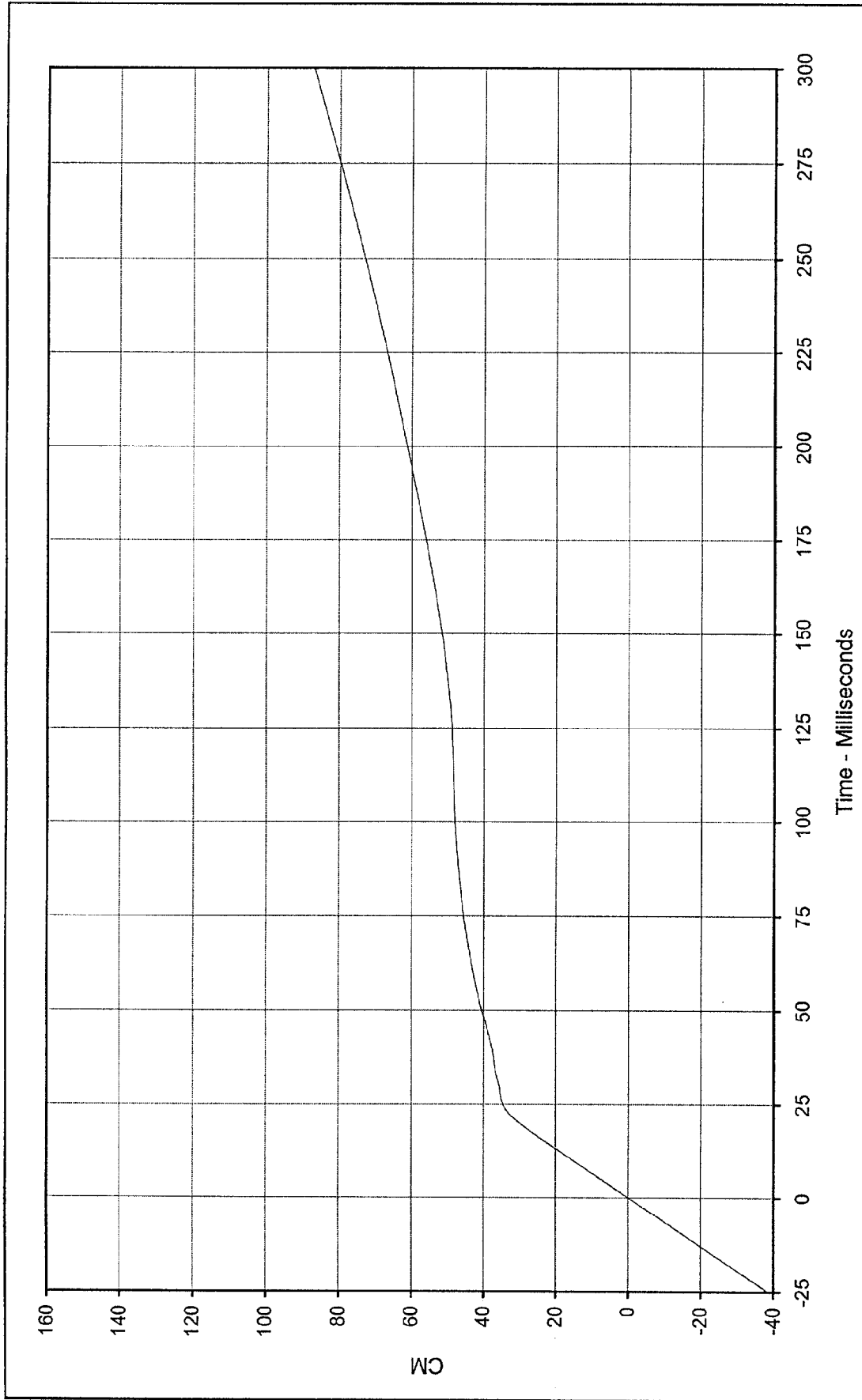
Minimum Value: 1.0 at 109.8 Milliseconds

SAE Filter Class: 180

Date of Test: 2/26/98

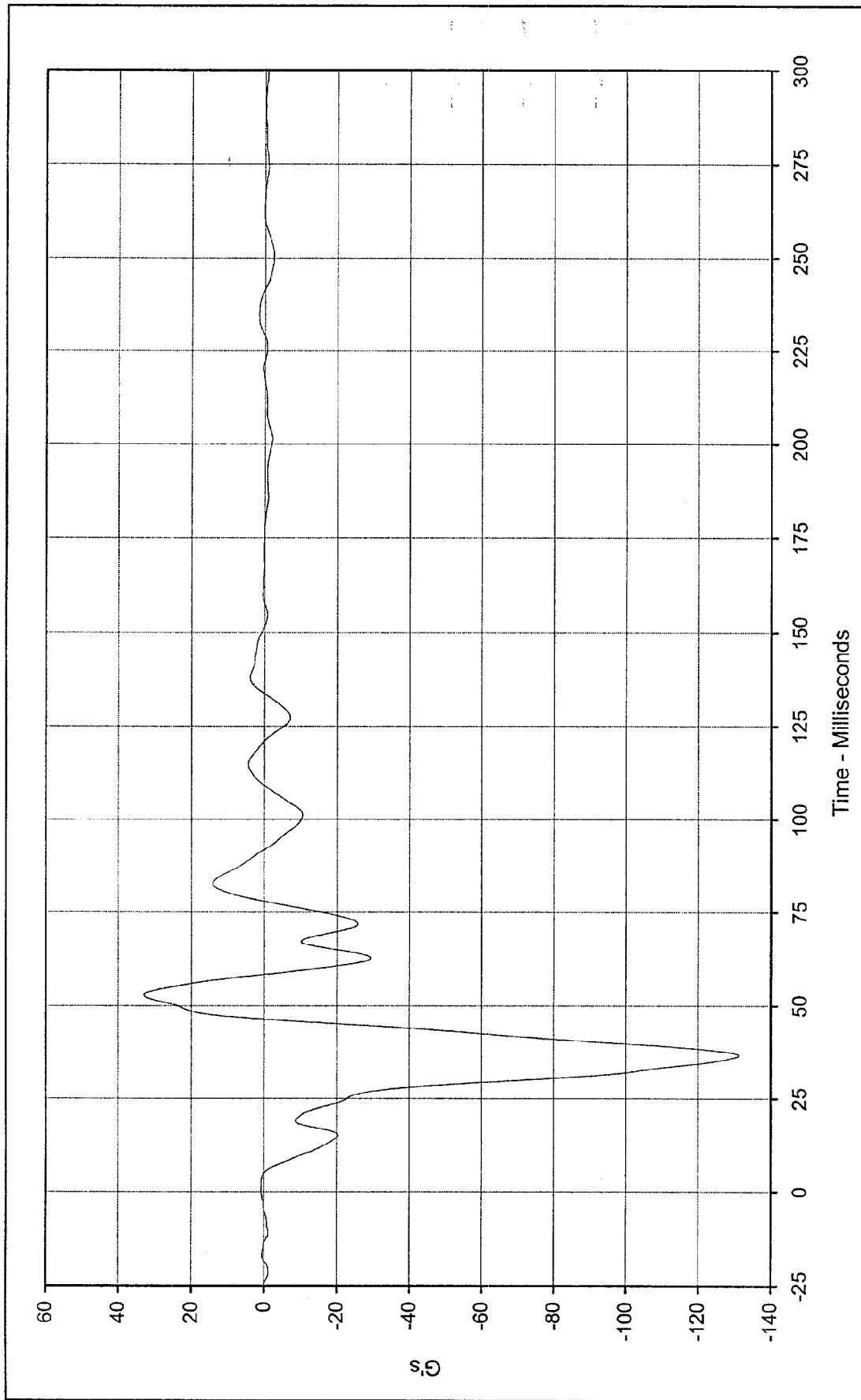
Curve Number: IN1-092





Curve Description:	Vehicle Engine Bottom Displ.	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	87.2 at 299.9 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	0.0 at 0.0 Milliseconds			
SAE Filter Class:	180			
Date of Test:	2/26/98			
Curve Number:	IN2-092			

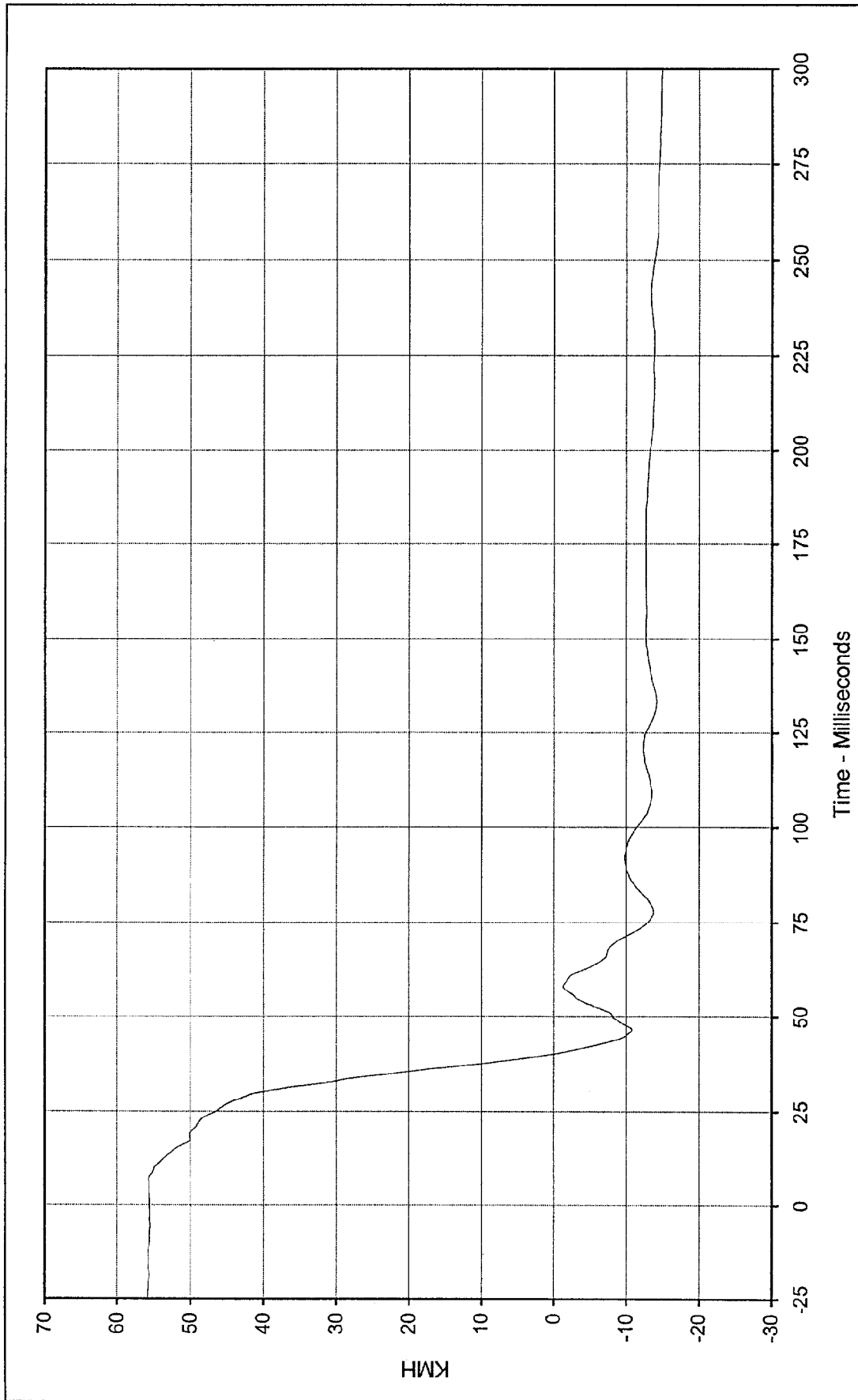




Curve Description:	Vehicle Left Brake Caliper	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	33.0 at 52.9 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-131.3 at 36.5 Milliseconds			
SAE Filter Class:	60			
Date of Test:	2/26/98			
Curve Number:	FIL-093			







Curve Description: Vehicle Left Brake Caliper Velocity

Maximum Value: 55.7 at 7.0 Milliseconds

Minimum Value: -15.0 at 299.9 Milliseconds

SAE Filter Class: 180

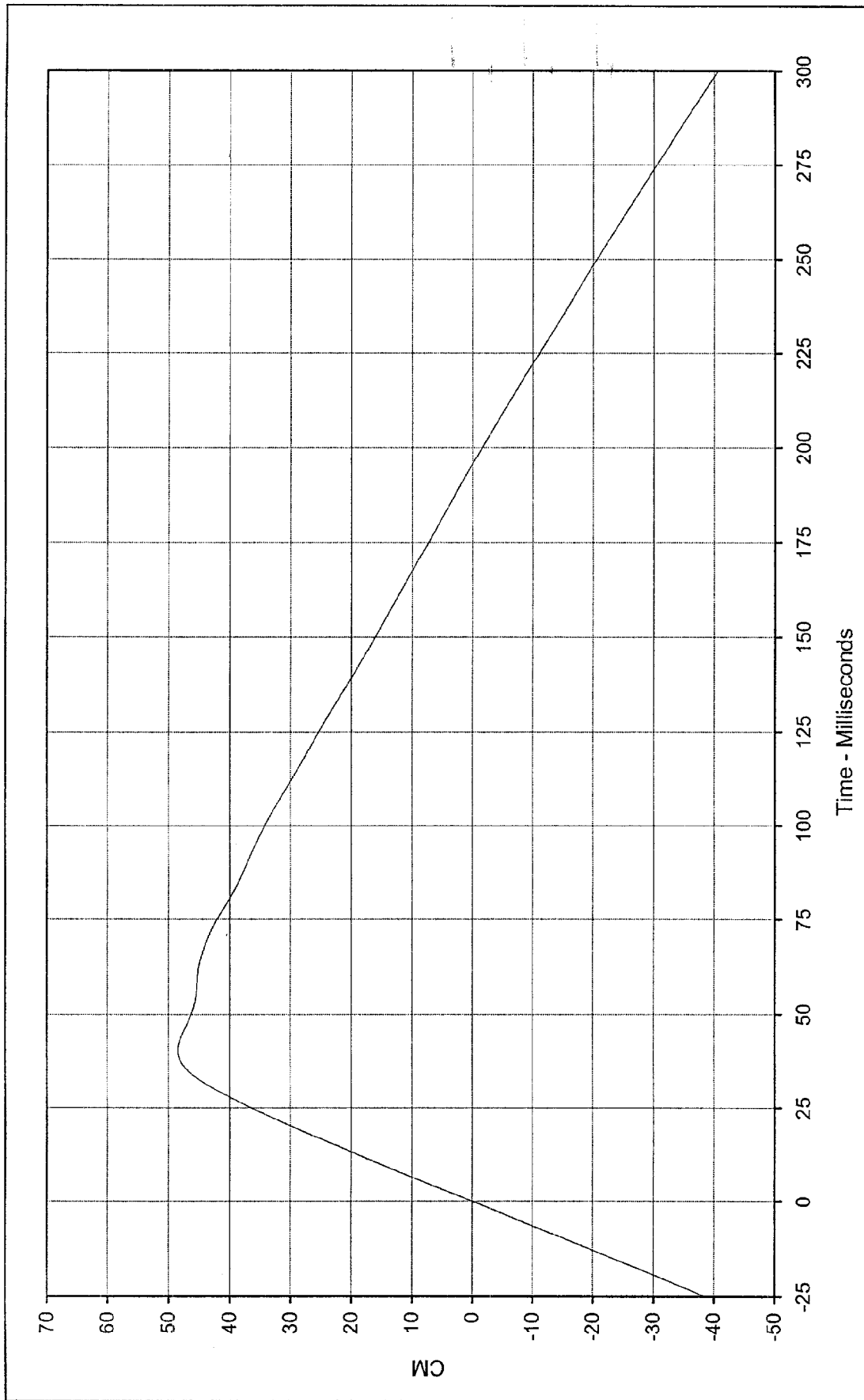
Date of Test: 2/26/98

Curve Number: IN1-093

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Left Brake Caliper Displ.

Maximum Value: 48.4 at 40.1 Milliseconds

Minimum Value: -40.7 at 299.9 Milliseconds

SAE Filter Class: 180

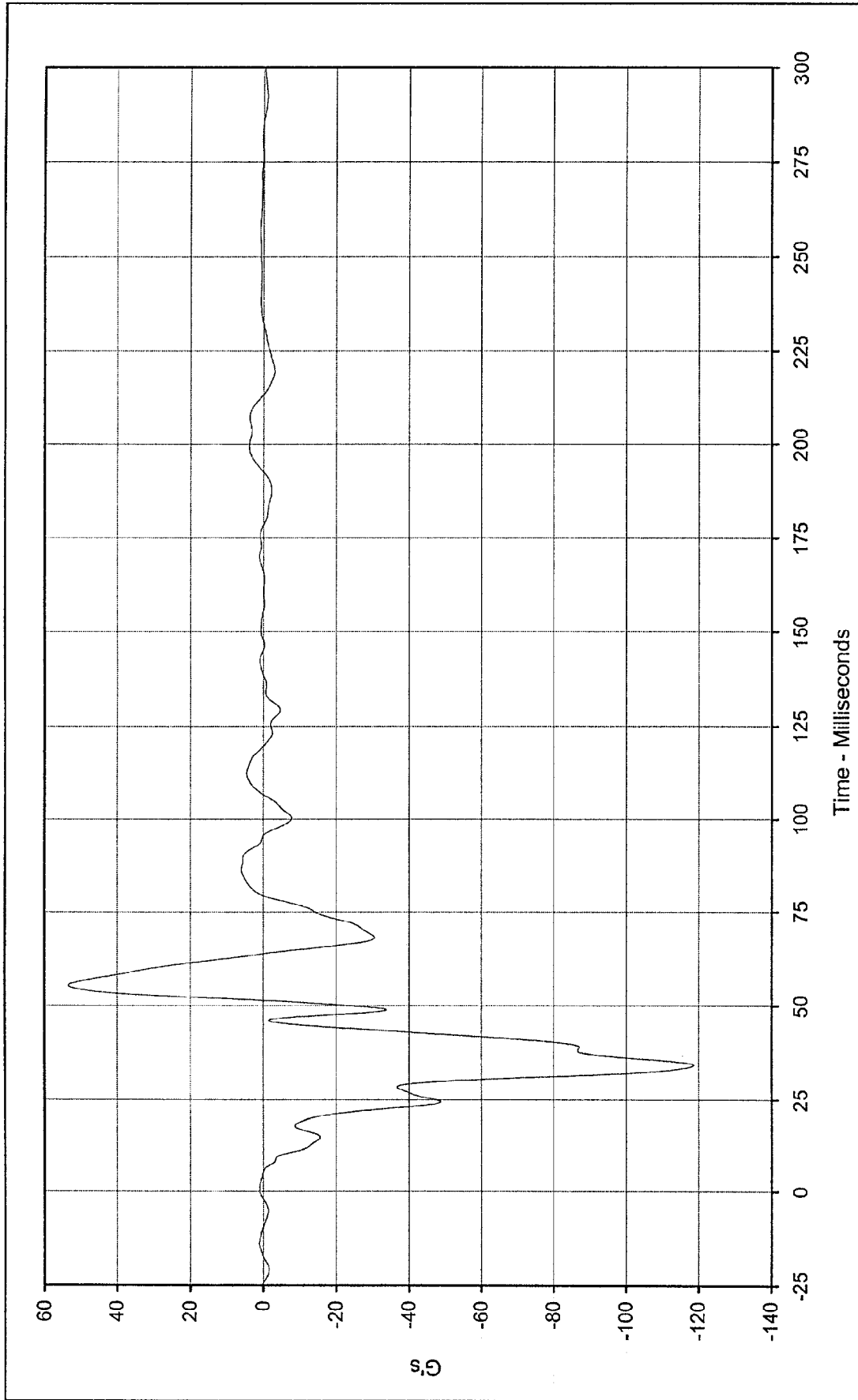
Date of Test: 2/26/98

Curve Number: IN2-093

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Right Brake Caliper

Maximum Value: 53.4 at 55.4 Milliseconds

Minimum Value: -118.6 at 34.2 Milliseconds

SAE Filter Class: 60

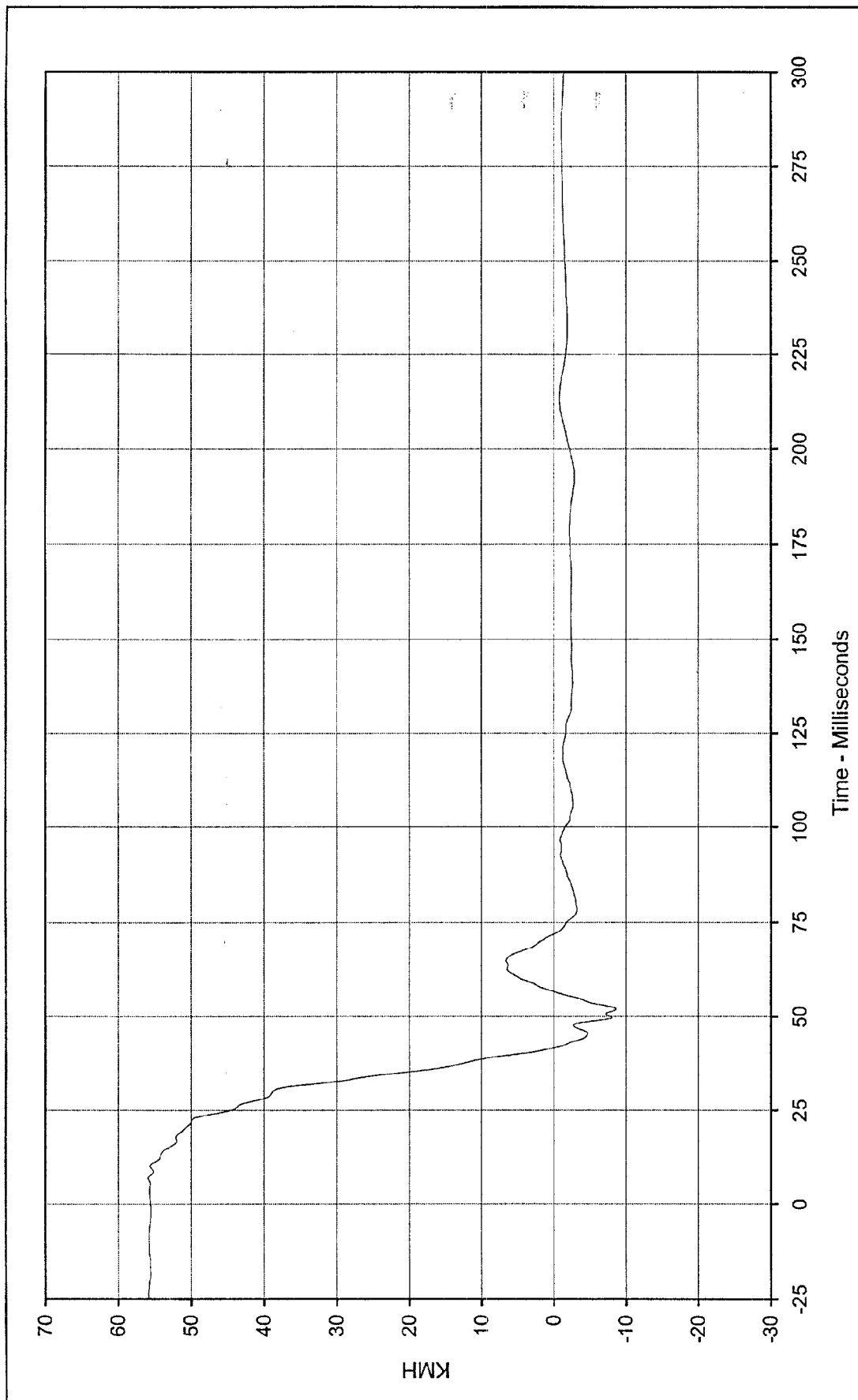
Date of Test: 2/26/98

Curve Number: FIL-094

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Right Brake Caliper Velocity

Maximum Value: 55.9 at 7.0 Milliseconds

Minimum Value: -8.6 at 52.0 Milliseconds

SAE Filter Class: 180

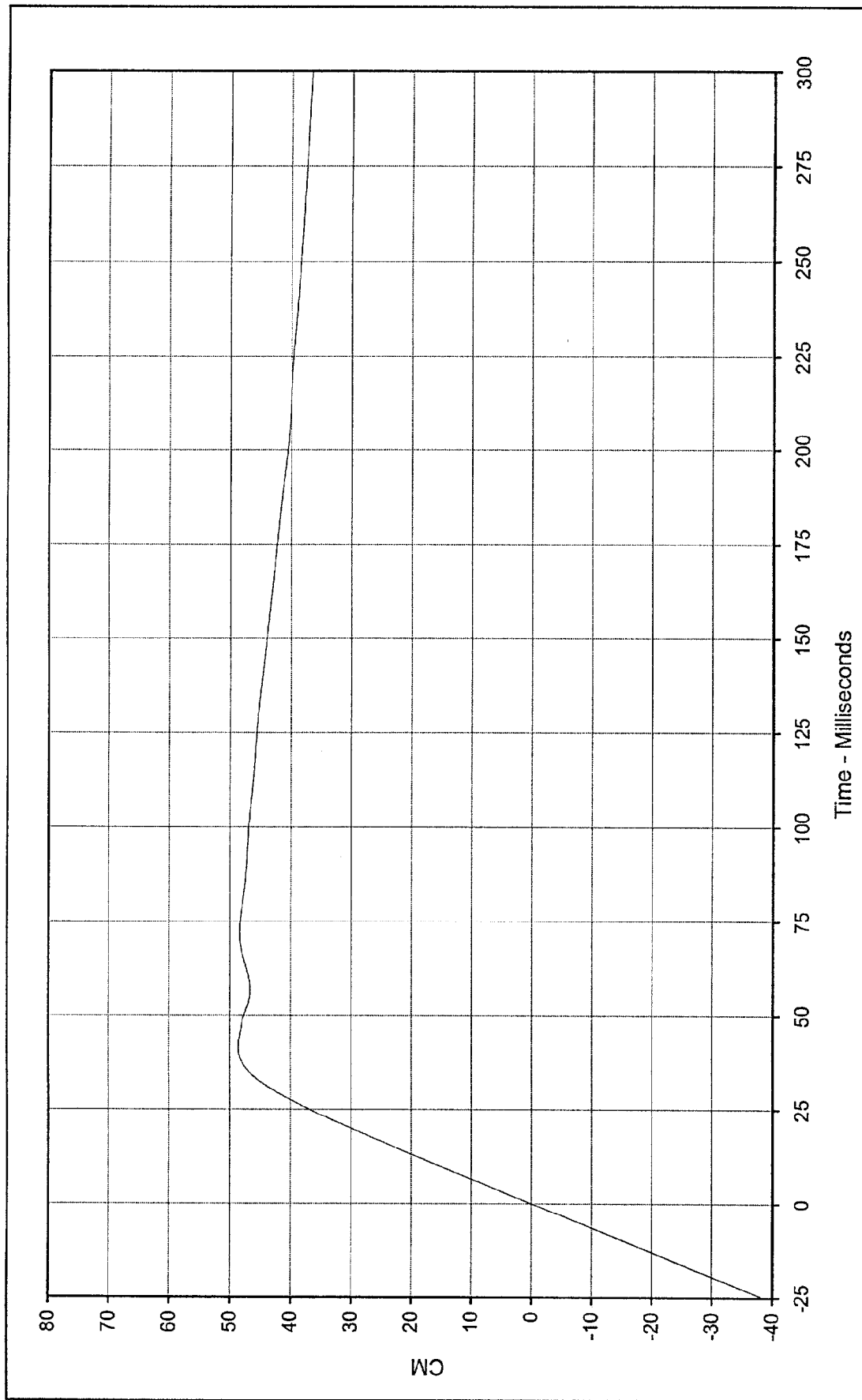
Date of Test: 2/26/98

Curve Number: IN1-094

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Right Brake Caliper Displ.

Maximum Value: 48.6 at 41.5 Milliseconds

Minimum Value: -0.1 at 0.0 Milliseconds

SAE Filter Class: 180

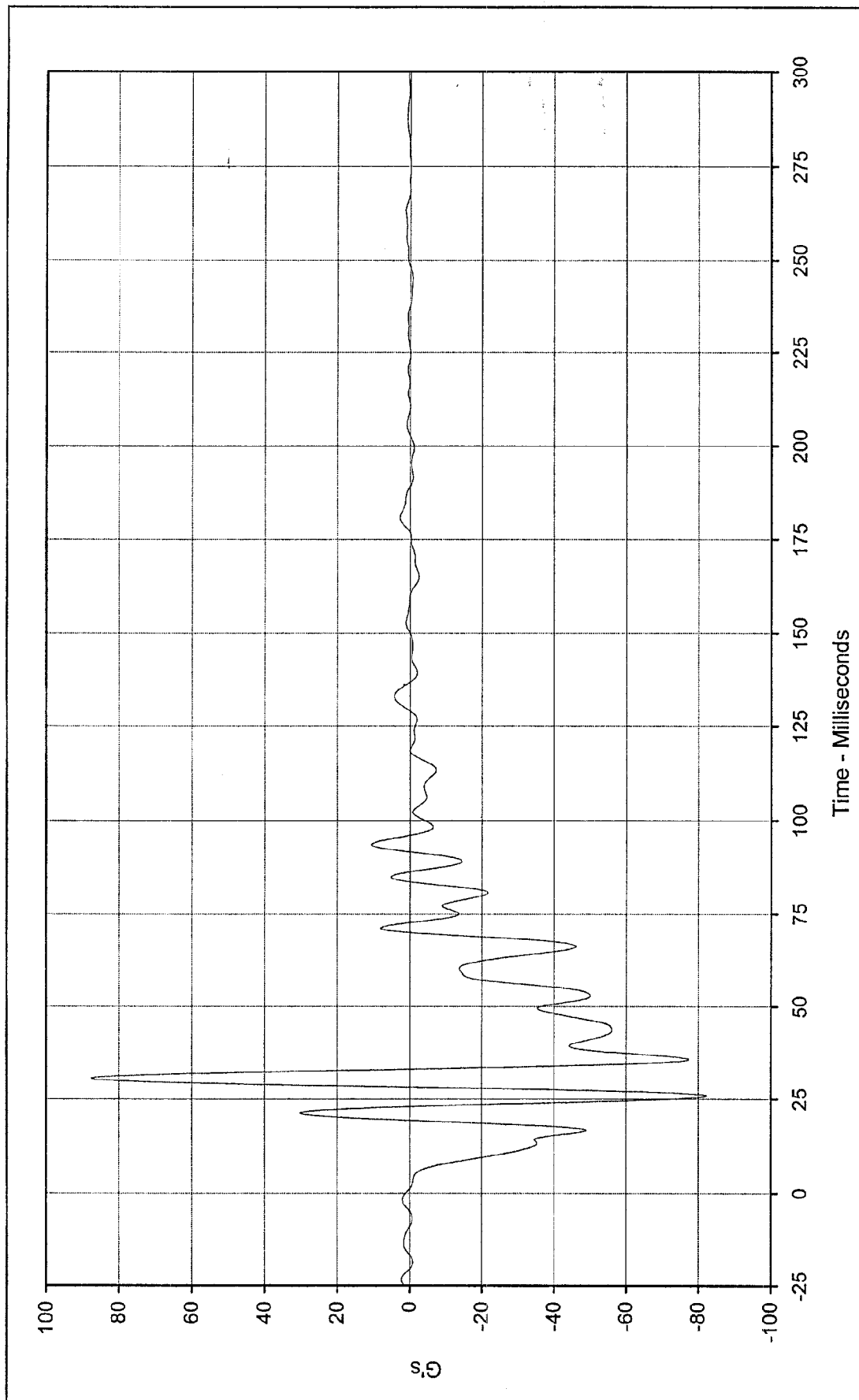
Date of Test: 2/26/98

Curve Number: IN2-094

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

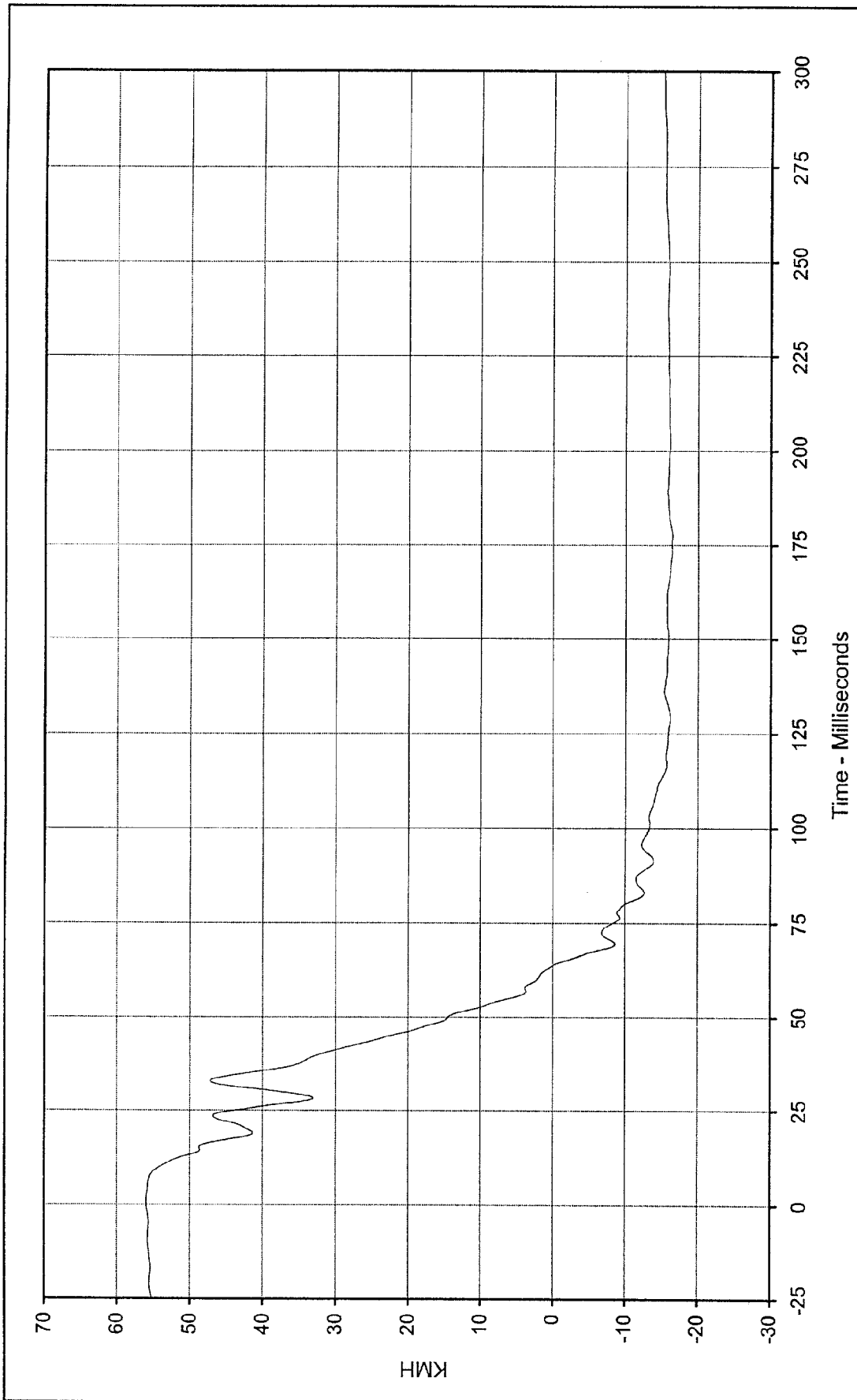
Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: _____ Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Maximum Value: 87.5 at 30.5 Milliseconds
 Minimum Value: -82.3 at 25.9 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/26/98
 Curve Number: FIL-095

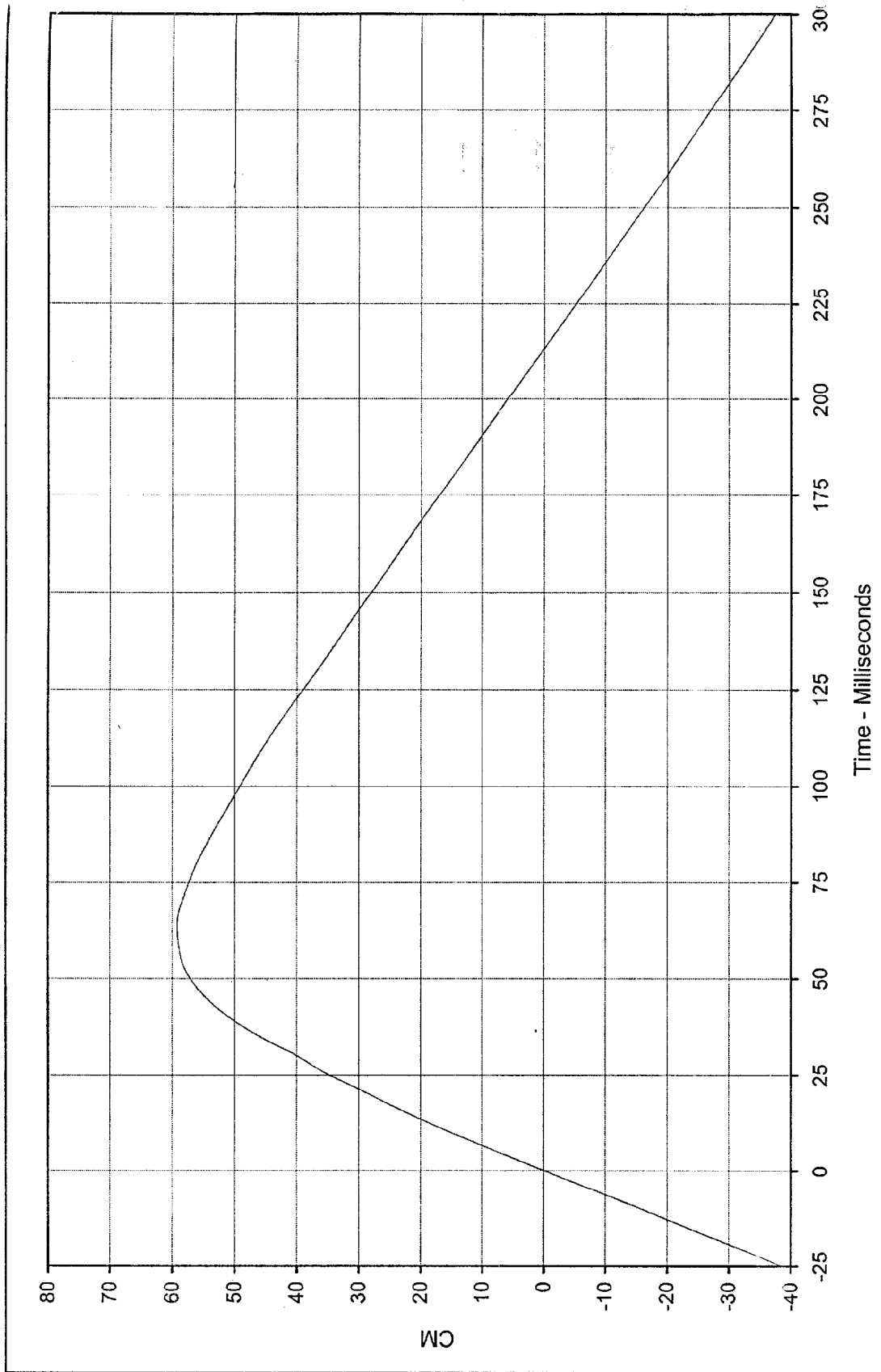




Curve Description:	Vehicle Instrument Panel Velocity		Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	56.0	at 0.7	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-16.5	at 177.7			
SAE Filter Class:	180				
Date of Test:	2/26/98				
Curve Number:	IN1-095				



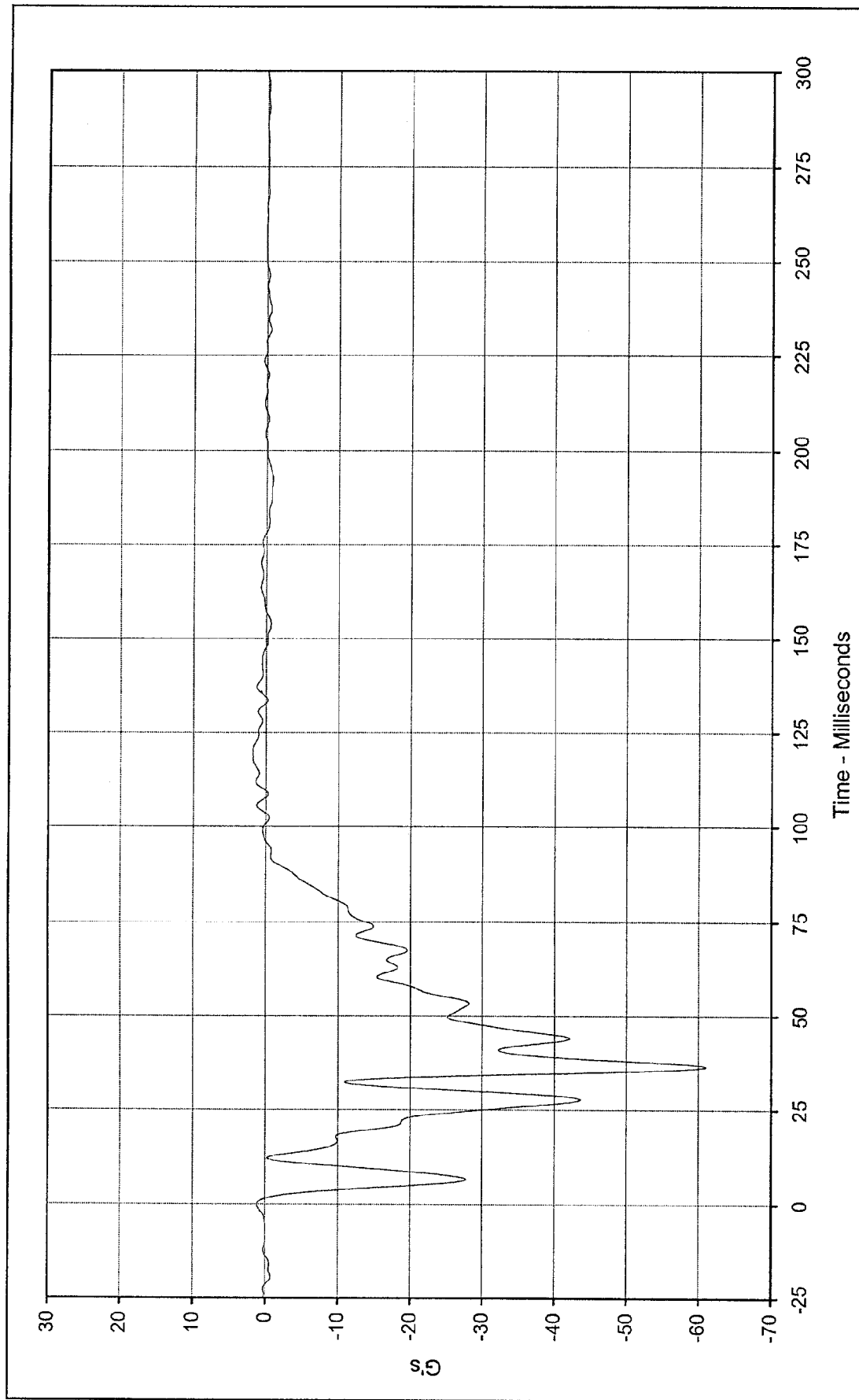




Curve Description: Vehicle Instrument Panel Displ. _____
 Maximum Value: 59.2 at 63.8 Milliseconds
 Minimum Value: -37.6 at 299.9 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN2-095

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description: Vehicle Left Rear Redundant

Maximum Value: 1.8 at 118.1 Milliseconds

Minimum Value: -61.1 at 36.4 Milliseconds

SAE Filter Class: 60

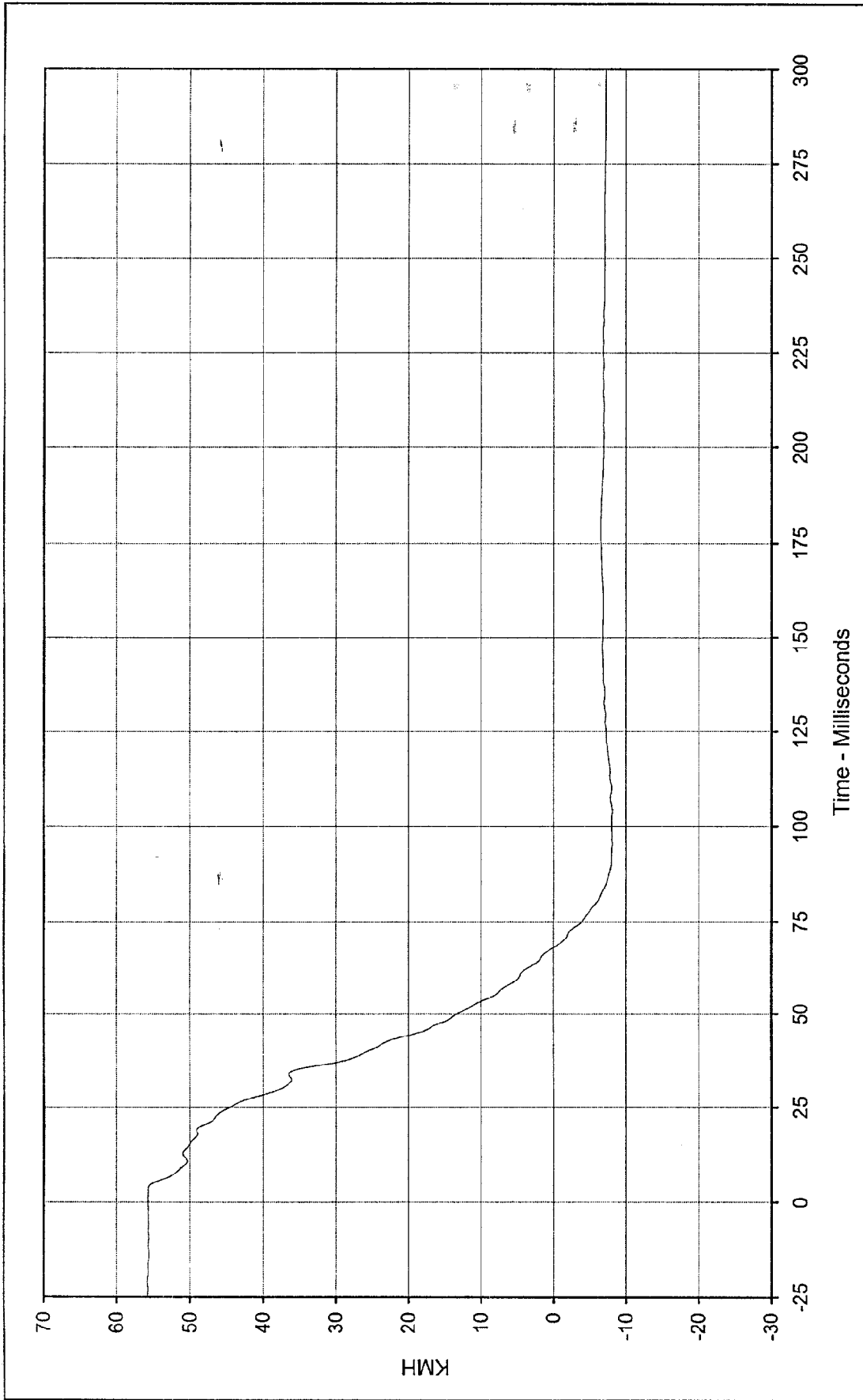
Date of Test: 2/26/98

Curve Number: FIL-096

Testing Program 1998 NHTSA 35 mph NCAP No.: MW5110

Test Vehicle: 1998 Toyota RAV-4 SUV

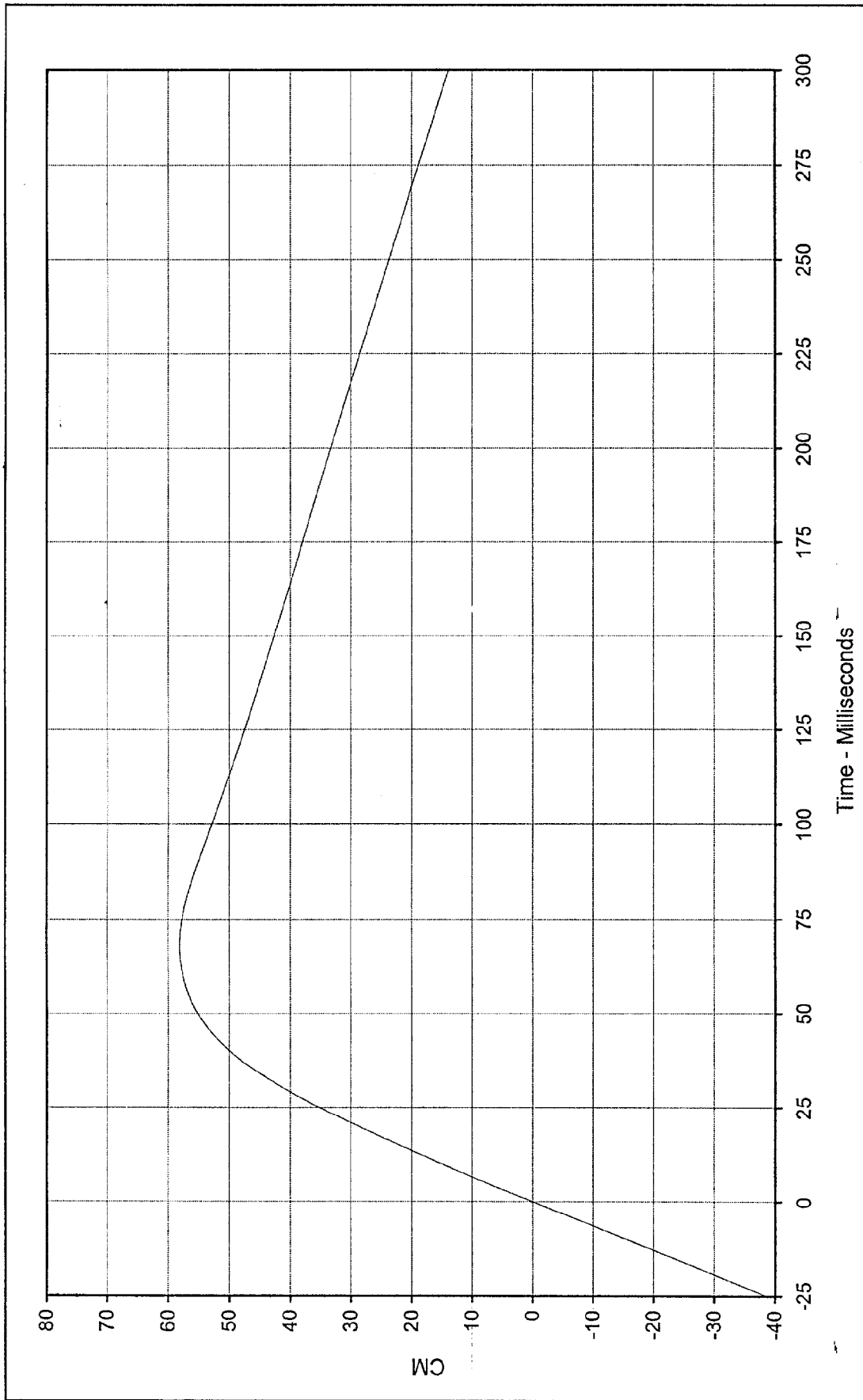




Curve Description: Vehicle Left Rear Redundant Velocity
 Maximum Value: 55.7 at 0.4 Milliseconds
 Minimum Value: -8.1 at 104.0 Milliseconds
 SAE Filter Class: 180
 Date of Test: 2/26/98
 Curve Number: IN1-096

Testing Program: 1998 NHTSA 35 mph NCAP No.: MW5110
 Test Vehicle: 1998 Toyota RAV-4 SUV





Curve Description:	Vehicle Left Rear Redundant Displ.	Testing Program	1998 NHTSA 35 mph NCAP	No.: MW5110
Maximum Value:	58.1 at 67.8 Milliseconds	Test Vehicle:	1998 Toyota RAV-4 SUV	
Minimum Value:	-0.1 at 0.0 Milliseconds			
SAE Filter Class:	180			
Date of Test:	2/26/98			
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: 2/26/98

Vehicle: 1998 Toyota RAV-4 CRV

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: 2/26/98

Vehicle: 1998 Toyota RAV-4 CRV

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	GPLT03FY	3 ch., lower tibia gage	R. A. Denton	1584	N
30	LWR. TIBIA LEFT FORCE	Z	GPLT03FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
31	LWR. TIBIA LEFT MOM.	X	GPLT03MX	3 ch., lower tibia gage	R. A. Denton	1584	N.m
32	LWR. TIBIA RIGHT FORCE	Y	GPLT04FY	3 ch., lower tibia gage	R. A. Denton	1584	N
33	LWR. TIBIA RIGHT FORCE	Z	GPLT04FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
34	LWR. TIBIA RIGHT MOM.	X	GPLT04MX	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	Celeco	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: 2/26/98

Vehicle: 1998 Toyota RAV-4 CRV

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: 2/26/98

Vehicle: 1998 Toyota RAV-4 CRV

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: 2/26/98

Vehicle: 1998 Toyota RAV-4 CRV

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

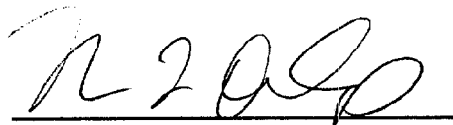
Left Knee Impact Test

ATD Serial No.: 034

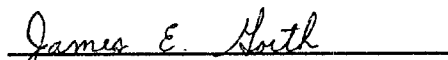
Part Serial No.: n/a

Test I.D.: KI001

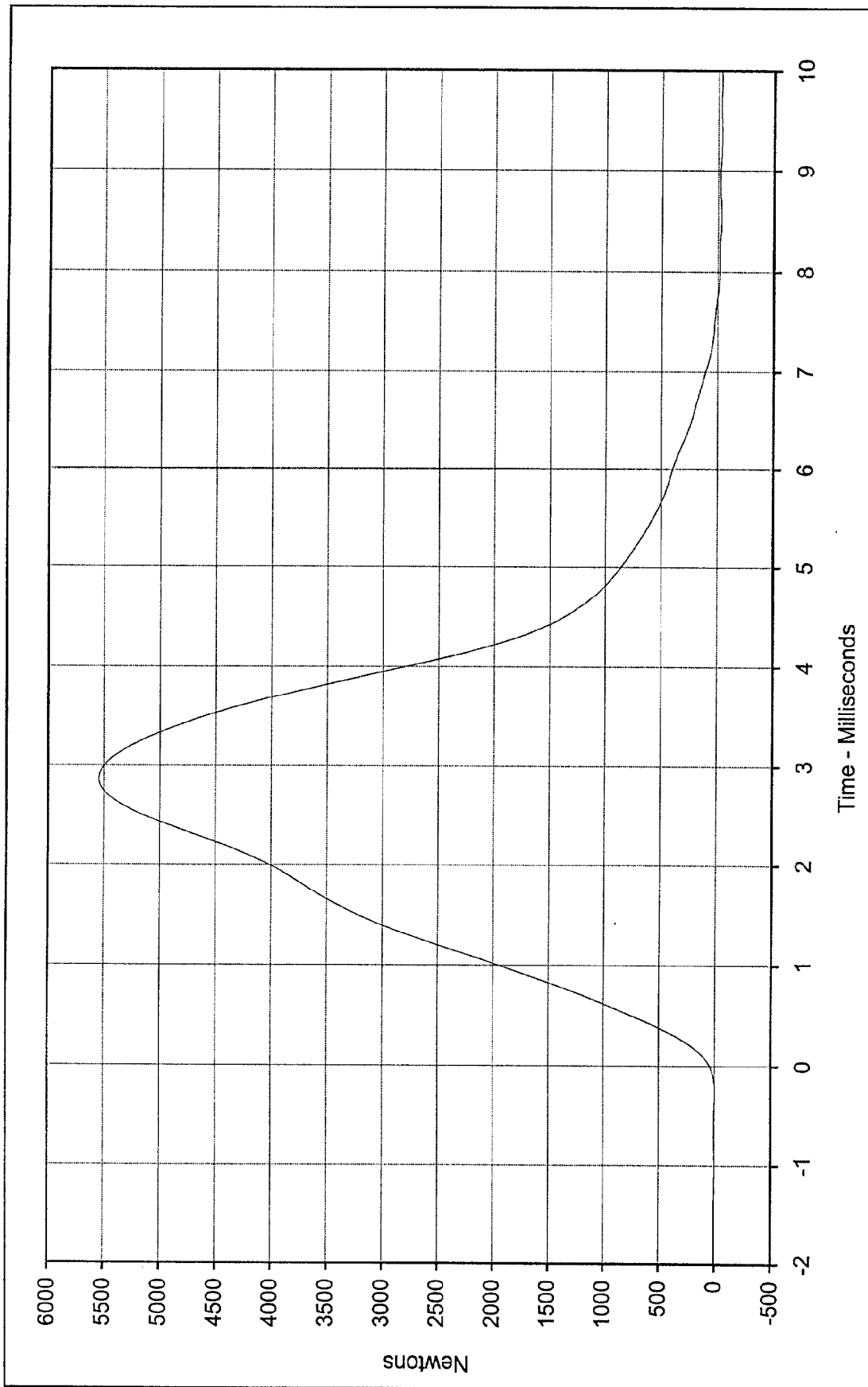
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.082	Pass
Peak Probe Force	Newtons	4715 to 5782	5542.2	Pass
Overall Test Results				Pass


Laboratory Technician

February 22, 1998
Test Date


Approved By

2/22/98
Date



Testing Program: Hybrid III Left Knee Impact Test
 Test Information: Part S/N: n/a Test I.D.: K1001



Curve Description: Probe Force
 Maximum Value: 5542.2 at 2.9 Milliseconds
 Minimum Value: -20.4 at 8.0 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/22/98
 ATD Serial No.: 034



Hybrid III Calibration Data Sheet

50TH Percentile Male

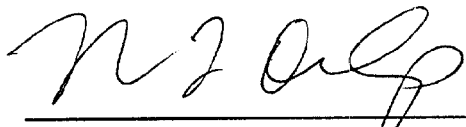
Right Knee Impact Test

ATD Serial No.: 034

Part Serial No.: n/a

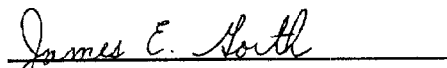
Test I.D.: KI004

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.082	Pass
Peak Probe Force	Newtons	4715 to 5782	5574.9	Pass
Overall Test Results				Pass


Laboratory Technician

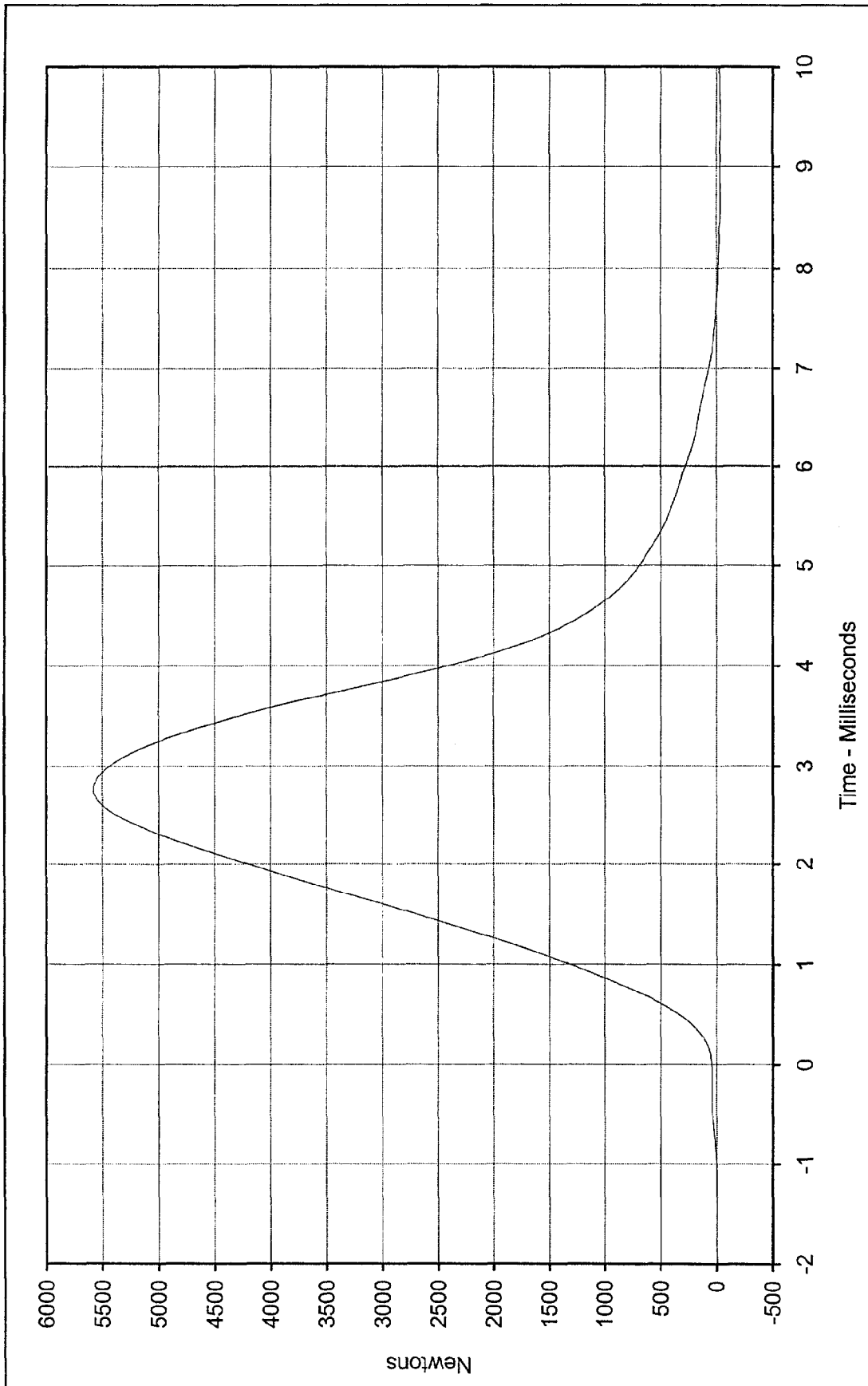
February 22, 1998

Test Date


Approved By

2/22/98

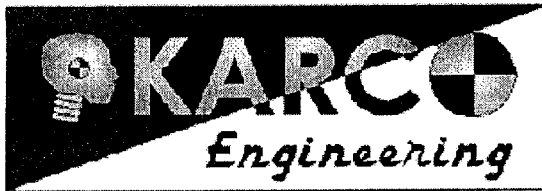
Date



Testing Program: Hybrid III Right Knee Impact Test
 Test Information: Part S/N: n/a Test I.D.: KI004



Curve Description: Probe Force
 Maximum Value: 5574.9 at 2.8 Milliseconds
 Minimum Value: -14.2 at 8.0 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/22/98
 ATD Serial No.: 034



Hybrid III Calibration Data Sheet

50TH Percentile Male

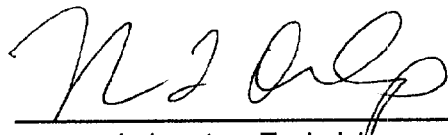
Head Drop Calibration

ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: H7000

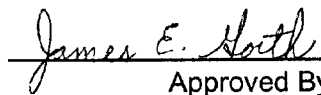
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	268.3	Pass
Peak Lateral Acceleration	G's	≤15.0	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Laboratory Technician

February 21, 1998

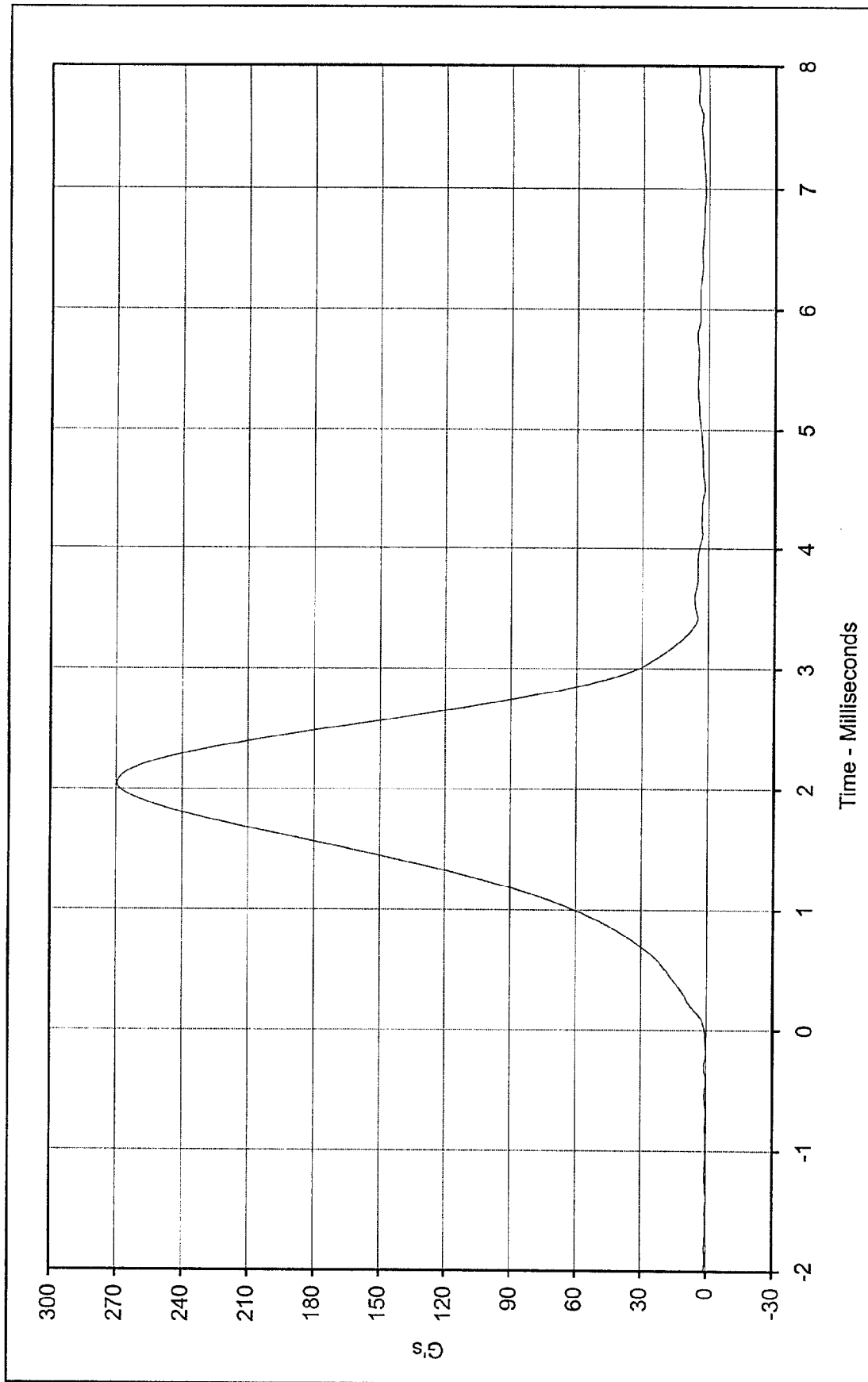
Test Date



Approved By

2/22/98

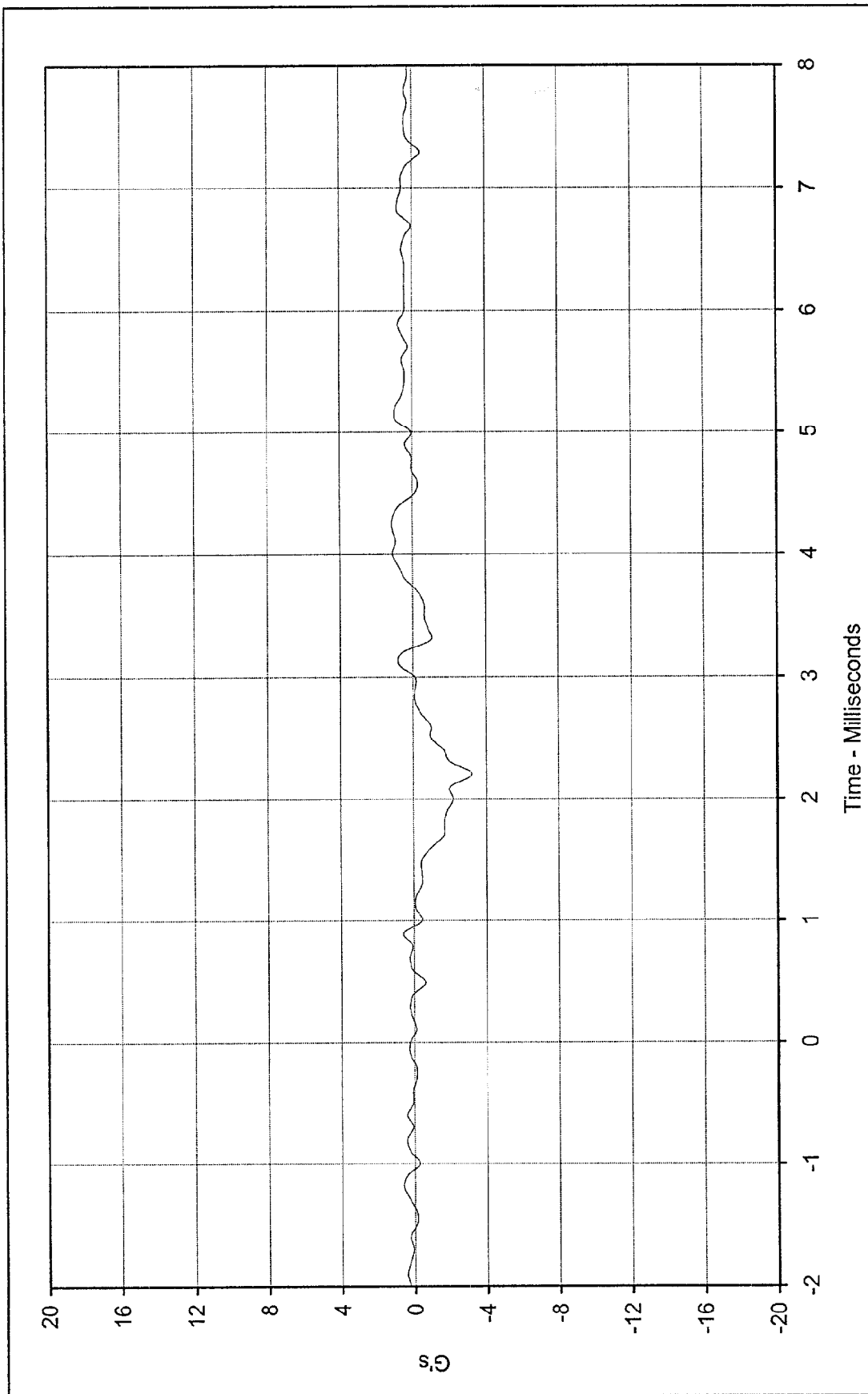
Date



Curve Description: Head Resultant Acceleration
 Maximum Value: 268.3 at 2.1 Milliseconds
 Minimum Value: 0.1 at -1.4 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/21/98
 ATD Serial No.: 034

Testing Program: Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: n/a Test I.D.: H7000

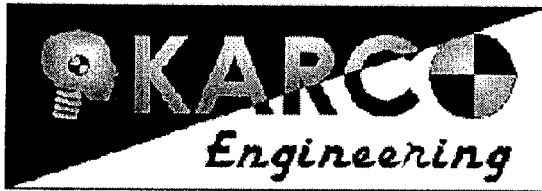




Testing Program: Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: n/a Test I.D.: H7000

Curve Description: Head Acceleration Y Axis
 Maximum Value: 1.1 at 4.0 Milliseconds
 Minimum Value: -3.2 at 2.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/21/98
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

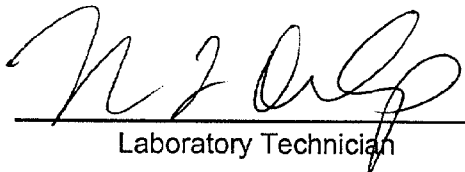
Thorax Impact Test

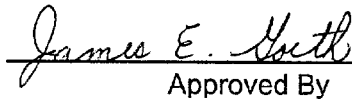
ATD Serial No.: 034

Part Serial No.: N/A

Test I.D.: CST13

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	5632	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.35	Pass
Internal Hysteresis	%	69 to 85	81.9	Pass
Overall Test Results				Pass


Laboratory Technician

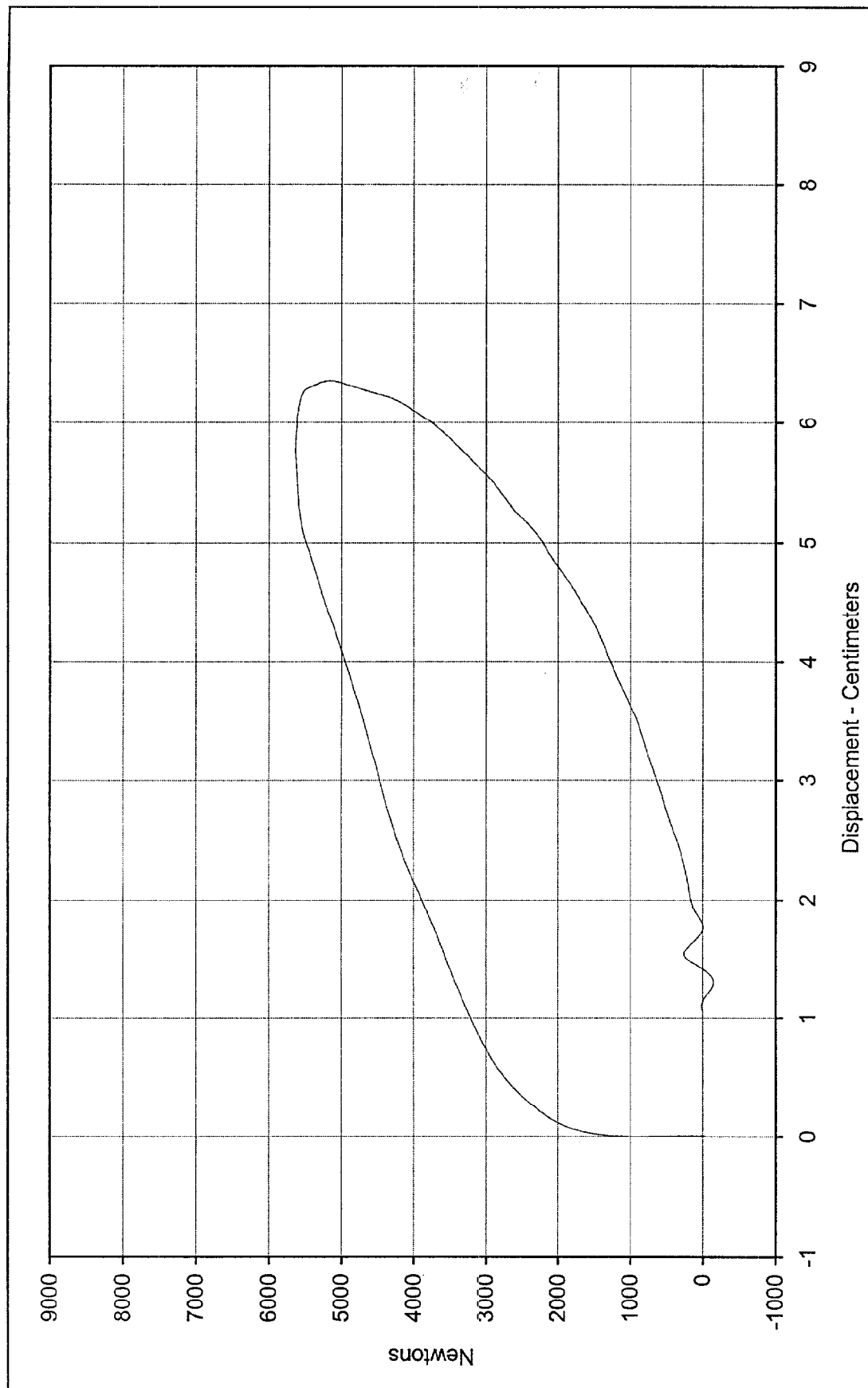

Approved By

March 20, 1998

Test Date

3/20/98

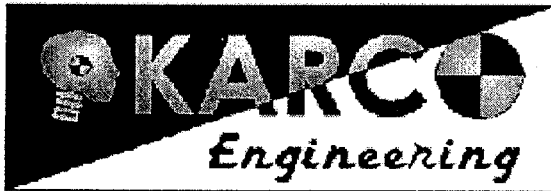
Date



Curve Description: Probe Force vs. Chest Displacement Testing Program: Hybrid III Thorax Impact Test
 Probe Force: 5632.1 Newtons Test Information: S/N of Part: N/A Test I.D.: CST13
 Chest Displ.: 6.35 Centimeters

SAE Filter Class: 180
 Date of Test: 3/20/98
 ATD Serial No.: 034





Hybrid III Calibration Data Sheet

50TH Percentile Male

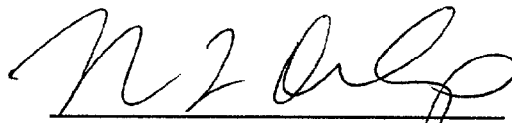
Neck Flexion Test

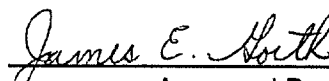
ATD Serial No.: 034

Part Serial No.: n/a

Test I.D.: NF201

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	23.6	Pass
	20 Msec.	G's	17.6 to 22.6	20.4	Pass
	30 Msec.	G's	12.5 to 18.5	16.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	76.2	Pass
	Time	Msec.	57.0 to 64.0	61.8	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	123.8	Pass
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	89.6	Pass
	Time	Msec.	47.0 to 58.0	55.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	103.9	Pass
Overall Test Results				Pass	

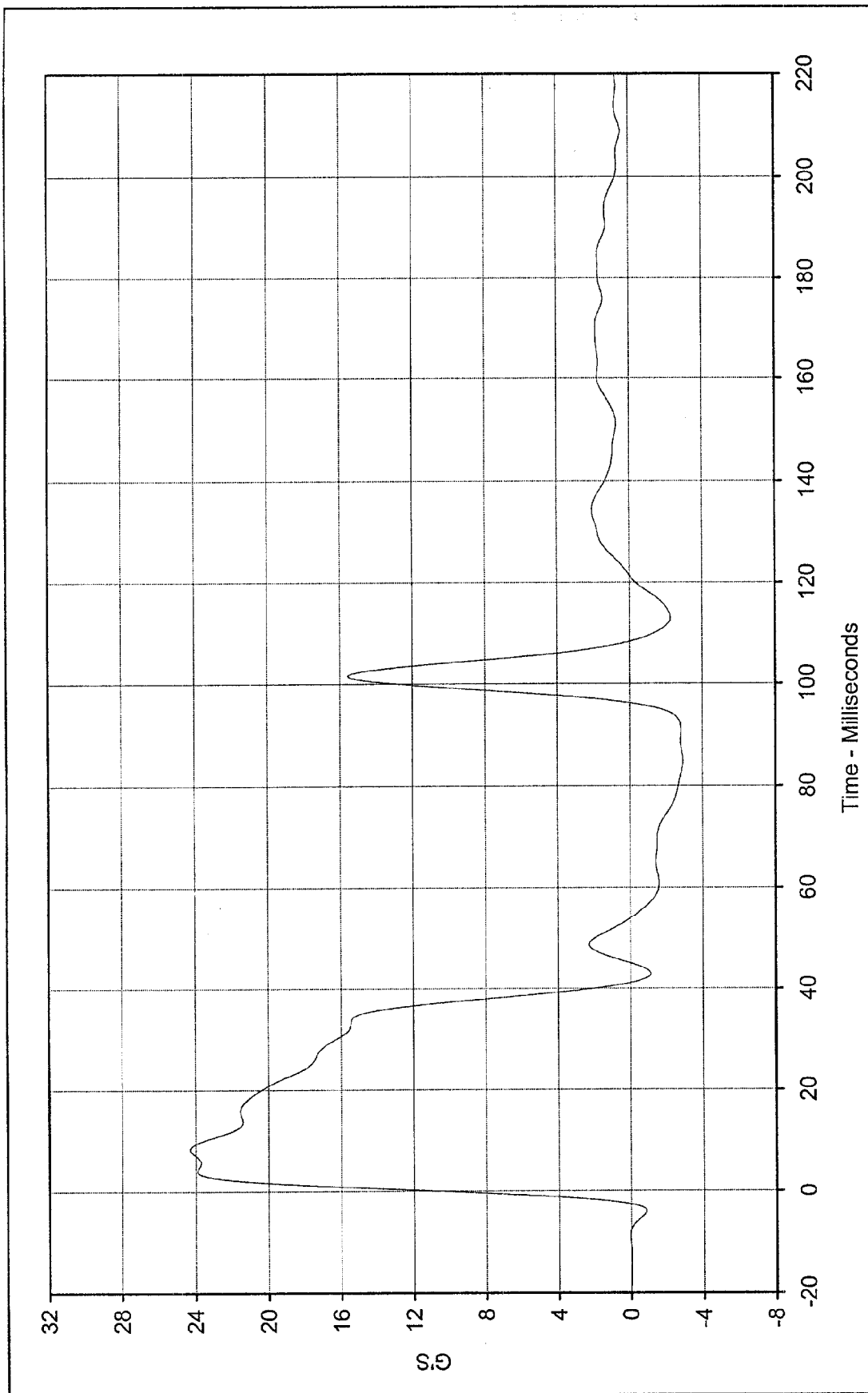

Laboratory Technician


Approved By

February 24, 1998

Test Date

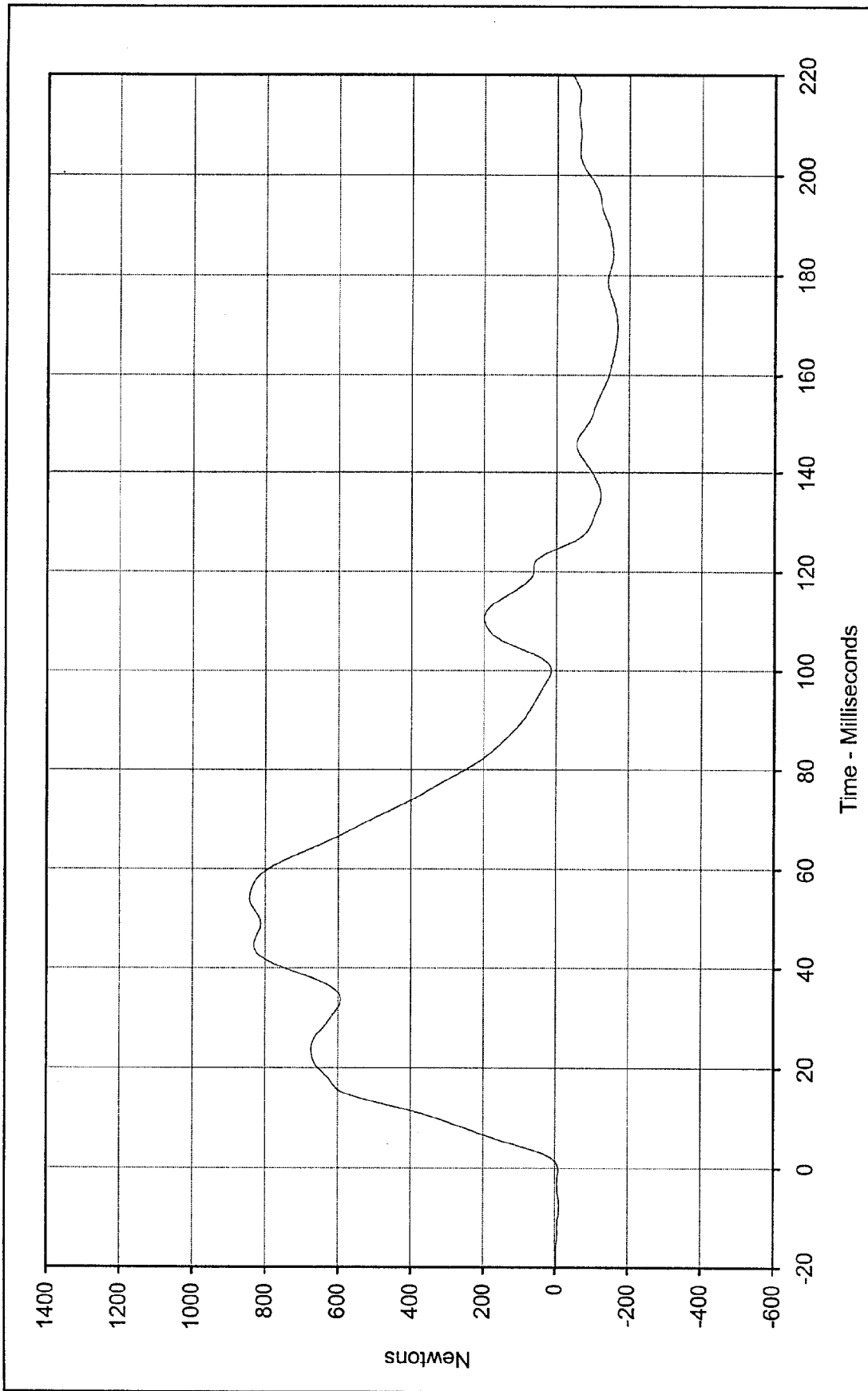
2/24/98
Date



Curve Description: Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NF201

Pendulum Deceleration
 Maximum Value: 24.3 at 8.4 Milliseconds
 Minimum Value: -2.9 at 84.8 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 034

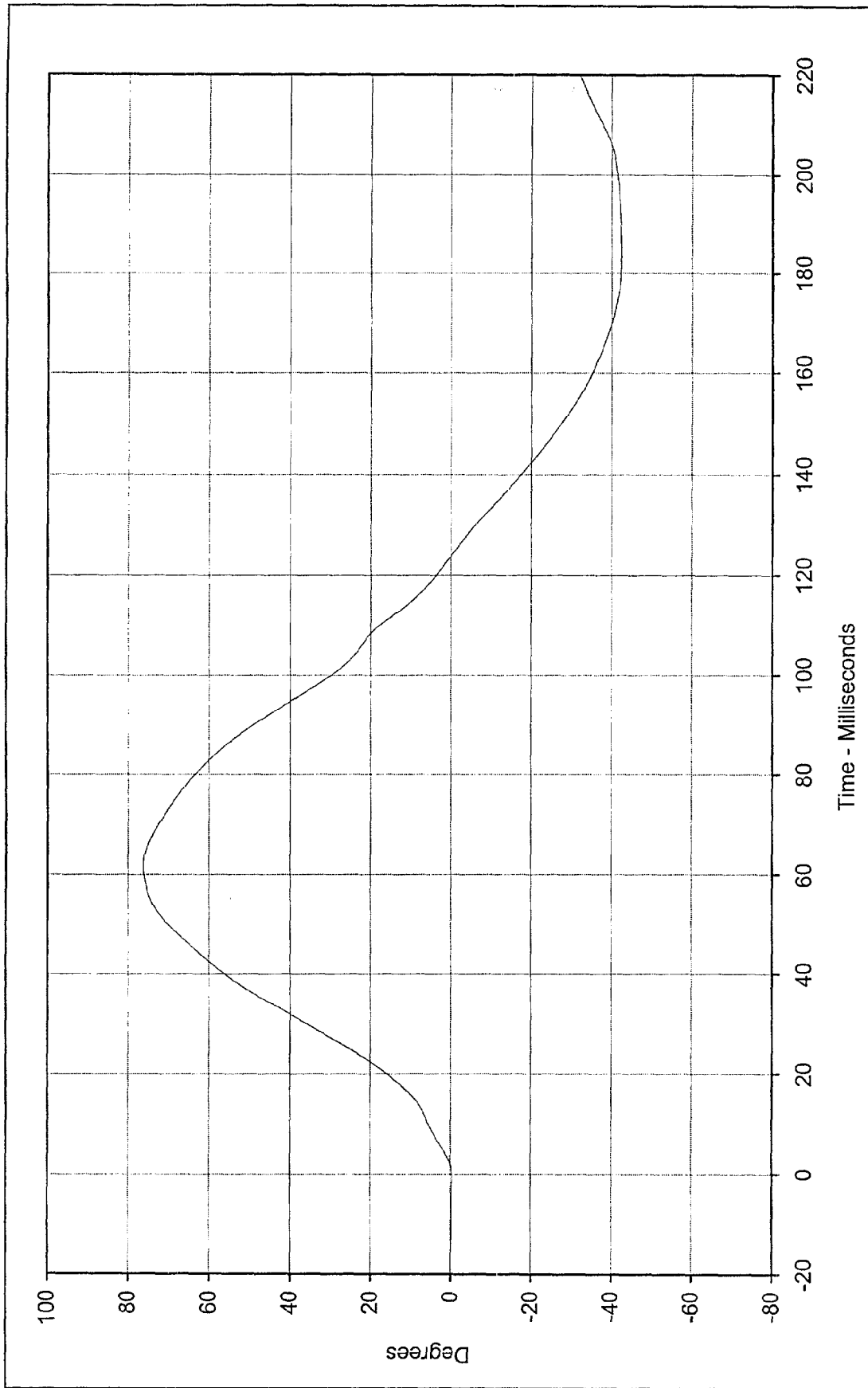




Curve Description: Neck Force X
 Maximum Value: 842.9 at 54.1 Milliseconds
 Minimum Value: -166.7 at 169.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 034

Testing Program: Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NF201

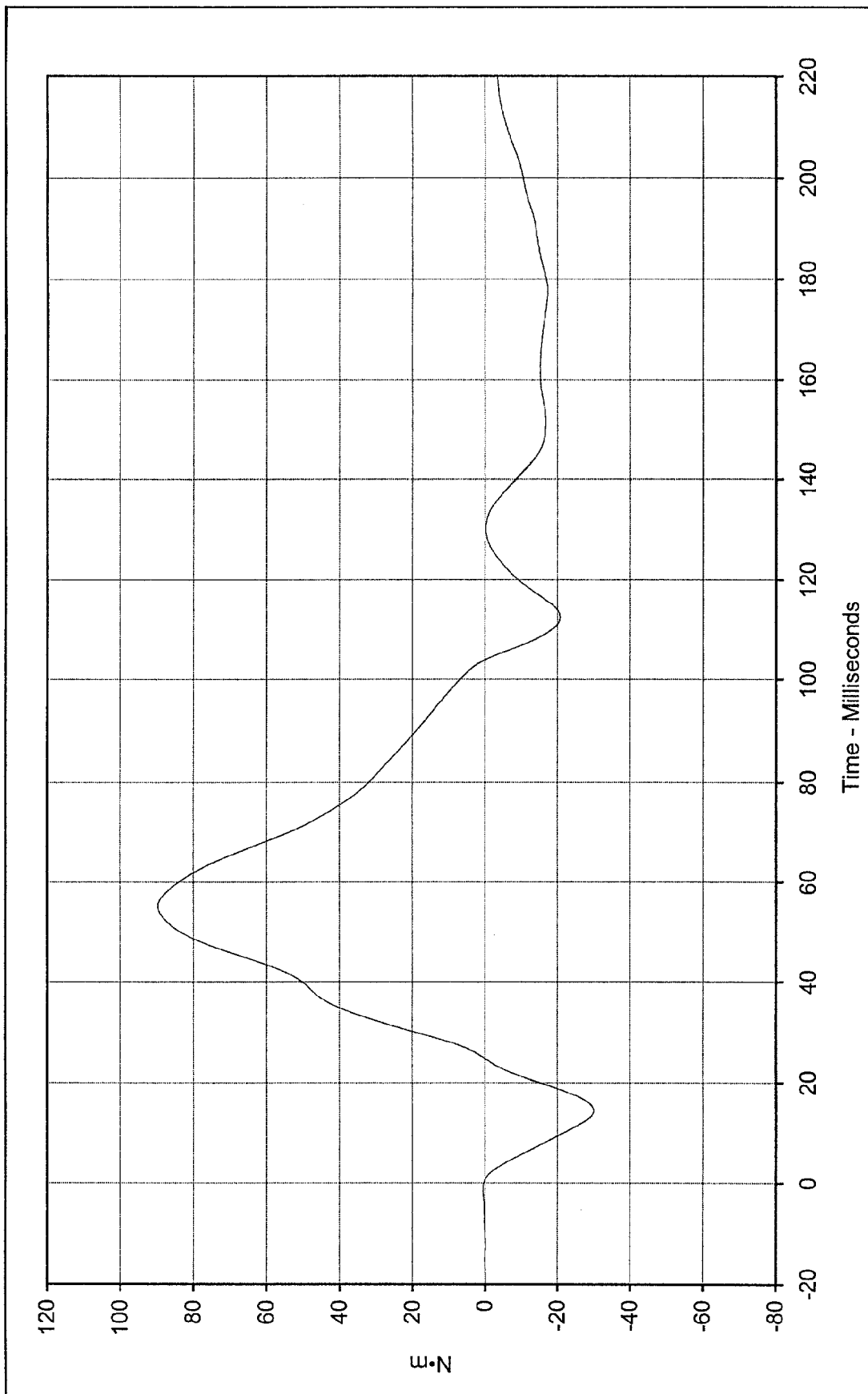




Testing Program: Hybrid III Neck Flexion Test (Male)
 Test Information: SN of Part: n/a Test I.D.: NF201

Curve Description: "D" Plane Rotation
 Maximum Value: 76.2 at 61.8 Milliseconds
 Minimum Value: -42.4 at 183.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 034





Curve Description: Moment About Occipital Condyles

Maximum Value:	89.6	at	55.1	Milliseconds
Minimum Value:	-30.0	at	14.4	Milliseconds
SAE Filter Class:	60			
Date of Test:	2/24/98			
ATD Serial No.:	034			

Testing Program Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF201





Hybrid III Calibration Data Sheet

50TH Percentile Male

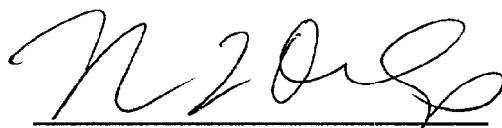
Neck Extension Test

ATD Serial No.: 34

Part Serial No.: n/a

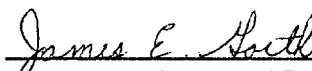
Test I.D.: NE201

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	6.17	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.0	Pass
	20 Msec.	G's	14.0 to 19.0	17.6	Pass
	30 Msec.	G's	11.0 to 16.0	14.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	44.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	101.8	Pass
	Time	Msec.	72.0 to 82.0	77.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	157.6	Pass
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-70.1	Pass
	Time	Msec.	65.0 to 79.0	67.0	Pass
Negative Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	143.8	Pass
Overall Test Results					Pass


Laboratory Technician

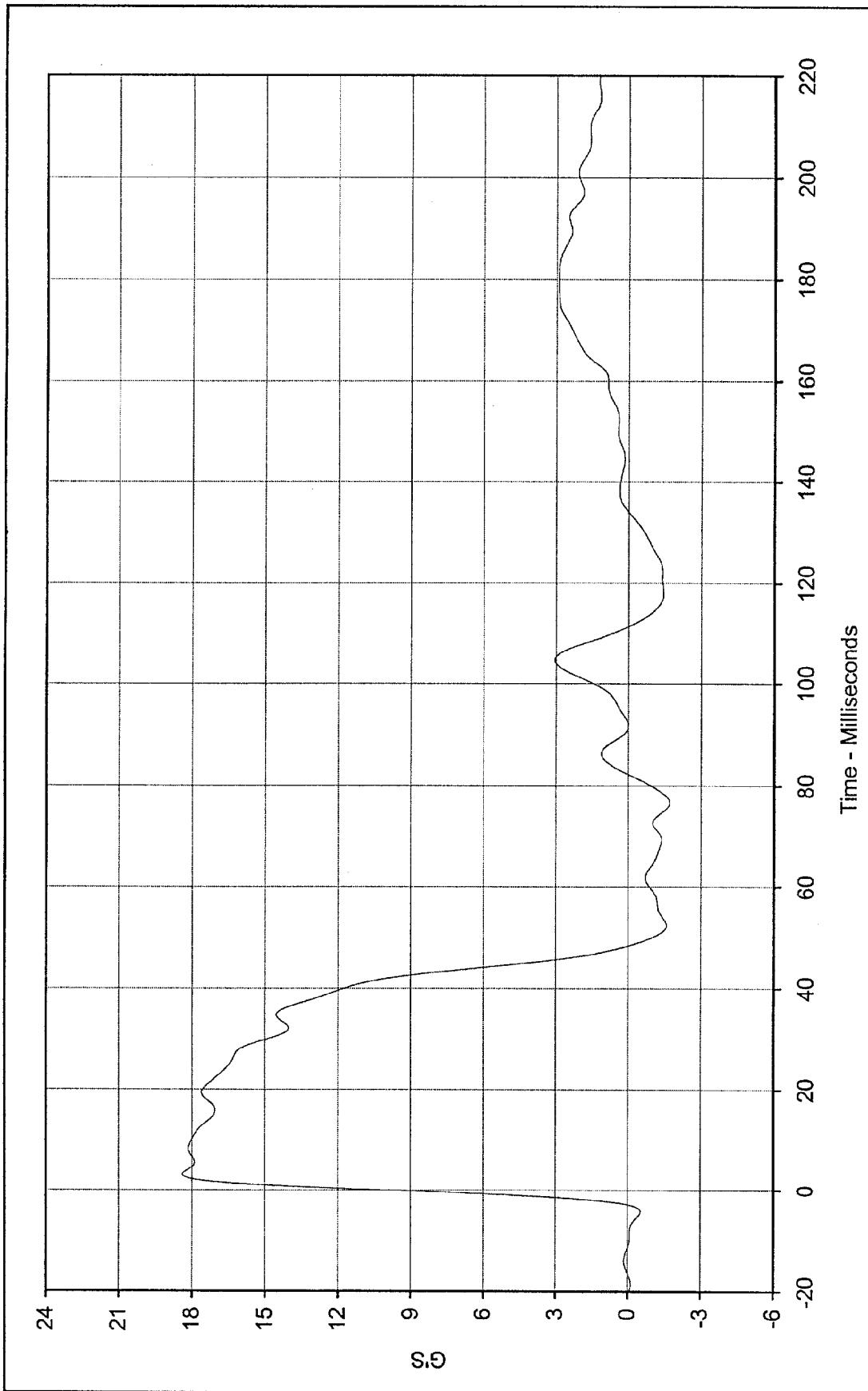
February 24, 1998

Test Date


Approved By

2/24/98

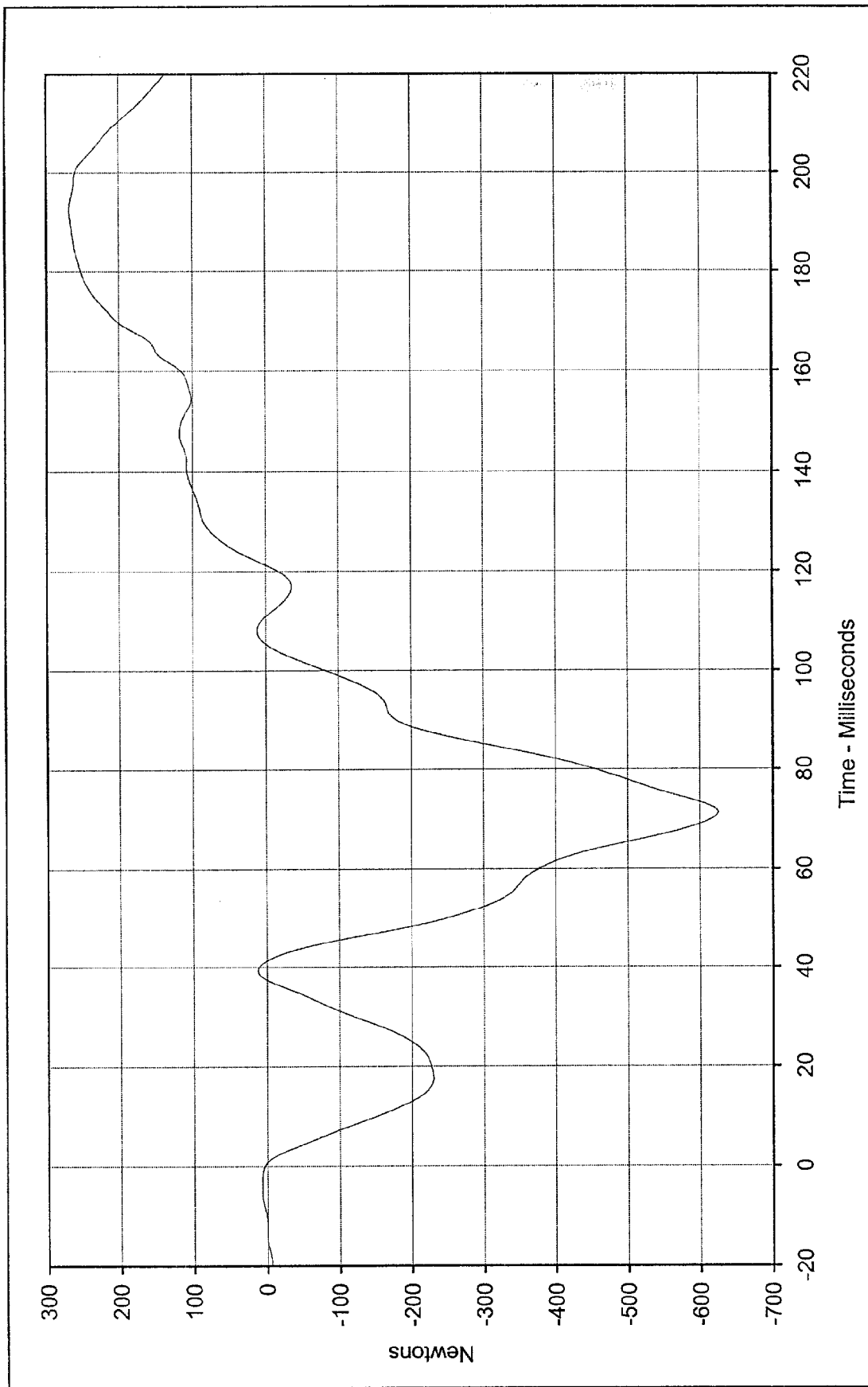
Date



Testing Program: Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE201



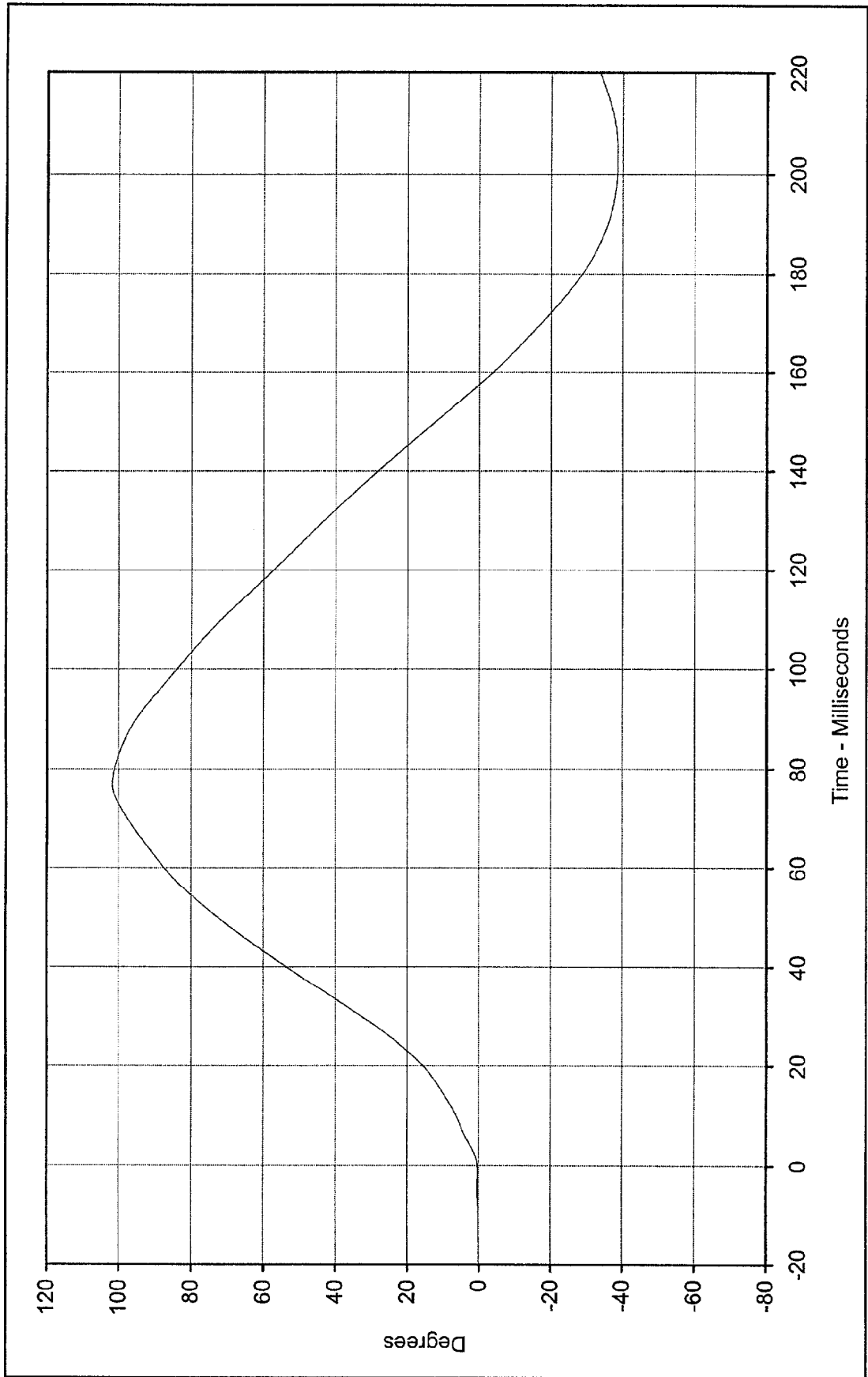
Curve Description: Pendulum Deceleration
 Maximum Value: 18.4 at 3.2 Milliseconds
 Minimum Value: -1.7 at 76.5 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 34



Testing Program: Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE201

Curve Description: Neck Force X
 Maximum Value: 268.1 at 192.6 Milliseconds
 Minimum Value: -625.5 at 71.4 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 34

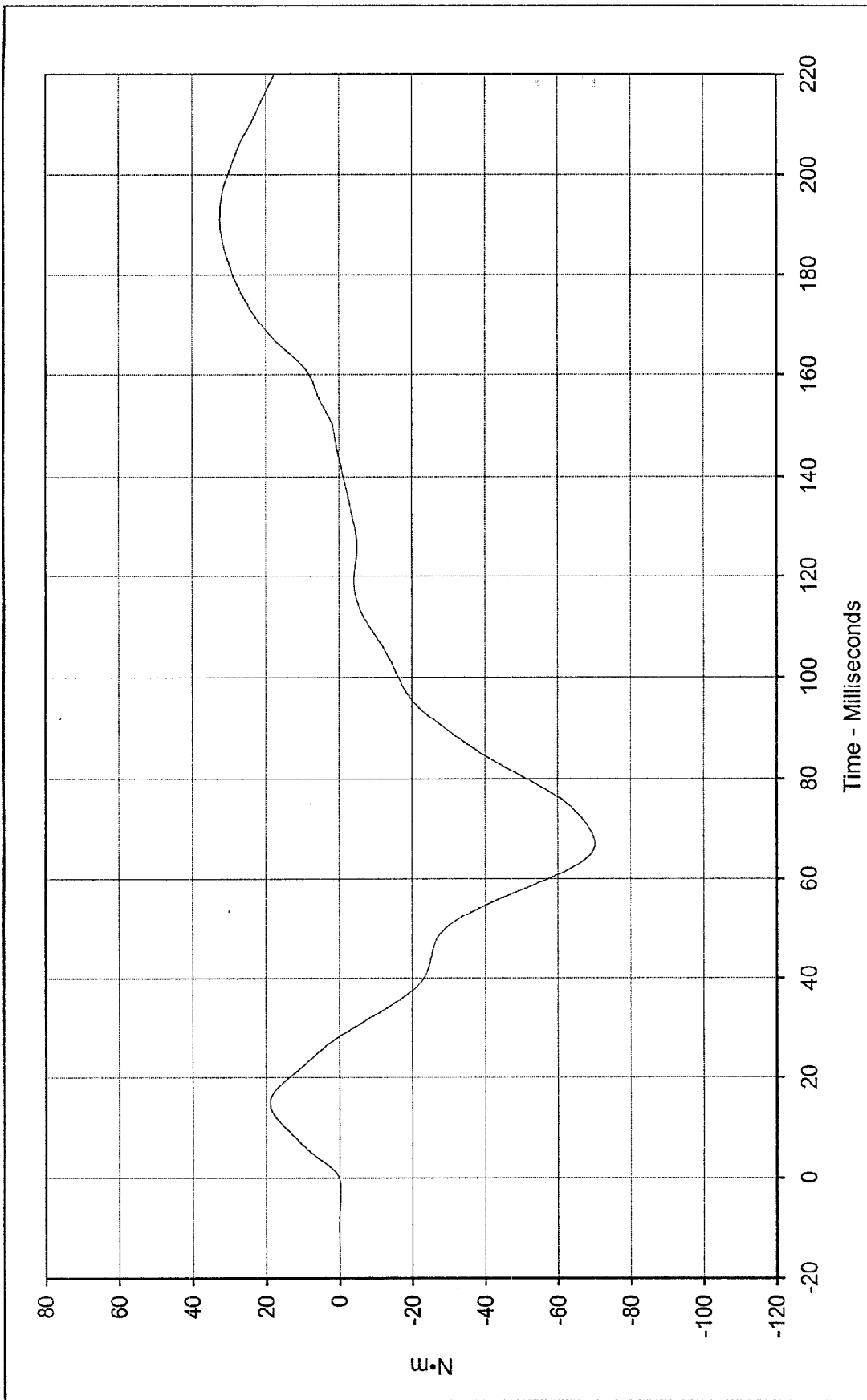




Testing Program: Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE201

Curve Description:	"D" Plane Rotation			
Maximum Value:	101.8	at	77.0	Milliseconds
Minimum Value:	-38.4	at	203.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	2/24/98			
ATD Serial No.:	34			

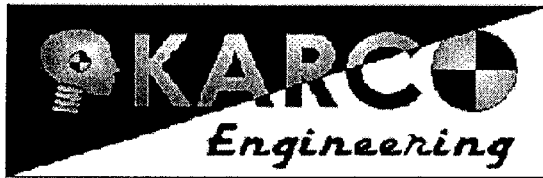




Testing Program: Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE201

Curve Description: Moment About Occipital Condyles
 Maximum Value: 32.5 at 191.0 Milliseconds
 Minimum Value: -70.1 at 67.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 34





Hybrid III Calibration Data Sheet

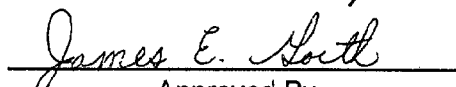
50TH Percentile Male

External Measurements

ATD Serial No.: 034Part Serial No.: N/ATest I.D.: N/A

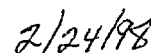
External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43.0	Pass
A - Total sitting height	mm	878.8 to 889.0	884.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	516.0	Pass
C - "H" point height	mm	83.8 to 88.9	88.0	Pass
D - "H" point from seat back	mm	134.6 to 139.7	138.1	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	45.0	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	210.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	601.0	Pass
L - Popliteal length	mm	429.3 to 454.7	450.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	488.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	475.0	Pass
O - Chest depth	mm	213.4 to 228.6	227.0	Pass
P - Foot length	mm	251.5 to 266.7	265.5	Pass
V - Shoulder breadth	mm	421.6 to 436.9	435.0	Pass
W - Foot breadth	mm	91.4 to 106.7	105.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	1000.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	861.0	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	230.0	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

February 24, 1998

Test Date



Date



Hybrid III Calibration Data Sheet

50TH Percentile Male

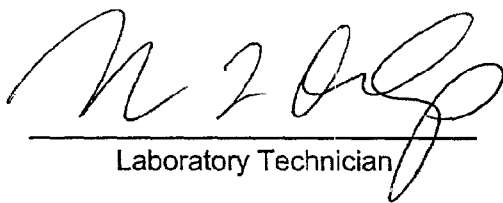
Left Knee Impact Test

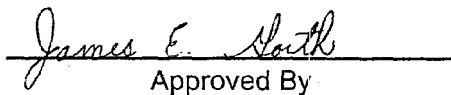
ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: KI006

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.111	Pass
Peak Probe Force	Newtons	4715 to 5782	5639.4	Pass
Overall Test Results				Pass


Laboratory Technician

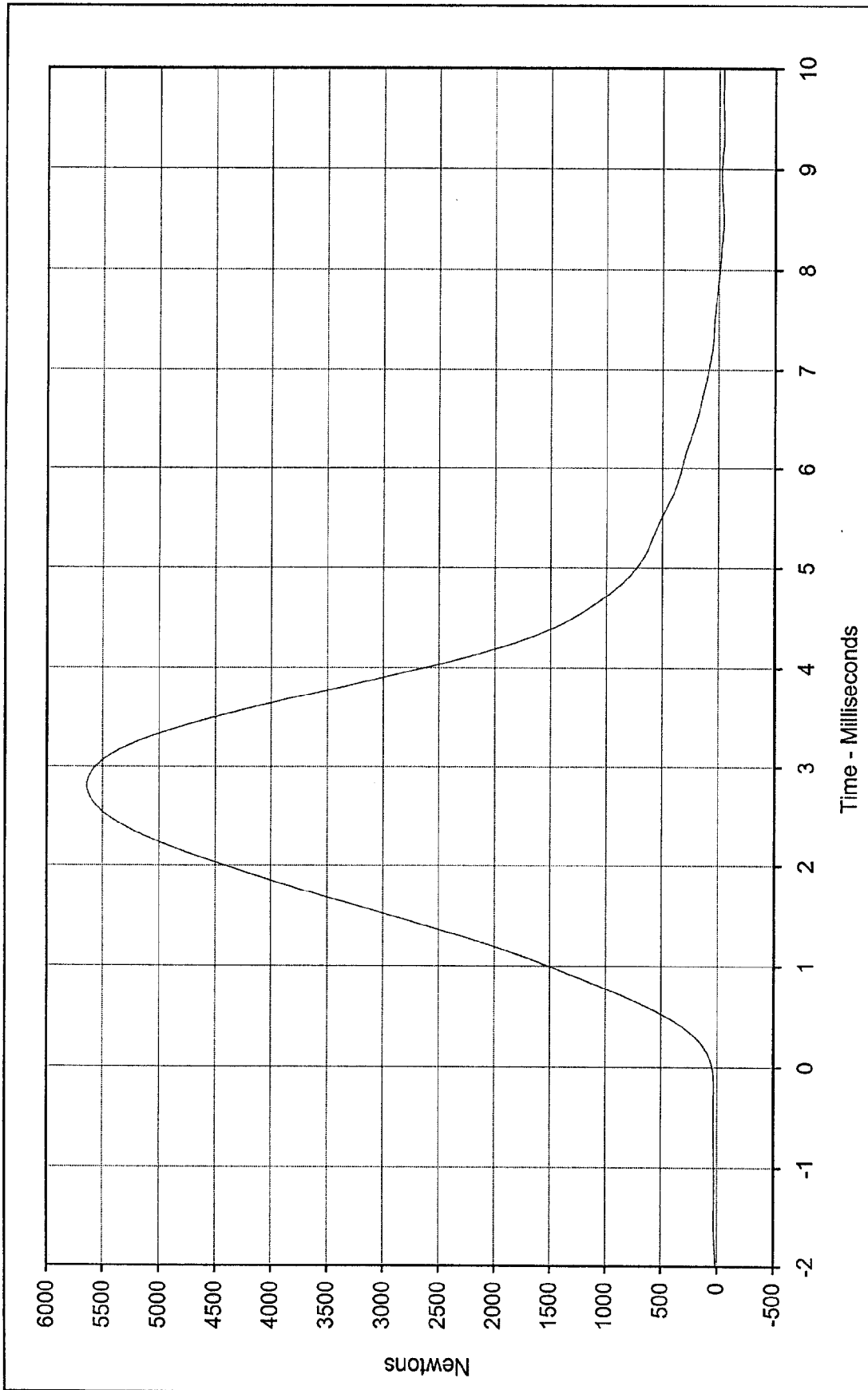

Approved By

February 22, 1998

Test Date

2/22/98

Date



Curve Description: Hybrid III Left Knee Impact Test
 Testing Program: Part S/N: n/a Test I.D.: KI006

Probe Force
 Maximum Value: 5339.4 at 2.8 Milliseconds
 Minimum Value: -9.4 at 8.0 Milliseconds
 SAE Filter Class: 600
 Date of Test: 2/22/98
 ATD Serial No.: 035





Hybrid III Calibration Data Sheet

50TH Percentile Male

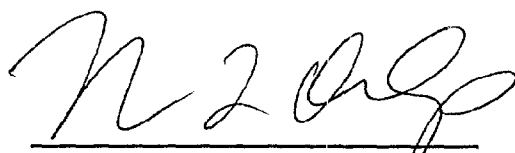
Right Knee Impact Test

ATD Serial No.: 035

Part Serial No.: n/a

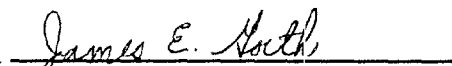
Test I.D.: KI008

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.089	Pass
Peak Probe Force	Newtons	4715 to 5782	5605.2	Pass
Overall Test Results				Pass


Laboratory Technician

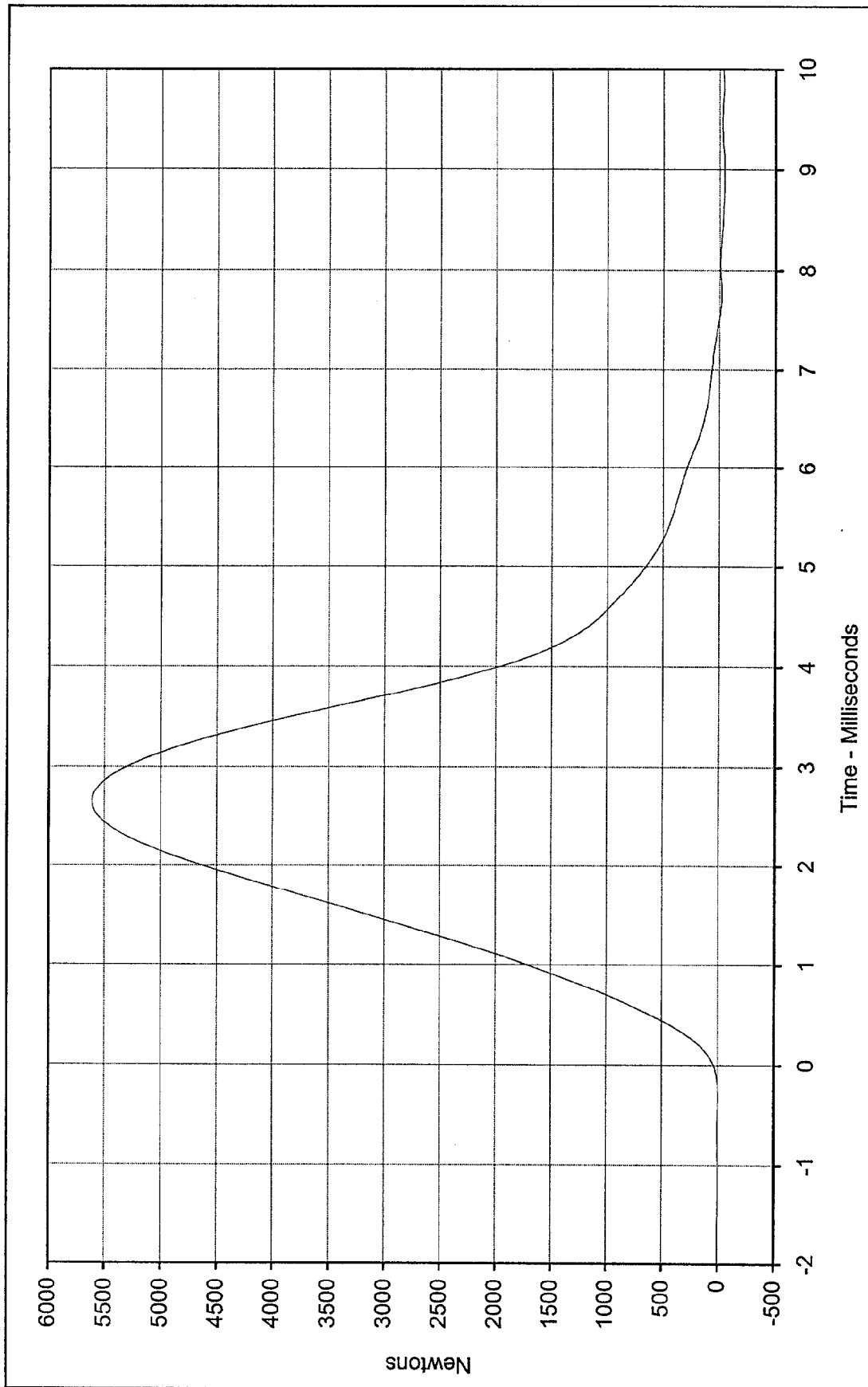
February 22, 1998

Test Date


Approved By

2/22/98

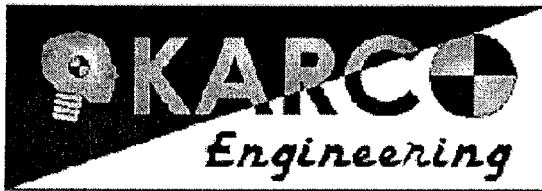
Date



Curve Description:		Testing Program	
Maximum Value:	5605.2	at	2.6 Milliseconds
Minimum Value:	-20.0	at	7.8 Milliseconds
SAE Filter Class:	600		
Date of Test:	2/22/98		
ATD Serial No.:	035		

Test Information:	
Part S/N:	n/a
Test I.D.:	KI008





Hybrid III Calibration Data Sheet

50TH Percentile Male

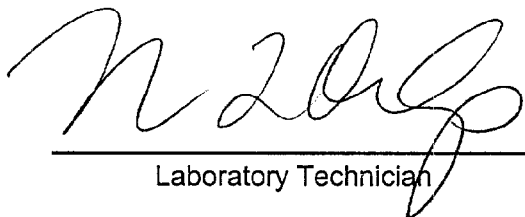
Head Drop Calibration

ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: H8000

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	264.1	Pass
Peak Lateral Acceleration	G's	≤15.0	13.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

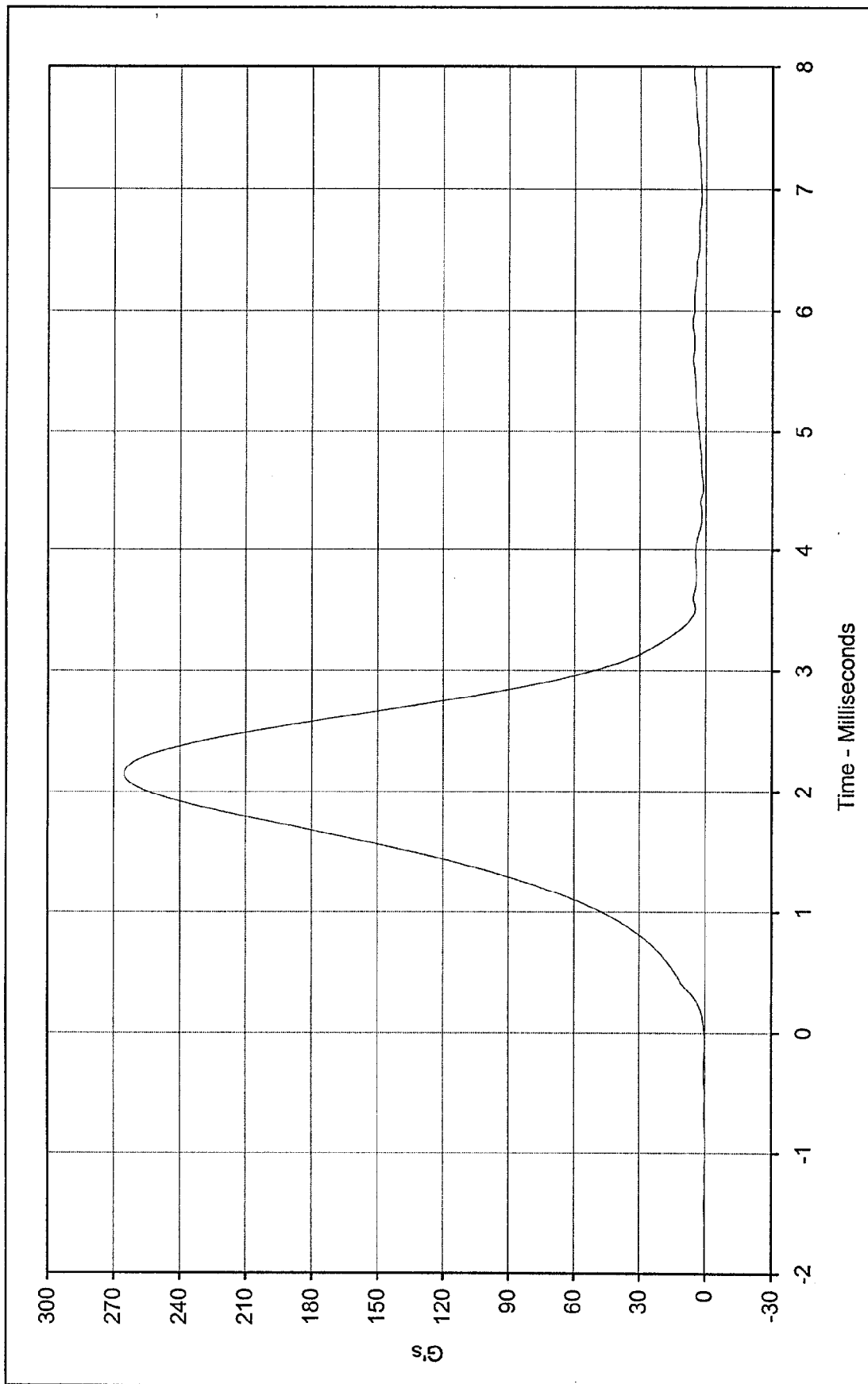

Laboratory Technician


Approved By

February 21, 1998

Test Date

2/21/98
Date

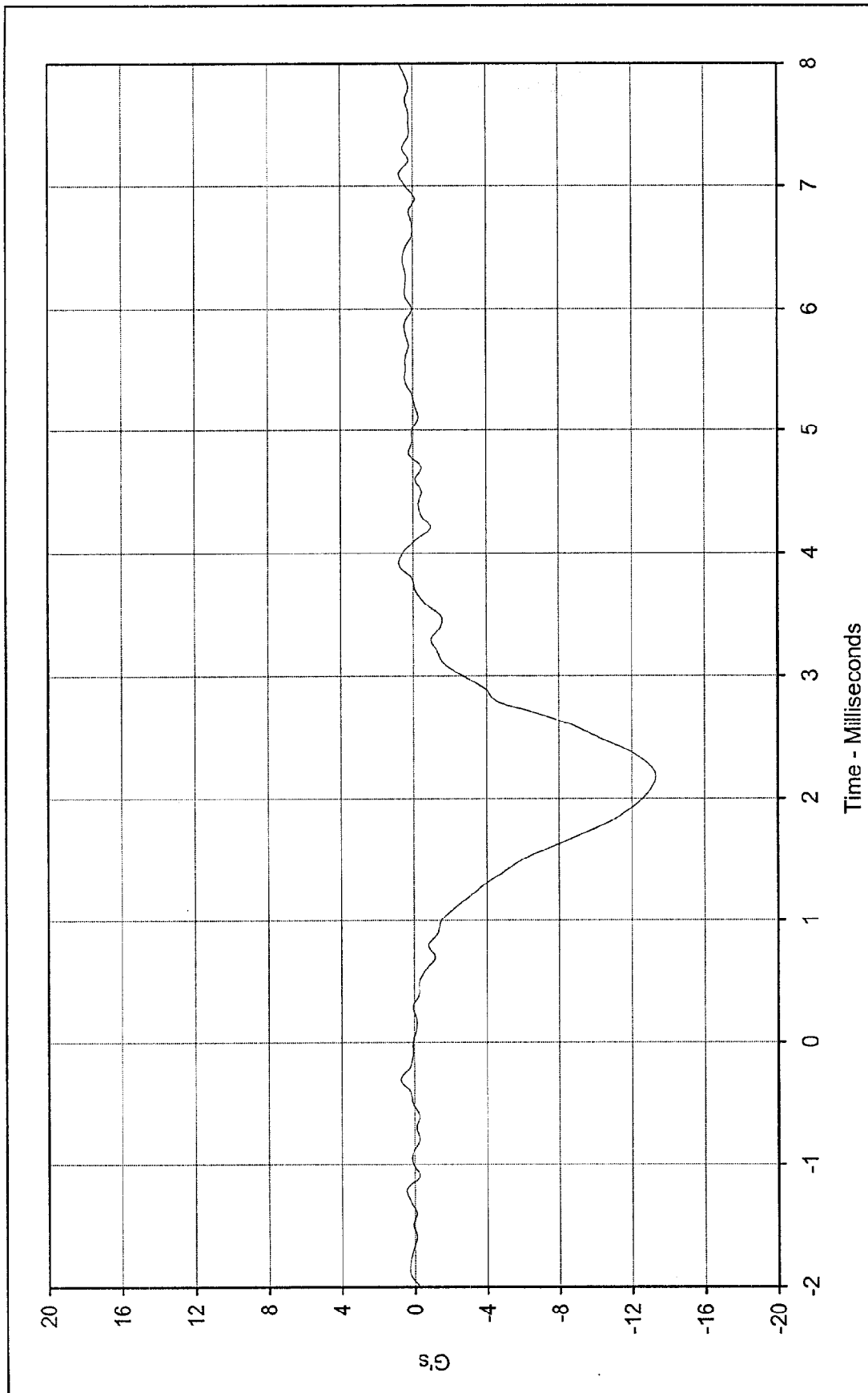


Curve Description: Head Resultant Acceleration
 Maximum Value: 264.1 at 2.1 Milliseconds
 Minimum Value: 0.1 at -1.0 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/21/98
 ATD Serial No.: 035

Testing Program: Hybrid III Head Drop Calibration (Male)

Test Information: S/N of Part: n/a Test I.D.: H8000

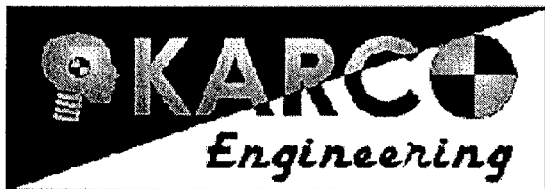




Testing Program: Hybrid III Head Drop Calibration (Male)
 Test Information: S/N of Part: n/a Test I.D.: H8000

Curve Description: Head Acceleration Y Axis
 Maximum Value: 0.8 at -0.3 Milliseconds
 Minimum Value: -13.3 at 2.2 Milliseconds
 SAE Filter Class: 1000
 Date of Test: 2/21/98
 ATD Serial No.: 035





Hybrid III Calibration Data Sheet

50TH Percentile Male

Thorax Impact Test

ATD Serial No.: 035

Part Serial No.: N/A

Test I.D.: CST11

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	6.81	Pass
Peak Probe Force	Newtons	5159 to 5893	5820	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.47	Pass
Internal Hysteresis	%	69 to 85	77.5	Pass
Overall Test Results				Pass

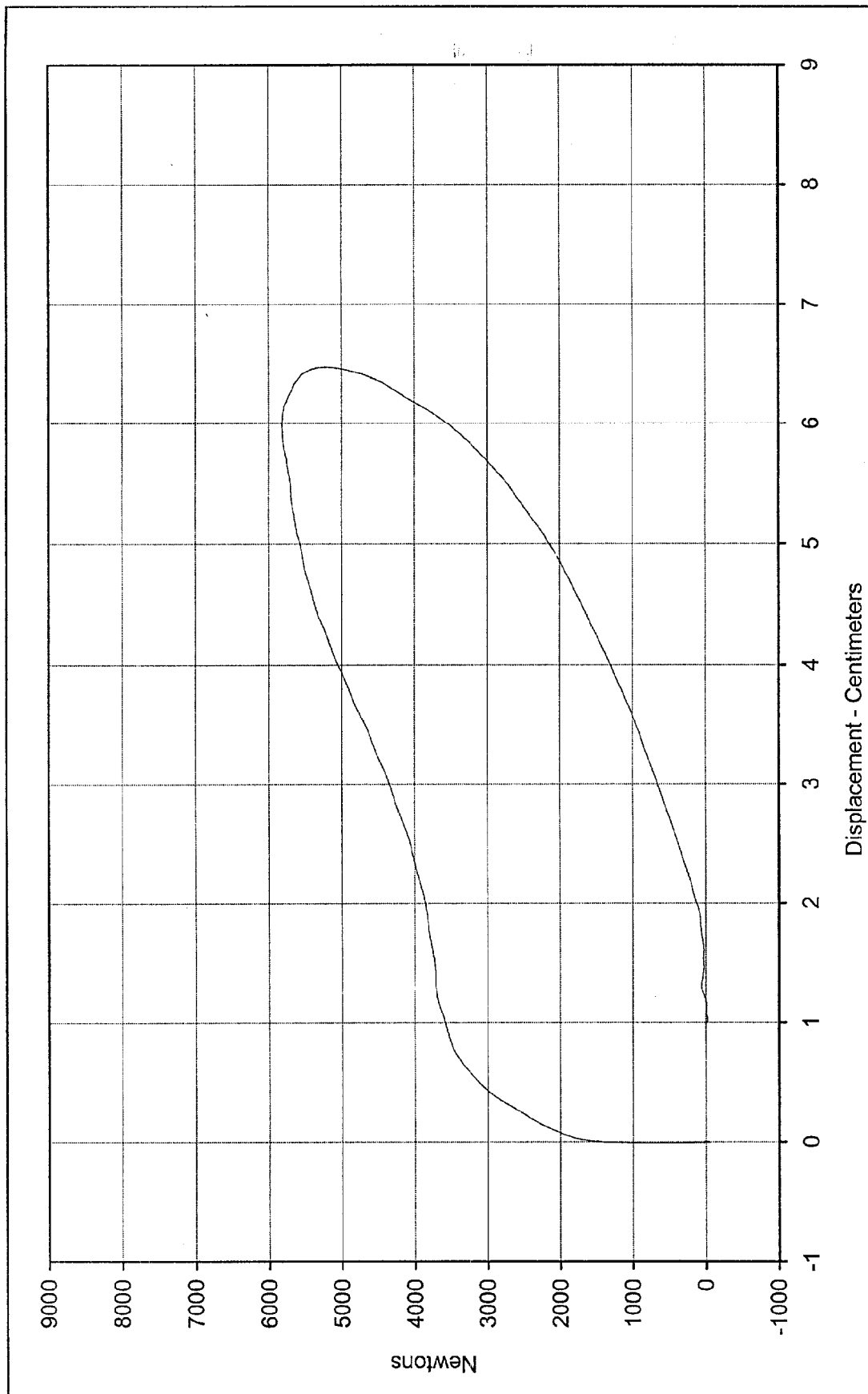

Laboratory Technician


Approved By

February 23, 1998

Test Date

2/23/98
Date



Curve Description: Probe Force vs. Chest Displacement Testing Program Hybrid III Thorax Impact Test
 Probe Force: 5820.3 Newtons Test Information: S/N of Part: N/A Test I.D.: CST11

Chest Displ.: 6.47 Centimeters

SAE Filter Class: 180

Date of Test: 2/23/98

ATD Serial No.: 035





Hybrid III Calibration Data Sheet

50TH Percentile Male

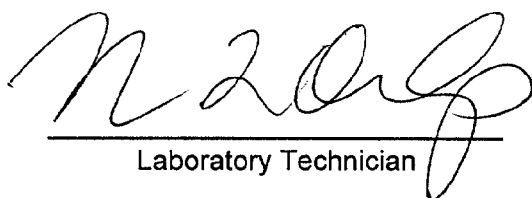
Neck Flexion Test

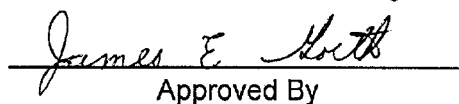
ATD Serial No.: 035

Part Serial No.: n/a

Test I.D.: NF200

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	6.98	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.9	Pass
	20 Msec.	G's	17.6 to 22.6	21.2	Pass
	30 Msec.	G's	12.5 to 18.5	17.8	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	37.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	70.9	Pass
	Time	Msec.	57.0 to 64.0	60.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	114.1	Pass
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	84.5	Pass
	Time	Msec.	47.0 to 58.0	50.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.5	Pass
Overall Test Results					Pass


Laboratory Technician

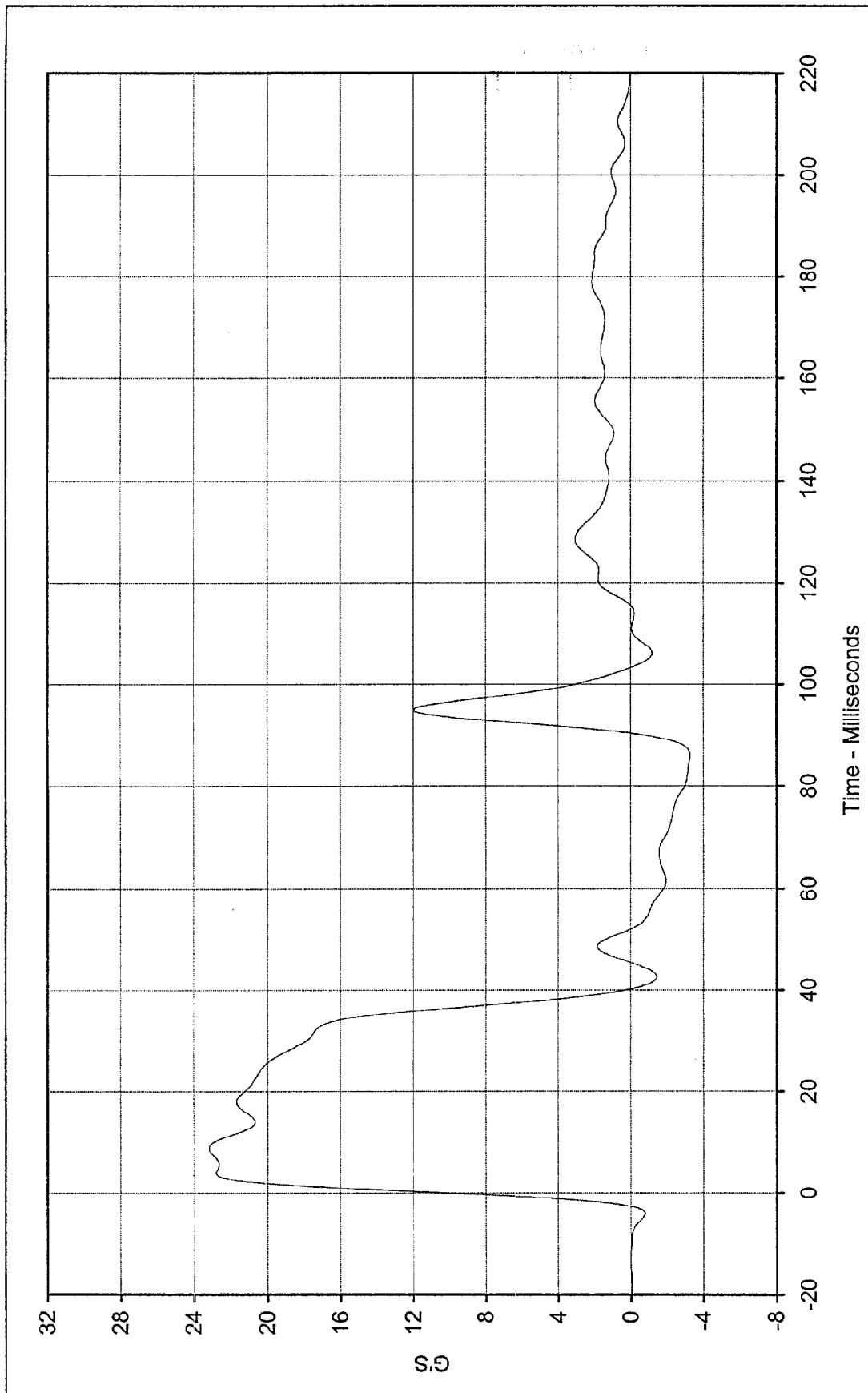

Approved By

February 24, 1998

Test Date

2/24/98

Date



Curve Description: Pendulum Deceleration

Maximum Value: 23.2 at 8.7 Milliseconds

Minimum Value: -3.2 at 85.9 Milliseconds

SAE Filter Class: 60

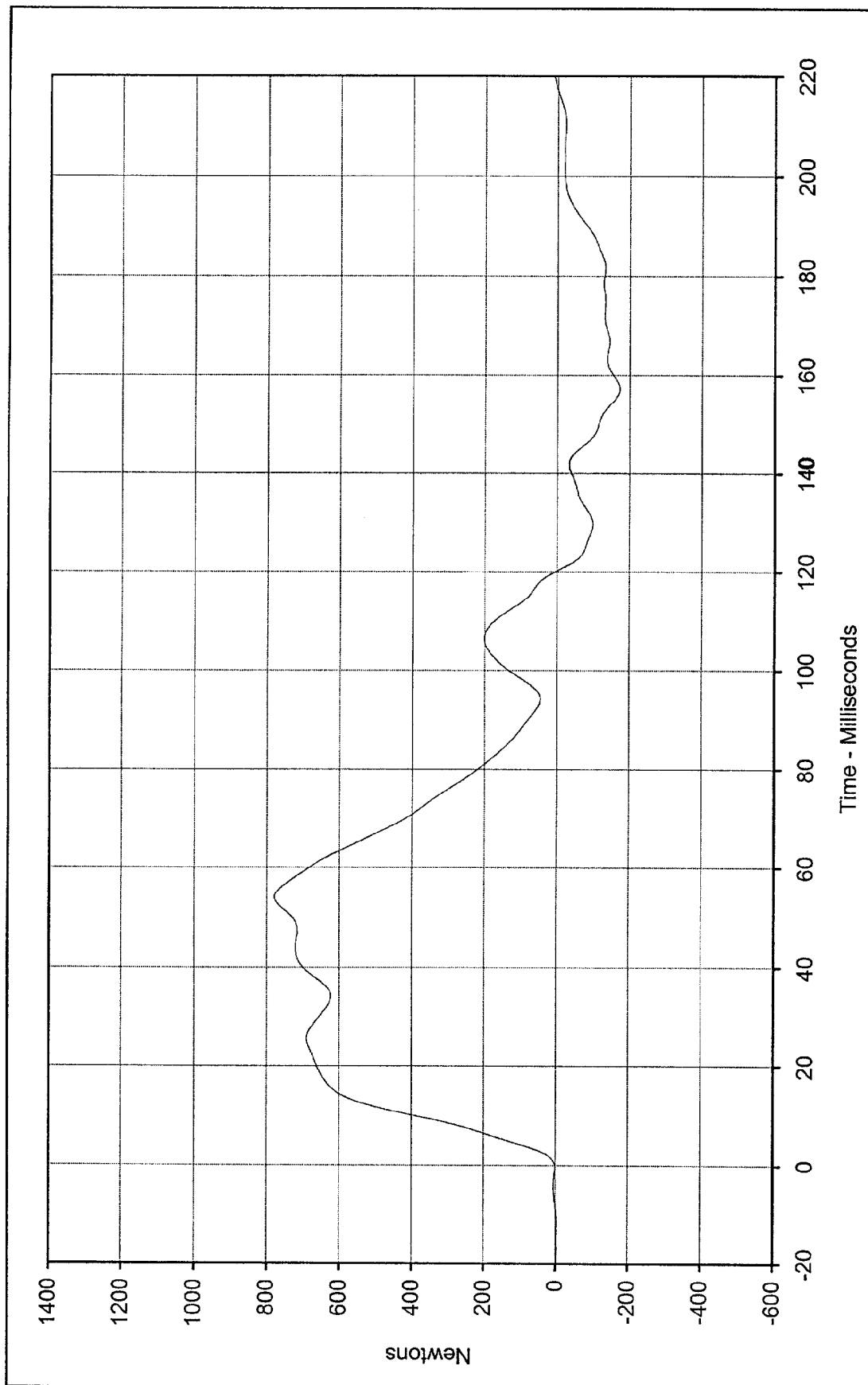
Date of Test: 2/24/98

ATD Serial No.: 035

Testing Program: Hybrid III Neck Flexion Test (Male)

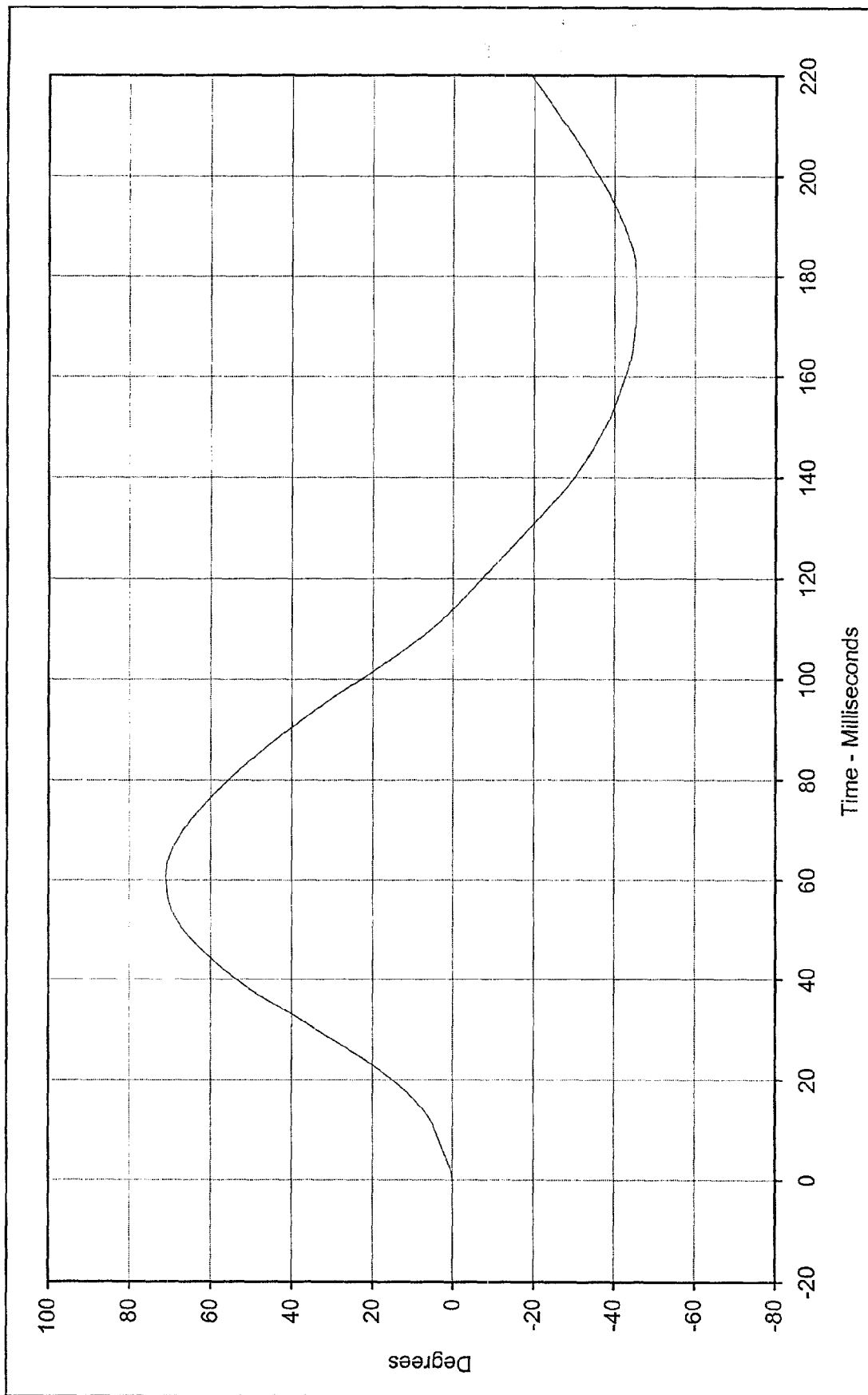
Test Information: S/N of Part: n/a Test I.D.: NF200





Curve Description: Hybrid III Neck Flexion Test (Male)
 Maximum Value: 778.6 at 53.9 Milliseconds
 Minimum Value: -172.4 at 157.3 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 035

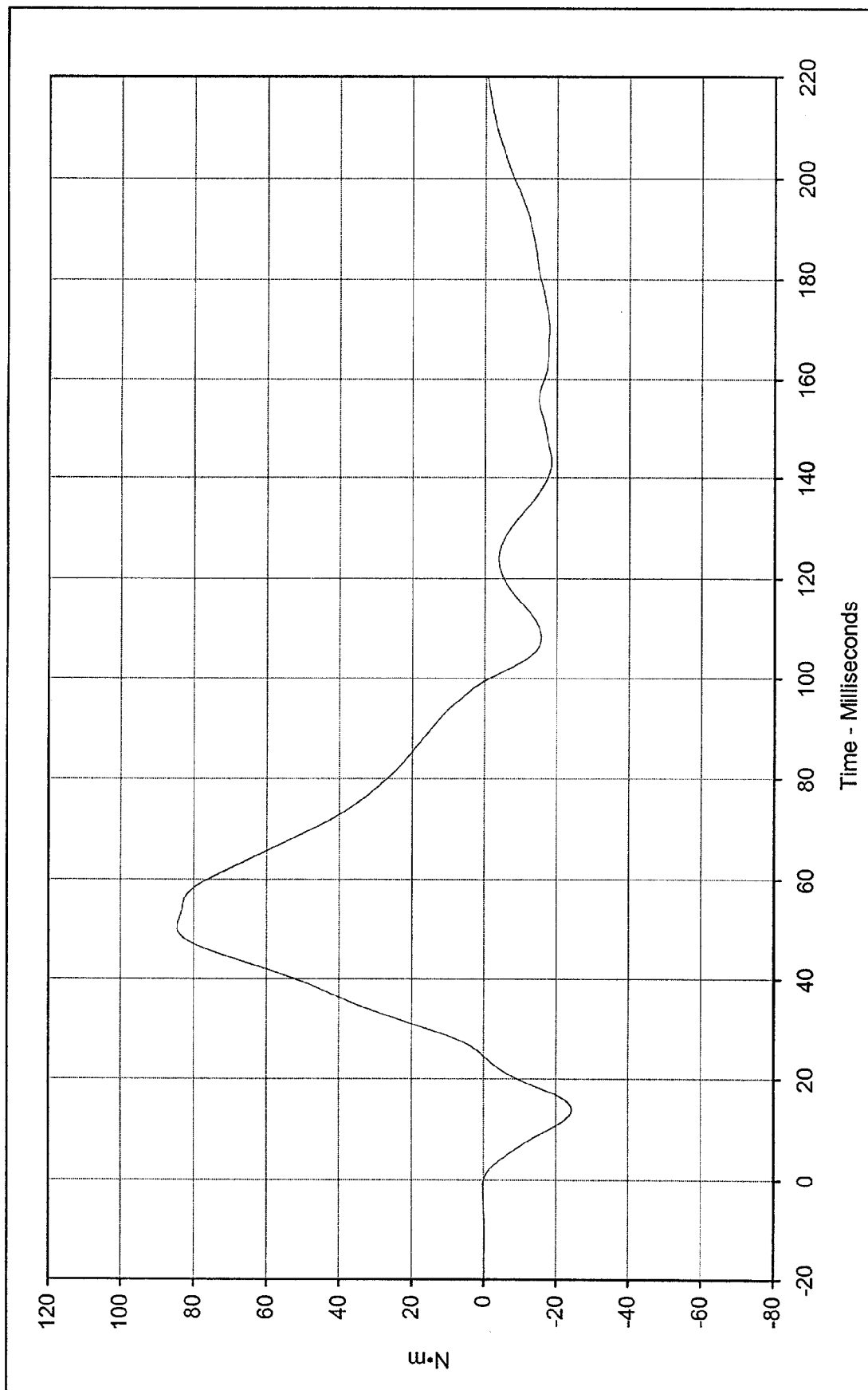




Testing Program Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NF200

Curve Description: "D" Plane Rotation
 Maximum Value: 70.9 at 60.6 Milliseconds
 Minimum Value: -45.5 at 174.7 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 035

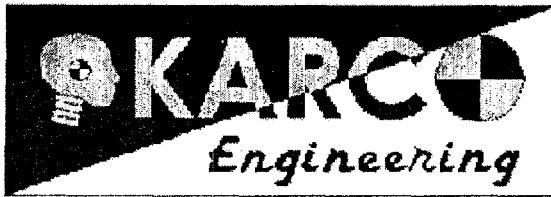




Curve Description:		Moment About Occipital Condyles	
Maximum Value:	84.5	at	50.4 Milliseconds
Minimum Value:	-24.3	at	13.9 Milliseconds
SAE Filter Class:	60		
Date of Test:	2/24/98		
ATD Serial No.:	035		

Testing Program: Hybrid III Neck Flexion Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NF200





Hybrid III Calibration Data Sheet

50TH Percentile Male

Neck Extension Test

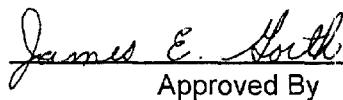
ATD Serial No.: 35Part Serial No.: n/aTest I.D.: NE200

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	6.17	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.2	Pass
	20 Msec.	G's	14.0 to 19.0	17.9	Pass
	30 Msec.	G's	11.0 to 16.0	14.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.1	Pass
	Time	Msec.	72.0 to 82.0	72.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	147.2	Pass
Moment About Occipital Condyle	Maximum	N • m	-52.9 to - 79.9	-72.6	Pass
	Time	Msec.	65.0 to 79.0	66.0	Pass
Negative Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	136.6	Pass
Overall Test Results					Pass


Laboratory Technician

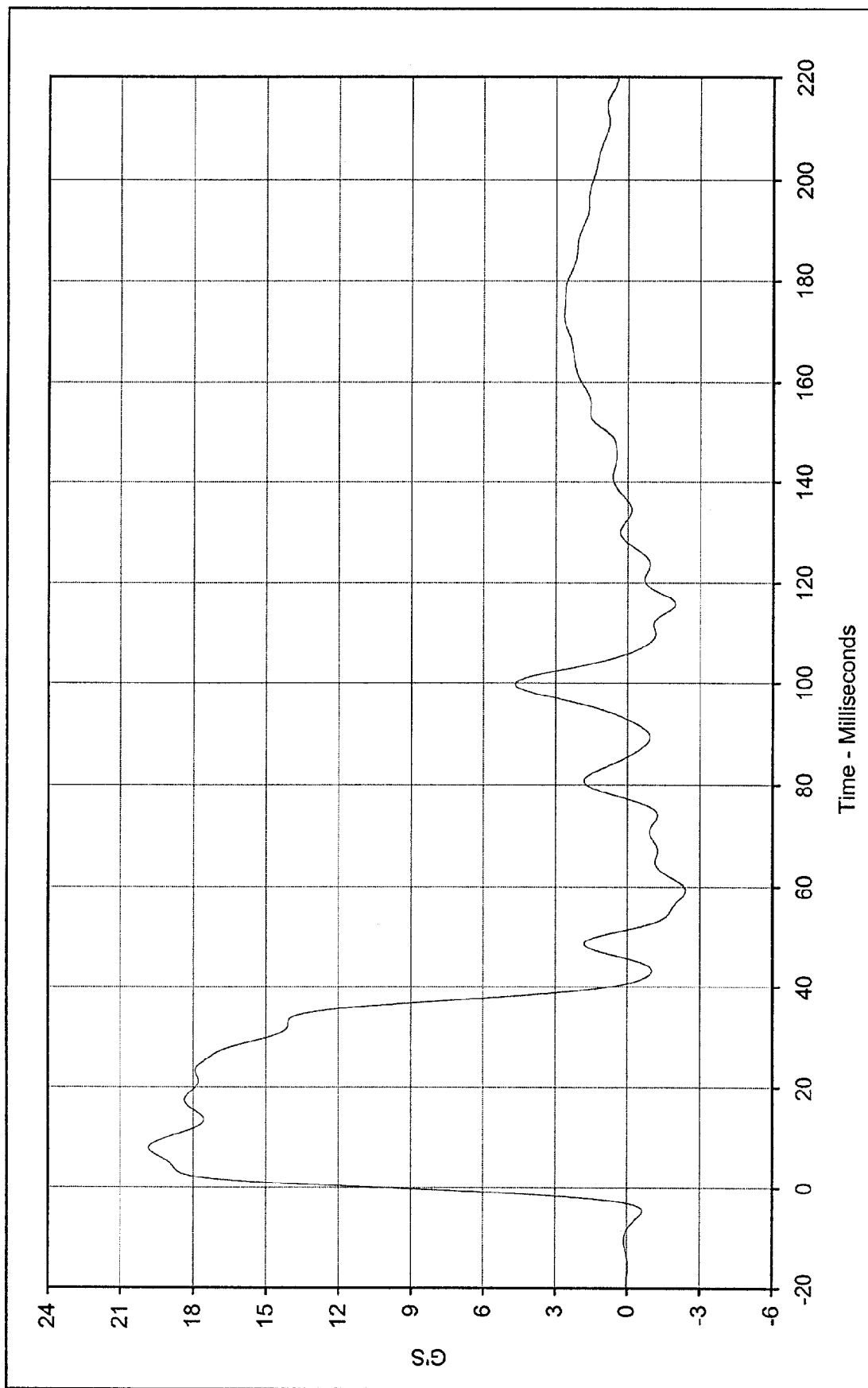
February 24, 1998

Test Date


Approved By

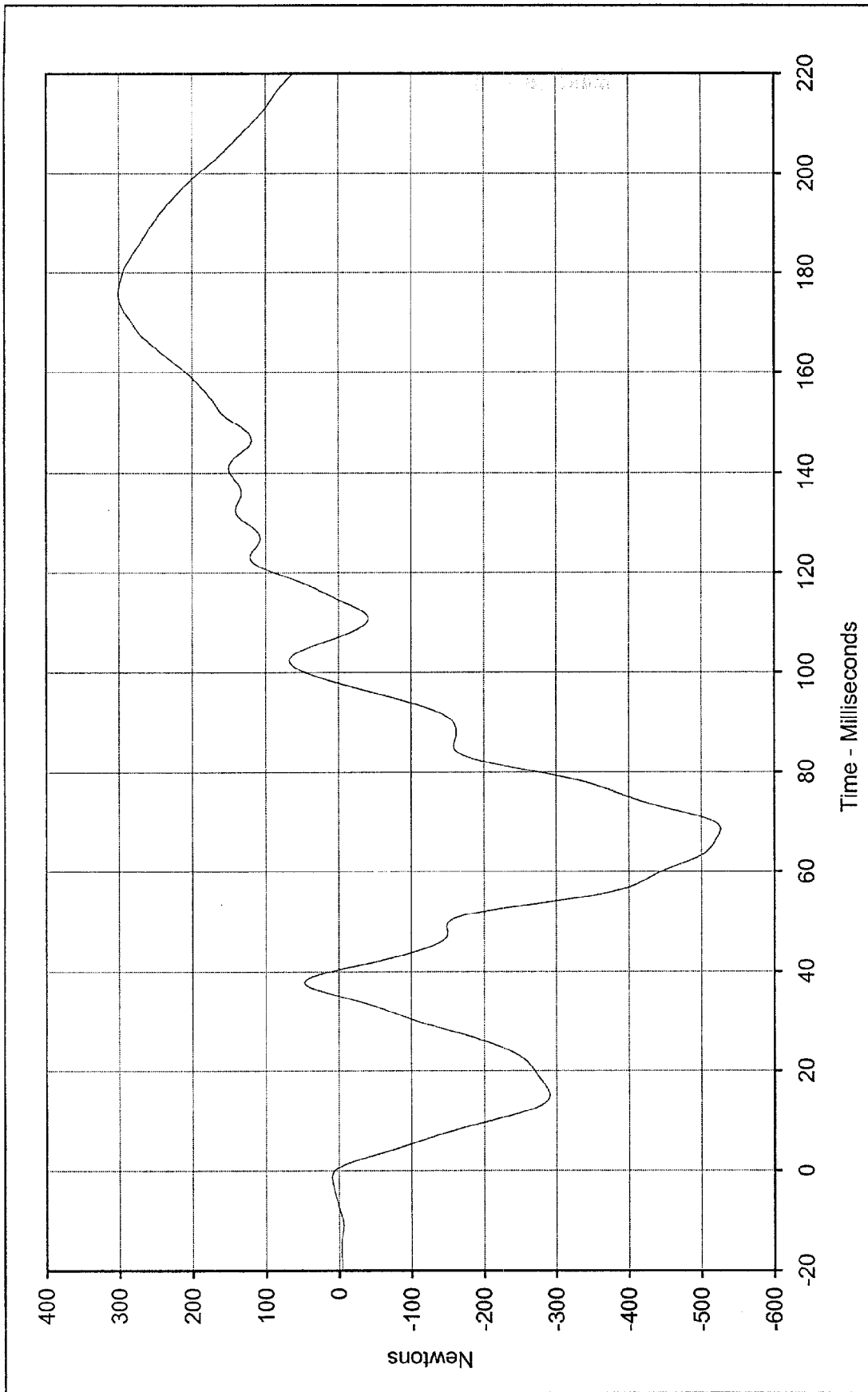


Date



Curve Description: _____ Testing Program: Hybrid III Neck Extension Test (Male)
 Maximum Value: 19.8 at 8.0 Milliseconds
 Minimum Value: -2.4 at 59.2 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 35

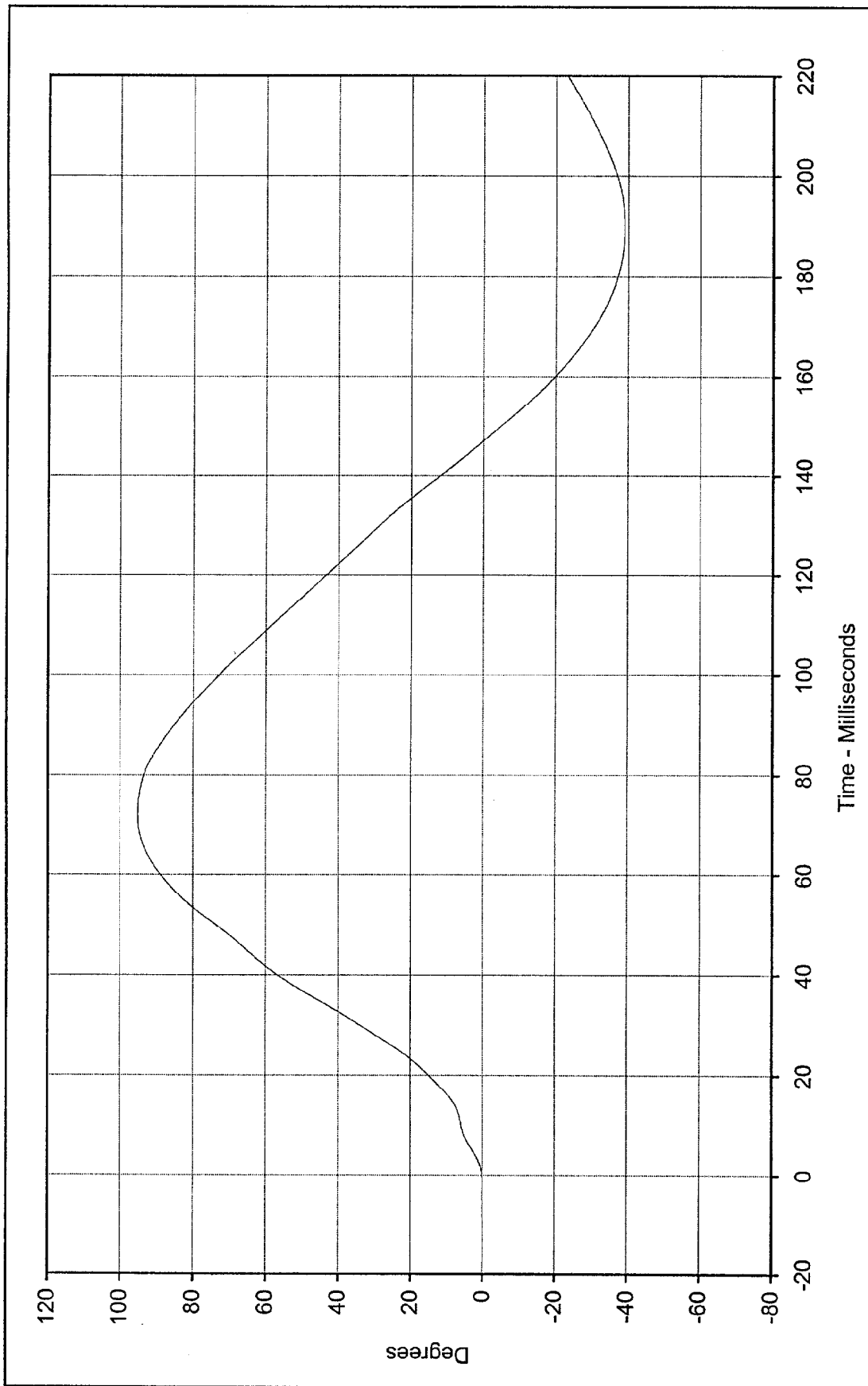




Curve Description: _____ Neck Force X _____
 Maximum Value: 301.0 at 175.8 Milliseconds
 Minimum Value: -526.4 at 68.5 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 35

Testing Program Hybrid III Neck Extension Test (Male)
 Test Information: S/N of Part: n/a Test I.D.: NE200

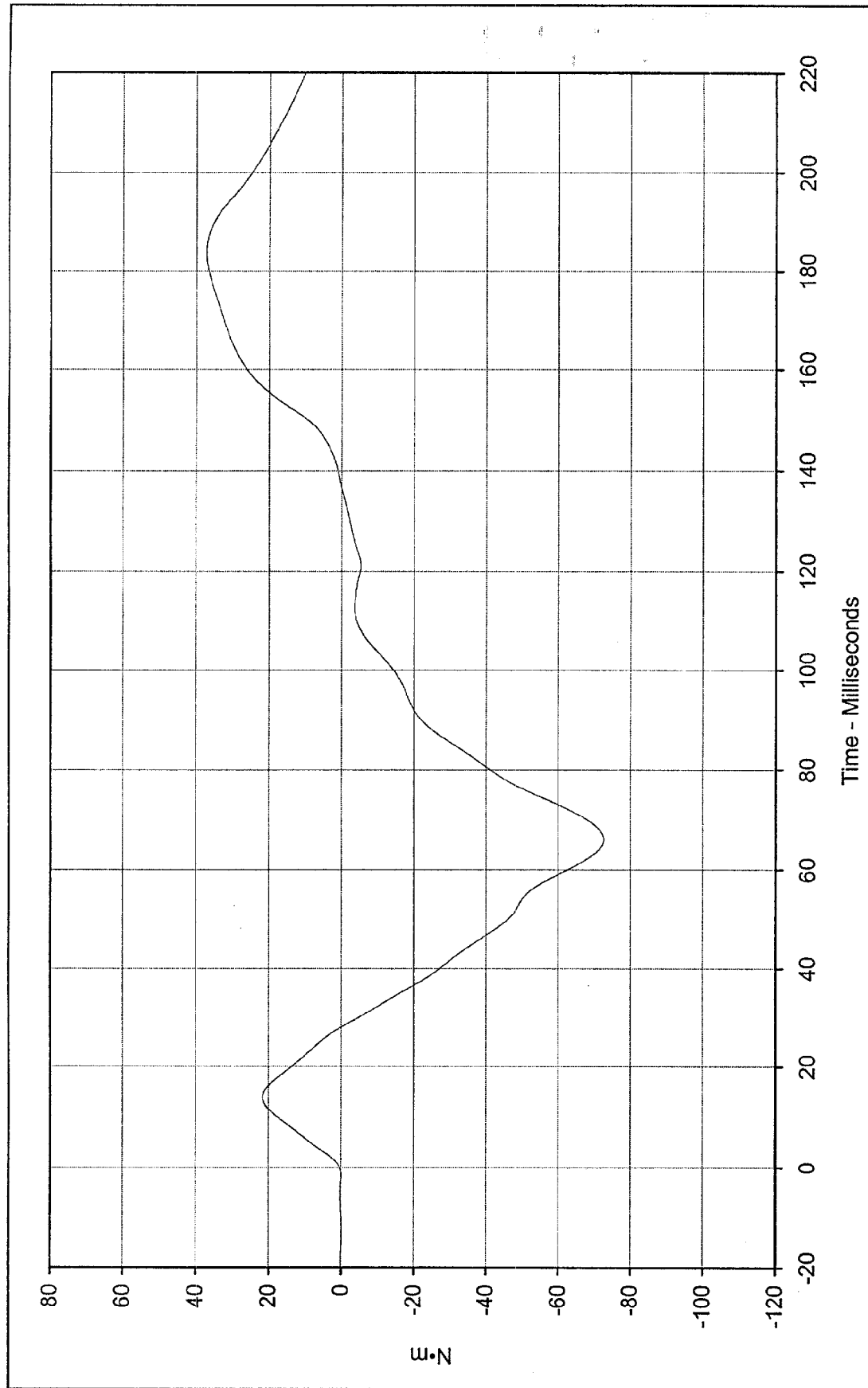




Curve Description: Hybrid III Neck Extension Test (Male)
 Testing Program: S/N of Part: n/a Test I.D.: NE200

"D" Plane Rotation
 Maximum Value: 95.1 at 72.0 Milliseconds
 Minimum Value: -38.9 at 189.5 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 35





Curve Description: Moment About Occipital Condyles
 Maximum Value: 37.3 at 183.8 Milliseconds
 Minimum Value: -72.6 at 66.0 Milliseconds
 SAE Filter Class: 60
 Date of Test: 2/24/98
 ATD Serial No.: 35

Testing Program Hybrid III Neck Extension Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NE200





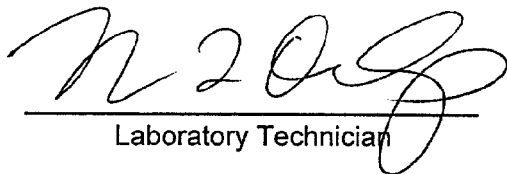
Hybrid III Calibration Data Sheet

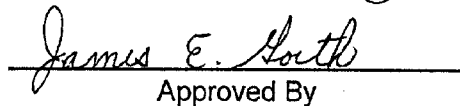
50TH Percentile Male

External Measurements

ATD Serial No.: 035Part Serial No.: N/ATest I.D.: N/A

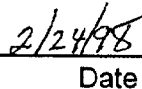
External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43.0	Pass
A - Total sitting height	mm	878.8 to 889.0	888.1	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	506.0	Pass
C - "H" point height	mm	83.8 to 88.9	87.1	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	90.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	153.0	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	300.4	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	335.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	207.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	603.1	Pass
L - Popliteal length	mm	429.3 to 454.7	451.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	500.0	Pass
N - Buttock popliteal length	mm	452.1 to 477.5	476.0	Pass
O - Chest depth	mm	213.4 to 228.6	225.0	Pass
P - Foot length	mm	251.5 to 266.7	255.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	429.0	Pass
W - Foot breadth	mm	91.4 to 106.7	103.2	Pass
Y - Chest circumference	mm	970.3 to 1000.8	980.3	Pass
Z - Waist circumference	mm	835.7 to 866.1	865.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	430.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	229.0	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

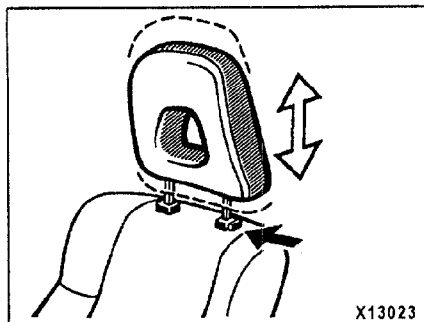
February 24, 1998

Test Date


Date

APPENDIX F
VEHICLE OWNER'S MANUAL
OCCUPANT RESTRAINT INSTRUCTIONS

Head restraints



For your safety, adjust the head restraint before driving.

To raise: Pull it up.

To lower: Push it down while pressing the lock release button.

The head restraint is most effective when it is close to your head. Therefore, using a cushion on the seatback is not recommended.

CAUTION

- Adjust the center of the head restraint so that it is closest to the top of your ears.
- After adjusting the head restraint, make sure it is locked in position.
- Do not drive with the head restraints removed.

Seat belts- -Seat belt precautions

Toyota strongly urges that the driver and passengers in the vehicle be properly restrained at all times with the seat belts provided. Failure to do so could increase the chance of injury and/or the severity of injury in accidents.

Child. Use a child restraint system appropriate for the child until the child becomes large enough to properly wear the vehicle's seat belts. See "Child restraint" for details.

If a child is too large for a child restraint system, the child should sit in the rear seat and must be restrained using the vehicle's seat belt. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat.

If a child must sit in the front seat, the seat belts should be worn properly. If an accident occurs and seat belts are not worn properly, the force of the rapid inflation of the airbag may cause death or serious injury to the child.

Do not allow the child to stand up or kneel on either rear or front seats. An unrestrained child could suffer serious injury or death during emergency braking or a collision. Also, do not let the child sit on your lap. It does not provide sufficient restraint.

Pregnant woman. Toyota recommends the use of a seat belt. Ask your doctor for specific recommendations. The lap belt should be worn securely and as low as possible over the hips and not on the waist.

Injured person. Toyota recommends the use of a seat belt. Depending on the injury, first check with your doctor for specific recommendations.

CAUTION

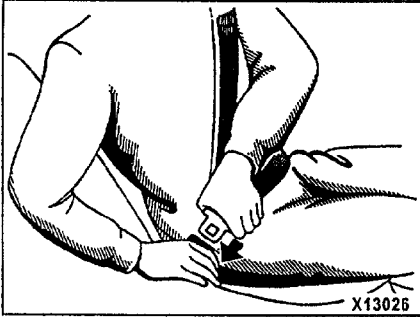
Persons should ride in their seats properly wearing their seat belts whenever the vehicle is moving. Otherwise, they are much more likely to suffer serious bodily injury or death in the event of sudden braking or a collision.

When using the seat belts, observe the following:

- Use the belt for only one person at a time. Do not use a single belt for two or more people-even children.
- Avoid reclining the seatbacks too much. The seat belts provide maximum protection when the seatbacks are in the upright position. (Refer to the seat adjustment instructions.)
- Be careful not to damage the belt webbing or hardware. Take care that they do not get caught or pinched in the seat or side doors.

- Inspect the belt system periodically. Check for cuts, fraying, and loose parts. Damaged parts should be replaced. Do not disassemble or modify the system.
- Keep the belts clean and dry. If they need cleaning, use a mild soap solution or lukewarm water. Never use bleach, dye, or abrasive cleaners-they may severely weaken the belts. (See "Cleaning the interior" in Part 5.)
- Replace the belt assembly (including bolts) if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.

-Front seat belts and rear outside seat belts



Adjust the seat as needed and sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.

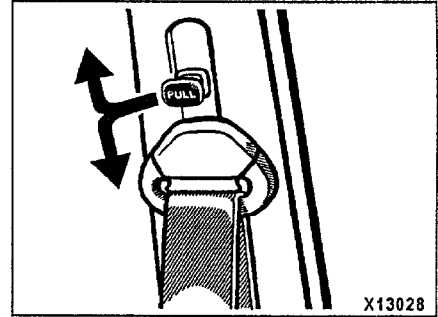
You will hear a click when the tab locks into the buckle.

The seat belt length automatically adjusts to your size and the seat position.

The retractor will lock the belt during a sudden stop or on impact. It also may lock if you lean forward too quickly. A slow, easy motion will allow the belt to extend, and you can move around freely.

If the seat belt cannot be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.

When a passenger's shoulder belt is completely extended and is then retracted even slightly, the belt is locked in that position and cannot be extended. This feature is used to hold the child restraint system securely. (For details, see "Child restraint" in this chapter.) To free the belt again, fully retract the belt and then pull the belt out once more.



Seat belts with an adjustable shoulder anchor-

Adjust the shoulder anchor position to your size.

To adjust the anchor position, pull the knob out and slide it up or down. Release the knob and make sure the anchor is locked in position.

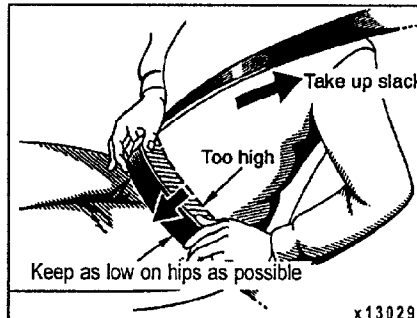
CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, immediately contact your Toyota dealer. Do not use the seat until the seat belt is fixed. It cannot protect an adult occupant or your child from injury.

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CAUTION

Always make sure the shoulder belt is positioned across the center of your shoulder. The belt should be kept away from your neck, but not falling off your shoulder. Failure to do so could reduce the amount of protection in an accident and cause serious injuries in a collision.



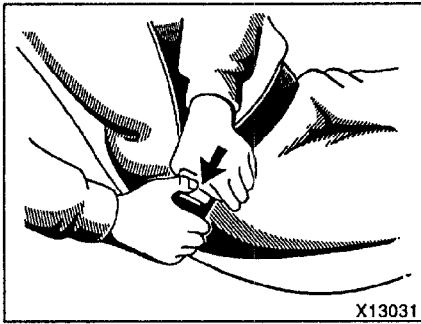
Adjust the position of the lap and shoulder belts.

Position the lap belt as low as possible on your hips-not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

CAUTION

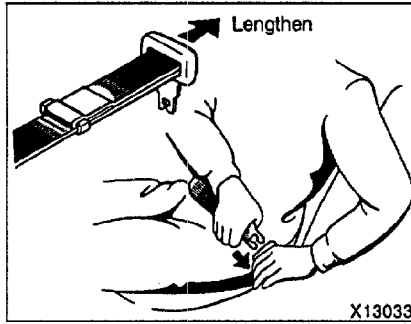
- High-positioned lap belts and loose-fitting belts both could cause serious injuries due to sliding under the lap belt during a collision or other unintended result. Keep the lap belt positioned as low on hips as possible.
- For your safety, do not place the shoulder belt under your arm.

-Rear center seat belt (4-door hardtop)



To release the belt, press the buckle-release button and allow the belt to retract.

If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure it remains untwisted as it retracts.



Sit up straight and well back in the seat. To fasten your belt, insert the tab into the buckle.

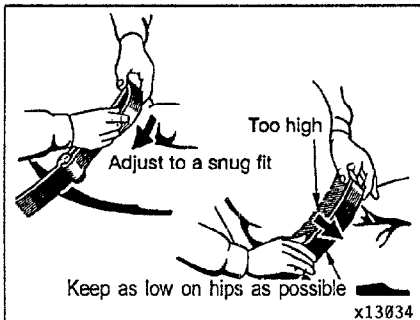
You will hear a click when the tab locks into the buckle.

If the belt is not long enough for you, hold the tab at a right angle to the belt and pull on the tab.

CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, immediately contact your Toyota dealer. Do not use the seat until the seat belt is fixed. It cannot protect an adult occupant or your child from injury.

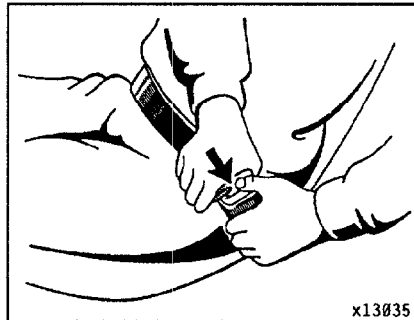
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Remove excess length of the belt and adjust the belt position.

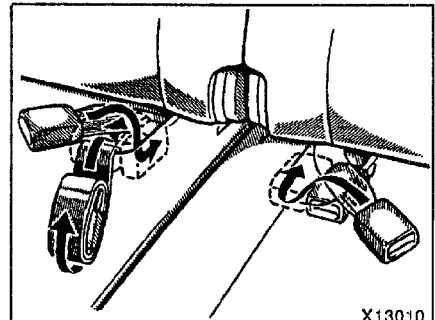
To shorten the belt, pull the free end of the belt.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit.



To release the belt, press the buckle-release button.

-Stowing the rear seat belts (4-door hardtop)



The rear seat belts can be stowed when not in use.

Seat belts must be stowed before you fold the seatback. (See "Rear seats-Folding up rear seats" in this chapter.)

CAUTION

High-positioned and loose-fitting lap belts could cause serious injuries due to sliding under the lap belt during a collision or other unintended result. Keep the lap belt positioned as low on hips as possible.

-Seat belt extender

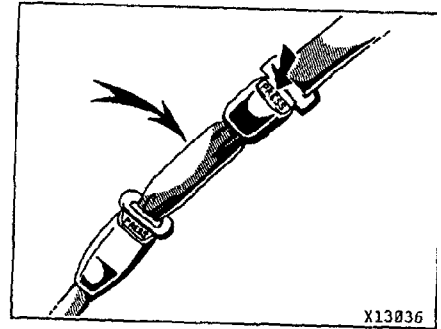
If your seat belt cannot be fastened securely because it is not long enough, a personalized seat belt extender is available from your Toyota dealer free of charge.

Please contact your local Toyota dealer so that the dealer can order the proper required length for the extender. Bring the heaviest coat you expect to wear for proper measurement and selection of length. Additional ordering information is available at your Toyota dealer.

CAUTION

When using the seat belt extender, observe the following. Failure to follow these instructions could result in less effectiveness of the seat belt restraint system in case of vehicle accident, increasing the chance of personal injury.

- Never use the seat belt extender if you can fasten the seat belt without it.
- Remember that the extender provided for you may not be safe when used on a different vehicle, or for another person or at a different seating position than the one originally intended for.



To connect the extender to the seat belt, insert the tab into the seat belt buckle so that the "PRESS" signs on the buckle-release buttons of the extender and the seat belt are both facing outward as shown.

You will hear a click when the tab locks into the buckle.

When releasing the seat belt, press on the buckle-release button on the extender, not on the seat belt. This helps prevent damage to the vehicle interior and extender itself.

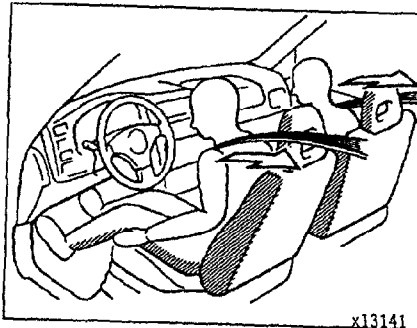
When not in use, remove the extender and store in the vehicle for future use.

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CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the seat belt extender is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, immediately contact your Toyota dealer. Do not use the seat until the seat belt is fixed. It cannot protect an adult occupant or your child from injury.

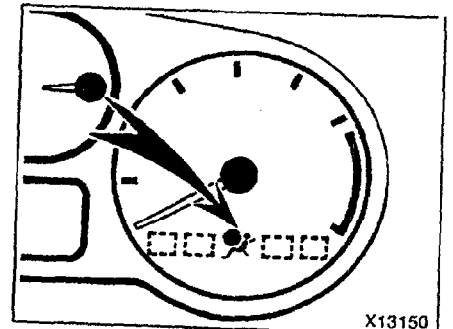
-Front seat belt pretensioners



The driver and front passenger's seat belt pretensioners are designed to be activated in response to a severe frontal impact.

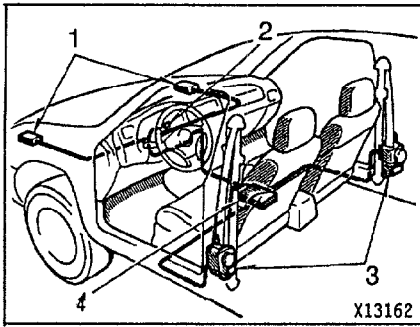
When the airbag sensor detects the shock of a severe frontal impact, the front seat belt is quickly drawn back in by the retractor so that the belt snugly restrains the front seat occupants.

The seat belt pretensioners are activated even with no passenger in the front seat.



This indicator comes on when the ignition key is turned to the "ACC" or "ON" position. It goes off after about 6 seconds. This means the front seat belt pretensioners are operating properly.

This warning light system monitors airbag sensor assembly, seat belt pretensioner assembly, warning light, interconnecting wiring and power sources. (For details, see "Service reminder indicators and warning buzzers" in chapter I-5.)



The seat belt pretensioner system mainly consists of the following components and their locations are shown in the illustration

1. Front airbag sensor
2. SRS airbag warning light
3. Seat belt pretensioner assembly
4. Airbag sensor assembly

The seat belt pretensioner is controlled by the airbag sensor assembly. The airbag sensor assembly consists of a safing sensor and airbag sensor.

When a seat belt pretensioner is activated, an operating noise may be heard and a small amount of smoke-like gas may be released. This gas is harmless and does not indicate that a fire is occurring.

Once the seat belt pretensioner has been activated, the seat belt retractor remains locked.

CAUTION

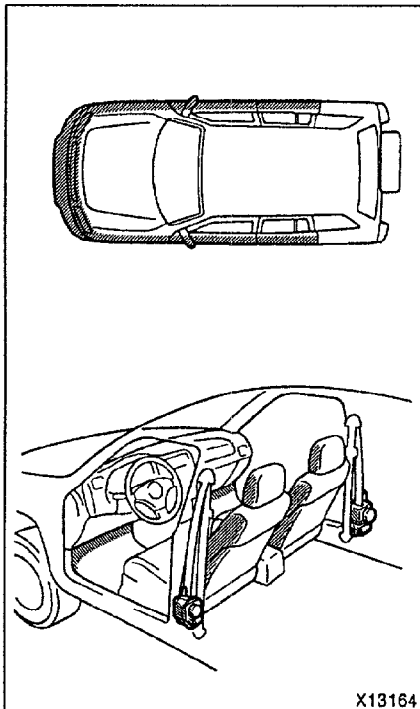
Do not modify, remove, strike or open the front seat belt pretensioner assemblies, airbag sensor or surrounding area or wiring. Doing any of these may cause sudden operation of the front seat belt pretensioners or disable the system, which could result in serious injury.

Failure to follow these instructions can result in serious injuries.

NOTICE

Do not perform any of the following changes without consulting your Toyota dealer. Such changes can interfere with proper operation of the seat belt pretensioners in some cases.

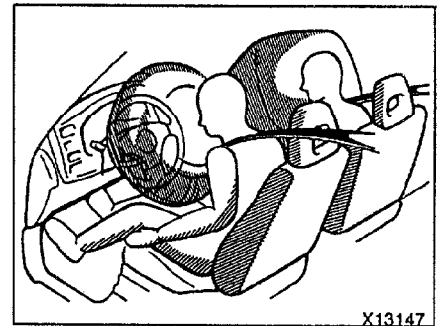
- ◆ **Installation of electronic items such as a mobile two-way radio, cassette tape player or compact disc player**
- ◆ **Repairs on or near the front seat belt retractor assemblies**
- ◆ **Modification of the suspension system**
- ◆ **Modification of the front end structure**
- ◆ **Attachment of a grille guard (bull bar, kangaroo bar, etc.), snowplow, winches or any other equipment to the front end**
- ◆ **Repairs made on or near the front fenders, front end structure or console**



This front seat belt pretensioner system has a service reminder indicator to inform the driver of operating problems. If either of the following conditions occurs, this indicates a malfunction of the airbags or pretensioners. Contact your Toyota dealer as soon as possible to service the vehicle.

- The light does not come on when the ignition key is turned to the "ACC" or "ON" position, or remains on.
- The light comes on or flashes while driving.
- If either front seat belt does not retract or can not be pulled out due to a malfunction or activation of the pretensioner.
- The front seat belt pretensioner assembly or surrounding area has been damaged.
- The front part of the vehicle (shaded in the illustration) was involved in an accident not of the extent to cause the seat belt pretensioners to operate.
- The front seat belt pretensioner assembly is scratched, cracked, or otherwise damaged.

SRS driver and front passenger airbags



The SRS (Supplemental Restraint System) airbags are designed to provide further protection for the driver and front passenger when added to the primary protection provided by the seat belts.

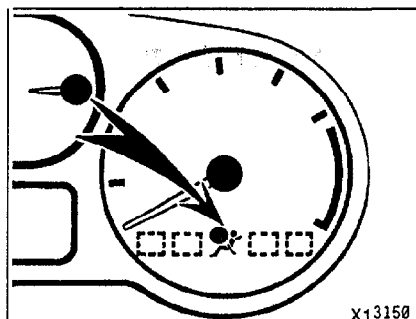
In response to a severe frontal impact, the SRS airbags work together with the seat belts to help prevent or reduce injury by inflating, in order to decrease the likelihood of the driver's or front passenger's head or chest directly hitting the steering wheel or dashboard. The passenger airbag is activated even with no passenger in the front seat.

Be sure to wear your seat belt.

CAUTION

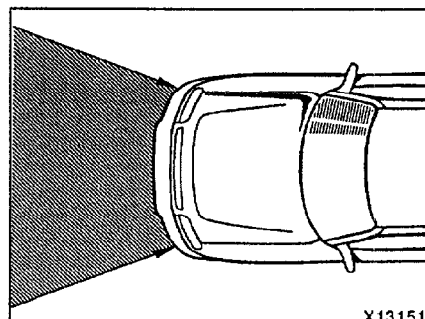
A driver or front passenger too close to the steering wheel or dashboard during airbag deployment can be killed or seriously injured. Toyota strongly recommends that:

- The driver sit as far back as possible from the steering wheel while still maintaining control of the vehicle.
- The front passenger sit as far back as possible from the dashboard.
- All vehicle occupants be properly restrained using the available seat belts.



This indicator comes on when the ignition key is turned to the "ACC" or "ON" position. It goes off after about 6 seconds. This means the SRS airbags are operating properly.

The SRS airbag warning light system monitors the airbag sensor assembly, inflator, warning light, interconnecting wiring and power sources. (For details, see "Service reminder indicators and warning buzzers" in chapter I-5.)



The SRS airbag system is designed to activate in response to a severe frontal impact within the shaded area between the arrows in the illustration.

There may be the case that the SRS airbags will not activate with such an impact in which the occupant wearing the seat belt correctly would not get serious injury.

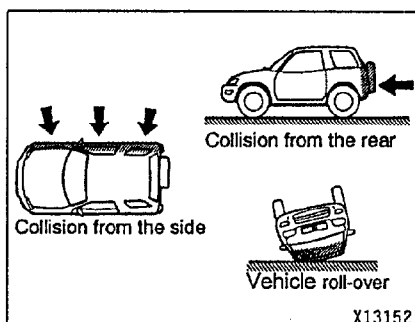
The SRS airbags will deploy if the severity of the impact is above the designed threshold level, comparable to an approximate 24 km/h (15 mph) collision in the U.S.A. and 30 km/h (18 mph) collision in Canada when impacting straight into a fixed barrier that does not move or deform.

If the severity of the impact is below the above threshold level, the SRS airbags may not deploy.

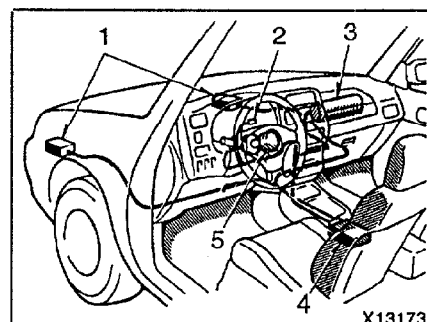
However, this threshold velocity will be considerably higher if the vehicle strikes an object, such as a parked vehicle or sign pole, which can move or deform on impact, or if it is involved in an underride collision (e.g. a collision in which the nose of the vehicle "underrides", or goes under, the bed of a truck).

It is possible with collision severity at the marginal level of airbag sensor detection and activation that only one of your vehicle's two airbags will deploy.

For the safety of all occupants, be sure to always wear seat belts.



The SRS airbags are not designed to inflate if the vehicle is subjected to a side or rear impact, if it rolls over, or if it is involved in a low-speed frontal collision.



The SRS airbag system mainly consists of the following components and their locations are shown in the illustration.

1. Front airbag sensor
2. SRS airbag warning light
3. Airbag module for passenger (airbag and inflator)
4. Airbag sensor assembly
5. Airbag module for driver (airbag and inflator)

The airbag sensor assembly consists of a safing sensor and airbag sensor.

In a severe frontal impact, sensors detect deceleration and the system triggers the airbag inflators. Then a chemical reaction in the inflators momentarily fills the airbags with non-toxic gas to help restrain the forward motion of the occupants.

When the airbags inflate, they produce a fairly loud noise and release some smoke along with non-toxic gas. This does not indicate a fire. Be sure to wash off any residue as soon as possible to prevent minor skin irritation.

Deployment of the airbags happen in a fraction of a second, so the airbags must inflate with considerable force. While the system is designed to reduce serious injuries, it may also cause minor burns or abrasions and swellings.

Parts of the airbag module (steering wheel hub, dashboard) may be hot for several minutes, but the airbags themselves will not be hot. The airbags are designed to inflate only once.

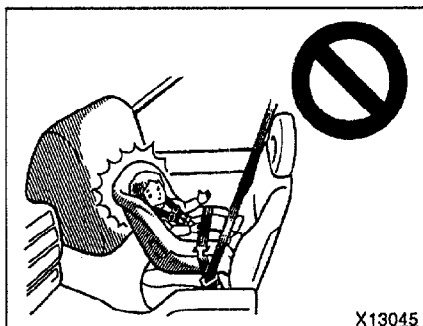
A crash severe enough to inflate the airbags may break the windshield as the vehicle buckles. In vehicles with a passenger airbag the windshield may also be damaged by absorbing some of the force of the inflating airbag.

CAUTION

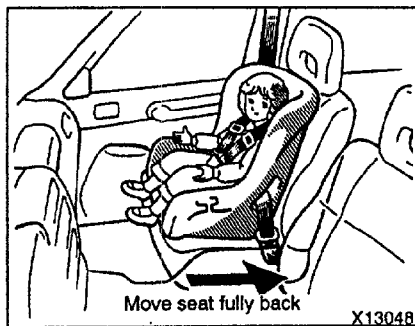
- The SRS airbag system is designed only as a supplement to the primary protection of the driver side and front passenger side seat belt systems. The front seat occupants can be killed or seriously injured by an inflating airbag if they do not wear the available seat belts. During sudden braking just before a collision, an unrestrained driver or front passenger can move forward into direct contact with or close proximity to the airbag which may then deploy during the collision. To obtain maximum protection in an accident, the driver and all passengers in the vehicle must wear their seat belts. Wearing a seat belt during an accident reduces the chances of death or serious injuries or being thrown out of the vehicle. For instructions and precautions concerning the seat belt system, see "Seat belts" in this chapter.

- Improperly seated and/or restrained infants and children can be killed or seriously injured by a deploying airbag. An infant or child who is too small to use a seat belt should be properly secured using a child restraint system. Toyota strongly recommends that all infants and children be placed in the rear seat of the vehicle and properly restrained. The rear seat is the safest for infants and children. For instructions concerning the installation of a child restraint system, see "Child restraint" in this chapter.

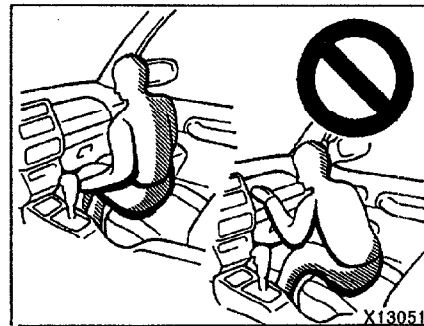
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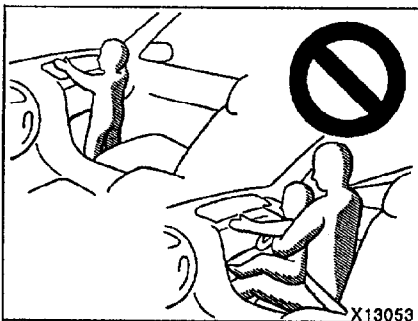
- Never put a rear-facing child restraint system on the front seat because the force of the rapid inflation of the passenger airbag can cause death or serious injury to the child.



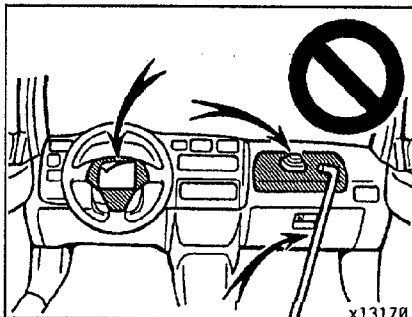
- A forward-facing child restraint system should be allowed to be put on the front seat only when it is unavoidable. Always move the seat as far back as possible because the force of a deploying airbag could cause death or serious injury to the child. For instructions concerning the installation of a child restraint system, see "Child restraint" in this chapter.



- Do not sit on the edge of the seat or lean over the dashboard when the vehicle is in use. The airbags inflate with considerable speed and force; you may be killed or seriously injured. Sit up straight and well back in the seat, and always use your seat belt.



- Do not allow a child to stand up, or to kneel on the front passenger seat. The airbag inflates with considerable speed and force; the child may be killed or seriously injured.
- Do not hold a child on your lap or in your arms. Use a child restraint system in the rear seat. For instructions concerning the installation of a child restraint system, see "Child restraint" in this chapter.



- Do not put objects or your pets on or in front of the dashboard or steering wheel pad that houses the airbag system. They might restrict inflation or cause death or serious injury as they are projected rearward by the force of the deploying airbags. Likewise, the driver and front passenger should not hold things in their arms or on their knees.

- Do not modify or remove any wiring. Do not modify, remove, strike or open any components, such as the steering wheel column cover, front passenger airbag cover, front passenger airbag, airbag sensor assembly. Doing any of these may cause sudden SRS airbag inflation or disable the system, which could result in death or serious injury.

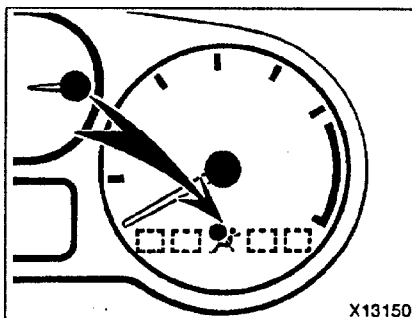
Failure to follow these instructions can result in death or serious injuries.

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NOTICE

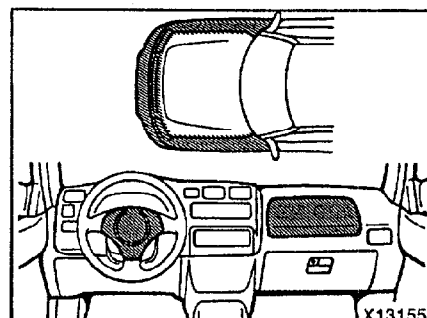
Do not perform any of the following changes without consulting your Toyota dealer. Such changes can interfere with proper operation of the SRS airbag system in some cases.

- ◆ Installation of electronic items such as a mobile two-way radio, cassette tape player or compact disc player
- ◆ Modification of the suspension system
- ◆ Modification of the front end structure
- ◆ Attachment of a grille guard (bull bar, kangaroo bar, etc.), snowplow, winches or any other equipment to the front end
- ◆ Repairs made on or near the front fenders, front end structure, console, steering column, steering wheel or dashboard near the front passenger airbag



This SRS airbag system has a service reminder indicator to inform the driver of operating problems. If either of the following conditions occurs, this indicates a malfunction of the airbags. Contact your Toyota dealer as soon as possible to service the vehicle.

- The light does not come on when the ignition key is turned to the "ACC" or "ON" position, or remains on.
- The light comes on while driving.



In the following cases, contact your Toyota dealer as soon as possible:

- The SRS airbags have been inflated.
- The front part of the vehicle (shaded in the illustration) was involved in an accident not of the extent to cause the SRS airbags to inflate.
- The pad section of the steering wheel or front passenger airbag cover (shaded in the illustration) is scratched, cracked, or otherwise damaged.

NOTICE

Do not disconnect the battery cables before contacting your Toyota dealer.

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