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REPORT NO. KAR-98-5

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

GENERAL MOTORS CORPORATION
1998 CHEVROLET BLAZER LS SUV
4-DOOR
NHTSA NO. MW0103

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

JANUARY 22, 1998
FINAL REPORT

PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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Prepared by: James E. Gorth
Mr. James E. Gorth, Project Engineer
KARCO Engineering
Date: January 22, 1998

Reviewed by: Jerry L Kratzke
Mr. Jerry L. Kratzke, Director of Operations
KARCO Engineering
Date: January 22, 1998

Approved by: Frank D Richardson
Mr. Frank D. Richardson, Program Manager
KARCO Engineering
Date: January 22, 1998

FINAL REPORT ACCEPTED BY:

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Manager, New Car Assessment Program

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Date of Acceptance

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COTR, NCAP Frontal Impact Program

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Date of Acceptance

Technical Report Documentation Page

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15. *Supplementary Notes*		

16. *Abstract*

A 35 mph (56.3 km/h) frontal barrier impact test was conducted on a 1998 Chevrolet Blazer at KARCO Engineering on January 8, 1998. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301 and footwell intrusion performance. The impact velocity was 56.63 km/h. The ambient temperature at the barrier face at the time of impact was 13.9°C. The vehicle's maximum post-test static crush was 625 mm, located at the centerline of the vehicle. The test vehicle was equipped with a 3-point continuous belt system and second generation supplemental airbags at both frontal outboard-seating positions.

With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" the occupant injury response data summary is as follows:

Injury Criteria	Threshold Value	Driver Dummy	Passenger Dummy
Head Injury Criteria (HIC)	1000	675.1	503.2
Chest Resultant Peak 3 msec clip	60 G's	51.4	55.7
Left Femur Force	10009 N	-7874.2	-5761.6
Right Femur Force	10009 N	-6335.1	-5136.3

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SECTION 1

PURPOSE, TEST PROCEDURE AND SUMMARY OF TEST MW0103

1.1 PURPOSE

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

1.2 TEST PROCEDURE

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

The test was conducted at KARCO Engineering on January 8, 1998, at a speed of 56.63 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 feet 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 used in one previous frontal impact test since their last calibration. Injury criteria were not exceeded by either ATD during this NCAP frontal offset impact test.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A immovable barrier was impacted by a 1998 Chevrolet Blazer LS SUV 4-Door at a velocity of 56.63 km/h. The test weight, with two (2) 50th percentile male ATDs, was 2190 kg.

The driver's Head Injury Criteria (HIC) was 675.1, the maximum chest deceleration over three (3) milliseconds was 51.4 g and the left and right femur loads were –7874.2 and –6335.1 Newtons, respectively. Chest deflection for the driver ATD was –26.8 mm. The driver ATD head contacted the airbag and headrest, its chest and abdomen contacted the airbag, and both knees contacted the lower dash knee bolster, with the left and right knees contacting the steering column.

The right front passenger's HIC was 503.2, maximum chest deceleration over three (3) milliseconds was 55.7 g and the left and right femur loads were –5761.6 and –5136.3 Newtons respectively. Chest deflection for the passenger ATD was –18.8 mm. The passenger ATD head contacted the airbag, headrest, B-pillar and the roof, the chest and abdomen contacted the airbag and both knees contacted the dashboard.

Seat belt spoolout, measured by on-board pullout potentiometers was 121.5 mm for the driver ATD and 178.9 mm for the passenger ATD. Shoulder belt stretch was 0.38 mm/cm for the driver ATD and 0.43 mm/cm for the passenger ATD.

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

The test vehicle sustained a maximum static crush of 625 mm at the vehicle centerline. All doors on both the driver side and the passenger side required the aid of tools to open.

1.4 GENERAL COMMENTS

The 1998 Chevrolet Blazer passed the requirements of FMVSS 212, FMVSS 219 and FMVSS 301-75. Data pertaining to these standards are presented in the data sheets.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. Appendix B contains the dummy, vehicle and response data traces. Appendix C contains Load Cell Barrier information, which is not applicable to this test. Appendix D contains the instrumentation data channel assignments. Appendix E contains the dummy calibration data and Appendix F contains the owner's manual instructions for the occupant restraint systems.

SECTION 2.

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

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

CONVERSION FACTORS USED IN THIS REPORT:

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

DATA SHEET NO. 1

CRASH TEST SUMMARY

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

TEST MODE: 56.3 km/h NCAP Frontal Barrier Impact

TEST DATE: January 8, 1998 TIME: 12:01 PM TEMPERATURE: 13.9° C

TEST WEIGHT: 2190 kg IMPACT VELOCITY: 56.63 km/h

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

Measurements in mm	Left Side	Centerline	Right Side
Vehicle Rebound	968	870	780

VEHICLE STATIC CRUSH

Measurements in mm	Left	Center	Right
Pre-test Measurements	4500	4700	4500
Post-test Measurements	4100	4075	4070
Static Crush	-400	-625	-430

DOOR OPENING AND SEAT TRACK INFORMATION

	Driver	Passenger
Door Opening (Front)	**JAMMED**	**JAMMED**
Door Opening (Rear)	**JAMMED**	**JAMMED**
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, HEAD REST, B-PILLAR, ROOF**
Chest	**AIR BAG**	**AIR BAG**
Abdomen	**AIR BAG**	**AIR BAG**
Left Knee	**DASH BOARD/STEERING COLUMN**	**GLOVE BOX**
Right Knee	**DASH BOARD/STEERING COLUMN**	**GLOVE BOX/SADHBOARD**

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR

TEST VEHICLE INFORMATION			
Manufacturer	GENERAL MOTORS CORPORATION	VIN	1GNDT13W4W2149739
Manufacturing Date	10/97	Delivery Date	12/30/97
Dealer	RICHARD HIBBARD CHEVROLET	NHTSA NO.	MW0103
Odometer Reading	000013 MI	Fuel Type	UNLEADED
Engine Displacement	4.3 LITERS	Cylinders	6
Transmission	AUTOMATIC	Final Drive	REAR/FRONT (4WD)
Engine Placement	LONGITUDINAL	Color	WHITE
Tire Press./Max. Cap. Front	220 kPa	Cold Tire Press. Front	220 kPa
Tire Press./Max. Cap. Rear	220 kPa	Cold Tire Press. Rear	220 kPa
Recommend Tire Size	P235/70R15	Type of Spare	FULL SIZE P235/70R15
Tire Size on Vehicle	P235/70R15	Manufacturer	MICHELIN
GVWR	2427 kg	Cargo Capacity	136 kg
GAWR Front	1270 kg	GAWR Rear	1225 kg
Air Conditioning	YES	Power Steering	YES
Power Brakes	YES	AM/FM/Cassette	YES
Disc Brakes (Front)	YES	Disc Brakes (Rear)	YES
Power Windows	YES	Tilt Steering	YES
Anti-lock Brakes (ABS)	YES	Power Seats	YES
Driver Airbag	YES	Passenger Airbag	YES

VEHICLE CAPACITY DATA:

TYPE OF FRONT SEATS Bucket Seats

TOTAL NUMBER OF OCCUPANTS 5 OCCUPANTS x 68 kg. 340 kg

WEIGHT OF VEHICLE AS RECEIVED AT KARCO (with maximum fluids): 1908 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	513	407	920
Left	551	437	988
Total	1064	844	1908
Percent of Total	55.7	44.3	100%

CALCULATION OF TEST TARGET WEIGHT (kg):

Total Delivered Weight	1908 kg
RCLW	136 kg
Weight of 2 P572 ATDs	152 kg
TARGET TEST WEIGHT	2197 kg

TEST WEIGHT OF VEHICLE WITH 2 ATDs AND BALLAST

	FRONT	REAR	TOTAL
Right	561	540	1101
Left	544	545	1089
Total	1105	1085	2190
Percent of Total	50.4	49.6	100%

Weight of Ballast secured in cargo area: 111.1 kg — Includes cameras, instrumentation, brake abort and bags containing lead shot secured in the right and left rear fender wells.

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

TEST VEHICLE ATTITUDE (mm)

ATTITUDE	LF	RF	LR	RR
As Delivered	785	805	842	865
As Tested	760	770	792	811

Vehicle Wheelbase: 2718 mm

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 68.2 liters

Usable Capacity Figure Furnished by COTR = 69.0 liters

Test Volume Range (92 to 94% of Usable Capacity) = 63.4 to 64.8 liters

ACTUAL TEST VOLUME = 64.8 liters (With entire fuel system filled)

Test Fluid Type = Stoddard Solvent **Specific Gravity** = 0.764

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

Type of Fuel Pump = Electric X Mechanical ____

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

DETAILS OF FUEL SYSTEM: Pump is activated when ignition is turned on. If engine is not running, pump shuts off after 1-2 seconds.

DATA SHEET NO. 3

POST IMPACT DATA

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

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

TEST DATE: January 8, 1998 TIME: 12:01 PM TEMPERATURE: 13.9° C

REQUIRED IMPACT VELOCITY RANGE: 59.53 km/h to 61.14 km/h

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

Trap No. 1 = 56.63 km/h Trap No. 2 = 56.62 km/h

Distance from vehicle to barrier - -

A. entering trap = 1524 mm

B. leaving trap = 305 mm

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

Vehicle Length	Left	Center	Right
Pre-test Measurements (mm)	4500	4700	4500
Post-test Measurements (mm)	4100	4075	4070
Static Crush (mm)	-400	-625	-430
Average	-485		

VEHICLE REBOUND: (from rigid barrier with rotational movement)

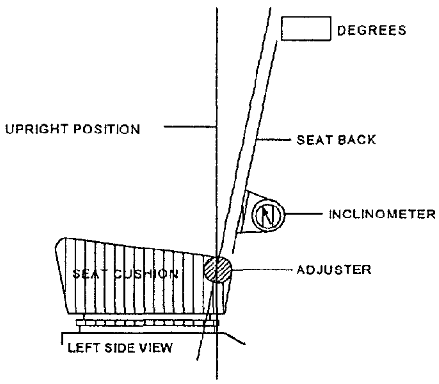
Measurements in mm	Left Side	Centerline	Right Side
Vehicle Rebound	968	870	780

DATA SHEET NO. 4

TEST VEHICLE INFORMATION

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

1. NOMINAL DESIGN RIDING POSITION -



FRONT SEAT ASSEMBLY

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

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

Seat back angle for driver's seat = 25 °

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

Seat back angle for passenger's seat = 25 °

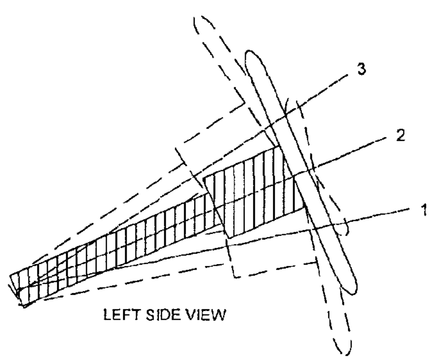
2. SEAT FORE & AFT POSITIONS -

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

Positioning of the driver's seat: Power seat, set to midpoint of fore-aft travel.

Positioning of the passenger's seat (if applicable): 20 positions, set at the 11th position from the front.

3. STEERING COLUMN ADJUSTMENTS:



STEERING COLUMN ASSEMBLY

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

Operational Instructions:

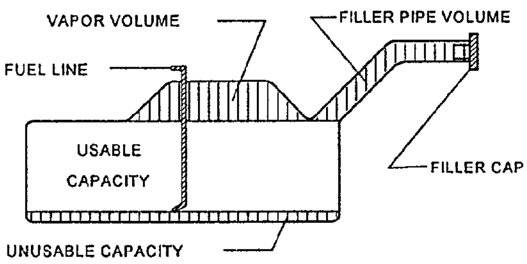
Position No. 1 is at 13°
Position No. 2 is at 25.5°
Position No. 3 is at 38°

4. SEAT BELT UPPER ANCHORAGE:

Set to mid-position

DATA SHEET NO. 4 (continued)

5. FUEL TANK CAPACITY DATA



VEHICLE FUEL TANK ASSEMBLY

5.1 A. "Usable Capacity" of standard equipment fuel tank = 69.9 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 = 63.4 to 64.8 liters.

Operational Instructions:

5.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 64.8 liters

5.3 Is vehicle equipped with electric fuel pump?

Yes X No ____

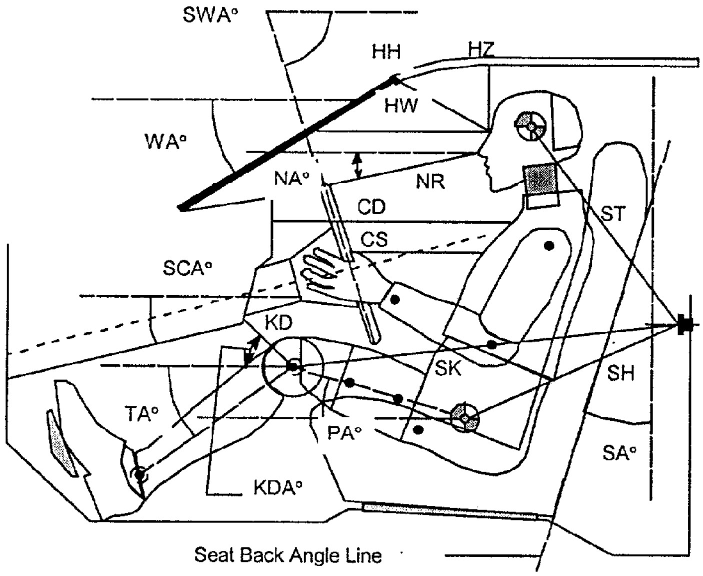
If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

Pump is activated when ignition is turned to on. If engine is not running, pump shuts off after 1-2 seconds.

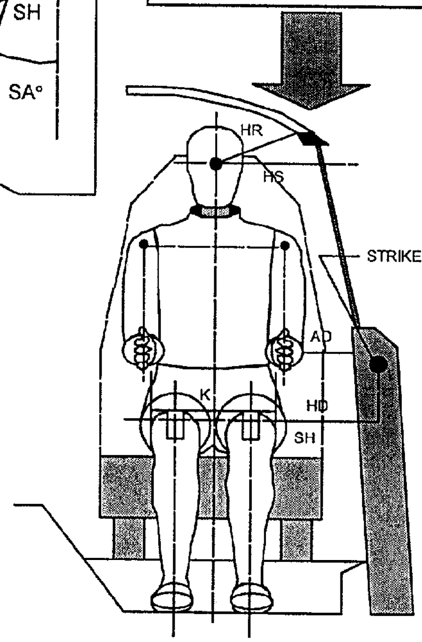
DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

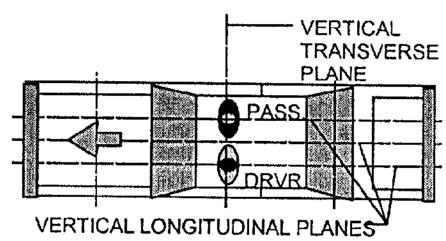
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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



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



DATA SHEET NO. 5...(continued)

DUMMY POSITIONING IN VEHICLE

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

FRONT SEAT MEASUREMENT TABLE

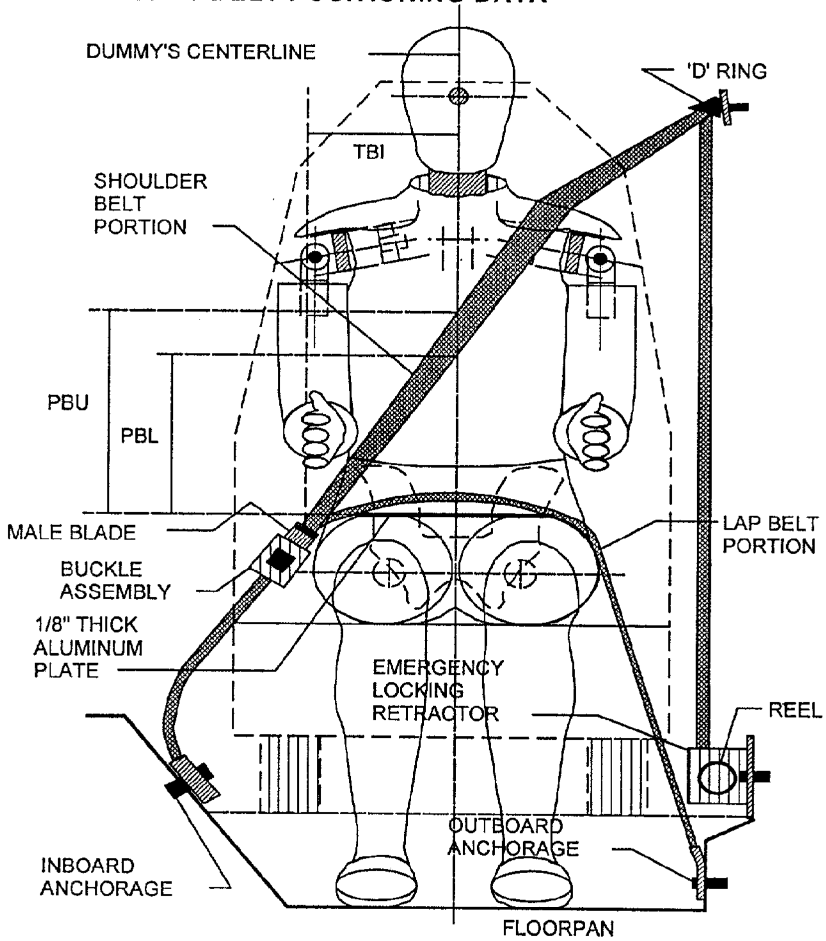
	DRIVER (Serial No. 34)		PASS. (Serial No. 35)	
	DISTANCE (mm)	ANGLE (°)	DISTANCE (mm)	ANGLE (°)
WA°		35		
SWA°		69		
SCA°		21		
SA°		25		25
HZ	230	90	215	90
HH	505	0	490	0
HW	600	0	600	0
HR	280		250	
NR	320	12		
CD	525		460	
CS	300	0		
RA	145	0		
KDL	160	40	15	
KDR	158		155	32
PA°		25		25
TA°		40		45
KK	230		250	
ST	600	21	630	22
SH	230	14	260	17
SHY	250		200	
HS	370		310	
HD	182		160	
AD	124		30	

DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

SEATING POSITION	DRIVER	PASSENGER
TCI -- Dummy centerline to shoulder bolt	160	160
PBU--Top surface of aluminum plate to belt upper edge	350	290
PBL--Top surface of aluminum plate to belt lower edge	260	210
Lap Belt tension	10 Newtons	10 Newtons
Shoulder Belt tension	Retractor	Retractor

SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

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

VEHICLE YR/MAKE/MODEL/BODY: 1998 CHEVROLET BLAZER LS SUV NHTSA No.: MW0103

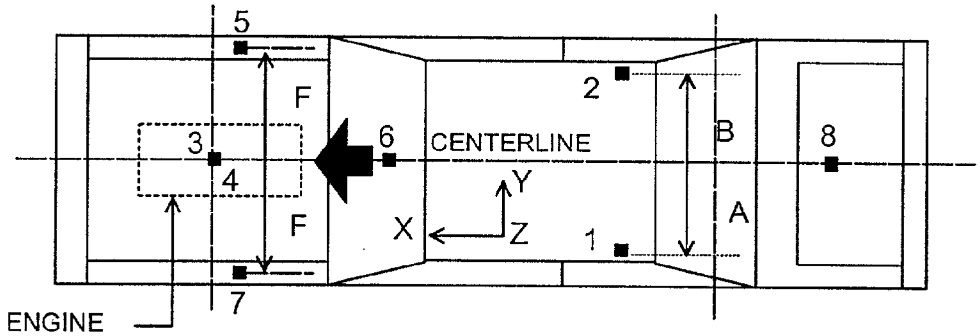
TEST PROGRAM: 1988 NHTSA 35 MPH NCAP TEST DATE: 1/8/98

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

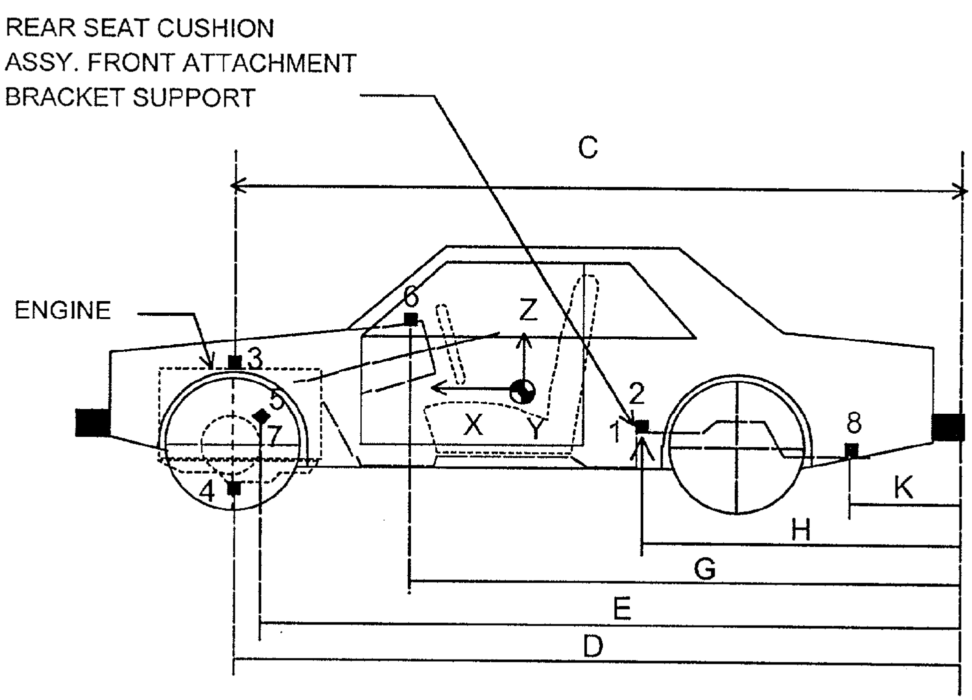
No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member (Pri.)	1869	-603	534	G's	3.5	185.6	-43.3	49.8
2	Right Rear X-Member (Pri.)	1921	553	534	G's	3.5	135.5	-45.7	52.2
3	Engine Top	3952	212	1022	G's	20.7	55.4	-113.7	33.9
4	Engine Bottom	3621	35	240	G's	16.2	50.6	-87.7	39.6
5	Left Brake Caliper	3780	-656	263	G's	0.0	0.0	0.0	0.0
6	Right Brake Caliper	3780	656	263	G's	63.1	56.8	-105.3	41.4
7	Instrument Panel	3082	0	1253	G's	101.2	56.6	-153.6	66.2
8	Left Rear X-Member (Rednt.)	1807	-603	534	G's	3.4	185.1	-38.3	48.3

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

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



TOP VIEW



LEFT SIDE VIEW

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

VEHICLE YR/MAKE/MODEL/BODY: 1998 CHEVROLET BLAZER LS SUV　　NHTSA No.: MW0103

TEST PROGRAM: 1988 NHTSA 35 MPH NCAP　　TEST DATE: 1/8/98

HEAD PRIMARY PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	15.5	222.5	-70.1	76.8	11.3	269.9	-57.4	84.7
Head CG	Y	G's	31.1	85.1	-6.2	63.5	5.4	37.5	-19.2	93.5
Head CG	Z	G's	19.2	69.1	-27.2	86.7	24.5	69.9	-21.1	89.5
Head CG Resultant	N/A	G's	73.6	82.6			59.8	84.8		

CHEST PRIMARY PEAK ACCELERATIONS

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.1	167.9	-54.1	78.0	3.0	171.9	-55.9	78.6
Chest CG	Y	G's	2.0	98.2	-9.1	82.7	6.7	85.8	-3.7	52.9
Chest CG	Z	G's	7.5	120.6	-17.3	84.7	9.0	119.2	-21.9	72.5
Chest CG Resultant	N/A	G's	54.4	78.0			58.0	78.5		

FEMUR PEAK FORCES

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	140.4	38.6	-7874.2	57.2	83.3	40.7	-5761.6	62.5
Right Femur	Z	Newtons	147.6	35.2	-6335.1	53.1	1661.3	33.9	-5136.3	51.6

SEAT BELT PEAK FORCES

			Driver				Passenger			
Location	Axis	Units	Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt	N/A	Newtons	6358.5	61.6	-54.4	140.6	8361.7	67.2	-18.5	0.4
Shoulder Belt	N/A	Newtons	5223.6	79.7	-88.8	187.1	5535.3	81.5	-14.0	271.0

HEAD INJURY CRITERA (HIC)

	Driver				Passenger			
Location	HIC	Avg G's	T^1	T^2	HIC	Avg G's	T^1	T^2
Head CG Primary	675.1	50.6	64.1	98.6	503.2	49.8	66.7	92.5

CHEST CLIP (3MSEC)

	Driver			Passenger		
Location	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	51.4	76.9	79.9	55.7	77.0	80.0

DATA SHEET NO. 8...(continued)

VEHICLE YR/MAKE/MODEL/BODY: 1998 CHEVROLET BLAZER LS SUV NHTSA No.: MW0103

TEST PROGRAM: 1988 NHTSA 35 MPH NCAP TEST DATE: 1/8/98

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	4.5	136.2	-70.4	55.4	3.7	121.3	-68.9	60.0
Pelvis	Y	G's	17.5	55.3	-12.6	48.4	2.8	108.5	-12.1	51.5
Pelvis	Z	G's	8.4	44.8	-27.9	60.1	6.1	44.7	-19.5	77.3

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	282.8	80.0	-810.8	63.5	478.9	158.2	-786.7	75.0
Neck Force	Y	Newtons	286.0	94.1	-249.5	144.9	151.9	140.0	-135.1	82.4
Neck Force	Z	Newtons	2769.5	77.3	-235.8	119.0	2256.9	75.5	-442.6	100.8
Neck Moment	X	Joules	24.7	95.9	-11.8	187.5	9.2	90.9	-16.6	135.8
Neck Moment	Y	Joules	64.7	64.2	-50.3	81.9	39.8	167.8	-29.9	283.9
Neck Moment	Z	Joules	32.1	105.7	-11.9	184.0	18.2	168.5	-25.2	109.2

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	138.5	44.5	-63.1	51.4	266.1	45.0	-42.2	53.8
Left Foot Aft	Z	G's	32.6	57.1	-130.2	51.7	181.8	49.3	-261.0	42.6
Left Foot Fore	Z	G's	61.1	51.5	-181.3	43.7	110.7	49.1	-325.7	43.2
Right Foot Aft	X	G's	273.9	45.8	-55.9	49.7	100.4	43.2	-27.2	61.9
Right Foot Aft	Z	G's	78.4	53.6	-260.6	44.6	16.0	77.9	-137.0	43.4
Right Foot Fore	Z	G's	79.9	54.3	-346.3	44.6	32.1	60.4	-149.6	43.3

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	353.8	61.7	-1201.2	52.6	87.9	205.7	-1608.8	45.1
Left Lower Force	Z	Newtons	148.2	61.2	-4505.1	45.5	496.7	65.7	-5309.5	46.3
Left Lower Moment	Y	Joules	28.5	41.6	-105.1	61.6	83.1	43.7	-86.0	50.3
Left Upper Moment	X	Joules	75.5	45.4	-68.5	52.3	20.0	49.8	-110.5	45.9
Left Upper Moment	Y	Joules	132.6	45.3	-224.8	61.0	203.5	44.6	-9.1	299.5
Right Lower Force	X	Newtons	48.3	209.5	-2368.8	47.4	76.4	232.1	-1011.4	45.2
Right Lower Force	Z	Newtons	107.9	212.1	-11209.1	47.8	247.9	72.2	-4657.0	51.8
Right Lower Moment	Y	Joules	124.4	45.5	-166.3	55.2	50.2	44.0	-29.7	113.3
Right Upper Moment	X	Joules	75.9	51.2	-13.0	235.5	4.9	219.3	-48.7	53.2
Right Upper Moment	Y	Joules	260.3	47.5	-61.1	84.5	171.6	51.8	-12.8	276.8

DATA SHEET NO. 8...(continued)

VEHICLE YR/MAKE/MODEL/BODY: 1998 CHEVROLET BLAZER LS SUV NHTSA No.: MW0103

TEST PROGRAM: 1988 NHTSA 35 MPH NCAP TEST DATE: 1/8/98

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.1	2.8	-26.8	62.4	0.1	5.9	-18.8	88.4

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	14.1	219.8	-69.6	77.9	12.0	270.0	-56.6	84.2
Head CG	Y	G's	26.8	83.6	-5.2	62.0	2.8	60.1	-16.3	92.9
Head CG	Z	G's	14.6	69.3	-27.1	87.2	25.0	69.7	-17.7	89.3
Head CG Resultant	N/A	G's	71.9	79.3			58.5	86.2		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.9	167.7	-55.4	78.0	3.1	172.2	-55.6	78.8
Chest CG	Y	G's	2.0	97.5	-10.0	81.1	7.2	85.9	-3.8	53.0
Chest CG	Z	G's	6.5	120.5	-16.8	84.8	7.4	116.0	-17.8	72.6
Chest CG Resultant	N/A	G's	56.0	78.0			57.3	78.7		

REDUNDANT HEAD INJURY CRITERA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T^1	T^2	HIC	Avg G's	T^1	T^2
Head CG Redundant	624.9	49.4	64.4	97.7	484.1	50.2	67.6	92.0

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Redundant	52.8	77.1	80.1	55.0	77.4	80.4

DATA SHEET NO. 9

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

BELT LENGTH DATA (mm)	DRIVER	PASSENGER
Total belt length for continuous webbing systems.	2790	2790
Retractor reel to 'D' ring	430	430
Shoulder belt length as measured on Part 572 Dummy	800	820
Lap belt length as measured on Part 572 Dummy	780	780
Remainder of belt on reel	760	760

SHOULDER BELT SPOOL-OFF DATA (mm)	DRIVER	PASSENGER
As determined mechanically	140	160
As determined electronically	121.5	178.9

BELT STRETCH DATA (mm/cm)	DRIVER	PASSENGER
Measured electronically between shoulder belt load cell and the "D" ring	0.38	0.43
Measured mechanically	0.79	0.79

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

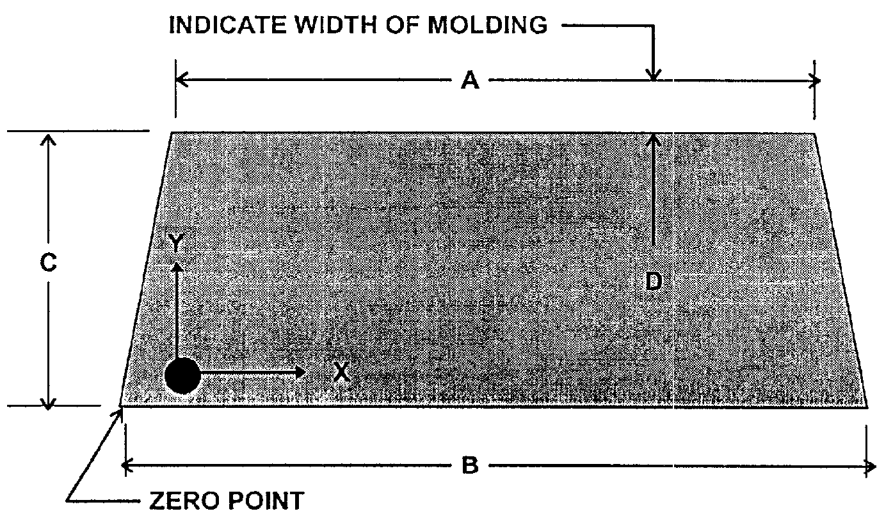
TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

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	2068	2068	100%
Left Side	2068	2068	100%
Total	4136	4136	100%

Indicate area of retention failure.



FRONT VIEW OF WINDSHIELD

Width of molding = Top 10 mm , Sides 23 mm, Bottom 0 mm.

Temperature of windshield molding during test = 21.11 °C

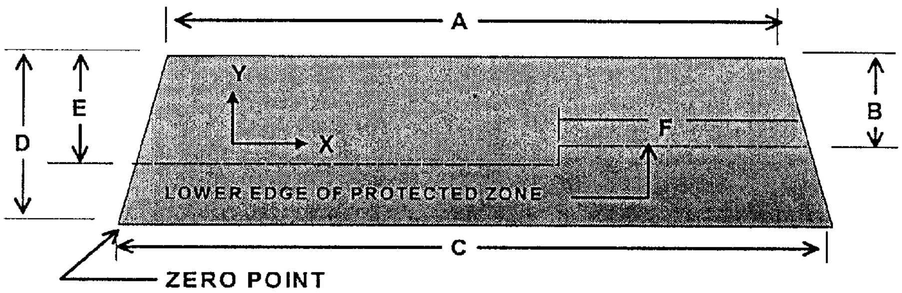
DATA SHEET NO. 11

WINDSHIELD ZONE INTRUSION FMVSS 219 (PARTIAL) DATA

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

SKETCH OF FRONT VIEW OF WINDSHIELD:

Provide all dimensions necessary to reproduce the protected area.



	DIMENSION mm
A	1245
B	305
C	1520
D	685
E	445
F	785

FRONT VIEW OF WINDSHIELD

AREA OF PROTECTED ZONE FAILURES:

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

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

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

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

DATA SHEET NO. 12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

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

TEST DATE: January 8, 1998 TIME: 12:01 PM TEMPERATURE: 13.9° C

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. From impact until vehicle motion ceases - -
Actual = 0.0 oz. (Maximum Allowable = 1 ounce)

B. For 5 minute period after vehicle motion ceases - -
Actual = 0.0 oz. (Maximum Allowable = 5 ounces)

C. For next 25 minutes - -
Actual = 0.0 oz. (Maximum Allowable = 1 oz./minute)

D. Provide Spillage Details: No solvent spillage occurred

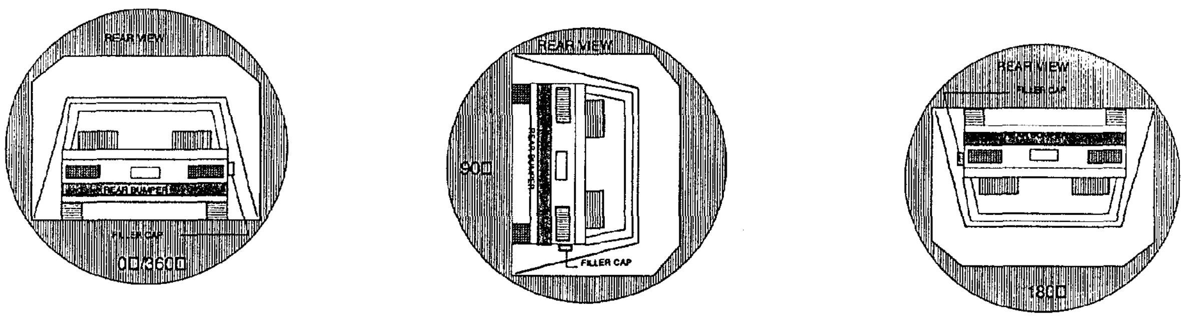
DATA SHEET NO. 13

FMVSS 301 STATIC ROLLOVER DATA SHEET

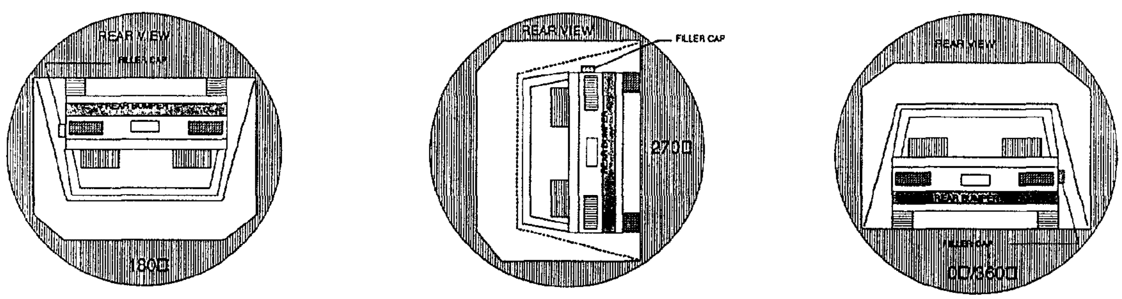
TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

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

TEST DATE: January 8, 1998 TIME: 12:01 PM TEMPERATURE: 13.9° C



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°	81	300	0
180° TO 270°	80	300	0
270° TO 360°	80	301	0

3. Provide Details of Stoddard Solvent Spillage Locations--

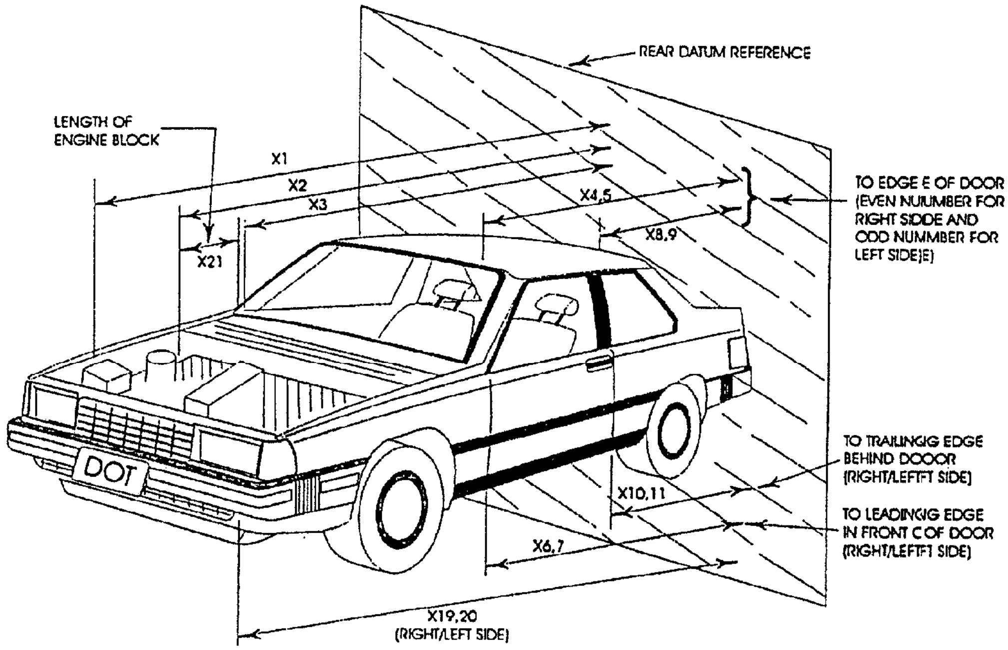
No solvent leakage occurred during rollover tests.

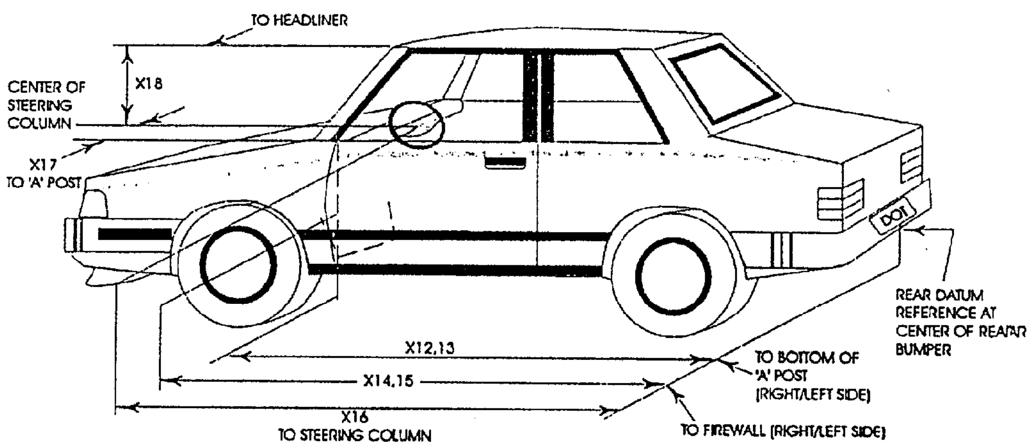
DATA SHEET NO. 14

VEHICLE MEASUREMENTS

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

NO.	MEASUREMENT DESCRIPTION	DIMENSIONS IN MM		
		PRE-TEST	POST-TEST	DIFFERENCE
1	Total length of vehicle at centerline	4700	4075	-625
2	Rear surface of vehicle (RSOV) to front of engine	4060	3850	-210
3	RSOV to firewall centerline	3440	3340	-100
4	RSOV to leading edge of right door	3290	3280	-10
5	RSOV to leading edge of left door	3285	3280	-5
6	RSOV to lower leading edge of right door	3255	3250	-5
7	RSOV to lower leading edge of left door	3260	3255	-5
8	RSOV to upper trailing edge of right door	2160	2155	-5
9	RSOV to upper trailing edge of left door	2160	2155	-5
10	RSOV to lower trailing edge of right door	2160	2155	-5
11	RSOV to lower trailing edge of left door	2160	2155	-5
12	RSOV to bottom of right 'A' pillar	3250	3230	-20
13	RSOV to bottom of left 'A' pillar	3250	3235	-15
14	RSOV to firewall on right side	3490	3430	-60
15	RSOV to firewall of left side	3510	3470	-40
16	RSOV to steering column	2840	2800	-40
17	Center of steering column to left 'A' pillar	390	320	-70
18	Center of steering column to headlining	400	470	+70
19	RSOV to right side of front bumper	4500	4070	-430
20	RSOV to left side of front bumper	4500	4100	-400
21	Length of engine block	500	500	0
22	RSOV to right side of dash panel	3000	3040	+40
23	RSOV to center of dash panel	3030	3040	+10
24	RSOV to left side of dash panel	3030	3025	-5


REAR DATUM REFERENCE
LENGTH OF ENGINE BLOCK
X1
X2
X3
X21
X4,5
X8,9
TO EDGE E OF DOOR (EVEN NUUMBER FOR RIGHT SIDDE AND ODD NUMMBER FOR LEFT SIDE)E)
TO TRAILINGIG EDGE BEHIND DOOOR (RIGHT/LEFTFT SIDE)
X10,11
TO LEADINGIG EDGE IN FRONT C OF DOOR (RIGHT/LEFTFT SIDE)
X6,7
X19,20 (RIGHT/LEFT SIDE)
DOT


TO HEADLINER
CENTER OF STEERING COLUMN
X18
X17 TO 'A' POST
DOT
REAR DATUM REFERENCE AT CENTER OF REAR/R BUMPER
X12,13
TO BOTTOM OF 'A' POST (RIGHT/LEFT SIDE)
X14,15
X16 TO STEERING COLUMN
TO FIREWALL (RIGHT/LEFT SIDE)

DATA SHEET NO. 15

CAMERA LOCATIONS

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

CAMERA NO.	VIEW	CAMERA POSITIONS (mm) *			ANGLE (Deg.)	FILM PLANE TO HEAD TARGET (mm)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Right Side View-Real Time	2083	8331	914	0	1651	Zoom	24
2A	Left Side View No. 1	1321	-8382	864	0	7925	13	360
2B	Left Side View No. 2	1499	-9855	1270	1	9931	25	970
3	Left Side View No. 3	787	-10,084	1372	0	2438	50	960
4	Left Side View No. 4	3048	2743	2007	17	8052	19	1000
5	Left Side View No. 5	1905	-8306	2515	14	8077	25	1020
6	Left Side View No. 6	1880	-8382	1092	7	7849	25	1010
7	Right Side View No. 1	1295	10,160	1168	0	9322	13	1080
8	Right Side View No. 2	1372	9957	1321	0	12,040	50	1230
9	Right Side View No. 3	6832	11,633	3175	7	10,363	80	950
10	Right Side View No. 4	2946	10,922	1245	0	10,546	50	1150
11	Overhead Windshield	914	0	5715	4	N/A	13	1280
12	Front View No. 1 Driver	-356	356	2540	40	2845	19	1200
13	Front View No. 2 Passenger	-356	508	2540	40	2845	19	1080
14	Pit Camera Engine View	864	0	-1600	0	N/A	13	870
15	Pit Camera Fuel Tank View	4953	0	-1778	45	N/A	19	800
16	Driver Side Onboard	3302	381	1473	10	914	13	450
17	Passenger Side Onboard	3277	381	1499	11	914	13	520

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

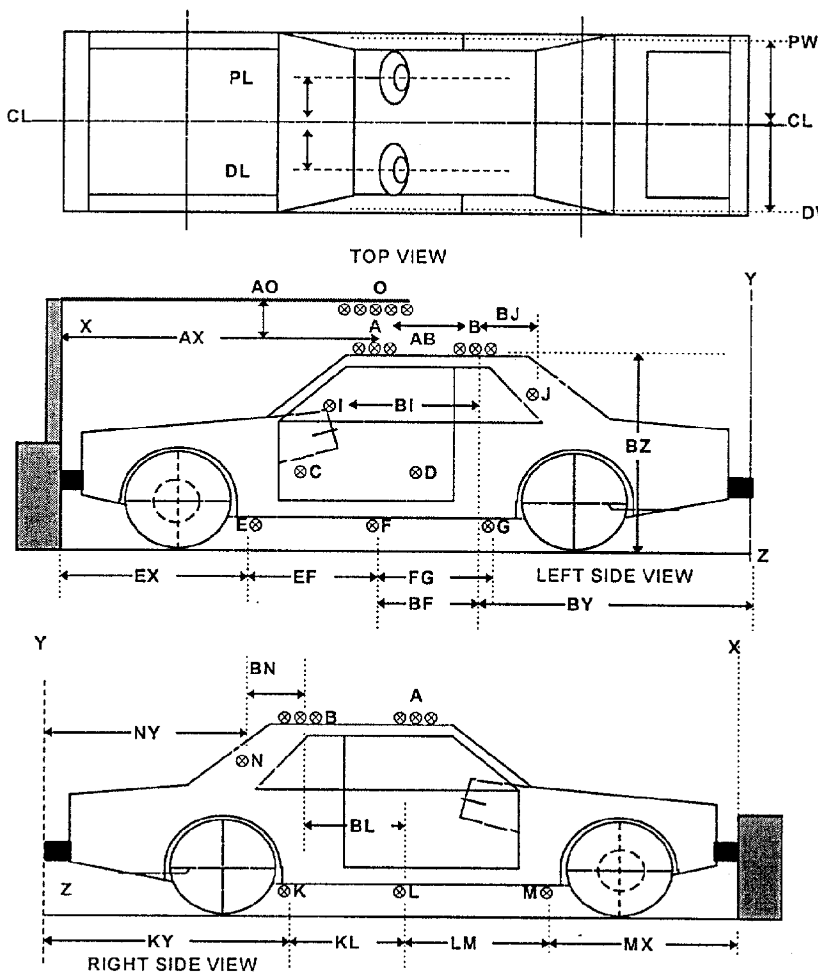
DATA SHEET NO. 16

REFERENCE PHOTOGRAPH TARGETS

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

ITEM	DESCRIPTION	VALUE	ITEM	DESCRIPTION	VALU
AX	TARGET A TO BARRIER	2160	NY	TARGET N TO REAR BUMPER	1340
AB	TARGET A TO TARGET B	610	BN	TARGET B TO TARGET N	560
AO	VERTICAL DISTANCE A TO O	152	KY	TARGET K TO REAR BUMPER	1570
BJ	TARGET B TO TARGET J	560	KL	TARGET K TO TARGET L	880
BI	TARGET B TO STEERING COLUMN	1030	BL	TARGET B TO TARGET L	510
BZ	TARGET B TO GROUND LEVEL	1660	LM	TARGET L TO TARGET M	880
EX	TARGET E TO BARRIER	1400	MX	TARGET M TO BARRIER	1420
EF	TARGET E TO TARGET F	880	CL/PL	VEHICLE CENTERLINE TO PASSENGER	345
FG	TARGET F TO TARGET G	880	CL/PW	VEHICLE CENTERLINE TO RIGHT SILL	780
BF	TARGET B TO TARGET F	510	CL/DL	VEHICLE CENTERLINE TO DRIVER	345
BY	TARGET B TO REAR BUMPER	1950	CL/DW	VEHICLE CENTERLINE TO LEFT SILL	780

Distances in mm

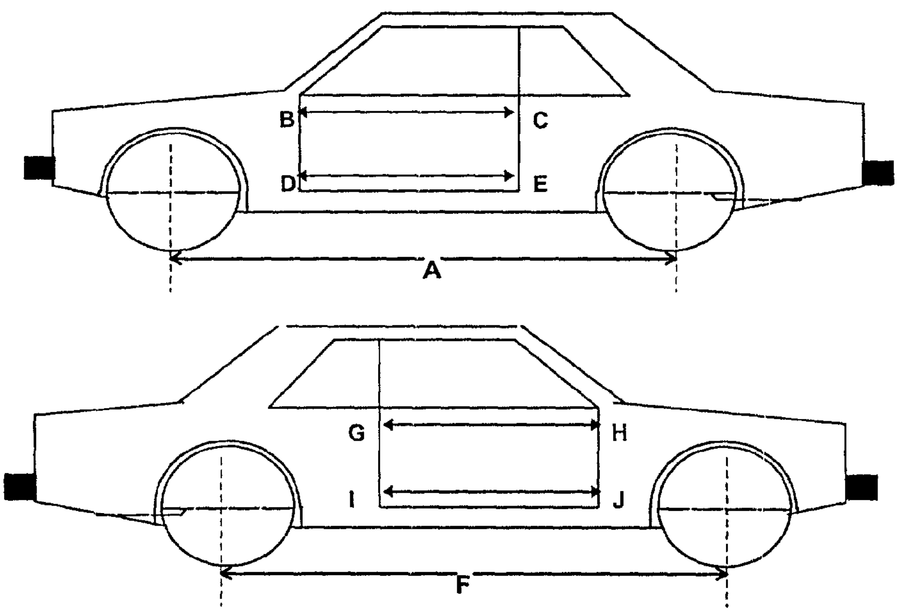


DATA SHEET NO. 17

VEHICLE INTRUSION MEASUREMENTS

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

DOOR OPENING WIDTH



UNITS (mm)	LEFT SIDE		RIGHT SIDE	
MEASUREMENT	BC	DE	GH	IJ
PRE-TEST	1125	1125	1130	1095
POST-TEST	1125	1135	1125	1095
DIFFERENCE	0	+10	-5	0

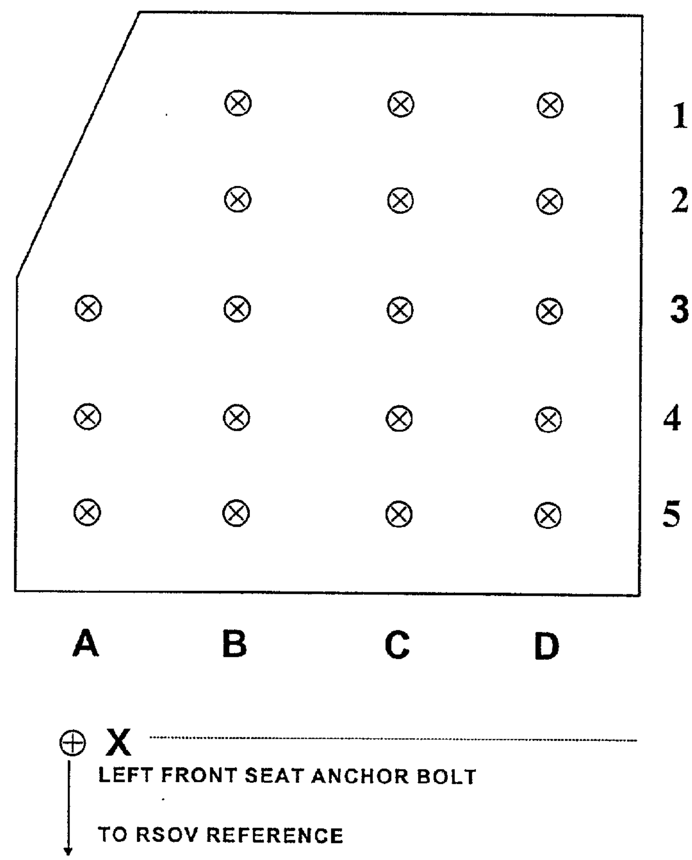
VEHICLE WHEELBASE CHANGE

UNITS (mm)	A = LEFT SIDE WHEELBASE	F = RIGHT SIDE WHEELBASE
PRE-TEST	2718	2718
POST-TEST	2570	2595
DIFFERENCE	-148	-123

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	800	700	800	680	800	690
2	640	620	640	600	640	590	640	590
3	480	470	480	460	480	450	480	450
4	320	320	320	290	320	290	320	285
5	160	150	160	150	160	149	160	N/A
REF. POINT	RSOV TO ANCHOR BOLT (PRE-TEST)		2640		RSOV TO ANCHOR BOLT (POST-TEST)		2640	



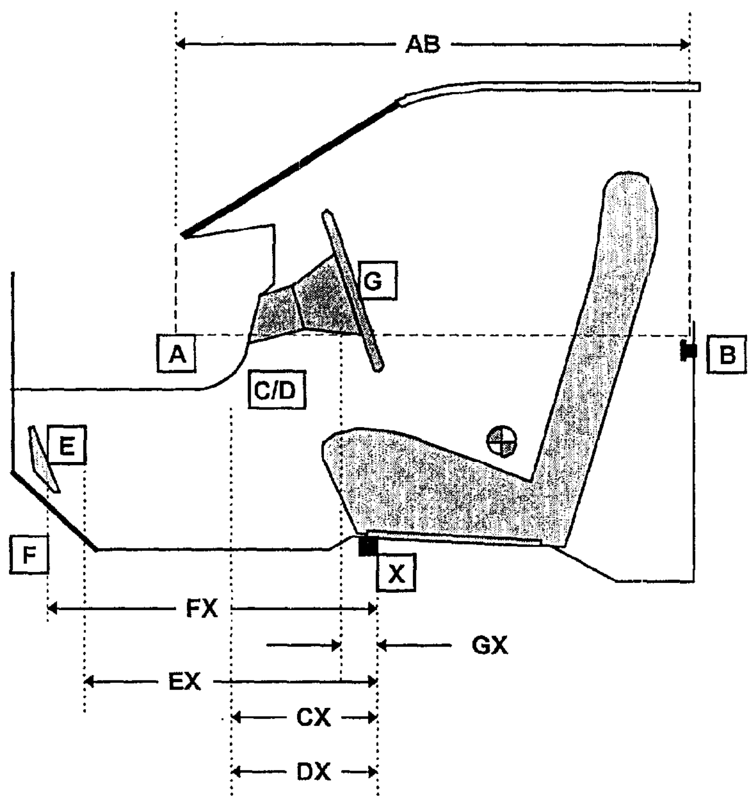
DRIVER SIDE FLOOR PLAN

(Data Sheet No. 17 .....Continued)

DRIVER COMPARTMENT INTRUSION (Distances in mm)

REF.	DESCRIPTION	PRE-TEST	POST-TEST
AB	DOOR OPENING (INSIDE WINDOW JAM)	1055	990
CX	LOWER LEFT KNEE BOLSTER TO X	410	390
DX	LOWER RIGHT KNEE BOLSTER TO X	410	395
EX	BRAKE PEDAL TO X	640	480
FX	FOOT REST TO X	720	680
GX	STEERING COLUMN HUB (CENTER) TO X	140	130

X = LEFT FRONT SEAT ANCHOR BOLT



DRIVER COMPARTMENT

DATA SHEET NO. 18

BARRIER ORIENTATION

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

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

(NO OFFSET REQUIRED FOR THIS TEST)

DATA SHEET NO. 19

ACCIDENT INVESTIGATION DIVISION DATA

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

VIN: 1GNDT13W4W2149739 TEST DATE: 1/8/98

WHEELBASE: 2718 mm TEST WEIGHT: 2190 kg

VEHICLE SIZE CATEGORY: 4-DOOR SPORT UTILITY VEHICLE

ACCELEROMETER DATA:

LOCATION: Left and right side passenger compartment

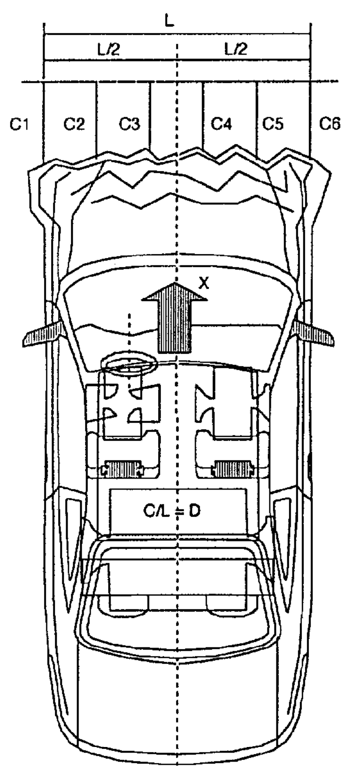
CALIBRATION PROCEDURE: 6 months/ drop test

LINEARITY: Good INTEGRATION ALGORITHM: NHTSA Standard

VEHICLE IMPACT SPEED: 56.63 km/h TIME OF SEPARATION: 68.35 msec

VELOCITY CHANGE: 76.30 km/h

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



IMPACT MODE: Full Frontal

CRUSH DEPTH DIMENSIONS:

C1 = 480 mm

C2 = 568 mm

C3 = 617 mm

C4 = 623 mm

C5 = 559 mm

C6 = 440 mm

MIDPOINT OF DAMAGE: D = vehicle centerline

LENGTH OF DAMAGE REGION:

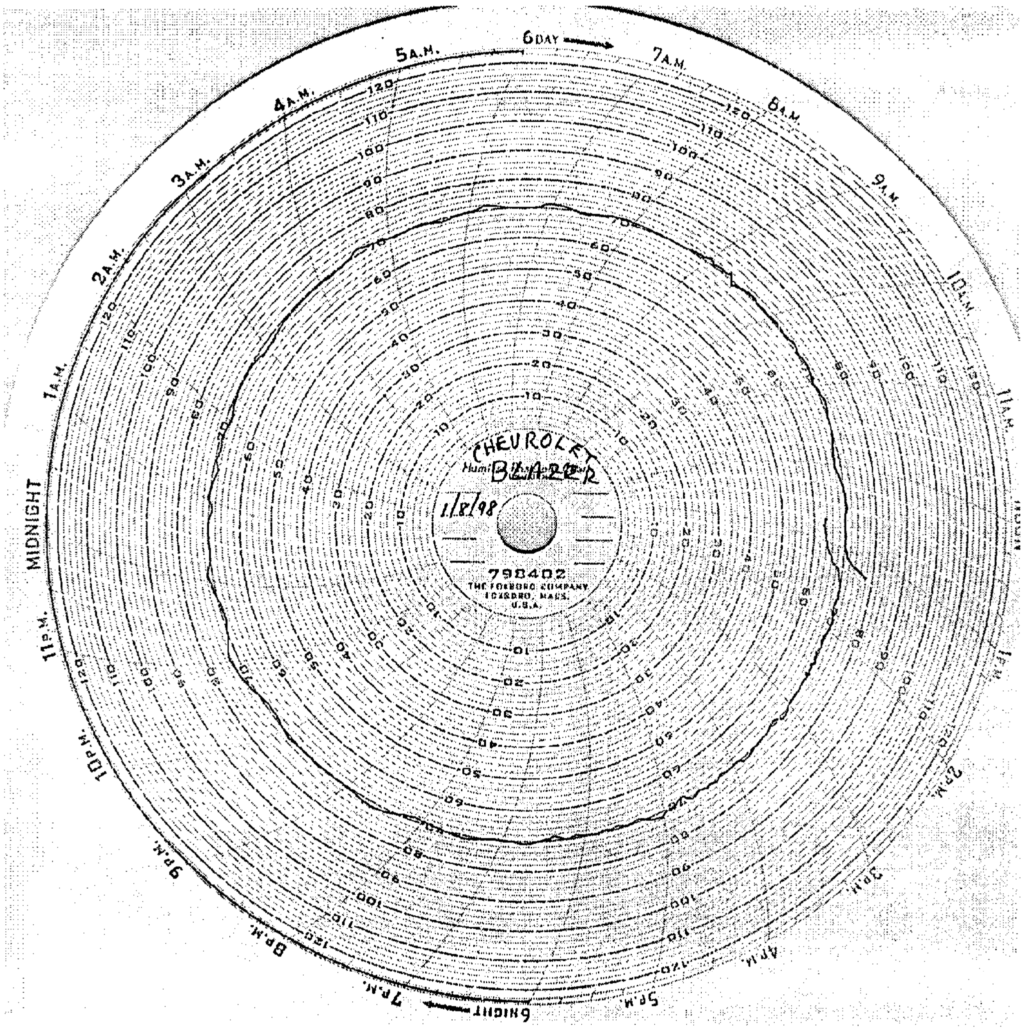
L = 1440 mm

DATA SHEET NO. 20

DUMMY/VEHICLE TEMPERATURE STABILIZATION

TEST VEHICLE: 1998 CHEVROLET BLAZER LS SUV 4-DOOR NHTSA NO. MW0103

VIN: 1GNDT13W4W2149739 TEST DATE: 1/8/98



APPENDIX A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS...(Continued)

FIGURE A-1. RIGHT FRONT AS RECEIVED

FIGURE A-2. LEFT REAR AS RECEIVED

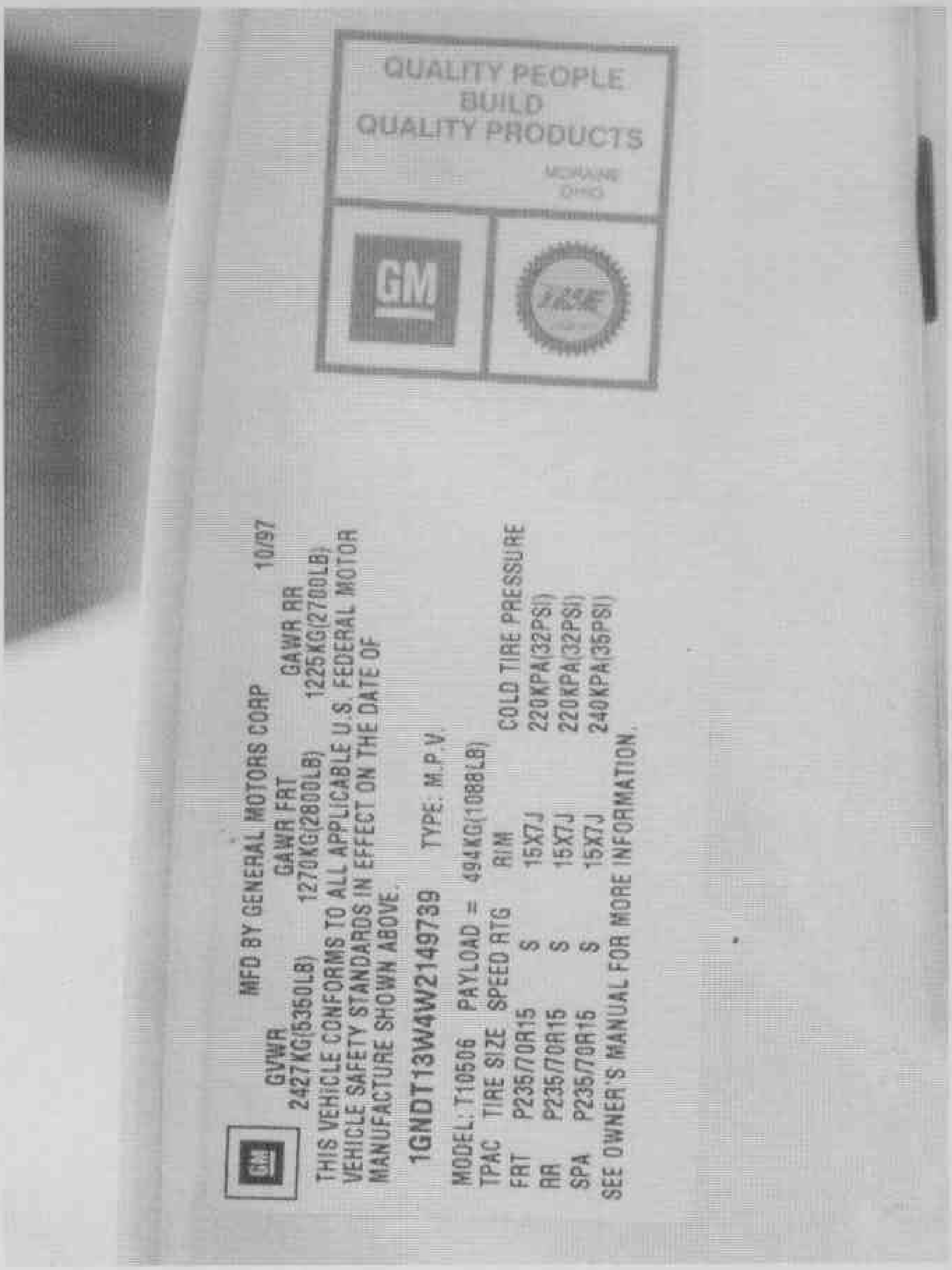


FIGURE A-3. VEHICLE CERTIFICATION LABEL

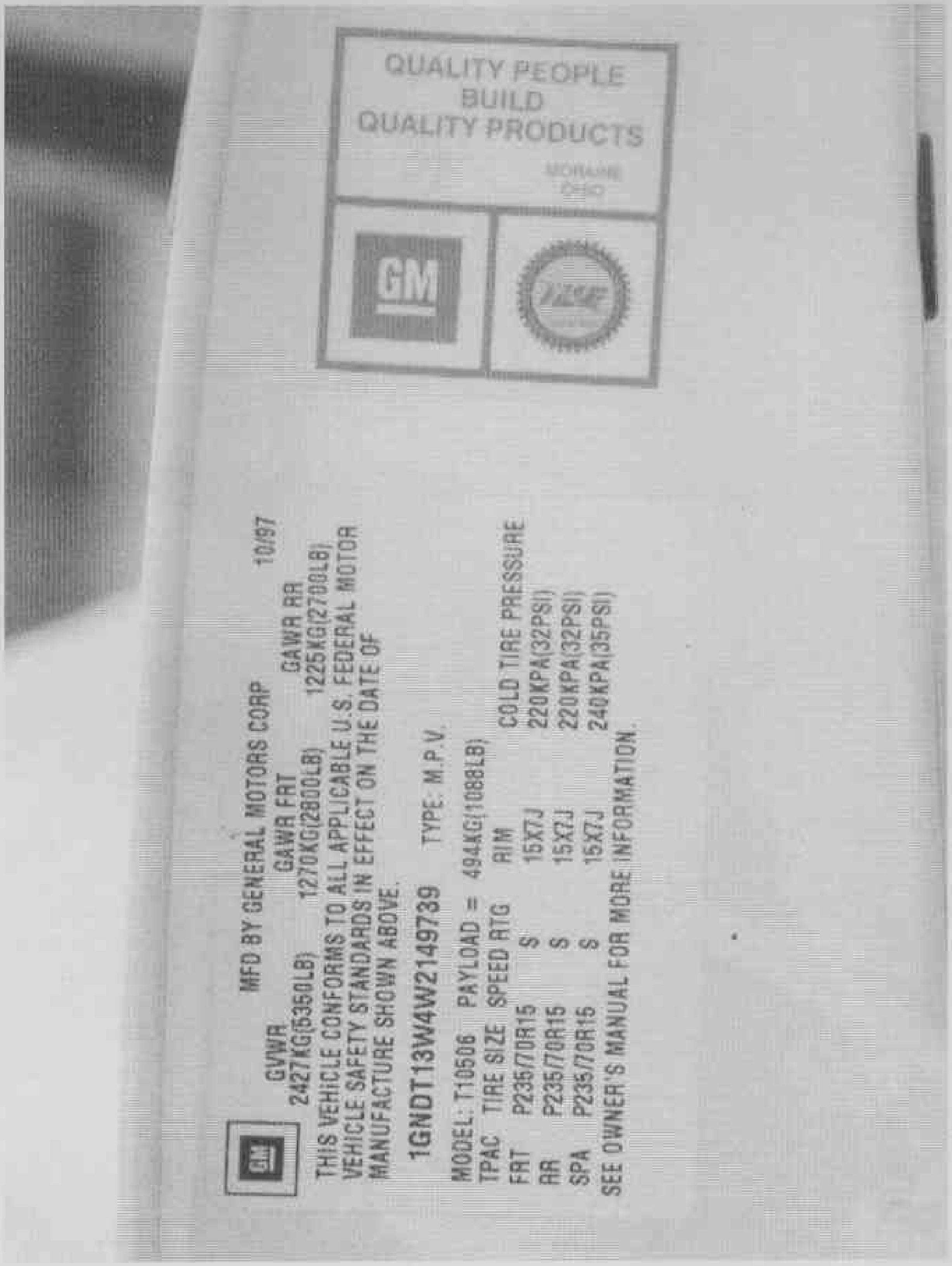


FIGURE A-4. VEHICLE TIRE PLACARD

FIGURE A-5. PRETEST FRONT VIEW

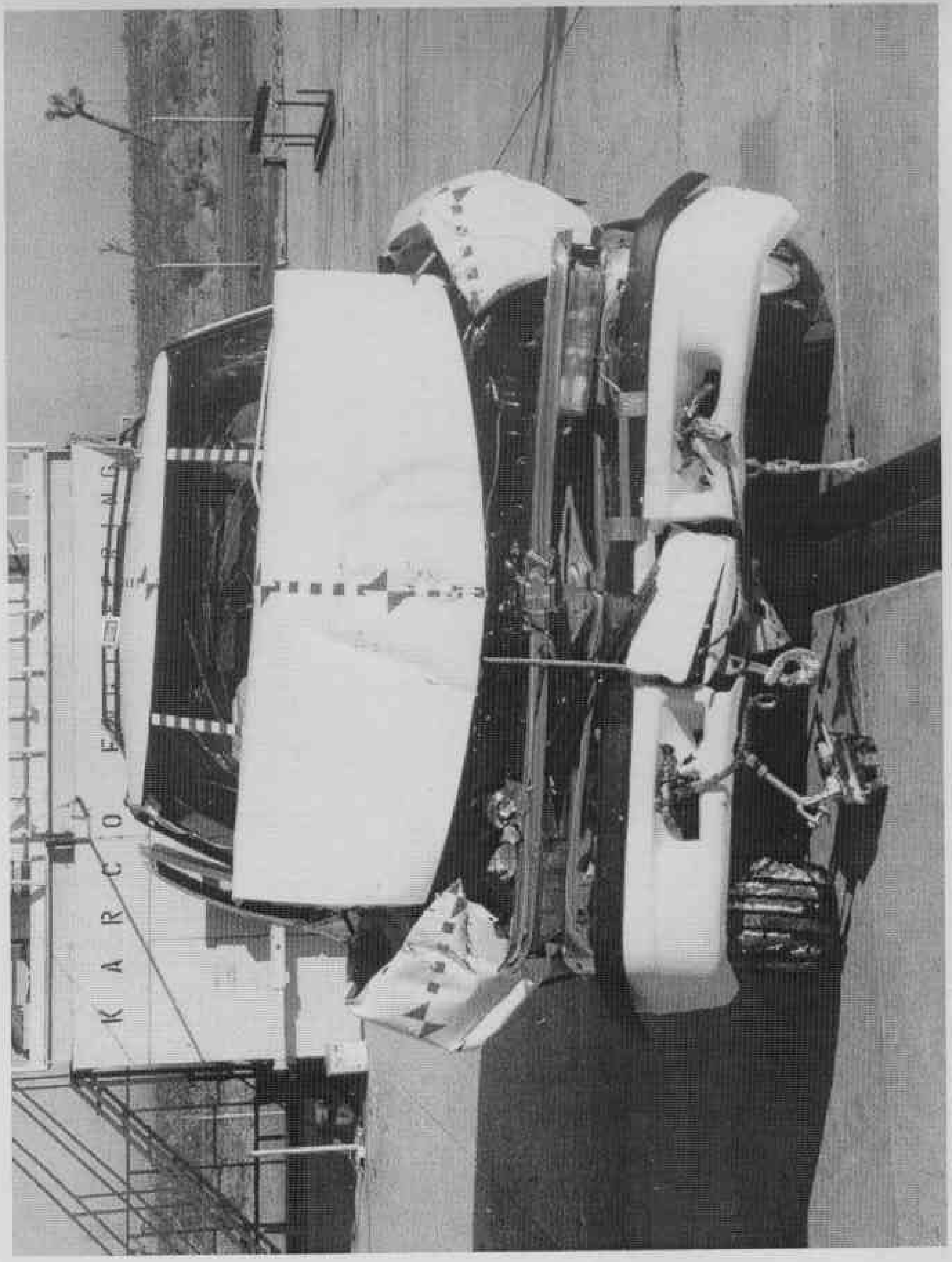


FIGURE A-6. POST TEST FRONT VIEW

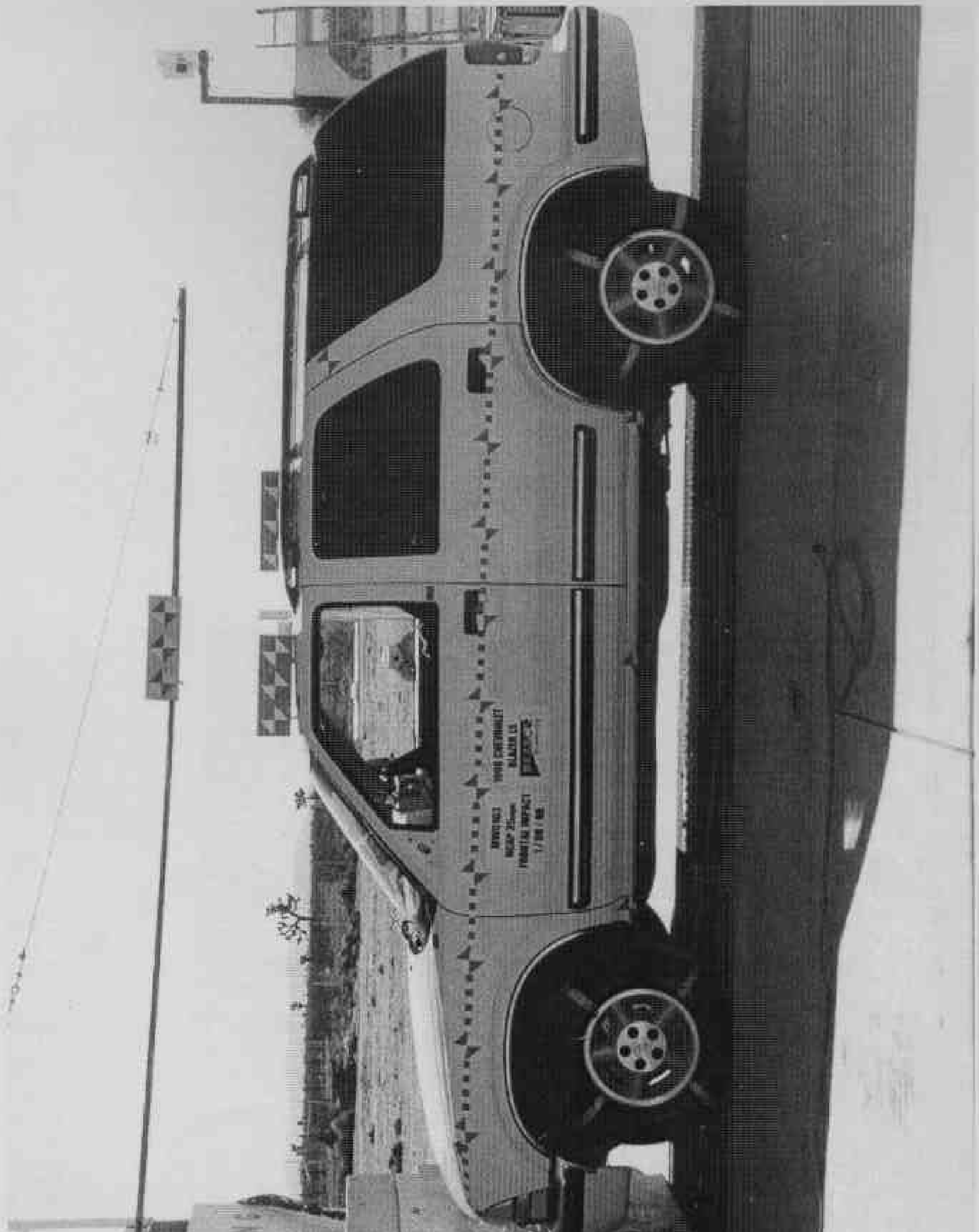


FIGURE A-7. PRETEST LEFT SIDE VIEW

FIGURE A-8. POST TEST LEFT SIDE VIEW

FIGURE A-9. PRETEST RIGHT SIDE VIEW

FIGURE A-10. POST TEST RIGHT SIDE VIEW

FIGURE A-11. PRETEST RIGHT FRONT VIEW

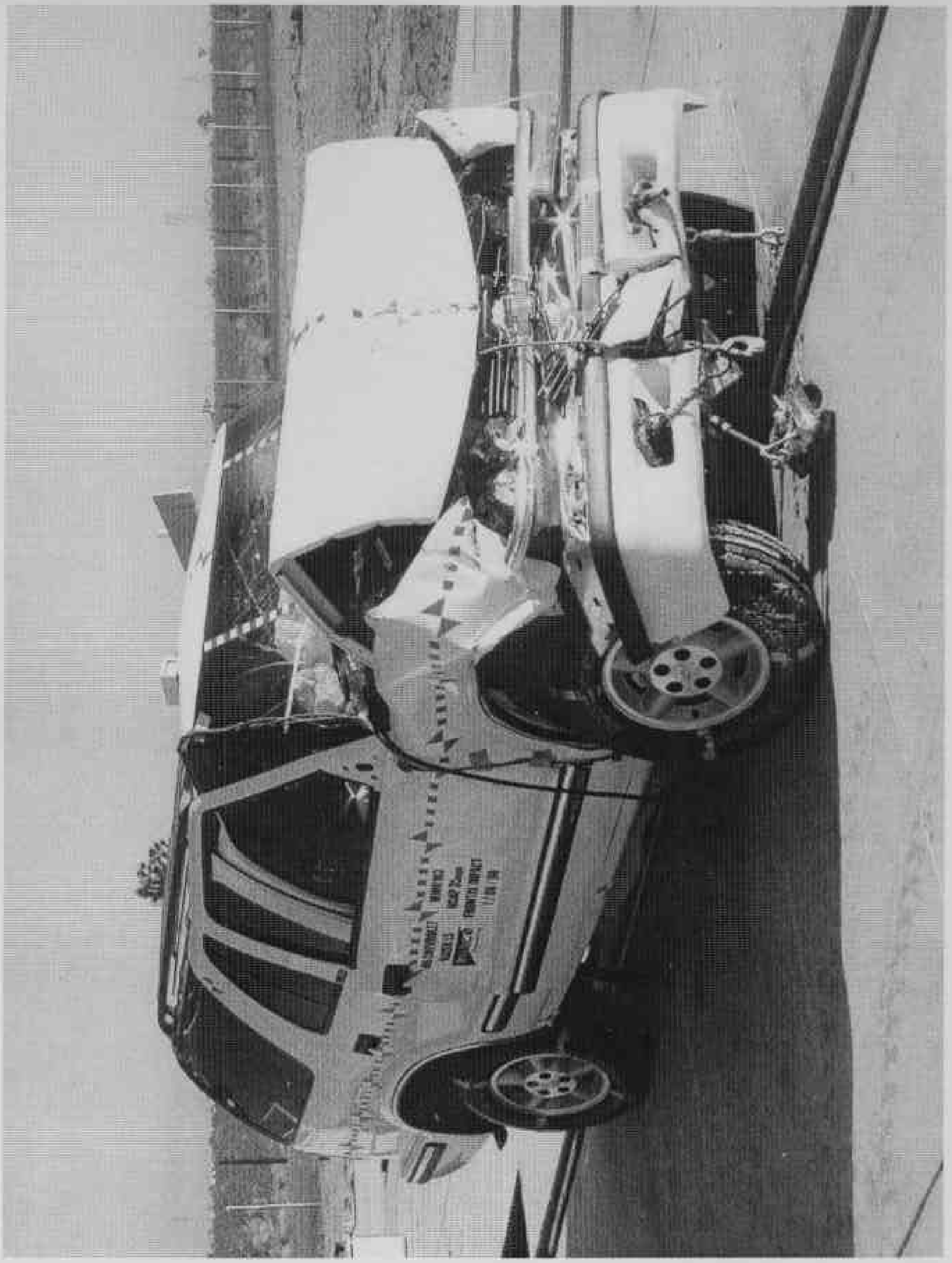


FIGURE A-12. POST TEST RIGHT FRONT VIEW

FIGURE A-13. PRETEST LEFT REAR VIEW

FIGURE A-14. POST TEST LEFT REAR VIEW

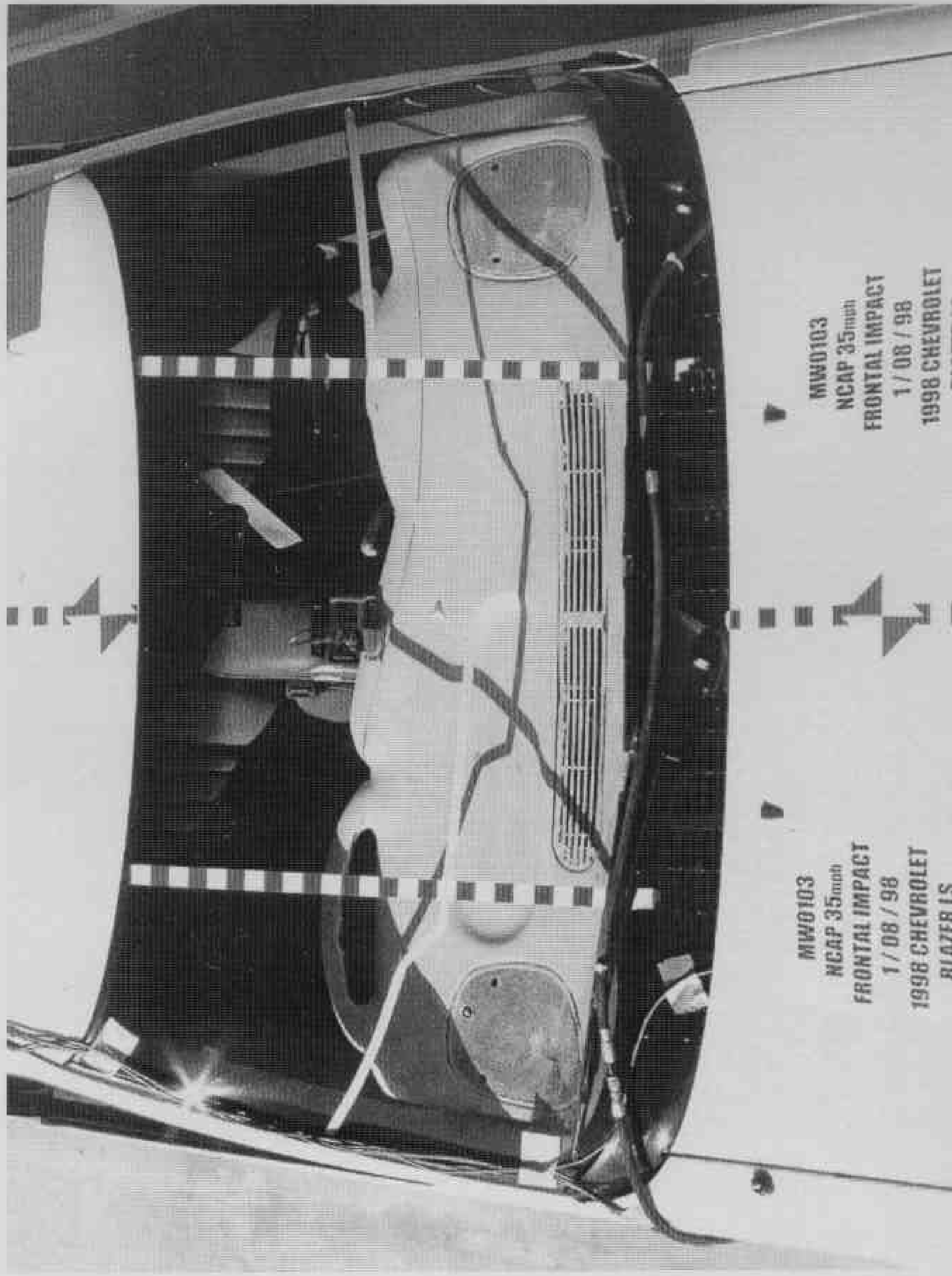


FIGURE A-15. PRETEST WINDSHIELD

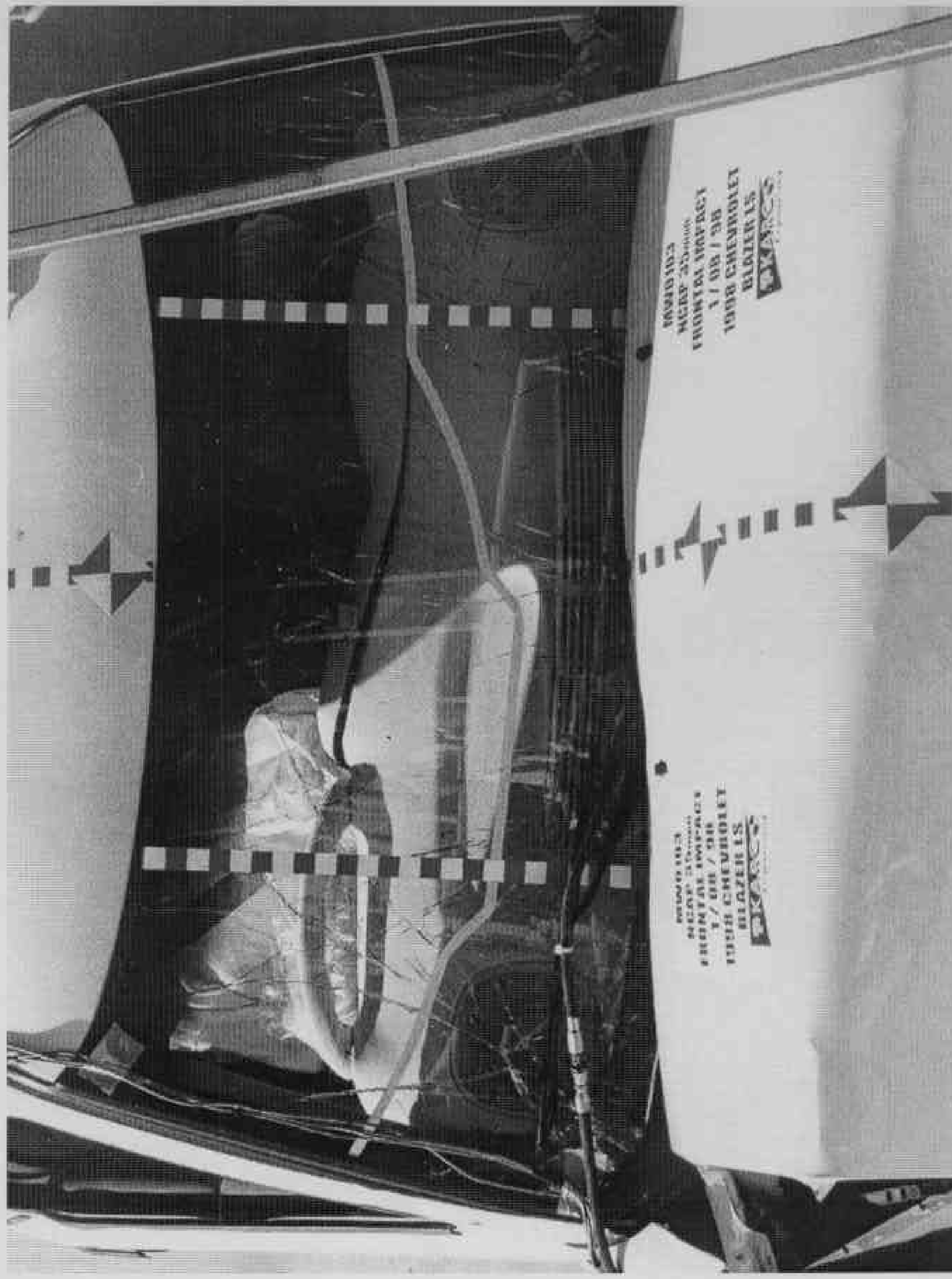


FIGURE A-16. POST TEST WINDSHIELD

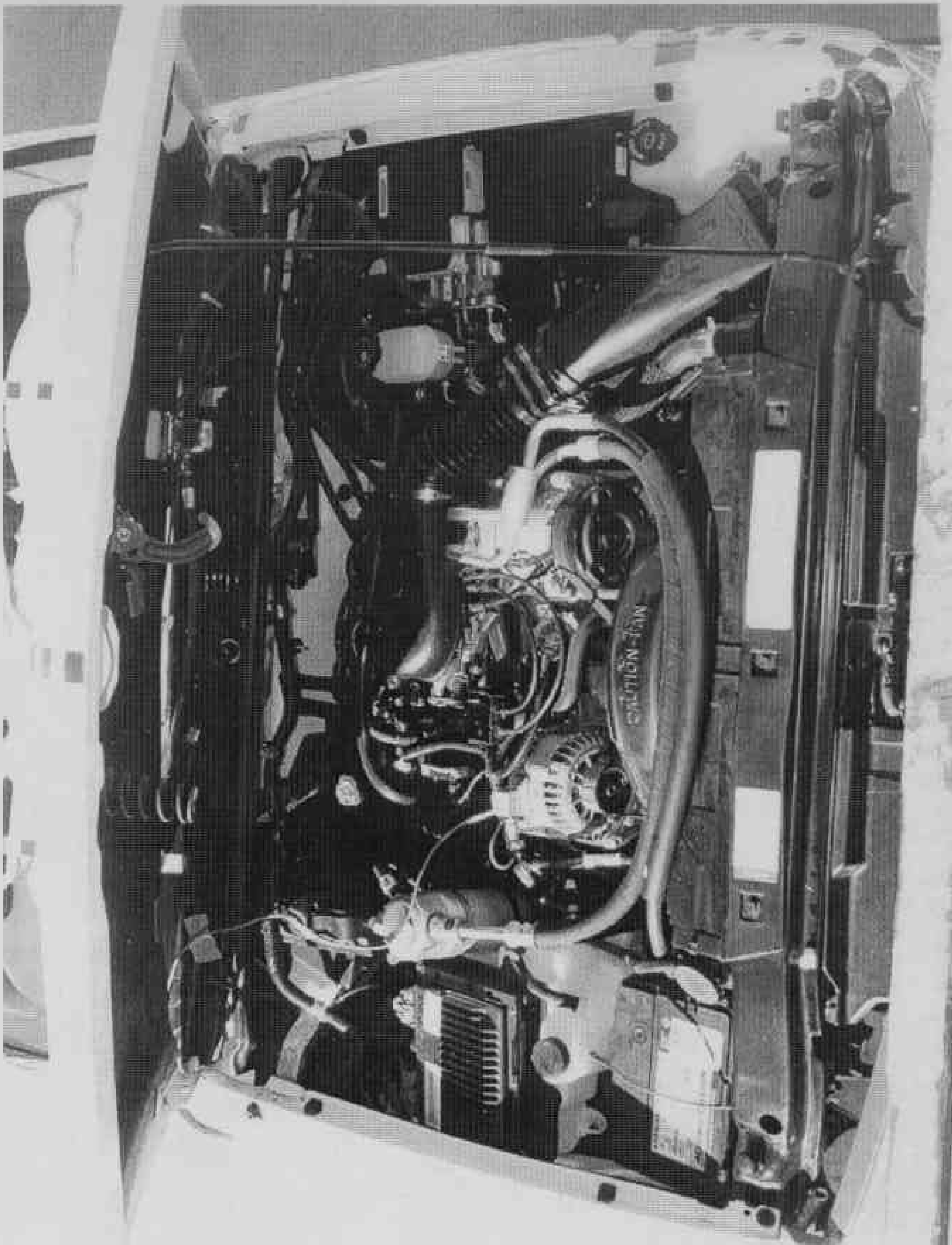


FIGURE A-17. PRETEST ENGINE COMPARTMENT

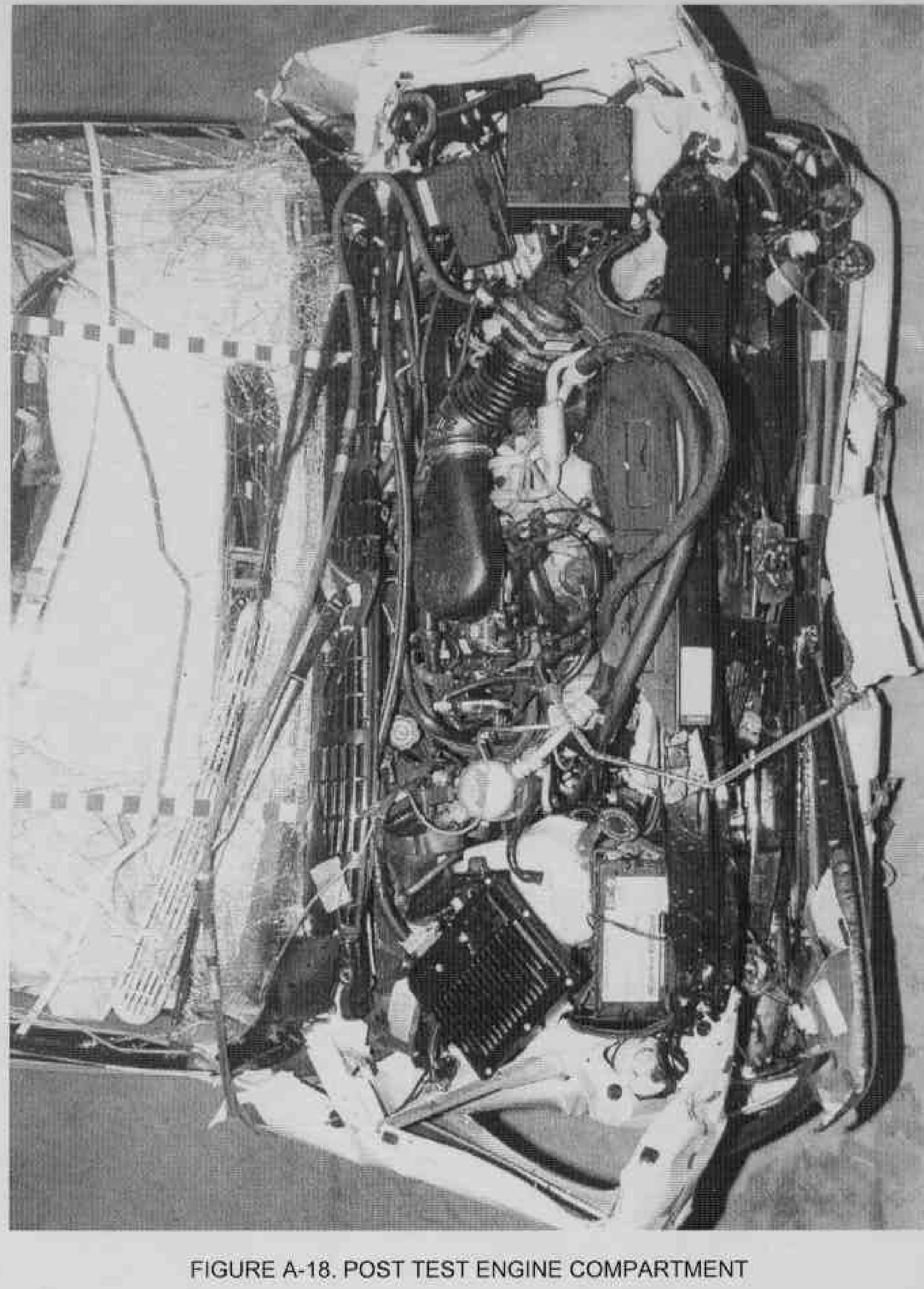


FIGURE A-18. POST TEST ENGINE COMPARTMENT

FIGURE A-19. PRETEST FUEL CAP

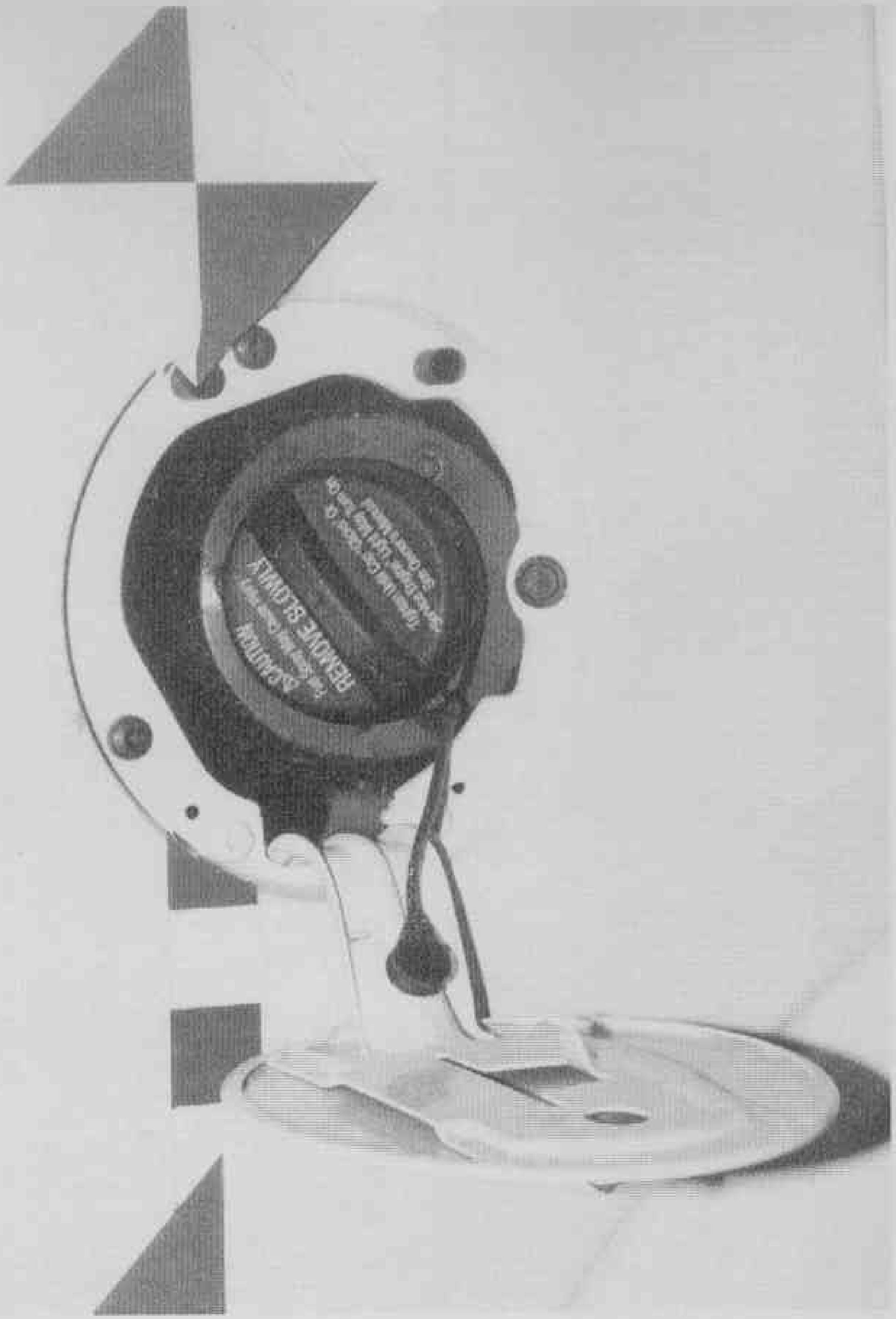


FIGURE A-20. POST TEST FUEL CAP

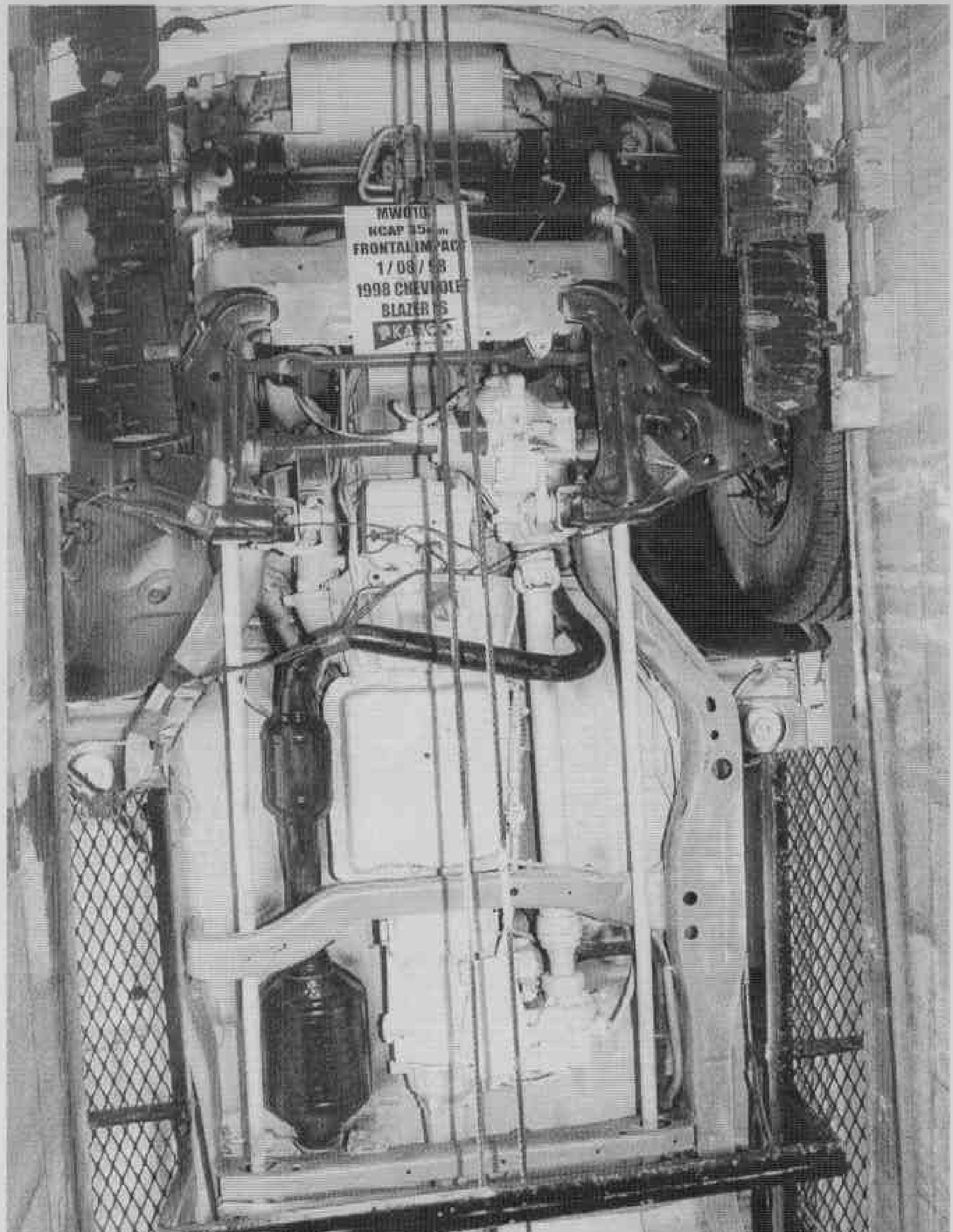


FIGURE A-21. PRETEST FRONT UNDERSIDE

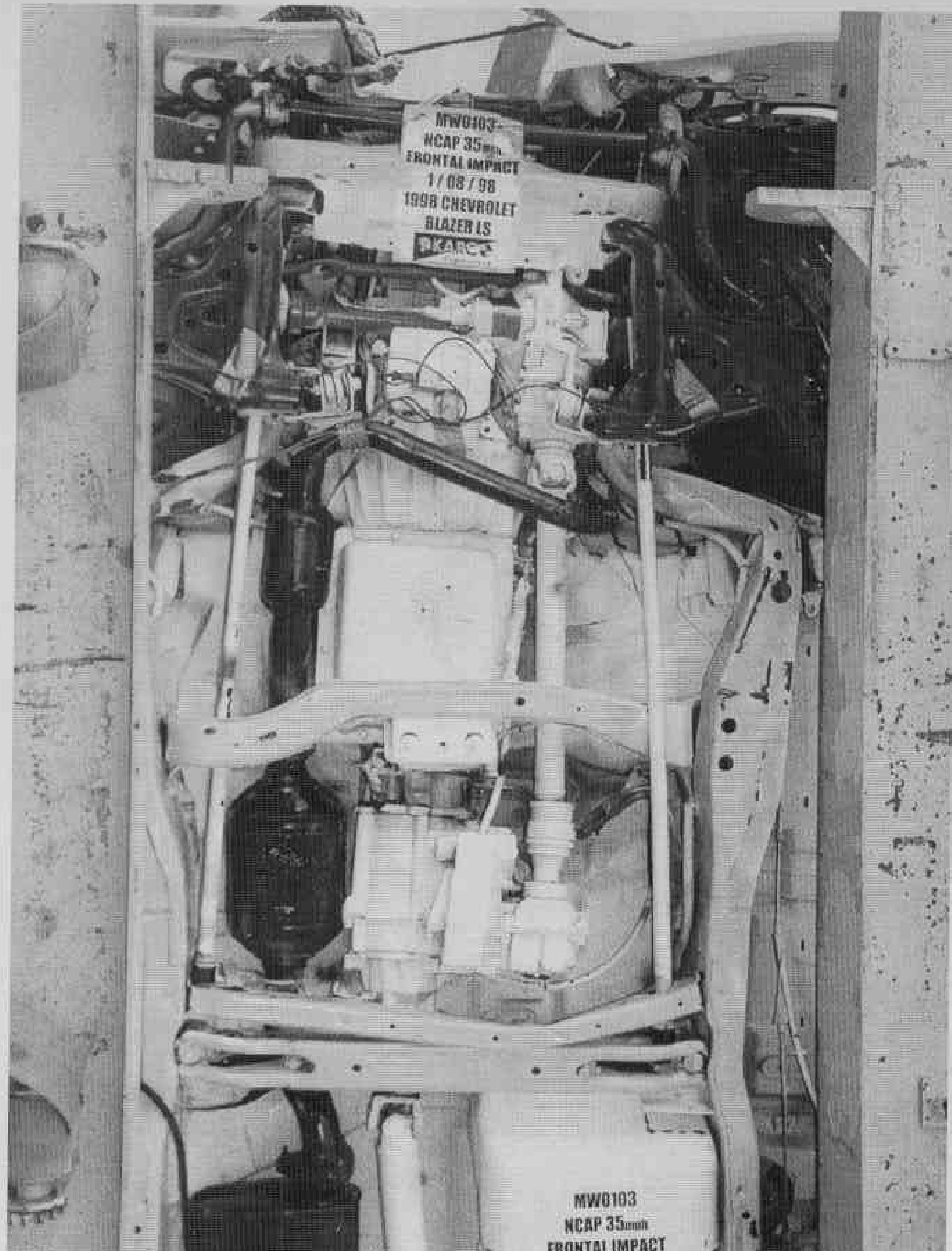


FIGURE A-22. POST TEST FRONT UNDERSIDE

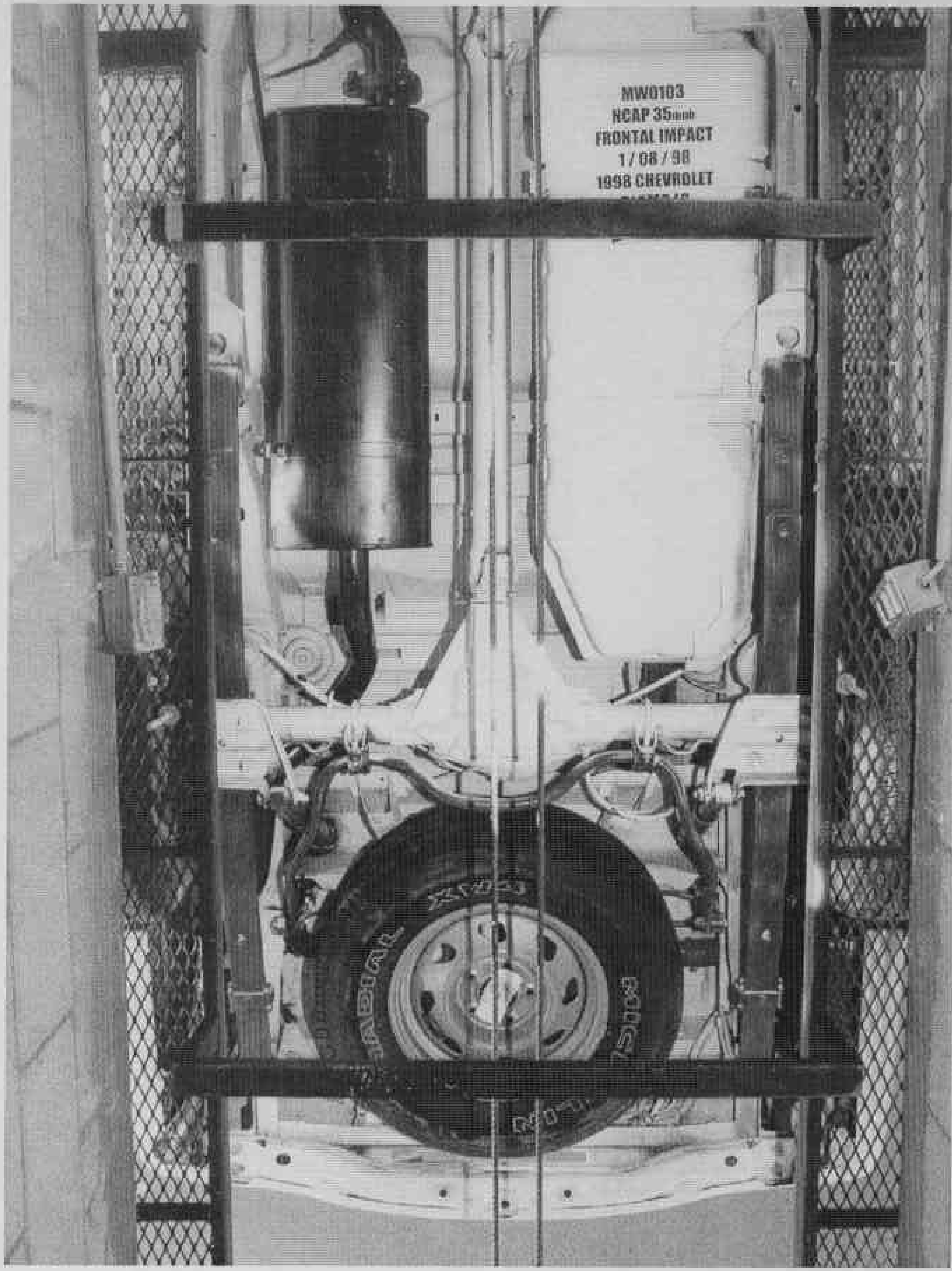


FIGURE A-23. PRETEST REAR UNDERSIDE

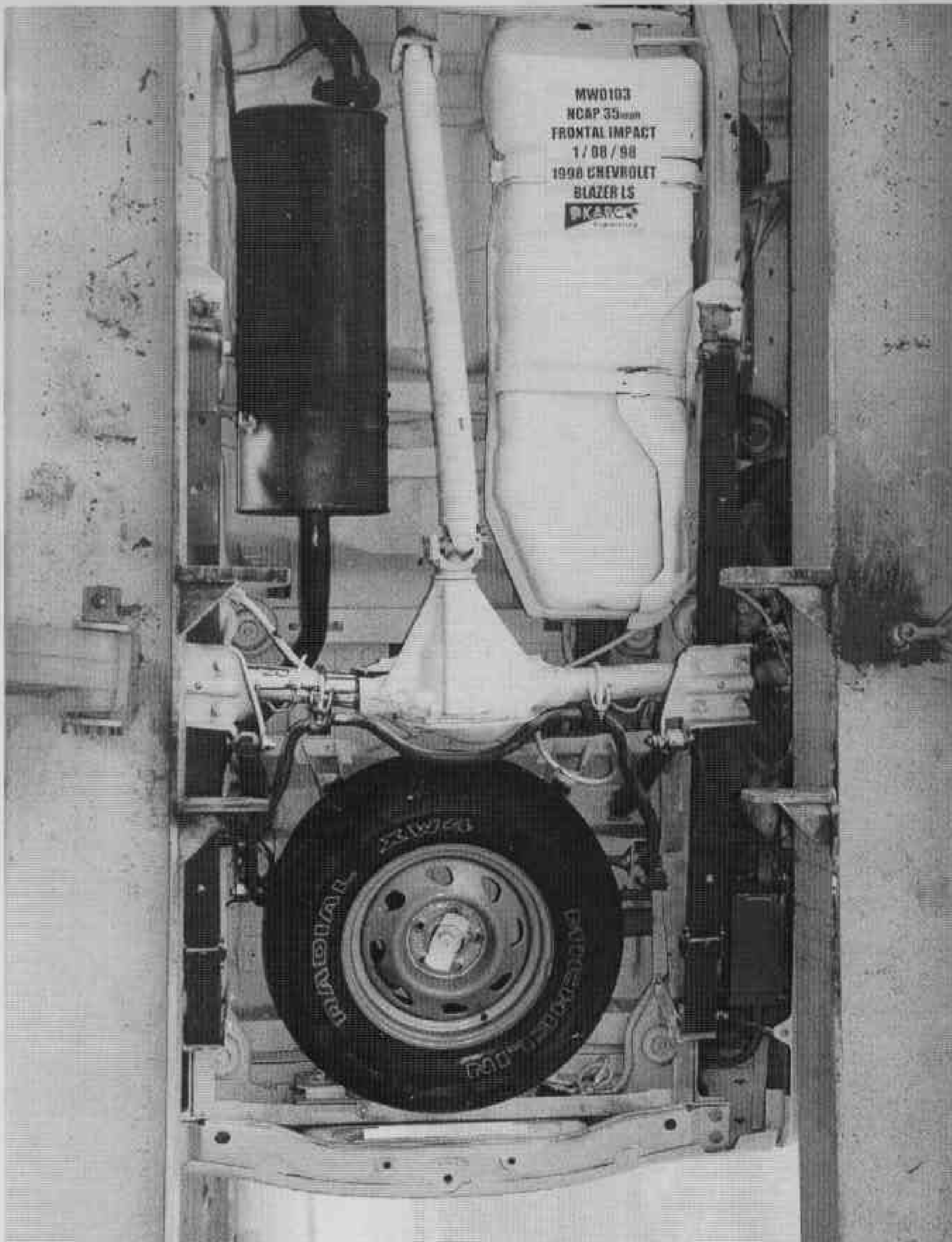


FIGURE A-24. POST TEST REAR UNDERSIDE

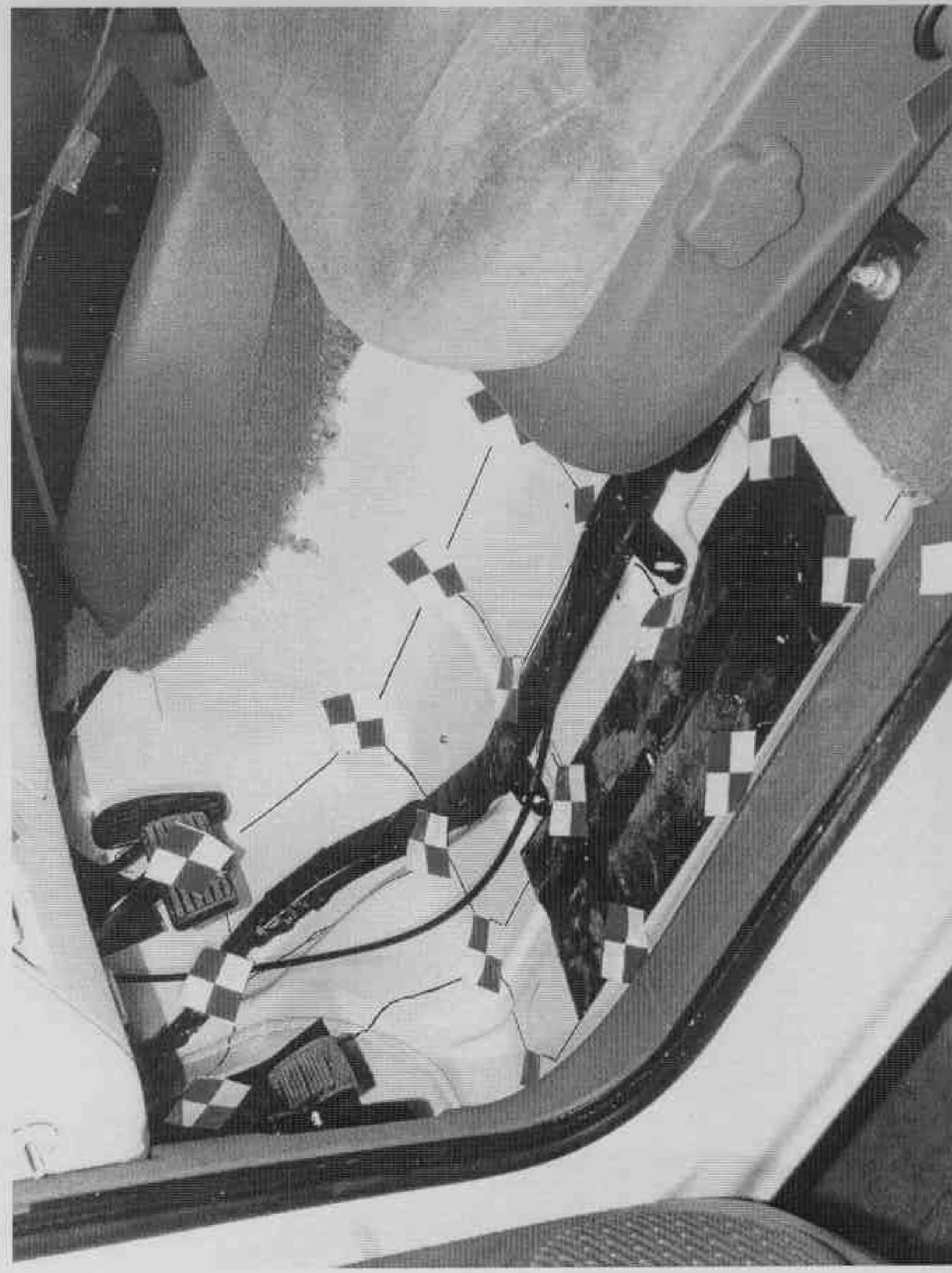


FIGURE A-25. PRETEST DRIVER FLOOR PAN

FIGURE A-26. POST TEST DRIVER FLOOR PAN

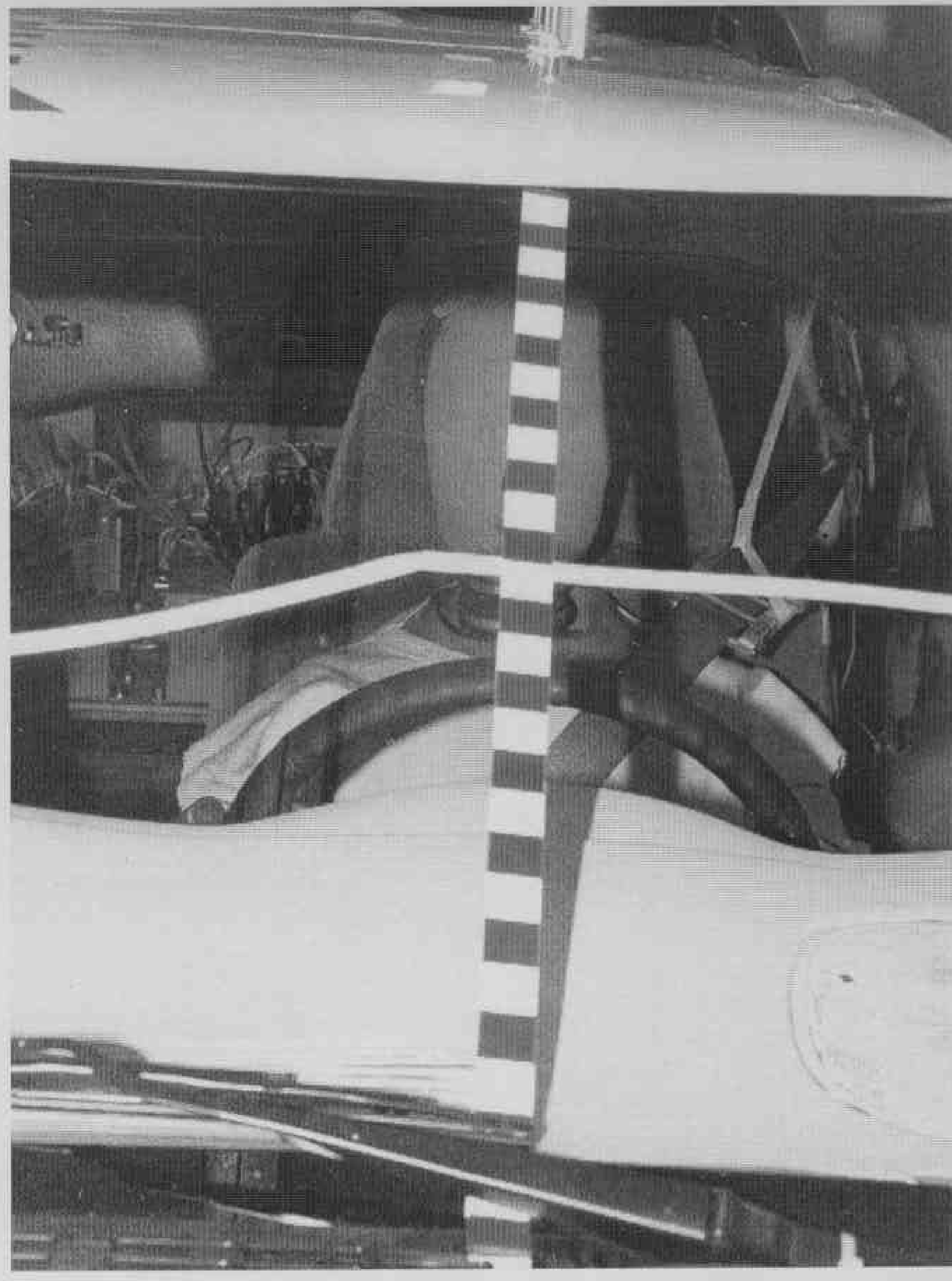


FIGURE A-27. PRETEST DRIVER DUMMY (FRONT VIEW)

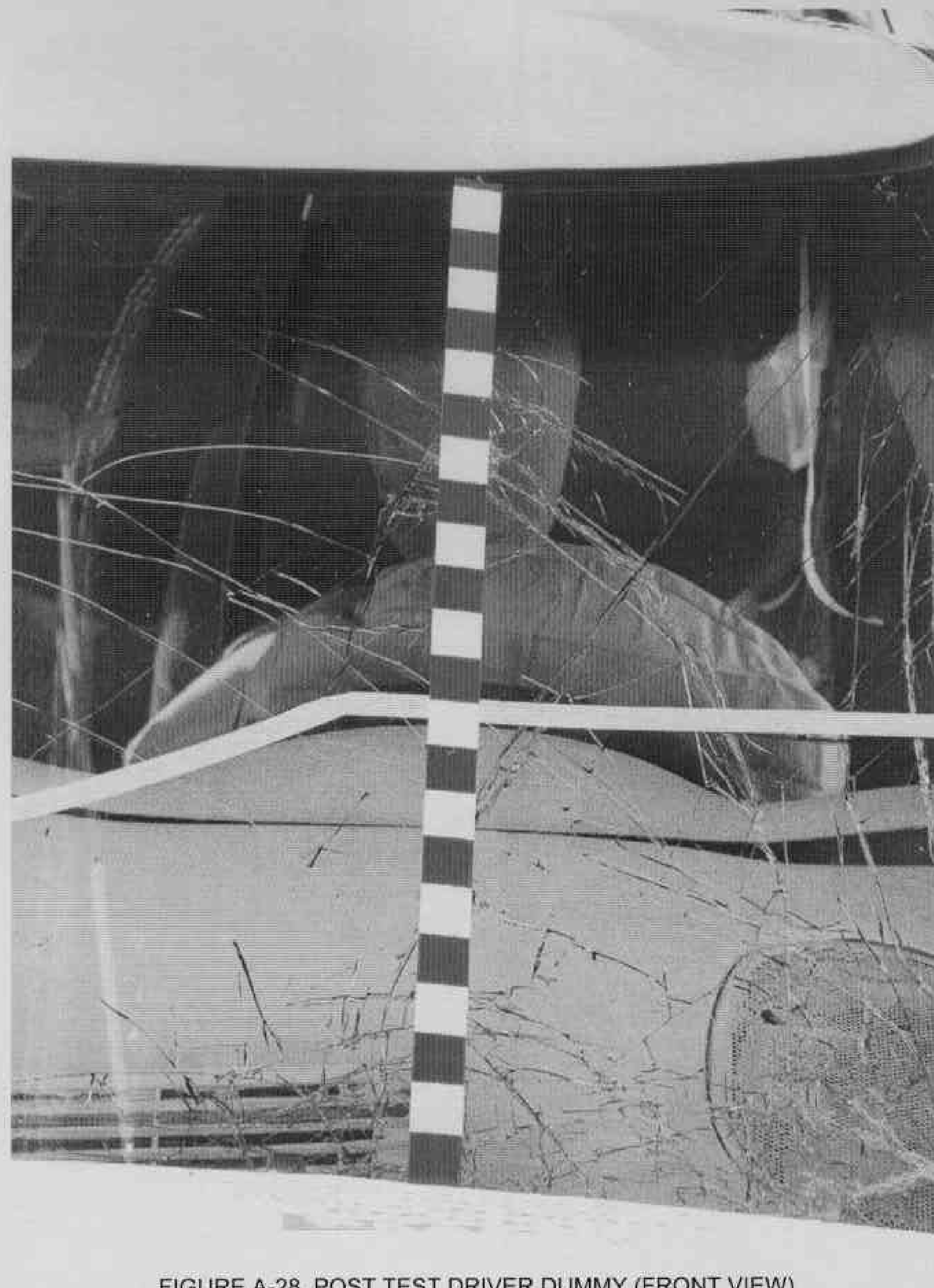


FIGURE A-28. POST TEST DRIVER DUMMY (FRONT VIEW)

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

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

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

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

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

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

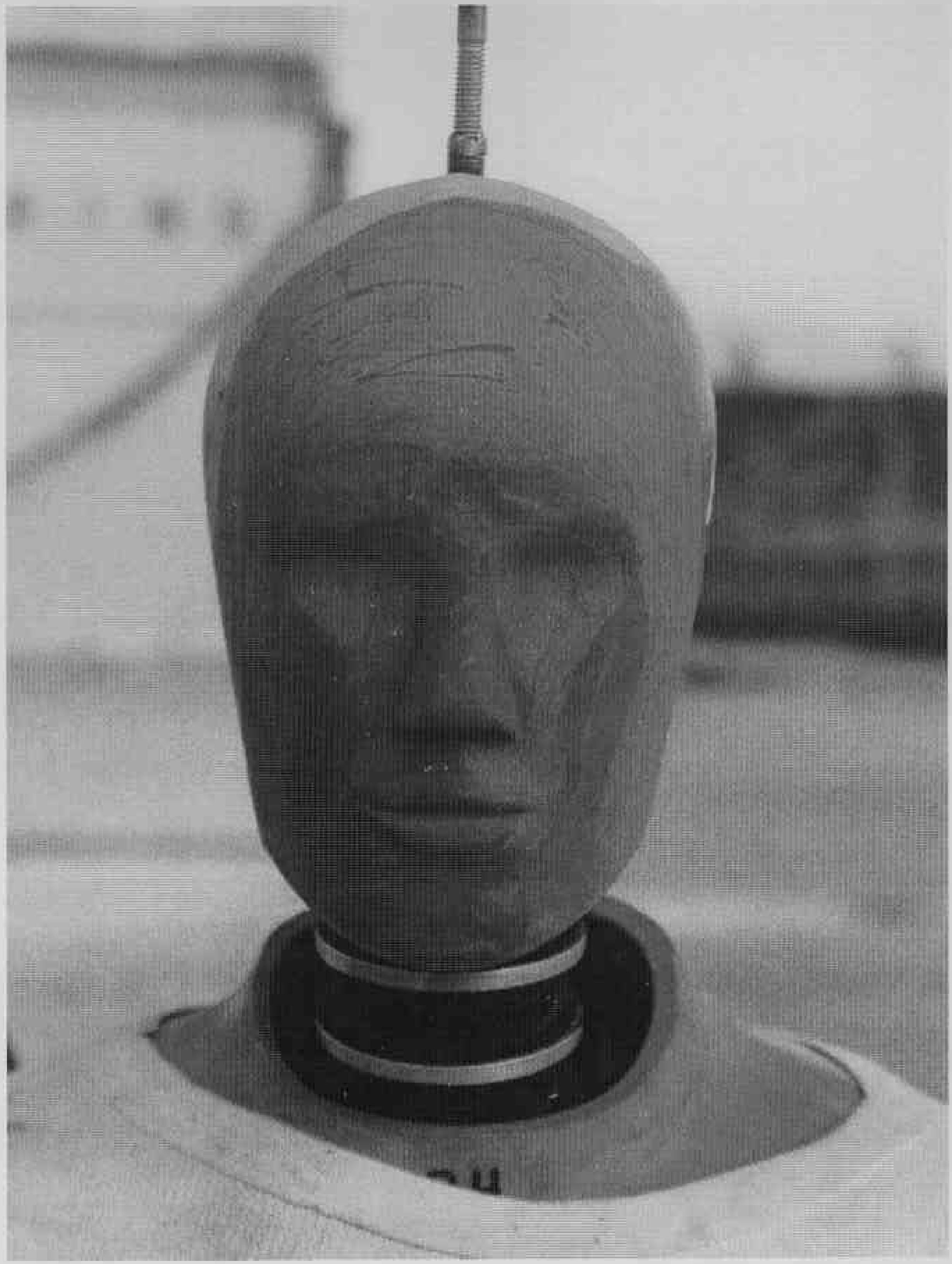


FIGURE A-35. POST TEST DRIVER DUMMY HEAD

FIGURE A-36. POST TEST DRIVER DUMMY CONTACT POINT

FIGURE A-37. POST TEST DRIVER DUMMY CONTACT POINT

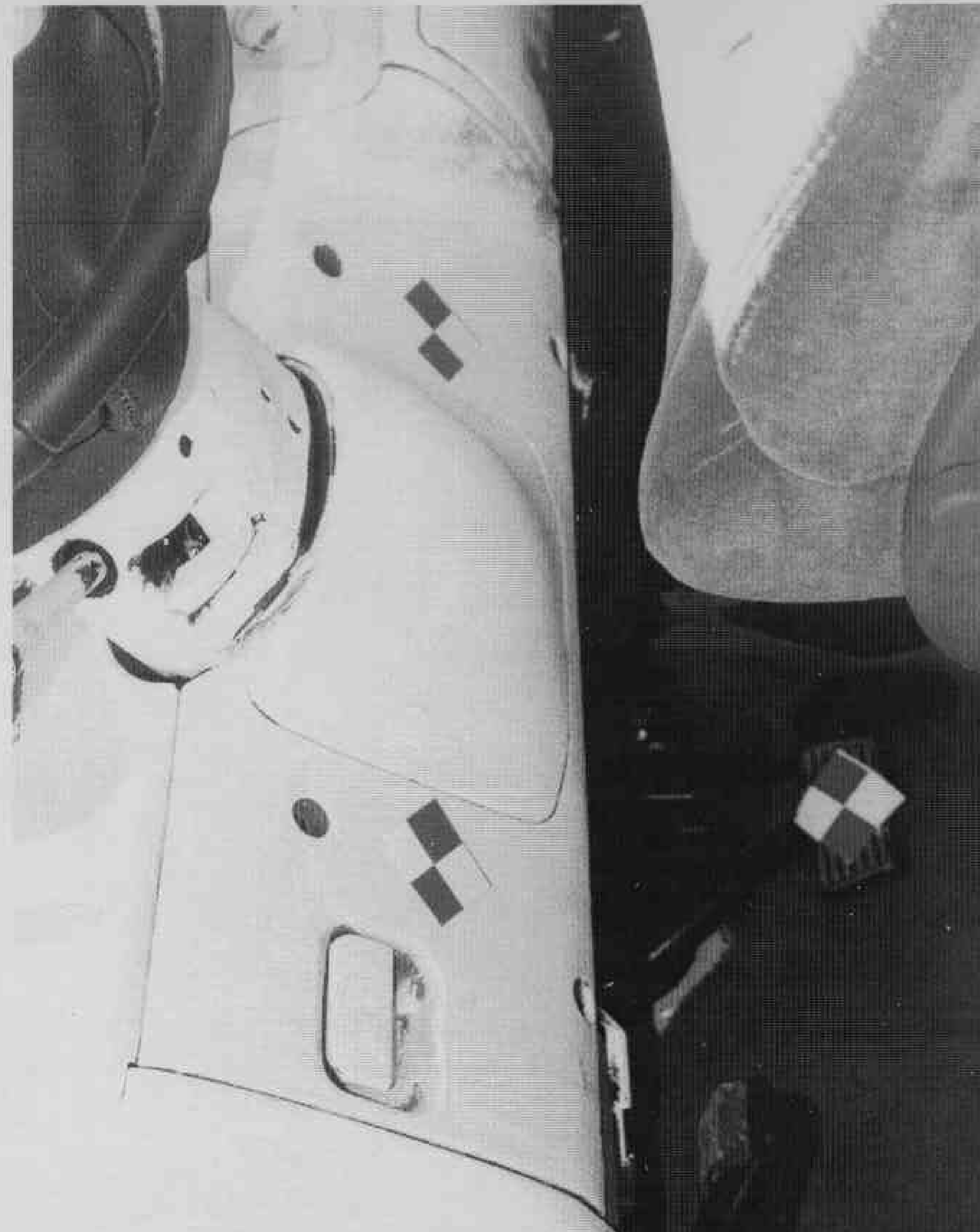


FIGURE A-38. PRETEST DRIVER SIDE KNEE BOLSTER

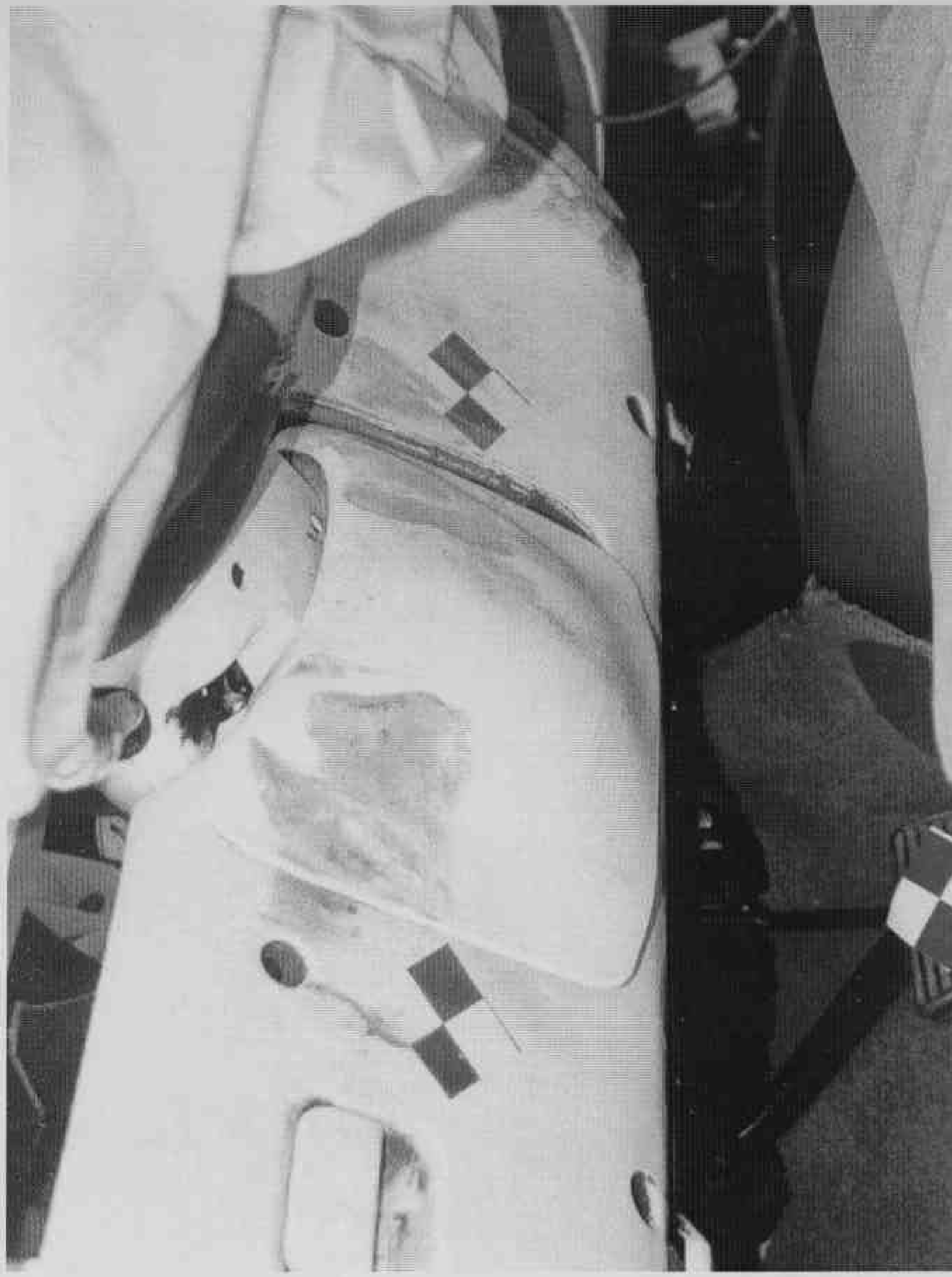


FIGURE A-39. POST TEST DRIVER KNEE BOLSTER

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

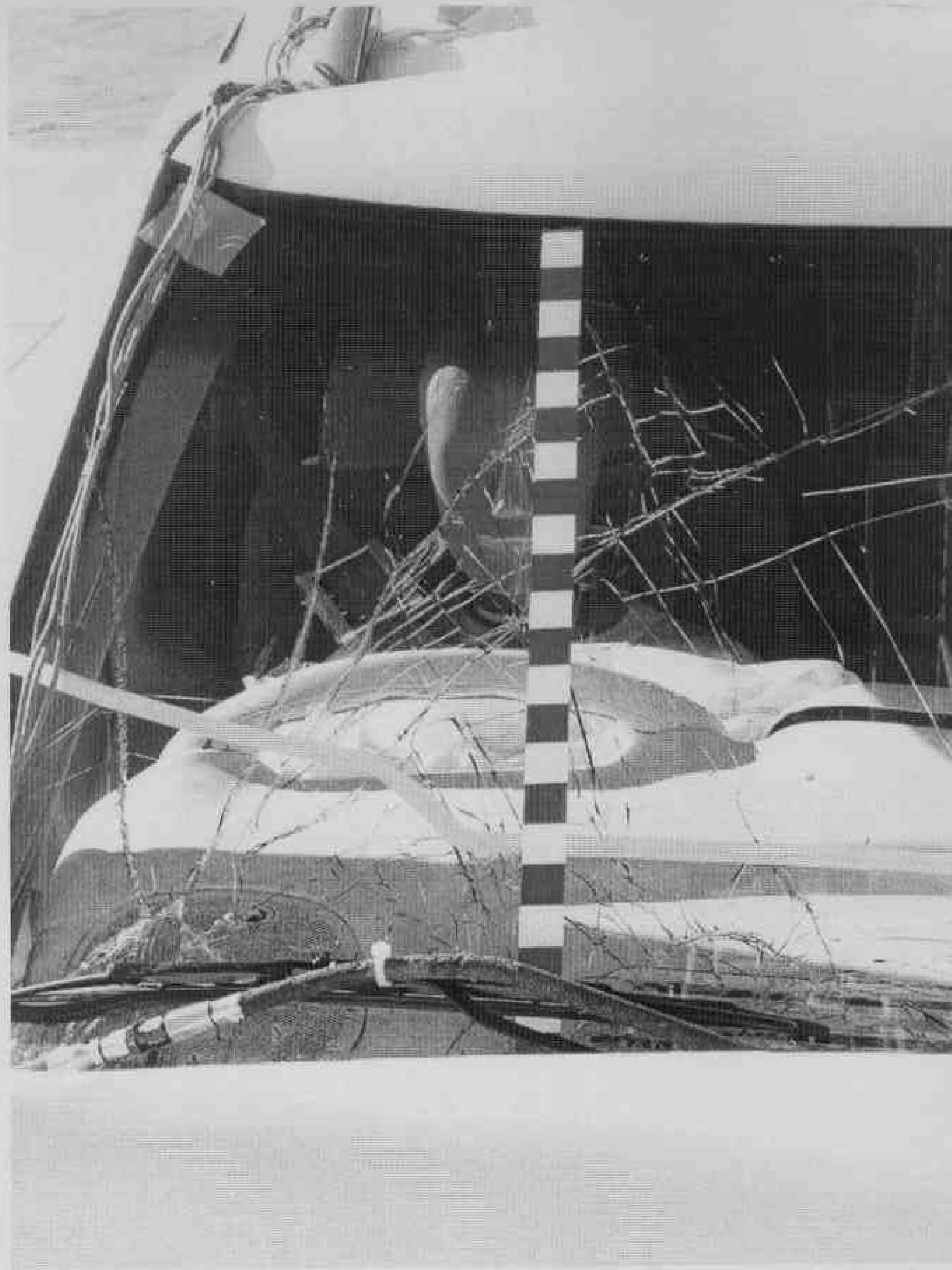


FIGURE A-41. POST TEST PASSENGER DUMMY (FRONT VIEW)

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

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

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

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

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

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

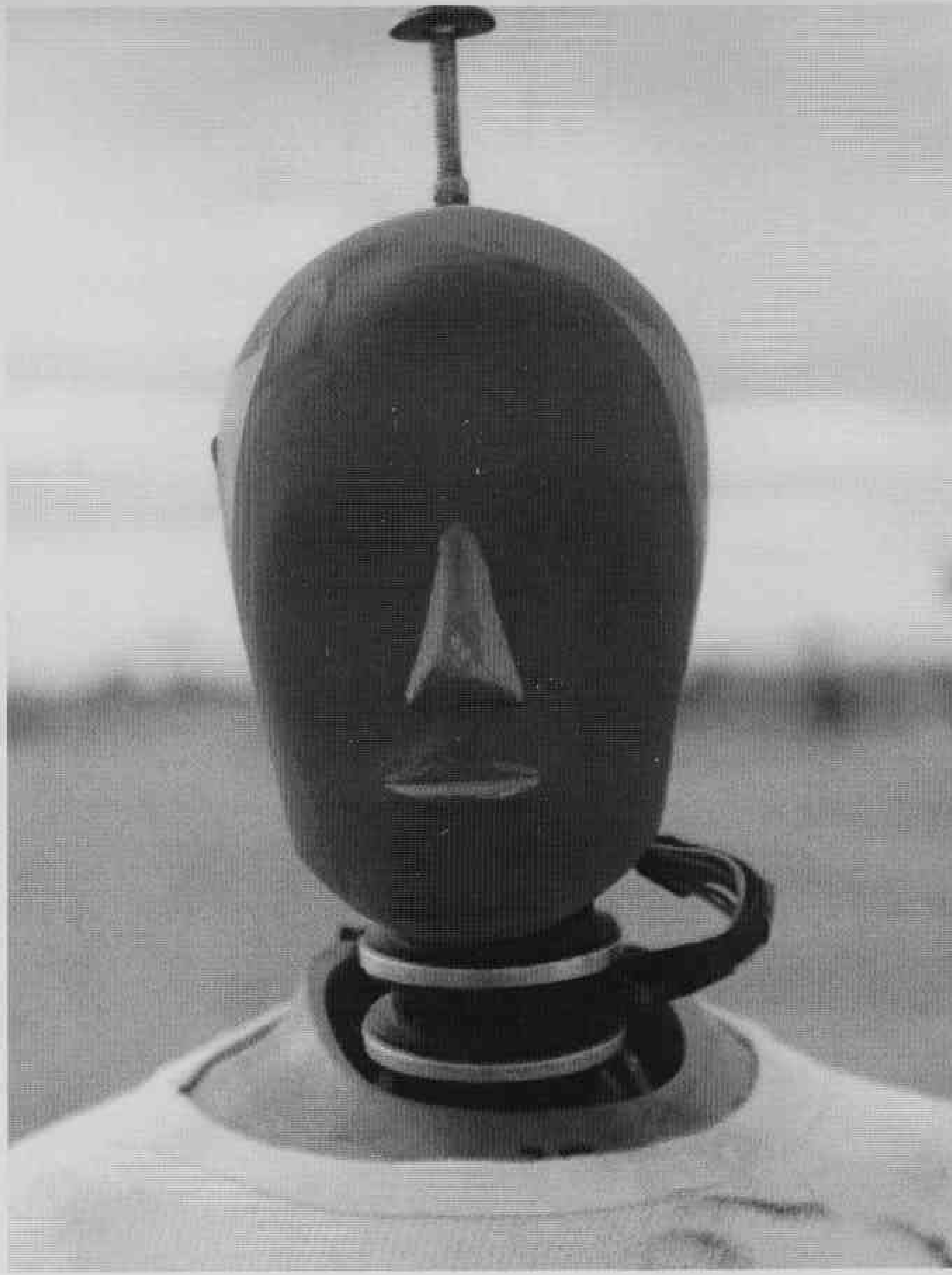


FIGURE A-48. POST TEST PASSENGER DUMMY HEAD

FIGURE A-49. POST TEST PASSENGER DUMMY CONTACT POINT

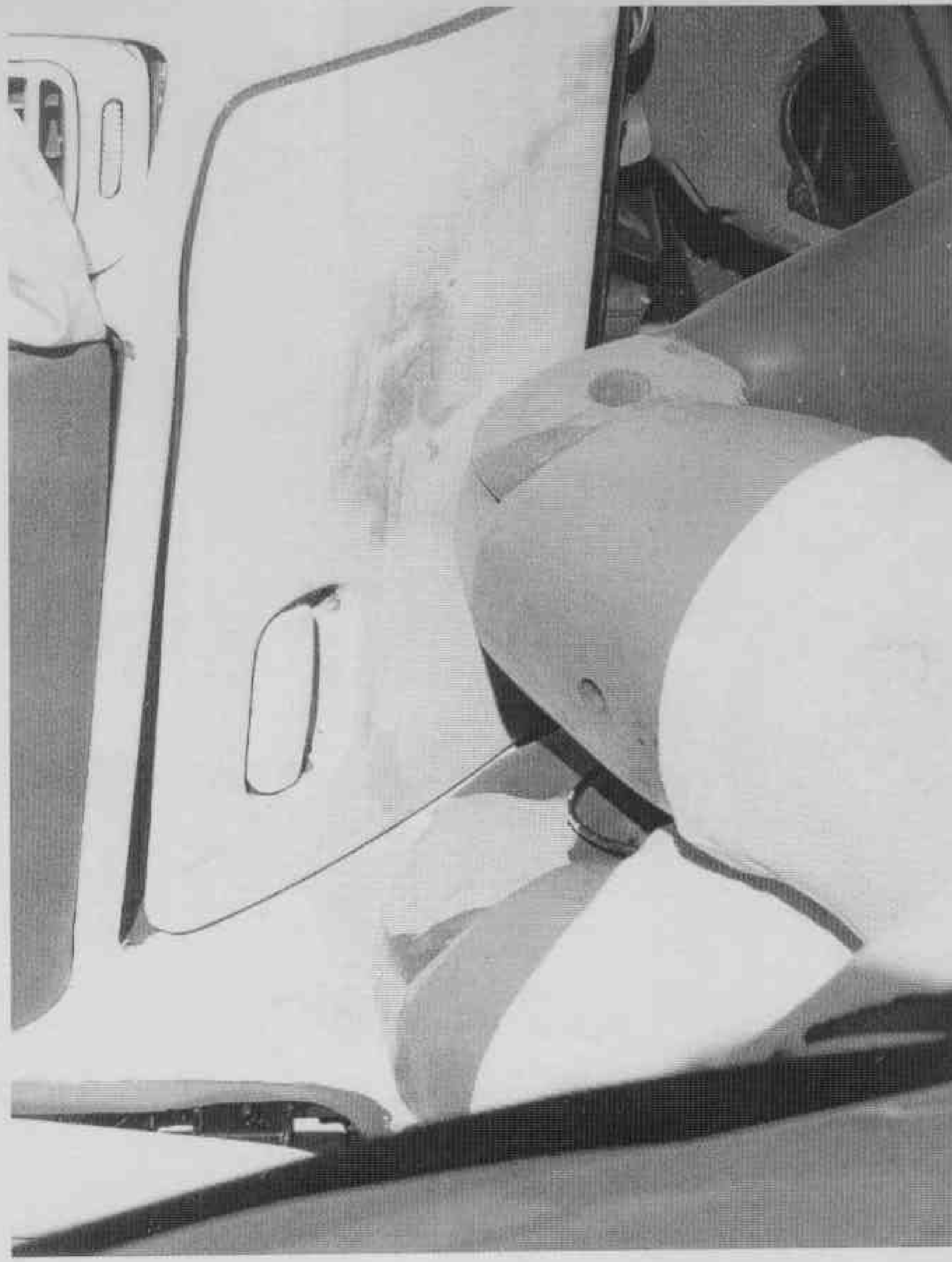


FIGURE A-50. POST TEST PASSENGER DUMMY CONTACT POINT

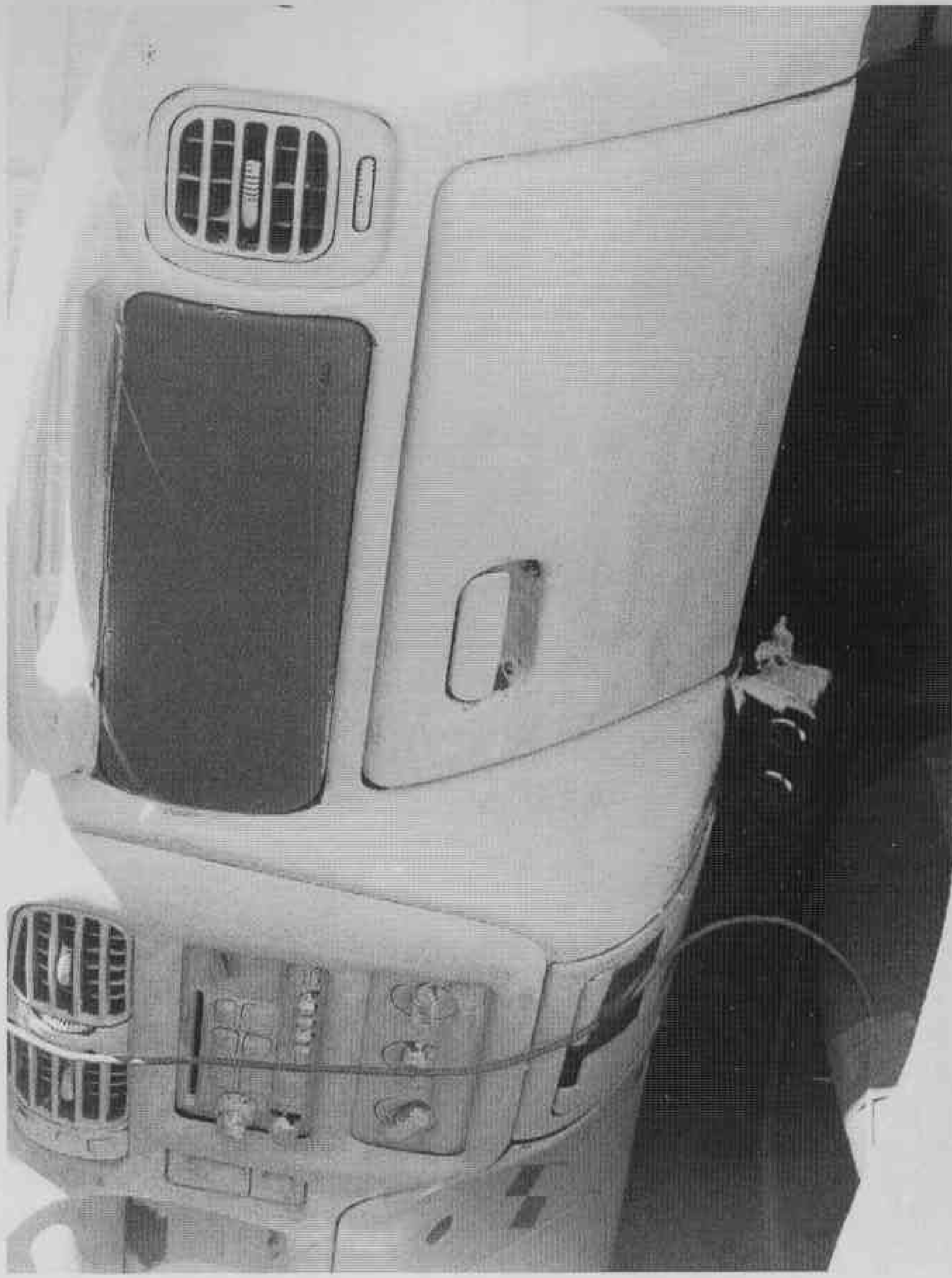


FIGURE A-51. PRETEST PASSENGER SIDE KNEE BOLSTER

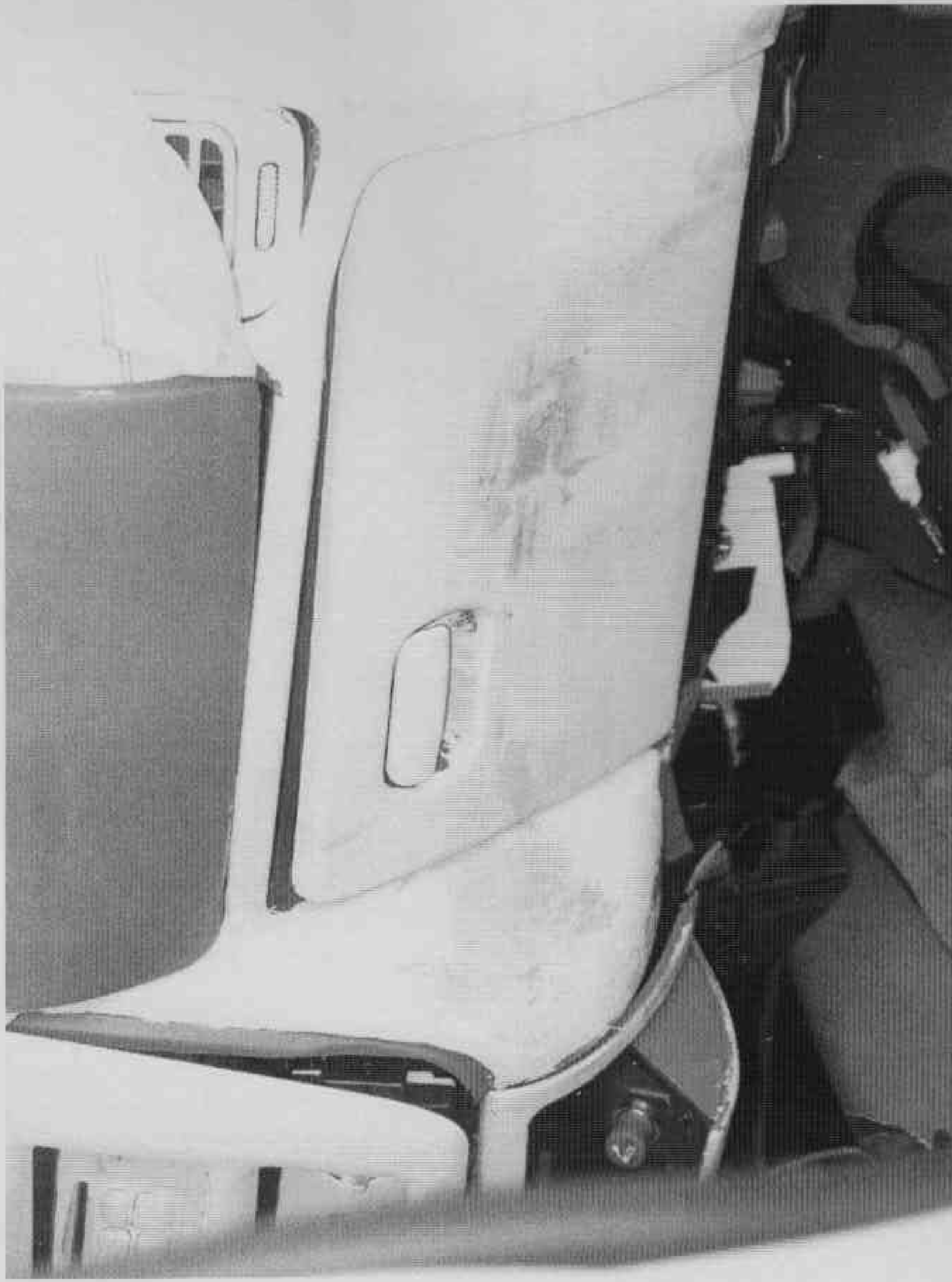


FIGURE A-52. POST TEST PASSENGER SIDE KNEE BOLSTER

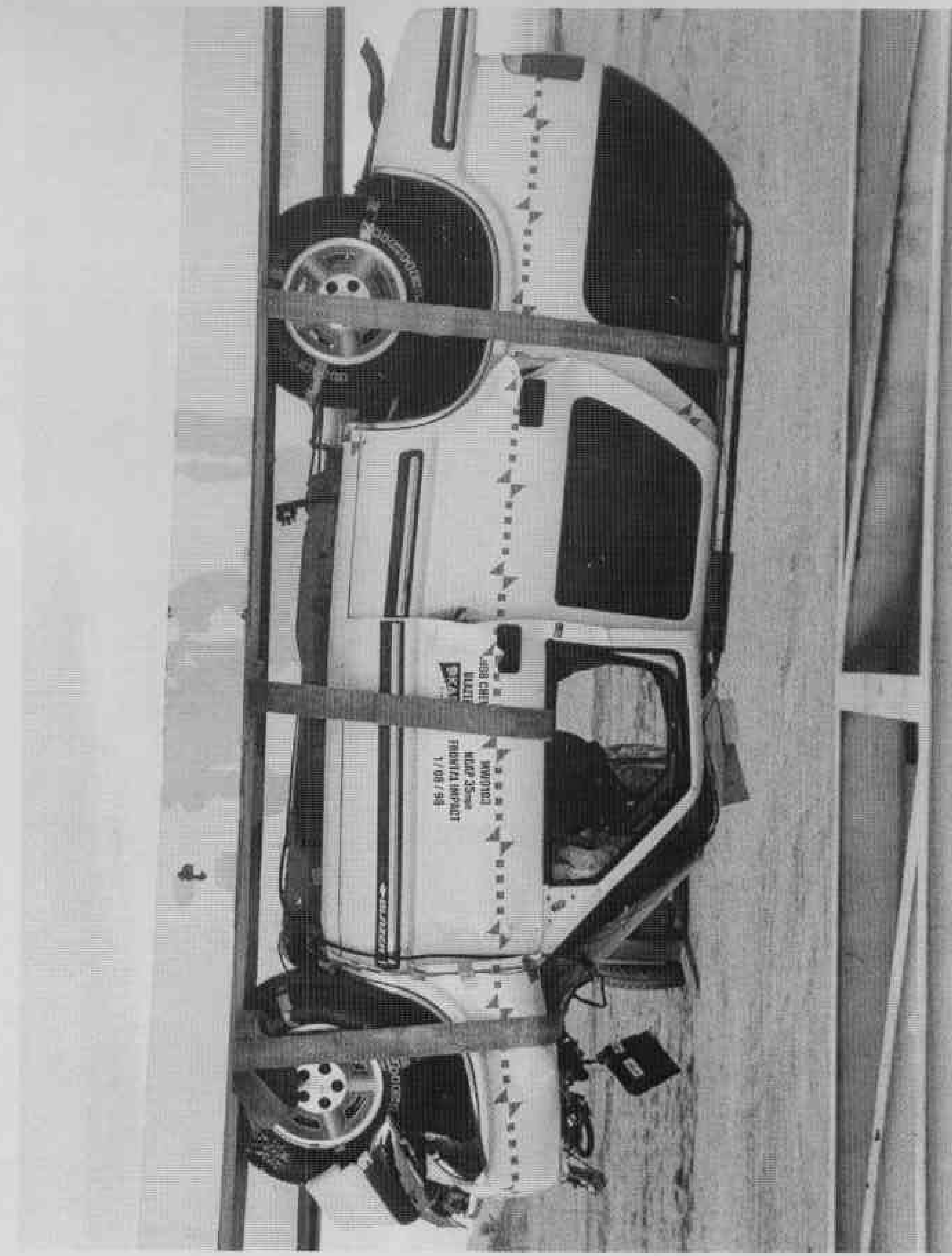


FIGURE A-53. VEHICLE ON ROLLOVER

FIGURE A-54. VEHICLE DURING IMPACT

APPENDIX B

DUMMY, VEHICLE AND RESPONSE DATA TRACES

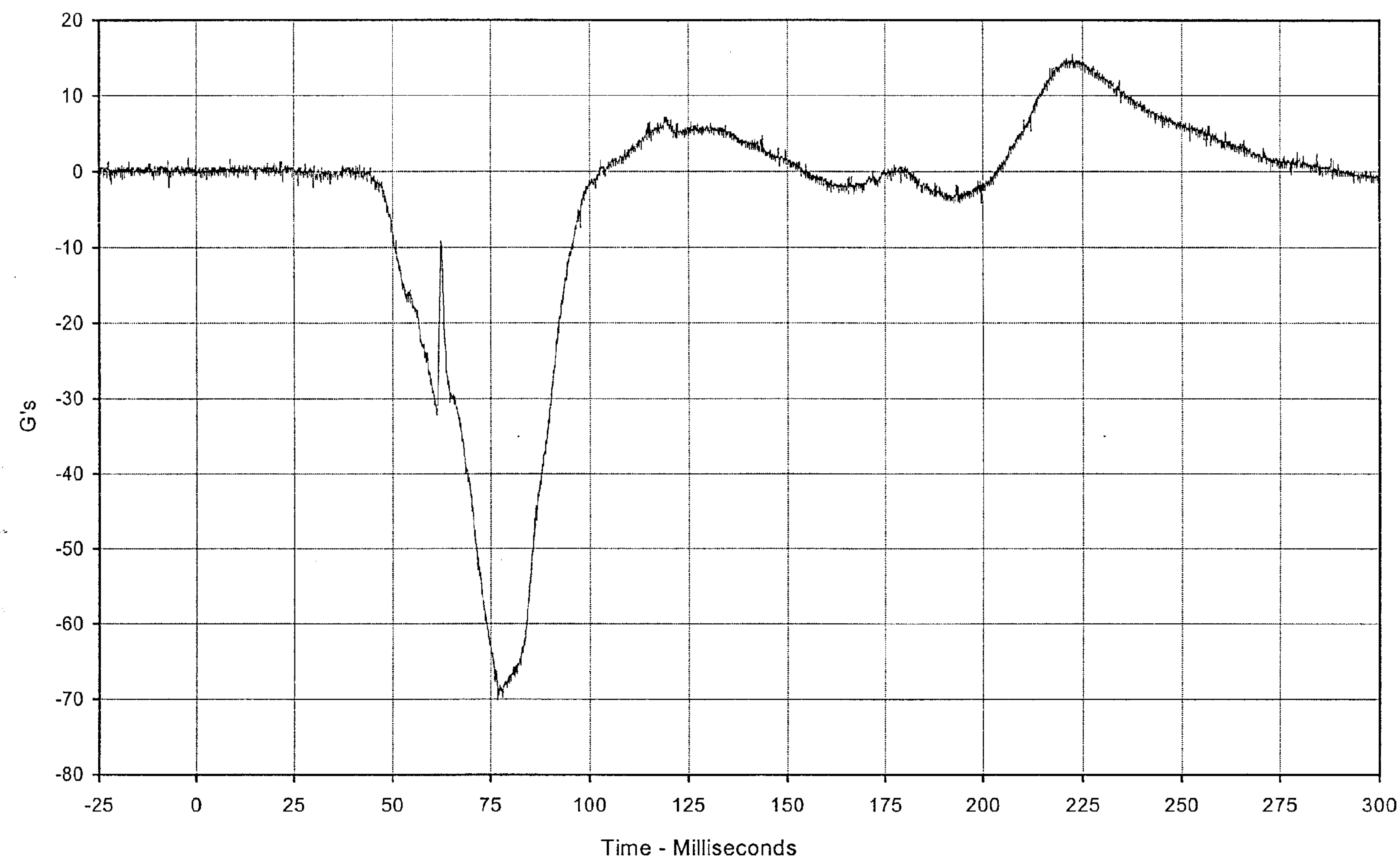
LIST OF DATA PLOTS

LIST OF DATA PLOTS...(Continued)

LIST OF DATA PLOTS...(Continued)

LIST OF DATA PLOTS...(Continued)

LIST OF DATA PLOTS...(Continued)

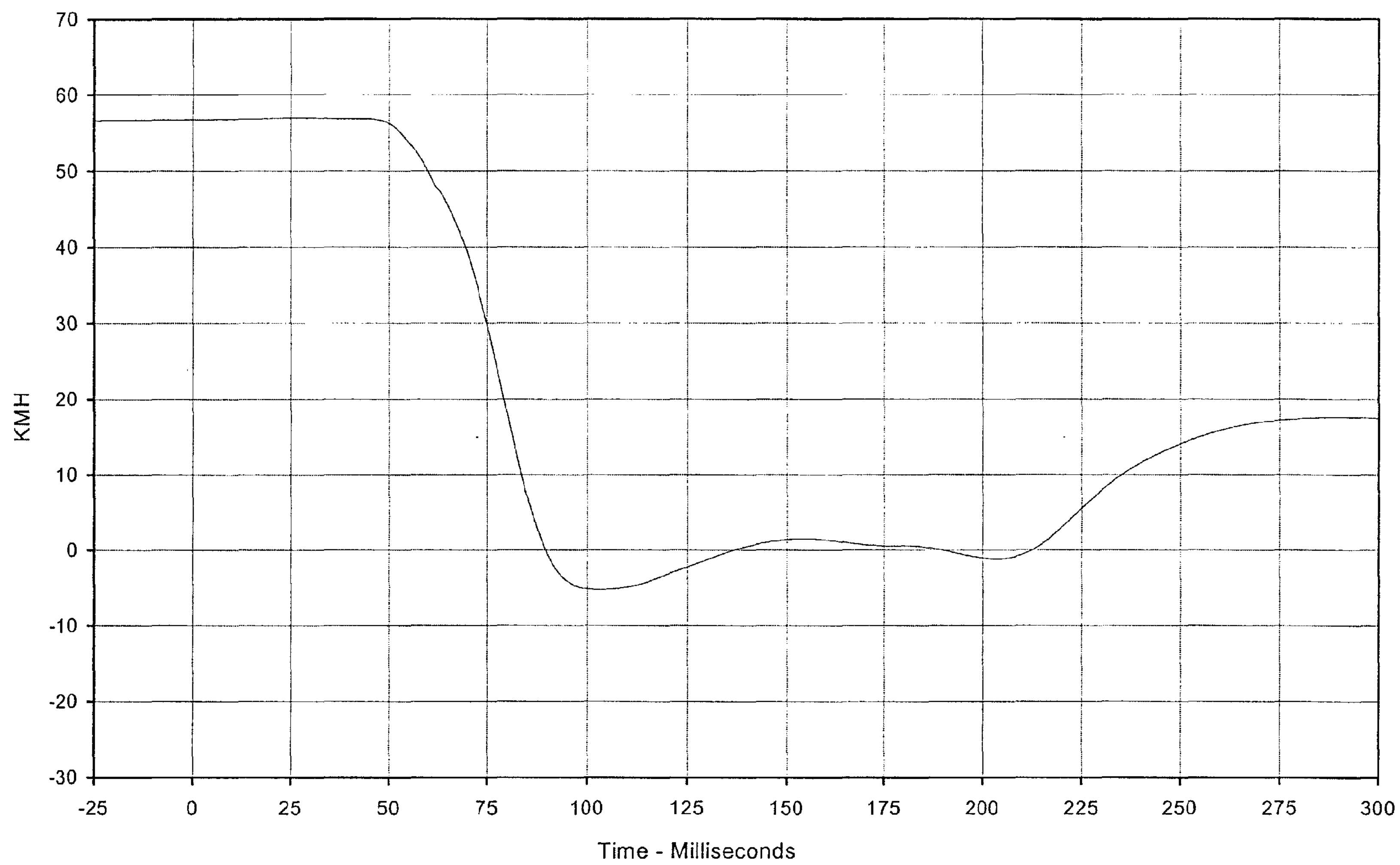


Curve Description:	Driver Head Primary X			
Maximum Value:	15.5	at	222.5	Milliseconds
Minimum Value:	-70.1	at	76.8	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-001			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

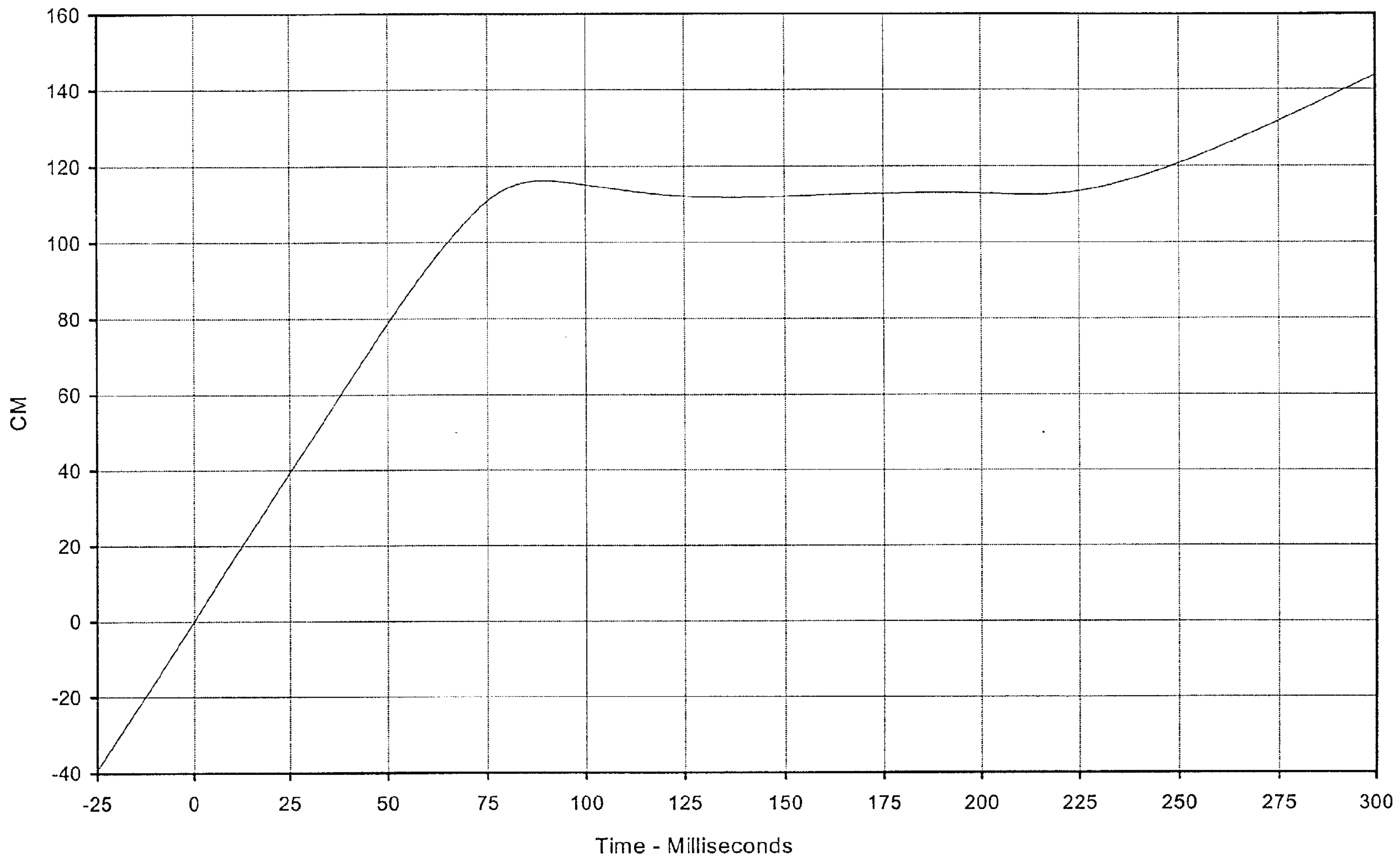
KARC Engineering



Curve Description:	Driver Head Primary X Velocity			
Maximum Value:	57.0	at	25.4	Milliseconds
Minimum Value:	-5.2	at	102.6	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-001			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering



Curve Description: Driver Head Primary X Displ.

Maximum Value: 143.8 at 299.9 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

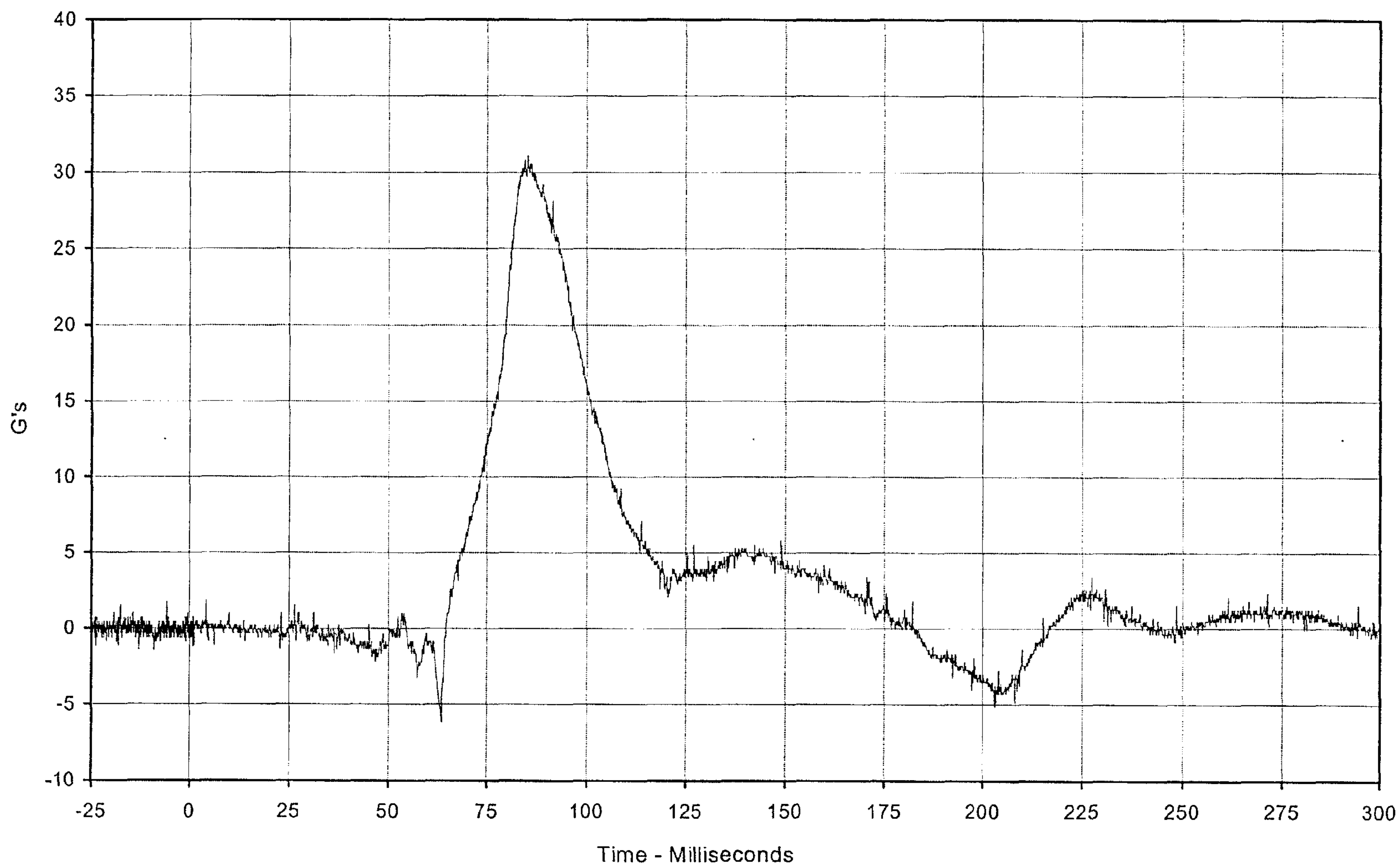
Date of Test: 1/8/98

Curve Number: IN2-001

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

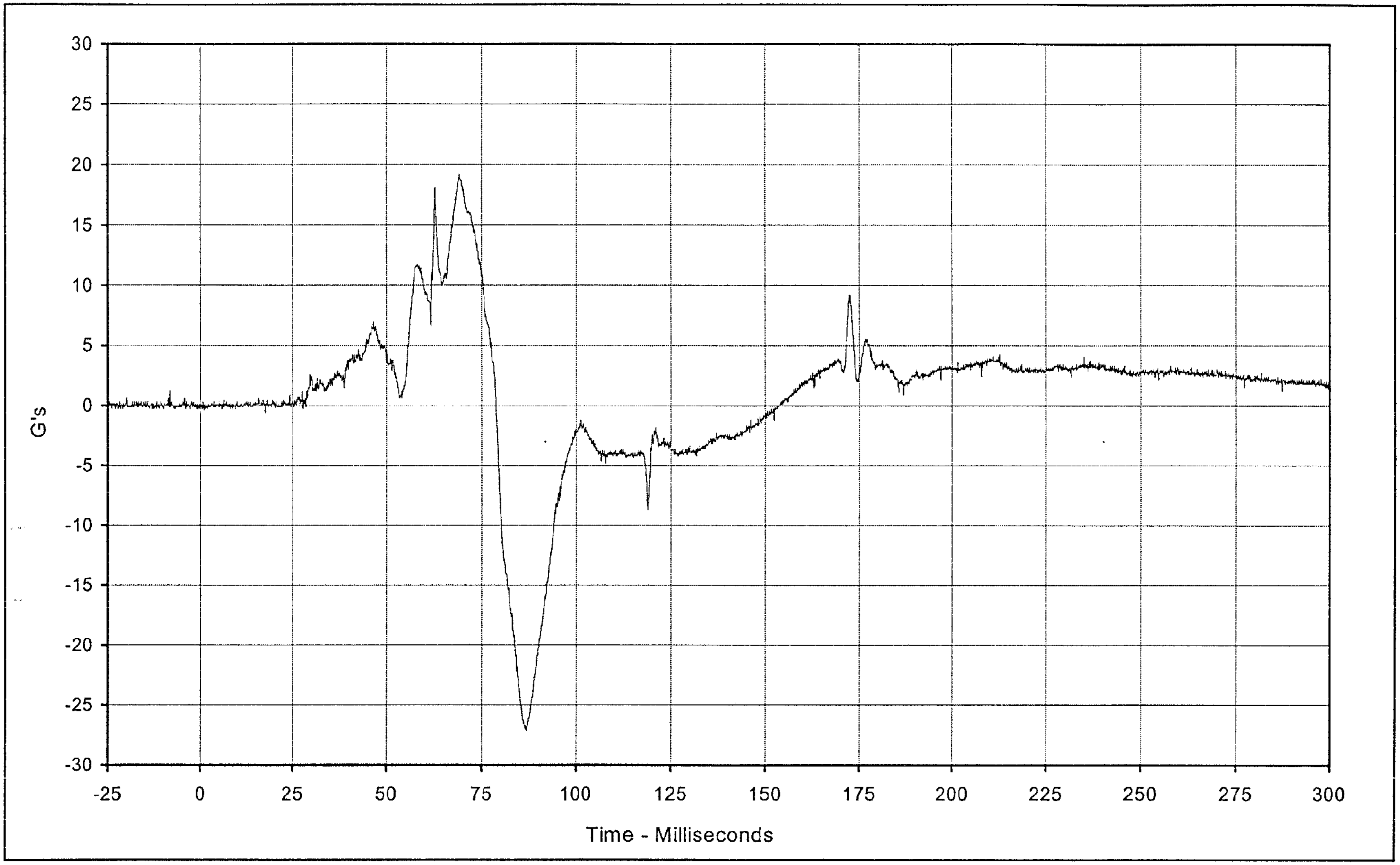
KARCO Engineering



Curve Description:	Driver Head Primary Y			
Maximum Value:	31.1	at	85.1	Milliseconds
Minimum Value:	-6.2	at	63.5	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-002			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

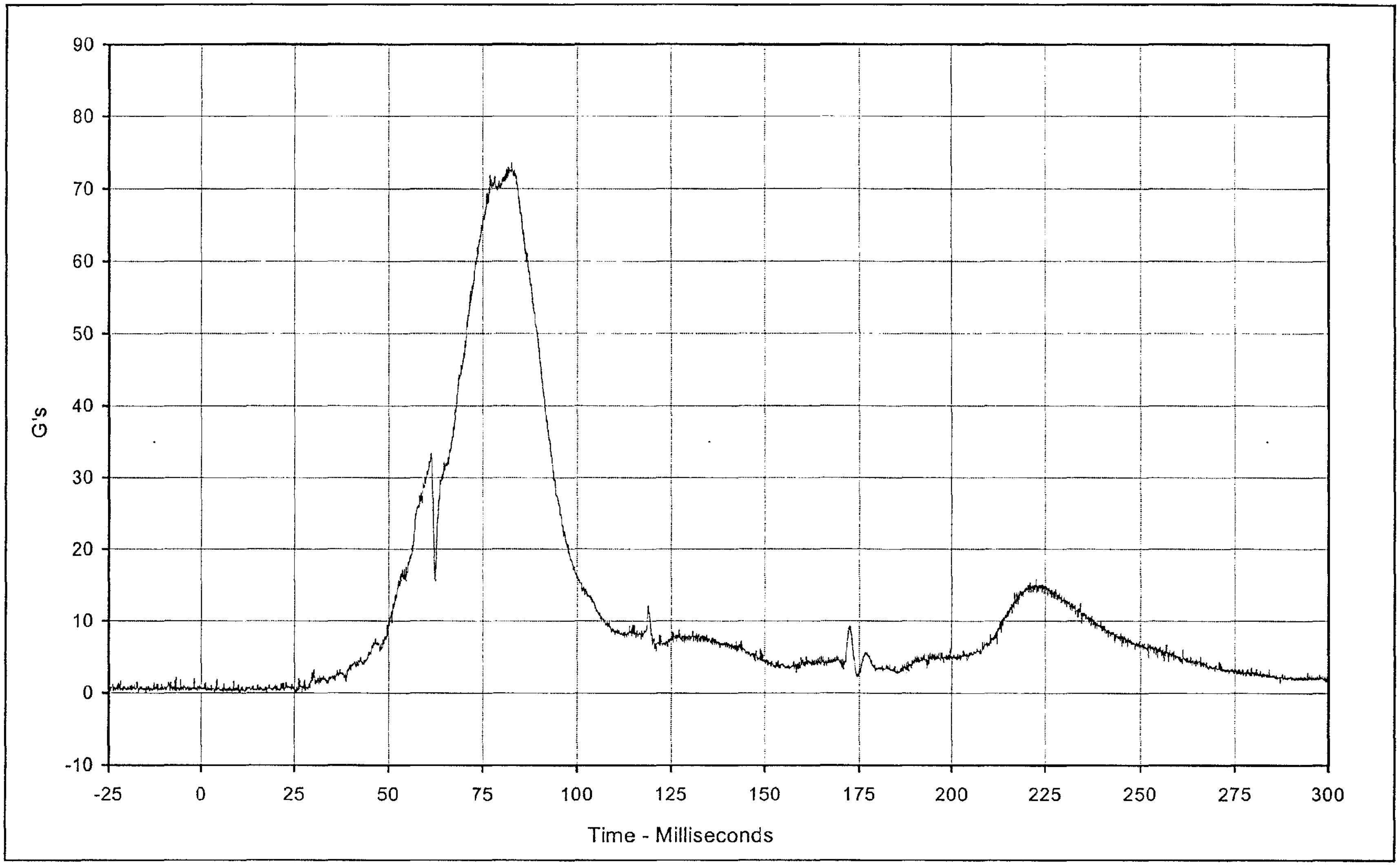
KARCO Engineering



Curve Description:	Driver Head Primary Z			
Maximum Value:	19.2	at	69.1	Milliseconds
Minimum Value:	-27.2	at	86.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-003			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

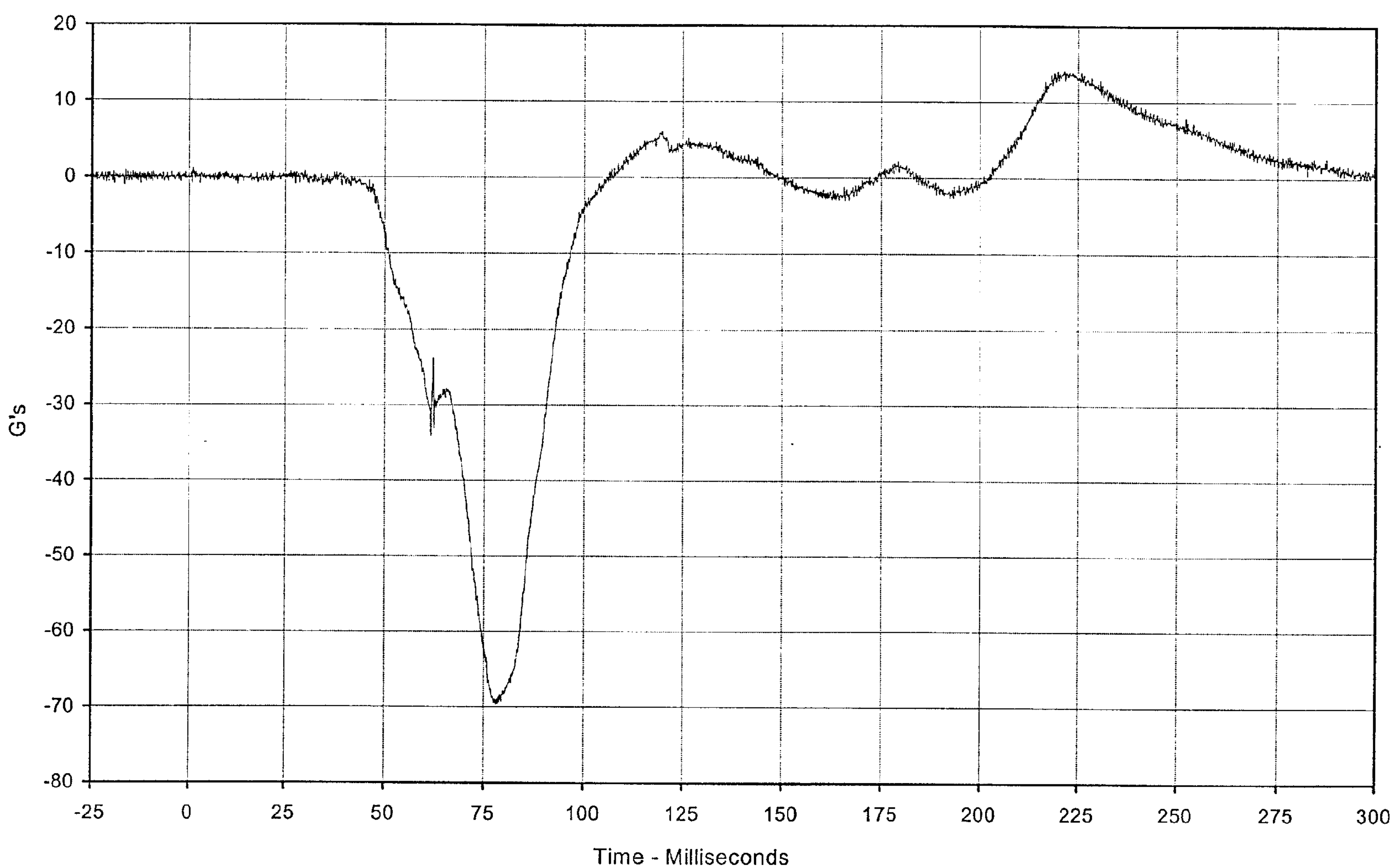
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Head Resultant Primary			
Maximum Value:	73.6	at	82.6	Milliseconds
Minimum Value:	0.1	at	6.8	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-001			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

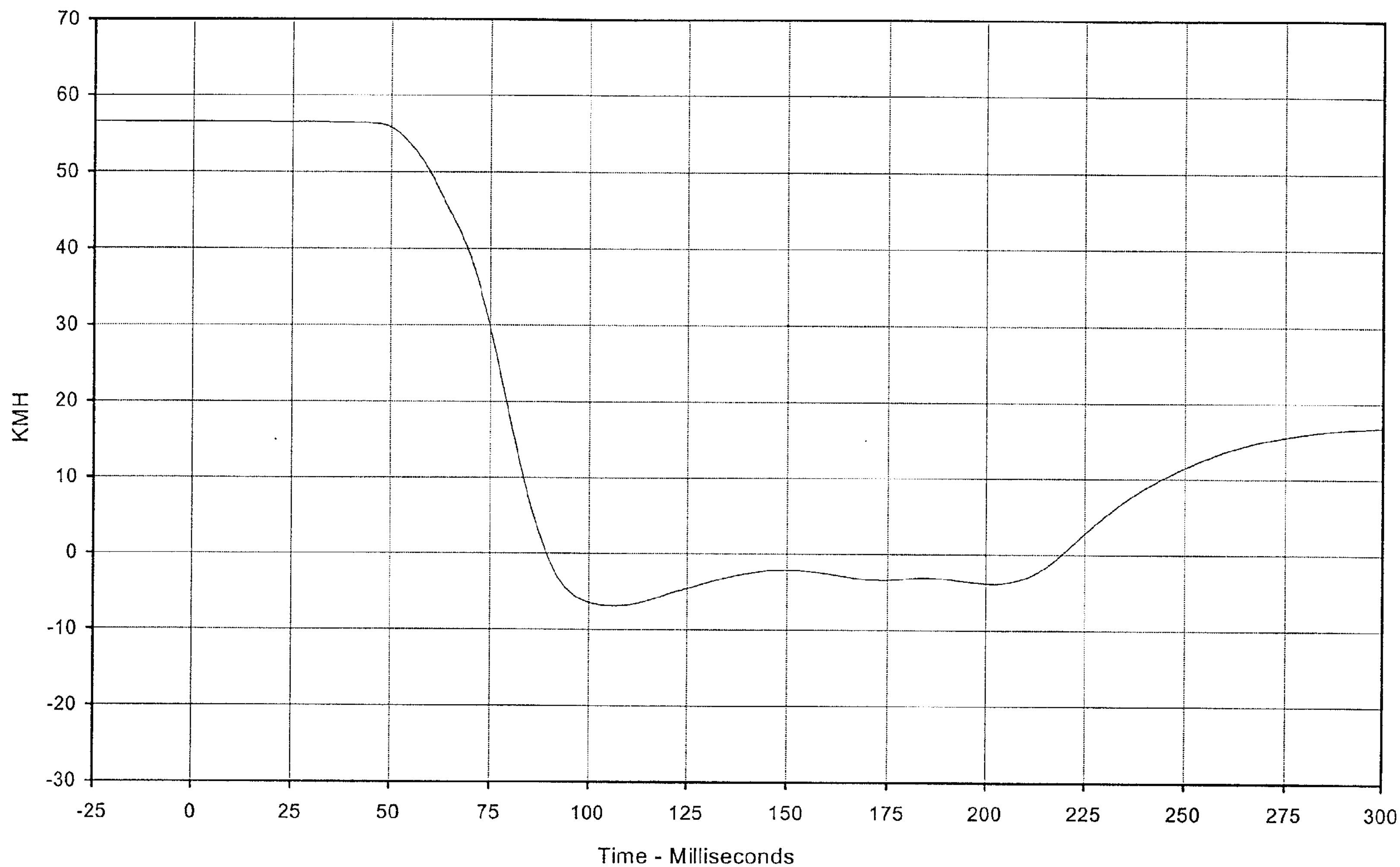
KARC Engineering



Curve Description:	Driver Head Redundant X			
Maximum Value:	14.1	at	219.8	Milliseconds
Minimum Value:	-69.6	at	77.9	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-004			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

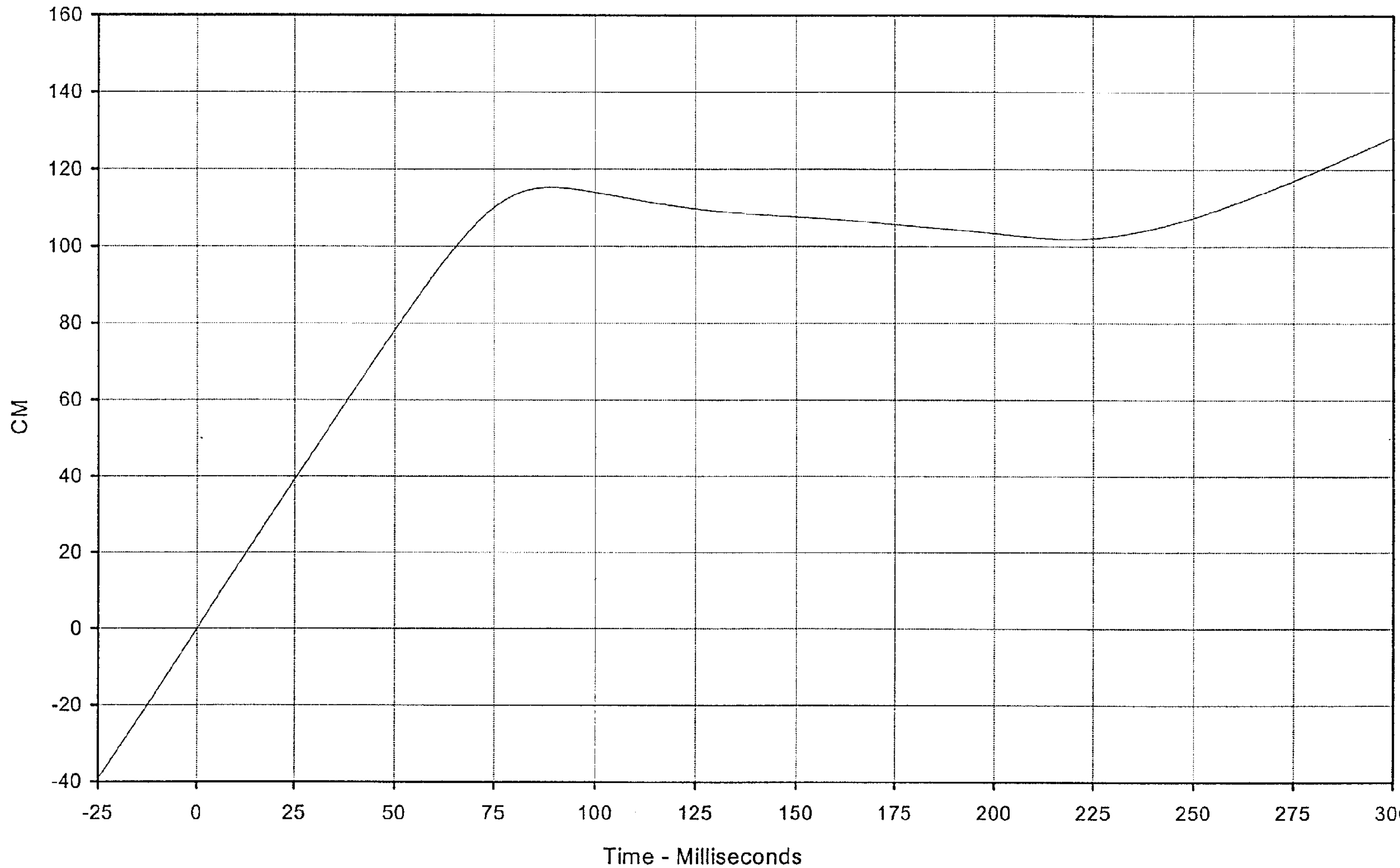


Curve Description:	Driver Head Redundant X Velocity			
Maximum Value:	56.6	at	10.7	Milliseconds
Minimum Value:	-6.8	at	106.1	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-004			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

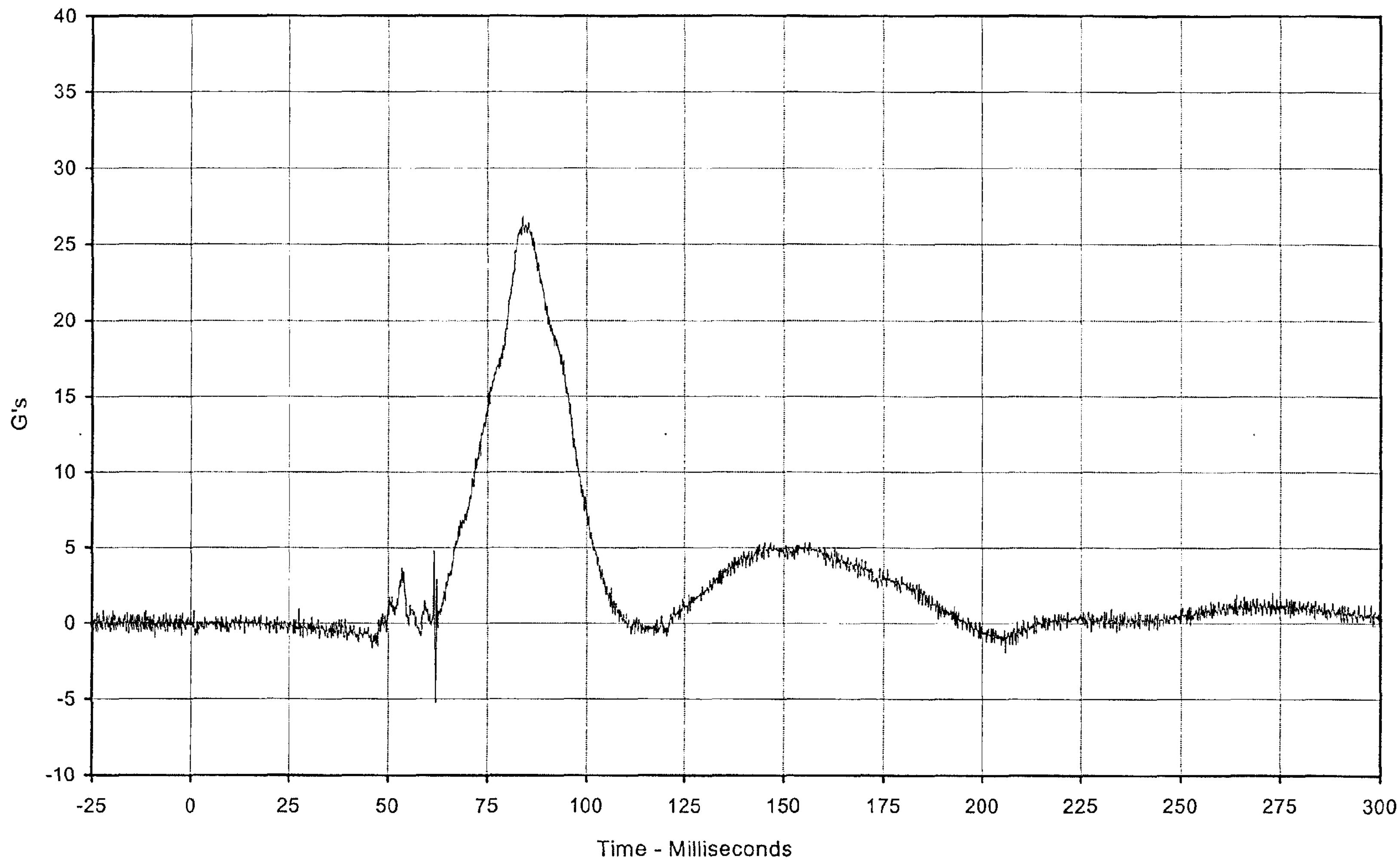
KARCO Engineering



Curve Description:	Driver Head Redundant X Displ.			
Maximum Value:	128.3	at	299.9	Milliseconds
Minimum Value:	-0.1	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-004			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

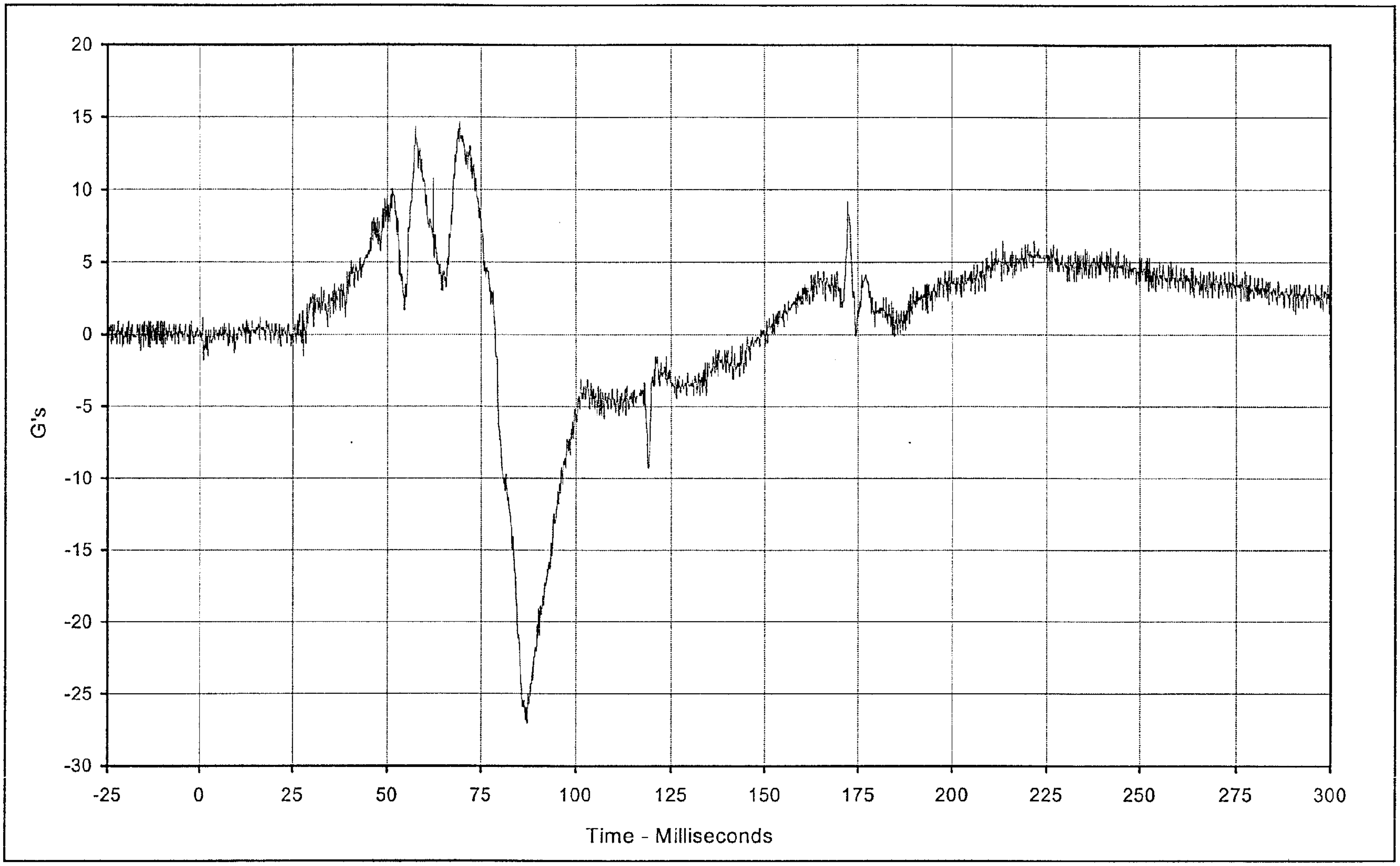


Curve Description:	Driver Head Redundant Y			
Maximum Value:	26.8	at	83.6	Milliseconds
Minimum Value:	-5.2	at	62.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-005			

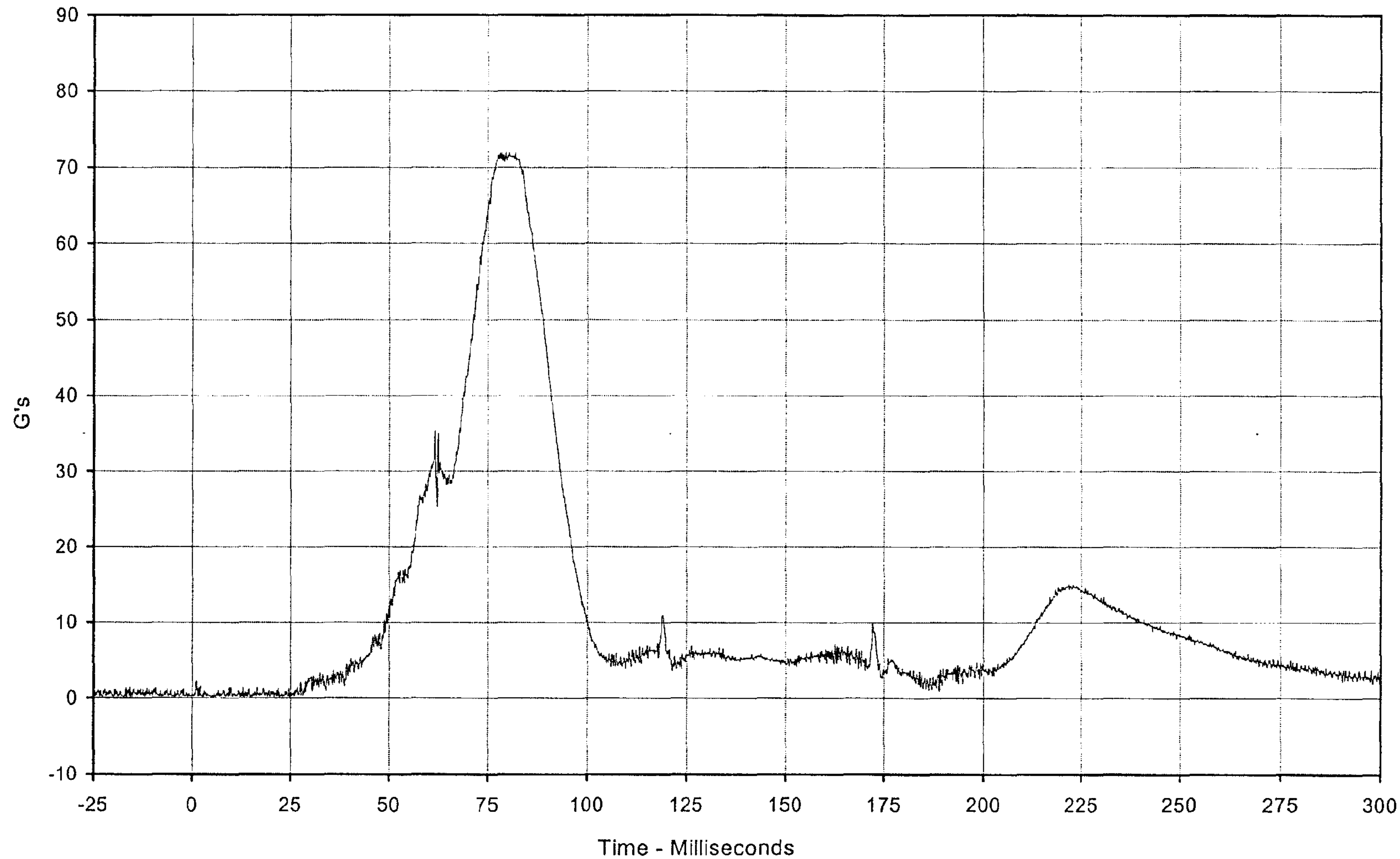
Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering



Curve Description:	Driver Head Redundant Z				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	14.6	at	69.3	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	-27.1	at	87.2	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	1/8/98					
Curve Number:	FIL-006					

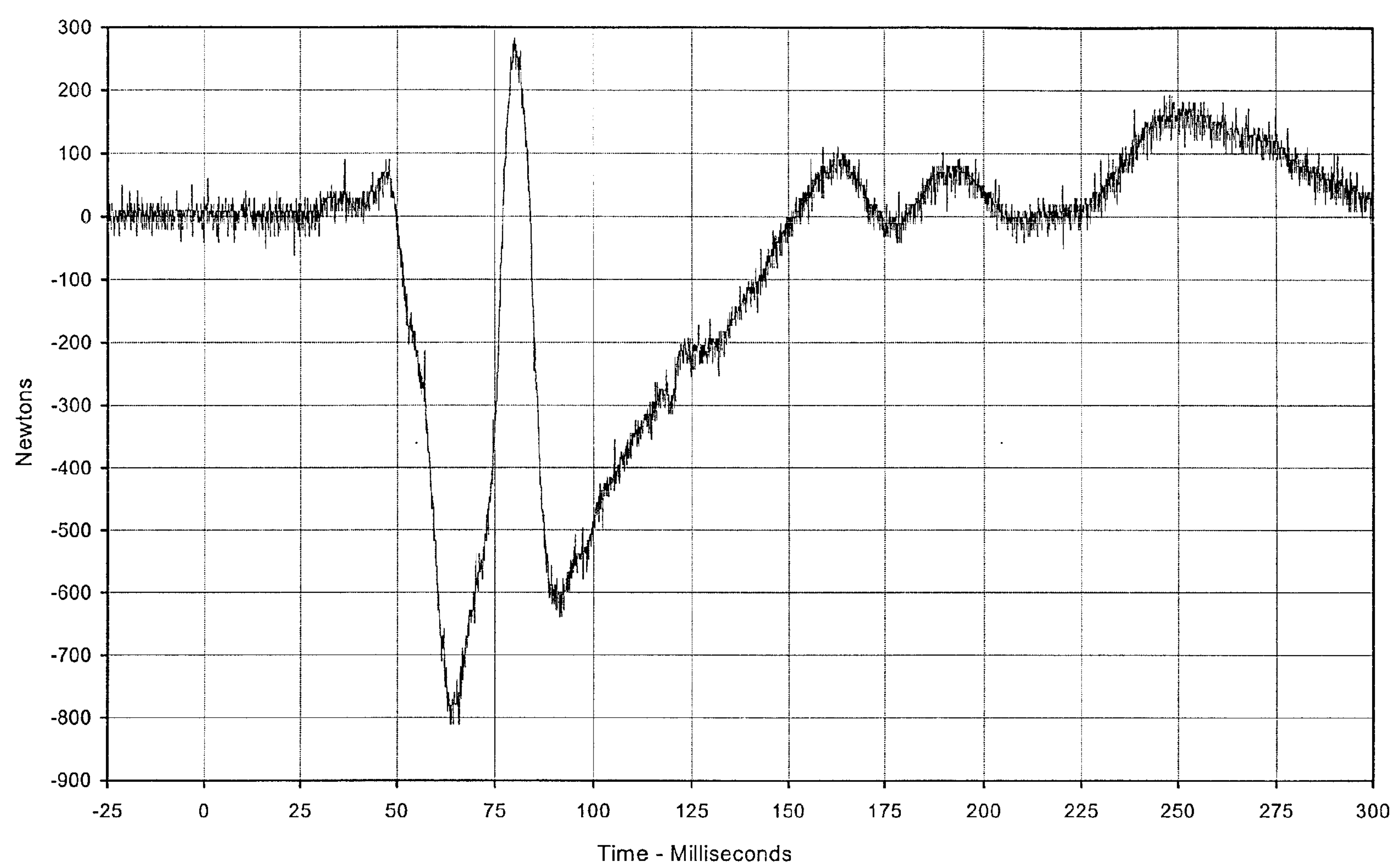


Curve Description:	Driver Head Resultant Redundant			
Maximum Value:	71.9	at	79.3	Milliseconds
Minimum Value:	0.1	at	4.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-004			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

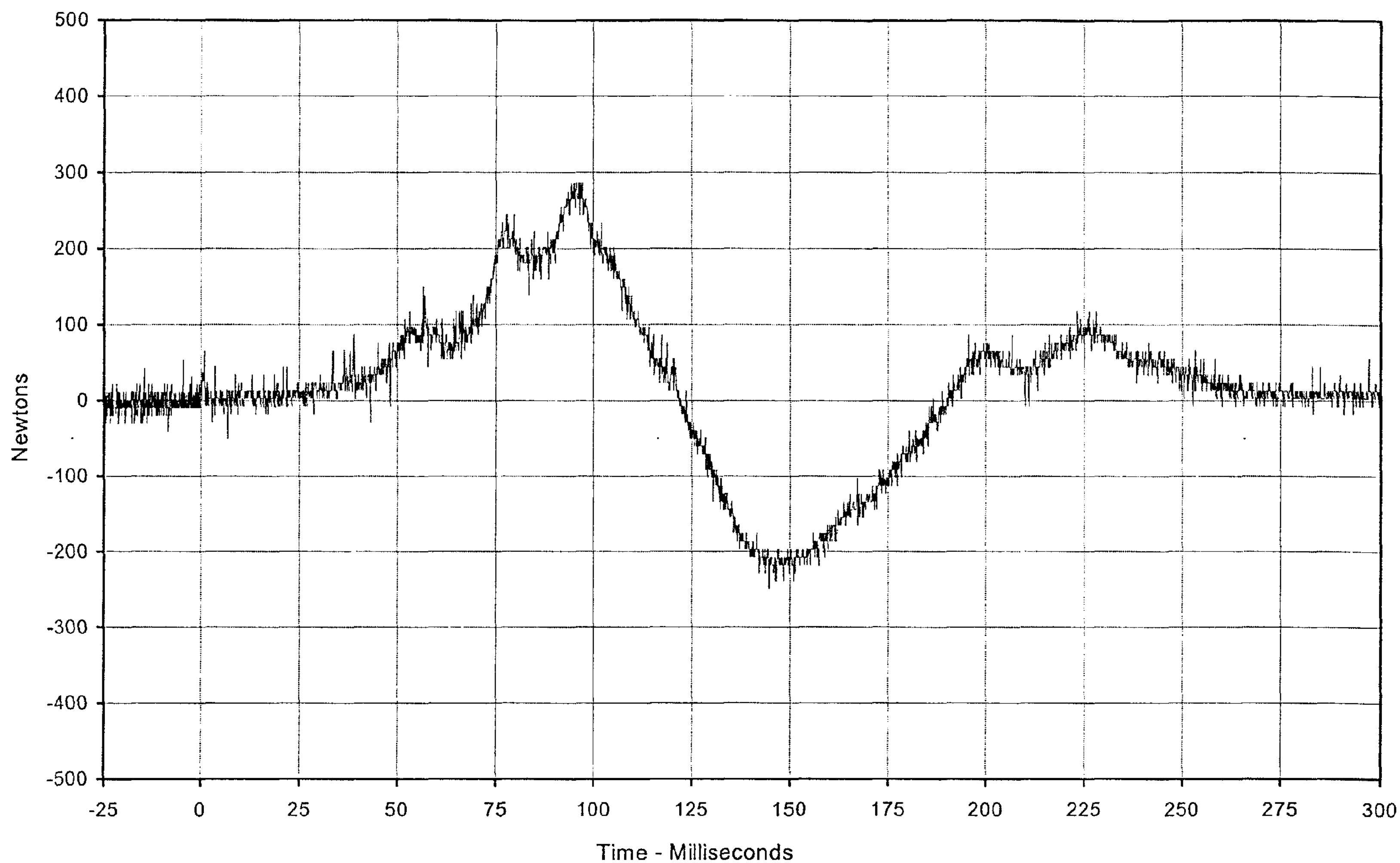
KARCO Engineering



Curve Description:	Driver Neck Force X			
Maximum Value:	282.8	at	80.0	Milliseconds
Minimum Value:	-810.8	at	63.5	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-007			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

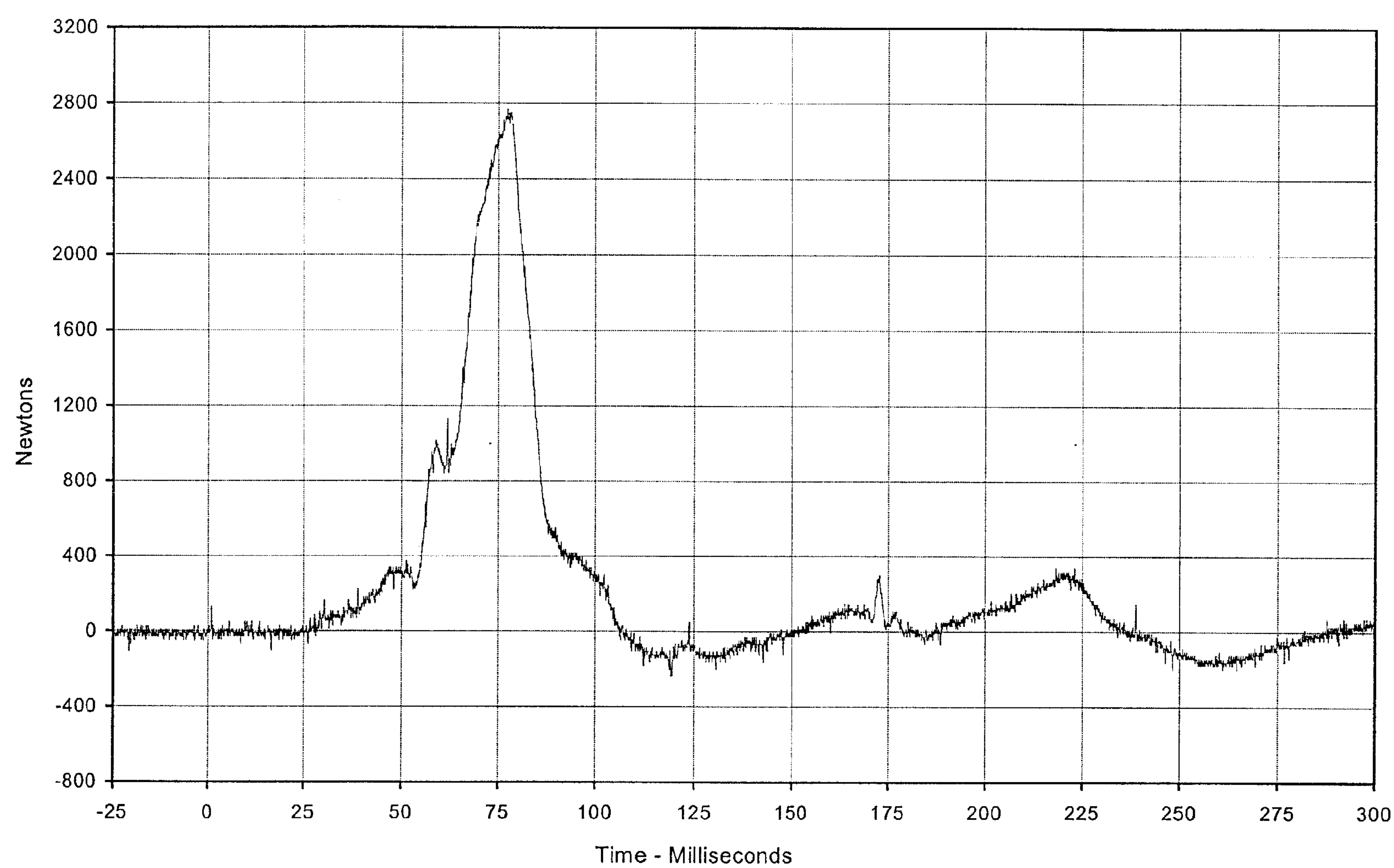
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Neck Force Y			
Maximum Value:	286.0	at	94.1	Milliseconds
Minimum Value:	-249.5	at	144.9	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-008			

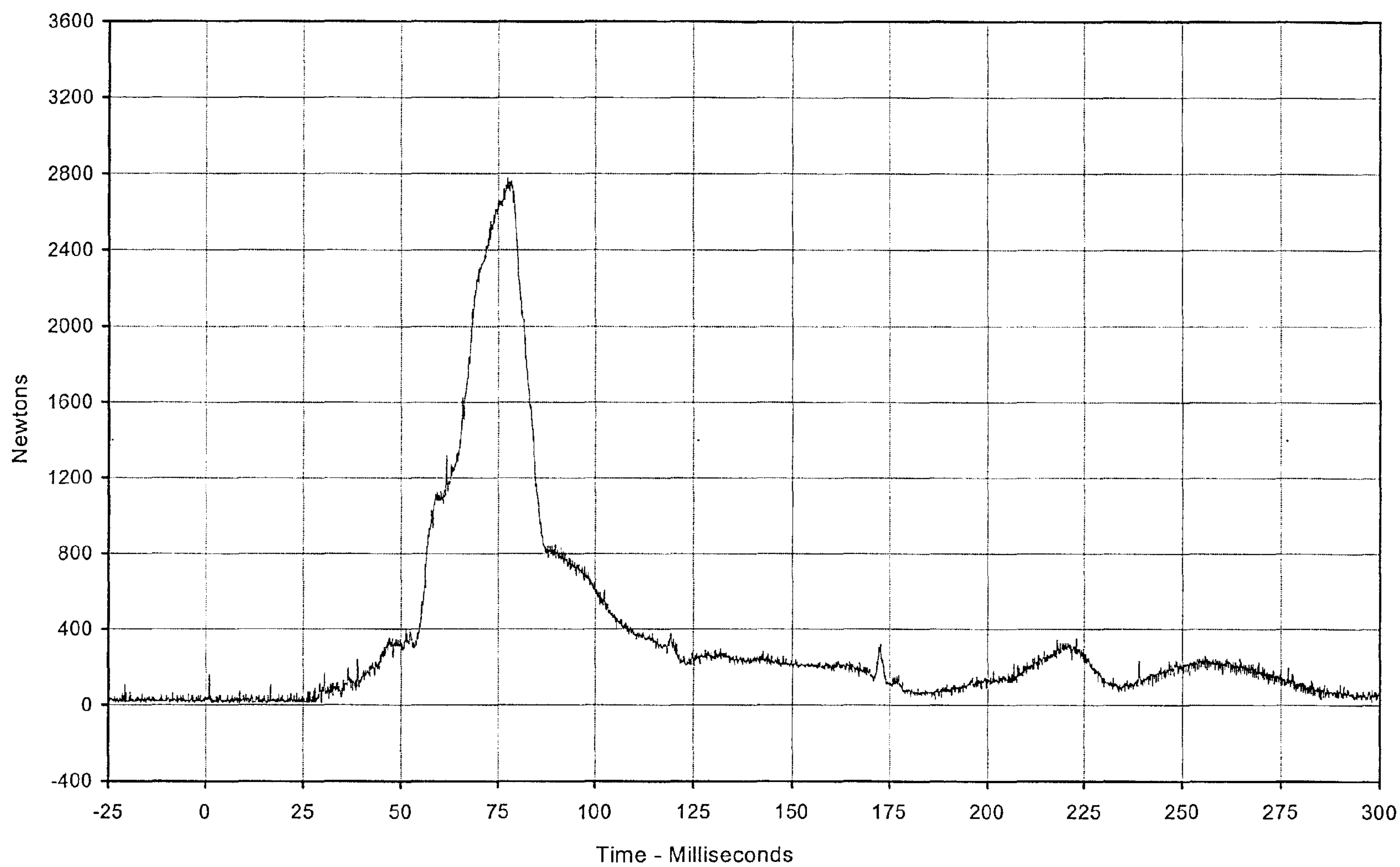
Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Neck Force Z			
Maximum Value:	2769.5	at	77.3	Milliseconds
Minimum Value:	-235.8	at	119.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-009			

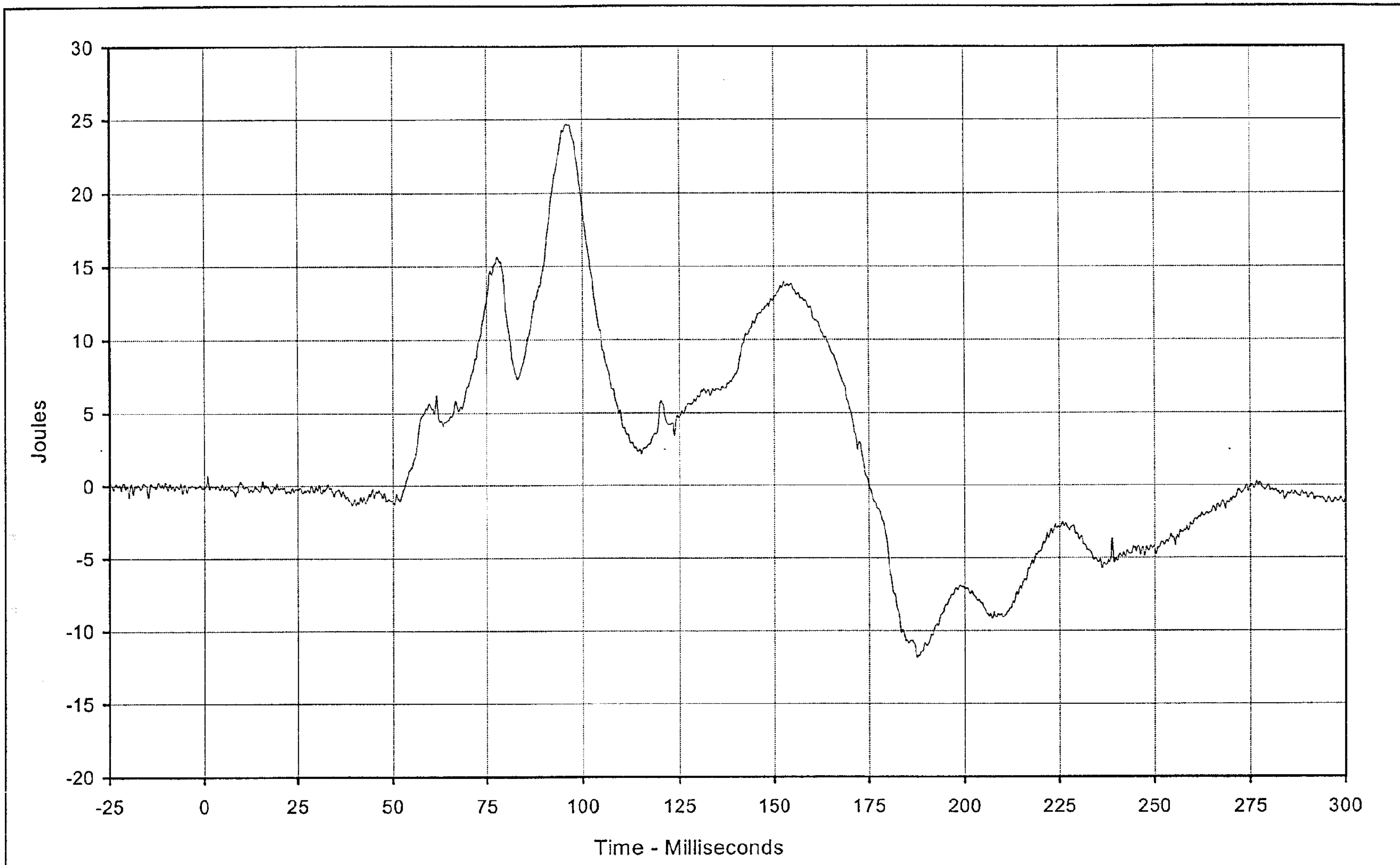
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Neck Force Resultant			
Maximum Value:	2778.5	at	77.3	Milliseconds
Minimum Value:	8.3	at	6.1	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-007			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

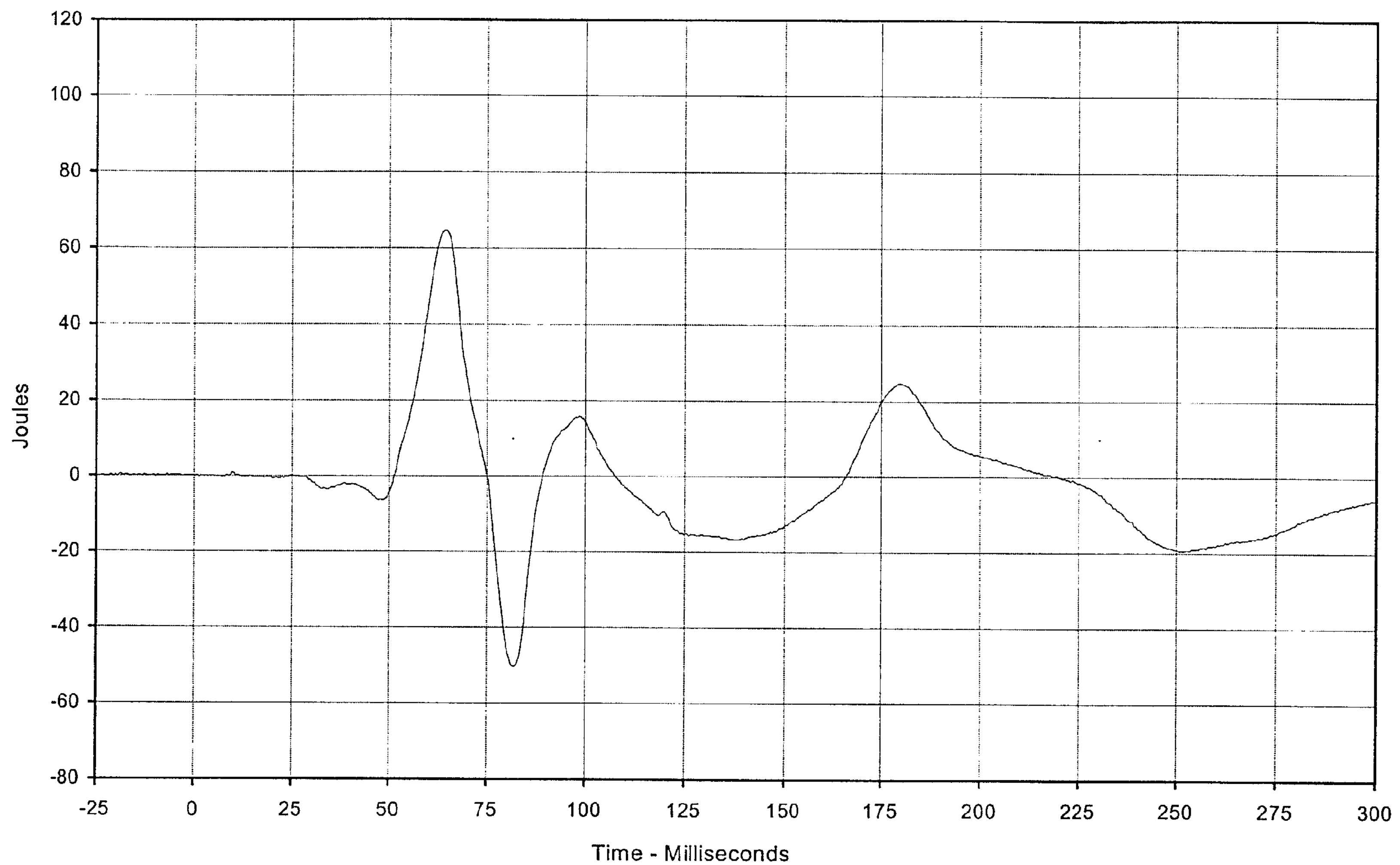


Curve Description:	Driver Neck Moment X			
Maximum Value:	24.7	at	95.9	Milliseconds
Minimum Value:	-11.8	at	187.5	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-010			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

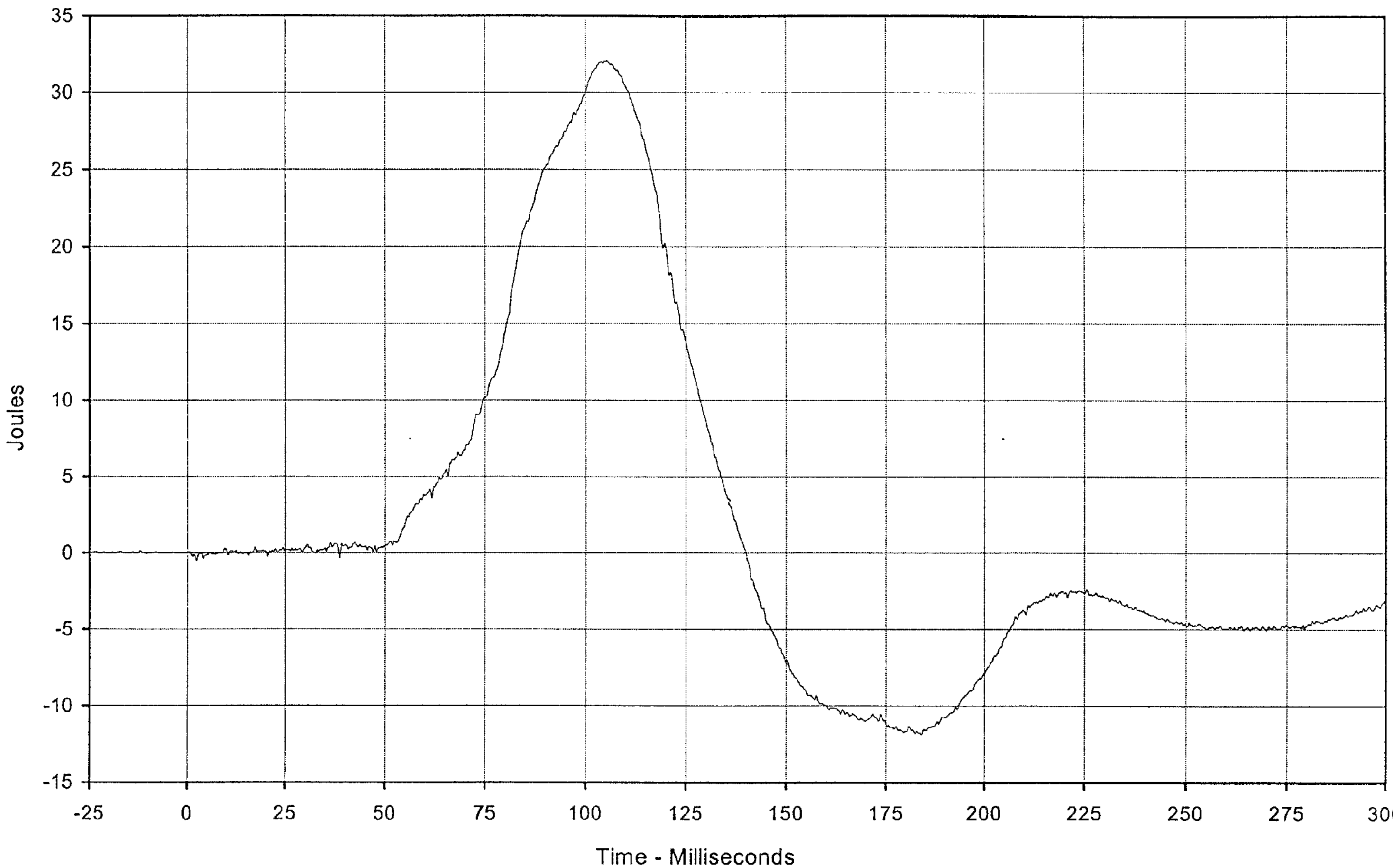
KARCO Engineering



Curve Description:	Driver Neck Moment Y			
Maximum Value:	64.7	at	64.2	Milliseconds
Minimum Value:	-50.3	at	81.9	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-011			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

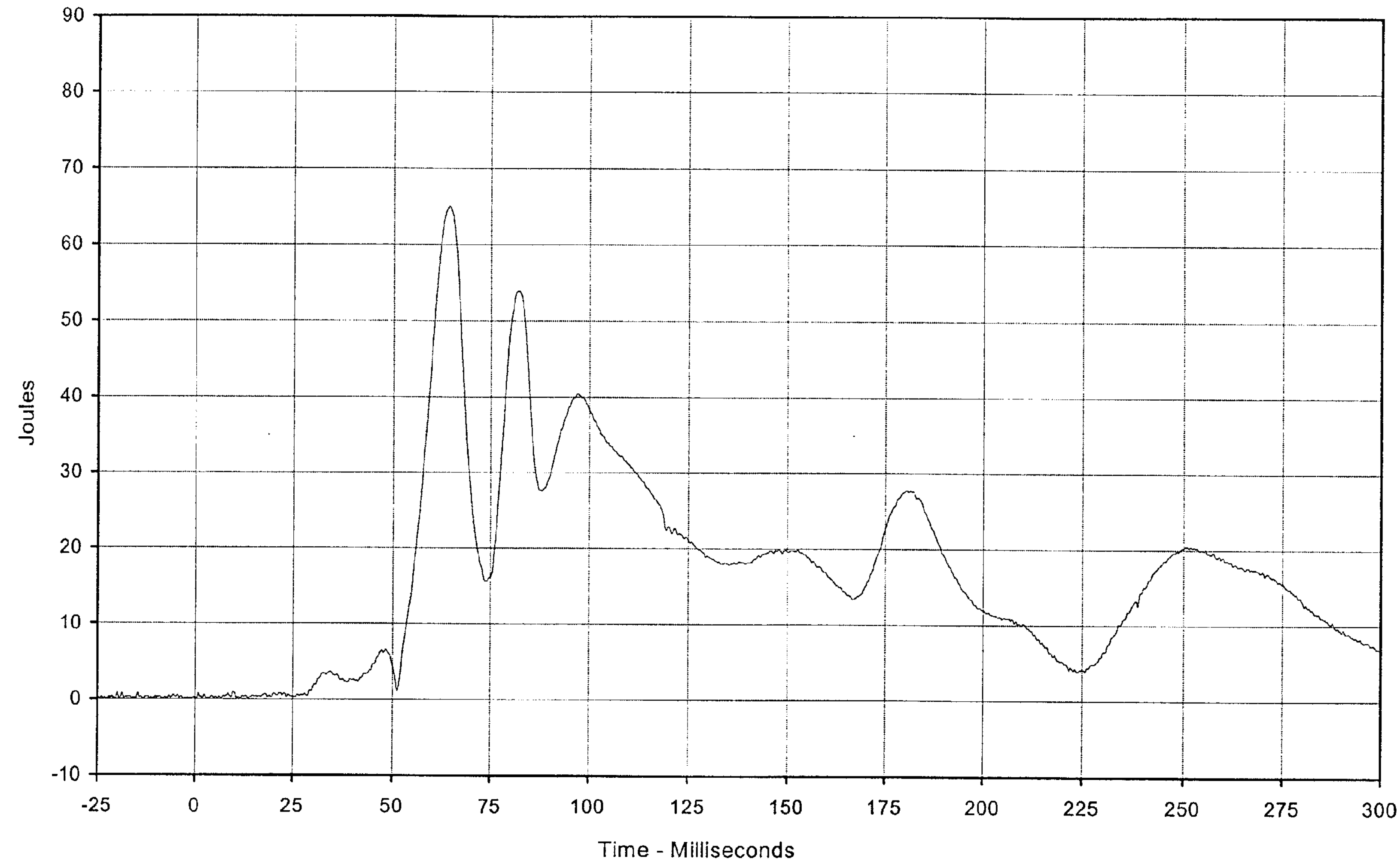
KARCO Engineering



Curve Description:	Driver Neck Moment Z			
Maximum Value:	32.1	at	105.7	Milliseconds
Minimum Value:	-11.9	at	184.0	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-012			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

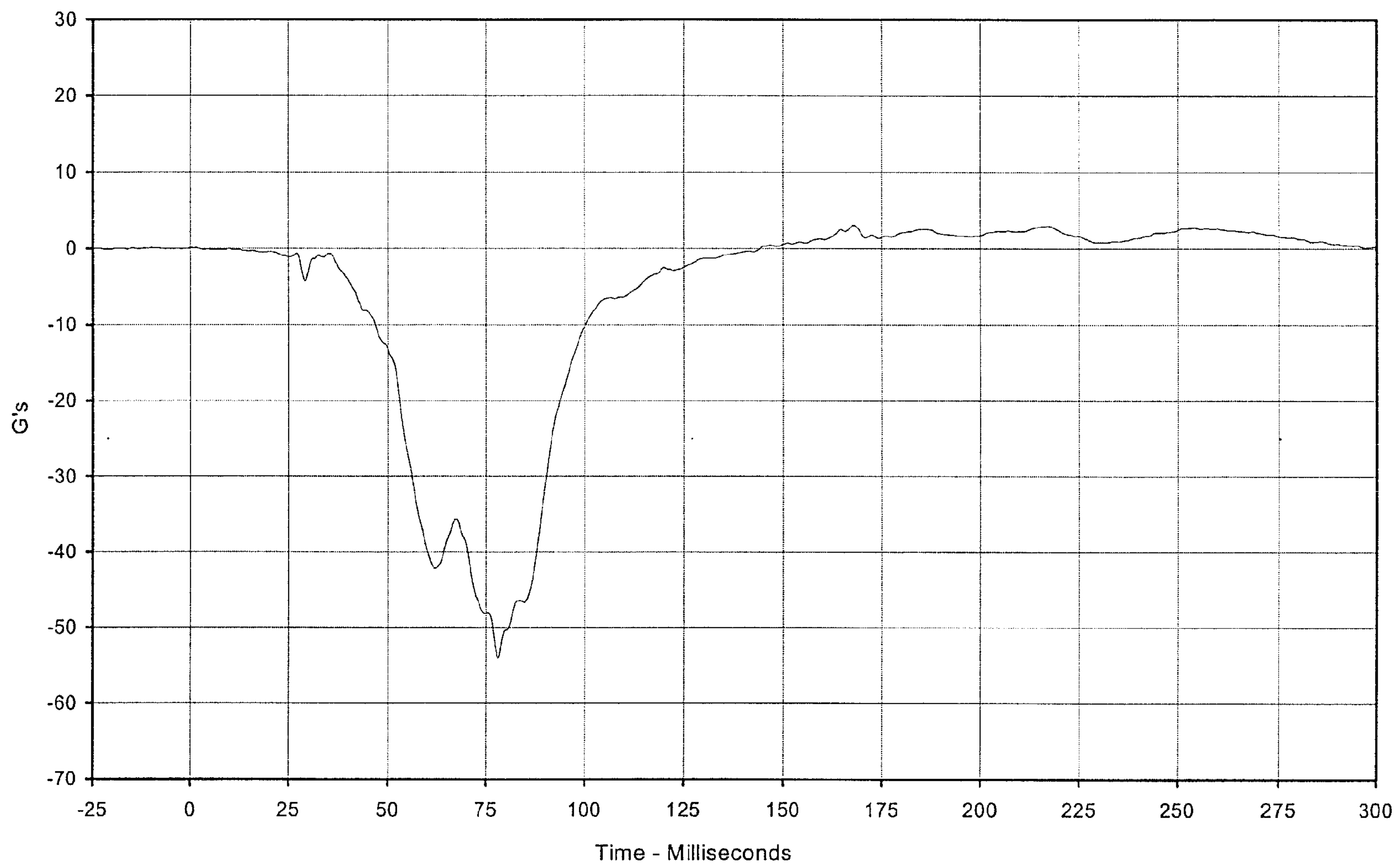
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Neck Moment Resultant			
Maximum Value:	65.0	at	64.2	Milliseconds
Minimum Value:	0.1	at	5.7	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	RES-010			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

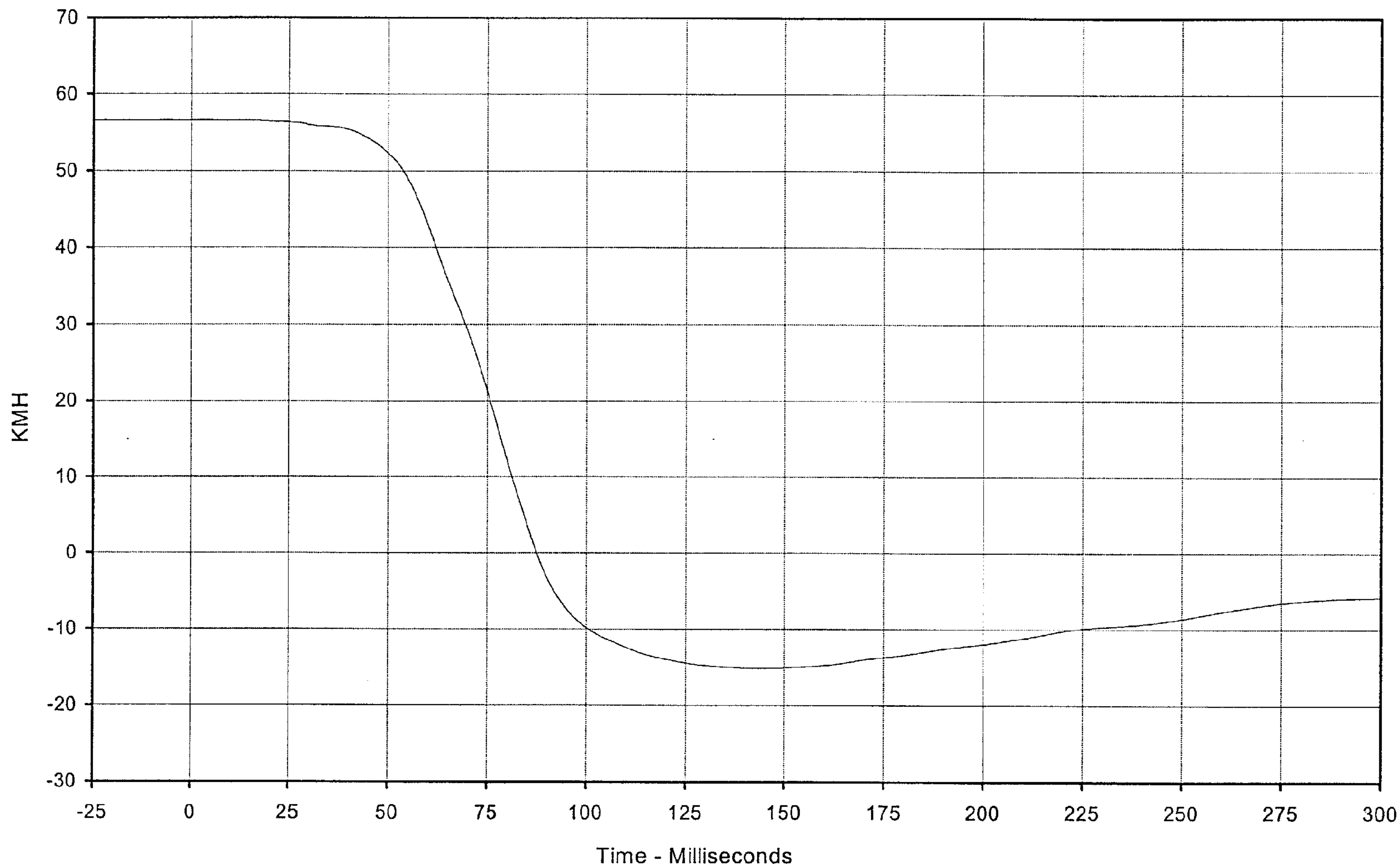
KARC Engineering



Curve Description:	Driver Chest Primary X				
Maximum Value:	3.1	at	167.9	Milliseconds	
Minimum Value:	-54.1	at	78.0	Milliseconds	
SAE Filter Class:	180				
Date of Test:	1/8/98				
Curve Number:	FIL-013				

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

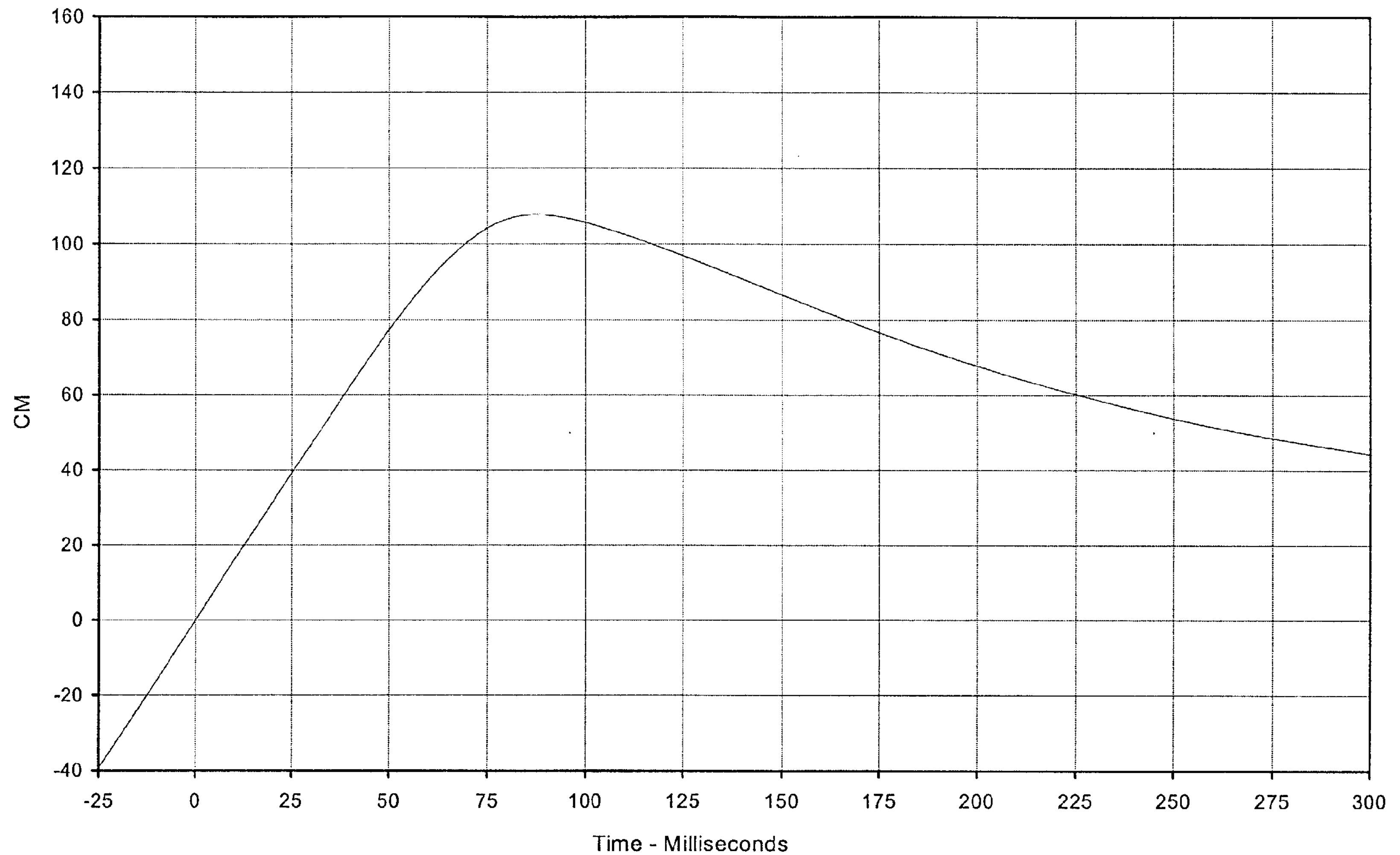
KARC Engineering



Curve Description:	Driver Chest Primary X Velocity			
Maximum Value:	56.6	at	2.3	Milliseconds
Minimum Value:	-15.1	at	144.1	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-013			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

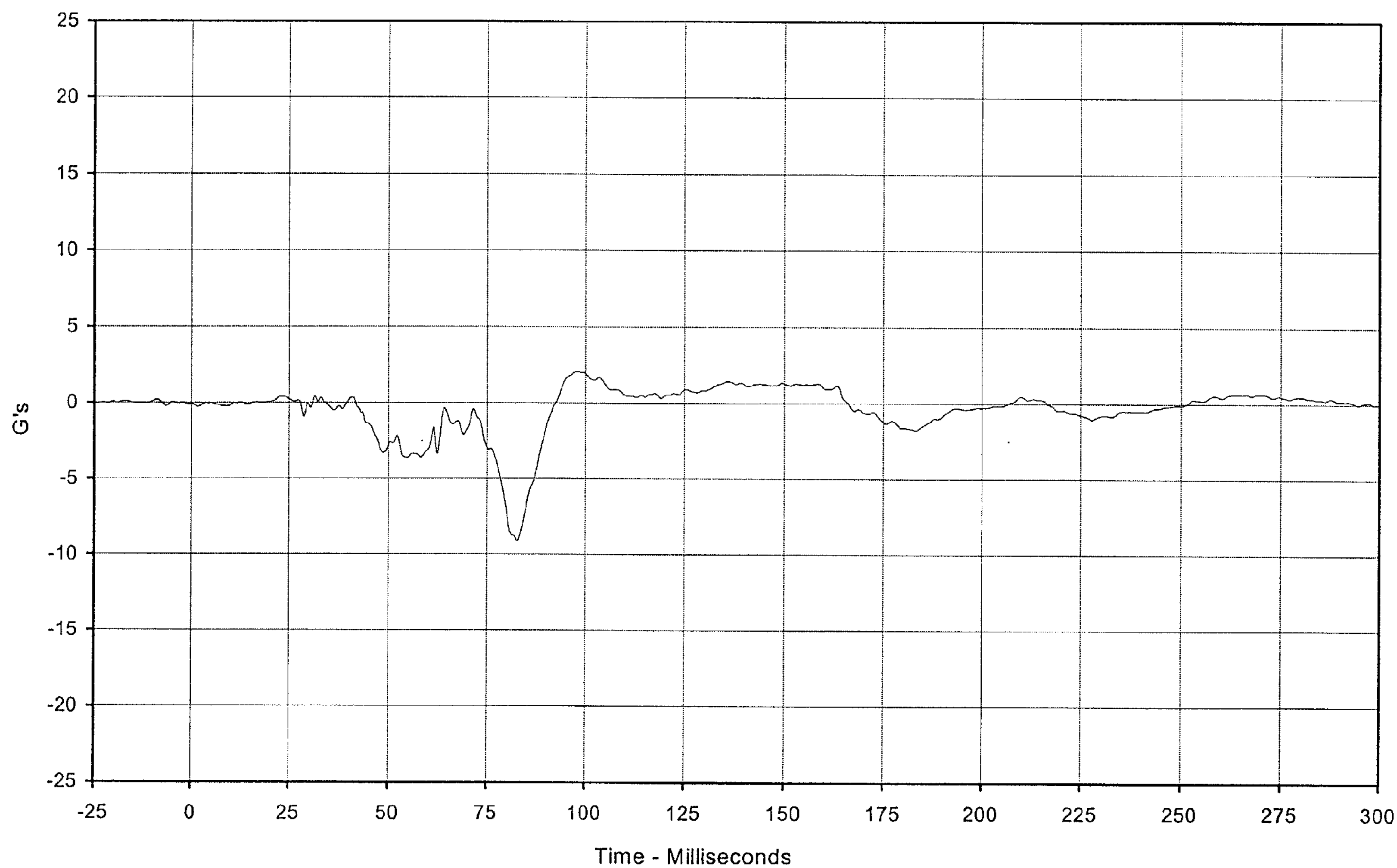


Curve Description:	Driver Chest Primary X Displ.			
Maximum Value:	107.8	at	87.4	Milliseconds
Minimum Value:	-0.1	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-013			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

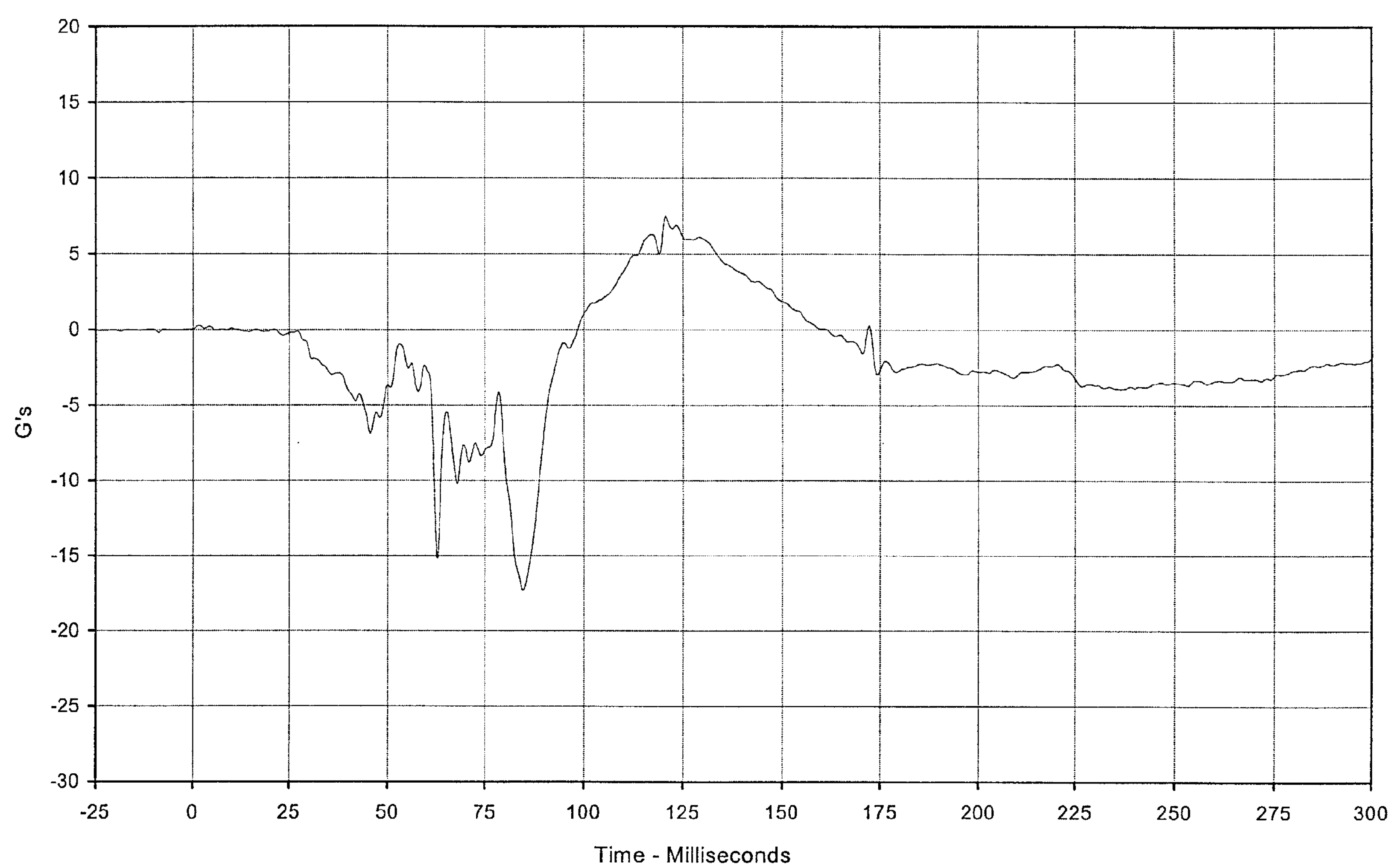


Curve Description:	Driver Chest Primary Y			
Maximum Value:	2.0	at	98.2	Milliseconds
Minimum Value:	-9.1	at	82.7	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-014			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering

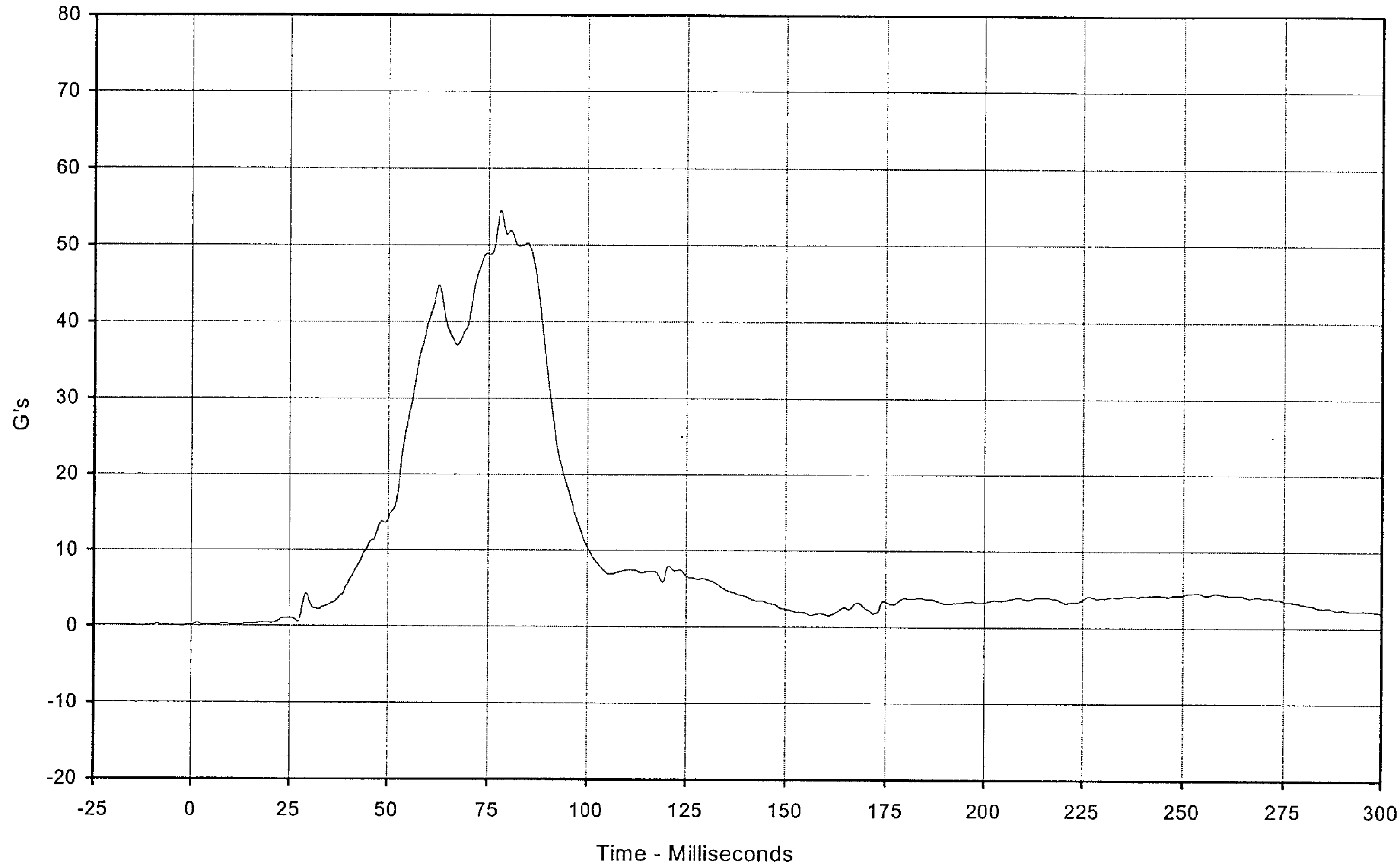


Curve Description:	Driver Chest Primary Z			
Maximum Value:	7.5	at	120.6	Milliseconds
Minimum Value:	-17.3	at	84.7	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-015			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

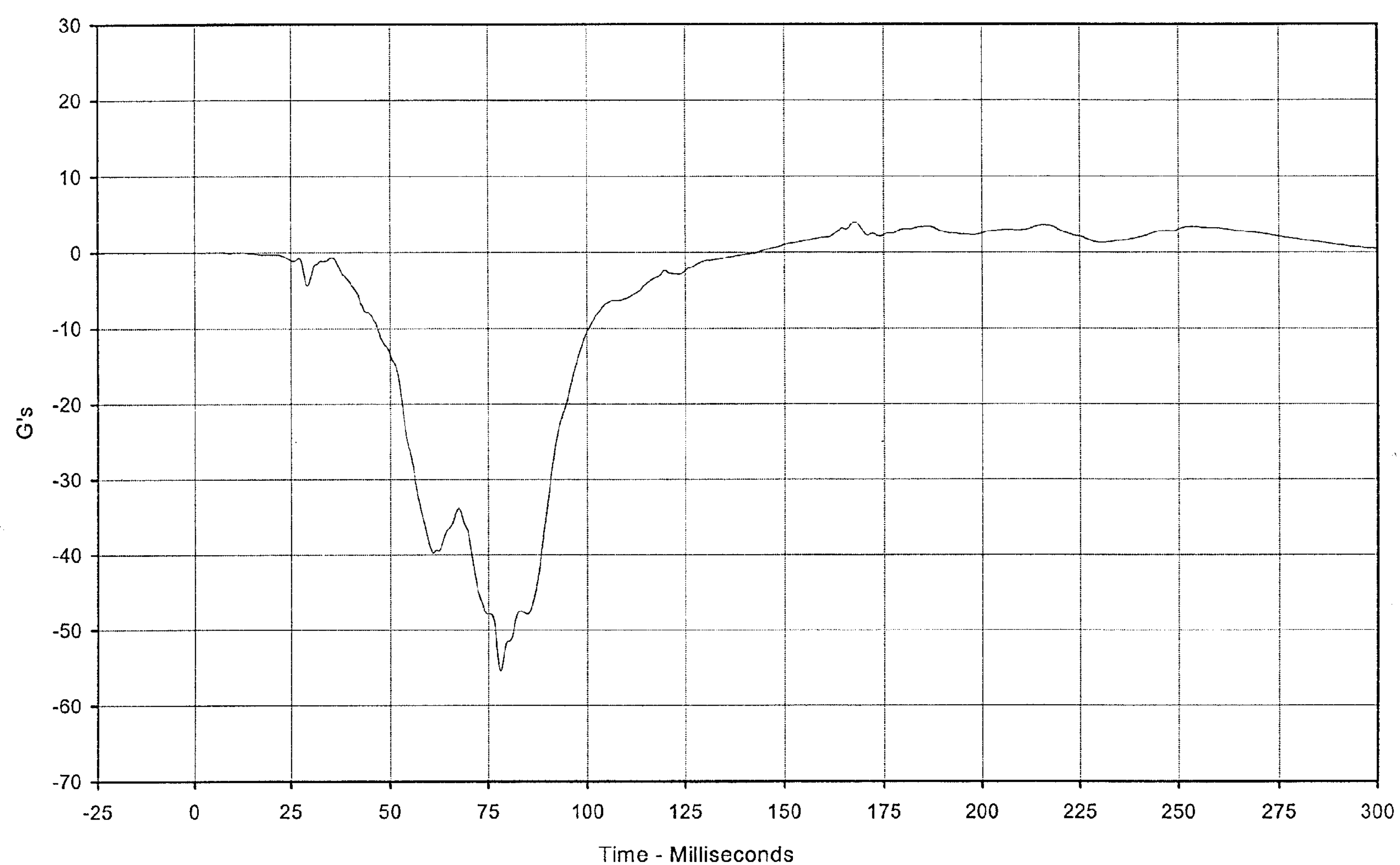


Curve Description:	Driver Chest Resultant Primary			
Maximum Value:	54.4	at	78.0	Milliseconds
Minimum Value:	0.1	at	5.3	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	RES-013			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

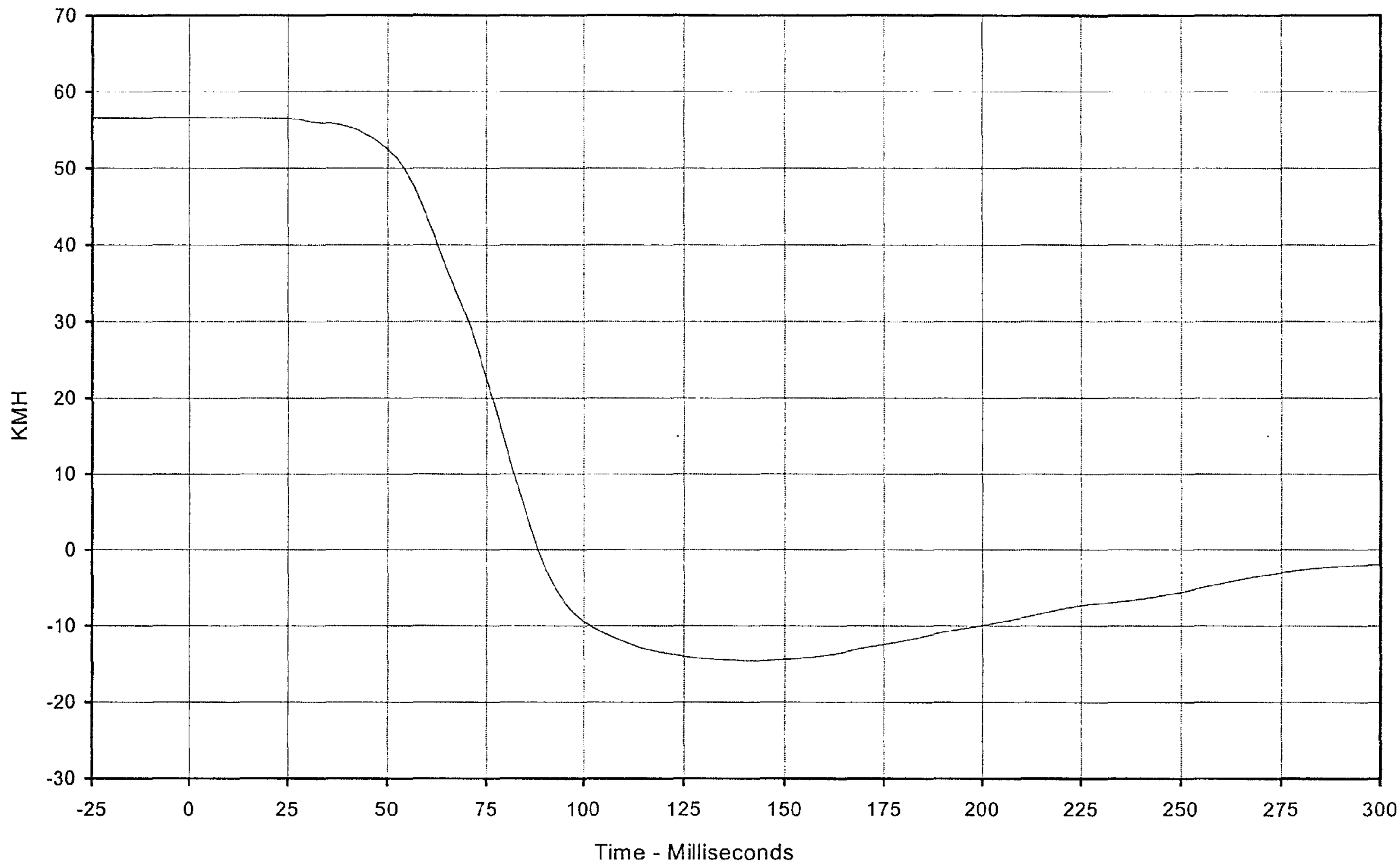


Curve Description:	Driver Chest Redundant X			
Maximum Value:	3.9	at	167.7	Milliseconds
Minimum Value:	-55.4	at	78.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-016			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

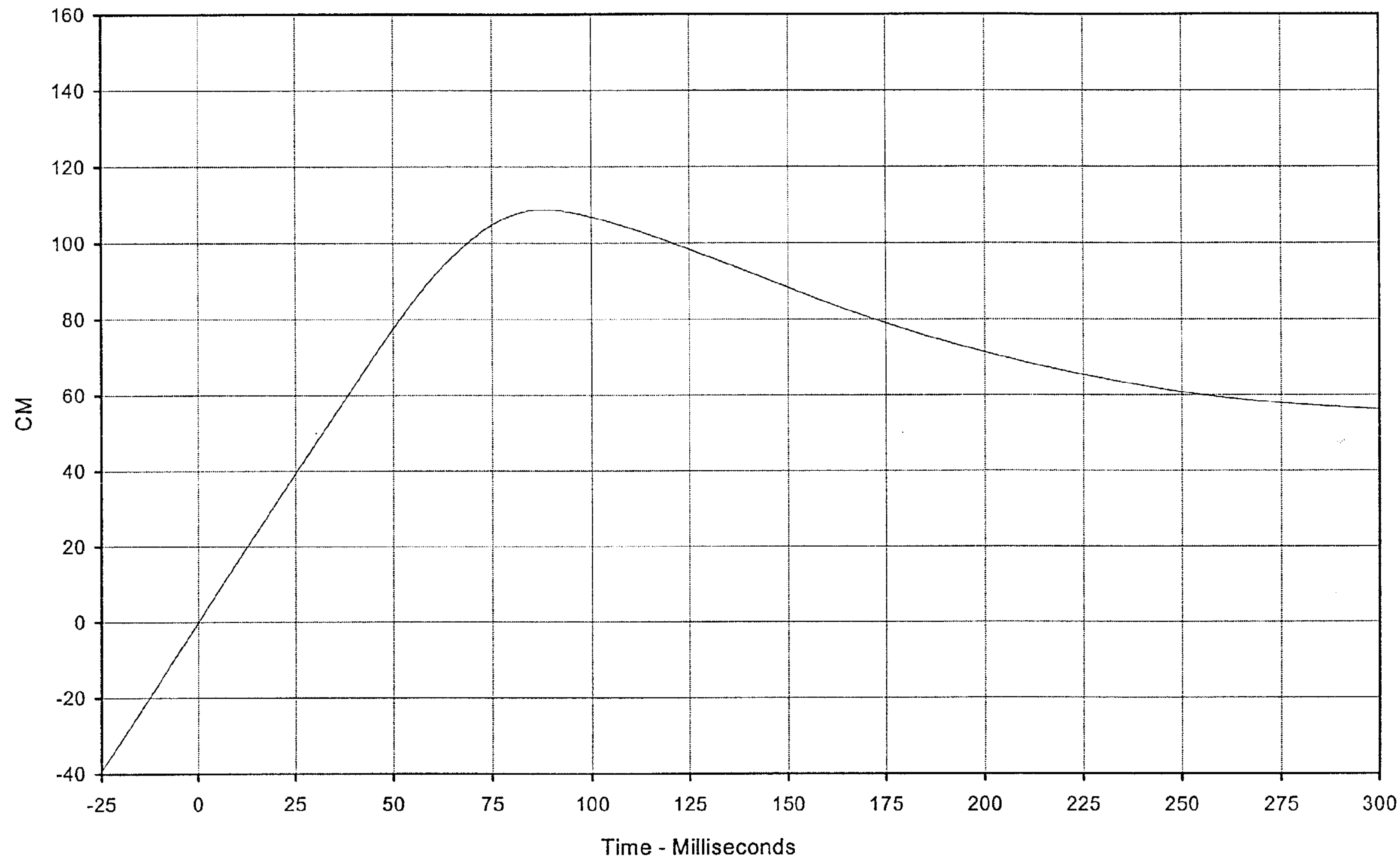


Curve Description:	Driver Chest Redundant X Velocity				
Maximum Value:	56.6	at	0.7	Milliseconds	
Minimum Value:	-14.6	at	143.4	Milliseconds	
SAE Filter Class:	180				
Date of Test:	1/8/98				
Curve Number:	IN1-016				

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

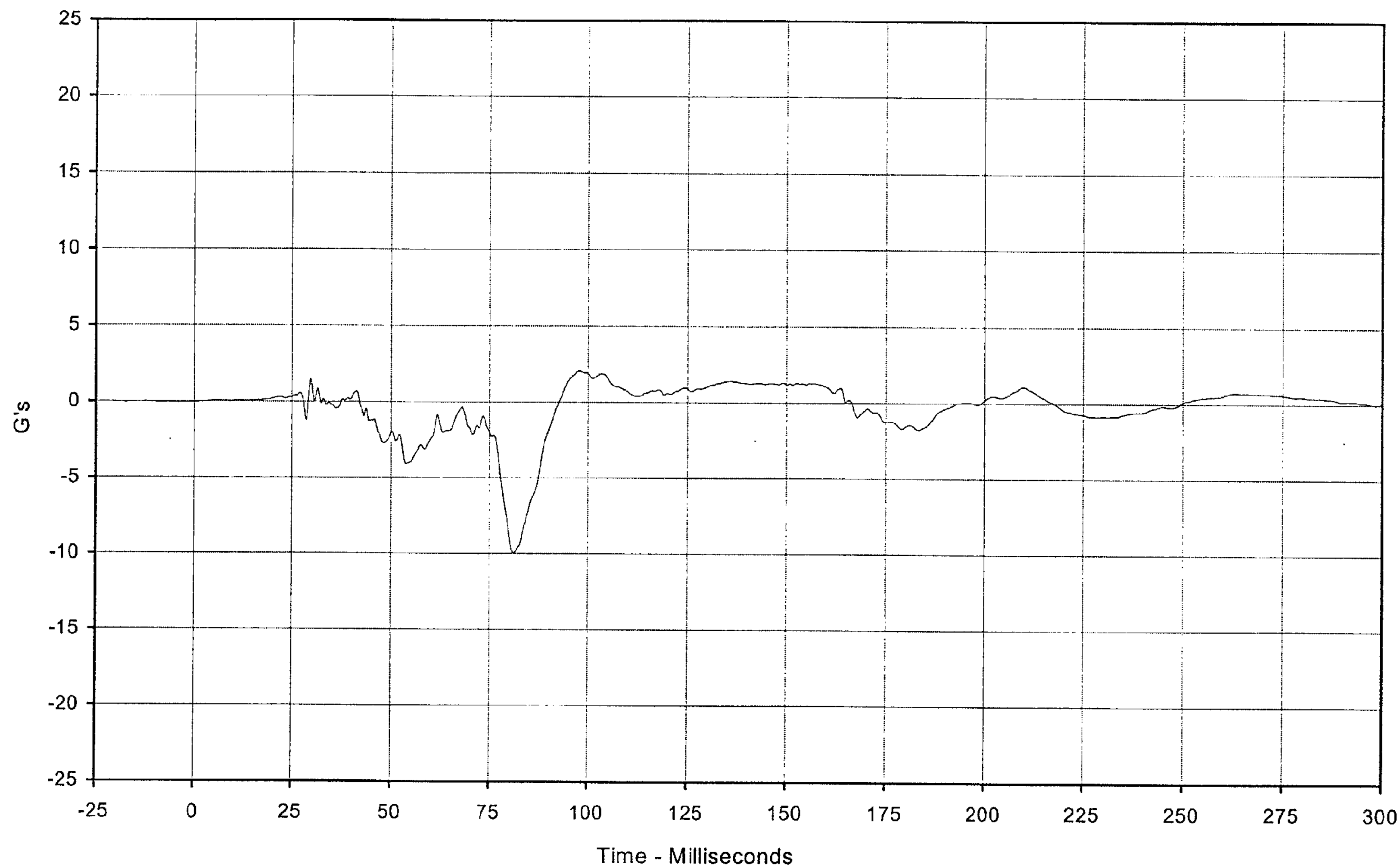


Curve Description:	Driver Chest Redundant X Displ.			
Maximum Value:	108.7	at	88.0	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-016			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

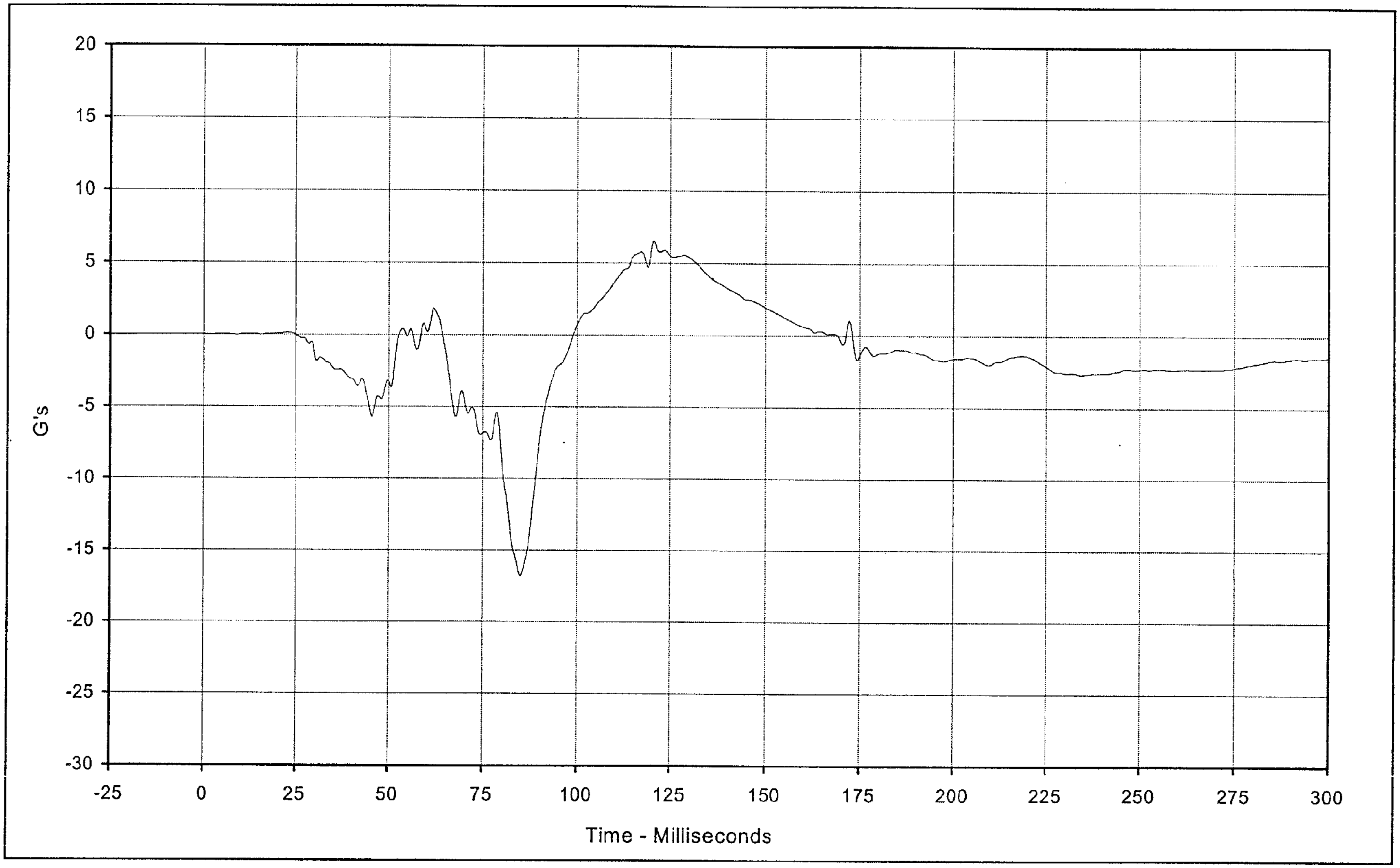
Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Driver Chest Redundant Y			
Maximum Value:	2.0	at	97.5	Milliseconds
Minimum Value:	-10.0	at	81.1	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-017			

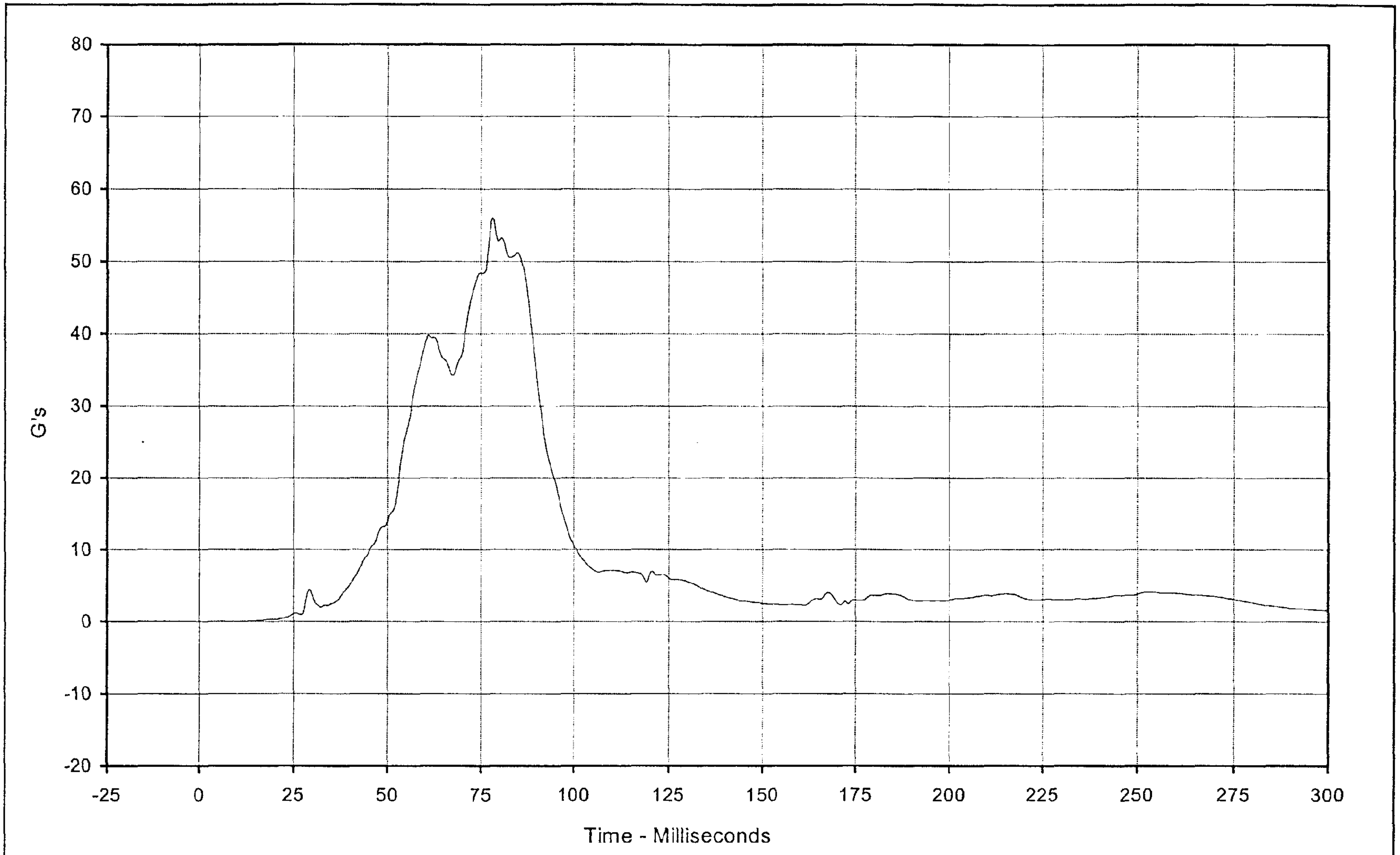
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Chest Redundant Z			
Maximum Value:	6.5	at	120.5	Milliseconds
Minimum Value:	-16.8	at	84.8	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-018			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

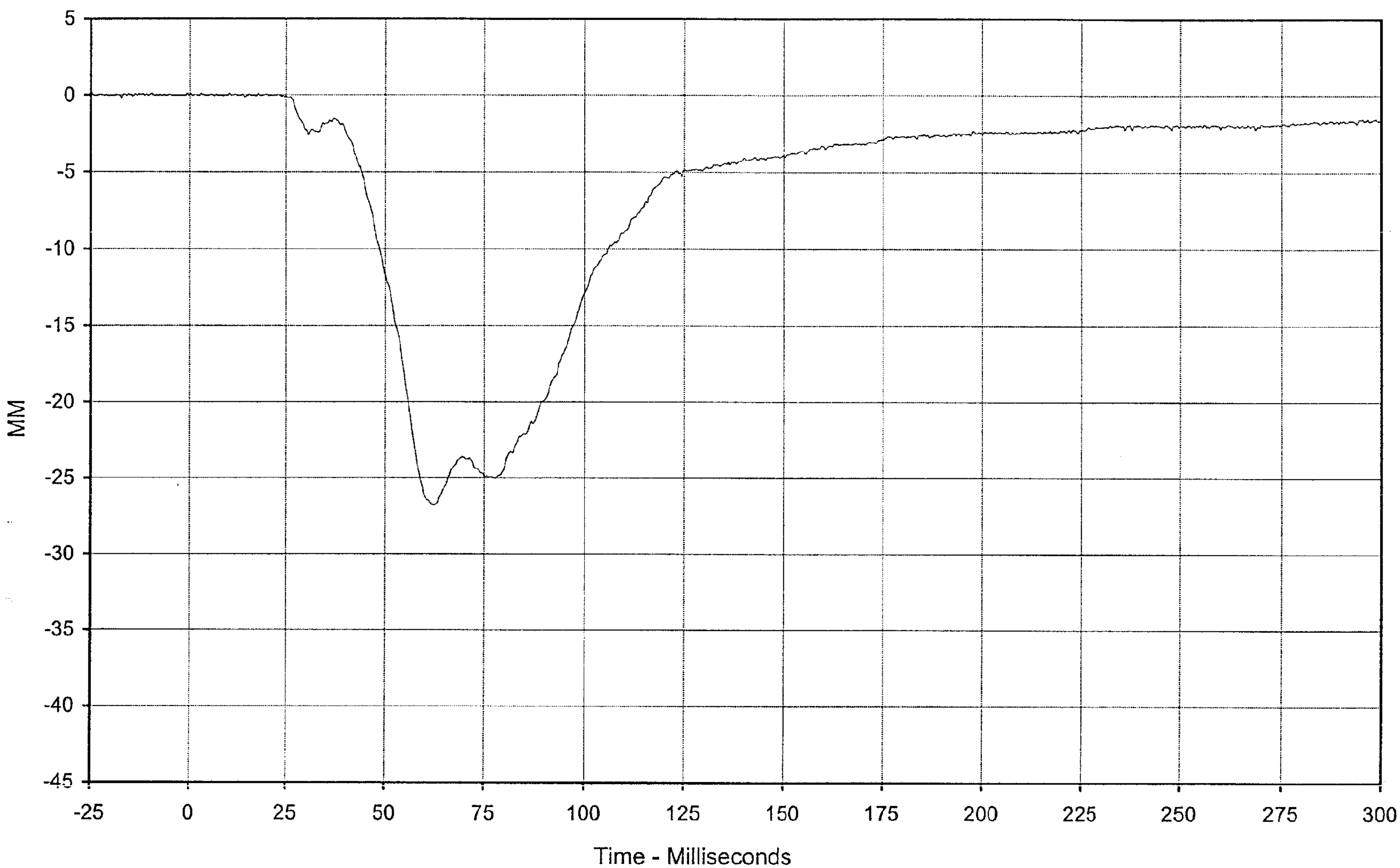


Curve Description:	Driver Chest Resultant Redundant			
Maximum Value:	56.0	at	78.0	Milliseconds
Minimum Value:	0.0	at	2.6	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	RES-016			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

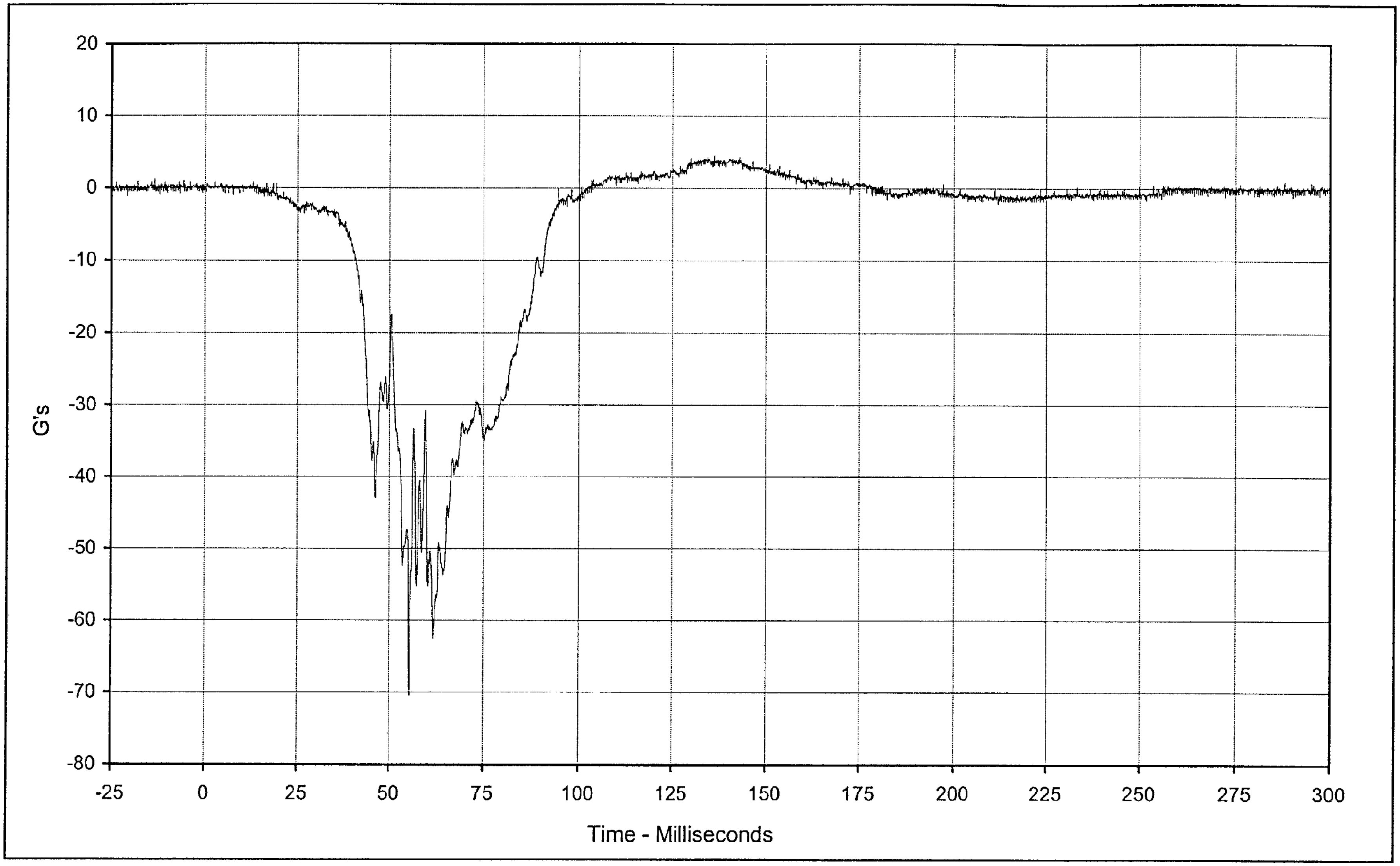
KARCO Engineering



Curve Description:	Driver Chest Displacement X			
Maximum Value:	0.1	at	2.8	Milliseconds
Minimum Value:	-26.8	at	62.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-019			

Testing Program 1983 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Pelvis X			
Maximum Value:	4.5	at	136.2	Milliseconds
Minimum Value:	-70.4	at	55.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-020			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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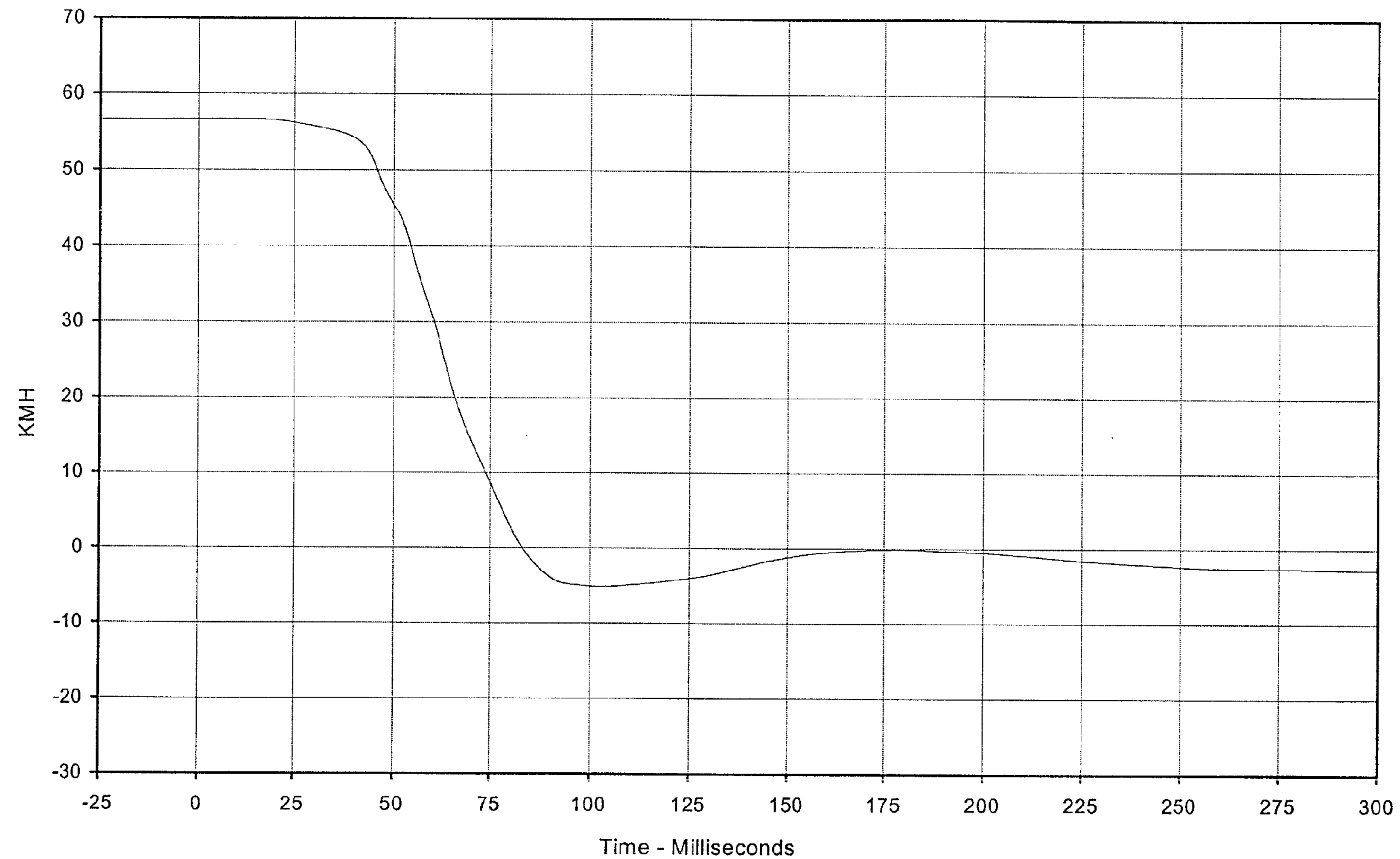

Curve Description:	Driver Pelvis X Velocity			
Maximum Value:	56.7	at	13.4	Milliseconds
Minimum Value:	-5.1	at	102.7	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-020			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

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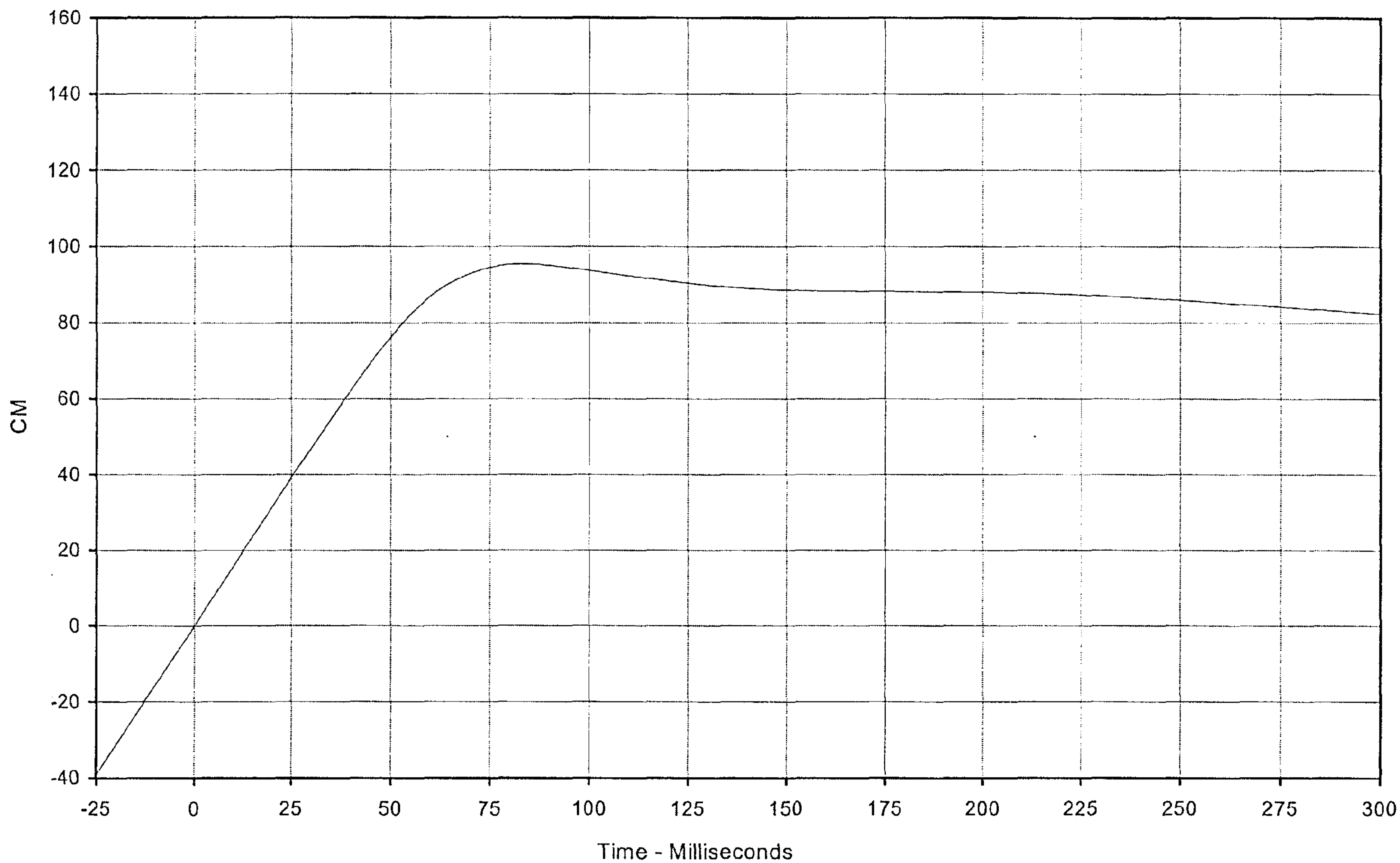
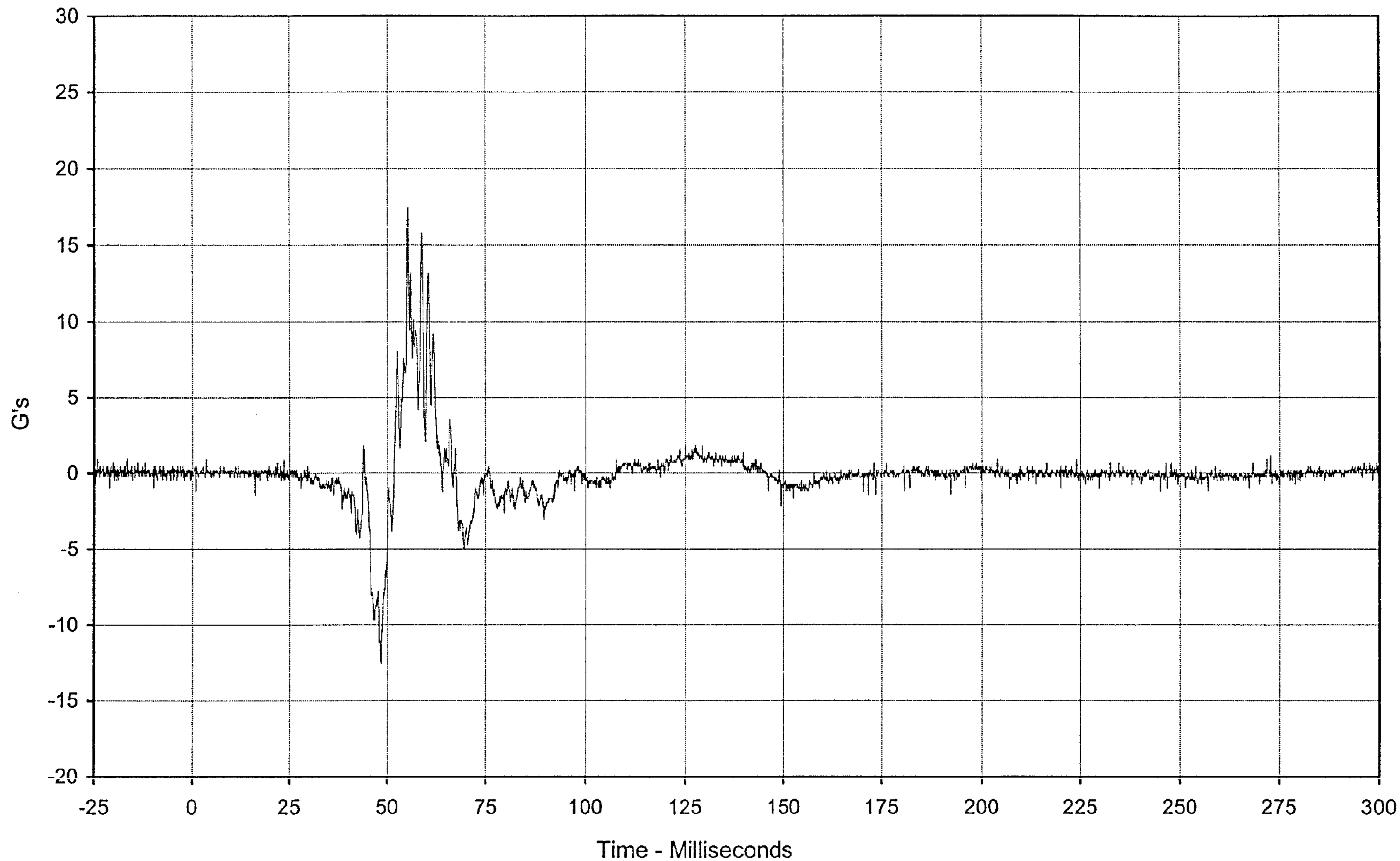


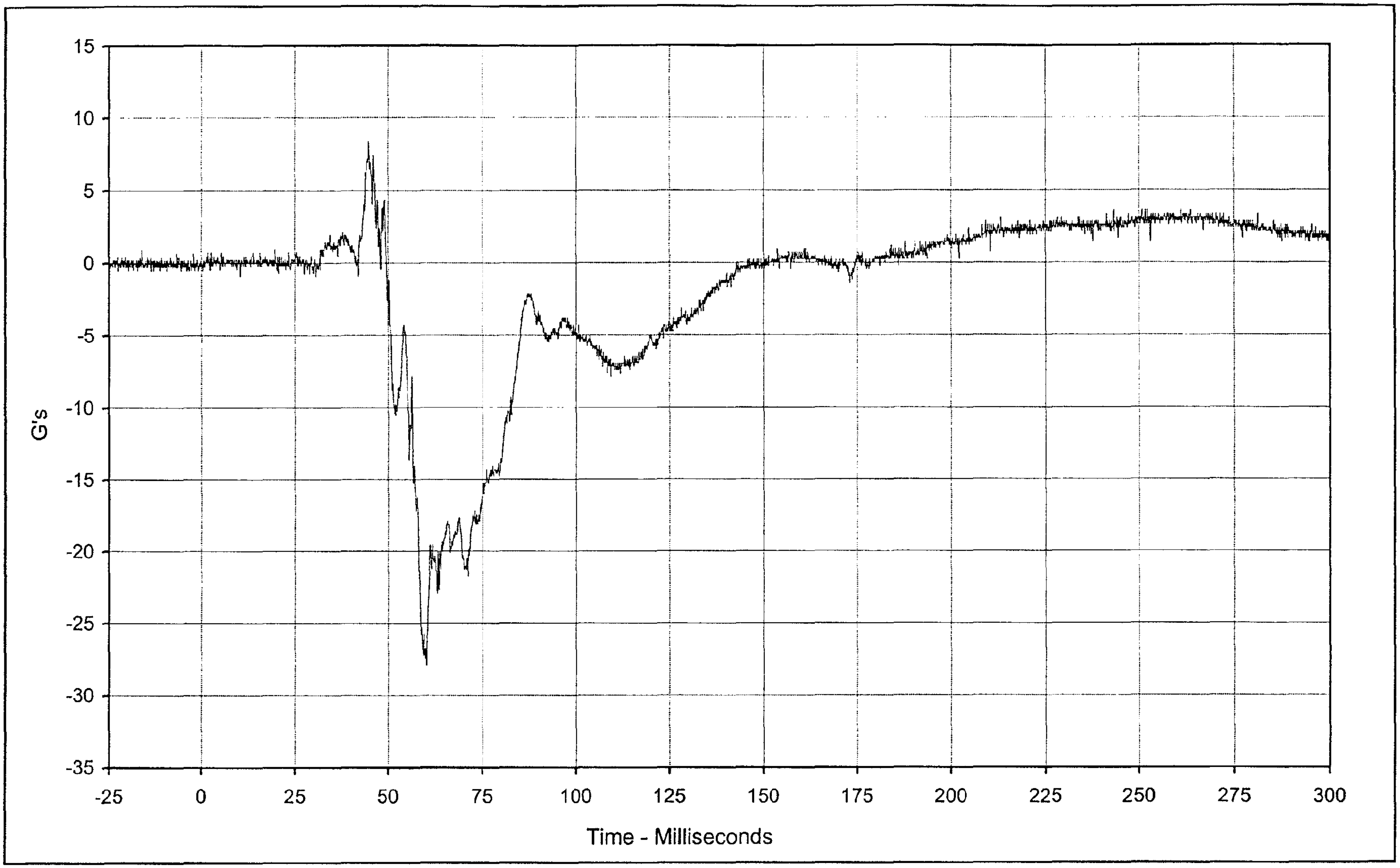
Curve Description:	Driver Pelvis X Displ.			
Maximum Value:	95.4	at	83.2	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-020			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Pelvis Y			
Maximum Value:	17.5	at	55.3	Milliseconds
Minimum Value:	-12.6	at	48.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-021			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Pelvis Z				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	8.4	at	44.8	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	-27.9	at	60.1	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	1/8/98					
Curve Number:	FIL-022					

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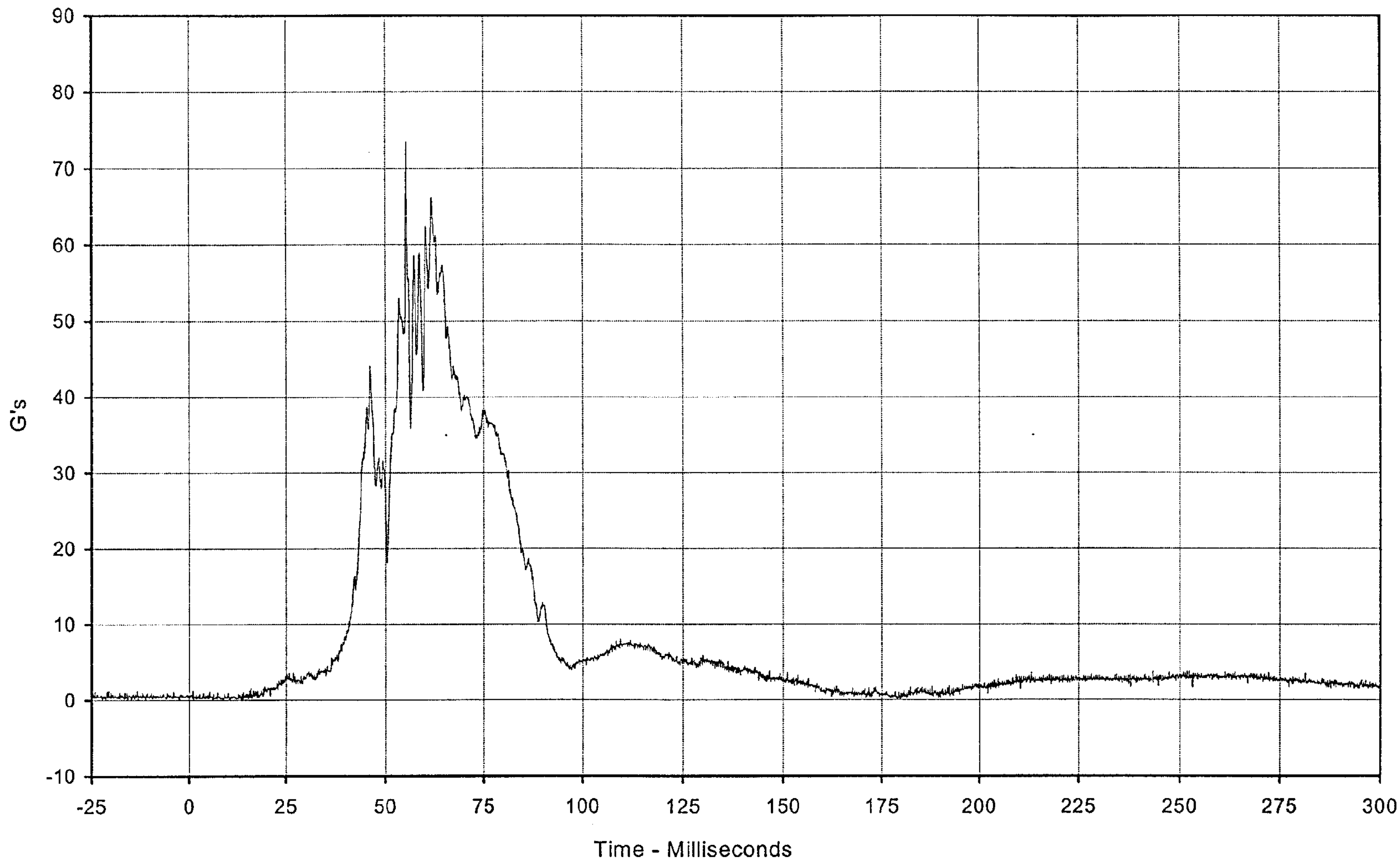

Curve Description:	Driver Pelvis Resultant			
Maximum Value:	73.4	at	55.4	Milliseconds
Minimum Value:	0.0	at	1.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-020			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

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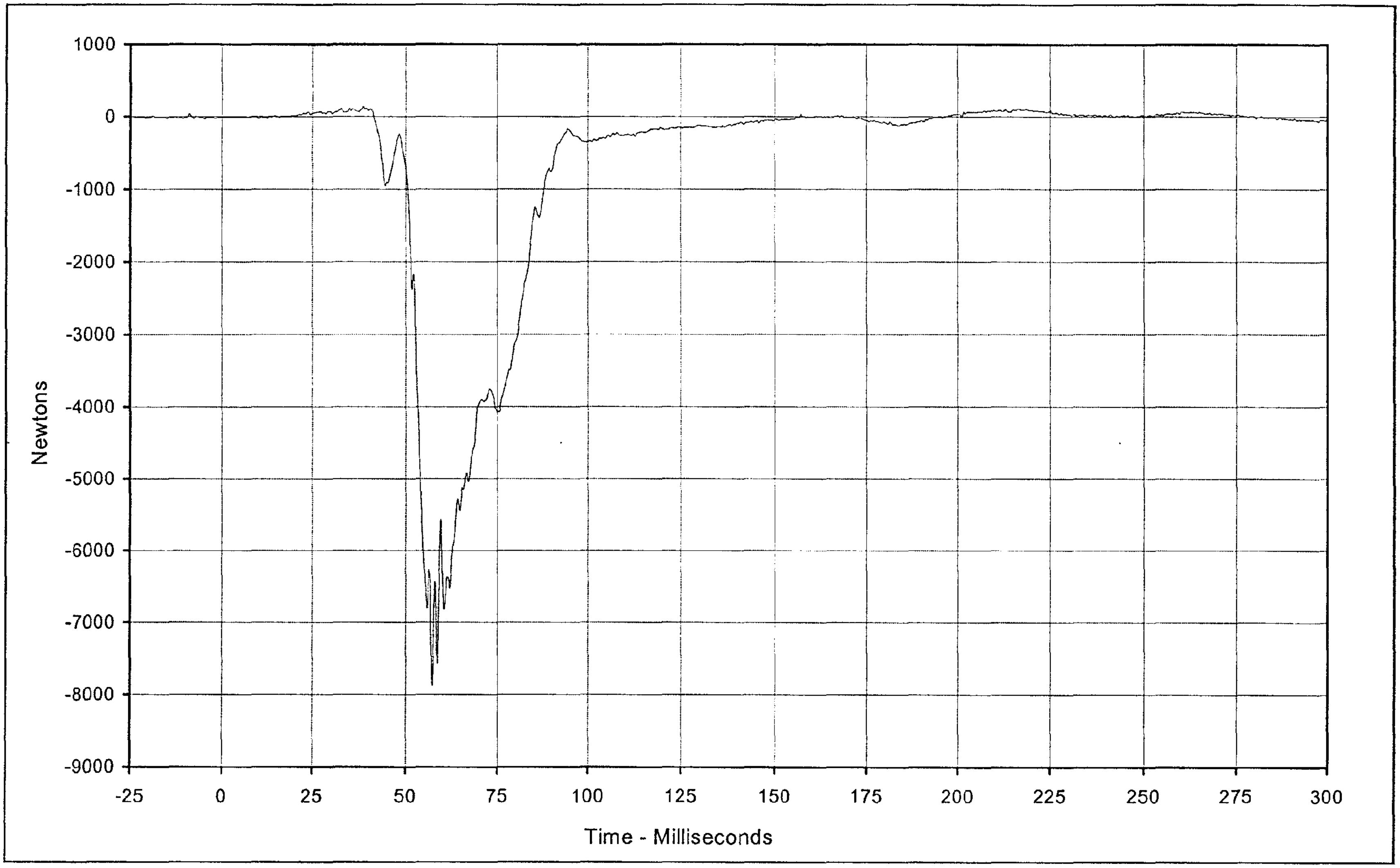

Curve Description:	Driver Left Femur Force			
Maximum Value:	140.4	at	38.6	Milliseconds
Minimum Value:	-7874.2	at	57.2	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-023			

Testing Program	1988 NHTSA 35 mph NCAP	No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV	

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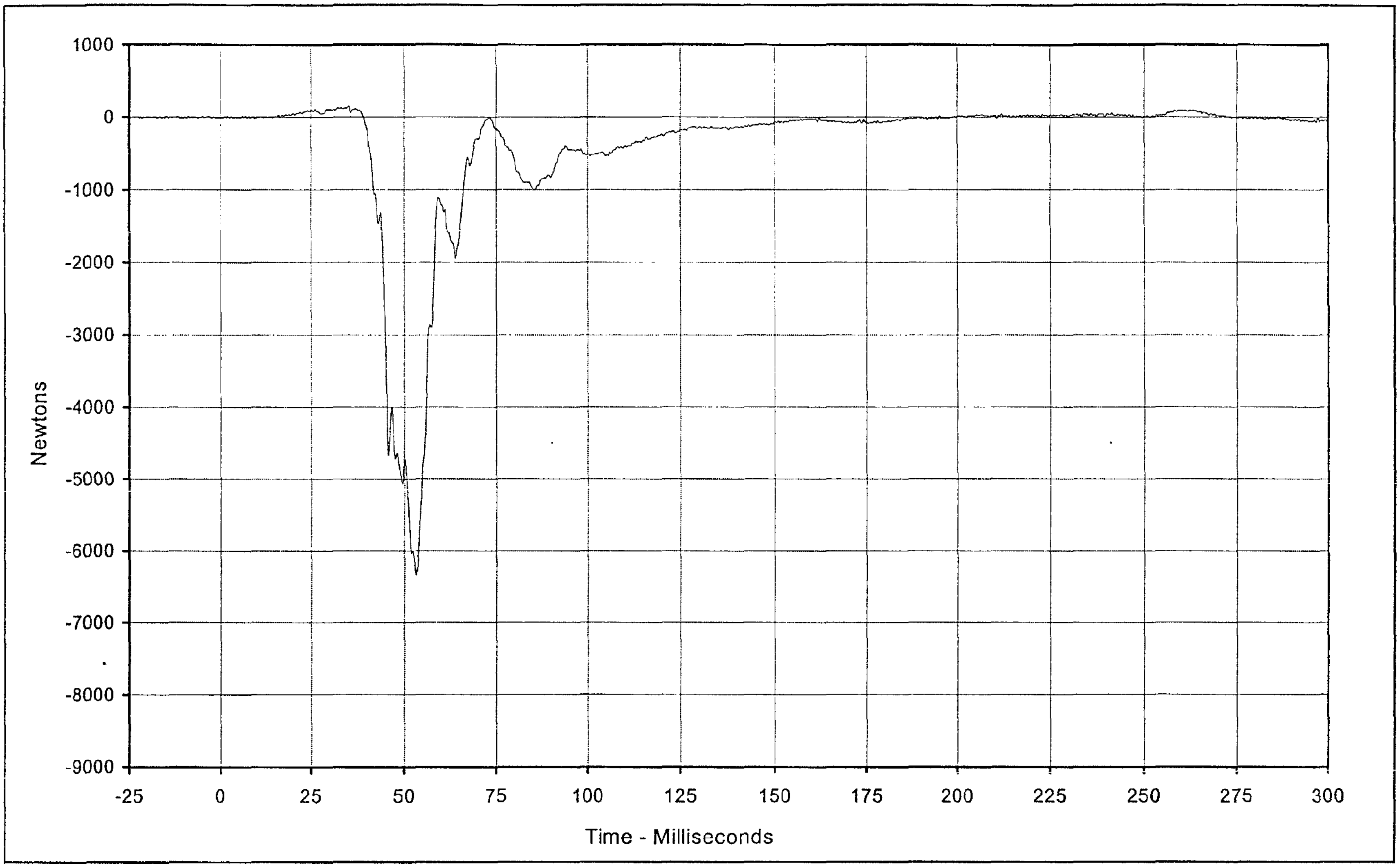
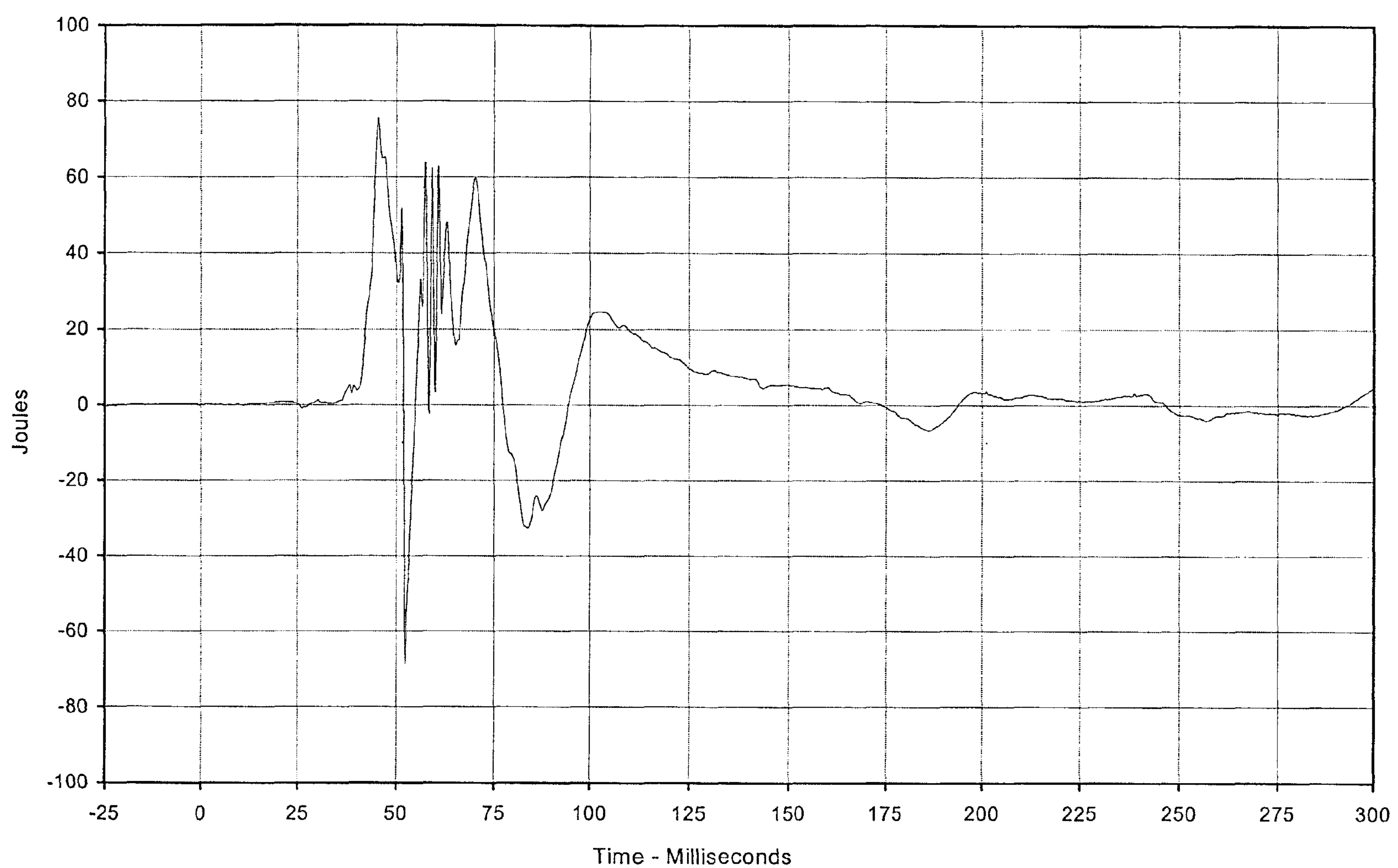


Curve Description:	Driver Right Femur Force			
Maximum Value:	147.6	at	35.2	Milliseconds
Minimum Value:	-6335.1	at	53.1	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-024			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Driver Left Upper Tibia Moment X			
Maximum Value:	75.5	at	45.4	Milliseconds
Minimum Value:	-68.5	at	52.3	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-025			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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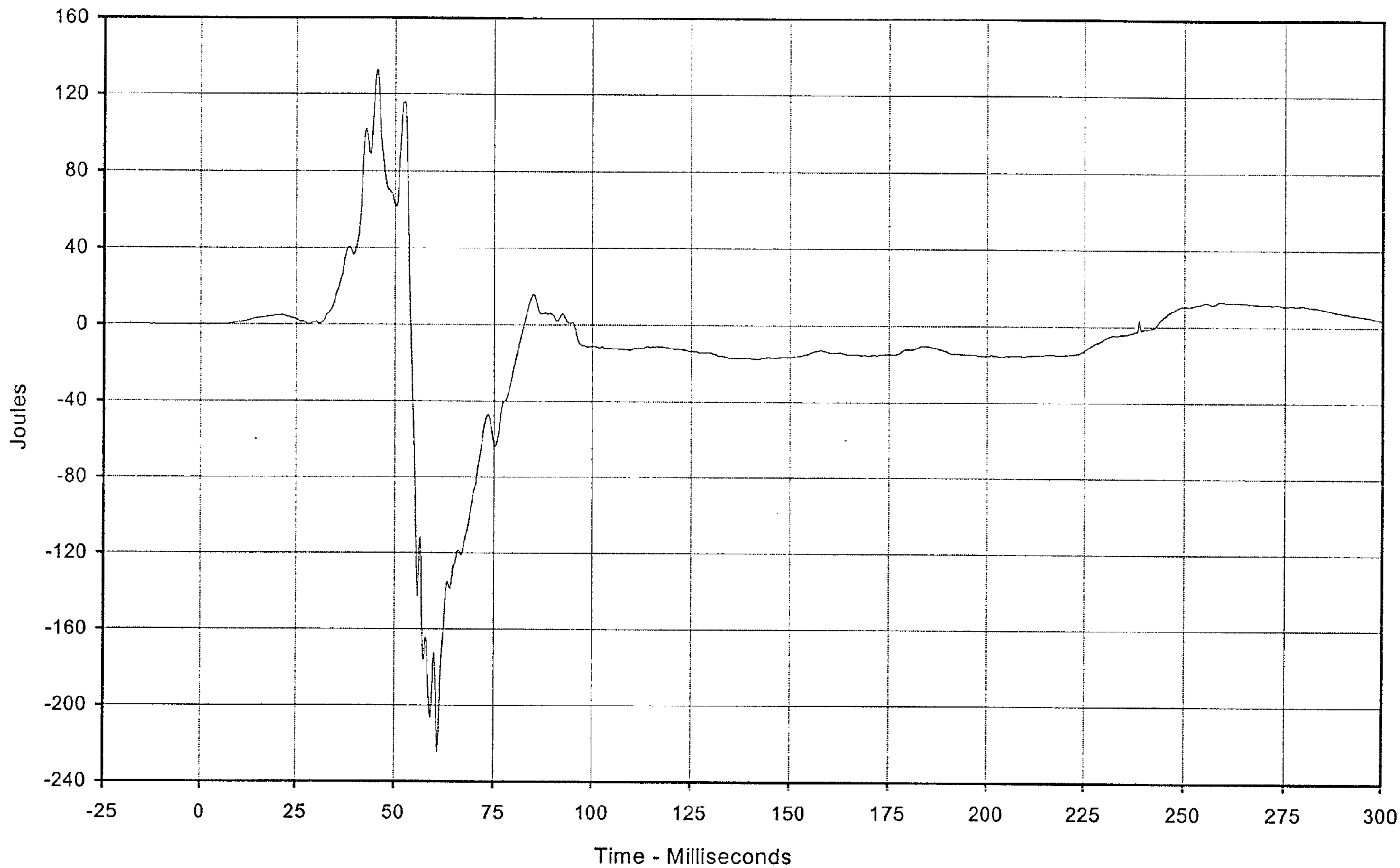
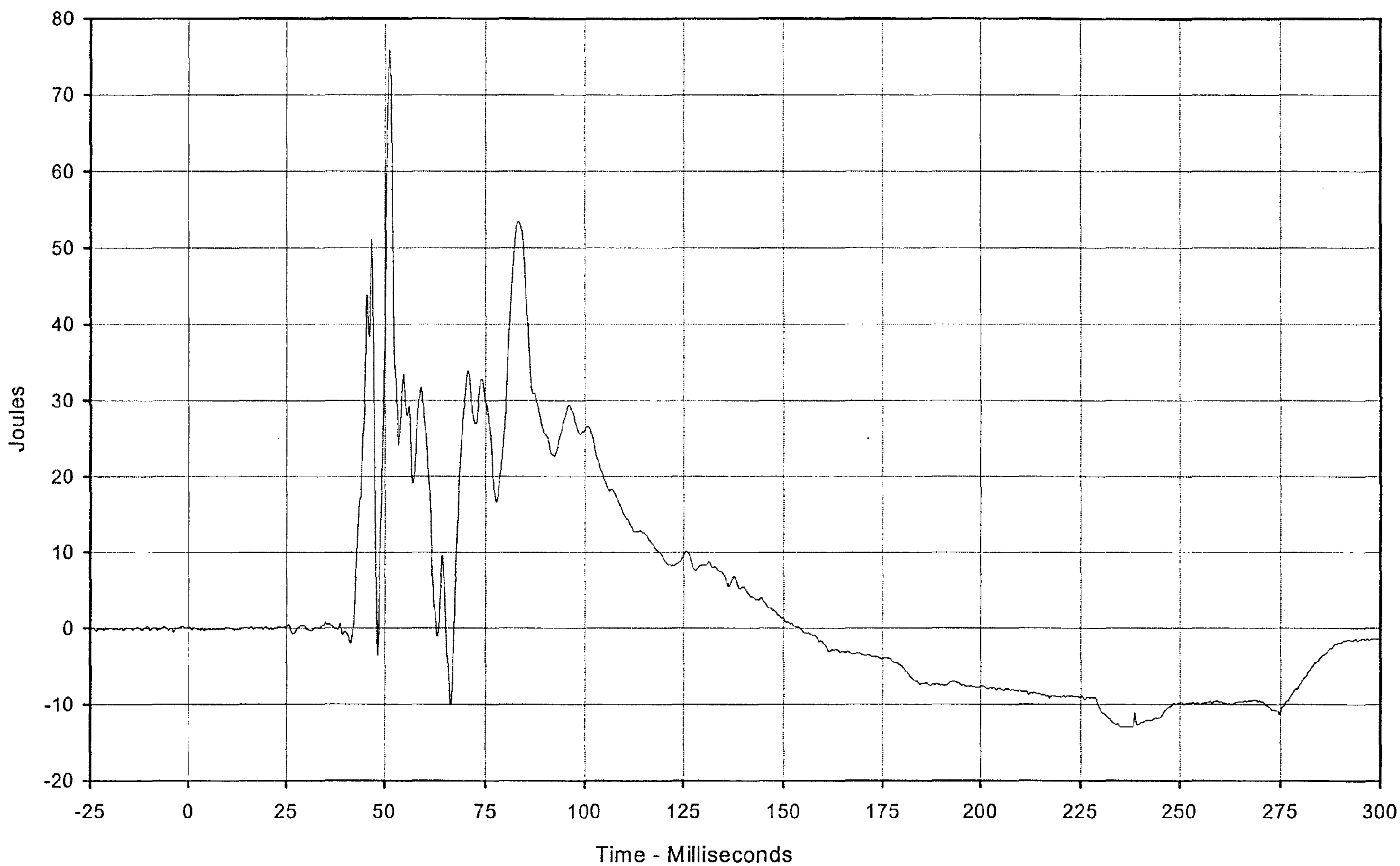


Curve Description:	Driver Left Upper Tibia Moment Y			
Maximum Value:	132.6	at	45.3	Milliseconds
Minimum Value:	-224.8	at	61.0	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-026			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

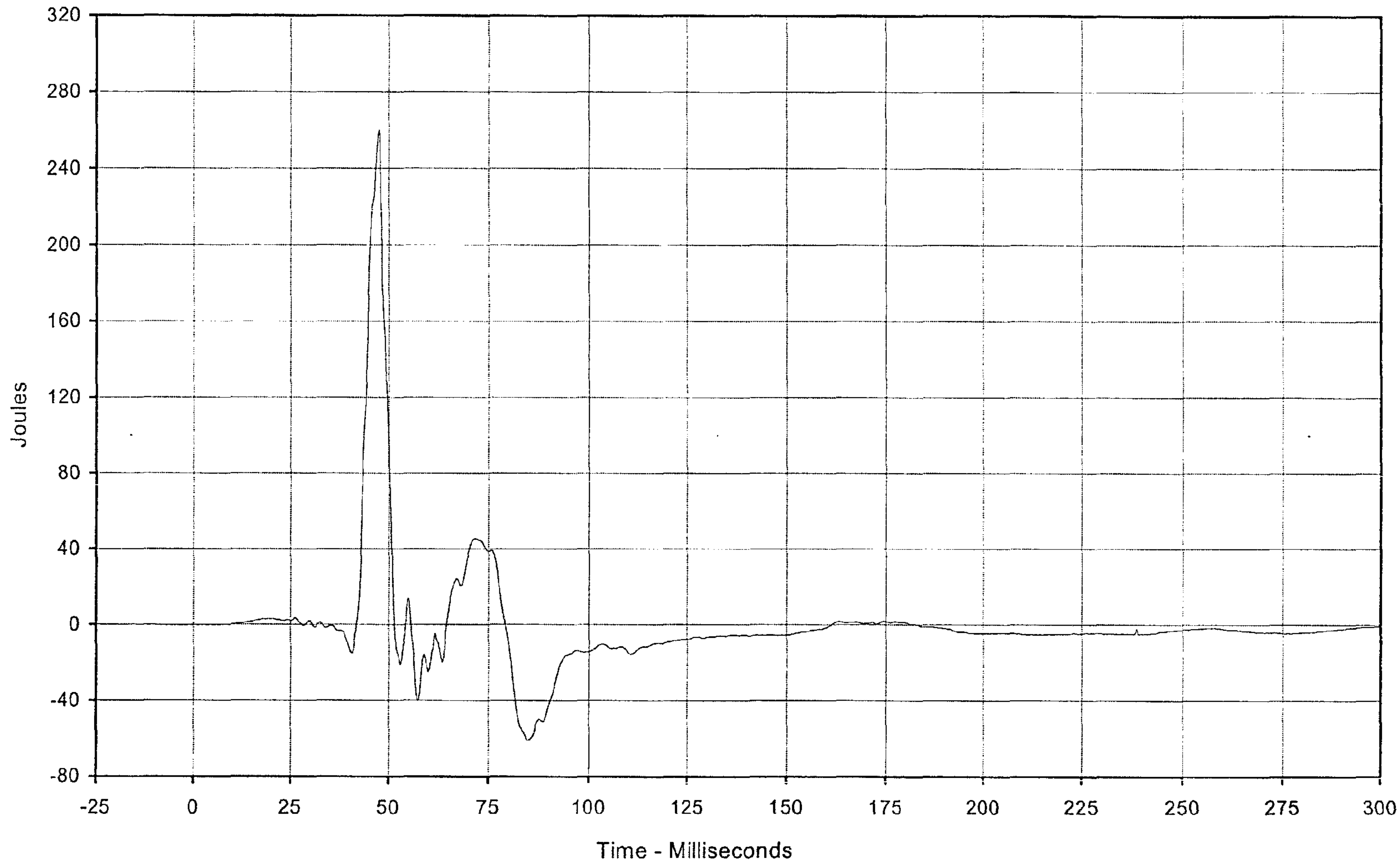
Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Driver Right Upper Tibia Moment X			
Maximum Value:	75.9	at	51.2	Milliseconds
Minimum Value:	-13.0	at	235.5	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-027			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Right Upper Tibia Moment Y			
Maximum Value:	260.3	at	47.5	Milliseconds
Minimum Value:	-61.1	at	84.5	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-028			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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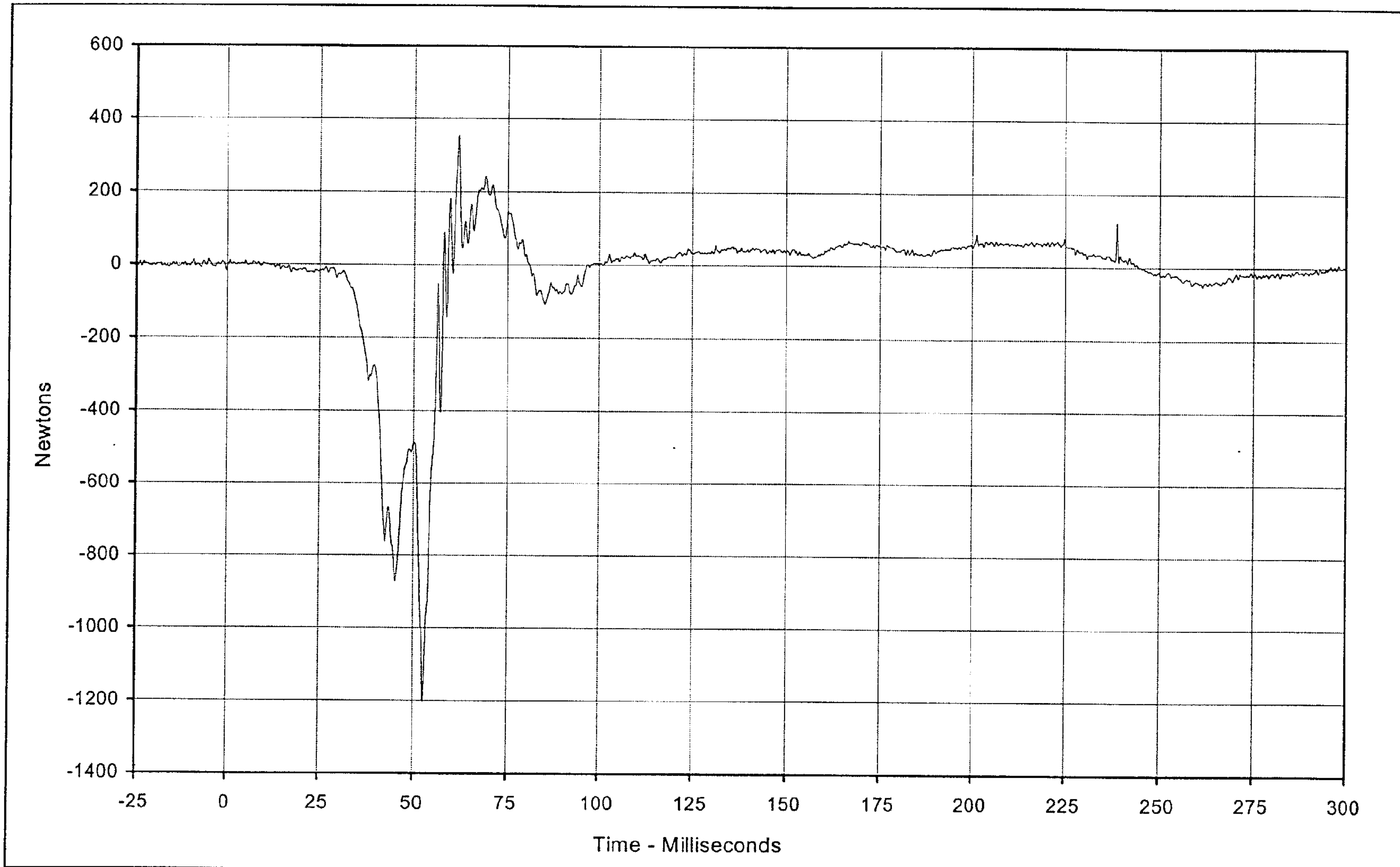

Curve Description:	Driver Left Lower Tibia Force X			
Maximum Value:	353.8	at	61.7	Milliseconds
Minimum Value:	-1201.2	at	52.6	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-029			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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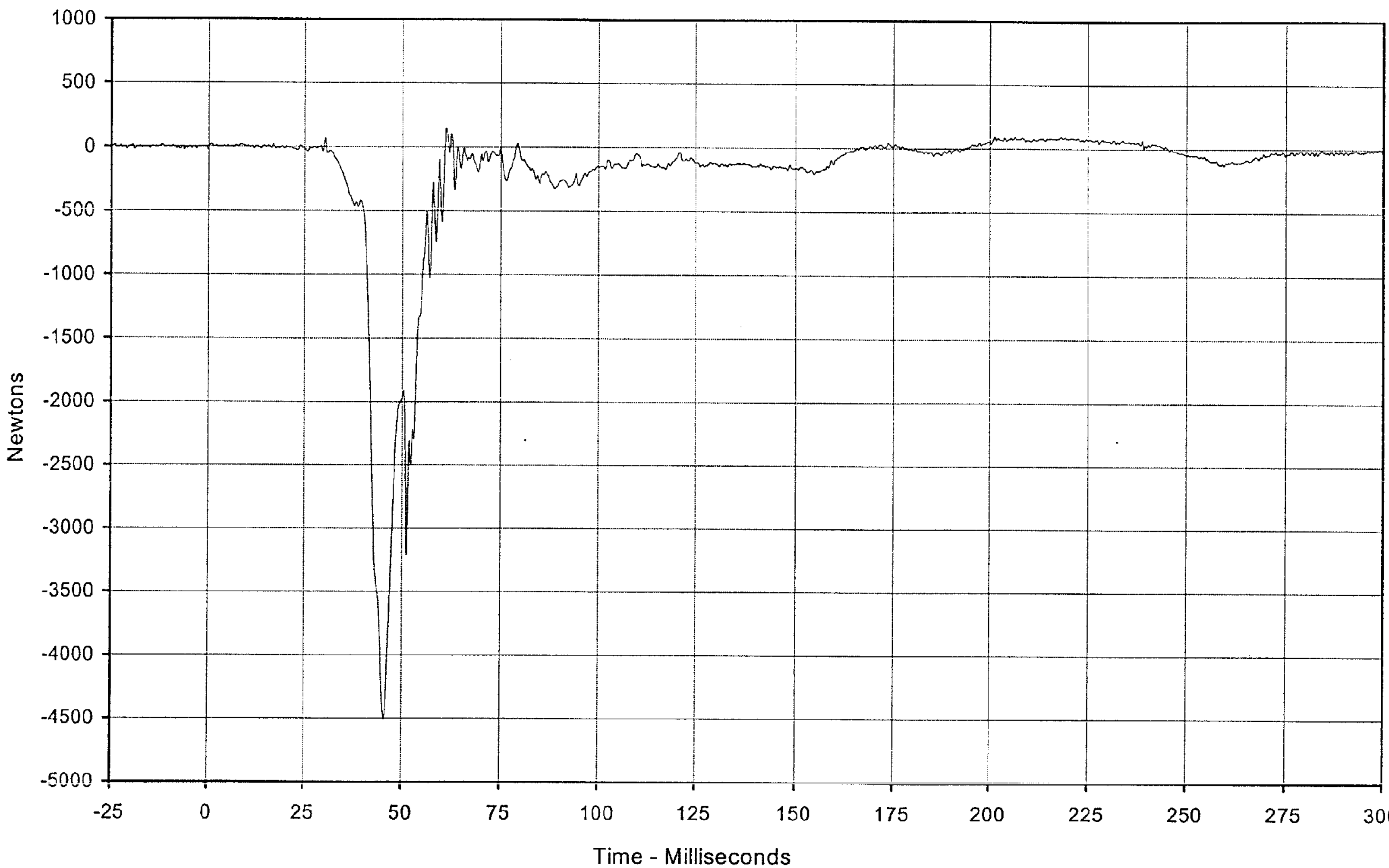
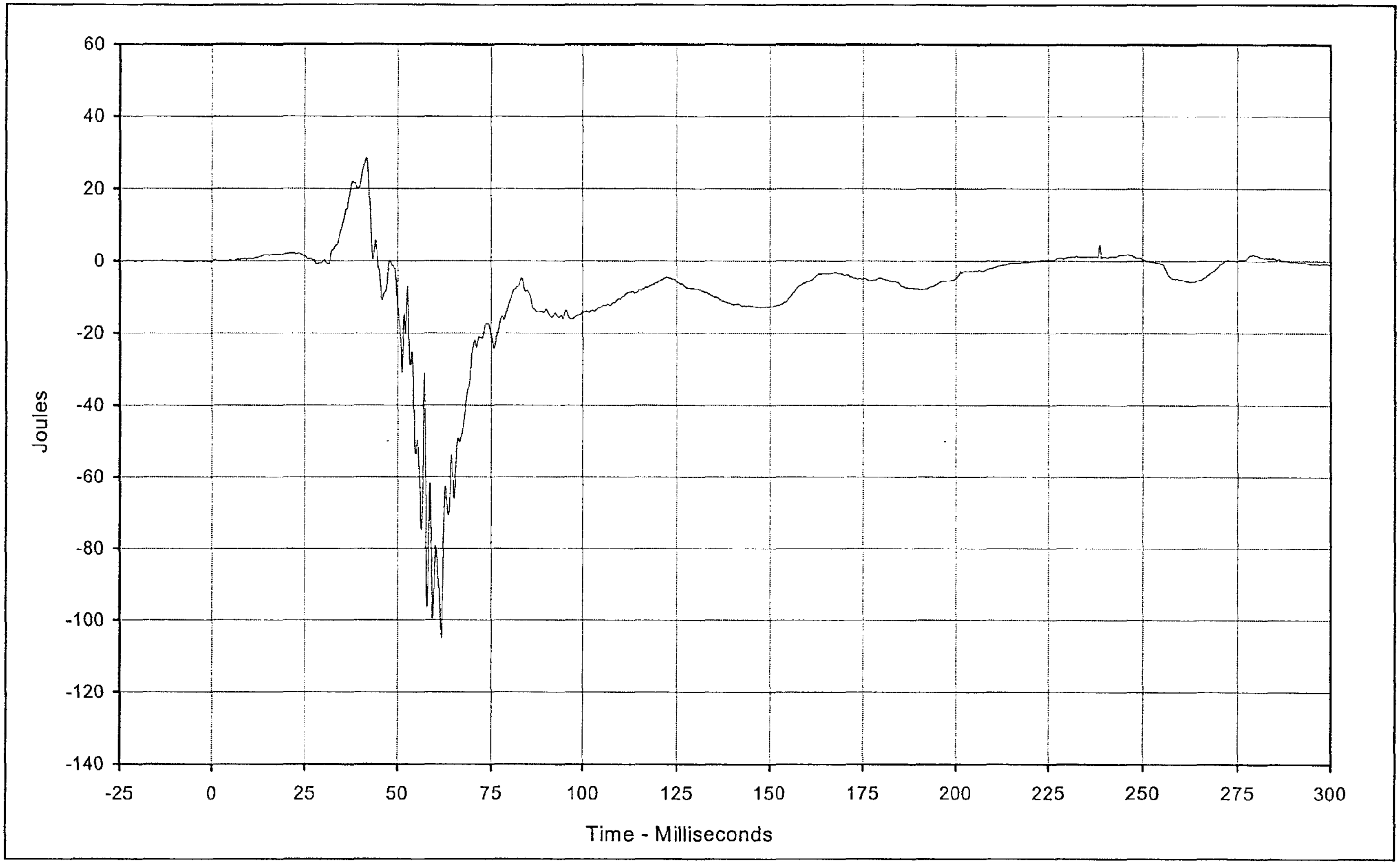


Curve Description:	Driver Left Lower Tibia Force Z			
Maximum Value:	148.2	at	61.2	Milliseconds
Minimum Value:	-4505.1	at	45.5	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-030			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Left Lower Tibia Moment Y			
Maximum Value:	28.5	at	41.6	Milliseconds
Minimum Value:	-105.1	at	61.6	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-031			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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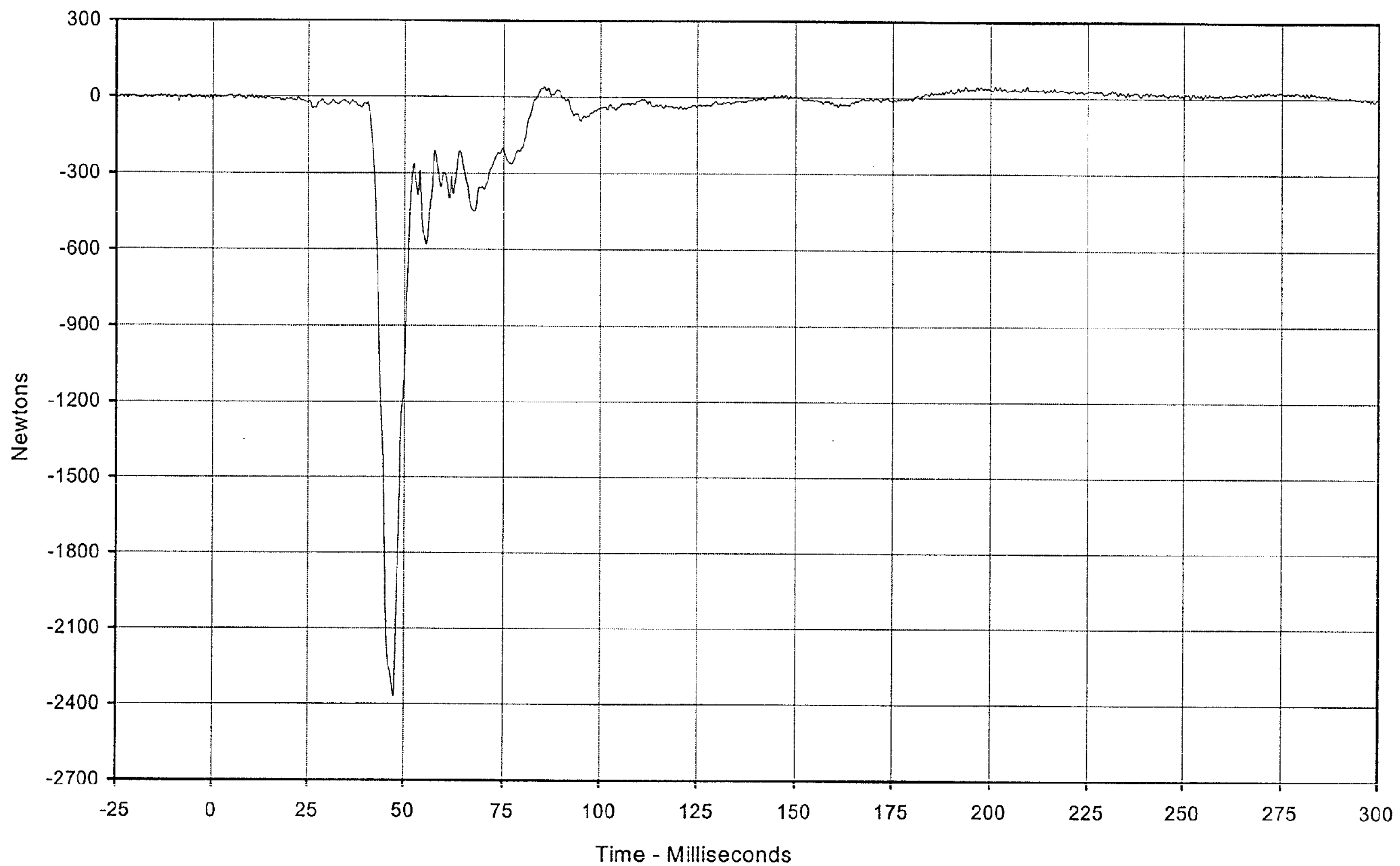

Curve Description:	Driver Right Lower Tibia Force X			
Maximum Value:	48.3	at	209.5	Milliseconds
Minimum Value:	-2368.8	at	47.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-032			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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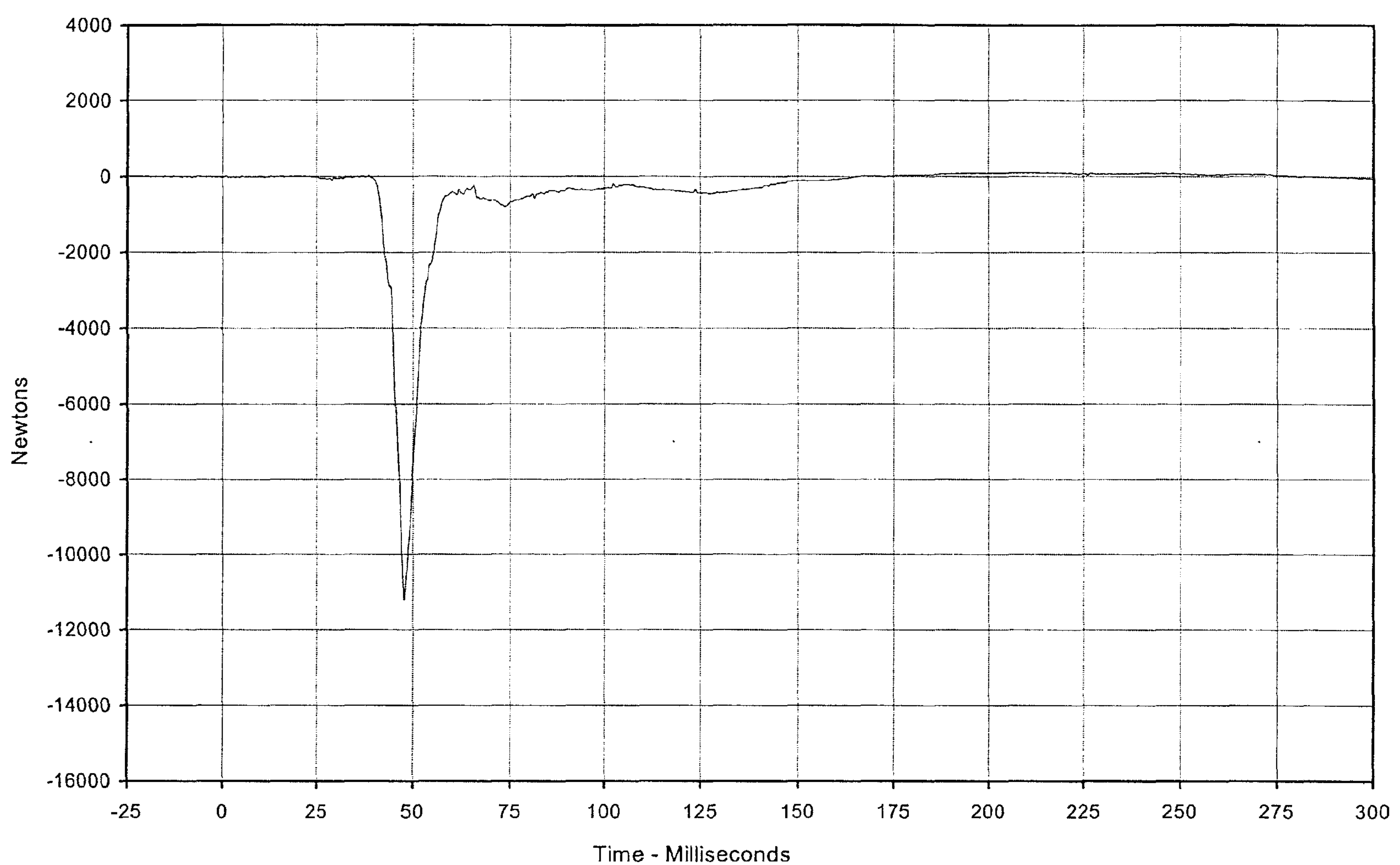
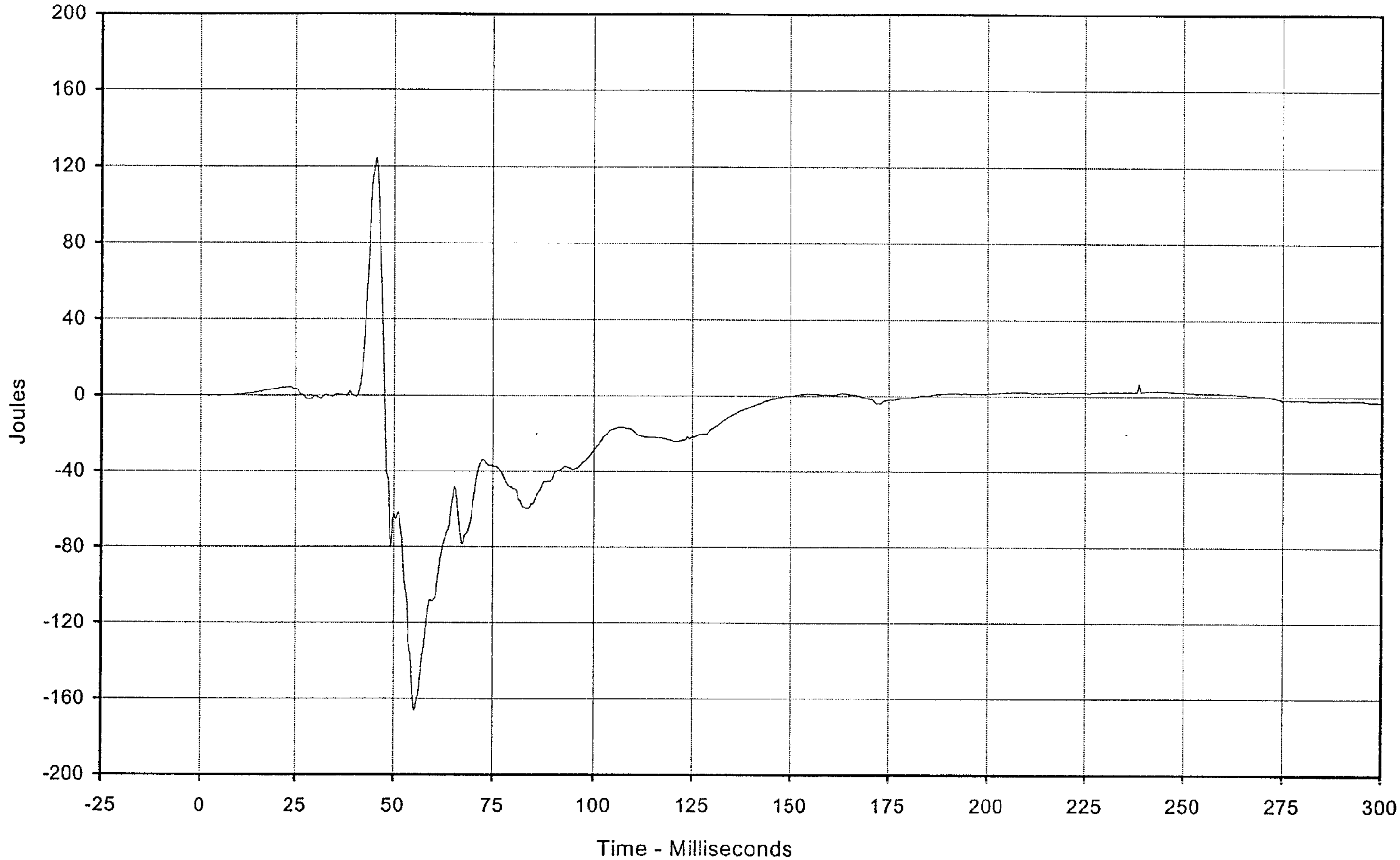


Curve Description:	Driver Right Lower Tibia Force Z			
Maximum Value:	107.9	at	212.1	Milliseconds
Minimum Value:	-11209.1	at	47.8	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-033			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

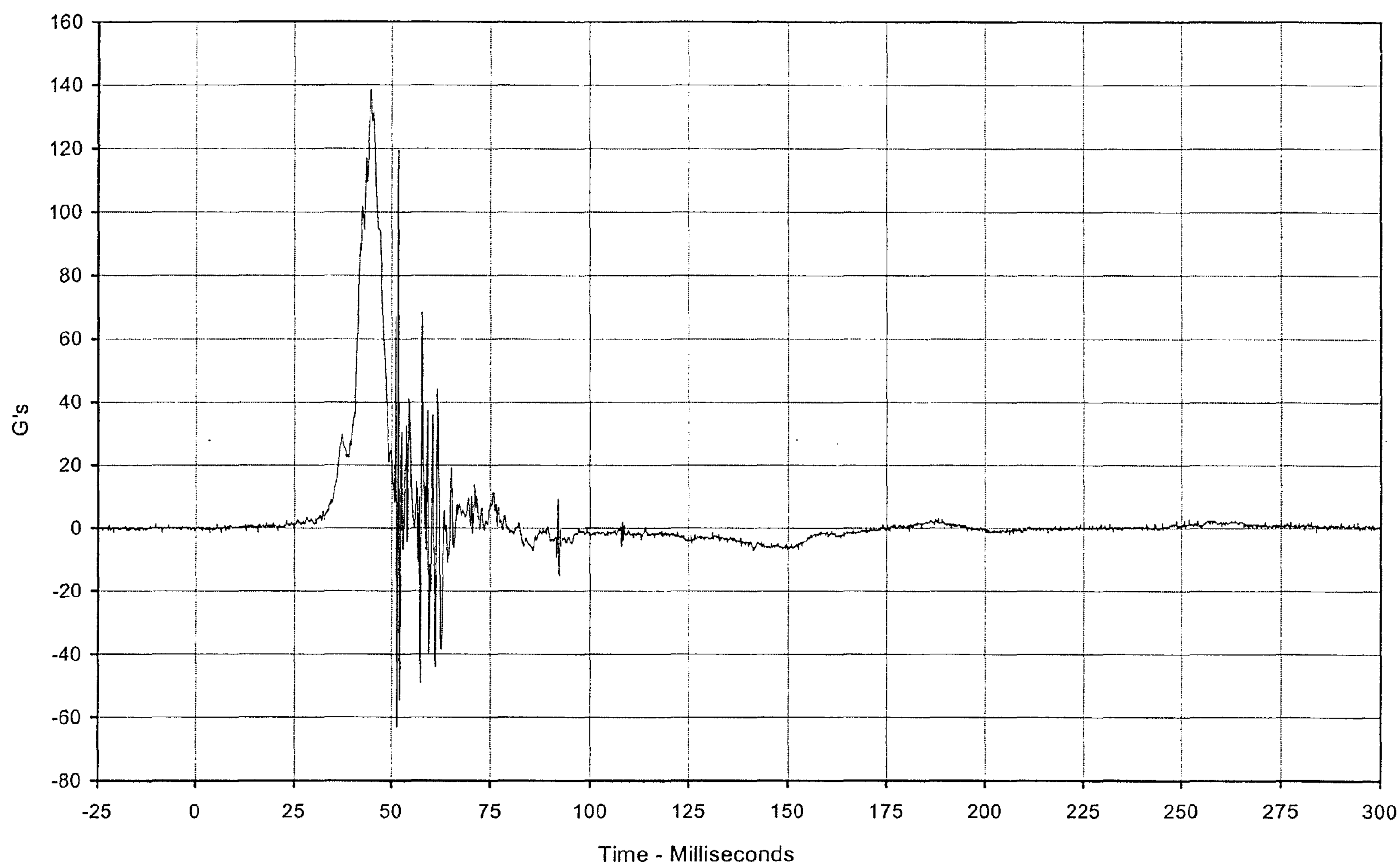


Curve Description:	Driver Right Lower Tibia Moment Y			
Maximum Value:	124.4	at	45.5	Milliseconds
Minimum Value:	-166.3	at	55.2	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-034			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

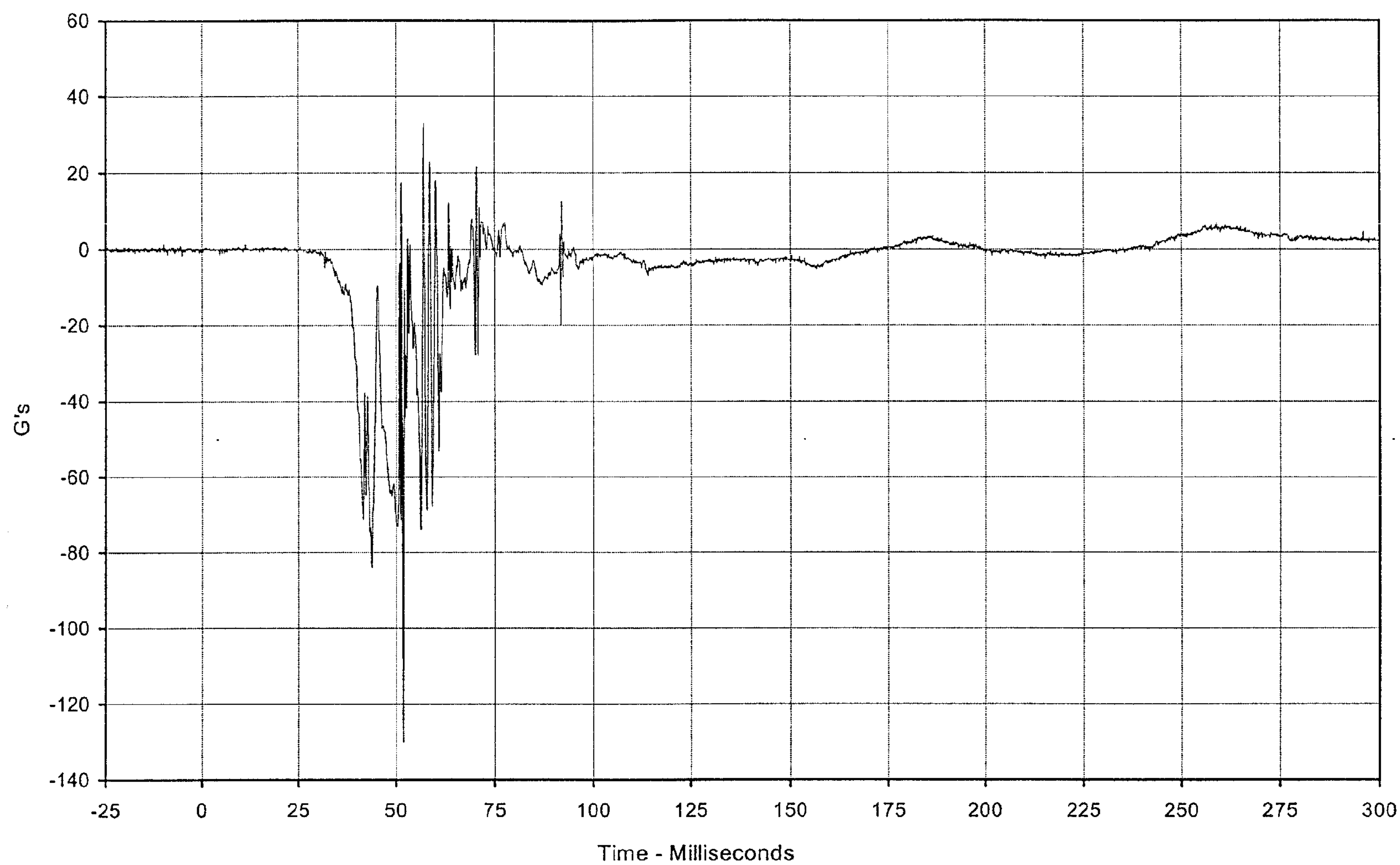


Curve Description:	Driver Left Foot Aft X			
Maximum Value:	138.5	at	44.5	Milliseconds
Minimum Value:	-63.1	at	51.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-035			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Driver Left Foot Aft Z			
Maximum Value:	32.6	at	57.1	Milliseconds
Minimum Value:	-130.2	at	51.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-036			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

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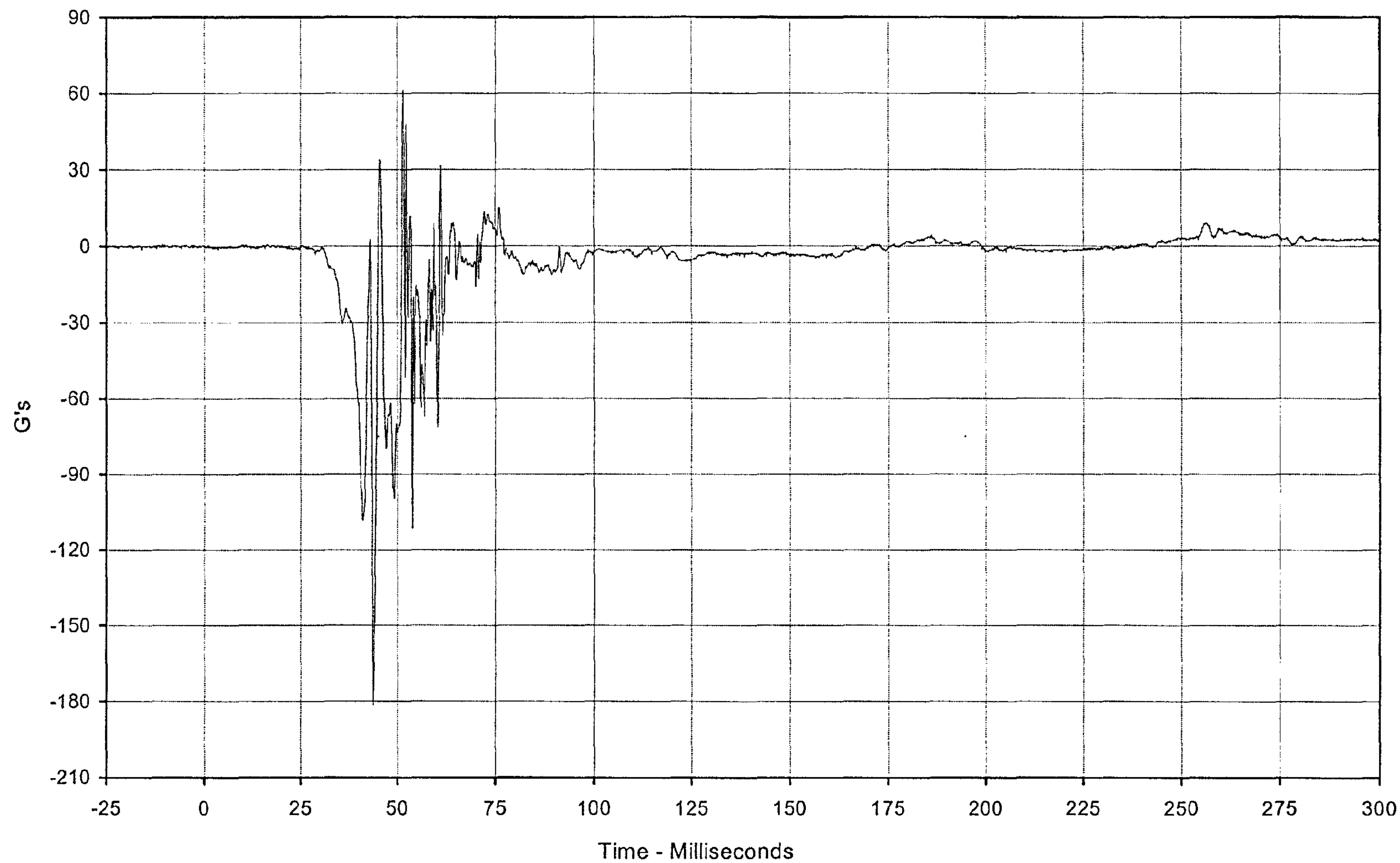
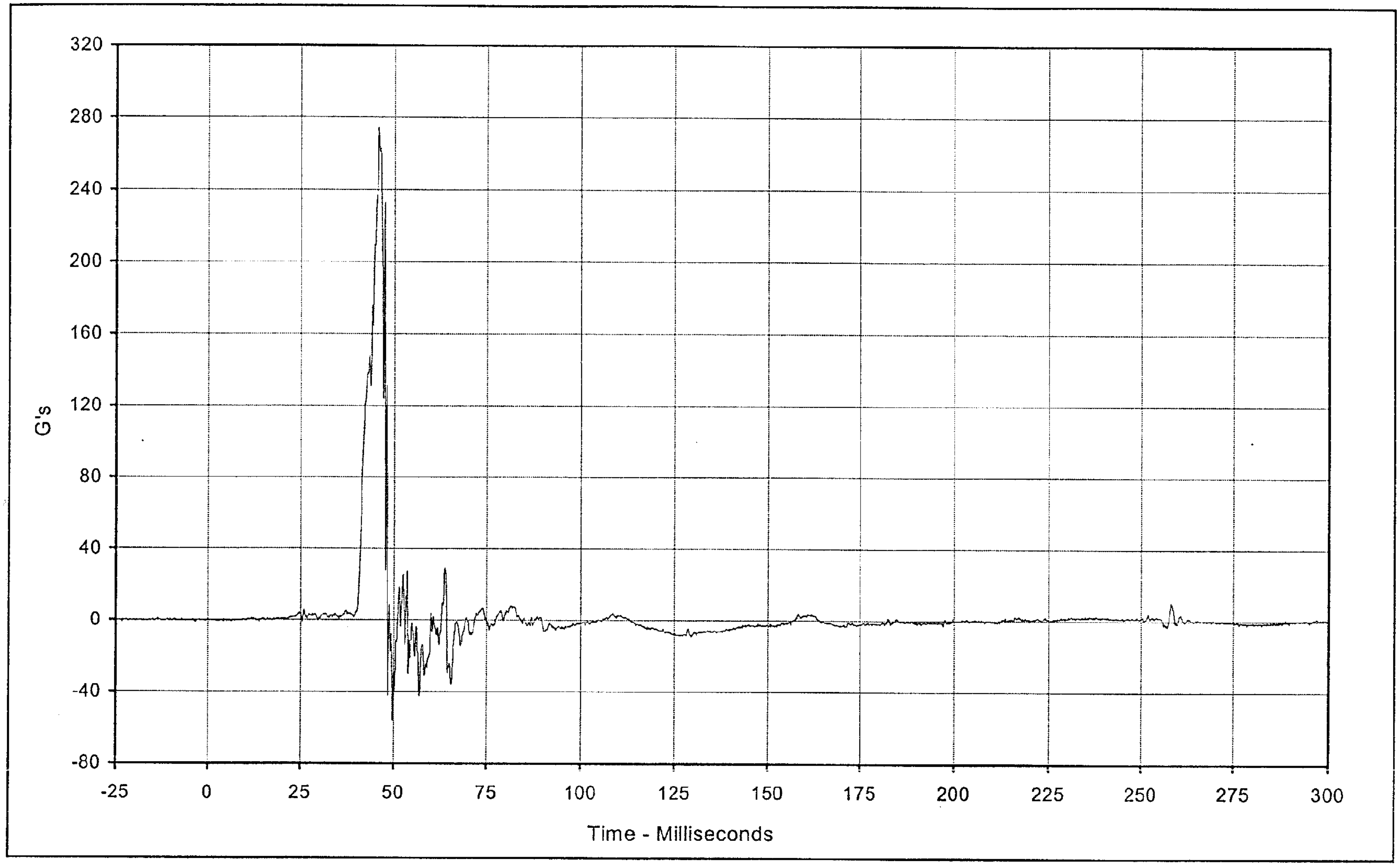


Curve Description:	Driver Left Foot Fore Z			
Maximum Value:	61.1	at	51.5	Milliseconds
Minimum Value:	-181.3	at	43.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-037			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

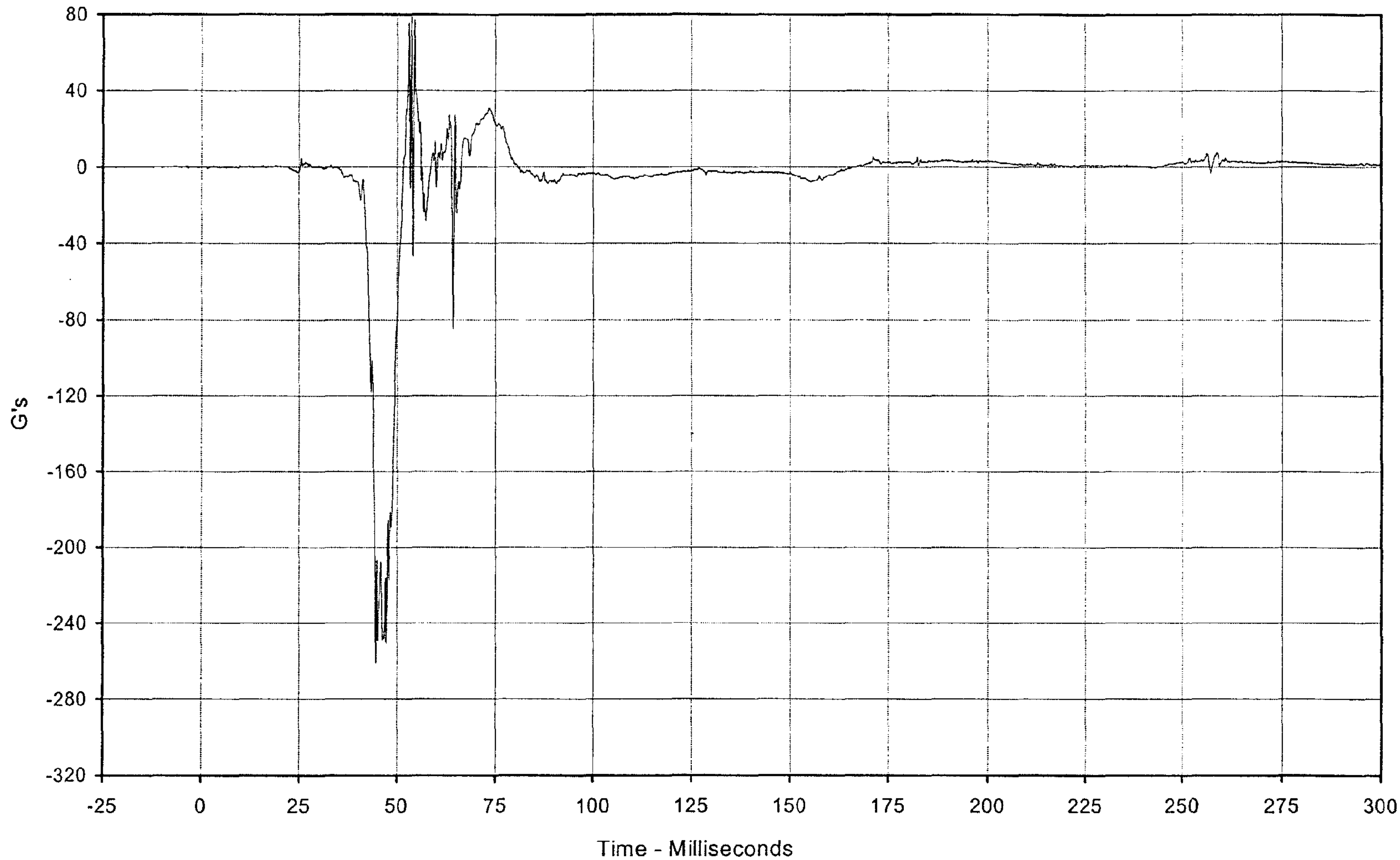
KARC Engineering



Curve Description:	Driver Right Foot Aft X			
Maximum Value:	273.9	at	45.8	Milliseconds
Minimum Value:	-55.9	at	49.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-038			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

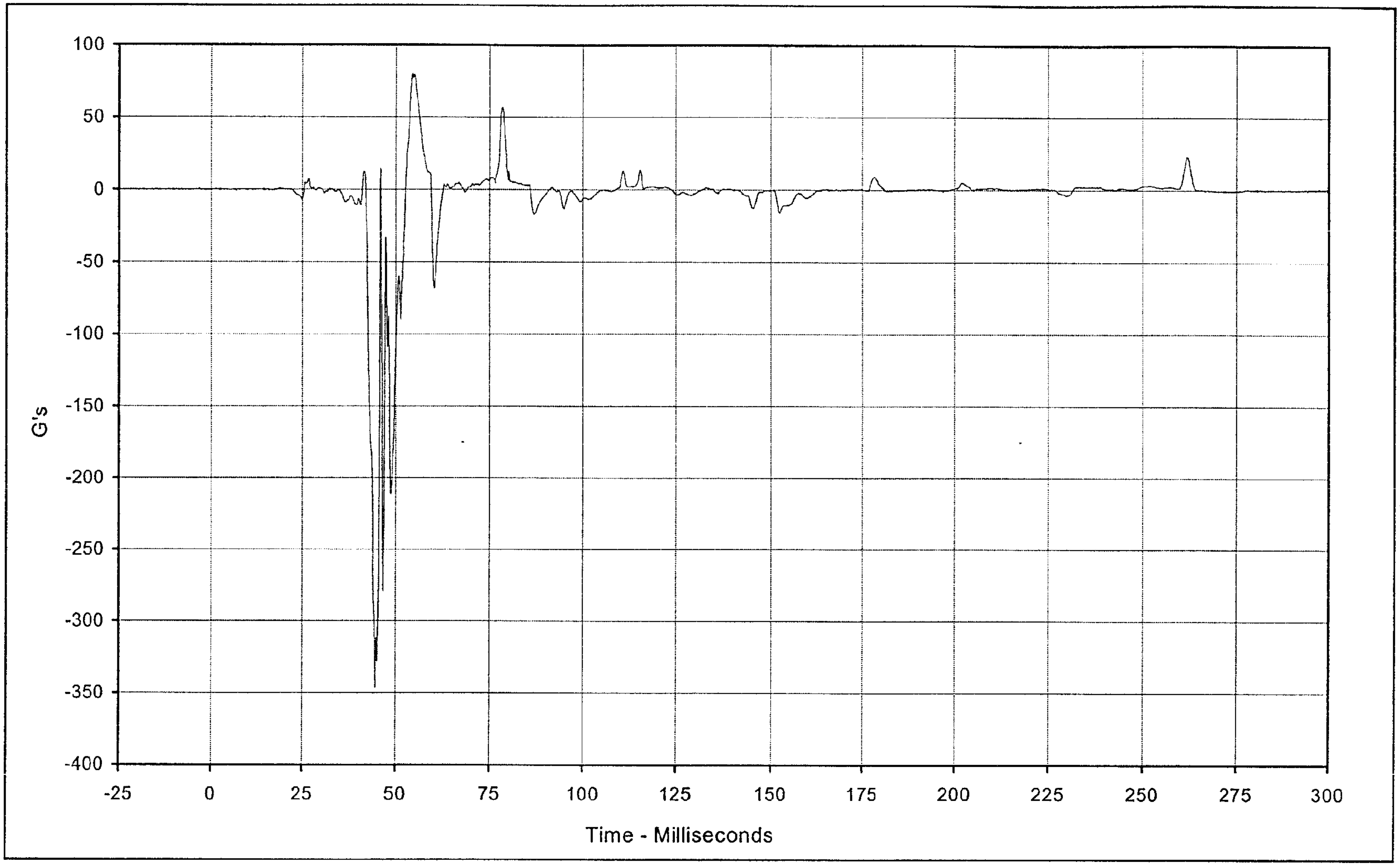


Curve Description:	Driver Right Foot Aft Z			
Maximum Value:	78.4	at	53.6	Milliseconds
Minimum Value:	-260.6	at	44.6	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-039			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

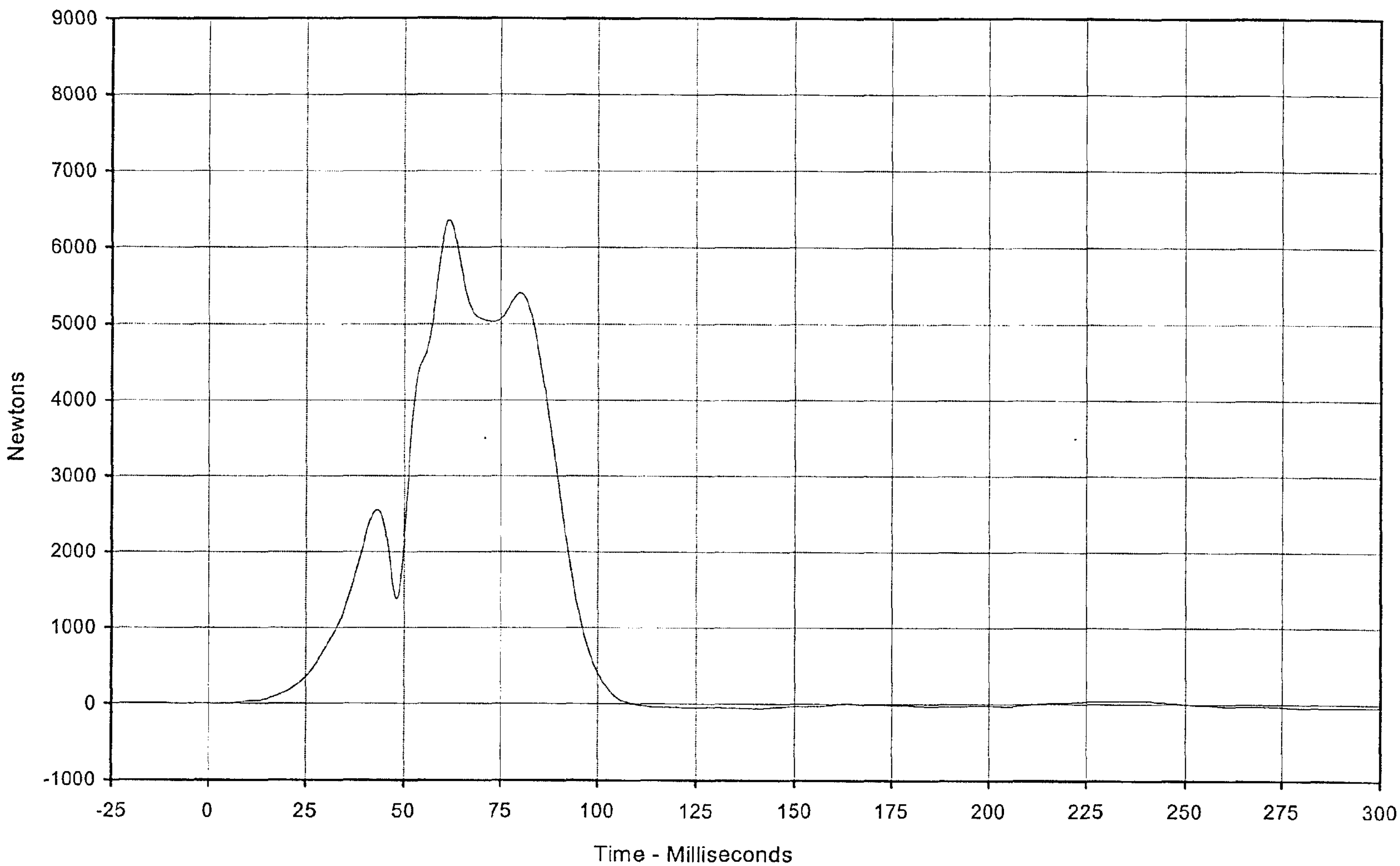
KARCO Engineering



Curve Description:	Driver Right Foot Fore Z			
Maximum Value:	79.9	at	54.3	Milliseconds
Minimum Value:	-346.3	at	44.6	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-040			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

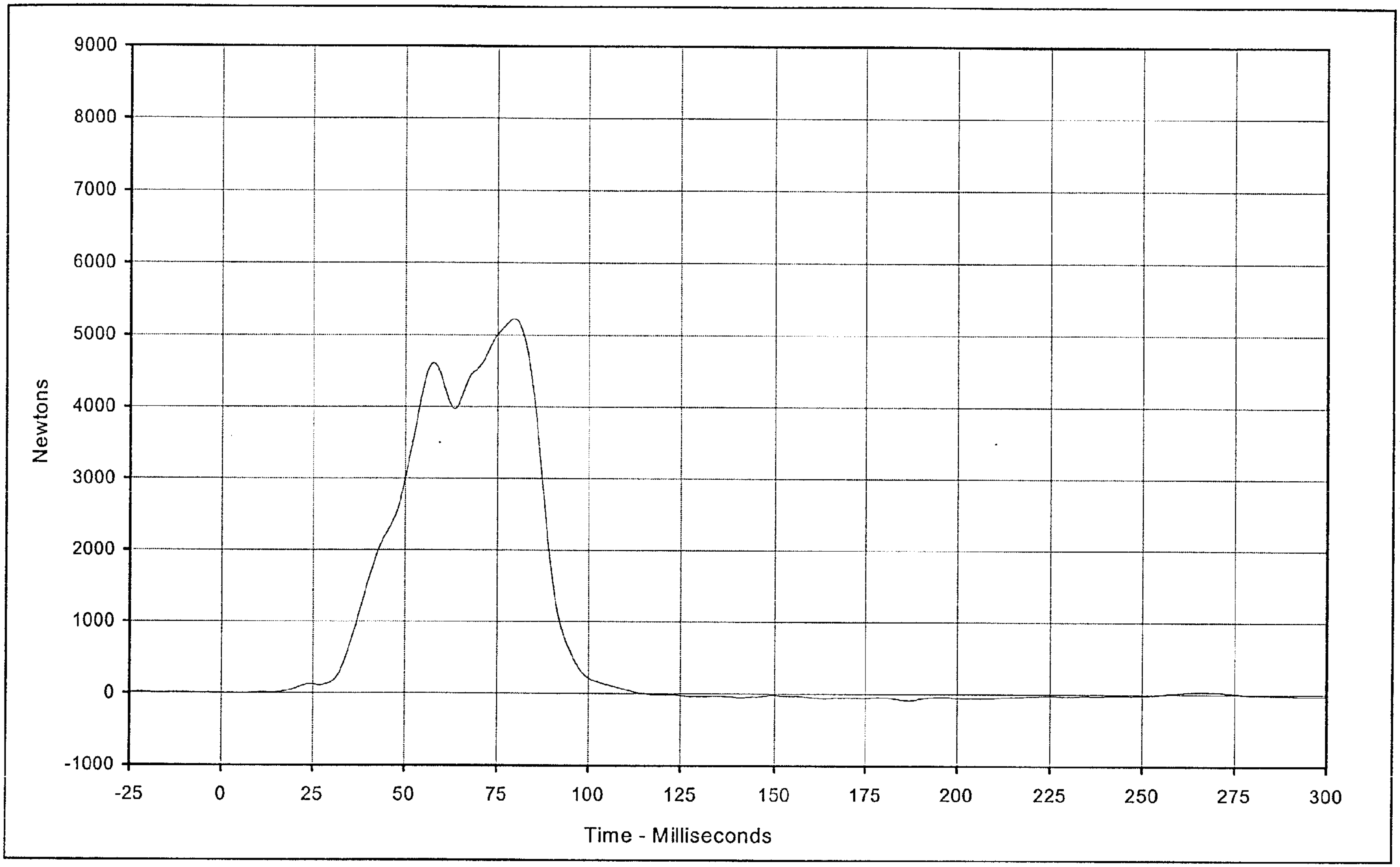
KARC Engineering



Curve Description:	Driver Lap Belt Force			
Maximum Value:	6358.5	at	61.6	Milliseconds
Minimum Value:	-54.4	at	140.6	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-041			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

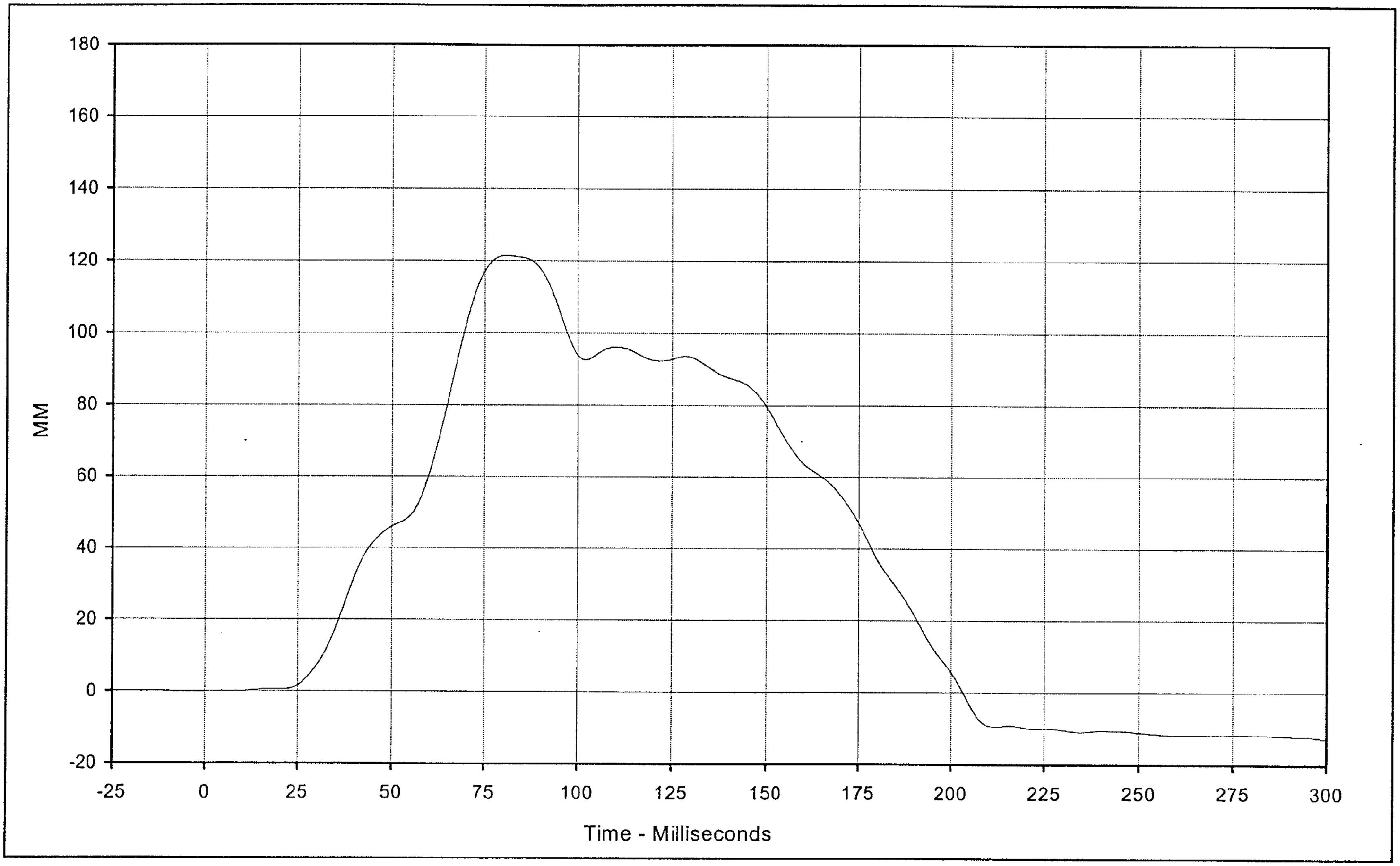
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Driver Shoulder Belt Force			
Maximum Value:	5223.6	at	79.7	Milliseconds
Minimum Value:	-88.8	at	187.1	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-042			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

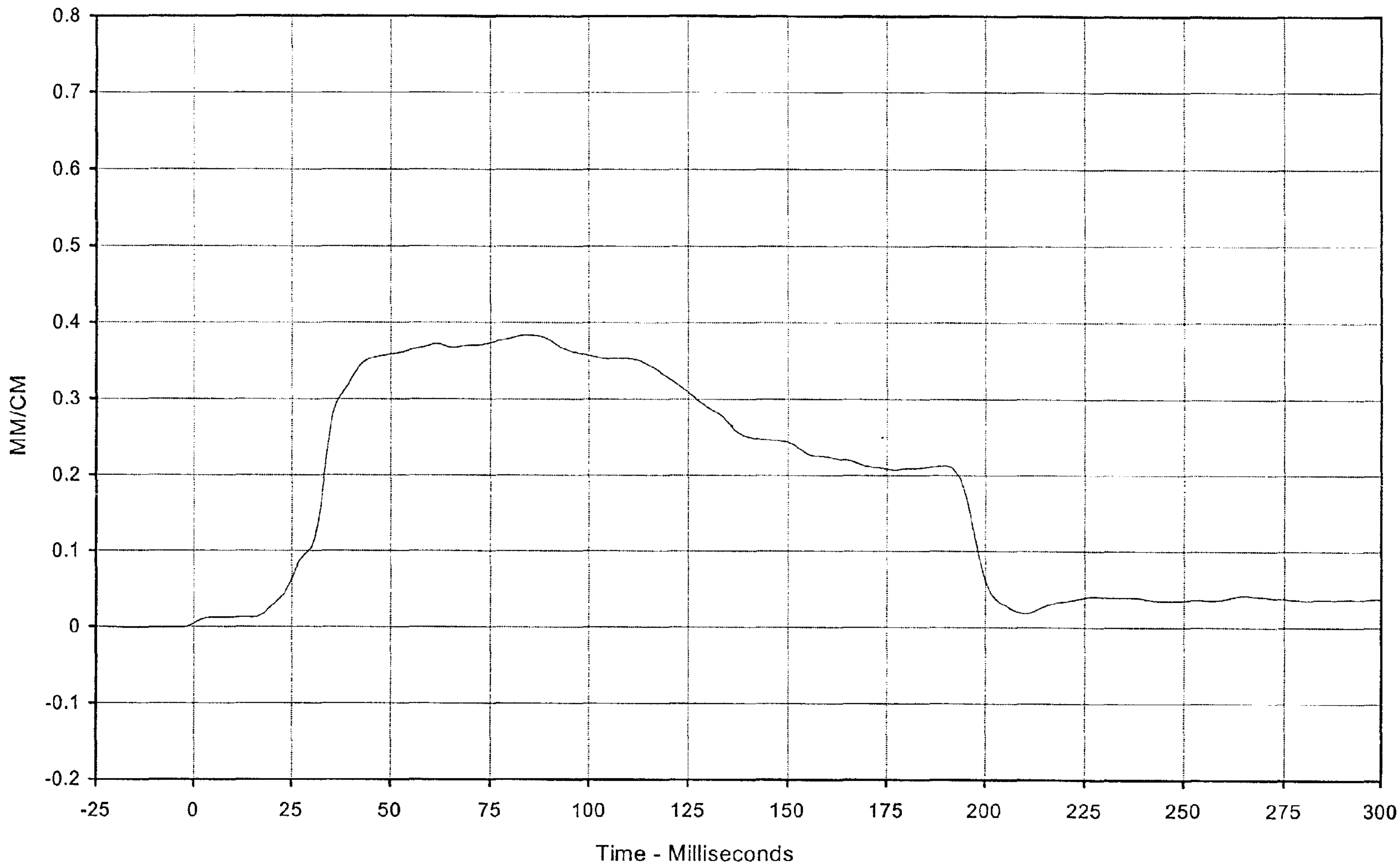
KARC Engineering



Curve Description:	Driver Shoulder Belt Pullout			
Maximum Value:	121.5	at	80.7	Milliseconds
Minimum Value:	-12.8	at	299.3	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-043			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

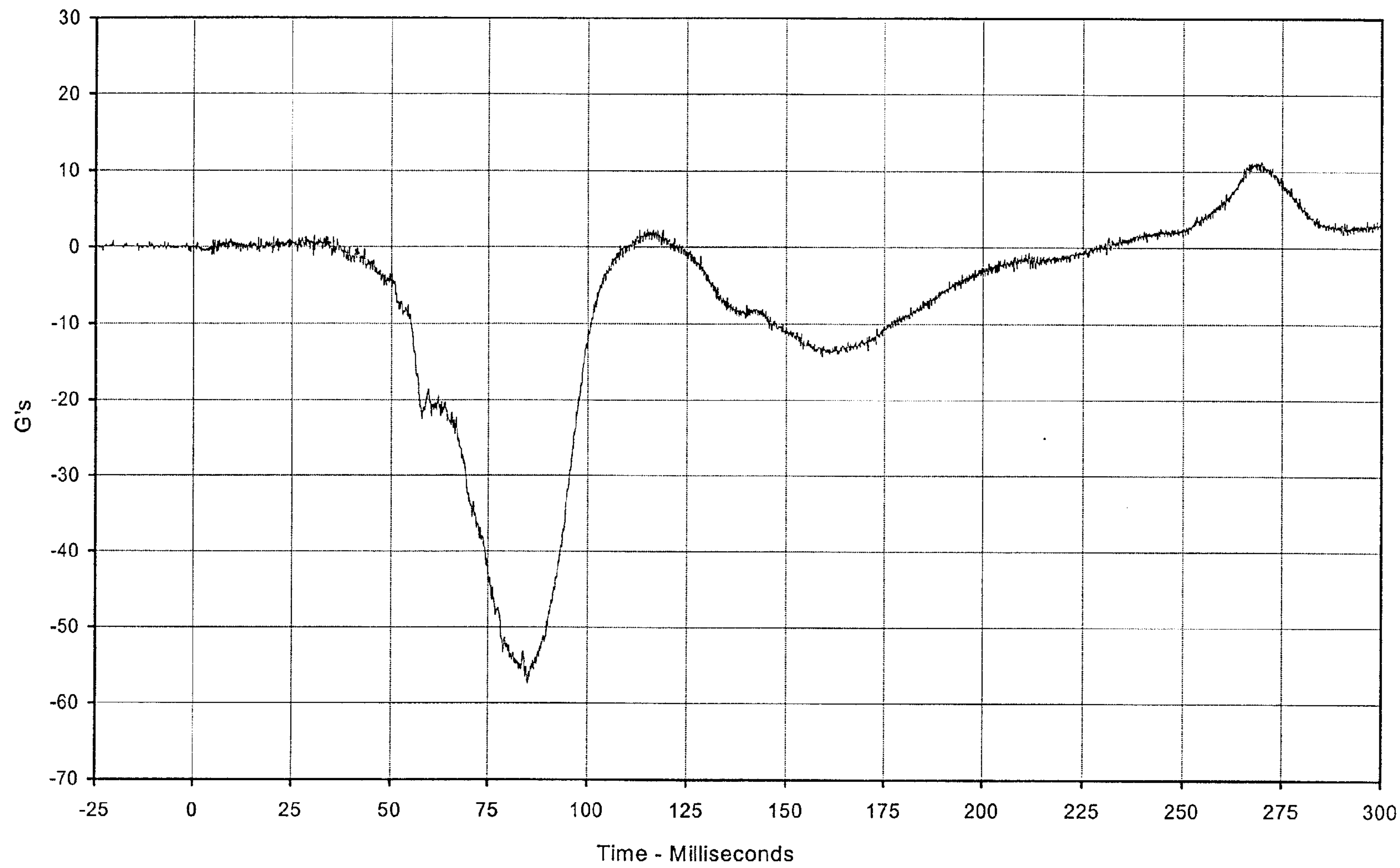


Curve Description:	Driver Shoulder Belt Elongation			
Maximum Value:	0.38	at	84.4	Milliseconds
Minimum Value:	0.00	at	0.0	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-044			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering

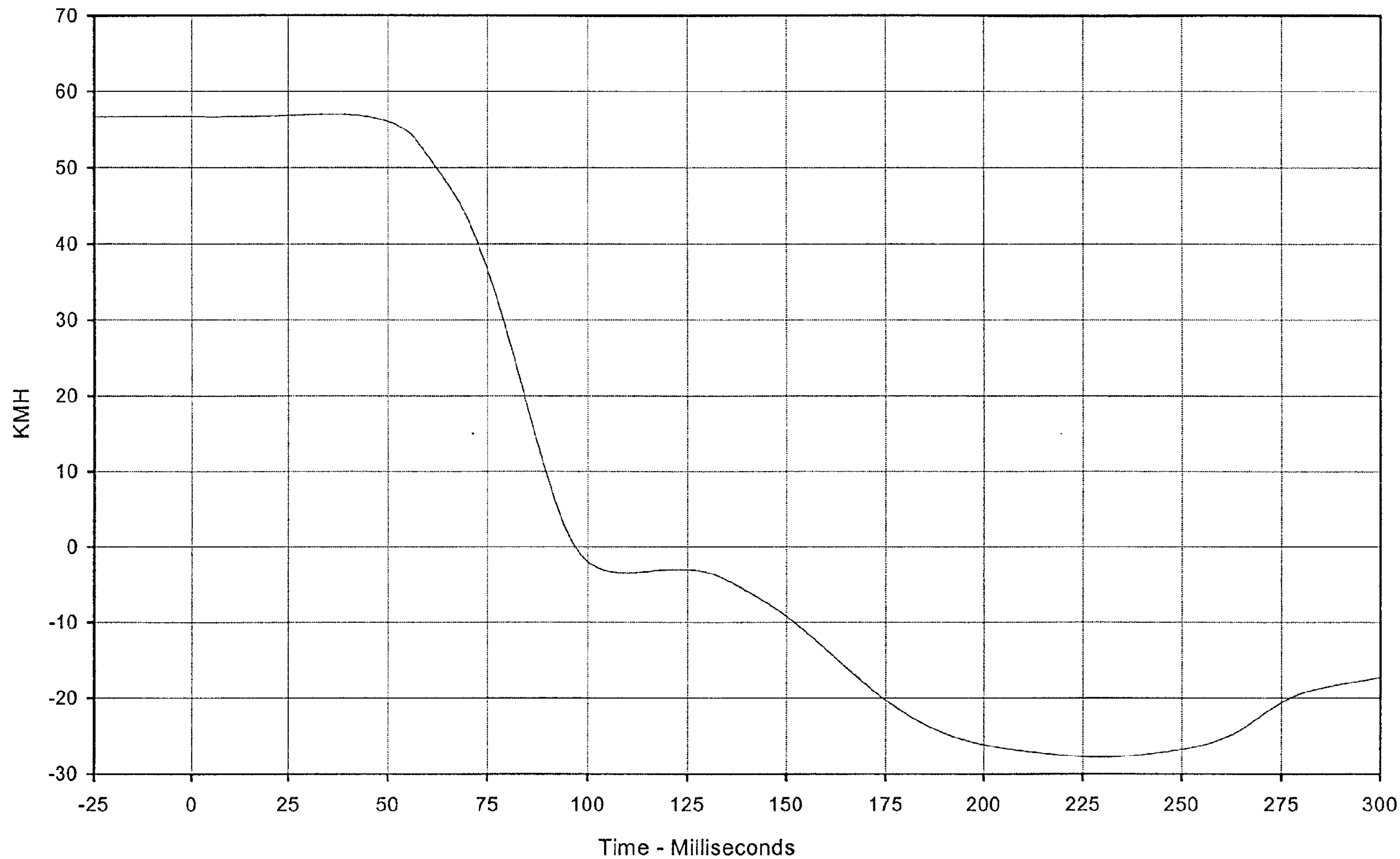


Curve Description:	Passenger Head Primary X			
Maximum Value:	11.3	at	269.9	Milliseconds
Minimum Value:	-57.4	at	84.7	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-045			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

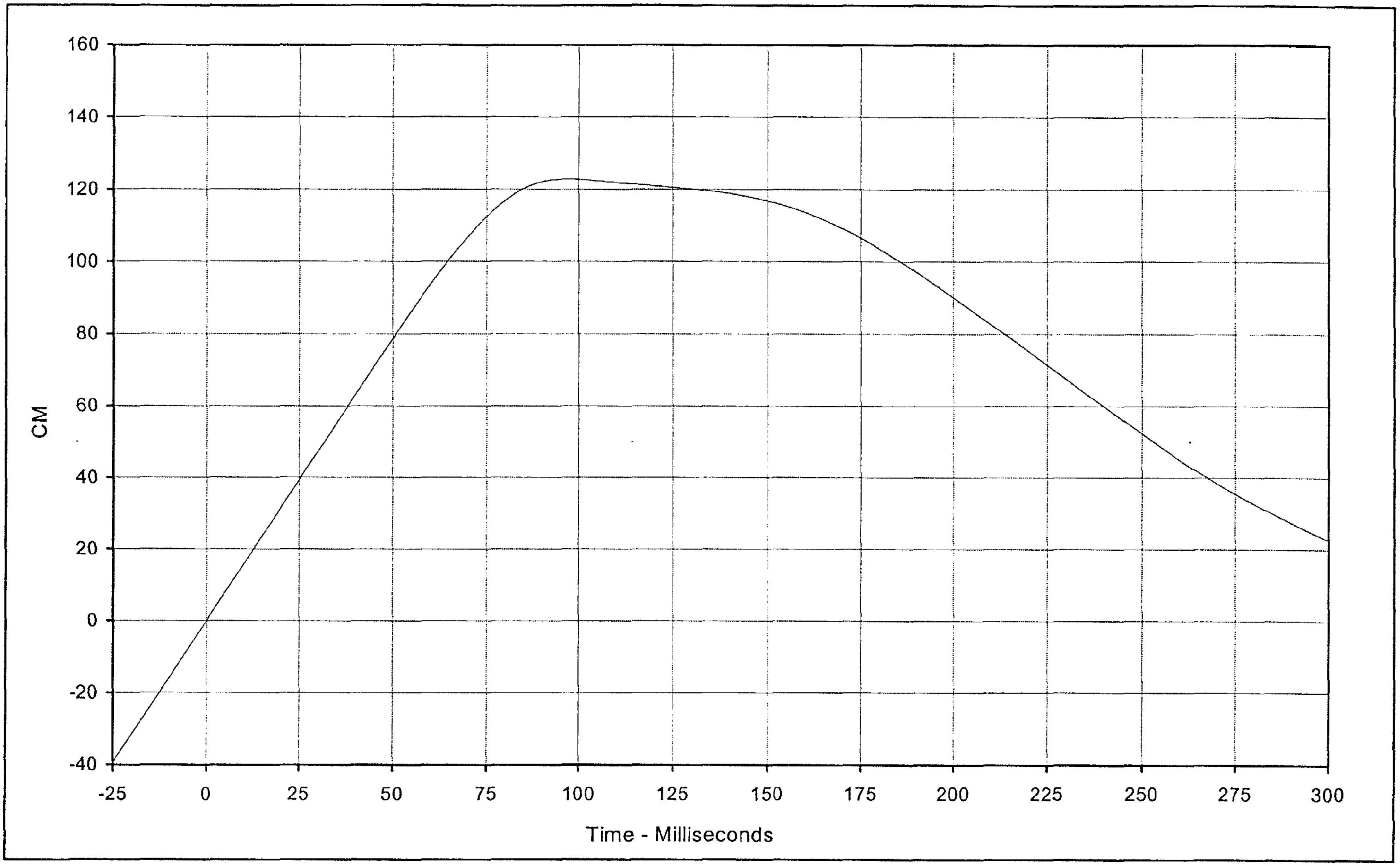
KARCO Engineering



Curve Description:	Passenger Head Primary X Velocity			
Maximum Value:	57.0	at	35.0	Milliseconds
Minimum Value:	-27.8	at	228.6	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-045			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

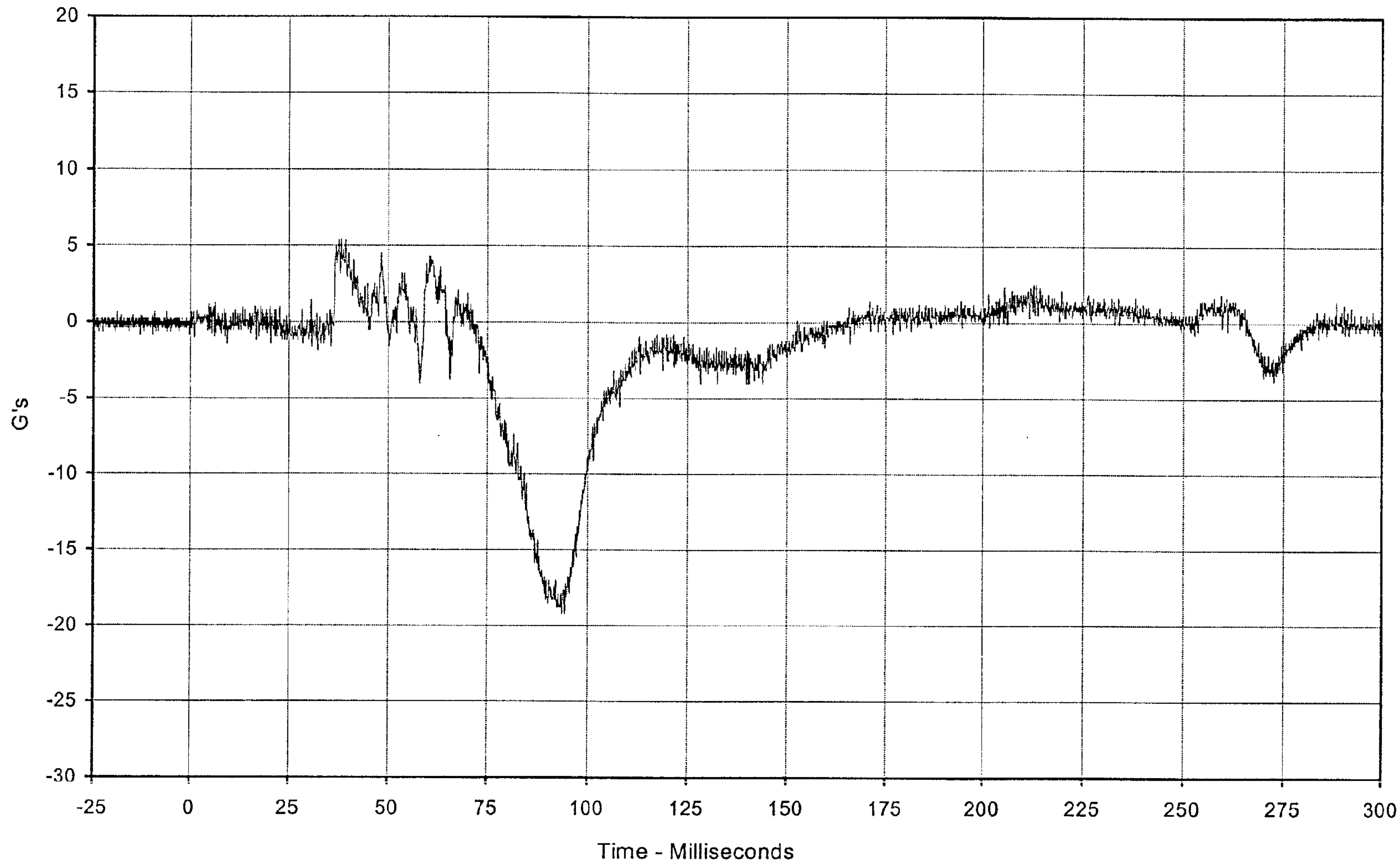


Curve Description:	Passenger Head Primary X Displ.			
Maximum Value:	122.8	at	96.8	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-045			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering

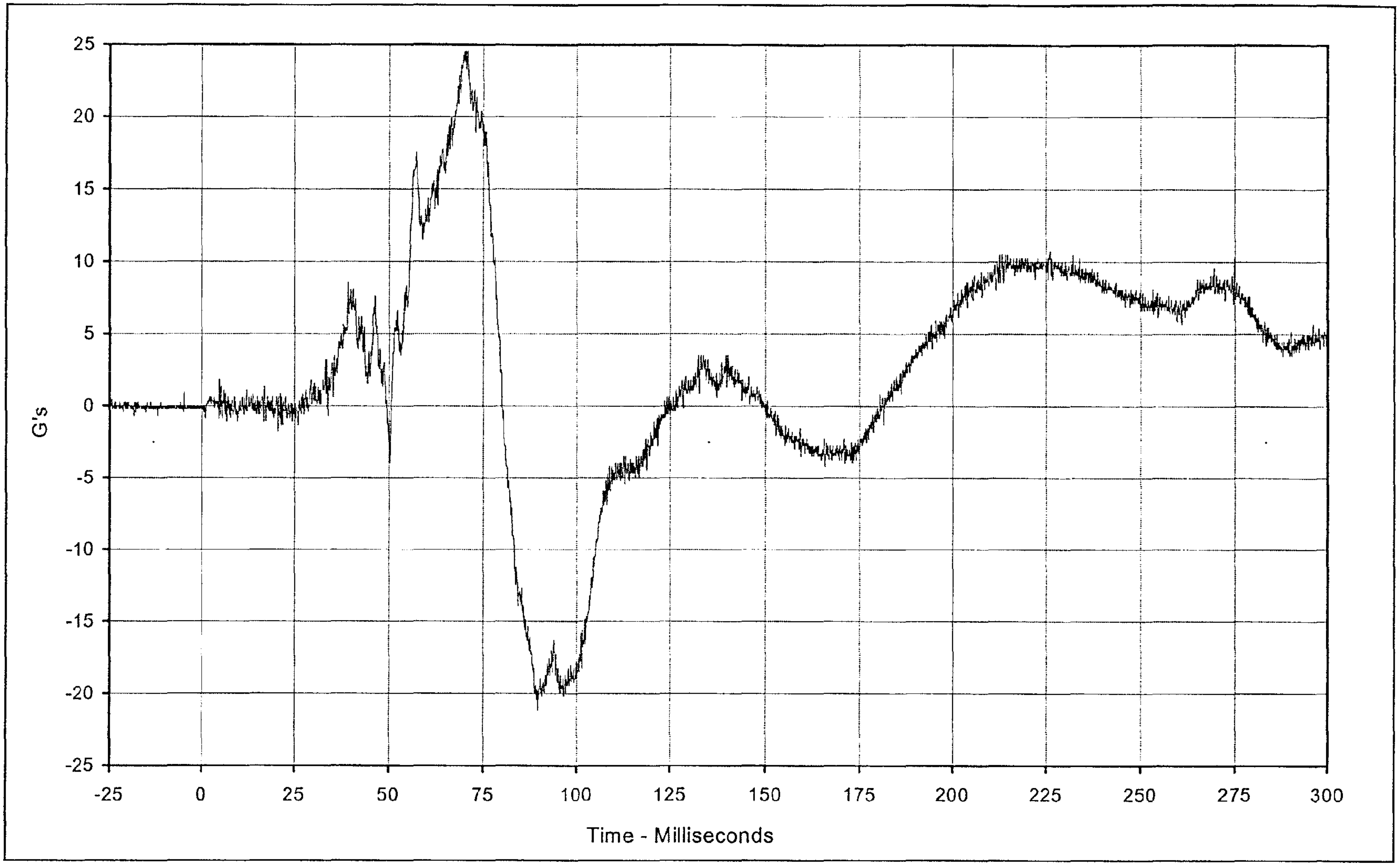


Curve Description:	Passenger Head Primary Y			
Maximum Value:	5.4	at	37.5	Milliseconds
Minimum Value:	-19.2	at	93.5	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-046			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

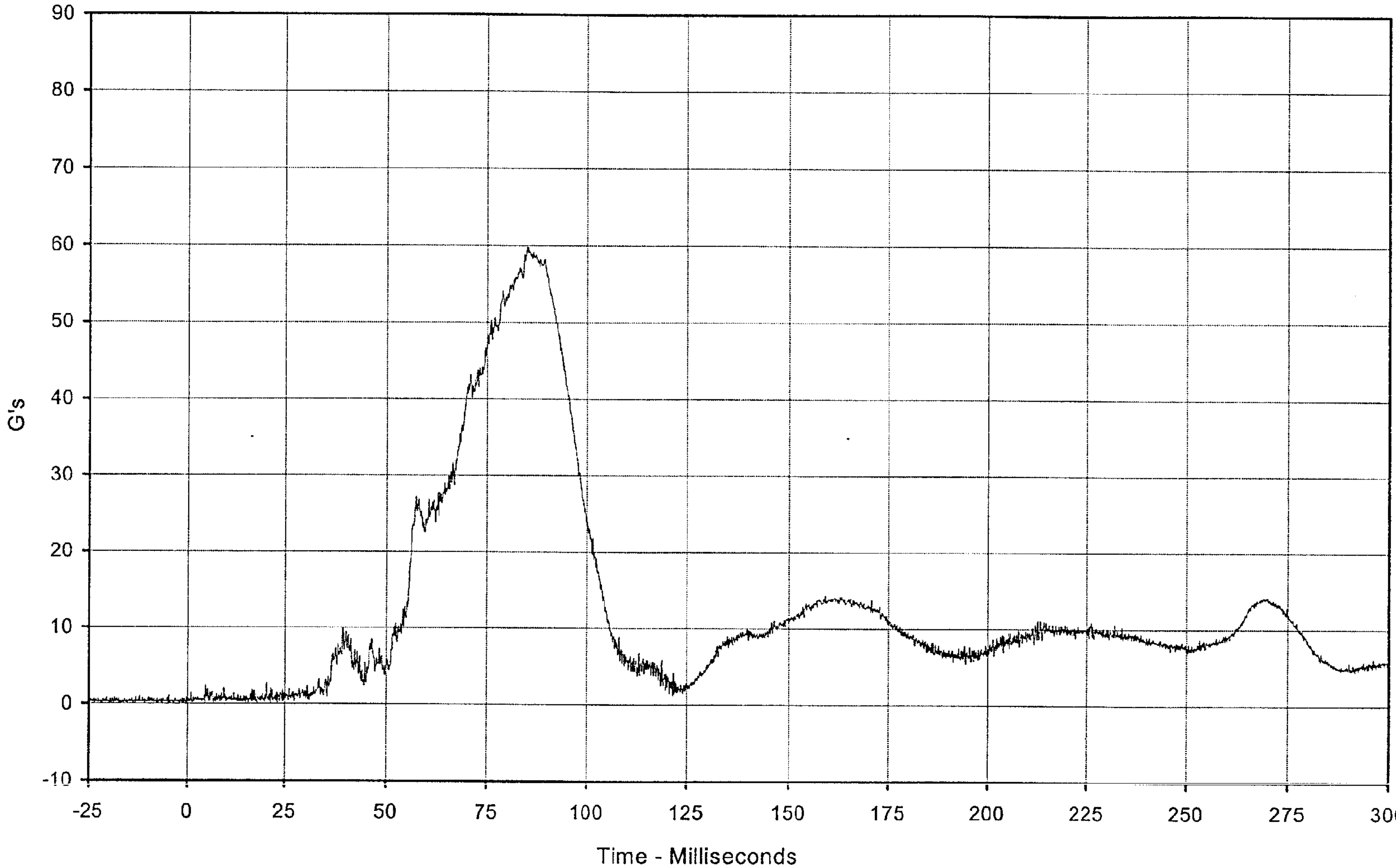


Curve Description:	Passenger Head Primary Z			
Maximum Value:	24.5	at	69.9	Milliseconds
Minimum Value:	-21.1	at	89.5	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-047			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

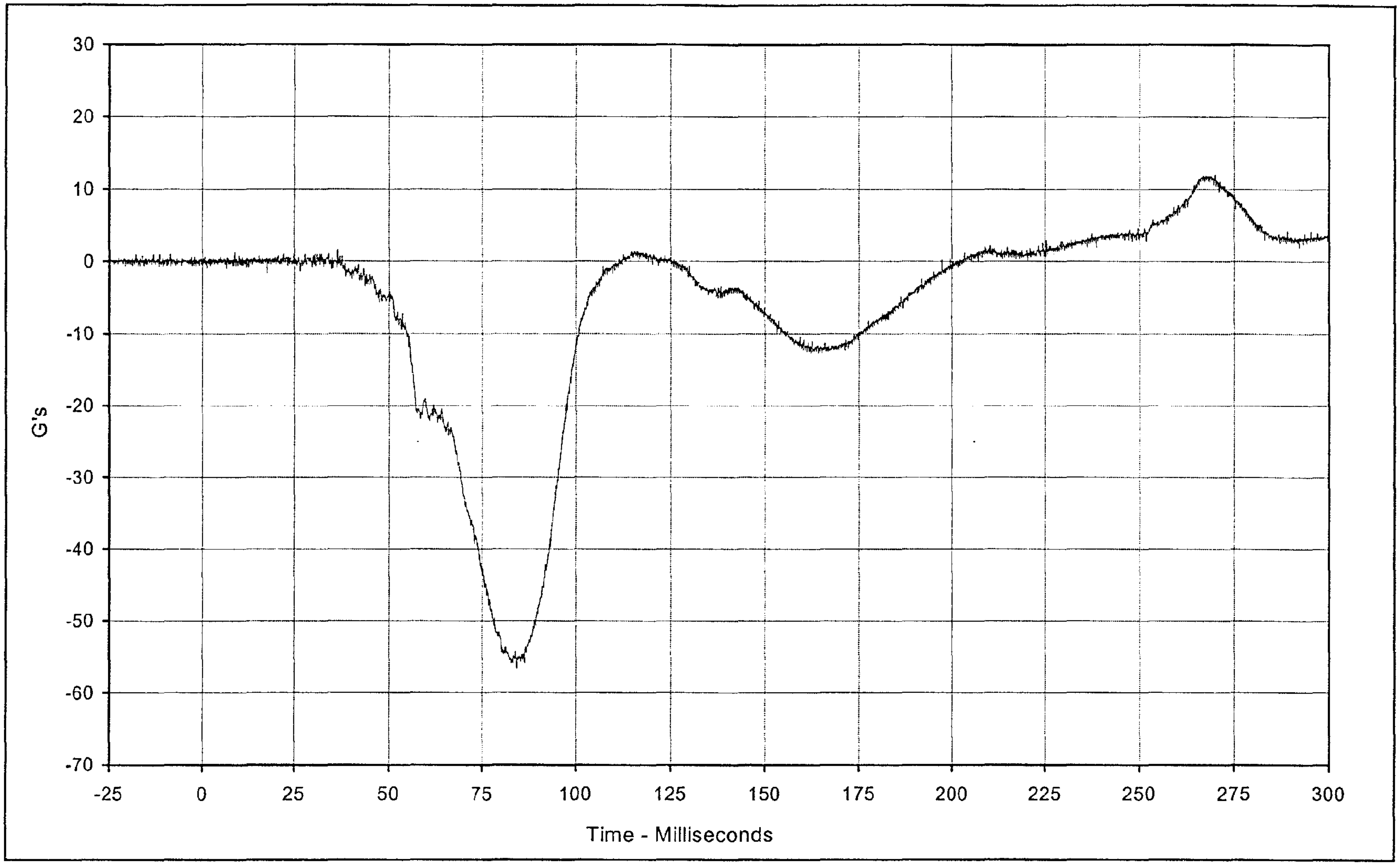
KARCO Engineering



Curve Description:	Passenger Head Resultant Primary			
Maximum Value:	59.8	at	84.8	Milliseconds
Minimum Value:	0.2	at	18.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-045			

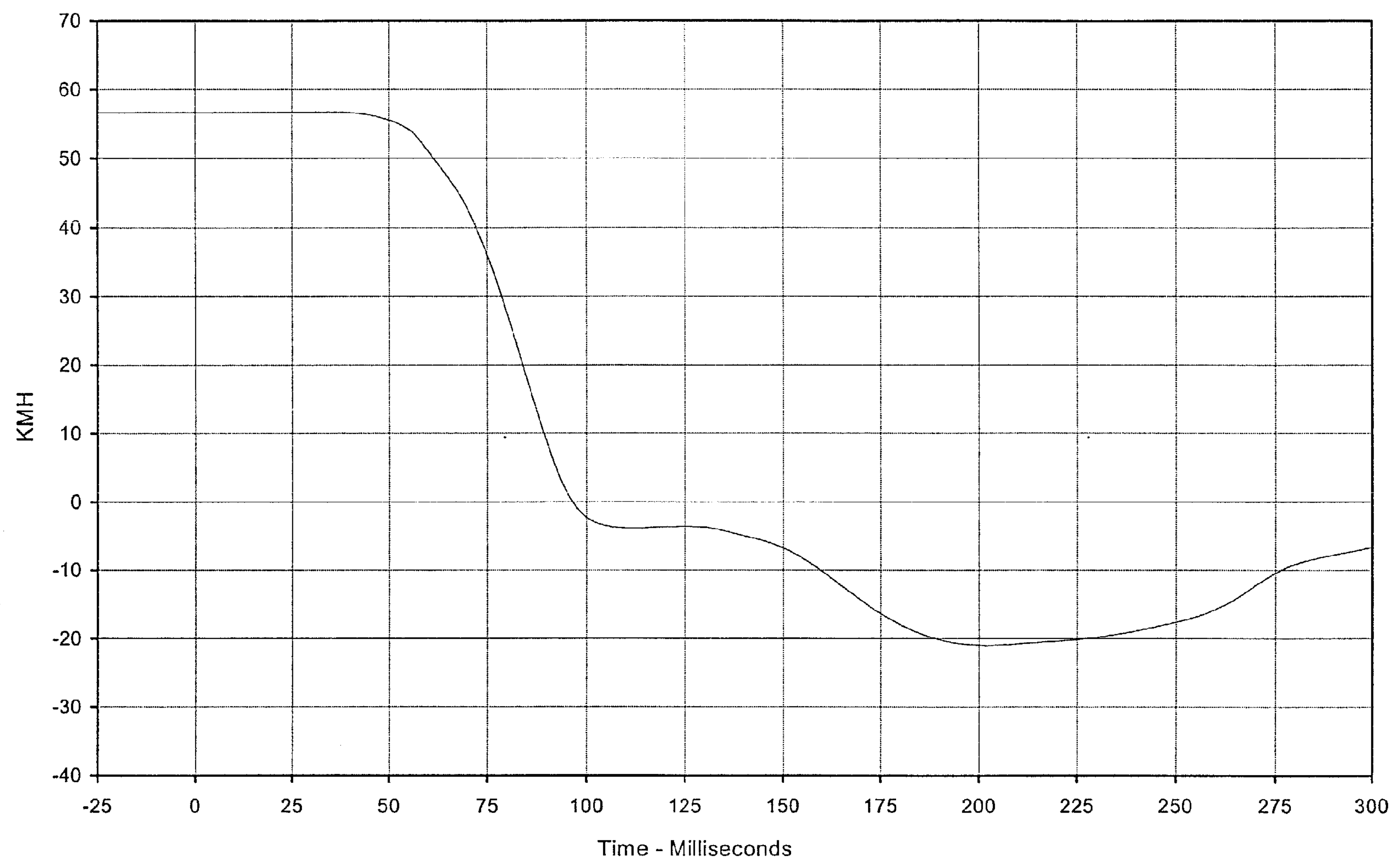
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Passenger Head Redundant X				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	12.0	at	270.0	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	-56.6	at	84.2	Milliseconds		
SAE Filter Class:	1000					
Date of Test:	1/8/98					
Curve Number:	FIL-048					

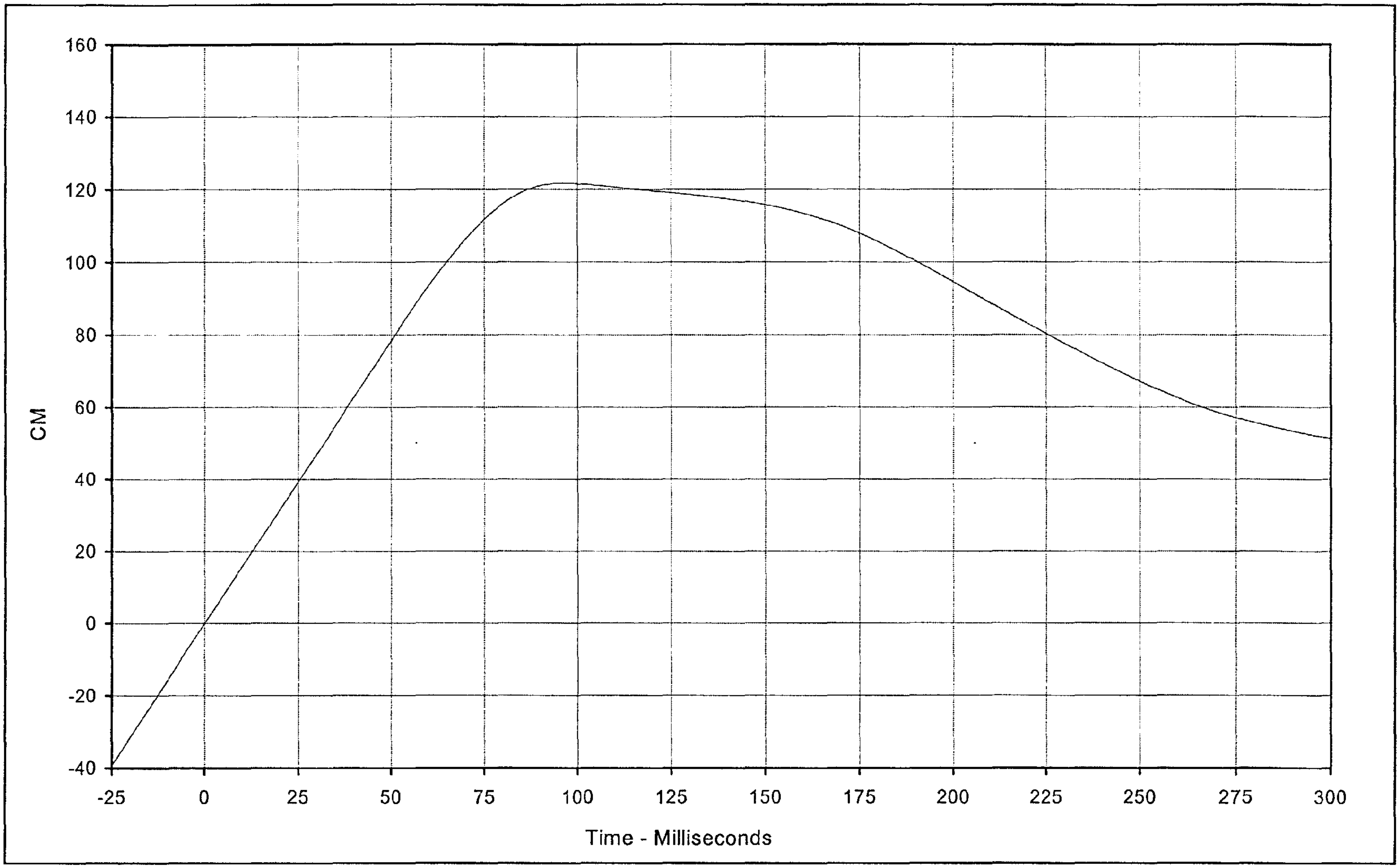
KARCO Engineering



Curve Description:	Passenger Head Redundant X Velocity			
Maximum Value:	56.7	at	34.4	Milliseconds
Minimum Value:	-21.0	at	202.5	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-048			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

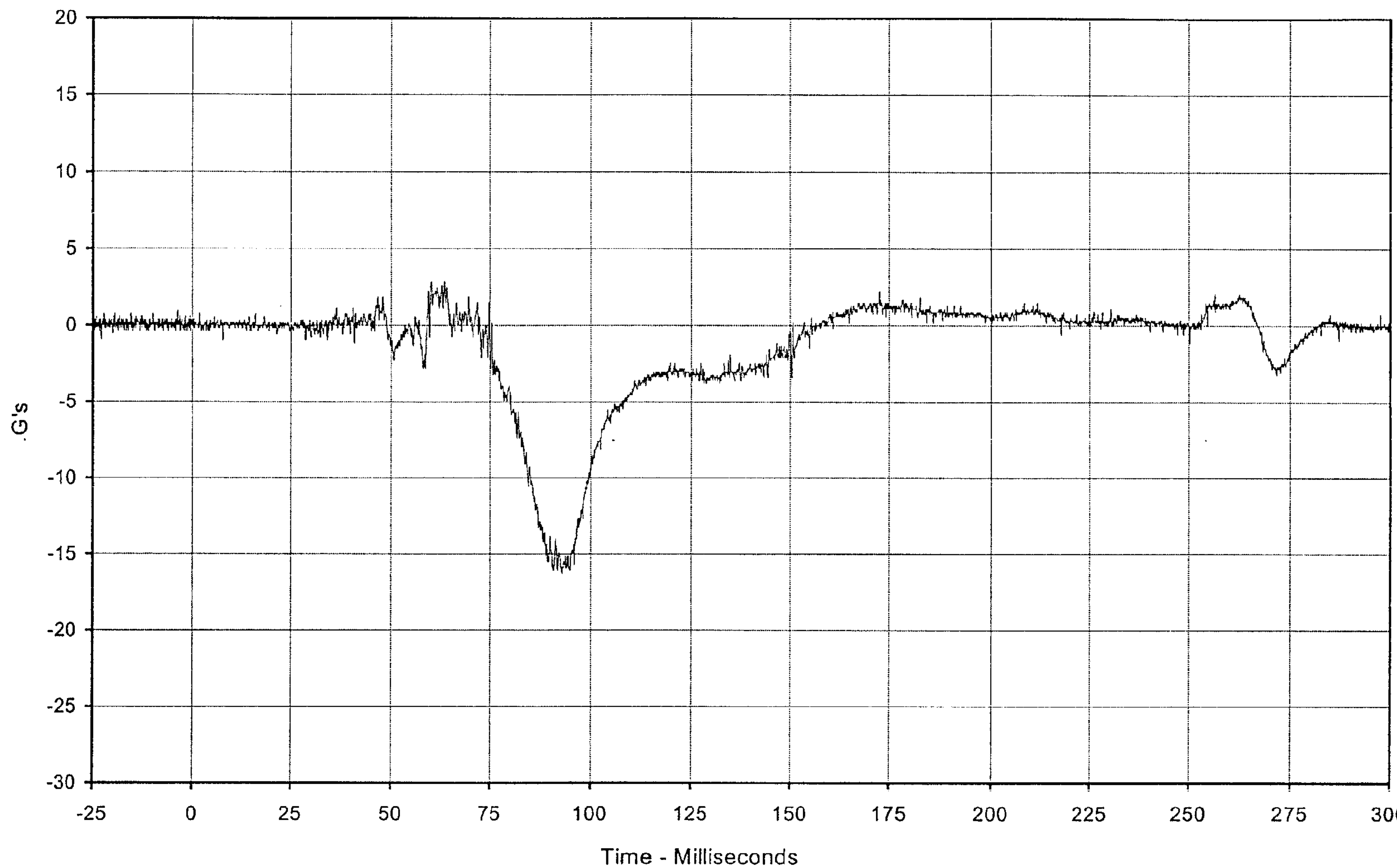


Curve Description:	Passenger Head Redundant X Displ.			
Maximum Value:	121.7	at	96.3	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-048			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

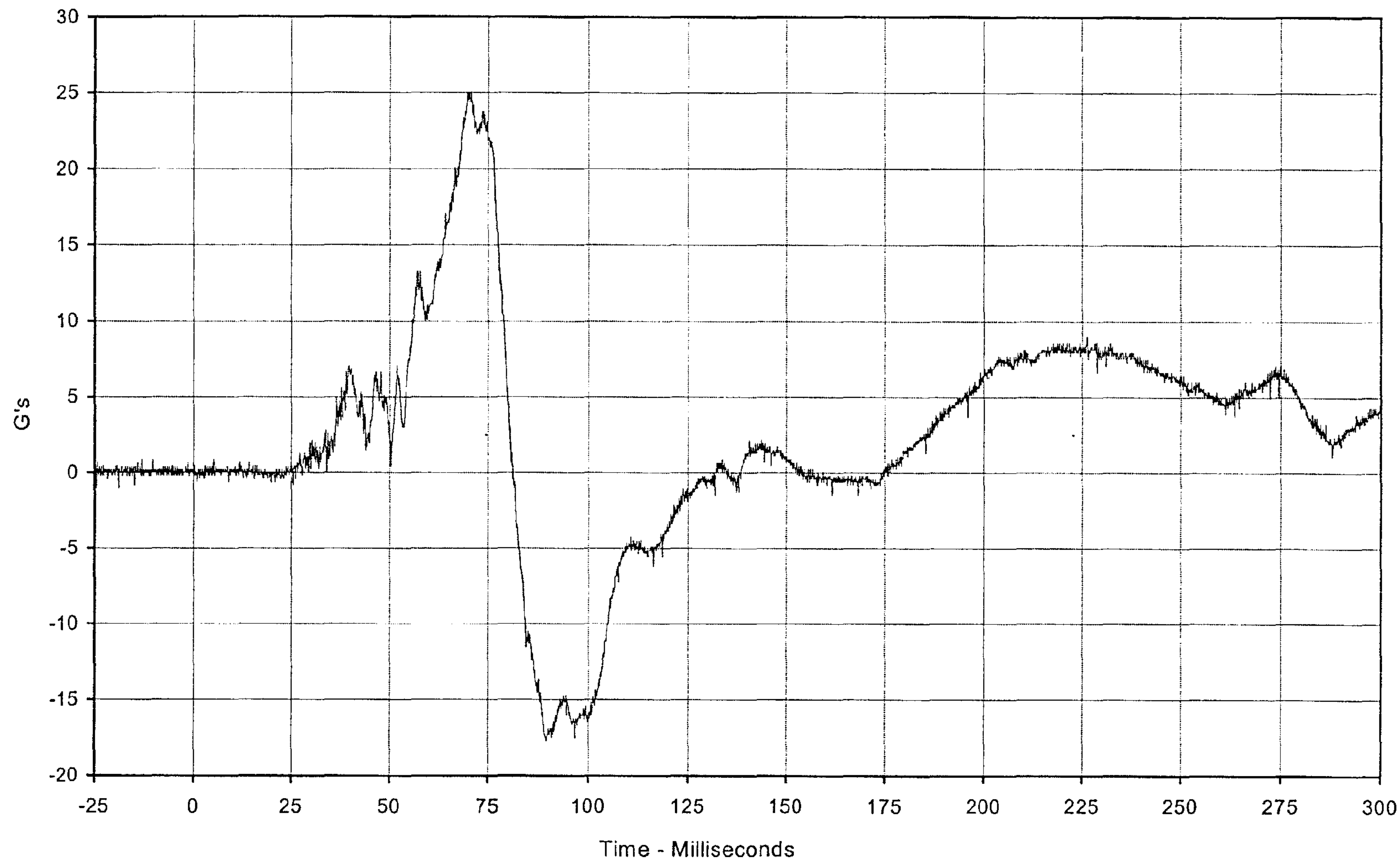


Curve Description:	Passenger Head Redundant Y			
Maximum Value:	2.8	at	60.1	Milliseconds
Minimum Value:	-16.3	at	92.9	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-049			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

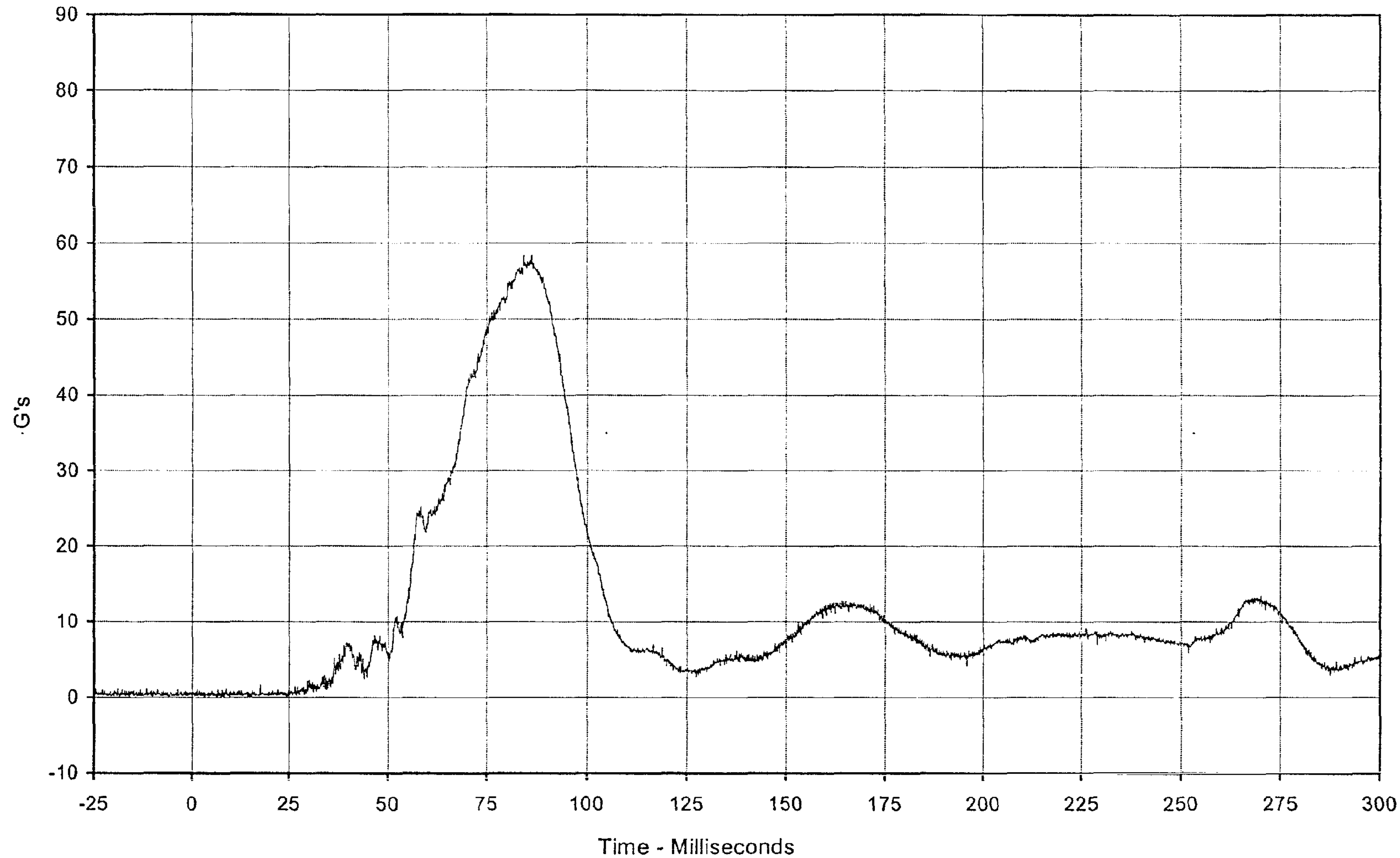
KARCO Engineering



Curve Description:	Passenger Head Redundant Z			
Maximum Value:	25.0	at	69.7	Milliseconds
Minimum Value:	-17.7	at	89.3	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-050			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Head Resultant Redundant			
Maximum Value:	58.5	at	86.2	Milliseconds
Minimum Value:	0.0	at	3.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-048			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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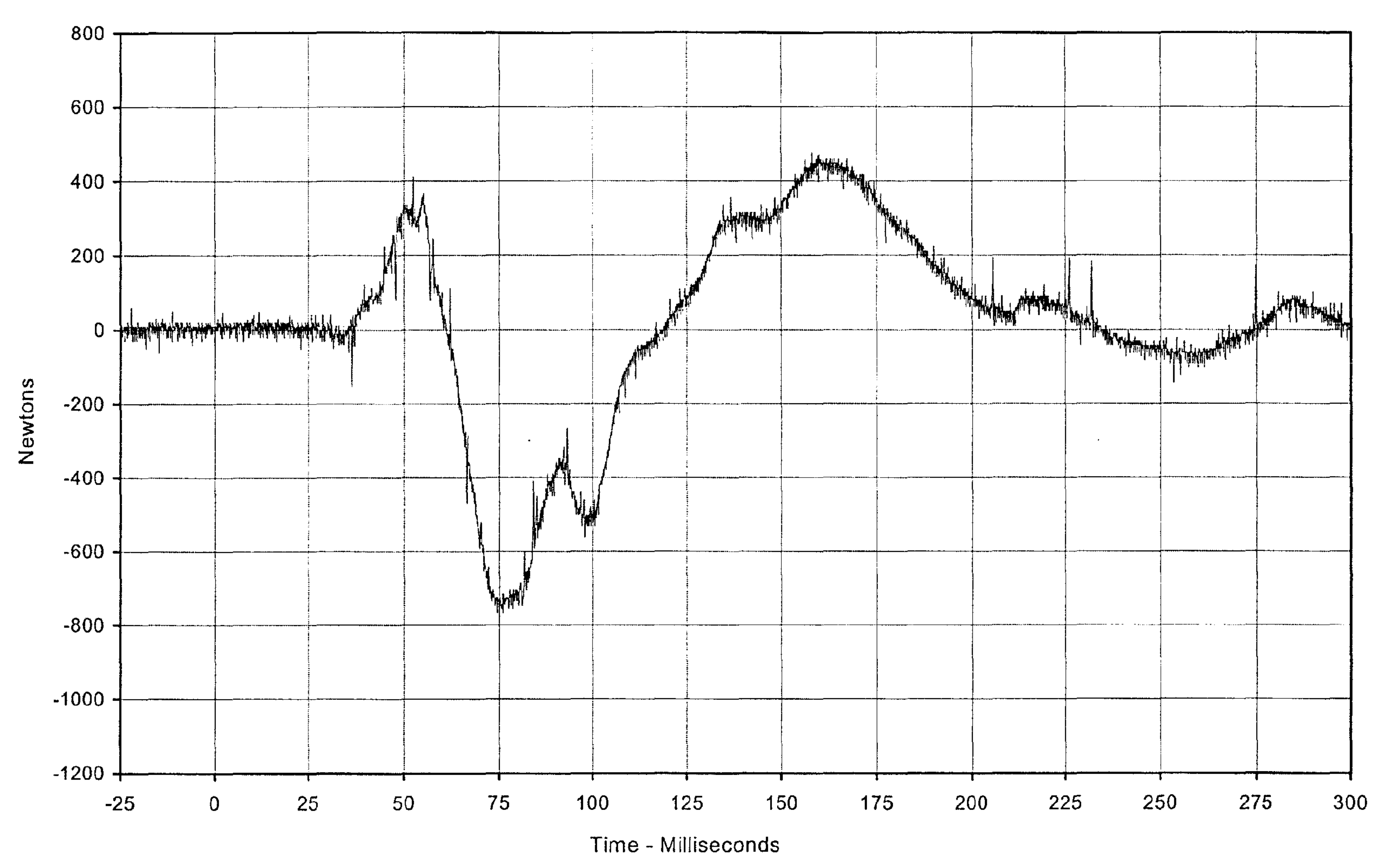
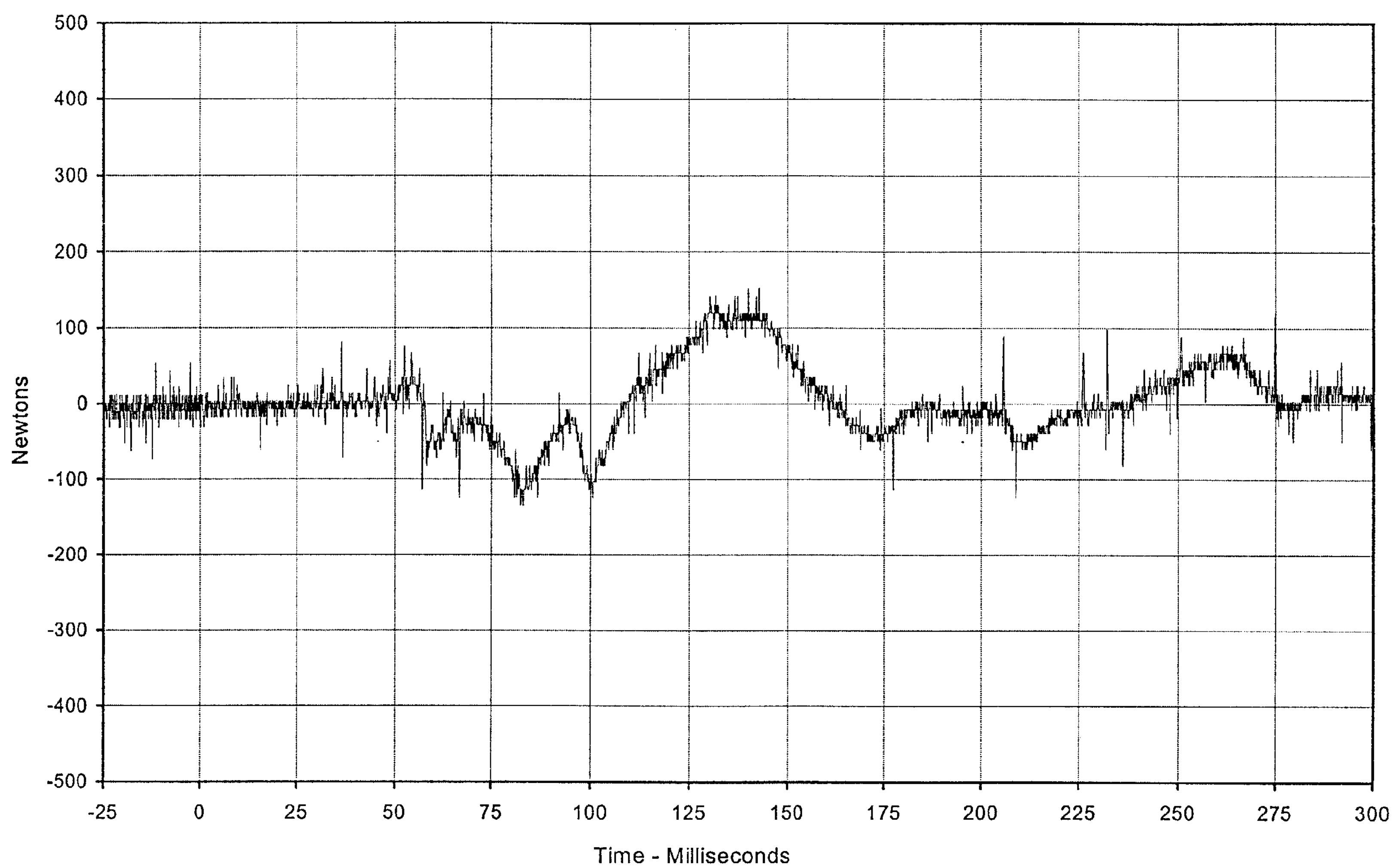


Curve Description:	Passenger Neck Force X			
Maximum Value:	478.9	at	158.2	Milliseconds
Minimum Value:	-786.7	at	75.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-051			

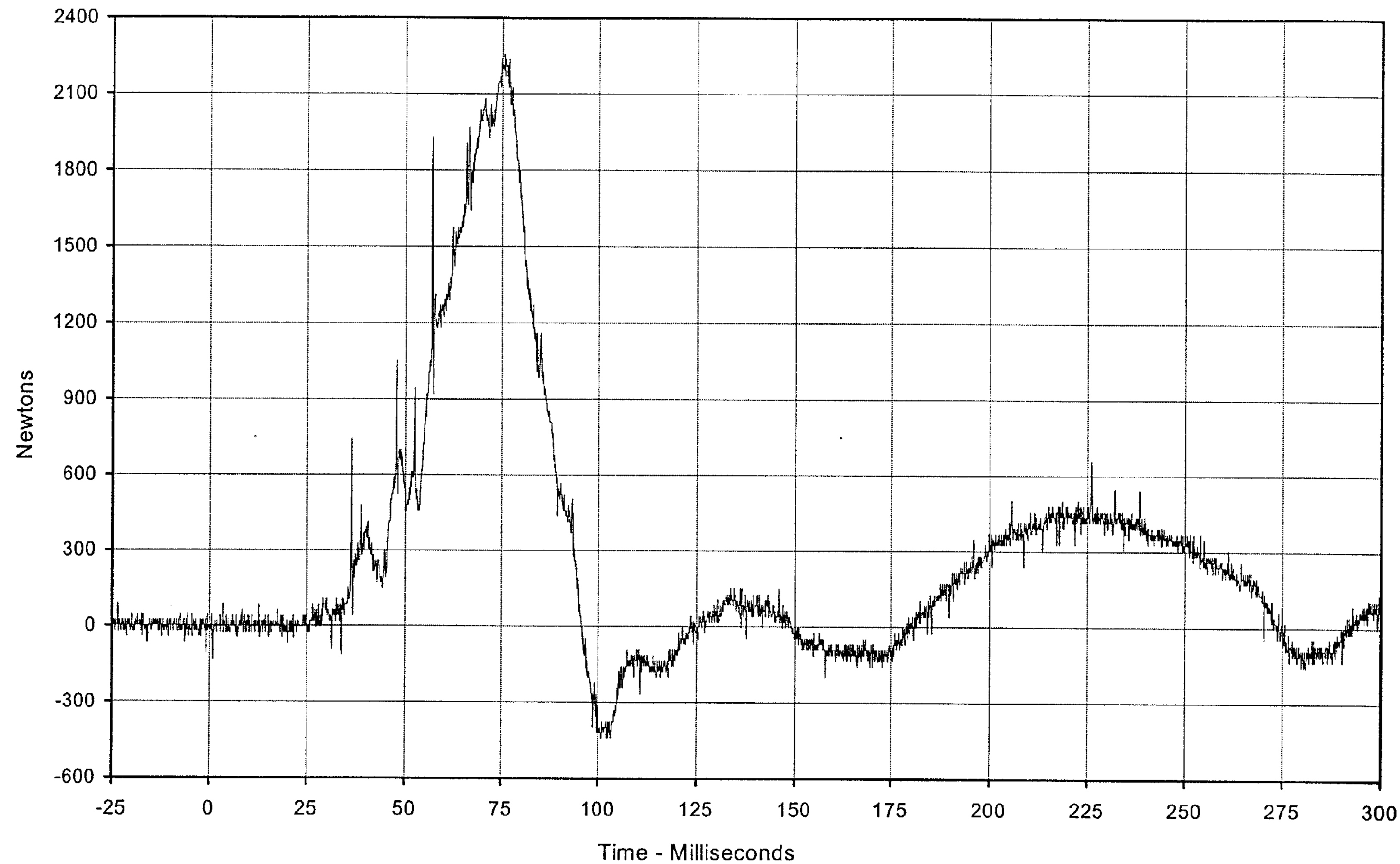
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Neck Force Y			
Maximum Value:	151.9	at	140.0	Milliseconds
Minimum Value:	-135.1	at	82.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-052			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Neck Force Z			
Maximum Value:	2256.9	at	75.5	Milliseconds
Minimum Value:	-442.6	at	100.8	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-053			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

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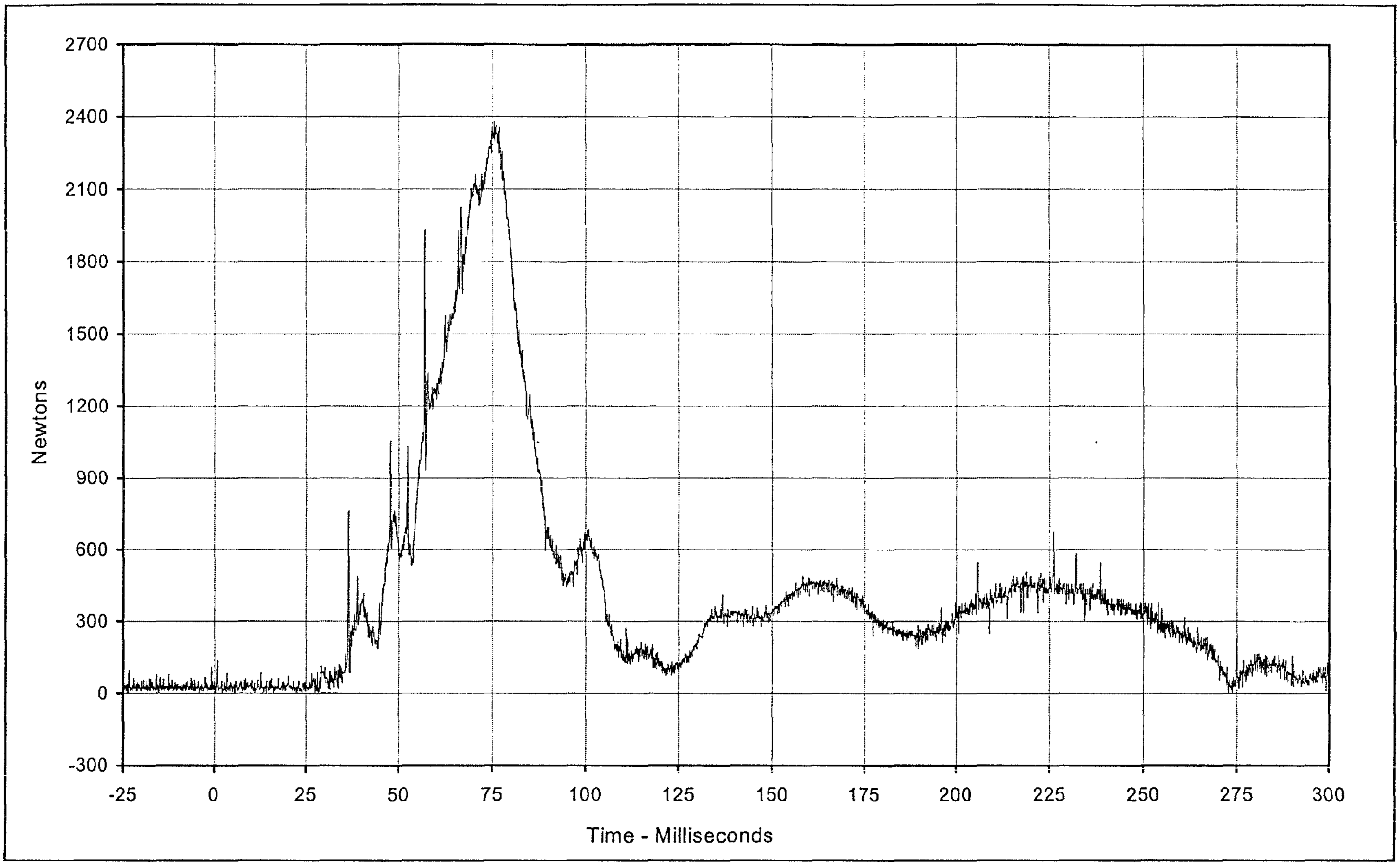
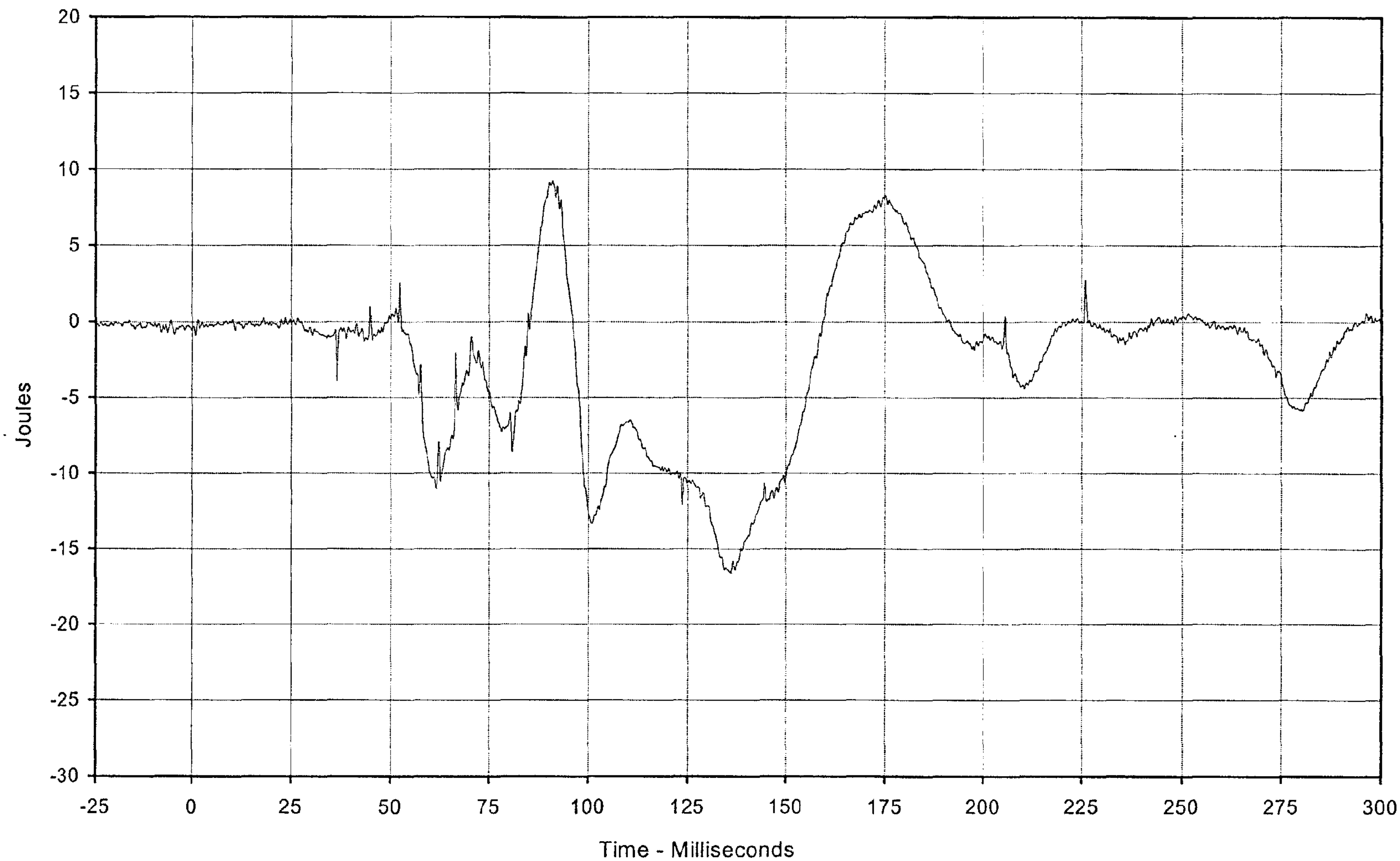


Curve Description:	Passenger Neck Force Resultant				
Maximum Value:	2381.0	at	75.5	Milliseconds	
Minimum Value:	2.0	at	0.3	Milliseconds	
SAE Filter Class:	1000				
Date of Test:	1/8/98				
Curve Number:	RES-051				

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

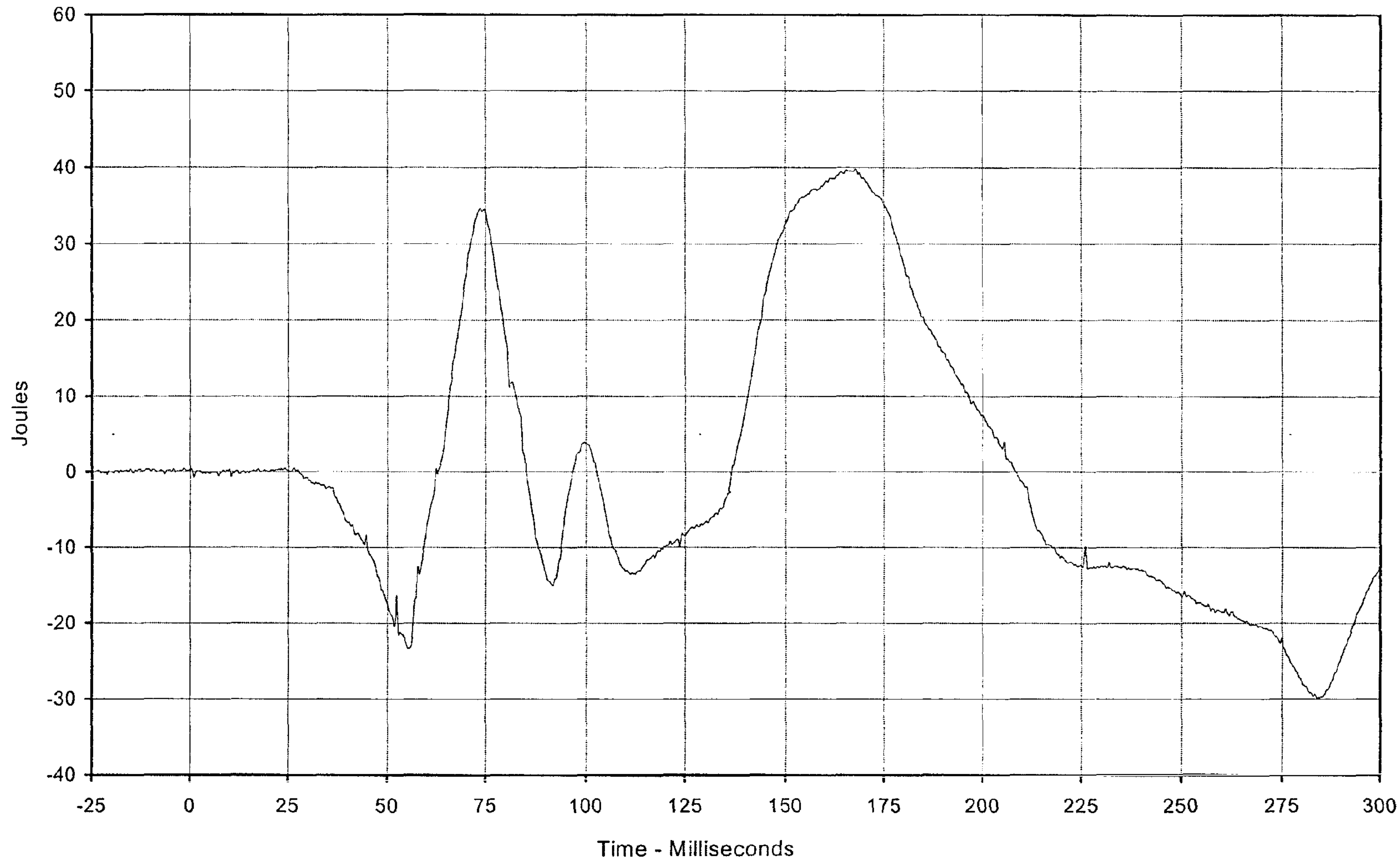
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Neck Moment X			
Maximum Value:	9.2	at	90.9	Milliseconds
Minimum Value:	-16.6	at	135.8	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-054			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Neck Moment Y			
Maximum Value:	39.8	at	167.8	Milliseconds
Minimum Value:	-29.9	at	283.9	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-055			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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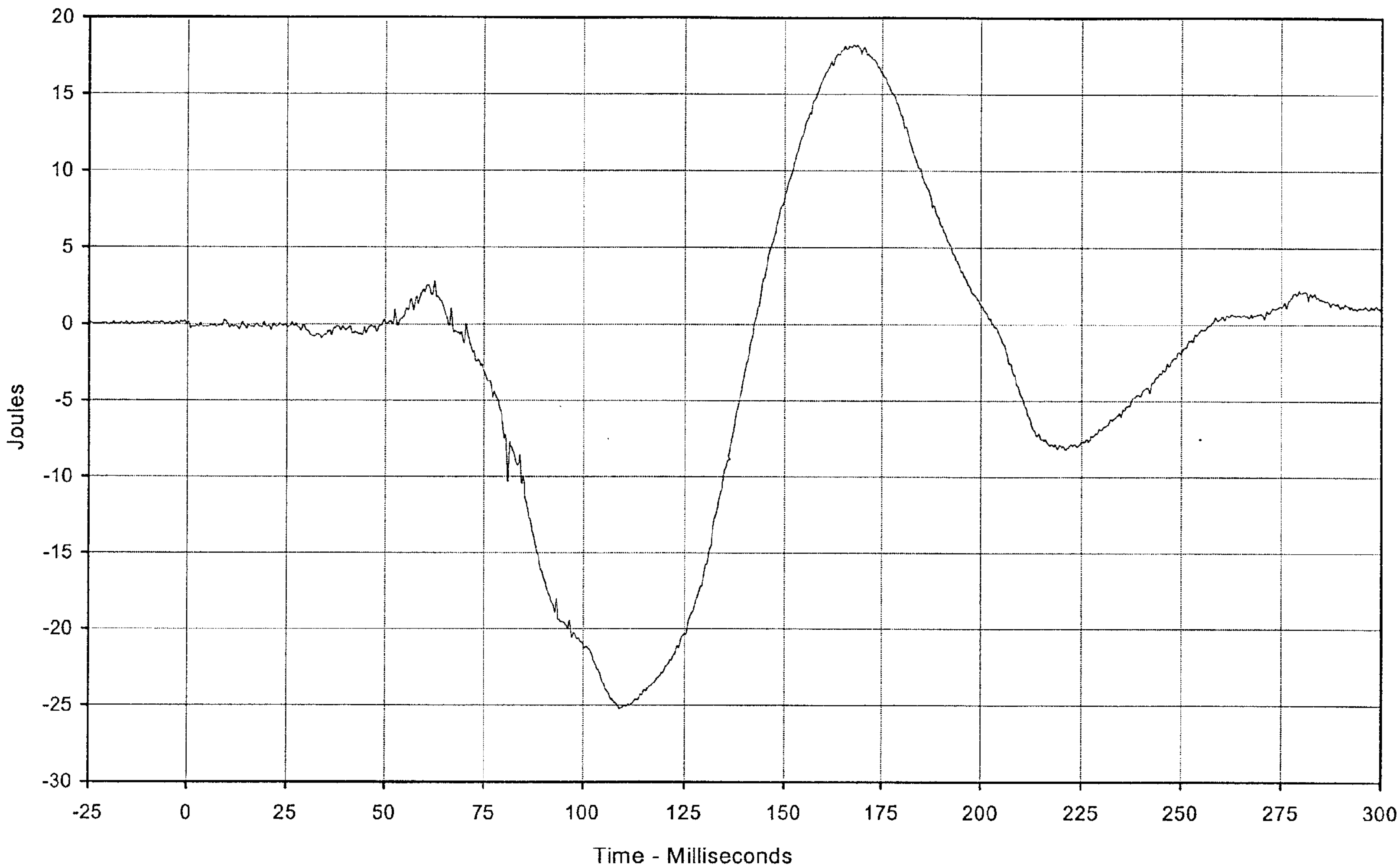

Curve Description:	Passenger Neck Moment Z			Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	18.2	at	168.5 Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	-25.2	at	109.2 Milliseconds		
SAE Filter Class:	600				
Date of Test:	1/8/98				
Curve Number:	FIL-056				

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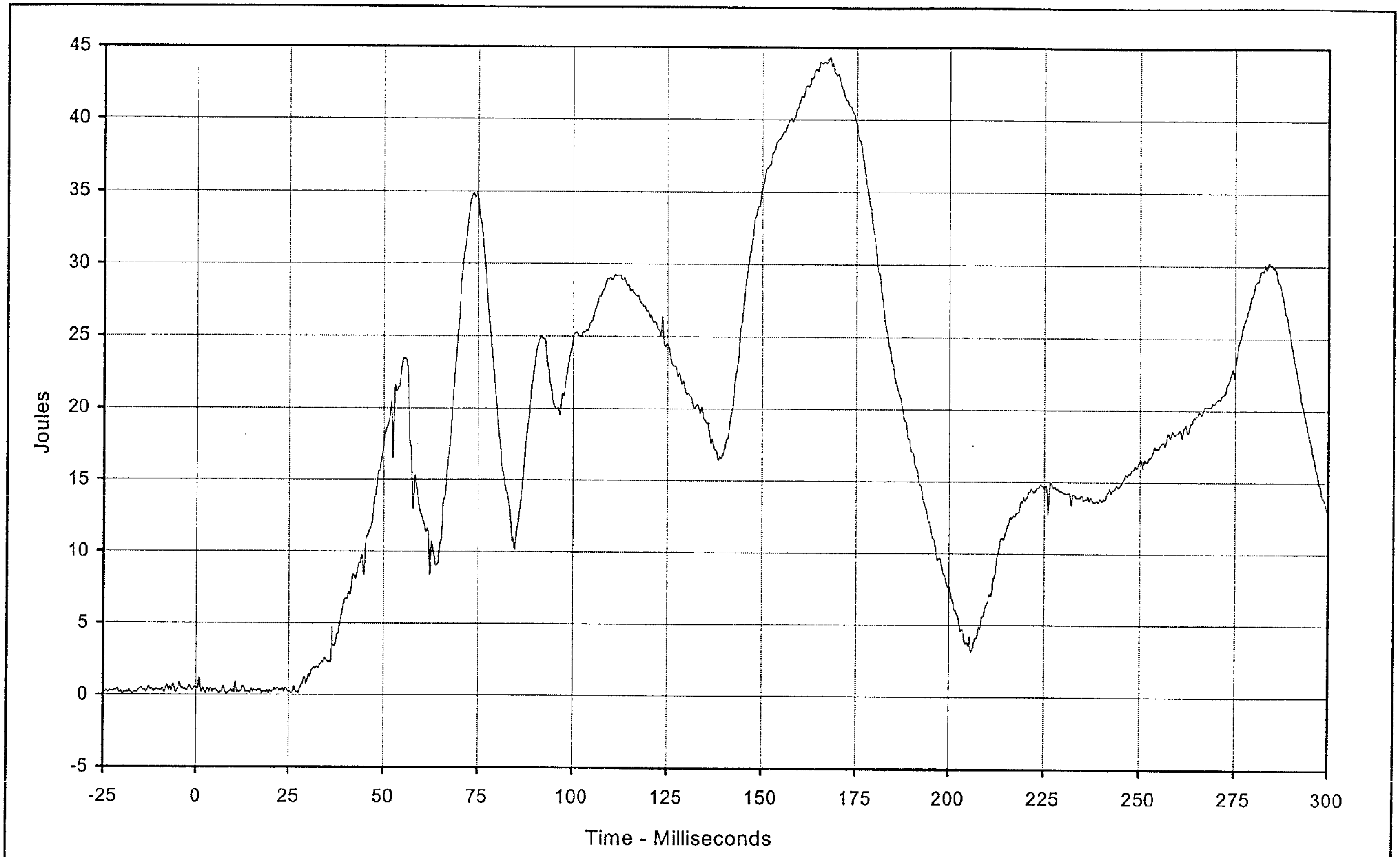

Curve Description:	Passenger Neck Moment Resultant			
Maximum Value:	44.3	at	167.7	Milliseconds
Minimum Value:	0.0	at	8.3	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	RES-054			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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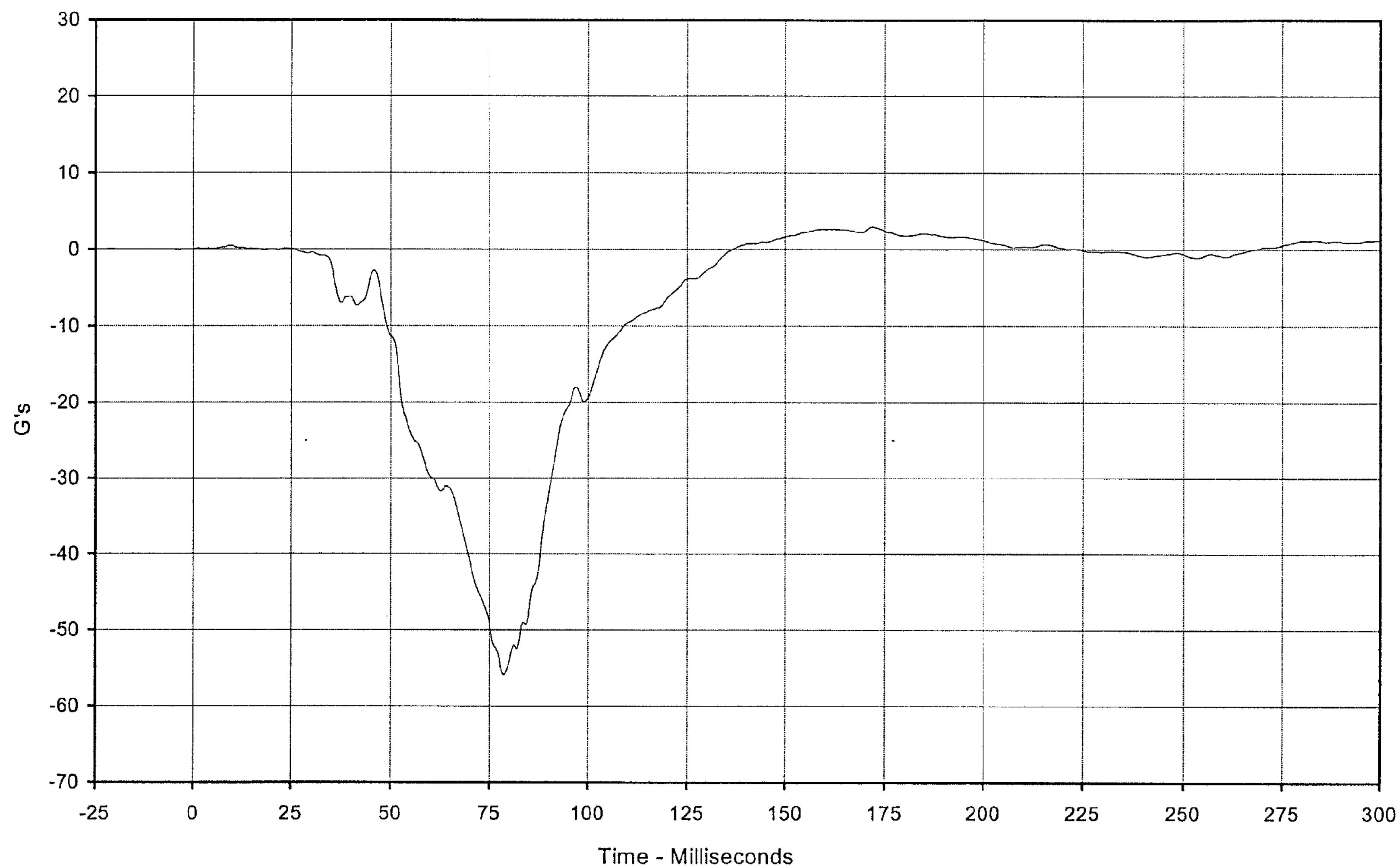
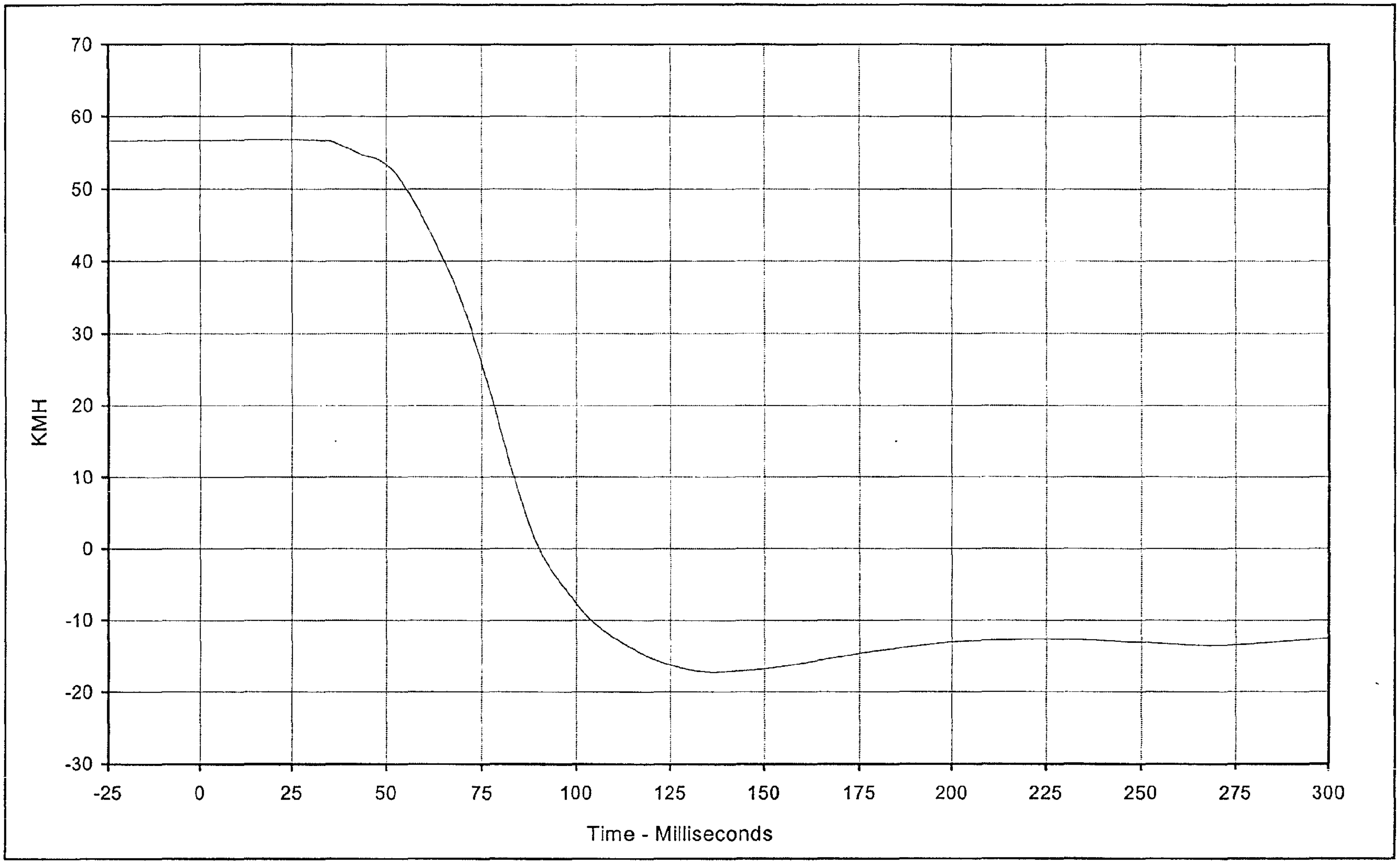


Curve Description:	Passenger Chest Primary X			
Maximum Value:	3.0	at	171.9	Milliseconds
Minimum Value:	-55.9	at	78.6	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-057			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

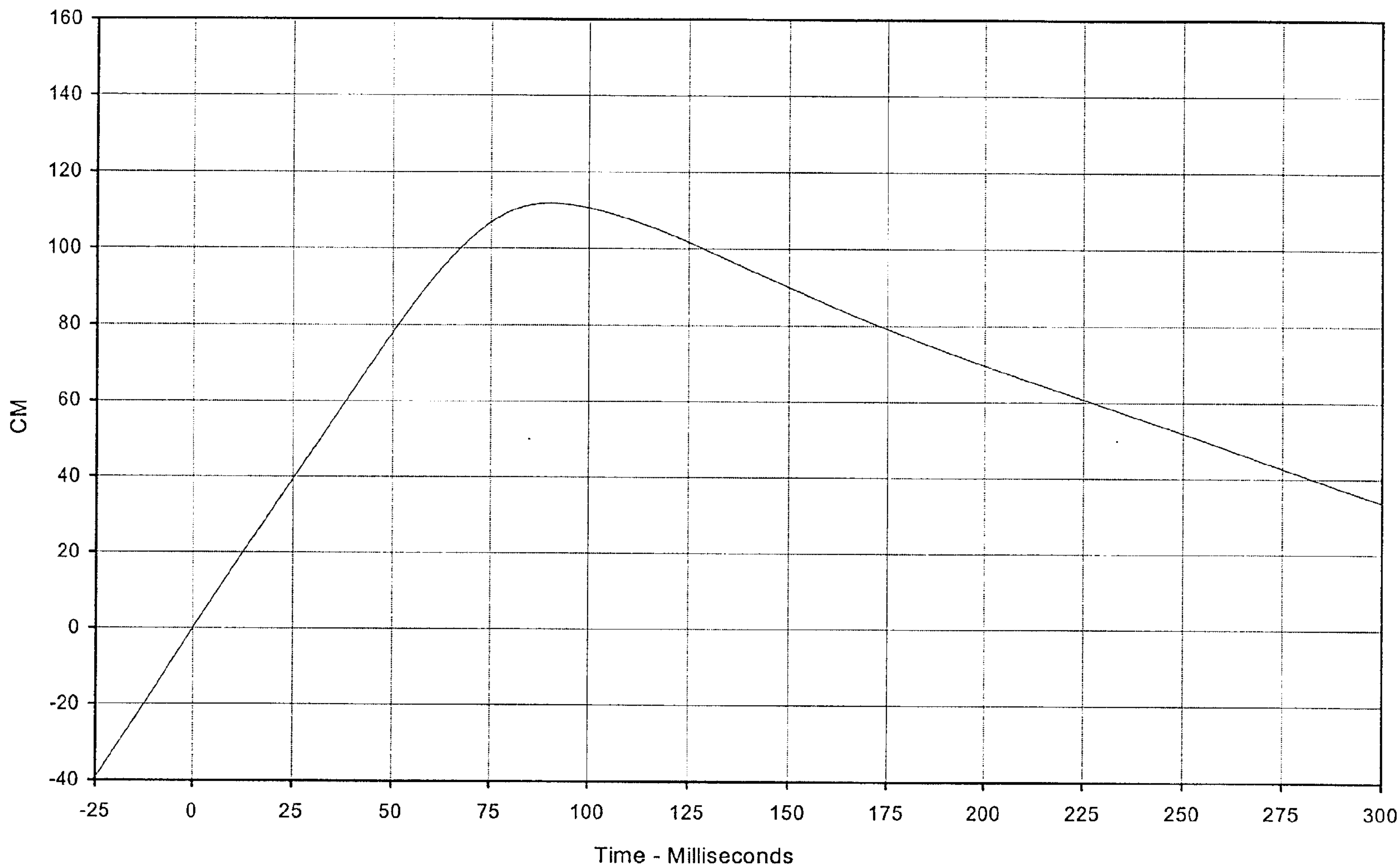
Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Passenger Chest Primary X Velocity				Testing Program	1988 NHTSA 35 mph NCAP	No.: MW0103
Maximum Value:	56.8	at	26.0	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV	
Minimum Value:	-17.2	at	136.6	Milliseconds			
SAE Filter Class:	180						
Date of Test:	1/8/98						
Curve Number:	IN1-057						

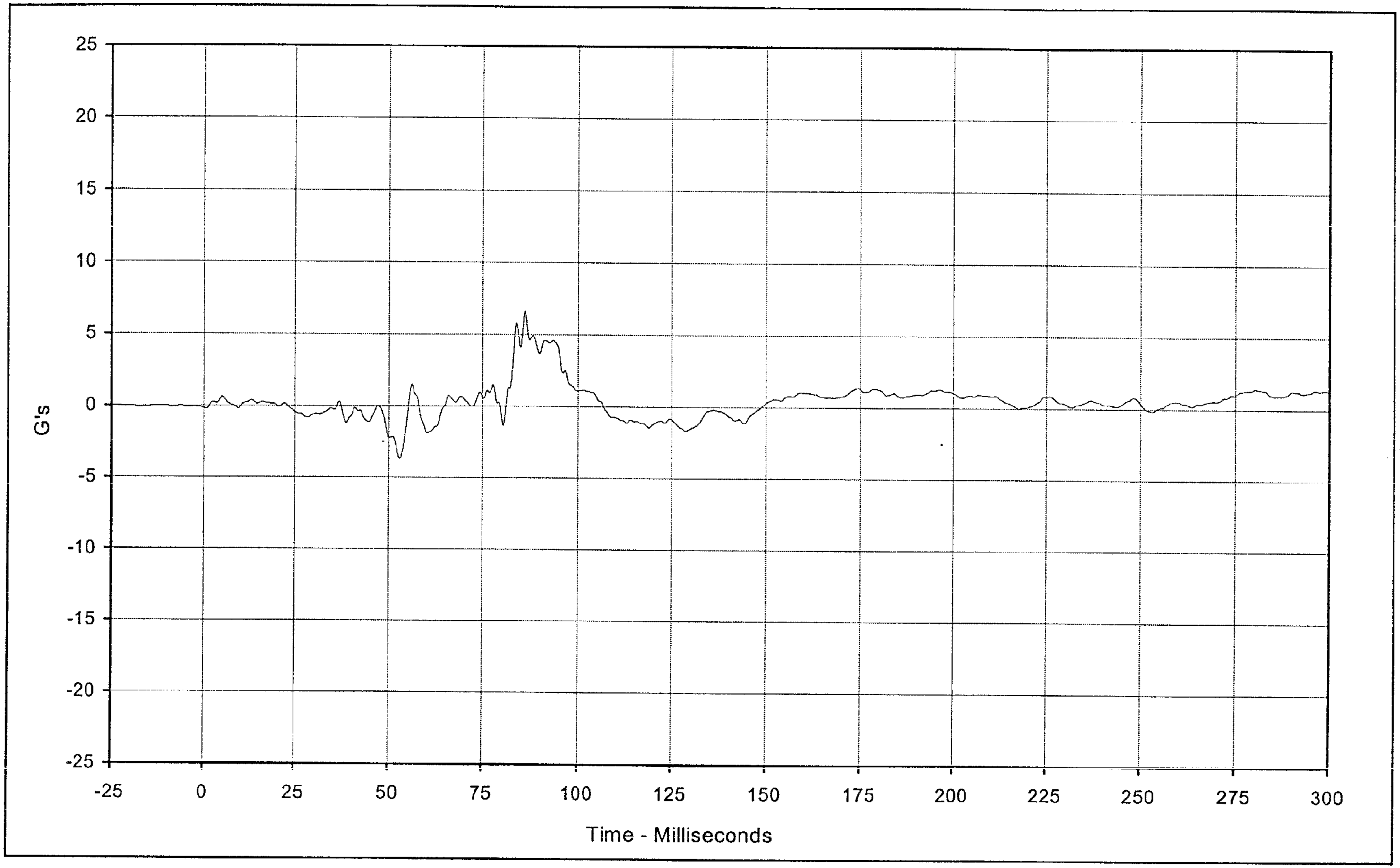
KARC Engineering



Curve Description:	Passenger Chest Primary X Displ.			
Maximum Value:	111.8	at	90.1	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-057			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

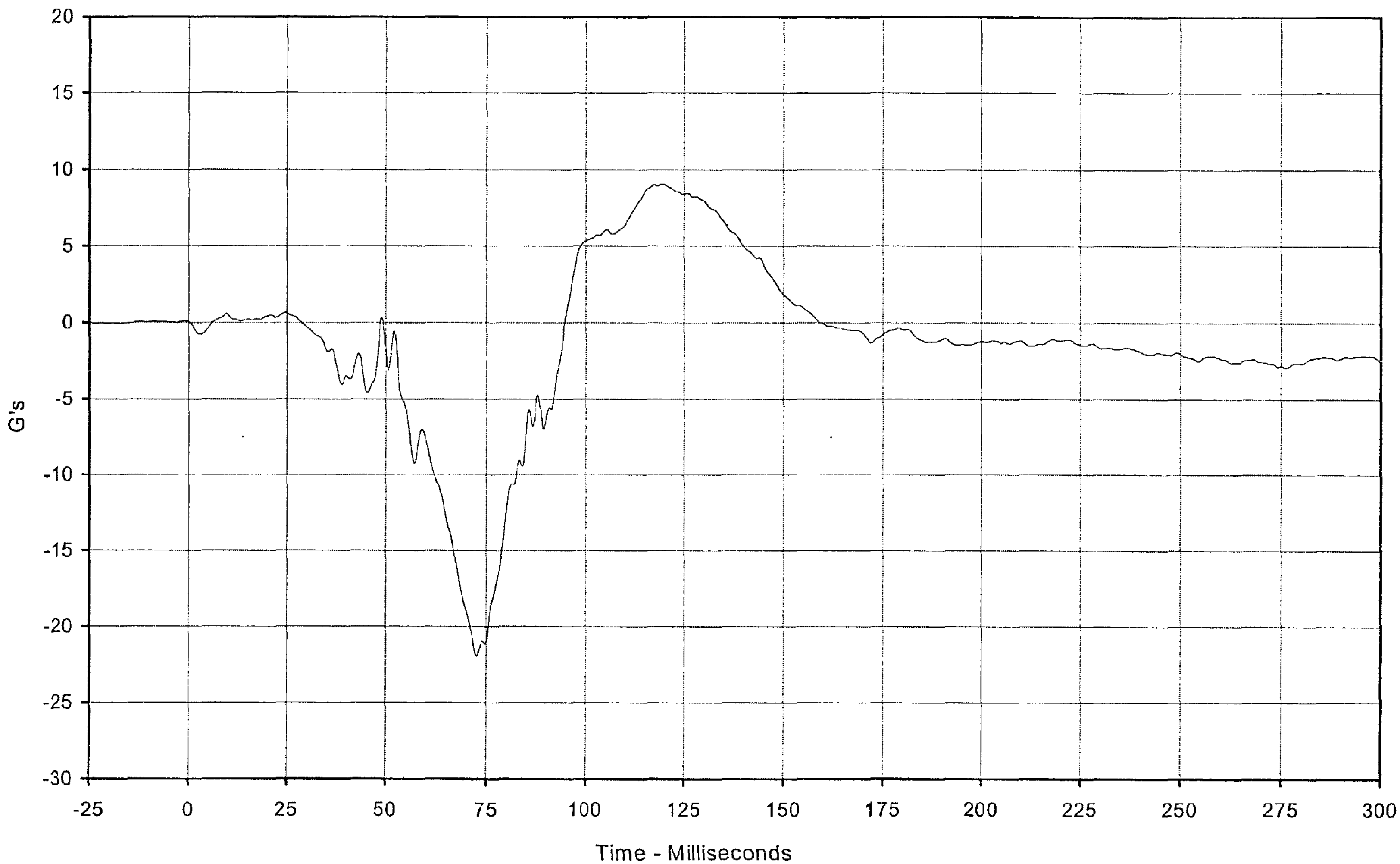
KARC Engineering



Curve Description:	Passenger Chest Primary Y			
Maximum Value:	6.7	at	85.8	Milliseconds
Minimum Value:	-3.7	at	52.9	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-058			

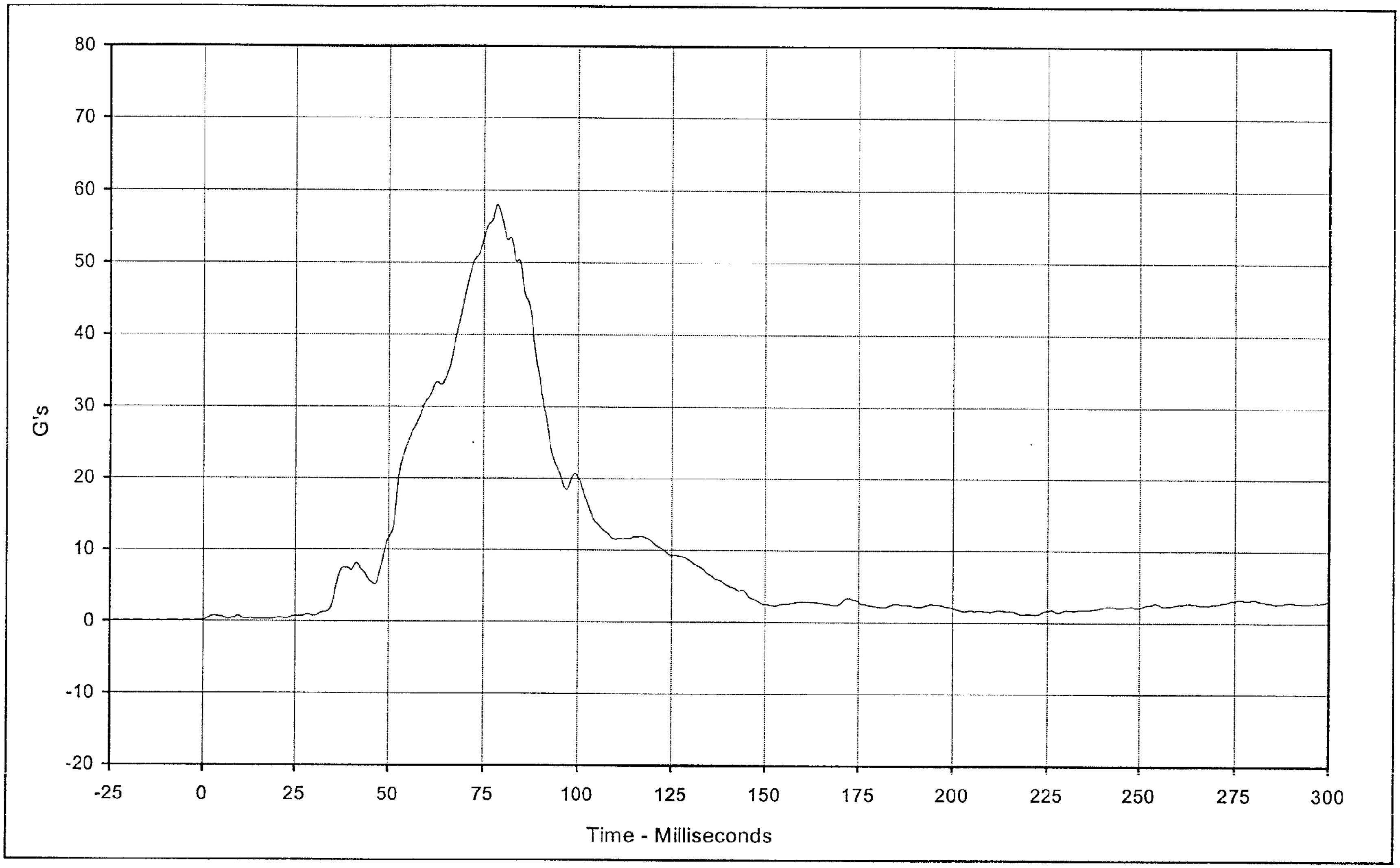
Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Chest Primary Z				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	9.0	at	119.2	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	-21.9	at	72.5	Milliseconds		
SAE Filter Class:	180					
Date of Test:	1/8/98					
Curve Number:	FIL-059					

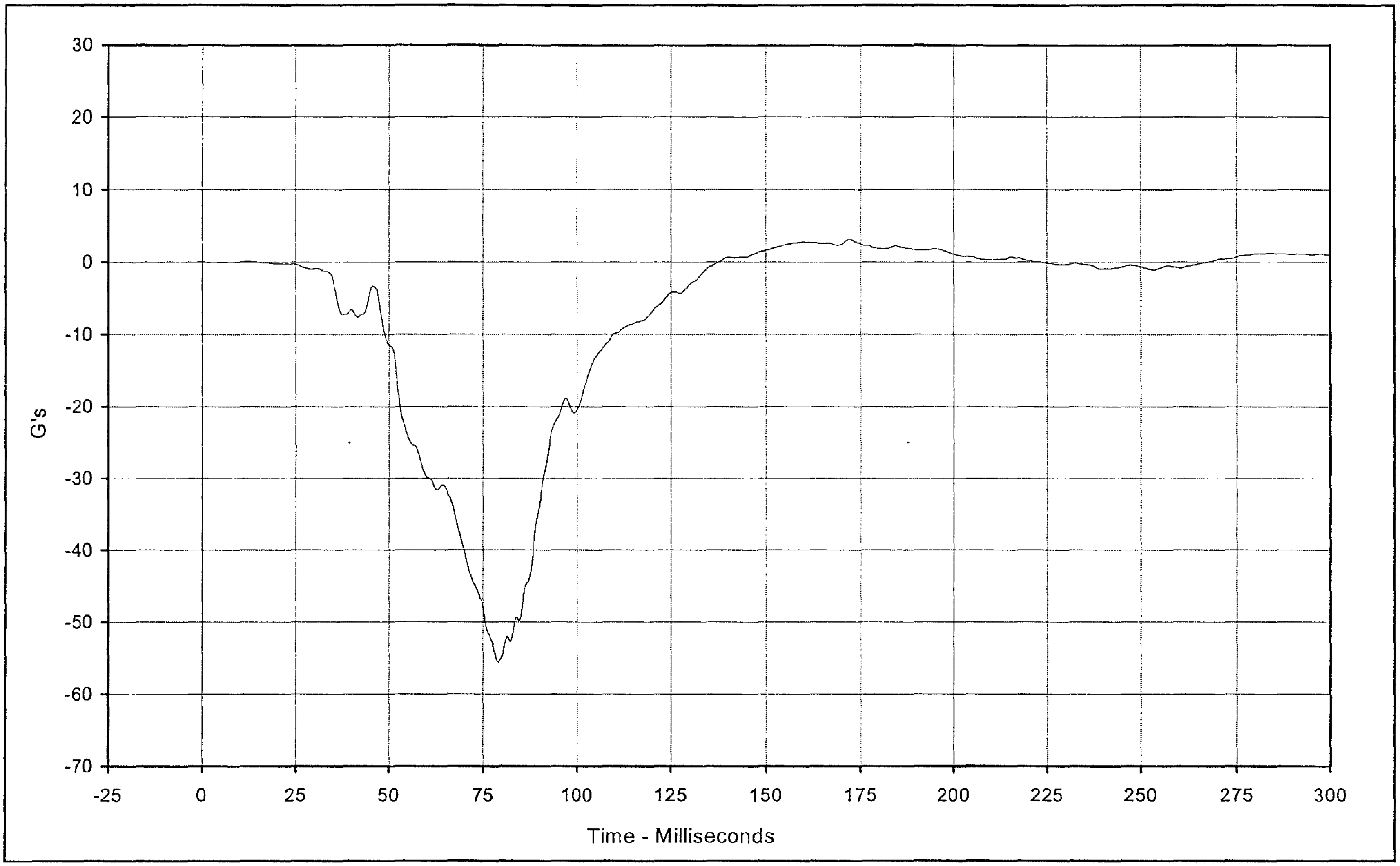
KARC Engineering



Curve Description:	Passenger Chest Resultant Primary			
Maximum Value:	58.0	at	78.5	Milliseconds
Minimum Value:	0.2	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	RES-057			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Chest Redundant X			
Maximum Value:	3.1	at	172.2	Milliseconds
Minimum Value:	-55.6	at	78.8	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-060			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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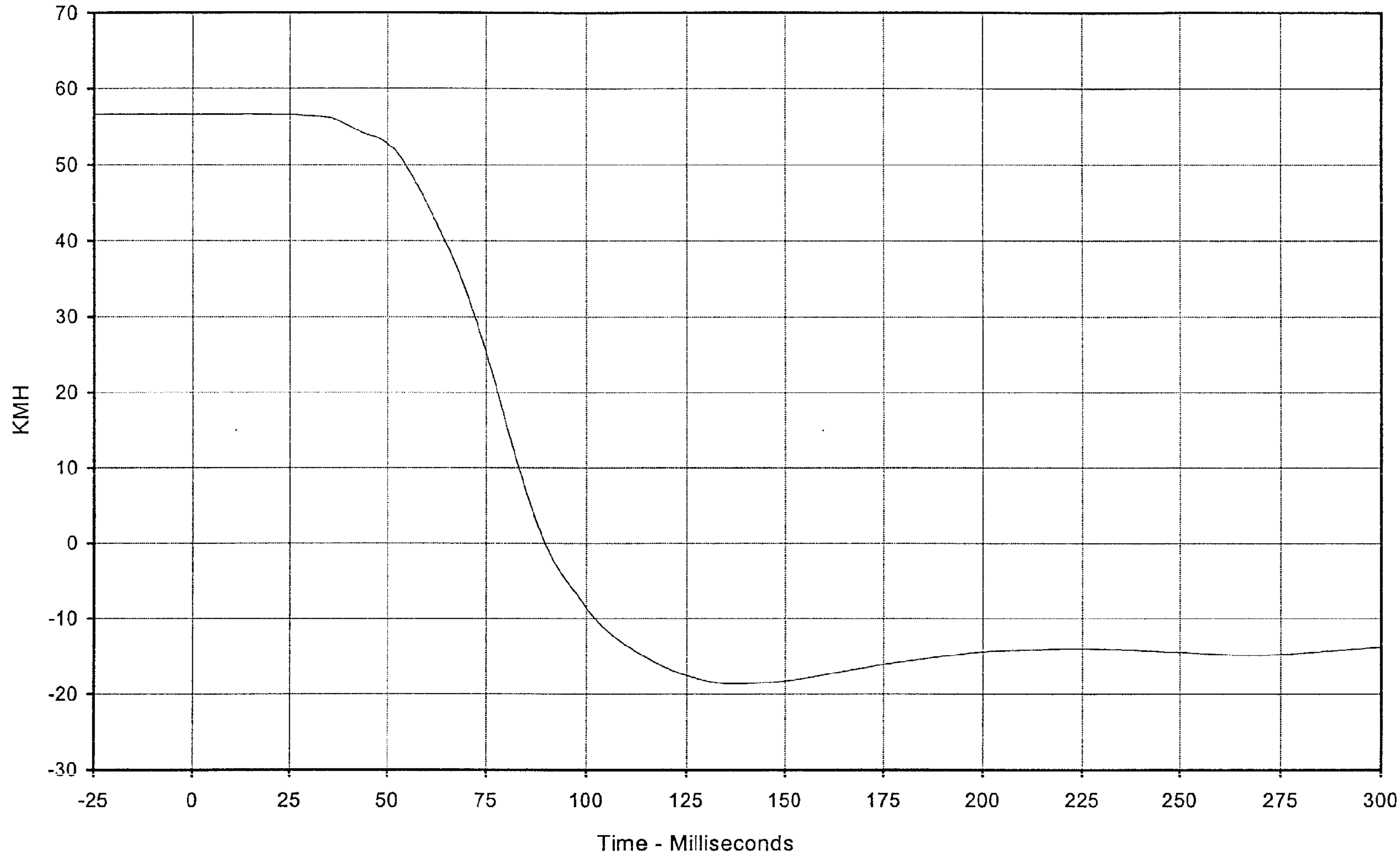
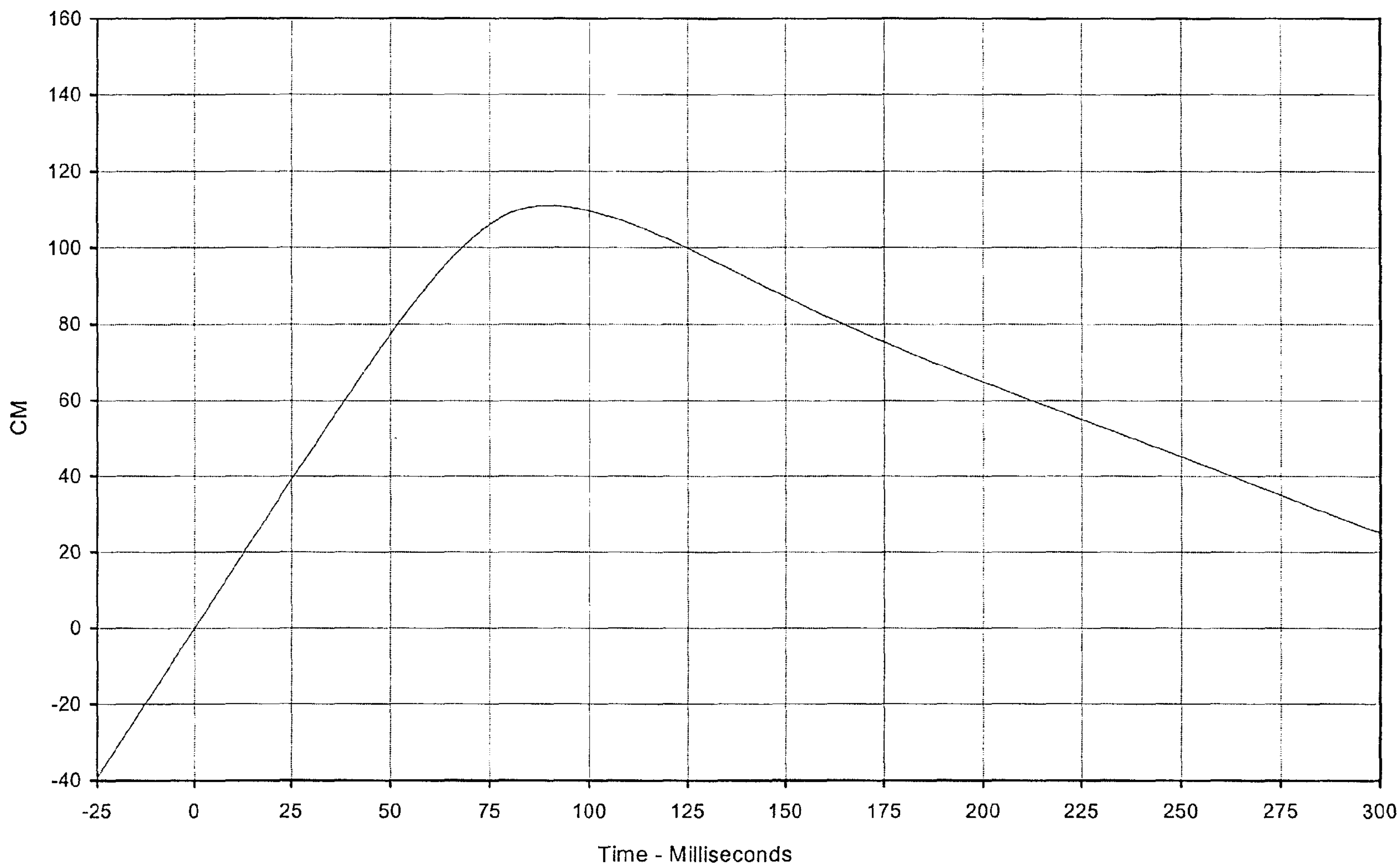


Curve Description:	Passenger Chest Redundant X Velocity			
Maximum Value:	56.6	at	14.8	Milliseconds
Minimum Value:	-18.6	at	137.7	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-060			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Passenger Chest Redundant X Displ.			
Maximum Value:	111.0	at	89.7	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-060			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

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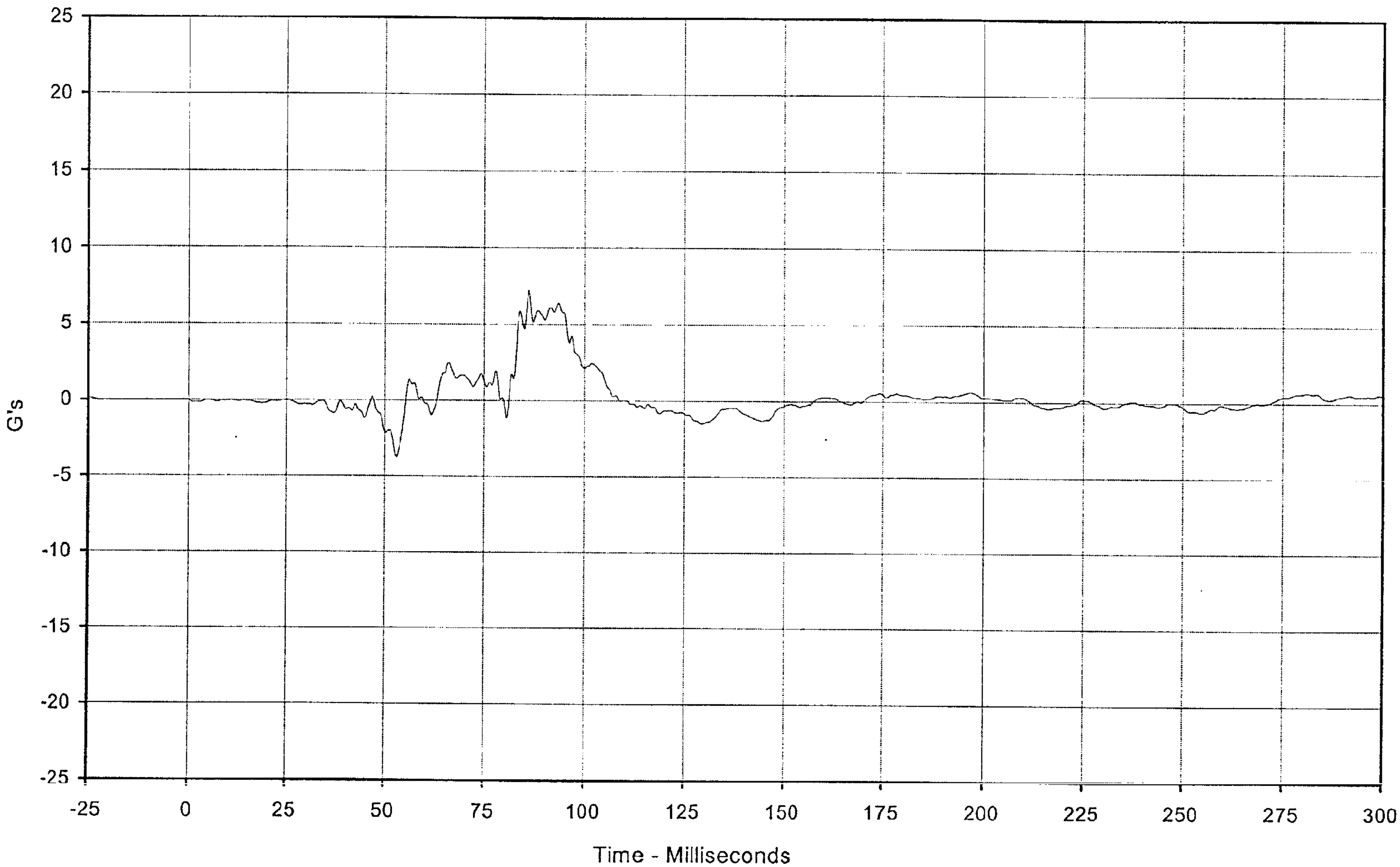
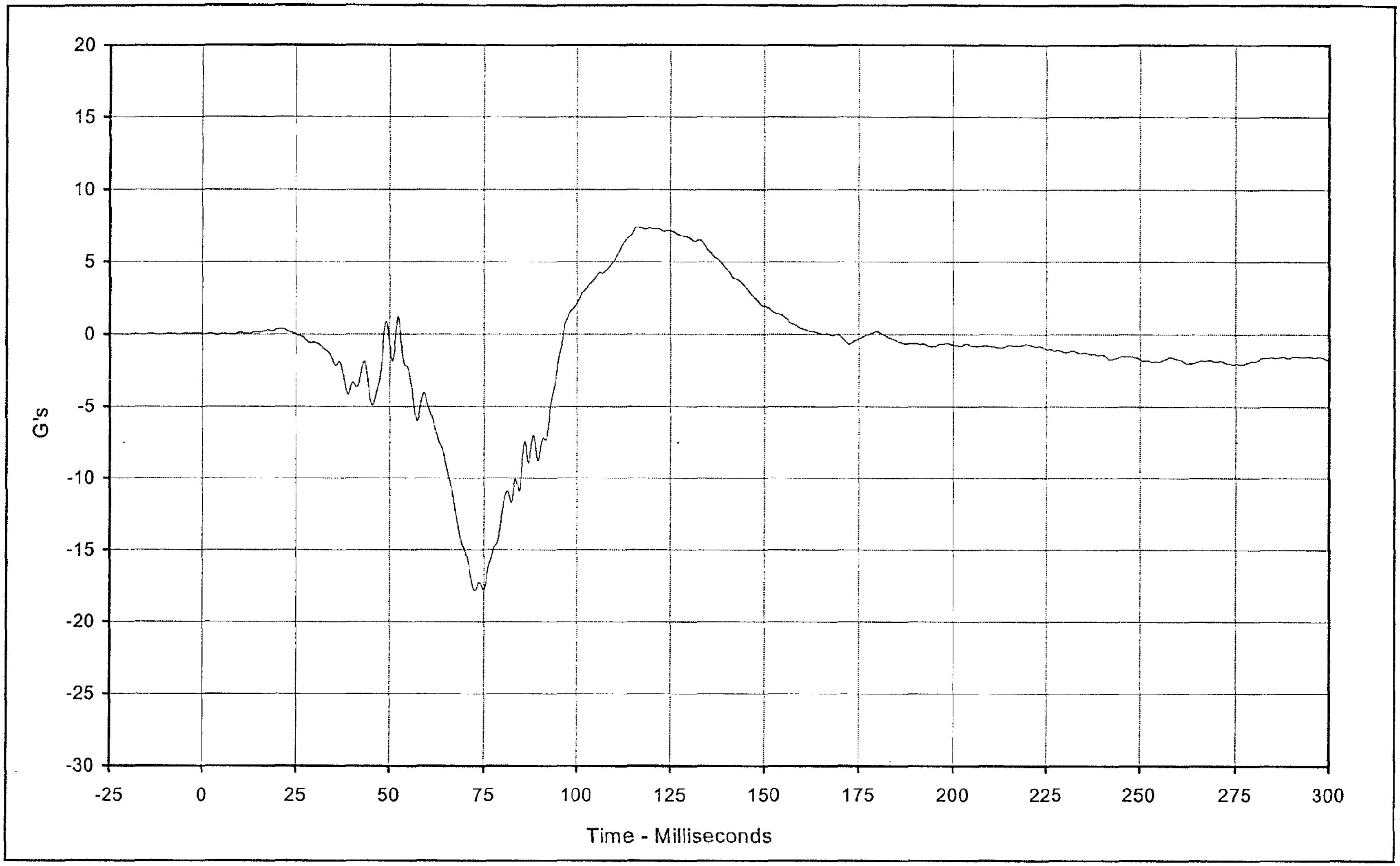


Curve Description:	Passenger Chest Redundant Y			
Maximum Value:	7.2	at	85.9	Milliseconds
Minimum Value:	-3.8	at	53.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-061			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

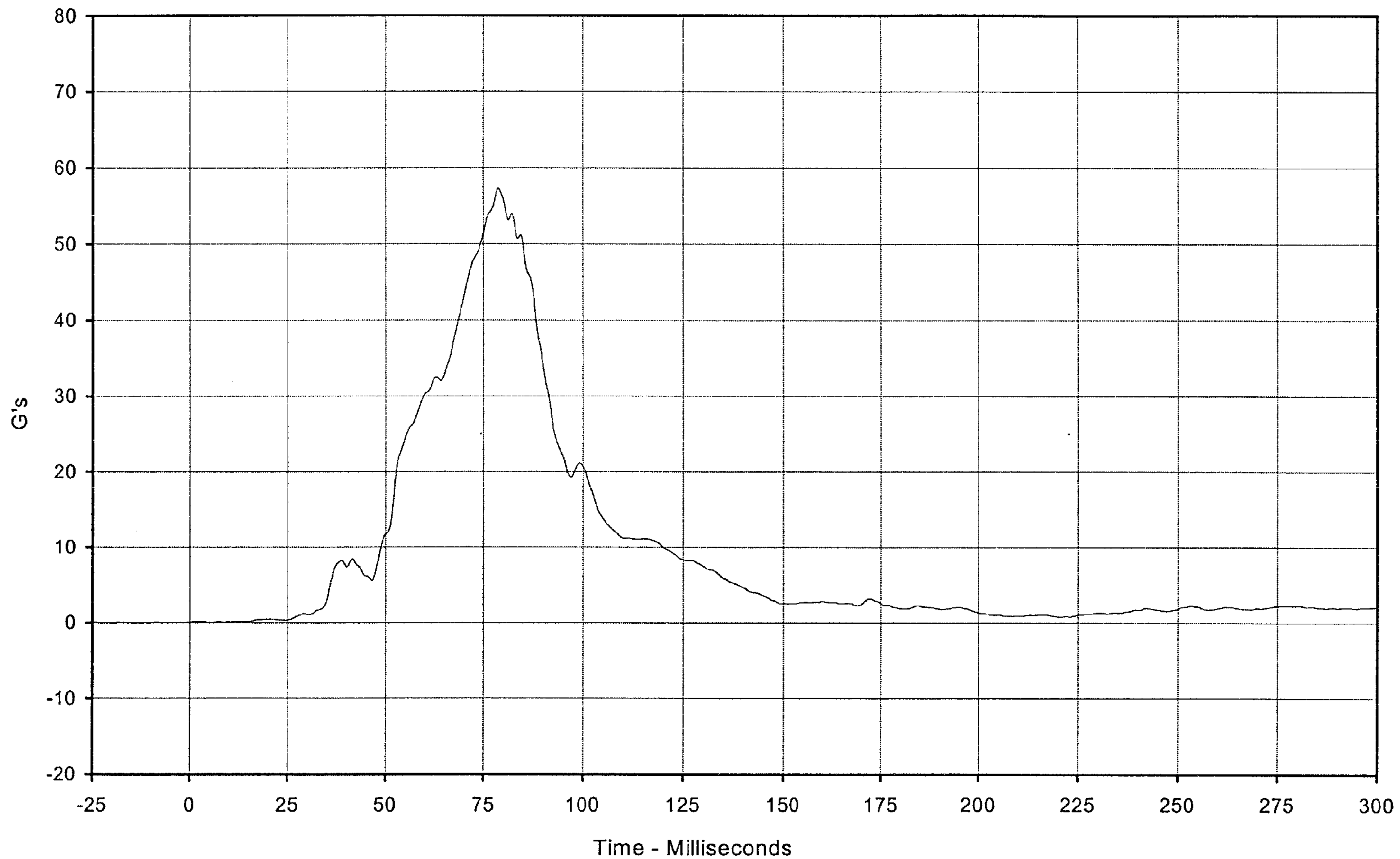
KARCO Engineering



Curve Description:	Passenger Chest Redundant Z			
Maximum Value:	7.4	at	116.0	Milliseconds
Minimum Value:	-17.8	at	72.6	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	FIL-062			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

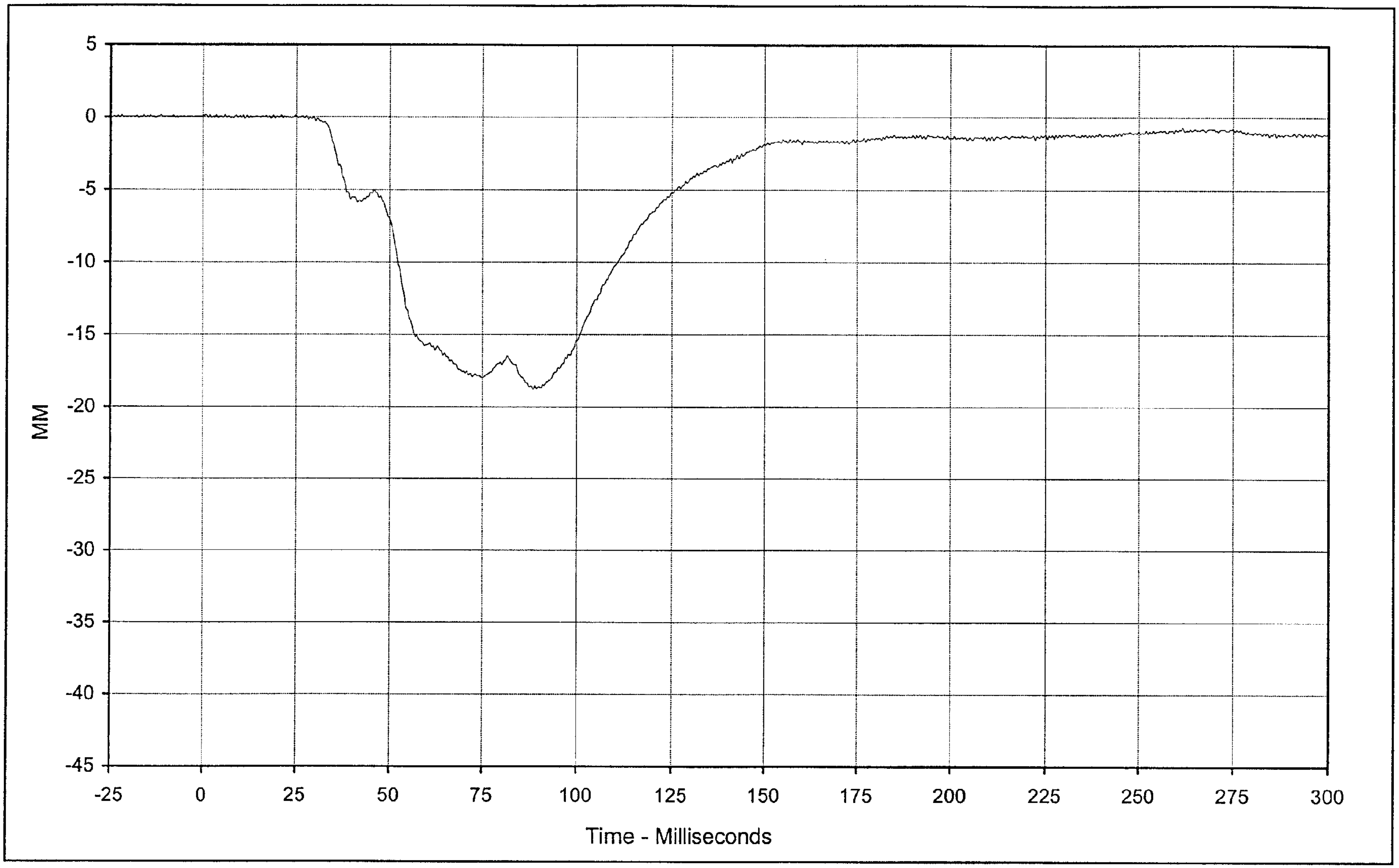
KARCO Engineering



Curve Description:	Passenger Chest Resultant Redundant			
Maximum Value:	57.3	at	78.7	Milliseconds
Minimum Value:	0.1	at	4.9	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	RES-060			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

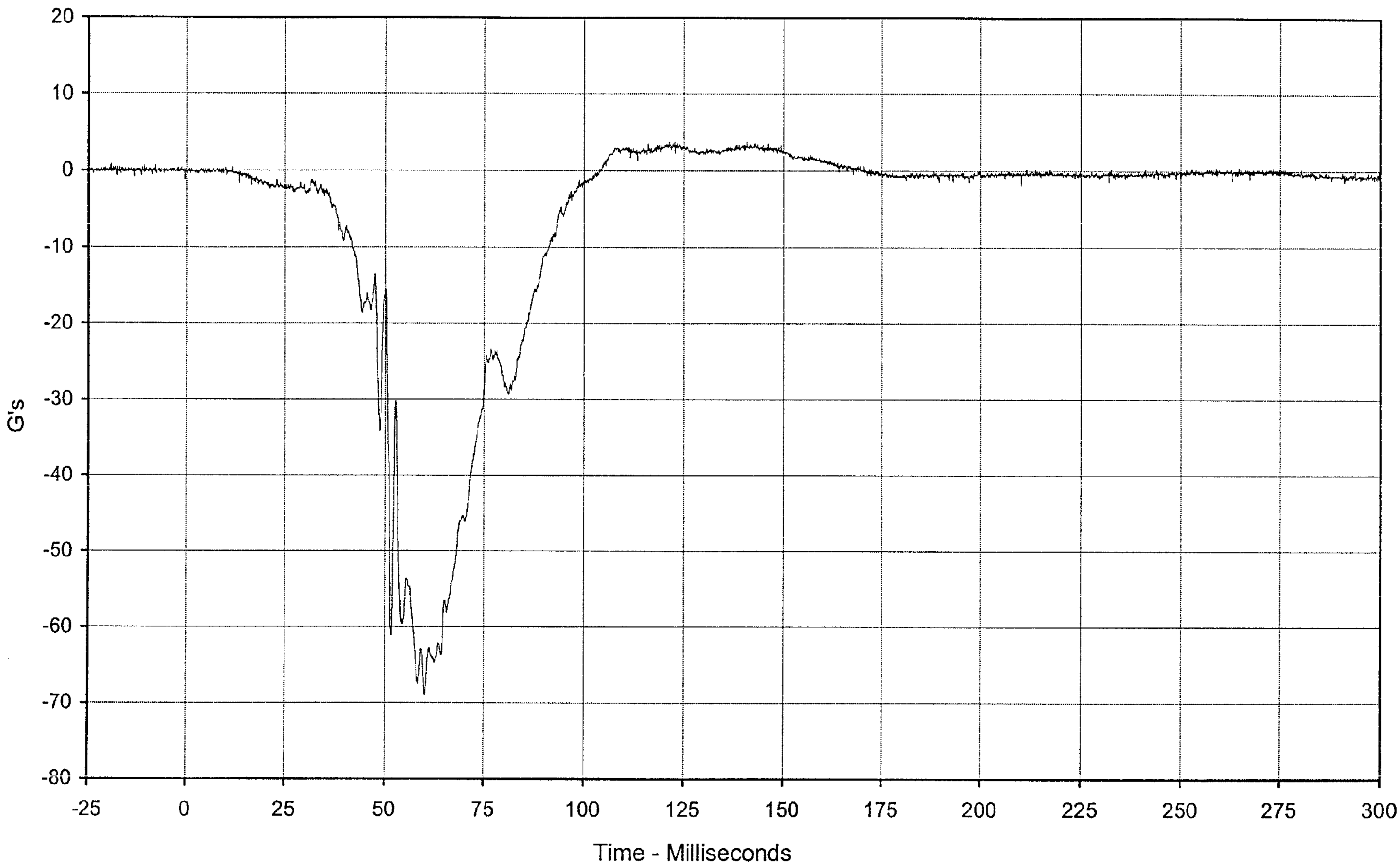
KARC Engineering



Curve Description:	Passenger Chest Displacement X			
Maximum Value:	0.1	at	5.9	Milliseconds
Minimum Value:	-18.8	at	88.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-063			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

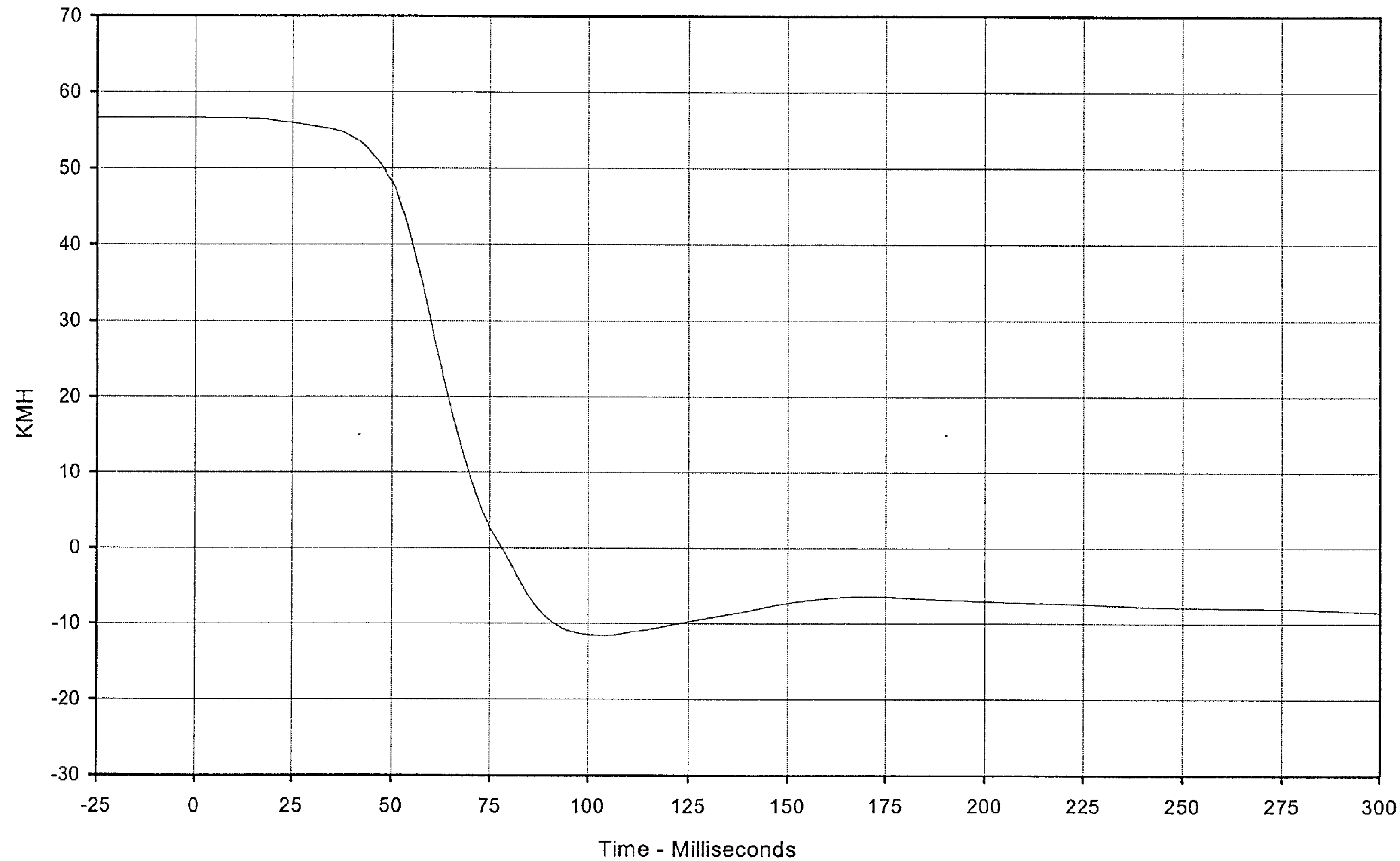


Curve Description:	Passenger Pelvis X			
Maximum Value:	3.7	at	121.3	Milliseconds
Minimum Value:	-68.9	at	60.0	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-064			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

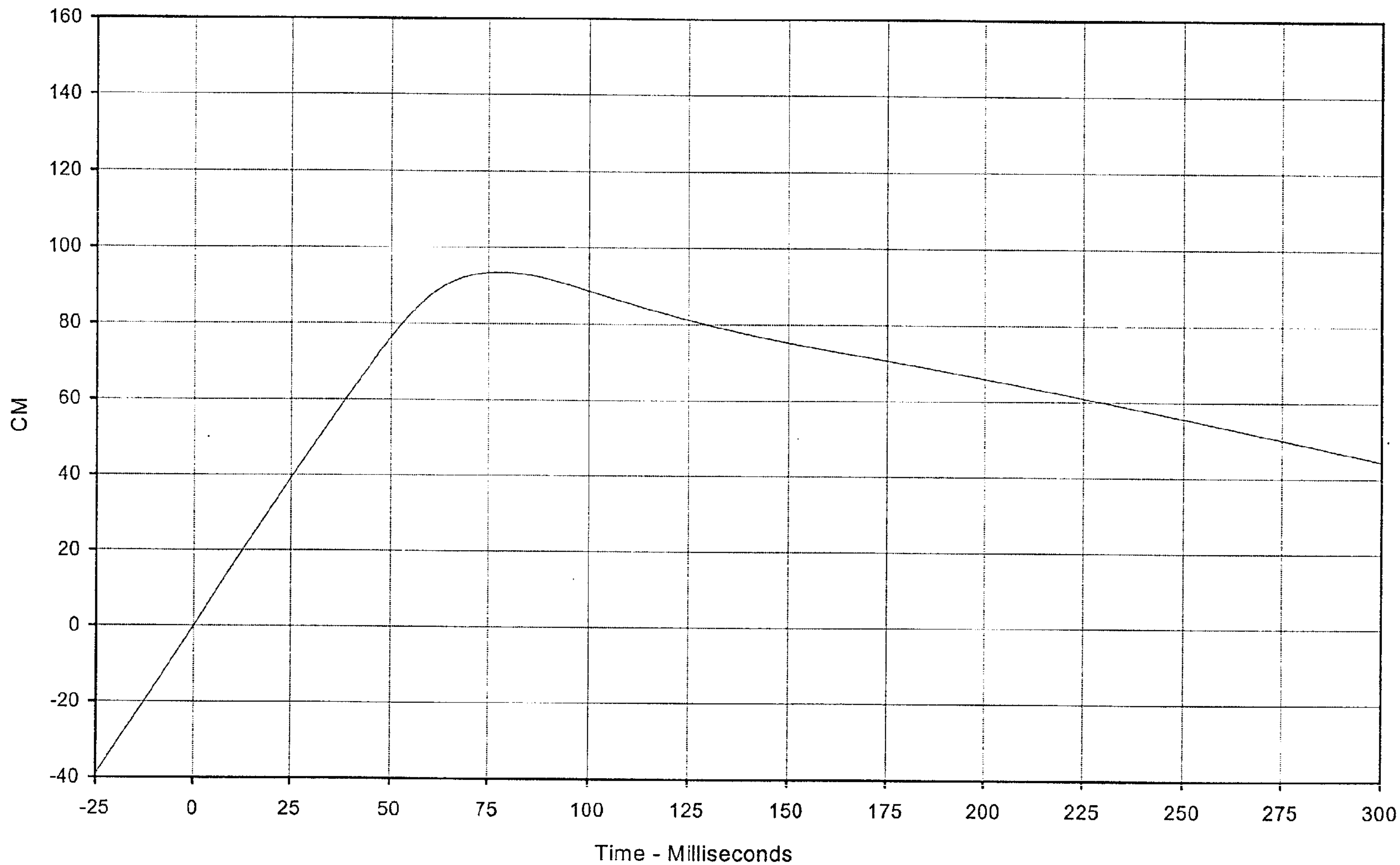
KARCO Engineering



Curve Description:	Passenger Pelvis X Velocity			
Maximum Value:	56.6	at	0.0	Milliseconds
Minimum Value:	-11.6	at	104.1	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-064			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

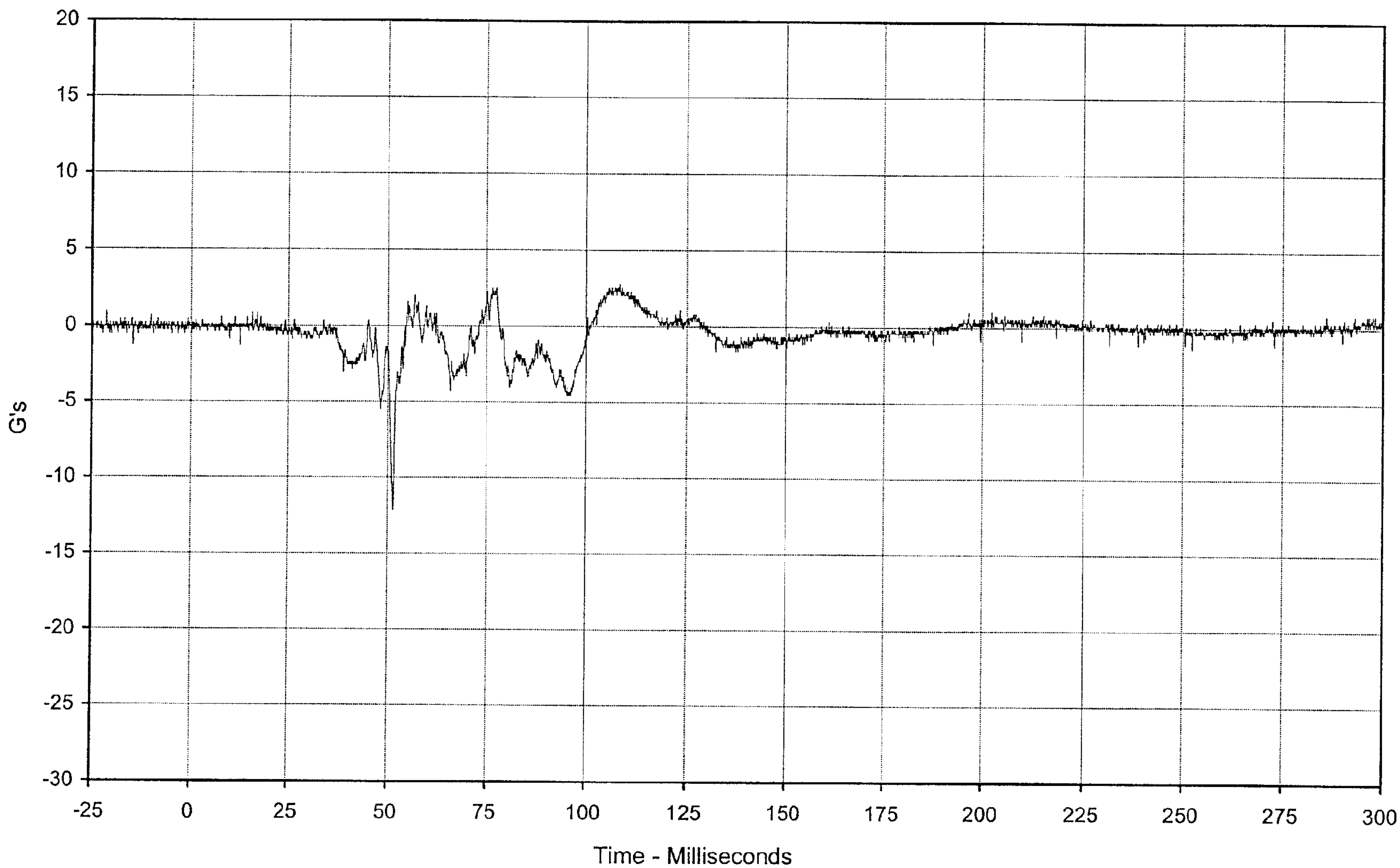


Curve Description:	Passenger Pelvis X Displ.			
Maximum Value:	93.5	at	77.9	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-064			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

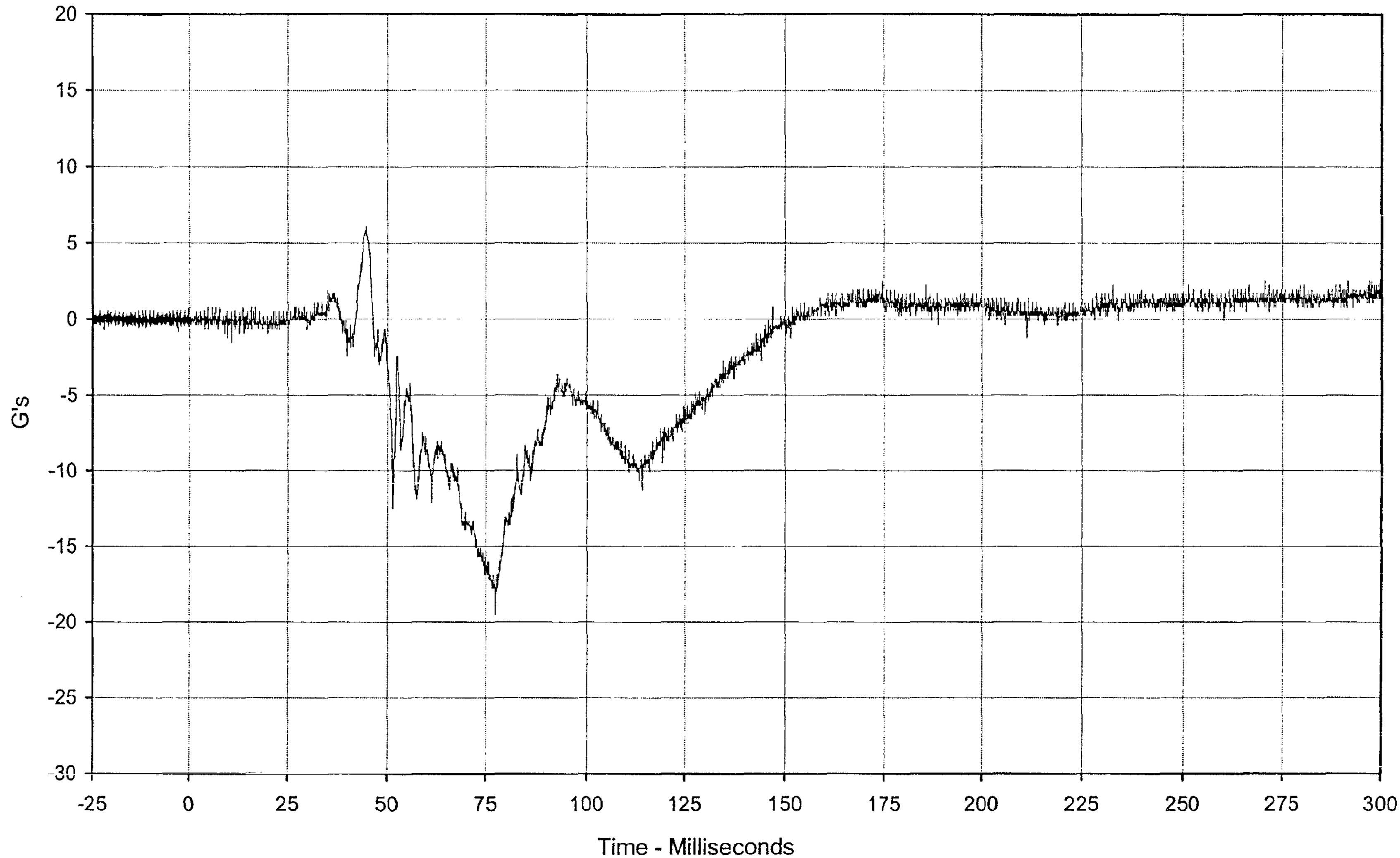


Curve Description:	Passenger Pelvis Y			
Maximum Value:	2.8	at	108.5	Milliseconds
Minimum Value:	-12.1	at	51.5	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-065			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

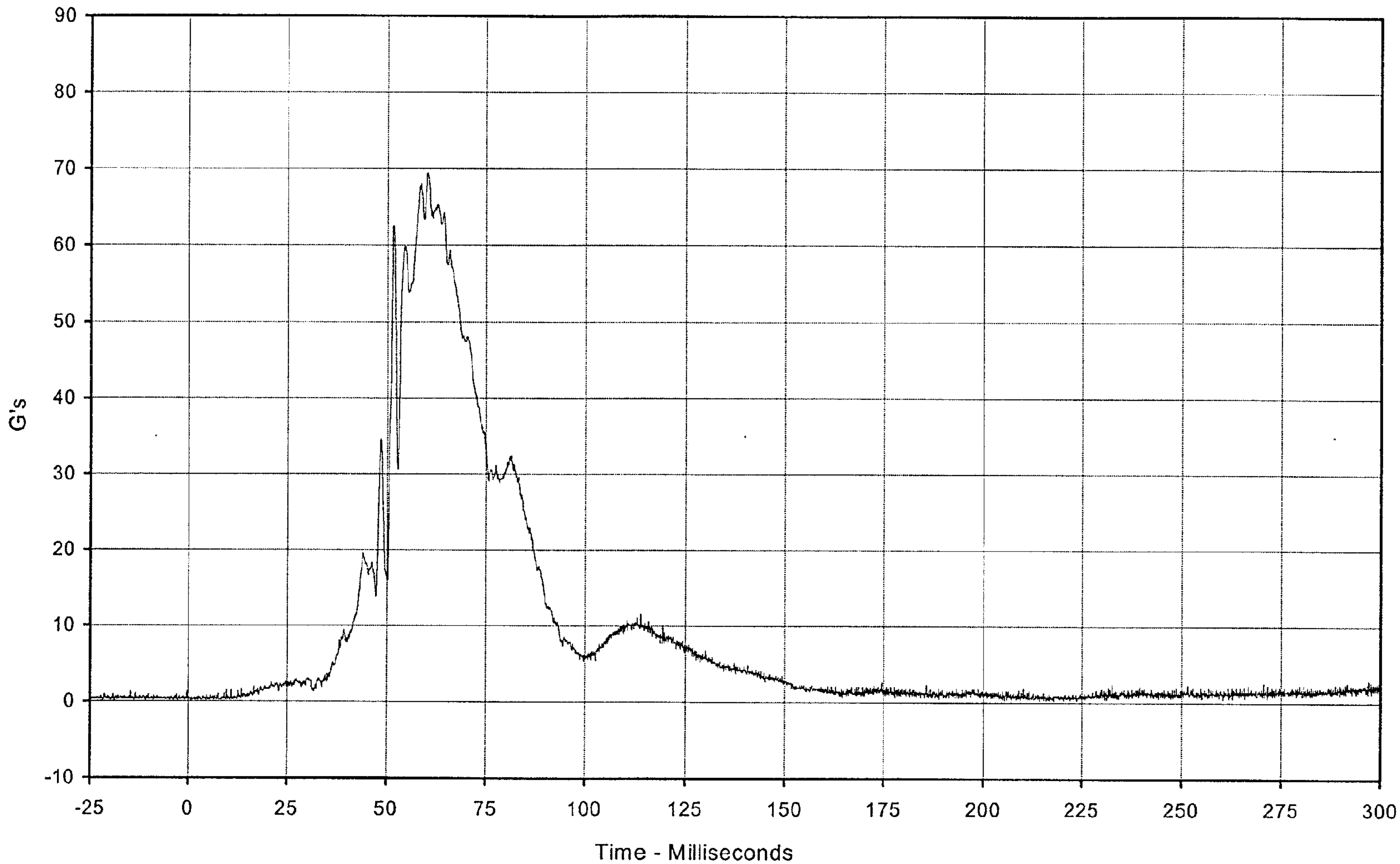


Curve Description:	Passenger Pelvis Z			
Maximum Value:	6.1	at	44.7	Milliseconds
Minimum Value:	-19.5	at	77.3	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-066			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

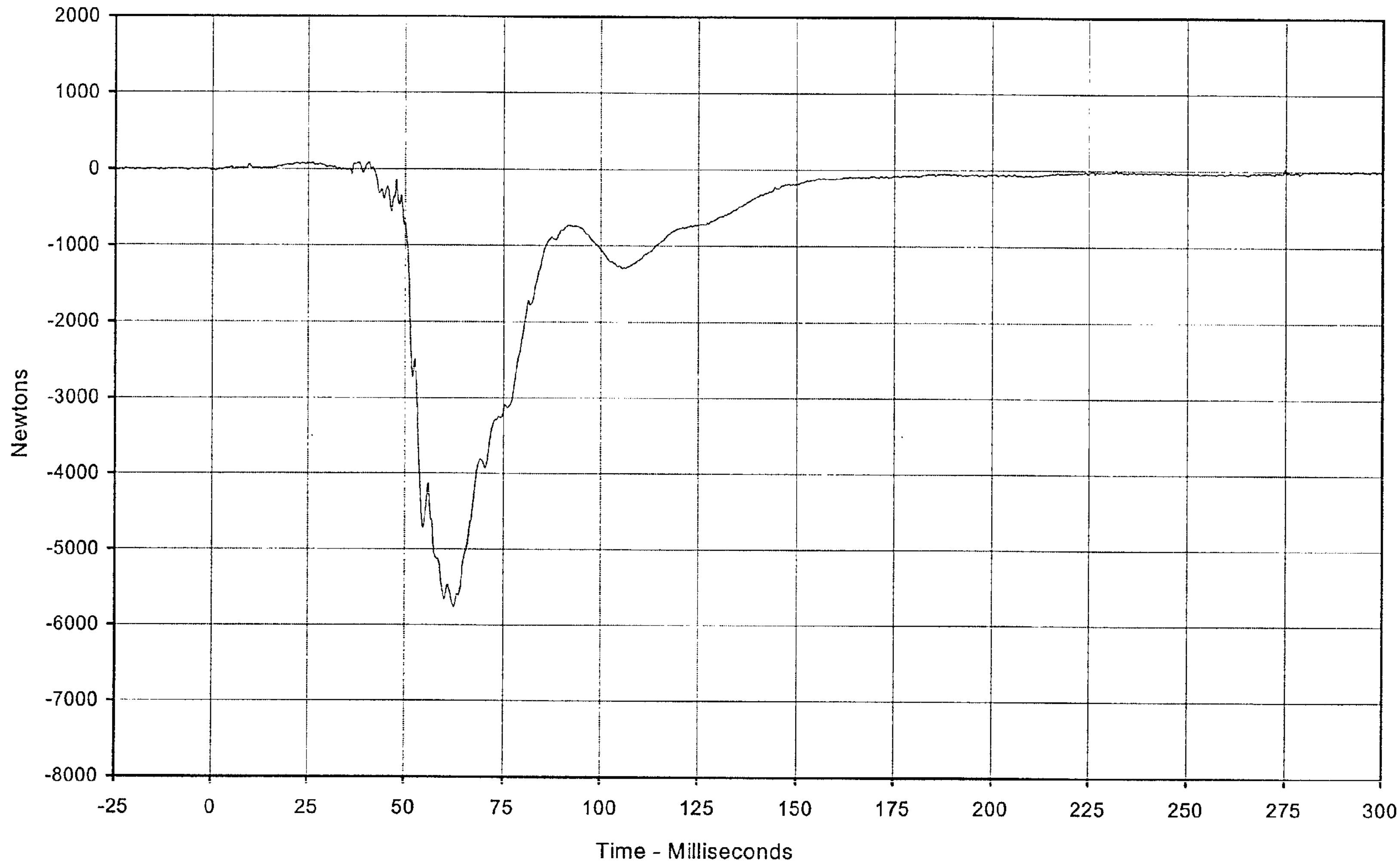
KARCO Engineering



Curve Description:	Passenger Pelvis Resultant			
Maximum Value:	69.5	at	60.0	Milliseconds
Minimum Value:	0.1	at	4.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	RES-064			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering



Curve Description: Passenger Left Femur Force

Maximum Value: 83.3 at 40.7 Milliseconds

Minimum Value: -5761.6 at 62.5 Milliseconds

SAE Filter Class: 600

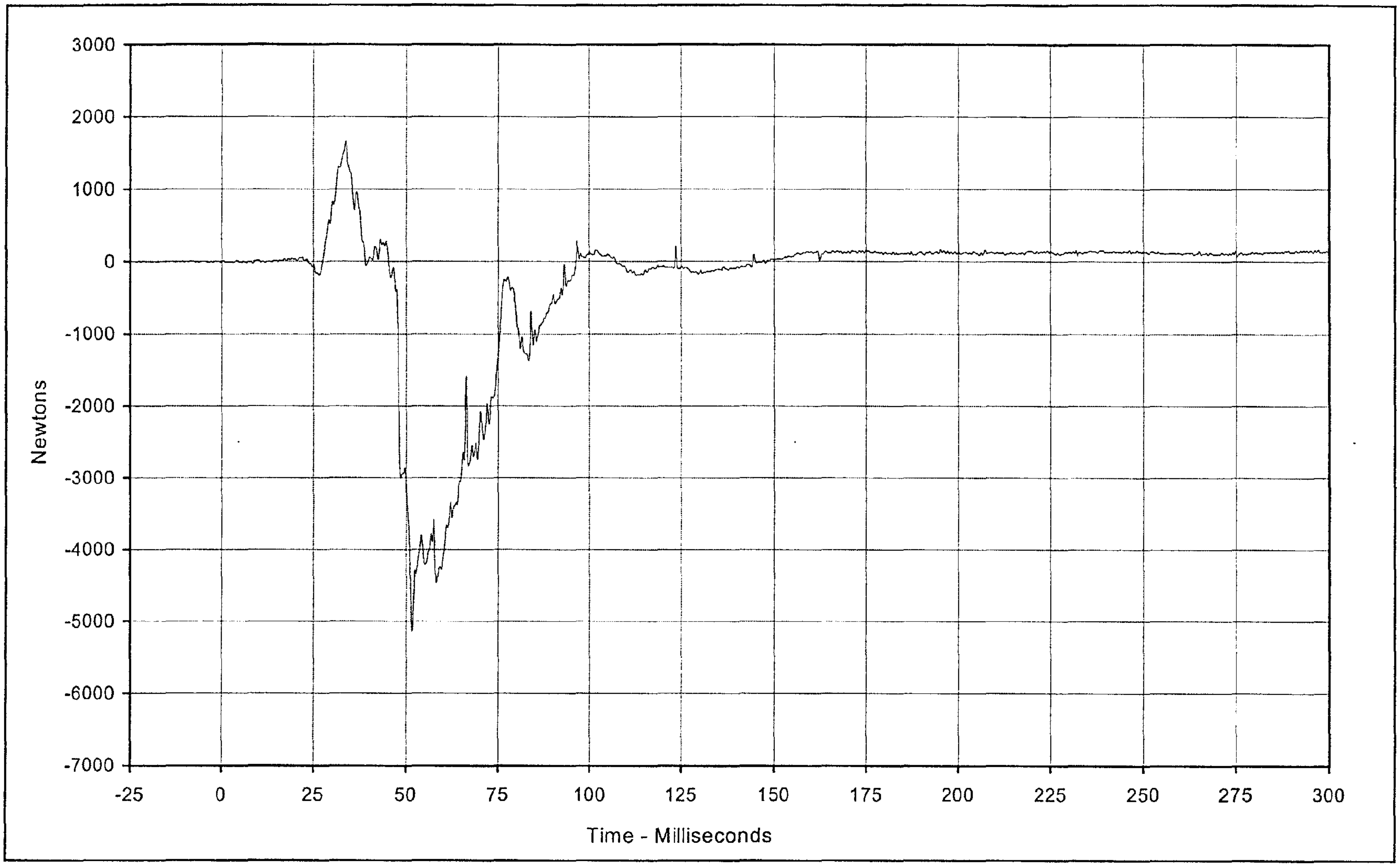
Date of Test: 1/8/98

Curve Number: FIL-067

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

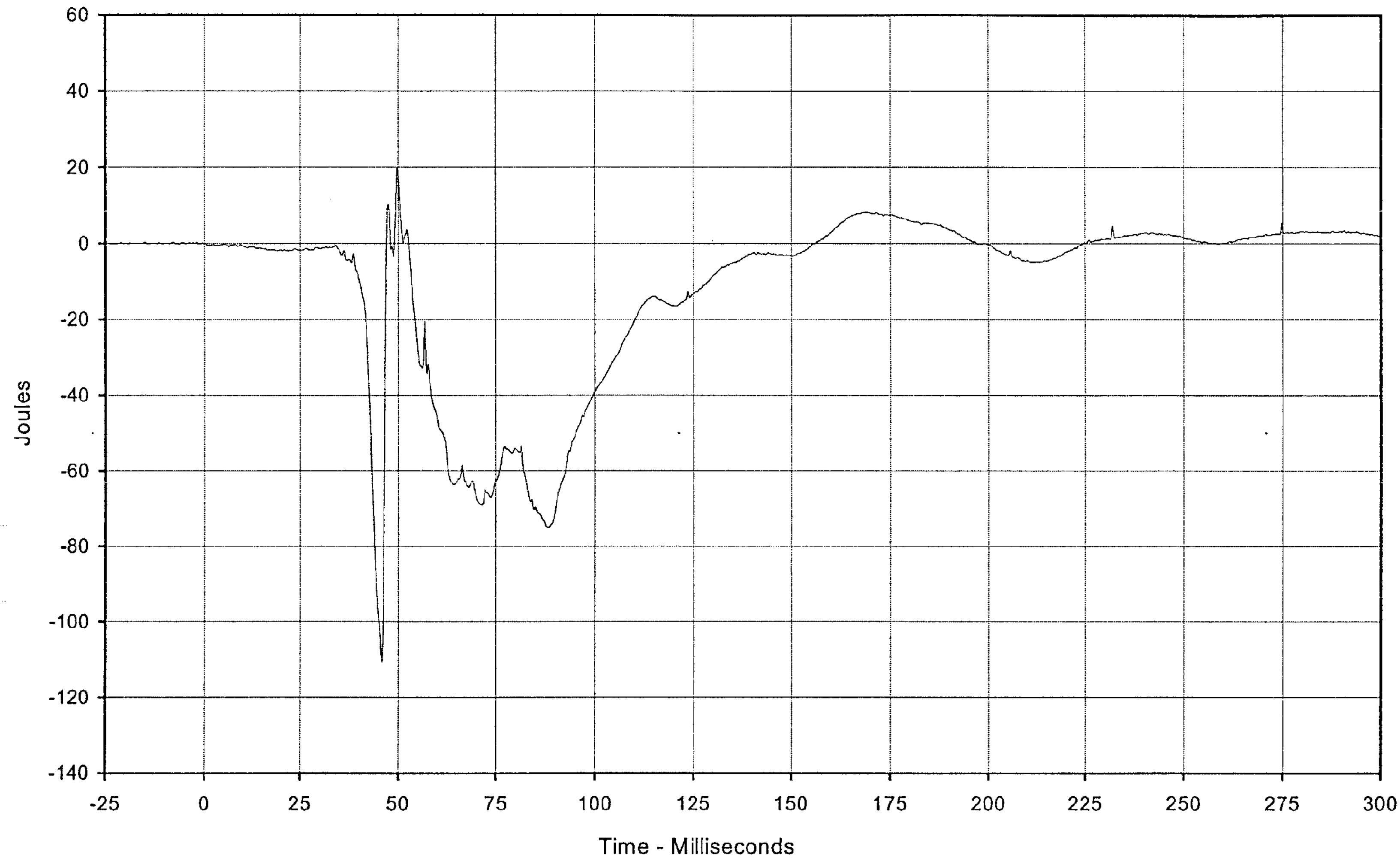
KARC Engineering



Curve Description:	Passenger Right Femur Force			
Maximum Value:	1661.3	at	33.9	Milliseconds
Minimum Value:	-5136.3	at	51.6	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-068			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

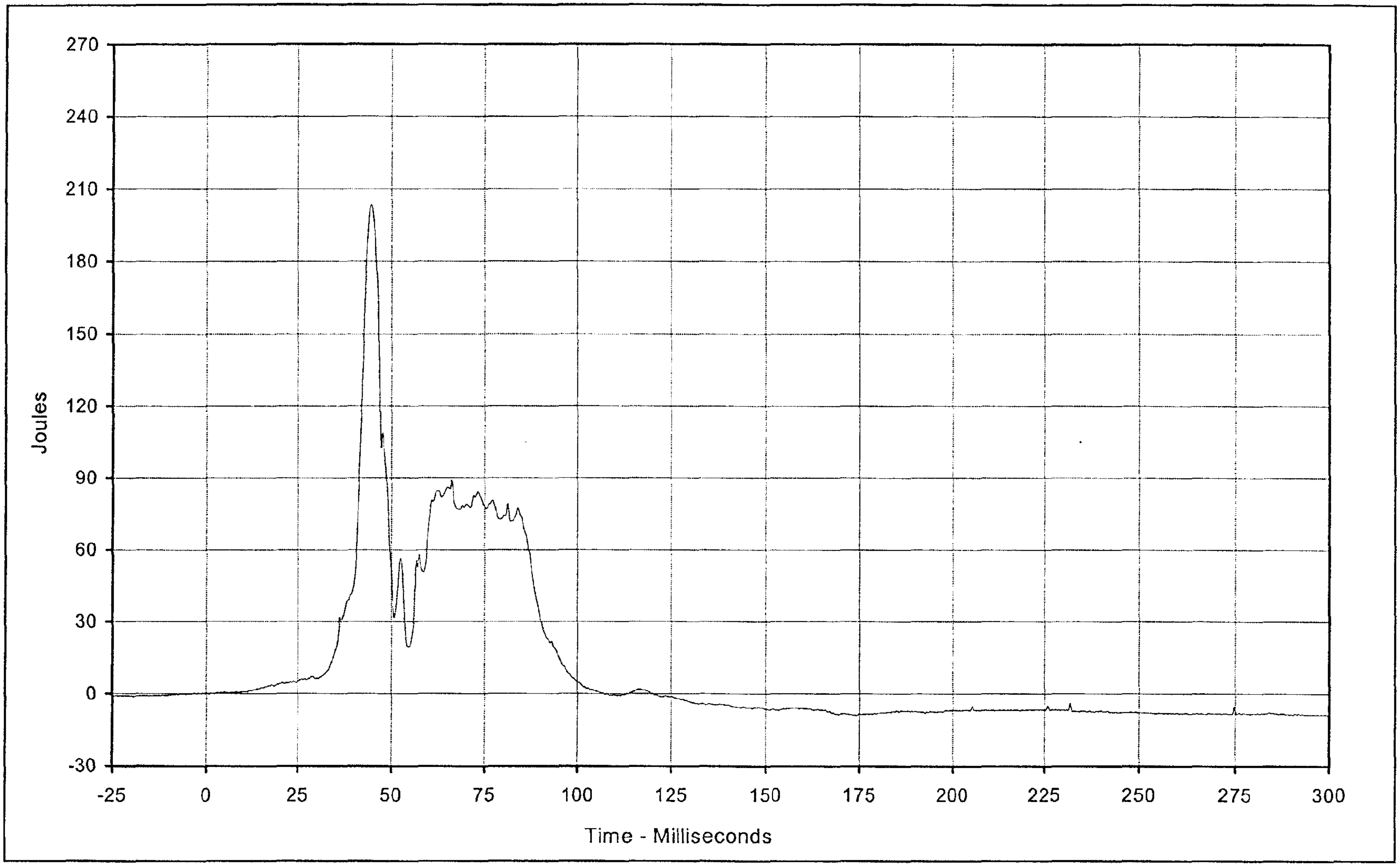
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Left Upper Tibia Moment X			
Maximum Value:	20.0	at	49.8	Milliseconds
Minimum Value:	-110.5	at	45.9	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-069			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

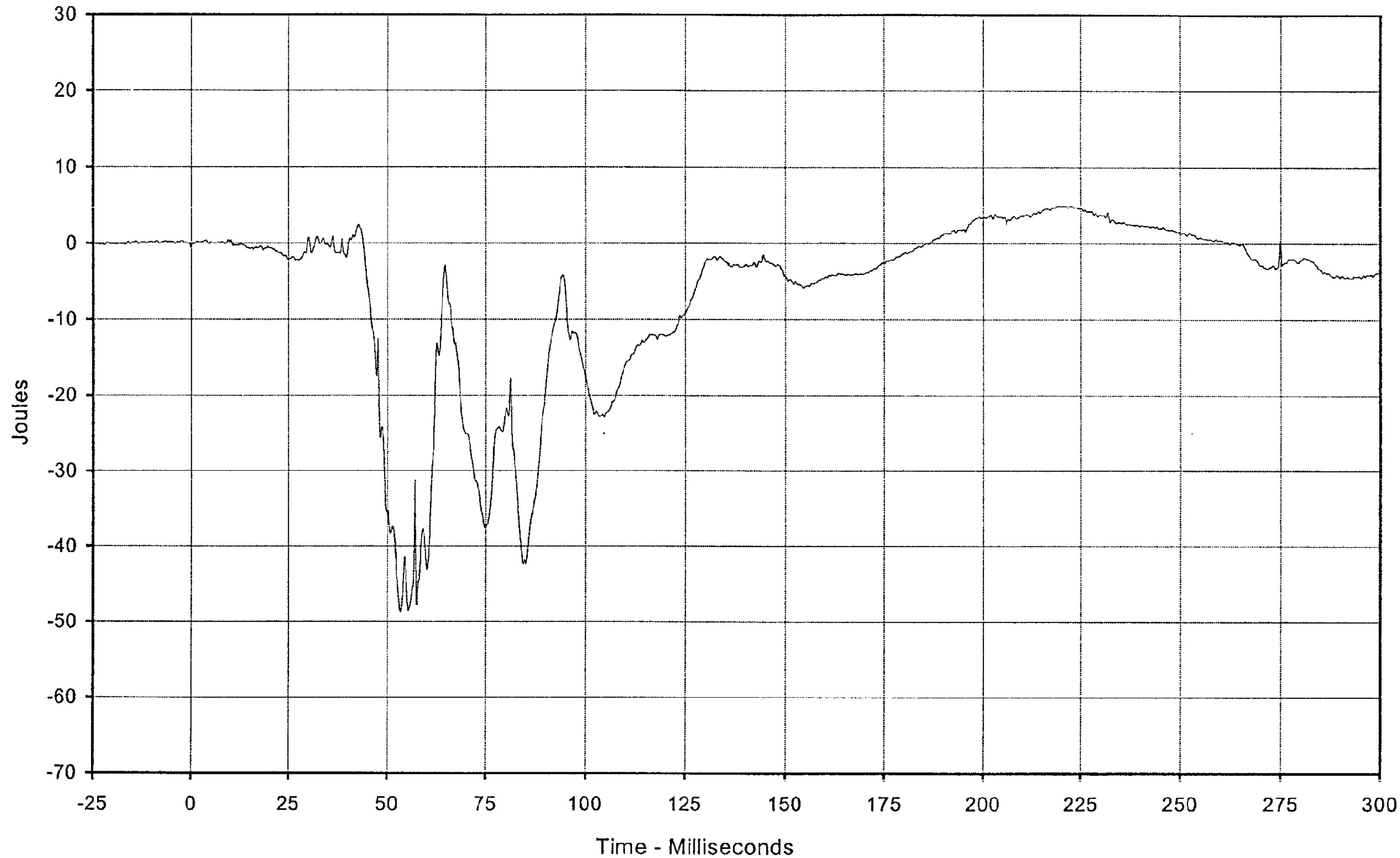
KARCO Engineering



Curve Description:	Passenger Left Upper Tibia Moment Y			
Maximum Value:	203.5	at	44.6	Milliseconds
Minimum Value:	-9.1	at	299.5	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-070			

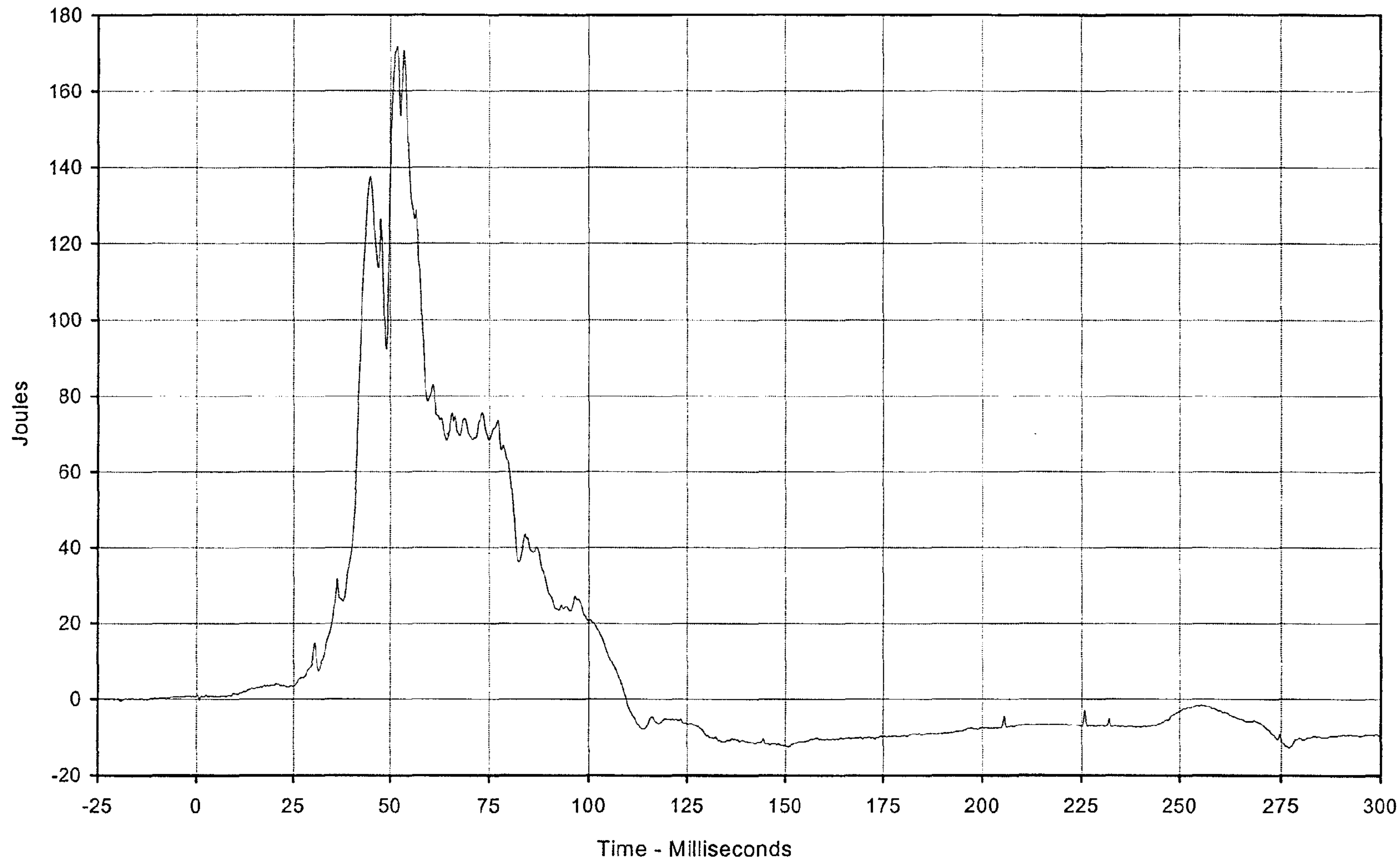
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering



Curve Description:	Passenger Right Upper Tibia Moment X			
Maximum Value:	4.9	at	219.3	Milliseconds
Minimum Value:	-48.7	at	53.2	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-071			

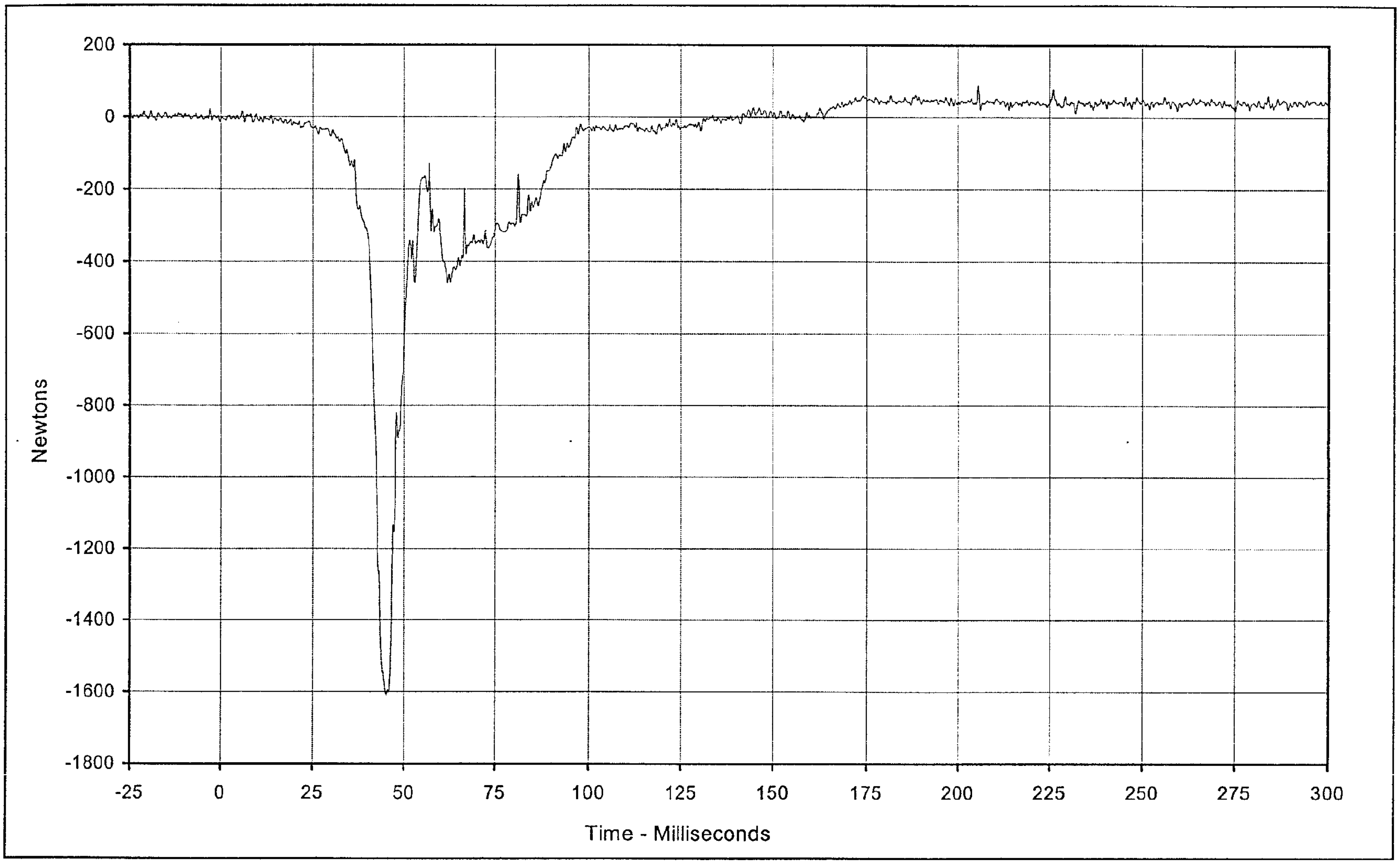
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Right Upper Tibia Moment Y			
Maximum Value:	171.6	at	51.8	Milliseconds
Minimum Value:	-12.8	at	276.8	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-072			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

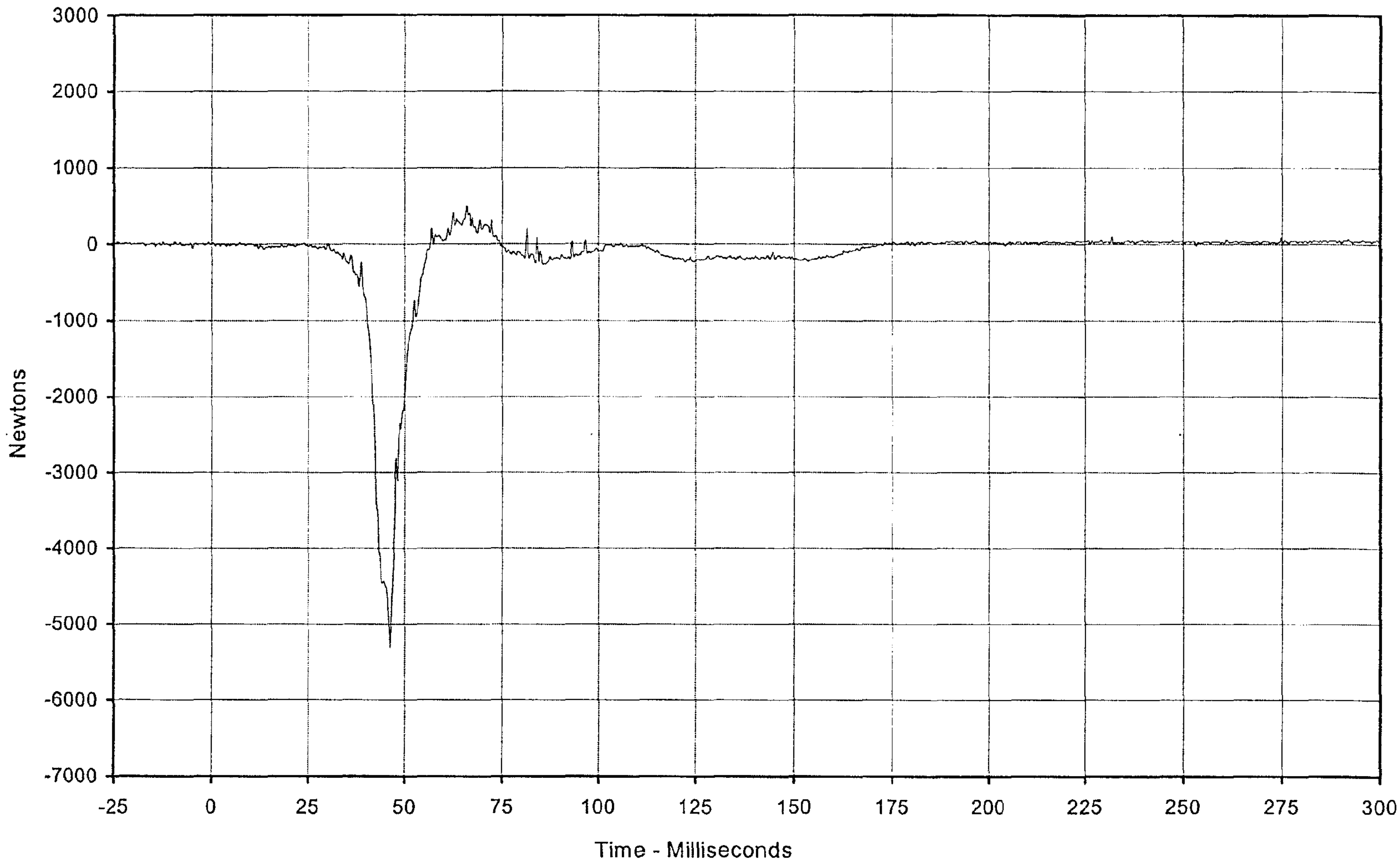


Curve Description:	Passenger Left Lower Tibia Force X			
Maximum Value:	87.9	at	205.7	Milliseconds
Minimum Value:	-1608.8	at	45.1	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-073			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

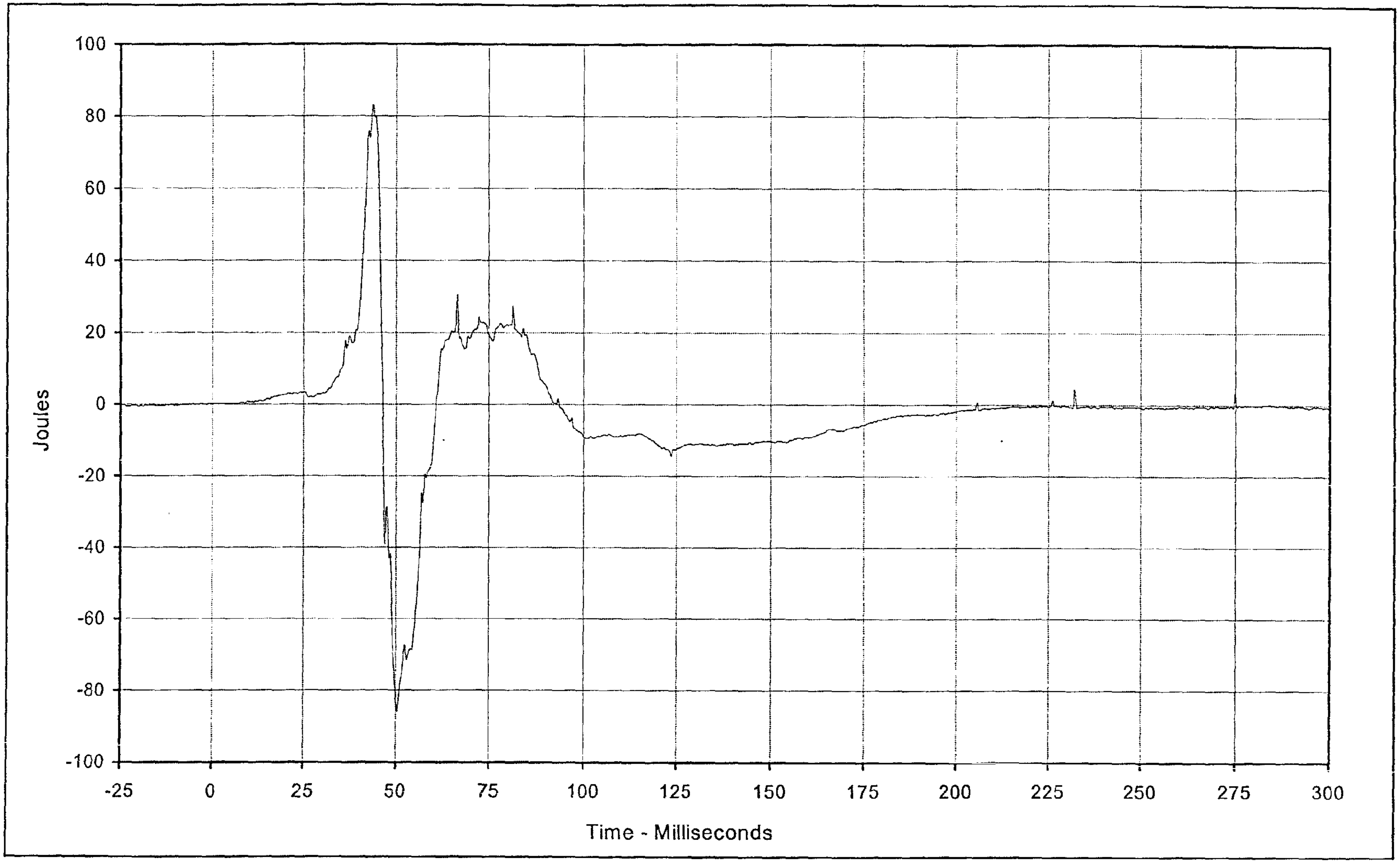
KARCO Engineering



Curve Description:	Passenger Left Lower Tibia Force Z			
Maximum Value:	496.7	at	65.7	Milliseconds
Minimum Value:	-5309.5	at	46.3	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-074			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

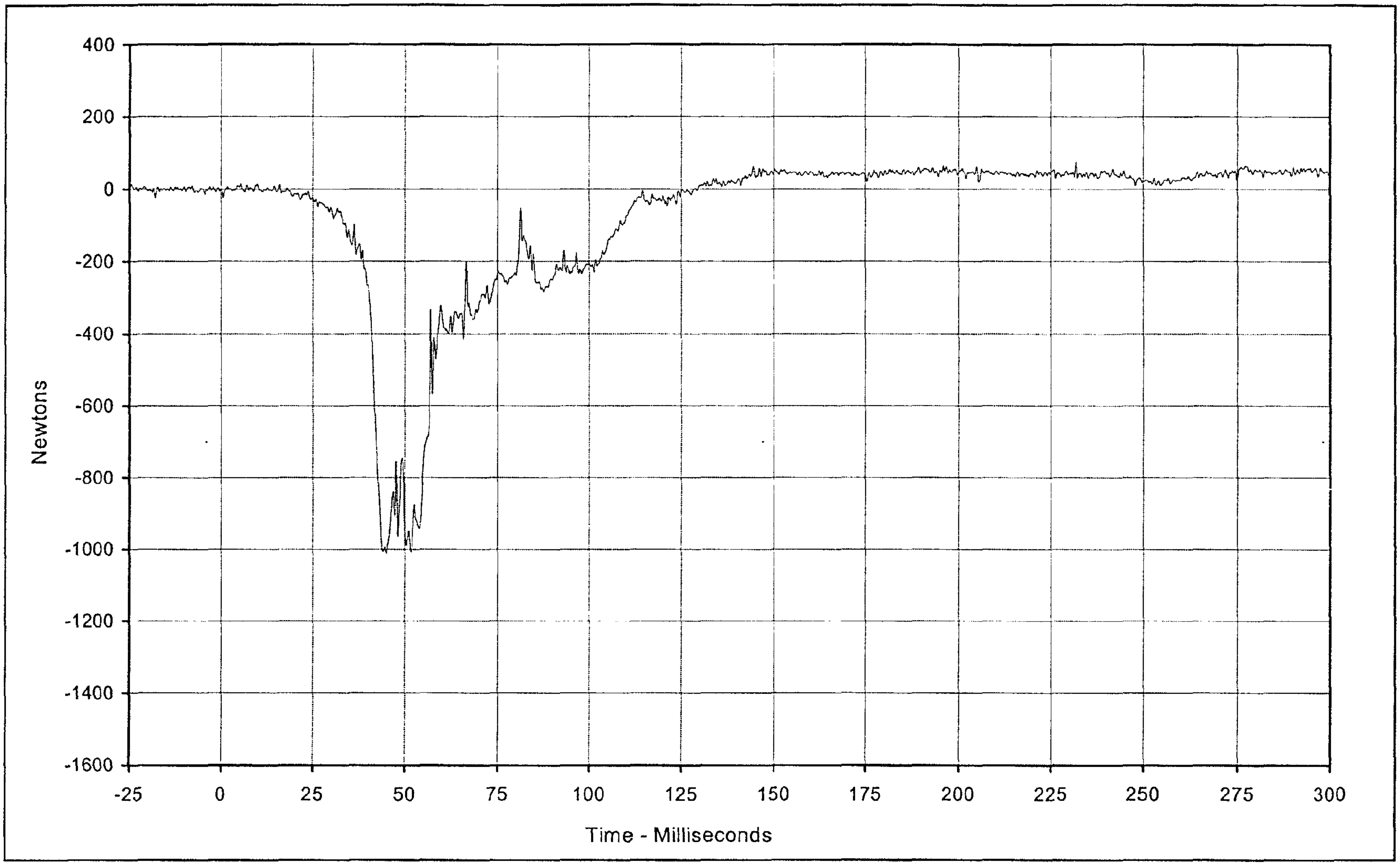
KARCO Engineering



Curve Description:	Passenger Left Lower Tibia Moment Y			
Maximum Value:	83.1	at	43.7	Milliseconds
Minimum Value:	-86.0	at	50.3	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-075			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

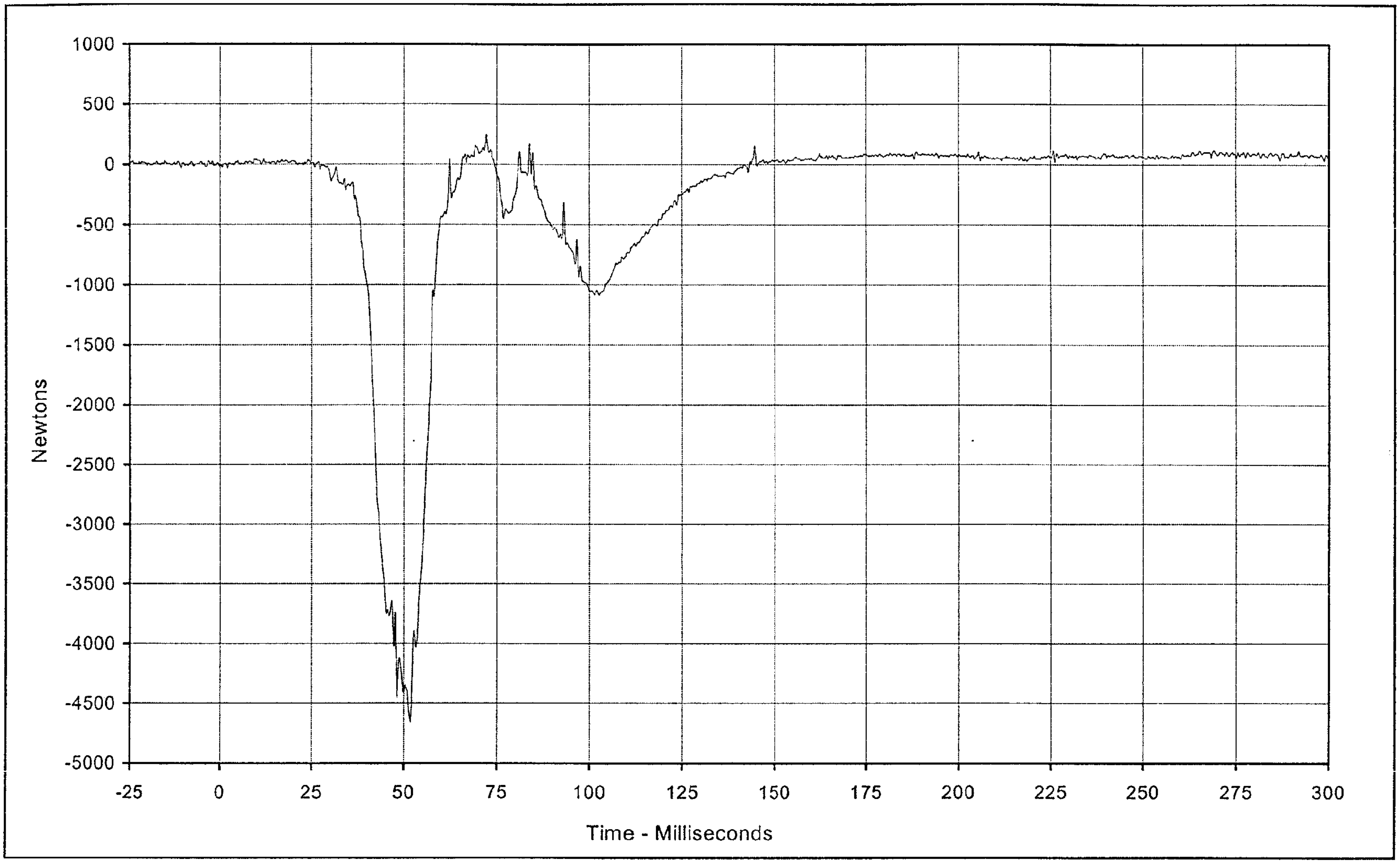
KARCO Engineering



Curve Description:	Passenger Right Lower Tibia Force X			
Maximum Value:	76.4	at	232.1	Milliseconds
Minimum Value:	-1011.4	at	45.2	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-076			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

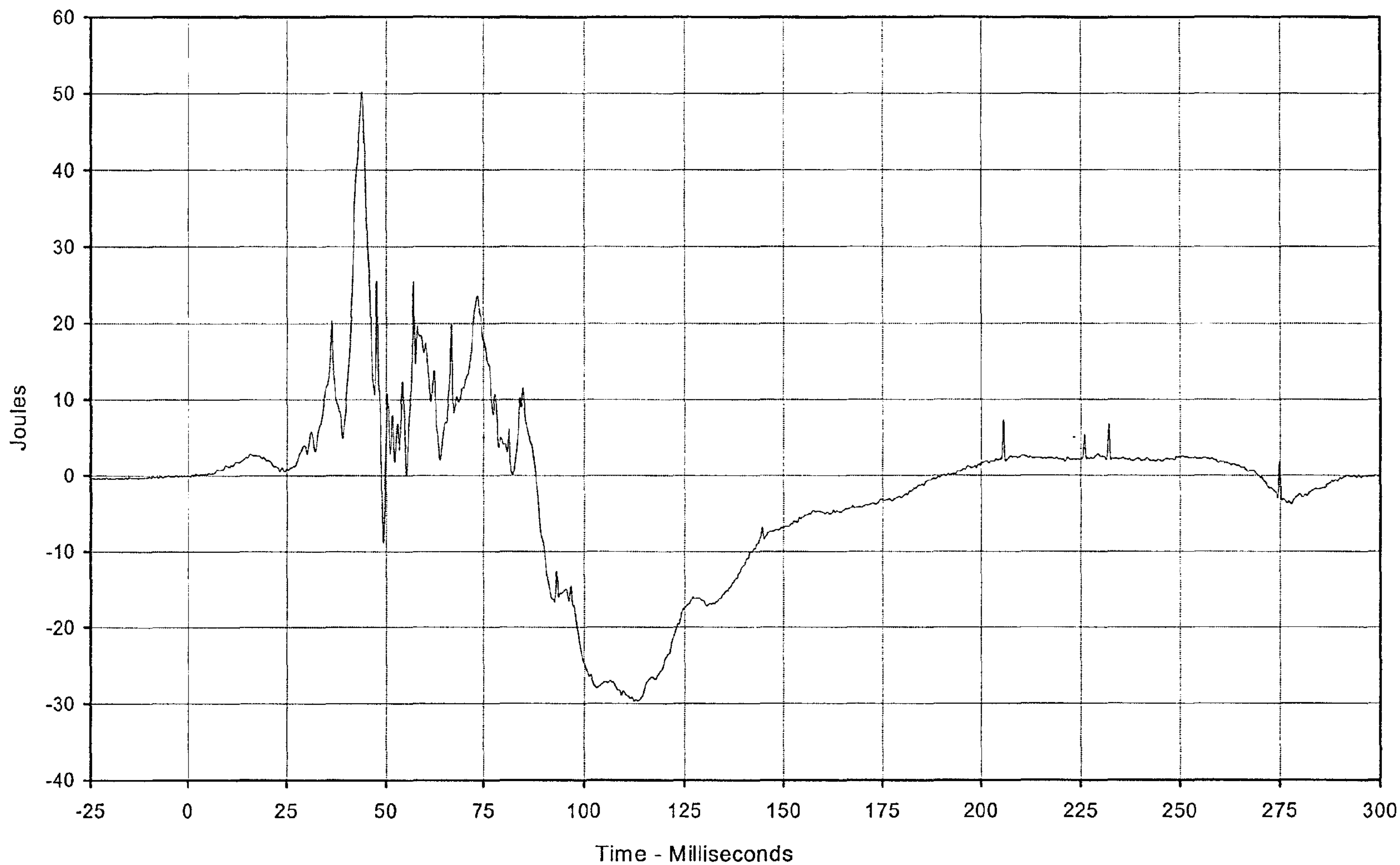
KARCO Engineering



Curve Description:	Passenger Right Lower Tibia Force Z			
Maximum Value:	247.9	at	72.2	Milliseconds
Minimum Value:	-4657.0	at	51.8	Milliseconds
SAE Filter Class:	600			
Date of Test:	1/8/98			
Curve Number:	FIL-077			

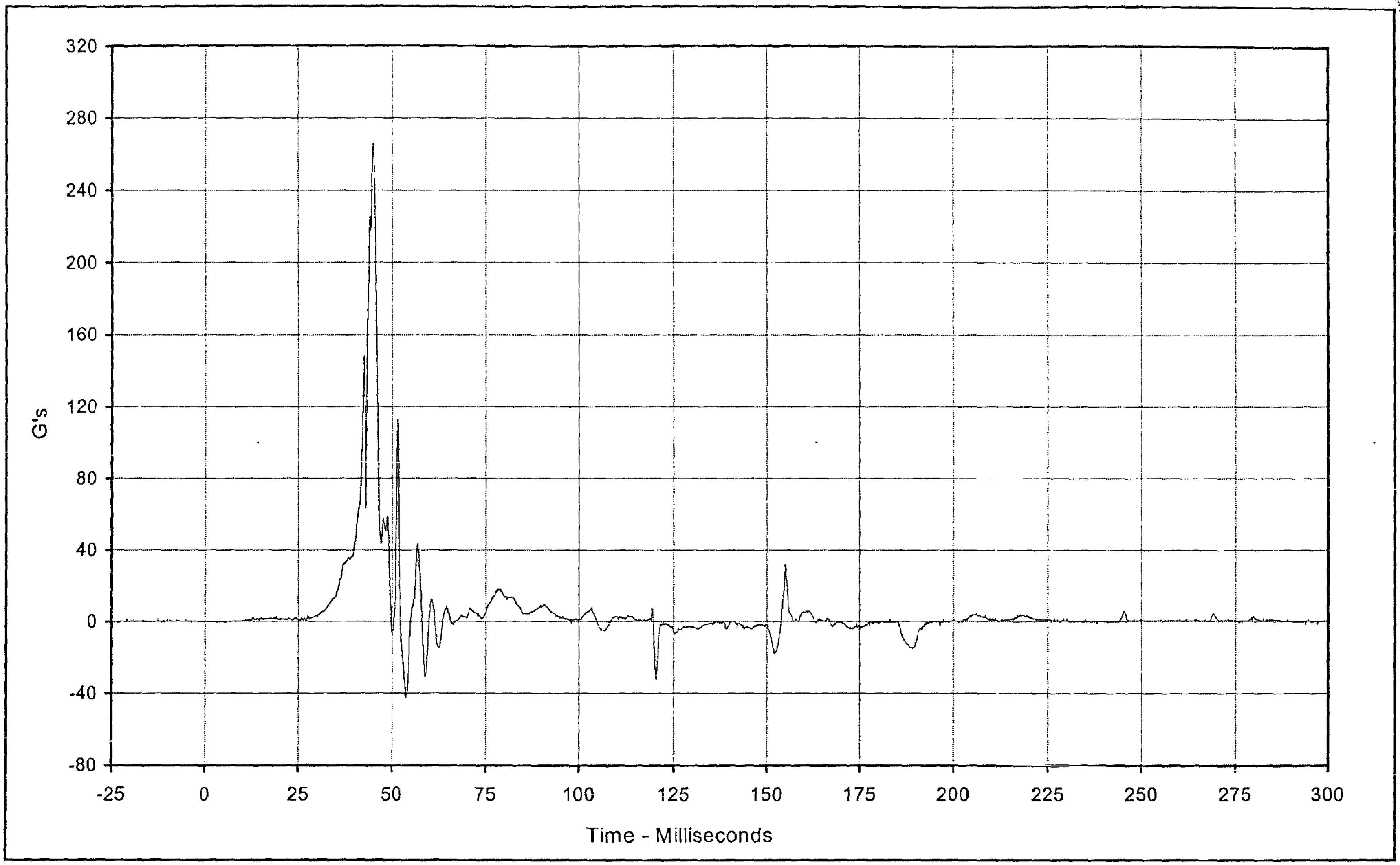
Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering



Curve Description:	Passenger Right lower Tibia Moment Y				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	50.2	at	44.0	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	-29.7	at	113.3	Milliseconds		
SAE Filter Class:	600					
Date of Test:	1/8/98					
Curve Number:	FIL-078					

KARCO Engineering

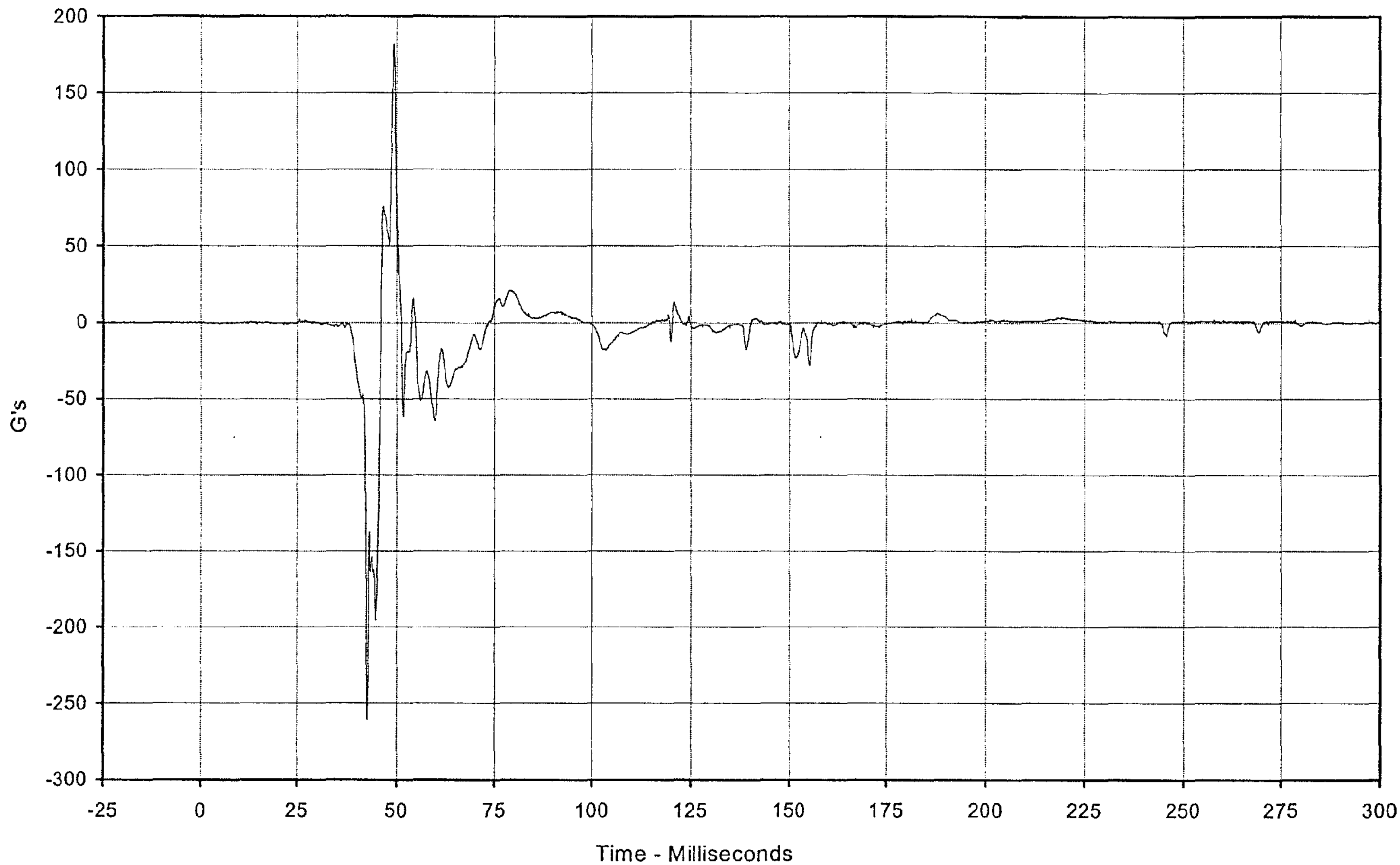


Curve Description:	Passenger Left Foot Aft X			
Maximum Value:	266.1	at	45.0	Milliseconds
Minimum Value:	-42.2	at	53.8	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-079			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

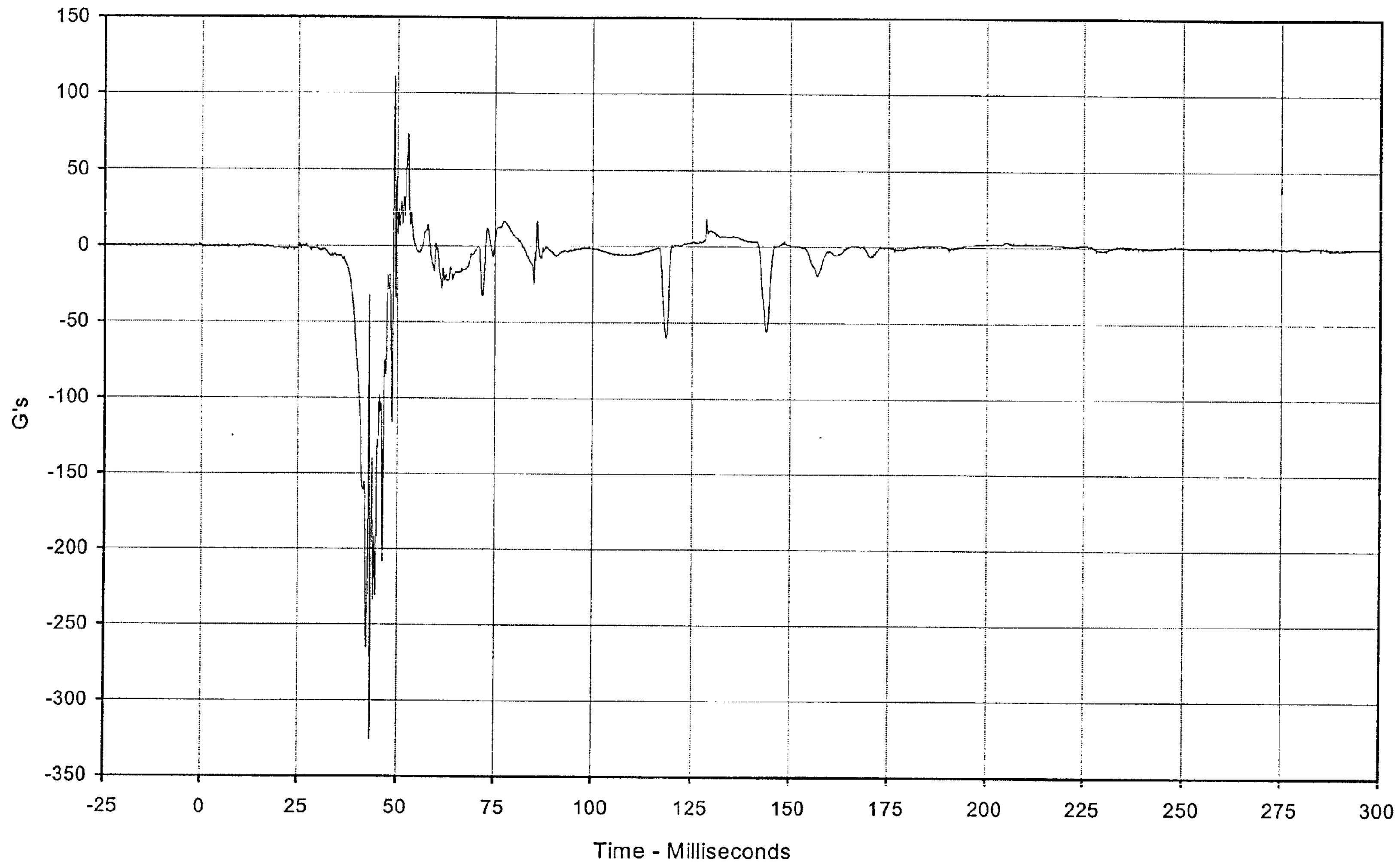
KARCO Engineering



Curve Description:	Passenger Left Foot Aft Z			
Maximum Value:	181.8	at	49.3	Milliseconds
Minimum Value:	-261.0	at	42.6	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-080			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

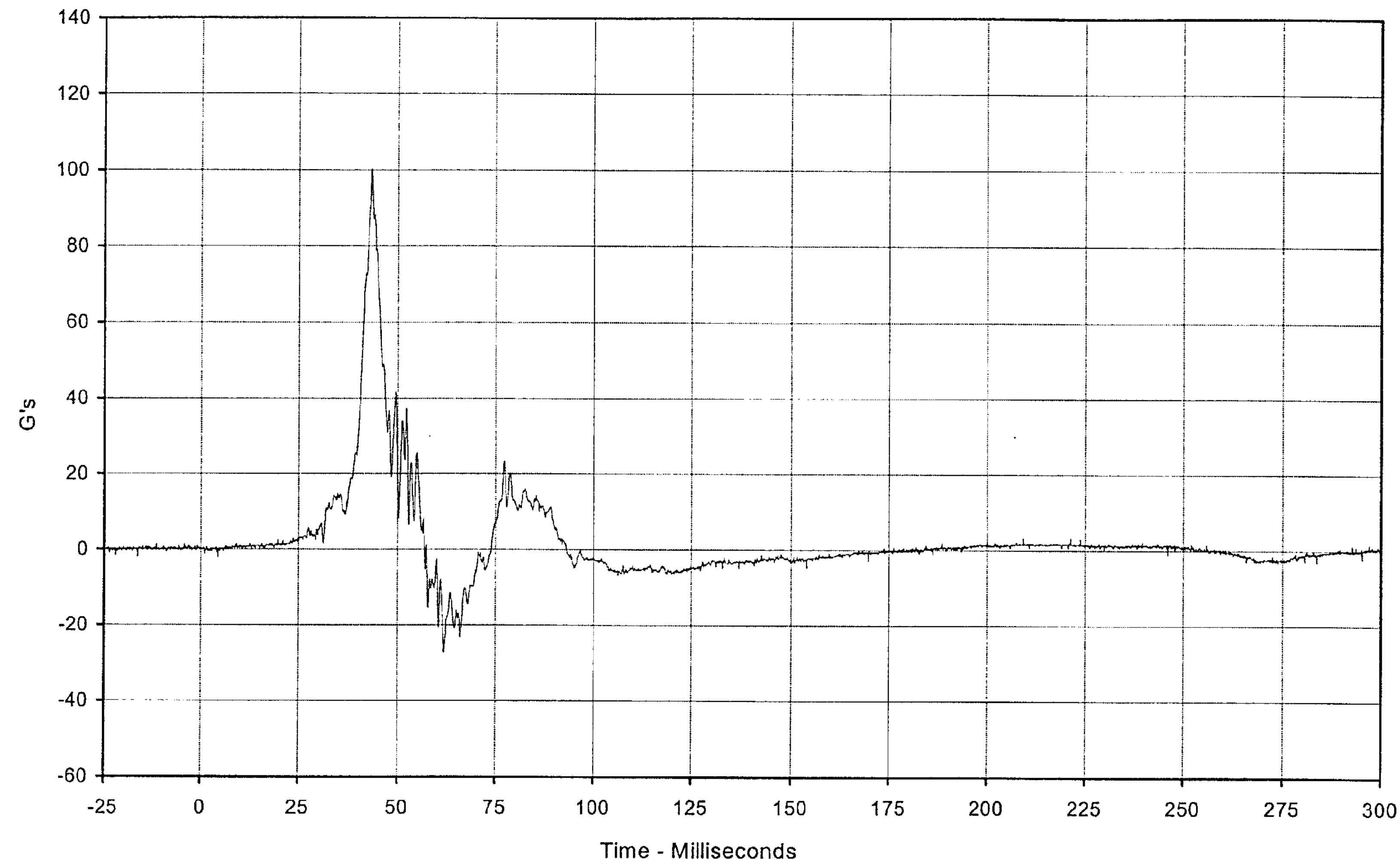


Curve Description:	Passenger Left Foot Fore Z			
Maximum Value:	110.7	at	49.1	Milliseconds
Minimum Value:	-325.7	at	43.2	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-081			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering

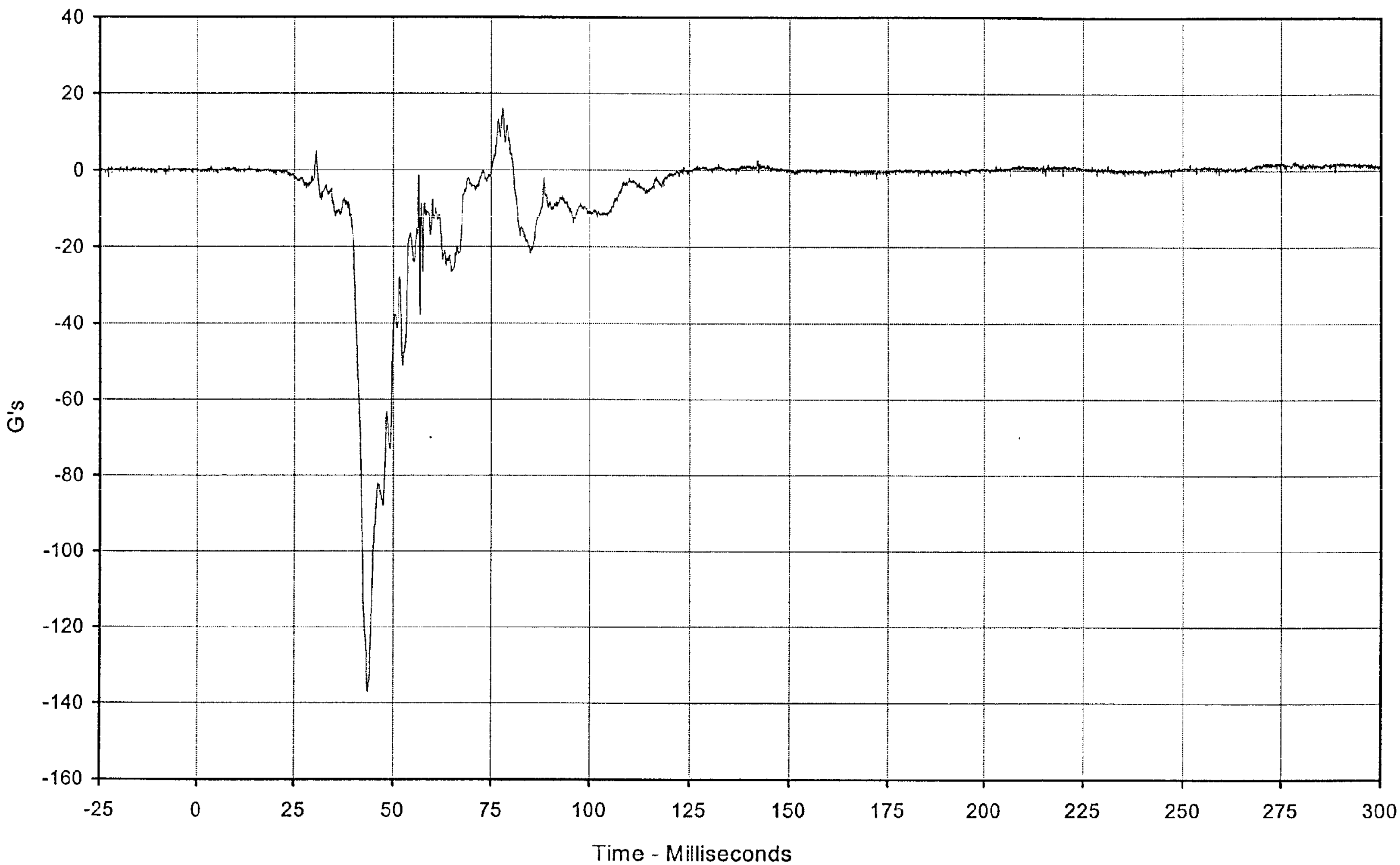


Curve Description:	Passenger Right Foot Aft X			
Maximum Value:	100.4	at	43.2	Milliseconds
Minimum Value:	-27.2	at	61.9	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-082			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

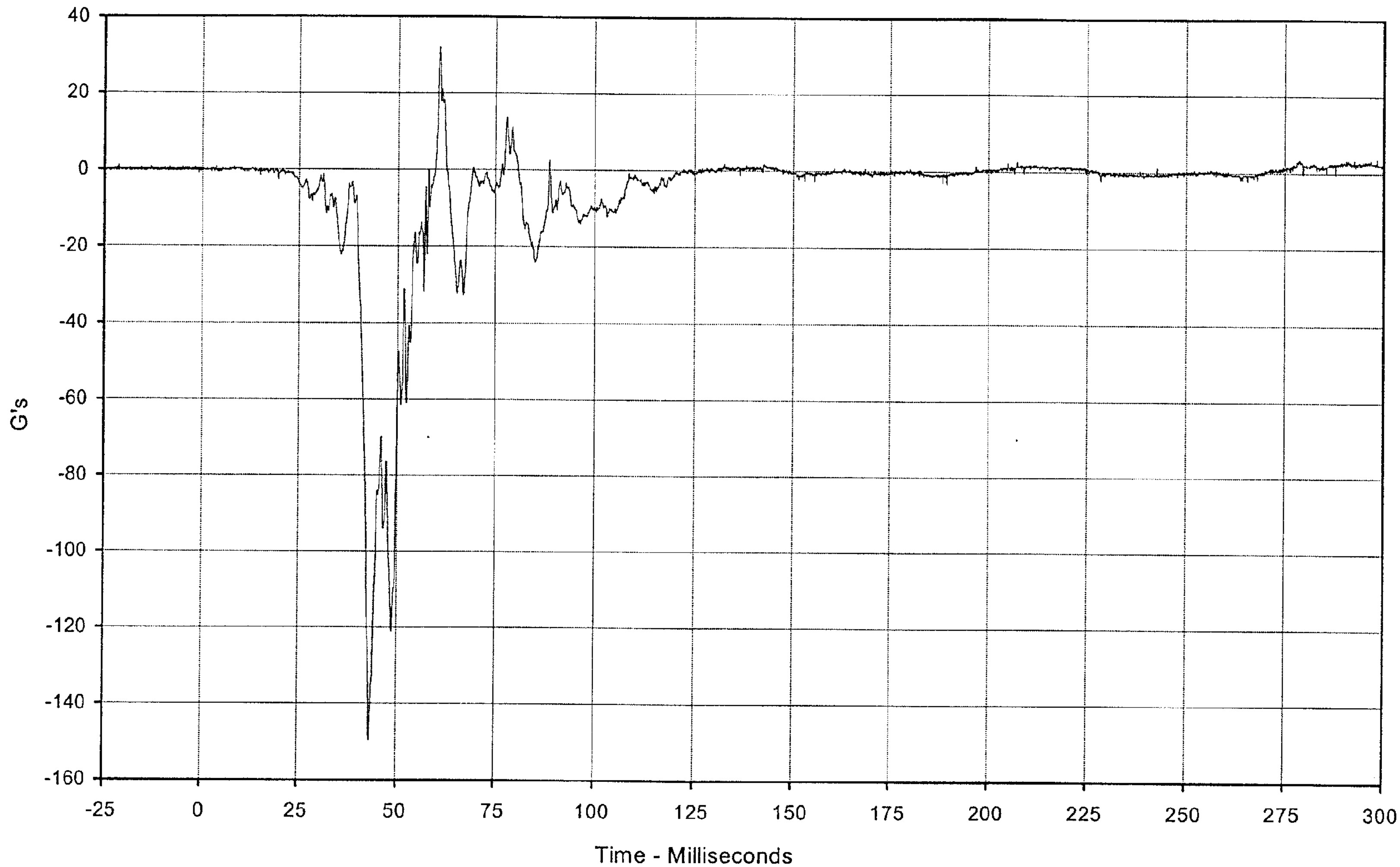
KARC Engineering



Curve Description:	Passenger Right Foot Aft Z			
Maximum Value:	16.0	at	77.9	Milliseconds
Minimum Value:	-137.0	at	43.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-083			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

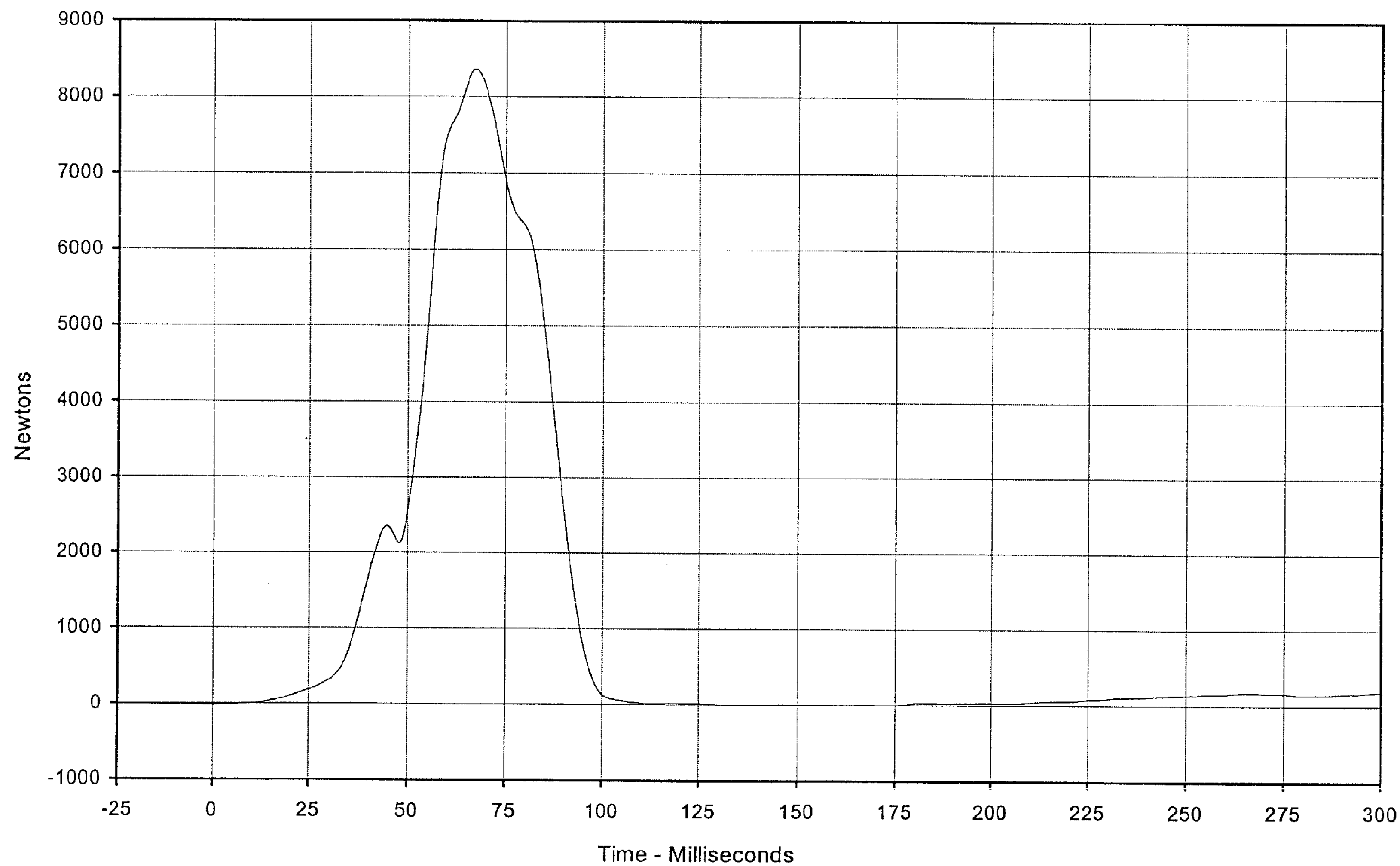
Test Vehicle: 1998 Chevrolet Blazer LS SUV



Curve Description:	Passenger Right Foot Fore Z			
Maximum Value:	32.1	at	60.4	Milliseconds
Minimum Value:	-149.6	at	43.3	Milliseconds
SAE Filter Class:	1000			
Date of Test:	1/8/98			
Curve Number:	FIL-084			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

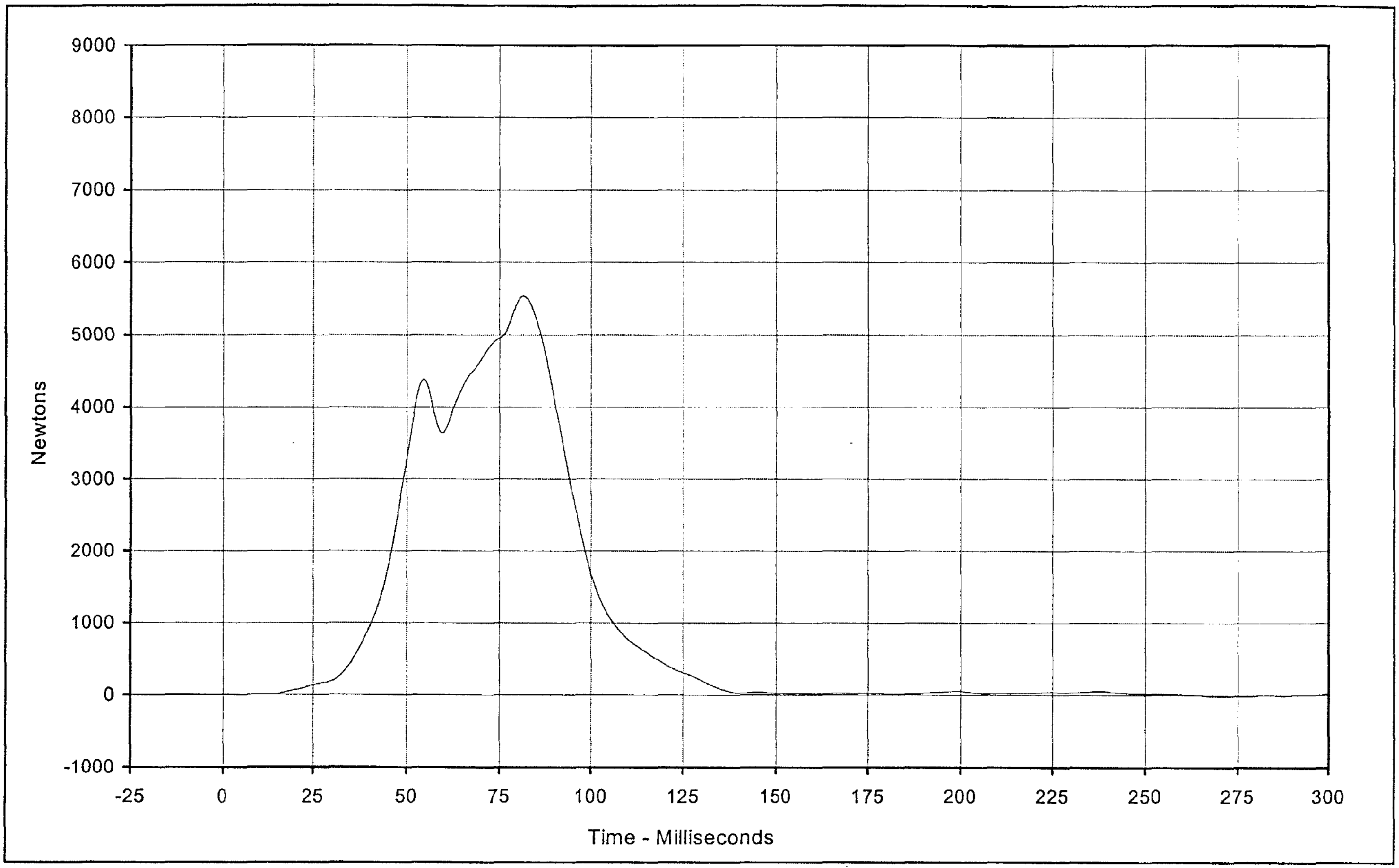


Curve Description:	Passenger Lap Belt Force			
Maximum Value:	8361.7	at	67.2	Milliseconds
Minimum Value:	-18.5	at	0.4	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-085			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

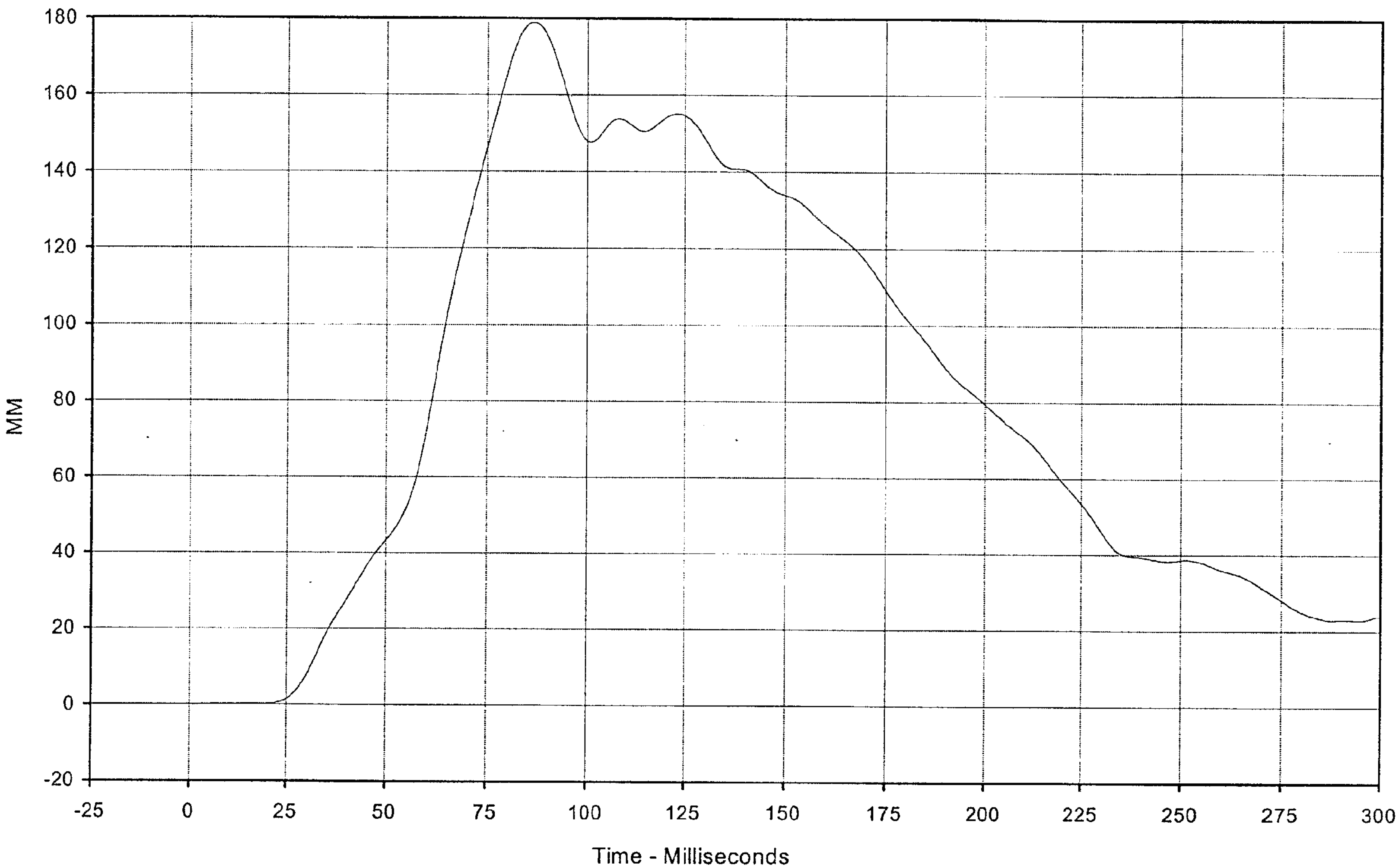
KARC Engineering



Curve Description:	Passenger Shoulder Belt Force			
Maximum Value:	5535.3	at	81.5	Milliseconds
Minimum Value:	-14.0	at	271.0	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-086			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

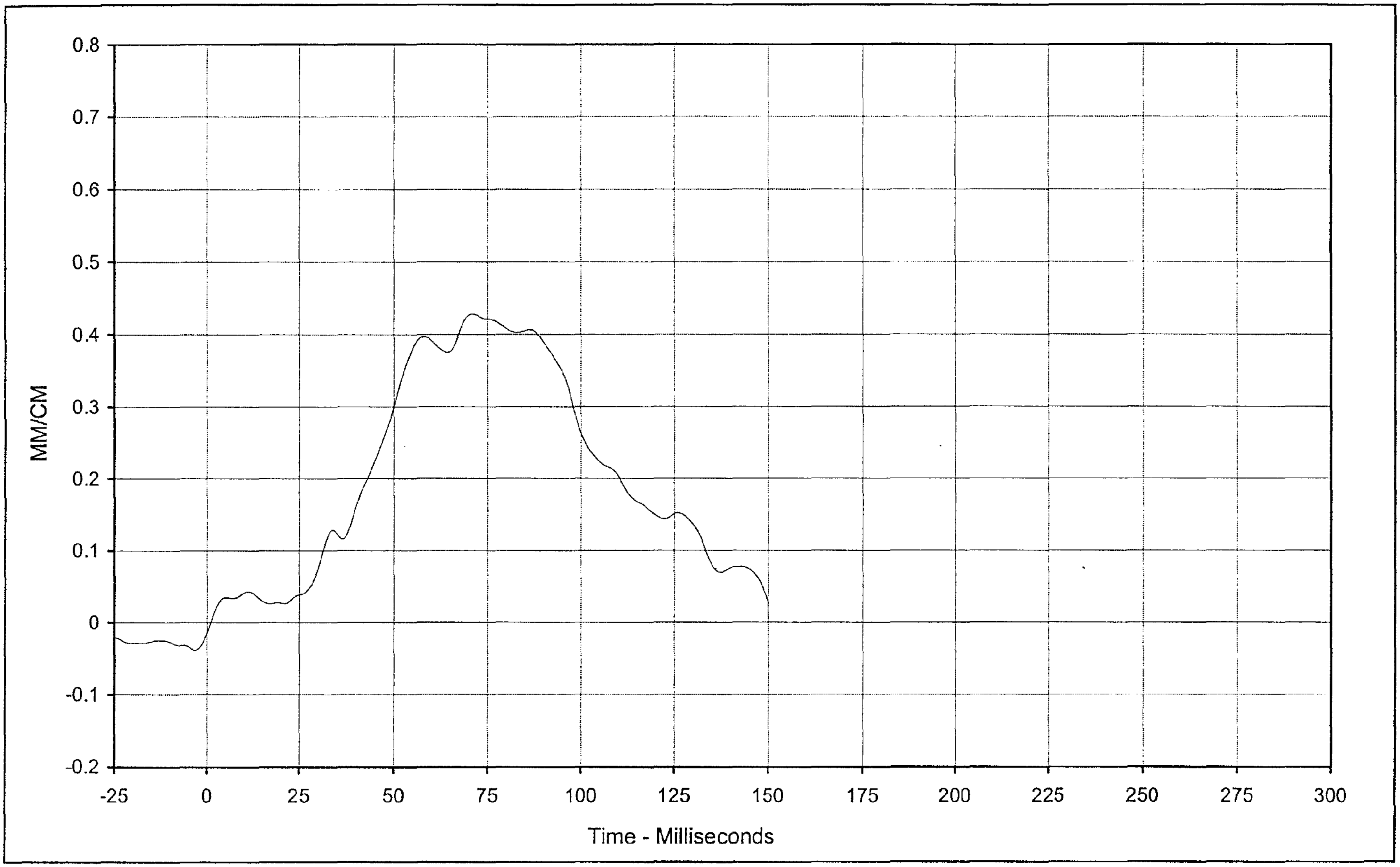


Curve Description:	Passenger Shoulder Belt Pullout				
Maximum Value:	178.9	at	86.4	Milliseconds	
Minimum Value:	-0.1	at	1.9	Milliseconds	
SAE Filter Class:	60				
Date of Test:	1/8/98				
Curve Number:	FIL-087				

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

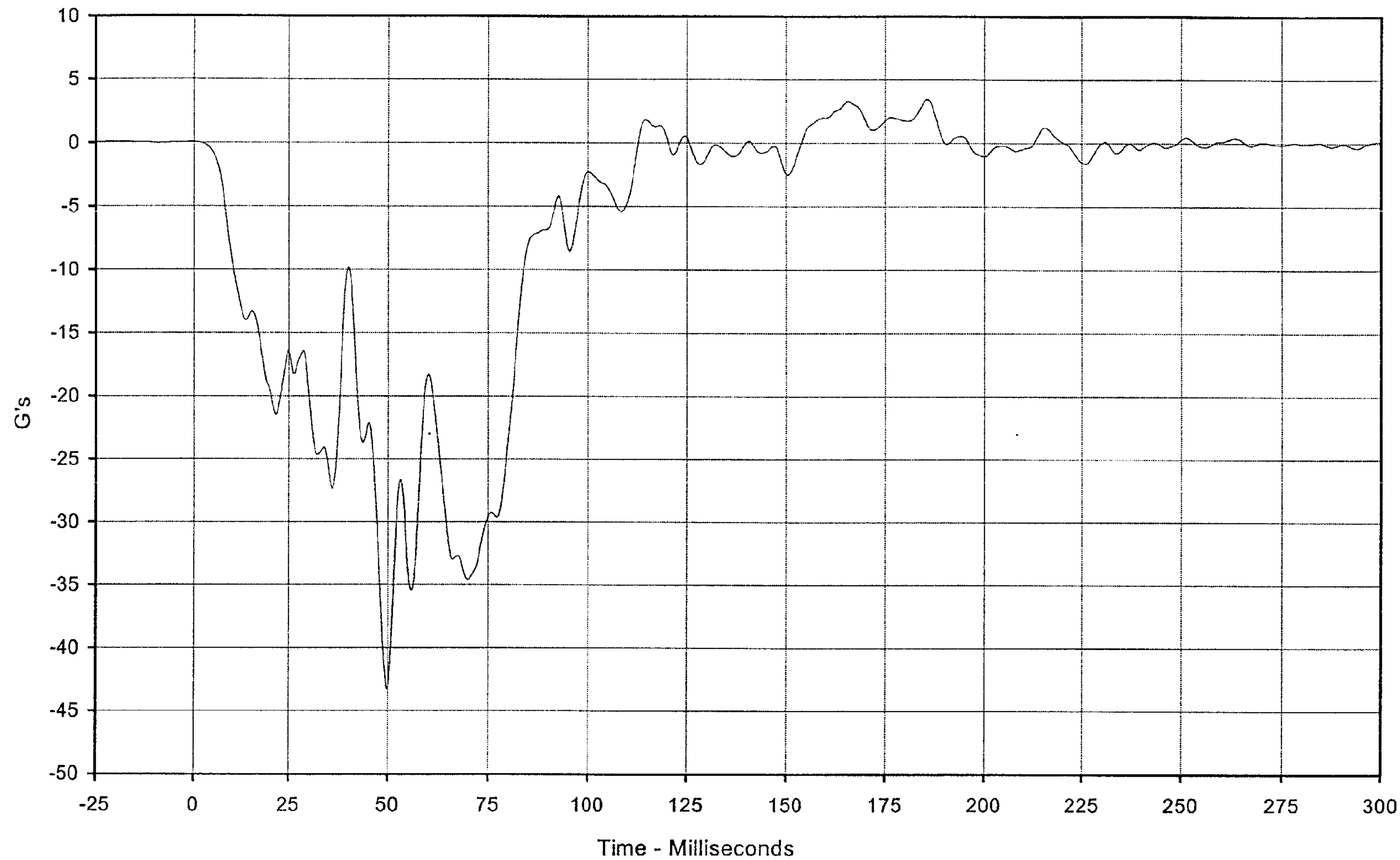
Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering



Curve Description:	Passenger Shoulder Belt Elongation *				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103	
Maximum Value:	0.43	at	70.9	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV	
Minimum Value:	-0.01	at	0.0	Milliseconds			
SAE Filter Class:	60						
Date of Test:	1/8/98						
Curve Number:	FIL-088						

* Channel Failed at 150.0 Msec.

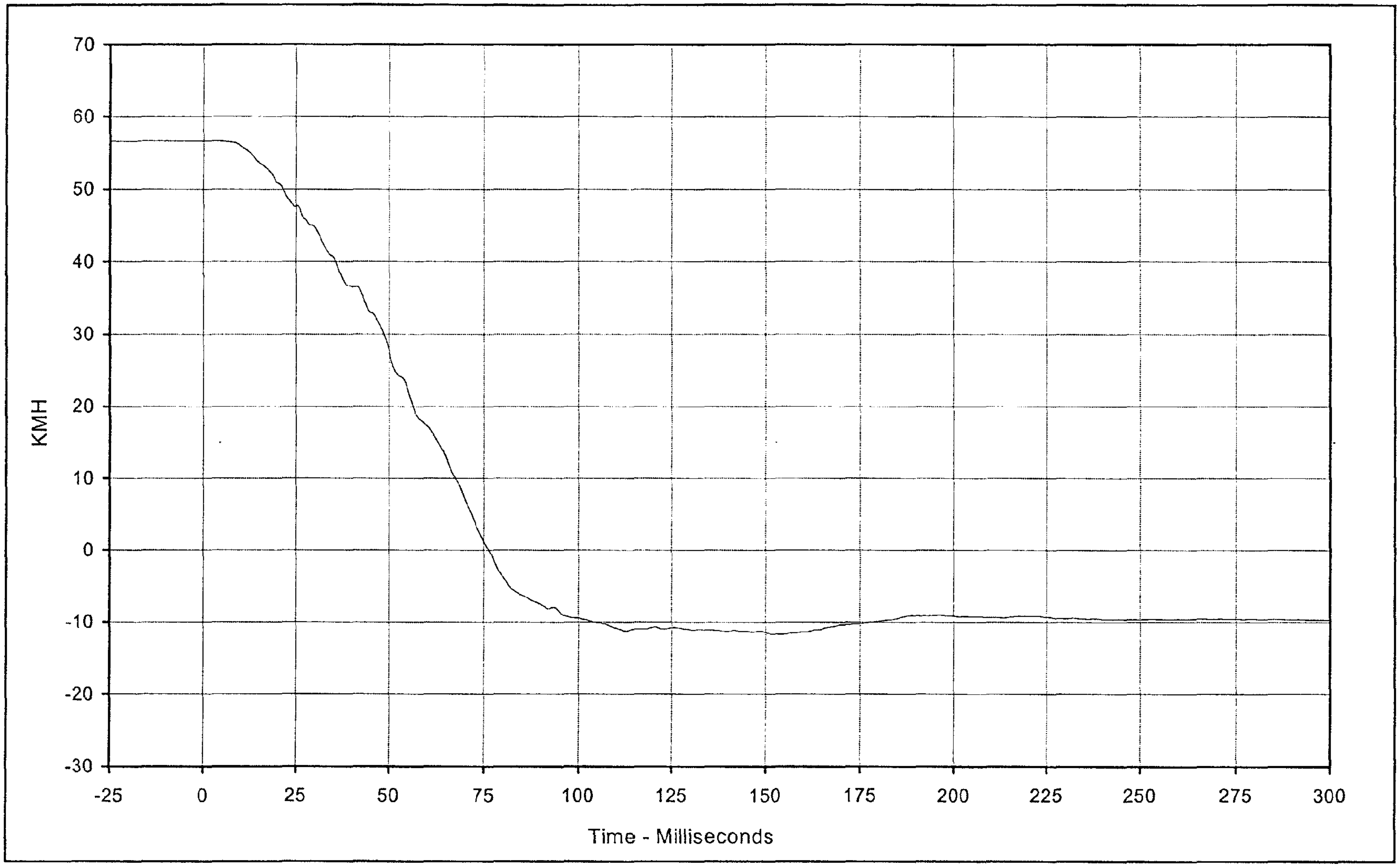


Curve Description:	Vehicle Left Rear Primary			
Maximum Value:	3.5	at	185.6	Milliseconds
Minimum Value:	-43.3	at	49.8	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-089			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

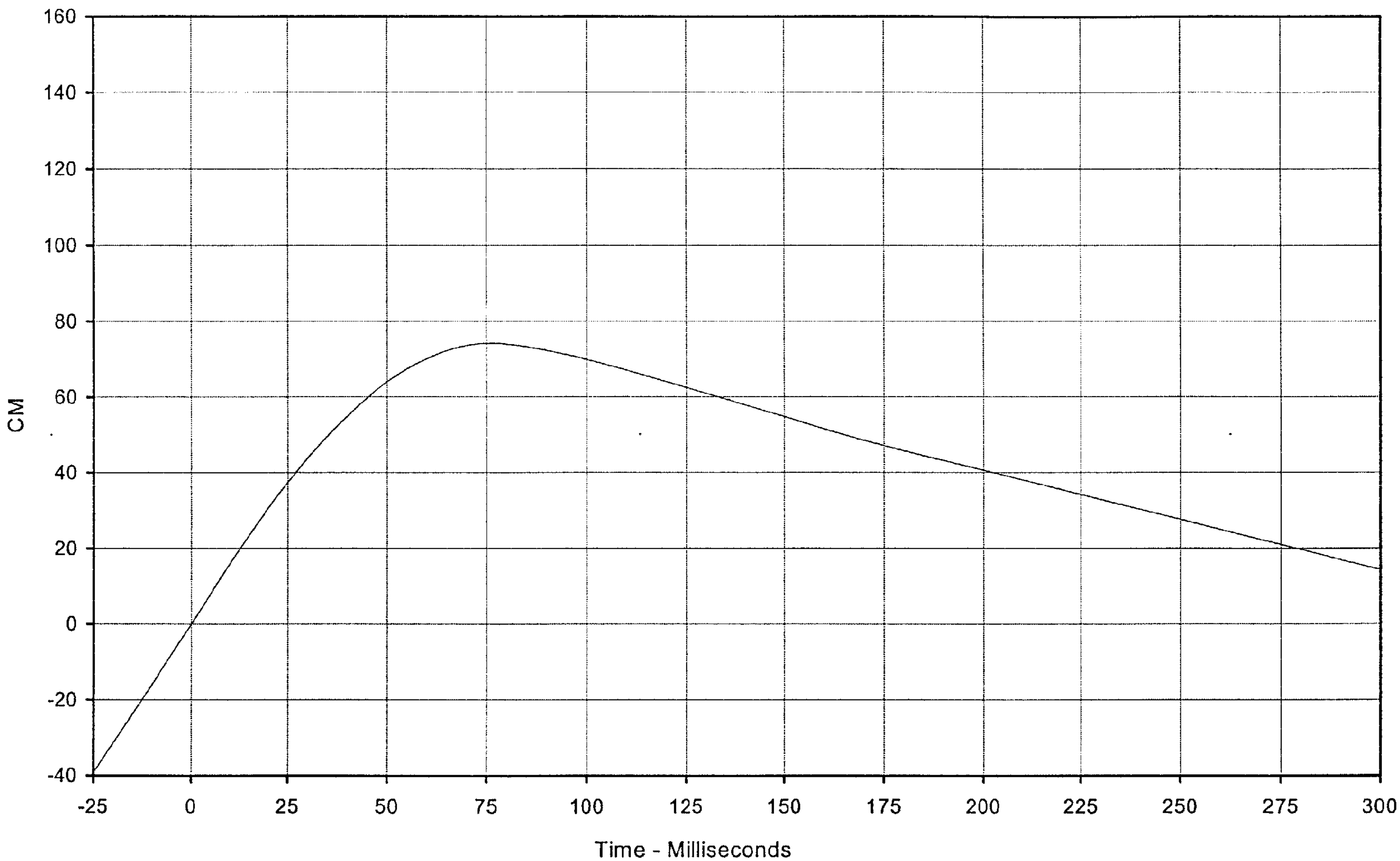
KARCO Engineering



Curve Description:	Vehicle Left Rear Primary Velocity			
Maximum Value:	56.7	at	0.7	Milliseconds
Minimum Value:	-11.7	at	154.2	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-089			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

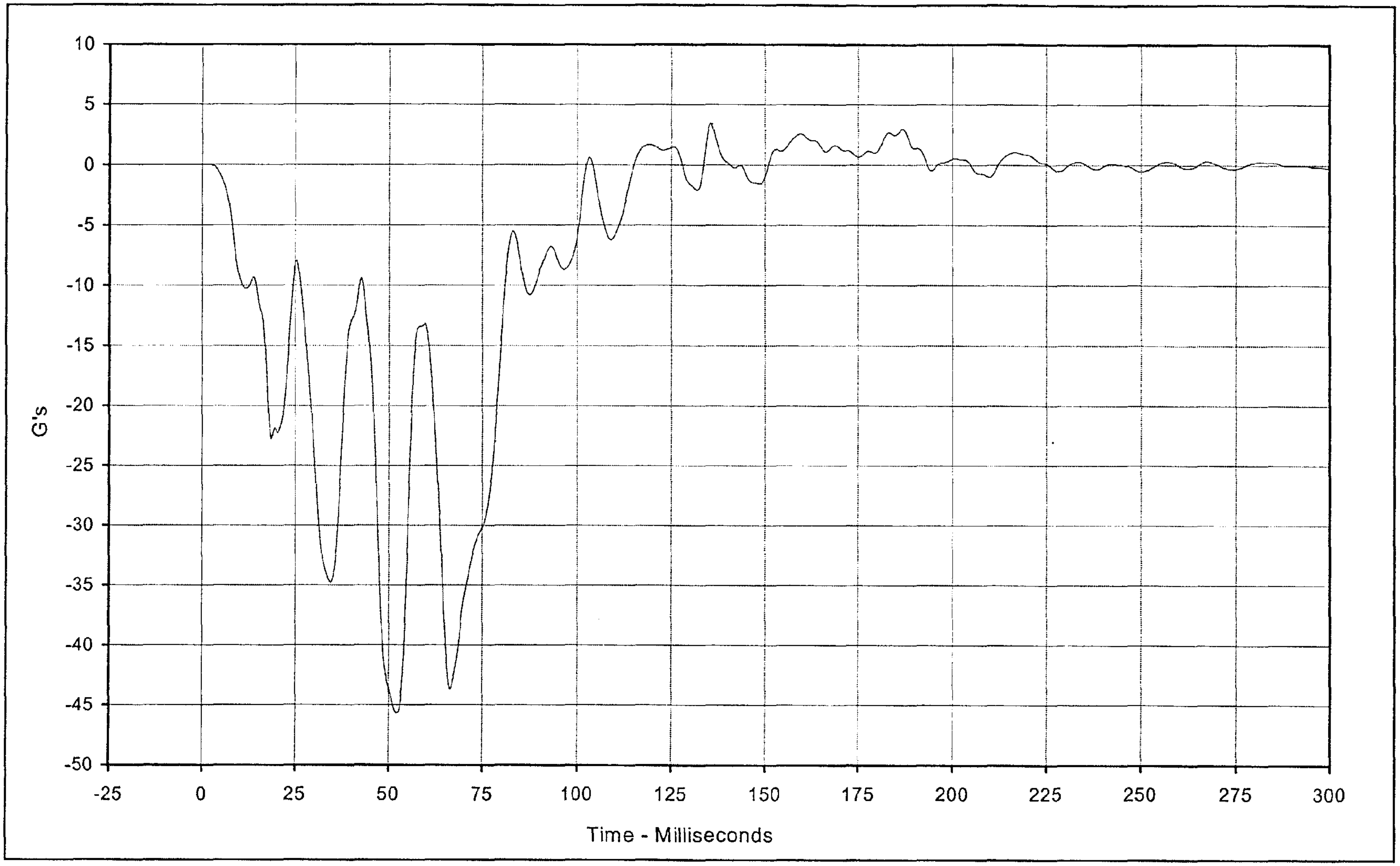
KARC Engineering



Curve Description:	Vehicle Left Rear Primary Displ.			
Maximum Value:	74.2	at	76.3	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-089			

Testing Program:	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

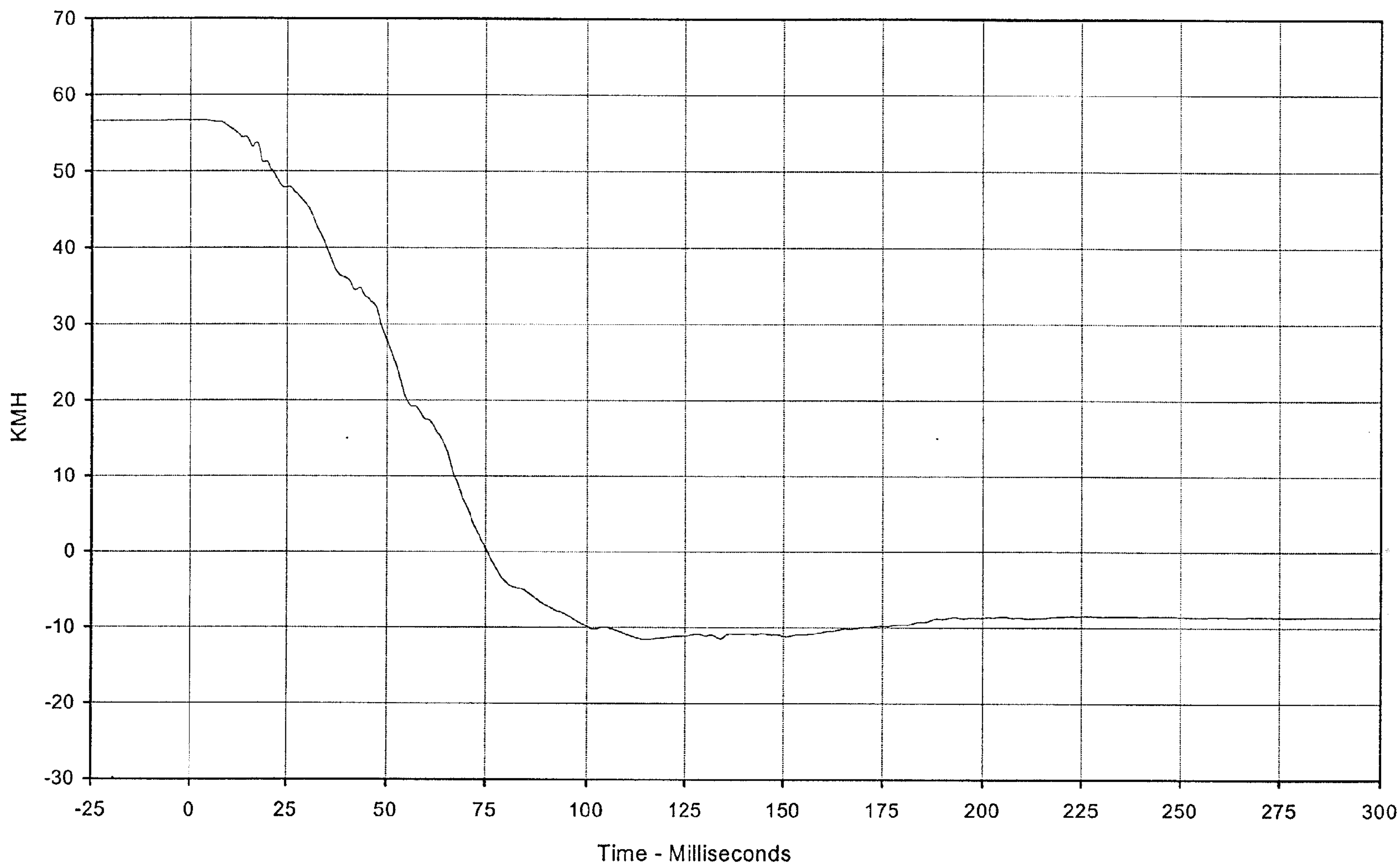
KARC Engineering



Curve Description:	Vehicle Right Rear Primary			
Maximum Value:	3.5	at	135.5	Milliseconds
Minimum Value:	-45.7	at	52.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-090			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

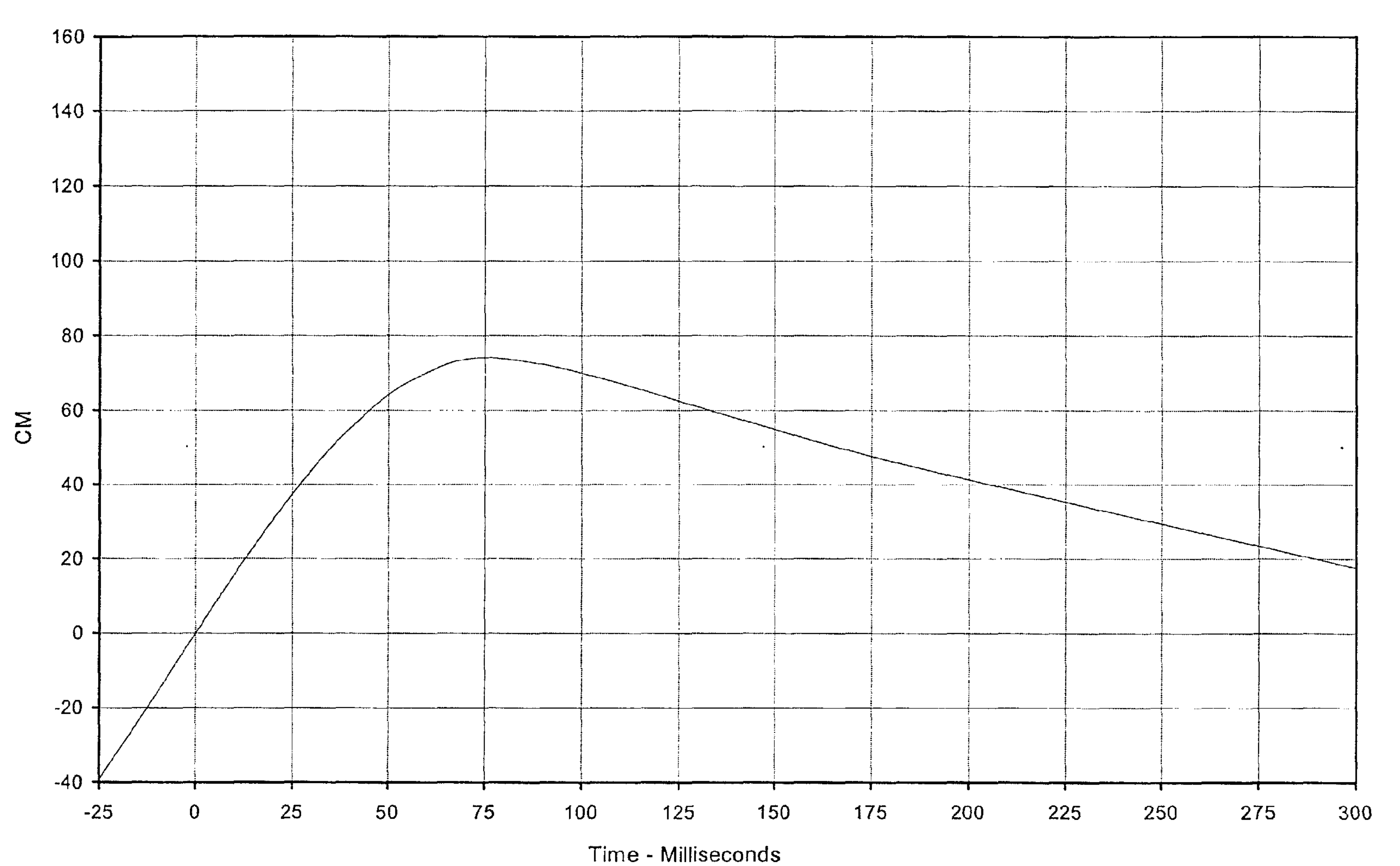


Curve Description:	Vehicle Right Rear Primary Velocity			
Maximum Value:	56.6	at	0.9	Milliseconds
Minimum Value:	-11.5	at	115.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-090			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARC Engineering

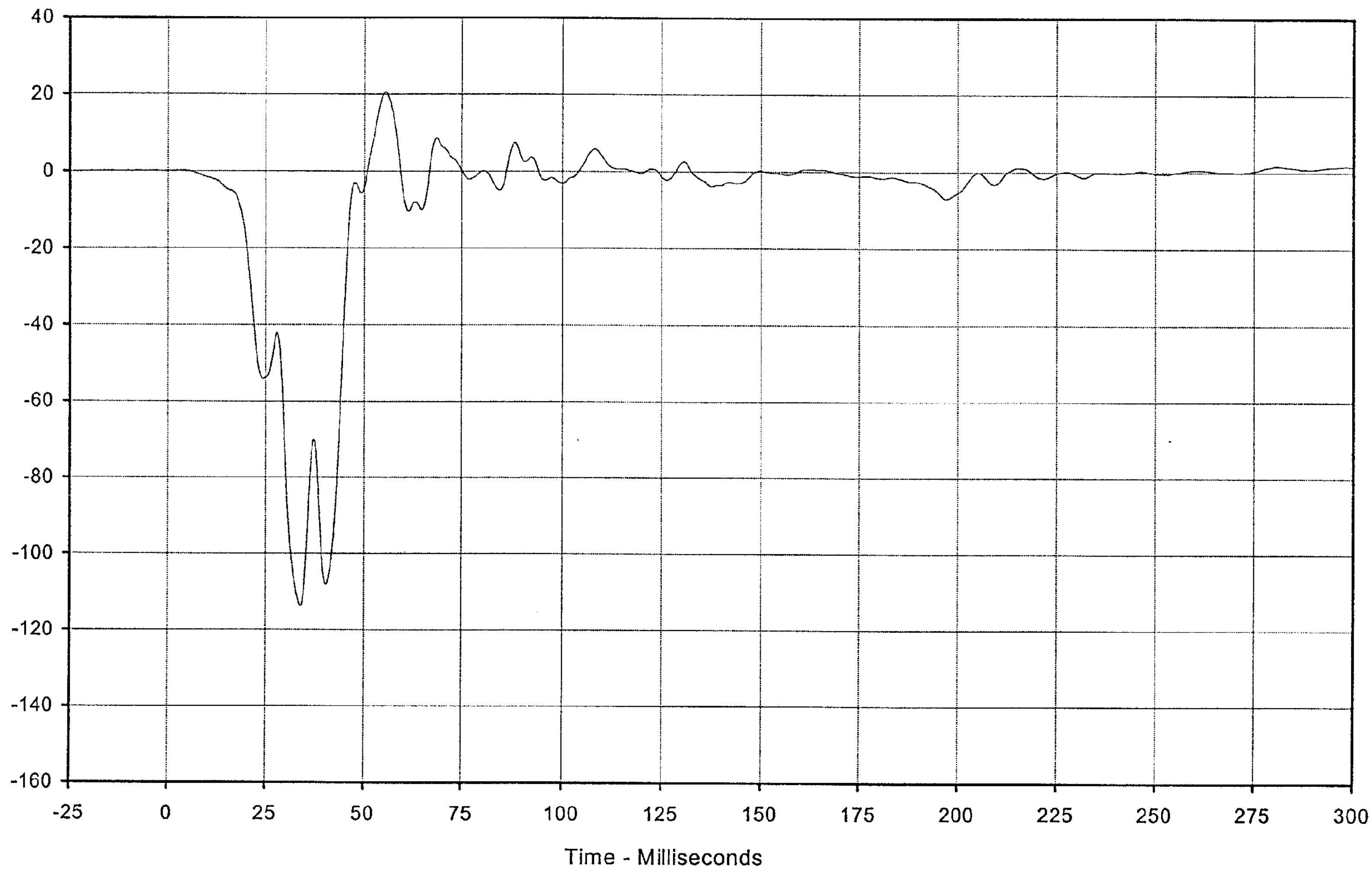


Curve Description:	Vehicle Right Rear Primary Displ.			
Maximum Value:	74.1	at	75.4	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-090			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

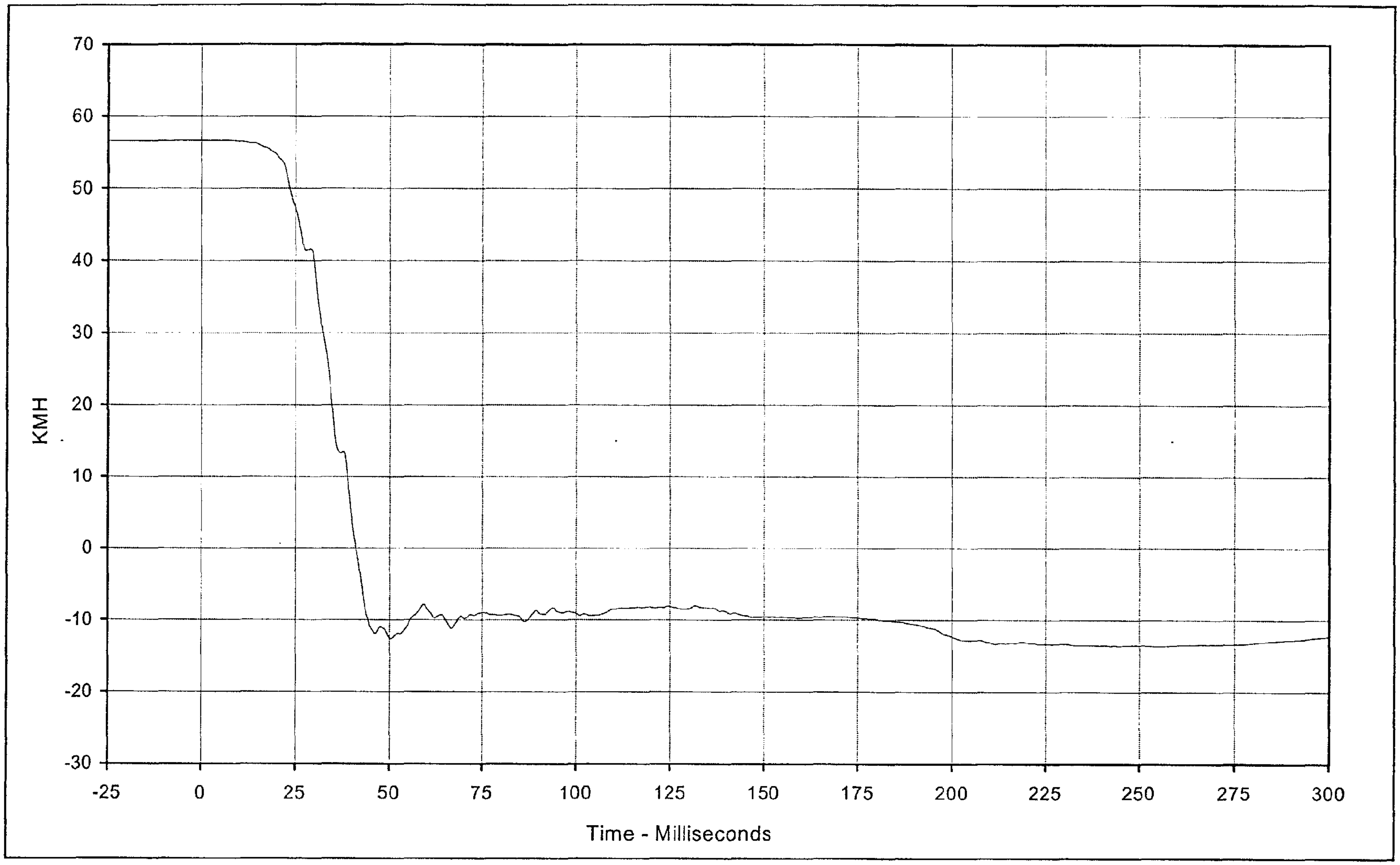
KARCO Engineering



Curve Description:	Vehicle Engine Top			
Maximum Value:	20.7	at	55.4	Milliseconds
Minimum Value:	-113.7	at	33.9	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-091			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

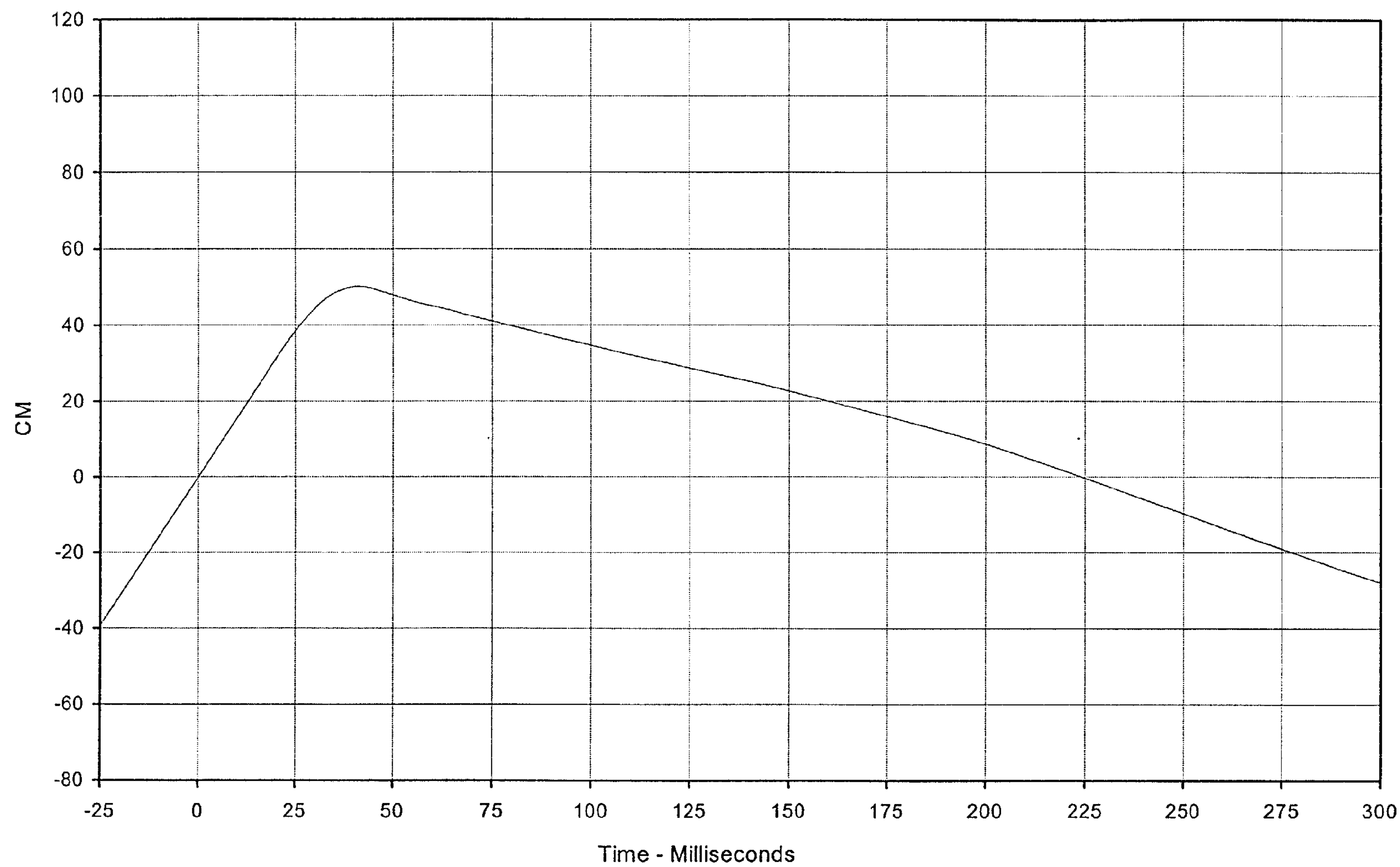


Curve Description:	Vehicle Engine Top Velocity			
Maximum Value:	56.7	at	6.4	Milliseconds
Minimum Value:	-13.6	at	254.6	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-091			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

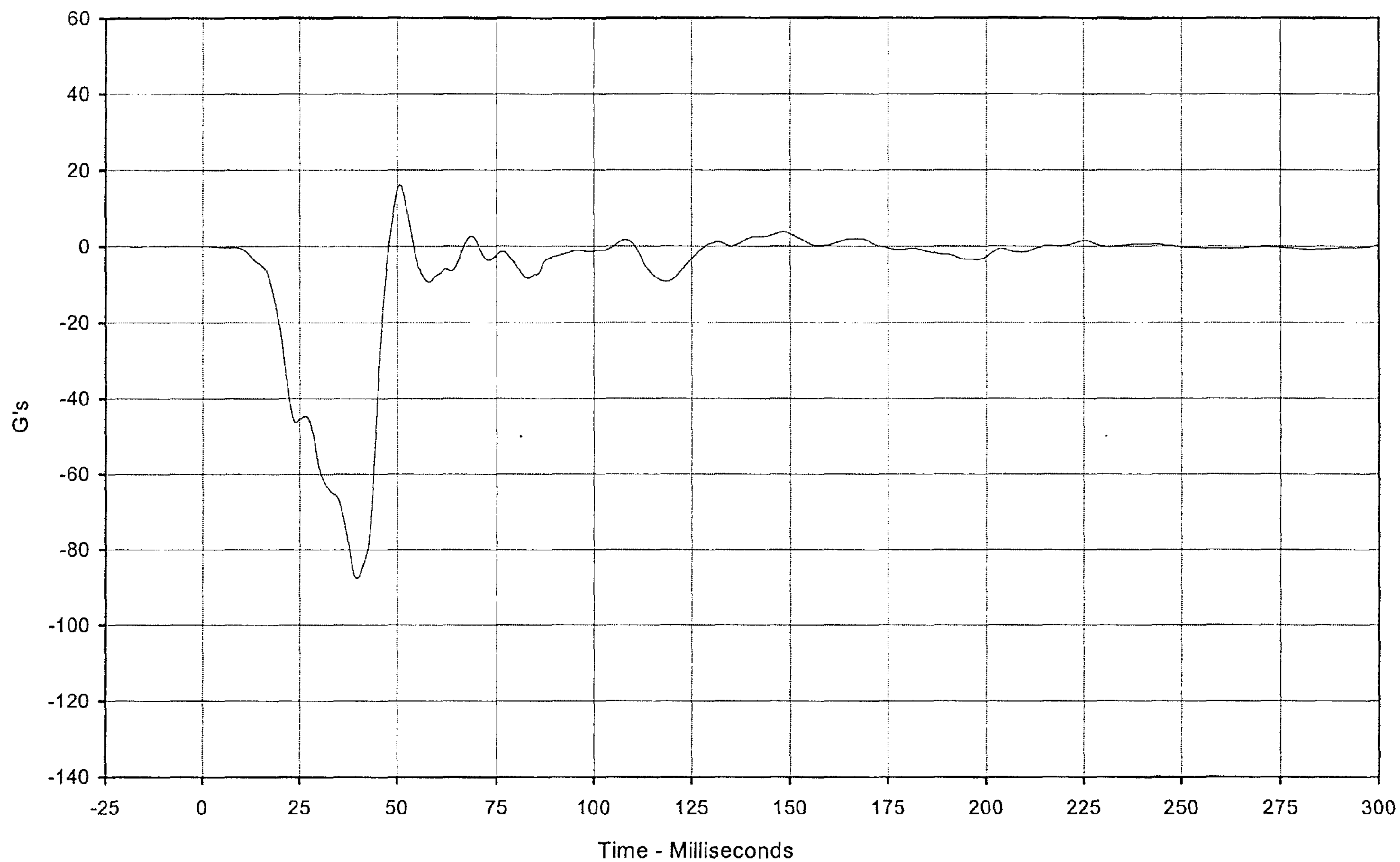


Curve Description:	Vehicle Engine Top Displ.			
Maximum Value:	50.1	at	41.1	Milliseconds
Minimum Value:	-27.9	at	299.9	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-091			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

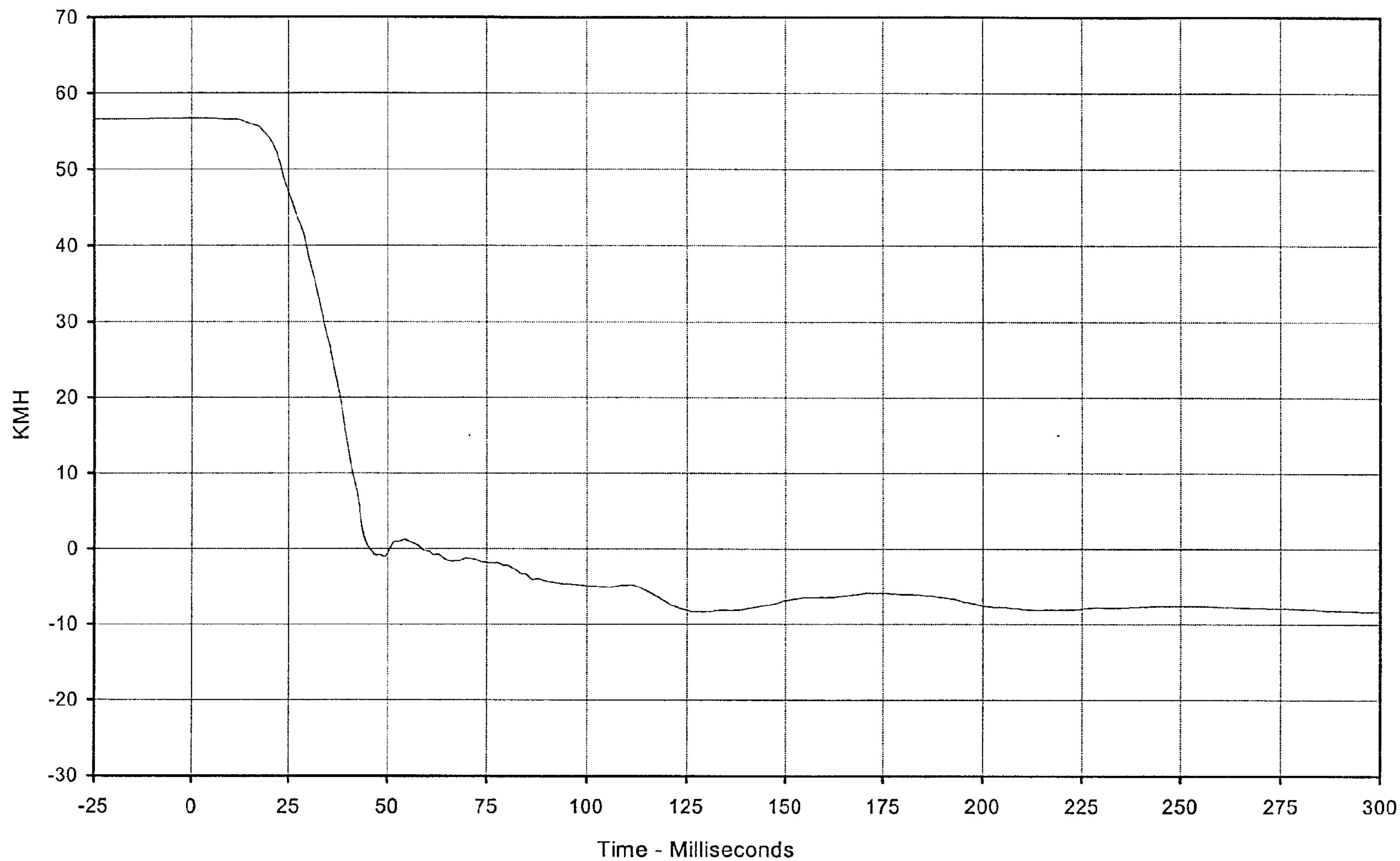
KARCO Engineering



Curve Description:	Vehicle Engine Bottom			
Maximum Value:	16.2	at	50.6	Milliseconds
Minimum Value:	-87.7	at	39.6	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-092			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

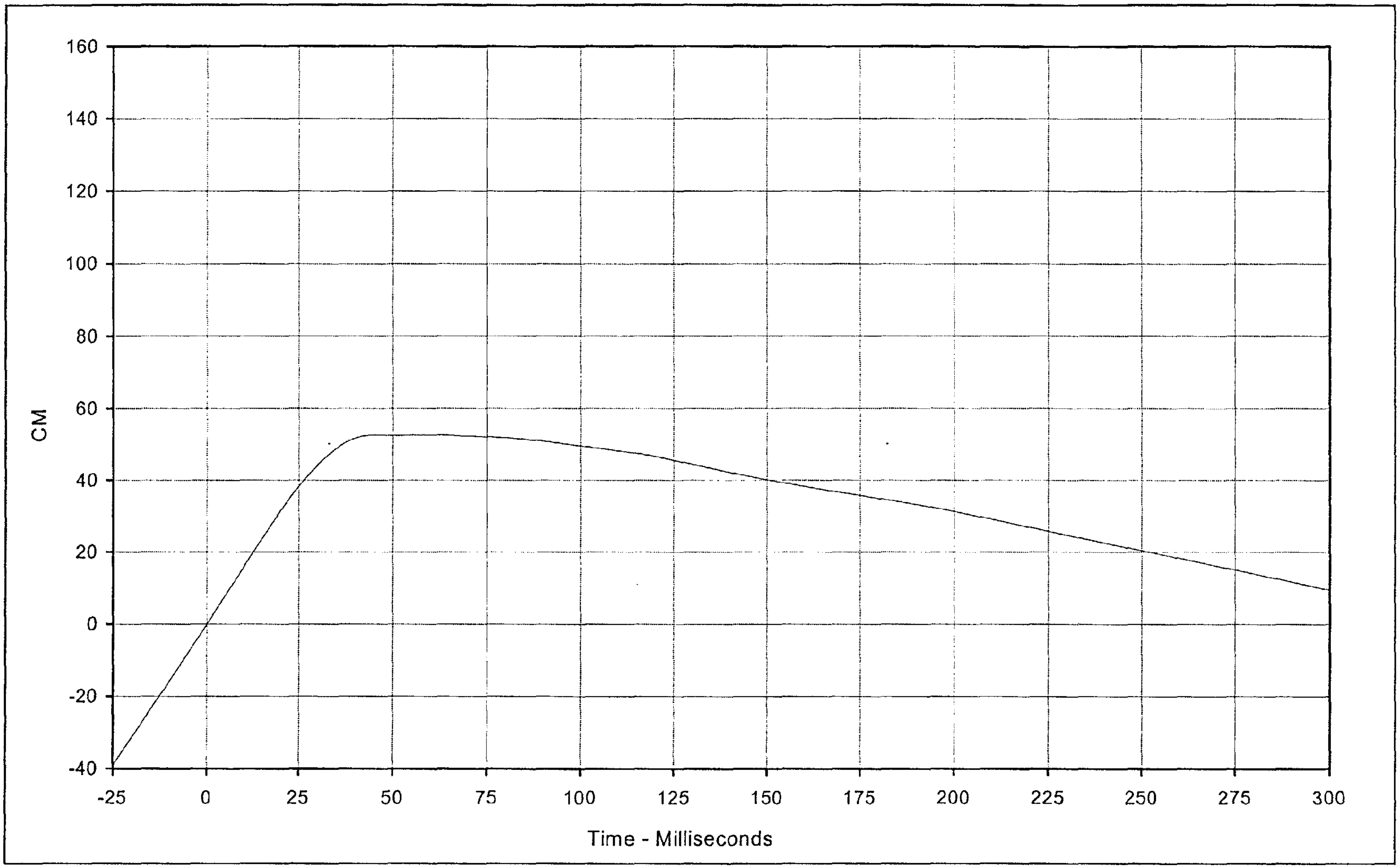
KARCO Engineering



Curve Description:	Vehicle Engine Bottom Velocity			
Maximum Value:	56.7	at	0.5	Milliseconds
Minimum Value:	-8.3	at	128.4	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-092			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

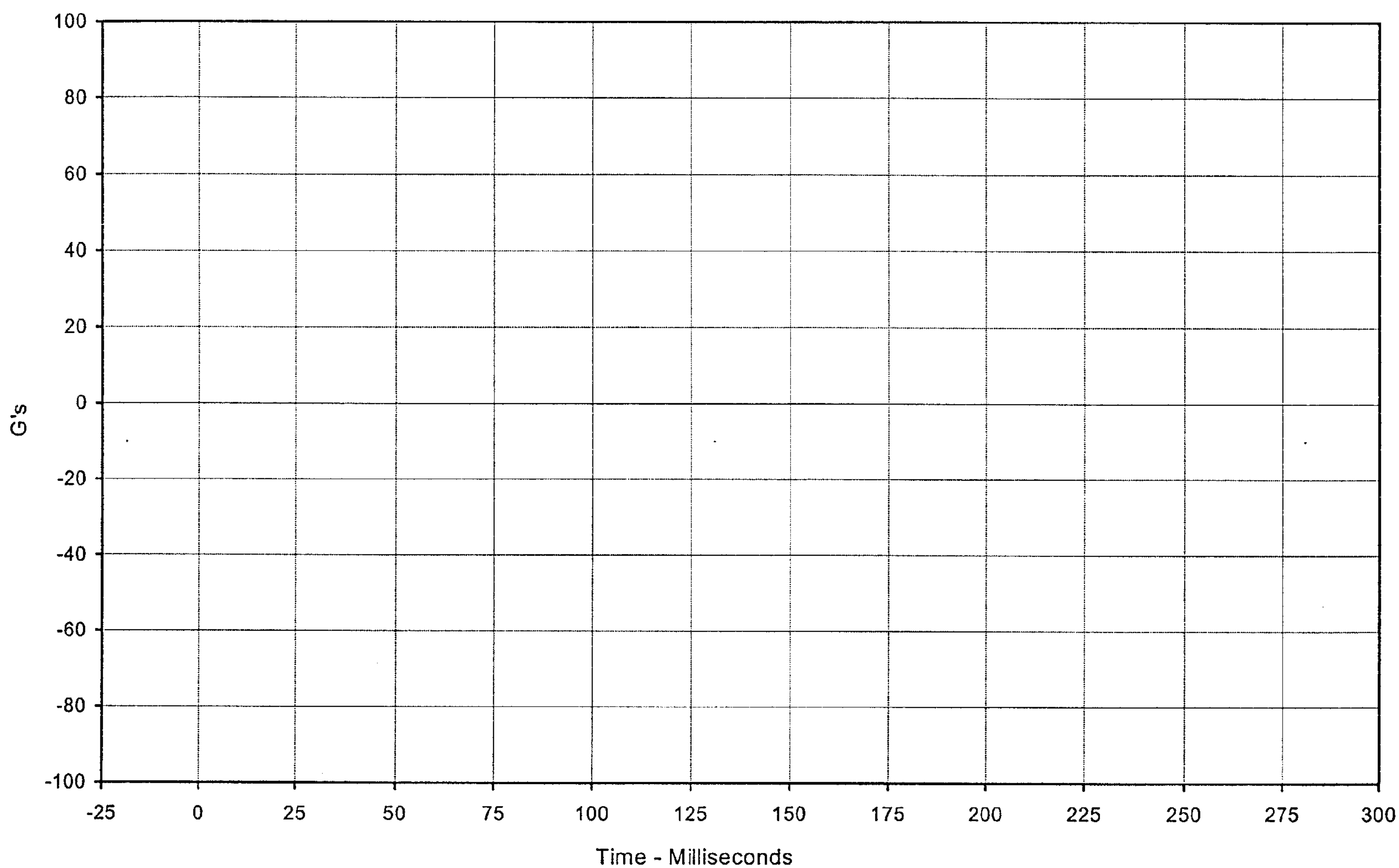


Curve Description:	Vehicle Engine Bottom Displ.			
Maximum Value:	52.6	at	58.5	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-092			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

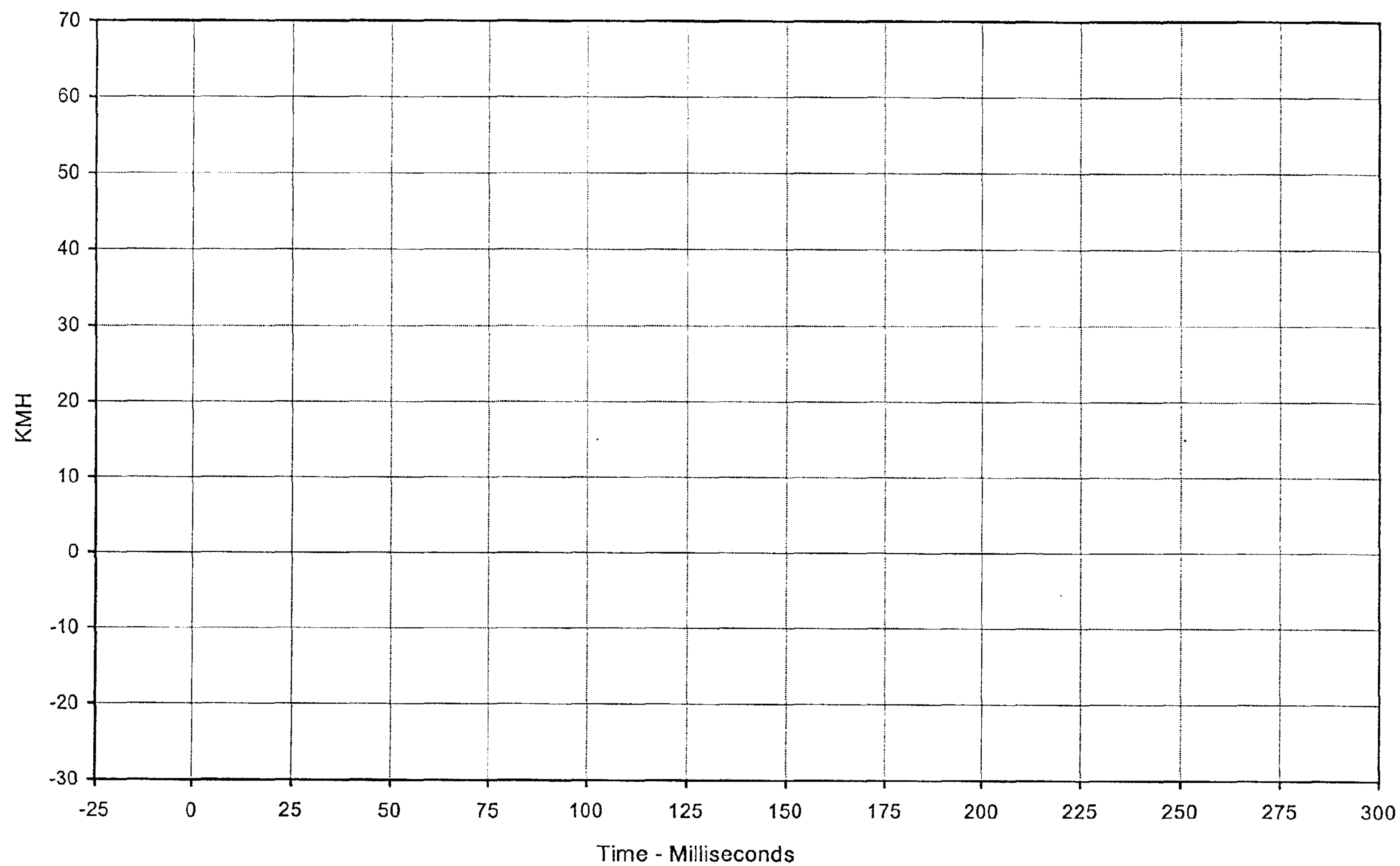
KARC Engineering



Curve Description:	Vehicle Left Brake Caliper *					Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	0.0	at	0.0	Milliseconds		Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	0.0	at	0.0	Milliseconds			
SAE Filter Class:	60						
Date of Test:	1/8/98						
Curve Number:	FIL-093						

* Channel Failed, No Data

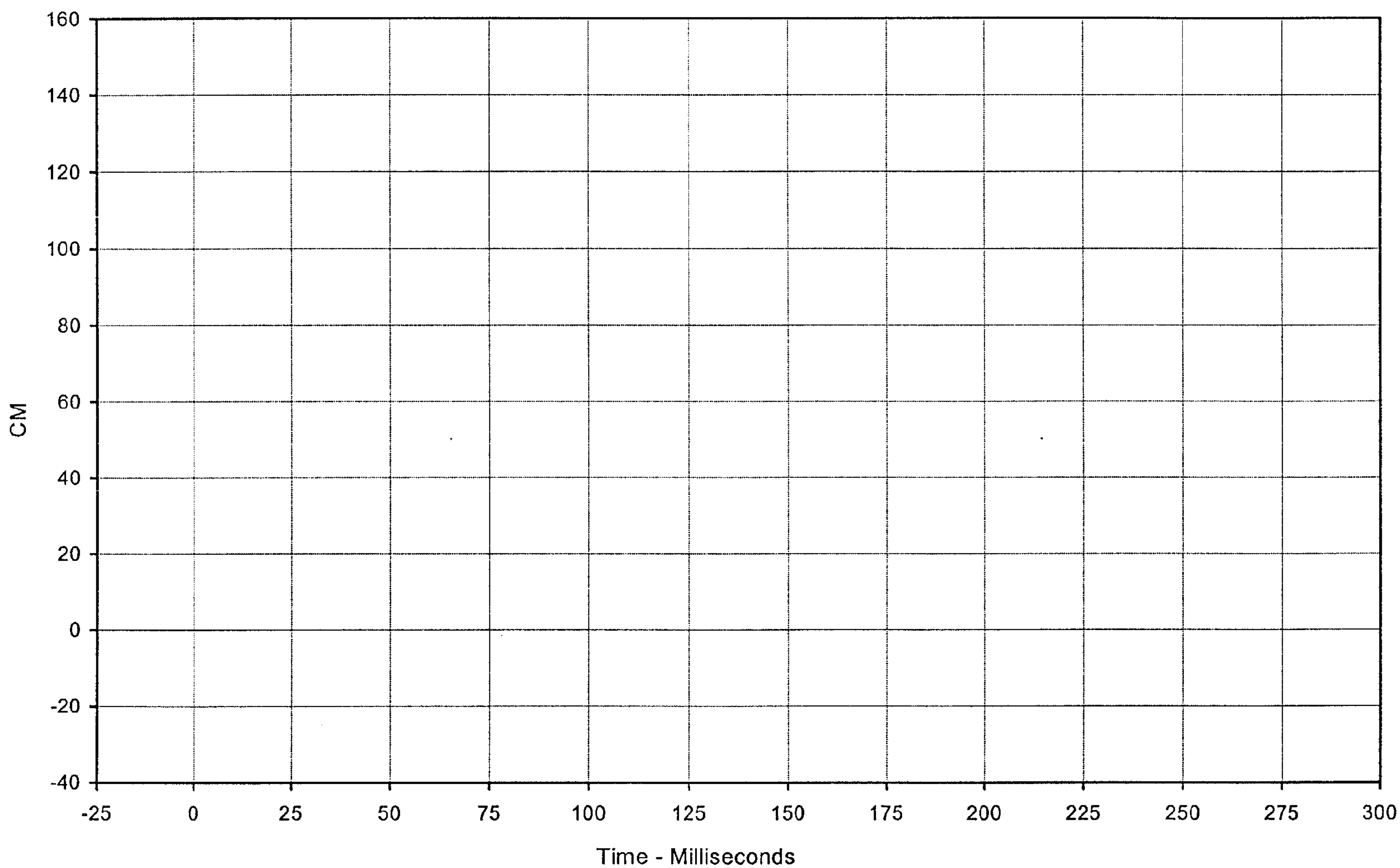
KARCO Engineering



Curve Description:	Vehicle Left Brake Caliper Velocity *				Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Maximum Value:	0.0	at	0.0	Milliseconds	Test Vehicle:	1998 Chevrolet Blazer LS SUV
Minimum Value:	0.0	at	0.0	Milliseconds		
SAE Filter Class:	180					
Date of Test:	1/8/98					
Curve Number:	IN1-093					

* Channel Failed, No Data

KARC Engineering



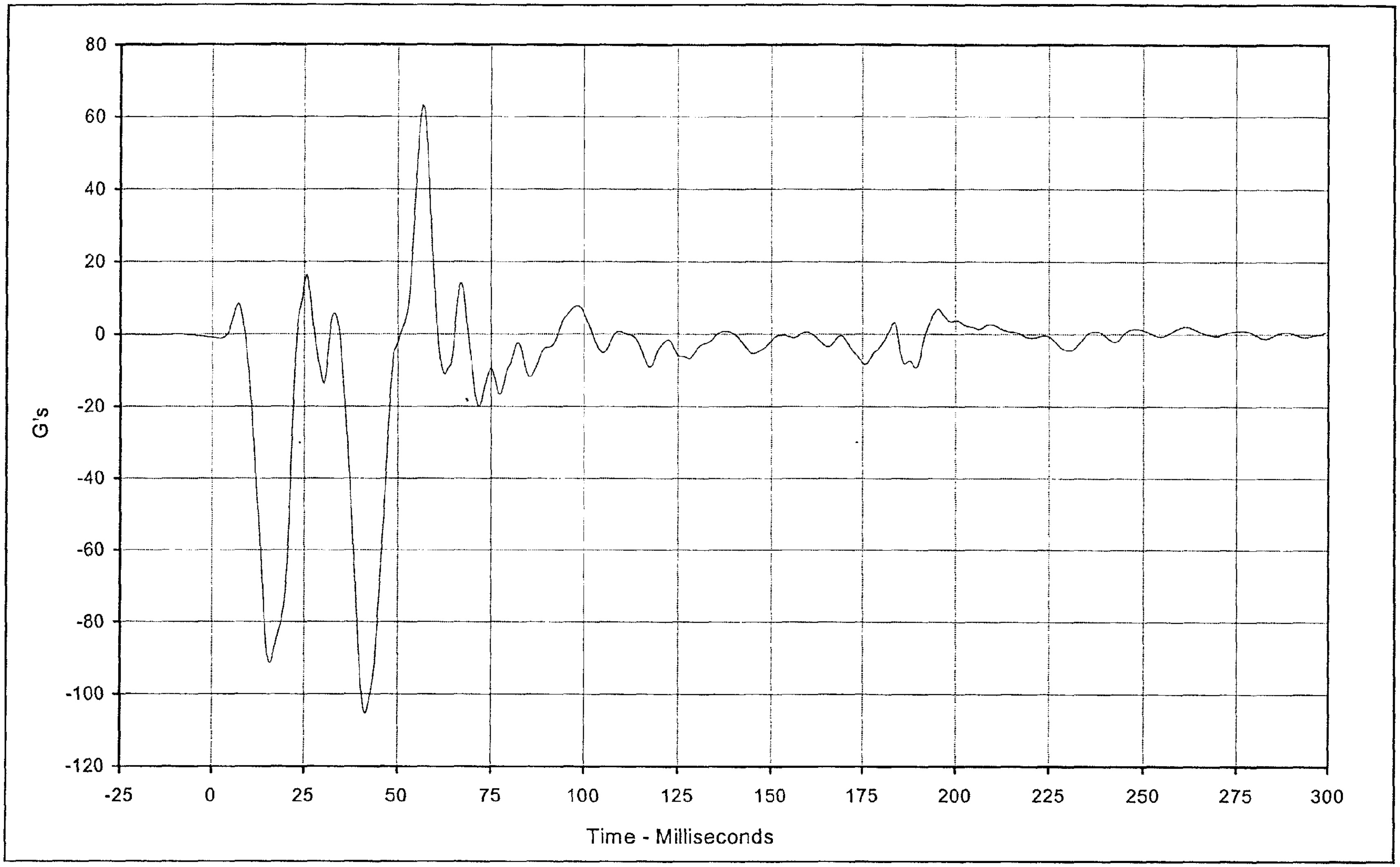
Curve Description:	Vehicle Left Brake Caliper Displ. *			
Maximum Value:	0.0	at	0.0	Milliseconds
Minimum Value:	0.0	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-093			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

* Channel Failed, No Data

KARC Engineering

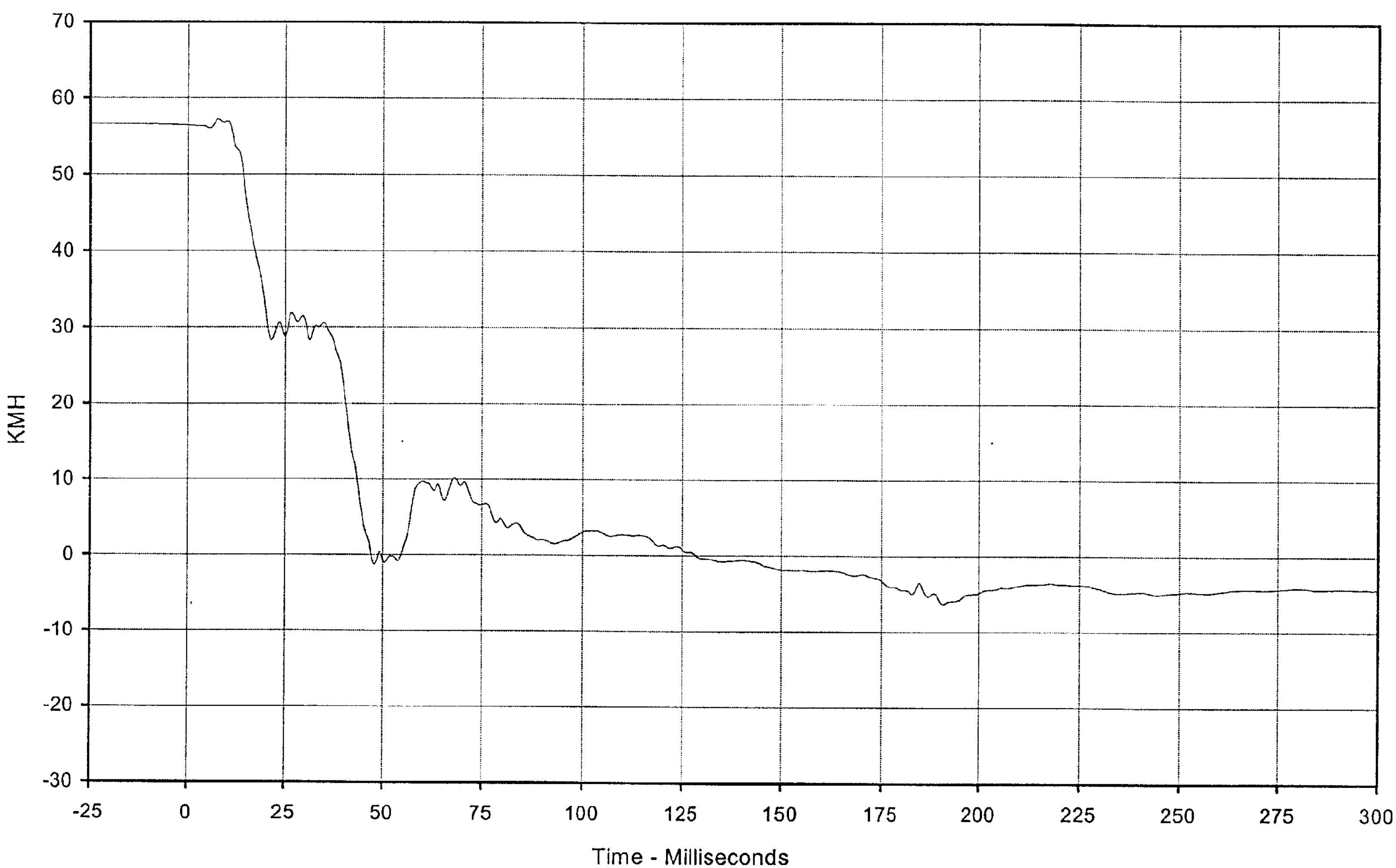


Curve Description:	Vehicle Right Brake Caliper			
Maximum Value:	63.1	at	56.8	Milliseconds
Minimum Value:	-105.3	at	41.4	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-094			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

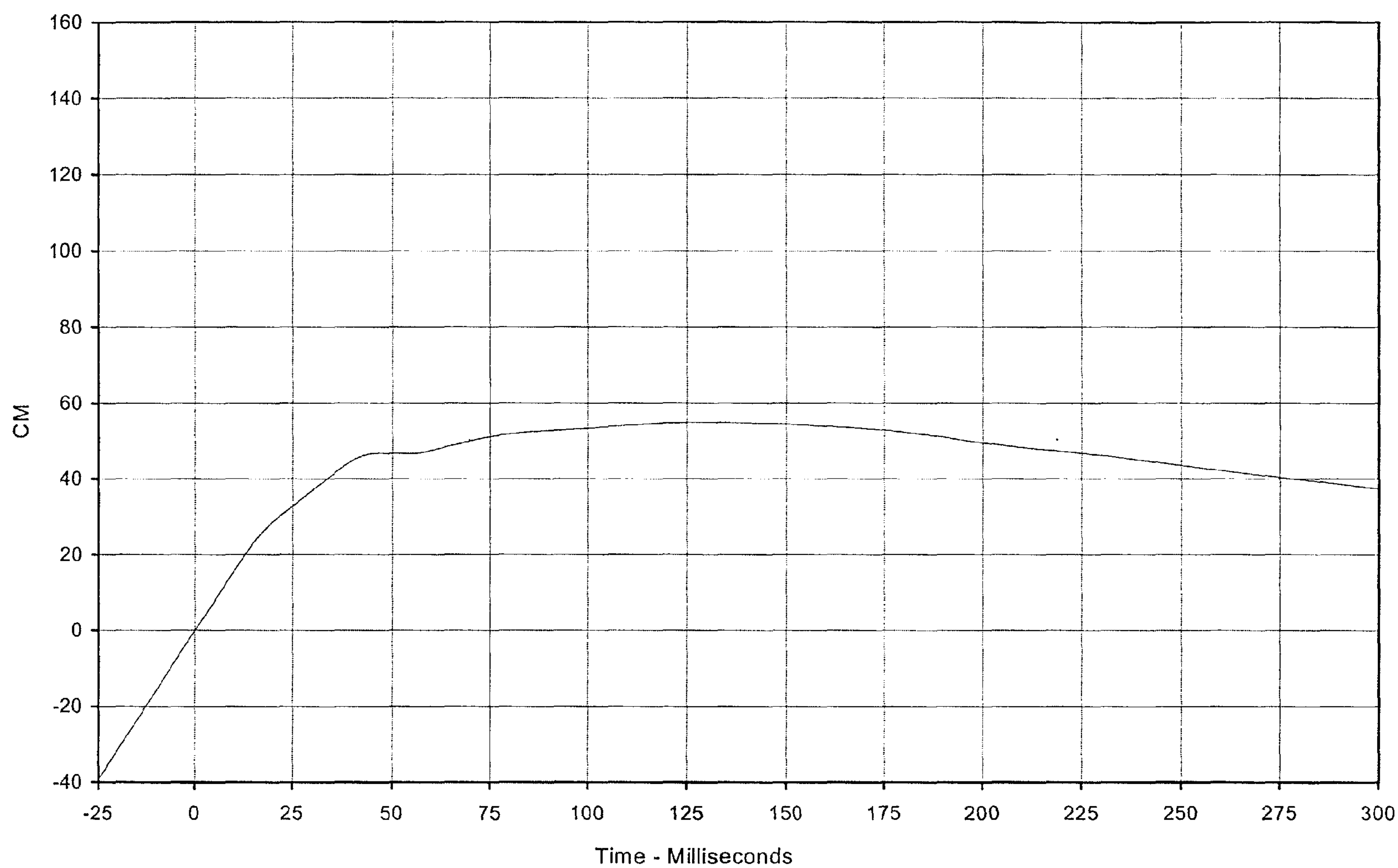


Curve Description:	Vehicle Right Brake Caliper Velocity			
Maximum Value:	57.2	at	8.1	Milliseconds
Minimum Value:	-6.3	at	190.8	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-094			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

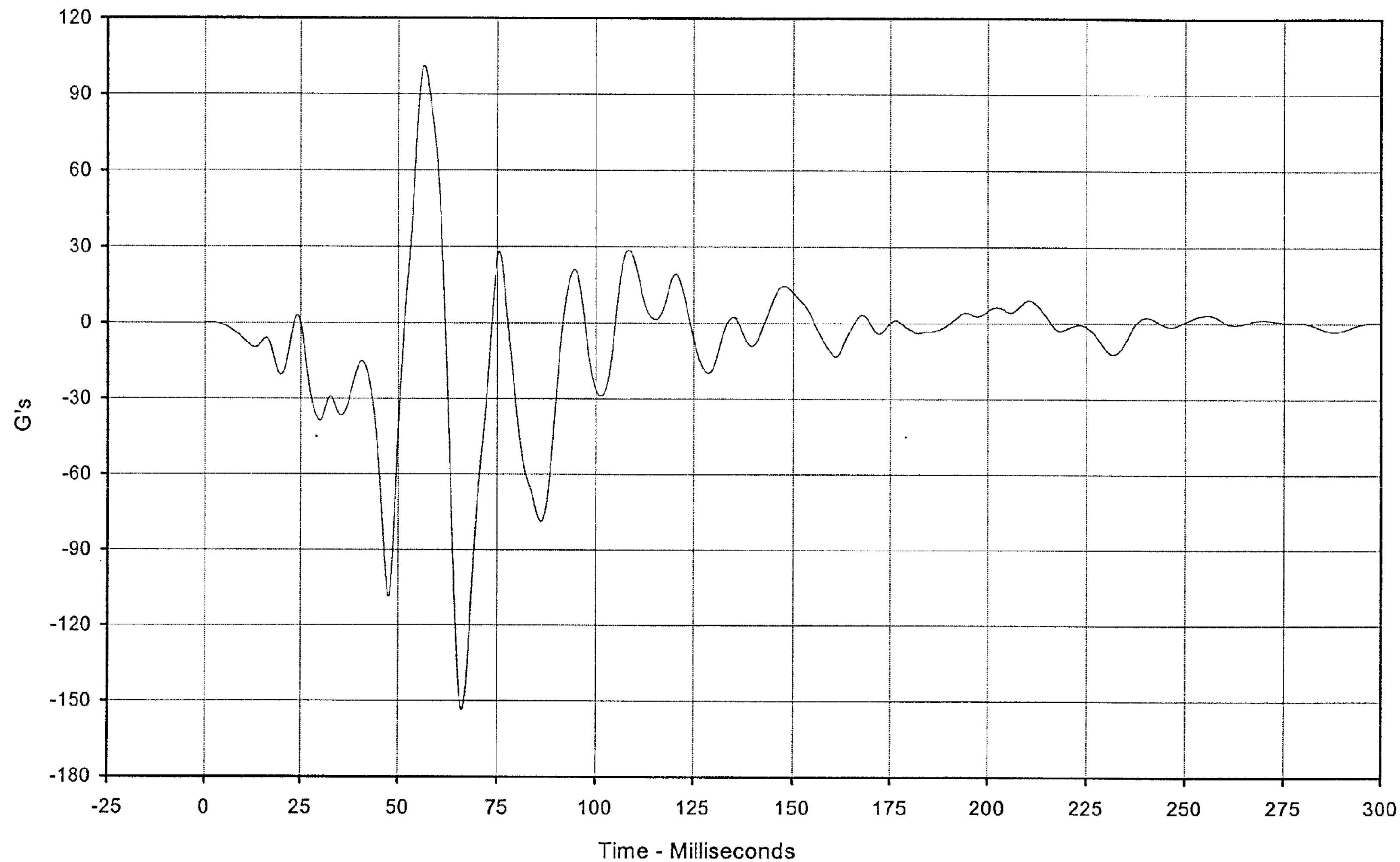


Curve Description:	Vehicle Right Brake Caliper Displ.			
Maximum Value:	54.9	at	128.5	Milliseconds
Minimum Value:	-0.1	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-094			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

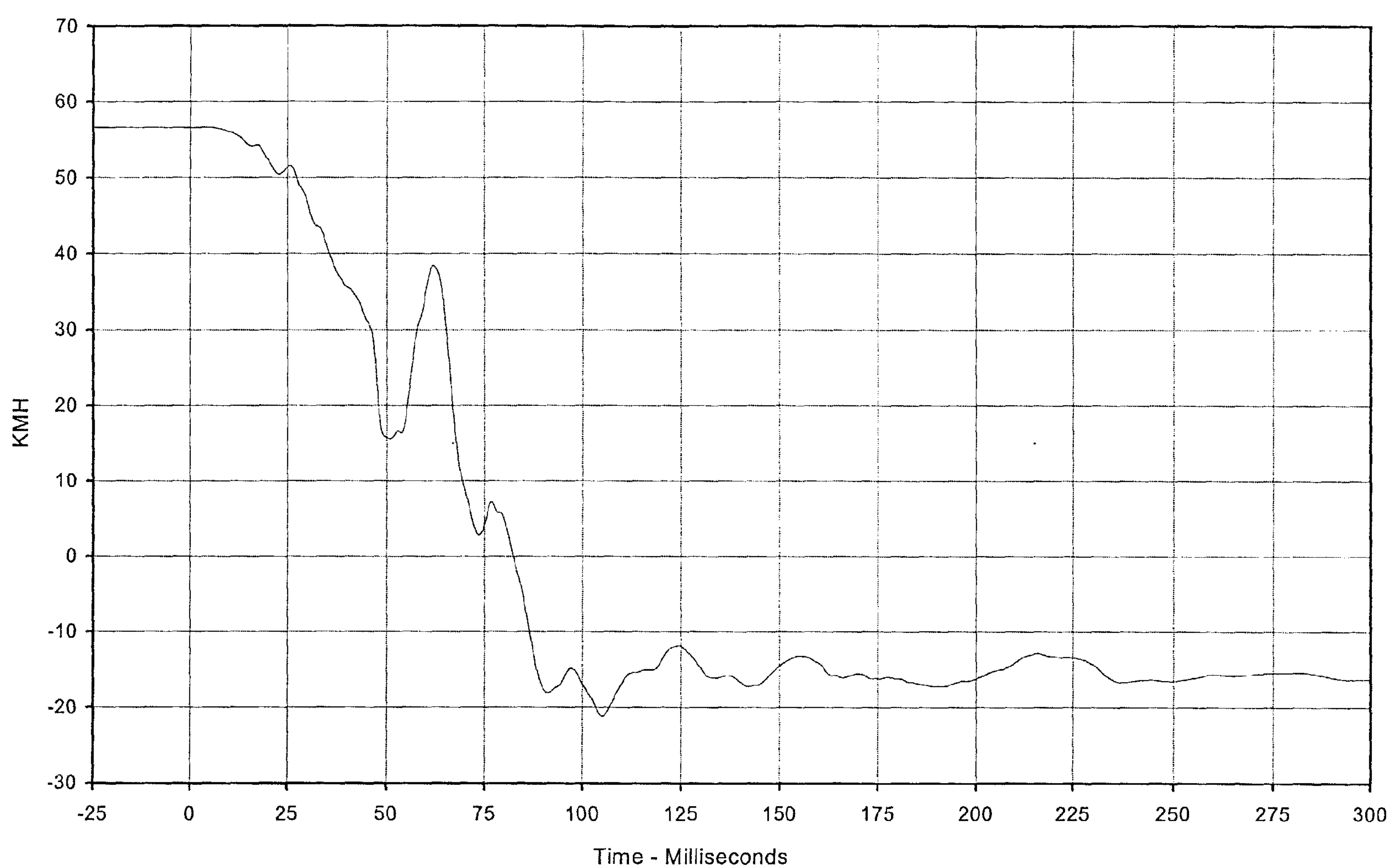


Curve Description:	Vehicle Instrument Panel			
Maximum Value:	101.2	at	56.6	Milliseconds
Minimum Value:	-153.6	at	66.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-095			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

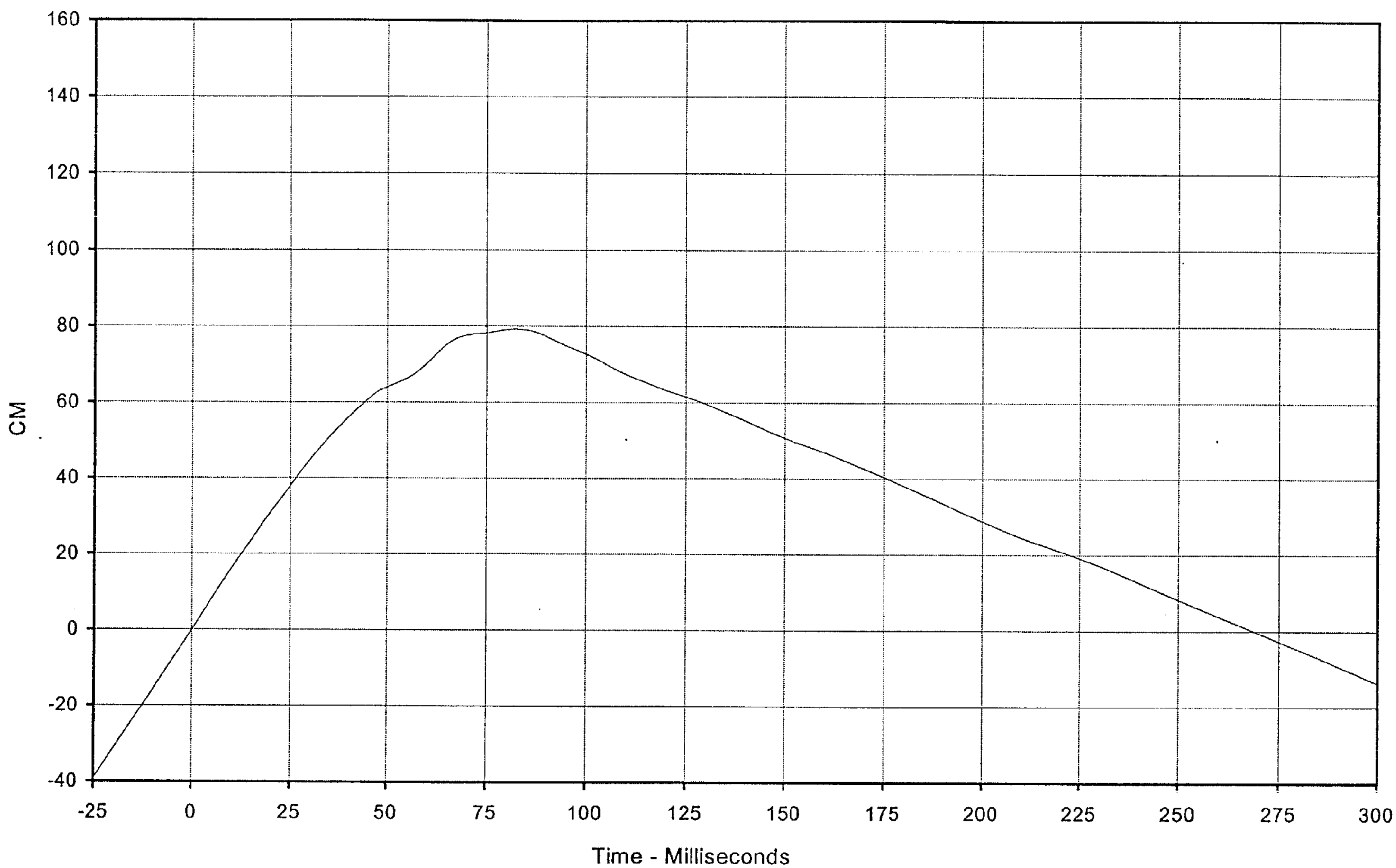
KARCO Engineering



Curve Description:	Vehicle Instrument Panel Velocity			
Maximum Value:	56.6	at	3.5	Milliseconds
Minimum Value:	-21.1	at	105.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-095			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARCO Engineering

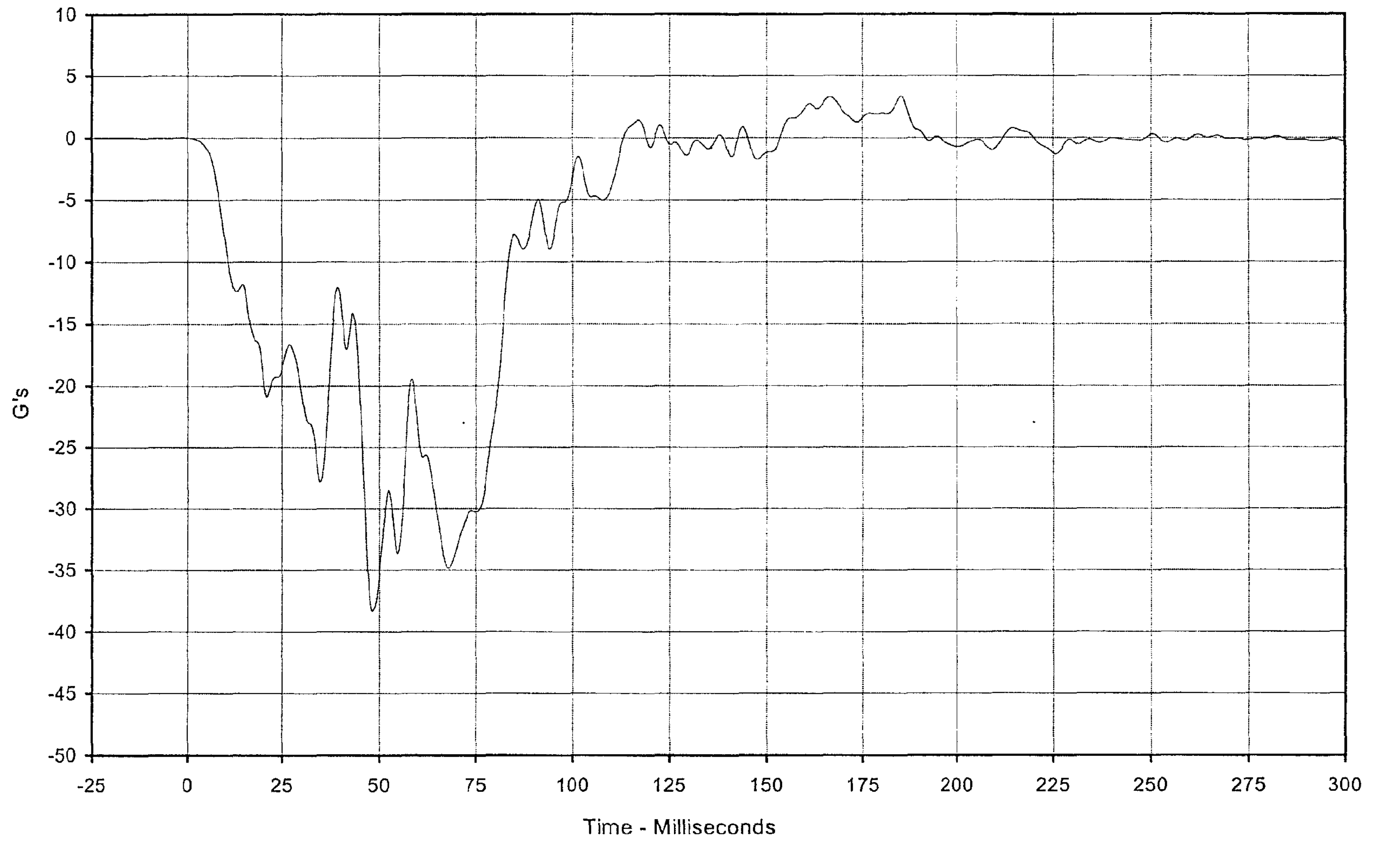


Curve Description:	Vehicle Instrument Panel Displ.			
Maximum Value:	79.2	at	82.3	Milliseconds
Minimum Value:	-13.6	at	299.9	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-095			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

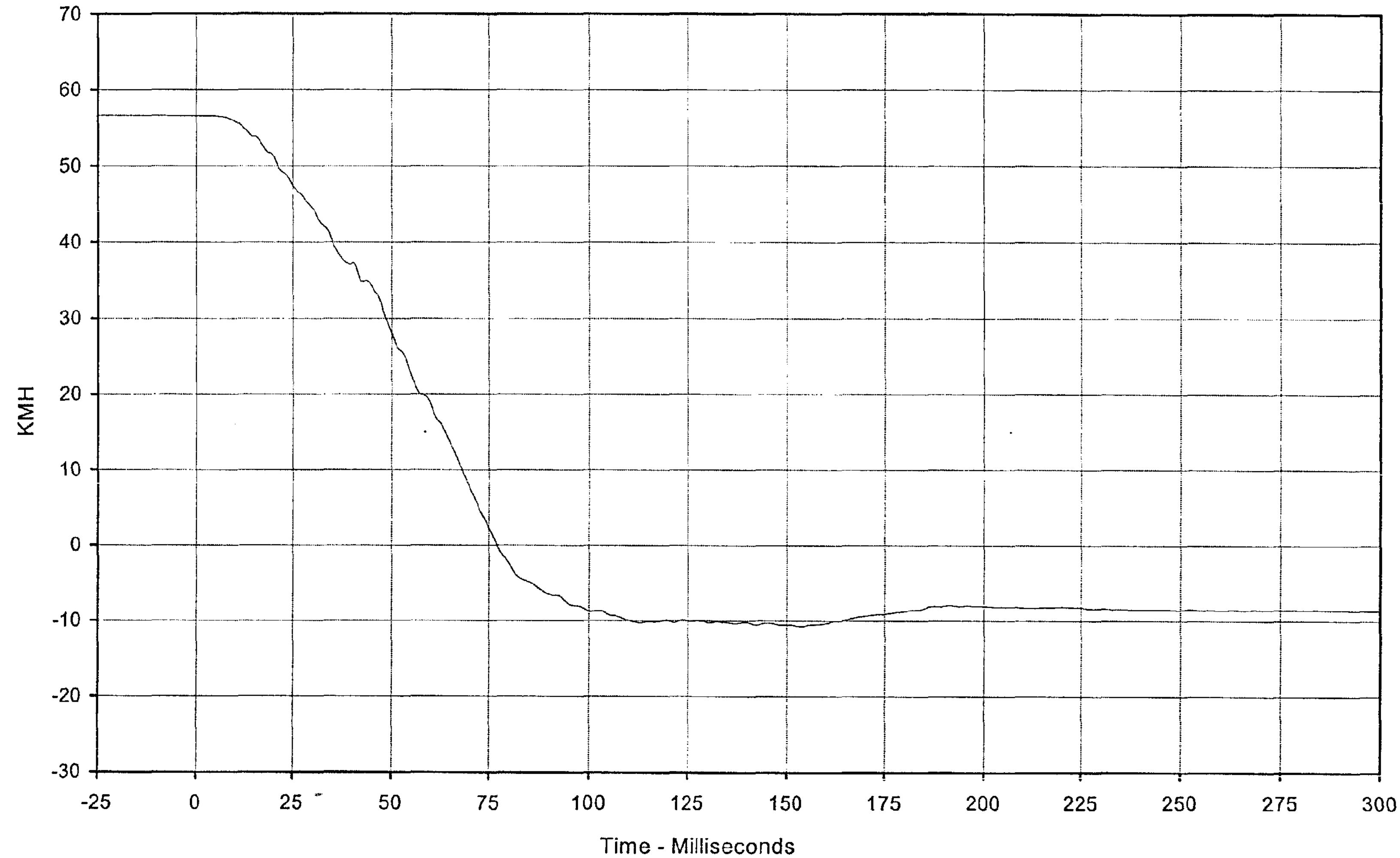
KARC Engineering



Curve Description:	Vehicle Left Rear Redundant			
Maximum Value:	3.4	at	185.1	Milliseconds
Minimum Value:	-38.3	at	48.3	Milliseconds
SAE Filter Class:	60			
Date of Test:	1/8/98			
Curve Number:	FIL-096			

Testing Program	1988 NHTSA 35 mph NCAP No.: MW0103
Test Vehicle:	1998 Chevrolet Blazer LS SUV

KARC Engineering

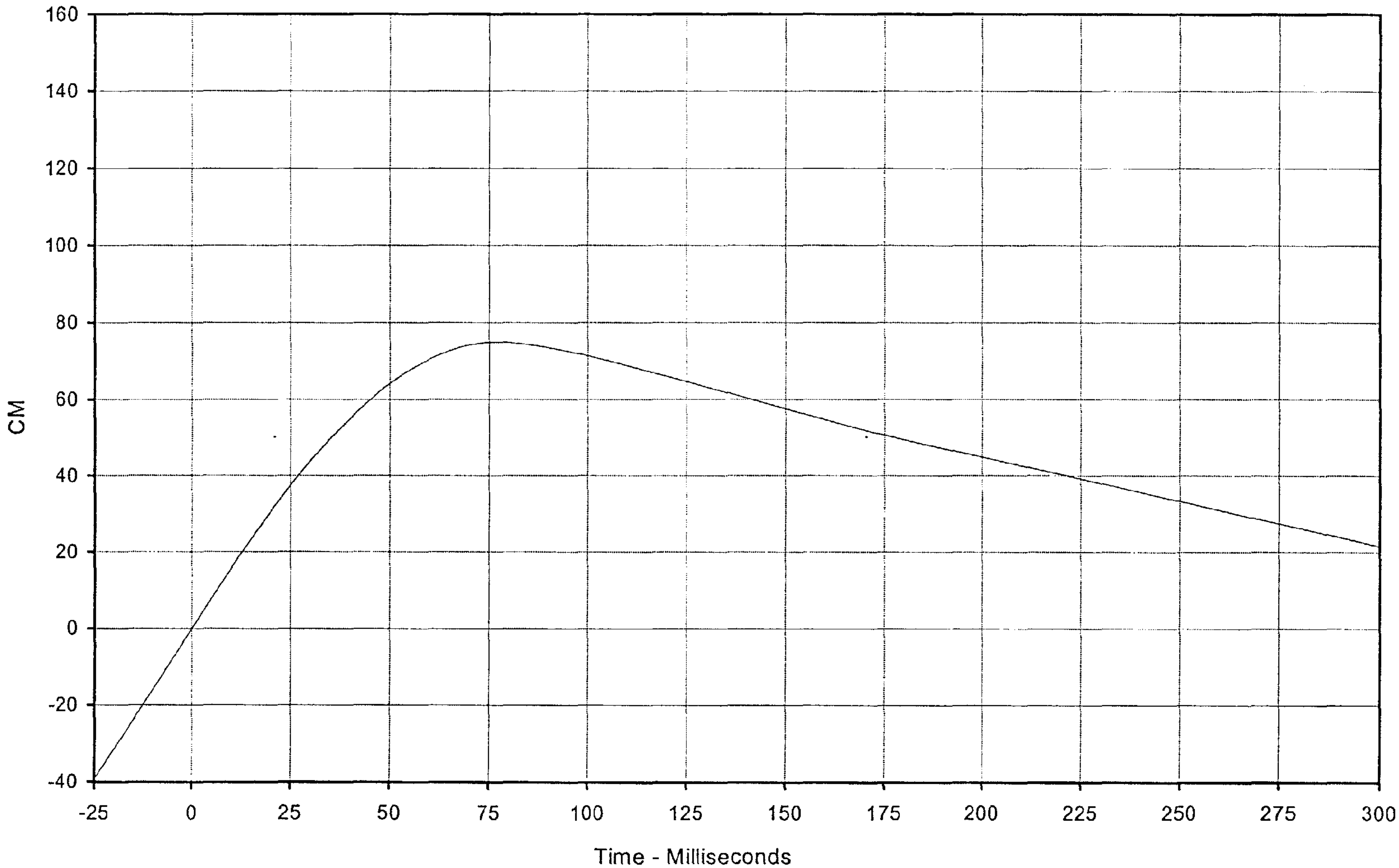


Curve Description:	Vehicle Left Rear Redundant Velocity			
Maximum Value:	56.6	at	0.6	Milliseconds
Minimum Value:	-10.7	at	153.9	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN1-096			

Testing Program 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering



Curve Description:	Vehicle Left Rear Redundant Displ.			
Maximum Value:	74.9	at	77.0	Milliseconds
Minimum Value:	-0.1	at	0.0	Milliseconds
SAE Filter Class:	180			
Date of Test:	1/8/98			
Curve Number:	IN2-096			

Testing Program: 1988 NHTSA 35 mph NCAP No.: MW0103

Test Vehicle: 1998 Chevrolet Blazer LS SUV

KARCO Engineering

APPENDIX C

LOAD CELL BARRIER INFORMATION (NOT APPLICABLE FOR THIS TEST)

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

Ncap Test With Hybrid III Male 50th Pecentile ATD
Instrumentation Data Channel Assignments
Driver A.T.D Serial Number 34
Test Date: 1/8/98
Vehicle: 1998 Chevrolet Blazer LS

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 Pecentile ATD

Instrumentation Data Channel Assignments

Driver A.T.D Serial Number 34

Test Date: 1/8/98

Vehicle: 1998 Chevrolet Blazer LS

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	Celesco	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 Pecentile ATD

Instrumentation Data Channel Assignments

Passenger A.T.D Serial Number 35

Test Date: 1/8/98

Vehicle: 1998 Chevrolet Blazer LS

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 Pecentile ATD
Instrumentation Data Channel Assignments
Passenger A.T.D Serial Number 35
Test Date: 1/8/98
Vehicle: 1998 Chevrolet Blazer LS

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	GPLT01FY	3 ch., lower tibia gage	R. A. Denton	1584	N
74	LWR. TIBIA LEFT FORCE	Z	GPLT01FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
75	LWR. TIBIA LEFT MOM.	X	GPLT01MX	3 ch., lower tibia gage	R. A. Denton	1584	N.m
76	LWR. TIBIA RIGHT FORCE	Y	GPLT02FY	3 ch., lower tibia gage	R. A. Denton	1584	N
77	LWR. TIBIA RIGHT FORCE	Z	GPLT02FZ	3 ch., lower tibia gage	R. A. Denton	1584	N
78	LWR. TIBIA RIGHT MOM.	X	GPLT02MX	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 Pecentile ATD
Instrumentation Data Channel Assignments
Vehicle Accelerometers
Test Date: 1/8/98
Vehicle: 1998 Chevrolet Blazer LS

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

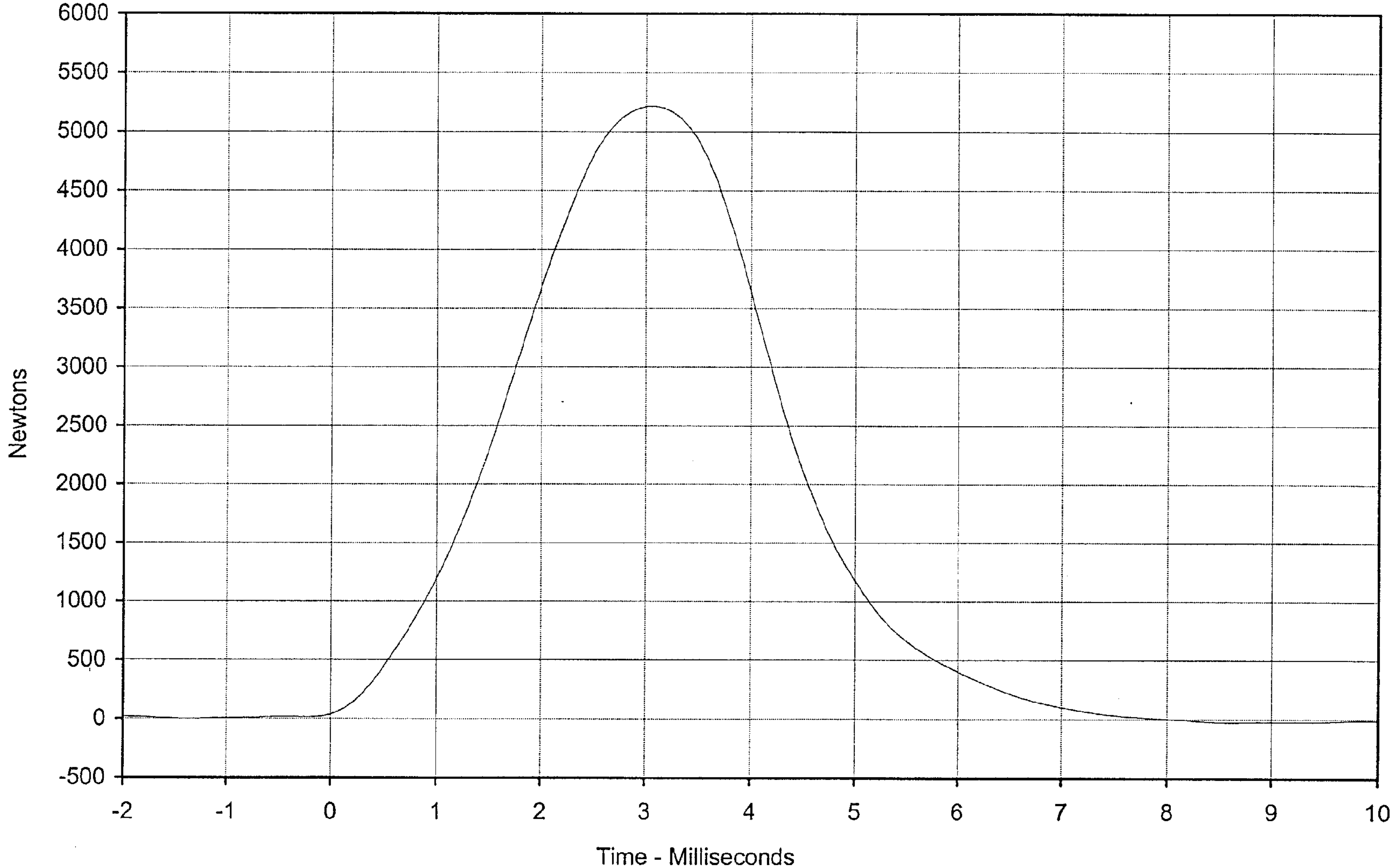
Hybrid III Calibration Data Sheet
50TH Percentile Male
Left Knee Impact Test

ATD Serial No.: 034 Part Serial No.: N/A Test I.D.: H3K12

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	2.129	Pass
Peak Probe Force	Newtons	4715 to 5782	5212.6	Pass
		Overall Test Results		Pass

Laboratory Technician — Test Date: December 15, 1997

Approved By — Date: 12/15/97



Curve Description:	Probe Force			
Maximum Value:	5212.6	at	3.1	Milliseconds
Minimum Value:	-1.2	at	-1.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	12/15/97			
ATD Serial No.:	034			

Testing Program: Hybrid III Left Knee Impact Test

Test Information: Part S/N: N/A Test I.D.: H3K12

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

KARC Engineering

ATD Serial No.: 034 Part Serial No.: N/A Test I.D.: H3K09

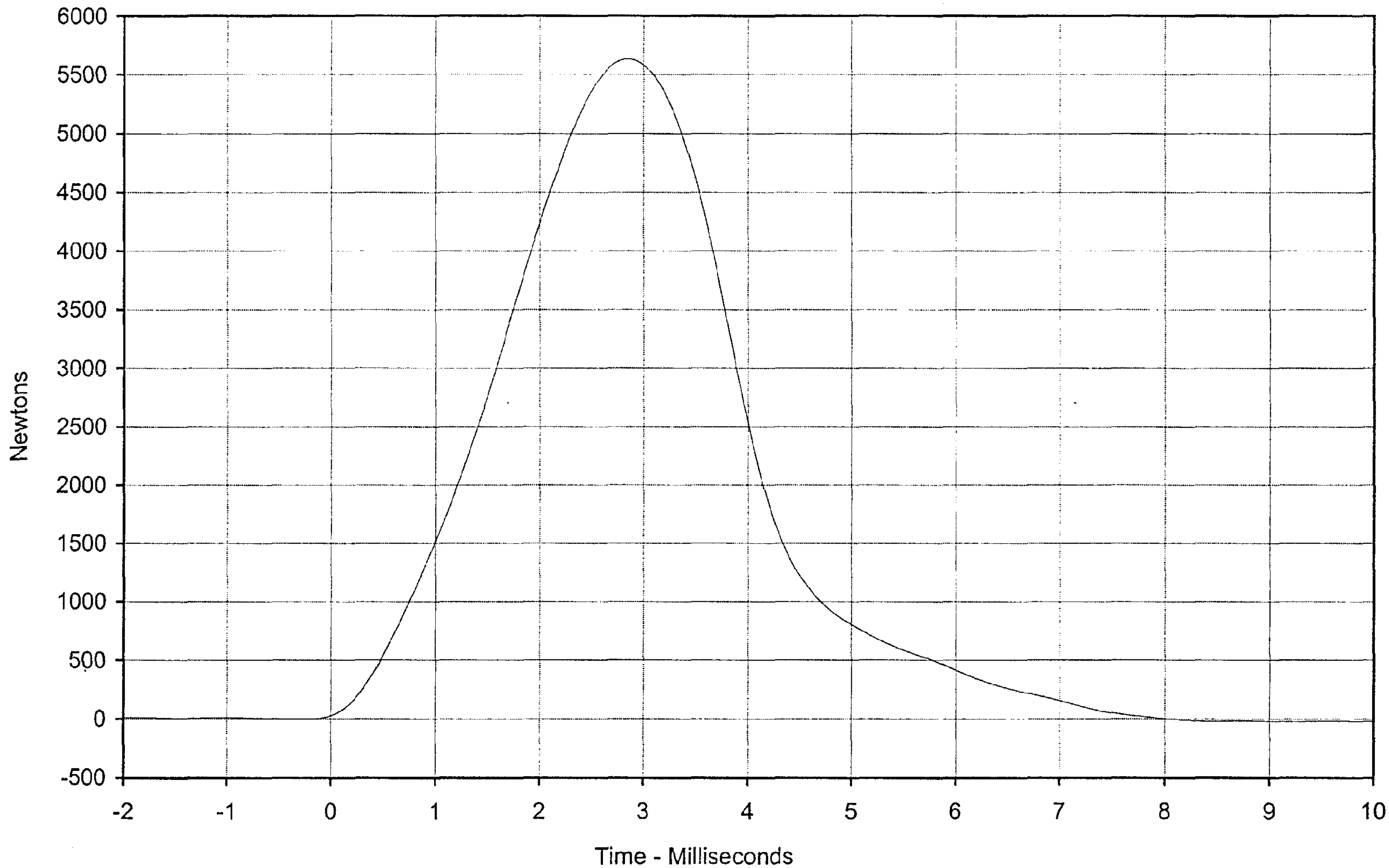
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	2.073 to 2.134	2.122	Pass
Peak Probe Force	Newtons	4715 to 5782	5626.9	Pass
		Overall Test Results		Pass

Laboratory Technician

December 15, 1997
Test Date

Approved By

12/15/97
Date



Curve Description:	Probe Force			
Maximum Value:	5626.9	at	2.9	Milliseconds
Minimum Value:	0.6	at	8.0	Milliseconds
SAE Filter Class:	600			
Date of Test:	12/15/97			
ATD Serial No.:	034			

Testing Program: Hybrid III Right Knee Impact Test

Test Information: Part S/N: N/A Test I.D.: H3K09

KARCO Engineering

Hybrid III Calibration Data Sheet
50TH Percentile Male
Head Drop Calibration

ATD Serial No.: 34 Part Serial No.: N/A Test I.D.: HD100

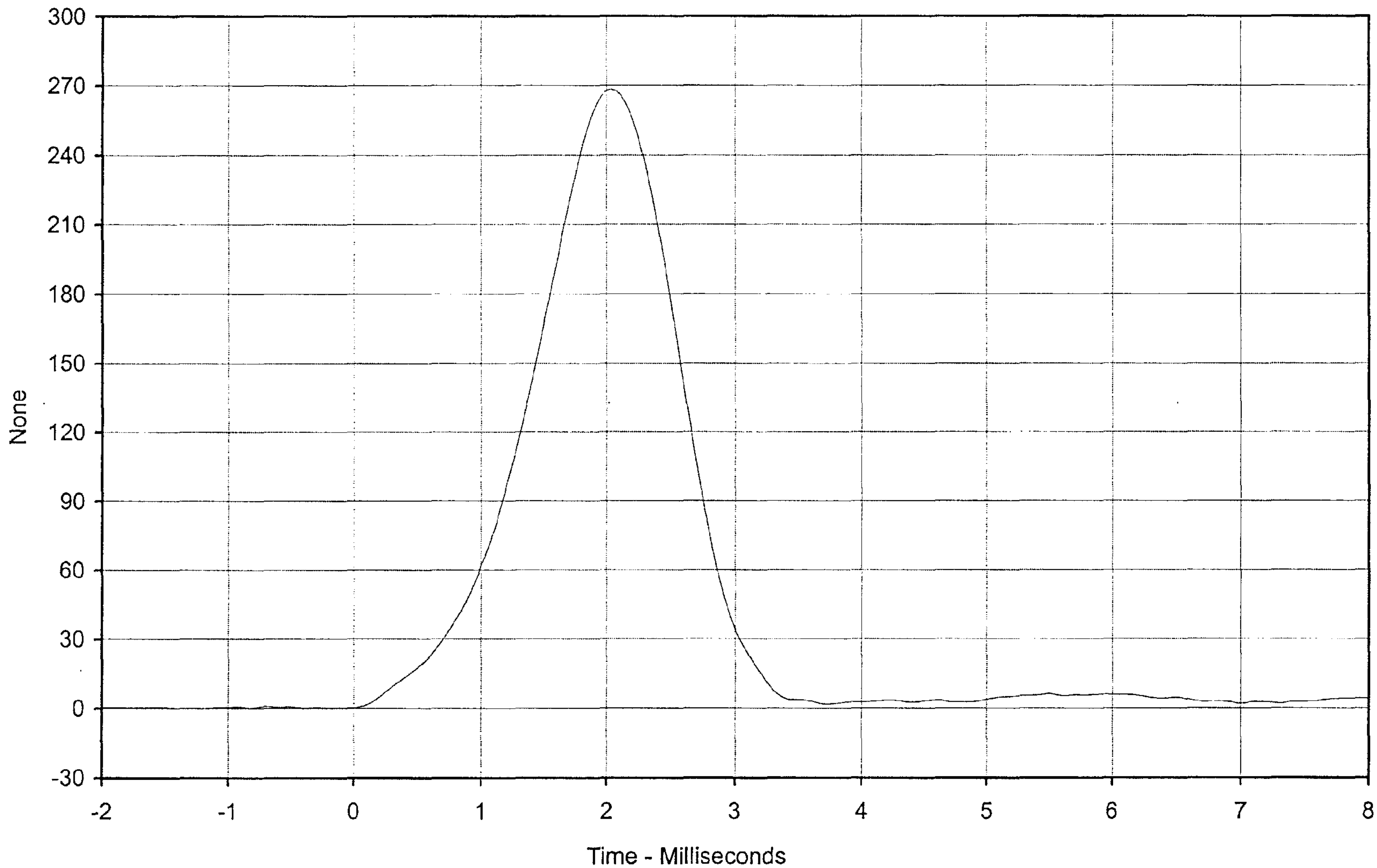
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	267.6	Pass
Peak Lateral Acceleration	G's	≤15.0	3.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

[signature]
Laboratory Technician

December 15, 1997
Test Date

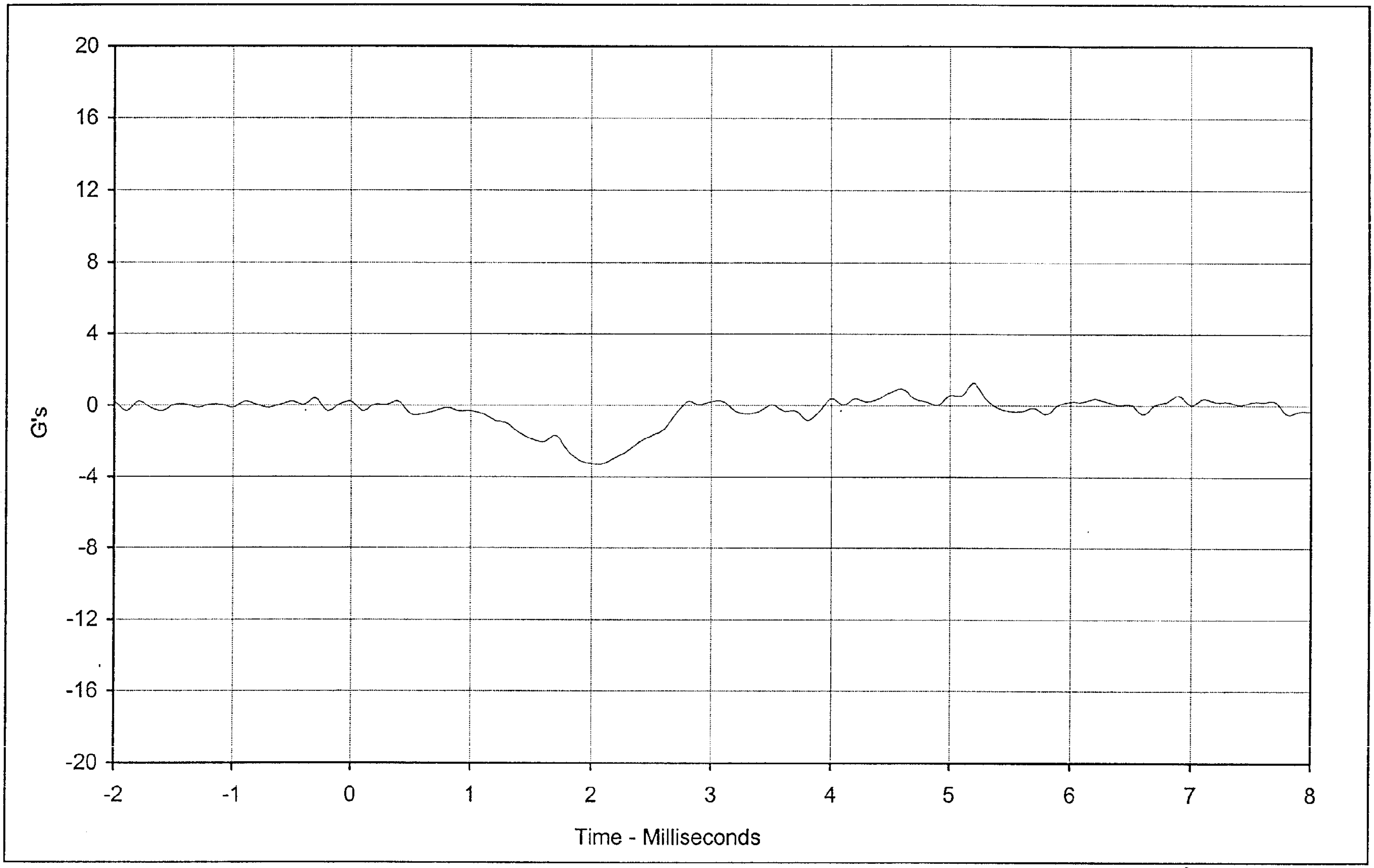
[signature]
Approved By

12/15/97
Date



Curve Description:	Head Resultant Acceleration			
Maximum Value:	267.6	at	2.0	Milliseconds
Minimum Value:	0.1	at	-1.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	12/15/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Head Drop Calibration (Male)
Test Information:	S/N of Part: N/A Test I.D.: HD100



Curve Description: Head Acceleration Y Axis

Maximum Value: 1.3 at 5.2 Milliseconds

Minimum Value: -3.3 at 2.0 Milliseconds

SAE Filter Class: 1000

Date of Test: 12/15/97

ATD Serial No.: 34

Testing Program Hybrid III Head Drop Calibration (Male)

Test Information: S/N of Part: N/A Test I.D.: HD100

KARC Engineering

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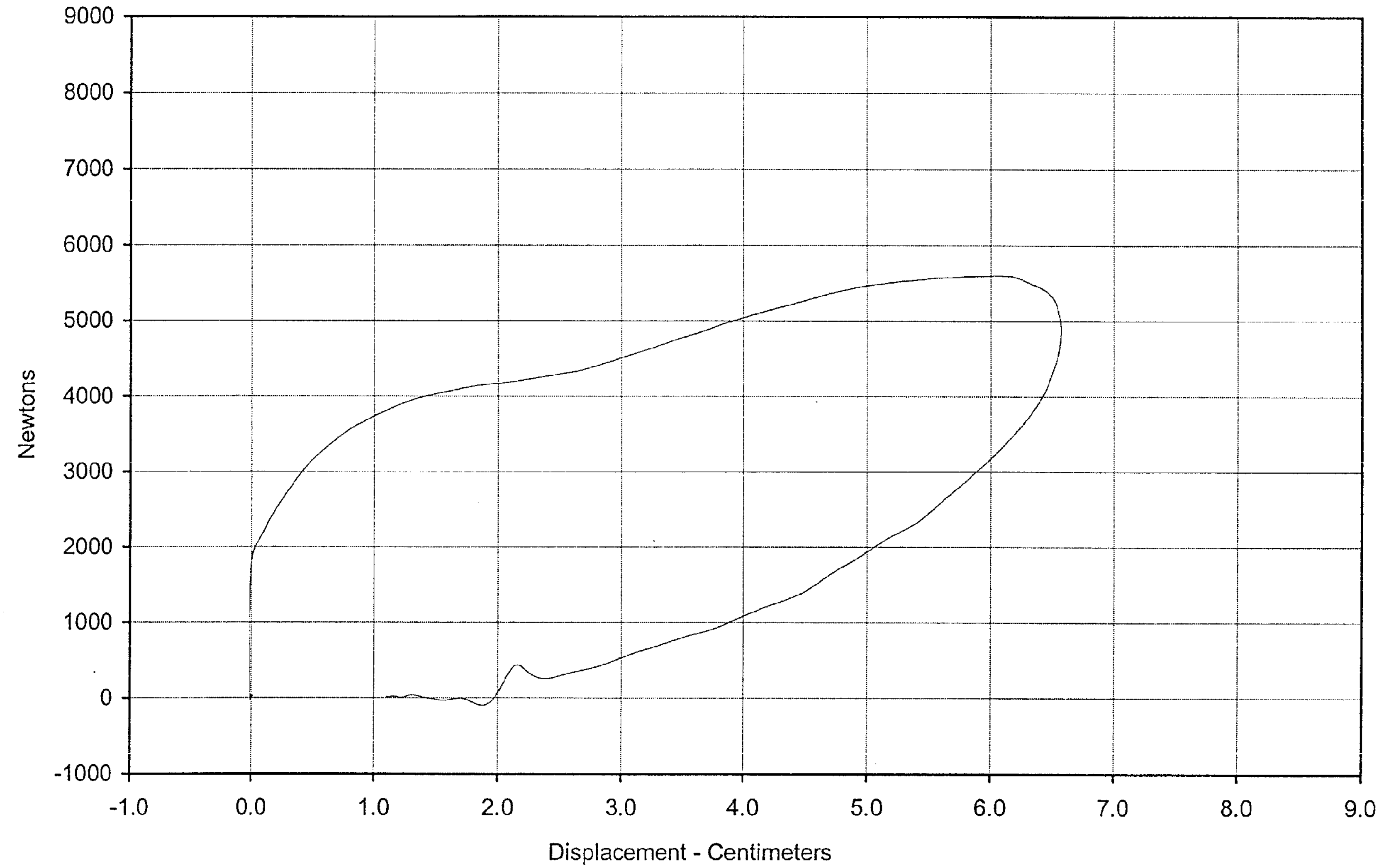
Hybrid III Calibration Data Sheet
50TH Percentile Male
Thorax Impact Test

ATD Serial No.: 034 Part Serial No.: n/a Test I.D.: CH101

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	6.71	Pass
Peak Probe Force	Newtons	5159 to 5893	5601	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.57	Pass
Internal Hysterysis	%	69 to 85	77.9	Pass
		Overall Test Results		Pass

Laboratory Technician — December 5, 1997 Test Date

Approved By — 12/5/97 Date



Curve Description:	Probe Force vs. Chest Displacement		Testing Program	Hybrid III Thorax Impact Test
Probe Force:	5601.2	Newtons	Test Information:	S/N of Part: n/a Test I.D.: CH101
Chest Displ.:	6.57	Centimeters		
SAE Filter Class:	180			
Date of Test:	12/5/97			
ATD Serial No.:	034			

Hybrid III Calibration Data Sheet
50^{TH} Percentile Male
Neck Flexion Test

ATD Serial No.: 34 Part Serial No.: n/a Test I.D.: NF100

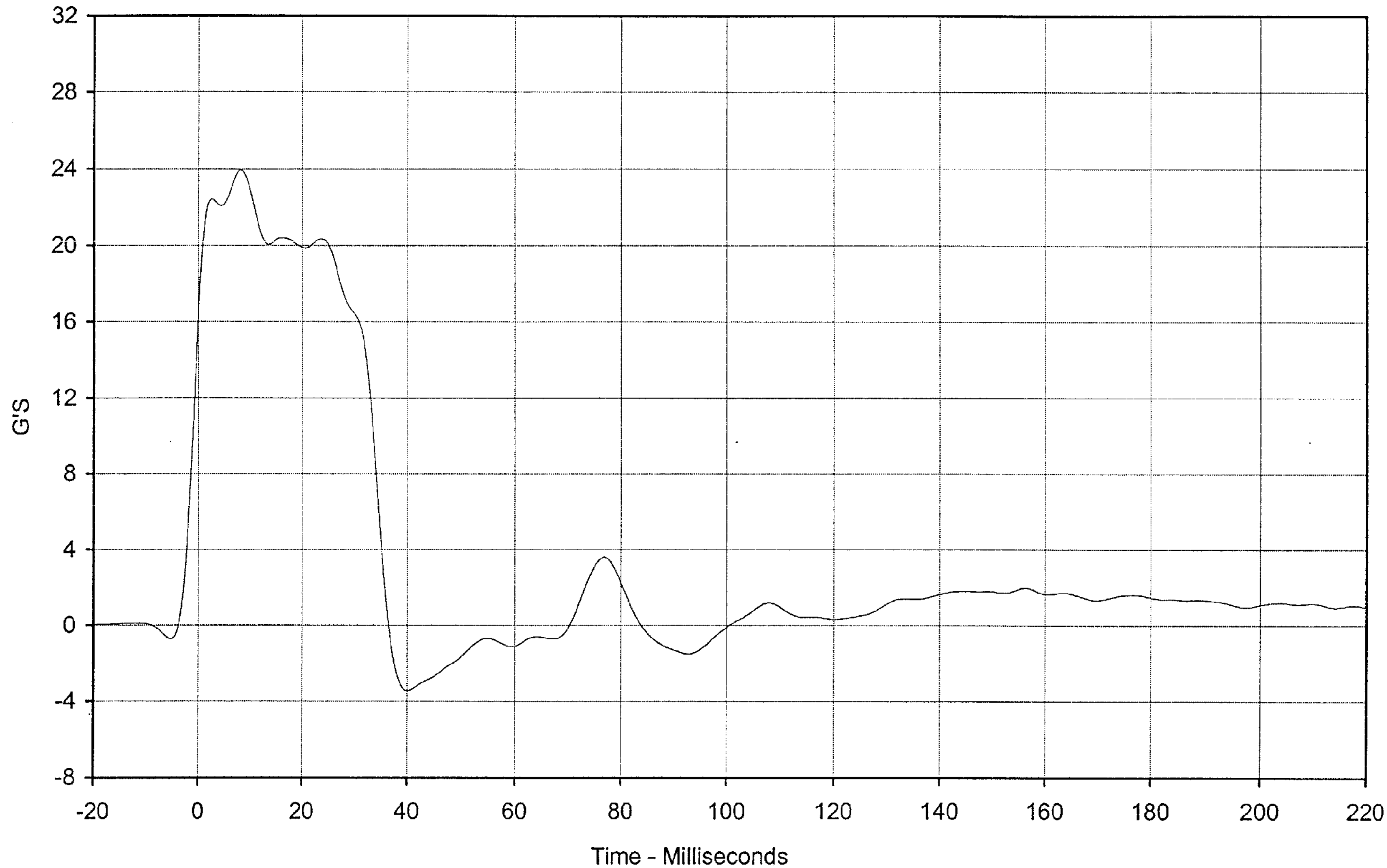
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.92	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.8	Pass
	20 Msec.	G's	17.6 to 22.6	19.9	Pass
	30 Msec.	G's	12.5 to 18.5	16.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	74.2	Pass
	Time	Msec.	57.0 to 64.0	61.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	120.5	Pass
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	94.3	Pass
	Time	Msec.	47.0 to 58.0	50.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	106.2	Pass
			Overall Test Results		Pass

N-20 [signature]
Laboratory Technician

December 14, 1997
Test Date

[signature]
Approved By

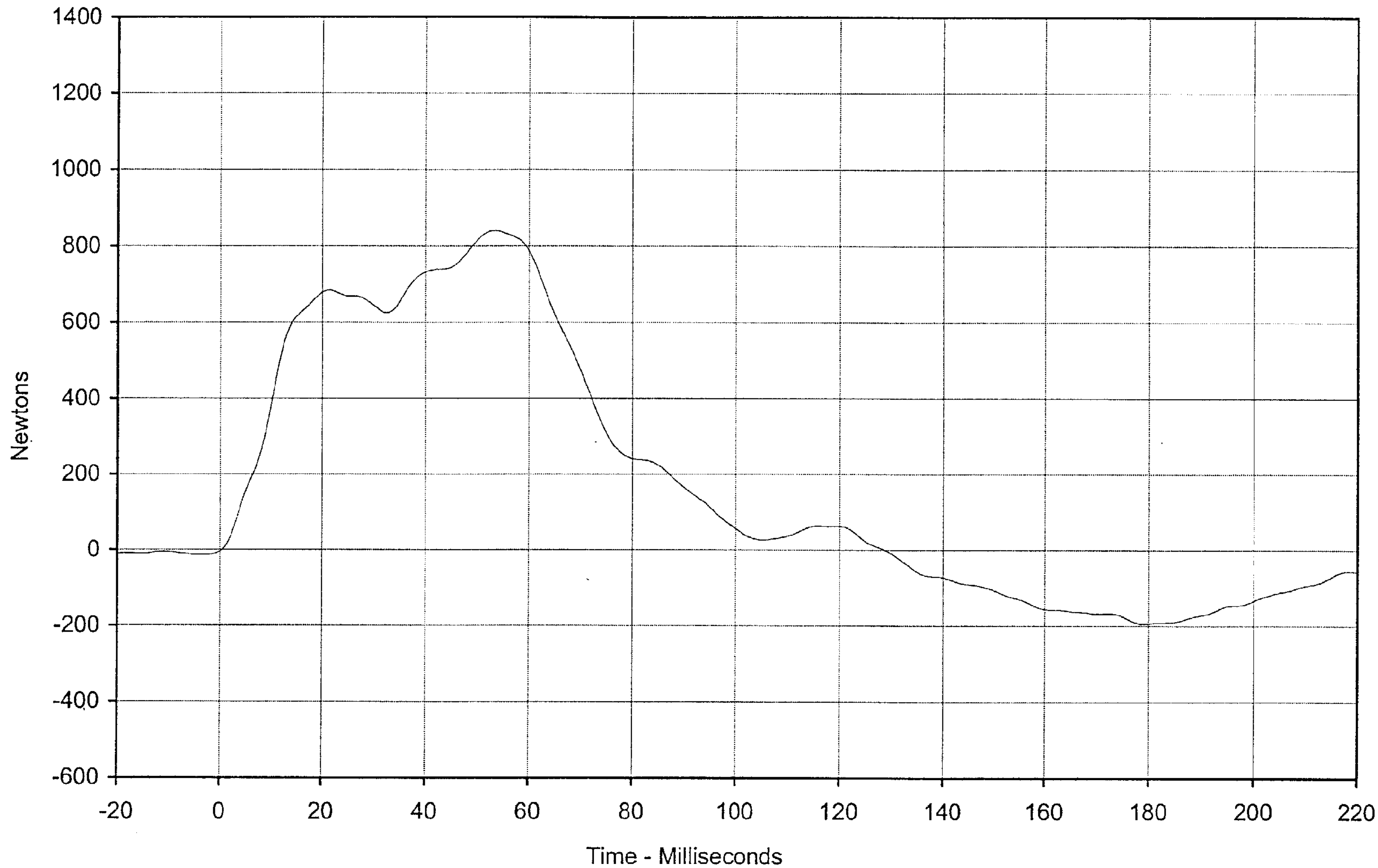
12/14/97
Date



Curve Description:	Pendulum Deceleration			
Maximum Value:	23.9	at	8.0	Milliseconds
Minimum Value:	-3.4	at	40.1	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Neck Flexion Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NF100

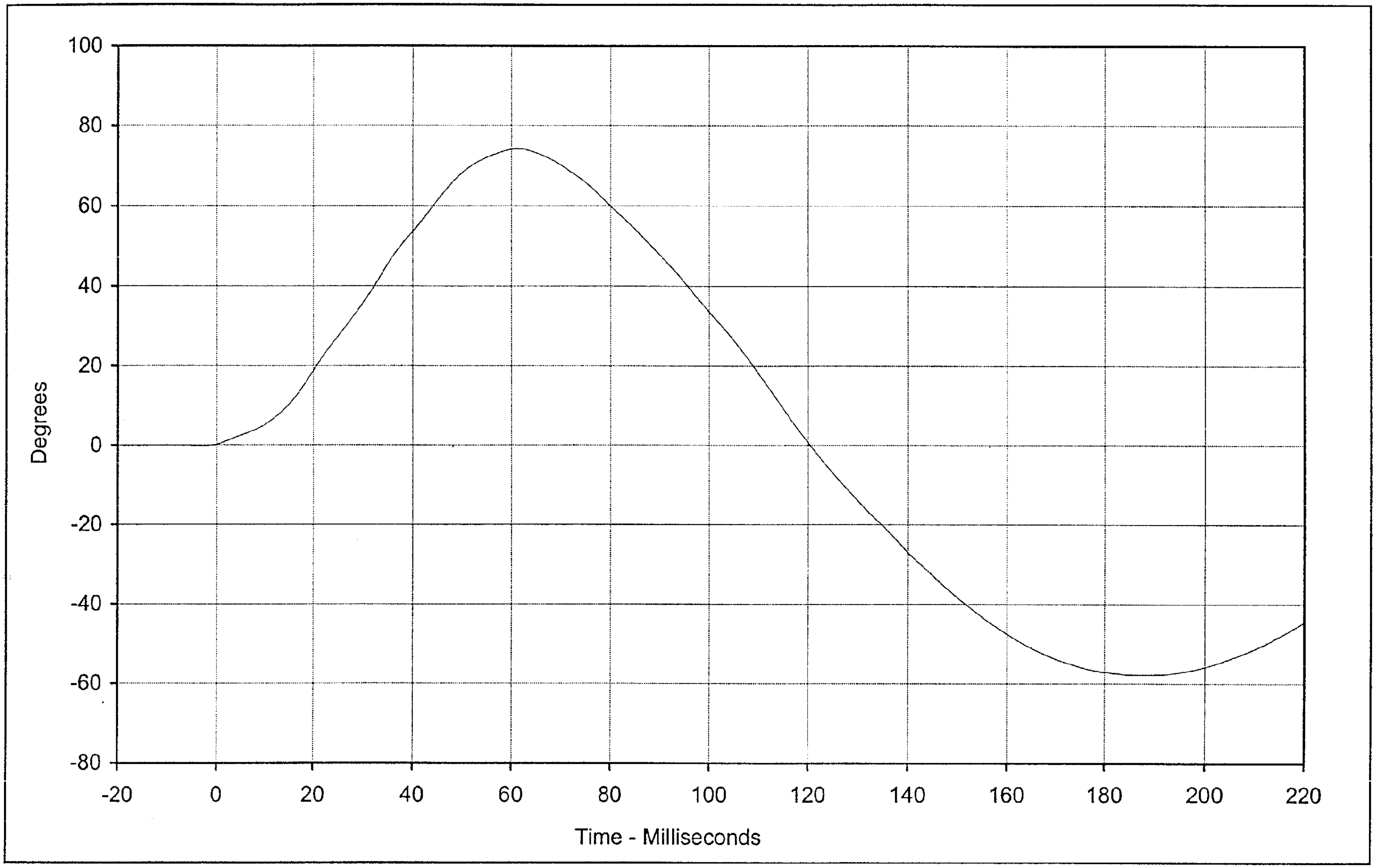
KARCO Engineering



Curve Description:	Neck Force X			
Maximum Value:	840.8	at	53.3	Milliseconds
Minimum Value:	-194.7	at	179.0	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Neck Flexion Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NF100

KARC Engineering

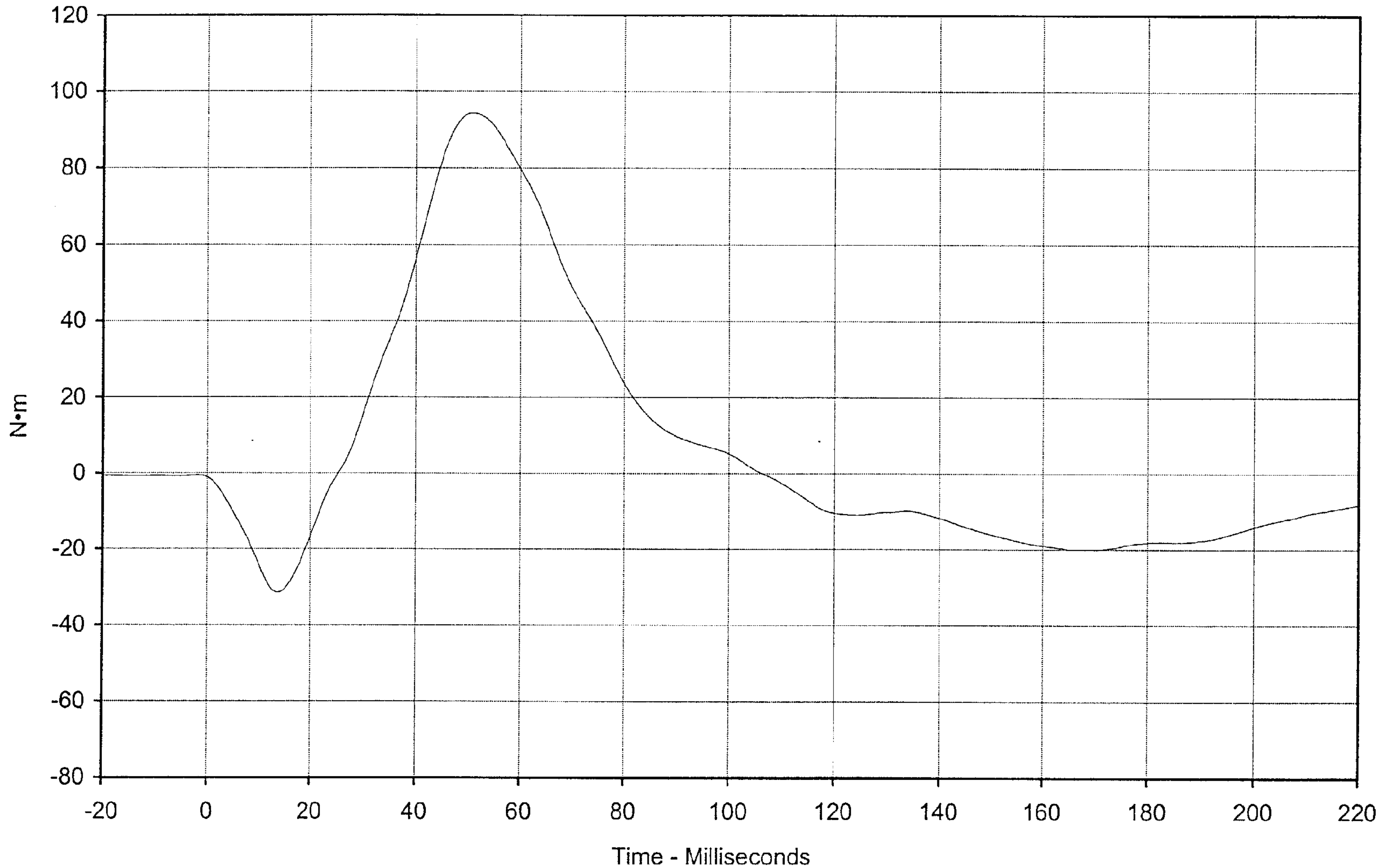


Curve Description:	"D" Plane Rotation			
Maximum Value:	74.2	at	61.2	Milliseconds
Minimum Value:	-57.8	at	186.7	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF100

KARCO Engineering



Curve Description:	Moment About Occipital Condyles			
Maximum Value:	94.3	at	50.9	Milliseconds
Minimum Value:	-31.5	at	13.7	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Neck Flexion Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NF100

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Hybrid III Calibration Data Sheet
50TH Percentile Male
Neck Extension Test

ATD Serial No.: 34 Part Serial No.: n/a Test I.D.: NE101

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	6.06	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.0	Pass
	20 Msec.	G's	14.0 to 19.0	16.2	Pass
	30 Msec.	G's	11.0 to 16.0	16.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	16.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	43.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	100.3	Pass
	Time	Msec.	72.0 to 82.0	77.8	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	162.5	Pass
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-76.0	Pass
	Time	Msec.	65.0 to 79.0	73.2	Pass
Negative Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	147.1	Pass
			Overall Test Results		Pass

N L O'Sp

Laboratory Technician

December 14, 1997

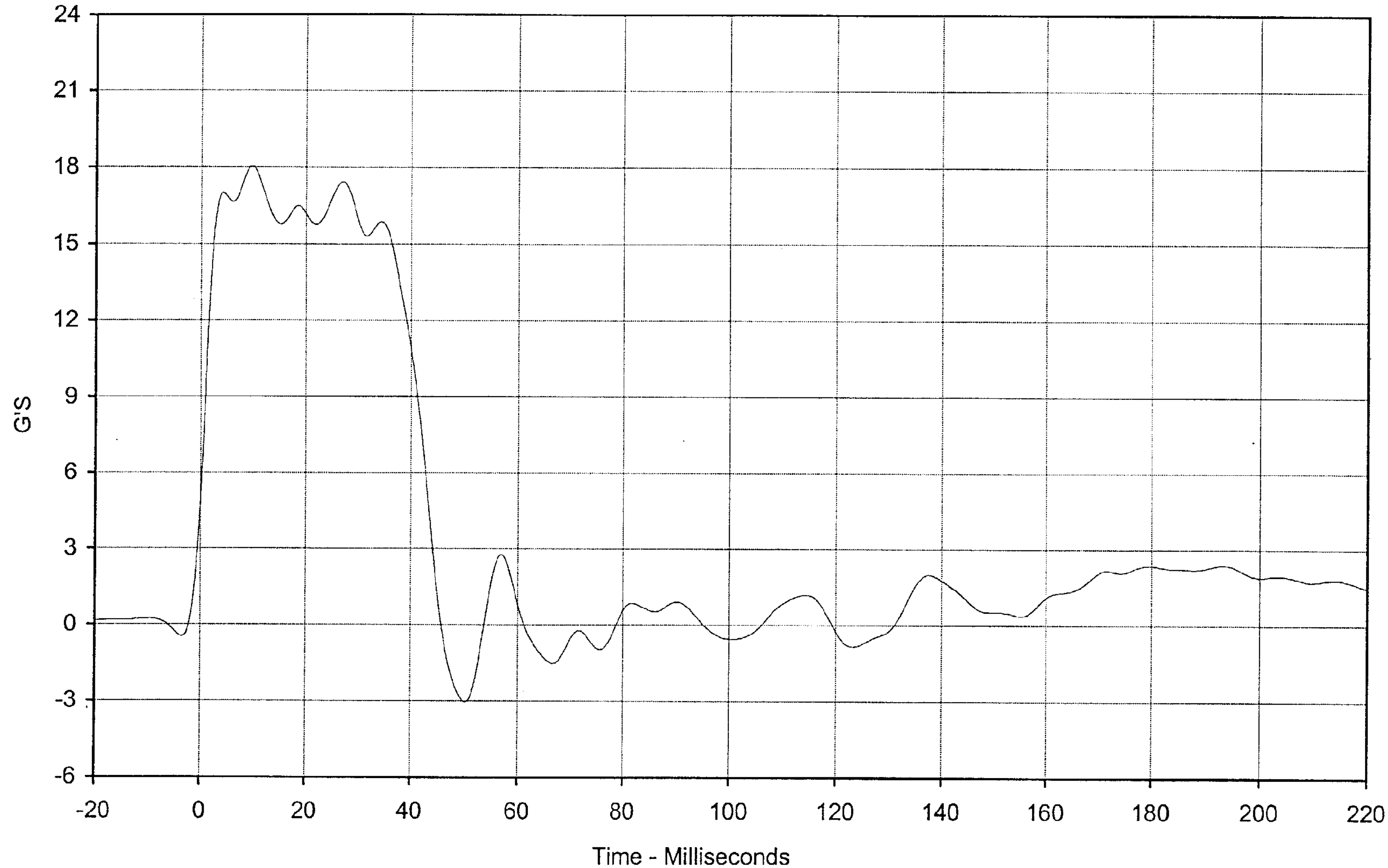
Test Date

J W Richardson

Approved By

12/14/97

Date

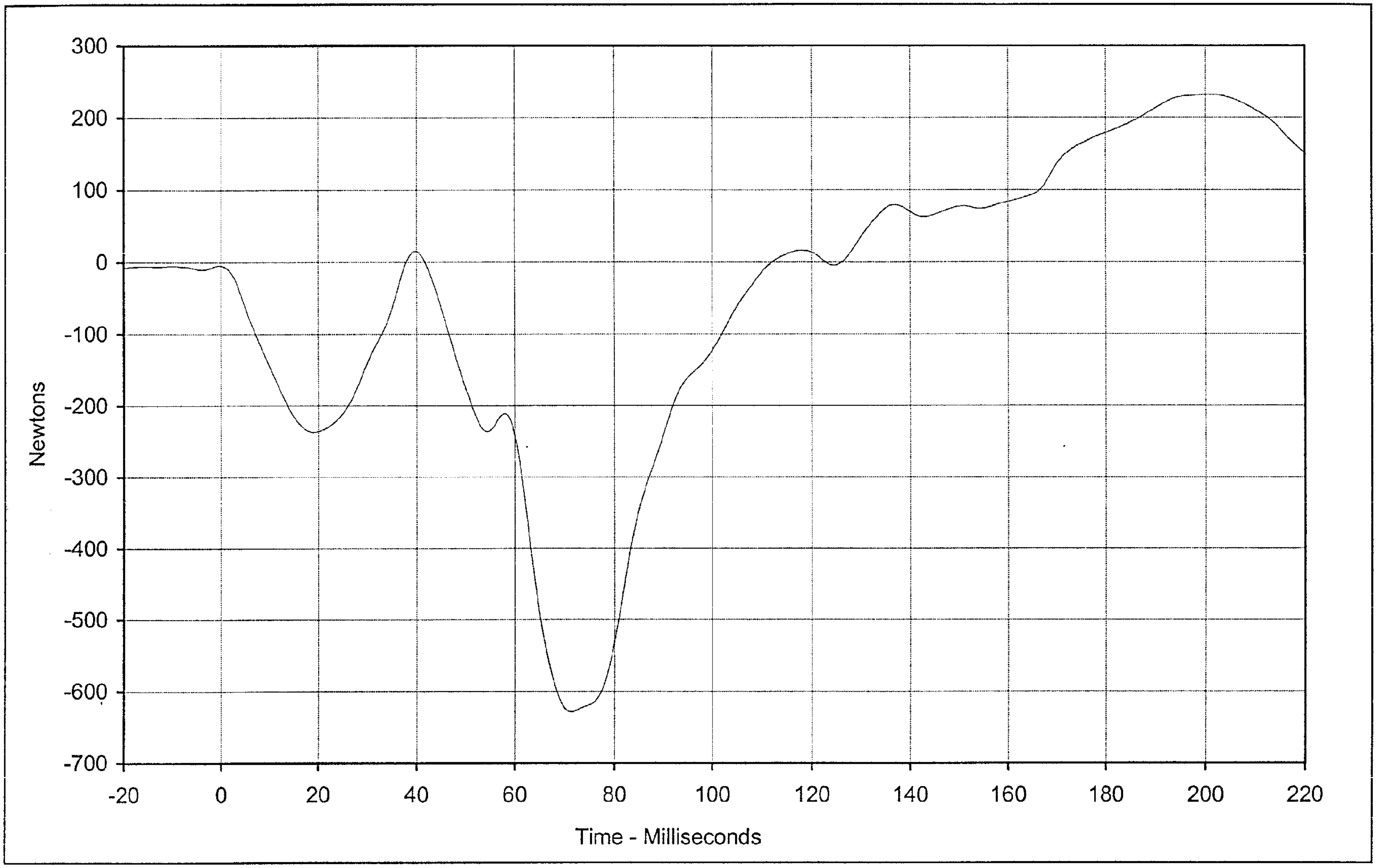


Curve Description:	Pendulum Deceleration			
Maximum Value:	18.0	at	9.8	Milliseconds
Minimum Value:	-3.0	at	50.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program: Hybrid III Neck Extension Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NE101

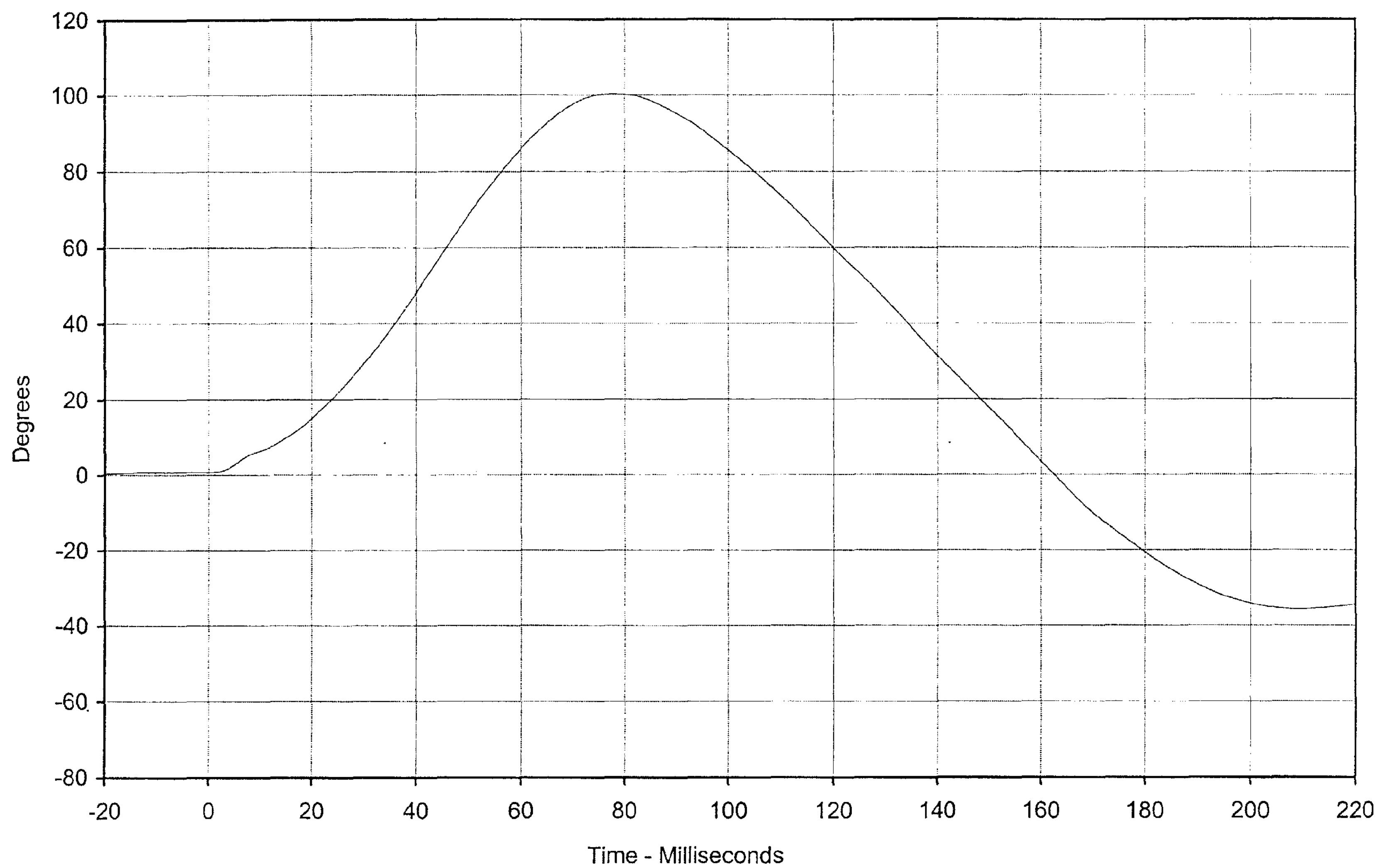
KARC Engineering



Curve Description:	Neck Force X			
Maximum Value:	231.8	at	201.0	Milliseconds
Minimum Value:	-628.8	at	71.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE101

KARC Engineering



Curve Description:	"D" Plane Rotation			
Maximum Value:	100.3	at	77.8	Milliseconds
Minimum Value:	-35.6	at	209.0	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE101

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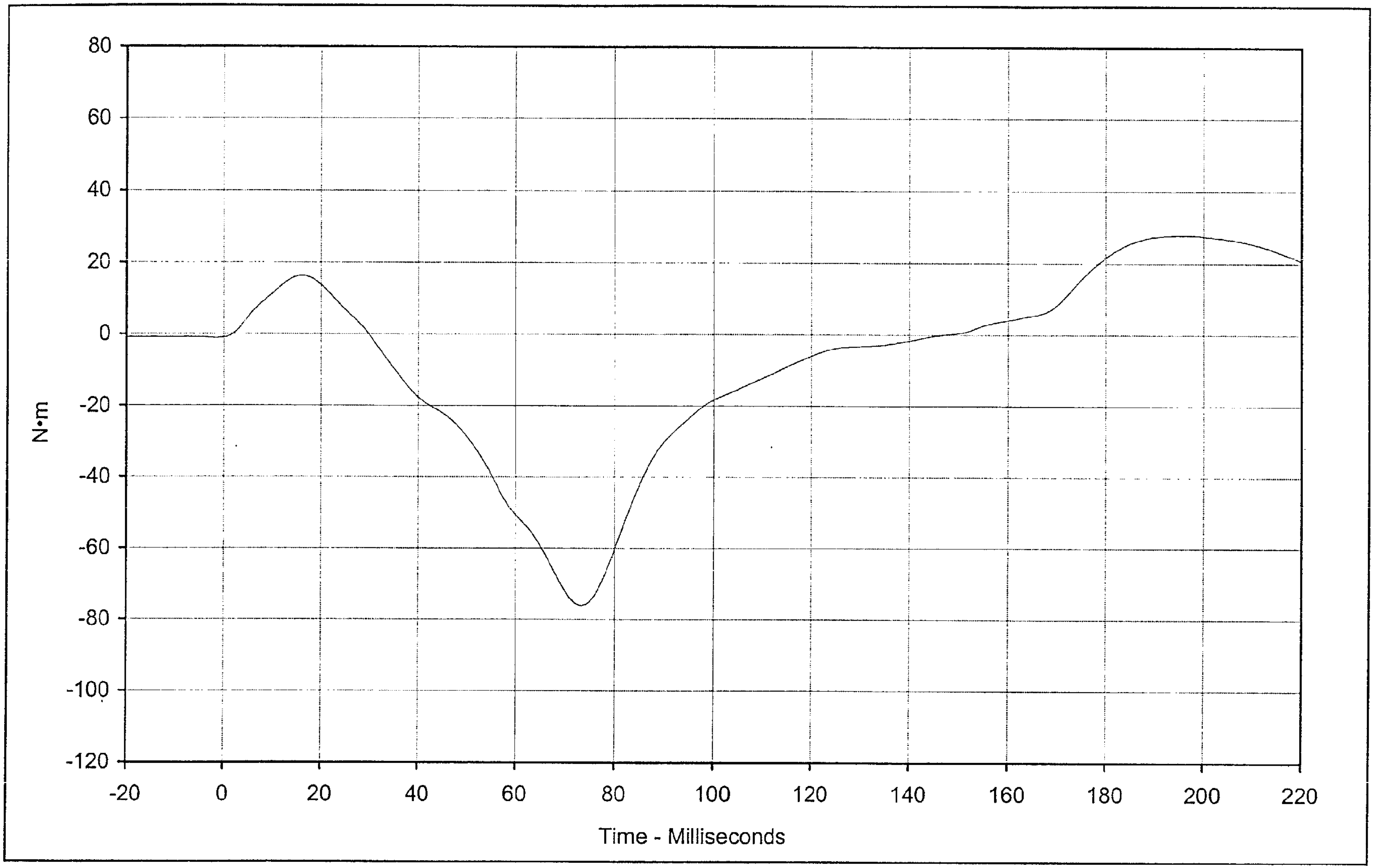

Curve Description:	Moment About Occipital Condyles			
Maximum Value:	27.8	at	195.7	Milliseconds
Minimum Value:	-76.0	at	73.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	34			

Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE101

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Hybrid III Calibration Data Sheet
50TH Percentile Male
External Measurements

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

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43.0	Pass
A - Total sitting height	mm	878.8 to 889.0	880.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	510.0	Pass
C - "H" point height	mm	83.8 to 88.9	87.0	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	85.0	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	300.0	Pass
H - Skull cap to back line	mm	40.6 to 45.7	43.0	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	341.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	209.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	590.0	Pass
L - Poplipteal length	mm	429.3 to 454.7	430.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	490.7	Pass
N - Buttock poplipteal length	mm	452.1 to 477.5	467.0	Pass
O - Chest depth	mm	213.4 to 228.6	216.0	Pass
P - Foot length	mm	251.5 to 266.7	260.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	435.0	Pass
W - Foot breadth	mm	91.4 to 106.7	99.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	1000.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	860.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	431.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	230.0	Pass
		Overall Test Results		Pass

[signature] December 16, 1997

Laboratory Technician Test Date

[signature] 12/16/97

Approved By 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.: H3K11

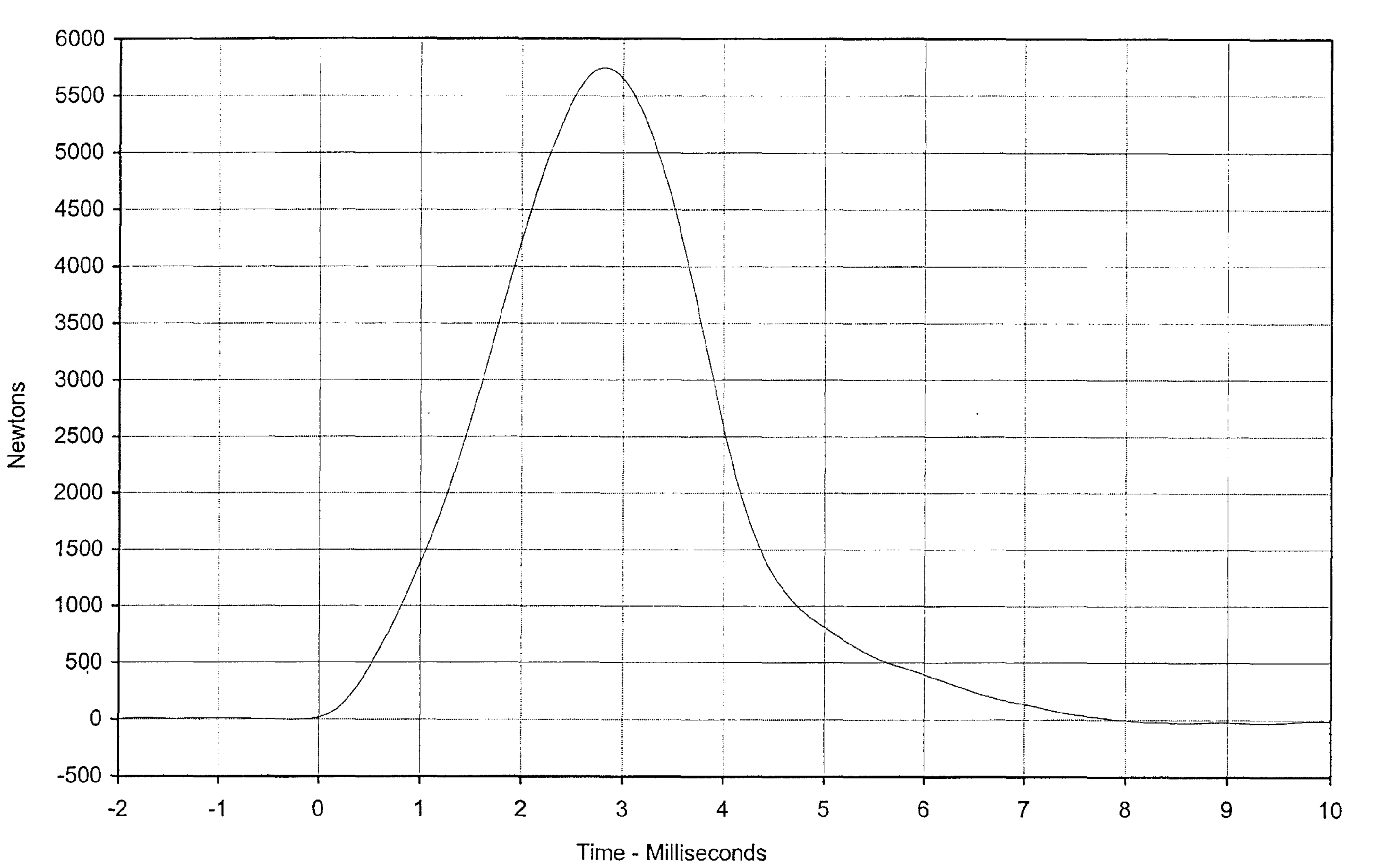
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.120	Pass
Peak Probe Force	Newtons	4715 to 5782	5743.7	Pass
		Overall Test Results		Pass

Laboratory Technician

December 15, 1997
Test Date

Approved By

12/15/97
Date



Curve Description:	Probe Force			
Maximum Value:	5743.7	at	2.8	Milliseconds
Minimum Value:	-7.3	at	8.0	Milliseconds
SAE Filter Class:	600			
Date of Test:	12/15/97			
ATD Serial No.:	035			

Testing Program:	Hybrid III Left Knee Impact Test
Test Information:	Part S/N: N/A Test I.D.: H3K11

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

ATD Serial No.: 035 Part Serial No.: N/A Test I.D.: H3K12

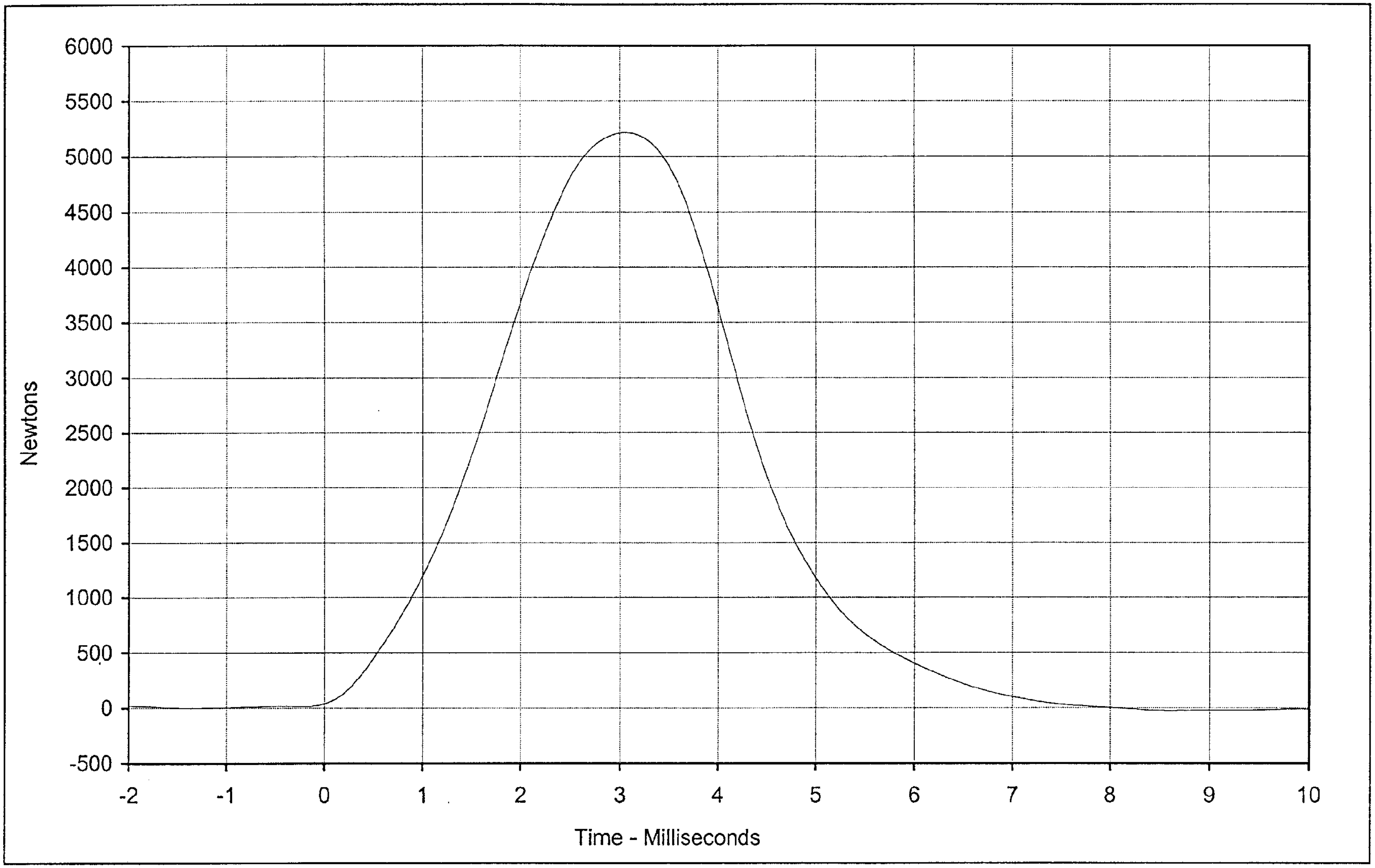
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	2.073 to 2.134	2.122	Pass
Peak Probe Force	Newtons	4715 to 5782	5212.6	Pass
		Overall Test Results		Pass

Laboratory Technician

December 15, 1997
Test Date

Approved By

12/15/97
Date



Curve Description:	Probe Force			
Maximum Value:	5212.6	at	3.1	Milliseconds
Minimum Value:	-1.2	at	-1.4	Milliseconds
SAE Filter Class:	600			
Date of Test:	12/15/97			
ATD Serial No.:	035			

Testing Program:	Hybrid III Right Knee Impact Test
Test Information:	Part S/N: N/A Test I.D.: H3K12

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Hybrid III Calibration Data Sheet
50^{TH} Percentile Male
Head Drop Calibration

KARCO Engineering

ATD Serial No.: 35 Part Serial No.: N/A Test I.D.: HD101

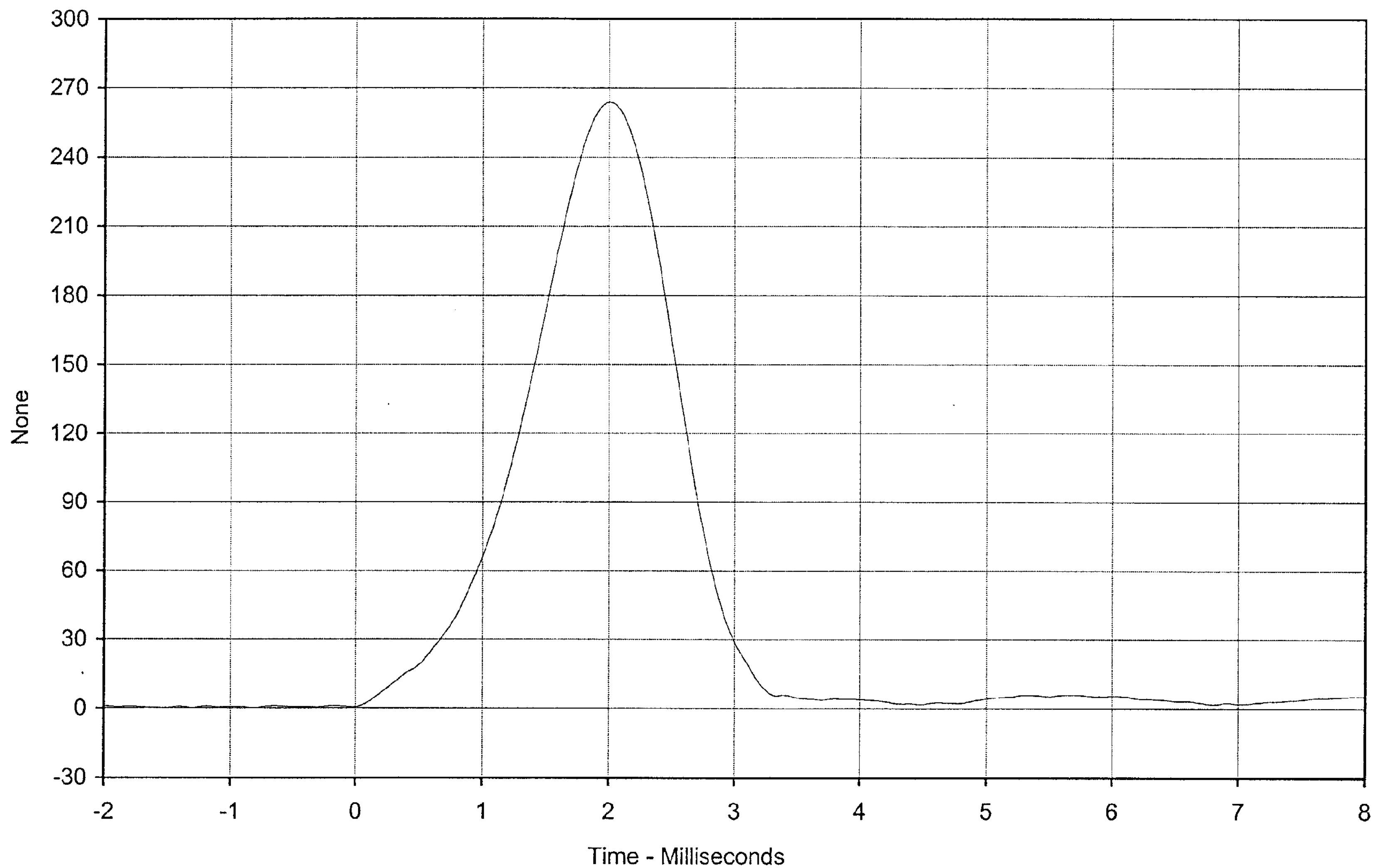
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	263.8	Pass
Peak Lateral Acceleration	G's	≤15.0	13.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

Laboratory Technician

December 15, 1997
Test Date

Approved By

12/15/97
Date



Curve Description:	Head Resultant Acceleration			
Maximum Value:	263.8	at	2.0	Milliseconds
Minimum Value:	0.3	at	-1.3	Milliseconds
SAE Filter Class:	1000			
Date of Test:	12/15/97			
ATD Serial No.:	35			

Testing Program	Hybrid III Head Drop Calibration (Male)
Test Information:	S/N of Part: N/A Test I.D.: HD101

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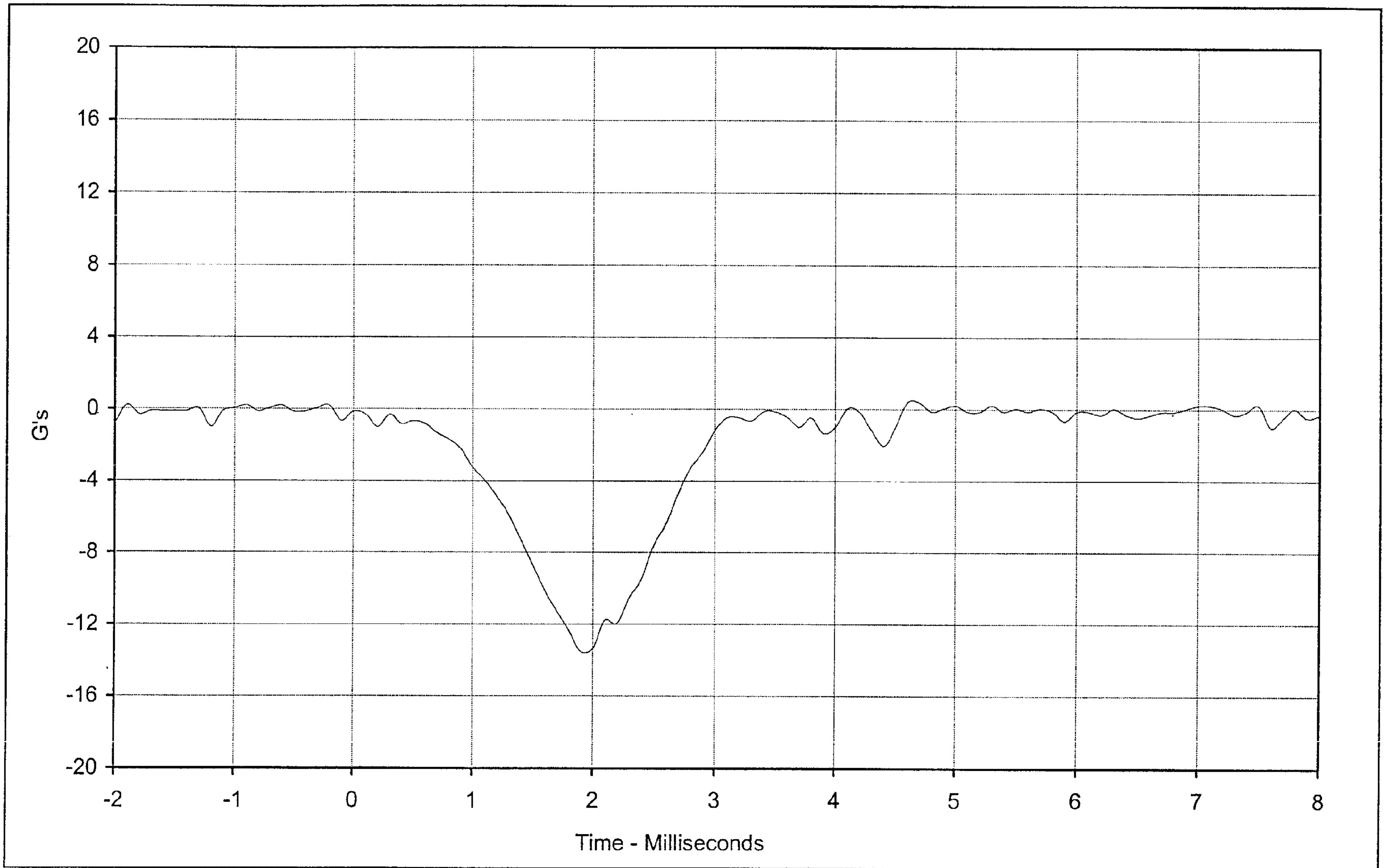

Curve Description:	Head Acceleration Y Axis			
Maximum Value:	0.4	at	4.6	Milliseconds
Minimum Value:	-13.5	at	1.9	Milliseconds
SAE Filter Class:	1000			
Date of Test:	12/15/97			
ATD Serial No.:	35			

Testing Program: Hybrid III Head Drop Calibration (Male)

Test Information: S/N of Part: N/A Test I.D.: HD101

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Hybrid III Calibration Data Sheet
50TH Percentile Male
Thorax Impact Test

ATD Serial No.: 035 Part Serial No.: n/a Test I.D.: CH100

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	5861	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.51	Pass
Internal Hysterysis	%	69 to 85	73.0	Pass
		Overall Test Results		Pass

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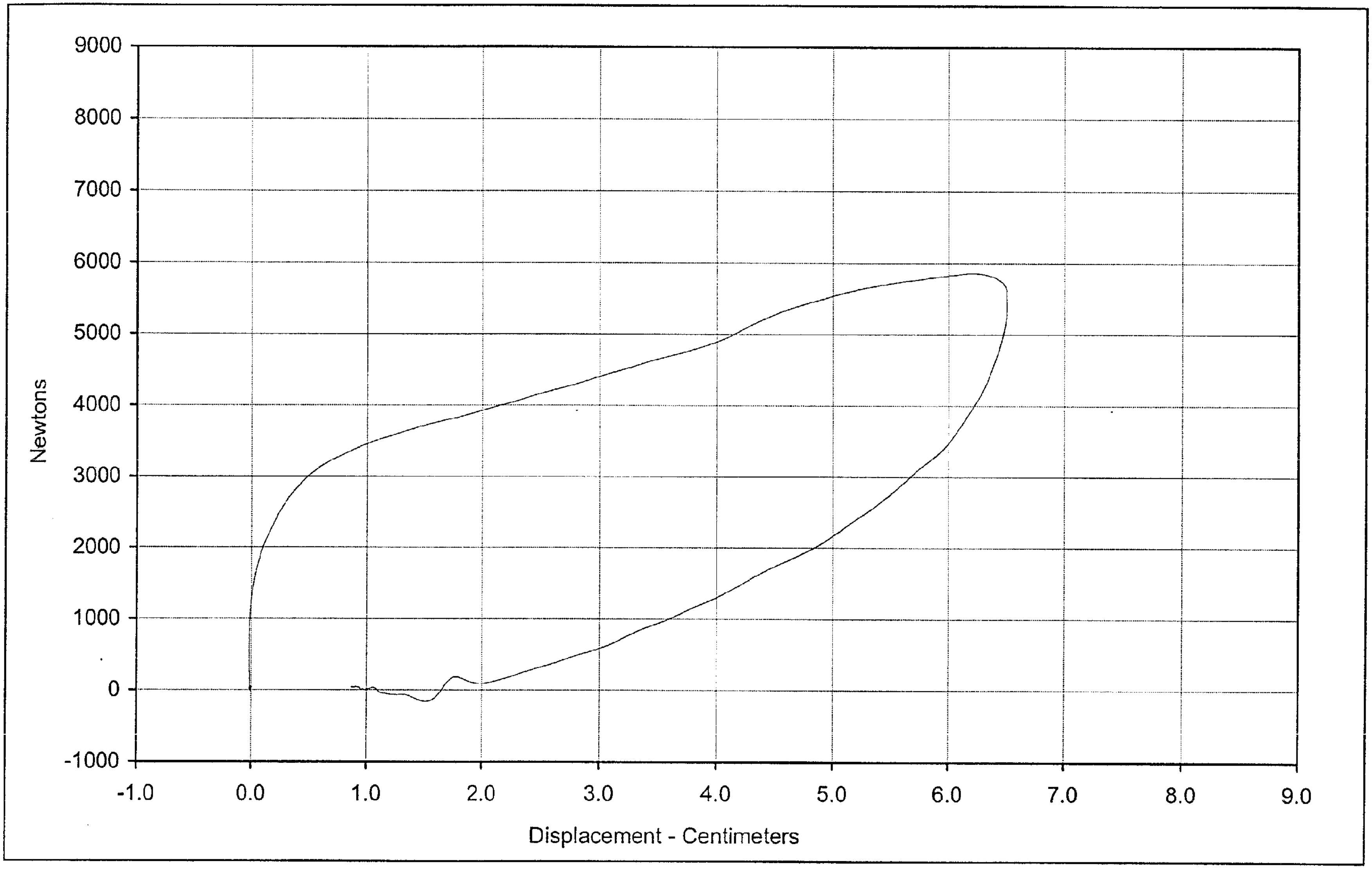
Laboratory Technician

December 16, 1997
Test Date

[signature]
Approved By

12/16/97
Date



Curve Description:	Probe Force vs. Chest Displacement		Testing Program	Hybrid III Thorax Impact Test
Probe Force:	5860.5	Newtons	Test Information:	S/N of Part: n/a Test I.D.: CH100
Chest Displ.:	6.51	Centimeters		
SAE Filter Class:	180			
Date of Test:	12/16/97			
ATD Serial No.:	035			

KARCO Engineering

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Hybrid III Calibration Data Sheet
50^{TH} Percentile Male
Neck Flexion Test

ATD Serial No.: 35 Part Serial No.: n/a Test I.D.: NF101

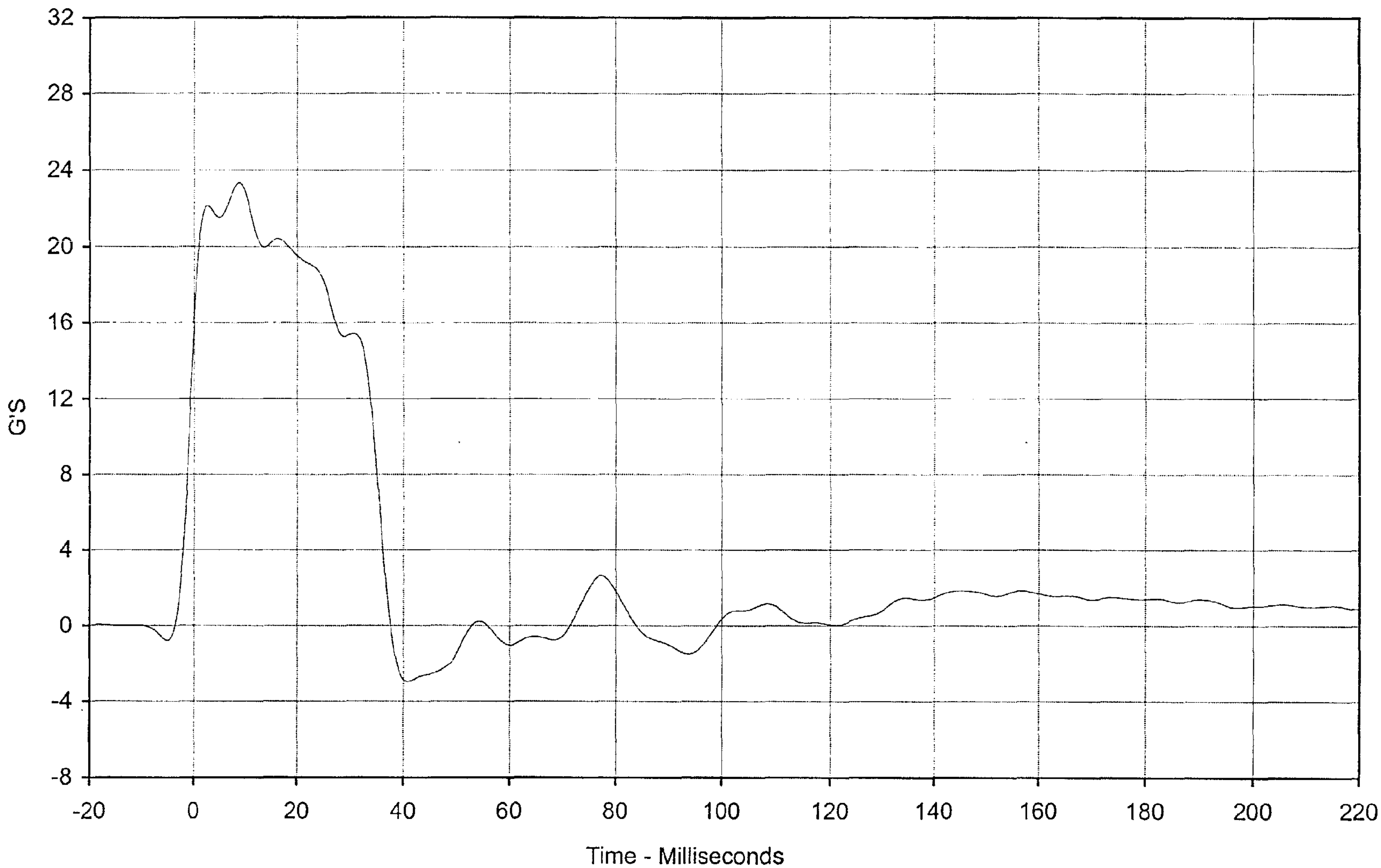
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.93	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.9	Pass
	20 Msec.	G's	17.6 to 22.6	19.5	Pass
	30 Msec.	G's	12.5 to 18.5	15.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	76.1	Pass
	Time	Msec.	57.0 to 64.0	61.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	122.7	Pass
Moment About Occipital Condyle	Maximum	N • m	84.1 to 108.5	94.0	Pass
	Time	Msec.	47.0 to 58.0	53.2	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	105.8	Pass
			Overall Test Results		Pass

Laboratory Technician

December 14, 1997
Test Date

Approved By

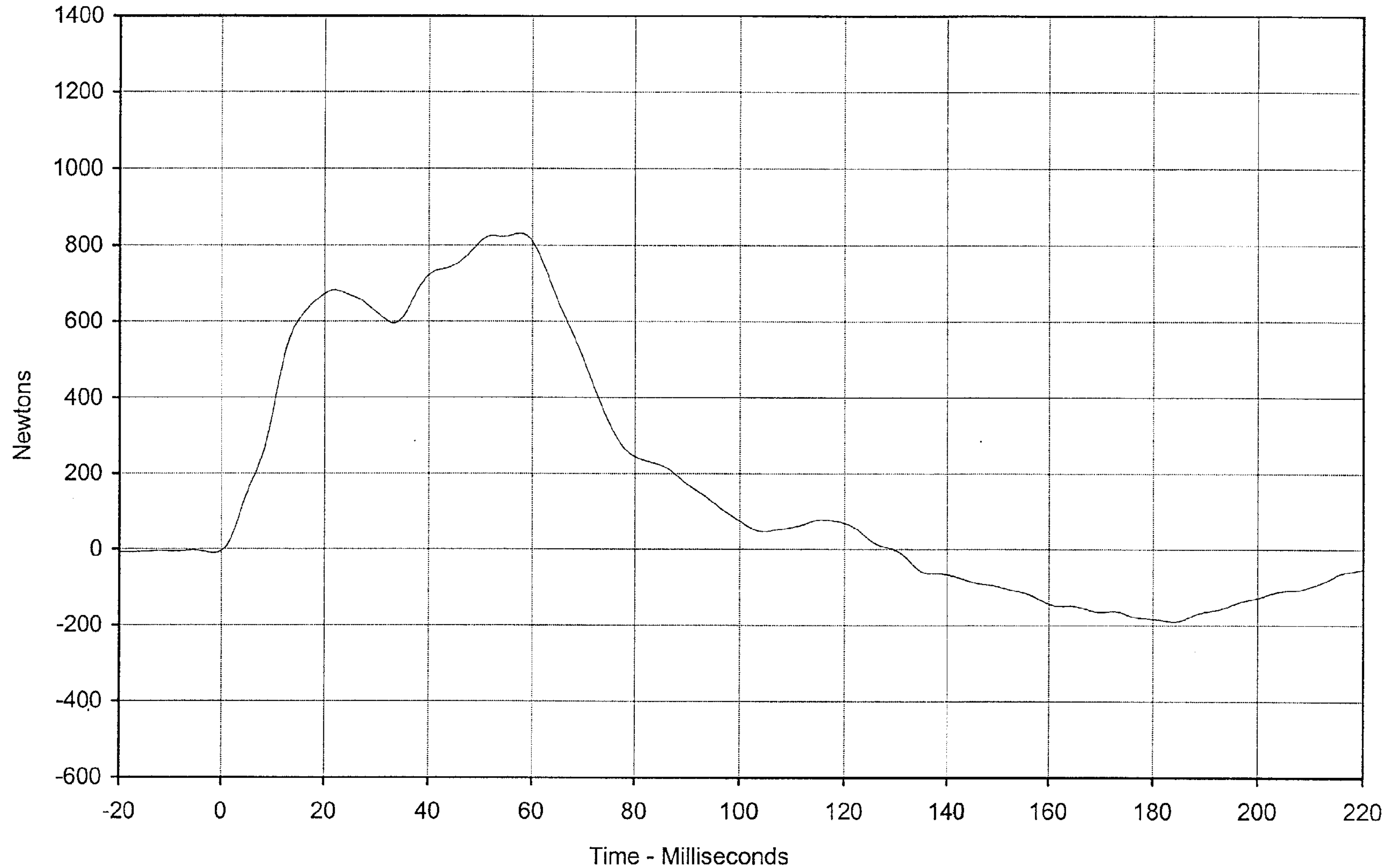
12/14/97
Date



Curve Description:	Pendulum Deceleration			
Maximum Value:	23.3	at	8.9	Milliseconds
Minimum Value:	-3.0	at	40.8	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program	Hybrid III Neck Flexion Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NF101

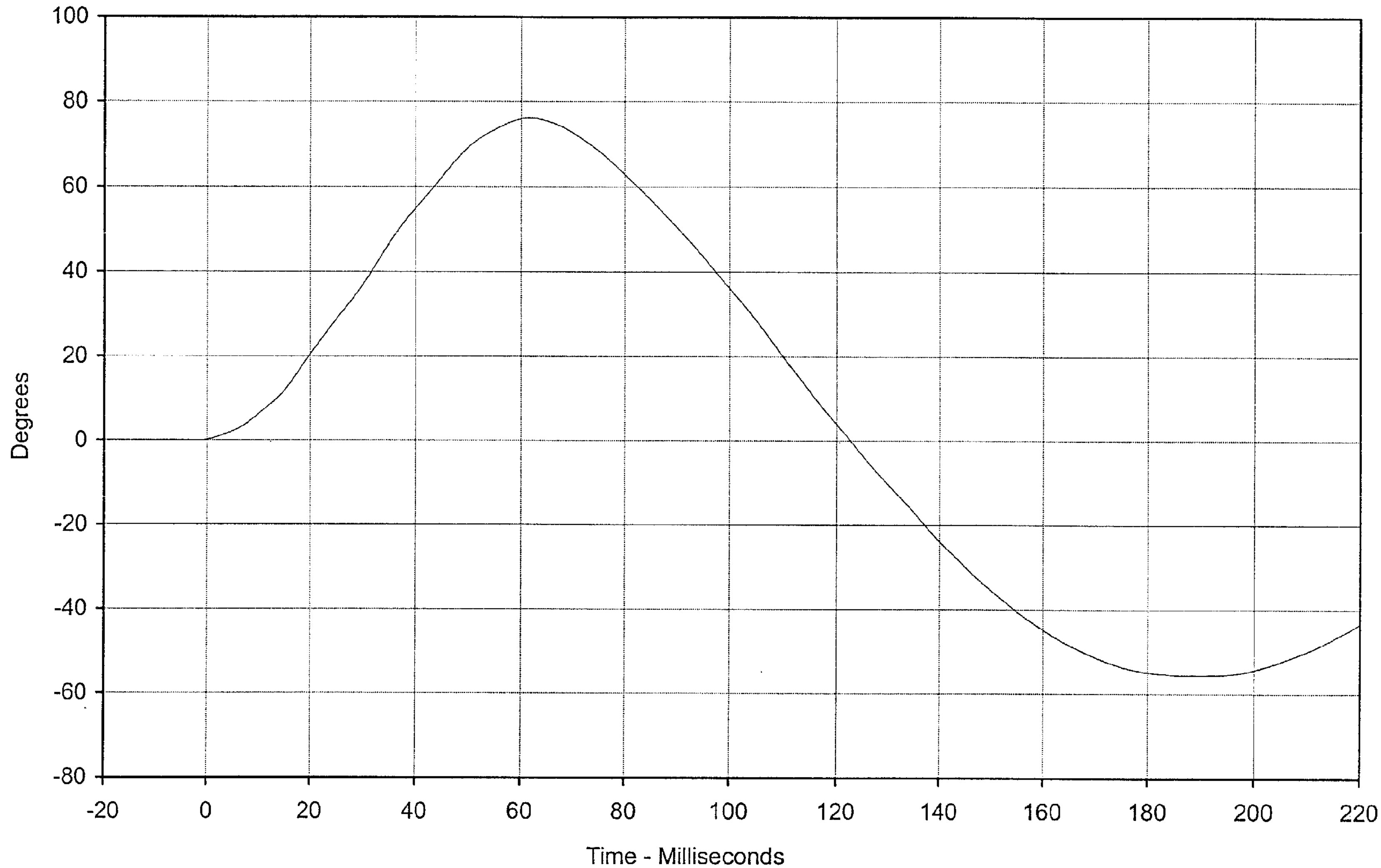
KARCO Engineering



Curve Description:	Neck Force X			
Maximum Value:	830.8	at	57.7	Milliseconds
Minimum Value:	-189.8	at	183.9	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF101

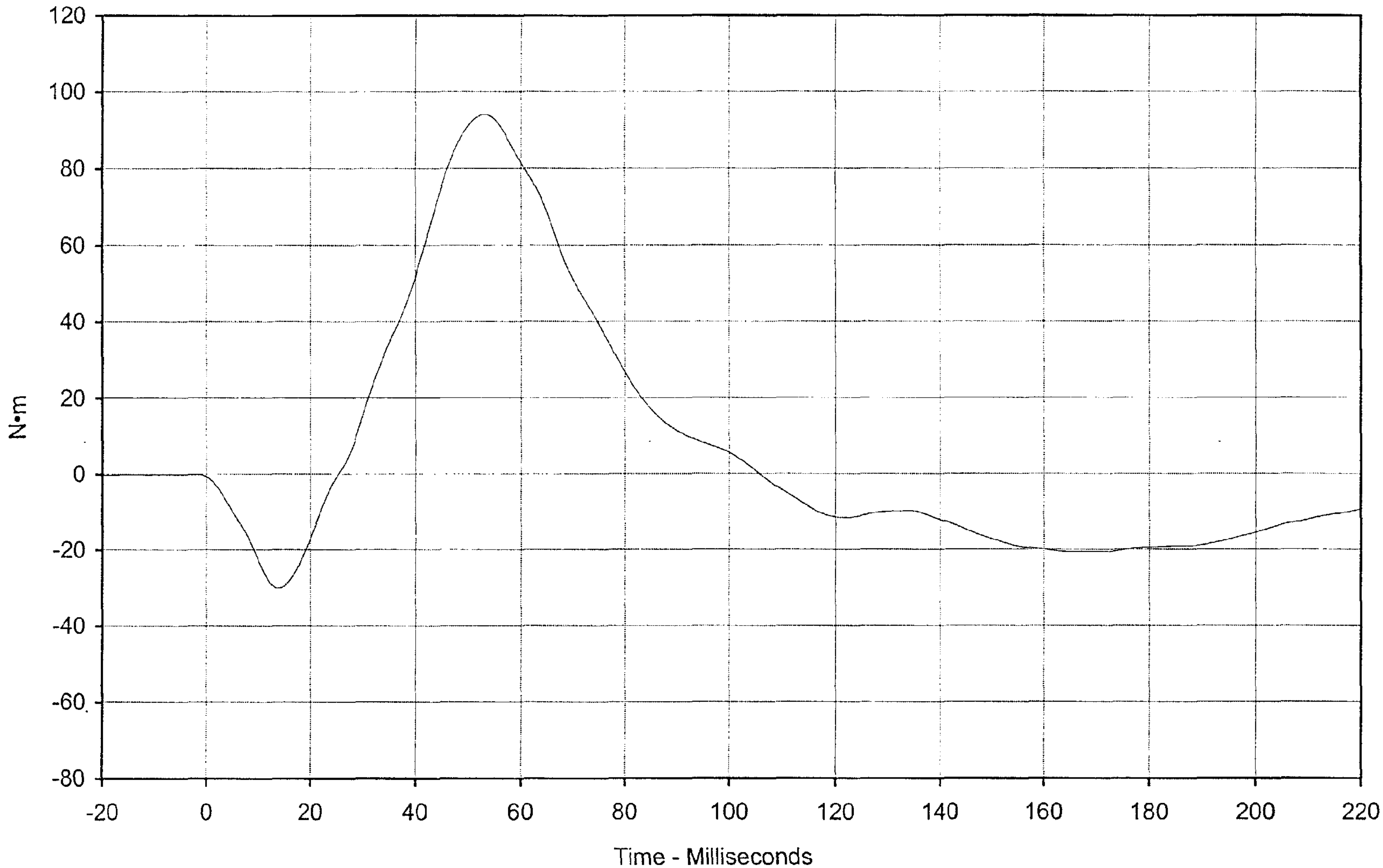


Curve Description:	"D" Plane Rotation			
Maximum Value:	76.1	at	61.7	Milliseconds
Minimum Value:	-55.6	at	188.0	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF101

KARCO Engineering



Curve Description:	Moment About Occipital Condyles			
Maximum Value:	94.0	at	53.2	Milliseconds
Minimum Value:	-30.1	at	13.8	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program: Hybrid III Neck Flexion Test (Male)

Test Information: S/N of Part: n/a Test I.D.: NF101

Hybrid III Calibration Data Sheet
50TH Percentile Male
Neck Extension Test

ATD Serial No.: 35 Part Serial No.: n/a Test I.D.: NE100

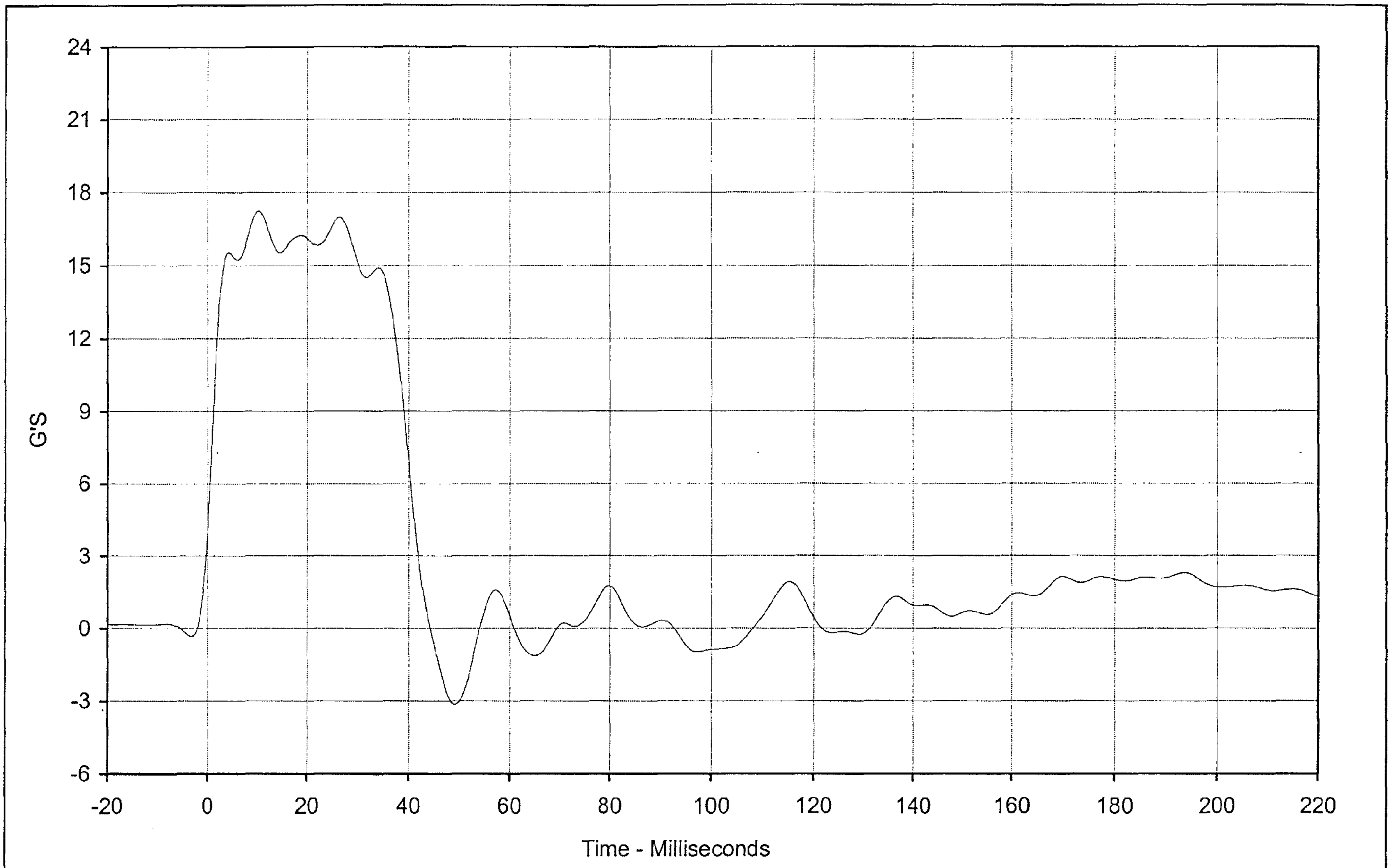
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.03	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.2	Pass
	20 Msec.	G's	14.0 to 19.0	16.1	Pass
	30 Msec.	G's	11.0 to 16.0	15.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	102.0	Pass
	Time	Msec.	72.0 to 82.0	77.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	161.7	Pass
Moment About Occipital Condyle	Maximum	N • m	-52.9 to- 79.9	-77.6	Pass
	Time	Msec.	65.0 to 79.0	72.2	Pass
Negative Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	147.0	Pass
			Overall Test Results		Pass

Laboratory Technician

December 14, 1997
Test Date

Approved By

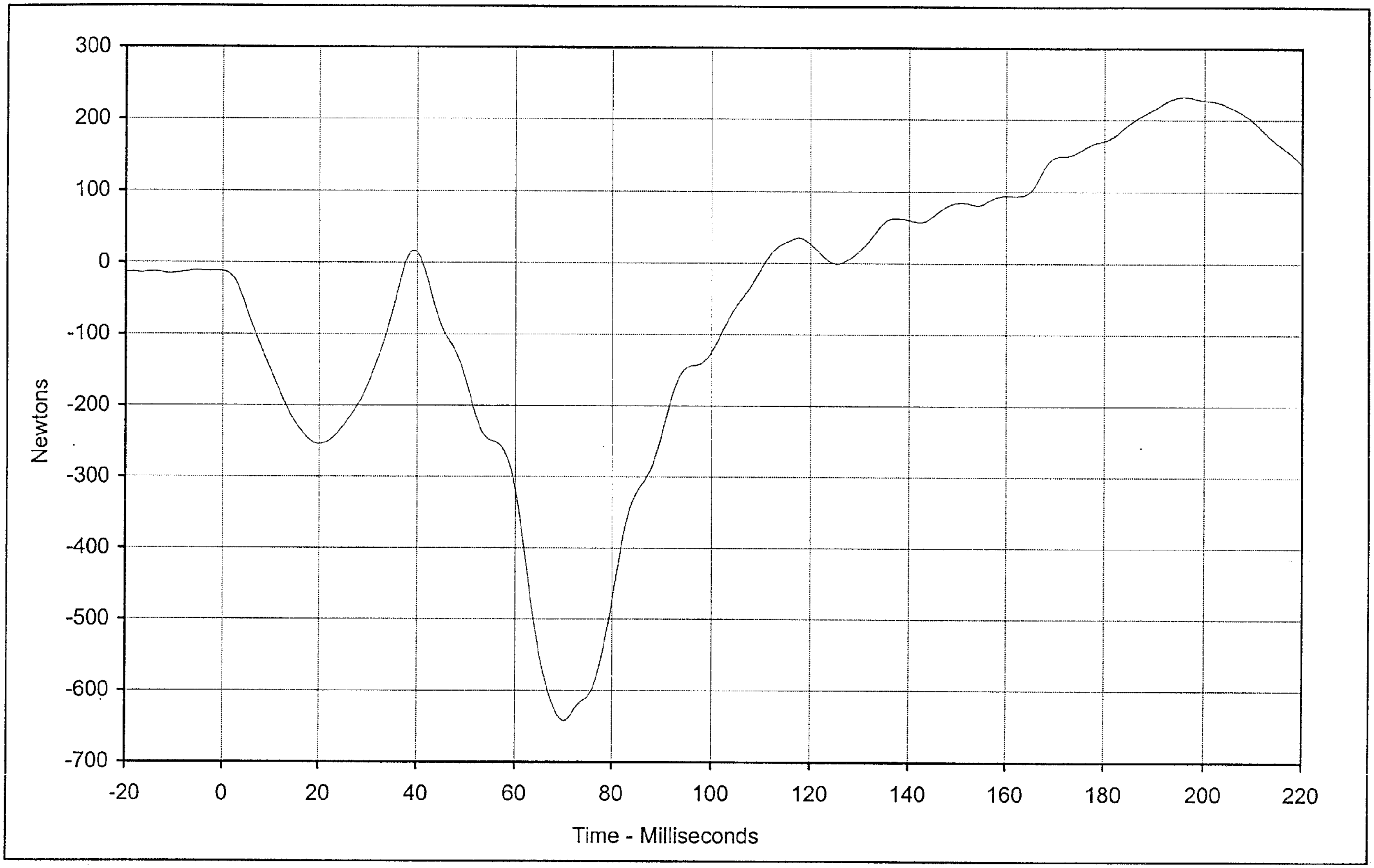
12/14/97
Date



Curve Description:	Pendulum Deceleration			
Maximum Value:	17.2	at	10.3	Milliseconds
Minimum Value:	-3.1	at	49.1	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE100

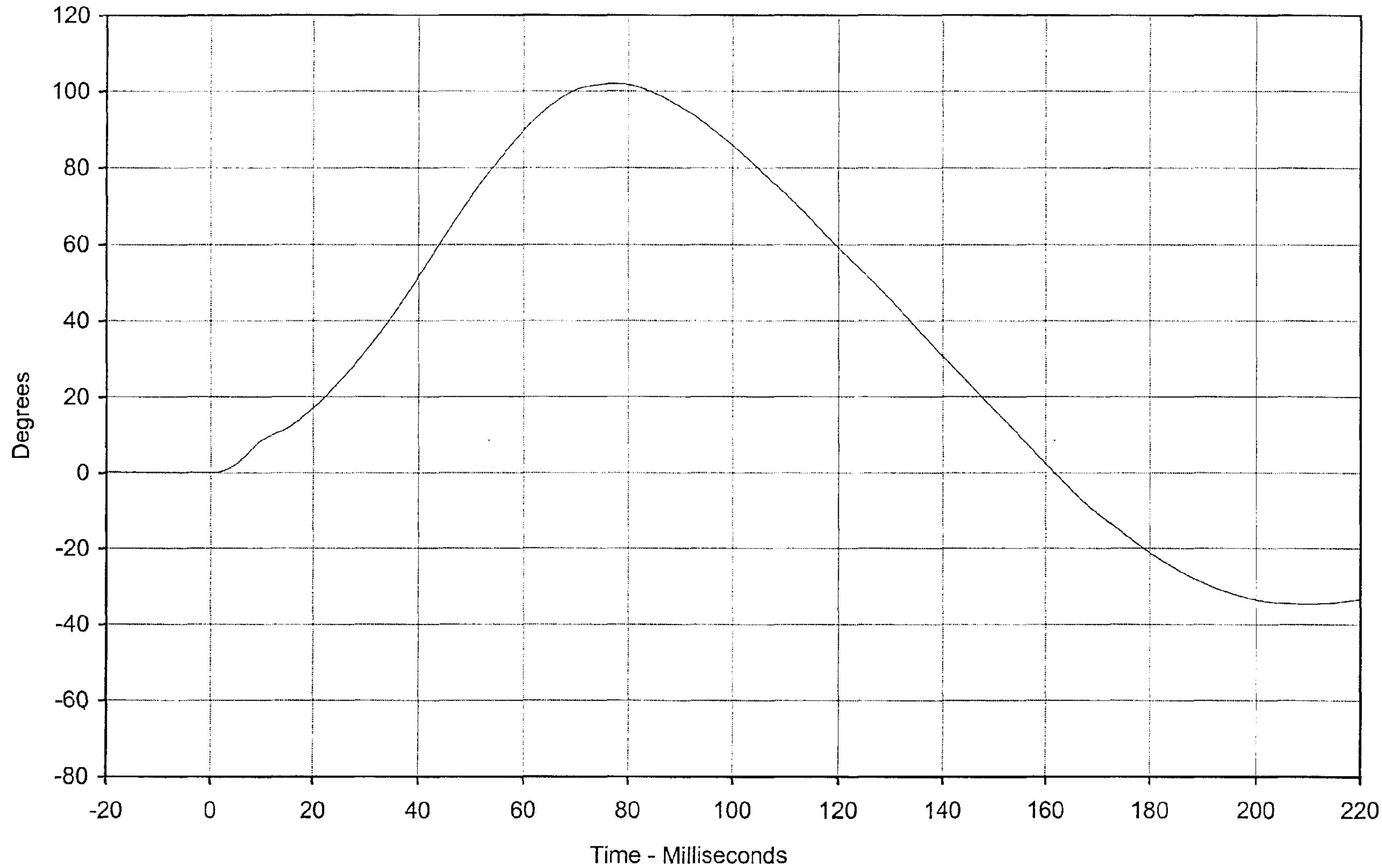
KARCO Engineering



Curve Description:	Neck Force X			
Maximum Value:	232.3	at	196.0	Milliseconds
Minimum Value:	-642.5	at	70.0	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

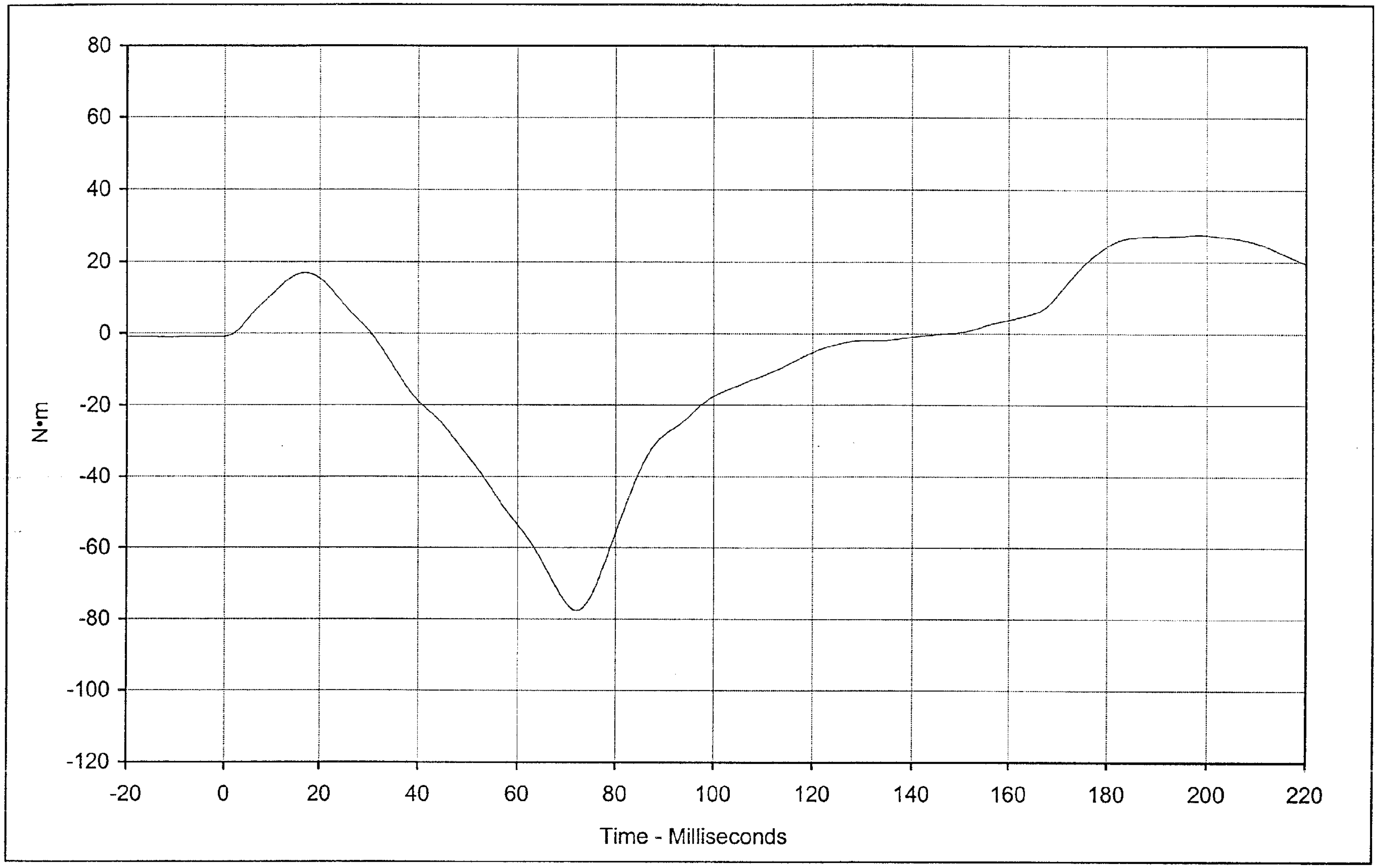
Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE100

KARC Engineering



Curve Description:	"D" Plane Rotation			
Maximum Value:	102.0	at	77.5	Milliseconds
Minimum Value:	-34.6	at	209.3	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE100



Curve Description:	Moment About Occipital Condyles			
Maximum Value:	27.6	at	198.5	Milliseconds
Minimum Value:	-77.6	at	72.2	Milliseconds
SAE Filter Class:	60			
Date of Test:	12/14/97			
ATD Serial No.:	35			

Testing Program	Hybrid III Neck Extension Test (Male)
Test Information:	S/N of Part: n/a Test I.D.: NE100

KARCO Engineering

Hybrid III Calibration Data Sheet
50TH Percentile Male
External Measurements

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

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.9	Pass
Laboratory relative humidity	%	10 to 70	43.0	Pass
A - Total sitting height	mm	878.8 to 889.0	881.0	Pass
B - Shoulder pivot height	mm	505.5 to 520.7	510.0	Pass
C - "H" point height	mm	83.8 to 88.9	85.0	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	91.0	Pass
F - Thigh clearance	mm	139.7 to 154.9	151.0	Pass
G - Elbow back to wrist pivot	mm	289.6 to 304.8	301.0	Pass
H - Skull cap to back line	mm	40.6 to 45.7	44.0	Pass
I - Shoulder to elbow length	mm	330.2 to 345.4	344.0	Pass
J - Elbow rest height	mm	190.5 to 210.8	209.0	Pass
K - Buttock to knee length	mm	579.1 to 604.5	600.0	Pass
L - Poplipteal length	mm	429.3 to 454.7	430.0	Pass
M - Knee pivot height	mm	485.1 to 500.4	499.0	Pass
N - Buttock poplipteal length	mm	452.1 to 477.5	470.0	Pass
O - Chest depth	mm	213.4 to 228.6	216.0	Pass
P - Foot length	mm	251.5 to 266.7	265.0	Pass
V - Shoulder breadth	mm	421.6 to 436.9	435.0	Pass
W - Foot breadth	mm	91.4 to 106.7	100.0	Pass
Y - Chest circumference	mm	970.3 to 1000.8	980.0	Pass
Z - Waist circumference	mm	835.7 to 866.1	860.0	Pass
AA - Location for chest circumference	mm	429.3 to 434.3	431.0	Pass
BB - Location for waist circumference	mm	226.1 to 231.1	229.0	Pass
		Overall Test Results		Pass

Laboratory Technician

December 16, 1997
Test Date

Approved By

12/16/97
Date

APPENDIX F

VEHICLE OWNER'S MANUAL

OCCUPANT RESTRAINT INSTRUCTIONS

Safety Belts: They're for Everyone

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

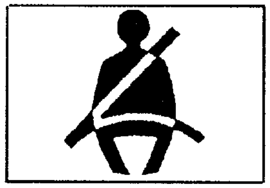
And it explains the Supplemental Inflatable Restraint (SIR), or air bag system.

CAUTION:

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

CAUTION:

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



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

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

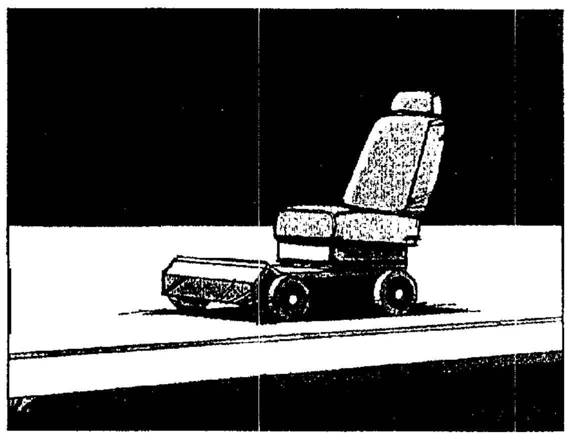
You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

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

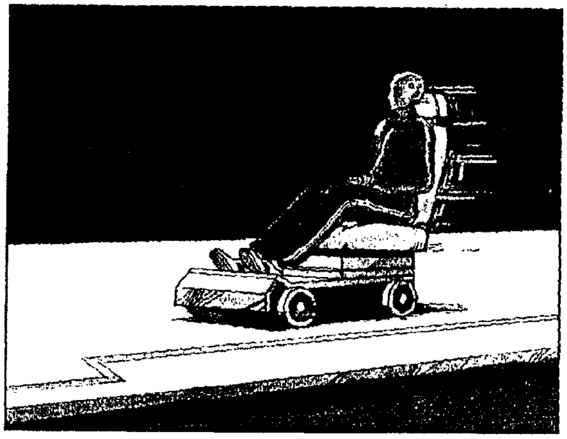
After more than 30 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter . . . a lot!

Why Safety Belts Work

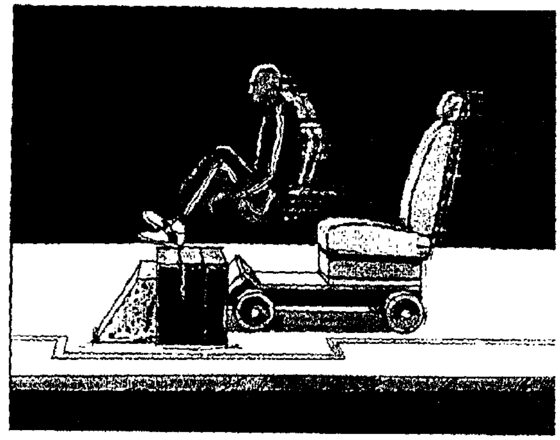
When you ride in or on anything, you go as fast as it goes.



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



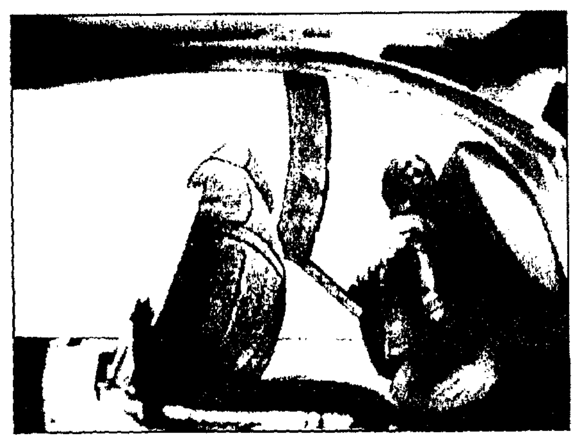
Put someone on it.



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

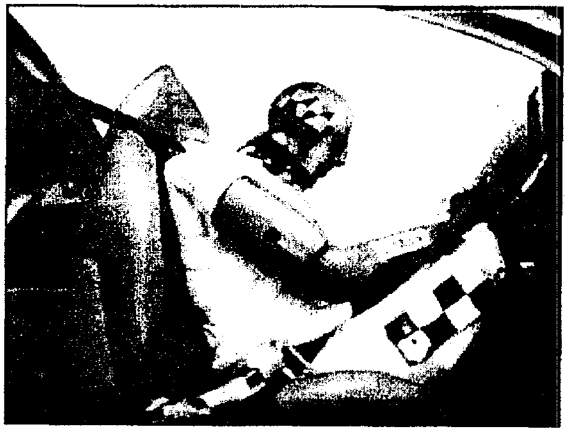
1-12

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



or the instrument panel

1-13



the safety belts!

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

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

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

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

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

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

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

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

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

Safety belts are for everyone.

How to Wear Safety Belts Properly

Adults

This part is only for people of adult size.

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

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

We'll start with the driver position.

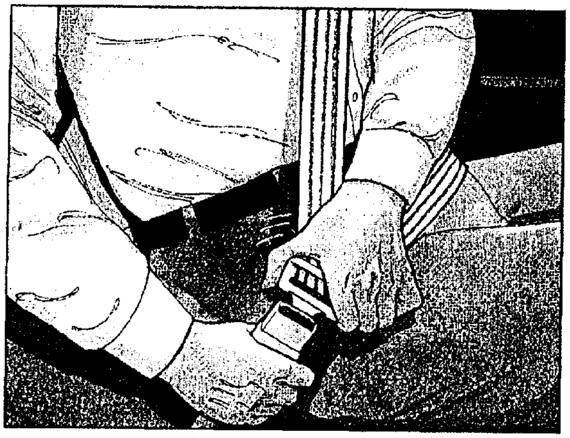
Driver Position

This part describes the driver's restraint system.

Lap-Shoulder Belt

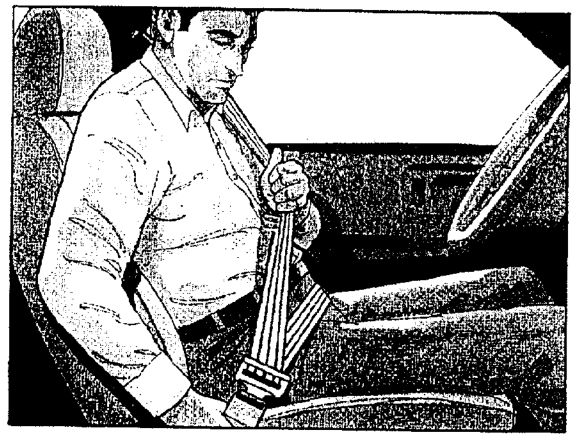
The driver has a lap-shoulder belt. Here's how to wear it properly.

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



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

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

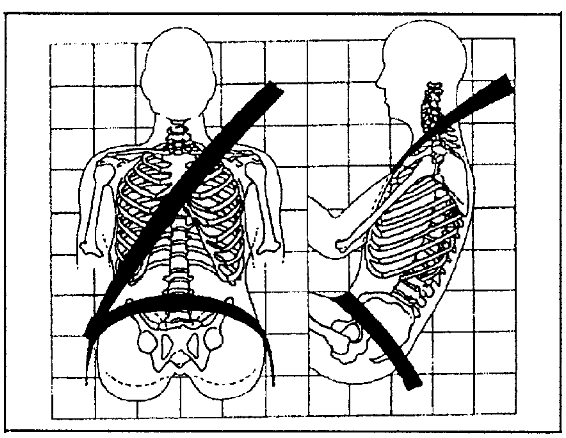


3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.

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

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

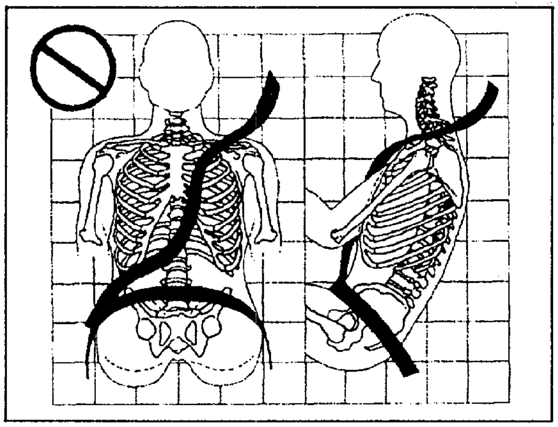
5. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder belt.



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

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

Q: What's wrong with this?

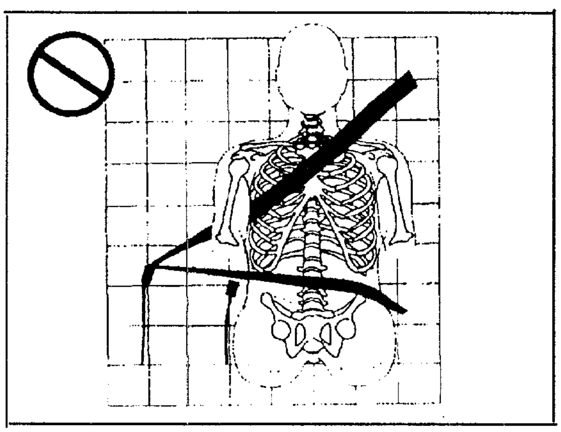


A: The shoulder hett is too loose. It won't give nearly as much protection this way.

⚠CAUTION:

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

Q: What's wrong with this?

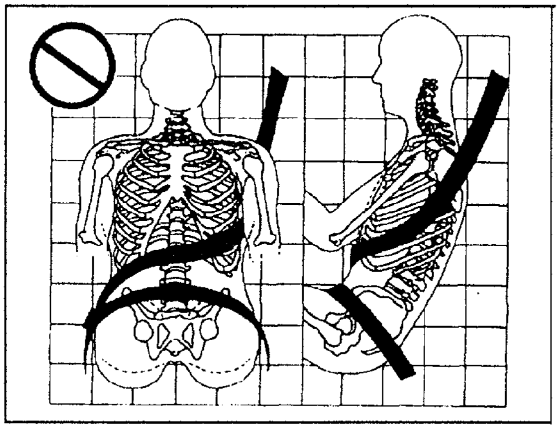


A: The belt Is buckled in the wrong place

⚠CAUTION:

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

Q: What's wrong with this?

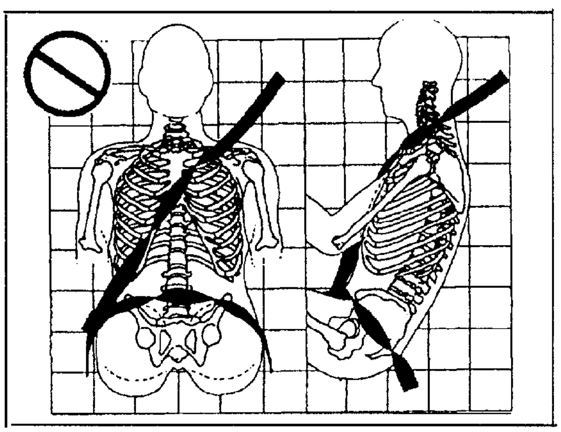


A: The shoulder belt is worn under the arm It should be worn over the shoulder at all times.

⚠CAUTION:

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

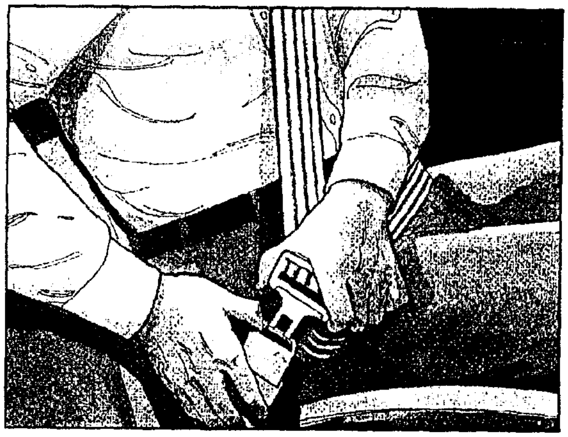
Q: What's wrong with this?



A: The belt is twisted across the body.

⚠CAUTION:

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

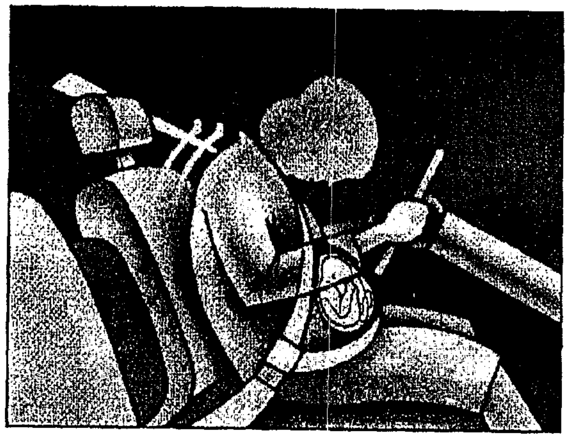


To unlatch the belt, just push the button on the buckle. The belt should go back out of the way.

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

Safety Belt Use During Pregnancy

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



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

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

Right Front Passenger Position

To learn how to wear the right front passenger's safety belt properly, see "Driver Position" earlier in this section.

The right front passenger's safety belt works the same way as the driver's safety belt -- except for one thing. If you ever pull the shoulder portion of the belt out all the way, you will engage the child restraint locking feature. If this happens, just let the belt go back all the way and start again.

Supplemental Inflatable Restraint (SIR) System

This part explains the Supplemental Inflatable Restraint (SIR) system or air bag system.

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

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

⚠CAUTION:

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

CAUTION:

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

! CAUTION:

Children who are up against, or very close to, an air bag when it inflates can be seriously injured or killed. Air bags plus lap-shoulder belts offer the best protection for adults and older children, but not for young children and infants. Neither

CAUTION: (Continued)

CAUTION: (Continued)

the vehicle's safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide. Always secure children properly in your vehicle. To read how, see the part of this manual called "Children" and see the caution labels on the sunvisors and the right front passenger's safety belt.

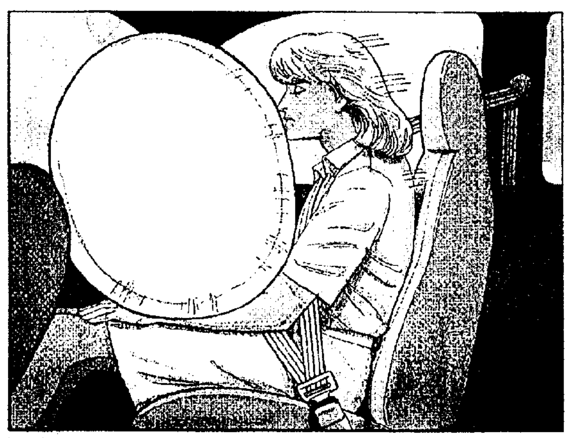
There is an air bag readiness light on the instrument panel, which shows the air bag symbol.

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

How the Air Bag System Works

Where are the air bags?

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



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

⚠CAUTION:

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

When should an air bag inflate?

An air bag is designed to inflate in a moderate to severe frontal or near-frontal crash. The air bag will inflate only if the impact speed is above the system's designed "threshold level." If your vehicle goes straight into a wall that doesn't move or deform. the threshold level is about 14 to 18 mph (23 to 29 km/h). The threshold level can vary, however. with specific vehicle design. so that it can be somewhat above of below this range. If your vehicle strikes something that will move or deform. such as a parked car. the threshold level will be higher. The air bag is not designed to inflate in rollovers. side impacts or rear impacts. because inflation would not help the occupant.

In any particular crash. no one can say whether an air bag should have inflated simply because of the damage to a vehicle or because of what the repair costs were. Inflation is determined by the angle of the impact and how quickly the vehicle slows down in frontal or near-frontal impacts.

The air bag system is designed to work properly under a wide range of conditions. including off-road usage. Observe safe driving speeds. especially on rough terrain. As always, wear your safety belt. See "Off-Road Driving" in the Index for more tips on off-road driving.

What makes an air bag inflate?

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

How does an air bag restrain?

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

What will you see after an air bag inflates?

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

⚠CAUTION:

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

- Air bags are designed to inflate only once. After they inflate. you'll need some new parts for your air bag system. If you don't get them, the air bag system won't be there to help protect you in another crash. A new system will include air bag modules and possibly other parts. The service manual for your vehicle covers the need to replace other parts.
- Your vehicle is equipped with a diagnostic module. which records information about the air bag system. The module records information about the readiness of the system. when the sensors are activated and driver's safety belt usage at deployment.

- Let only qualified technicians work on your air bag system. Improper service can mean that your air bag system won't work properly. See your dealer for service.

NOTICE:

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

Servicing Your Air Bag-Equipped Vehicle

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

⚠CAUTION:

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

The air bag systetn does not need regular maintenance.

Adding Equipment to Your Air Bag-Equipped Vehicle

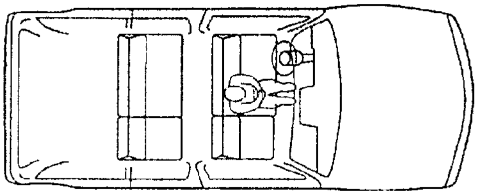
Q: If I add a push bumper or a bicycle rack to the front of my vehicle, will it keep the air bags from working properly?

A: As long as the push bumper or bicycle rack is attached to your vehicle so that the vehicle's basic structure isn't changed. it's not likely to keep the air bags from working properly in a crash.

Q: Is there anything I might add to the front of the vehicle that could keep the air bags from working properly?

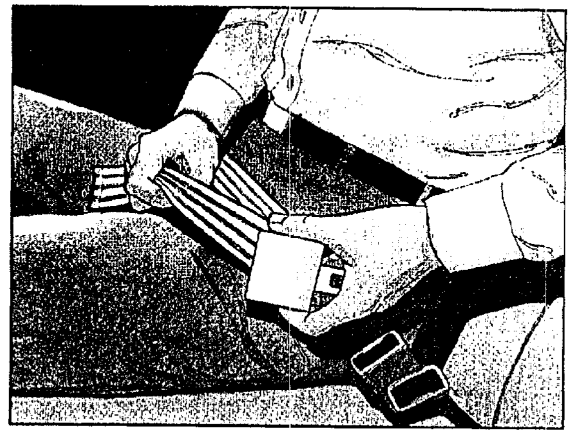
A: **Yes.** if you add things that change your vehicle's frame. bumper system. front end sheet metal or height. they may keep the air bag system from working propcrly. Also. the air bag system may not work properly it' you relocate any of the air bag sensors. If you have any questions about this. you should contact Customer Assistance before you modify your vehicle. (The phone numbers and addrcsscs for Customer Assistance are in Step Two of the Customer Satisfaction Procedure in this manual. Scc "Customer Satisfaction Procedure" in the Index.)

Center Front Passenger Position (4-Door Models)

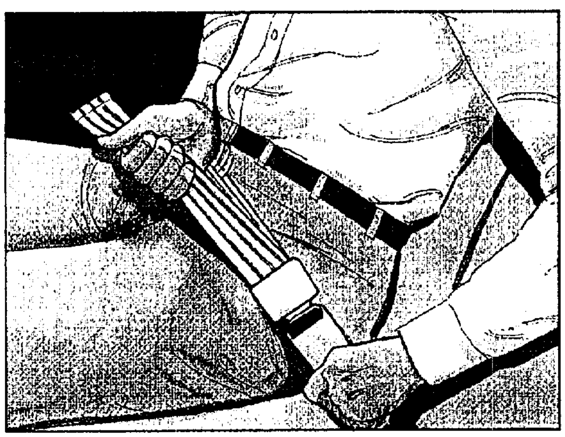


Lap Belt

If your vehicle has a front bench seat, someone can sit in the center position.



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



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

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

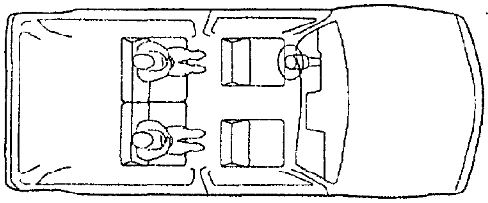
Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

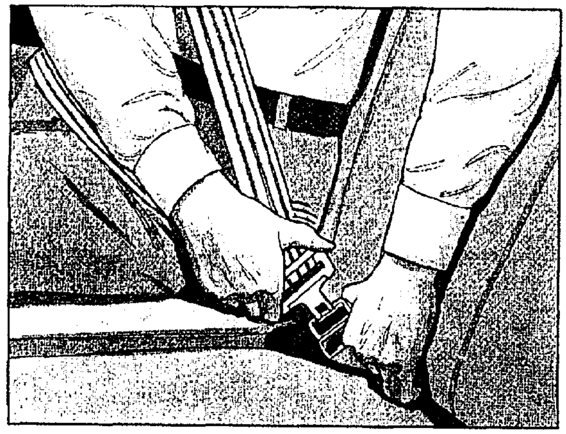
Rear Seat Passengers

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

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

Rear Seat Outside Passenger Positions





Lap-Shoulder Belt

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

1. Pick up the latch plate and pull the belt across you. Don't let it get twisted. The shoulder belt may lock it' you pull the belt across you very quickly. If this happens. let the belt go back slightly to **unlock it.** Then pull the belt across you more slowly.

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

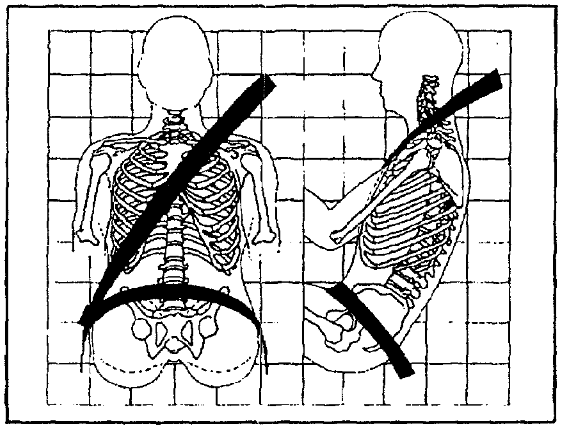
   Pull up on the latch plate to make sure it is secure.

   When the shoulder belt is pulled out all the way. it will lock. If it does, let it go back all the way and start again.

   If the belt is not long enough. see "Safety Belt Extender" at the end of this section.

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

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



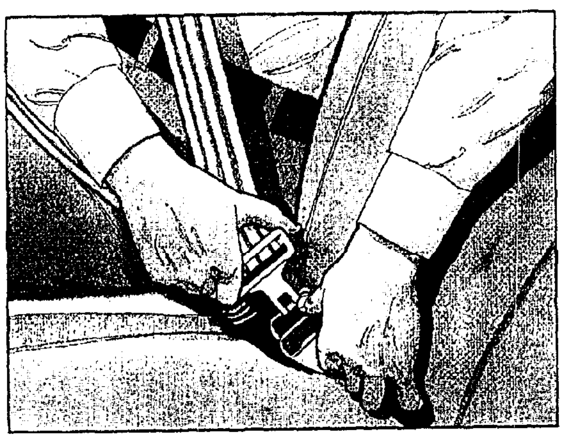
The lap part of the belt should be worn low and snug on the hips. just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even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

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

The safety belt also locks if you pull the belt very quickly out of the retractor.

⚠CAUTION:

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

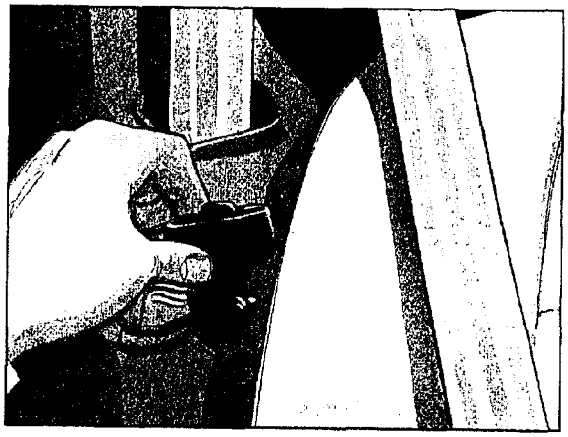


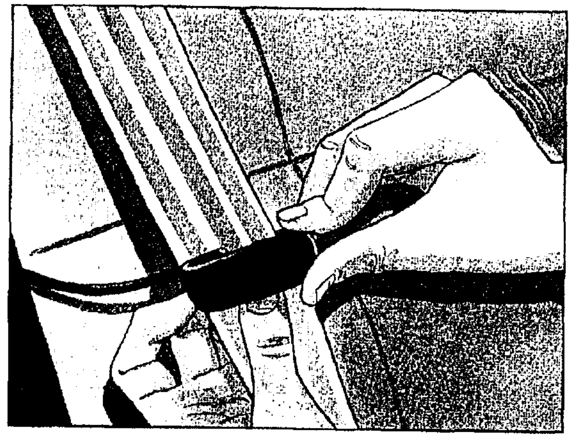
To unlatch the belt. just push the button on the buckle.

Rear Safety Belt Comfort Guides for Children and Small Adults (4-Door Models)

Four-door models have rear shoulder belt comfort guides. This feature will provide added safety belt comfort for children who have outgrown child restraints and for small adults. When installed on a shoulder belt. the comfort guide pulls the belt away from the neck and head.

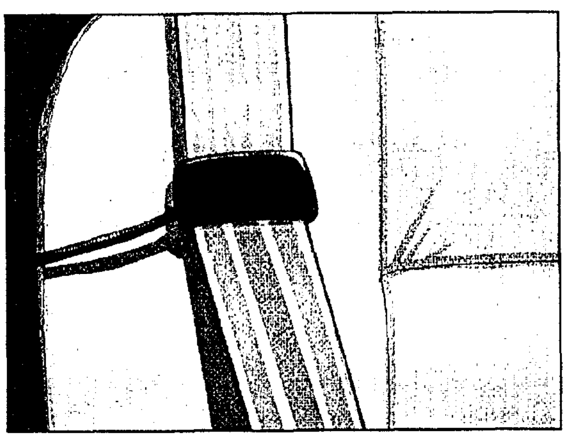
There is one guide for each outside passenger position in the rear seat. To provide added safety belt comfort for children who have outgrown child restraints and for smaller adults. the comfort guides may be installed on the shoulder belts. Here's how to install a comfort guide and use the safety belt:





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

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

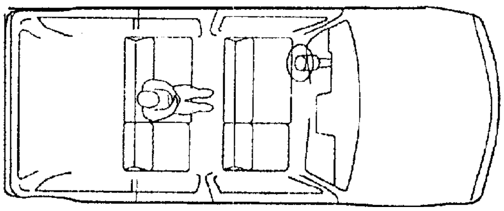


3. Be sure that the belt is not twisted and it lies flat. The elastic cord must be under the belt and the guide on top.

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

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

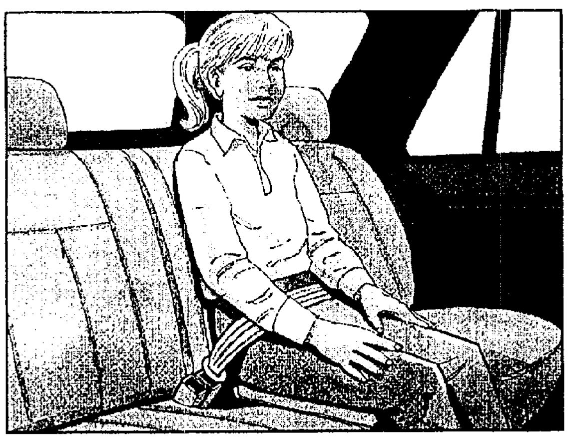
Center Rear Passenger Position (4-Door Models)



Lap Belt

When you sit in the center rear seating position, you have a lap safety belt which has a retractor.

1. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
2. Push the latch plate into the buckle until it clicks. Pull up on the latch plate to make sure it is secure.
3. Feed the lap belt into the retractor to tighten it.



4. Position and release it the same way as the lap part of a lap-shoulder belt.

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

Children

Everyone in a vehicle needs protection! That includes infants and all children smaller than adult size. Neithct the distance traveled nor the age and size of the traveler changes the need, for everyone. to use safety restraints. In fact. the law in every state in the United States and in every Canadian province says children up to some age must be restrained while in a vehicle.

Smaller Children and Babies

A! CAUTION:

Children who are up against, or very close to, an air bag when it inflates can be seriously injured or killed. Air bags plus lap-shoulder belts offer the best protection for adults and older children, but not for young children and infants. Neither the vehicle's safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide. Always secure children properly in your vehicle.

⚠CAUTION:

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

Infants need complete support, including support for the head and neck. This is necessary because an infant's neck is weak and its head weighs so much compared with the rest of its body. In a crash, an infant in a rear-facing restraint settles into the restraint, so the crash forces can be distributed across the strongest part of the infant's body, the back and shoulders. A baby should be secured in an appropriate infant restraint. This is so important that many hospitals today won't release a newborn infant to its parents unless there is an infant restraint available for the baby's first trip in a motor vehicle.

⚠CAUTION:

Never hold a baby in your arms while riding in a vehicle. A baby doesn't weigh much -- until a crash. During a crash a baby will become so heavy you can't hold it. For example, in a crash

CAUTION: (Continued)

CAUTION: (Continued)

at only 25 mph (40 km/h), a 12-lb. (5.5 kg) baby will suddenly become a 240-lb. (110 kg) force on your arms. The baby would be almost impossible to hold.

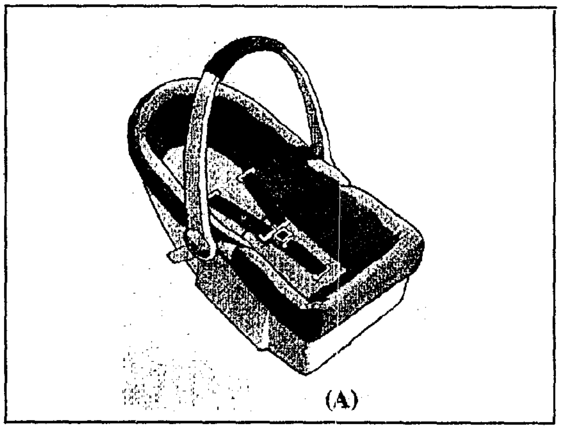
Secure the baby in an infant restraint.

Child Restraints

Every time infants and young children ride in vehicles. they should have protection provided by appropriate restraints.

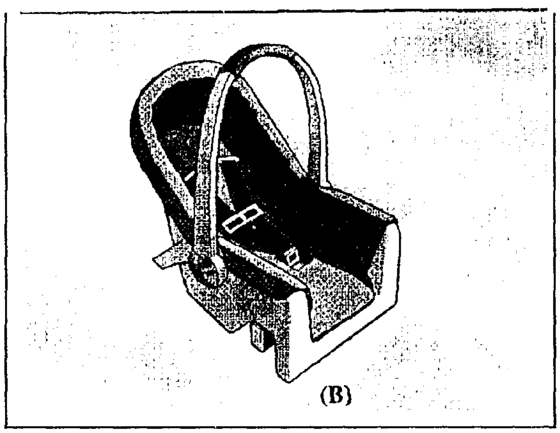
Q: What are the different types of add-on child restraints?

A: Add-on child restraints are available in four basic types. When selecting a child restraint, take into consideration not only the child's weight and size, but also whether or not the restraint will be compatible with the motor vehicle in which it will be used.

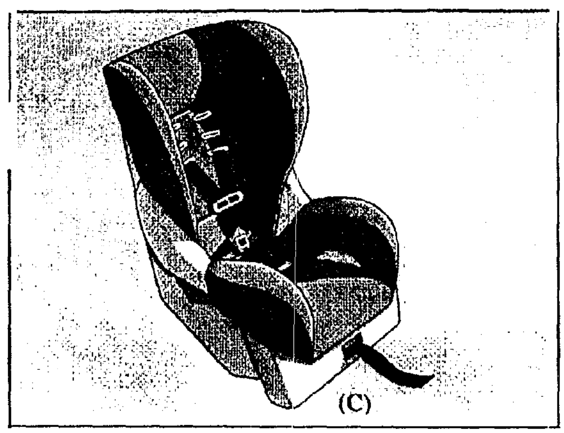


(A)

An infant car bed (A) is a special bed made for use in a motor vehicle. It's an infant restraint system designed to restrain or position a child on a continuous flat surface. With an infant car bed. make sure that the infant's head rests toward the center of the vehicle.

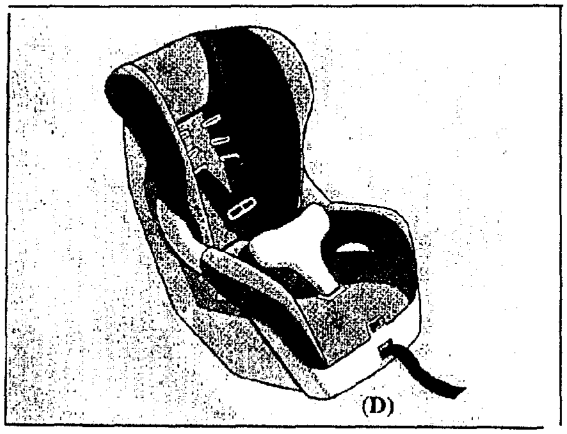


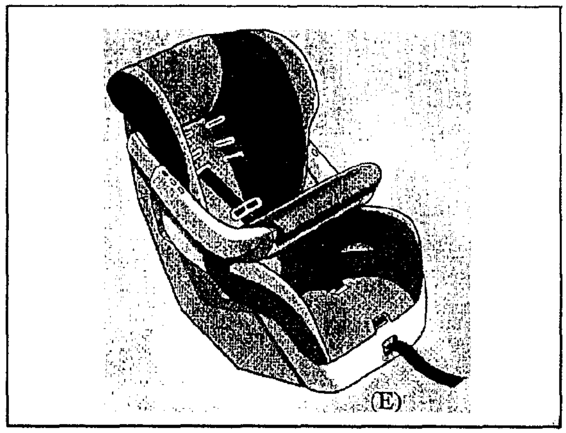
(B)



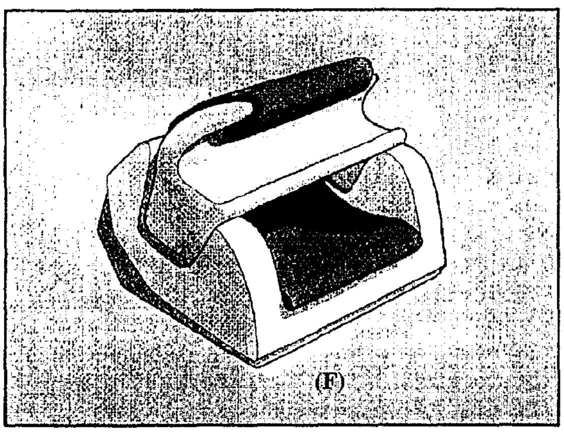
(C)

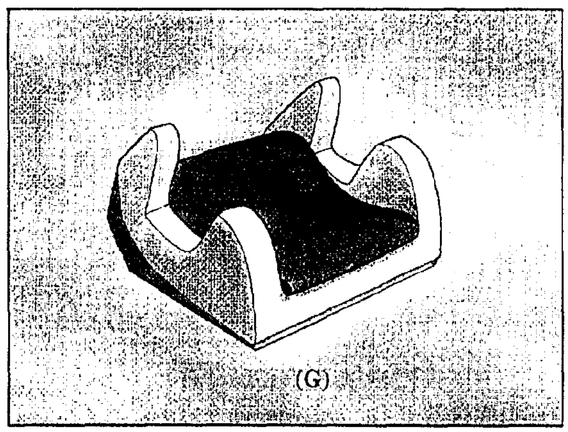
A rear-facing infant restraint (B) positions an infant to face the rear of the vehicle. Rear-facing infant restraints are designed for infants of up to about 20 lbs. (9 kg) and about one year of age. This type of restraint faces the rear so that the infant's head. neck and body can have the support they need in a crash. Some infant seats come in two parts -- the base stays secured in the vehicle and the seat part is removable.





A forward-facing child restraint (C-E) positions a child upright to face forward in the vehicle. These forward-facing restraints are designed to help protect children who are from 20 to 40 Ibs. (9 to 18 kg) and about 26 to 40 inches (66 to 102 cm) in height. or up to around four years of age. One type, a convertible restraint, is designed to be used either as a rear-facing infant seat or a forward-facing child seat.





A booster seat (F. G) is designed for children who are about 40 to 60 Ibs. (18 to 27 kg) and about four to eight years of age. It's designed to improve the fit of the vehicle's safety belt system. Booster seats with shields use lap-only belts: however. booster seats without shields use lap-shoulder belts. Booster seats can also help a child to see out the window.

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

Then follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both. These restraints use the belt system in your vehicle, but the child also has to be secured within the restraint to help reduce the chance of personal injury. The instructions that come with the infant or child restraint will show you how to do that. Both the owner's manual and the child restraint instructions are important, so if either one of these is not available, obtain a replacement copy from the manufacturer.

Where to Put the Restraint

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

⚠CAUTION:

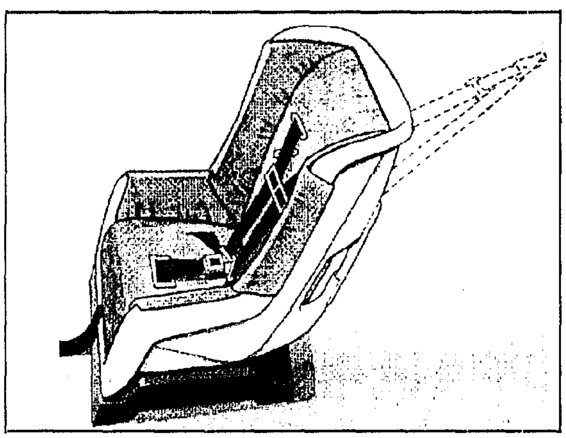
A child in a rear-facing child restraint can be seriously injured if the right front passenger's air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in a rear seat outside position.

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

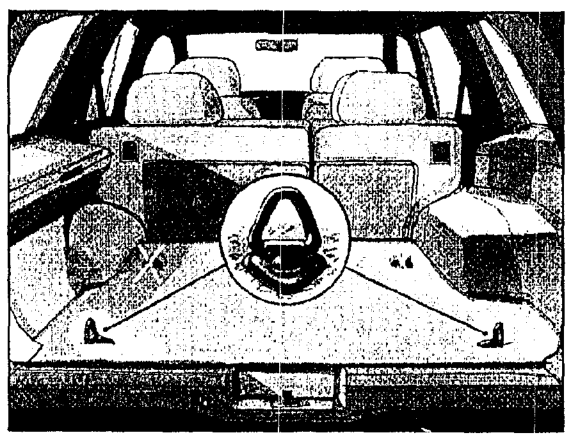
Wherever you install it, be sure to secure the child restraint properly.

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

Top Strap



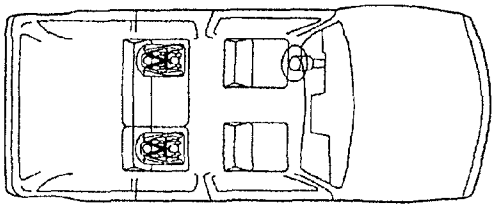
If your child restraint has a top strap, it should be anchored. Anchor brackets for the rear outside seat positions are located on the floor in the cargo area.



Don't use the front set of tie-down brackets. Anchor the top strap to the rearmost bracket on the same side of the vehicle as the child restraint.

Once you have the top strap anchored, you'll be ready to secure the child restraint itself.

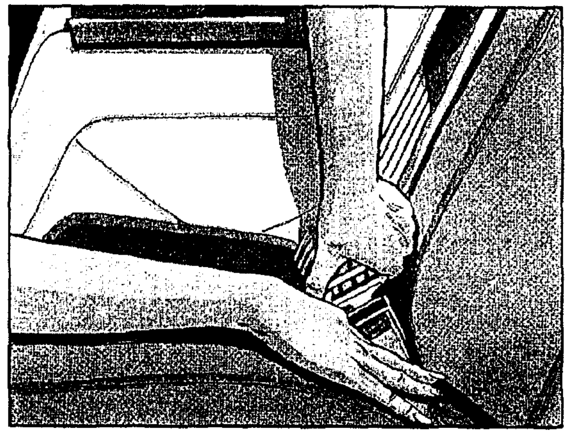
Securing a Child Restraint in a Rear Outside Seat Position



You'll be using the lap-shoulder belt. See the earlier part about the top strap if the child restraint has one. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

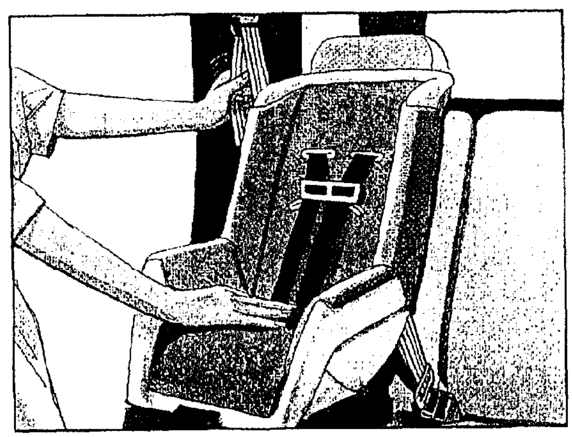
1. Put the restraint on the seat.
2. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.

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



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

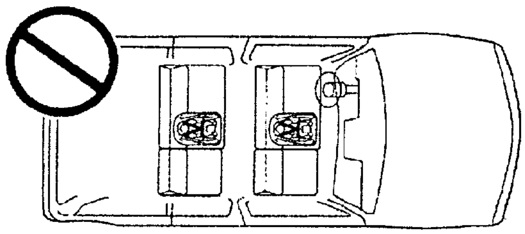
3. Pull the rest of the shoulder belt all the way out of the retractor to set the lock.



5. To tighten the belt, feed the shoulder belt back into the retractor while you push down on the child restraint. If you're using a forward-facing child restraint, you may find it helpful to use your knee to push down on the child restraint as you tighten the belt.
6. Push and pull the child restraint in different directions to be sure it is secure.

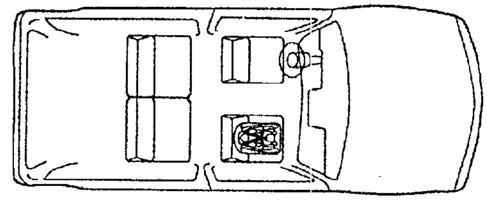
To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

Center Seat Positions (4-Door Models)



Don't use child restraints in these positions. The restraints won't work properly.

Securing a Child Restraint in the Right Front Seat Position



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

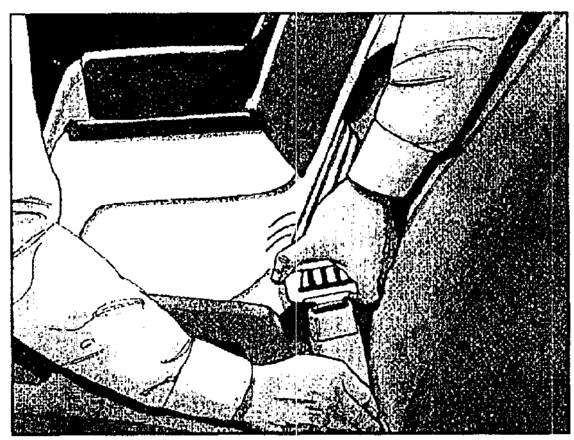
⚠CAUTION:

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

You'll be using the lap-shoulder belt. See the earlier part about the top strap if the child restraint has one. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

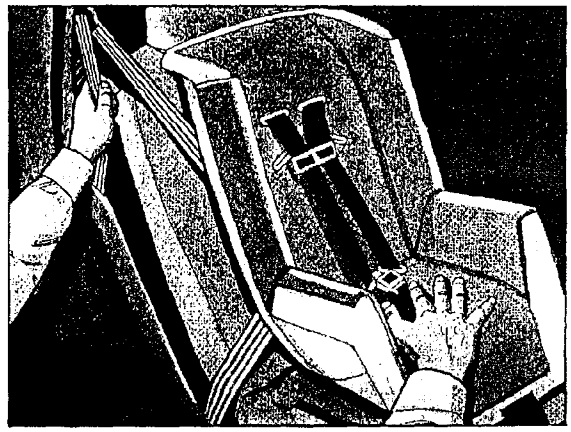
1. Because your vehicle has a right front passenger air bag, always move the seat as far back as it will go before securing a forward-facing child restraint. (See "Seats" in the Index.)
2. Put the restraint on the seat.
3. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's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

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



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

5. Pull the rest of the shoulder belt all the way out of the retractor to set the lock.



6. To tighten the belt, feed the shoulder belt back into the retractor while you push down on the child restraint. You may find it helpful to use your knee to push down on the child restraint as you tighten the belt.
7. Push and pull the child restraint in different directions to be sure it is secure.

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

Larger Children

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

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

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

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

⚠CAUTION:

Never do this.

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

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

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

⚠CAUTION:

Never do this.

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

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

Safety Belt Extender

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

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

Checking Your Restraint Systems

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

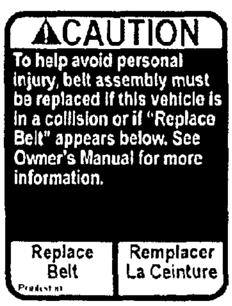
Torn or frayed safety belts may not protect you in a crash. They can rip apart under impact forces. If a belt is torn or frayed, get a new one right away.

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

Replacing Restraint System Parts After a Crash

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

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



If you ever see a label on the driver's or the right front passenger's safety belt that says to replace the belt, be sure to do so. Then the new belt will be there to help protect you in a collision. You would see this label on the belt near the door opening.

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

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