V1607

REPORT NUMBER: CAL-91-N16

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

CHRYSLER CORPORATION
1991 PLYMOUTH ACCLAIM
4-DOOR SEDAN

NHTSA NUMBER: MM0304

CALSPAN TEST NUMBER: 7893-12

CALSPAN CORPORATION
ADVANCED TECHNOLOGY CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

May 21, 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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Prepared: Michael J. Kilgallon
Michael J. Kilgallon, Project Engineer

Approved: Steven J. Popkin for
Walter E. Levan, Program Manager
Transportation Research/
Physical Sciences Department

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program (NCAP)

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15. Supplementary Notes

16. Abstract

A frontal load cell barrier test of a 1991 Plymouth Acclaim 4-Door Sedan was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York on May 21, 1991.

The impact speed was 35.0 mph and the ambient temperature at the barrier face at the time of impact was 75°F. The maximum post-test vehicle crush was 23.9 inches. The test vehicle was equipped with a 3-point continuous belt restraint system at each of the front outboard seating positions. The test vehicle was also equipped with a driver side airbag as a supplemental restraint device.

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 requirement.

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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 MM0304

A load cell barrier consisting of 36 load cells was impacted by a 1991 Plymouth Acclaim 4-Door Sedan at a velocity of 35.0 mph. The test was performed at the Calspan Corporation Advanced Technology center on May 21, 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 572E, 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. 150) was used in a previous test (MM0107). Injury criteria values were not exceeded in that test. The right front passenger ATD (Serial No. 245) was calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendices C and D.

The 83 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 #4(X), located on the bottom of engine block, was separated from the engine block during impact, therefore, the accelerometer did not record accurately during test. In addition, accelerometer #6(X), (located on the left disc brake caliper) did not record accurately during test. The velocity and displacement data traces have been removed from this report for both accelerometers. Position 2 Belt Spool Out and Position 2 Neck Force Z failed to record during test. Consequently, Position 2 Neck Force Resultant data trace was removed from report. Position 1 Neck Forces and Neck Moments contained a noise disturbance at approximately 74 milliseconds. The reason for this disturbance is unknown. Position 1 Neck Moment Z contained intermittent data after 145 milliseconds.

The driver's HIC was 761.5. The maximum chest deceleration over 3 milliseconds was 54.6 g's and femur loads were 1044.4 and 890.9 pounds.

The right front passenger's HIC was 445.8 and maximum chest deceleration over 3 milliseconds was 42.8 g's. Femur loads were 252.1 and 1116.7 pounds.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1991 Plymouth Acclaim 4-Door Sedan

NHTSA No.: MM0304 VIN.: 1P3XA46K1MF515457

Body Color: White Date Of Manufacture: August 1990

Engine: 4 Cylinders; - C.I.D.; 2.5 Liters; - CC
X Gas; - Diesel; - Turbocharged
- Longitudinal; X Transverse

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

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

Date Received: 5-13-91 Odometer Reading: 32 miles

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

Type of Occupant Restraint: 3-point continuous belt restraint with a driver side airbag

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 32 psi, Rear 35 psi

Recommended Tire Size: P185/70R14

Recommended Cold Tire Pressure: Front 32 psi, Rear 35 psi

Tires on Vehicle: P185/70R14 ; Manufacturer: Goodyear

Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 865 lbs. (A)

No. of Occupants x 150 lbs. = 750 lbs. (B)

Rated Cargo and Luggage
Weight (RCLW) A-B = 115 lbs.

GVWR 4025 lbs. GAWR: Front 2177 lbs. Rear 1898 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 = 840 lbs. Right Rear = 540 lbs.

Left Front = 960 lbs. Left Rear = 520 lbs.

TOTAL FRONT WEIGHT = 1800 lbs. (62.9 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1060 lbs. (37.1 % of Total Vehicle Weight)

TOTAL DELIVERY WEIGHT = 2860 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight (2860 lbs.)

VCW = Vehicle Capacity Weight (865 lbs.)

DSC = Designated Seating Capacity (5)

RCLW = VCW - 150 (DSC) = 115 lbs.

Target Test Weight = UDW + RCLW + (2 dummies x 167 lbs./dummy)

Target Test Weight = 3309 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 106 POUNDS CARGO:

Right Front = 930 lbs. Right Rear = 700 lbs.

Left Front = 980 lbs. Left Rear = 690 lbs.

TOTAL FRONT WEIGHT = 1910 lbs. (57.9 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1390 lbs. (42.1 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 3300 lbs.

Weight of ballast secured in vehicle trunk area = 0 lbs.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 27.0 LF 26.8 RR 27.5 LR 27.2

Test Attitude: RF 26.5 LF 26.3 RR 25.5 LR 24.9

Wheel Base: 103.6 in.; C.G. = 43.6 in. rearward of front wheel C/L

Remarks: 14.9 gallons of stoddard solution was placed in the 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 21, 1991 Time of Test: 12:15

Ambient Temperature: 75 °F at impact area

Temperature in Occupant Compartment: 72 °F

Windshield Molding Temperature: 72 °F

Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: primary = 35.0 mph, secondary = 35.0 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	175.7	C_L	180.4	L	175.5
	Post-test	= R	156.5	C_L	156.5	L	154.2
	Crush	= R	19.2	C_L	23.9	L	21.3

Distance from front of test vehicle to point of impact:

R 19.3 C_L 19.6 L 23.5

VISIBLE DUMMY CONTACT POINTS:

	Driver	Passenger
Head	Air Bag	Top of Head Had Slight Contact with Dashpanel
Chest	Air Bag	No Contact
Abdomen	No Contact	No Contact
Left Knee	Lower Dash Panel	Glove Compartment Door
Right Knee	Lower Dash Panel	Glove Compartment Door

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	Front		Rear	
	Left	Right	Left	Right
Door Opening	Tools Required	Tools Required	Operable	Operable

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

Glazing Damage

Backlight/Windshield: Windshield sustained stress fractures but remained intact.

Other Notable Impact Effects: None.

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.: MM0304 Vehicle: 1991 Plymouth Acclaim 4-Door Sedan

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-79.8	-19.8	32.2	85.2
Position #2 - Passenger	-51.8	8.9	38.5	59.9

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-55.9	-8.3	15.9	54.6
Position #2 - Passenger	-44.0	-13.8	9.9	42.8

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	1044.4	890.9
Position #2 - Passenger	252.1	1116.7

	MAXIMUM FORCE - SEAT BELT LOADS (lbs.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	1229.0	-	1231.0
Position #2 - Passenger	1680.8	1182.0	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t_1 (SEC)	t_2 (SEC)	Average Acceleration t_1 TO t_2
Position #1 - Driver	761.5	.05424	.07740	64.1
Position #2 - Passenger	445.8	.07932	.11520	43.4

HIC is as defined in FMVSS 208. The maximum time interval from t_1 to t_2 is 36 milliseconds.

Table 3

HYBRID III NECK AND CHEST DATA SHEET

Vehicle Year/Make/Model/Body Style: 1991 Plymouth Acclaim 4-Door Sedan

Vehicle NHTSA No.: MM0304 Test Date: May 21, 1991

MAXIMUM VALUES	DRIVER DUMMY ID # 150	PASSENGER DUMMY ID # 245
Neck Load X	-150*	297.8
Neck Load Y	-265*	281.6
Neck Load Z	1050*	**
Neck Moment X	125*	253.3
Neck Moment Y	450*	327.2
Neck Moment Z	650*	122.7
Chest Deflection X (in.)	1.8	1.4
Time of Max. Occurance	66.7 msec	88.4 msec

NOTE: All values listed must be occurring during primary impact event.

*The maximum values that are shown are only approximations, thus neglecting the noise disturbance at 74 msec.

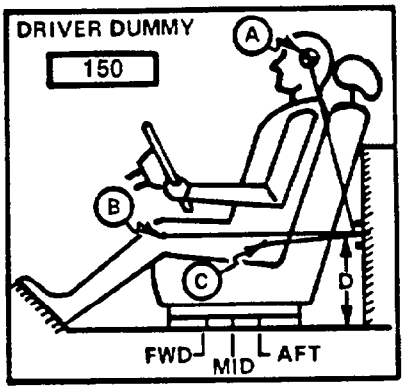
**Pos. 2 Neck Load Z failed to record during test.

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION

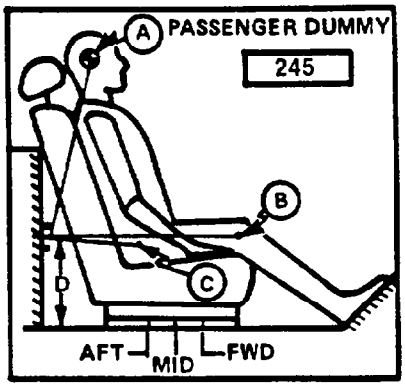
Test No.: MM0304 Vehicle: 1991 Plymouth Acclaim 4-Door Sedan

SEAT TYPE:	ADJUSTER TYPE:	SEAT BACK TYPE:
- Bench	X Manual	- Fixed
X Bucket	- Power	X Adjustable Reclining
- Split Bench		

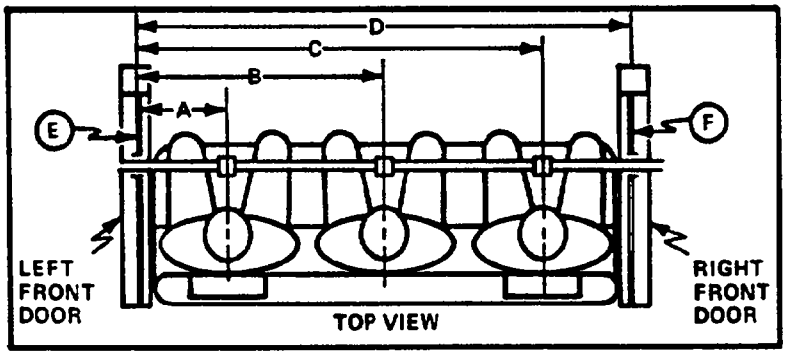


MEASUREMENT LOCATION

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



A =	19.9 in.	15 Degrees	A =	18.7 in.	13 Degrees
B =	23.5 in.	98 Degrees	B =	24.8 in.	98 Degrees
C =	9.5 in.	130 Degrees	C =	9.9 in.	132 Degrees
D =	14.9 in.		D =	14.9 in.	



DUMMY ID

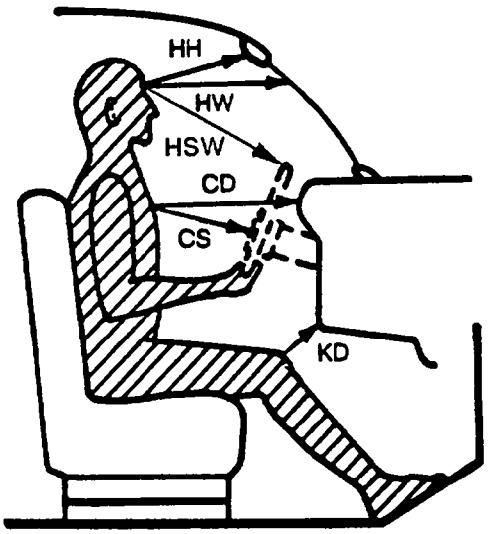
S/N 150 S/N 245

A =	Left Door to Driver Centerline	13.5	in.
B =	Left Door to Center Passenger Centerline	-	in.
C =	Left Door to Right Passenger Centerline	39.1	in.
D =	Left Door to Right Door	51.8	in.
E,F =	Window Glass Height (Right and Left Must Be Equal)	11.0	in.

Figure 2

OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	12.1	12.6
HW	17.8	17.7
CD	18.5	20.5
CS	9.9	–
KDL	4.8	5.0
KDR	5.8	5.0
SA	See Note	See Note
TA	24°	23°
HSW	15.0	–



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

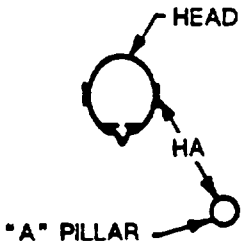
HS = Head to Side Window

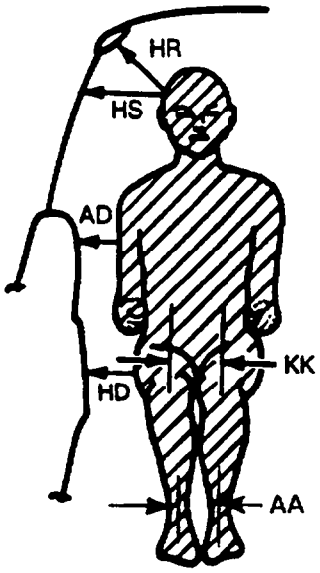
AD = Arm to Door

HD = Hip to Door

KK = Knee to Knee

AA = Ankle to Ankle



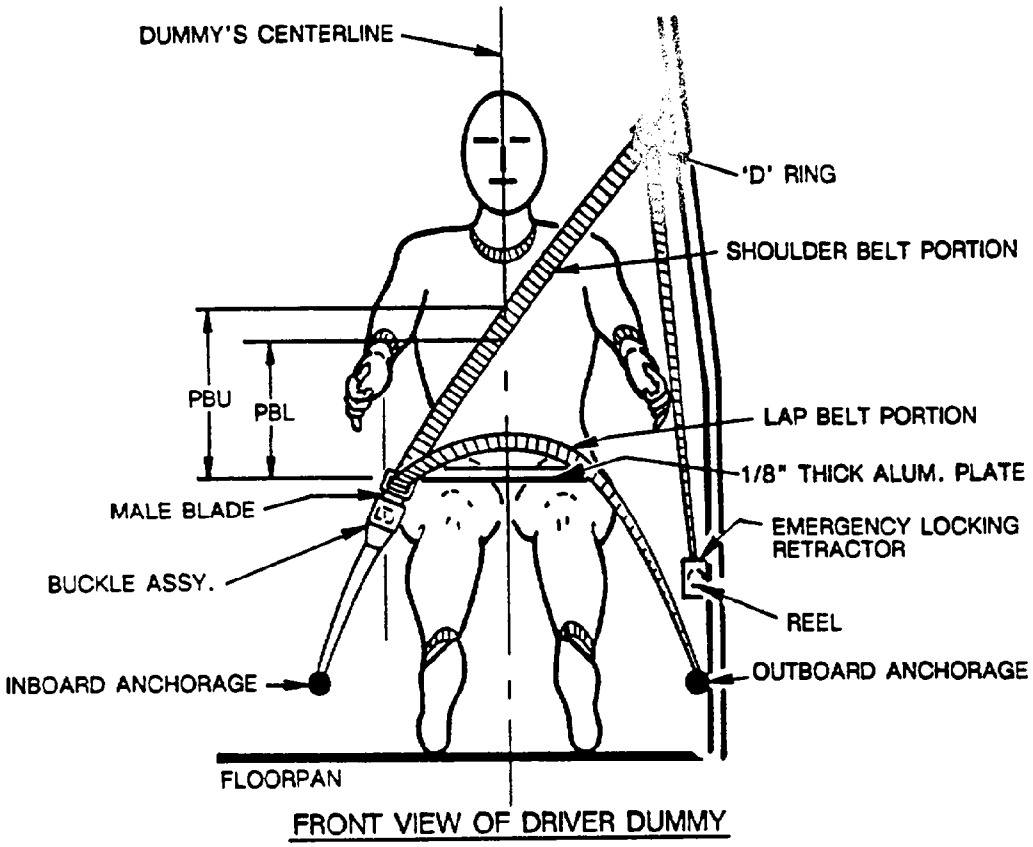


	DRIVER	PASSENGER
HR	6.8	6.3
HS	10.2	9.6
AD	4.8	4.4
HD	6.9	6.6
KK	9.5	7.0
HA	17.0	16.7
AA	12.0	7.2

Note: Seat back was positioned according to manufacturer's specifications.

Figure 3

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
PBU -- Top surface of alum. plate to upper edge	12.5	12.5
PBL -- Top surface of alum. plate to belt lower edge	9.5	9.5
LAP BELT TENSION	2.0 lbs.	2.0 lbs.
SHOULDER BELT TENSION	-	-

Table 4

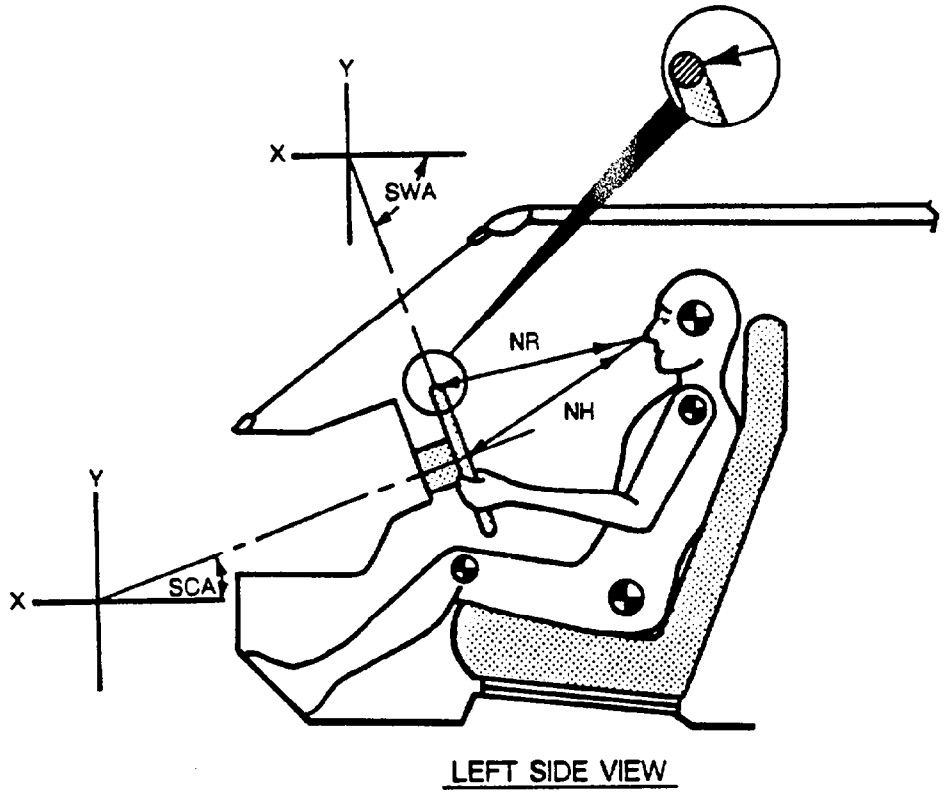
SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:	Driver	Passenger
Shoulder [illegible] length as measured on Part [illegible] mmy.	83.5"	83.5"
Shoulder [illegible] length as measured on Part [illegible] my.	34.5"	34.5"
Lap belt length as measured on Part 572 Dummy.	30.0"	30.0"
SHOULDER BELT SPOOL-OFF DATA:		
As determined by film analysis.	2.3"	2.2"
As determined mechanically.	2.0"	2.3"
As determined electronically.	2.7"	*
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	0.8 in/ft	0.8 in/ft
Measured mechanically	0.0 in/ft	0.0 in/ft

*Position 2 Belt Spool-Out did not record during test.

Figure 4

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



LEFT SIDE VIEW

	MEASUREMENTS	
NR -- Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	14.0	Inches
NH -- Distance from tip of dummy's nose to center of steering column hub	14.3	Inches
SCA -- Angle of steering column relative to the horizontal X axis	25.0	Degrees
SWA -- Angle of steering wheel relative to the horizontal X axis	-65.0	Degrees

Figure 5

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera Information Shown on Table 4

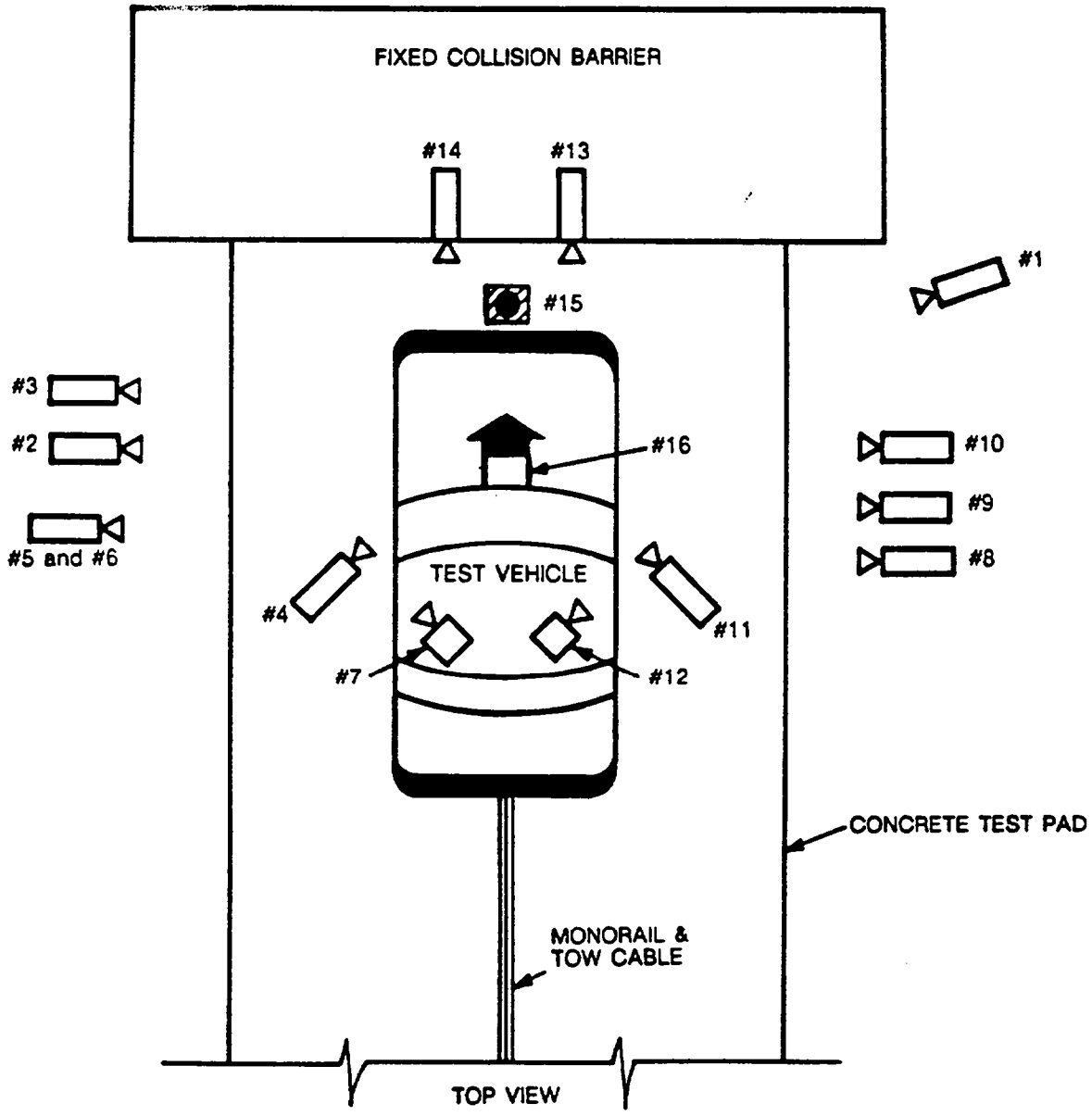


Table 5

HIGH-SPEED CAMERA LOCATIONS

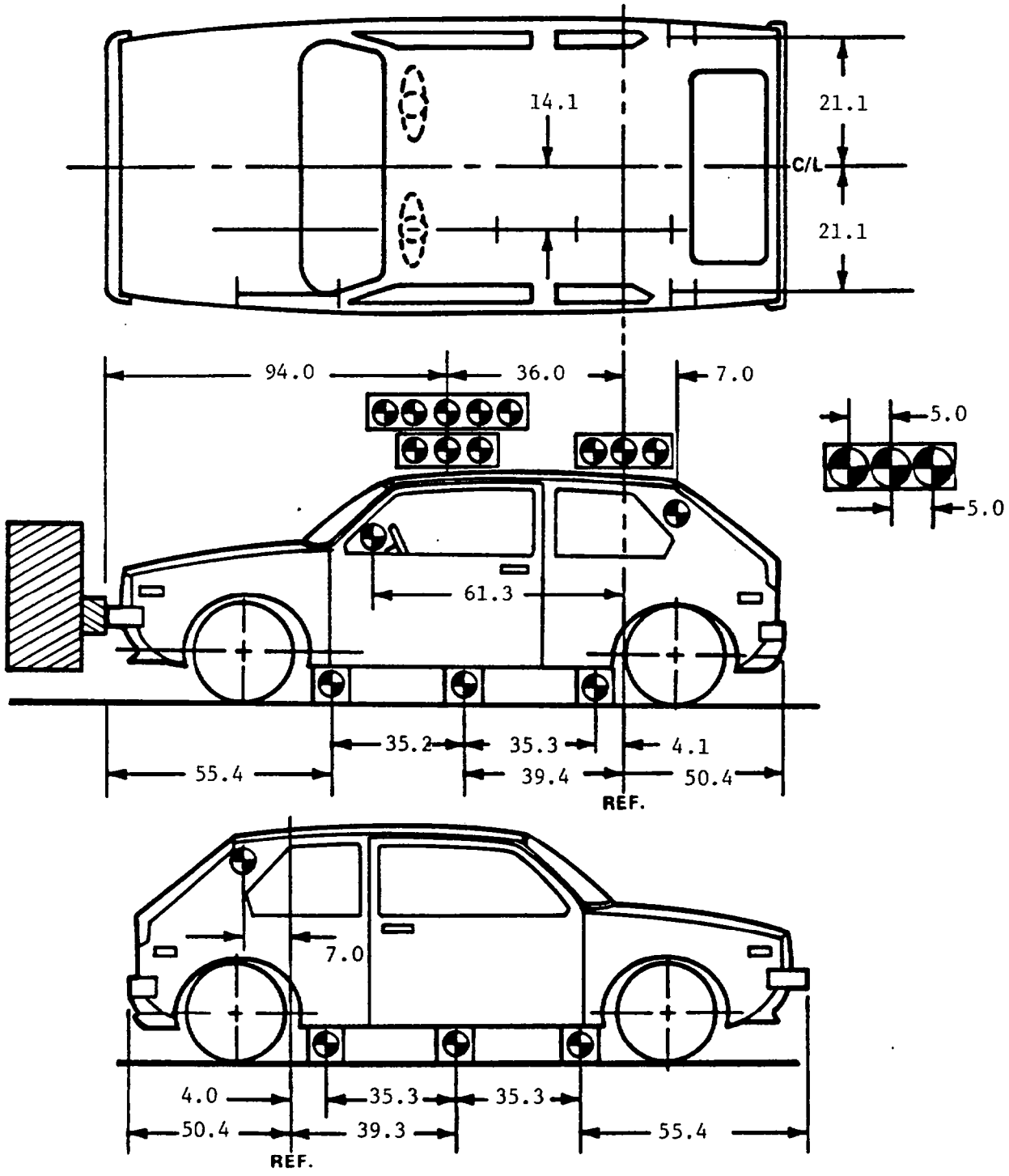
Test No. MM0304 Vehicle: 1991 Plymouth Acclaim 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (in)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	–	–	–	–	–	–	24
2	Overall Left Side	218	57	41	-6	201	13	540
3	Left Side View	306	28	41	-3	290	25	570
4	Driver and Interior View	94	100	70	-19	77	13	650
5	Steering Column (Bottom)	271	70	47	-5	254	25	540
6	Steering Column (Top)	271	70	68	-9	254	25	570
7	Left Belt	–	–	–	–	–	8	790
8	Overall Right Side	221	65	41	-2	204	13	620
9	Right Side View	298	46	40	-2	281	25	640
10	Right Passenger View	284	58	52	-3	[illegible]	35	550
11	Passenger and Interior View	104	125	63	-21	87	25	530
12	Right Belt	–	–	–	–	–	8	625
13	Passenger Front View	24	-5	72	-40	–	13	530
14	Driver Front View	24	-5	72	-35	–	13	520
15	Windshield View	0	0	120	-45	–	13	540
16	Pit View of Engine	0	34	-120	90	–	13	680

*X = film plane to monorail centerline
Y = film plane to impact location
Z = film plan to ground
** = referenced to horizontal plane

Figure 6

VEHICLE TARGET LOCATIONS

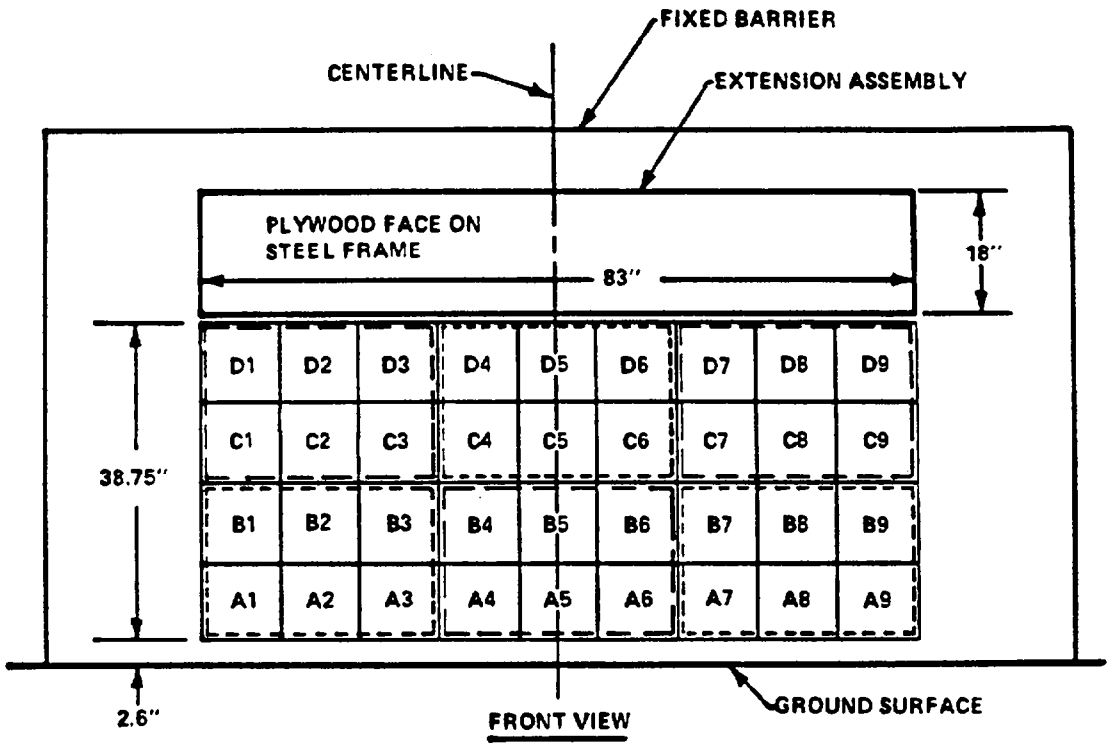


(DIMENSIONS IN INCHES)

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

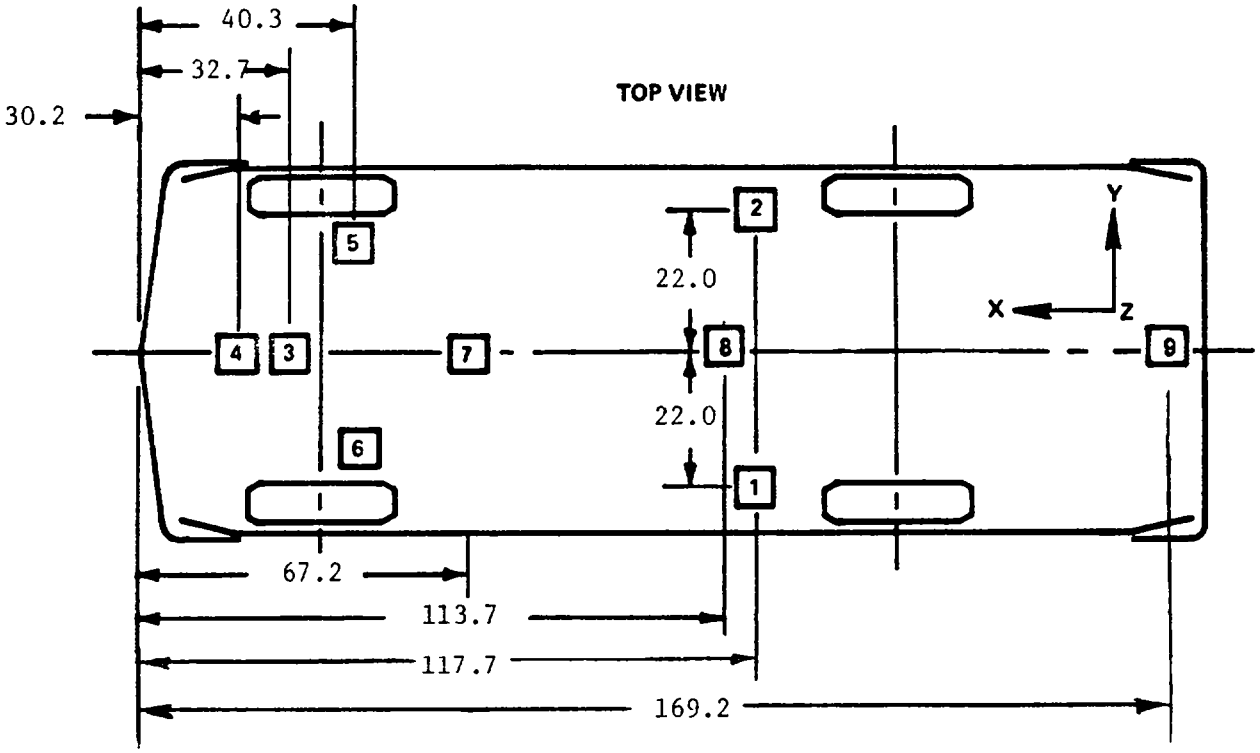
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

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



(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 Disk 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.

**Note: Due to location the top engine accelerometer was removed prior to test.

Figure 9

TEST VEHICLE MEASUREMENTS

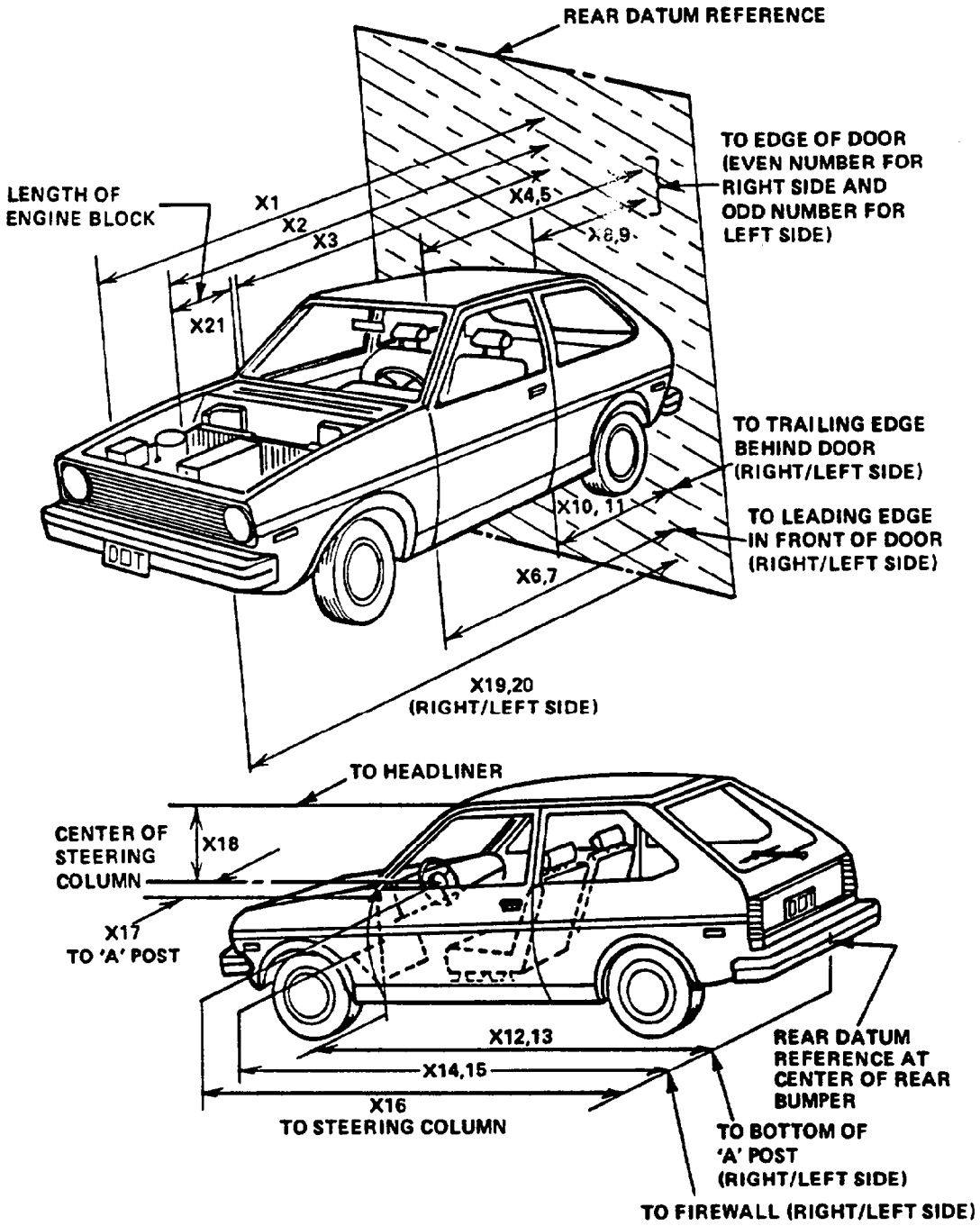


Table 6

VEHICLE MEASUREMENTS

No.		All Dimensions in Inches		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	180.4	156.5	23.9
X2	Rear Surface of Vehicle to Front of Engine	151.2	143.5	7.7
X3	Rear Surface of Vehicle to Firewall	133.7	127.4	6.3
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	122.5	122.3	0.2
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	122.5	122.9	-0.4
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	121.5	120.4	1.1
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	121.3	120.6	0.7
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	82.9	83.1	-0.2
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	82.6	82.9	-0.3
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	83.2	82.4	0.8
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	82.9	82.6	0.3
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	121.2	119.5	1.7
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	121.0	120.4	0.6
X14	Rear Surface of Vehicle to Firewall, Right Side	134.2	128.5	5.7
X15	Rear Surface of Vehicle to Firewall, Left Side	133.7	126.2	7.5
X16	Rear Surface of Vehicle to Steering Column	104.0	103.0	1.0
X17	Center of Steering Column to "A" Post	16.5	15.5	1.0
X18	Center of Steering Column to Headliner	17.2	17.5	-0.3
X19	Rear Surface of Vehicle to Right Side of Front Bumper	175.7	156.5	19.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	175.5	154.2	21.3
X21	Length of Engine Block	15.3	15.3	0.0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	113.9	113.3	0.6
CD	Rear Surface of Vehicle to Center of Dash Panel	112.3	110.3	2.0
LD	Rear Surface of Vehicle to Left Side of Dash Panel	111.3	110.3	1.0

Appendix A

PHOTOGRAPHS

PHOTOGRAPHS

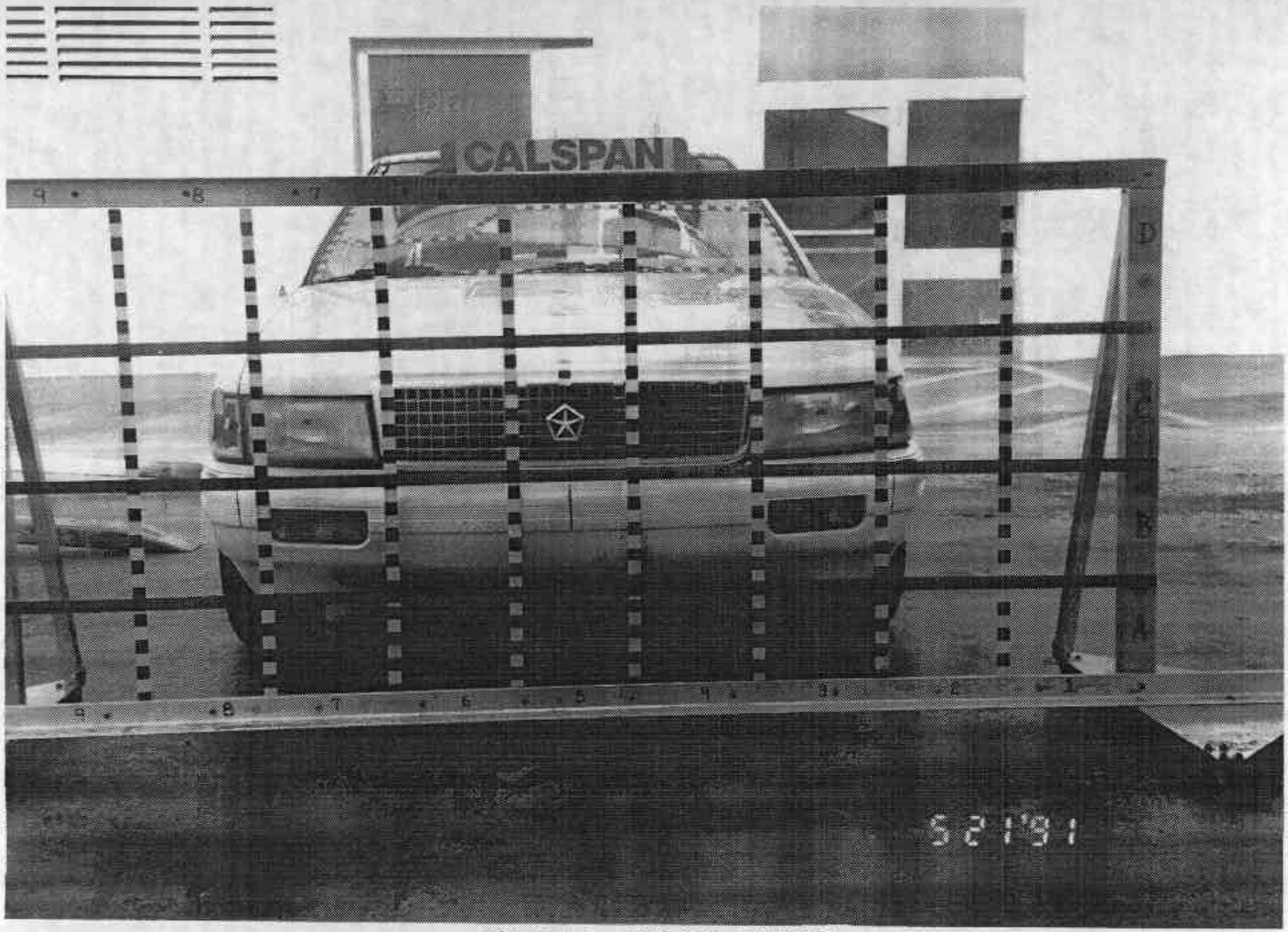


Figure A-1 LOAD CELL LOCATIONS

7893-12

Figure A-2 PRE-TEST FRONT VIEW

Figure A-3 POST TEST FRONT VIEW

Figure A-4 PRE-TEST LEFT SIDE VIEW

Figure A-5 POST TEST LEFT SIDE VIEW

Figure A-6 PRE-TEST RIGHT SIDE VIEW

7893-12

Figure A-7 POST-TEST RIGHT SIDE VIEW

7895-12

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

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

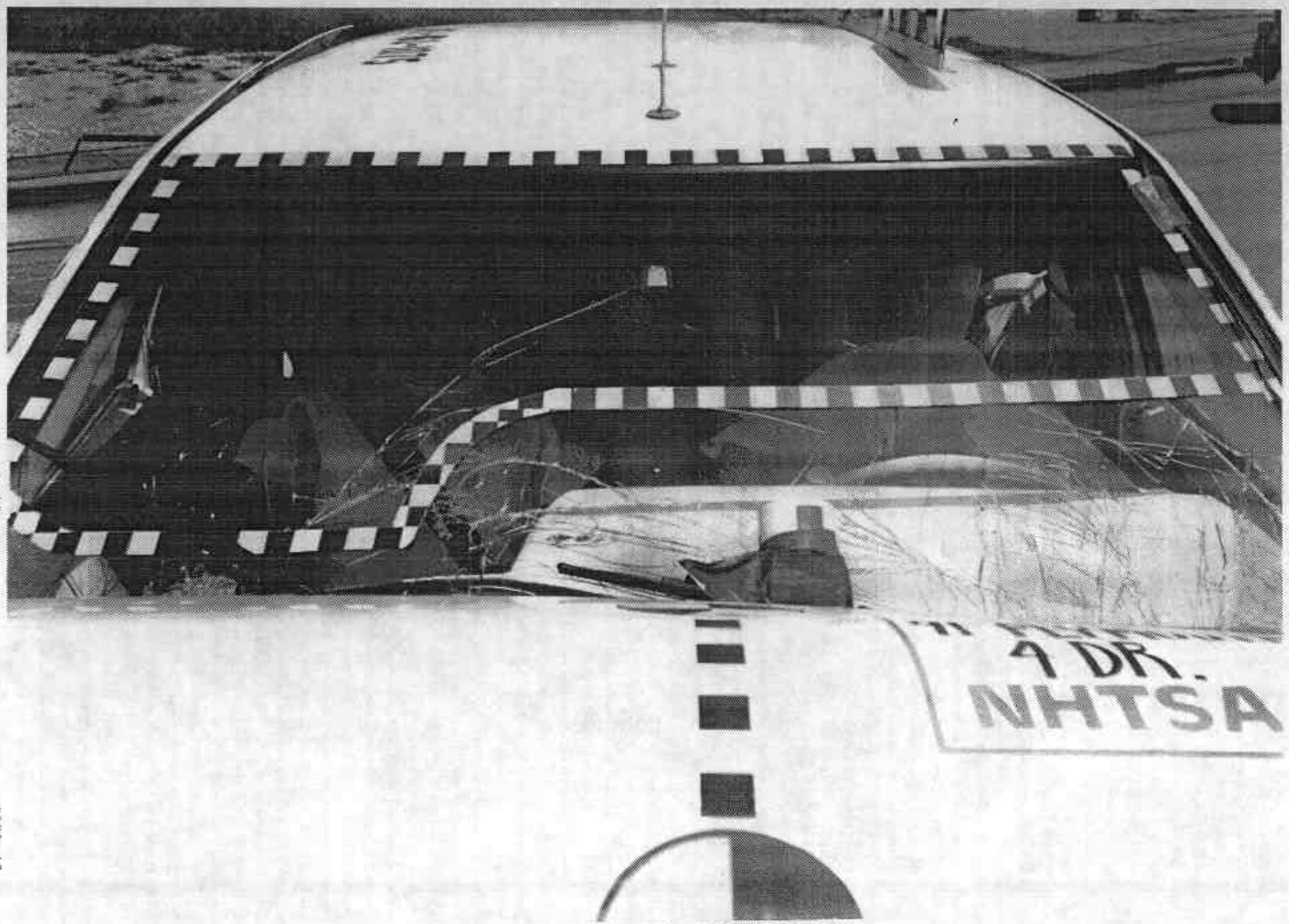
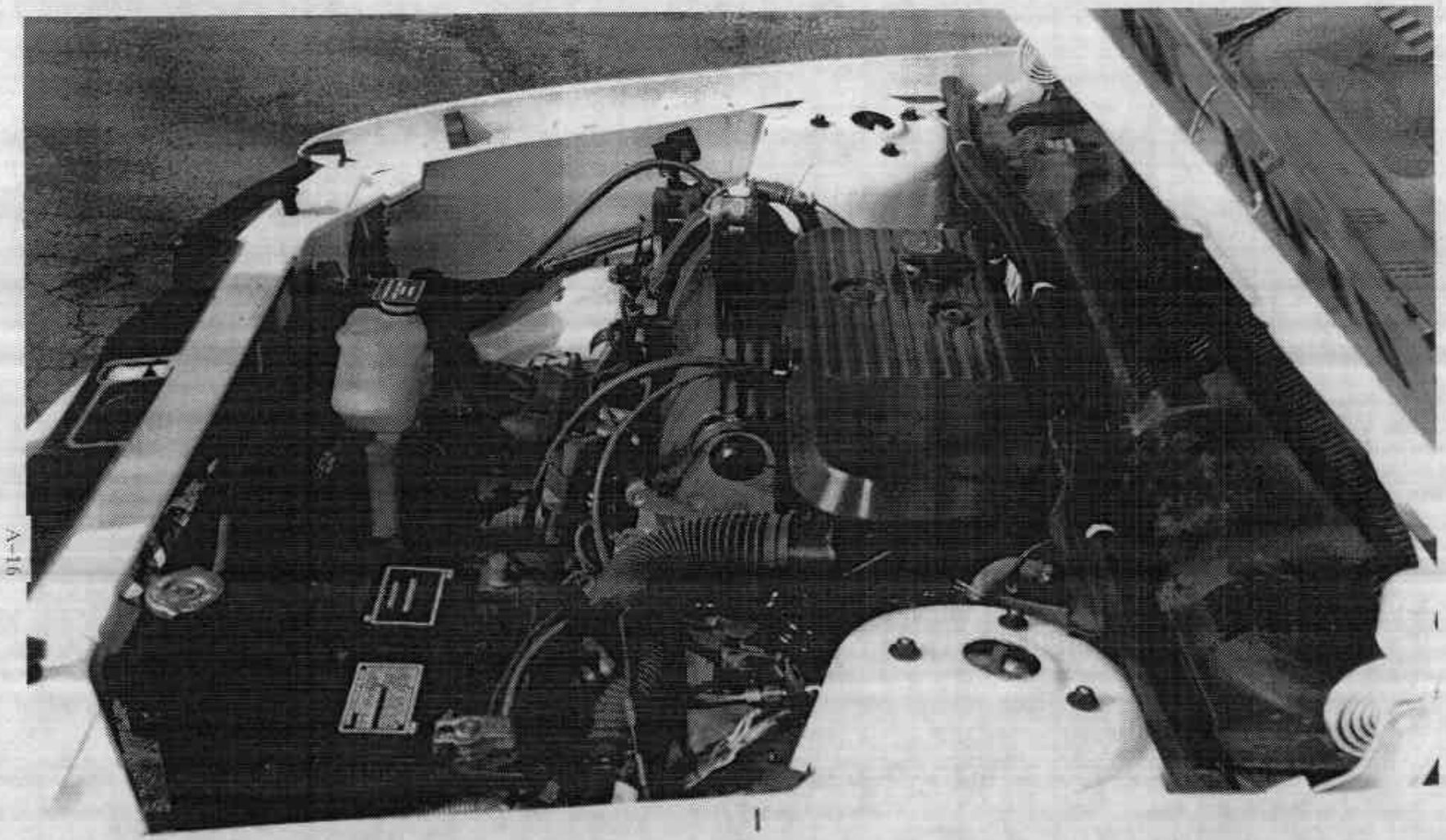


Figure A-13 POST-TEST WINDSHIELD VIEW



7893-12

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 FUEL CAP VIEW

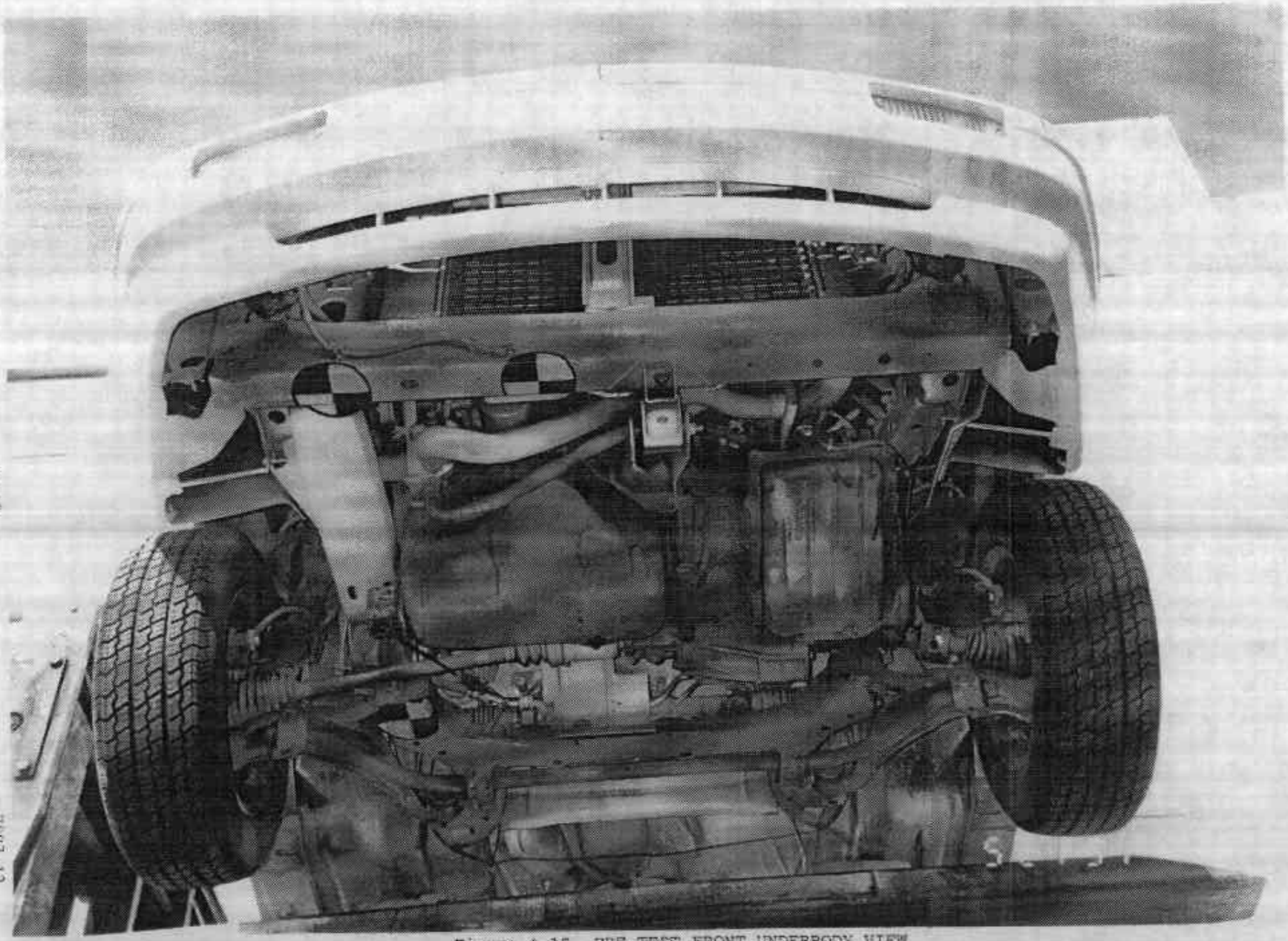


Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

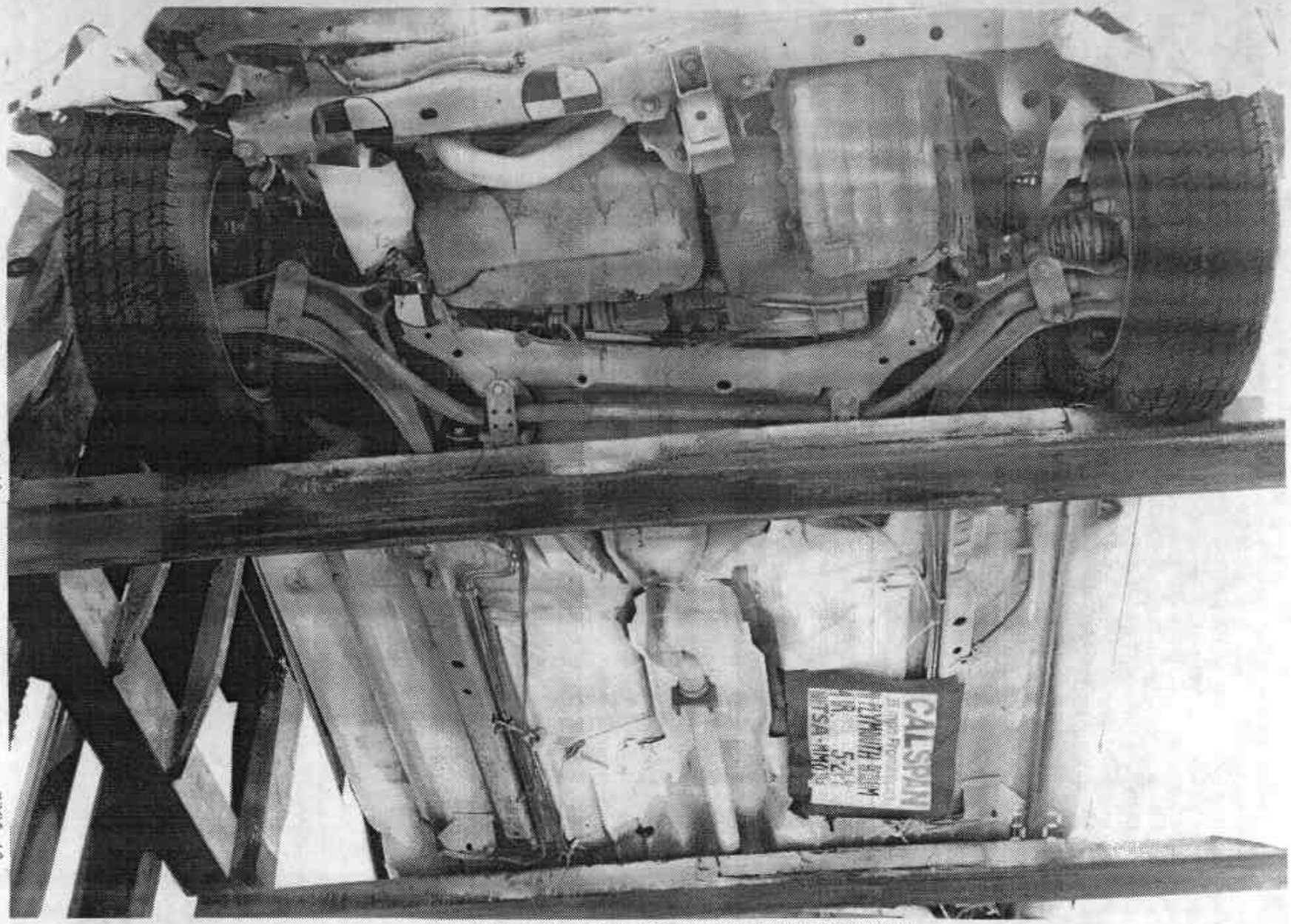


Figure A-17 POST-TEST FRONT UNDERBODY VIEW

Figure V-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

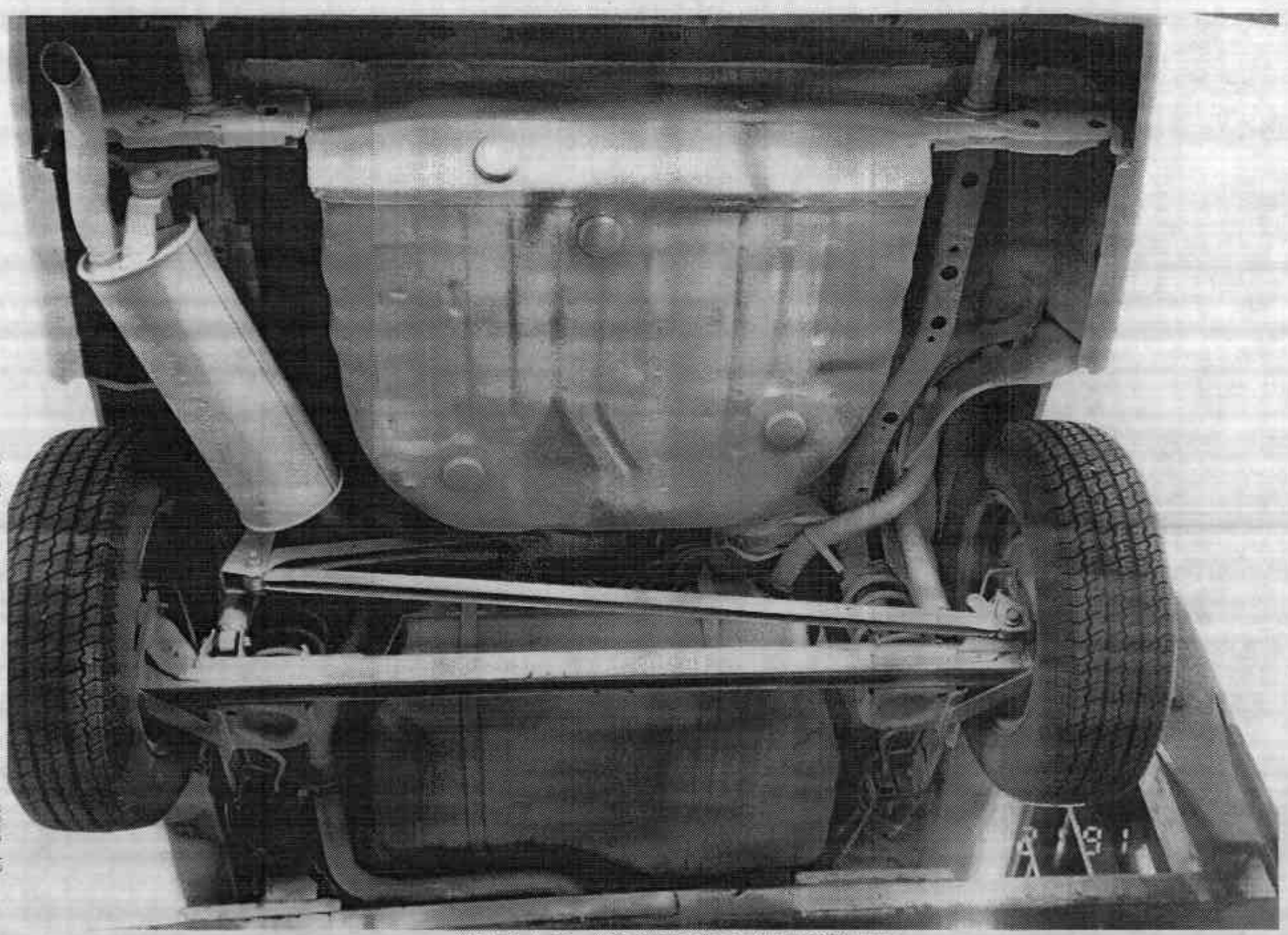


Figure A-20 PRE-TEST REAR UNDERBODY VIEW

Figure A-21 POST-TEST REAR UNDERBODY VIEW

7893-12

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

A-28

7893-12

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

7893-12

Figure A-30 PRE-TEST DRIVER HEAD LOCATION

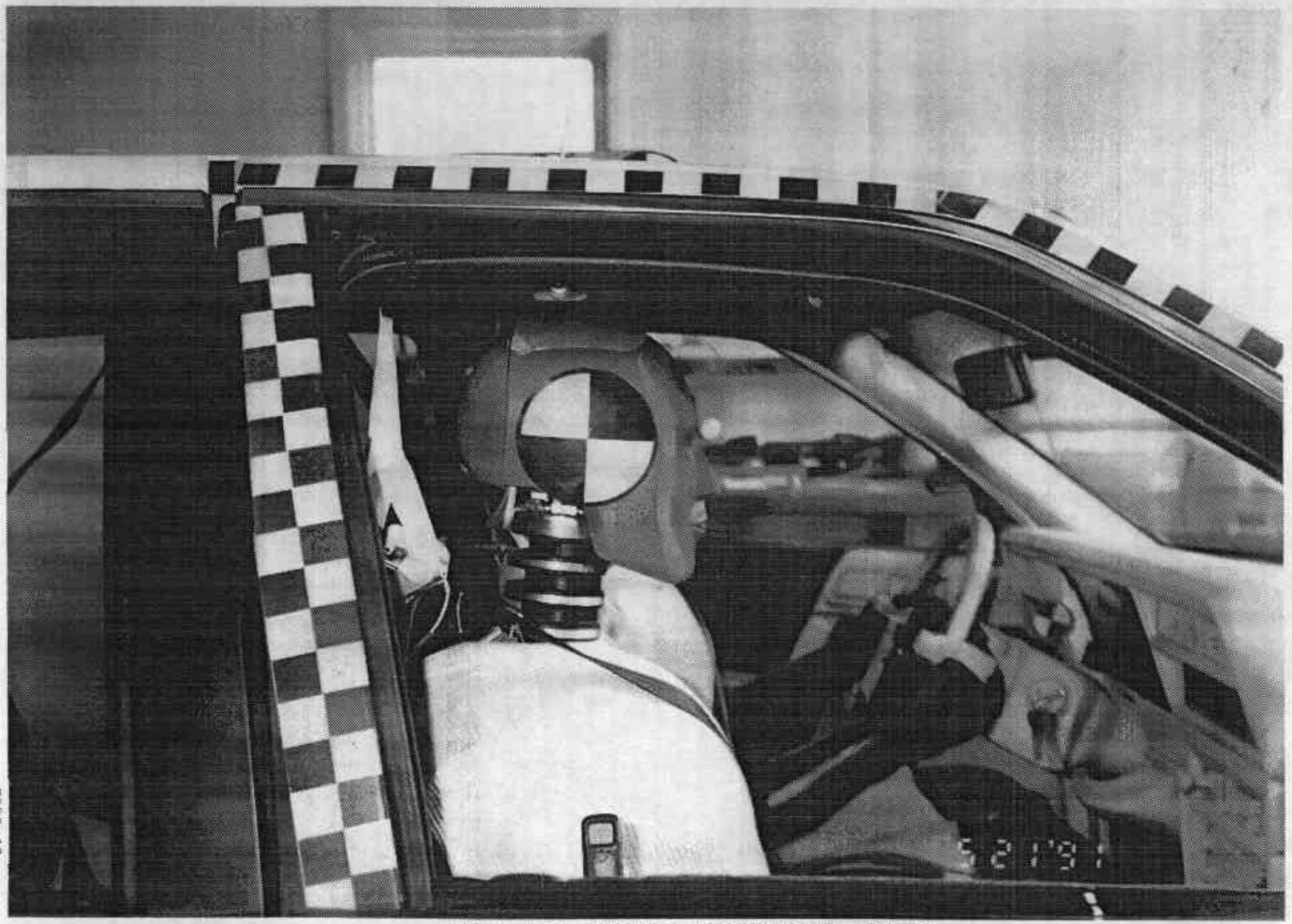


Figure A-31 PRE-TEST PASSENGER HEAD LOCATION

Figure A-32 IMPACT VIEW

Appendix B

VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

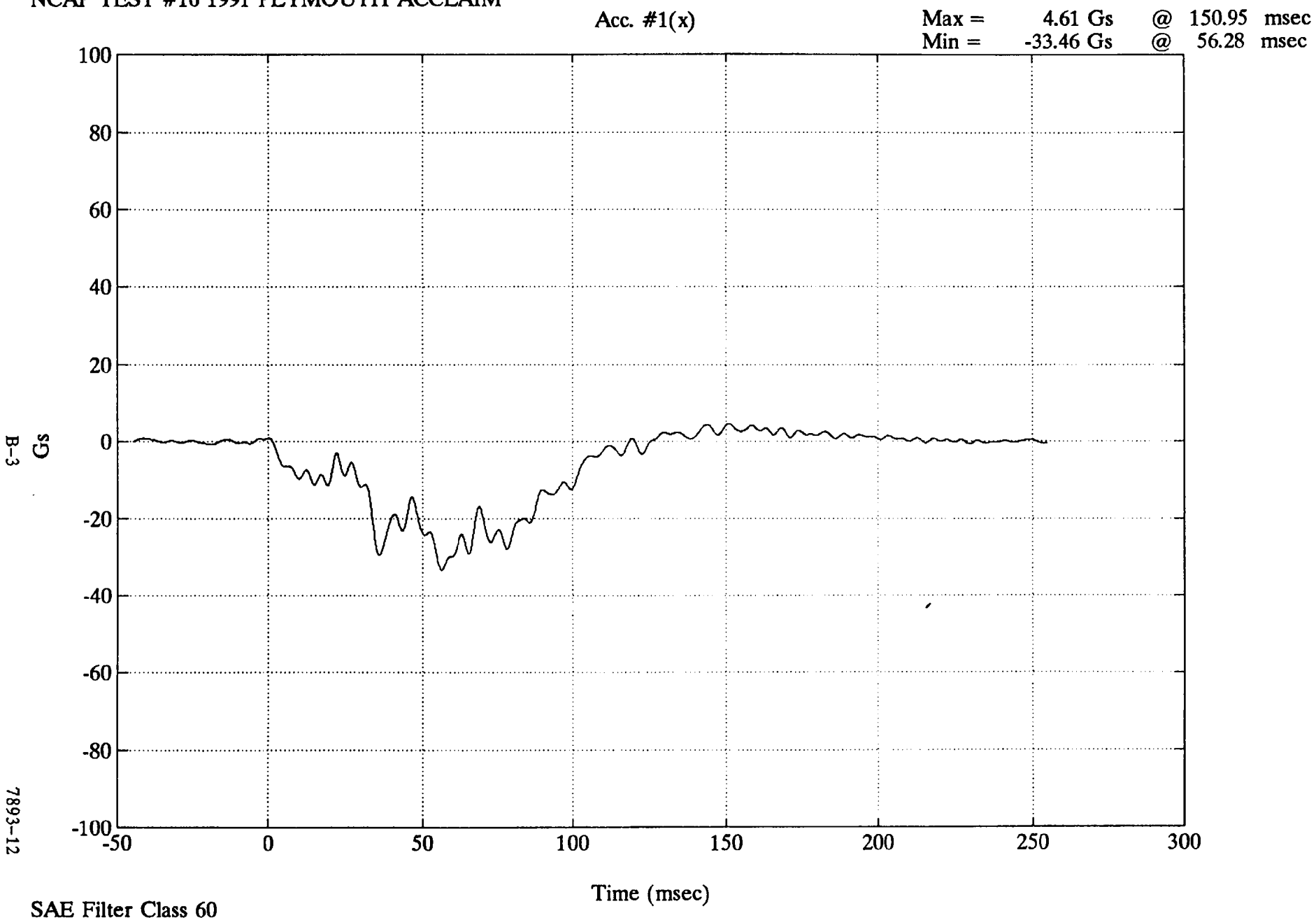
TEST NO. MM0304

VEHICLE DATA

FILTER CHANNEL CLASS

60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

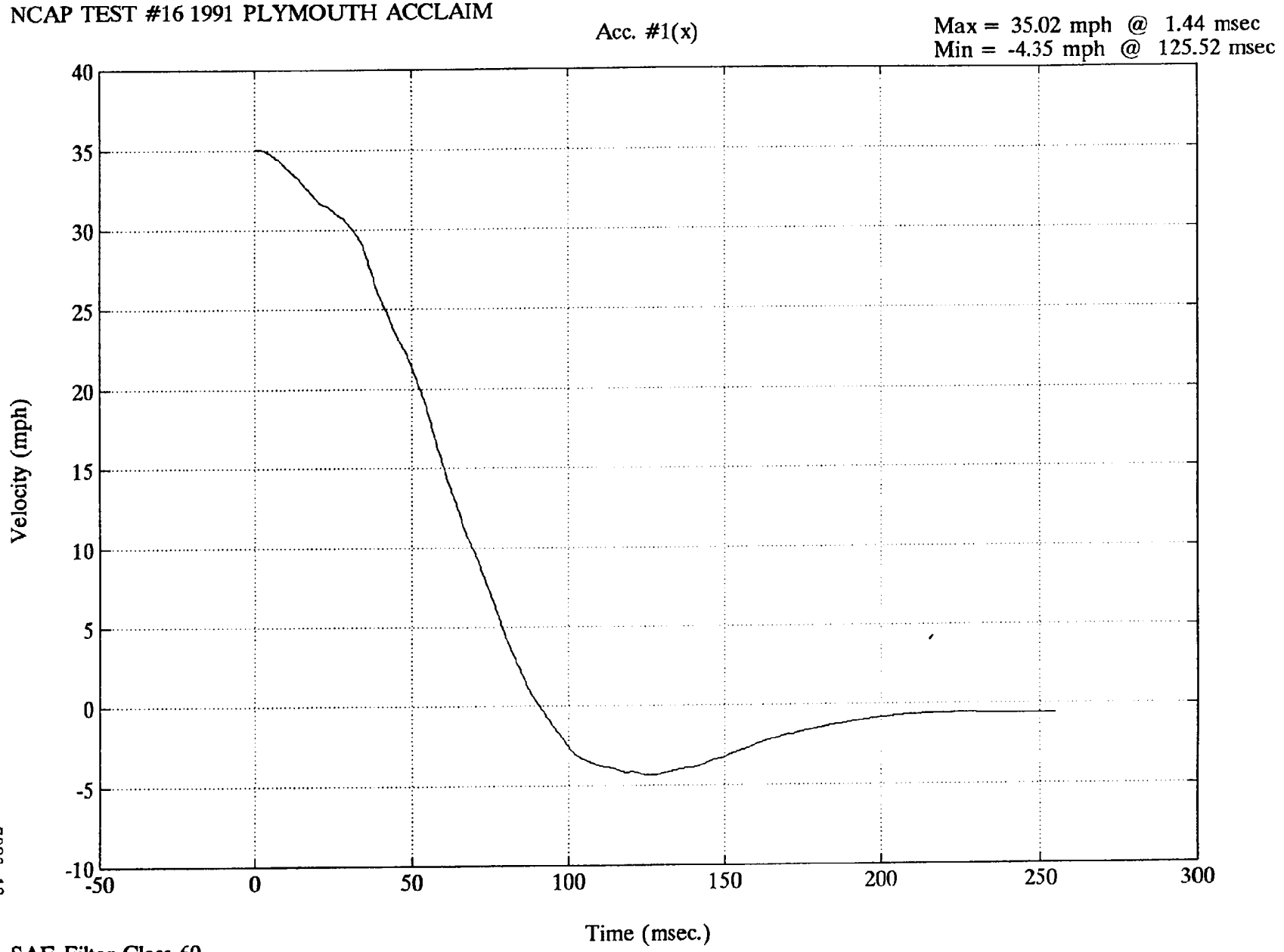


B-3

7893-12

SAE Filter Class 60

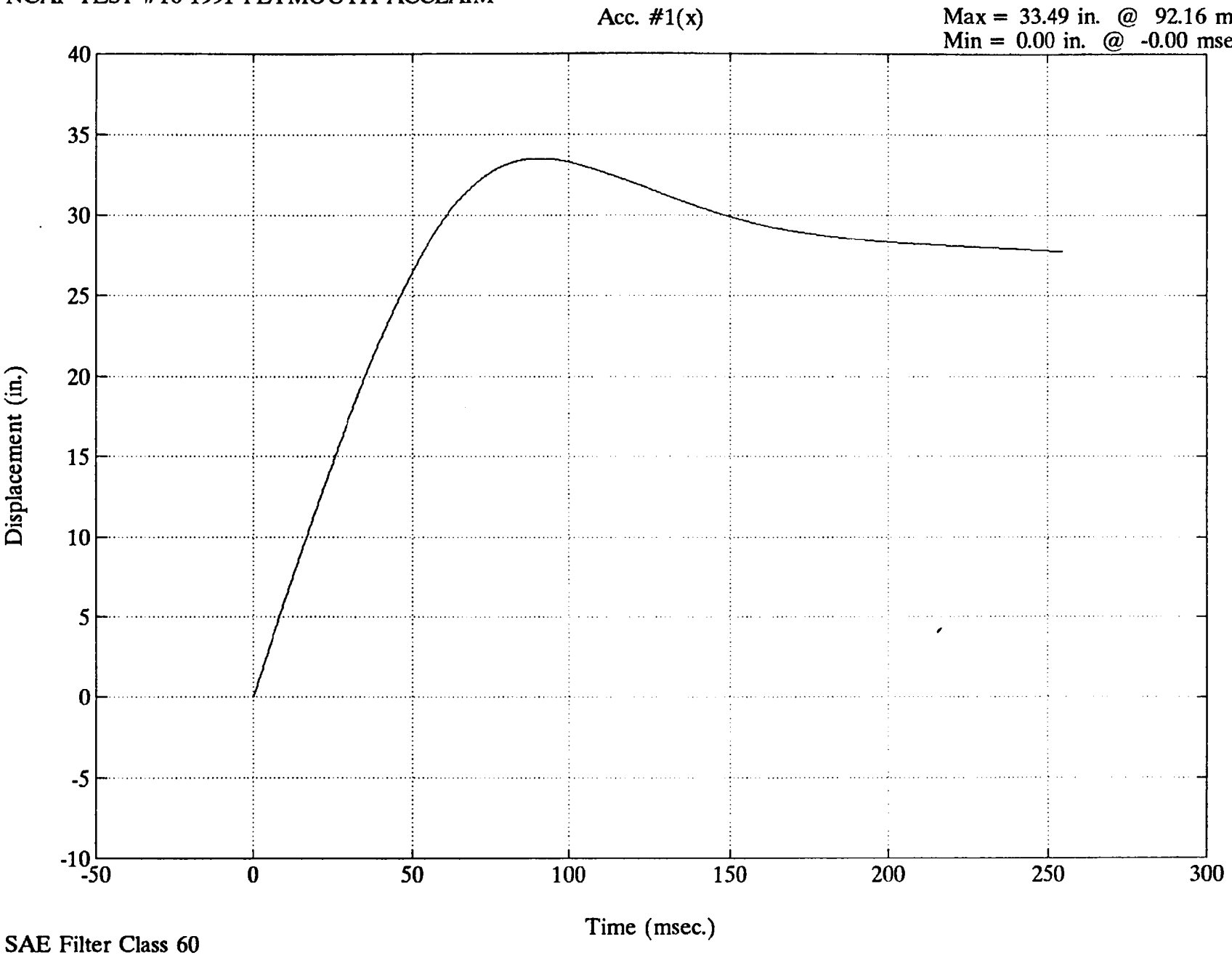
NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

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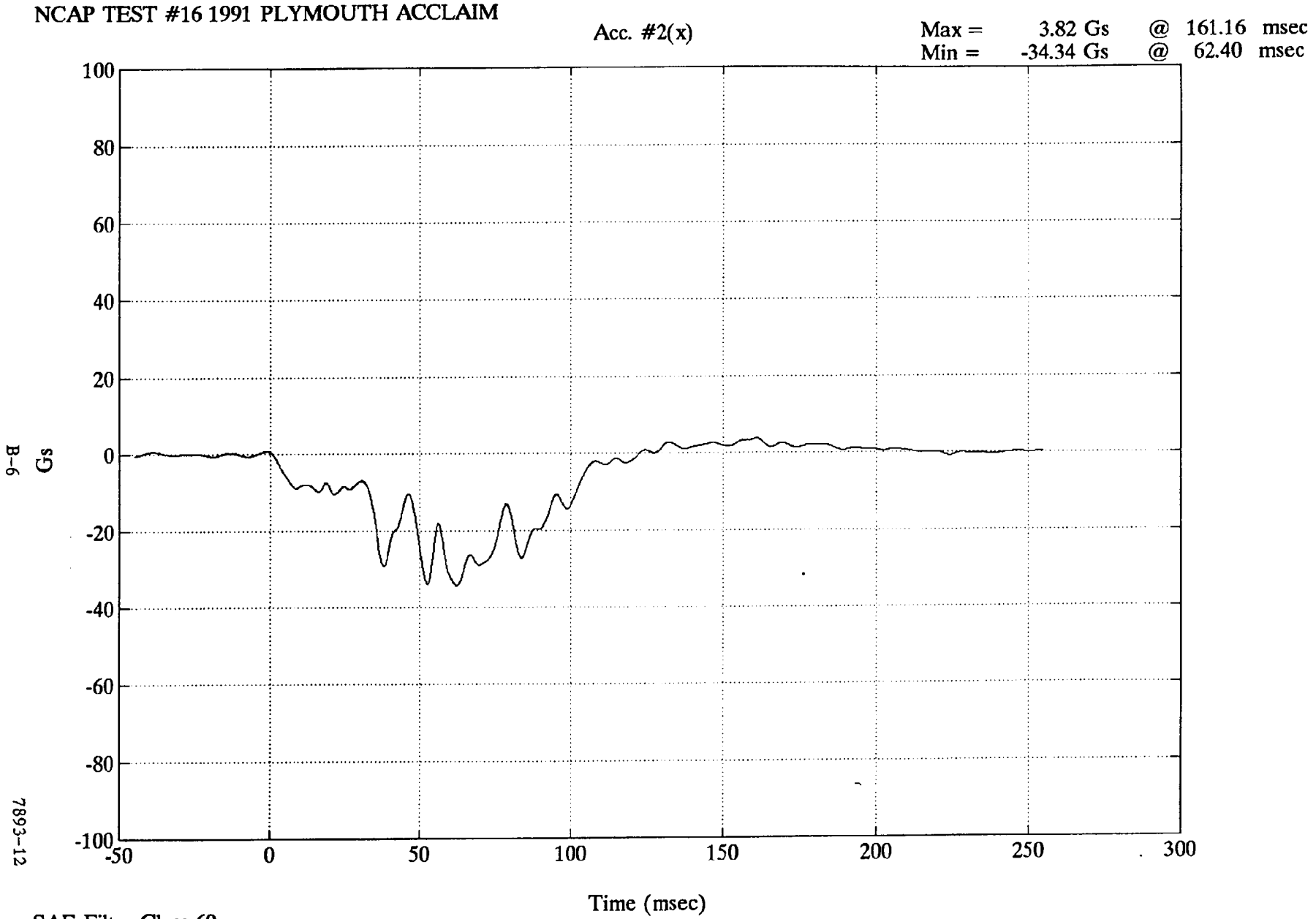

B-6

7893-12

SAE Filter Class 60

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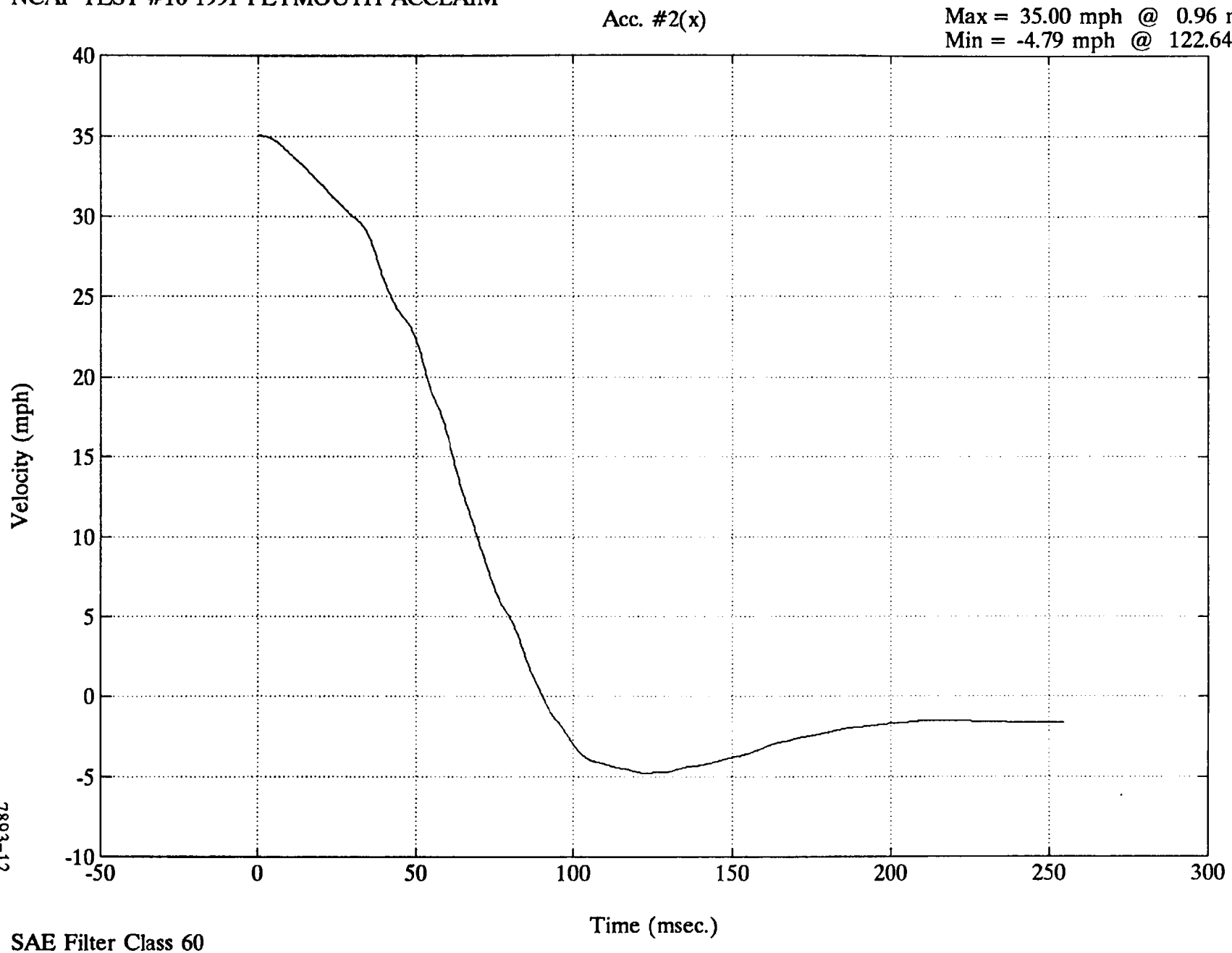
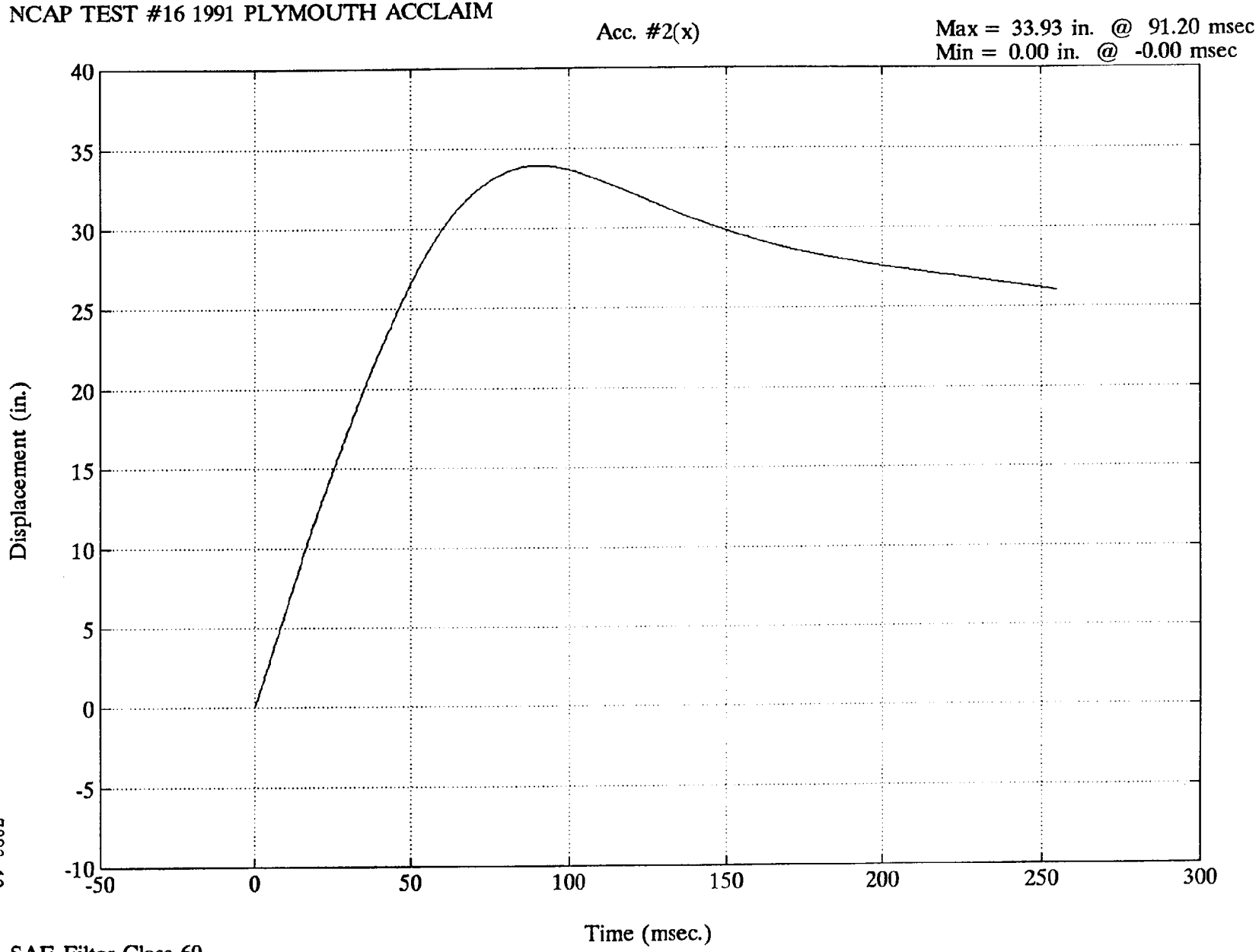


SAE Filter Class 60

7893-12

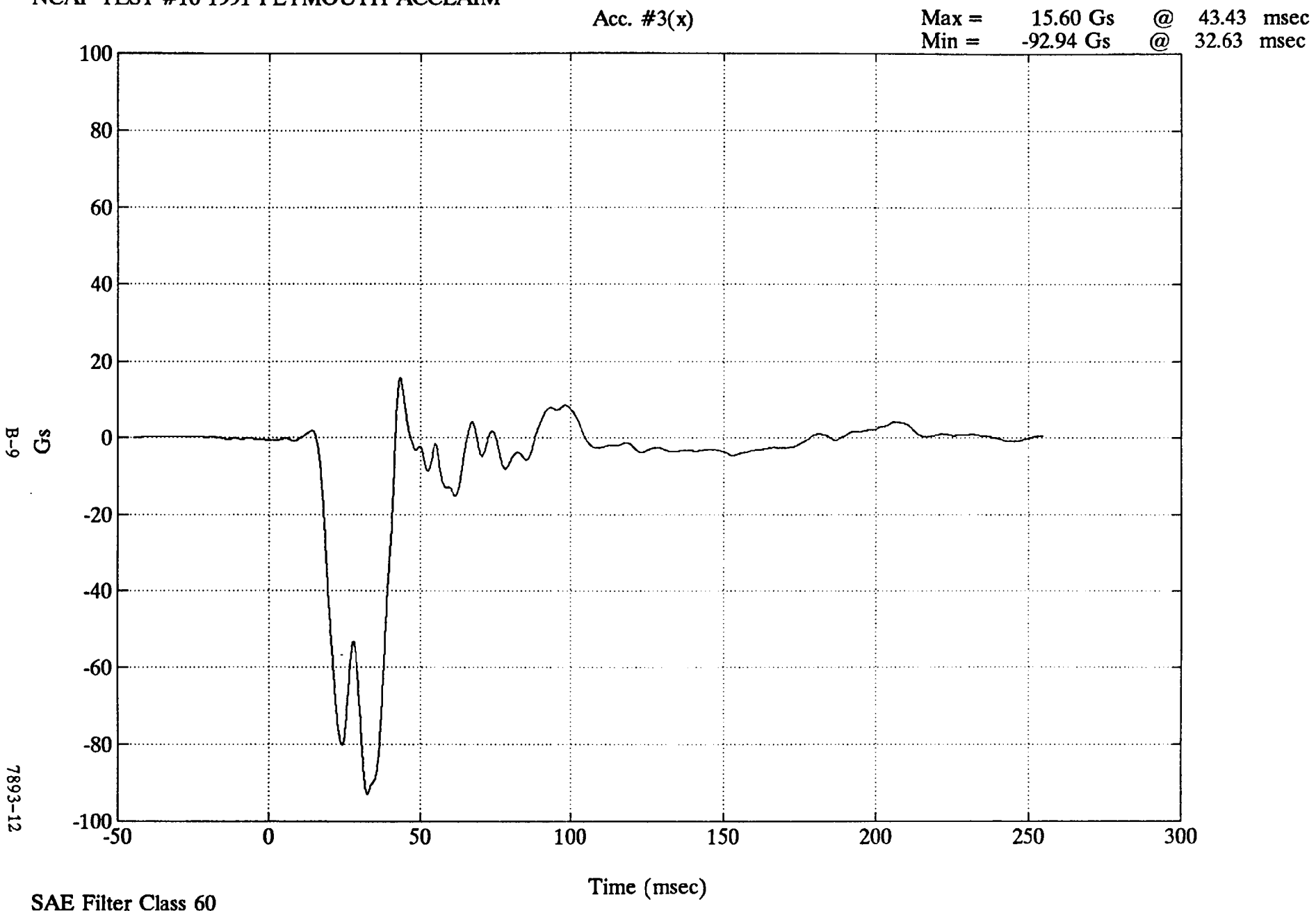
NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

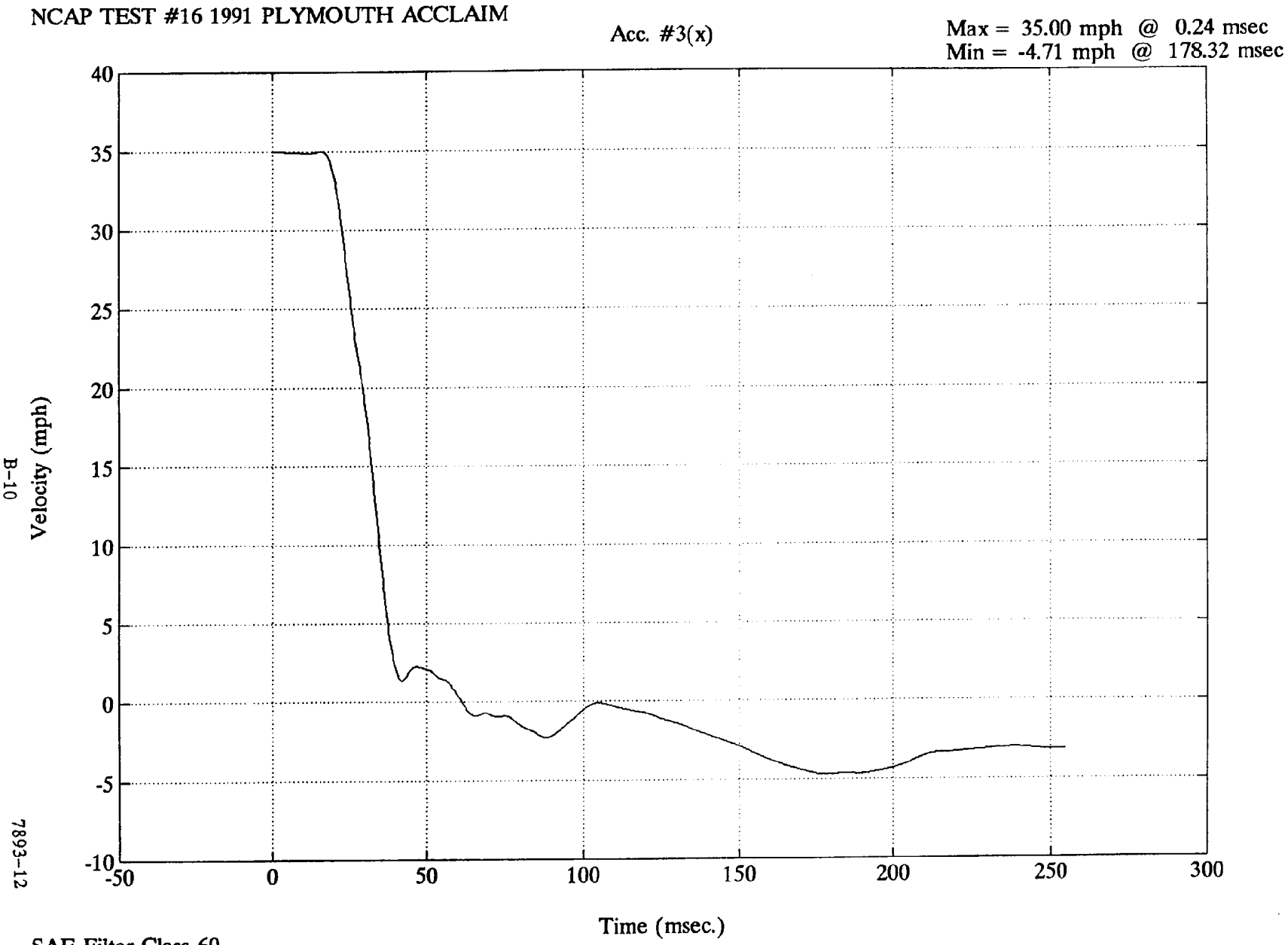


B-9

7893-12

SAE Filter Class 60

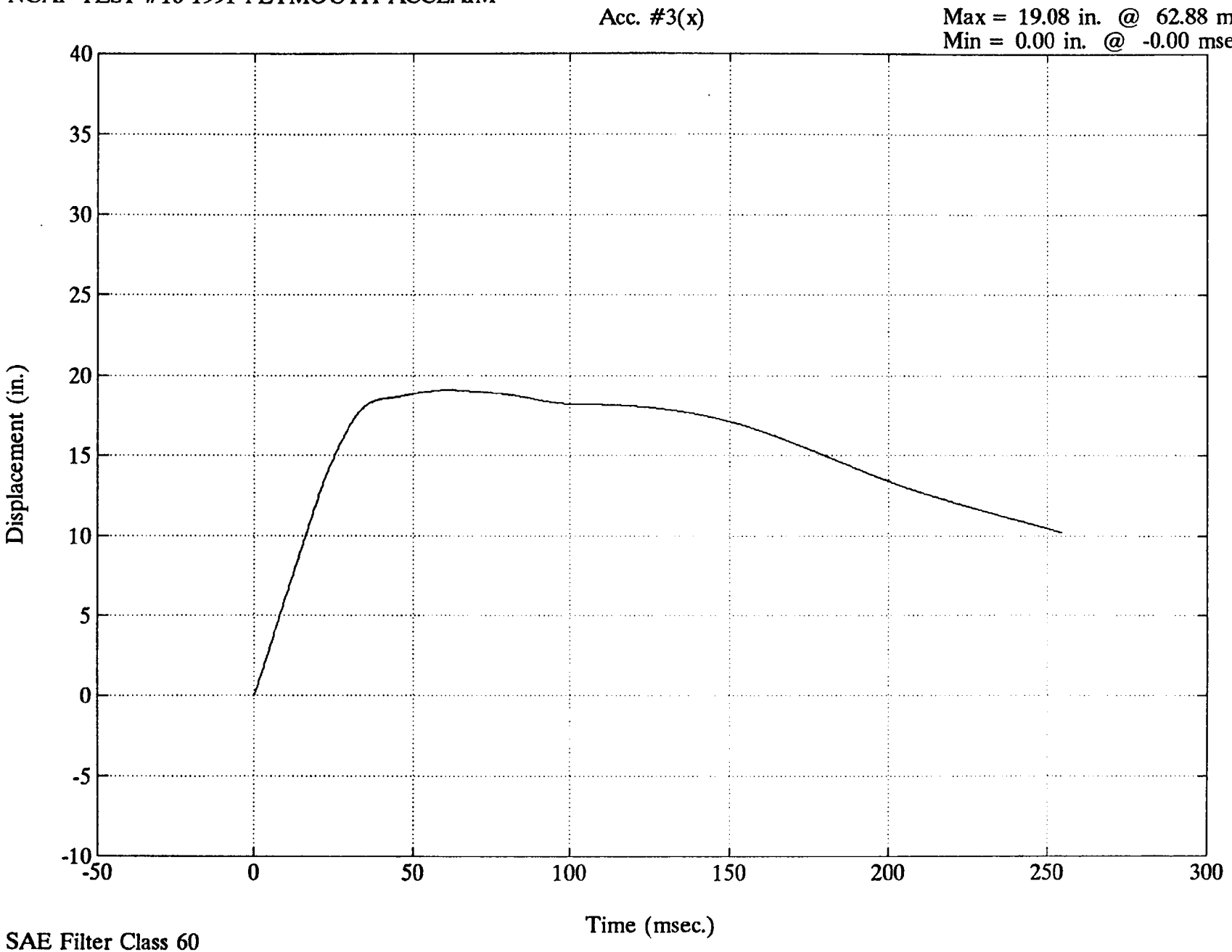
NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

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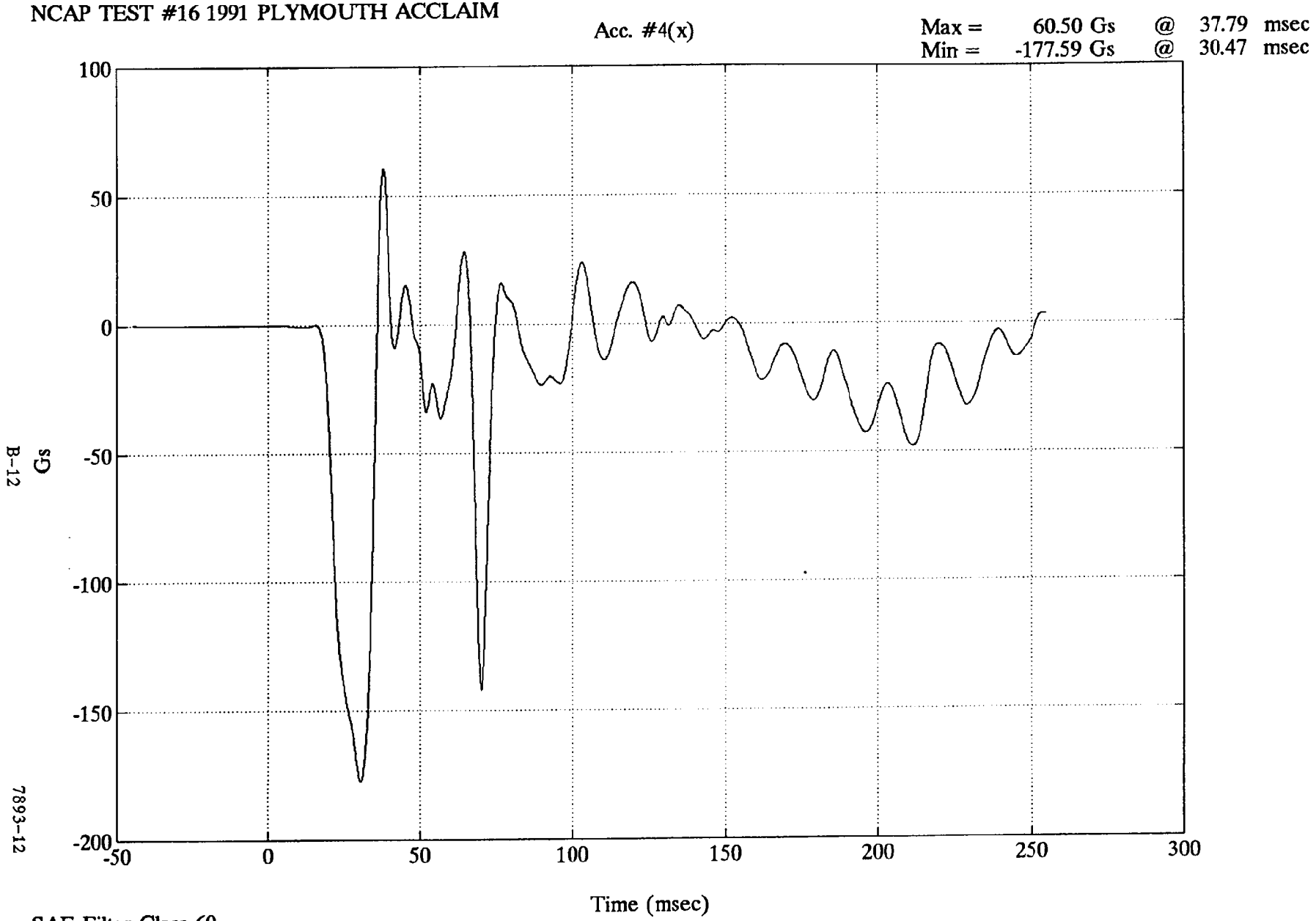

SAE Filter Class 60

B-12

7893-12

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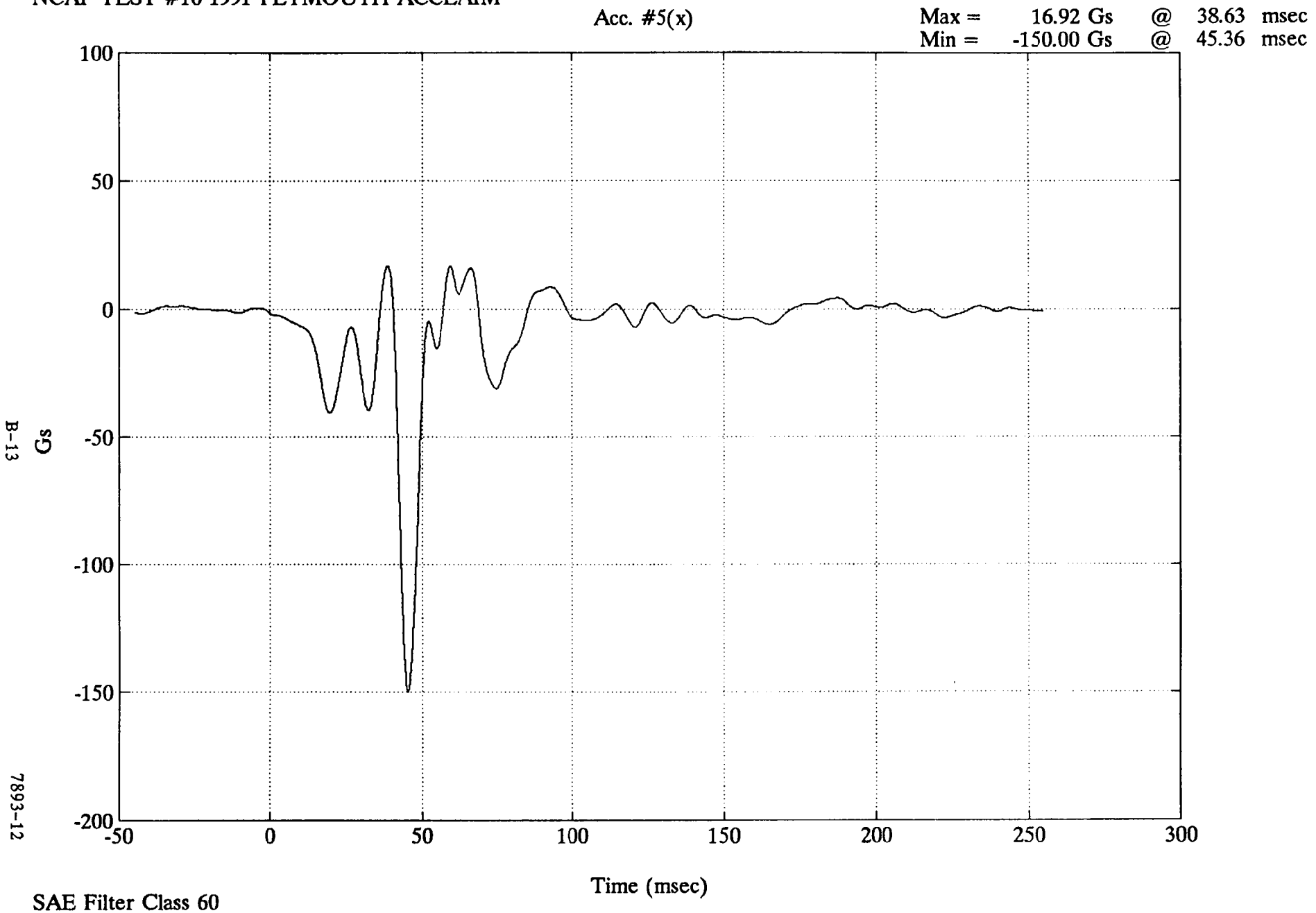

B-13

7893-12

SAE Filter Class 60

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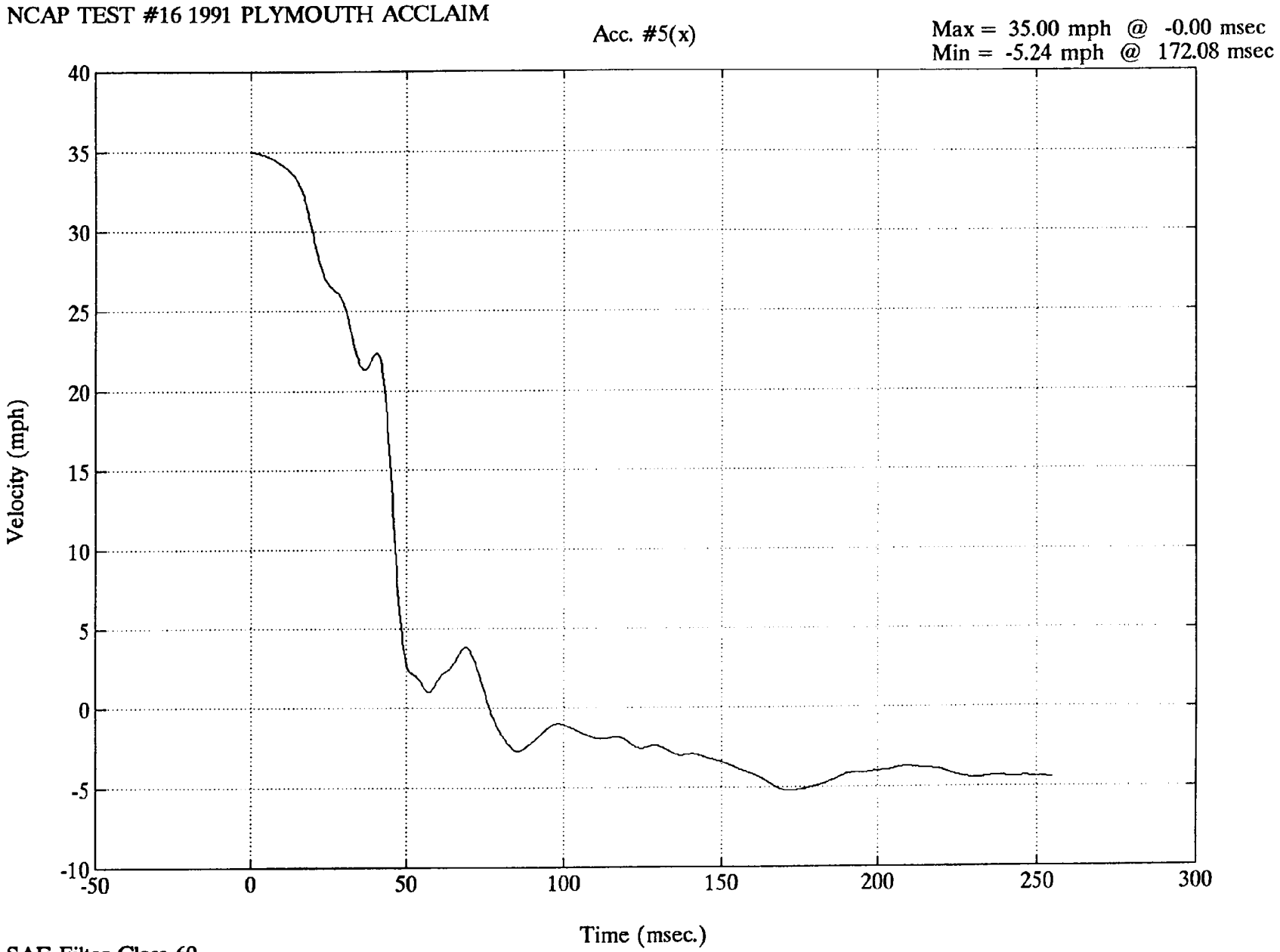

B-14

7893-12

SAE Filter Class 60

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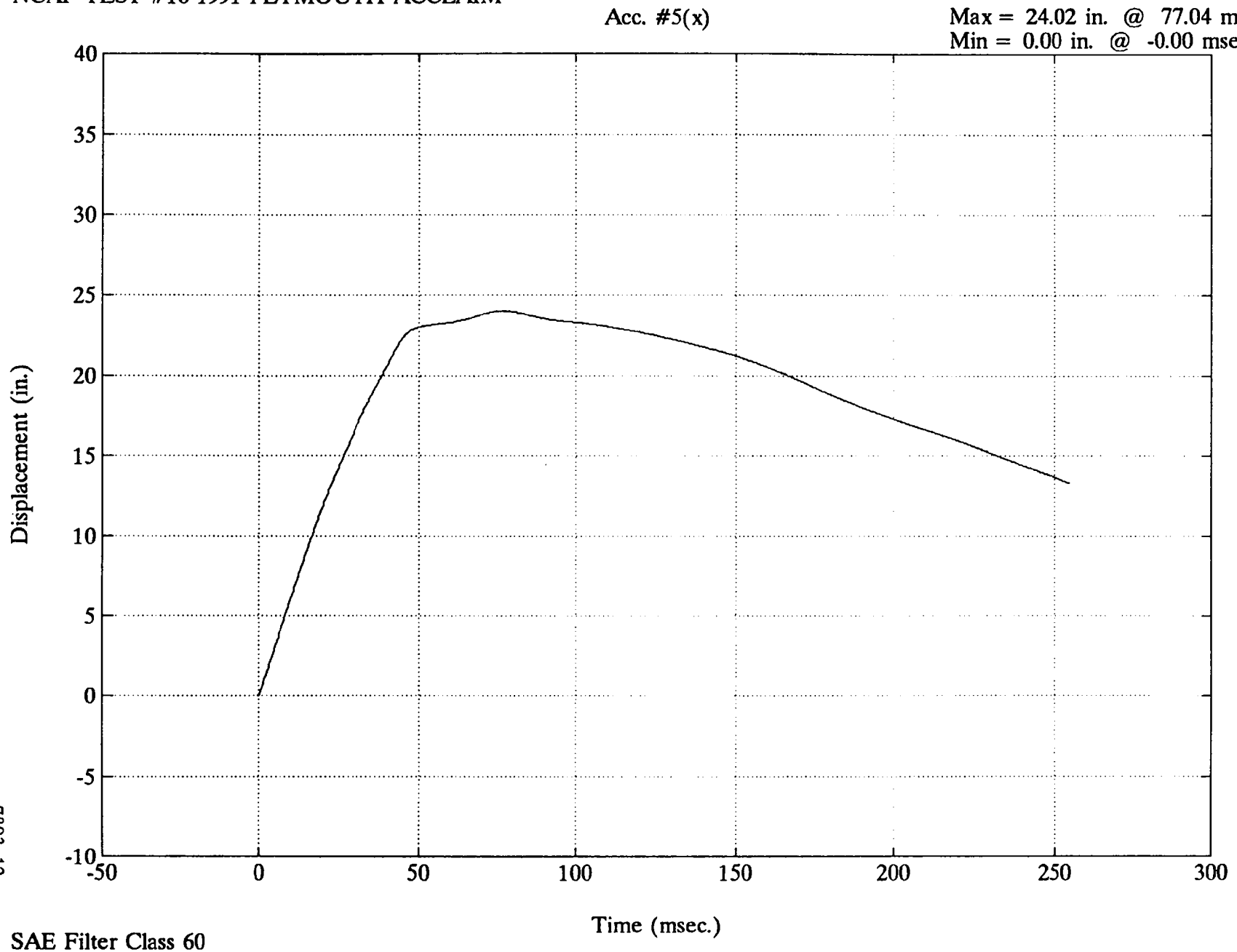


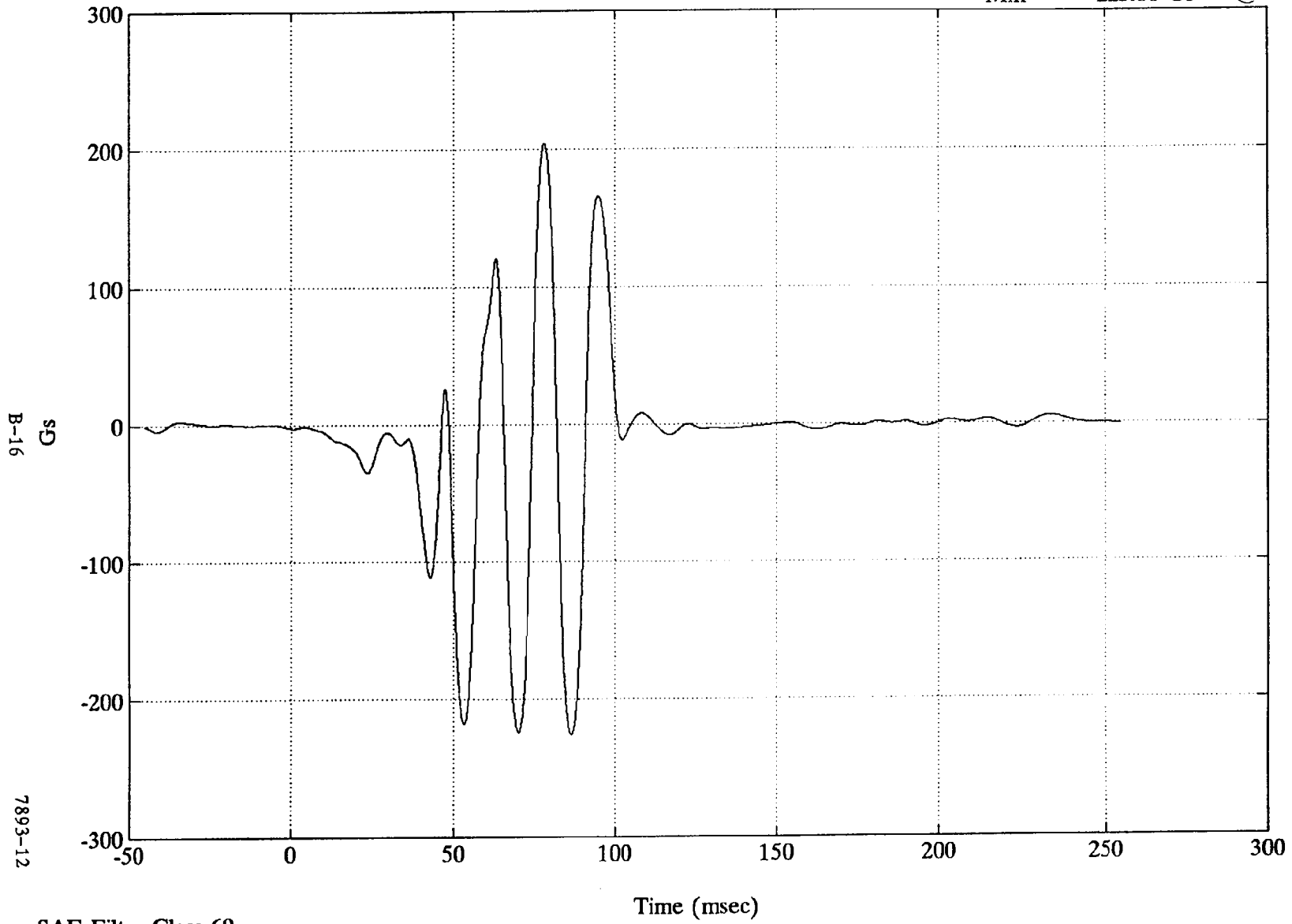
SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Acc. #6(x)

Max = 204.14 Gs @ 78.00 msec
Min = -225.66 Gs @ 86.40 msec

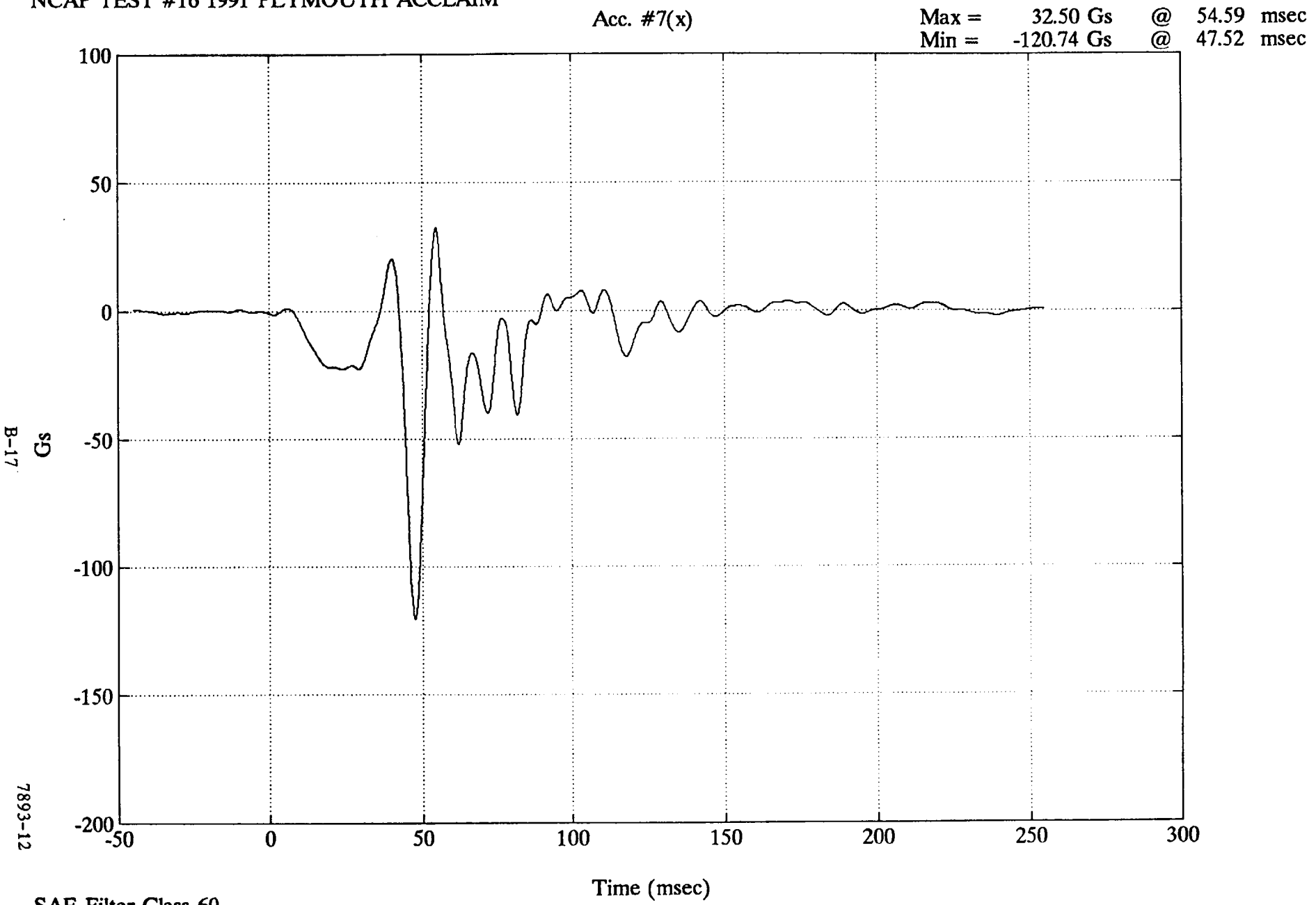


B-16

7893-12

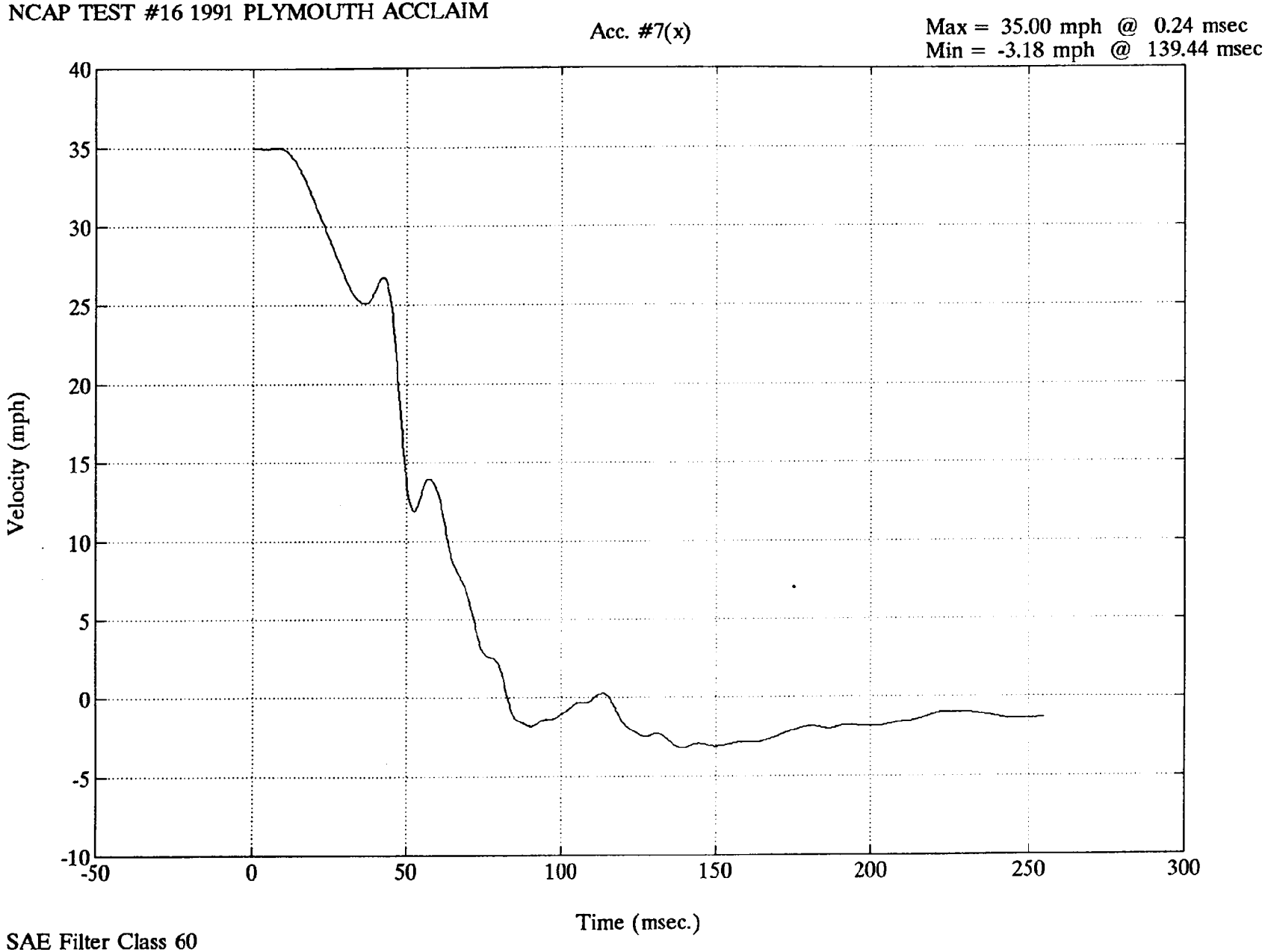
SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

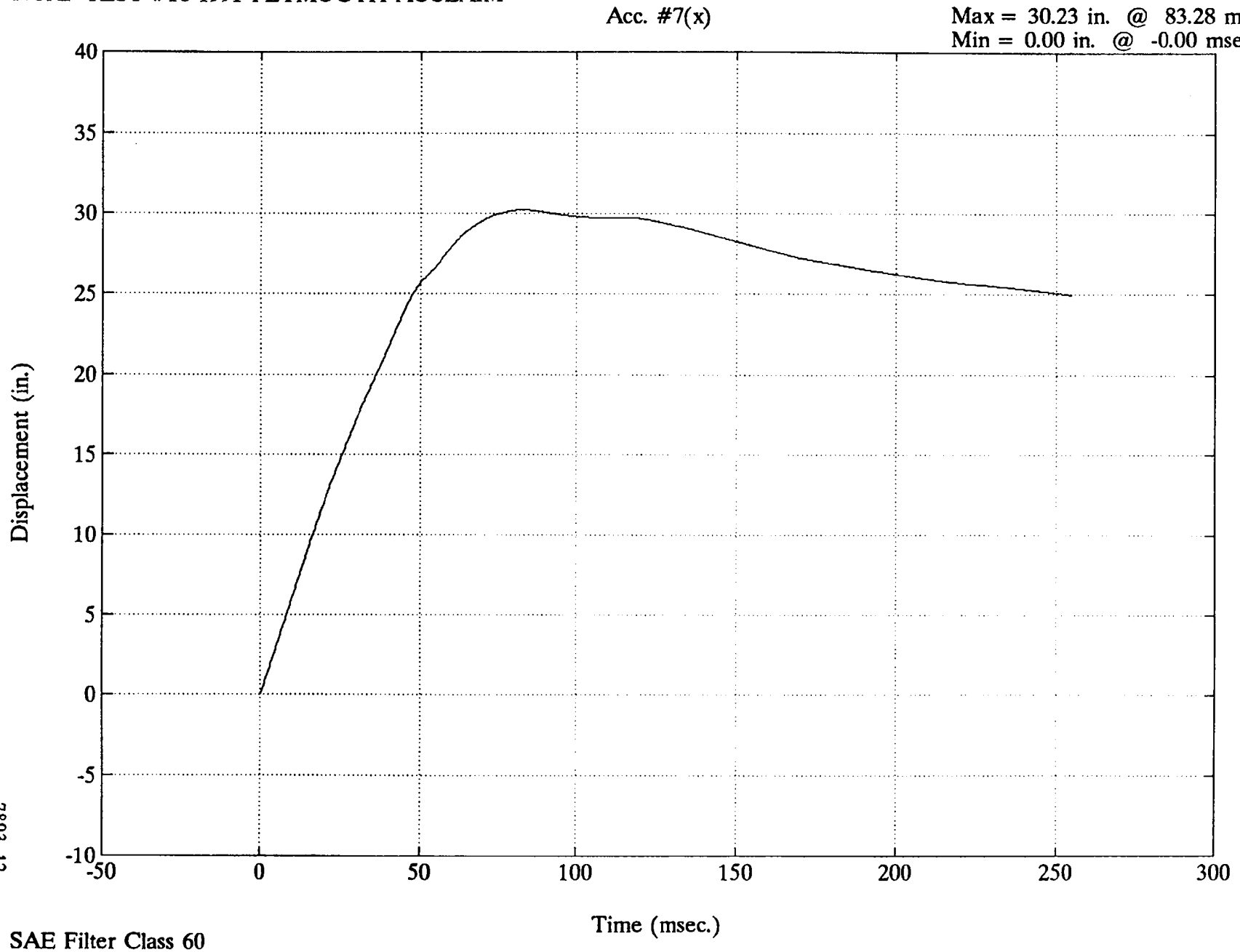
NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

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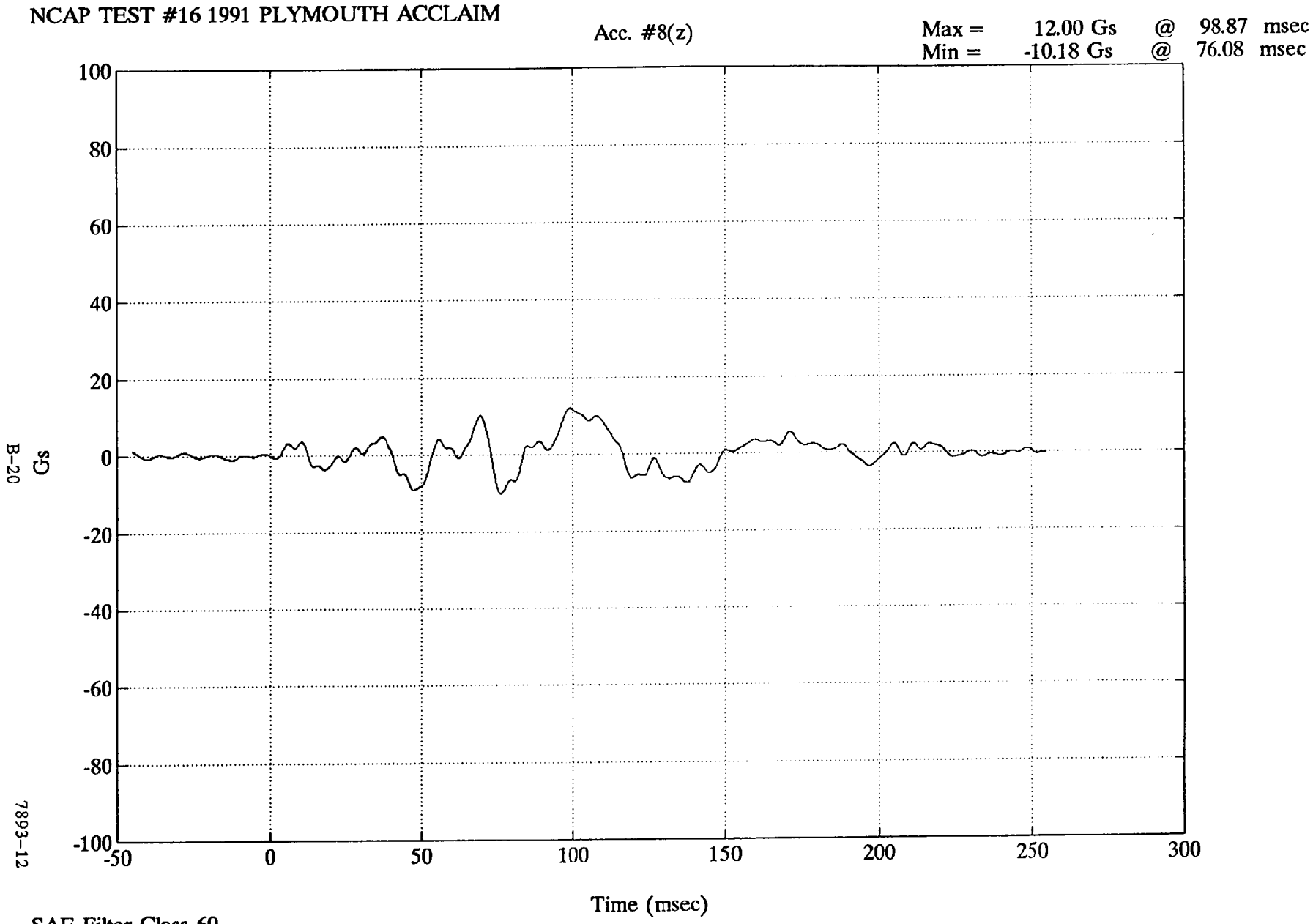

SAE Filter Class 60

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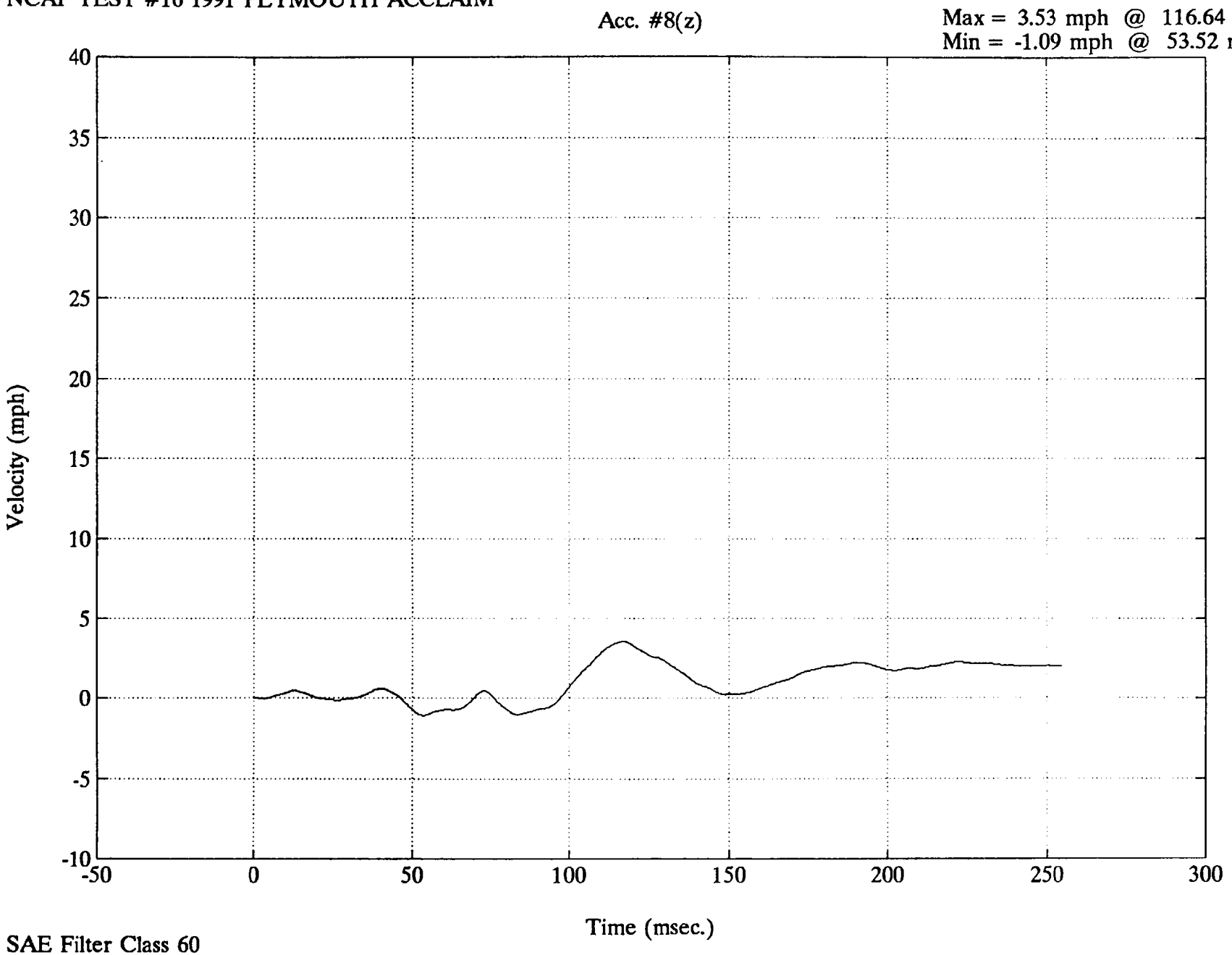
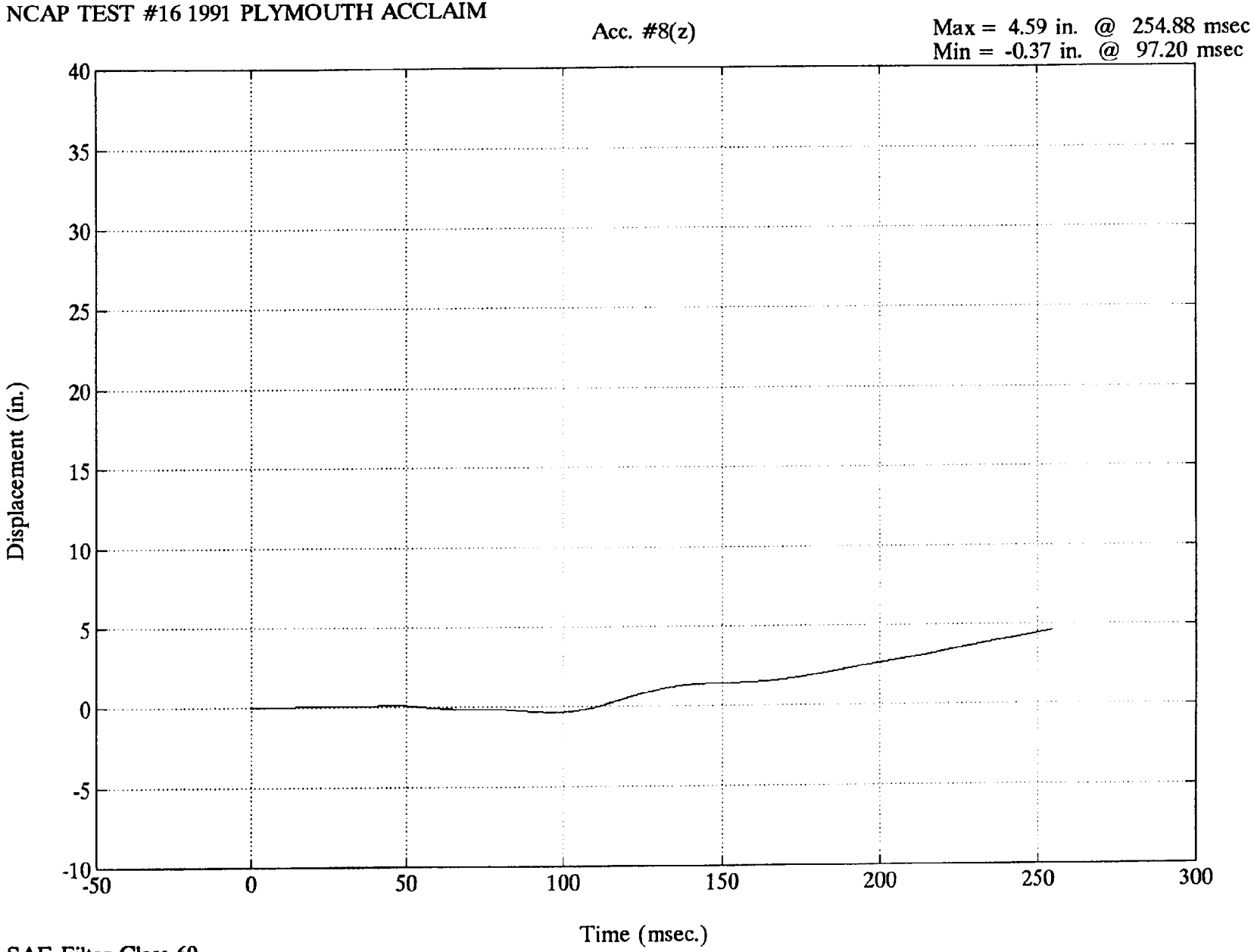


SAE Filter Class 60

7893-12

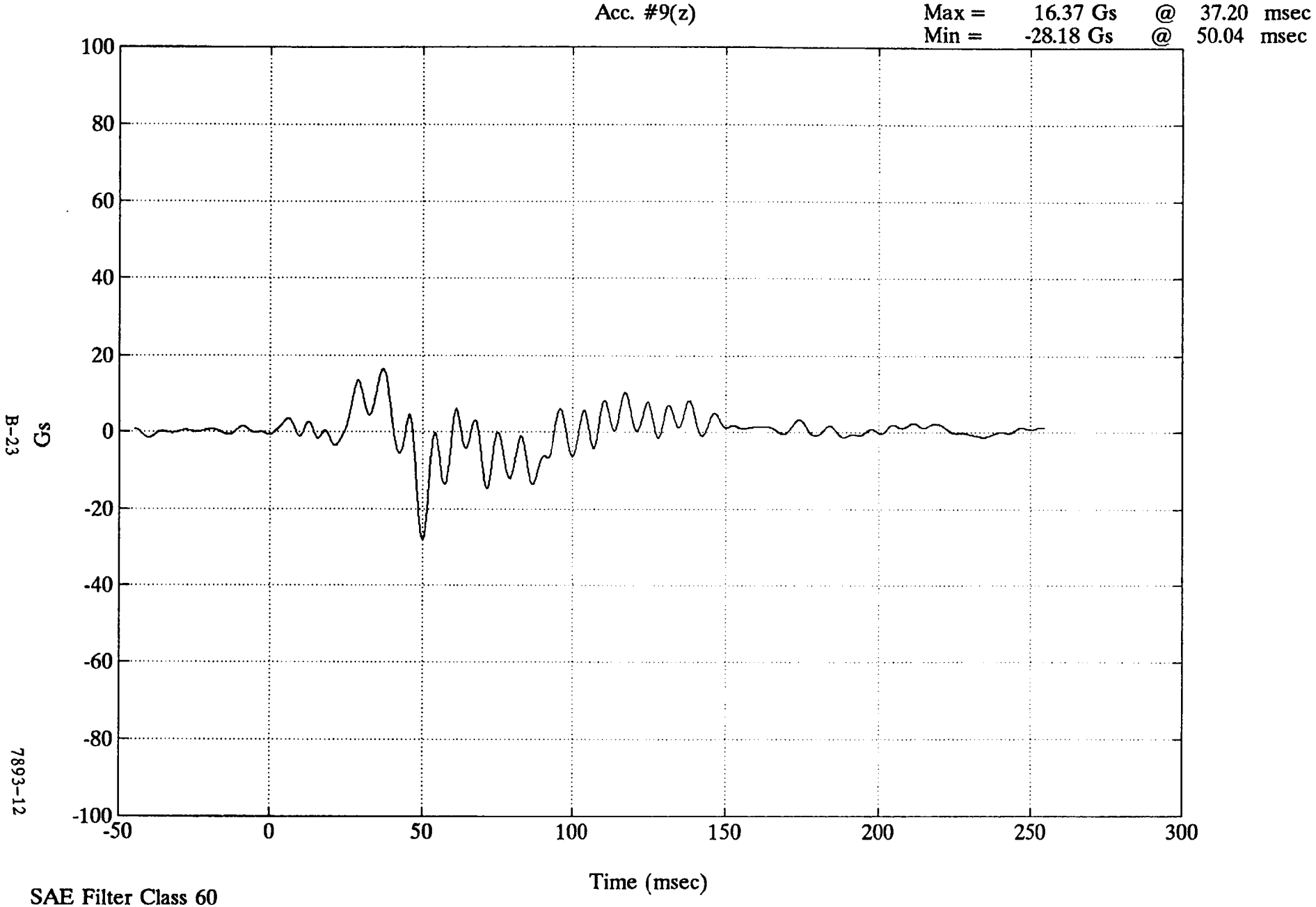
NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

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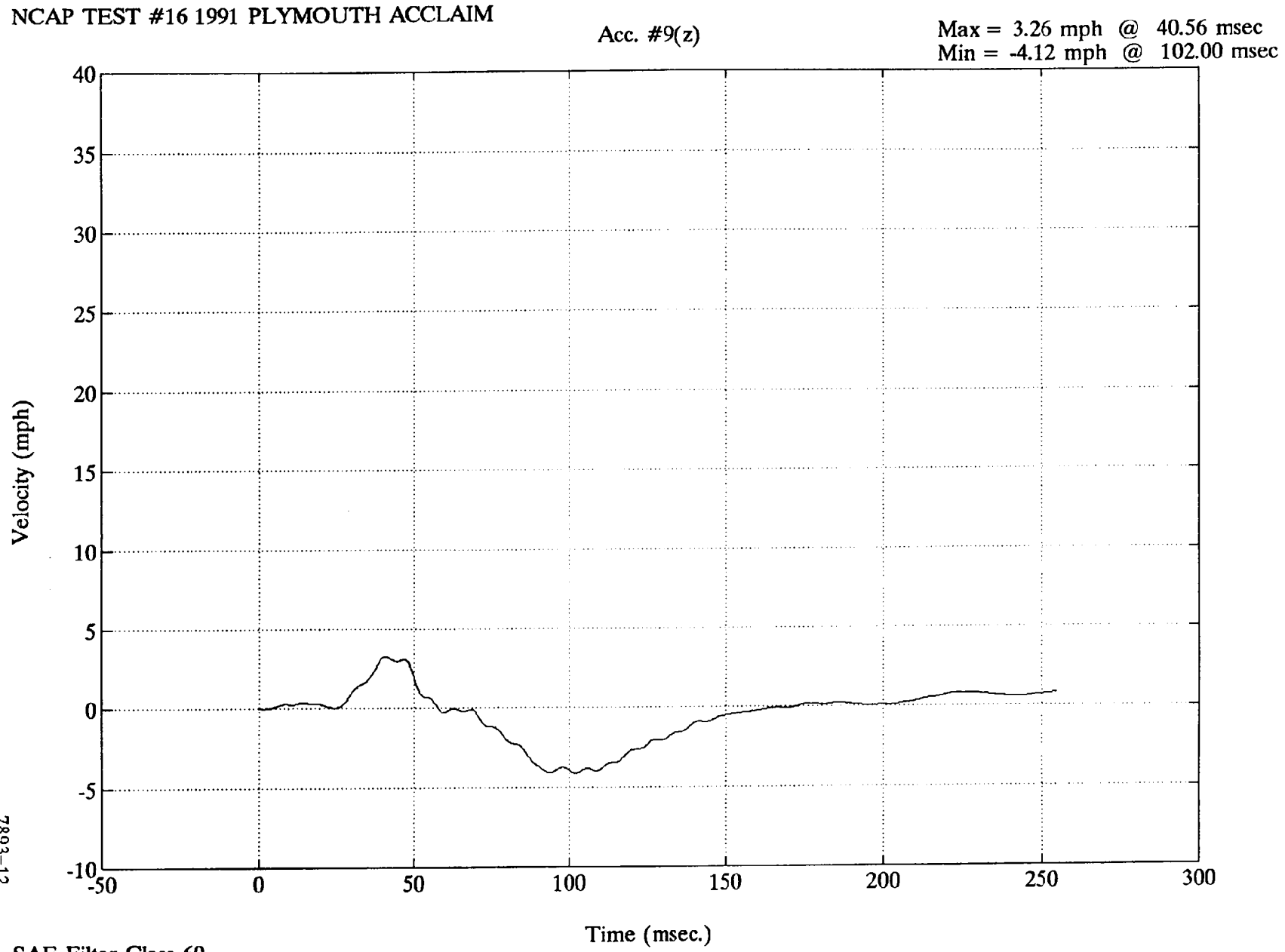
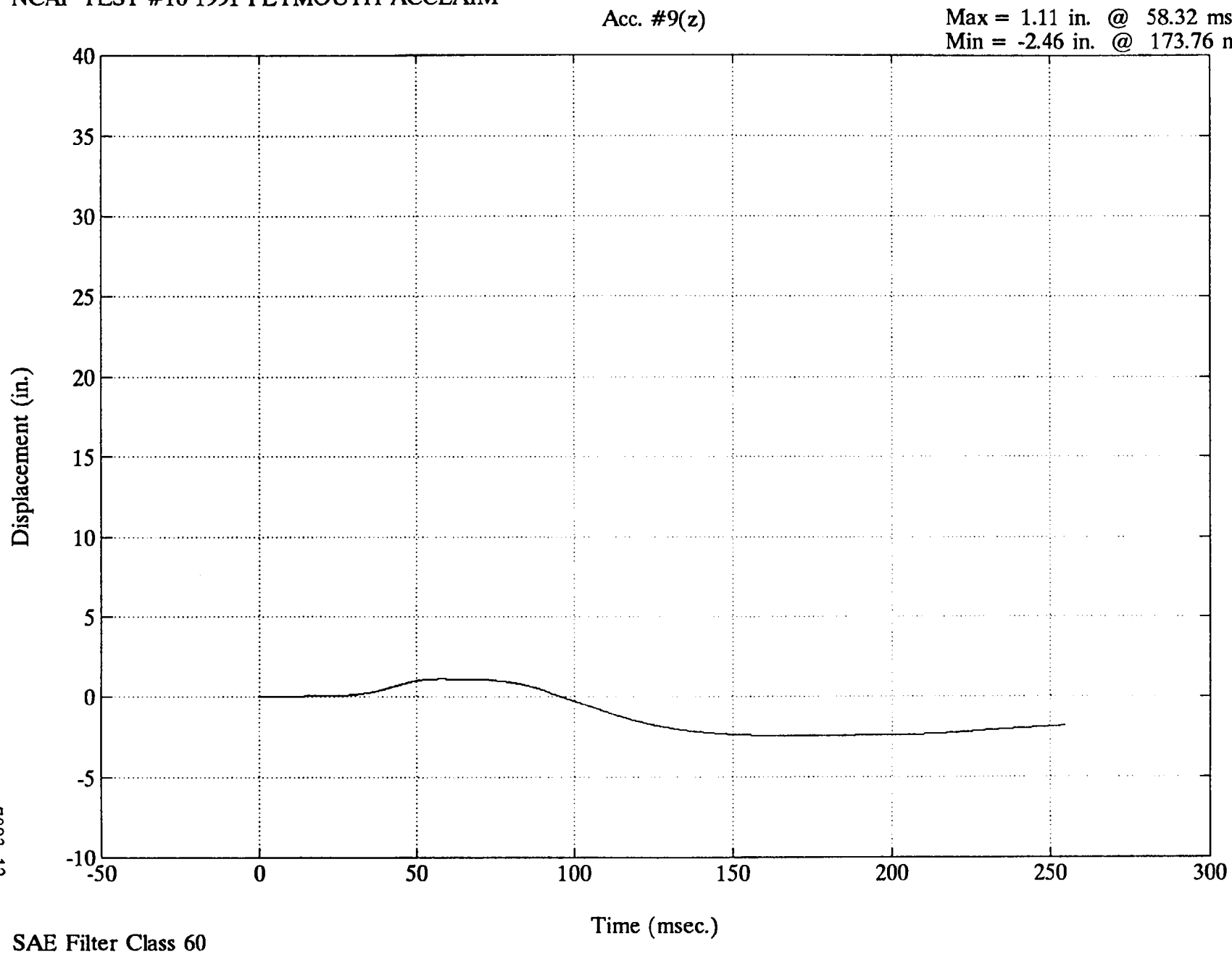


SAE Filter Class 60

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

7893-12

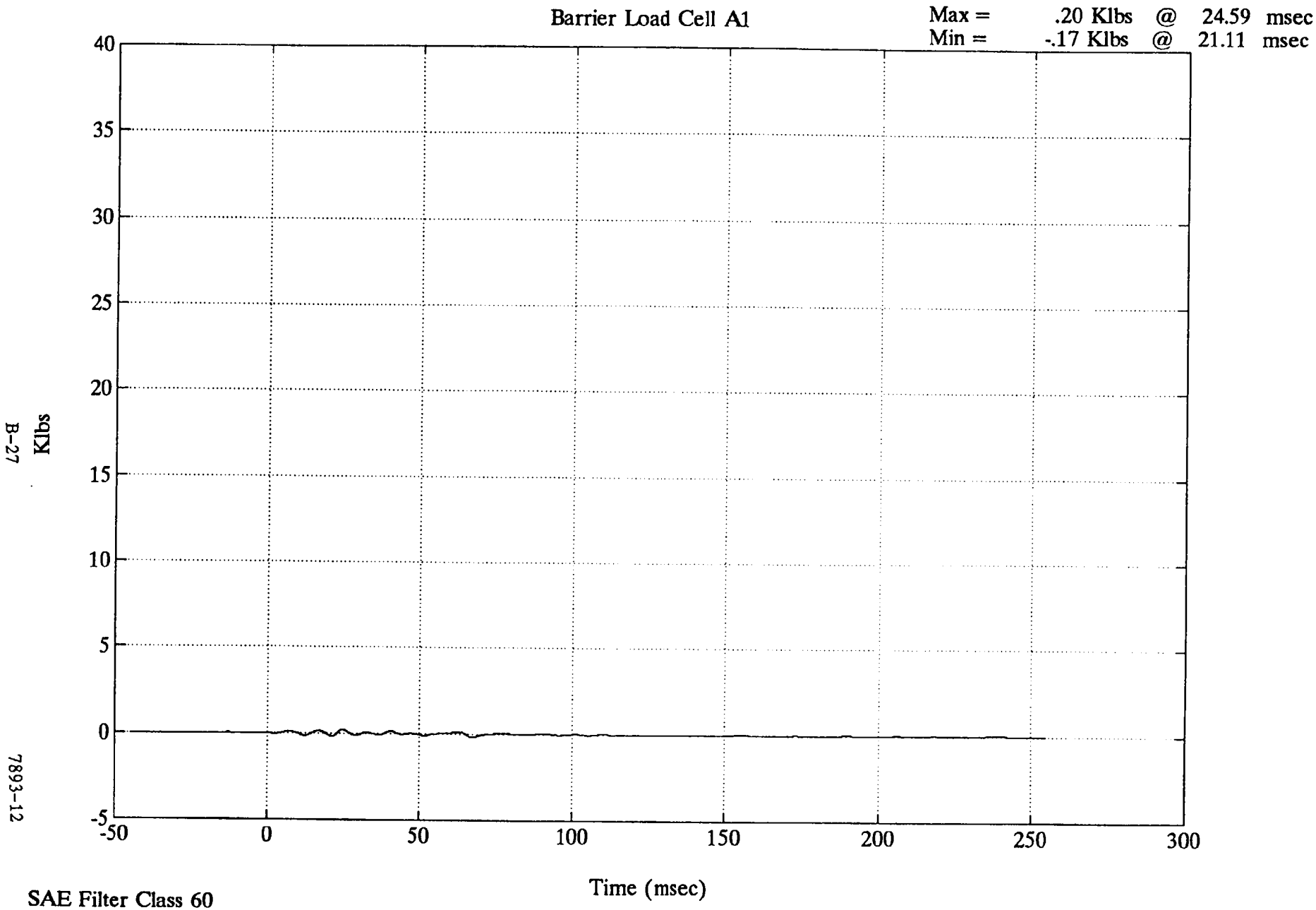
TEST NO. MM0304

LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-27

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Barrier Load Cell A2

Max = 1.37 Klbs @ 34.31 msec
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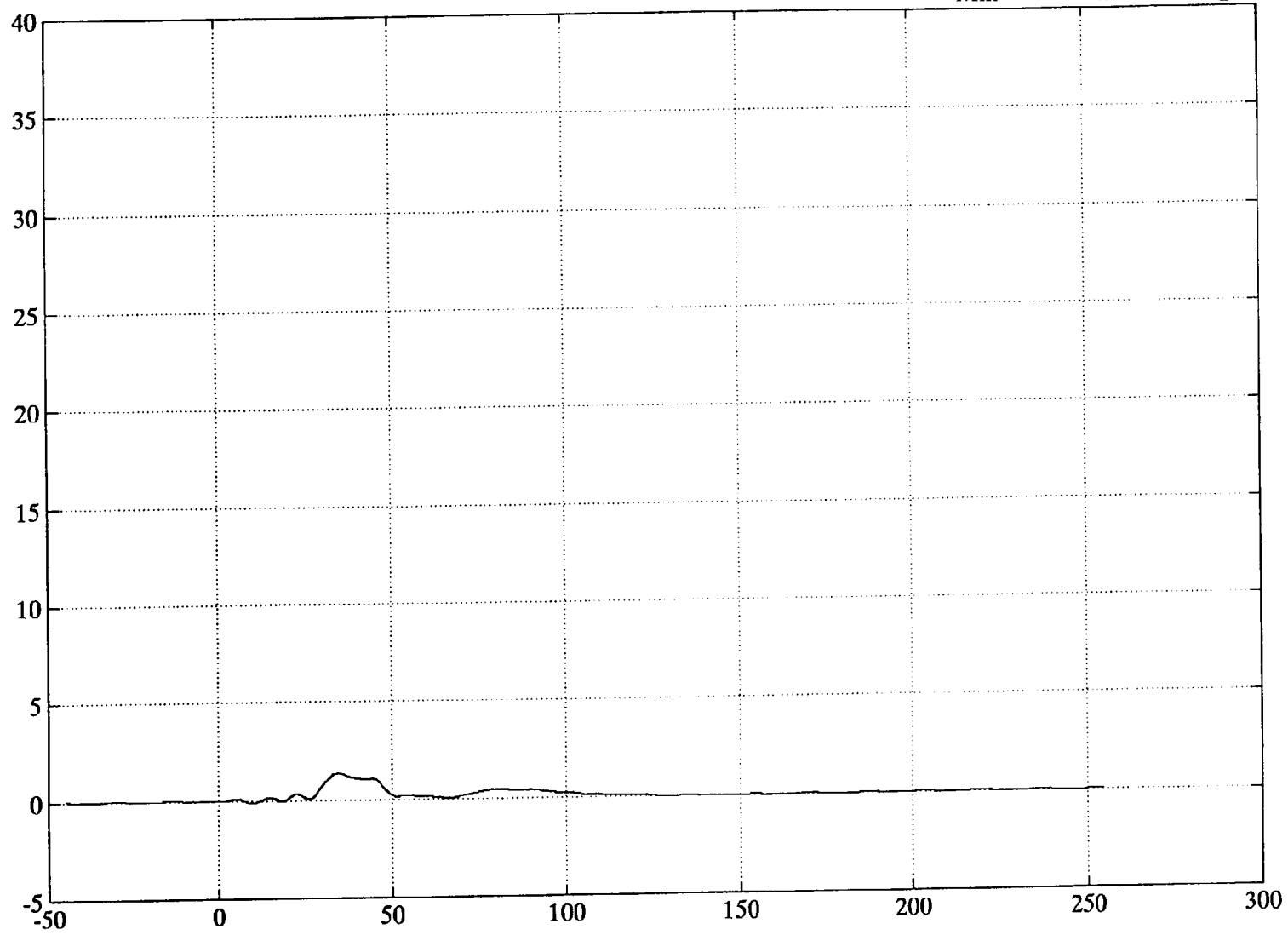
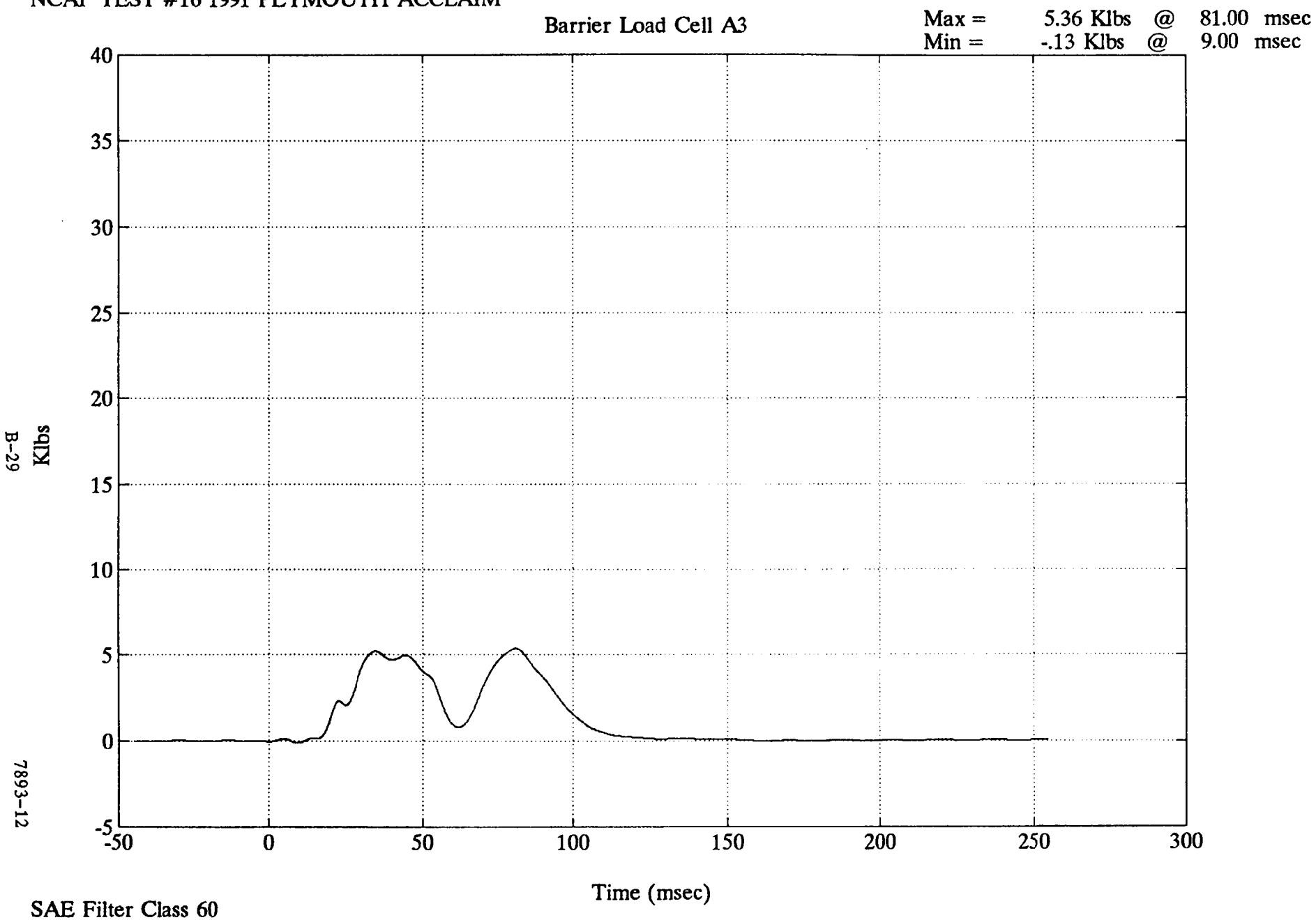


B-28

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

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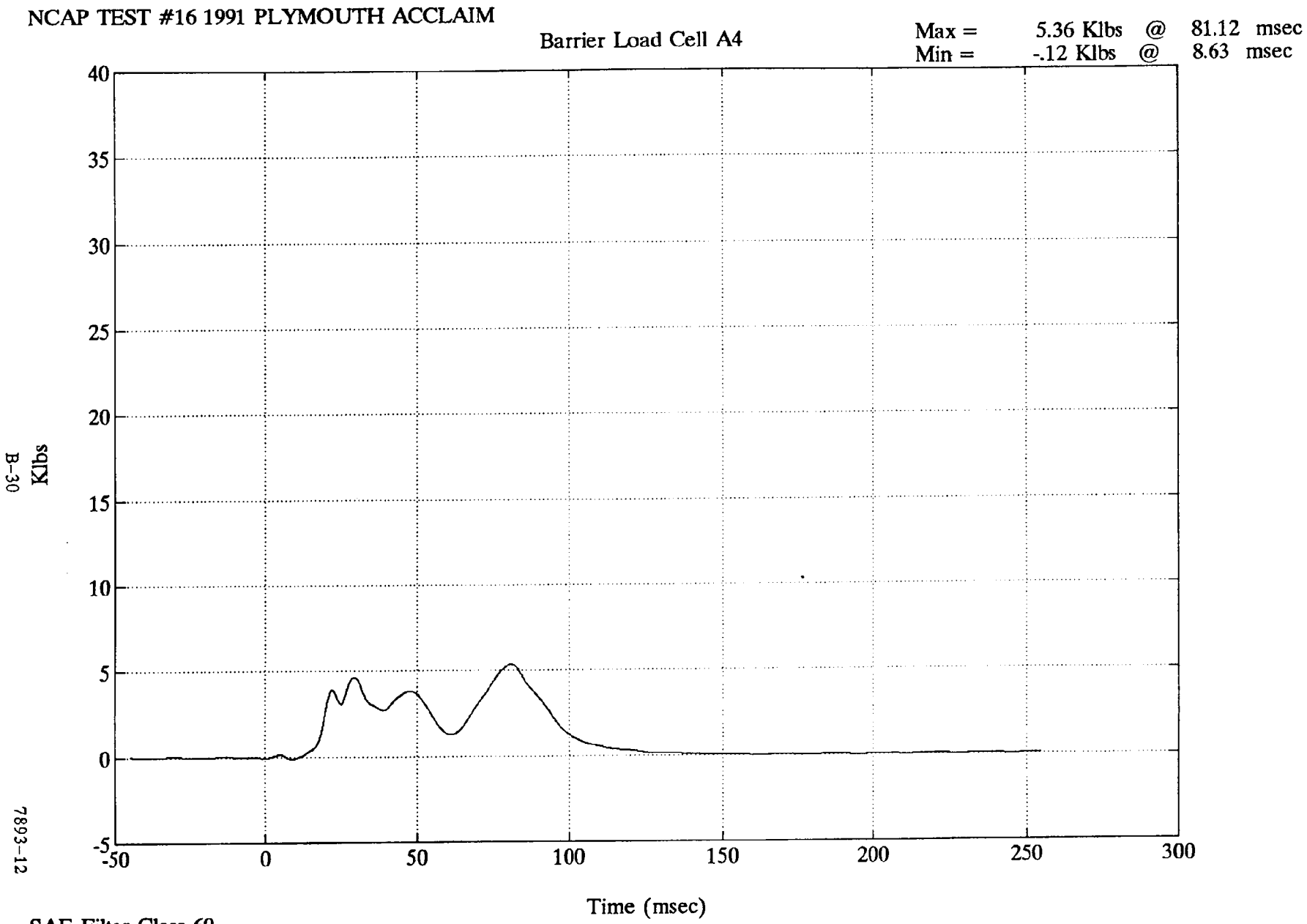

SAE Filter Class 60

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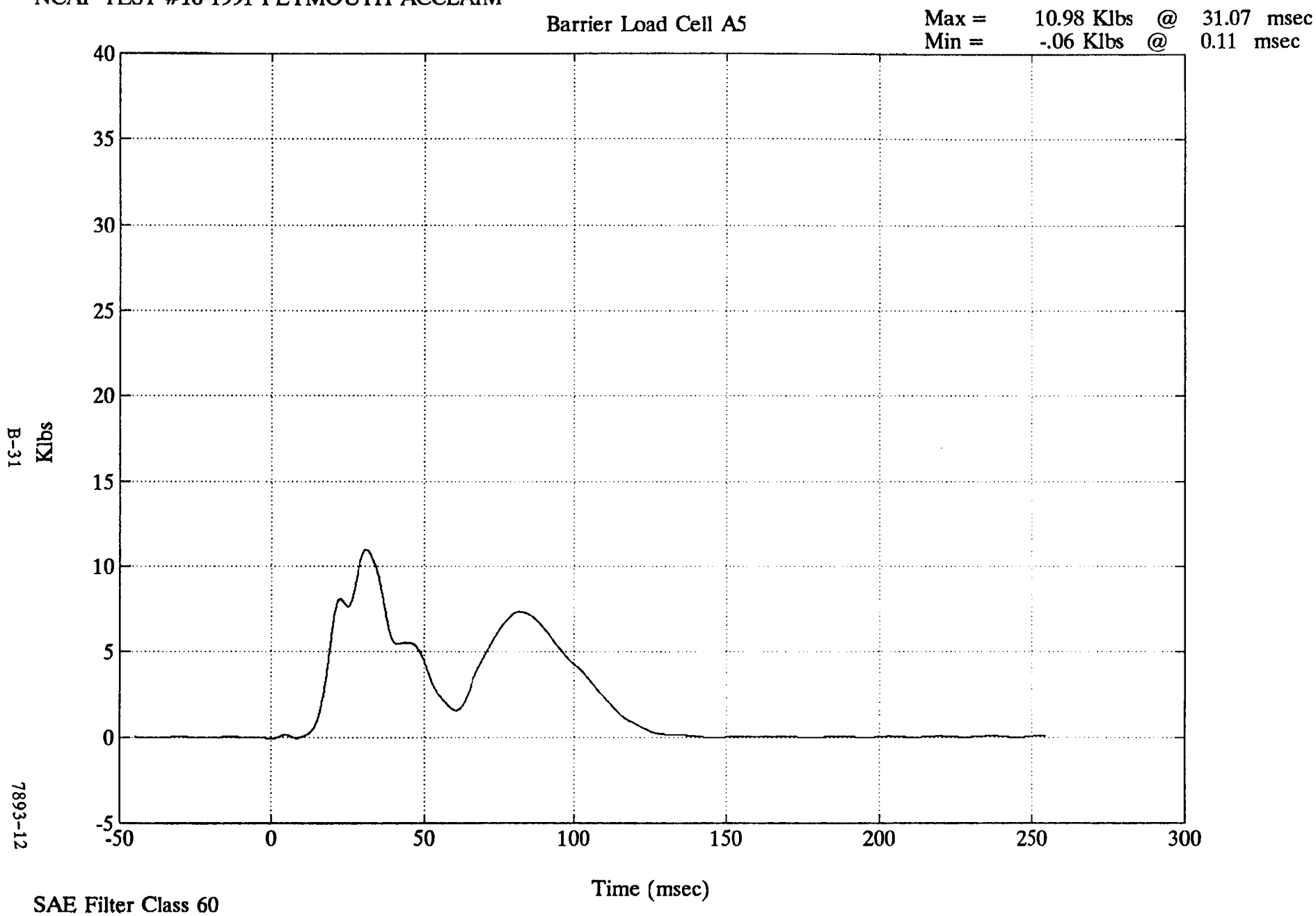

B-31

7893-12

SAE Filter Class 60

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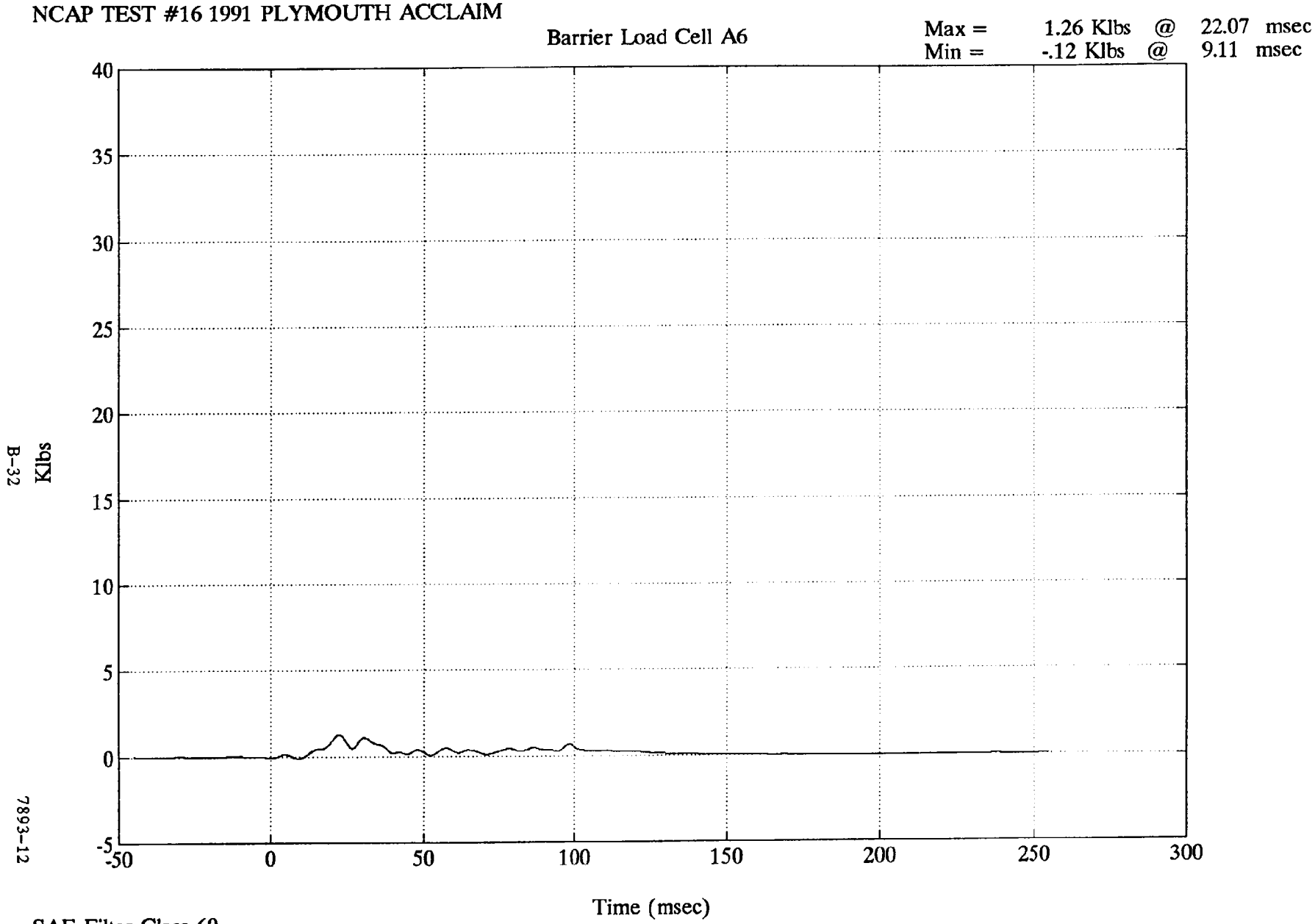
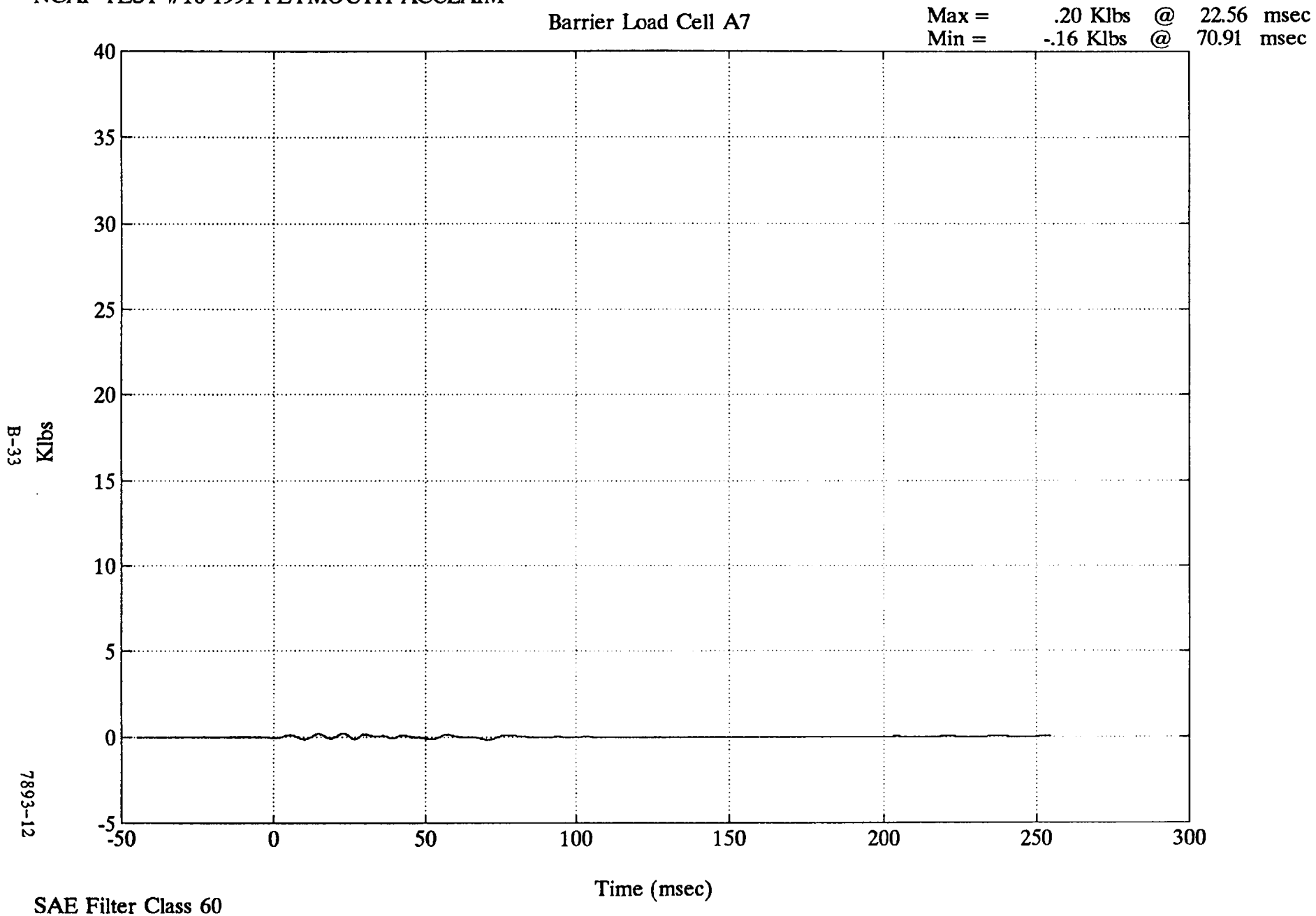


SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

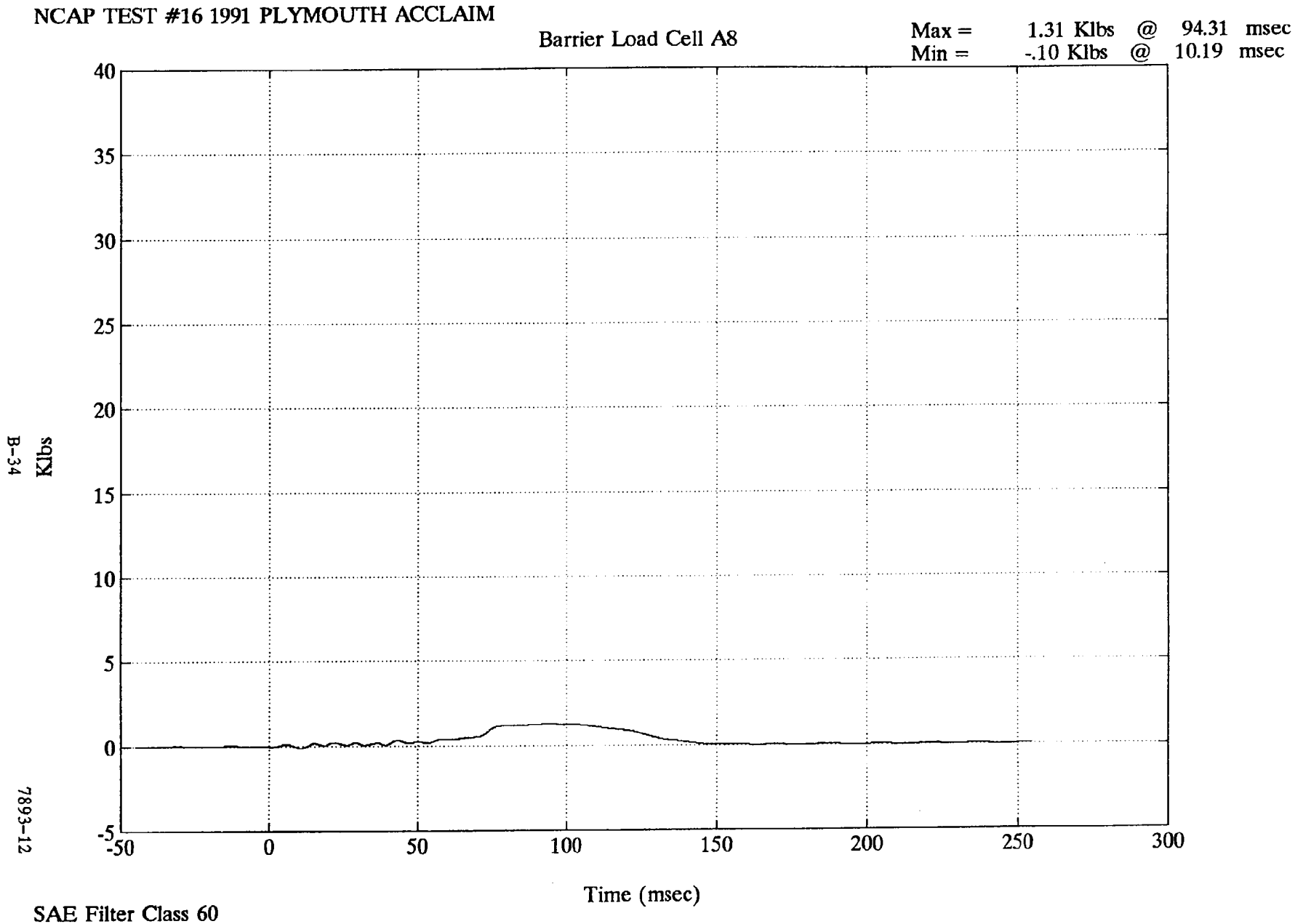


SAE Filter Class 60

B-33

7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-34

7893-12

SAE Filter Class 60

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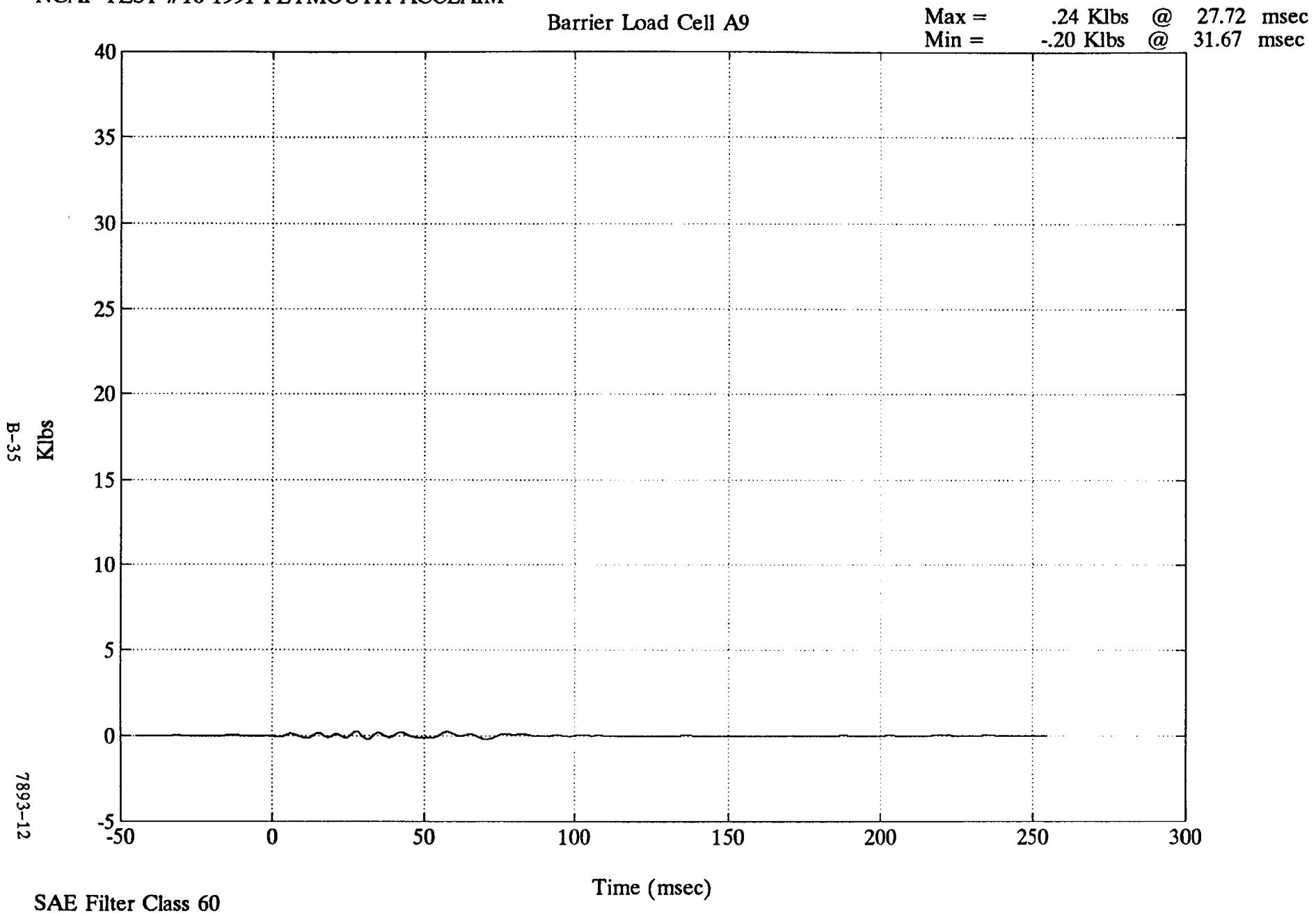
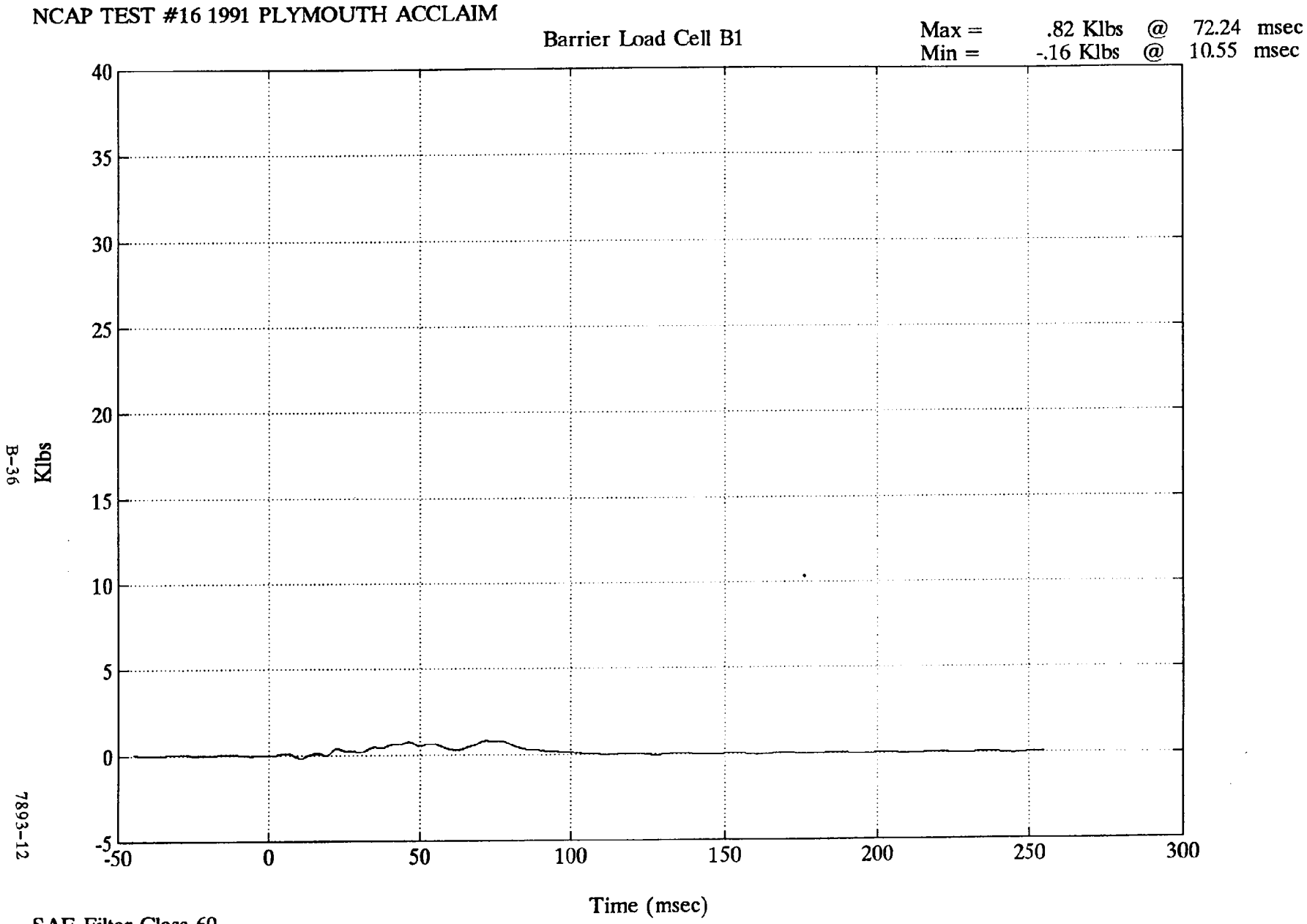


B-35

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

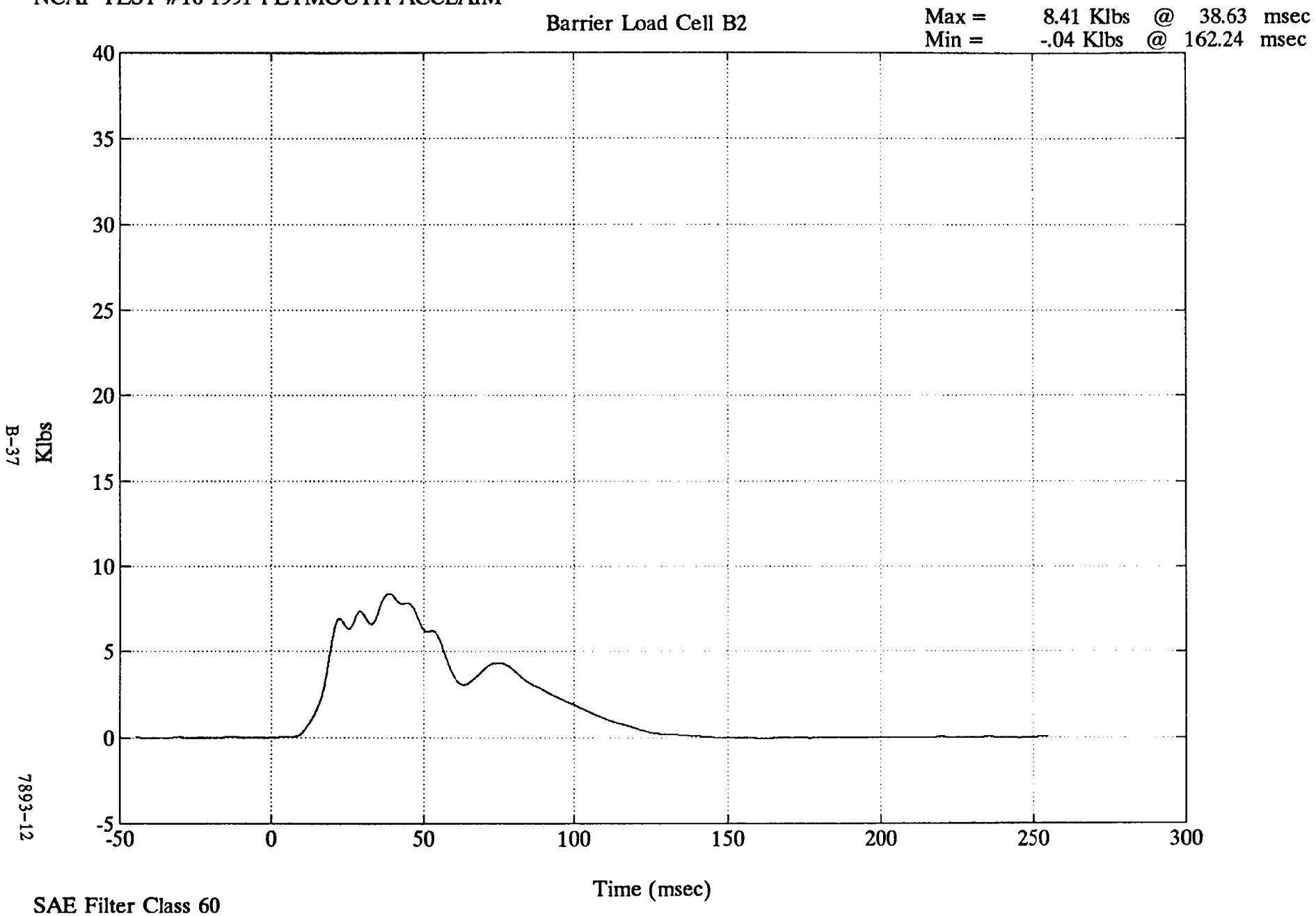


SAE Filter Class 60

B-36

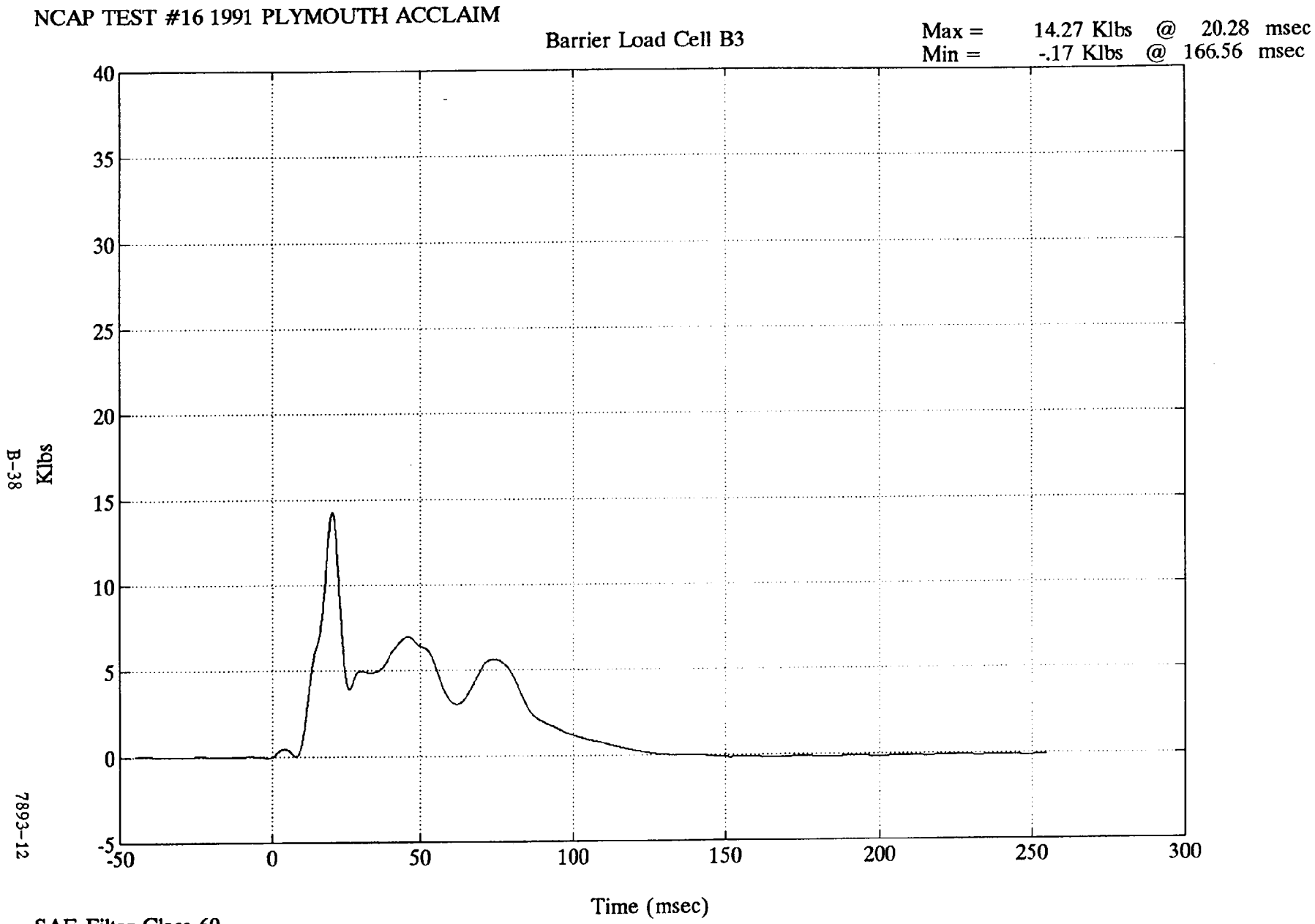
7893-12

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

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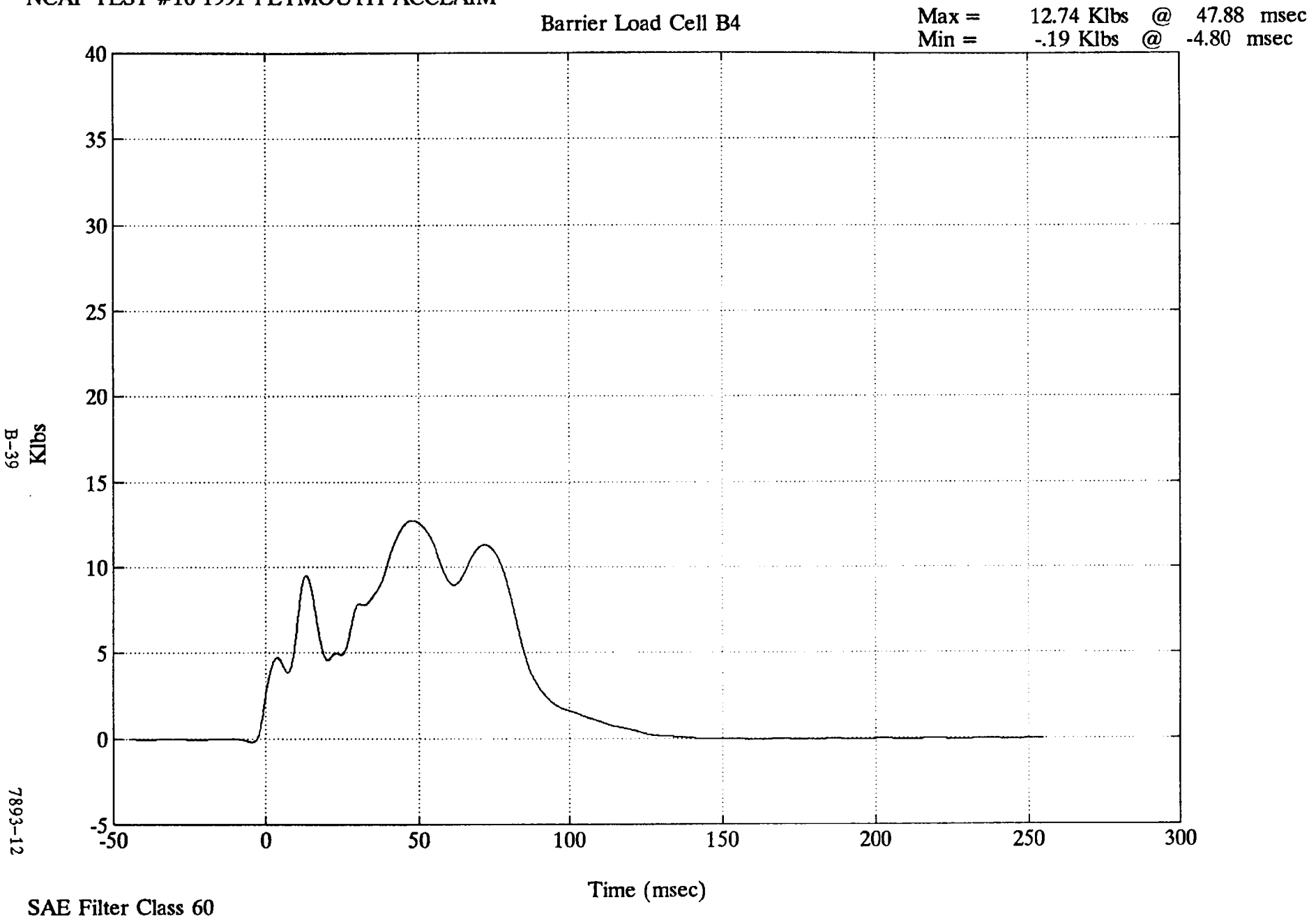

SAE Filter Class 60

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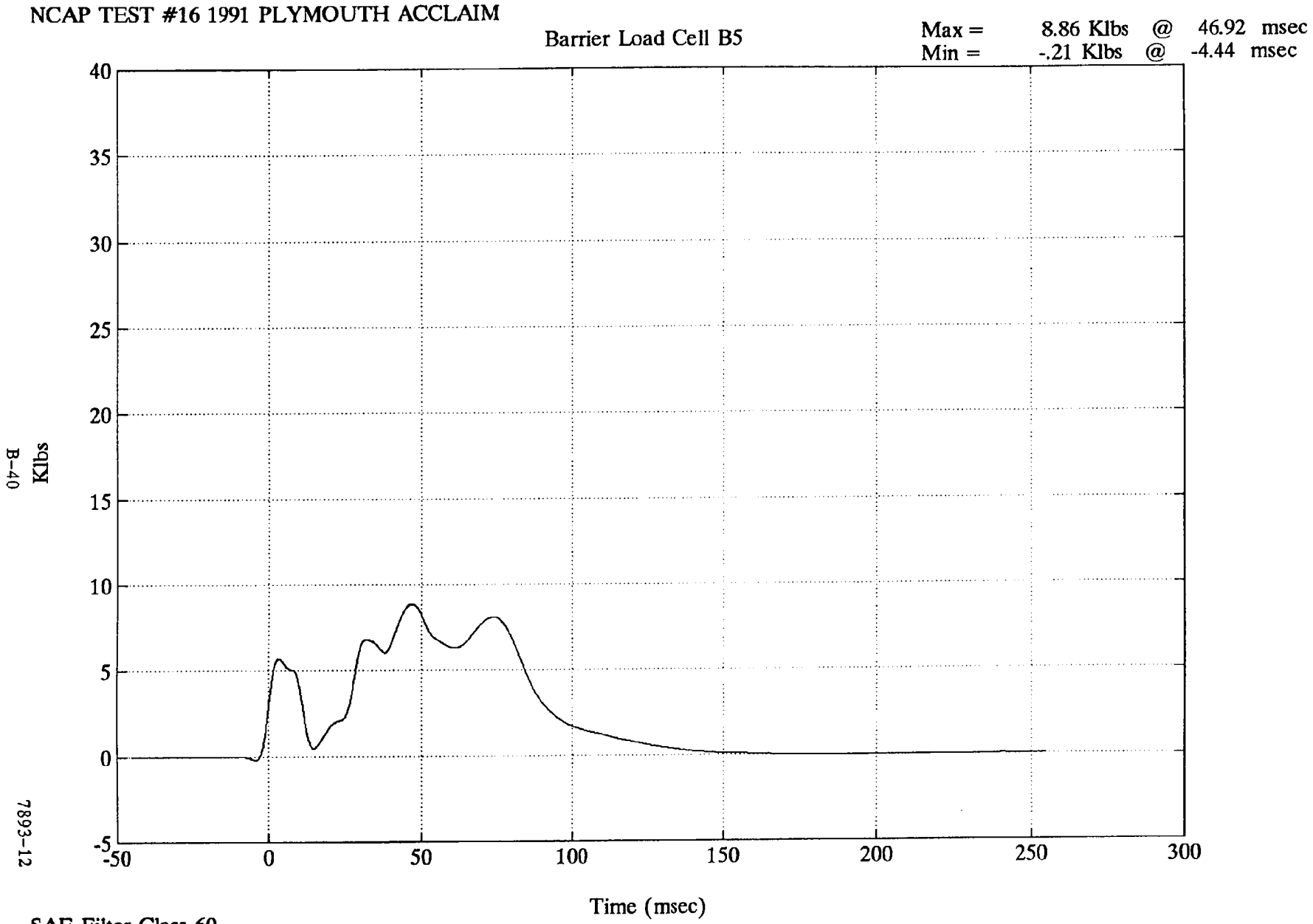

B-40

7893-12

SAE Filter Class 60

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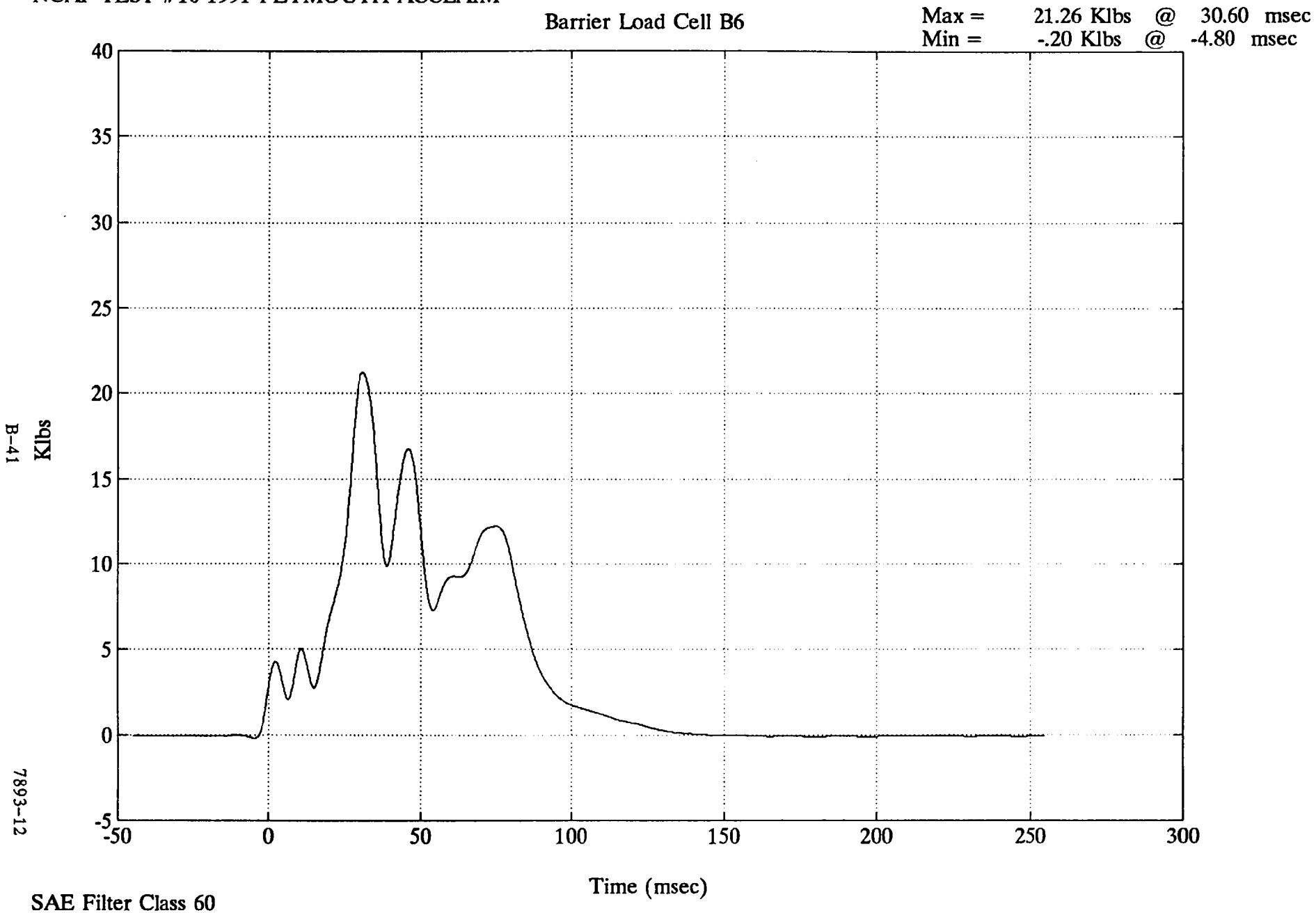
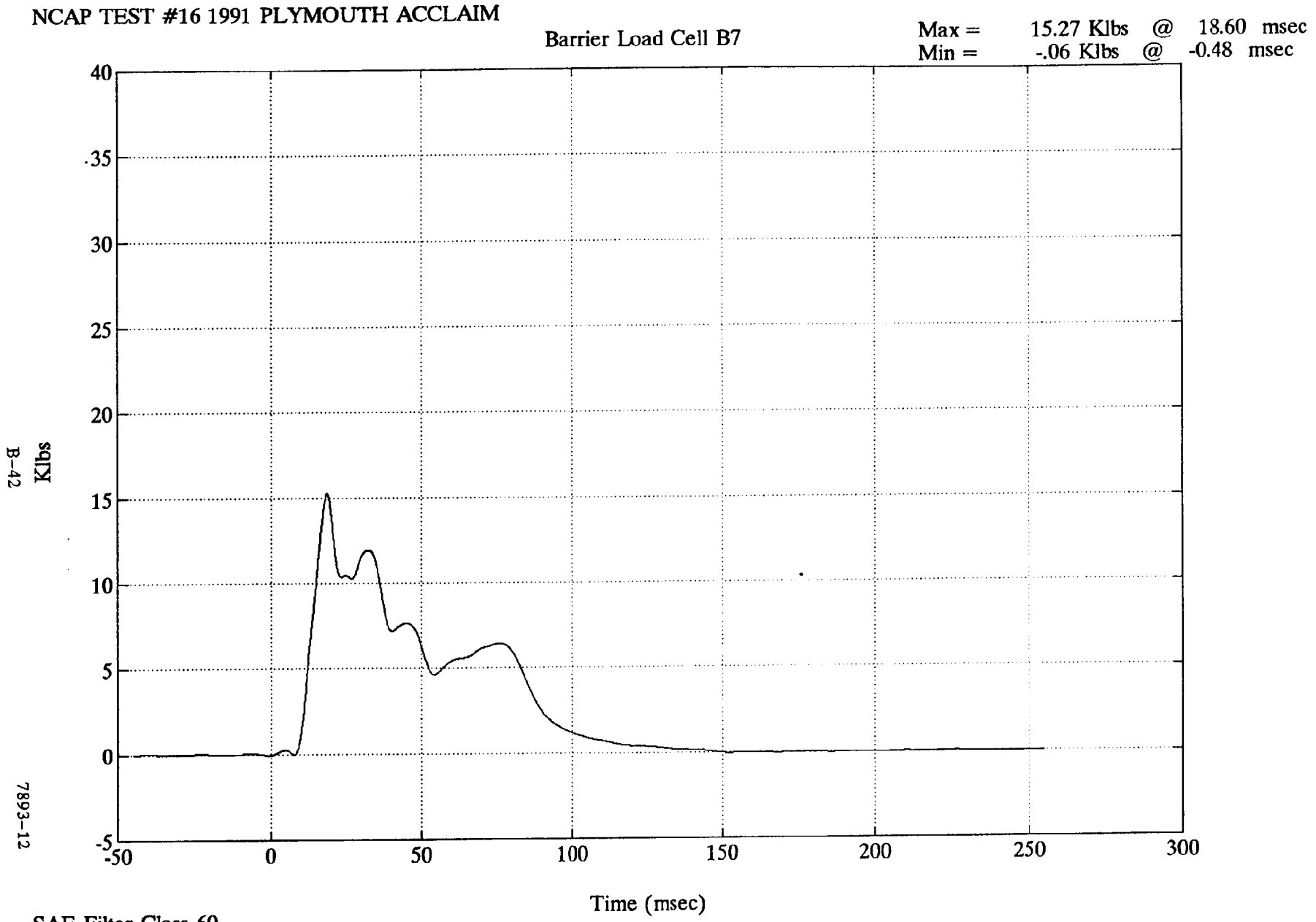


B-41

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

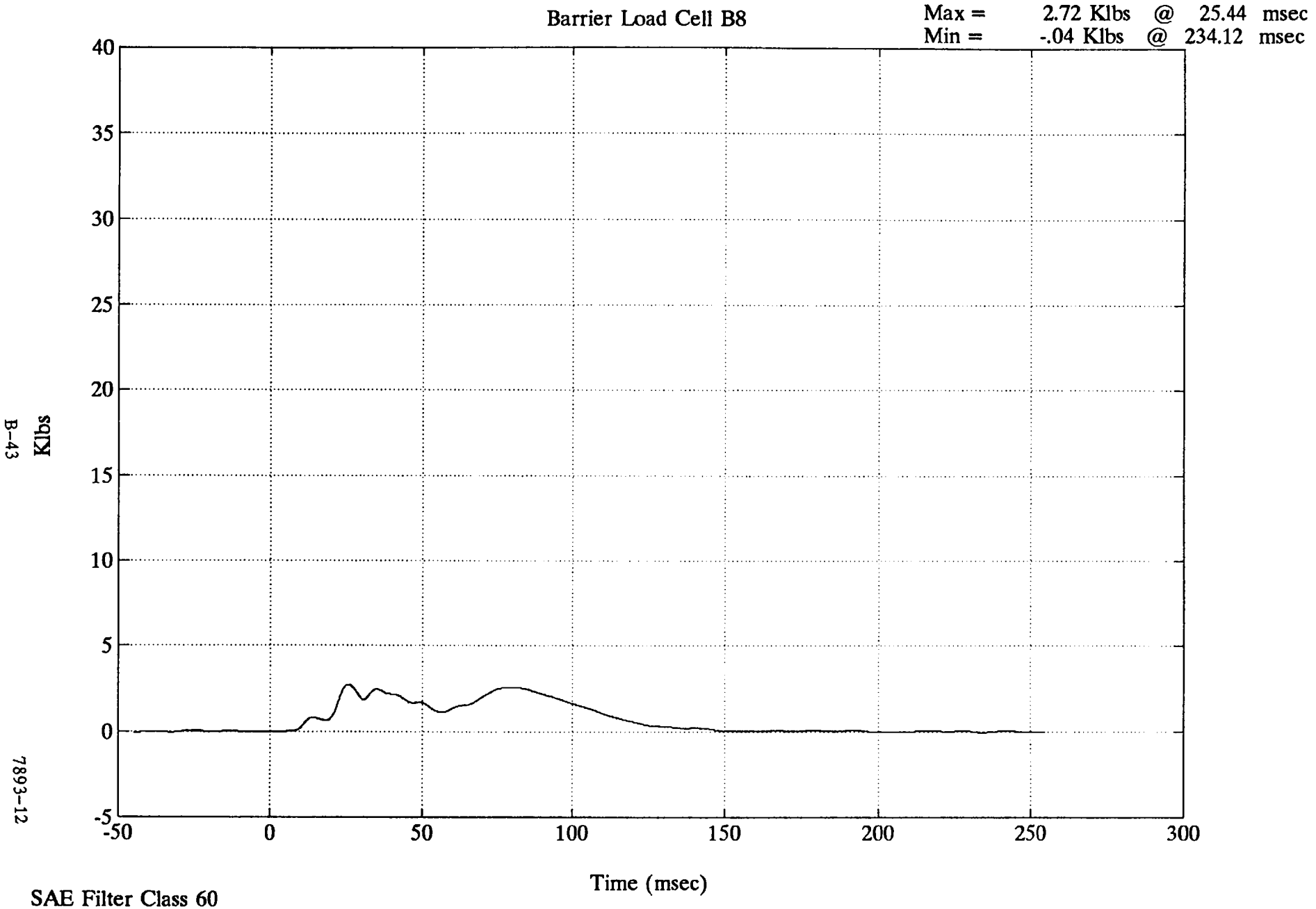


B-42

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-43

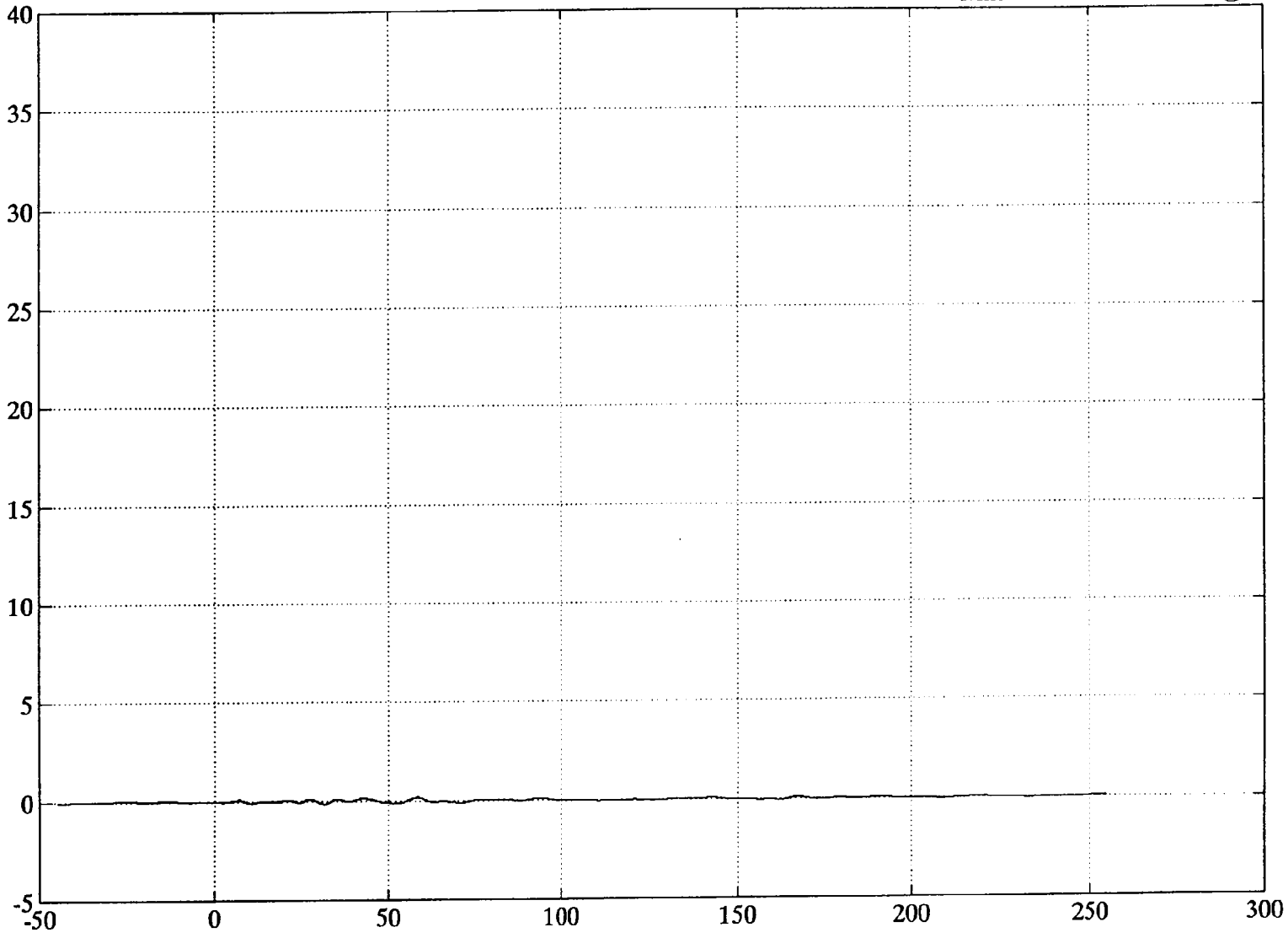
7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Barrier Load Cell B9

Max = .16 Klbs @ 58.43 msec
Min = -.14 Klbs @ 31.31 msec

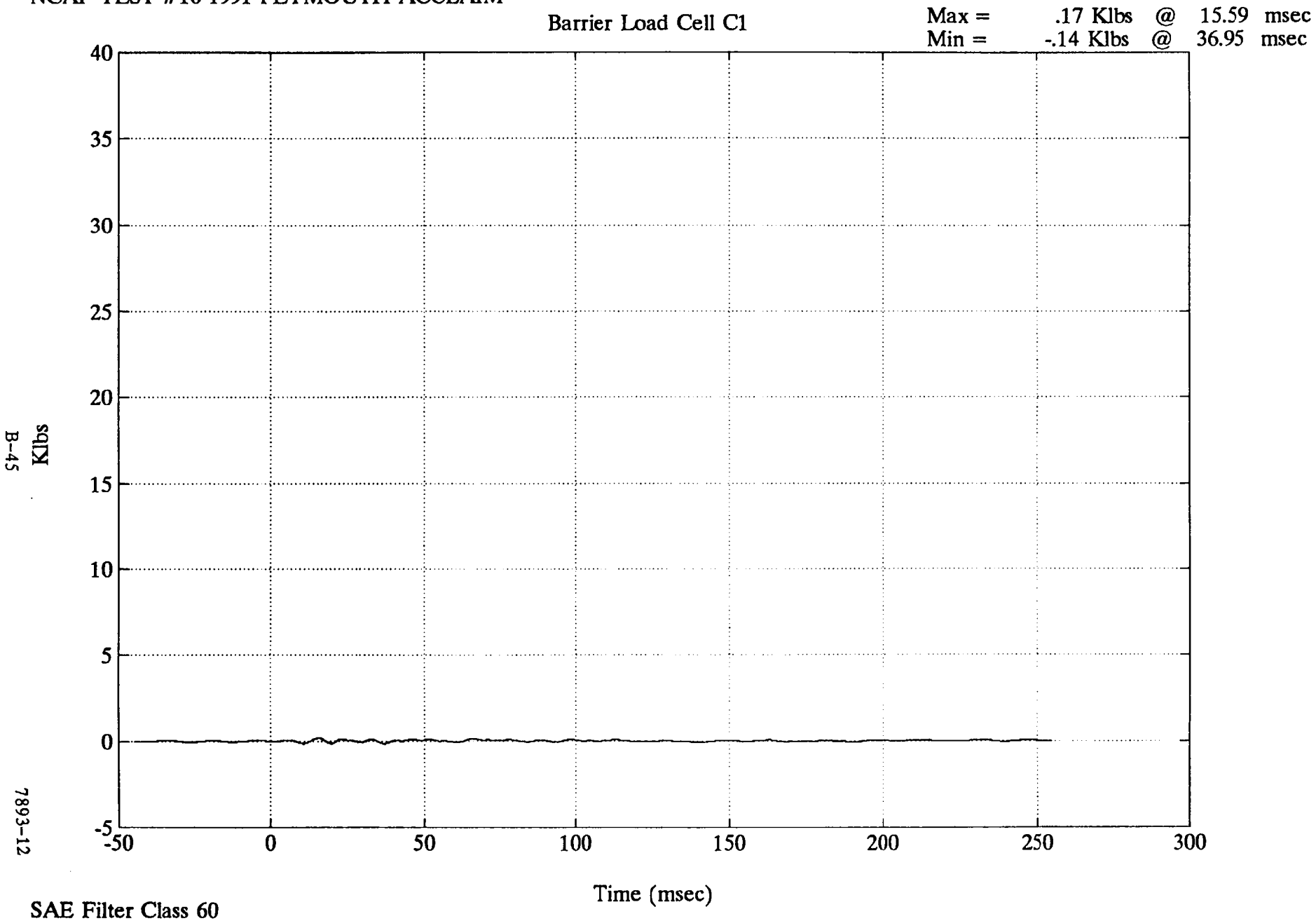


B-44

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

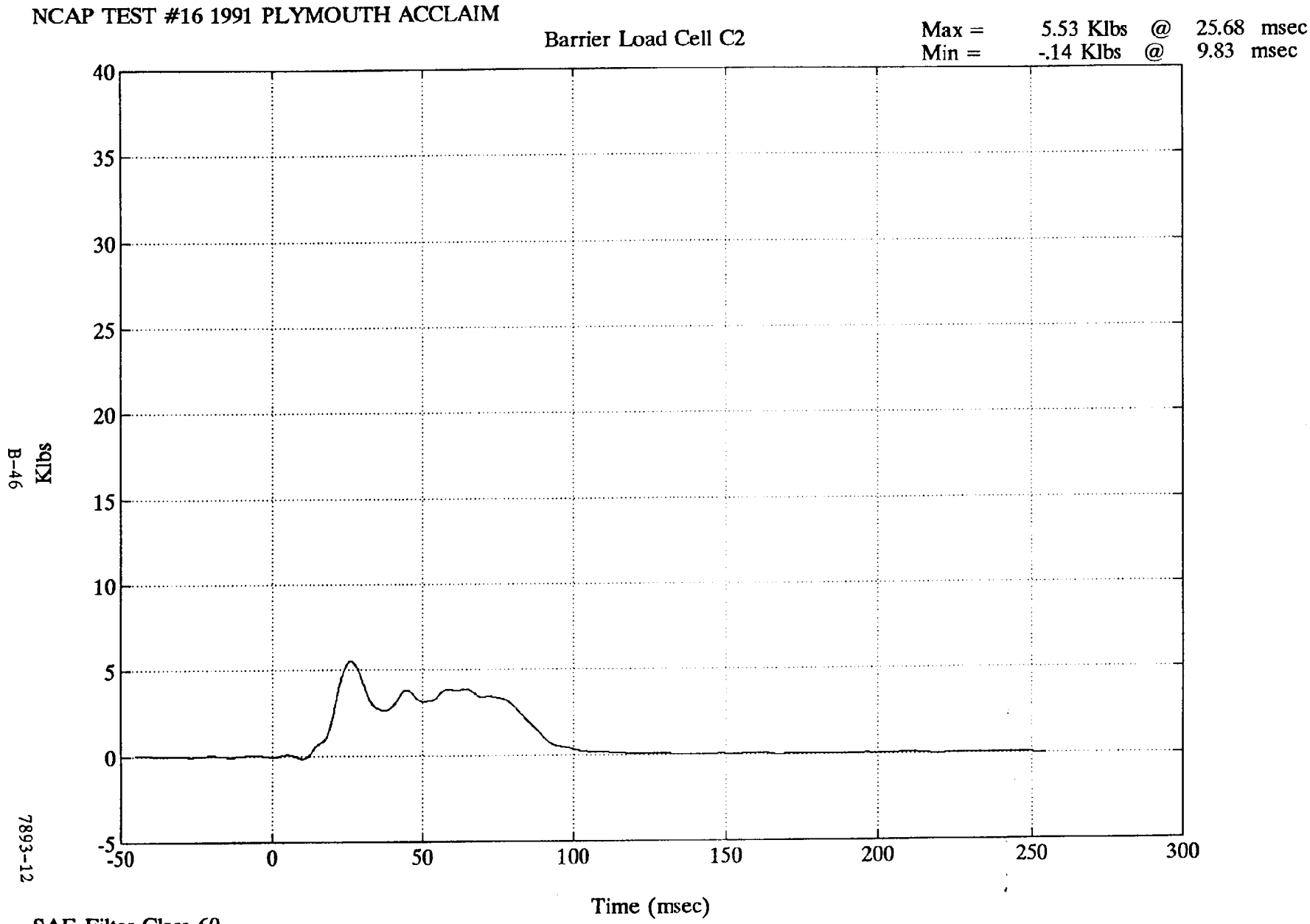


B-45

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

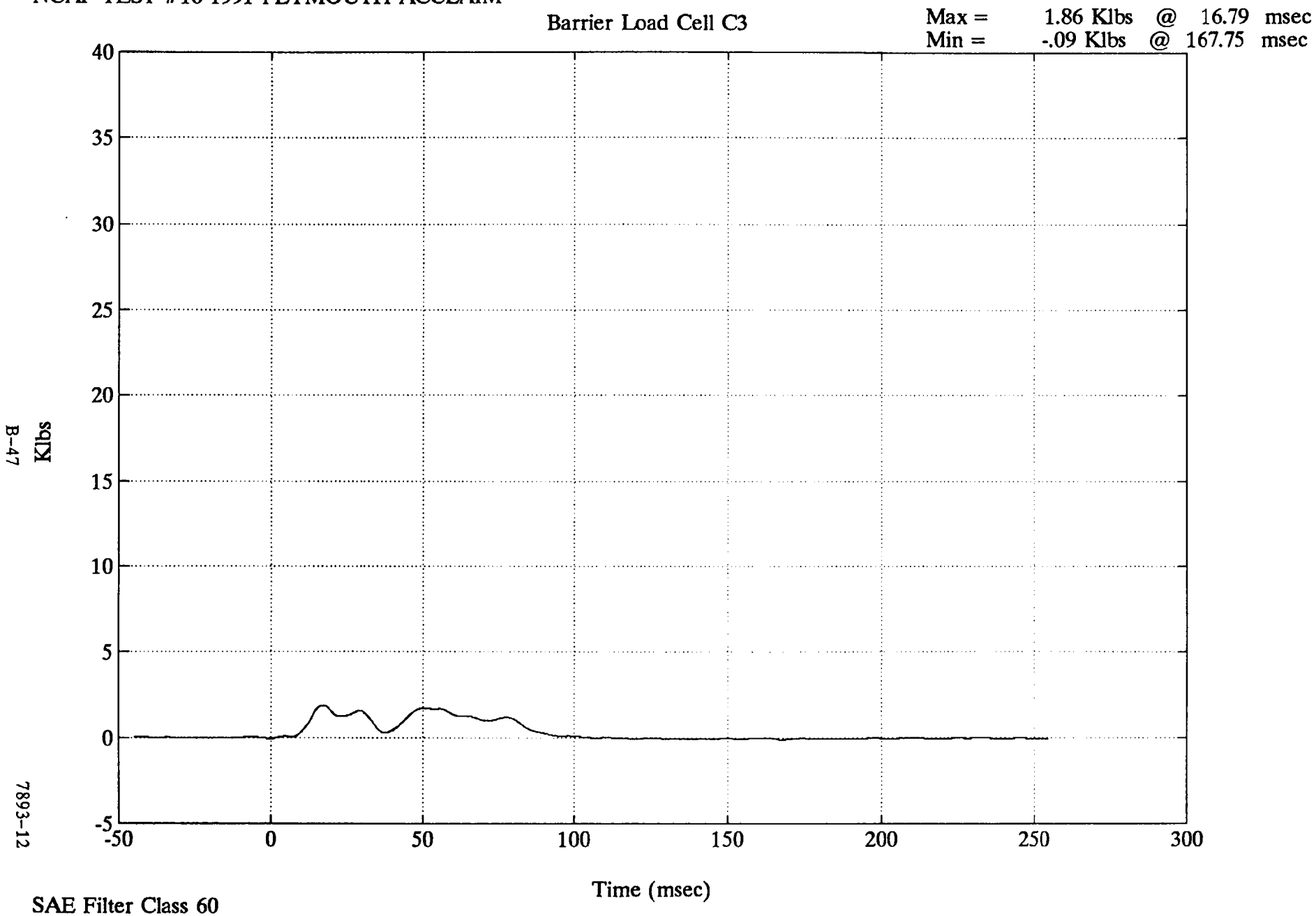


B-46

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-47

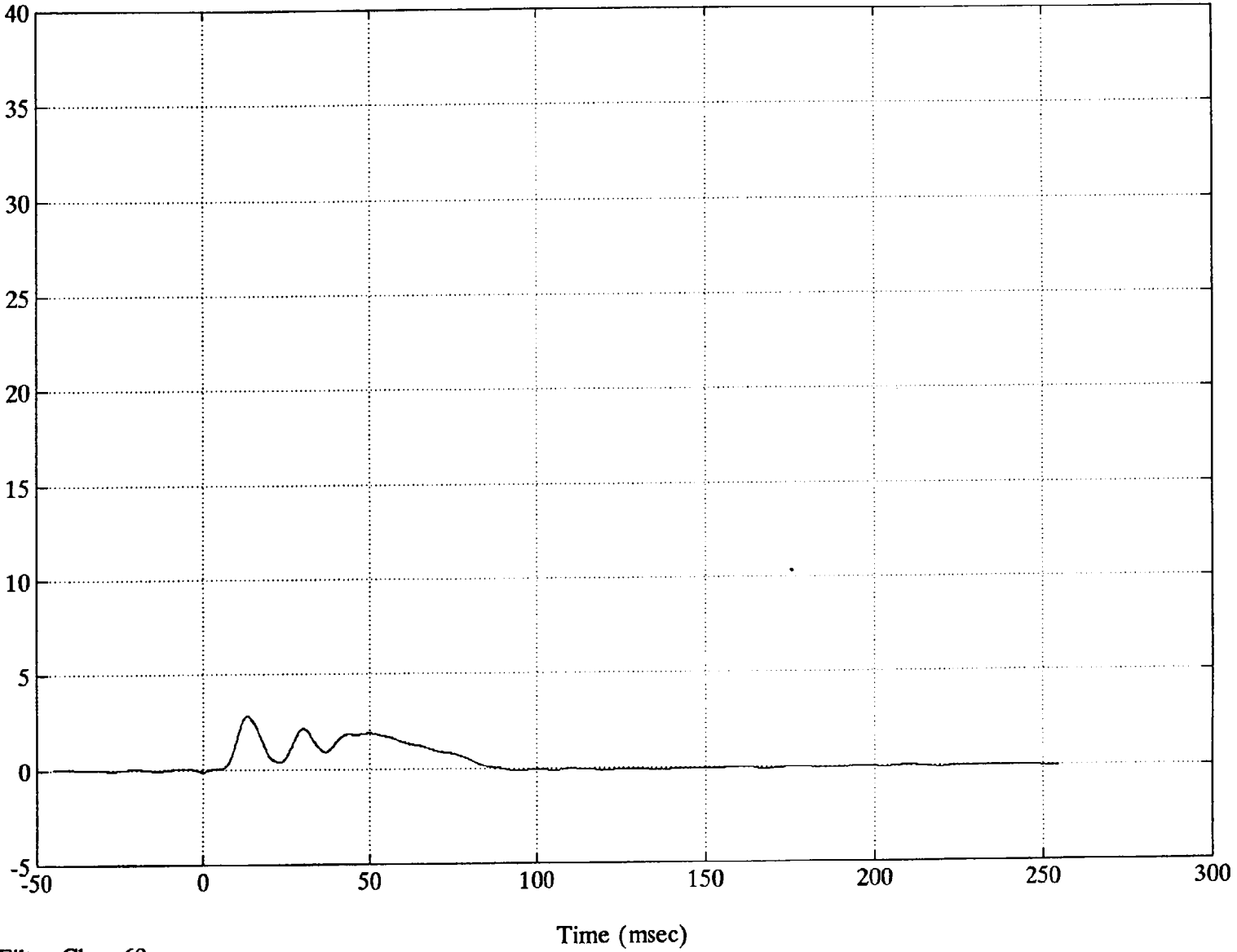
7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Barrier Load Cell C4

Max = 2.80 Klbs @ 12.95 msec
Min = -.13 Klbs @ 167.75 msec

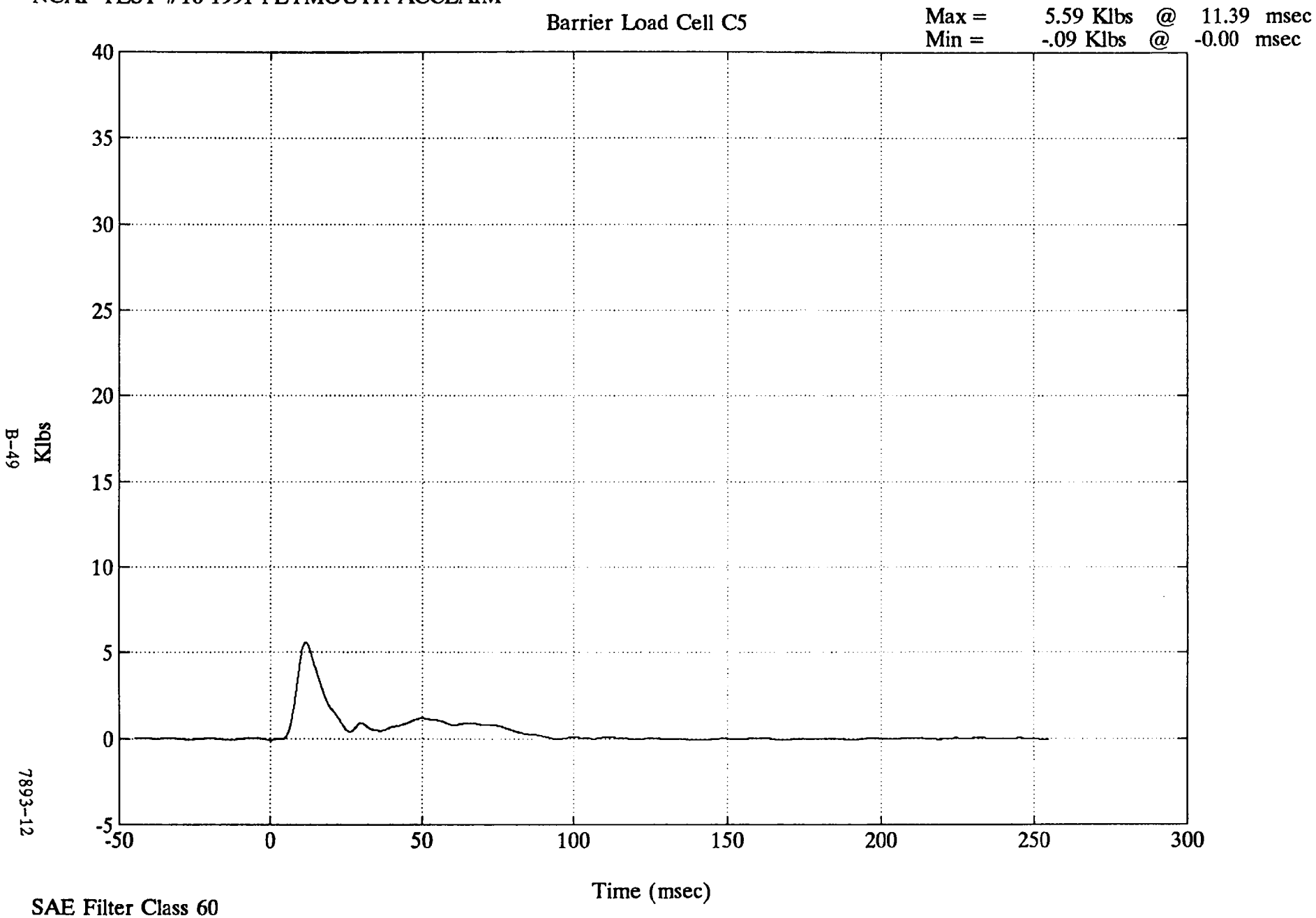


B-48

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

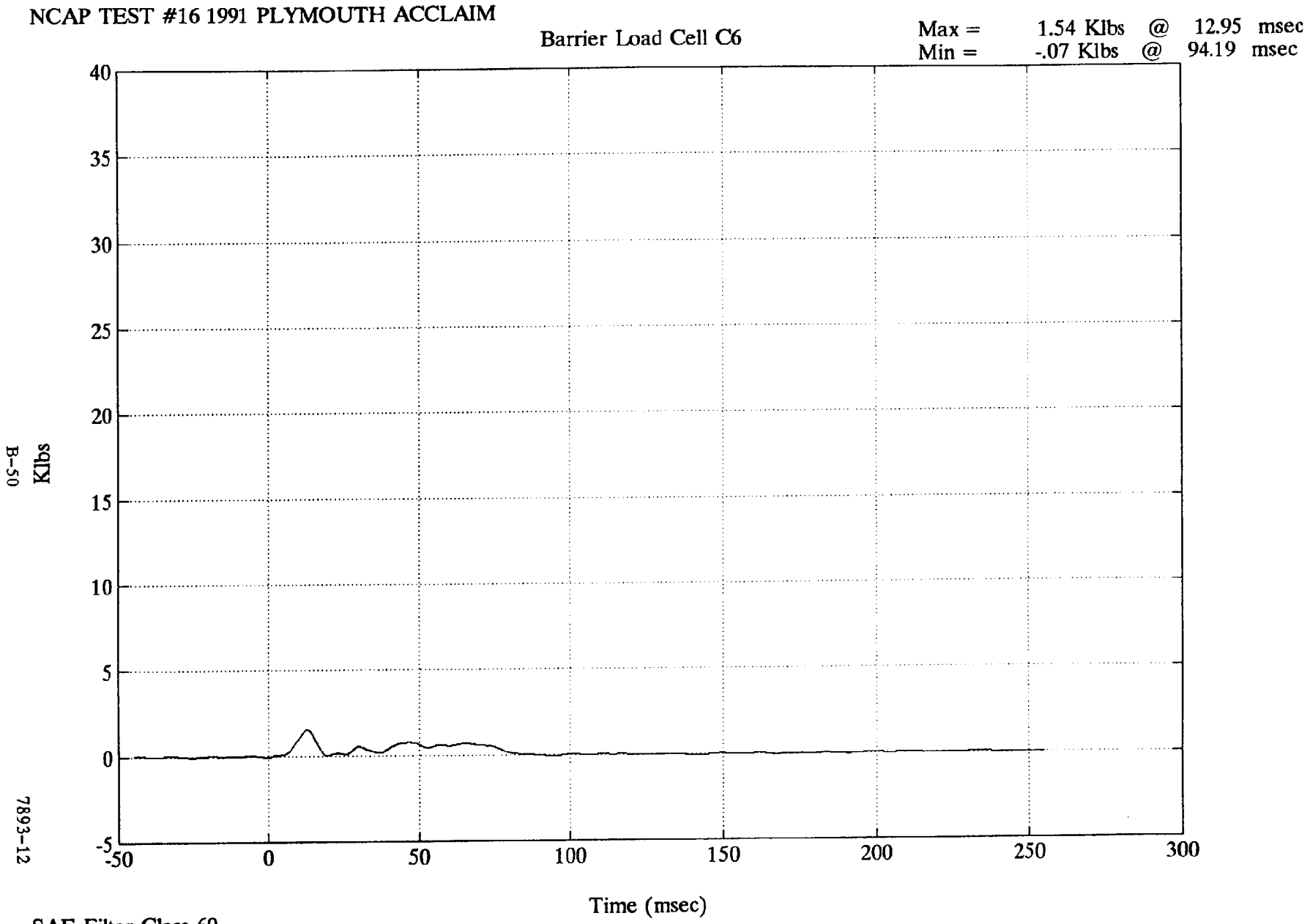


B-49

7893-12

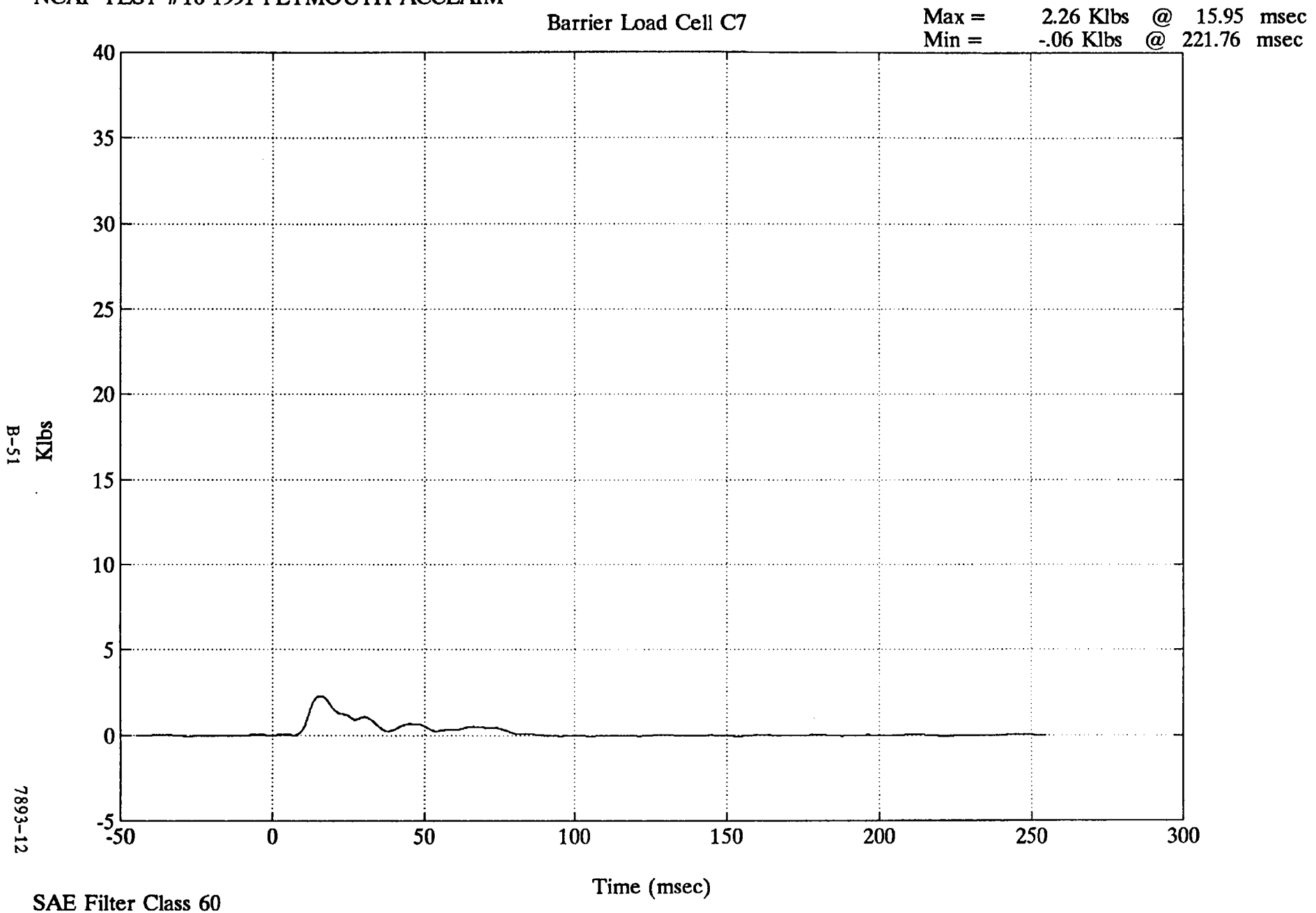
SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



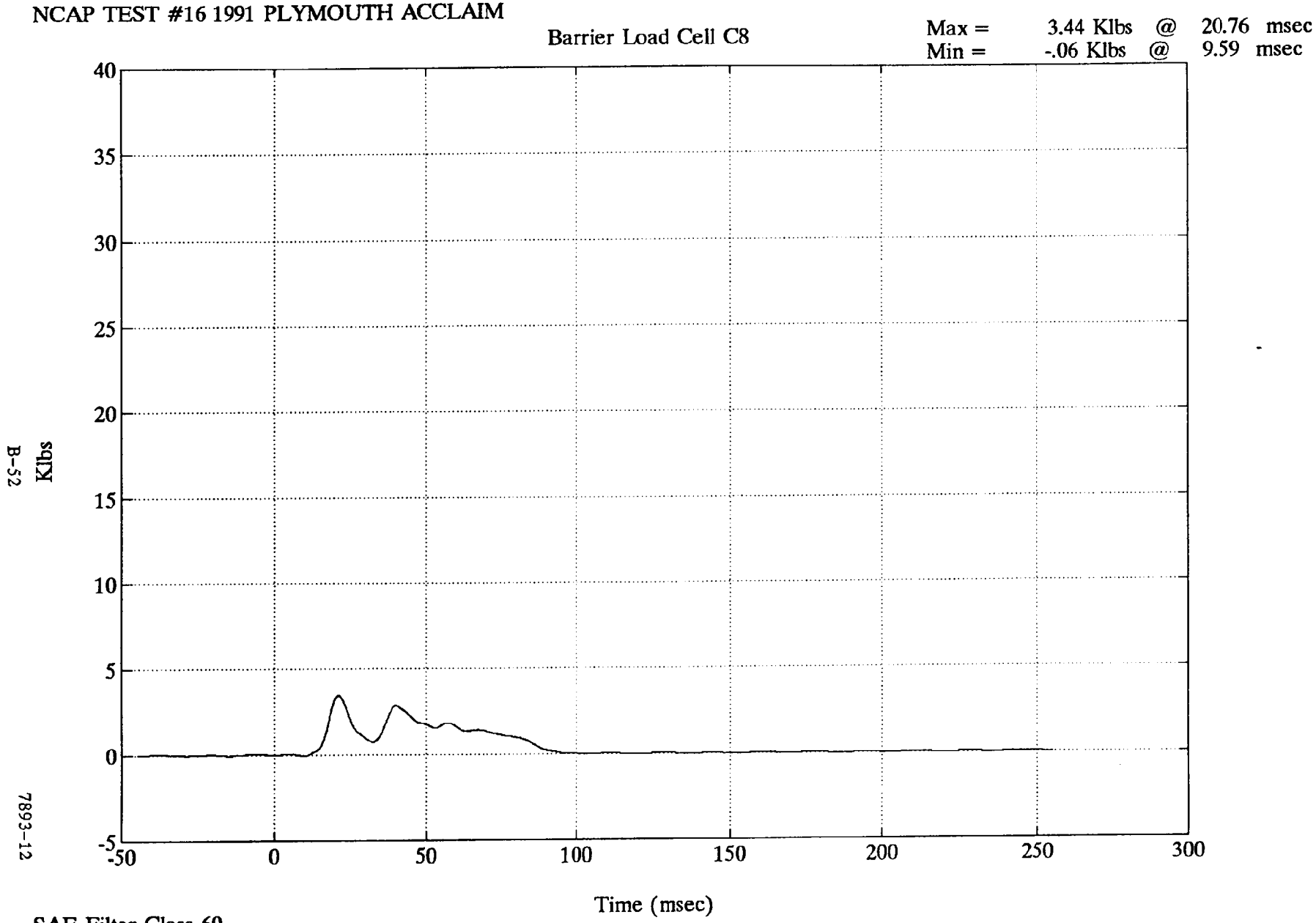
SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

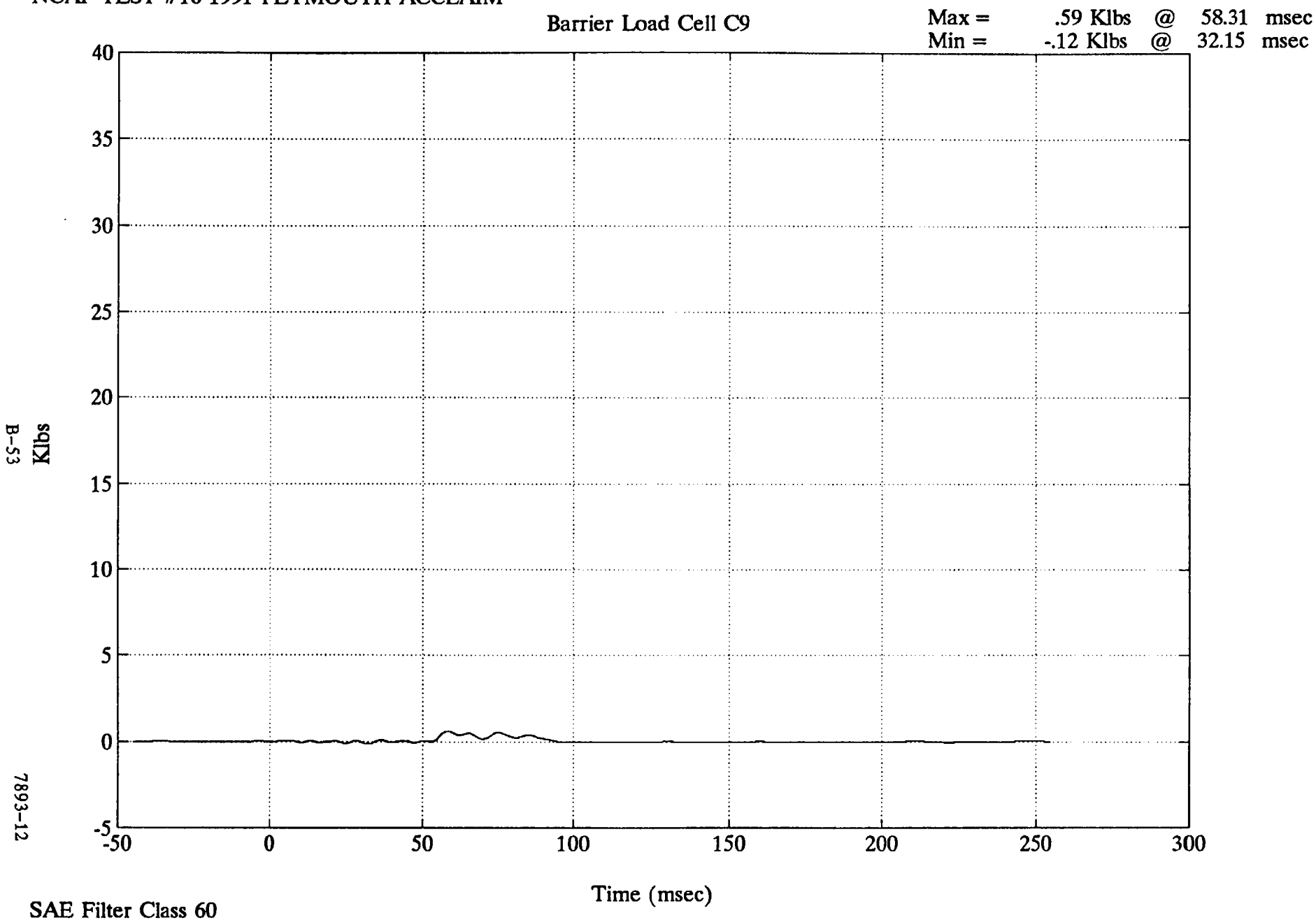


B-52

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

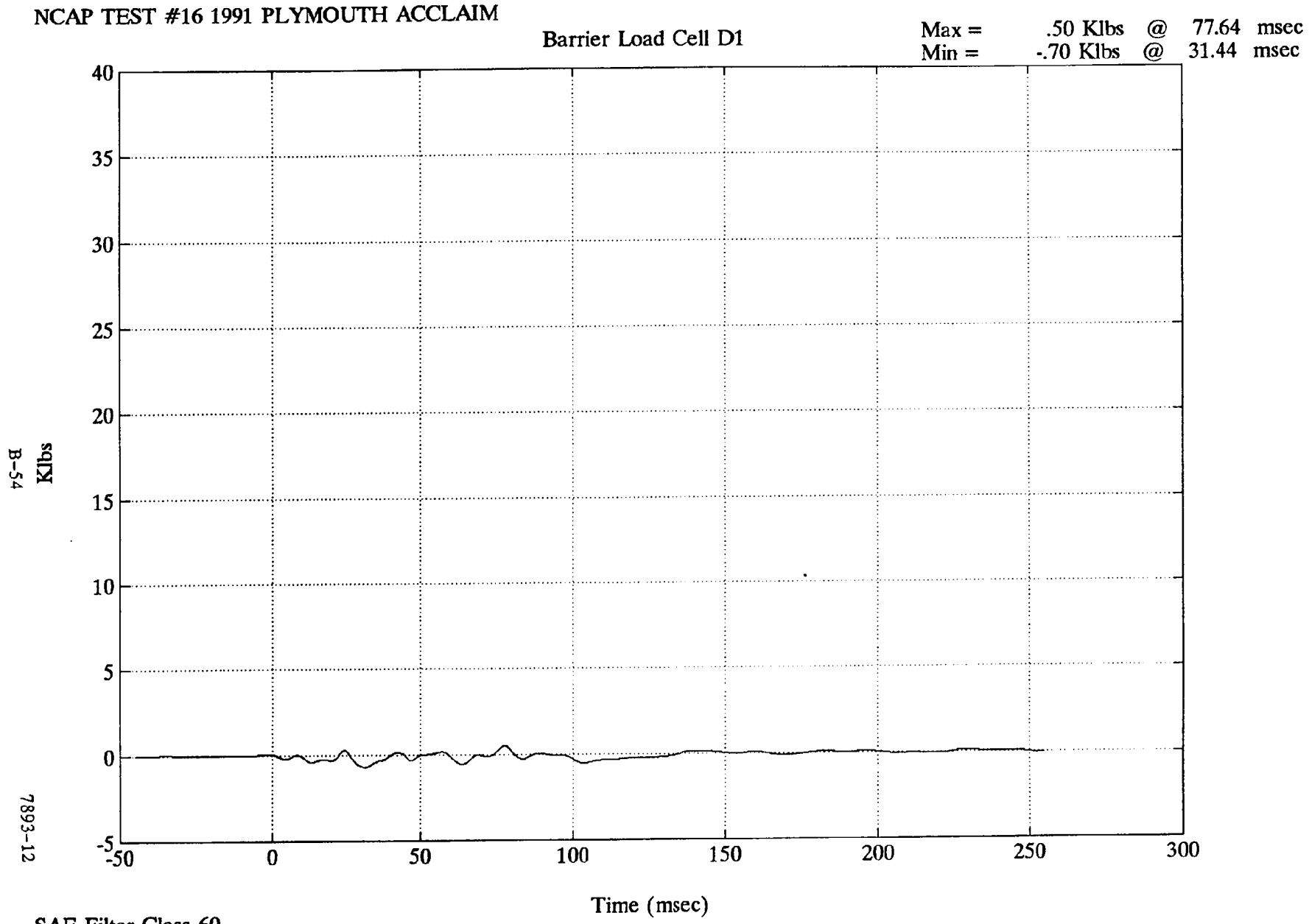


B-53

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

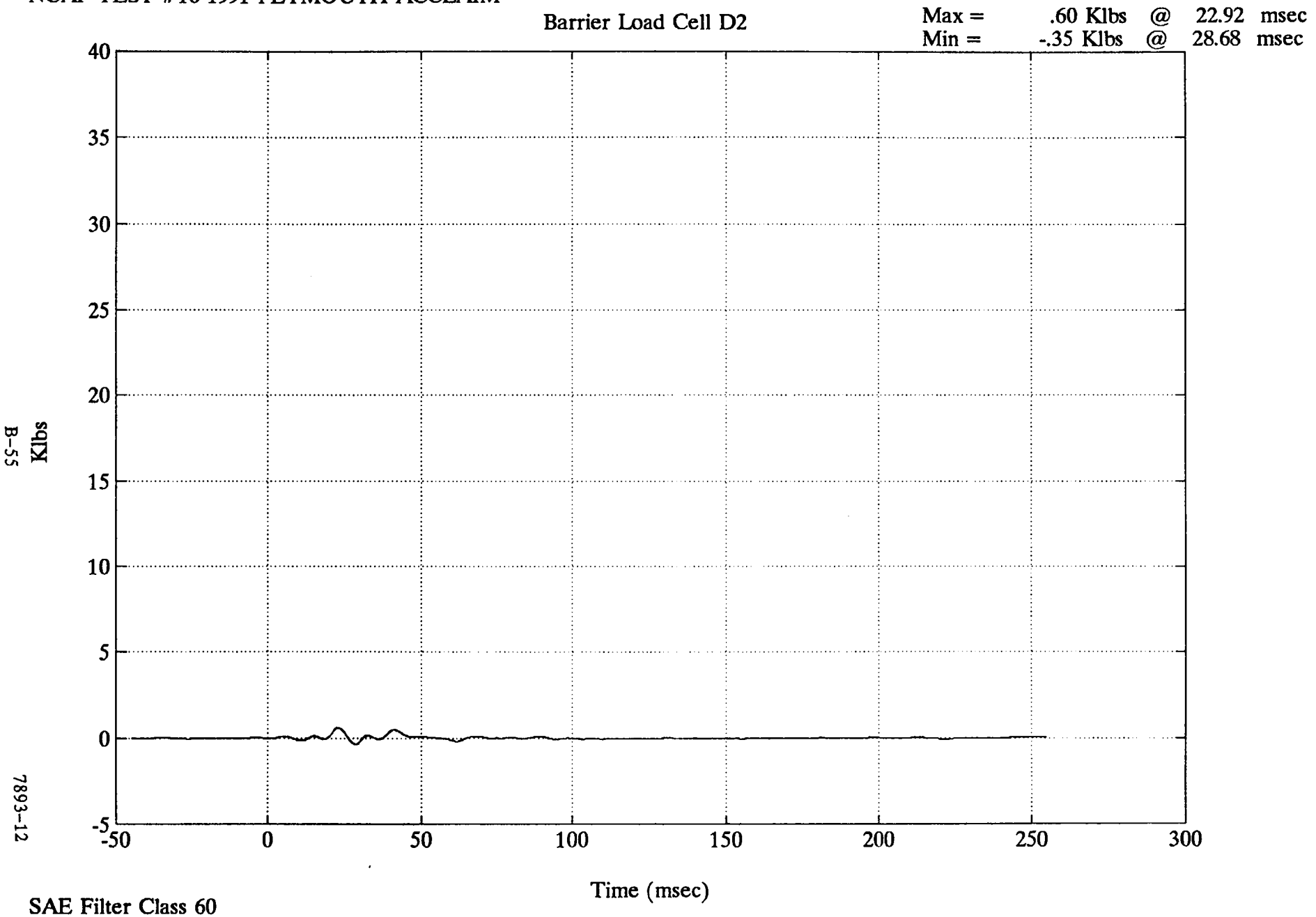


B-54

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-55

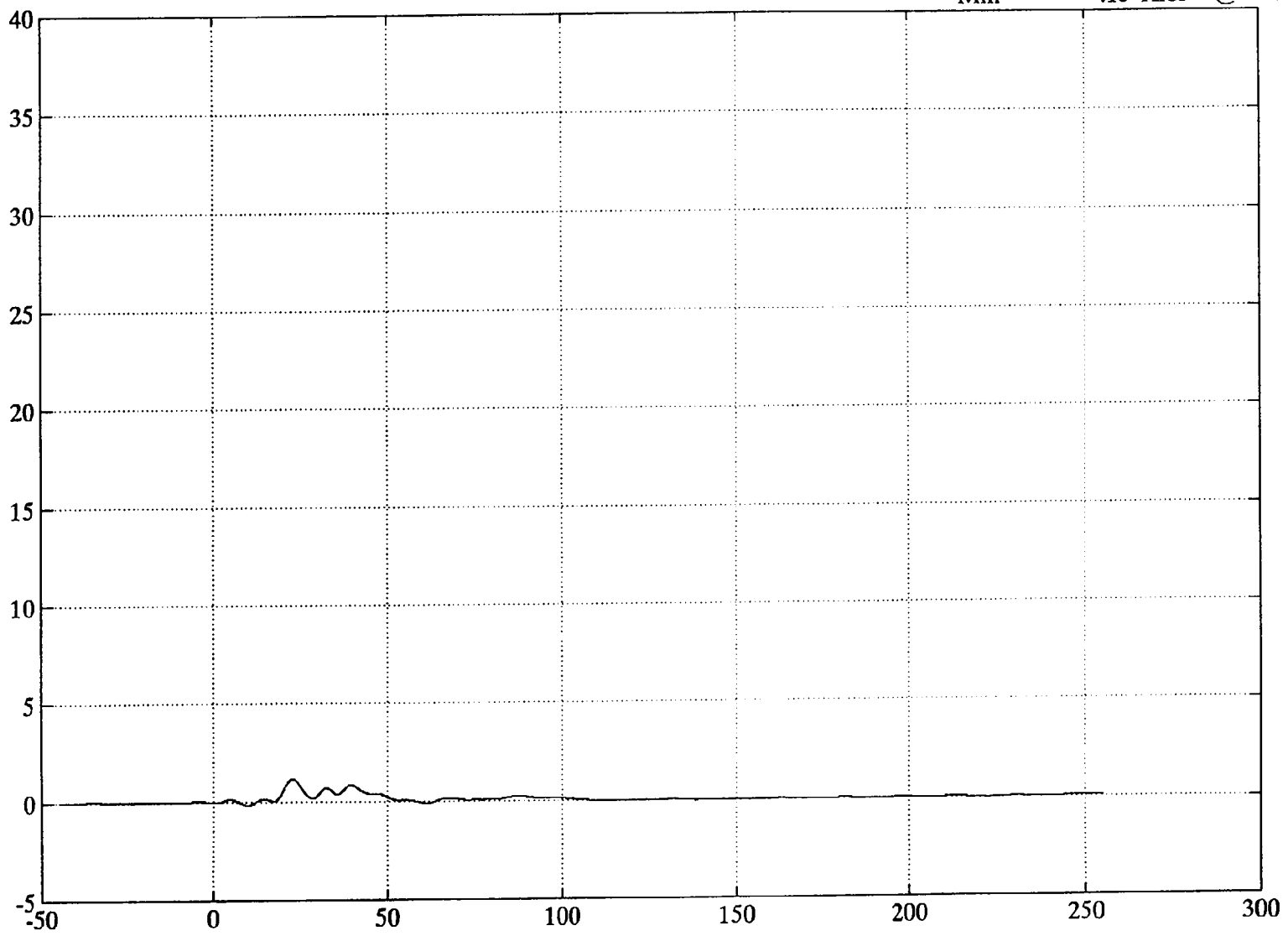
7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Barrier Load Cell D3

Max = 1.16 Klbs @ 22.56 msec
Min = -.15 Klbs @ 9.95 msec

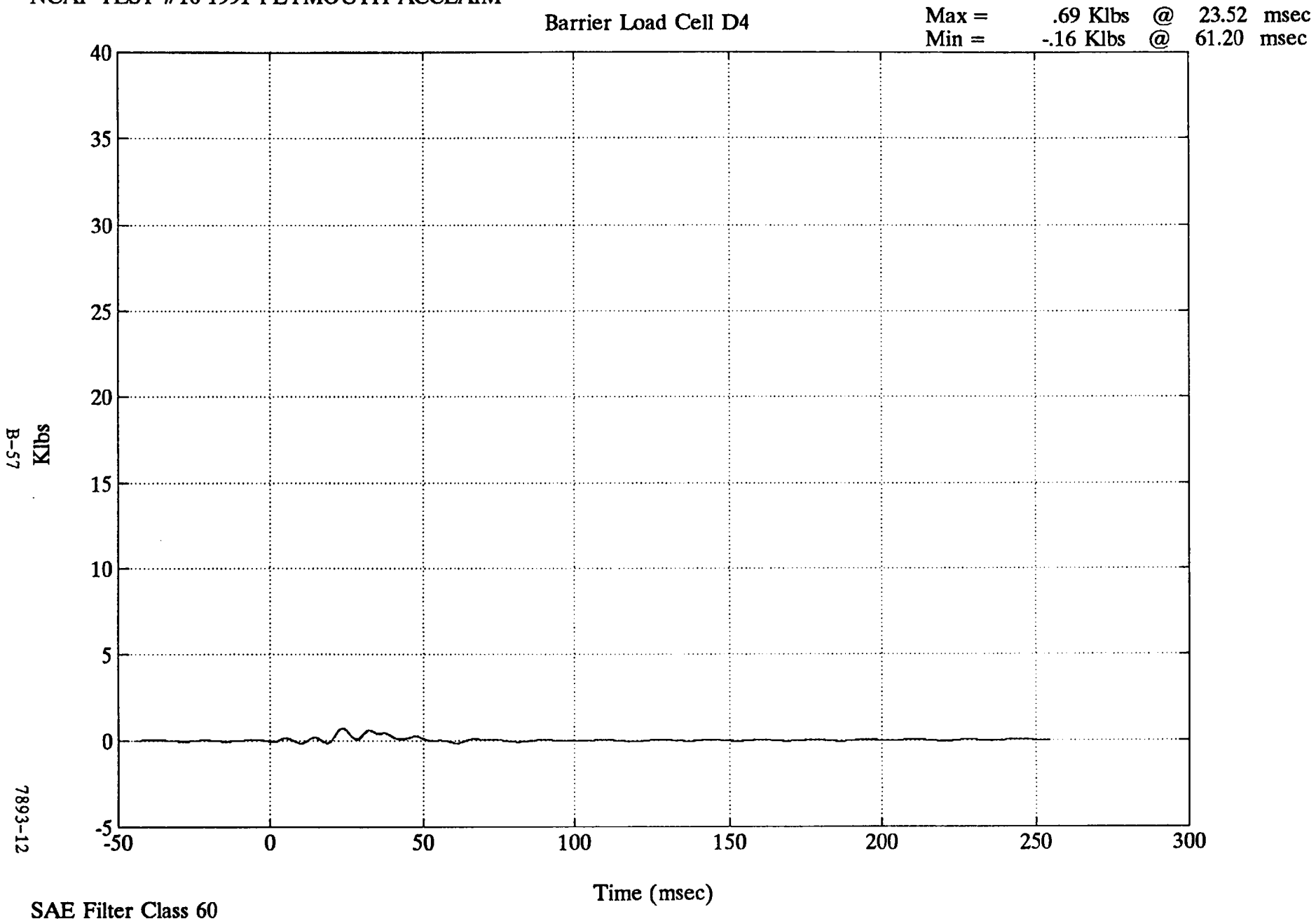


B-56

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

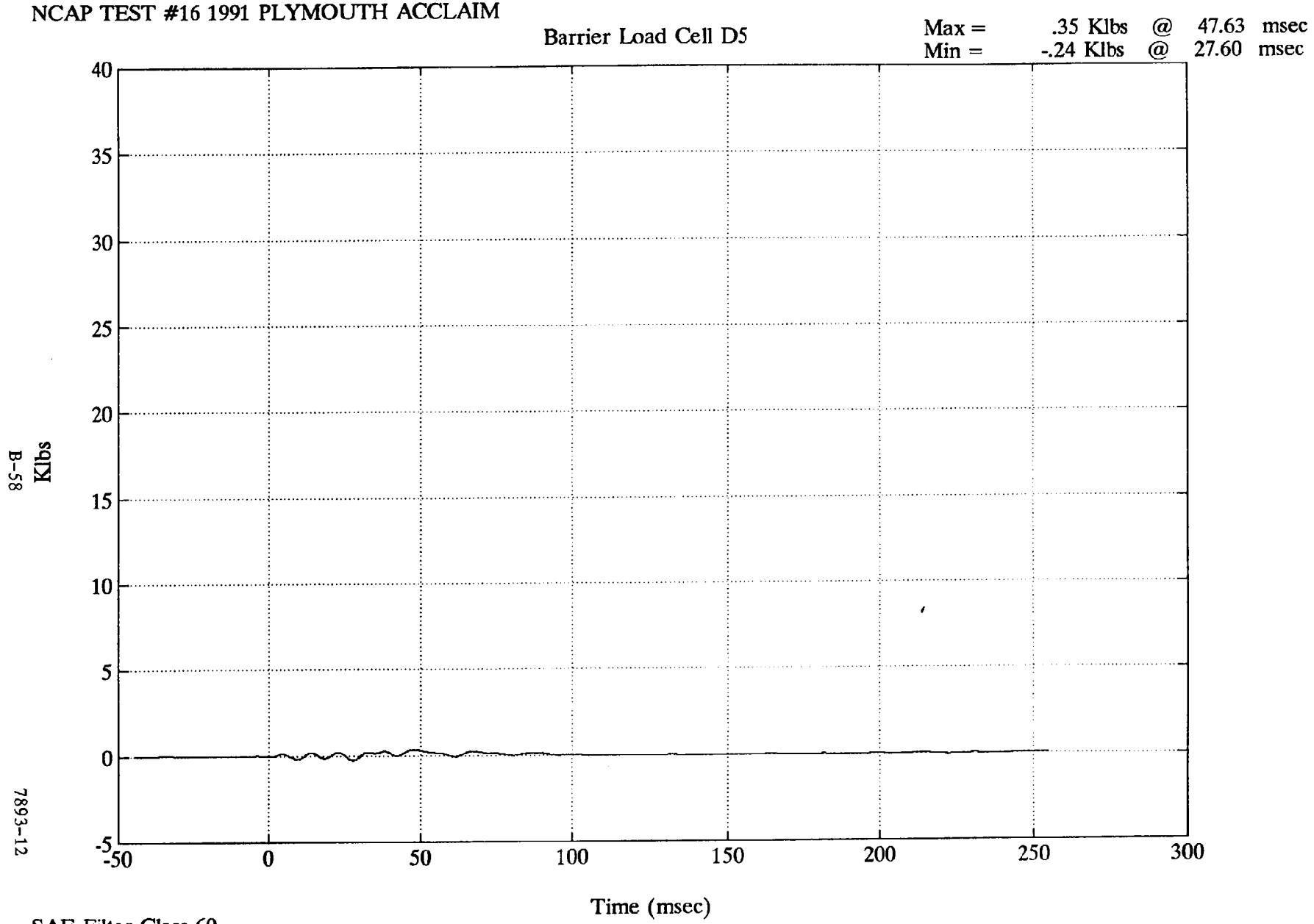


B-57

7893-12

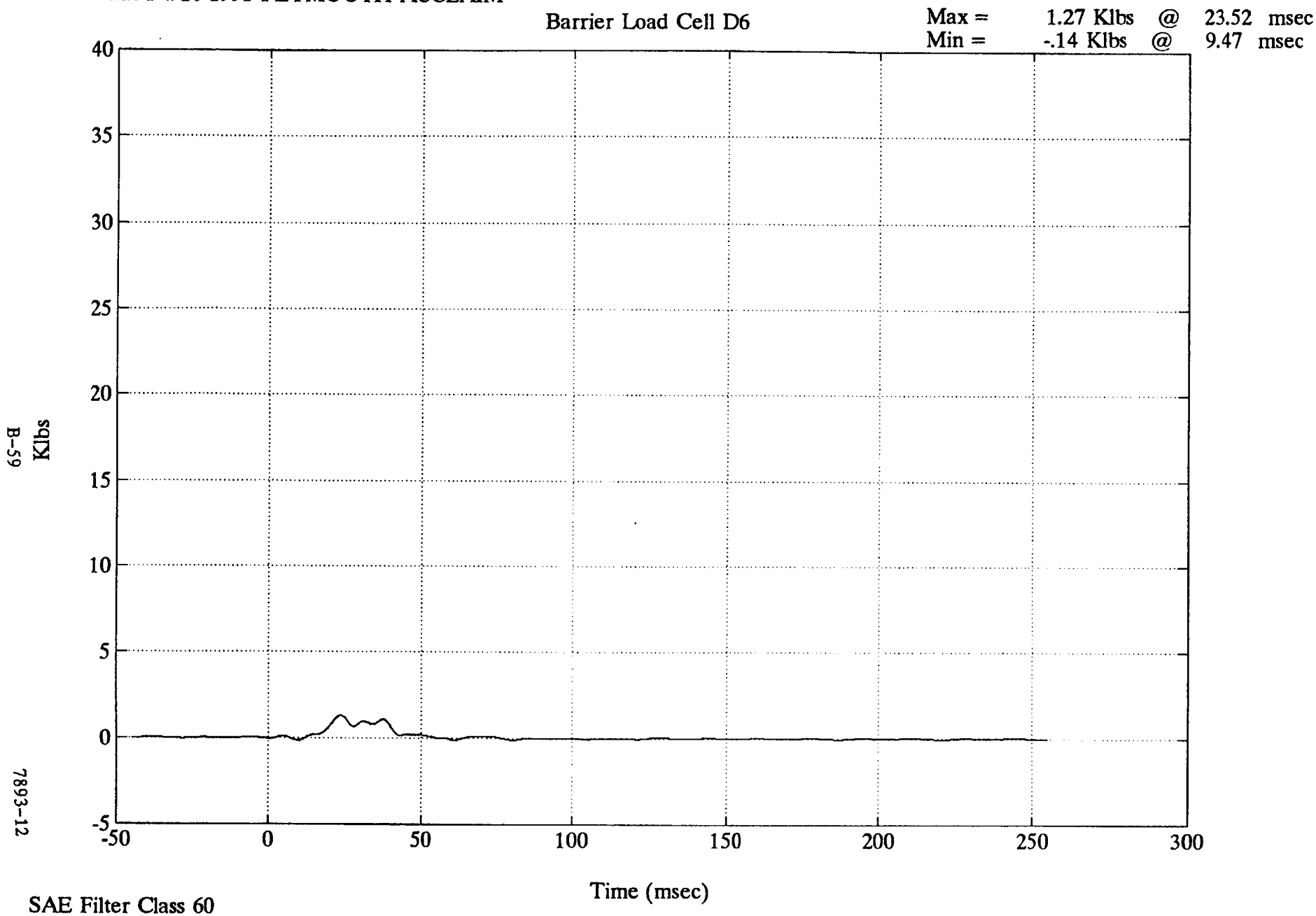
SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

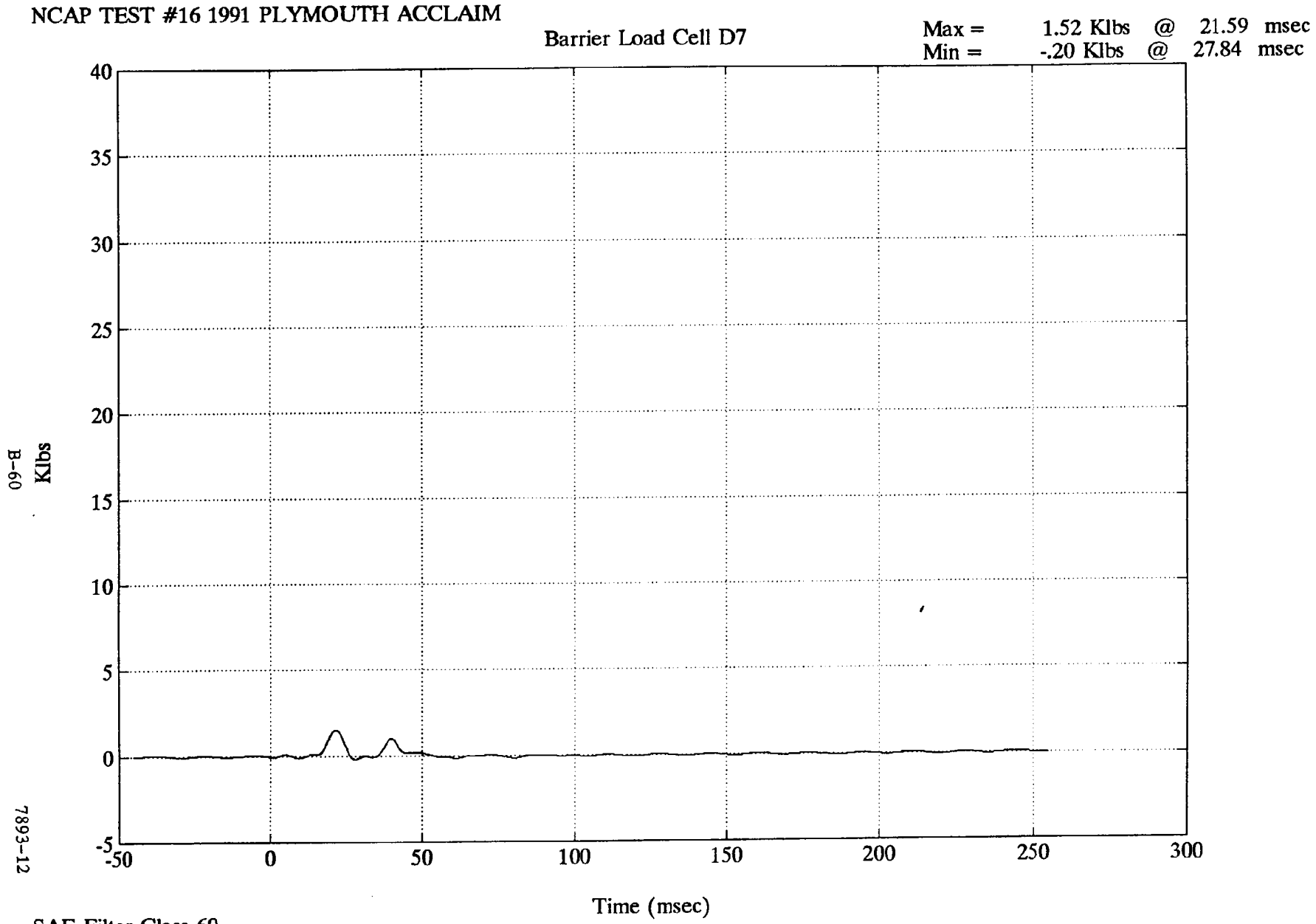


B-59

7893-12

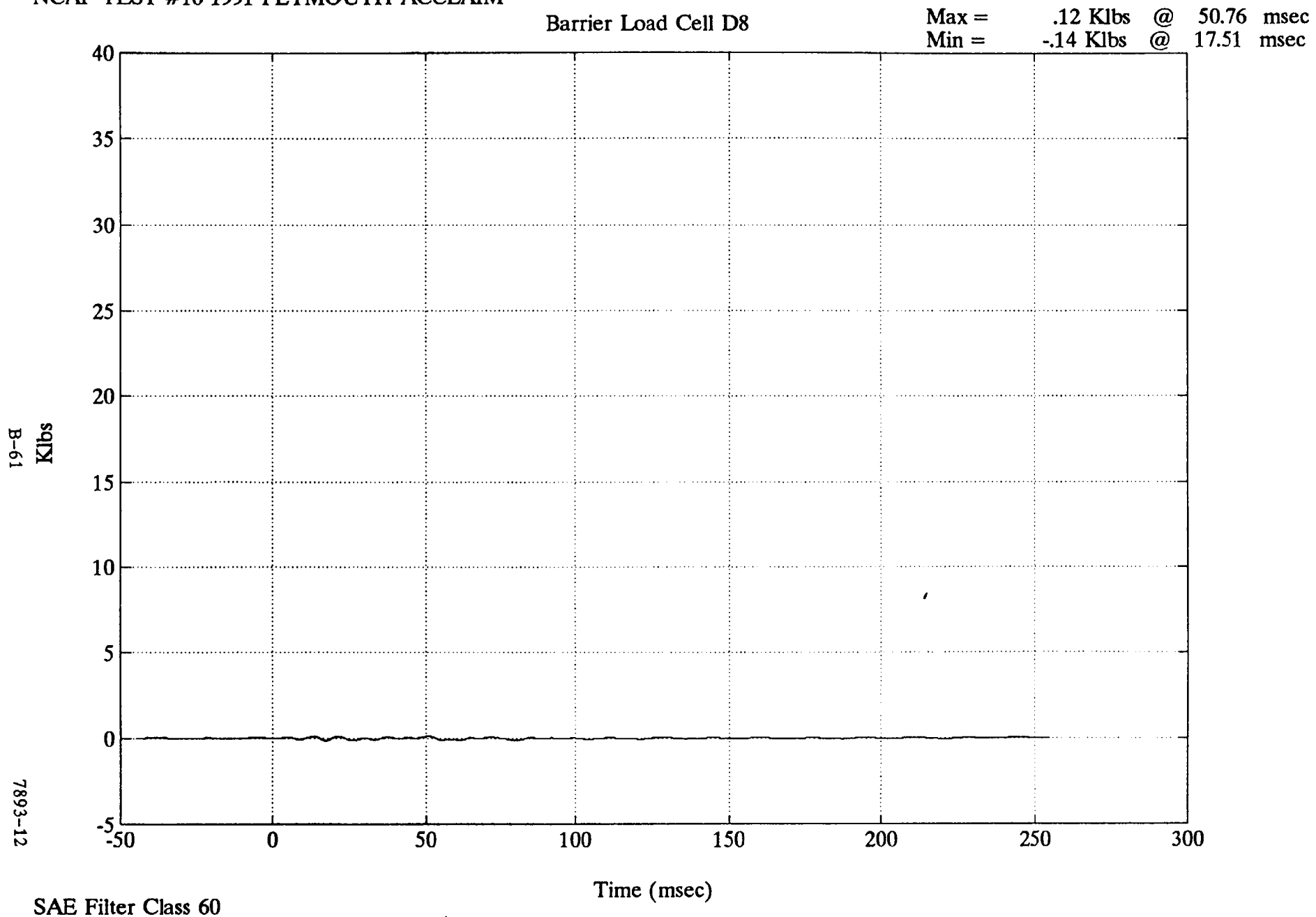
SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-61

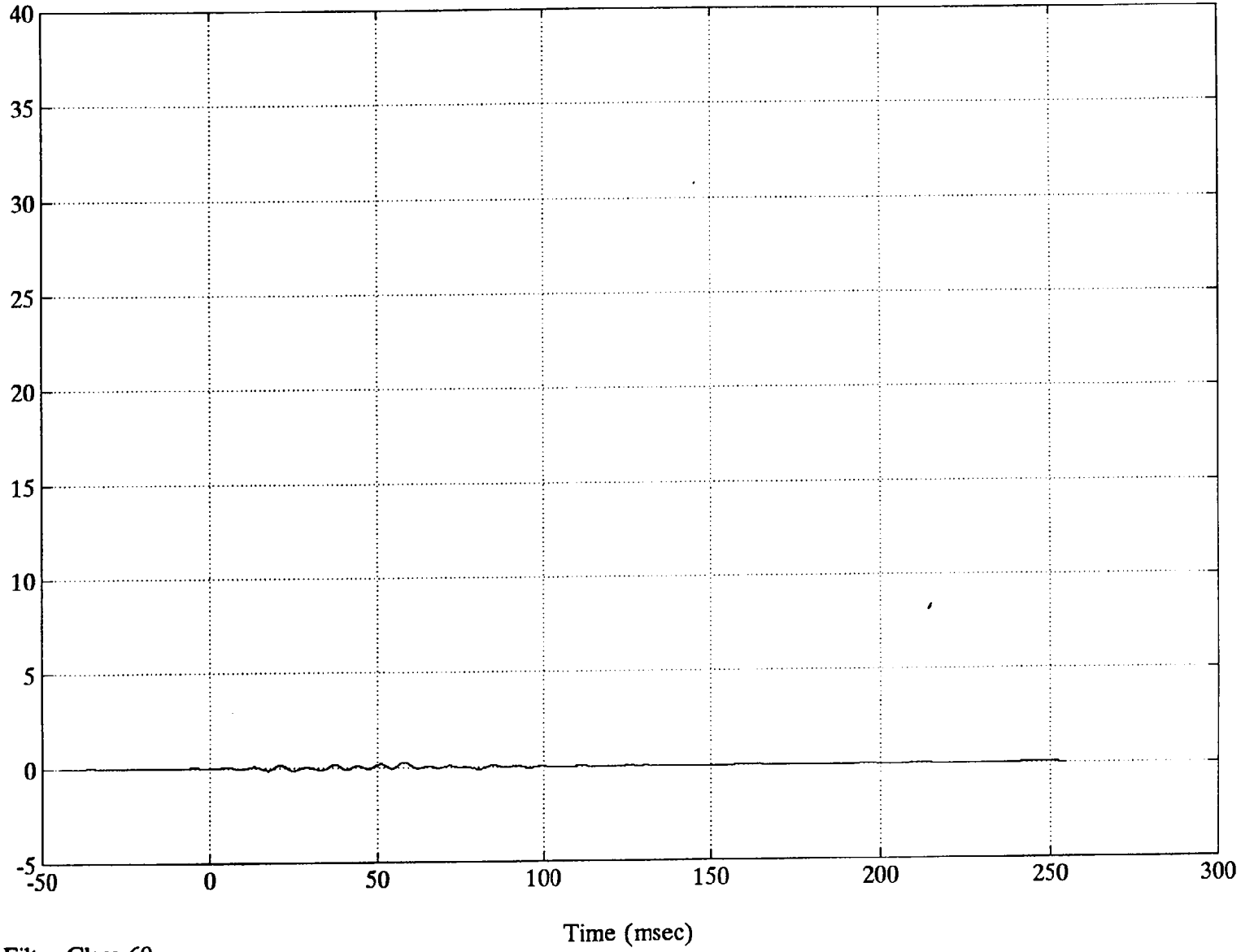
7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Barrier Load Cell D9

Max = .24 Klbs @ 57.84 msec
Min = -.15 Klbs @ 24.71 msec

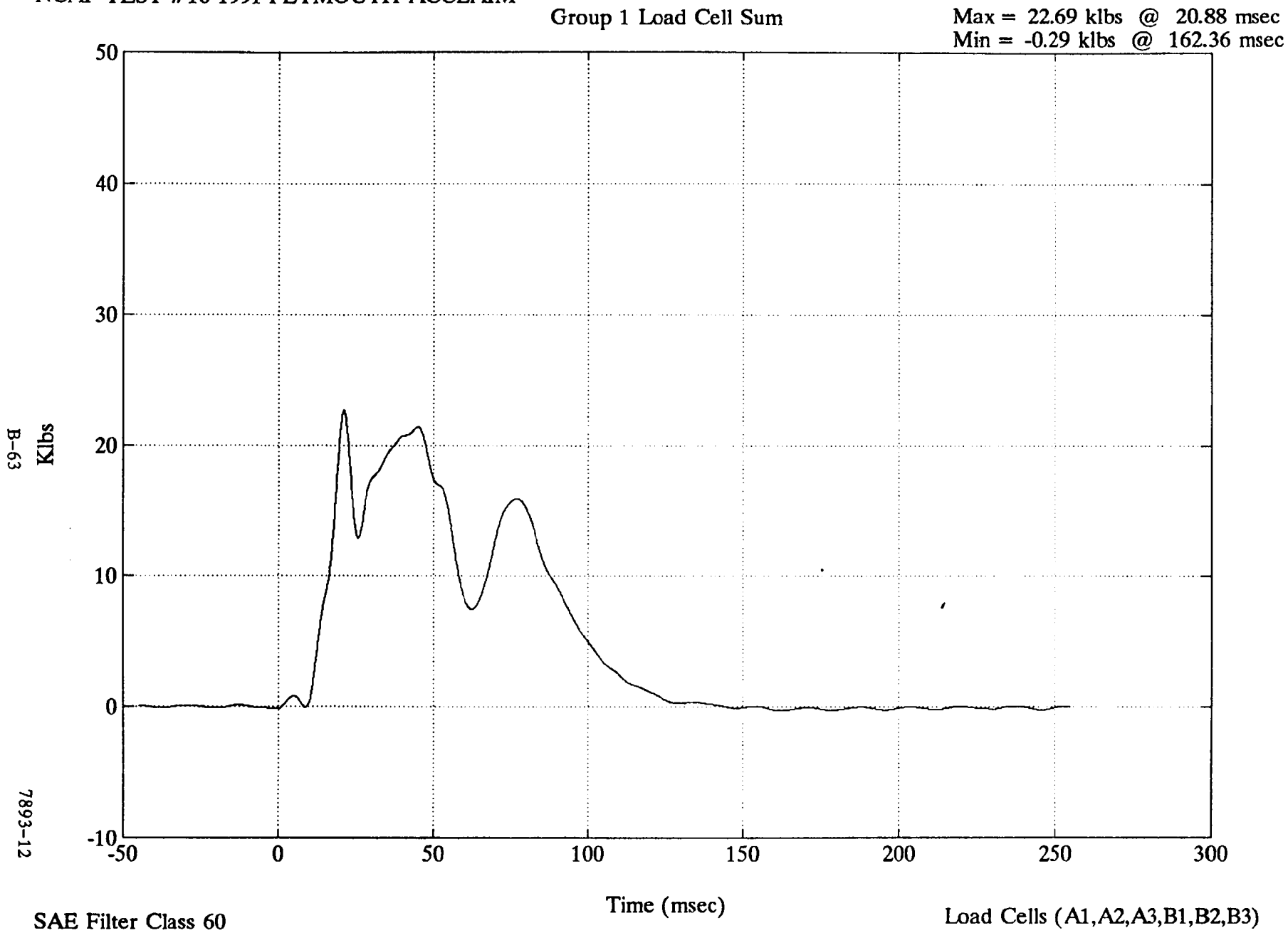


B-62

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



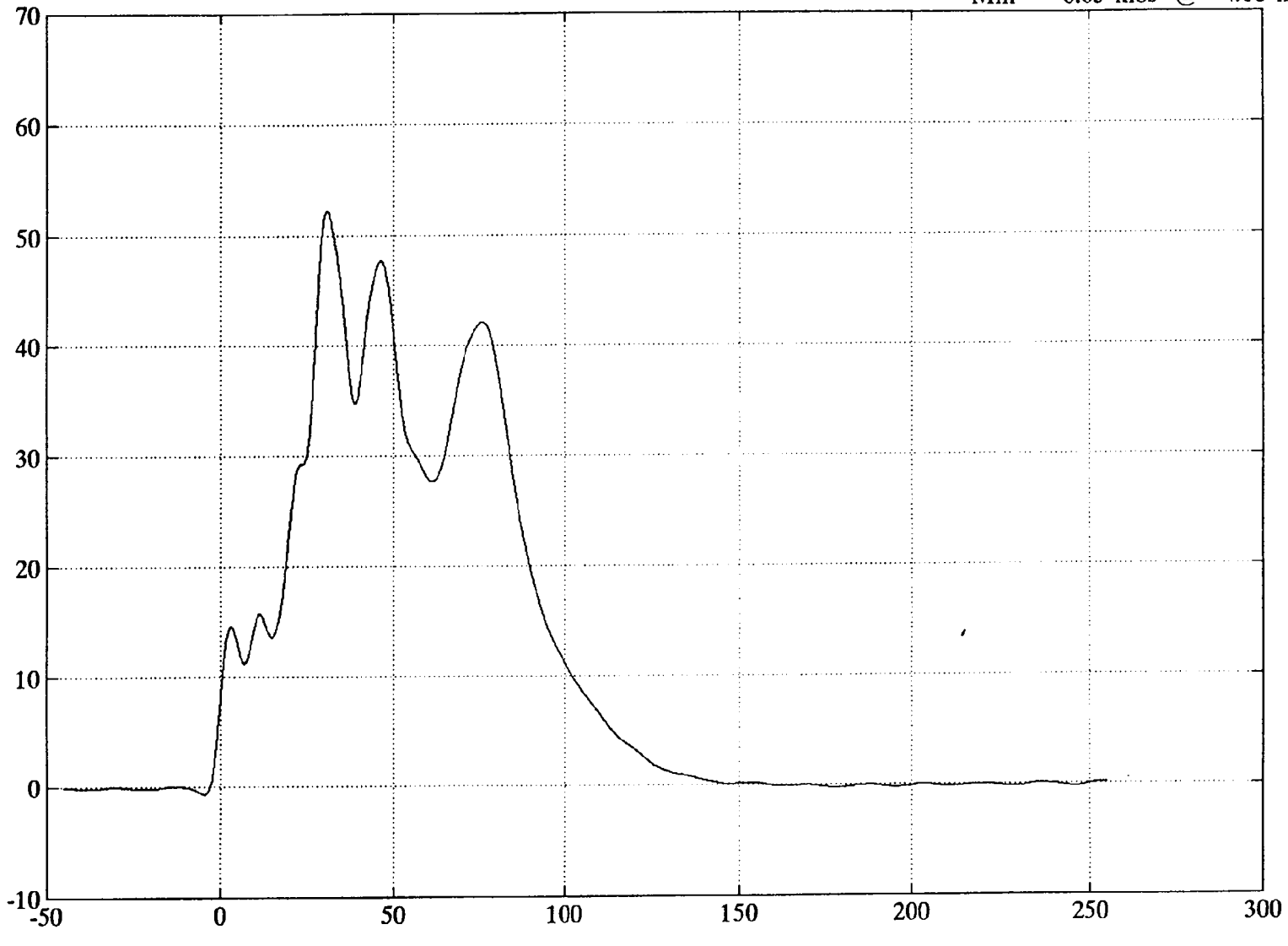
SAE Filter Class 60

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Group 2 Load Cell Sum

Max = 52.22 klbs @ 30.60 msec
Min = -0.65 klbs @ -4.68 msec



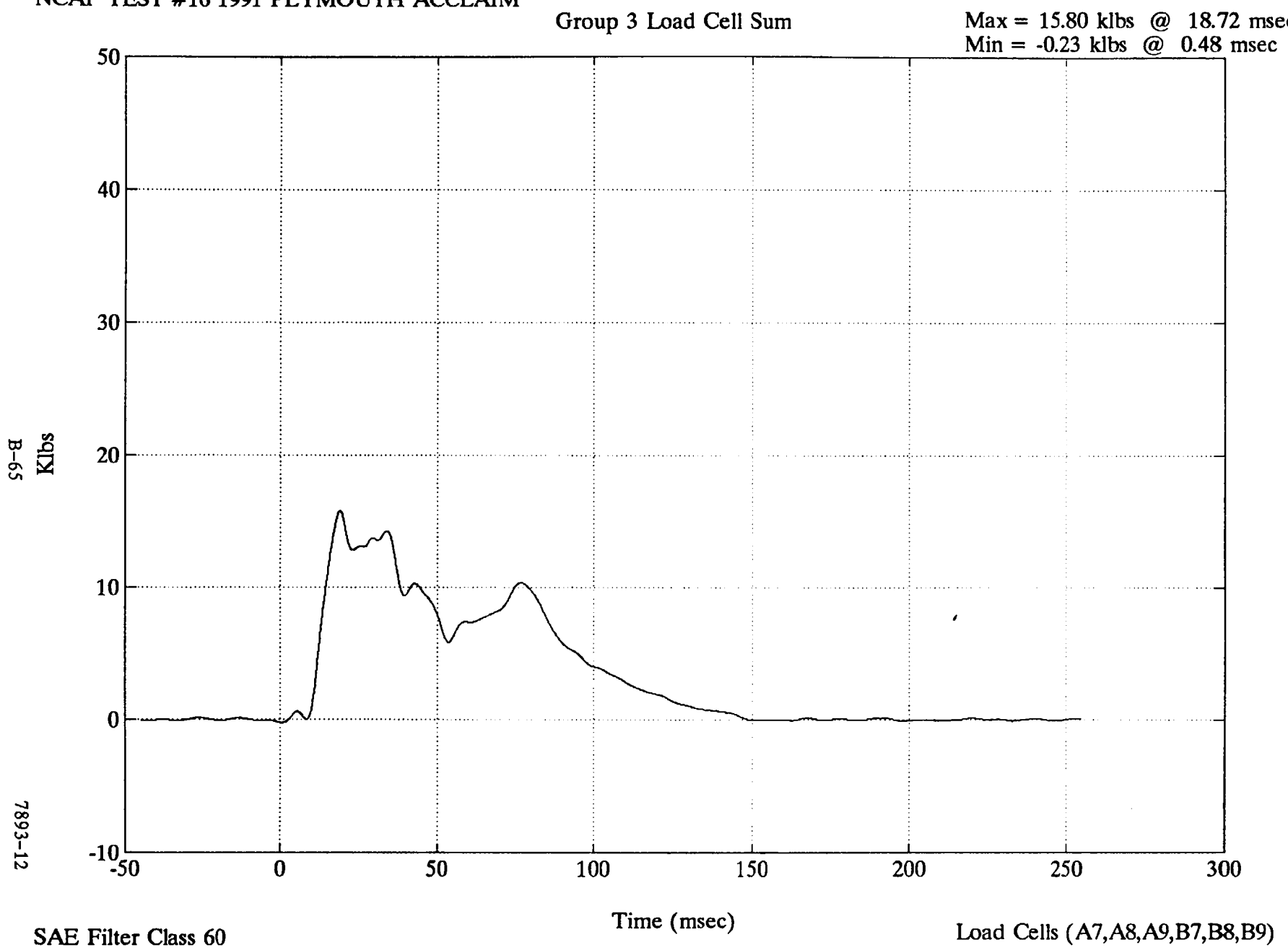
B-64

7893-12

SAE Filter Class 60

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



B-65

7893-12

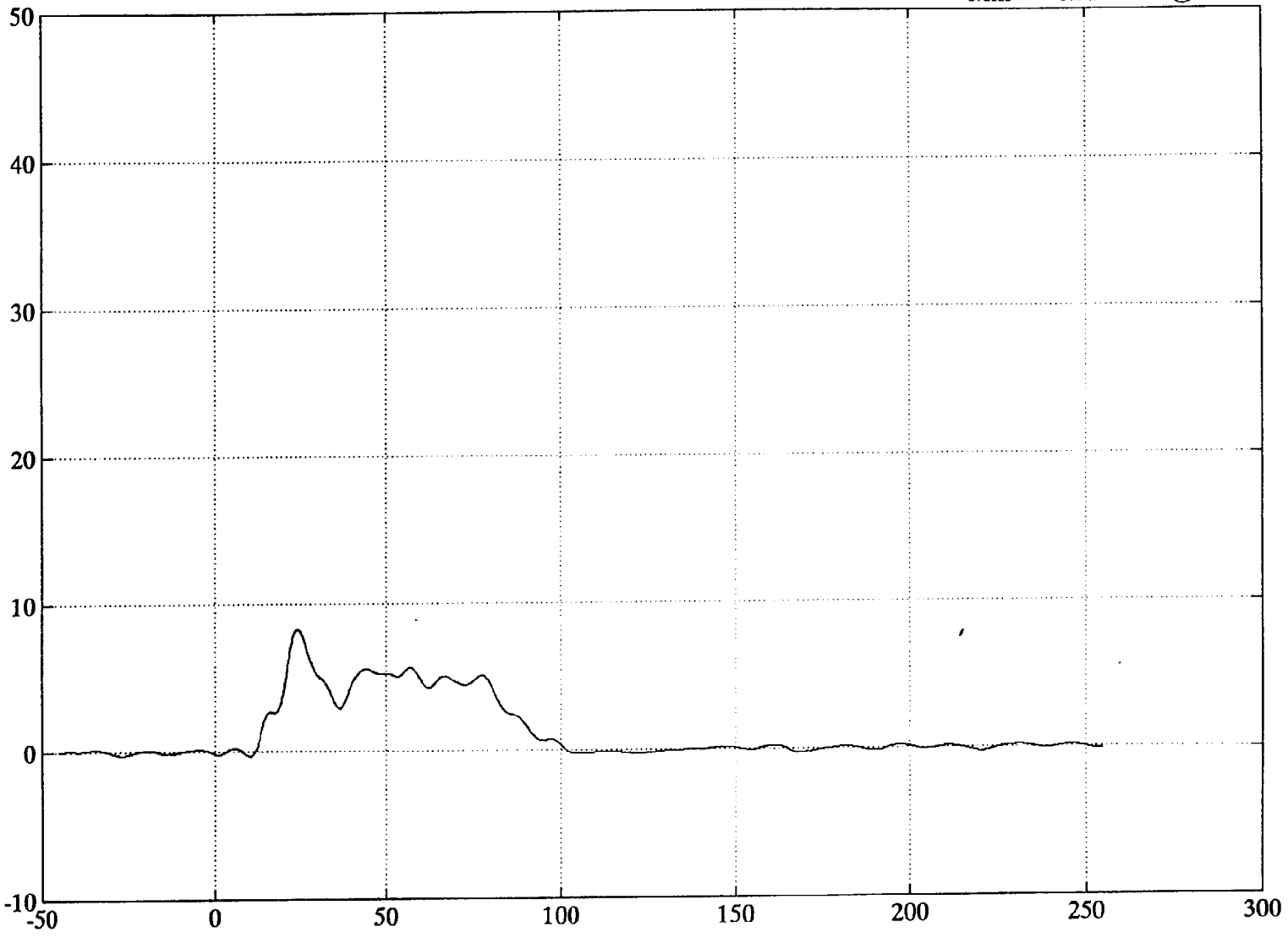
SAE Filter Class 60

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Group 4 Load Cell Sum

Max = 8.29 klbs @ 24.12 msec
Min = -0.31 klbs @ 9.96 msec



B-66

7893-12

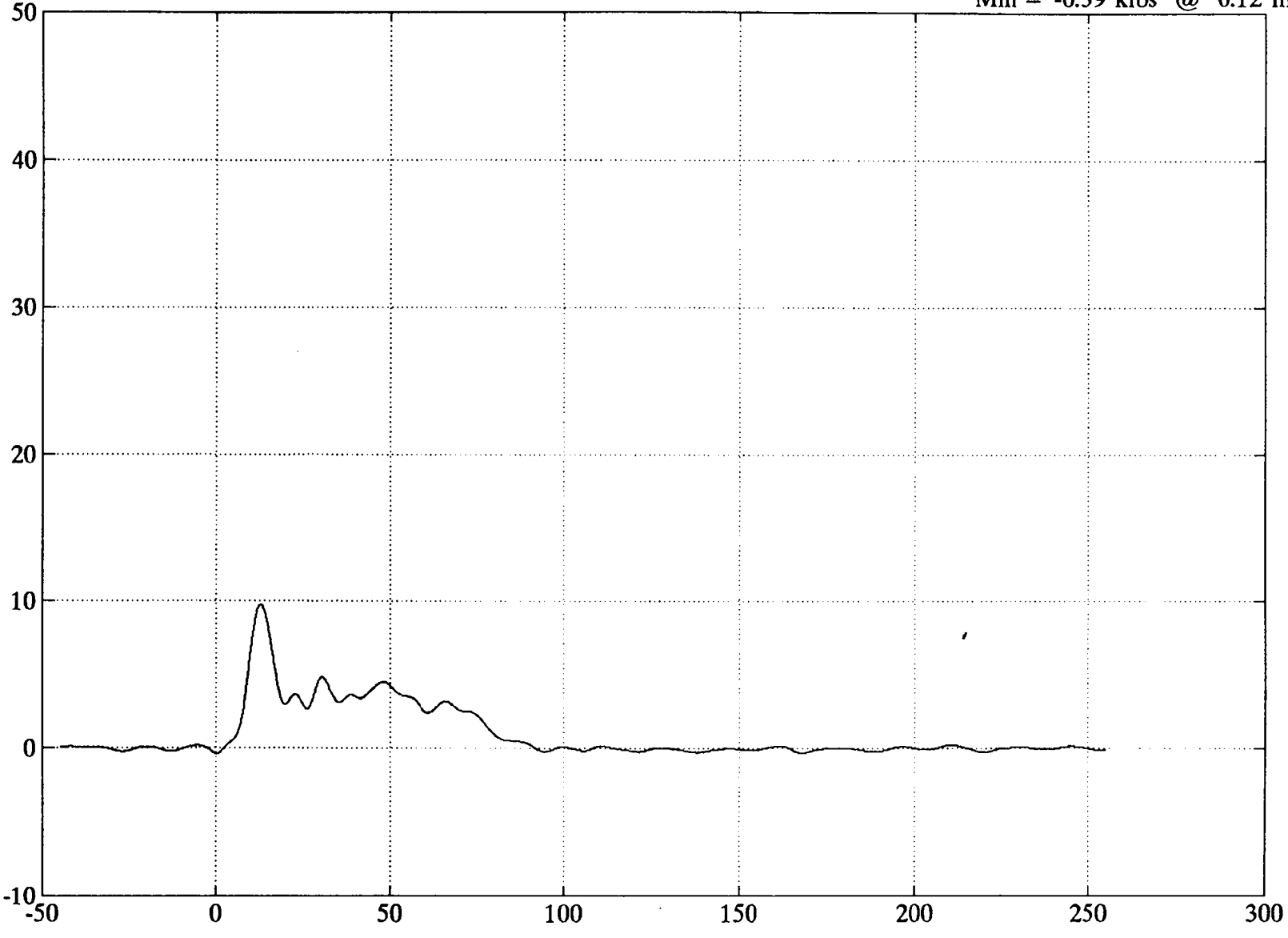
SAE Filter Class 60

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Group 5 Load Cell Sum

Max = 9.77 klbs @ 12.60 msec
Min = -0.39 klbs @ 0.12 msec



B-67

7893-12

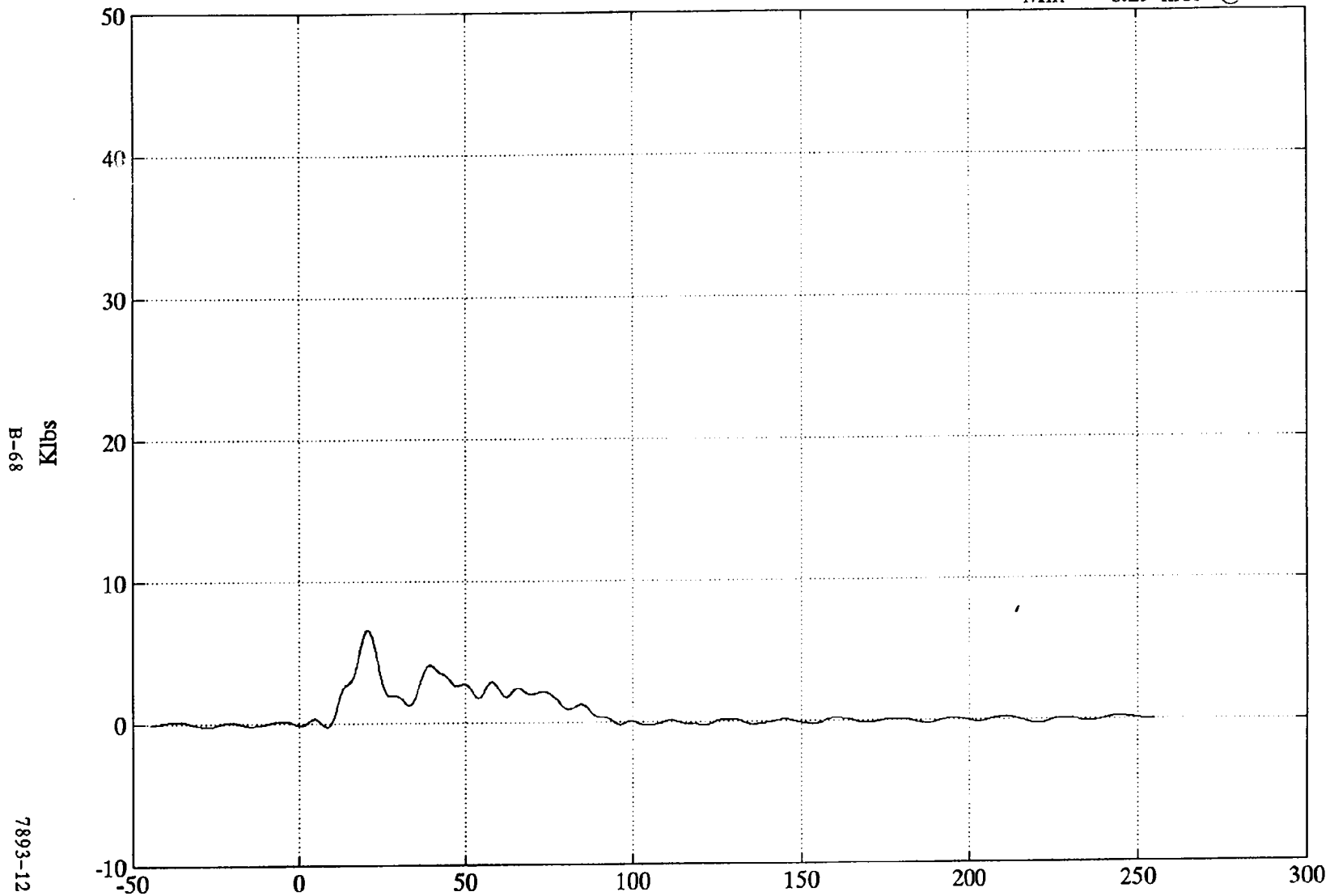
SAE Filter Class 60

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Group 6 Load Cell Sum

Max = 6.59 klbs @ 21.00 msec
Min = -0.29 klbs @ 220.92 msec



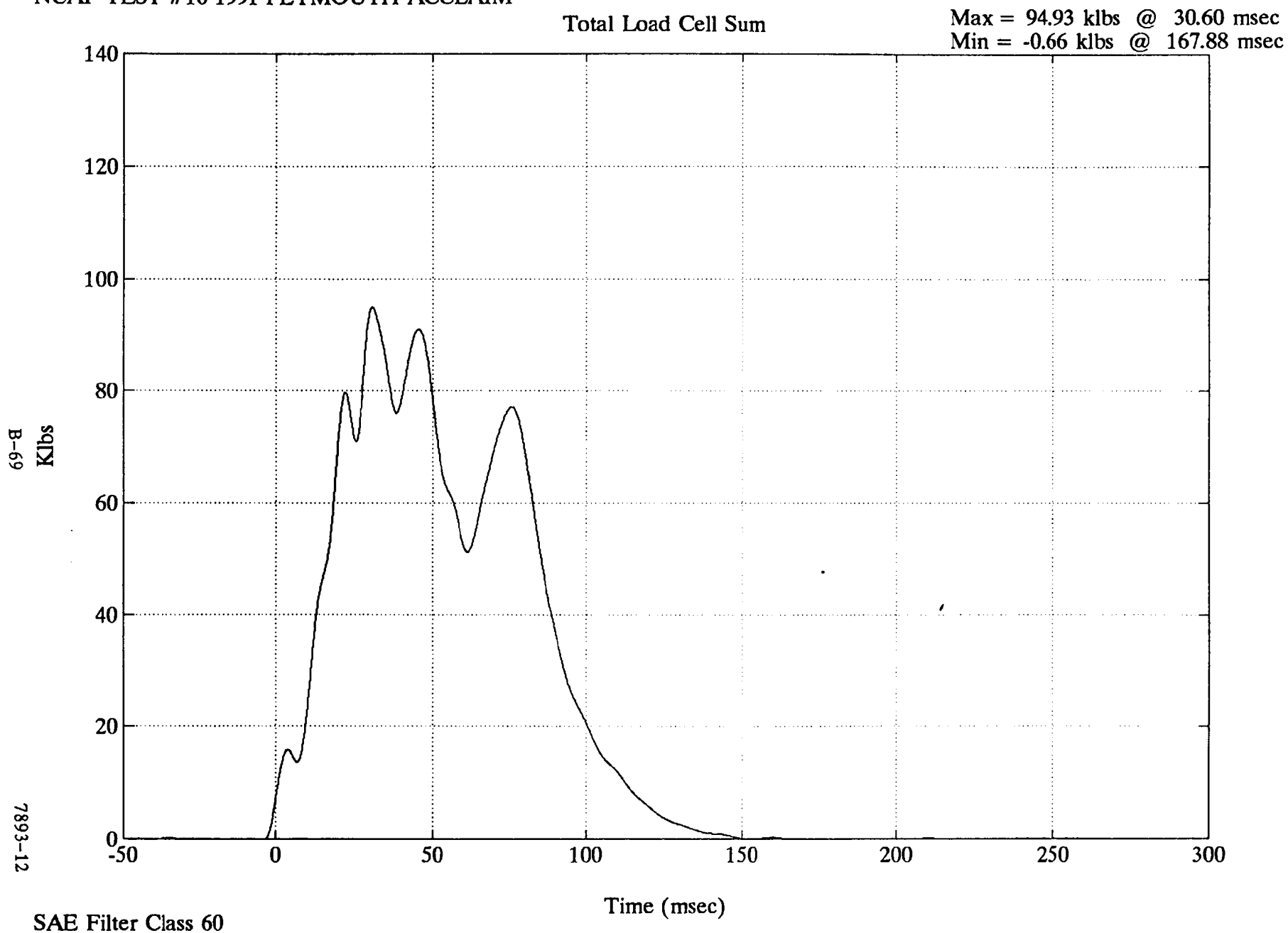
B-68

7893-12

SAE Filter Class 60

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



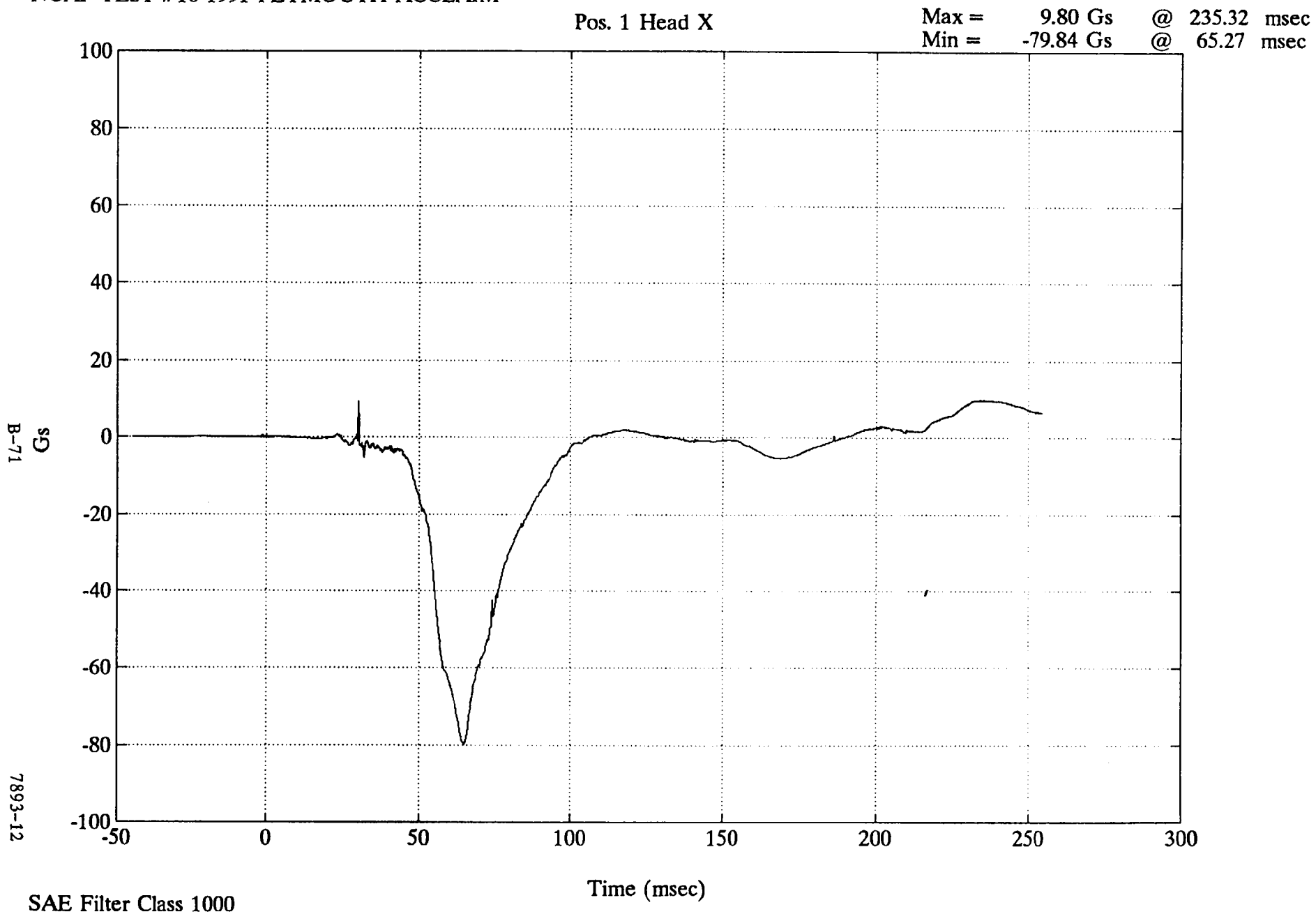
SAE Filter Class 60

TEST NO. MM0304

DUMMY DATA

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

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

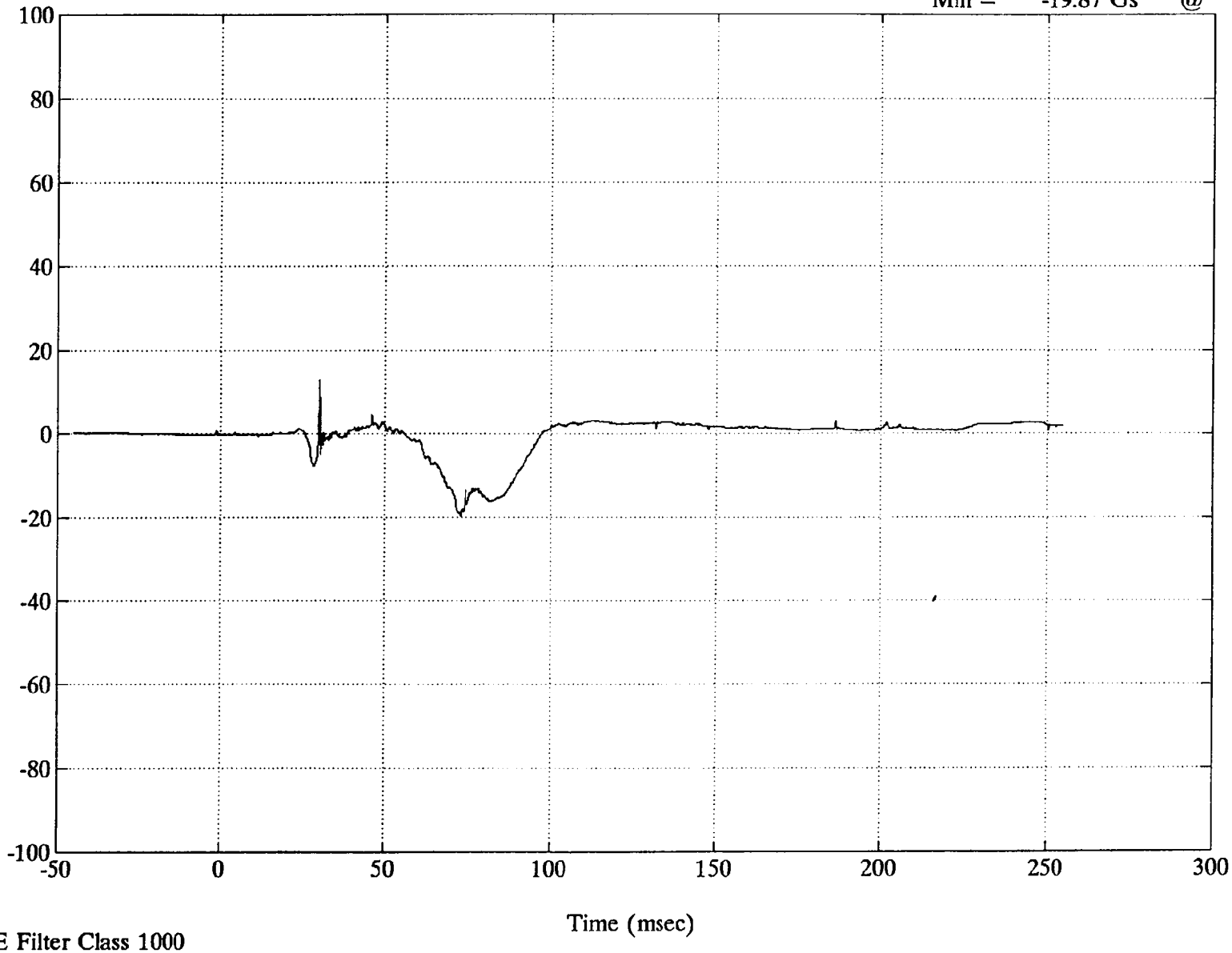


SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 1 Head Y

Max = 12.75 Gs @ 30.23 msec
Min = -19.87 Gs @ 72.83 msec

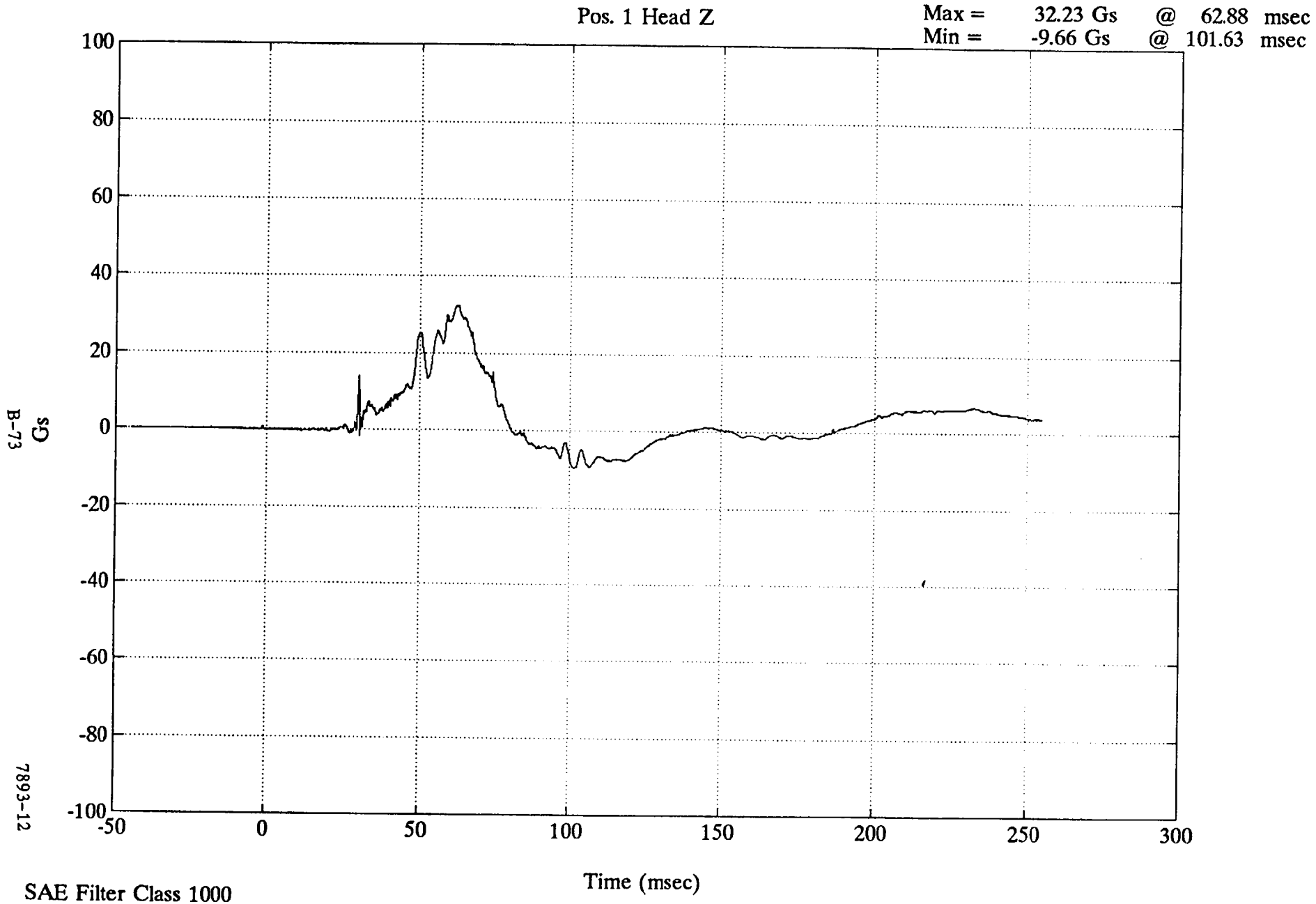


B-72

7893-12

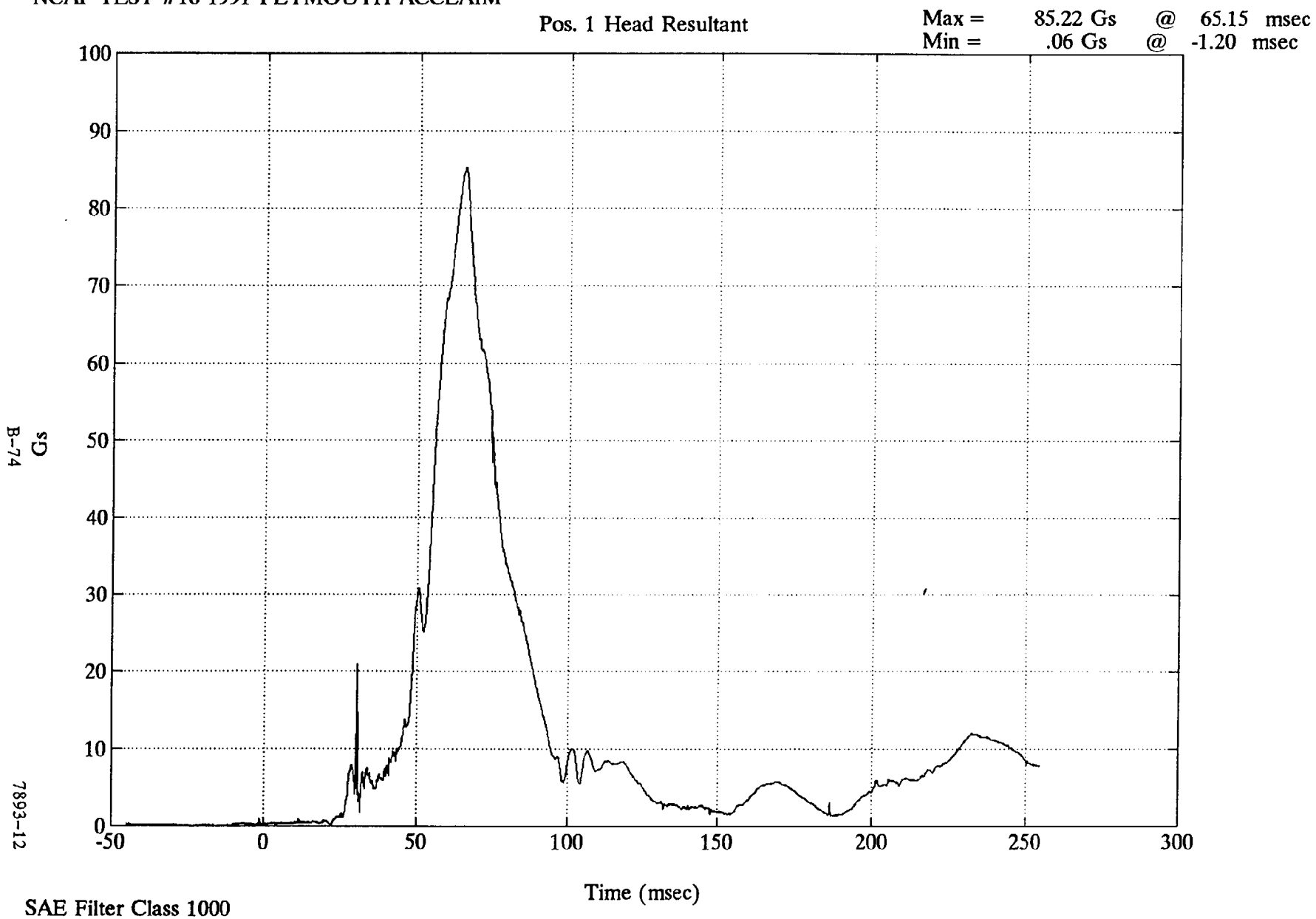
SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



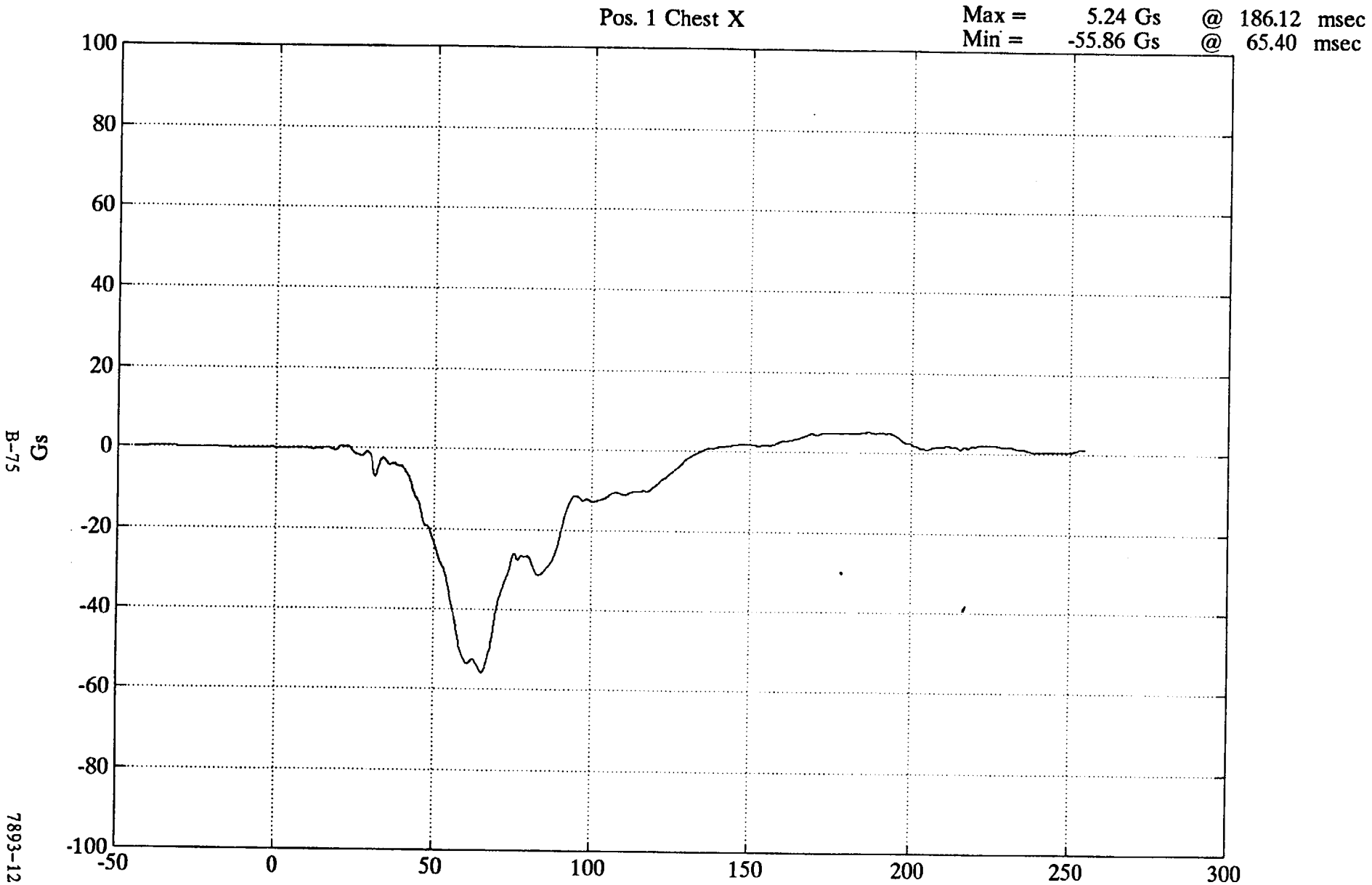
SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

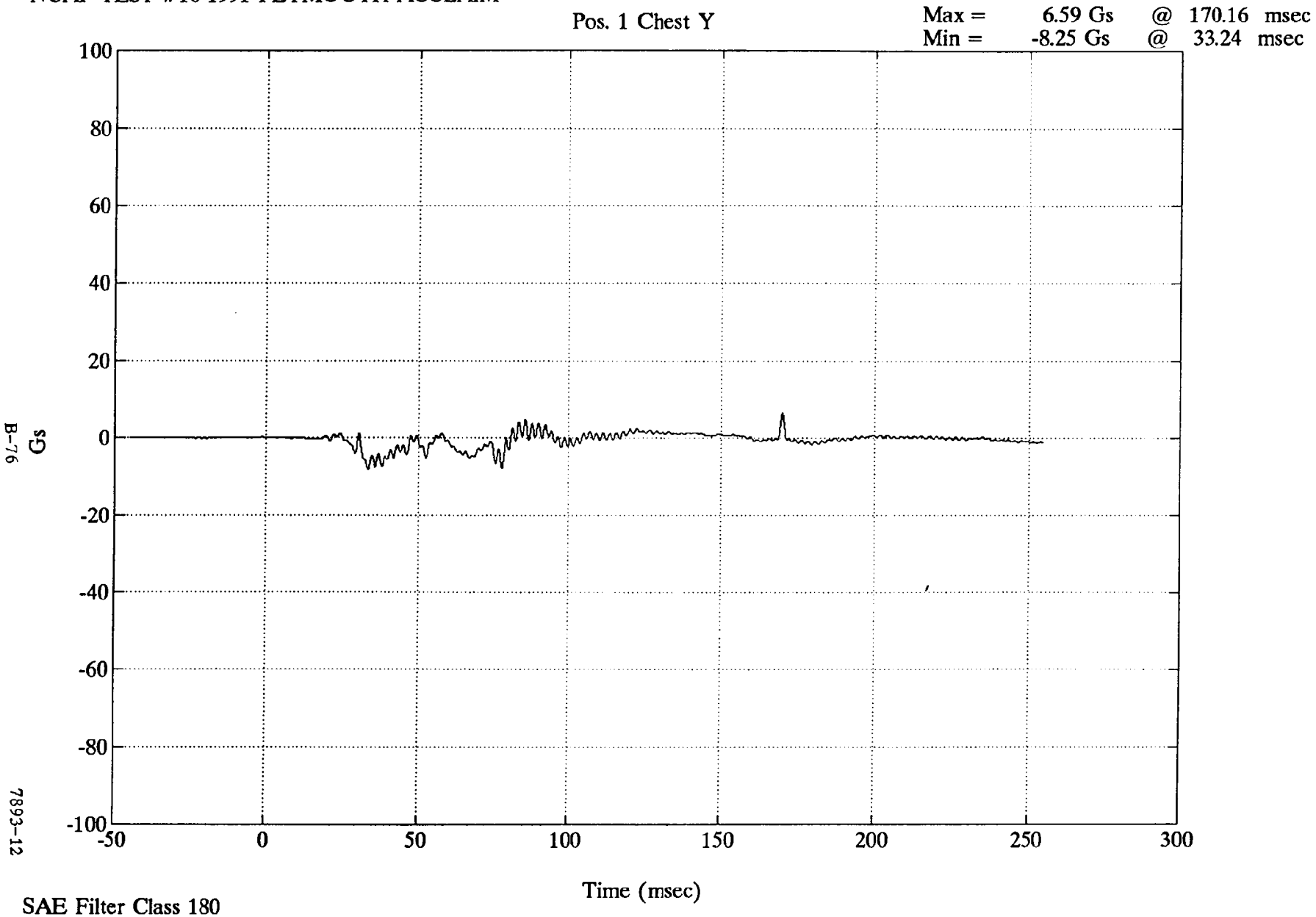


B-75

7893-12

SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

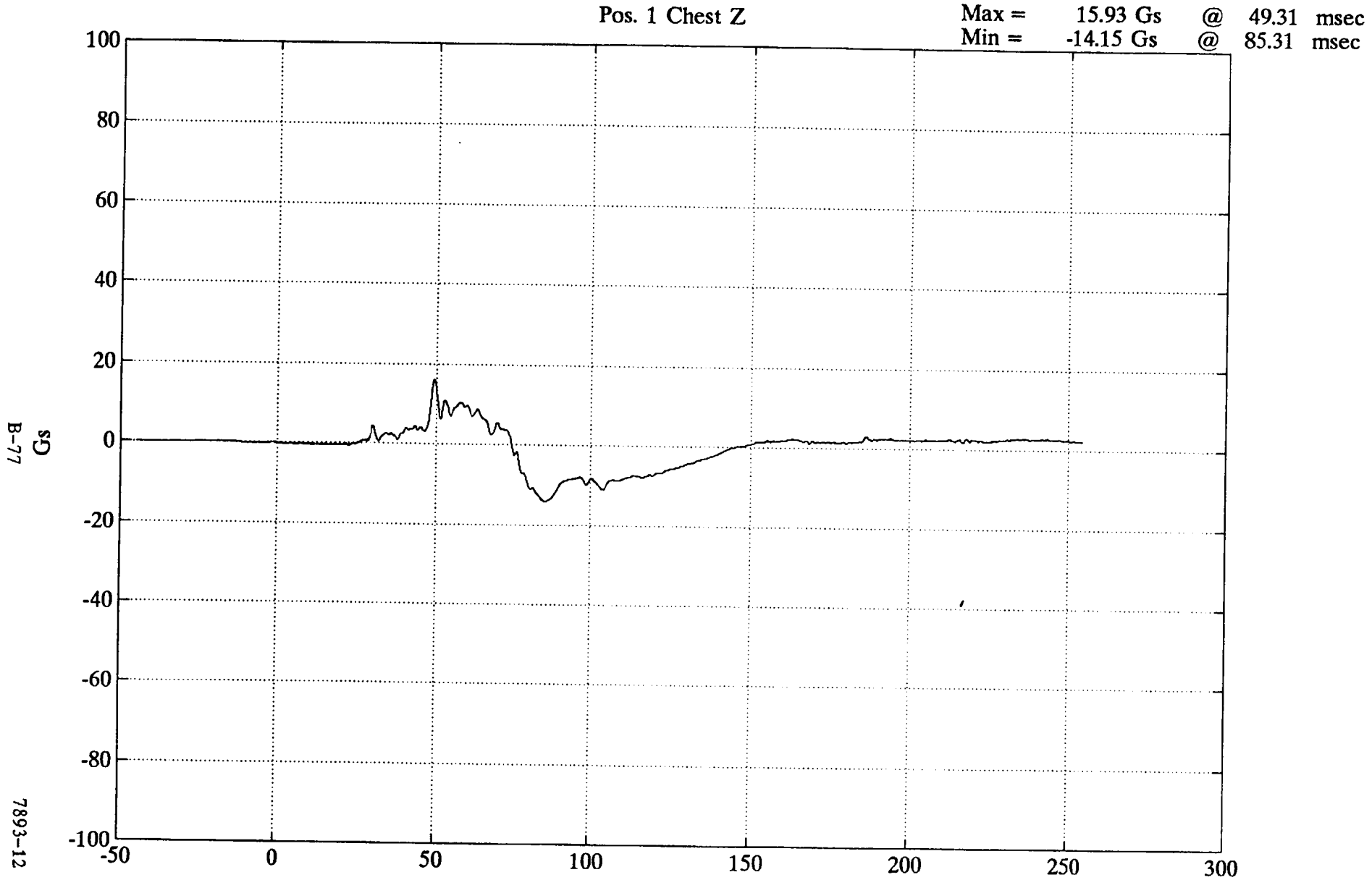


B-76

7893-12

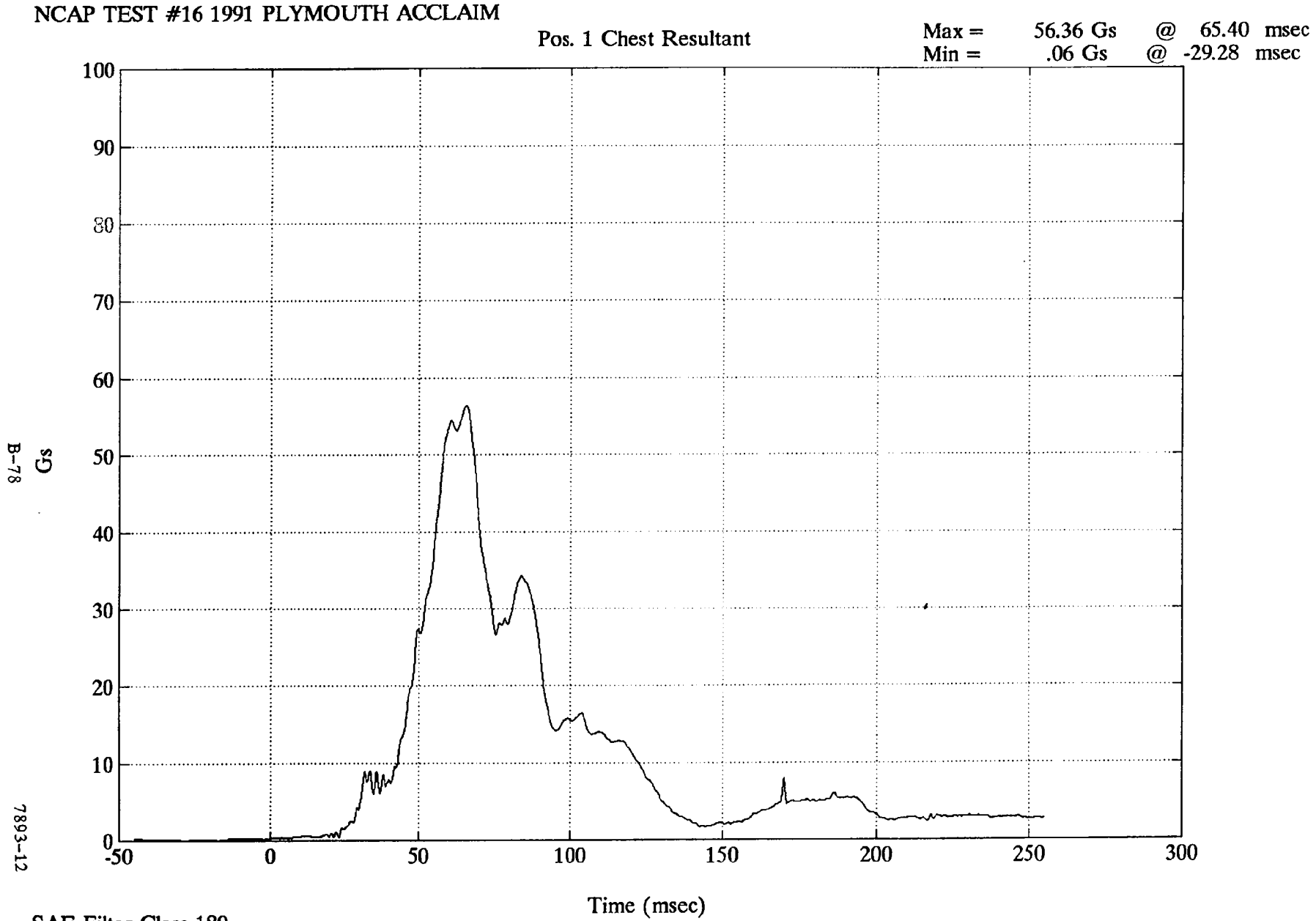
SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



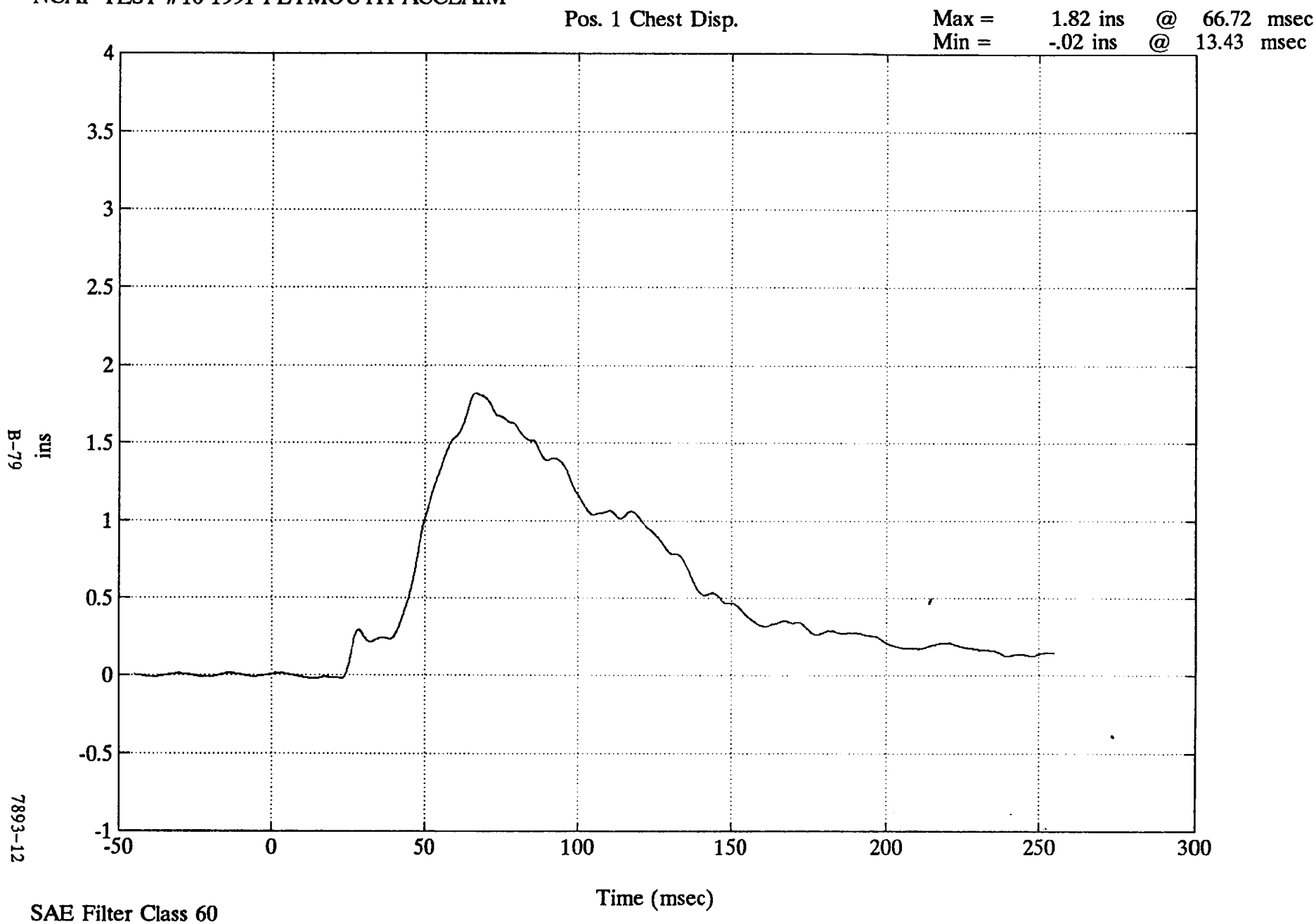
SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



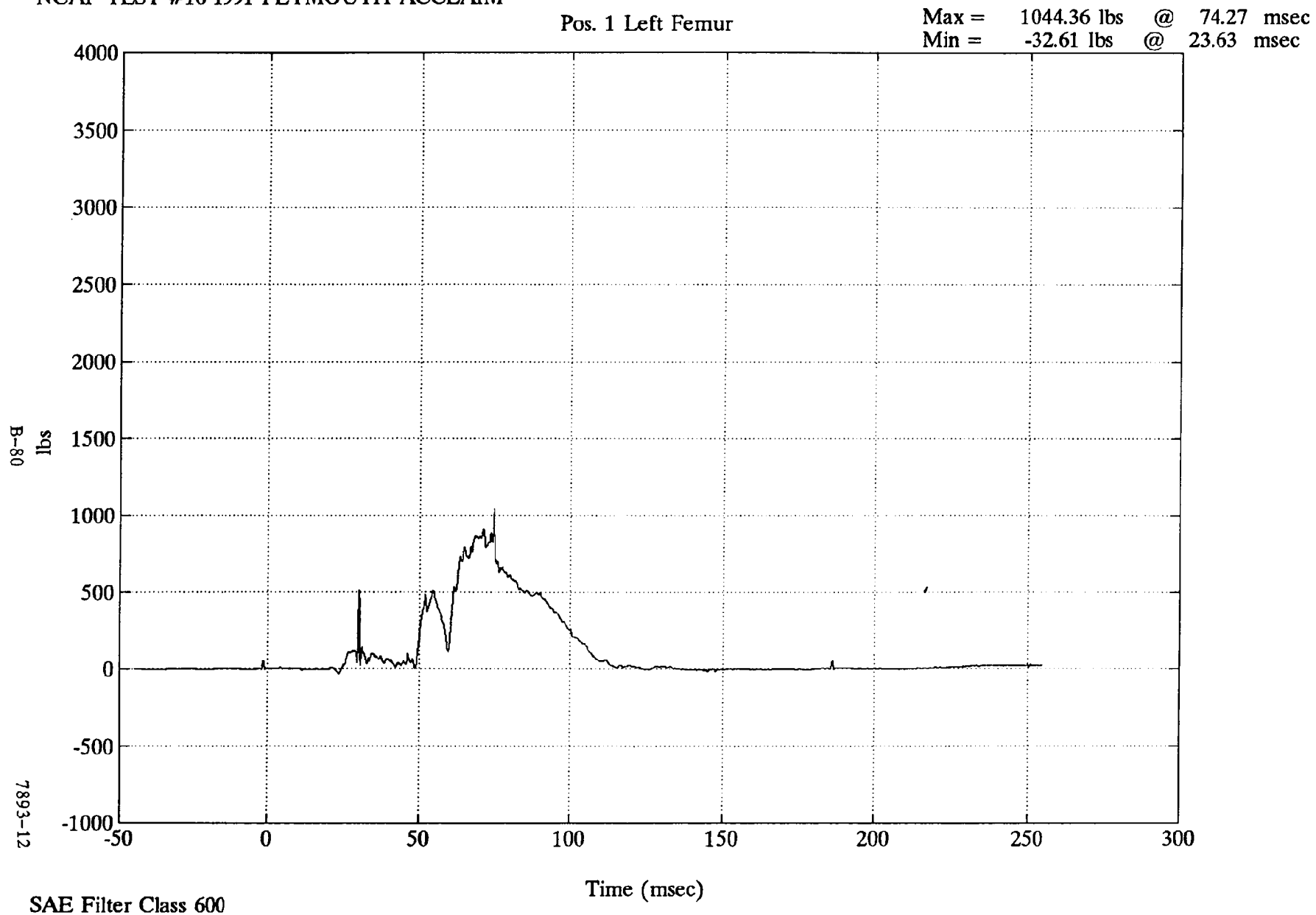
SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



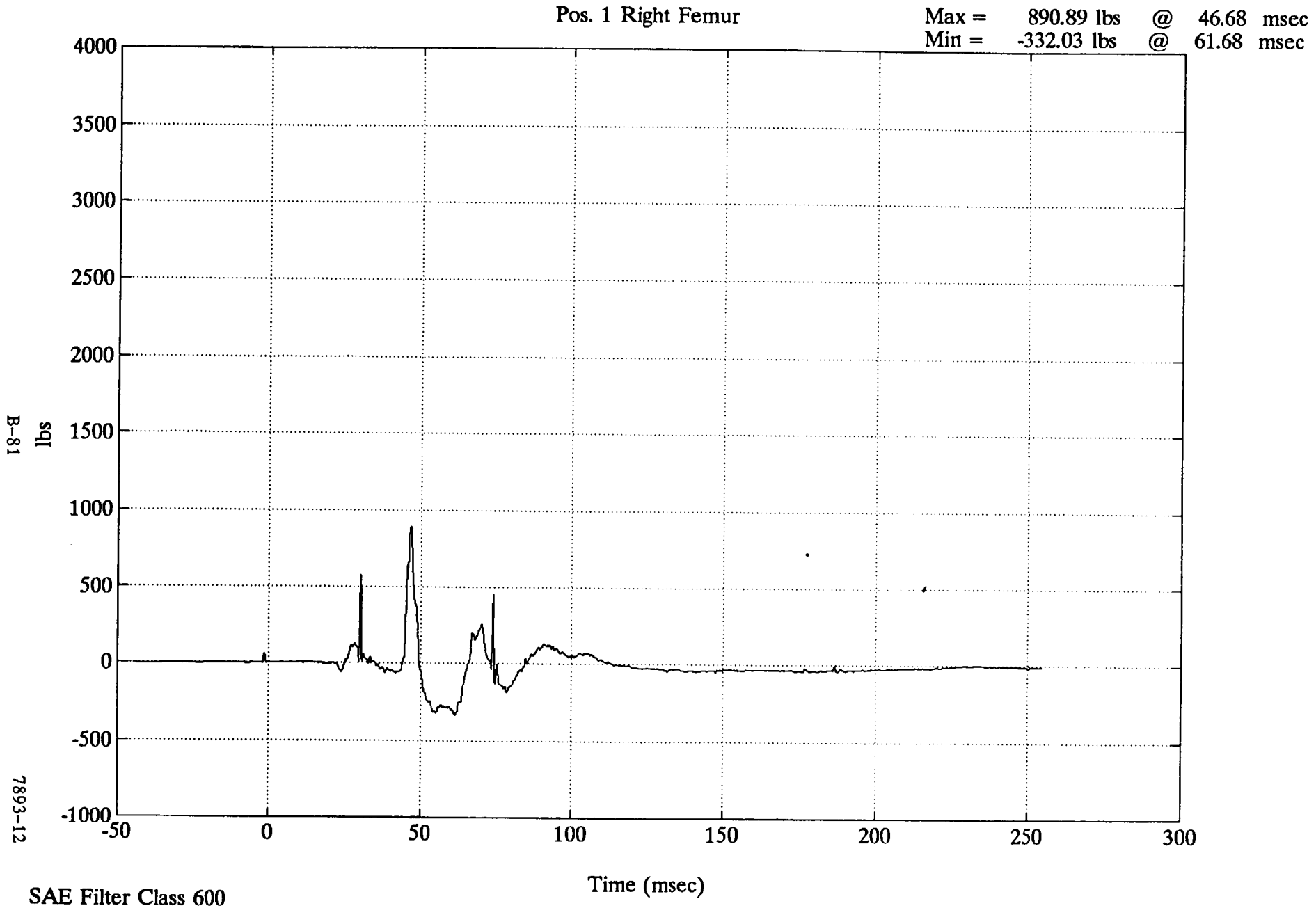
SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

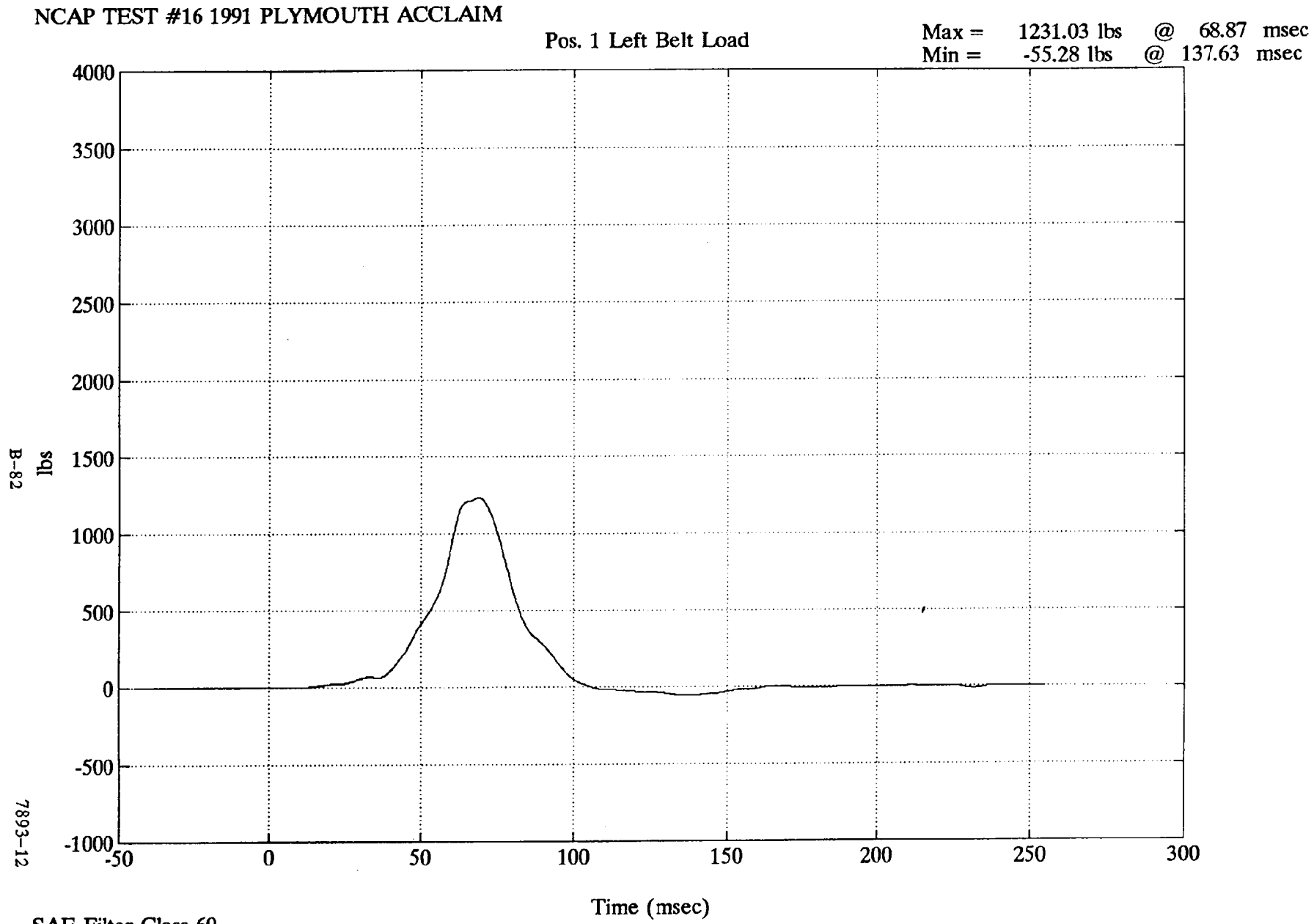


B-81

7893-12

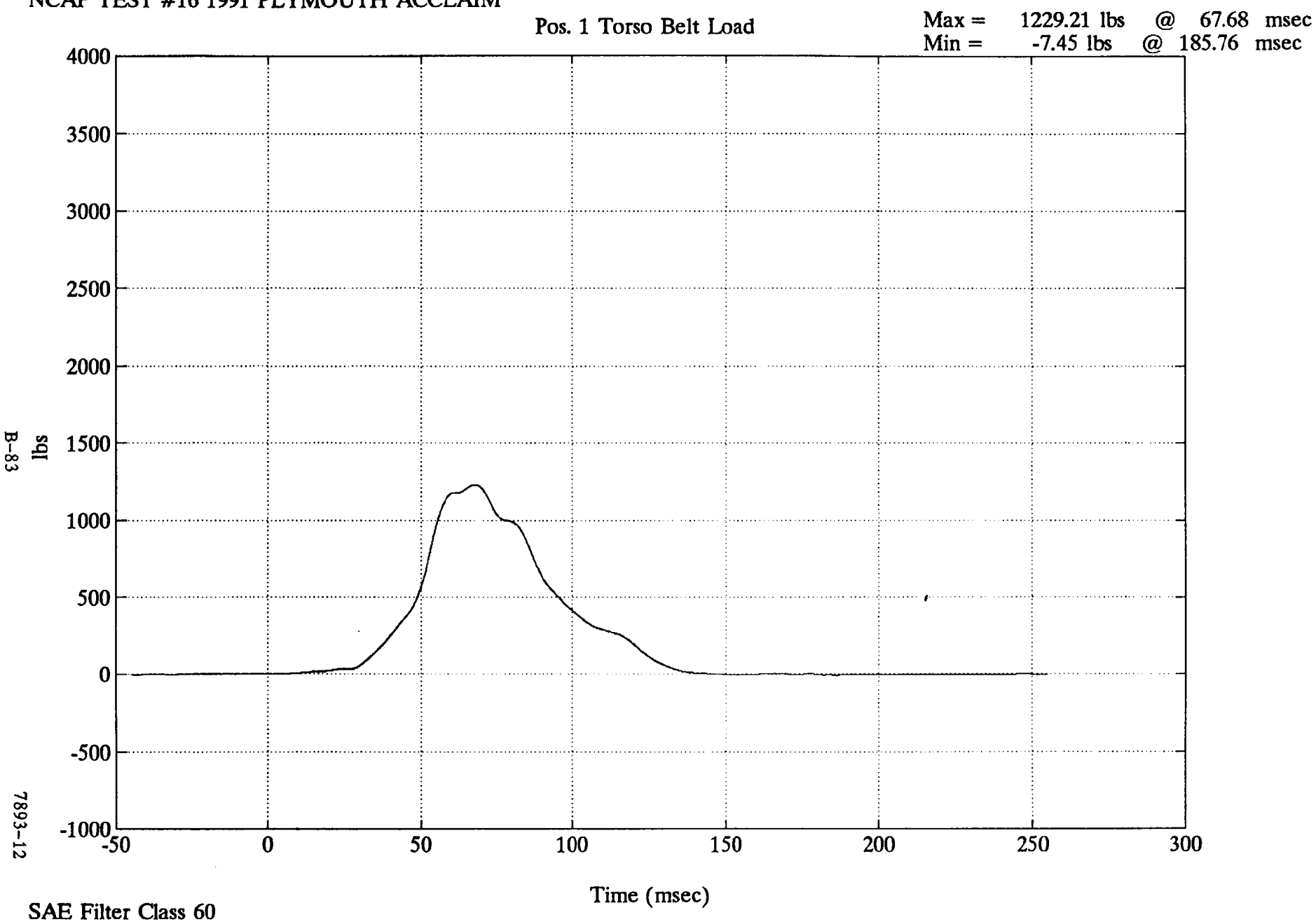
SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

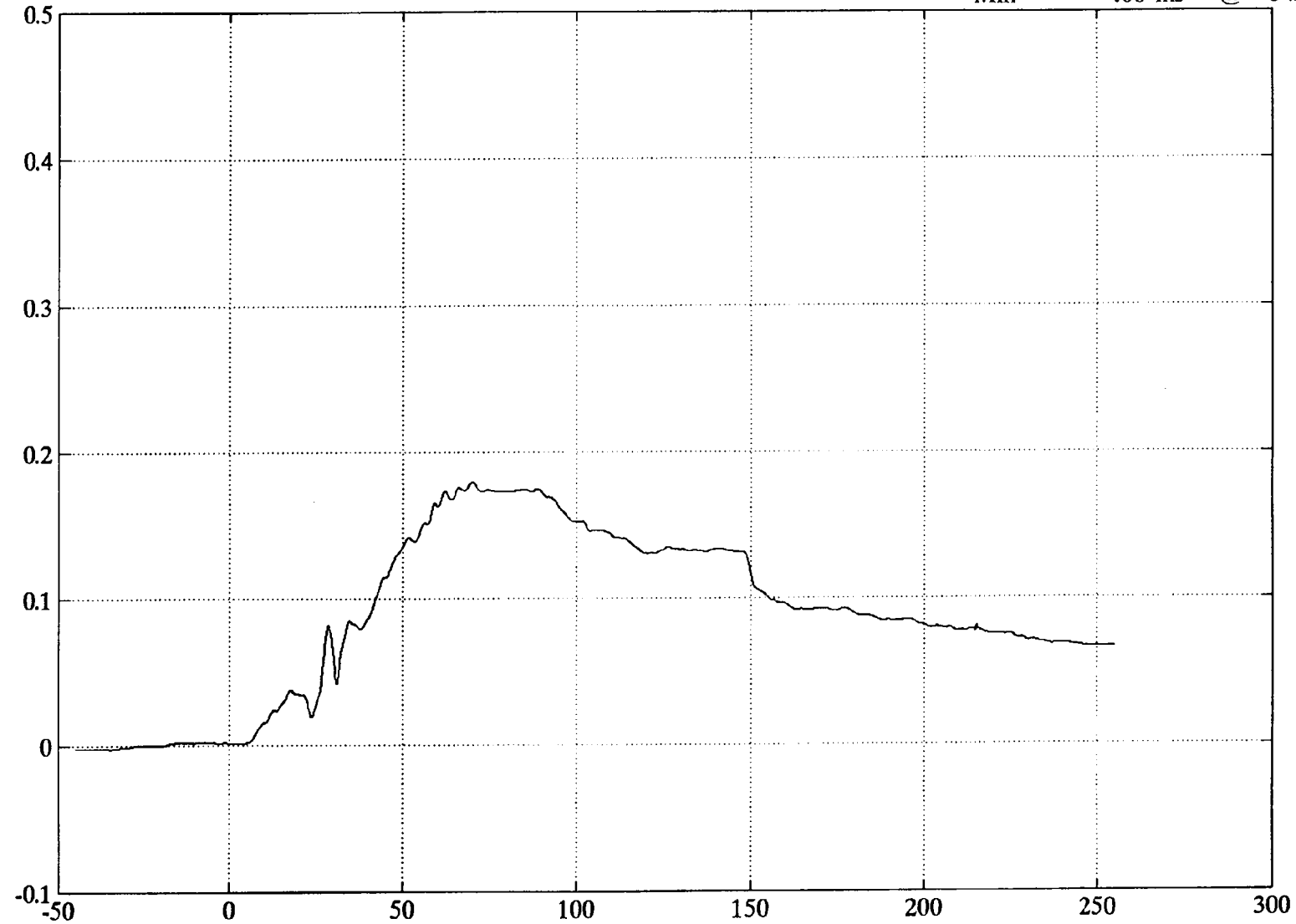


SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 1 Belt Elongation

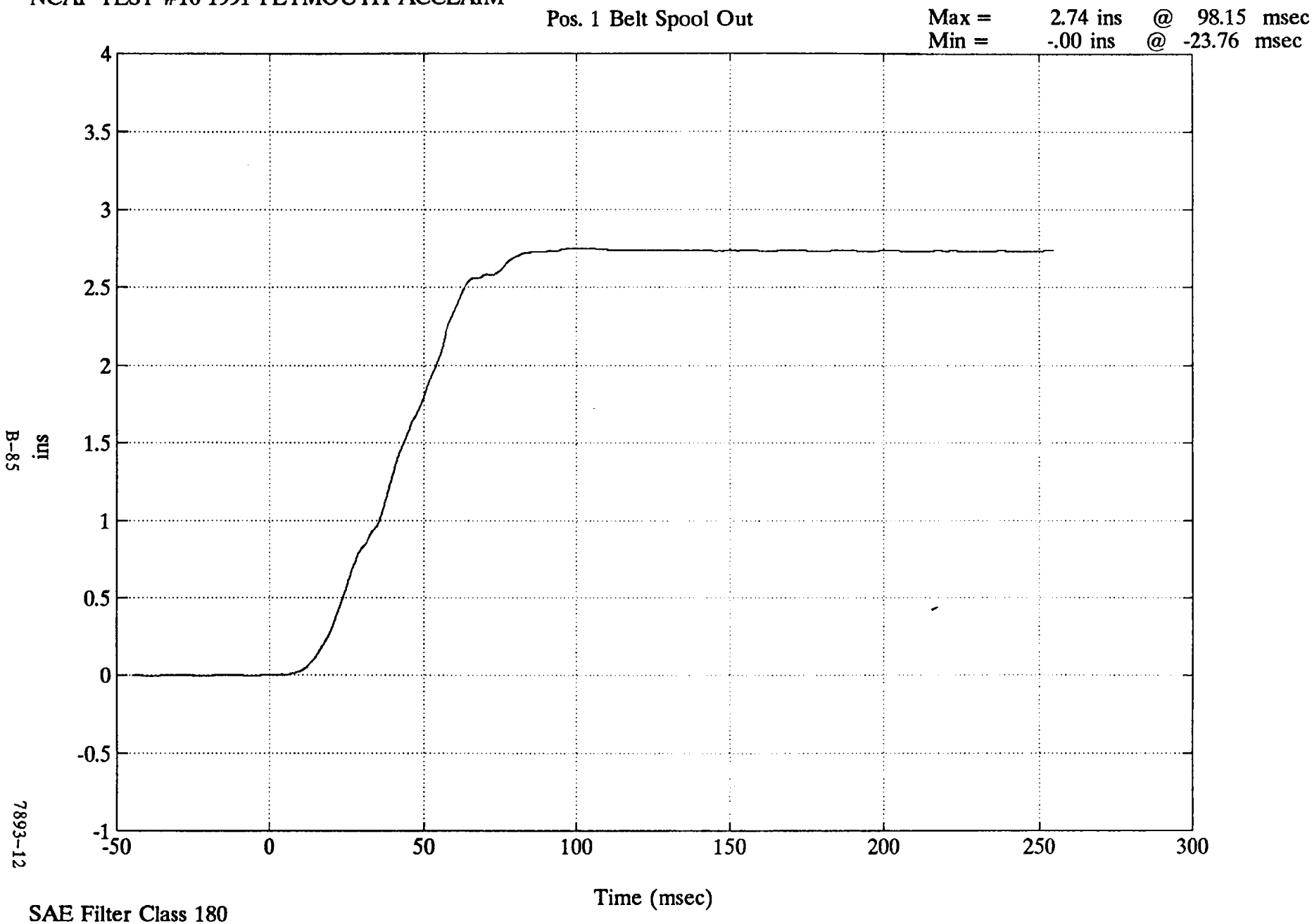
Max = .17 ins @ 70.20 msec
Min = -.00 ins @ -34.80 msec



SAE Filter Class 180

Measured over 2.5 inches

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

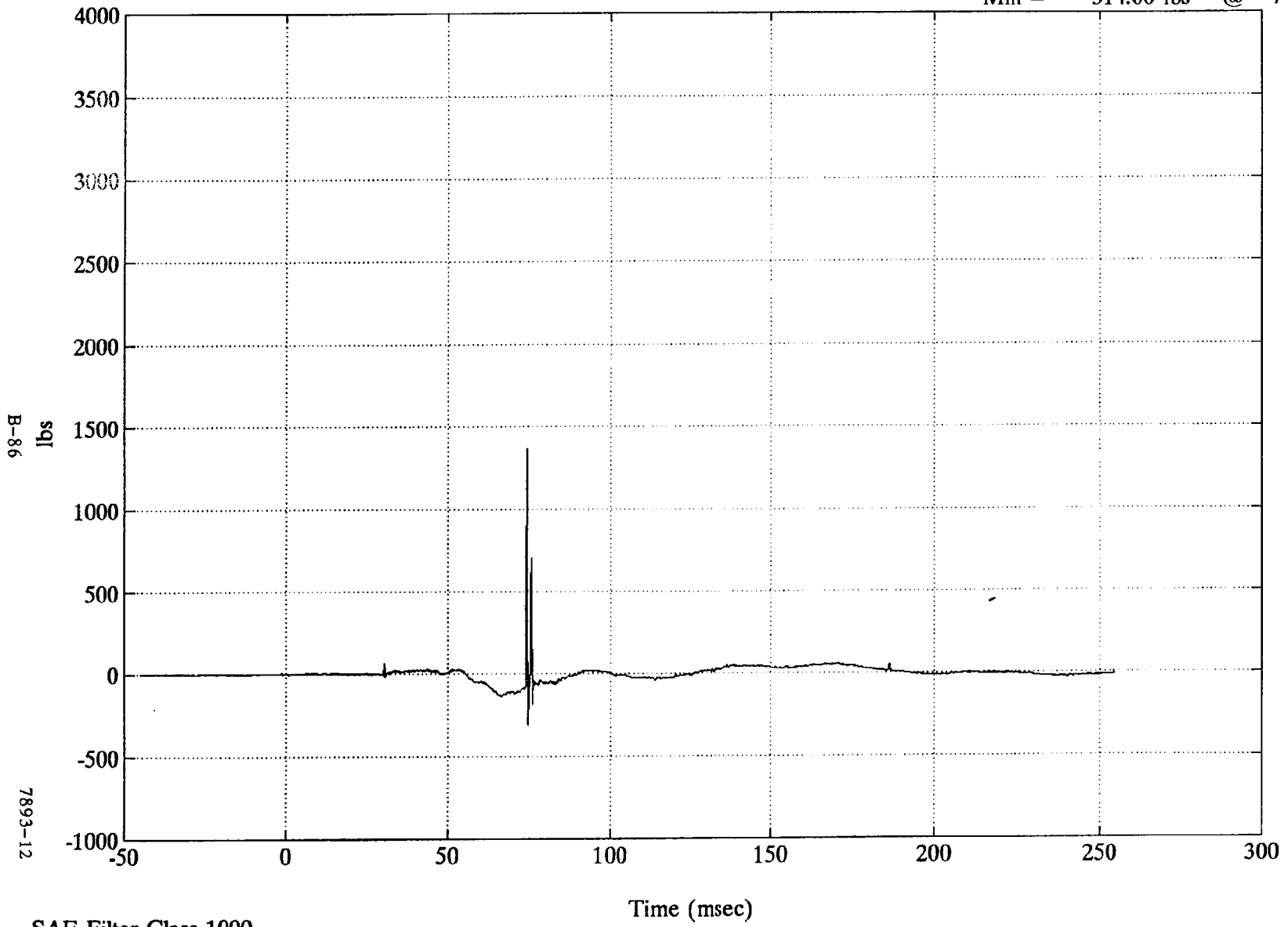


SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 1 Upper Neck Fx

Max = 1364.69 lbs @ 74.27 msec
Min = -314.00 lbs @ 74.76 msec

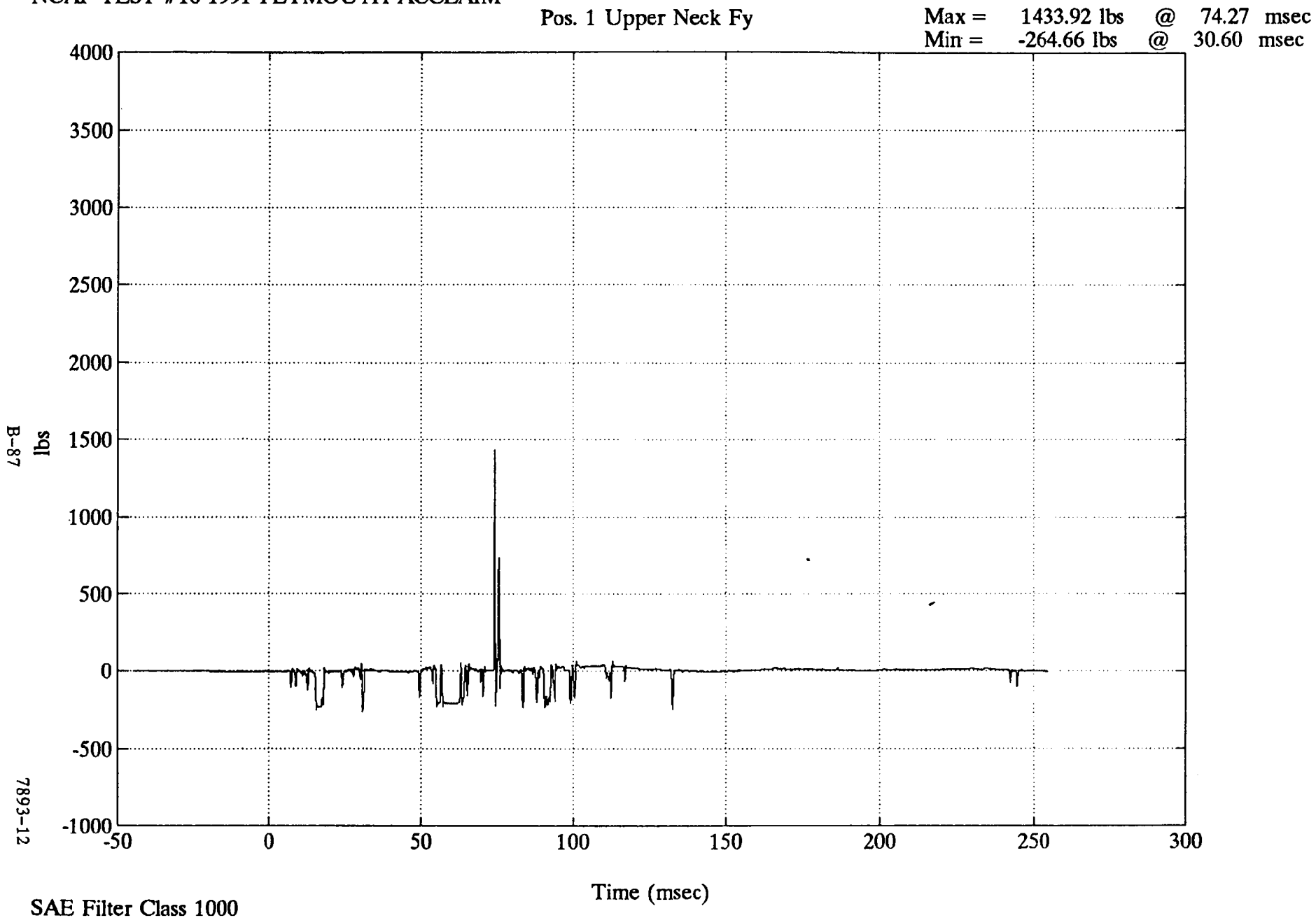


B-86

7893-12

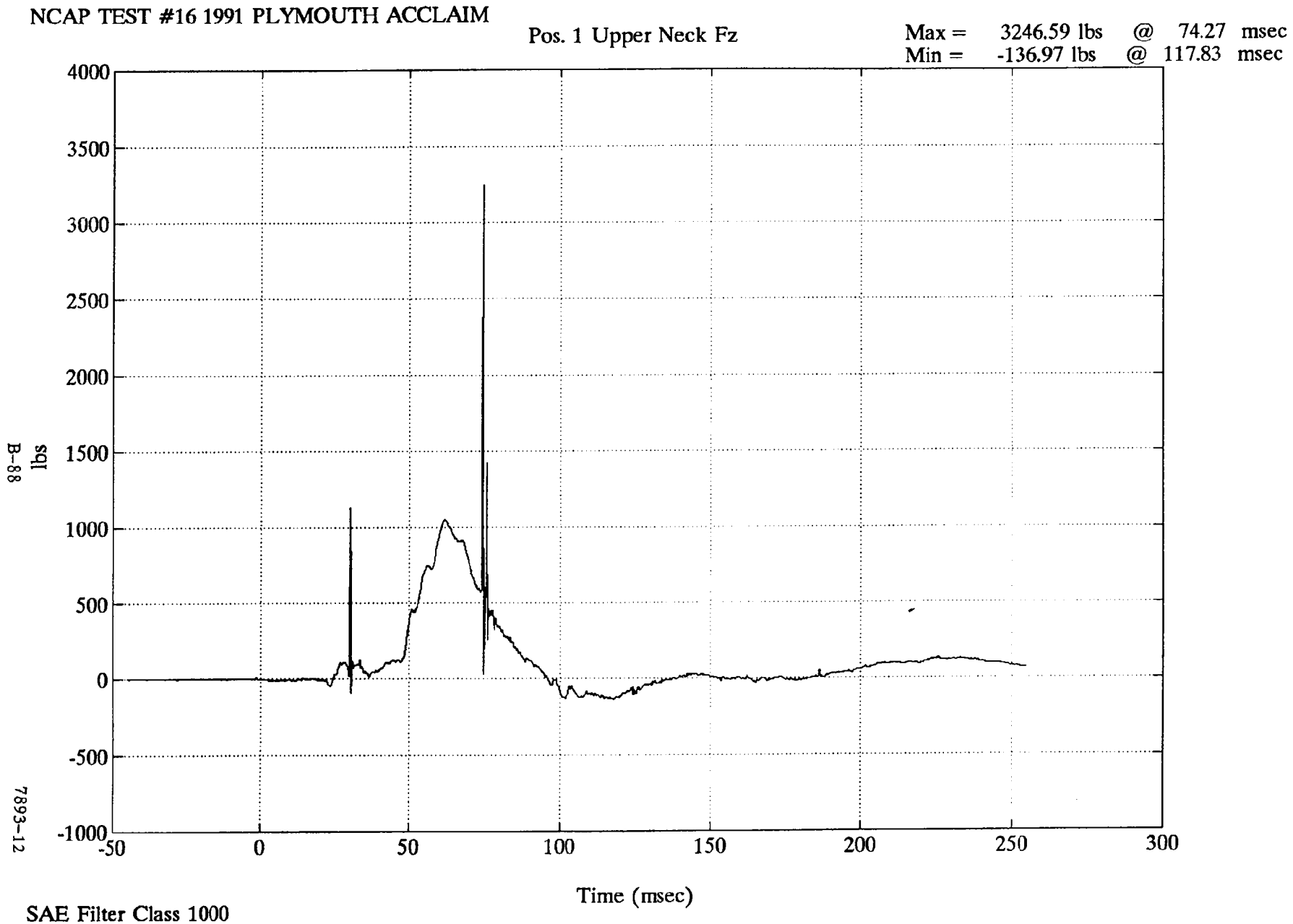
SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



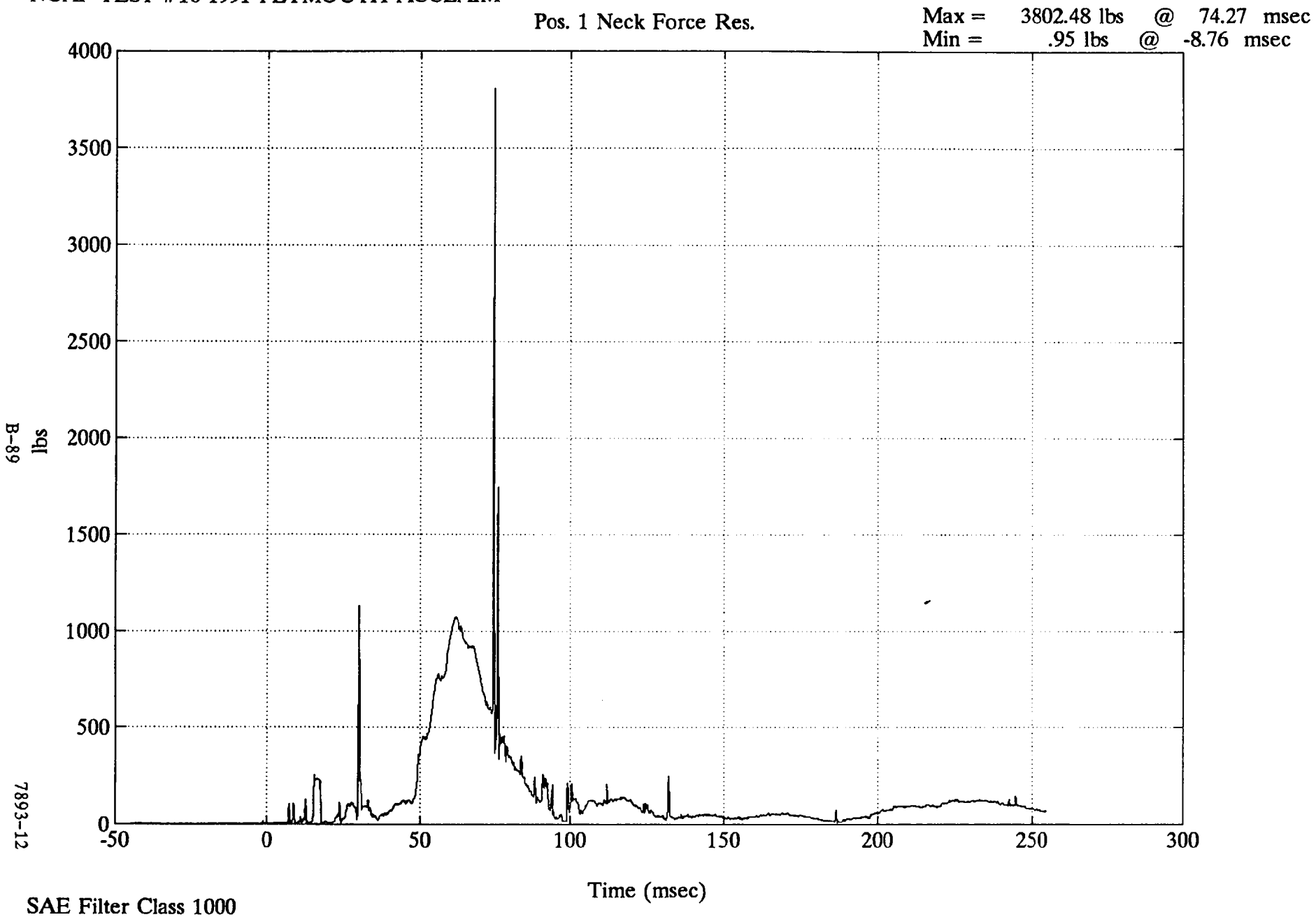
SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

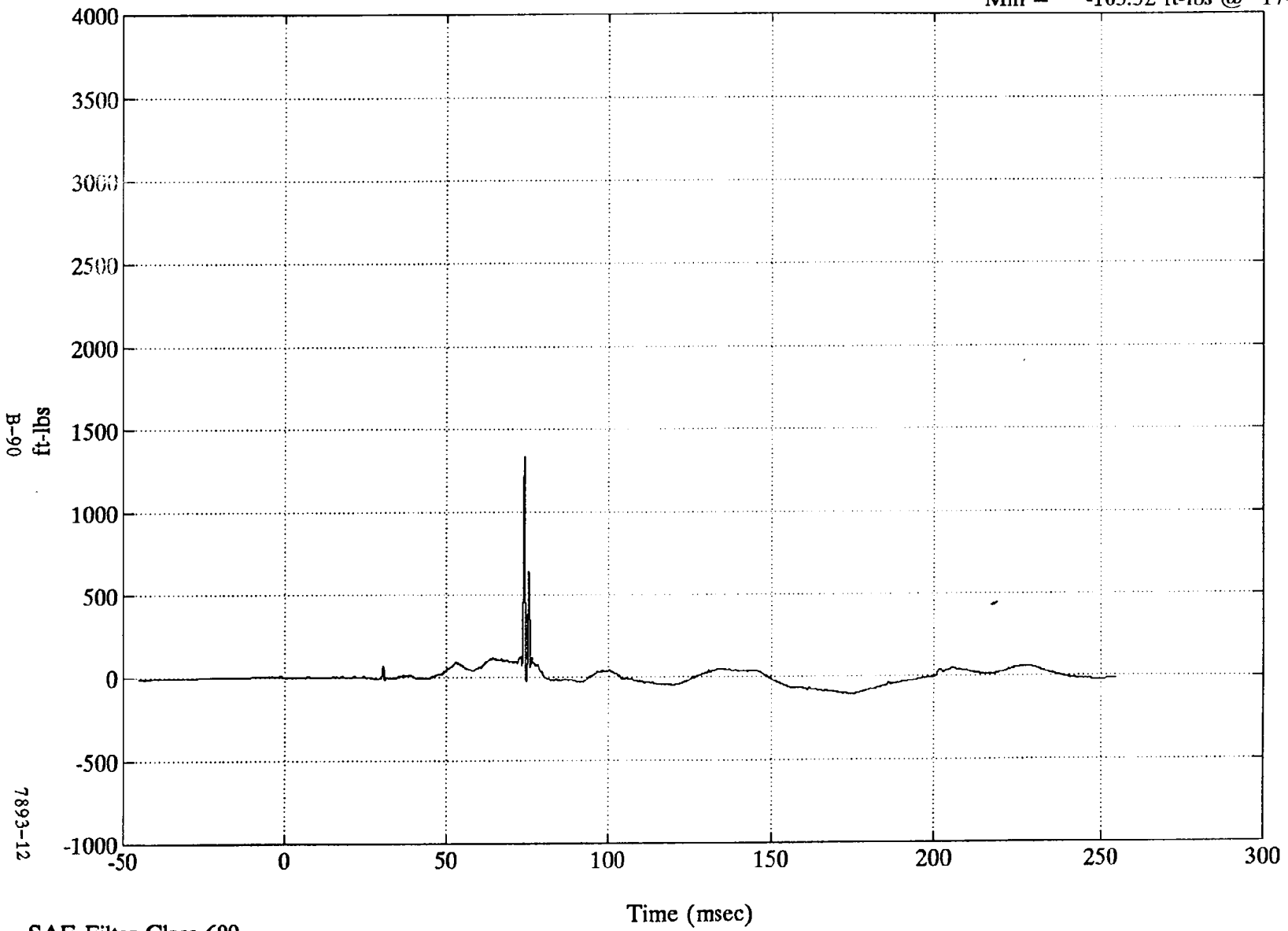


SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 1 Upper Neck Mx

Max = 1331.80 ft-lbs @ 74.27 msec
Min = -105.52 ft-lbs @ 174.00 msec

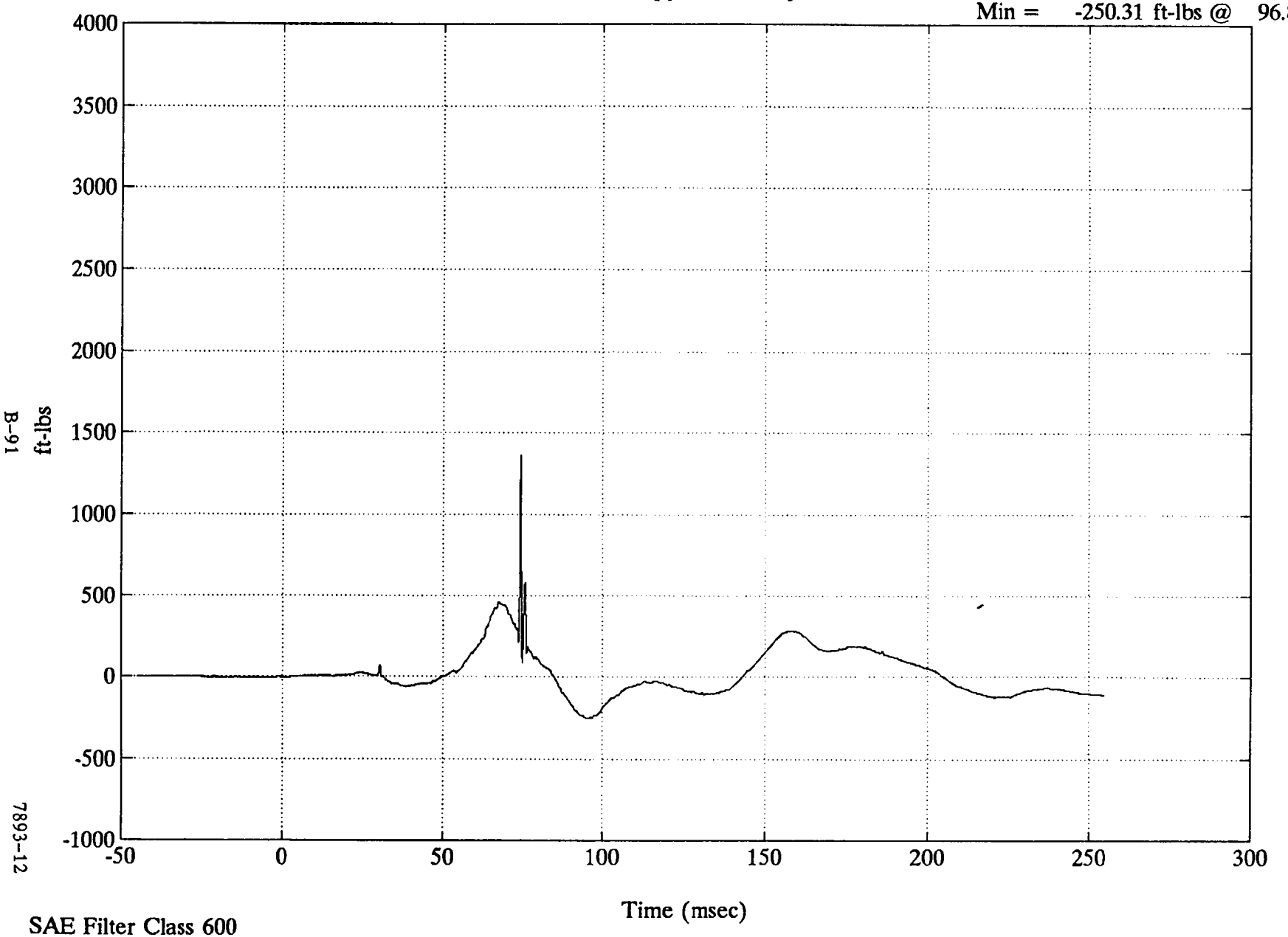


SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 1 Upper Neck My

Max = 1358.42 ft-lbs @ 74.27 msec
Min = -250.31 ft-lbs @ 96.84 msec

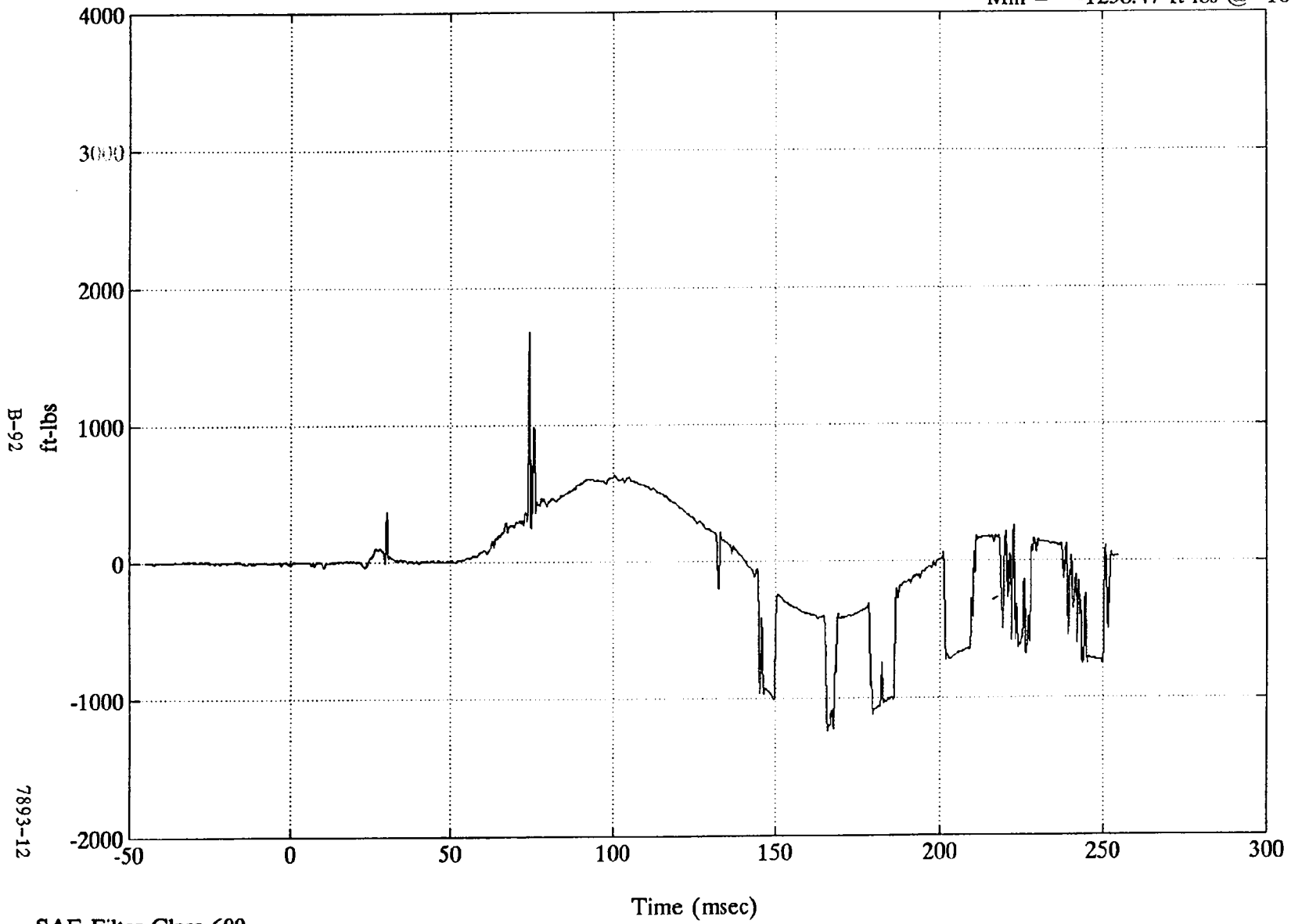


SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 1 Upper Neck Mz

Max = 1678.06 ft-lbs @ 74.27 msec
Min = -1238.47 ft-lbs @ 166.20 msec

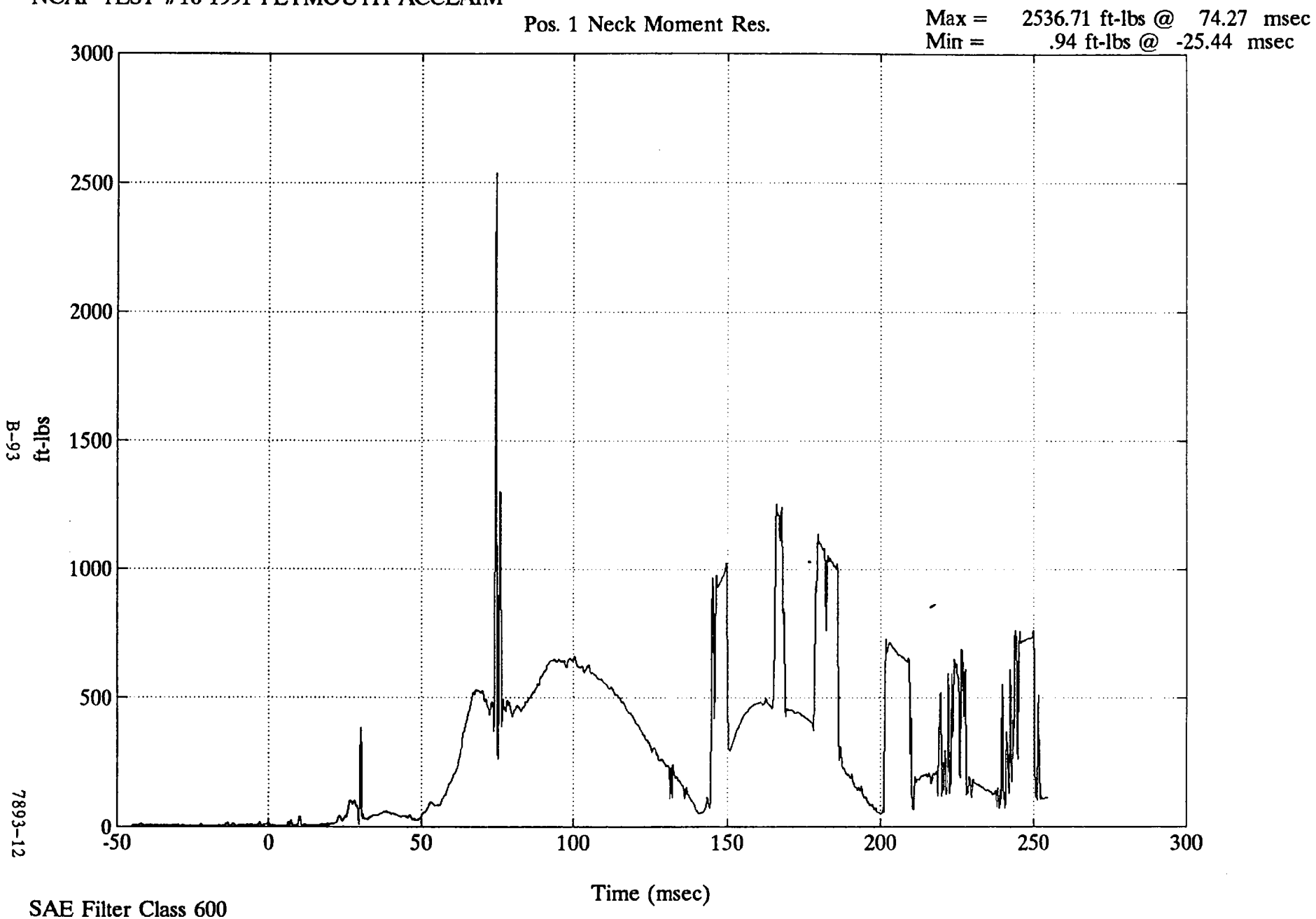


B-92

7893-12

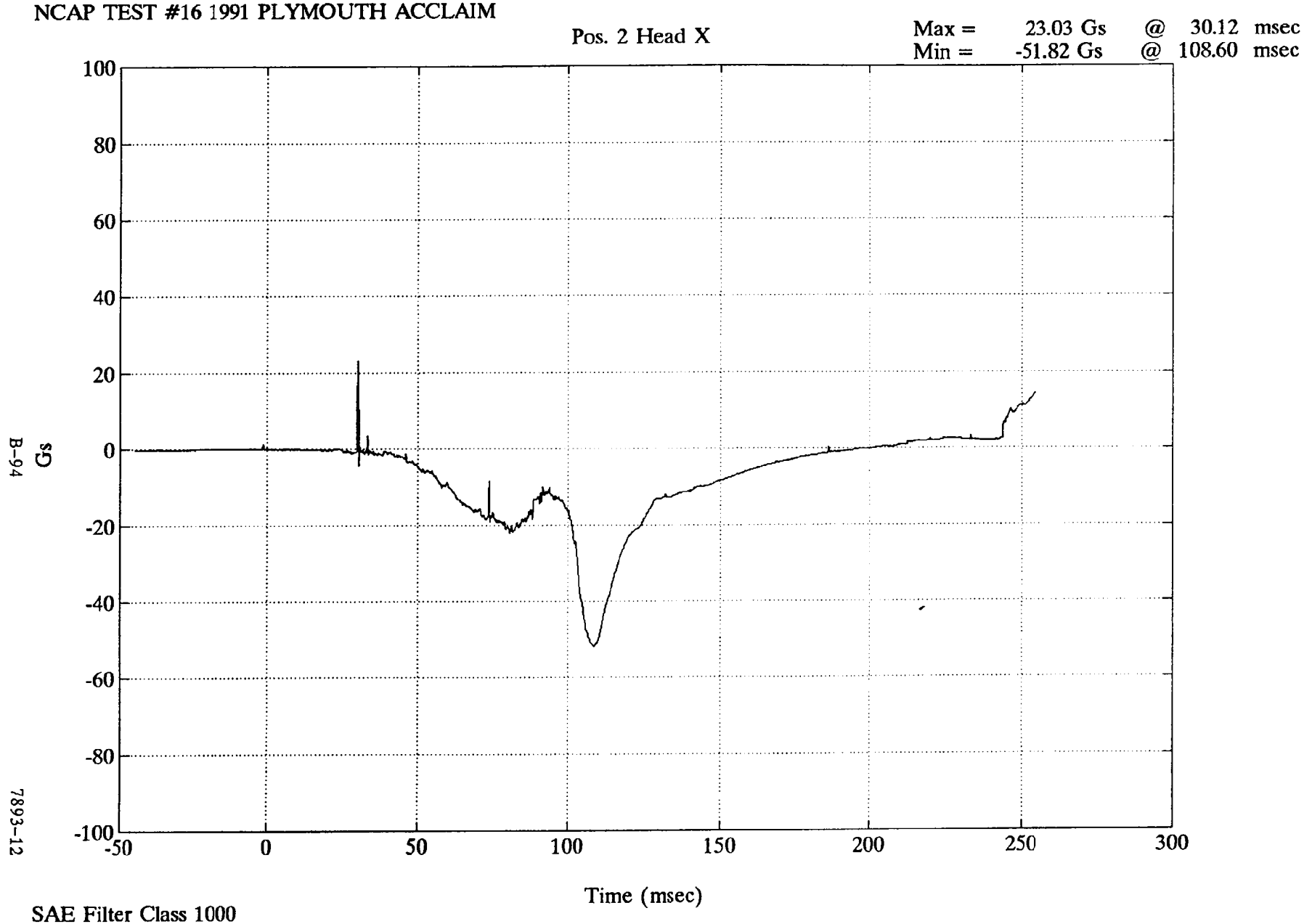
SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



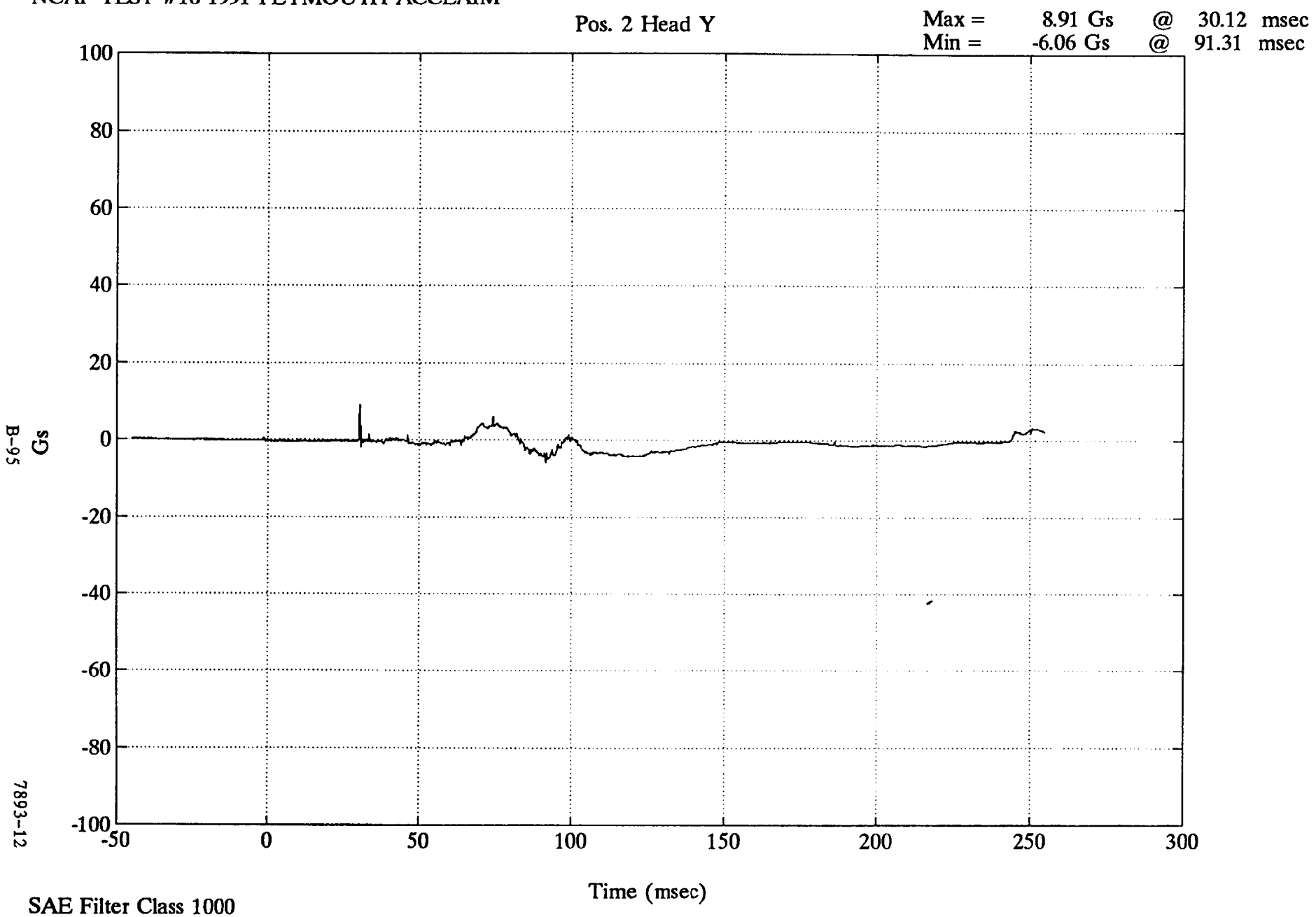
SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

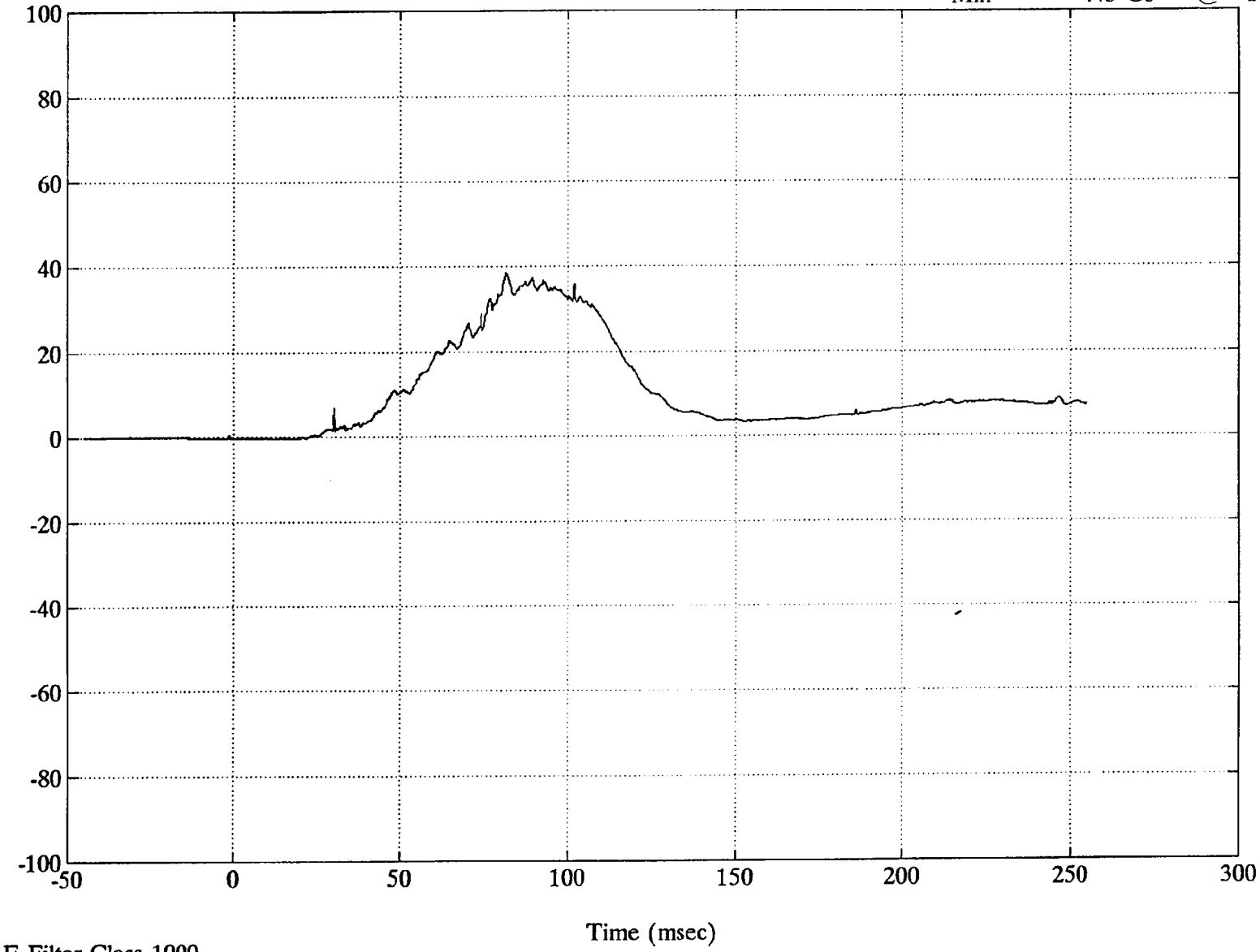


SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Head Z

Max = 38.51 Gs @ 81.60 msec
Min = -.43 Gs @ 18.00 msec

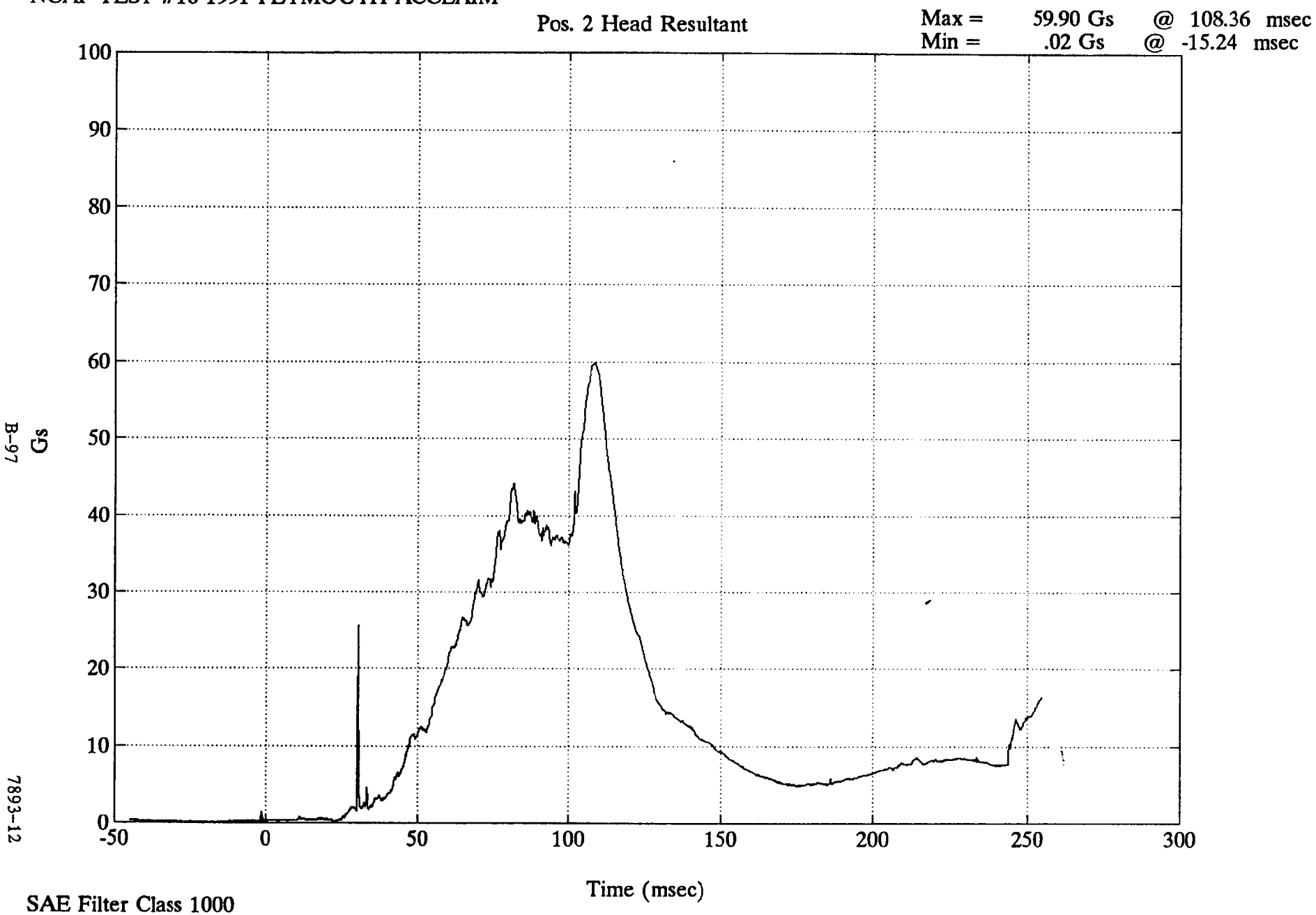


B-96

7893-12

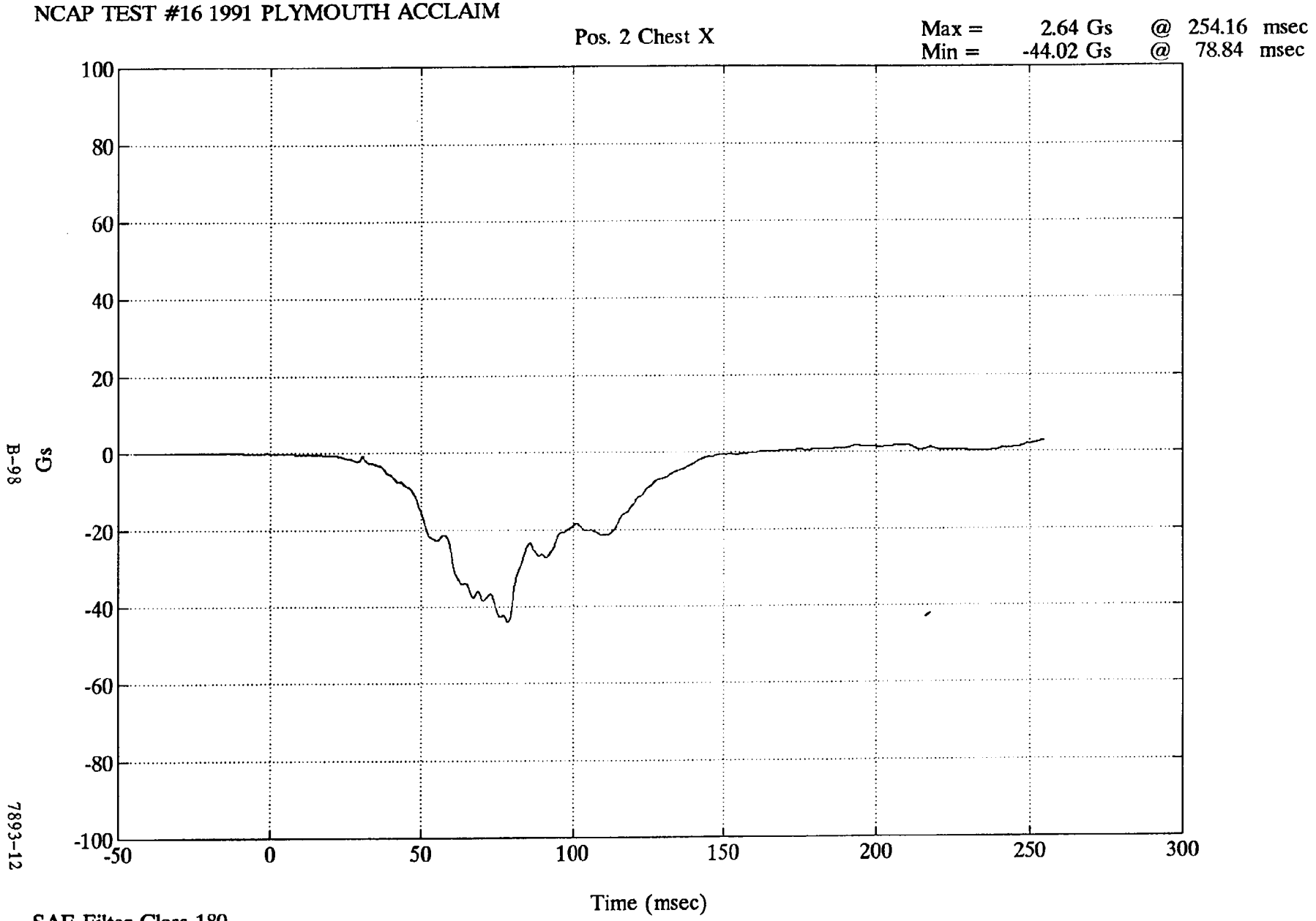
SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

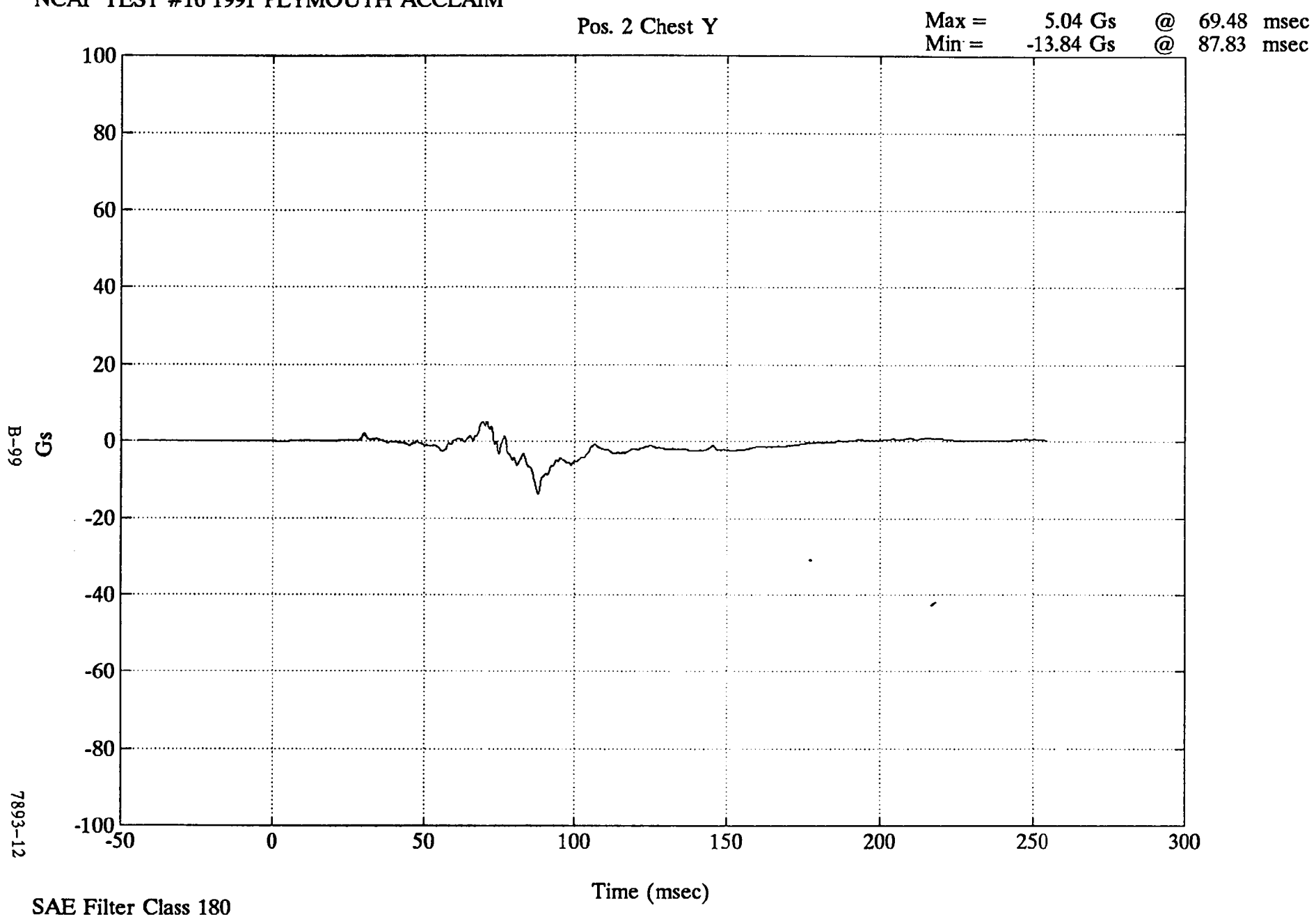


B-98

7893-12

SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

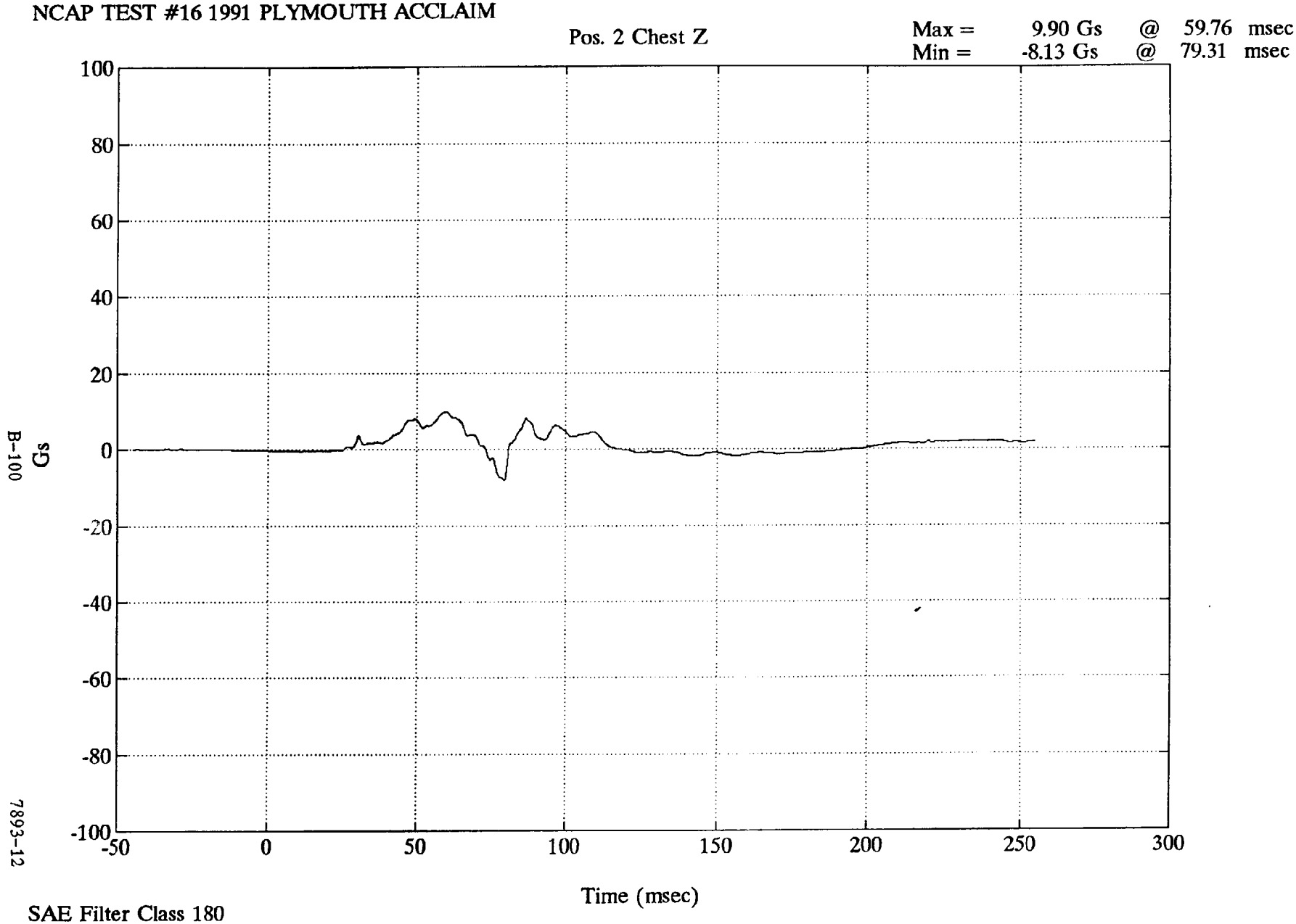


B-99

7893-12

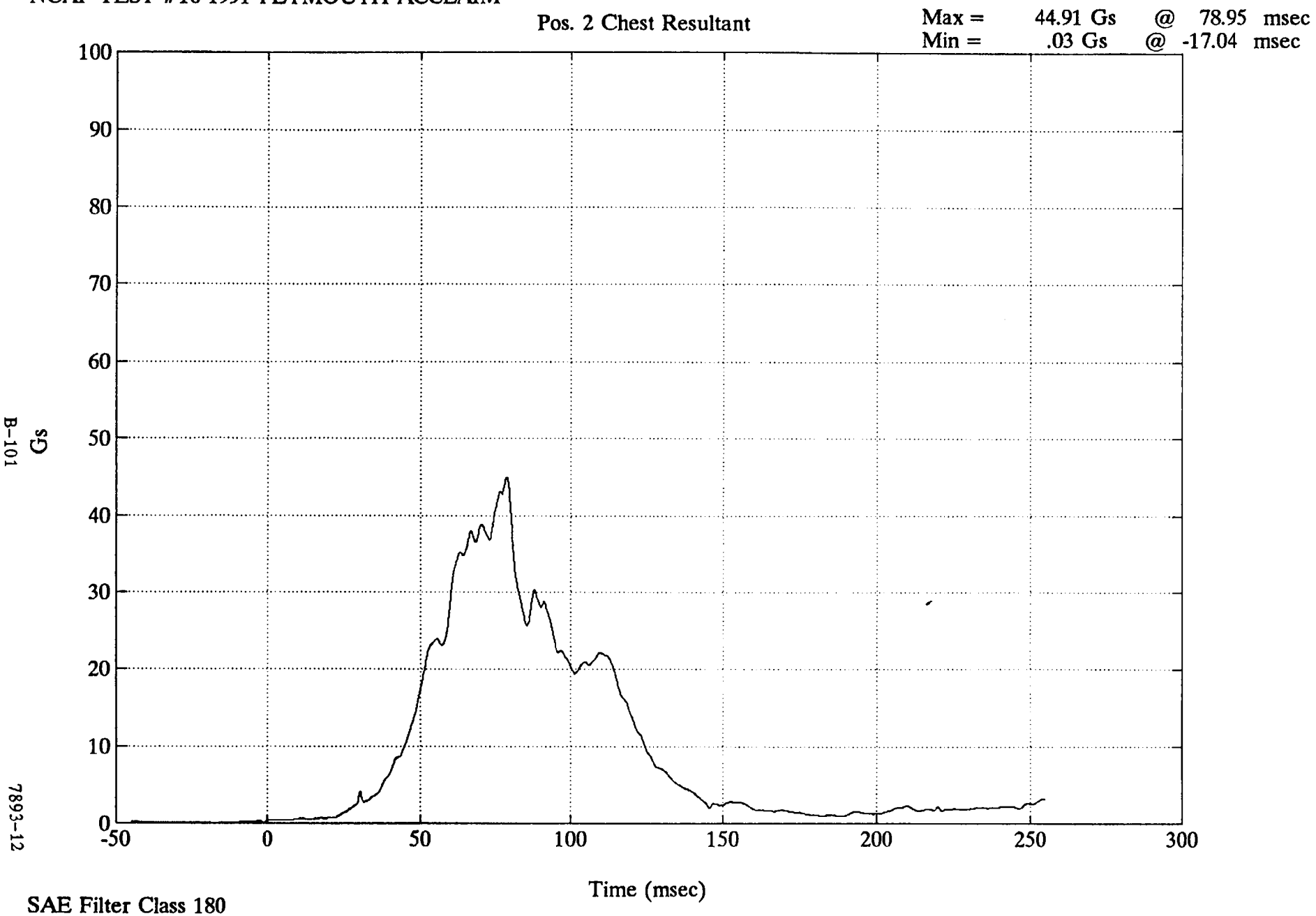
SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

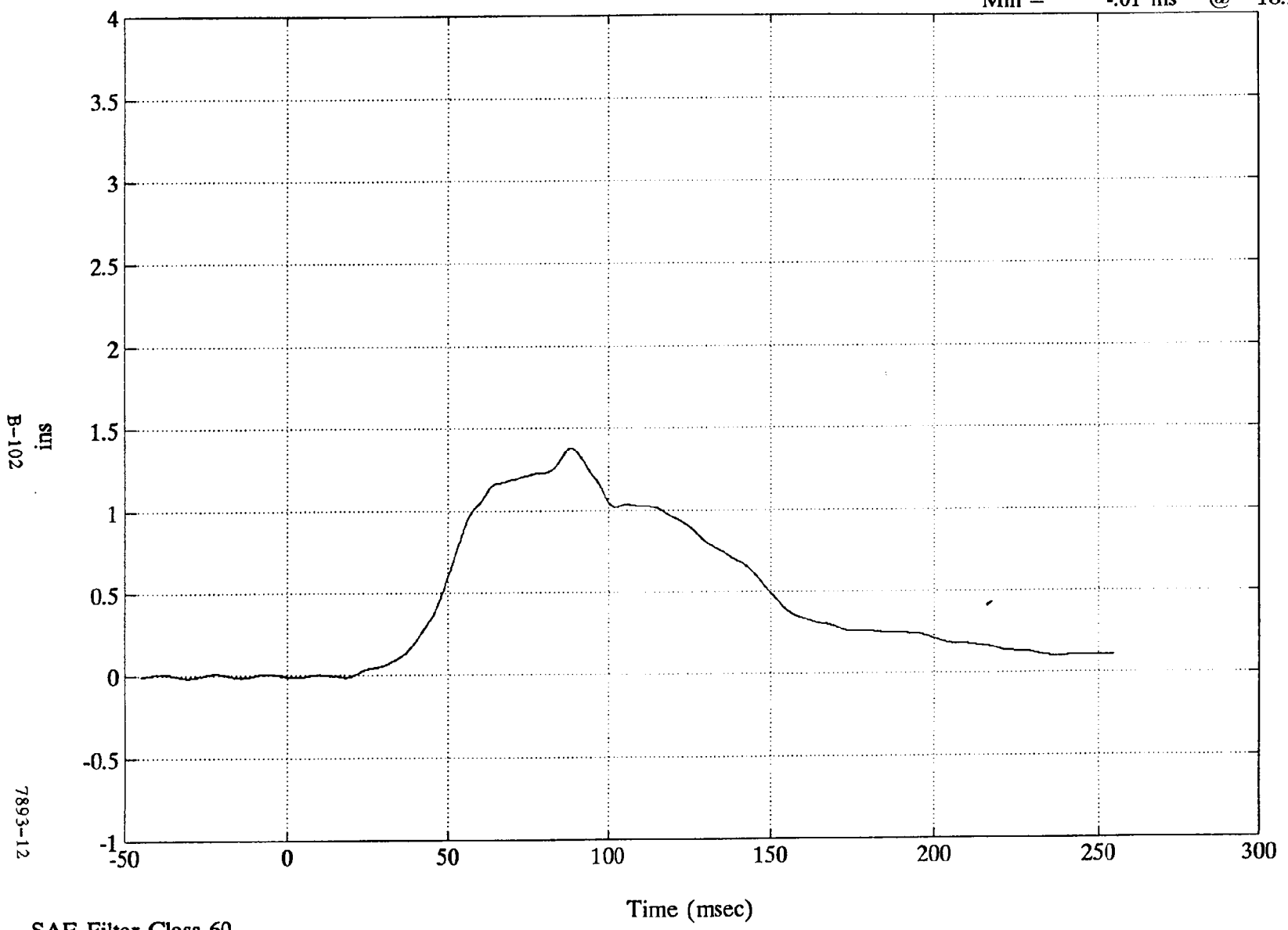


SAE Filter Class 180

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Chest Disp.

Max = 1.37 ins @ 88.44 msec
Min = -.01 ins @ 18.23 msec

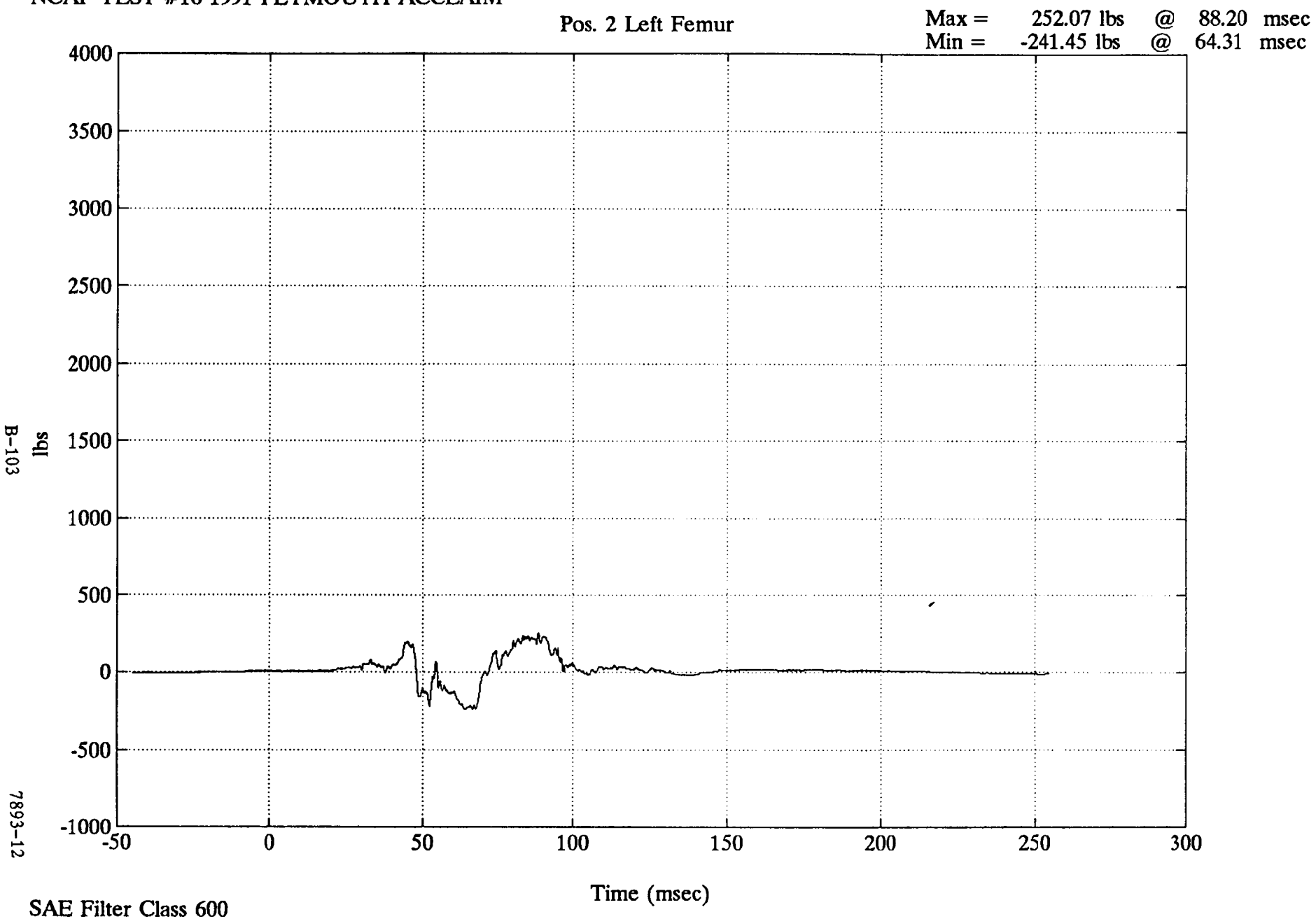


B-102

7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

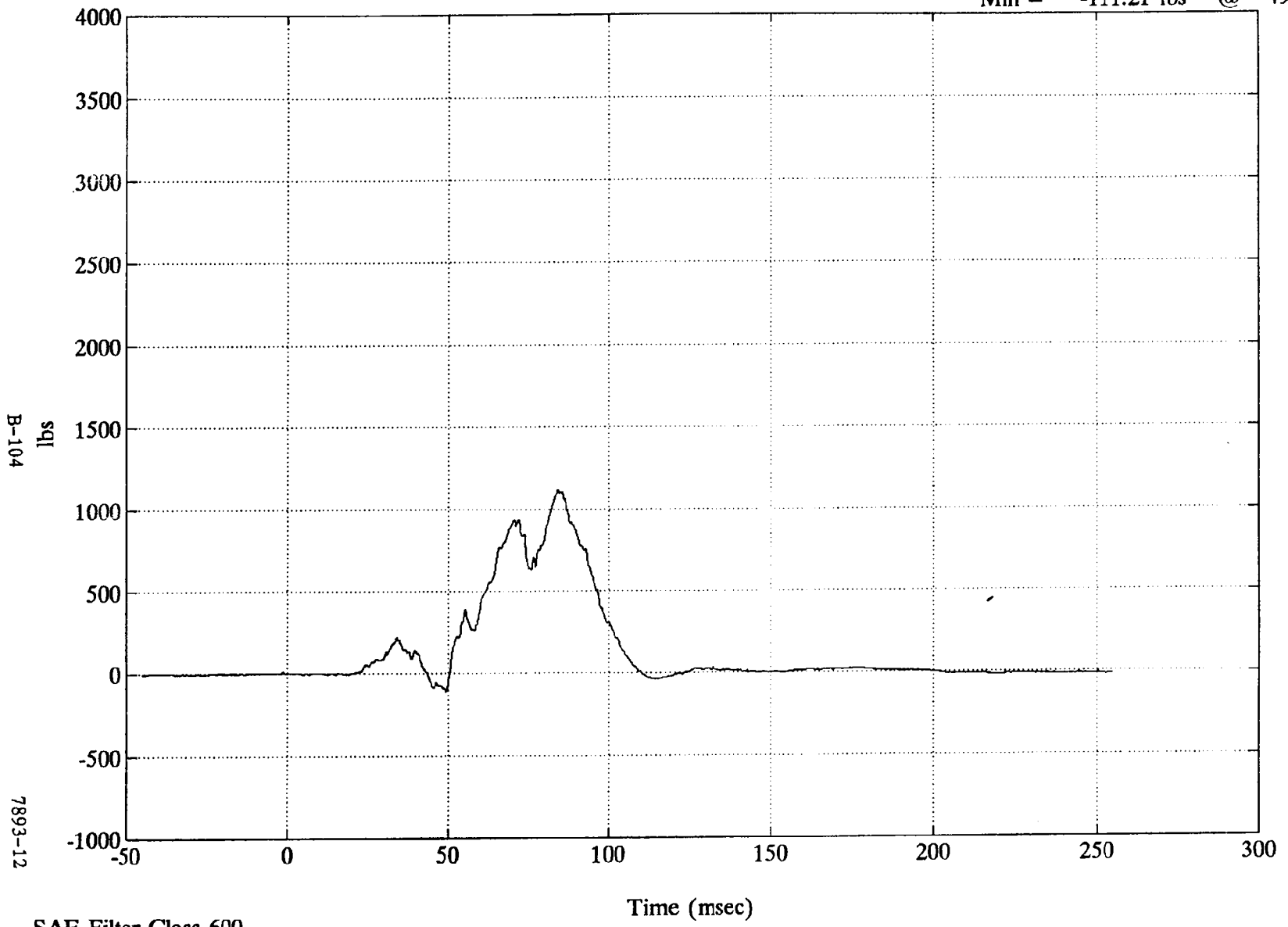


SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Right Femur

Max = 1116.66 lbs @ 84.48 msec
Min = -111.21 lbs @ 49.31 msec

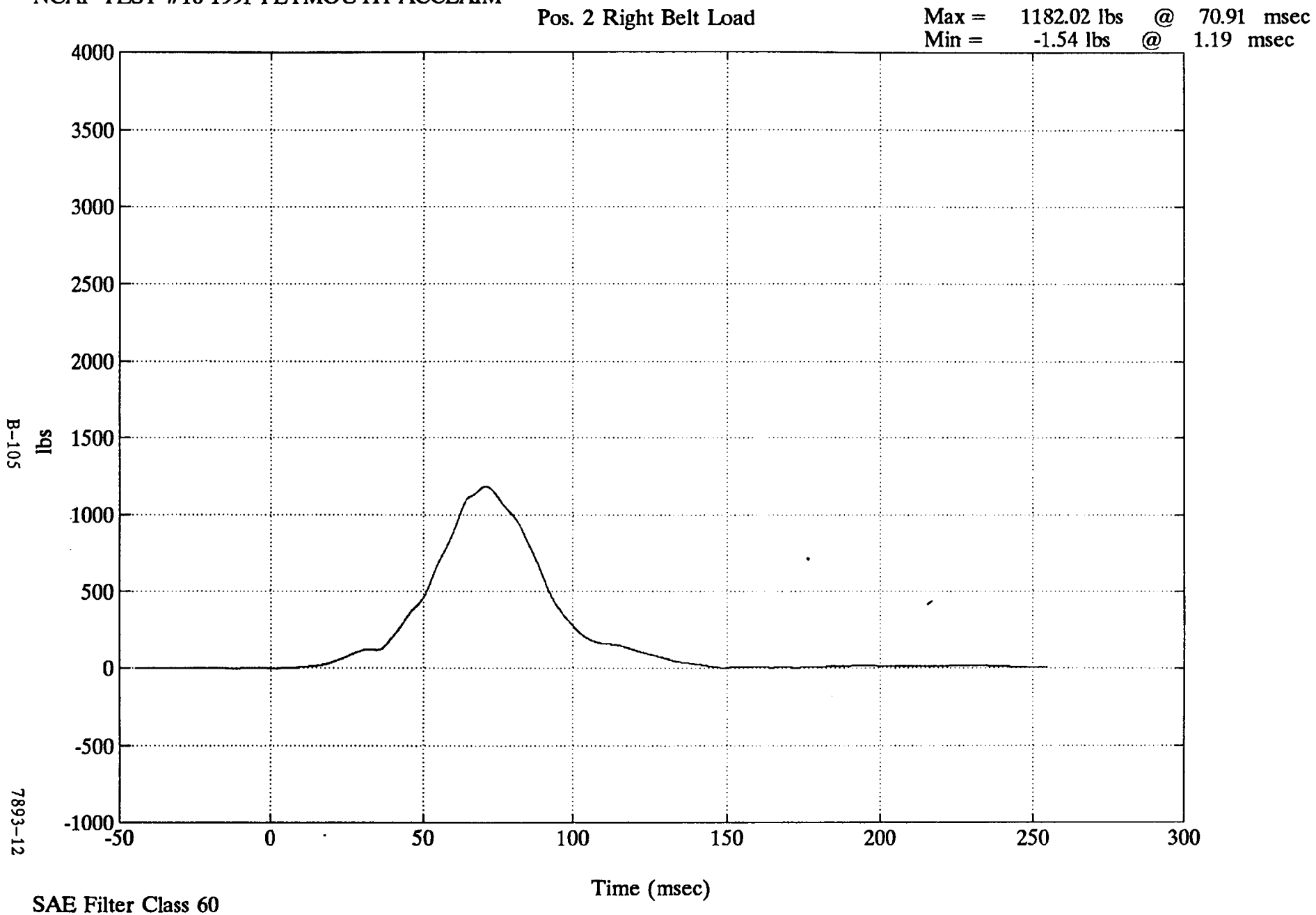


B-104

7893-12

SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

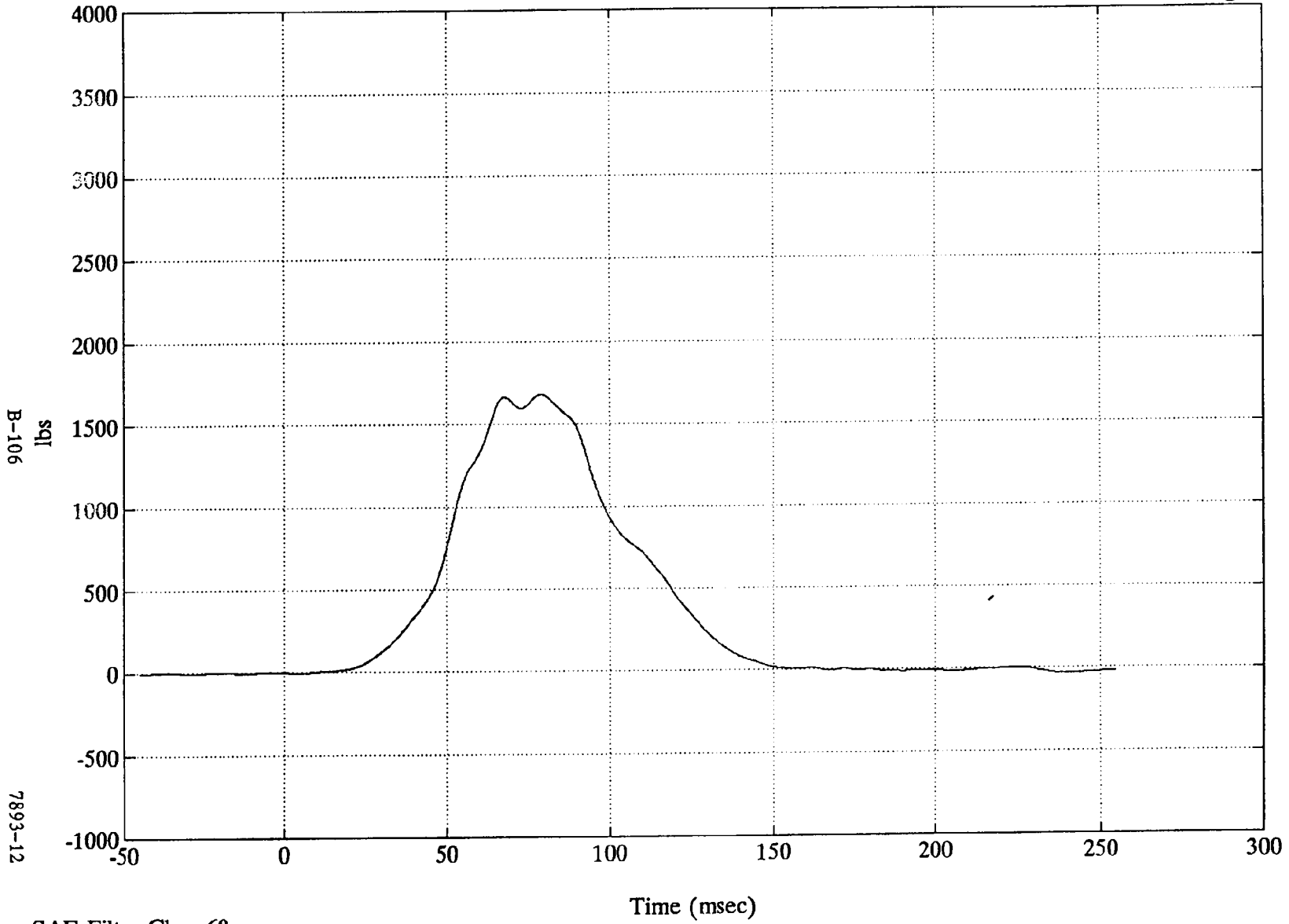


SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Torso Belt Load

Max = 1680.77 lbs @ 79.19 msec
Min = -33.38 lbs @ 241.32 msec



B-106

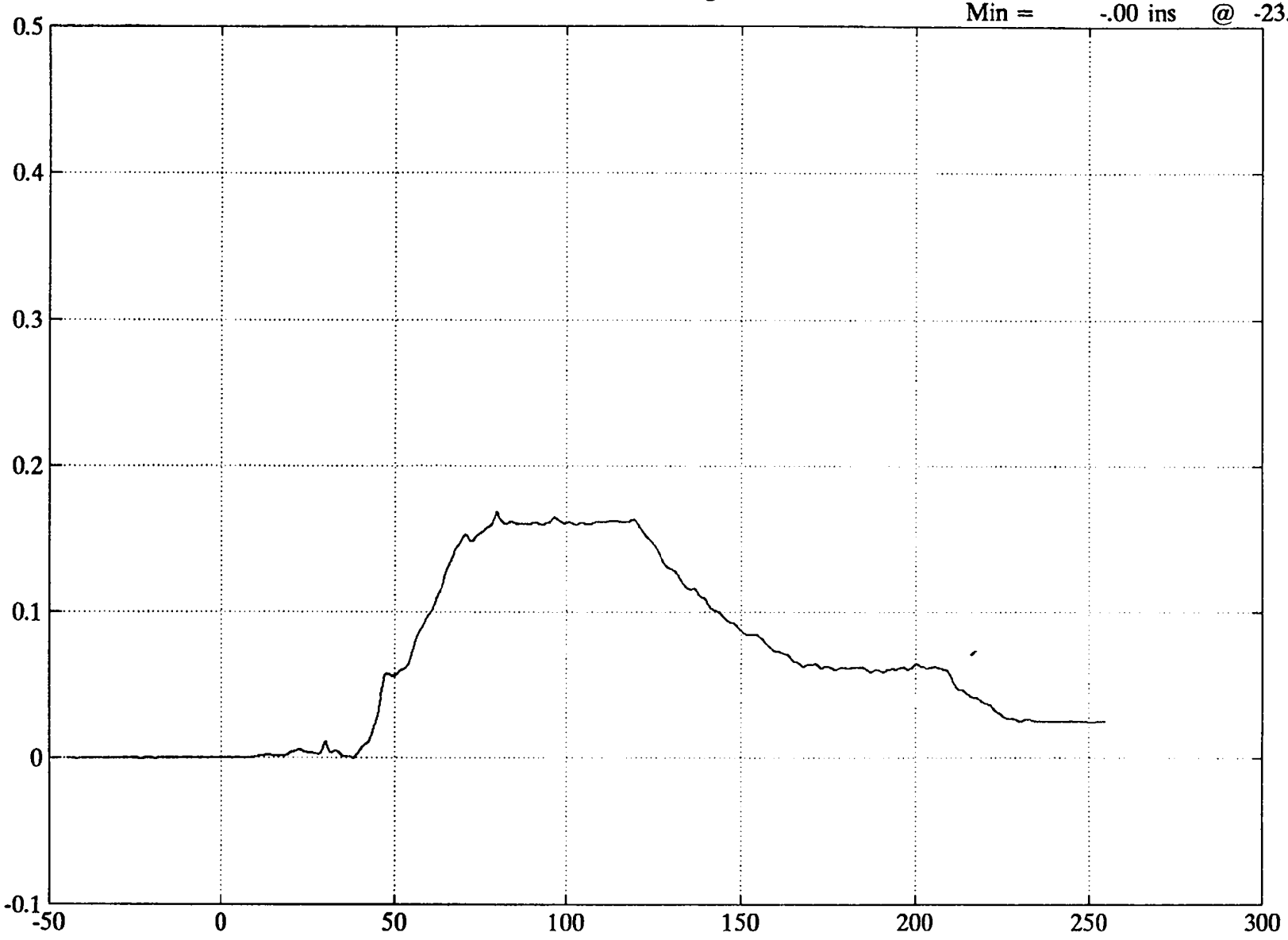
7893-12

SAE Filter Class 60

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Belt Elongation

Max = .16 ins @ 79.44 msec
Min = -.00 ins @ -23.52 msec



B-107

7893-12

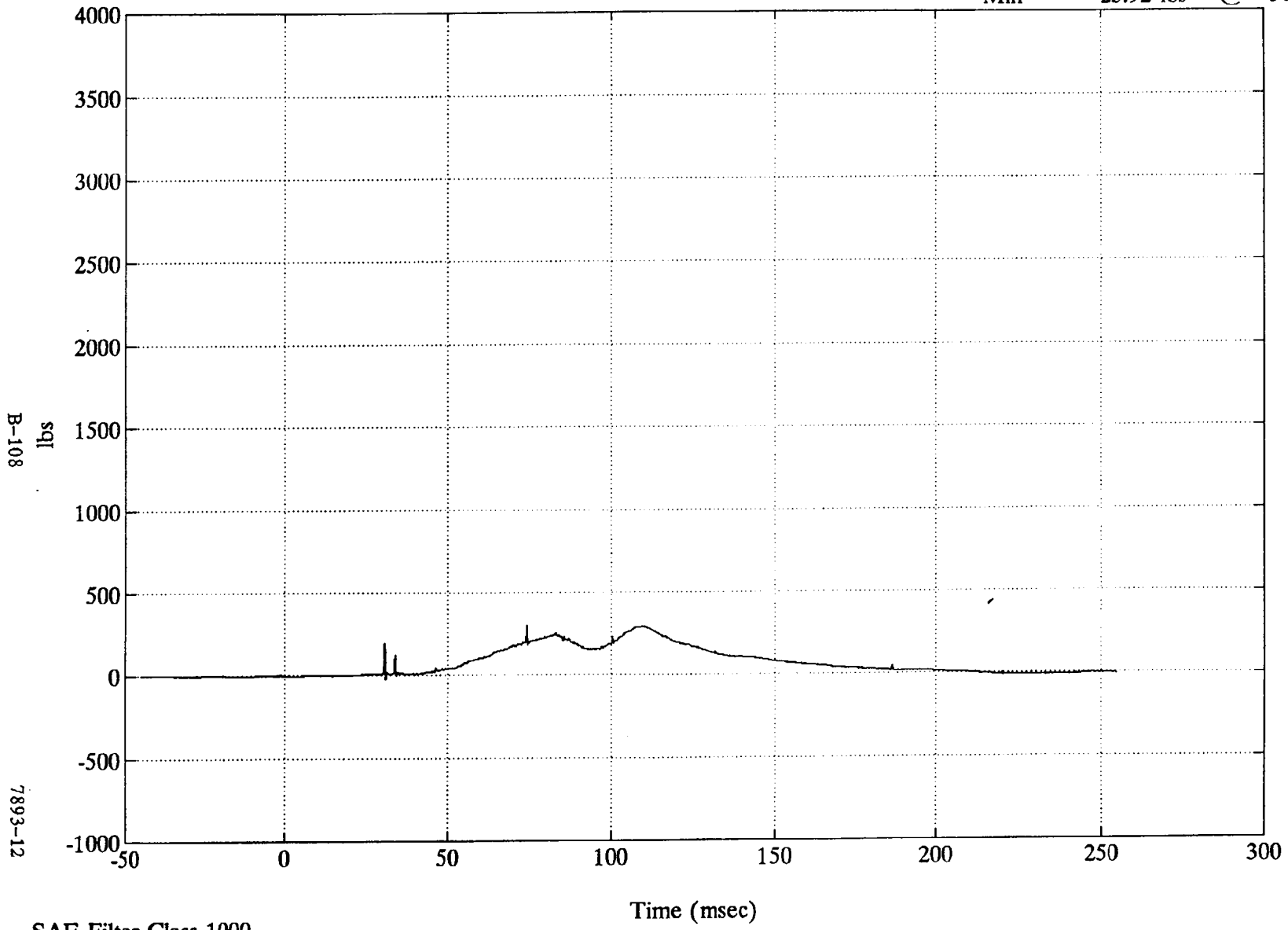
SAE Filter Class 180

Measured over 2.5 inches

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Upper Neck Fx

Max = 297.76 lbs @ 74.40 msec
Min = -23.92 lbs @ 30.60 msec

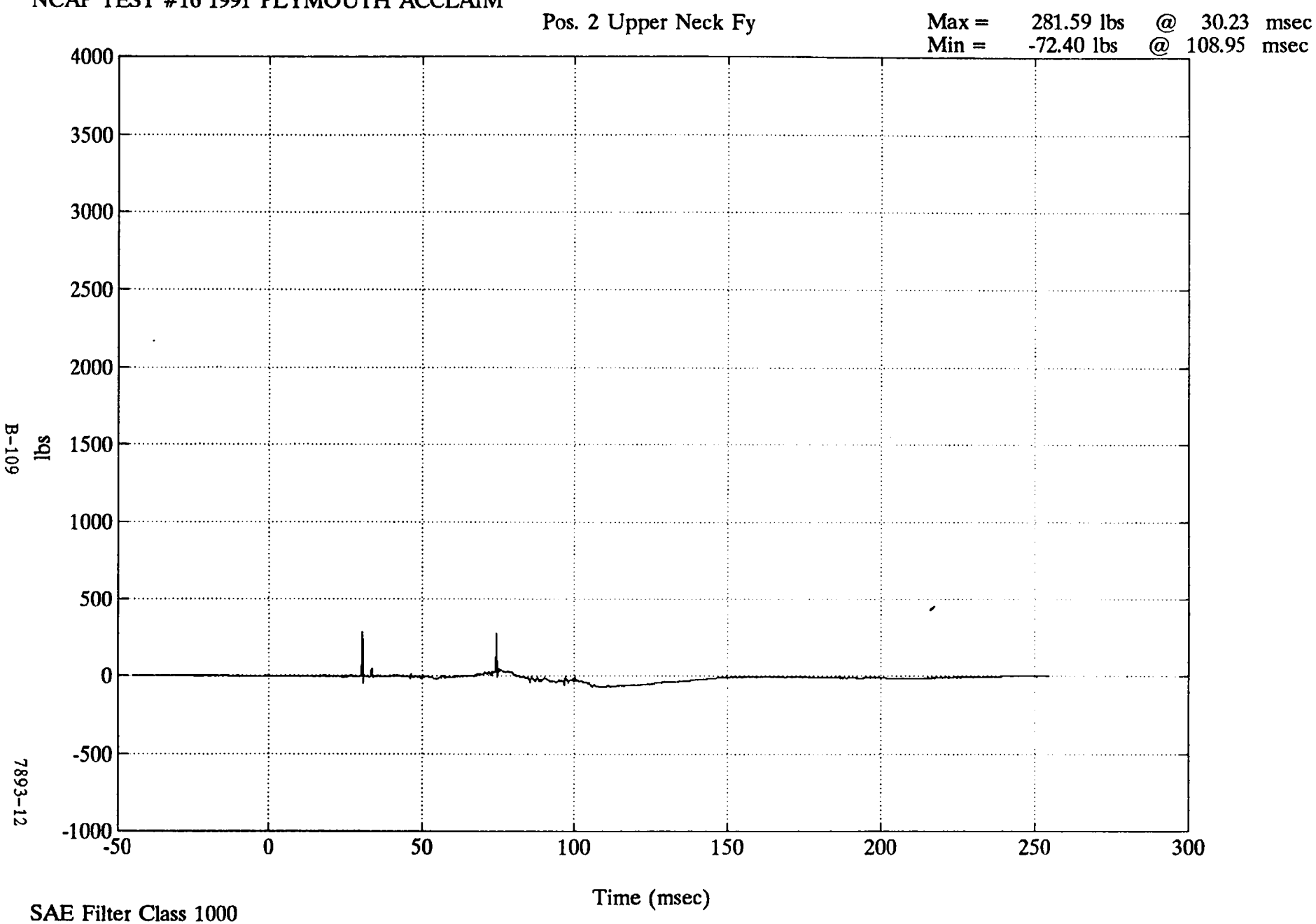


B-108

7893-12

SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

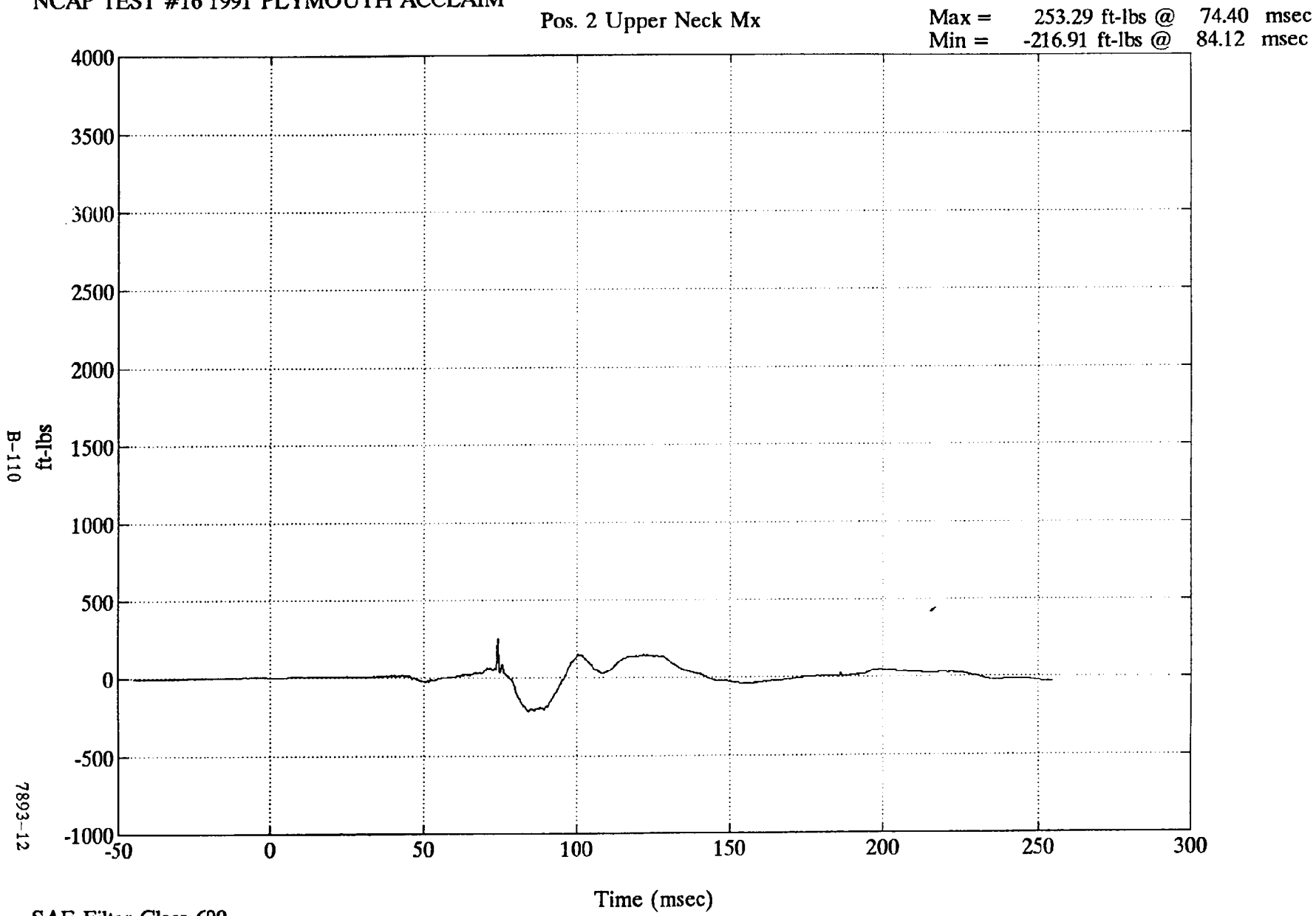


B-109

7893-12

SAE Filter Class 1000

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

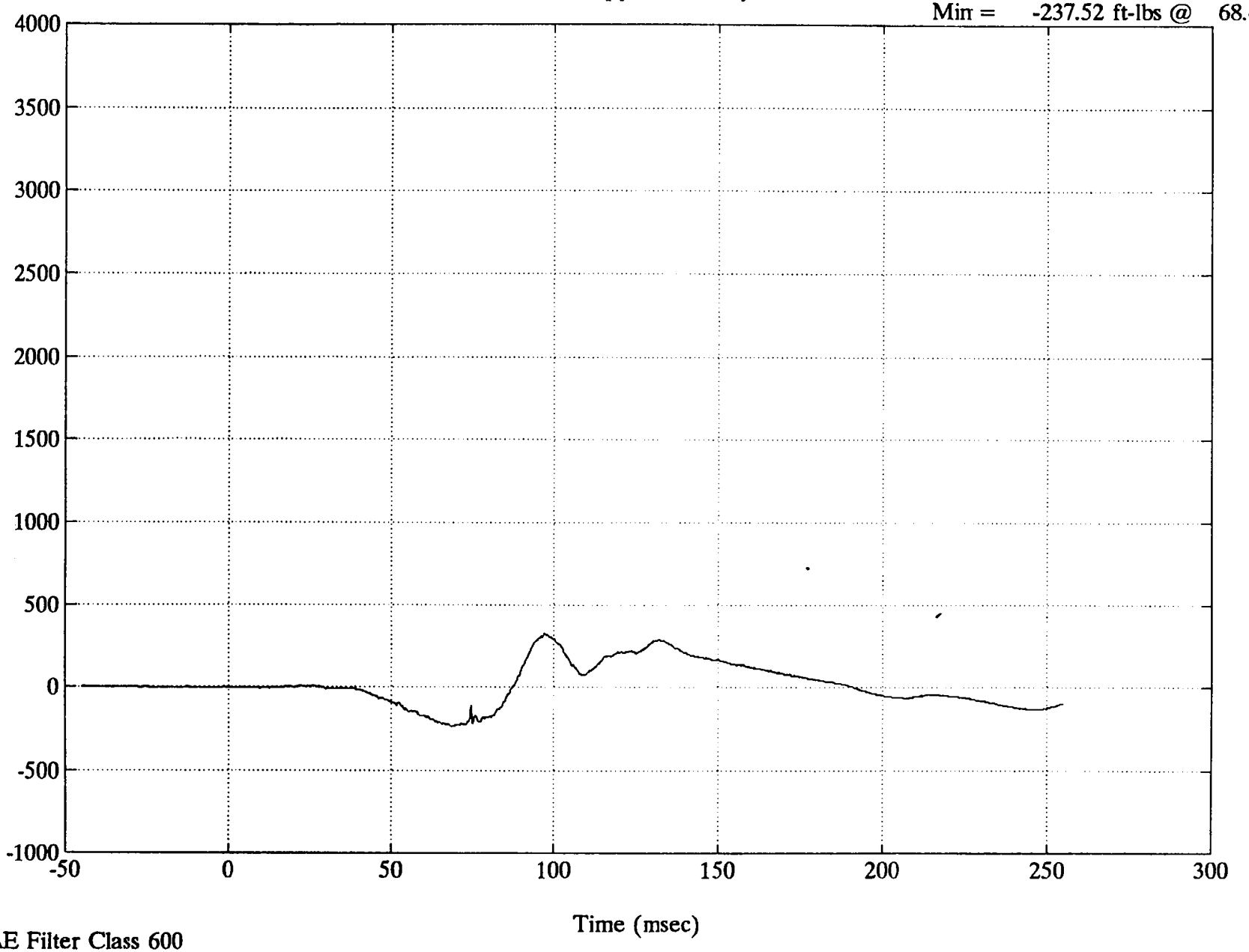


SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Upper Neck My

Max = 327.15 ft-lbs @ 97.08 msec
Min = -237.52 ft-lbs @ 68.40 msec



B-111

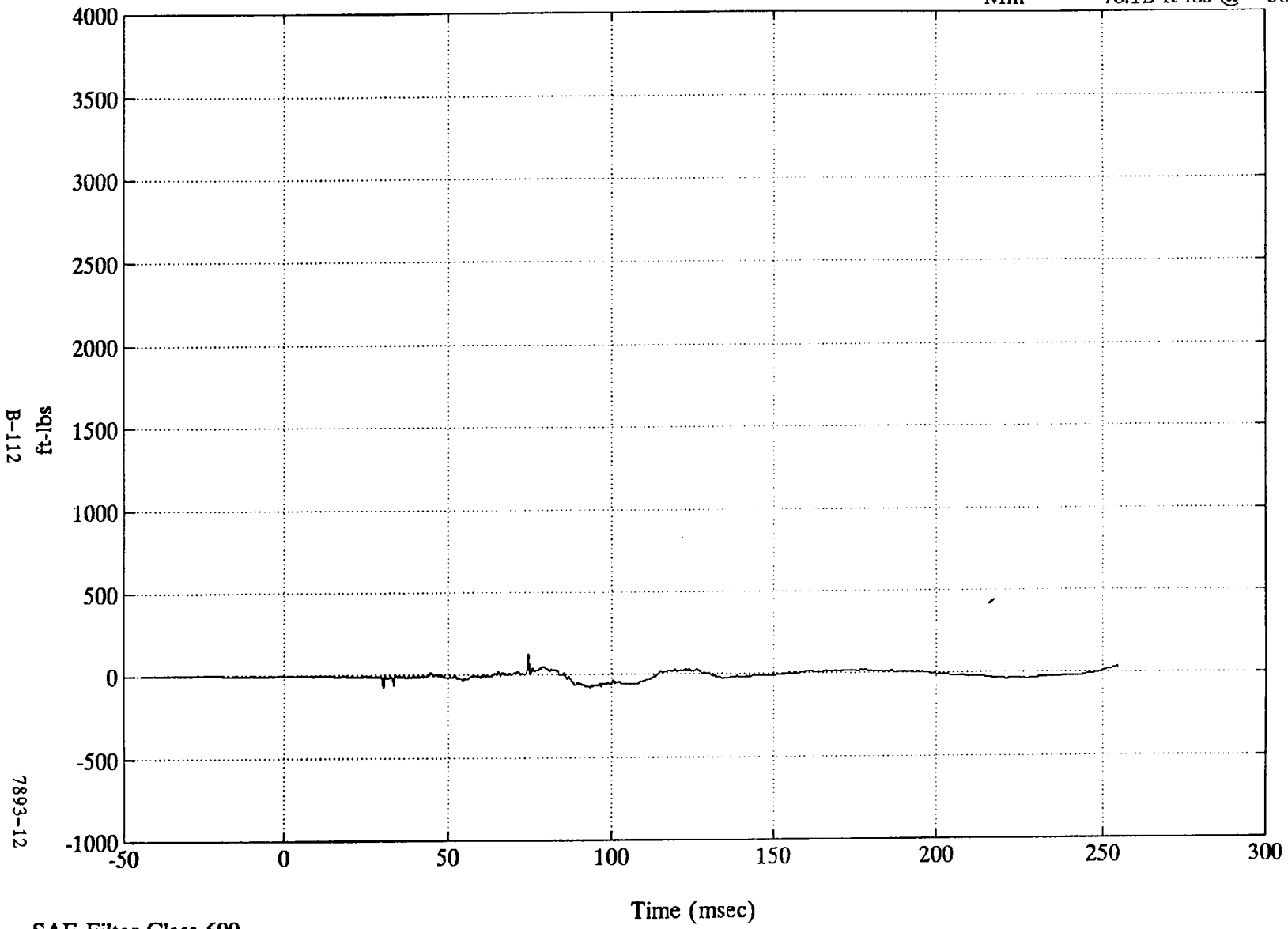
7893-12

SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM

Pos. 2 Upper Neck Mz

Max = 122.68 ft-lbs @ 74.40 msec
Min = -78.12 ft-lbs @ 30.23 msec

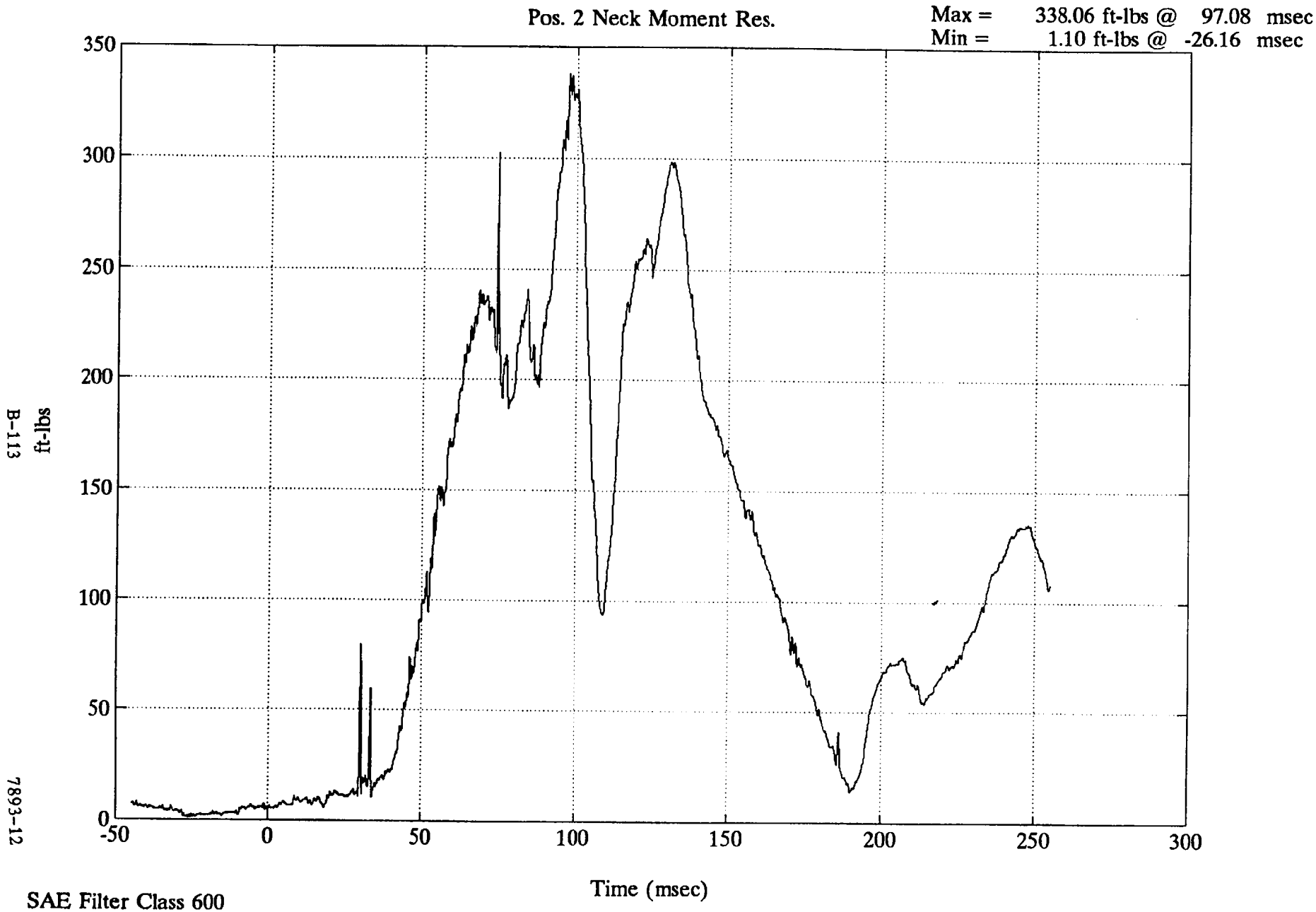


B-112

7893-12

SAE Filter Class 600

NCAP TEST #16 1991 PLYMOUTH ACCLAIM



SAE Filter Class 600

Appendix C

PART 572E 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:

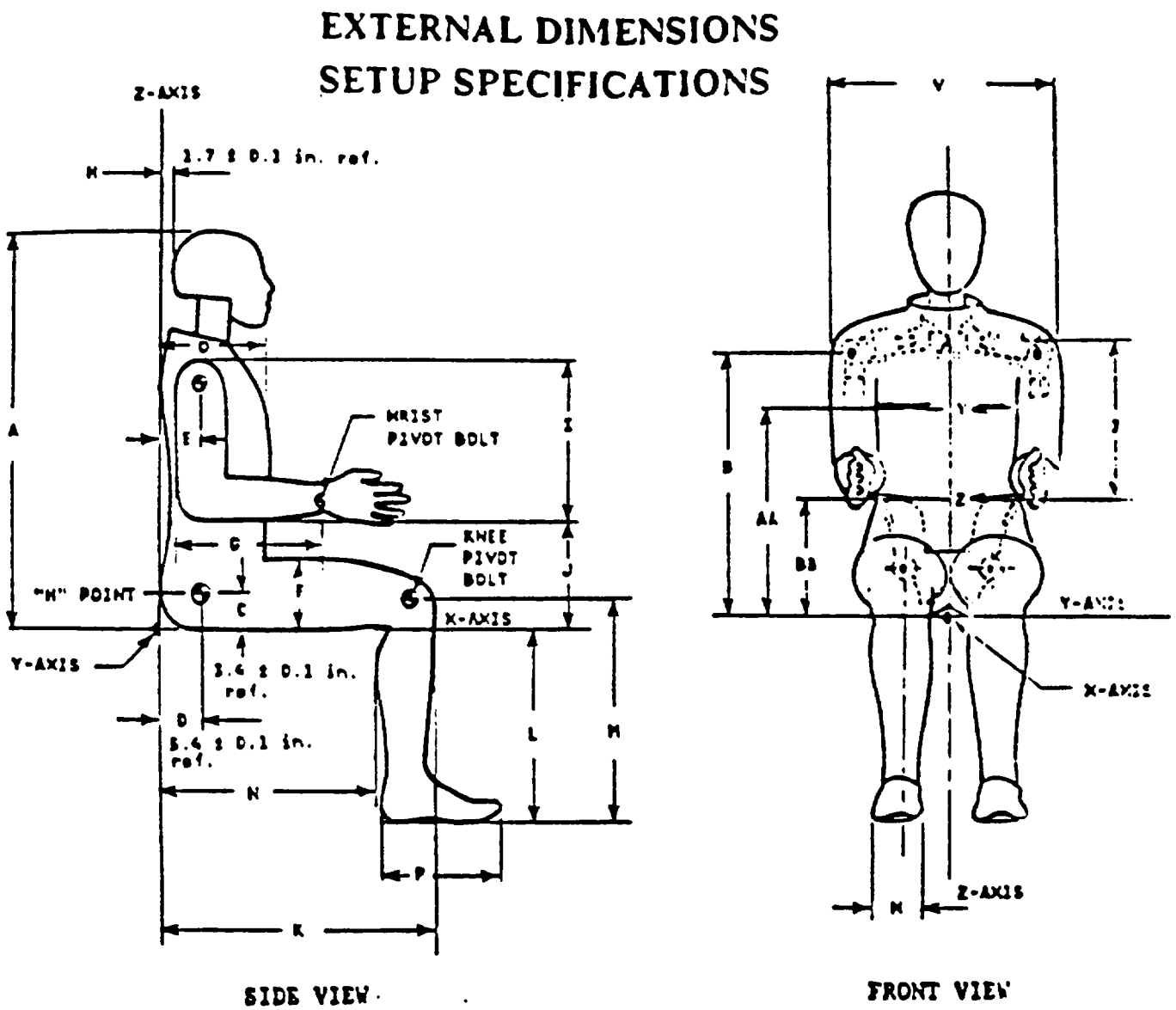
Serial No.	Completion Date
150	3-25-91
245	4-18-91

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



NOTE: FIGURE IS REFERENCED TO THE ERECT SEATED POSITION. THE CURVED LUMBAR DOES NOT ALLOW THE HYBRID III TO BE POSITIONED IN A PERFECT ERECT ATTITUDE.

HYBRID III EXTERNAL DIMENSIONS S/N 150 HUMANOID			
DUMMY SERIAL NO. 150		DATE: 3-18-91	
TEMPERATURE		69.0-72.0 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10-70 %	50 %
LOCATION FOR CHEST CIRCUMFERENCE	(AA)	16.9-17.1 IN	17.0 IN
LOCATION FOR WAIST CIRCUMFERENCE	(BB)	8.9-9.1 IN	9.0 IN
CHEST CIRCUMFERENCE	(Y)	38.2-39.4 IN	38.8 IN
WAIST CIRCUMFERENCE	(Z)	32.1-34.1 IN	32.7 IN
CHEST DEPTH	(O)	8.4-9.0 IN	8.7 IN
H-POINT HEIGHT	(C)	3.3-3.5 IN	3.4 IN
H-POINT FROM SEAT BACK	(D)	5.3-5.5 IN	5.4 IN
SKULL CAP TO BACKLINE	(H)	1.6-1.8 IN	1.7 IN
TOTAL SITTING HEIGHT	(A)	34.6-35.0 IN	34.9 IN
THIGH CLEARANCE	(F)	5.5-6.1 IN	5.8 IN
BUTTOCK KNEE LENGTH	(K)	22.8-23.8 IN	23.4 IN
BUTTOCK POPLITAL LENGTH	(N)	17.8-18.8 IN	18.4 IN
POPLITEAL LENGTH	(L)	16.9-17.9 IN	17.5 IN
KNEE PIVOT HEIGHT	(M)	19.1-19.7 IN	19.4 IN
FOOT LENGTH	(P)	9.9-10.5 IN	10.1 IN
FOOT BREADTH	(W)	3.6-4.2 IN	4.0 IN
SHOULDER PIVOT FROM BACKLINE	(E)	3.3-3.7 IN	3.6 IN
SHOULDER BREADTH	(V)	16.6-17.2 IN	16.9 IN
SHOULDER PIVOT HEIGTH	(B)	19.9-20.5 IN	20.3 IN
ELBOW REST HEIGHT	(J)	7.5-8.3 IN	8.0 IN
SHOULDER-ELBOW LENGTH	(I)	13.0-13.6 IN	13.6 IN
BACK OF ELBOW TO WRIST PIVOT	(G)	11.4-12.0 IN	11.9 IN

DUMMY MEETS SPECIFICATIONS

TECHNICATION IVAN MINKEWICZ

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK EXTENSION TEST

HYBRID III

DATE : 3-20-91 6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 4 HY3 SN 150 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	32 %
IMPACT VELOCITY		19.50 - 20.30 FPS	19.9 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.61 G
	20 MS	14.00 - 19.00 G	17.63 G
	30 MS	11.00 - 16.00 G	14.41 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.41 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	43.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	94.06 DEG.
	TIME	72 - 82 MS	73.5 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	-50.0 FT.-LBS.
	TIME	65 - 79 MS	67.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	151.63 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	126.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 3-20-91 6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 4 HY3 SN 150 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	32 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.9 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.46 G
	20 MS	17.60 - 22.60 G	22.3 G
	30 MS	12.50 - 18.50 G	18.41 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	18.41 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	40.0 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	76.52 DEG.
	TIME	57 - 64 MS	59.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	72.24 FT.-LBS.
	TIME	47 - 58 MS	53.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	119 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

THORAX IMPACT TEST

HYBRID III

DATE : 3-25-91

CALSPAN SEQUENTIAL NUMBER 4 HY3 SN 150 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	36 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.6 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.51 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1243 POUNDS
INTERNAL HYSTERESIS	69% - 85%	70.6 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 3-20-91 KNEE : LEFT

CALSPAN SEQUENTIAL NUMBER 4 HY3 SN 150 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	32 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1068 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 3-20-91 KNEE : RIGHT

CALSPAN SEQUENTIAL NUMBER 4 HY3 SN 150 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	32 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1095 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 3-18-91

CALSPAN SEQUENTIAL NUMBER 4 HY3 SN 150 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	34 %
PEAK RESULTANT ACCELERATION	225 - 275 G	274.4 G
PEAK LATERAL ACCELERATION	15 G MAX	12.1 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER ____150_____

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

HYBRID III EXTERNAL DIMENSIONS S/N 245 HUMANOID			
DUMMY SERIAL NO. 245		DATE: 4-10-91	
TEMPERATURE		69.0-72.0 DEG. F	72 DEG. F
RELATIVE HUMIDITY		10-70 %	39 %
LOCATION FOR CHEST CIRCUMFERENCE	(AA)	16.9-17.1 IN	17.0 IN
LOCATION FOR WAIST CIRCUMFERENCE	(BB)	8.9-9.1 IN	9.0 IN
CHEST CIRCUMFERENCE	(Y)	38.2-39.4 IN	39.3 IN
WAIST CIRCUMFERENCE	(Z)	32.1-34.1 IN	33.6 IN
CHEST DEPTH	(O)	8.4-9.0 IN	8.4 IN
H-POINT HEIGHT	(C)	3.3-3.5 IN	3.5 IN
H-POINT FROM SEAT BACK	(D)	5.3-5.5 IN	5.4 IN
SKULL CAP TO BACKLINE	(H)	1.6-1.8 IN	1.7 IN
TOTAL SITTING HEIGHT	(A)	34.6-35.0 IN	35.0 IN
THIGH CLEARANCE	(F)	5.5-6.1 IN	6.1 IN
BUTTOCK KNEE LENGTH	(K)	22.8-23.8 IN	23.6 IN
BUTTOCK POPLITAL LENGTH	(N)	17.8-18.8 IN	18.5 IN
POPLITEAL LENGTH	(L)	16.9-17.9 IN	17.1 IN
KNEE PIVOT HEIGHT	(M)	19.1-19.7 IN	19.3 IN
FOOT LENGTH	(P)	9.9-10.5 IN	10.2 IN
FOOT BREADTH	(W)	3.6-4.2 IN	3.8 IN
SHOULDER PIVOT FROM BACKLINE	(E)	3.3-3.7 IN	3.7 IN
SHOULDER BREADTH	(V)	16.6-17.2 IN	16.8 IN
SHOULDER PIVOT HEIGTH	(B)	19.9-20.5 IN	20.4 IN
ELBOW REST HEIGHT	(J)	7.5-8.3 IN	8.2 IN
SHOULDER-ELBOW LENGTH	(I)	13.0-13.6 IN	13.3 IN
BACK OF ELBOW TO WRIST PIVOT	(G)	11.4-12.0 IN	11.5 IN

DUMMY MEETS SPECIFICATIONS

TECHNICATION IVAN MINKEWICZ

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK EXTENSION TEST

HYBRID III

DATE : 4-17-91 6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 2 HY3 SN 245 CAL NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	71 DEG. F
RELATIVE HUMIDITY		10% - 70%	34 %
IMPACT VELOCITY		19.50 - 20.30 FPS	20.0 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.99 G
	20 MS	14.00 - 19.00 G	17.67 G
	30 MS	11.00 - 16.00 G	15.98 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	15.98 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	42.38 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	97.11 DEG.
	TIME	72 - 82 MS	74.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	-59.0/-39.0 FT.-LBS.	-48.43 FT.-LBS.
	TIME	65 - 79 MS	70.0 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	149.0 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	128.38 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

NECK FLEXION TEST

HYBRID III

DATE : 4-17-91 6 AXIS NECK TRANSDUCER

CALSPAN SEQUENTIAL NUMBER 2 HY3 SN 245 CAL NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70 DEG. F
RELATIVE HUMIDITY		10% - 70%	36 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.6 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.83 G
	20 MS	17.60 - 22.60 G	20.66 G
	30 MS	12.50 - 18.50 G	17.74 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.74 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	41.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.61 DEG.
	TIME	57 - 64 MS	59.13 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.-LBS.	68.42 FT.-LBS.
	TIME	47 - 58 MS	55.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.5 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	102.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

THORAX IMPACT TEST

HYBRID III

DATE : 4-16-91

CALSPAN SEQUENTIAL NUMBER 2 HY3 SN 245 H.S. THORAX CAL

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	69 DEG. F
RELATIVE HUMIDITY	10% - 70%	38 %
PENDULUM VELOCITY	21.6 - 22.4 FT/SEC	21.6 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.52 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1235 POUNDS
INTERNAL HYSTERESIS	69% - 85%	74.3 %

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 4-10-91 KNEE : LEFT

CALSPAN SEQUENTIAL NUMBER 2 HY3 SN 245 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	37 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1073 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

KNEE IMPACT TEST

HYBRID III

DATE : 4-10-91 KNEE : RIGHT

CALSPAN SEQUENTIAL NUMBER 2 HY3 SN 245 KNEE 11LB. CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	37 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	7.0 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1096 LBS.
PROBE WEIGHT	11 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ____IVAN MINKEWICZ_____

CALSPAN CORPORATION

TRANSPORTATION RESEARCH DEPARTMENT

HEAD DROP TEST

HYBRID III

DATE : 4-18-91

CALSPAN SEQUENTIAL NUMBER 2 HY3 SN 245 HEAD DROP CAL

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	68 - 78 DEG. F	70 DEG. F
RELATIVE HUMIDITY	10% - 70%	35 %
PEAK RESULTANT ACCELERATION	225 - 275 G	272.6 G
PEAK LATERAL ACCELERATION	15 G MAX	8.2 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN ___IVAN MINKEWICZ_____

INSTRUMENT CALIBRATION INFORMATION

NHTSA DUMMY ID NUMBER _____245_____

DUMMY INSTRUMENT--	MFG	SERIAL NUMBER	DATE LAST CALIBRATED	DATE OF NEXT CALIBRATION
1. HEAD ACCELEROMETER--				
HX LONGITUDINAL--	ENDEVCO	FY05	4-91	10-91
HY LATERAL--	ENDEVCO	GD98	4-91	10-91
HZ VERTICAL--	ENDEVCO	CD75	4-91	10-91
2. CHEST ACCELEROMETER-				
CX LONGITUDINAL--	CEC	A73	4-91	10-91
CY LATERAL--	ENDEVCO	CE06	4-91	10-91
CZ VERTICAL--	CEC	A44	4-91	10-91
3. FEMUR LOAD CELLS				
LEFT SIDE	GSE	954	4-91	10-91
RIGHT 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)

PASSENGER DUMMY	Serial #	Manufacturer	Calibration Last	Calibration Next
Head X	ER72	ENDEVCO	4-91	10-91
Y	GD54	ENDEVCO	4-91	10-91
Z	CK11	ENDEVCO	4-91	10-91
Chest X	A145	CEC	4-91	10-91
Y	FL04	ENDEVCO	4-91	10-91
Z	A149	CEC	4-91	10-91
Right Femur Load Cell	549	GSE	3-91	9-91
Left Femur Load Cell	548	GSE	3-91	9-91
Neck Load Cell X	269	DENTON	10-90	-
Y	269	DENTON	10-90	-
Z	269	DENTON	10-90	-
Neck Moment X	269	DENTON	10-90	-
Y	269	DENTON	10-90	-
Z	269	DENTON	10-90	-
Chest Deflection Gauge Hybrid III Use Only	150	HUMANOID	10-90	-
Lap Belt Load Cells	123	LEBOW	3-91	9-91
Shoulder Belt Load Cells	127	LEBOW	3-91	9-91
Spool-Out Potentiometer	22	SERVONIC INST.	4-91	10-91
Belt Stretch Transducer	E1	CALSPAN	4-91	10-91

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(6 Month Calibration Minimum)

DRIVER DUMMY	Serial #	Manufacturer	Calibration Last	Calibration Next
Head X	FY05	ENDEVCO	4-91	10-91
Y	GD98	ENDEVCO	4-91	10-91
Z	CD75	ENDEVCO	4-91	10-91
Chest X	A73	CEC	4-91	10-91
Y	GL77	ENDEVCO	4-91	10-91
Z	A44	CEC	4-91	10-91
Right Femur Load Cell	955	GSE	3-91	9-91
Left Femur Load Cell	954	GSE	3-91	9-91
Neck Load Cell X	076	DENTON	10-90	-
Y	076	DENTON	10-90	-
Z	076	DENTON	10-90	-
Neck Moment X	076	DENTON	10-90	-
Y	076	DENTON	10-90	-
Z	076	DENTON	10-90	-
Chest Deflection Gauge Hybrid III Use Only	245	HUMANOID	10-90	-
Lap Belt Load Cells	133	LEBOW	3-91	9-91
Shoulder Belt Load Cells	135	LEBOW	3-91	9-91
Spool-Out Potentiometer	32	SERVONIC INST.	4-91	10-91
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	A181	CEC	12-90	6-91
Right Rear Seat Crossmember	A177	CEC	12-90	6-91
Top of Engine	A144	CEC	4-91	10-91
Bottom of Engine	A83	CEC	3-91	9-91
Left Disc Brake Caliper	A24	CEC	3-91	9-91
Right Disc Brake Caliper	A68	CEC	4-91	10-91
Instrument Panel	A179	CEC	12-91	6-91
Center Rear Crossmember Z	A146	CEC	2-91	8-91
Vehicle Rear Z	A115	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	A161	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

OCCUPANT RESTRAINTS

Seat Belts

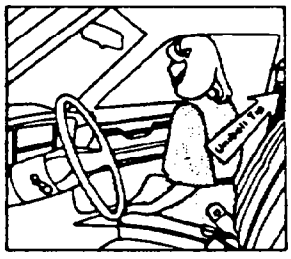
Always use the seat belts. The chance of a serious injury is greatly reduced when the belts are properly used.

Seat belts provide protection against being thrown from the vehicle as well as reducing the risk of an injury caused by striking the interior of the vehicle.

Unibelts

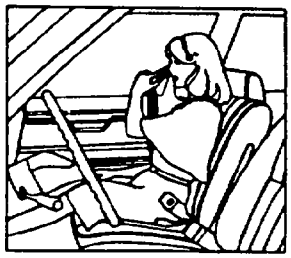
The "UNIBELT", or single continuous-belt restraint system, incorporates an inertia sensitive belt webbing retractor which is designed to lock (i.e., prevent belt travel) *only during very sudden stops or impacts.* This feature allows the shoulder belt to move freely with the wearer under normal conditions. *The retractor will not lock by jerking or pulling the webbing rapidly by hand.*

UNIBELT OPERATING INSTRUCTIONS



1

1. Enter the vehicle and close the door. Sit back and erect and adjust the seat. Note the latch plate of the unibelt in its stowed position.



2

2. Grasp the latch plate and slide it up the webbing as far as necessary to go around your lap as you pull out the webbing.

3

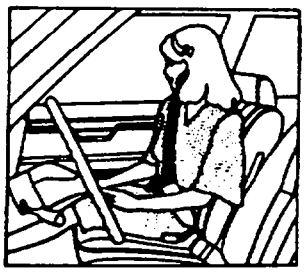
3. As you pull the webbing across your lap and over your shoulder, move the latch plate toward the buckle.

Insert the latch plate into the buckle until a "click" is heard.

Do not wear the shoulder belt under your arm or otherwise out of position. Such use could increase the chance and/or severity of injury in a collision.

4

4. Position the lap belt with the upper edge of the belt drawn across the thighs and snug against the hips. Slack will automatically be removed due to tension created by the retractor. If a snug fit in the lap belt portion is desired, pull up on the shoulder belt as shown. *A snug belt reduces the risk of sliding under the belt in a collision.*



5

5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. Any slack in the belt will be withdrawn automatically by the retractor.

6

6. To release the belt, push the button. The belt will automatically retract to its stowed position when the door is opened.

If needed, slide the latch plate down the webbing to allow the belt to fully retract.

DRIVER SUPPLEMENTAL RESTRAINT SYSTEM - AIRBAG (If so equipped)

This vehicle is equipped with a supplemental airbag restraint system for the driver. The seat belt continues to be the primary restraint and should be worn whenever the vehicle is in motion. It is important to wear the seat belt because it helps to provide protection in collisions for which the airbag is not designed to deploy, either because of low impact speed or non-frontral direction of impact (such as lateral, rollover or rear impacts). The seat belt also helps to position the driver for higher-speed frontal collisions in which the airbag does deploy. The steering wheel mounted airbag, lower instrument panel knee bolster and seat belt work together as a system to provide protection for the driver.

Service and general information labels about the airbag system can be found on the driver's sun visor, glove box door and in the engine compartment. Instructions on how to properly dispose of deployed airbags or airbag equipped vehicles can be obtained from your Chrysler Motors dealer.

The supplemental restraint system consists of the following items:

- impact sensors
- system diagnostic unit
- "AIRBAG" readiness lamp
- airbag module/inflator unit
- unique steering column and wheel
- interconnecting wiring
- instrument panel knee bolster

When the impact sensors located in the front of the car and in the passenger compartment detect a front end collision warranting airbag deployment, their internal

switches complete an electrical circuit that actuates the inflator unit in the airbag module. This starts the process of generating a large quantity of non-toxic nitrogen gas which inflates the airbag. As the airbag inflates from its folded, stored position behind the steering wheel hub trim cover, the trim cover separates along seams and folds back out of the way to allow the airbag to inflate to its full size. The airbag fully inflates in about 50 milliseconds, about half the time it takes to blink your eye. It then begins to deflate by venting the non-toxic nitrogen gas through holes in the rear of the airbag so it will not interfere with controlling the car, and within a short amount of time, the airbag is almost entirely deflated.

Should A Deployment Occur

The airbag system is designed to deploy when the impact sensors detect a moderate to severe frontal collision, and then immediately deflate.

NOTE: *A frontal collision that does not warrant airbag protection will not activate the system. This does not indicate something is wrong with the airbag system.*

Should you experience a frontal collision which deploys the airbag, any or all of the following events may occur.

The nylon airbag material may under certain conditions cause abrasions and/or skin reddening to the driver as the airbag deploys and unfolds itself from its stored position. The abrasions are similar in nature to friction type rope burns or those experienced by sliding along a carpet or gymnasium floor. They are not caused by contact with chemicals, are not permanent and normally heal quickly. However, if significant healing has not occurred within a few days, or in the unlikely event that blistering occurs, seek the immediate advice of a personal physician.

As the airbag deflates from its fully inflated condition, some degree of smoke-like particles may be ob-

served. The particles are a normal by-product of the process which generates the non-toxic nitrogen gas used for airbag inflation. These airborne particles may cause irritation of the skin, eyes, nose, or throat. Should skin or eye irritation occur, rinse the area with cool water. For nose or throat irritation, move to fresh air. If irritation continues, seek the advice of a personal physician.

Within a few seconds, the particles will begin to settle out and dissipate. As they do, the residue will settle on the interior surfaces of the vehicle. Avoid prolonged contact with this residue as it could irritate the skin and/or eyes. Should any irritation occur, rinse the skin or eyes with cool water. If the irritation continues, seek the advice of a personal physician. Should the residue come in contact with clothing, follow the garment manufacturer's instructions for cleaning.

If the vehicle is safely driveable following the airbag deployment, the deployed airbag can be tucked back inside the opening in the steering wheel hub trim cover to make driving the vehicle somewhat easier. The airbag once deployed, will not re-deploy to provide occupant protection in a subsequent collision, and should be replaced by an authorized dealer as soon as possible.

Readiness Indicator

The diagnostic unit monitors the electrical portions of the airbag system components listed above, continuously whenever the ignition switch is in the "start" or "run" position. When the ignition switch is first turned on, the diagnostic unit will light the "AIRBAG" lamp in the instrument cluster for a period of 6 to 8 seconds and then turn the lamp off. This indicates the airbag system is ready to deploy for your protection in the event of an impact.

NOTE: *Should the "AIRBAG" lamp not come on at all, remain lit or light either momentarily or continously while driving, a malfunction in one or more of the monitored components may have occurred and prompt service is required.*

Important Maintenance

To assure that the airbag will be ready to deploy in a collision, have the system serviced promptly by an authorized dealer if any of the following indications of a possible system malfunction occurs:

- the "AIRBAG" lamp does not light for 6 to 8 seconds when the ignition switch is first turned on;
- the "AIRBAG" lamp remains lit after the ignition switch is first turned on;
- the "AIRBAG" lamp flickers during the 6 to 8 second period when the ignition switch is first turned on;
- the "AIRBAG" lamp flickers or lights and remains lit while operating the vehicle.

> **WARNING!** Failure to have the airbag system properly serviced by an authorized dealer should one of the above conditions exist may lead to possible injury in the event of an accident.

Aside from the maintenance required in response to the above "AIRBAG" lamp conditions, an inspection of the mechanical and electrical components of the system is included in the regular maintenance service recommended for every 3 years or 30,000 miles. (See SECTION 4 - MAINTENANCE.)

System Precautions

> **WARNING!** Modification to the airbag system components or wiring, including the addition of any kind of badges or

stickers to the steering wheel hub trim cover or modifications to the front bumper or vehicle body structure, can adversely affect system performance and lead to possible injury.

Make sure the fuse access panel, located in the left lower portion of the knee bolster is in place before driving the vehicle, and do not mount or locate any aftermarket equipment on or behind the knee bolster. This is important to provide proper knee impact protection in the event of a collision.

Do not attempt to repair any component of the airbag system yourself. You can be injured if you are too close to the steering wheel hub and the air bag inflates. Be sure to tell anyone who works on your vehicle that it is equipped with an airbag.

Front Center and Rear Center Lap Belts (if so equipped)

The lap belts should be worn with the upper edge of the belt drawn across the thighs and snug against the hips. To reduce the risk of sliding under the belt in a collision, it should be adjusted as tight as comfort will allow, while sitting back and erect in the seat.

The center front and center rear seat belts are lengthened by tilting the latch plate relative to the webbing and pulling. To shorten the belt, pull the loose end of the webbing.

Never use the same lap belt on more than one person at a time.

Use of Seat Belts During Pregnancy

Chrysler Motors recommends that pregnant women use the available seat belts. This will reduce the possibility of