V2452

REPORT NUMBER: CAL-96-N09

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
1997 FORD F-150
PICKUP

NHTSA NUMBER: MV0200

CALSPAN TEST NUMBER: 8313-9

Sept. 10, 1996

CALSPAN SRL CORPORATION
TRANSPORTATION SCIENCE CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Market Incentives
400 Seventh Street, S. W.
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Prepared: James A. Czarnecki

James A. Czarnecki, Project Engineer

Approved: David J. Travale

David J. Travale, Program Manager
Transportation Research/
Physical Sciences Department

FINAL REPORT ACCEPTED BY:

Richard M. Morgan

Manager, New Car Assessment Program (NCAP)

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16. *Abstract*

A frontal load cell barrier test of a 1997 Ford F-150 Pickup was performed at Calspan SRL Corporation crash test facility in Buffalo, New York, on Sept. 10, 1996.

The impact velocity was 55.7 kph and the temperature at the barrier face was 21°C. The maximum post-test vehicle crush was 685 mm. The test vehicle was equipped with a 3-point continuous belt system and supplemental airbags at both front outboard seating positions.

With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appear to comply with head, chest and femur requirements.

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Section 1

PURPOSE AND TEST PROCEDURE

This 55.7 kph frontal barrier impact test is part of the Composite FY 92 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 48.3 kph requirements.

The 55.7 kph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test procedure.

Section 2

SUMMARY OF TEST MV0200

A load cell barrier consisting of 36 load cells was impacted by a 1997 Ford F-150 Pickup at a velocity of 55.7 kph. The test was performed at the Calspan SRL Corporation on Sept. 10, 1996. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by 1 real-time camera and 14 high-speed cameras. Camera locations and other pertinent camera information can be found in this report. Location of the seat belts prevented the belt spool out cameras from being used.

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 (position 1) ATD (Serial No. 150) and the right-front passenger (position 2) ATD (Serial No. 064) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 129 channels of data were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Position 2 Chest X (R) did not record accurately, data is not available for this channel.

The driver's HIC was 548. The maximum chest deceleration over 3 milliseconds was 44.9 g's and maximum chest deflection was -21.2 mm. Femur loads were -7961.2 newtons on the left and -5636.0 newtons on the right.

The right front passenger's HIC was 474. Maximum chest deceleration over 3 milliseconds was 41.6 g's and maximum chest deflection was -21.3 mm. Femur loads were -4693.0 newtons on the left and -3795.8 newtons on the right.

Table 1

GENERAL TEST AND VEHICLE DATA

Vehicle Year/Make/Model/Body Style: 1997 Ford F-150 Pickup

NHTSA Test No.: MV0200 VIN.: 1FTDF1722VNA87035

Body Color: Silver Date of Manufacture: 5/96

Date Received: 8/6/96

Odometer Reading: 00061

Engine:	6	Cylinders;	-	C.I.D.;	4.2	Liters;	-	CC
	X	Gas;	-	Diesel;	-	Turbocharged		
	X	Longitudinal;			-	Transverse		
Transmission:	5	Speed;	X	Manual;	-	Automatic;	-	Overdrive
Final Drive:	-	Front Wheel;	X	Rear Wheel;	-	Four Wheel		
Accessories:	-	A/C;	-	P/S;	X	P/B;	-	P/wdo
	-	Tilt Wheel;	-	P/seats;	-	Cruise Control	-	Other

Type of Occupant Restraint: Driver and passenger position equipped with 3-point restraint system and supplemental airbags.

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 221 kPa, Rear 241 kPa

Recommended Tire Size: P235/70R16

Recommended Cold Tire Pressure: Front 221 kPa, Rear 241 kPa

Tires on Vehicle: P235/70R16 Manufacturer: Firestone

Number of Occupants:	3	Front;	-	Rear;	-	3rd Seat;	3	TOTAL
Type of Front Seats:	-	Bucket;	-	Bench;	X	Split Bench		
Type of Front Seat Back:	X	Fixed;	-	Adj. with	-	Lever	-	Rot. Knob

Rated Cargo and Luggage Weight (RCLW) = 136 kgs.

GVWR 2517 kgs. GAWR: Front 1133 kgs. Rear 1451 kgs.

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids) = UDW:

Right Front	= 498 kgs.		Right Rear	= 377	kgs.
Left Front	= 511 kgs.		Left Rear	= 389	kgs.

TOTAL FRONT WEIGHT = 1,009 kgs. (56.9 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 766 kgs. (43.2 % of Total Vehicle Weight)

TOTAL DELIVERED WEIGHT = 1,775 kgs.

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1775 kgs.

VCW = Vehicle Capacity Weight 742 kgs.

DSC = Designated Seating Capacity 3

RCLW = VCW - 68 (DSC) = 136 kgs.

Target Test Weight = UDW + RCLW + (2 dummies x 74.4 kgs./ dummy)

Target Test Weight = 2060 kgs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 131 KGS CARGO:

Right Front	= 530 kgs.		Right Rear	= 494	kgs.
Left Front	= 535 kgs.		Left Rear	= 497	kgs.

TOTAL FRONT WEIGHT = 1,065 kgs. (51.8 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 991 kgs. (48.2 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 2,056 kgs.

Weight of ballast secured in vehicle trunk area = 40 kgs.

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude:	RF	866	LF	860	RR	938	LR	931
Test Attitude:	RF	857	LF	850	RR	886	LR	870

Wheel Base: 3050 mm.; C.G. = 1470 mm. rearward of front wheel C/L

Remarks: 89 liters of stoddard solvent was placed in the fuel tanks

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)

POST -IMPACT DATA:

Type of Test:	Frontal Barrier	Impact Angle:	0°
Date of Test:	Sept. 10, 1996	Time of Test:	13:06

Ambient Temperature: 21 ° C at impact area

Temperature in Occupant Compartment: 21 ° C

Windshield Molding Temperature: 21 ° C

Required Impact Velocity Range: 55.5 to 57.1 kph

Impact Velocity: primary = 55.7 kph, secondary = 55.7 kph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 1321 mm

Exiting Speed Trap: 305 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test = R	5055	C_L	5223	L	5045
	Post-test = R	4550	C_L	4550	L	4520
	Crush = R	505	C_L	673	L	525

Distance from front of test vehicle to point of impact:

R	248	C_L	286	L	254

VISIBLE DUMMY CONTACT POINTS:

	Driver	Passenger
Head	Airbag	Airbag
Chest	Airbag	Airbag
Abdomen	None	None
Left Knee	Knee bolster	Glove box
Right Knee	Knee bolster	Glove box

Table 1

GENERAL TEST AND VEHICLE DATA (cont'd)

	Front		Rear	
	Left	Right	Left	Right
Door Opening	Operable	Operable	-	-

	Front		Rear	
Seat Movement	Left	Right	Left	Right
Seat Back Failure	None	None	-	-
Seat Shift (mm.)	0	0	-	-

Glazing Damage

Backlight/Windshield: Windshield sustained stress fractures but remained intact

Other Notable Impact Effects: - - -

Section 3

OCCUPANT AND VEHICLE INFORMATION

I. DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Performance Assessment Data
4. Camera Locations
5. Vehicle Target Locations
6. Load Cell Barrier Data
7. Vehicle Accelerometer Data
8. Test Vehicle Measurements

Table 2

DUMMY INJURY CRITERIA VALUES

NHTSA Test No.: MV0200 Vehicle: 1997 Ford F-150 Pickup

	MAXIMUM HEAD ACCELERATION (g's)			
	X	Y	Z	R
Position #1 - Driver	-47.5	-21.9	30.8	53.3
Position #2 - Passenger	-46.2	-15.8	39.0	59.8

	MAXIMUM CHEST ACCELERATION (g's)			
	X	Y	Z	R*
Position #1 - Driver	-44.9	-7.2	-12.7	44.9
Position #2 - Passenger	-40.3	17.0	-14.4	41.6

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

	MAXIMUM FORCE - FEMUR LOAD (nwt)	
	LEFT FEMUR	RIGHT FEMUR
Position #1 - Driver	-7961.2	-5636.0
Position #2 - Passenger	-4693.0	-3795.8

	MAXIMUM FORCE - SEAT BELT LOADS (nwt)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
Position #1 - Driver	4476.2	-	7408.4
Position #2 - Passenger	8715.7	5338.1	-

	HEAD INJURY CRITERIA (HIC)			
	HIC**	t_1 (mSec)	t_2 (mSec)	Average Acceleration t_1 to t_2
Position #1 - Driver	548	65.88	101.88	47.09
Position #2 - Passenger	474	62.40	98.40	44.45

** 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: 1997 Ford F-150 Pickup

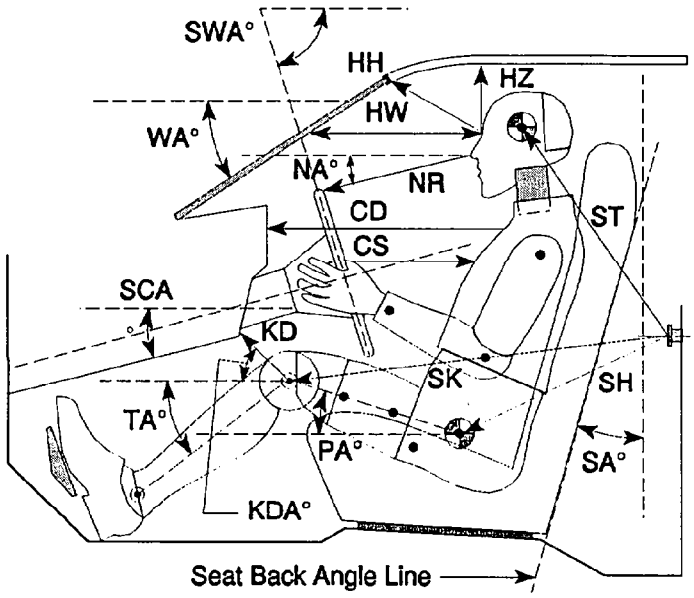
NHTSA Test No.: MV0200 Test Date: Sept. 10, 1996

MAXIMUM VALUES	DRIVER DUMMY ID #150:	PASSENGER DUMMY ID #064:
Neck Load X (nwt)	332.9	930.3
Neck Load Y (nwt)	-533.4	-502.0
Neck Load Z (nwt)	2095.8	2101.2
Neck Moment X (nwt-m)	30.5	33.0
Neck Moment Y (nwt-m)	-50.7	-38.9
Neck Moment Z (nwt-m)	36.9	17.2
Chest Deflection X (mm.)	-21.2	-21.3
Time of Max. Occurrence (msec)	84.5	84.8

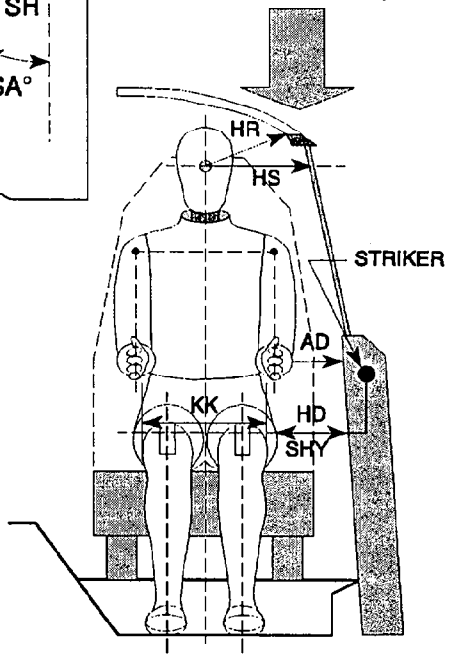
Note: All values listed occur during the primary impact event.

Figure 1

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



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



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

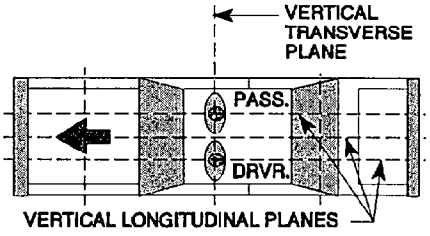


Table 4

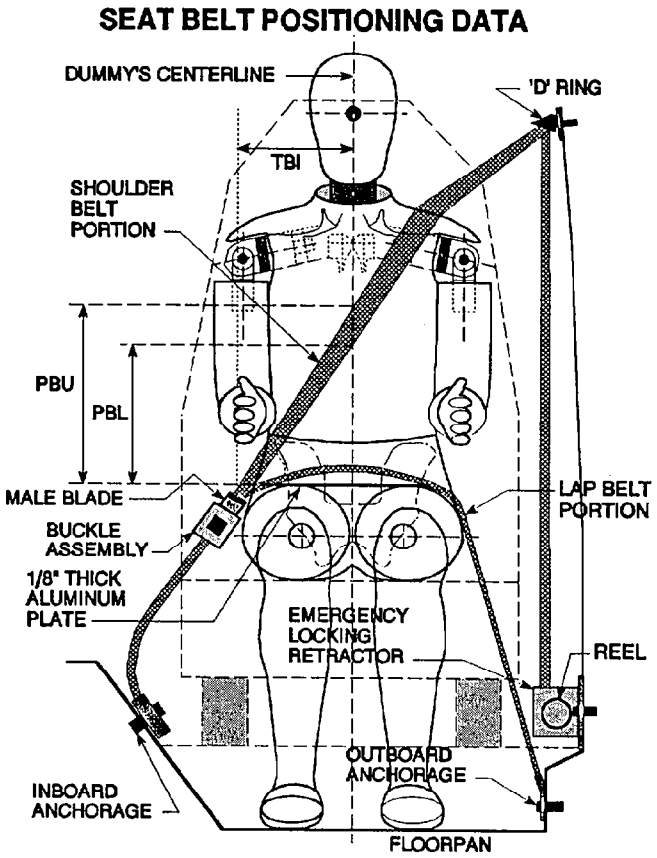
FRONT SEAT OCCUPANT MEASUREMENTS

	DRIVER (Serial #150)			PASS. (Serial # 064)		
WA°	34 deg.			N/A		
SWA°	20 deg.			N/A		
SCA°	70 deg.			N/A		
SA°	Fixed			Fixed		
HZ	260			240		
HH	428			435		
HW	620			613		
HR	263			257		
NR	410	Angle	13 deg.	N/A		
CD	593			560		
CS	343			N/A		
RA	222			N/A		
KDL	140	Angle (KDA)	35 deg.	181		
KDR	177			183	Angle (KDA)	35 deg.
PA°	22 deg.			23 deg.		
TA°	47 deg.			35 deg.		
KK	302*			272		
ST	652	Angle	26 deg.	630	Angle	26 deg.
SK	792	Angle	92 deg.	782	Angle	92 deg.
SH	373	Angle	102 deg.	386	Angle	103 deg.
SHY	270			260		
HS	329			350		
HD	175			200		
AD	122			135		

Dimensions in millimeters
*moved foot to footrest on left side as requested by Ford personnel.

Figure 2

SEAT BELT POSITIONING DATA



	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	331	352
PBL-- Top surface of alum. plate to belt lower edge	245	270
LAP BELT TENSION	Retractor	Retractor
SHOULDER BELT TENSION	10 nwt	10 nwt

Table 5

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:	Driver	Passenger
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	2070	2000
Shoulder belt length as measured on Part 572 Dummy.	910	910
Lap belt length as measured on Part 572 Dummy.	900	830
SHOULDER BELT SPOOL-OFF DATA:		
As determined by film analysis.	-	-
As determined mechanically.	51	62
As determined electronically.	43.7	45.5
BELT STRETCH DATA:		
Measured electronically between shoulder belt load cell and the "D" ring.	75 mm/M	60 mm/M
Measured mechanically.	0 mm/M	1 mm/M

Dimensions in millimeters

Figure 3

CAMERA POSITIONS FOR FRONTAL IMPACTS

NOTE: Camera information shown in Table 6.

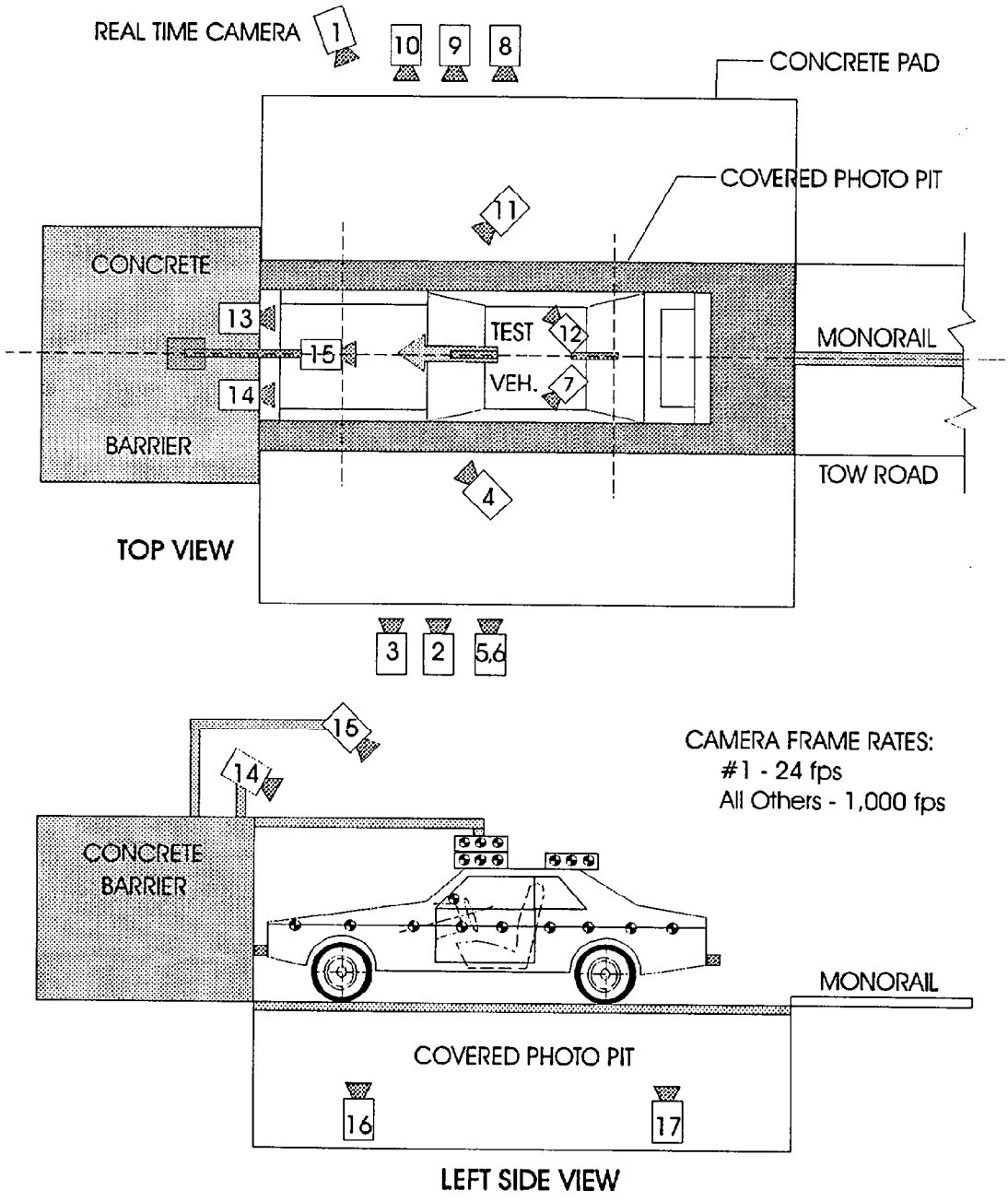


Table 6
HIGH-SPEED CAMERA LOCATIONS

NHTSA Test No.: MV0200 Vehicle: 1997 Ford F-150 Pickup

CAMERA NO.	VIEW	CAMERA POSITIONS (MM.)* X	Y	Z	ANGLE** (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	7010	1520	1164	-3	6639	13	1120
3	Left Side View	9742	870	1224	-2	9371	28	850
4	Driver and Interior View	7628	2733	2130	-10	-	35	950
5	Steering Column (Bottom)	8141	1805	1170	-2	7770	25	1000
6	Steering Column (Top)	8141	1805	1776	-6	7770	25	1000
7***	Left Belt	-	-	-	-	-	-	-
8	Overall Right Side	7196	2599	1153	-2	6825	13	1080
9	Right Side View	8755	1683	1155	-2	8384	25	1100
10	Right Passenger View	9060	2043	1467	-1.5	8689	35	1010
11	Passenger and Interior View	7982	3520	2119	-8	-	35	1015
12***	Right Belt	-	-	-	-	-	-	-
13	Passenger Front View	580	0	2000	-32	-	13	1045
14	Driver Front View	580	0	2000	-32	-	13	1050
15	Windshield View	0	-530	3048	-51	-	13	1080
16	Pit View of Engine	0	505	-3048	90	-	13	990
17	Pit View of Fuel Tank	0	3432	-3048	90	-	13	970

*X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

** = referenced to horizontal plane

N.T. indicates No Timing

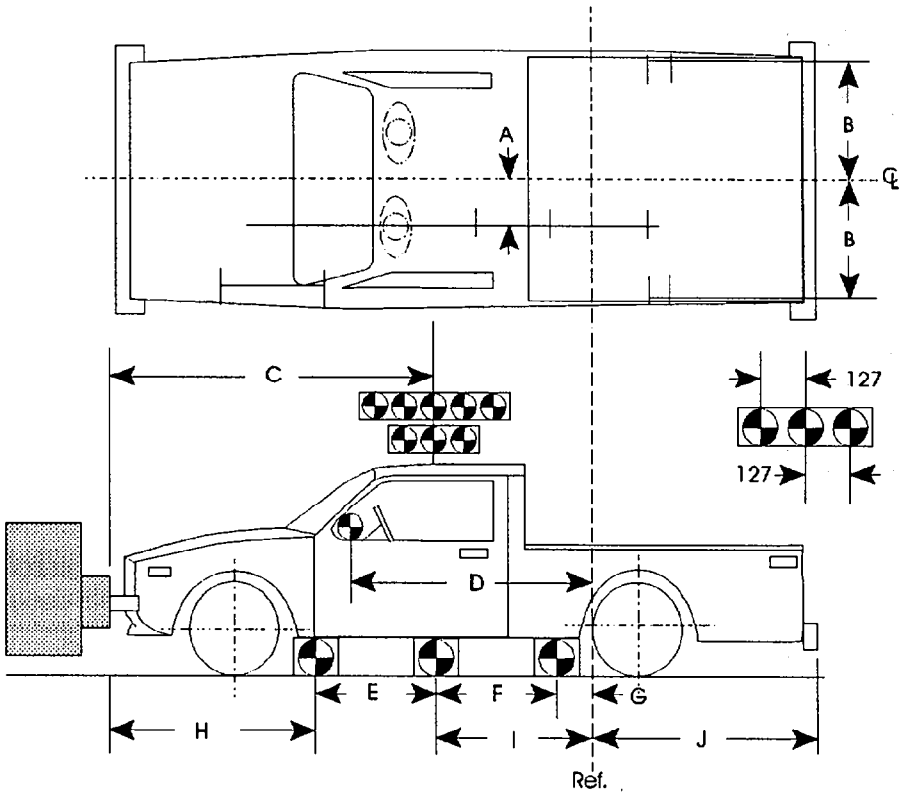
*** Cameras were not used in this test.

Figure 4

VEHICLE TARGET LOCATIONS

(Dimensions in millimeters)

A	447
B	942
C	2441
D	1785
E	985
F	982
G	173
H	1490
I	1155
J	1585
K	166
L	988
M	988
N	1585
O	1154
P	1488



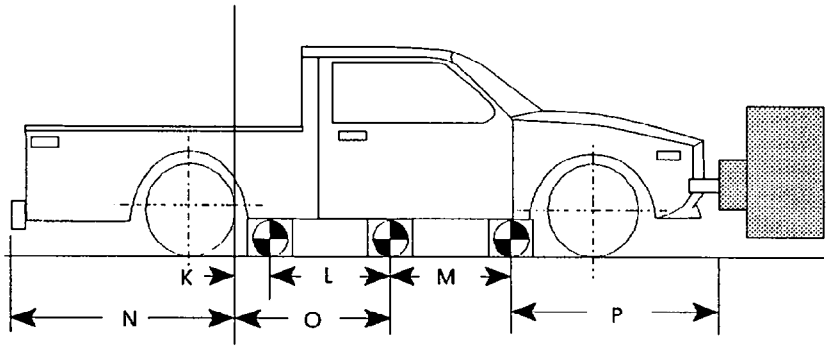
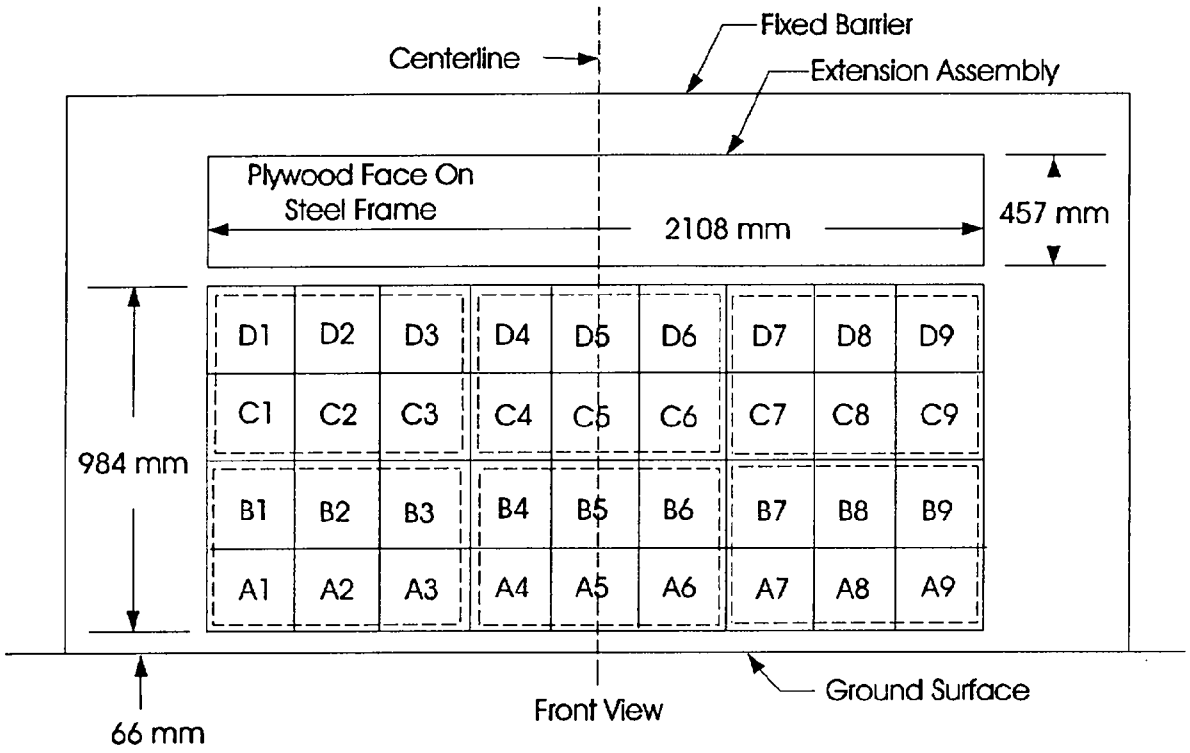


Figure 5

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

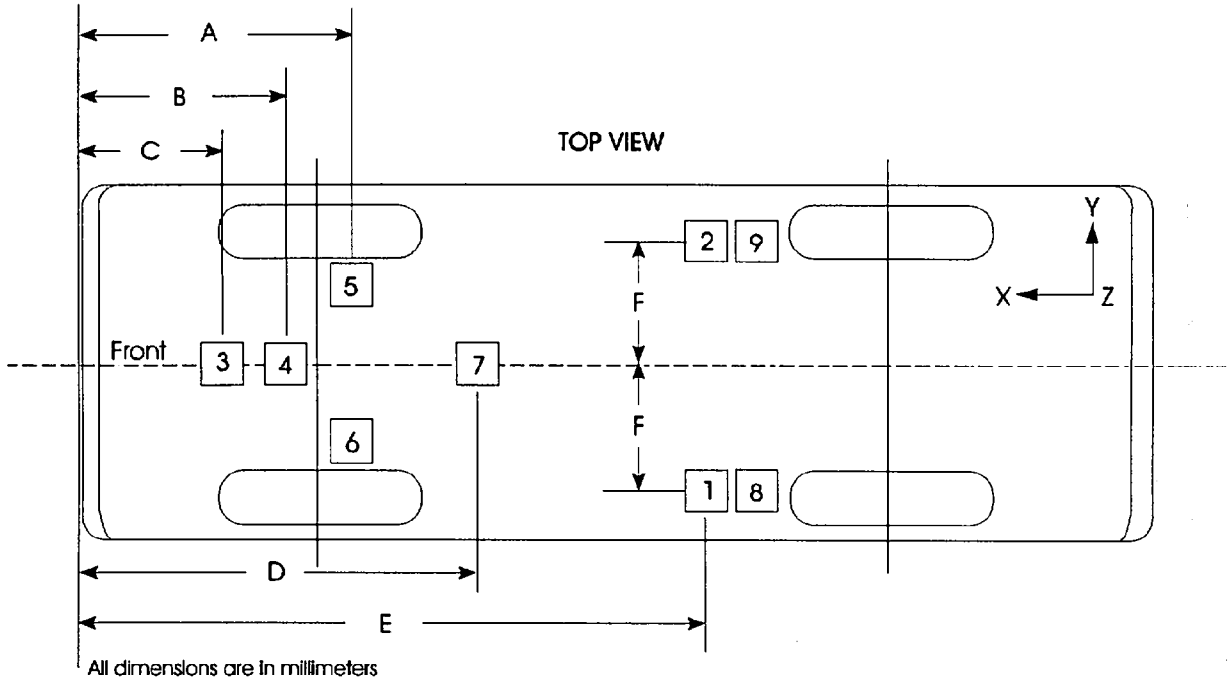
Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

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 6

VEHICLE ACCELEROMETER LOCATIONS



ACCELEROMETER NUMBER*	ACCELEROMETER LOCATION	Distances From Vehicle Front All dimensions in millimeters	
1	Left Rear Seat Crossmember [E/F]	X = 2792	Y = -579
2	Right Rear Seat Crossmember [E/F]	X = 2792	Y = 571
3	Top of engine [C]	887	
4	Bottom of engine [B]	1227	
5	Right Disc Brake Caliper [A]	1151	
6	Left Disc Brake Caliper [A]	1151	
7	Instrument Panel [D]	1845	
8	Left Rear Seat Crossmember [E/F]	X = 2792	Y = -609
9	Right Rear Seat Crossmember [E/F]	X = 2792	Y = 604

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

Figure 7

TEST VEHICLE MEASUREMENTS

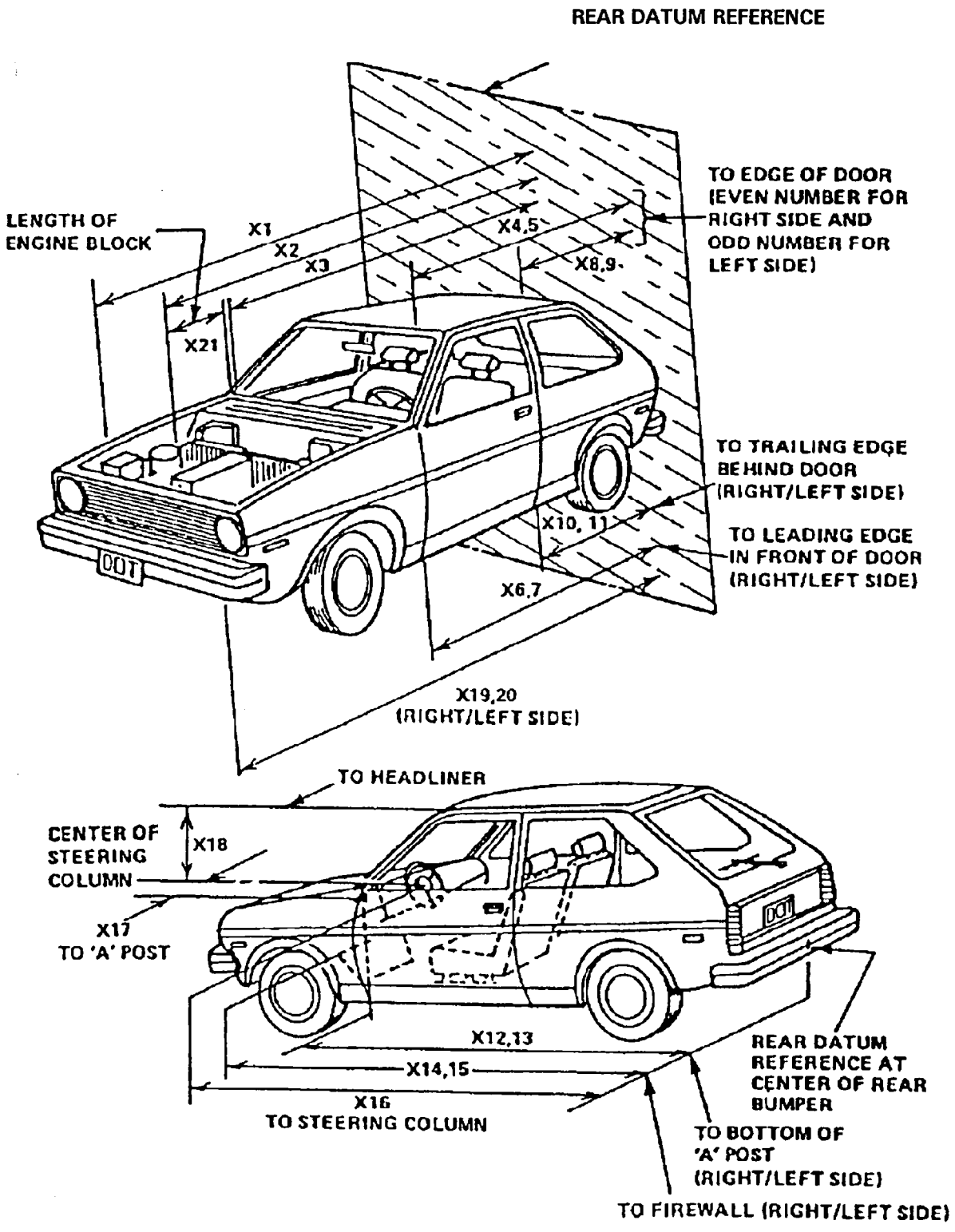


Table 7

VEHICLE MEASUREMENTS

No.		All Dimensions in mm		
		Pre-Test	Post-Test	Differences
X1	Total Length of Vehicle at Centerline	5223	4520	703
X2	Rear Surface of Vehicle to Front of Engine	4303	4132	171
X3	Rear Surface of Vehicle to Firewall	4065	3960	105
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3677	3654	23
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3680	3653	27
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3584	3555	29
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3587	3555	32
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2398	2375	23
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2404	2380	24
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2463	2432	31
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2467	2436	31
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3607	3574	33
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3611	3575	36
X14	Rear Surface of Vehicle to Firewall, Right Side	4045	4020	25
X15	Rear Surface of Vehicle to Firewall, Left Side	4064	4010	54
X16	Rear Surface of Vehicle to Steering Column	3205	3185	20
X17	Center of Steering Column to "A" Post	435	420	15
X18	Center of Steering Column to Headliner	475	455	20
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5055	4550	505
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5045	4520	525
X21	Length of Engine Block	430	430	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3485	3465	20
CD	Rear Surface of Vehicle to Center of Dash Panel	3390	N.A.	N. A.
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3310	3285	25

Table 8

ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

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

NHTSA Test No.: MV0200 VIN: 1FTDF1722VNA87035

Model Year: 1997 Build Date: 5/96 Test Date: Sept. 10, 1996

Vehicle Size Category: Pickup Truck Test Weight: 2055 Kgs

Vehicle Wheelbase: 3050 mm; Front Overhang: 1493 mm; Overall Width: 1991 mm

Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions;

C1 = 510 mm

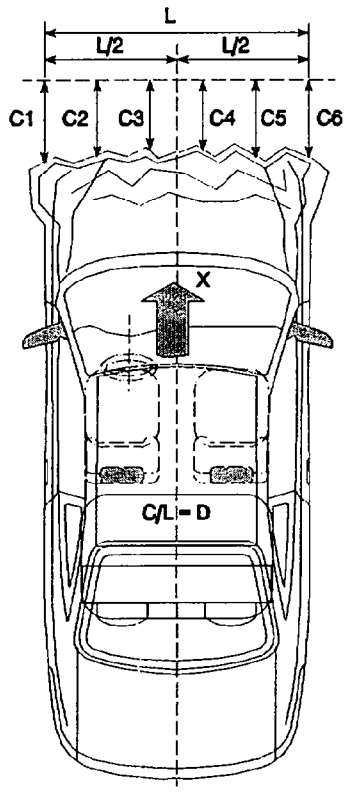
C2 = 602 mm

C3 = 664 mm

C4 = 685 mm

C5 = 590 mm

C6 = 485 mm



Midpoint of Damage: D = Vehicle Centerline (Longitud.)

Longitude Length of Damaged Region: L= 1991 mm

Section 4

SUMMARY OF RESULTS OF FMVSS 212, 219 (Partial) AND 301

"Windshield Mounting" FMVSS No. 212 Data

"Windshield Zone Intrusion" FMVSS No. 219 Data

"Fuel System Integrity" FMVSS No. 301

Figure 8

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with 30 mm molding.

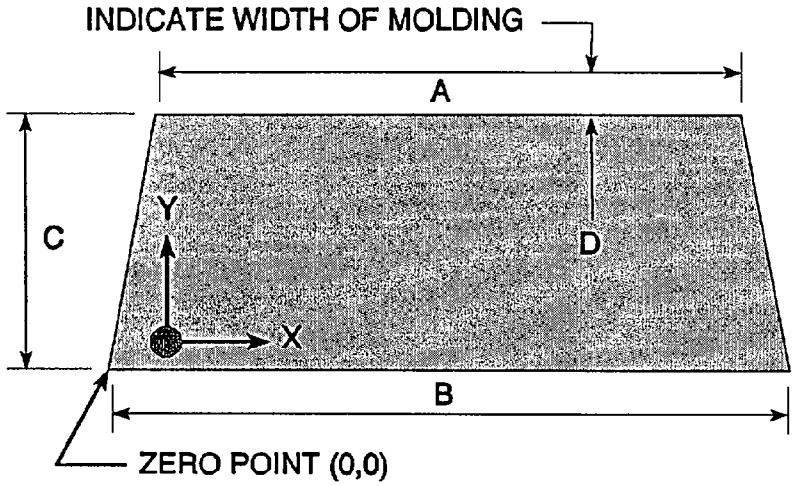
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		
	PRE-TEST (mm)	POST-TEST(mm)	% OF RETENTION
RIGHT SIDE	2280	2280	100
LEFT SIDE	2280	2280	100
TOTAL	4,560	4,560	100

AREA OF RETENTION FAILURE:



FRONT VIEW OF WINDSHIELD

DIMENSIONS	
A	1368
B	1750
C	721
D	30

FAILURE DETAILS: None

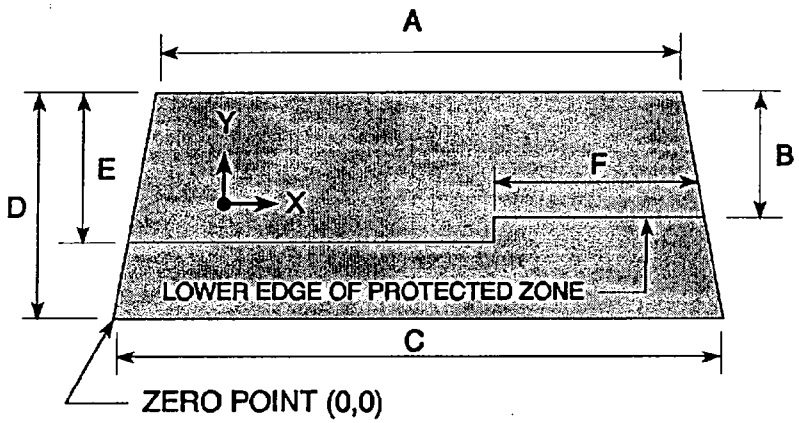
Figure 9

FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" diameter rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA: (Dimensions in mm)



FRONT VIEW OF WINDSHIELD

DIMENSIONS	
A	1368
B	419
C	1750
D	721
E	509
F	884

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4": None

(Show location of penetration on the above sketch)

	COORDINATES	
	X	Y
1.		
2.		
3.		
4.		

Table 9

FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

NHTSA TEST No.:	MV0200	TEST DATE:	Sept. 10, 1996
VEHICLE MAKE/MODEL:	1997 Ford F-150		

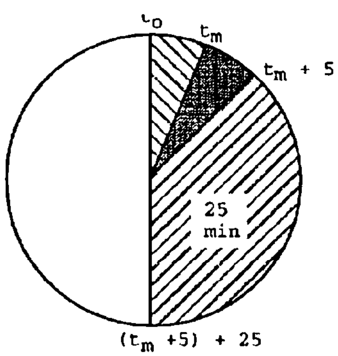
The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

= =

TEST VEHICLE IMPACT TYPE:

X	Frontal (35 mph)
-	Oblique (30 mph) with ________ deg. barrier face first contacting ________________ (driver/passenger) side
-	Rear Moving Barrier (30 mph)
-	Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:



	ACTUAL	MAX ALLOWED
1. From impact until vehicle motion ceases	0	1 oz.
2. For 5 minute period after vehicle motion ceases	0	5 oz.
3. For next 25 minutes	0	1 oz./min.

SOLVENT SPILLAGE DETAILS:

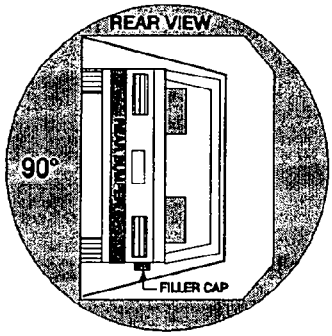
None

Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	36	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	36	seconds
Next whole minute interval	7	minutes	00	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

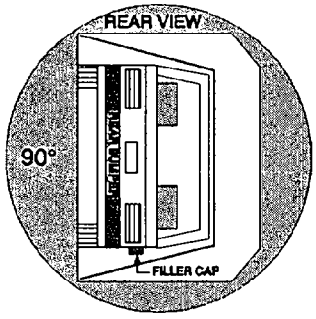
IV. SOLVENT SPILLAGE LOCATION(S): None

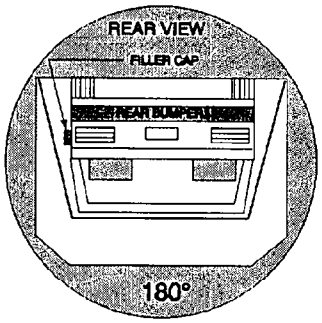
Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0200





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	54	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	54	seconds
Next whole minute interval	7	minutes	00	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

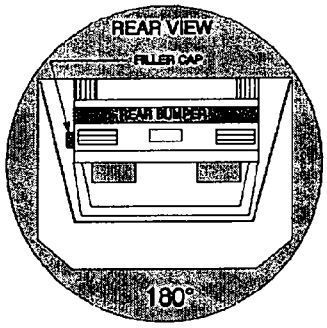
IV. SOLVENT SPILLAGE LOCATION(S): None

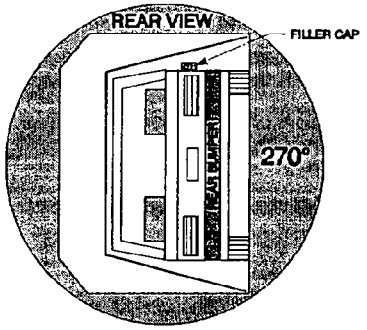
Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0200





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	59	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	59	seconds
Next whole minute interval	7	minutes	00	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

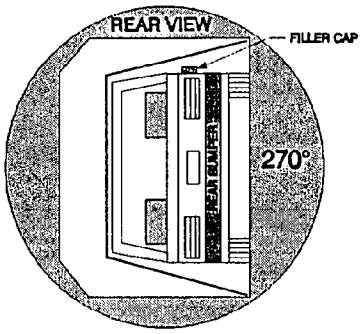
IV. SOLVENT SPILLAGE LOCATION(S): None

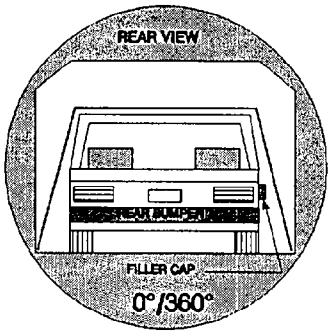
Table 10

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE:

NHTSA Test No.:
MV0200





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90 deg. Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	58	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	58	seconds
Next whole minute interval	7	minutes	00	seconds

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min. from onset of rotation	6th min.	7th min.	8th min. if reqd.

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

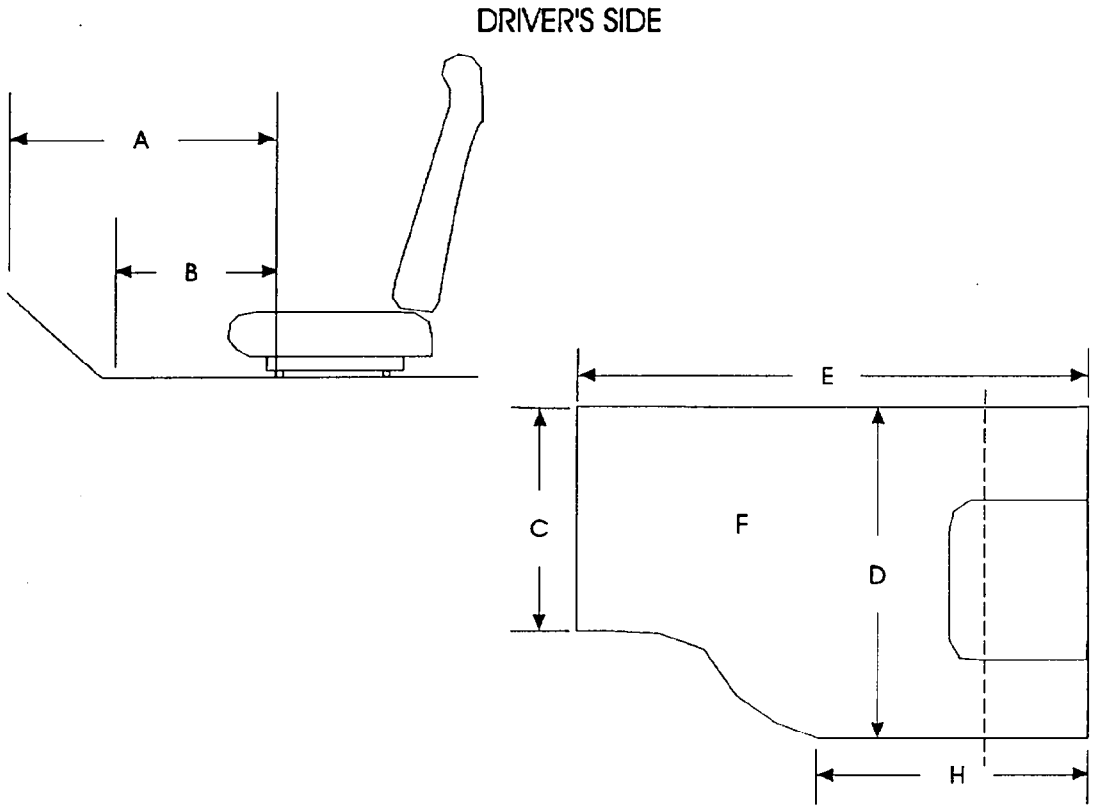
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S): None

Figure 10
DRIVER SIDE FLOORBOARD DEFORMATION

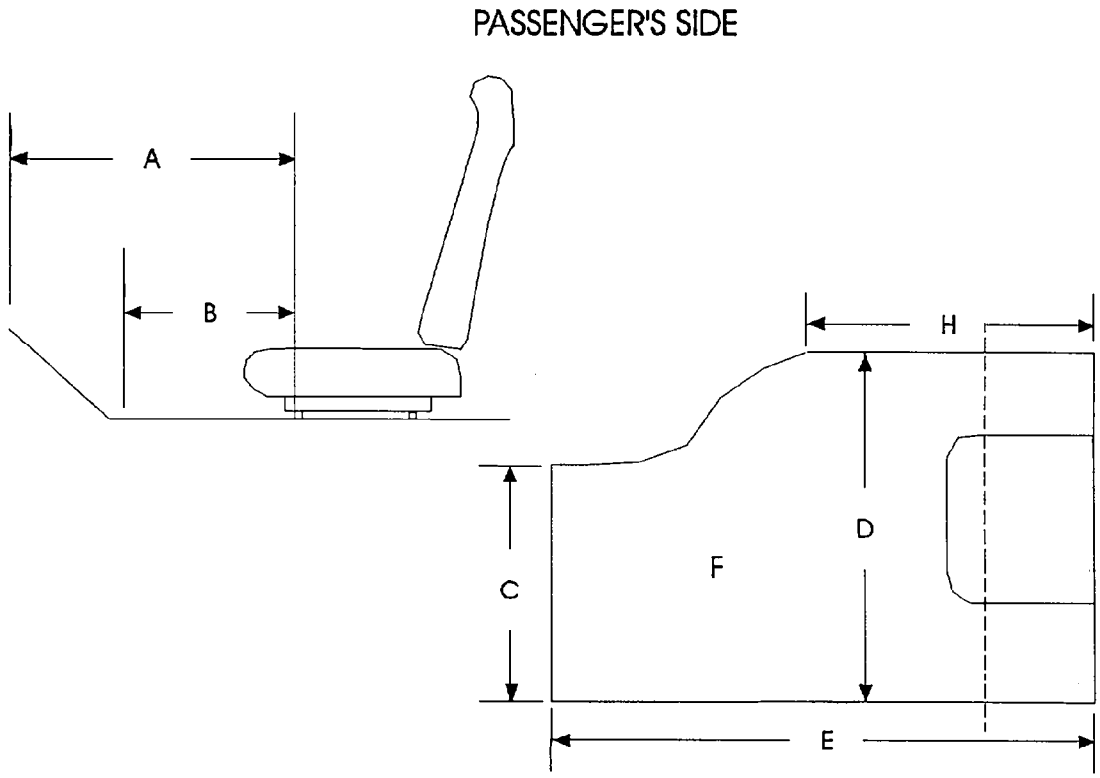


Measurement	Pre-Test	Post-Test	Difference
A	695	690	5
B	490	490	0
C	440	440	0
D	515	505	10
E	980	980	0
H	590	600	-10
F $(cm)^2$	4755	4702	53

Units = mm

$F = H \times D + (E - H) \times C$

Figure 11
PASSENGER SIDE FLOORBOARD DEFORMATION

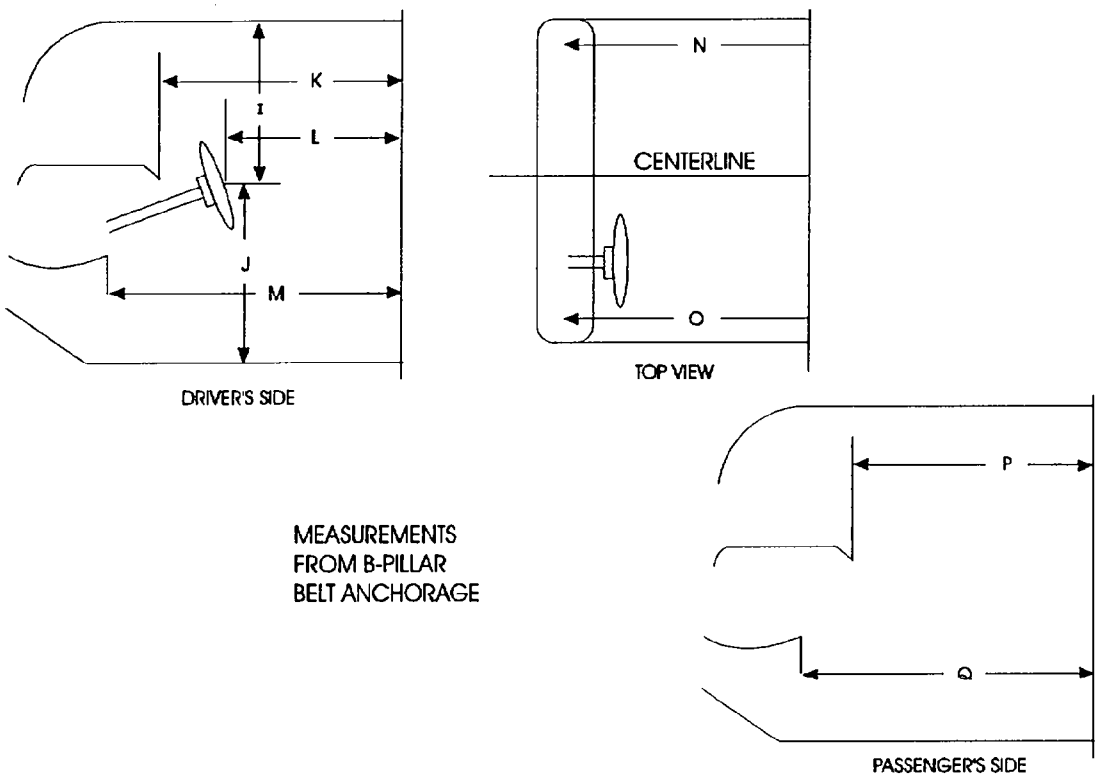


Measurement	Pre-Test	Post-Test	Difference
A	680	670	10
B	515	505	10
C	480	485	-5
D	510	500	10
E	1000	1000	0
H	660	655	5
F $(cm)^2$	4998	4948	50

Units = mm

$F = H \times D + (E - H) \times C$

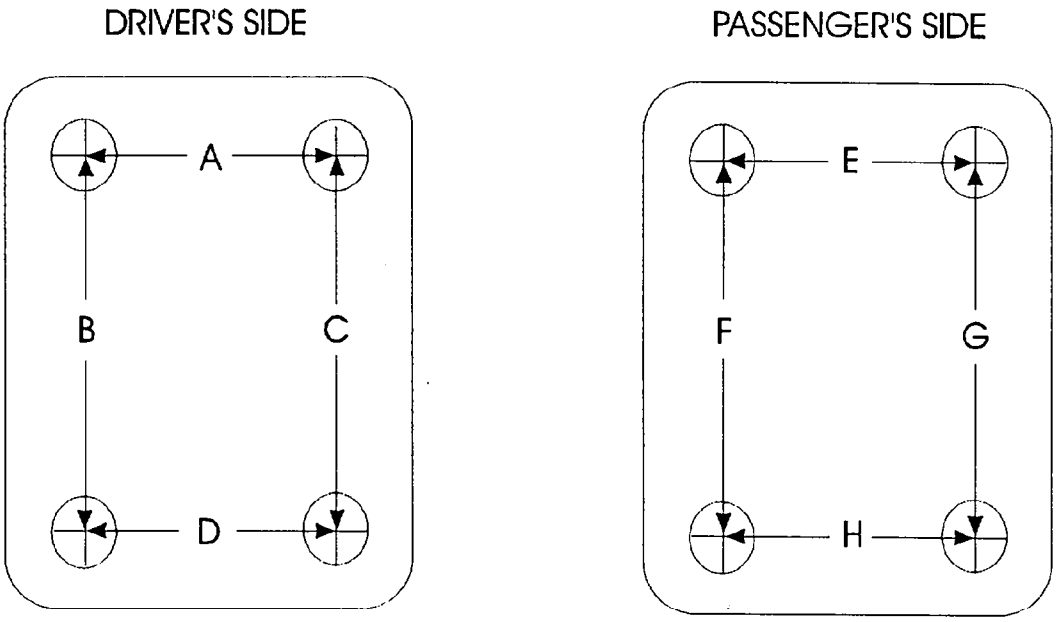
Figure 12
INTERIOR DEFORMATION



Measurement	Pre-Test	Post-Test	Difference
I	470	440	30
J	720	725	-5
K	1155	1135	20
L	910	905	5
M	1115	1115	0
N	1200	1005	195
O	1015	1185	-170
P	1275	1270	5
Q	1115	N/A	N/A

Units = mm

Figure 13
FLOORBOARD DEFORMATION



Measurement	Pre-Test	Post-Test	Difference
A	490	480	10
B	640	640	0
C	610	610	0
D	420	420	0
E	490	480	10
F	595	585	10
G	640	645	-5
H	410	410	0

Units = mm

Appendix A

PHOTOGRAPHS

PHOTOGRAPHS

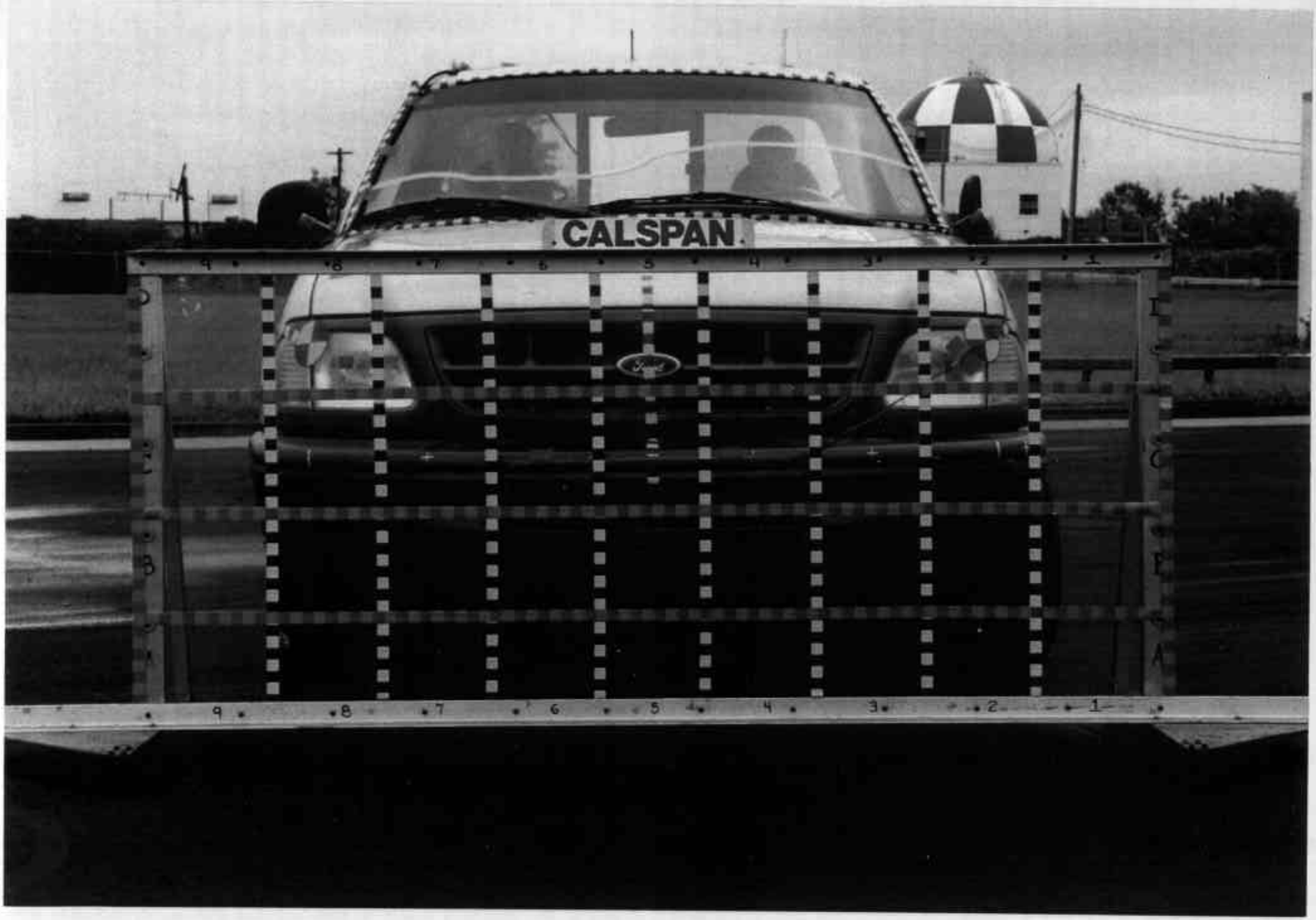


Figure A-1 LOAD CELL LOCATIONS

8313-9

Figure A-2 PRE-TEST FRONT VIEW

Figure A-3 POST-TEST FRONT VIEW

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Figure A-4 PRE-TEST LEFT SIDE VIEW

Figure A-5 POST-TEST LEFT SIDE VIEW

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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

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

8313-9

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

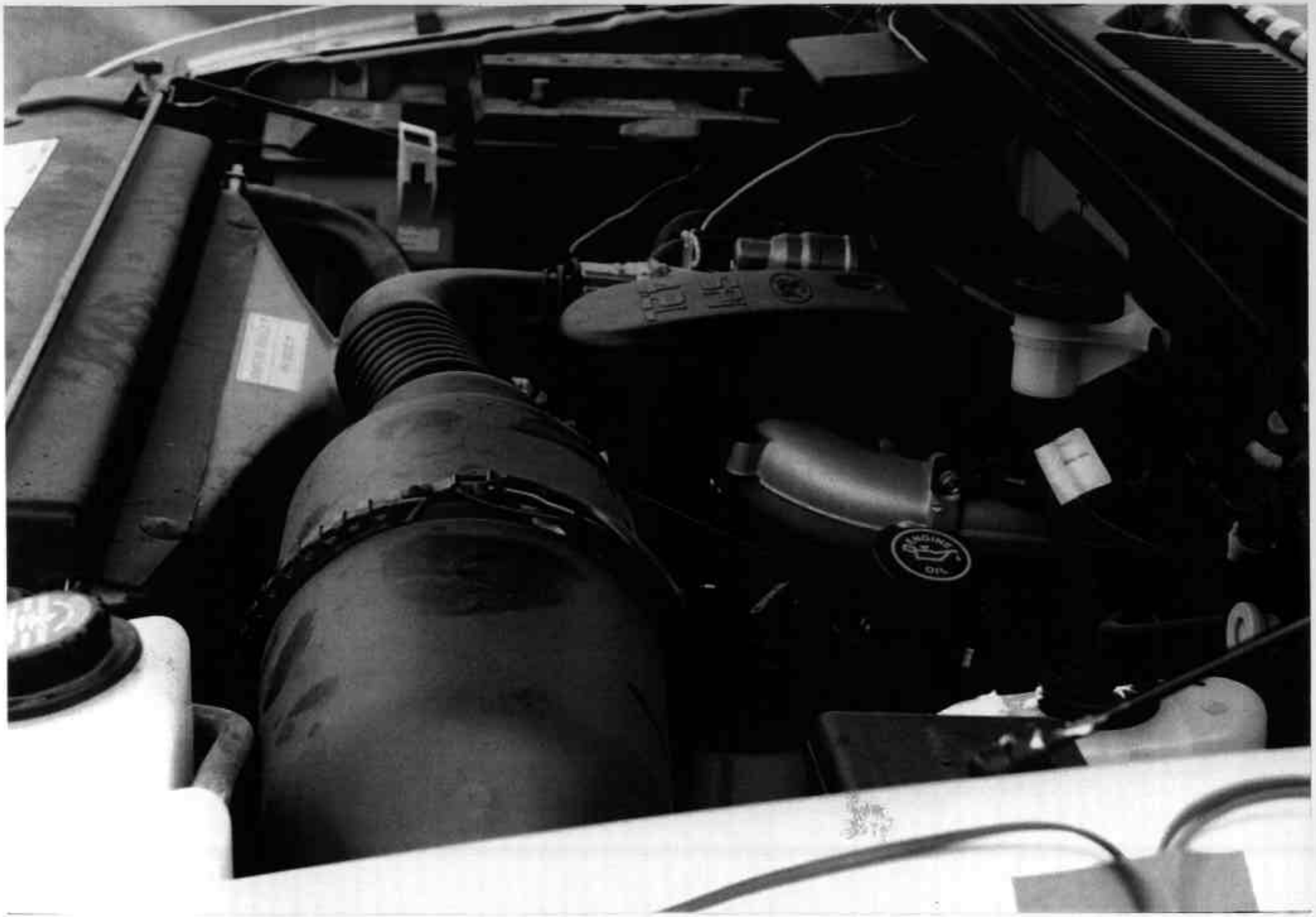

Figure A-14 PRE-TEST ENGINE COMPARTMENT VIEW

Figure A-15 FUEL CAP VIEW

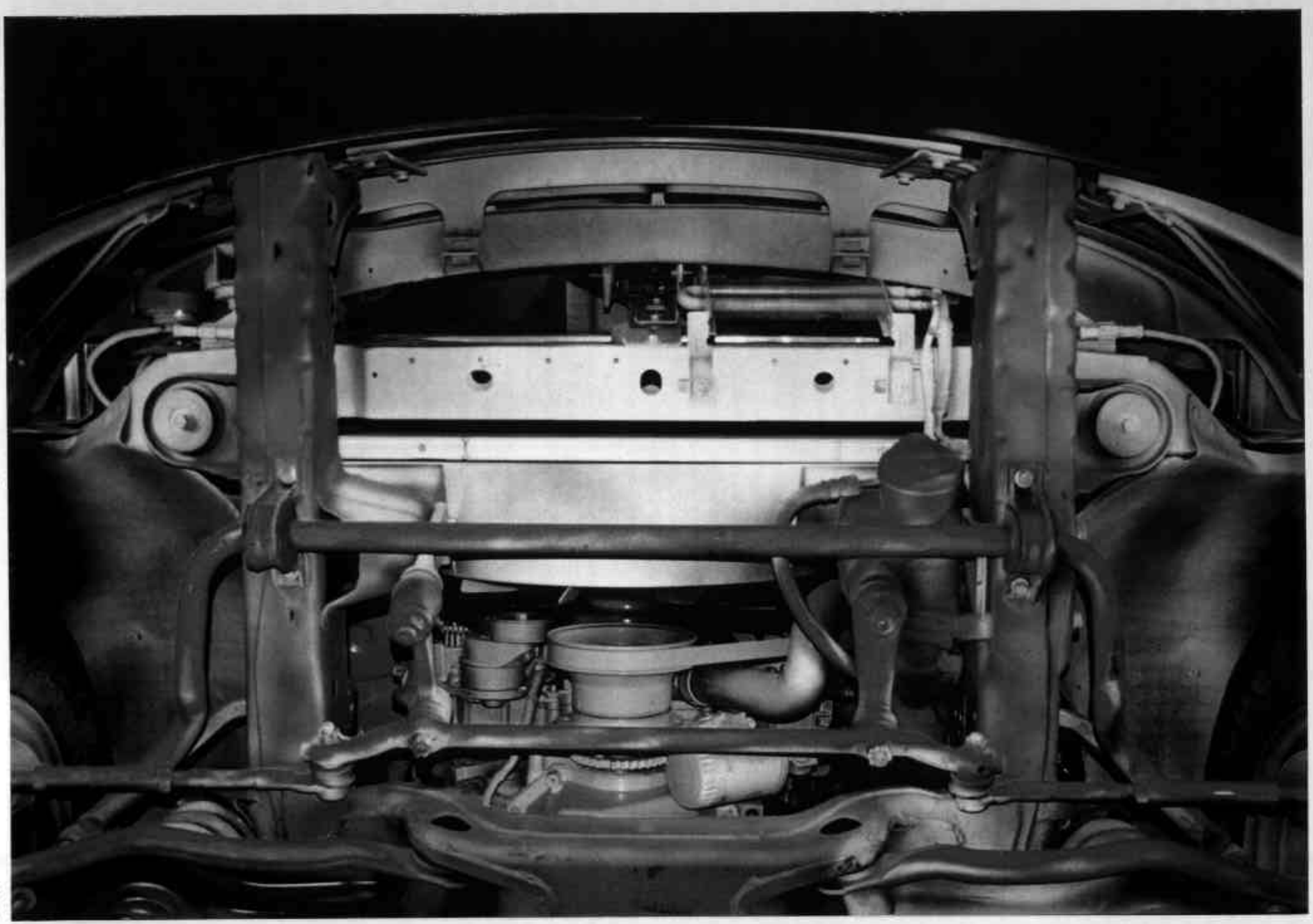

Figure A-16 PRE-TEST FRONT UNDERBODY VIEW

Figure A-17 POST-TEST FRONT UNDERBODY VIEW

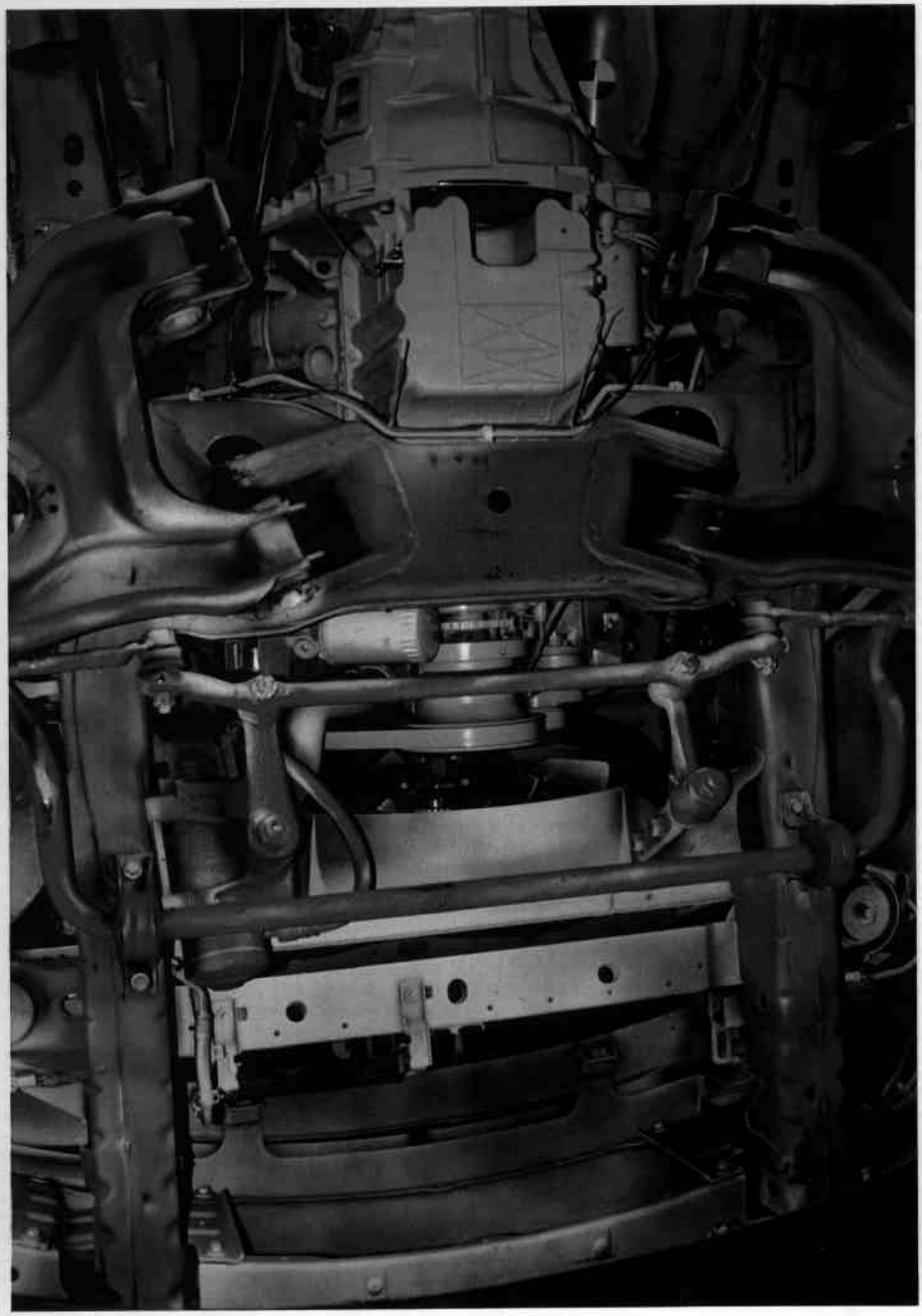

Figure A-18 PRE-TEST FRONT SIDE UNDERBODY VIEW

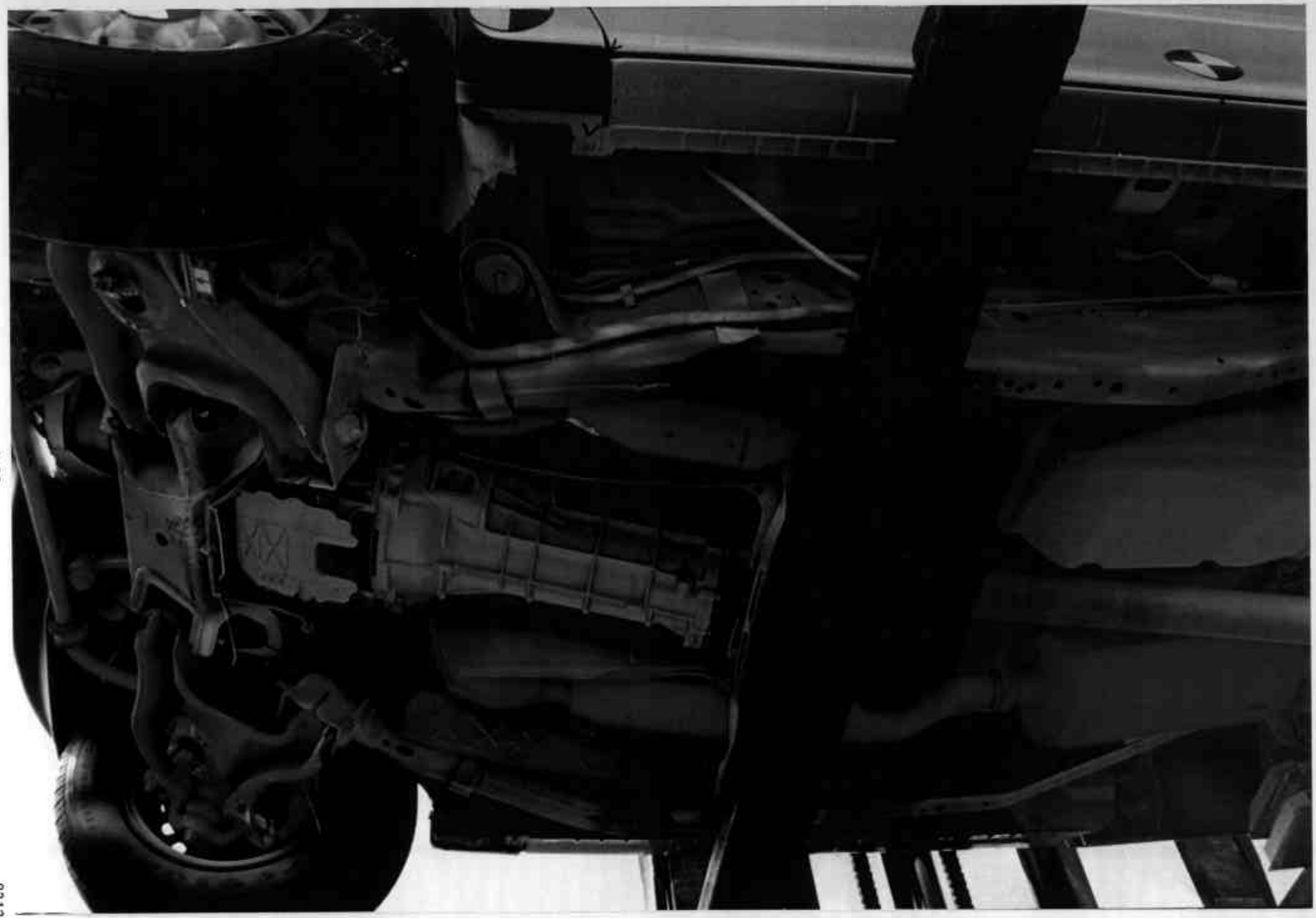

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Figure A-19 POST-TEST FRONT SIDE UNDERBODY VIEW

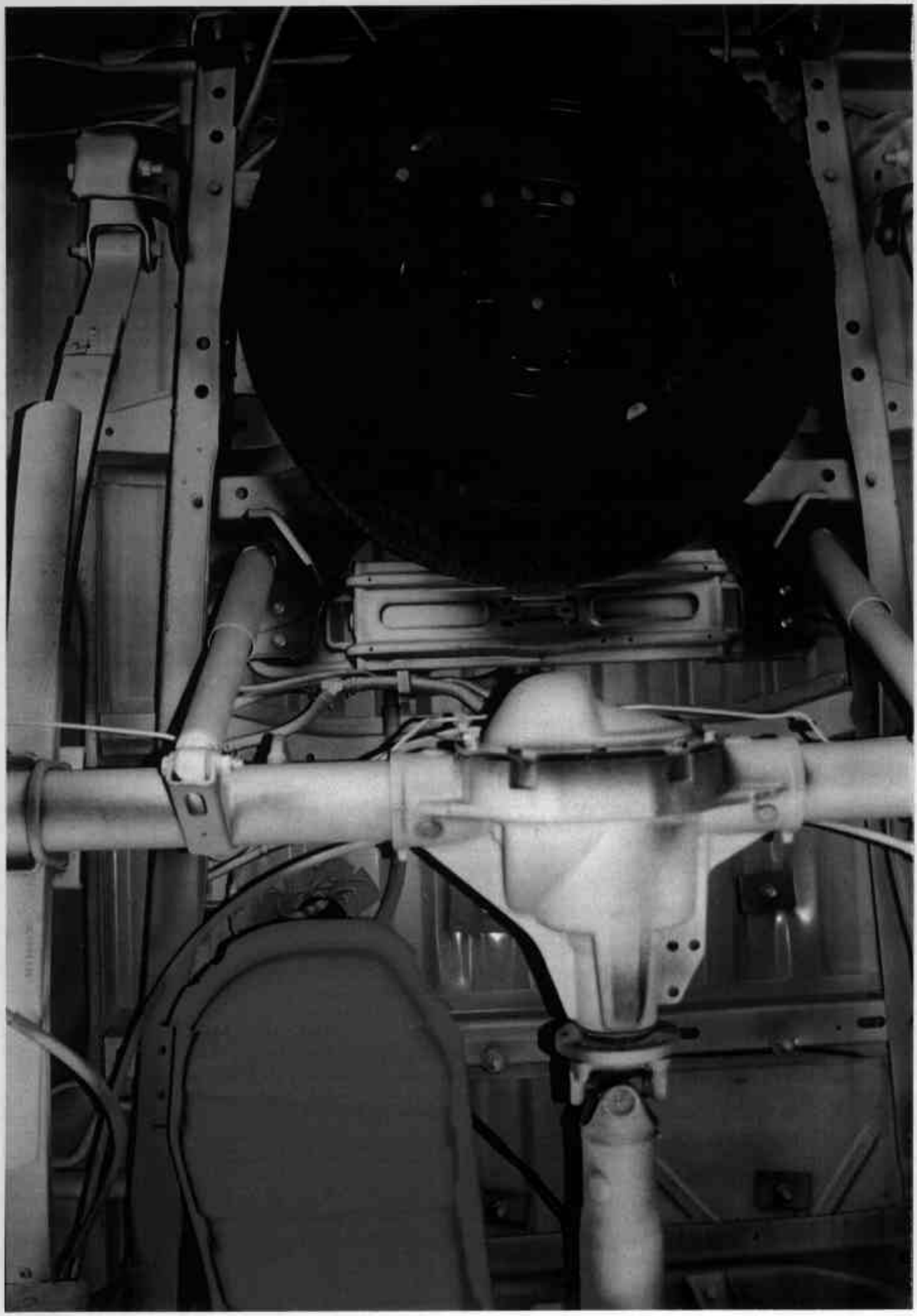
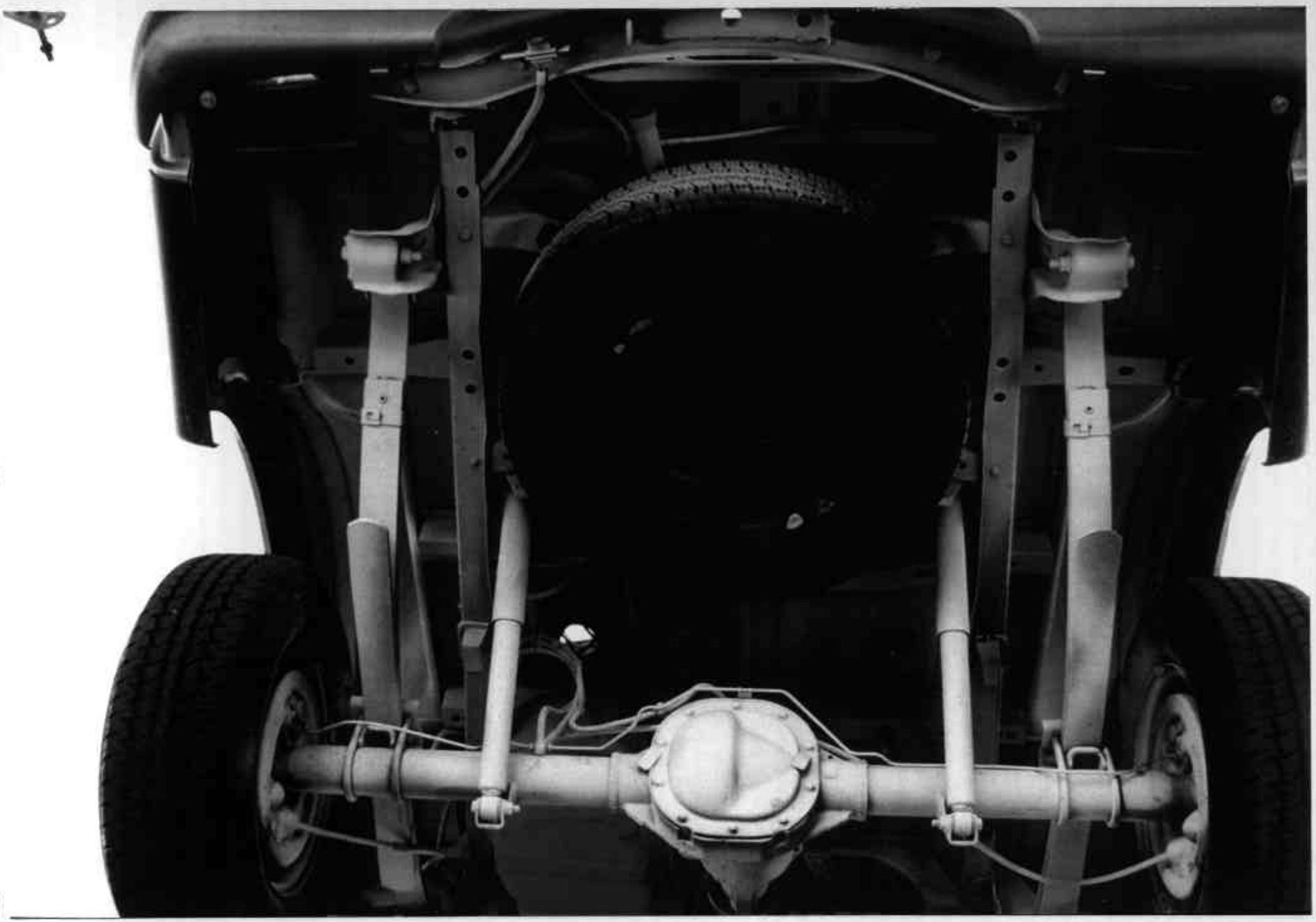


Figure A-20 PRE-TEST REAR UNDERBODY VIEW



A-24

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Figure A-21 POST-TEST REAR UNDERBODY VIEW

A-25

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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

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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 PRE-TEST DRIVER HEAD LOCATION

8313-9

Figure A-31 POST-TEST DRIVER HEAD LOCATION

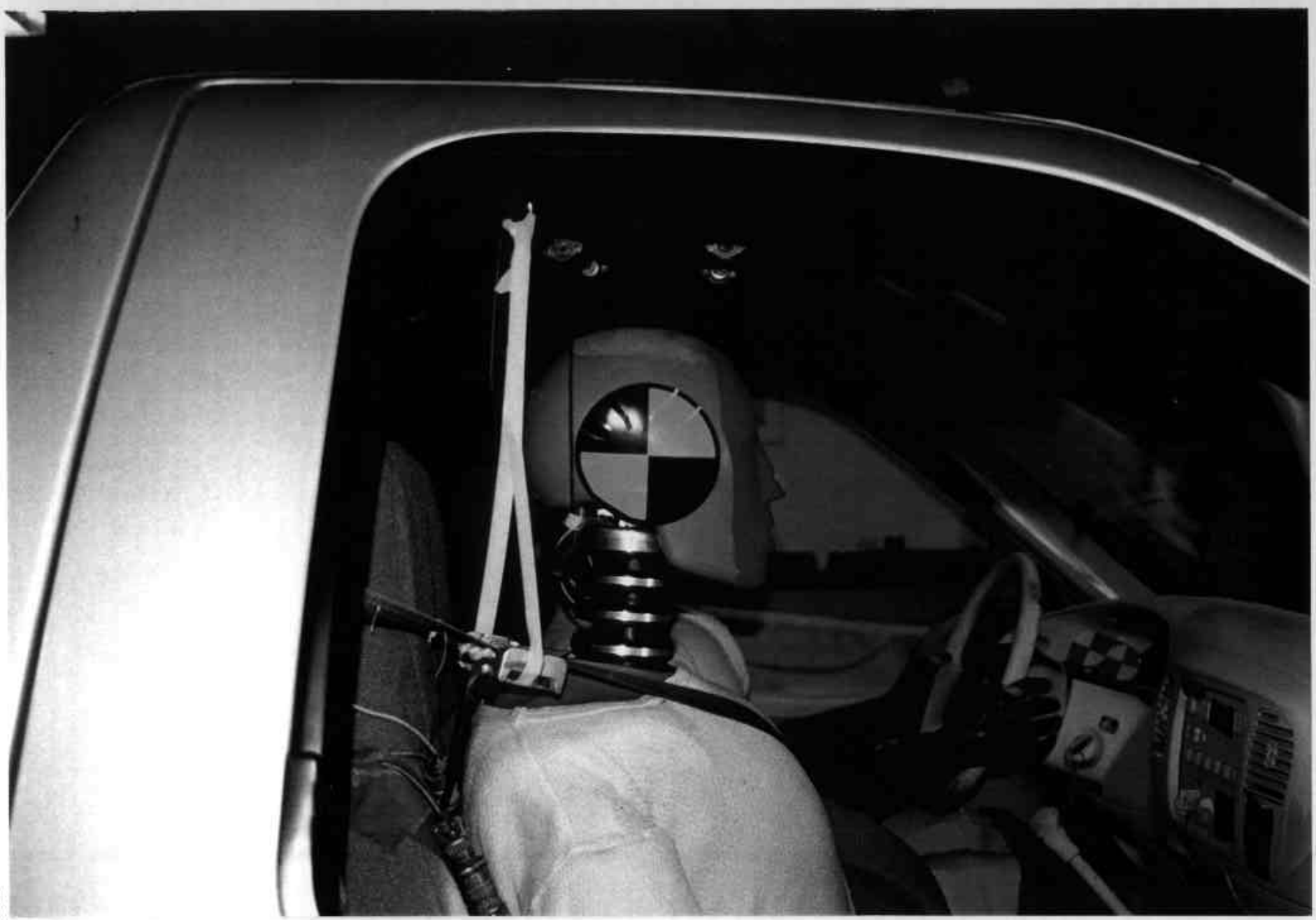

Figure A-32 PRE-TEST PASSENGER HEAD LOCATION

8313-9

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8313-9

Figure A-33 POST-TEST PASSENGER HEAD LOCATION

PHOTOGRAPH NOT AVAILABLE

Figure A-34 PRE-TEST DRIVER FLOOR PAN VIEW

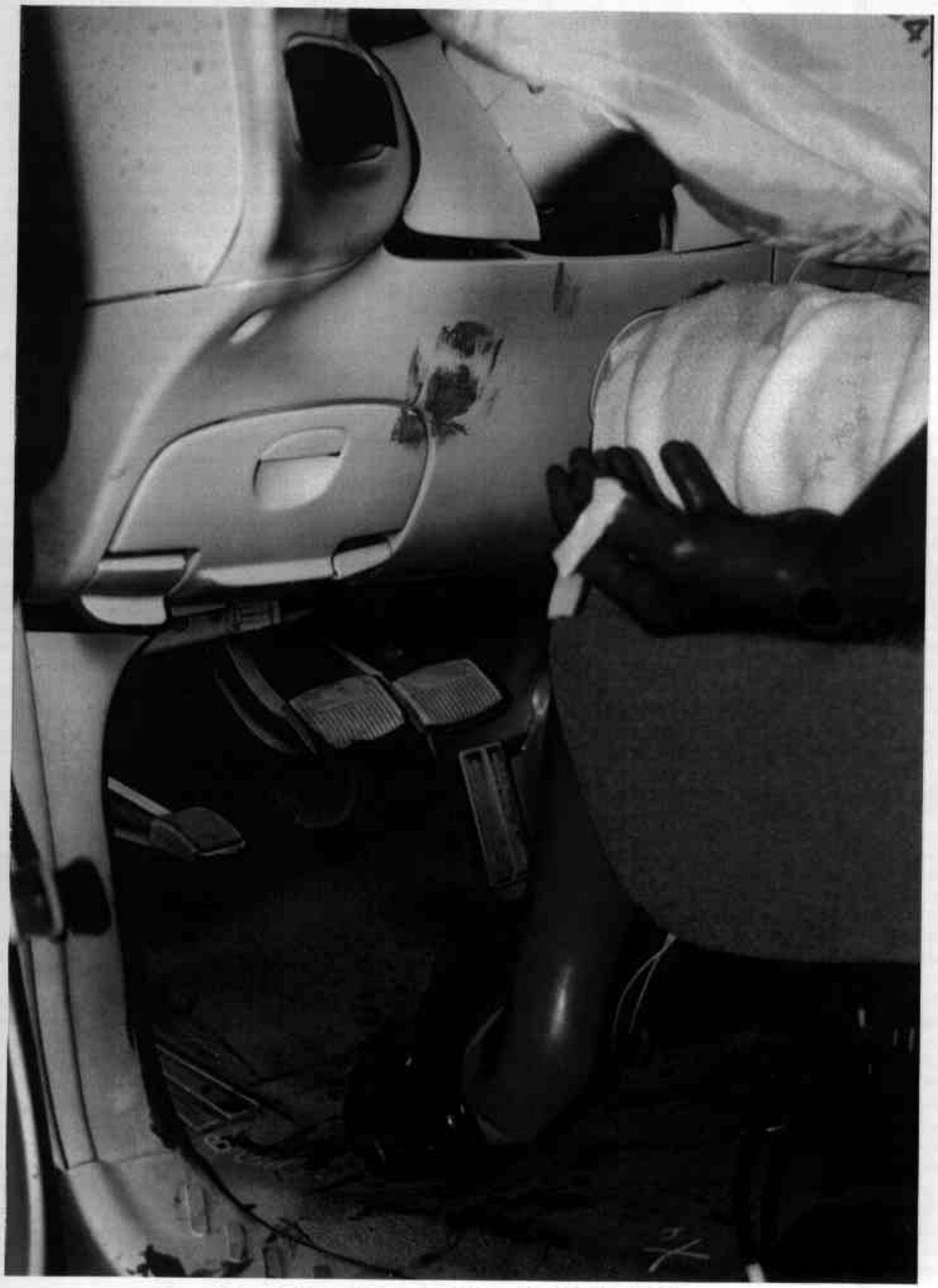


Figure A-35 POST-TEST DRIVER FLOOR PAN VIEW

PHOTOGRAPH NOT AVAILABLE

Figure A-36 PRE-TEST PASSENGER FLOOR PAN VIEW

Figure A-37 POST-TEST PASSENGER FLOOR PAN VIEW

Figure A-38 ROLLOVER VIEW

Figure A-39 IMPACT VIEW

8313-9

Appendix B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

NHTSA TEST NO. MV0200

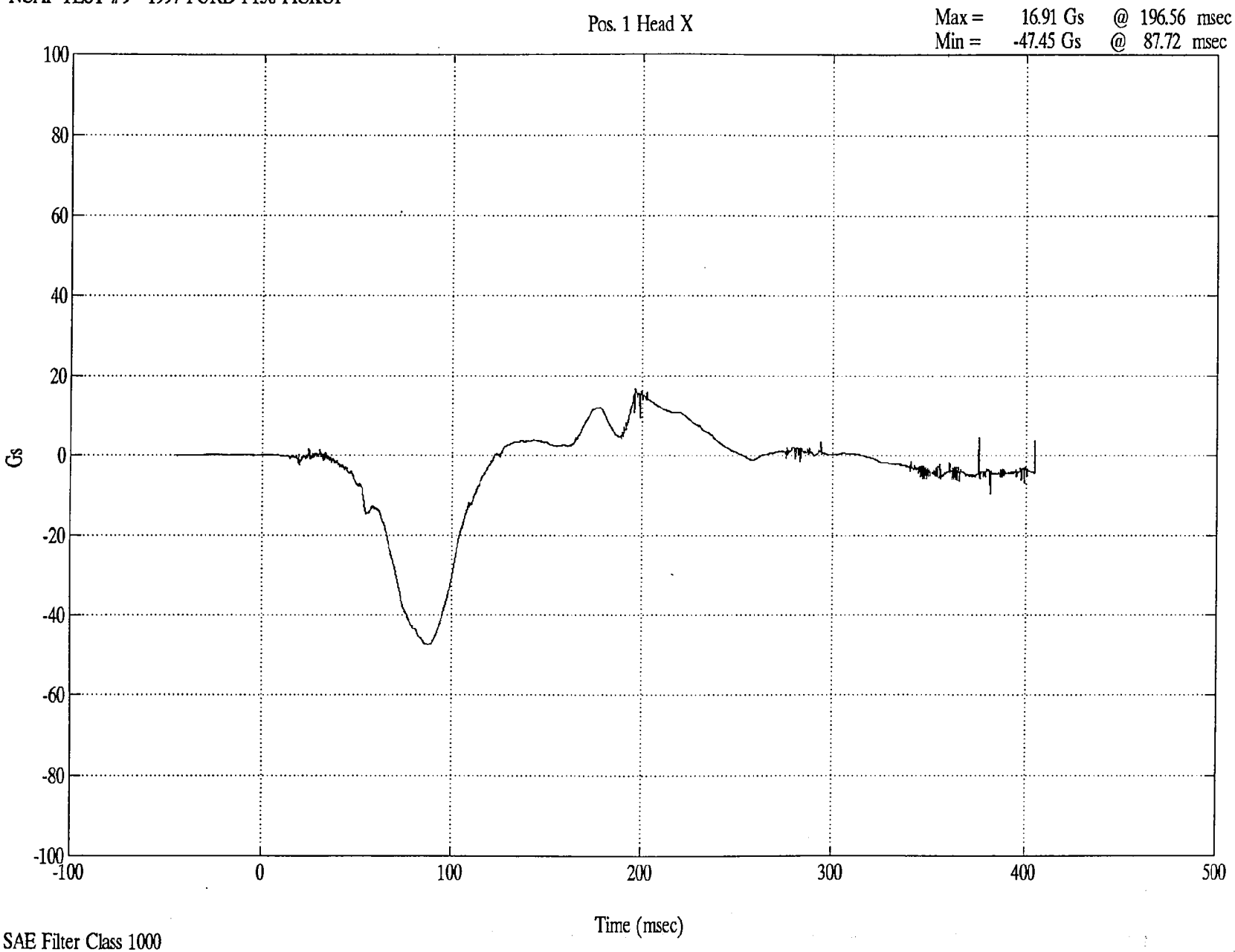
DUMMY DATA

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

Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers

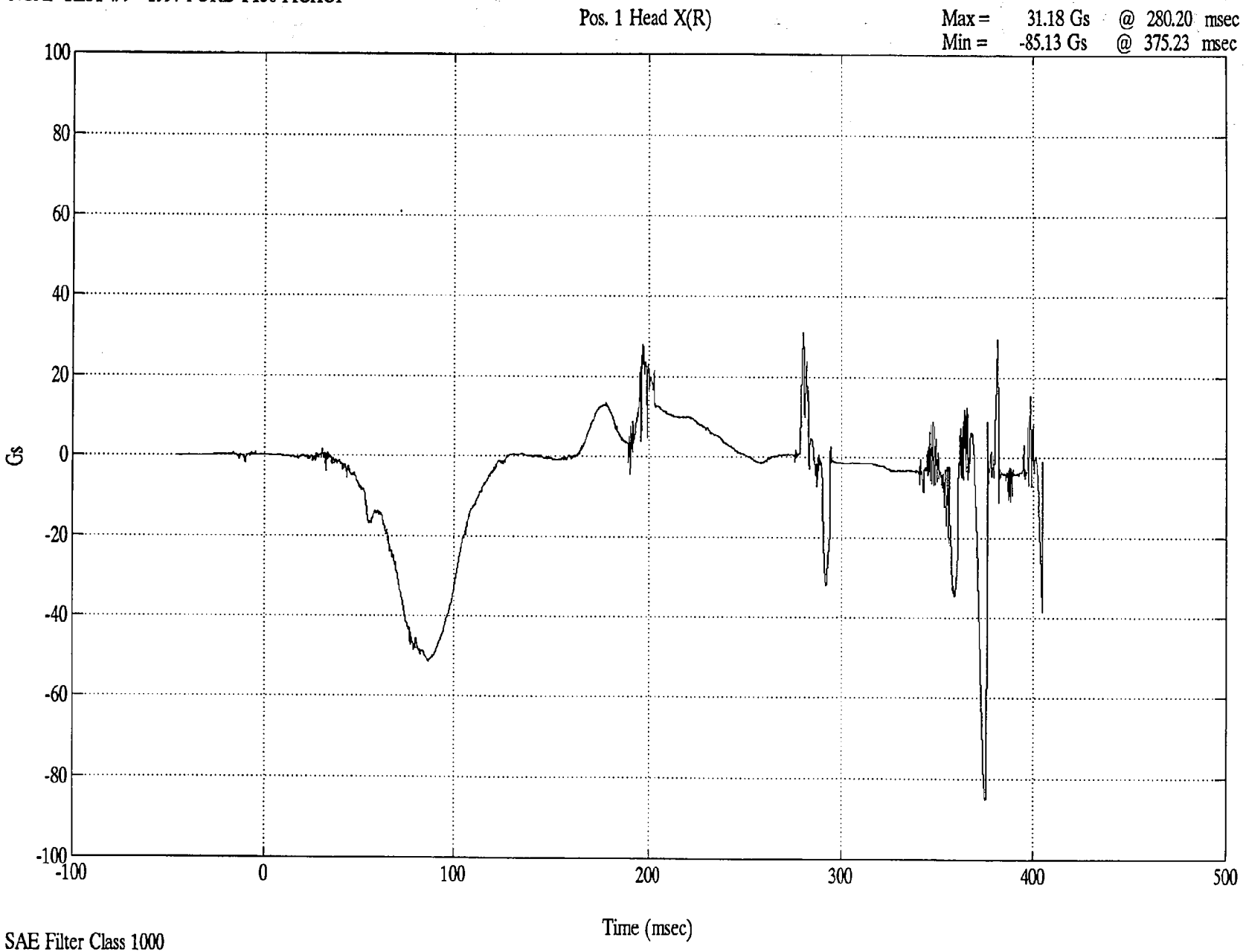
Transducer	DOT/NHTSA Sign Convention (positive unless noted)
Upper Neck Load Cell	Fx Head forward Fy Head left Fz Neck in tension Mx Right ear to right shoulder My Chin to chest (flexion) Mz Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative
Pelvic Load Cell (Lower Lumbar)	Fx Chest forward Fy Chest left Fz Spine in tension
Femur Load Cell	Compression is negative
Upper Tibia Load Cell (right and left leg)	Mx Support tibia, load right side center My Support tibia, load front (shin) center
Lower Tibia Load Cell (right and left leg)	Fy Foot right w/r to left Fz Tibia in tension Mx Support tibia, press right side center

NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

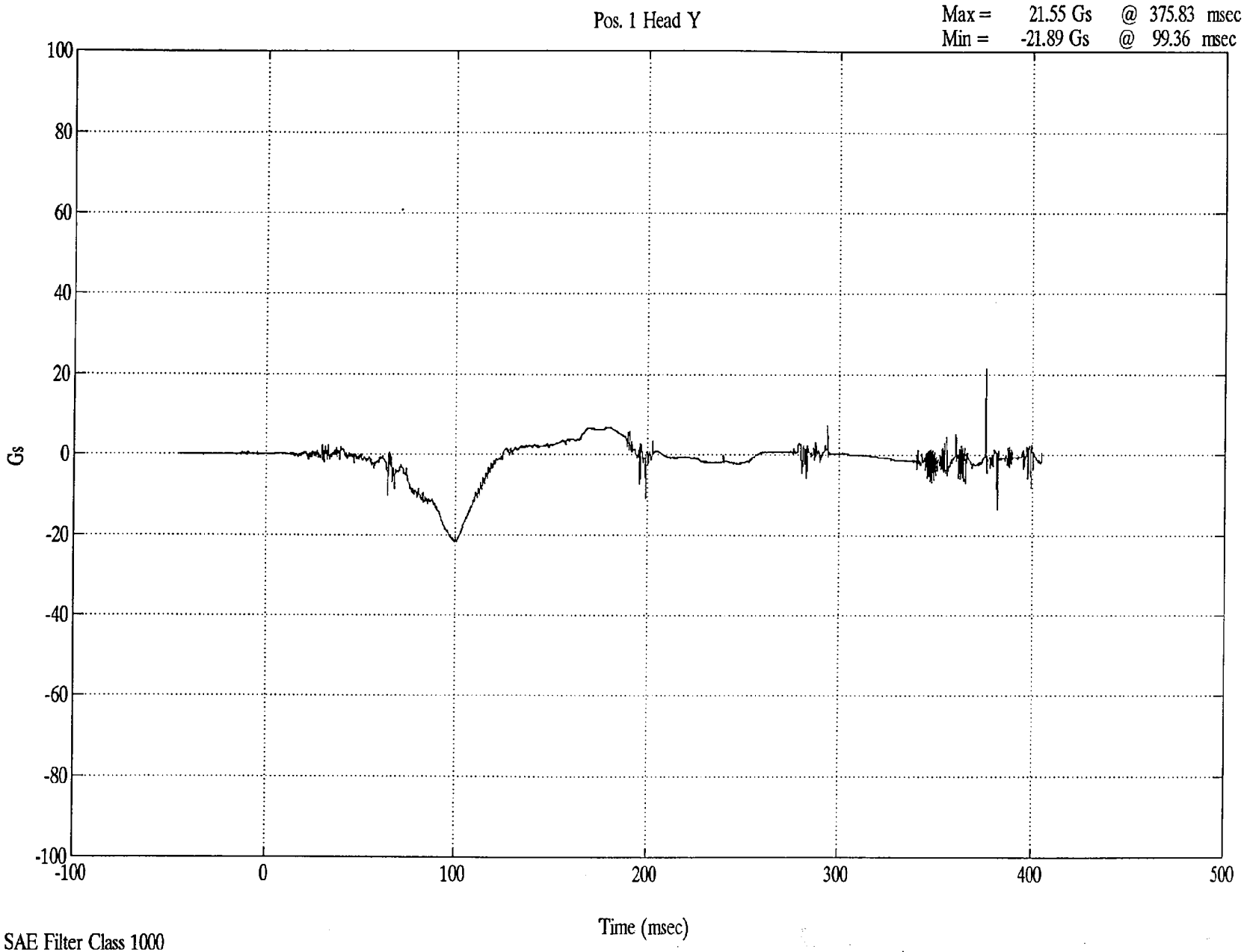


B-5

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

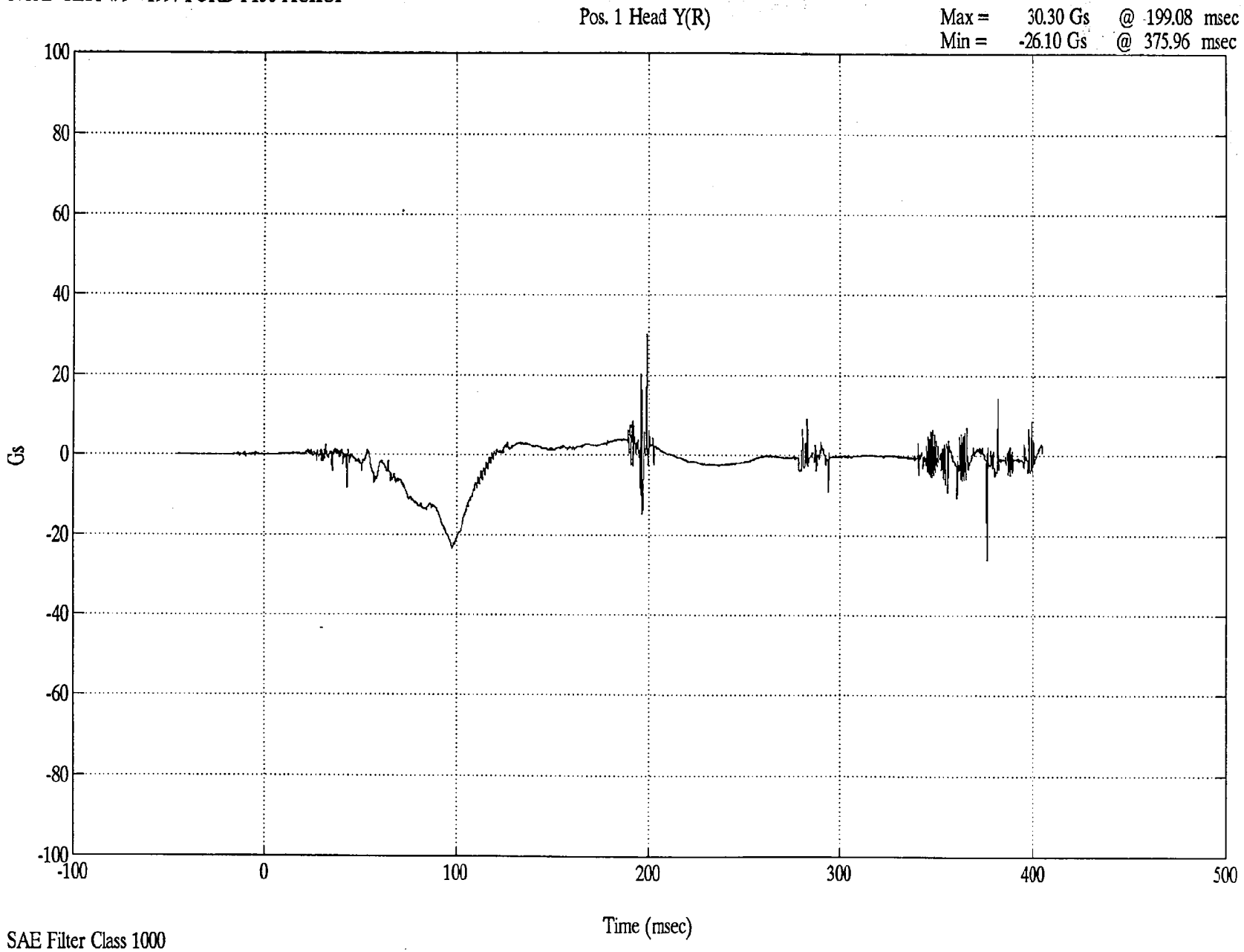


B-6

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

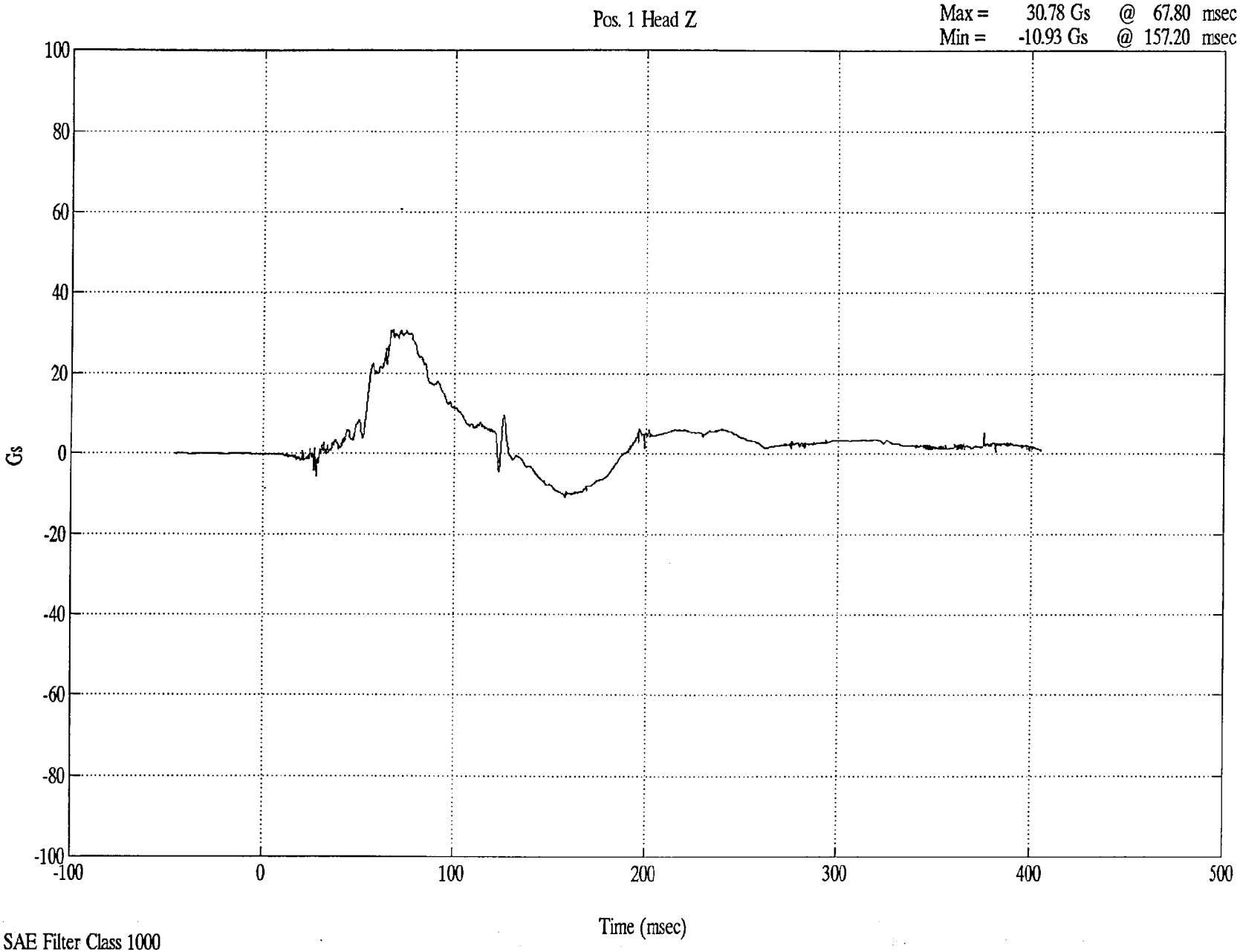


B-7

8313-9

SAE Filter Class 1000

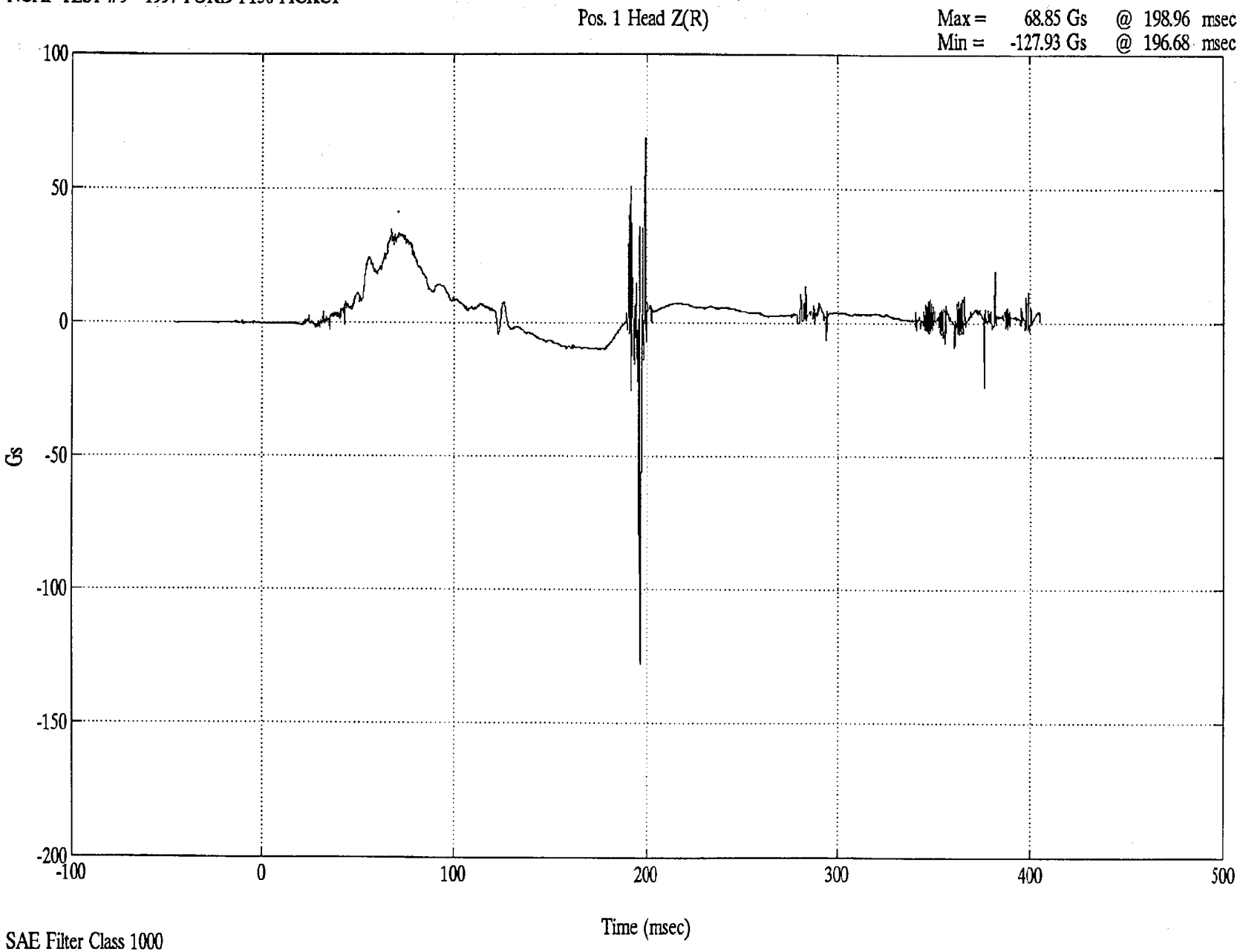
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

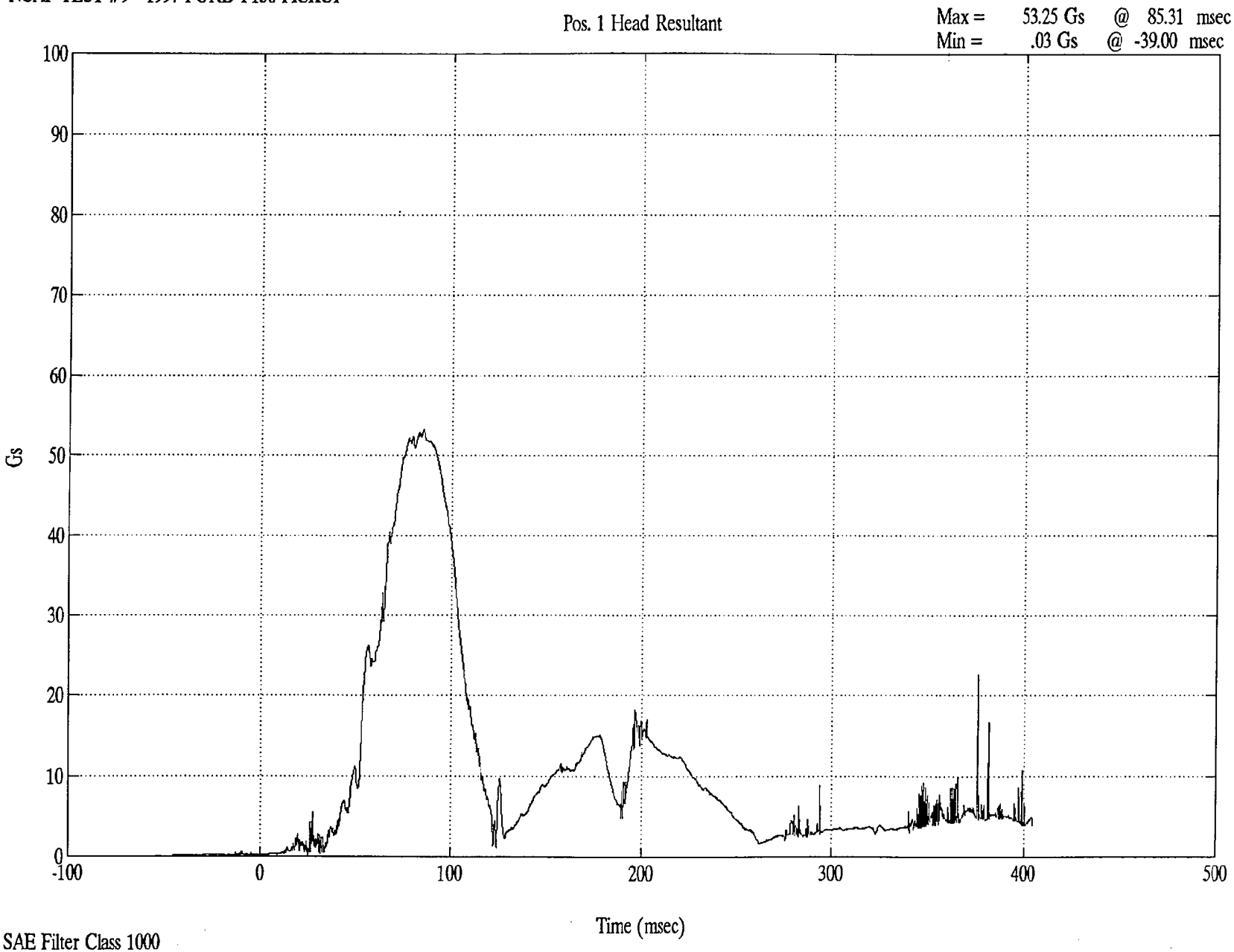


B-9

8313-9

SAE Filter Class 1000

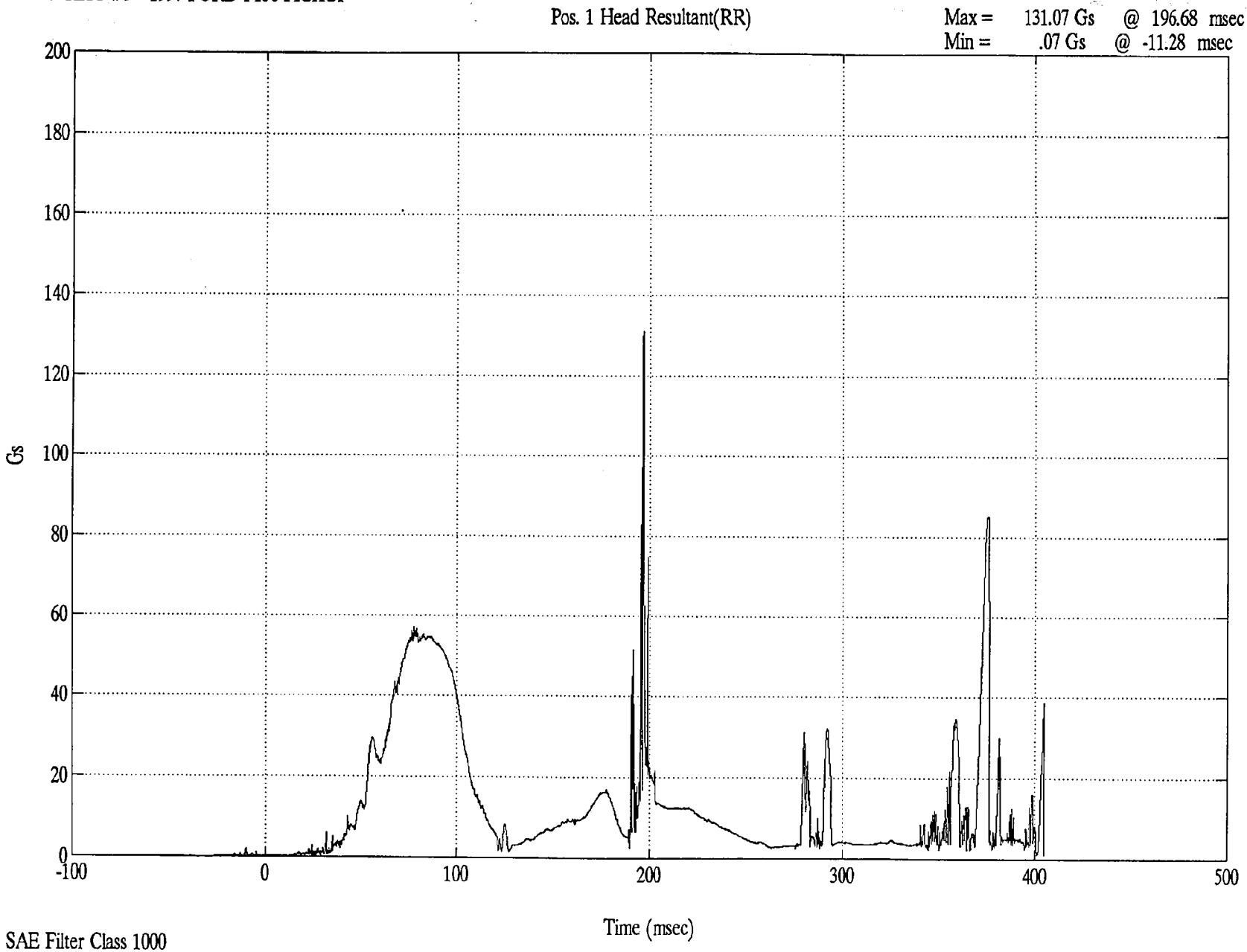
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

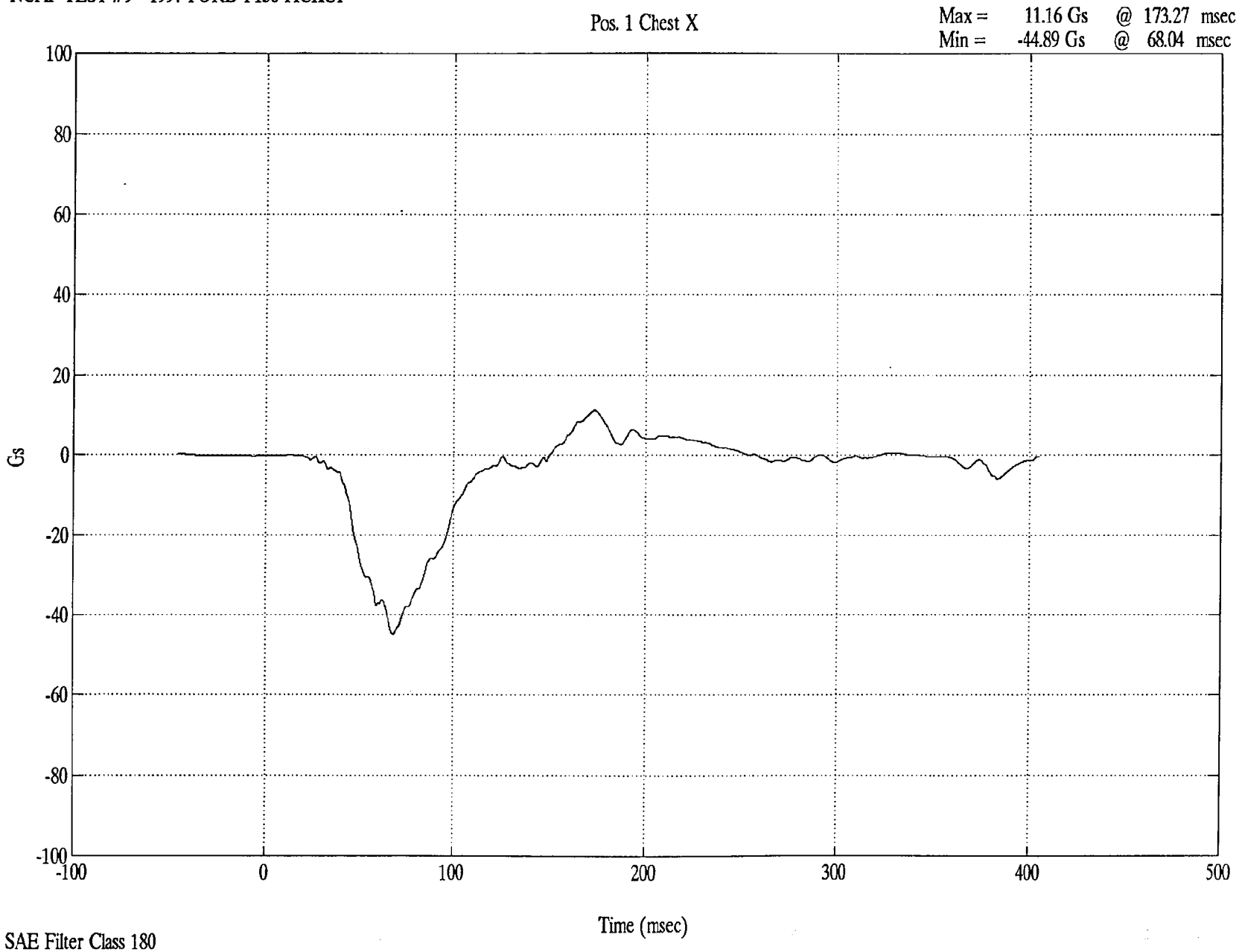
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

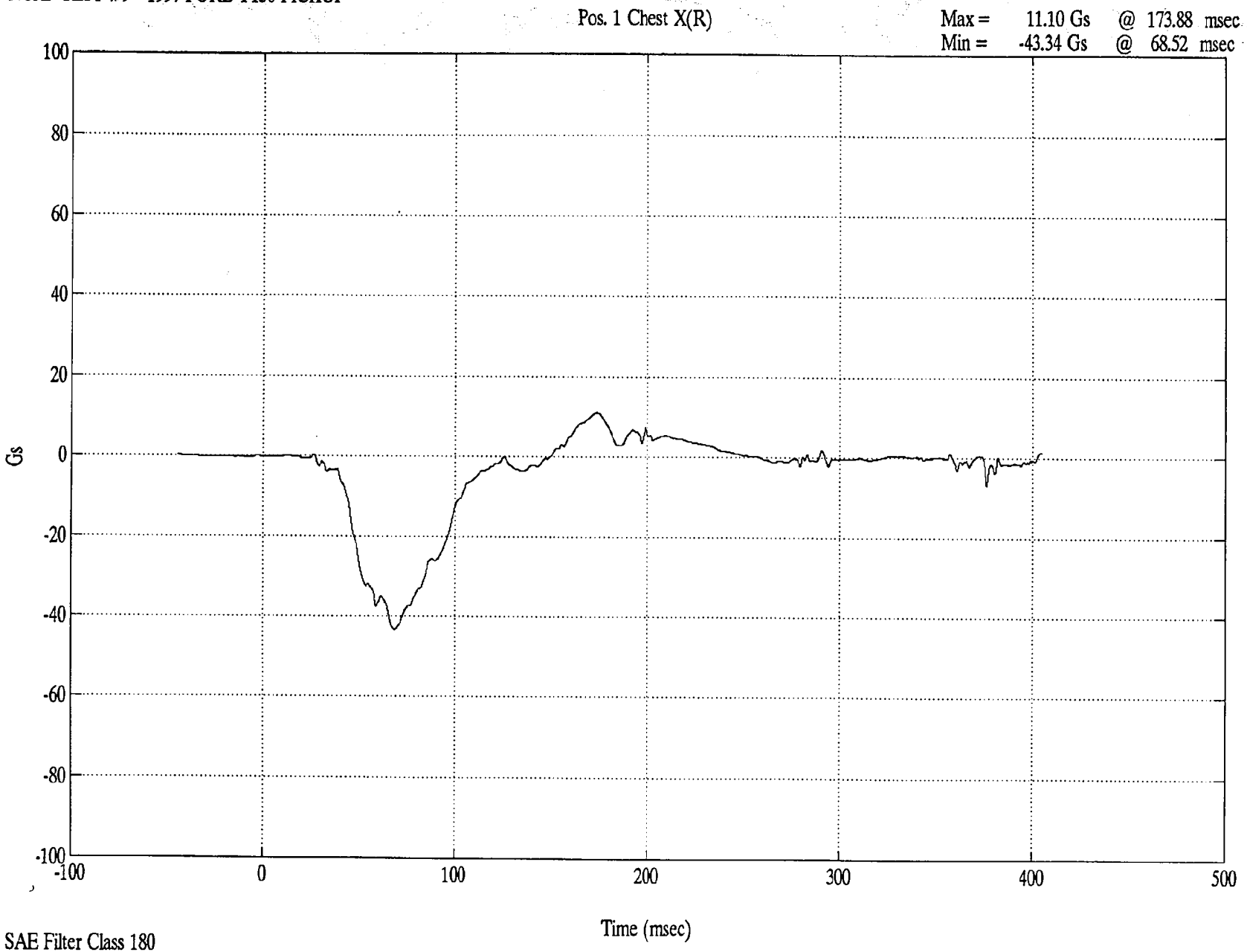


B-12

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

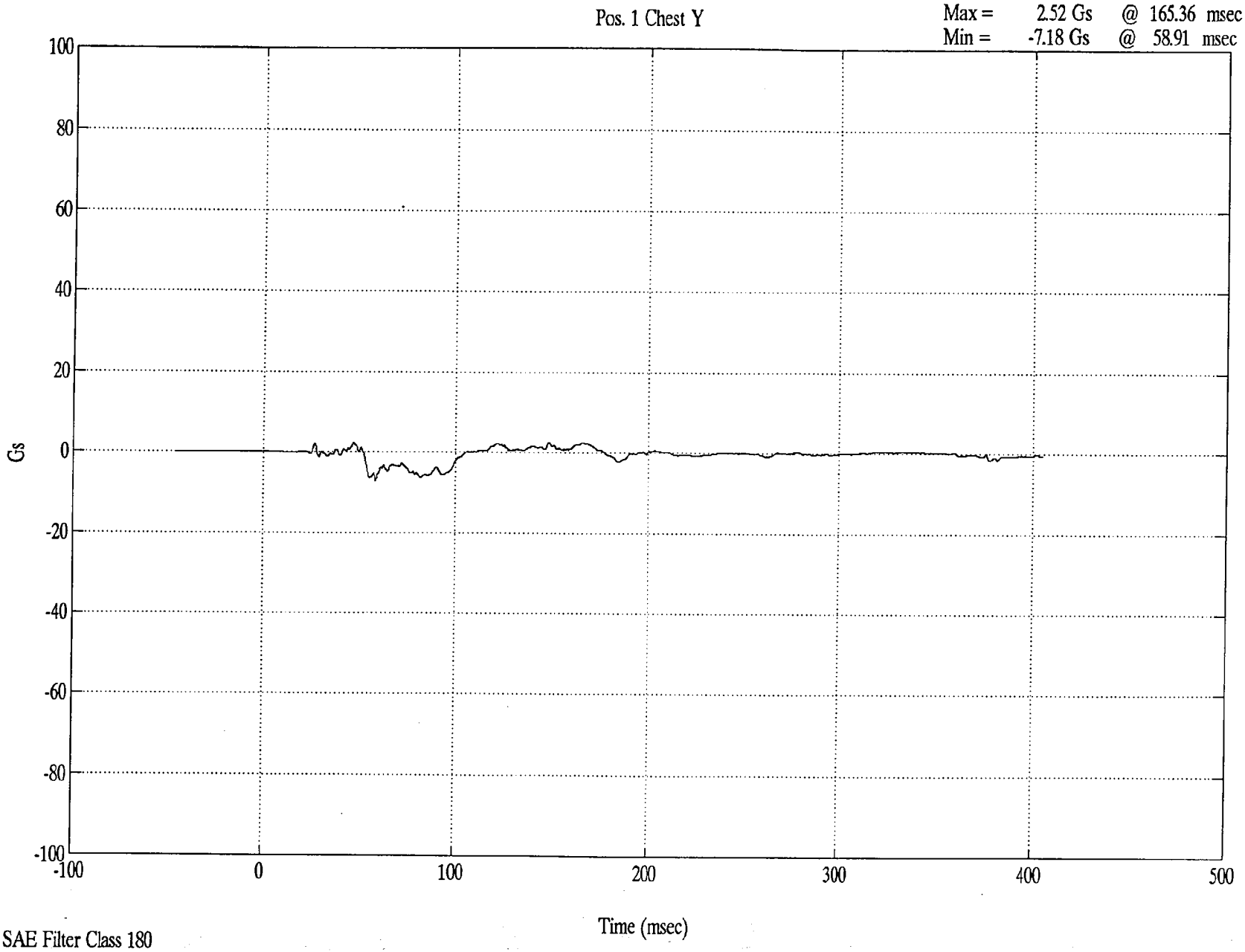


SAE Filter Class 180

B-13

8313-9

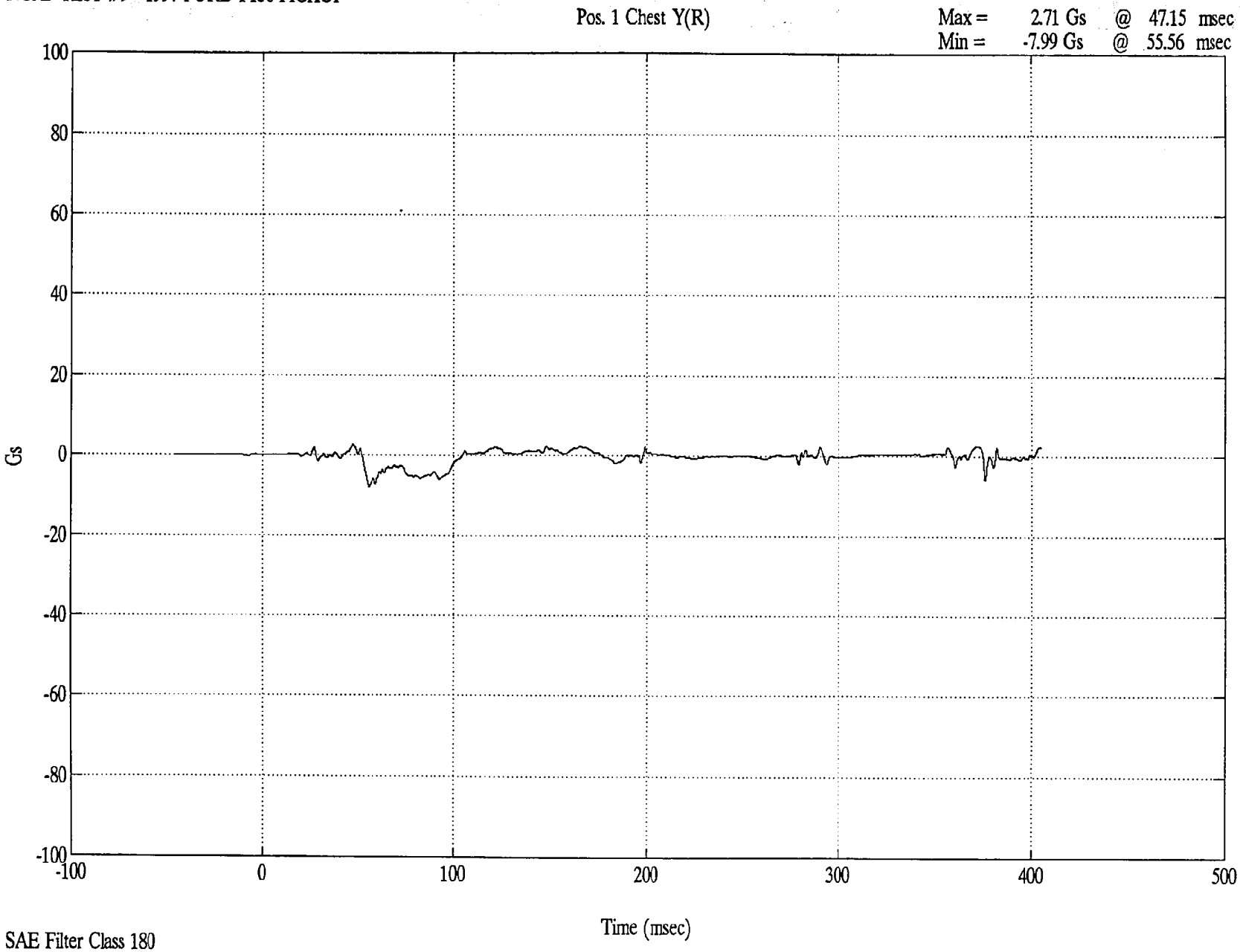
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

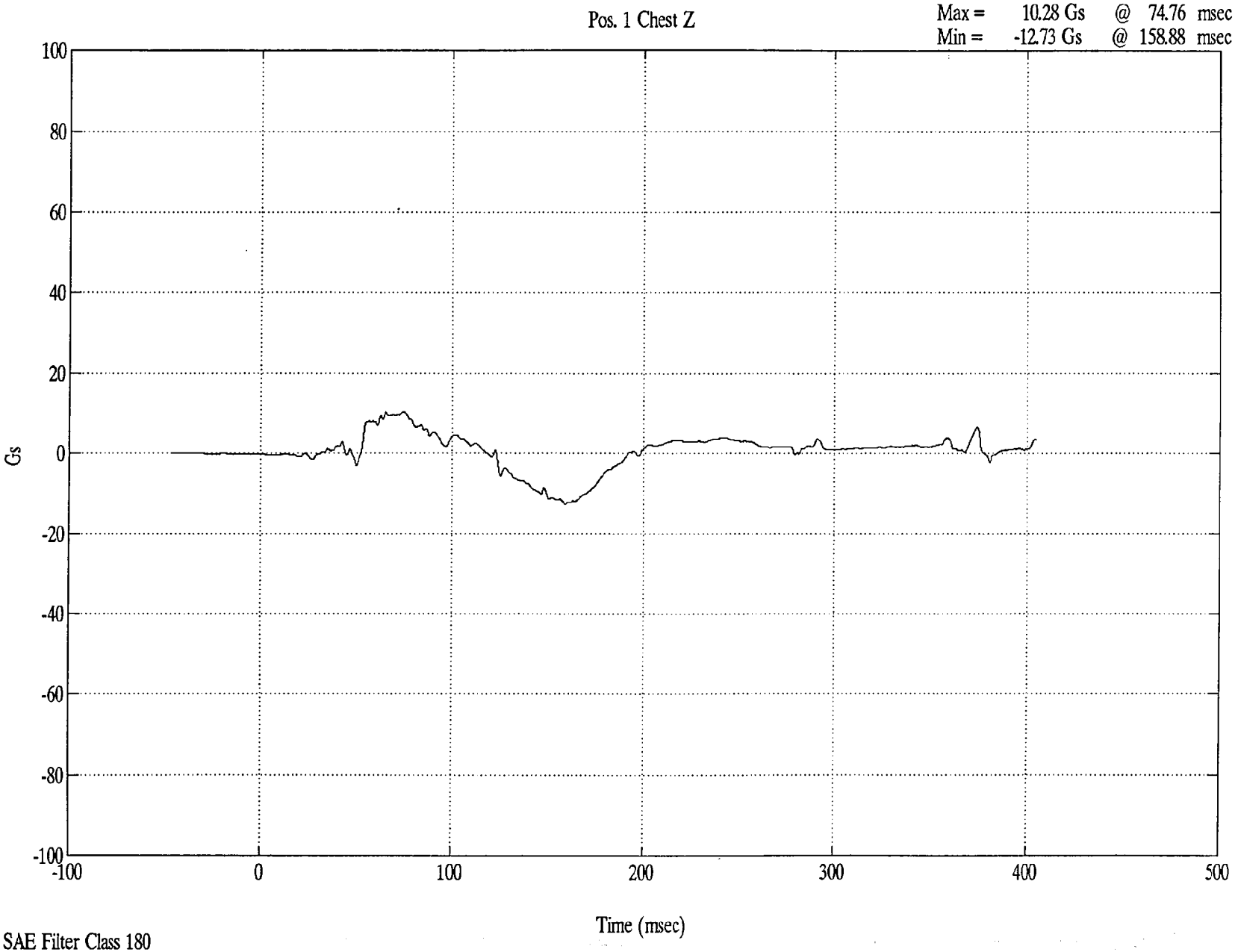


B-15

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

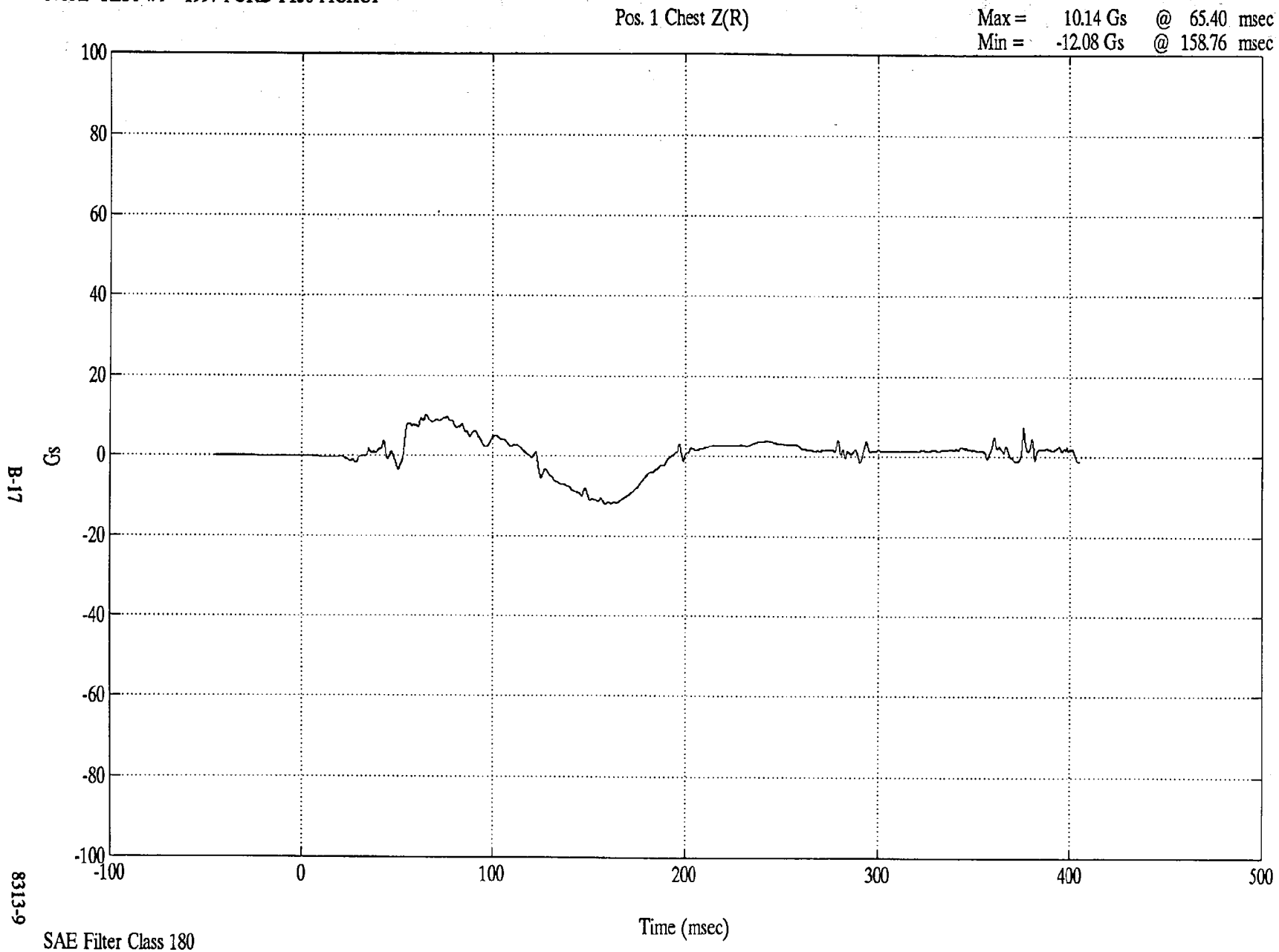


B-16

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

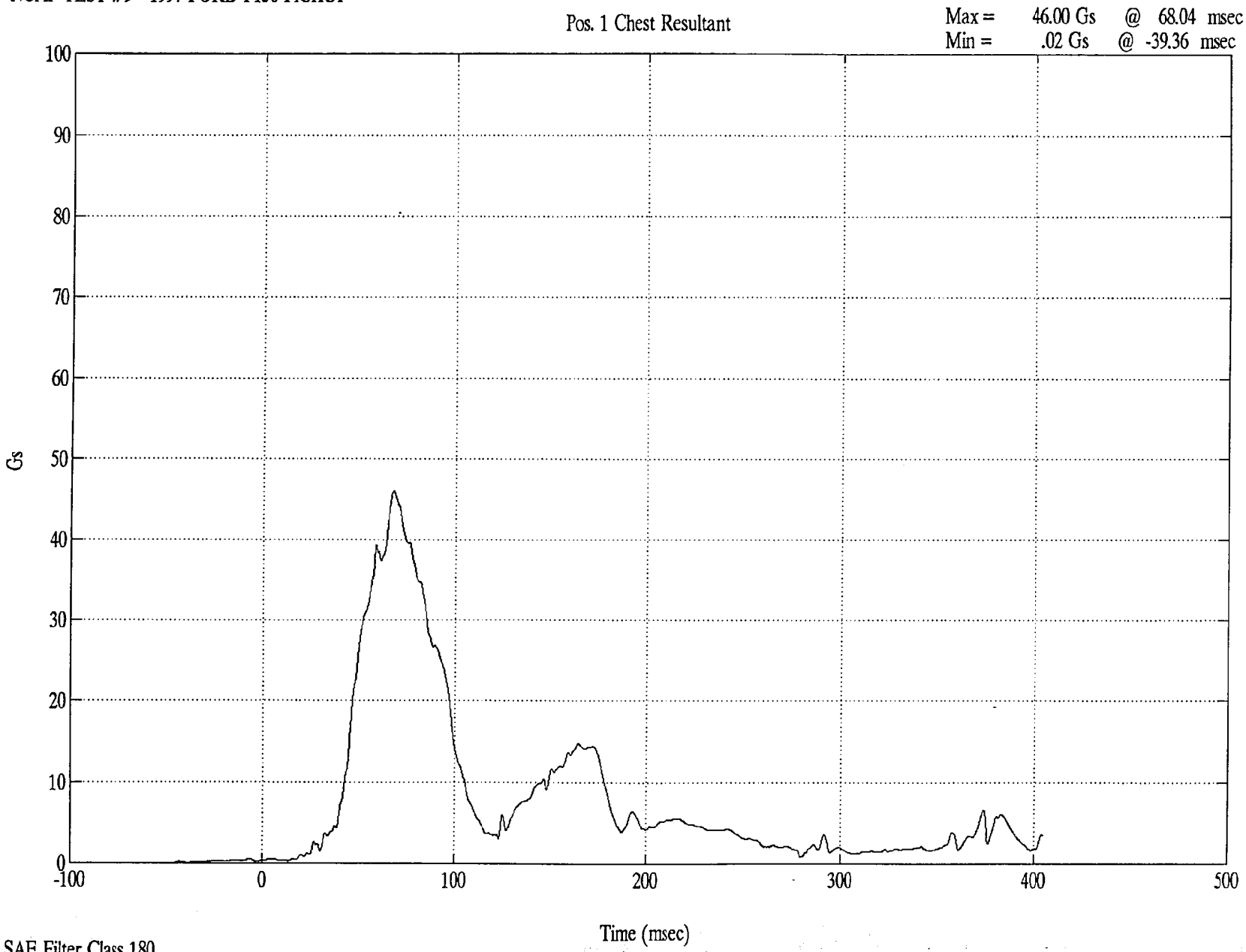


B-17

8313-9

SAE Filter Class 180

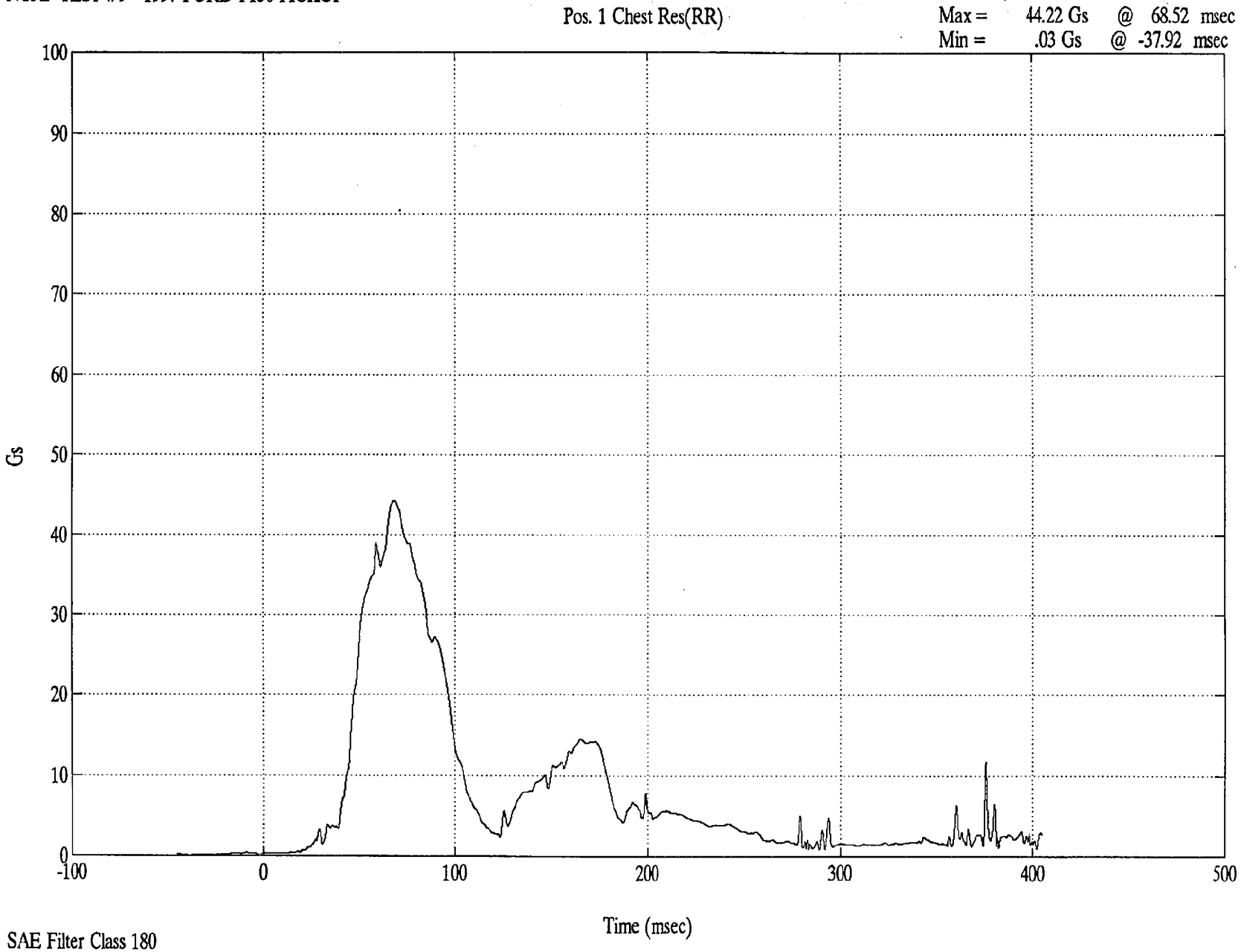
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

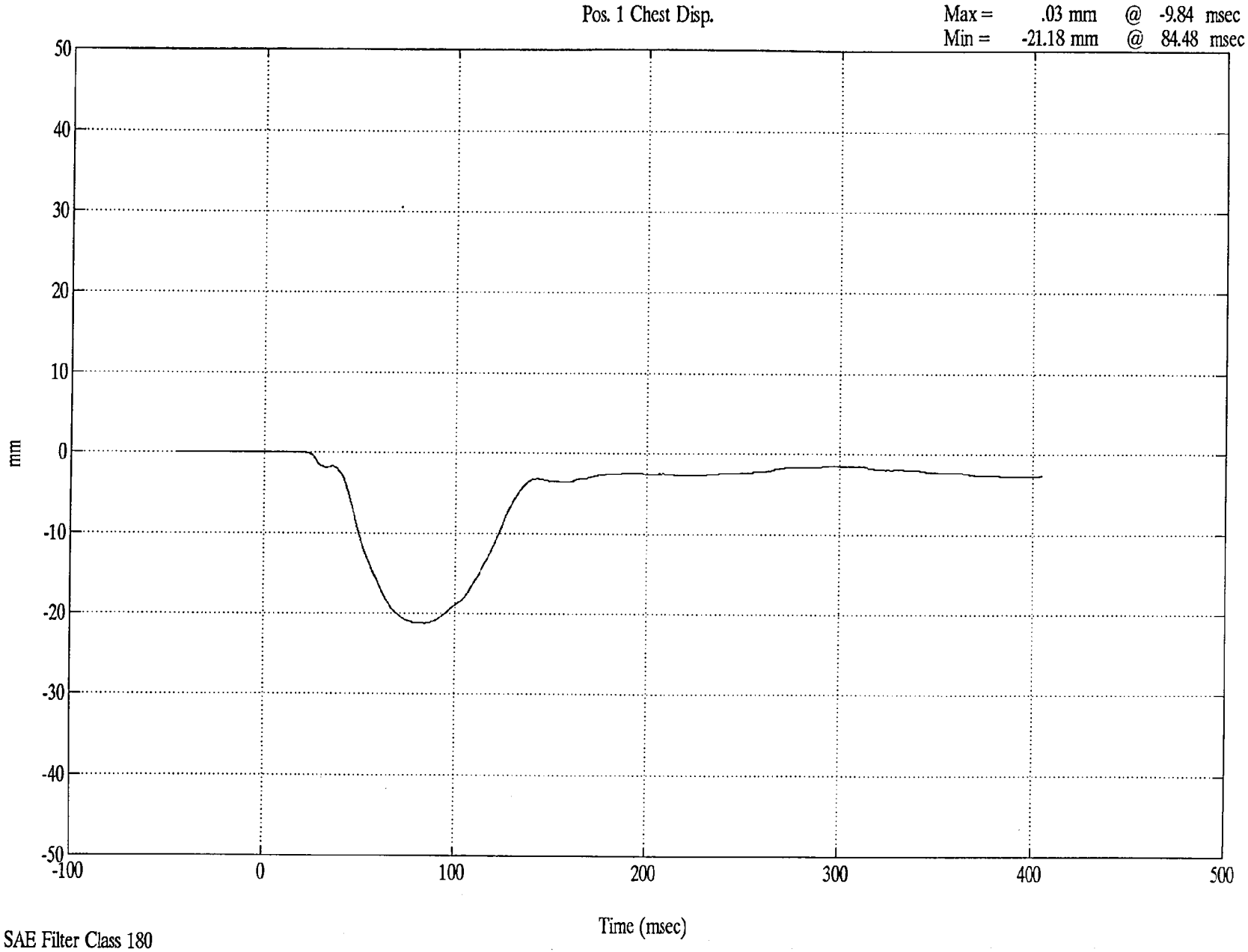
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

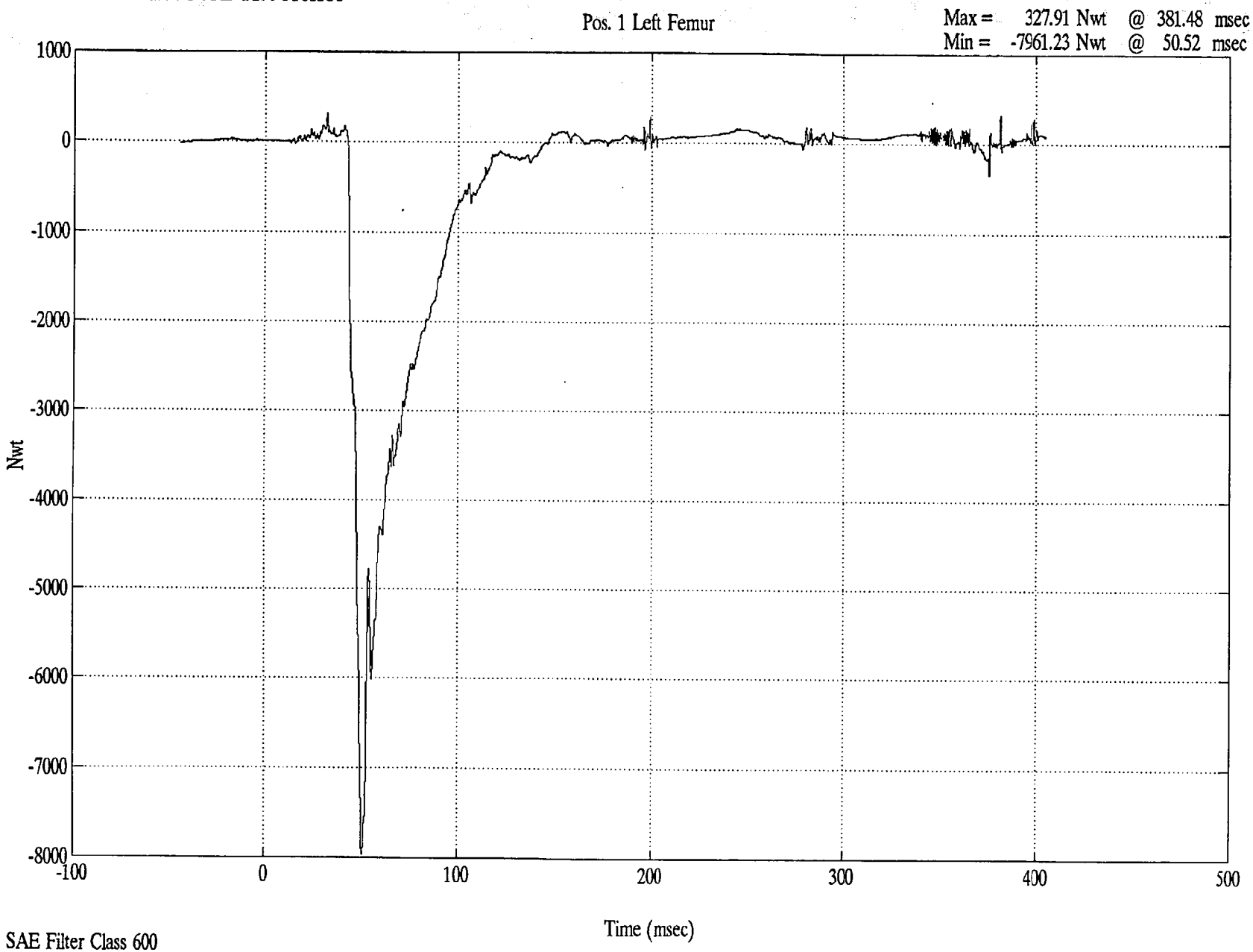


SAE Filter Class 180

B-20

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

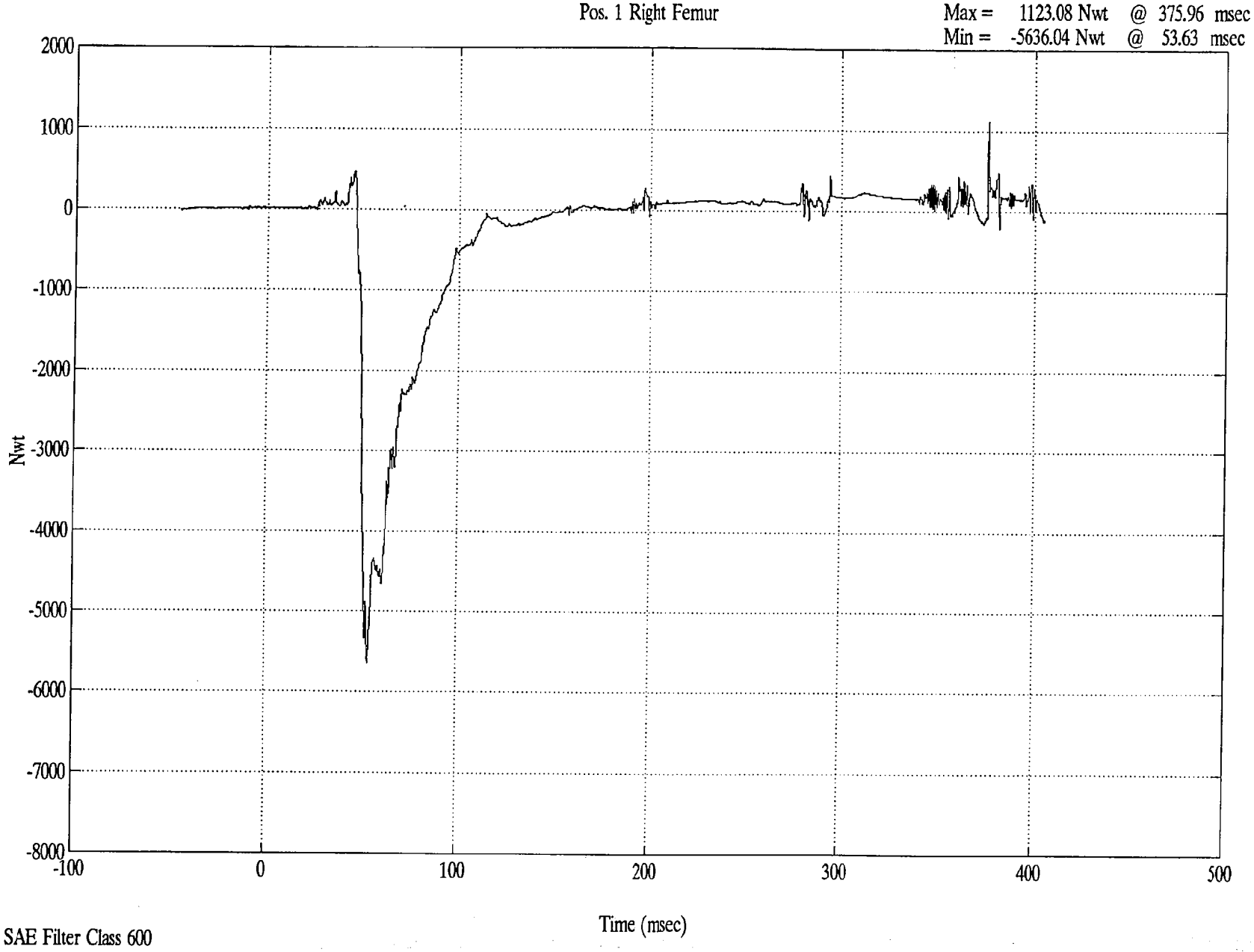


B-21

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

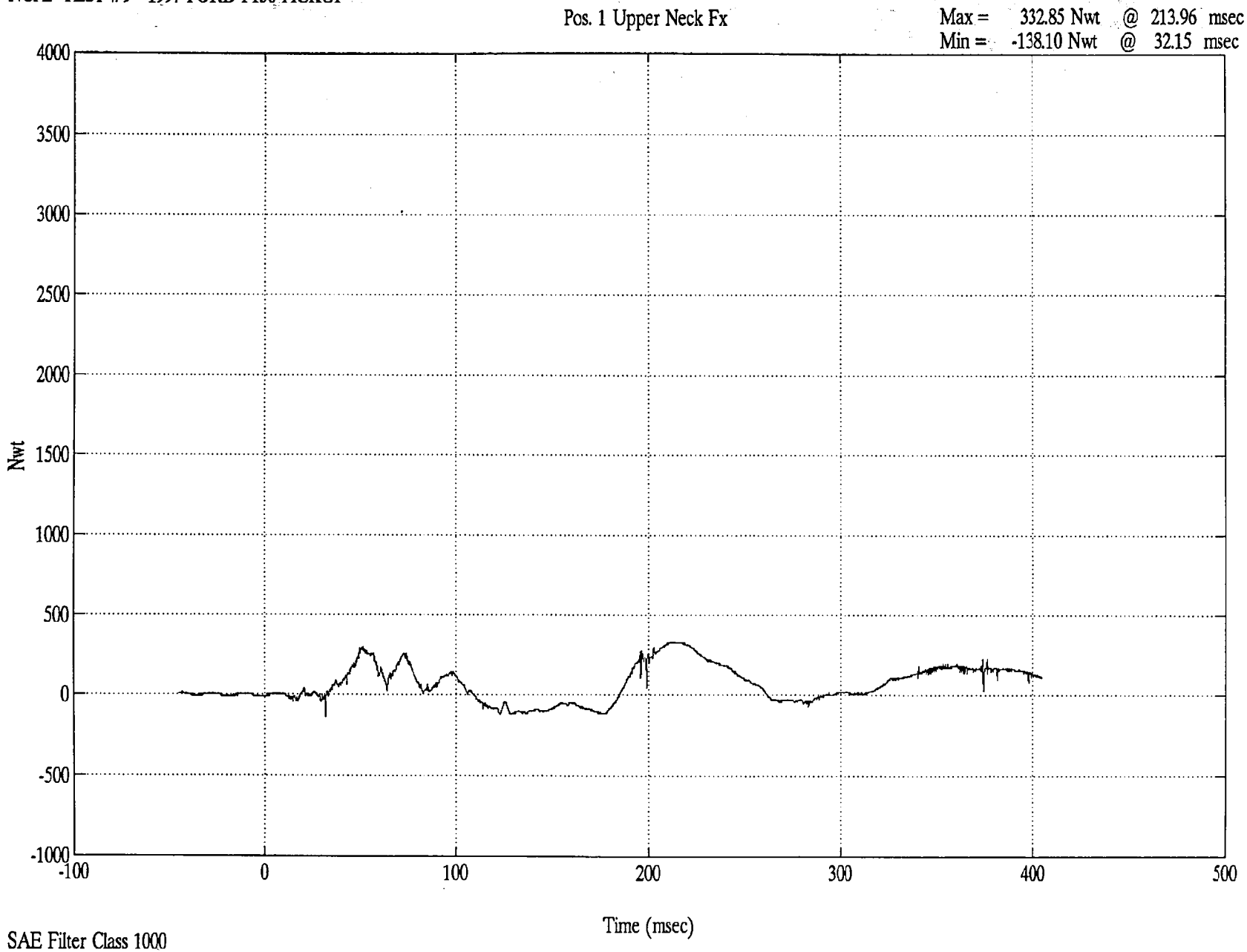


B-22

8313-9

SAE Filter Class 600

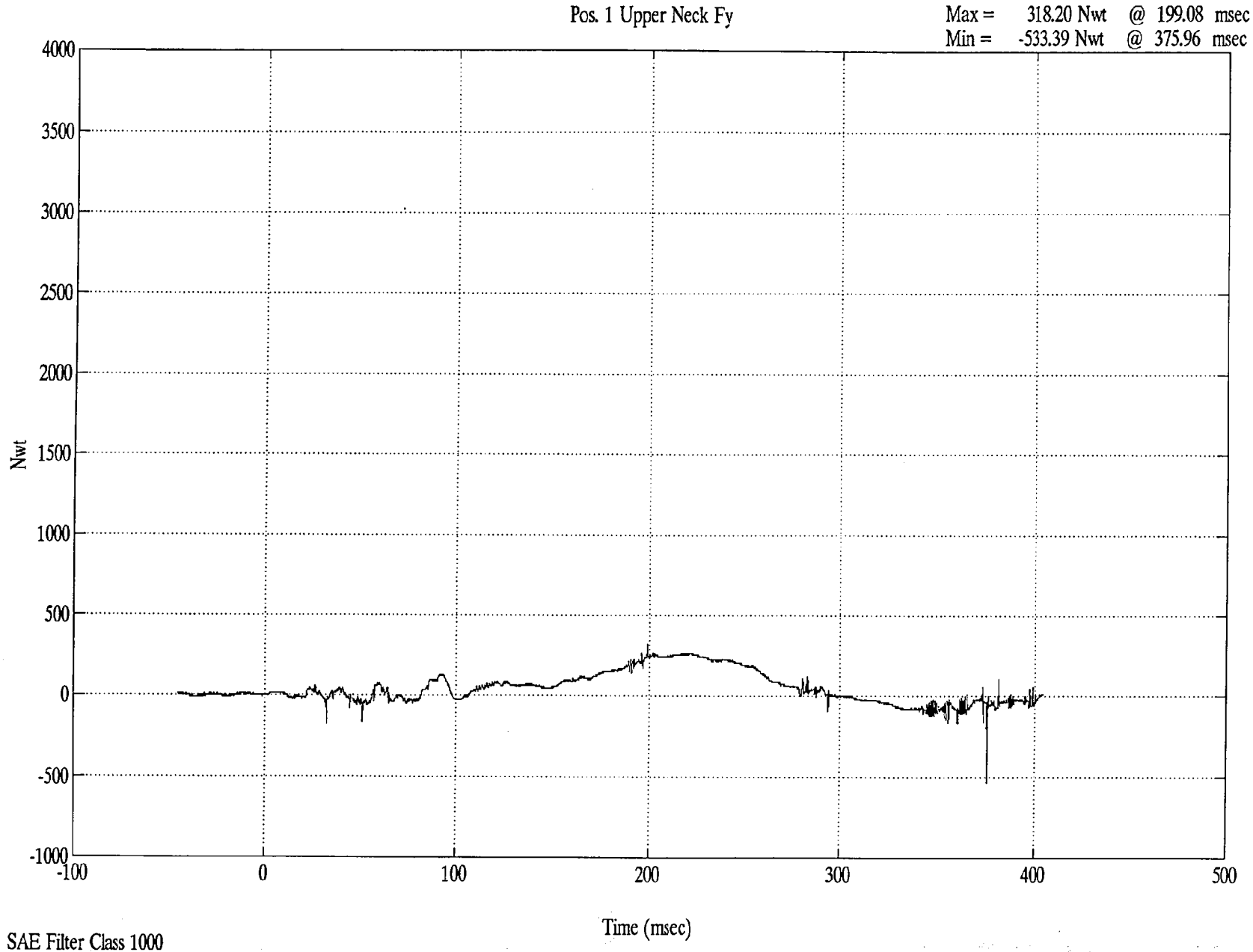
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

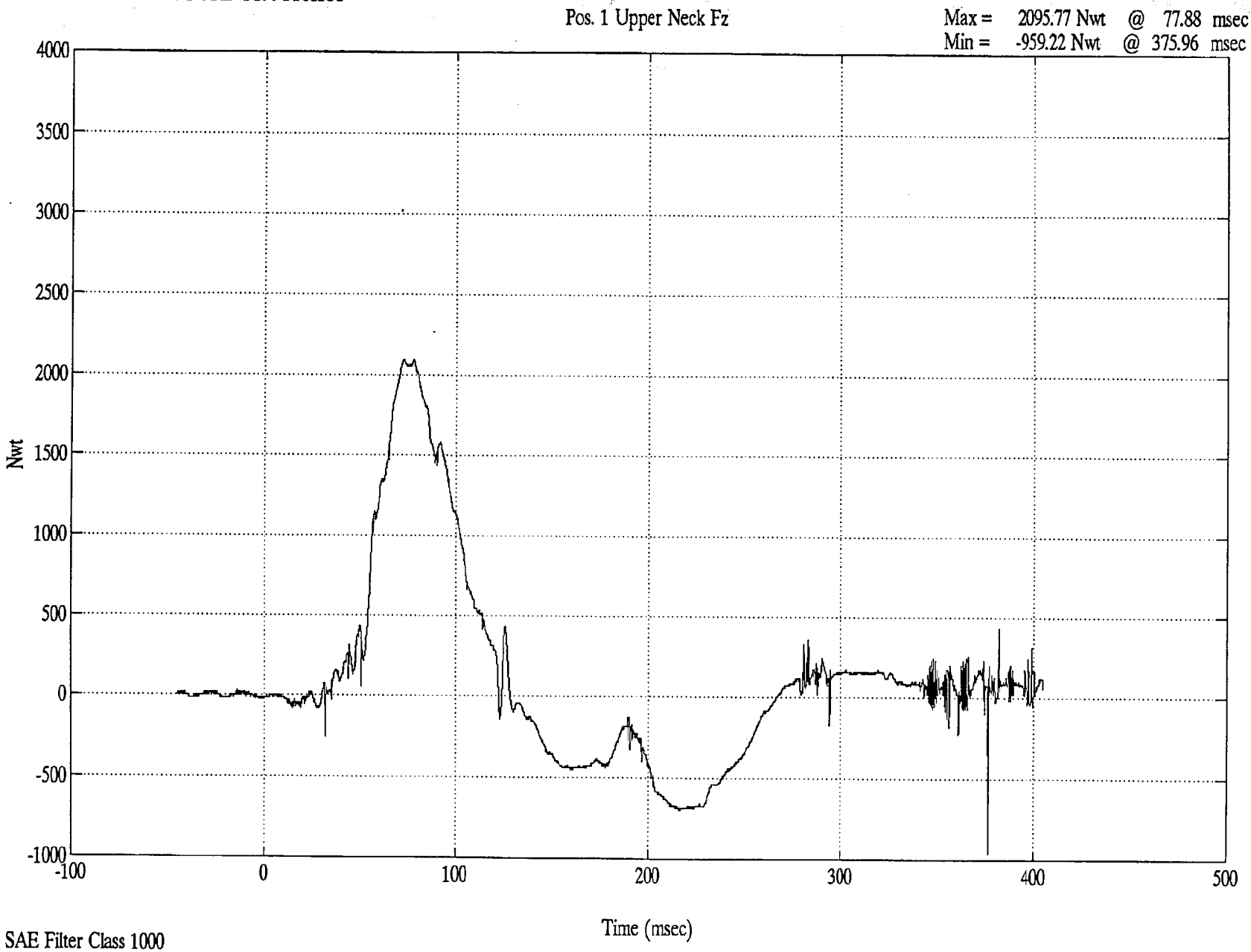


SAE Filter Class 1000

B-24

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

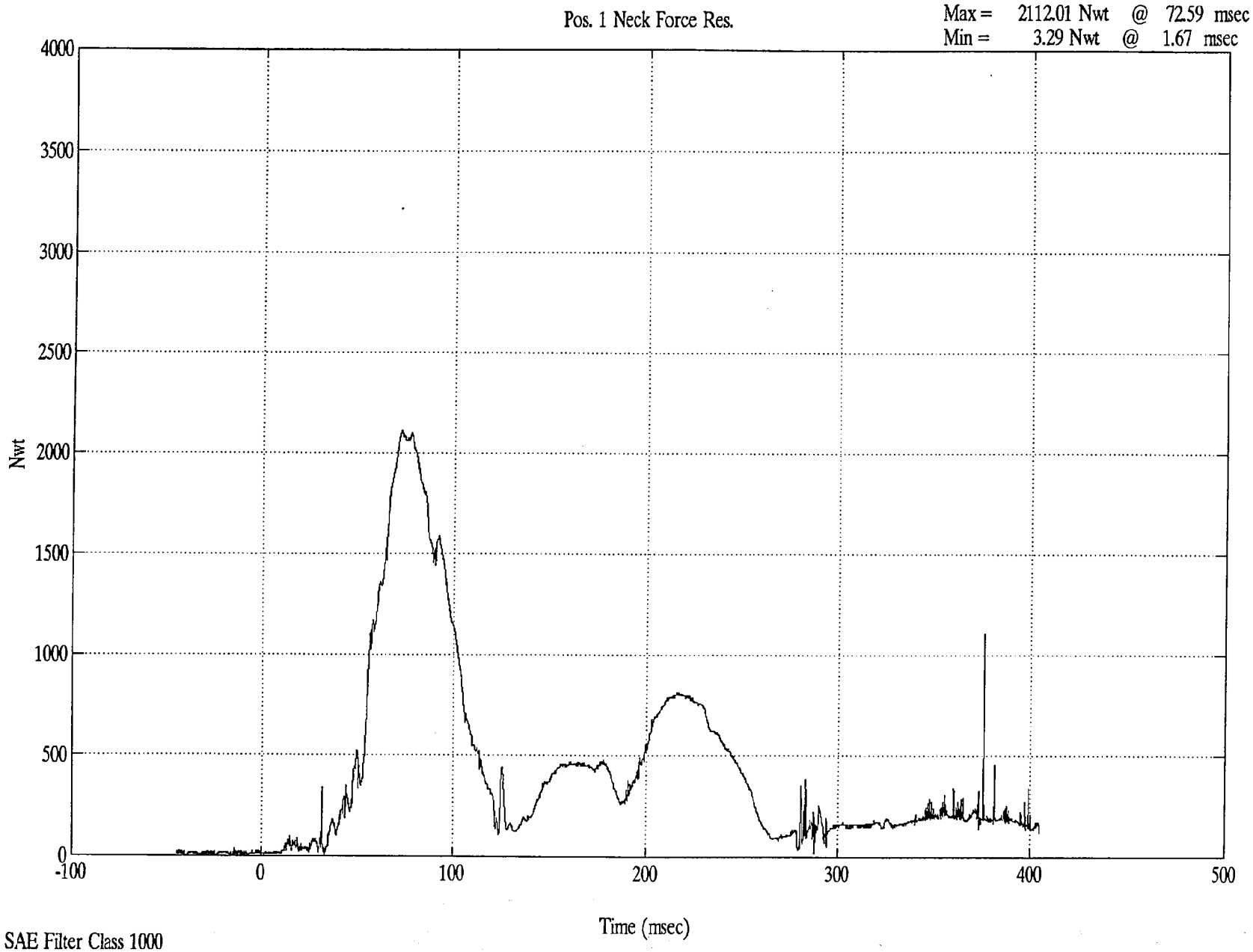


B-25

8313-9

SAE Filter Class 1000

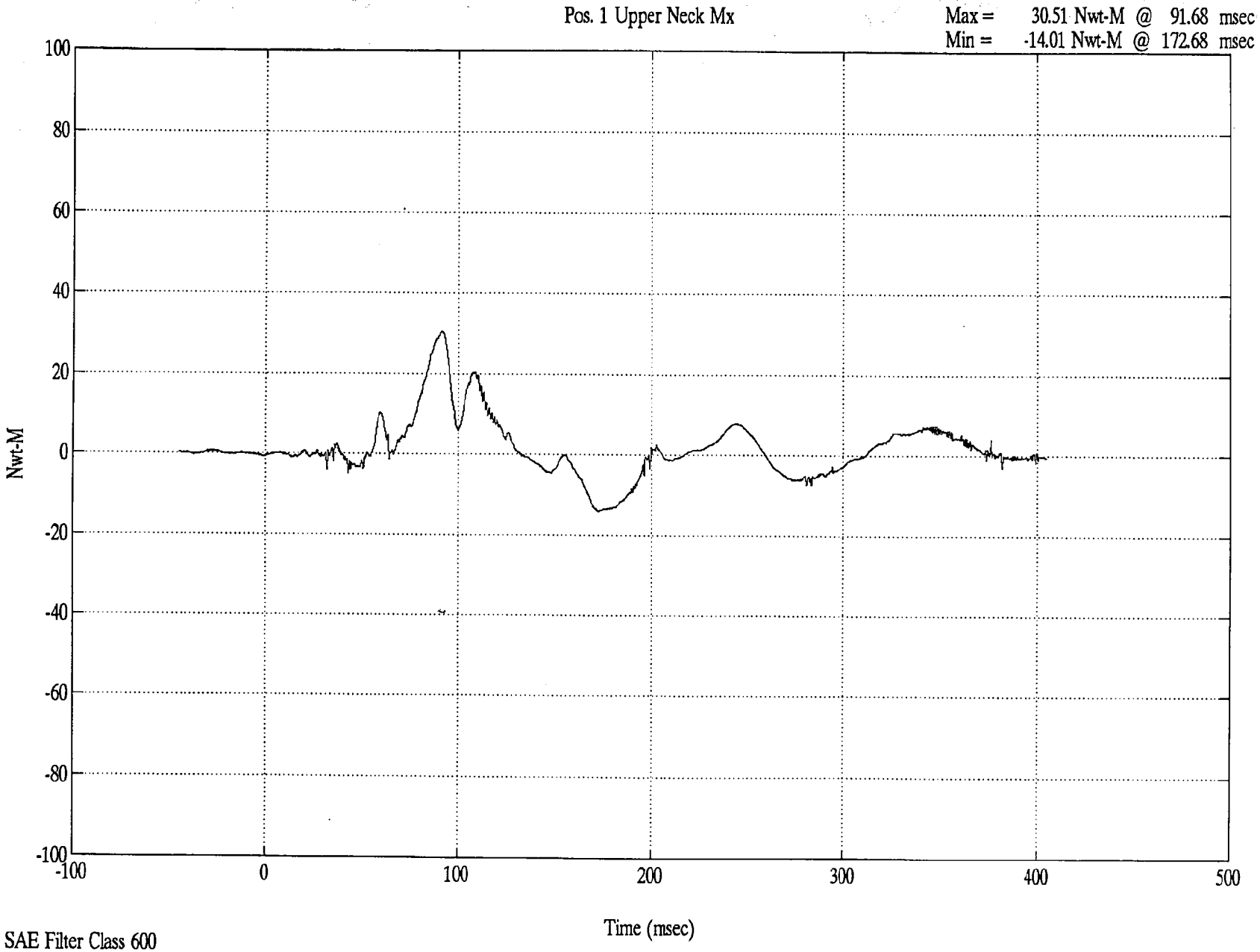
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

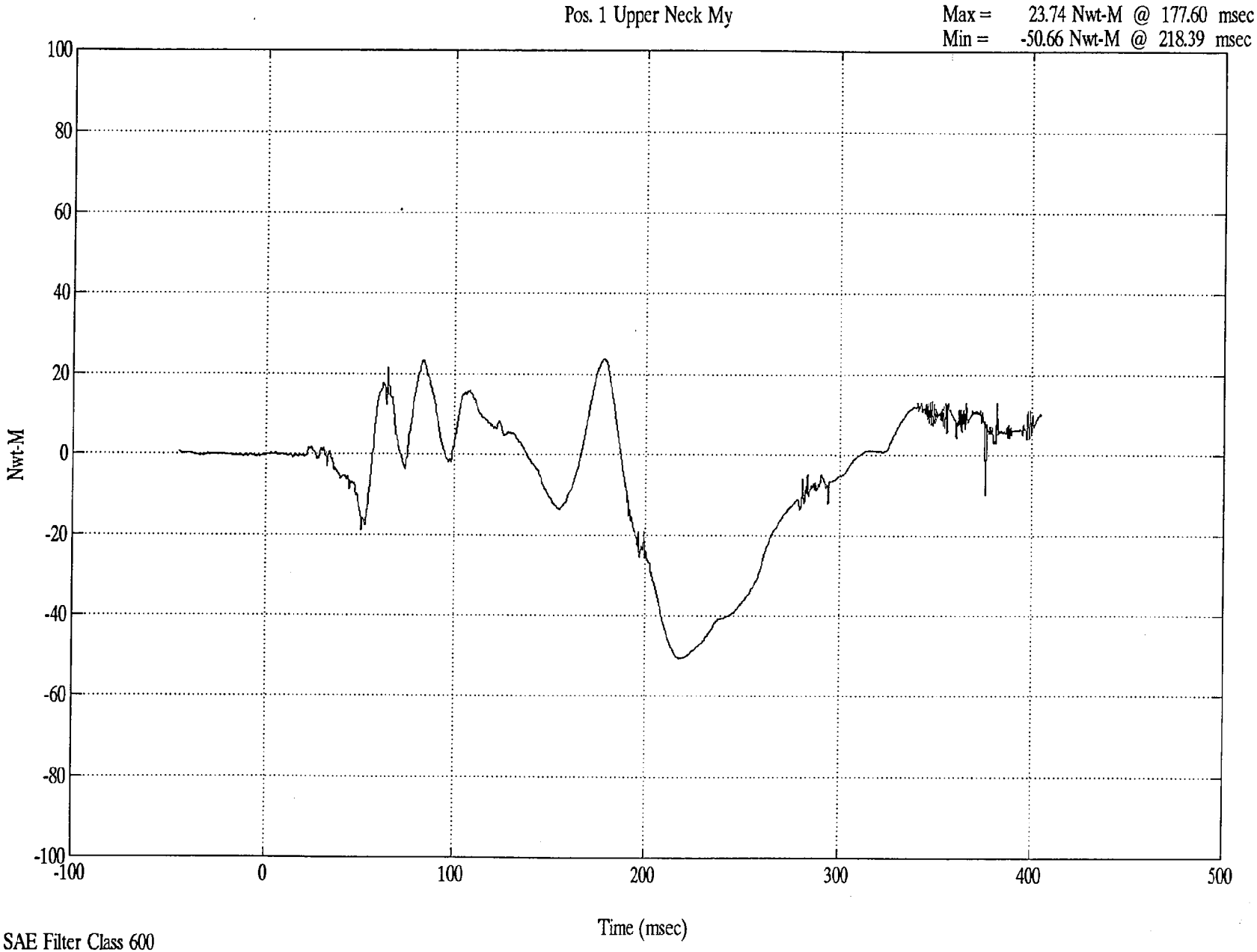


B-27

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP



B-28

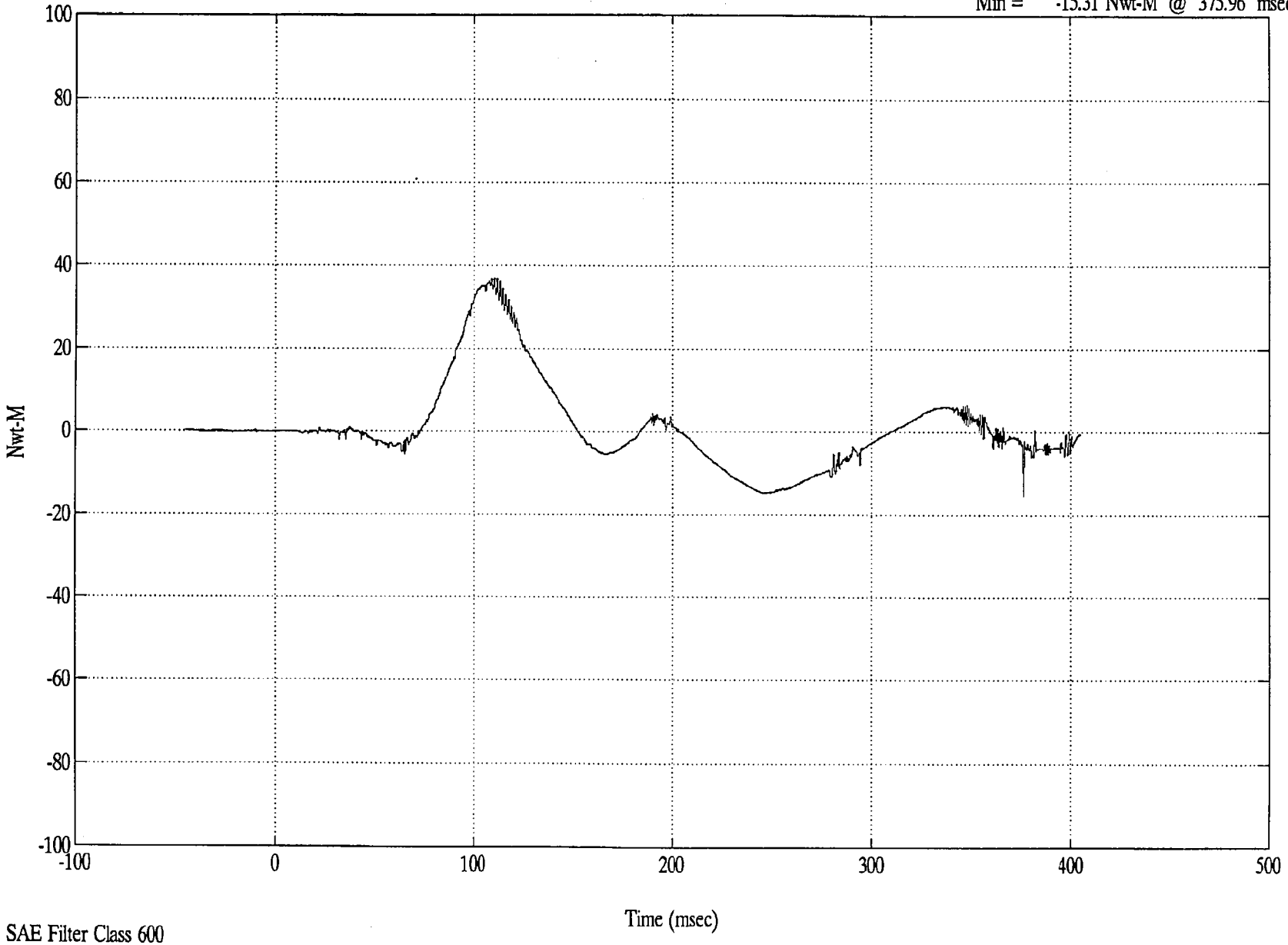
8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

Pos. 1 Upper Neck Mz

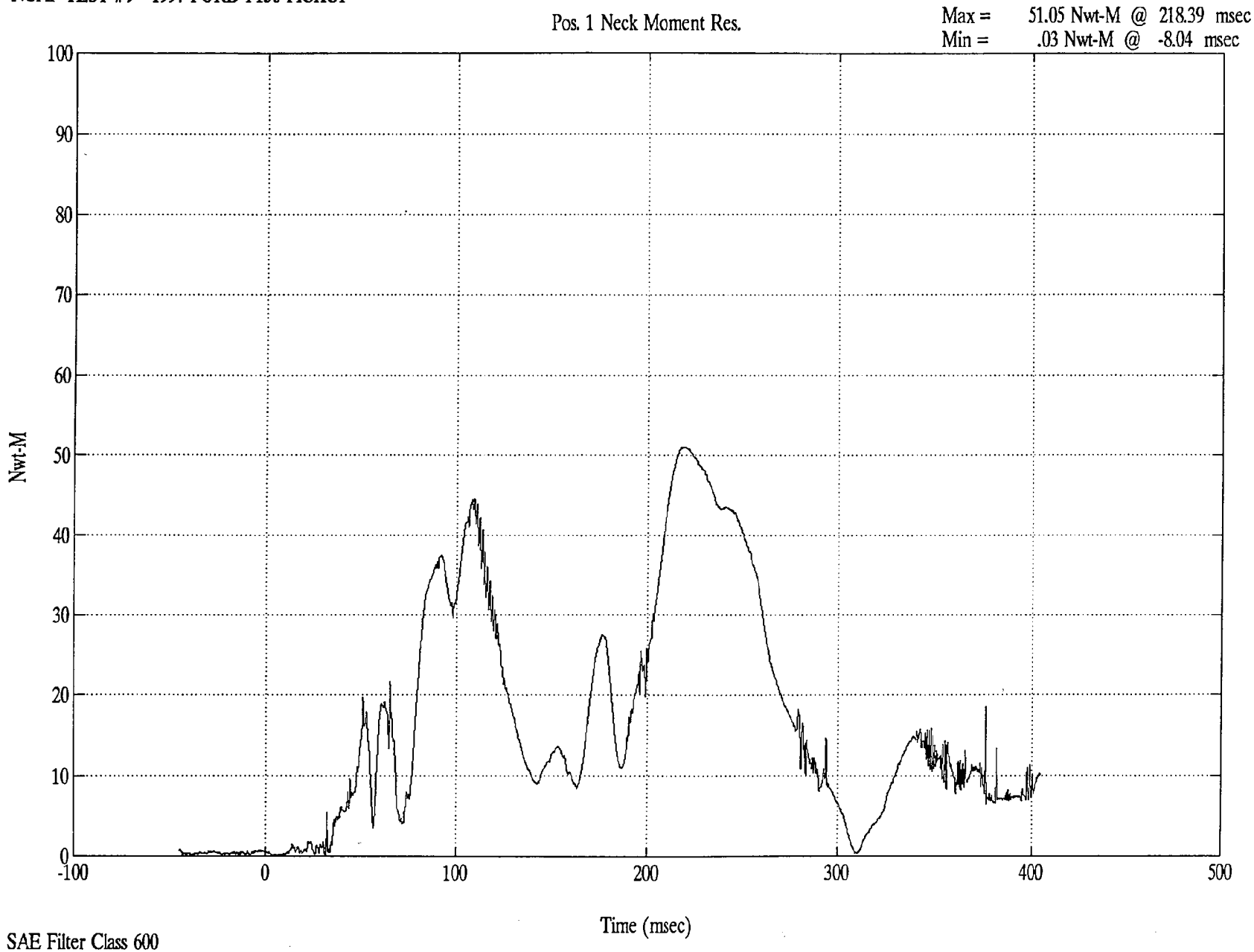
Max = 36.91 Nwt-M @ 110.52 msec
Min = -15.31 Nwt-M @ 375.96 msec



SAE Filter Class 600

8313-9

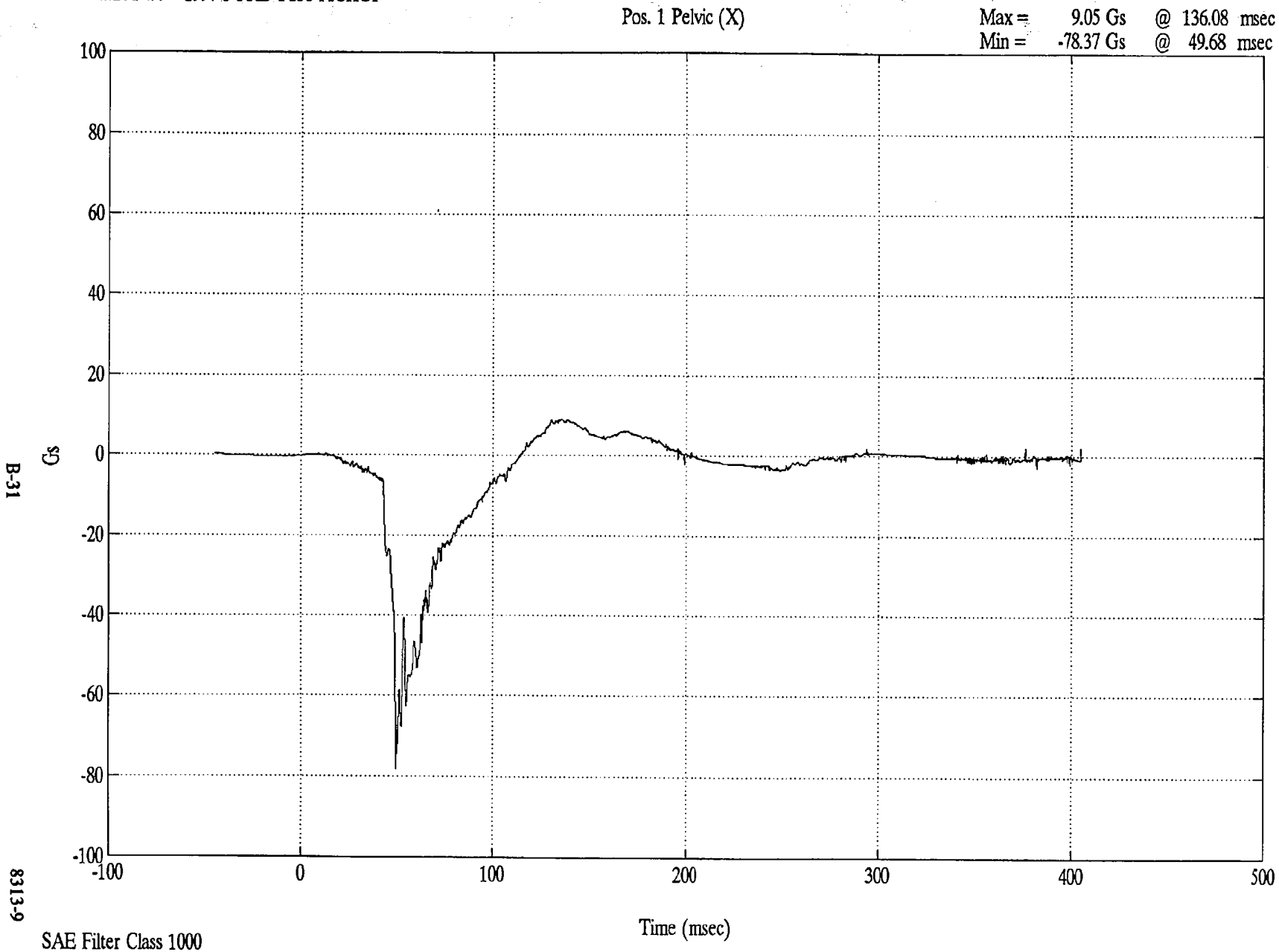
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

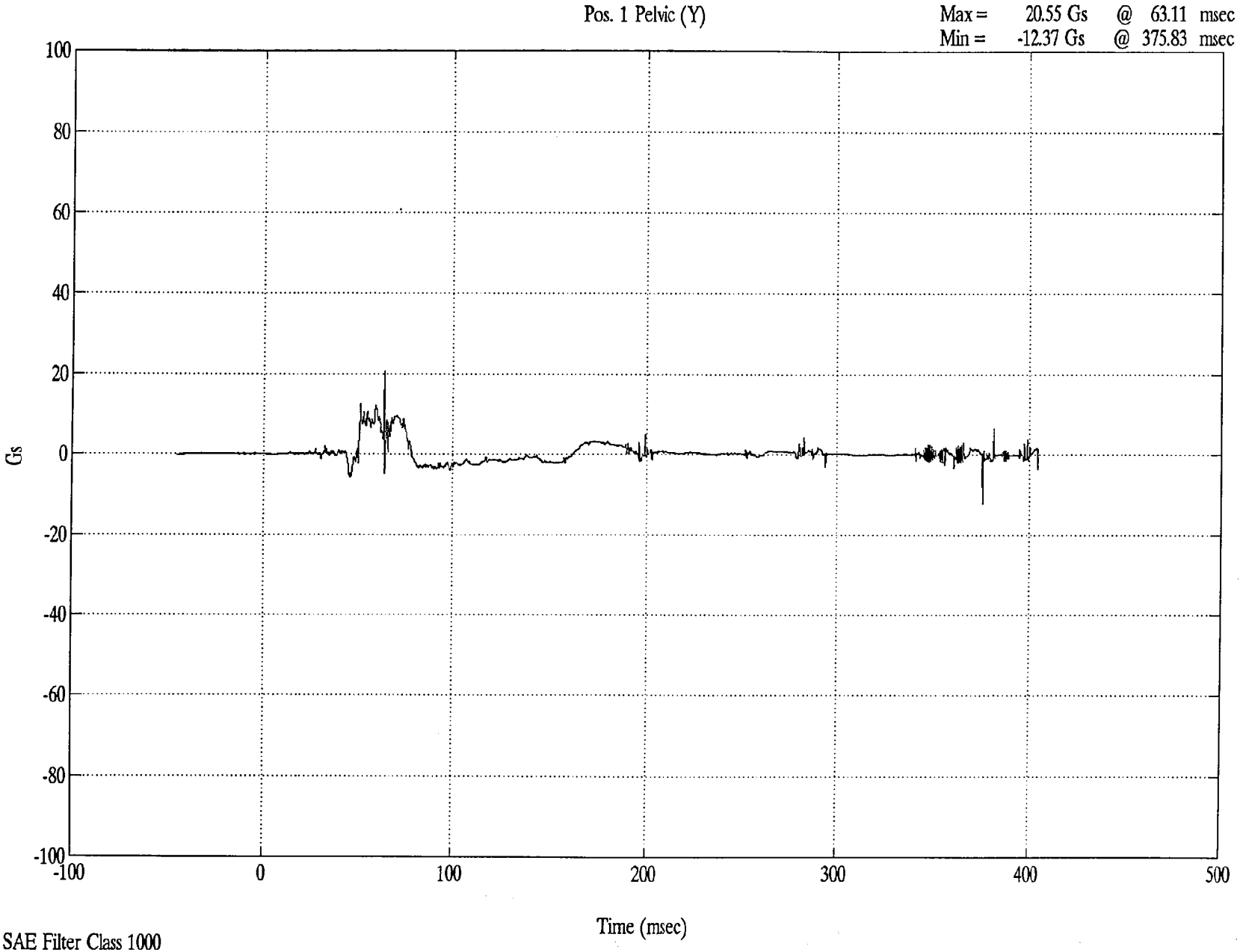


B-31

8313-9

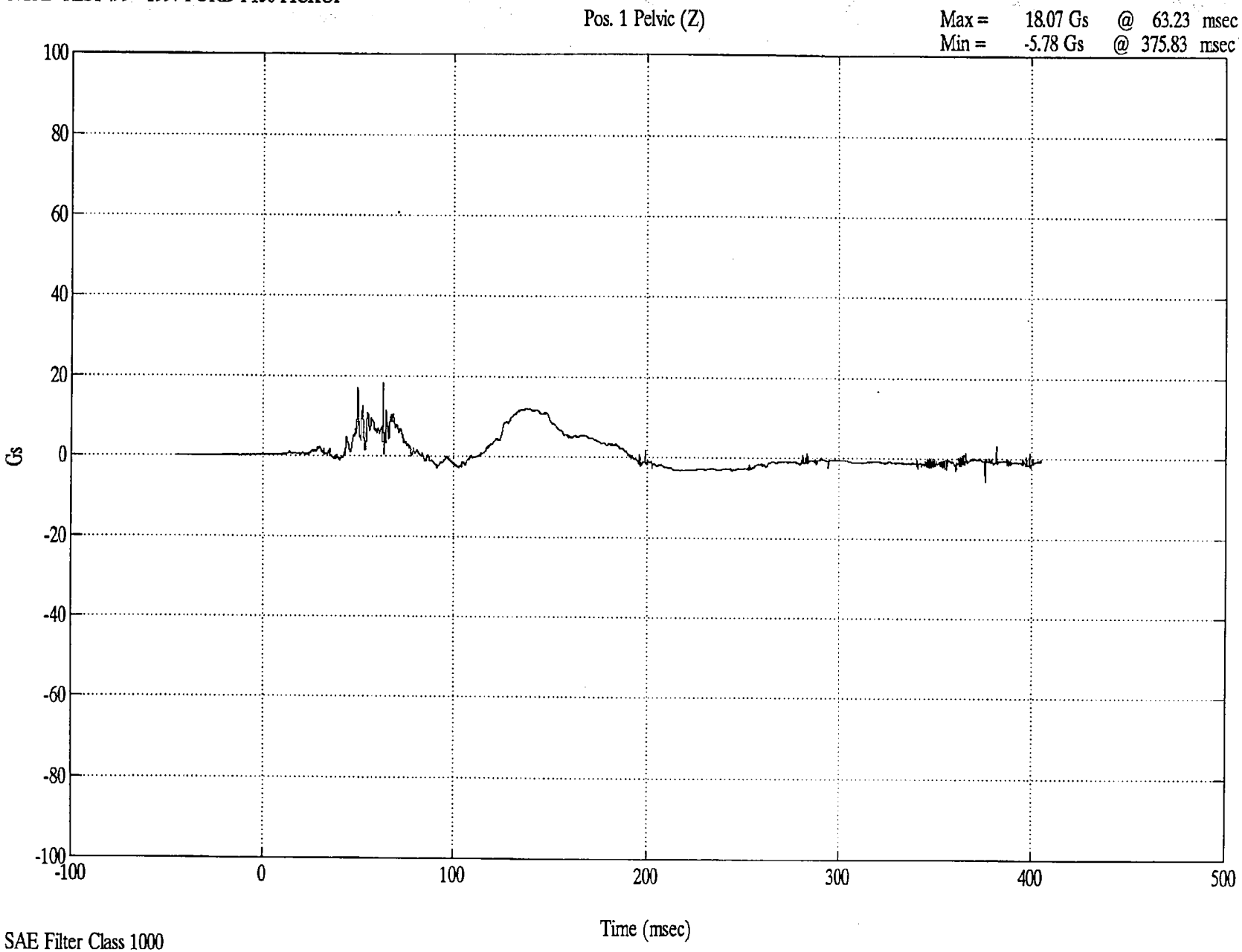
SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

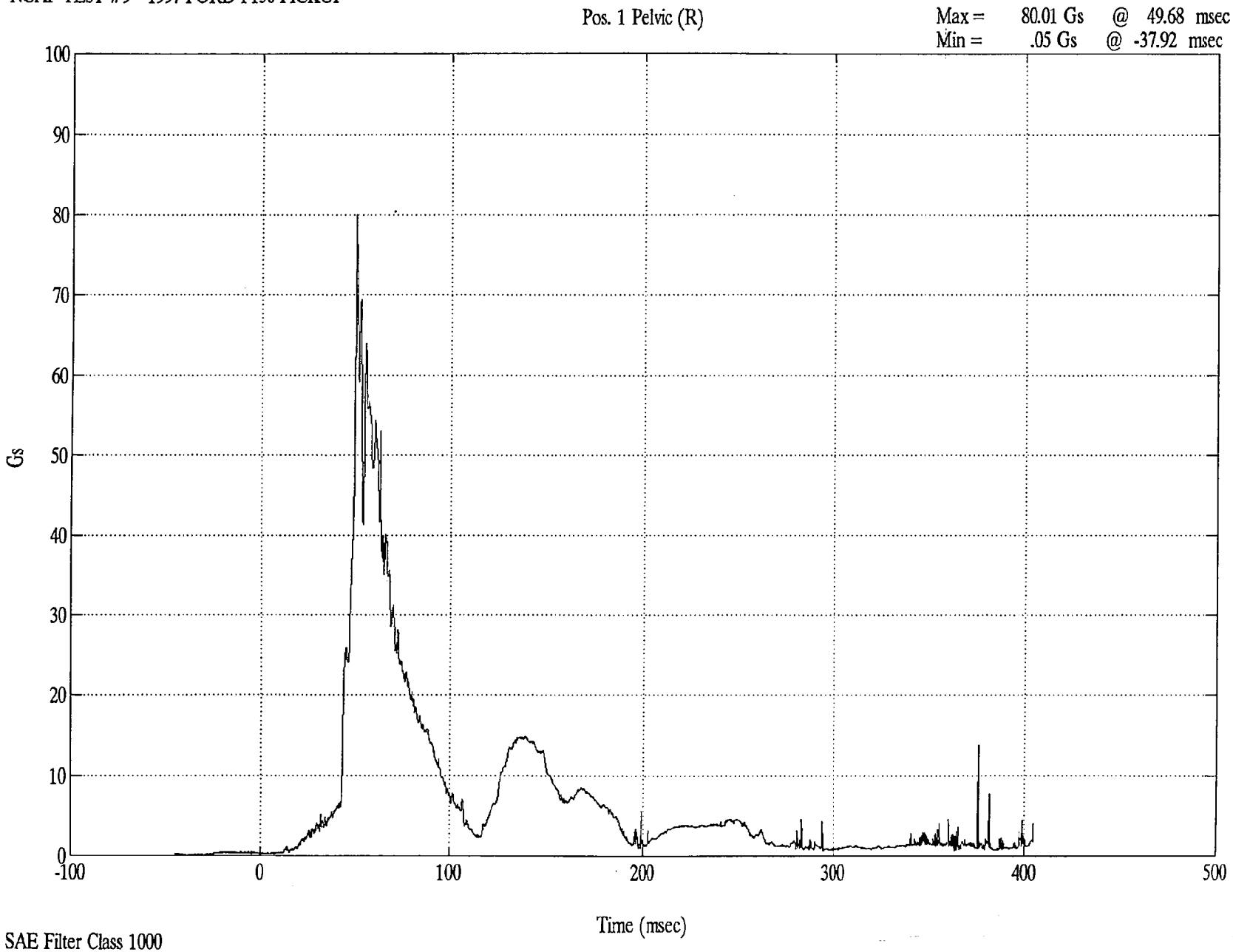


B-33

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP



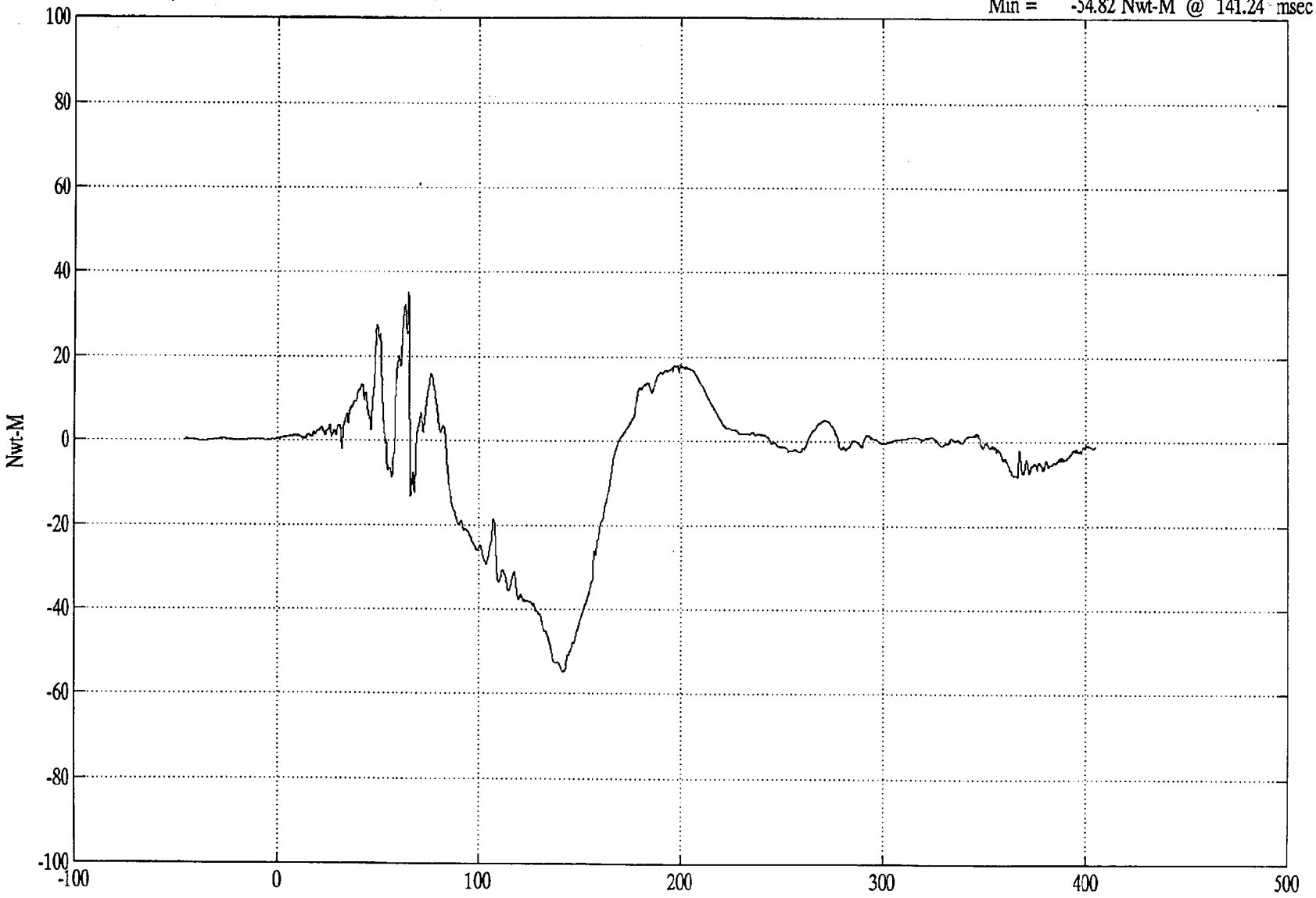
SAE Filter Class 1000

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

P1 Lt Upper Tibia Mx

Max = 35.13 Nwt-M @ 65.27 msec
Min = -54.82 Nwt-M @ 141.24 msec

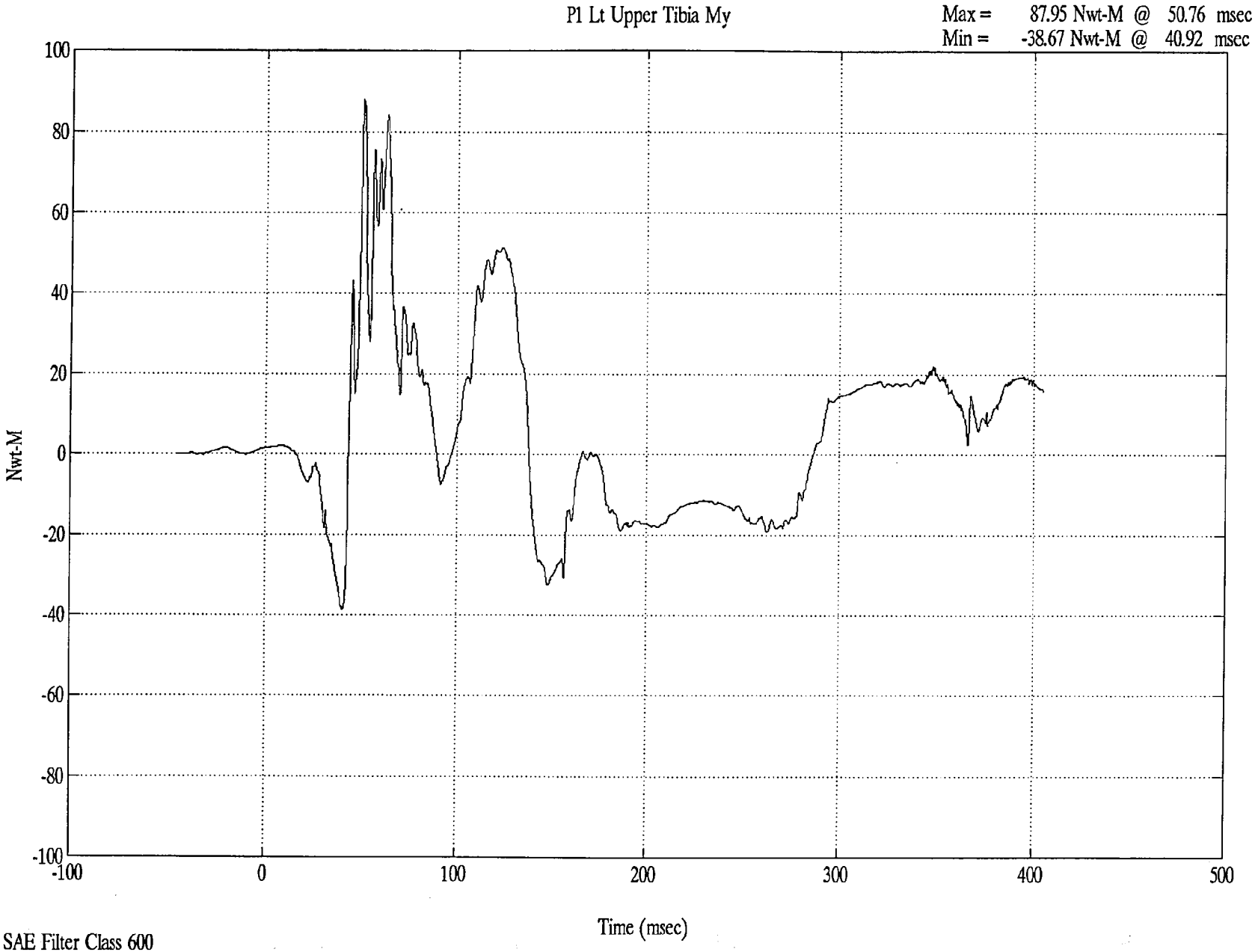


SAE Filter Class 600

B-35

8313-9

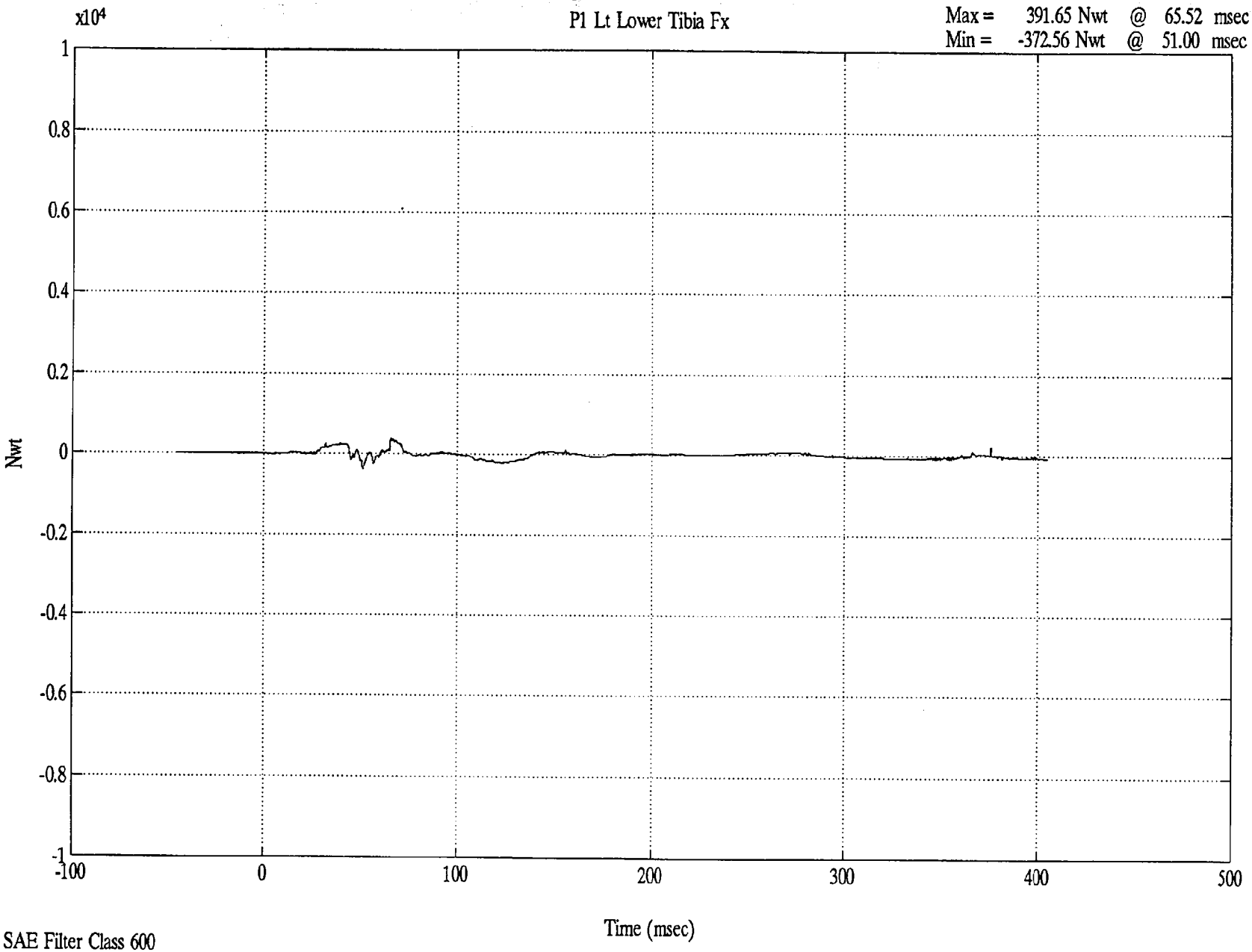
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

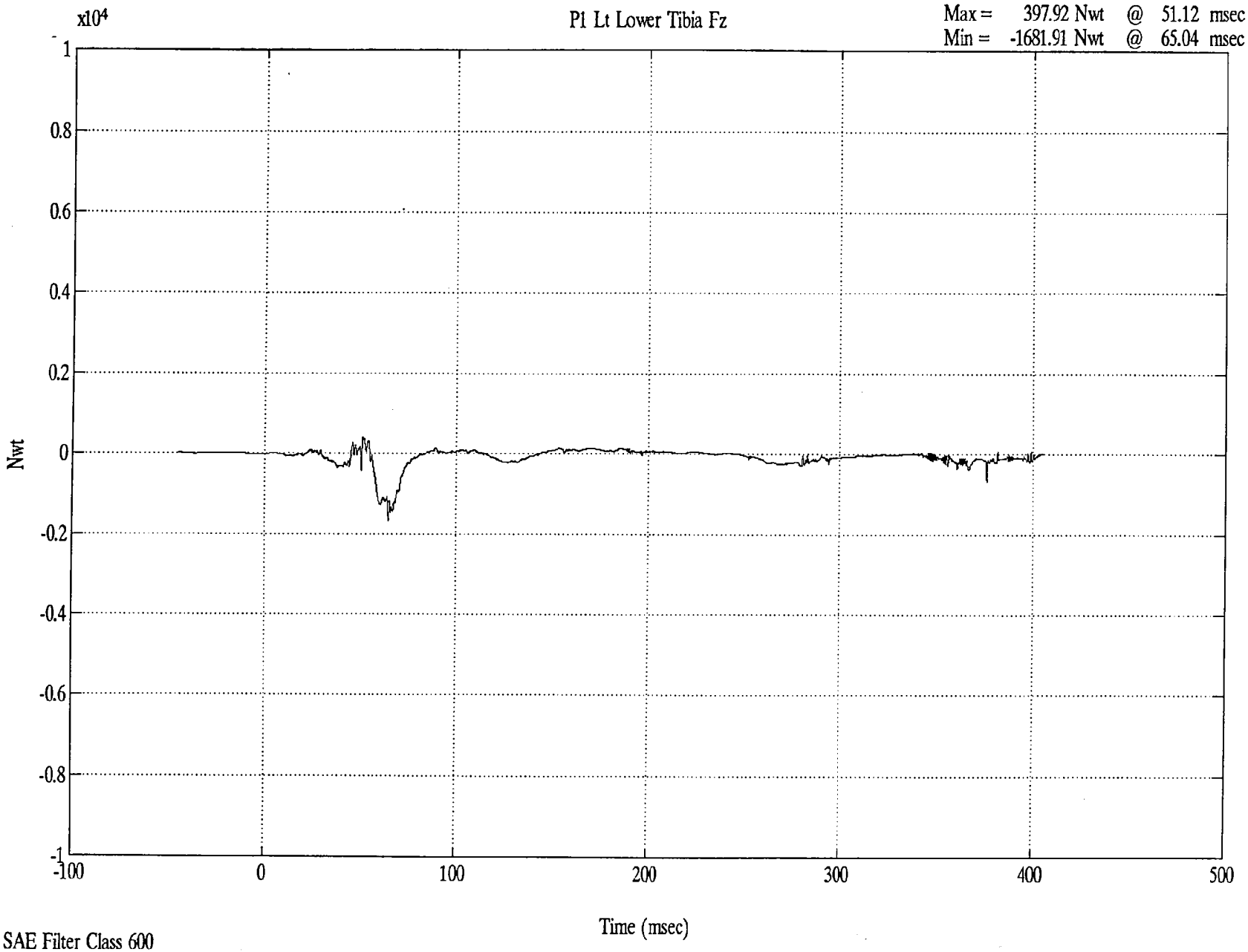


B-37

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

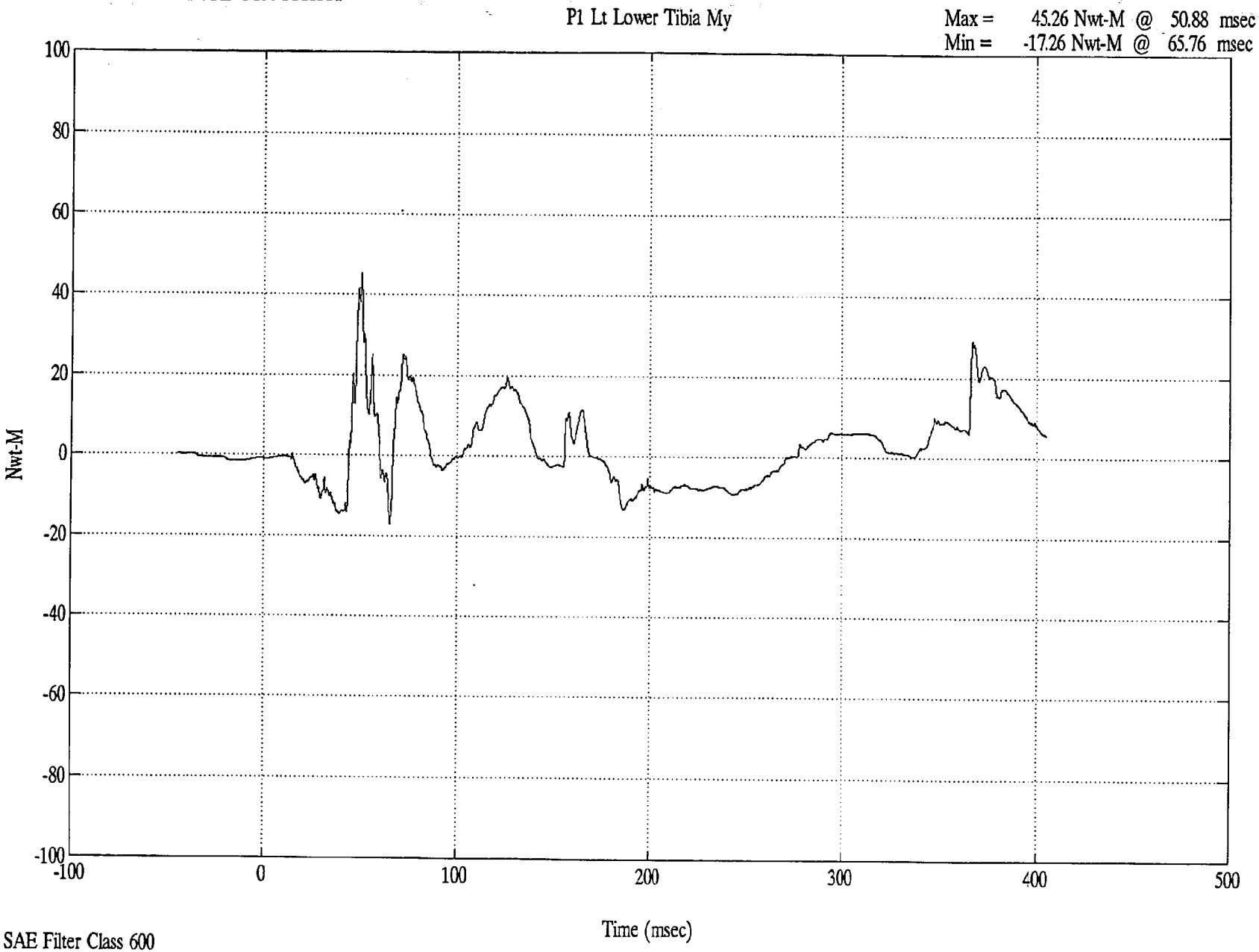


B-38

8313-9

SAE Filter Class 600

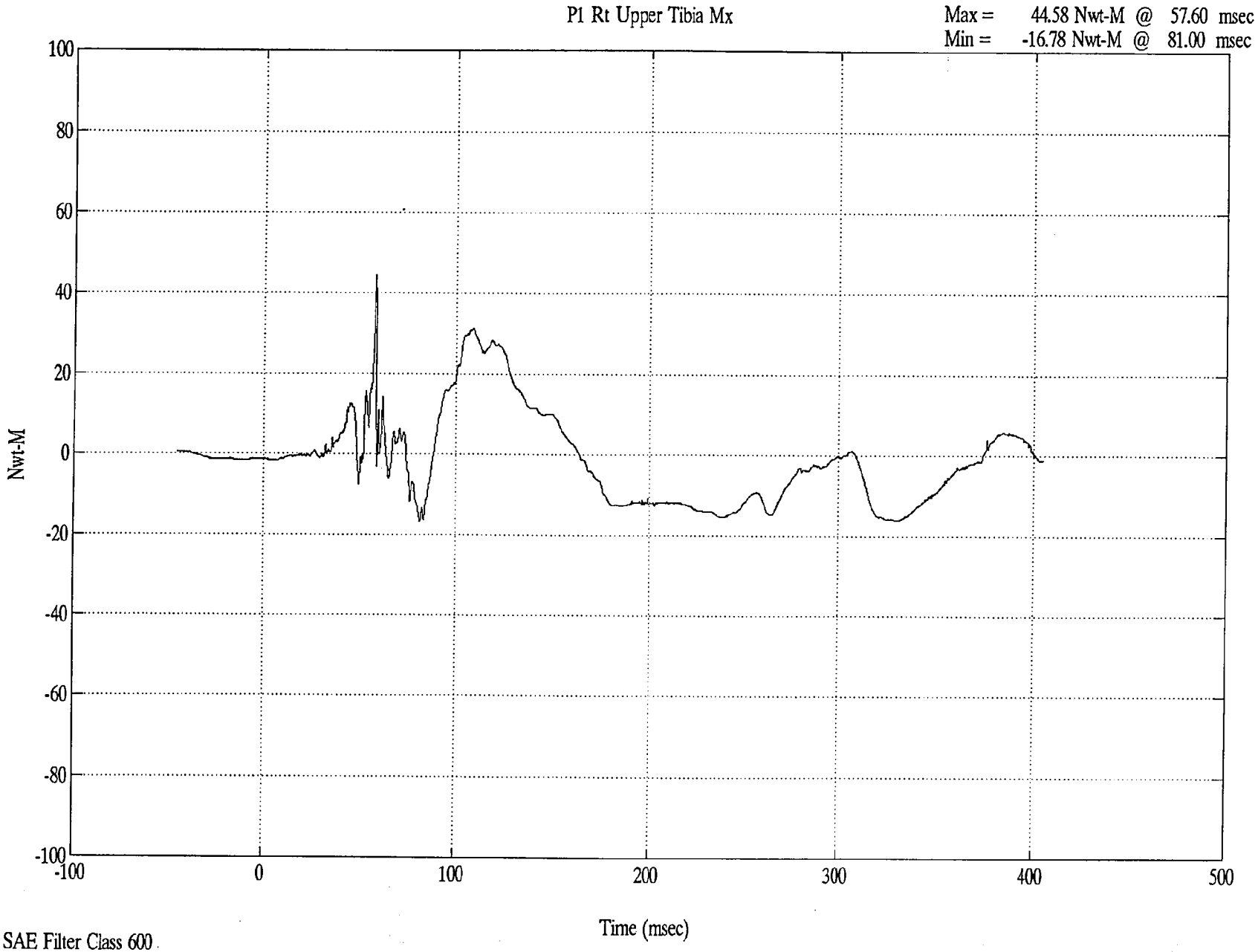
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

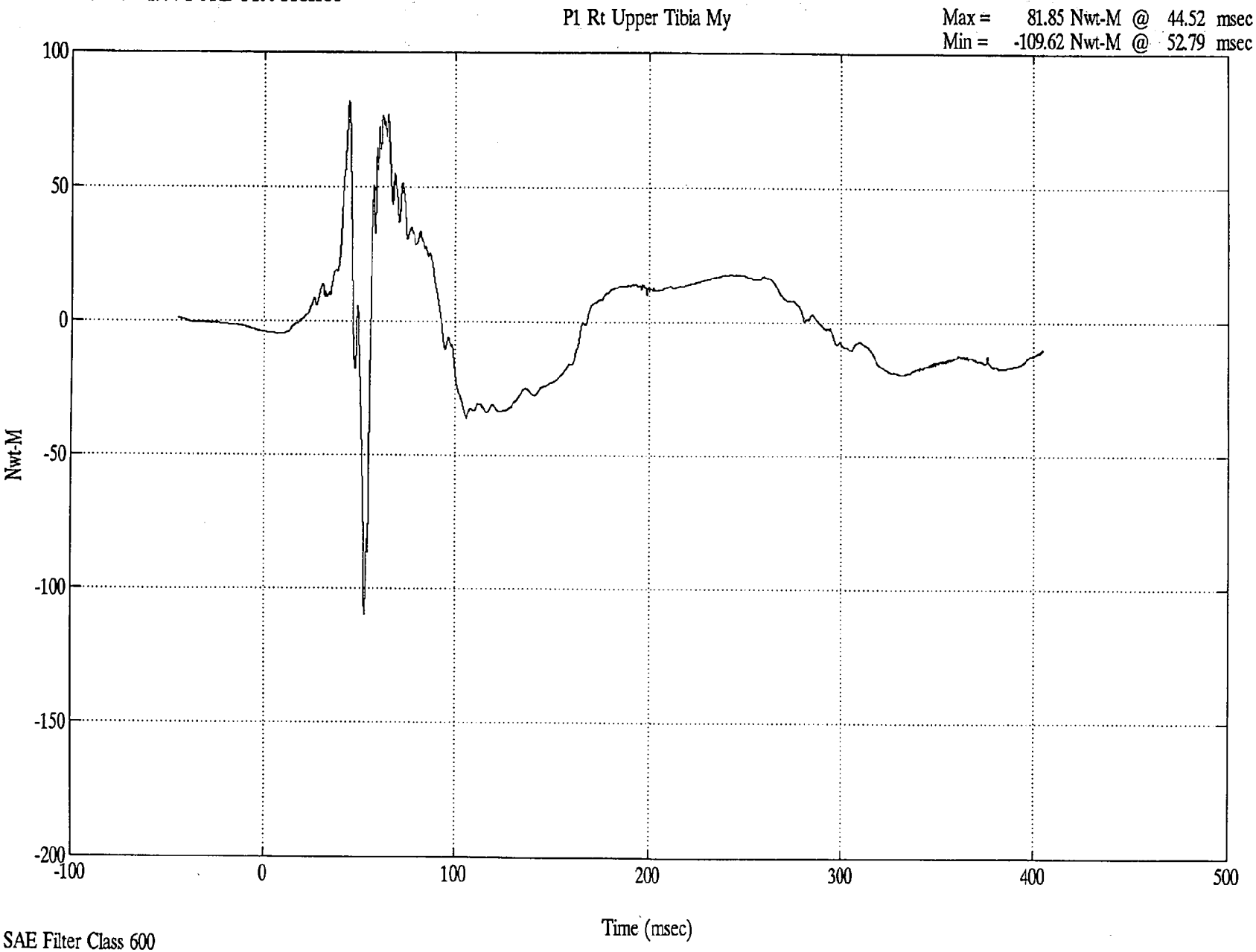
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

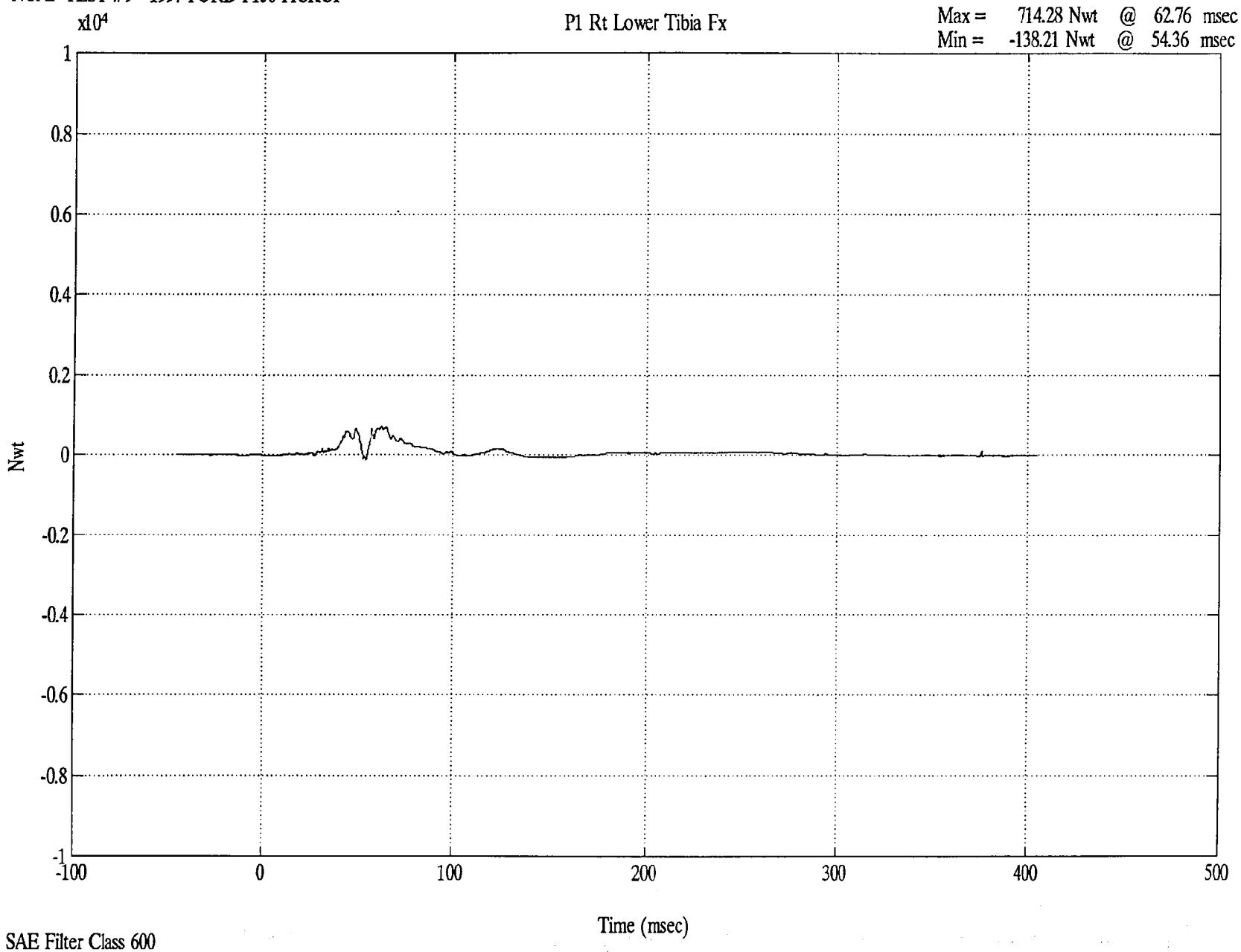
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

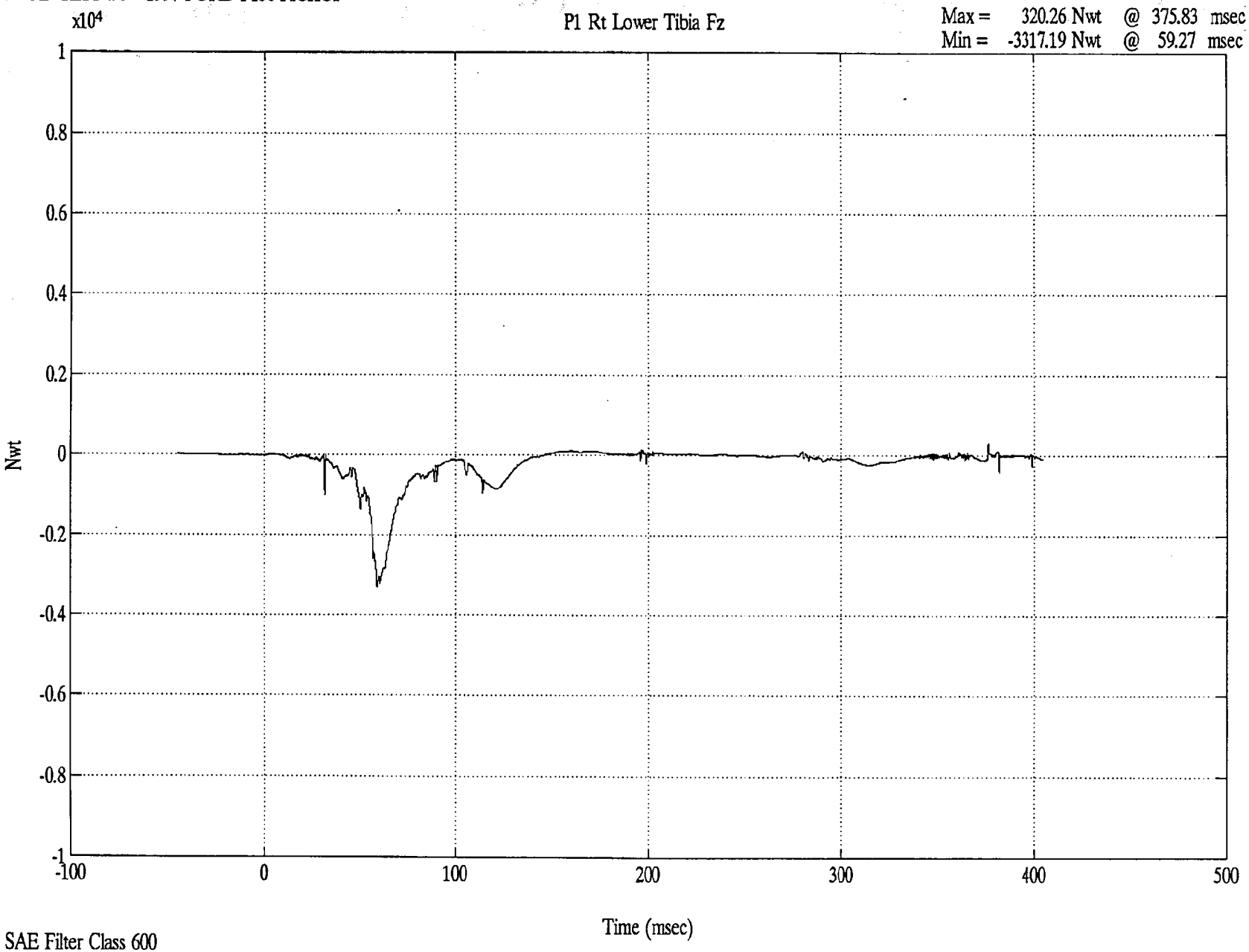
8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

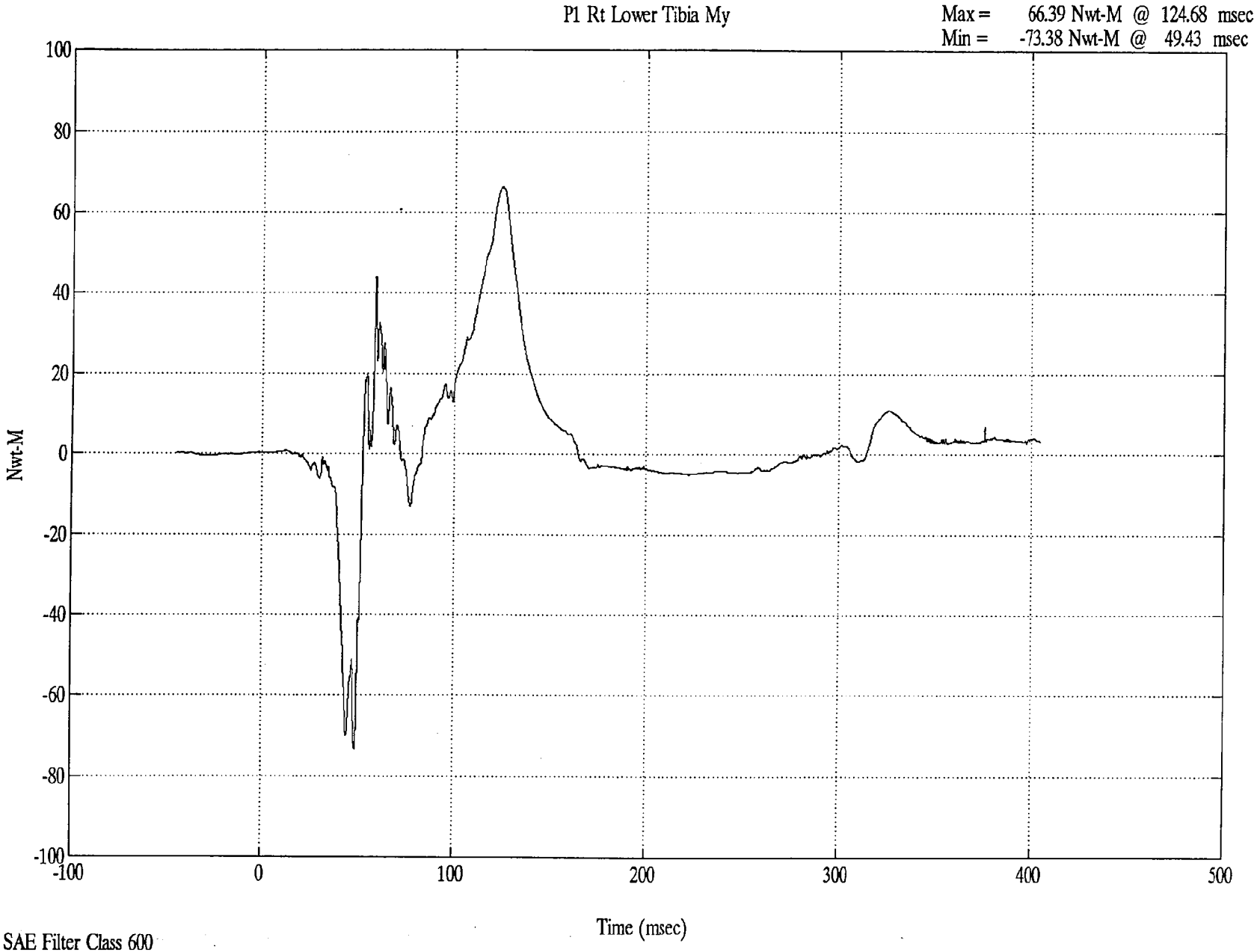


B-43

8313-9

SAE Filter Class 600

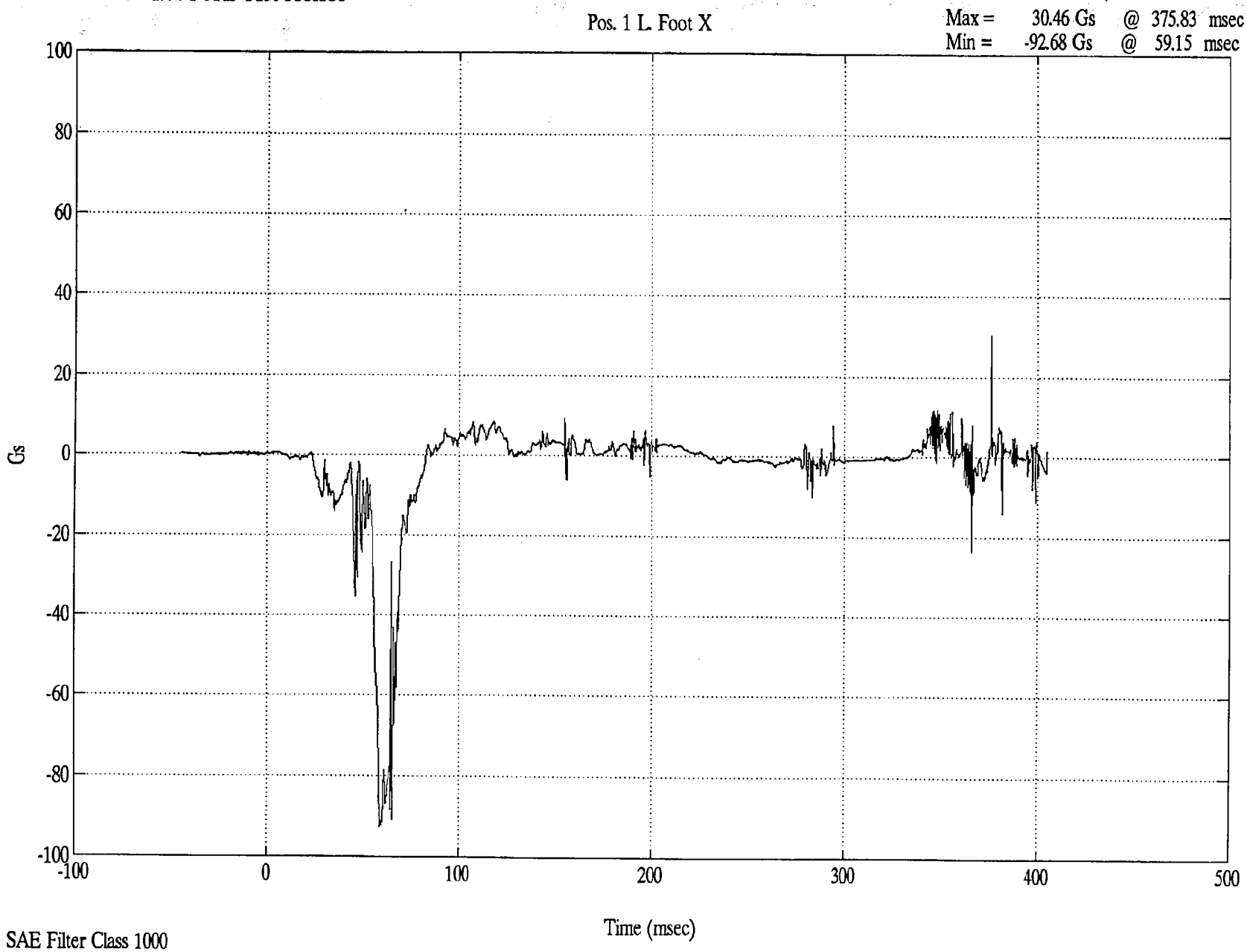
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

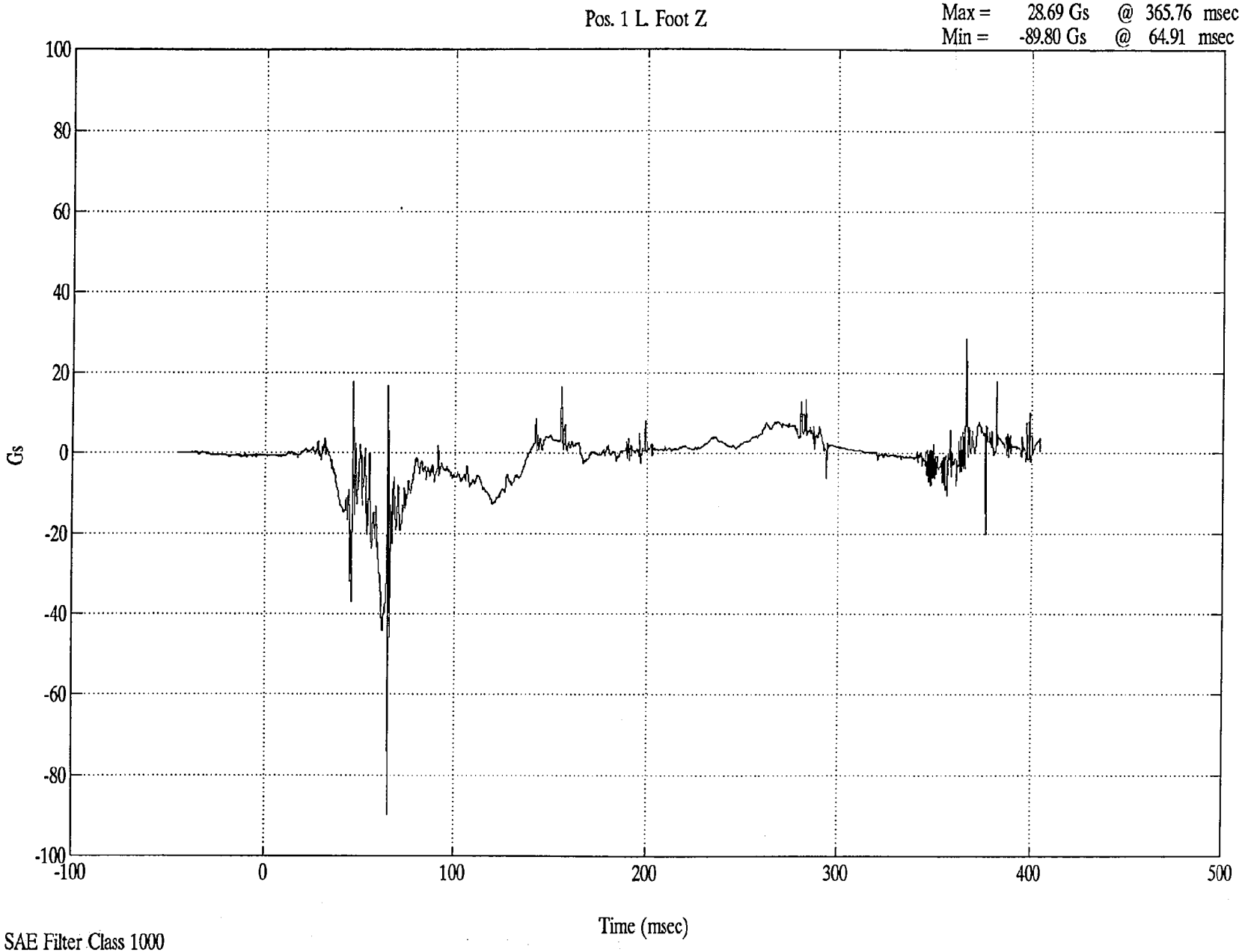


B-45

8313-9

SAE Filter Class 1000

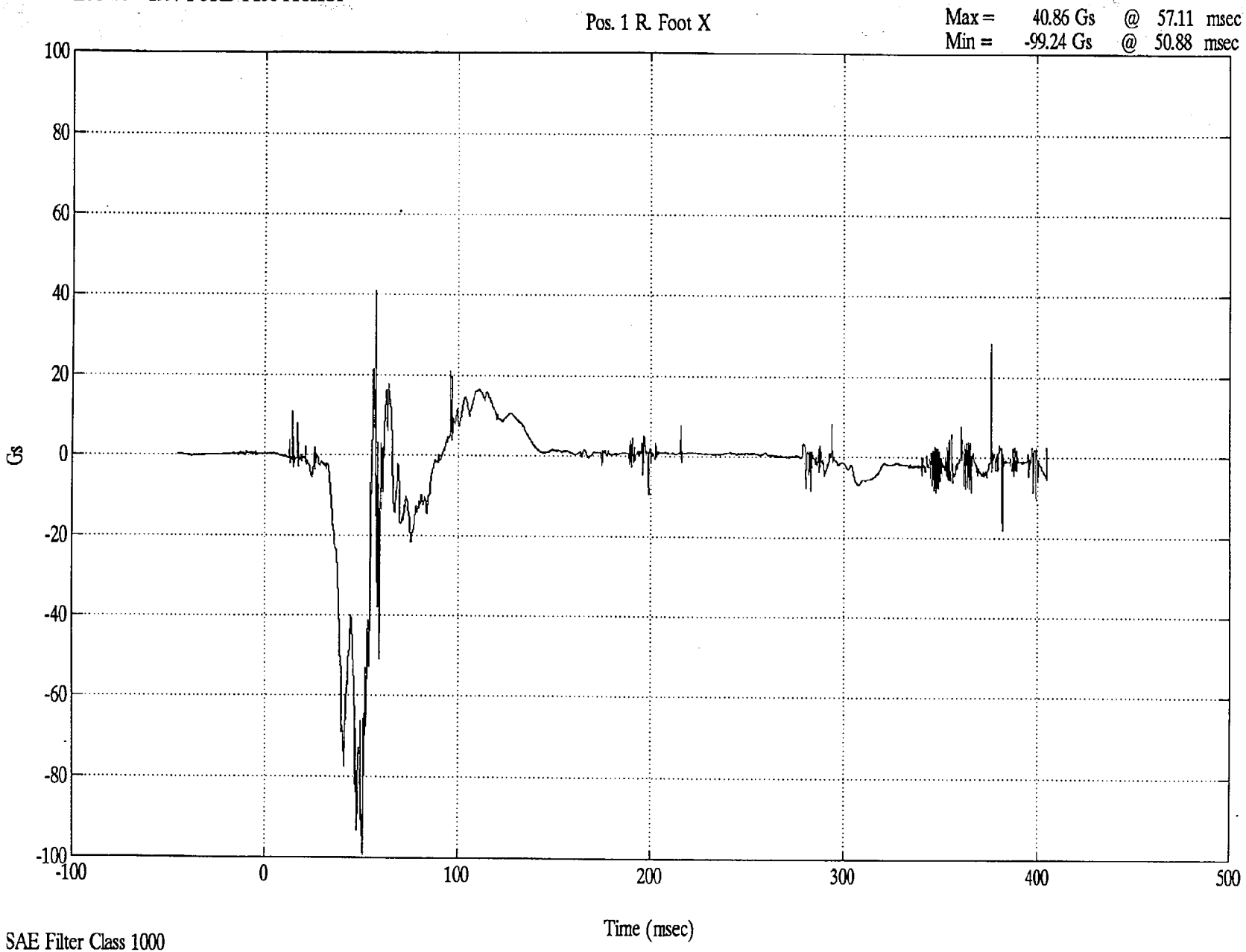
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

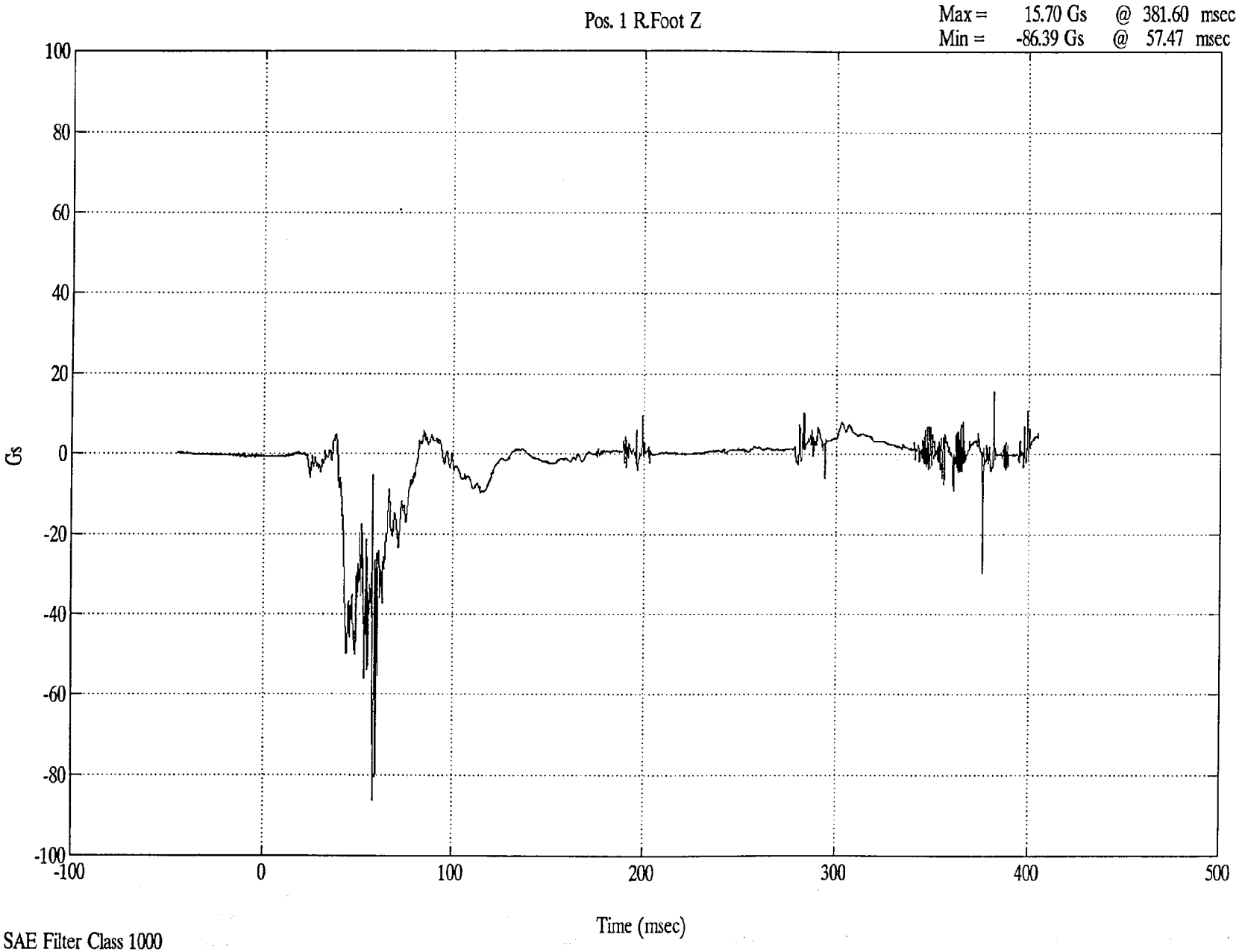
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

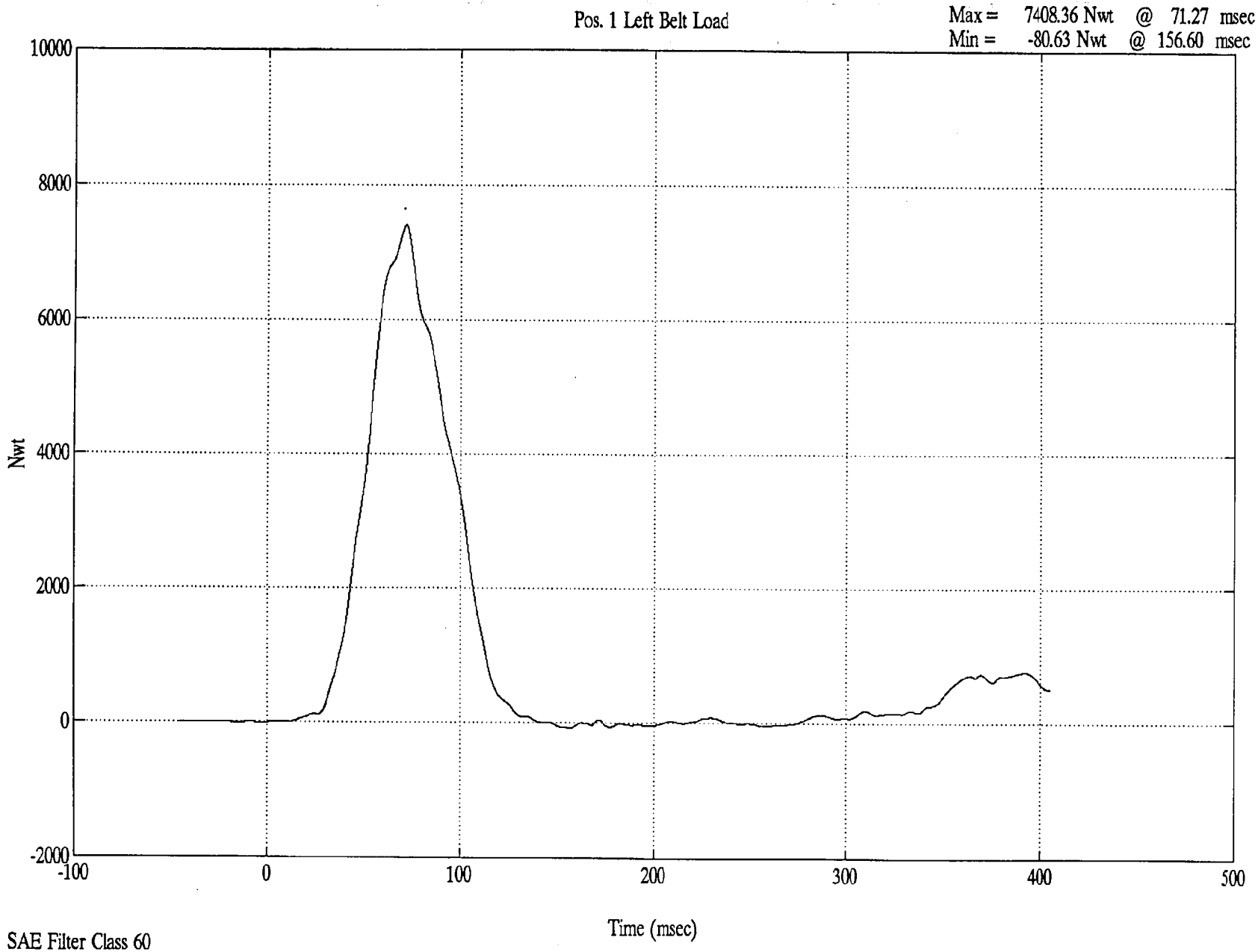
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

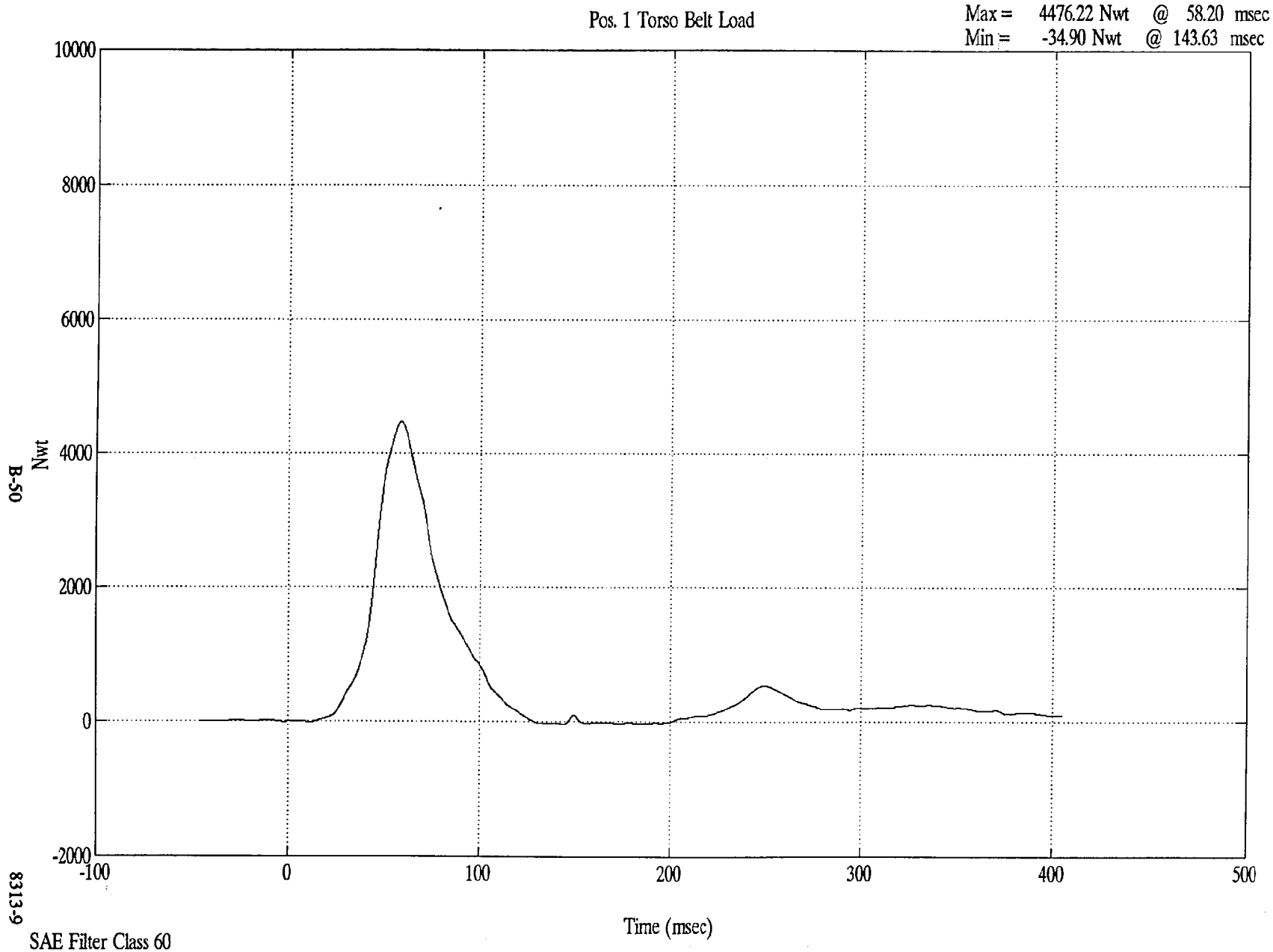
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

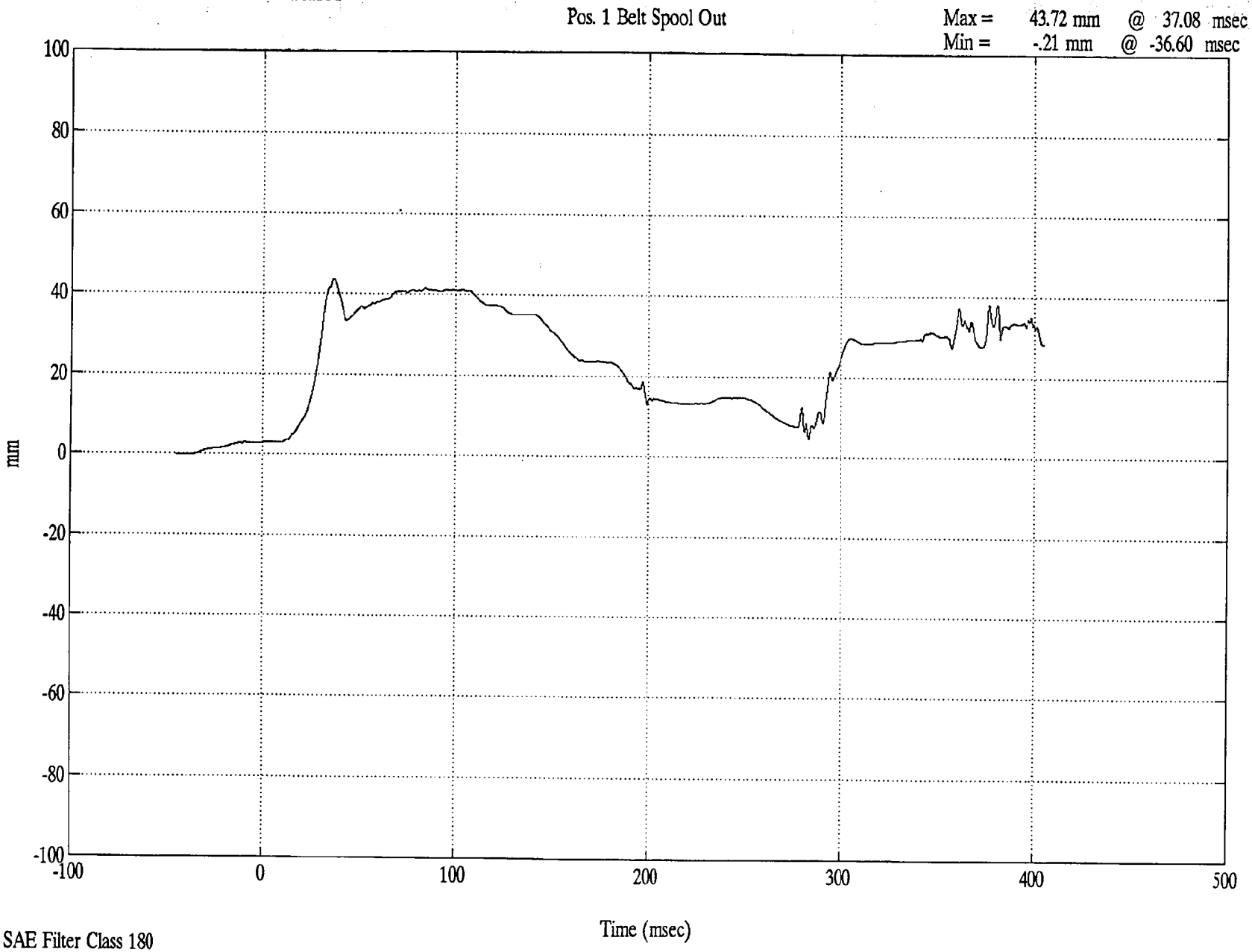


B-50

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

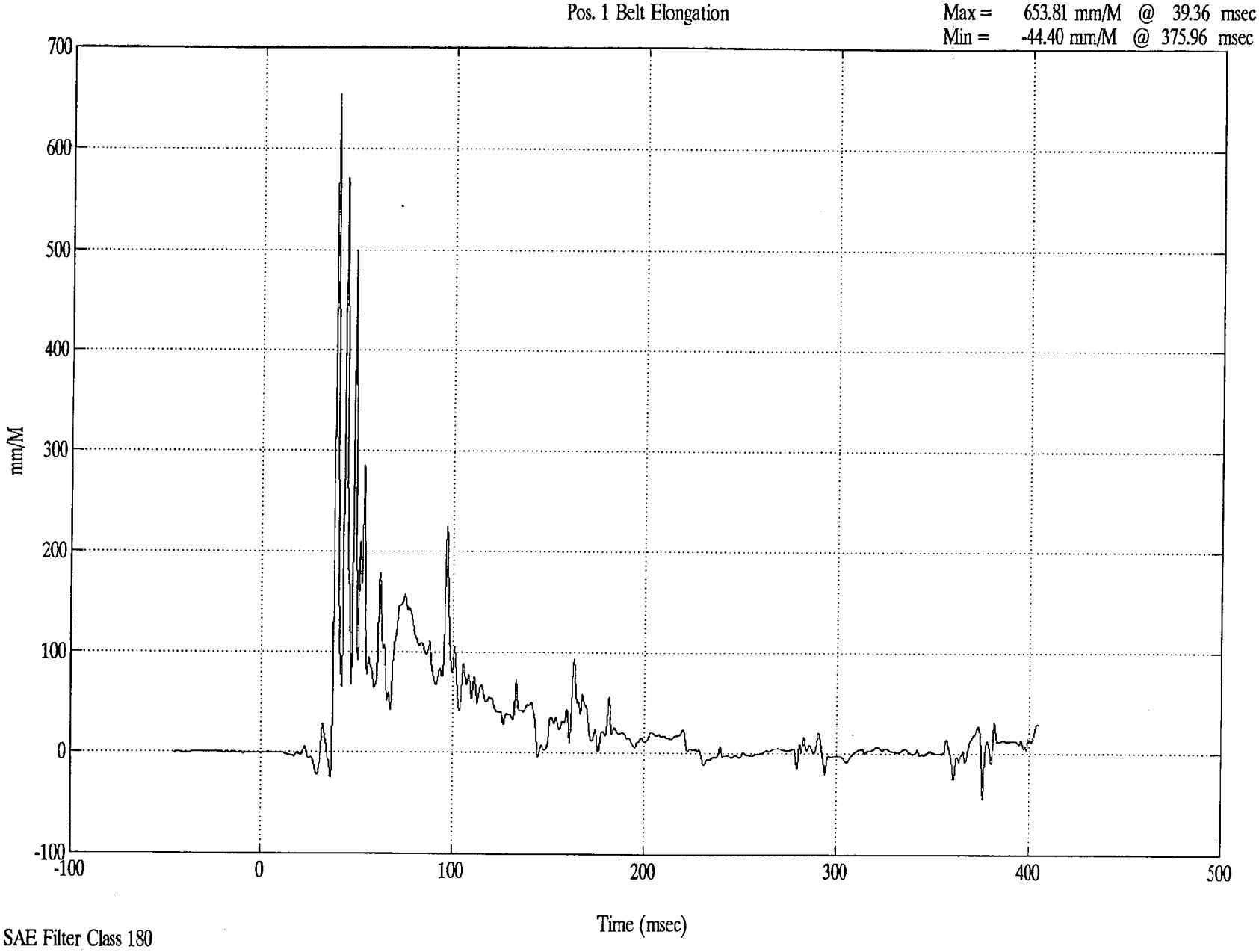


B-51

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

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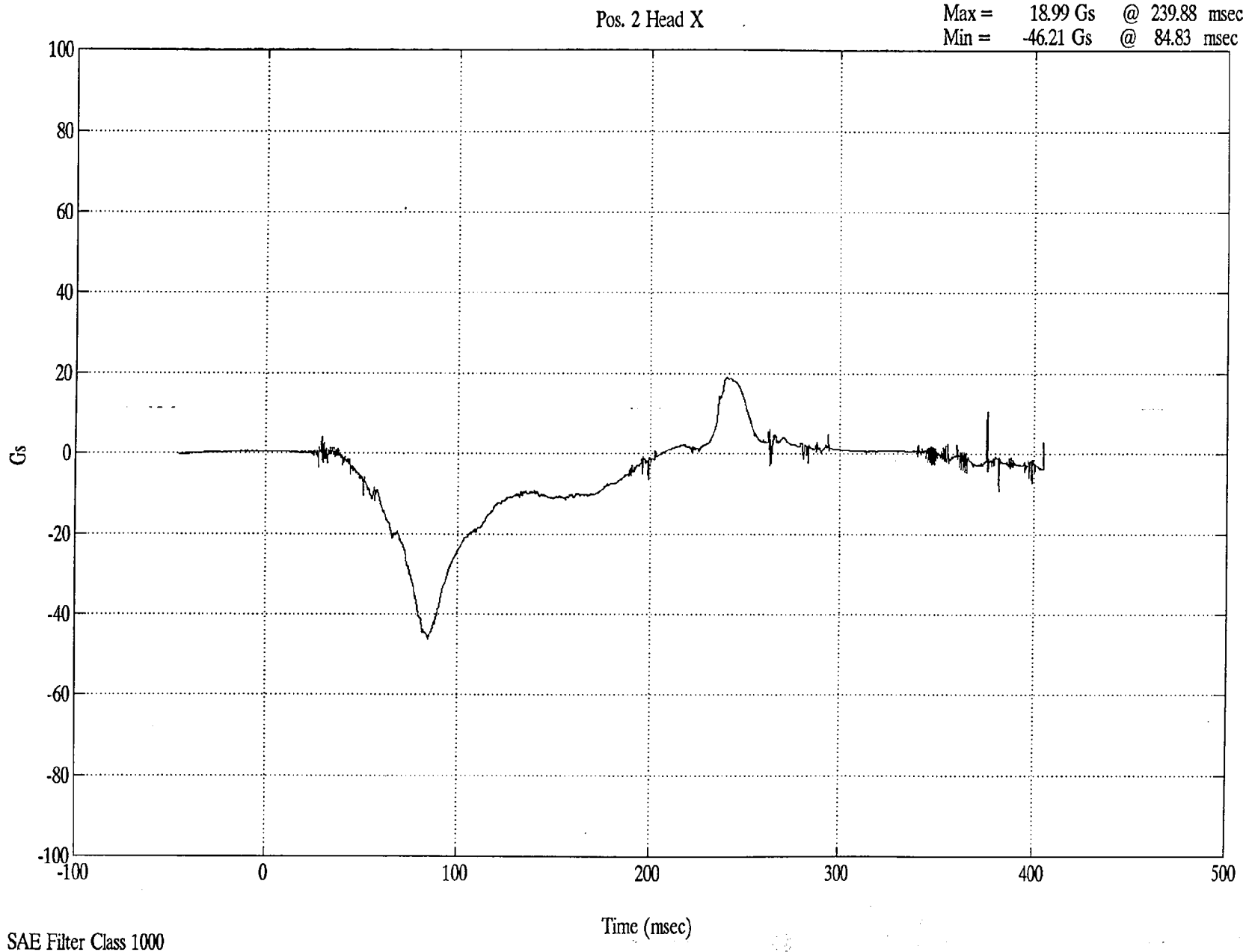
NCAP TEST #9 - 1997 FORD F150 PICKUP

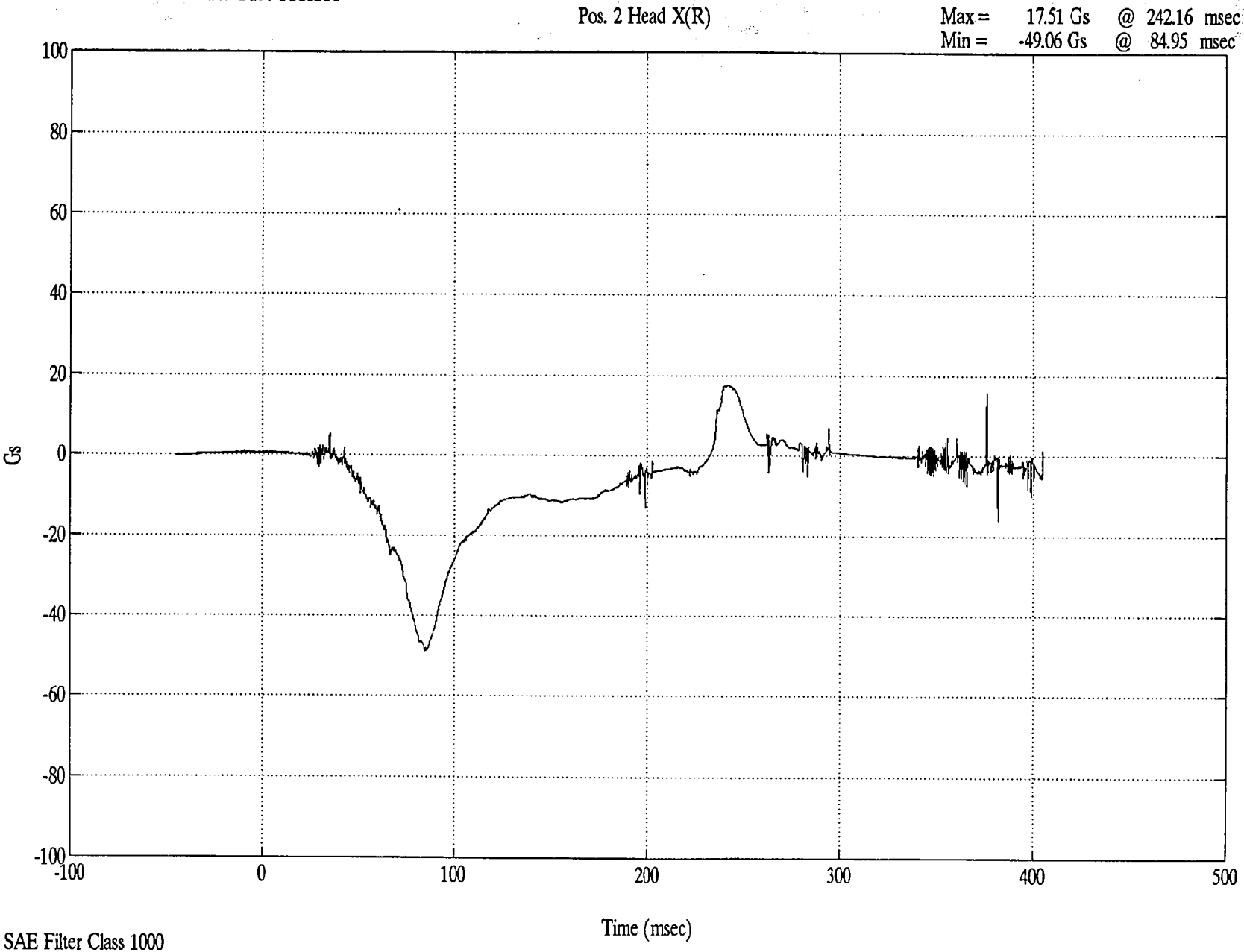


B-54

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

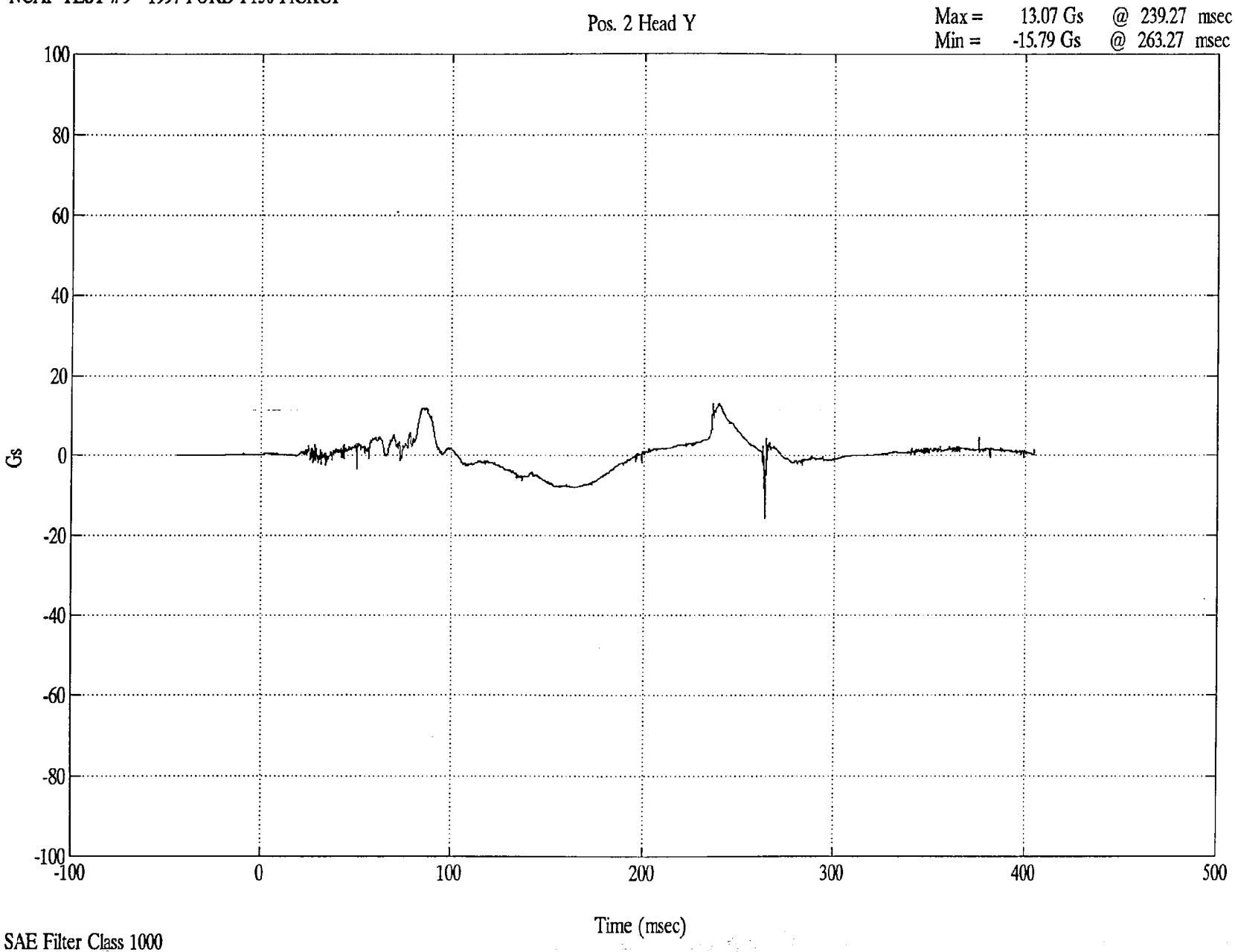


B-55

8313-9

SAE Filter Class 1000

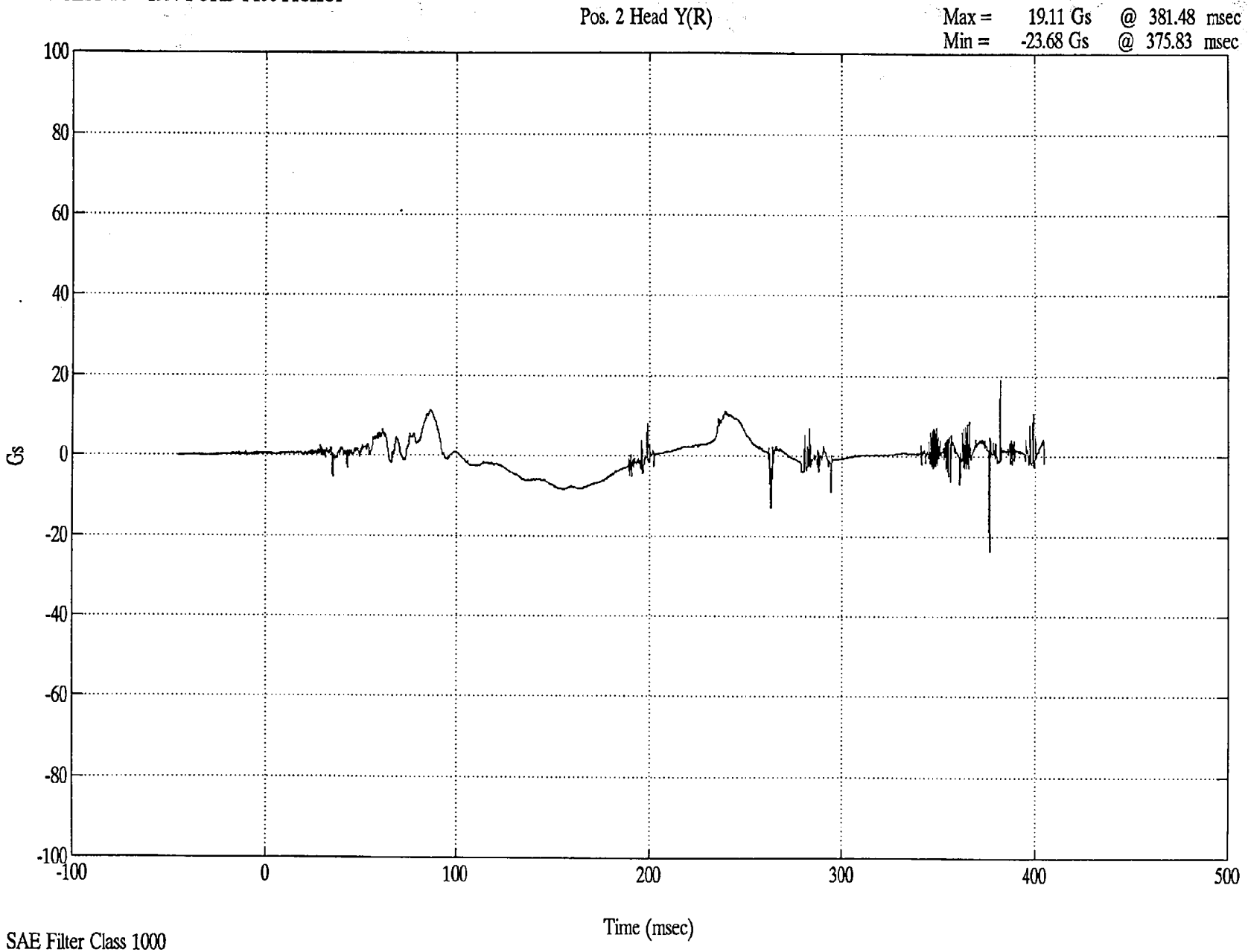
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 1000

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

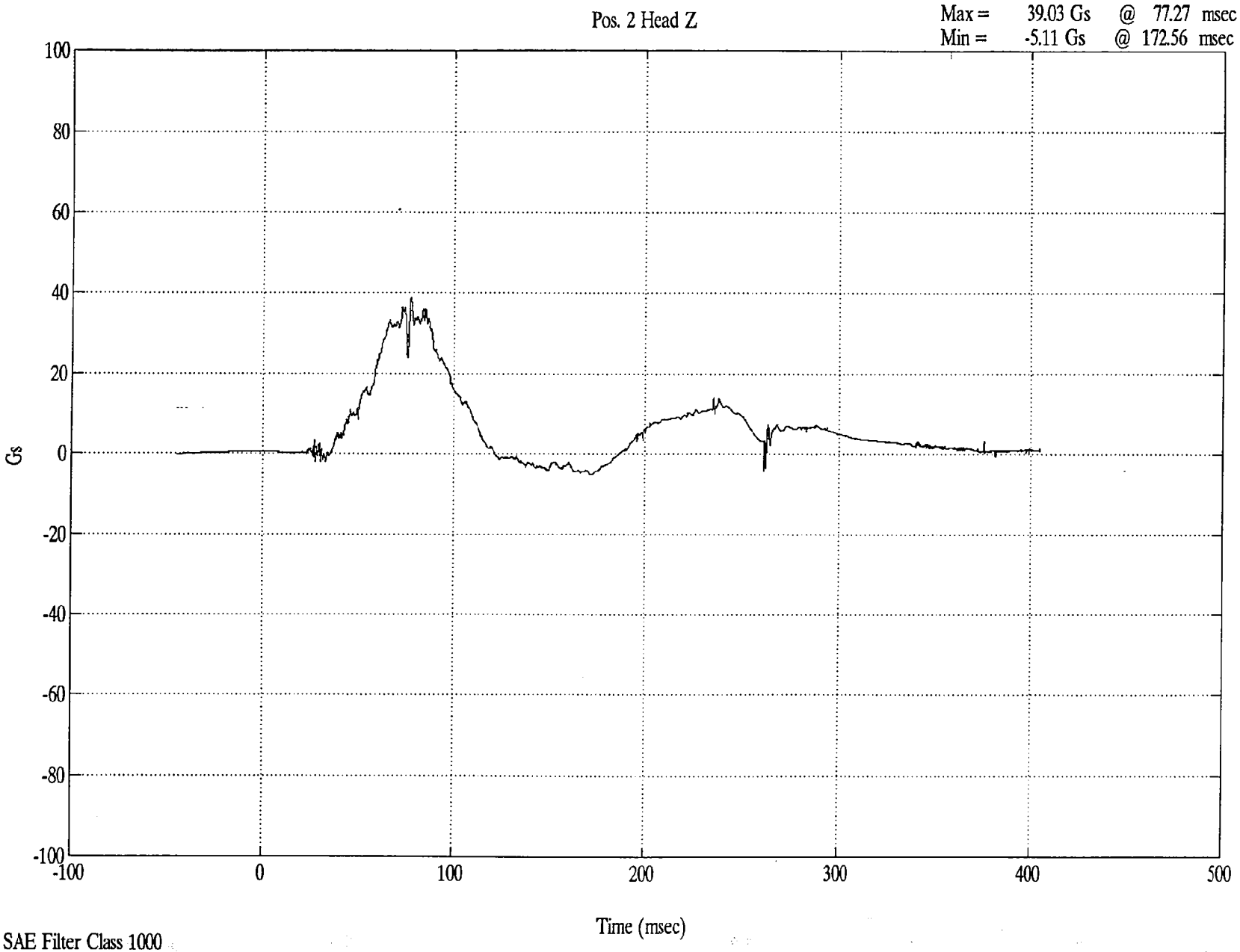


B-57

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

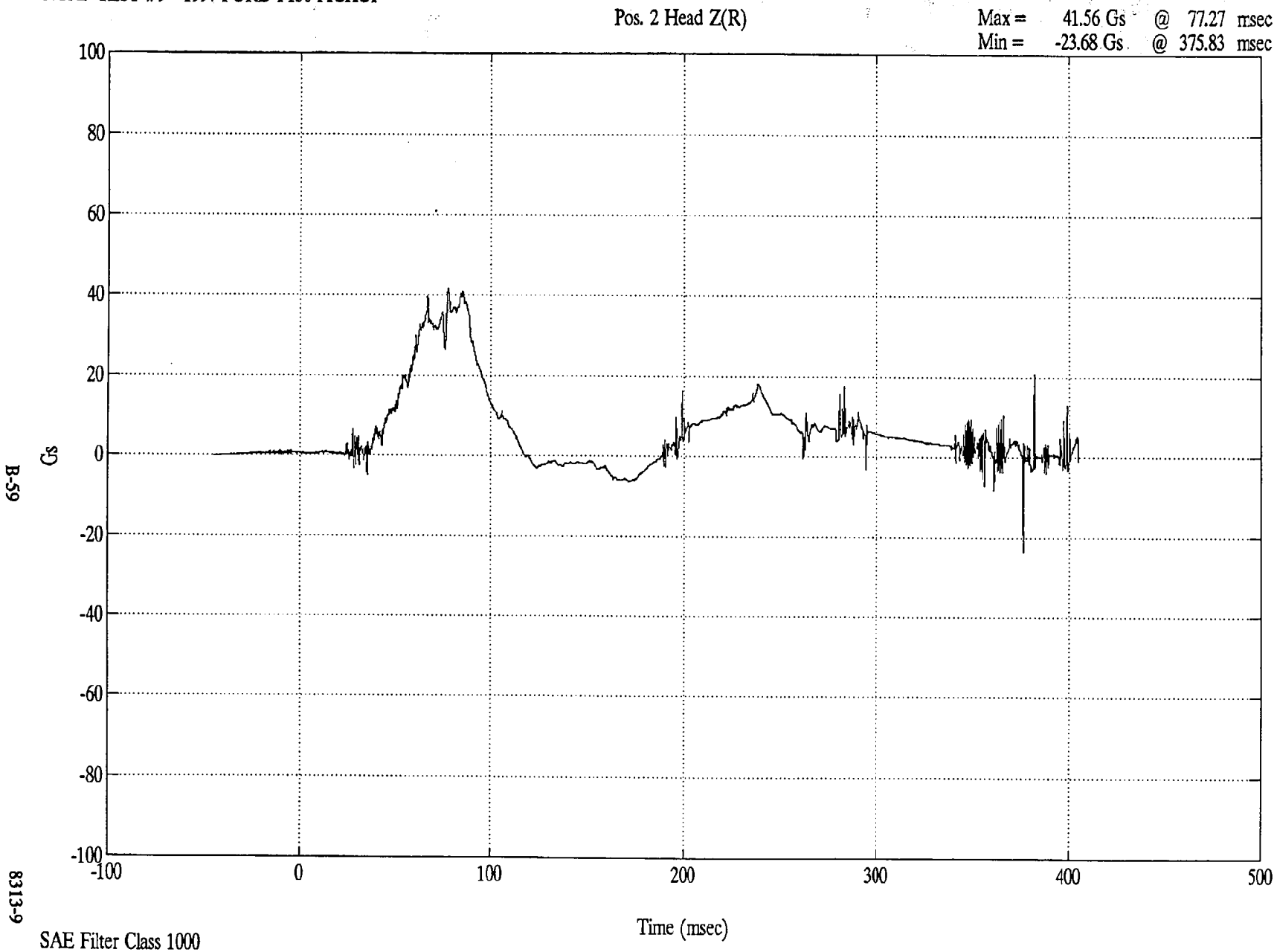


B-58

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

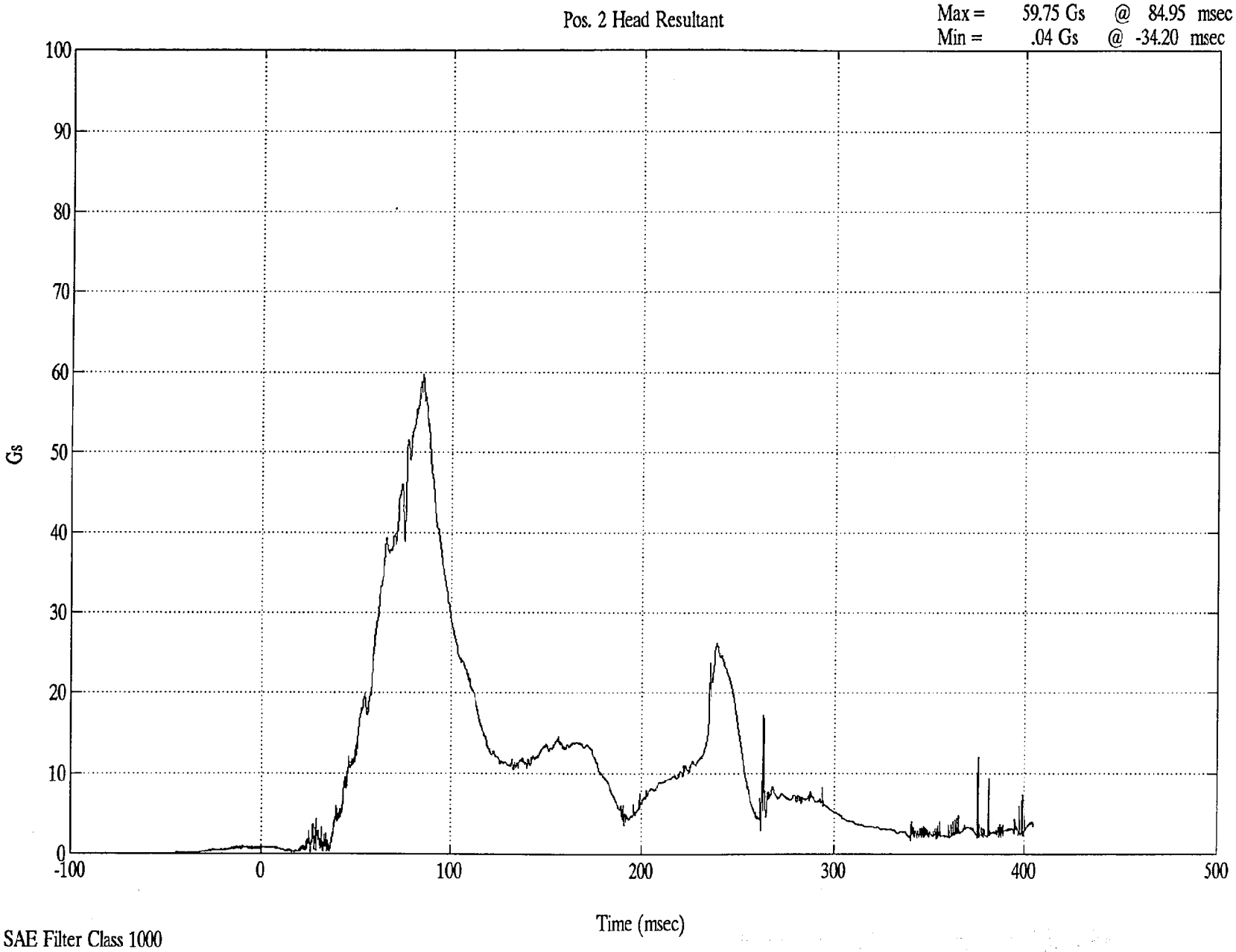


B-59

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

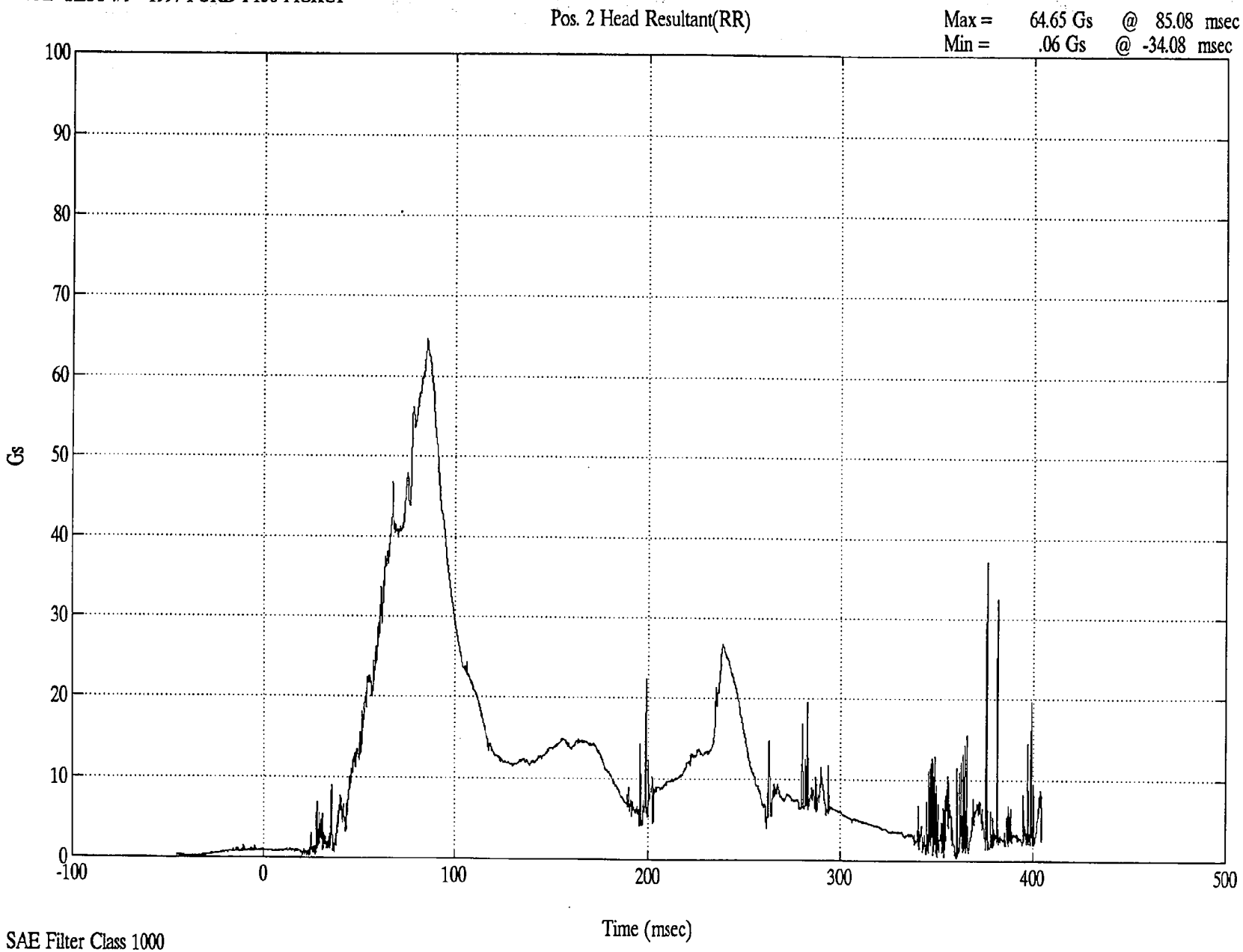


B-60

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

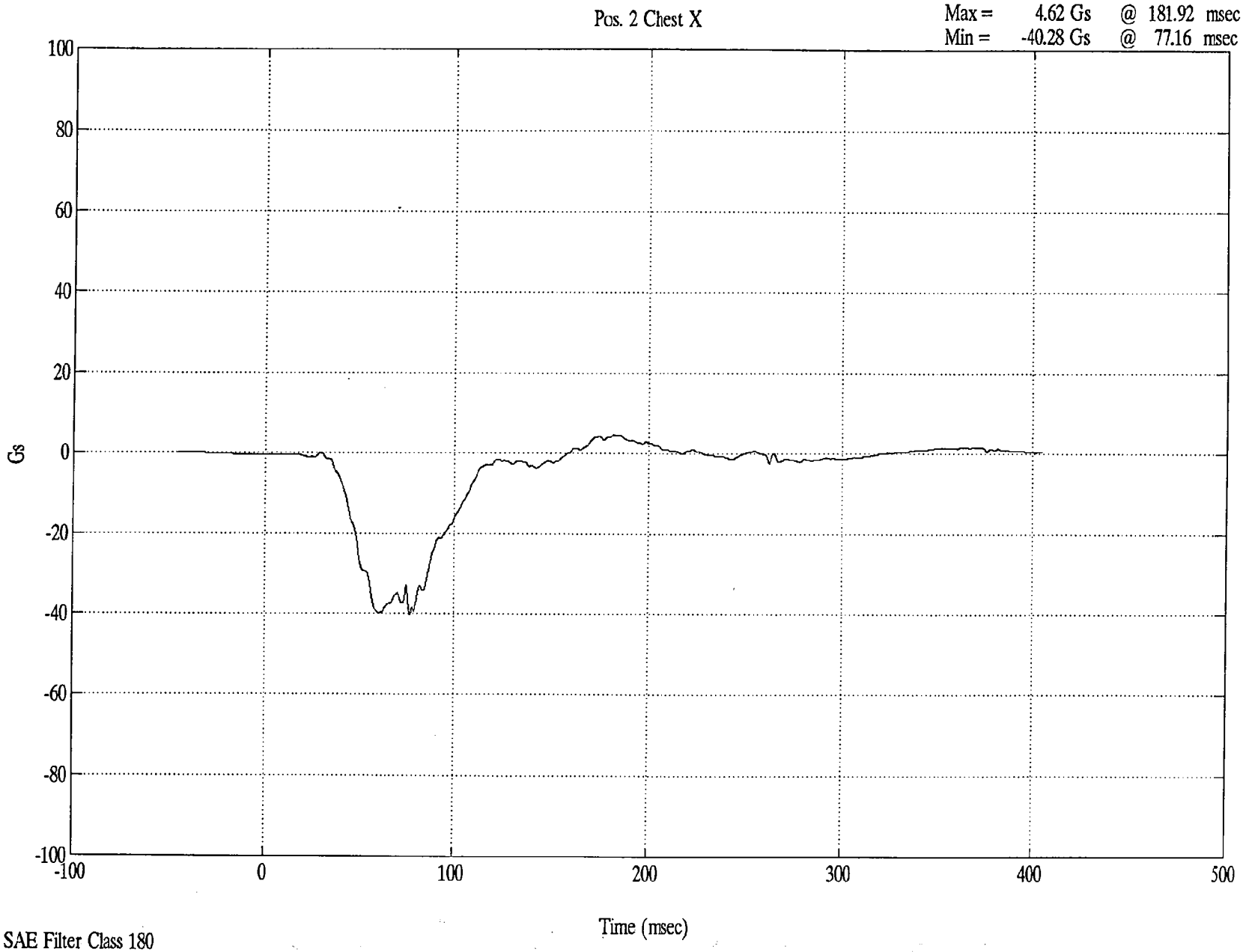


B-61

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP



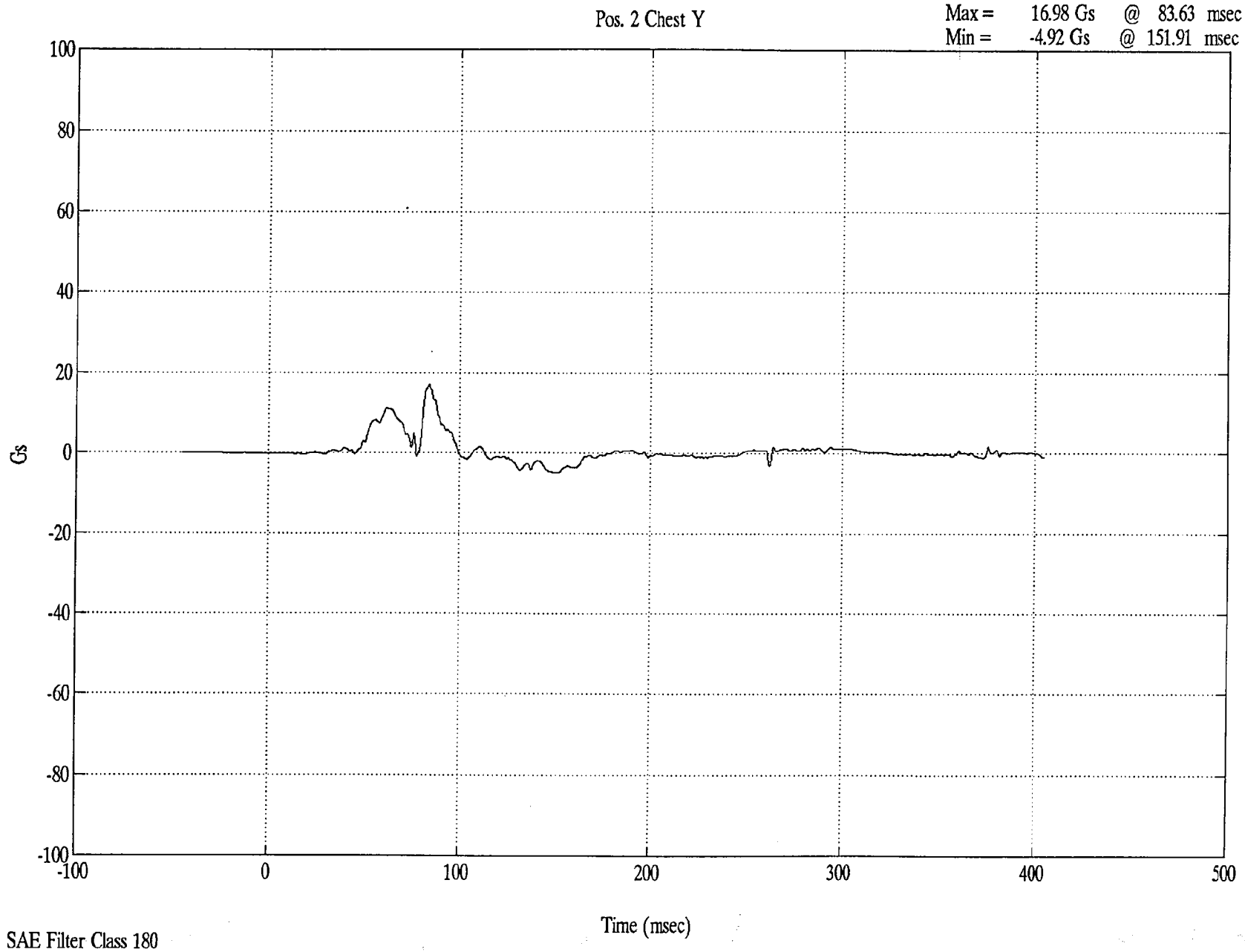
B-62

8313-9

SAE Filter Class 180

Position #2 Chest X(R) Data Not Available

NCAP TEST #9 - 1997 FORD F150 PICKUP

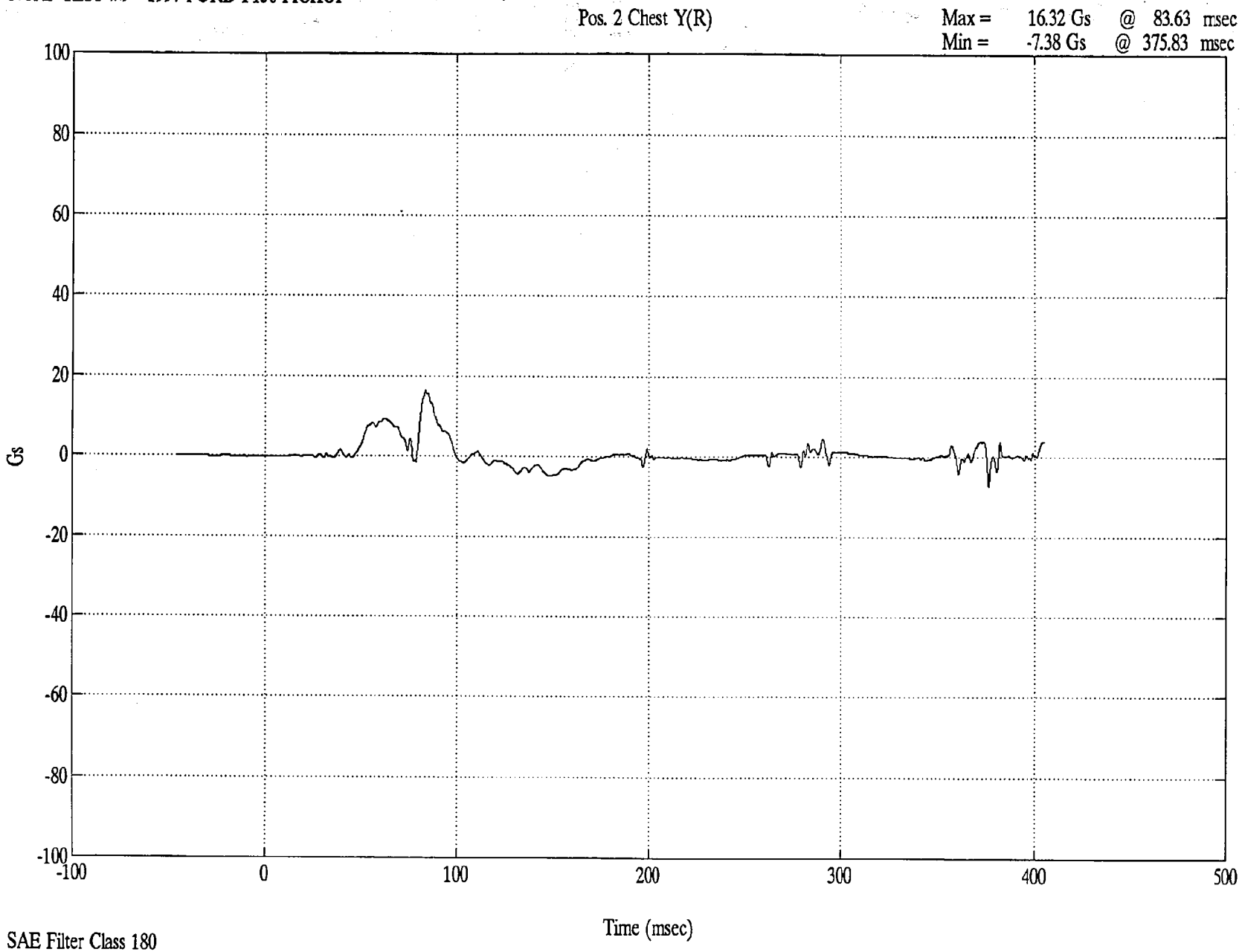


B-64

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

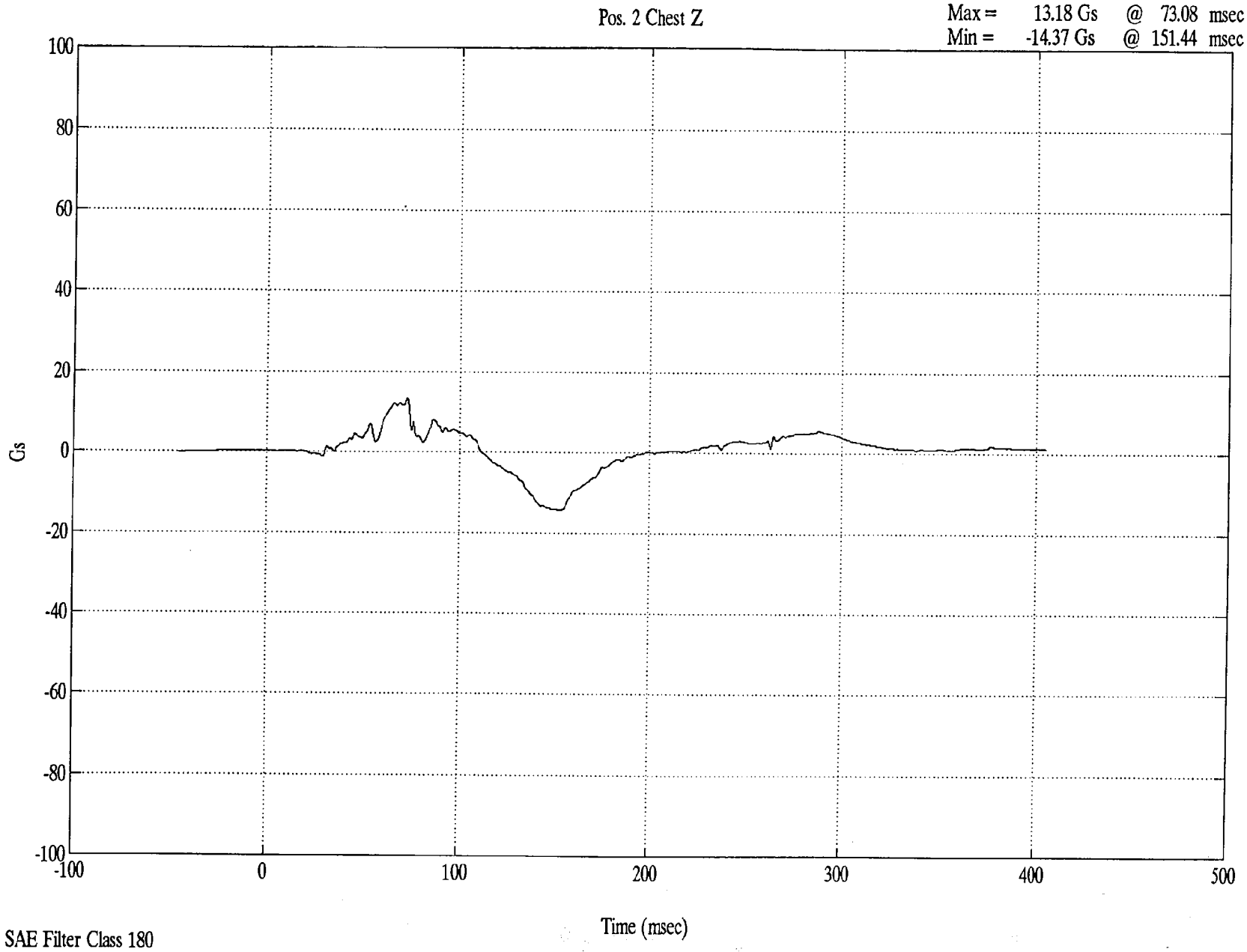


B-65

8313-9

SAE Filter Class 180

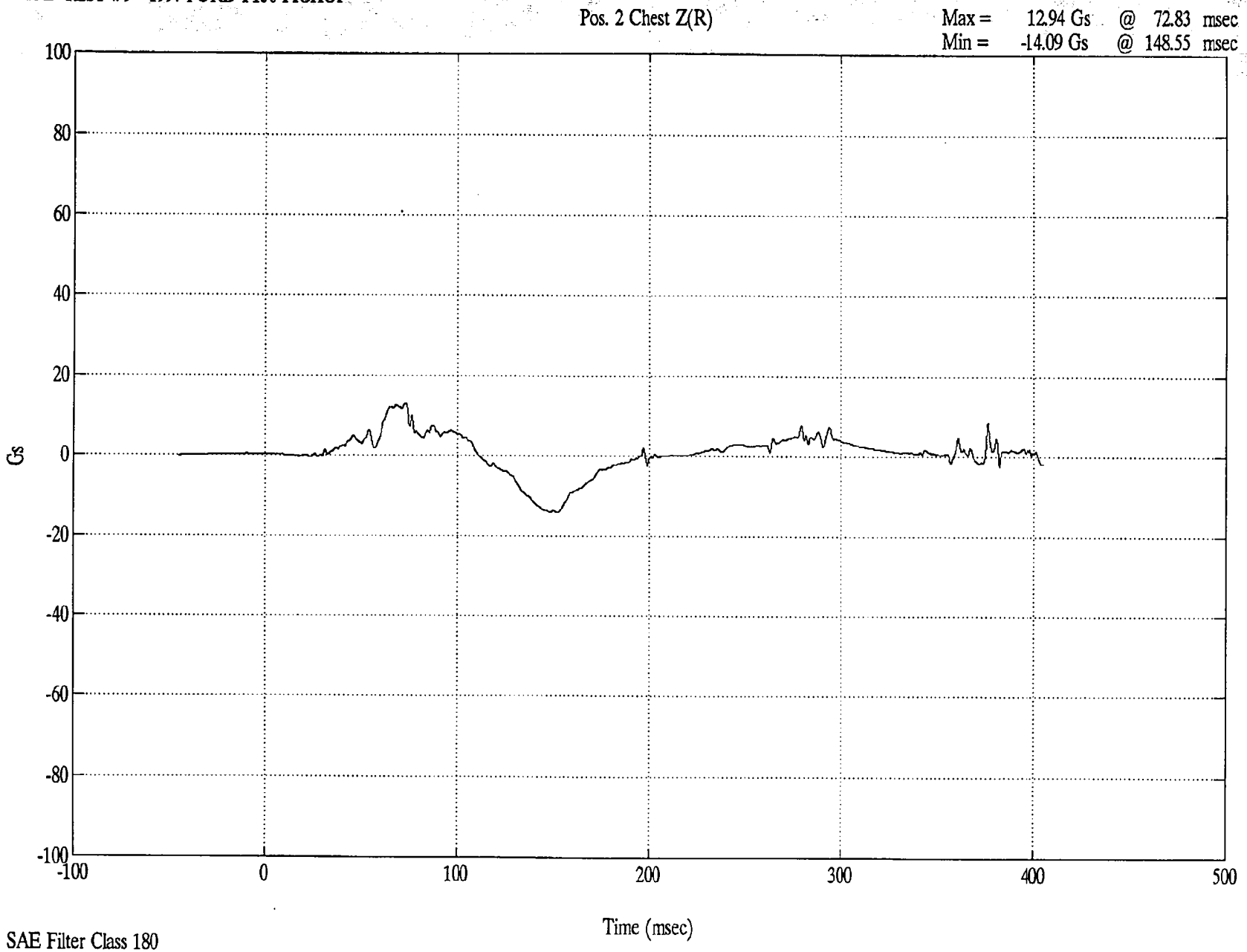
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

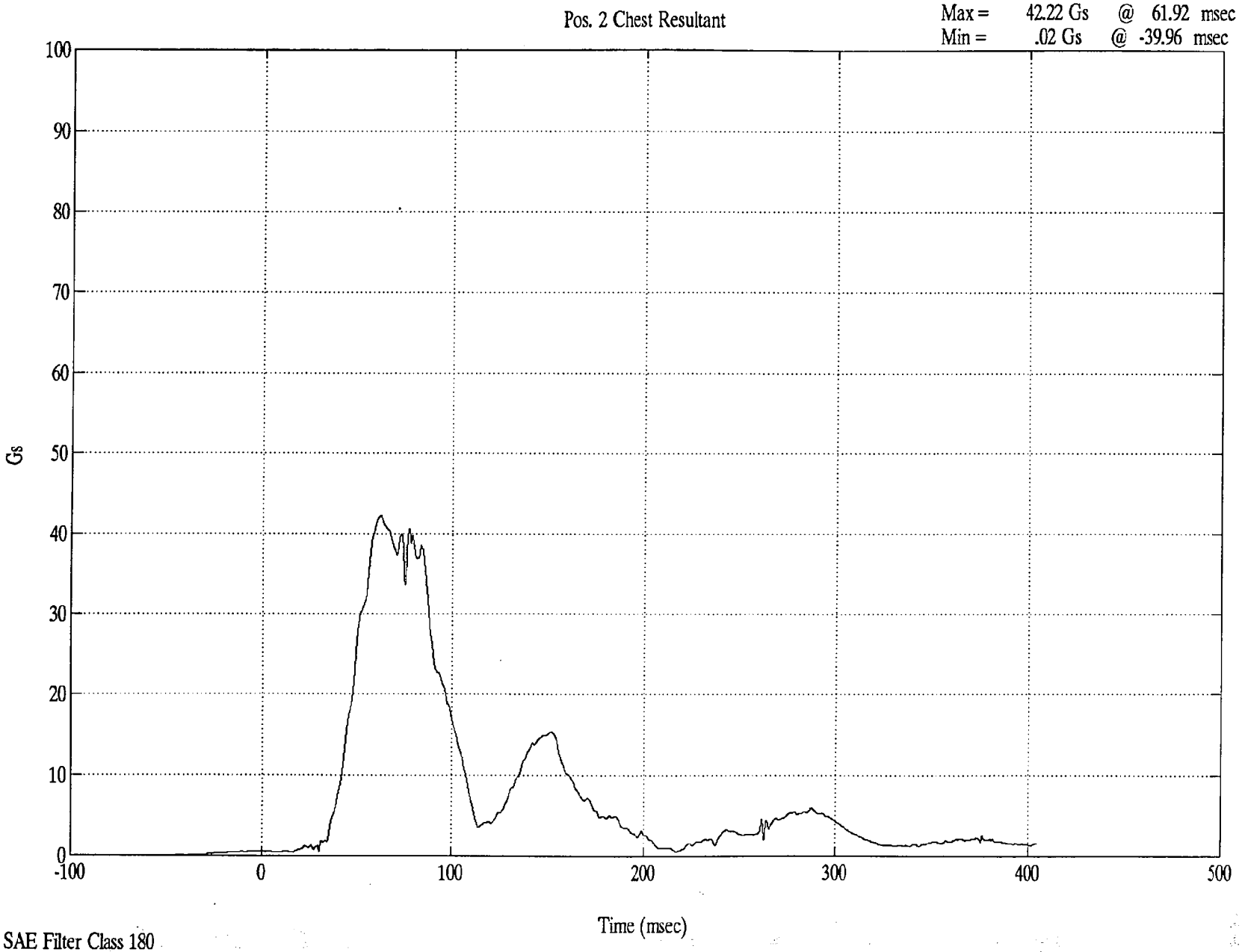


B-67

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

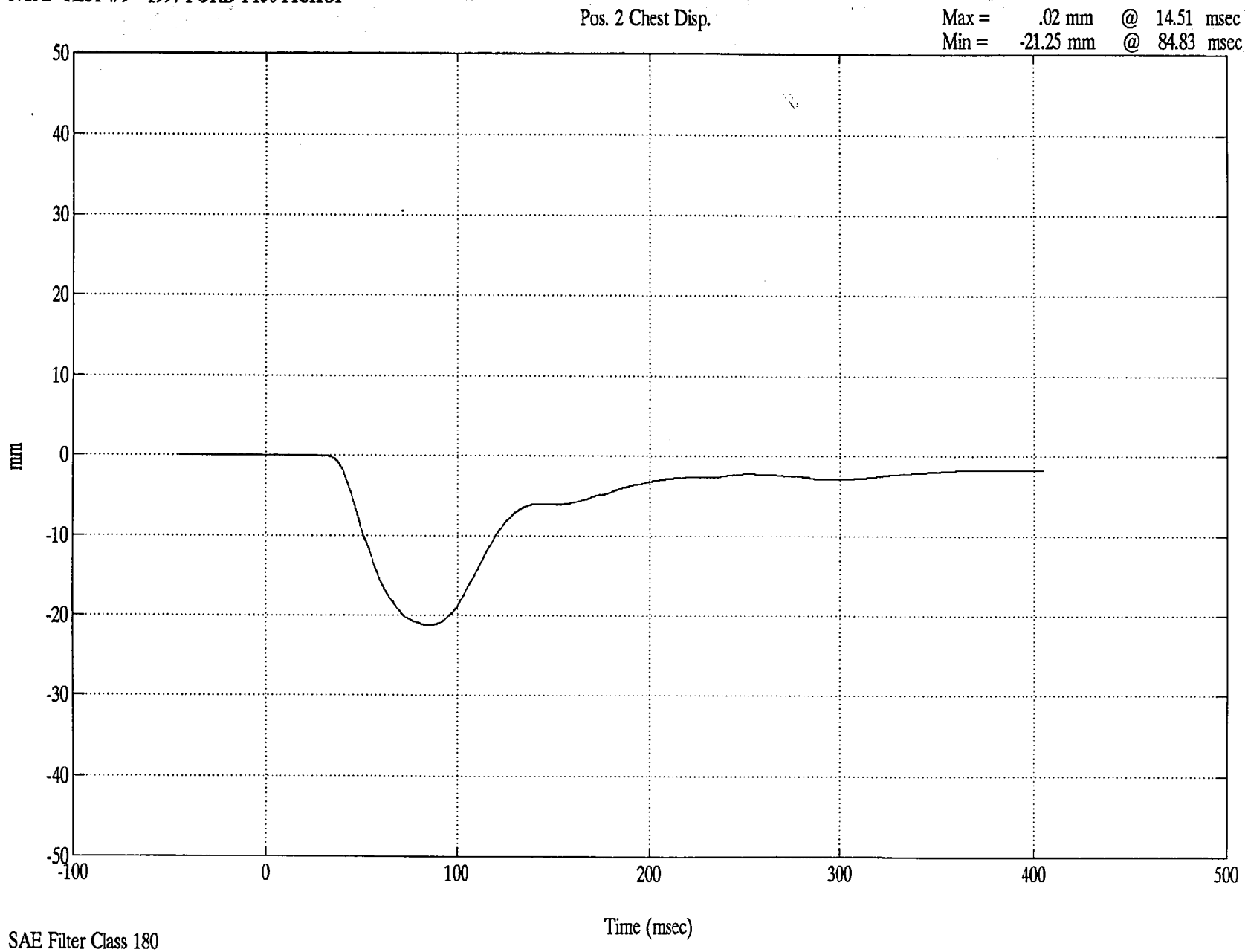


B-68

8313-9

SAE Filter Class 180

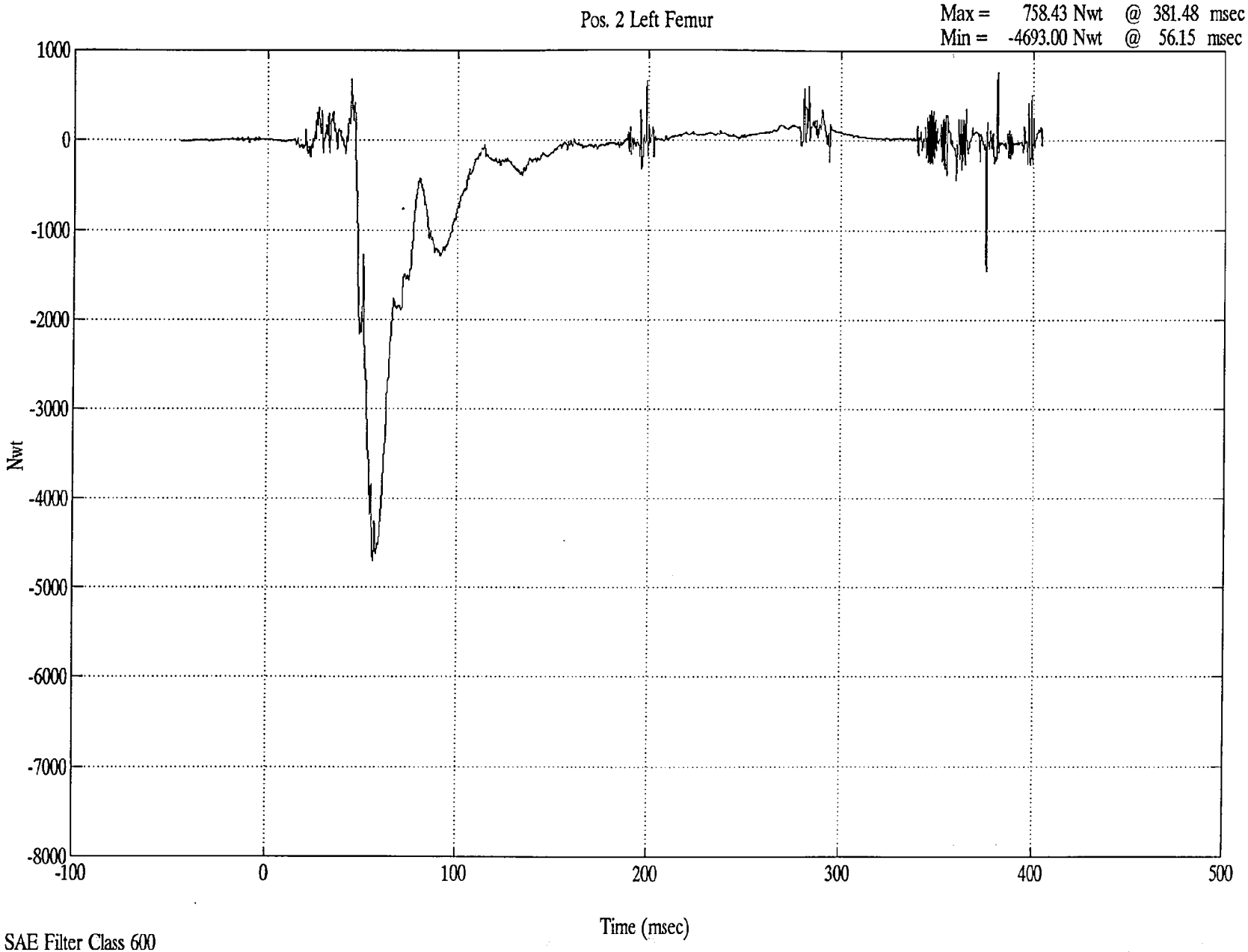
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

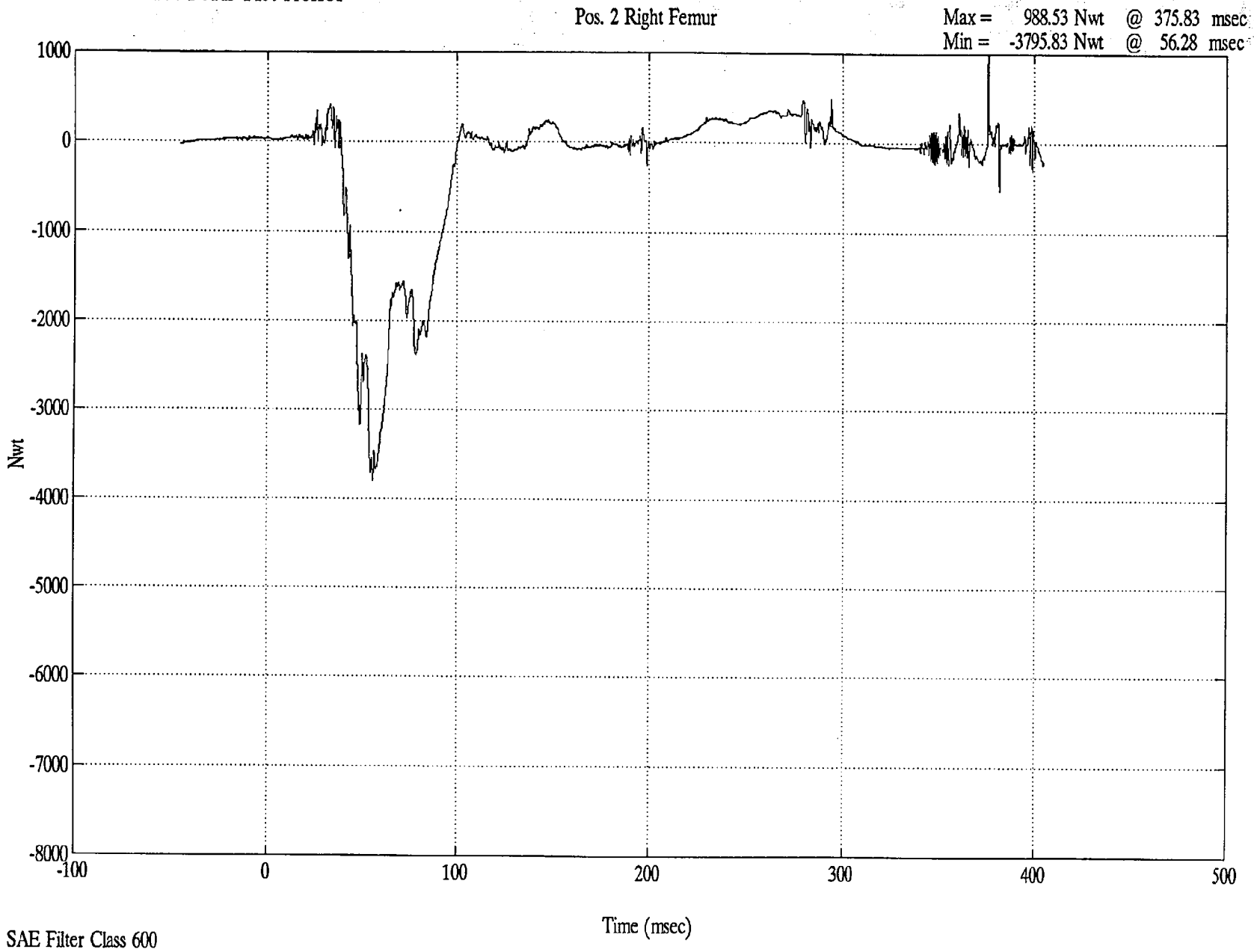


B-70

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

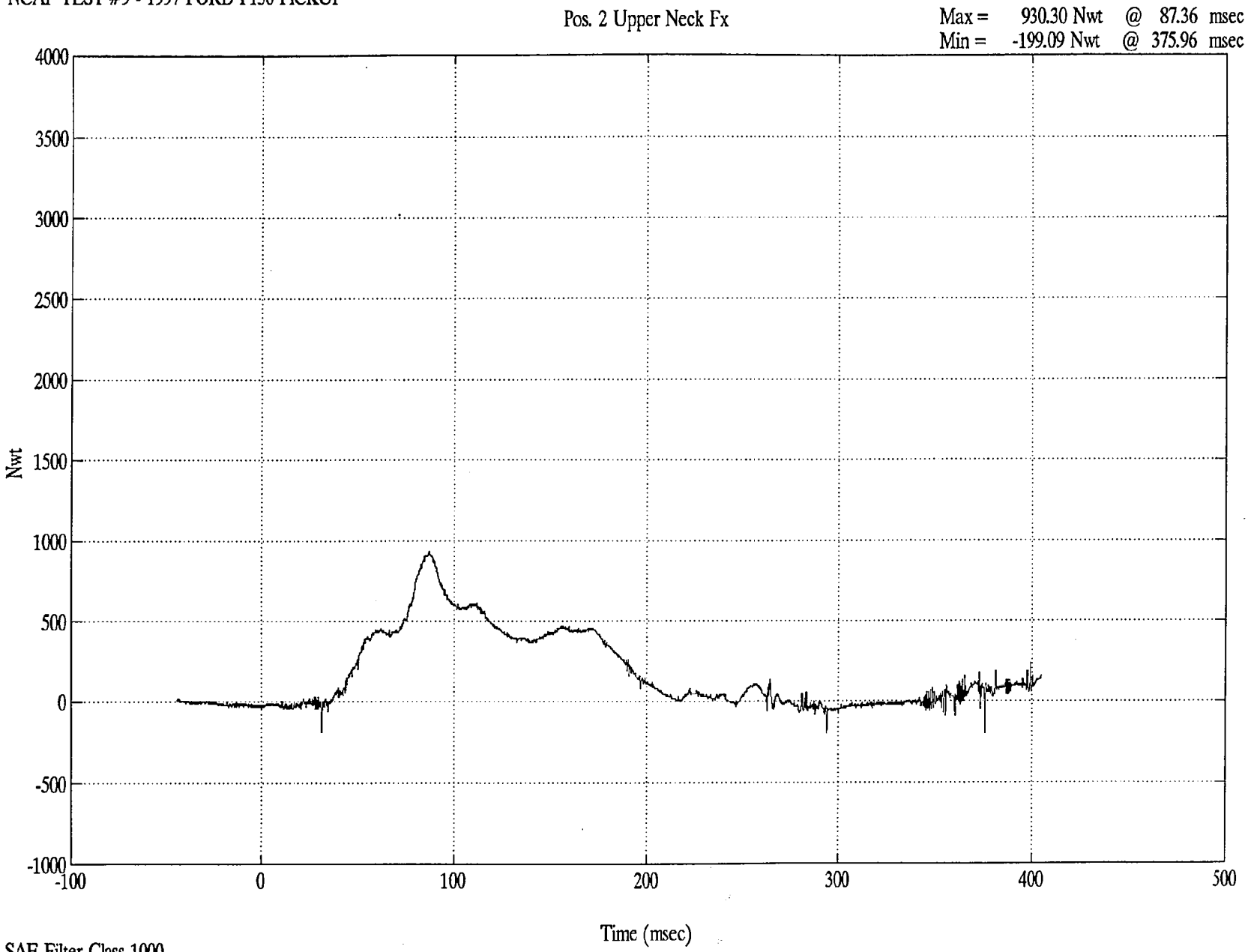


B-71

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

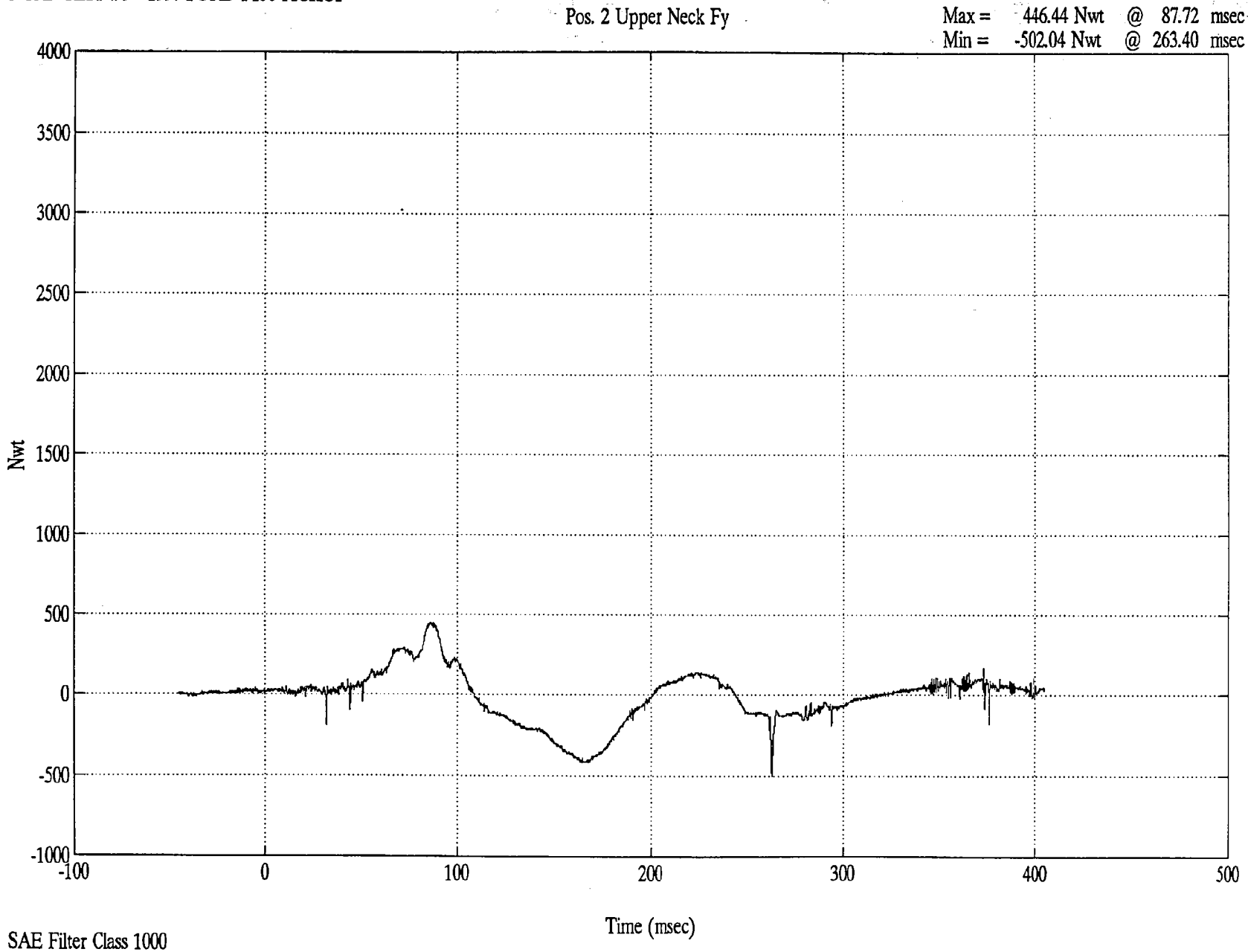


B-72

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

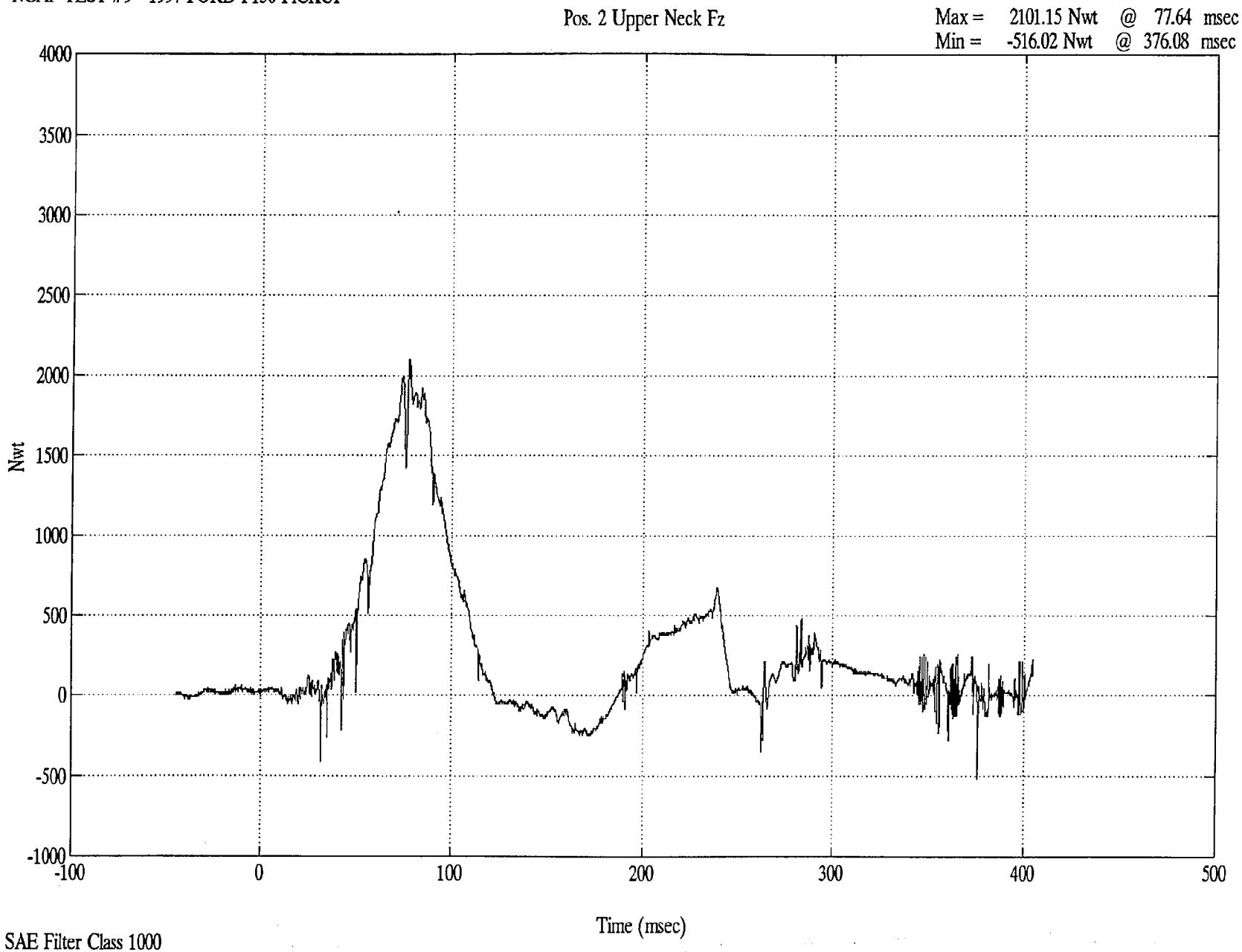


B-73

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

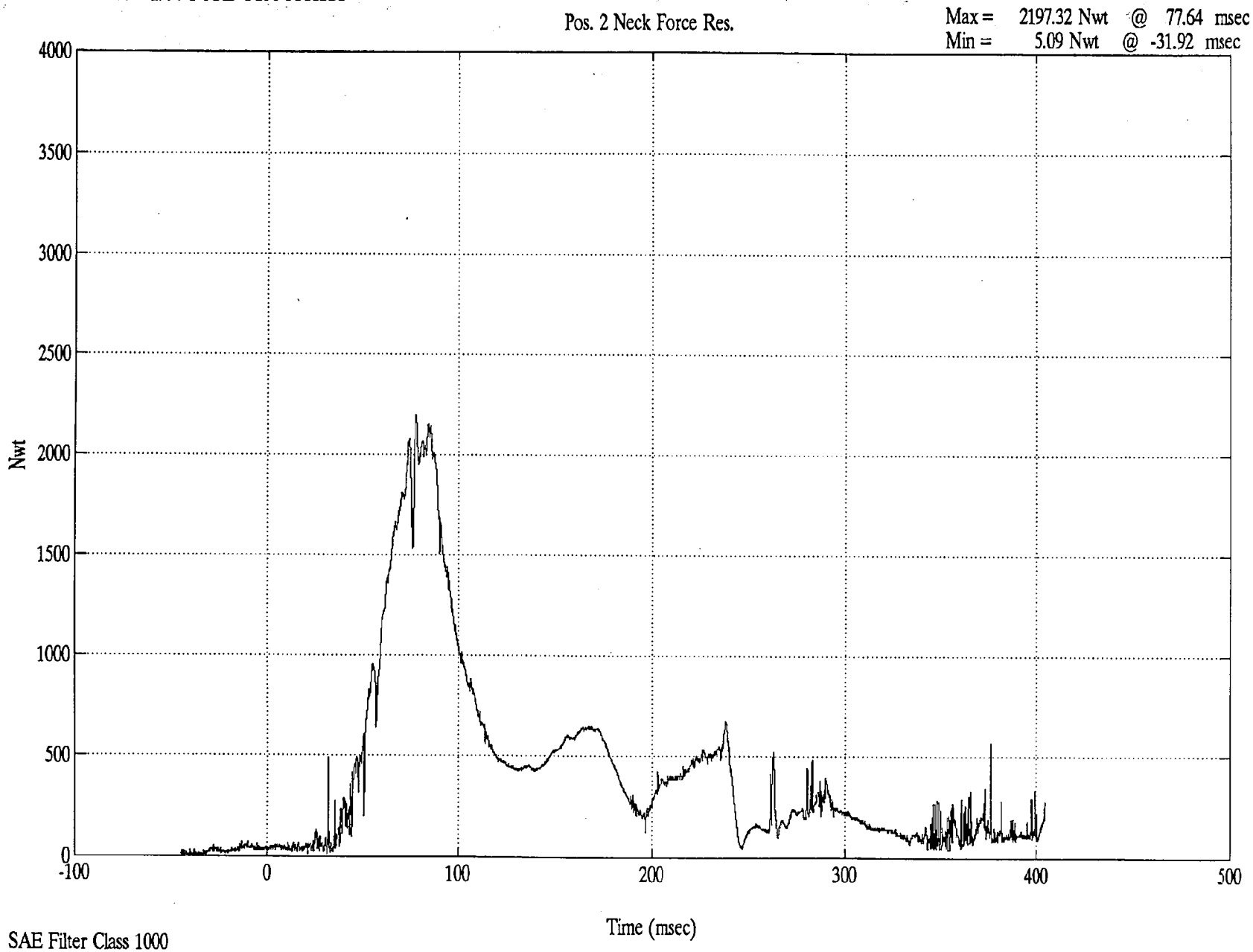


B-74

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

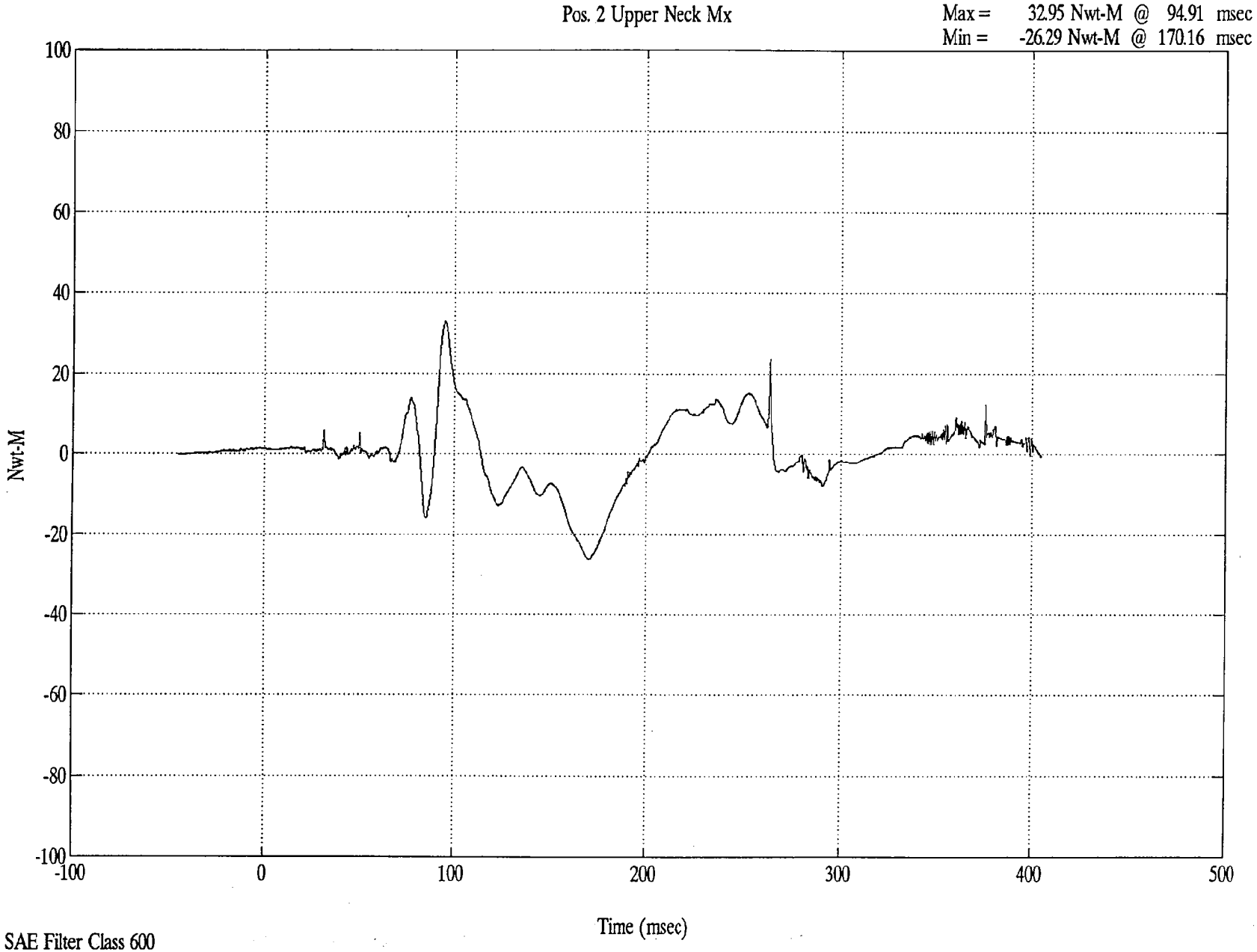


SAE Filter Class 1000

B-75

8313-9

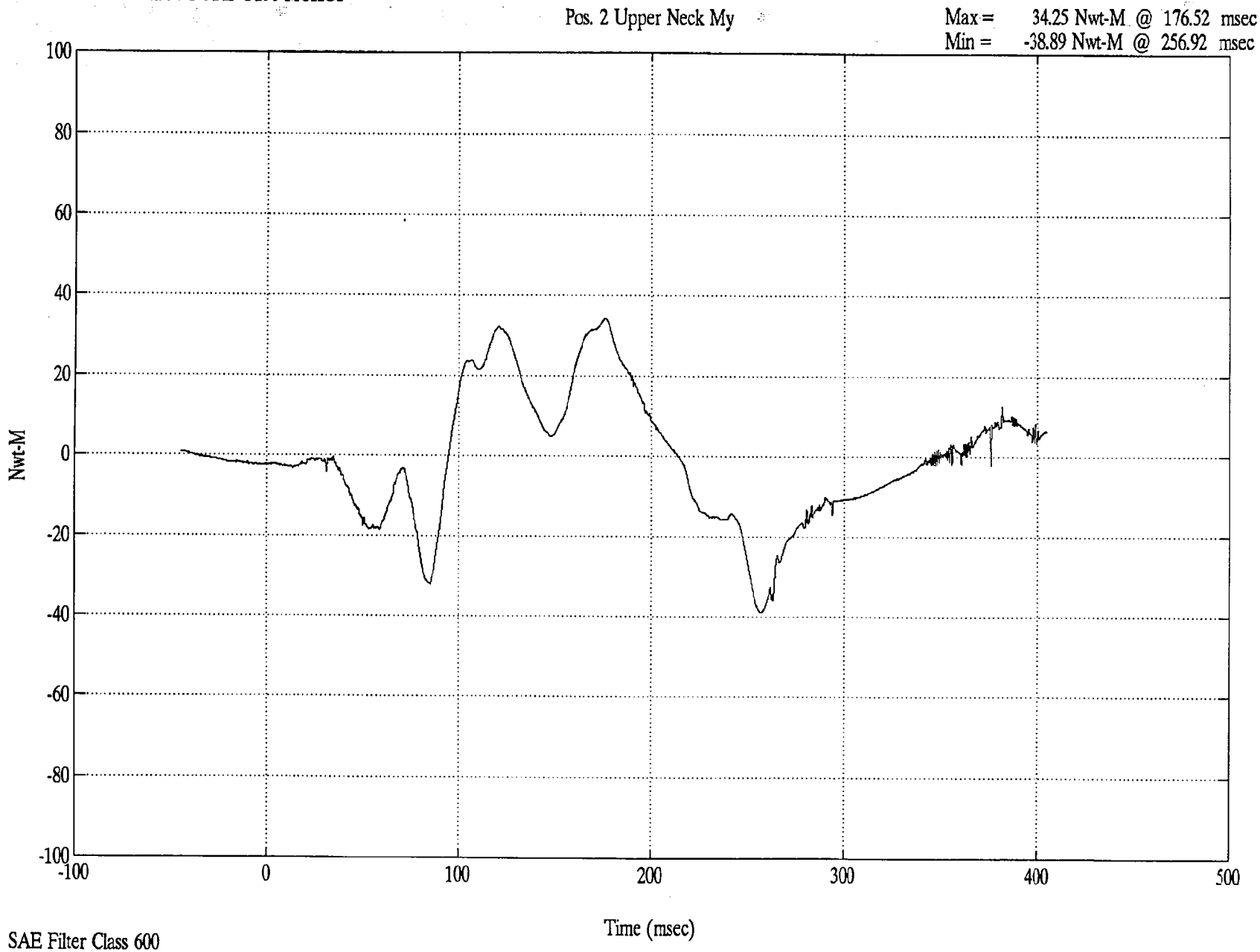
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

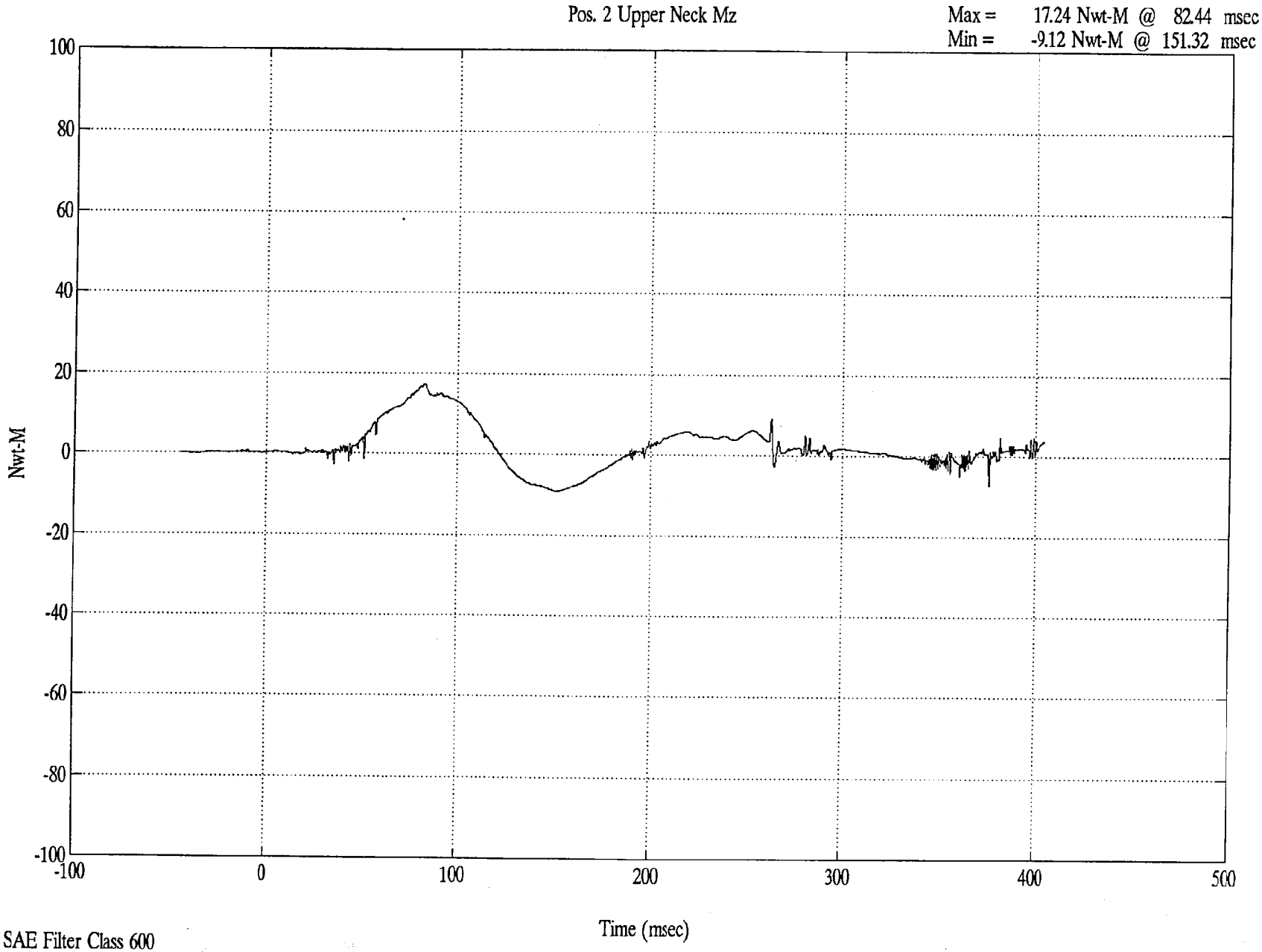


SAE Filter Class 600

B-77

8313-9

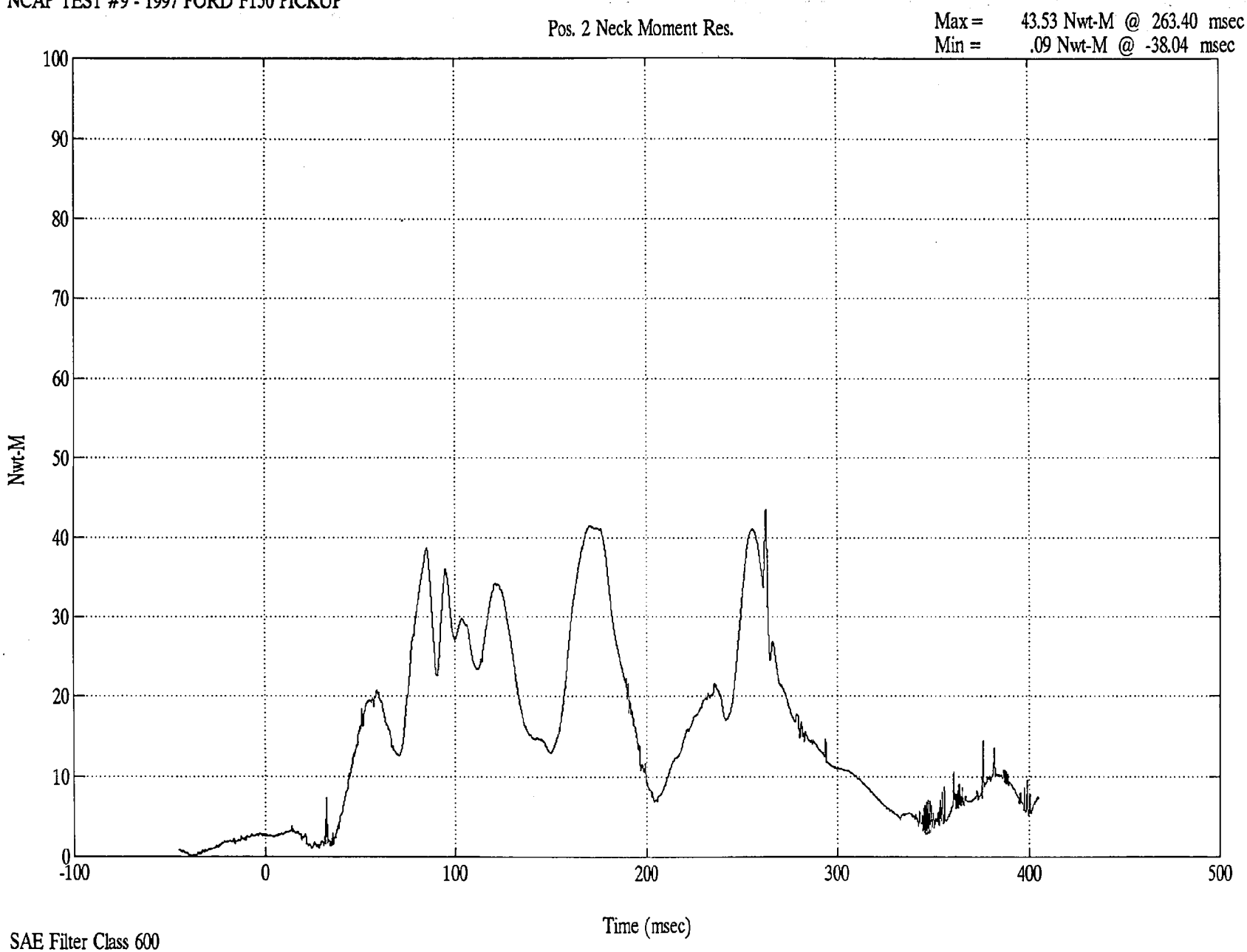
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

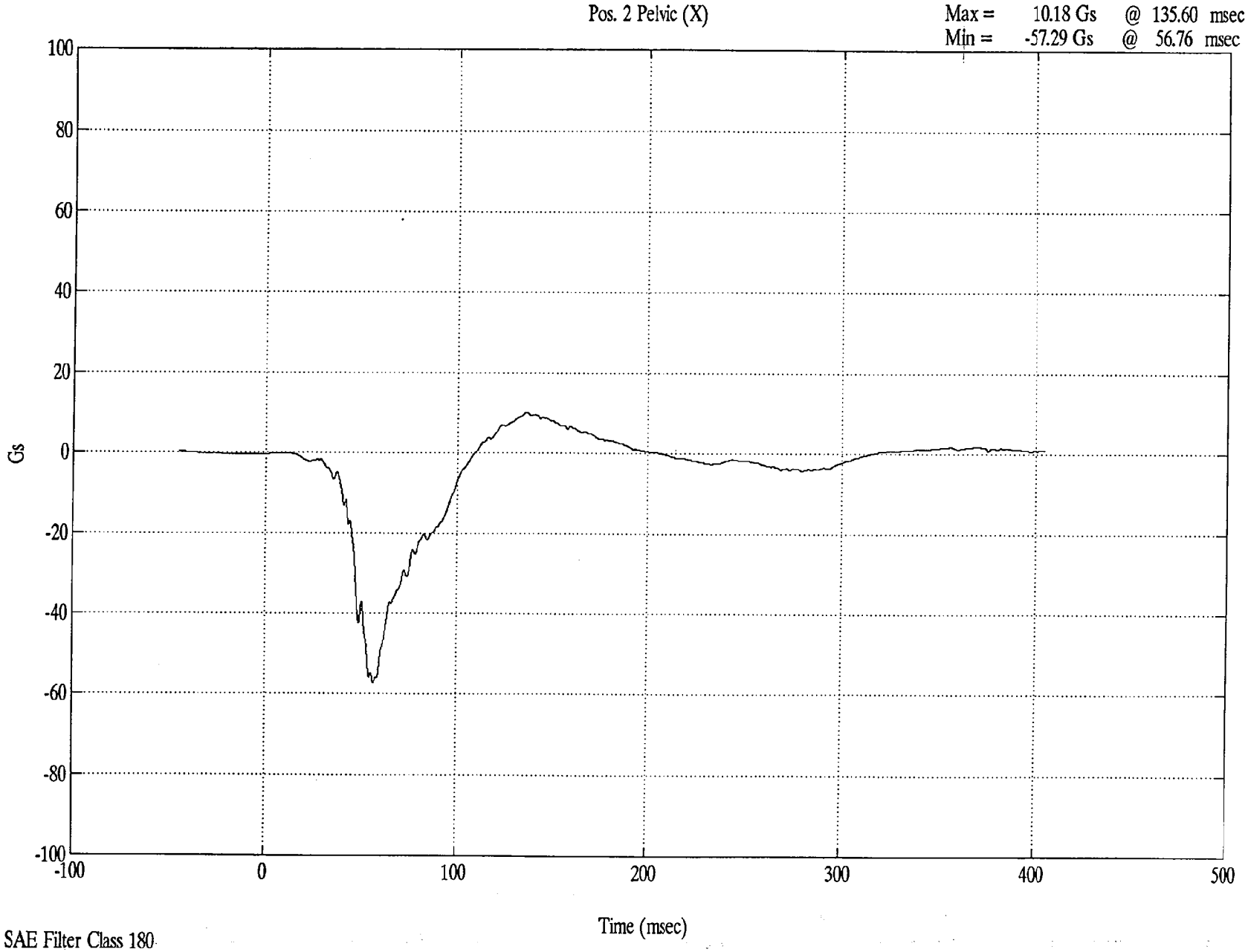
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

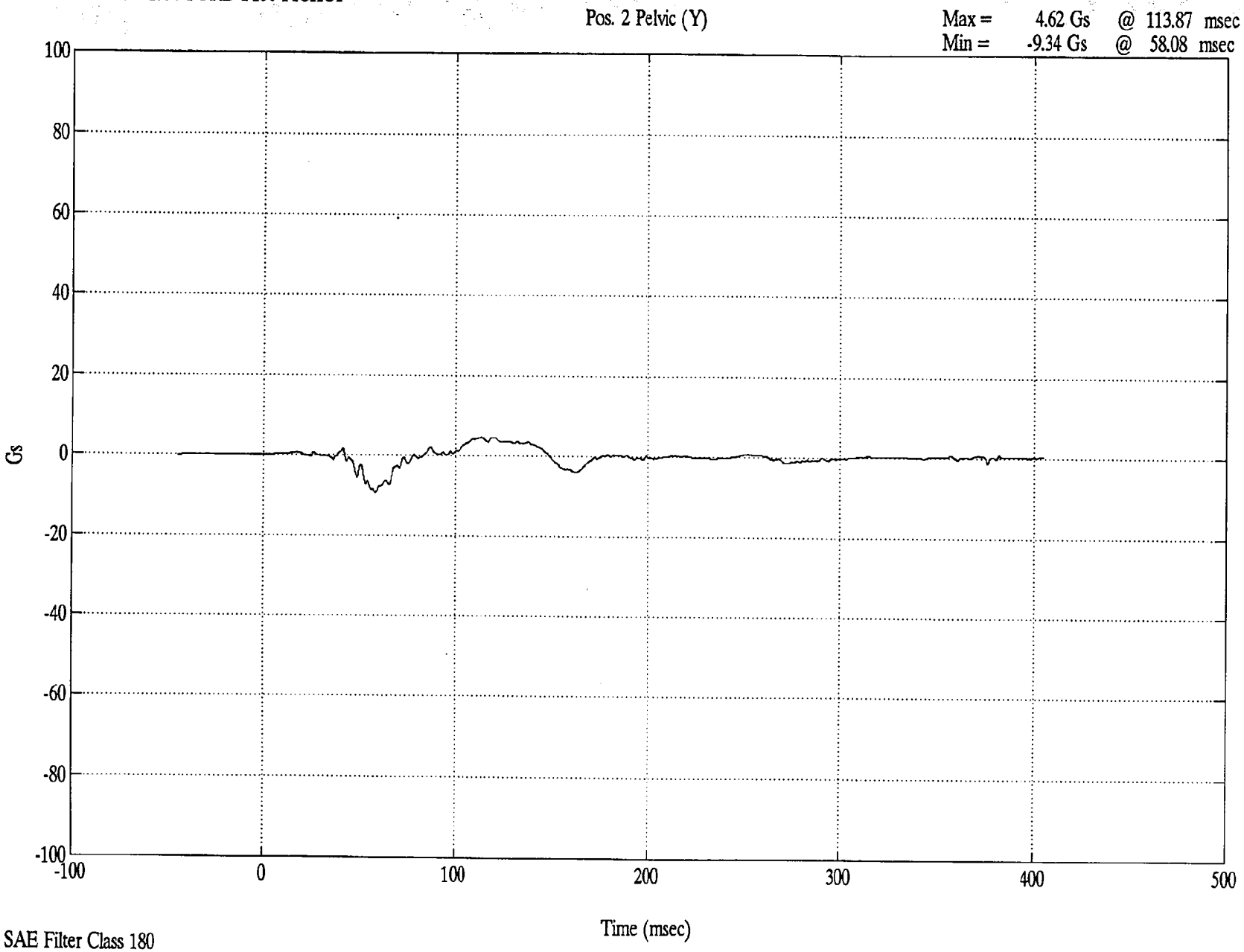


B-80

8313-9

SAE Filter Class 180

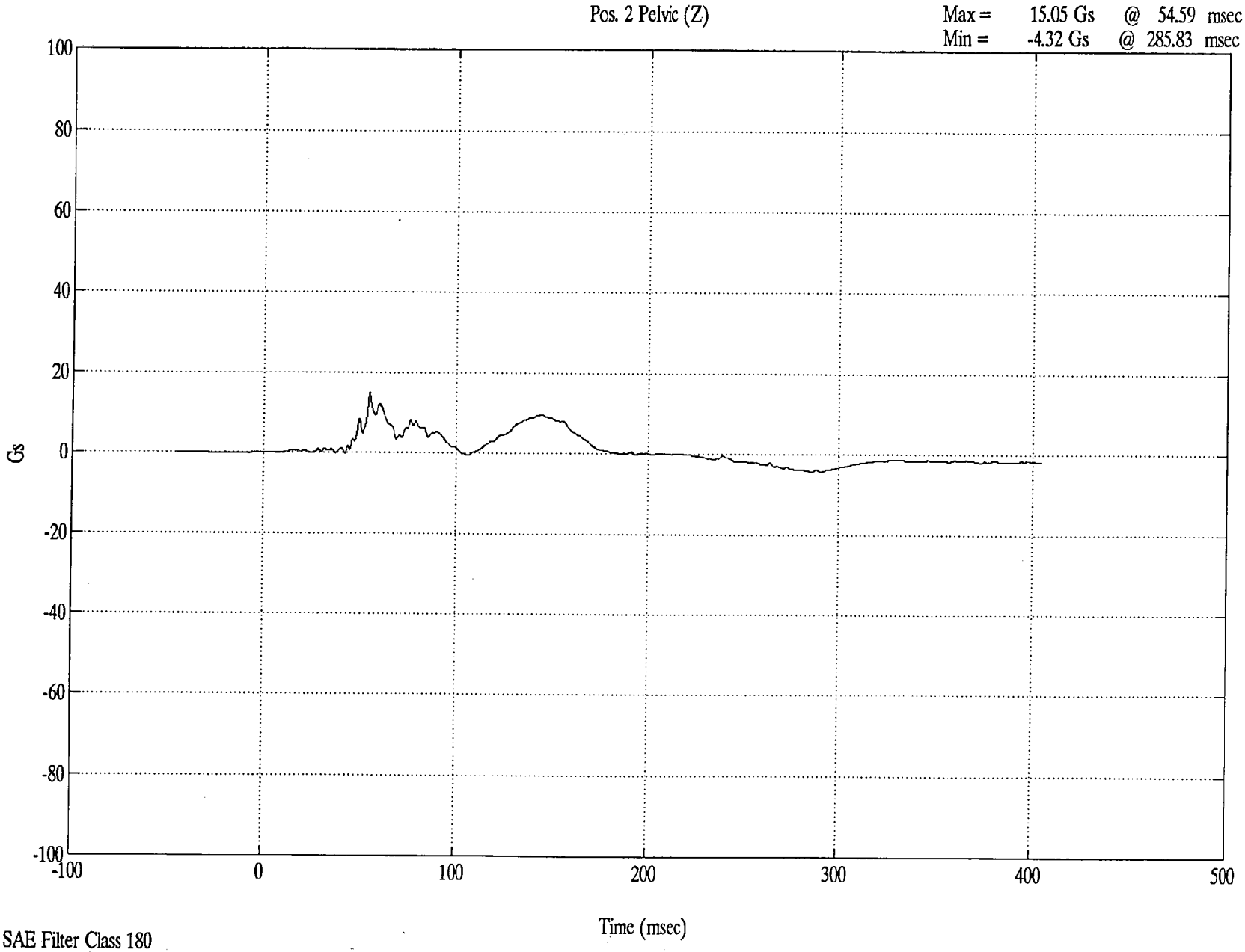
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

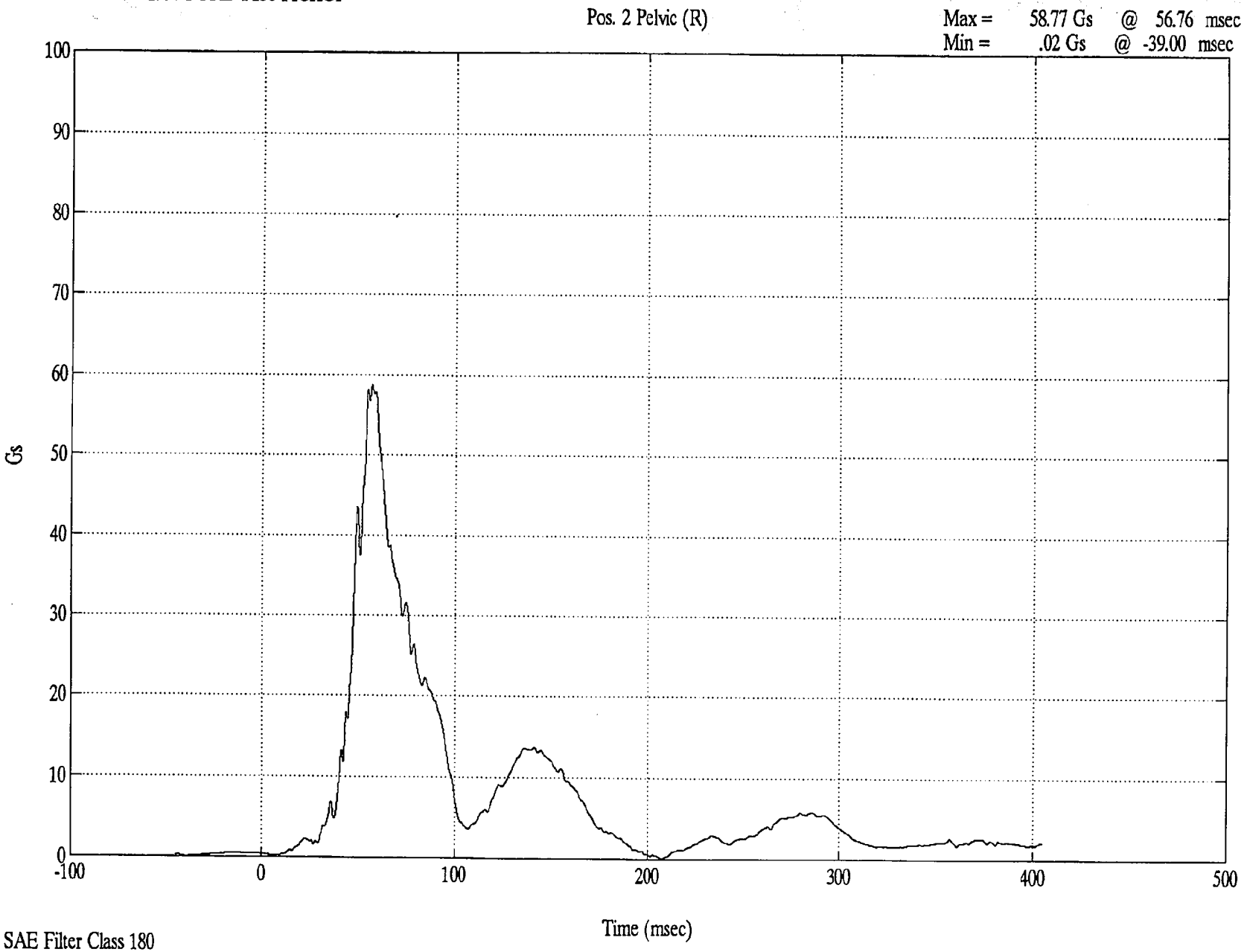


B-82

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP



B-83

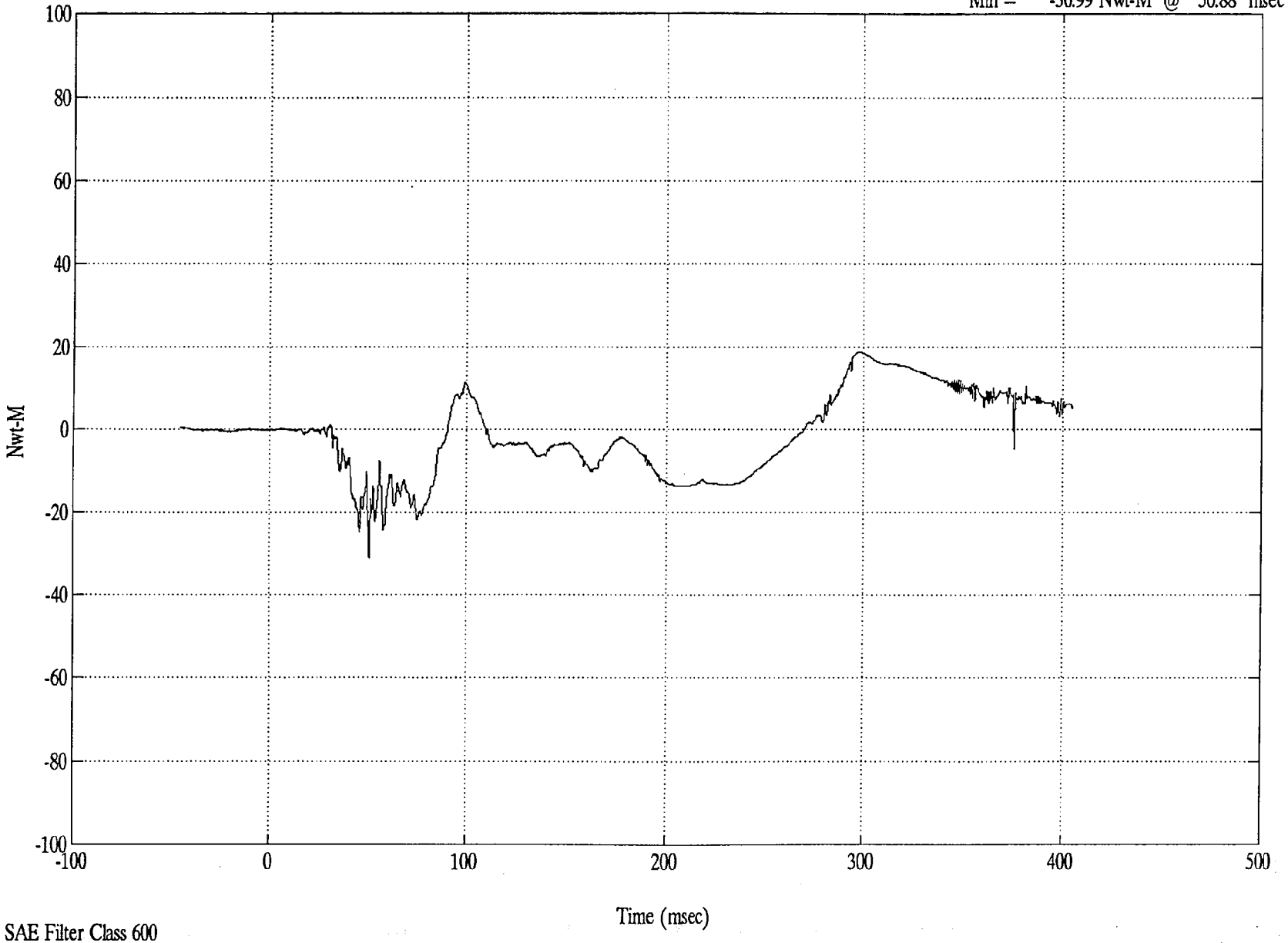
8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

Pos. 2 Lt Upper Tibia Mx

Max = 18.86 Nwt-M @ 298.56 msec
Min = -30.99 Nwt-M @ 50.88 msec

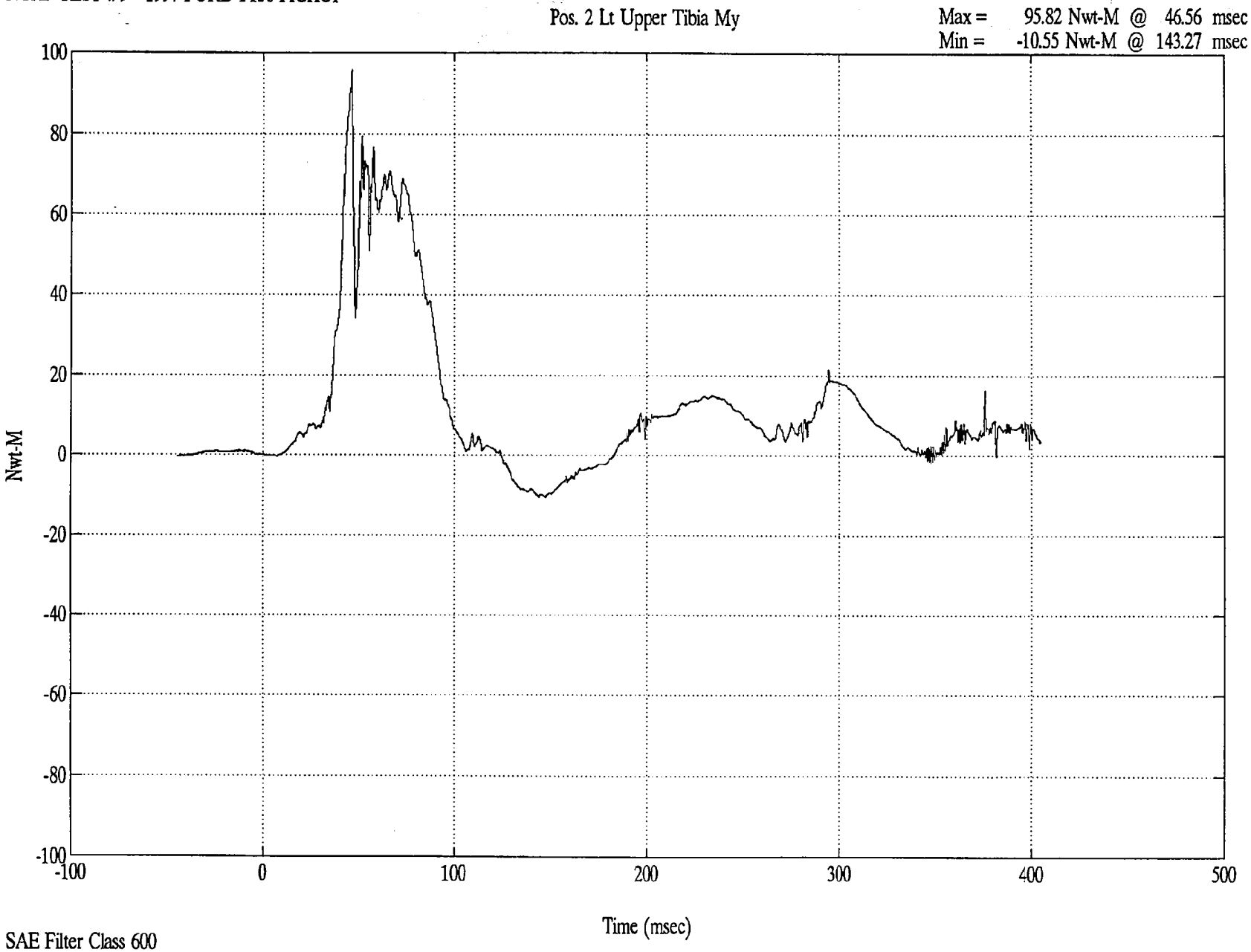


B-84

8313-9

SAE Filter Class 600

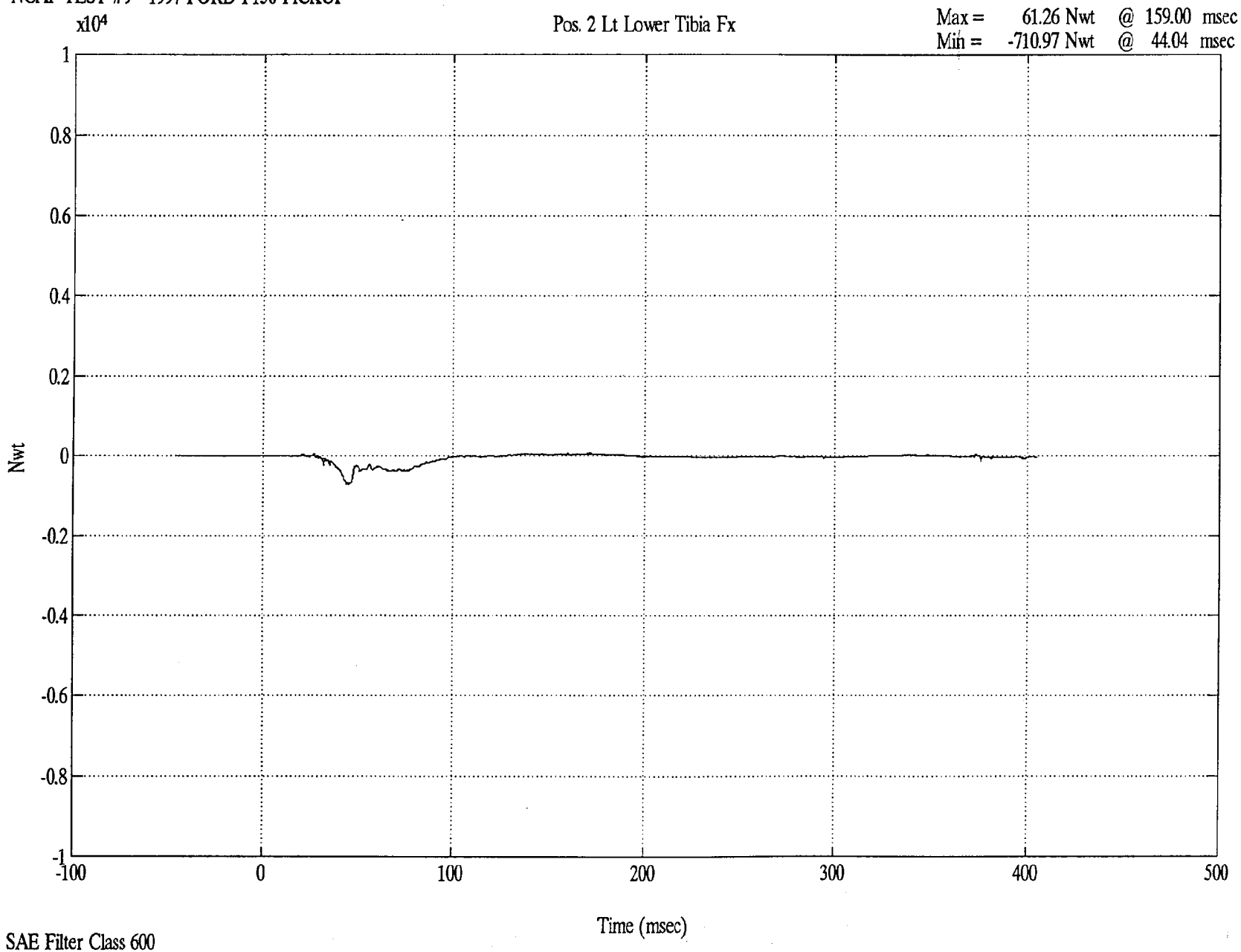
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

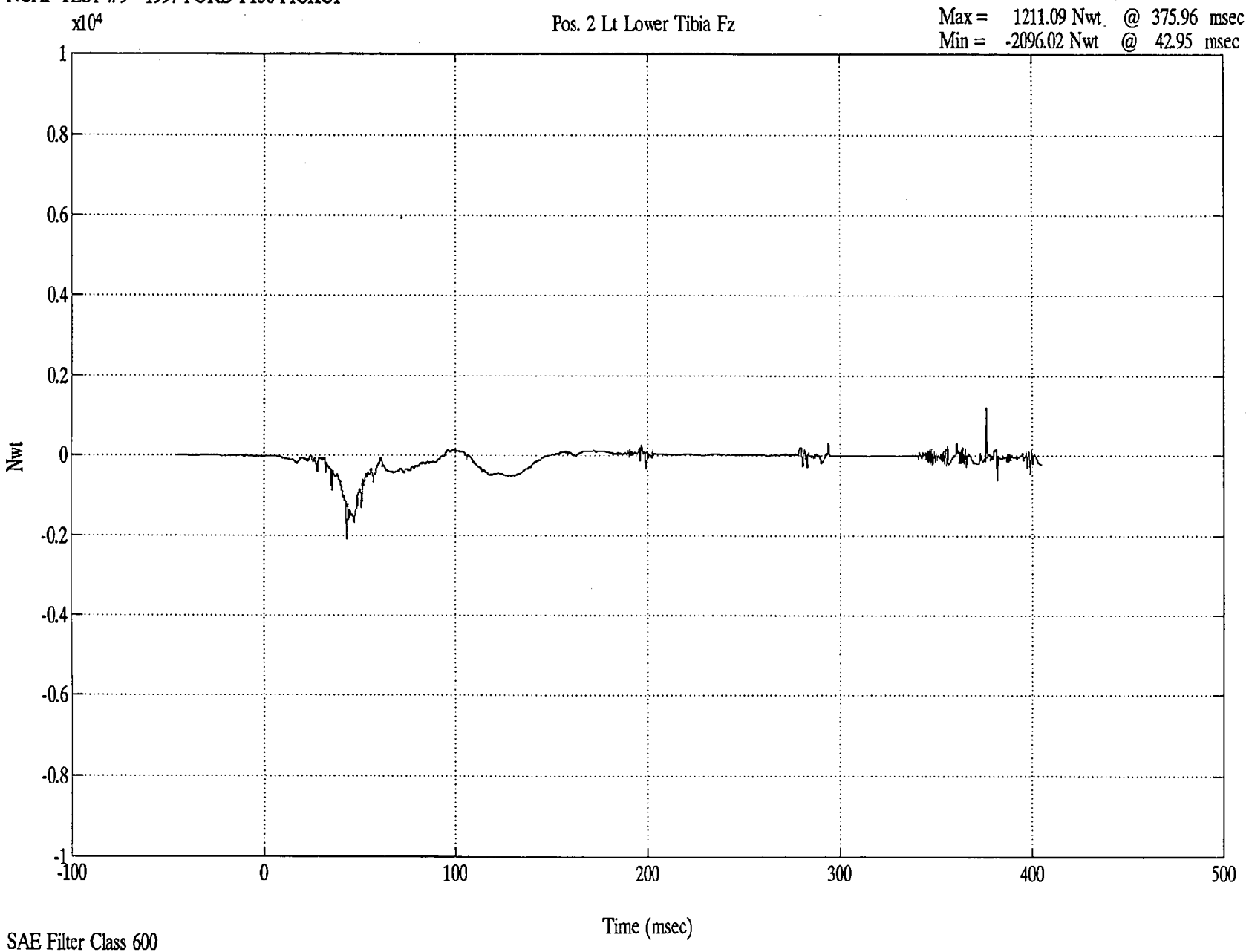


B-86

8313-9

SAE Filter Class 600

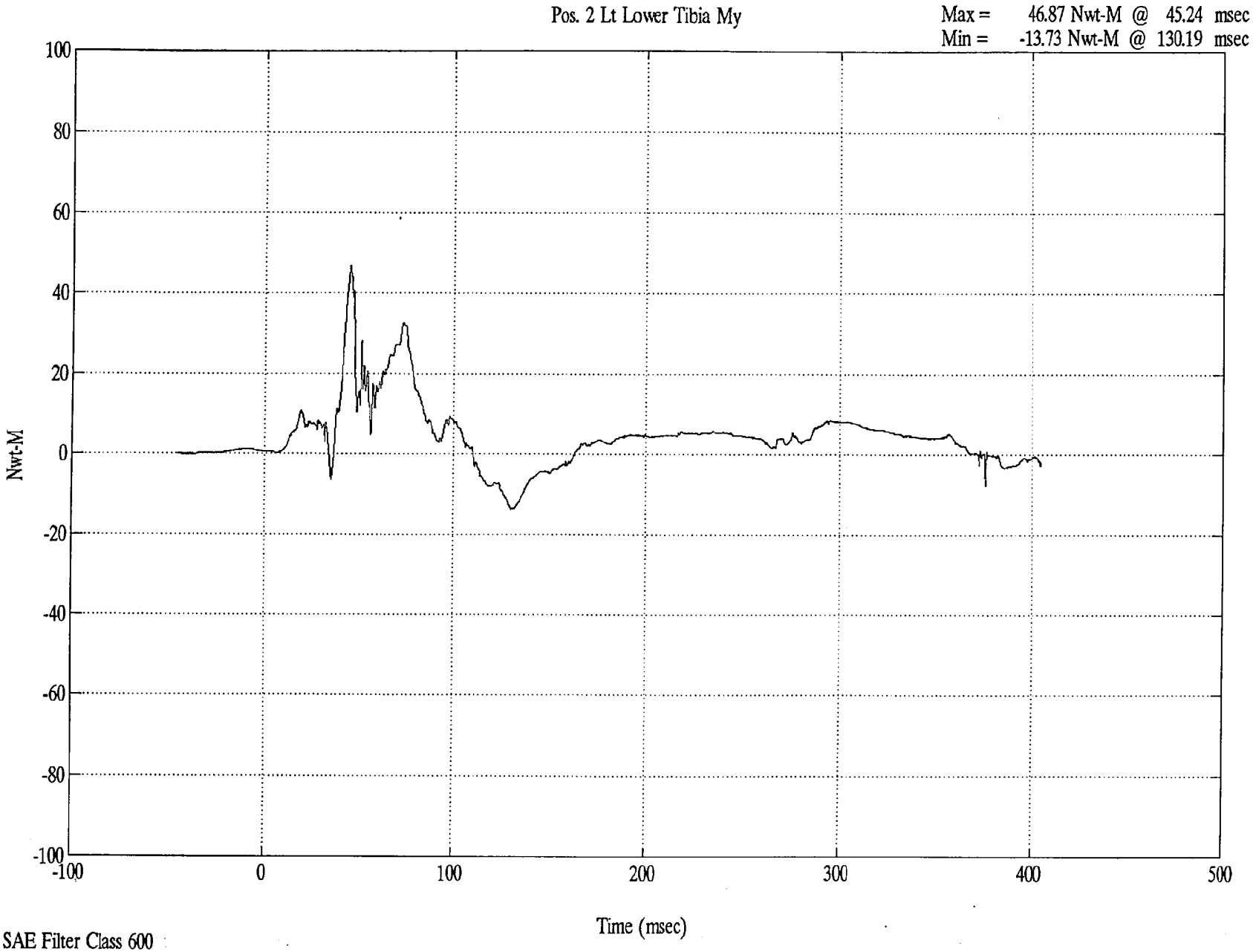
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP



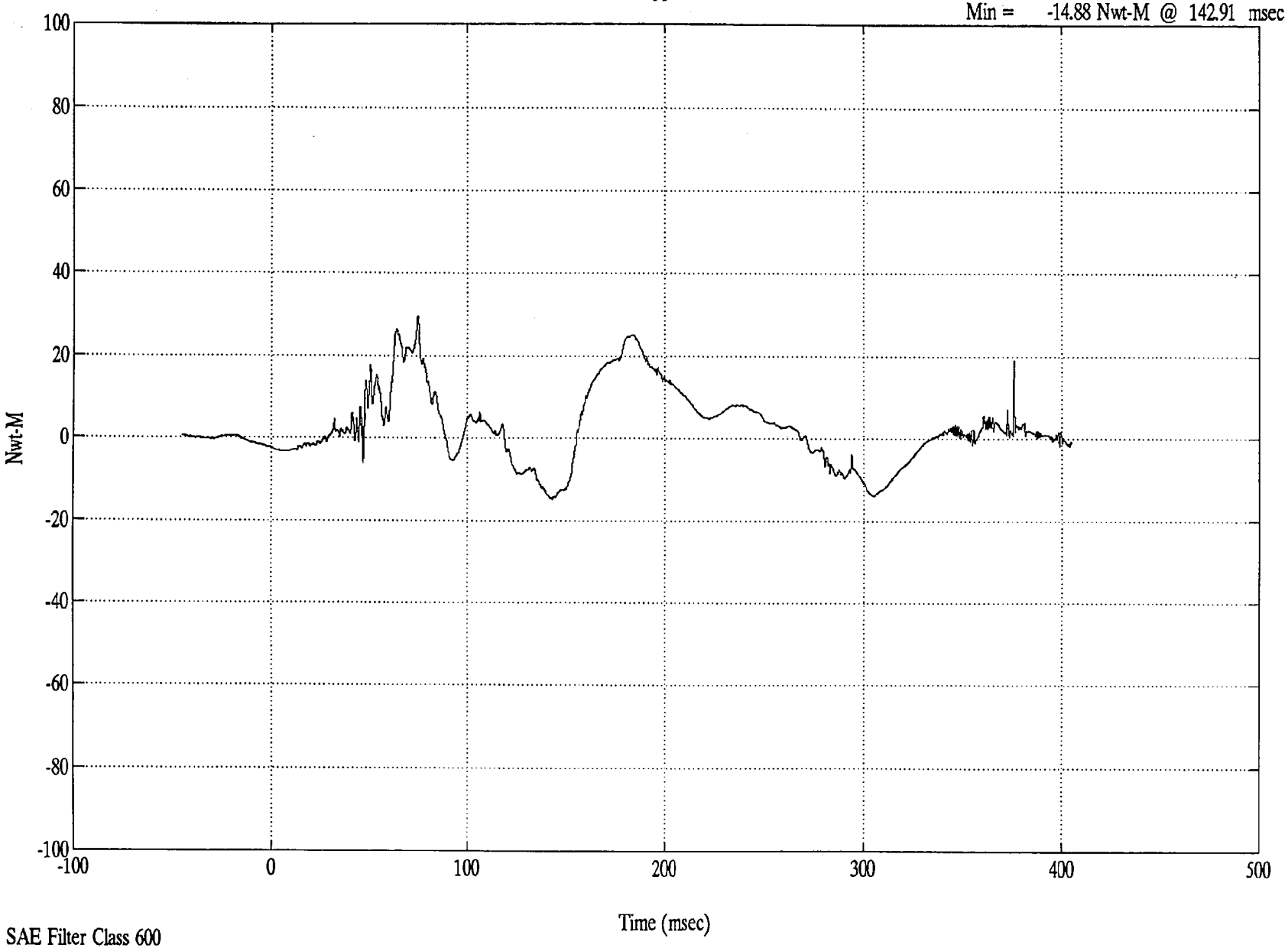
SAE Filter Class 600

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

Pos. 2 Rt Upper Tibia Mx

Max = 29.56 Nwt-M @ 74.88 msec
Min = -14.88 Nwt-M @ 142.91 msec

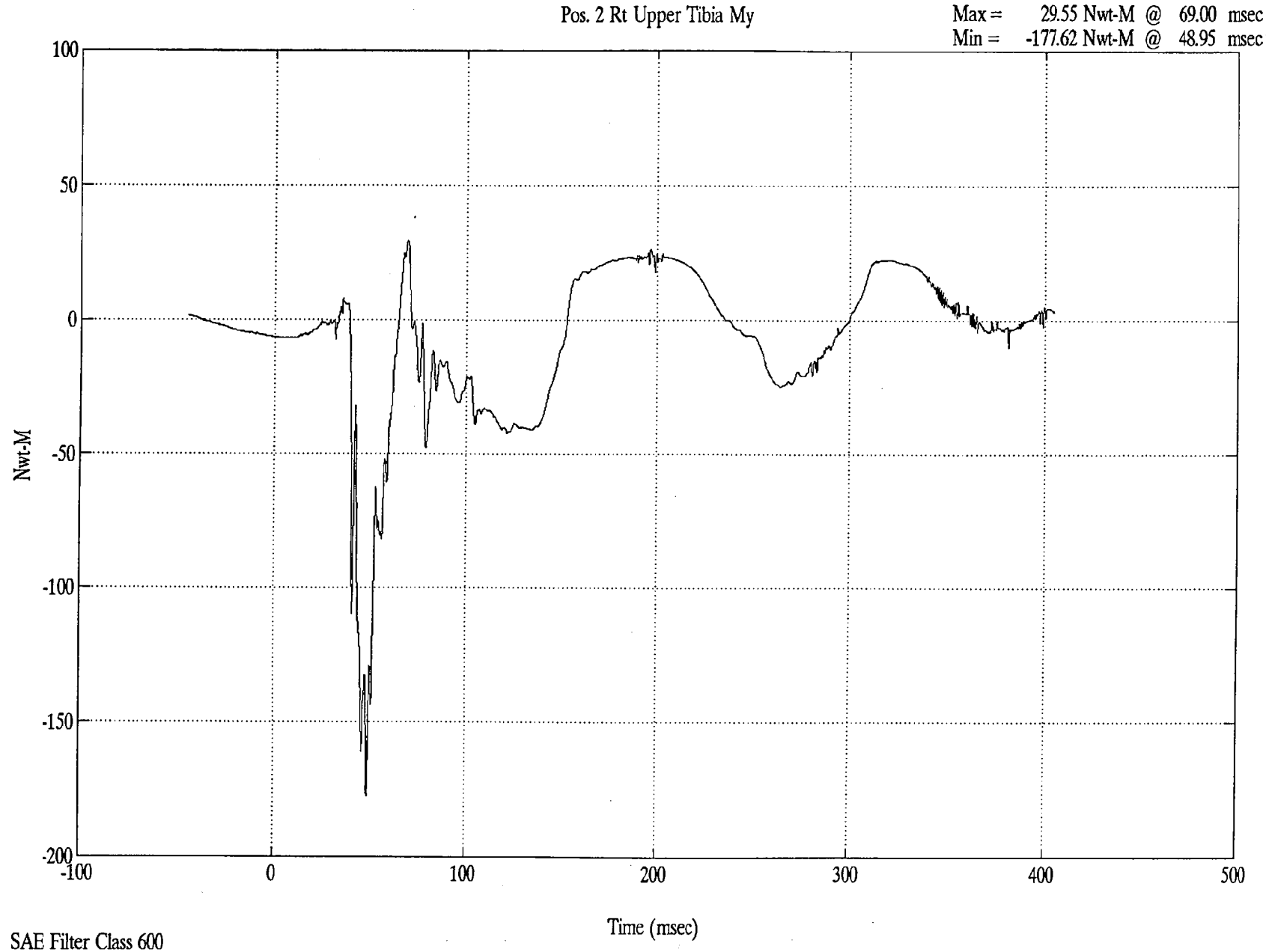


B-89

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

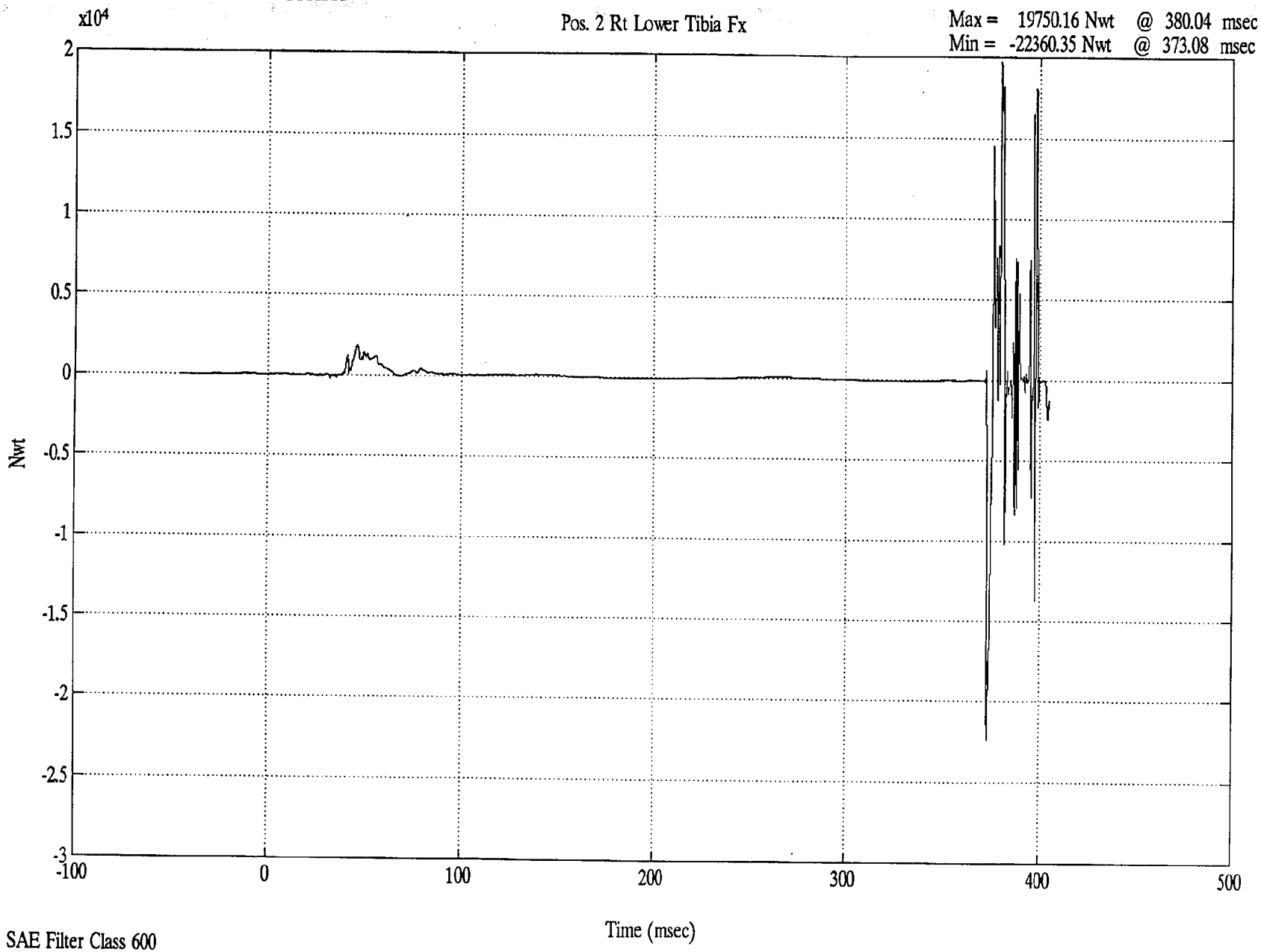


B-90

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

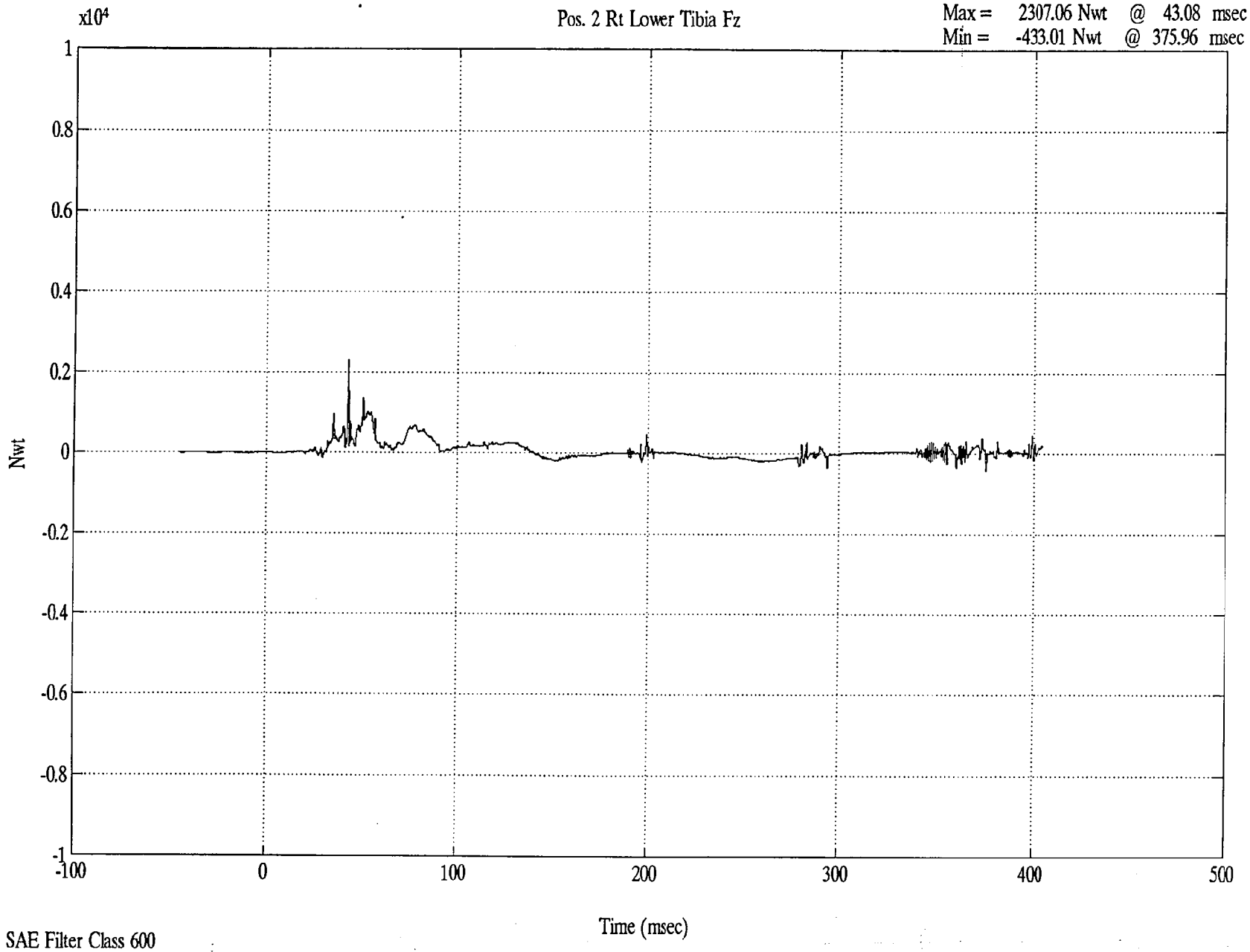


SAE Filter Class 600

B-91

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

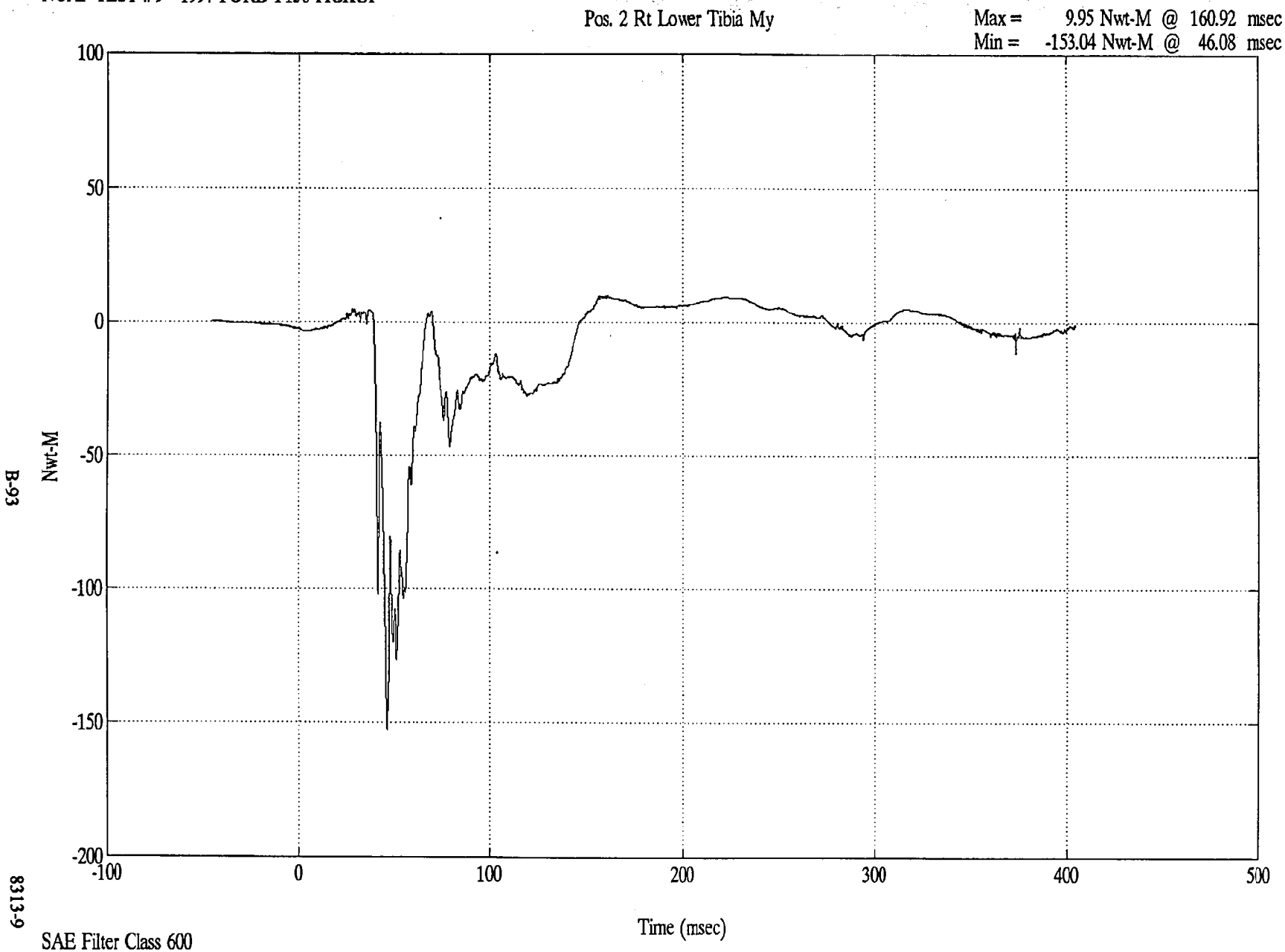


B-92

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

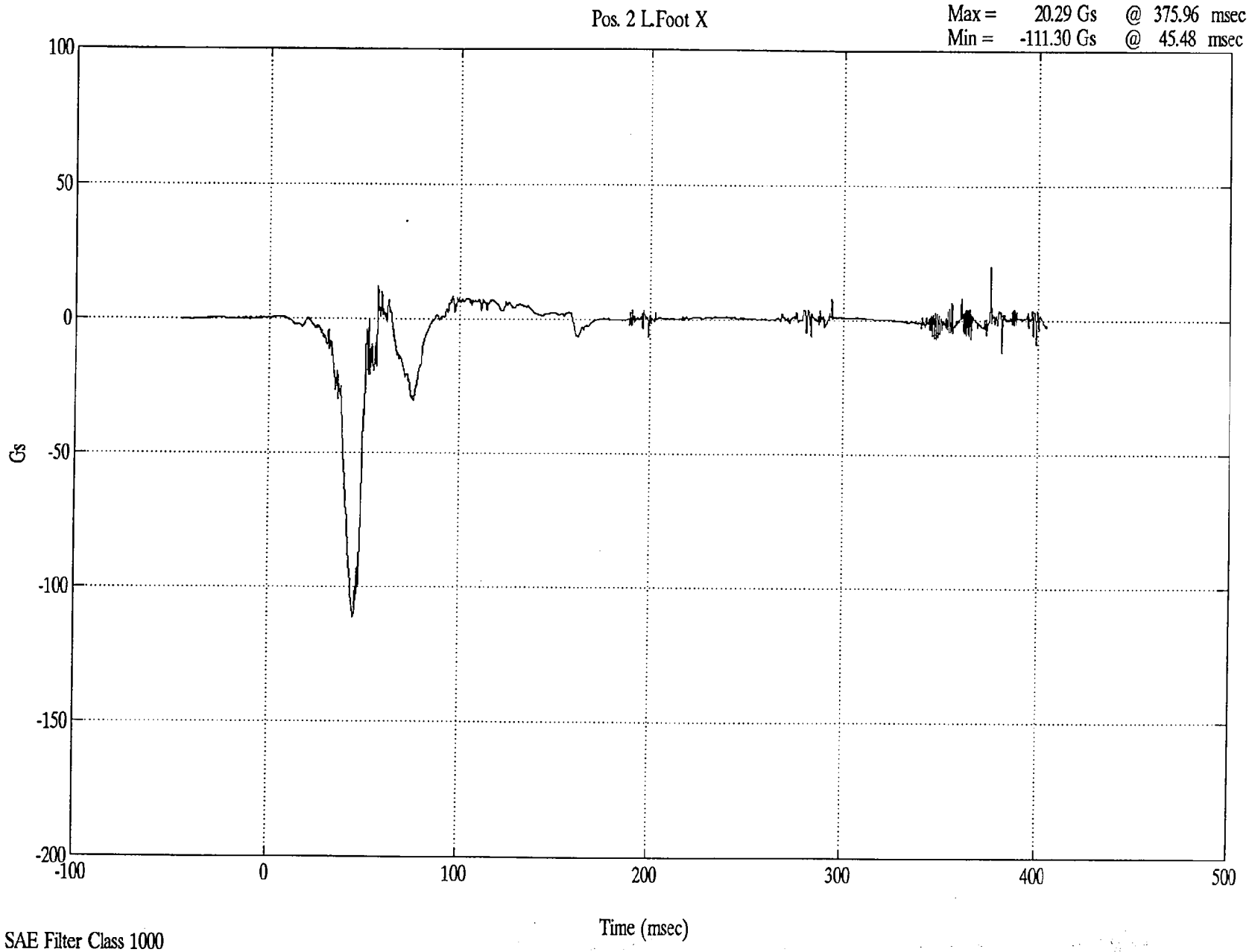


B-93

8313-9

SAE Filter Class 600

NCAP TEST #9 - 1997 FORD F150 PICKUP

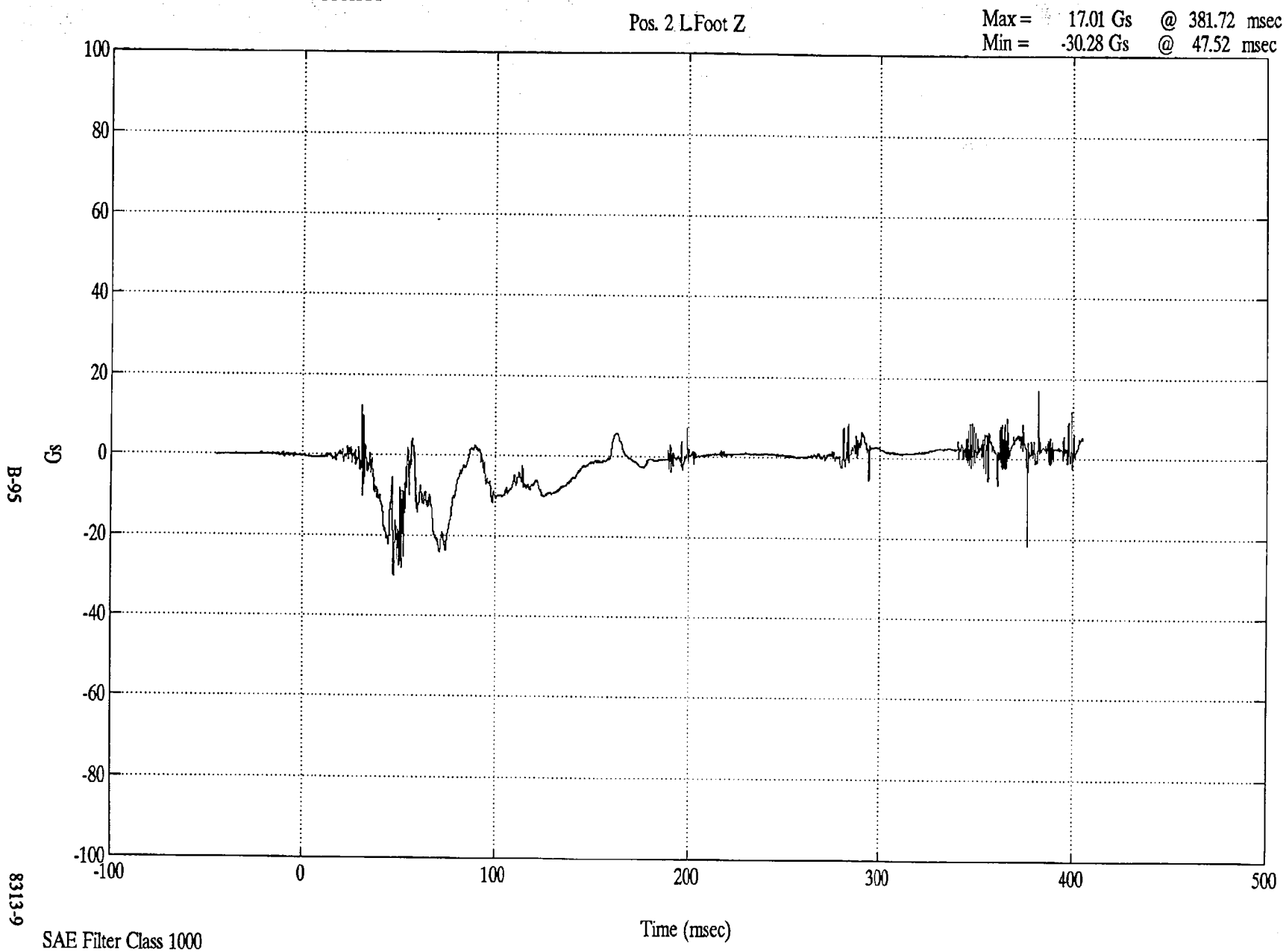


B-94

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

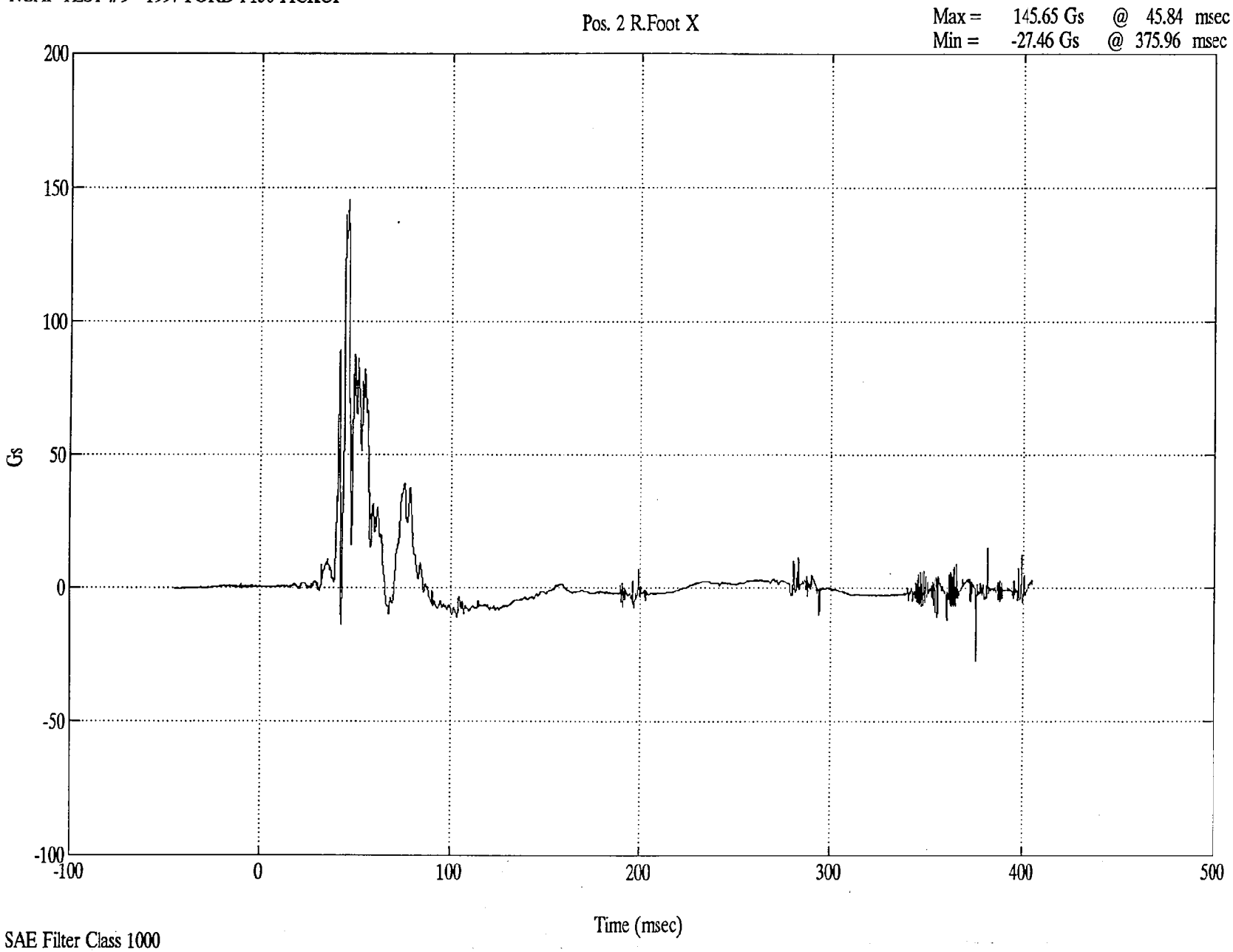


B-95

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

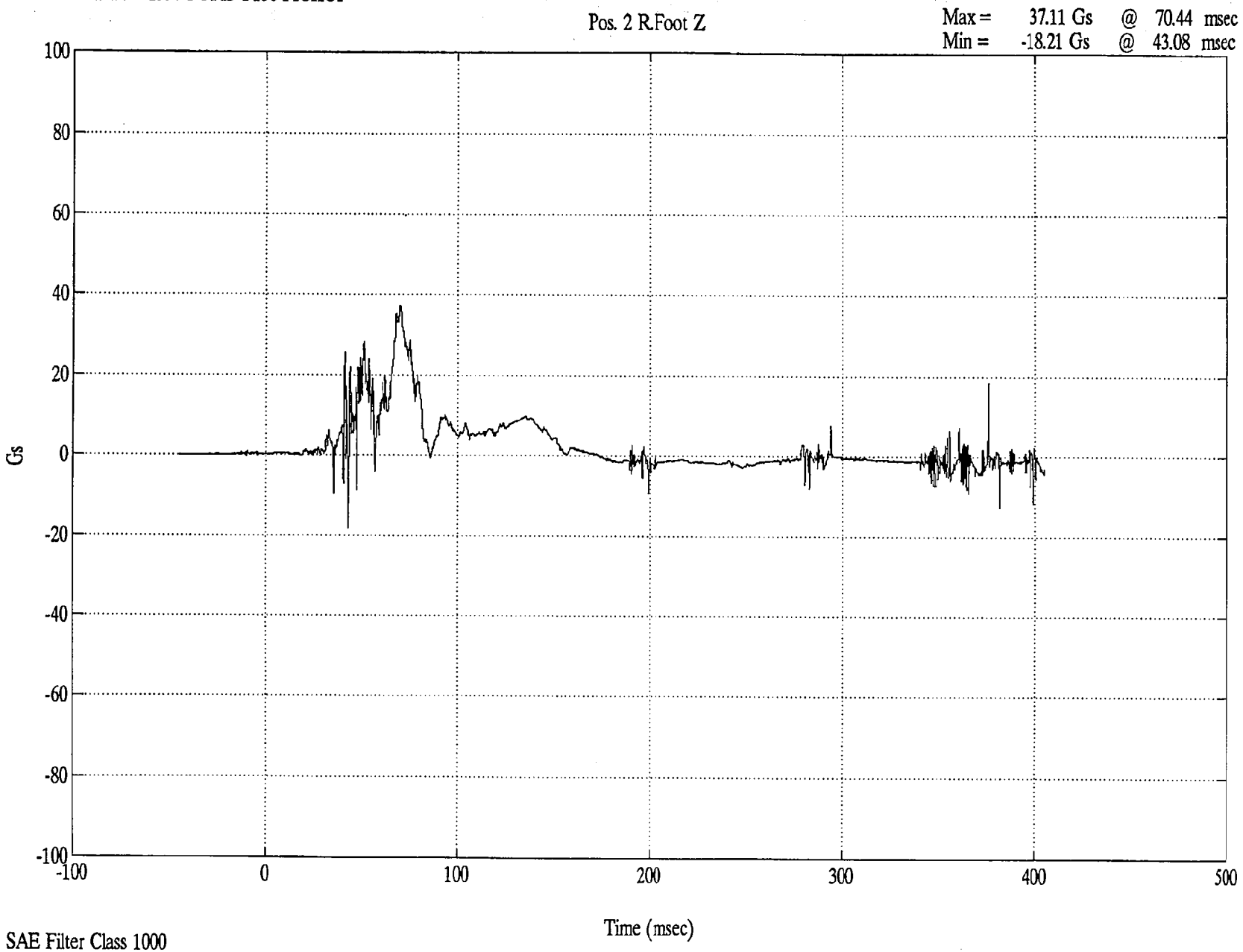


SAE Filter Class 1000

B-96

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

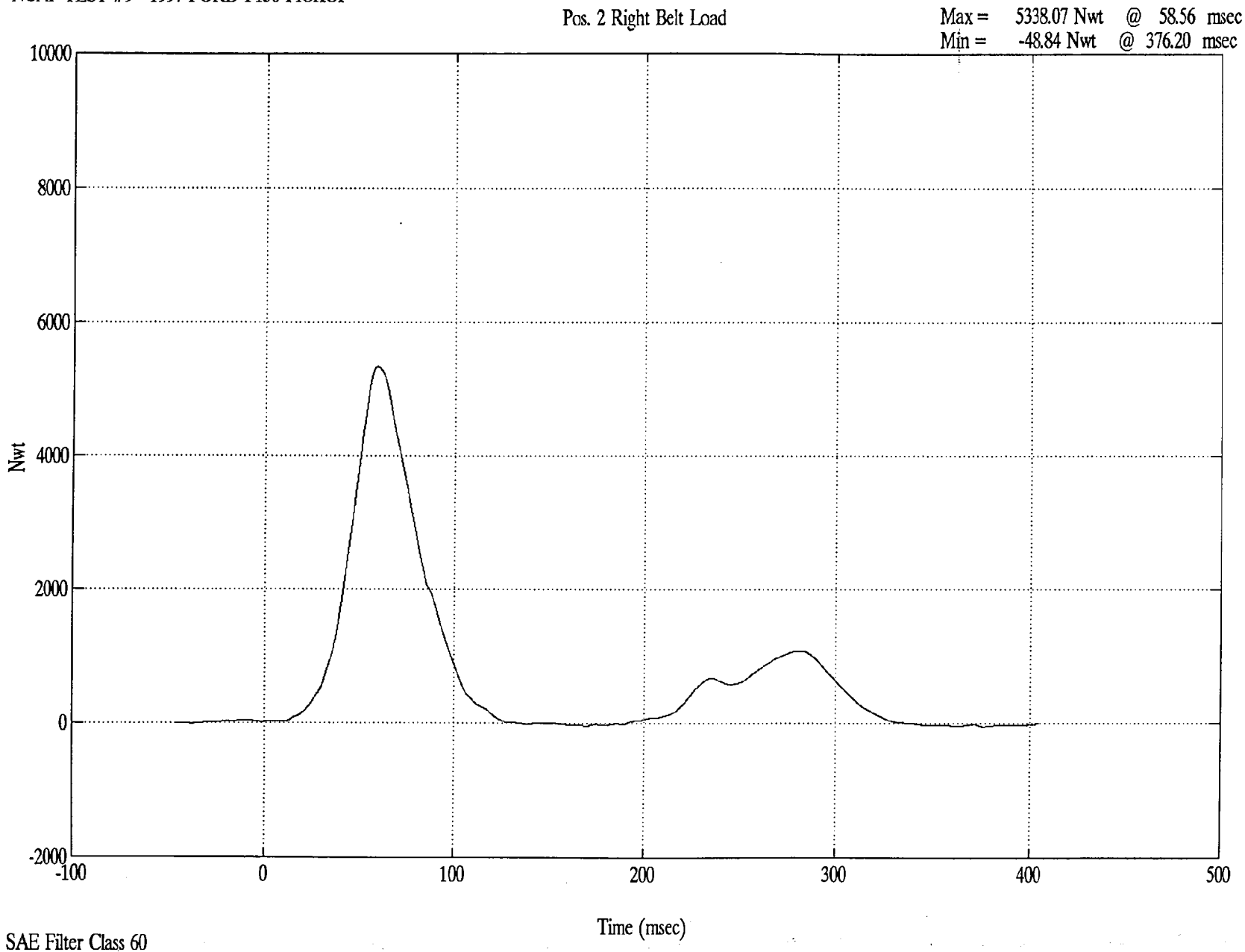


B-97

8313-9

SAE Filter Class 1000

NCAP TEST #9 - 1997 FORD F150 PICKUP

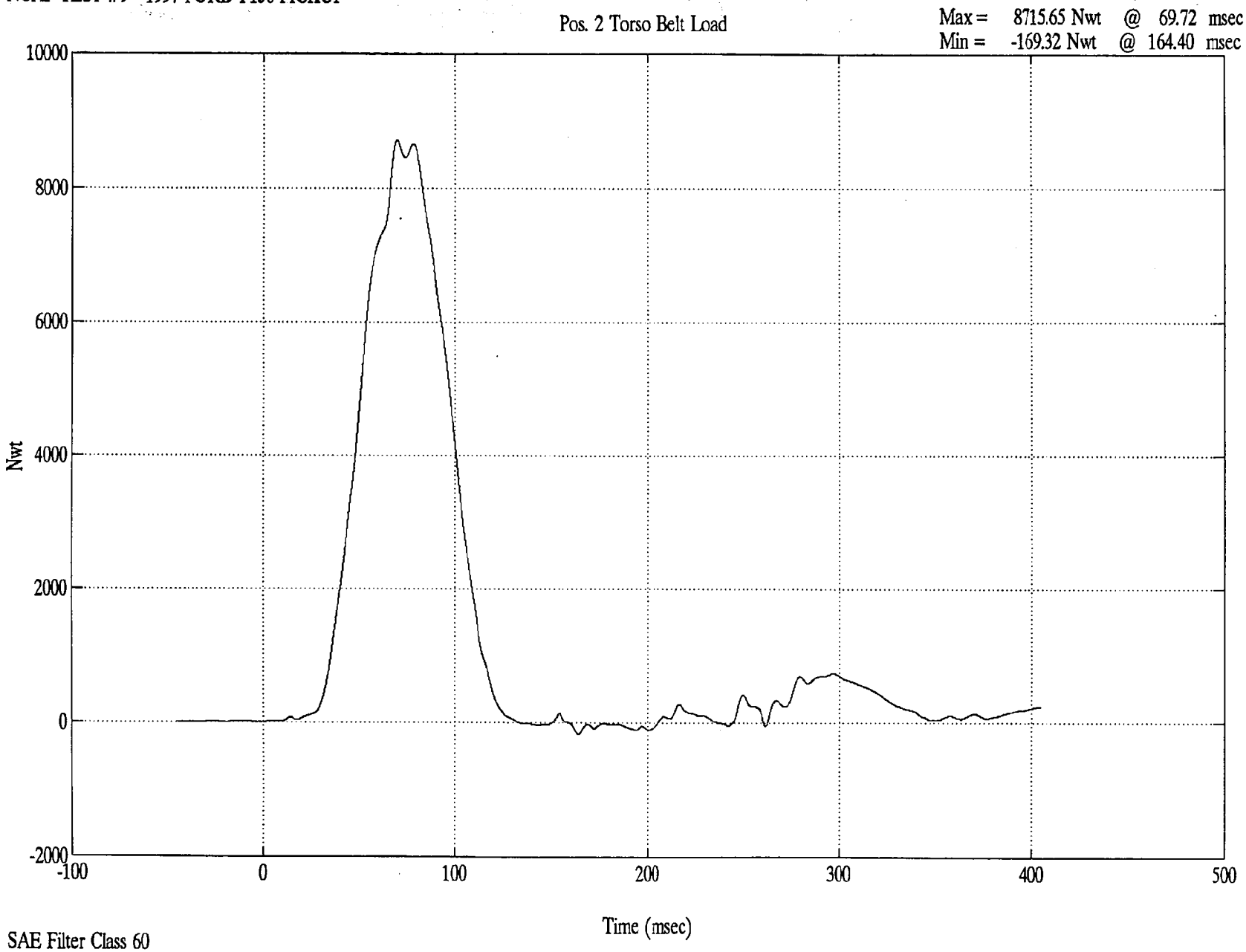


B-98

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

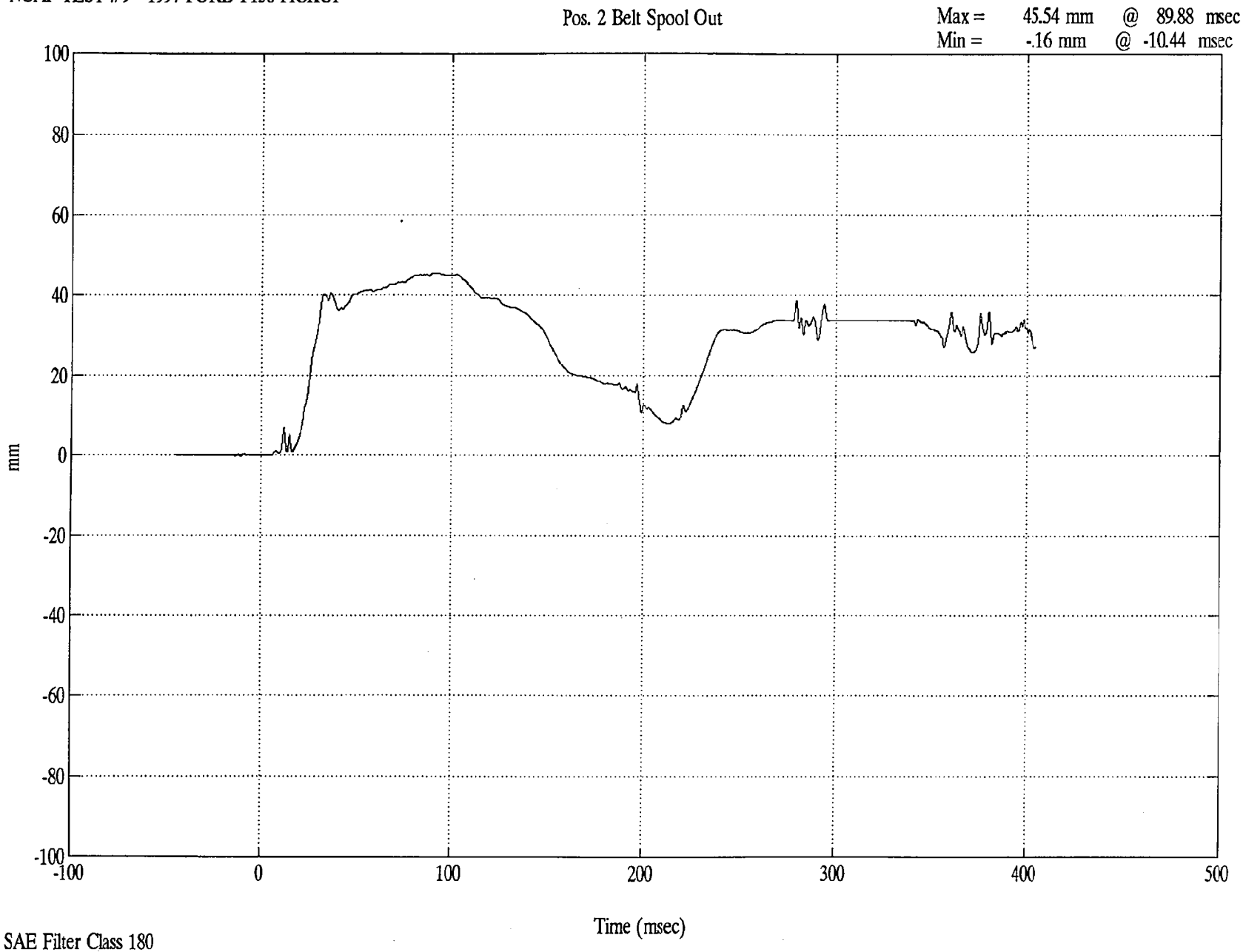


SAE Filter Class 60

B-99

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

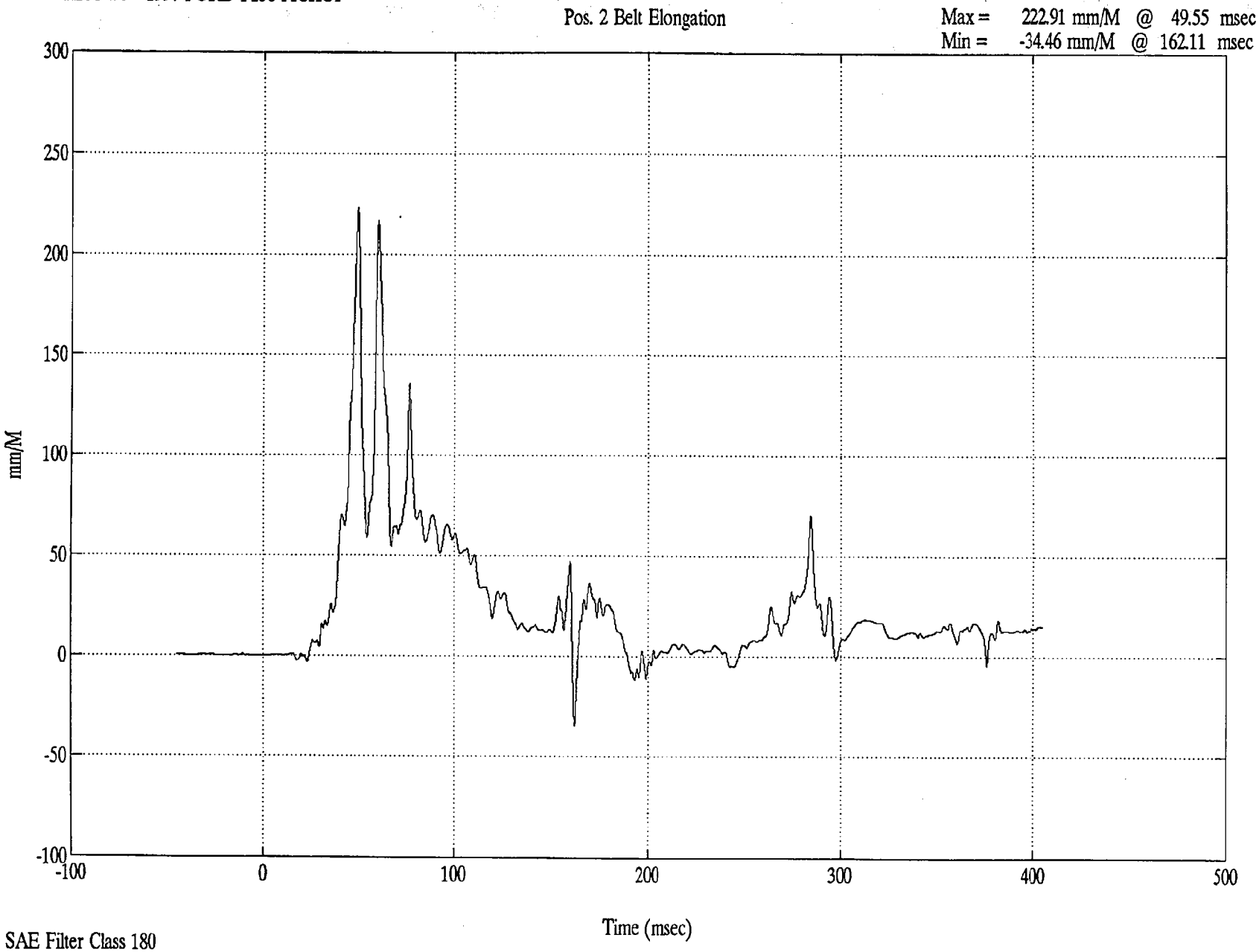


B-100

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP



B-101

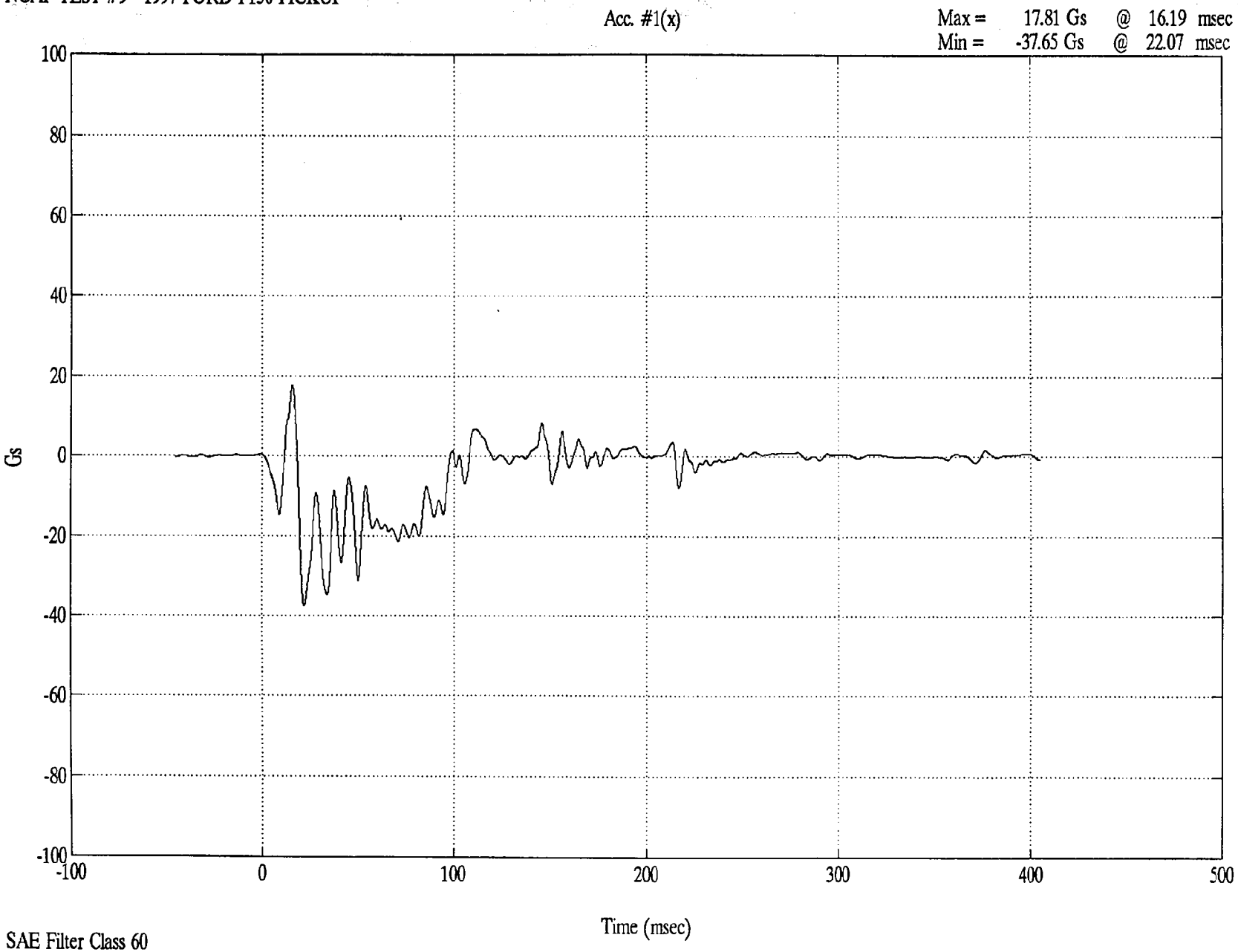
8313-9

SAE Filter Class 180

NHTSA TEST NO. MV0200

VEHICLE DATA	FILTER CHANNEL CLASS
Acceleration	60
Velocity	180
Displacement	180

NCAP TEST #9 - 1997 FORD F150 PICKUP

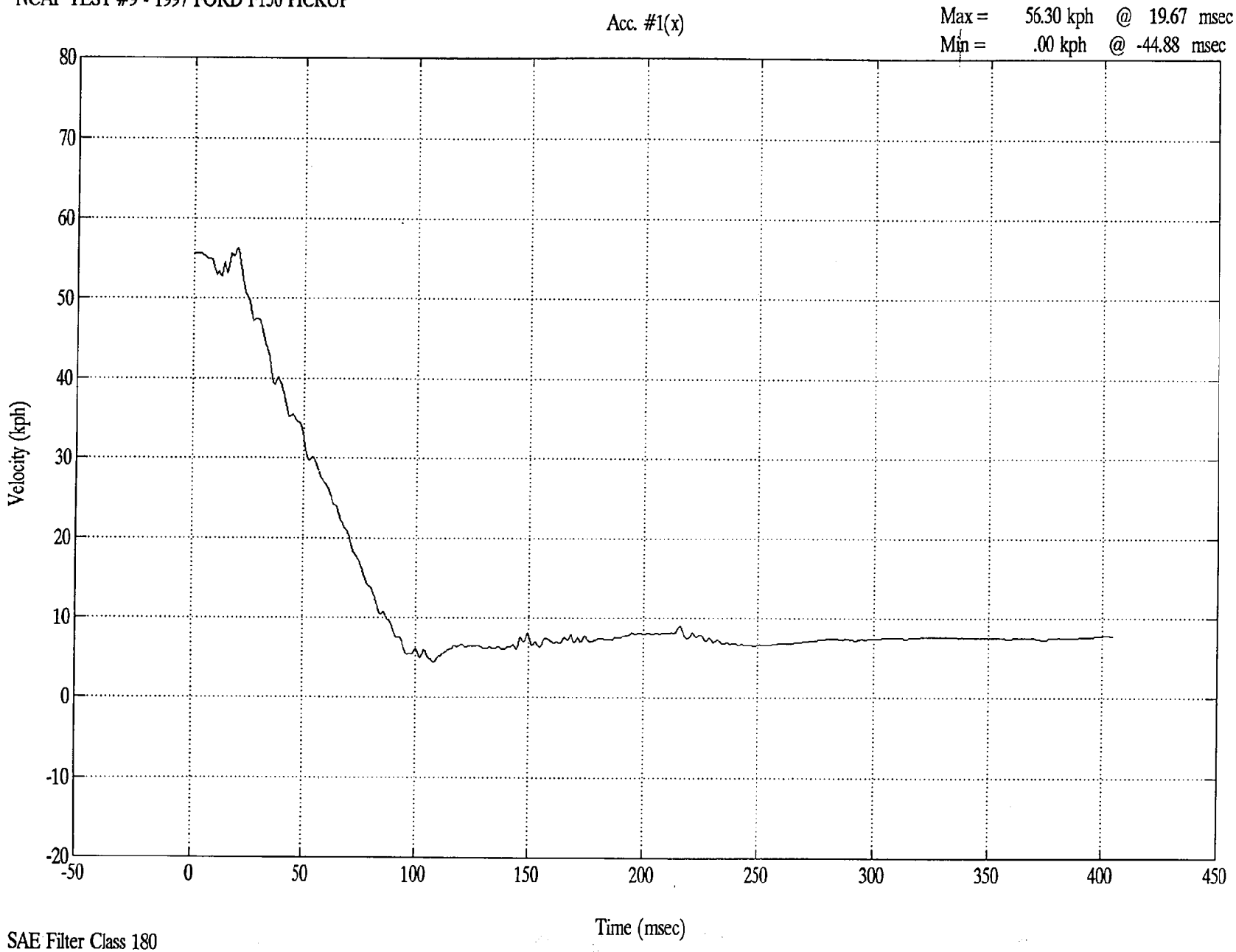


B-103

8313-9

SAE Filter Class 60

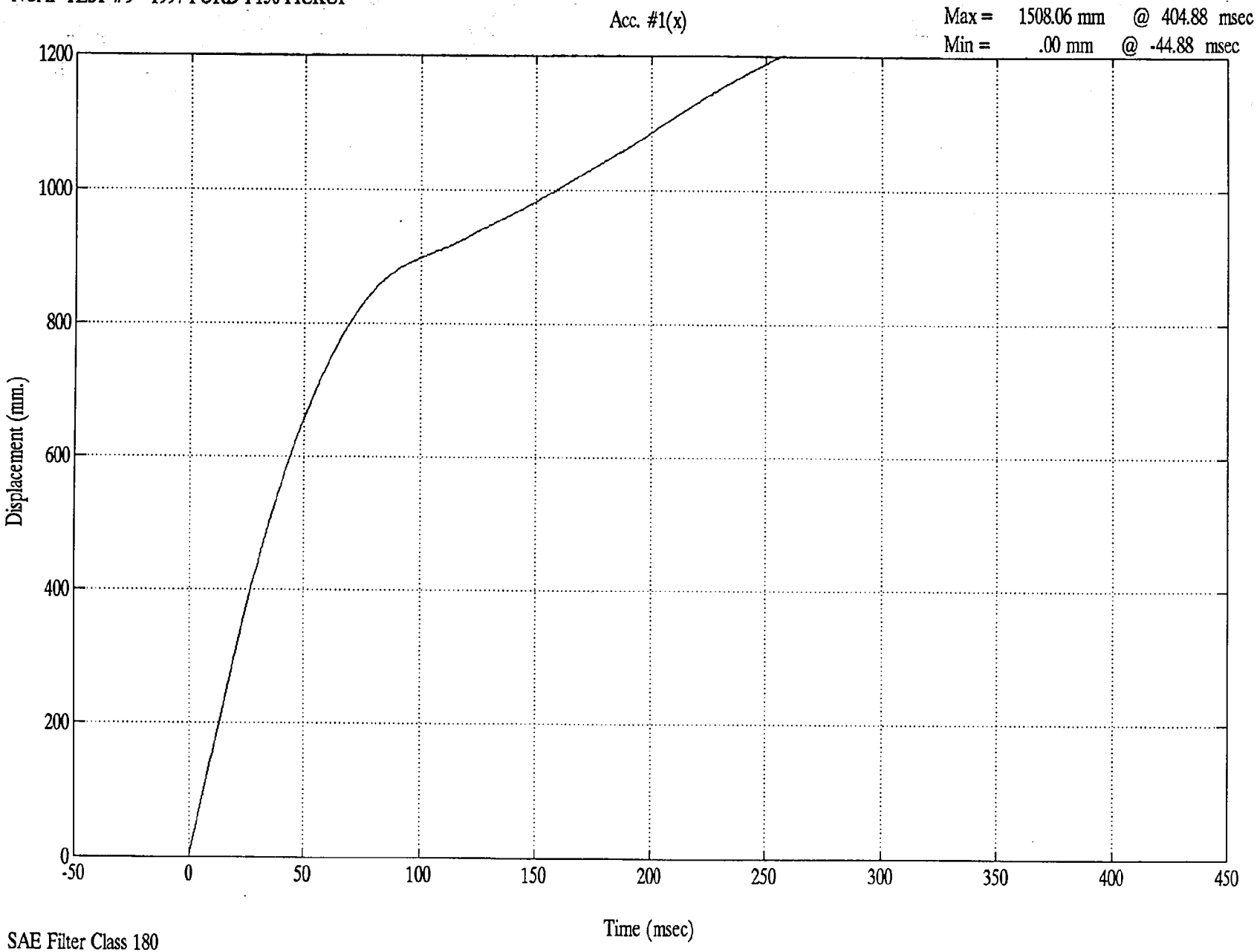
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

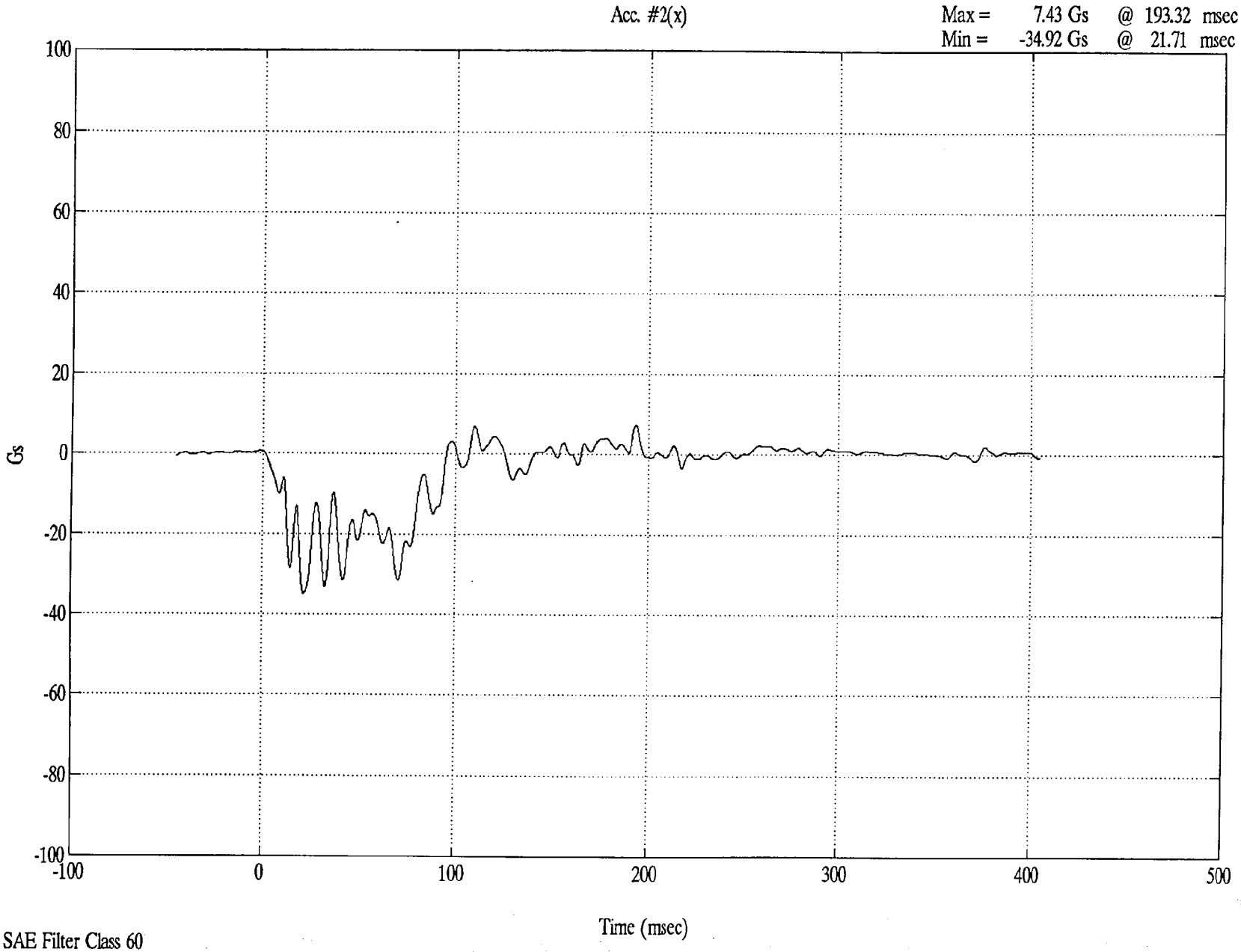
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

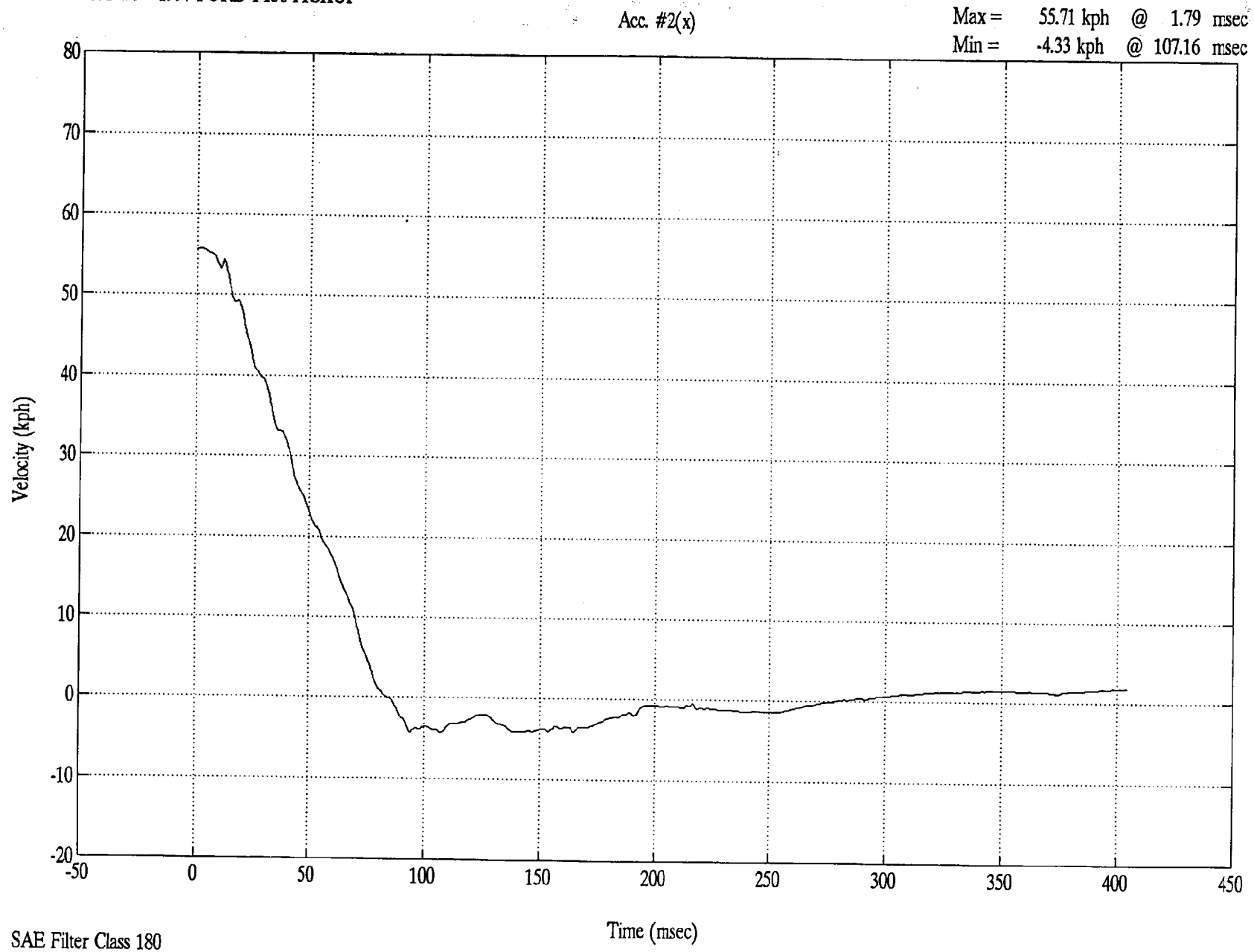


B-106

8313-9

SAE Filter Class 60

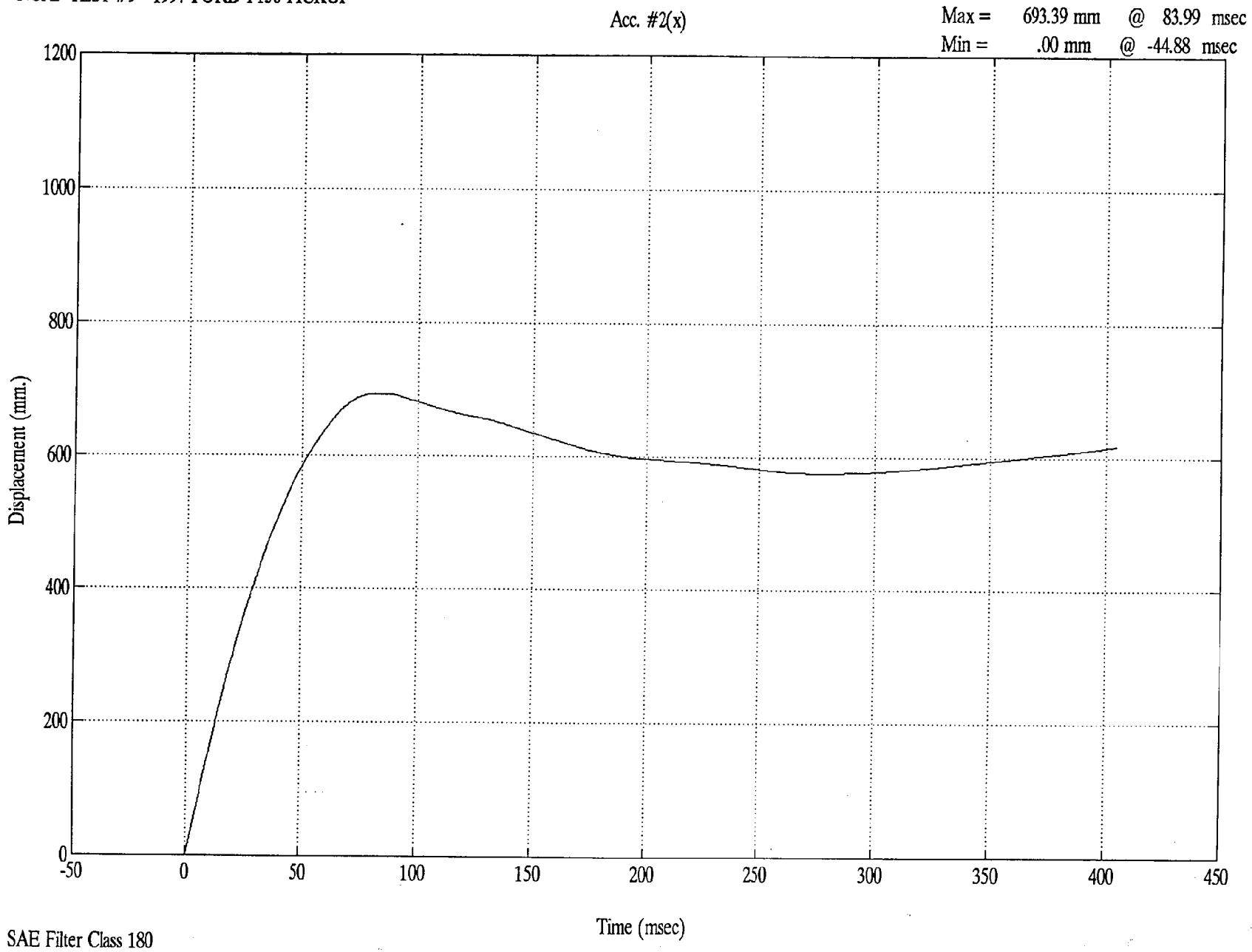
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

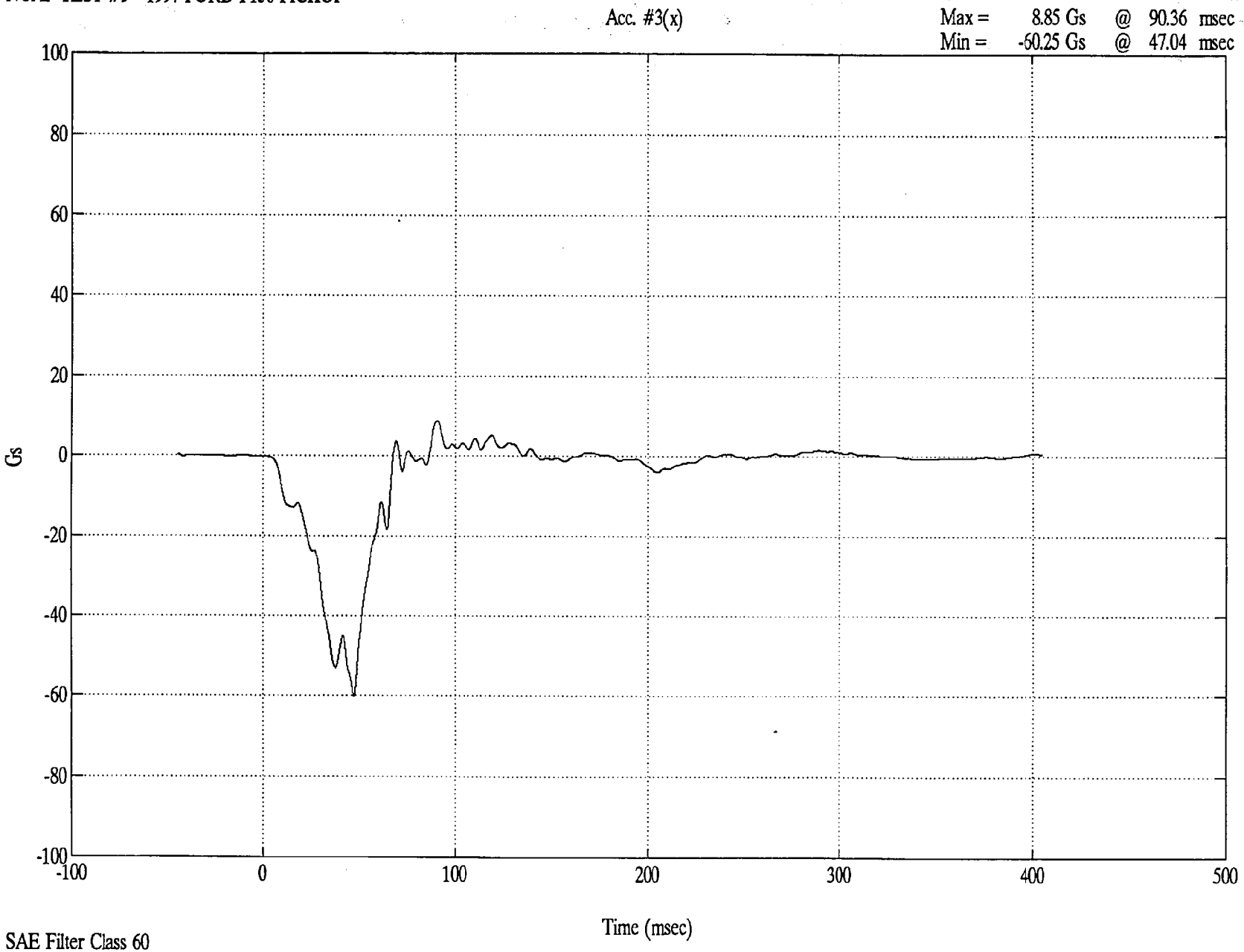
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

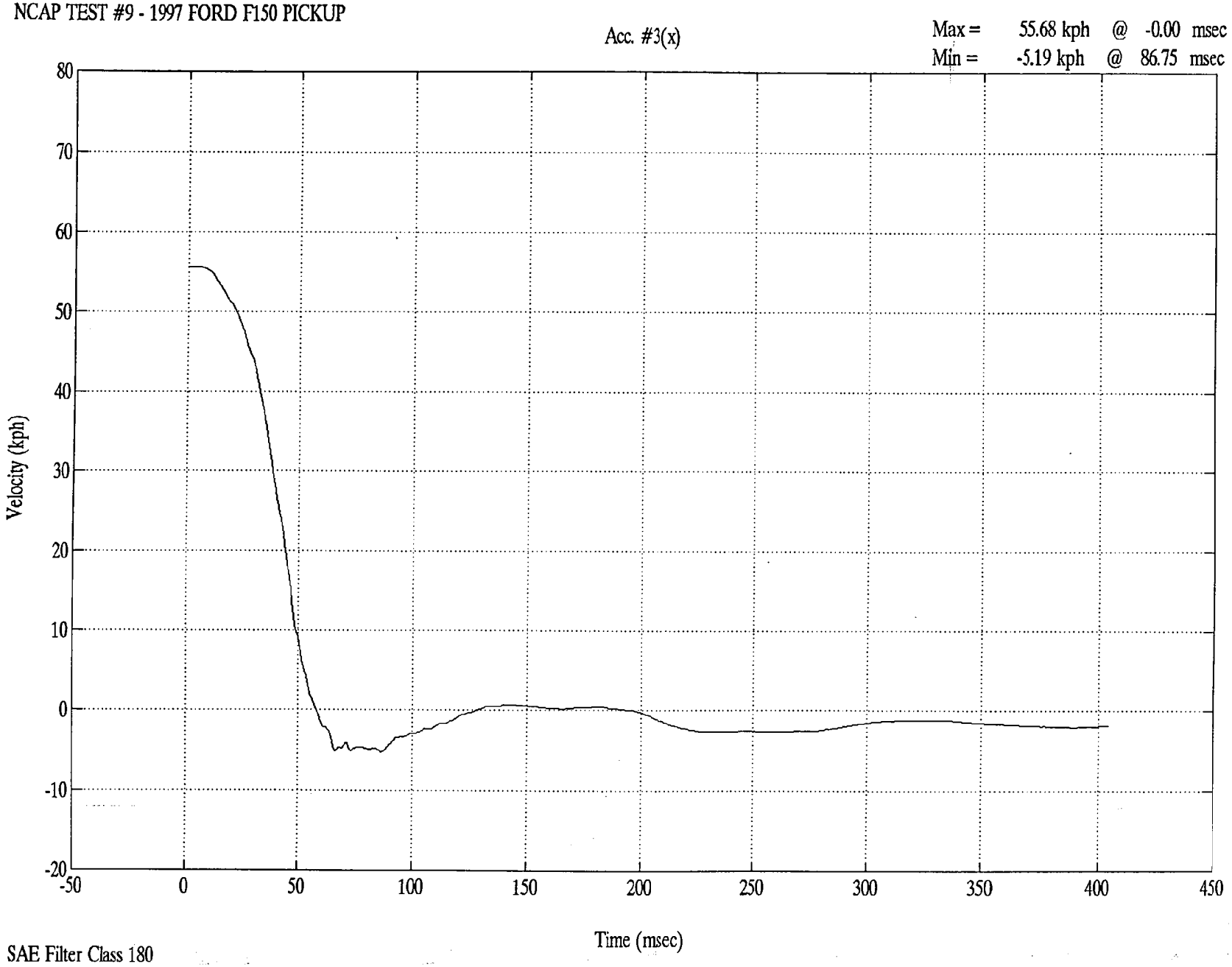


B-109

8313-9

SAE Filter Class 60

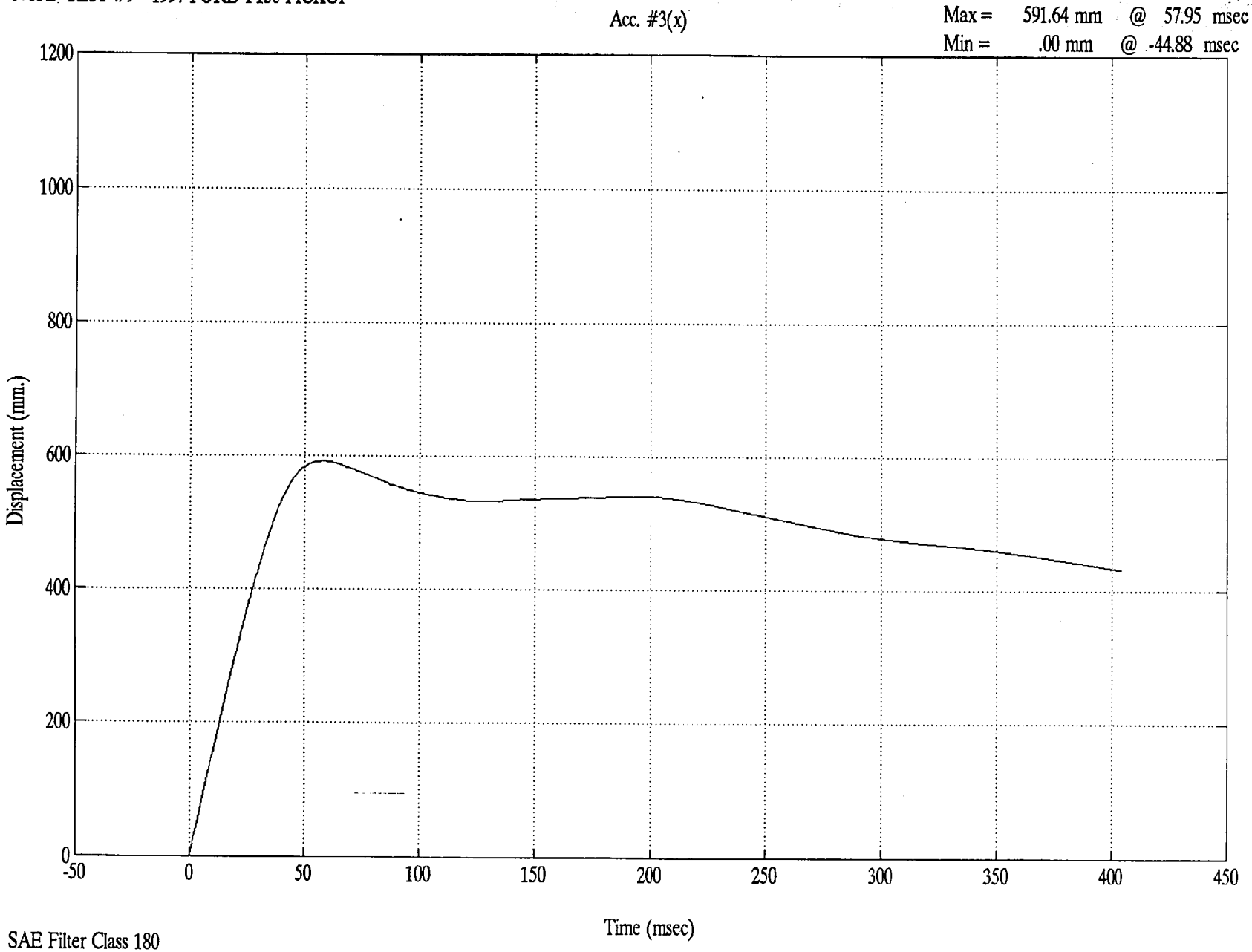
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

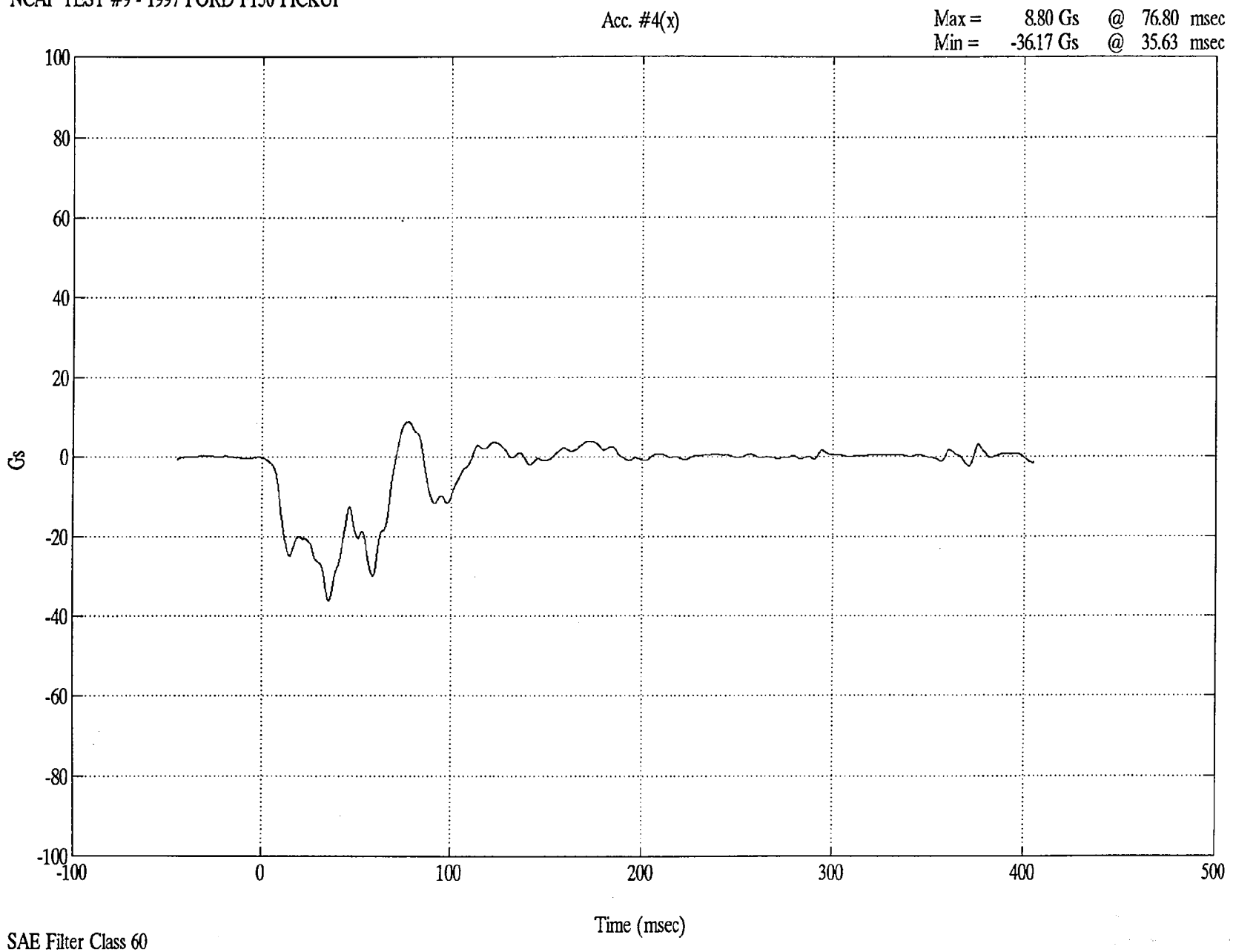


B-111

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

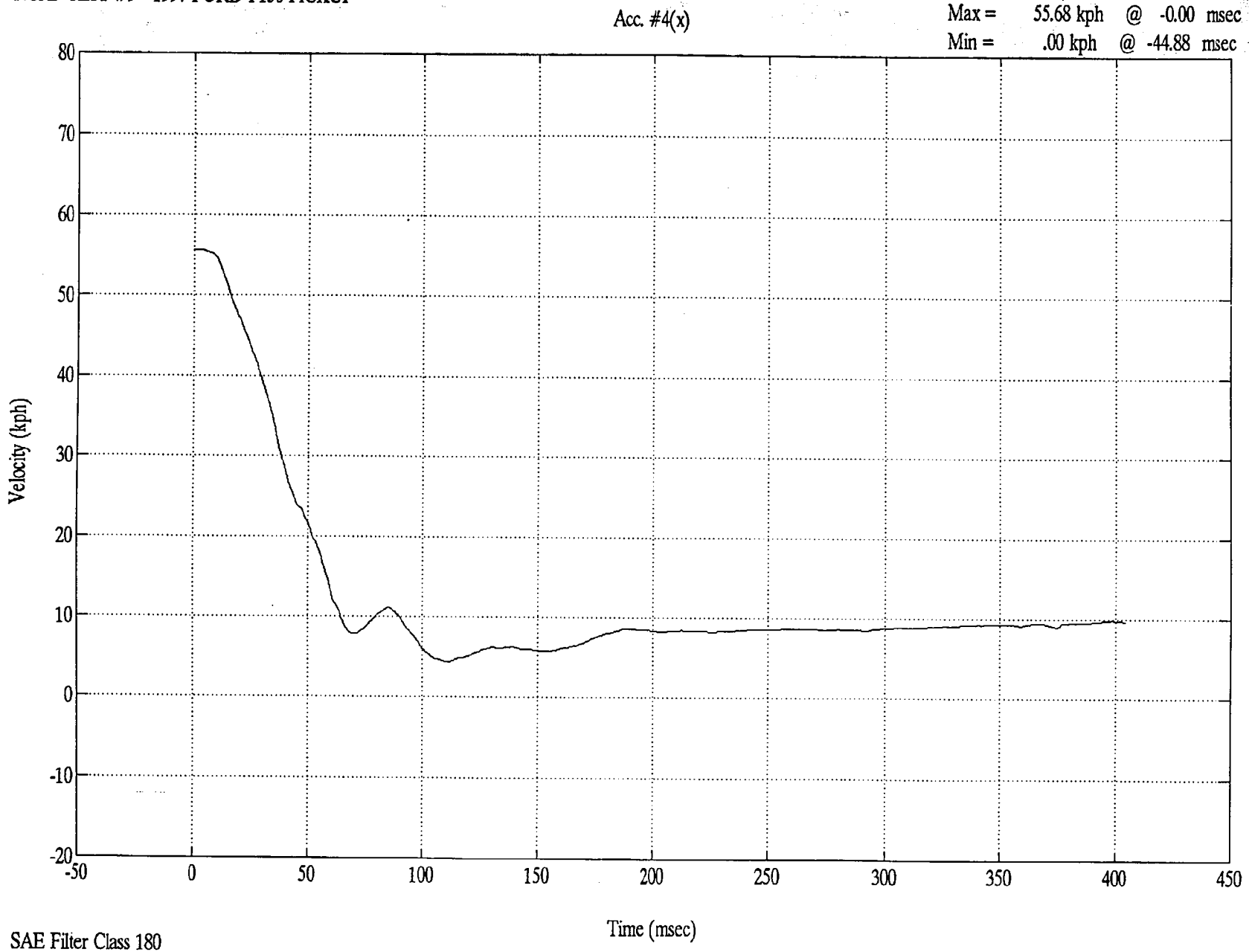


B-112

8313-9

SAE Filter Class 60

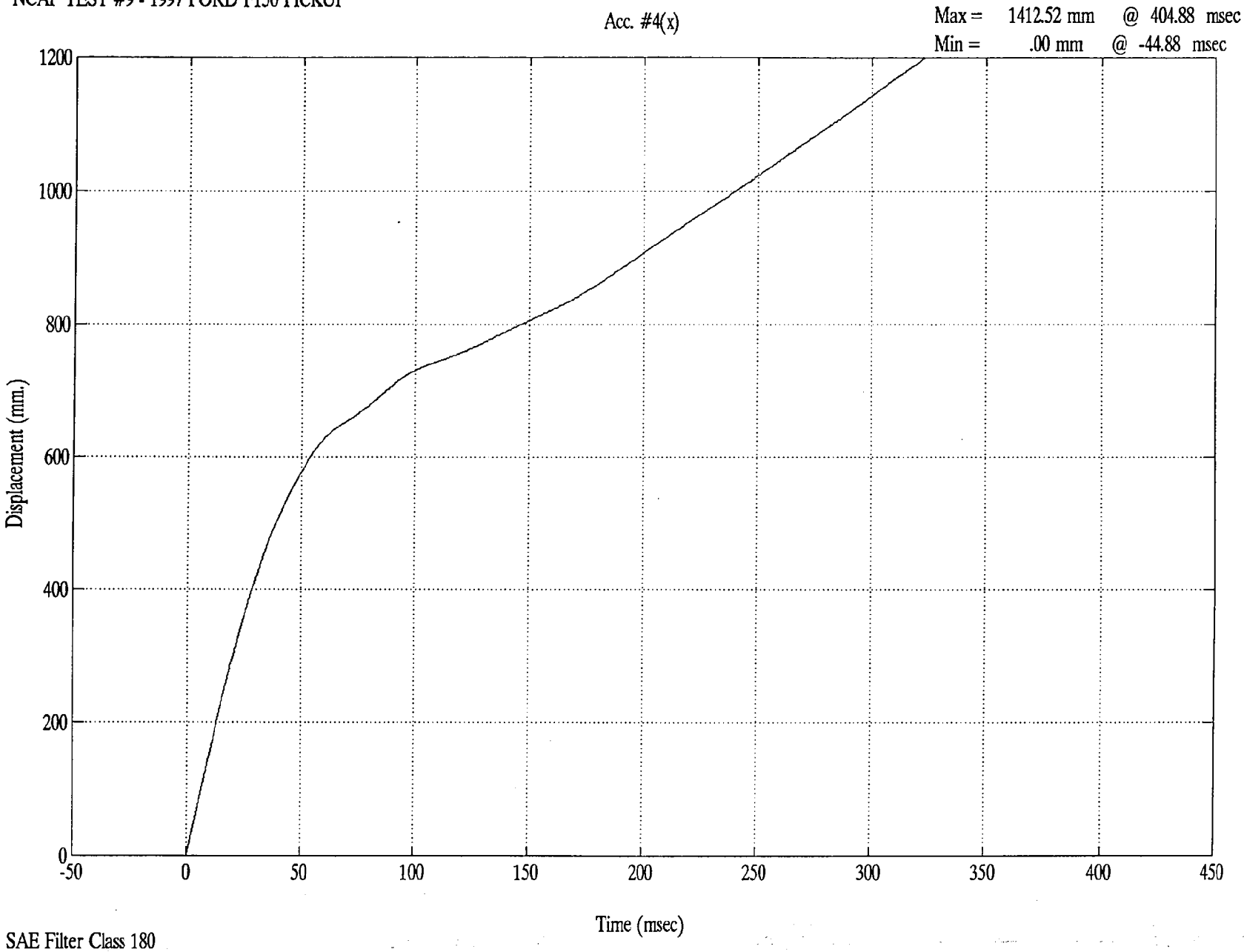
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

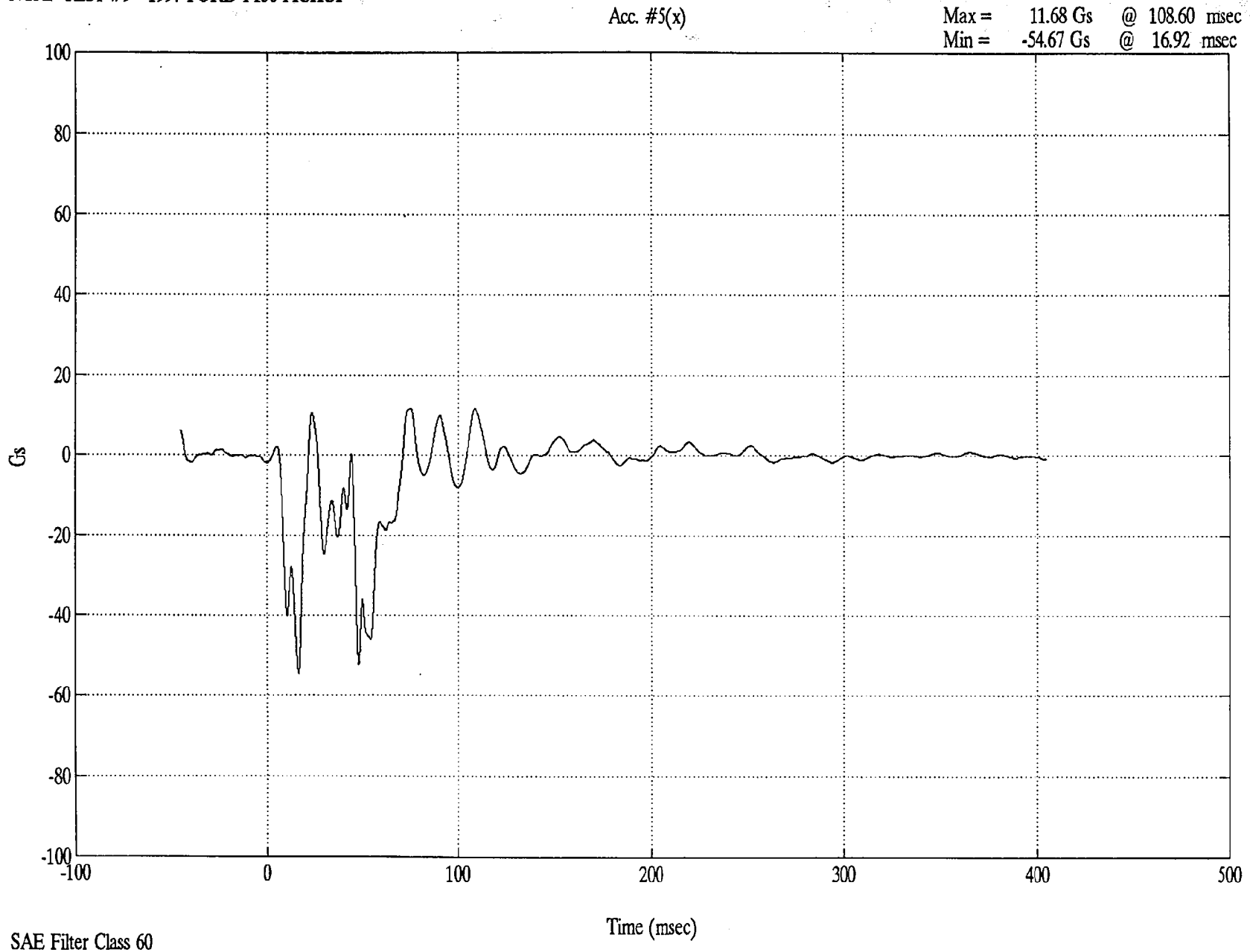
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

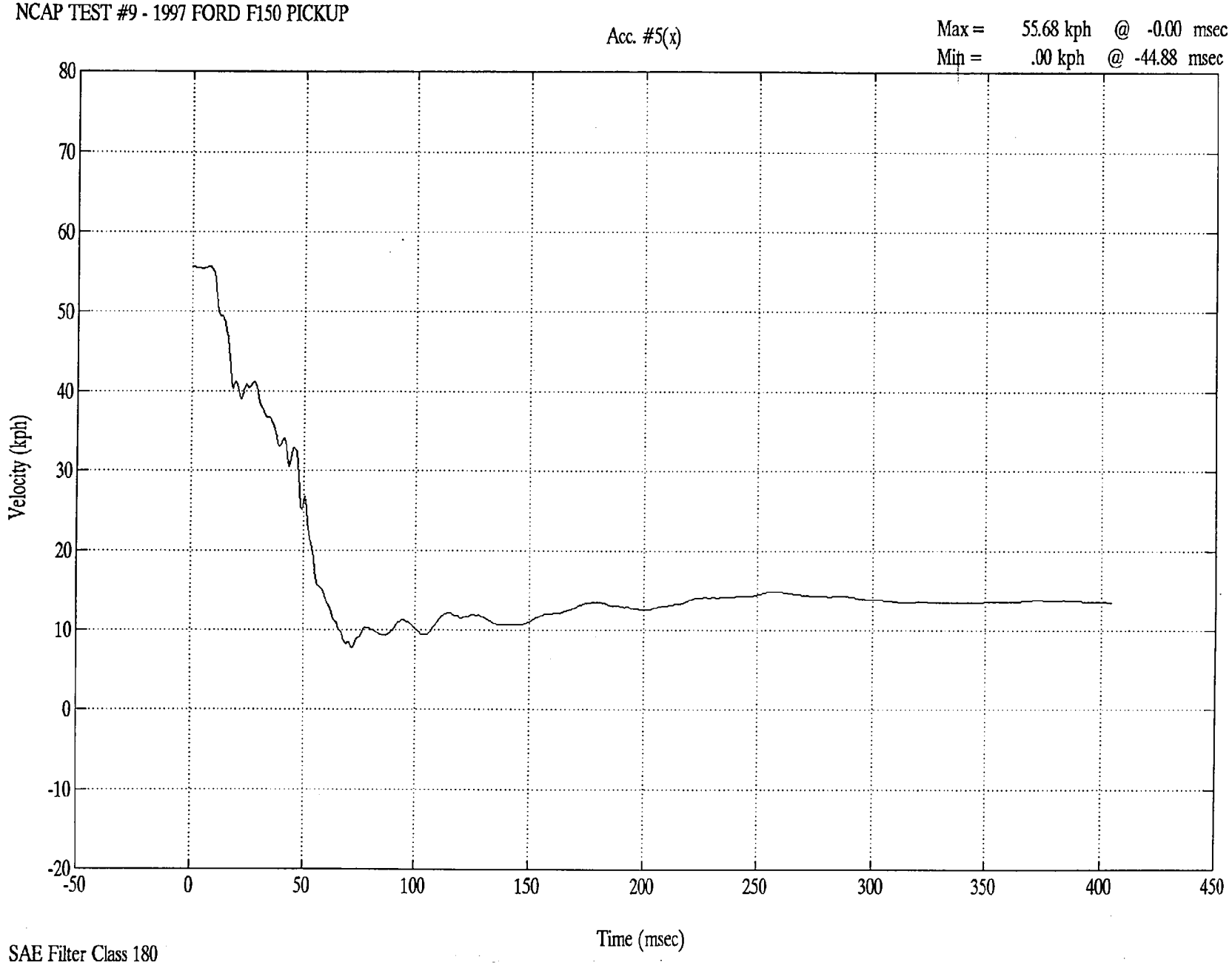


SAE Filter Class 60

B-115

8313-9

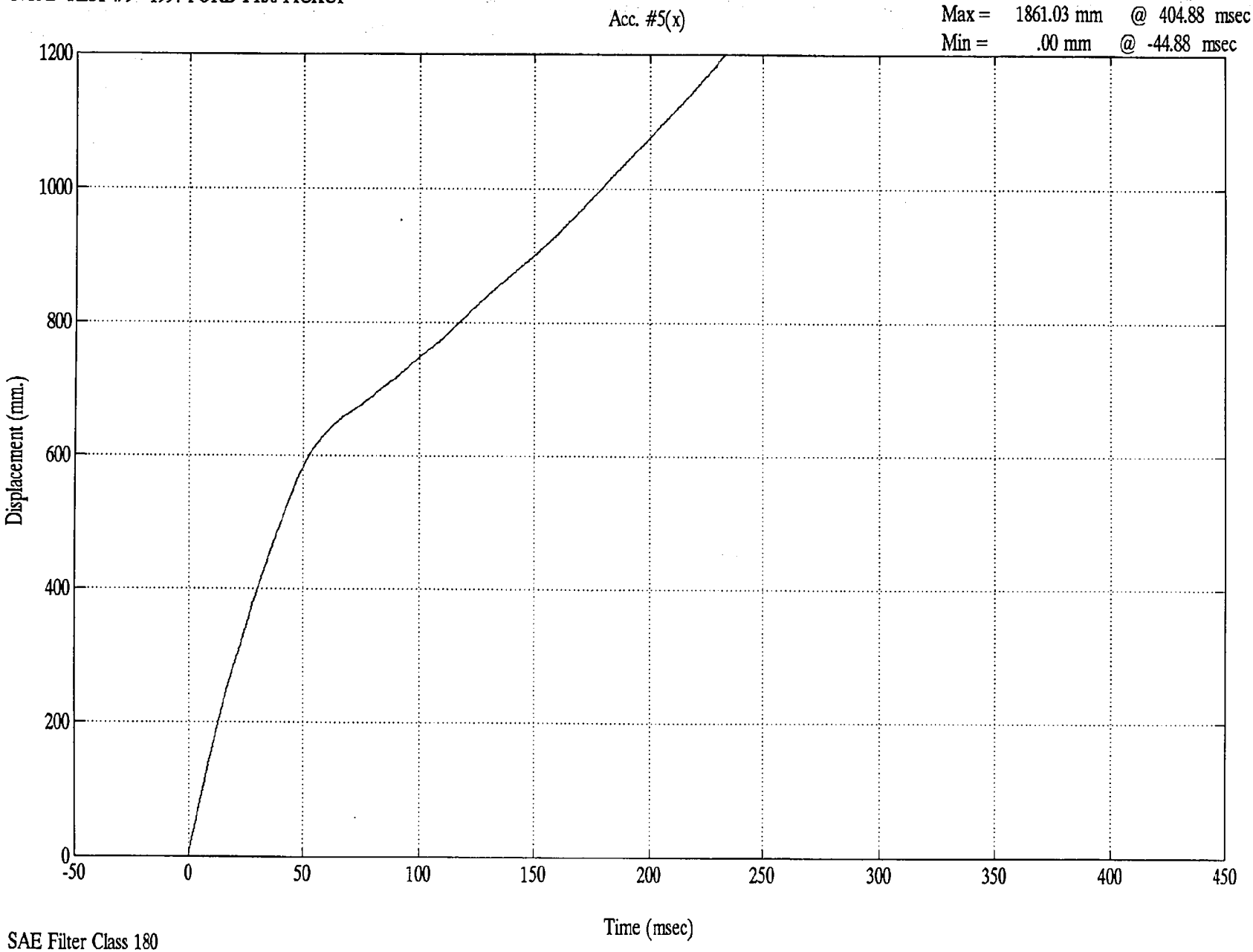
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

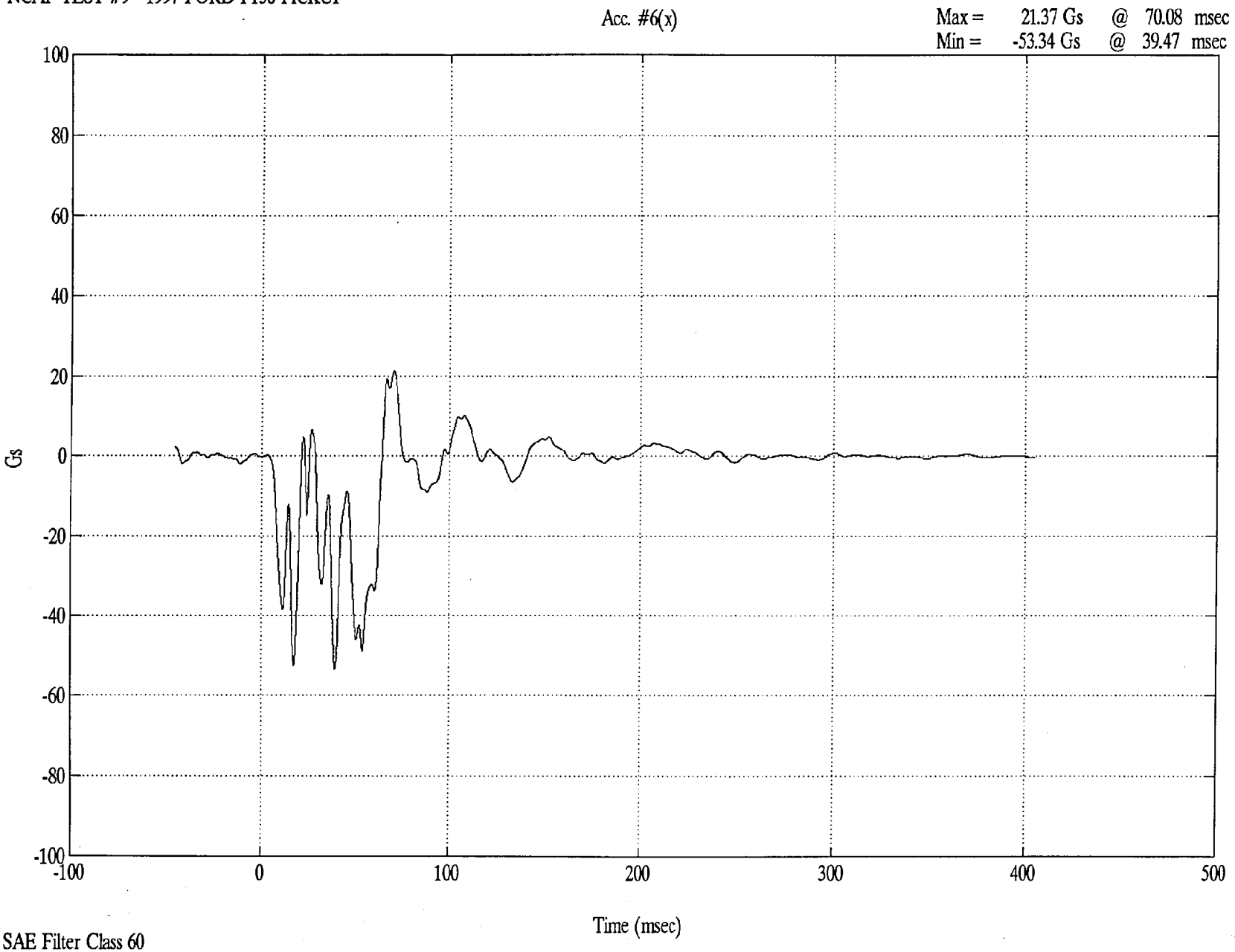
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

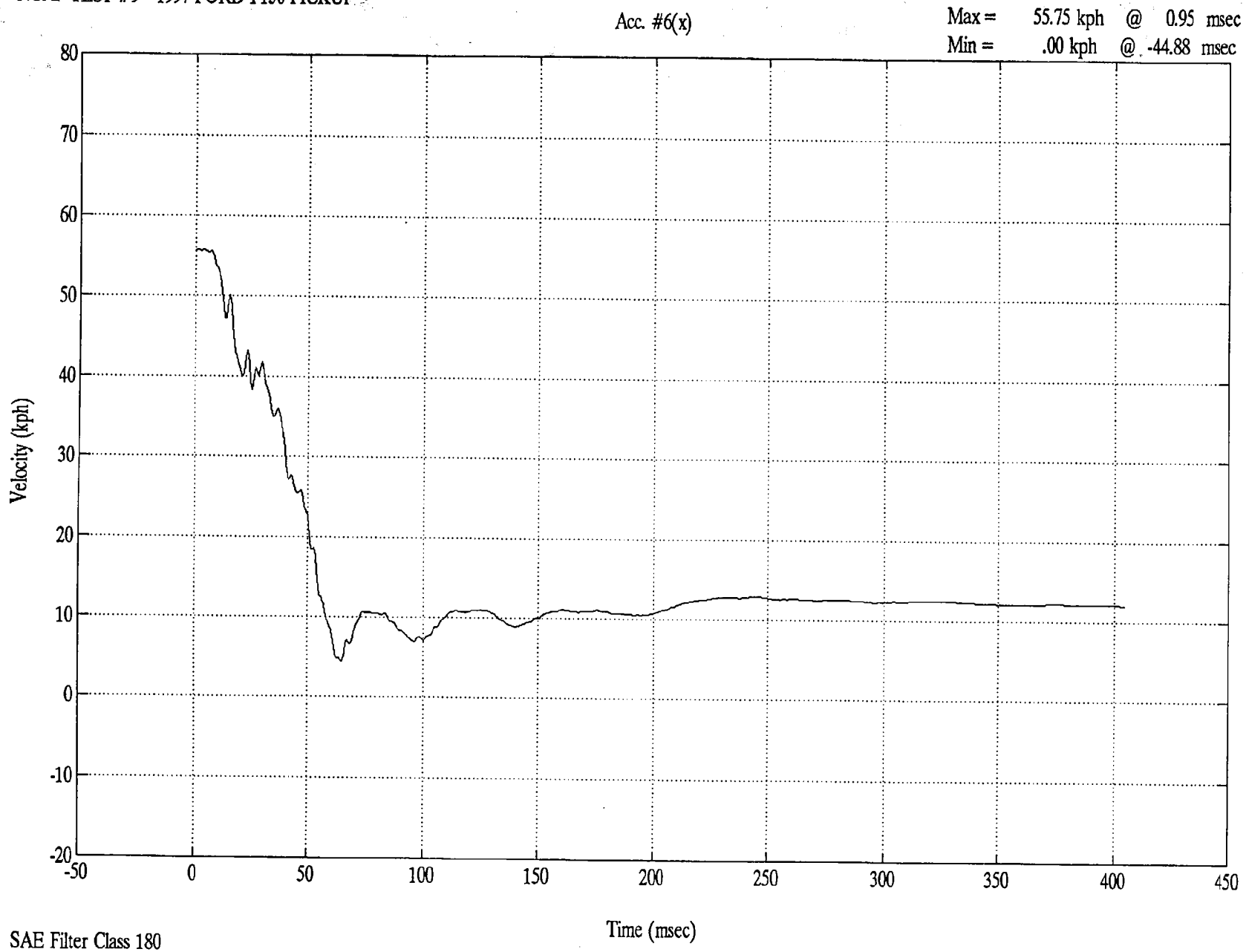


B-118

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

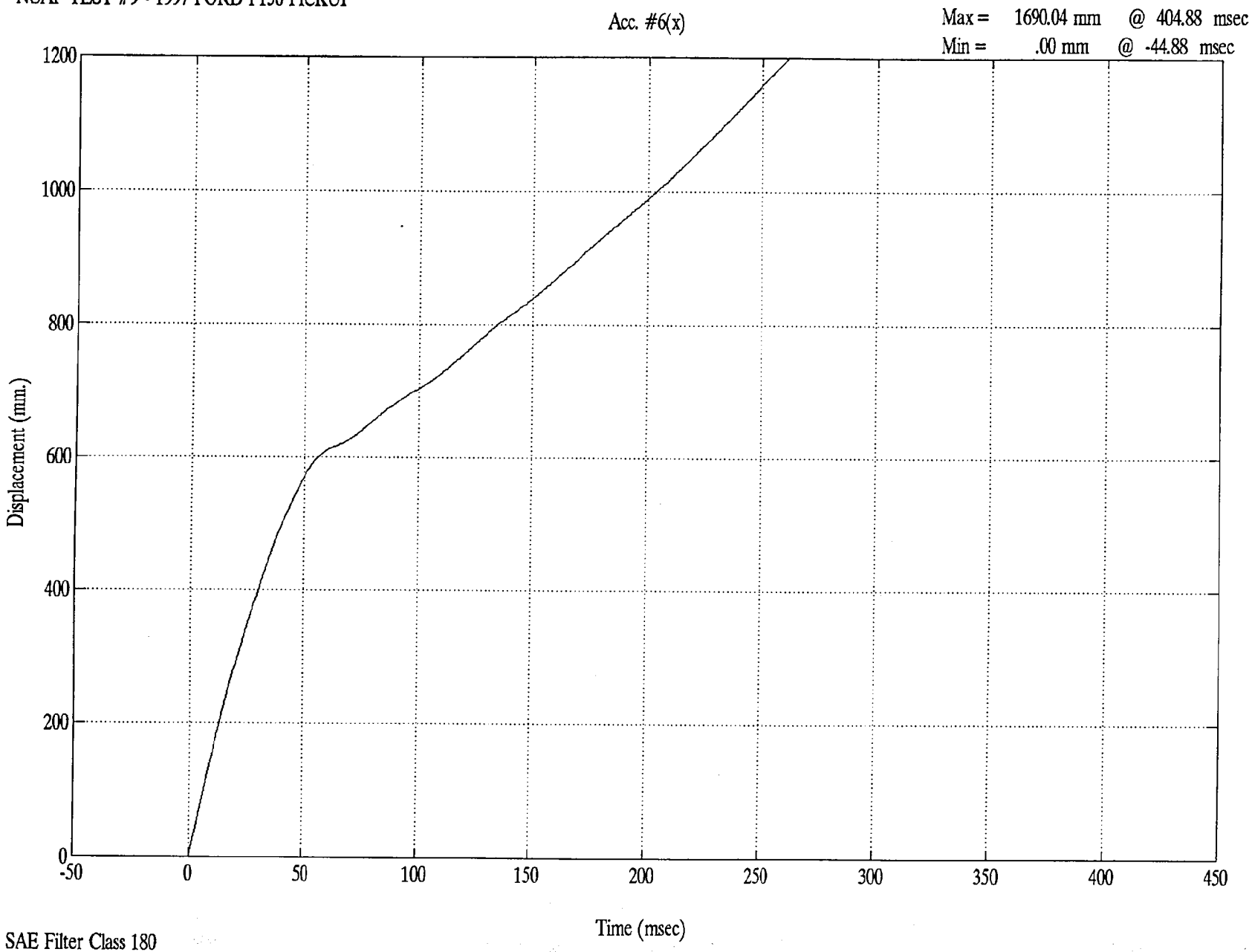


B-119

8313-9

SAE Filter Class 180

NCAP TEST #9 - 1997 FORD F150 PICKUP

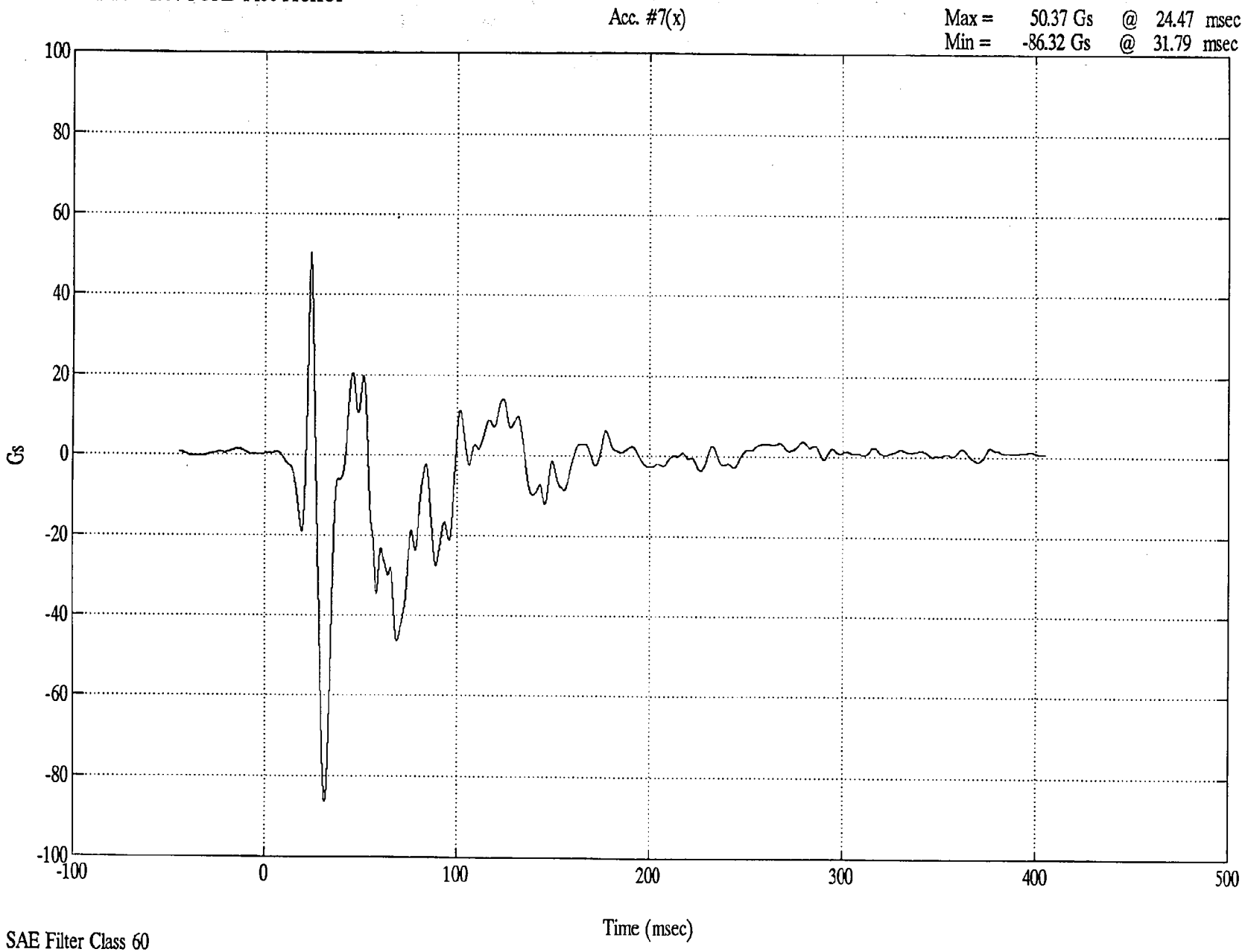


B-120

8313-9

SAE Filter Class 180

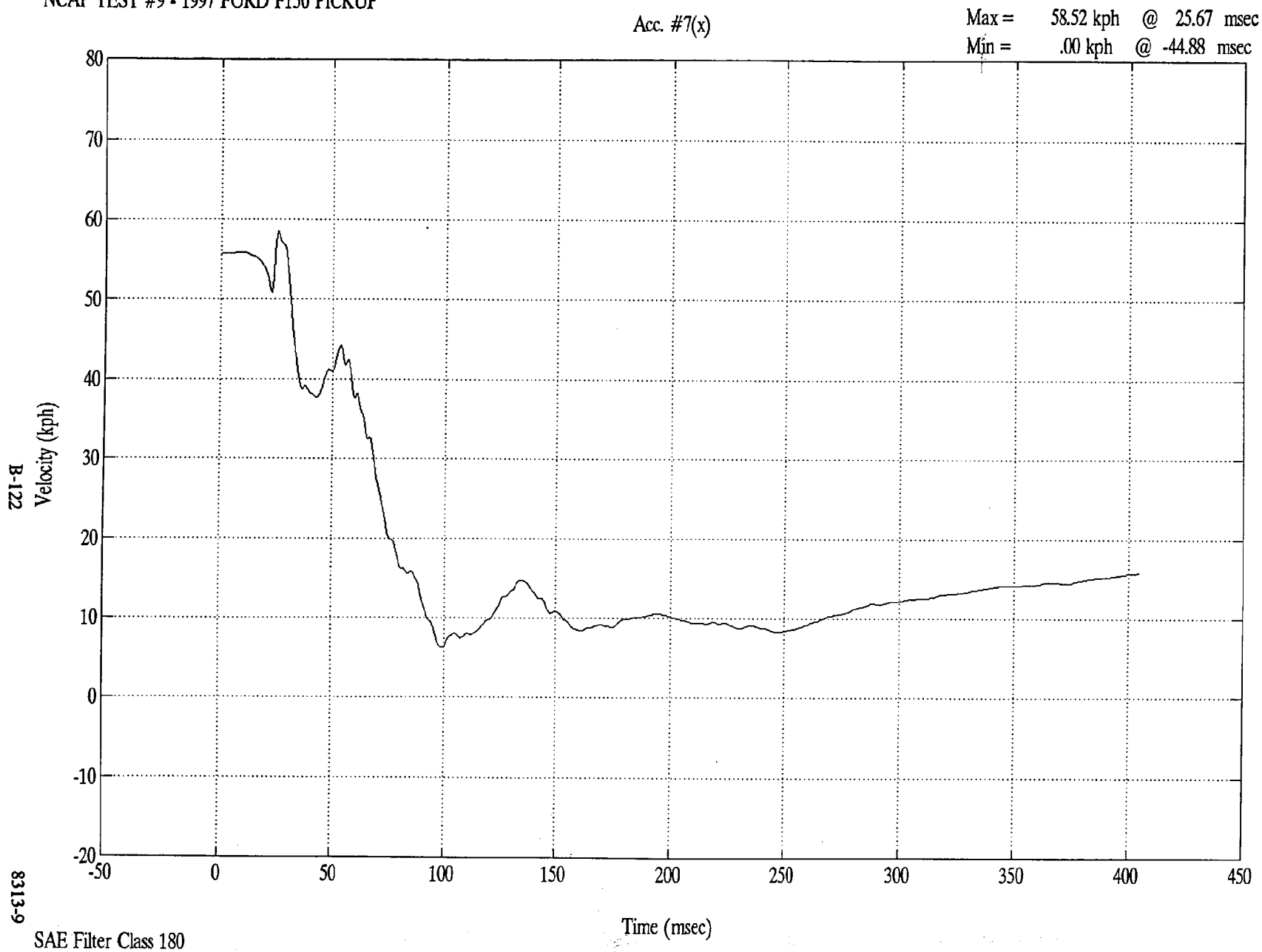
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

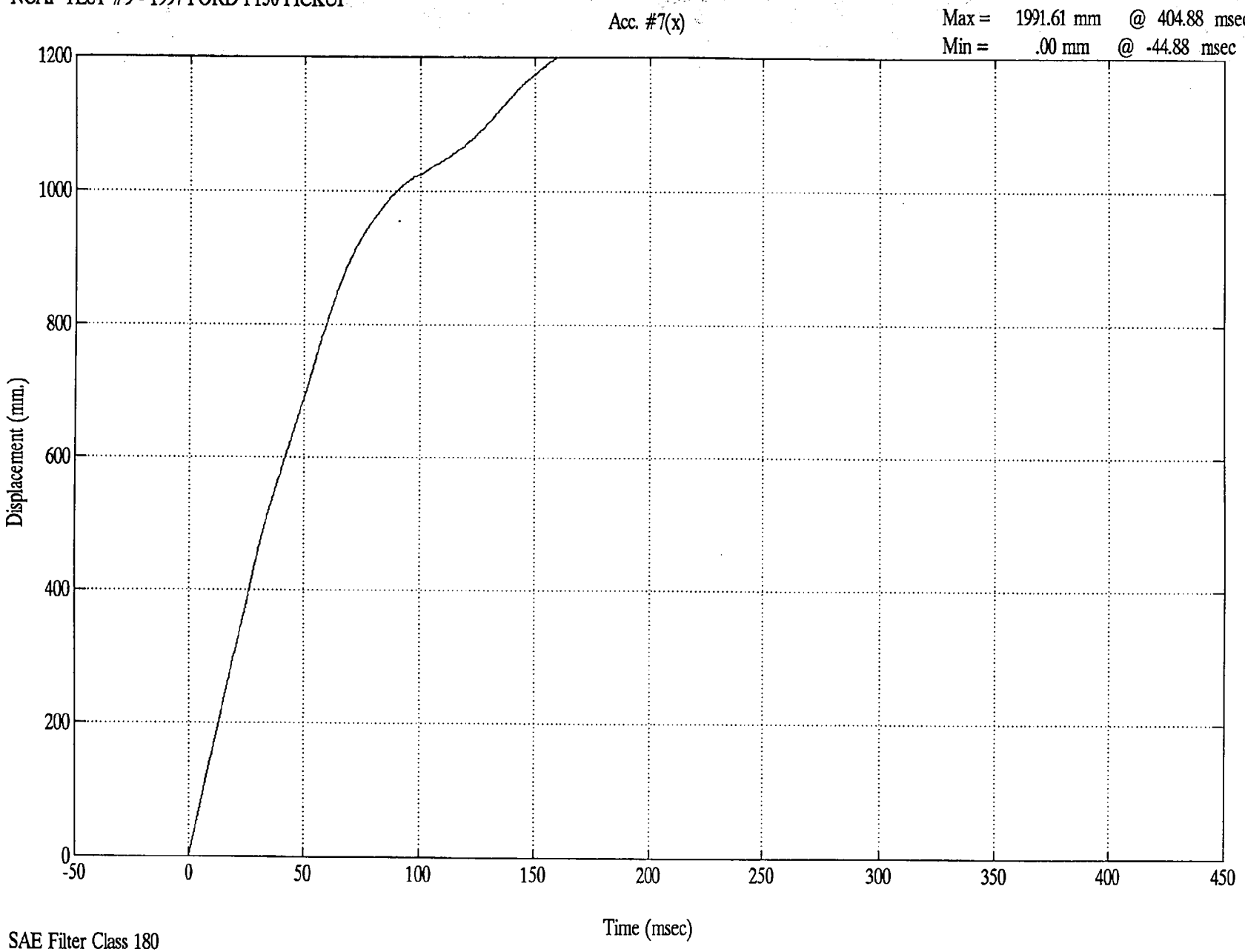


B-122

8313-9

SAE Filter Class 180

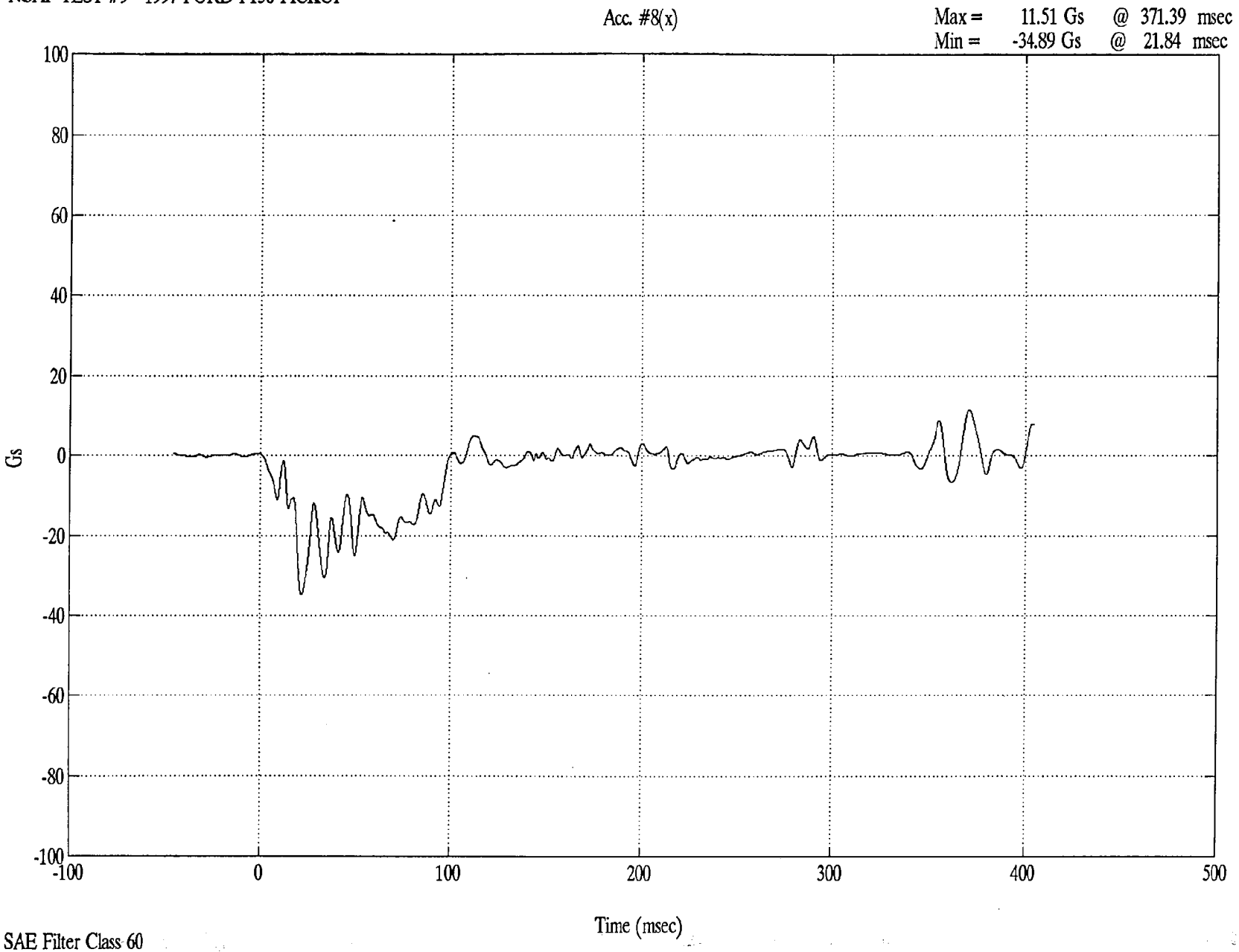
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

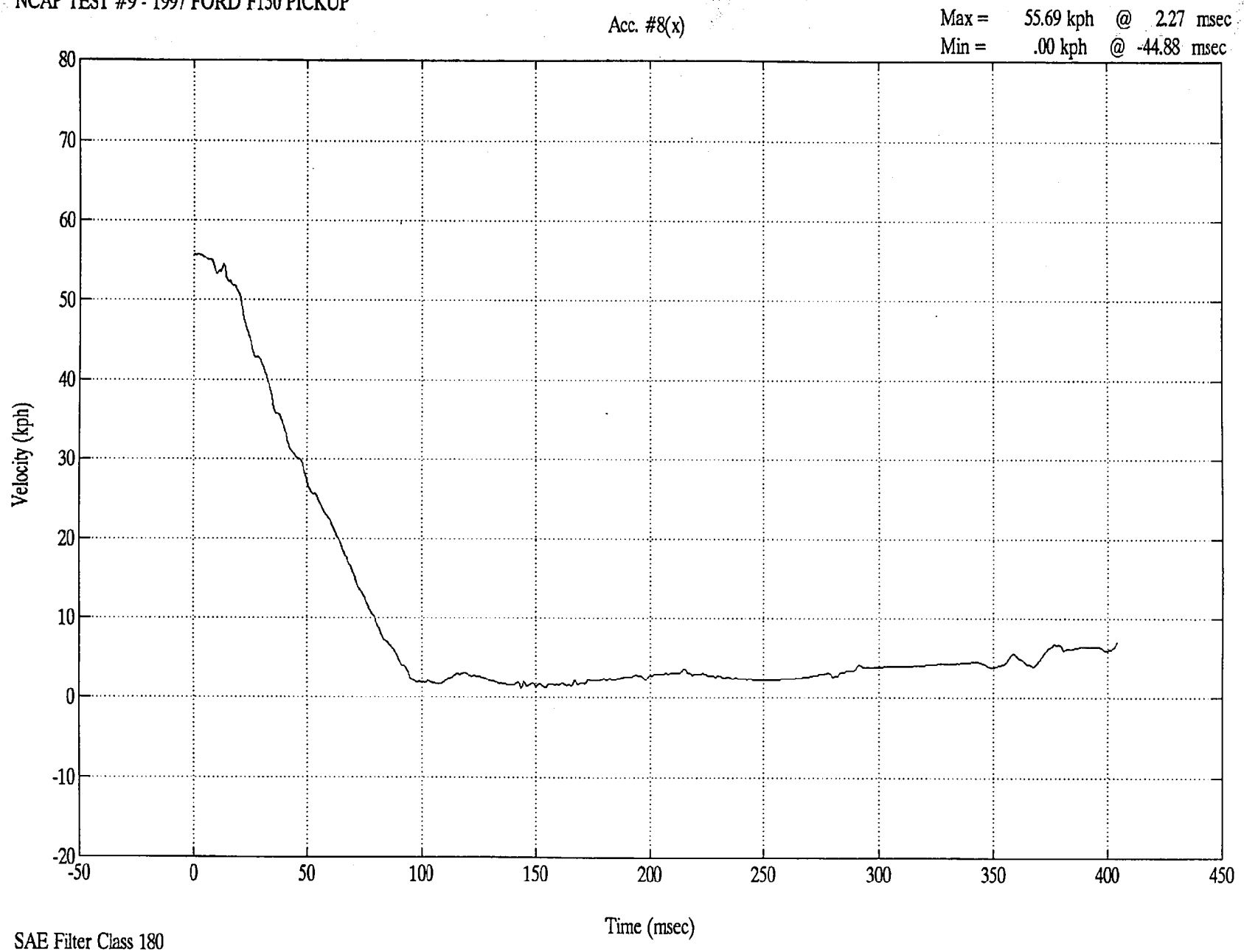
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

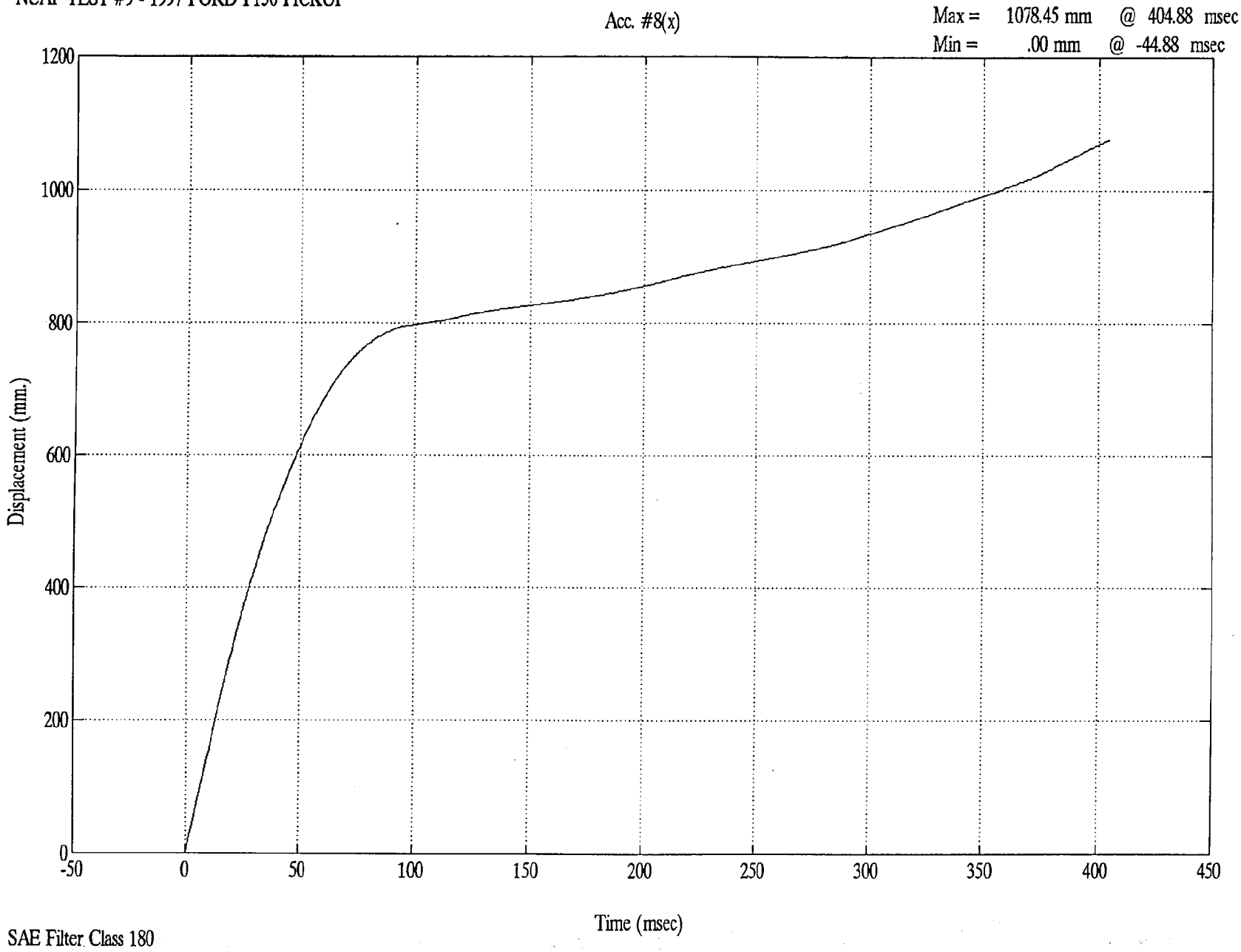


B-125

8313-9

SAE Filter Class 180

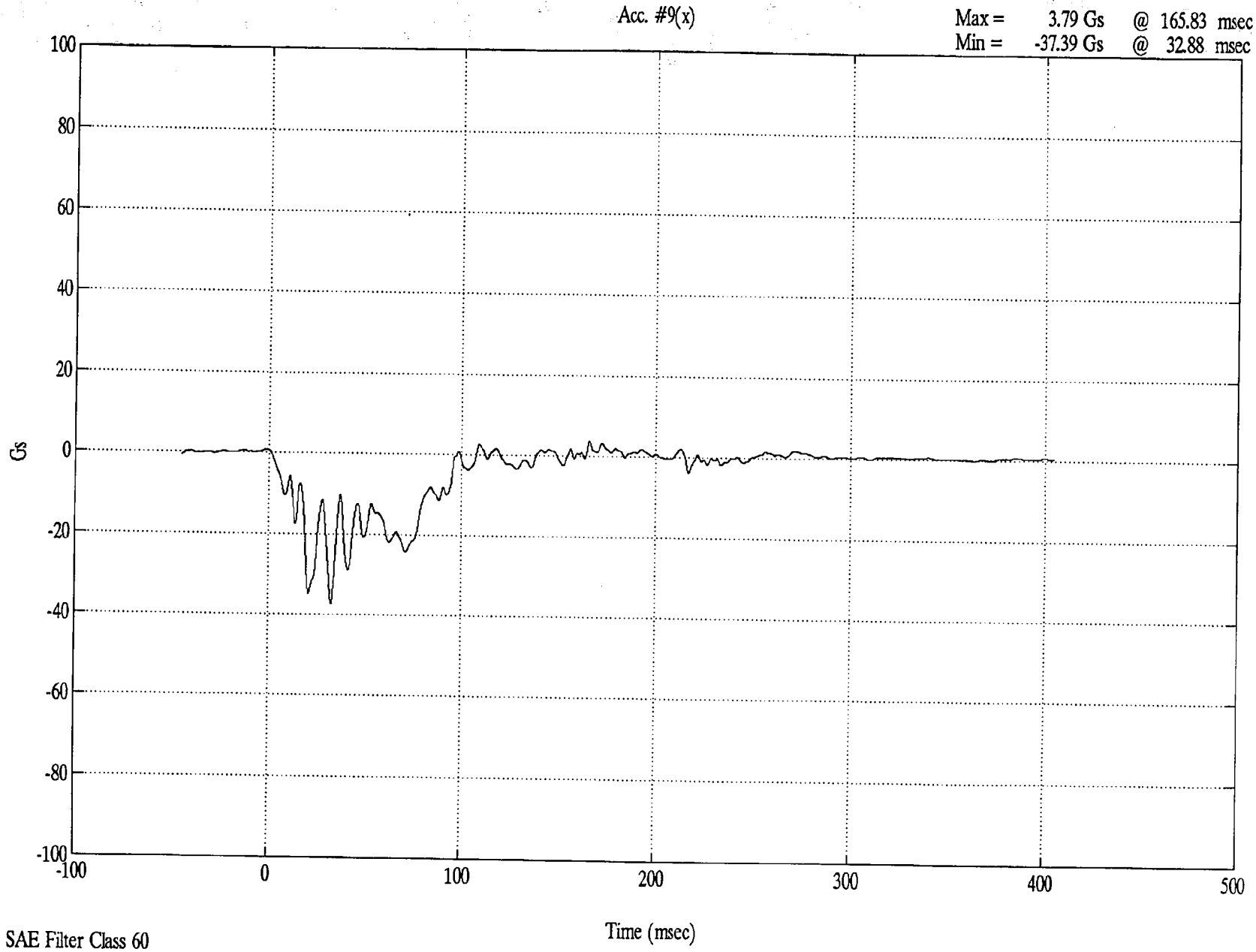
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

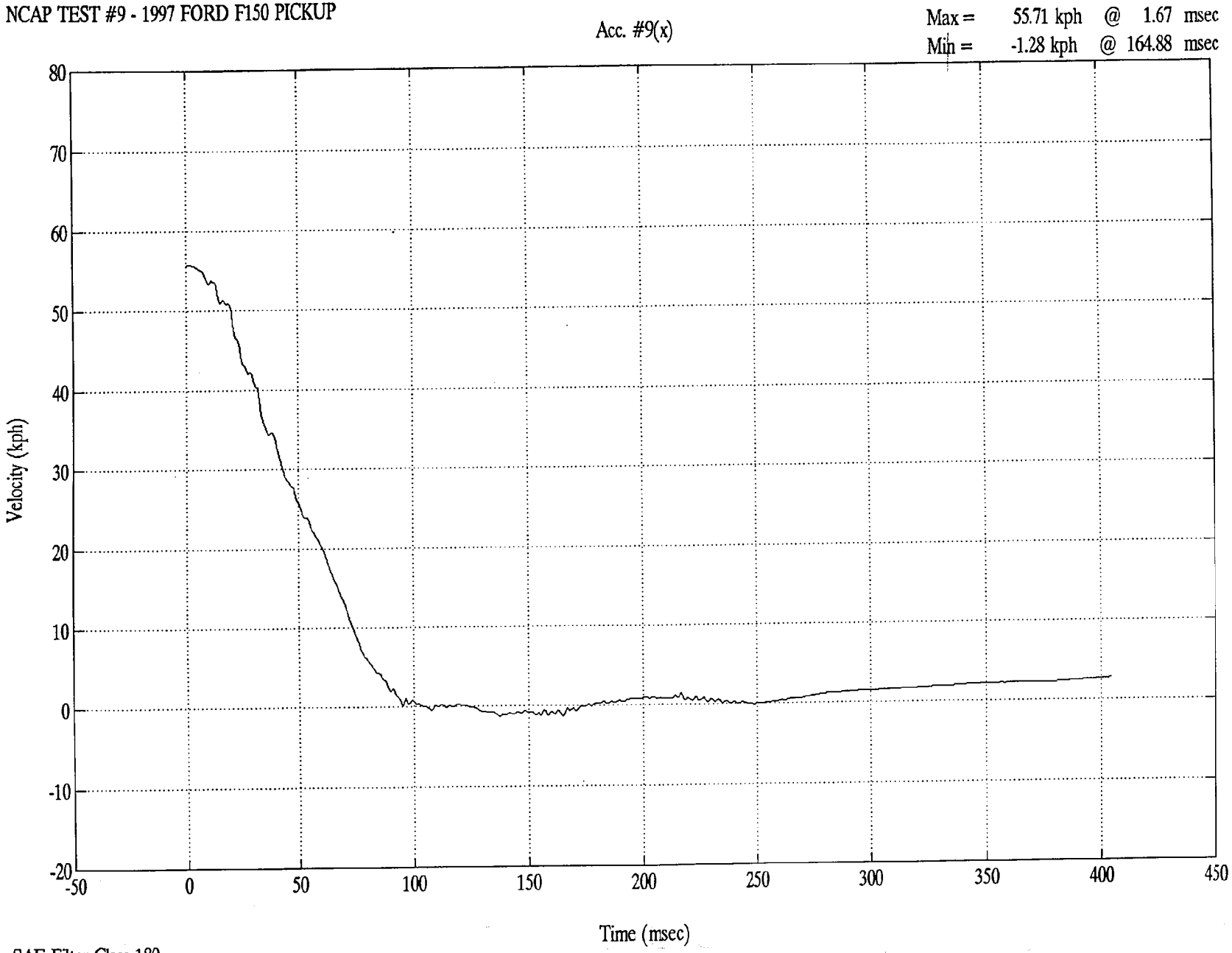


B-127

8313-9

SAE Filter Class 60

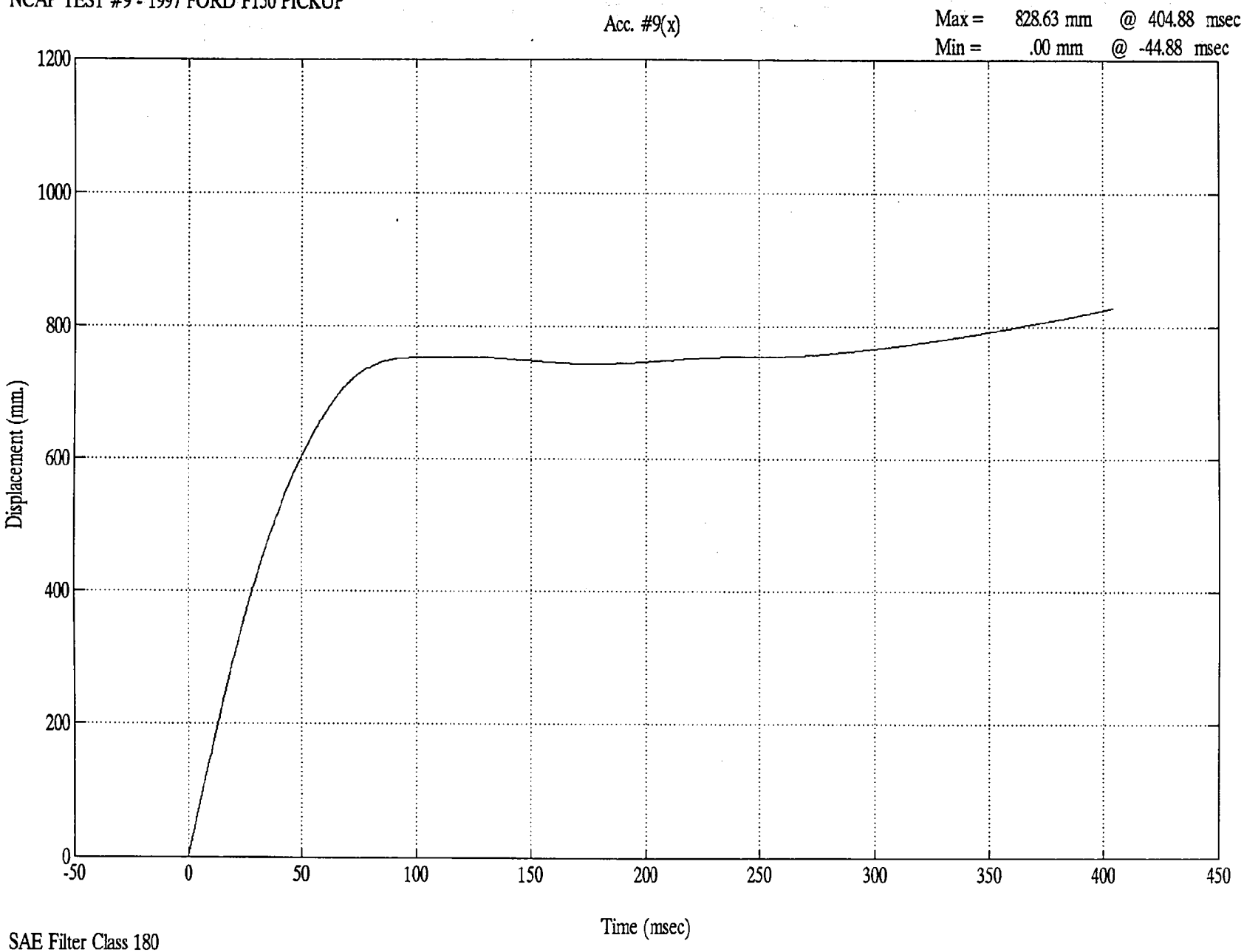
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 180

8313-9

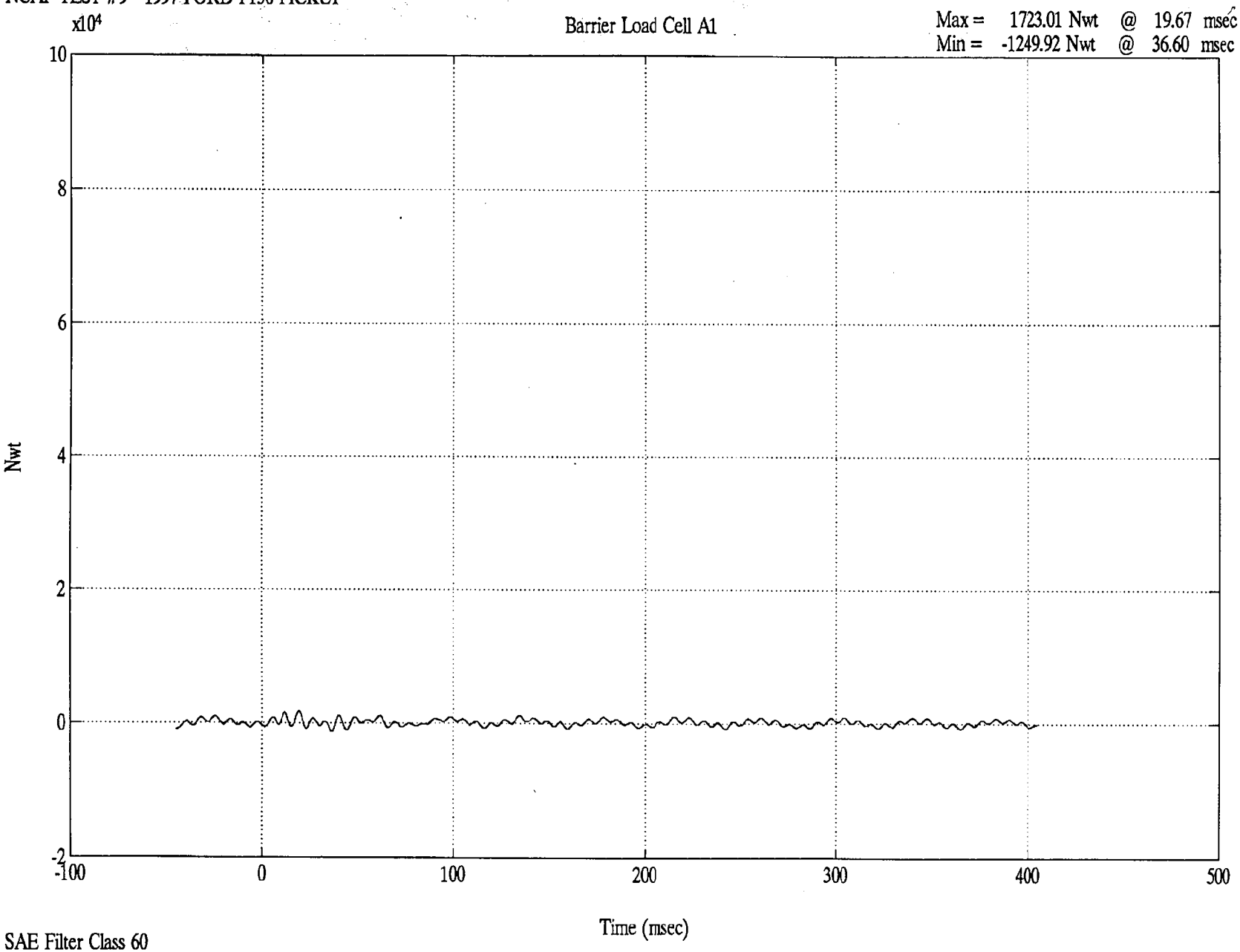
NHTSA TEST NO. MV0200

LOAD CELL BARRIER DATA

FILTER CHANNEL CLASS

60

NCAP TEST #9 - 1997 FORD F150 PICKUP

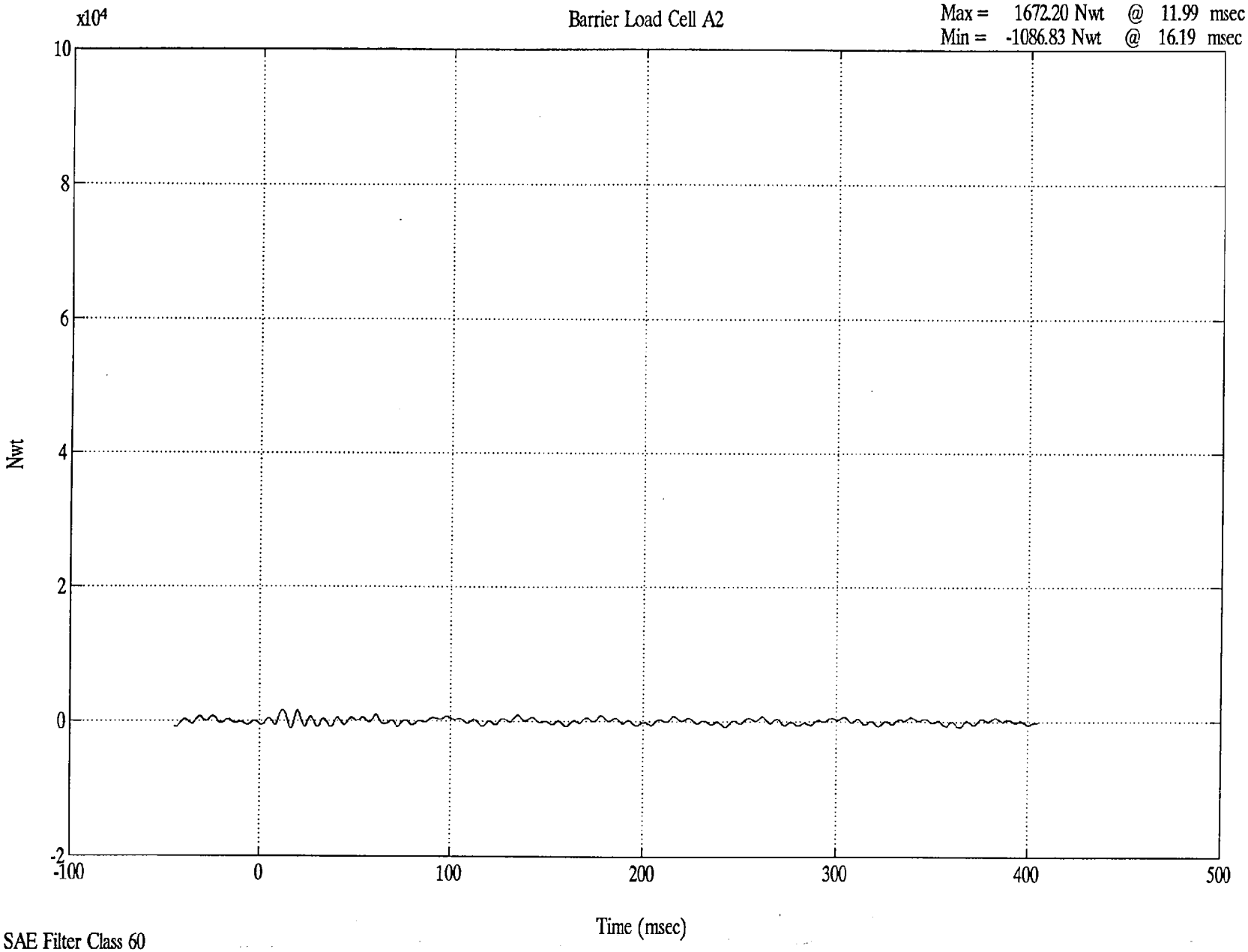


B-131

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

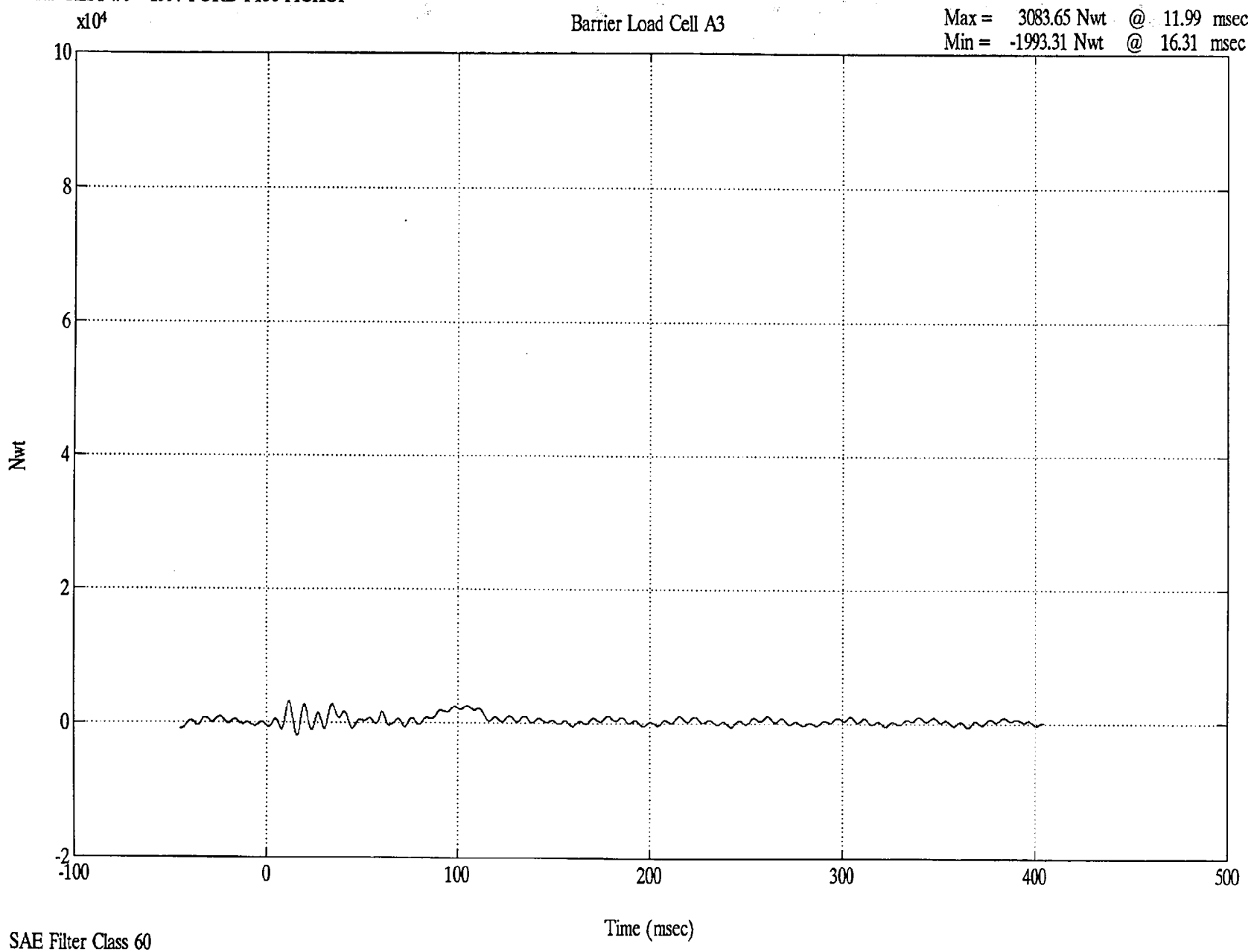


B-132

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

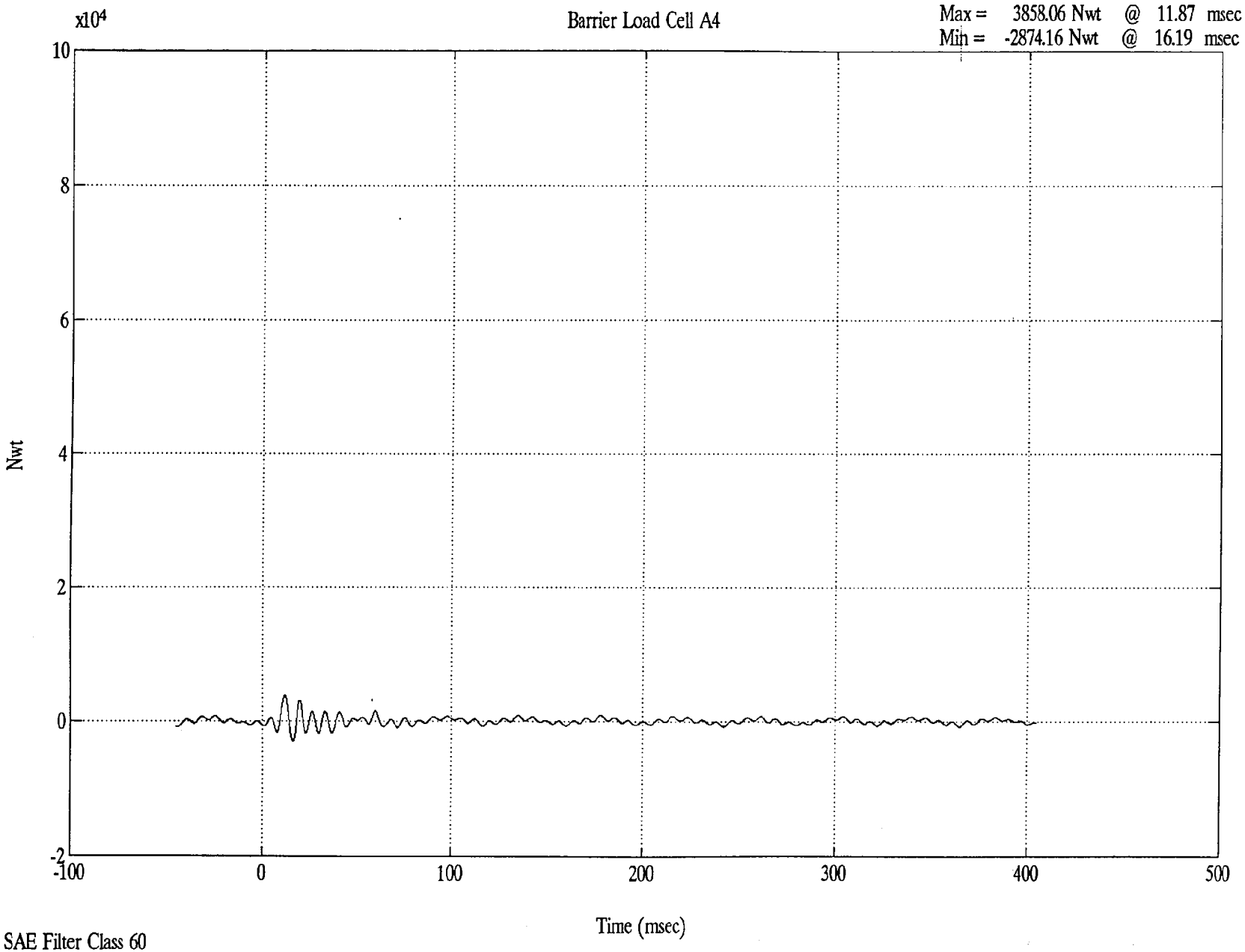


SAE Filter Class 60

B-133

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

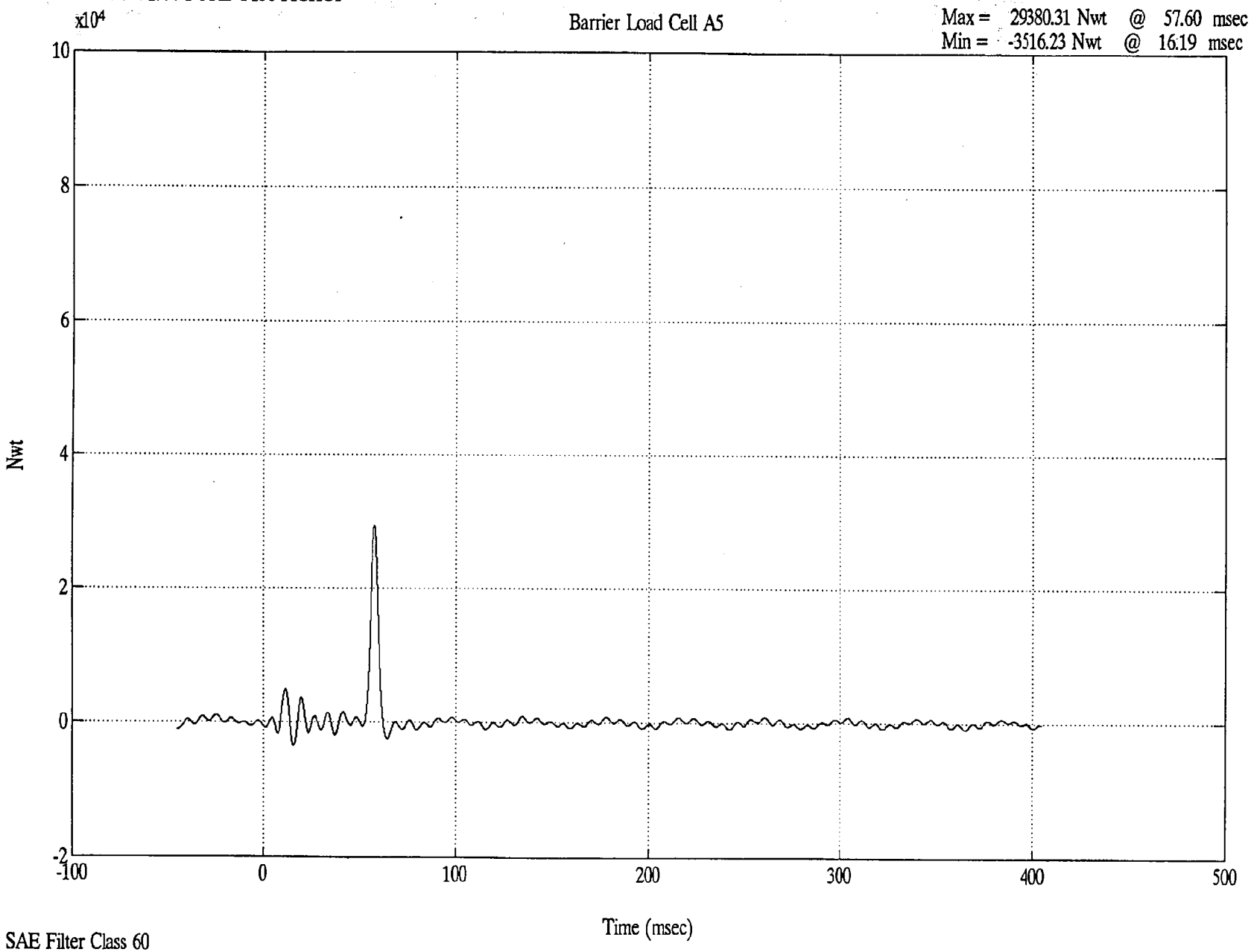


SAE Filter Class 60

B-134

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

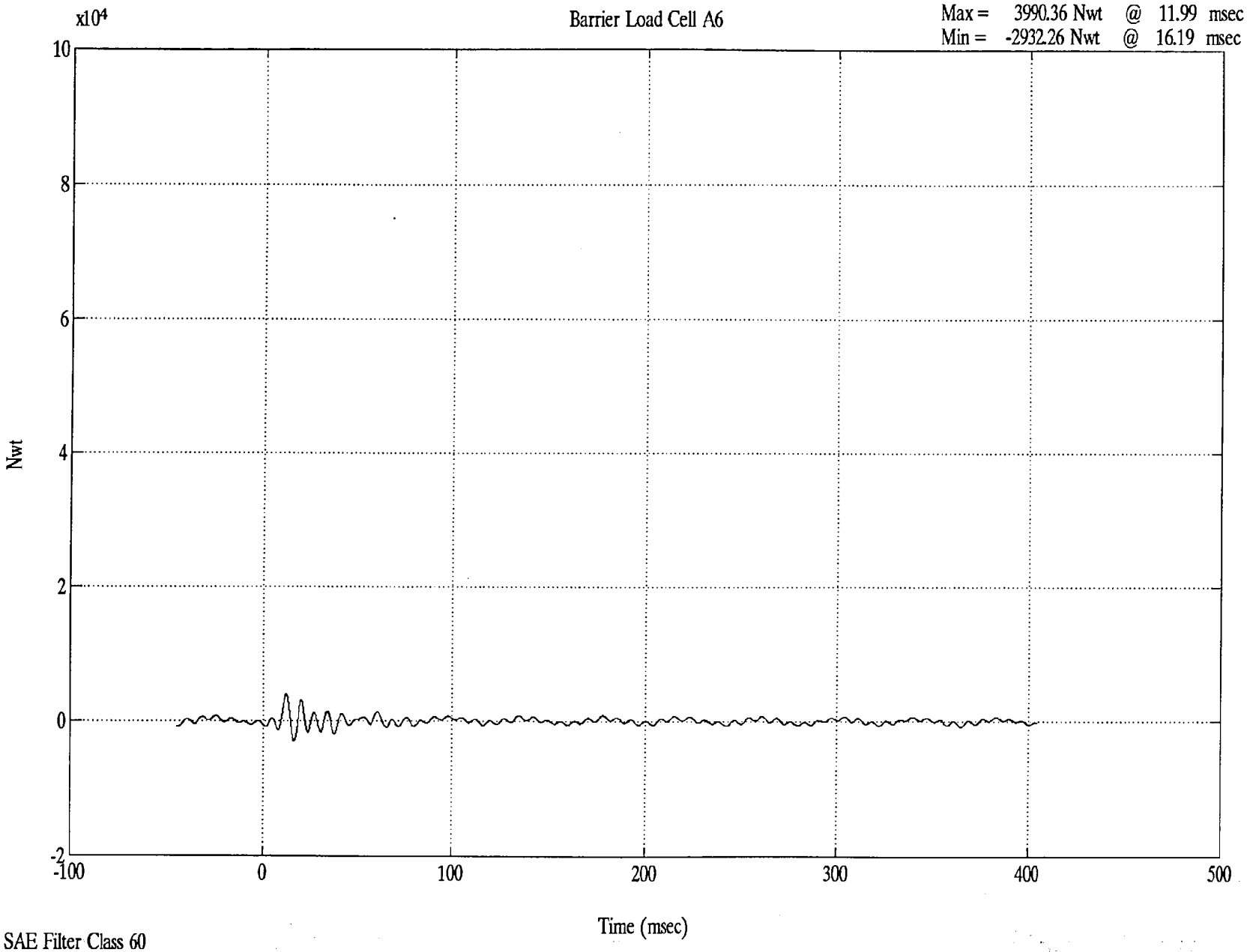


SAE Filter Class 60

B-135

8313-9

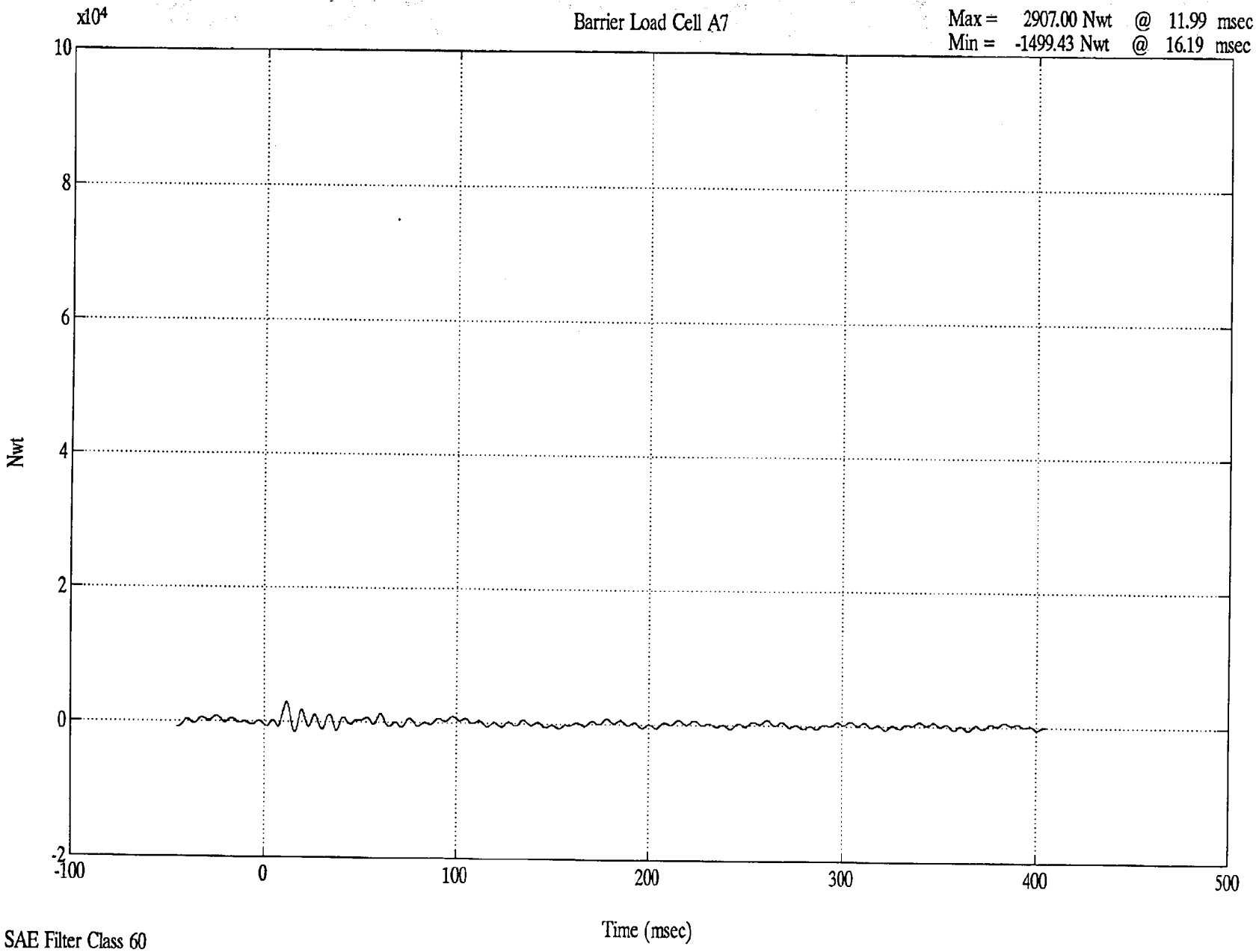
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

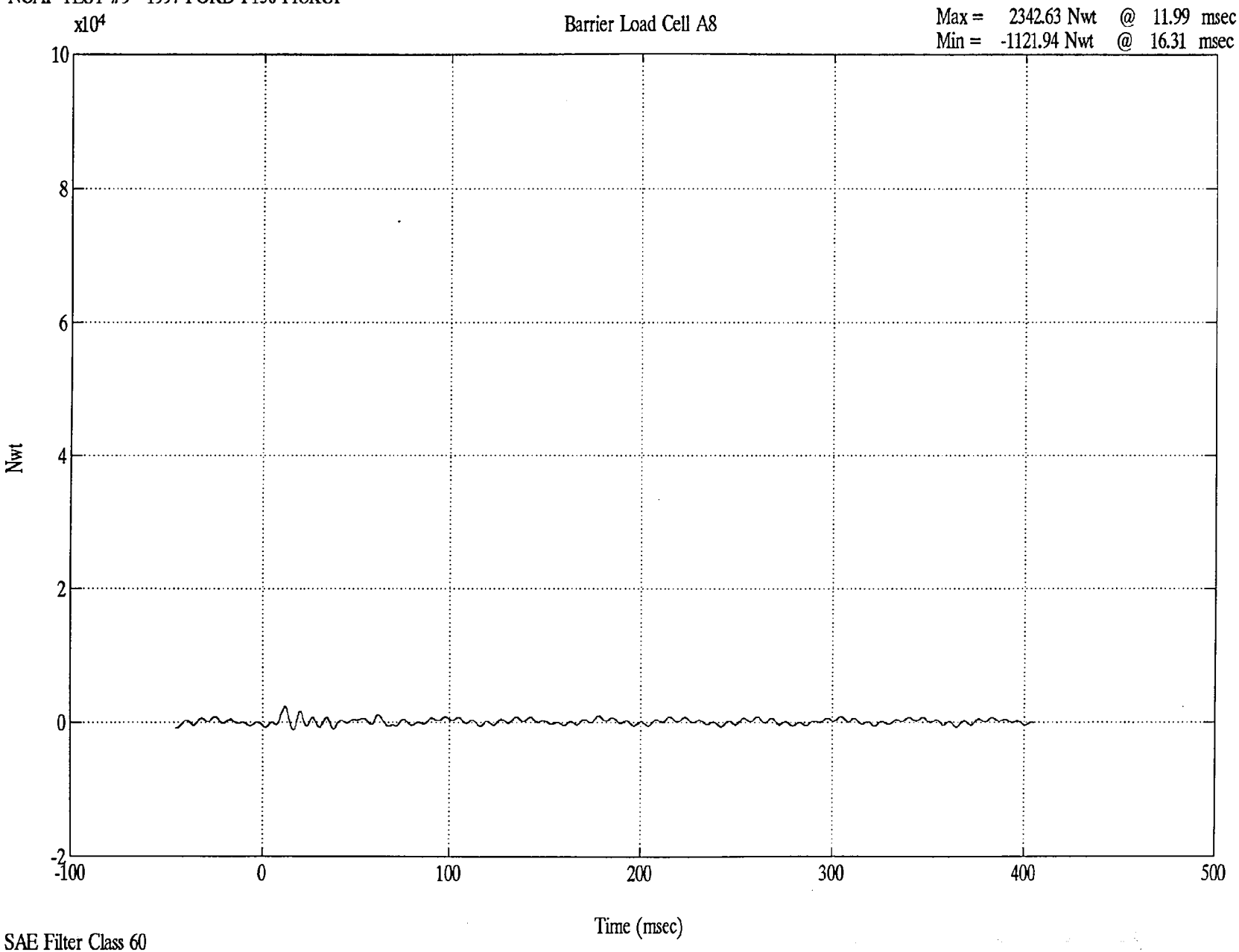


B-137

8313-9

SAE Filter Class 60

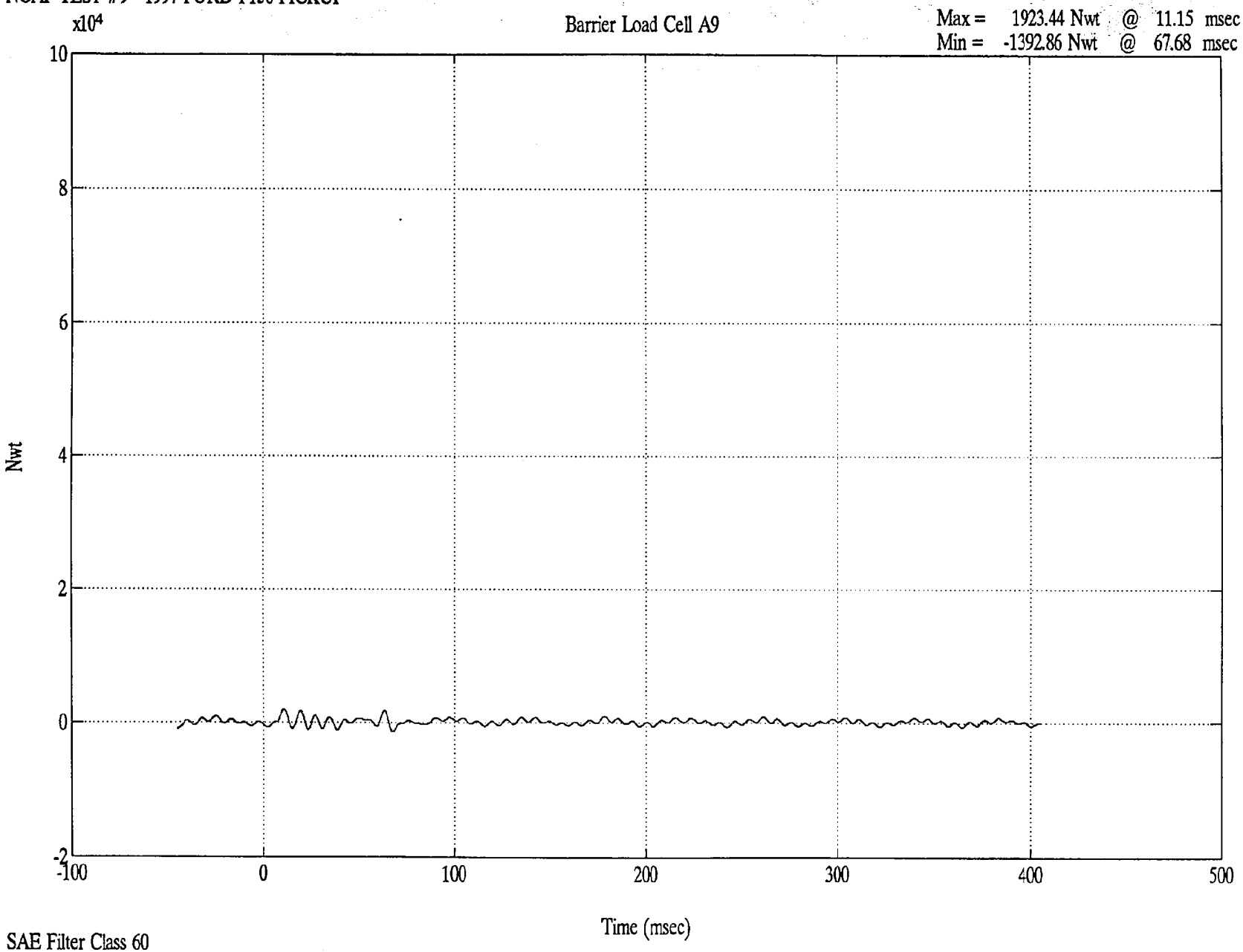
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

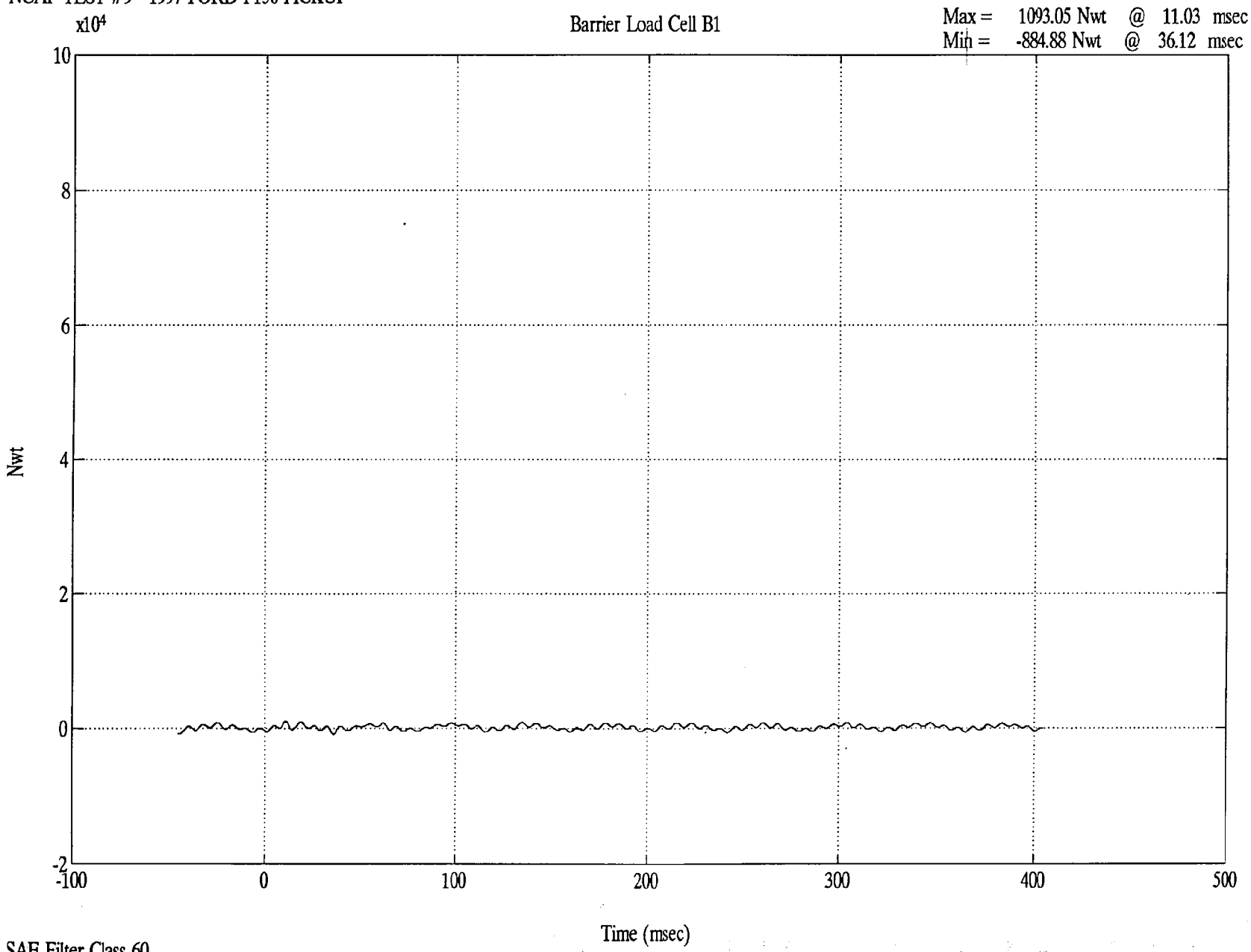


SAE Filter Class 60

B-139

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

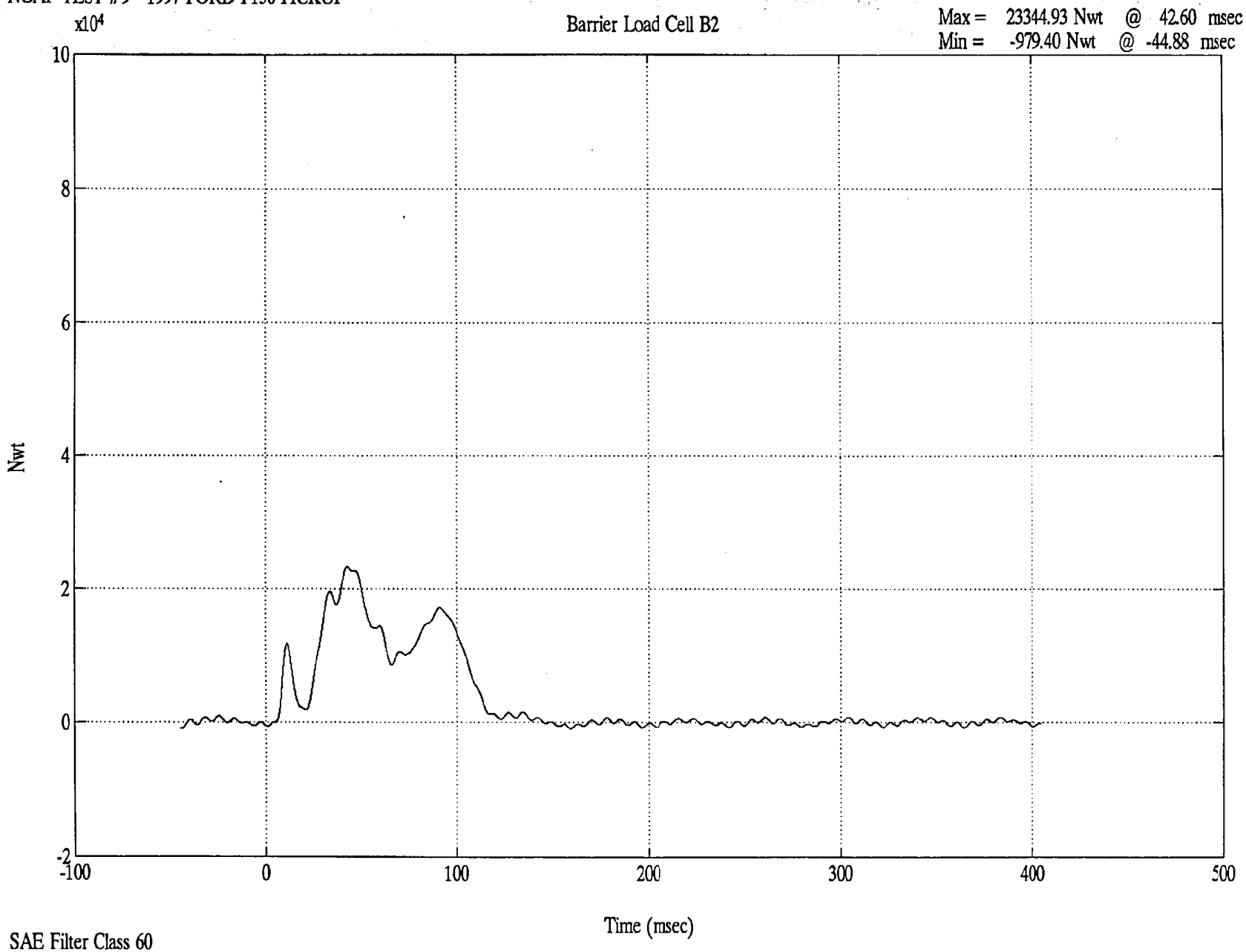


SAE Filter Class 60

B-140

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

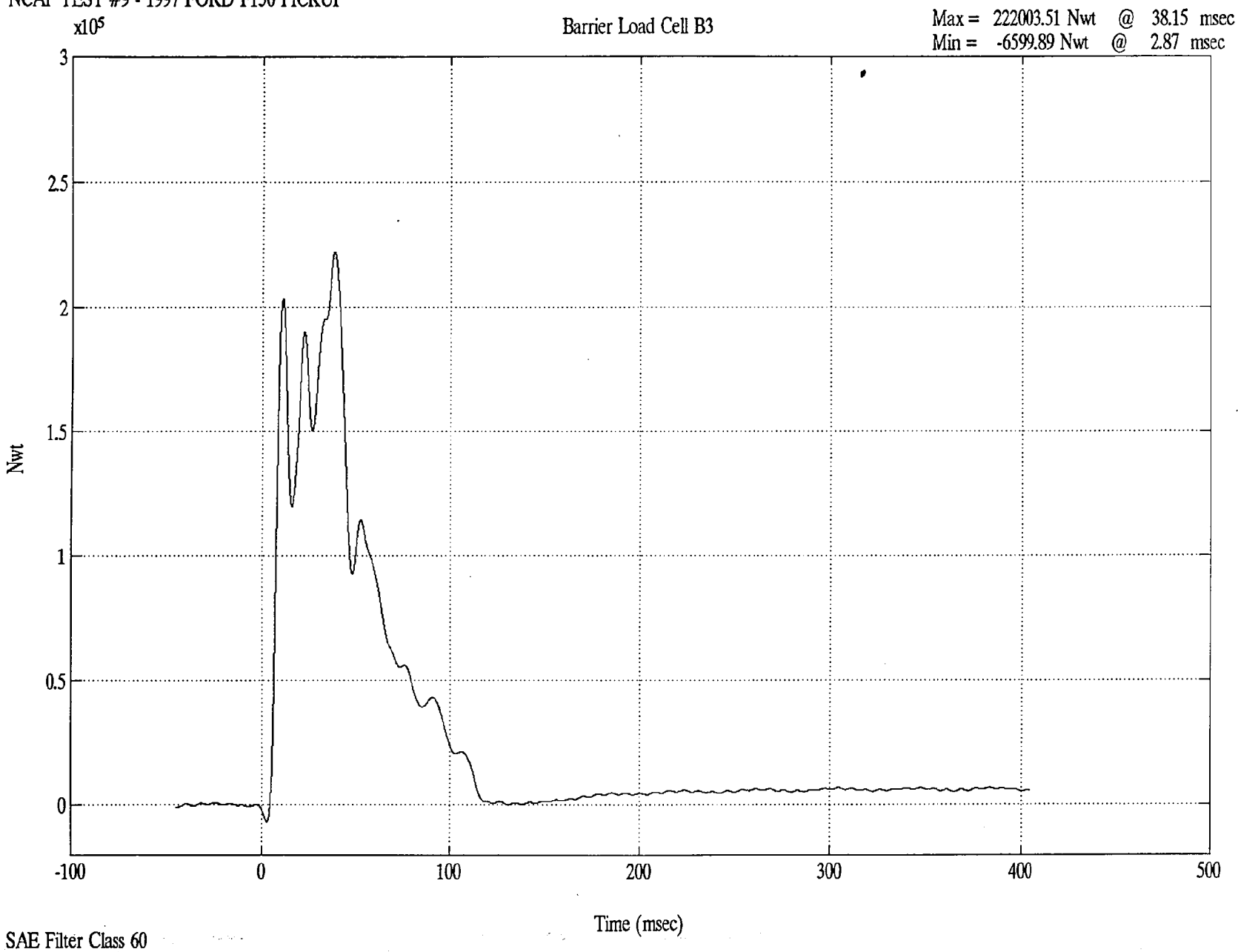


B-141

8313-9

SAE Filter Class 60

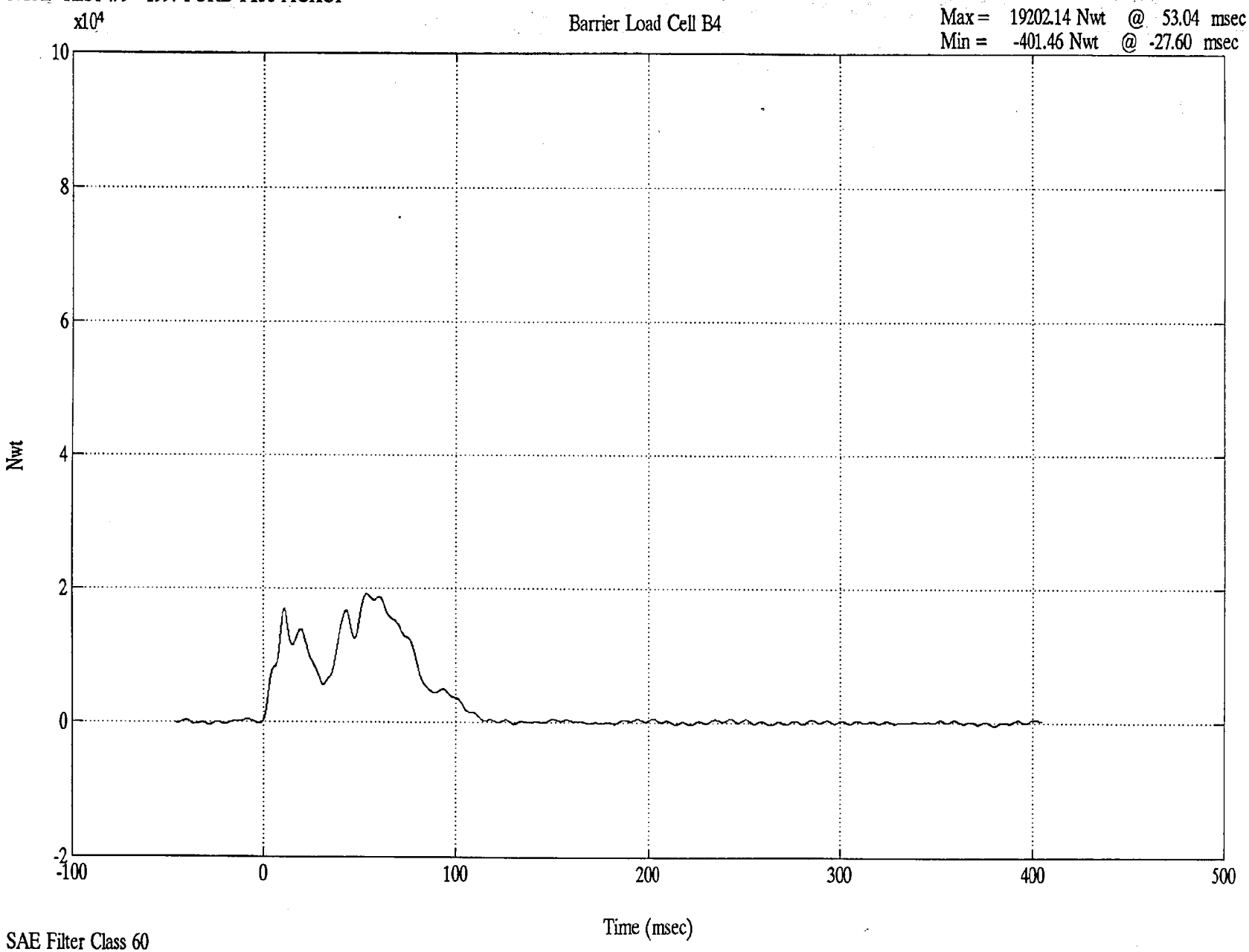
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

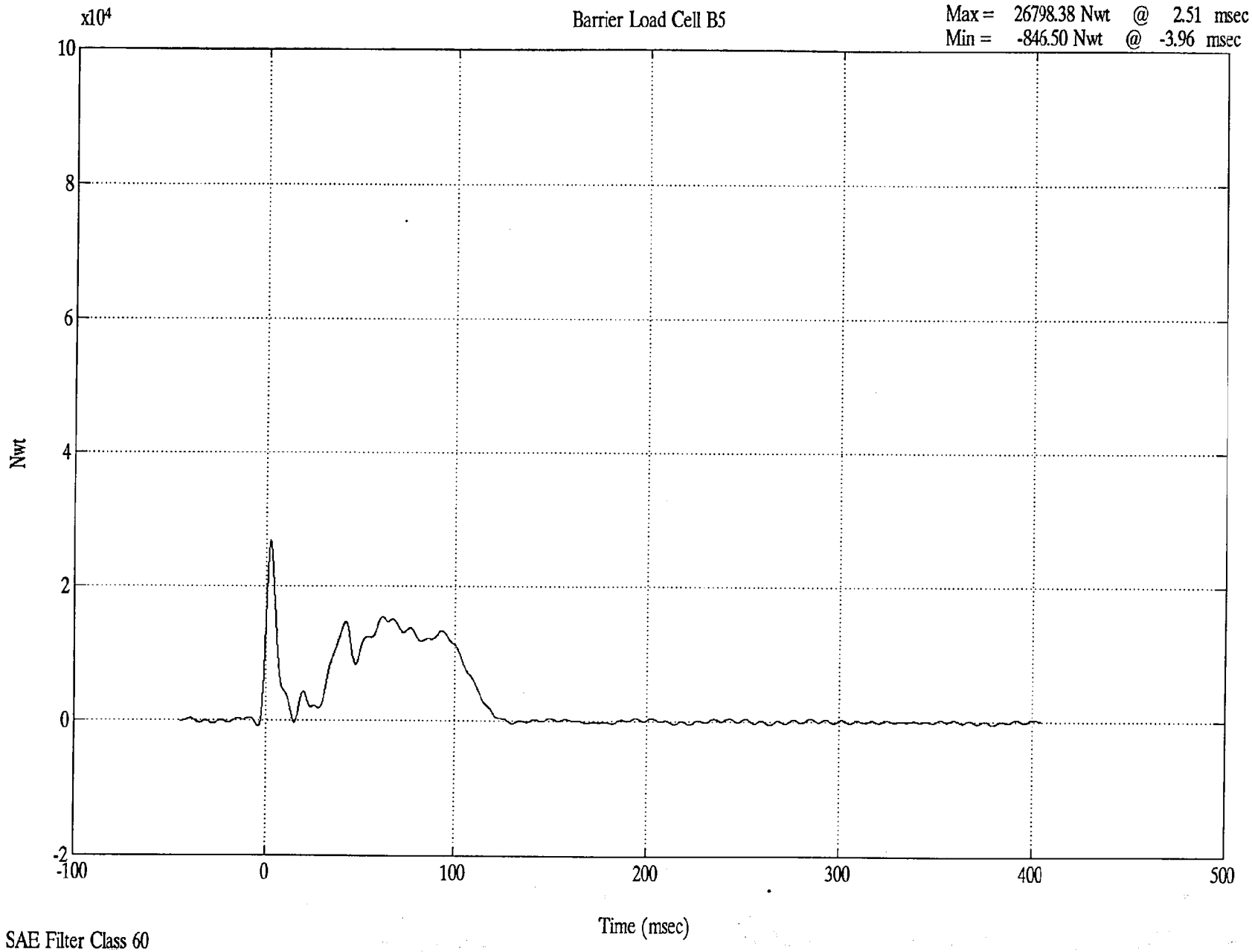


SAE Filter Class 60

B-143

8313-9

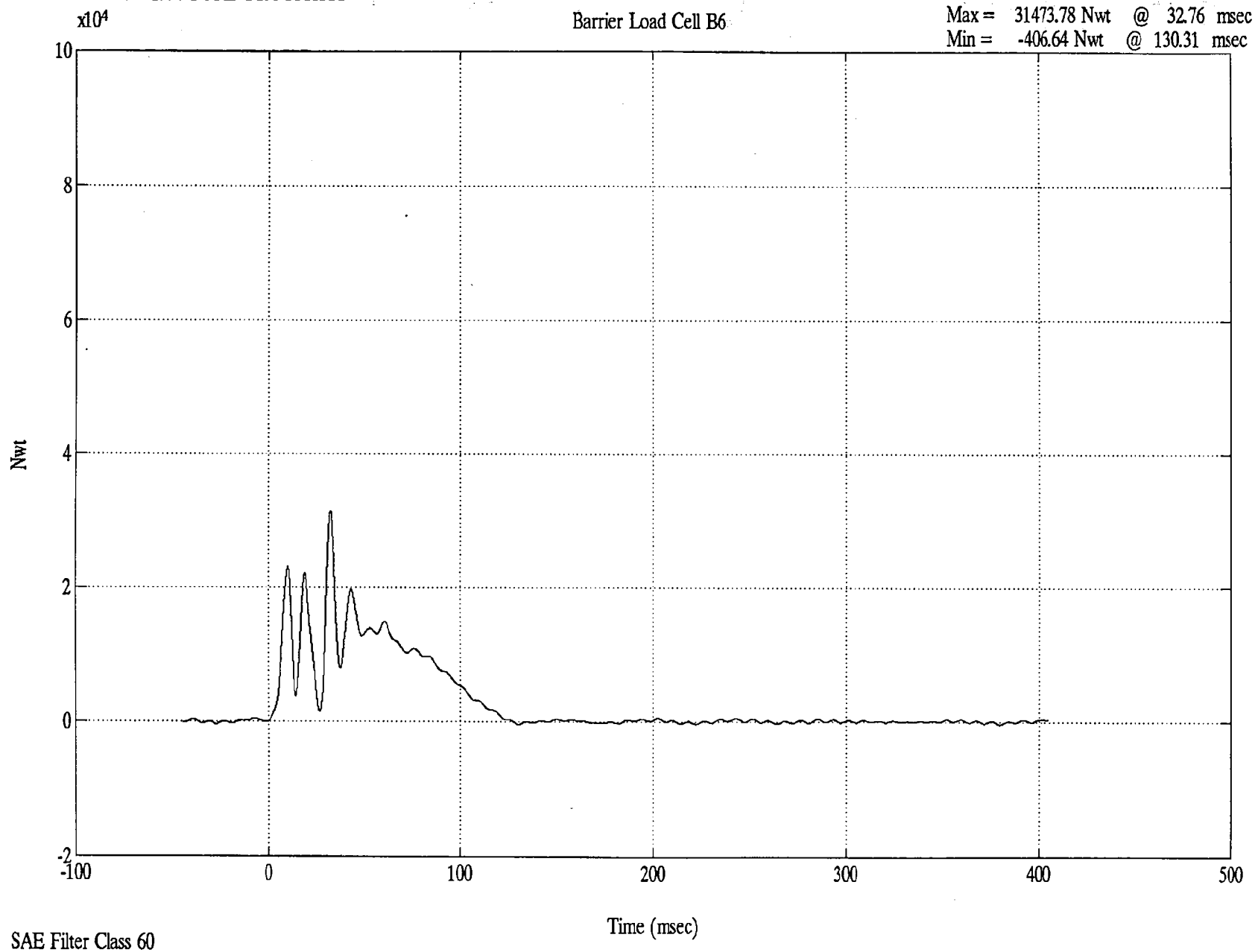
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

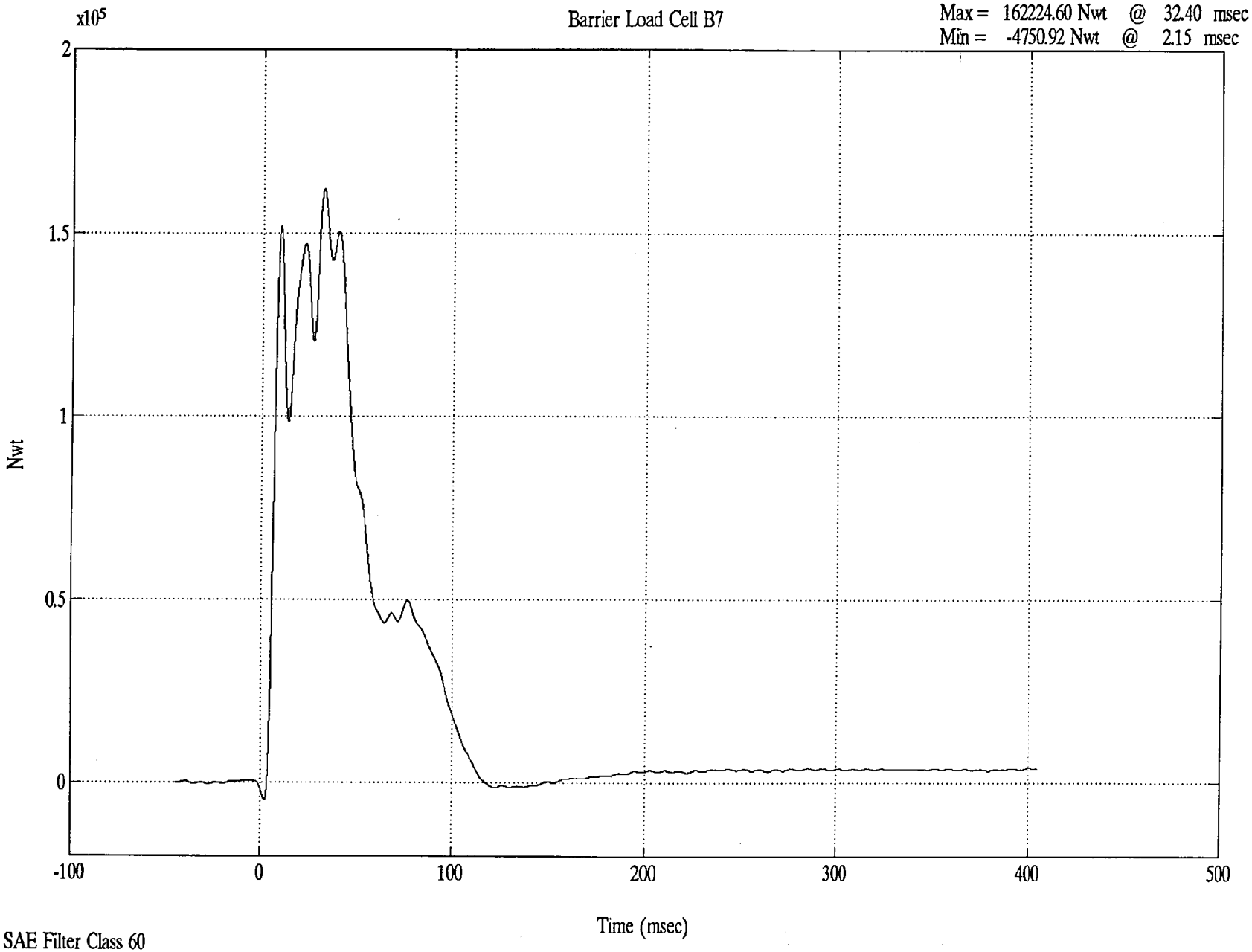


B-145

8313-9

SAE Filter Class 60

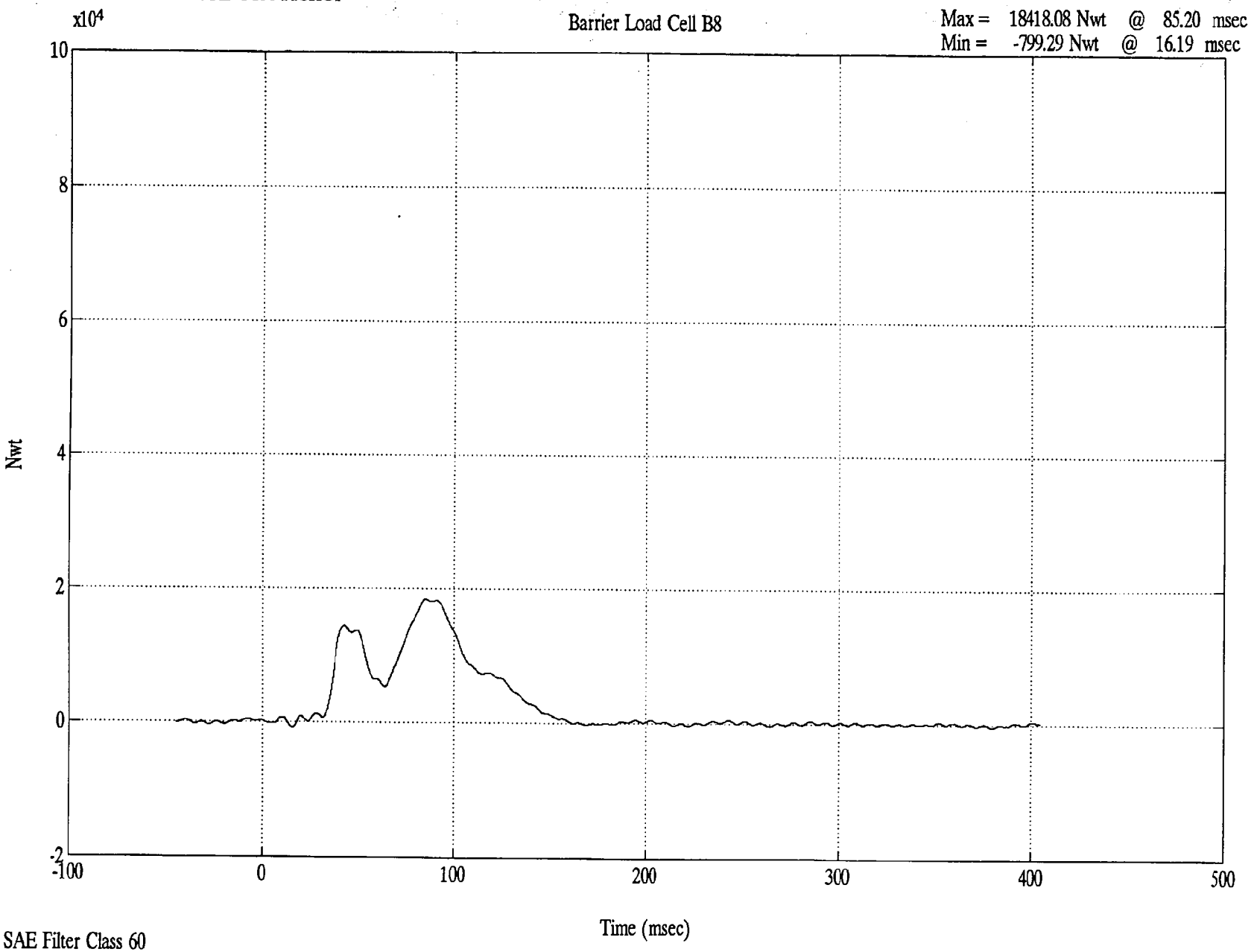
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

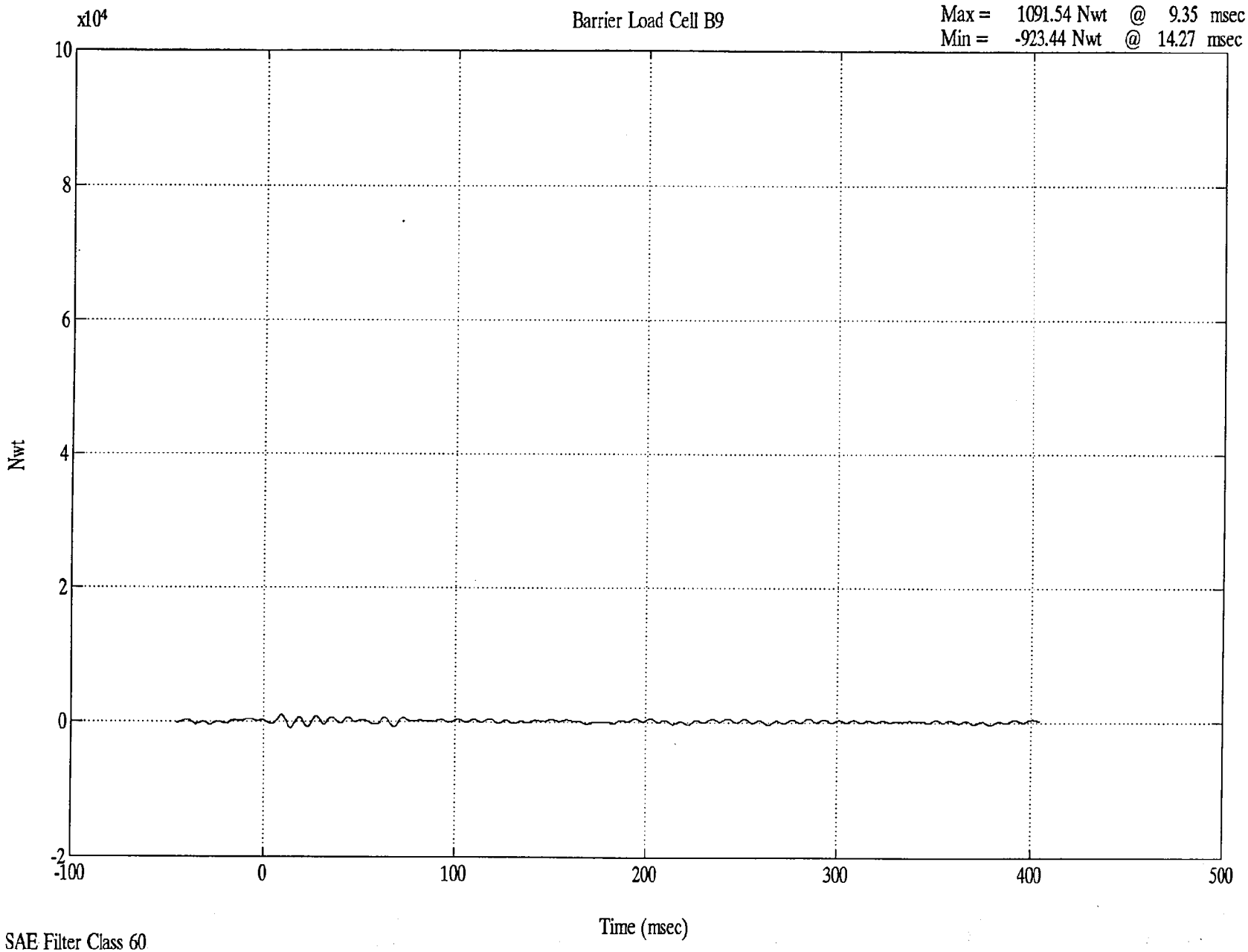
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

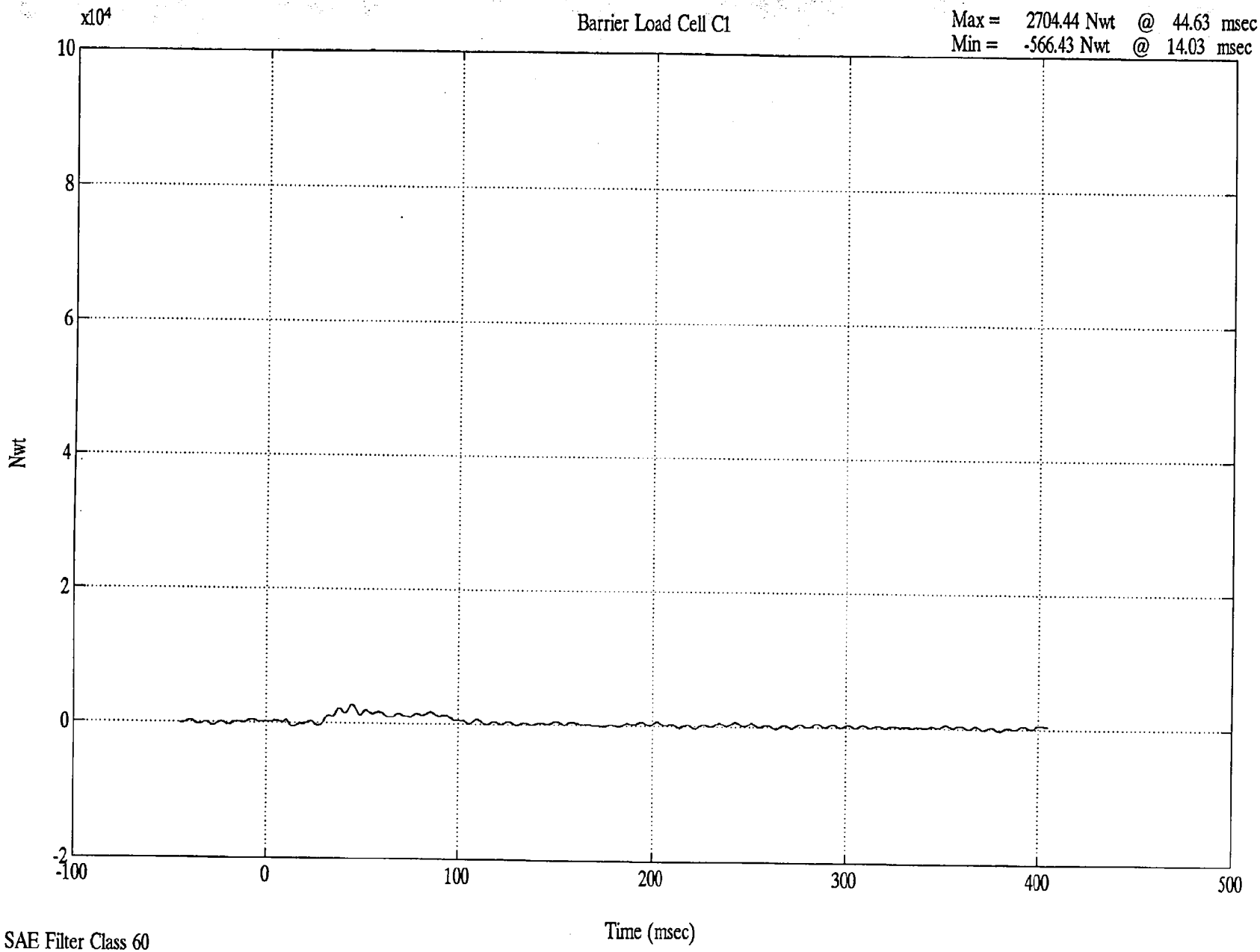


SAE Filter Class 60

B-148

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

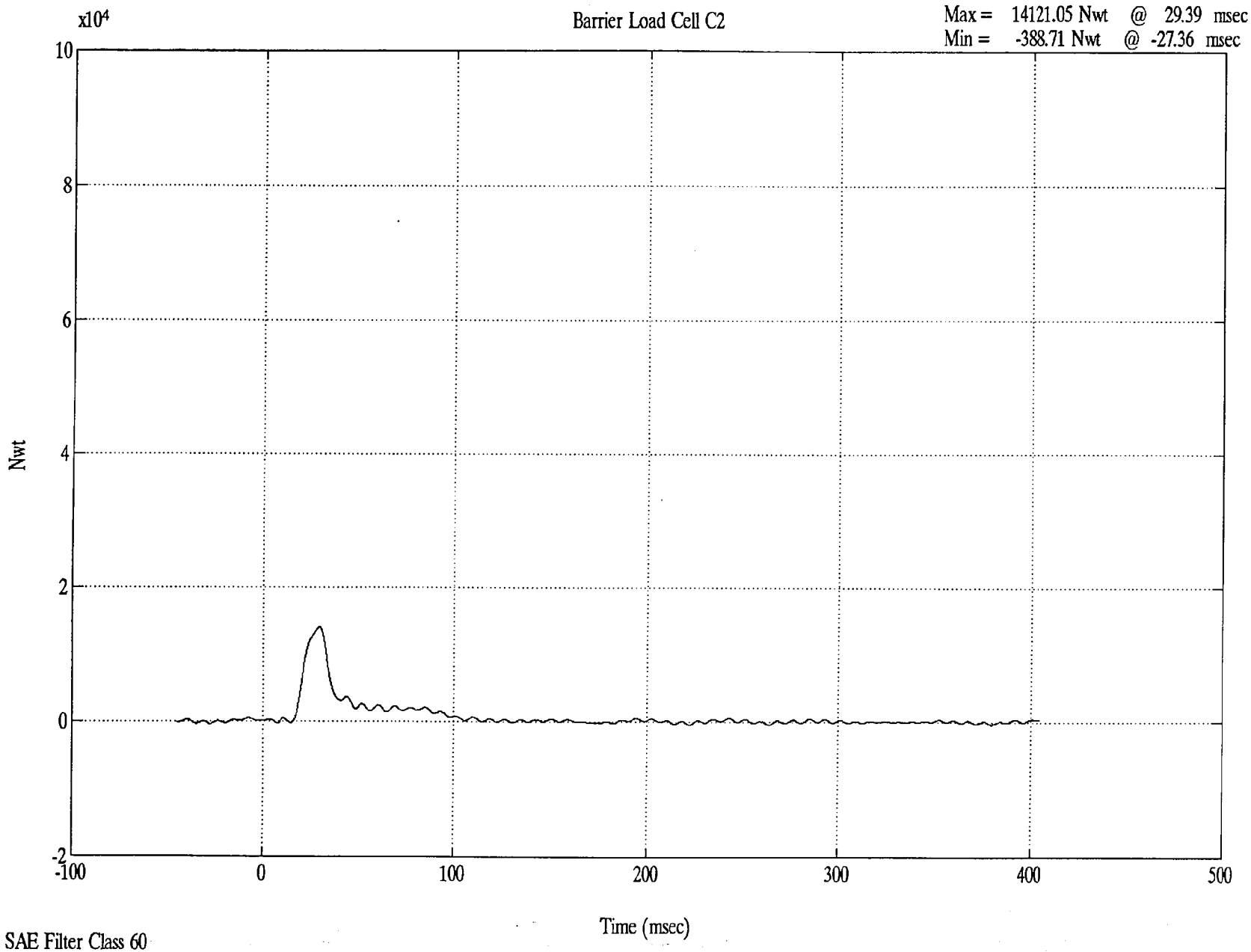


B-149

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

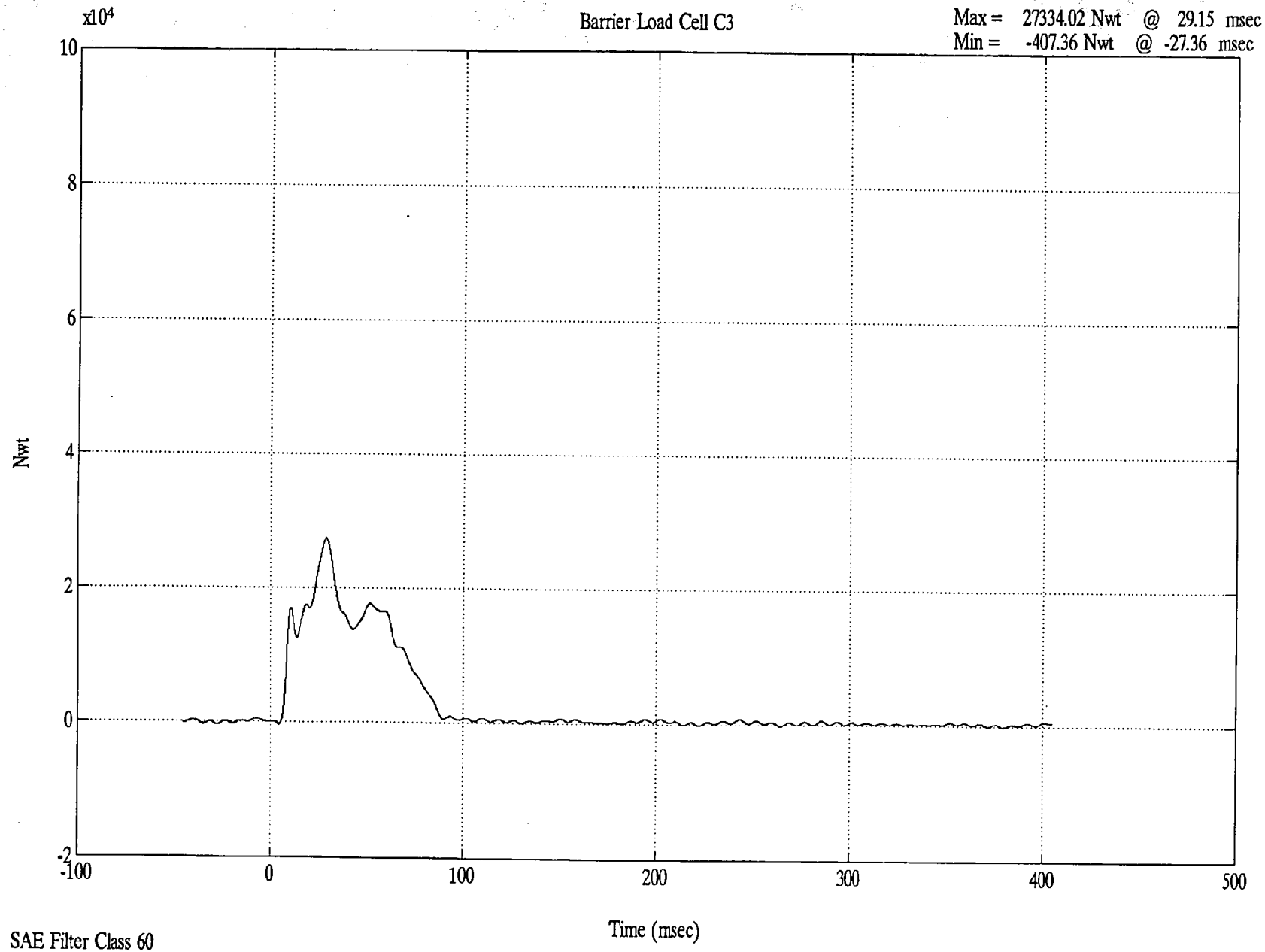


B-150

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

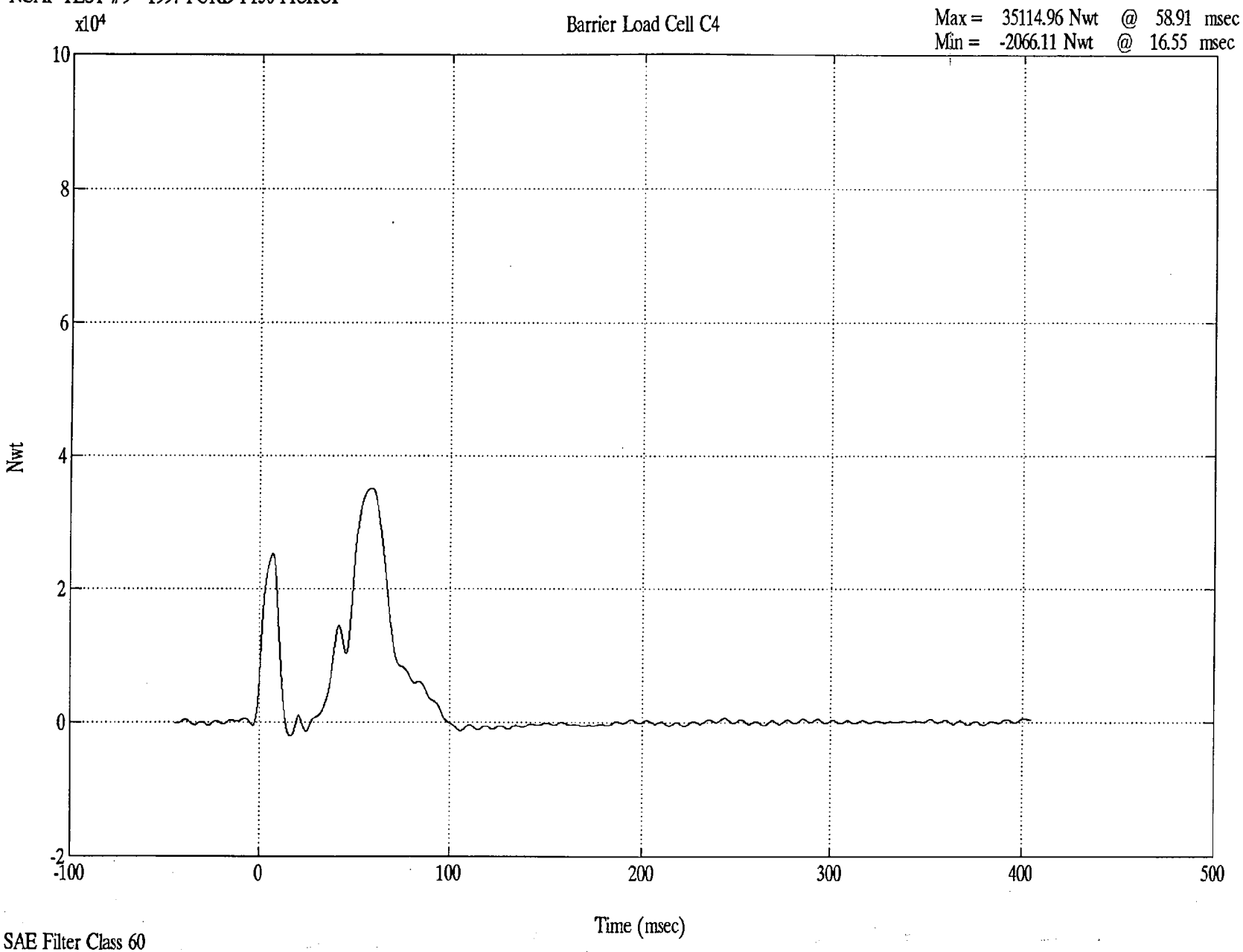


B-151

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

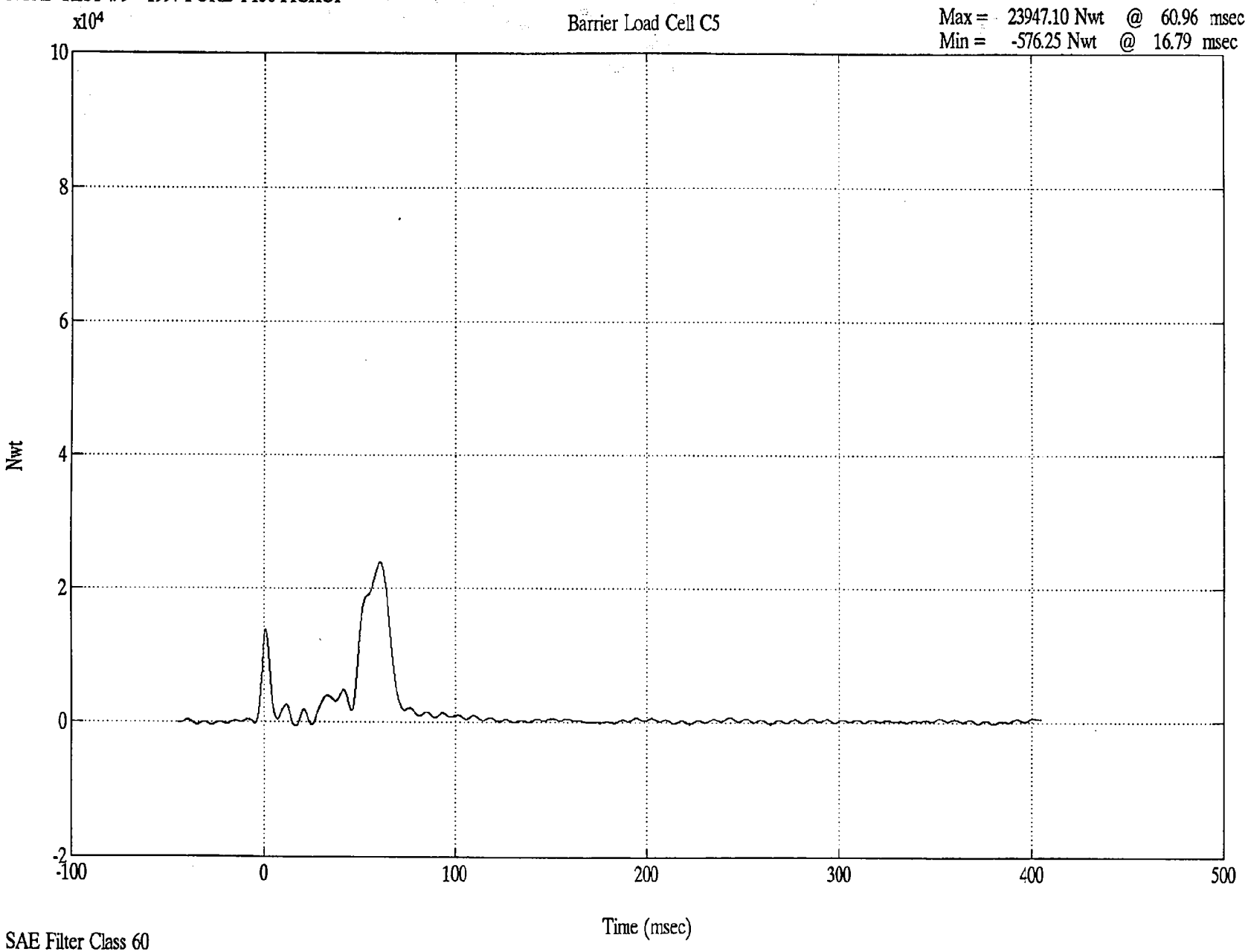


B-152

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

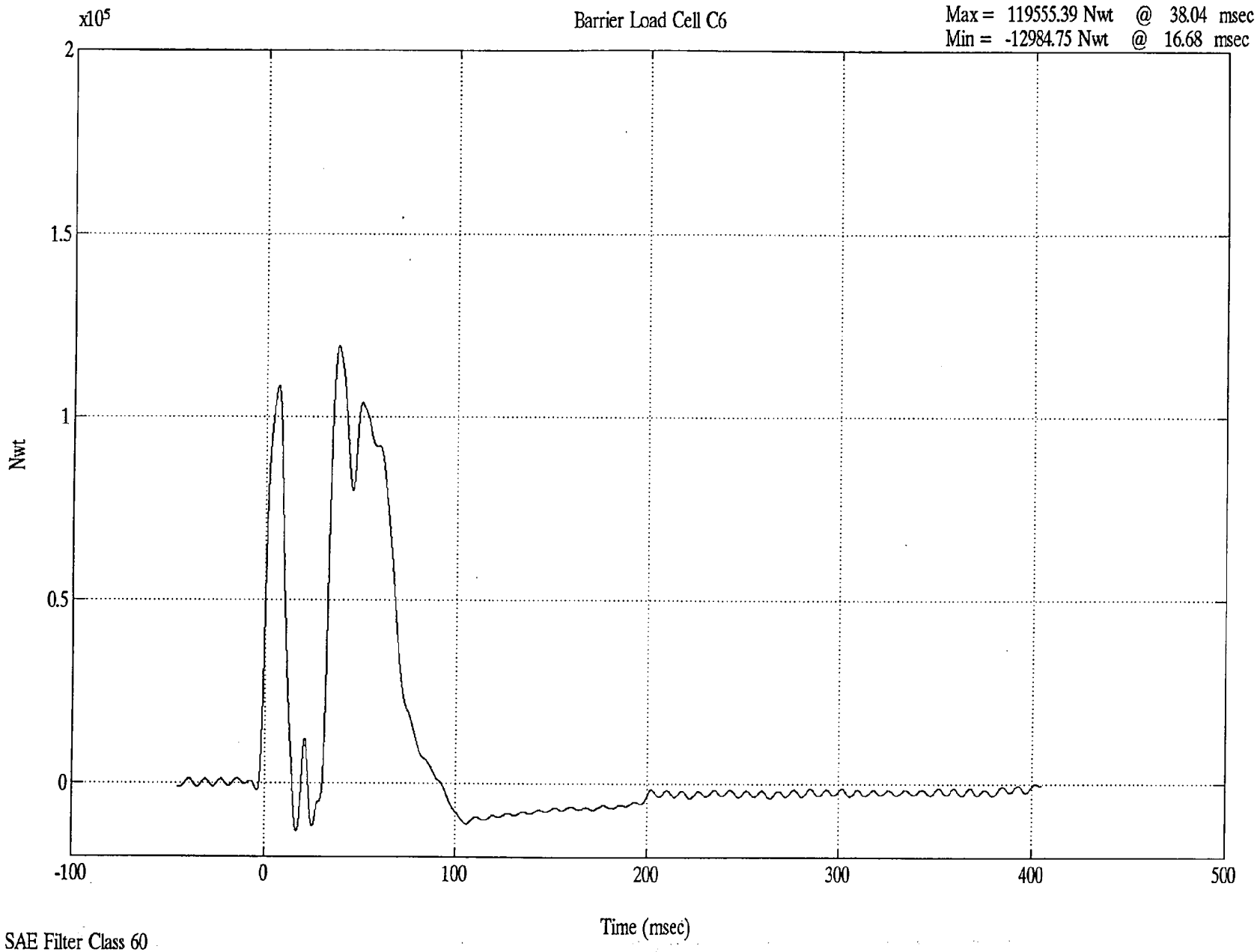


SAE Filter Class 60

B-153

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

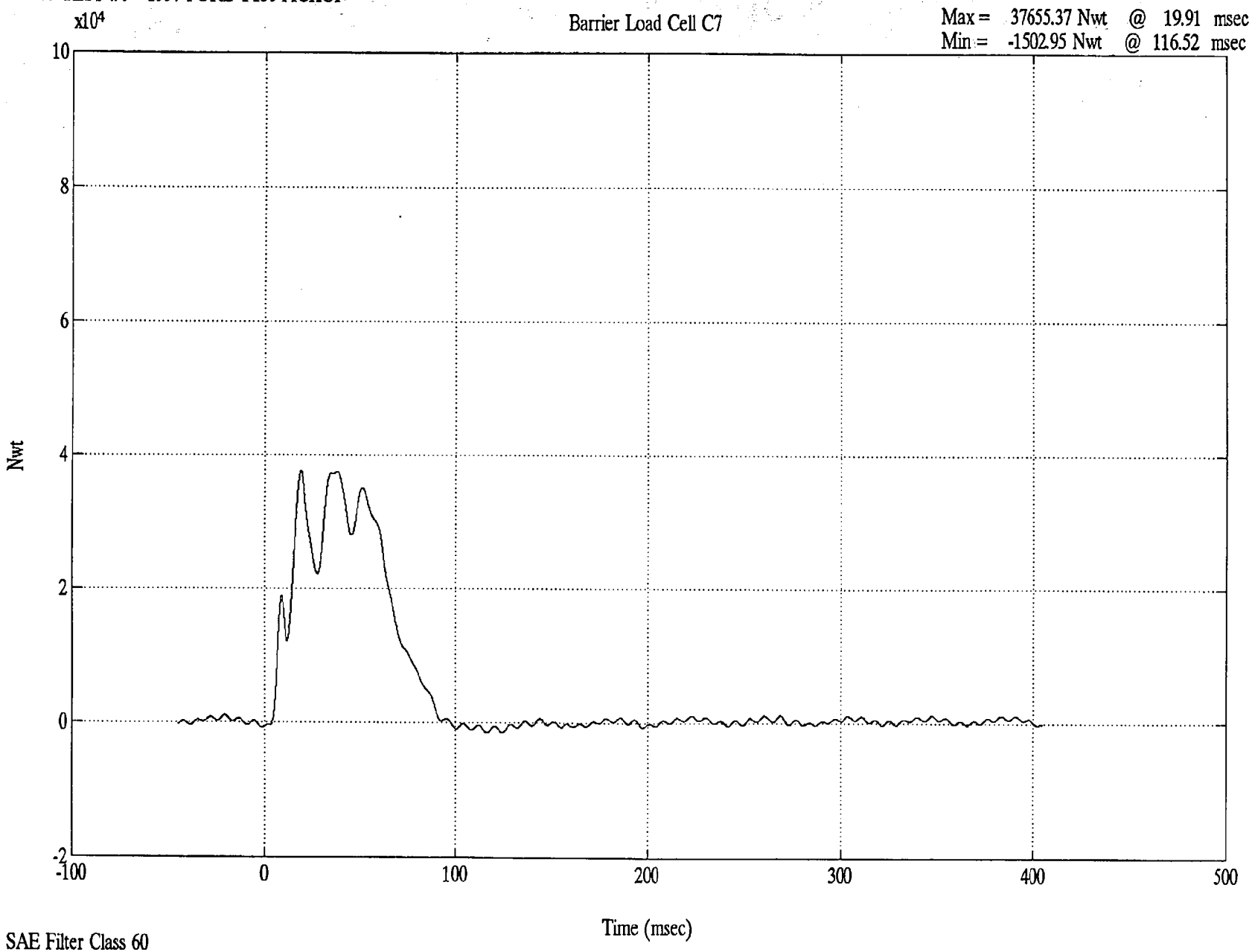


B-154

8313-9

SAE Filter Class 60

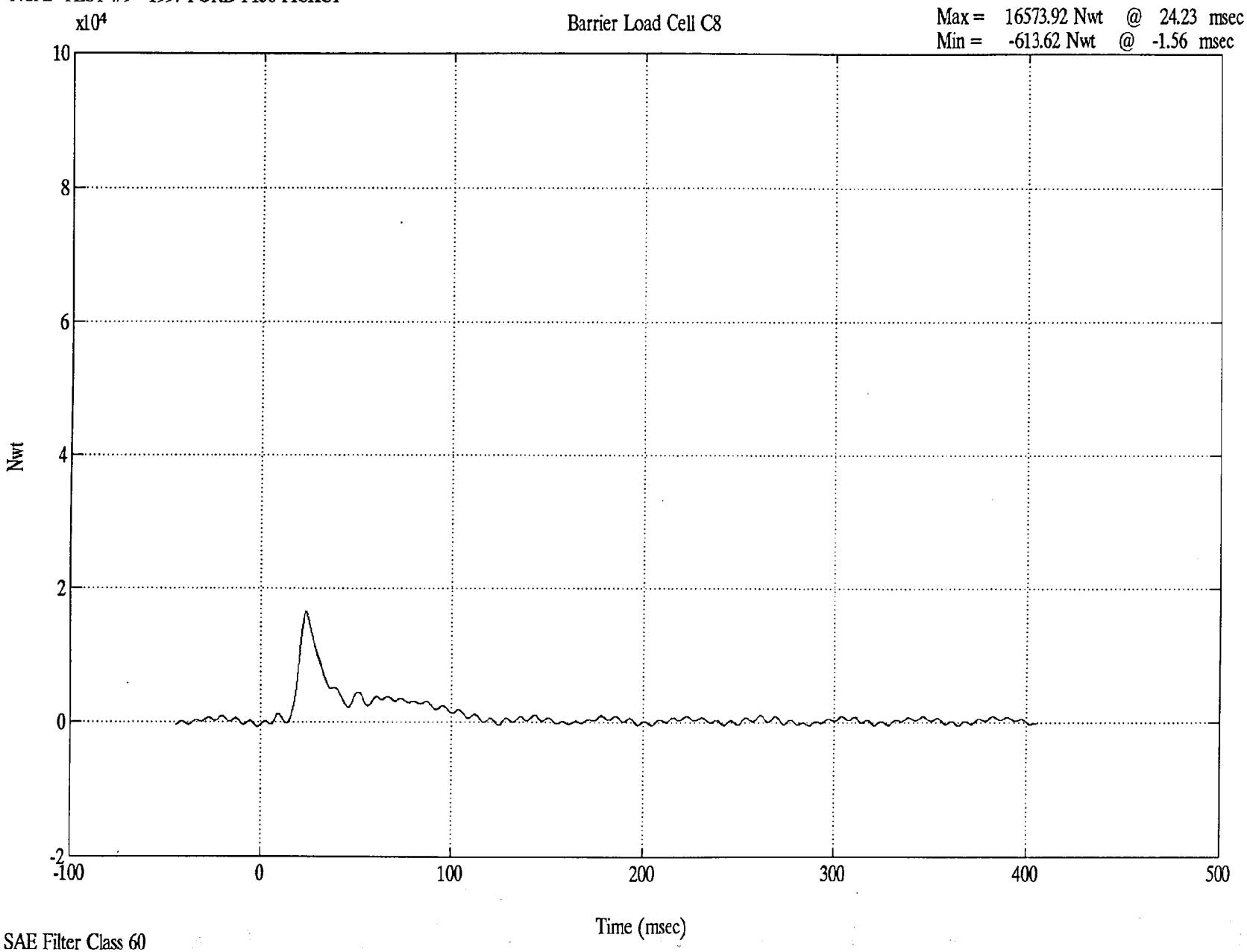
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

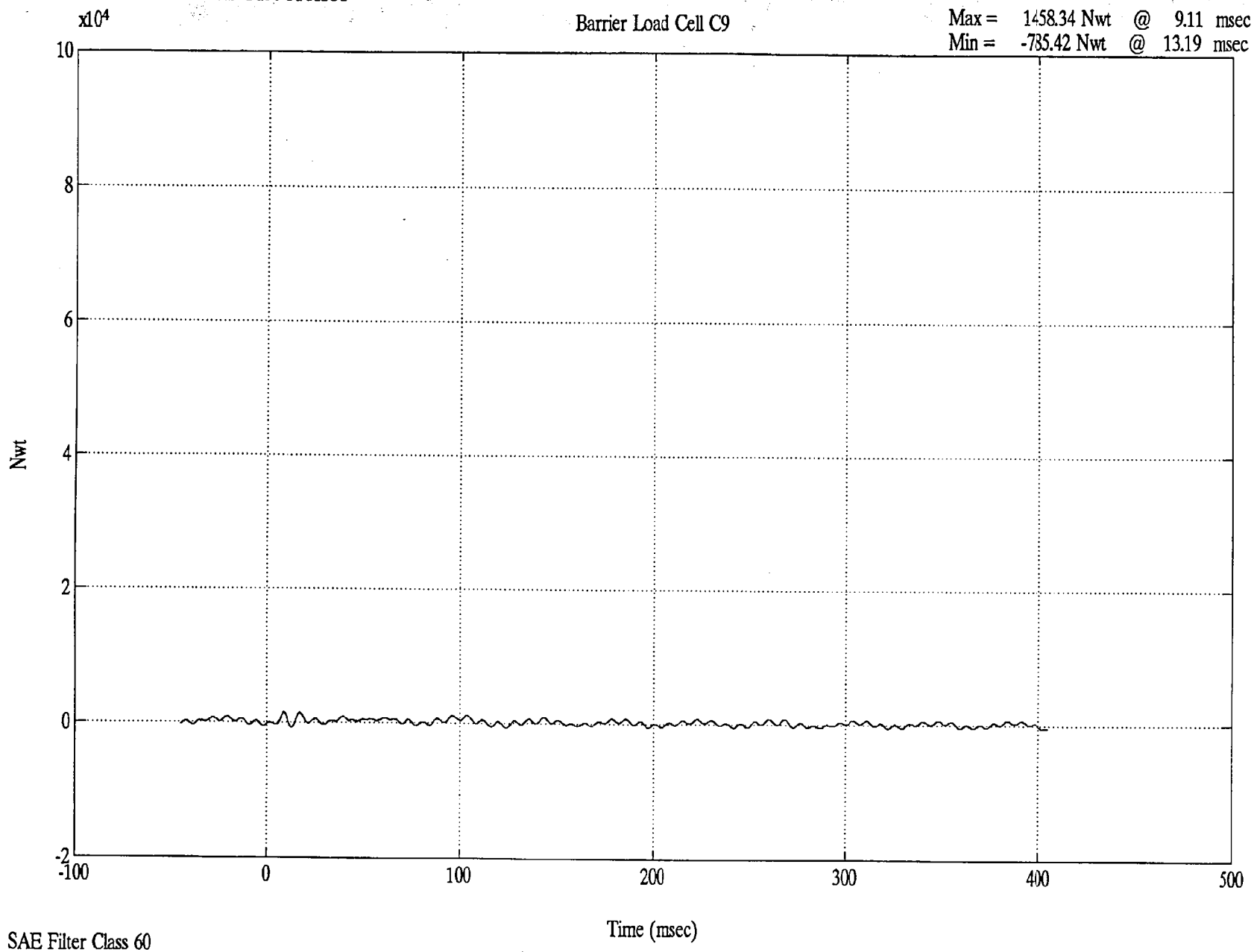


SAE Filter Class 60

B-156

8313-9

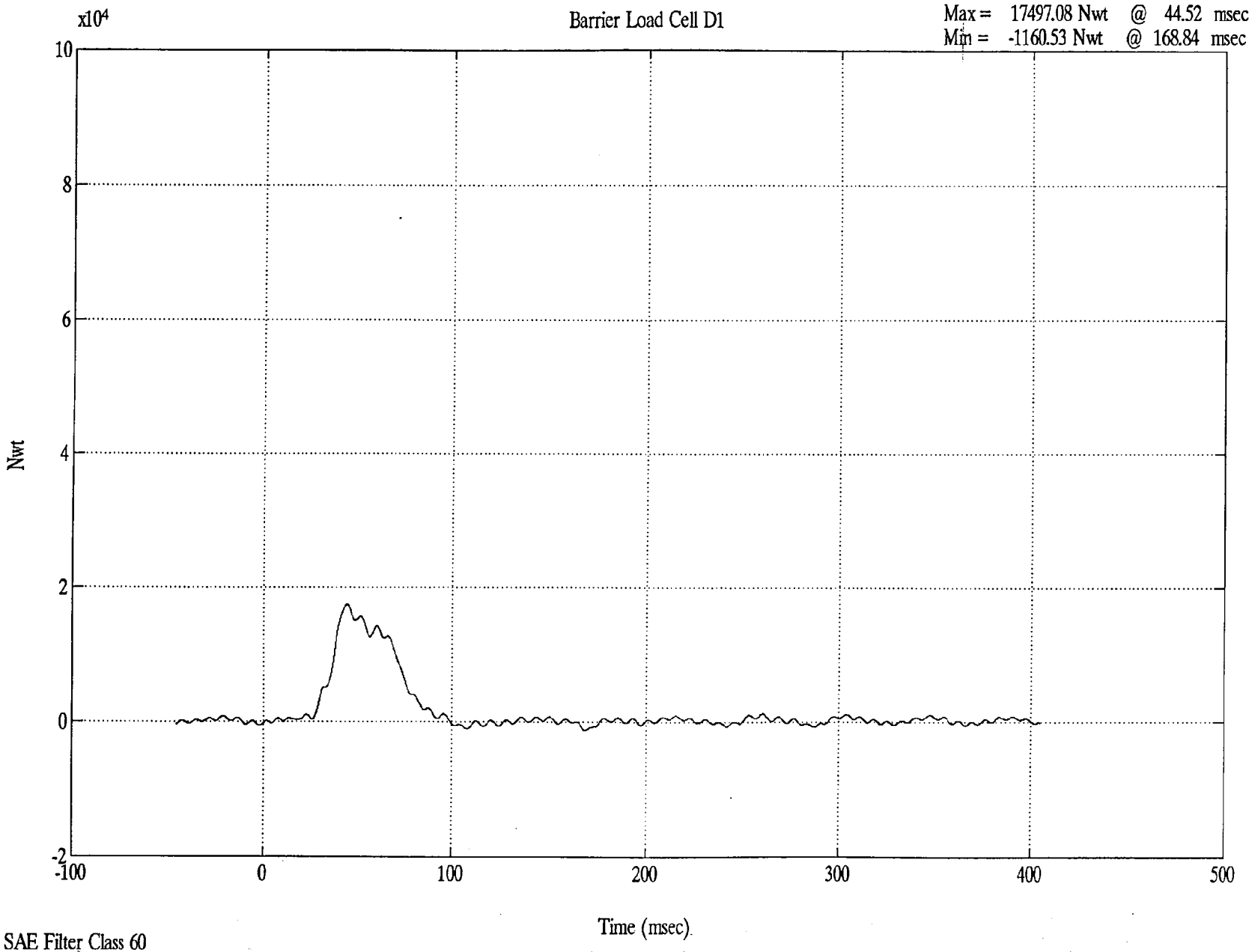
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

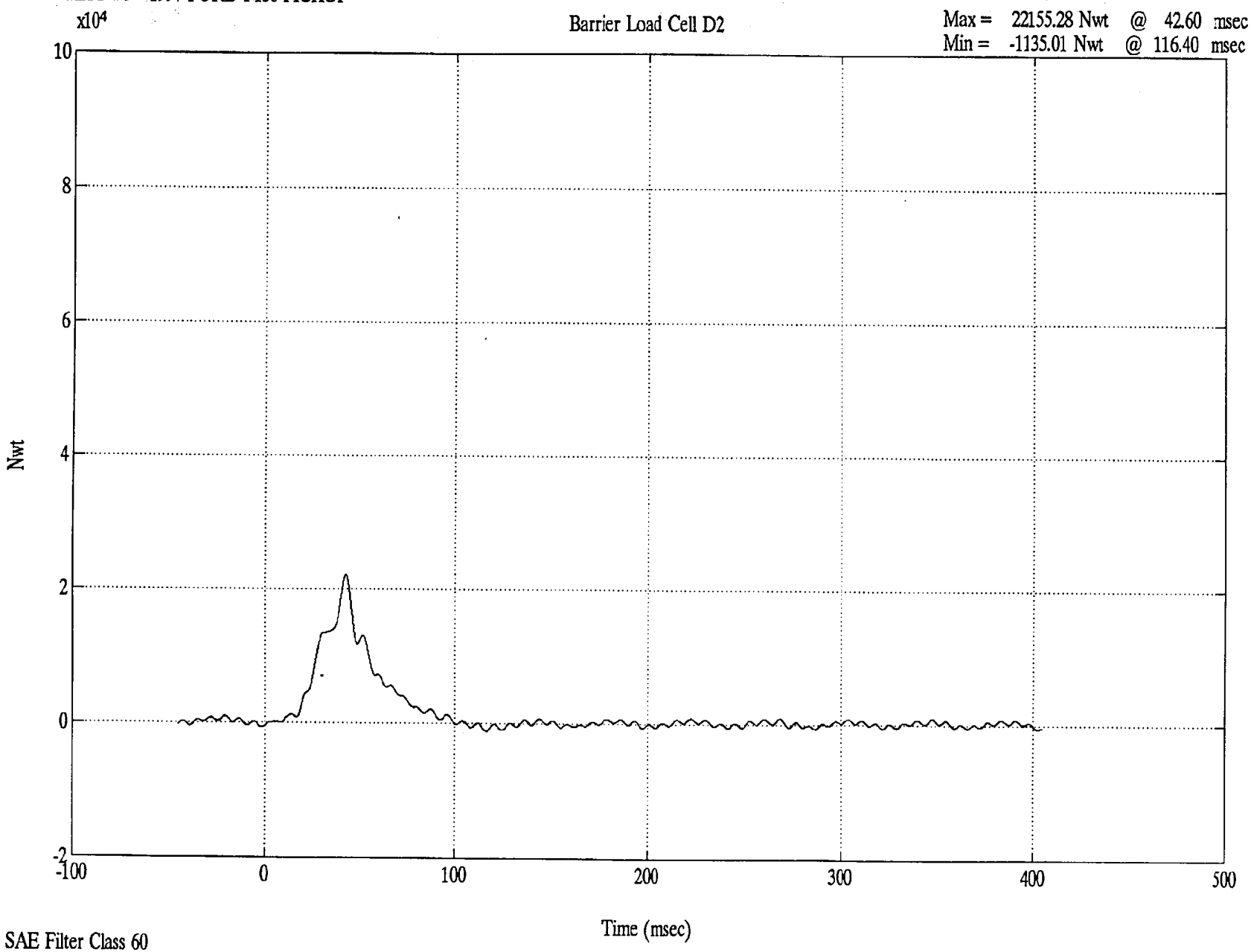


SAE Filter Class 60

B-158

8313-9

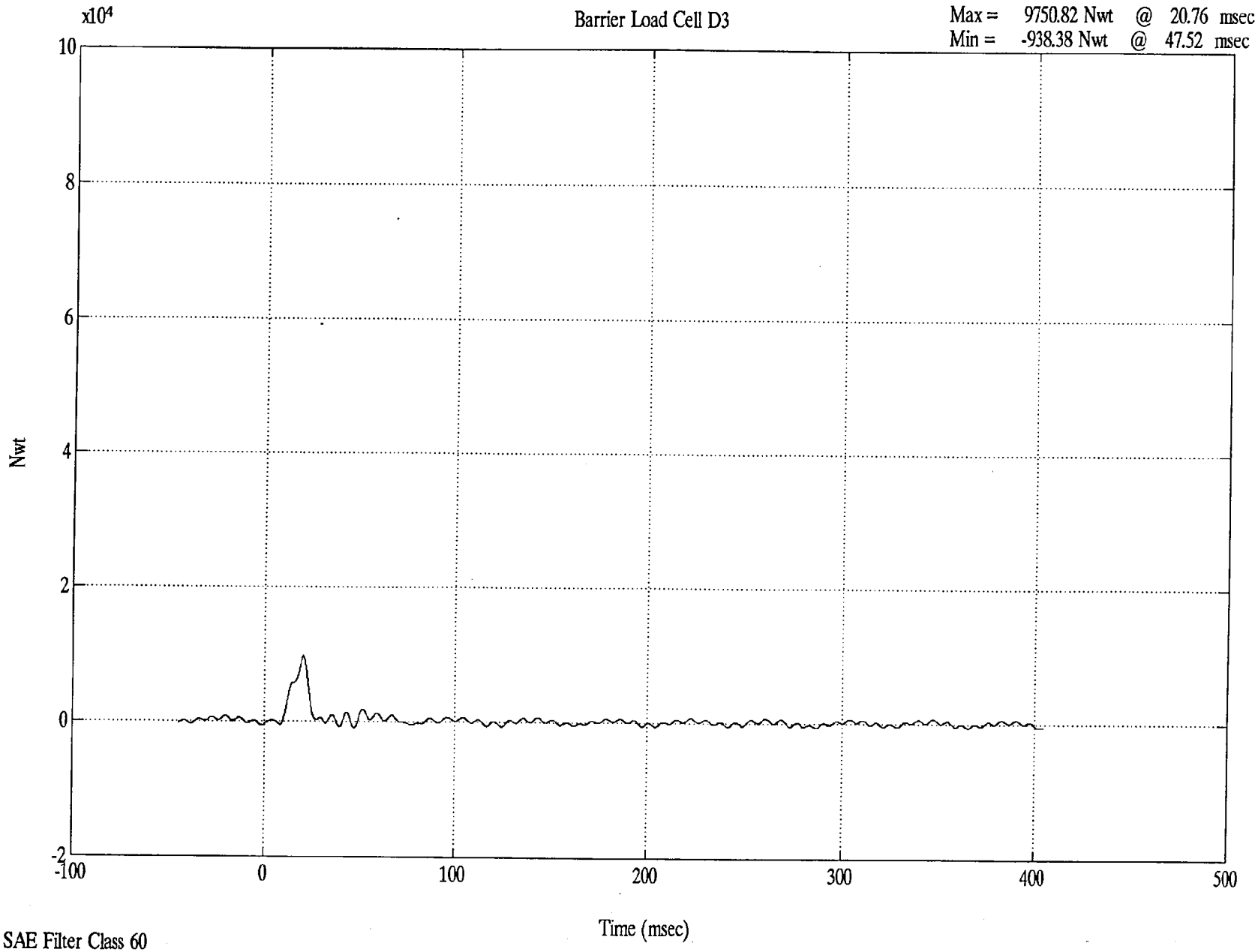
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

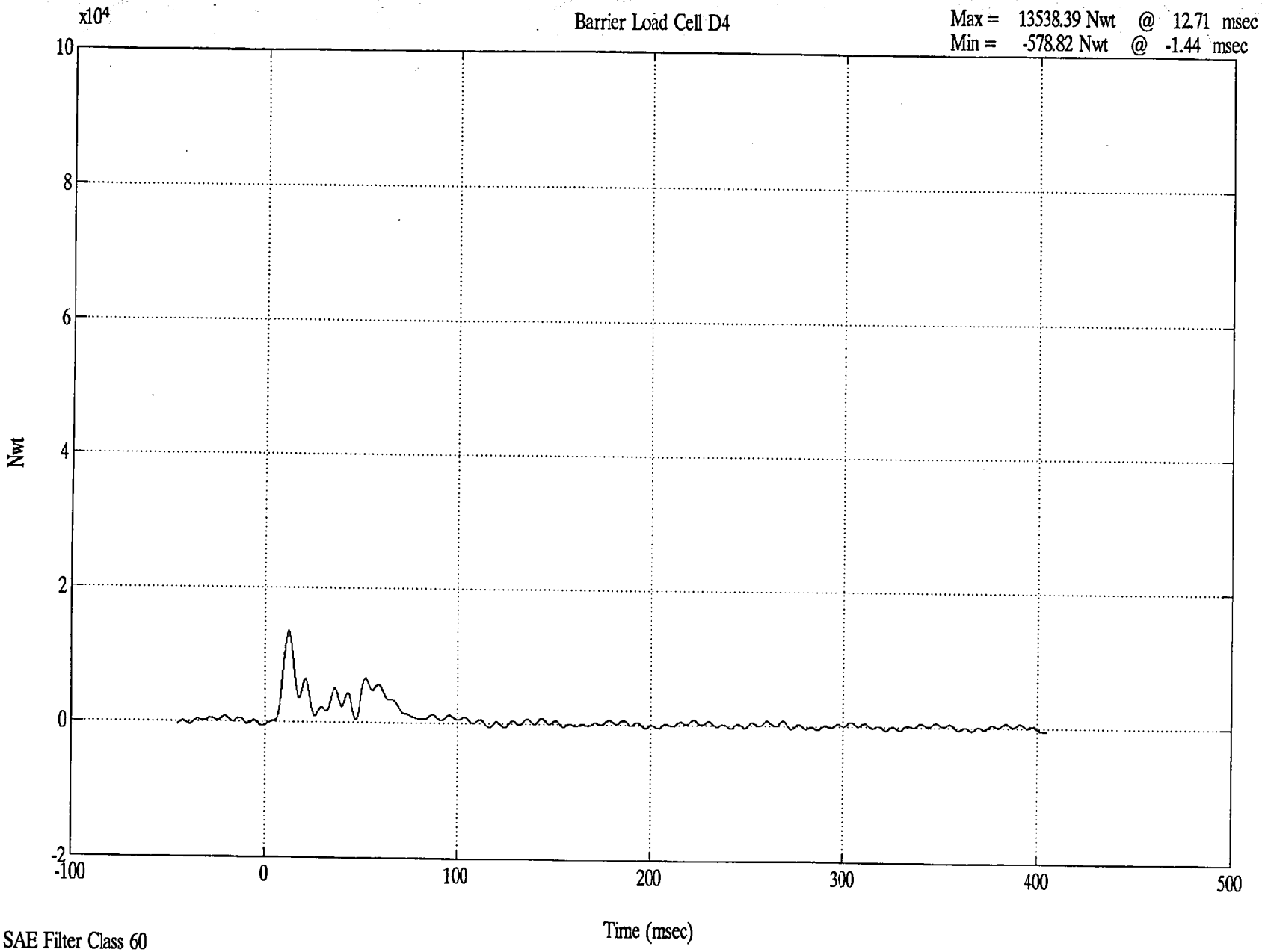


B-160

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

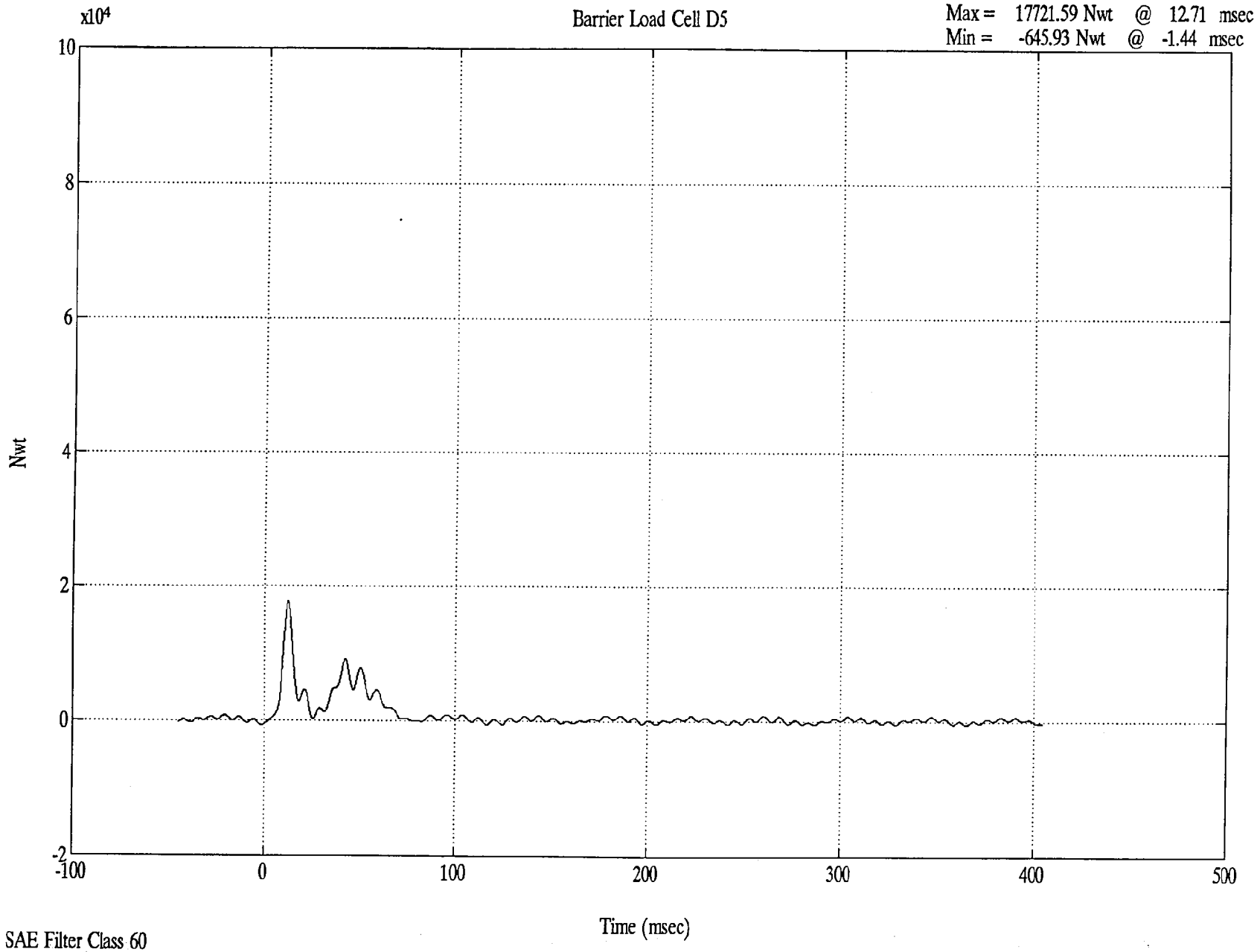


B-161

8313-9

SAE Filter Class 60

NCAP TEST #9 - 1997 FORD F150 PICKUP

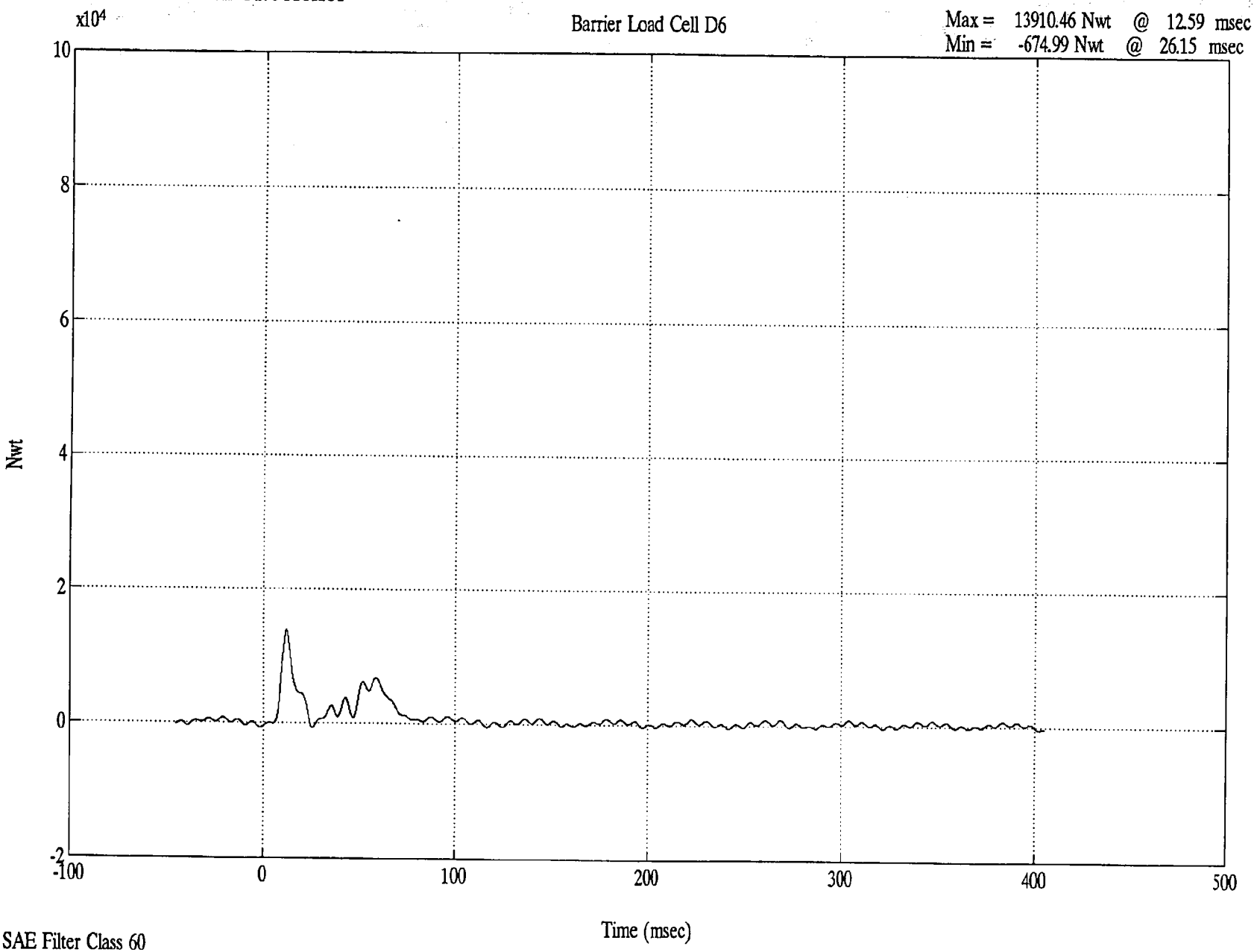


SAE Filter Class 60

B-162

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

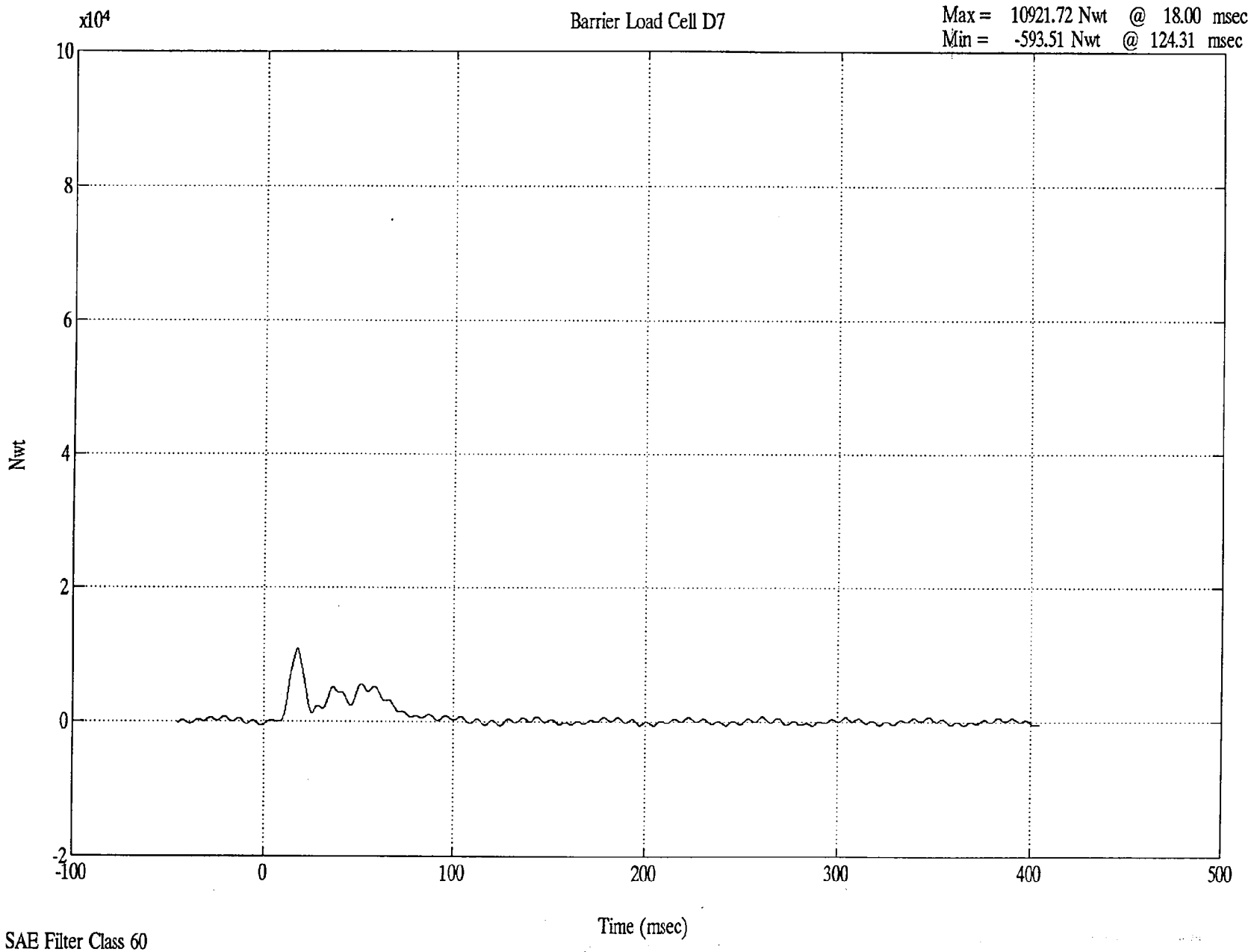


B-163

8313-9

SAE Filter Class 60

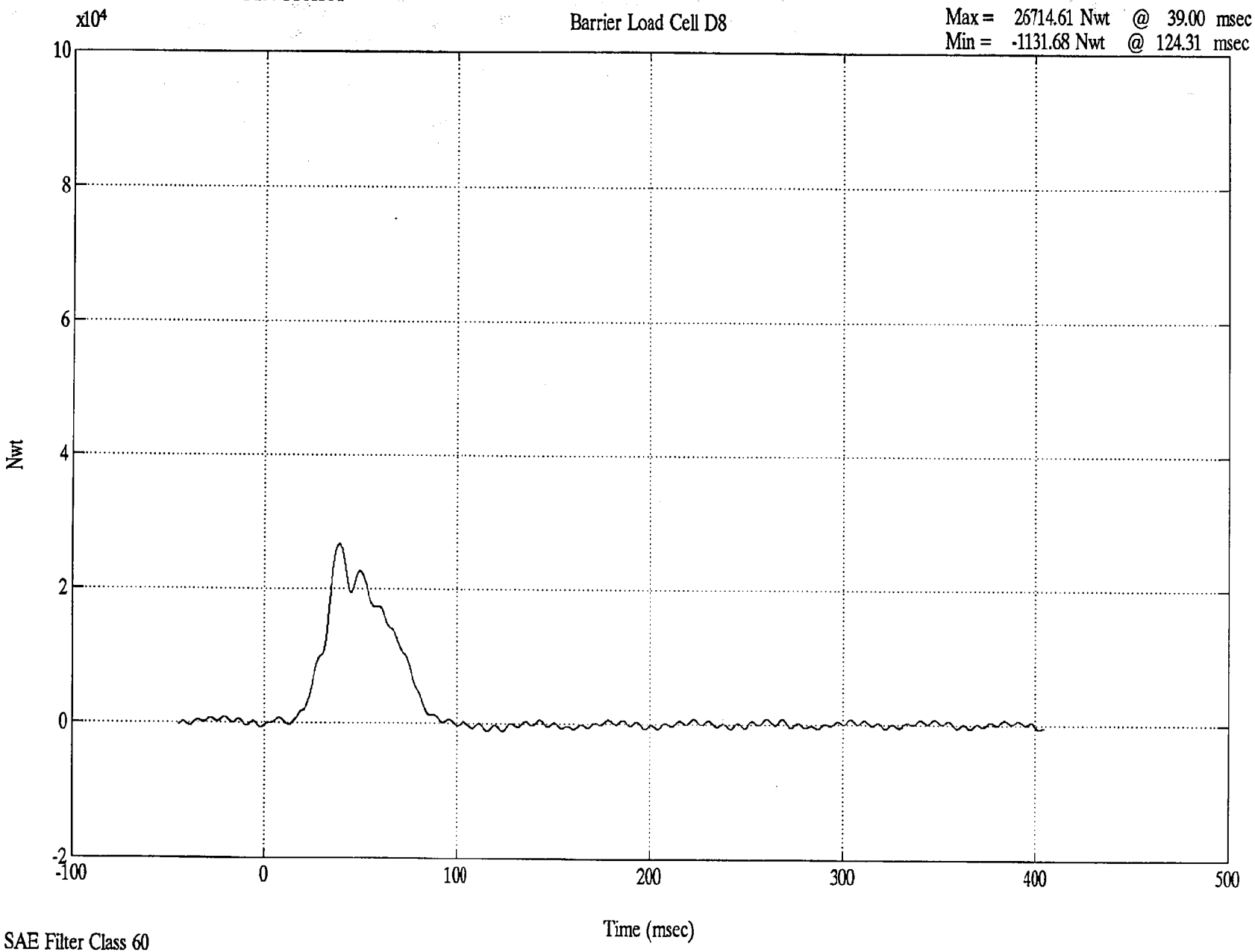
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP

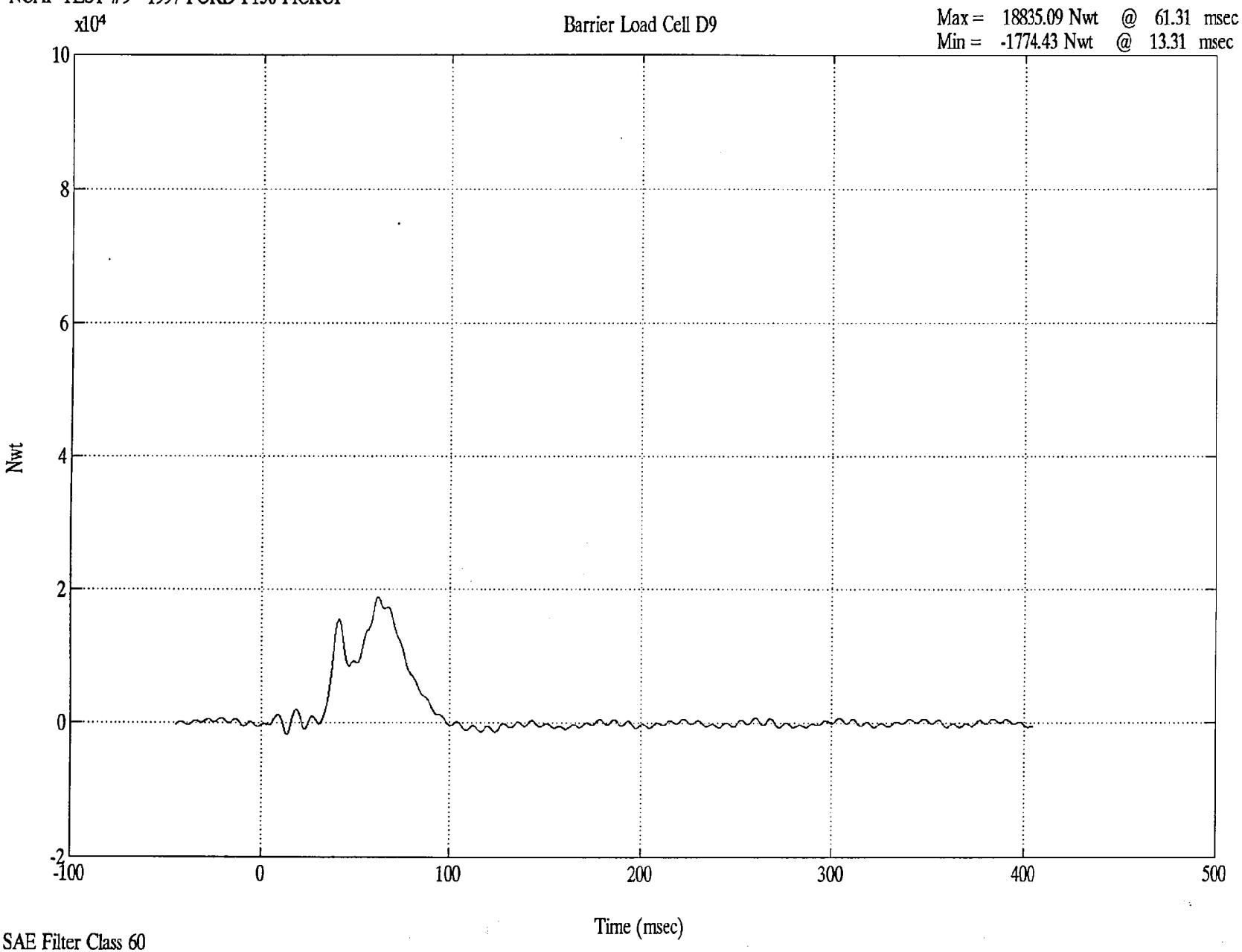


SAE Filter Class 60

B-165

8313-9

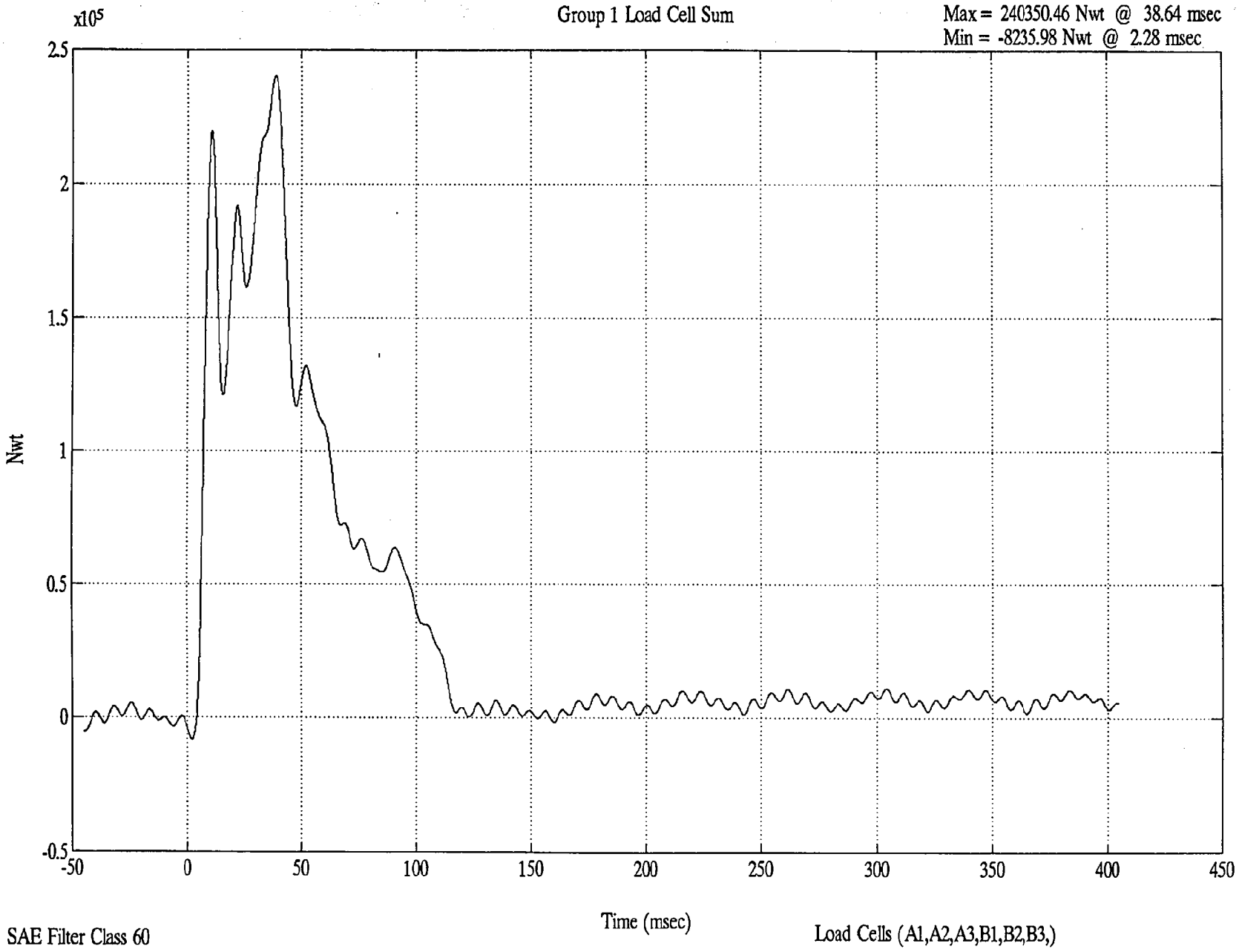
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

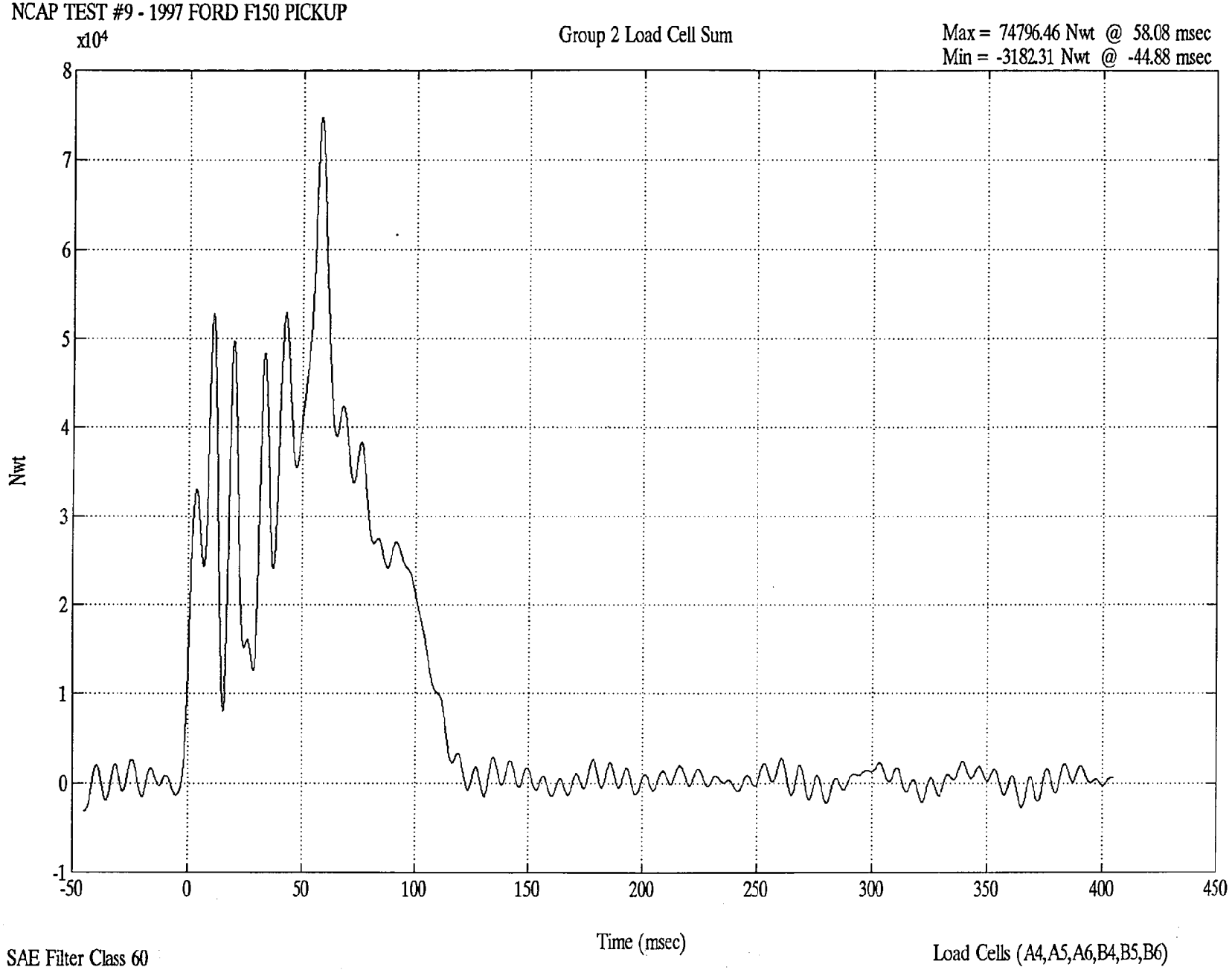
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

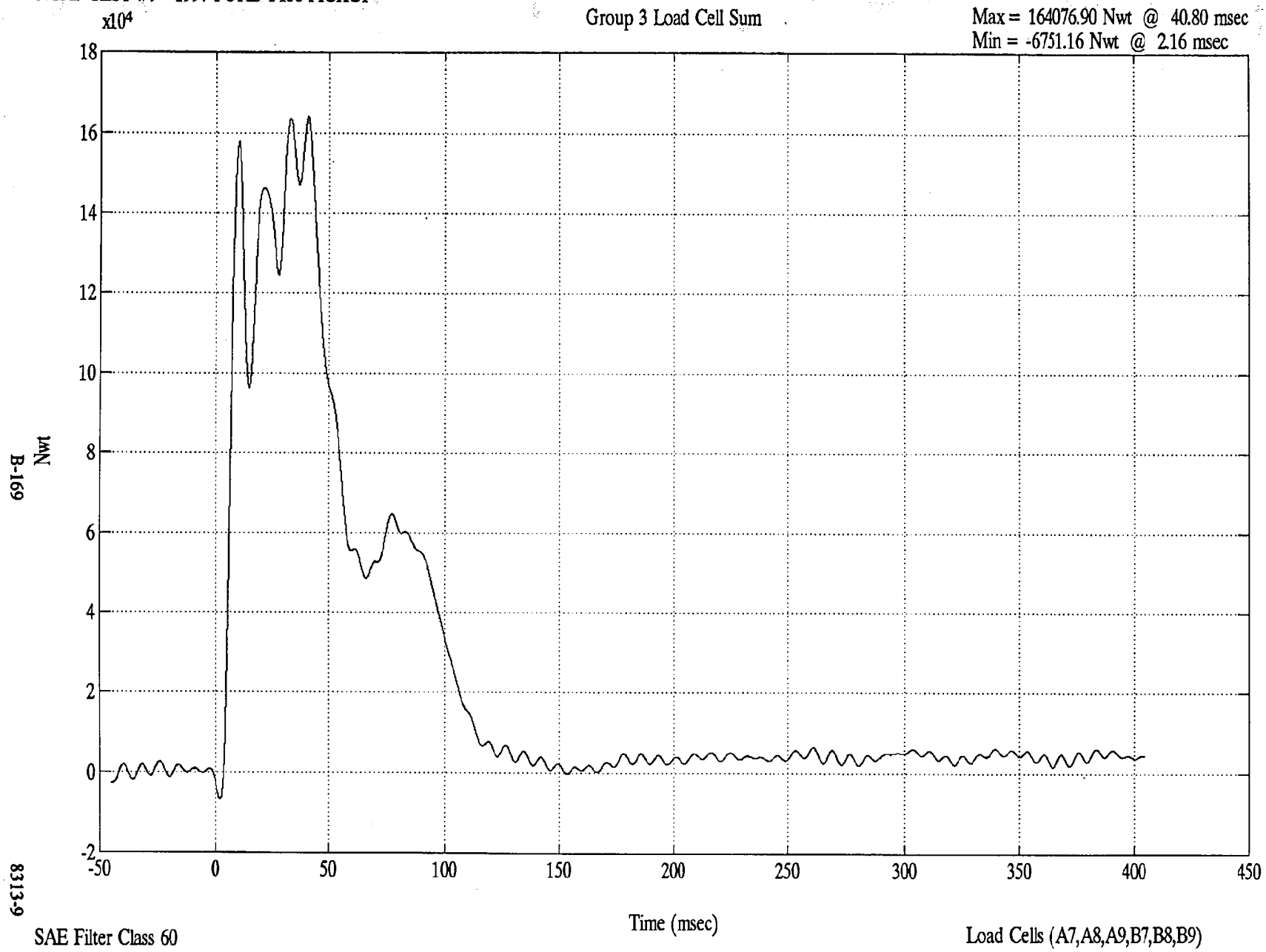
Load Cells (A1,A2,A3,B1,B2,B3,)

8313-9


NCAP TEST #9 - 1997 FORD F150 PICKUP
x10^4
Group 2 Load Cell Sum
Max = 74796.46 Nwt @ 58.08 msec
Min = -3182.31 Nwt @ -44.88 msec
Nwt
Time (msec)
SAE Filter Class 60
Load Cells (A4,A5,A6,B4,B5,B6)

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP



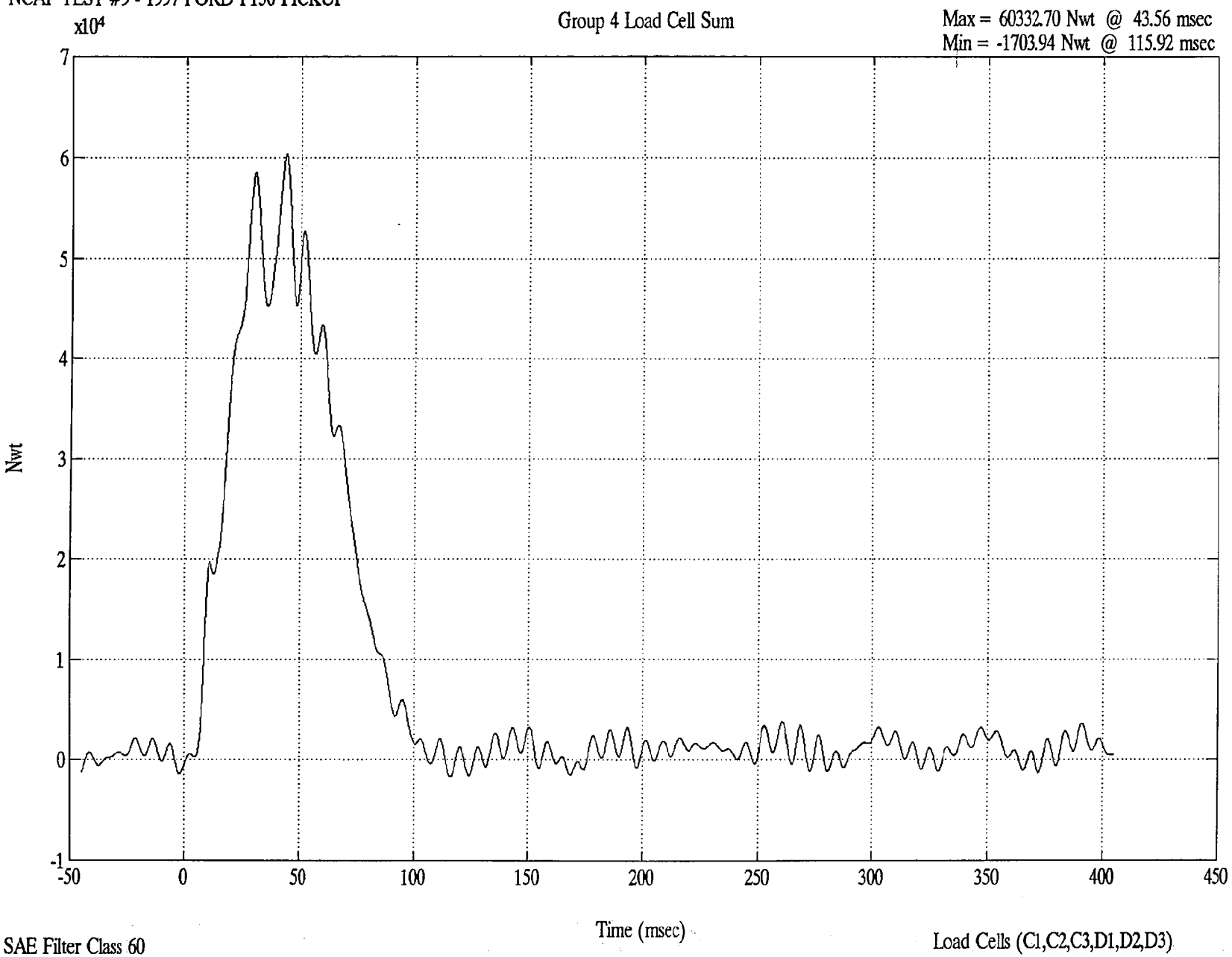
B-169

8313-9

SAE Filter Class 60

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

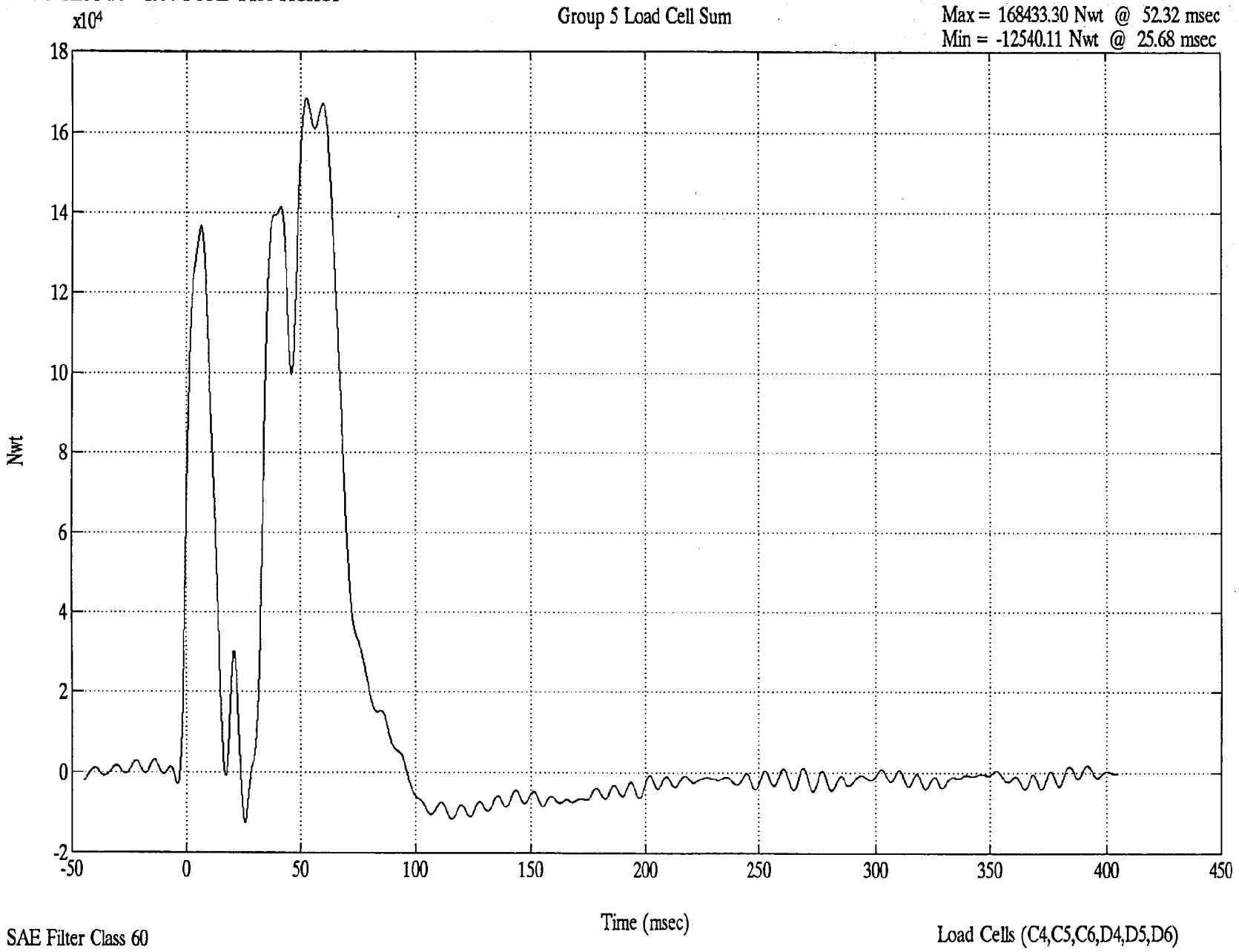
NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

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

NCAP TEST #9 - 1997 FORD F150 PICKUP



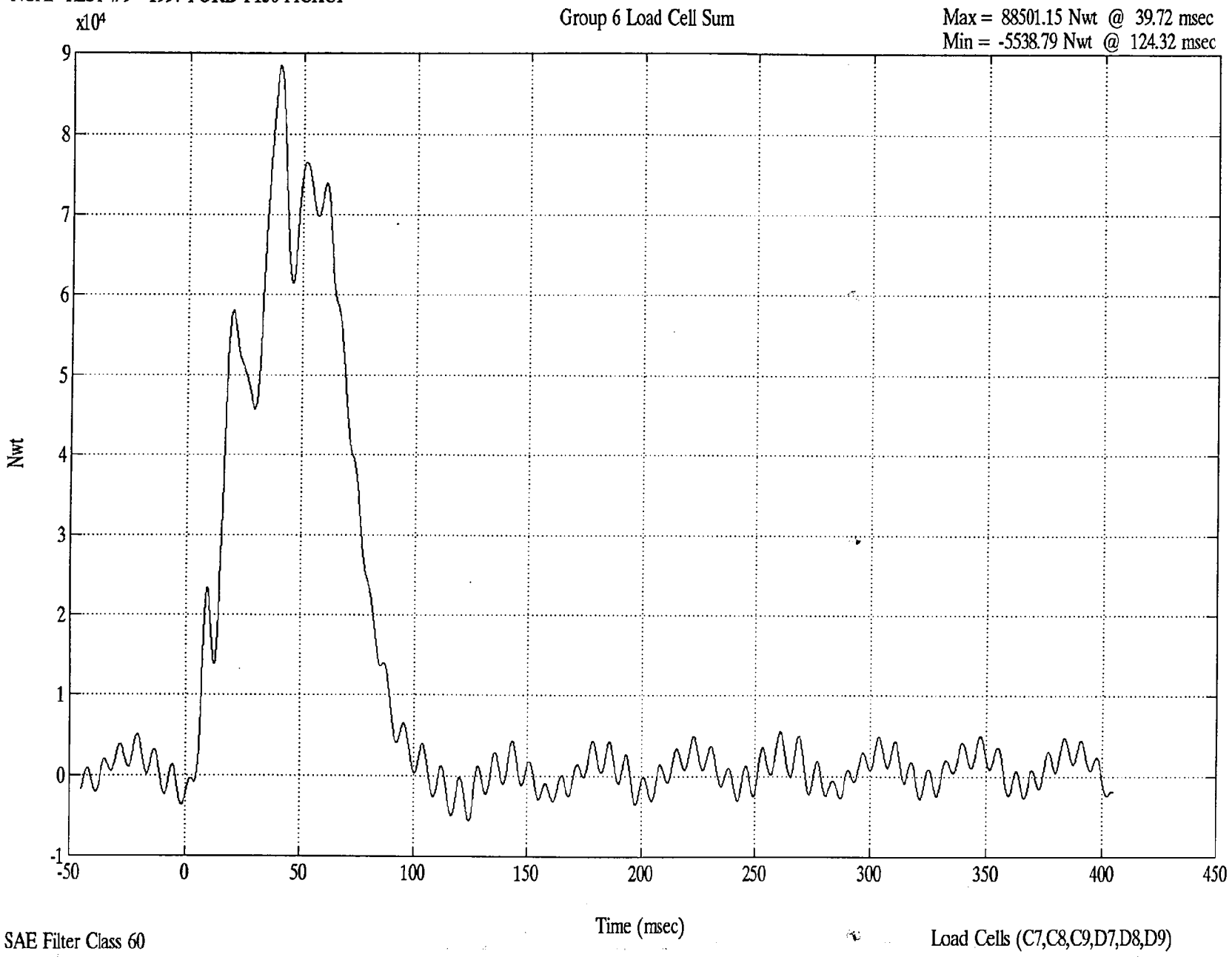
SAE Filter Class 60

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

B-171

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP



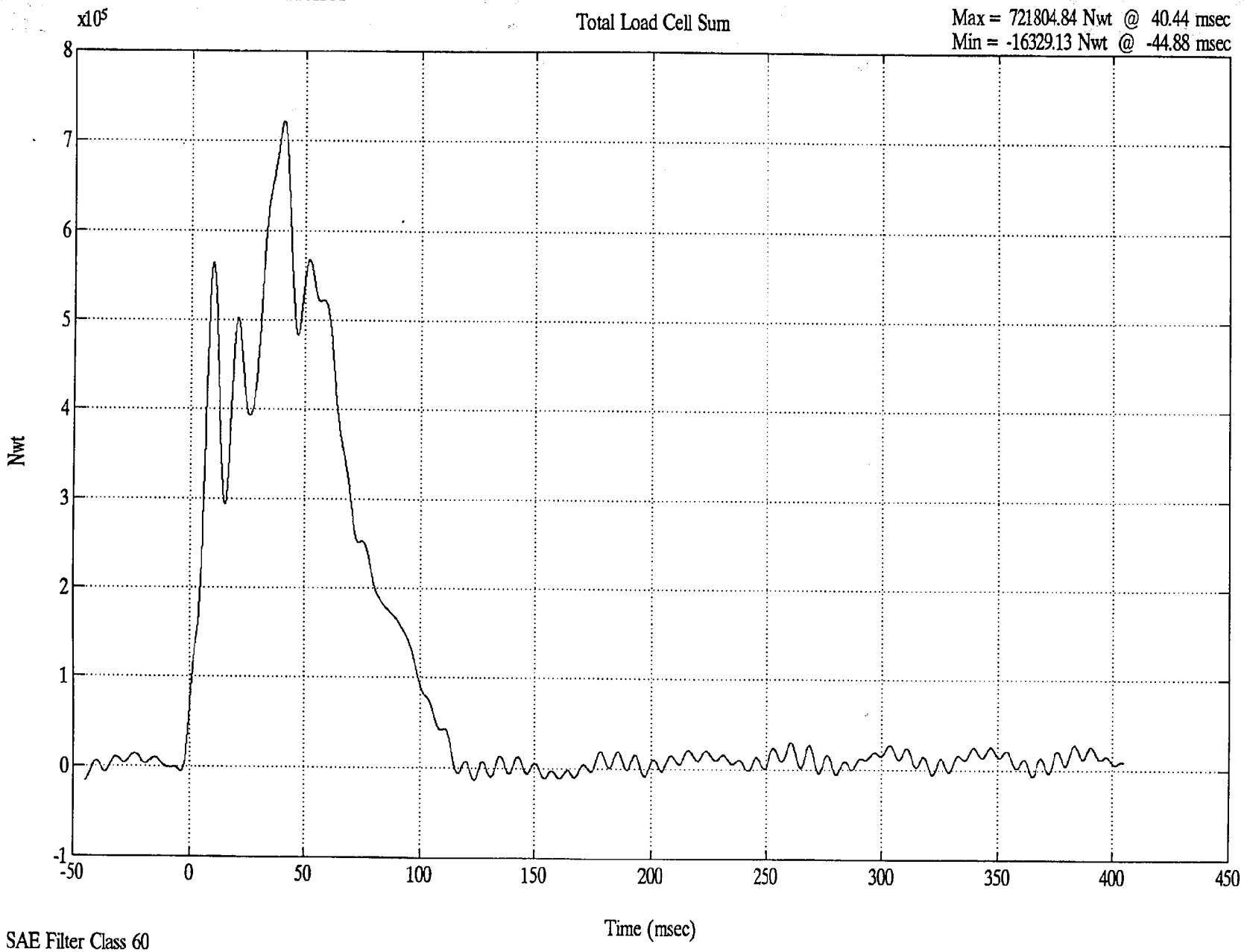
SAE Filter Class 60

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

B-172

8313-9

NCAP TEST #9 - 1997 FORD F150 PICKUP



SAE Filter Class 60

8313-9

Appendix C

PART 572B/E 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 SRL Corporation. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

Position No./Location	Serial No.	Completion Date
#1/Driver	150	8/19/96
#2/Right Front Passenger	064	8/19/96

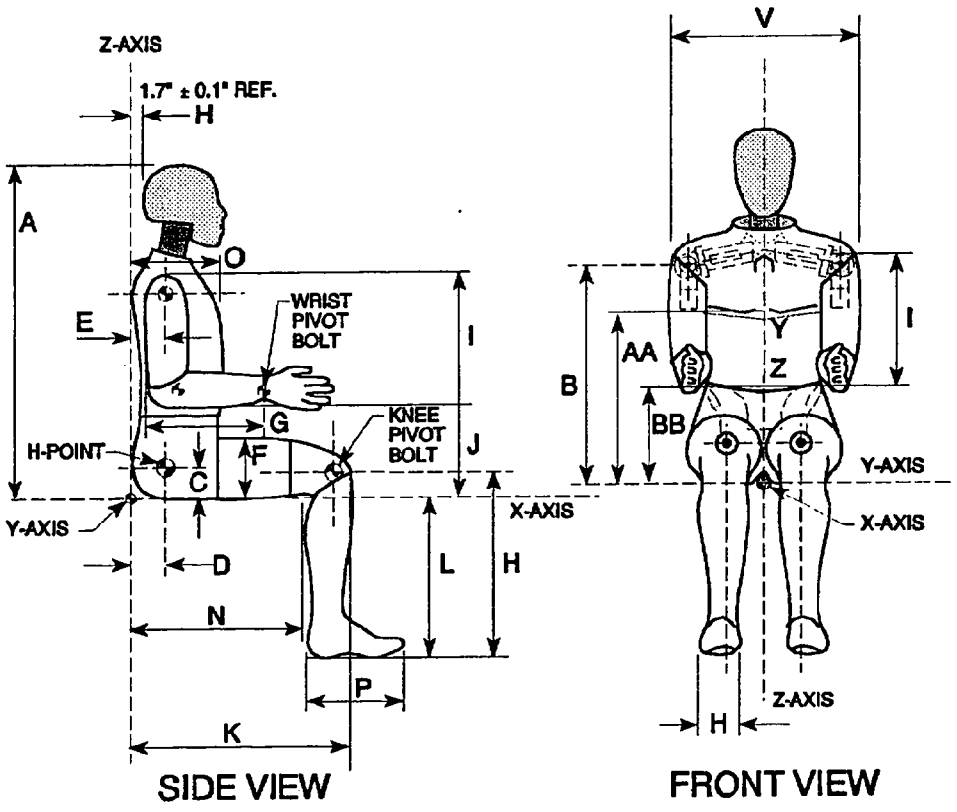
Electronic Test Equipment

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 14

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



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. (REF: S572.31(A)(6))

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number: 150
Calspan Sequential Test Number: 1
Date: 8/19/96

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21 Deg C
Relative Humidity			62 %
Location for Chest Circumference	AA	429 - 434 mm	432 mm
Location for Waist Circumference	BB	226 - 231 mm	229 mm
Chest Circumference (With Jacket)	Y	970 - 1001 mm	996 mm
Waist Circumference	Z	815 - 866 mm	864 mm
Chest Depth	O	213 - 229 mm	213 mm
H-Point Height	C	84 - 89 mm	86 mm
H-Point from Backline	D	135 - 140 mm	137 mm
Skull Cap to Backline	H	41 - 46 mm	43 mm
Total Sitting Height	A	879 - 889 mm	884 mm
Thigh Clearance	F	140 - 155 mm	145 mm
Buttock Knee Length	K	579 - 604 mm	594 mm
Buttock Popliteal Length	N	452 - 477 mm	472 mm
Popliteal Height	L	429 - 455 mm	452 mm
Knee Pivot Height	M	485 - 500 mm	498 mm
Foot Length	P	252 - 267 mm	256 mm
Foot Breadth	W	91 - 107 mm	96 mm
Shoulder Pivot from Backline	E	84 - 94 mm	91 mm
Shoulder Breadth	V	422 - 437 mm	429 mm
Shoulder Pivot Height	B	505 - 521 mm	513 mm
Elbow Rest Height	J	190 - 211 mm	206 mm
Shoulder - Elbow Length	I	330 - 345 mm	335 mm
Back of Elbow to Wrist Pivot	G	290 - 305 mm	292 mm

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
HEAD DROP TEST

Dummy Serial Number: 150
Calspan Sequential Test Number: 1
Date: 8/14/96
Workfile: 1501896.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	19 - 25 Deg. C	23.8 Deg. C
Relative Humidity	10% - 70%	55 %
Peak Resultant Acceleration	225 - 275 G's	271.1 G's
Peak Lateral Acceleration	15 G's Max	6.3 G's
Is Acceleration Curve Unimodal?	YES	YES

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION

Transportation Sciences Center

PART 572E
NECK FLEXION TEST

Dummy Serial Number: 150
Calspan Sequential Test Number: 1
Date: 8/15/96
Workfile: 1501896.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.5 - 22.2 Deg. C	21.1 Deg. F
Relative Humidity		10% - 70%	60 %
Impact Velocity		24.8 - 25.7 Kph	25.0 Kph
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.03 G's
	20 ms	17.60 - 22.60 G's	19.91 G's
	30 ms	12.50 - 18.50 G's	17.54 G's
Max Pendulum G's Above 30 ms		29 G's Max	17.54 G's
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	35.88 ms
D Plane Rotation	Max	64 - 78 Deg	67.92 Deg.
	Time	57 - 64 ms	62.38 ms
Moment About Occipital Condyle	Max	88 - 108 N-M	95.13 N-M
	Time	47 - 58 ms	48.25 ms
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	117.38 ms
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	103.25 ms

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
NECK EXTENSION TEST

Dummy Serial Number: 150
Calspan Sequential Test Number: 1
Date: 8/15/96
Workfile: 1501896.nex

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.5 - 22.2 Deg. C	21.1 Deg. C
Relative Humidity		10% - 70%	60 %
Impact Velocity		21.4 - 22.3 Kph	21.80 Kph
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.20 G's
	20 ms	14.00 - 19.00 G's	15.71 G's
	30 ms	11.00 - 16.00 G's	12.88 G's
Max Pendulum G's Above 30 ms		22 G's Max	12.88 G's
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.50 ms
D Plane Rotation	Max	81 - 106 Deg	96.37 Deg.
	Time	72 - 82 ms	78.13 ms
Moment About Occipital Condyle	Max	-80.0/-52.9 N-M	-70.7 N-M
	Time	65 - 79 ms	71.63 ms
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	152.63 ms
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	141.63 ms

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION

Transportation Sciences Center

PART 572E
THORAX IMPACT TEST

Dummy Serial Number: 150
Calspan Sequential Test Number: 1
Date: 8/19/96
Workfile: 1501896.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.5 - 22.2 Deg. C	21.1 Deg. C
Relative Humidity	10% - 70%	62 %
Pendulum Velocity	23.7 - 24.6 Kph	24.13 Kph
Maximum Deflection	64 - 73 mm	70.6 mm
Maximum Resistive Force	5160 - 5894 Newton's	5415 Newton's
Internal Hysteresis	69 - 85 %	70.7 %

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
KNEE IMPACT TEST

Dummy Serial Number: 150
Calspan Sequential Test Number: 1
Date: 8/24/96
Workfile:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	19 - 25 Deg. C	23.9 Deg. C
Relative Humidity	10% - 70%	58 %
Probe Velocity	7.5 - 7.7 Kph	7.7 Kph
Peak Knee Impact Force	4715 - 5782 N	5059 N
RIGHT KNEE		
Temperature	19 - 25 Deg. C	23.3 Deg. C
Relative Humidity	10% - 70%	59 %
Probe Velocity	7.5 - 7.7 Kph	7.7 Kph
Peak Knee Impact Force	4715 - 5782 N	4770 N

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number: 064
Calspan Sequential Test Number: 1
Date: 8/19/96

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			21.1 Deg C
Relative Humidity			62 %
Location for Chest Circumference	AA	429 - 434 mm	432 mm
Location for Waist Circumference	BB	226 - 231 mm	229 mm
Chest Circumference (With Jacket)	Y	970 - 1001 mm	988 mm
Waist Circumference	Z	815 - 866 mm	846 mm
Chest Depth	O	213 - 229 mm	218 mm
H-Point Height	C	84 - 89 mm	86 mm
H-Point from Backline	D	135 - 140 mm	137 mm
Skull Cap to Backline	H	41 - 46 mm	43 mm
Total Sitting Height	A	879 - 889 mm	884 mm
Thigh Clearance	F	140 - 155 mm	152 mm
Buttock Knee Length	K	579 - 604 mm	599 mm
Buttock Popliteal Length	N	452 - 477 mm	467 mm
Popliteal Height	L	429 - 455 mm	439 mm
Knee Pivot Height	M	485 - 500 mm	493 mm
Foot Length	P	252 - 267 mm	256 mm
Foot Breadth	W	91 - 107 mm	96 mm
Shoulder Pivot from Backline	E	84 - 94 mm	91 mm
Shoulder Breadth	V	422 - 437 mm	427 mm
Shoulder Pivot Height	B	505 - 521 mm	518 mm
Elbow Rest Height	J	190 - 211 mm	203 mm
Shoulder - Elbow Length	I	330 - 345 mm	340 mm
Back of Elbow to Wrist Pivot	G	290 - 305 mm	295 mm

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
HEAD DROP TEST

Dummy Serial Number: 064
Calspan Sequential Test Number: 1
Date: 8/14/96
Workfile: 0641896.hdp

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	19 - 25 Deg. C	23.3 Deg. C
Relative Humidity	10% - 70%	59 %
Peak Resultant Acceleration	225 - 275 G's	262.0 G's
Peak Lateral Acceleration	15 G's Max	12.1 G's
Is Acceleration Curve Unimodal?	YES	YES

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
NECK FLEXION TEST

Dummy Serial Number: 064
Calspan Sequential Test Number: 1
Date: 8/15/96
Workfile: 0641896.nfl

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.5 - 22.2 Deg. C	21.1 Deg. C
Relative Humidity		10% - 70%	60 %
Impact Velocity		24.8 - 25.7 Kph	25.0 Kph
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.70 G's
	20 ms	17.60 - 22.60 G's	18.89 G's
	30 ms	12.50 - 18.50 G's	15.03 G's
Max Pendulum G's Above 30 ms		29 G's Max	15.03 G's
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.50 ms
D Plane Rotation	Max	64 - 78 Deg.	66.95 Deg.
	Time	57 - 64 ms	63.50 ms
Moment About Occipital Condyle	Max	88 - 108 N-M	89.38 N-M
	Time	47 - 58 ms	52.00 ms
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.38 ms
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	105.00 ms

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
NECK EXTENSION TEST

Dummy Serial Number: 064
Calspan Sequential Test Number: 1
Date: 8/15/96
Workfile: 0641896.nex

6 Axis Neck Transducer

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.5 - 22.2 Deg. C	21.1 Deg. C
Relative Humidity		10% - 70%	60 %
Impact Velocity		21.4 - 22.3 Kph	21.6 Kph
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.23 G's
	20 ms	14.00 - 19.00 G's	14.97 G's
	30 ms	11.00 - 16.00 G's	13.55 G's
Max Pendulum G's Above 30 ms		22 G's Max	13.55 G's
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	43.63 ms
D Plane Rotation	Max	81 - 106 Deg.	95.02 Deg.
	Time	72 - 82 ms	77.63 ms
Moment About Occipital Condyle	Max	-80.0/-52.9 N-M	-65.19 N-M
	Time	65 - 79 ms	73.50 ms
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	155.38 ms
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	143.13 ms

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
THORAX IMPACT TEST

Dummy Serial Number: 064
Calspan Sequential Test Number: 1
Date: 8/18/96
Workfile: 0641896.th3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	20.5 - 22.2 Deg. C	21.1 Deg. C
Relative Humidity	10% - 70%	58 %
Pendulum Velocity	23.7 - 24.6 Kph	24.1 Kph
Maximum Deflection	64 - 73 mm	64.0 mm
Maximum Resistive Force	5160 - 5894 Newton's	5598 Newton's
Internal Hysteresis	69 - 85 %	73.6 %

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

CALSPAN SRL CORPORATION
Transportation Sciences Center

PART 572E
KNEE IMPACT TEST

Dummy Serial Number: 064
Calspan Sequential Test Number: 1
Date: 8/24/96
Workfile:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	19 - 25 Deg. C	23.3 Deg. C
Relative Humidity	10% - 70%	59 %
Probe Velocity	7.5 - 7.7 Kph	7.7 Kph
Peak Knee Impact Force	4715 - 5782 N	4748 N
RIGHT KNEE		
Temperature	19 - 25 Deg. C	23.3 Deg. C
Relative Humidity	10% - 70%	58 %
Probe Velocity	7.5 - 7.7 Kph	7.7 Kph
Peak Knee Impact Force	4715 - 5782 N	5006 N

Remarks: DUMMY COMPONENT MEETS SPECIFICATIONS

Laboratory Technician: Brian Swiecicki

Appendix D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY (S/N 150)		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X	ADL98	ENDEVCO	9/96	3/97
	Y	AE8K0	ENDEVCO	9/96	3/97
	Z	ADMB6	ENDEVCO	9/96	3/97
Chest	X	A26A	ENDEVCO	9/96	3/97
	Y	A27A	ENDEVCO	9/96	3/97
	Z	A51A	ENDEVCO	9/96	3/97
Right Femur Load Cell		952	GSE	7/96	1/97
Left Femur Load Cell		951	GSE	7/96	1/97
Neck Load Cell	X	269	DENTON	8/96	2/97
	Y	269	DENTON	8/96	2/97
	Z	269	DENTON	8/96	2/97
Neck Moment	X	269	DENTON	8/96	2/97
	Y	269	DENTON	8/96	2/97
	Z	269	DENTON	8/96	2/97
Chest Deflection Gauge		150	HUMANOID	9/96	3/97
Hybrid III Use Only					
Lap Belt Load Cells		706	LEBOW	9/96	3/97
Shoulder Belt Load Cells		707	LEBOW	9/96	3/97
Spool-Out Potentiometer		M6	MAGNETEK	9/96	3/97
Belt Stretch Transducer		E6	CALSPAN	7/96	1/97

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X (R)	AP1A0	ENDEVCO	7/96	1/97
	Y (R)	AC8F6	ENDEVCO	9/96	3/97
	Z (R)	ACCW0	ENDEVCO	9/96	3/97
Chest	X (R)	AHRC9	ENDEVCO	9/96	3/97
	Y (R)	AC7W8	ENDEVCO	9/96	3/97
	Z (R)	ACC06	ENDEVCO	9/96	3/97
Pelvic	X	AL6N5	ENDEVCO	9/96	3/97
	Y	AL6R7	ENDEVCO	9/96	3/97
	Z	A12C	ENDEVCO	9/96	3/97
Left Upper Tibia	Mx	38	DENTON	9/96	3/97
Left Upper Tibia	My	38	DENTON	9/96	3/97
Left Lower Tibia	Fx	32	DENTON	9/96	3/97
Left Lower Tibia	Fz	32	DENTON	9/96	3/97
Left Lower Tibia	My	32	DENTON	9/96	3/97
Right Upper Tibia	Mx	45	DENTON	9/96	3/97
Right Upper Tibia	My	45	DENTON	9/96	3/97
Right Lower Tibia	Fx	41	DENTON	9/96	3/97
Right Lower Tibia	Fz	41	DENTON	9/96	3/97
Right Lower Tibia	My	41	DENTON	9/96	3/97

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

DRIVER DUMMY		Serial #	Manufacture	Calibration	
				Last	Next
Left Foot	X	AET34	ENDEVCO	9/96	3/97
Left Foot	Z	AKD93	ENDEVCO	9/96	3/97
Right Foot	X	AEW70	ENDEVCO	9/96	3/97
Right Foot	Z	AEWK1	ENDEVCO	8/96	2/97

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X	AD4A9	ENDEVCO	9/96	3/97
	Y	AE8T7	ENDEVCO	9/96	3/97
	Z	AF5R7	ENDEVCO	9/96	3/97
Chest	X	AE8R7	ENDEVCO	9/96	3/97
	Y	AF5H9	ENDEVCO	9/96	3/97
	Z	AH5L8	ENDEVCO	9/96	3/97
Right Femur Load Cell		419	GSE	7/96	1/97
Left Femur Load Cell		723	GSE	7/96	1/97
Neck Load Cell	X	576	DENTON	7/96	1/97
	Y	576	DENTON	7/96	1/97
	Z	576	DENTON	7/96	1/97
Neck Moment	X	576	DENTON	7/96	1/97
	Y	576	DENTON	7/96	1/97
	Z	576	DENTON	7/96	1/97
Chest Deflection Gauge		064	HUMANOID	9/96	3/97
Hybrid III Use Only					
Lap Belt Load Cells		710	LEBOW	9/96	3/97
Shoulder Belt Load Cells		711	LEBOW	9/96	3/97
Spool-Out Potentiometer		M8	MAGNETEK	5/96	11/96
Belt Stretch Transducer		E7	CALSPAN	7/96	1/97

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY		Serial #	Manufacturer	Calibration	
				Last	Next
Head	X (R)	AC7Y3	ENDEVCO	9/96	3/97
	Y (R)	AC824	ENDEVCO	9/96	3/97
	Z (R)	AC814	ENDEVCO	9/96	3/97
Chest	X (R)	AP1E0	ENDEVCO	9/96	3/97
	Y (R)	AJ9F8	ENDEVCO	9/96	3/97
	Z (R)	AP1A2	ENDEVCO	9/96	3/97
Pelvic	X	AH5F3	ENDEVCO	9/96	3/97
	Y	AL6H7	ENDEVCO	9/96	3/97
	Z	AL6C8	ENDEVCO	9/96	3/97
Left Upper Tibia	Mx	015	DENTON	9/96	3/97
Left Upper Tibia	My	015	DENTON	9/96	3/97
Left Lower Tibia	Fx	011	DENTON	9/96	3/97
Left Lower Tibia	Fz	011	DENTON	9/96	3/97
Left Lower Tibia	My	011	DENTON	9/96	3/97
Right Upper Tibia	Mx	016	DENTON	9/96	3/97
Right Upper Tibia	My	016	DENTON	9/96	3/97
Right Lower Tibia	Fx	012	DENTON	9/96	3/97
Right Lower Tibia	Fz	012	DENTON	9/96	3/97
Right Lower Tibia	My	012	DENTON	9/96	3/97

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

PASSENGER DUMMY		Serial #	Manufacture	Calibration	
				Last	Next
Left Foot	X	AKEB3	ENDEVCO	9/96	3/97
Left Foot	Z	AEW71	ENDEVCO	9/96	3/97
Right Foot	X	AEWJ5	ENDEVCO	8/96	2/97
Right Foot	Z	AEWE3	ENDEVCO	8/96	2/97

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

	Serial #	Manufacturer	Calibration	
			Last	Next
Left Seat Rear Crossmember	Y18	ICS	8/96	2/97
Right Rear Seat Crossmember	X26	ICS	4/96	10/96
Top of Engine	MB20	ICS	9/96	3/97
Bottom of Engine	Y22	ICS	8/96	2/97
Left Disc Brake Caliper	A178	CEC	6/96	12/96
Right Disc Brake Caliper	A44	CEC	9/96	3/97
Instrument Panel	Y93	CEC	4/96	10/96
Left Seat Rear Crossmember (R)	Y171	ICS	8/96	2/97
Right Seat Rear Crossmember (R)	MB18	ICS	9/96	3/97

Appendix E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

SAFETY RESTRAINTS/AIR BAG

Important Safety Restraints Precautions

The use of safety belts helps to restrain you and your passengers in case of a collision. In most states and in Canada, the law requires the use of safety belts.

⚠ **To reduce the risk of serious injury in a collision, always drive and ride with your seatback upright and the lap belt snug and low across the hips.**

⚠ **Safety belts must be worn by all vehicle occupants to be properly restrained and help reduce the risk of injury in a collision.**

⚠ **To prevent the risk of injury make sure children sit where they can be properly restrained.**

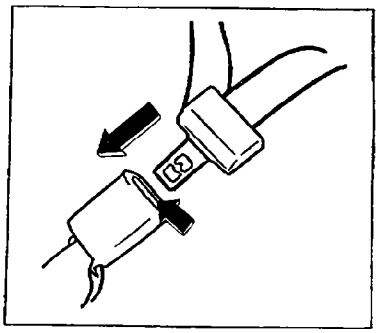
⚠ **It is extremely dangerous to ride in a cargo area inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed.**

Do not allow people to ride in any area of your vehicle that is not equipped with seats and safety belts.

Be sure everyone in your vehicle is in a seat and using a safety belt properly.

SAFETY RESTRAINTS/AIR BAG

How to Use the Safety Restraints Properly



Combination Lap and Shoulder Belts

How to Connect

Insert the tongue into the slot in the buckle

How to Disconnect

Push the red release button and remove the tongue from the buckle.

The front (and rear – if equipped) outboard safety restraints in your vehicle are combination lap and shoulder safety belts. The outboard passenger safety belts have the two types of locking modes described below.

Vehicle Sensitive (Emergency) Locking Mode

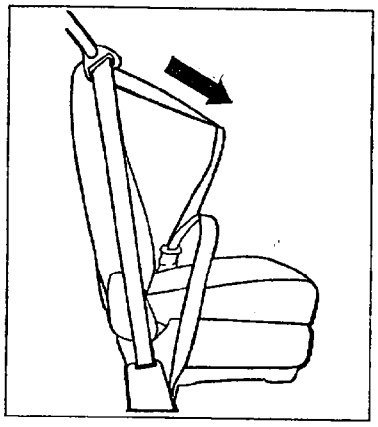
This is the normal retractor mode, which allows shoulder belt length adjustment in response to your movement. For example, if the driver brakes suddenly or turns a corner sharply, the combination safety belts will lock to restrain forward movement of the driver and passengers.

The front seat belt system can also be made to lock manually by quickly pulling on the shoulder belt.

NOTE: Rear seat belts cannot be made to lock up by pulling quickly on the belt.

How to Manually Lock the Combination Safety Belt

Pull the shoulder belt quickly to lock



Automatic Locking Mode

In this mode, the shoulder belt is automatically pre-locked. The belt will still retract to remove any slack in the shoulder belt.

NOTE: The automatic locking mode is not available on the driver safety belt.

When to Use the Automatic Locking Mode

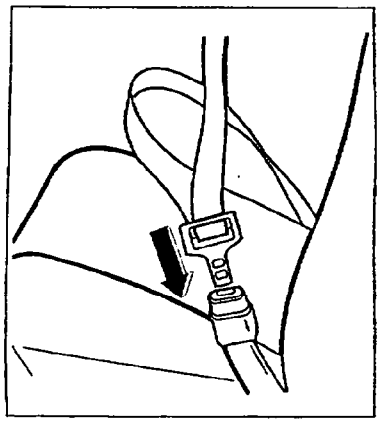
- When a tight lap/shoulder belt fit is desired.
- **Any time** a child safety seat is installed in the vehicle. Refer to *Children and Infant or Child Safety Seats* later in this section.

SAFETY RESTRAINTS/AIR BAG

How to Use the Automatic Locking Mode

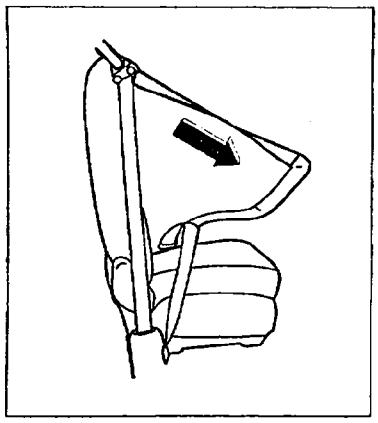
1. Buckle the combination lap and shoulder belt.

   Insert the tongue into buckle



2. Grasp the shoulder belt portion and pull downward until the entire belt is extracted.

   Pull the shoulder belt downward



3. Allow the belt to retract. As the belt retracts, you will hear a clicking sound. This indicates that the safety belt is now in the Automatic Locking Mode.

How to Cancel the Automatic Locking Mode:

Disconnect the combination lap and shoulder belt and allow it to completely retract to cancel the Automatic Locking Mode and be in the Vehicle Sensitive (Emergency) Mode.

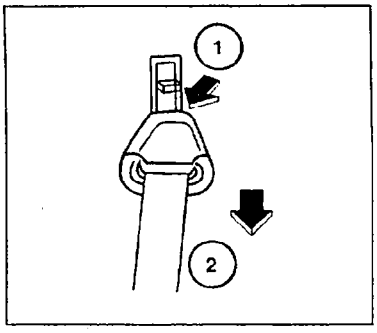
Front Seat Shoulder Belt Height Adjustment

Adjust the height of the shoulder belt so the belt rests across the middle of your shoulder.

- To lower the height of the shoulder belt:

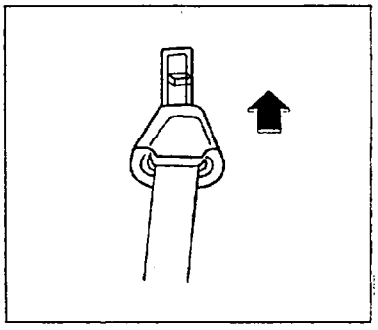
(1) Push the button down

(2) Slide down



- To raise the height of the shoulder belt:

↑ Slide up



Pull down on the height adjustment assembly to make sure it is locked in place.

NOTE: If you have a SuperCab vehicle, the front passenger seat combination lap and shoulder belt height cannot be adjusted.

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SAFETY RESTRAINTS/AIR BAG

Lap Belt

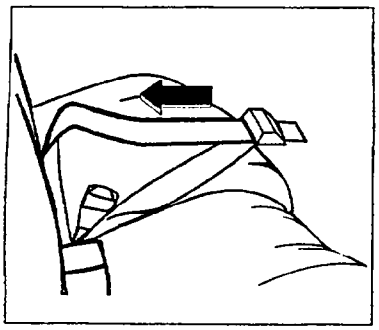
Lap belts are located in the center of the front bench or split bench seat (if equipped) and rear bench seat (SuperCab models only).

How to Adjust the Lap Belt

Because the lap belt does not have a retractor to automatically adjust itself during vehicle movement, the lap belts should be adjusted before use.

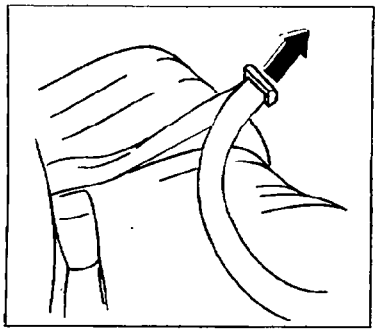
- To shorten the belt:

  Pull the loose end of the belt until it is snug



- To lengthen the belt:

  Tip the buckle and pull it to lengthen



Safety Belt Indicator Light and Warning Chime

 – illuminates in the instrument cluster and a chime sounds to remind the occupants to fasten their safety belts.

Conditions of Operation

If . . .	Then . . .
The driver safety belt is not buckled before the ignition key is turned to ON . . .	The safety belt indicator illuminates for 1-2 minutes and the reminder chime sounds for 4-8 seconds.
The driver safety belt is buckled while the indicator light is illuminated and the reminder chime is sounding . . .	The safety belt indicator light and the reminder chime turn off.
The driver safety belt is buckled before the ignition key is turned to ON . . .	The safety belt indicator light and the safety belt reminder chime remain off.

Cleaning and Maintaining the Safety Belts

- Clean the safety belts with a mild soap solution recommended for cleaning upholstery or carpets. Do not bleach or dye the belts, because these actions may weaken the belt webbing.
- Check the safety belt system periodically to make sure there are no nicks, wear, or cuts. If your vehicle has been involved in an accident, have all the safety belts and child seat anchoring brackets (if equipped) examined by a qualified technician.

SAFETY RESTRAINTS/AIR BAG

Important Air Bag Precautions

Your vehicle is equipped with a supplemental restraint system designed to work with the safety belts to help protect you and your right front seat passenger in the event of a collision.

All occupants of the vehicle, including the driver, should always wear their safety belts, even when an air bag Supplemental Restraint System is provided.

The right front passenger air bag is not designed to restrain occupants in the center front seating position.

Do not place objects or mount equipment on or near the air bag cover on the steering wheel or in front seat areas that may come into contact with an inflating air bag. Failure to follow this instruction may increase the risk of personal injury in the event of a collision.

Do not attempt to service, repair, or modify the air bag Supplemental Restraint System or its fuses. See your Ford or Lincoln-Mercury dealer.

Air bags and air bag equipped vehicles should be disposed of only by your Ford or Lincoln-Mercury dealer.

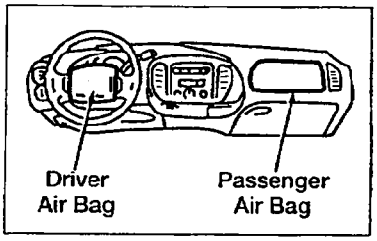
Your vehicle comes equipped with a passenger air bag that can be turned off to safely place a rear-facing infant seat in the front seat. Be sure to read *Passenger Air Bag Deactivate Switch.*

⚠ **Rear-facing infant seats should not be placed in the front seat unless the passenger air bag deactivate switch is turned to OFF. In rear-facing infant seats, the infant's head is close to the passenger air bag. The force of the rapidly-inflating air bag could push the top of the rear-facing infant seat against the vehicle seatback and injure the infant. Turning the passenger air bag deactivate switch to OFF will prevent the passenger air bag from inflating and hitting the rear-facing infant seat.**

After the child seat is removed, turn the passenger air bag deactivate switch on. Refer to *How to Turn the Passenger Air Bag Back On.*

SAFETY RESTRAINTS/AIR BAG

Air Bag System Description



The air bag system activates in collisions more severe than hitting a parked vehicle of similar size and weight head-on at about 28 mph (45 km/h).

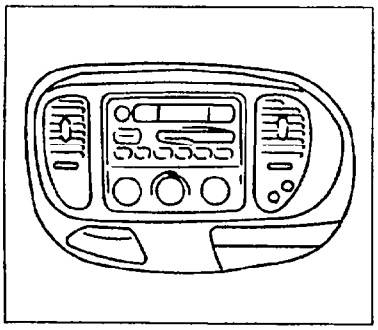
The system consists of two parts:

- The driver air bag in the middle of the steering wheel and the passenger air bag near the glove compartment.
- The electrical system, made up of impact sensors, a diagnostic module, and a backup power supply.
- The diagnostic module monitors itself, the rest of the air bag electrical system, the warning light and the gas generators.

The air bags inflate within a fraction of a second after air bag sensors detect a severe frontal collision. Gas generators within the air bags fill the air bags with a non-toxic, non-flammable gas. After the vehicle occupants have contacted the air bags, the gas empties through holes in the air bags, and the air bags deflate. You may notice smoke and smell the escaping gas after the air bags deflate. This is normal.

You and your passenger must wear your safety belts in order for the air bag system to operate effectively.

Passenger Air Bag Deactivate Switch



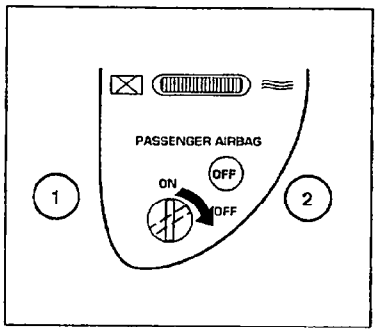
Your vehicle has a passenger air bag deactivate switch.

(OFF) Passenger air bag deactivate OFF indicator light

Passenger air bag deactivate switch

The switch MUST be used to turn off or deactivate the passenger air bag whenever a rear-facing infant seat is used in the right front or center front passenger seat position.

How to Turn the Passenger Air Bag Off



1. Insert the ignition key, turn the switch to "OFF" and remove key.
2. (OFF) light illuminates when the key is inserted in the ignition and turned to ON. This indicates that the passenger air bag is deactivated

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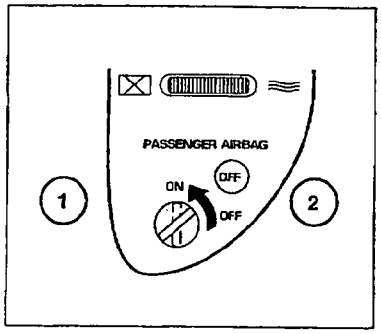
SAFETY RESTRAINTS/AIR BAG

How to Turn the Passenger Air Bag Back On

The passenger air bag remains off until you turn it back on.

1. Insert the ignition key and turn the switch to ON
2. (OFF) light will not illuminate when the ignition is ON



Keep the passenger air bag turned on unless there is a rear-facing child seat placed in the front seat. When the passenger air bag switch is turned off, the passenger air bag will not inflate in a collision.

Air Bag Warning Light and Warning Tone

When you turn the ignition key to the ON position, the warning light in the instrument cluster illuminates for approximately 6 seconds to indicate the air bag system is functional.

If you hear a group of five beeps, or if the warning light does not illuminate, stays lit, or flashes, the air bag system requires immediate service. Have your vehicle serviced at your Ford or Lincoln-Mercury dealer.