

V1670

REPORT NUMBER: CAL-92-N07

NEW CAR ASSESSMENT PROGRAM (NCAP)  
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY  
1992 FORD F-150 PICKUP

NHTSA NUMBER: MNO204

CALSPAN TEST NUMBER: 7951-1

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November 26, 1991



FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation  
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  <p>A frontal load cell barrier test on a 1992 Ford F-150 Pickup was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York on November 26, 1991.</p> <p>The impact speed was 34.8 mph and the ambient temperature at the barrier face at the time of impact was 34°F. The maximum post-test vehicle crush was 26.0 inches. The test vehicle was equipped with a 3-point continuous belt system at each of the front outboard seating positions.</p> <p>With regard to FMVSS 208 "Occupant Crash Protection", injury criteria, both the driver and passenger dummies appear to comply with the maximum head, chest and femur requirements.</p>					
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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 MNO204

A load cell barrier consisting of 36 load cells was impacted by a 1992 Ford F-150 Pickup at a velocity of 34.8 mph. The test was performed at the Calspan Corporation Advanced Technology Center on November 26, 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, 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. 358) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C and D.

The 69 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. Barrier load cell B3 was damaged at impact and did not record accurately. This load cell was not used in the calculation of load cell sums.

The driver's head struck the steering wheel rim and hub; the HIC was 860.0. The maximum chest deceleration over 3 milliseconds was 47.8 g's and femur loads were 1108.8 and 976.0 pounds.

The right front passenger's HIC was 590.0 and maximum chest deceleration over 3 milliseconds was 36.7 g's. Femur loads were 653.9 and 462.5 pounds.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1992 Ford F-150 Pickup

NHTSA Test No.: MN0204 VIN.: 2FTDF15Y4NCA05187

Body Color: Gray Date of Manufacture: 9/91

Engine: 6 Cylinders; - C.I.D.; 4.9 Liters; - CC

Gas; - Diesel; - Turbocharged

Longitudinal; - Transverse

Transmission: 5 Speed;  Manual; - Automatic;  Overdrive

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

Date Received: 10-24-91 Odometer Reading: 30.4

- A/C;  P/S;  P/B; - P/wdo;

- Tilt Wheel - P/seats; - Cruise Control

Type of Occupant Restraint: 3-point continuous loop restraint system

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 35 psi, Rear 41 psi

Recommended Tire Size: P235/75R15XL

Recommended Cold Tire Pressure: Front 35 psi, Rear 41 psi

Tires on Vehicle: P235/75R15M&S; Manufacturer: Firestone

Number of Occupants: 3 Front; - Rear; - 3rd Seat; 3 TOTAL

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

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

Rated Cargo and Luggage

Weight (RCLW) A-B = 300 lbs.

GVWR 5450 lbs. GAWR: Front 2650 lbs. Rear 3166 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 = 1140 lbs.      Right Rear = 840 lbs.  
Left Front = 1140 lbs.      Left Rear = 870 lbs.  
TOTAL FRONT WEIGHT = 2280 lbs. (57.1% of Total Vehicle Weight)  
TOTAL REAR WEIGHT = 1710 lbs. (42.9% of Total Vehicle Weight)  
TOTAL DELIVERED WEIGHT = 3990 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (3990 lbs.)  
RCLW = 300 lbs.  
Target Test Weight = UDW + RCLW + (2 dummies x 164 lbs./dummy)  
Target Test Weight = 4618 lbs.

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

Right Front = 1200 lbs.      Right Rear = 1080 lbs.  
Left Front = 1220 lbs.      Left Rear = 1110 lbs.  
TOTAL FRONT WEIGHT = 2420 lbs. (52.5% of Total Vehicle Weight)  
TOTAL REAR WEIGHT = 2190 lbs. (47.5 % of Total Vehicle Weight)  
TOTAL TEST WEIGHT = 4610 lbs.  
Weight of ballast secured in vehicle trunk area = 40 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 32.2"    LF 31.9"    RR 35.3"    LR 35.2"  
Test Attitude:      RF 32.3"    LF 31.8"    RR 34.1"    LR 33.7"  
Wheel Base: 133.0 in.; C.G. = 63.2 in. rearward of front wheel C/L

Remarks: 17.7 gallons of stoddard solution was placed in mid fuel tank  
16.9 gallons of stoddard solution was placed in rear 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: November 26, 1991 Time of Test: 13:05  
 Ambient Temperature: 34°F at impact area  
 Temperature in Occupant Compartment: 71 °F  
 Windshield Molding Temperature: 70 °F  
 Required Impact Velocity Range: 34.5 to 35.5 mph  
 Impact Velocity: primary = 34.8 mph, secondary = 34.7 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 207.4 C<sub>L</sub> 213.2 L 207.6  
                   Post-test = R 188.1 C<sub>L</sub> 187.2 L 185.6  
                   Crush = R 19.3 C<sub>L</sub> 26.0 L 22.0

Distance from front of test vehicle to point of impact:

R 10.7 C<sub>L</sub> 9.6 L 10.4

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	Upper steering rim <u>partial steering hub</u>	Chin with chest - dummy's <u>head contacted left knee</u>
Chest	<u>No contact</u>	<u>No contact</u>
Abdomen	<u>Lower steering rim</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>Operable</u>	<u>-</u>	<u>-</u>
	<u>Front</u>		<u>Rear</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</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>
<u>Glazing Damage</u>				
Backlight/Windshield	<u>Windshield sustained stress fractures but remained intact</u>			
Other Notable Impact Effects:	<u>None</u>			

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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 VALUESNHTSA No.: MNQ204 Vehicle: 1992 Ford F-150 Pickup

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-156.9	-30.1	73.3	174.9
Position #2 - Passenger	-39.2	167.4	90.8	192.6

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-46.3	-13.1	16.3	47.8
Position #2 - Passenger	-40.2	29.3	18.4	36.7

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	1108.8	976.0
Position #2 - Passenger	653.9	462.5

	MAXIMUM FORCE - SEAT BELT LOADS (lbs.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	1867.8	-	1492.0
Position #2 - Passenger	1715.1	1672.3	-

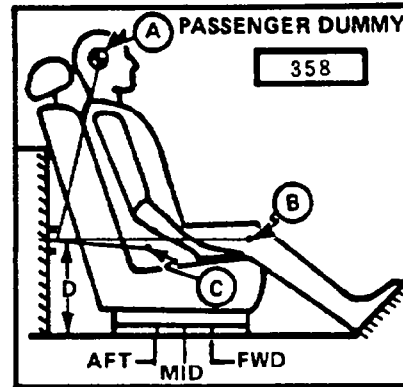
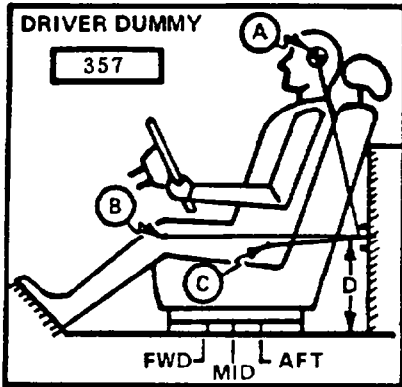
	HEAD INJURY CRITERIA (HIC)			
	HIC	t <sub>1</sub> (SEC)	t <sub>2</sub> (SEC)	Average Acceleration t <sub>1</sub> TO t <sub>2</sub>
Position #1 - Driver	860.0	.06720	.10308	56.5
Position #2 - Passenger	590.0	.07668	.11256	48.6

HIC is as defined in FMVSS 208. The maximum time interval from t<sub>1</sub> to t<sub>2</sub> is 36 milliseconds.

Figure 1  
PART 572 DUMMY IN-VEHICLE POSITION

Test No.: MN0204 Vehicle: 1992 Ford F-150 Pickup

<u>SEAT TYPE:</u>	<u>ADJUSTER TYPE:</u>	<u>SEAT BACK TYPE:</u>
<u>X</u> Bench	<u>X</u> Manual	<u>X</u> Fixed
<u>-</u> Bucket	<u>-</u> Power	<u>-</u> Adjustable Reclining
<u>-</u> Split Bench		

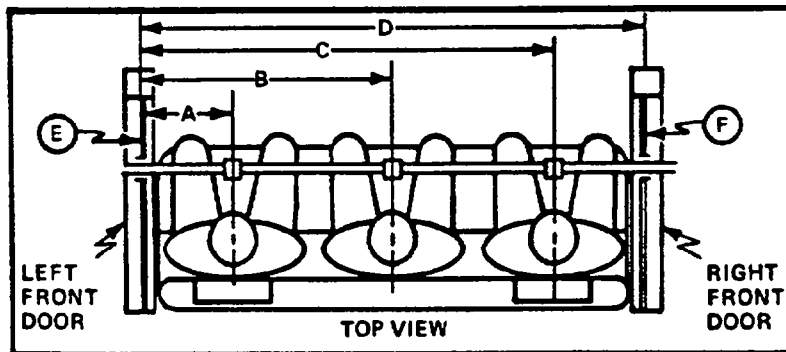


MEASUREMENT LOCATION

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

A = 25.9 in. 15 Degrees  
 B = 27.6 in. 90 Degrees  
 C = 11.2 in. 103 Degrees  
 D = 18.1 in.

A = 25.8 in. 14 Degrees  
 B = 28.2 in. 89 Degrees  
 C = 11.7 in. 99 Degrees  
 D = 18.1 in.



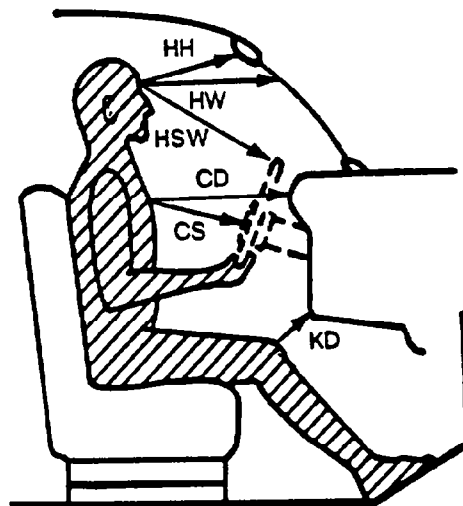
S/N 357 DUMMY ID S/N 358

A = Left Door to Driver Centerline 14.0 in.  
 B = Left Door to Center Passenger Centerline - in.  
 C = Left Door to Right Passenger Centerline 49.6 in.  
 D = Left Door to Right Door 63.6 in.  
 E, F = Window Glass Height (Right and Left Must Be Equal) 13.5 in.

Figure 2

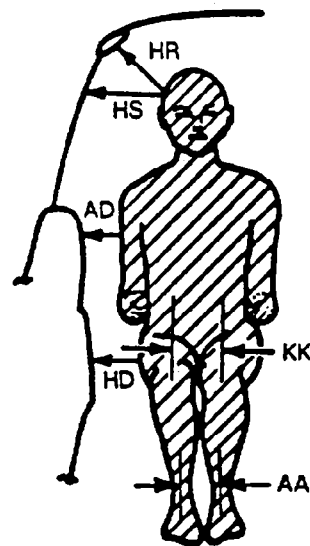
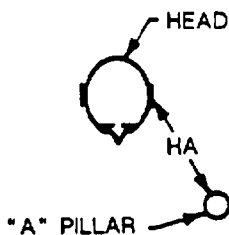
OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	20.9	21.0
HW	24.5	24.3
CD	23.3	22.5
CS	12.5	-
KDL	5.1	5.1
KDR	5.6	5.1
SA	Fixed	Fixed
TA	23°	22°
HSW	18.3	-



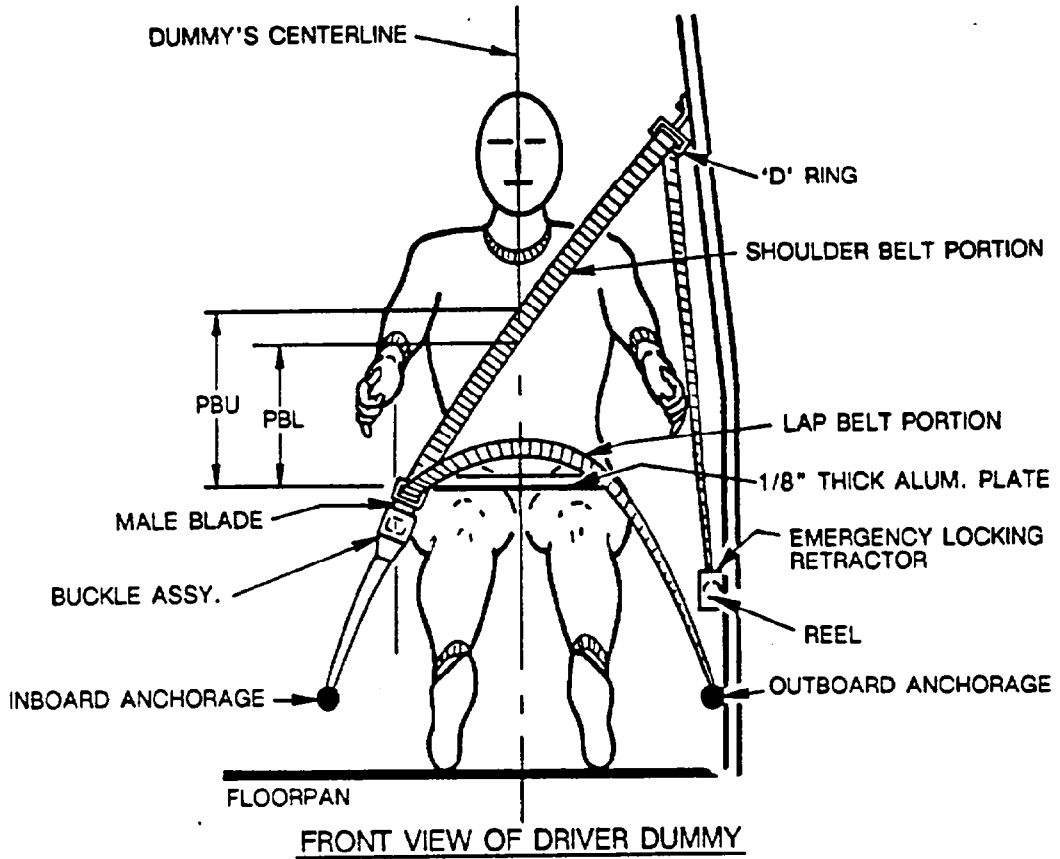
- HH = Head to Windshield Header
- HW = Head to Windshield
- HSW = Head to Steering Wheel
- CD = Chest to Dash
- CS = Chest to Steering Wheel
- KD(L/R) = Knee to Dash (Left/Right)
- SA = Seat Back Angle
- TA = Torso Angle

- 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	8.3	8.6
HS	11.0	11.0
AD	4.6	3.8
HD	7.8	8.4
KK	10.2	7.5
HA	23.8	24.0
AA	12.5	6.6

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	11.5	11.4
<u>LAP BELT TENSION</u>	2 lbs	2 lbs
<u>SHOULDER BELT TENSION</u>	-	-

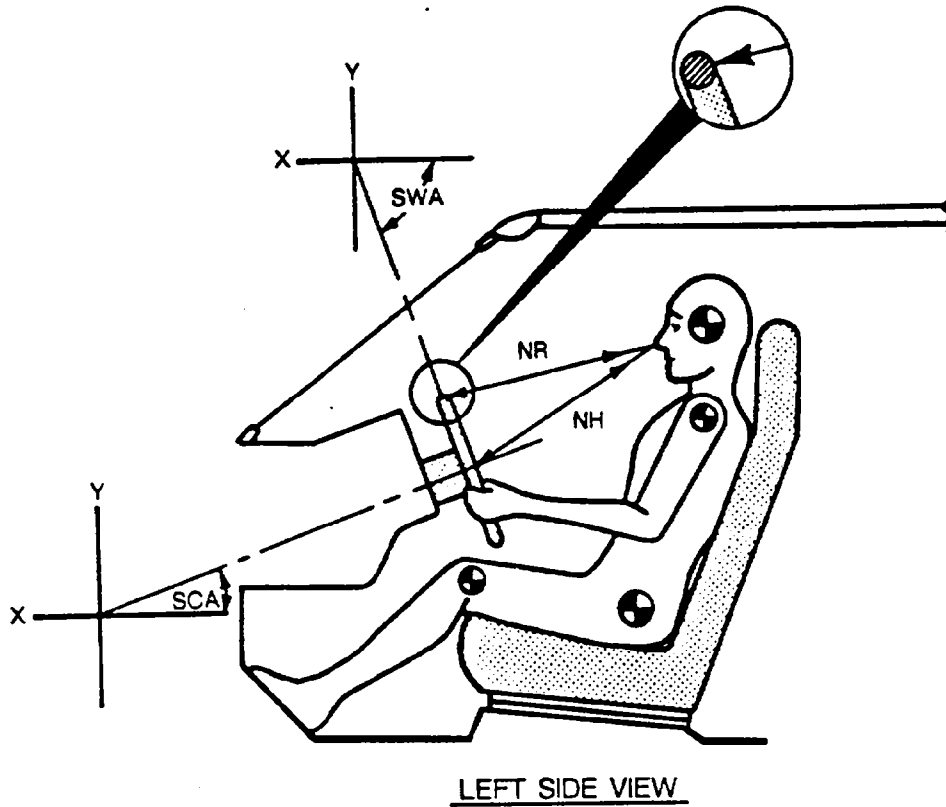
Table 3

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>95.0</u> in.	<u>95.5</u> in.
Shoulder belt length as measured on Part 572 Dummy.	<u>32.0</u> in.	<u>32.5</u> in.
Lap belt length as measured on Part 572 Dummy.	<u>39.0</u> in.	<u>39.0</u> in.
<u>SHOULDER BELT SPOOL-OFF DATA:</u>		
As determined by film analysis.	<u>2.5</u> in.	<u>2.2</u> in.
As determined mechanically.	<u>1.8</u> in.	<u>1.8</u> in.
As determined electronically.	<u>1.9</u> in.	<u>2.1</u> in.
<u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>0.5</u> in/ft	<u>1.5</u> in/ft
Measured mechanically	<u>0</u> in/ft	<u>0.6</u> in/ft

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	16.4	Inches
<u>NH</u> -- Distance from tip of dummy's nose to center of steering column hub	17.1	Inches
<u>SCA</u> -- Angle of steering column relative to the horizontal X axis	27	Degrees
<u>SWA</u> -- Angle of steering wheel relative to the horizontal X axis	-63	Degrees

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

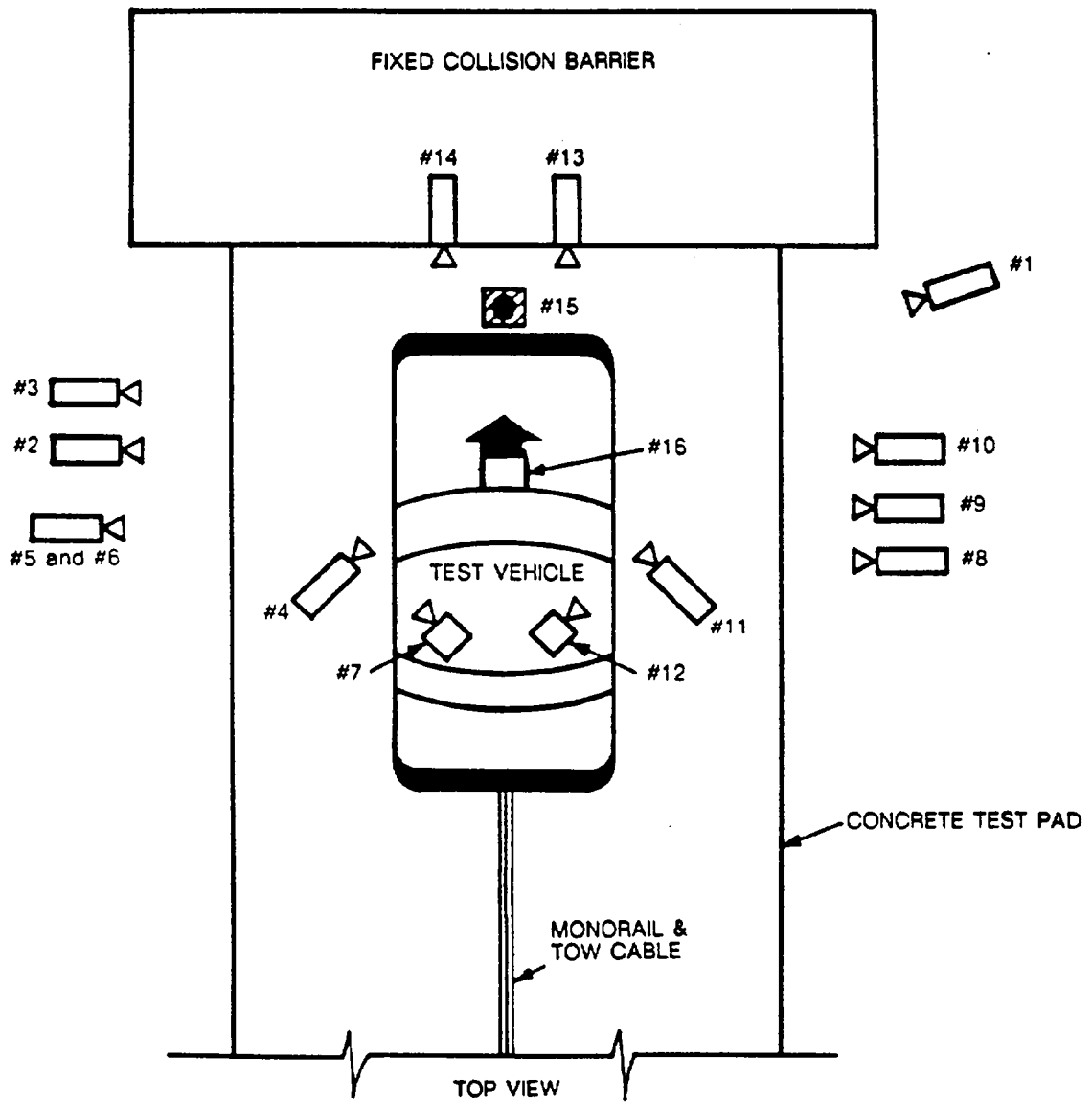


Table 4

## 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	265	60	41	-5	245	550	
3	Left Side View	327	49	41	-1	307	580	
4	Driver and Interior View	111	109	71	-12	91	500	
5	Steering Column (Bottom)	321	74	47	-2	301	500	
6	Steering Column (Top)	321	74	71	-8	301	490	
7	Left Belt	-	-	-	-	-	N.T.	
8	Overall Right Side	279	73	43	-1	259	590	
9	Right Side View	320	36	41	-2	300	N.T.	
10	Right Passenger View	327	67	56	-2	307	550	
11	Passenger and Interior View	113	103	69	-12	93	600	
12	Right Belt	-	-	-	-	-	N.T.	
13	Passenger Front View	24	-5	72	-45	-	560	
14	Driver Front View	24	-5	72	-45	-	530	
15	Windshield View	0	0	120	-50	-	530	
16	Pit View of Engine	0	40	-120	90	-	N.T.	

\*X = film plane to monorail centerline  
 Y = film plane to impact location  
 Z = film plan to ground  
 \*\* = referenced to horizontal plane  
 N.T. = No Timing

Figure 6  
VEHICLE TARGET LOCATIONS

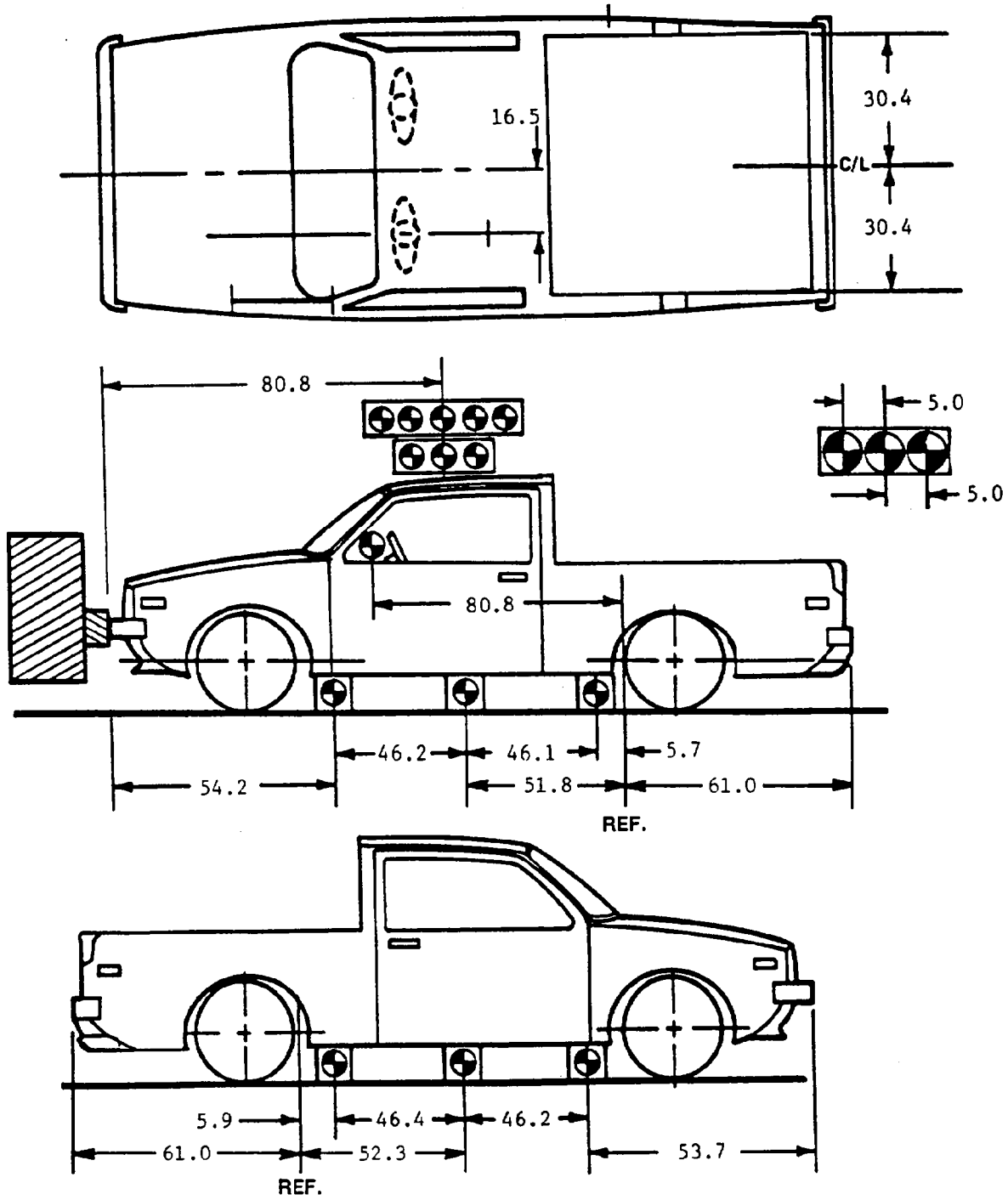
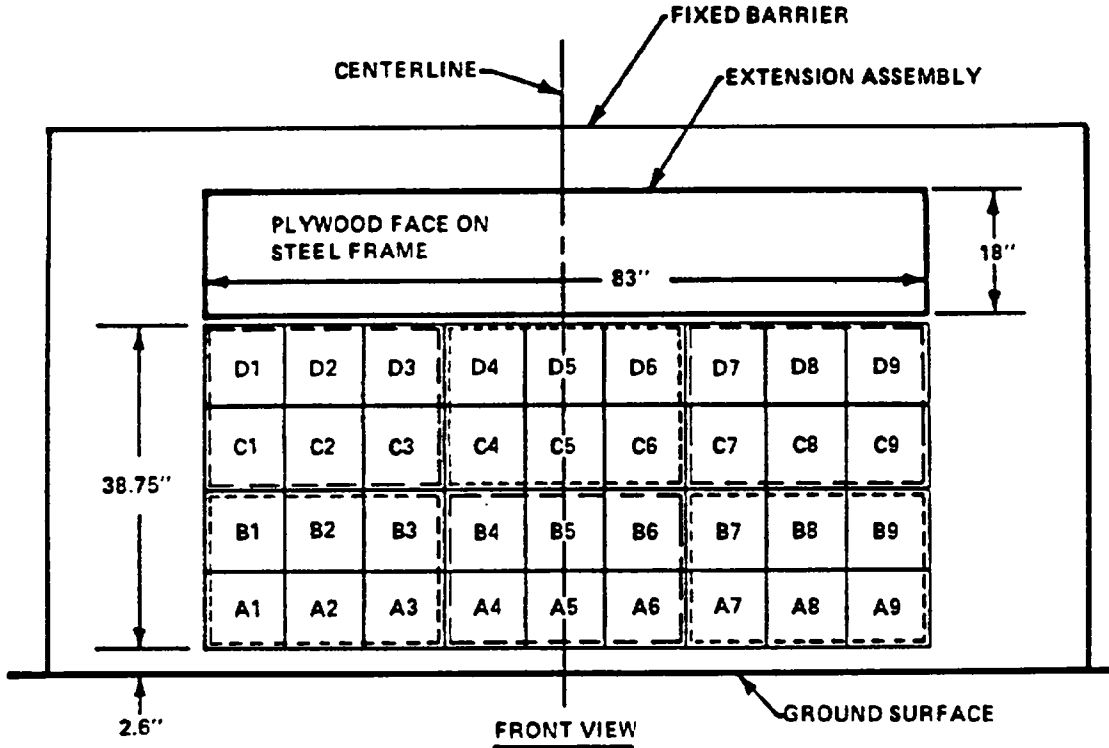


Figure 7

LOAD CELL LOCATIONS ON FIXED BARRIER

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



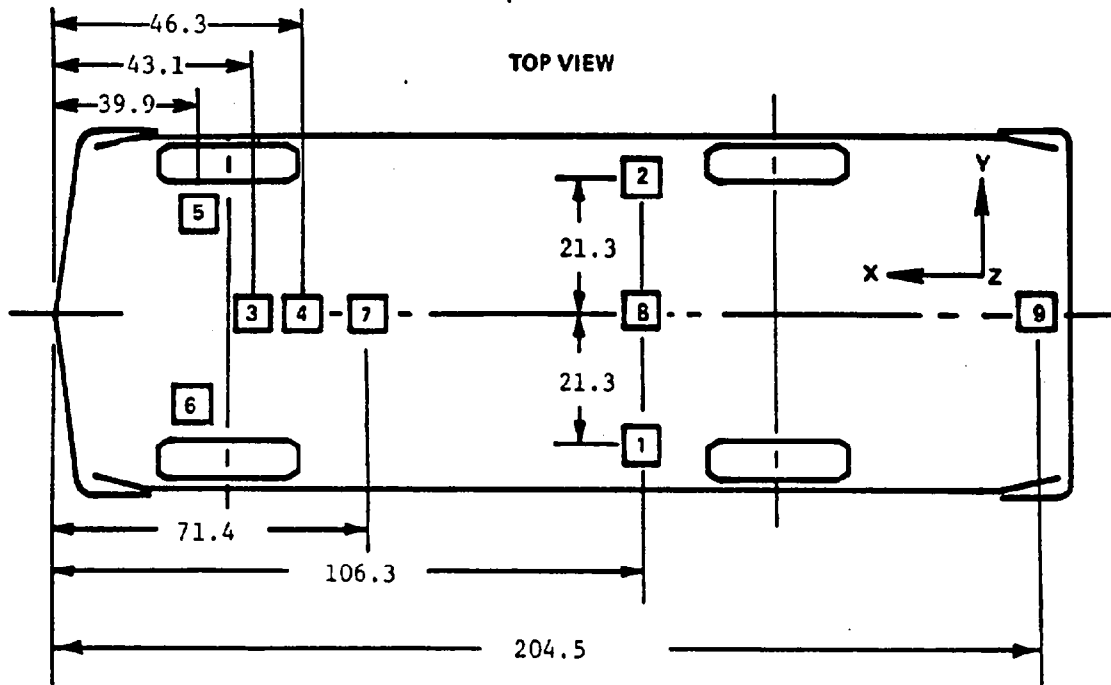
6 GROUPS OF 6 LOAD CELLS EACH

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



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	Rear Seat Crossmember			X
9	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

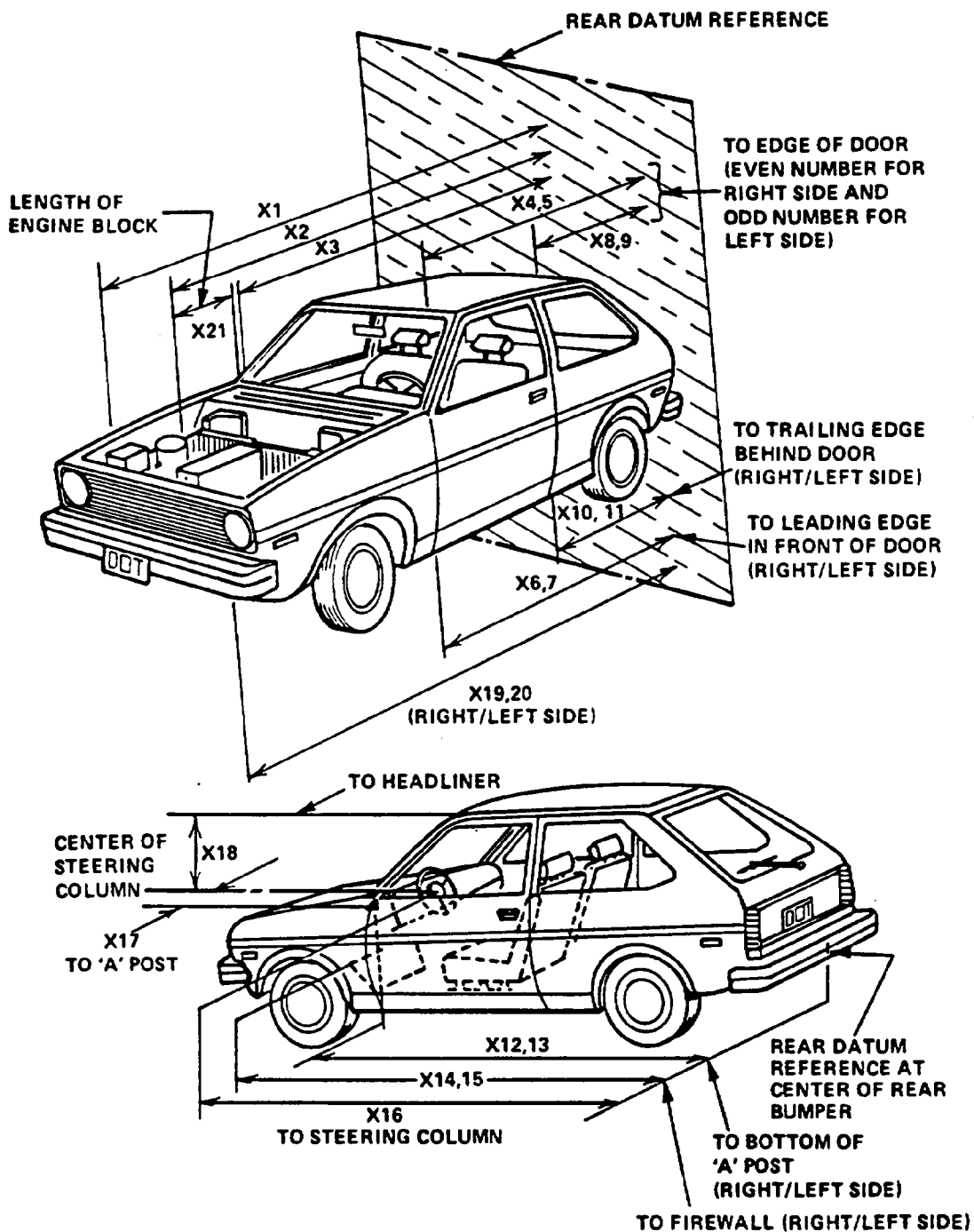


Table 5  
VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	213.2	187.2	26.0
X2	Rear Surface of Vehicle to Front of Engine	190.5	180.1	10.4
X3	Rear Surface of Vehicle to Firewall	164.8	159.5	5.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	150.2	148.5	1.7
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	150.4	148.2	2.2
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	149.0	148.2	0.8
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	148.9	146.9	2.0
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	108.5	107.3	1.2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	108.5	106.9	1.6
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	107.5	106.8	0.7
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	107.4	105.6	1.8
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	149.4	147.4	2.0
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	148.8	147.9	0.9
X14	Rear Surface of Vehicle to Firewall, Right Side	161.0	158.1	2.9
X15	Rear Surface of Vehicle to Firewall, Left Side	163.0	159.6	3.4
X16	Rear Surface of Vehicle to Steering Column	133.9	132.0	1.9
X17	Center of Steering Column to "A" Post	15.8	15.0	0.8
X18	Center of Steering Column to Headliner	18.2	18.3	-0.1
X19	Rear Surface of Vehicle to Right Side of Front Bumper	207.4	188.1	19.3
X20	Rear Surface of Vehicle to Left Side of Front Bumper	207.6	185.6	22.0
X21	Length of Engine Block	25.8	25.8	0.0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	144.0	142.5	1.5
CD	Rear Surface of Vehicle to Center of Dash Panel	143.9	141.5	2.4
LD	Rear Surface of Vehicle to Left Side of Dash Panel	142.5	141.2	1.3

Appendix A

PHOTOGRAPHS

PHOTOGRAPHS

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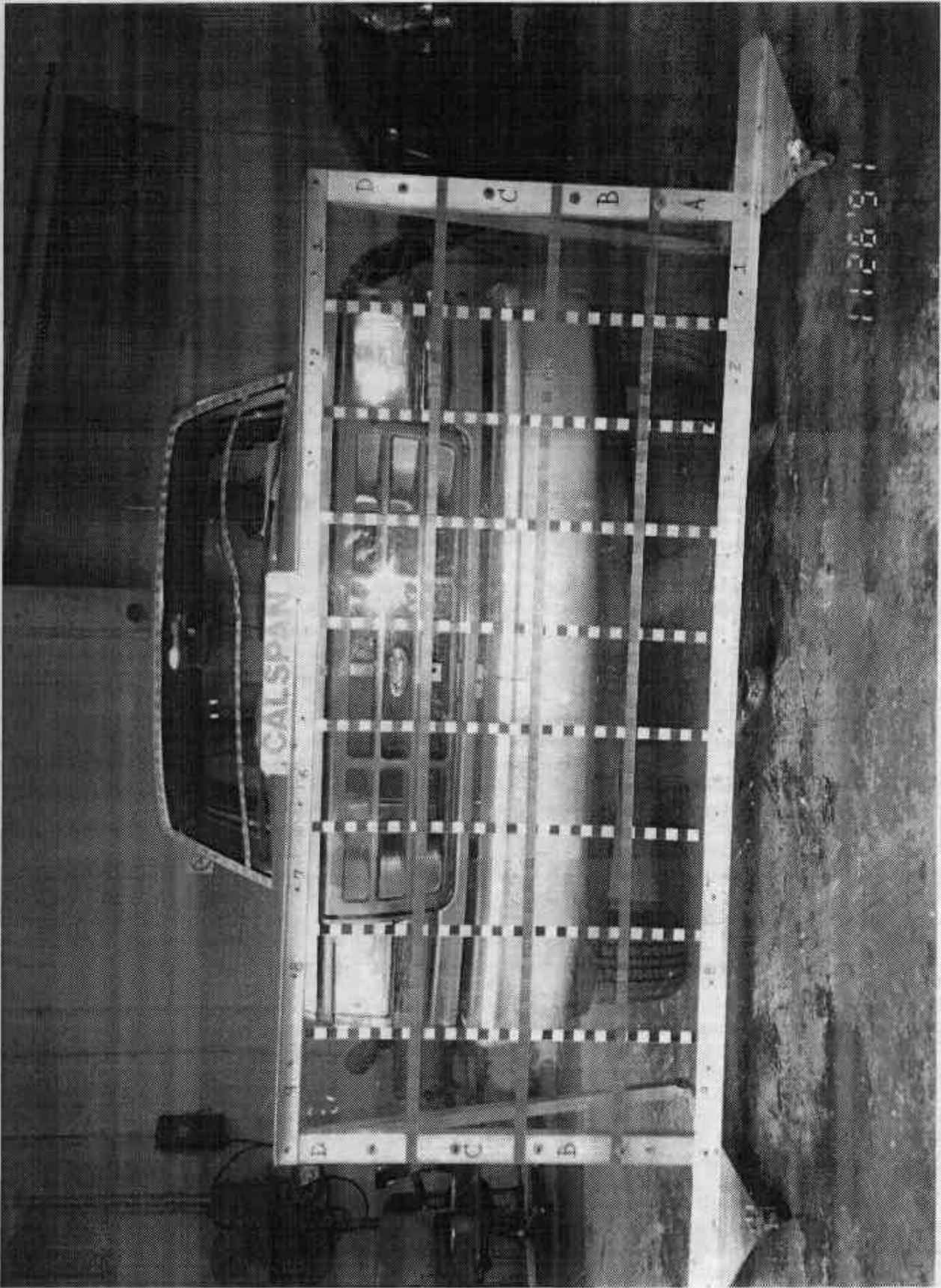


Figure A-1 LOAD CELL LOCATIONS



Figure A-2 PRE-TEST FRONT VIEW



15,9211

Figure A-3 POST TEST FRONT VIEW

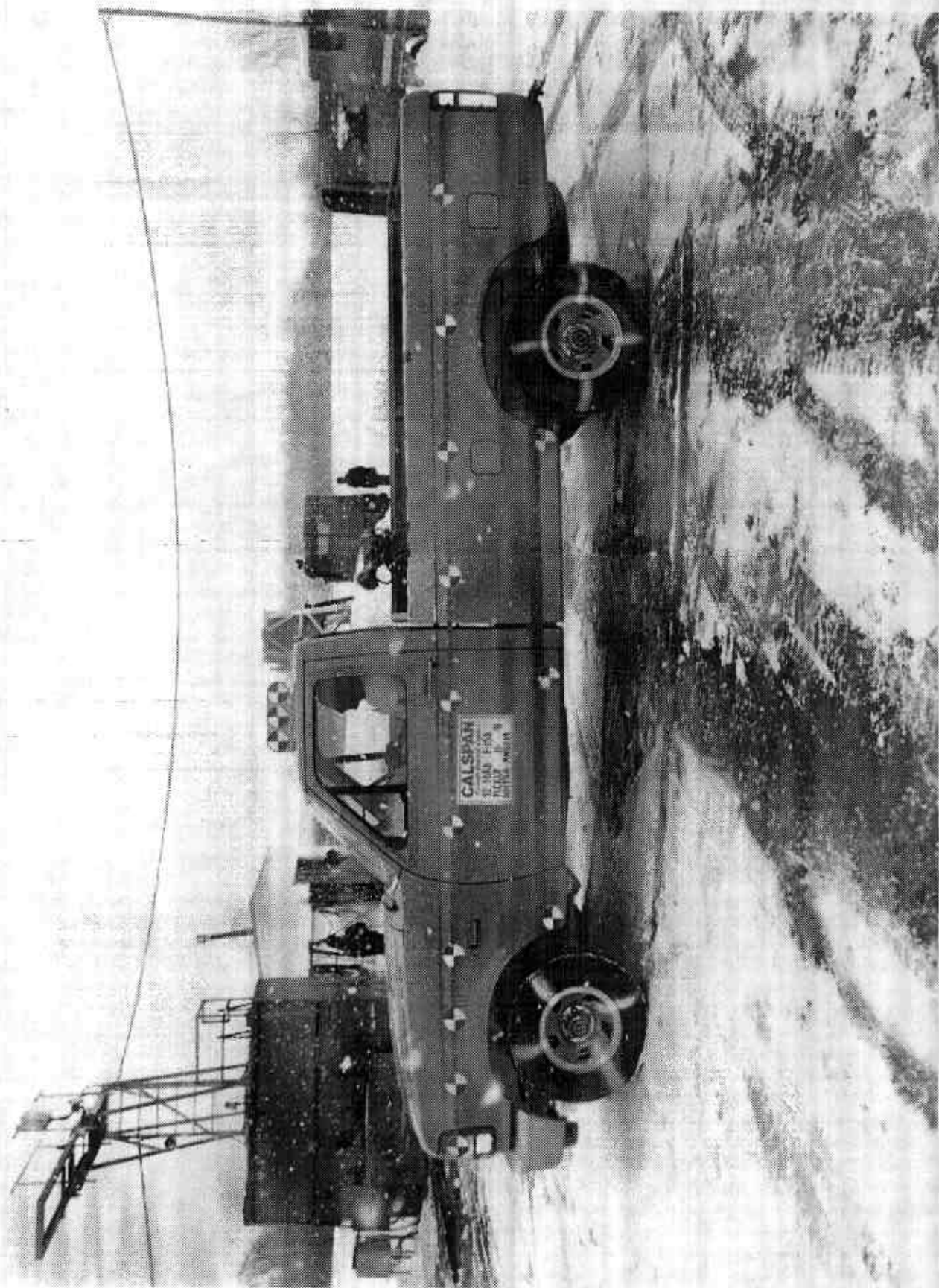


Figure A-4 PRE-TEST LEFT SIDE VIEW

A-5

7951-1



Figure A-5 POST TEST LEFT SIDE VIEW

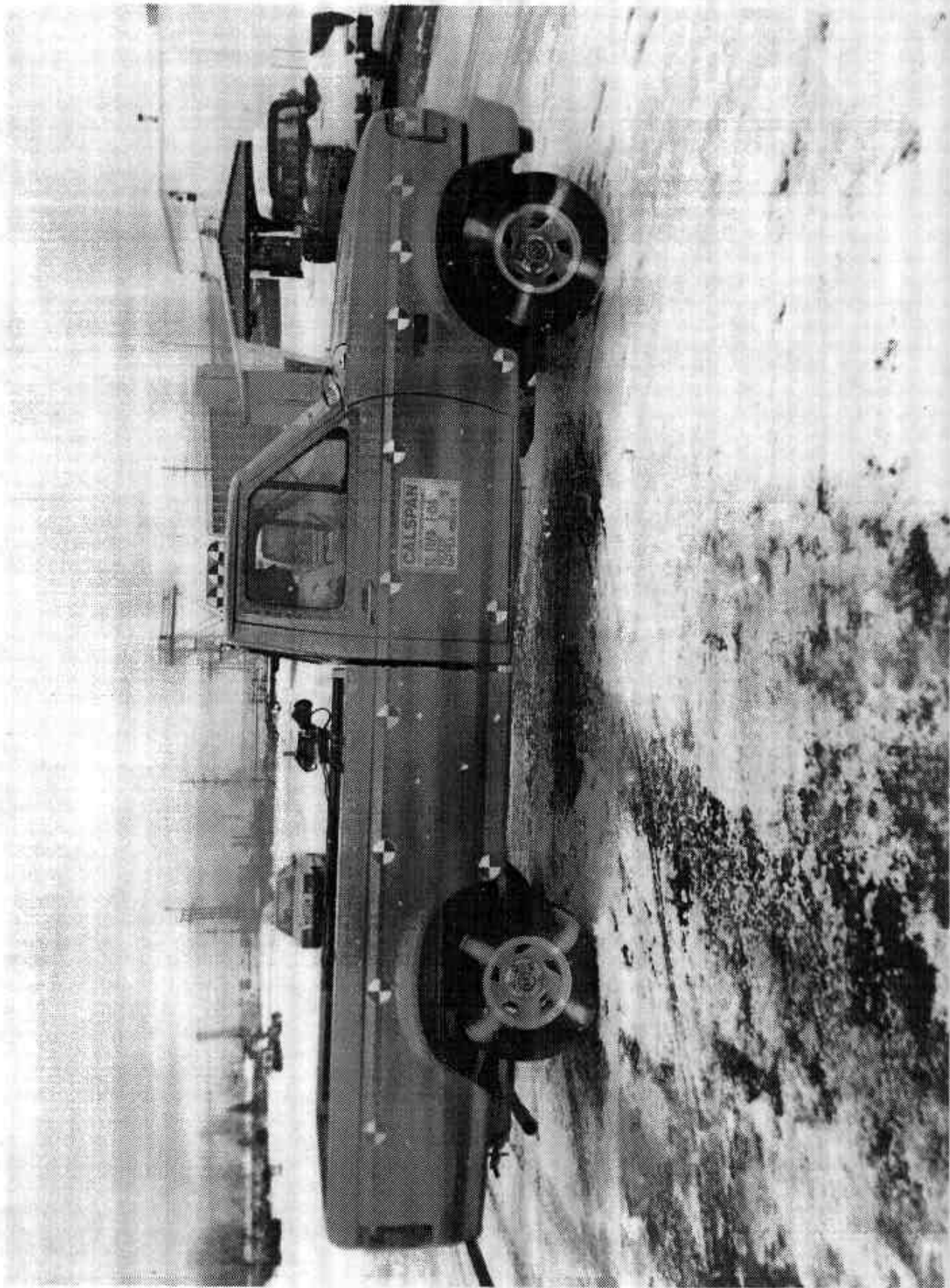


Figure A-6 PRE-TEST RIGHT SIDE VIEW



Figure A-7 POST-TEST RIGHT SIDE VIEW



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



112691

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



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



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



FIGURE A-12 PRE-TEST WINDSHIELD VIEW

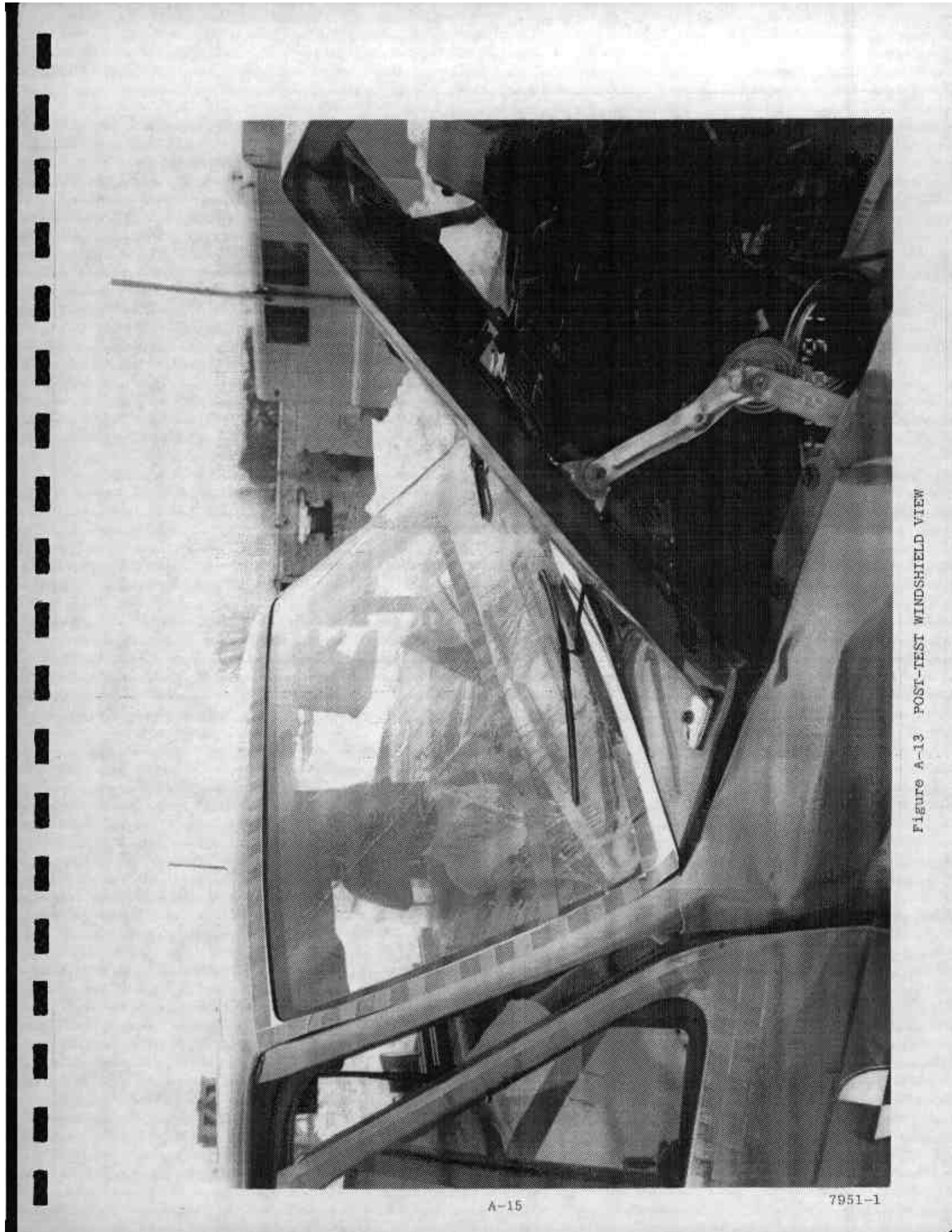


Figure A-13 POST-TEST WINDSHIELD VIEW

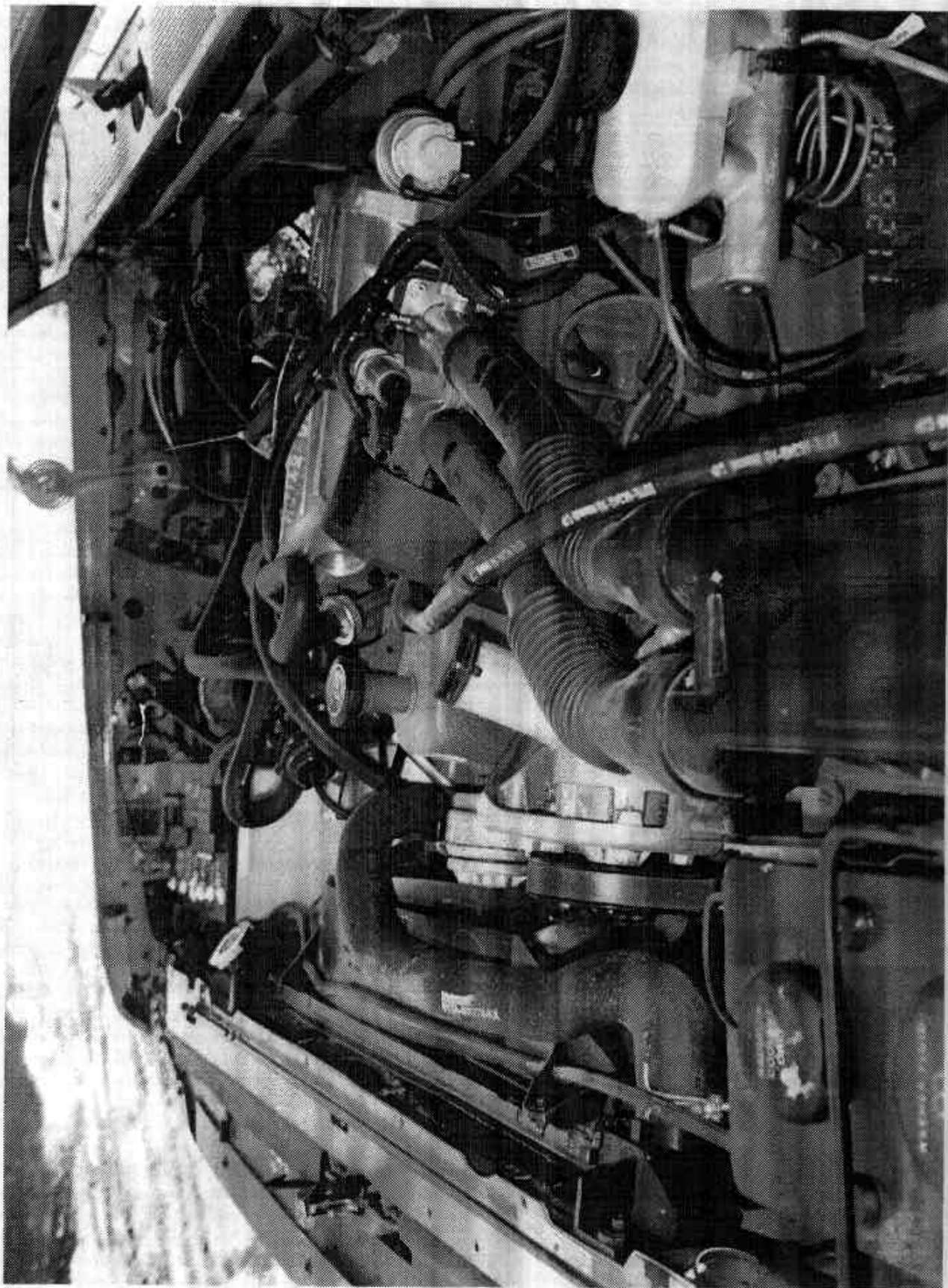


FIGURE A-14 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15 FUEL CAP VIEW

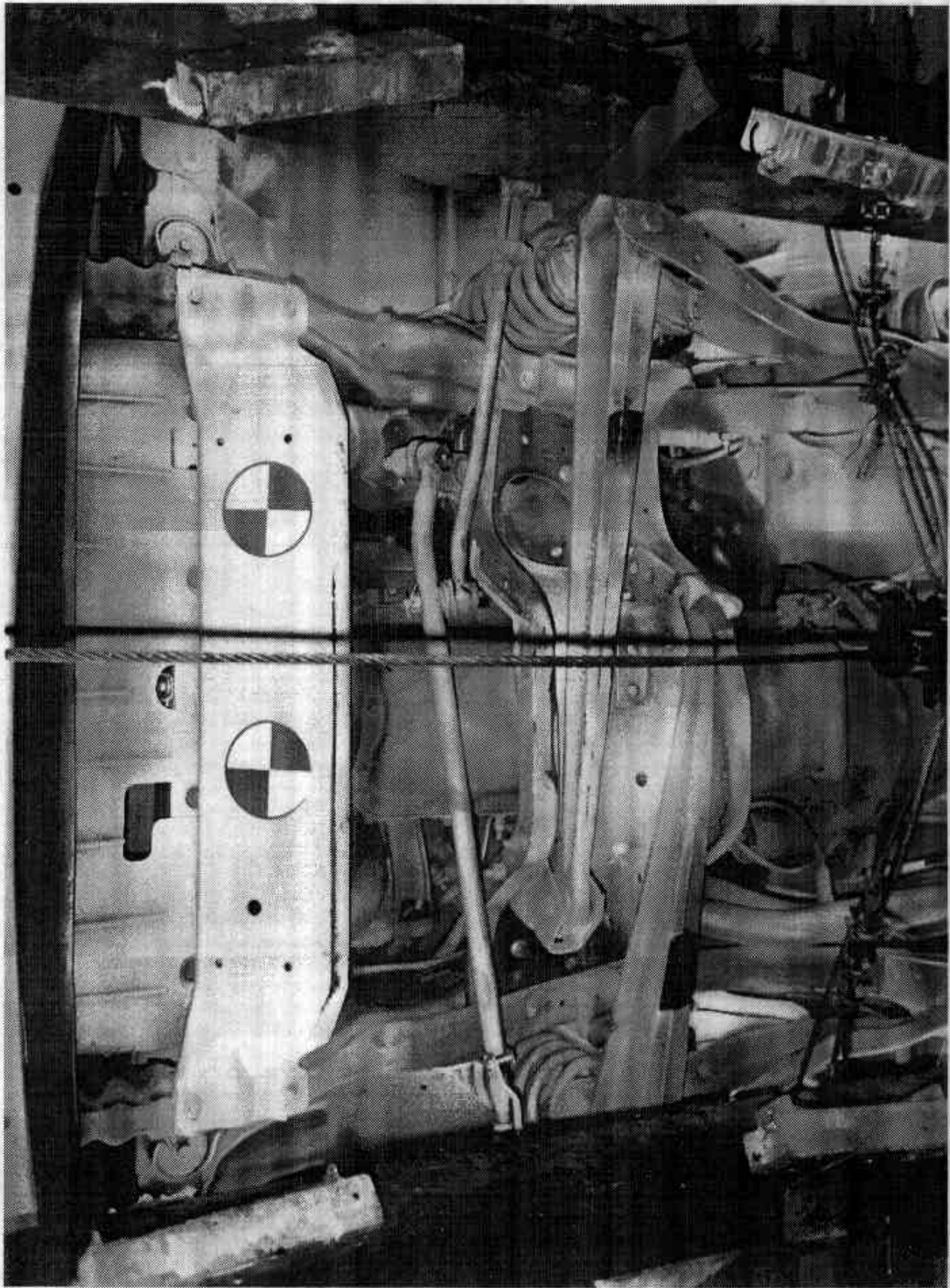


FIGURE A-18 PRE-TEST FRONT UNDERBODY VIEW



Figure A-17 POST-TEST FRONT UNDERBODY VIEW

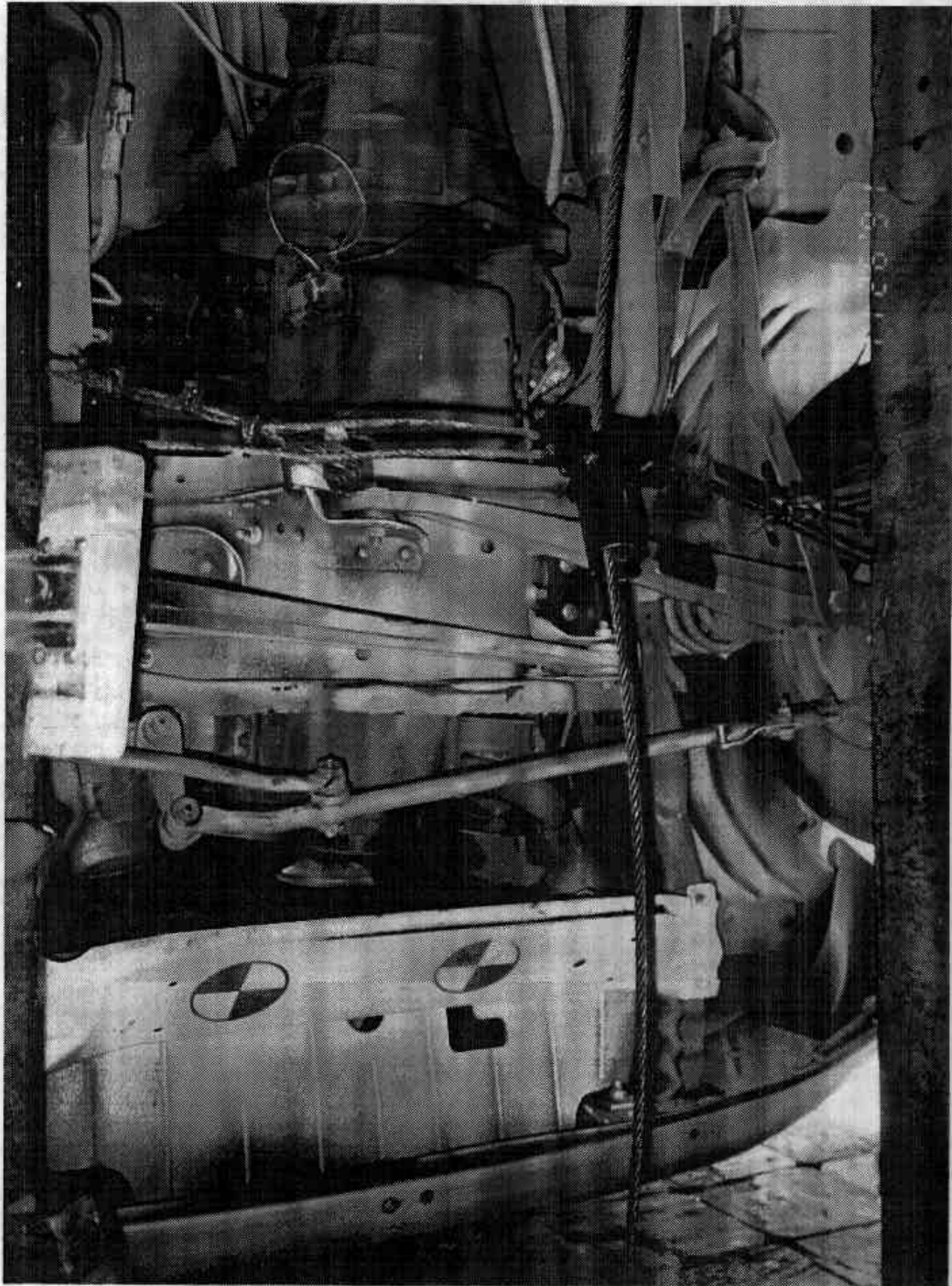


Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW



FIGURE A-19. POST-TEST FRONT SIDE UNDERBODY VIEW

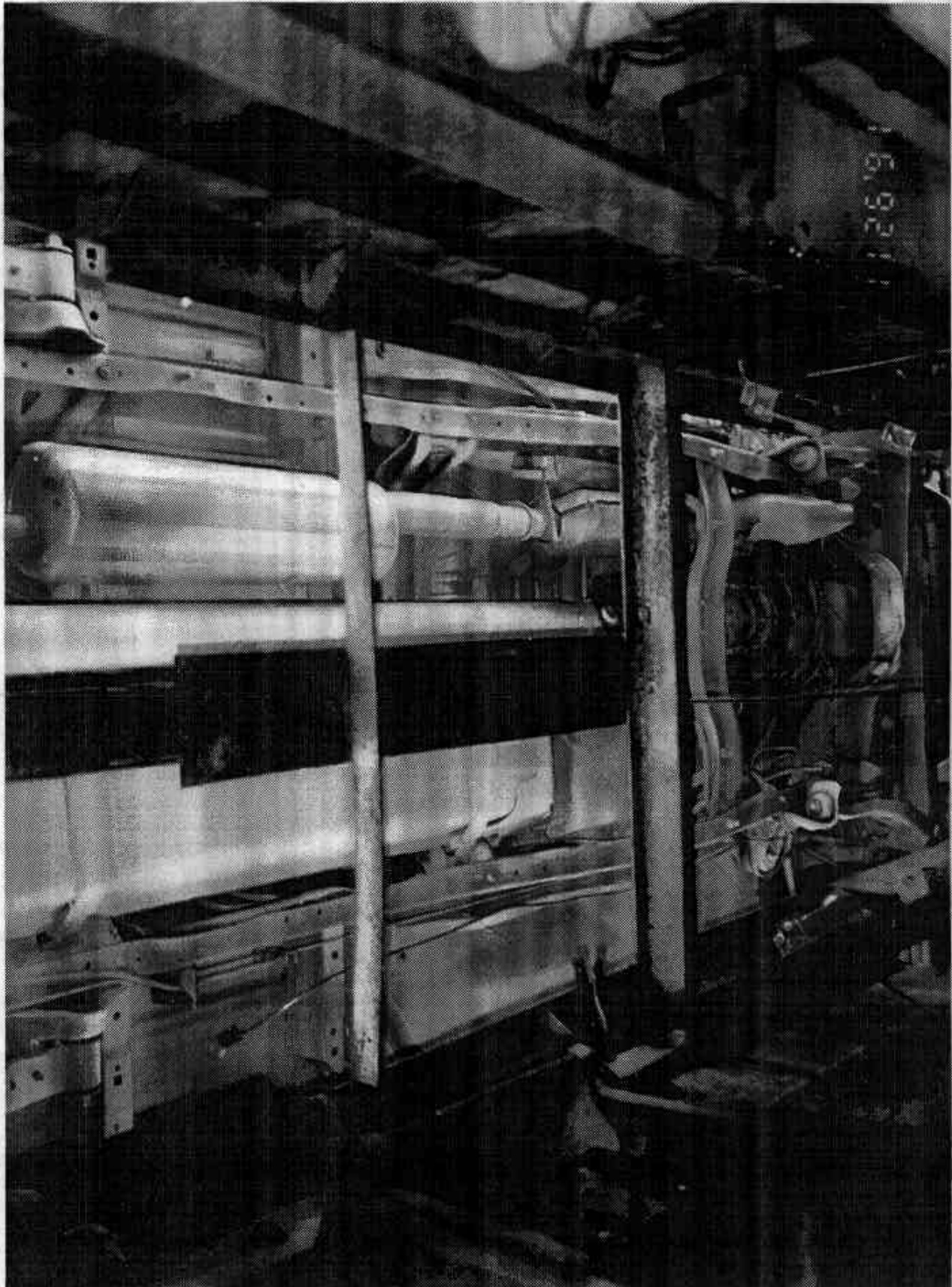


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

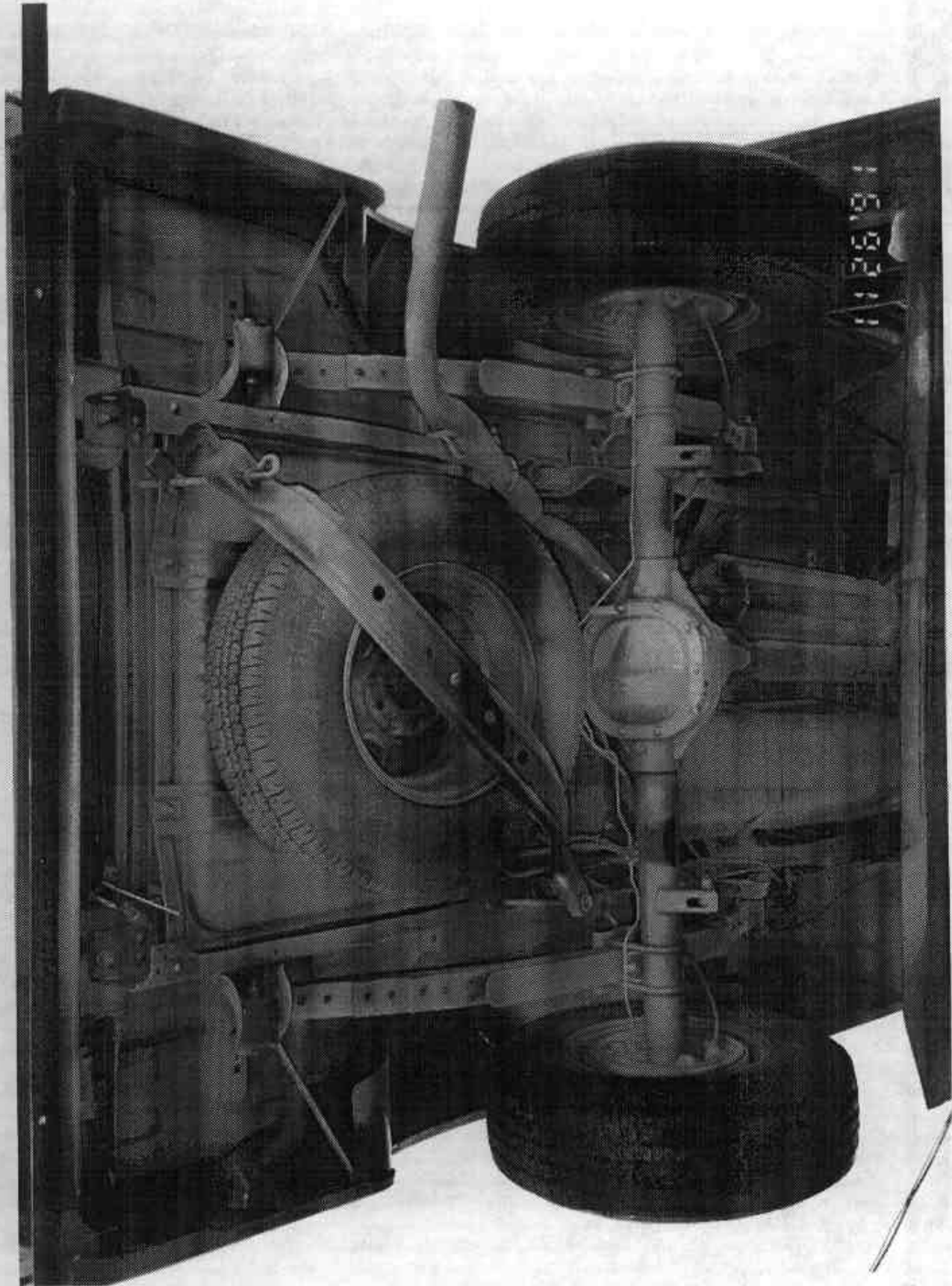


Figure A-21 POST-TEST REAR UNDERBODY VIEW



FIGURE A-22 PRE-TEST DRIVER POSITION VIEW



Figure A-23 POST-TEST DRIVER POSITION VIEW



Figure A-24 PRE-TEST PASSENGER POSITION VIEW



Figure A-25 POST-TEST PASSENGER POSITION VIEW

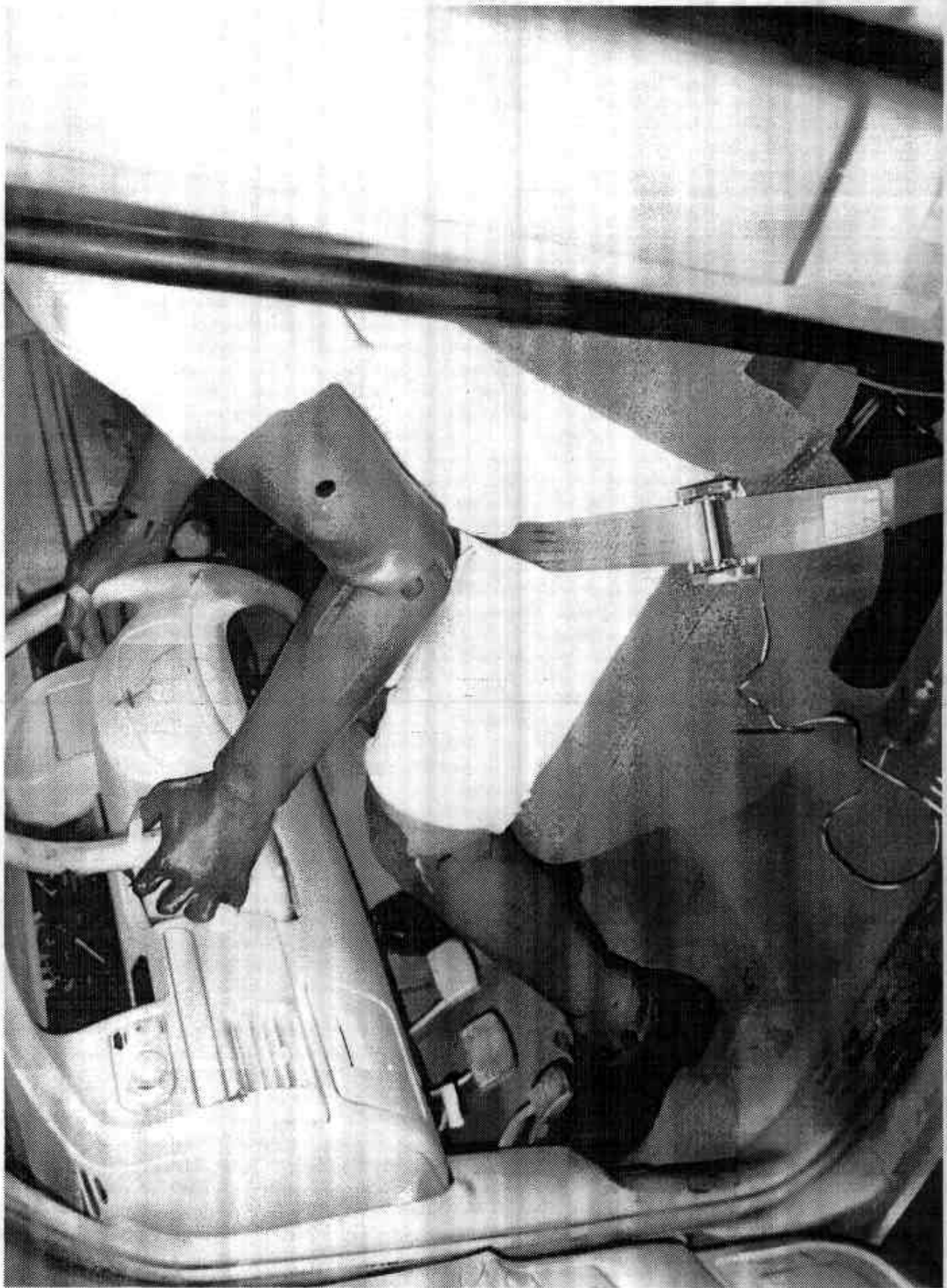


Figure A-26 PRE-TEST DRIVER AND INTERIOR VIEW

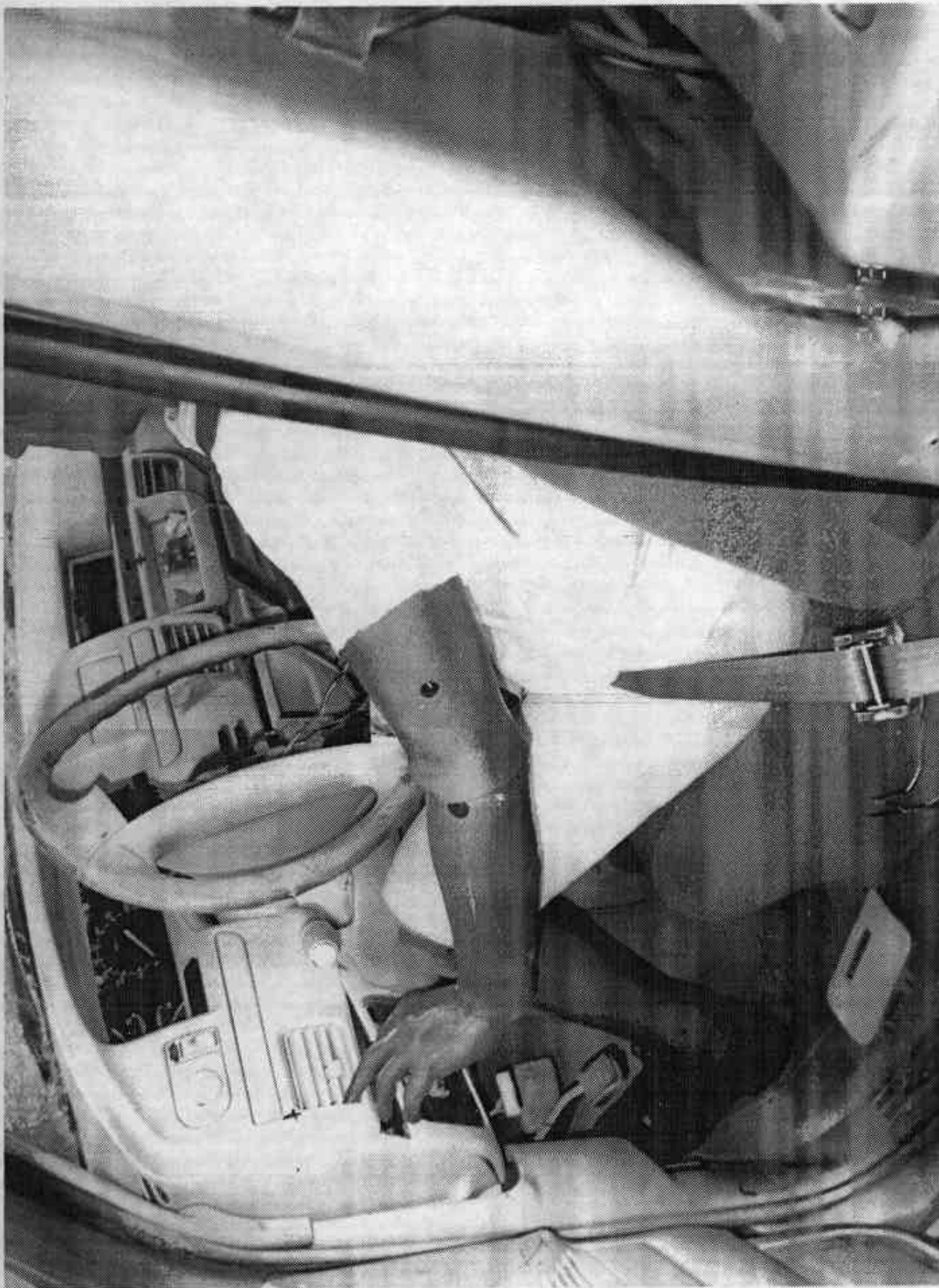


Figure A-27 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-28. PRE-TEST PASSENGER AND INTERIOR VIEW

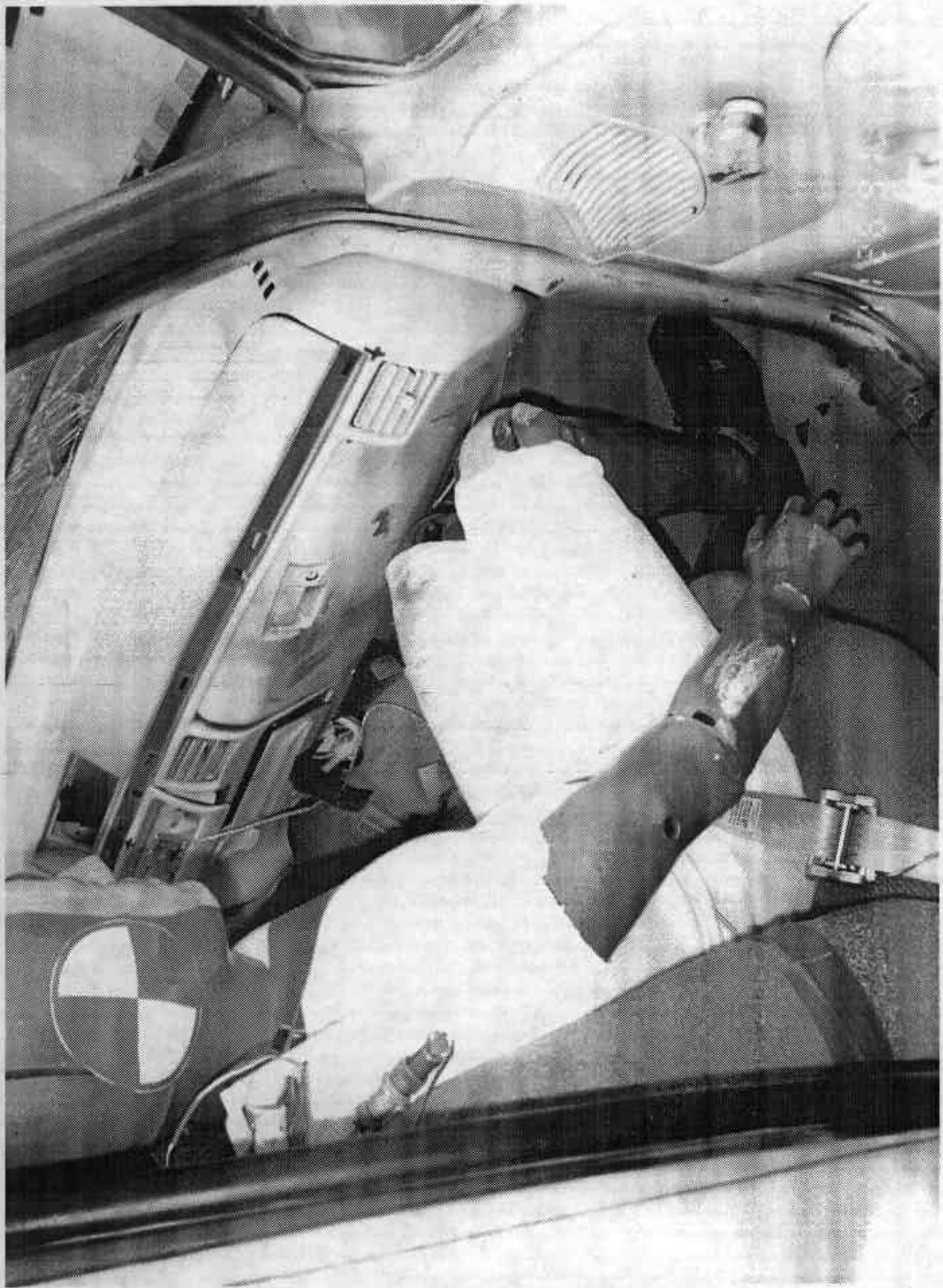


Figure A-29 POST-TEST PASSENGER AND INTERIOR VIEW

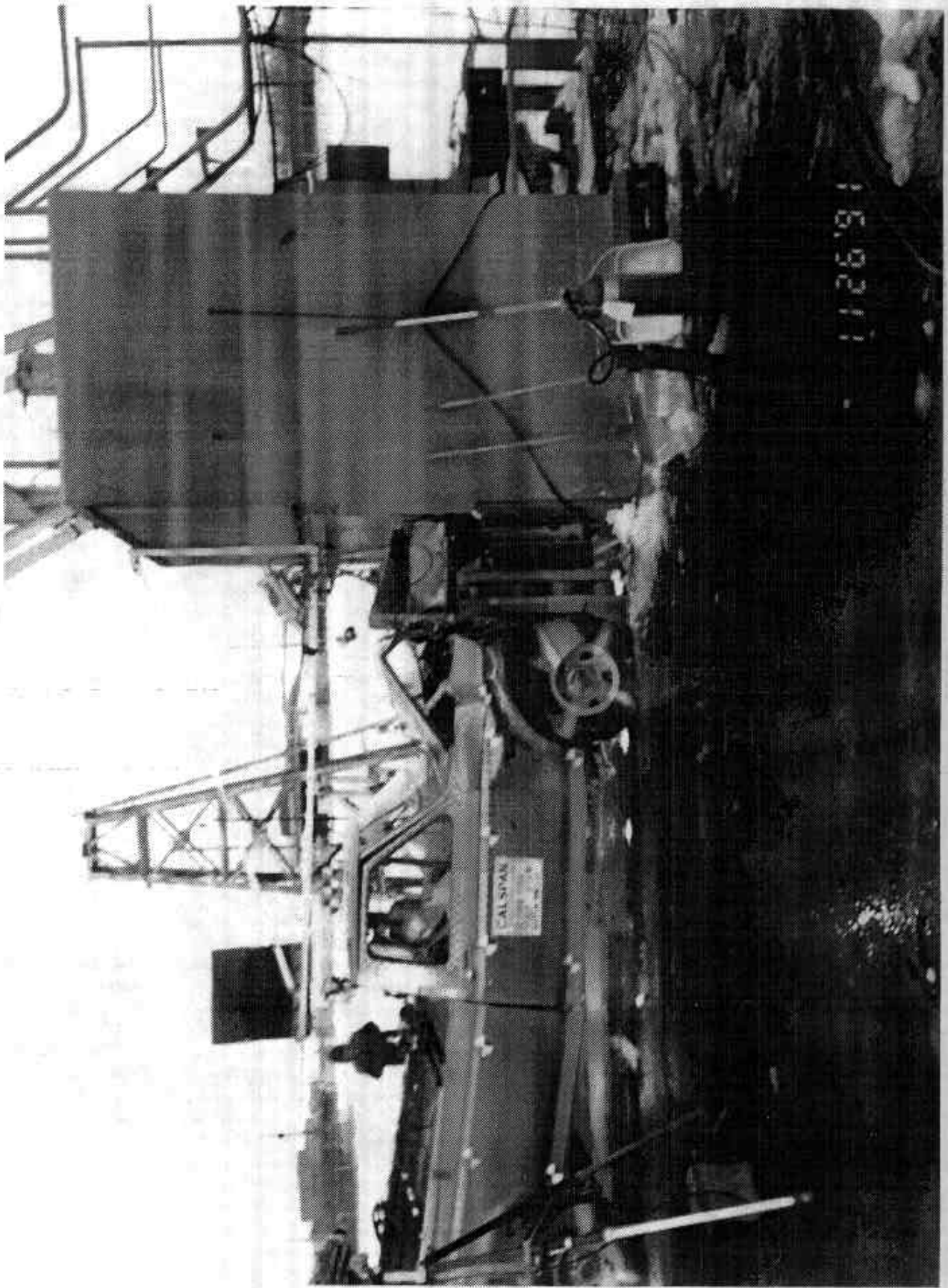


Figure A-30 IMPACT VIEW

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

TEST NO. MN0204

VEHICLE DATA

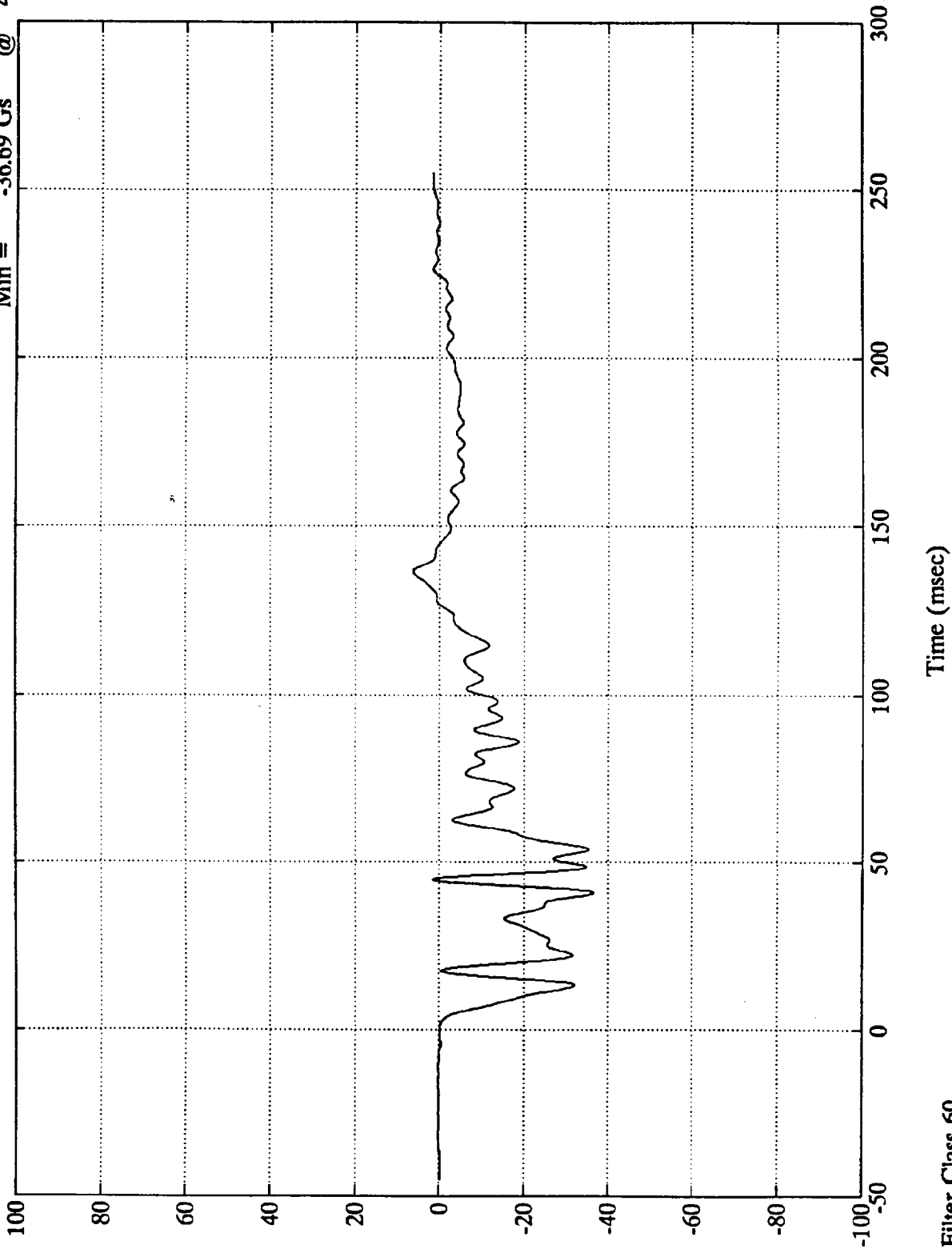
FILTER CHANNEL CLASS

60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #1(x)

Max = 6.27 Gs @ 136.56 msec  
Min = -36.69 Gs @ 40.80 msec



B-3

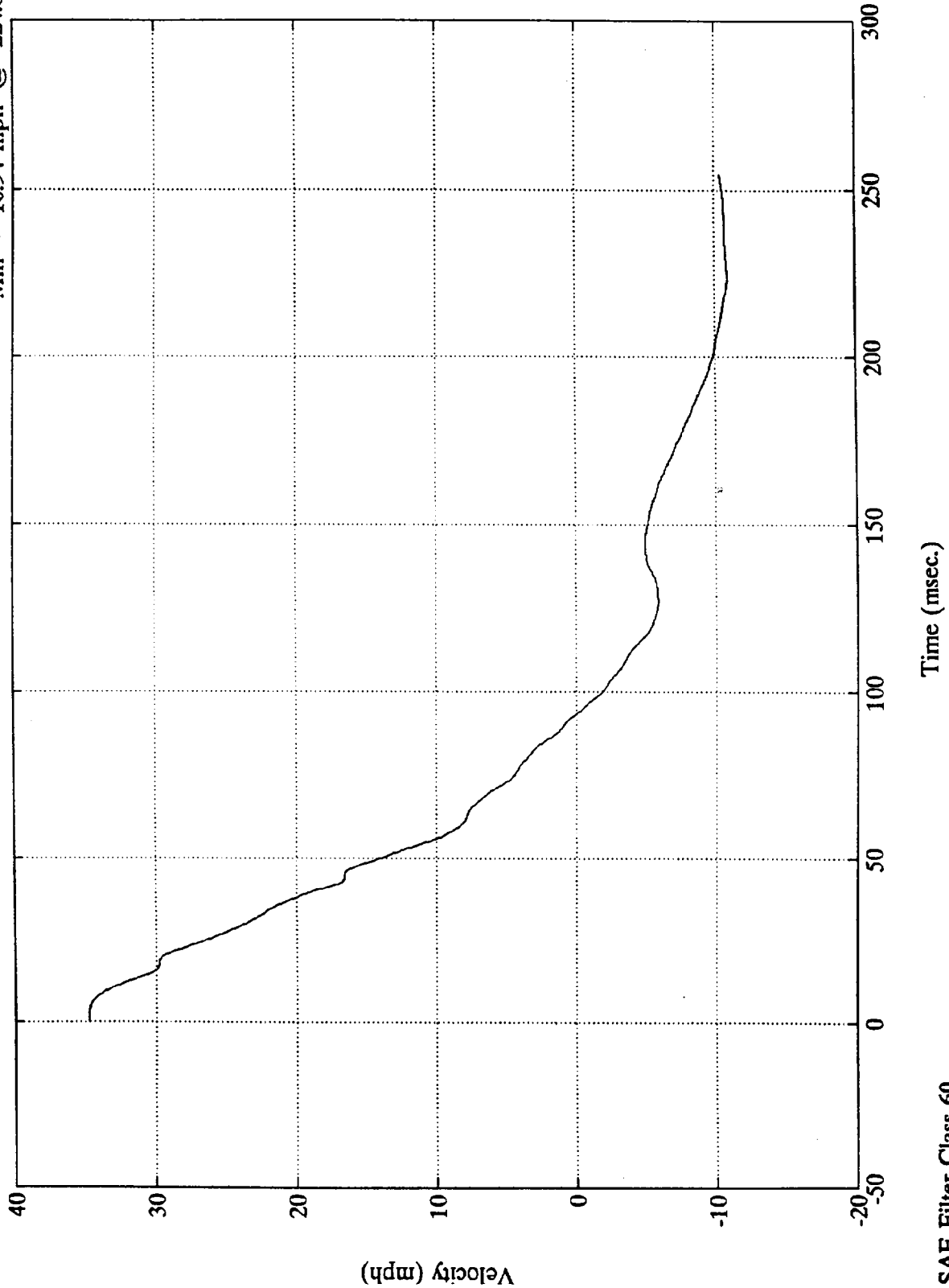
Sae Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #1(x)

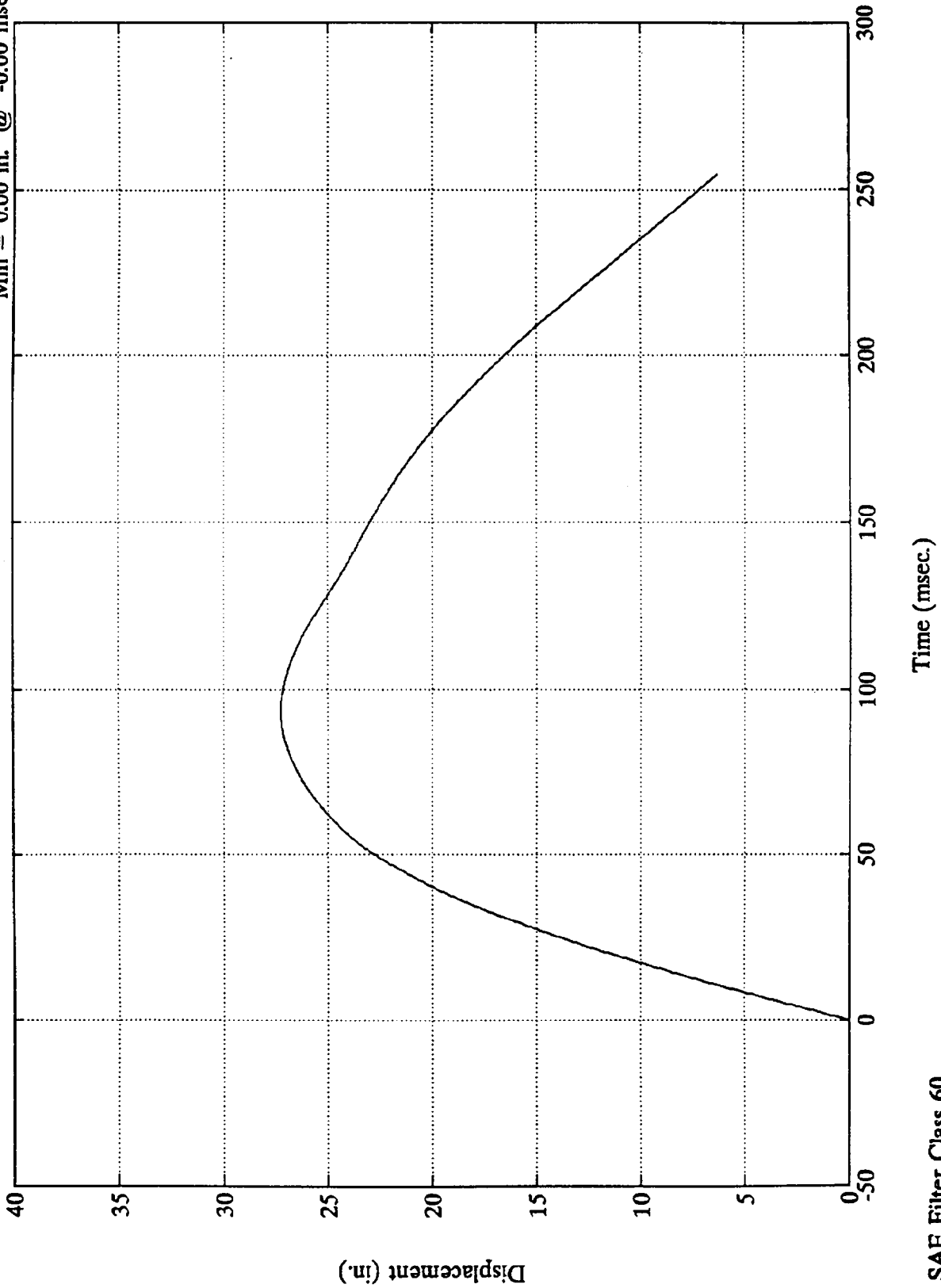
Max = 34.80 mph @ 0.48 msec  
Min = -10.94 mph @ 224.88 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Max = 27.26 in. @ 94.56 msec  
Min = 0.00 in. @ -0.00 msec

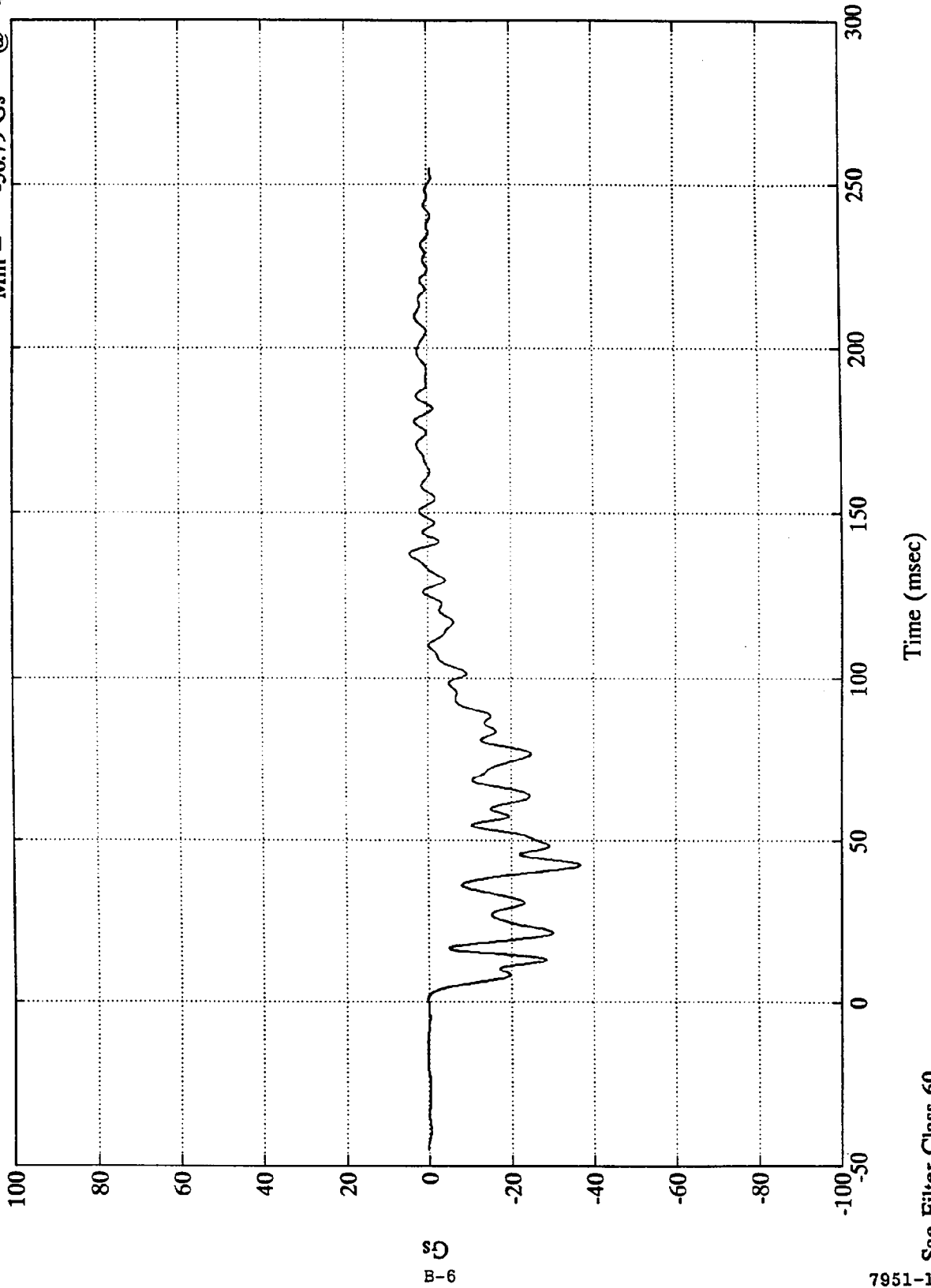
Acc. #1(x)



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #2(x)

Max = 4.41 Gs @ 137.63 msec  
Min = -36.79 Gs @ 42.36 msec

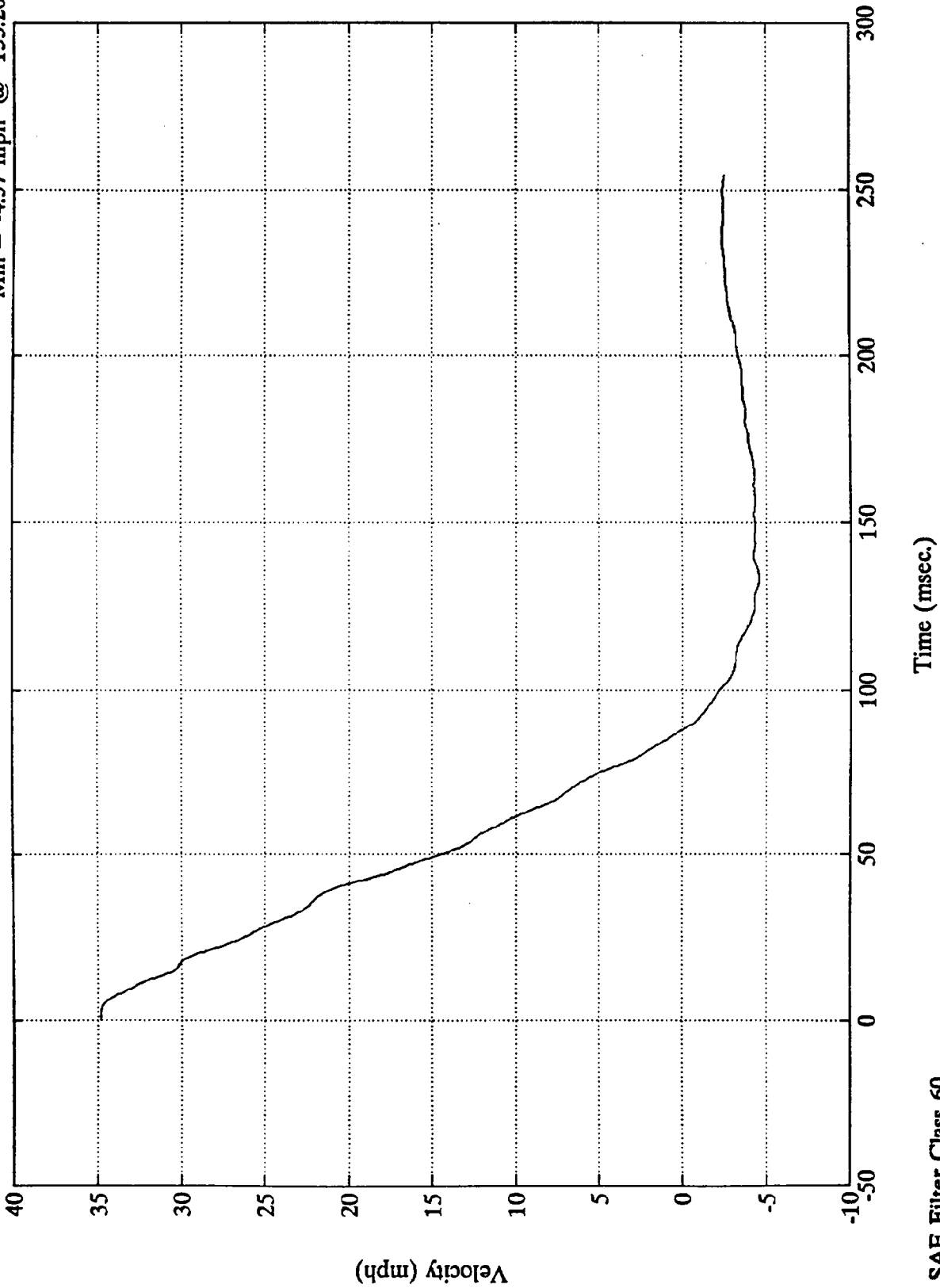


B-6

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #2(x)

Max = 34.81 mph @ 2.16 msec  
Min = -4.57 mph @ 133.20 msec



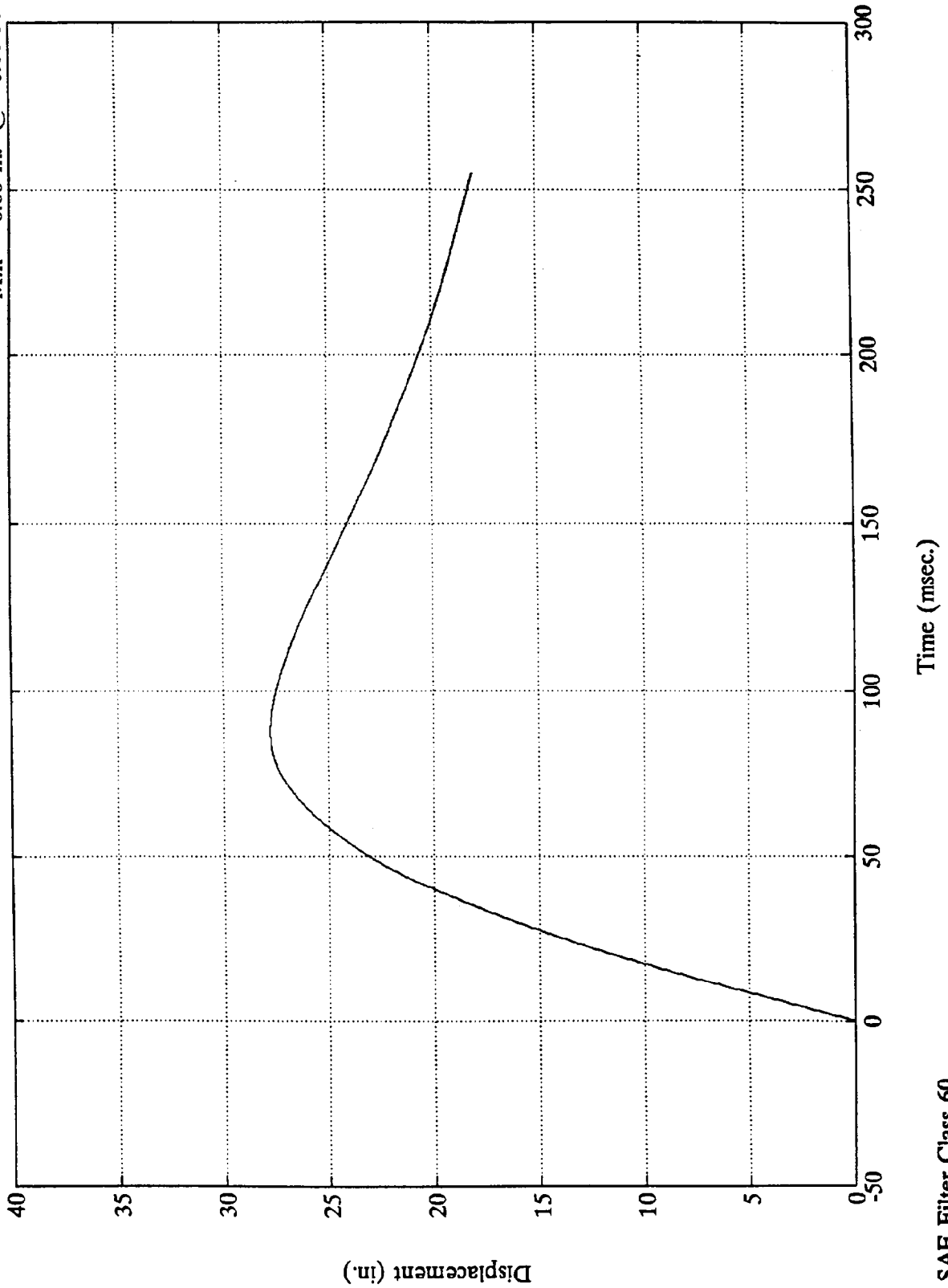
SAE Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #2(x)

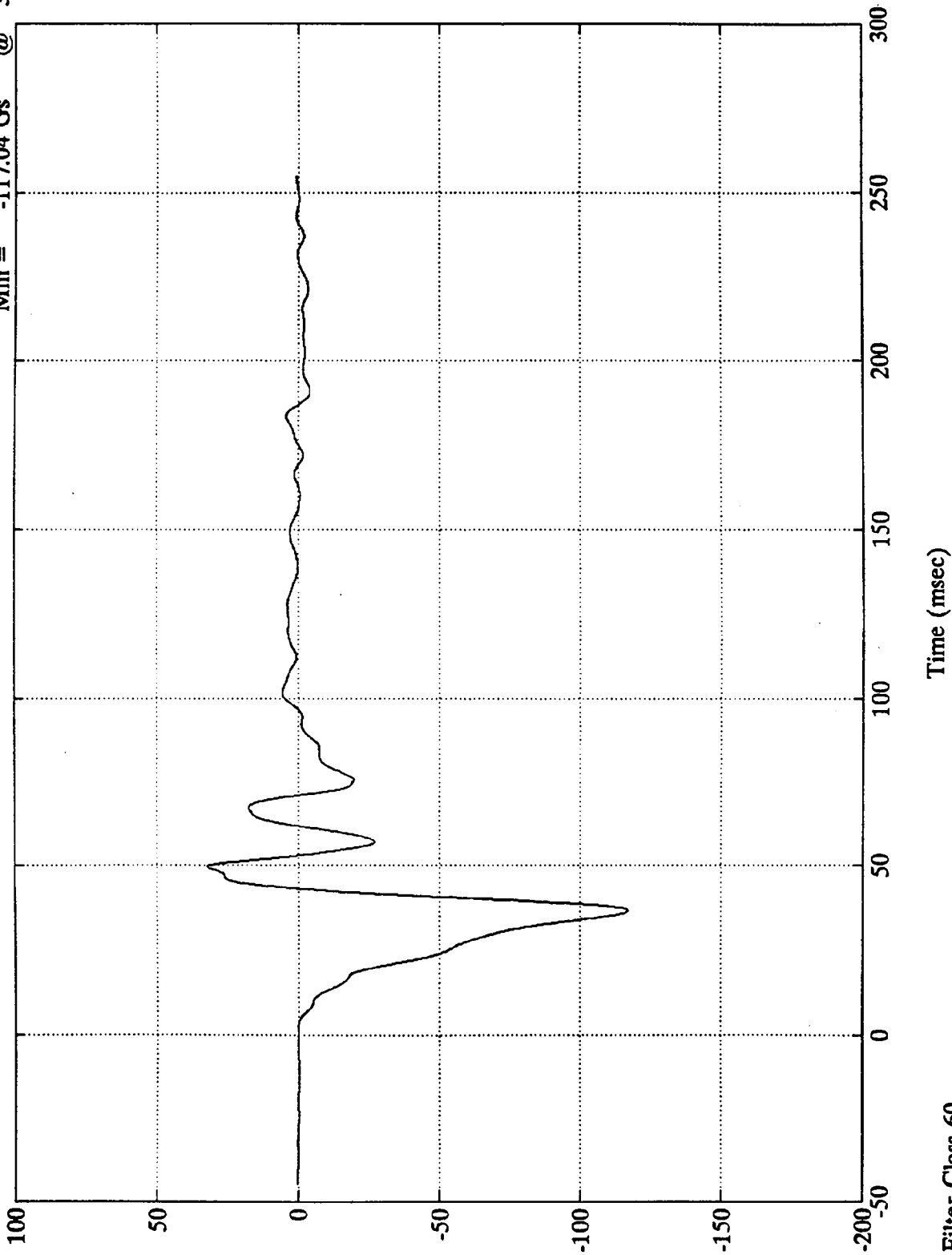
Max = 27.77 in. @ 89.28 msec  
Min = 0.00 in. @ -0.00 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #3(x)

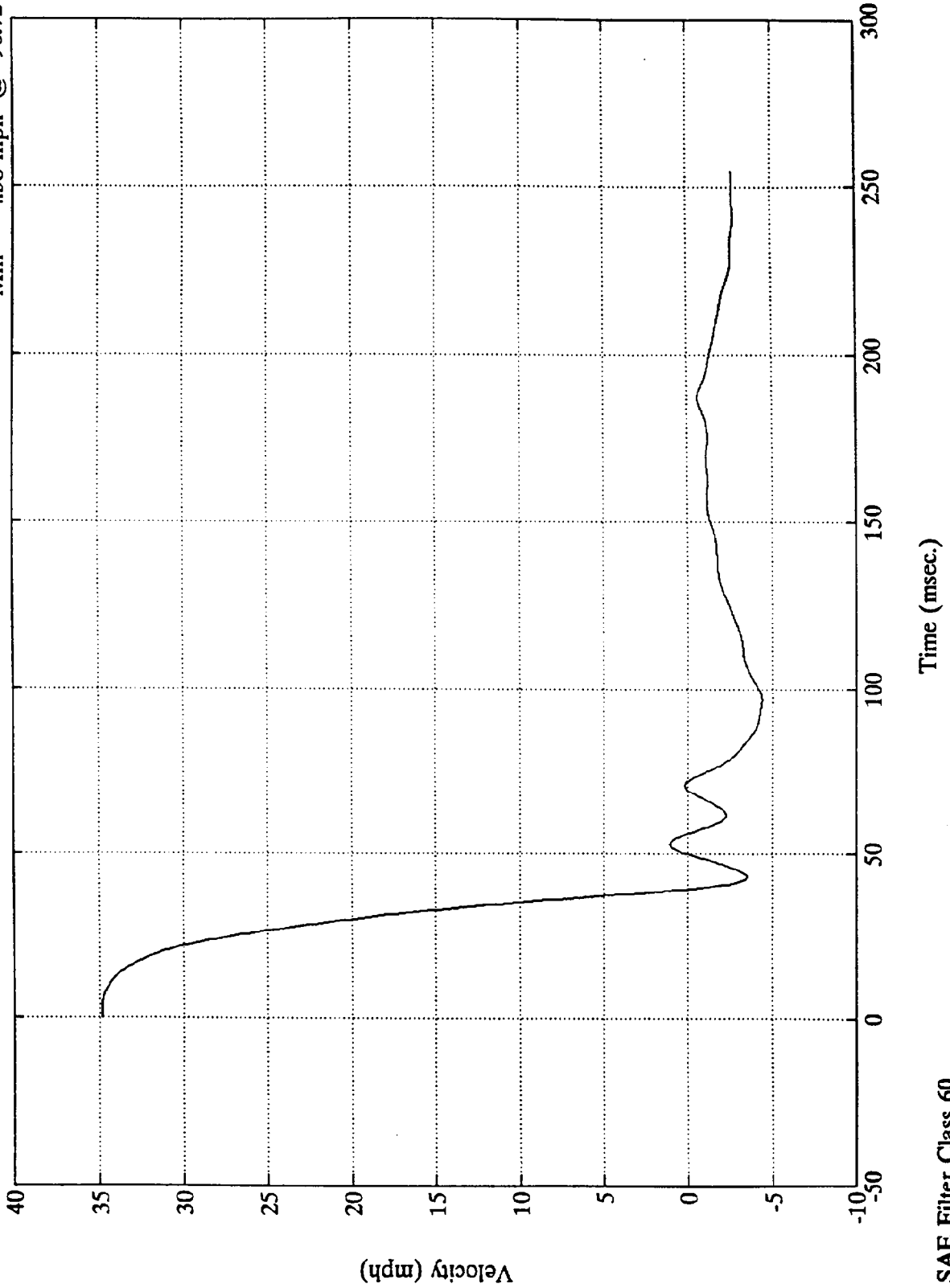
Max = 32.33 Gs @ 49.55 msec  
Min = -117.04 Gs @ 36.72 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Max = 34.80 mph @ 3.84 msec  
Min = -4.38 mph @ 96.72 msec

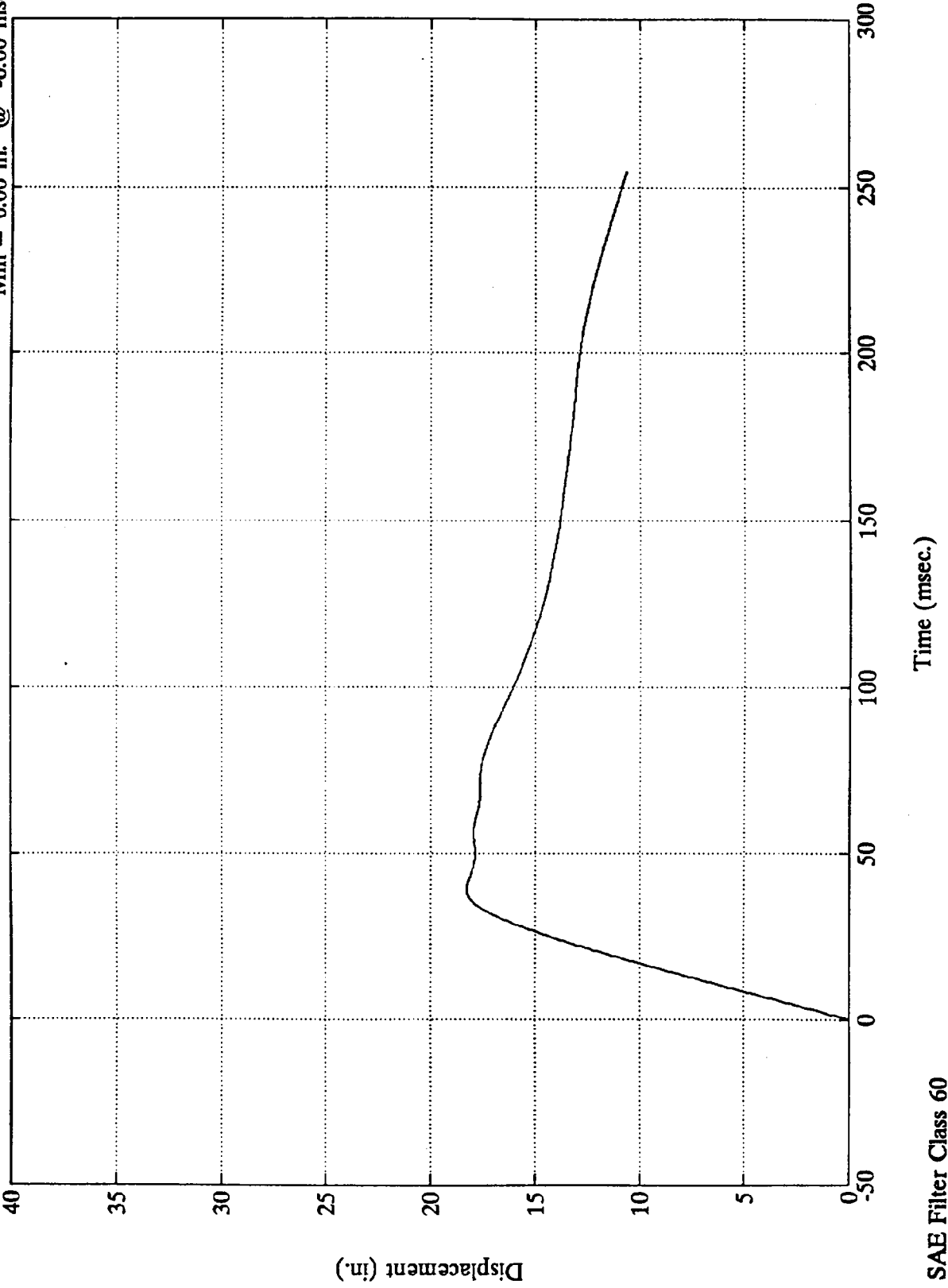
Acc. #3(x)



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #3(x)

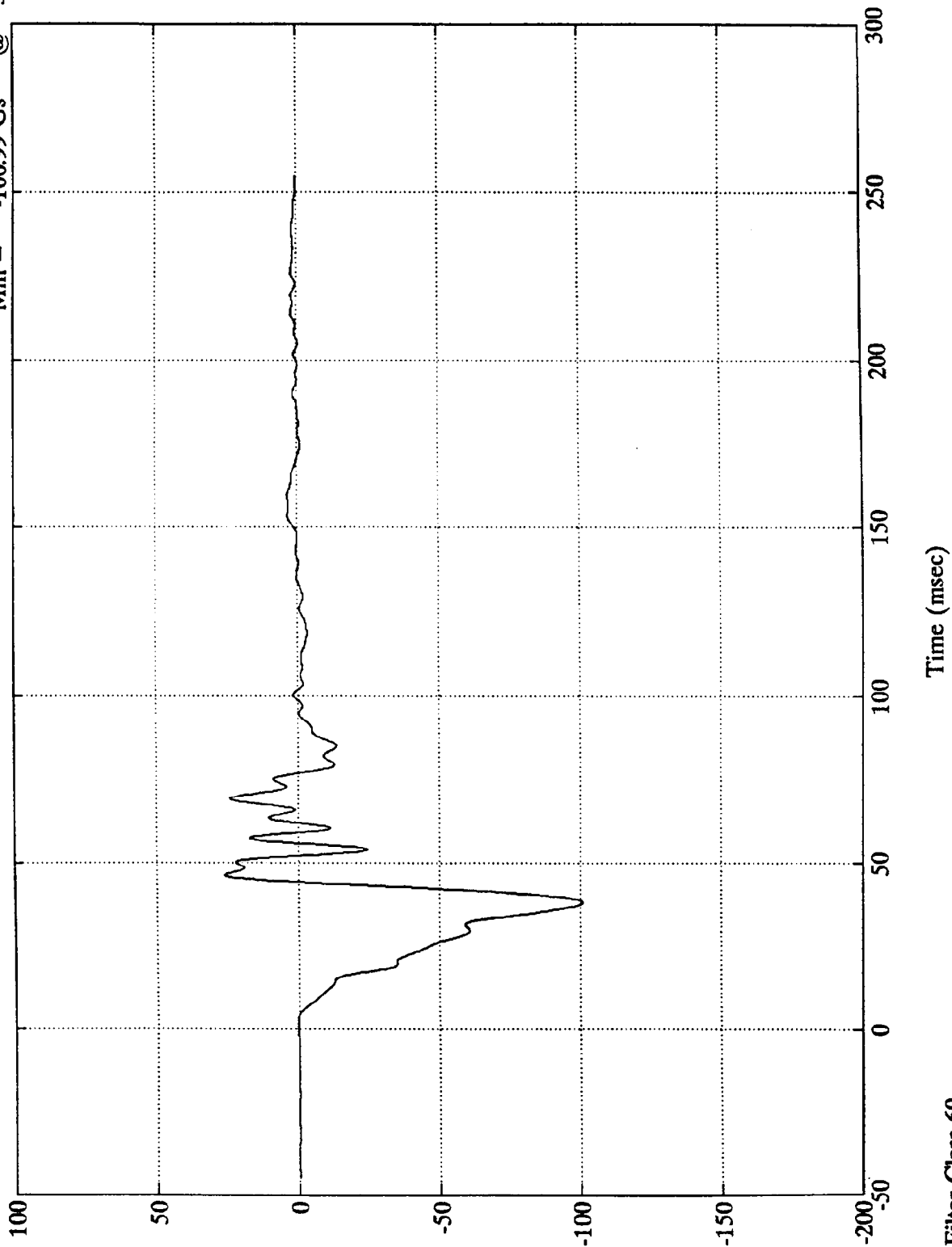
Max = 18.27 in. @ 39.84 msec  
Min = 0.00 in. @ -0.00 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #4(x)

Max = 26.12 Gs @ 46.31 msec  
Min = -100.99 Gs @ 38.04 msec



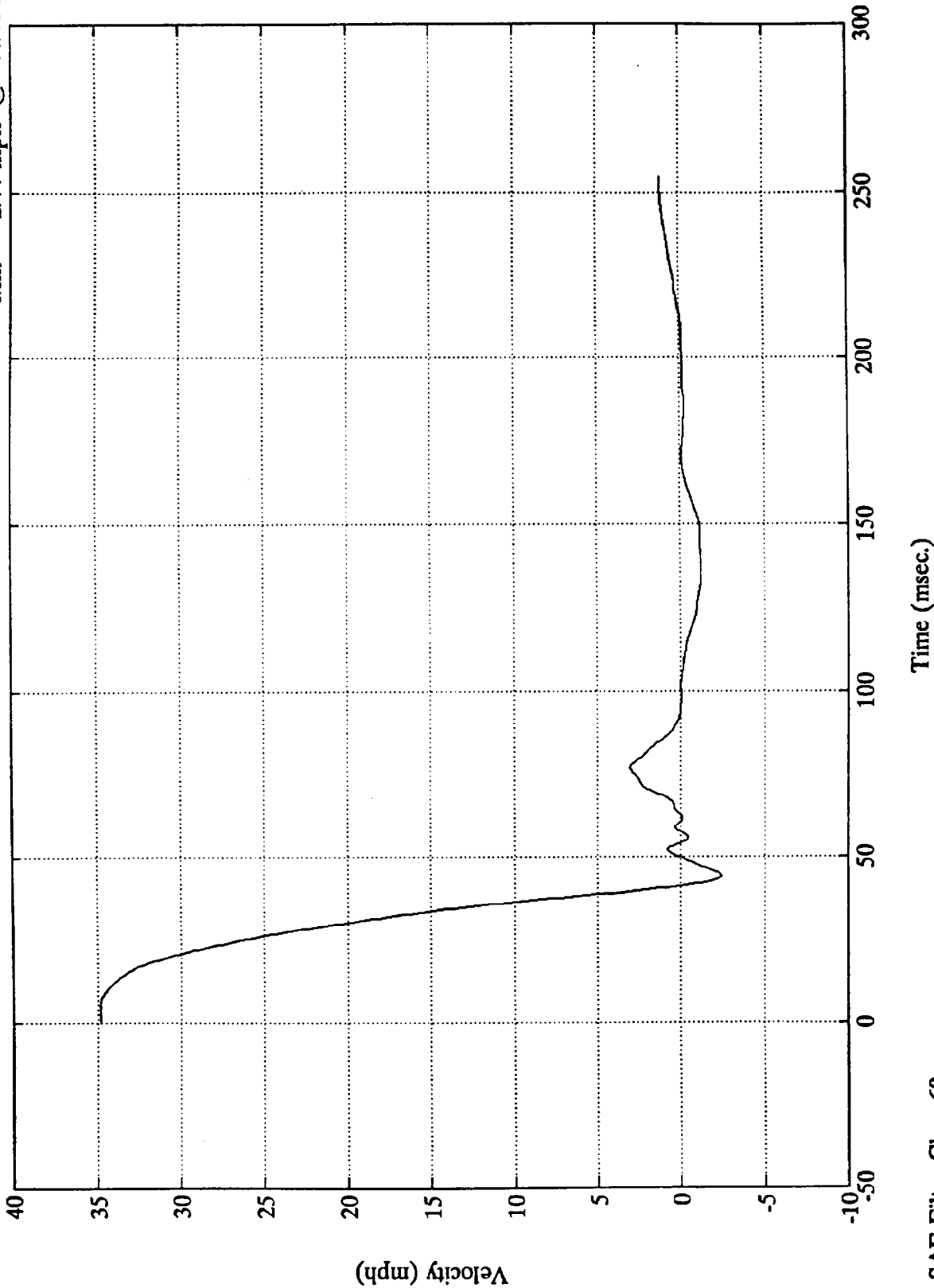
B-12

7951-1 Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #4(x)

Max = 34.83 mph @ 4.80 msec  
Min = -2.44 mph @ 44.40 msec



Velocity (mph)

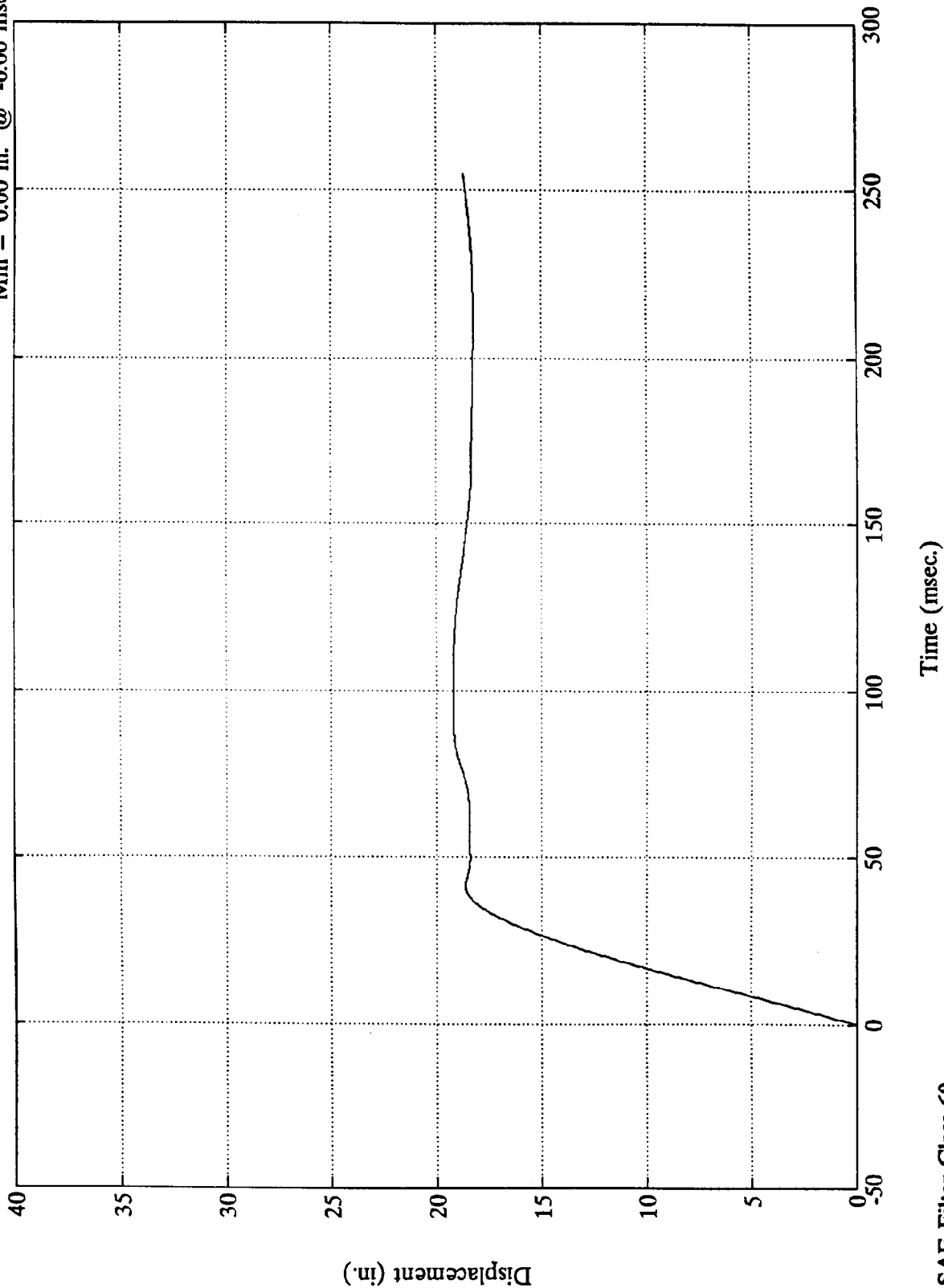
Time (msec.)

SAE Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #4(x)

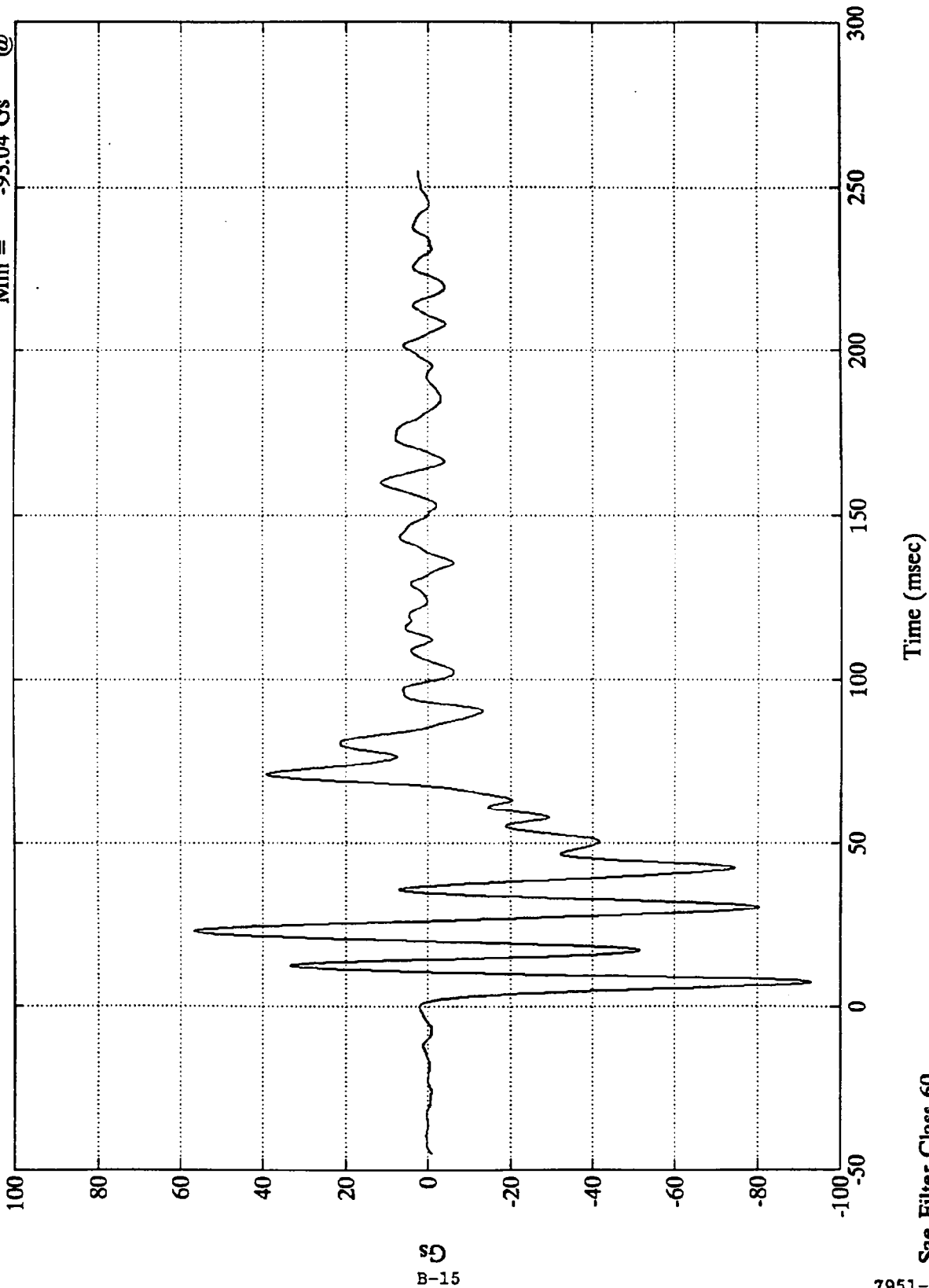
Max = 19.21 in. @ 106.32 msec  
Min = 0.00 in. @ -0.00 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #5(x)

Max = 56.66 Gs @ 22.68 msec  
Min = -93.04 Gs @ 7.19 msec



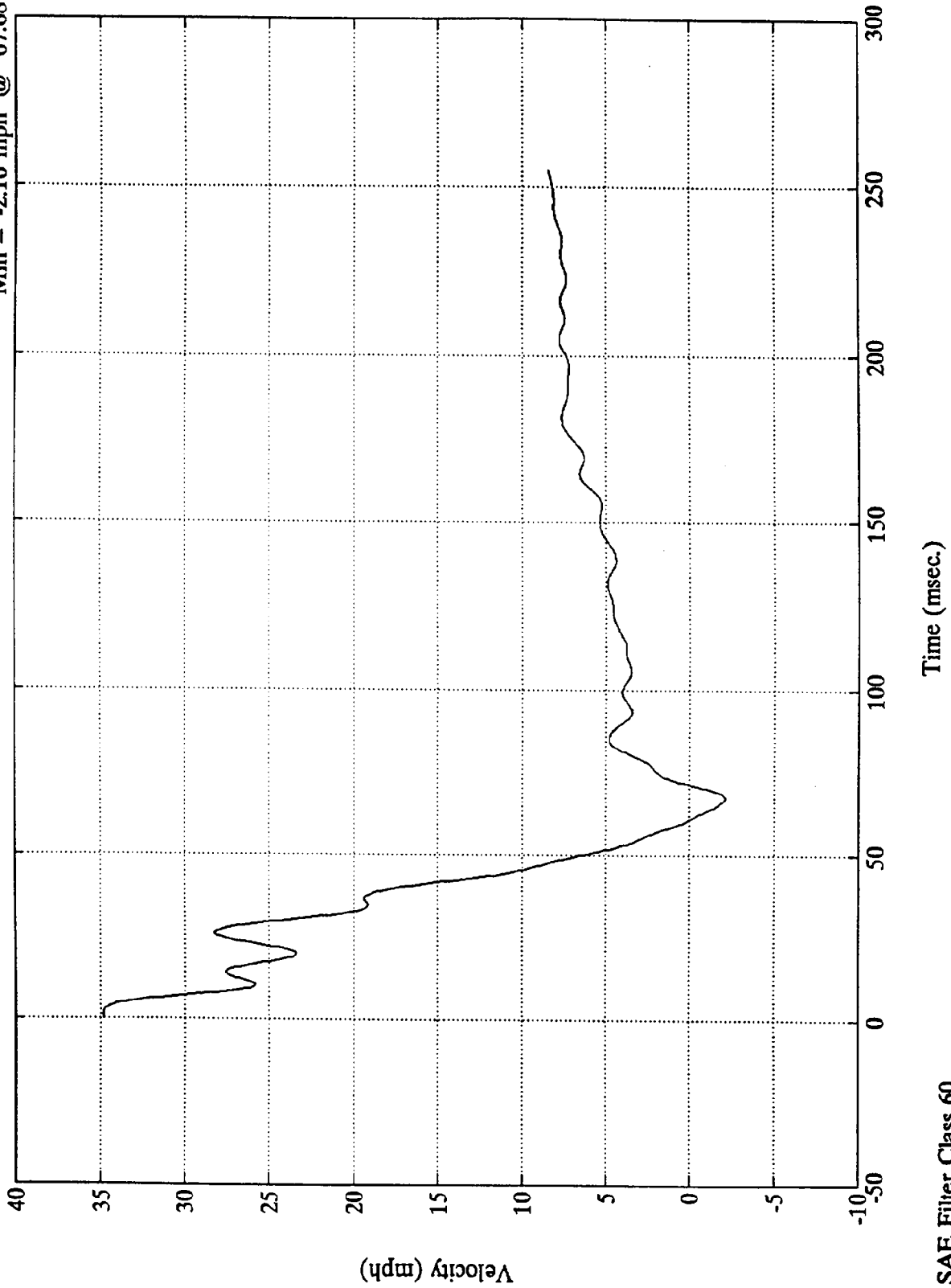
B-15

7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #5(x)

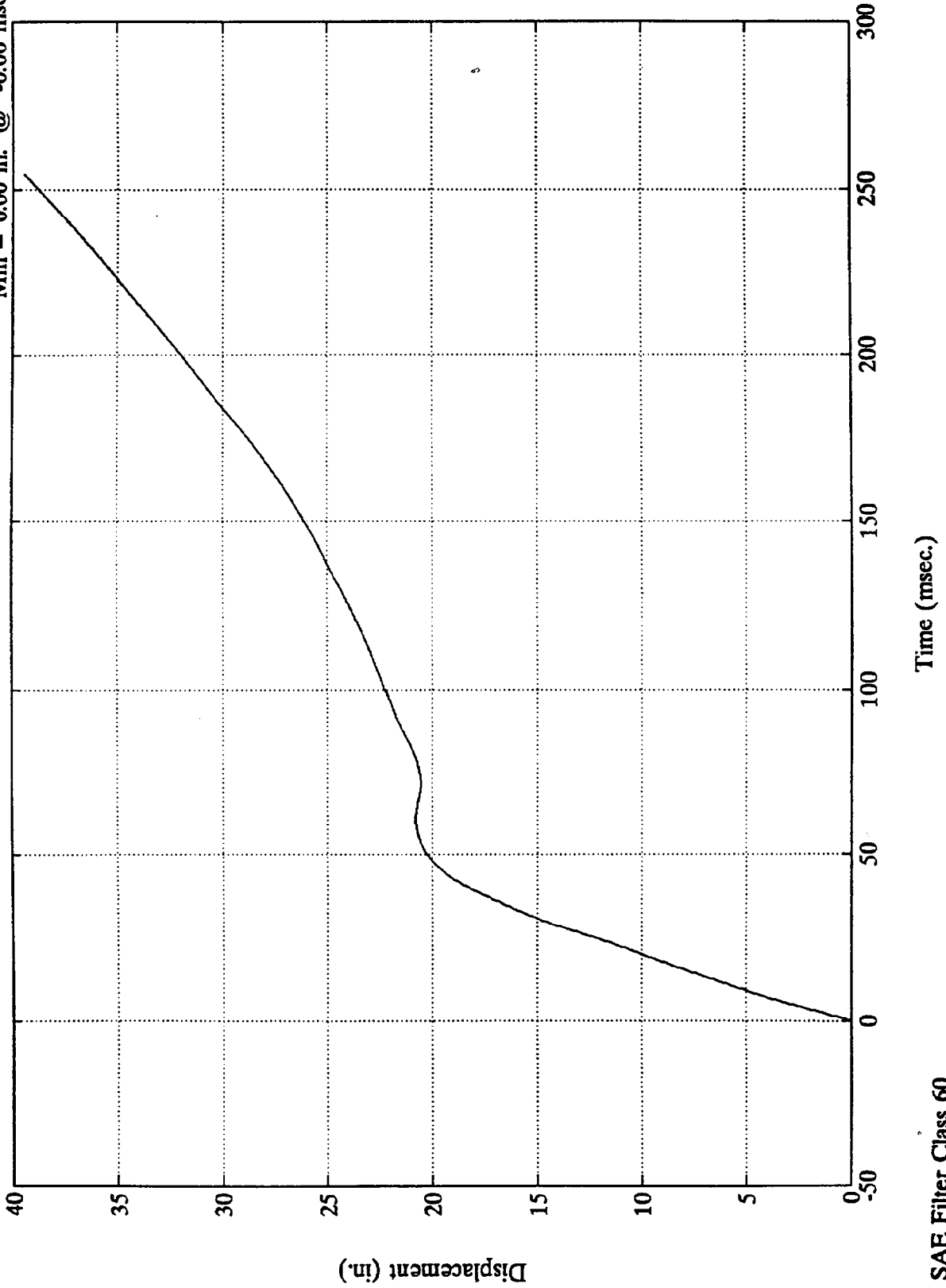
Max = 34.83 mph @ 1.44 msec  
Min = -2.10 mph @ 67.68 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #5(x)

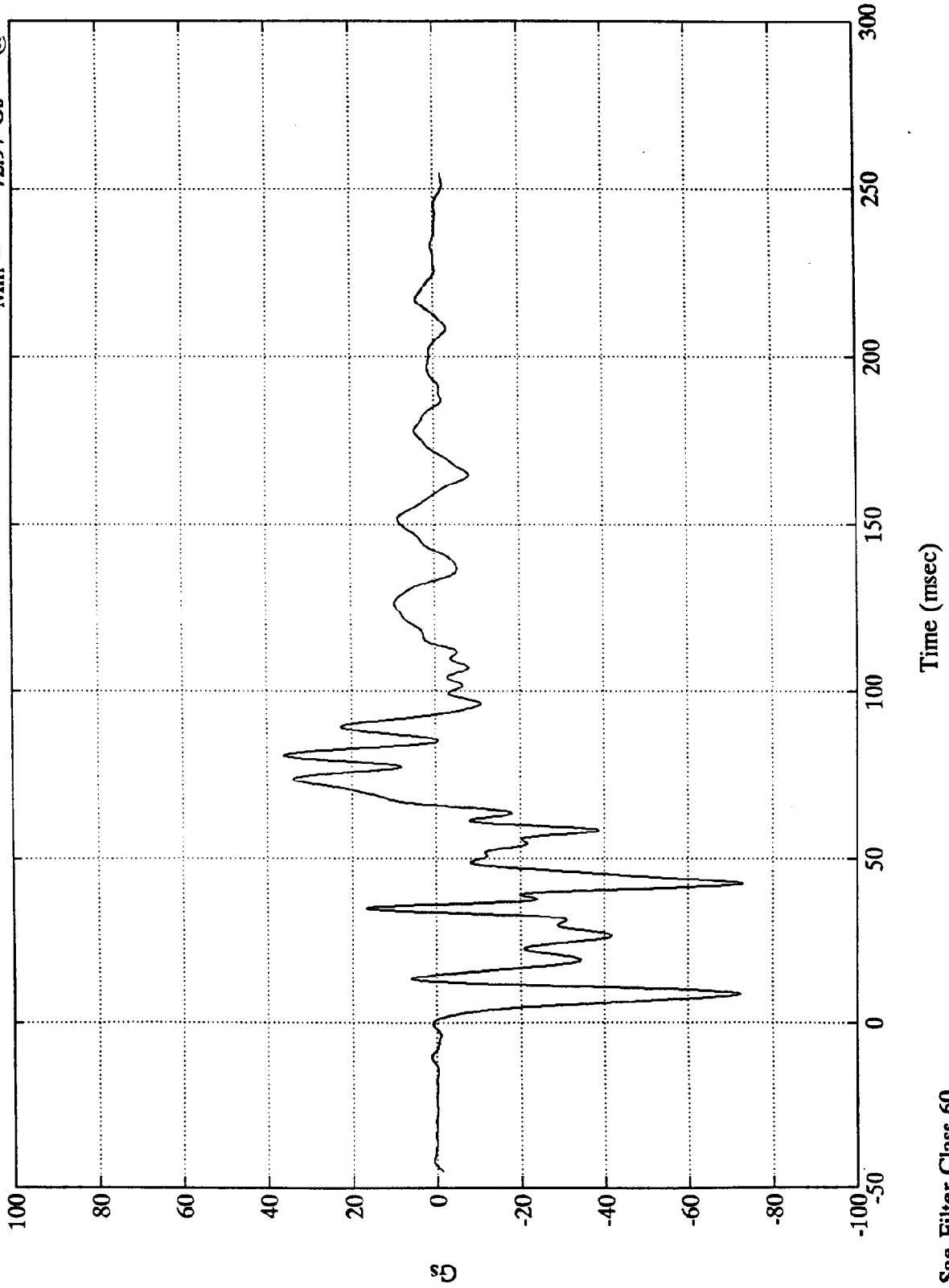
Max = 39.46 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Max = 36.07 Gs @ 80.88 msec  
Min = -72.97 Gs @ 42.47 msec

Acc. #6(x)



SD

B-18

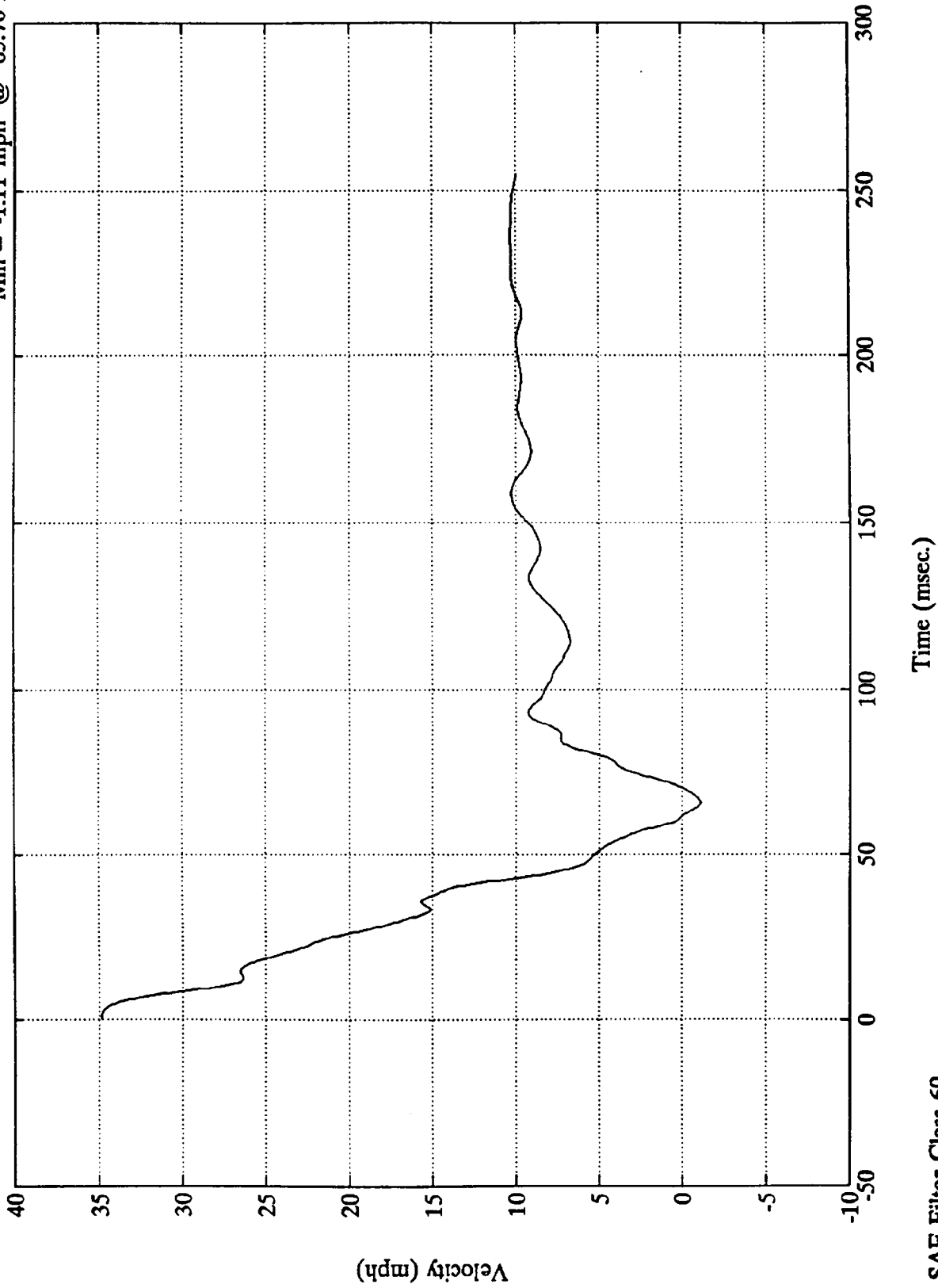
7951-1

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #6(x)

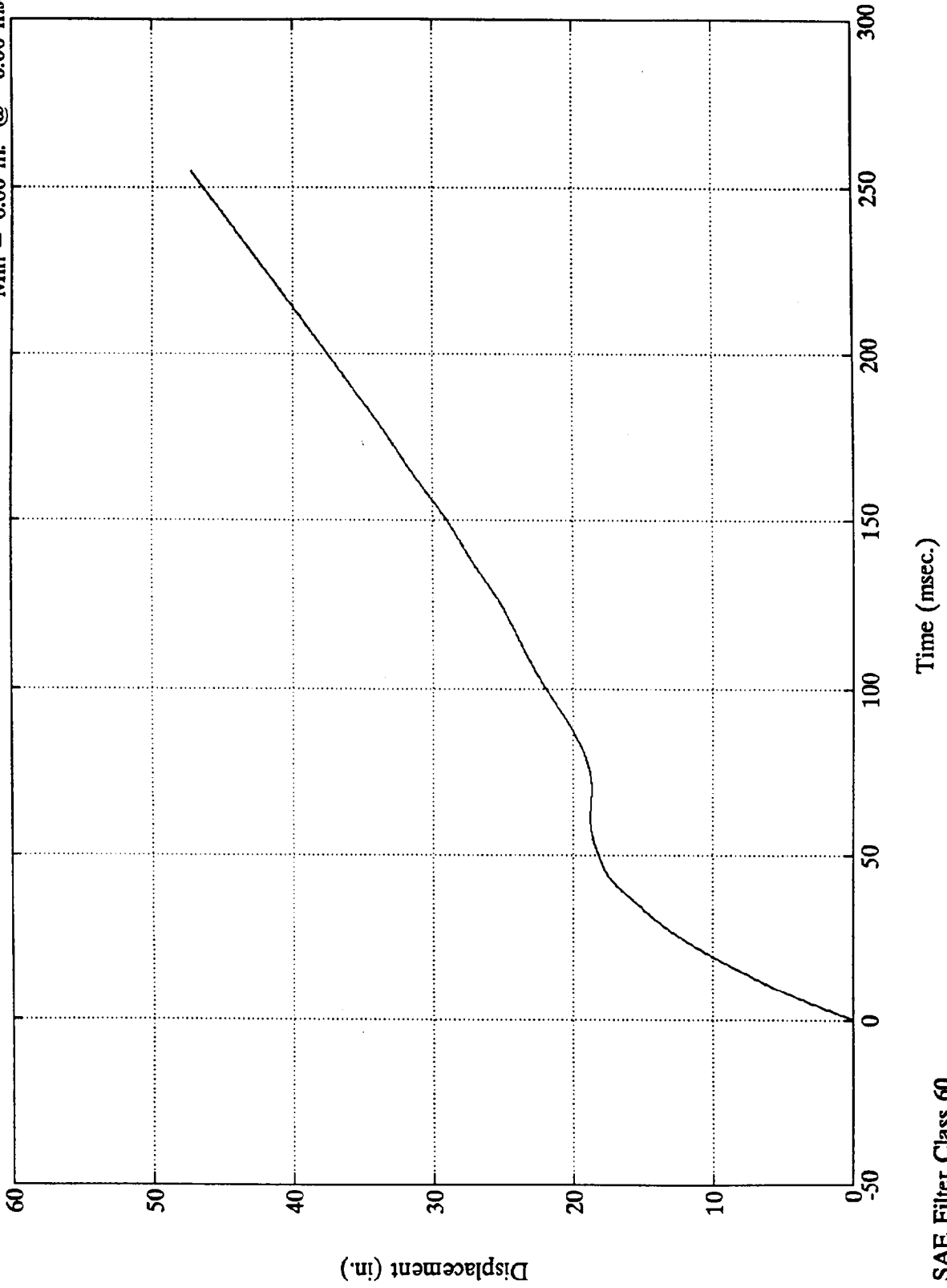
Max = 34.81 mph @ 0.96 msec  
Min = -1.11 mph @ 65.76 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #6(x)

Max = 47.25 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



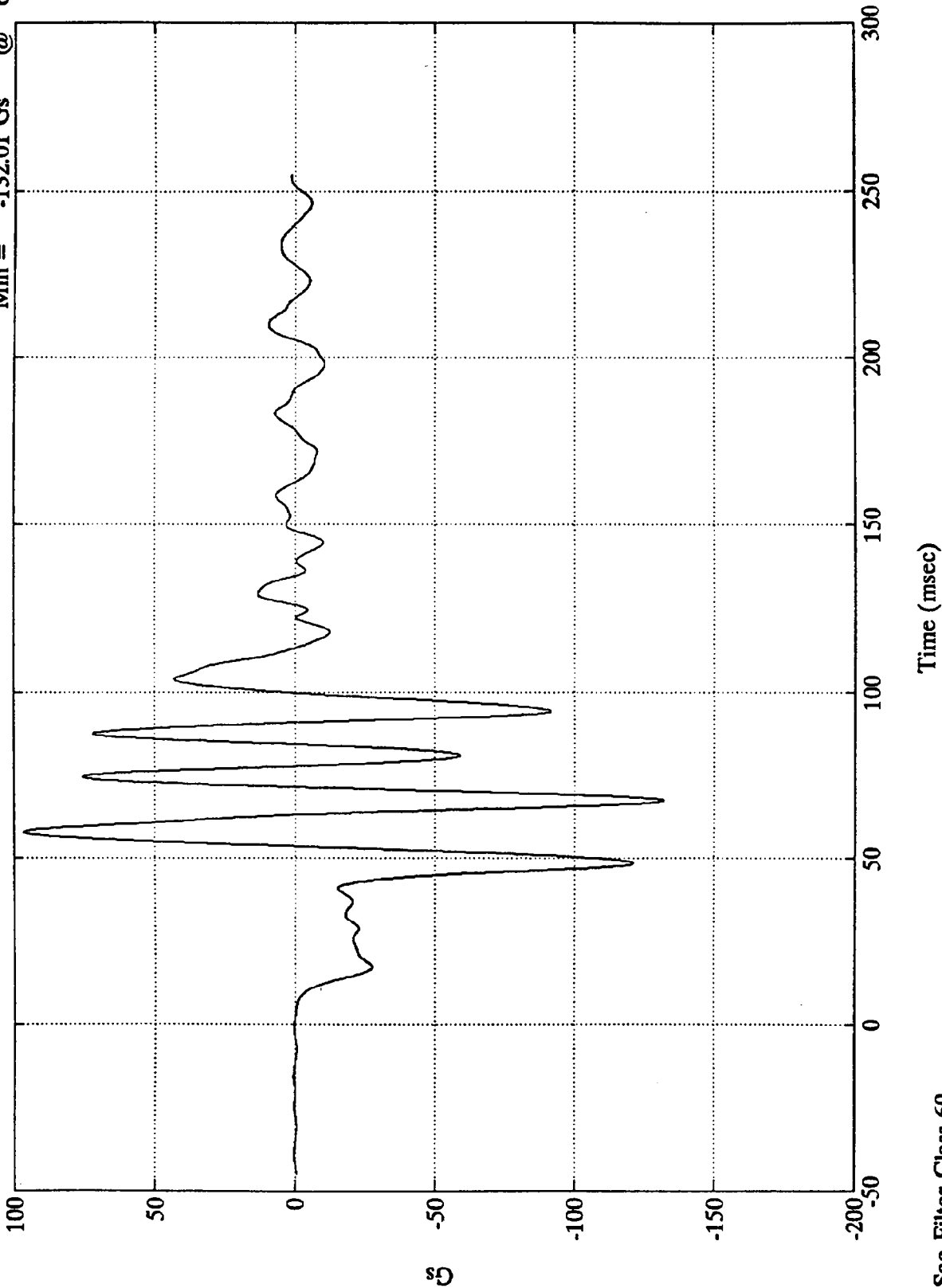
SAE Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #7(x)

Max = 96.74 Gs @ 57.84 msec  
Min = -132.01 Gs @ 67.56 msec



Gs

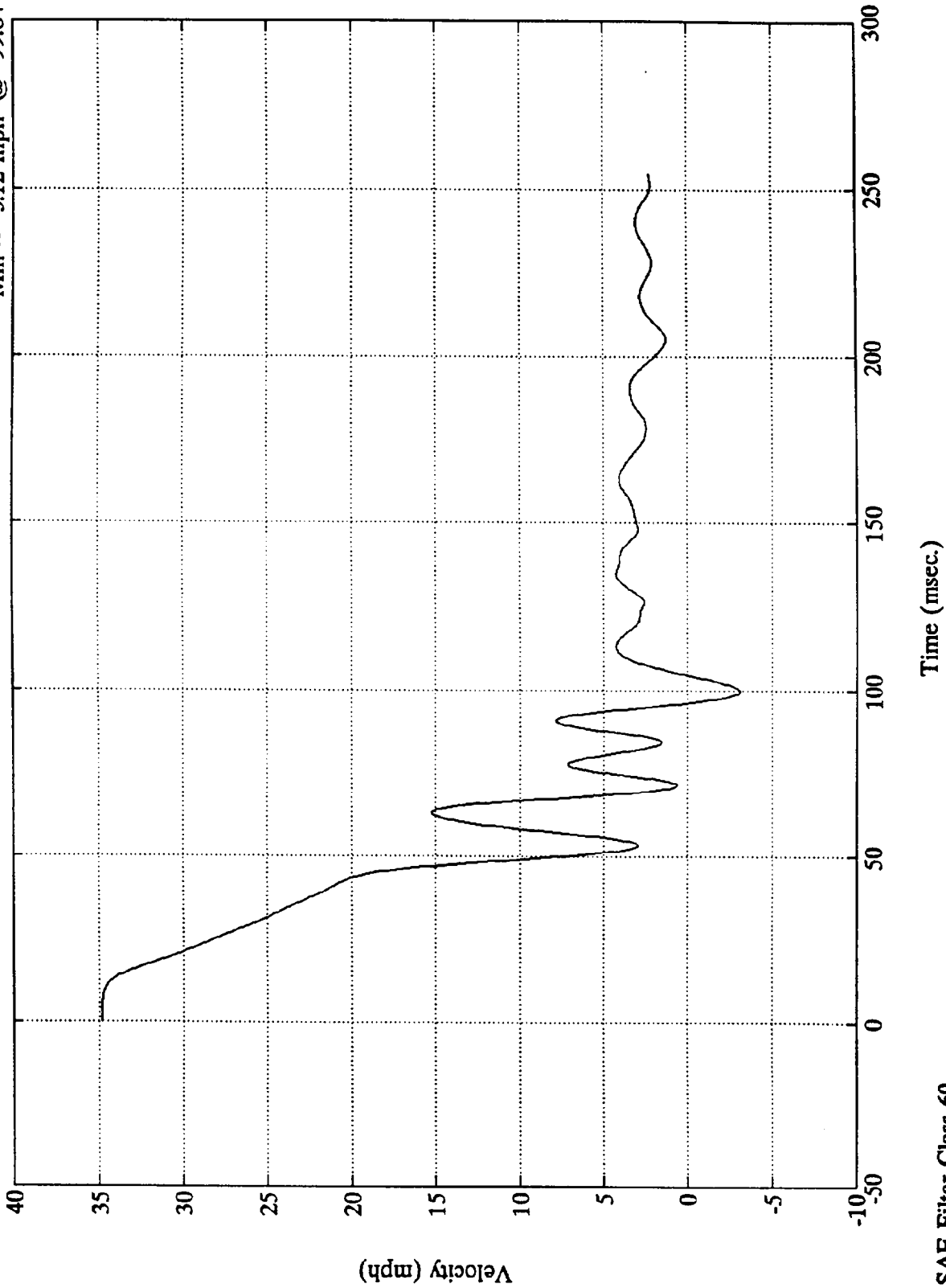
Time (msec)

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #7(x)

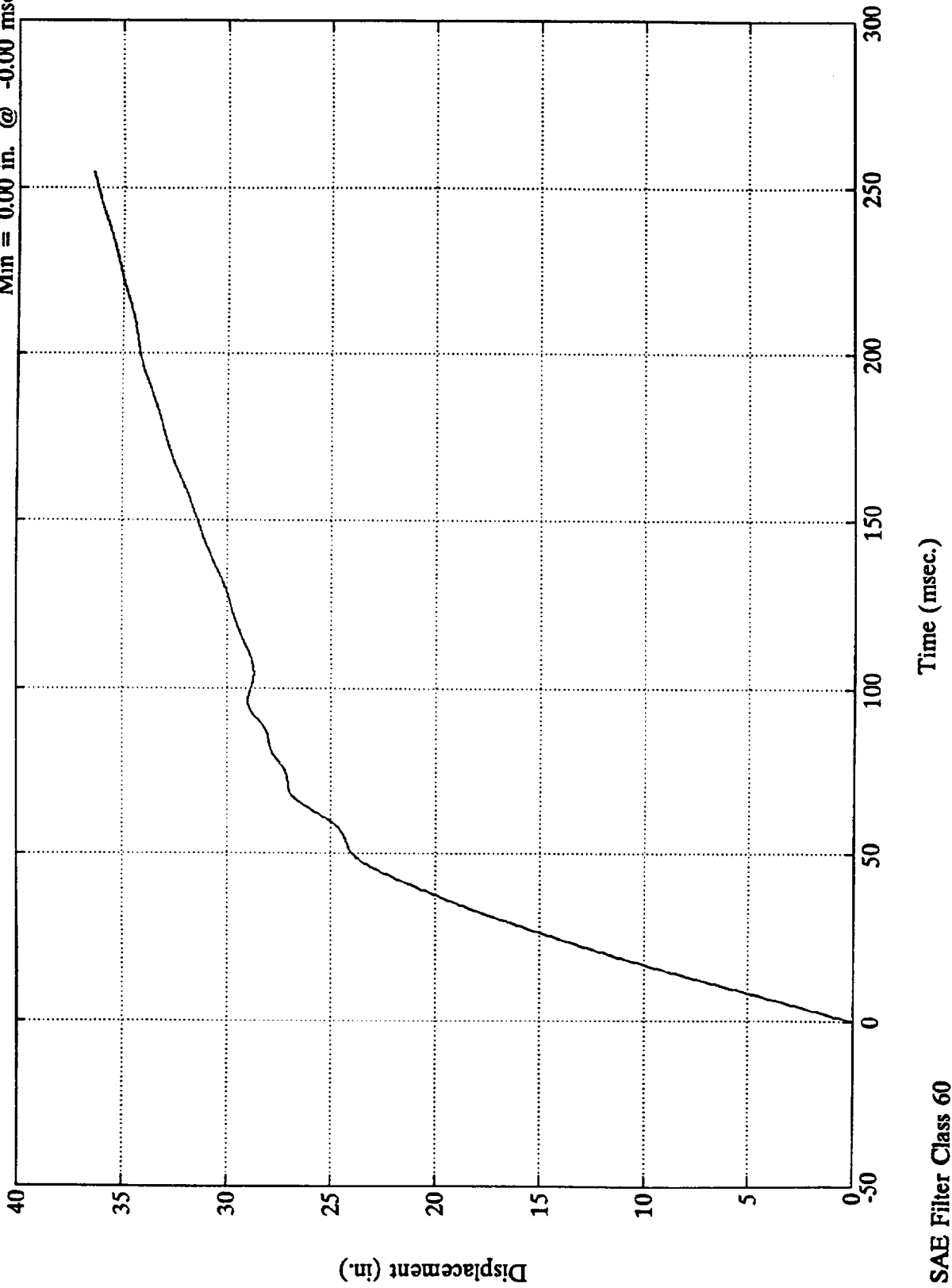
Max = 34.81 mph @ 3.36 msec  
Min = -3.12 mph @ 99.84 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #7(x)

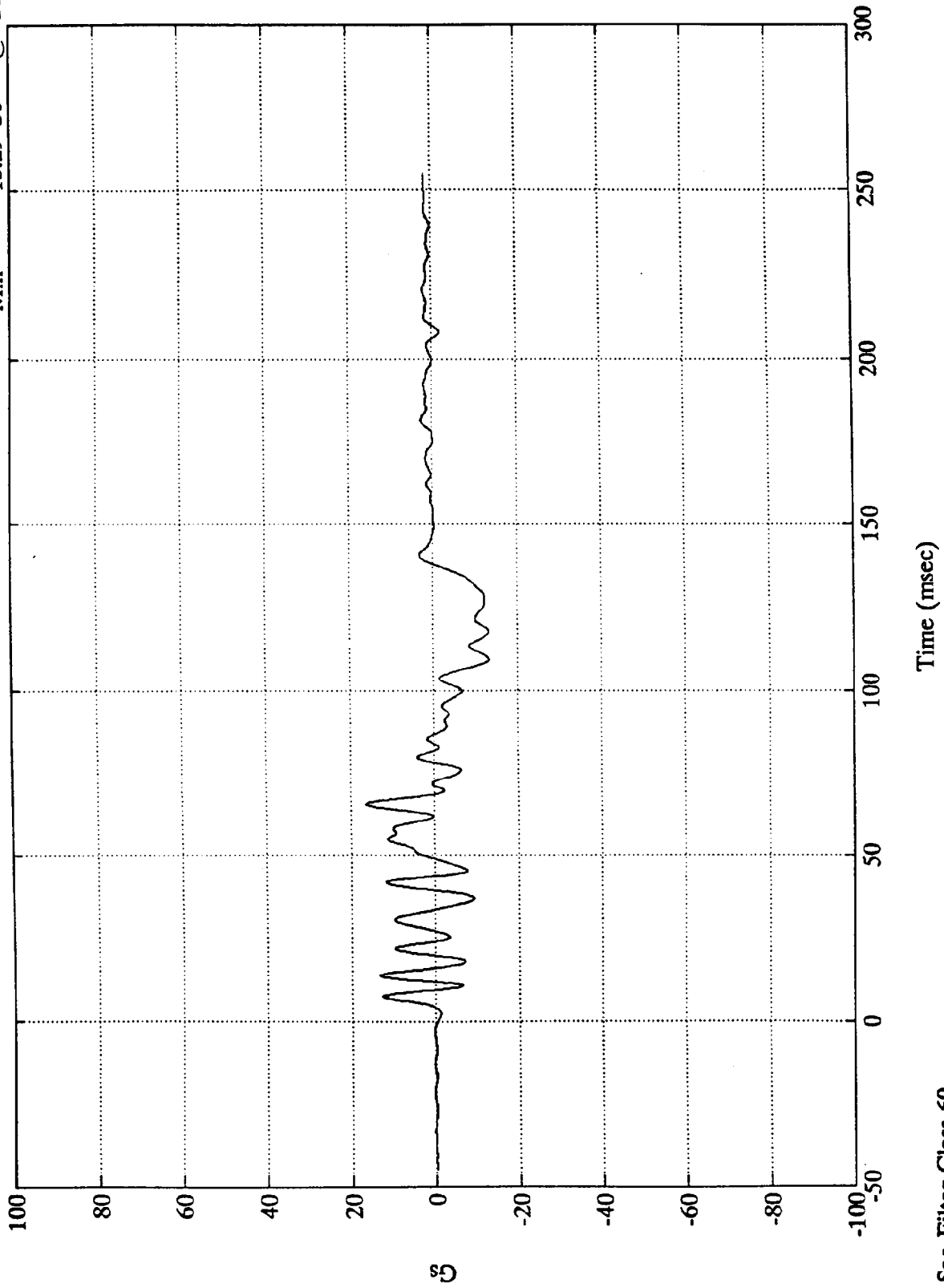
Max = 36.42 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Max = 16.40 Gs @ 65.27 msec  
Min = -13.29 Gs @ 109.56 msec

Acc. #8(z)



5

B-24

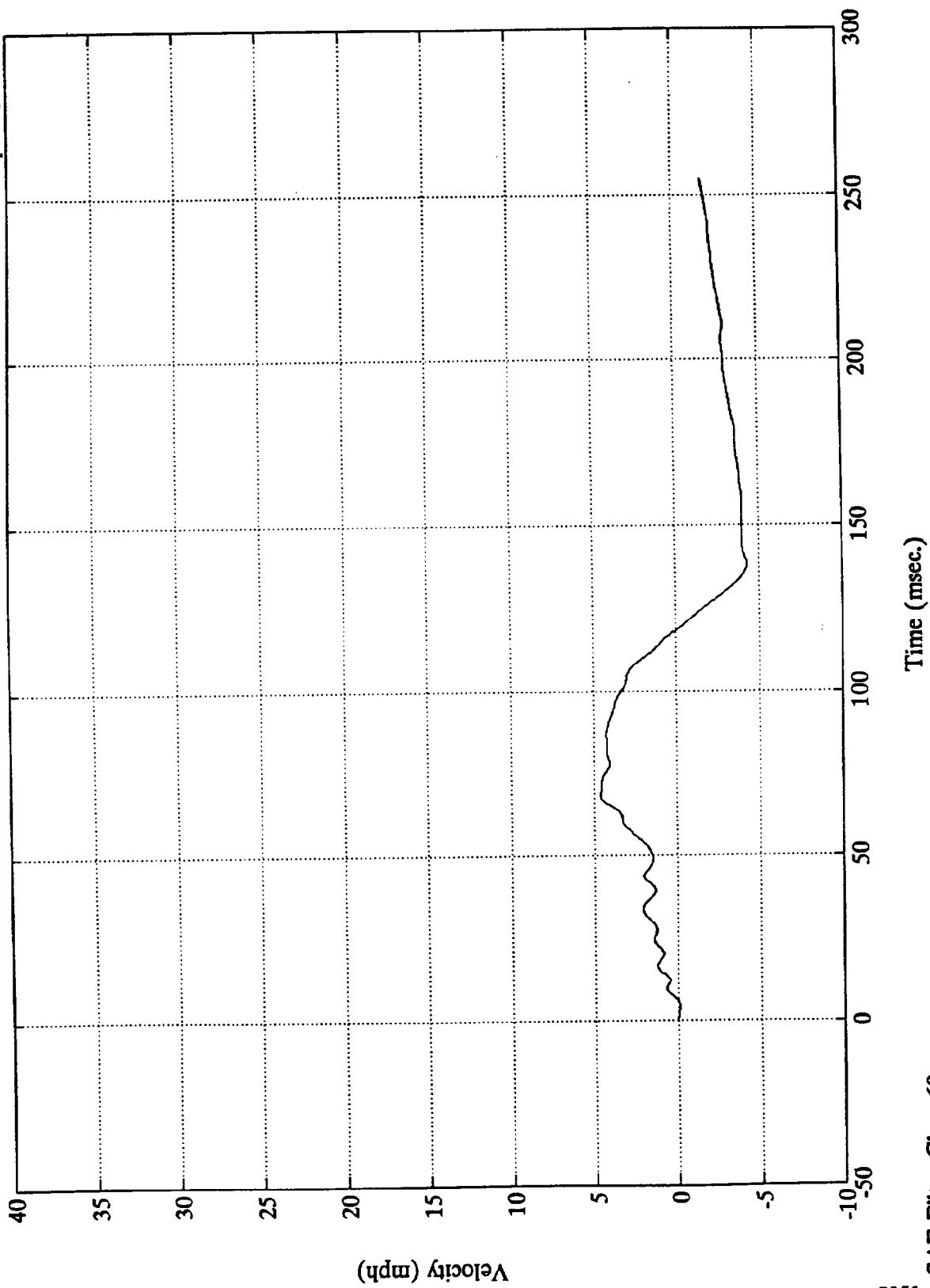
7951-1

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Max = 4.62 mph @ 68.40 msec  
Min = -4.29 mph @ 138.00 msec

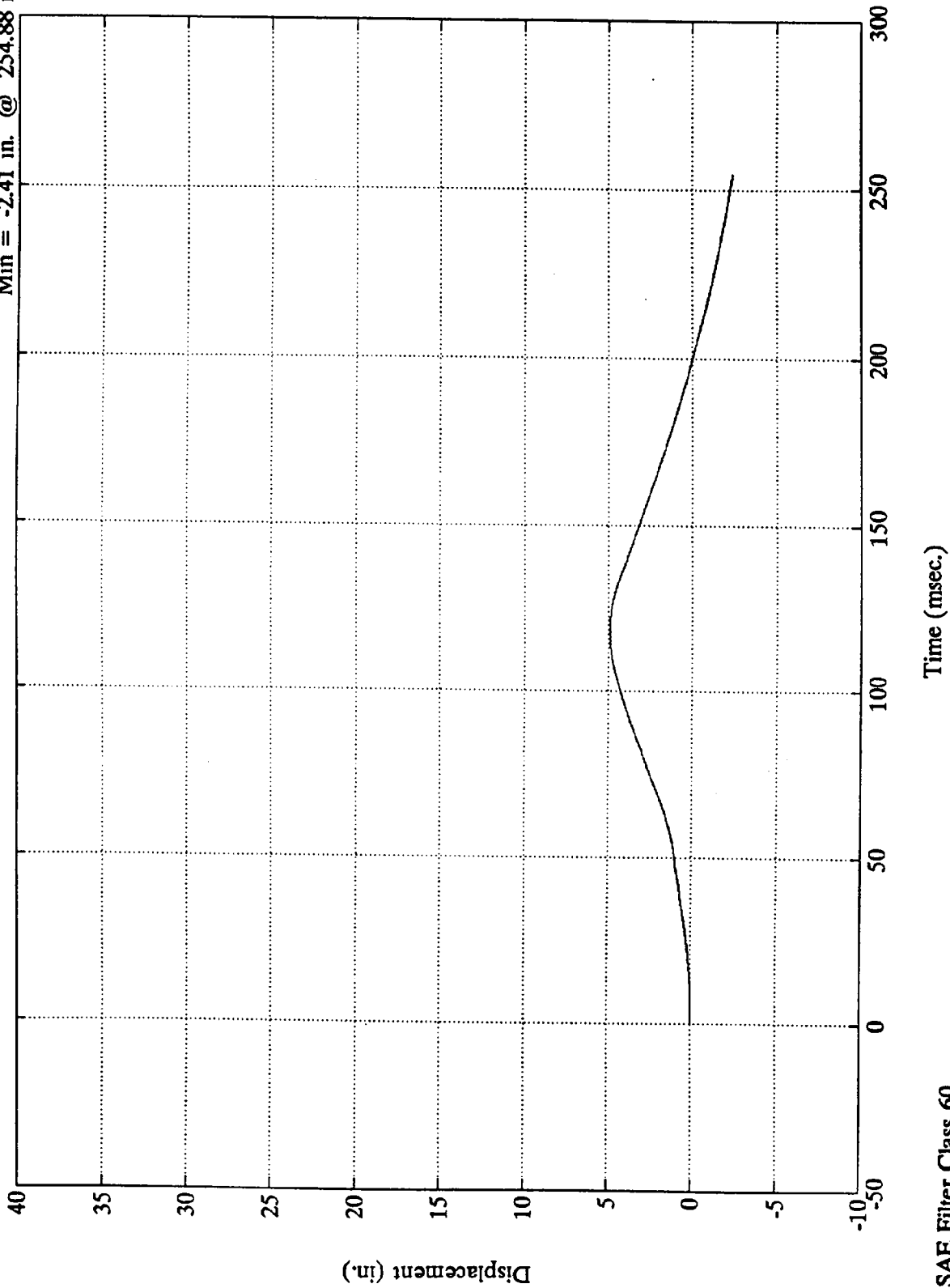
Acc. #8(z)



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #8(z)

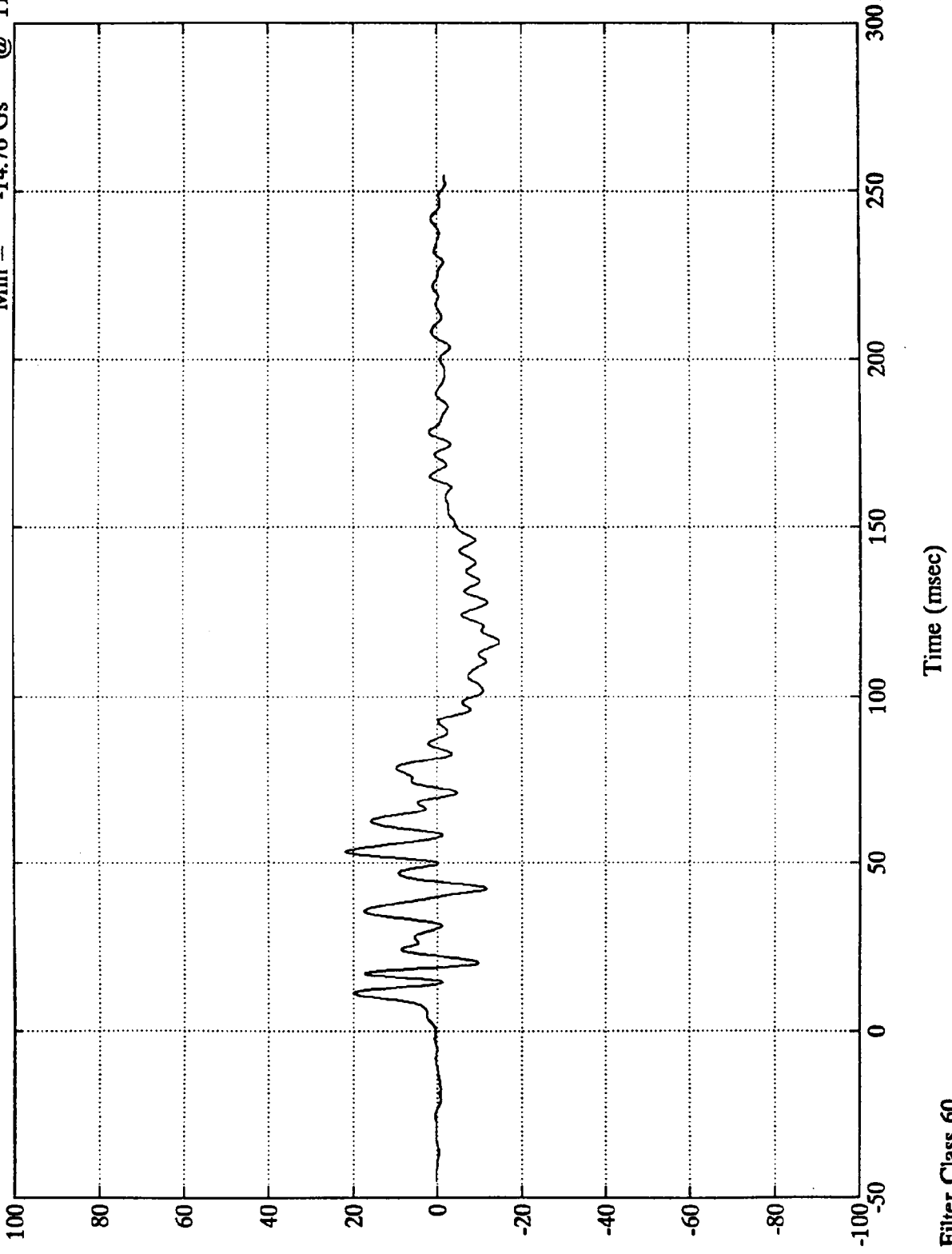
Max = 4.91 in. @ 118.56 msec  
Min = -2.41 in. @ 254.88 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #9(z)

Max = 21.63 Gs @ 53.40 msec  
Min = -14.76 Gs @ 116.04 msec



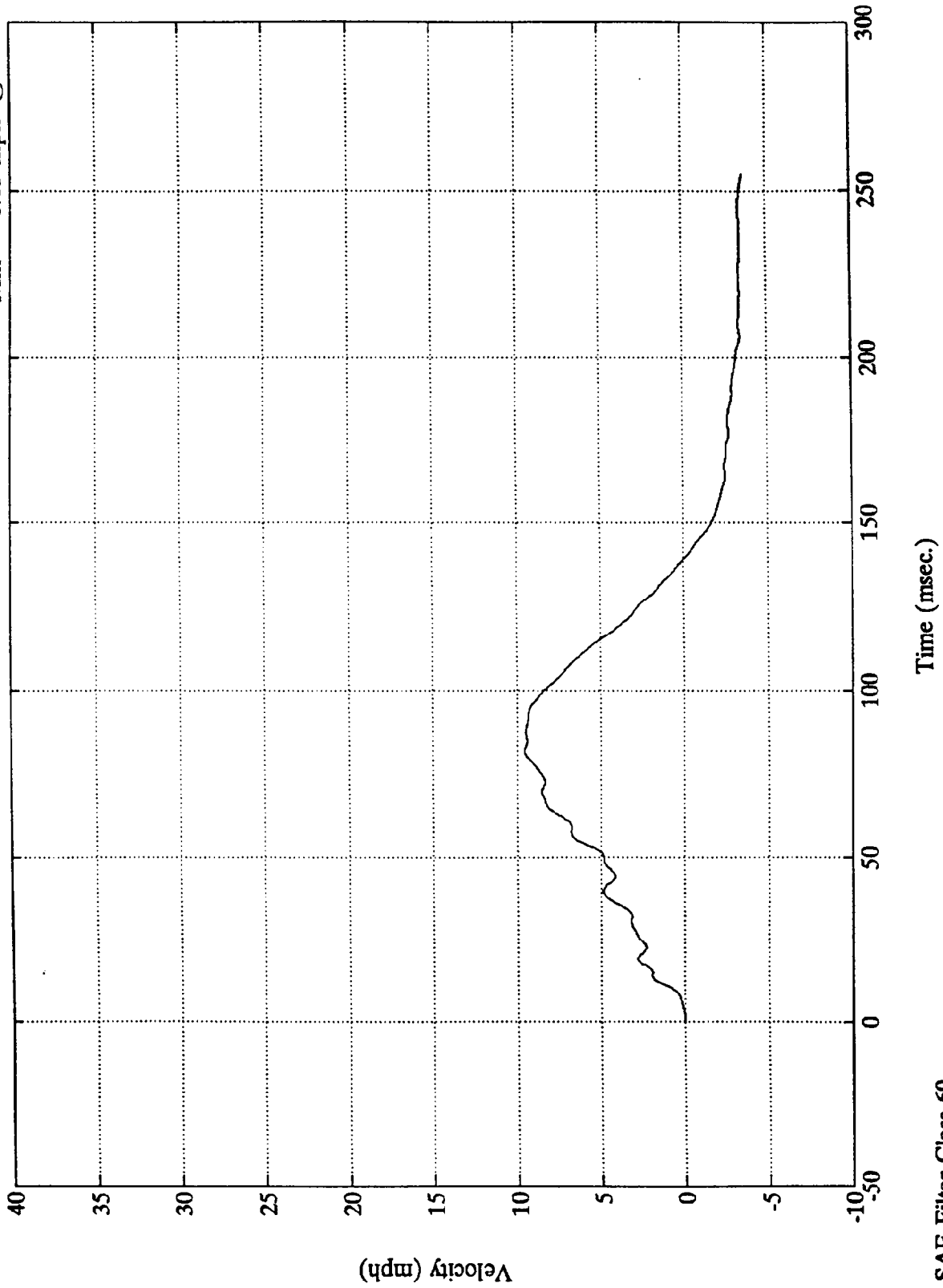
B-27

7951-1 Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #9(z)

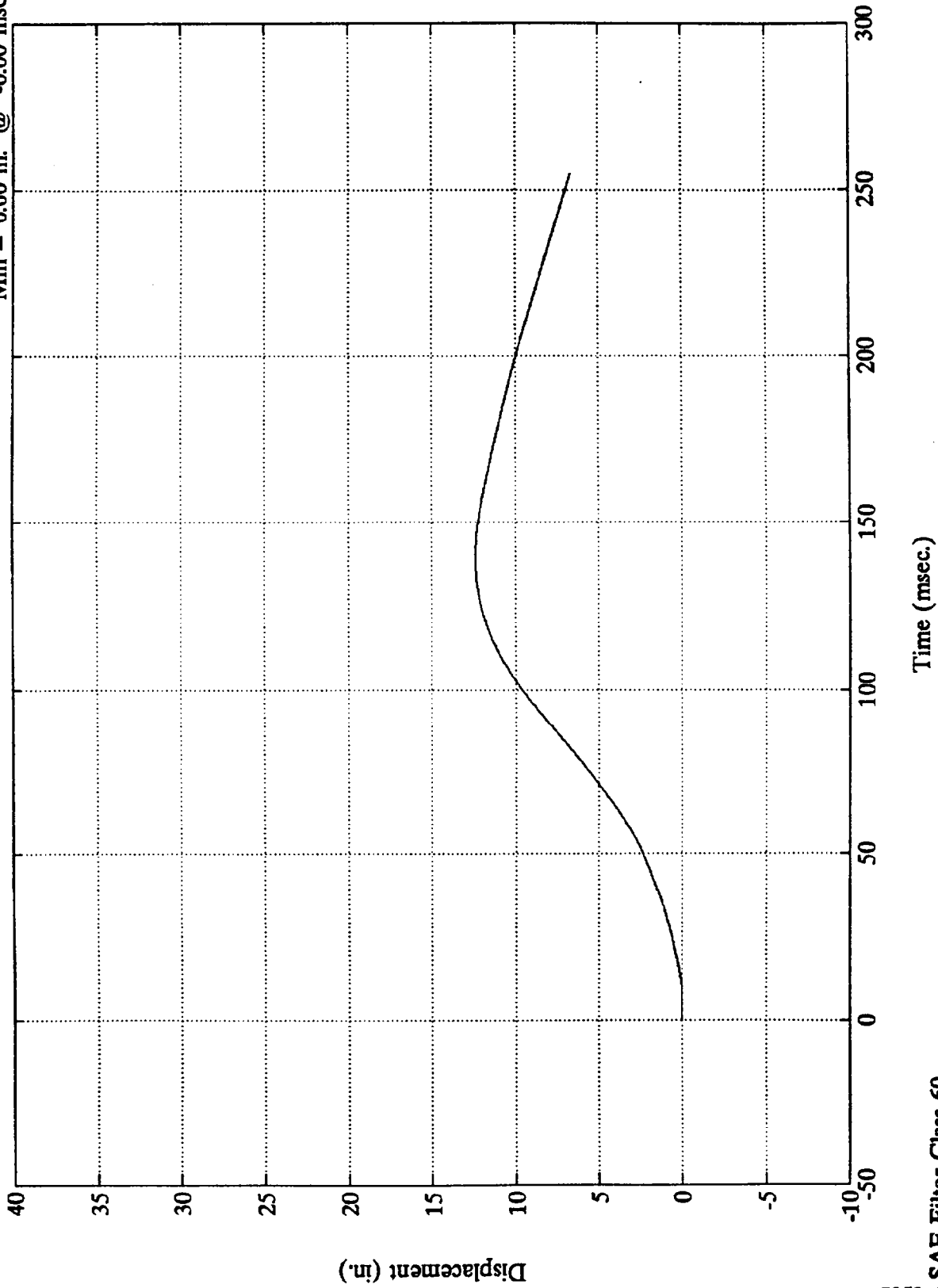
Max = 9.53 mph @ 81.60 msec  
Min = -3.63 mph @ 254.88 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Acc. #9(z)

Max = 12.38 in. @ 140.64 msec  
Min = 0.00 in. @ -0.00 msec



TEST NO. MNO204

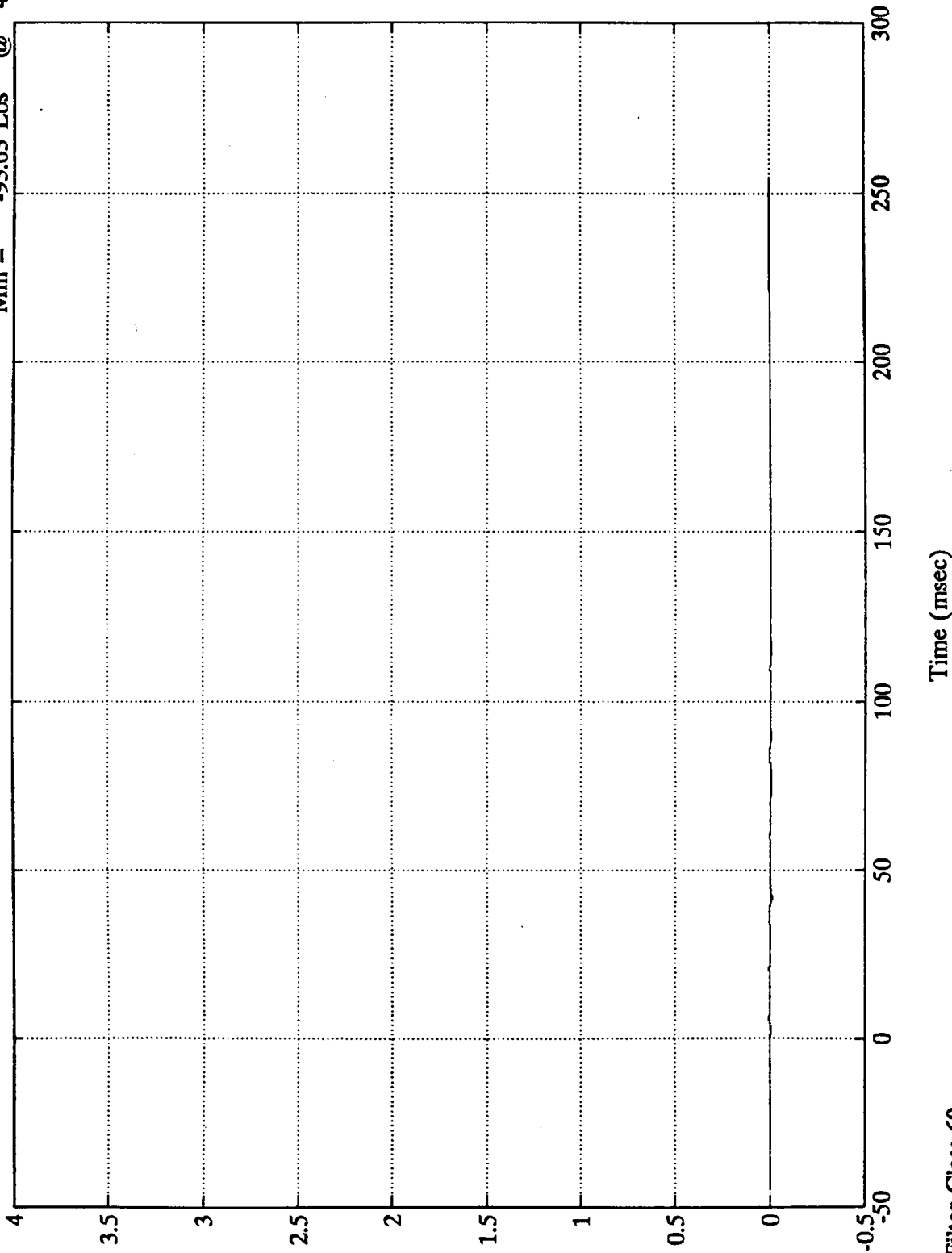
LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell A1  
Max = 48.59 Lbs @ 83.87 msec  
Min = -93.63 Lbs @ 41.88 msec



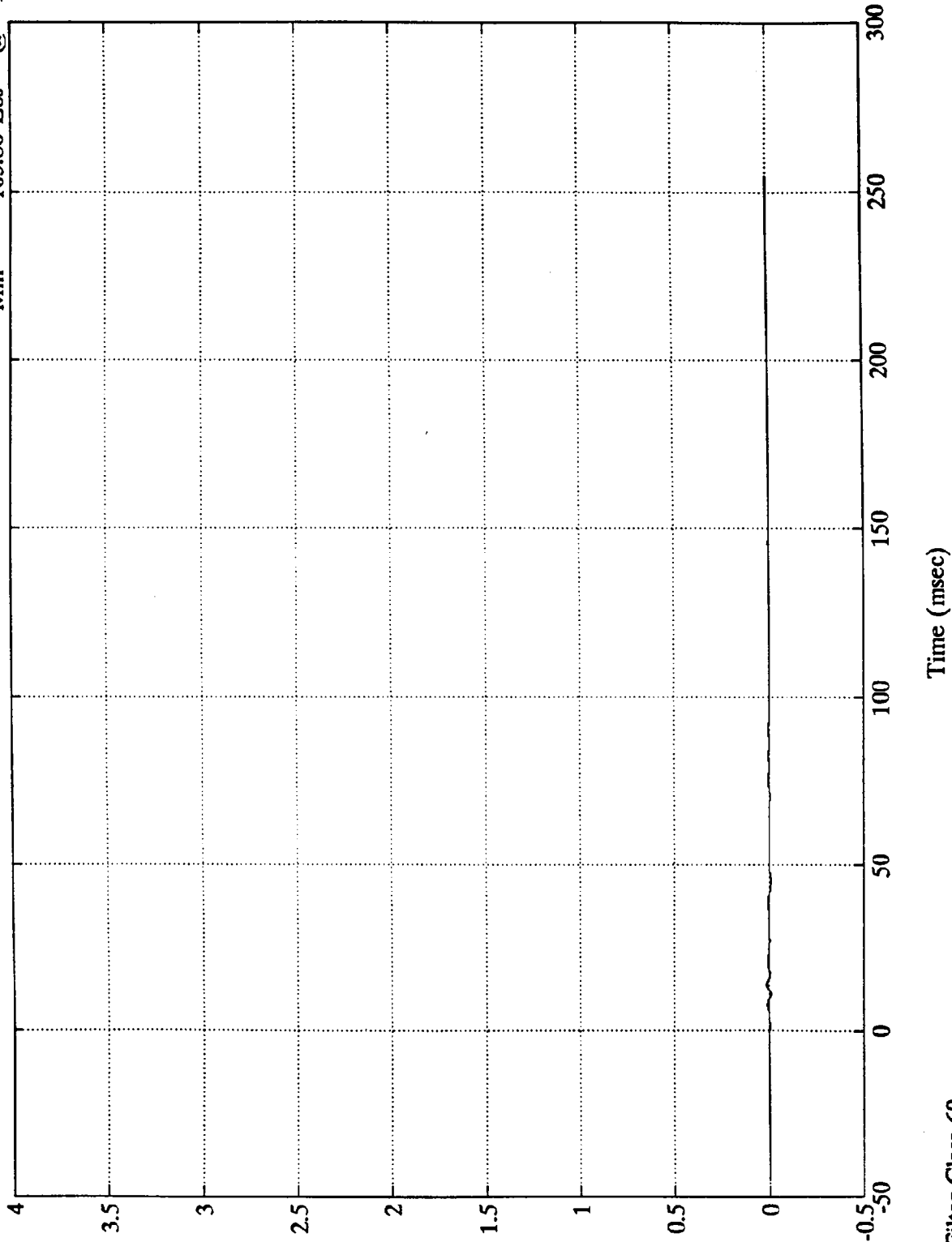
B-31

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell A2

Max = 121.39 Lbs @ 13.91 msec  
Min = -105.86 Lbs @ 11.03 msec



B-32

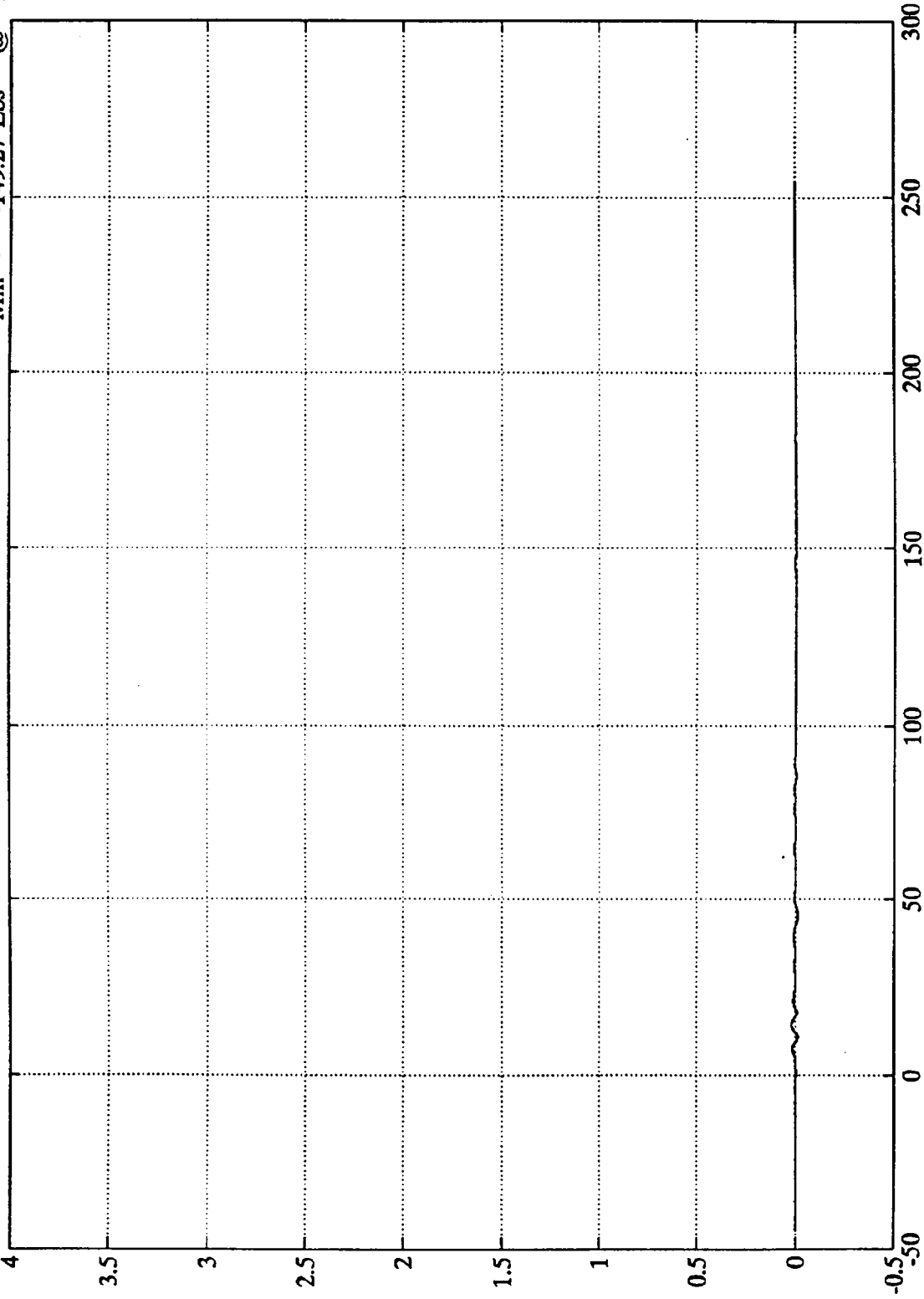
7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell A3

Max = 189.16 Lbs @ 14.27 msec  
Min = -149.27 Lbs @ 10.91 msec



B-33  
Lbs

Time (msec)

Sae Filter Class 60

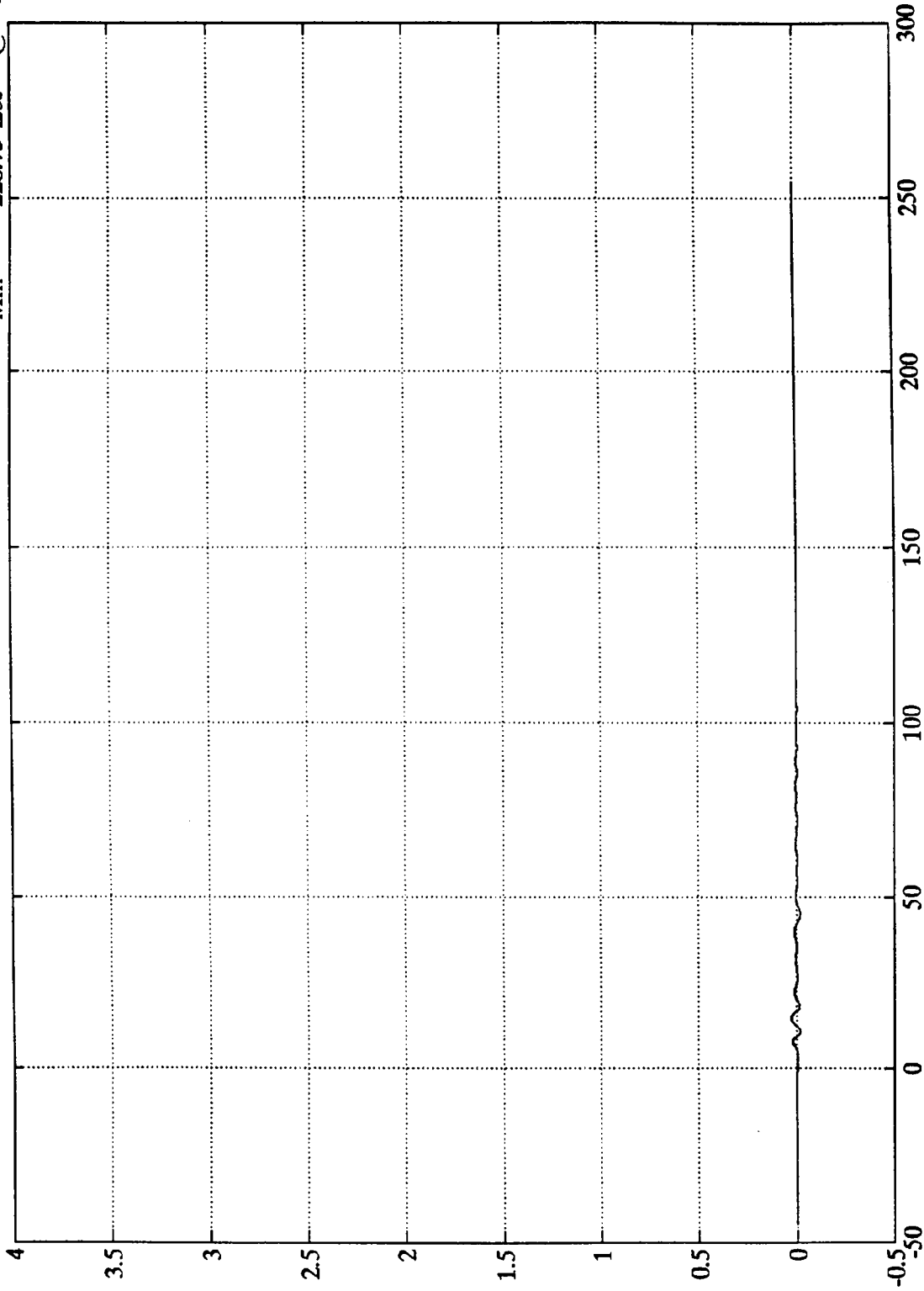
7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell A4

Max = 263.16 Lbs @ 14.51 msec  
Min = -228.73 Lbs @ 10.67 msec



B-34  
lbs

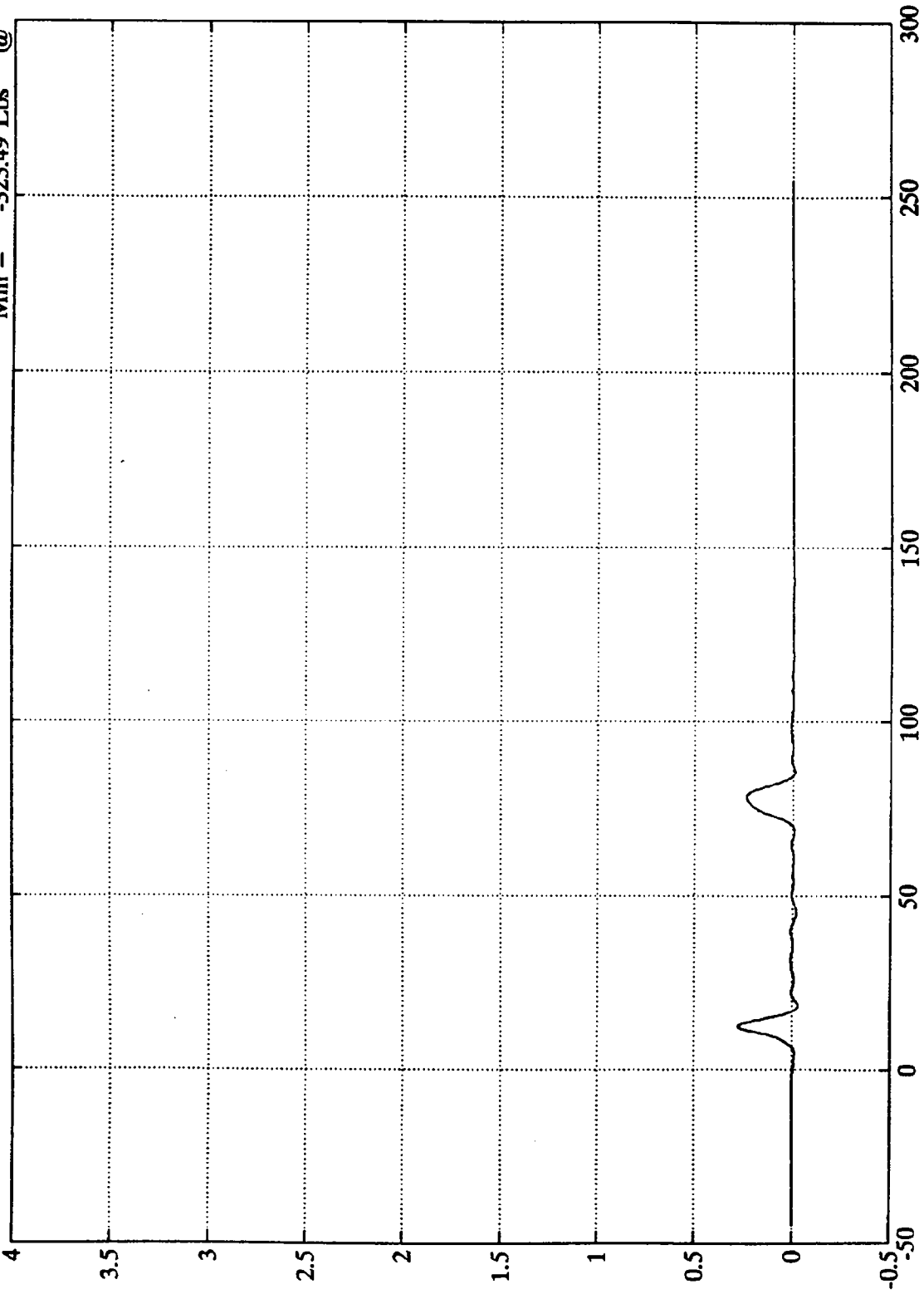
7951-1  
Sae Filter Class 60

Time (msec)

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell A5  
Max = 2744.09 Lbs @ 12.23 msec  
Min = -323.49 Lbs @ 18.12 msec

x10<sup>4</sup>



B-35  
Lbs

Time (msec)

Sae Filter Class 60

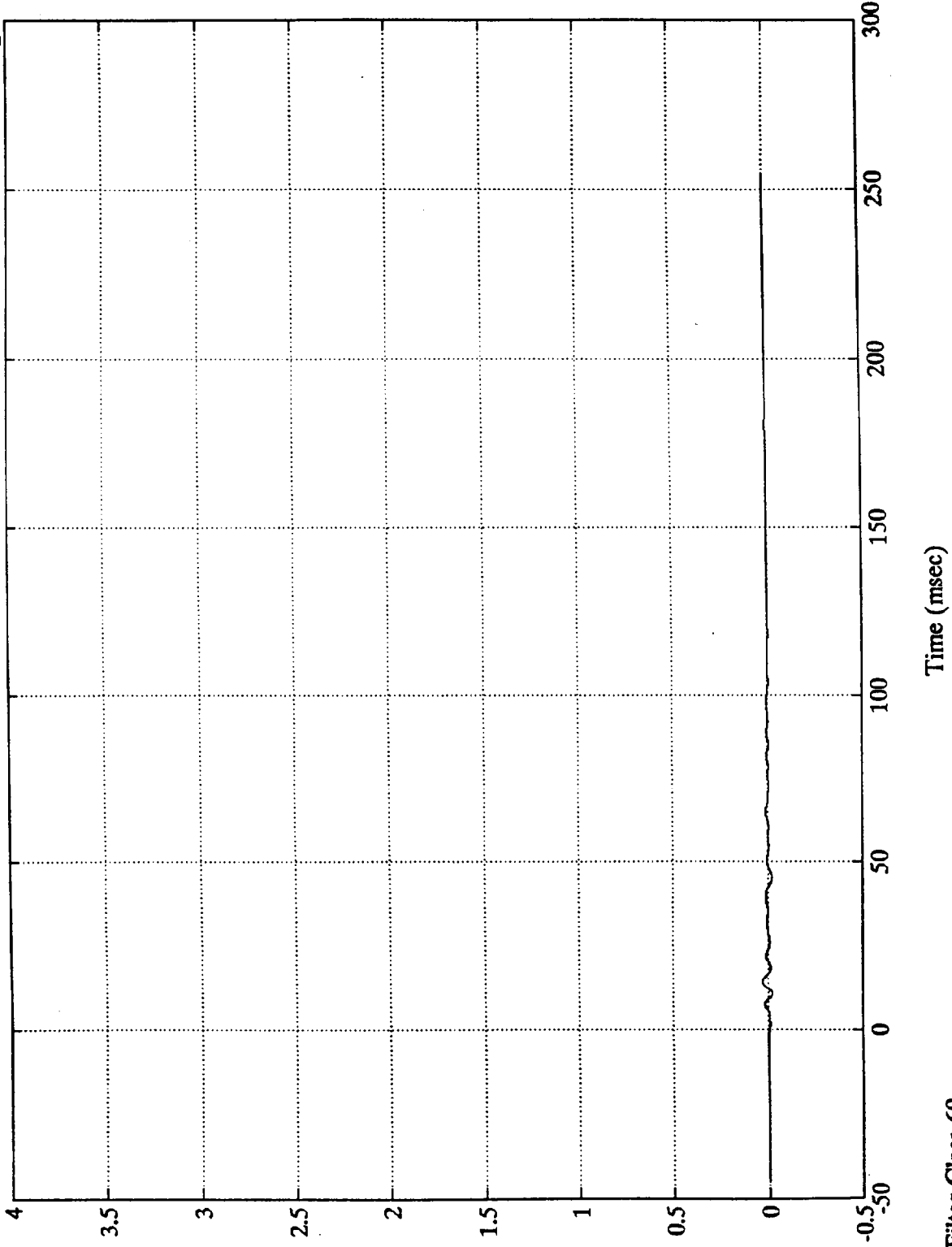
7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell A6

Max = 305.56 Lbs @ 14.27 msec  
Min = -232.90 Lbs @ 10.67 msec



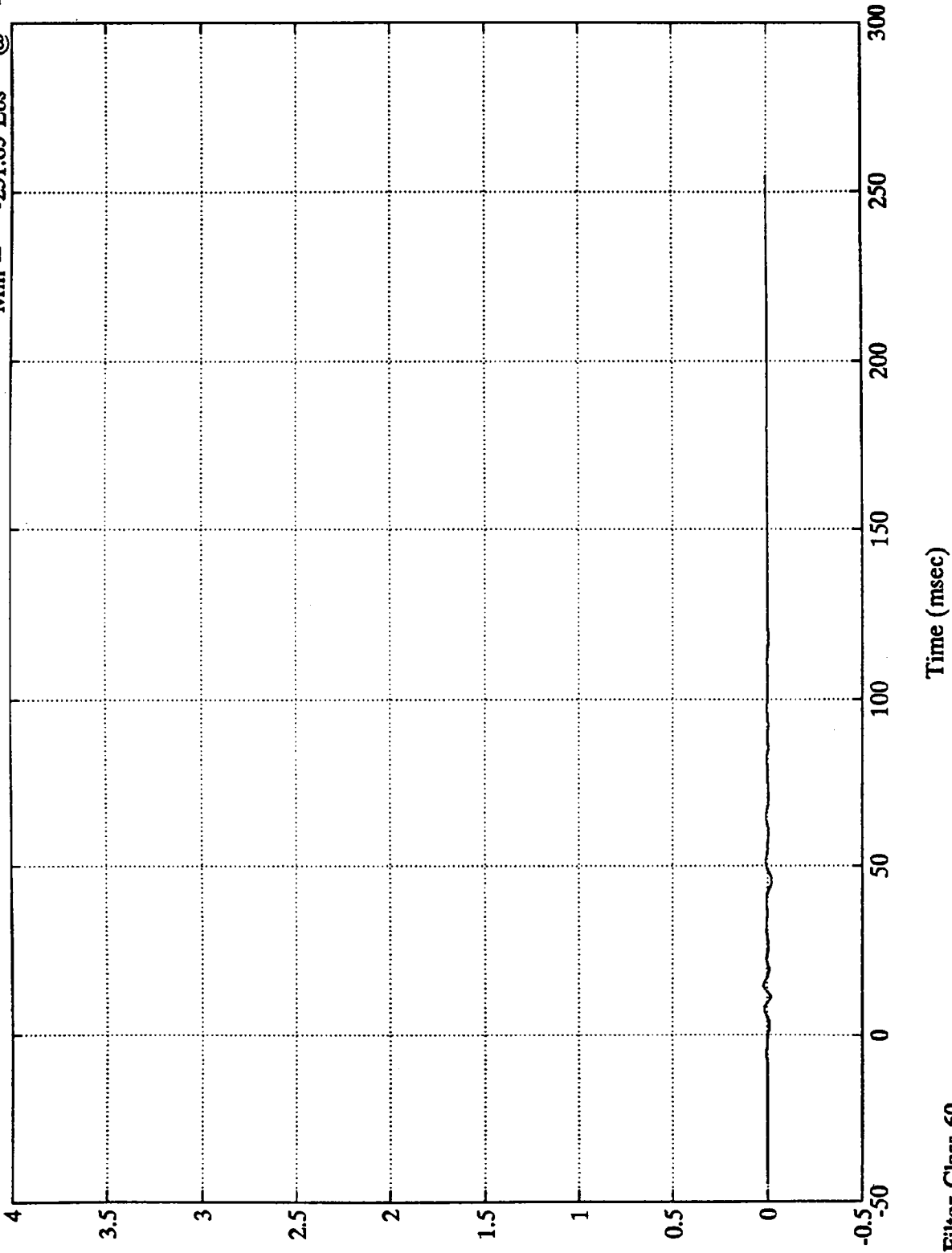
98-B  
B-36

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell A7

Max = 183.33 Lbs @ 14.39 msec  
Min = -231.85 Lbs @ 45.60 msec

x10<sup>4</sup>



1-B-37

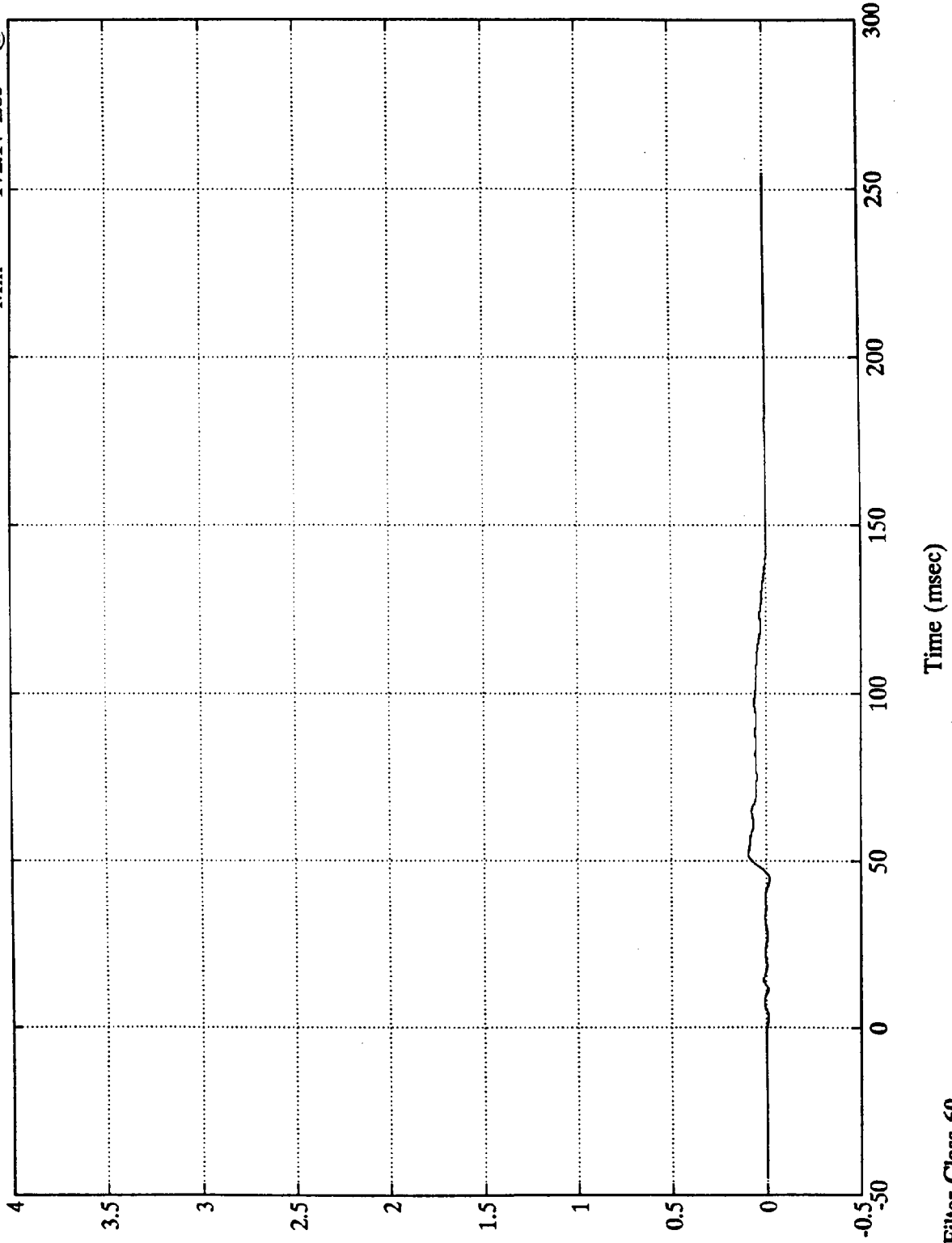
7951-1

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell A8

Max = 943.63 Lbs @ 52.08 msec  
Min = -172.17 Lbs @ 44.63 msec



B-38  
Lbs

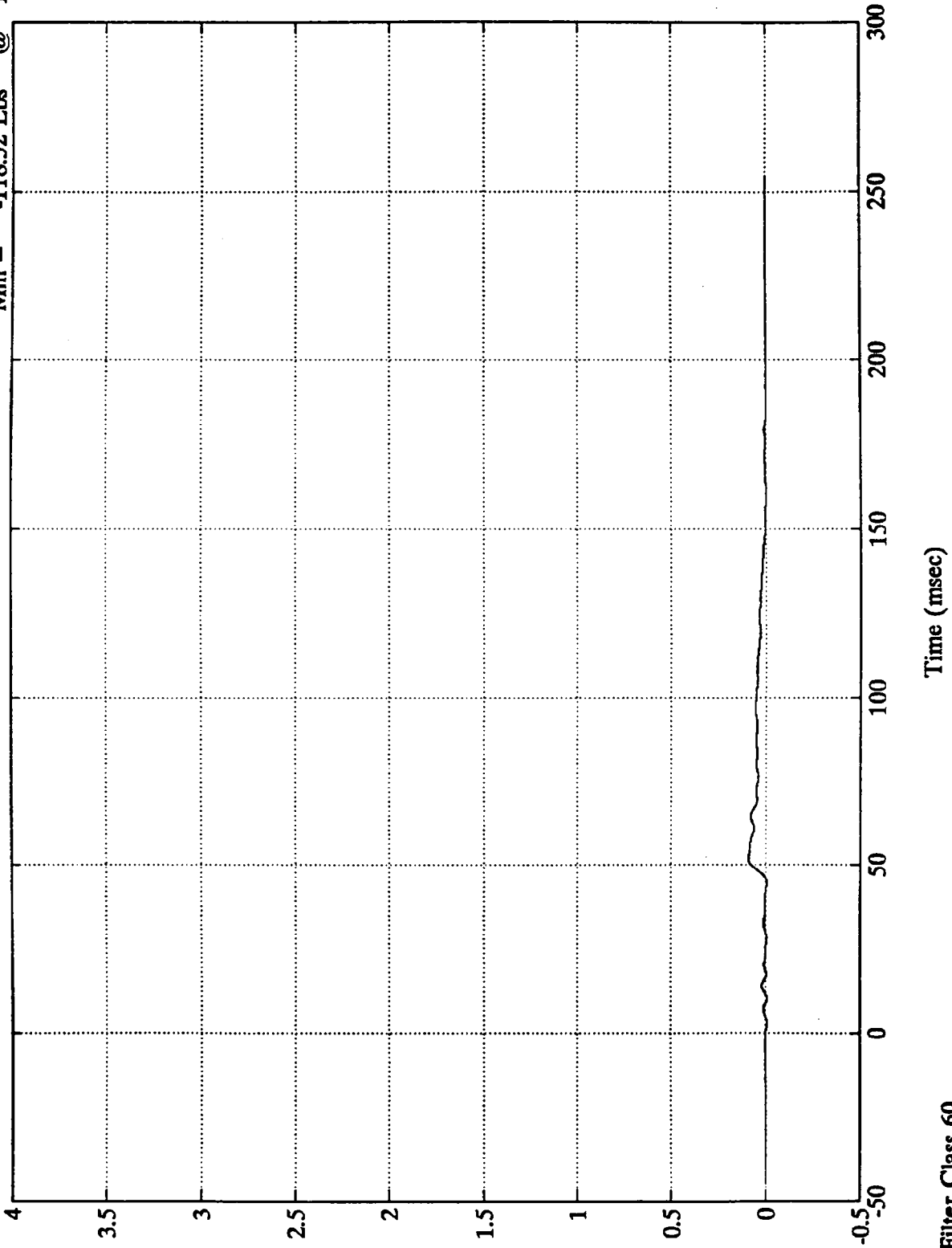
7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell A9

Max = 906.15 Lbs @ 51.72 msec  
Min = -118.52 Lbs @ 10.19 msec



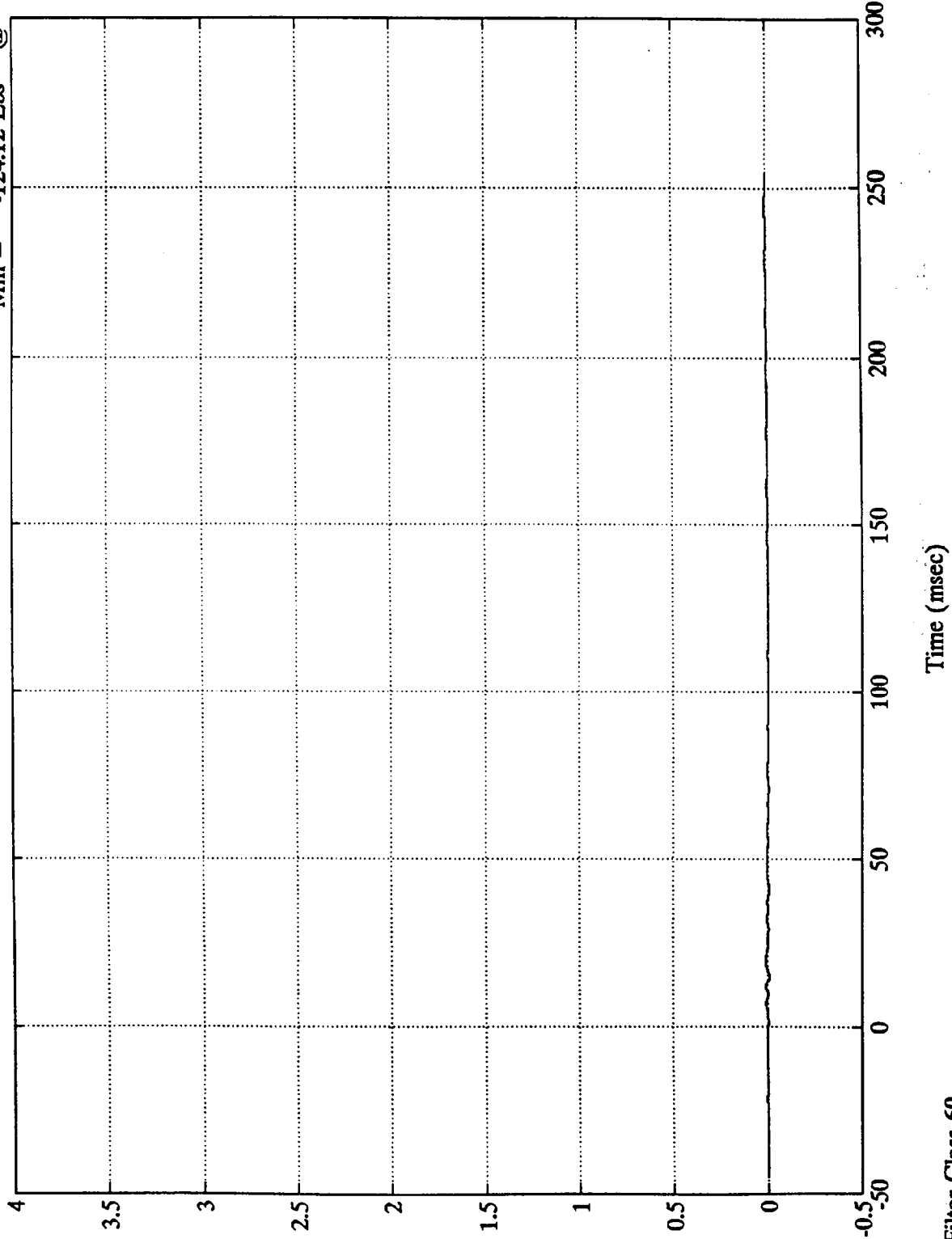
B-39  
Lbs

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell B1

Max = 77.63 Lbs @ 11.87 msec  
Min = -124.12 Lbs @ 14.88 msec



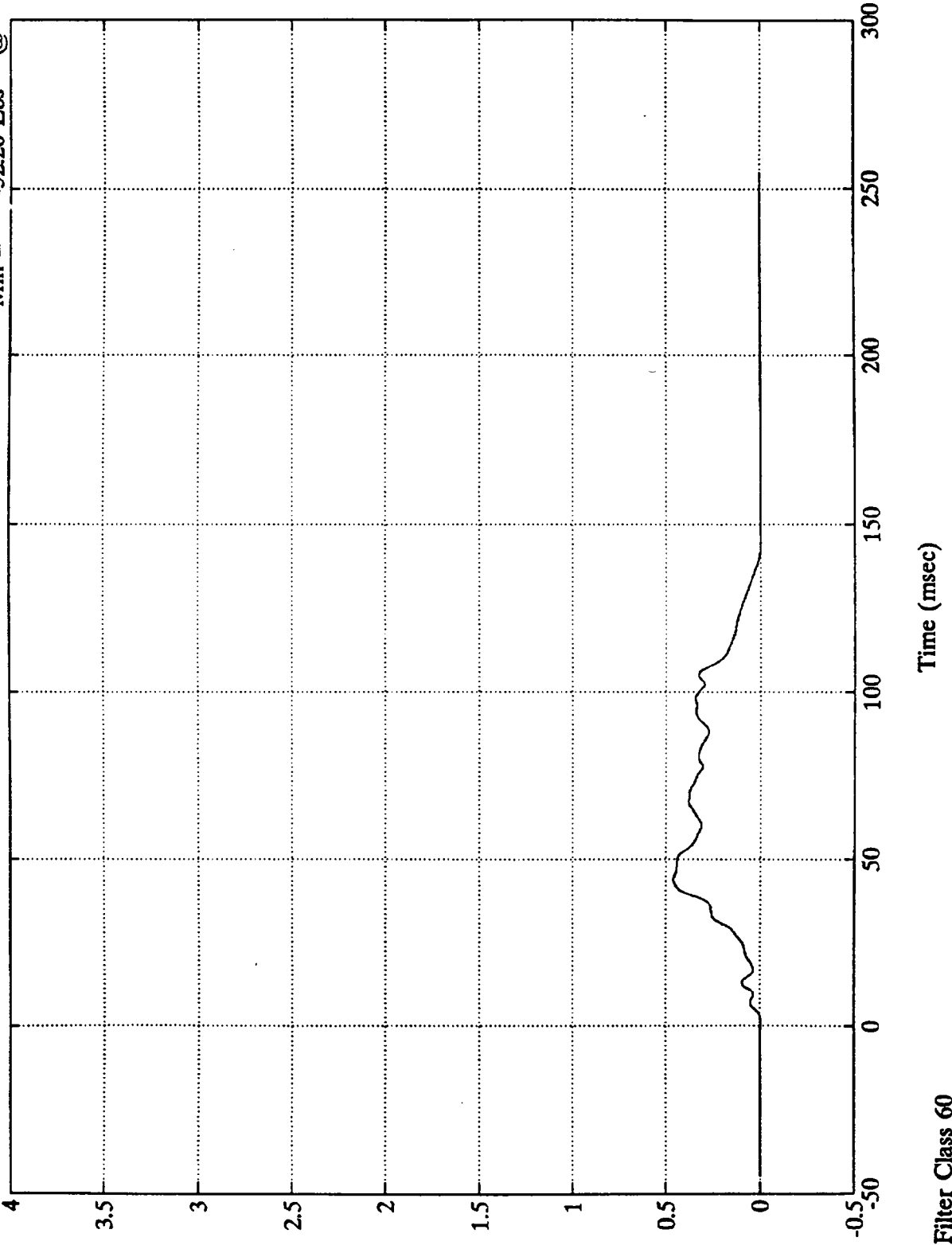
B-40  
Lbs

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell B2

Max = 4605.64 Lbs @ 43.91 msec  
Min = -52.20 Lbs @ 0.35 msec



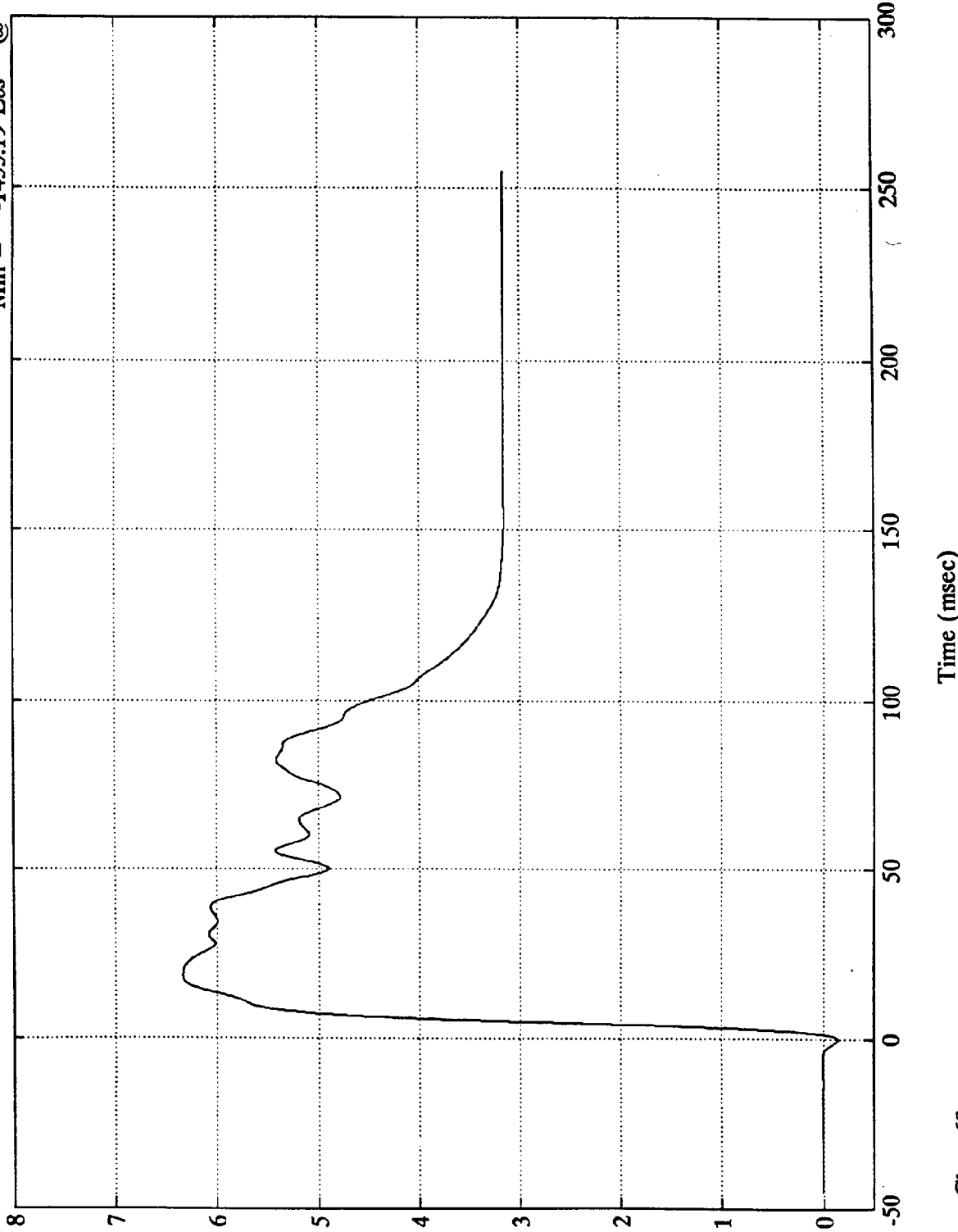
B-41

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell B3

Max = 63429.01 Lbs @ 18.23 msec  
Min = -1455.19 Lbs @ -0.24 msec



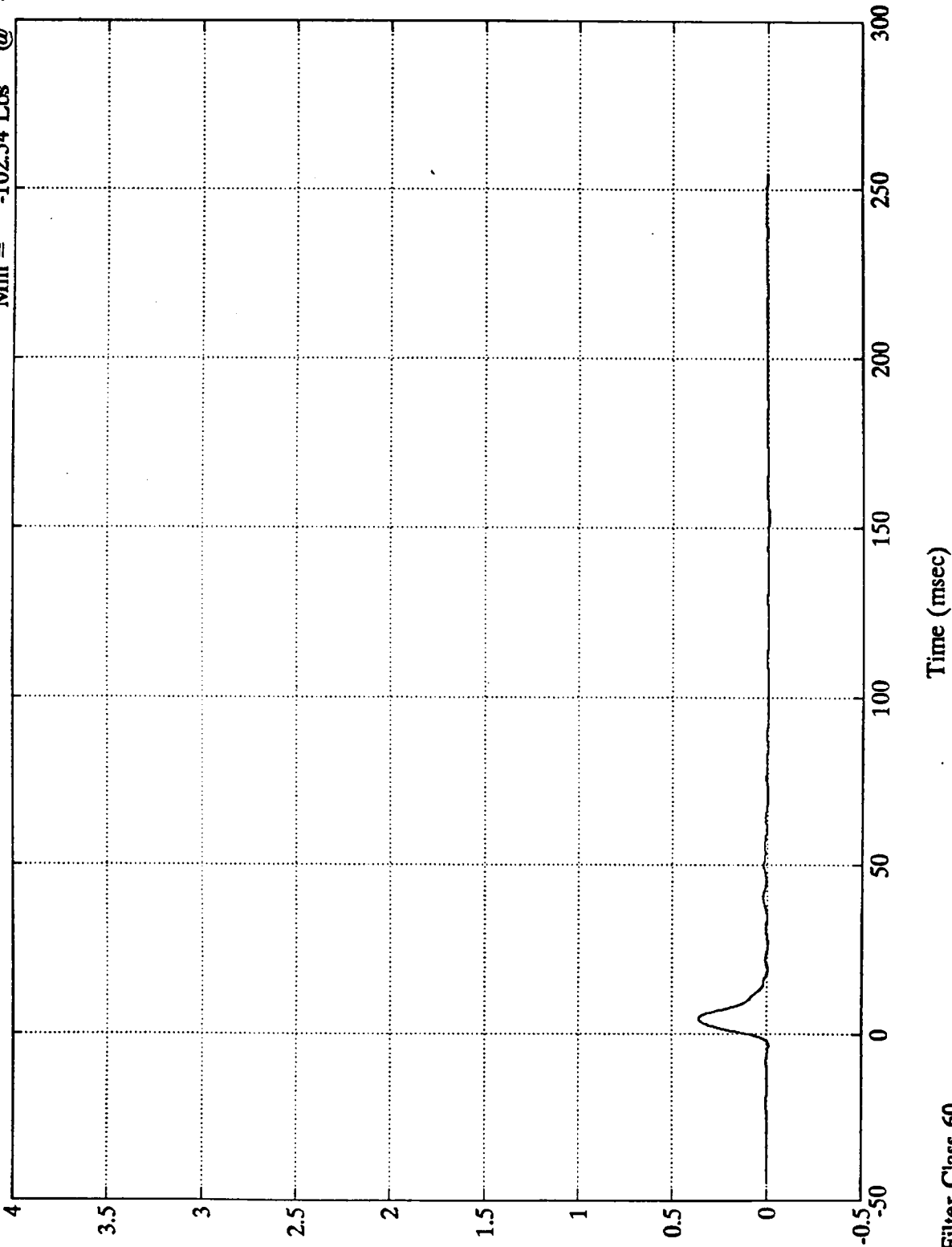
1-15-B  
Lbs

7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell B4

Max = 3627.27 Lbs @ 4.43 msec  
Min = -102.54 Lbs @ -3.60 msec

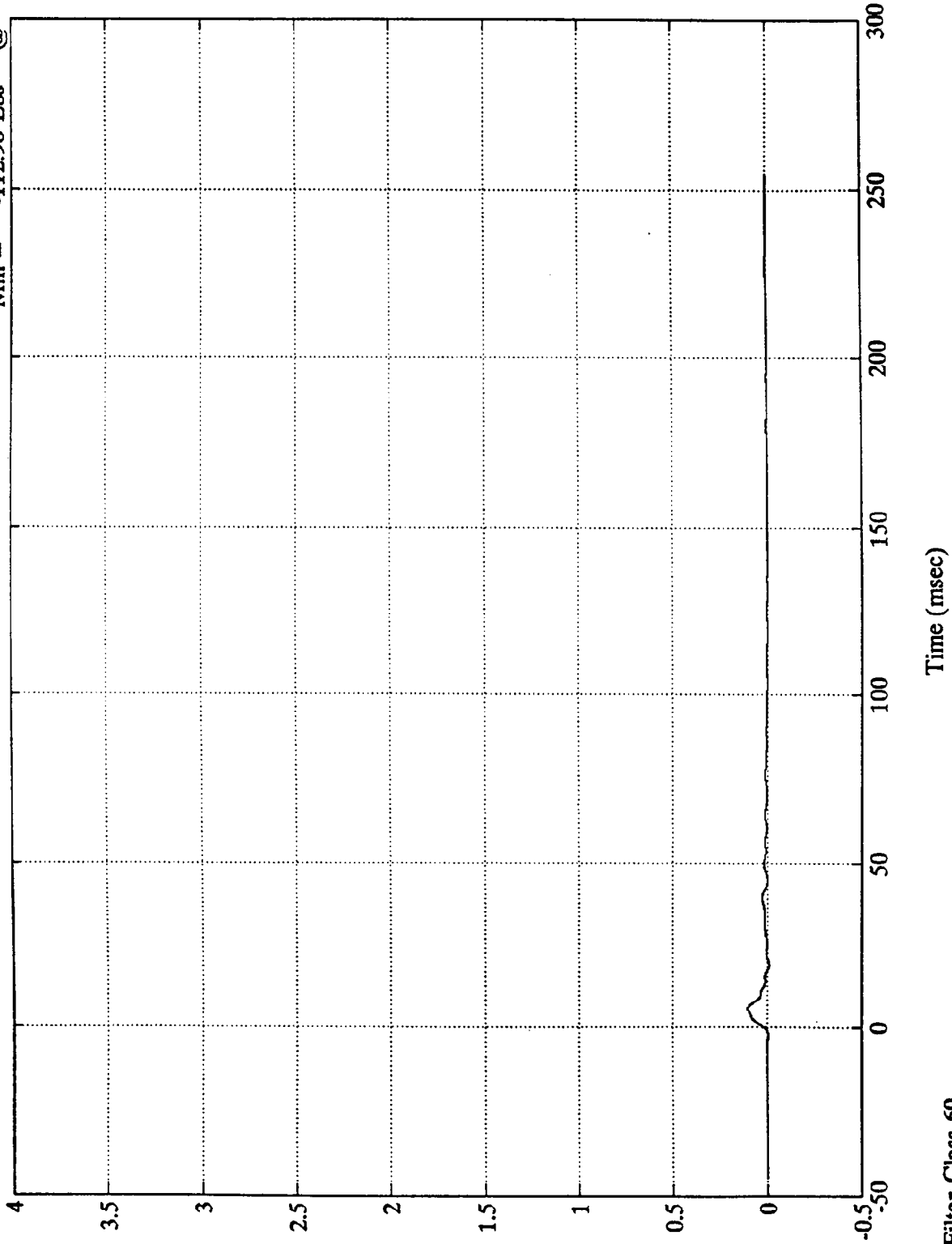


B-43

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell B5

Max = 1034.72 Lbs @ 5.51 msec  
Min = -112.96 Lbs @ 18.60 msec



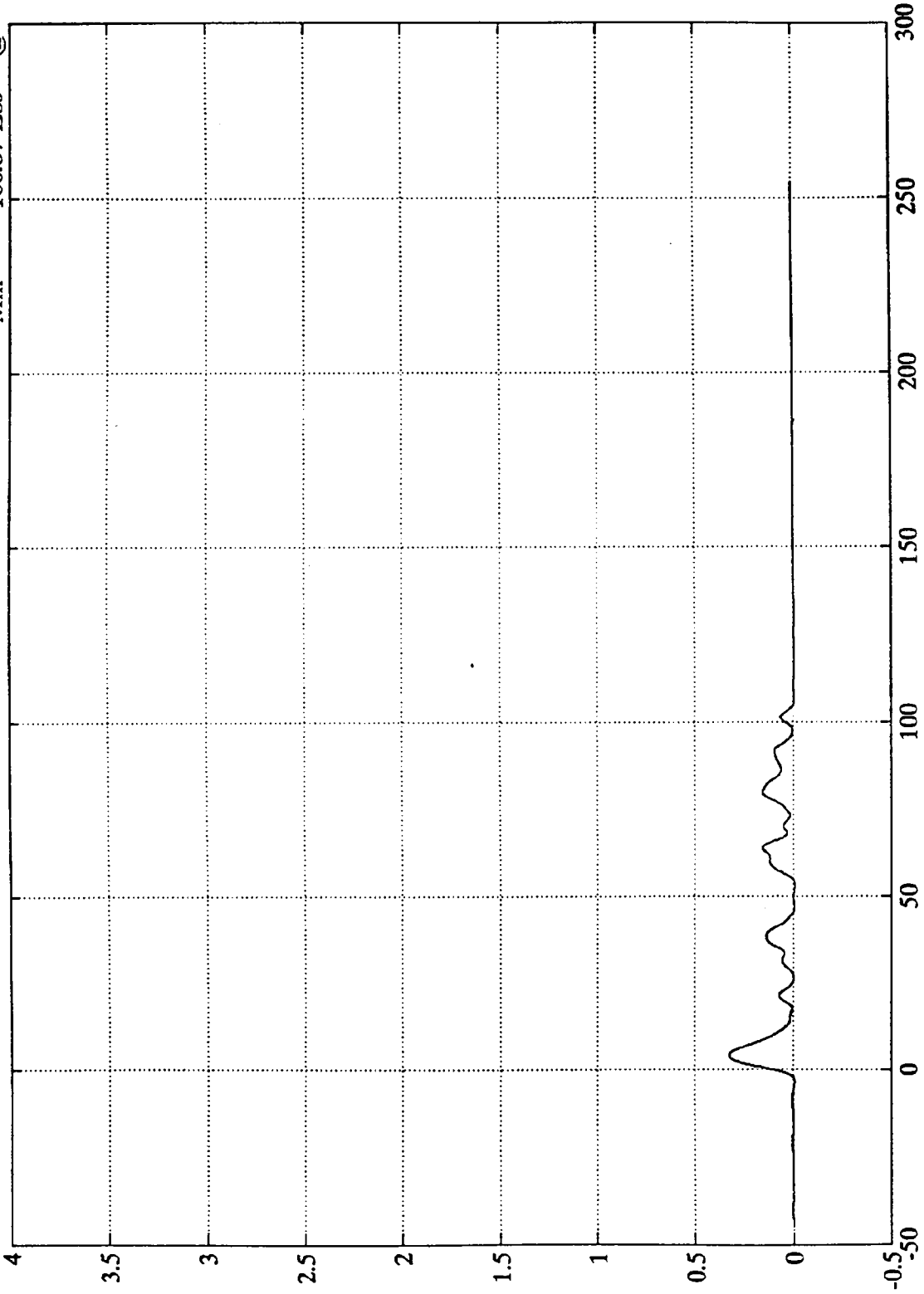
lbs  
B-44

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell B6

Max = 3252.77 Lbs @ 3.83 msec  
Min = -100.67 Lbs @ -3.60 msec

x10<sup>4</sup>



B-45  
Lbs

Time (msec)

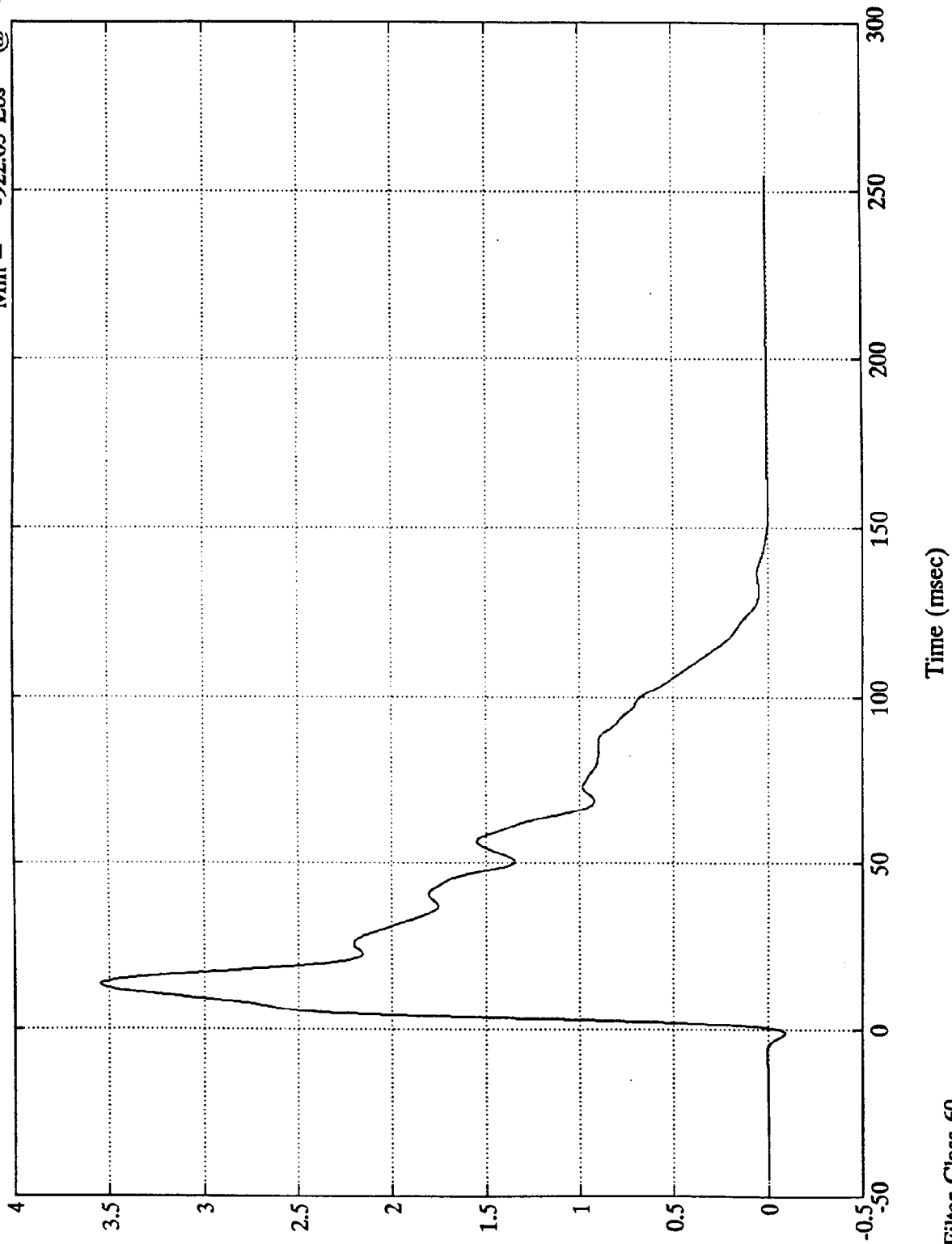
Sae Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell B7

Max = 35484.17 Lbs @ 13.31 msec  
Min = -922.65 Lbs @ -1.08 msec



B-46  
lbs

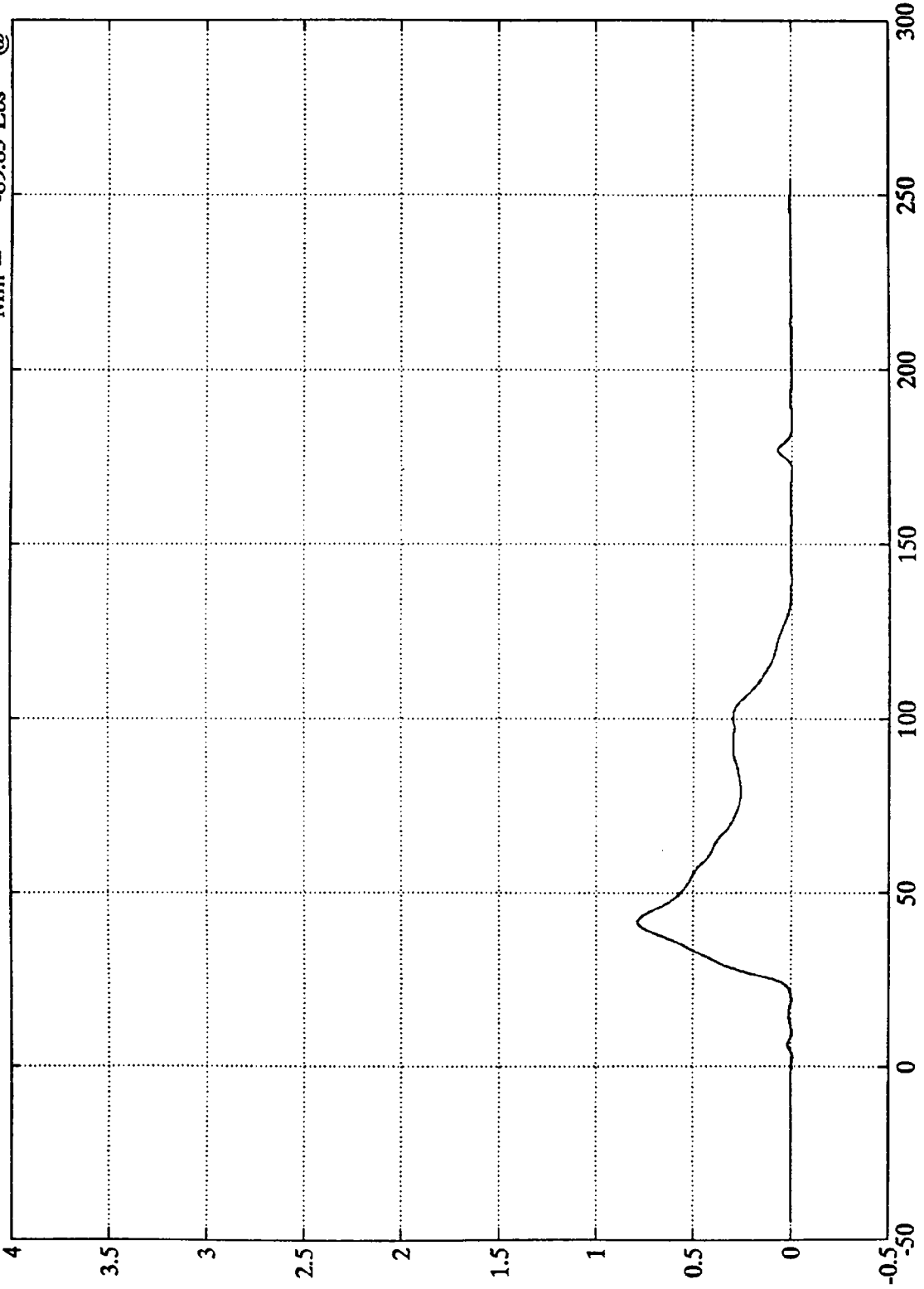
7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell B8

Max = 7883.06 Lbs @ 41.76 msec  
Min = -89.83 Lbs @ 2.63 msec



B-47  
Lbs

Time (msec)

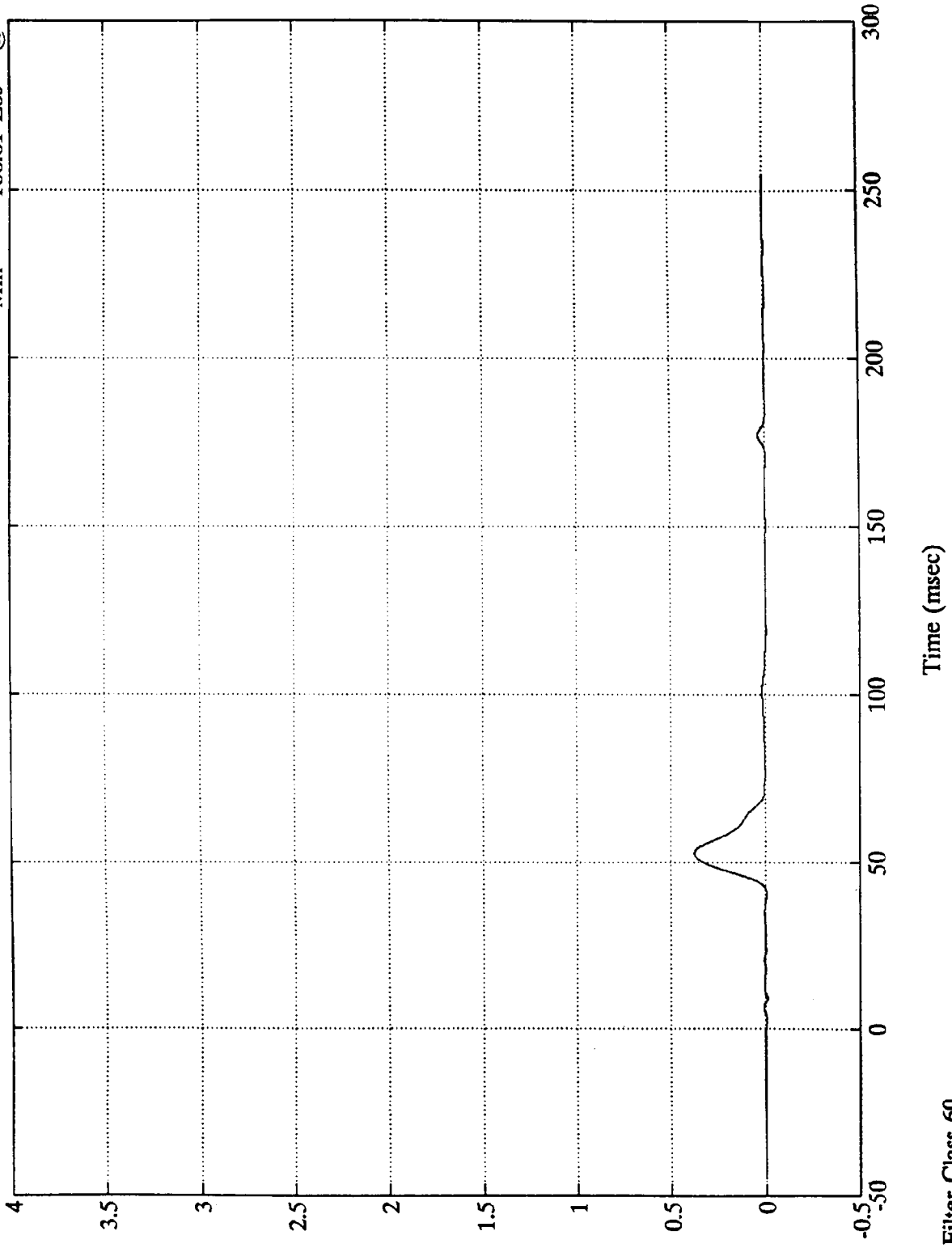
Sae Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell B9

Max = 3791.93 Lbs @ 52.68 msec  
Min = -106.61 Lbs @ 9.11 msec



B-48

Sae Filter Class 60

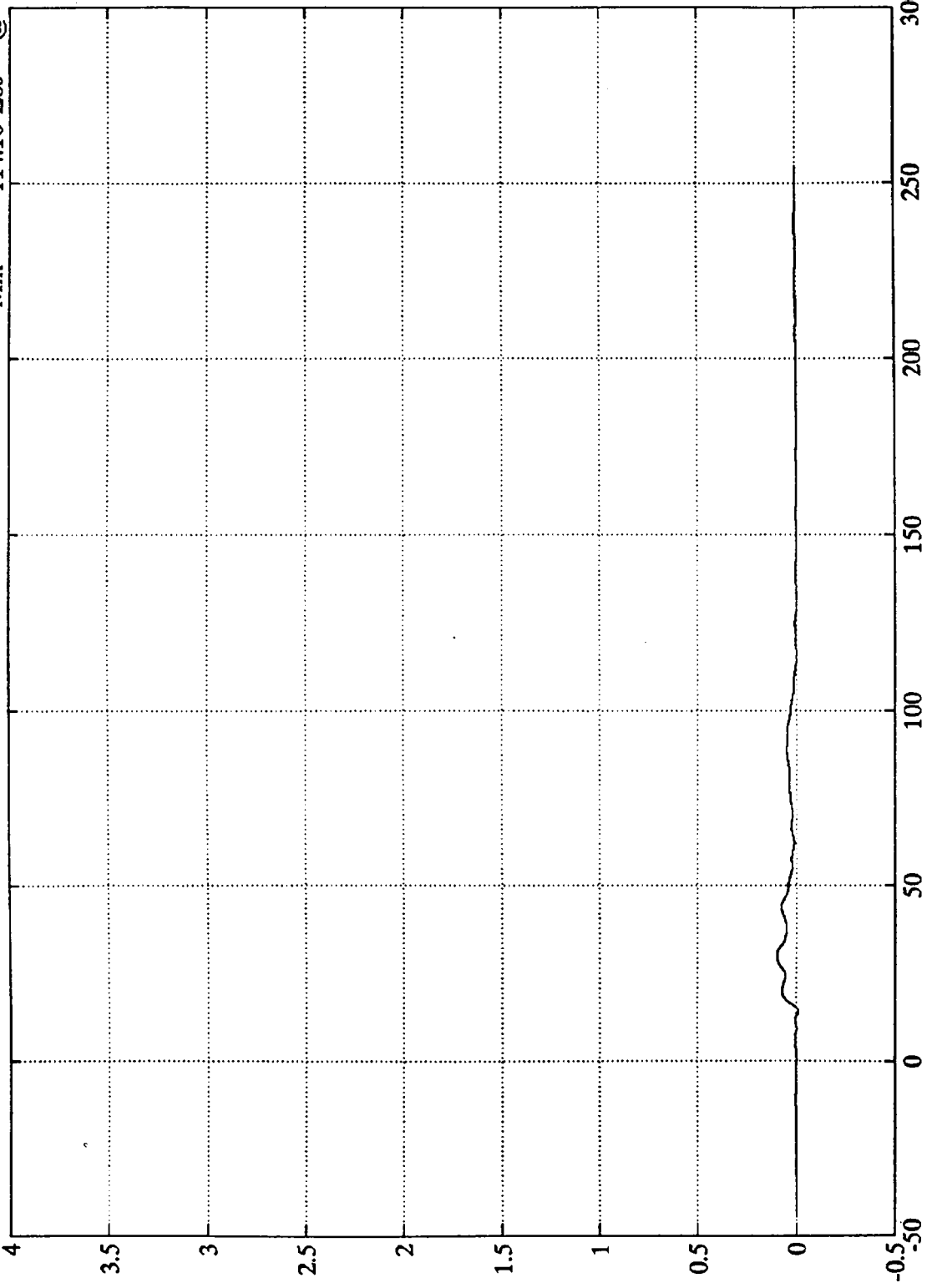
7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell C1

Max = 955.30 Lbs @ 30.12 msec  
Min = -114.16 Lbs @ 14.15 msec

x10<sup>4</sup>



B-49

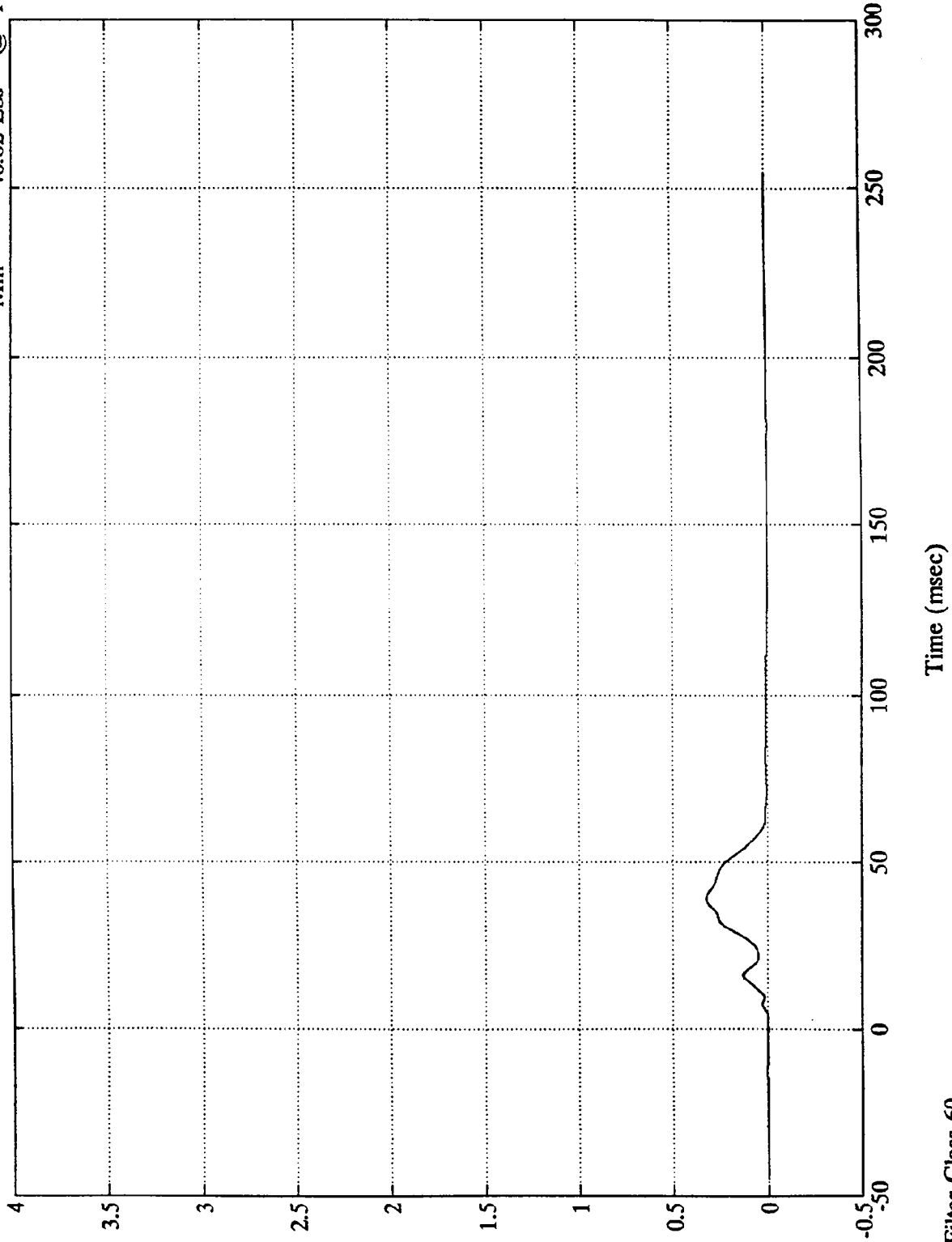
Sae Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell C2

Max = 3239.68 Lbs @ 39.11 msec  
Min = -46.62 Lbs @ 179.16 msec



B-50  
lbs

Sae Filter Class 60

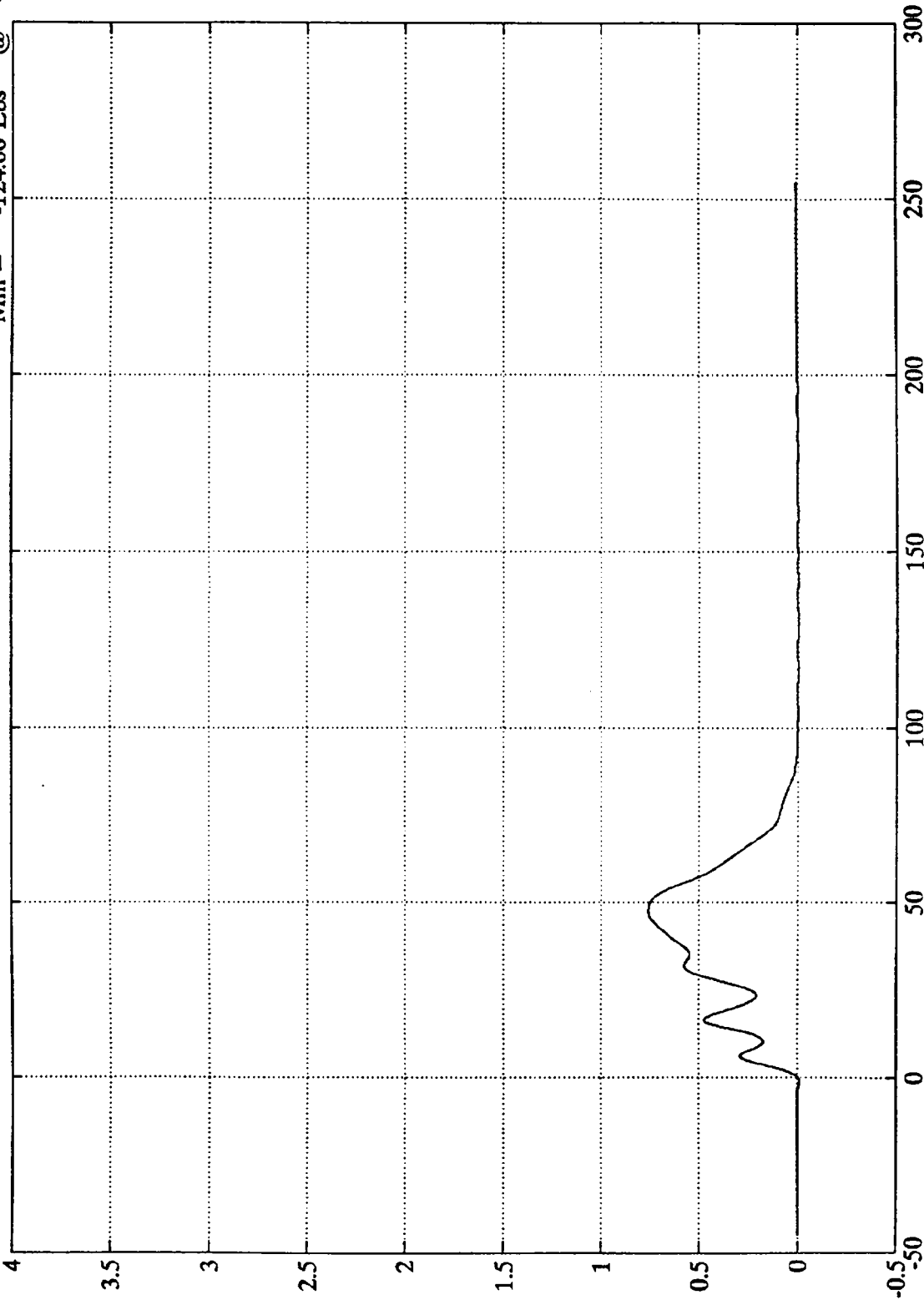
7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell C3

Max = 7571.35 Lbs @ 47.52 msec  
Min = -124.06 Lbs @ -1.32 msec



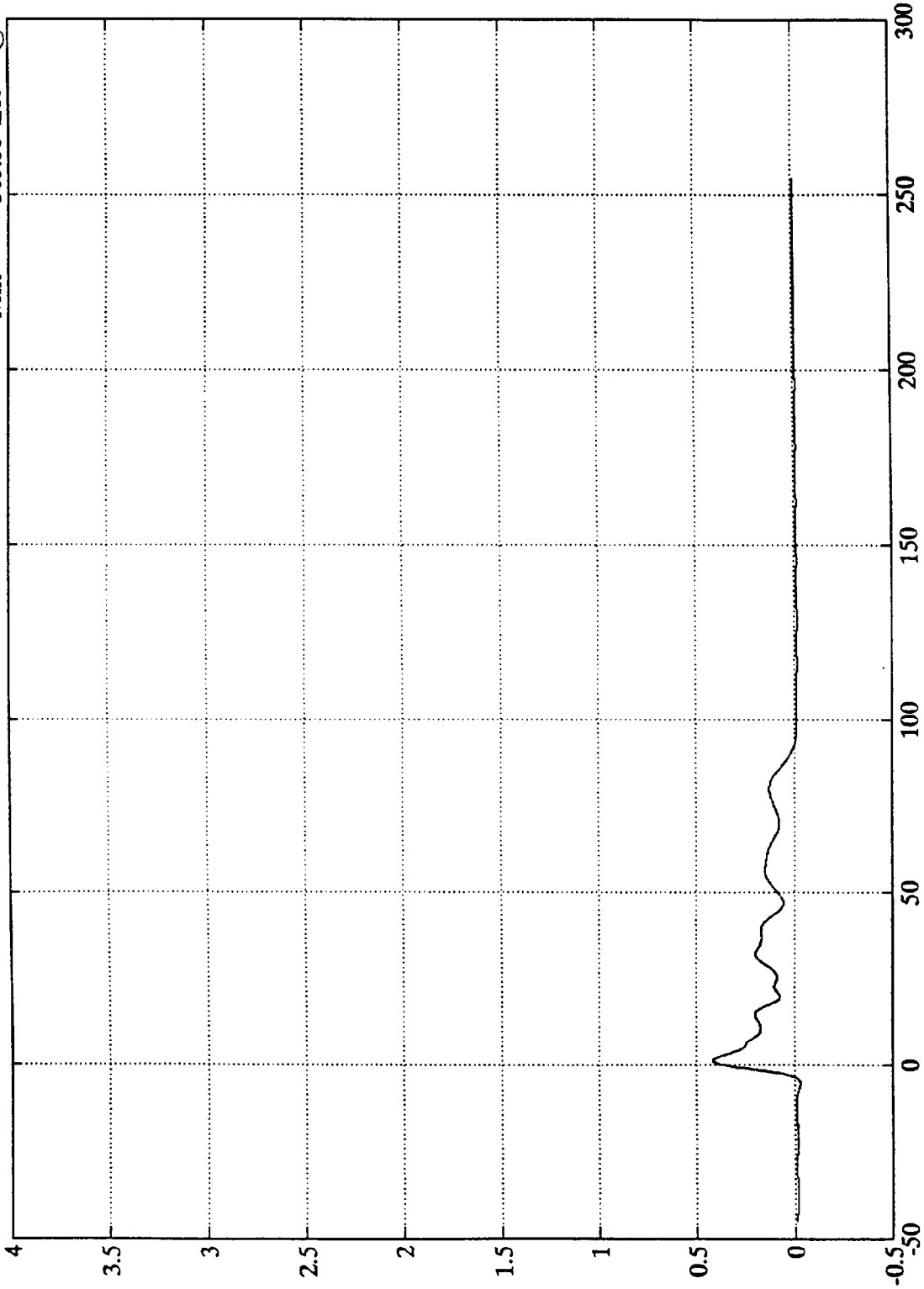
B-51

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell C4

Max = 4171.11 Lbs @ 0.95 msec  
Min = -305.35 Lbs @ -5.52 msec



B-52  
lbs

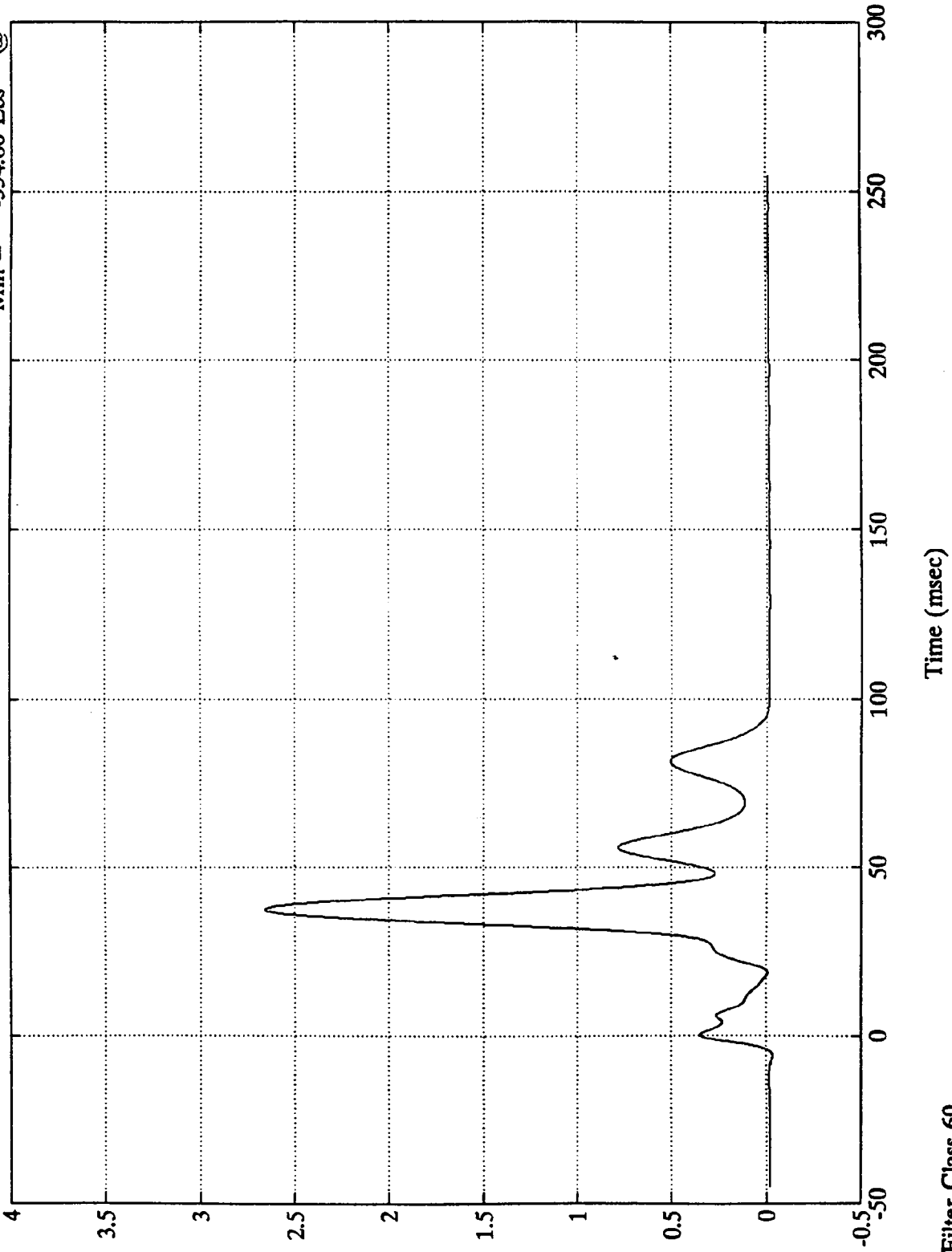
Time (msec)

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell C5

Max = 26576.01 Lbs @ 37.31 msec  
Min = -354.86 Lbs @ -6.00 msec



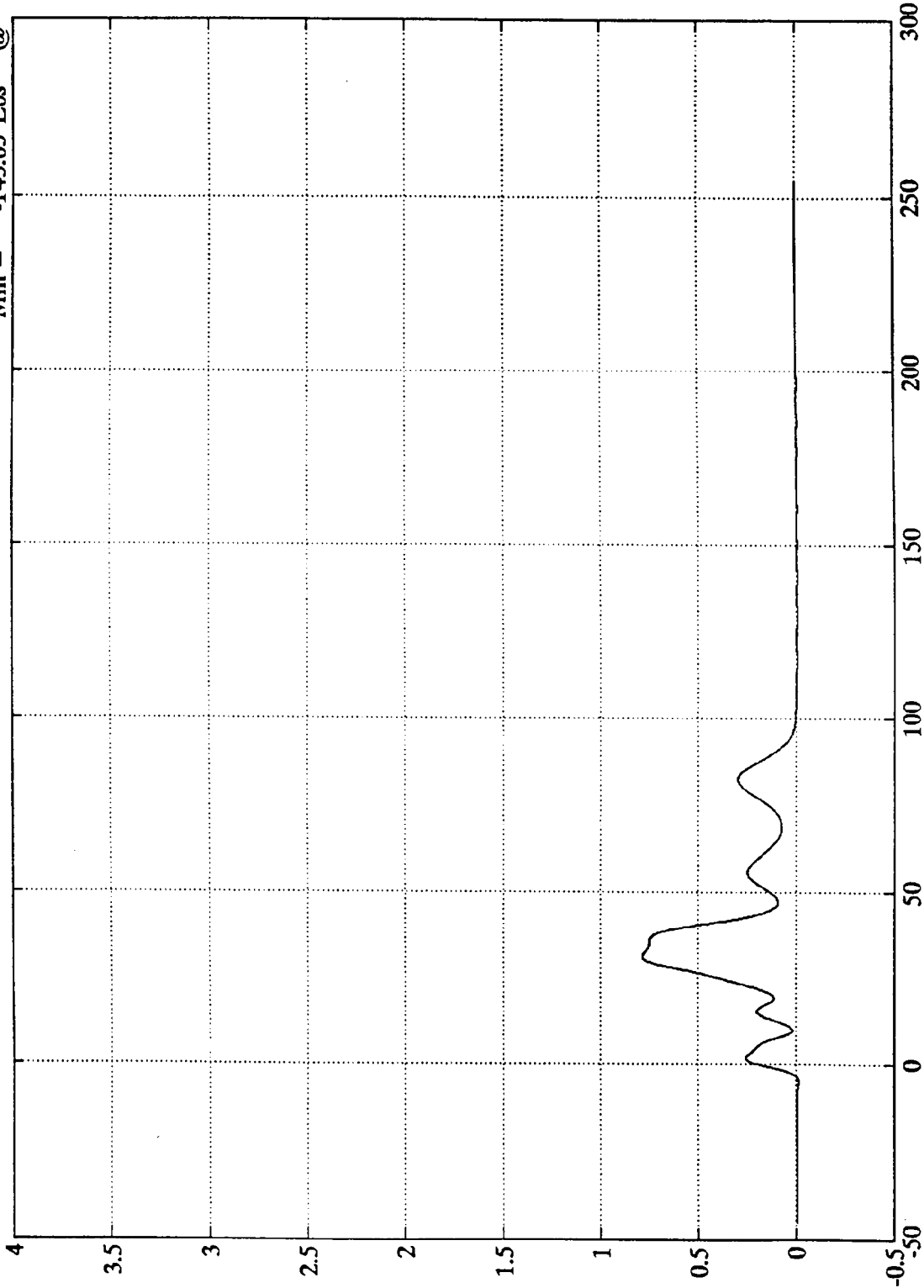
lbs  
B-53

NCAP 92 TEST 7 FORD F150 PICKUP

$\times 10^4$

Barrier Load Cell C6

Max = 7862.40 Lbs @ 31.19 msec  
Min = -145.05 Lbs @ -5.16 msec



Lbs  
45-54

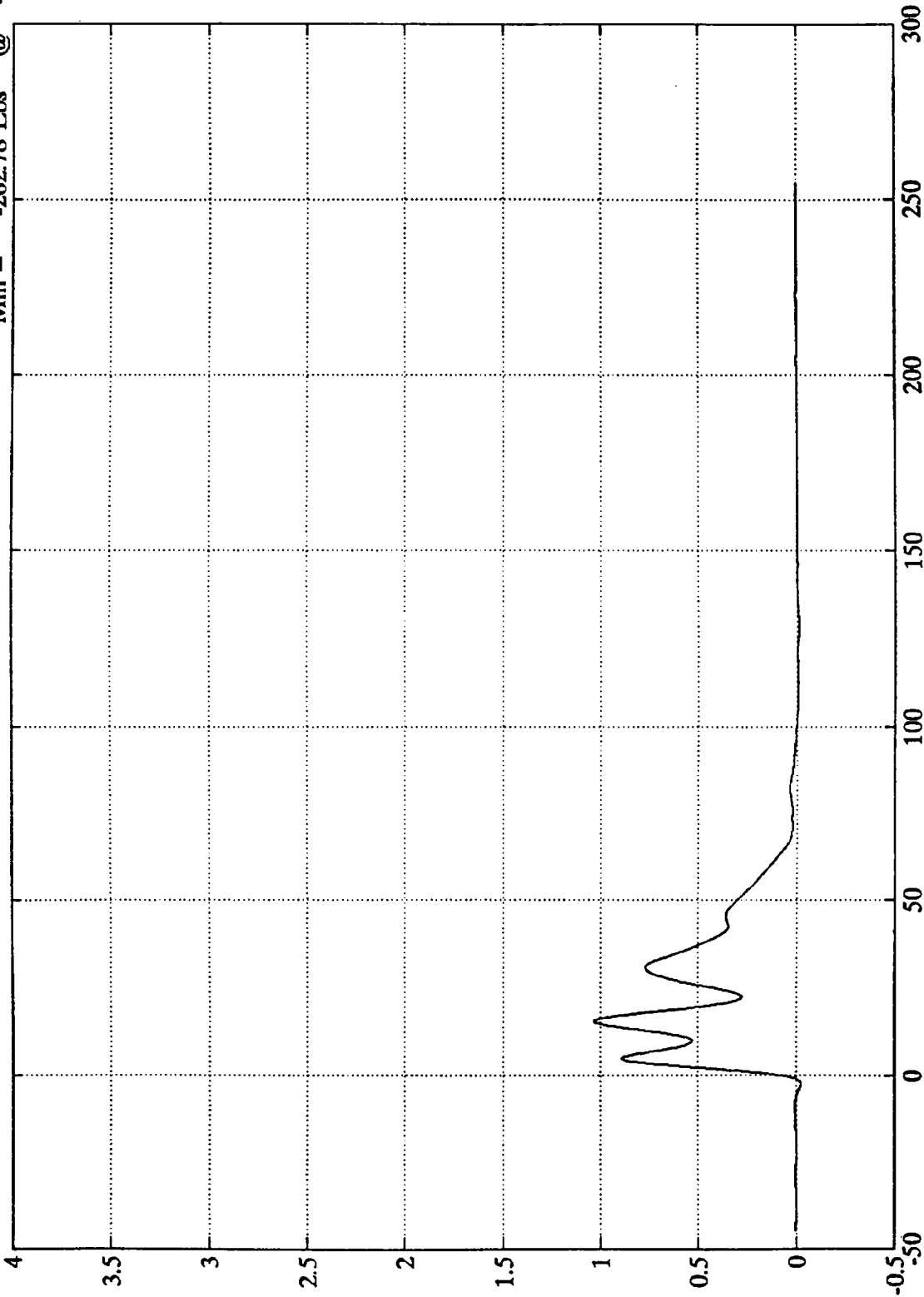
Time (msec)

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell C7

Max = 10330.06 Lbs @ 15.47 msec  
Min = -262.78 Lbs @ -2.64 msec

x10<sup>4</sup>



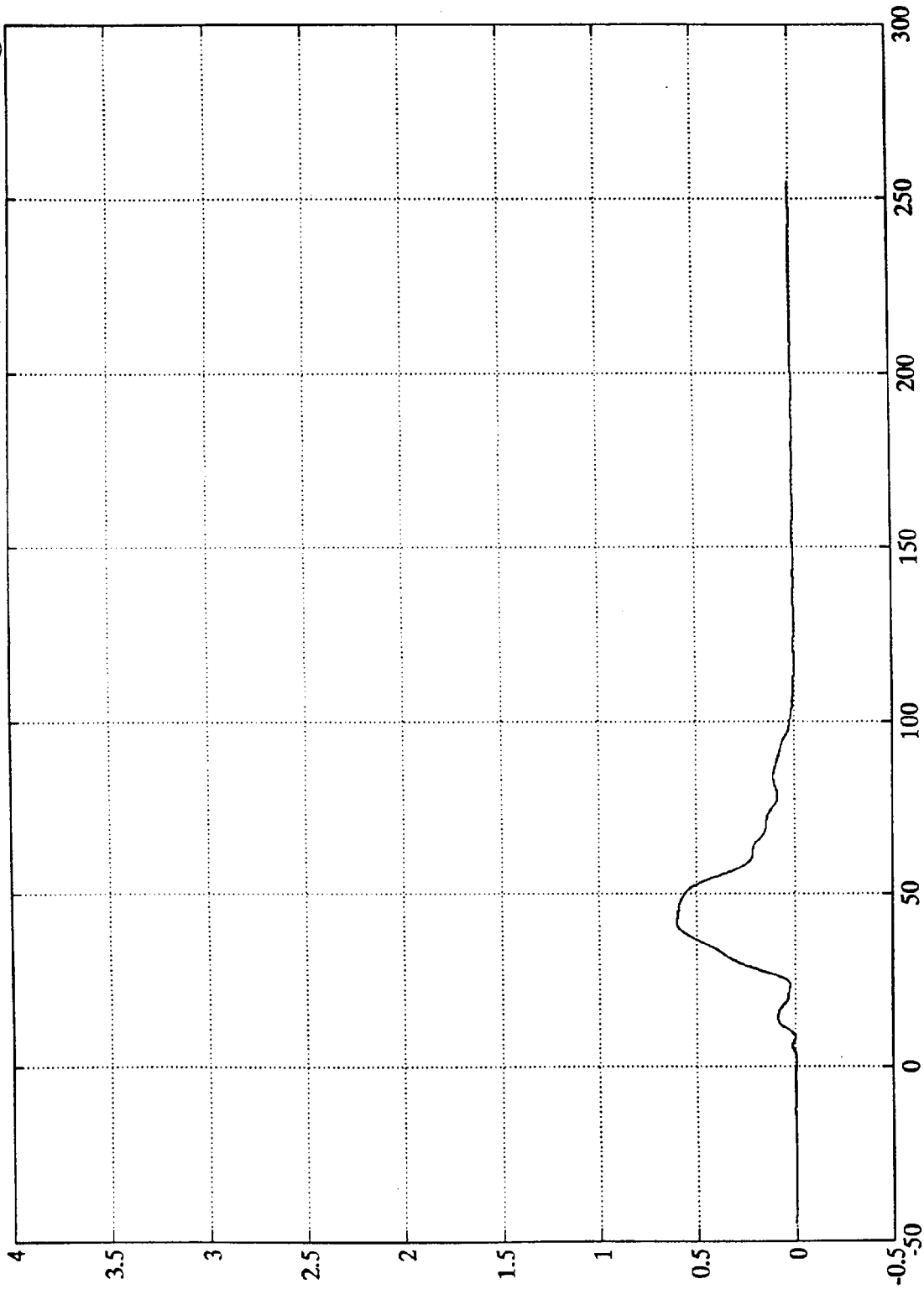
B-55

7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell C8  
Max = 6039.18 Lbs @ 41.76 msec  
Min = -50.49 Lbs @ 0.83 msec



B-56  
Lbs

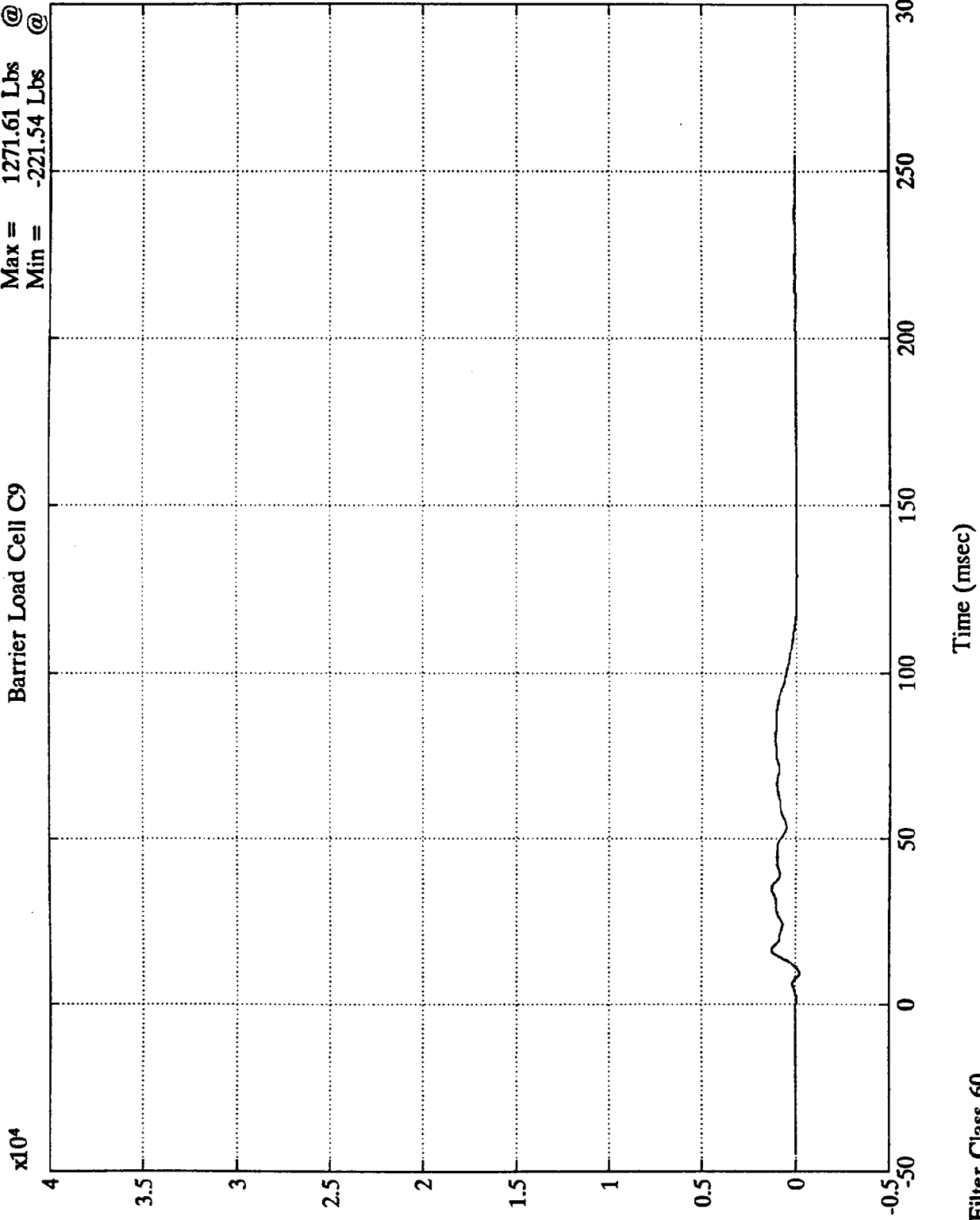
Time (msec)

Sae Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell C9  
Max = 1271.61 Lbs @ 34.91 msec  
Min = -221.54 Lbs @ 9.11 msec

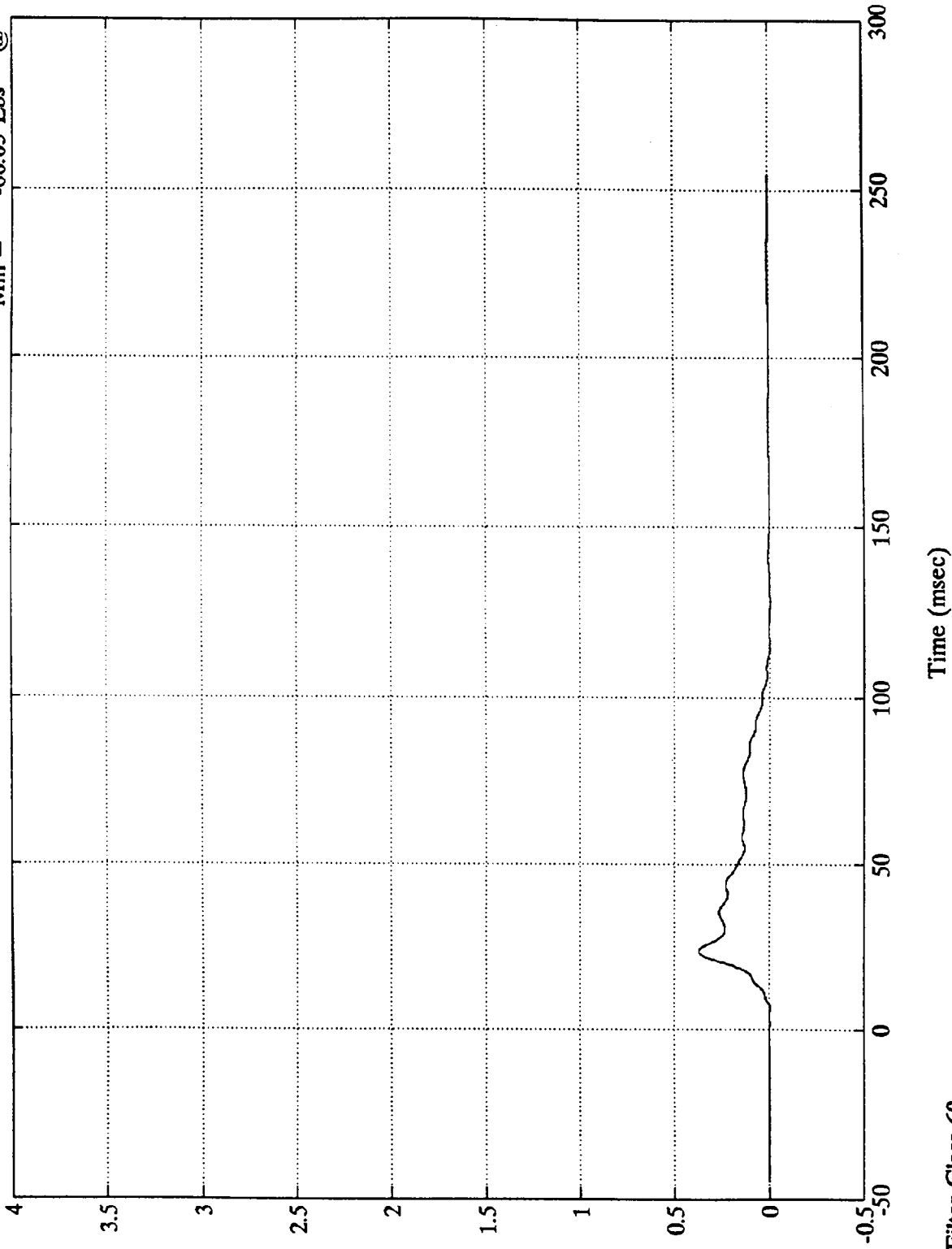


B-57  
Lbs

7951-1  
Sac Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell D1  
Max = 3730.09 Lbs @ 23.52 msec  
Min = -60.05 Lbs @ 6.47 msec



B-58  
Lbs

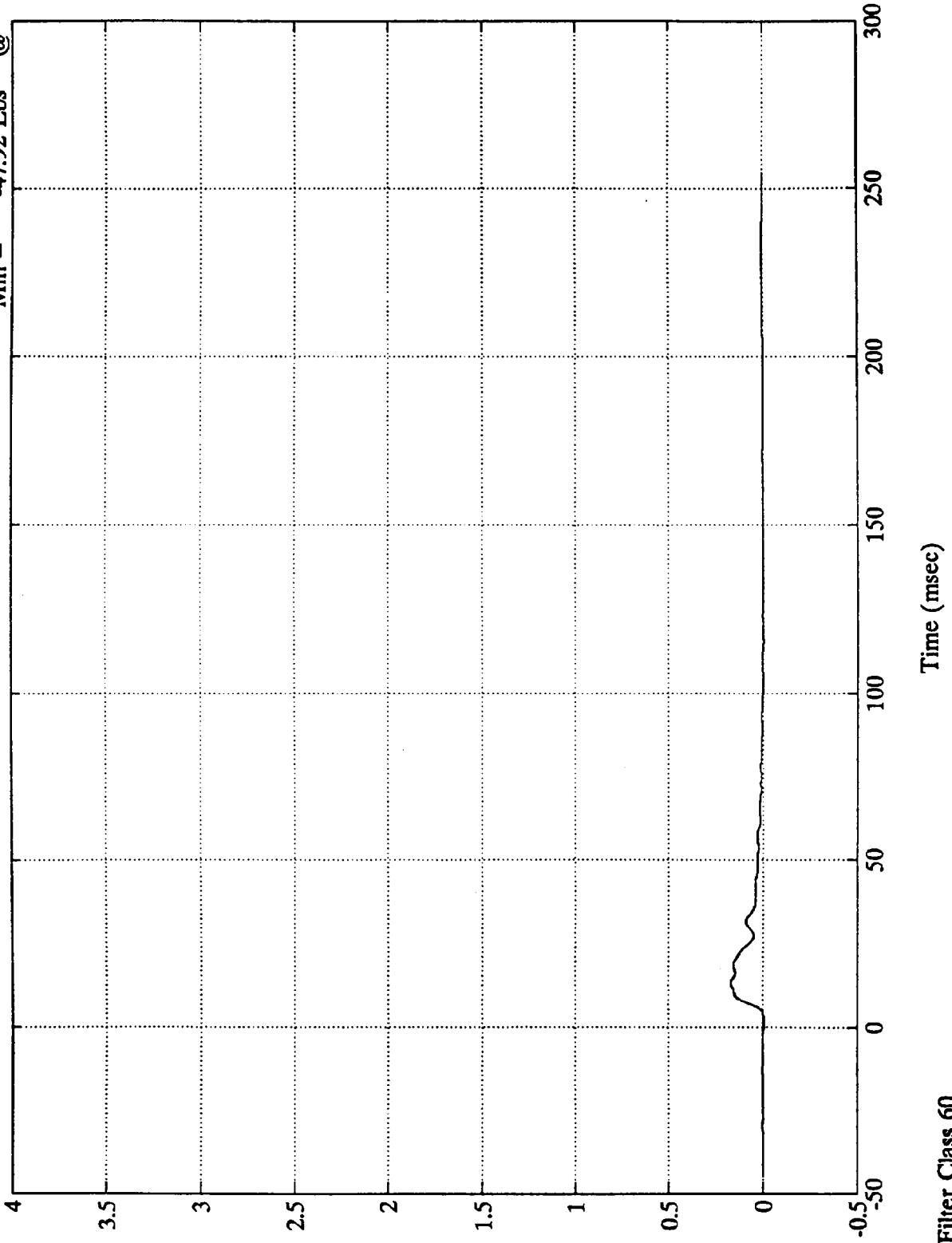
7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell D2

Max = 1710.81 Lbs @ 12.95 msec  
Min = -47.92 Lbs @ 0.47 msec



B-59  
Lbs

7951-1

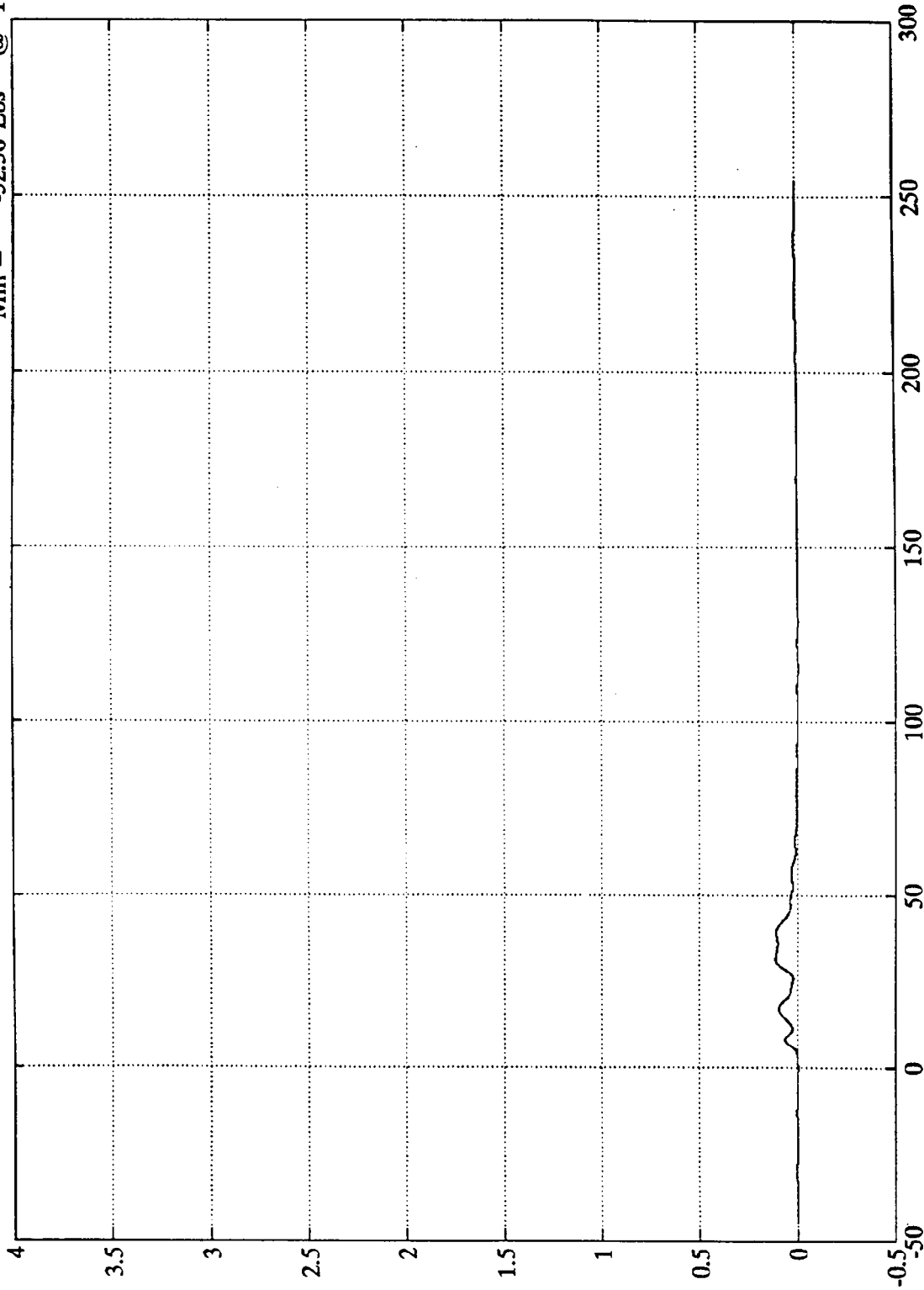
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell D3

Max = 1121.64 Lbs @ 31.19 msec  
Min = -52.36 Lbs @ 114.95 msec

x10<sup>4</sup>



B-60  
lbs

Time (msec)

Sae Filter Class 60

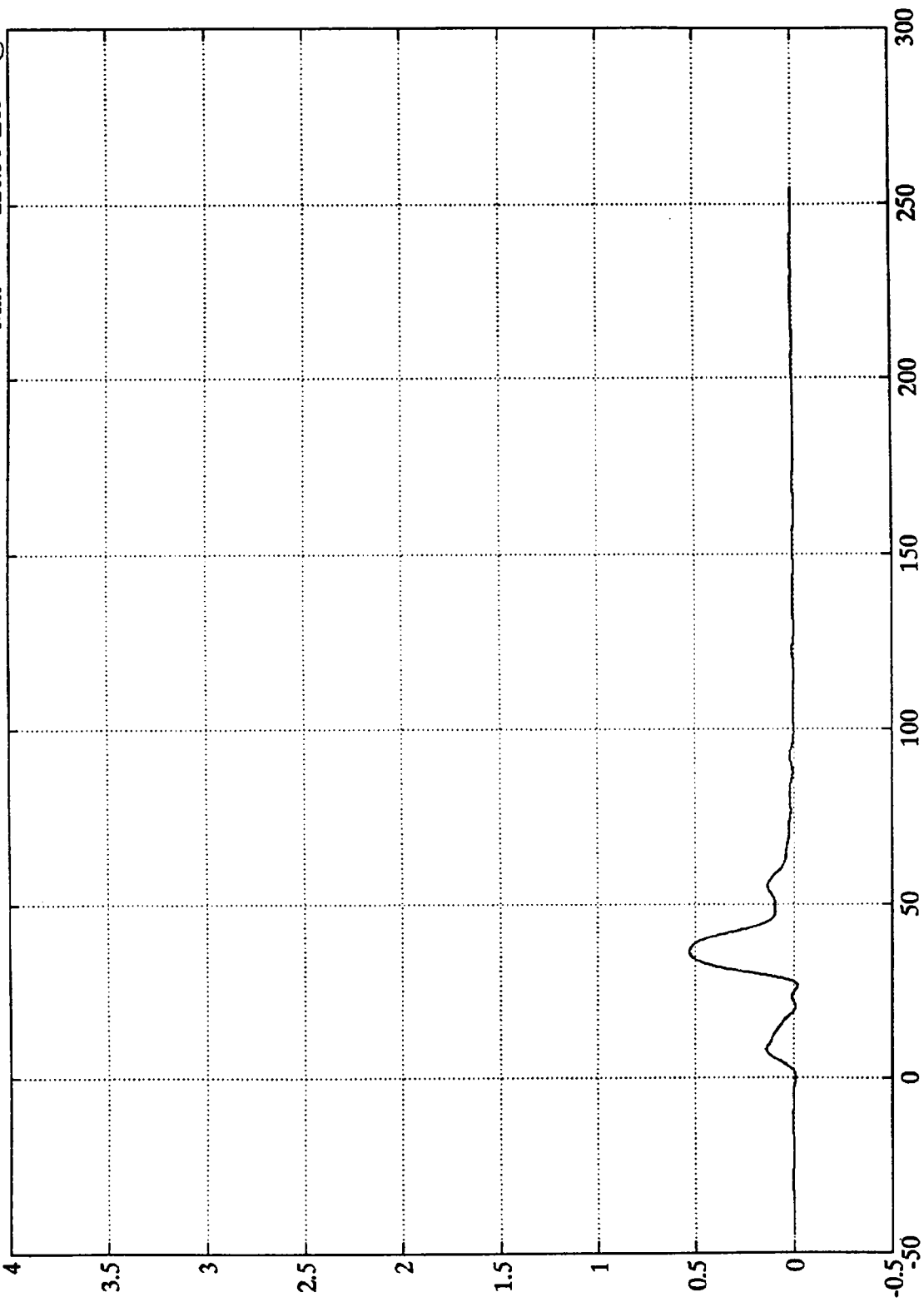
7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell D4

Max = 5316.70 Lbs @ 36.36 msec  
Min = -226.56 Lbs @ 26.27 msec

x10<sup>4</sup>



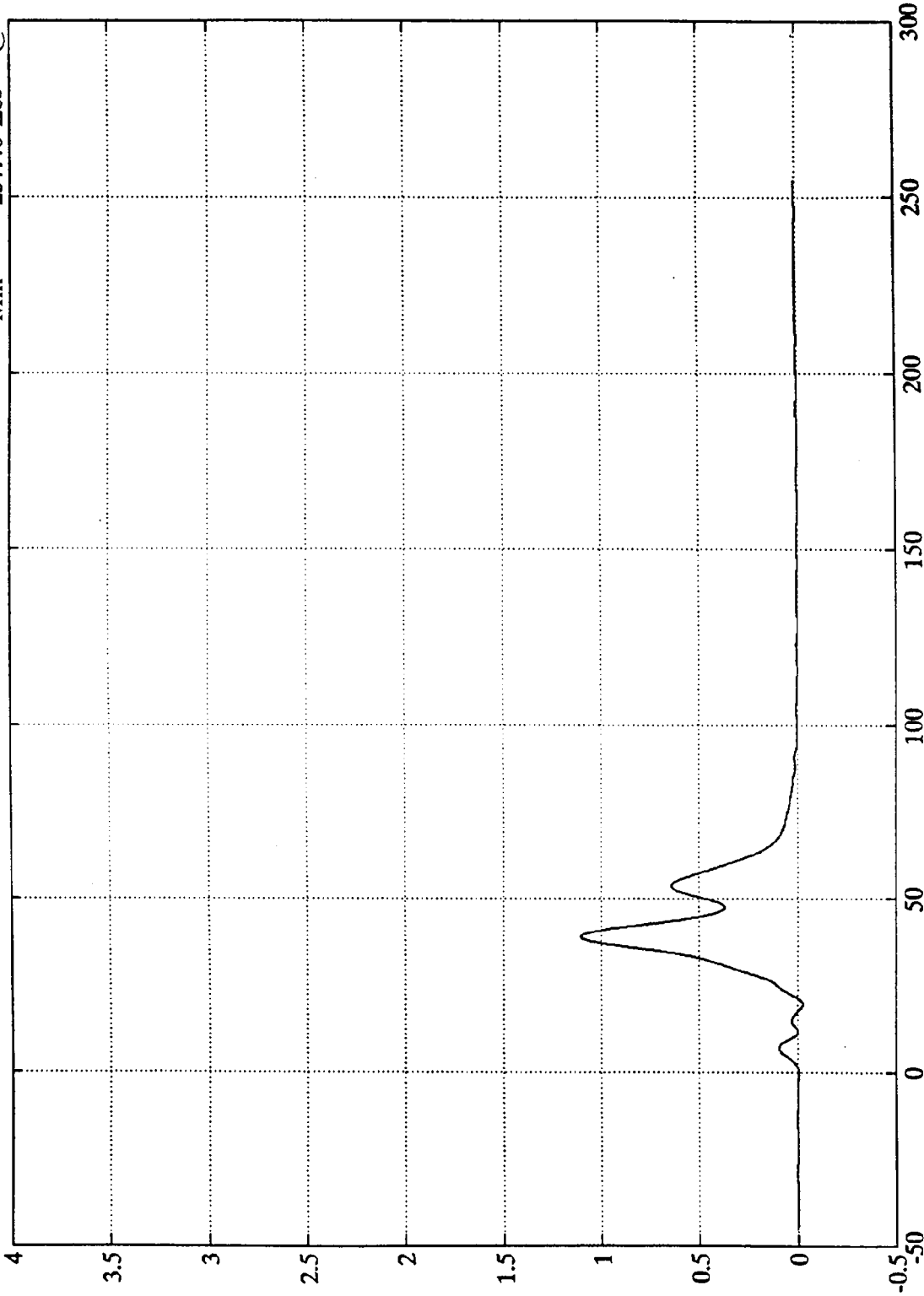
B-61  
Lbs

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Barrier Load Cell D5

Max = 11064.15 Lbs @ 39.00 msec  
Min = -257.46 Lbs @ 19.67 msec



sq7  
B-62

7951-1

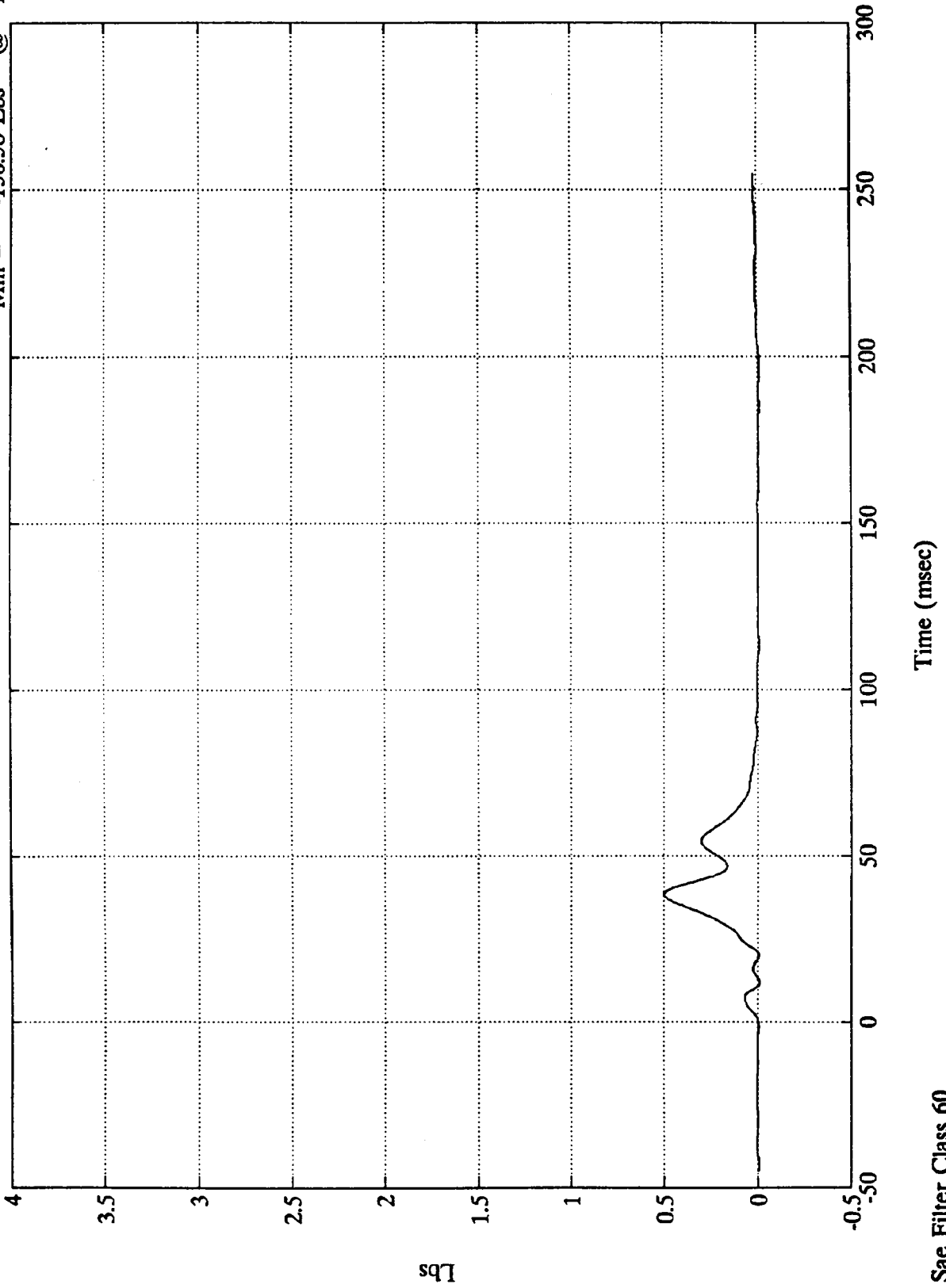
Sae Filter Class 60

Time (msec)

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell D6

Max = 5015.05 Lbs @ 38.27 msec  
Min = -136.58 Lbs @ 11.75 msec

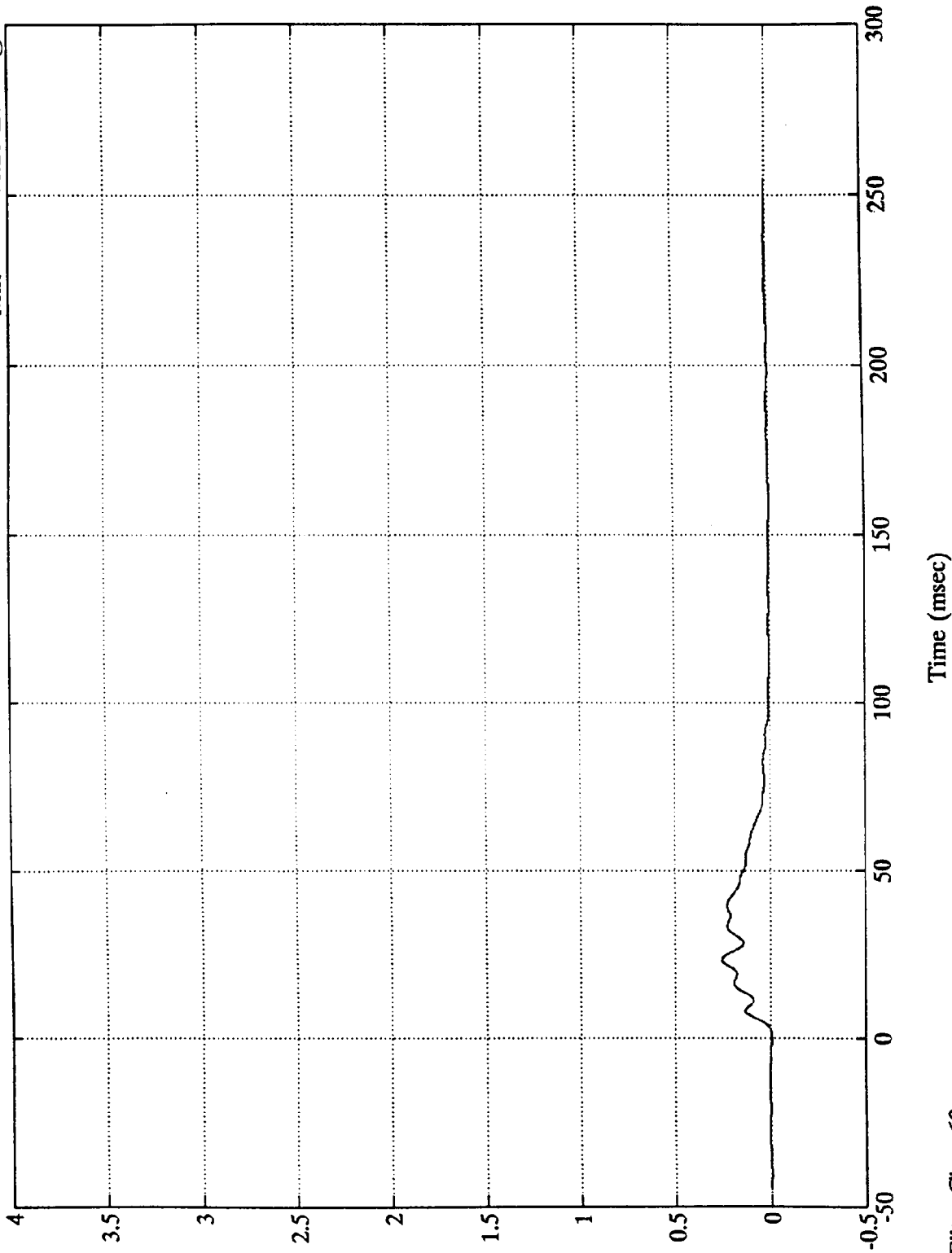


B-63  
Lbs

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell D7

Max = 2575.10 Lbs @ 23.39 msec  
Min = -70.28 Lbs @ 0.11 msec



B-64

7951-1

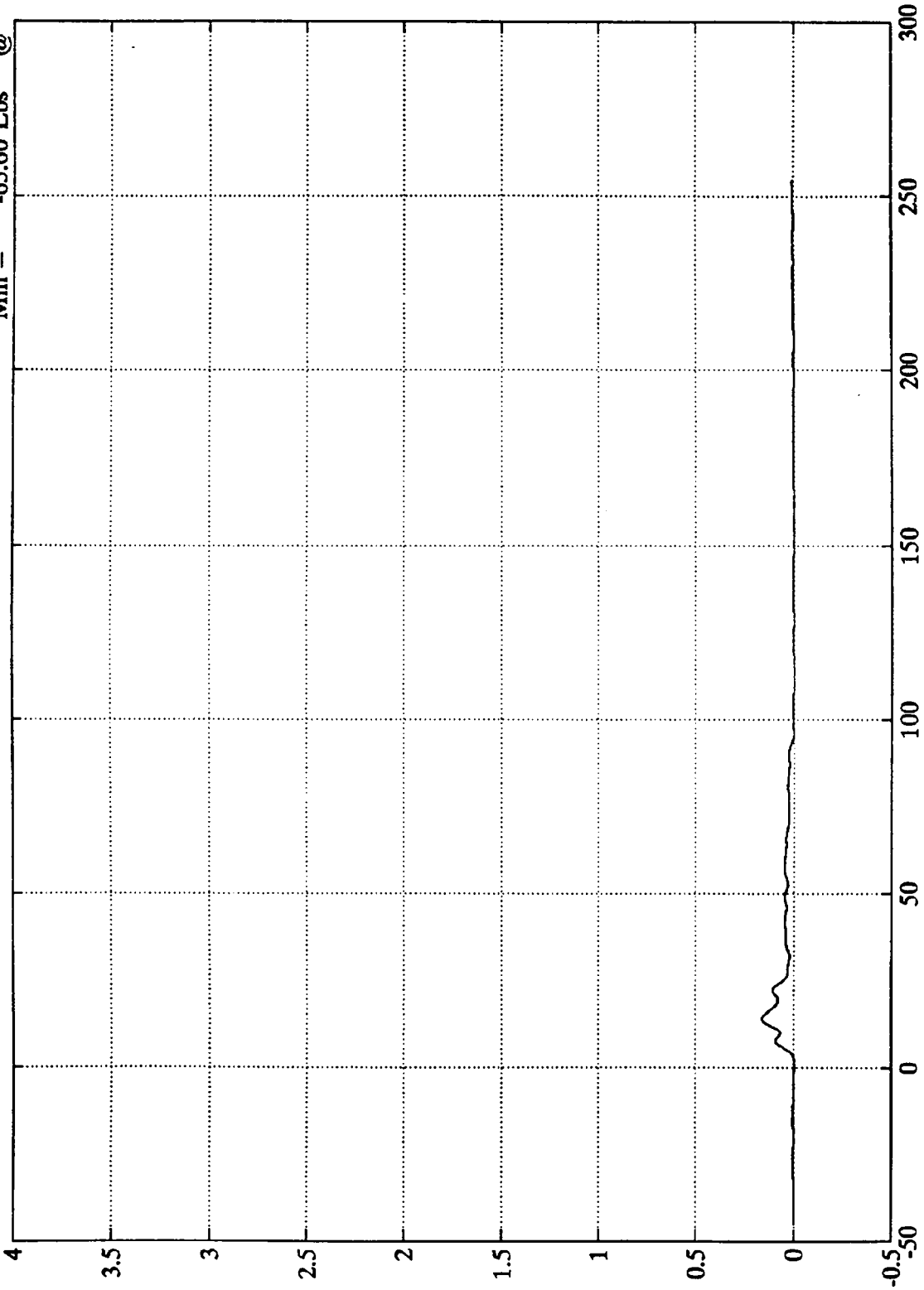
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Barrier Load Cell D8

Max = 1591.20 Lbs @ 13.91 msec  
Min = -65.60 Lbs @ 1.19 msec

x10<sup>4</sup>



lbs  
B-65

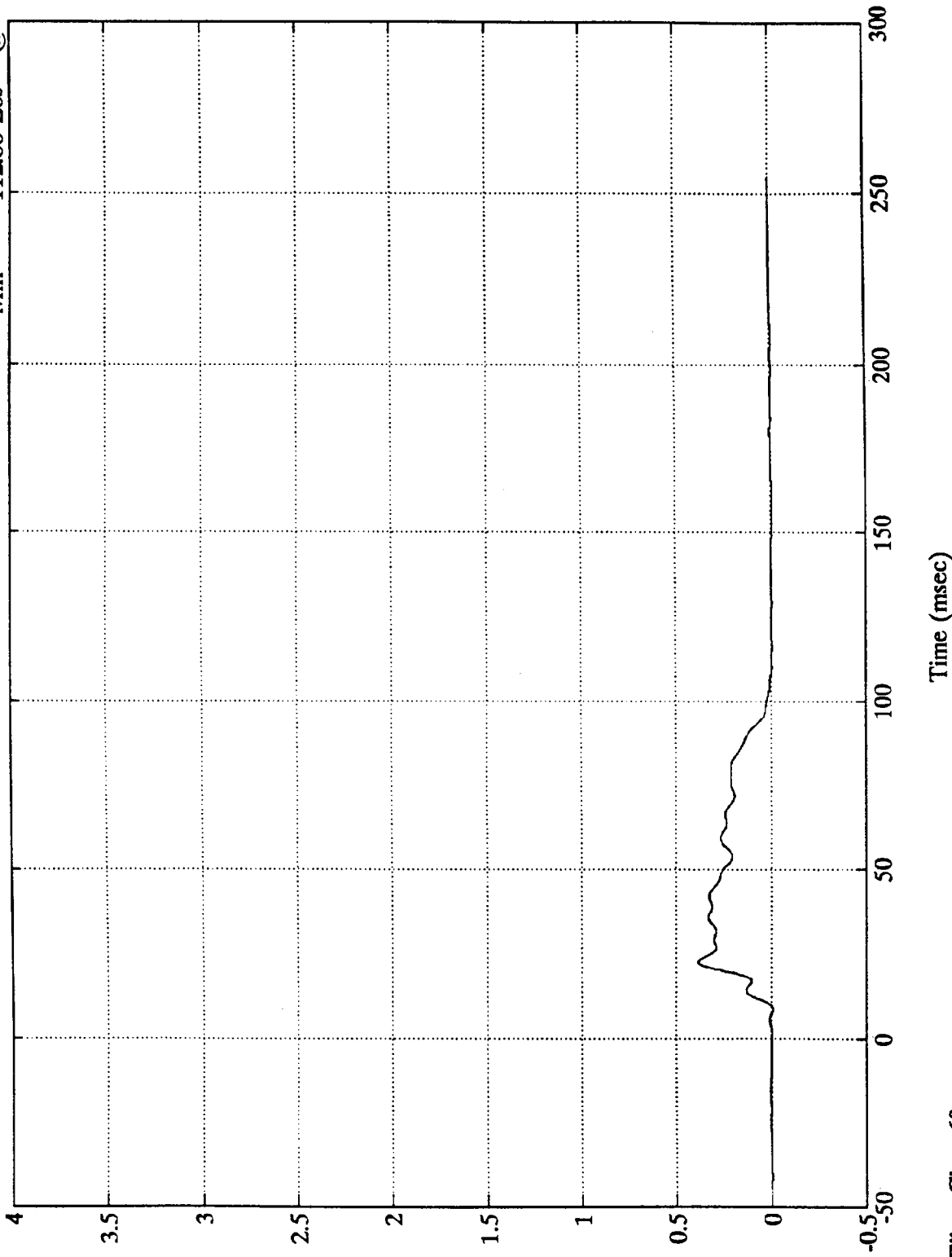
Time (msec)

Sac Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Barrier Load Cell D9  
Max = 3847.78 Lbs @ 22.43 msec  
Min = -112.88 Lbs @ 8.75 msec



99-B  
B-66

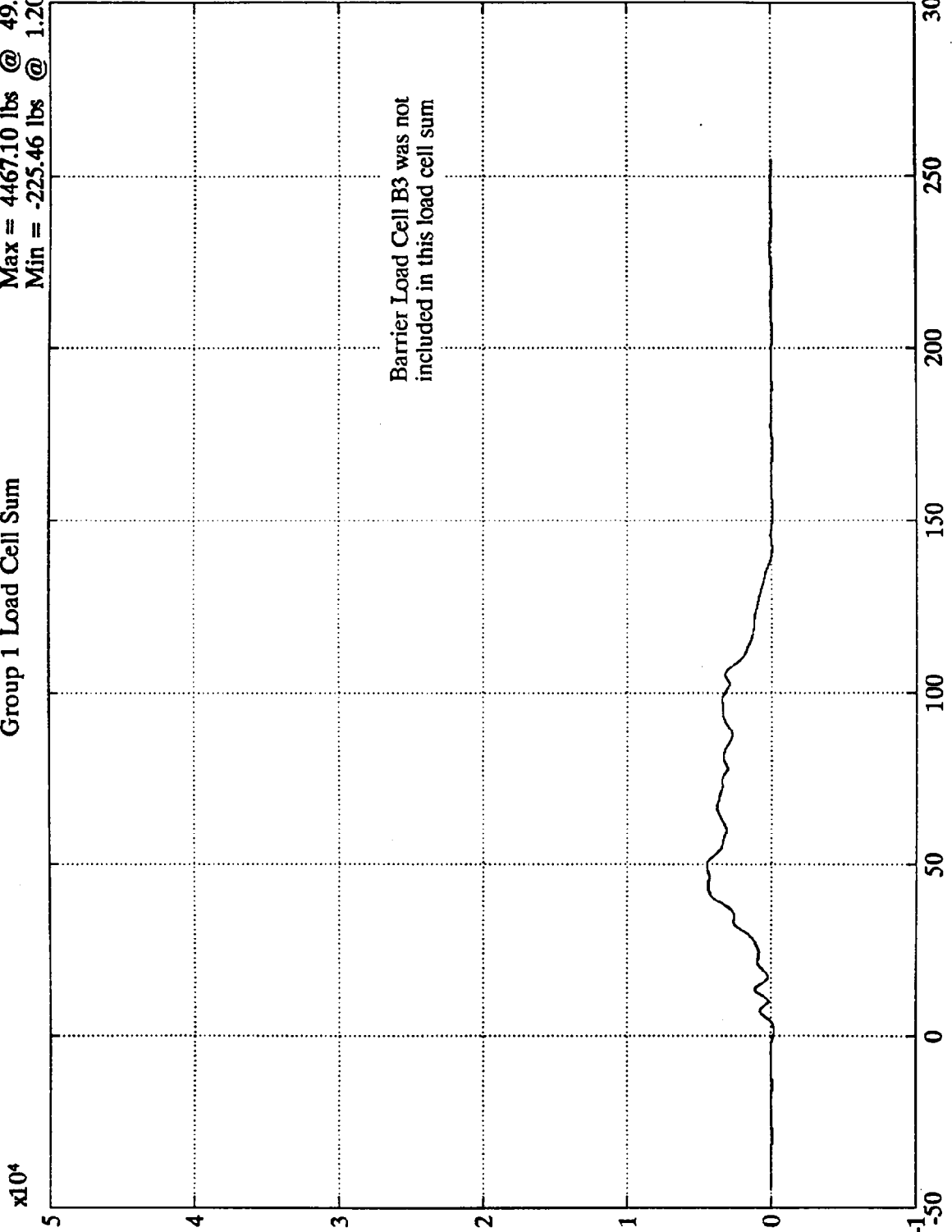
7951-1

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Group 1 Load Cell Sum

Max = 4467.10 lbs @ 49.56 msec  
Min = -225.46 lbs @ 1.20 msec



Load Cells (A1,A2,A3,B1,B2,B3)

Time (msec)

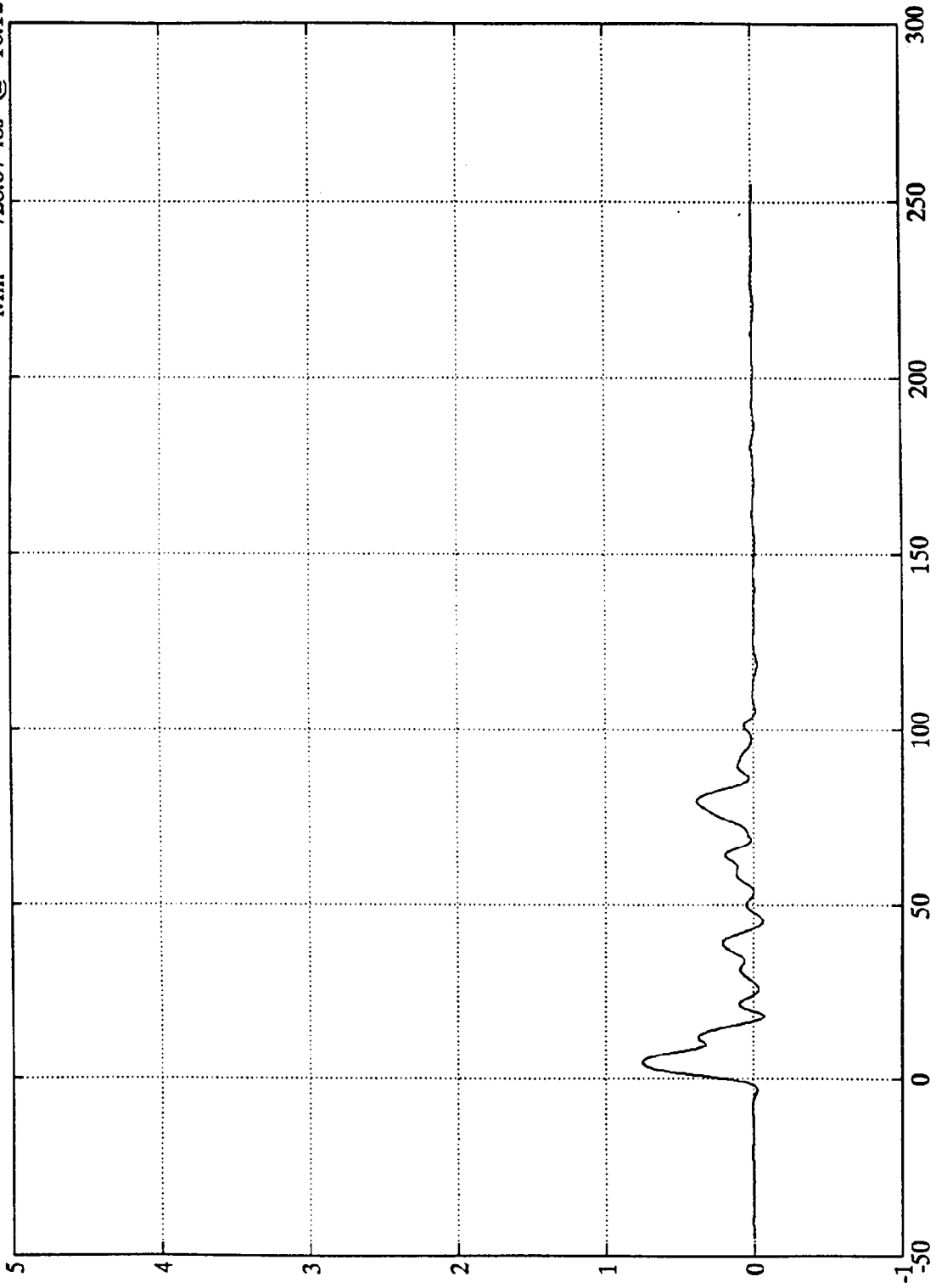
SAE Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Max = 7511.50 lbs @ 4.44 msec  
Min = -728.67 lbs @ 18.12 msec

Group 2 Load Cell Sum

x10<sup>4</sup>



B-68

7951-1

SAE Filter Class 60

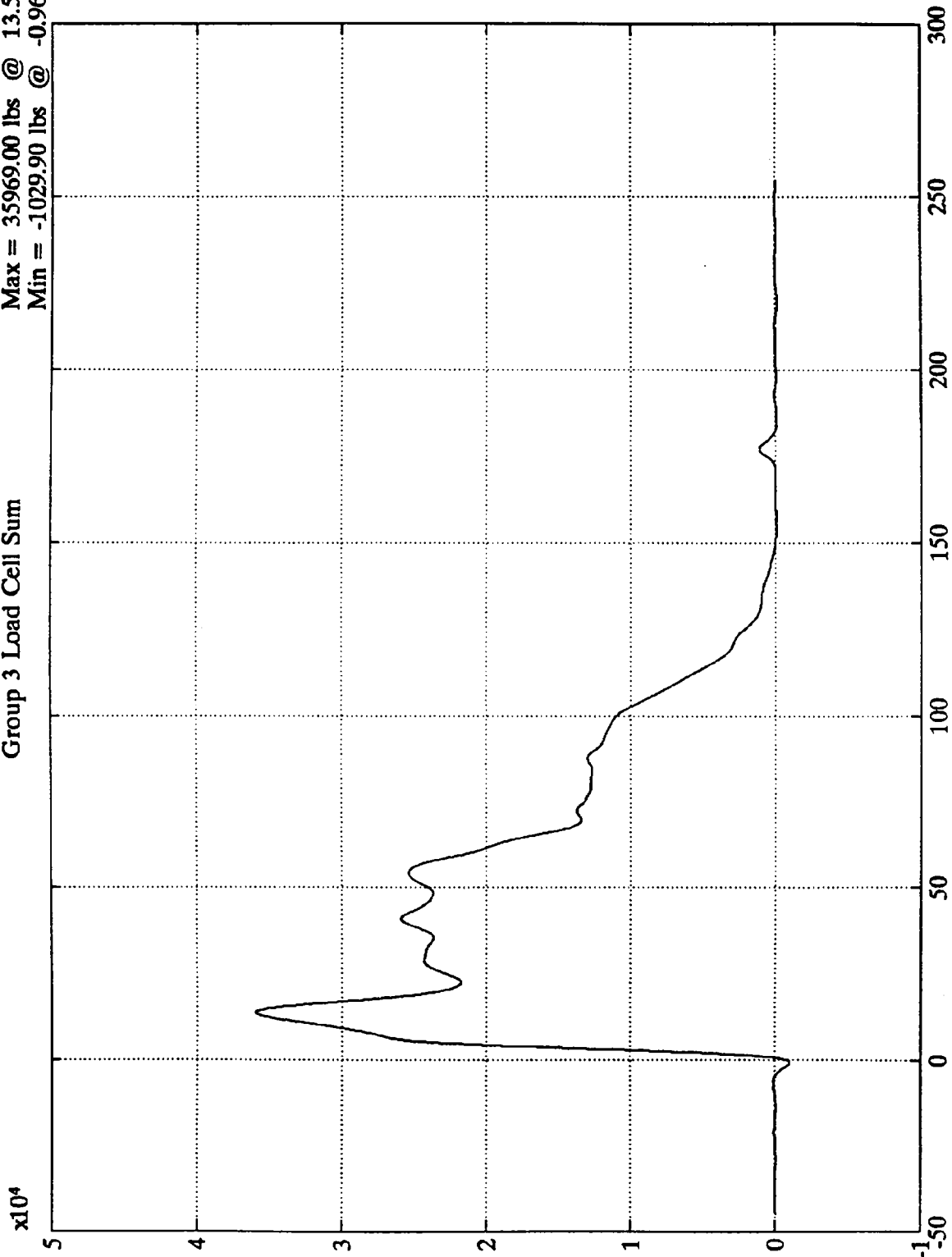
Time (msec)

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

NCAP 92 TEST 7 FORD F150 PICKUP

Group 3 Load Cell Sum

Max = 35969.00 lbs @ 13.56 msec  
Min = -1029.90 lbs @ -0.96 msec



Load Cells (A7,A8,A9,B7,B8,B9)

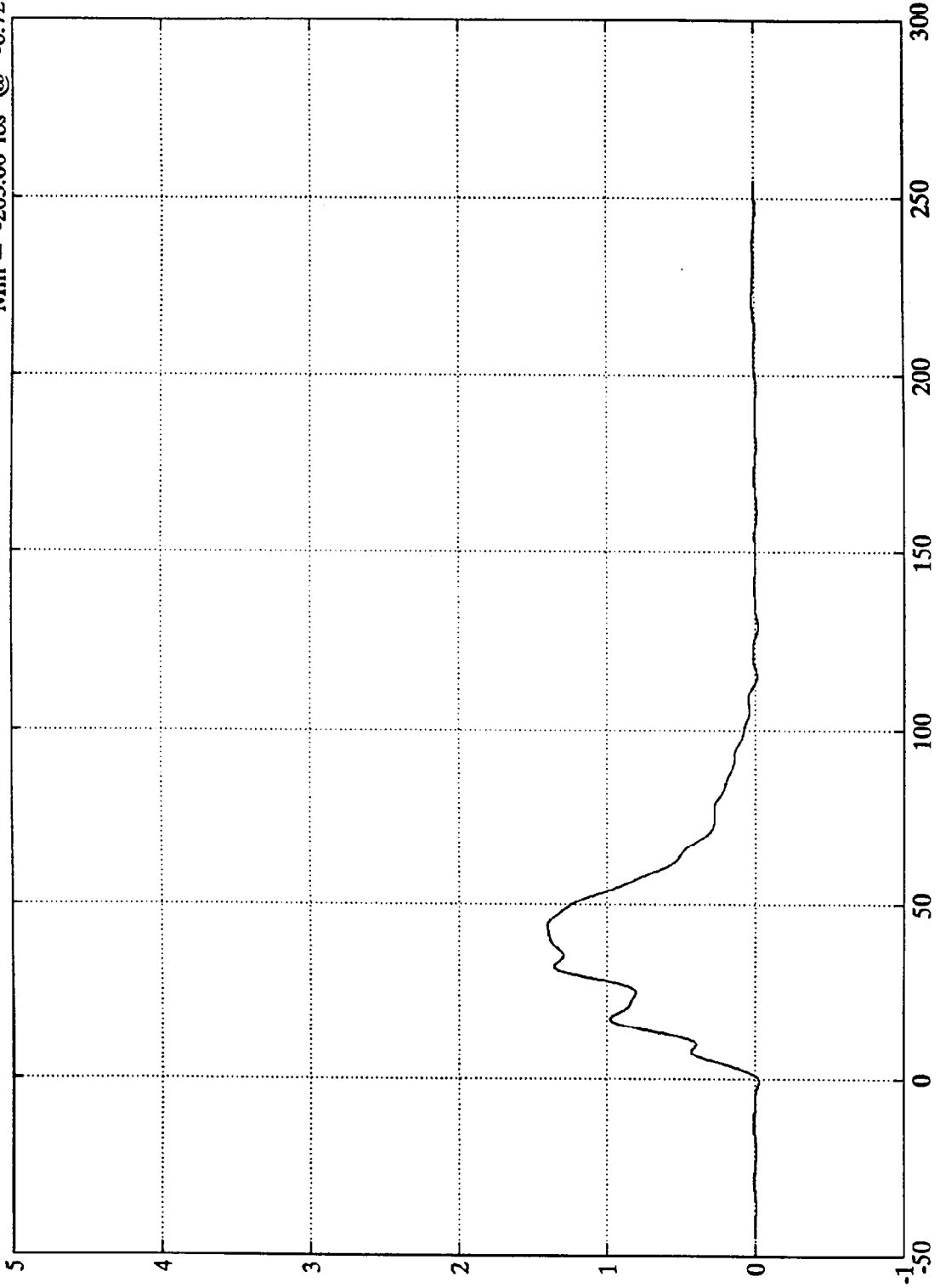
Time (msec)

SAE Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Group 4 Load Cell Sum

Max = 14060.00 lbs @ 43.80 msec  
Min = -263.60 lbs @ -0.72 msec



Load Cells (C1,C2,C3,D1,D2,D3)

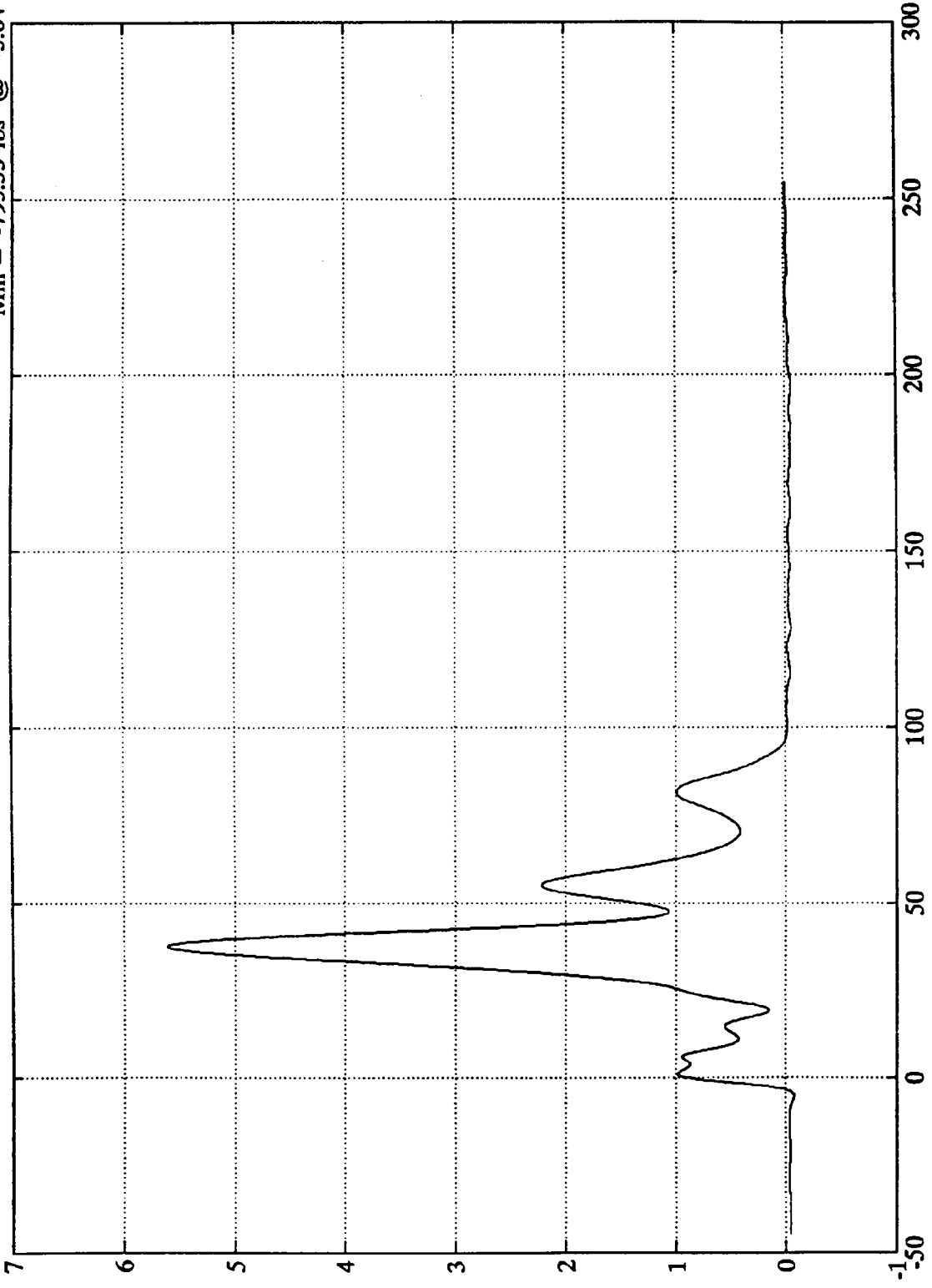
Time (msec)

SAE Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Group 5 Load Cell Sum

Max = 56094.00 lbs @ 37.68 msec  
Min = -795.53 lbs @ -5.64 msec



B-71  
sqi

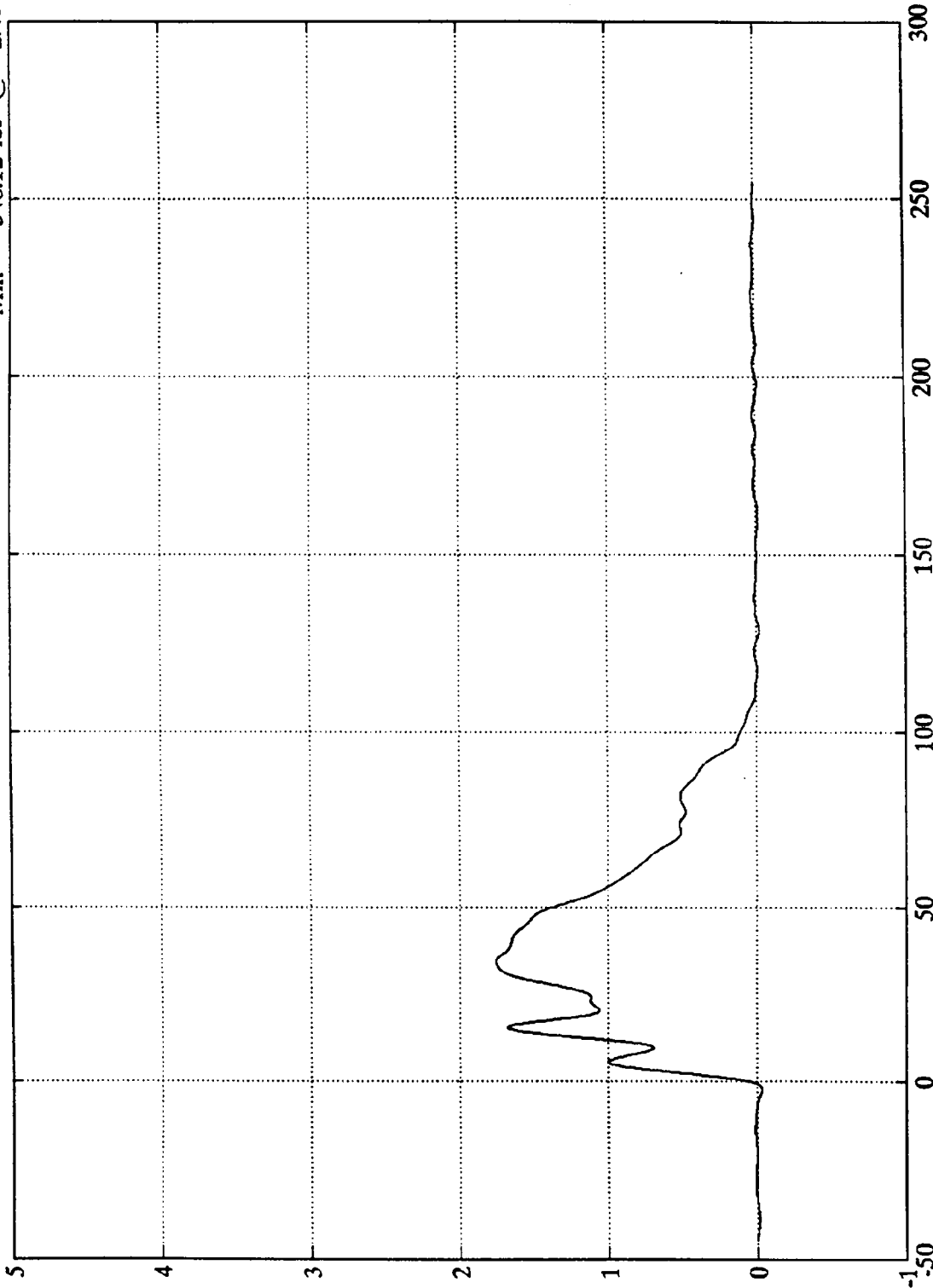
Load Cells (C4,C5,C6,D4,D5,D6)

SAE Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP  
x10<sup>4</sup>

Group 6 Load Cell Sum

Max = 17580.00 lbs @ 34.20 msec  
Min = -348.12 lbs @ -2.40 msec



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

Time (msec)

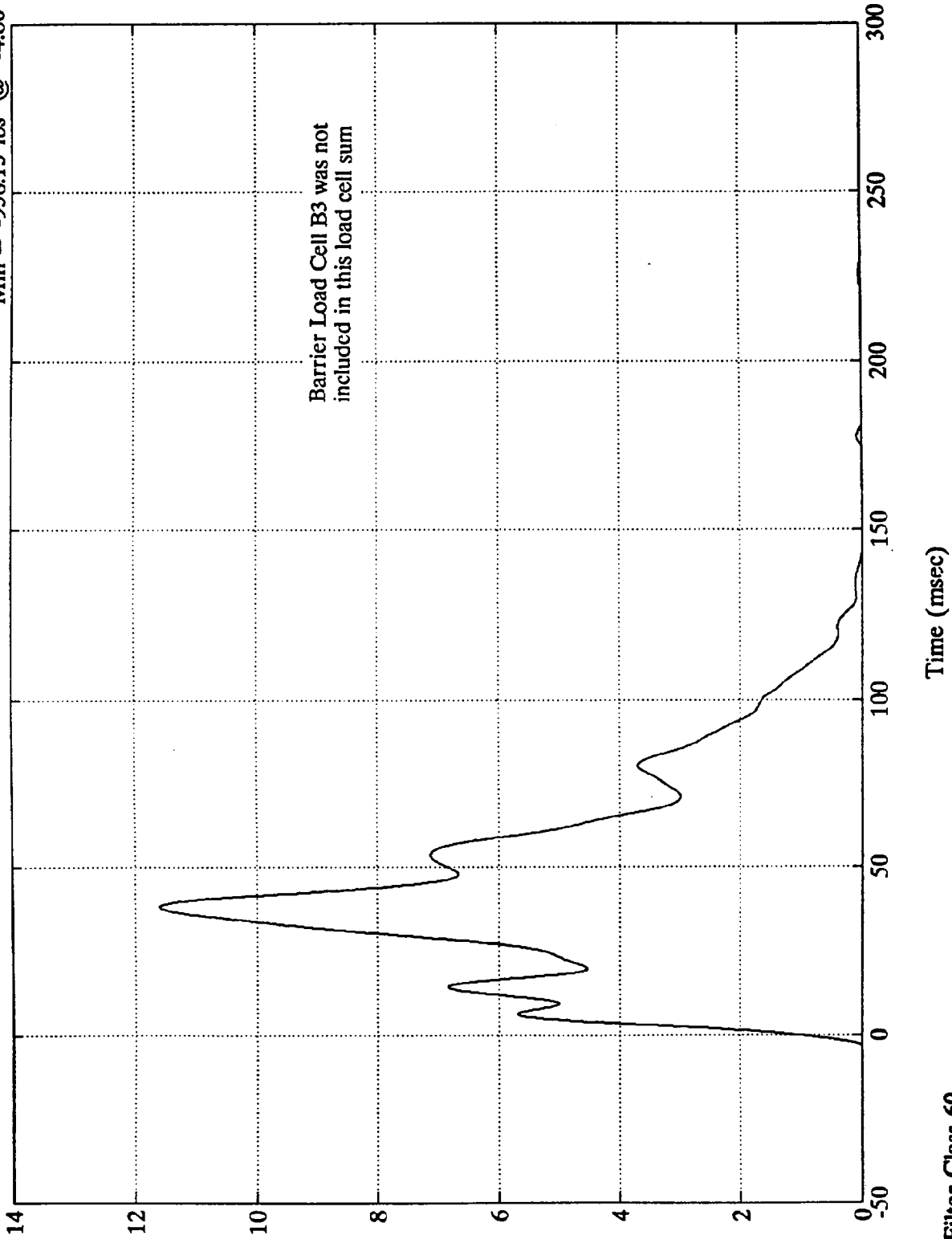
SAE Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

x10<sup>4</sup>

Max = 115910.00 lbs @ 38.28 msec  
Min = -958.13 lbs @ -4.80 msec

Total Load Cell Sum



lbs  
B-73

SAE Filter Class 60

7951-1

TEST NO. MN0204

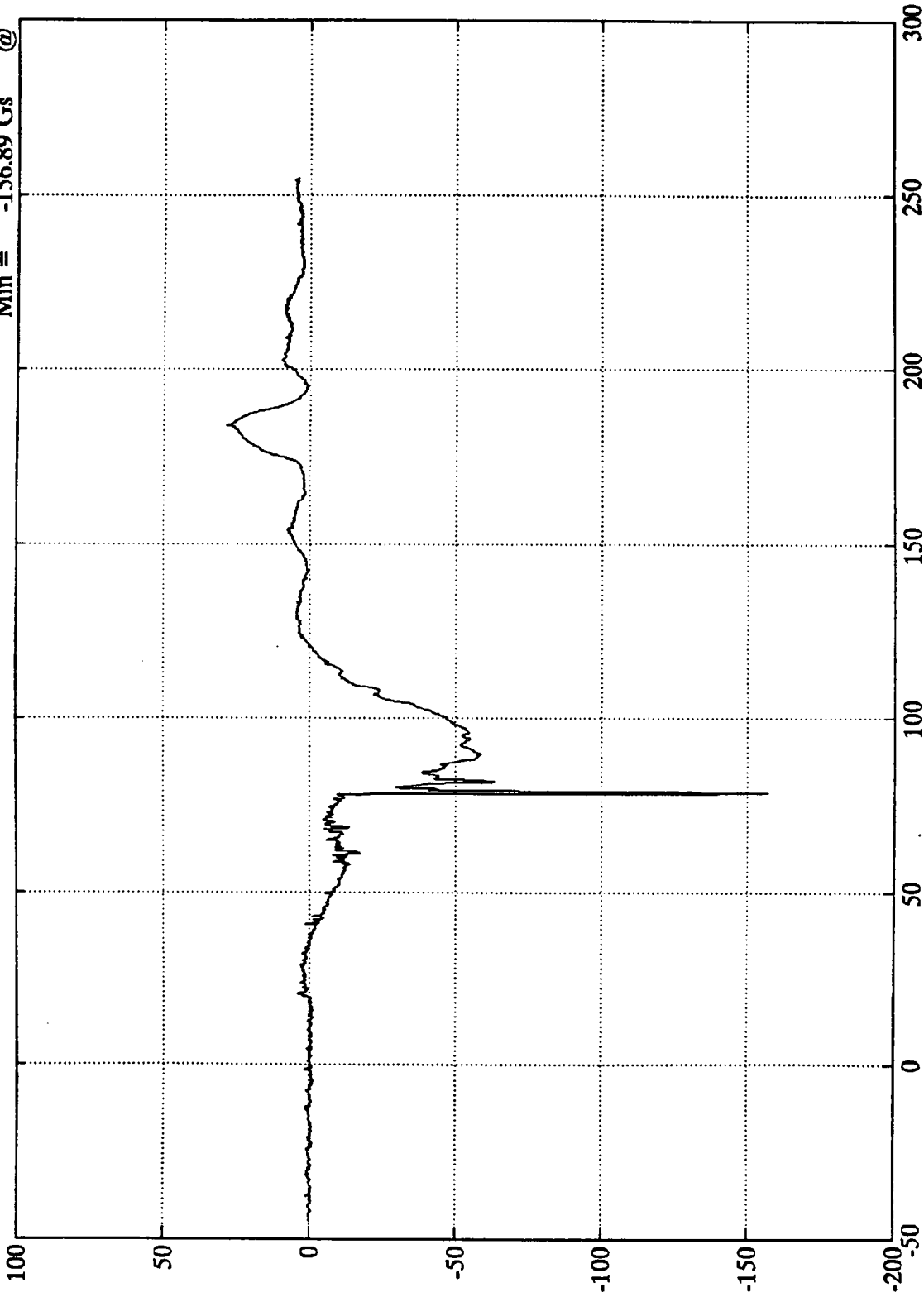
DUMMY DATA

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

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Head X

Max = 28.49 Gs @ 183.84 msec  
Min = -156.89 Gs @ 78.60 msec



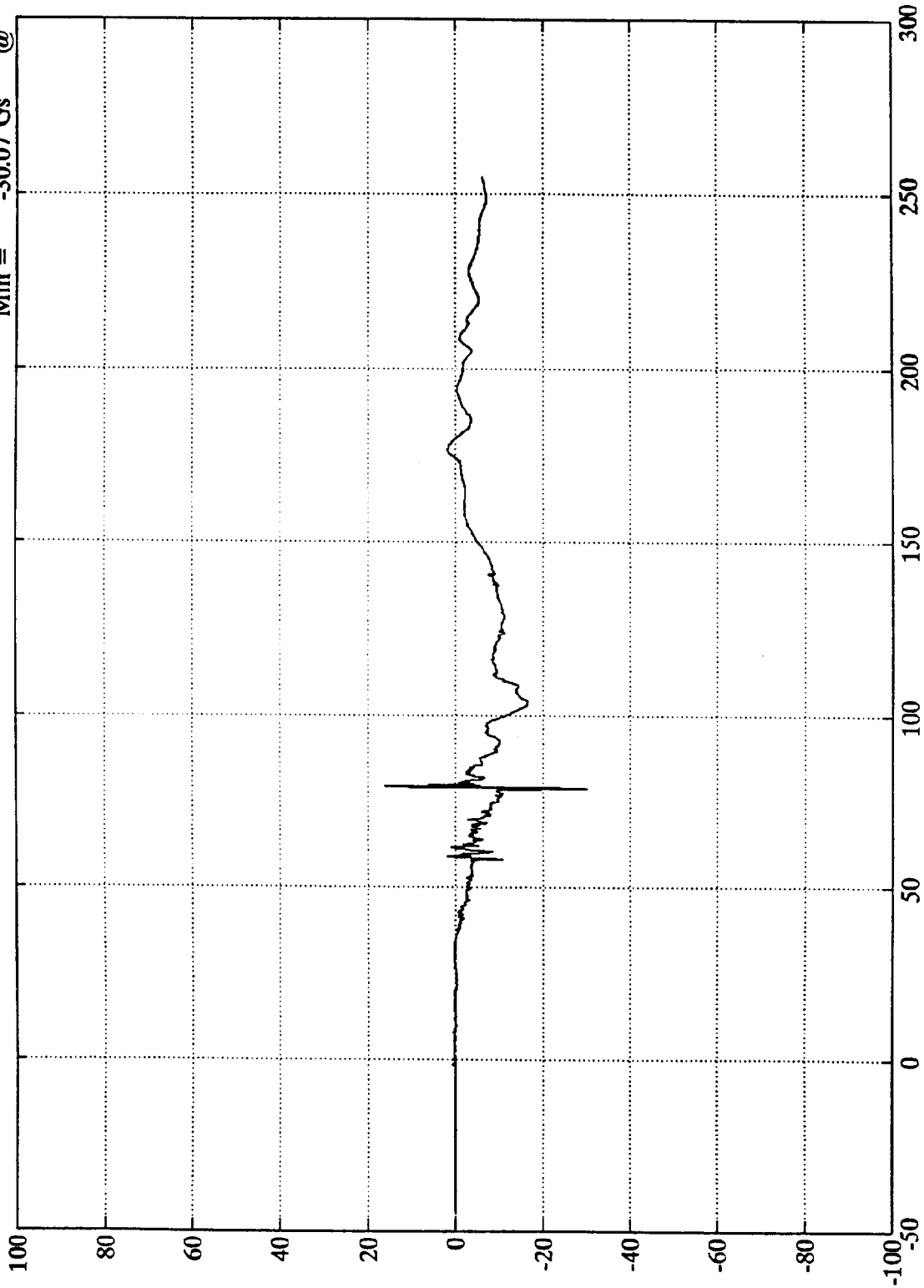
Time (msec)

Sae Filter Class 1000

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Head Y

Max = 16.02 Gs @ 79.08 msec  
Min = -30.07 Gs @ 78.72 msec



B-76  
Gs

Time (msec)

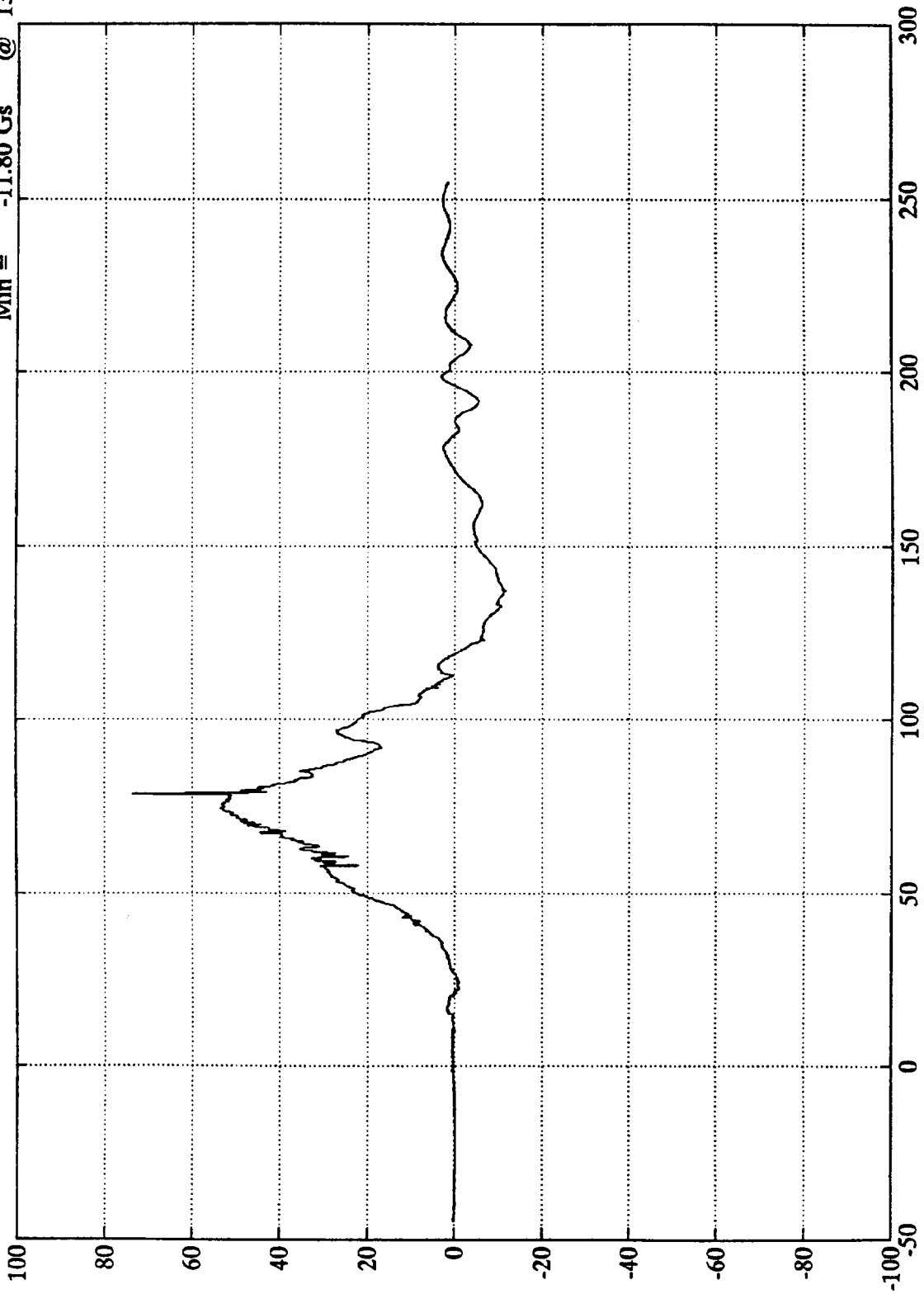
Sac Filter Class 1000

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Head Z

Max = 73.31 Gs @ 78.60 msec  
Min = -11.80 Gs @ 137.27 msec

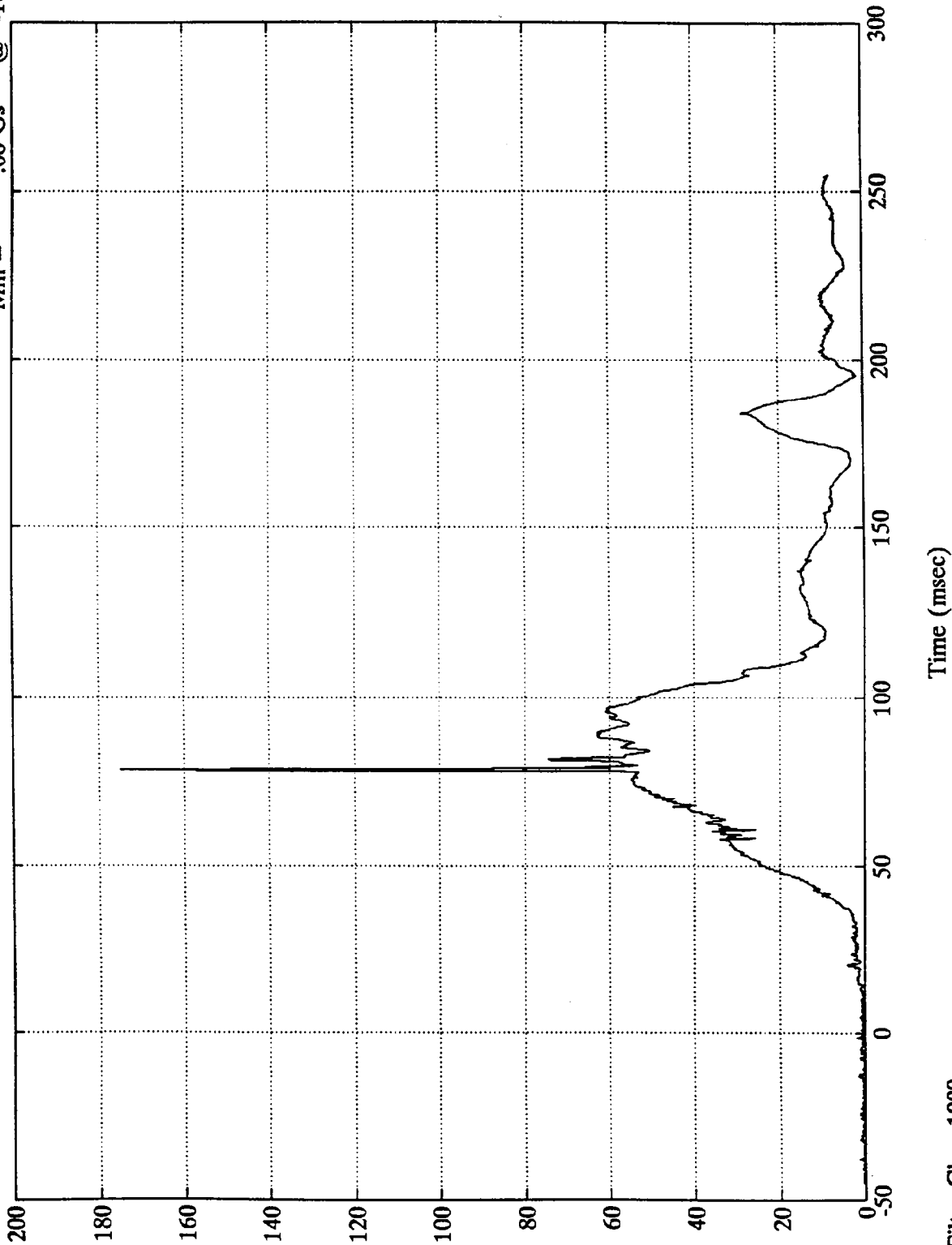


B-77

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Head Resultant

Max = 174.88 Gs @ 78.60 msec  
Min = .06 Gs @ -16.68 msec



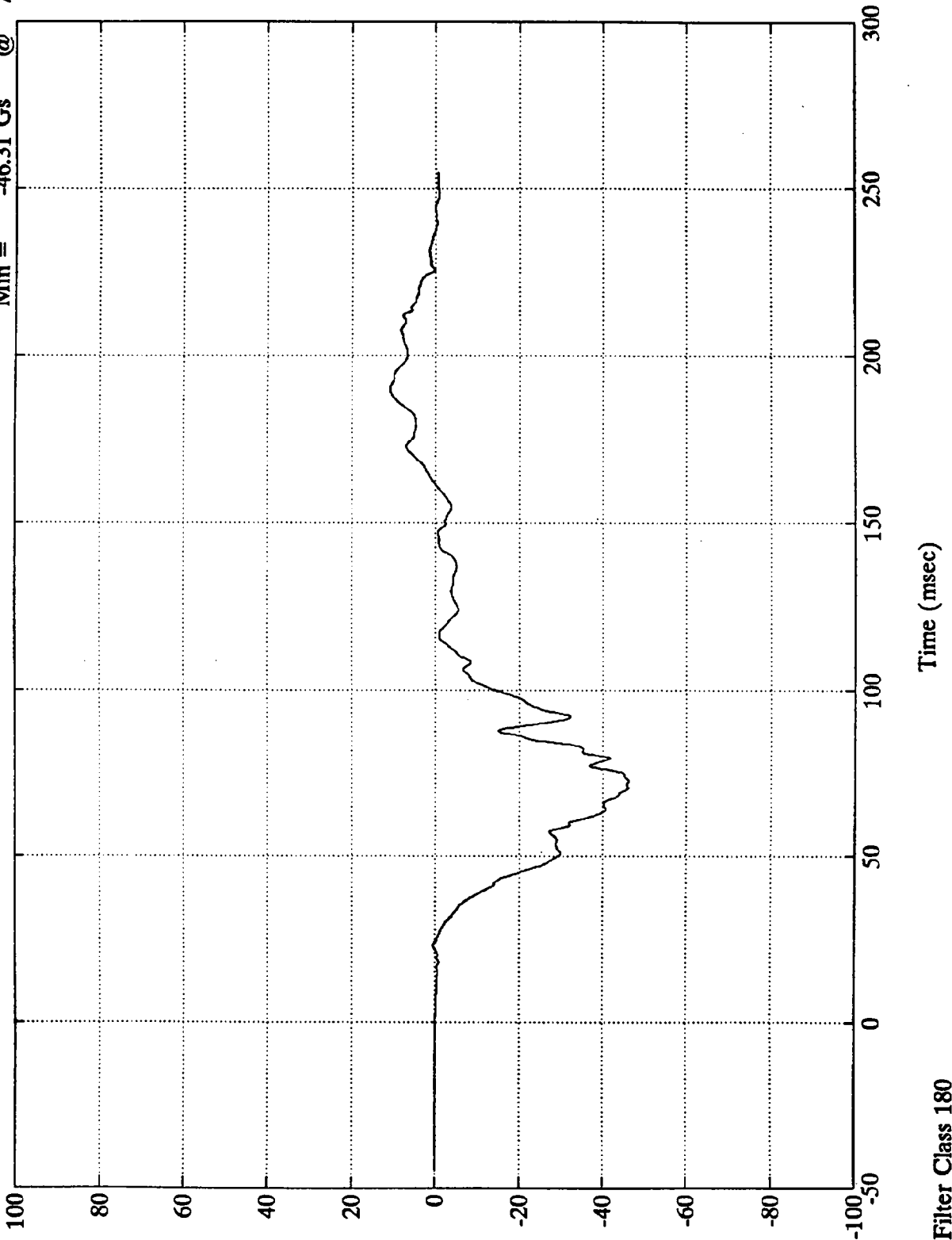
B-78

7951-1 Sae Filter Class 1000

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Chest X

Max = 10.72 Gs @ 190.44 msec  
Min = -46.31 Gs @ 72.59 msec

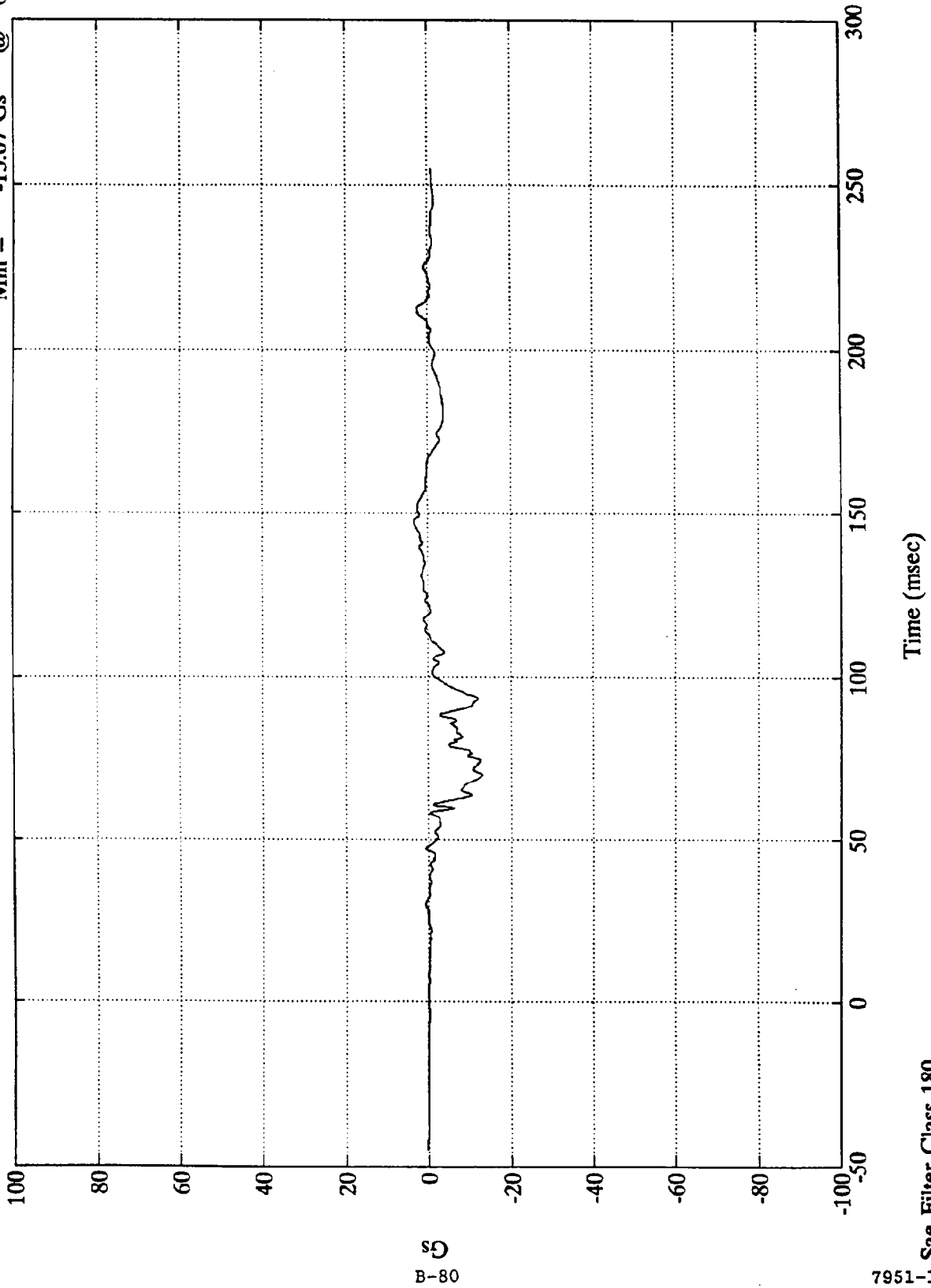


B-79

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Chest Y

Max = 3.45 Gs @ 147.60 msec  
Min = -13.07 Gs @ 69.83 msec



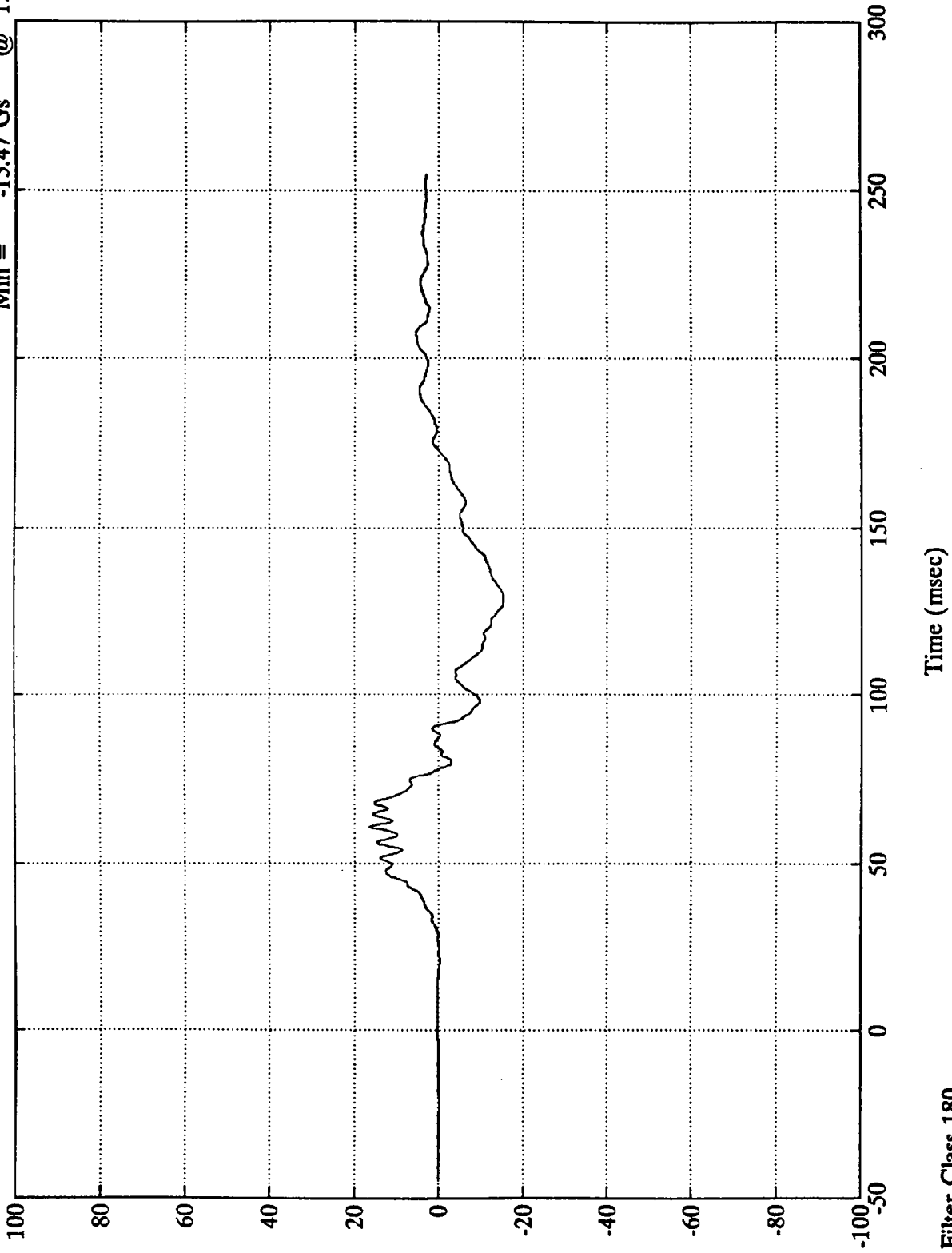
B-80

7951-1  
Sae Filter Class 180

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Chest Z

Max = 16.34 Gs @ 60.96 msec  
Min = -15.47 Gs @ 129.36 msec



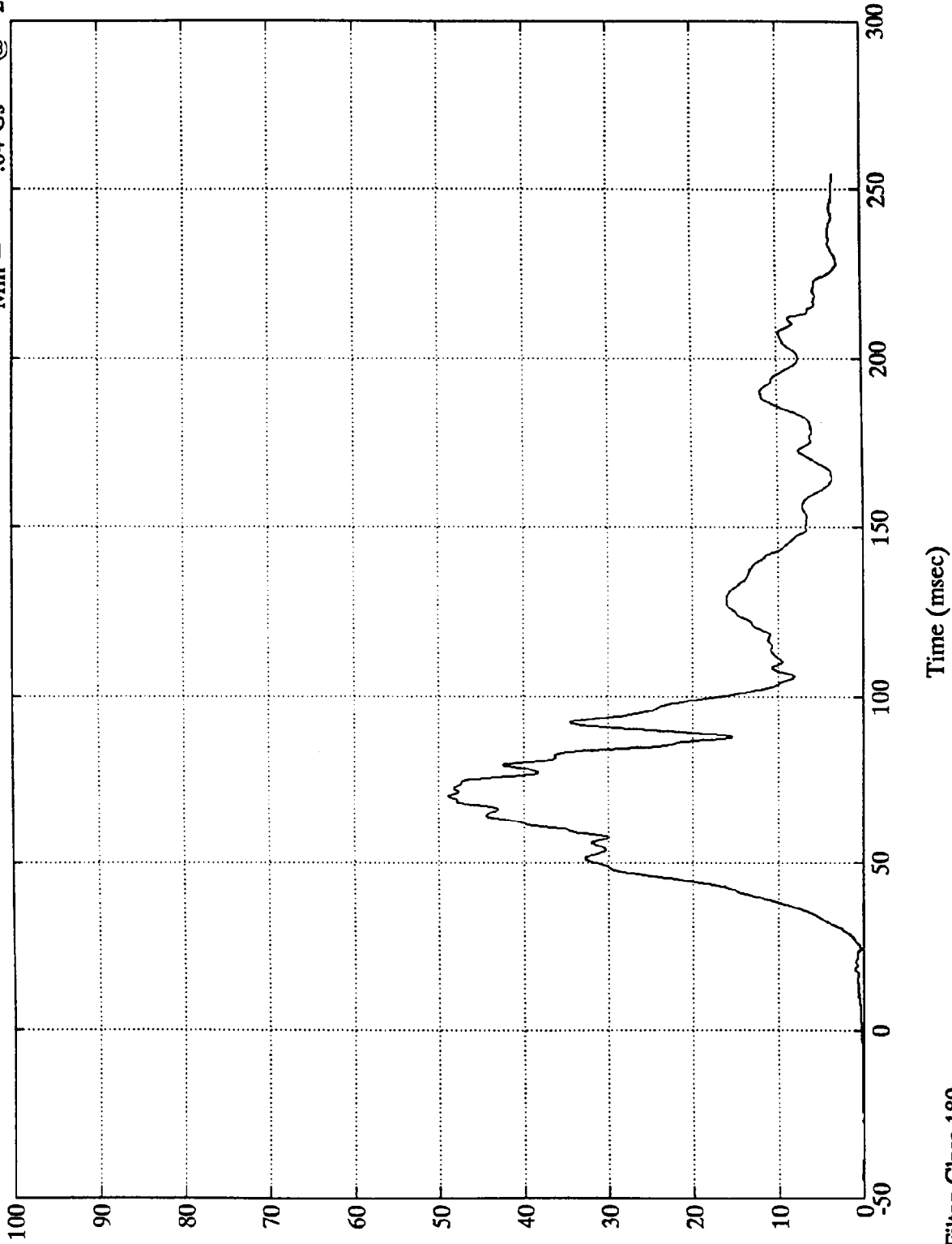
B-81

Sae Filter Class 180

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Chest Resultant  
Max = 48.86 Gs @ 70.20 msec  
Min = .04 Gs @ -28.80 msec



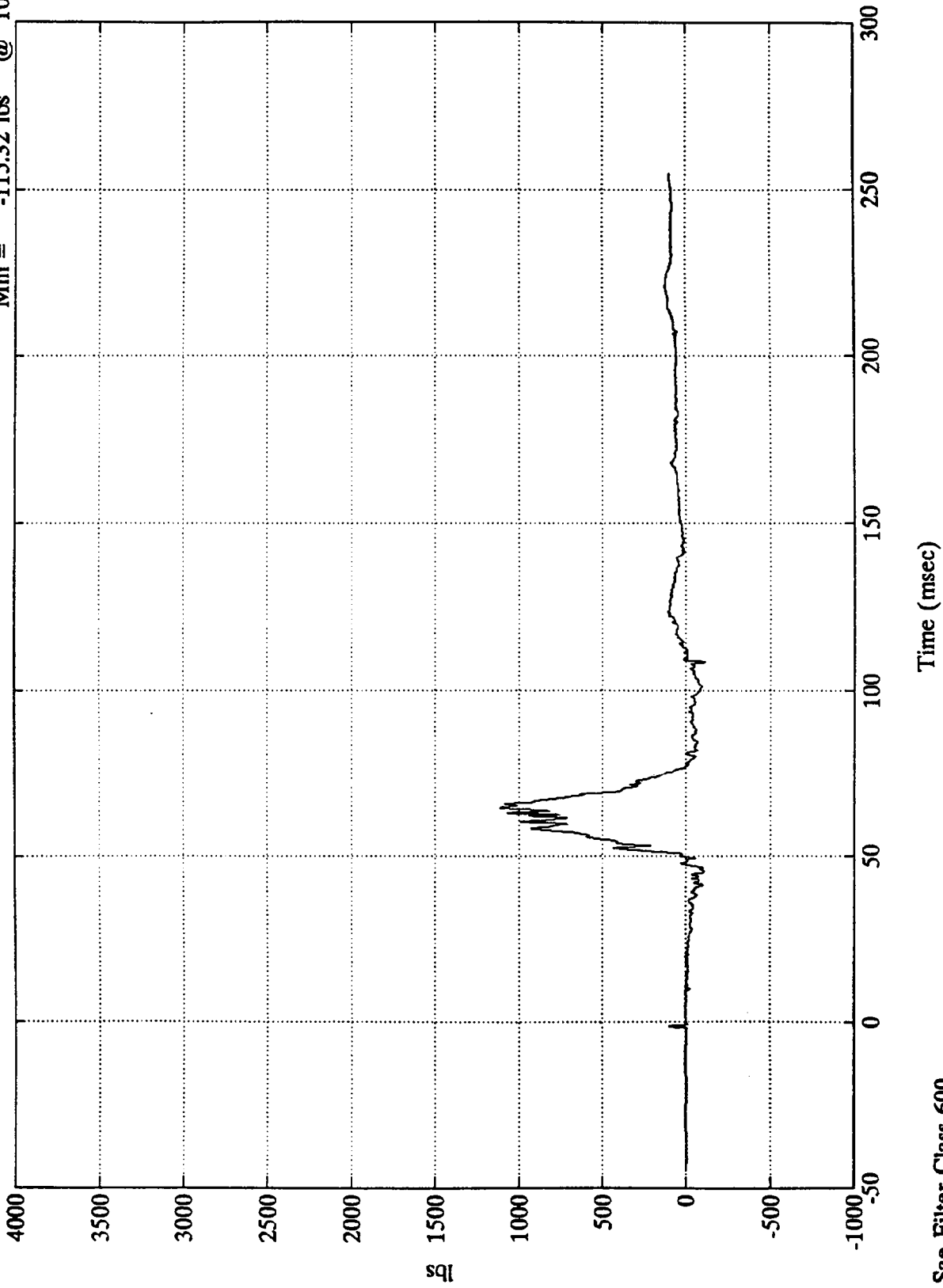
50  
B-82

7951-1  
Sae Filter Class 180

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Left Femur

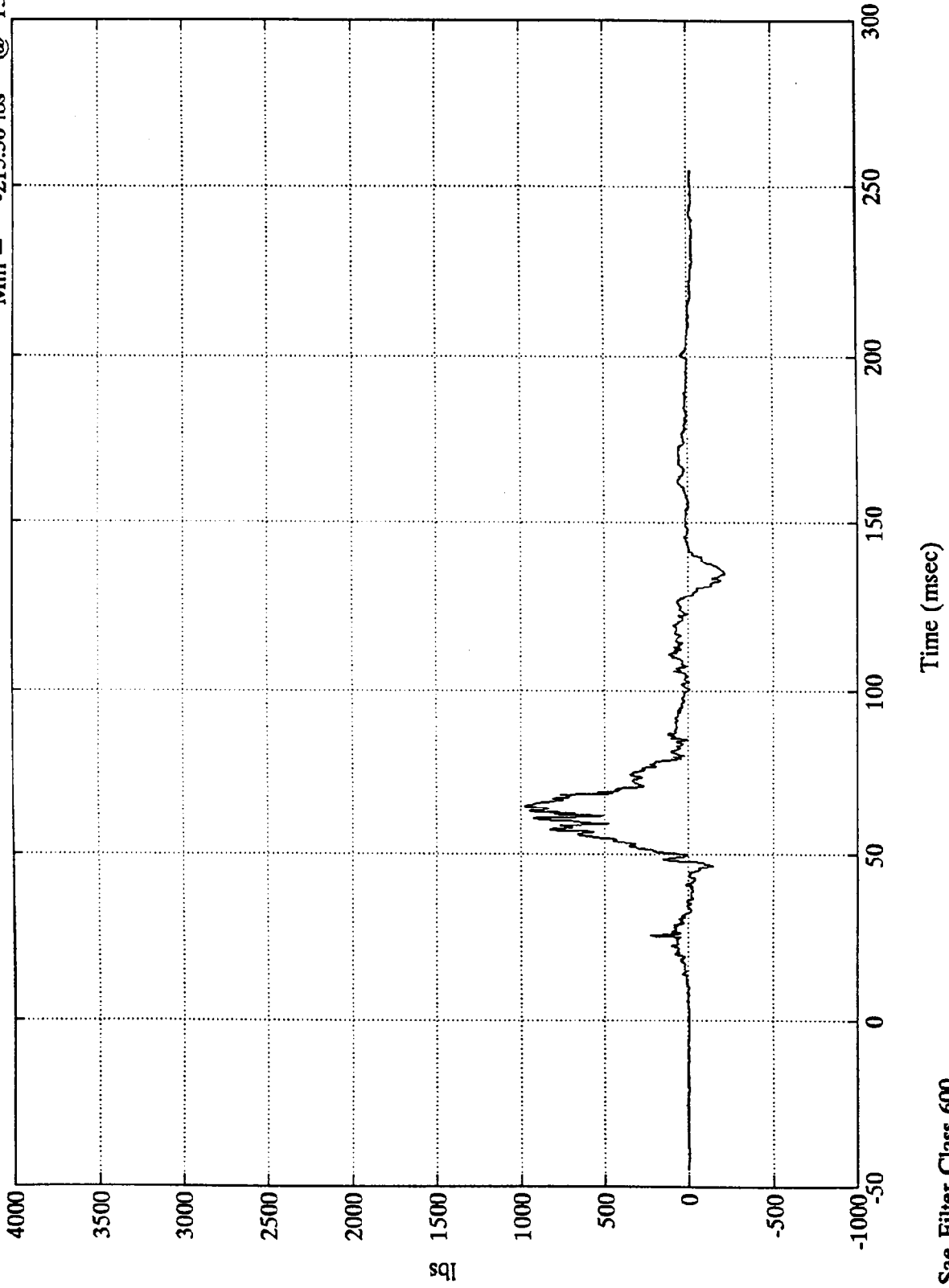
Max = 1108.83 lbs @ 64.31 msec  
Min = -115.32 lbs @ 108.60 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Right Femur

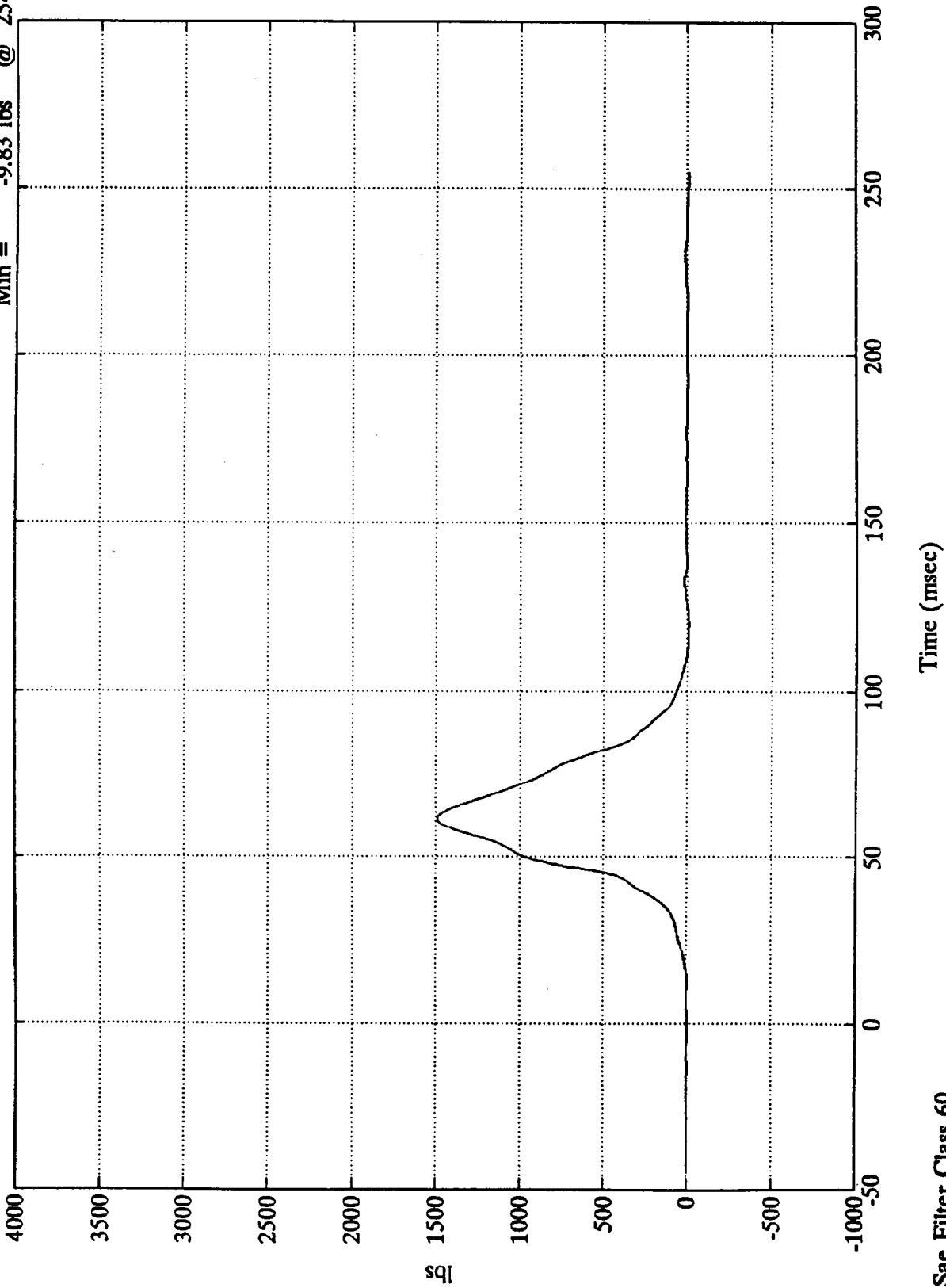
Max = 975.96 lbs @ 64.68 msec  
Min = -215.30 lbs @ 135.00 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Left Belt Load

Max = 1491.96 lbs @ 61.31 msec  
Min = -9.83 lbs @ 254.04 msec



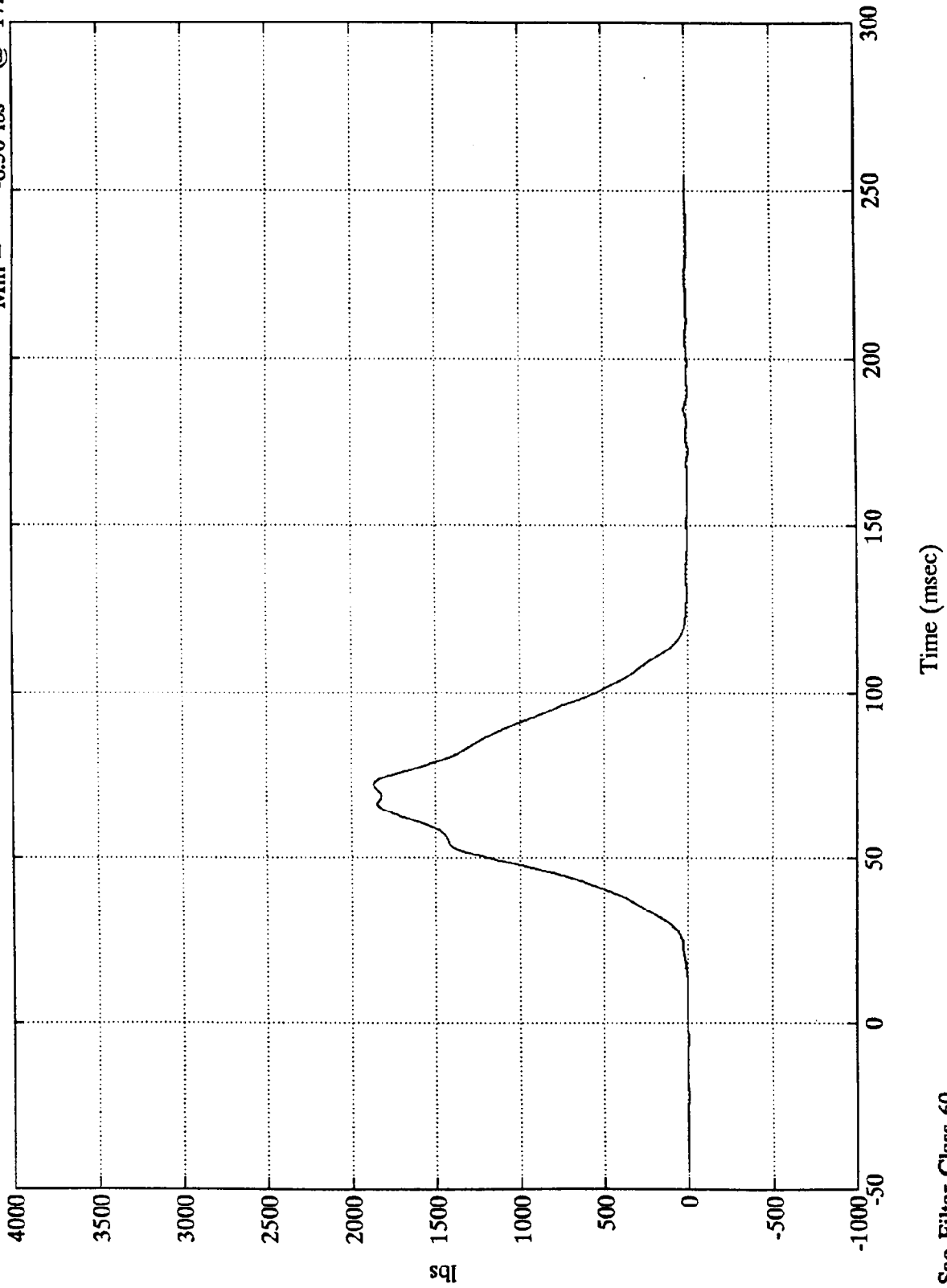
B-85

7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Torso Belt Load

Max = 1867.79 lbs @ 72.48 msec  
Min = -8.50 lbs @ 172.68 msec



B-86

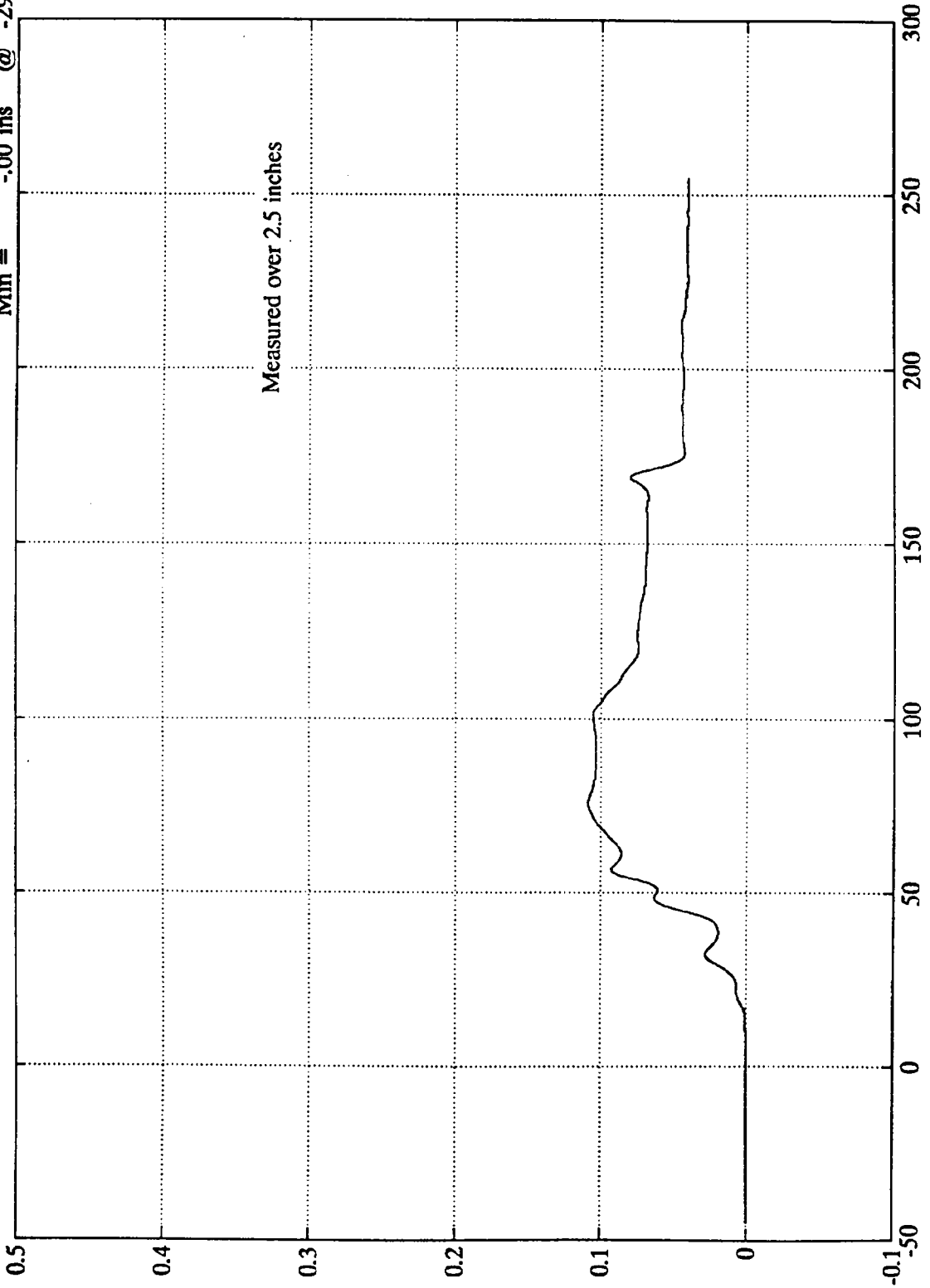
7951-1

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Belt Elongation

Max = .10 ins @ 75.59 msec  
Min = -.00 ins @ -29.16 msec



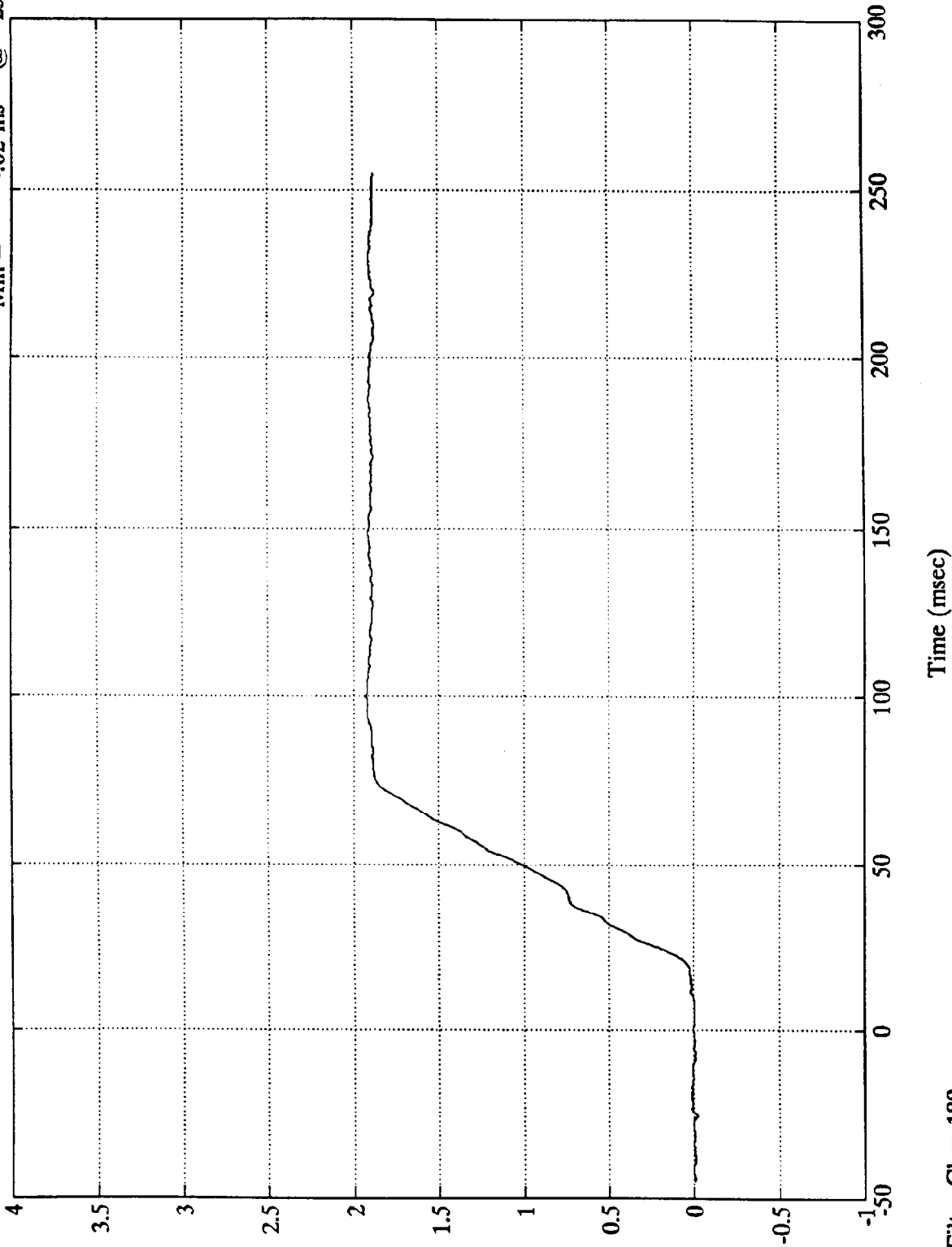
B-87

7951-1  
Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 1 Belt Spool Out

Max = 1.92 ins @ 99.72 msec  
Min = -.02 ins @ -25.68 msec



SUI  
B-88

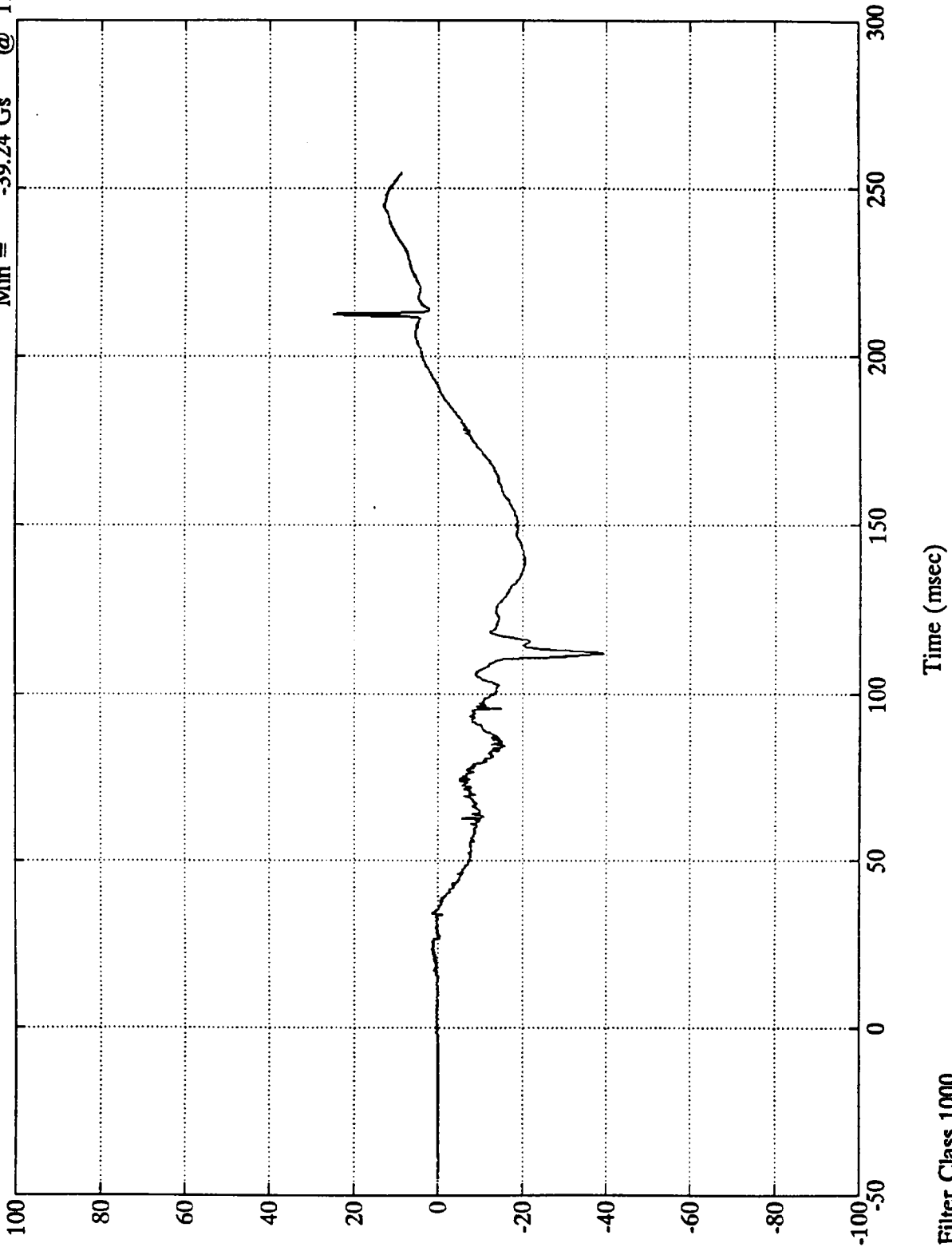
Sae Filter Class 180

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Head X

Max = 24.93 Gs @ 212.40 msec  
Min = -39.24 Gs @ 111.84 msec

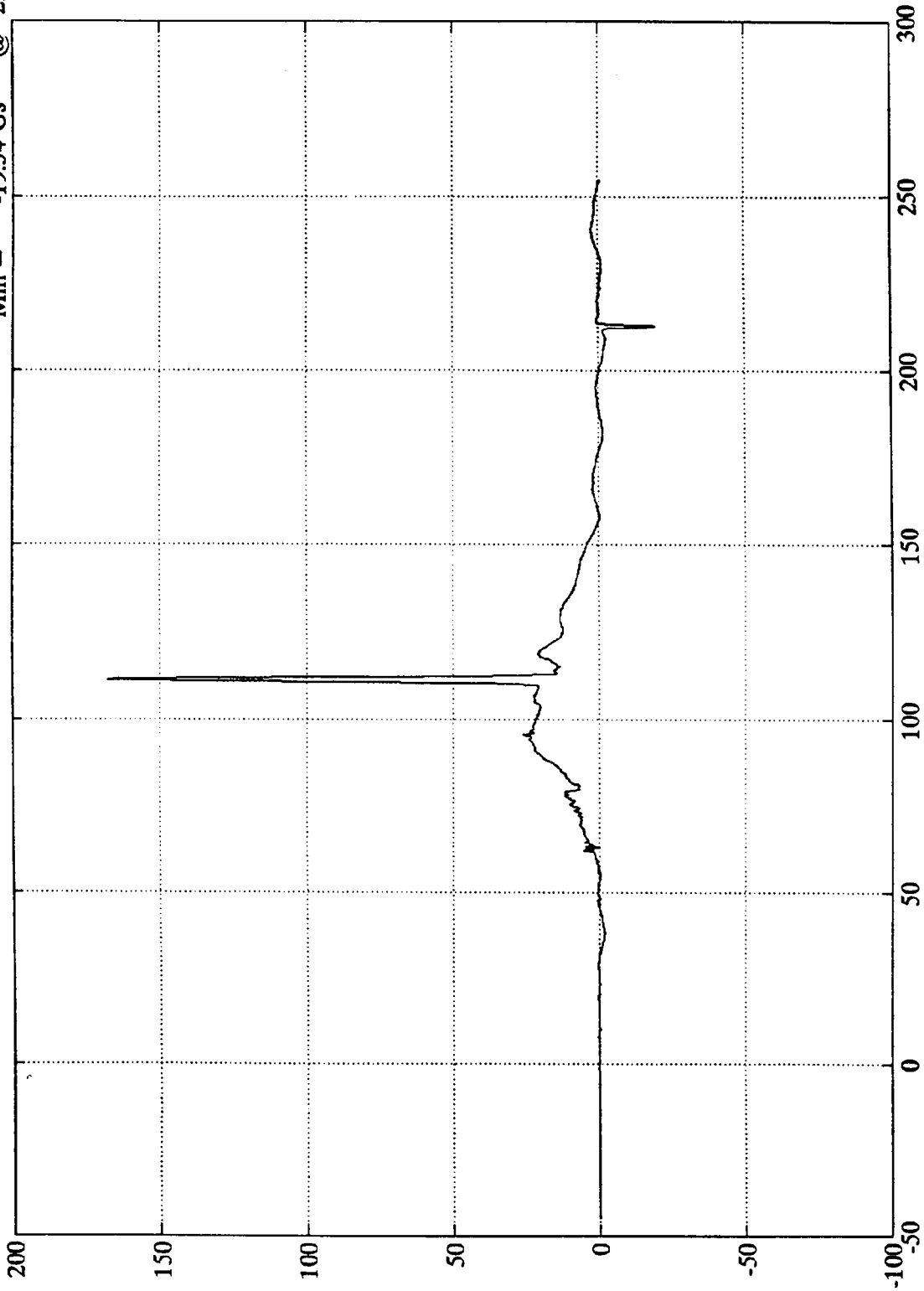


B-89

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Head Y

Max = 167.41 Gs @ 111.36 msec  
Min = -19.54 Gs @ 212.40 msec



B-90  
Gs

Time (msec)

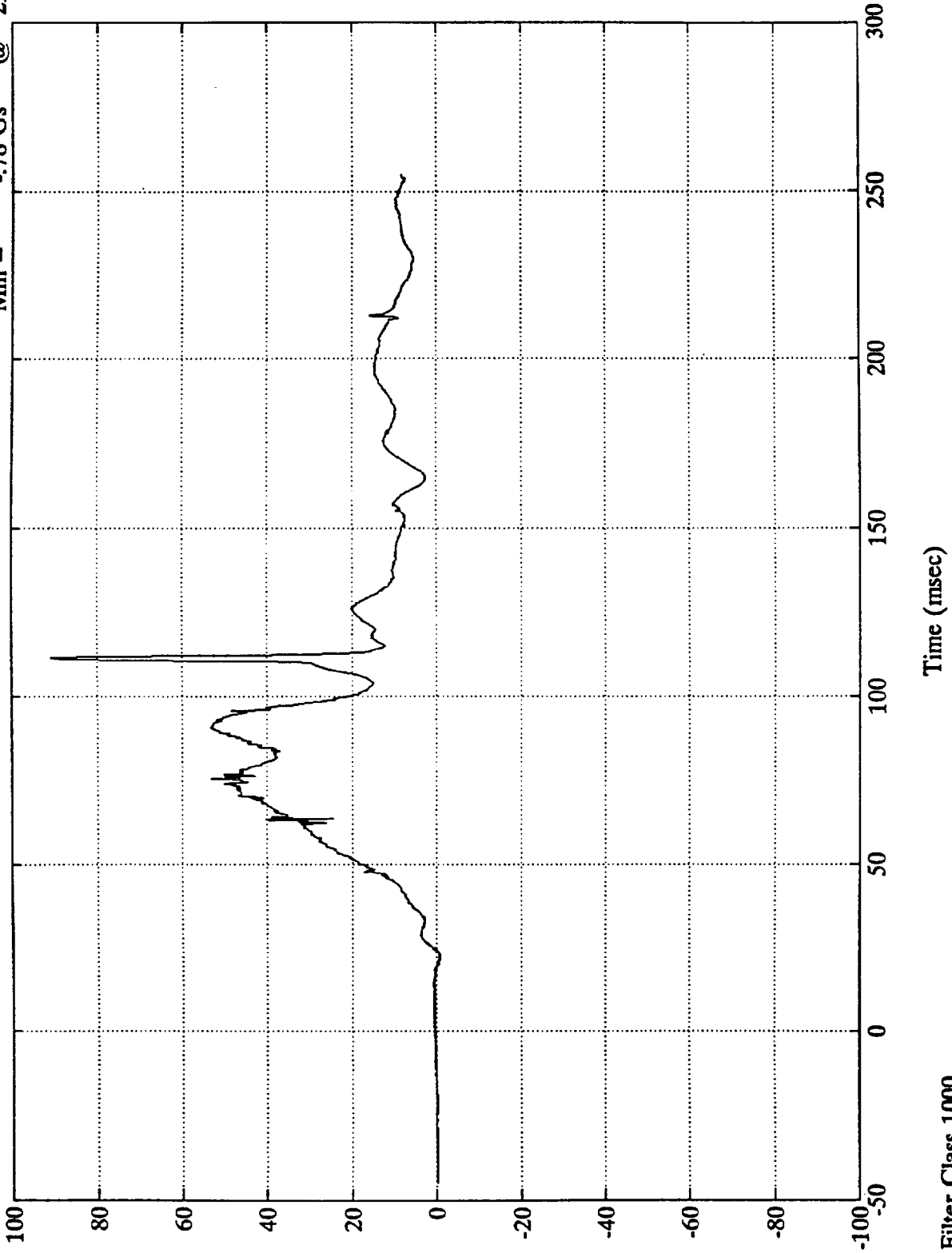
Sae Filter Class 1000

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Max = 90.77 Gs @ 111.48 msec  
Min = -7.8 Gs @ 21.84 msec

Pos. 2 Head Z



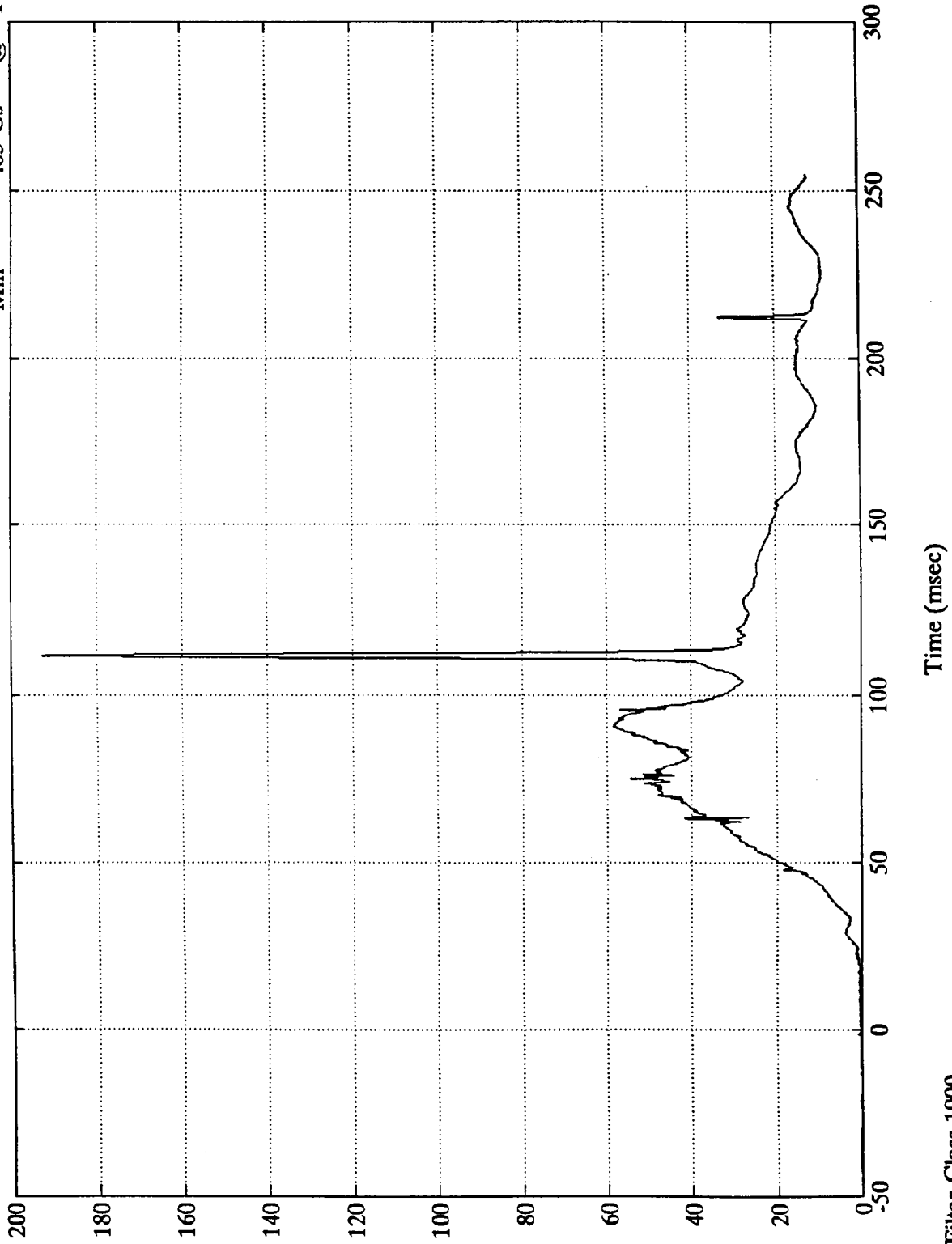
B-91

7851-1  
Sae Filter Class 1000

NCAP 92 TEST 7 FORD F150 PICKUP

Max = 192.62 Gs @ 111.36 msec  
Min = .05 Gs @ -17.88 msec

Pos. 2 Head Resultant



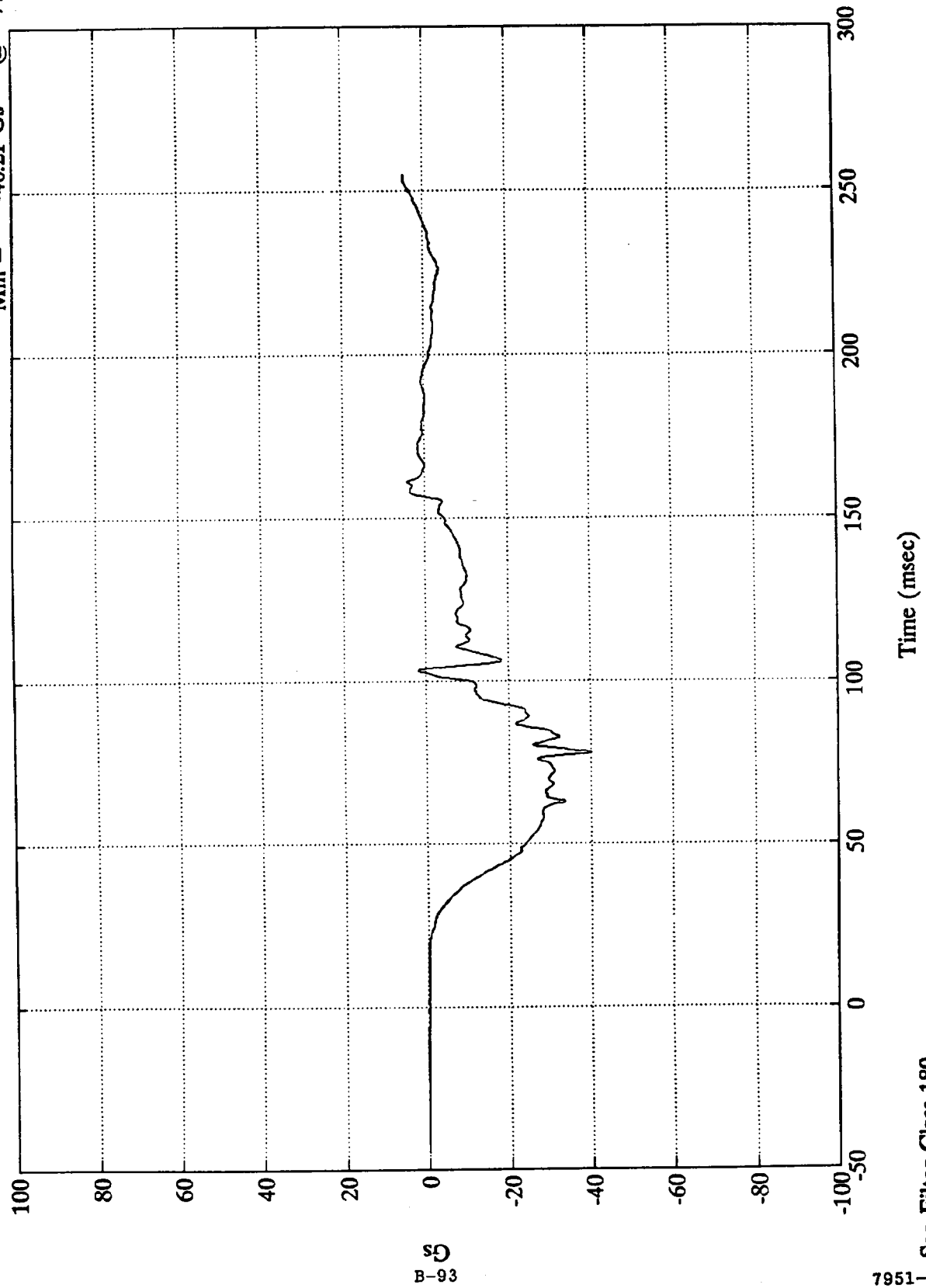
B-92

Sae Filter Class 1000

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

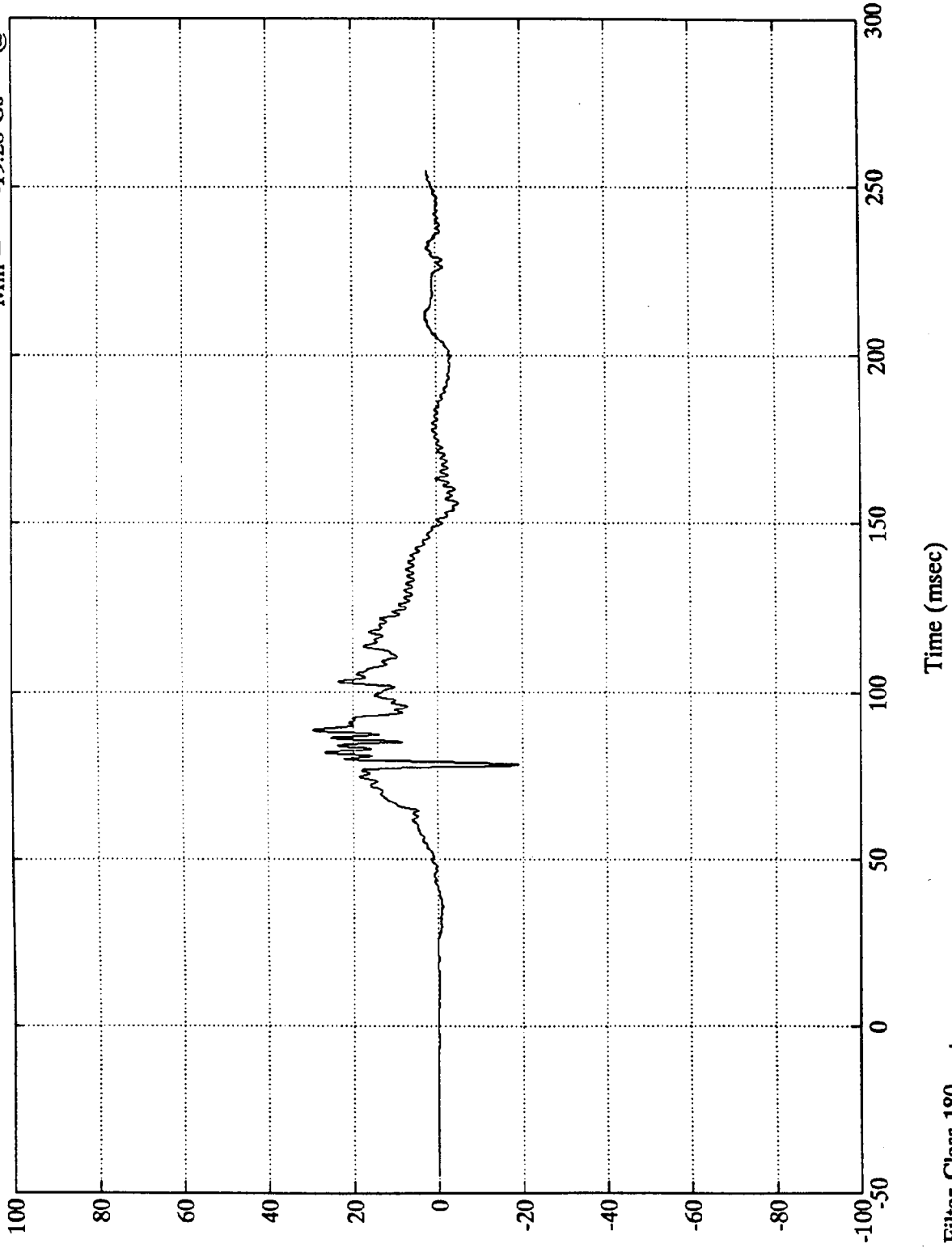
Pos. 2 Chest X  
Max = 4.81 Gs @ 254.16 msec  
Min = -40.21 Gs @ 77.88 msec



SD  
B-93

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Chest Y  
Max = 29.34 Gs @ 88.31 msec  
Min = -19.28 Gs @ 78.12 msec



B-94

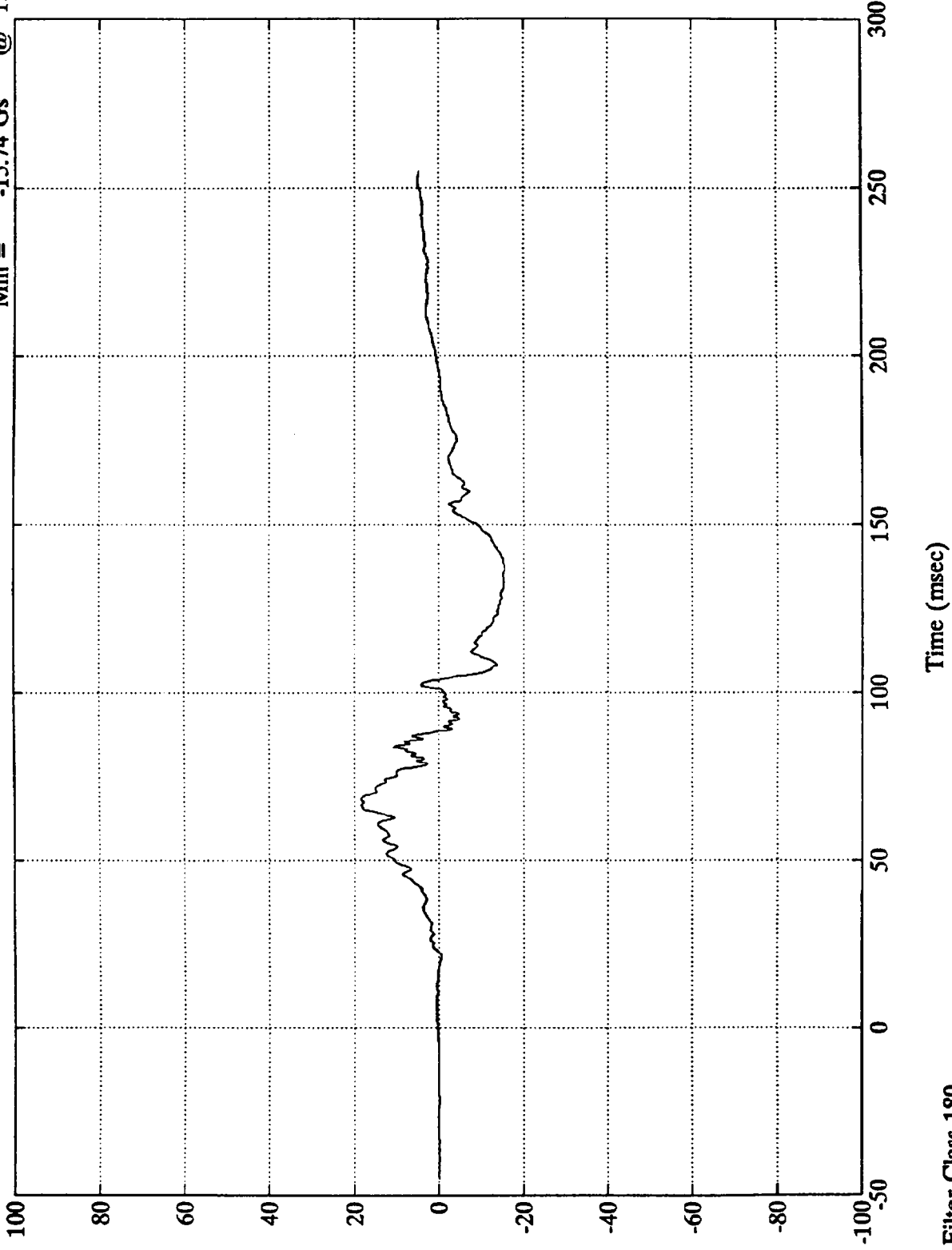
7951-1

Sae Filter Class 180

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Chest Z

Max = 18.39 Gs @ 68.28 msec  
Min = -15.74 Gs @ 137.16 msec



B-95

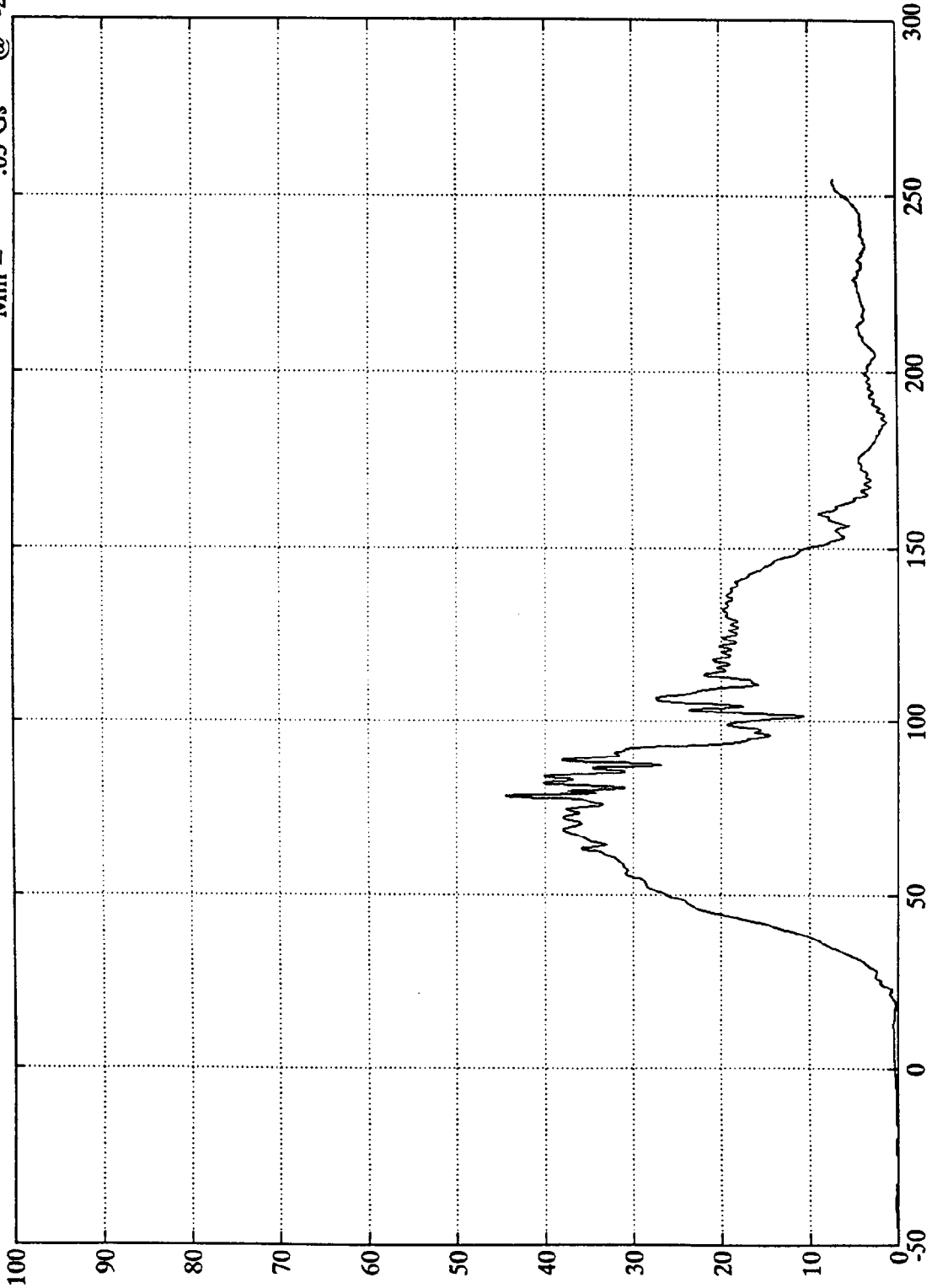
7951-1

Sac Filter Class 180

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Chest Resultant

Max = 44.42 Gs @ 78.00 msec  
Min = .03 Gs @ -24.84 msec



B-96

Time (msec)

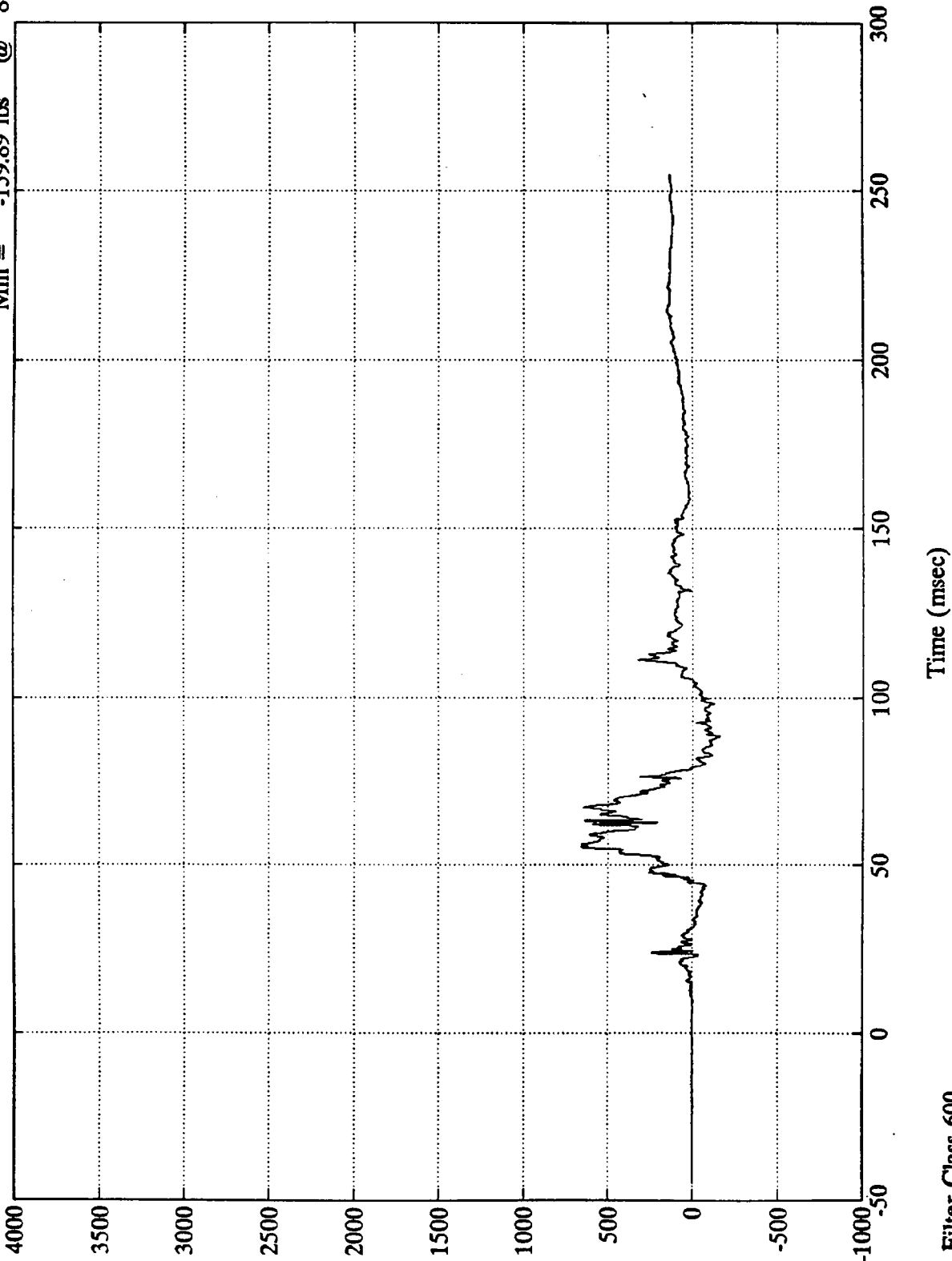
Sac Filter Class 180

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Left Femur

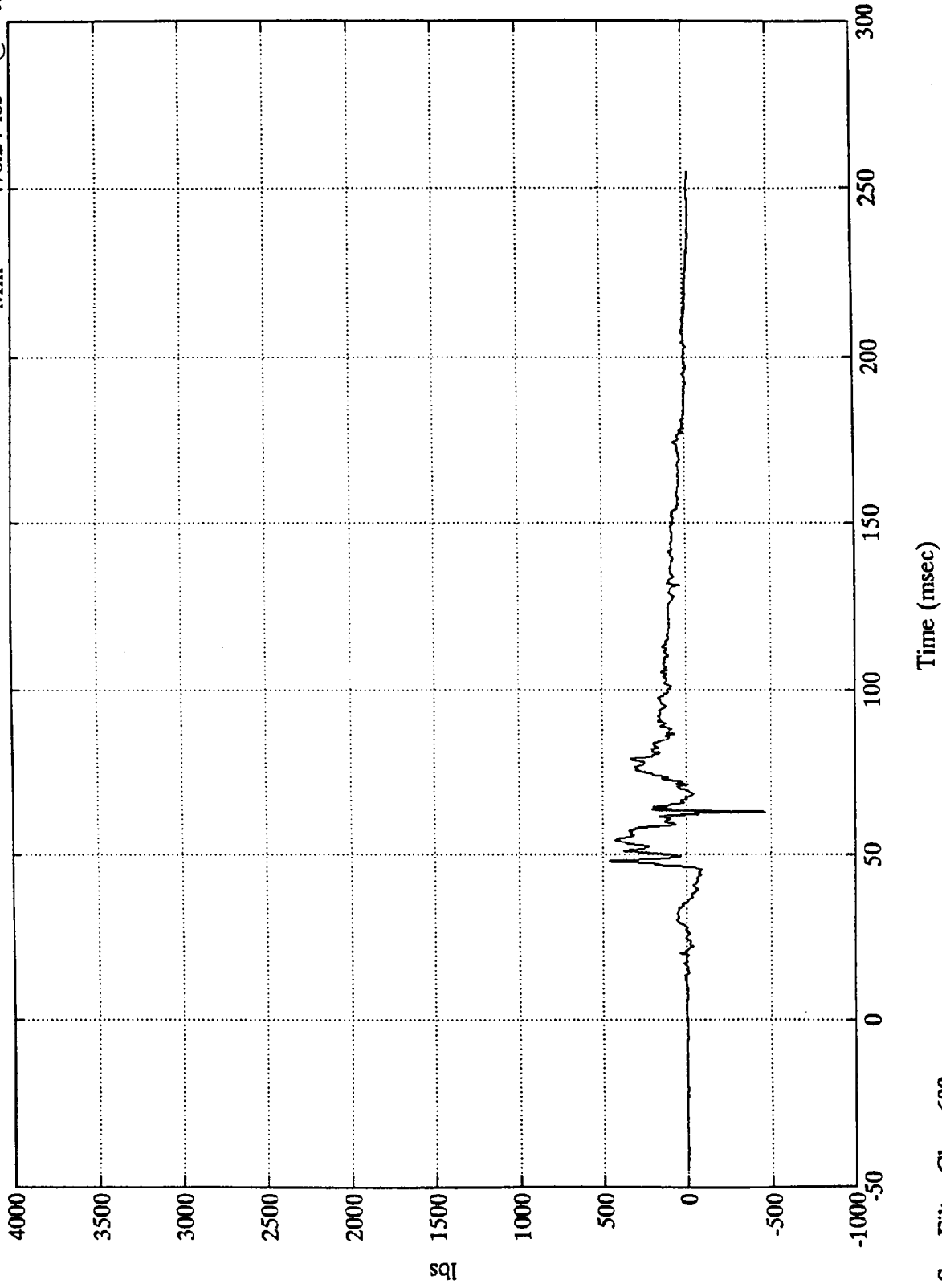
Max = 653.91 lbs @ 55.32 msec  
Min = -159.89 lbs @ 88.44 msec



NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Right Femur

Max = 462.52 lbs @ 48.00 msec  
Min = -470.24 lbs @ 62.64 msec



B-98

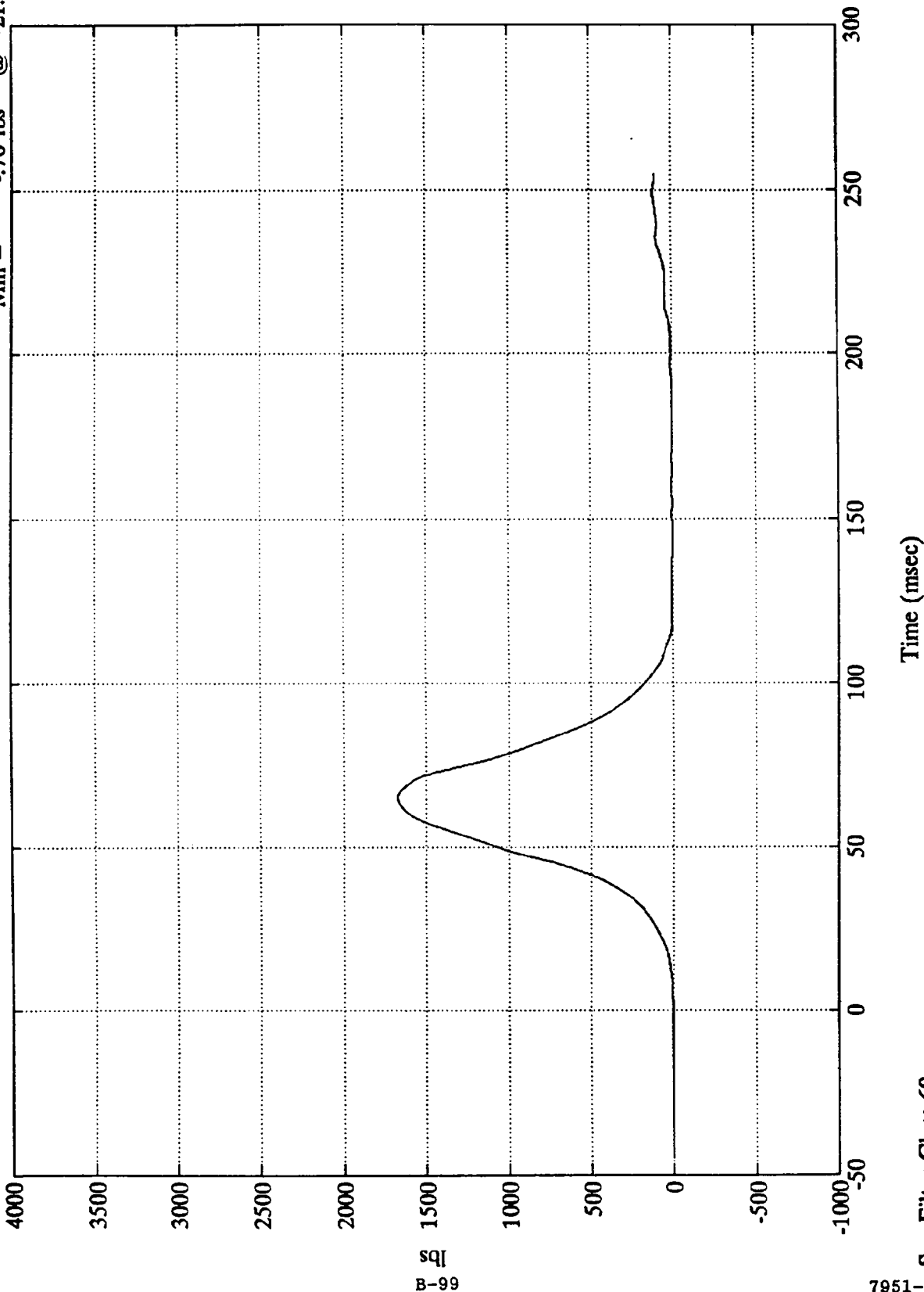
7951-1

Sae Filter Class 600

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Right Belt Load

Max = 1672.28 lbs @ 65.27 msec  
Min = -76 lbs @ -21.60 msec



B-99

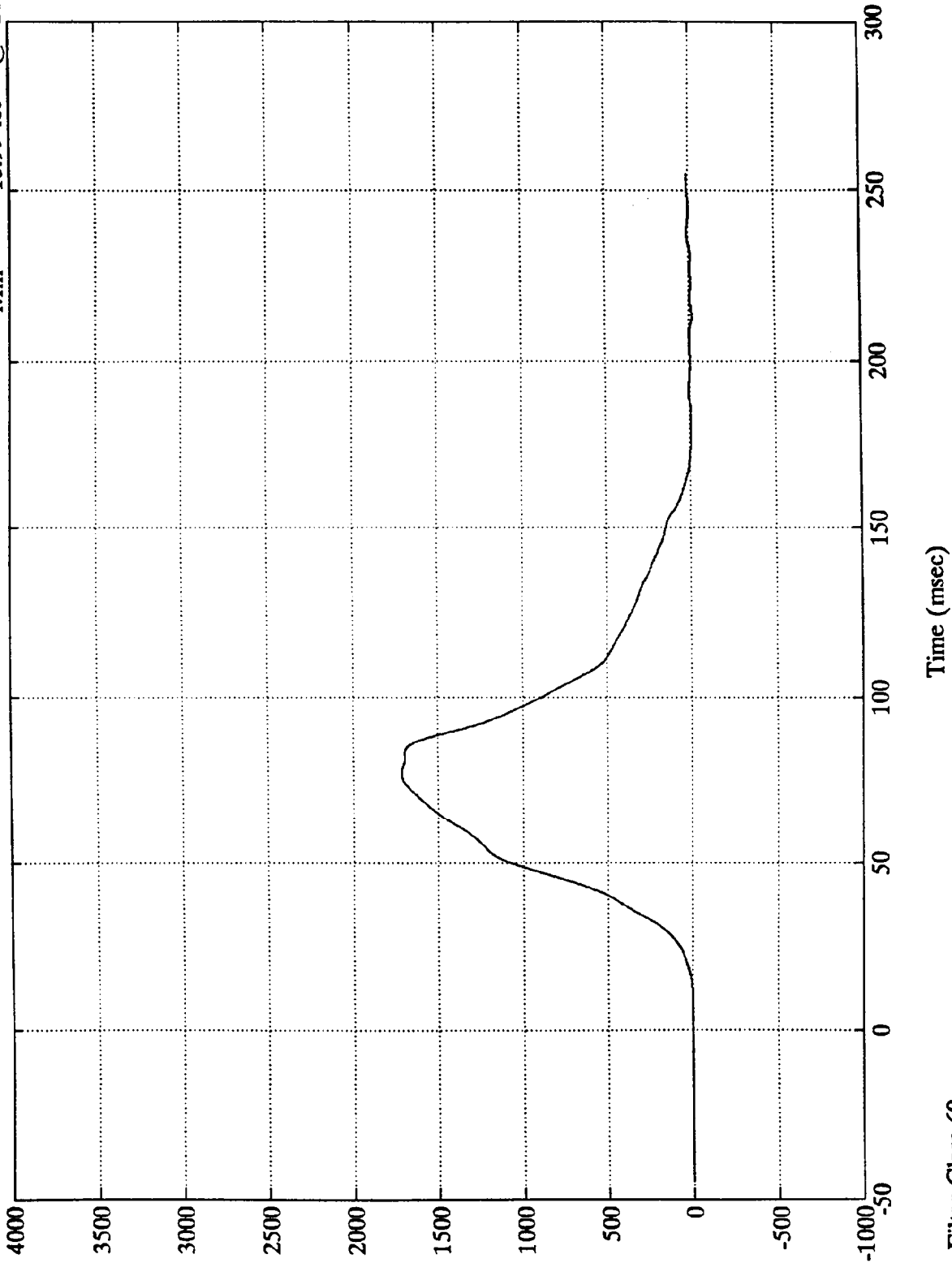
Sae Filter Class 60

7951-1

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Torso Belt Load

Max = 1715.05 lbs @ 76.68 msec  
Min = -13.99 lbs @ 212.75 msec



B-100

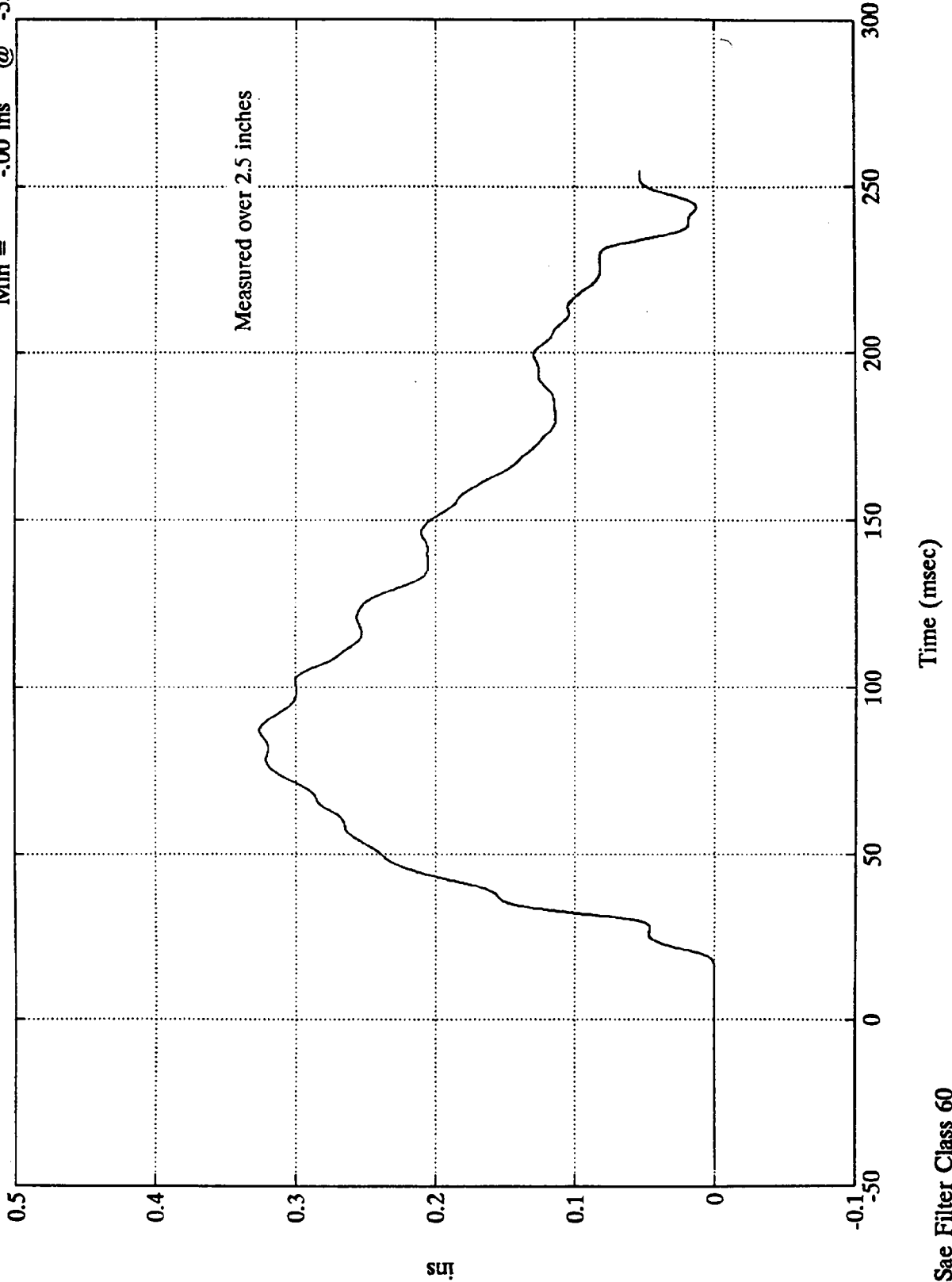
7951-1

Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Belt Elongation

Max = .32 ins @ 86.87 msec  
Min = -.00 ins @ -5.76 msec



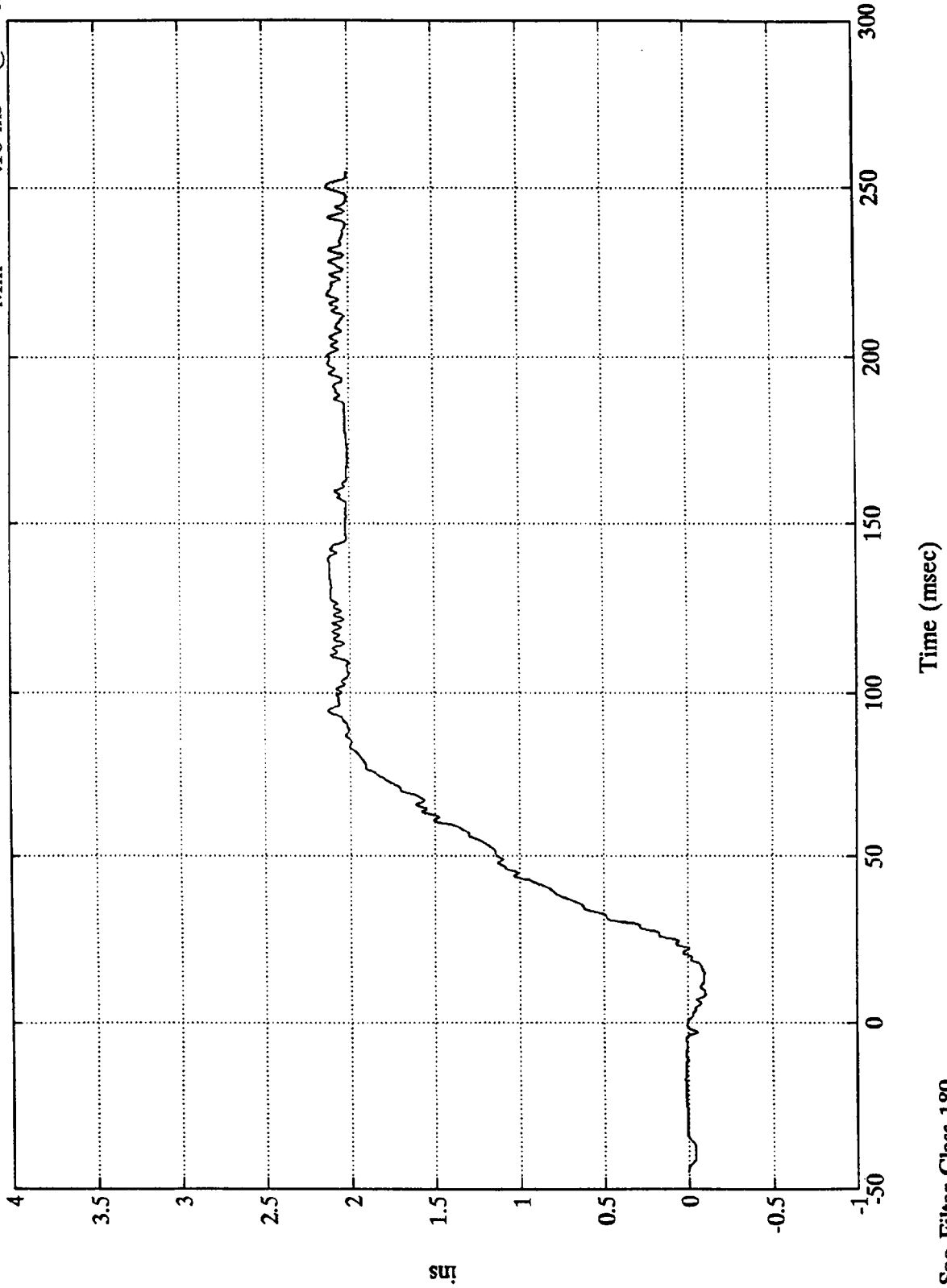
B-101

7951-1 Sae Filter Class 60

NCAP 92 TEST 7 FORD F150 PICKUP

Pos. 2 Belt Spool OUt

Max = 2.12 ins @ 250.56 msec  
Min = -.10 ins @ 8.51 msec



B-102

7951-1 Sae Filter Class 180

Appendix C

PART 572B 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.

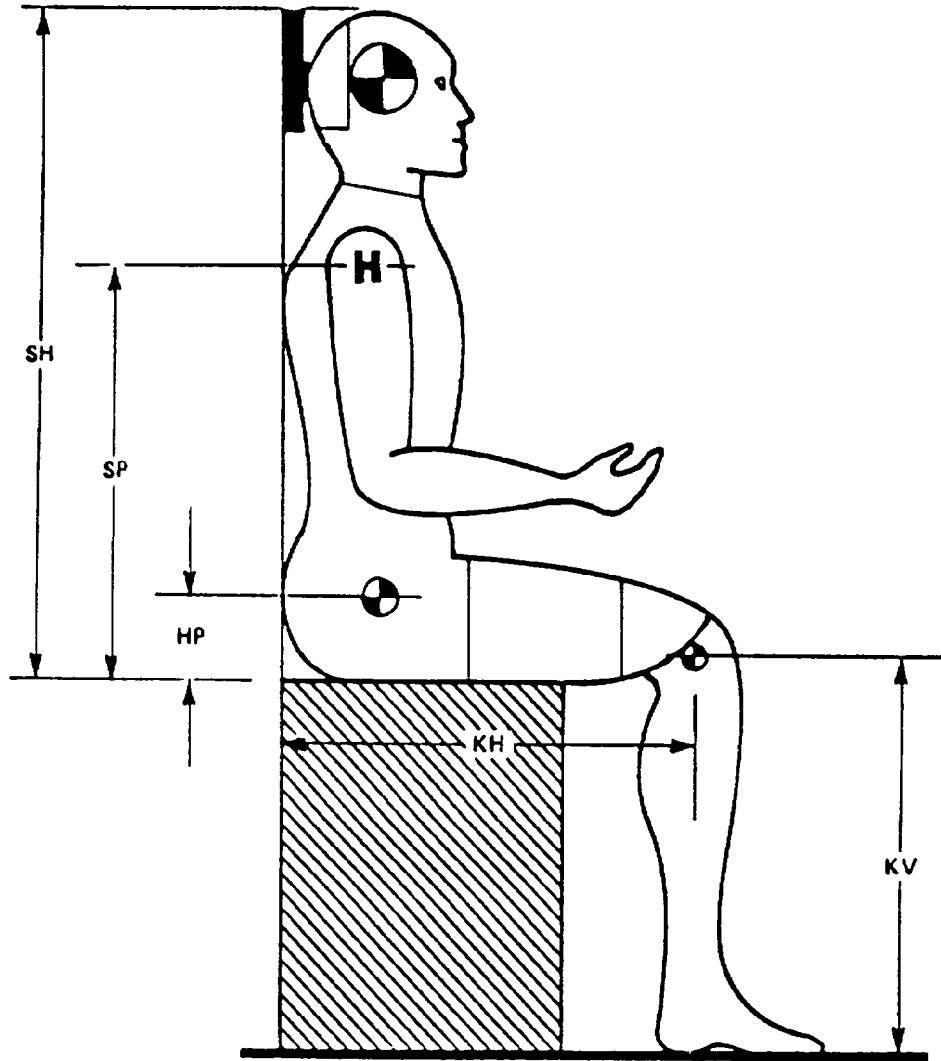
Dummy serial numbers and certification dates are:

<u>Serial No.</u>	<u>Completion Date</u>
357	11-25-91
358	11-25-91

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	11/25/91	
VERIFICATION NUMBER FOR DUMMY (*)	XXXXXXXXXXXXXX	3	
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		11/25/91	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		3	
VERIFICATION LAB TEMPERATURE ( 66 to 78 deg. )		69-71 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		33-41 %	%
TEST PARAMETER	SPECIFICATION		
1. <u>HEAD DROP TEST</u>			
a. peak resultant accel.	210 to 260 G's	210.8 G's	G's
b. peak lateral accel.	<= 10 G's	5.4 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 year 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)
<b>2. NECK BENDING TEST</b>			
a. Pendulum Speed	21.5 to 25.5 fps.	23.7 fps	fps
b. Pend. Avg. Decel. over t3 to t2	20 to 24 G's	22.9 G's	G's
c. Peak Resultant Head Acceleration	26 G's max.	25.47 G's	G's
d. Pendulum Decel. (t2-t1)	<= 3 ms.	2.73 ms	ms
e. Pendulum Decel. (t3-t2)	25 to 30 ms.	26.54 ms	ms
f. Pendulum Decel. (t4-t3)	<= 10 ms.	6.2 ms	ms
g. Max. Head Rotation	63 to 73 deg.	68.33 deg	deg
<b>h. Chordal Displacement</b>			
<b>HEAD ROTATION ANGLE</b>			
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.	30.51 ms
	Displ.	2.1 to 3.1"	2.49 "
60 deg.	Time	40.3 to 51.7 ms.	44.64 ms
	Displ.	4.3 to 5.3"	4.73 "
Maximum	Time	53.2 to 66.8 ms.	53.94 ms
	Displ.	5.0 to 6.0"	5.12 "
60 deg.	Time	67.0 to 83.0 ms.	69.44 ms
	Displ.	4.3 to 5.3"	4.73 "
30 deg.	Time	85.4 to 104.6 ms.	87.55 ms
	Displ.	2.1 to 3.1"	2.15 "
0 deg.	Time	101.0 - 123.0 ms.	101.81 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)
<b>3. ABDOMINAL COMPRESSION</b> <u>TEST:</u> (preload = 50 lbs.)			
a. Force @ 0.5"	23 to 36 lbs.	24 lbs	lbs
b. Force @ 0.75"	36 to 50 lbs.	39 lbs	lbs
c. Force @ 1.0"	50 to 63 lbs.	56.5 lbs	lbs
d. Force @ 1.3"	73 to 88 lbs.	87 lbs	lbs
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20 deg.	22 to 34 lbs.	23 lbs	lbs
b. Force @ 30 deg.	34 to 46 lbs.	37 lbs	lbs
c. Force @ 40 deg.	46 to 58 lbs.	50 lbs	lbs
d. Return Angle	12 deg. maximum	10 deg	deg
<b>5. CHEST IMPACT TESTS:</b>			
A. <u>High Speed</u>			
(1) Probe Speed	21.78-22.22 fps.	21.8 fps	fps
(2) Peak Deflection	1.7" maximum	1.53 "	"
(3) Peak Resistive Force	2250 lbs maximum	2125 lbs	lbs
(4) Internal Hysteresis	50 to 70%	58.4 %	%
B. <u>Low Speed</u>			
(1) Probe Speed	13.86-14.14 fps.	13.9 fps	fps
(2) Peak Deflection	1.1" maximum	.95 "	"
(3) Peak Resistive Force	1450 lbs maximum	1273 lbs	lbs
(4) Internal Hysteresis	50 to 70%	55.5 %	%

TECHNICIAN'S 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)
<b>6. <u>KNEE IMPACT TEST</u></b>			
<b>A. <u>Left Knee</u></b>			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	fps
(2) Maximum Force	1850 to 2500 lbs	2267 lbs	lbs
(3) Time above 1000 lbs.	1.7 ms. minimum	1.75 ms	ms
<b>B. <u>Right Knee</u></b>			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	fps
(2) Maximum Force	1850 to 2500 lbs	2027 lbs	lbs
(3) Time Above 1000 lbs.	1.7 ms. minimum	1.75 ms	ms

REMARKS:

TECHNICIAN'S NAME: Ivan Minkewicz

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 357

A. DUMMY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER				
HX LONGITUDINAL	ENDEVCO	CS75	10/91	4/92
HY LATERAL	ENDEVCO	CY89	10/91	4/92
HZ VERTICAL	ENDEVCO	CE76	10/91	4/92
2. CHEST ACCELEROMETER				
CX LONGITUDINAL	CEC	A147	10/91	4/92
CY LATERAL	ENDEVCO	CJ54	10/91	4/92
CZ VERTICAL	CEC	A148	10/91	4/92
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	311	11/91	5/92
RIGHT SIDE	GSE	312	11/91	5/92

B. CALIBRATION LABORATORY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. PENDULUM ACC.	CEC	A160	5/91	11/91
2. TEST PROBE ACCELEROMETER	CEC	A161	5/91	11/91
3. LUMBAR FLEXION TEST PUSH FORCE GAUGE	TRANS-DUCER INC	20051	7/91	1/92
4. ABDOMINAL COMPRESS. TEST FORCE GAUGE	BLH	72952	7/91	1/92
5. ABDOMINAL COMPRESS. TEST FORCE GAUGE	CIC	567-11	7/91	1/92

PART 572 DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

NHTSA DUMMY I.D. NUMBER: 358

I. CONFIGURATION VERIFICATION DATA:

	P. 572 SPECIFICATION	PRE-TEST if required	POST-TEST if required
DATE OF CONFIGURATION VERIFICATION	XXXXXXXXXXXXXX	11-25-91	
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"	22.1 "	"
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"	19.6 "	"
SW - Shoulder Width	17.8 to 18.4"	18.0 "	"
HW - Hip Width	14.0 to 15.4"	14.8 "	"

II. PERFORMANCE VERIFICATION DATA:

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION		11-25-91	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY (*)		2	
VERIFICATION LAB TEMPERATURE ( 66 to 78 deg. )		69-71 deg	deg
VERIFICATION LAB HUMIDITY (10 TO 70 %)		33-41 %	%
TEST PARAMETER	SPECIFICATION		
<u>1. HEAD DROP TEST</u>			
a. peak resultant accel.	210 to 260 G's	245 G's	G's
b. peak lateral accel.	<= 10 G's	2.7 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 year 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: 358

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
<b>2. NECK BENDING TEST</b>			
a. Pendulum Speed	21.5 to 25.5 fps.	23.9 fps	fps
b. Pend. Avg. Decel. over t3 to t2	20 to 24 G's	23.6 G's	G's
c. Peak Resultant Head Acceleration	26 G's max.	25.24 G's	G's
d. Pendulum Decel. (t2-t1)	<= 3 ms.	2.48 ms	ms
e. Pendulum Decel. (t3-t2)	25 to 30 ms.	25.42 ms	ms
f. Pendulum Decel. (t4-t3)	<= 10 ms.	9.42 ms	ms
g. Max. Head Rotation	63 to 73 deg.	69.05 deg	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.	30.13 ms
	Displ.	2.1 to 3.1"	2.37 "
60 deg.	Time	40.3 to 51.7 ms.	44.52 ms
	Displ.	4.3 to 5.3"	4.62 "
Maximum	Time	53.2 to 66.8 ms.	57.04 ms
	Displ.	5.0 to 6.0"	5.26 "
60 deg.	Time	67.0 to 83.0 ms.	71.92 ms
	Displ.	4.3 to 5.3"	4.62 "
30 deg.	Time	85.4 to 104.6 ms.	89.16 ms
	Displ.	2.1 to 3.1"	2.11 "
0 deg.	Time	101.0 - 123.0 ms.	103.3 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: 358

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
<b>3. ABDOMINAL COMPRESSION</b> <u>TEST: (preload = 50 lbs.)</u>			
a. Force @ 0.5"	23 to 36 lbs.	25 lbs	lbs
b. Force @ 0.75"	36 to 50 lbs.	38.5 lbs	lbs
c. Force @ 1.0"	50 to 63 lbs.	56 lbs	lbs
d. Force @ 1.3"	73 to 88 lbs.	81.5 lbs	lbs
<b>4. LUMBAR FLEXION TEST:</b>			
a. Force @ 20 deg.	22 to 34 lbs.	31 lbs	lbs
b. Force @ 30 deg.	34 to 46 lbs.	41.5 lbs	lbs
c. Force @ 40 deg.	46 to 58 lbs.	55 lbs	lbs
d. Return Angle	12 deg. maximum	7 deg	deg
<b>5. CHEST IMPACT TESTS:</b>			
A. <u>High Speed</u>			
(1) Probe Speed	21.78-22.22 fps.	21.8 fps	fps
(2) Peak Deflection	1.7" maximum	1.5 "	"
(3) Peak Resistive Force	2250 lbs maximum	2098 lbs	lbs
(4) Internal Hysteresis	50 to 70%	64.3 %	%
B. <u>Low Speed</u>			
(1) Probe Speed	13.86-14.14 fps.	14.1 fps	fps
(2) Peak Deflection	1.1" maximum	1.02 "	"
(3) Peak Resistive Force	1450 lbs maximum	1361 lbs	lbs
(4) Internal Hysteresis	50 to 70%	58.6 %	%

TECHNICIAN'S NAME: Ivan Minkewicz

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA (continued)

II. PERFORMANCE VERIFICATION DATA (continued)

NHTSA DUMMY I.D. NUMBER: 358

TEST PARAMETER	SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
<b>6. <u>KNEE IMPACT TEST</u></b>			
<b>A. <u>Left Knee</u></b>			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	fps
(2) Maximum Force	1850 to 2500 lbs	2083 lbs	lbs
(3) Time above 1000 lbs.	1.7 ms. minimum	1.875 ms	ms
<b>B. <u>Right Knee</u></b>			
(1) Probe Speed	6.76 to 7.04 fps	7.0 fps	fps
(2) Maximum Force	1850 to 2500 lbs	1951 lbs	lbs
(3) Time Above 1000 lbs.	1.7 ms. minimum	1.875 ms	ms

REMARKS:

TECHNICIAN'S NAME: Ivan Minkewicz

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY I.D. NUMBER: 358

A. DUMMY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
<b>1. HEAD ACCELEROMETER</b>				
HX LONGITUDINAL	ENDEVCO	ER72	10/91	4/92
HY LATERAL	ENDEVCO	GD54	10/91	4/92
HZ VERTICAL	ENDEVCO	CK11	10/91	4/92
<b>2. CHEST ACCELEROMETER</b>				
CX LONGITUDINAL	CEC	A145	10/91	4/92
CY LATERAL	ENDEVCO	FL04	10/91	4/92
CZ VERTICAL	CEC	A149	10/91	4/92
<b>3. FEMUR LOAD CELLS</b>				
LEFT SIDE	GSE	548	11/91	5/92
RIGHT SIDE	GSE	549	11/91	5/92

B. CALIBRATION LABORATORY INSTRUMENTS

	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
<b>1. PENDULUM ACC.</b>	CEC	A160	5/91	11/91
<b>2. TEST PROBE ACCELEROMETER</b>	CEC	A161	5/91	11/91
<b>3. LUMBAR FLEXION TEST PUSH FORCE GAUGE</b>	TRANS-DUCER INC	20051	7/91	1/92
<b>4. ABDOMINAL COMPRESS. TEST FORCE GAUGE</b>	BLH	72952	7/91	1/92
<b>5. ABDOMINAL COMPRESS. TEST FORCE GAUGE</b>	CIC	567-11	7/91	1/92



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	CS75	ENDEVCO	10/91	4/92
	CY89	ENDEVCO	10/91	4/92
	CE76	ENDEVCO	10/91	4/92
Chest X Y Z	A147	CEC	10/91	4/92
	CJ54	ENDEVCO	10/91	4/92
	A148	CEC	10/91	4/92
Right Femur Load Cell	312	GSE	11/91	5/92
Left Femur Load Cell	311	GSE	11/91	5/92
Neck Load Cell X Y Z		DENTON		
		DENTON		
		DENTON		
Neck Moment X Y Z		DENTON		
		DENTON		
		DENTON		
Chest Deflection Gauge Hybrid III Use Only		HUMANOID		
Lap Belt Load Cells	123	LEBOW	11/91	5/92
Shoulder Belt Load Cells	127	LEBOW	11/91	5/92
Spool-Out Potentiometer	22	SERVONIC INST.	10/91	4/92
Belt Stretch Transducer	E1	CALSPAN	10/91	4/92

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY  
(6 Month Calibration Minimum)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration	
			Last	Next
Head X Y Z	ER72	ENDEVCO	10/91	4/92
	GD54	ENDEVCO	10/91	4/92
	CK11	ENDEVCO	10/91	4/92
Chest X Y Z	A145	CEC	10/91	4/92
	FLO4	ENDEVCO	10/91	4/92
	A149	CEC	10/91	4/92
Right Femur Load Cell	549	GSE	11/91	5/92
Left Femur Load Cell	548	GSE	11/91	5/92
Neck Load Cell X Y Z		DENTON		
		DENTON		
		DENTON		
Neck Moment X Y Z		DENTON		
		DENTON		
		DENTON		
Chest Deflection Gauge Hybrid III Use Only		HUMANOID		
Lap Belt Load Cells	133	LEBOW	11/91	5/92
Shoulder Belt Load Cells	135	LEBOW	11/91	5/92
Spool-Out Potentiometer	32	SERVONIC INST.	10/91	4/92
Belt Stretch Transducer	E3	CALSPAN	10/91	4/92

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS  
(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	A187	CEC	9/91	3/92
Right Rear Seat Crossmember	A52	CEC	10/91	4/92
Top of Engine	A144	CEC	10/91	4/92
Bottom of Engine	A181	CEC	10/91	4/92
Left Disc Brake Caliper	A189	CEC	10/91	4/92
Right Disc Brake Caliper	A70	CEC	7/91	1/92
Instrument Panel	A142	CEC	10/91	4/92
Center Rear Crossmember Z	A101	CEC	10/91	4/92
Vehicle Rear Z	A177	CEC	10/91	4/92

INSTRUMENT CALIBRATION FOR LABORATORY INSTRUMENTS  
(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Neck Bending Pendulum Accel.	A160	CEC	5/91	11/91
Neck Bending Rotary Potentiometer	None	BOURNS	7/91	1/92
Femur Probe Accelerometer	A161	CEC	5/91	11/91
Chest/Thorax Probe Accel.	A161	CEC	5/91	11/91
Lumbar Flexion Force Gauge	20051	TRANSDUCER INC.	7/91	1/92

Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

## Safety Restraints

### Using Safety Restraints Properly Safety Belts

The use of safety belts help to restrain you and your passengers in case of a collision. In most states, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Safety belts provide best restraint when:

- the seat back is upright
- the occupant is sitting upright (not slouched)
- the lap belt is snug and low on the hips
- the shoulder belt is snug against the chest
- the knees are straight forward

For your safety, your vehicle has different types of safety belts:

- Combination lap and shoulder belts - for people who sit next to the side windows in either front or rear seats
- Lap belts without retractors

See the following sections for directions on how to properly use these safety belts. Also see *Safety Restraints for Children* in this chapter for special instructions about using safety belts for children.

#### Warning:

Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that lap belts fit snugly and as low as possible around the hips. If safety belts are not used properly, the risk of you or your passengers being injured in a collision greatly increases.

#### Warning:

Always drive and ride with your seatback upright and the lap belt snug and low across the hips to reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Do not allow any people to ride in the cargo area of your vehicle. People who are not riding in seats with their safety belts fastened are much more likely to be injured in a collision.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Children should always ride with the seatback in the fully upright position. When the seatback is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

Never use a single belt for more than one person or across more than one seating position. This greatly increases the risk that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair.

**Warning:** Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Failure to follow these precautions could increase the risk and/or severity of injury in an accident.

**Warning:** Be sure to lock all doors before you drive away. This will lessen your risk of being thrown from the vehicle in a collision.

### Combination Lap and Shoulder Belts

While your vehicle is in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, corner hard or if your truck receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and prevents you from moving. If your vehicle is an F-350 crew cab, your belt system can also be made to lock by jerking on the belt. (Front belts only)

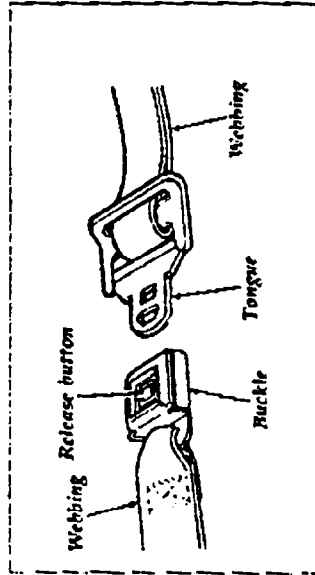
After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, pull the lap-shoulder belt from the retractor so that the shoulder portion

of the belt crosses your shoulder and chest. Insert the belt tongue into the proper buckle until you hear a snap and feel it latch.

**Warning:** Use the shoulder belt only on the shoulder that is closest to the side of the vehicle. Never wear the belt under your arm. Never swing it around your neck over the inside shoulder. If you do not use the shoulder belt properly, the chances of your being injured in a collision greatly increase.

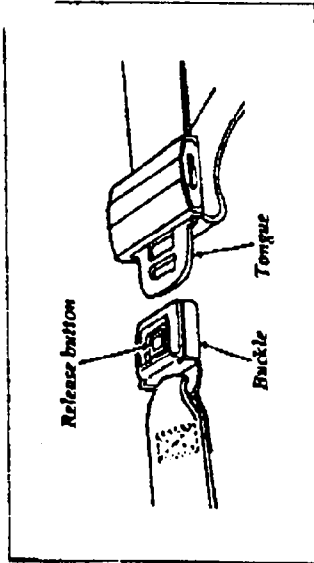
To tighten the lap portion of the belt, pull up on the shoulder belt until it fits you snugly. The belt should rest as low on your hips as possible.



Unfastening the outboard lap-shoulder belts

### Lap Belts Without Retractors

The center lap belts and center (facing seat) lap belts do not have retractors and therefore should be shortened and fastened when you are not using them. To lengthen your belt, tip the belt tongue at a right angle to the belt and pull the belt over your lap until the tongue reaches the buckle.



**Fastening and unfastening rear occupant safety belts**

To fasten the belt, pull the belt across your hips and insert the tongue into the correct buckle on your seat until you hear a snap and feel it lock. Make sure the buckle is securely fastened.

Adjust the belt so that it fits snugly and as low as possible around the hips:

- If you need to lengthen the belt, unfasten it and repeat the procedure above.
- If you need to shorten the belt, pull on the loose end of the webbing.

**To Unfasten the Safety Belts with Retractors:**

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.
2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

**To Untwist or Unjam a Safety Belt (Retractor):**

If you should jam the lap belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Pull on the belt with both hands to tighten it on the retractor spool.
2. Feed the belt back into the retractor until it is completely retracted. Repeat previous step if necessary.
3. Pull the belt out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.
4. Then, pull the belt out and let it retract several times to make sure that the belt works properly.

**Safety Belt Extension Assembly**

For some people, the safety belt may be too short even when it is fully extended. You can add about eight inches (20 cm) to the belt length with a safety belt extension assembly (6J1C22). Safety belt extensions are available from your dealer.

**Warning:** To ensure that the safety belt extension assembly will hold in the event of a collision, only safety belt extensions manufactured by the same supplier as the safety belt should be used. Manufacturer identification is located at the end of the webbing on a label.

**Safety Belt Maintenance**

Check your safety belt system periodically to make sure that it works properly and isn't damaged. If the webbing shows any wear, nicks