

V1604

REPORT NUMBER: CAL-91-N15

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

MAZDA MOTOR CORPORATION
1991 MAZDA MPV
7-PASSENGER VAN

NHTSA NUMBER: MM5400

CALSPAN TEST NUMBER: 7893-11

CALSPAN CORPORATION
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FINAL REPORT

PREPARED FOR:

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National Highway Traffic Safety Administration
Office of Market Incentives
400 Seventh Street, S.W.
Room No. 5313 (NRM-20)
Washington, DC 20590

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16. Abstract A frontal load cell barrier test of a 1991 Mazda MPV 7-Passenger Van was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York on May 7, 1991. The impact speed was 34.8 mph and the ambient temperature at the barrier face at the time of impact was 53°F. The maximum post-test vehicle crush was 17.5 inches. The test vehicle was equipped with a 3-point continuous best system at each of the front outboard seating positions. With regard to FMVSS 208 "Occupant Crash Protection," injury criteria, the driver dummy appeared to exceed the maximum head injury criteria.					
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Section 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY 90 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-90-D-02121. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph requirements.

The 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

Section 2

SUMMARY OF TEST NUMBER MM5400

A load cell barrier consisting of 36 load cells was impacted by a 1991 Mazda MPV 7-Passenger Van at a velocity of 34.8 mph. The test was performed at the Calspan Corporation Advanced Technology center on May 7, 1991. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 15 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572-B, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers and right/left femur load cells. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 357) and the right-front passenger ATD (Serial No. 749) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendices C and D.

The 67 channels of data were recorded on six 14-channel FM tape recorders. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Accelerometer #1(X), located on the left rear seat crossmember, contained a zero offset occurring after approximately 68 milliseconds. Accelerometer #4(X), located on the bottom of engine block, contained a zero offset occurring after approximately 100 milliseconds. The velocity and displacement data curves for both accelerometers have been removed from this report. Barrier load cells B3 and B7 contained a zero offset occurring after impact, therefore the data curves have been removed from this report. In addition, these load cells were not used in the calculation of the load cell sums. Position #1 Belt Elongation contained questionable data after approximately 237 milliseconds.

The driver's head struck the steering wheel hub; the HIC was 1038.3. The maximum chest deceleration over 3 milliseconds was 58.4 g's and femur loads were 803.0 and 578.7 pounds.

The right front passenger's HIC was 500.0 and maximum chest deceleration over 3 milliseconds was 47.9 g's. Femur loads were 926.7 and 776.1 pounds.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1991 Mazda MPV 7-Passenger Van

NHTSA No.: MM5400 VIN.: JM3LV5224MO308957

Body Color: White Date Of Manufacture: September 1990

Engine: 6 Cylinders; - C.I.D.; 3 Liters; - CC

X Gas; - Diesel; - Turbocharged

X Longitudinal; - Transverse

Transmission: 3 Speed; - Manual; X Automatic; - Overdrive

Final Drive: - Front Wheel; X Rear Wheel; - Four Wheel

Date Received: 2-5-91 Odometer Reading: 17 miles

X A/C; X P/S; X P/B; - P/wdo.; X Tilt Wheel

- P/seats; - Cruise Control

Type of Occupant Restraint: 3-point continuous belt system

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 35 psi, Rear 35 psi

Recommended Tire Size: P205/70R14

Recommended Cold Tire Pressure: Front 35 psi, Rear 35 psi

Tires on Vehicle: P205/70R14; Manufacturer: Yokohama

Number of Occupants: 2 Front; 2 Rear; 3 3rd Seat; 7 TOTAL

Type of Front Seats: X Bucket; - Bench; - Split Bench

Type of Front Seat Back: - Fixed X Adj. With X Lever - Rot. Knob

Rated Cargo and Luggage

Weight (RCLW) A-B = 300 lbs.

GVWR 5000 lbs. GAWR: Front 2450 lbs. Rear 2600 lbs.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 1030 lbs. Right Rear = 860 lbs.
 Left Front = 980 lbs. Left Rear = 860 lbs.
 TOTAL FRONT WEIGHT = 2010 lbs. (53.9 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1720 lbs. (46.1 % of Total Vehicle Weight)
 TOTAL DELIVERY WEIGHT = 3730 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (3730 lbs.)
 DSC = Designated Seating Capacity (7)
 RCLW = 300 lbs.
 Target Test Weight = UDW + RCLW + (2 dummies x 167 lbs./dummy)
 Target Test Weight = 4358 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 292 POUNDS CARGO:

Right Front = 1100 lbs. Right Rear = 1120 lbs.
 Left Front = 1050 lbs. Left Rear = 1080 lbs.
 TOTAL FRONT WEIGHT = 2150 lbs. (49.4 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 2200 lbs. (50.6 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 4350 lbs.
 Weight of ballast secured in vehicle trunk area = 365 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 28.0 LF 28.5 RR 28.5 LR 28.7
 Test Attitude: RF 27.6 LF 27.8 RR 27.0 LR 27.2
 Wheel Base: 110.6 in.; C.G. = 55.9 in. rearward of front wheel C/L.

Remarks: 14.5 gallons of stoddard solution was placed in fuel tank.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°
 Date of Test: May 7, 1991 Time of Test: 15:00
 Ambient Temperature: 53 °F at impact area
 Temperature in Occupant Compartment: 72 °F
 Windshield Molding Temperature: 70 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: primary = 34.8 mph, secondary = 34.8 mph
 Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 52 inches
 Exiting Speed Trap: 12 inches

VEHICLE REBOUND AND CRUSH (inches):

Vehicle Length: Pre-test = R 172.0 C 175.5 L 172.8
 Post-test = R 156.2 C 158.0 L 157.8
 Crush = R 15.8 C 17.5 L 15.0

Distance from front of test vehicle to point of impact:

R 9.3 C 10.2 L 10.6

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>Steering Wheel Humb</u>	<u>No Contact</u>
Chest	<u>Lower Steering Wheel Rim</u>	<u>No Contact</u>
Abdomen	<u>No Contact</u>	<u>No Contact</u>
Left Knee	<u>Dash Panel</u>	<u>Glove Box</u>
Right Knee	<u>Dash Panel</u>	<u>Glove Box</u>

Table 1
GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>operable</u>	<u>tools required</u>	<u>none</u>	<u>operable</u>

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Left</u>
<u>Seat Movement</u>				
Seat Back Failure	<u>None</u>	<u>None</u>	<u>-</u>	<u>-</u>
Seat Shift (in.)	<u>0.0</u>	<u>0.0</u>	<u>-</u>	<u>-</u>

Glazing Damage

Backlight/Windshield Windshield sustained stress fractures but
remained intact.

Other Notable Impact Effects: Floor pan buckled.

Section 3
OMI FINAL DATA

Occupant and Vehicle Information

I. OMI DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Positioning Data
4. Seat Belt Performance Assessment Data
5. Driver Dummy to Steering Column Dimensions
6. Camera Locations
7. Vehicle Target Locations

II. OVR DATA

1. Load Cell Barrier Data
2. Vehicle Accelerometer Data
3. Test Vehicle Measurements

Table 2
DUMMY INJURY CRITERIA VALUES

NHTSA No.: MM5400 Vehicle: 1991 Mazda MPV 7-Passenger Van

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-124.8	17.8	62.2	135.7
Position #2 - Passenger	-28.5	-12.8	55.3	56.3

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-58.4	-28.6	-24.2	58.4
Position #2 - Passenger	-50.9	17.0	-18.2	47.9

The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

	MAXIMUM FORCE - FEMUR LOAD (lbs.)	
	LEFT FEMUR	RIGHT FEMUR
Position #1 - Driver	803.0	578.7
Position #2 - Passenger	926.7	776.1

	MAXIMUM FORCE - SEAT BELT LOADS (lbs.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	2300.4	-	2382.1
Position #2 - Passenger	2255.9	2296.7	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
Position #1 - Driver	1038.3	.05544	.09132	60.9
Position #2 - Passenger	500.0	.05100	.08688	45.5

HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

Test No.: MM5400 Vehicle: 1991 Mazda MPV 7-Passenger Van

SEAT TYPE:

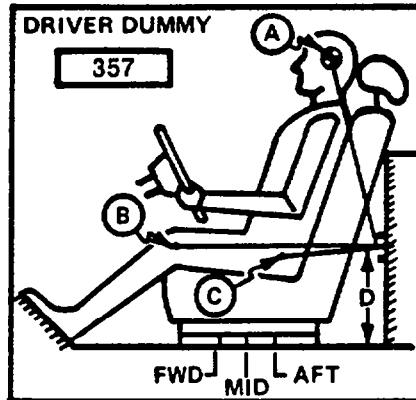
- Bench
X Bucket
- Split Bench

ADJUSTER TYPE:

X Manual
- Power

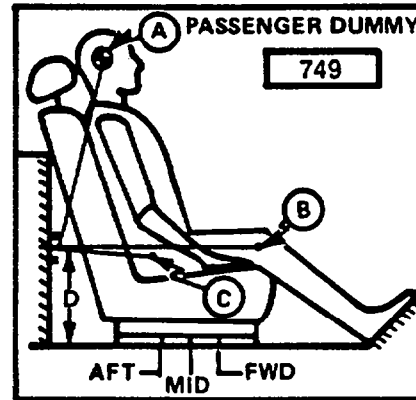
SEAT BACK TYPE:

- Fixed
X Adjustable Reclining



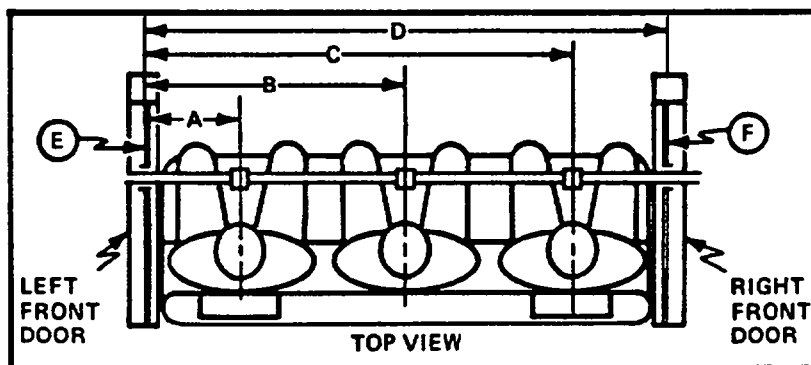
MEASUREMENT
LOCATION

- A - Head Target
- B - Knee Joint
- C - Approximate 'H' Point
- D - Sill to Reference Point



A = 25.5 in. 10 Degrees
 B = 23.7 in. 94 Degrees
 C = 7.7 in. 112 Degrees
 D = 15.9 in.

A = 25.3 in. 9 Degrees
 B = 23.7 in. 91 Degrees
 C = 7.8 in. 117 Degrees
 D = 15.9 in.



S/N 357

DUMMY ID

S/N 749

A = Left Door to Driver Centerline 12.8 in.
 B = Left Door to Center Passenger Centerline - in.
 C = Left Door to Right Passenger Centerline 44.1 in.
 D = Left Door to Right Door 56.7 in.
 E,F = Window Glass Height (Right and Left Must Be Equal) 12.0 in.

Figure 2

OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	12.5	12.7
HW	21.6	21.6
CD	22.0	23.8
CS	14.1	—
KDL	6.9	7.9
KDR	7.3	7.8
SA	See Note	See Note
TA	21°	20°
HSW	19.1	—

HH = Head to Windshield Header

HW = Head to Windshield

HSW = Head to Steering Wheel

CD = Chest to Dash

CS = Chest to Steering Wheel

KD(L/R) = Knee to Dash (Left/Right)

SA = Seat Back Angle

TA = Torso Angle

HA = Head Target to "A" Pillar

HR = Head to Side Roof

HS = Head to Side Window

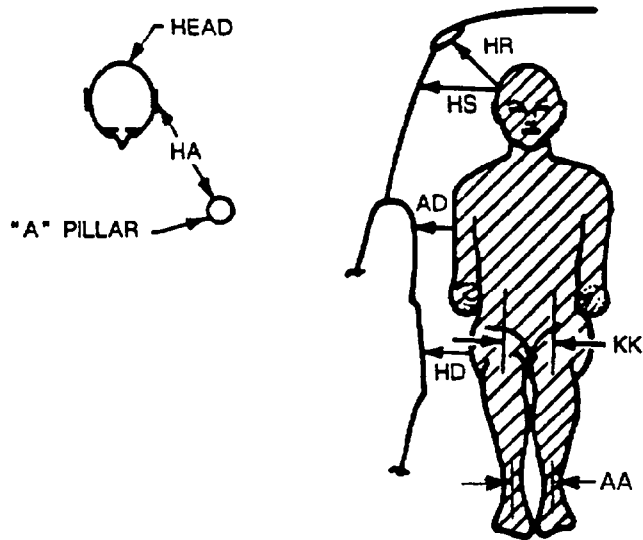
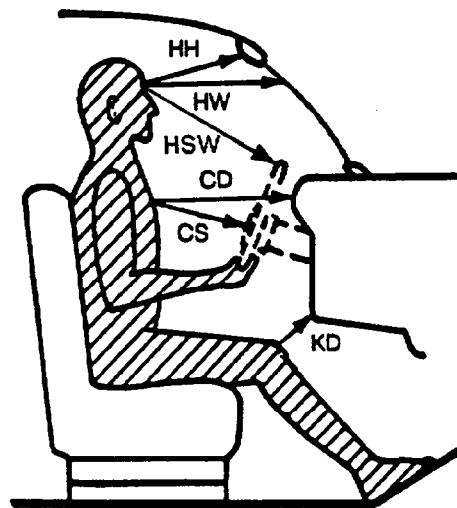
AD = Arm to Door

HD = Hip to Door

KK = Knee to Knee

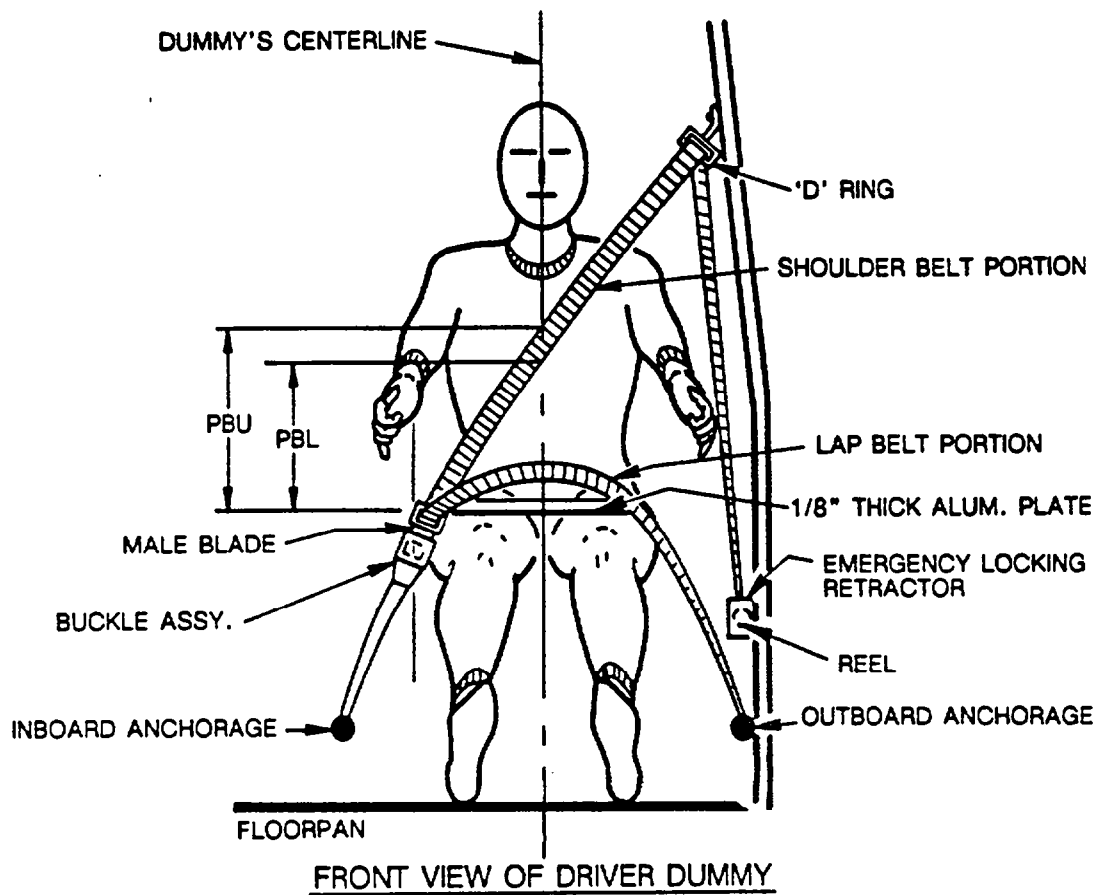
AA = Ankle to Ankle

	DRIVER	PASSENGER
HR	7.6	7.4
HS	9.9	9.5
AD	3.8	3.3
HD	4.5	4.0
KK	9.7	7.5
HA	21.3	21.2
AA	11.3	8.4



Note: Seat was positioned according to manufacturer specifications

Figure 3
SEAT BELT POSITIONING DATA



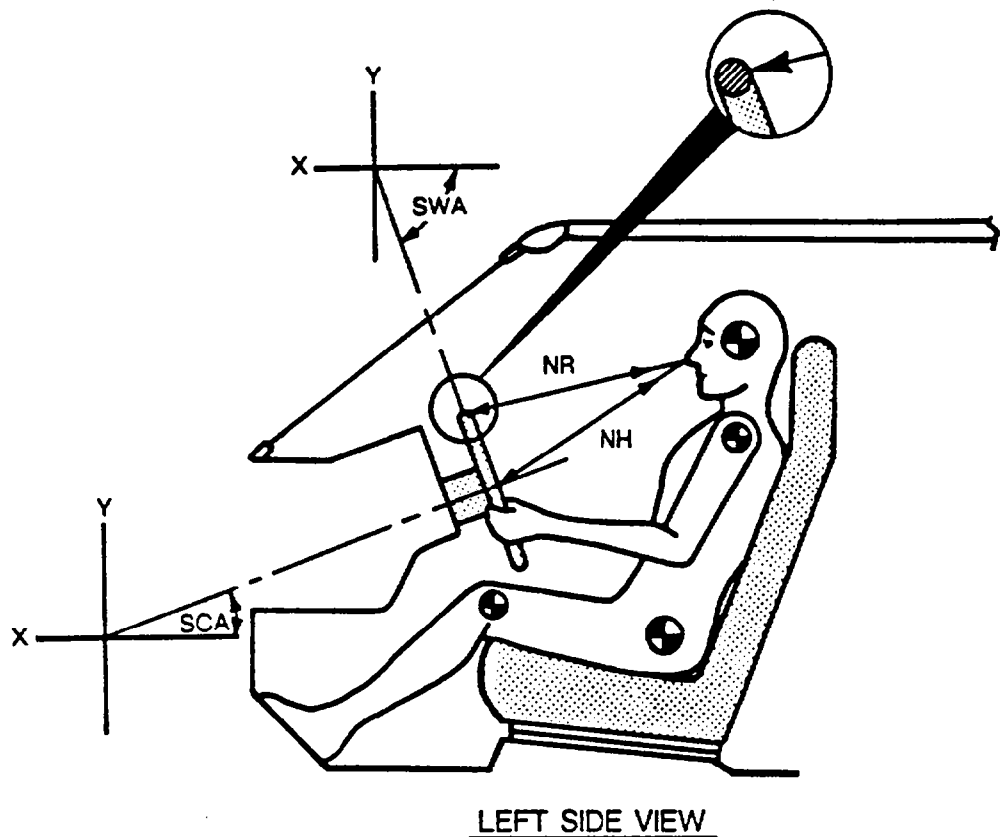
	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to upper edge	14.5	14.4
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	11.0	11.1
<u>LAP BELT TENSION</u>	2.0 lbs.	2.0 lbs.
<u>SHOULDER BELT TENSION</u>	—	—

Table 3

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

<u>BELT LENGTH DATA:</u>	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>93.5"</u>	<u>93.5"</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>41.5"</u>	<u>41.0"</u>
Lap belt length as measured on Part 572 Dummy.	<u>40.0"</u>	<u>40.0"</u>
<u>BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>1.5"</u>	<u>2.0"</u>
As determined mechanically.	<u>1.3"</u>	<u>1.5"</u>
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>.35 in/ft</u>	<u>1.3 in/ft</u>
Measured mechanically	<u>0.0 in/ft</u>	<u>0.0 in/ft</u>

Figure 4
 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



		MEASUREMENTS	
<u>NR</u>	-- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	17.8	Inches
<u>NH</u>	-- Distance from tip of dummy's nose to center of steering column hub	18.1	Inches
<u>SCA</u>	-- Angle of steering column relative to the horizontal X axis	32	Degrees
<u>SWA</u>	-- Angle of steering wheel relative to the horizontal X axis	-58	Degrees

Figure 5
CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

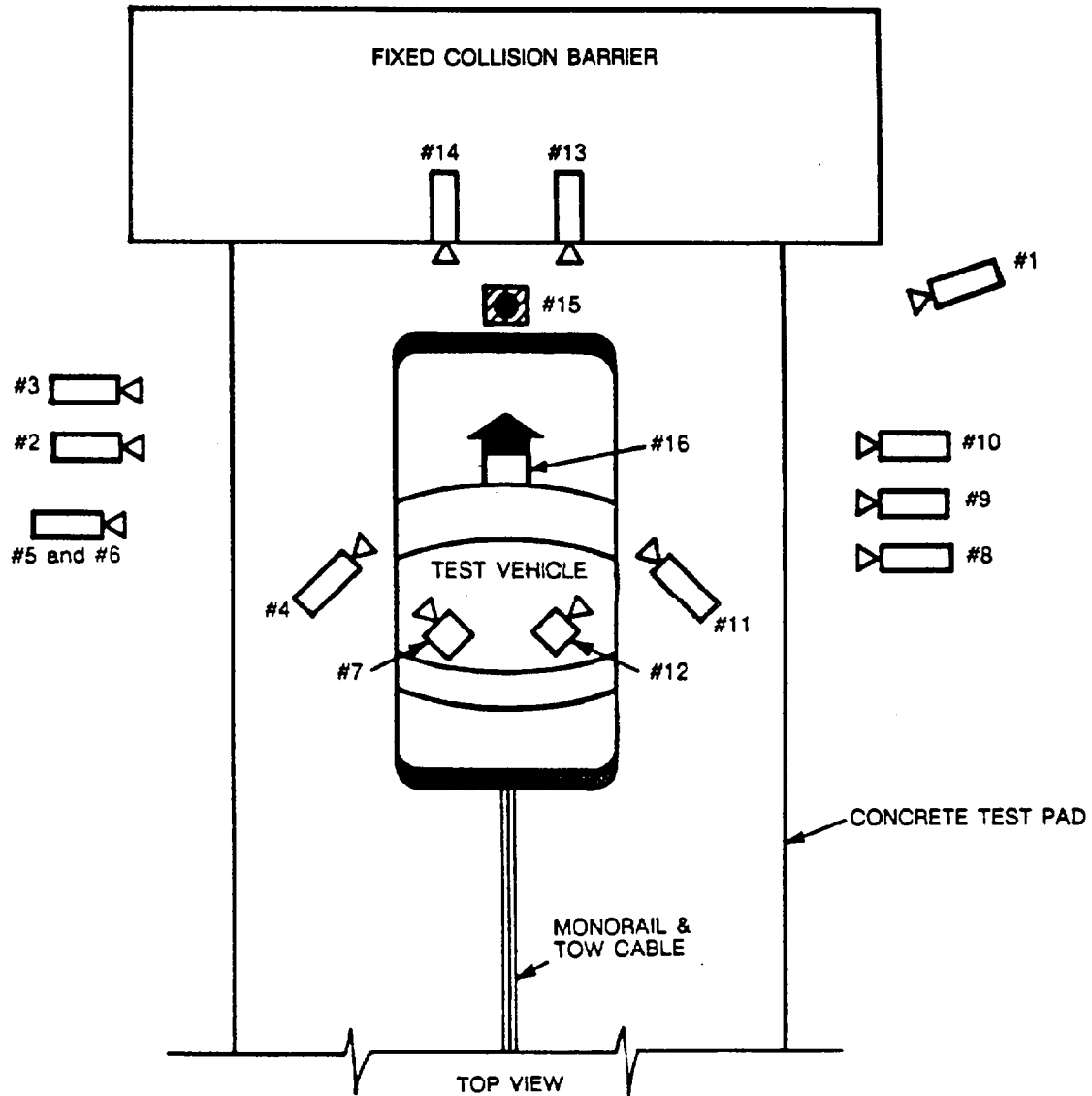


Table 4

HIGH-SPEED CAMERA LOCATIONS

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	212	53	41	-4	194	13	N.T.
3	Left Side View	281	28	42	-2	263	25	N.T.
4	Driver and Interior View	103	92	74	-18	85	13	660
5	Steering Column (Bottom)	278	67	46	-3	260	25	550
6	Steering Column (Top)	278	67	70	-8	260	25	N.T.
7	Left Belt	-	-	-	-	-	8	N.T.
8	Overall Right Side	228	62	42	0	210	13	570
9	Right Side View	289	44	41	-2	271	25	610
10	Right Passenger View	296	58	54	-3	278	35	510
11	Passenger and Interior View	103	84	71	-20	85	25	530
12	Right Belt	-	-	-	-	-	8	740
13	Passenger Front View	24	-6	72	-40	-	13	N.T.
14	Driver Front View	24	-6	72	-38	-	13	N.T.
15	Windshield View	0	0	125	-45	-	13	N.T.
16	Pit View of Engine	0	36	-120	90	-	13	670

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

N.T. = no timing

Figure 6
VEHICLE TARGET LOCATIONS

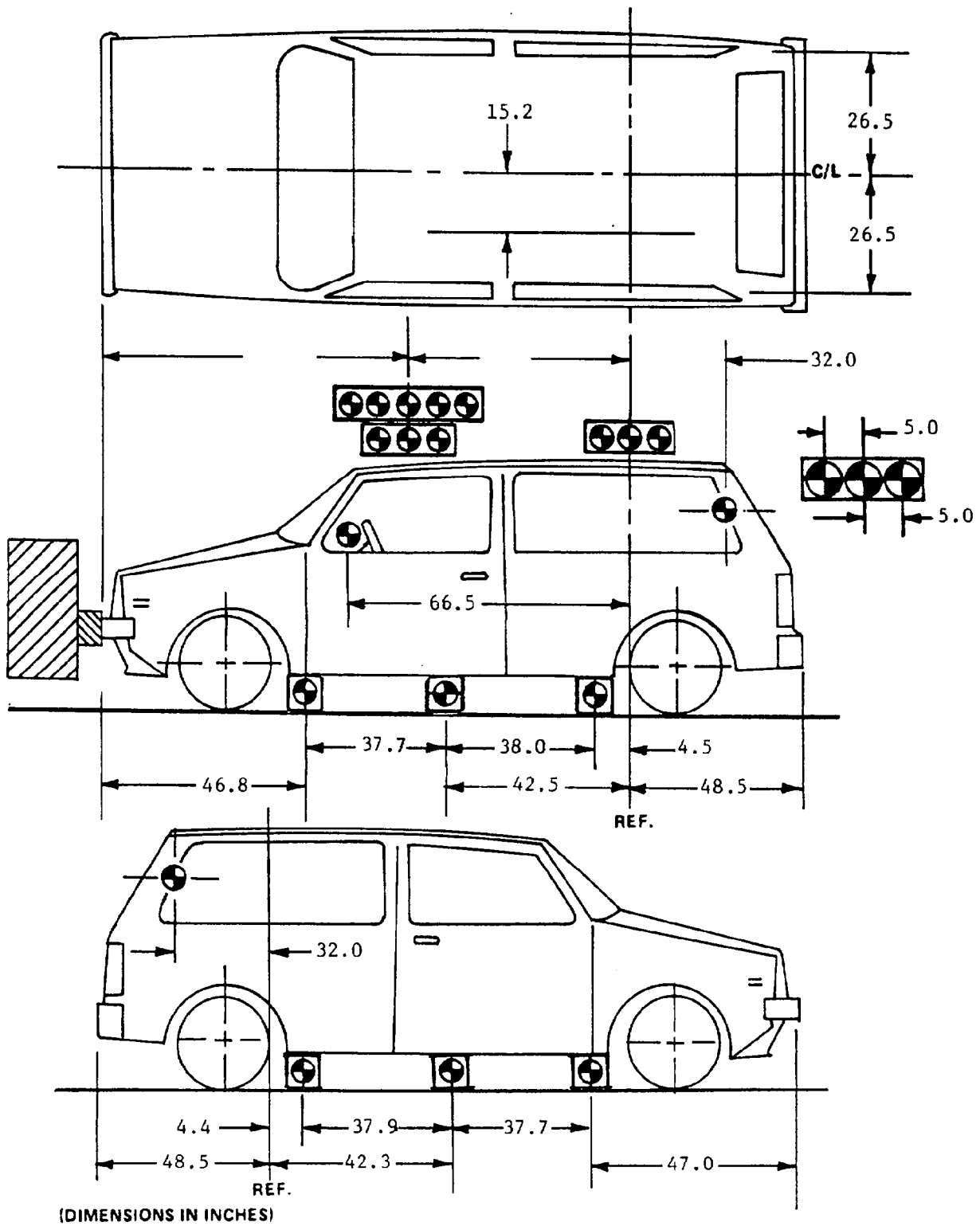
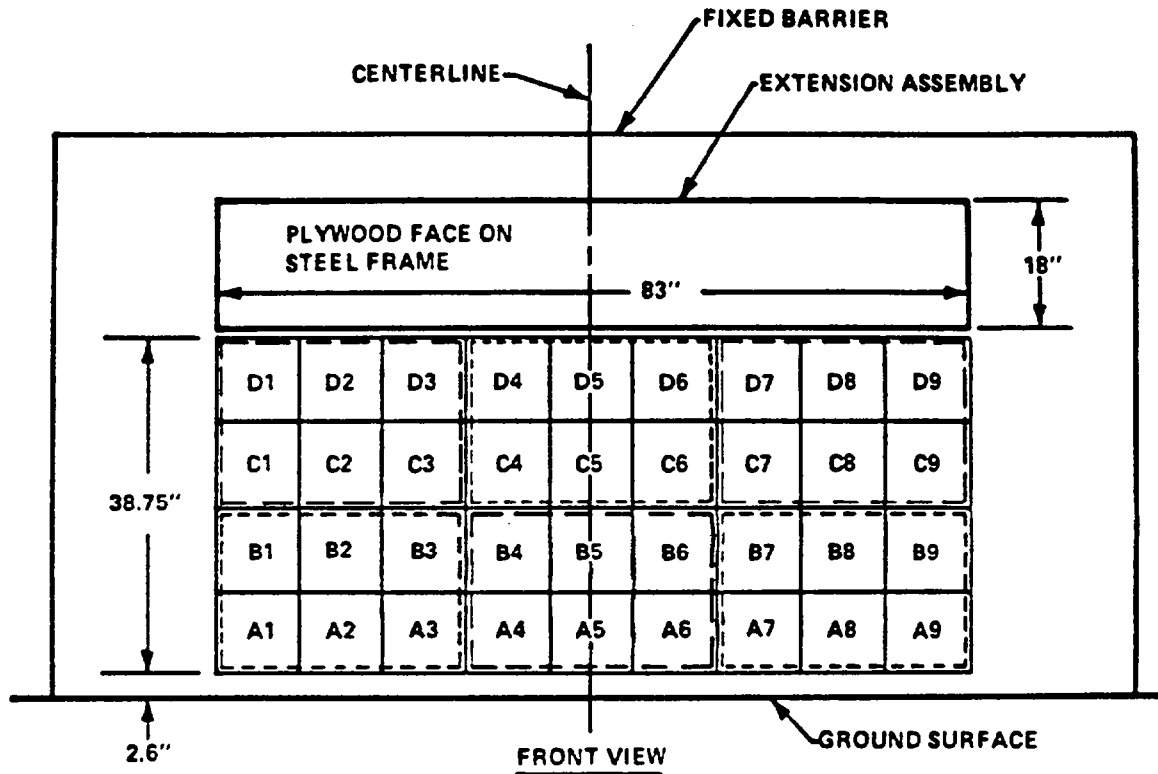


Figure 7

LOAD CELL LOCATIONS ON FIXED BARRIER

- 36 Load Cells
- 4 Rows
- 9 Columns
- 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

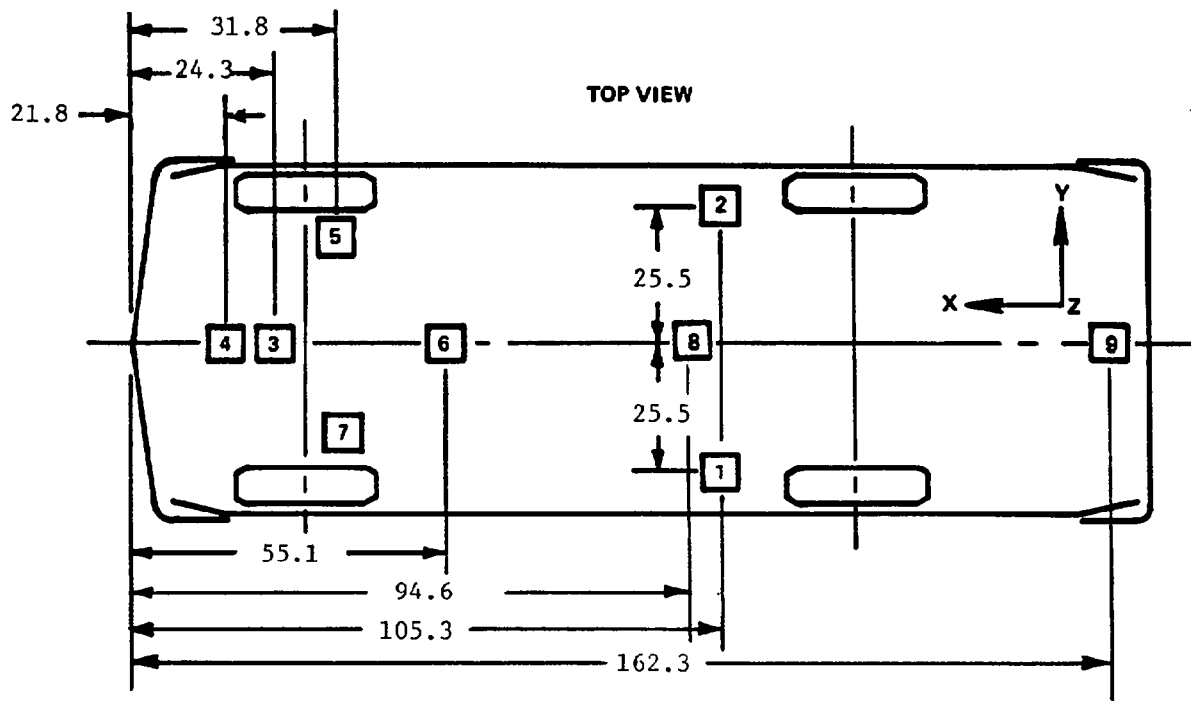
Group 4	Group 5	Group 6
C1 thru D3	C4 thru D6	C7 thru D9
Group 1	Group 2	Group 3
A1 thru B3	A4 thru B6	A7 thru B9

The following data is presented in Appendix B:

- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

Figure 8

VEHICLE ACCELEROMETER LOCATIONS



(All Measurements in Inches)

ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	DIRECTION		
		X	Y	Z
1	Left Rear Seat Crossmember	X		
2	Right Rear Seat Crossmember	X		
3	Top of Engine	X		
4	Bottom of Engine	X		
5	Right Disc Brake Caliper	x		
6	Left Disc Brake Caliper	X		
7	Instrument Panel	X		
8	Center Rear Seat Crossmember			X
9	Rear Trunk Centerline			X

*The accelerometer pack number can be correlated with the vehicle response data traces found in Appendix B.

Figure 9
TEST VEHICLE MEASUREMENTS

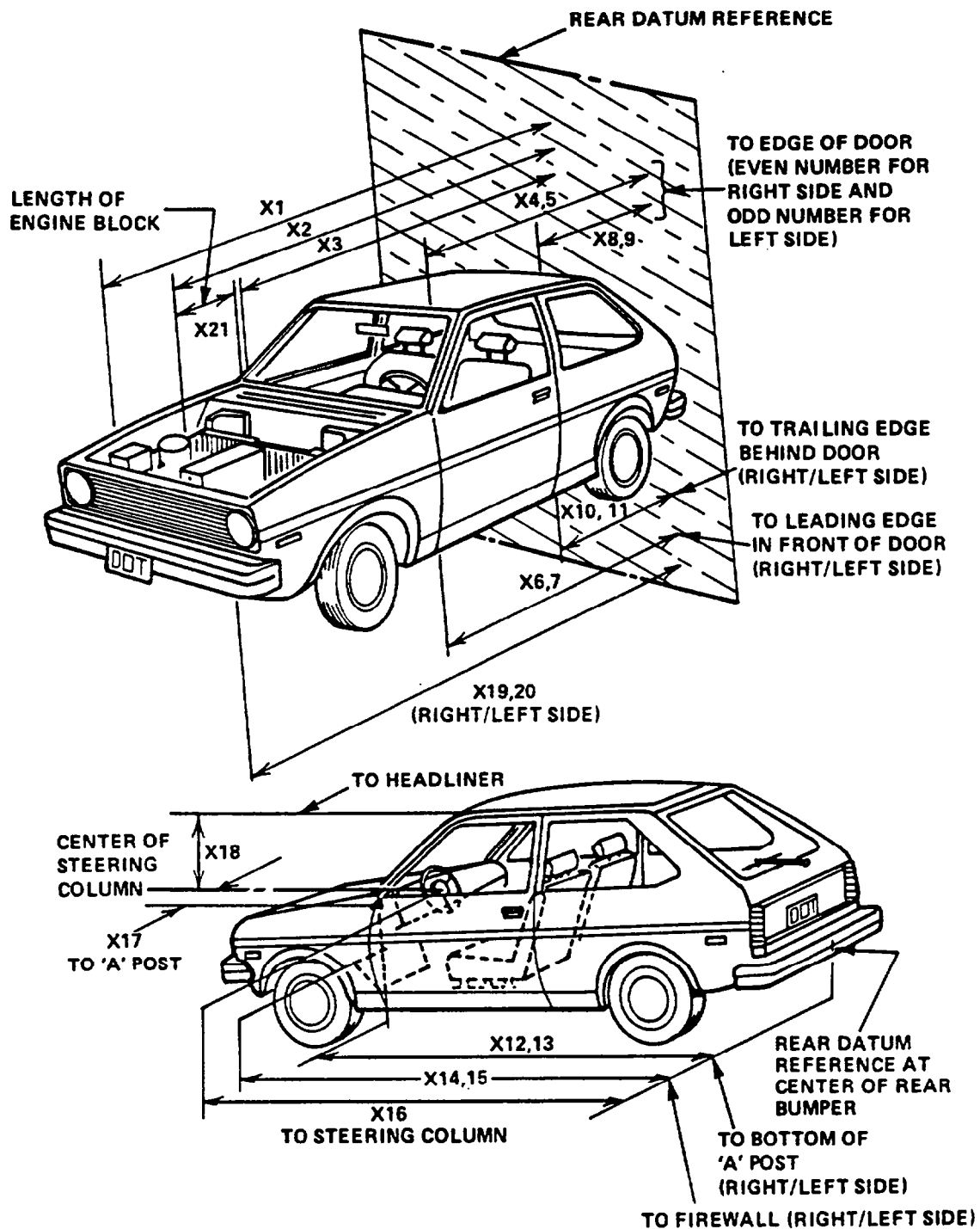


Table 5
VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	175.5	158.0	17.5
X2	Rear Surface of Vehicle to Front of Engine	156.2	145.1	11.1
X3	Rear Surface of Vehicle to Firewall	134.4	142.4	-8.0
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	126.5	125.4	1.1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	127.4	127.3	0.1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	126.2	126.3	-0.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	126.8	126.7	0.1
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	84.6	84.0	0.6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	85.0	85.0	0.0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	84.2	84.3	-0.1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	84.6	85.4	-0.8
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	125.5	126.0	-0.5
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	126.3	126.2	0.1
X14	Rear Surface of Vehicle to Firewall, Right Side	133.8	138.7	-4.9
X15	Rear Surface of Vehicle to Firewall, Left Side	134.7	139.0	-4.3
X16	Rear Surface of Vehicle to Steering Column	110.4	110.9	-0.5
X17	Center of Steering Column to "A" Post	15.6	15.8	-0.2
X18	Center of Steering Column to Headliner	18.8	17.5	1.3
X19	Rear Surface of Vehicle to Right Side of Front Bumper	172.0	156.2	15.8
X20	Rear Surface of Vehicle to Left Side of Front Bumper	172.8	157.8	15.0
X21	Length of Engine Block	16.5	16.5	0.0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	118.5	117.9	0.6
CD	Rear Surface of Vehicle to Center of Dash Panel	122.2	121.1	1.1
LD	Rear Surface of Vehicle to Left Side of Dash Panel	119.2	118.7	0.5

Appendix A

PHOTOGRAPHS

PHOTOGRAPHS

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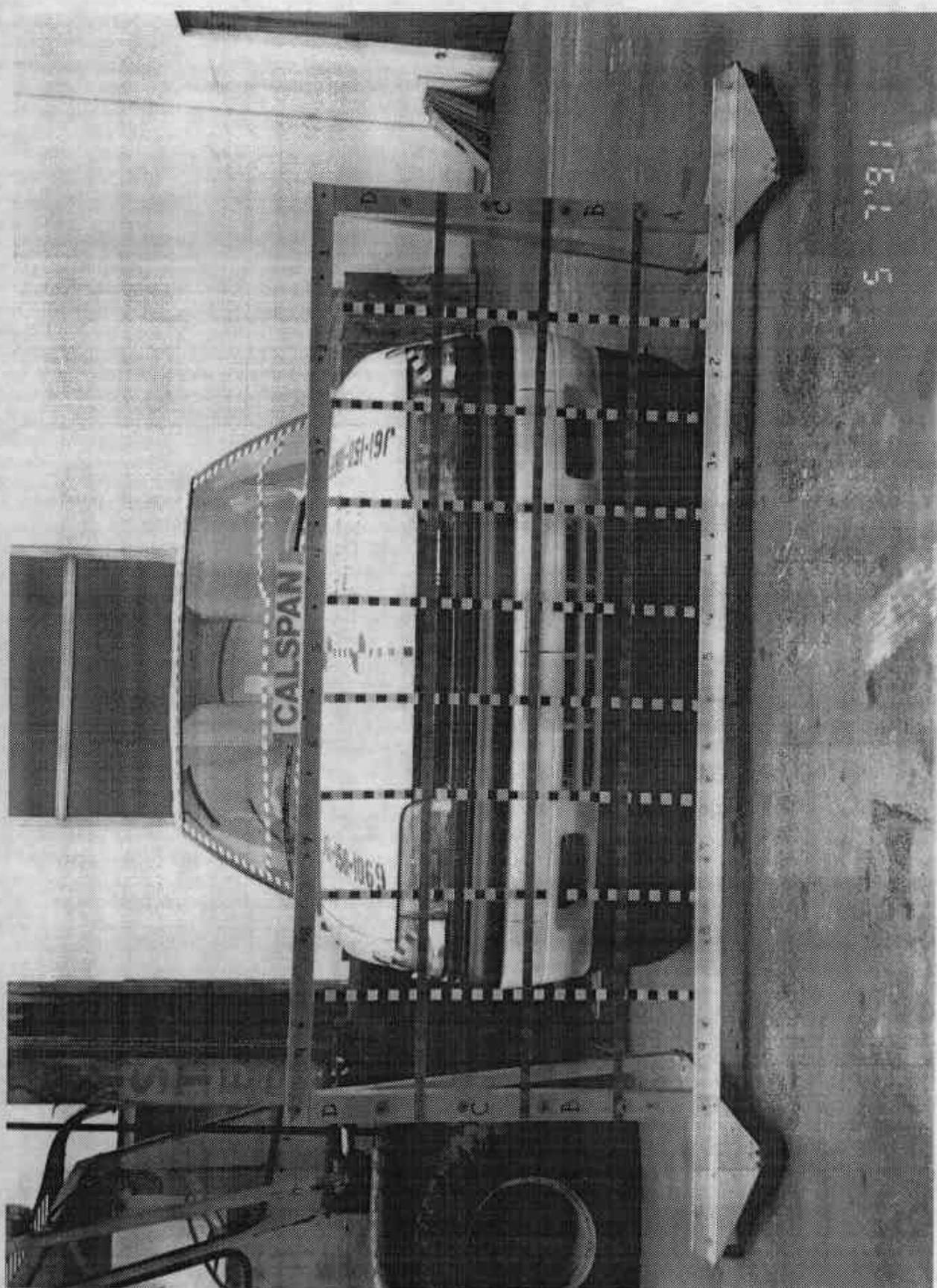


Figure A-1 LOAD CELL LOCATIONS

A-3

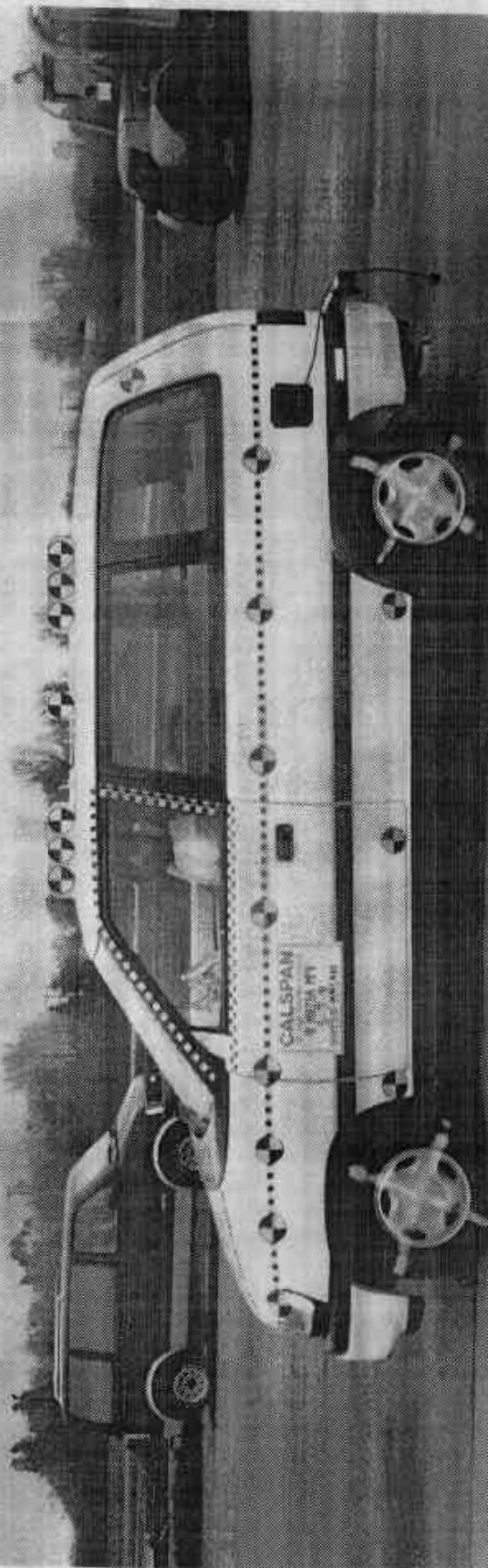
7893-11



Figure A-2 PRE-TEST FRONT VIEW



FIGURE A-3 POST TEST FRONT VIEW



5 791

Figure A-4 PRE-TEST LEFT SIDE VIEW

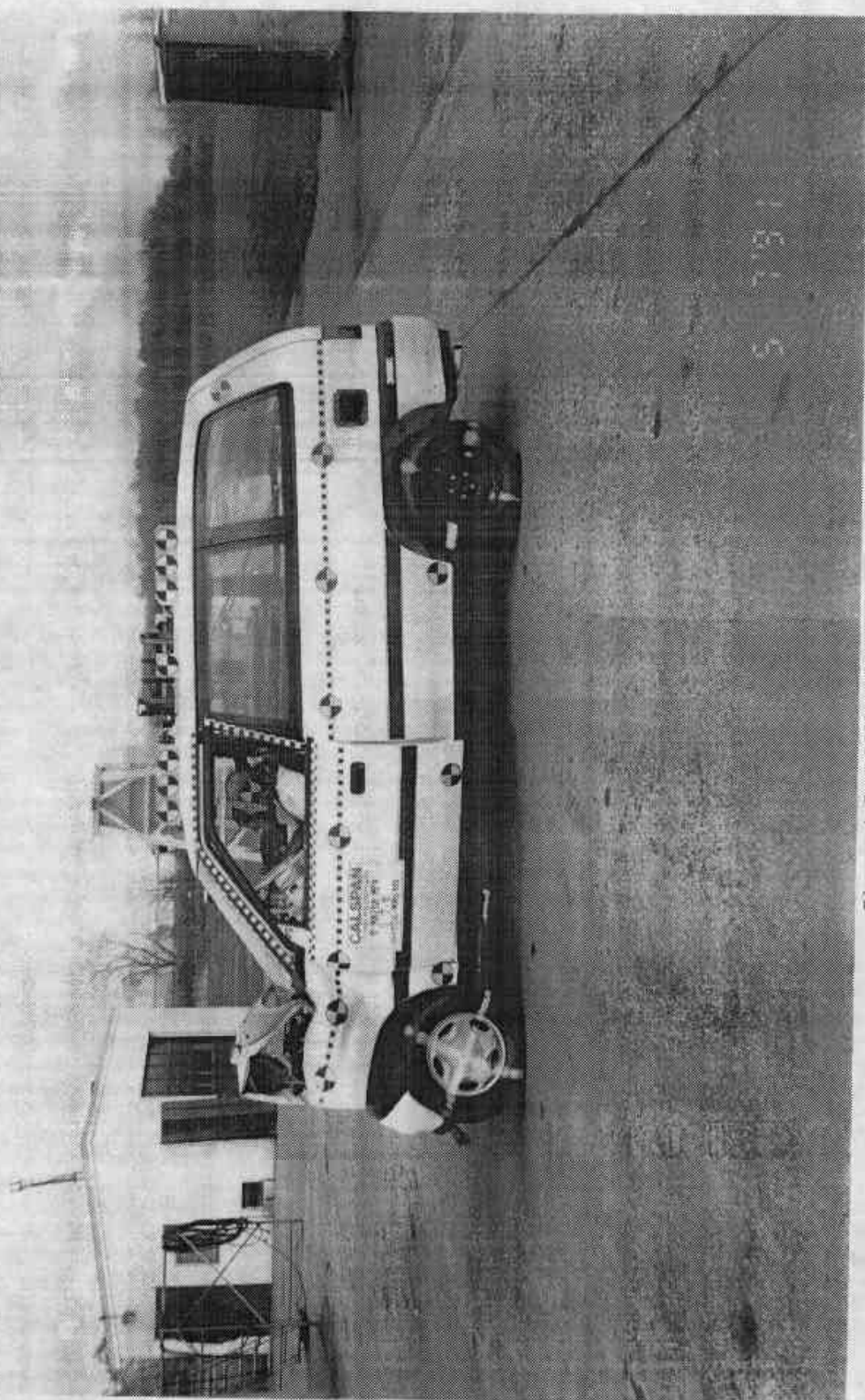


Figure A-5 POST TEST LEFT SIDE VIEW

A-7

7893-11

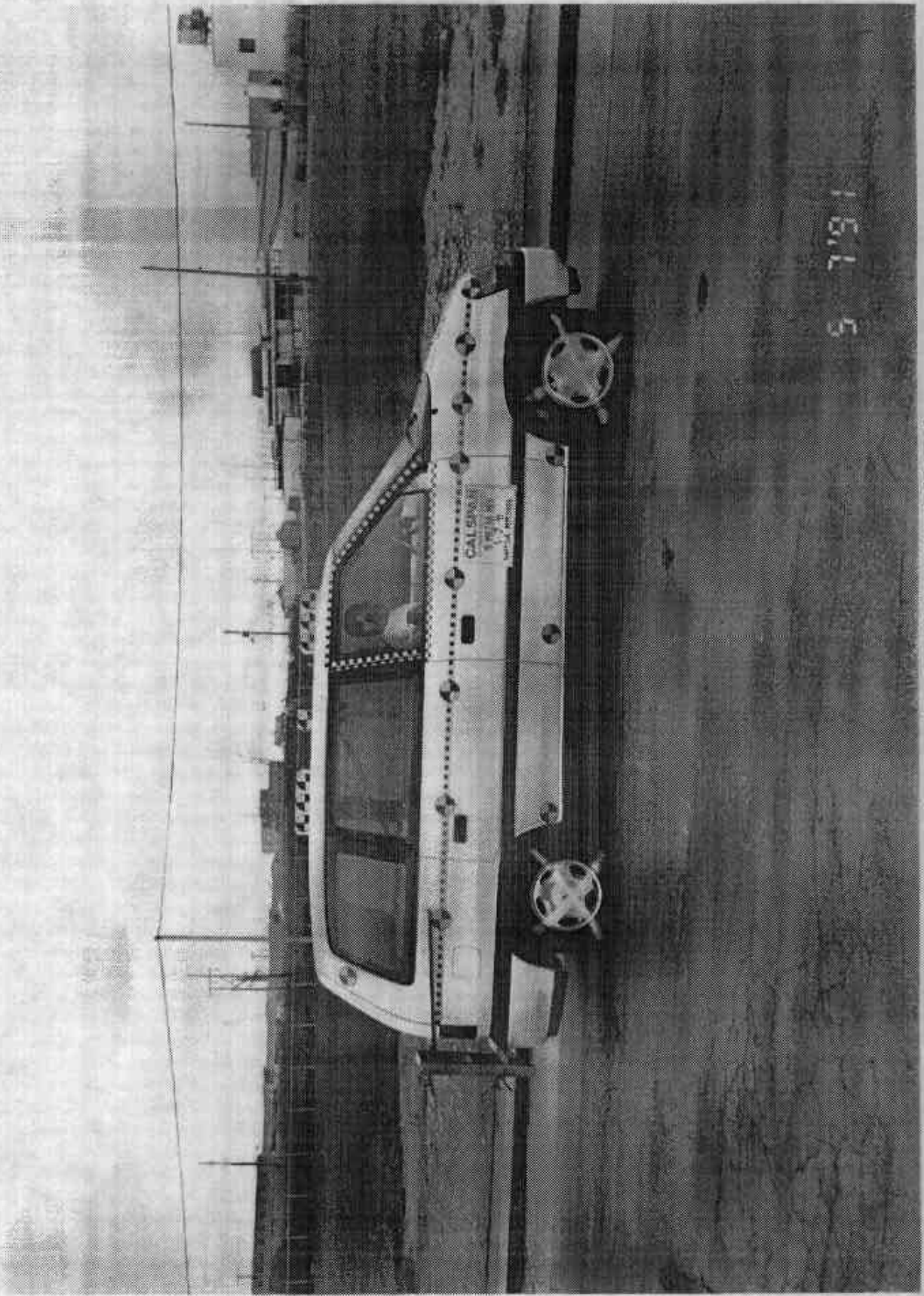


Figure A-8 PRE-TEST RIGHT SIDE VIEW

A-8

7893-11

151 5

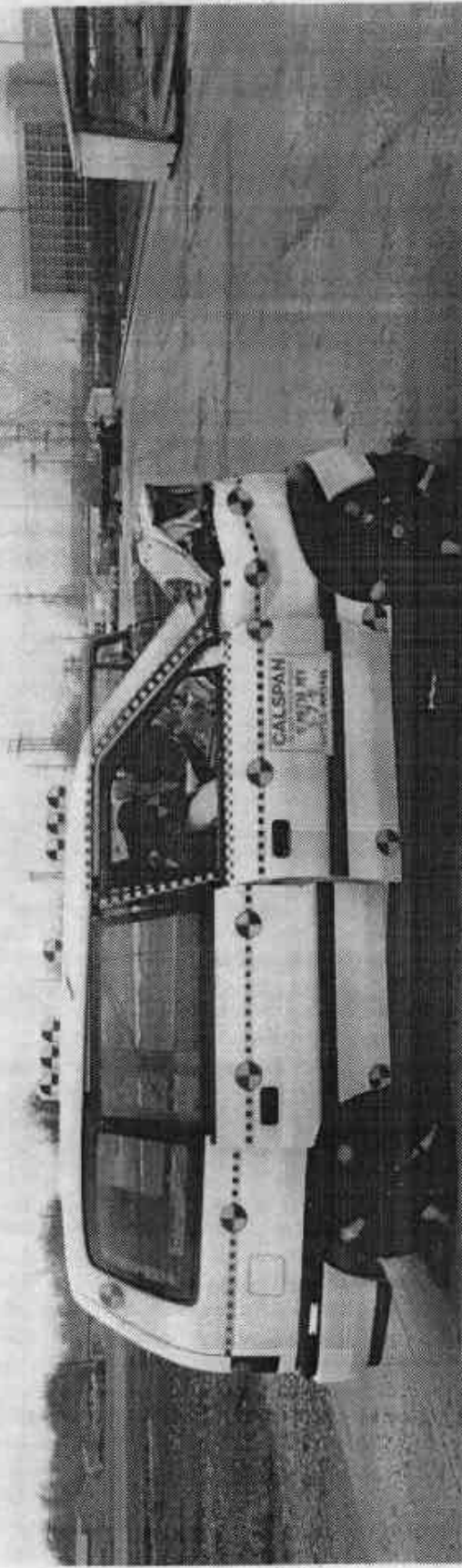


FIGURE A-7 POST-TEST RIGHT SIDE VIEW

A-9

7893-11

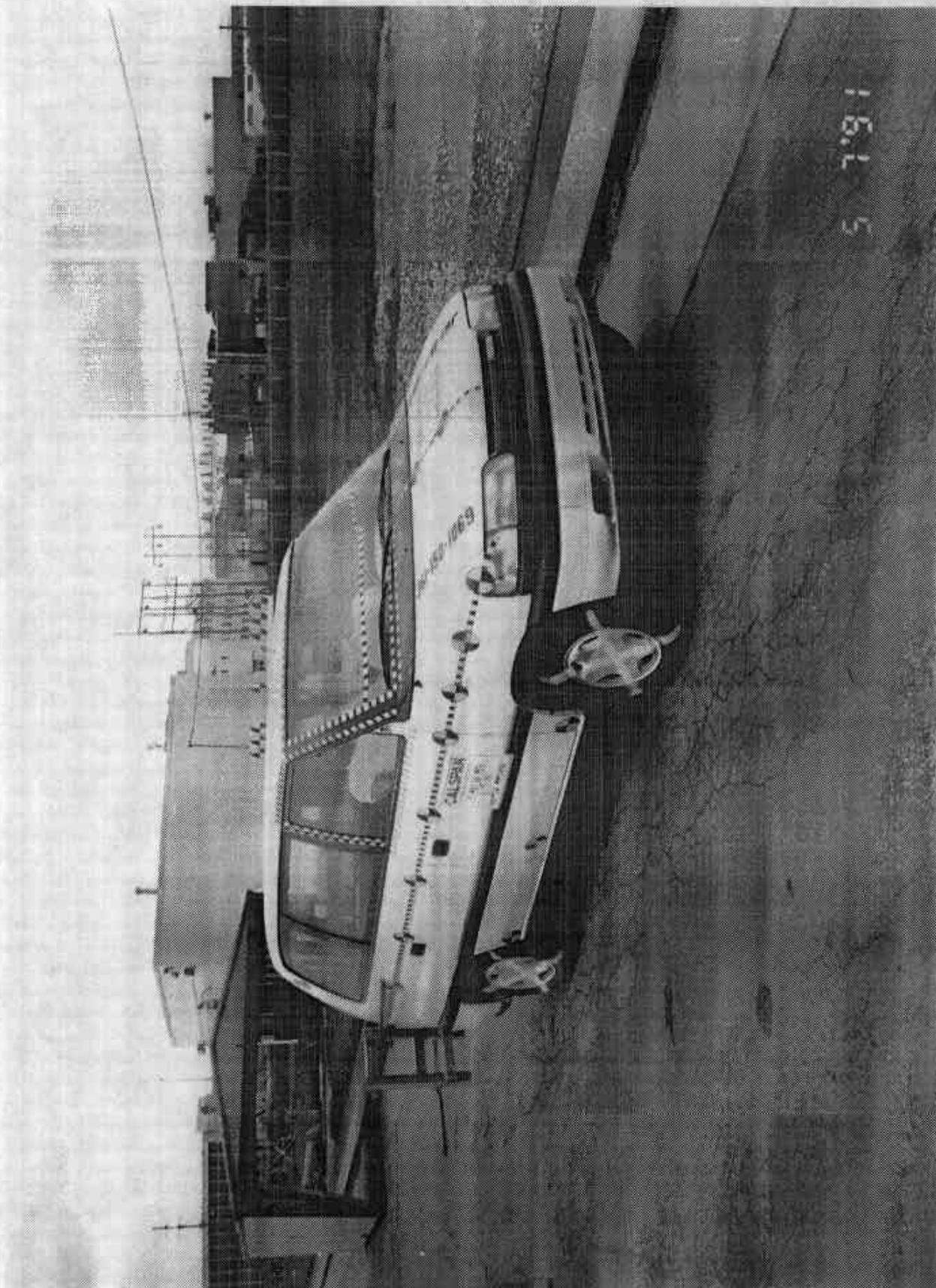


Figure A-8 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-9 POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

7893-11



Figure A-10 PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-11 POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

7893-11

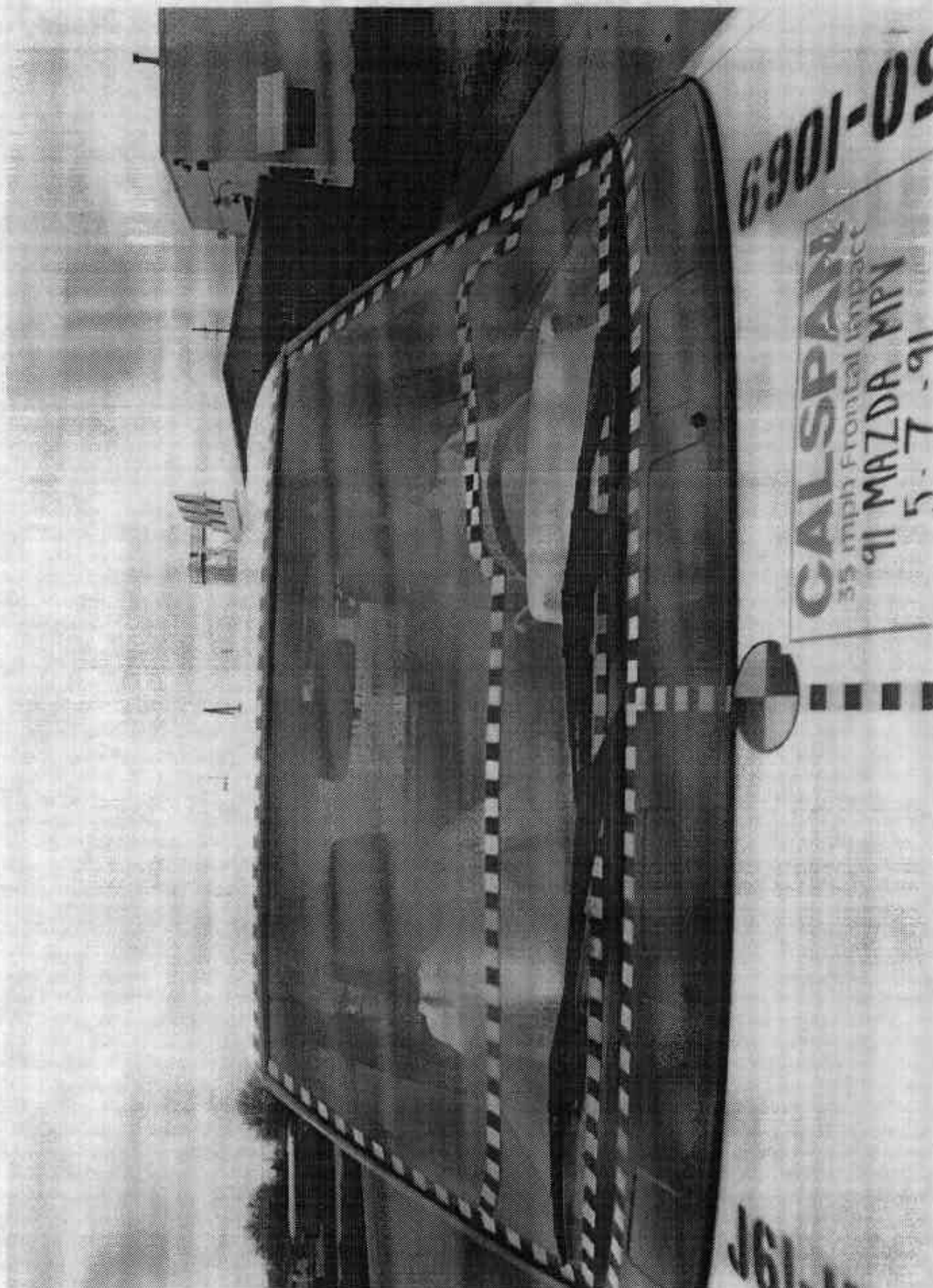


Figure A-12 PRE-TEST WINDSHIELD VIEW

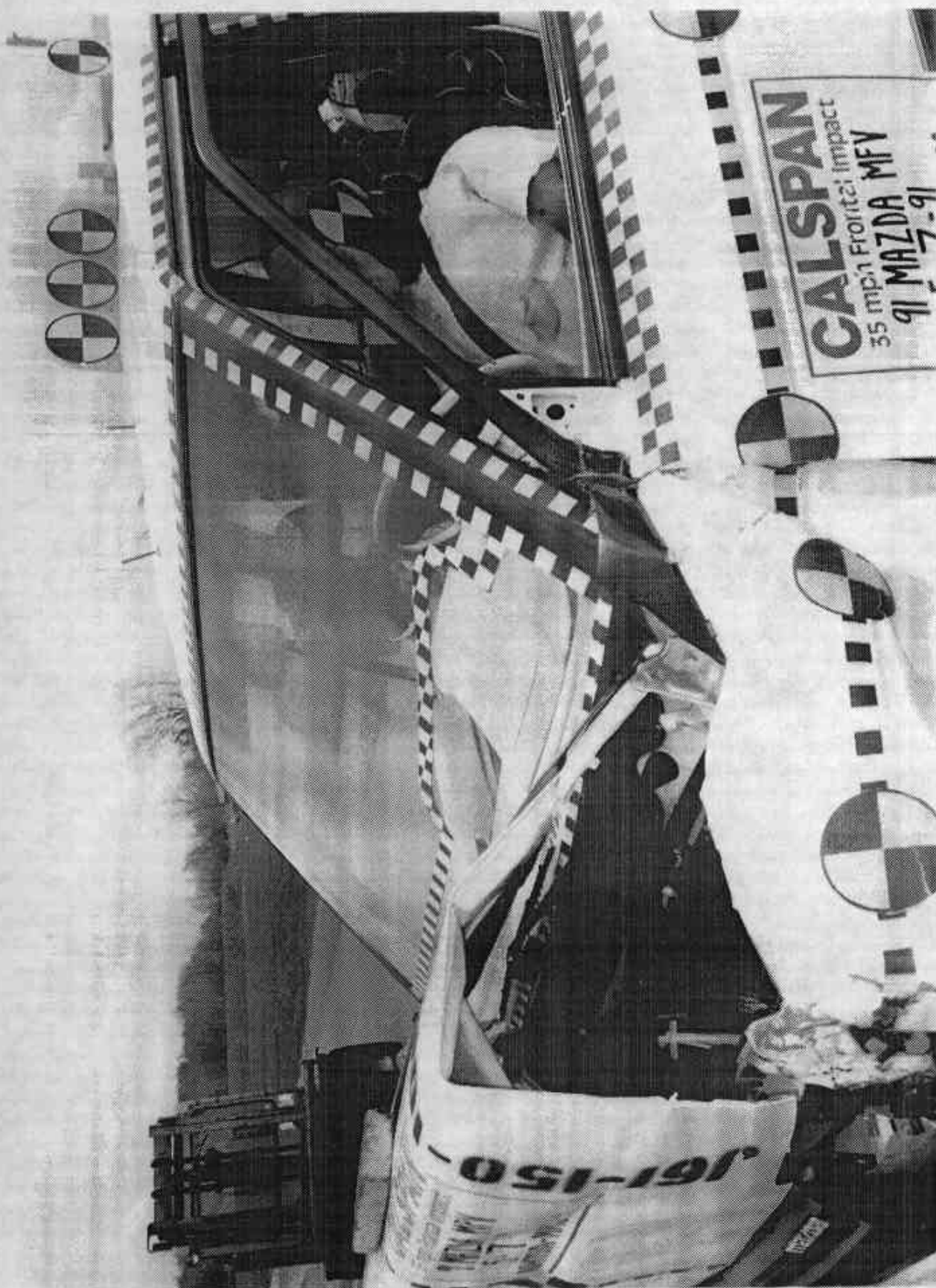


Figure A-13 POST-TEST WINDSHIELD VIEW

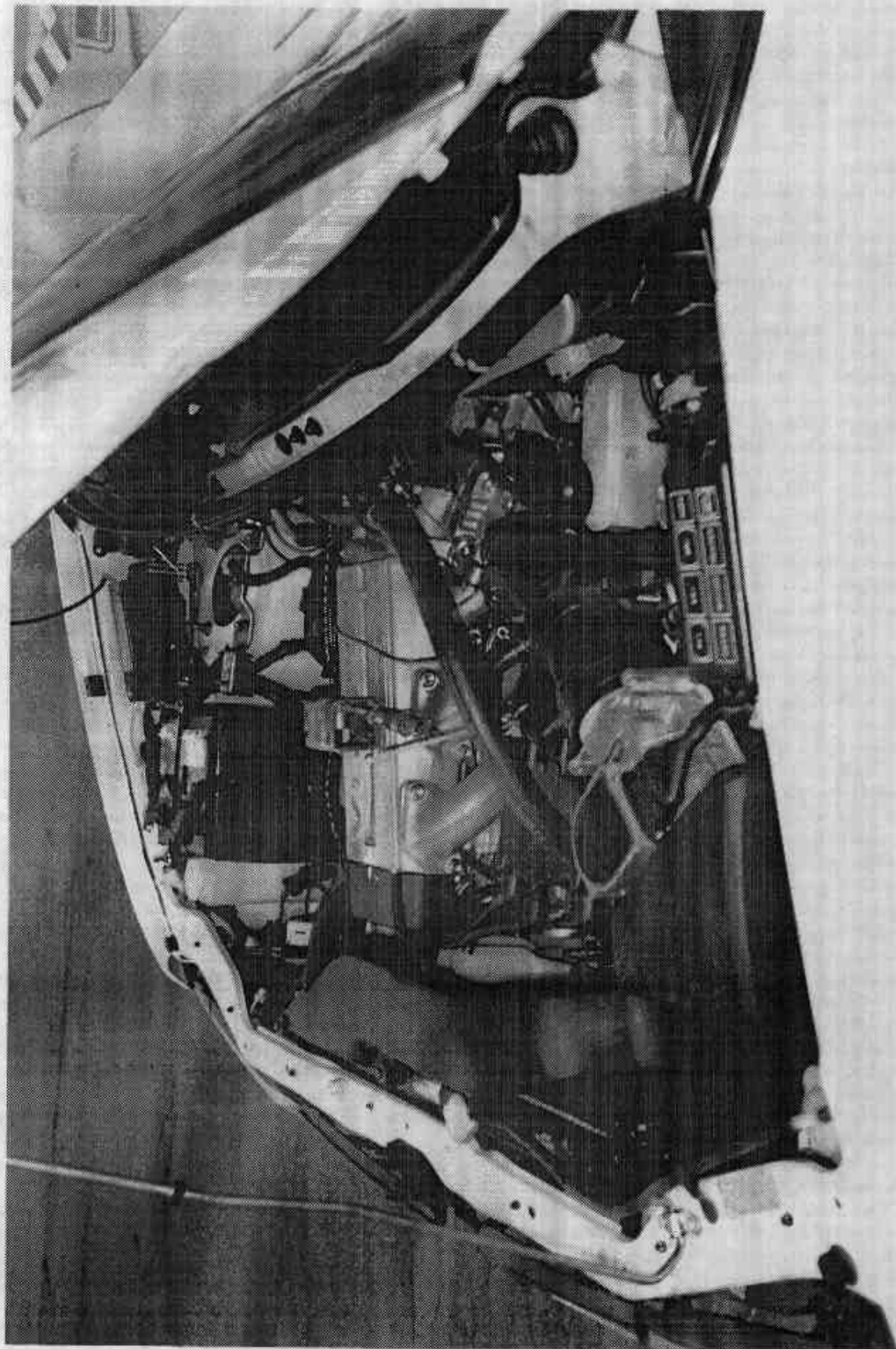


Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

A-16

7893-11

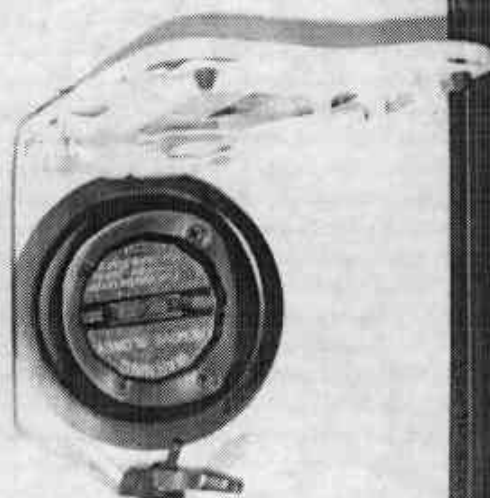
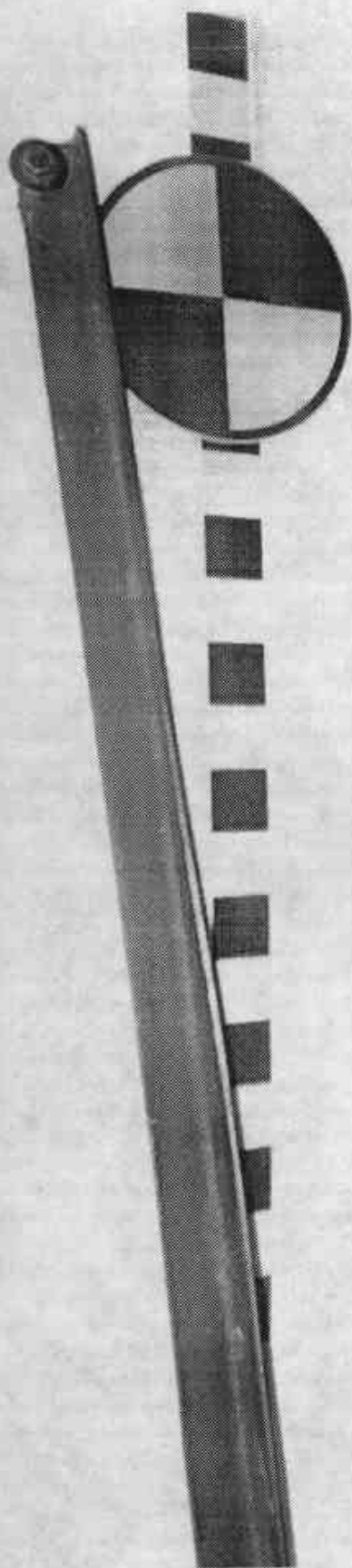


Figure A-16 FUEL CAP VIEW

A-17

7893-11

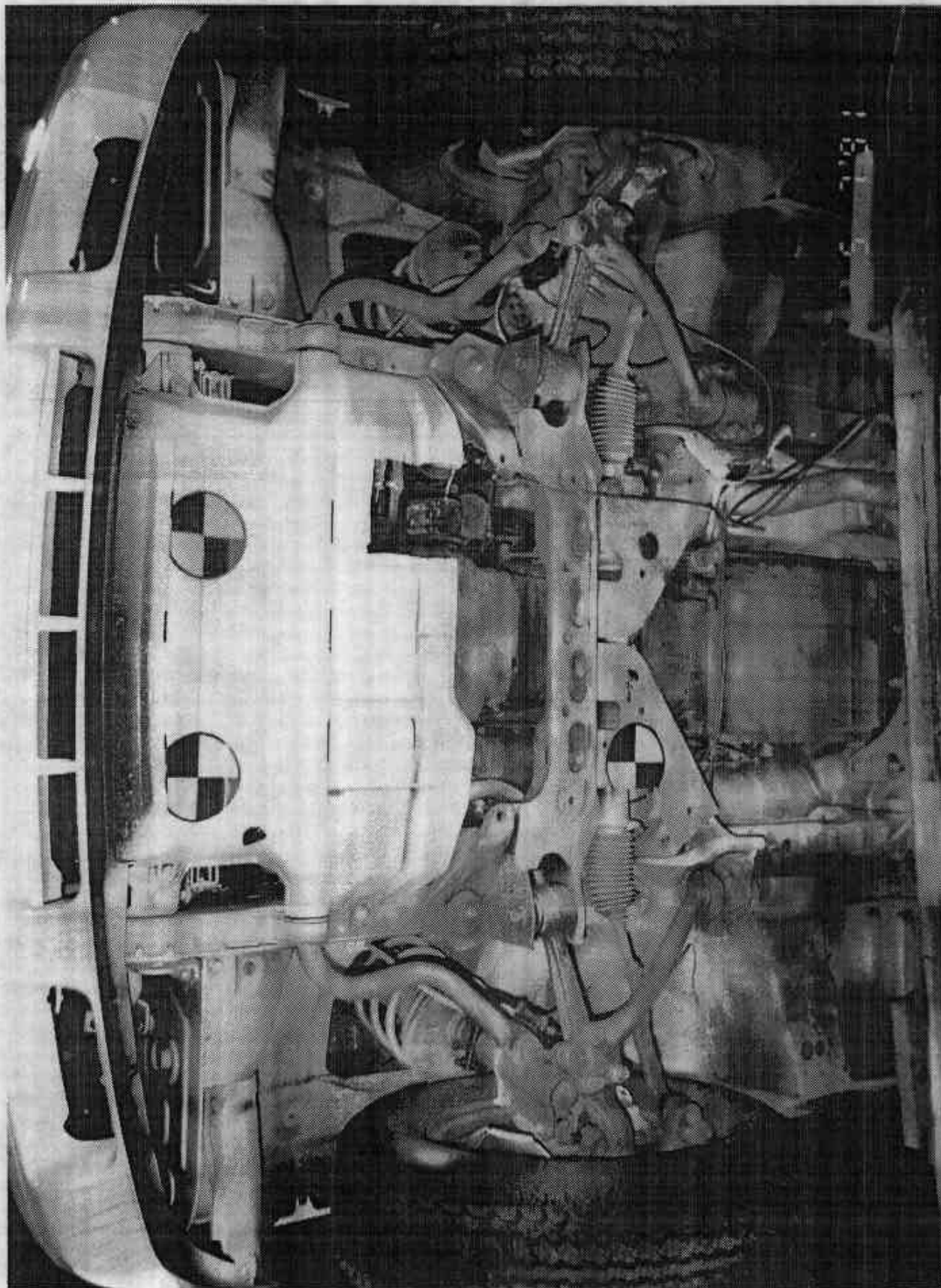


FIGURE A-16 PRE-TEST FRONT UNDERBODY VIEW

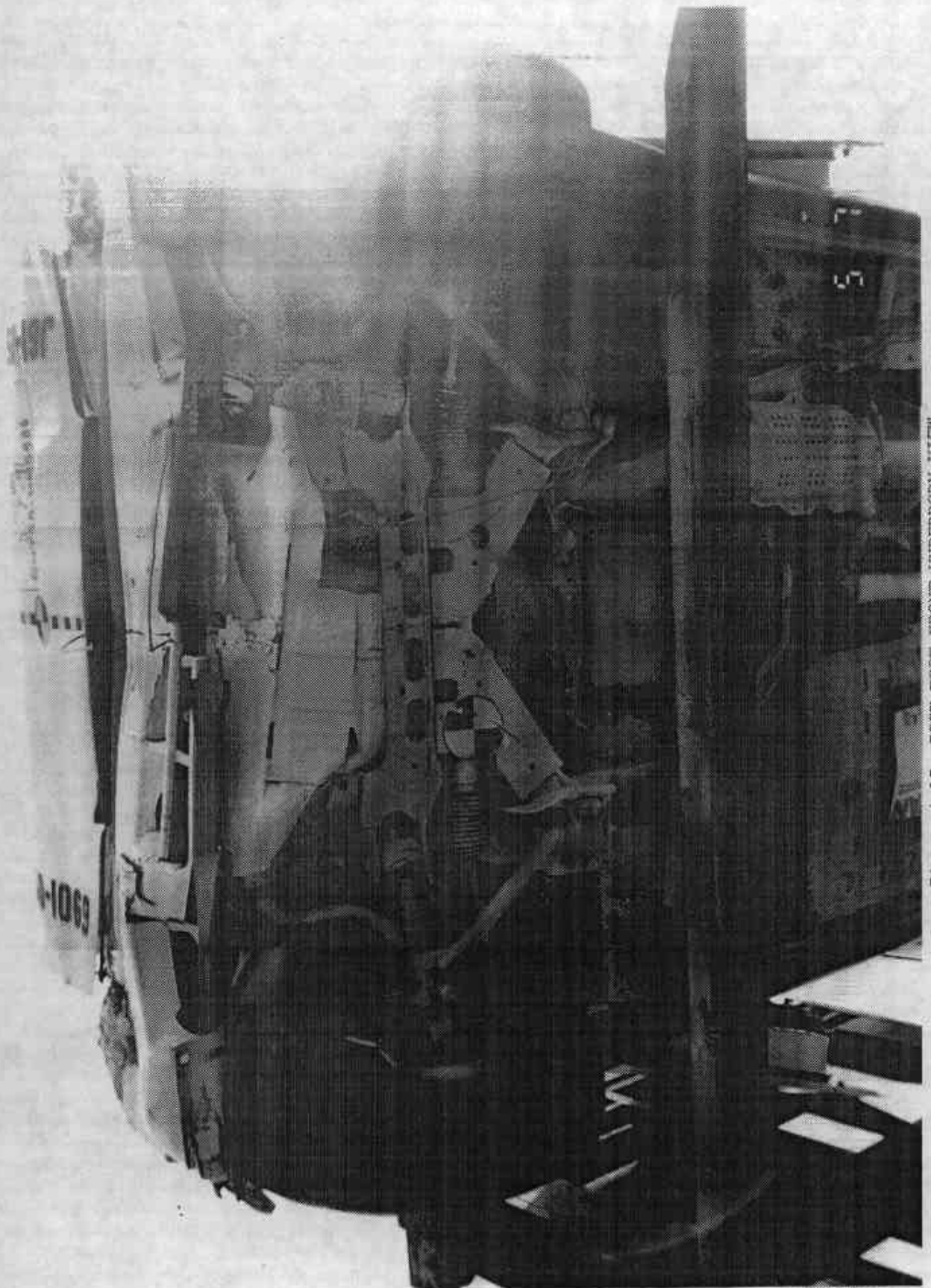


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

A-19

7893-11

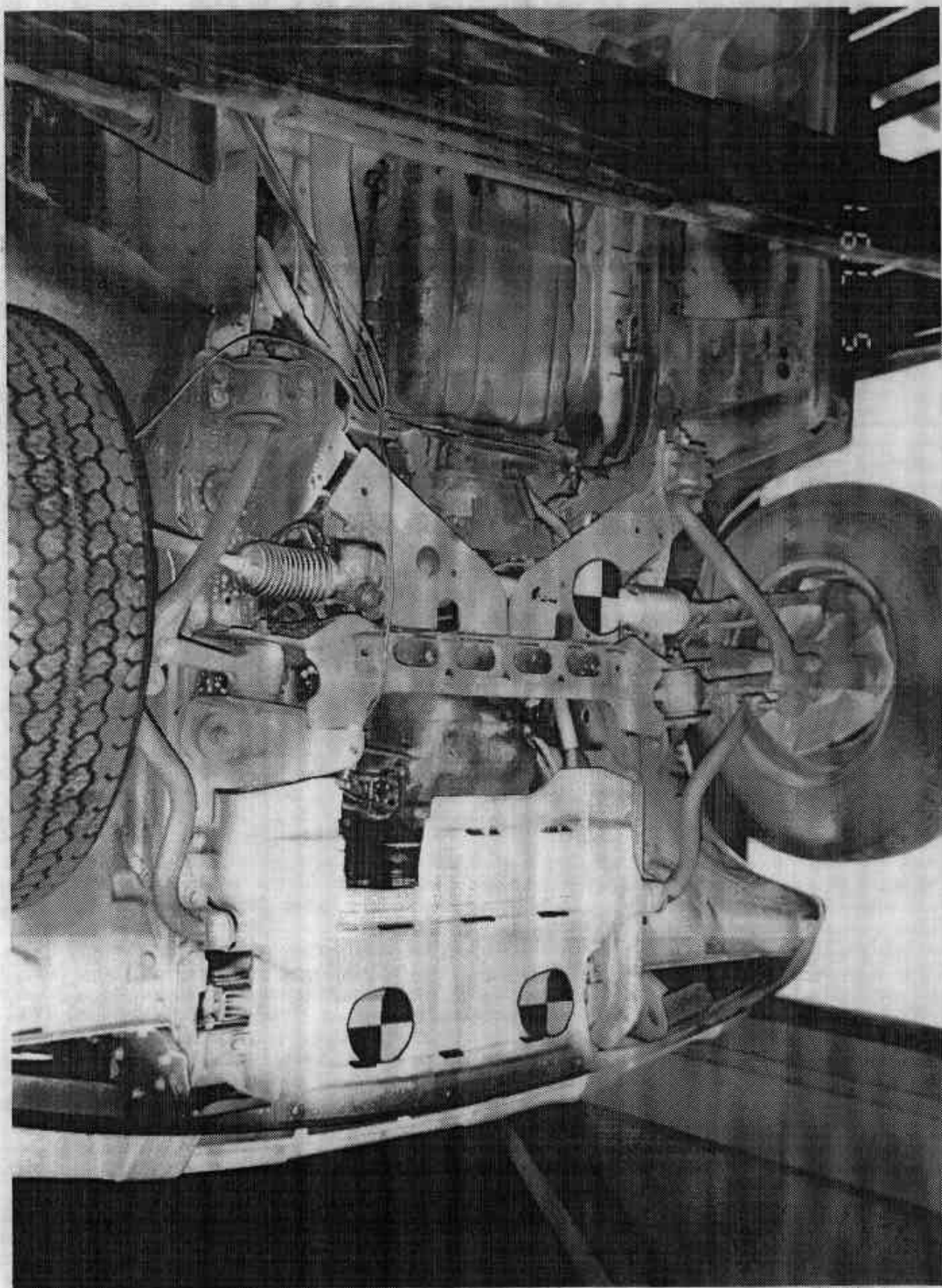


FIGURE A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

A-20

7893-11



Figure A-10 POST-TEST FRONT SIDE UNDERBODY VIEW

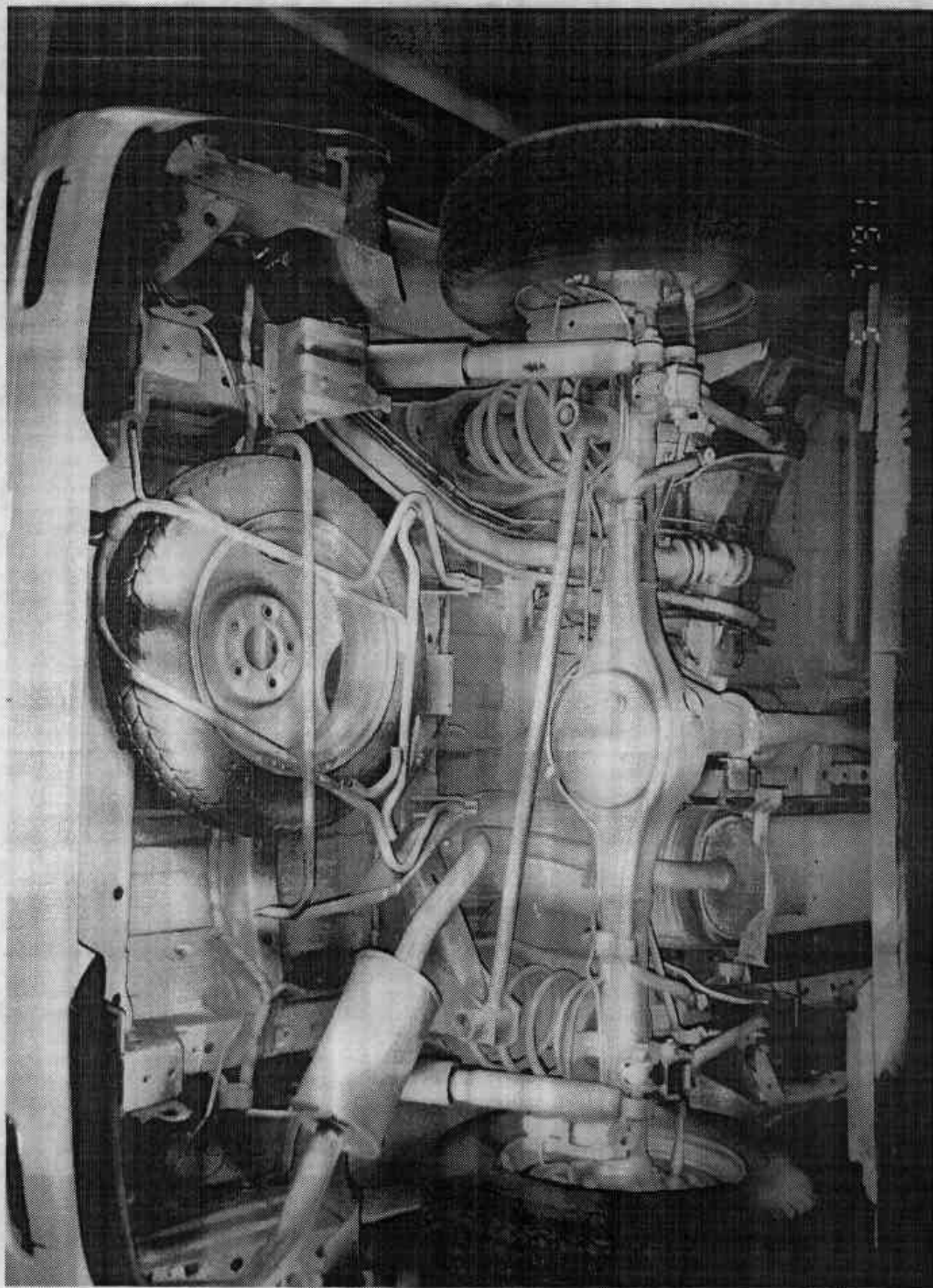


FIGURE A-20 PRE-TEST REAR UNDERBODY VIEW

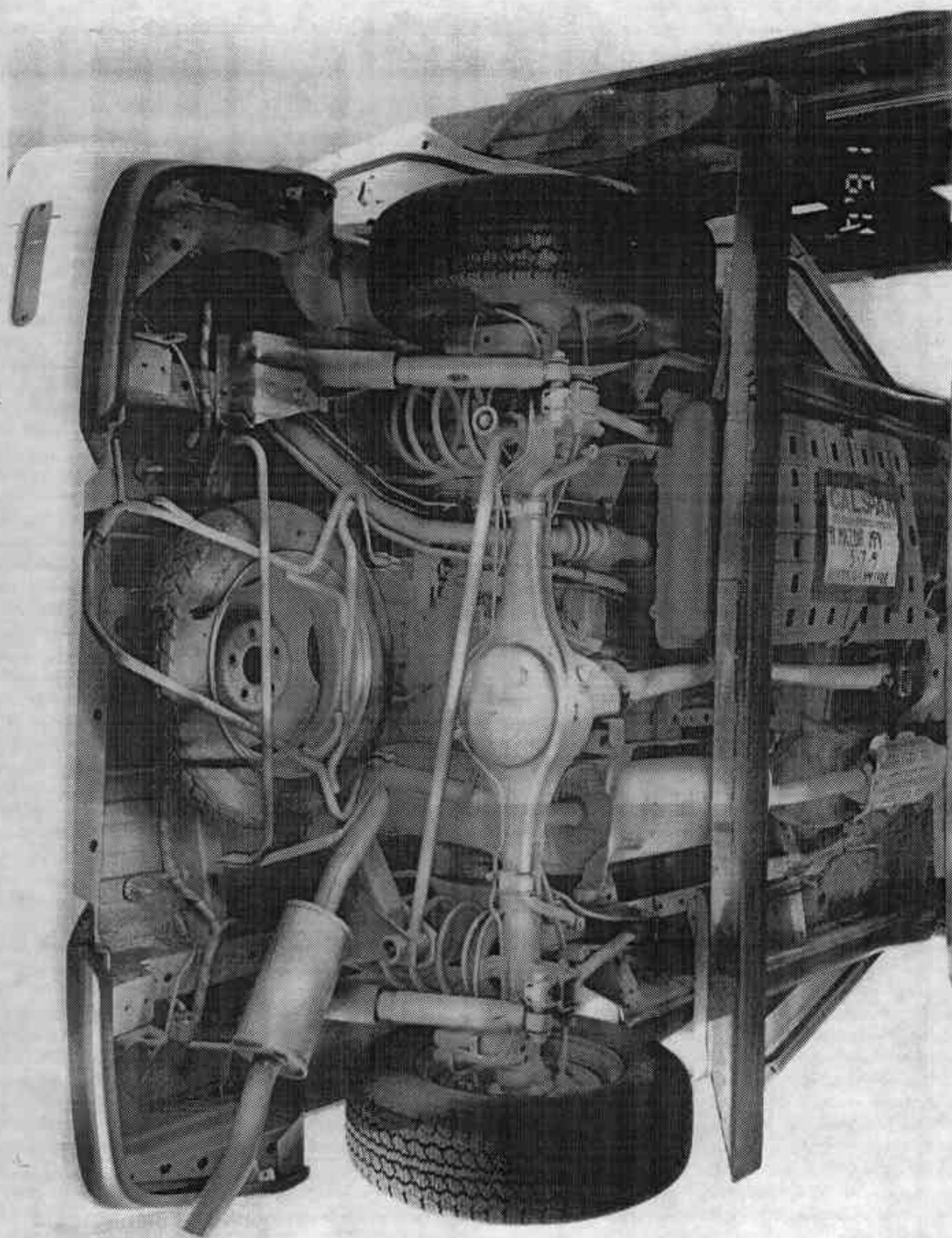


Figure A-21 POST-TEST REAR UNDERBODY VIEW



FIGURE A-22 PRE-TEST DRIVER POSITION VIEW

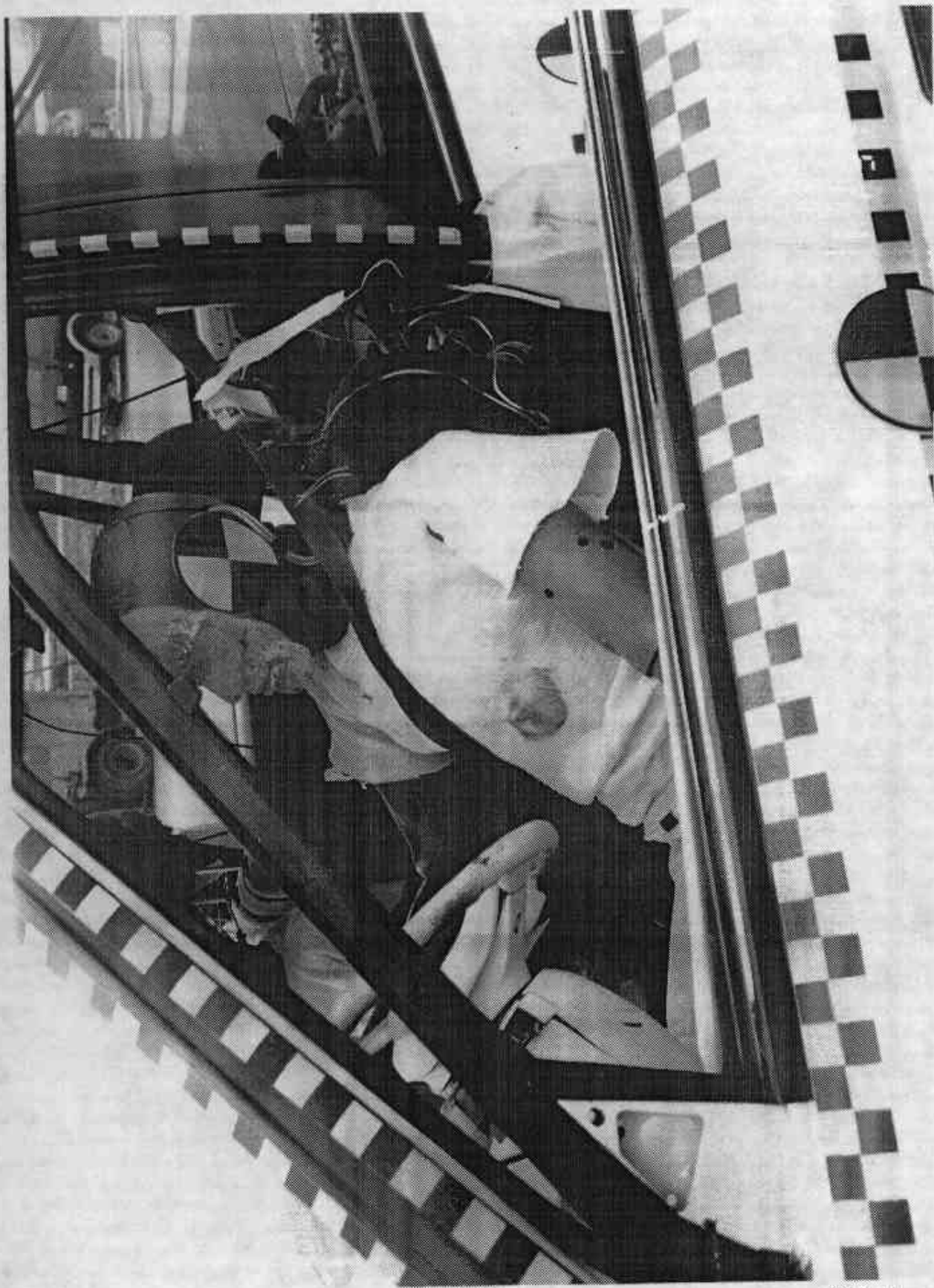


FIGURE A-23 POST-TEST DRIVER POSITION VIEW



Figure A-24 PRE-TEST PASSENGER POSITION VIEW

A-26

7893-11

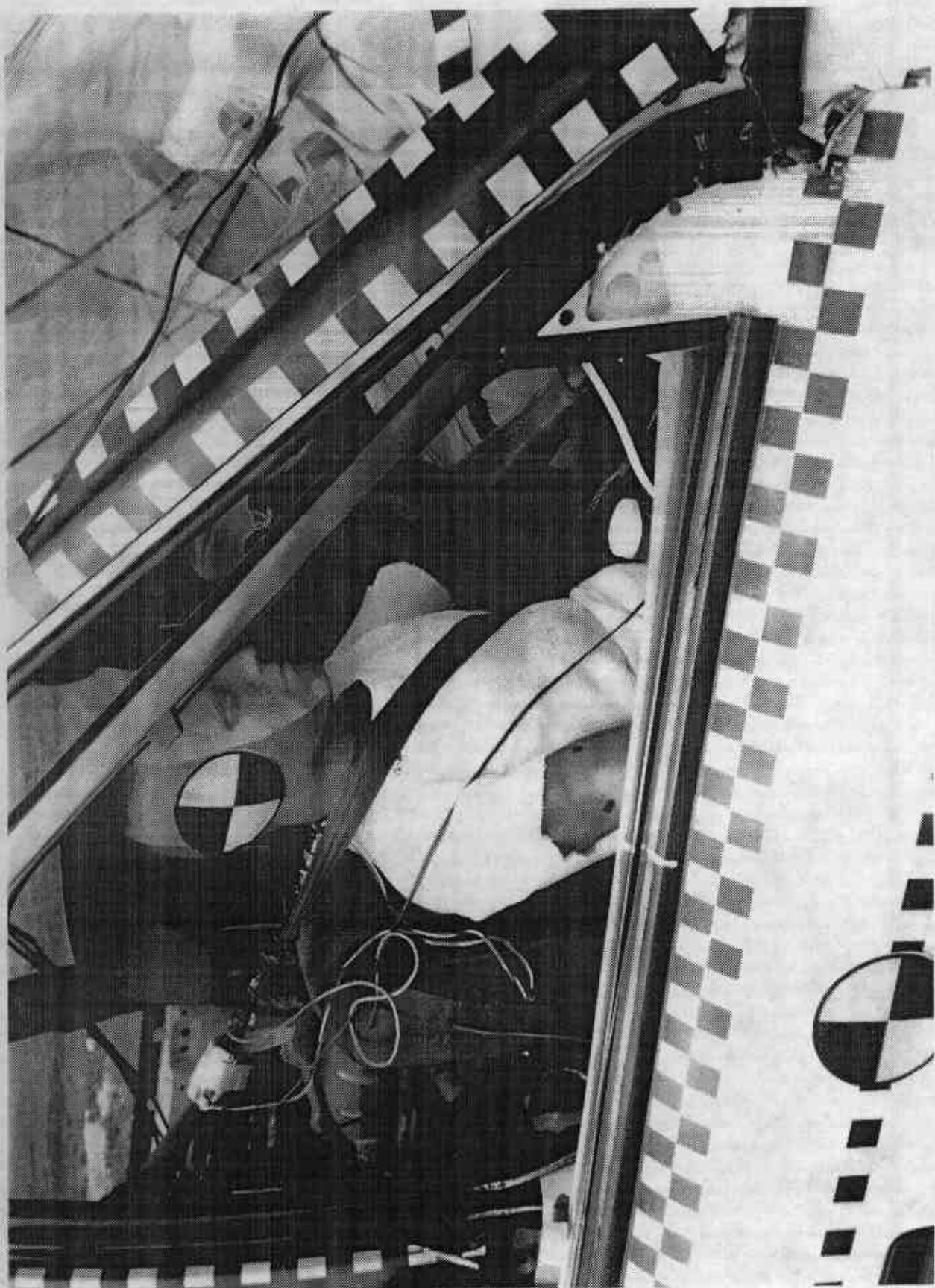


Figure A-25 POST-TEST PASSENGER POSITION VIEW

A-27

7893-11



FIGURE A-26 PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW

A-29

7893-11



Figure A-28 PRE-TEST PASSENGER AND INTERIOR VIEW

A-30

7893-11

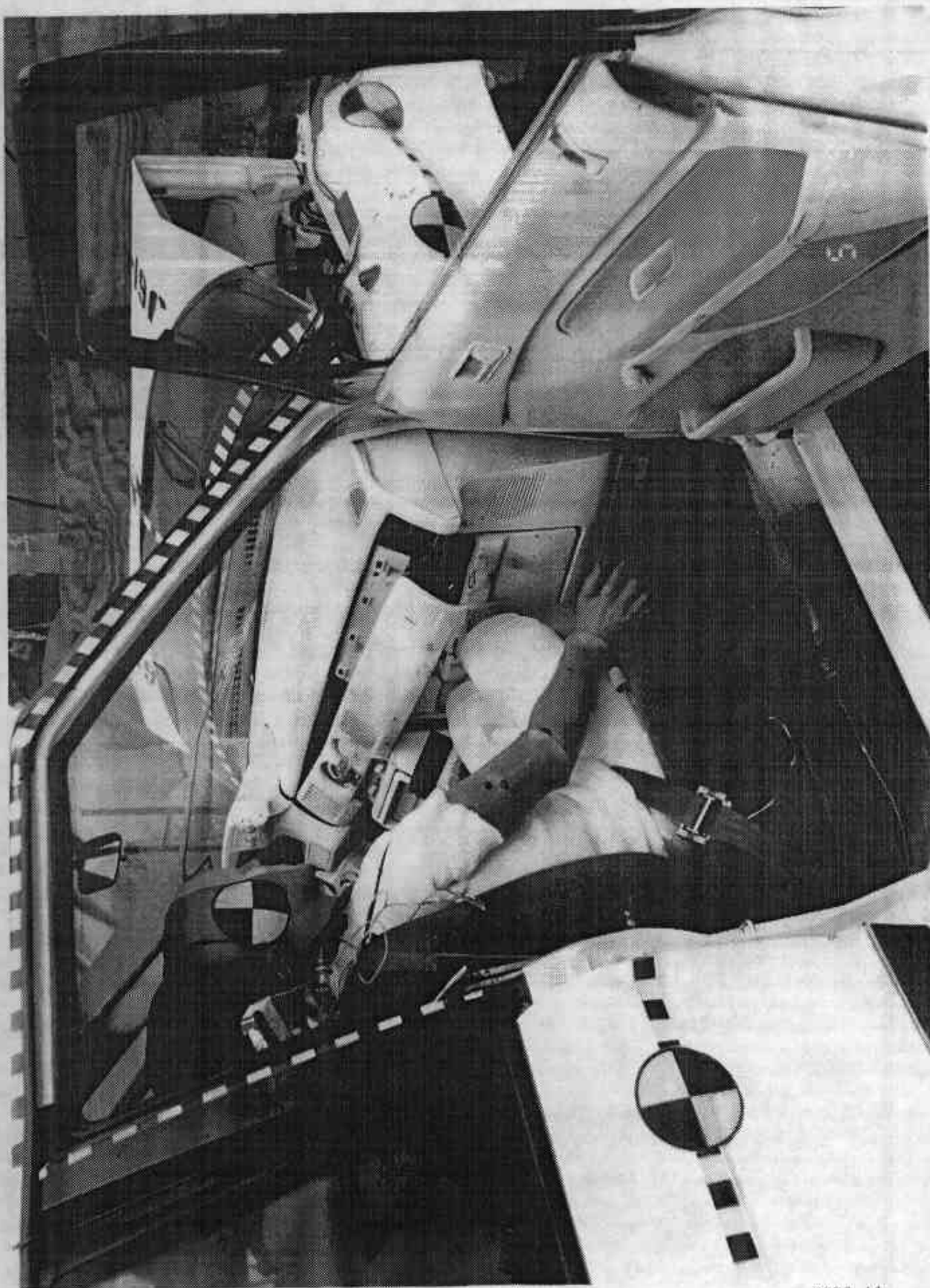


Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

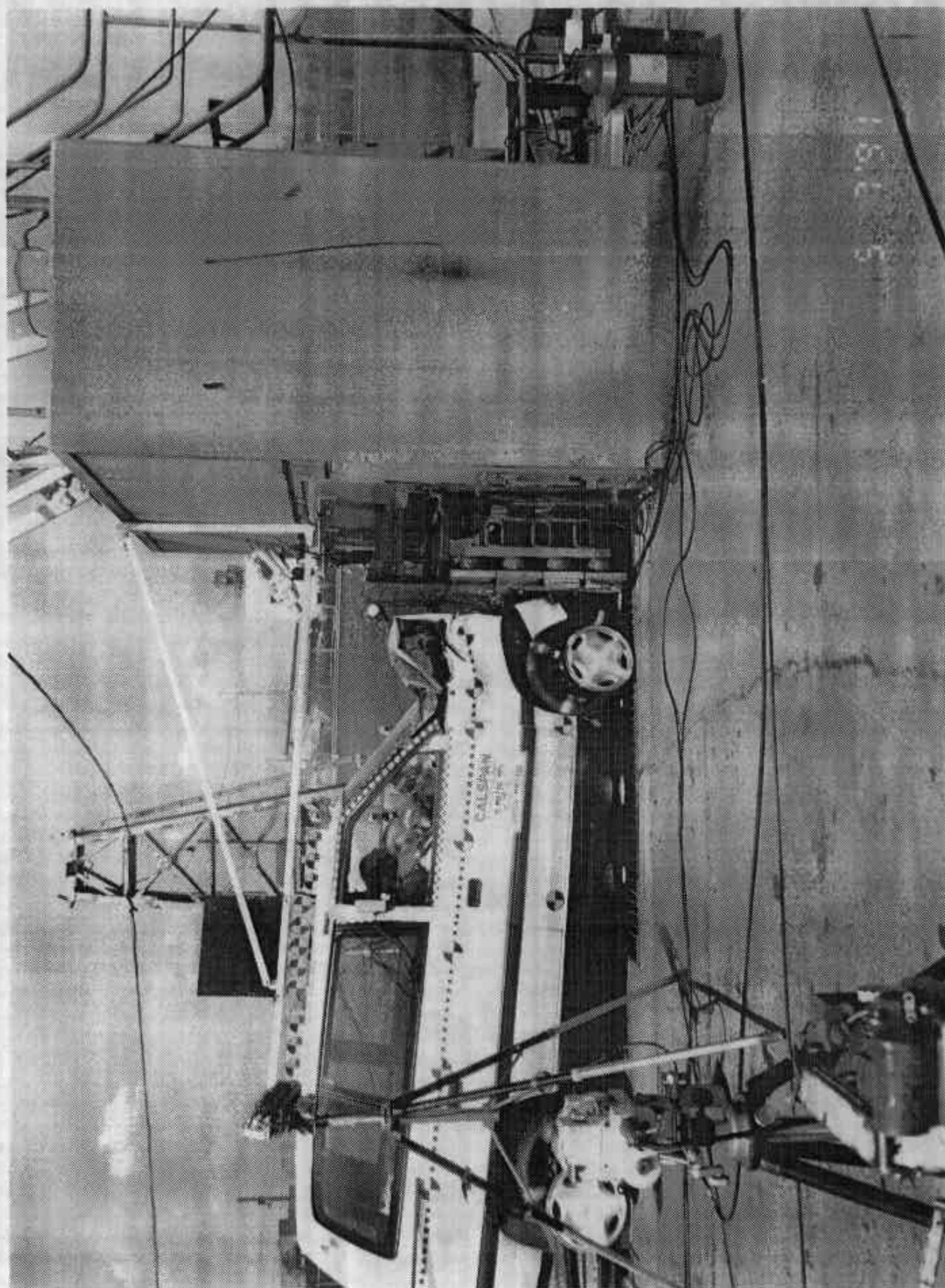


Figure A-30 IMPACT VIEW

A-32

7893-11

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

TEST NO. MM5400

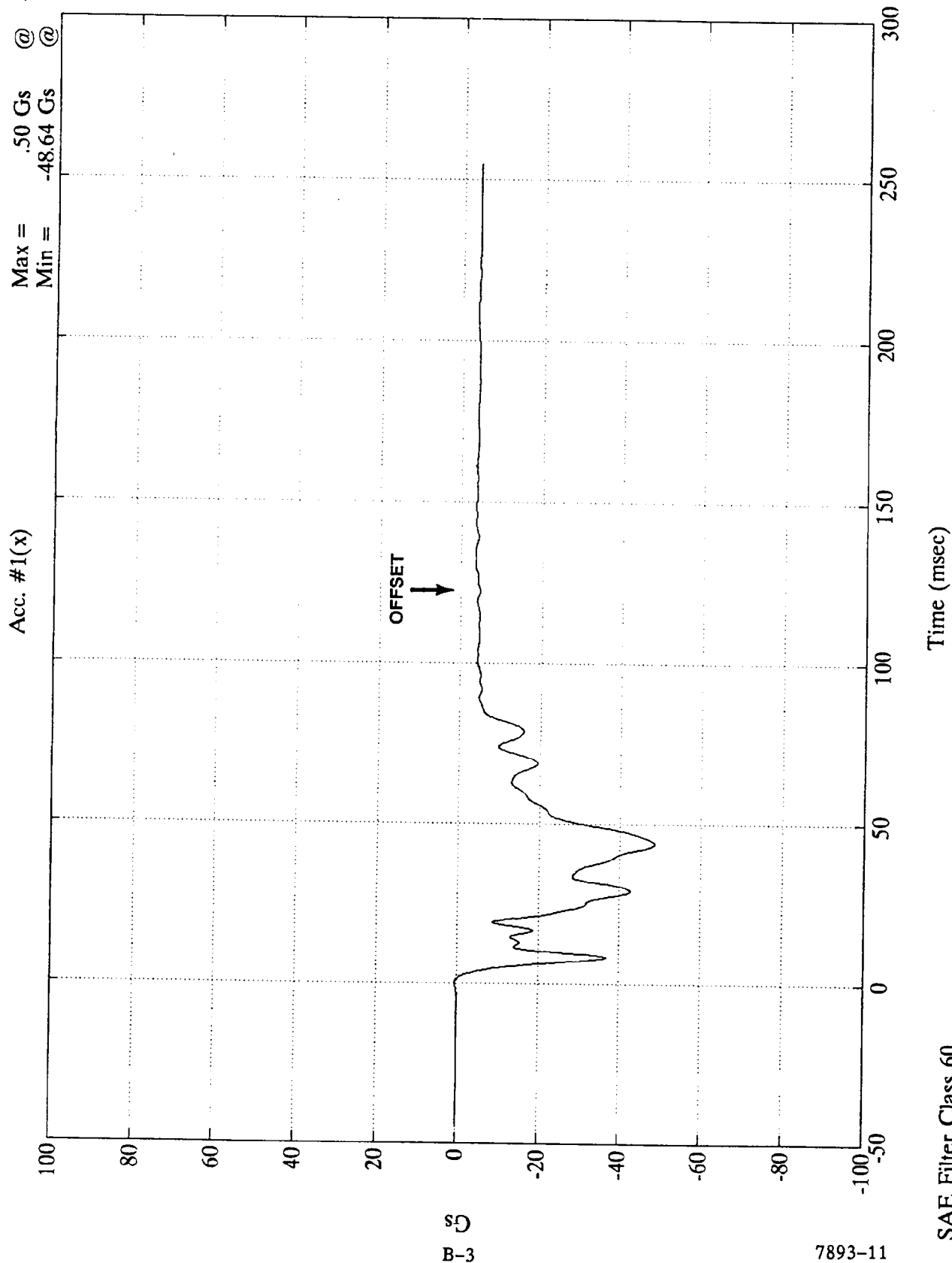
VEHICLE DATA

FILTER CHANNEL CLASS

60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = .50 Gs @ -0.12 msec
 Min = -48.64 Gs @ 44.04 msec



B-3

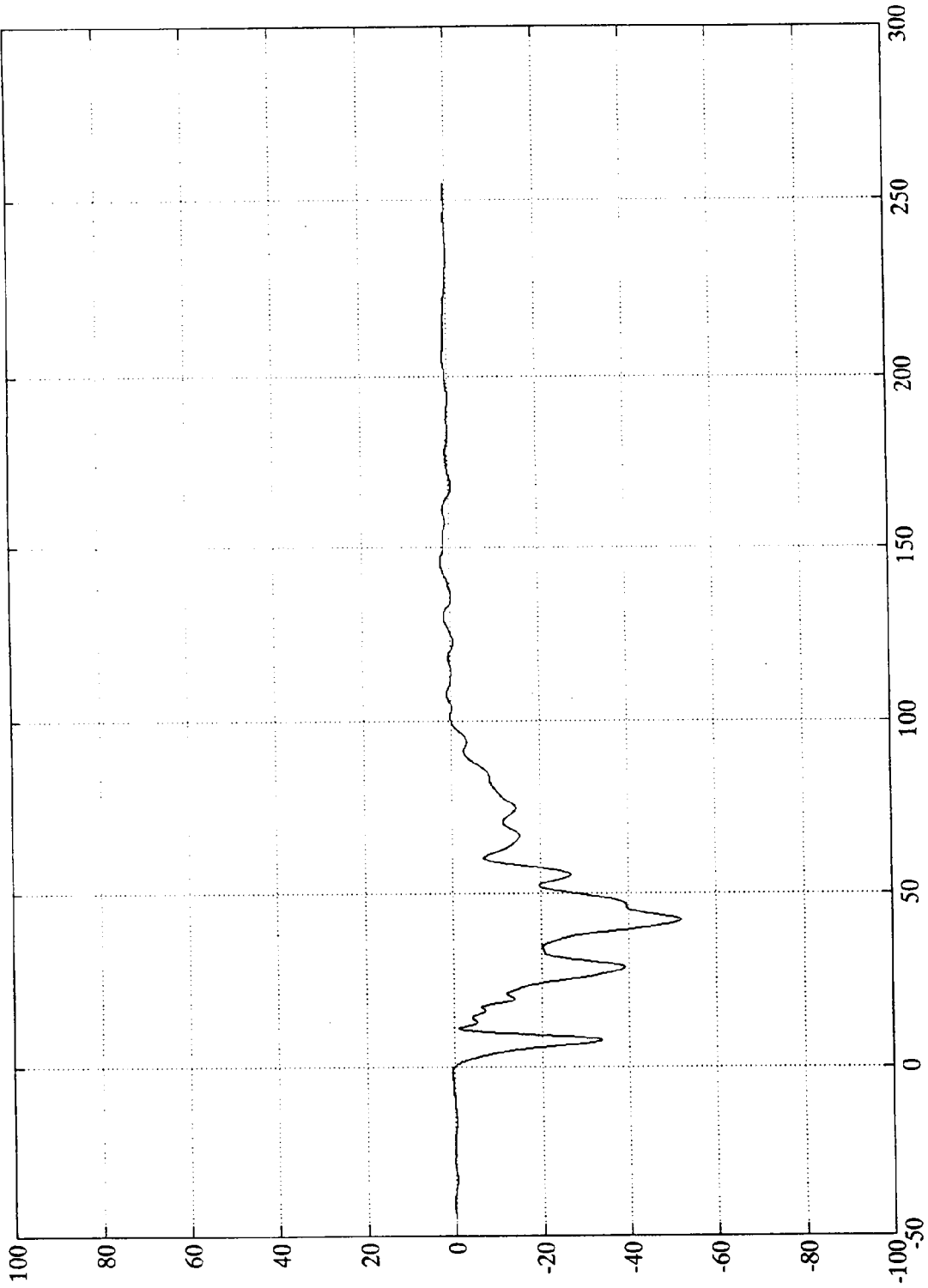
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 2.13 Gs @ 146.04 msec
Min = -52.03 Gs @ 42.00 msec

Acc. #2(x)



Time (msec)

SAE Filter Class 60

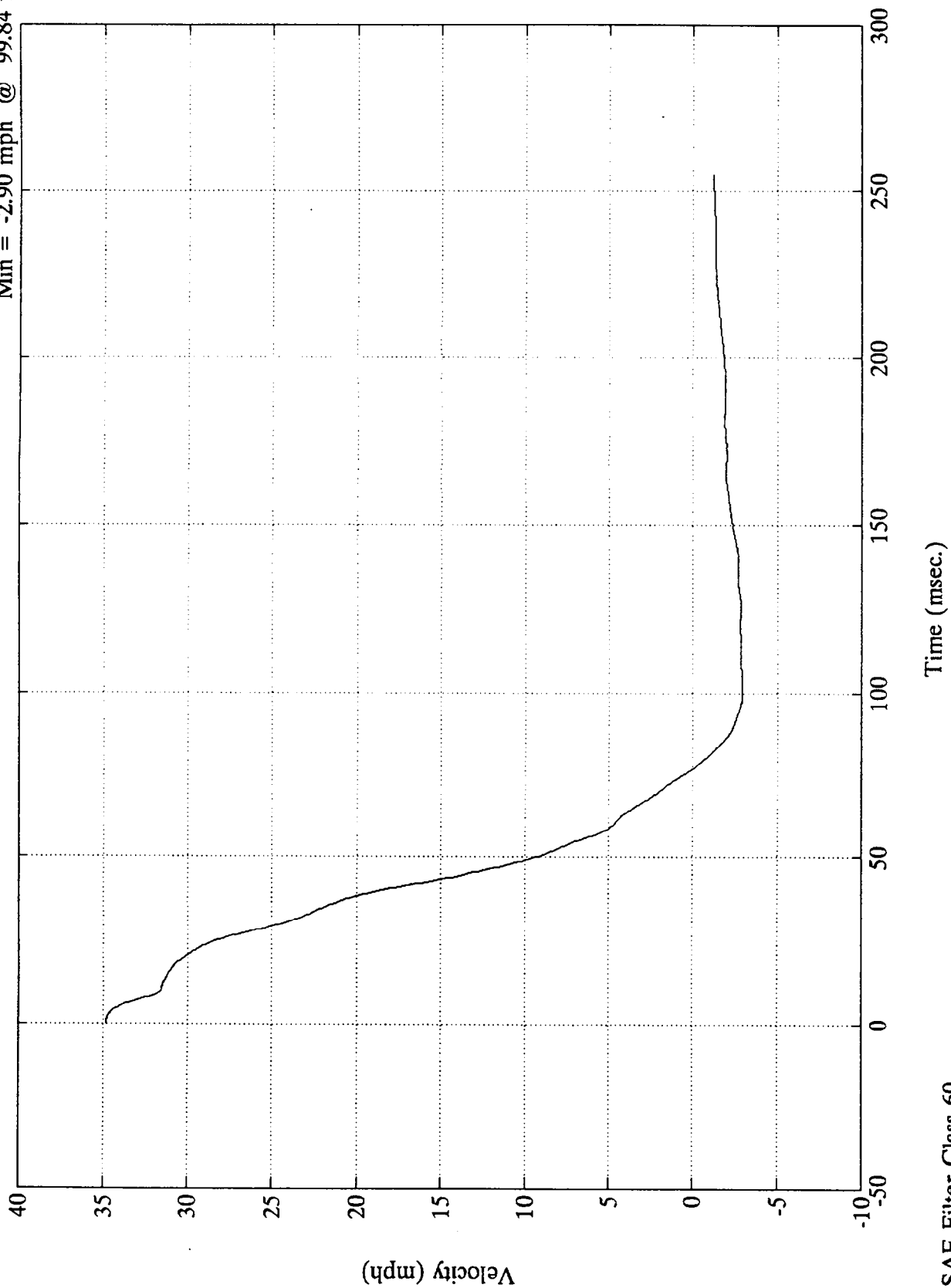
SD
B-4

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 34.80 mph @ 0.48 msec
Min = -2.90 mph @ 99.84 msec

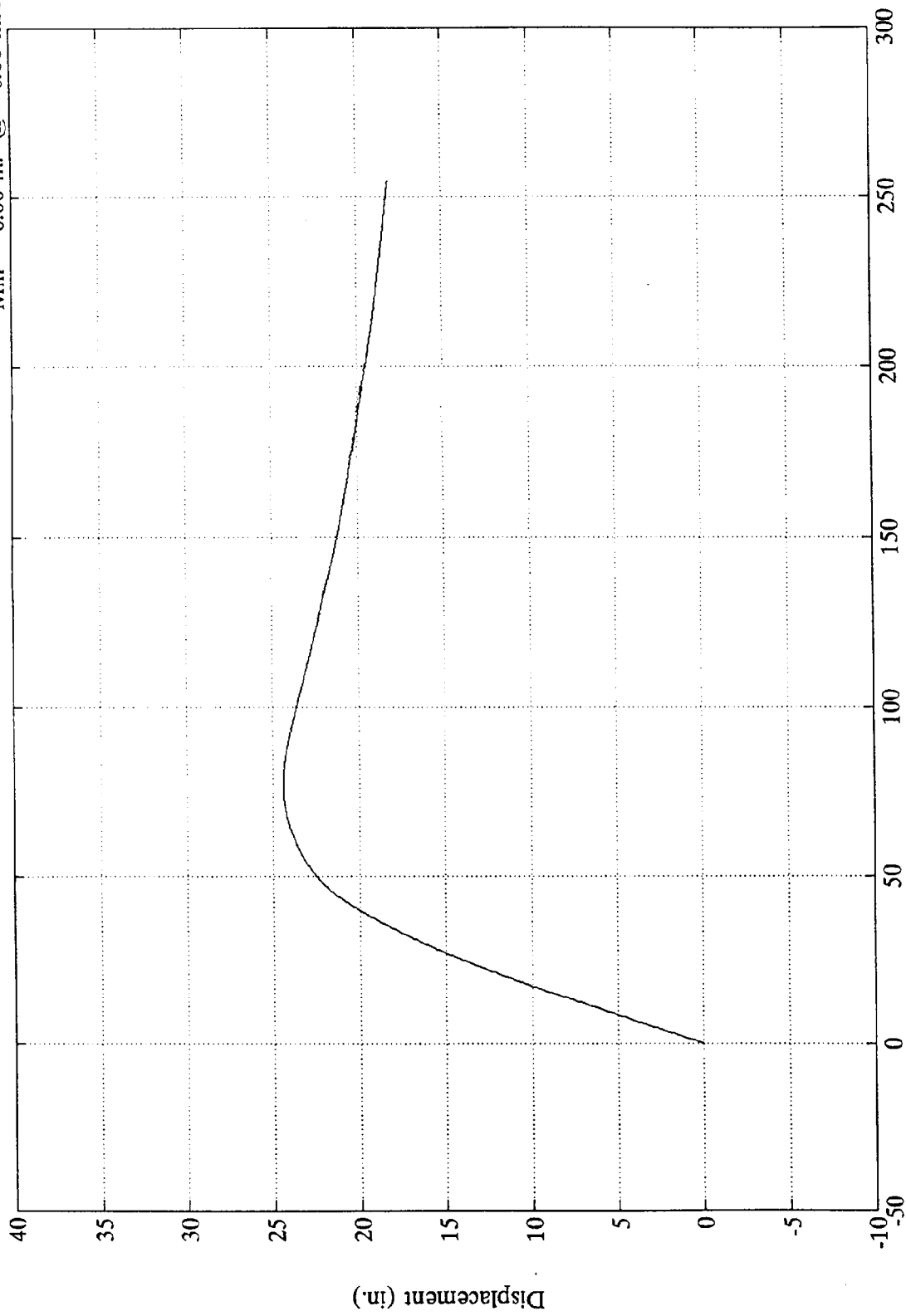
Acc. #2(x)



NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #2(x)

Max = 24.43 in. @ 78.00 msec
Min = 0.00 in. @ -0.00 msec



B-6

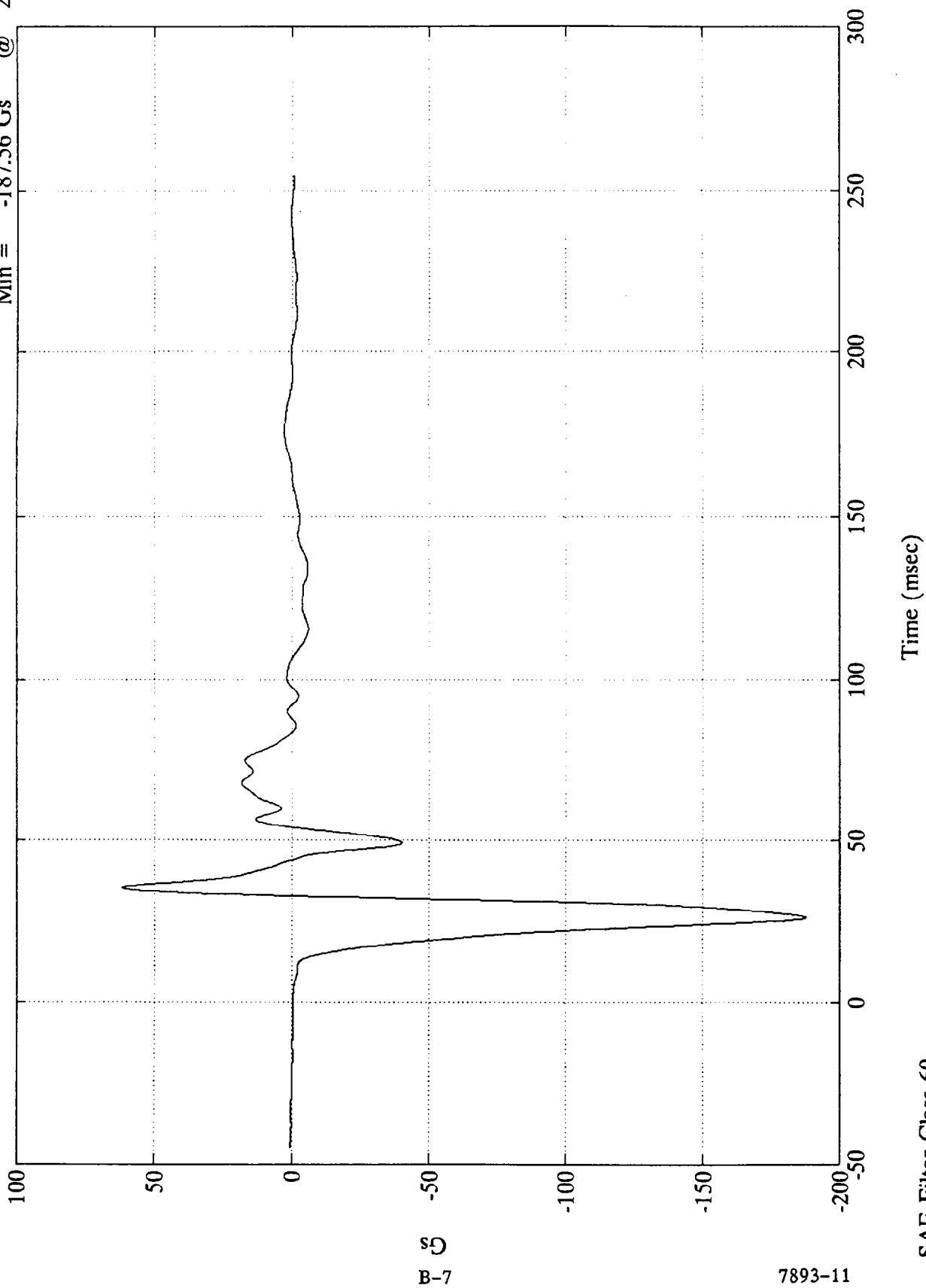
7893-11

Time (msec.)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #3(x) Max = 61.72 Gs @ 35.27 msec
Min = -187.56 Gs @ 26.27 msec

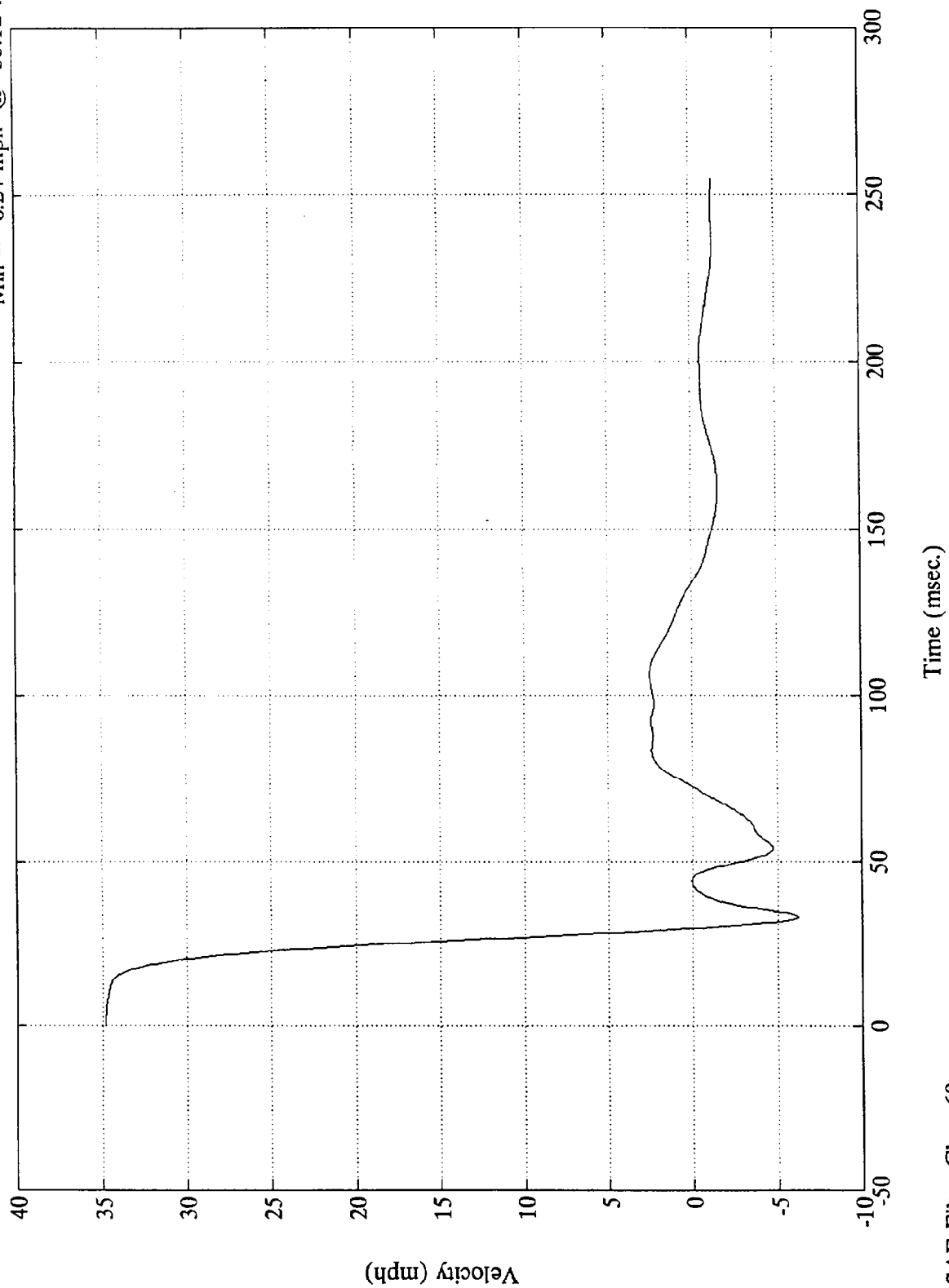


SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

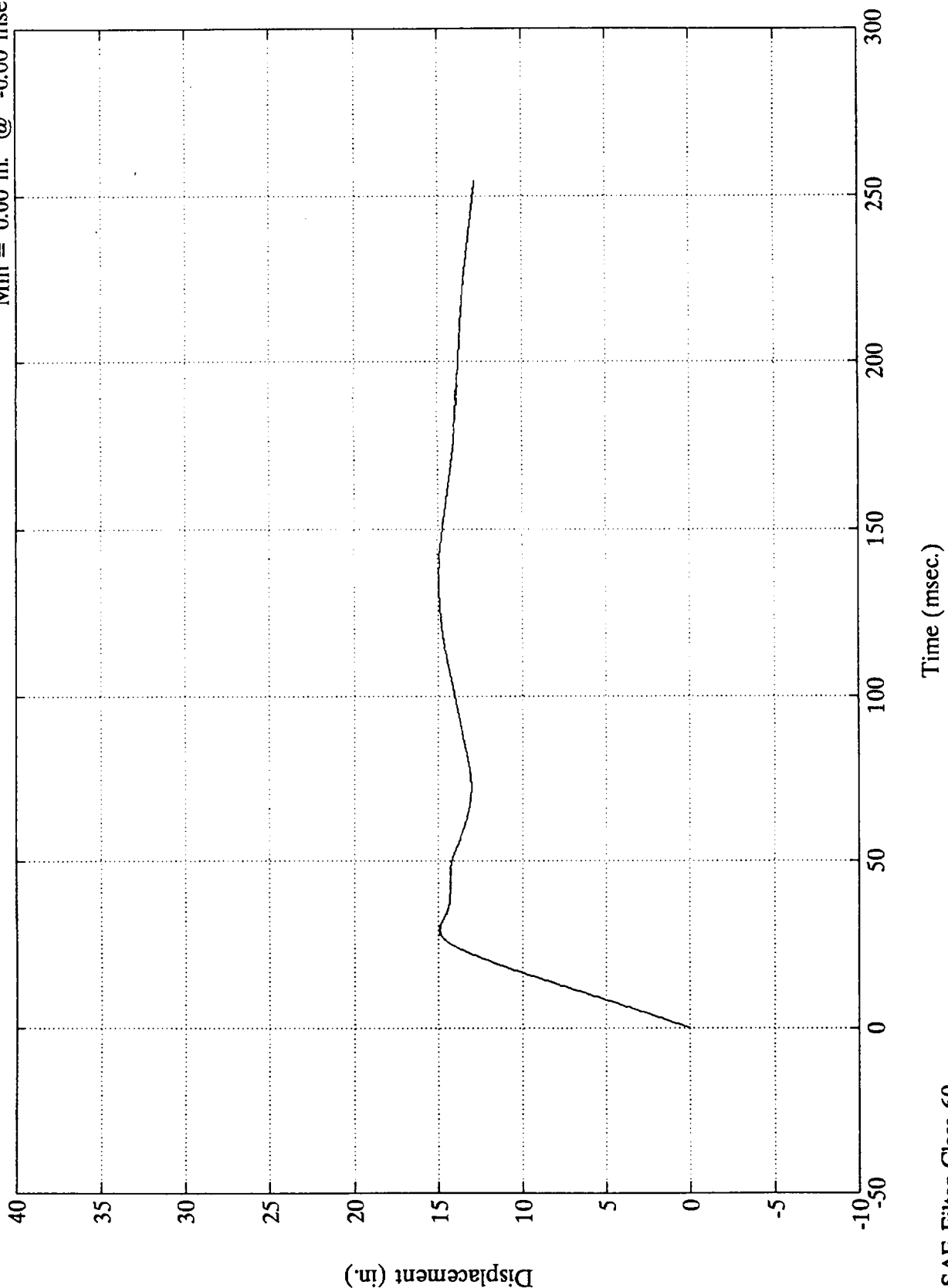
Max = 34.80 mph @ 0.24 msec
Min = -6.24 mph @ 33.12 msec

Acc. #3(x)



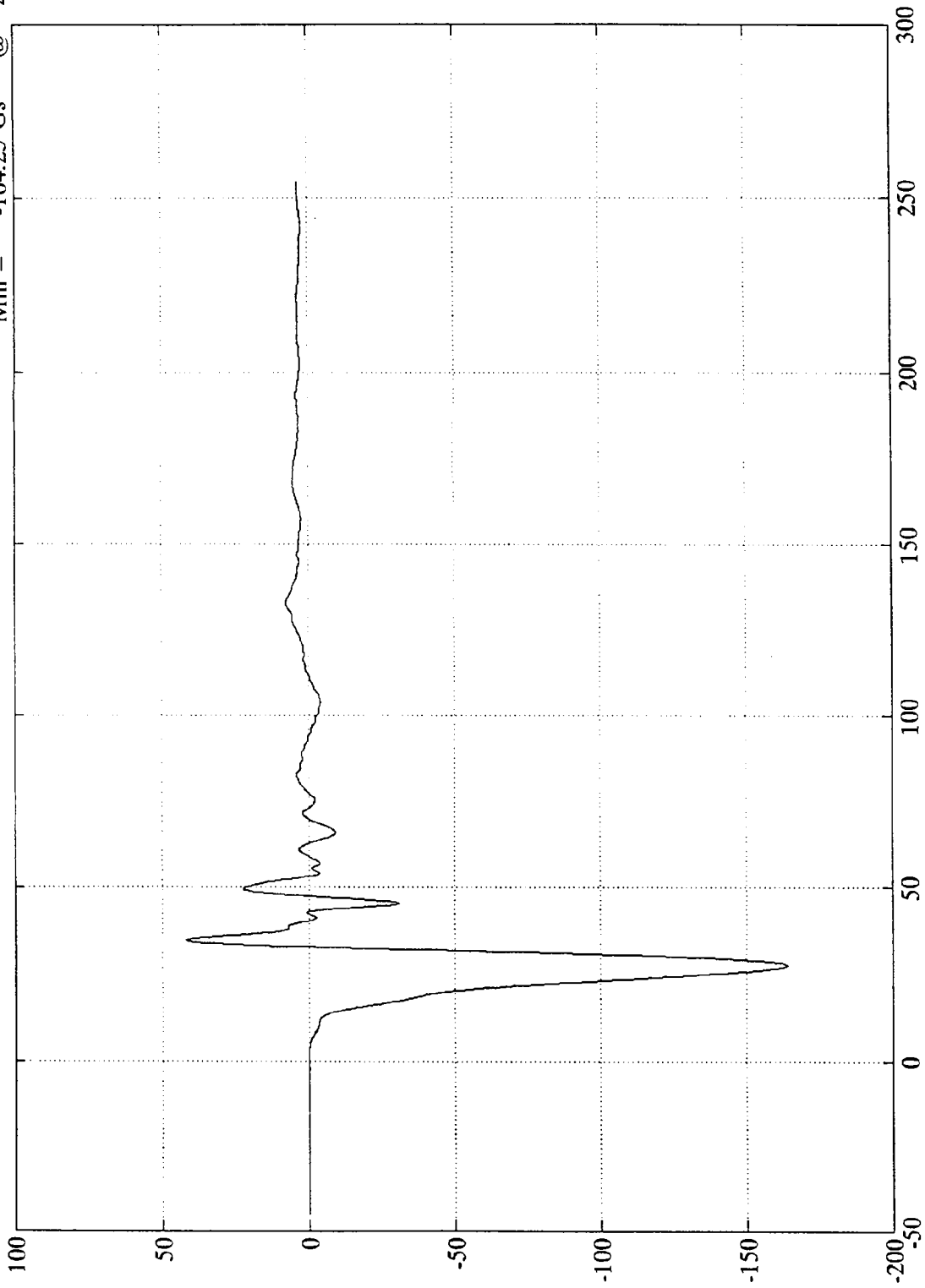
NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #3(x) Max = 14.95 in. @ 134.64 msec
Min = 0.00 in. @ -0.00 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #4(x) Max = 41.94 Gs @ 34.43 msec
Min = -164.25 Gs @ 27.48 msec



B-10
Gs

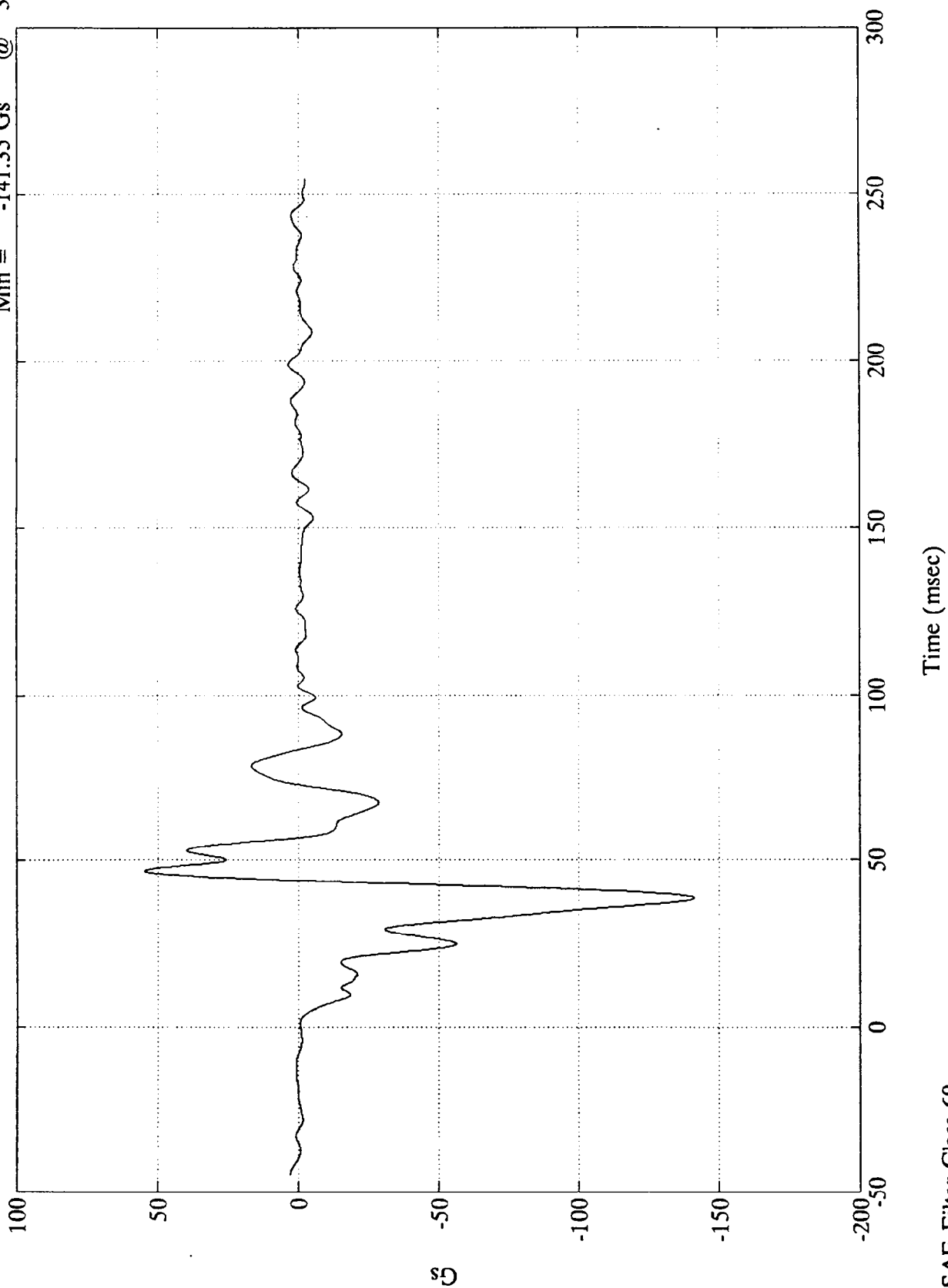
7893-11

Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

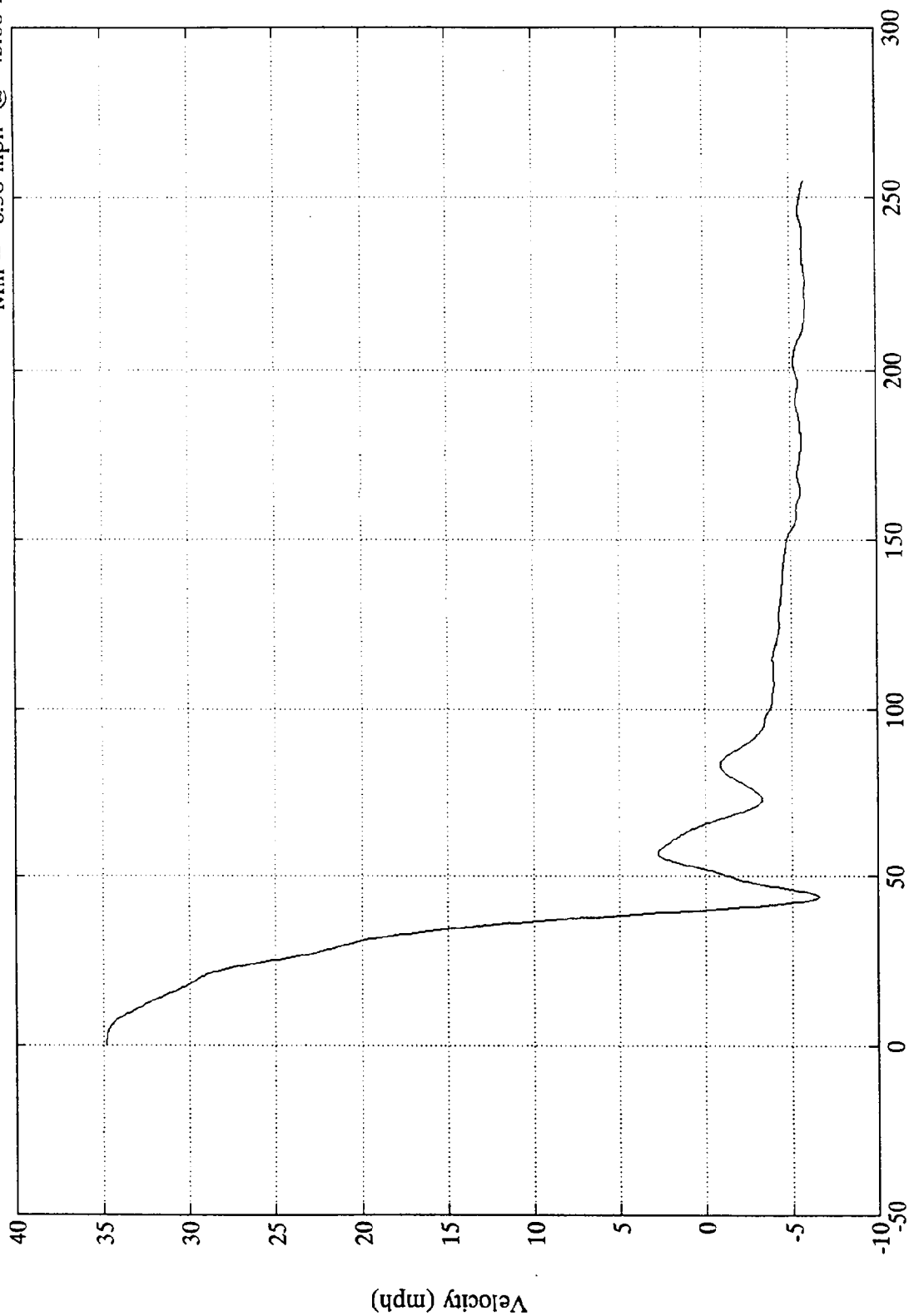
Acc. #5(x) Max = 54.72 Gs @ 46.68 msec
 Min = -141.35 Gs @ 38.40 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Max = 34.80 mph @ -0.00 msec
Min = -6.58 mph @ 43.68 msec

Acc. #5(x)

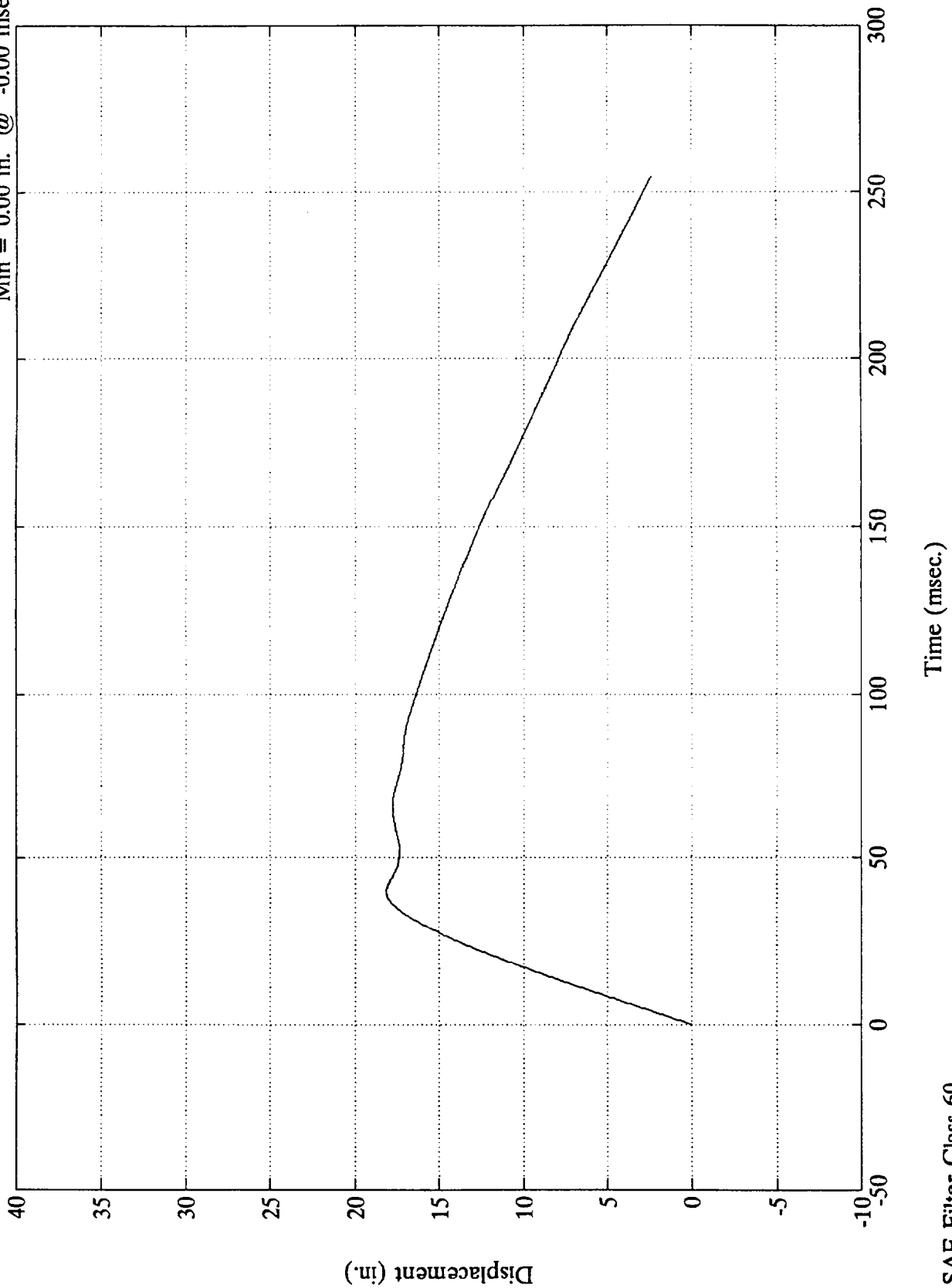


Time (msec.)

SAE Filter Class 60

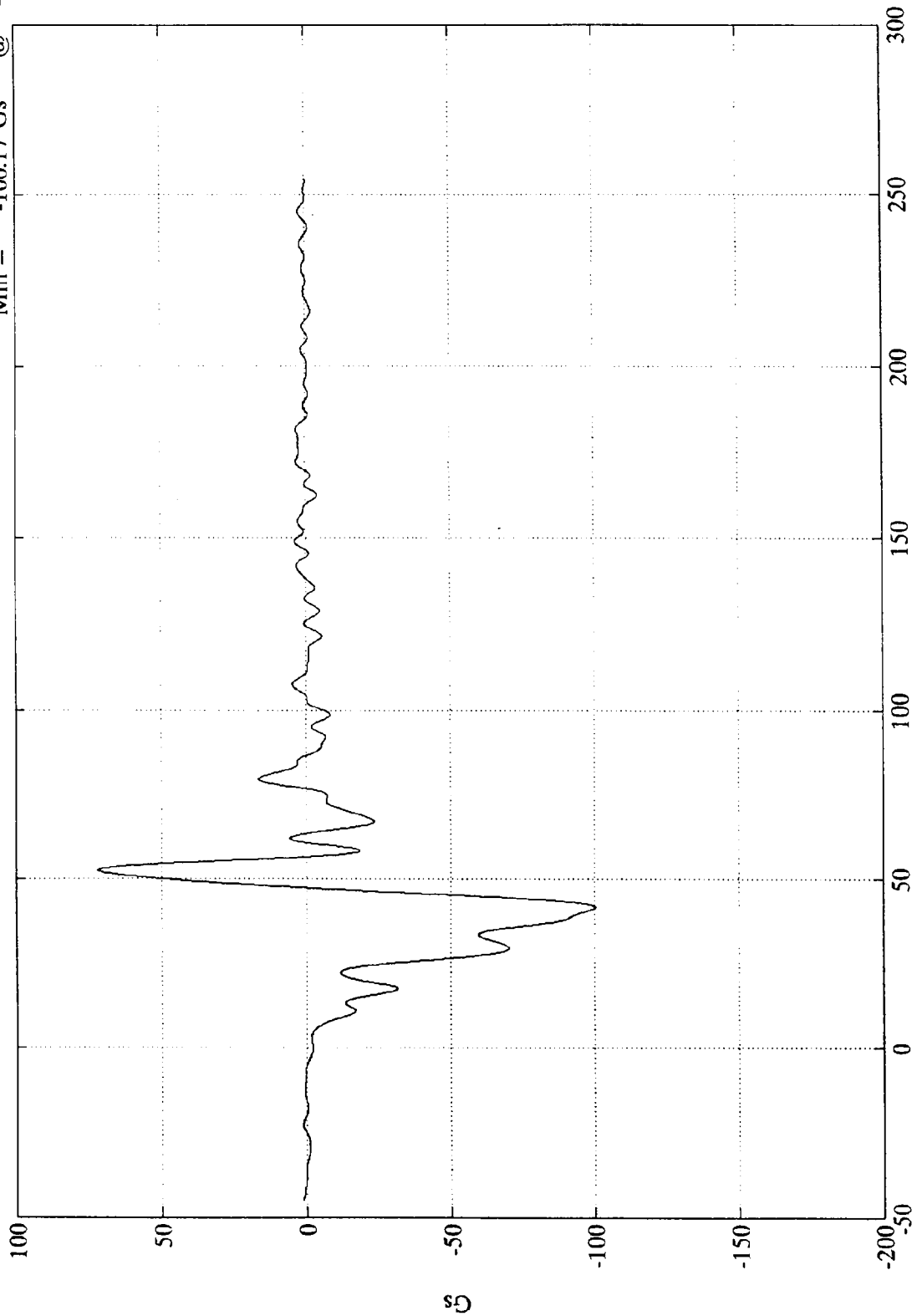
NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #5(x)
Max = 18.12 in. @ 40.32 msec
Min = 0.00 in. @ -0.00 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #6(x) Max = 72.02 Gs @ 52.56 msec
Min = -100.17 Gs @ 41.40 msec

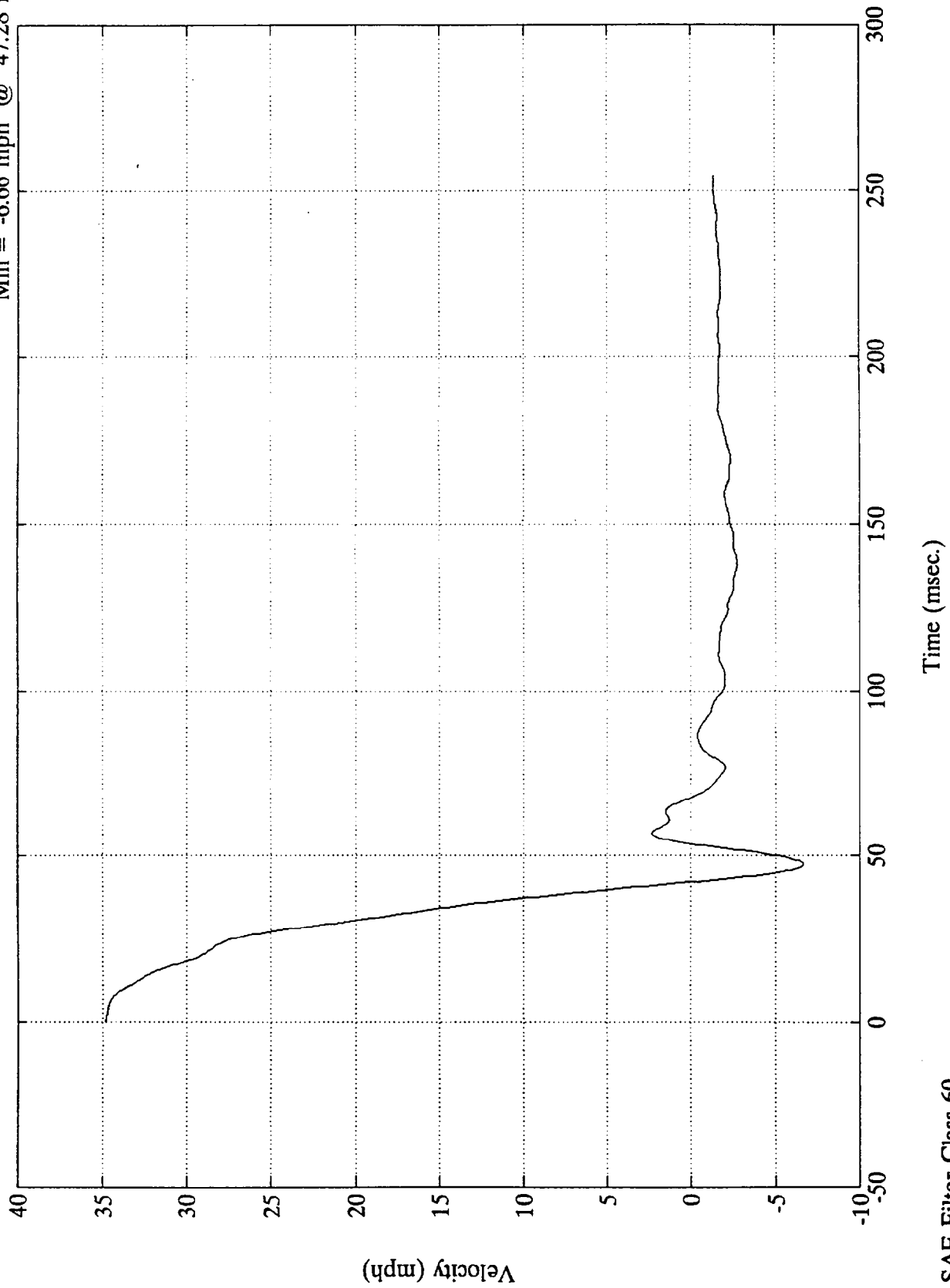


Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

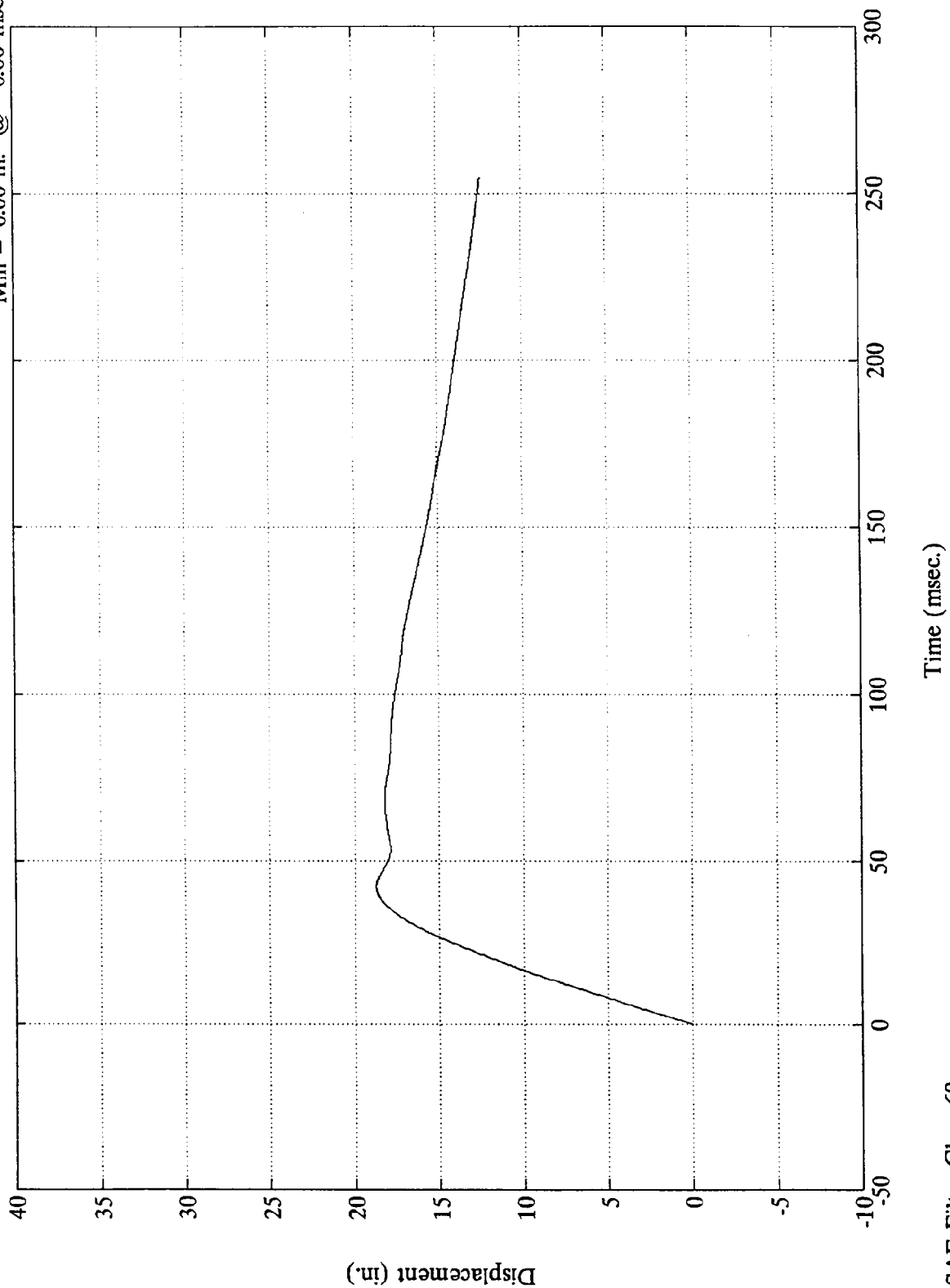
Acc. #6(x)
Max = 34.80 mph @ -0.00 msec
Min = -6.66 mph @ 47.28 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Max = 18.73 in. @ 42.48 msec
Min = 0.00 in. @ -0.00 msec

Acc. #6(x)



B-16

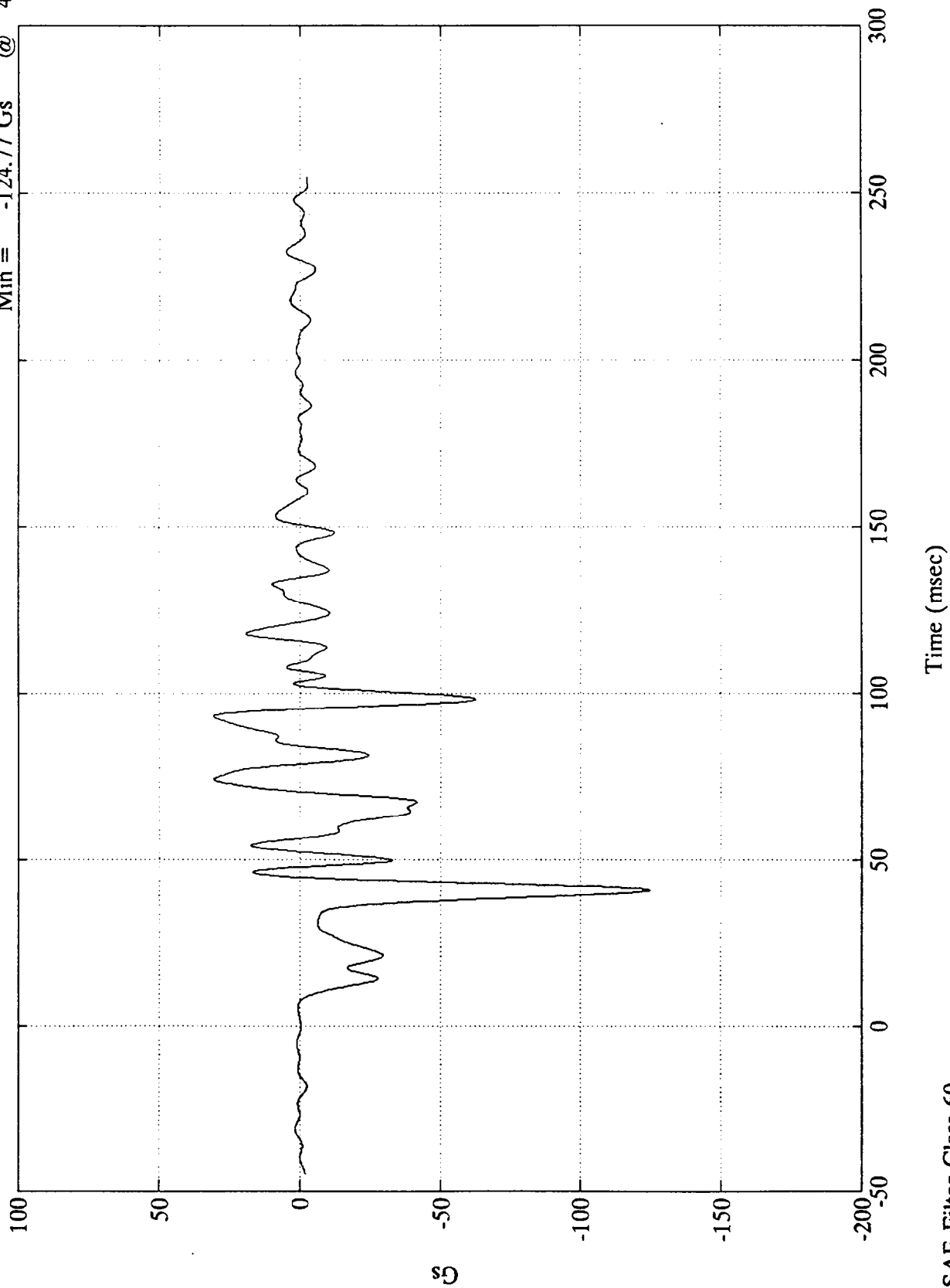
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 30.64 Gs @ 92.88 msec
Min = -124.77 Gs @ 40.92 msec

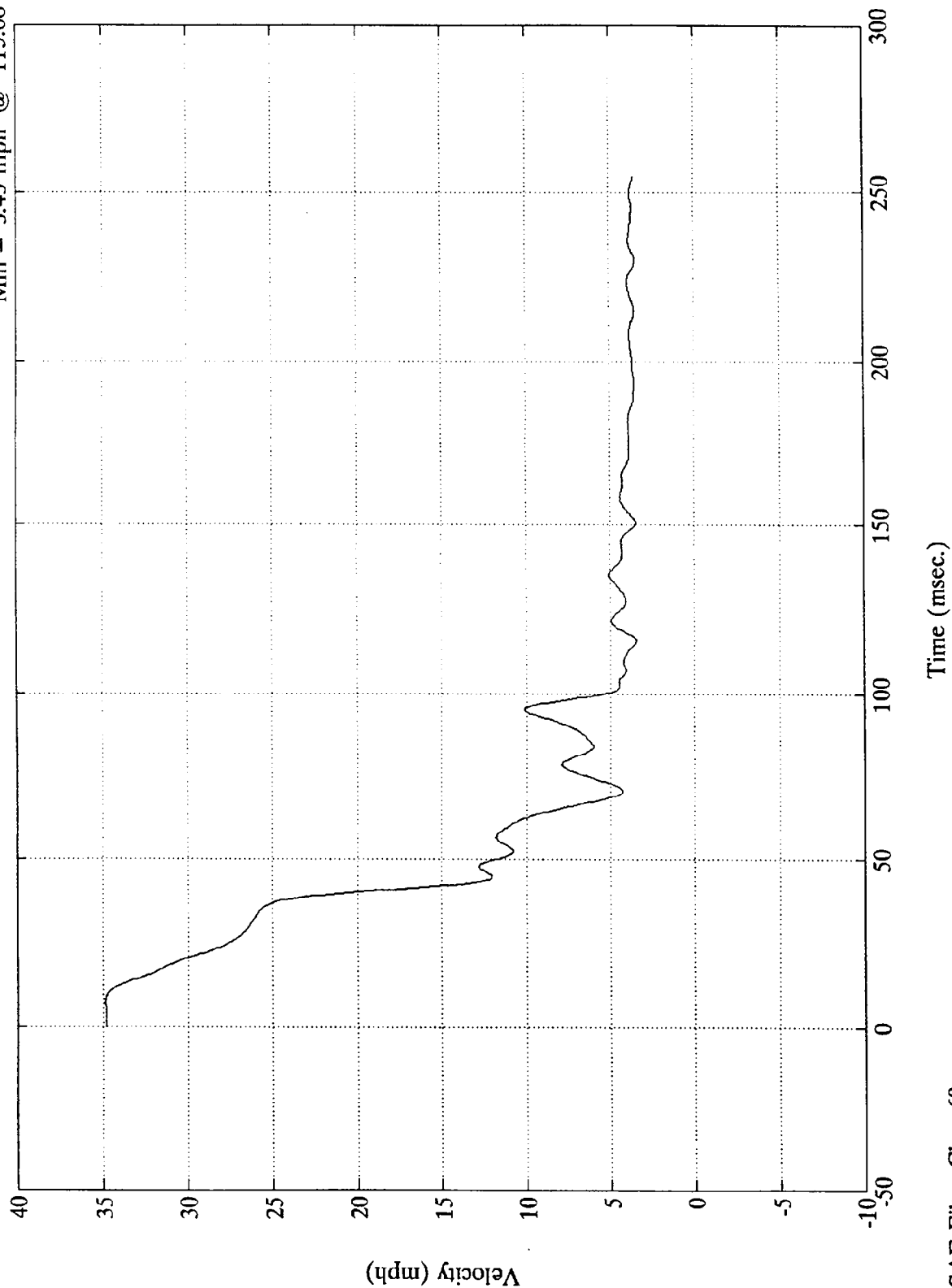
Acc. #7(x)



NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #7(x)

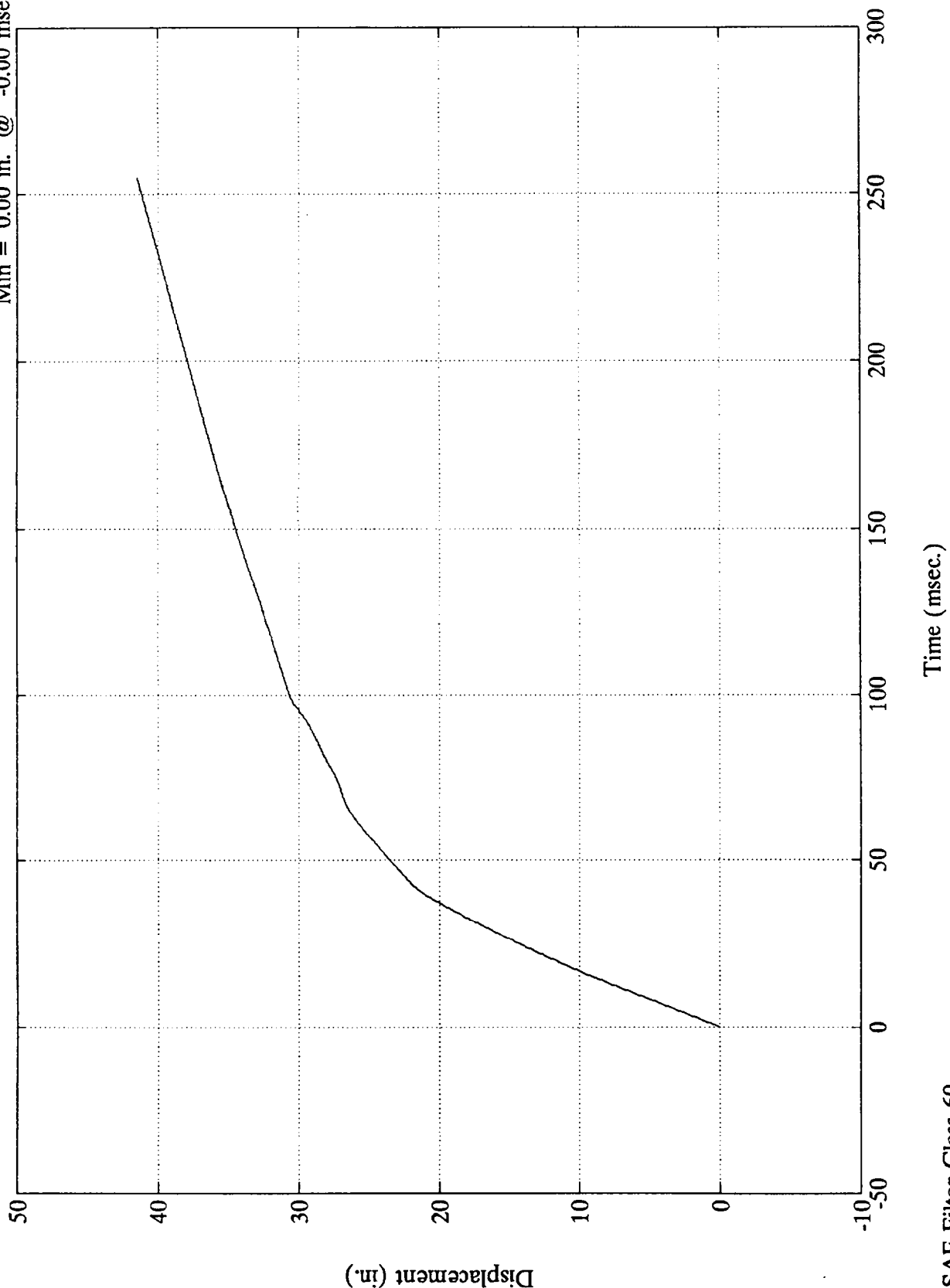
Max = 34.85 mph @ 7.68 msec
Min = 3.45 mph @ 115.68 msec



NCAP TEST 15 1991 MAZDA M.P.V.

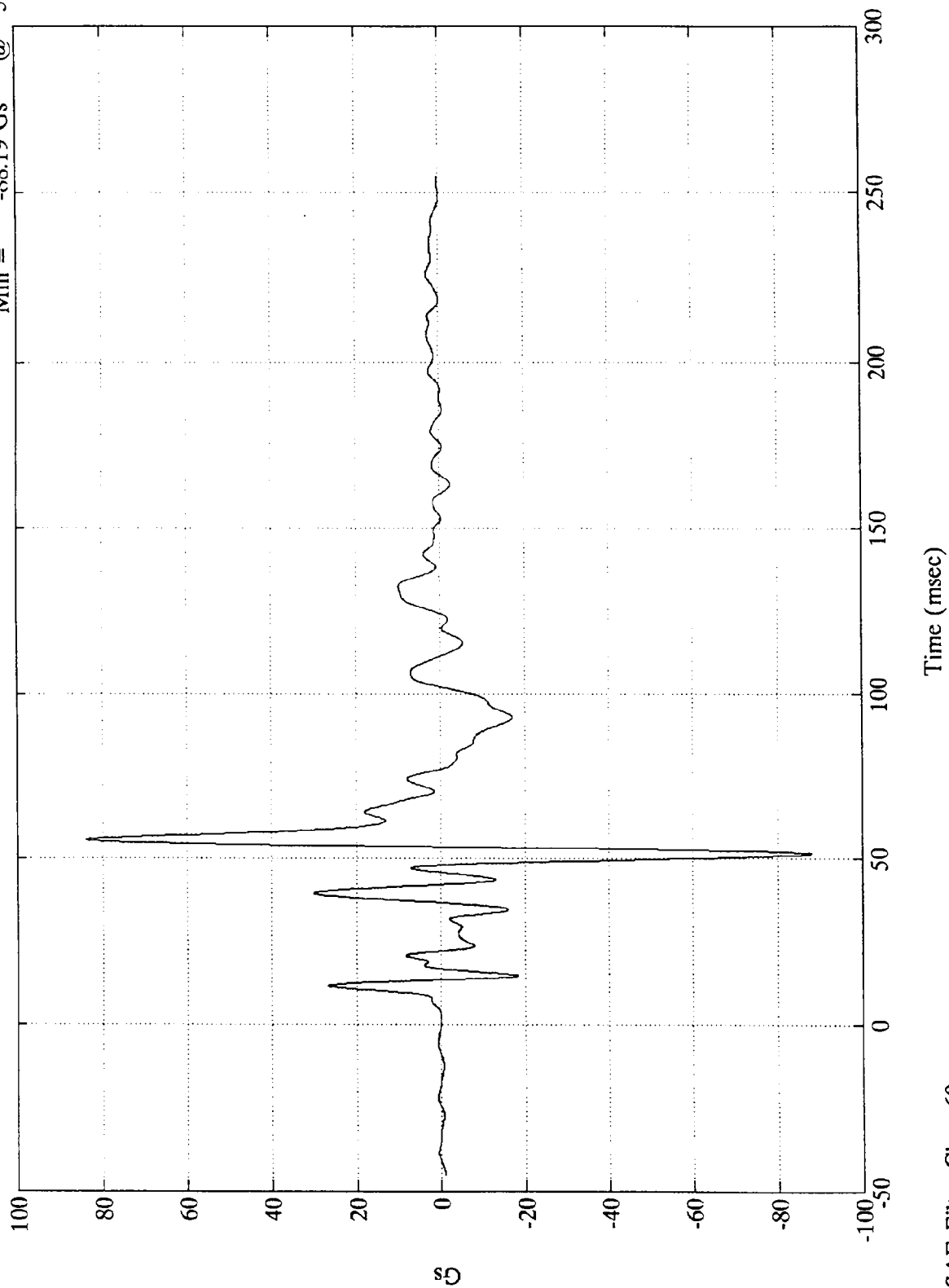
Max = 41.49 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec

Acc. #7(x)



NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #8(z) Max = 83.90 Gs @ 55.68 msec
Min = -88.19 Gs @ 51.47 msec



B-20

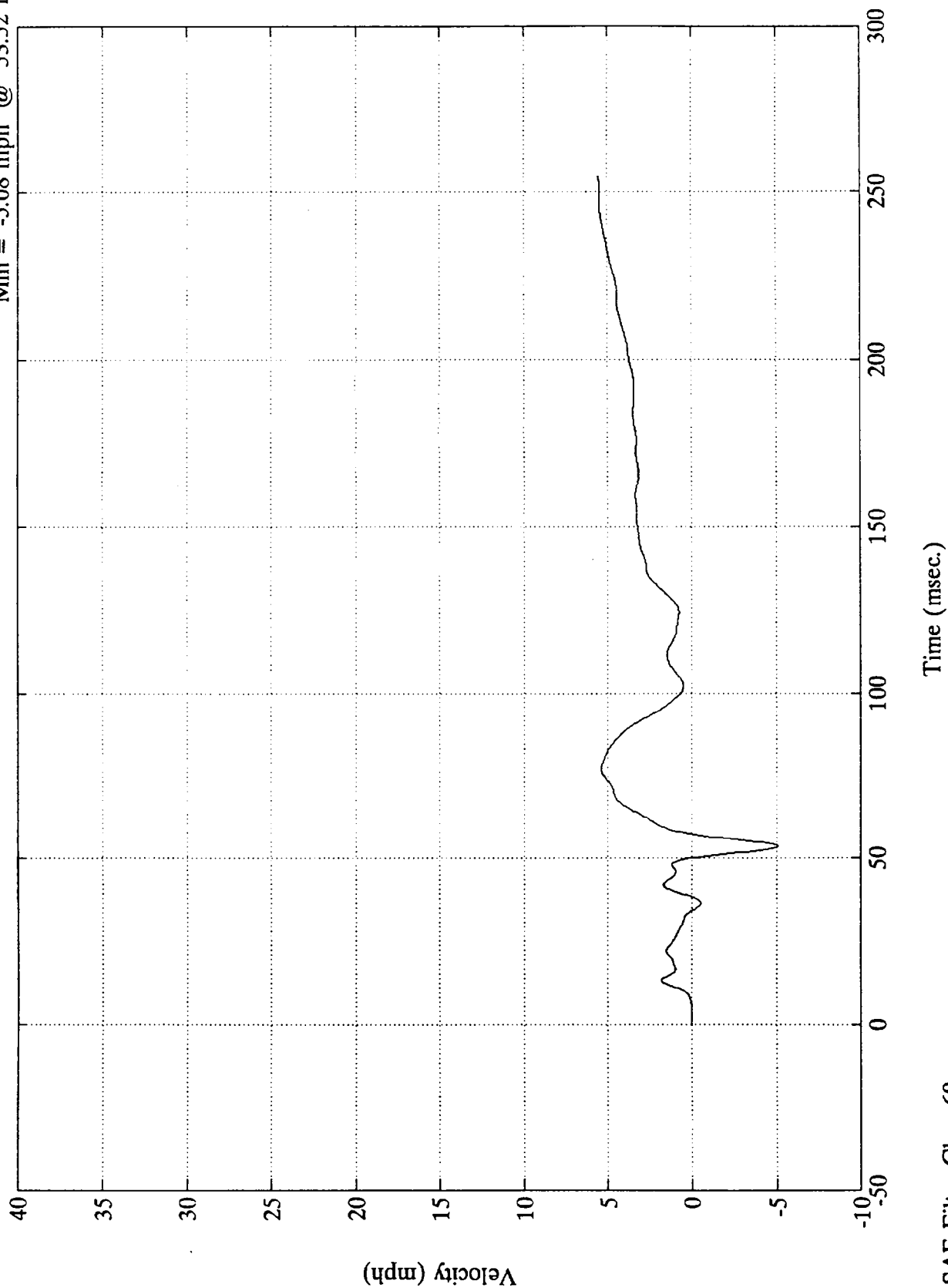
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 5.48 mph @ 254.88 msec
Min = -5.08 mph @ 53.52 msec

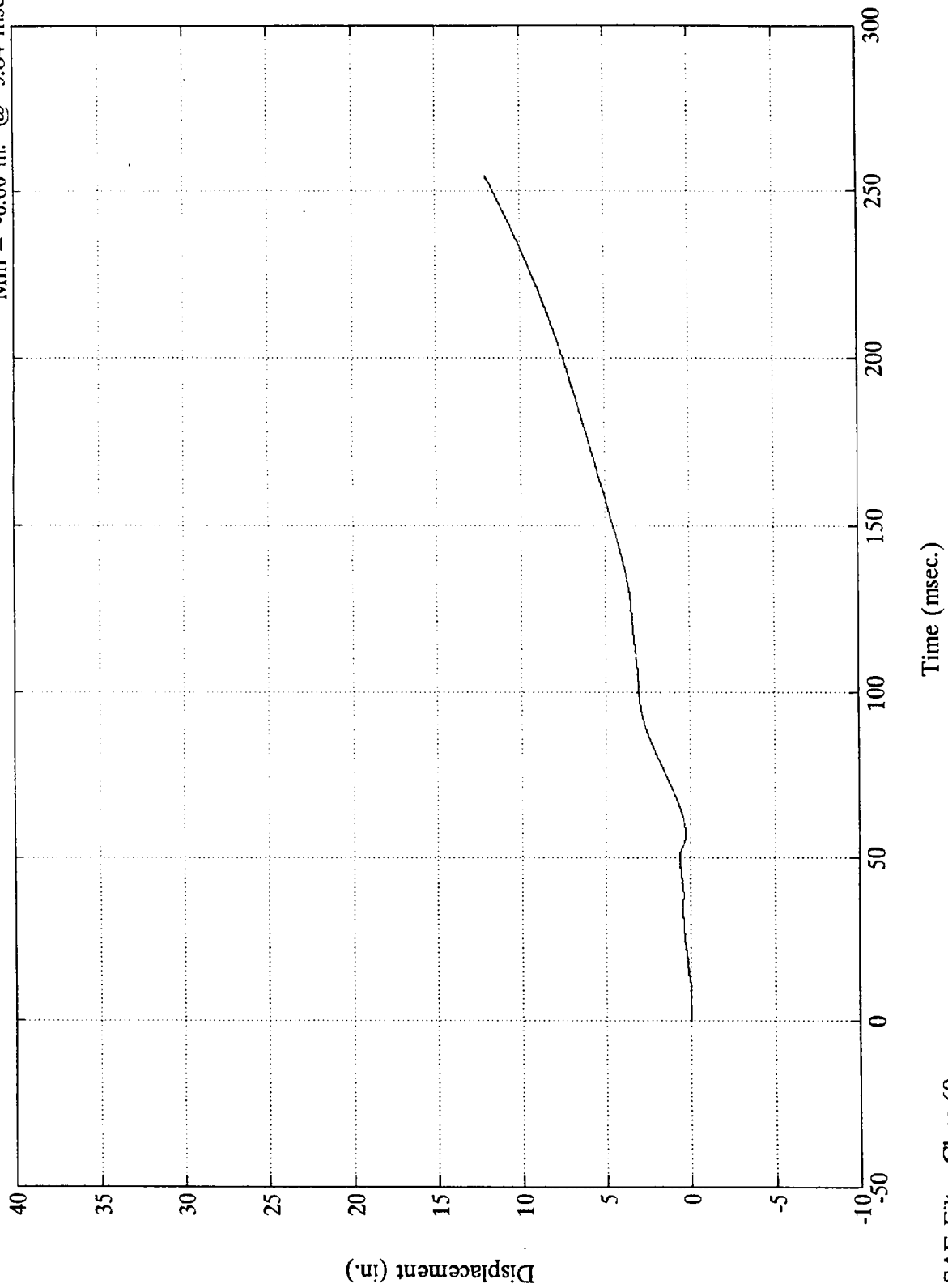
Acc. #8(z)



NCAP TEST 15 1991 MAZDA M.P.V.

Max = 12.03 in. @ 254.88 msec
Min = -0.00 in. @ 3.84 msec

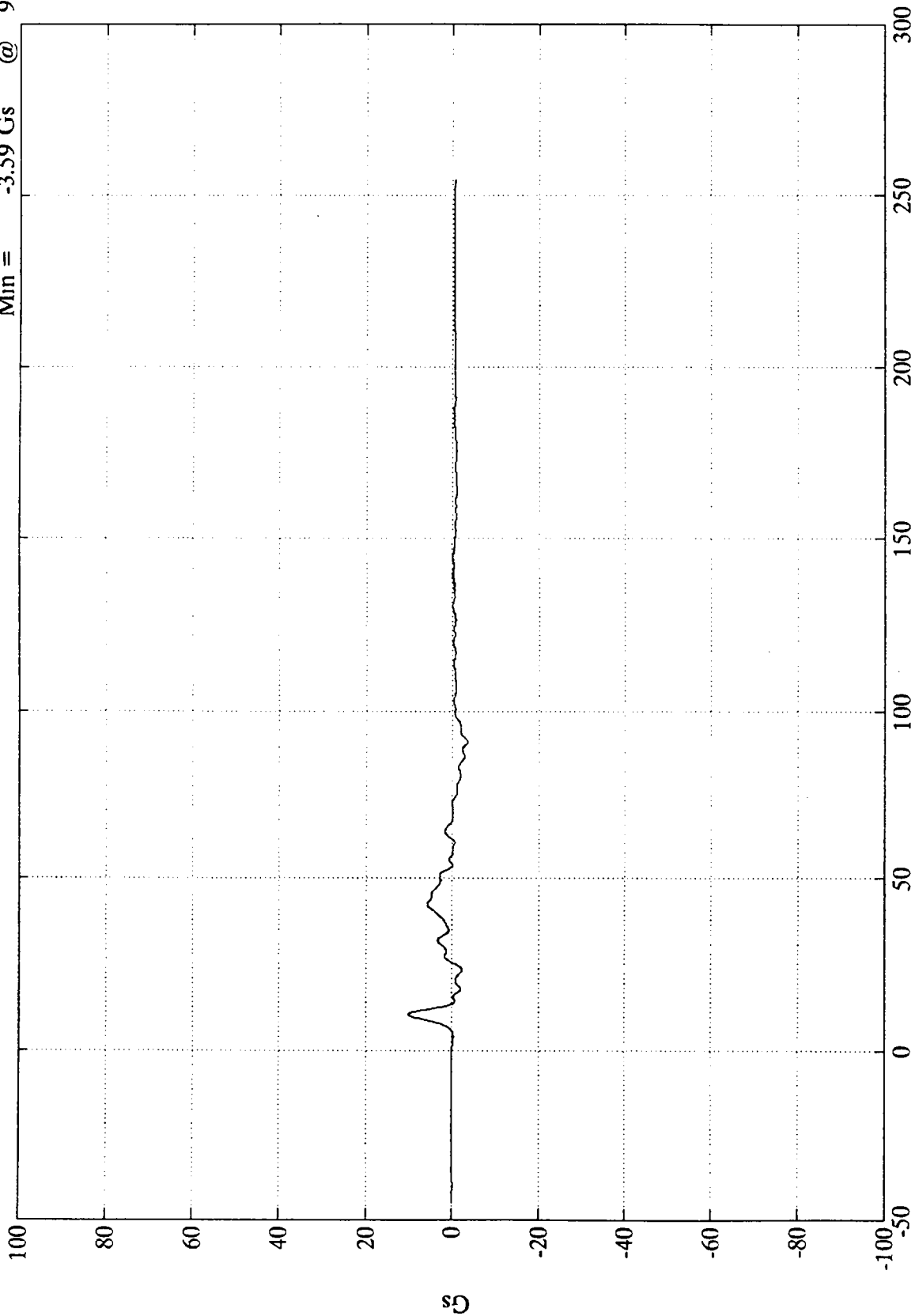
Acc. #8(z)



NCAP TEST 15 1991 MAZDA M.P.V.

Max = 10.06 Gs @ 10.19 msec
Min = -3.59 Gs @ 90.59 msec

Acc. #9(z)



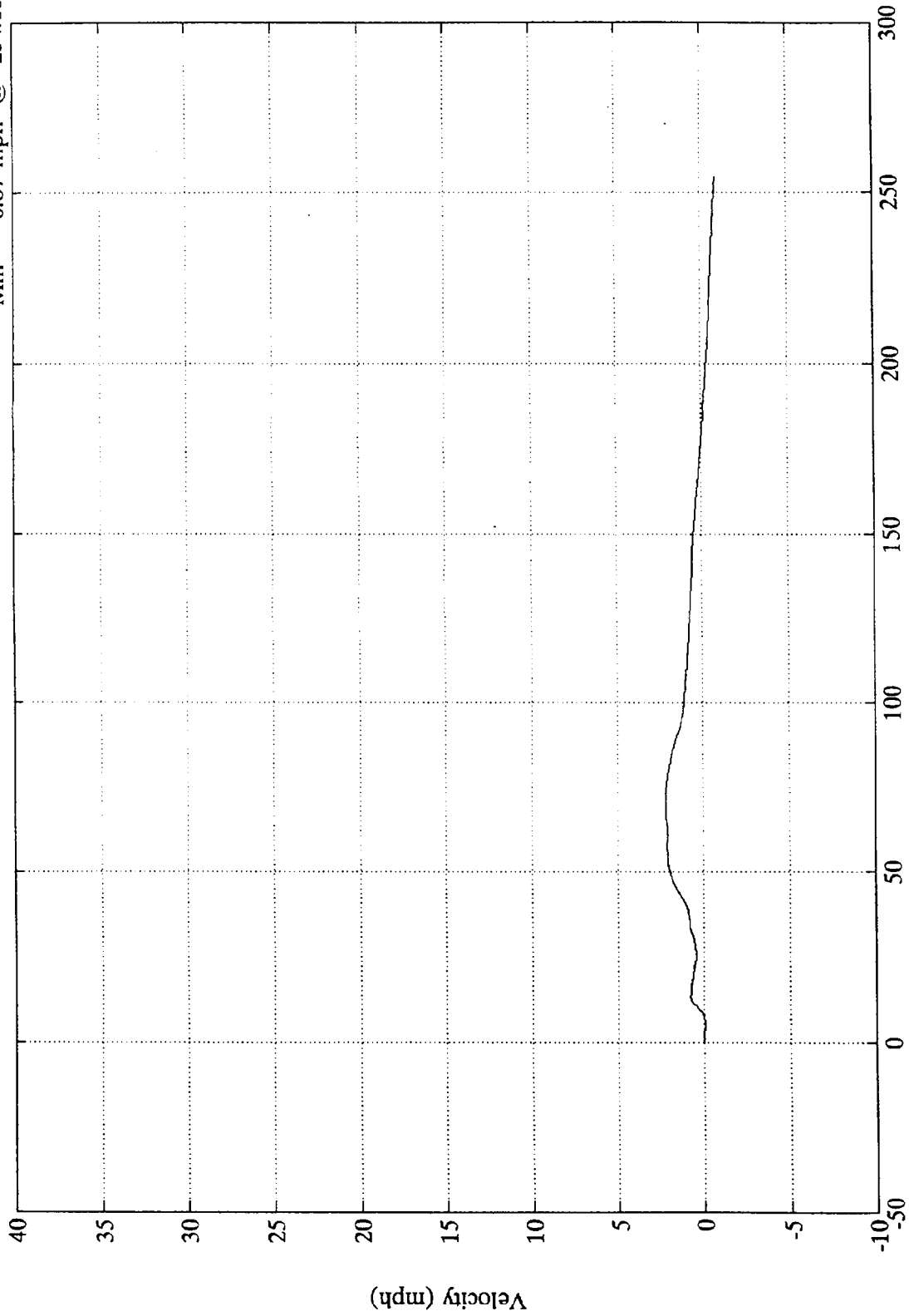
Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 2.20 mph @ 67.20 msec
Min = -0.87 mph @ 254.88 msec

Acc. #9(z)



Velocity (mph)

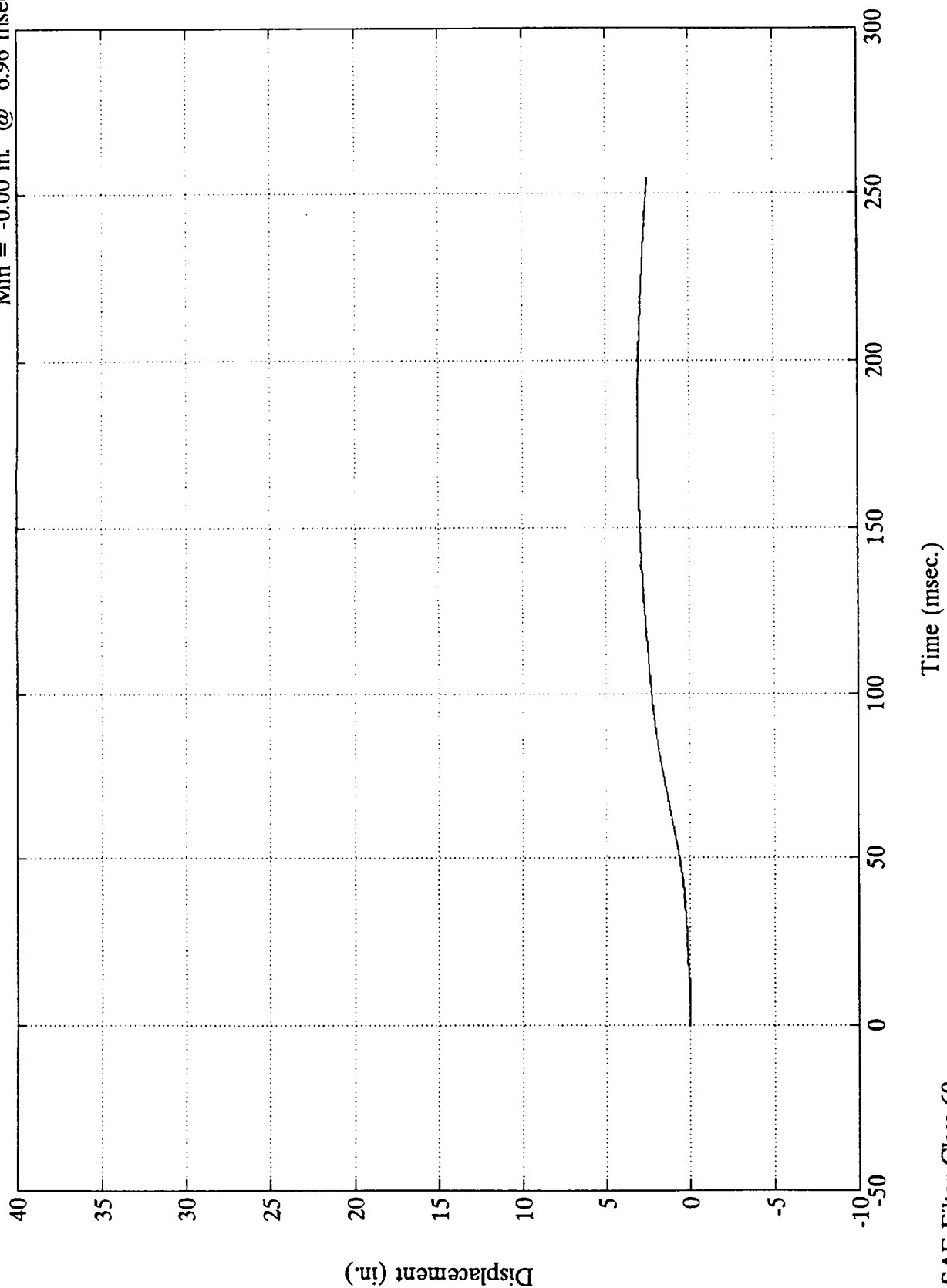
Time (msec.)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Acc. #9(z)

Max = 3.10 in. @ 179.28 msec
Min = -0.00 in. @ 6.96 msec



TEST NO. MM5400

LOAD CELL BARRIER DATA

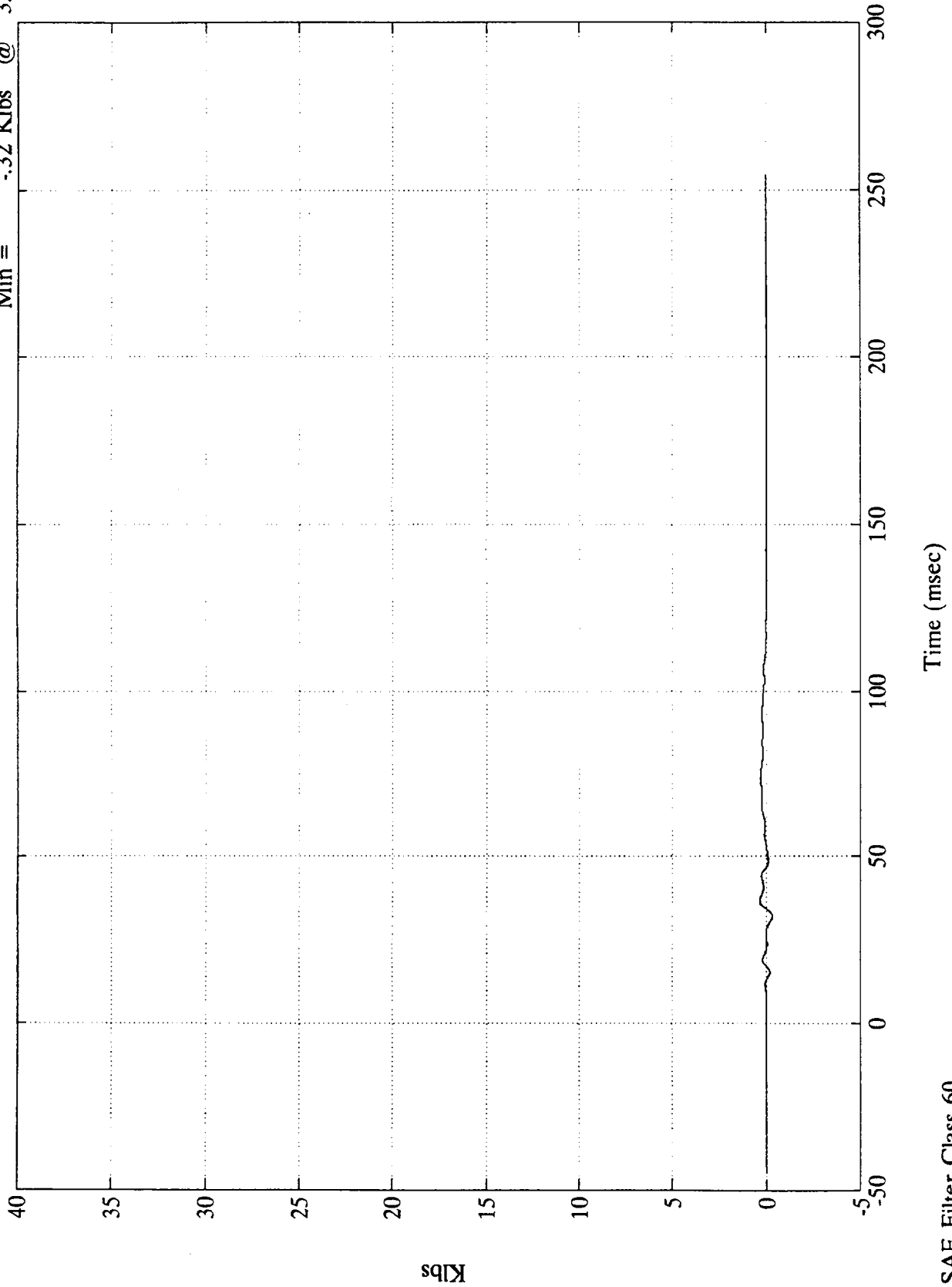
FILTER CHANNEL CLASS

60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A1

Max = .35 Klbs @ 36.60 msec
Min = -.32 Klbs @ 32.28 msec



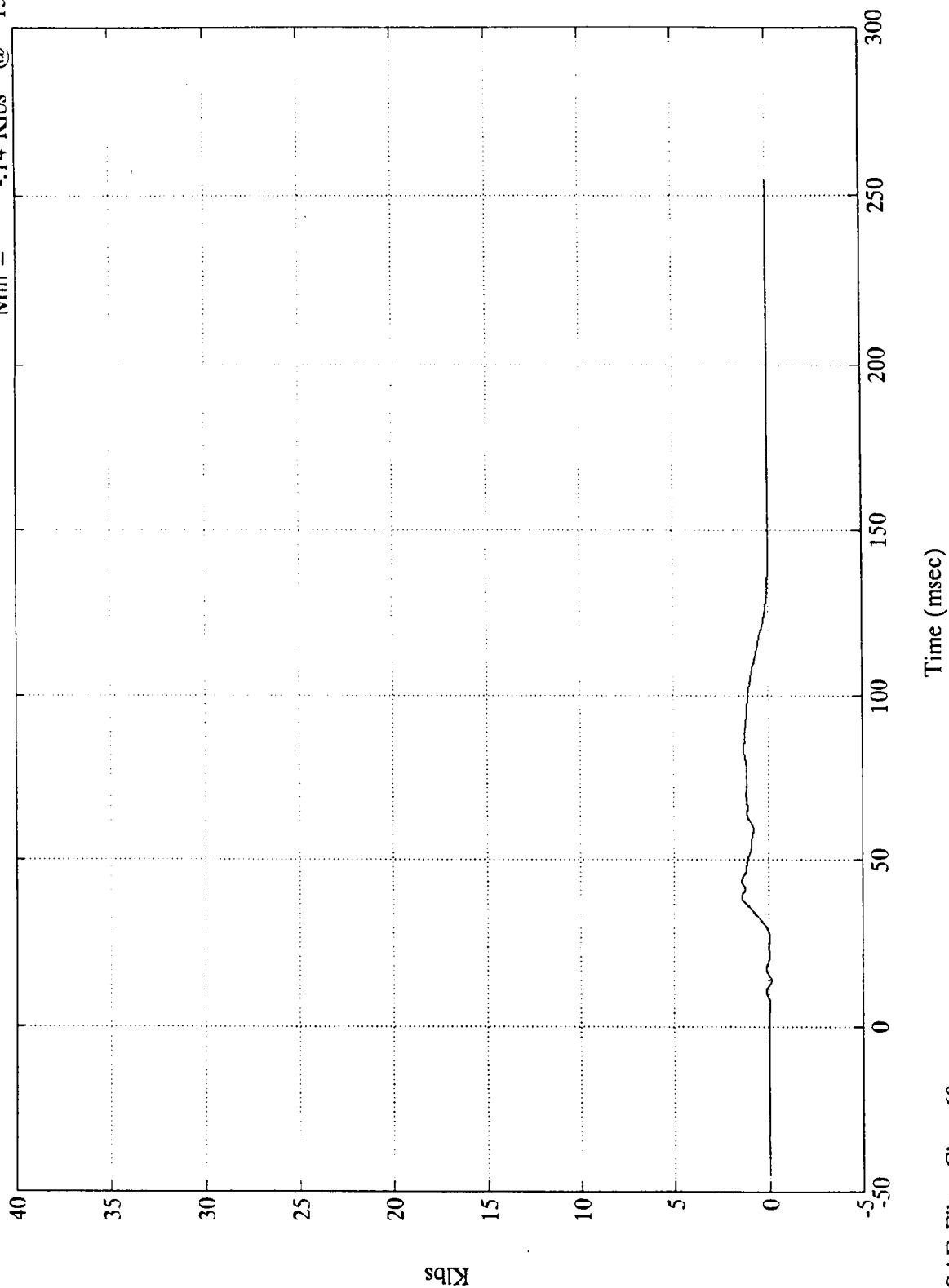
B-27

7893-11

SAE Filter Class 60

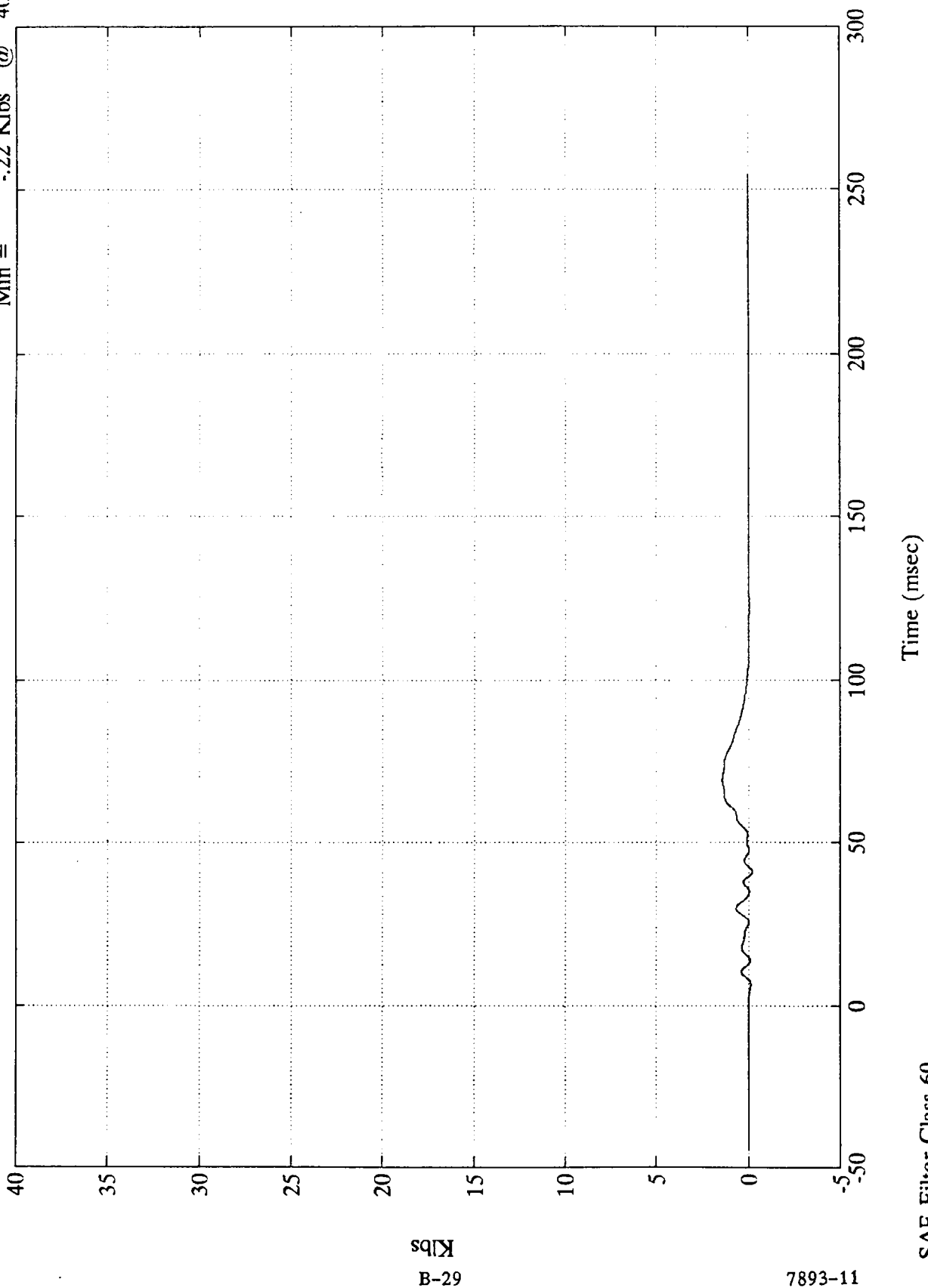
NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A2
Max = 1.45 Klbs @ 38.52 msec
Min = -.14 Klbs @ 13.79 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A3
Max = 1.42 Klbs @ 69.36 msec
Min = -.22 Klbs @ 40.92 msec



B-29
Klbs

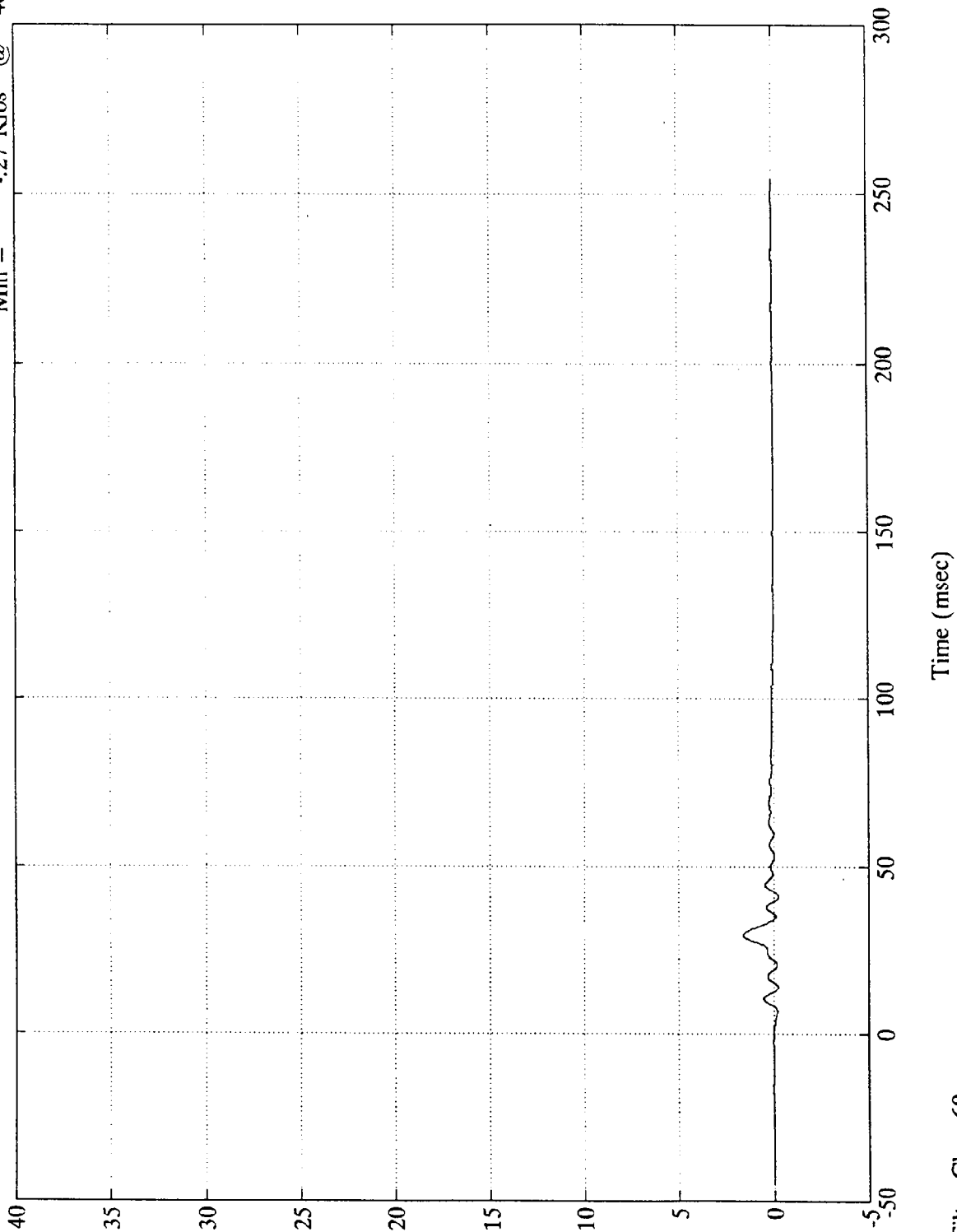
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A4

Max = 1.60 Klbs @ 29.39 msec
Min = -.27 Klbs @ 40.92 msec



B-30
Klbs

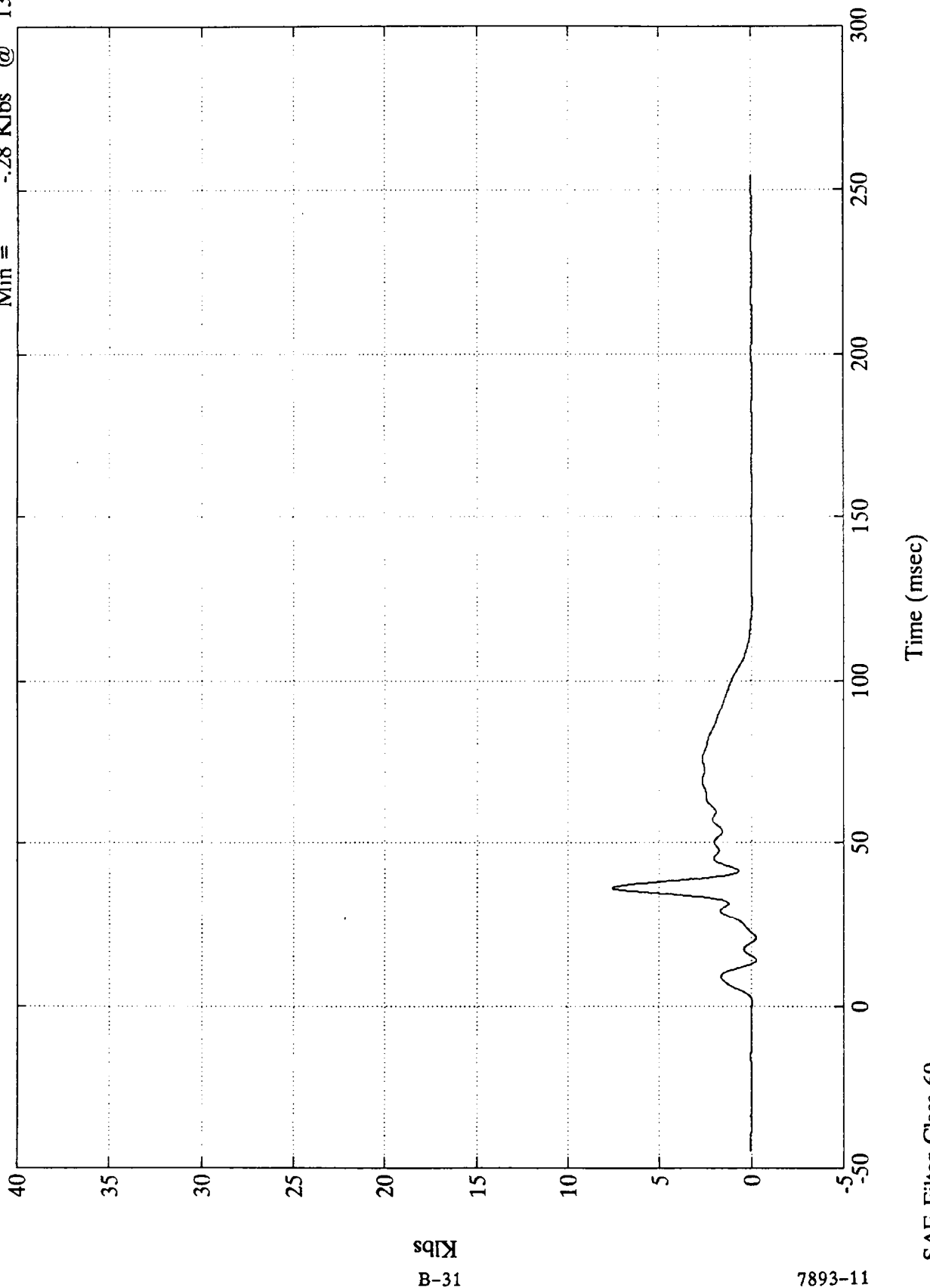
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A5

Max =	7.55 Klbs	@	36.24 msec
Min =	-28 Klbs	@	13.91 msec



B-31

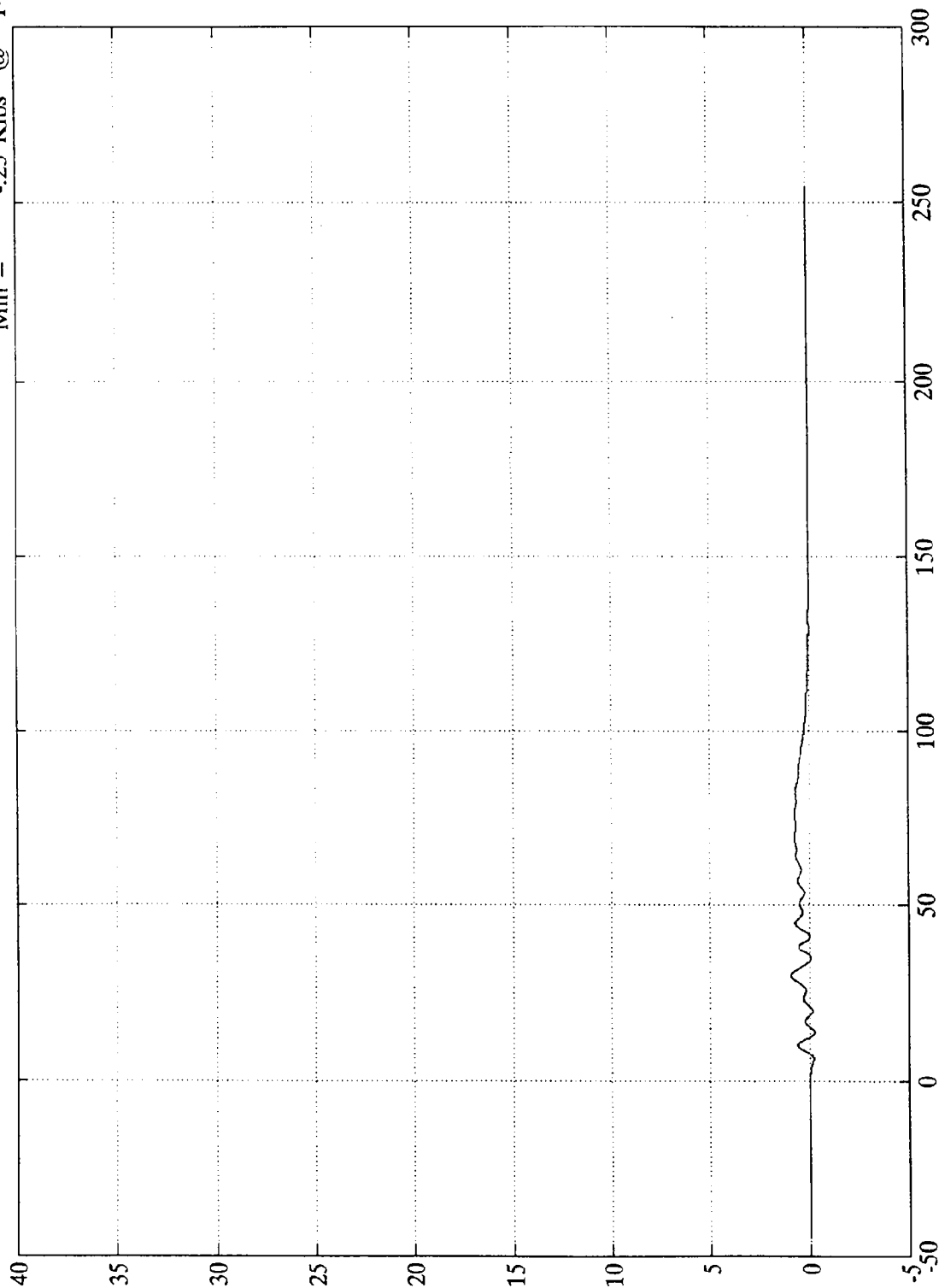
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A6

Max = .92 Klbs @ 29.88 msec
Min = -.25 Klbs @ 14.15 msec

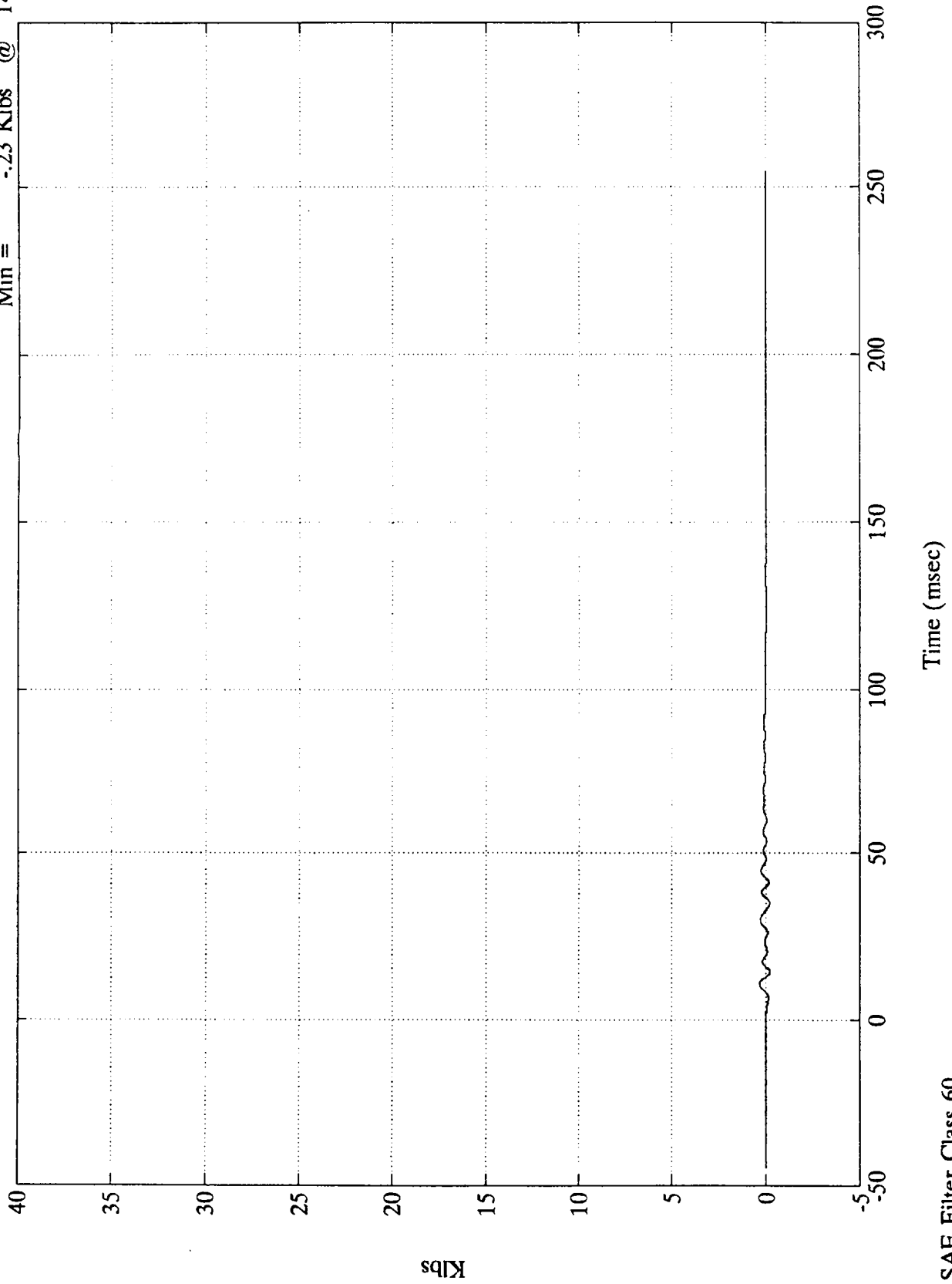


Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A7
Max = .36 Klbs @ 10.55 msec
Min = -.23 Klbs @ 14.15 msec



B-33
Klbs

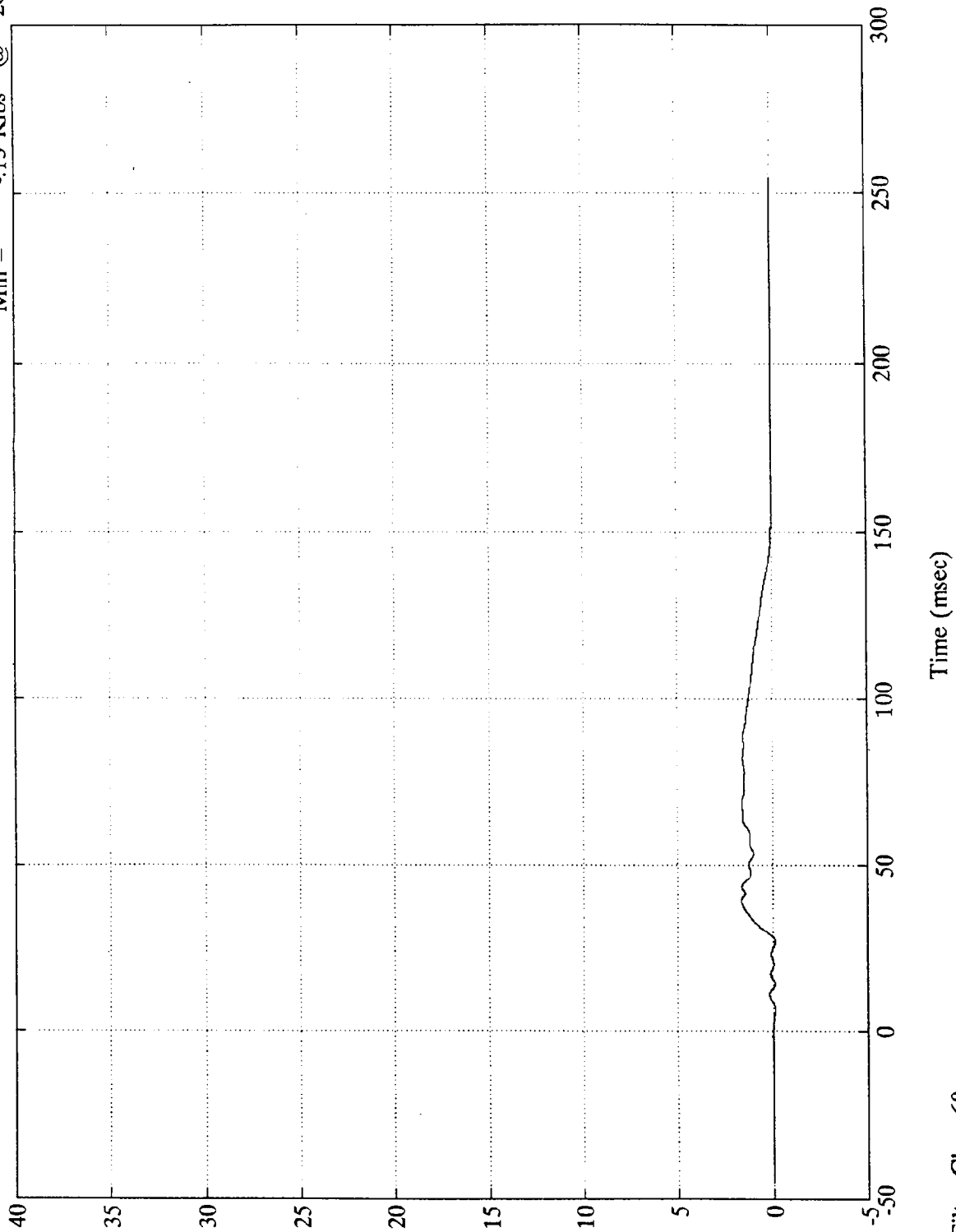
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 1.65 Klbs @ 38.63 msec
Min = -1.13 Klbs @ 26.63 msec

Barrier Load Cell A8



B-34

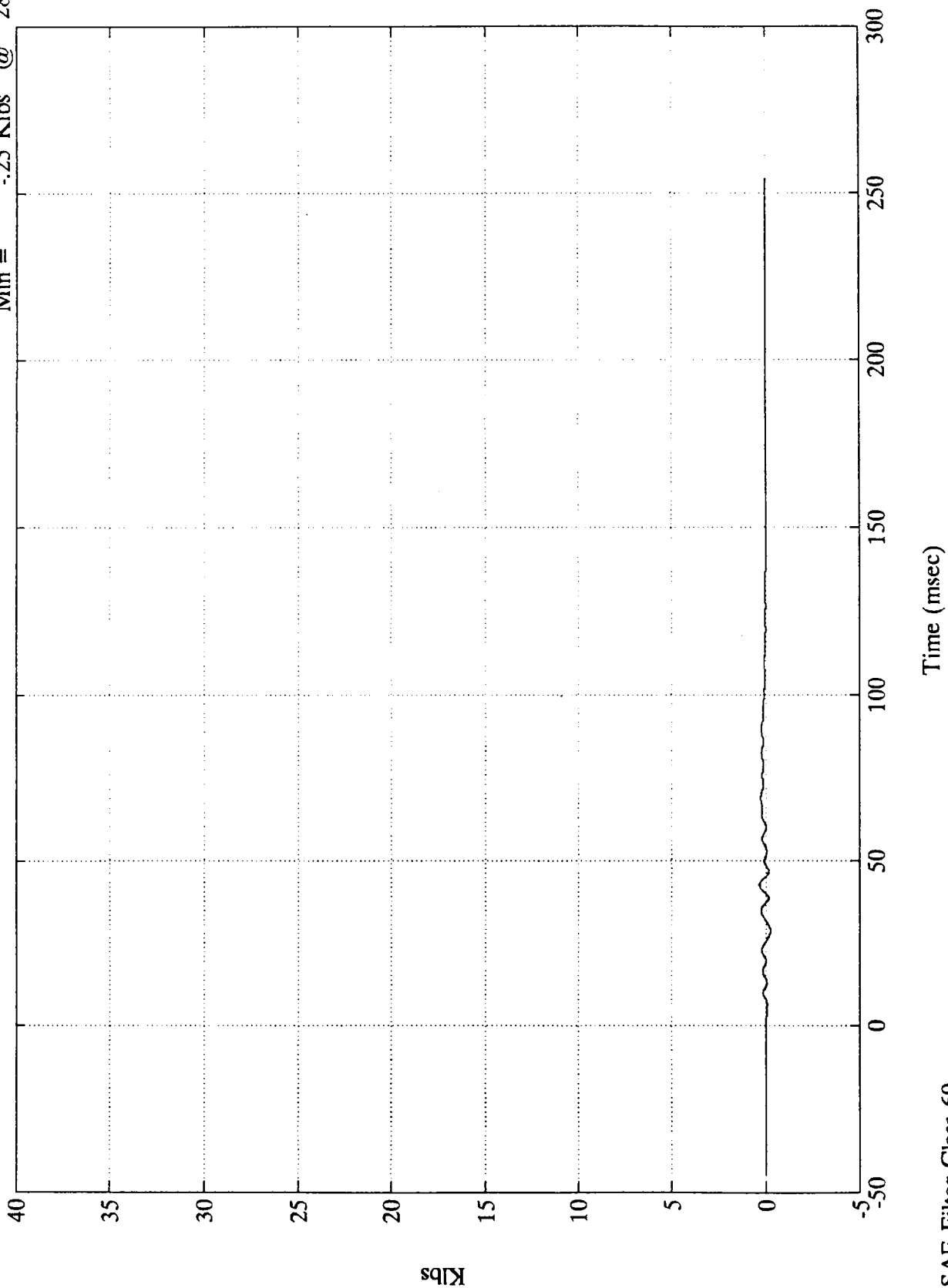
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell A9

Max = .31 Klbs @ 42.72 msec
Min = -.25 Klbs @ 28.79 msec



B-35
Klbs

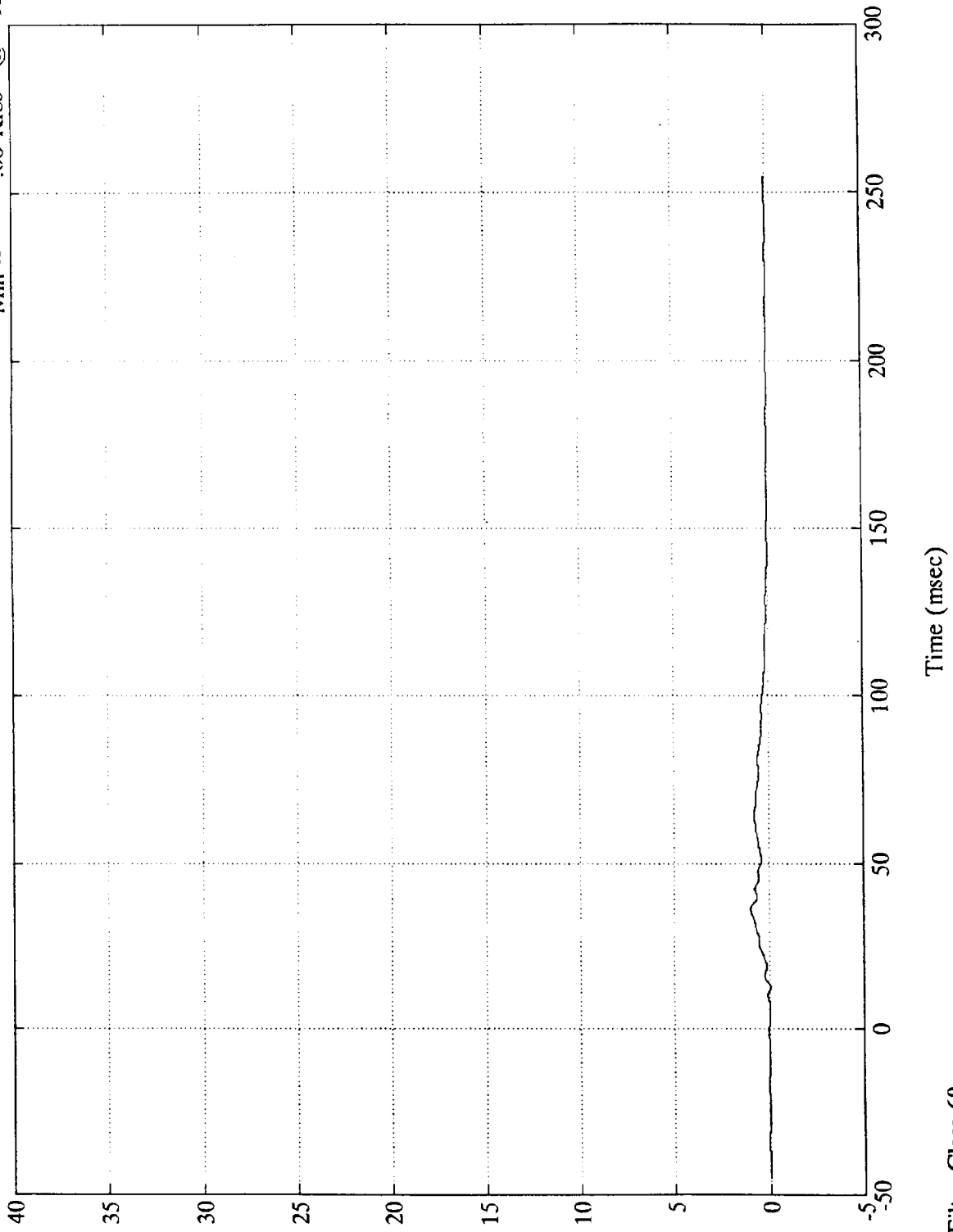
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = .97 Klbs @ 36.24 msec
Min = -.06 Klbs @ 12.59 msec

Barrier Load Cell B1



B-36

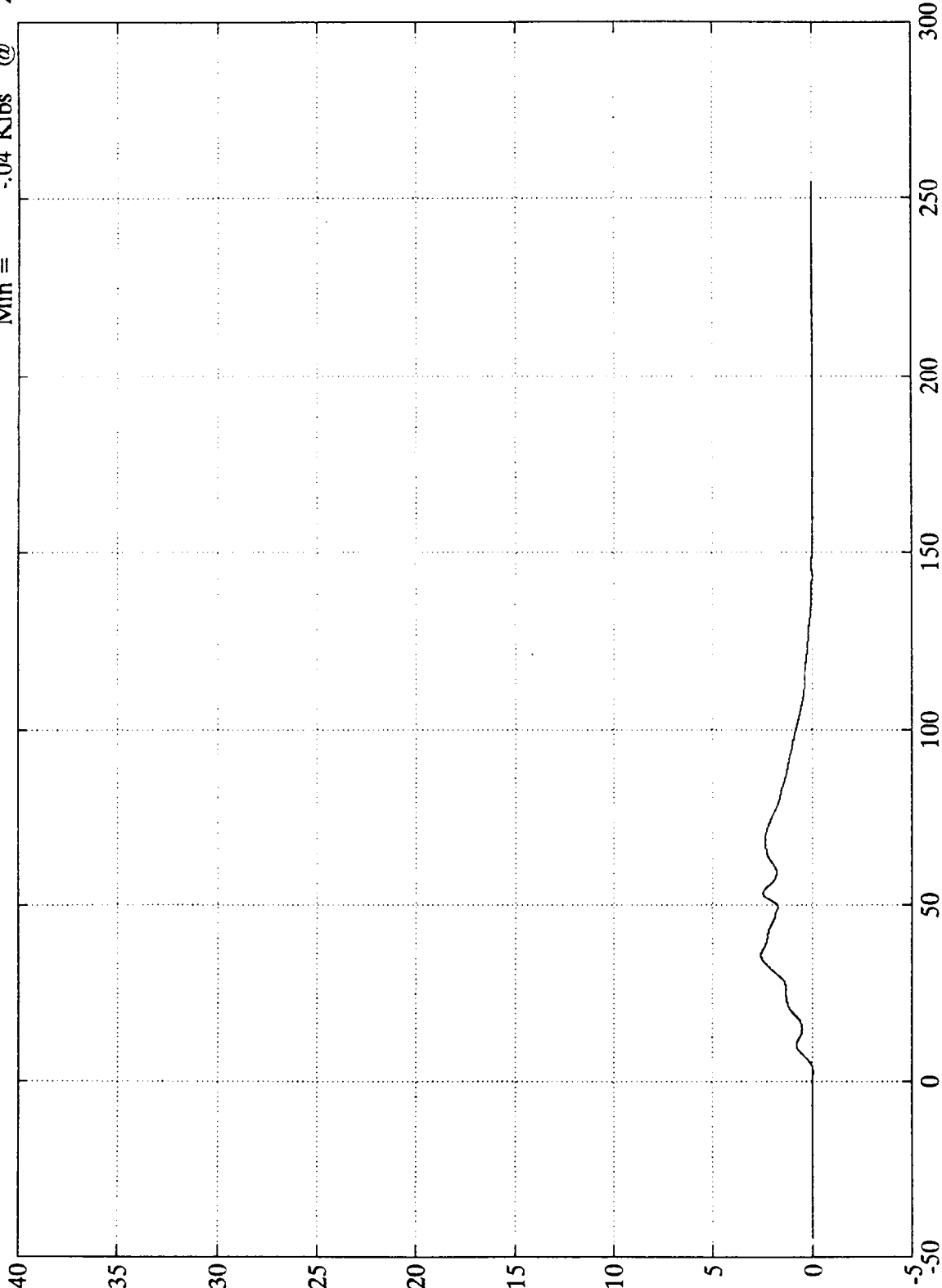
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 2.59 Klbs @ 36.00 msec
Min = -.04 Klbs @ 2.51 msec

Barrier Load Cell B2



Time (msec)

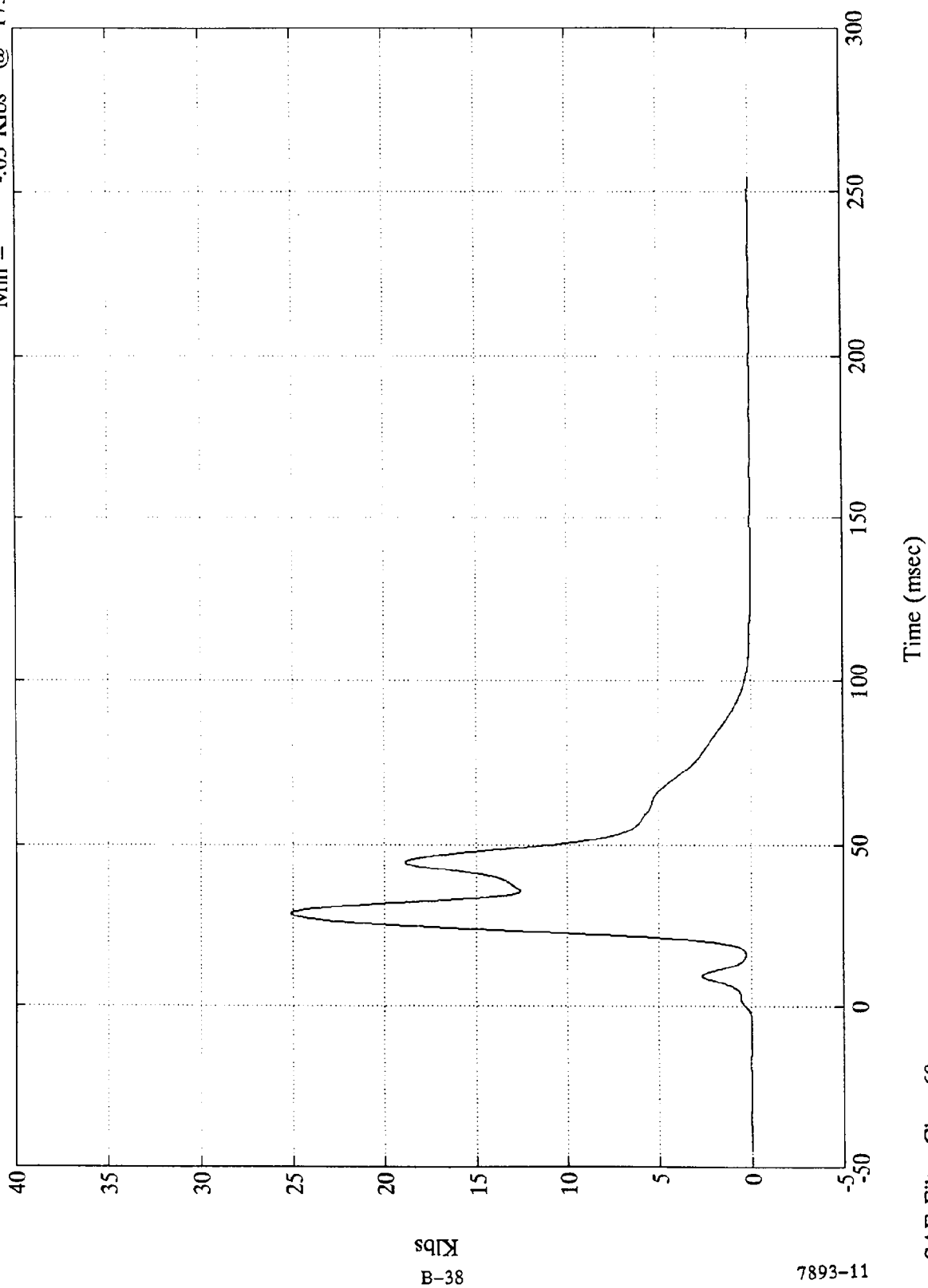
SAE Filter Class 60

B-37
Klbs

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell B4
Max = 25.11 Klbs @ 28.07 msec
Min = -.03 Klbs @ 173.88 msec



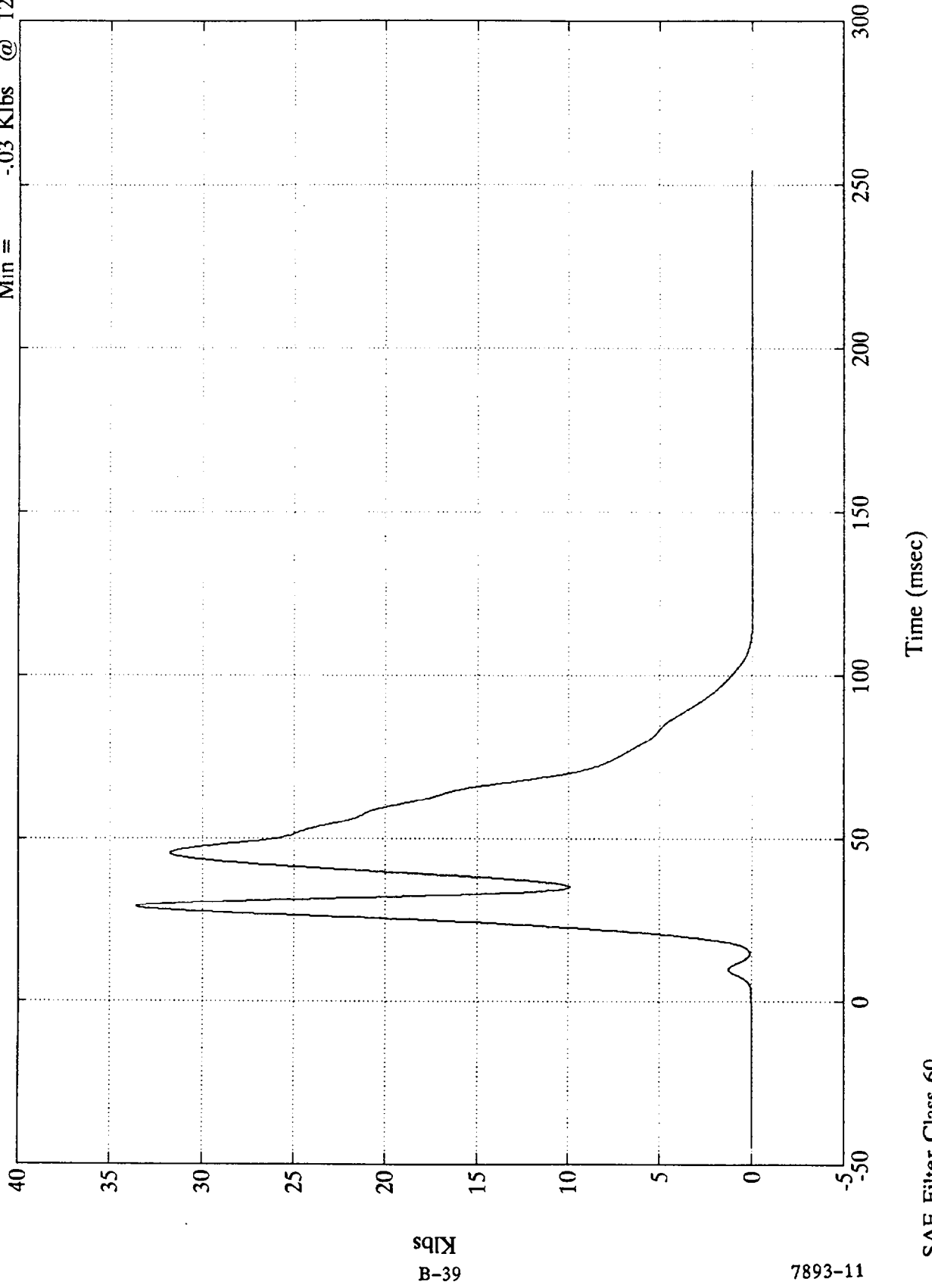
SAE Filter Class 60

7893-11

B-38
Klbs

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell B5
Max = 33.56 Klbs @ 28.92 msec
Min = -.03 Klbs @ 122.64 msec



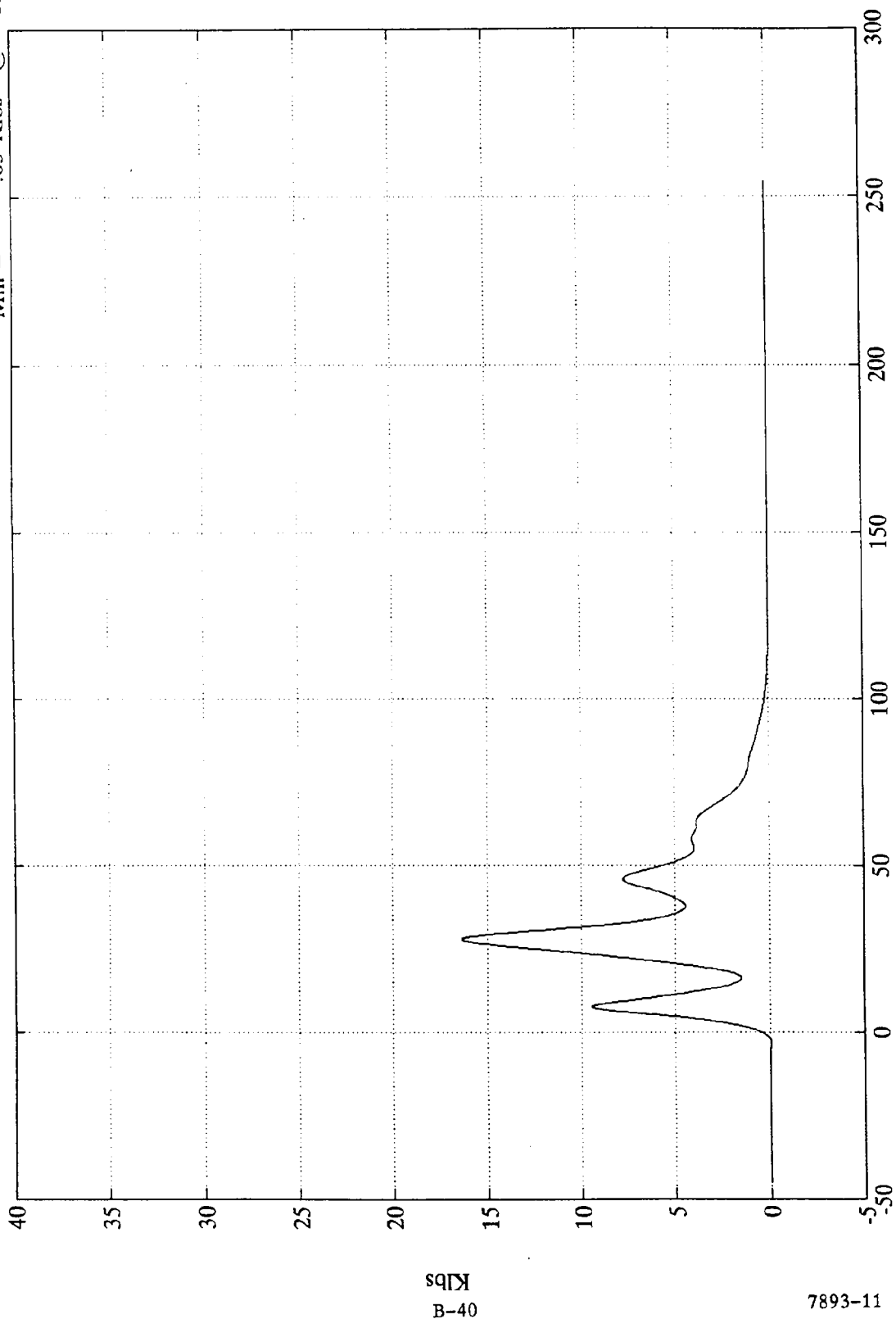
B-39

7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell B6
Max = 16.35 Klbs @ 27.84 msec
Min = -0.05 Klbs @ -3.48 msec



Time (msec)

SAE Filter Class 60

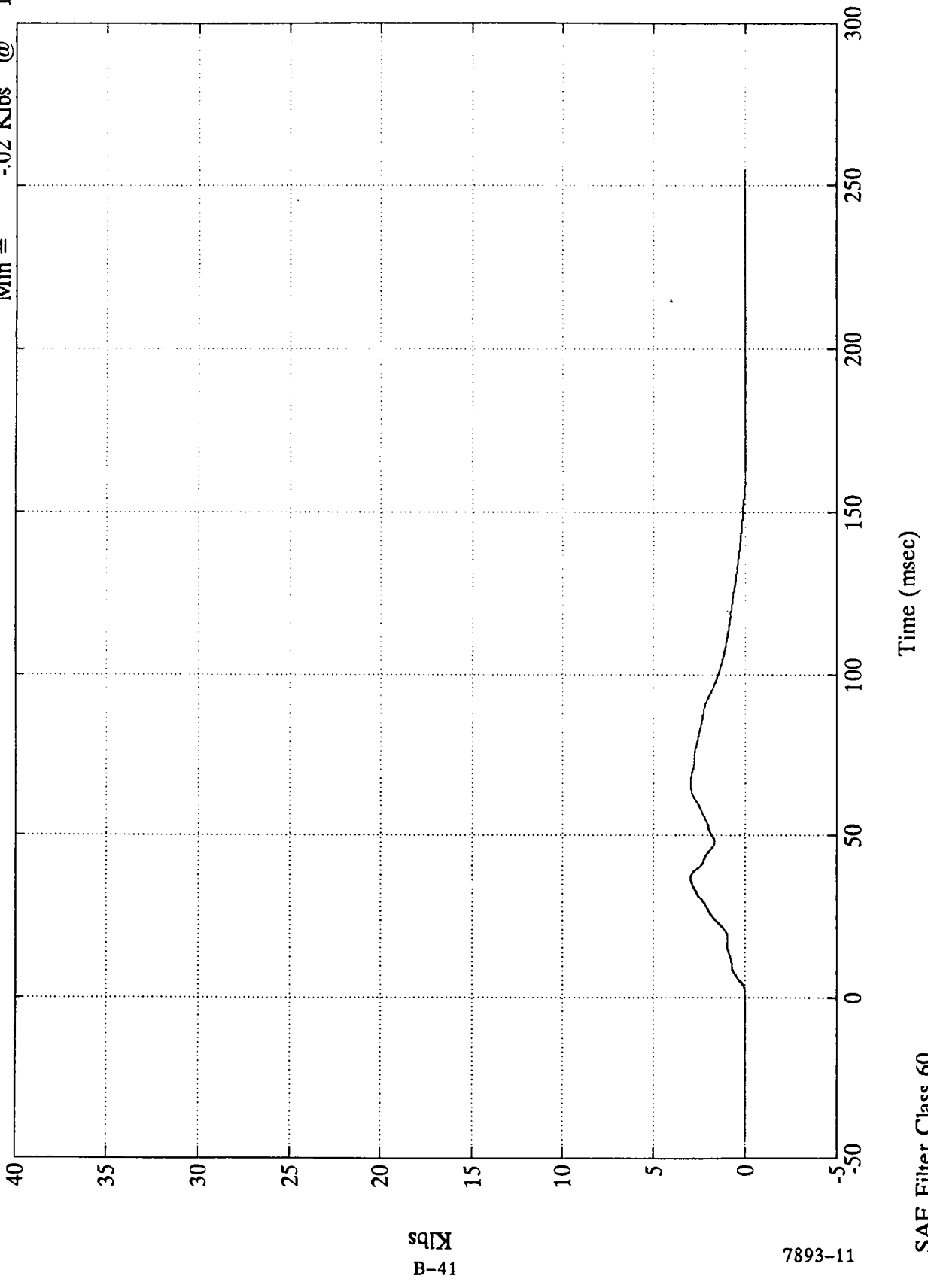
7893-11

B-40
Klbs

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell B8

Max = 2.95 Klbs @ 36.95 msec
Min = -.02 Klbs @ 1.19 msec



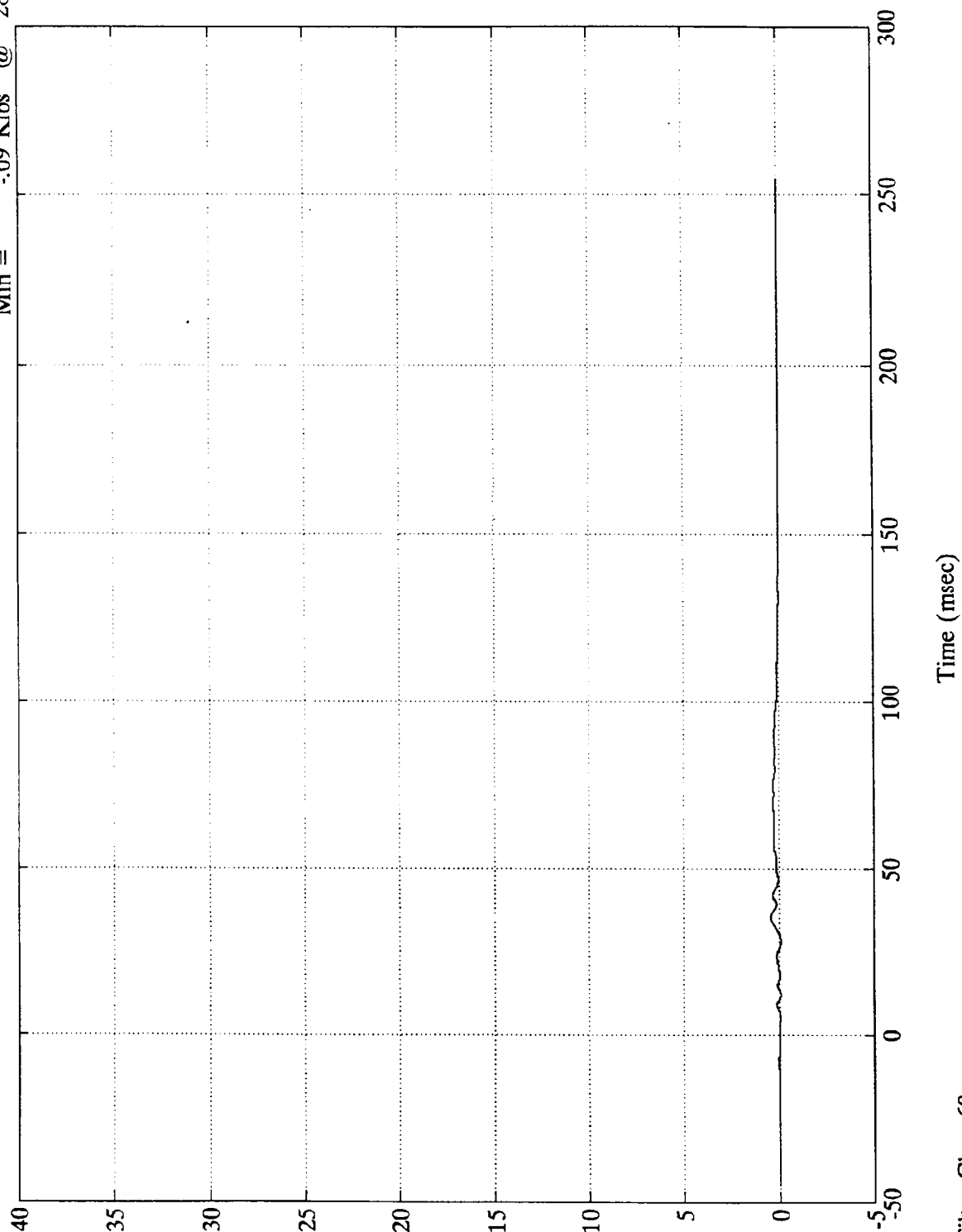
14-B
B-41

7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell B9
Max = .43 Klbs @ 35.27 msec
Min = -.09 Klbs @ 28.07 msec



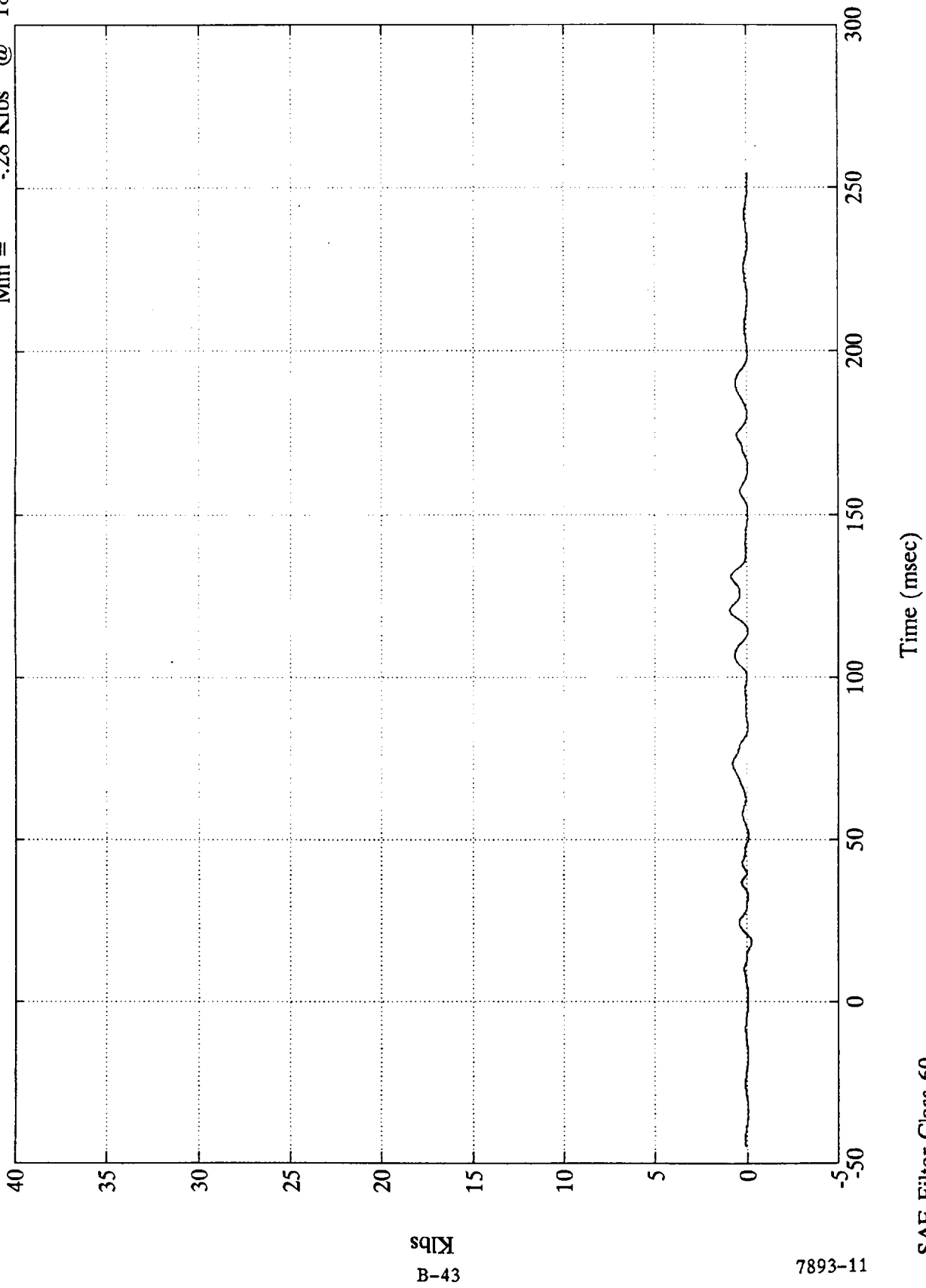
B-42

7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell C1
Max = .92 Klbs @ 120.59 msec
Min = -.28 Klbs @ 18.00 msec



B-43

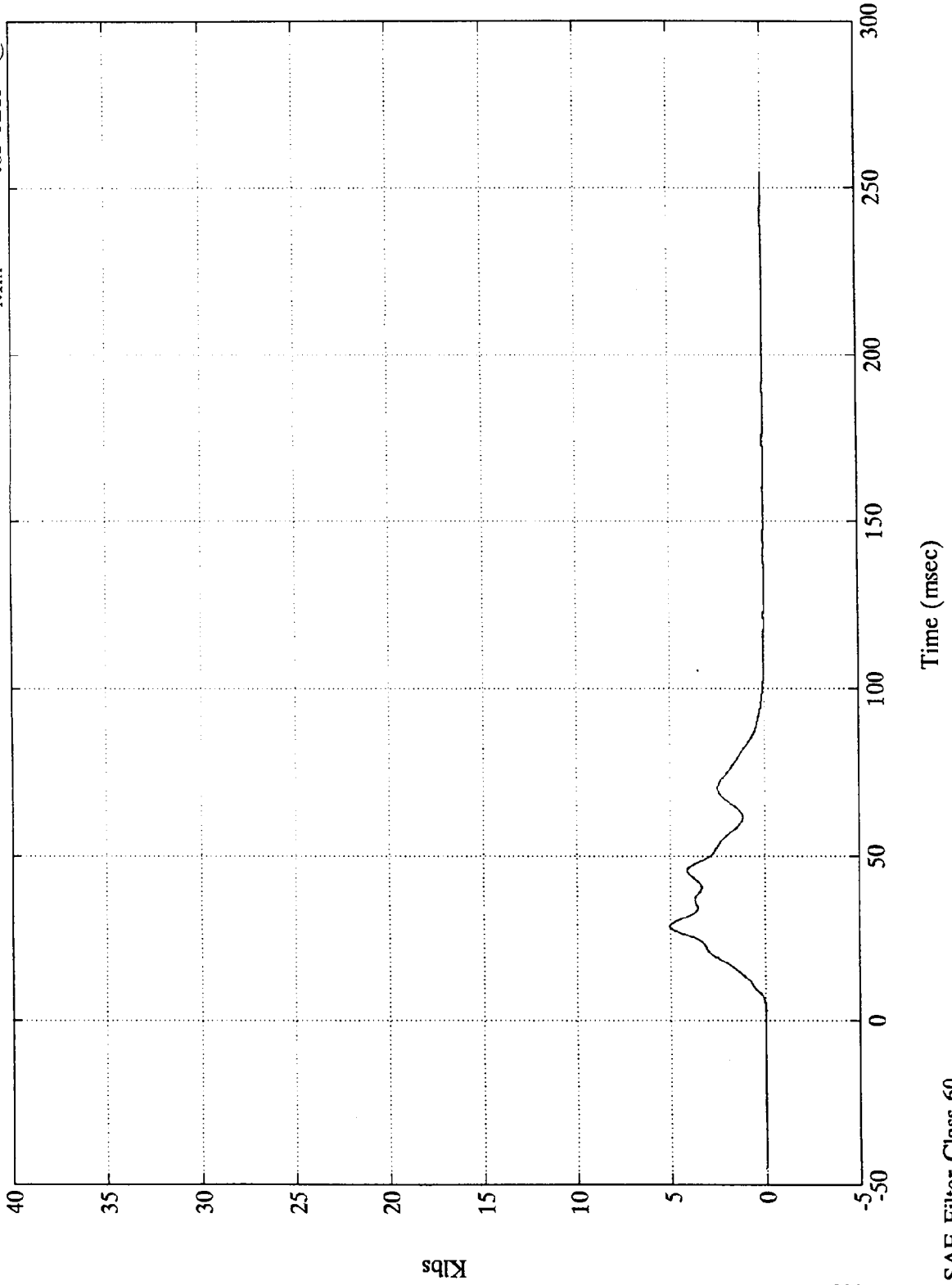
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 5.06 Klbs @ 28.79 msec
Min = -.03 Klbs @ 2.87 msec

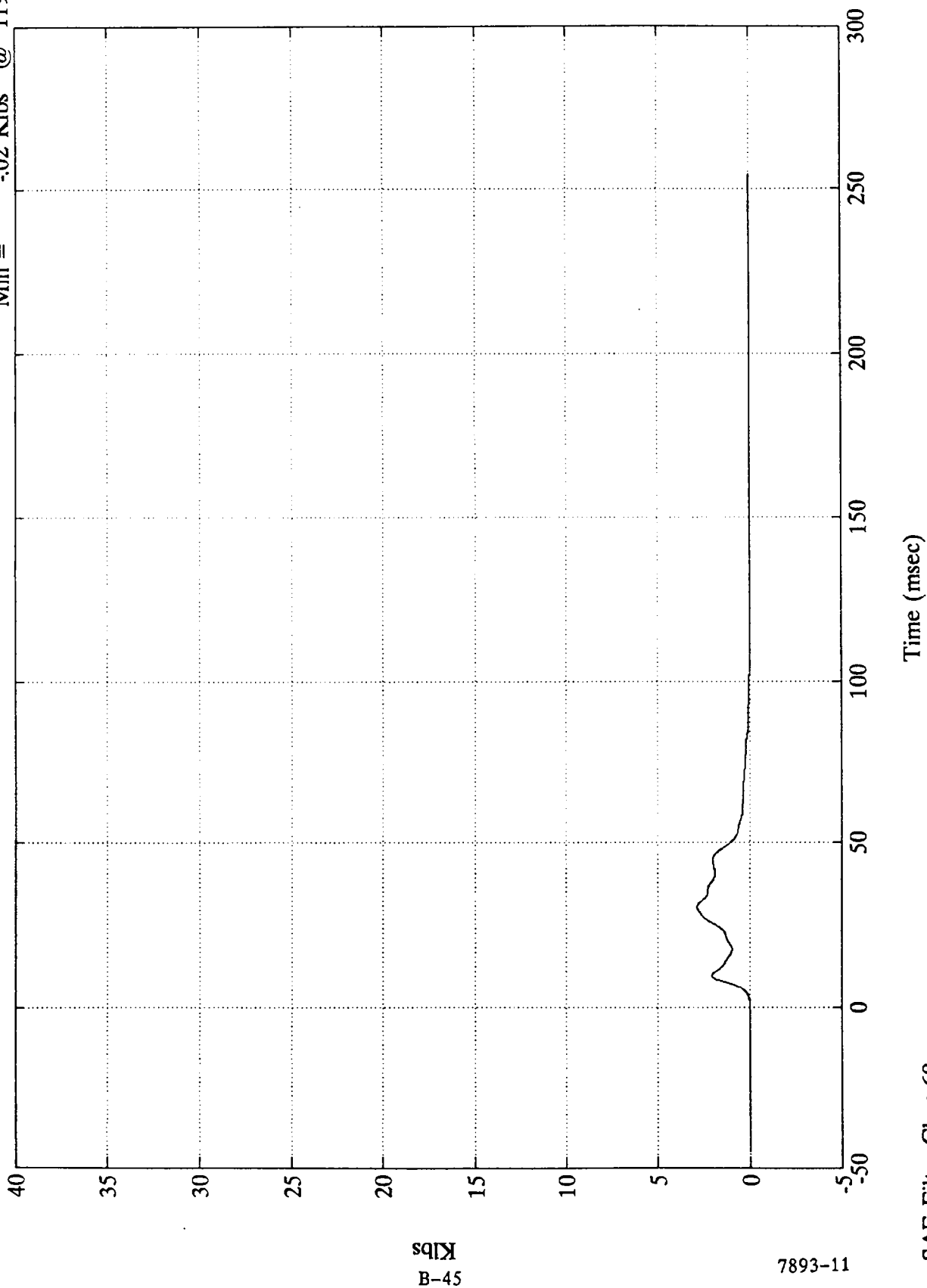
Barrier Load Cell C2



SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell C3
Max = 2.84 Klbs @ 30.36 msec
Min = -.02 Klbs @ 119.16 msec



B-45

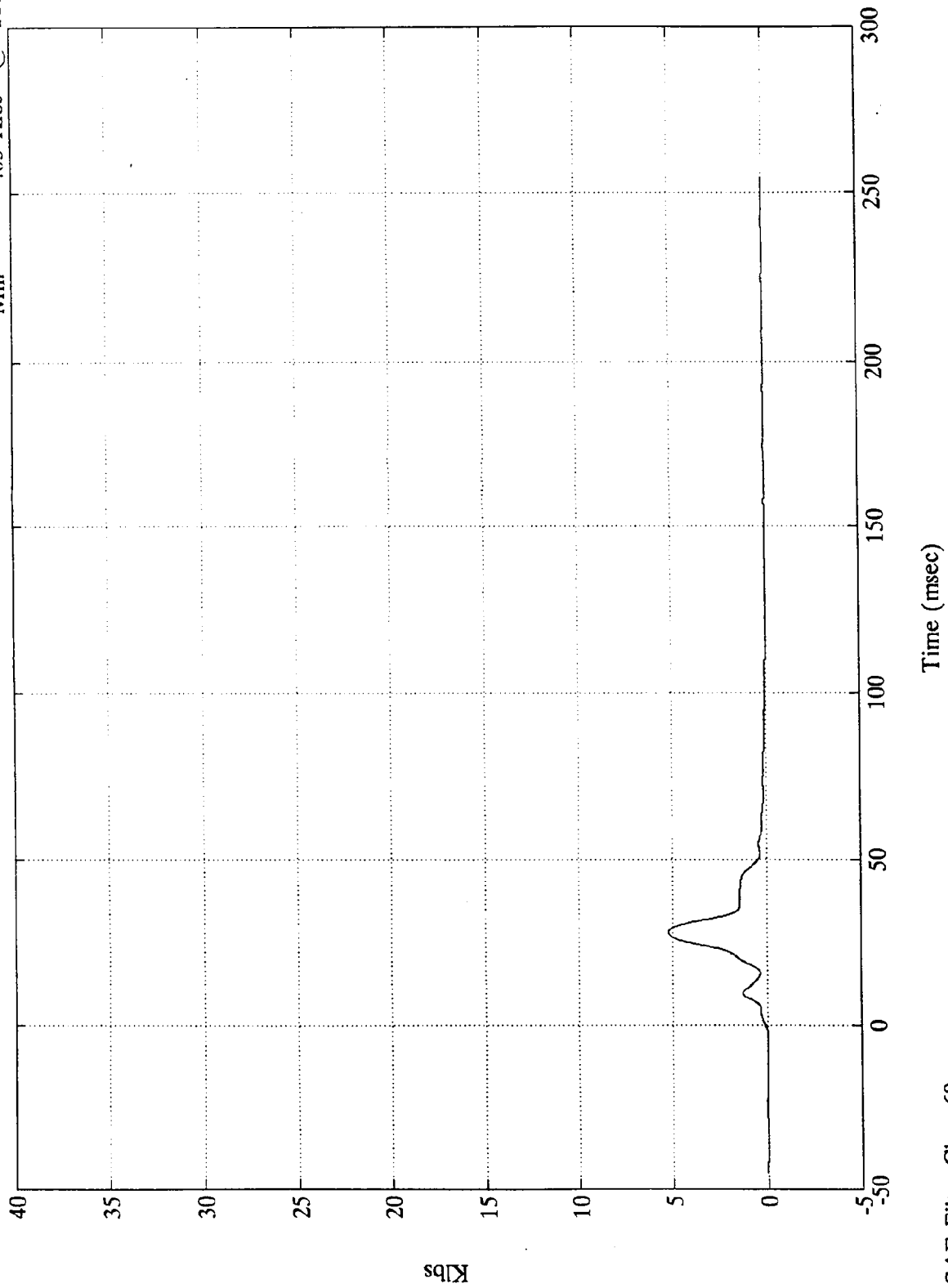
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell C4

Max = 5.22 Klbs @ 28.20 msec
Min = -.03 Klbs @ 118.80 msec



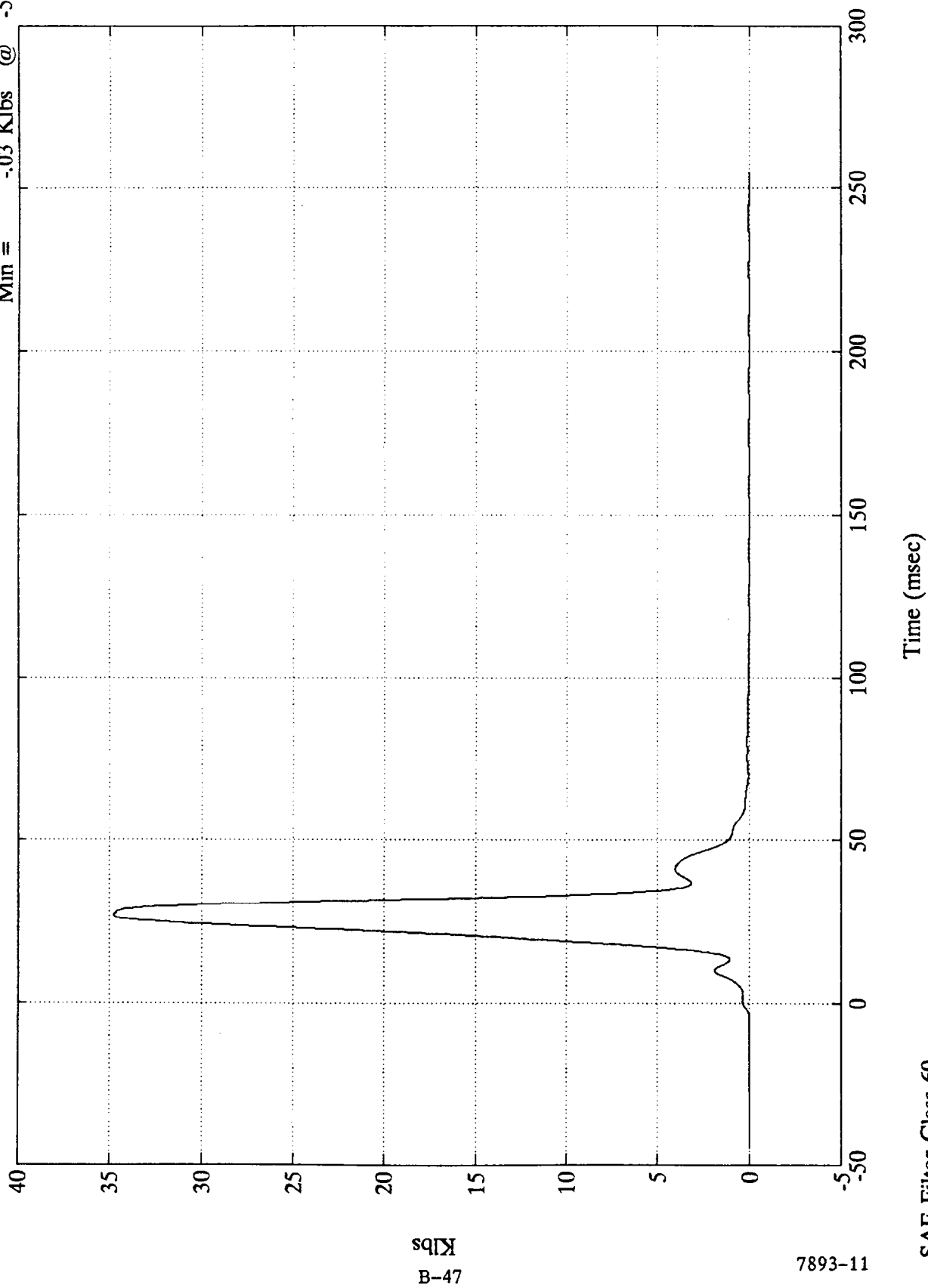
B-46

7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell C5
Max = 34.79 Klbs @ 26.63 msec
Min = -.03 Klbs @ -5.88 msec



B-47
Klbs

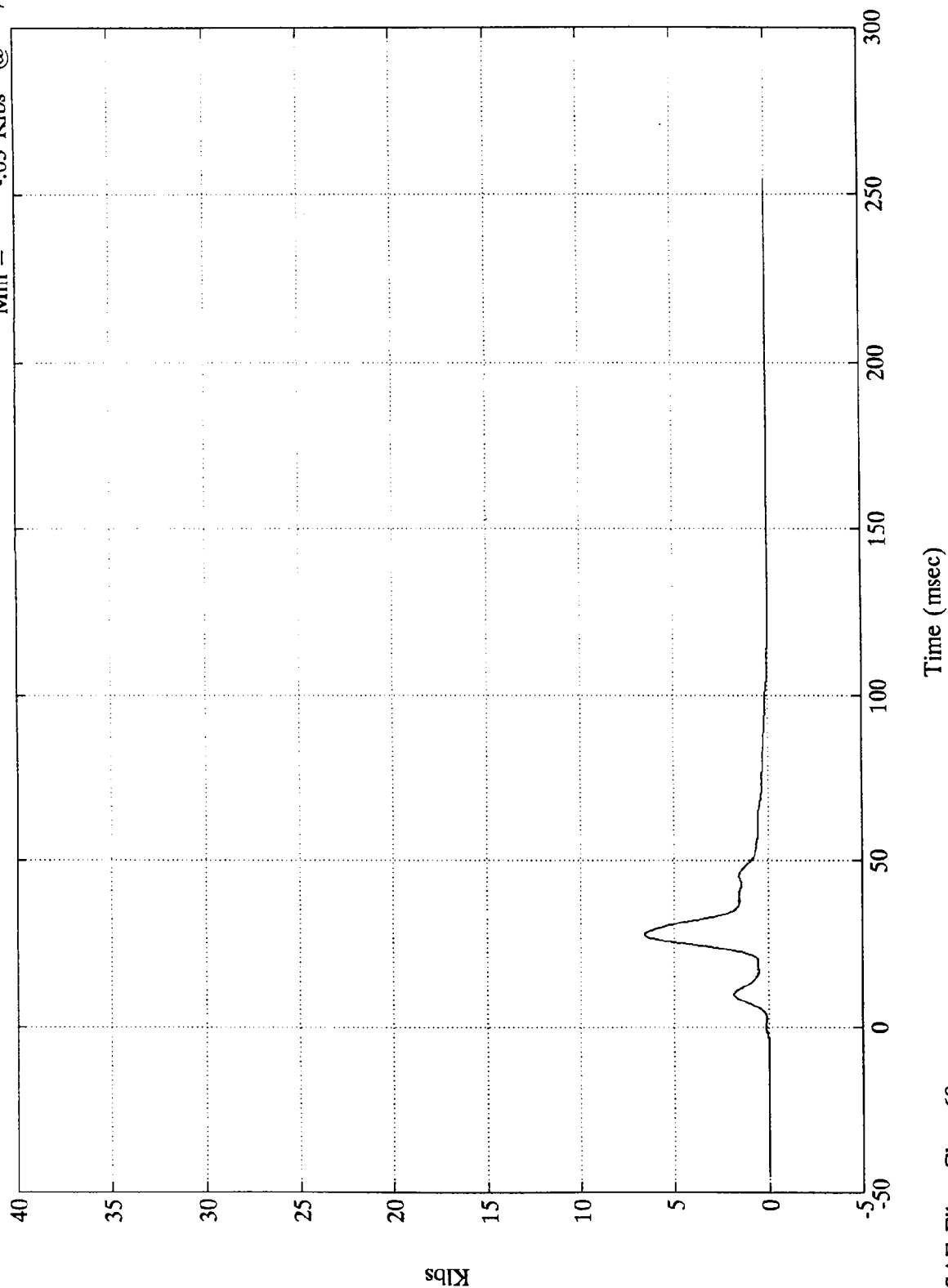
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell C6

Max = 6.59 Klbs @ 27.60 msec
Min = -.03 Klbs @ -7.92 msec



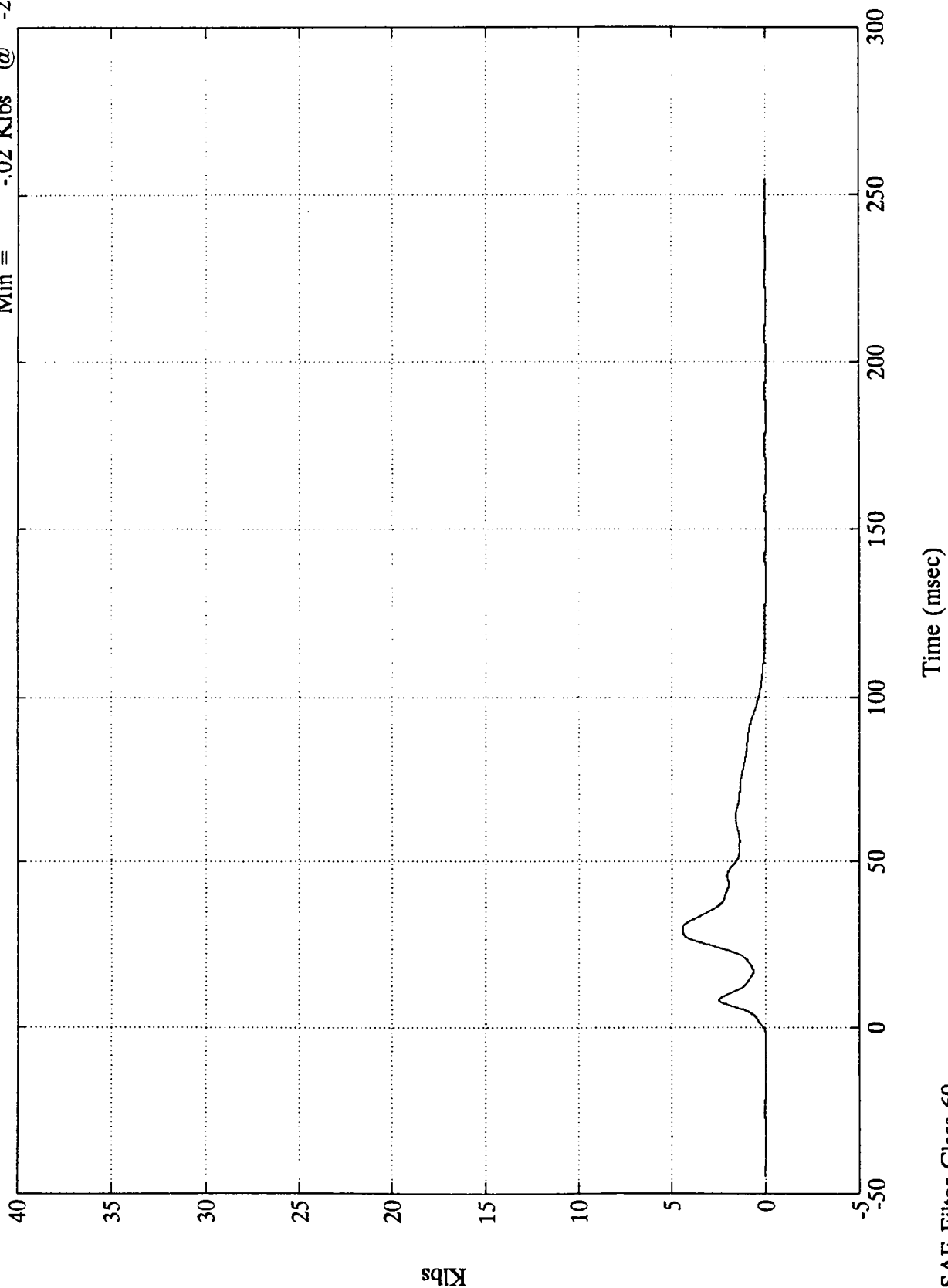
B-48

7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

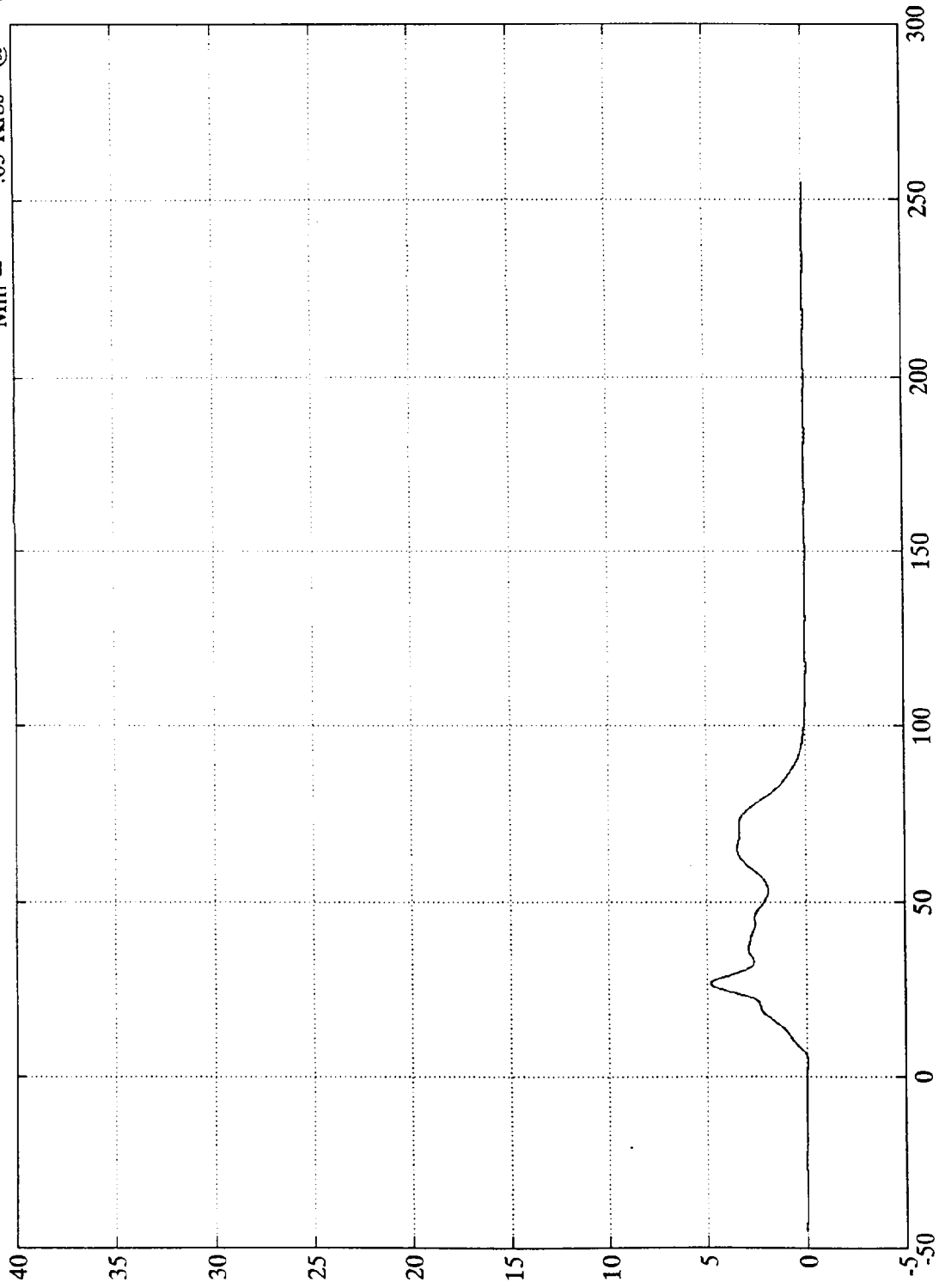
Barrier Load Cell C7
Max = 4.43 Klbs @ 30.00 msec
Min = -0.02 Klbs @ -2.88 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell C8

Max = 4.82 Klbs @ 26.75 msec
Min = -.05 Klbs @ 4.43 msec



Time (msec)

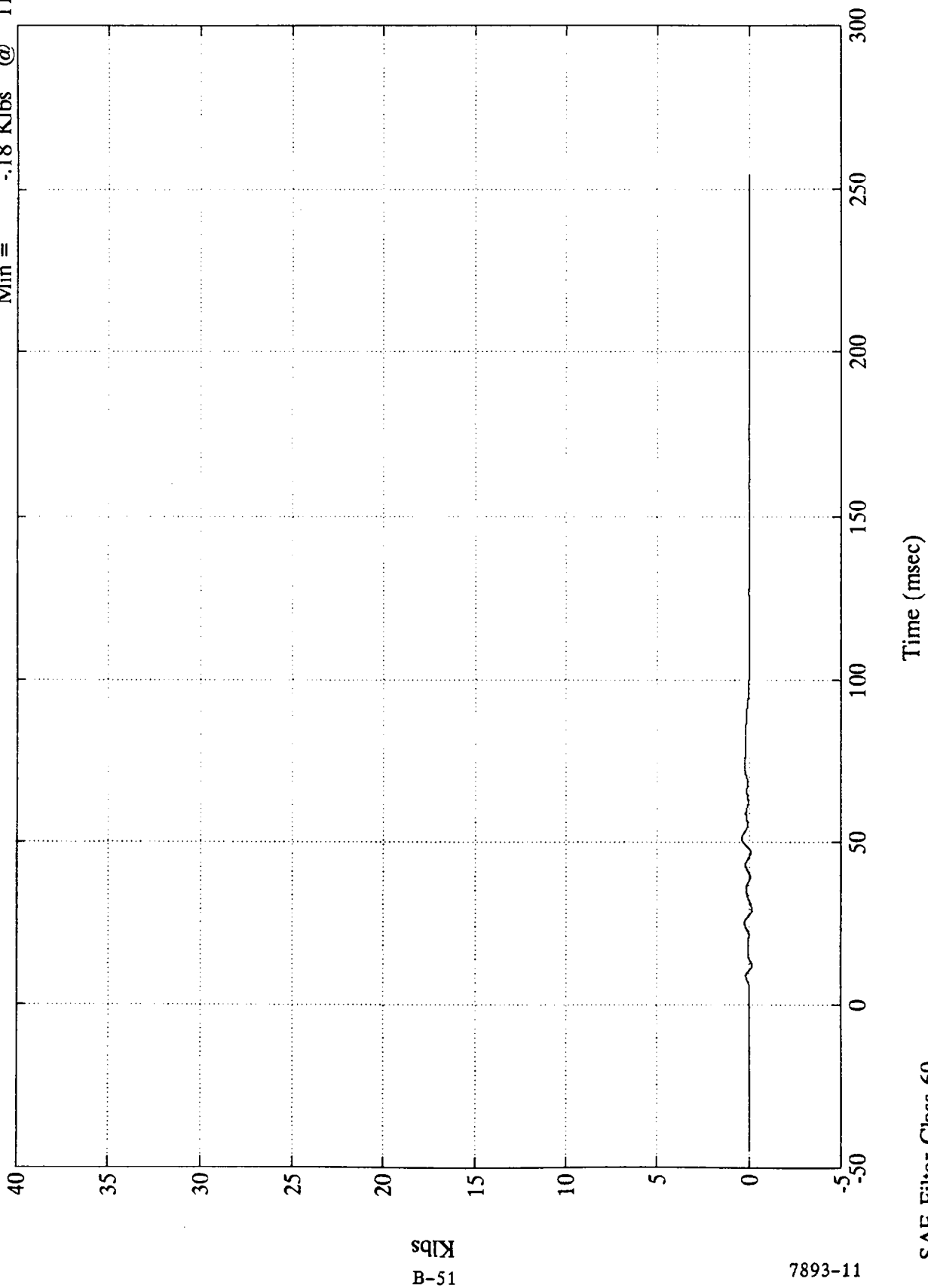
SAE Filter Class 60

B-50

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

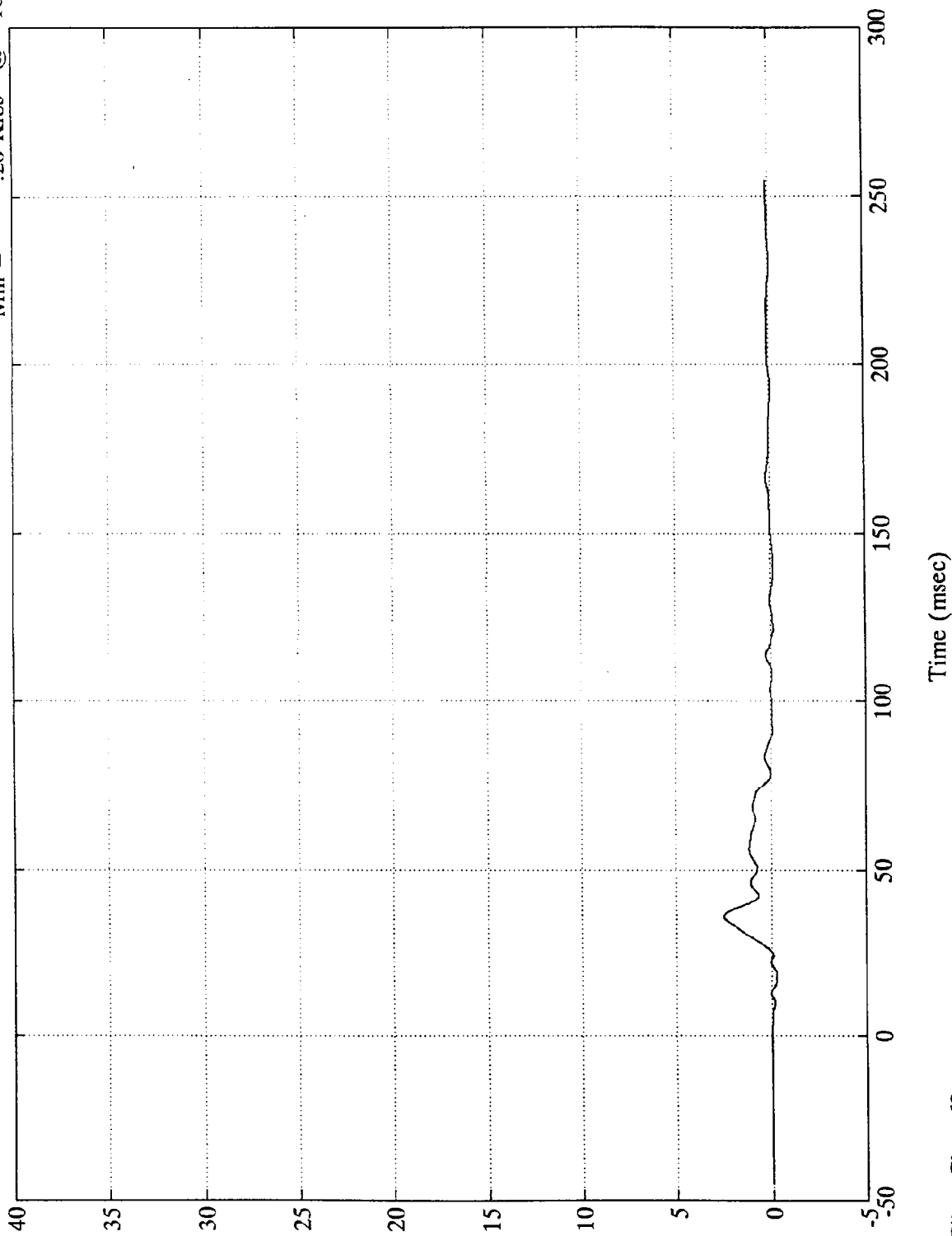
Barrier Load Cell C9
Max = .39 Klbs @ 51.24 msec
Min = -.18 Klbs @ 11.87 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D1

Max = 2.53 Klbs @ 35.88 msec
Min = -2.6 Klbs @ 18.12 msec



B-52
Klbs

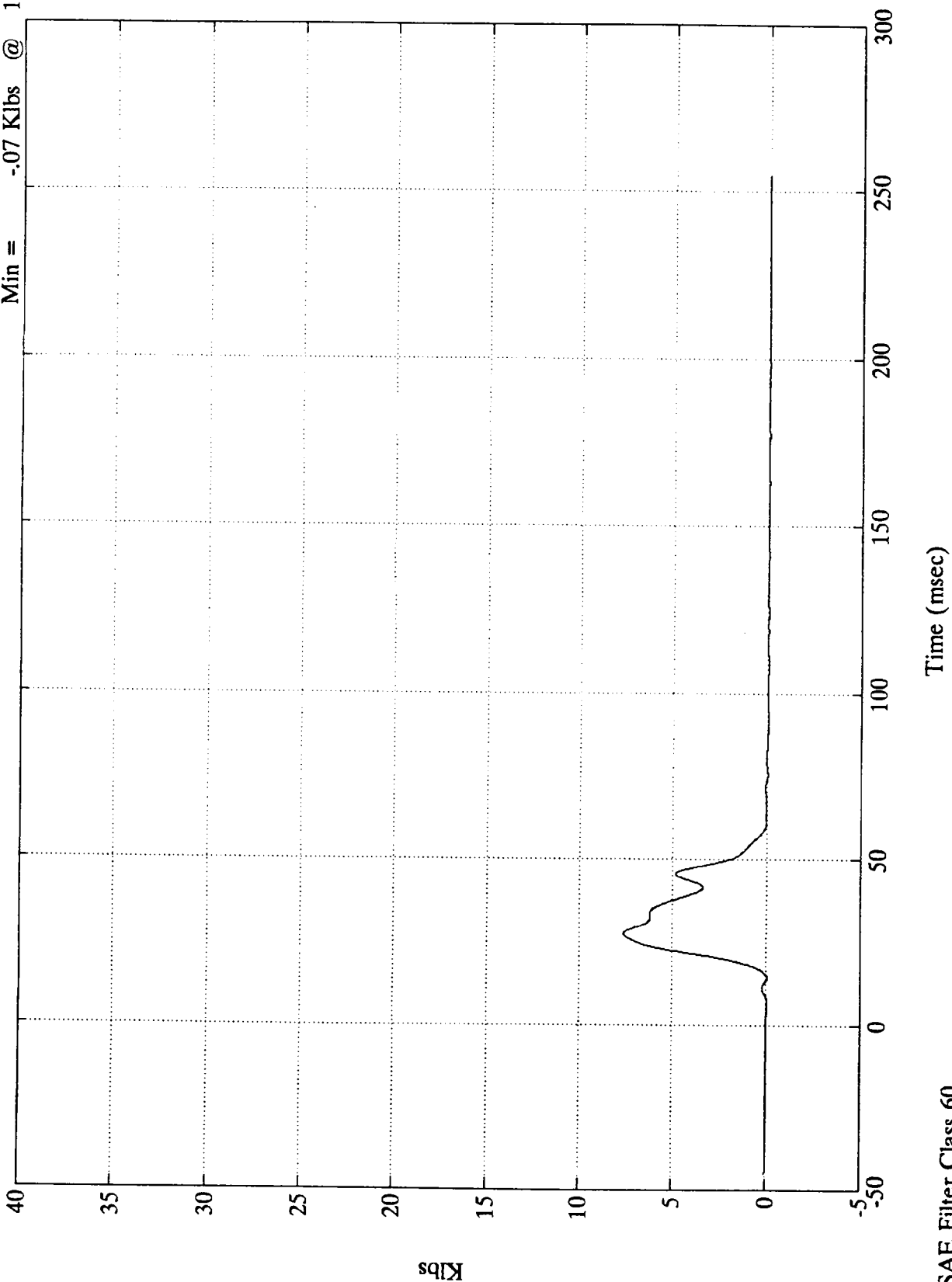
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D2

Max = 7.62 Klbs @ 27.72 msec
Min = -0.07 Klbs @ 14.51 msec



B-53

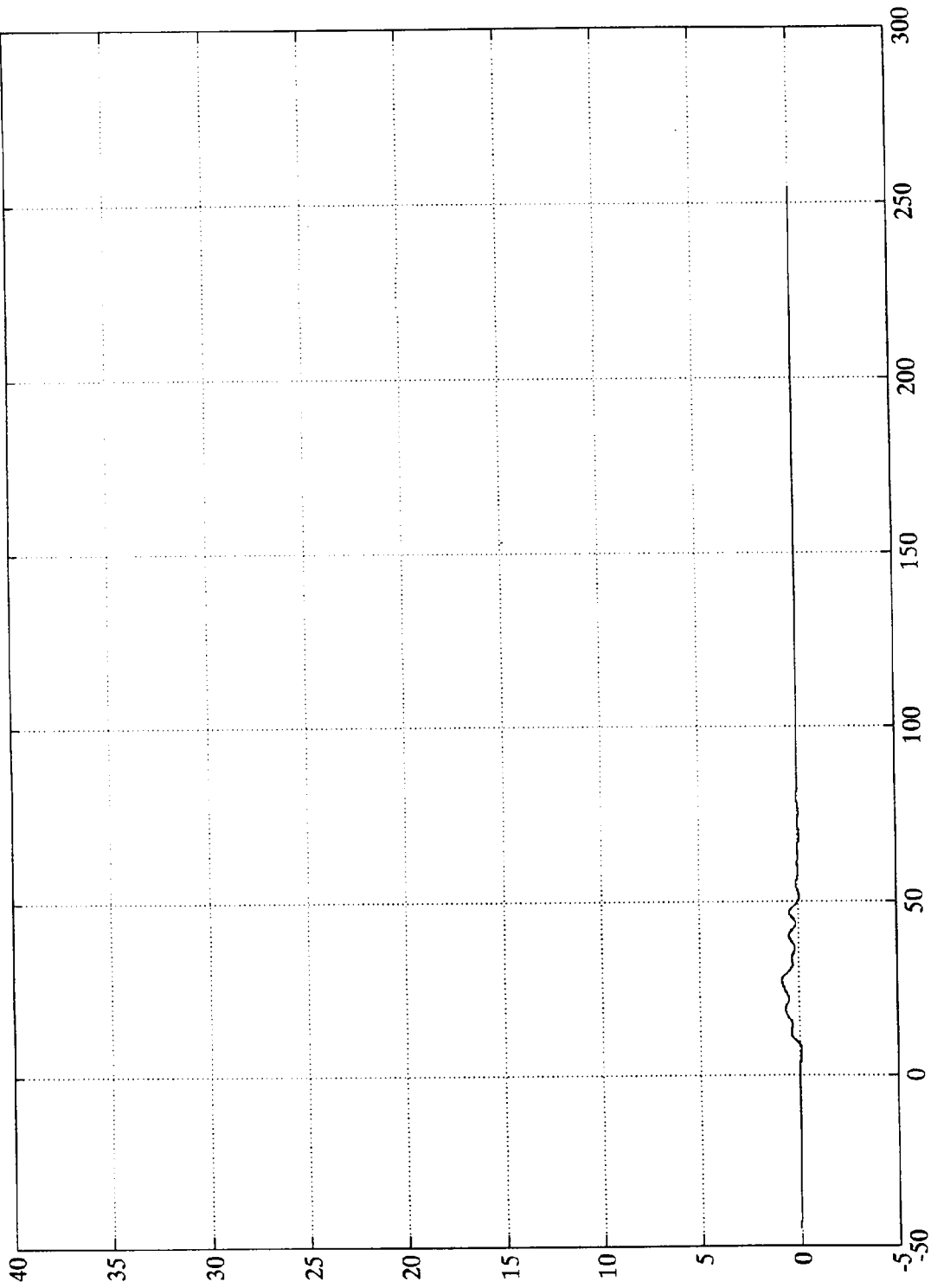
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = .85 Klbs @ 26.87 msec
Min = -1.10 Klbs @ 7.43 msec

Barrier Load Cell D3



B-54
Klbs

Time (msec)

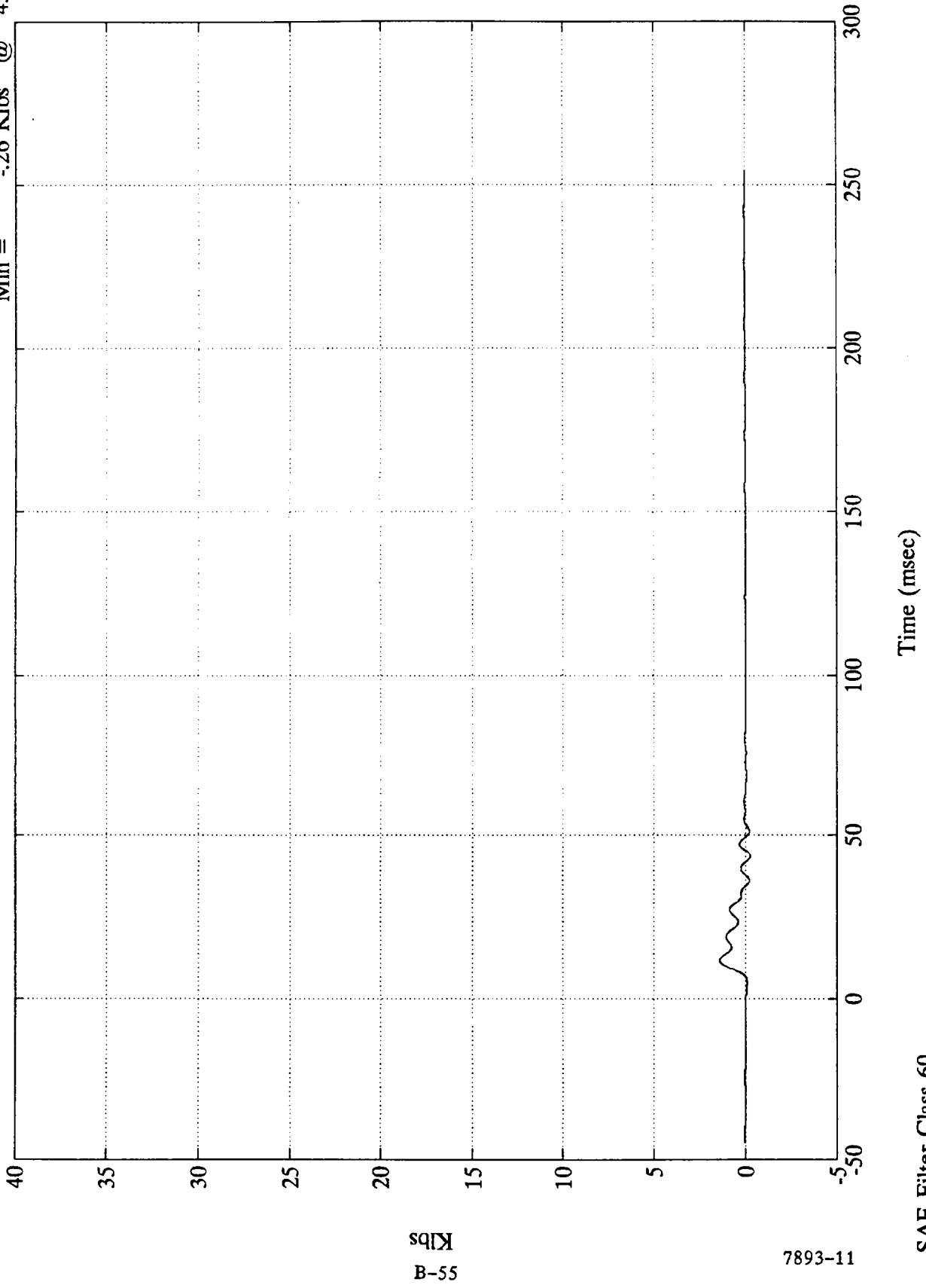
SAE Filter Class 60

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D4

Max = 1.39 Klbs @ 11.63 msec
Min = -.26 Klbs @ 43.68 msec



B-55
Klbs

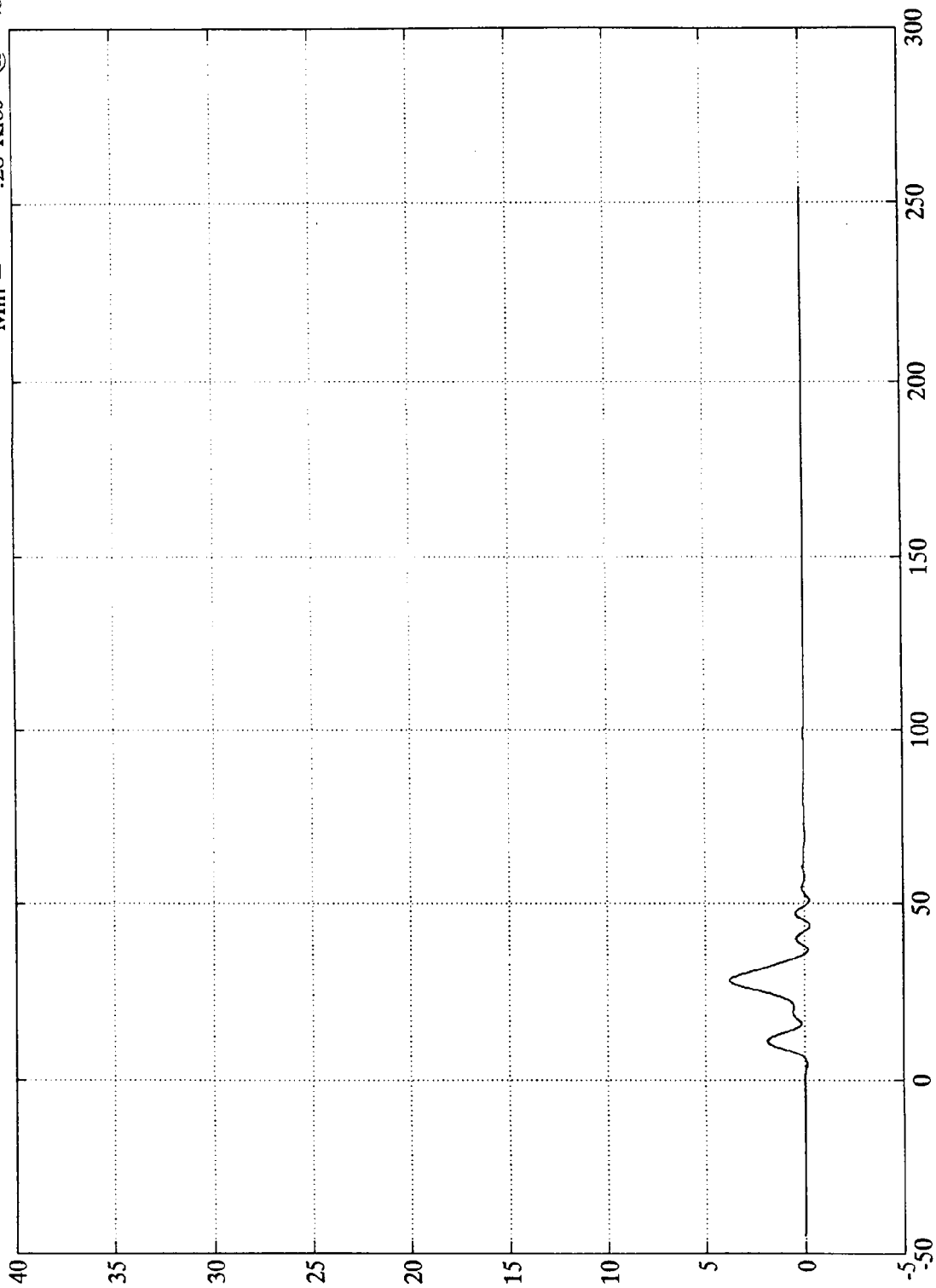
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D5

Max = 3.81 Klbs @ 27.72 msec
Min = -2.28 Klbs @ 43.56 msec



B-56
Klbs

7893-11

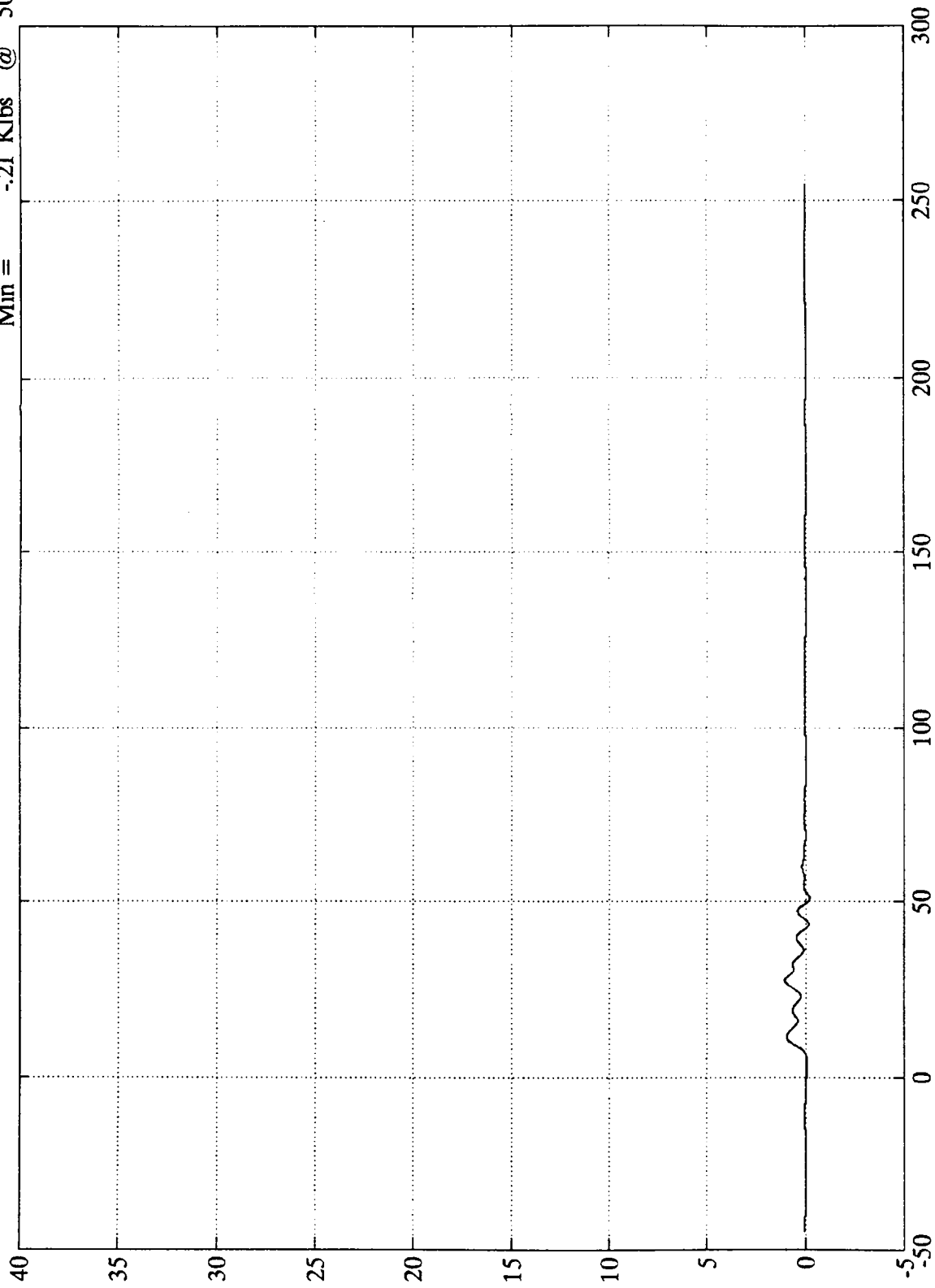
Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D6

Max = 1.03 Klbs @ 27.23 msec
Min = -.21 Klbs @ 50.88 msec



B-57

7893-11

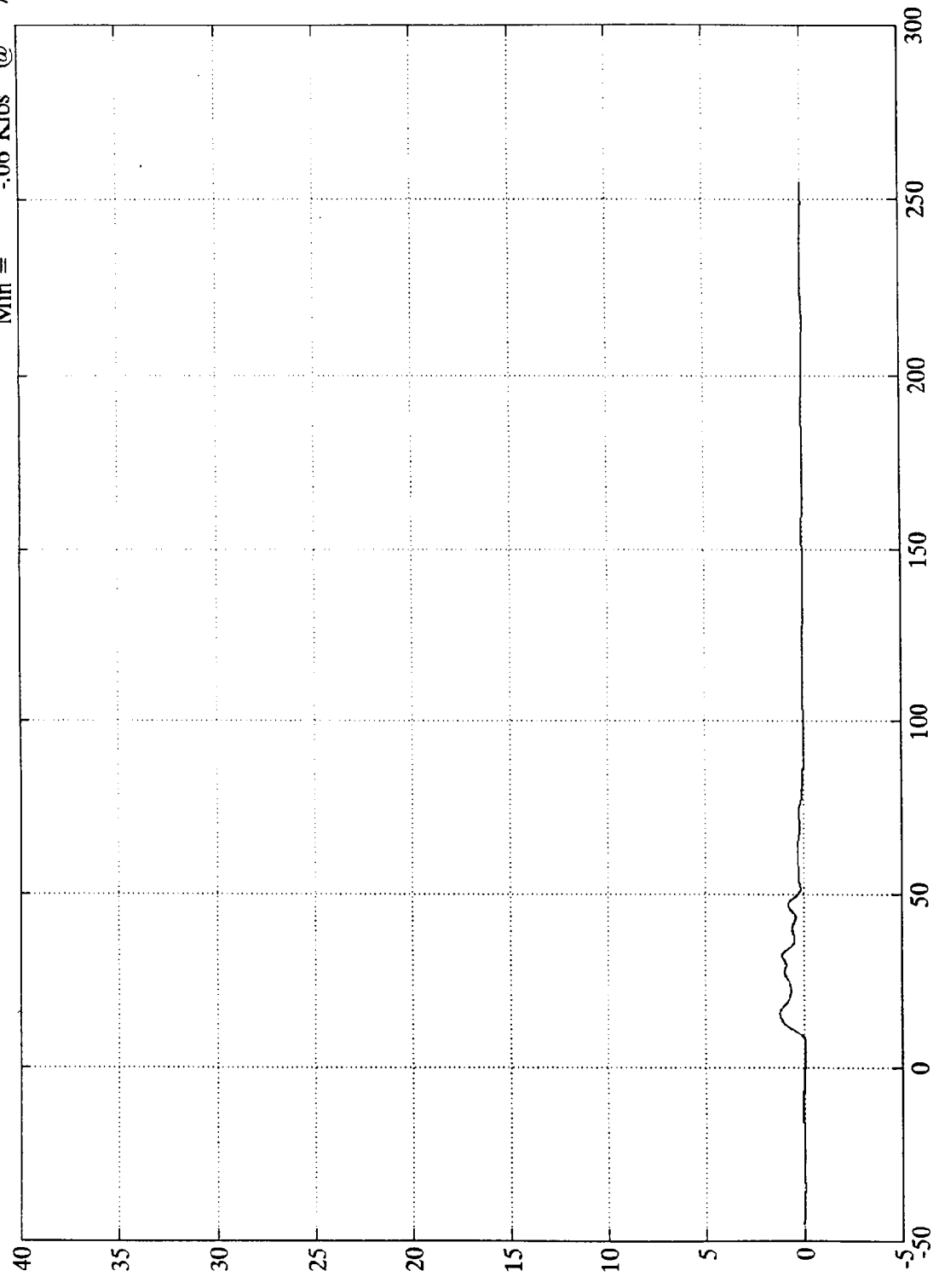
Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 1.22 Klbs @ 15.59 msec
Min = -0.06 Klbs @ 7.07 msec

Barrier Load Cell D7

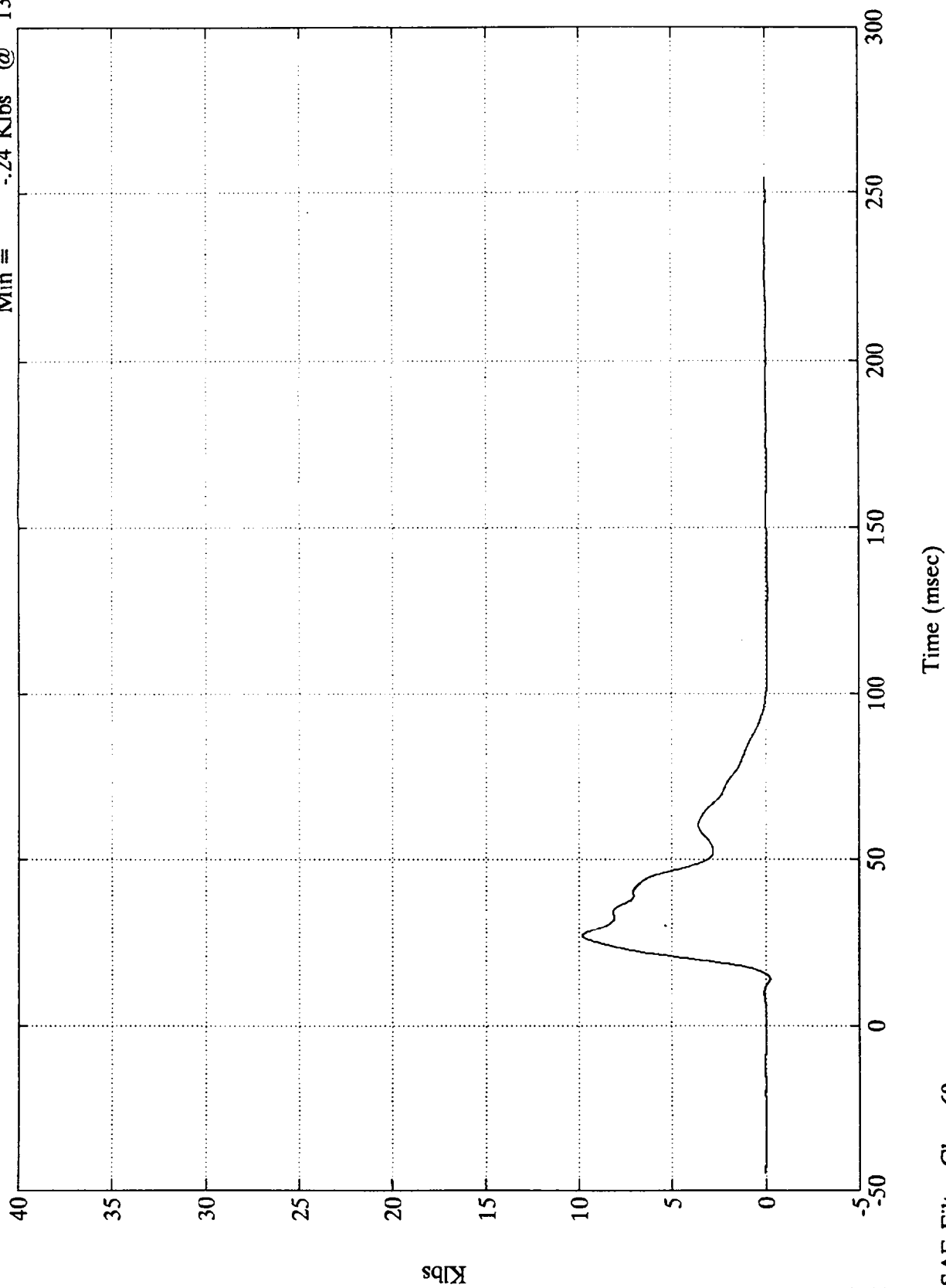


Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D8
Max = 9.81 Klbs @ 27.00 msec
Min = -.24 Klbs @ 13.91 msec



B-59
Klbs

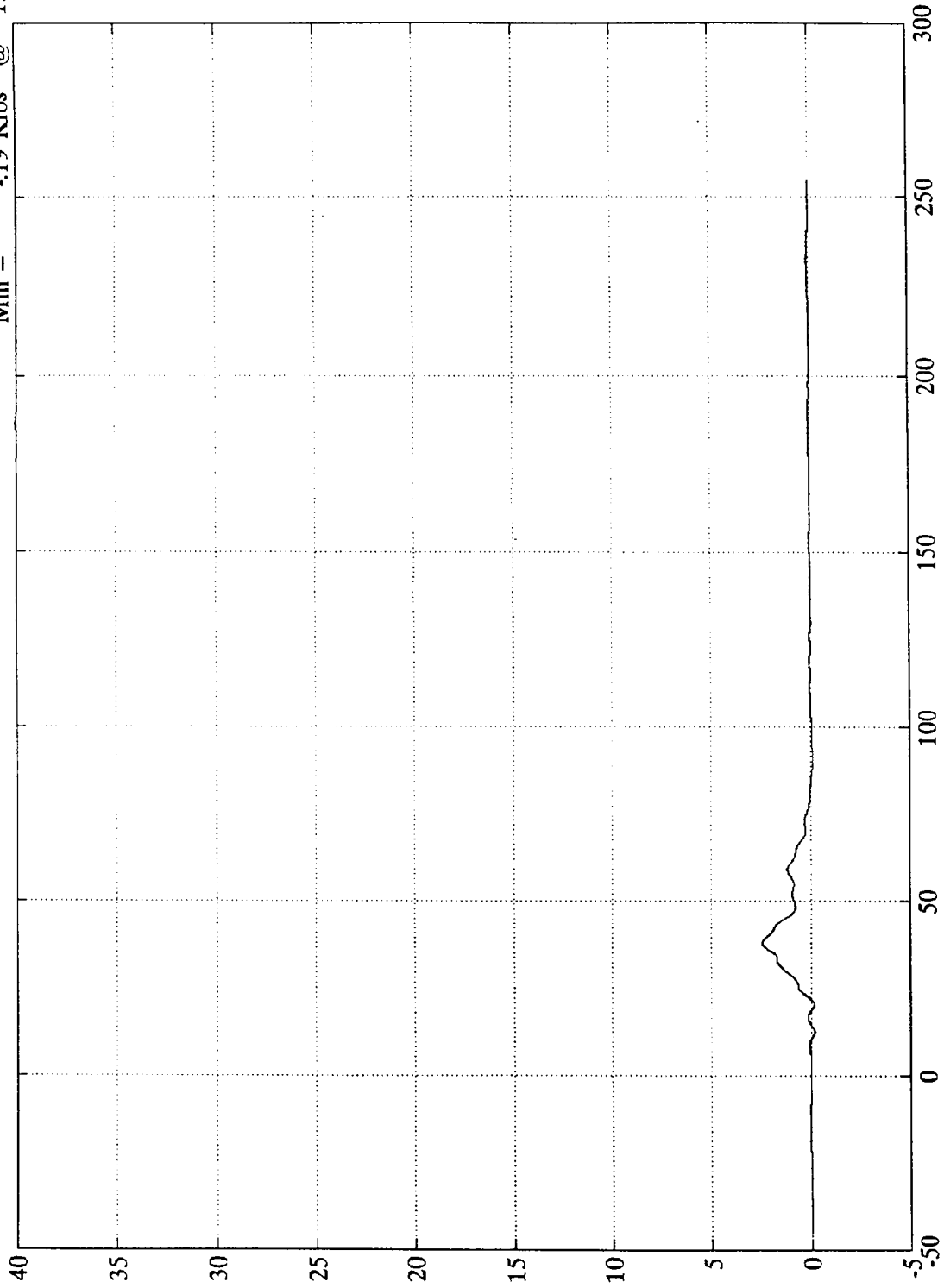
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Barrier Load Cell D9

Max = 2.45 Klbs @ 37.79 msec
Min = -1.19 Klbs @ 12.47 msec



Time (msec)

SAE Filter Class 60

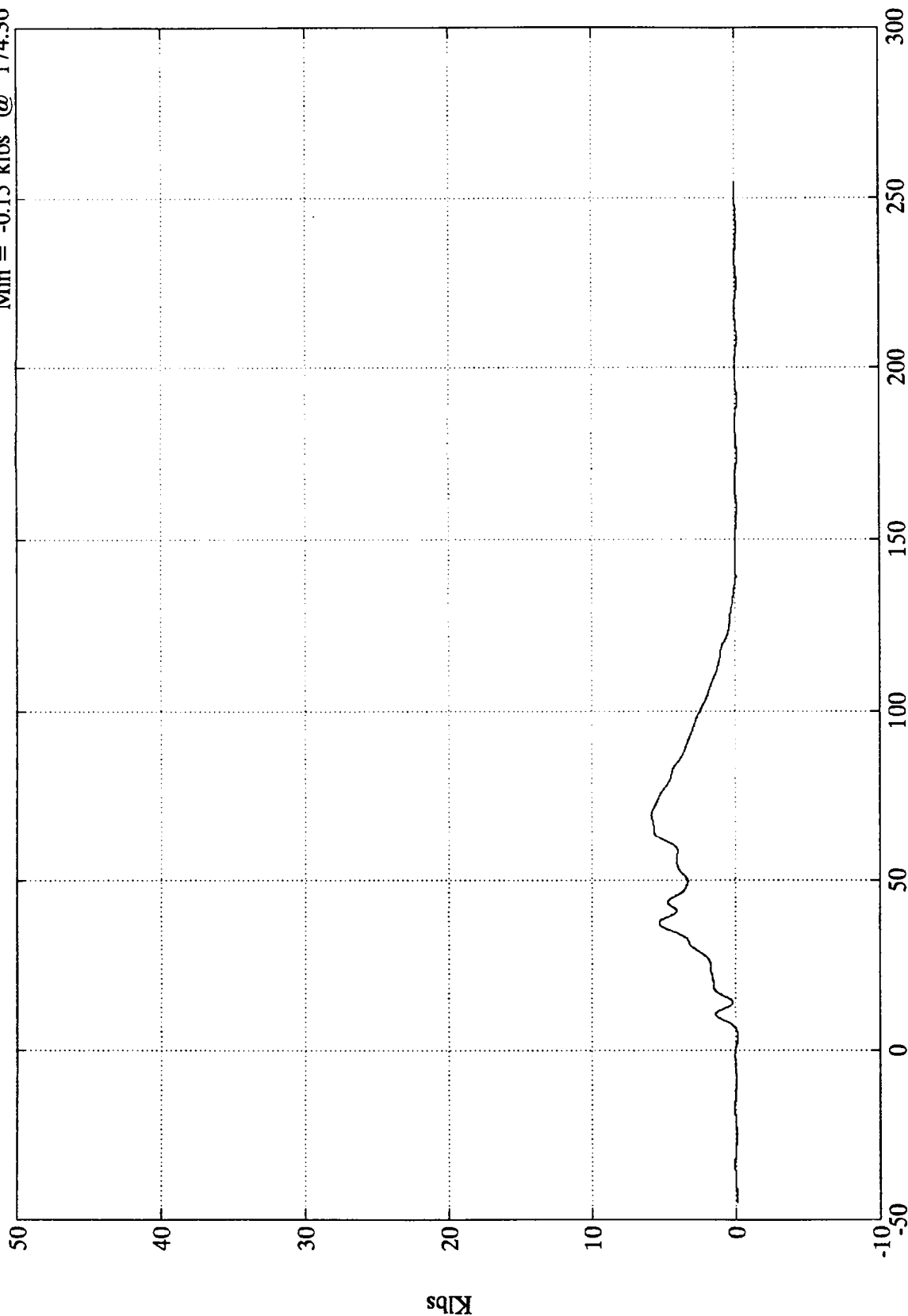
B-60

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Group 1 Load Cell Sum

Max = 5.88 klbs @ 69.60 msec
Min = -0.15 klbs @ 174.36 msec



Time (msec)

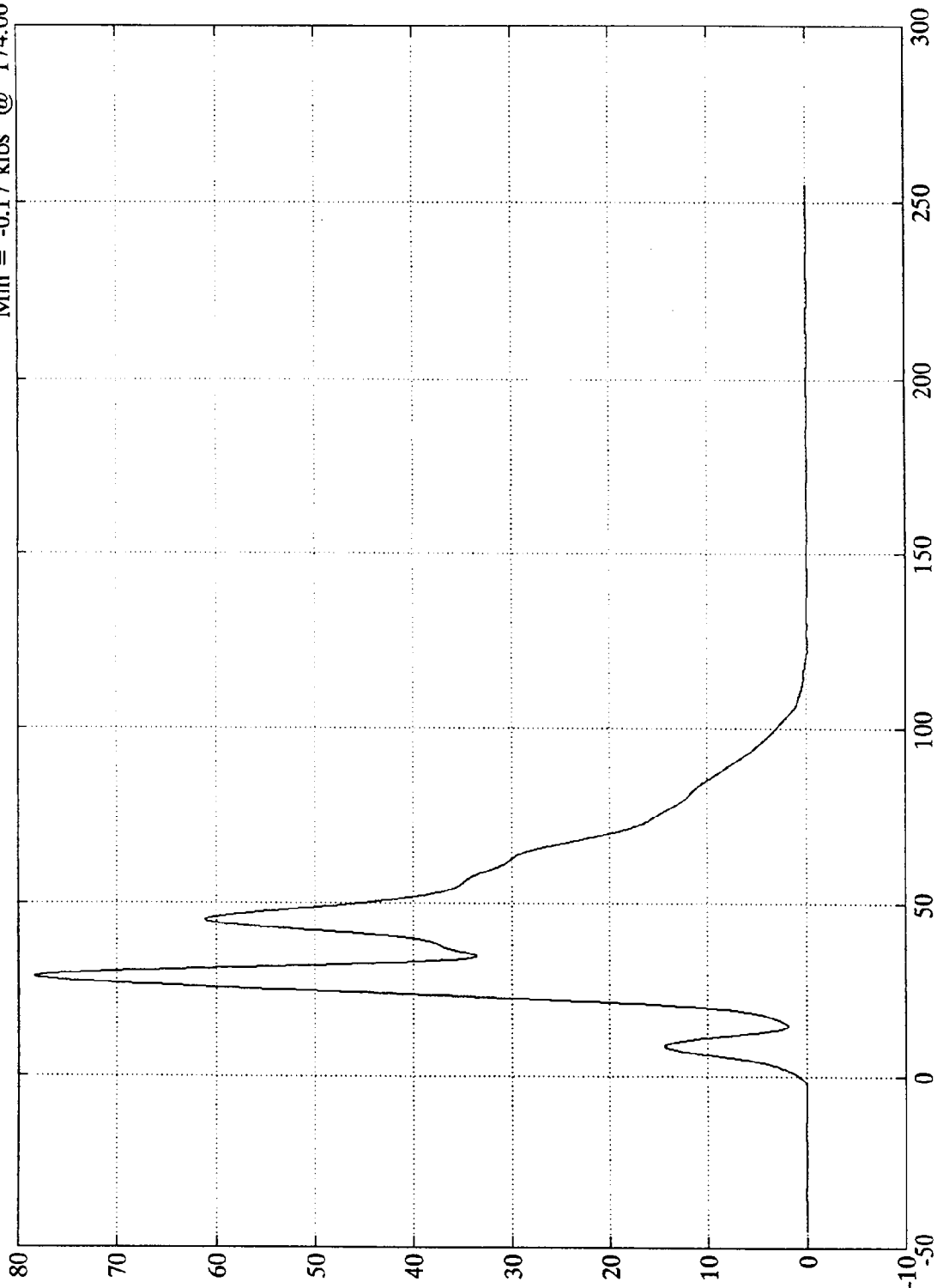
Load Cells (A1,A2,A3,B1,B2,B3)
Load Cell B3 was not included
in this load cell sum.

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Group 2 Load Cell Sum

Max = 78.26 klbs @ 28.68 msec
Min = -0.17 klbs @ 174.00 msec



Time (msec)

Load Cells (A4,A5,A6,B4,B5,B6)

SAE Filter Class 60

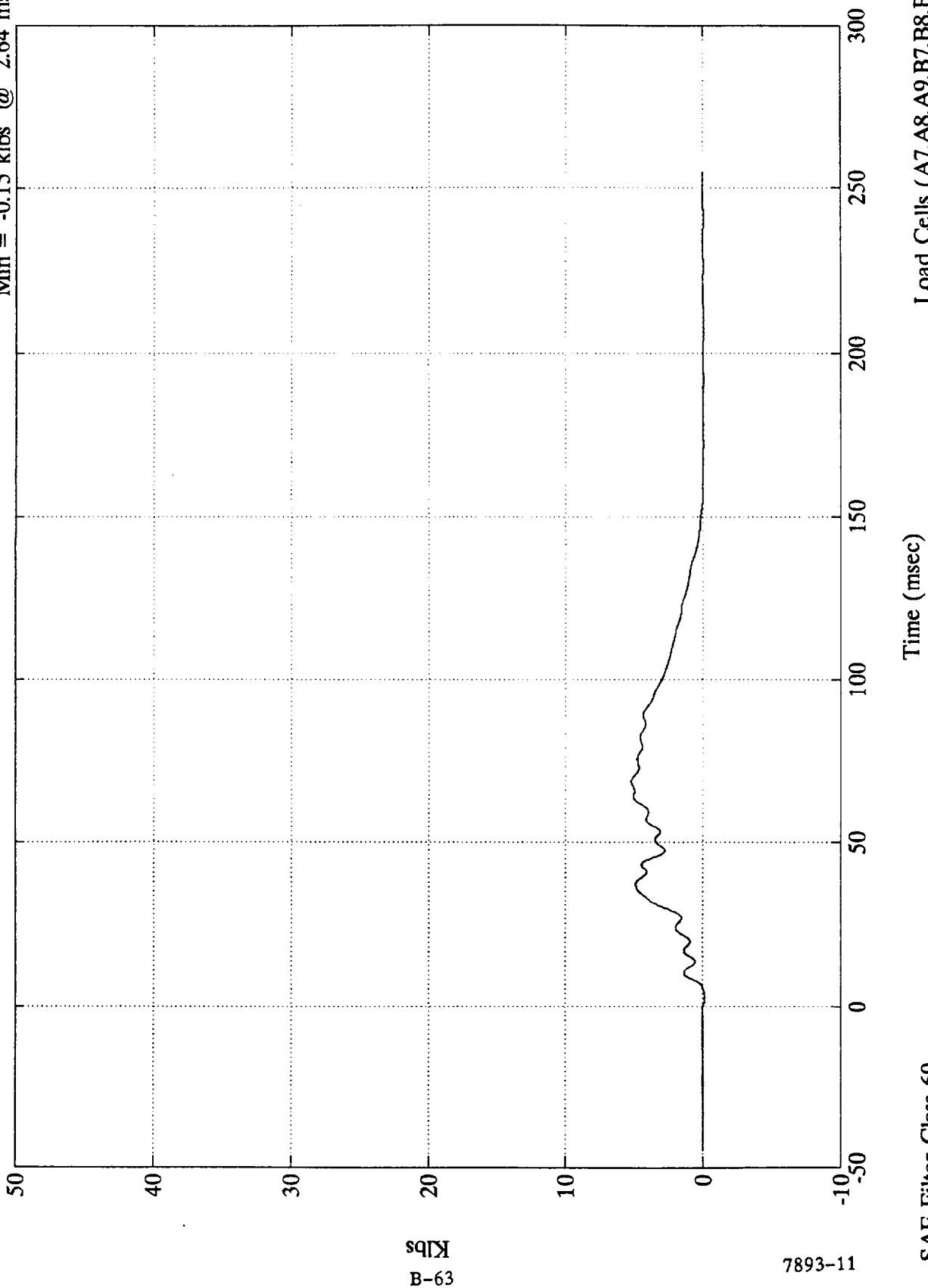
B-62

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Group 3 Load Cell Sum

Max = 5.22 klbs @ 68.76 msec
Min = -0.15 klbs @ 2.64 msec



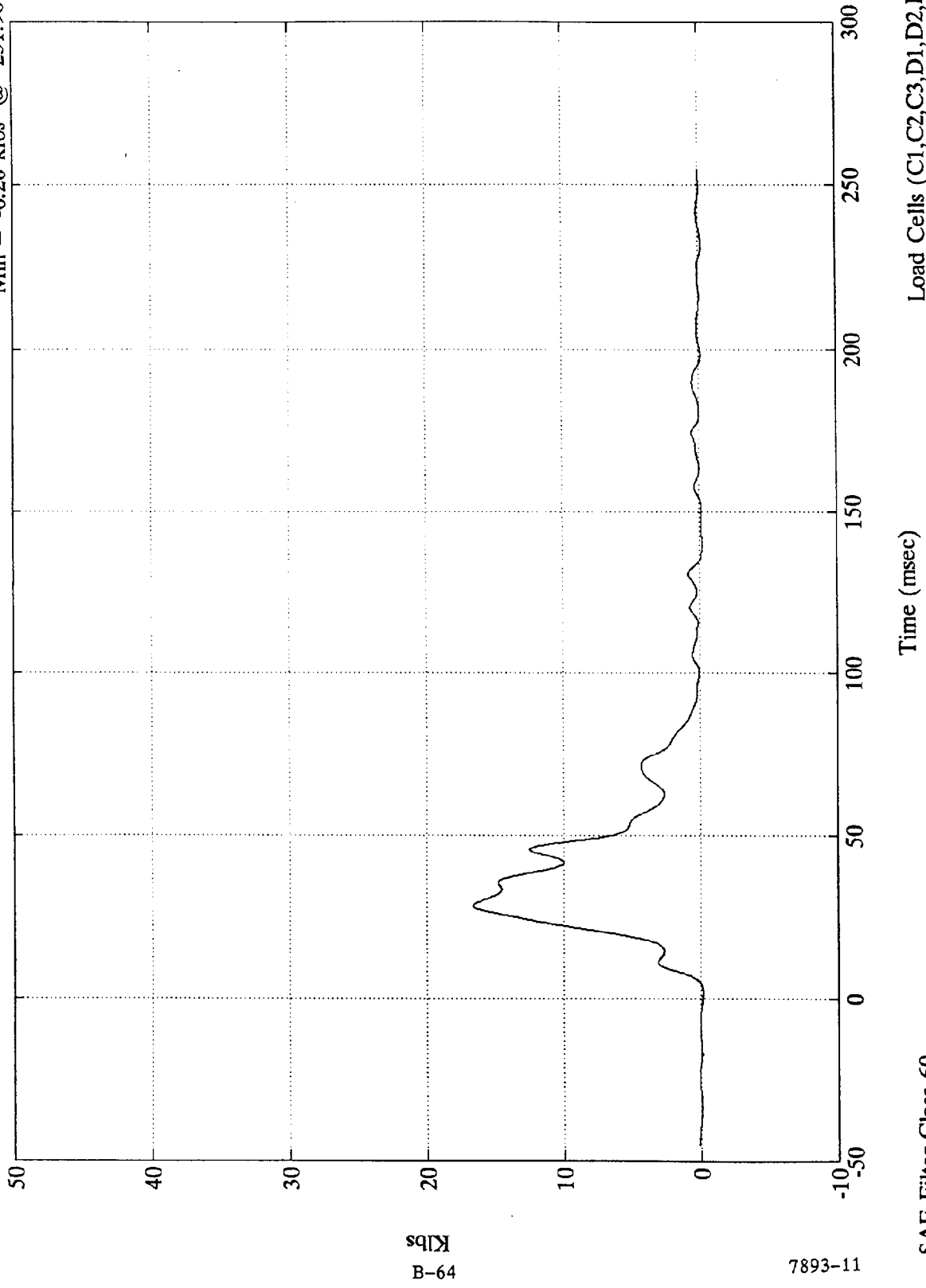
SAE Filter Class 60

Load Cells (A7,A8,A9,B7,B8,B9)
Load cell B7 was not included
in this load cell sum.

NCAP TEST 15 1991 MAZDA M.P.V.

Group 4 Load Cell Sum

Max = 16.64 klbs @ 28.44 msec
Min = -0.20 klbs @ 231.96 msec



SAE Filter Class 60

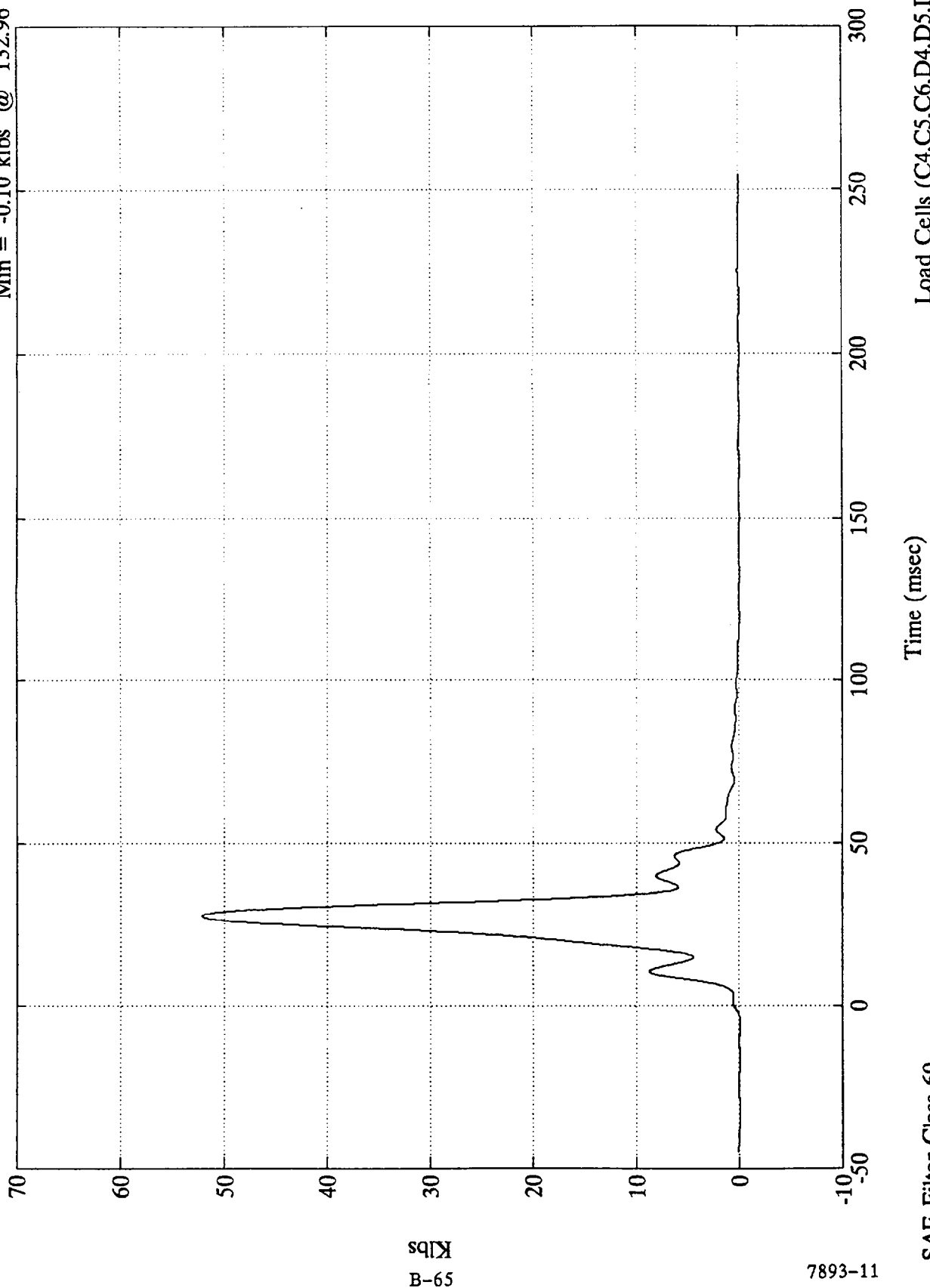
7893-11

B-64

NCAP TEST 15 1991 MAZDA M.P.V.

Group 5 Load Cell Sum

Max = 52.15 klbs @ 27.48 msec
Min = -0.10 klbs @ 132.96 msec



SAE Filter Class 60

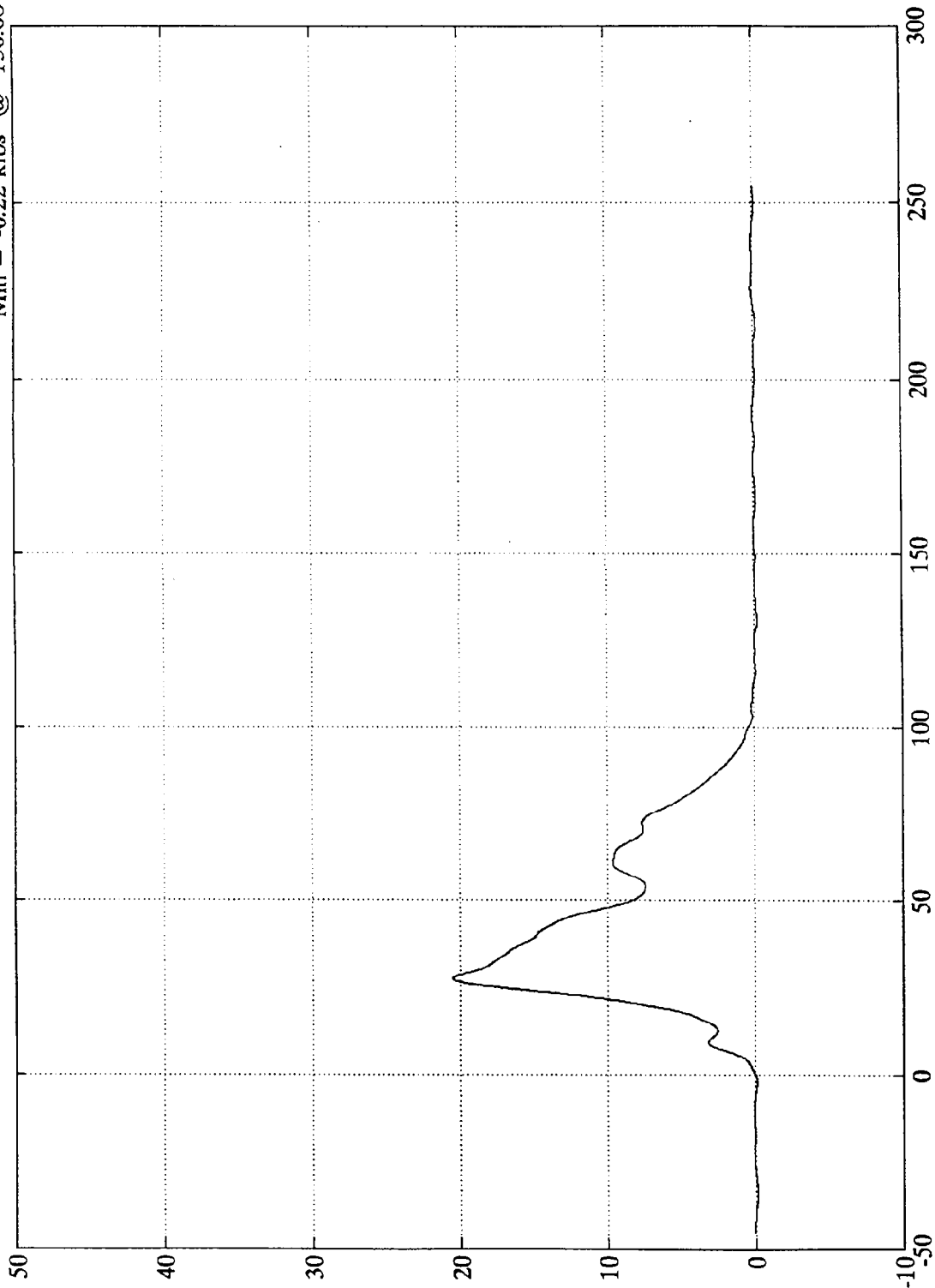
Time (msec)

Load Cells (C4,C5,C6,D4,D5,D6)

NCAP TEST 15 1991 MAZDA M.P.V.

Group 6 Load Cell Sum

Max = 20.53 klbs @ 27.24 msec
Min = -0.22 klbs @ 130.68 msec



Load Cells (C7,C8,C9,D7,D8,D9)

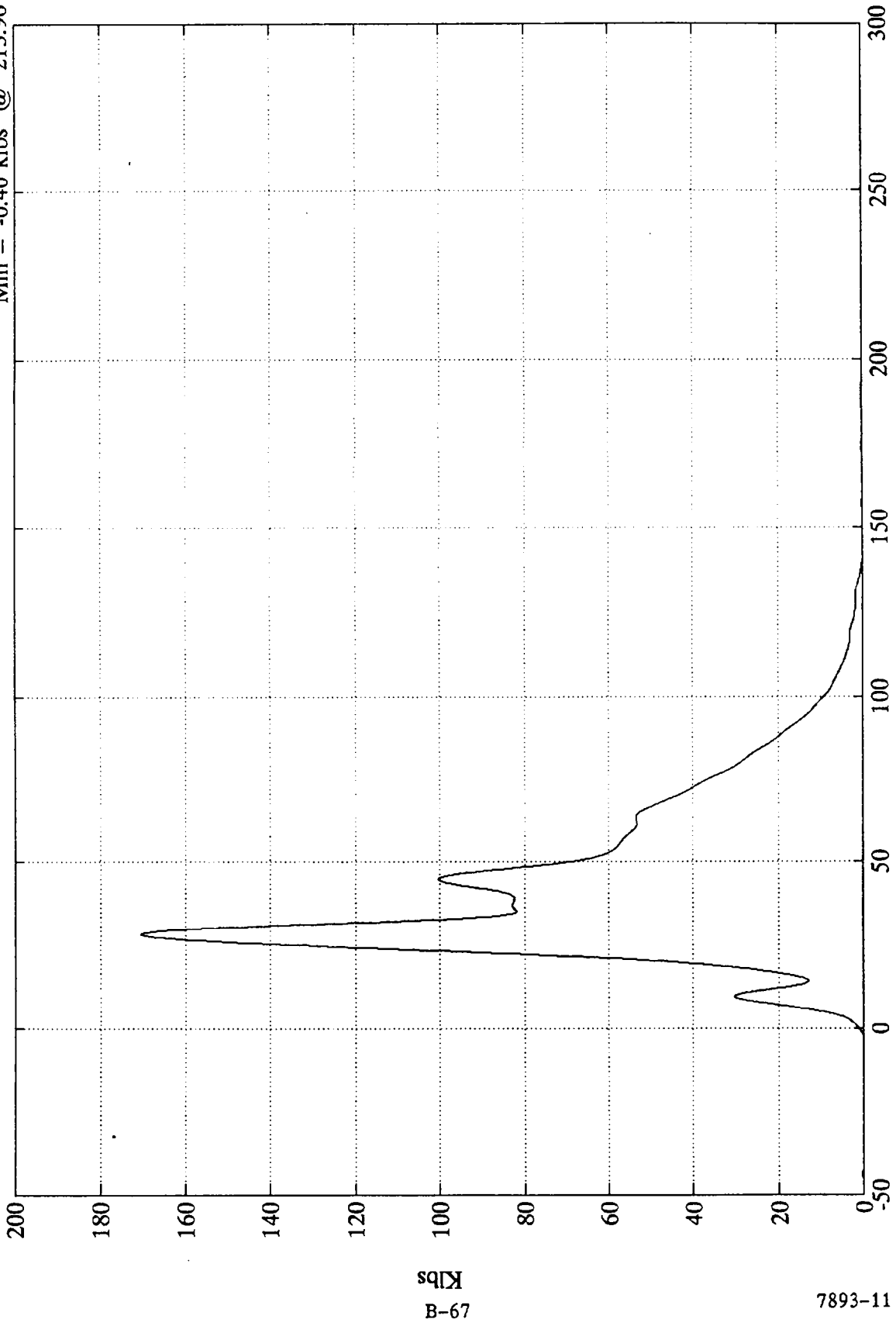
Time (msec)

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 170.40 klbs @ 28.32 msec
Min = -0.40 klbs @ 213.96 msec

Total Load Cell Sum



Load cells B3 and B7 are not included in this load cell sum.

SAE Filter Class 60

7893-11

B-67

TEST NO. MM5400

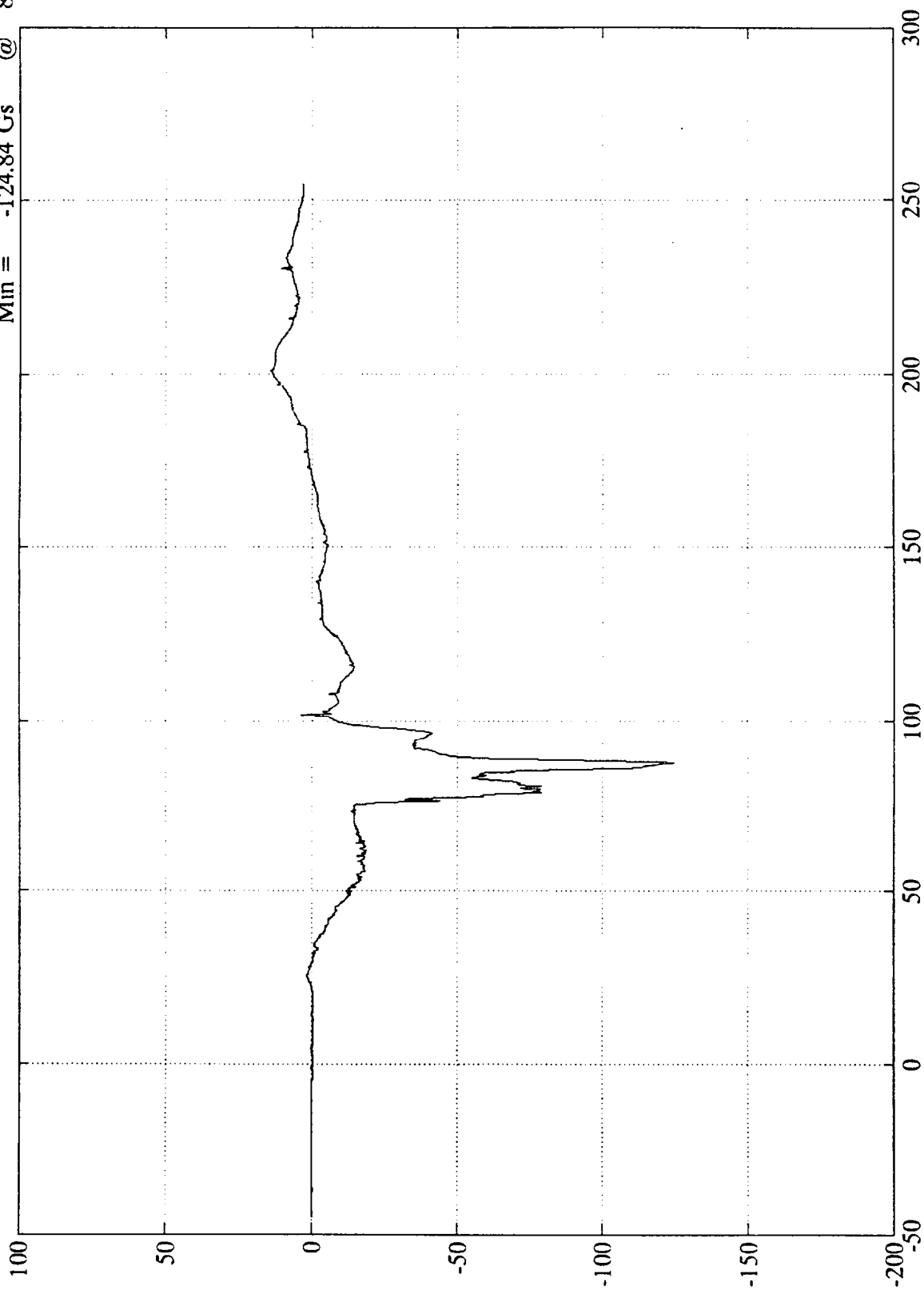
DUMMY DATA

CLASS	FILTER CHANNEL
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600
Belt Loads	60

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 14.20 Gs @ 201.00 msec
Min = -124.84 Gs @ 87.36 msec

Pos. 1 Head X

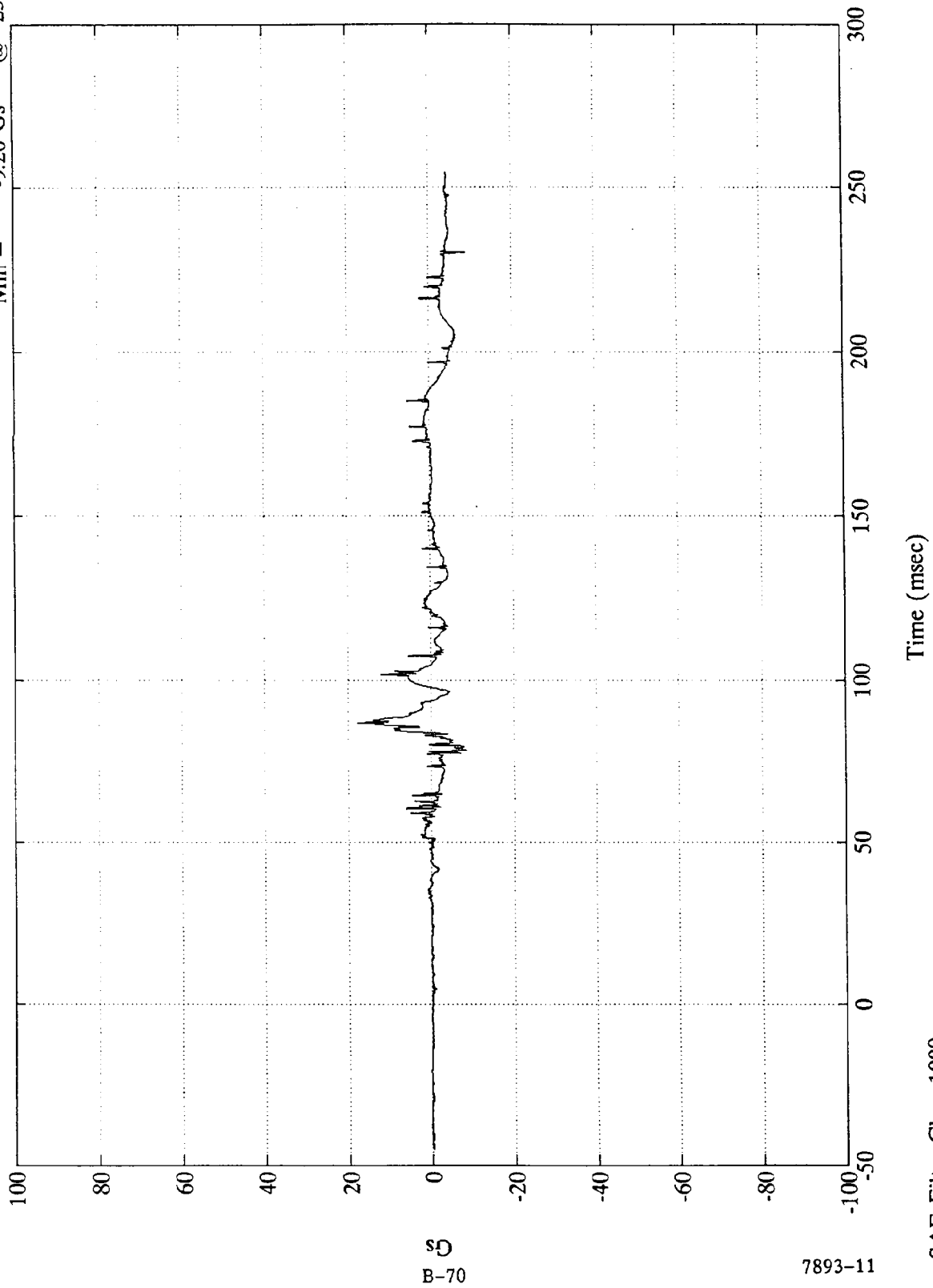


Time (msec)

SAE Filter Class 1000

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Head Y
Max = 17.80 Gs @ 87.00 msec
Min = -9.20 Gs @ 230.28 msec



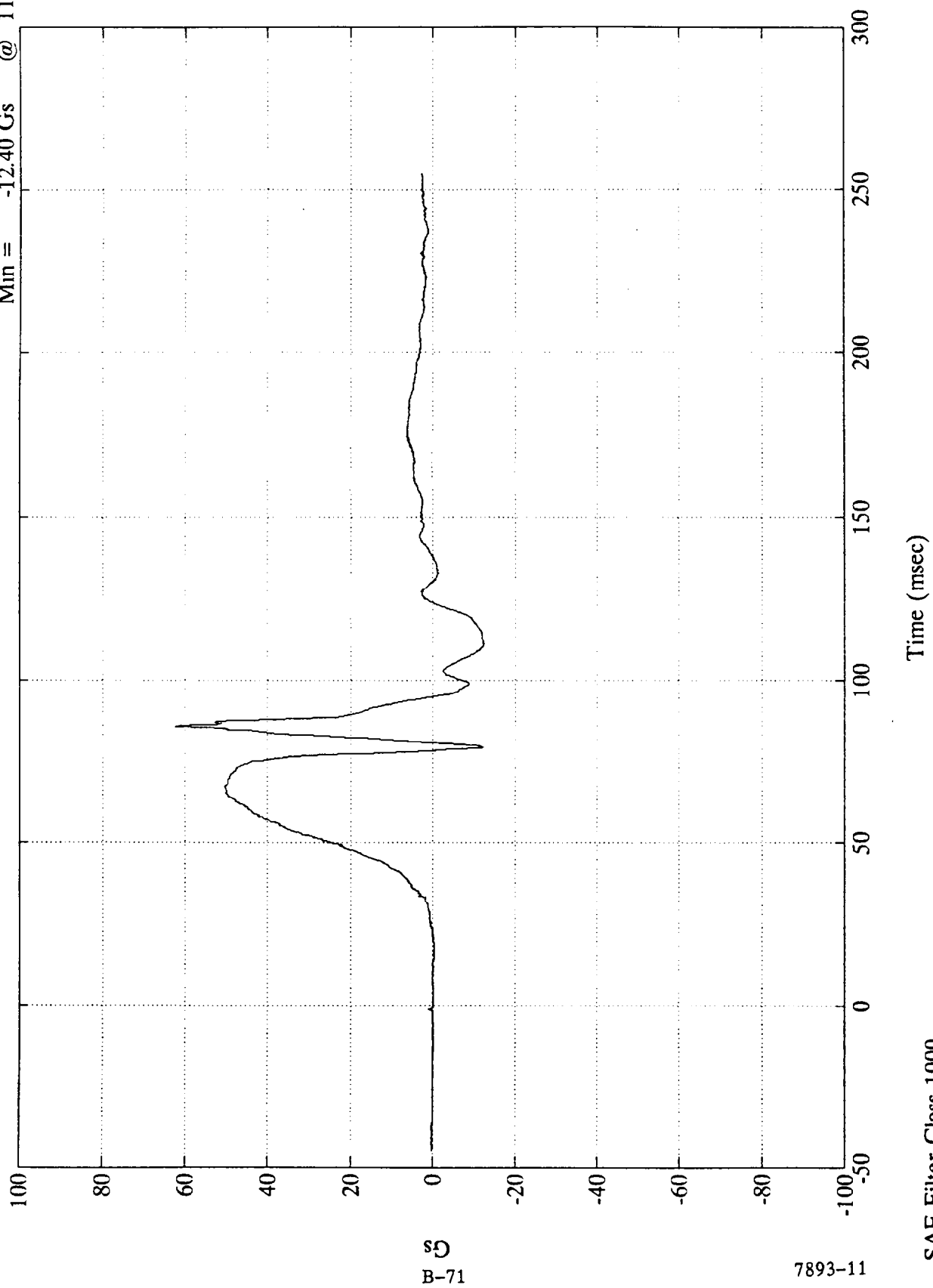
B-70

7893-11

SAE Filter Class 1000

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Head Z
Max = 62.18 Gs @ 85.80 msec
Min = -12.40 Gs @ 111.12 msec



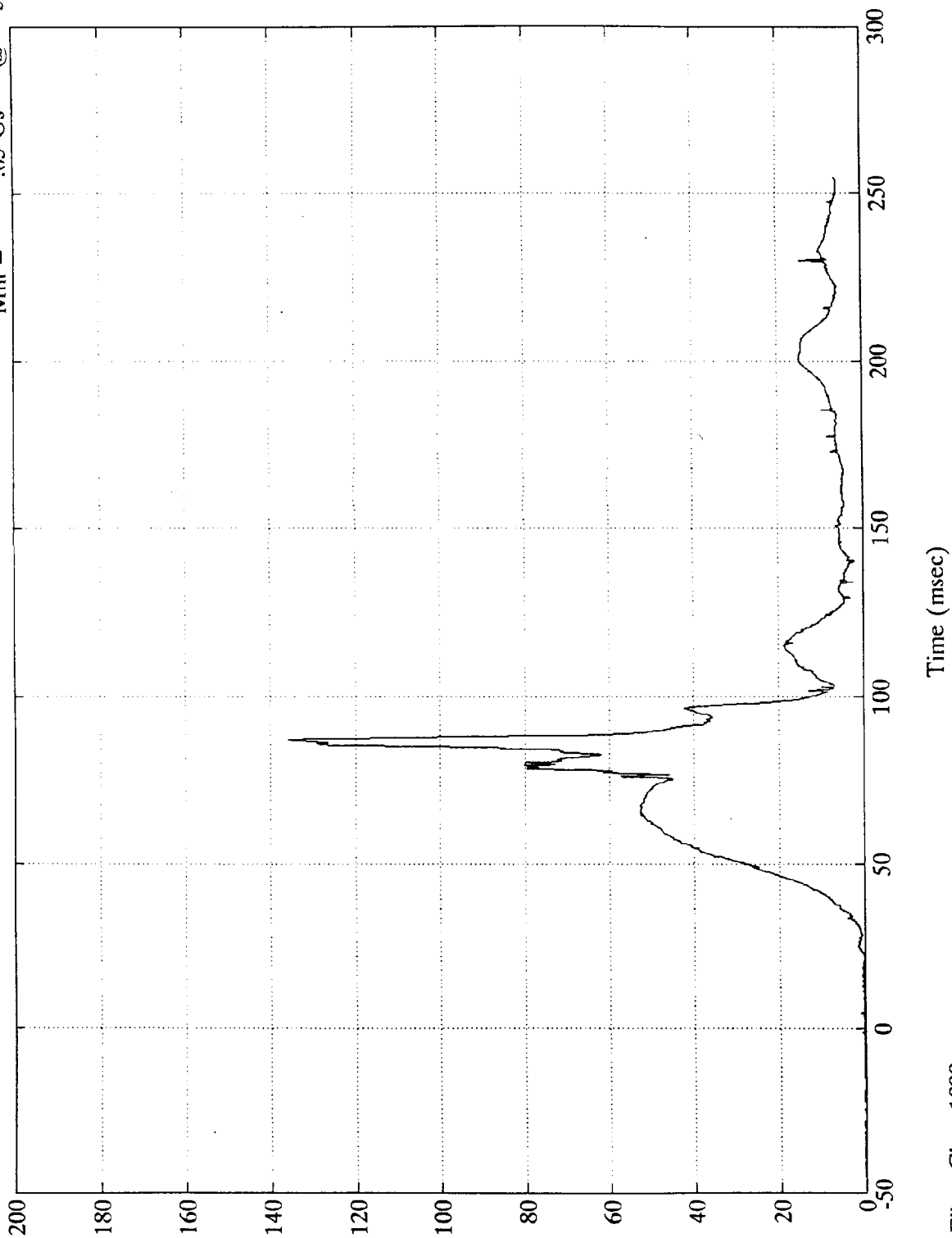
SD
B-71

7893-11

SAE Filter Class 1000

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Head Resultant
Max = 135.73 Gs @ 87.36 msec
Min = .05 Gs @ -5.04 msec



B-72

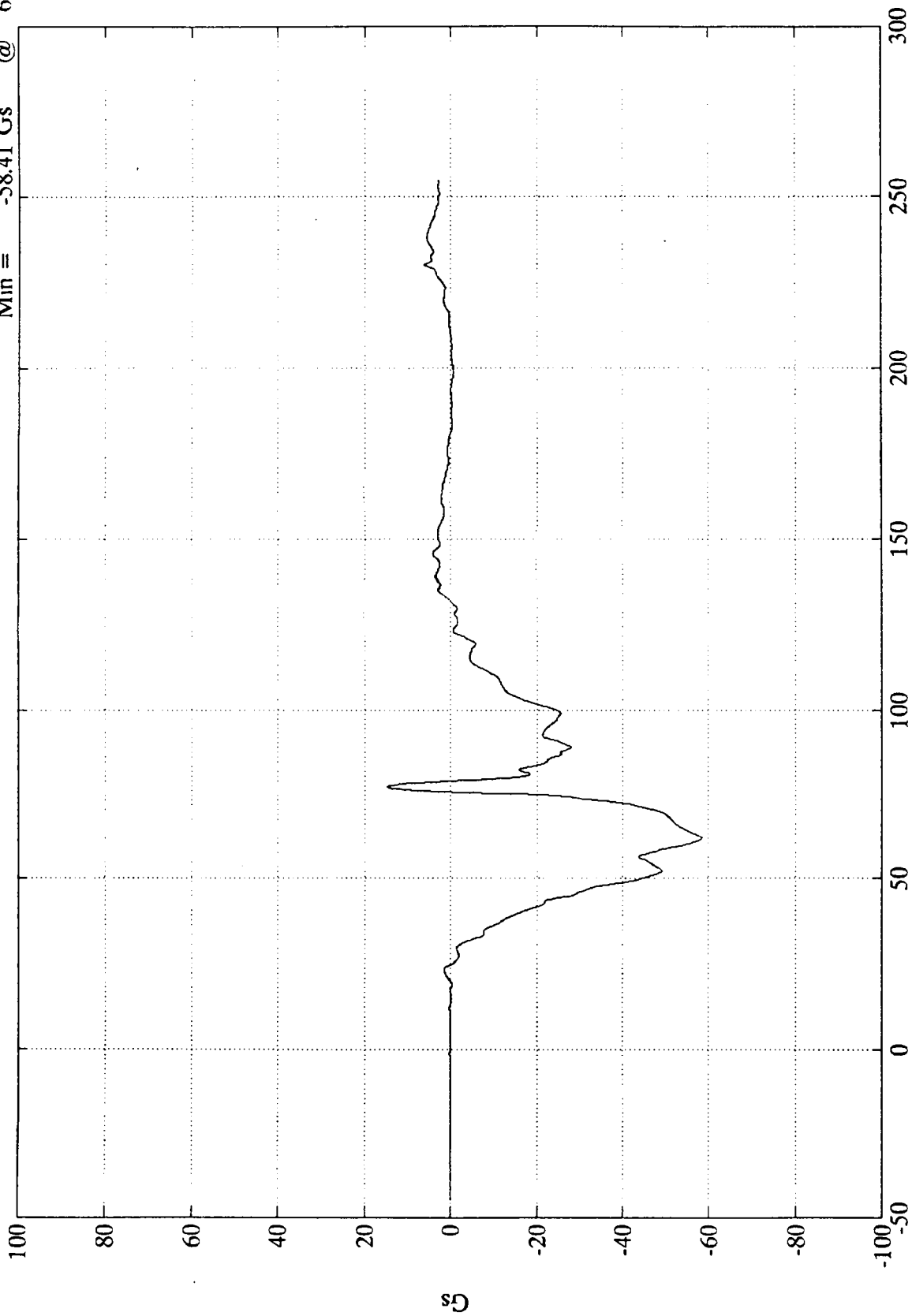
7893-11

SAE Filter Class 1000

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 14.51 Gs @ 77.16 msec
Min = -58.41 Gs @ 62.04 msec

Pos. 1 Chest X

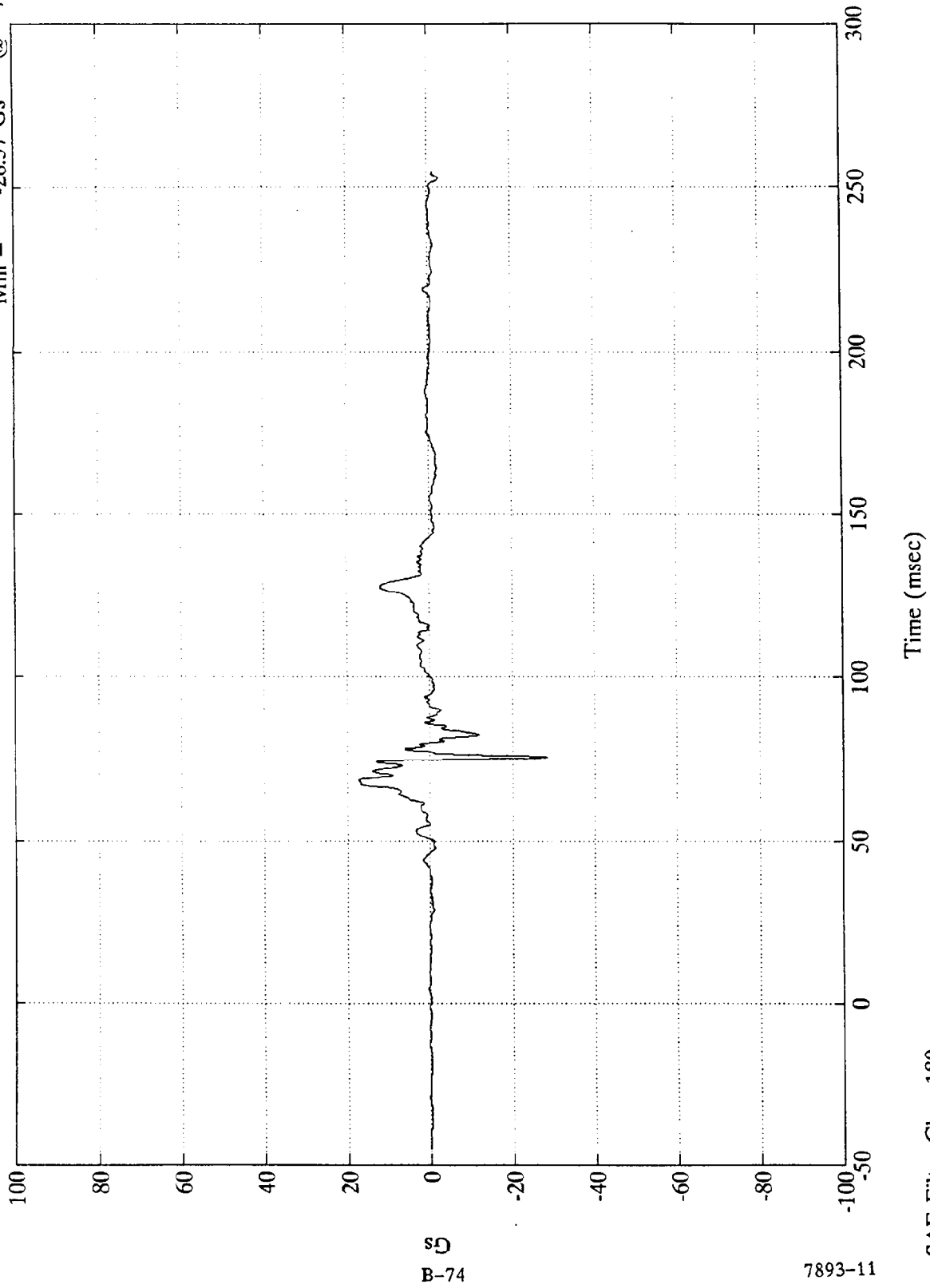


Time (msec)

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Chest Y
Max = 17.31 Gs @ 68.63 msec
Min = -28.57 Gs @ 75.59 msec



B-74

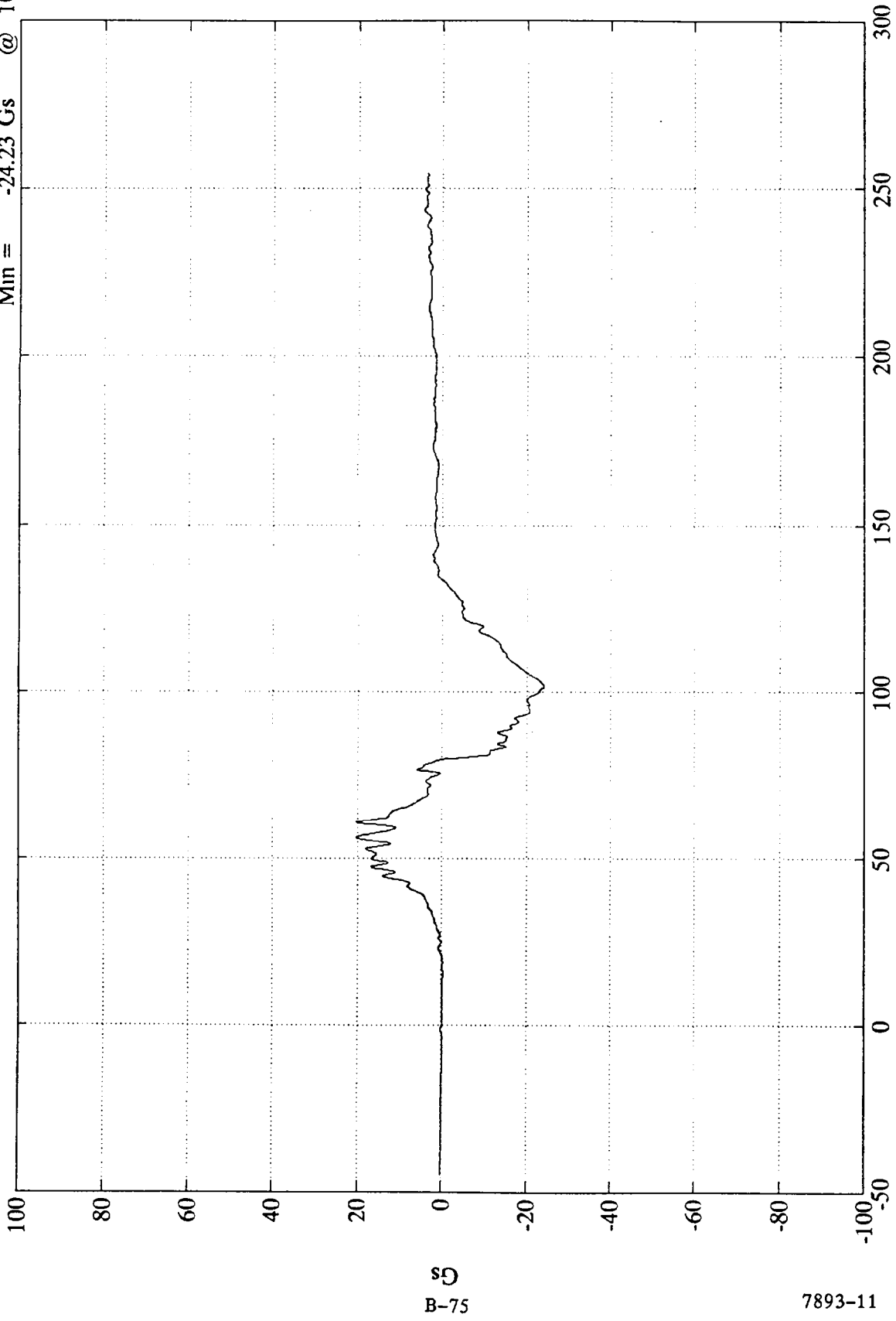
7893-11

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 20.39 Gs @ 56.28 msec
Min = -24.23 Gs @ 101.63 msec

Pos. 1 Chest Z



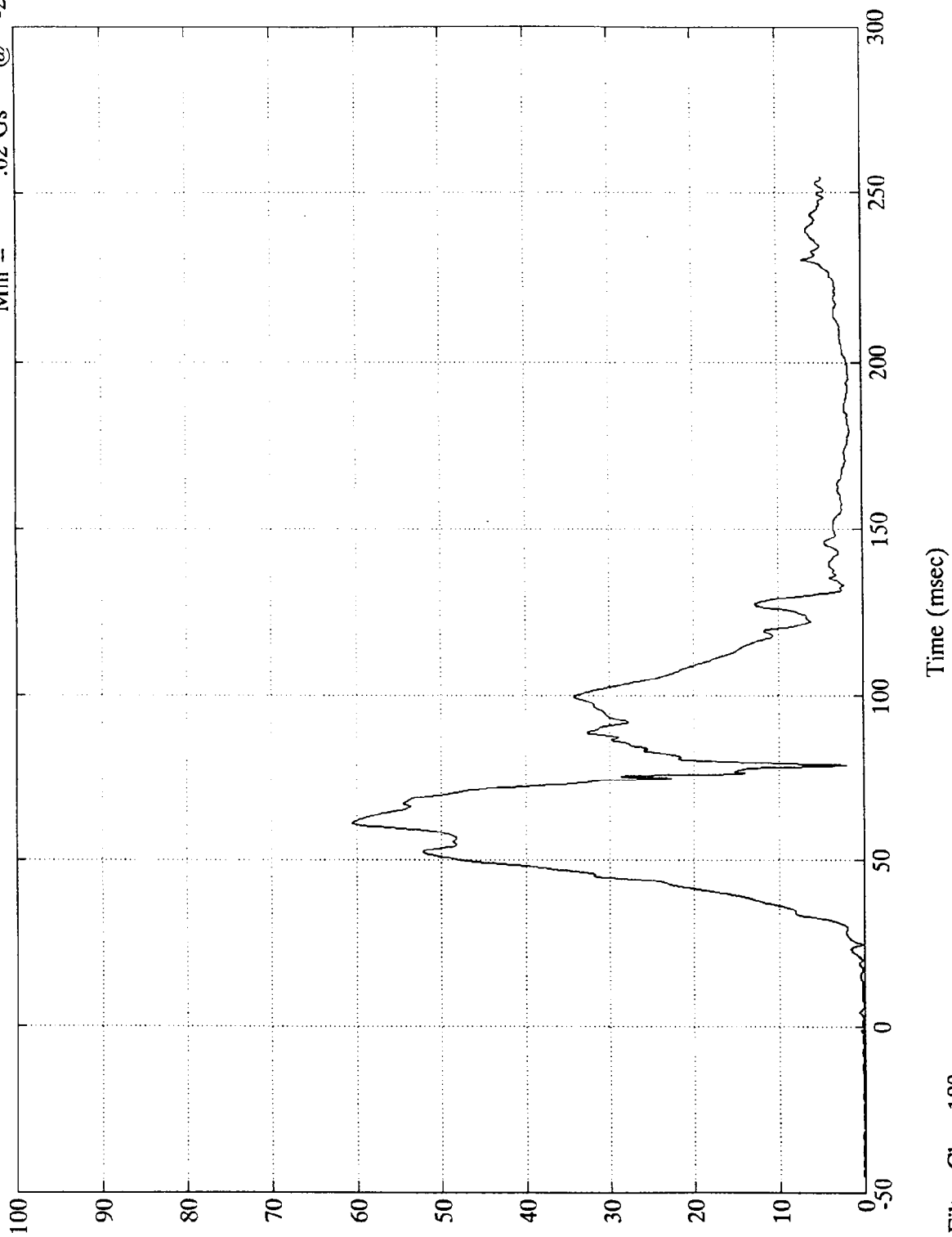
Time (msec)

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 60.57 Gs @ 61.20 msec
Min = .02 Gs @ -2.16 msec

Pos. 1 Chest Resultant



SD
B-76

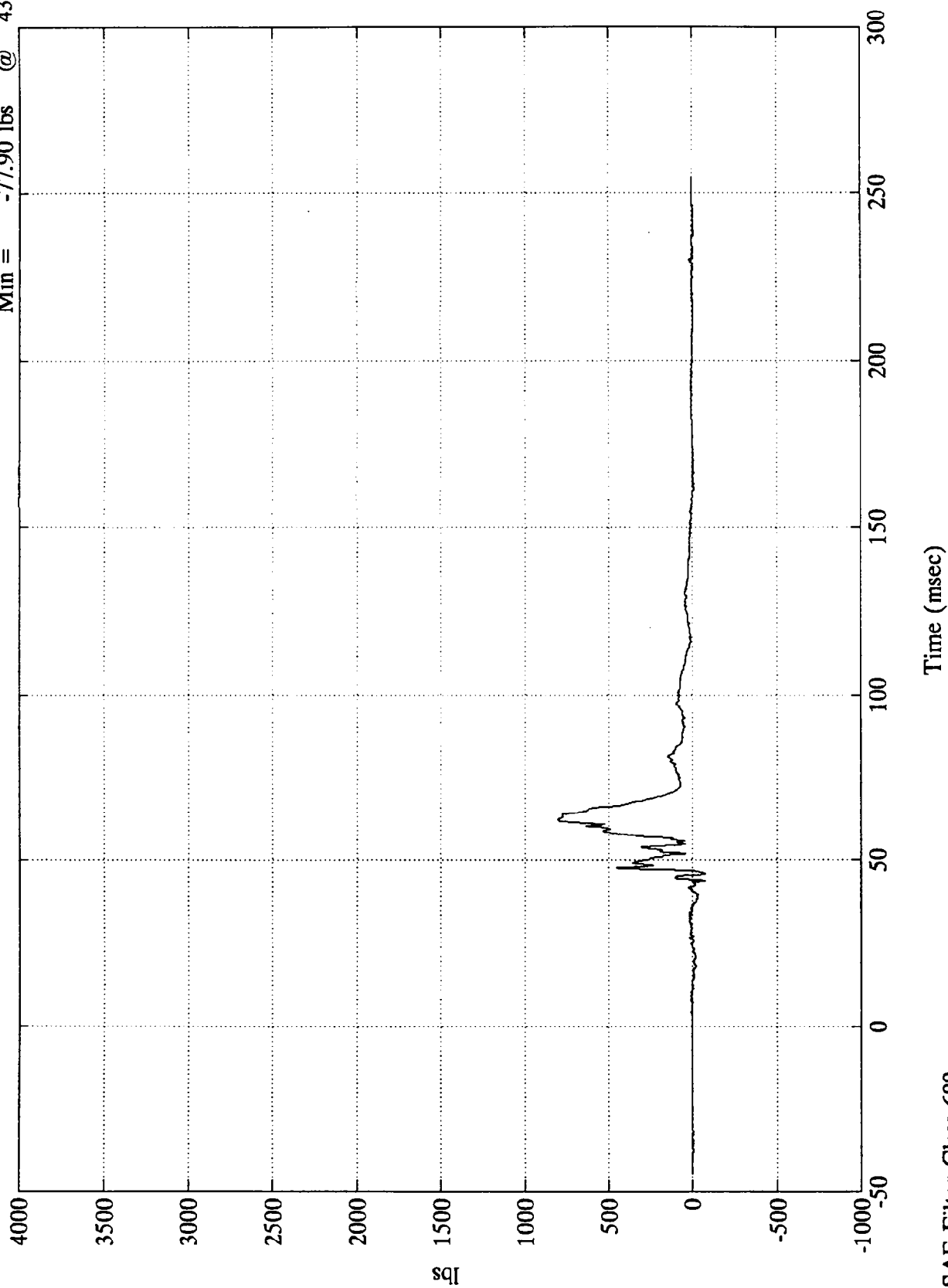
7893-11

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 803.00 lbs @ 62.64 msec
Min = -77.90 lbs @ 43.80 msec

Pos. 1 Left Femur



sqi
B-77

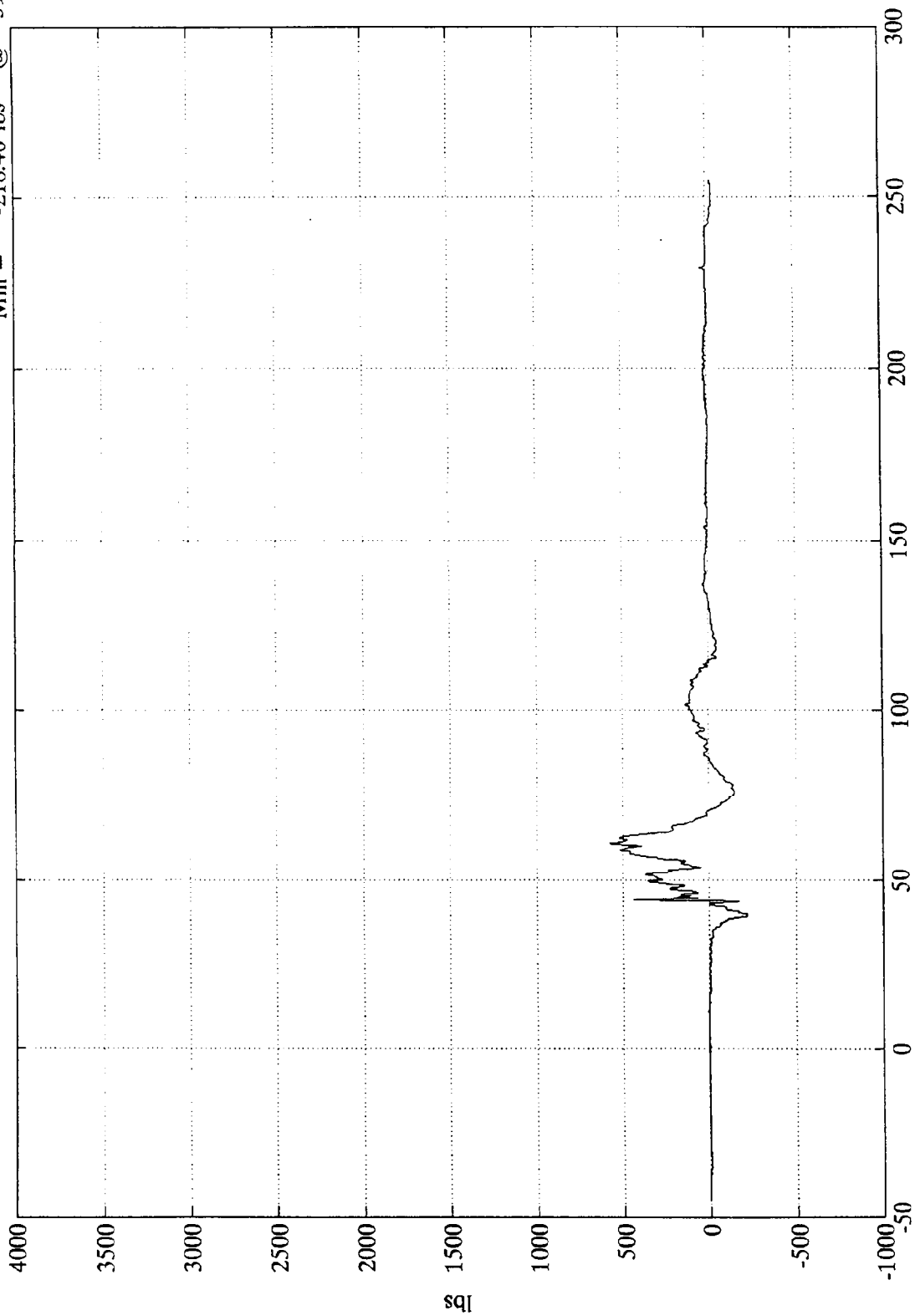
7893-11

SAE Filter Class 600

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Right Femur

Max = 578.72 lbs @ 60.96 msec
Min = -218.40 lbs @ 39.23 msec



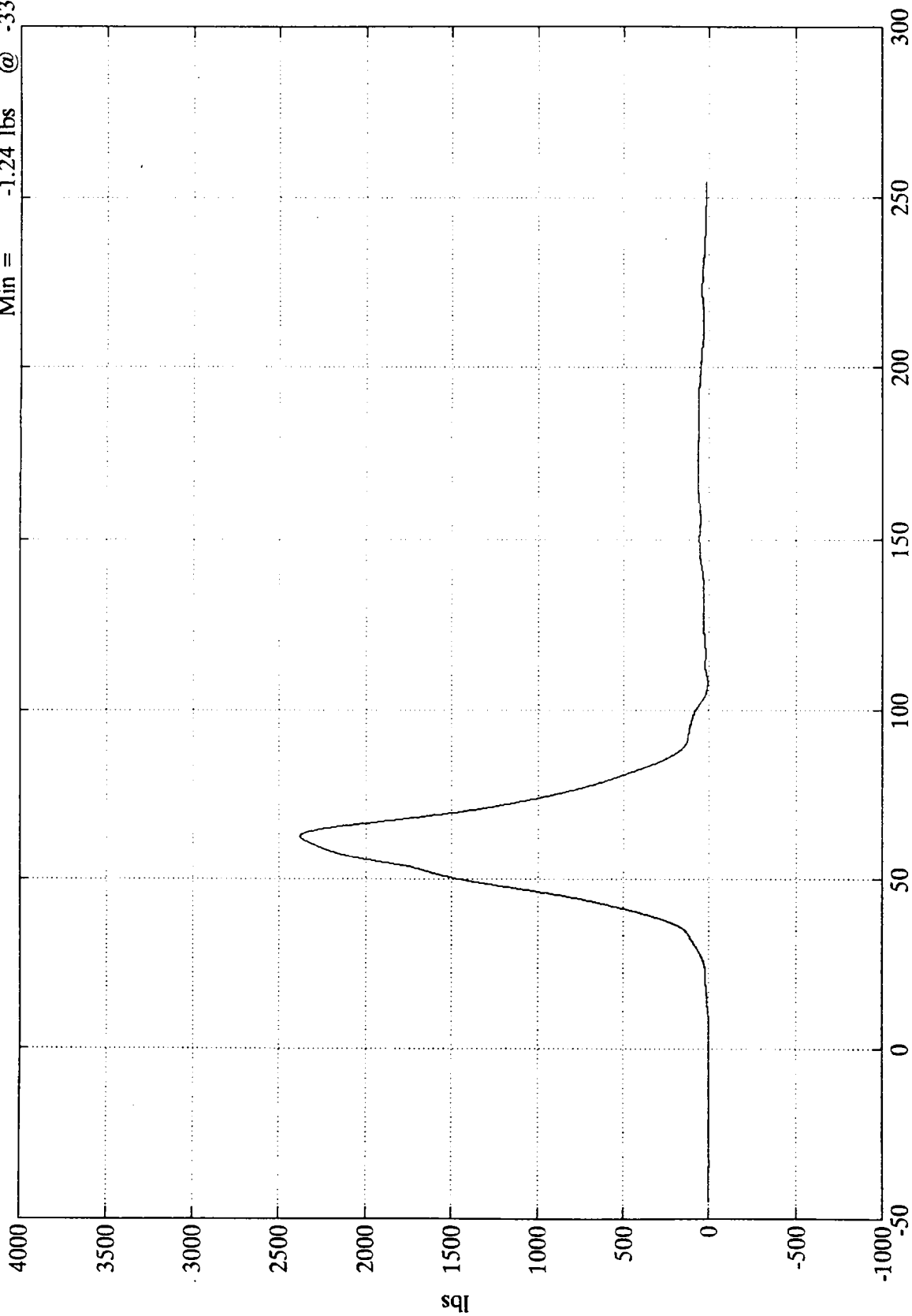
Time (msec)

SAE Filter Class 600

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Left Belt Load

Max = 2382.05 lbs @ 62.51 msec
Min = -1.24 lbs @ -33.60 msec



B-79

7893-11

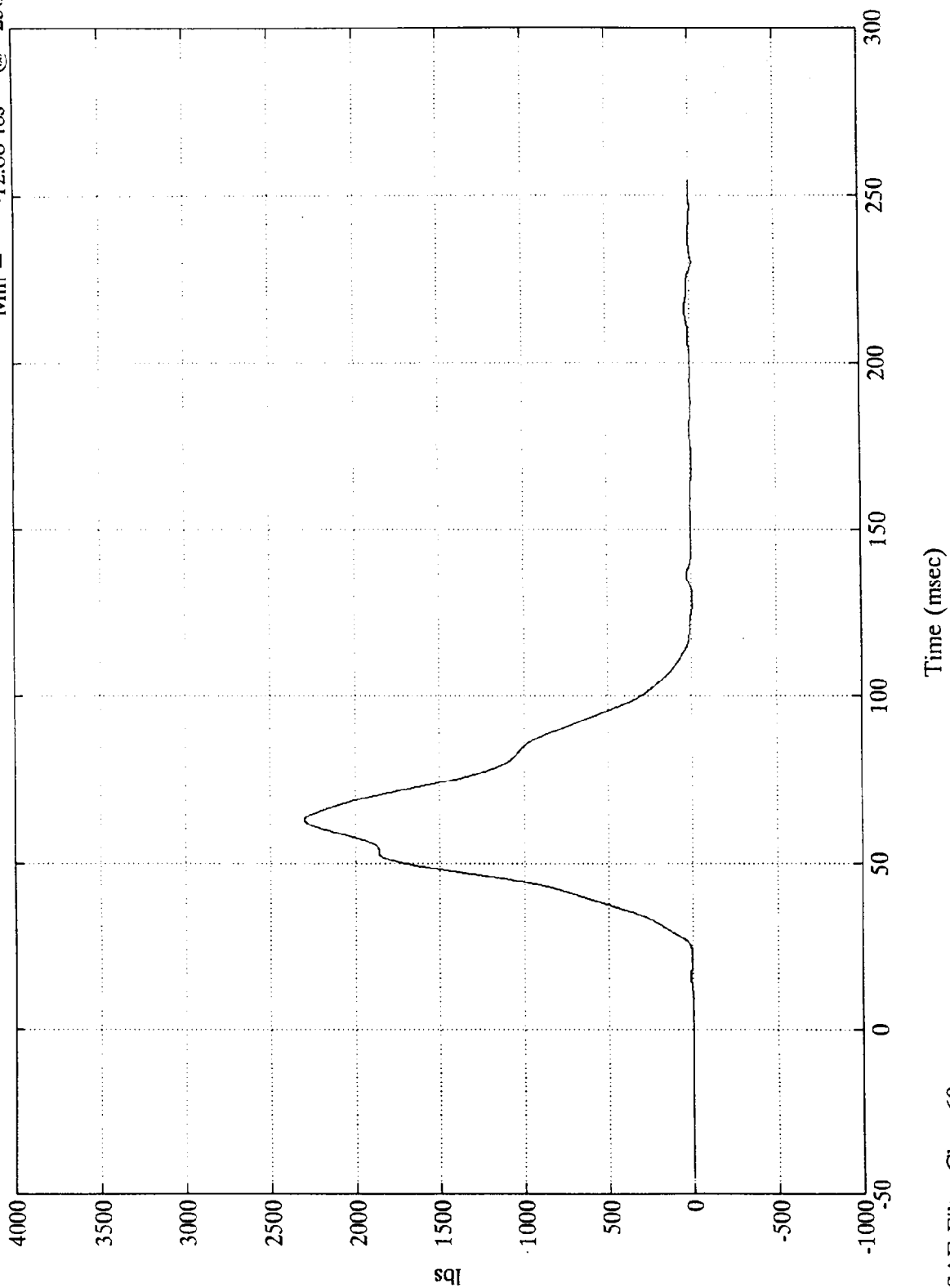
SAE Filter Class 60

Time (msec)

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Torso Belt Load

Max = 2300.37 lbs @ 63.23 msec
Min = -12.88 lbs @ 230.64 msec



sq
B-80

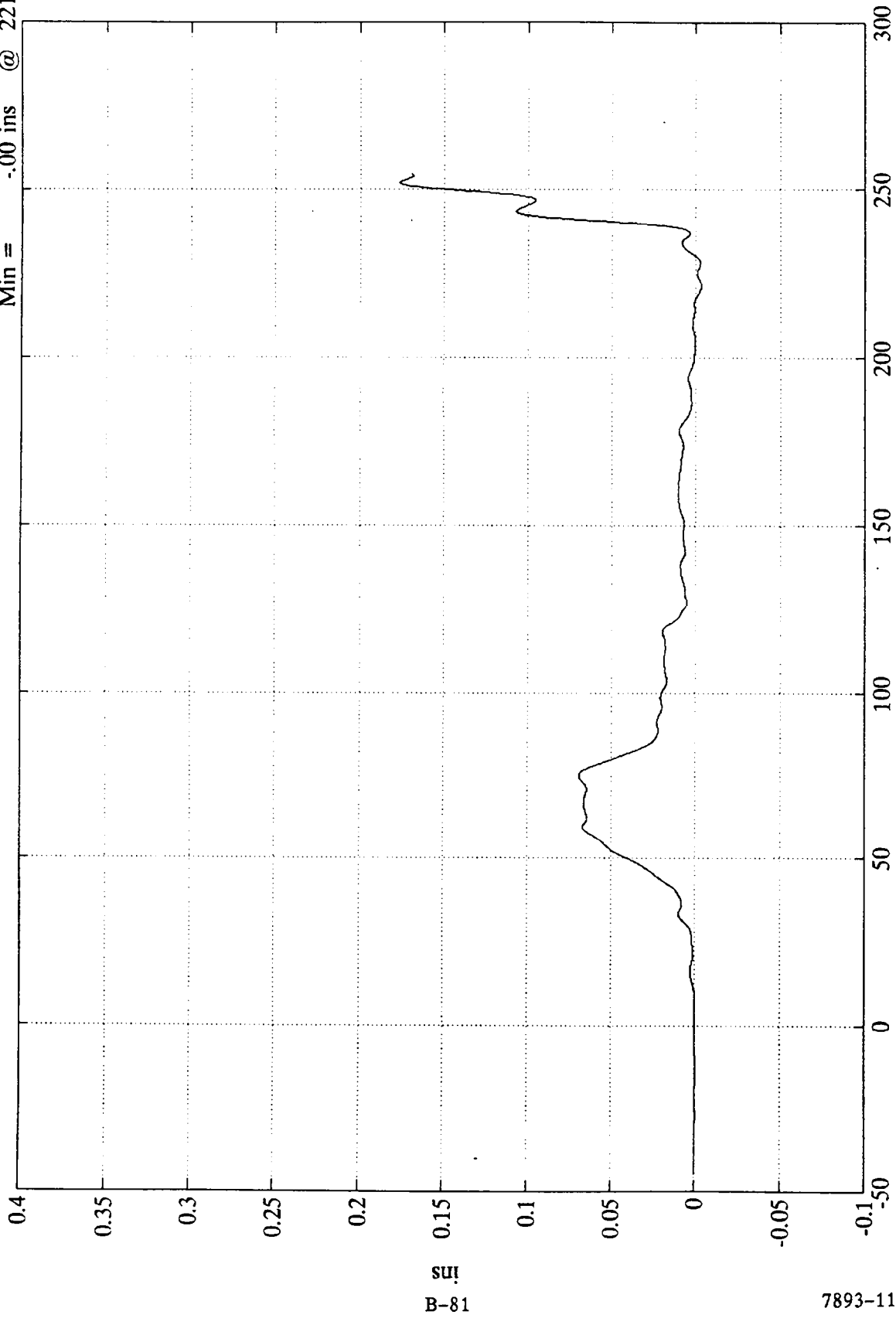
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 1 Belt Elongation

Max = .17 ins @ 252.00 msec
Min = -.00 ins @ 221.28 msec



B-81

7893-11

SAE Filter Class 60

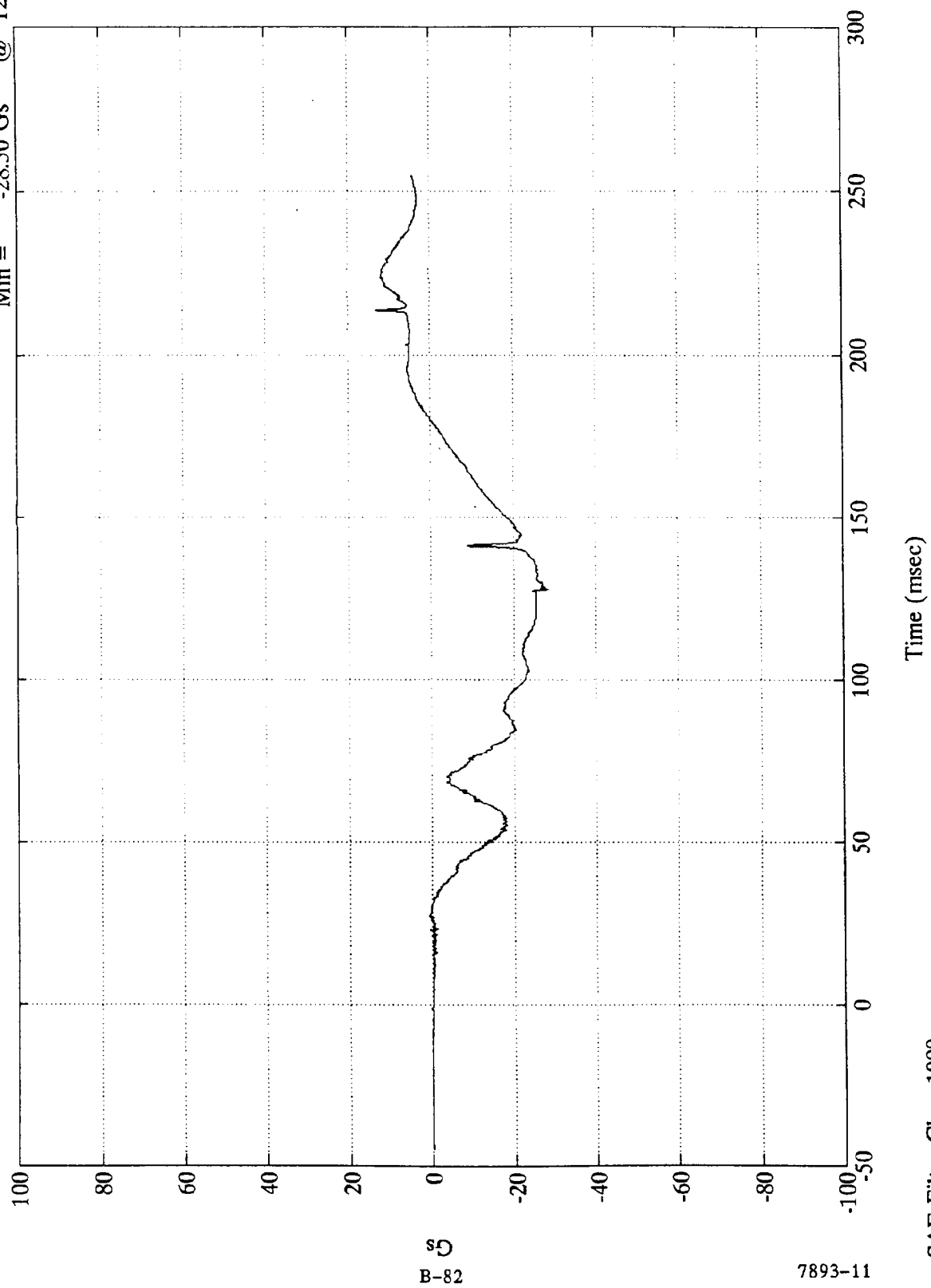
Time (msec)

As measured over 2.5 inches

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Head X

Max = 12.92 Gs @ 213.48 msec
Min = -28.50 Gs @ 128.16 msec



B-82

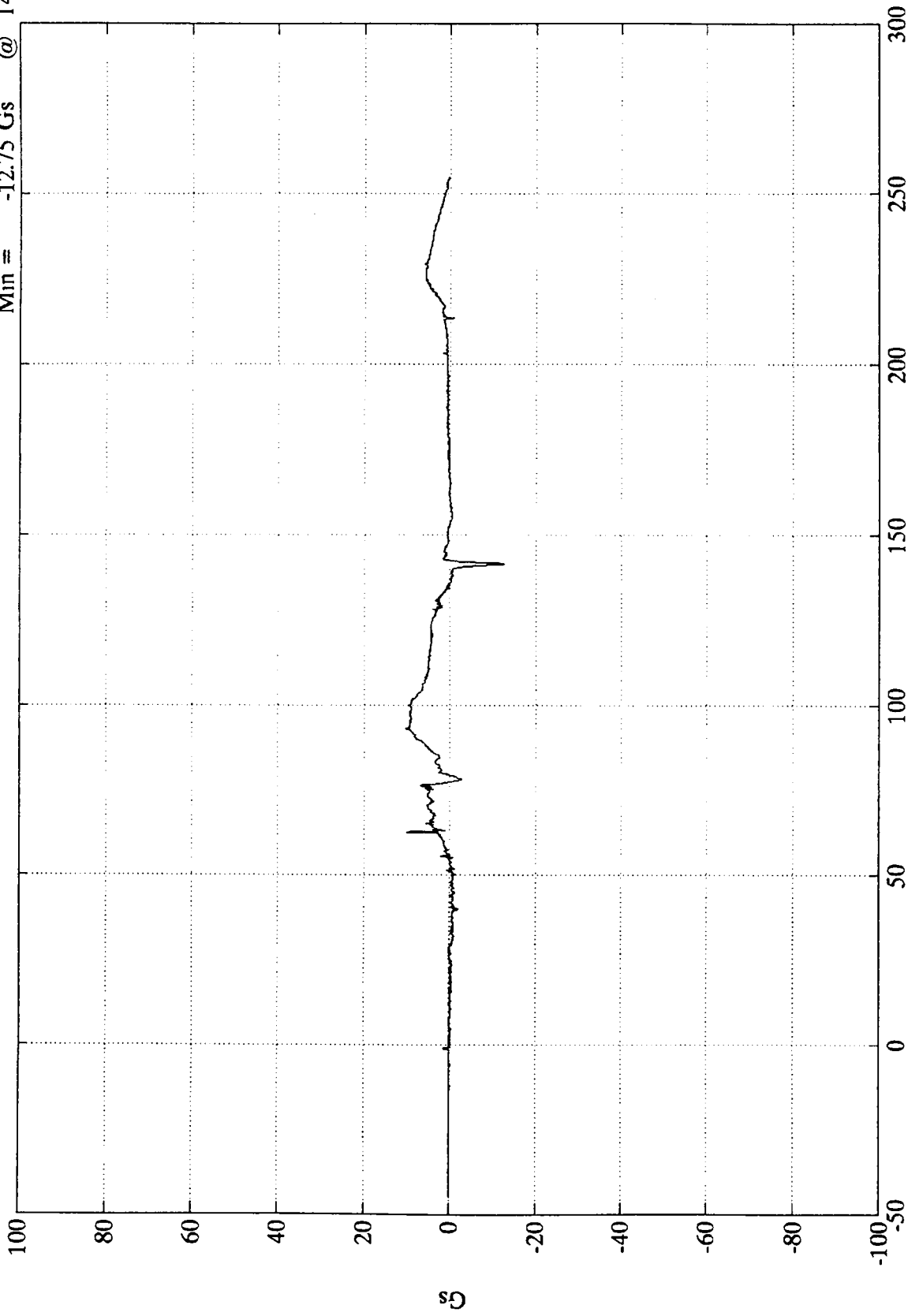
7893-11

SAE Filter Class 1000

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 10.04 Gs @ 93.00 msec
Min = -12.75 Gs @ 141.47 msec

Pos. 2 Head Y



Time (msec)

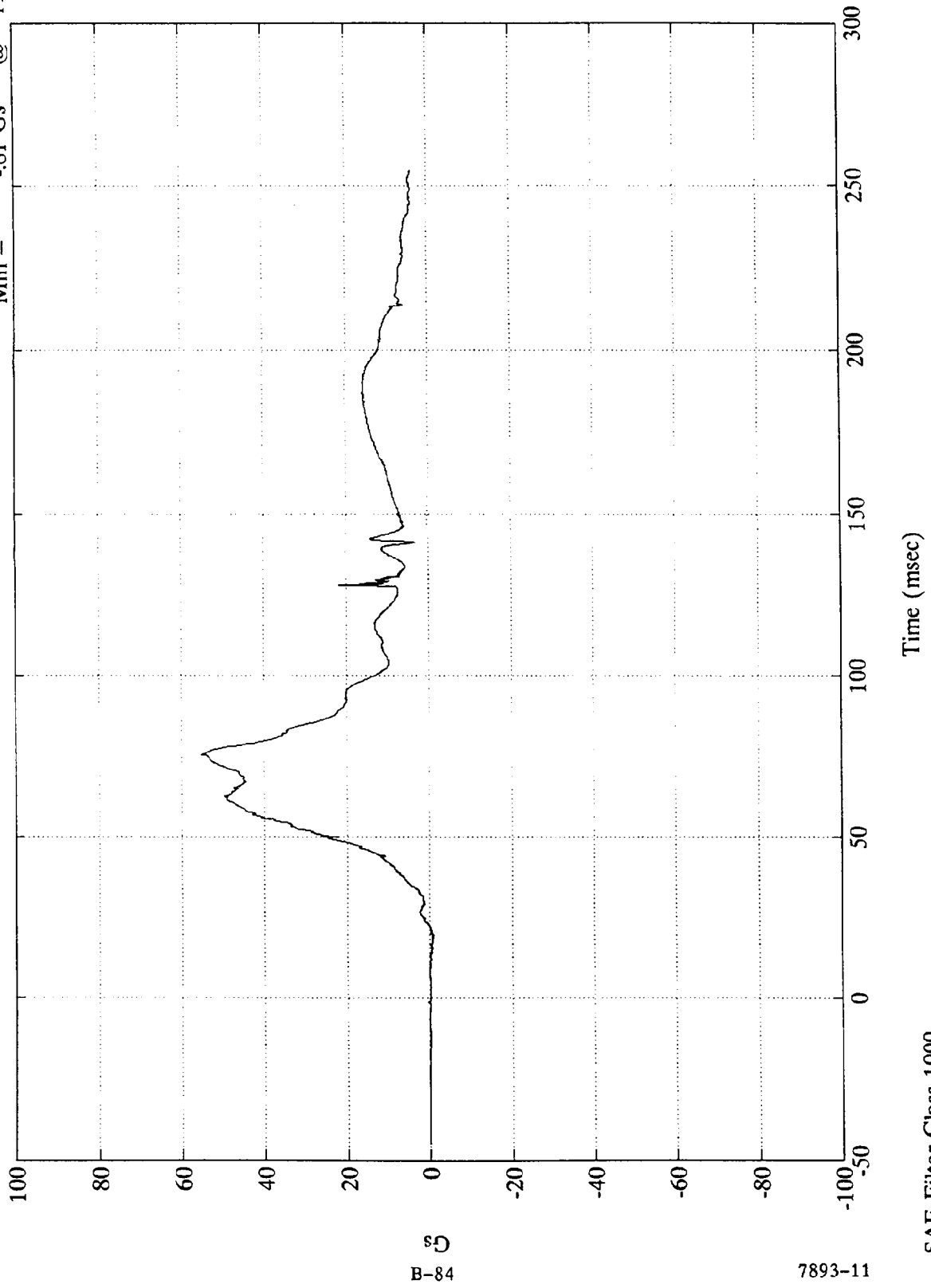
SAE Filter Class 1000

B-83

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Head Z
Max = 55.26 Gs @ 75.59 msec
Min = -81 Gs @ 19.19 msec



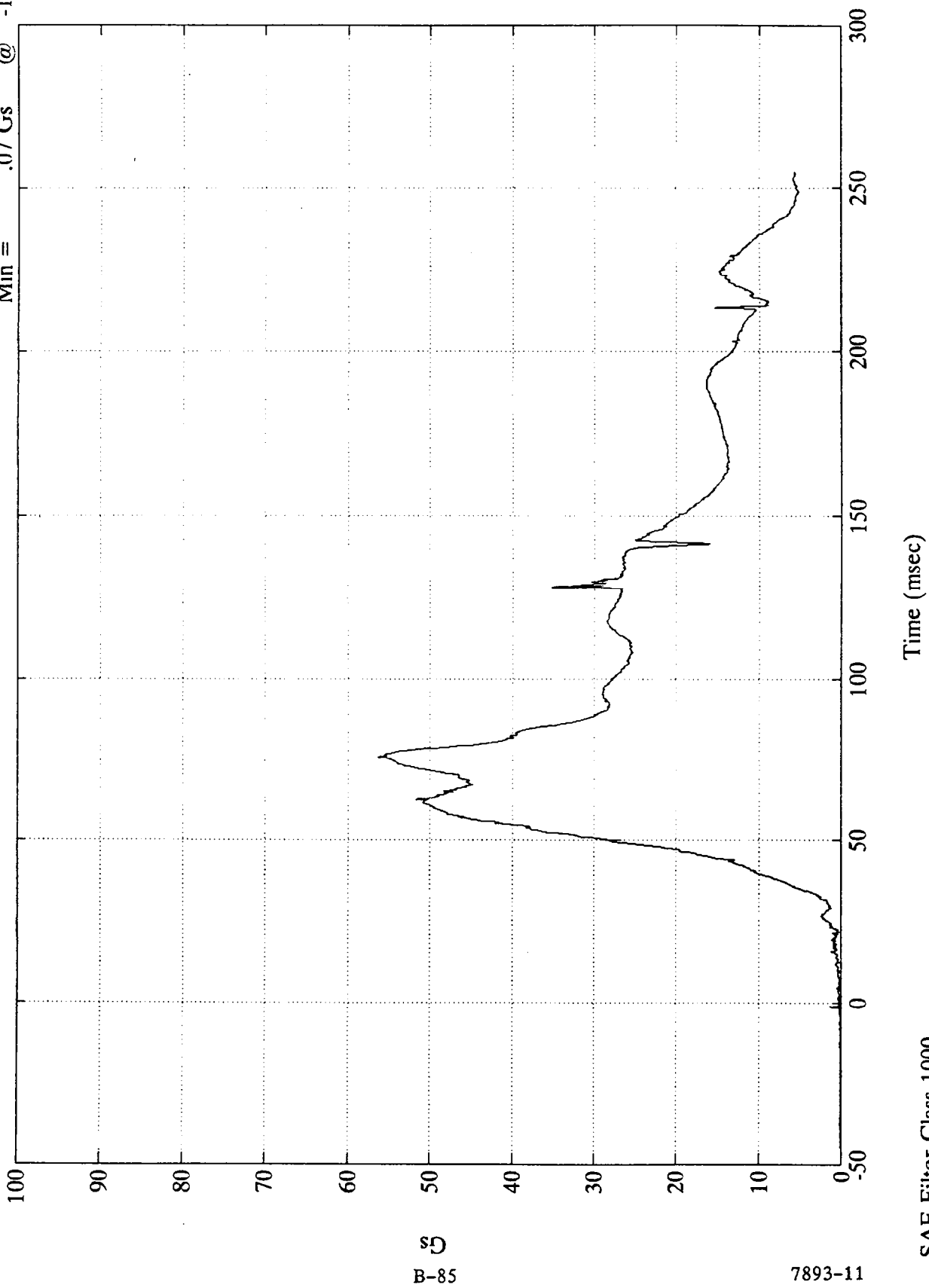
B-84

7893-11

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 56.26 Gs @ 75.59 msec
Min = .07 Gs @ -1.56 msec

Pos. 2 Head Resultant



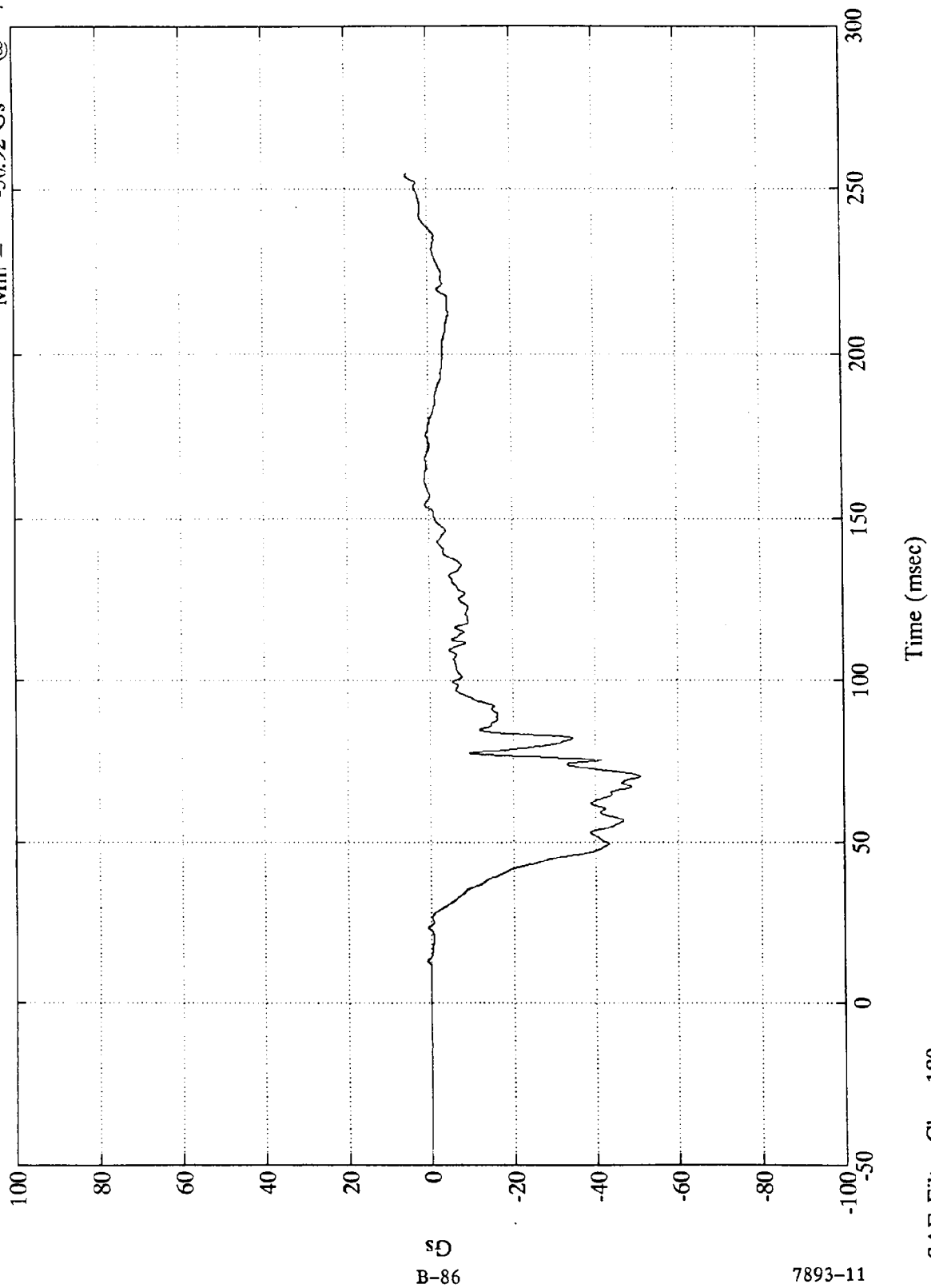
B-85

7893-11

SAE Filter Class 1000

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Chest X
Max = 5.11 Gs @ 254.16 msec
Min = -50.92 Gs @ 70.31 msec



B-86

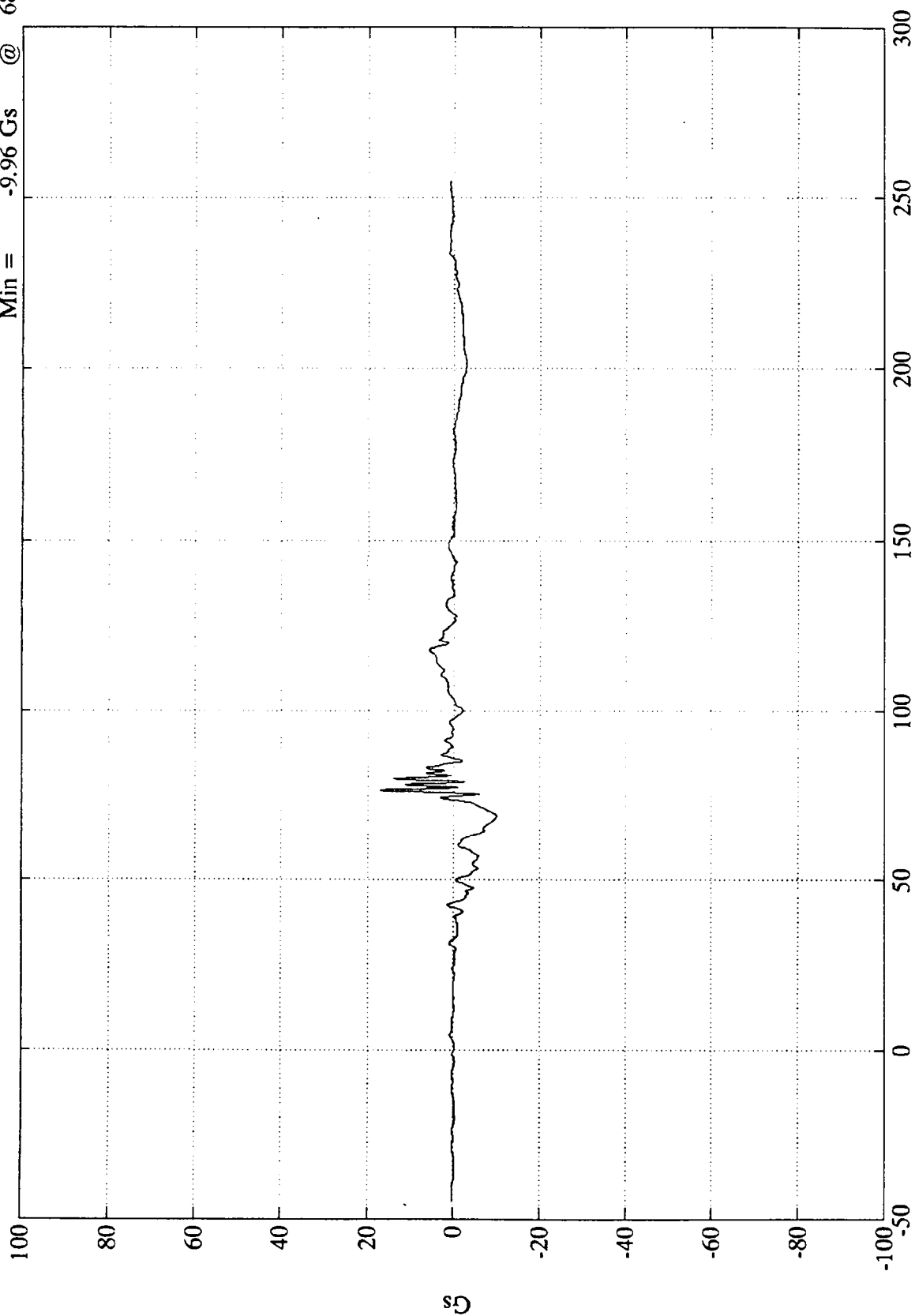
7893-11

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 16.98 Gs @ 76.31 msec
Min = -9.96 Gs @ 68.87 msec

Pos. 2 Chest Y

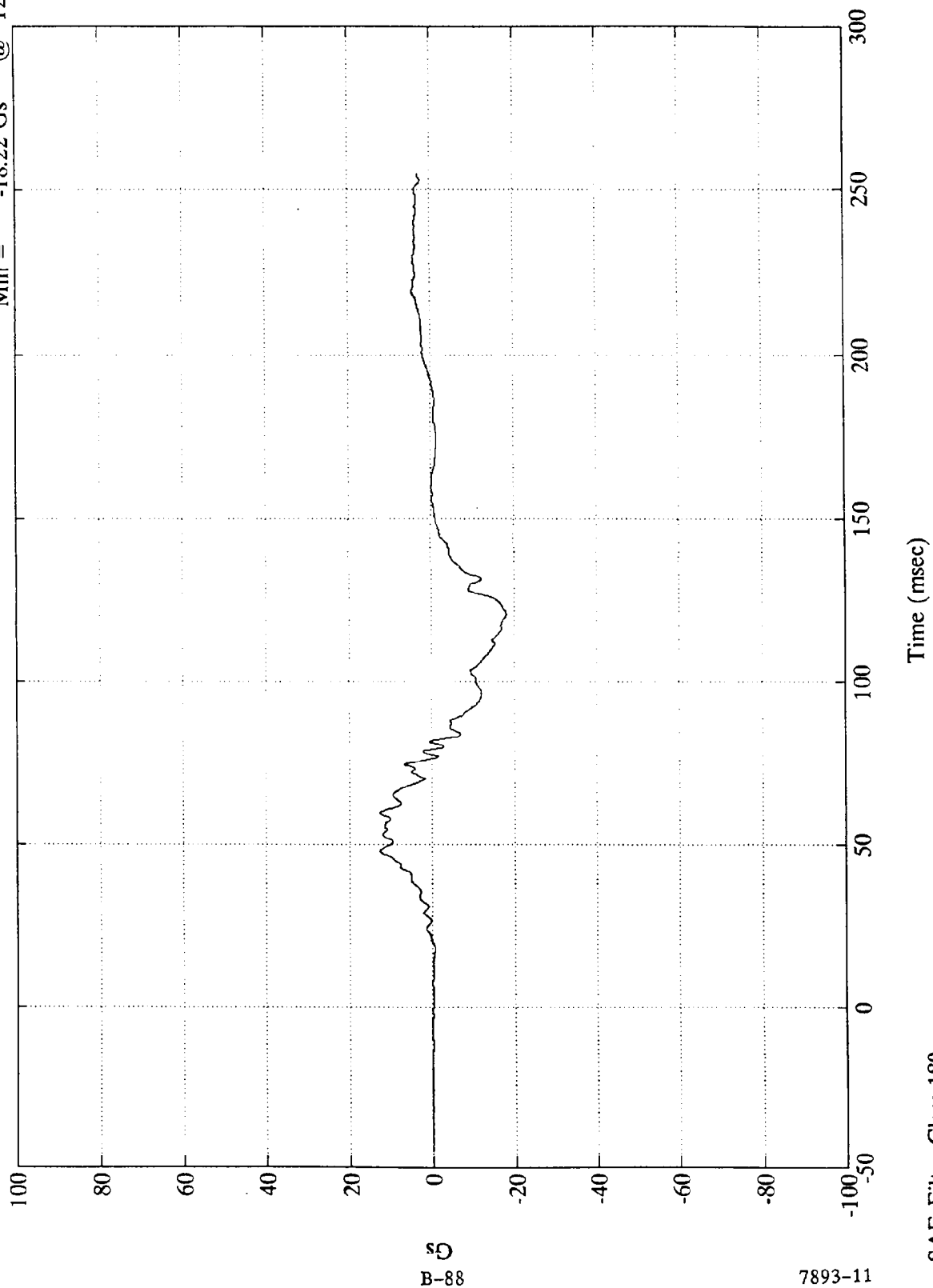


Time (msec)

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Chest Z
Max = 12.64 Gs @ 59.76 msec
Min = -18.22 Gs @ 120.59 msec



B-88

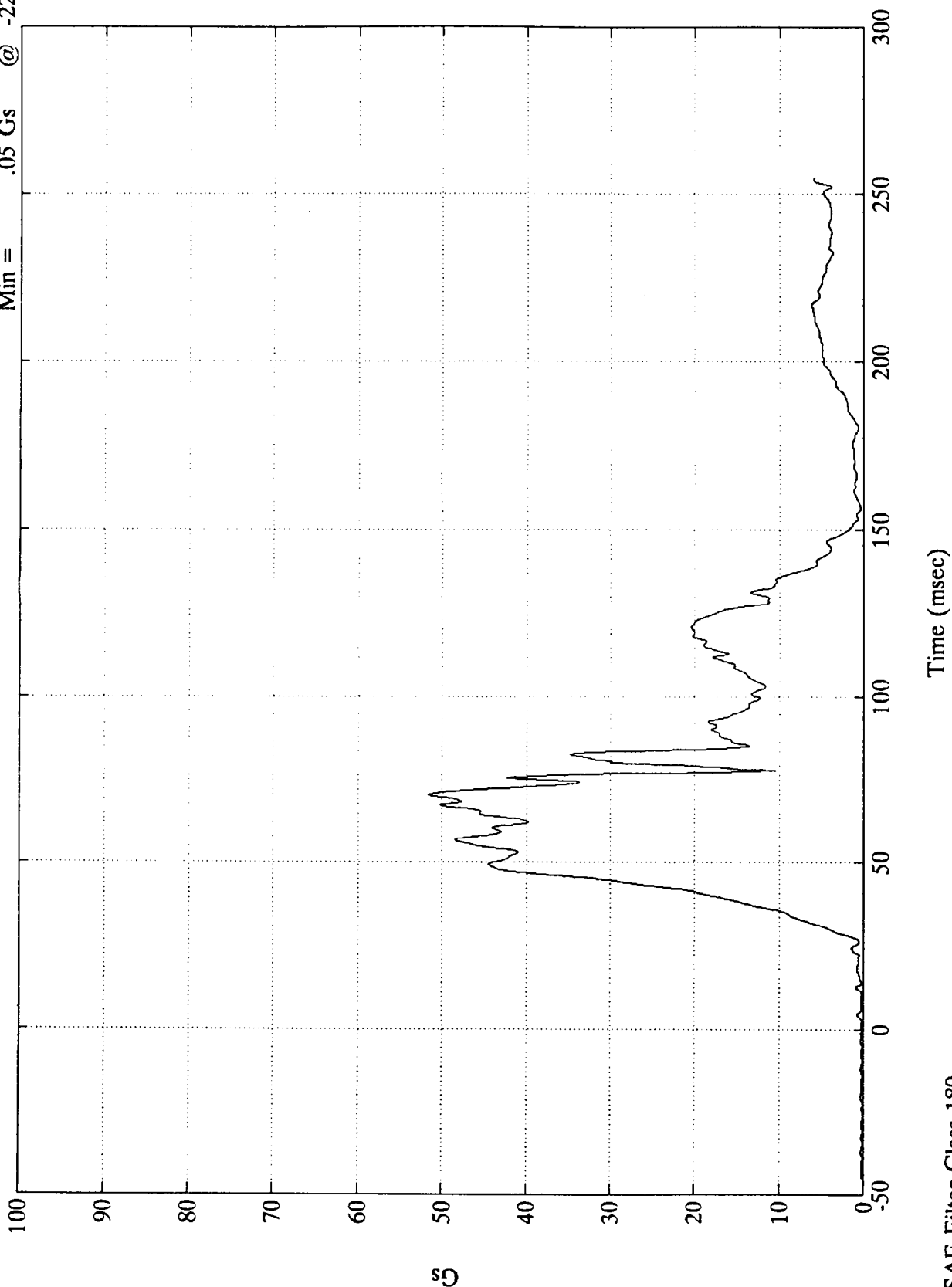
7893-11

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Max = 51.62 Gs @ 70.31 msec
Min = .05 Gs @ -22.56 msec

Pos. 2 Chest Resultant



B-89

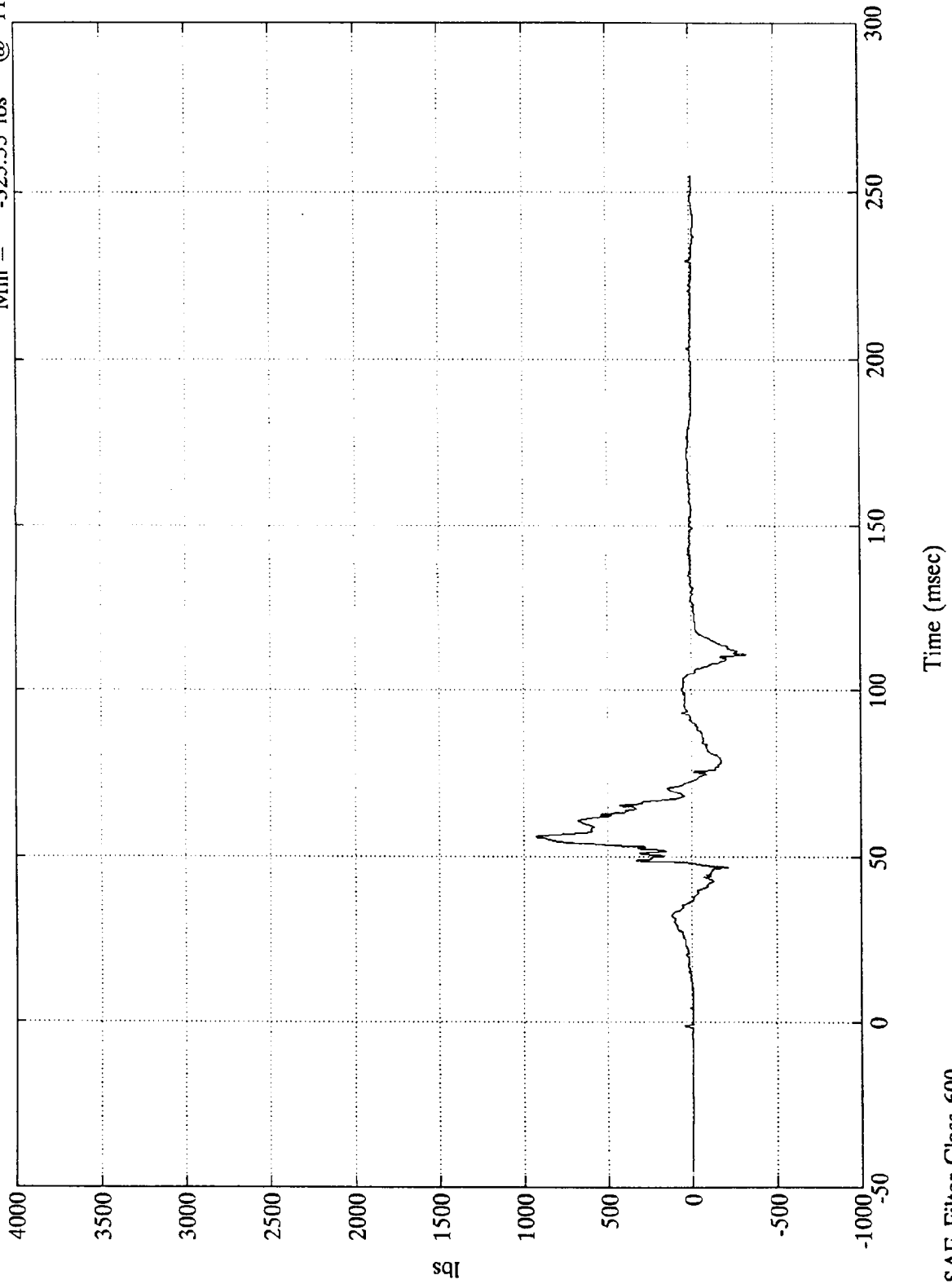
7893-11

SAE Filter Class 180

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Left Femur

Max = 926.65 lbs @ 55.92 msec
Min = -325.55 lbs @ 110.88 msec



B-90

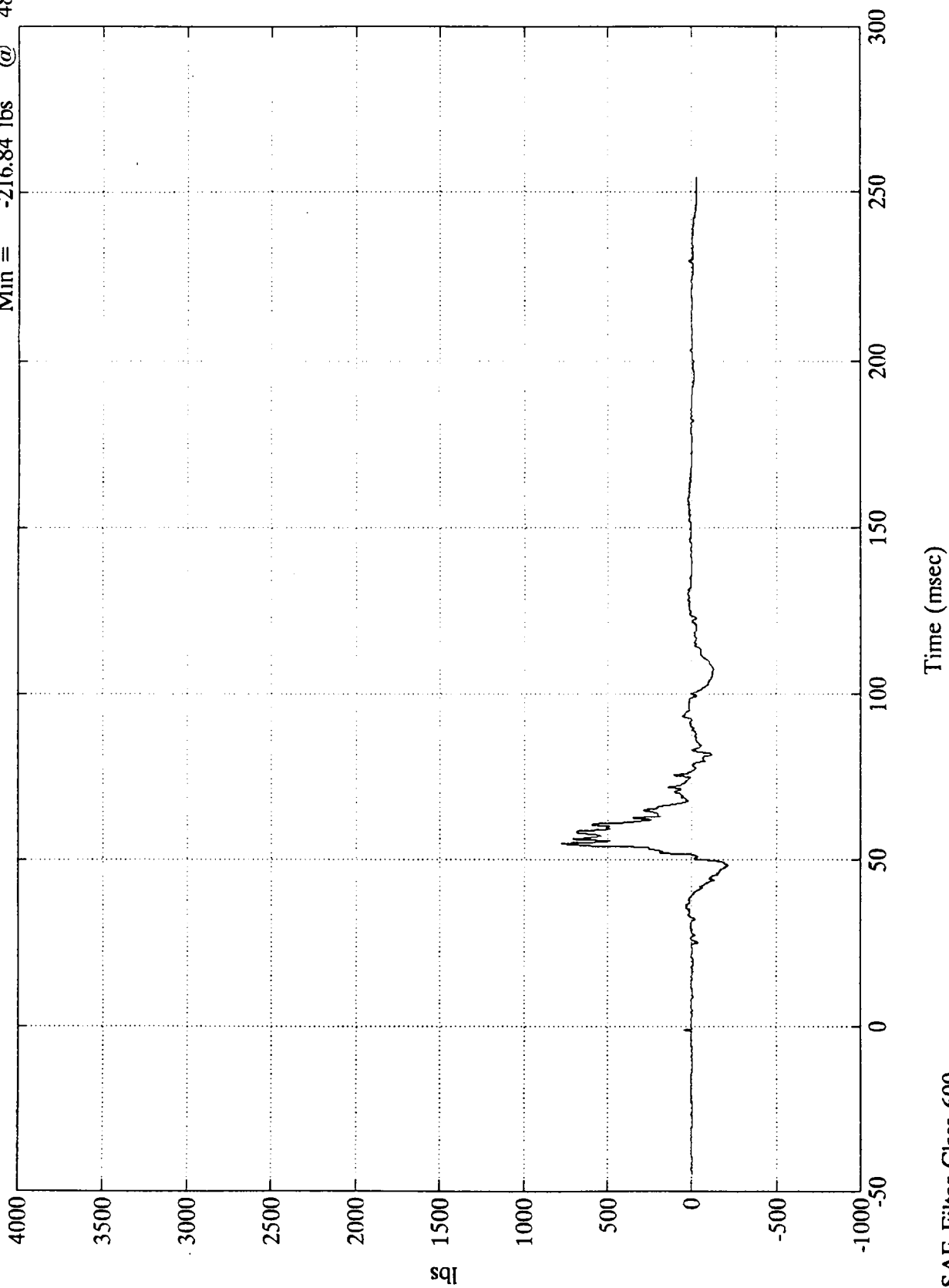
7893-11

SAE Filter Class 600

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Right Femur

Max = 776.09 lbs @ 54.84 msec
Min = -216.84 lbs @ 48.24 msec



B-91

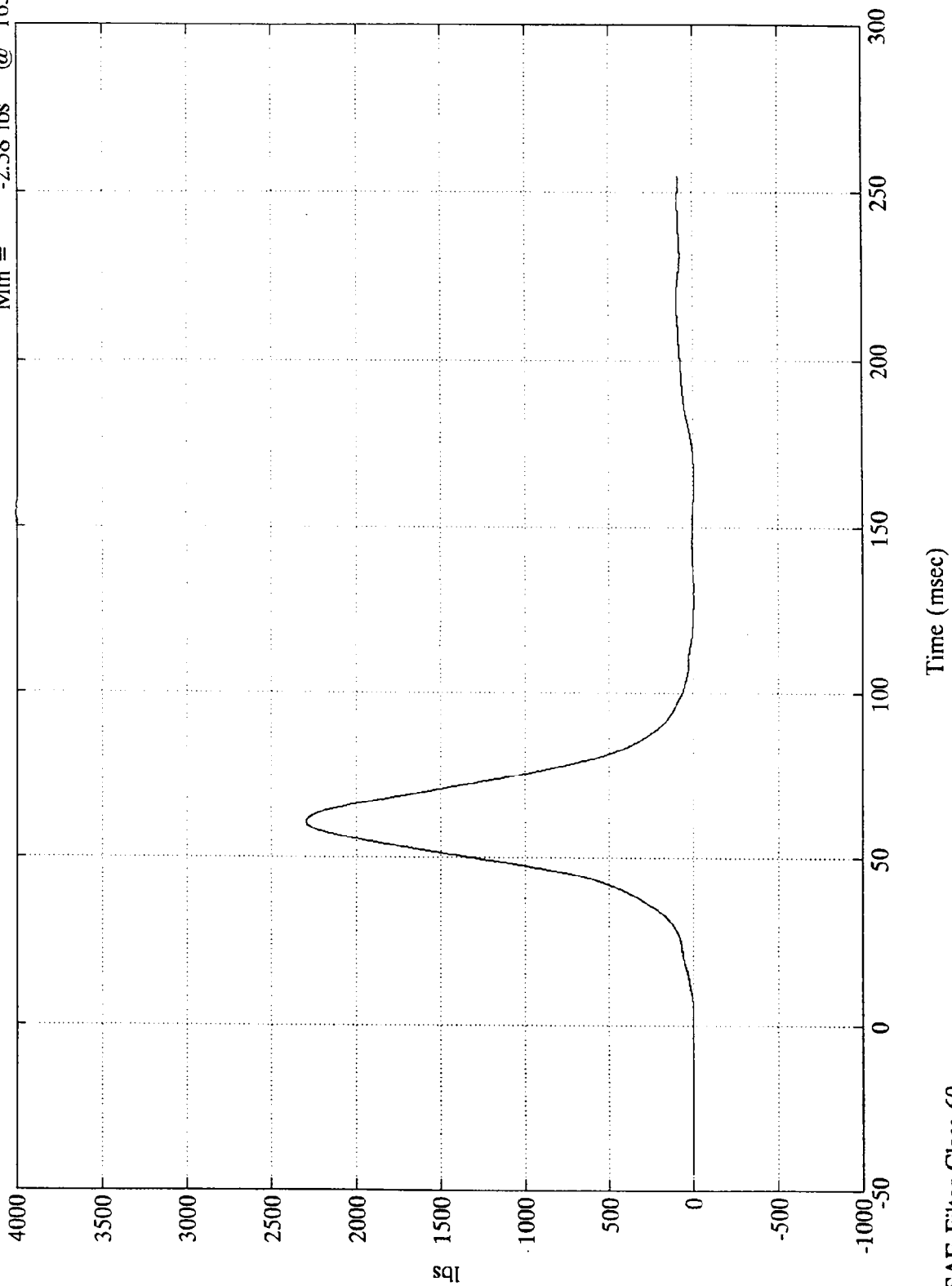
7893-11

SAE Filter Class 600

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Right Belt Load

Max = 2296.71 lbs @ 60.48 msec
Min = -2.58 lbs @ 165.24 msec



B-92

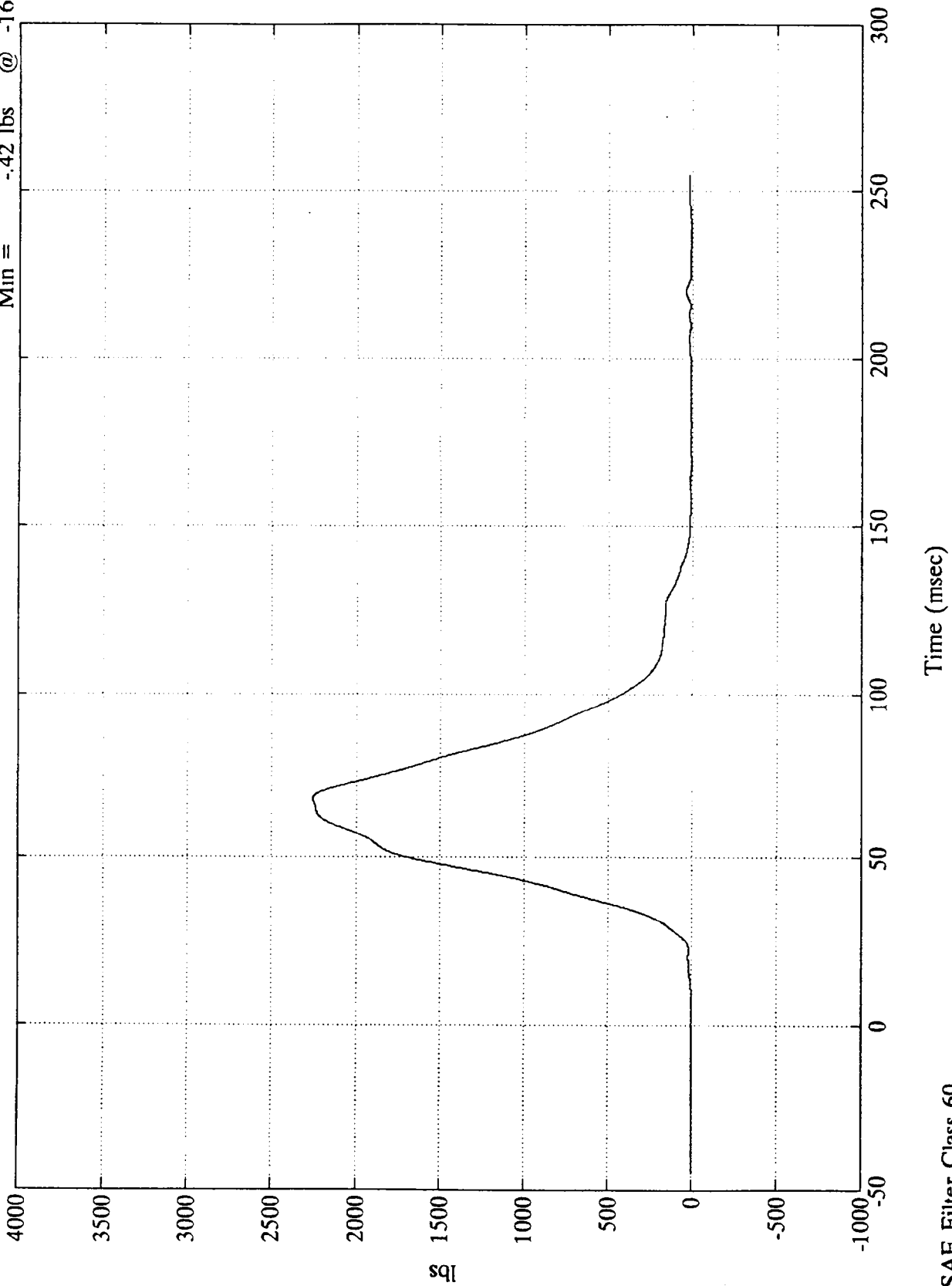
7893-11

SAE Filter Class 60

NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Torso Belt Load

Max = 2255.88 lbs @ 68.04 msec
Min = -42 lbs @ -16.56 msec



NCAP TEST 15 1991 MAZDA M.P.V.

Pos. 2 Belt Elongation

Max = .28 ins @ 78.36 msec
Min = -.00 ins @ 24.96 msec



B-94

7893-11

Time (msec)

As measured over 2.5 inches

SAE Filter Class 60

Appendix C

PART 572-B DUMMY CONFIGURATION

AND PERFORMANCE VERIFICATION DATA SHEETS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation, Advanced Technology Center. A summary of the test results, and Part 572 specifications are included in this Appendix.

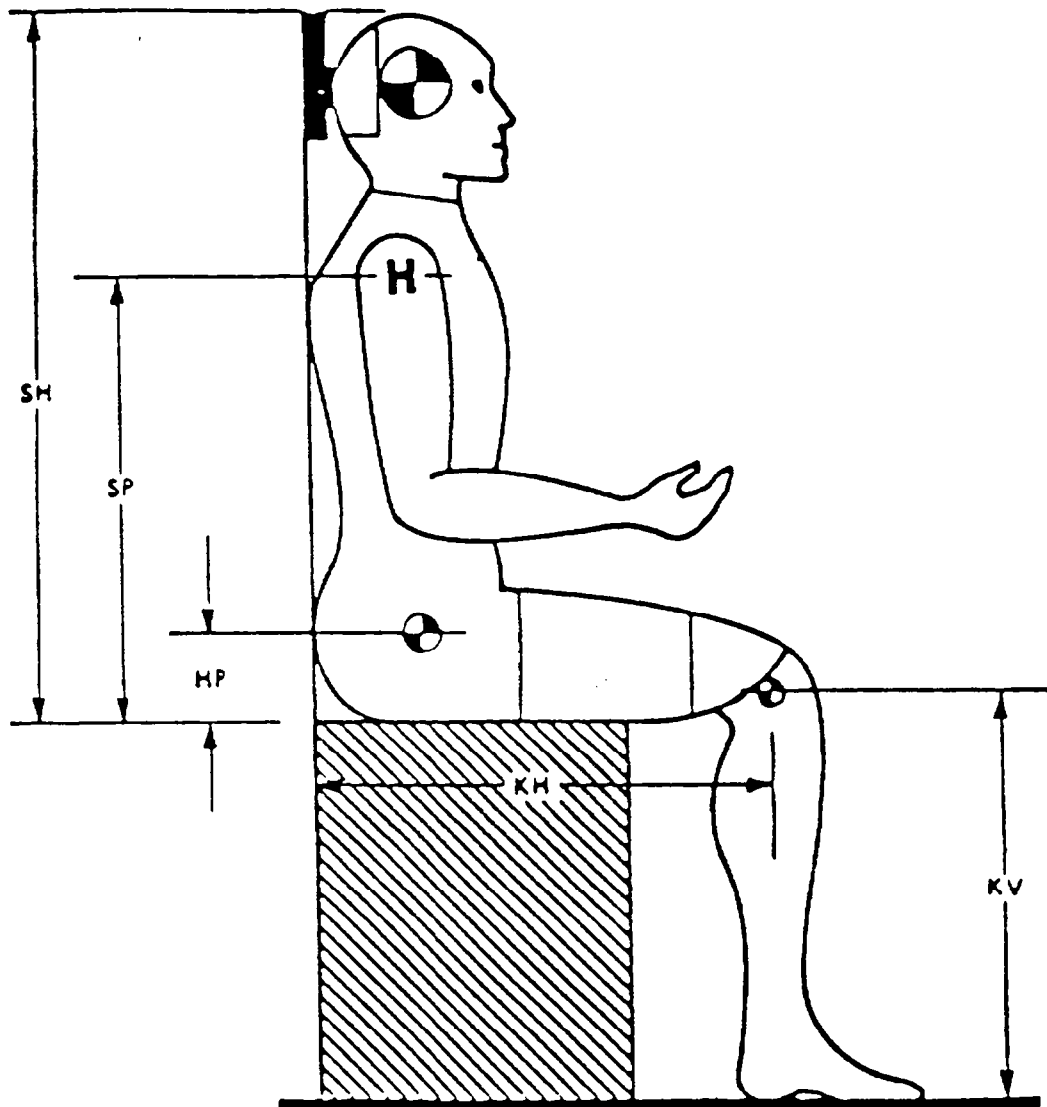
Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
357	4-29-91
749	4-5-91

Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Indicant Testing Final Report No. 6525-V-1.

Figure 10
DUMMY CONFIGURATION DIMENSIONS



PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 357

I. CONFIGURATION VERIFICATION DATA

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXXXX	4-29-91	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXXXX	2	
SH - Seated Height	35.6 to 35.8"	35.6 "	"
SP - Shoulder Pivot Height	21.8 to 22.4"	21.9 "	"
HP - Hip Pivot Height	3.9" ref.	3.9 "	"
KH - Knee Pivot from Back Line	20.1 to 20.7"	20.4 "	"
KV - Knee Pivot from floor	19.3 to 19.9"	19.5 "	"
SW - Shoulder Width	17.8 to 18.4"	18.0 "	"
HW - Hip Width	14.0 to 15.4"	14.3 "	"

II. PERFORMANCE VERIFICATION DATA:

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION -----		4-29-91	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)---		2	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		69-70 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		33-46 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	213.9 G's	G's
b. peak lateral accel.	<= 10 G's	3.3 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.38 ms	ms

* Sequential number beginning with "1" at the start of each fiscal years' crash test program.

TECHNICIAN'S NAME: IVAN MINKEWICZ

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA...continued

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
2. NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	23.5 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	22.5 G's	
c. Peak Resultant Head Acceleration		26 G's max.	25.71 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2.6 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	25.05 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	8.93 ms	
g. Max. Head Rotation		63 to 73 deg.	67.43 deg	
h. Chordal Displacement				
HEAD ROTATION ANGLE				
0 deg.	Time	-2 to 2 ms.	0.0 ms	
	Displ.	-.5 to .5"	0.0 "	
30 deg.	Time	25.6 to 34.4 ms.	29.64 ms	
	Displ.	2.1 to 3.1"	2.61 "	
60 deg.	Time	40.3 to 51.7 ms.	45.88 ms	
	Displ.	4.3 to 5.3"	4.88 "	
Maximum	Time	53.2 to 66.8 ms.	55.56 ms	
	Displ.	5.0 to 6.0"	5.11 "	
60 deg.	Time	67.0 to 83.0 ms.	67.09 ms	
	Displ.	4.3 to 5.3"	4.94 "	
30 deg.	Time	85.4 to 104.6 ms.	87.55 ms	
	Displ.	2.1 to 3.1"	2.18 "	
0 deg.	Time	101.0 - 123.0 ms.	102.06 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
3. ABDOMINAL COMPRESSION			
TEST: (preload = 50 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.	26 lbs	
b. Force @ 0.75"	36 to 50 lbs.	41.5 lbs	
c. Force @ 1.0"	50 to 63 lbs.	61 lbs	
d. Force @ 1.3"	73 to 88 lbs.	85 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	26.5 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	40 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	52 lbs	
d. Return Angle	12 deg. maximum	9 deg	
5. CHEST IMPACT TESTS:			
A. High Speed			
(1) Probe Speed	21.78-22.22 fps.	21.8 fps	
(2) Peak Deflection	1.7" maximum	1.67 "	
(3) Peak Resistive Force	2250 lbs maximum	2018 lbs	
(4) Internal Hysteresis	50 to 70%	57.2 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.1 fps	
(2) Peak Deflection	1.1" maximum	.96 "	
(3) Peak Resistive Force	1450 lbs maximum	1265 lbs	
(4) Internal Hysteresis	50 to 70%	50.1 %	

TECHNICIAN'S NAME: IVAN MINKIEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 357

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
6. KNEE IMPACT TEST			
A. Left Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	2076 lbs	
(3) Time above 1000 lbs.	1.7 ms. minimum	1.75 ms	
B. Right Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	1958 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	1.875 ms	

REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER 357

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	CP30	4-91	10-91
HY LATERAL--	ENDEVCO	CX05	4-91	10-91
HZ VERTICAL--	ENDEVCO	DB47	4-91	10-91
2. CHEST ACCELEROMETER--				
CX LONGITUDINAL--	CEC	A74	4-91	10-91
CY LATERAL--	ENDEVCO	GL77	4-91	10-91
CZ VERTICAL--	CEC	A128	4-91	10-91
3. FEMUR LOAD CELLS				
RIGHT SIDE	GSE	951	4-91	10-91
LEFT SIDE	GSE	952	4-91	10-91
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A160	11-90	5-91
2. TEST PROBE ACCELEROMETER--	CEC	A161	11-90	5-91
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS- DUCER INC	20051	1-91	7-91
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	1-91	7-91
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	1-91	7-91

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER.: 749

I. CONFIGURATION VERIFICATION DATA

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXXXX	4-5-91	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXXXX	2	
SH - Seated Height	35.6 to 35.8"	35.6 "	"
SP - Shoulder Pivot Height	21.8 to 22.4"	22.0 "	"
HP - Hip Pivot Height	3.9" ref.	3.9 "	"
KH - Knee Pivot from Back Line	20.1 to 20.7"	20.5 "	"
KV - Knee Pivot from floor	19.3 to 19.9"	19.5 "	"
SW - Shoulder Width	17.8 to 18.4"	18.1 "	"
HW - Hip Width	14.0 to 15.4"	14.7 "	"

II. PERFORMANCE VERIFICATION DATA:

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION		4-5-91	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		2	
VERIFICATION LAB TEMPERATURE (66 to 78 deg.)		69-72 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		26-41 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST			
a. peak resultant accel.	210 to 260 G's	236.1 G's	G's
b. peak lateral accel.	<= 10 G's	4.4 G's	G's
c. Time above 100 G's	0.9 to 1.5 ms.	1.25 ms	ms

* Sequential number beginning with "1" at the start of each fiscal years's crash test program.

TECHNICIAN'S NAME: IVAN MINKEWICZ

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA...continued

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 749

TEST PARAMETER		SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
2. NECK BENDING TEST				
a. Pendulum Speed		21.5 to 25.5 fps.	23.7 fps	
b. Pend. Avg. Decel. over t3 to t2		20 to 24 G's	23.2 G's	
c. Peak Resultant Head Acceleration		26 G's max.	24.26 G's	
d. Pendulum Decel. (t2-t1)		<= 3 ms.	2.6 ms	
e. Pendulum Decel. (t3-t2)		25 to 30 ms.	25.55 ms	
f. Pendulum Decel. (t4-t3)		<= 10 ms.	7.94 ms	
g. Max. Head Rotation		63 to 73 deg.	72.7 deg	
h. Chordal Displacement				
HEAD ROTATION ANGLE				
0 deg.	Time	-2 to 2 ms.	0.0 ms	
	Displ.	-.5 to .5"	0.0 "	
30 deg.	Time	25.6 to 34.4 ms.	30.01 ms	
	Displ.	2.1 to 3.1"	2.53 "	
60 deg.	Time	40.3 to 51.7 ms.	44.52 ms	
	Displ.	4.3 to 5.3"	4.72 "	
Maximum	Time	53.2 to 66.8 ms.	58.78 ms	
	Displ.	5.0 to 6.0"	5.27 "	
60 deg.	Time	67.0 to 83.0 ms.	75.77 ms	
	Displ.	4.3 to 5.3"	4.53 "	
30 deg.	Time	85.4 to 104.6 ms.	92.76 ms	
	Displ.	2.1 to 3.1"	2.11 "	
0 deg.	Time	101.0 - 123.0 ms.	106.52 ms	
	Displ.	-.5 to 0.5"	0.0 "	

TECHNICIANS NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 749

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
3. ABDOMINAL COMPRESSION			
TEST: (preload = 50 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.	28 lbs	
b. Force @ 0.75"	36 to 50 lbs.	42 lbs	
c. Force @ 1.0"	50 to 63 lbs.	57.5 lbs	
d. Force @ 1.3"	73 to 88 lbs.	82 lbs	
4. LUMBAR FLEXION TEST:			
a. Force @ 20 deg.	22 to 34 lbs.	31.5 lbs	
b. Force @ 30 deg.	34 to 46 lbs.	43.5 lbs	
c. Force @ 40 deg.	46 to 58 lbs.	53.5 lbs	
d. Return Angle	12 deg. maximum	7 deg	
5. CHEST IMPACT TESTS:			
A. High Speed			
(1) Probe Speed	21.78-22.22 fps.	21.8 fps	
(2) Peak Deflection	1.7" maximum	1.57 "	
(3) Peak Resistive Force	2250 lbs maximum	2142 lbs	
(4) Internal Hysteresis	50 to 70%	58.5 %	
B. Low Speed			
(1) Probe Speed	13.86-14.14 fps.	14.0 fps	
(2) Peak Deflection	1.1" maximum	.98 "	
(3) Peak Resistive Force	1450 lbs maximum	1323 lbs	
(4) Internal Hysteresis	50 to 70%	54.7 %	

TECHNICIAN'S NAME: IVAN MINKEWICZ

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 749

		PRE-TEST (if required)	POST-TEST (if required)
TEST PARAMETER	SPECIFICATION		
6. KNEE IMPACT TEST			
A. Left Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	2214 lbs	
(3) Time above 1000 lbs.	1.7 ms. minimum	1.75 ms	
B. Right Knee			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	
(2) Maximum Force	1850 to 2500 lbs	1863 lbs	
(3) Time Above 1000 lbs.	1.7 ms. minimum	2.00 ms	

REMARKS:

TECHNICIAN'S NAME: IVAN MINKEWICZ

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER 749

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	FY05	3-91	9-91
HY LATERAL--	ENDEVCO	GD98	3-91	9-91
HZ VERTICAL--	ENDEVCO	CD75	3-91	9-91
2. CHEST ACCELEROMETER--				
CX LONGITUDINAL--	CEC	A73	3-91	9-91
CY LATERAL--	ENDEVCO	CE06	3-91	9-91
CZ VERTICAL--	CEC	A44	3-91	9-91
3. FEMUR LOAD CELLS				
RIGHT SIDE	GSE	954	4-91	10-91
LEFT SIDE	GSE	955	4-91	10-91
CALIBRATION LABORATORY INSTRUMENTS--				
1. PENDULUM ACC.--	CEC	A160	11-90	5-91
2. TEST PROBE ACCELEROMETER--	CEC	A161	11-90	5-91
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE--	TRANS- DUCER INC	20051	1-91	7-91
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	BLH	72952	1-91	7-91
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE--	CIC	567-11	1-91	7-91

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head X Y Z	CP30	ENDEVCO	4-91	10-91
	CX05	ENDEVCO	4-91	10-91
	DB47	ENDEVCO	4-91	10-91
Chest X Y Z	A74	CEC	4-91	10-91
	GL77	ENDEVCO	4-91	10-91
	AL28	CEC	4-91	10-91
Right Femur Load Cell	952	GSE	4-91	10-91
Left Femur Load Cell	951	GSE	4-91	10-91
Neck Load Cell X				
Y				
Z				
Neck Moment X				
Y				
Z				
Chest Deflection Gauge Hybrid III Use Only				
Lap Belt Load Cells	123	LEBOW	3-91	9-91
Shoulder Belt Load Cells	127	LEBOW	3-91	9-91
Spool-Out Potentiometer	-	-	-	-
Belt Stretch Transducer	E1	CALSPAN	4-91	10-91

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head X Y Z	FY05	ENDEVCO	3-91	9-91
	GD98	ENDEVCO	3-91	9-91
	CD75	ENDEVCO	3-91	9-91
Chest X Y Z	A73	CEC	3-91	9-91
	CE06	ENDEVCO	3-91	9-91
	A44	CEC	3-91	9-91
Right Femur Load Cell	955	GSE	3-91	9-91
Left Femur Load Cell	954	GSE	3-91	9-91
Neck Load Cell X Y Z				
Neck Moment X Y Z				
Chest Deflection Gauge Hybrid III Use Only				
Lap Belt Load Cells	133	LEBOW	3-91	9-91
Shoulder Belt Load Cells	135	LEBOW	3-91	9-91
Spool-Out Potentiometer	-	-	-	-
Belt Stretch Transducer	E3	CALSPAN	4-91	10-91

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	A83	CEC	3-91	9-91
Right Rear Seat Crossmember	A70	CEC	4-91	10-91
Top of Engine	A159	CEC	3-91	9-91
Bottom of Engine	A116	CEC	1-91	7-91
Left Disc Brake Caliper	A24	CEC	3-91	9-91
Right Disc Brake Caliper	A68	CEC	4-91	10-91
Instrument Panel	A179	CEC	12-90	6-91
Center Rear Crossmember Z	A154	CEC	3-91	9-91
Vehicle Rear Z	A131	CEC	3-91	9-91

INSTRUMENT CALIBRATION FOR LABORATORY INSTRUMENTS
(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Neck Bending Pendulum Accel.	A160	CEC	11-90	5-91
Neck Bending Rotary Potentiometer	None	BOURNS	1-91	7-91
Femur Probe Accelerometer	A160	CEC	11-90	5-91
Chest/Thorax Probe Accel.	A161	CEC	11-90	5-91
Lumbar Flexion Force Gauge	20051	TRANSDUCER INC.	1-91	7-91

Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

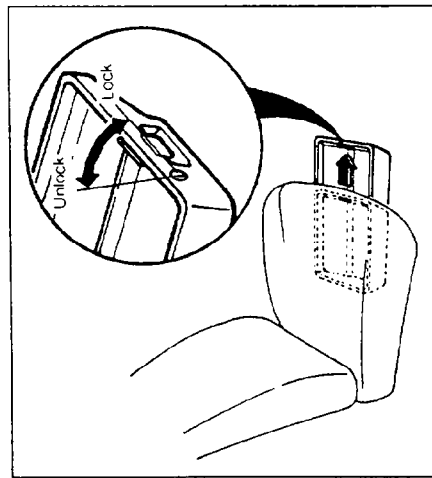
9MU2 0285F

UNDER-SEAT TRAY (front passenger's seat, if equipped)

The tray is located under the front passenger's seat for handy storage of small items. It can be locked with the key.

NOTE

If desired the tray may be lined with some type of material to prevent rattles and noises. Before pulling out the under-seat tray, check to be sure that it's unlocked. The release lever might be damaged if the tray is pulled while locked.



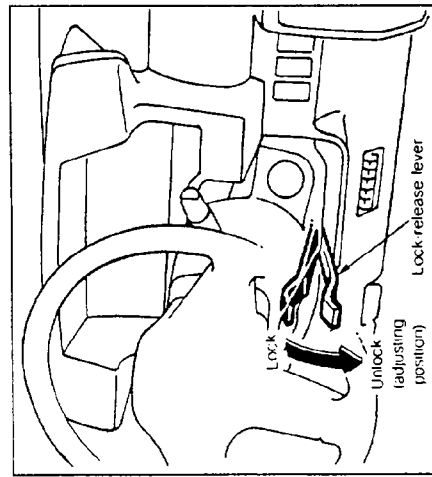
9MU2 0290F

TILT STEERING WHEEL (if equipped)

To change the steering wheel angle, pull down on the lock-release lever located under the steering column. Tilt the steering wheel to the desired angle while holding the lever fully down. Push up on the lock-release lever to lock. After adjusting, push up and down against the steering wheel to be certain it is locked in position.

WARNING!

Never adjust the position of the steering wheel or column while the vehicle is moving.



9MU2 0300E

SEAT BELT RESTRAINT SYSTEM

To help decrease the possibility or severity of injury in accidents or sudden stops, we recommend that you and your passengers in the vehicle be properly restrained at all times, using the seat belts provided. The front seat are equipped with retractable inertia-locking seat belts. The rear seats have either retractable inertia-locking seat belts or standard non-retracting belts, depending on the seating position.

The retractors keep the belts out of the way while passengers enter or exit the vehicle. Inertia locks allow freedom of movement until a deceleration force occurs (such as a sudden stop or collision). At that time the belts will automatically lock in position, and you and your passengers will be restrained.

WARNING!

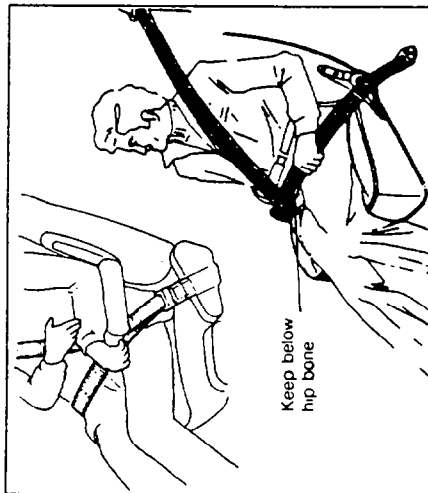
- Lap/shoulder belt assemblies subjected to stress by occupants in a collision must be replaced.
- Persons who are not sitting in a seat with a fastened seat belt are much more likely to suffer serious bodily injury in the event of a collision.
- Aftermarket comfort clips are not recommended since they could impair the function and safety of the belts.

FRONT SEAT BELTS

To Fasten Seat Belt

1. Grasp the buckle end and tongue plate.
2. Slowly pull out the lap/shoulder belt.
3. Insert the tongue plate into the open end of the buckle until an audible click is heard. An audible click will come out when the belt is securely locked.

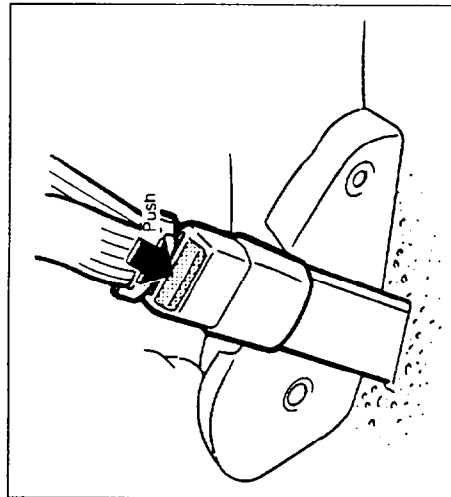
- Make sure the seat belt passes under the armrest and not over it, when fastening the belt while the seat's armrest is in use.
- Position the lap belt across your lap as LOW ON THE HIPS as possible to reduce the risk of sliding under it during an accident. Adjust it to a SNUG FIT by pulling the belt.



- The belt retractor is designed to take up excess webbing automatically and to maintain tension on the belt.

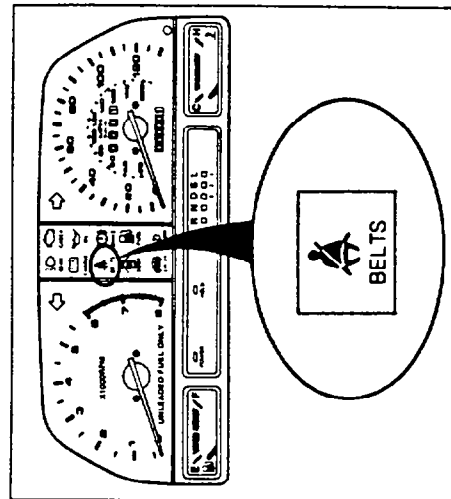
To Unfasten Seat Belts

Depress the button on the buckle.



Seat belt warning lamp/beeper system

1. As a reminder to you to fasten the lap/shoulder belt(s), the warning lamp will glow for about six seconds after turning the ignition switch to the ON position.
2. The reminder will also sound for about six seconds, or until the driver's seat belt is fastened (if the driver's seat belt is not fastened when the ignition switch is turned to the ON position).
3. If the system does not operate as described, consult your nearest Authorized Mazda Dealer.



NOTE

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

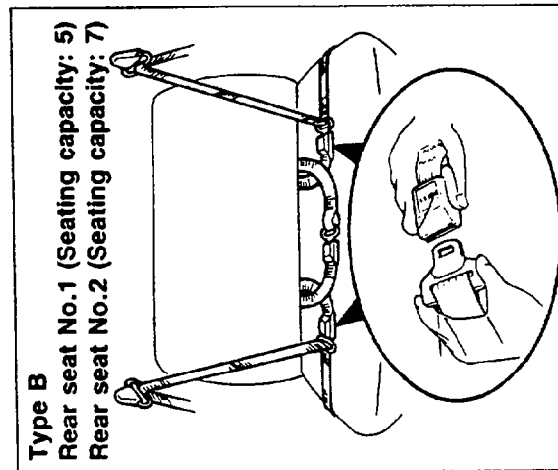
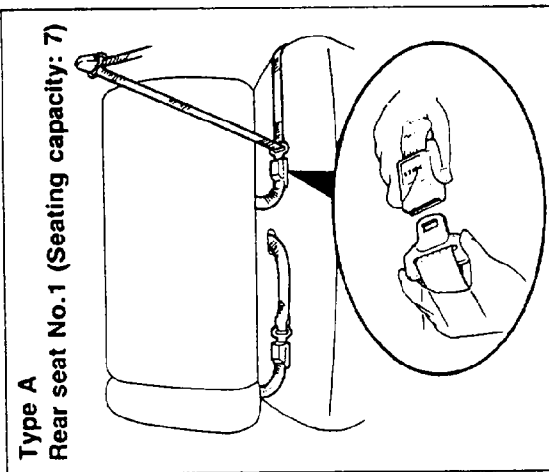
WARNING!

- Never wear the shoulder belt under the arm, or swing it behind your neck and over the inside shoulder.
- Use the shoulder belt on the outside shoulder only.
- Never use a single belt for more than one person.
- Be sure the lap portion of the belt is fitted snugly, low on the hips, not on the waist.
- Pregnant women should use seat belts according to specific recommendations by their doctors.
- The lap belt should be worn as **SNUG-LY AND AS LOW** as possible.
- Failure to follow these precautions could increase the possibility and/or severity of injury in an accident.

REAR SEAT NO.1 or/and NO.2 BELTS

To Fasten Outboard Seat Belts

Use in the same manner as the **FRONT SEAT BELTS**.



To Fasten Center Seat Belts

1. Grasp the buckle end.
2. Grasp the tongue plate and pull it until the desired length is obtained.

NOTE

(Type A)

If the belt locks when being pulled out, re-wind the belt completely in the retractor and then pull out to the desired length.

3. Insert the tongue plate into the open end of the buckle until an audible click is

heard, indicating the belt is locked. Make sure the belt is not twisted.

Position the lap belt across your lap as LOW ON THE HIPS as possible.

(Type B)

If necessary, lengthen or shorten the lap belt. To adjust, hold the tongue at a right angle to the webbing and pull to lengthen, or pull the loose end of the belt webbing to shorten.

WARNING!

Be sure the lap belt is fit snugly around the hips, not on the waist. Failure to do so may increase the chance of injury in the event of a collision.

