

#1973

CALSPAN REPORT NUMBER: 8118-1

30 MPH FRONTAL BARRIER IMPACT  
OF A 1993 FORD TAURUS  
4-DOOR SEDAN

CALSPAN TEST NUMBER: Y49-1-1306  
REPORT NUMBER: 8118-1

AUGUST 6, 1993

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FINAL REPORT

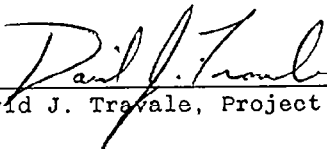
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16. Abstract  A 30 mph frontal load cell barrier test on a 1993 Ford Taurus was performed at the Calspan Advanced Technology Center crash test facility in Buffalo, New York on August 6, 1993.  The impact speed was 30.1 mph and the ambient temperature at the barrier face was 77°F. The occupants were restrained with the onboard supplemental airbags only. The vehicle was equipped with a 3-point belt system at both the driver and passenger locations, however they were not used for this test. Both the driver and passenger dummies appear to comply with the maximum head, chest and femur requirements of the FMVSS 208 "Occupant Crash Protection", injury criteria.					
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## Section 1

### PURPOSE AND TEST PROCEDURE

This 30 mph frontal vehicle-to-barrier impact test is part of the Crashworthiness Testing and Analysis Program sponsored by the Research and Special Programs Administration under Contract No. DTRS57-90-C-00104. The purpose of this Technical Task Directive (TTD 7) is to obtain responses from vehicles and restrained Hybrid III dummies during frontal barrier crashes. This test was performed using a 1993 Ford Taurus 4-door sedan. The vehicle contained one 95th percentile Hybrid III dummy in the driver seating position and one 5th percentile Hybrid III dummy in the right front seating position. The dummies were restrained using the vehicle's supplemental restraint systems (SRS) only.

Section 2  
SUMMARY OF TEST

A load cell barrier consisting of 36 load cells was impacted by a 1993 Ford Taurus at velocity of 30.1 mph. The test was performed at the Calspan Corporation Advanced Technology Center on August 6, 1993. Pre and post-test photographs can be found in Appendix A.

The frontal barrier impact event was documented by one real time camera and 9 high speed cameras. Camera locations and other pertinent camera information can be found in this report.

One 95th percentile male anthropomorphic test device (ATD) was placed in the driver's seating position. One 5th percentile female ATD was placed in the passenger's seating position. Both ATD's were positioned according to dummy placement instructions found in Appendix C and FMVSS 208.

The driver was equipped with head, chest, and pelvis triaxial accelerometers, chest potentiometer, upper and lower neck transducers as well as a lumbar transducer package. The legs were instrumented with femur load cells, knee shear and upper and lower tibia transducer packages.

The 5th female passenger was equipped with head, chest, and pelvis triaxial accelerometers, and chest potentiometer. Forces and moments were recorded in the upper neck, thorax, lumbar spine and left and right iliac regions. The legs were instrumented with femur load cells and knee shear data.

The 116 channels were recorded on a P.C. based data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. The following data channels did not record accurately:

Barrier Load Cell C7  
Rear Seat Crossmember Z  
Brake Pedal X

The driver's head contacted the airbag and sunvisor; the HIC was 462.1. The maximum chest deceleration over 3 milliseconds was 43.4 gs. Femur loads were -2187.4 pounds on the left and -1486.9 pounds on the right.

The right front passenger's HIC was 319.0. Maximum chest deceleration was 49.9 gs. Femur loads were -1081.7 pounds on the left and -847.9 pounds on the right.

Section 3

VEHICLE AND OCCUPANT INFORMATION

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1993 Ford Taurus GL 4-Door Sedan

Test No.: 1306 VIN.: 1FALP52U2PG268206

Body Color: Royal Blue Date of Manufacture: 5/93

Engine: 6 Cylinders; - C.I.D.; 3.0 Liters; - CC

X Gas; - Diesel; - Turbocharged

- Longitudinal; X Transverse

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

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

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

X Tilt Wheel - P/seats; - Cruise Control

\*Type of Occupant Restraint: Driver and right front passenger airbag

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P205/70R14

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

Tires on Vehicle: P20570R14; Manufacturer: Firestone

Number of Occupants: 3 Front; 3 Rear; - 3rd Seat; 6 TOTAL

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

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

Vehicle Capacity Weight (VCW) = 1100 lbs. (A)

No. of Occupants x 150 lbs. = 900 lbs. (B)

Rated Cargo and Luggage

Weight (RCLW) A-B = 200 lbs.

GVWR 4692 lbs. GAWR: Front 2545 lbs. Rear 2178 lbs.

\*Driver and right-front passenger 3-point manual belt system were not used for this test.

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

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

Right Front = 1050 lbs.      Right Rear = 550 lbs.  
Left Front = 1010 lbs.      Left Rear = 570 lbs.  
TOTAL FRONT WEIGHT = 2060 lbs. (64.8% of Total Vehicle Weight)  
TOTAL REAR WEIGHT = 1120 lbs. (35.2% of Total Vehicle Weight)  
TOTAL DELIVERED WEIGHT = 3180 lbs.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES:

Right Front = 1030 lbs.      Right Rear = 690 lbs.  
Left Front = 1070 lbs.      Left Rear = 745 lbs.  
TOTAL FRONT WEIGHT = 2100 lbs. (59.4% of Total Vehicle Weight)  
TOTAL REAR WEIGHT = 1435 lbs. (40.6 % of Total Vehicle Weight)  
TOTAL TEST WEIGHT = 3535 lbs.  
Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.

TEST VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 28.0 ; LF 27.8 ; RR 27.4 ; LR 27.1  
Test Attitude: RF 28.0 ; LF 27.8 ; RR 25.9 ; LR 25.9  
Vehicle's Wheel Base = 106.3 in.  
Location of Vehicle's C.G. = 43.2" Rearward of front wheel center

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

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°  
 Date of Test: 8/6/93 Time of Test: 12:15  
 Ambient Temperature: 77°F at impact area  
 Temperature in Occupant Compartment: 71°F  
 Windshield Molding Temperature: - °F  
 Required Impact Velocity Range: 29.5 to 30.5 mph  
 Impact Velocity: primary = 30.1 mph, secondary = - mph  
 Distance From Front Bumper to Barrier Face When  
     Entering Speed Trap: 52  
     Exiting Speed Trap: 12

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<ul style="list-style-type: none"> <li>• Face with airbag</li> <li>• <u>Forehead and top of head with Sunvisor</u></li> </ul>	<ul style="list-style-type: none"> <li>Face with Airbag, Rear of Head with Headrest</li> </ul>
Chest	<u>Chest with Airbag</u>	<u>Chest to Airbag</u>
Abdomen	<u>No Contact</u>	<u>Abdomen to Airbag</u>
Left Knee	<u>Knee with lower dash panel</u>	<u>Knee to glove box door</u>
Right Knee	<u>Knee with lower dash panel</u>	<u>Knee to glove box door</u>

Comments: Steering column stroked, windshield cracked near "A" pillars, slight roof deformation behind "B" pillars on both sides of vehicle.

	<u>Front</u>		<u>Rear</u>	
	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Door Opening	<u>Closed</u>	<u>Closed</u>	<u>Closed</u>	<u>Closed</u>

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

Table 2  
DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-61.5	22.8	-33.0	63.5	-46.9	5.5	19.2	43.4
DUMMY (2)	-62.0	15.2	-19.4	63.8	-52.0	5.6	-13.7	49.9
DUMMY (3)	-	-	-	-	-	-	-	-
DUMMY (4)	-	-	-	-	-	-	-	-

	MAXIMUM FORCE FEMUR LOAD (LBS.)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-1486.9	-2187.4
DUMMY (2)	-847.9	-1081.7
DUMMY (3)	-	-
DUMMY (4)	-	-

	MAXIMUM FORCE SEAT BELT LOADS (LBS.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)	***	***	***
DUMMY (2)	***	***	***
DUMMY (3)	-	-	-
DUMMY (4)	-	-	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t <sub>1</sub> (SEC)	t <sub>2</sub> (SEC)	Average Acceleration t <sub>1</sub> TO t <sub>2</sub>
DUMMY (1)	462.1	62.88	86.64	51.95
DUMMY (2)	319.0	51.36	70.44	48.9
DUMMY (3)	-	-	-	-
DUMMY (4)	-	-	-	-

\*Defined as exceeding 0.003 sec. duration  
 \*\*As defined in FMVSS No. 208  
 \*\*\*Manual seat belts not used for this test

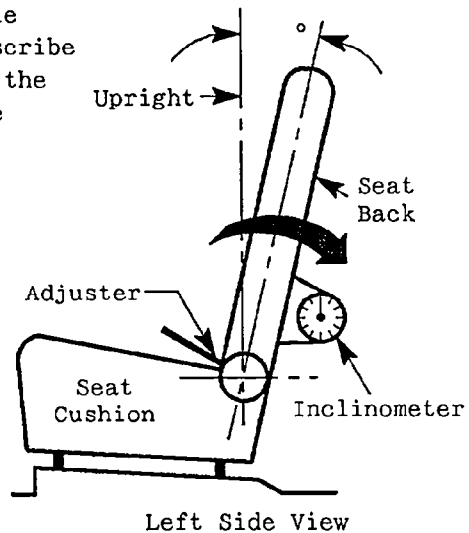
Figure 1

TEST VEHICLE SETUP INFORMATION

VEHICLE IDENTIFICATION:

Model Year: 1993 Vehicle Model: Ford Taurus Body Style: 4-door sedan

1. Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Seat back angle for driver's 20°

Measurement instructions: Measure along outside seat back frame 13 inches up from pivot point

Seat back angle for passenger's seat: 20°

Measurement instructions: Same as driver

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Position seat in rear most (13th detent, full front is position 1) detent for 95th percentile driver

Positioning of the passenger's seat (if applicable): Same as driver

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 16.0 gallons

B. "Usable Capacity" of the optional equipment fuel tank is - gallons

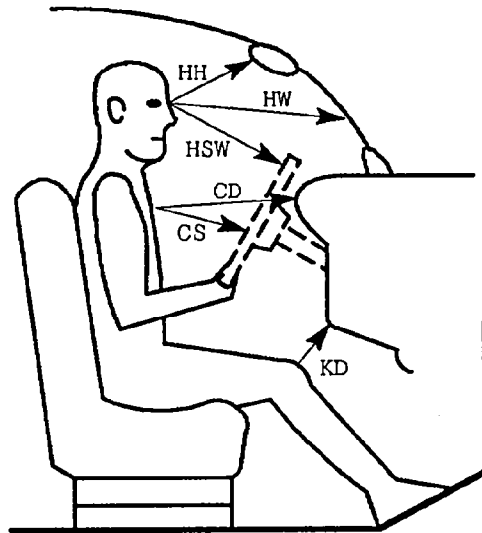
4. Steering Column Position: Mid position

5. Other: Fuel tank loaded with 14.8 gallons of stoddard for test

Figure 2

OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	15.3	10.0
HW	20.5	21.1
NSW	18.3	-
NIP	24.3	-
NH	18.3	-
CD	23.7	14.3
CS	14.8	-
KDL	5.9	1.5
KDR	6.2	1.6
1	28.2	-
2	2.0	-
SA	20°	20°
PA	22°*	22.5°
ULA	101°	110°
LLA	230°	211°

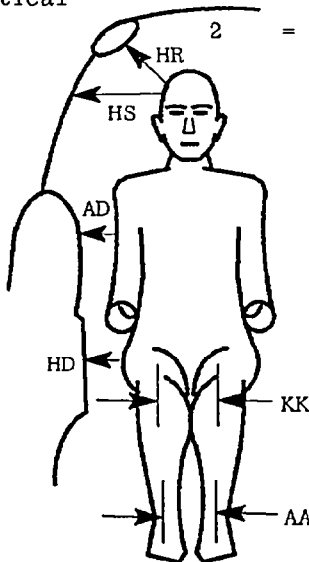


\*Estimated from shoulder and H-point location. Standard pelvic bar could not be used due to specialized spine instrumentation.

- HH = Head to Windshield Header
- HW = Head to Windshield
- NSW = Nose to Steering Wheel
- NIP = Nose to Instrument Panel
- NH = Nose to Steering Wheel Hub
- CD = Chest to Dash
- CS = Chest to Steering Wheel Hub
- KDL = Knee to Dash Left
- KDR = Knee to Dash Right
- 1 = Head Target to Steering Column Target
- 2 = Distance between Steering Column Targets

Angles taken relative to vertical

- SA = Seat Back Angle
- PA = Pelvic Angle
- ULA = Upper Leg Angle
- LLA = Lower Leg Angle

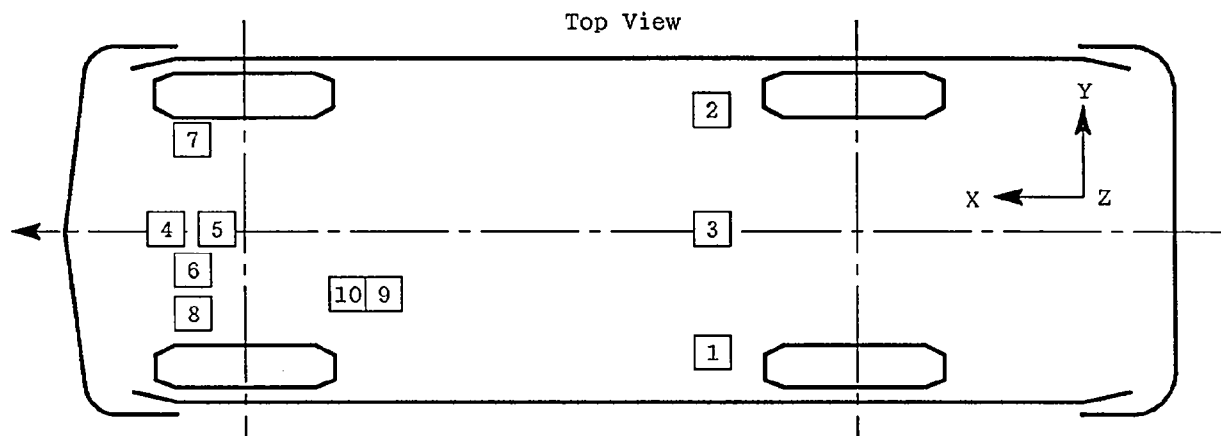


- HR = Head to Side Roof
- HS = Head to Side Window
- AD = Arm to Door
- HD = Hip to Door
- KK = Knee to Knee
- AA = Ankle to Ankle
- DT = Dummy Temperature °F

	DRIVER	PASSENGER
HR	5.5	8.0
HS	9.3	10.9
AD	3.6	5.7
HD	6.7	*7.4
KK	10.6	7.7
AA	12.5	8.2
DT	71°	71°

\*To door pocket

Figure 3  
SUMMARY OF ACCELEROMETER DATA



Vehicle: 1993 Ford Taurus 4-Door Sedan

Loc, No.	Description	Axis	Maximum Value (g's)*	
			"-"	"+"
1	Rear seat crossmember left side	x	-28.7	5.6
2	Rear seat crossmember right side	x	-25.9	22.6
3	Rear seat crossmember centerline, X	x	-38.8	3.2
3	Rear seat crossmember centerline, Y	y	-5.8	3.3
3	Rear seat crossmember centerline, Z	z	-	-
4	Top of engine block	x	-91.6	20.4
5	Bottom of engine block	x	-98.6	21.6
6	Front suspension crossmember	x	-112.8	36.8
7	Right front brake caliper	x	-82.9	17.8
8	Left front brake caliper	x	-78.8	18.2
9	Brake pedal	x	-67.8	-
9	Brake pedal	z	-28.3	47.9
10	Toe pan	x	-48.6	8.1

\*Values filtered using SAE class 60 filter.

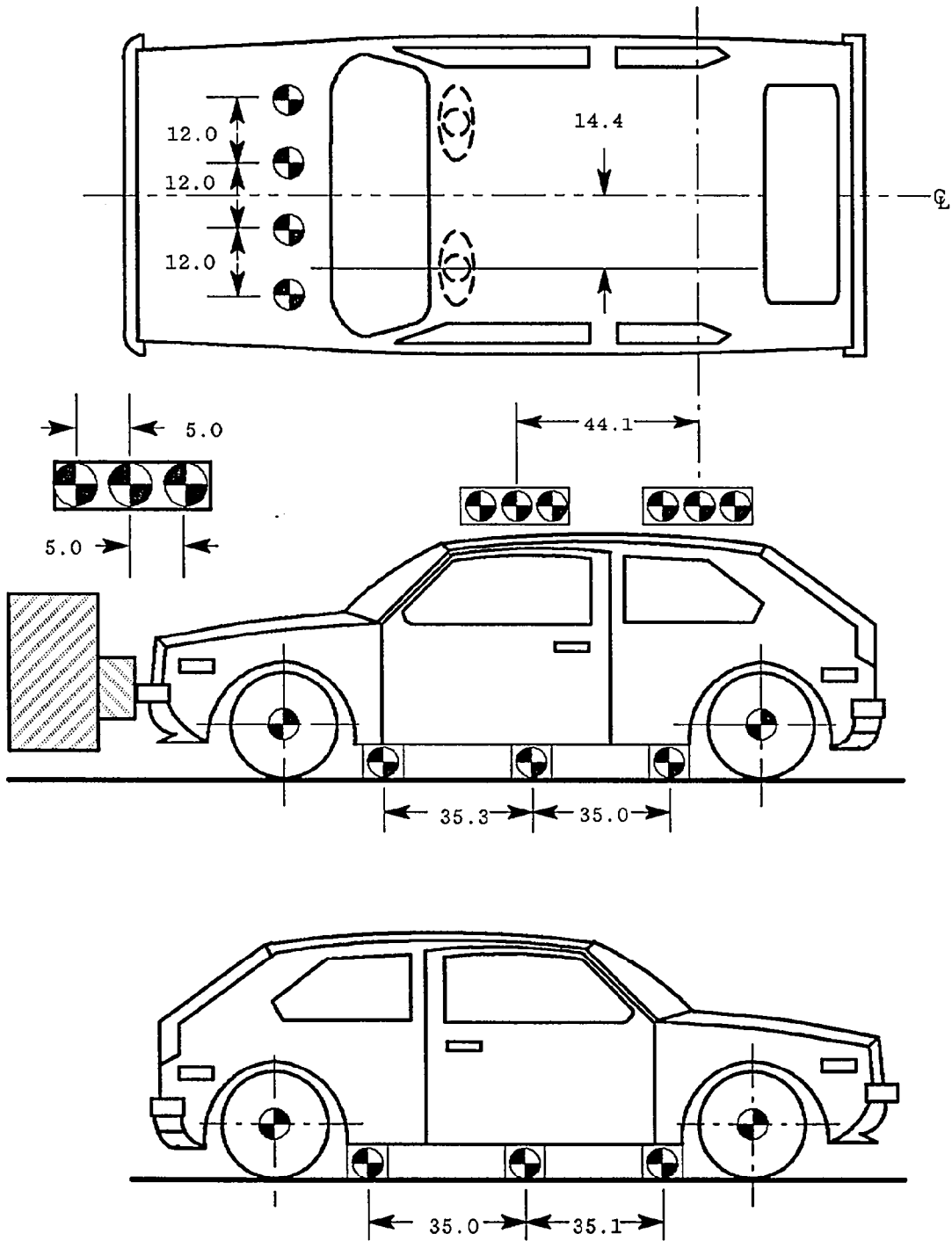
Figure 4

PRE- AND POST-TEST POSITION OF TEST VEHICLE  
ACCELEROMETER LOCATIONS

Test Description: 30 mph Frontal Vehicle-to-Barrier Impact  
 Test Vehicle: 1993 Ford Taurus 4-door sedan  
 Reference Plane: Vehicle plane at rear bumper

Accelerometer Description	LONGITUDINAL LOCATION (in.)		
	Pre-Test	Post-Test	Change
Rear seat crossmember left side	74.5	74.5	0.0
Rear seat crossmember right side	73.9	73.9	0.0
Rear seat crossmember centerline	73.7	73.7	0.0
Top of engine block	156.4	148.7	7.7
Bottom of engine block	148.5	147.3	1.2
Front suspension crossmember	143.8	142.5	1.3
Right front brake caliper	148.6	144.8	3.8
Left front brake caliper	148.6	146.0	2.6
Toe pan	133.0	132.7	0.3
Brake pedal	130.4	130.2	0.2

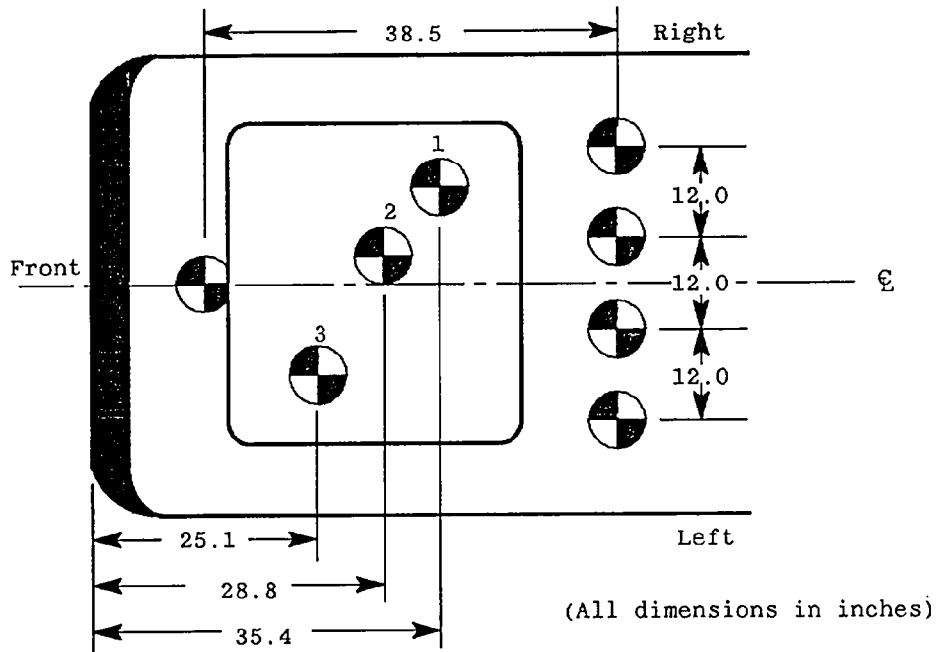
Figure 5  
 VEHICLE TARGET LOCATIONS  
 (All dimensions in inches)



(Dimensions in inches)

Figure 5

VEHICLE TARGET LOCATIONS (continued)  
(TOP VIEW OF HOOD AND ENGINE COMPARTMENT)



Note: Drawing not to scale.

Target 1: Intake manifold  
2: Alternator  
3: Valve Cover

Figure 6

MEASUREMENT POINTS

(All dimensions in inches)

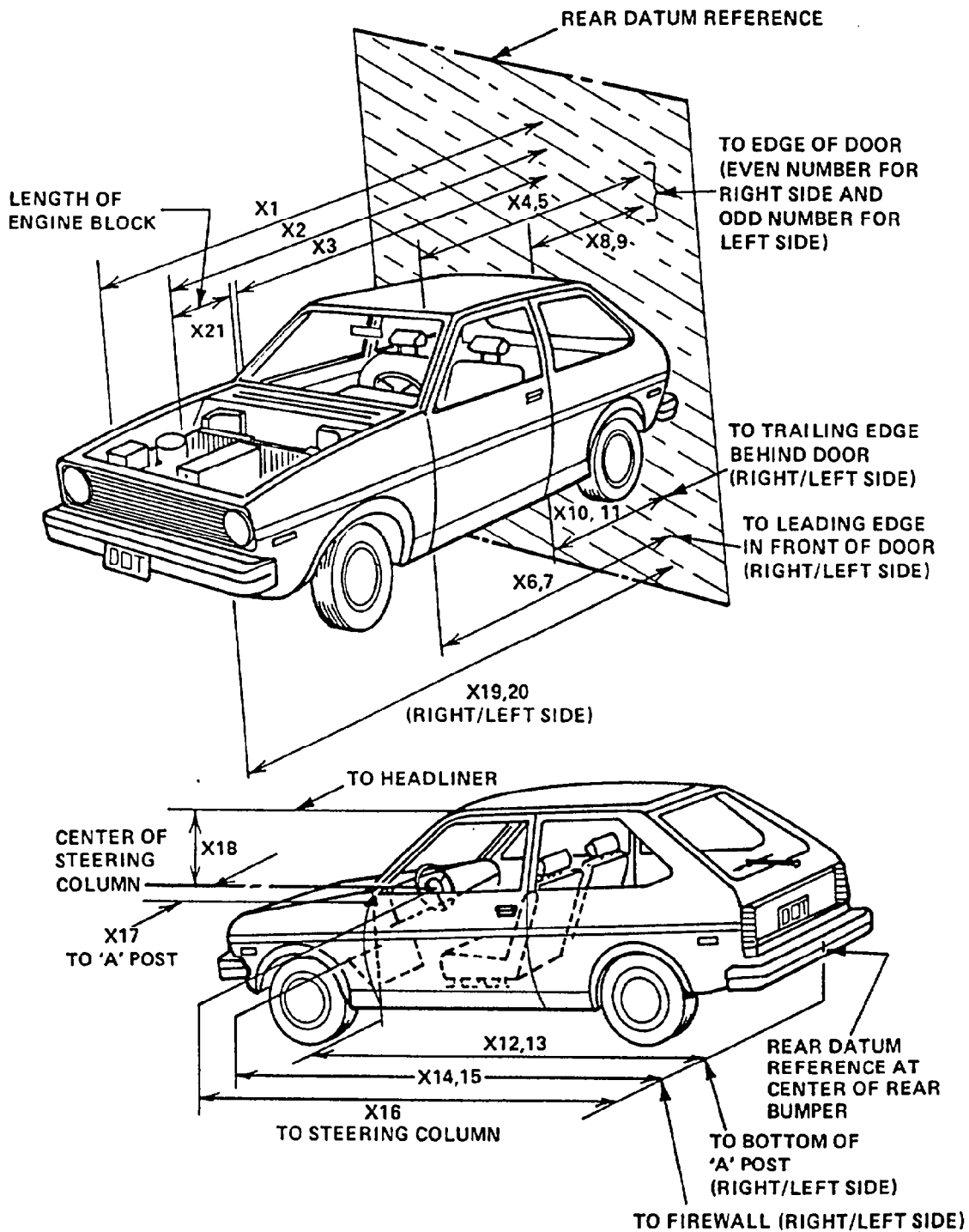


Figure 6  
MEASUREMENT POINTS (continued)

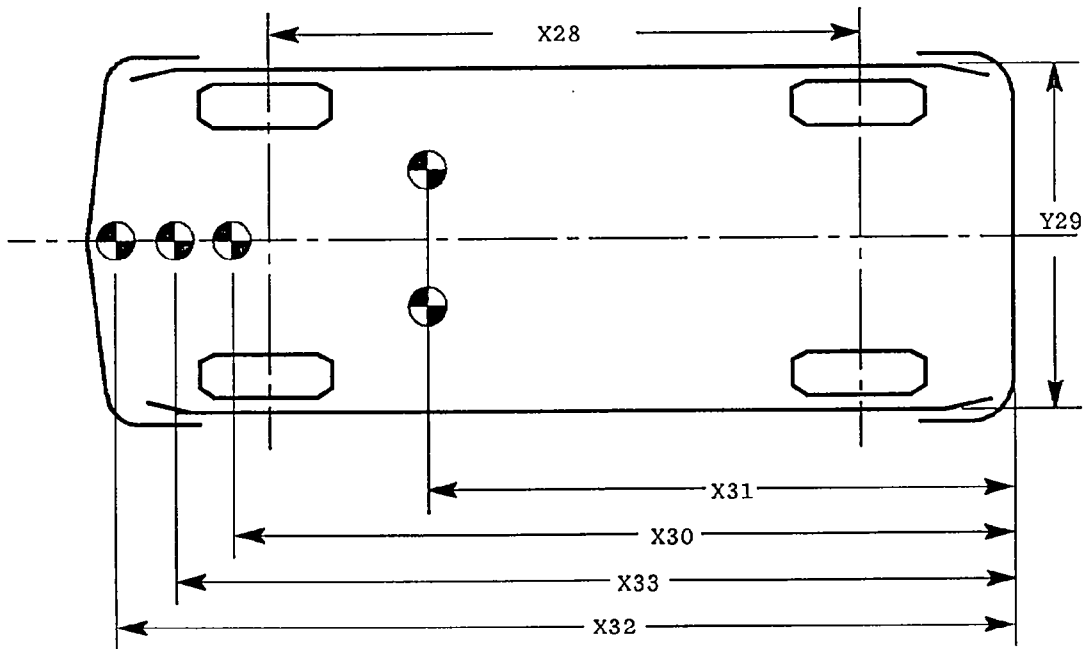
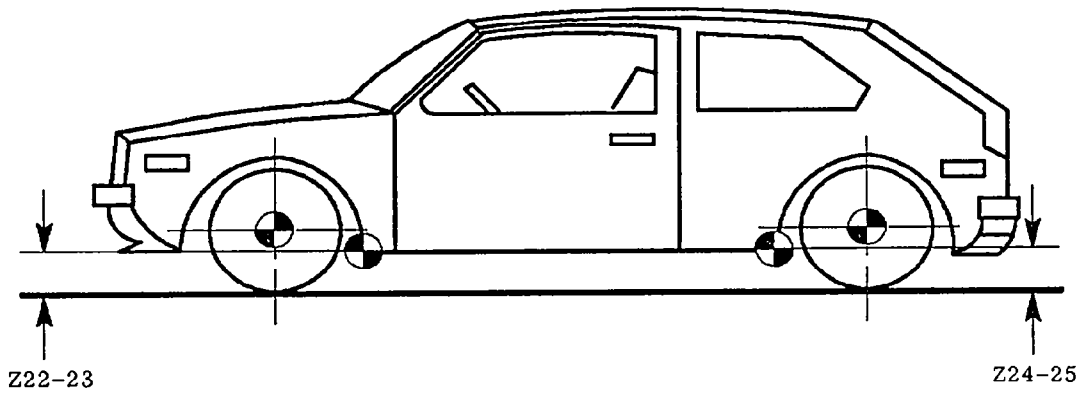


Table 3

## VEHICLE MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	192.1	175.6
X2	Rear Surface of Vehicle to Engine at Centerline	169.1	162.5
X3	Rear Surface of Vehicle to Firewall	144.1	142.2
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	131.4	130.6
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	132.3	131.6
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	130.3	128.8
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	130.2	129.2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	89.8	88.6
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	90.3	89.4
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	89.1	88.2
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	89.6	88.5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	131.1	130.7
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	131.2	131.4
X14	Rear Surface of Vehicle to Firewall - Right Side	143.6	139.7
X15	Rear Surface of Vehicle to Firewall - Left Side	142.8	141.8
X16	Rear Surface of Vehicle to Steering Wheel Center	113.3	114.3
Y17	Steering Column to "A" Post	15.6	14.3

Table 3

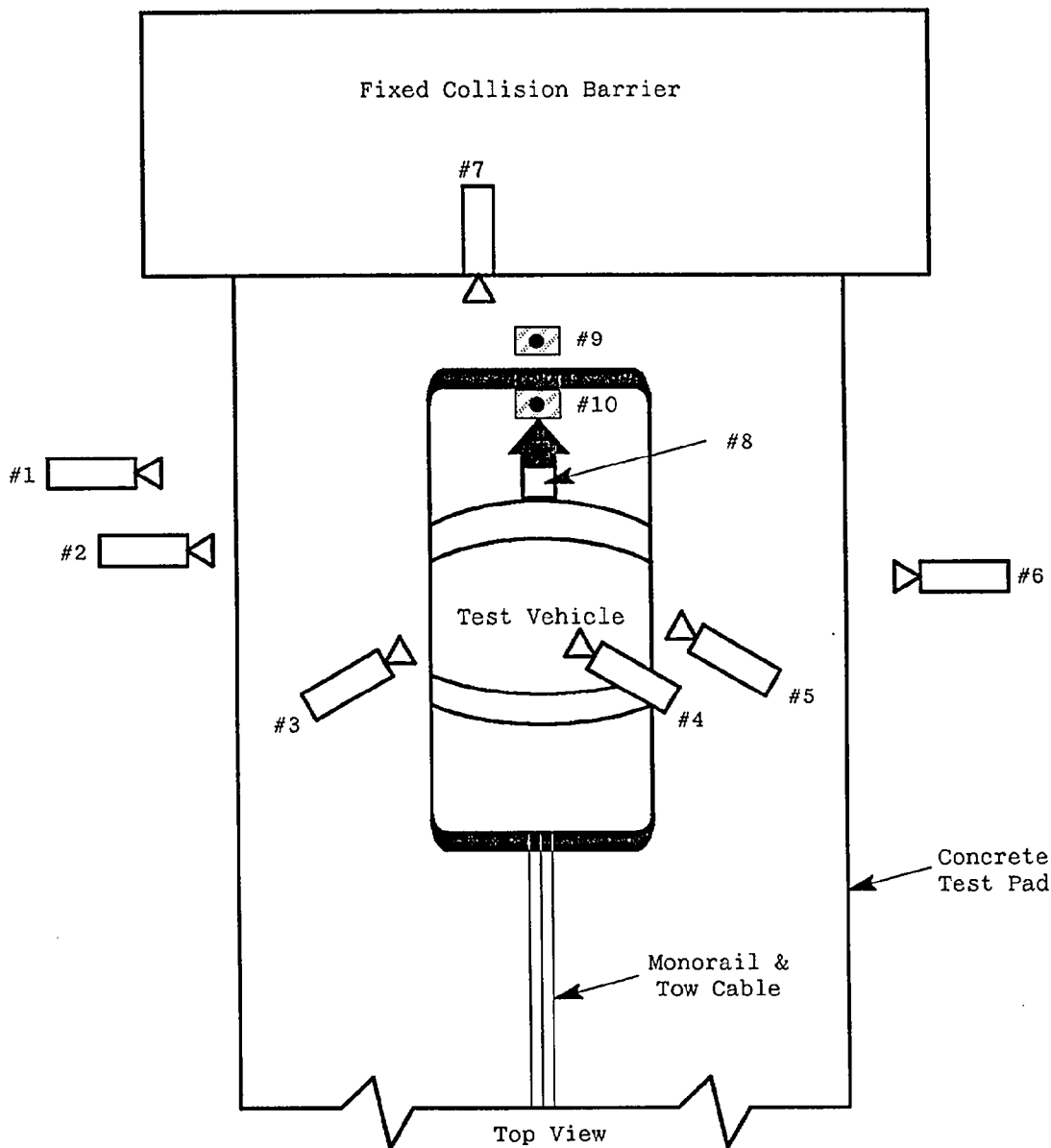
## VEHICLE MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
Z18	Rear of Windshield Header to Steering Wheel Column	64.1	65.5
X19	Rear Surface of Vehicle to Right Side of Front Bumper	186.7	173.2
X20	Rear Surface of Vehicle to Left Side of Front Bumper	186.6	173.0
X21	Width of Engine Block	16.0	16.0
Z22	Right Front Sill to Ground Plane	9.2	7.6
Z23	Left Front Sill to Ground Plane	9.3	8.8
Z24	Right Rear Sill to Ground Plane	8.6	7.5
Z25	Left Rear Sill to Ground Plane	8.5	8.5
X26	Firewall to Engine or Transaxle	-	-
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	23.6	15.4
X28	Wheelbase of Vehicle	106.0	103.8
Y29	Width of Vehicle at Maximum Width Point	68.8	69.2
X30	Rear Surface of Vehicle to Engine Target	148.5	147.3
X31	Rear Surface of Vehicle to Compartment Target	131.6	131.8
X32	Rear Surface of Vehicle to Bumper Target	188.3	173.4
X33	Rear Surface of Vehicle to Frame Crossmember	143.8	142.5

Figure 7

CAMERA POSITIONS FOR FRONTAL IMPACT

NOTE: Camera Information Shown on Table 4.



- Camera #1 - Rear-time camera
- Camera #2 - Left side overall view
- Camera #3 - Driver and steering column view
- Camera #4 - Onboard seat belt view
- Camera #5 - Passenger interior view
- Camera #6 - Right side overall view
- Camera #7 - Driver front view
- Camera #8 - Windshield view
- Camera #9 - Underbody view
- Camera #10 - Overhead view

Table 4  
HIGH-SPEED CAMERA LOCATIONS

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	--	--	--	--	--	24
2	Left Side Overall Camera	253	88	42	-2°	13	880
3	Driver and Steering Column View	108	112	69	-19	13	870
4	Onboard Seat Belt View	--	--	--	--	13	N/A
5	Passenger and Interior View	110	108	69	-19	13	940
6	Right Side Overall View	246	79	42	-2	13	1,000
7	Driver Front View	22	0	78	-33	13	860
8	Windshield View	0	-23	124	-53	13	890
9	Underbody View	0	24	-83	90	13	760
10	Overhead View	0	11	166	-82	13	870

Test No. Y49-1-1306 Vehicle: 1993 Ford Taurus 4-Door Sedan

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

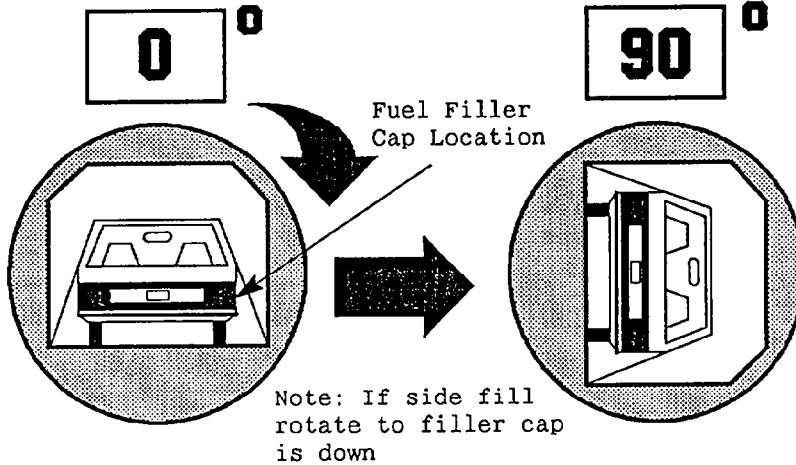


Table 6  
STATIC ROLLOVER DATA SHEET

TEST PHASE:

Test No.:

Y049-0010



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	_____ 2 _____ minutes _____ 00 _____ seconds
FMVSS 301 Position Hold Time +	_____ 5 _____ minutes _____ 00 _____ seconds
TOTAL	_____ 7 _____ minutes _____ 00 _____ seconds
Next whole minute interval	_____ 8 _____ minutes

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	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

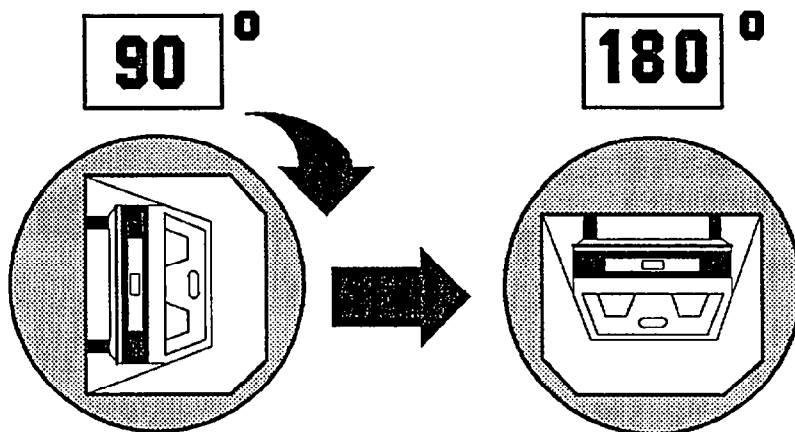
None

Table 6  
STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Test No.:

Y049-0010



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time                      1   minutes  58  seconds  
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time +                          5   minutes  00  seconds

TOTAL      6   minutes  58  seconds

Next whole minute interval                                  7   minutes

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):

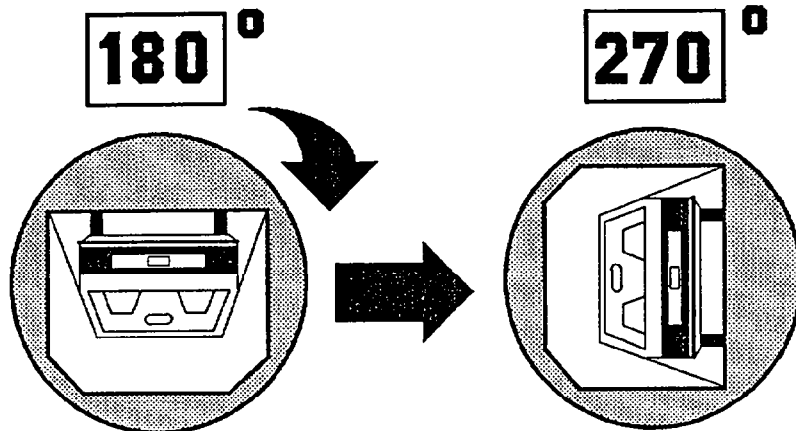
NONE

Table 6  
STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Test No.:

\_\_\_\_\_ Y049-0010 \_\_\_\_\_



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	_____ 1 _____	minutes	_____ 50 _____	seconds
FMVSS 301 Position Hold Time +	_____ 5 _____	minutes	_____ 00 _____	seconds
TOTAL	_____ 6 _____	minutes	_____ 50 _____	seconds
Next whole minute interval	_____ 7 _____	minutes		

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):

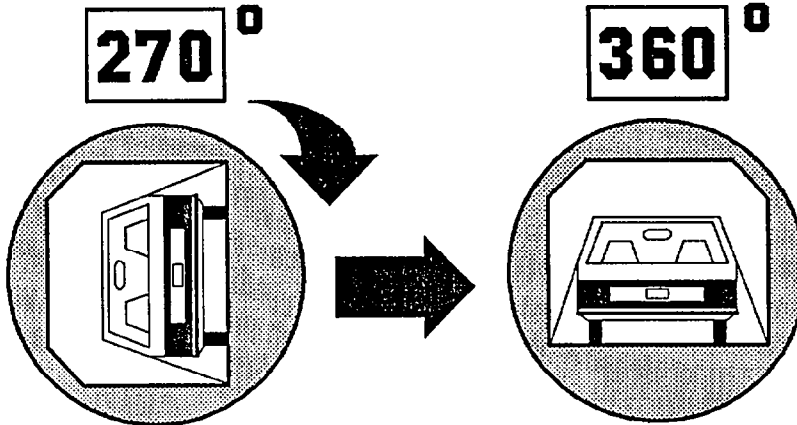
NONE

Table 6  
STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Test No.:

Y049-0010



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time                    2 minutes 04 seconds  
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time +                    5 minutes 00 seconds

---

TOTAL                    7 minutes 04 seconds

Next whole minute interval                    8 minutes

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	0
---	---	---	---

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

IV. SOLVENT SPILLAGE LOCATION(S):

NONE

Appendix A

PHOTOGRAPHS

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Figure A-1 PRE-TEST FRONT VIEW

A-3

8118-1

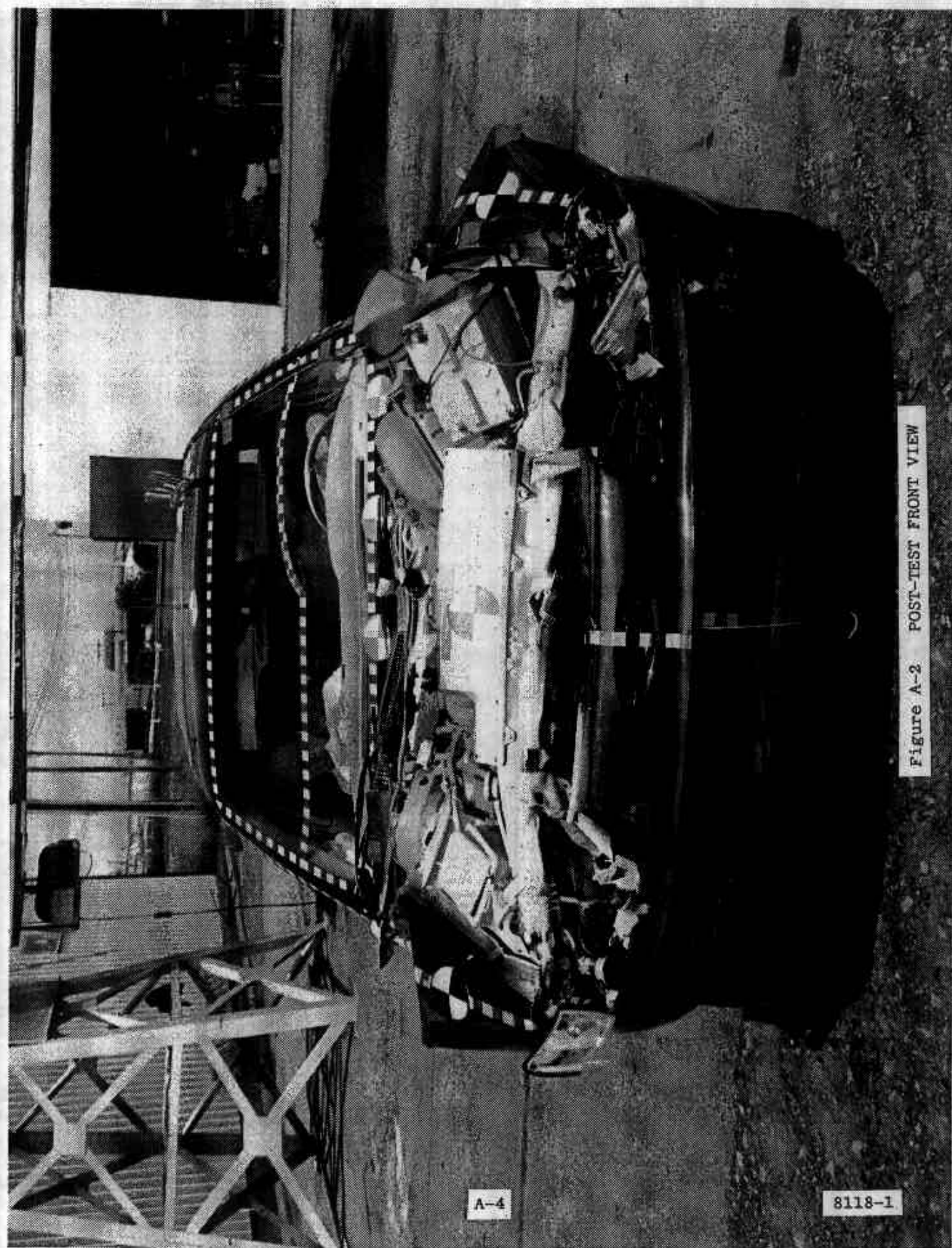


Figure A-2 POST-TEST FRONT VIEW

A-4

8118-1

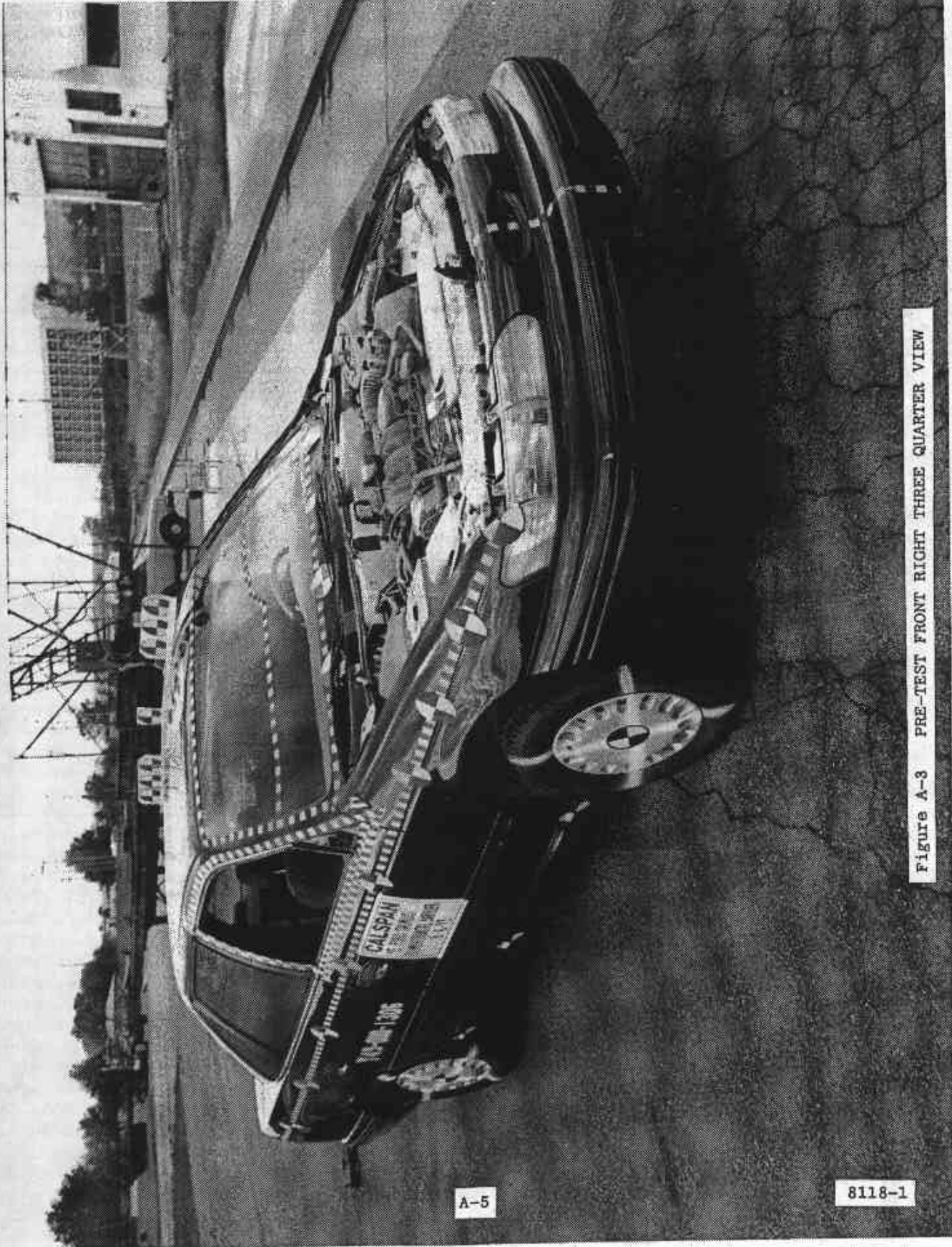


Figure A-3 PRE-TEST FRONT RIGHT THREE QUARTER VIEW

A-5

8118-1



Figure A-4 POST-TEST FRONT RIGHT THREE QUARTER VIEW

A-6

8118-1

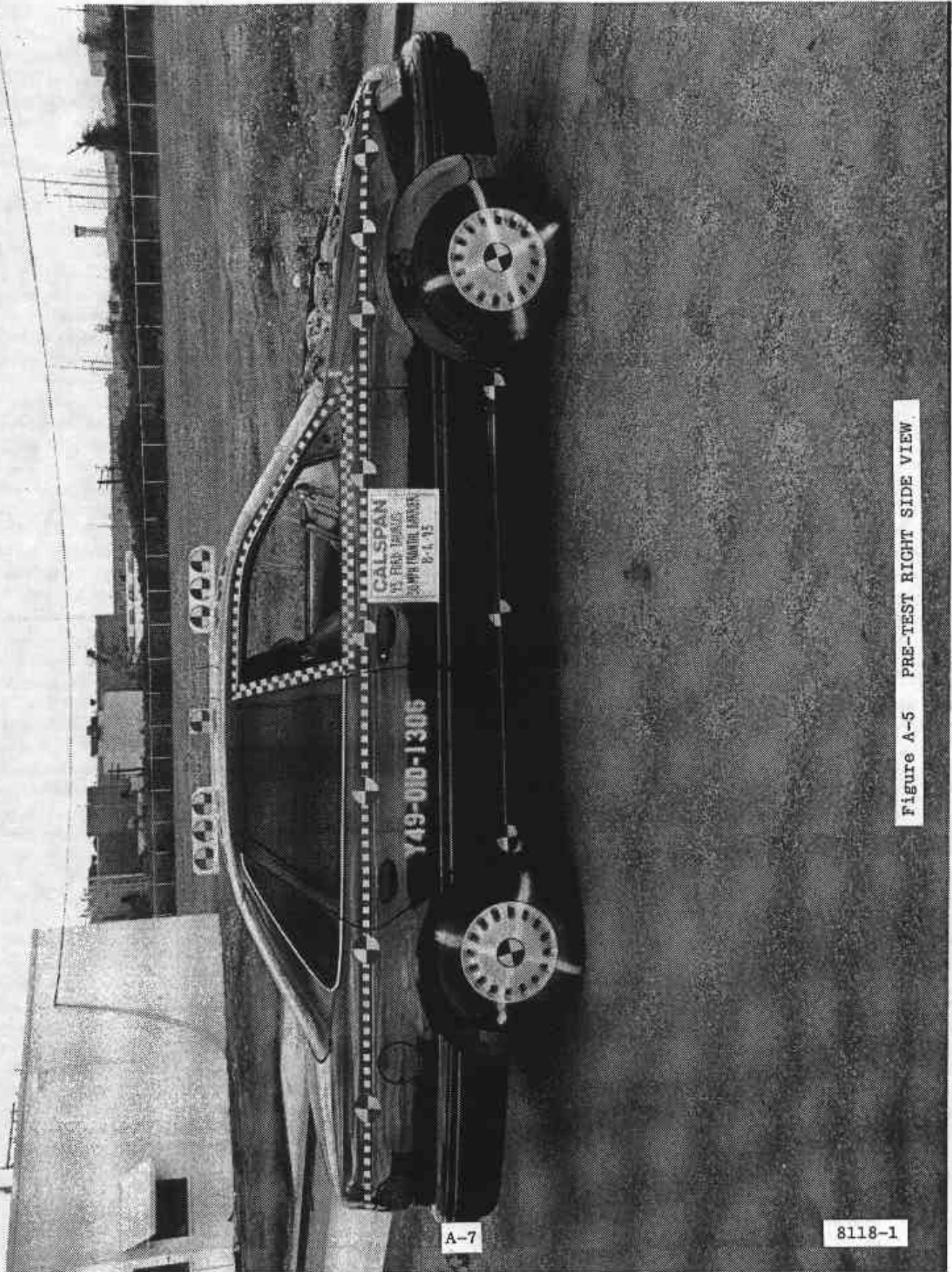


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-7

8118-1



Figure A-6 POST-TEST RIGHT SIDE VIEW

A-8

8118-1

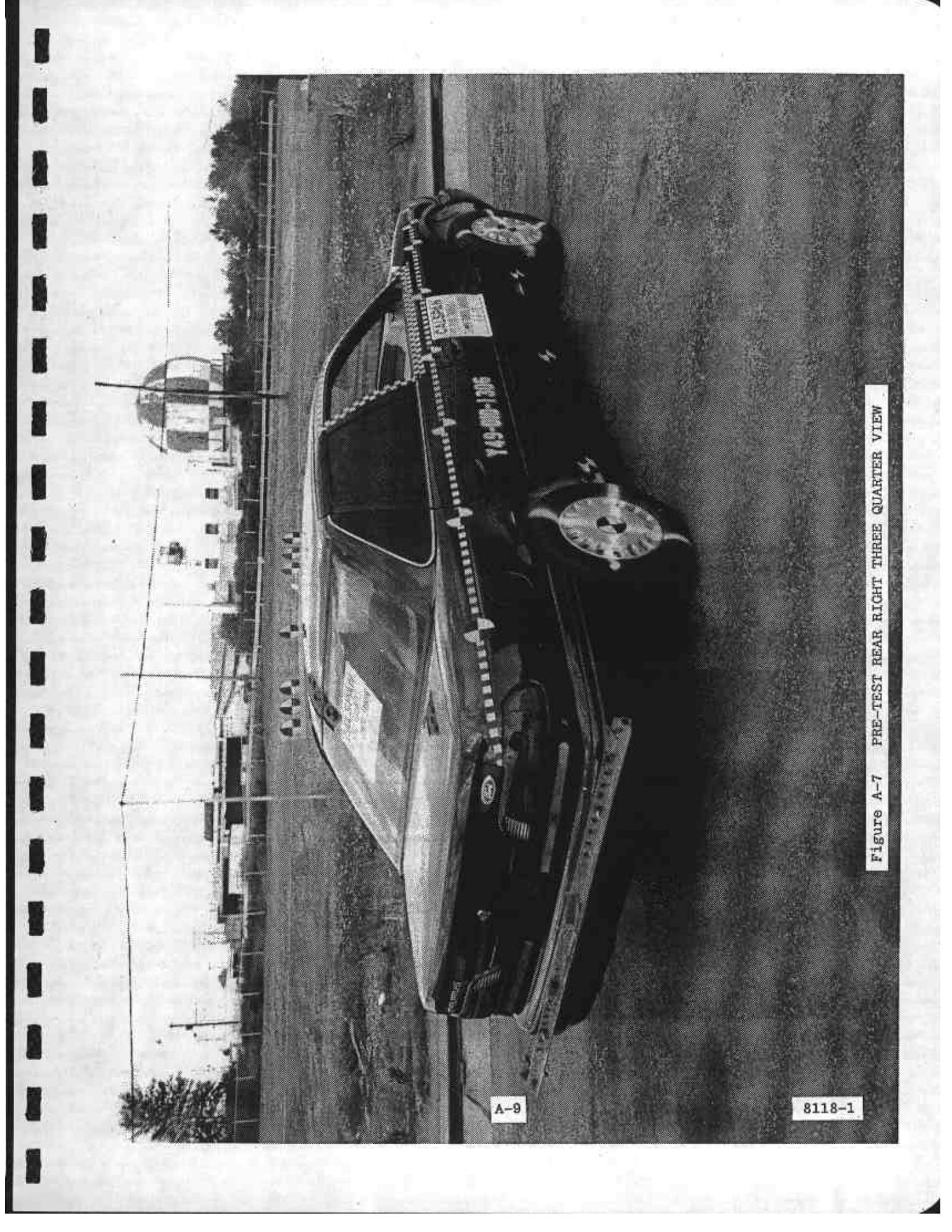


Figure A-7 PRE-TEST REAR RIGHT THREE QUARTER VIEW

A-9

8118-1



Figure A-8 POST-TEST REAR RIGHT THREE QUARTER VIEW

A-10

8118-1

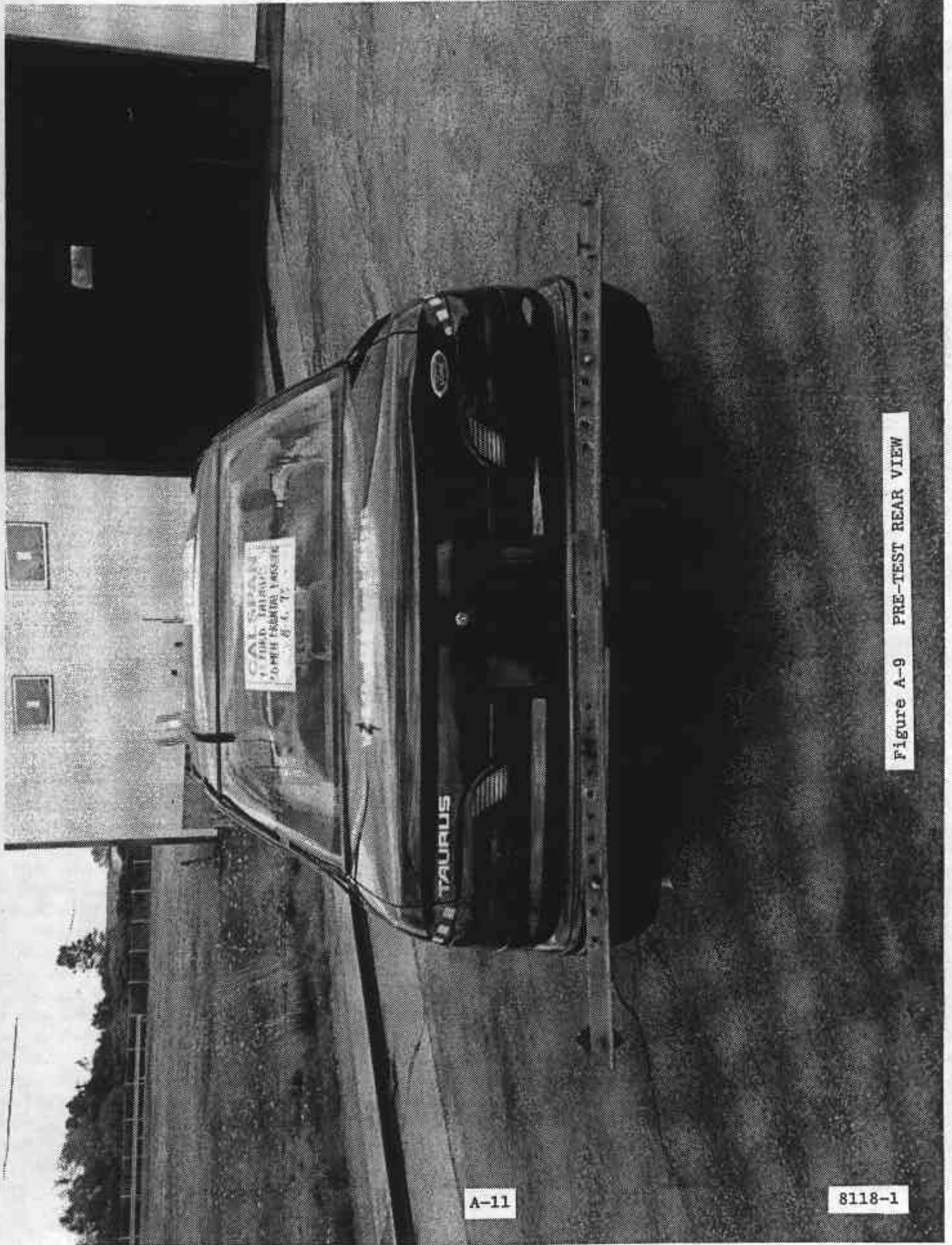


Figure A-9 PRE-TEST REAR VIEW

A-11

8118-1

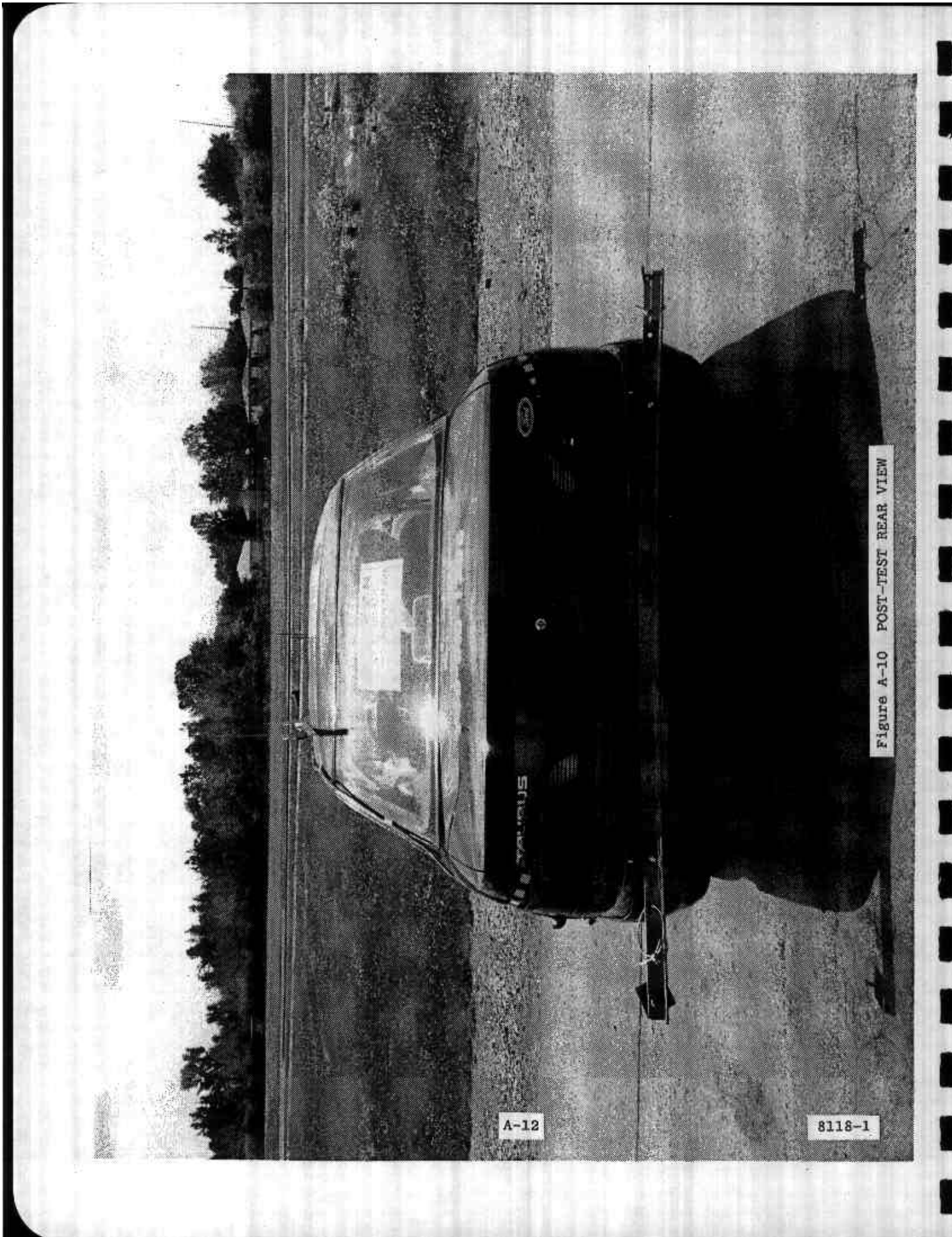


Figure A-10 POST-TEST REAR VIEW

A-12

8118-1



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

A-13

8118-1

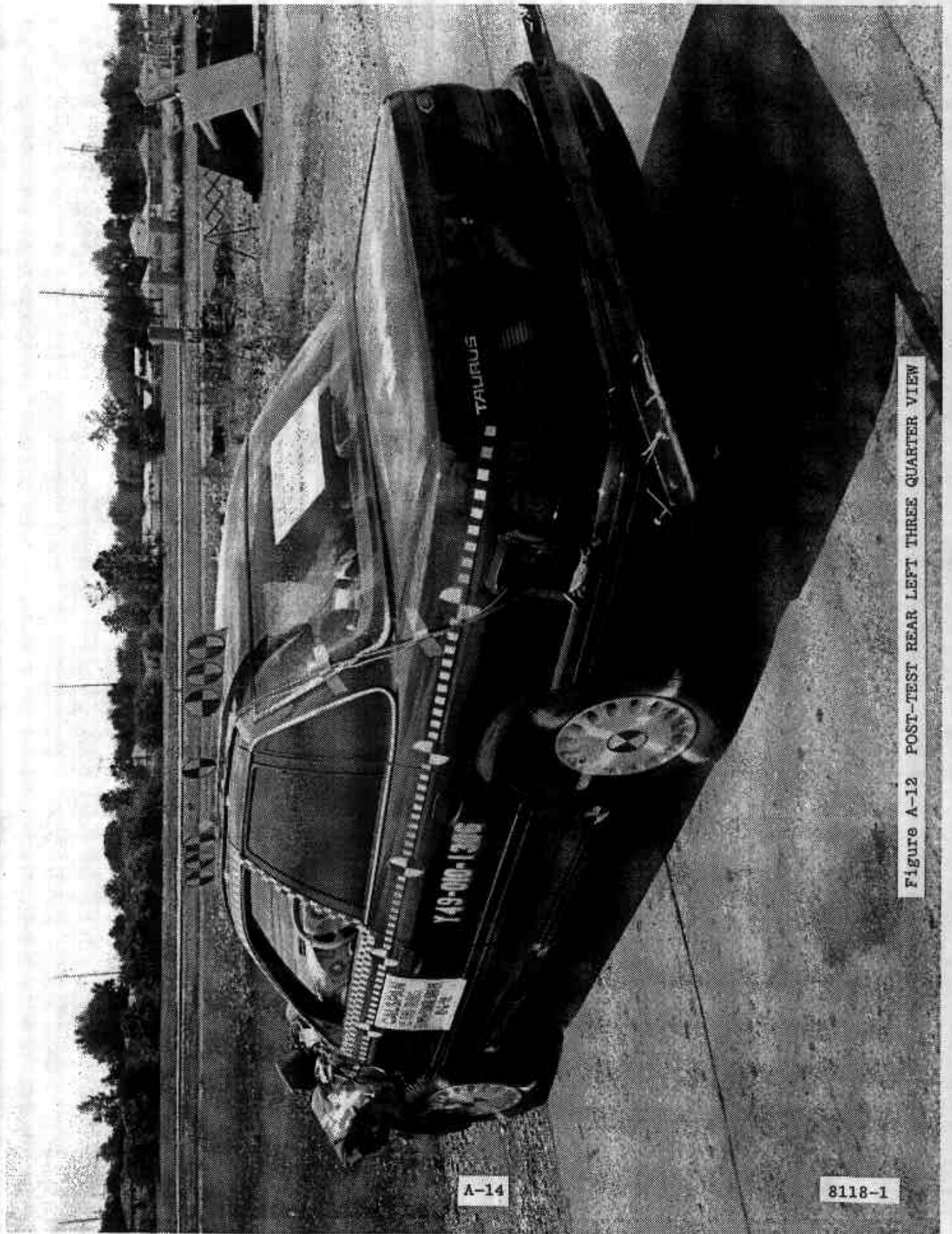


Figure A-12 POST-TEST REAR LEFT THREE QUARTER VIEW

A-14

8118-1

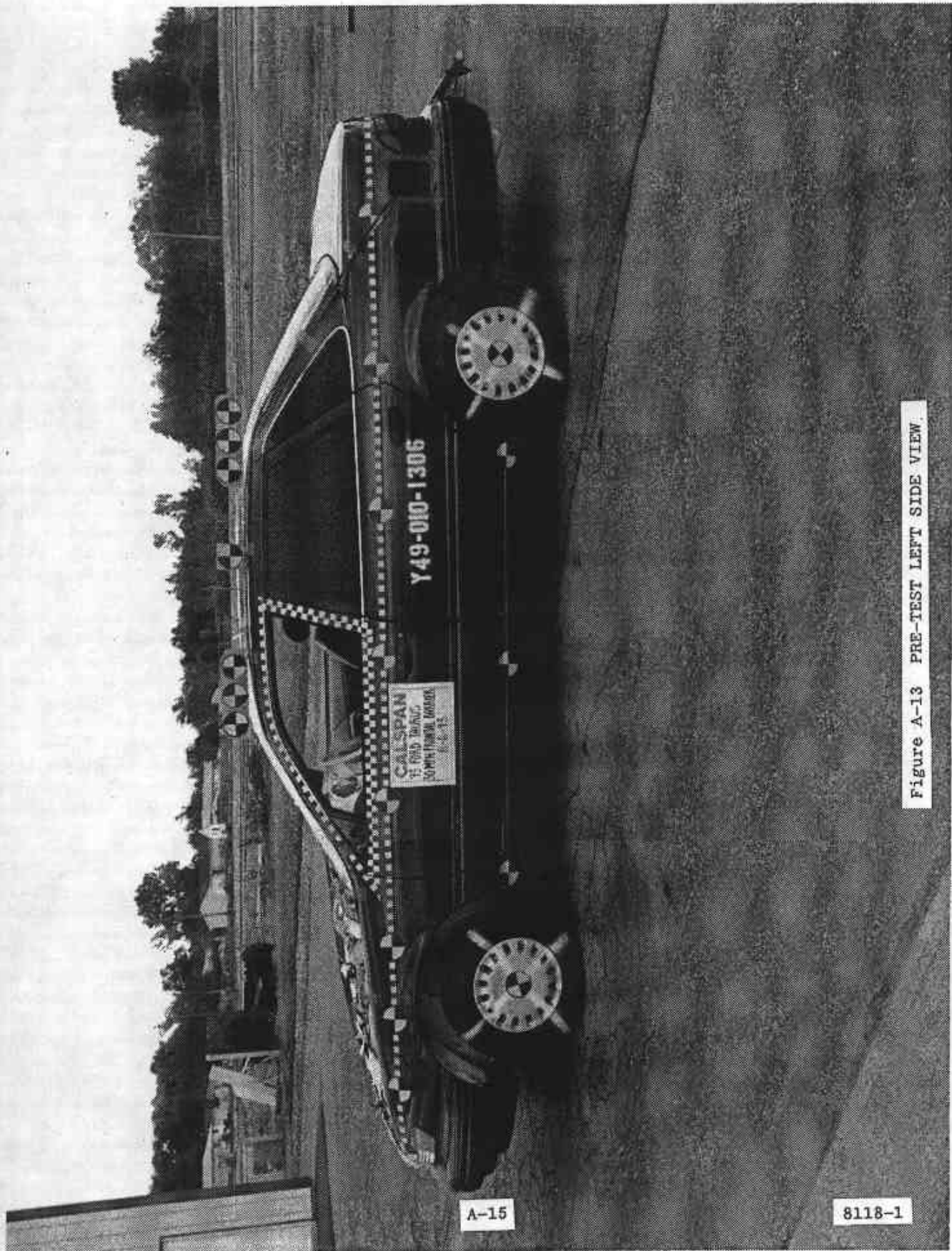


Figure A-13 PRE-TEST LEFT SIDE VIEW.

A-15

8118-1

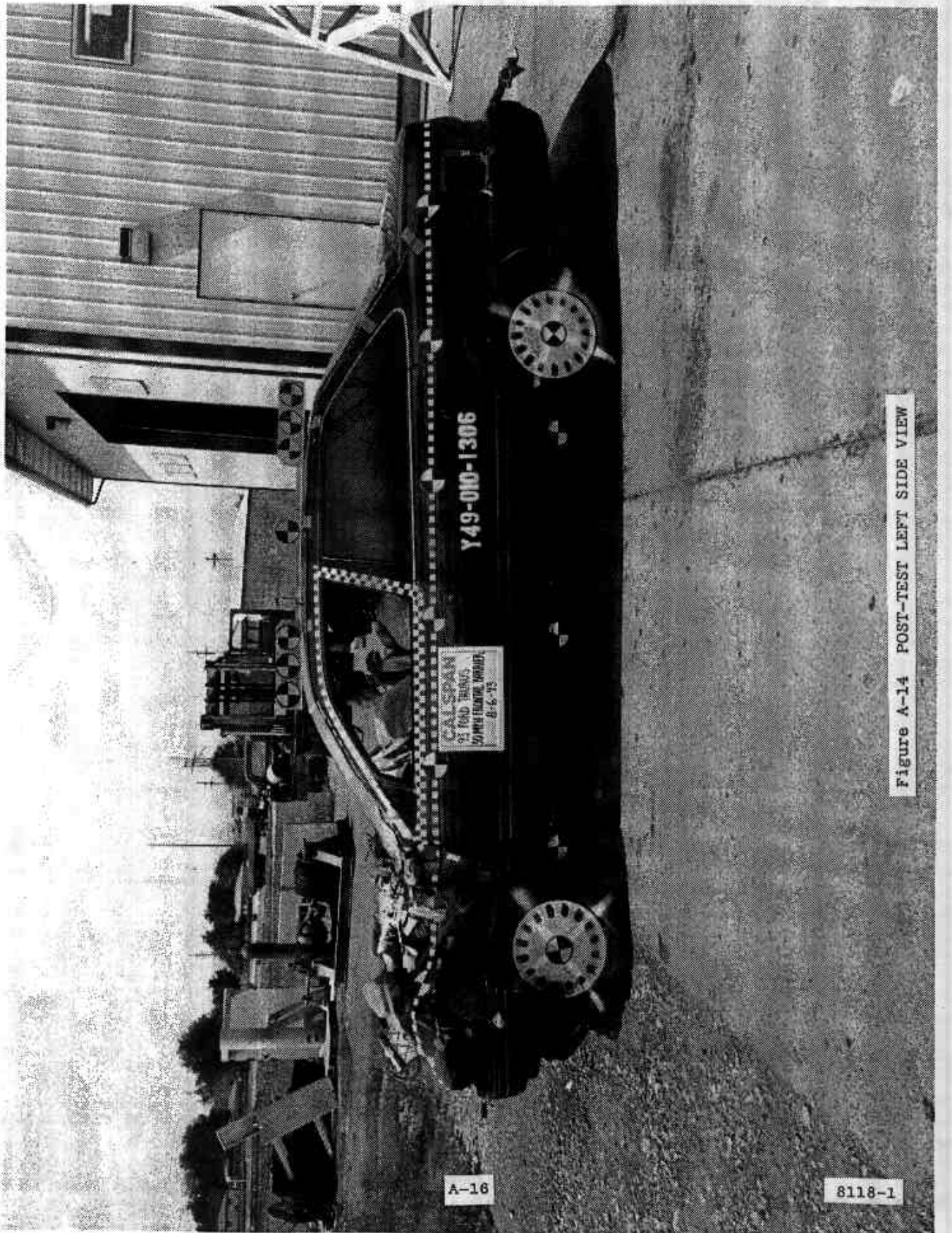


Figure A-14 POST-TEST LEFT SIDE VIEW

A-16

8118-1

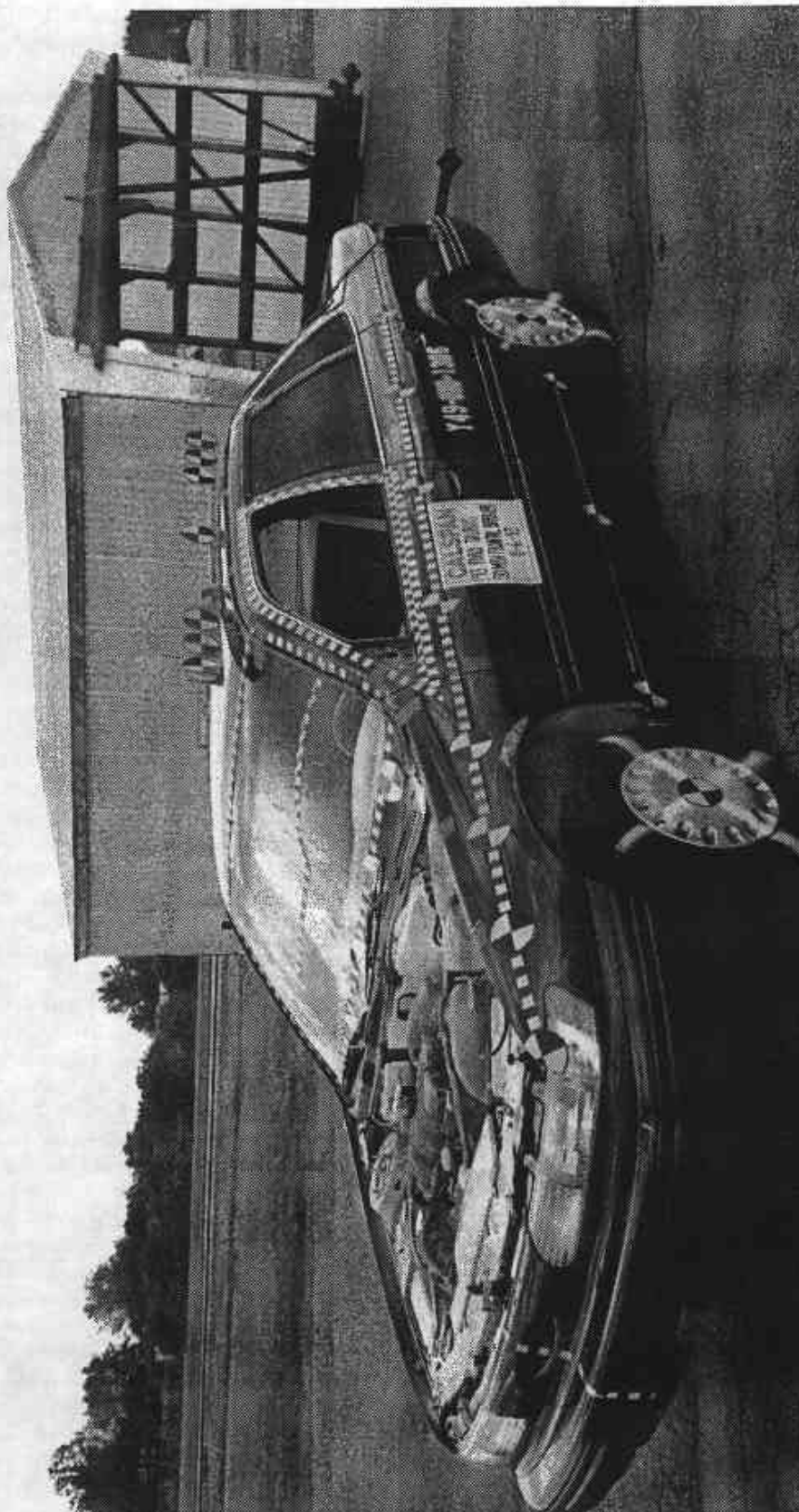


Figure A-15 PRE-TEST FRONT LEFT THREE QUARTER VIEW

A-17

8118-1

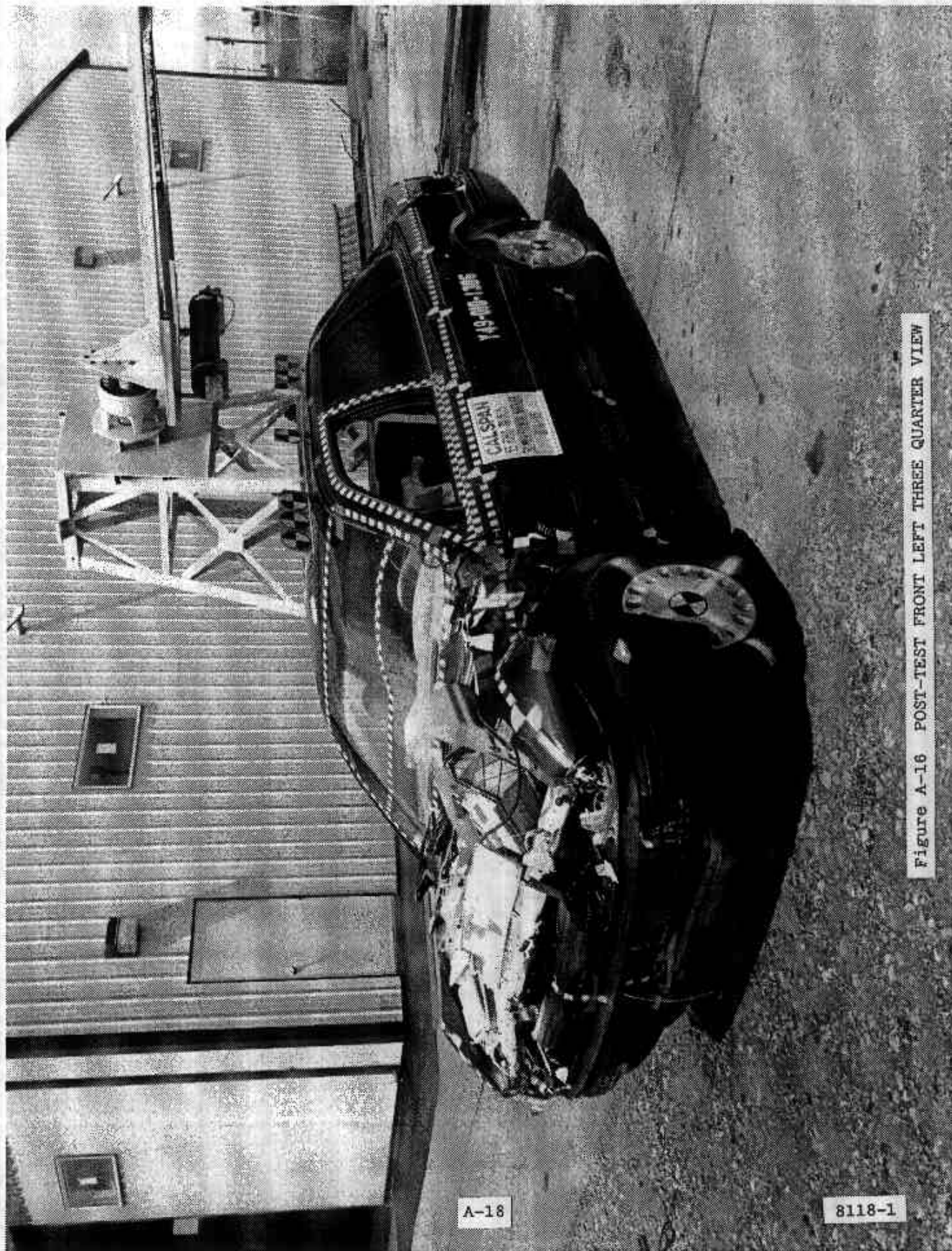


Figure A-16 POST-TEST FRONT LEFT THREE QUARTER VIEW

A-18

8118-1

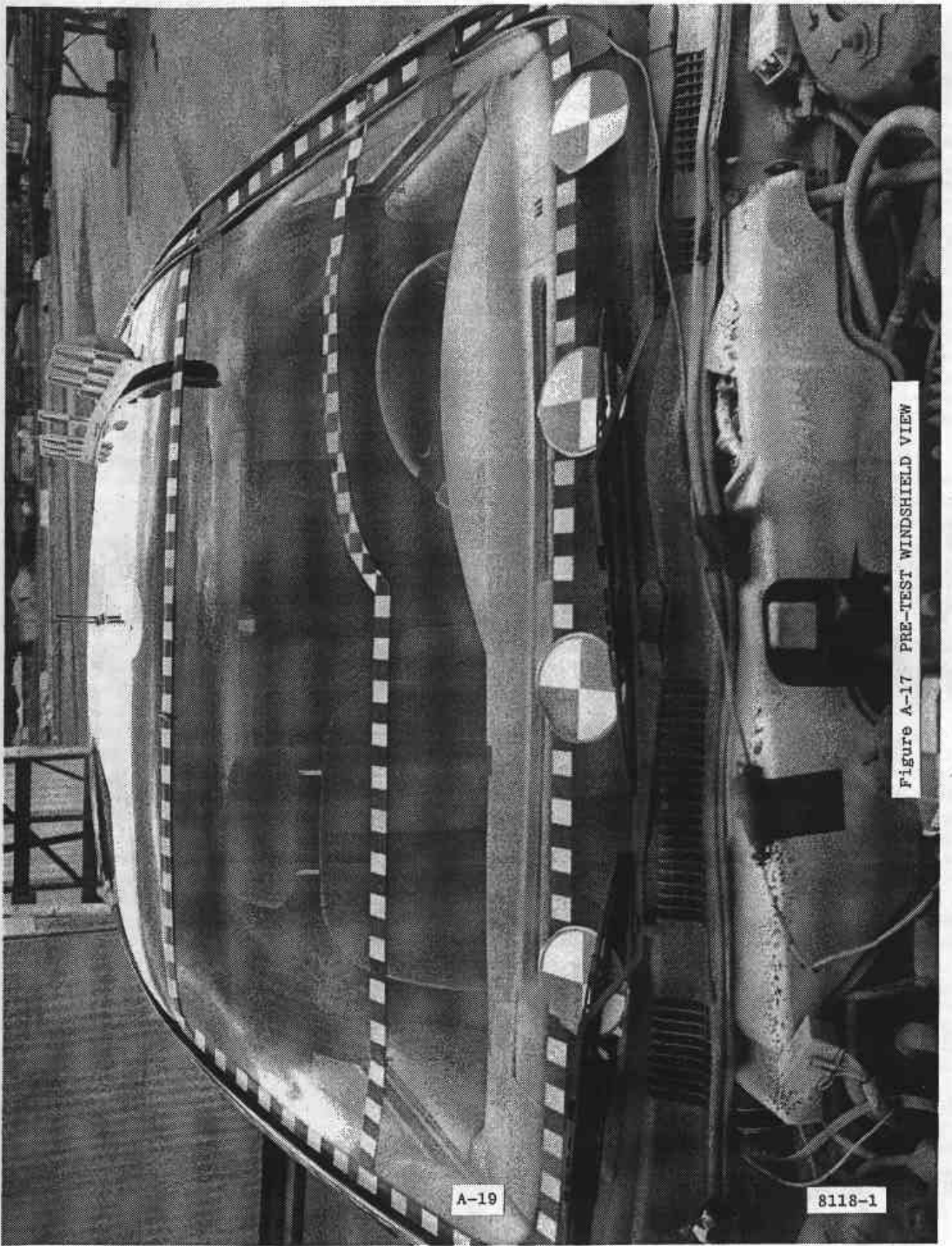


Figure A-17 PRE-TEST WINDSHIELD VIEW

A-19

8118-1

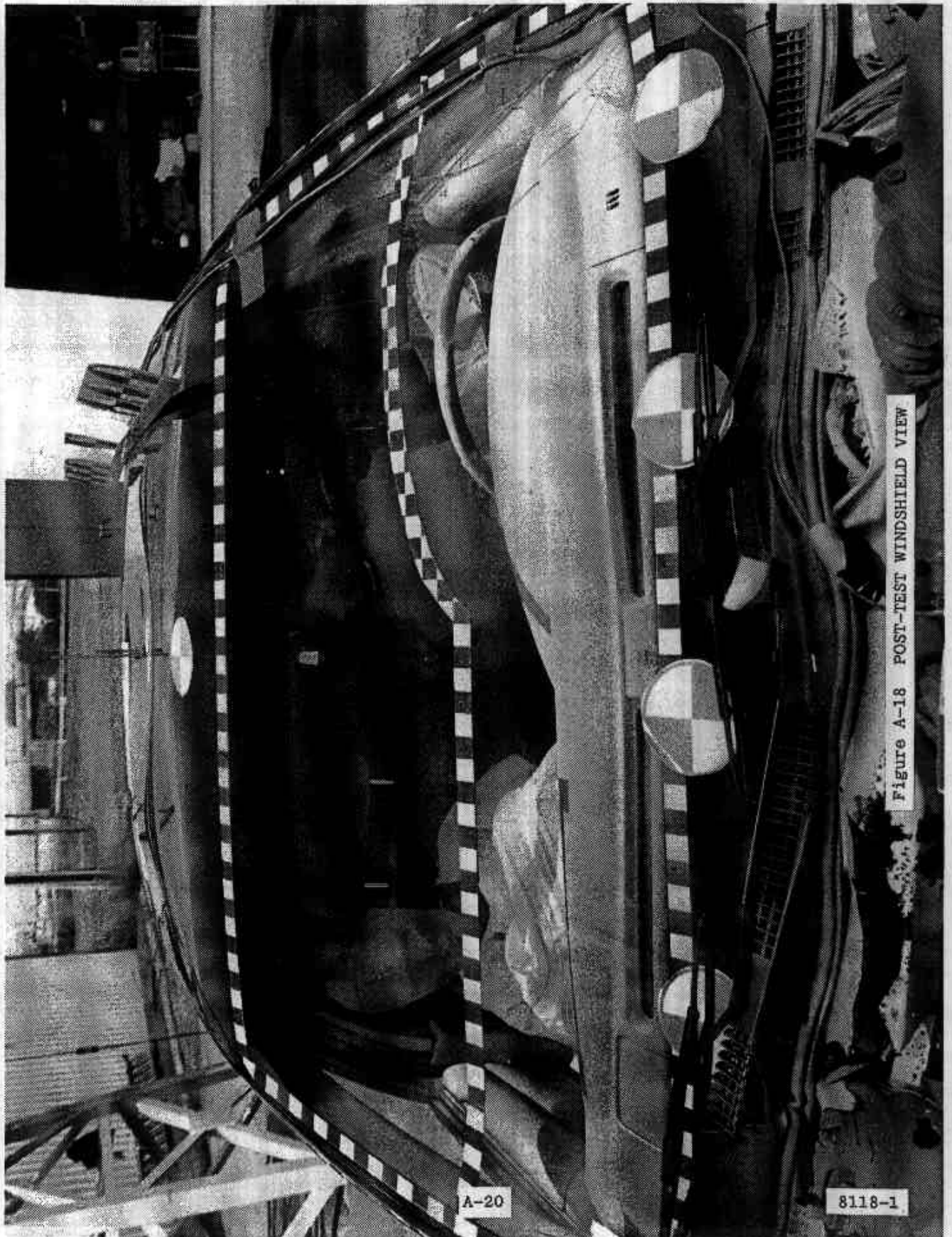


Figure A-18 POST-TEST WINDSHIELD VIEW

A-20

8118-1

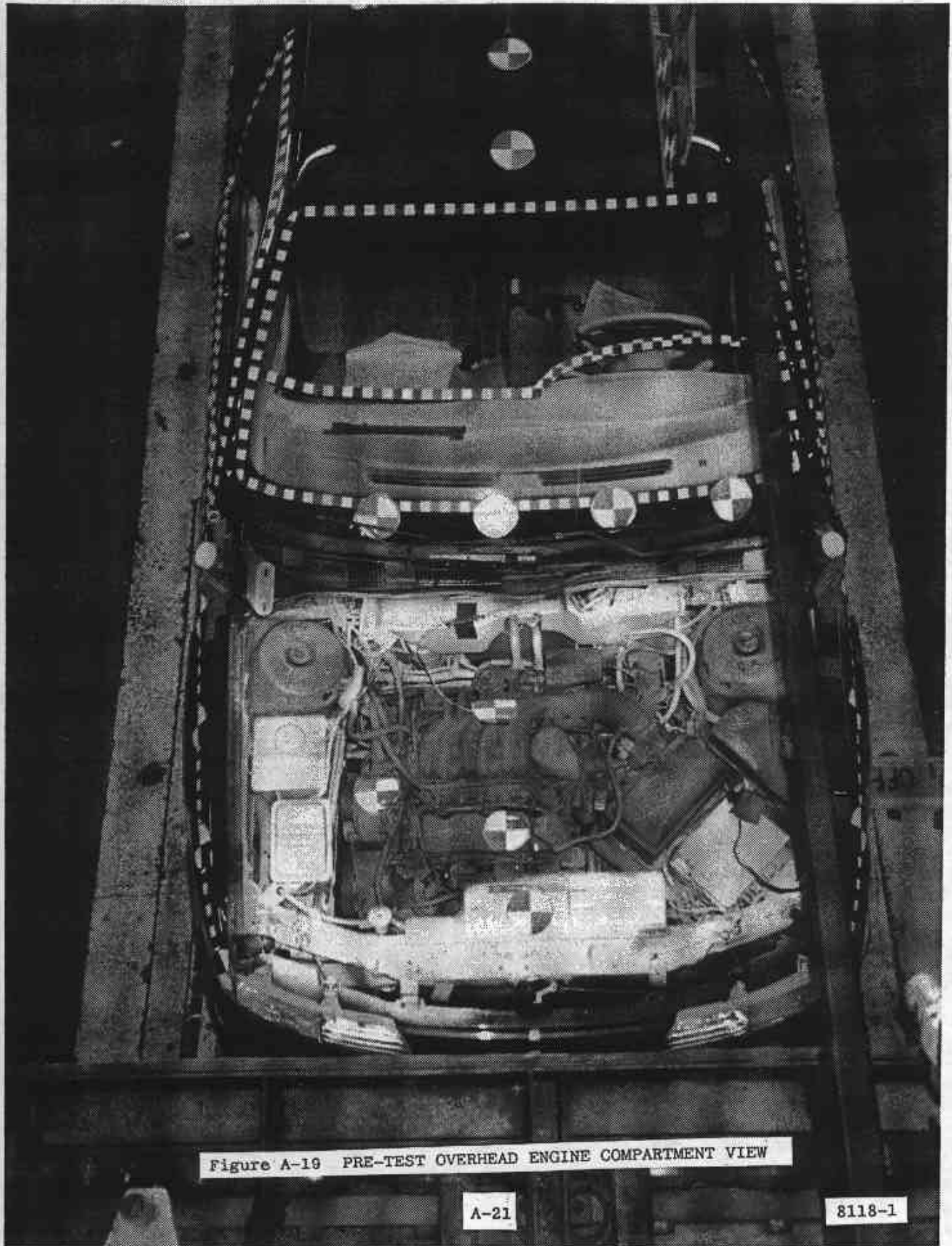


Figure A-19 PRE-TEST OVERHEAD ENGINE COMPARTMENT VIEW

A-21

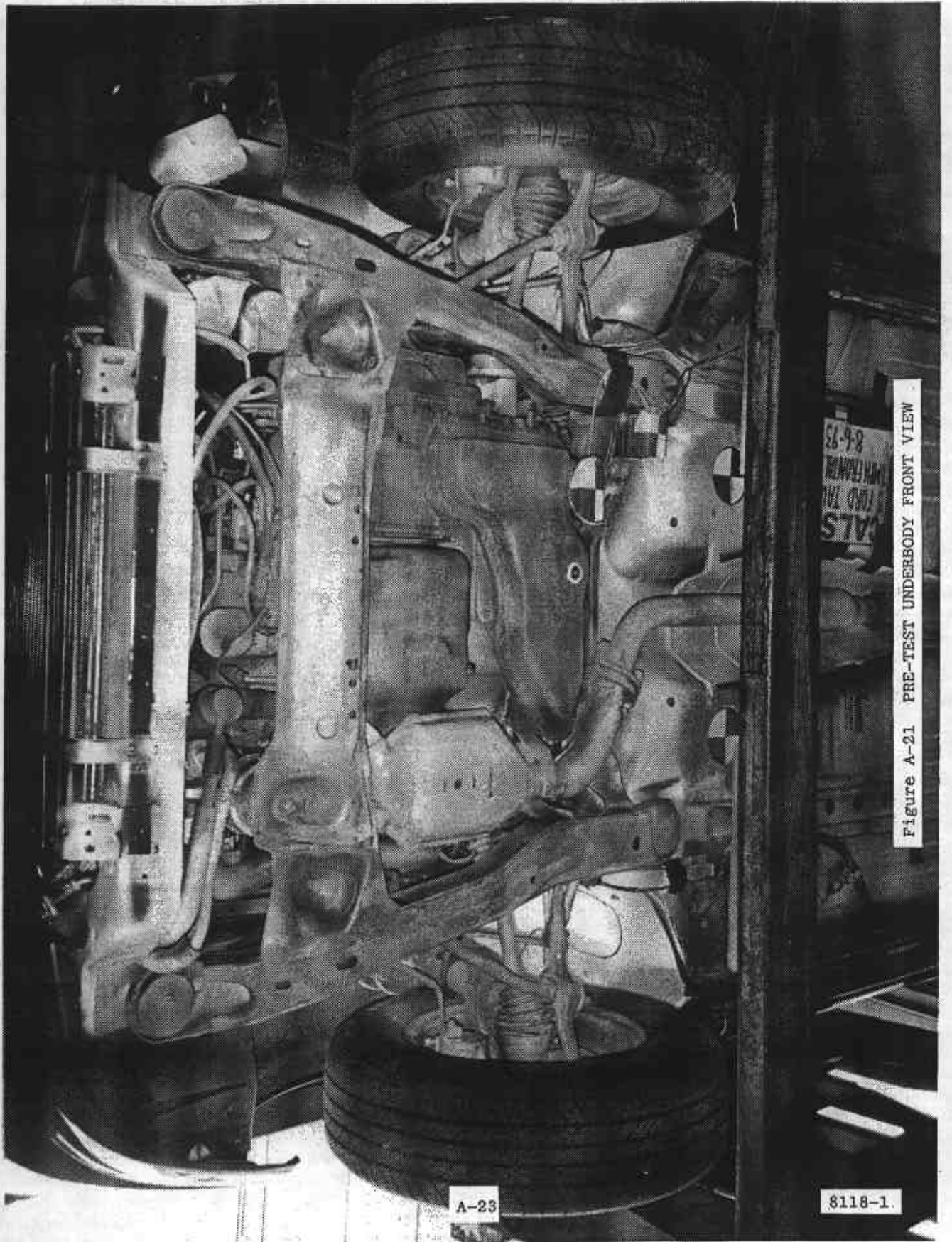
8118-1



Figure A-20 POST-TEST OVERHEAD ENGINE COMPARTMENT VIEW

A-22

8118-1



A-23

8118-1.

Figure A-21 PRE-TEST UNDERBODY FRONT VIEW

81-9-8  
REPAIRMAN  
FORD TRUCK  
STATS

PHOTO NOT AVAILABLE



Figure A-23 PRE-TEST UNDERBODY FRONT SIDE VIEW

A-25

8118-1

PHOTO NOT AVAILABLE

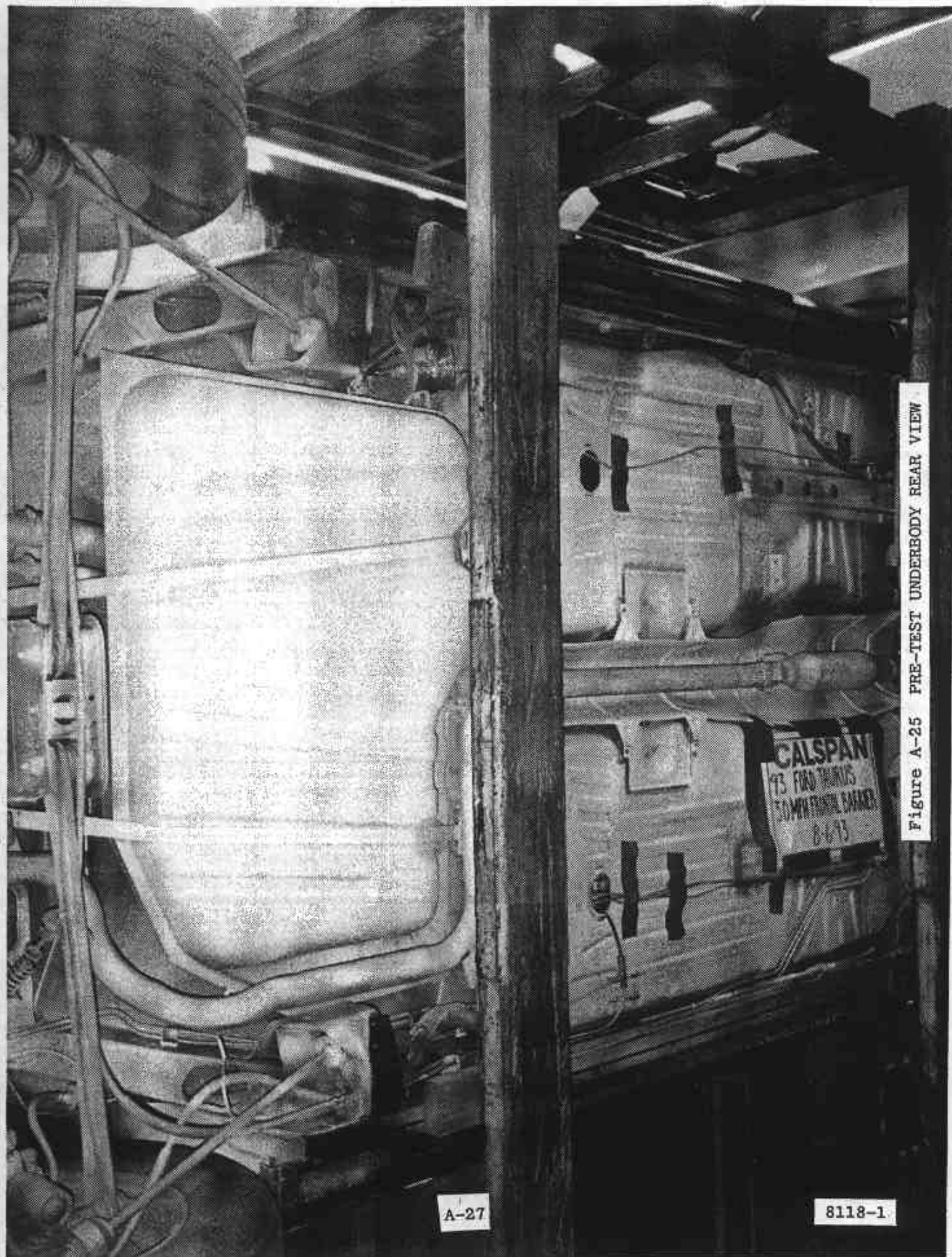


Figure A-25 PRE-TEST UNDERBODY REAR VIEW

A-27

8118-1

PHOTO NOT AVAILABLE

PHOTO NOT AVAILABLE



Figure A-28 POST-TEST DRIVER POSITION VIEW

A-30

8118-1



Figure A-29 PRE-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW

A-31

8118-1



Figure A-30 POST-TEST DRIVER AND OCCUPANT COMPARTMENT VIEW.

A-32

8118-1



Figure A-31 PRE-TEST PASSENGER POSITION VIEW

A-33

8118-1

CALSPAN



Figure A-32 POST-TEST PASSENGER POSITION VIEW

A-34

8118-1



Figure A-33 PRE-TEST PASSENGER AND OCCUPANT COMPARTMENT VIEW

A-35

8118-1

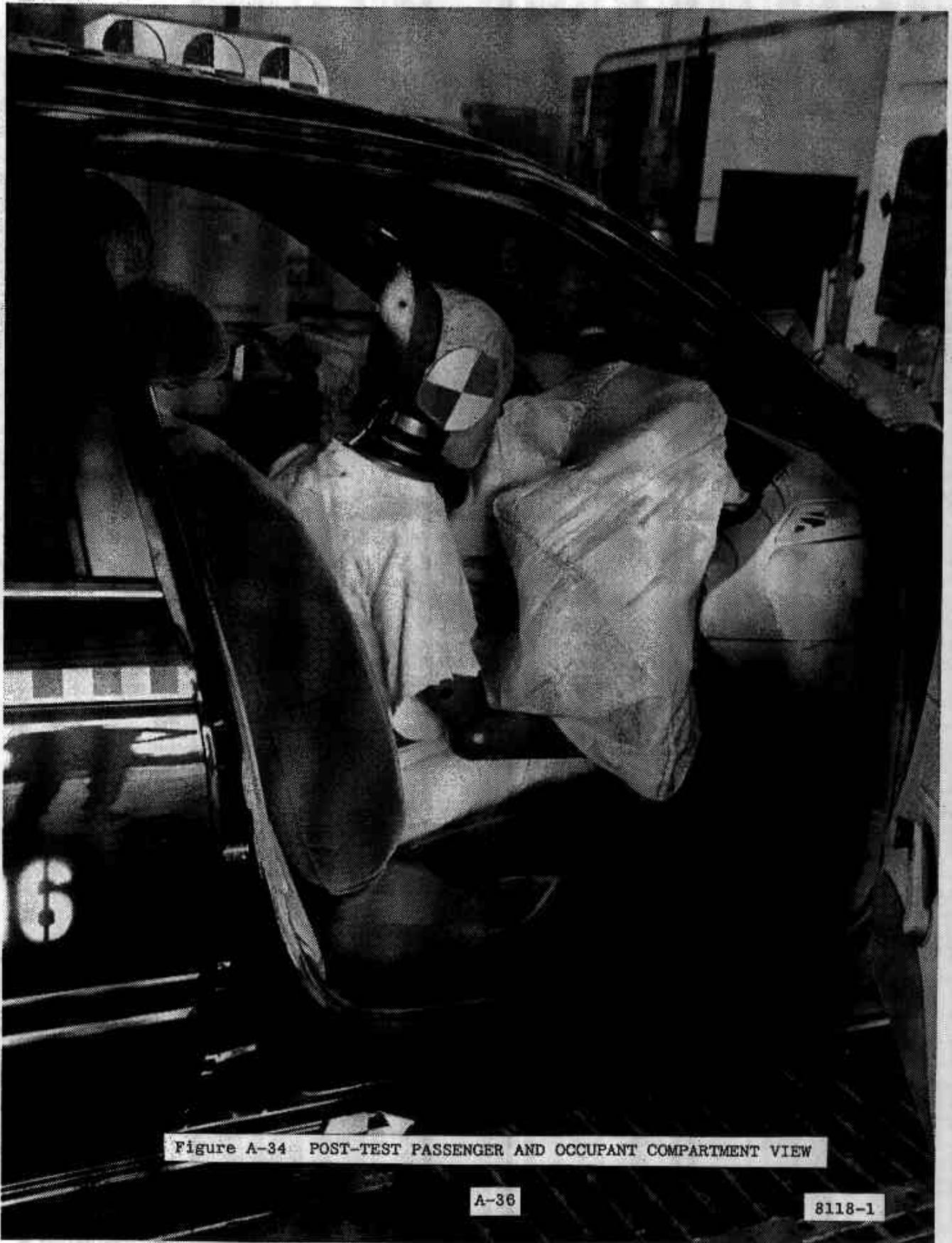


Figure A-34 POST-TEST PASSENGER AND OCCUPANT COMPARTMENT VIEW

A-36

8118-1

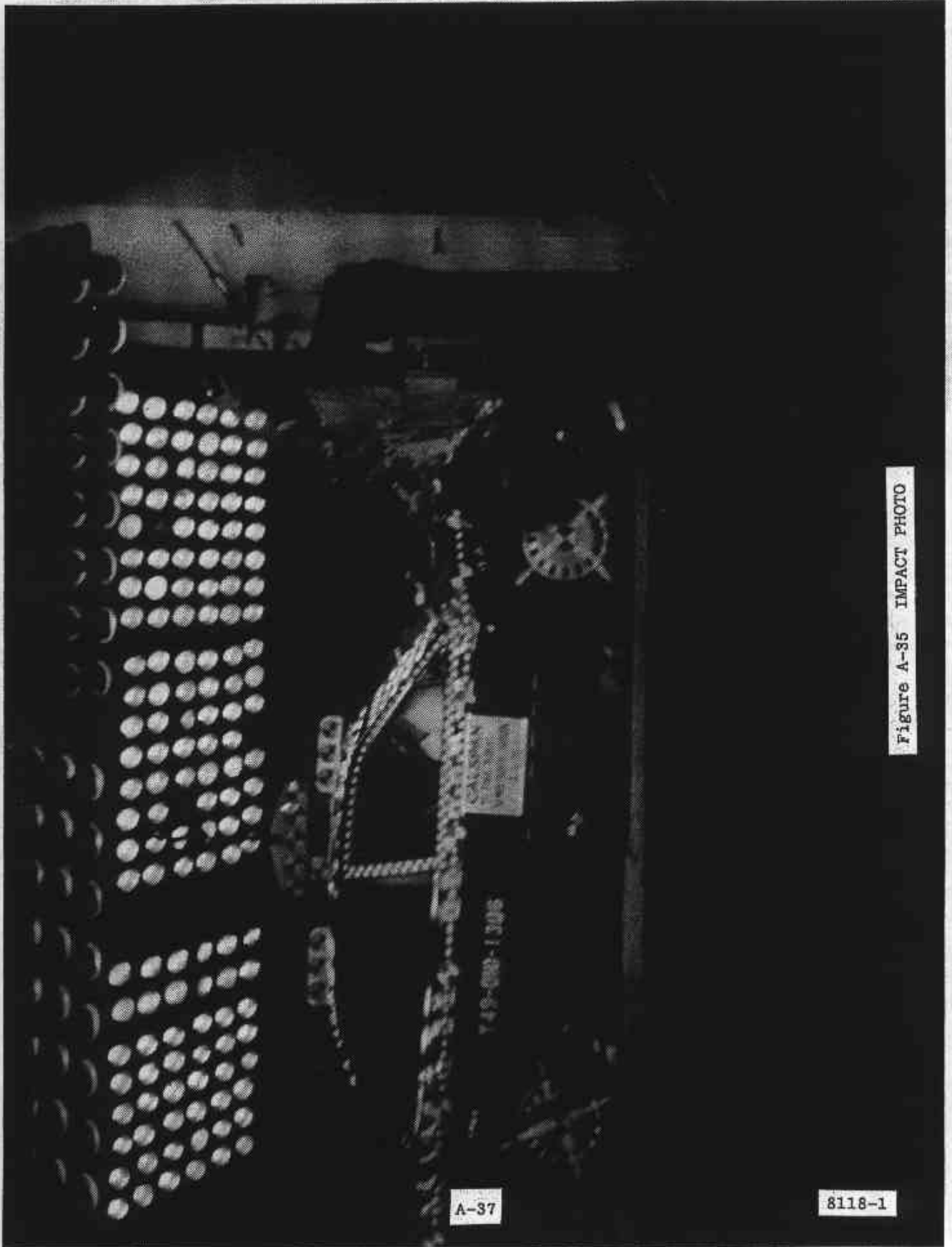


Figure A-35 IMPACT PHOTO

A-37

8118-1

Appendix B

LOAD CELL, VEHICLE AND DUMMY DATA

TEST NO. Y049-0010-1306

LOAD CELL BARRIER DATA

SAE FILTER CHANNEL CLASS

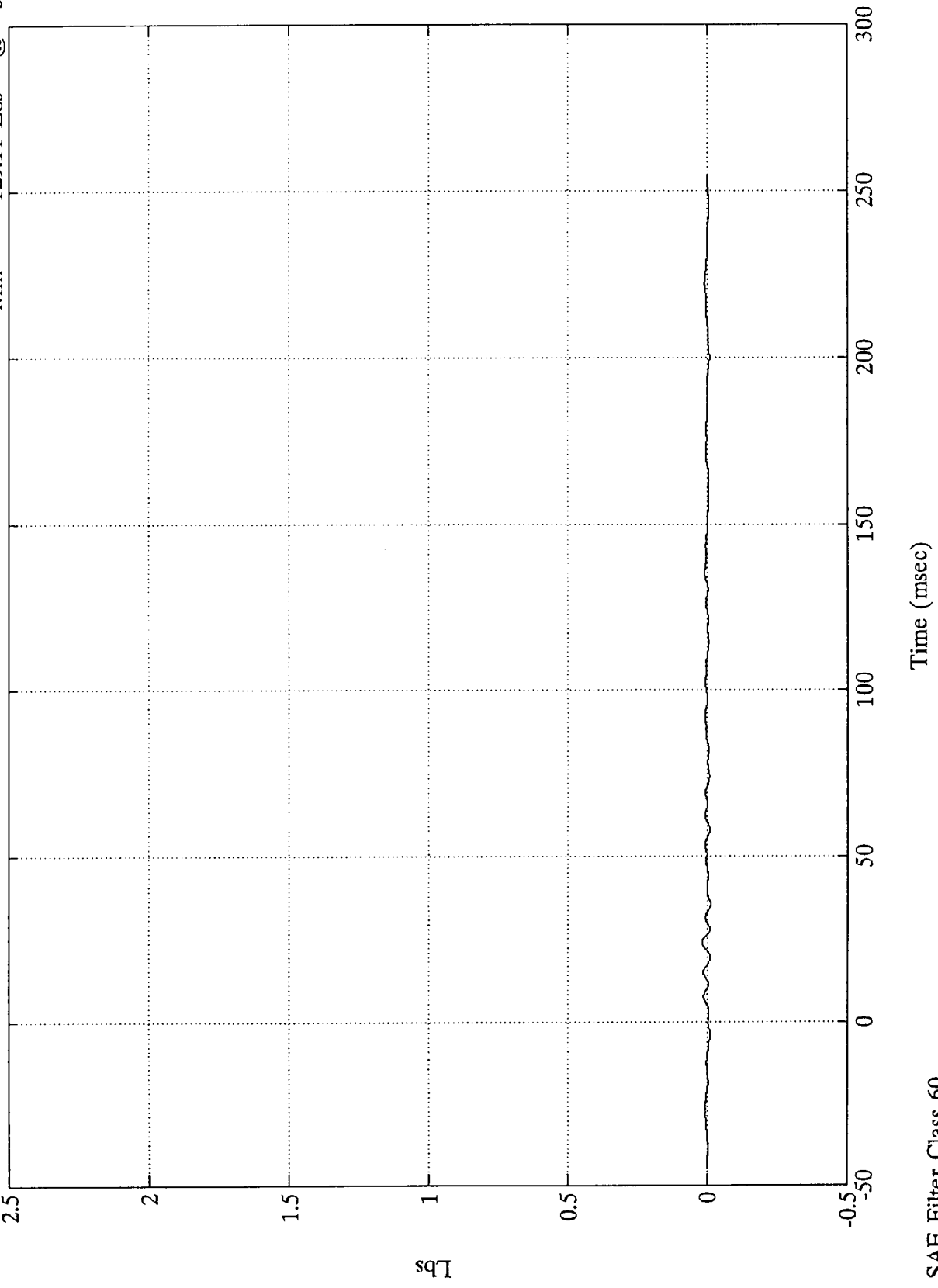
60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A1

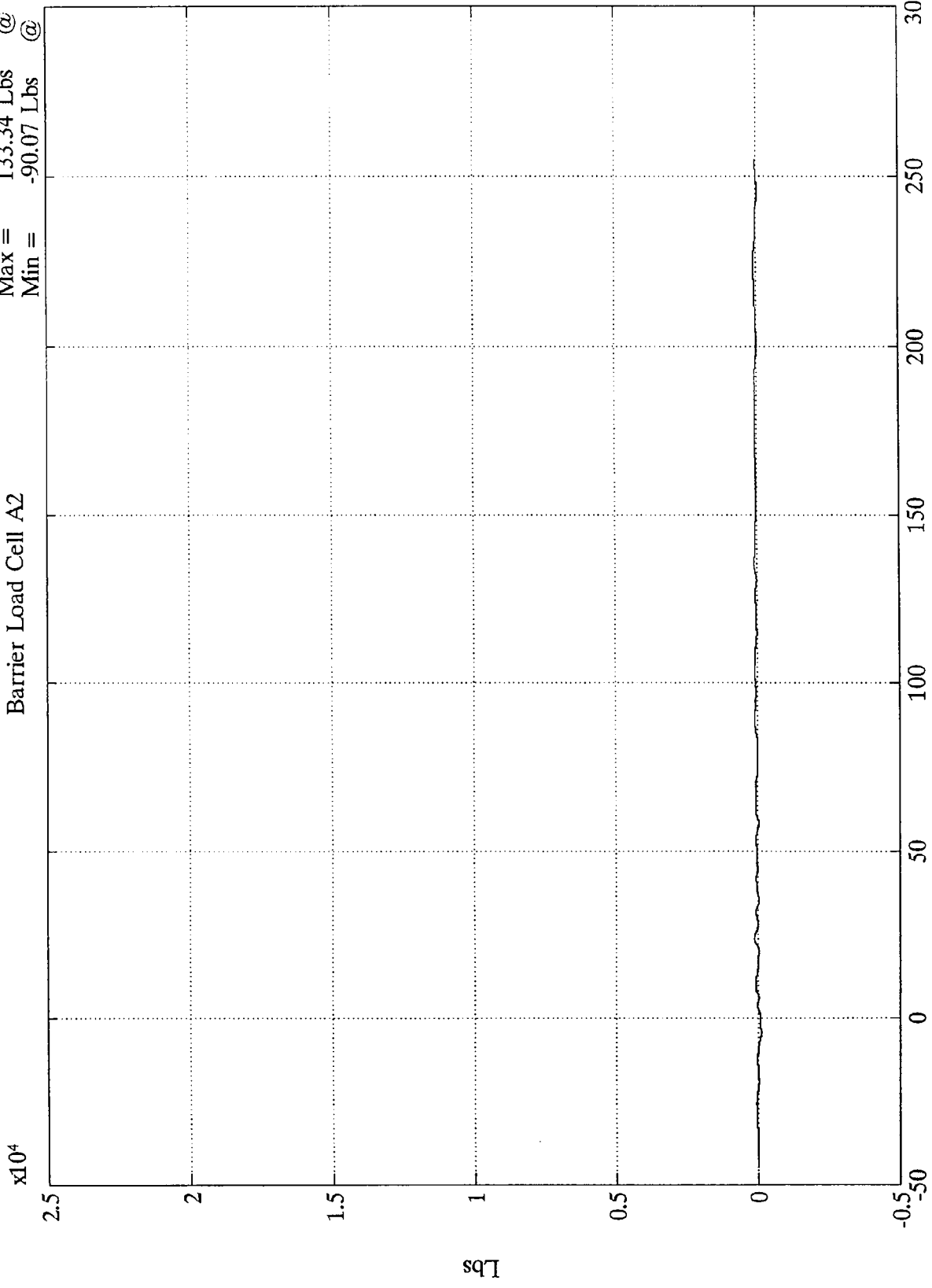
Max = 185.62 Lbs @ 23.87 msec  
Min = -129.11 Lbs @ 35.39 msec

$\times 10^4$



TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A2  
Max = 133.34 Lbs @ 23.87 msec  
Min = -90.07 Lbs @ -4.68 msec

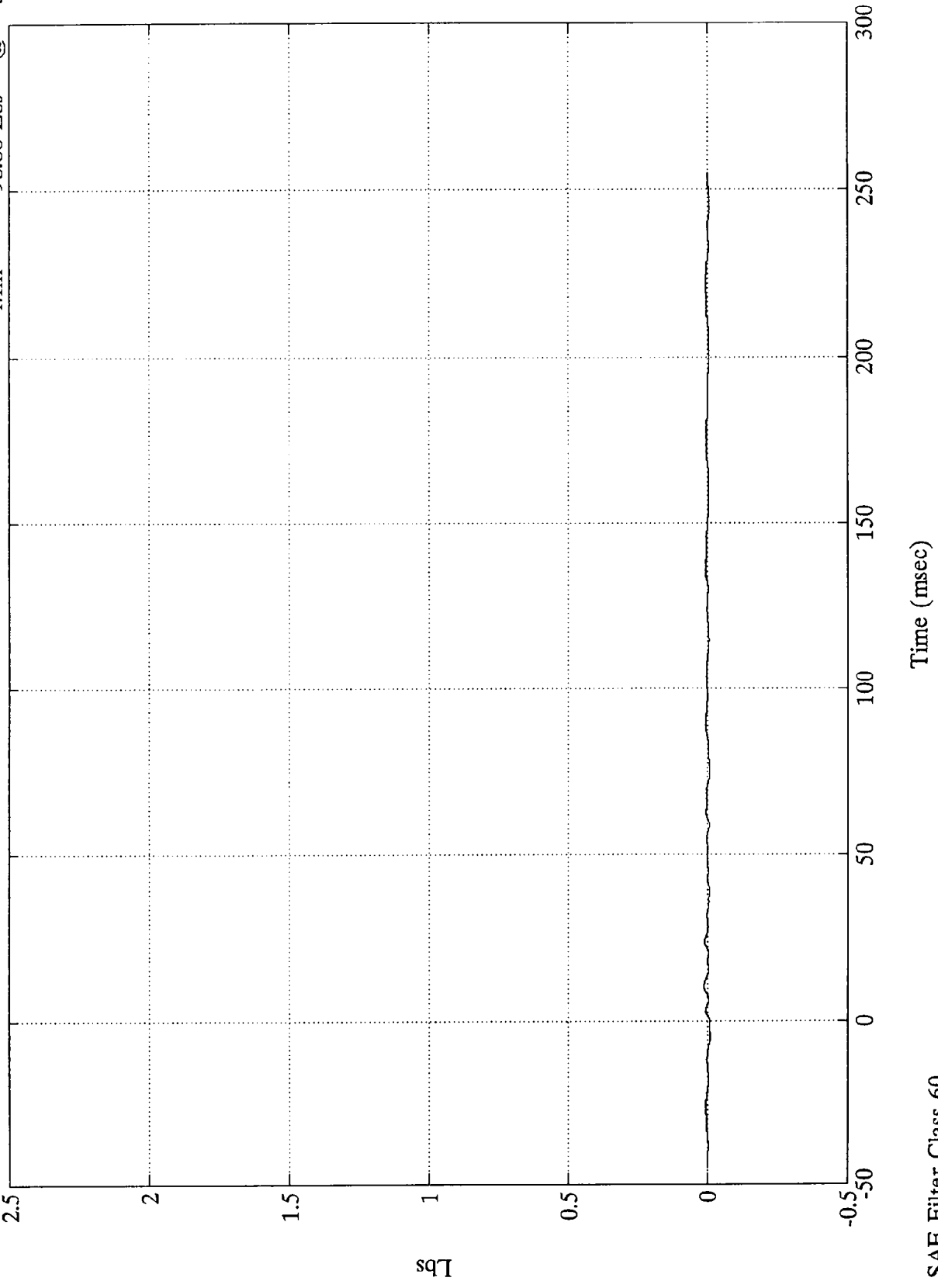


TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A3

Max = 131.81 Lbs @ 10.19 msec  
Min = -98.88 Lbs @ -5.16 msec

$\times 10^4$



1-B-5

8118-1

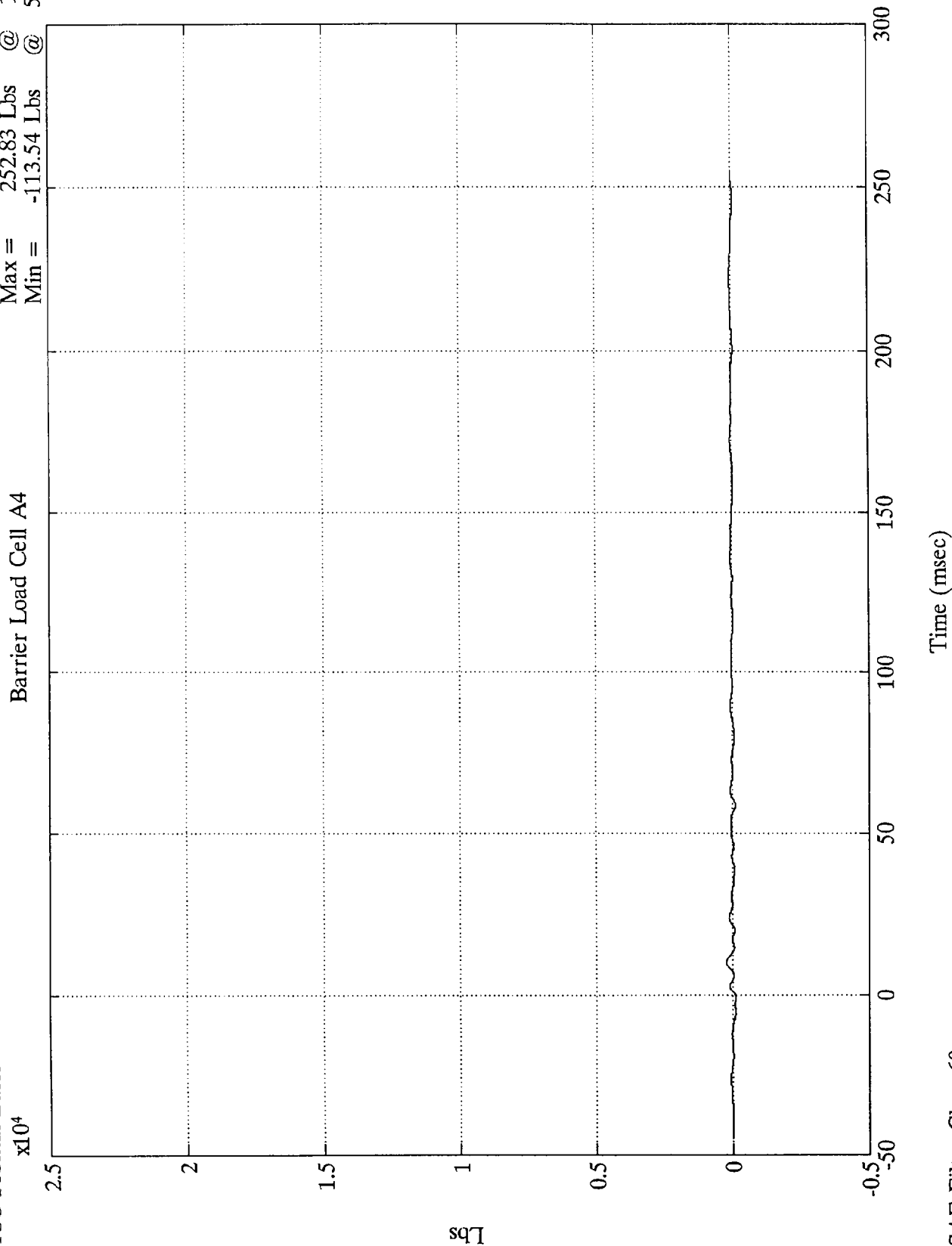
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A4

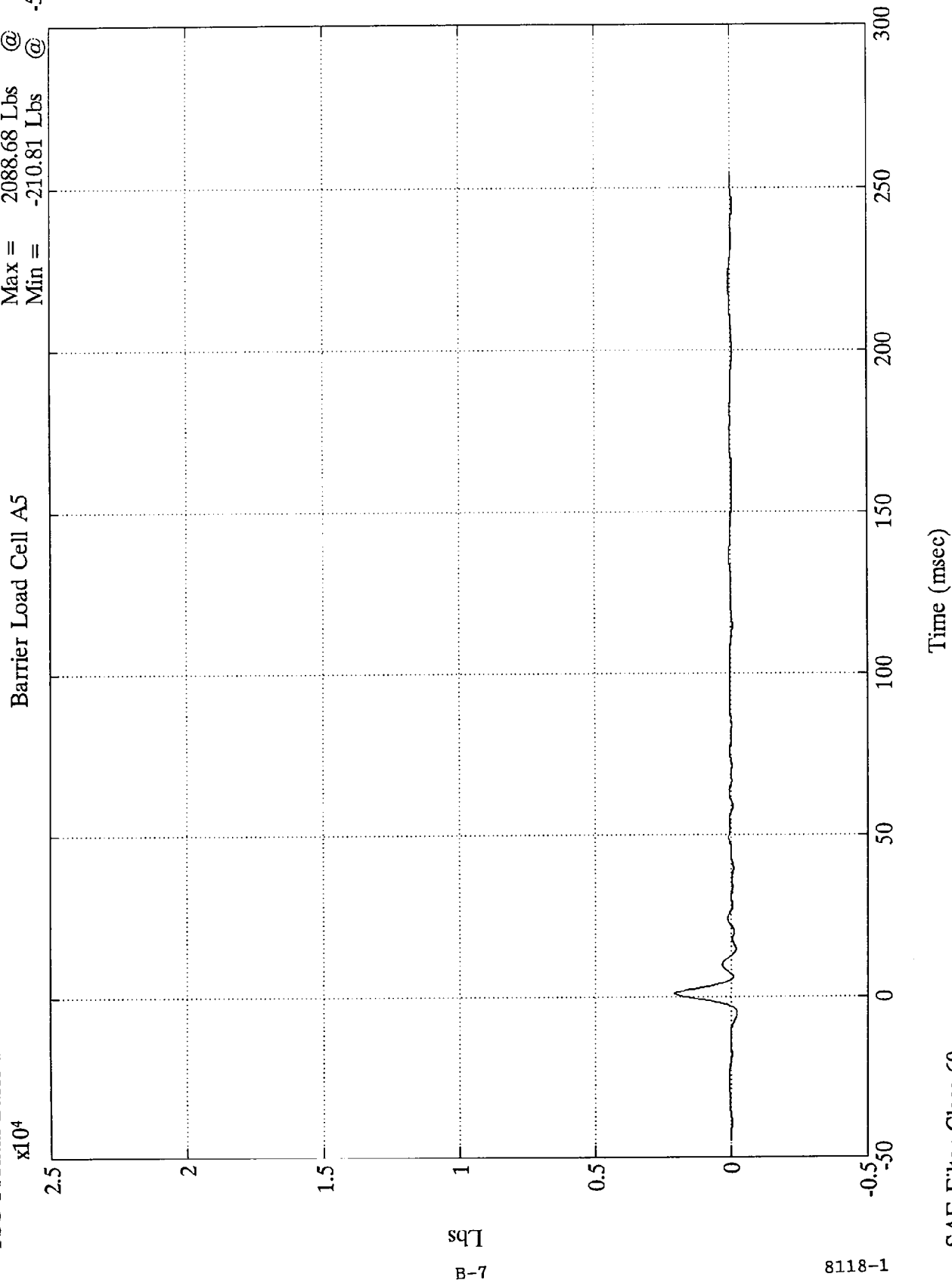
Max = 252.83 Lbs @ 10.19 msec  
Min = -113.54 Lbs @ 58.68 msec



TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A5

Max = 2088.68 Lbs @ 0.83 msec  
Min = -210.81 Lbs @ -5.16 msec



B-7

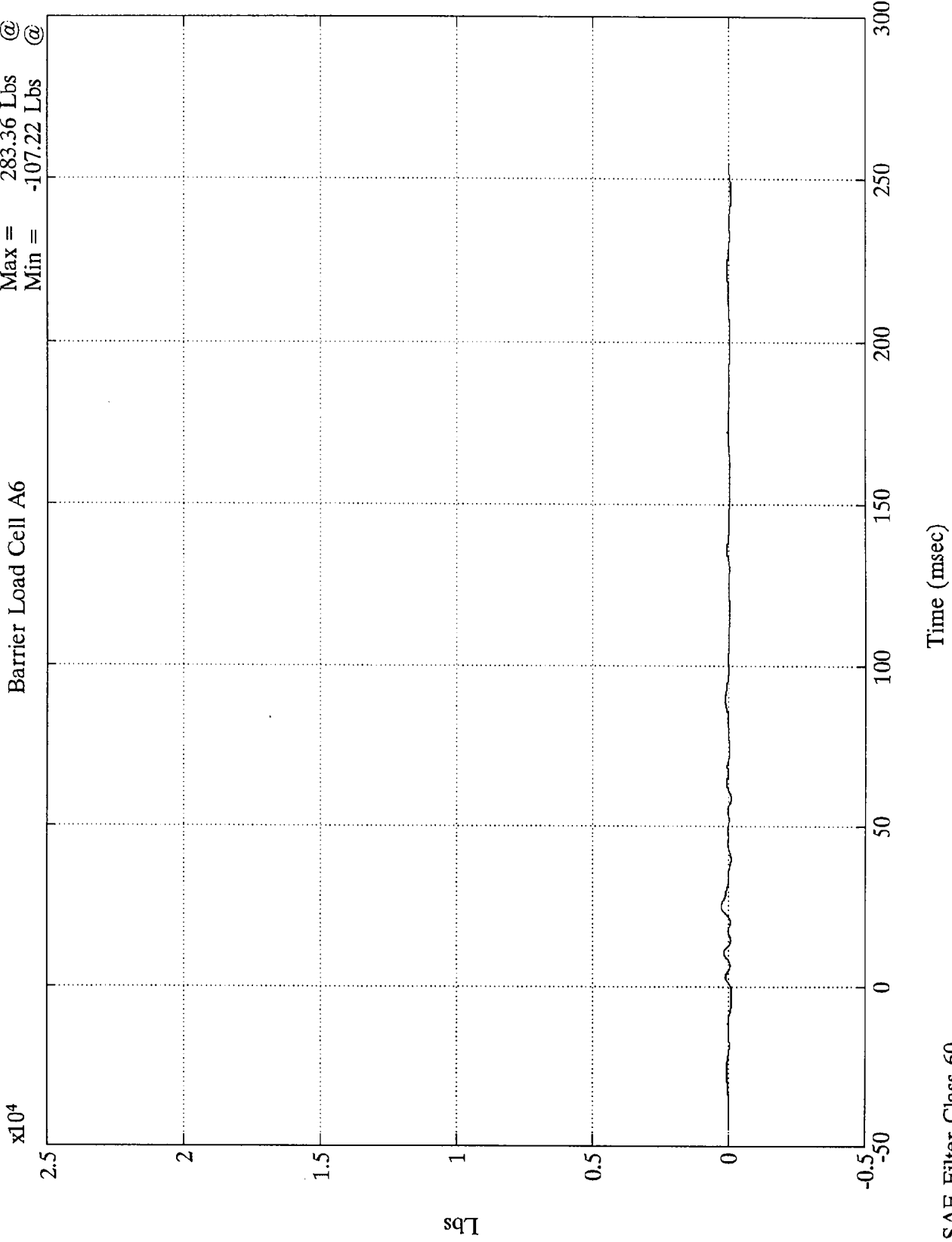
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A6

Max = 283.36 Lbs @ 24.83 msec  
Min = -107.22 Lbs @ 58.68 msec



8-B

8118-1

SAE Filter Class 60

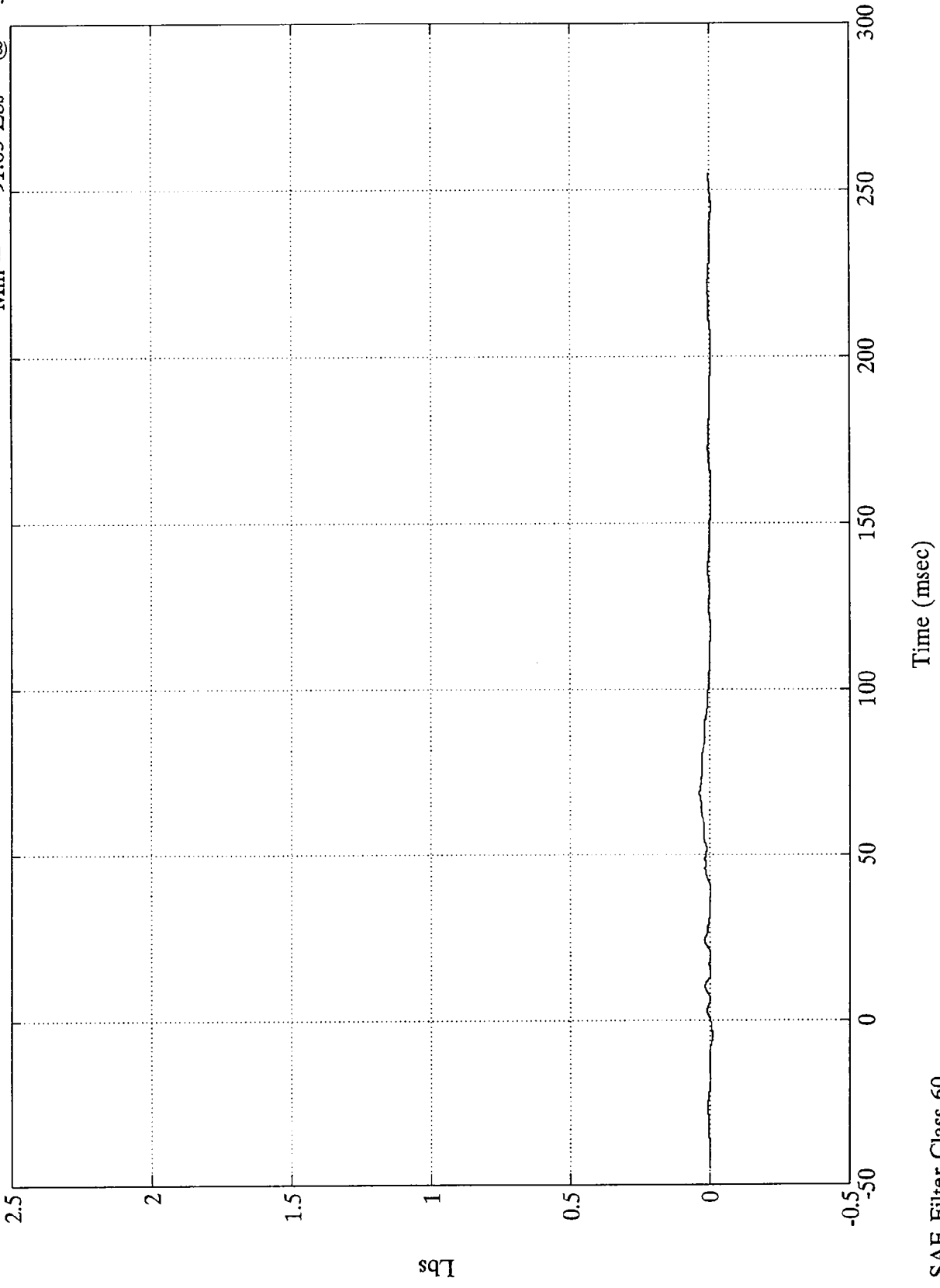
Time (msec)

TSC Frontal Barrier - Ford Taurus

$\times 10^4$

Barrier Load Cell A7

Max = 358.39 Lbs @ 68.76 msec  
Min = -91.63 Lbs @ -5.04 msec



B-9

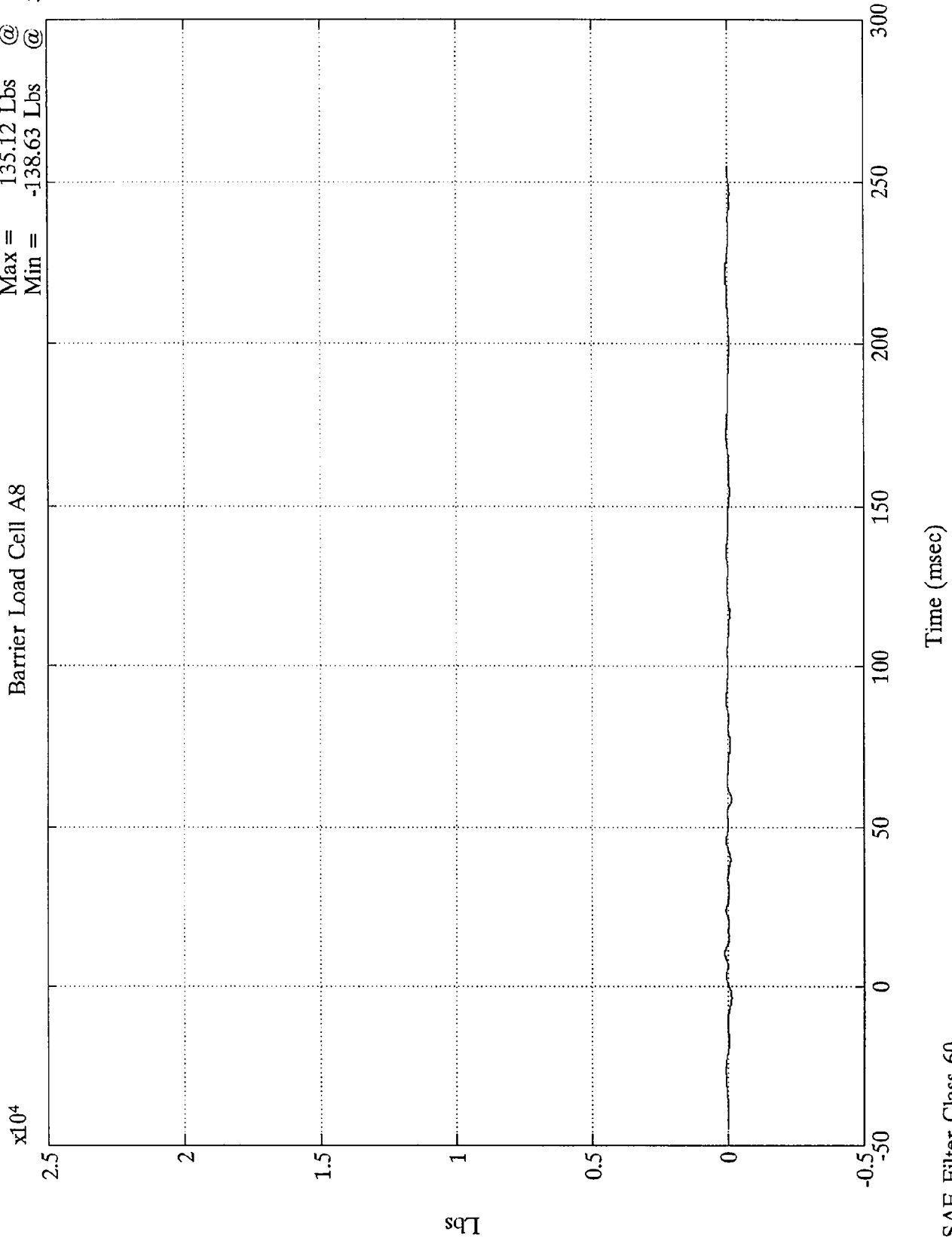
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A8

Max = 135.12 Lbs @ 10.19 msec  
Min = -138.63 Lbs @ 58.68 msec

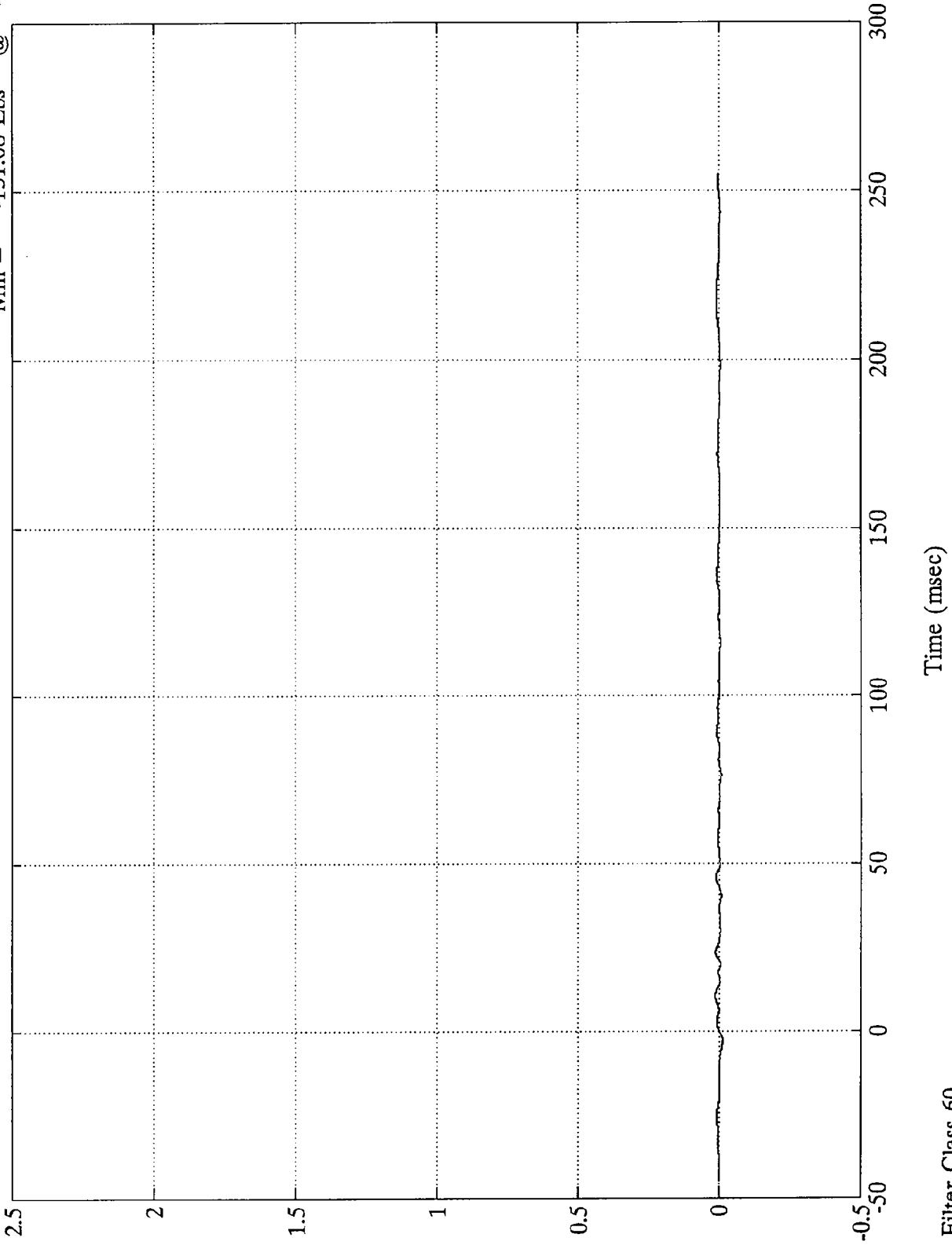


TSC Frontal Barrier - Ford Taurus

Barrier Load Cell A9

Max = 129.62 Lbs @ 10.43 msec  
Min = -131.08 Lbs @ -3.00 msec

$\times 10^4$



11-8  
Lbs

8118-1

SAE Filter Class 60

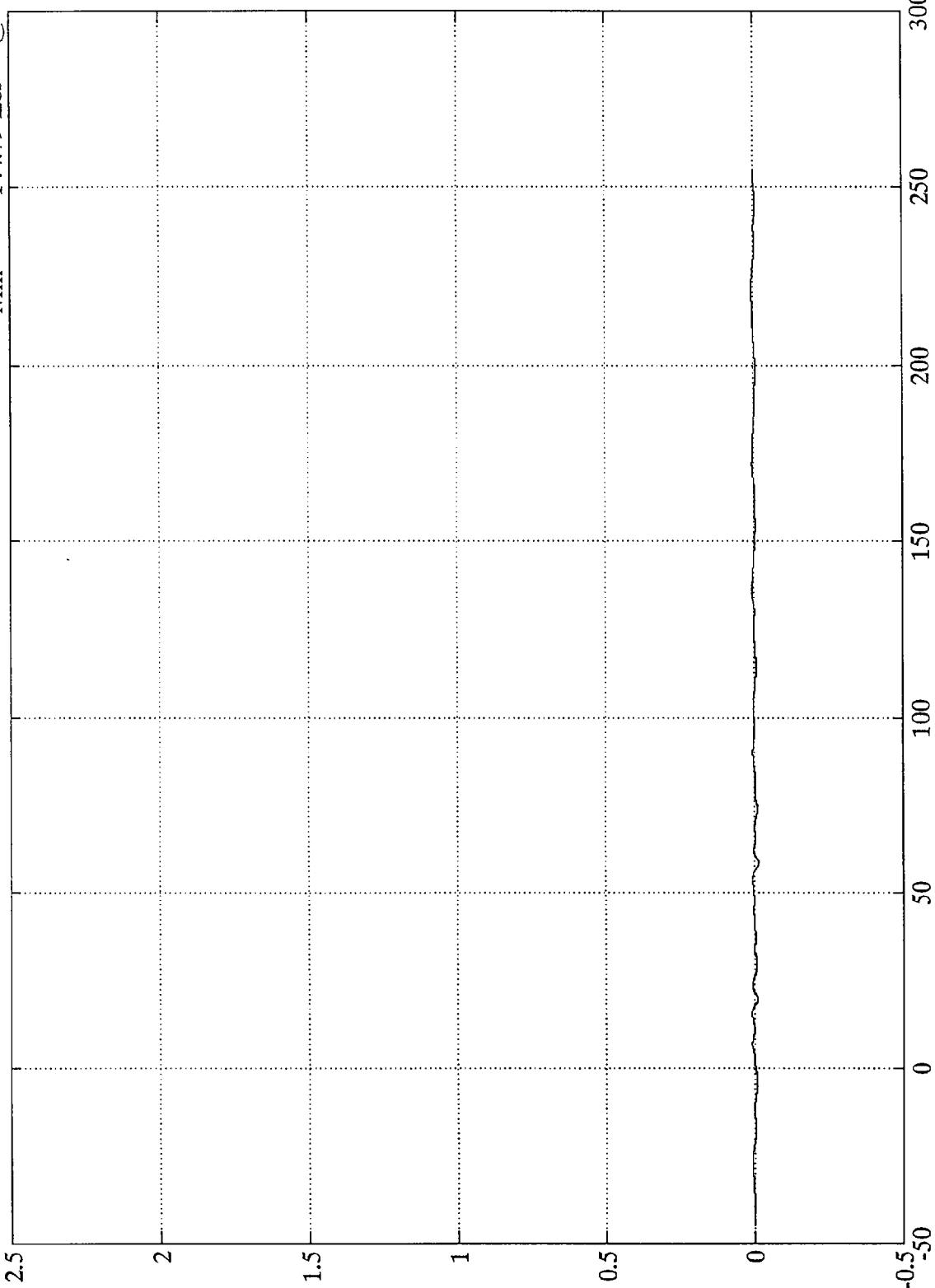
Time (msec)

TSC Frontal Barrier - Ford Taurus

Max = 98.38 Lbs @ 15.11 msec  
Min = -144.79 Lbs @ 58.56 msec

Barrier Load Cell B1

x10<sup>4</sup>



B-12

8118-1

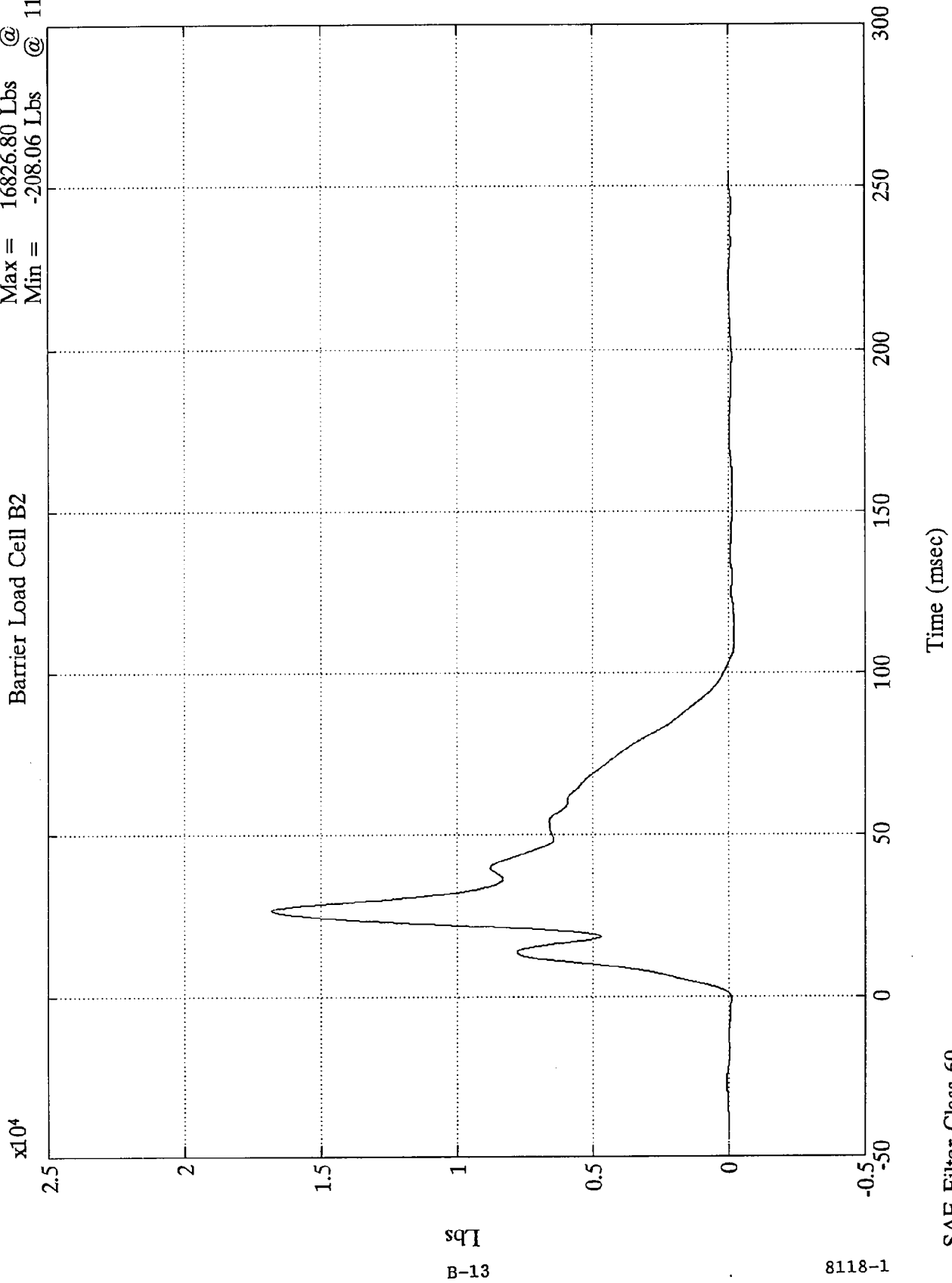
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell B2

Max = 16826.80 Lbs @ 26.51 msec  
Min = -208.06 Lbs @ 114.48 msec

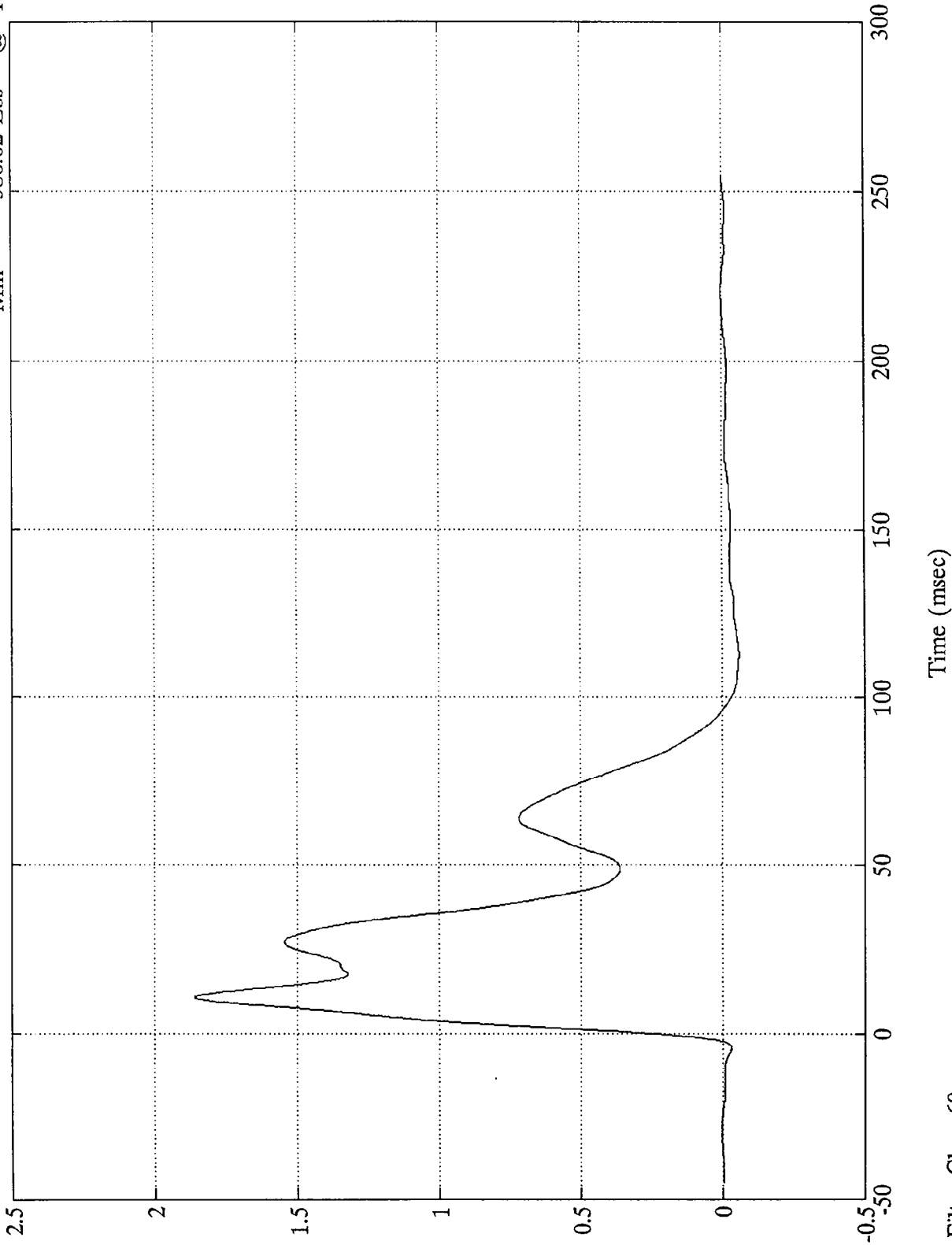


TSC Frontal Barrier - Ford Taurus

$\times 10^4$

Barrier Load Cell B3

Max = 18607.47 Lbs @ 10.67 msec  
Min = -586.02 Lbs @ 112.56 msec



lbs  
B-14

8118-1

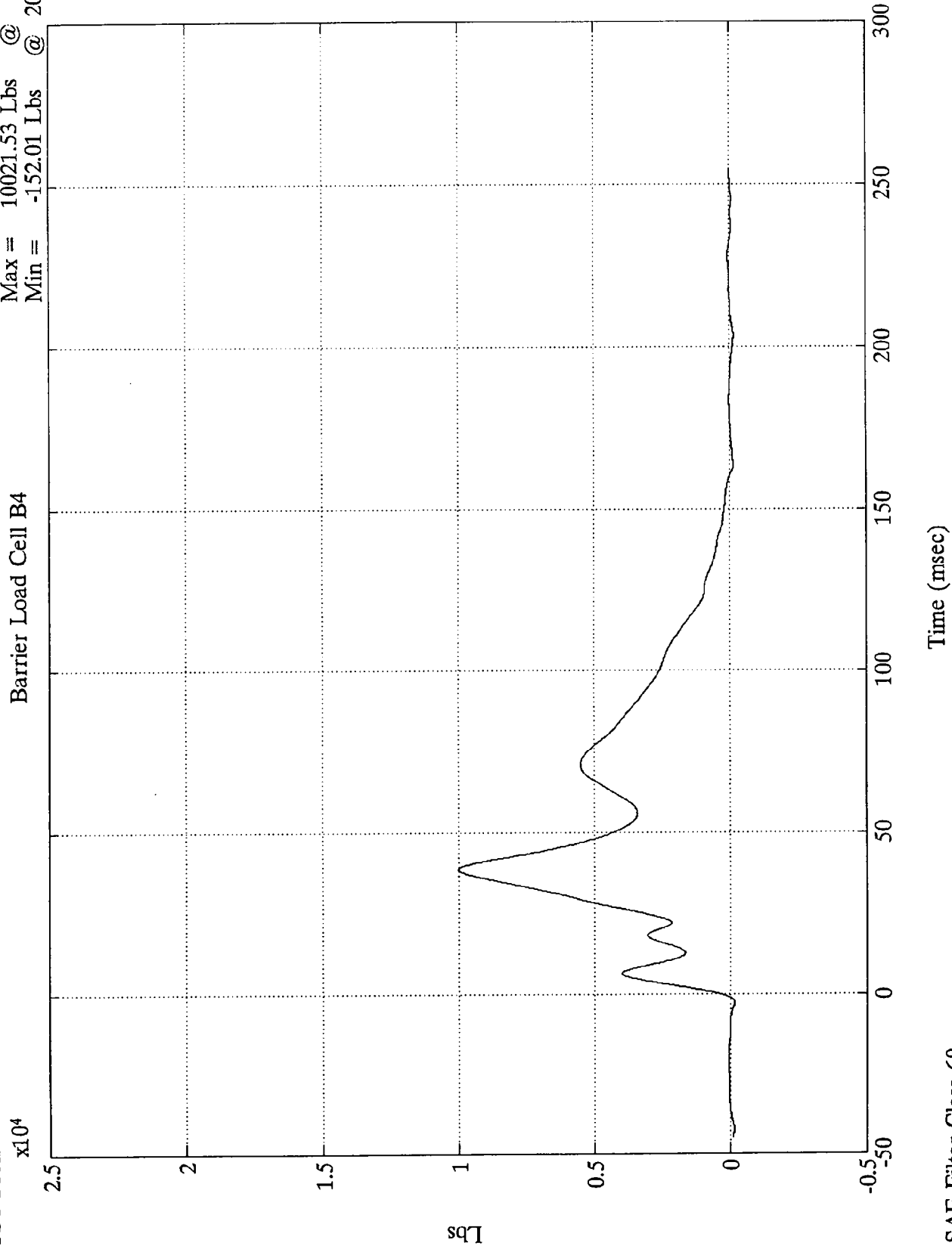
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell B4

Max = 10021.53 Lbs @ 38.52 msec  
Min = -152.01 Lbs @ 203.52 msec



sqI  
B-15

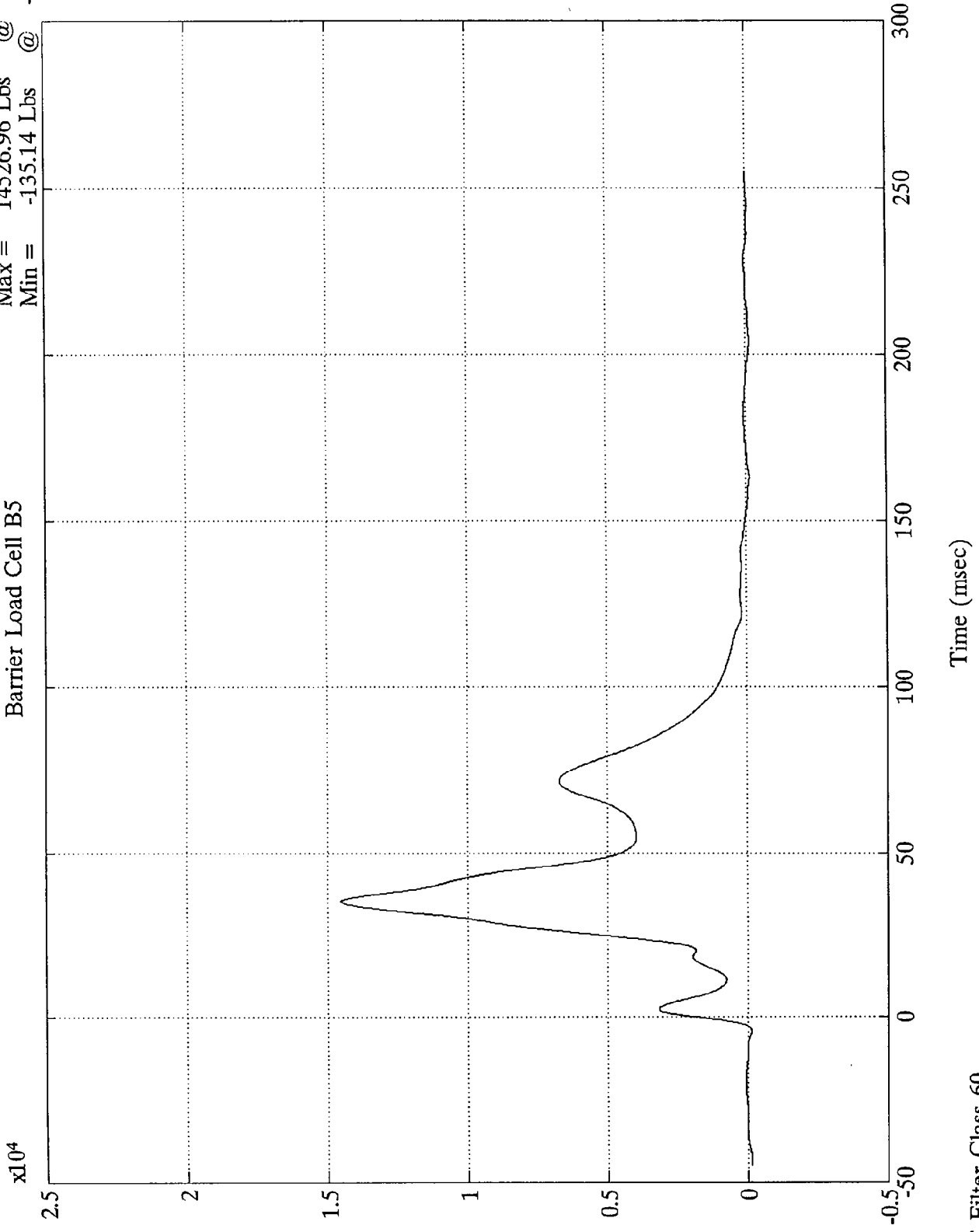
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell B5

Max = 14526.96 Lbs @ 35.39 msec  
Min = -135.14 Lbs @ -4.44 msec



B-16

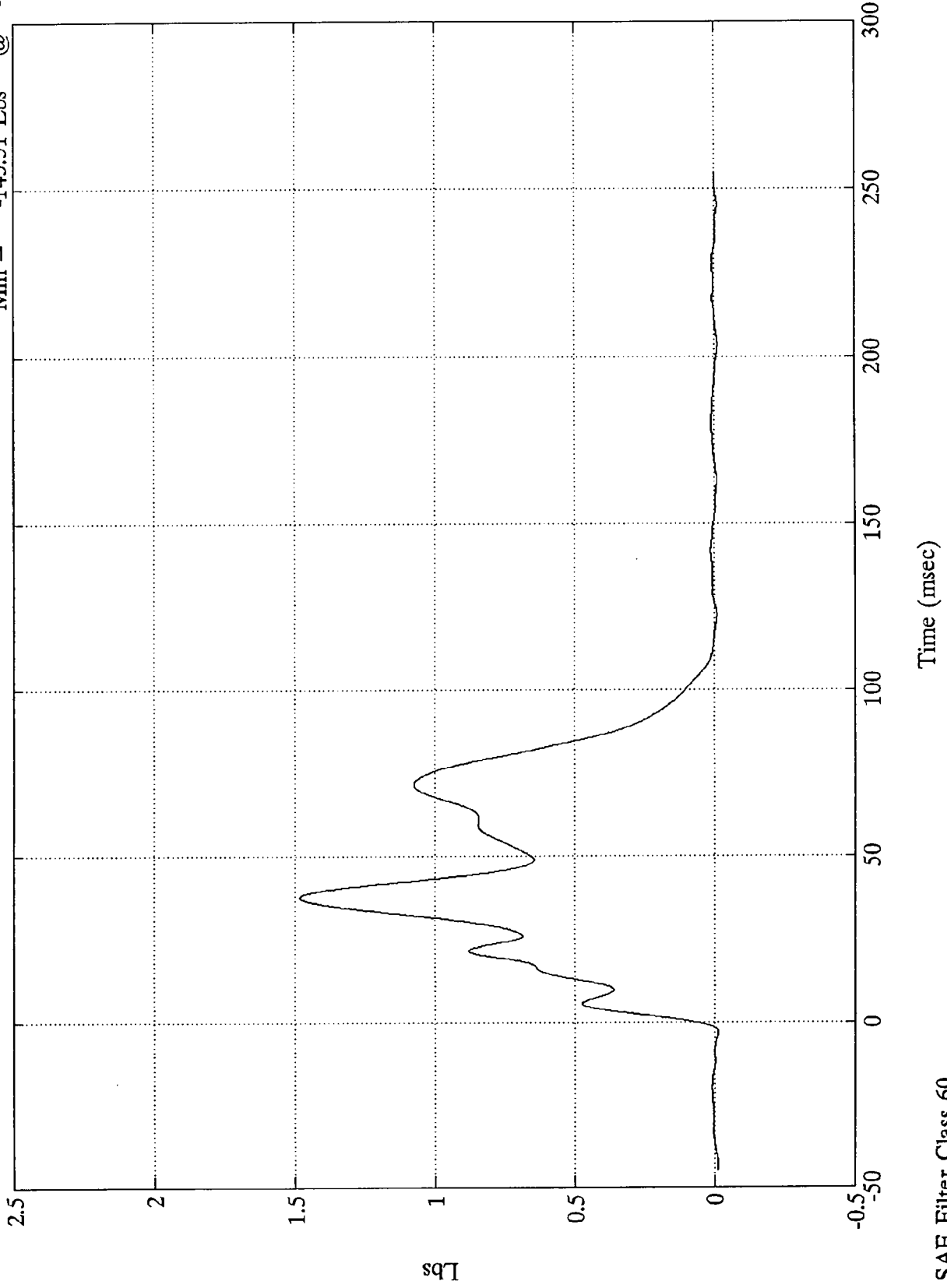
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell B6

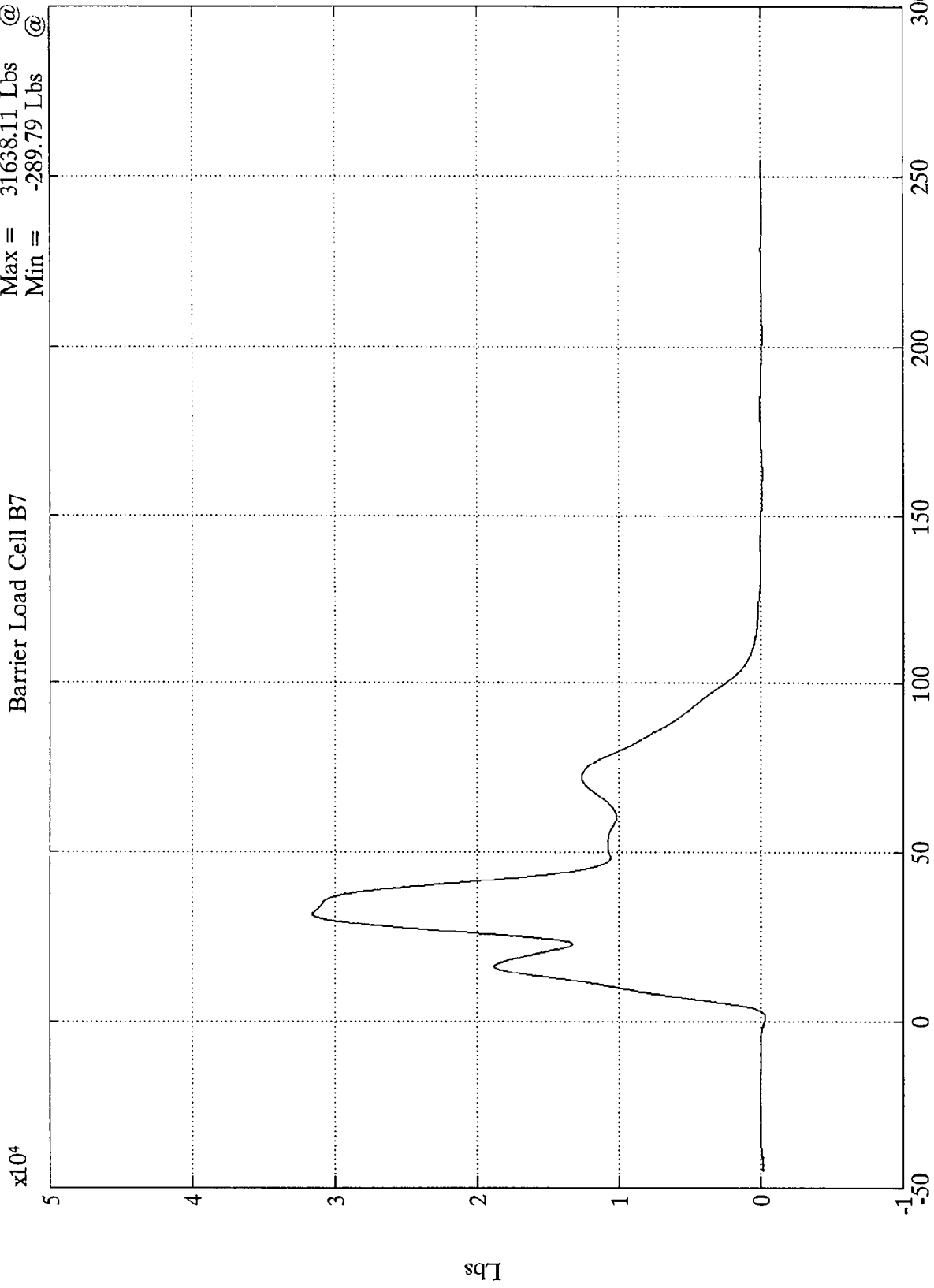
Max = 14824.48 Lbs @ 37.56 msec  
Min = -143.51 Lbs @ -3.12 msec



TSC Frontal Barrier - Ford Taurus

Max = 31638.11 Lbs @ 31.44 msec  
Min = -289.79 Lbs @ 1.07 msec

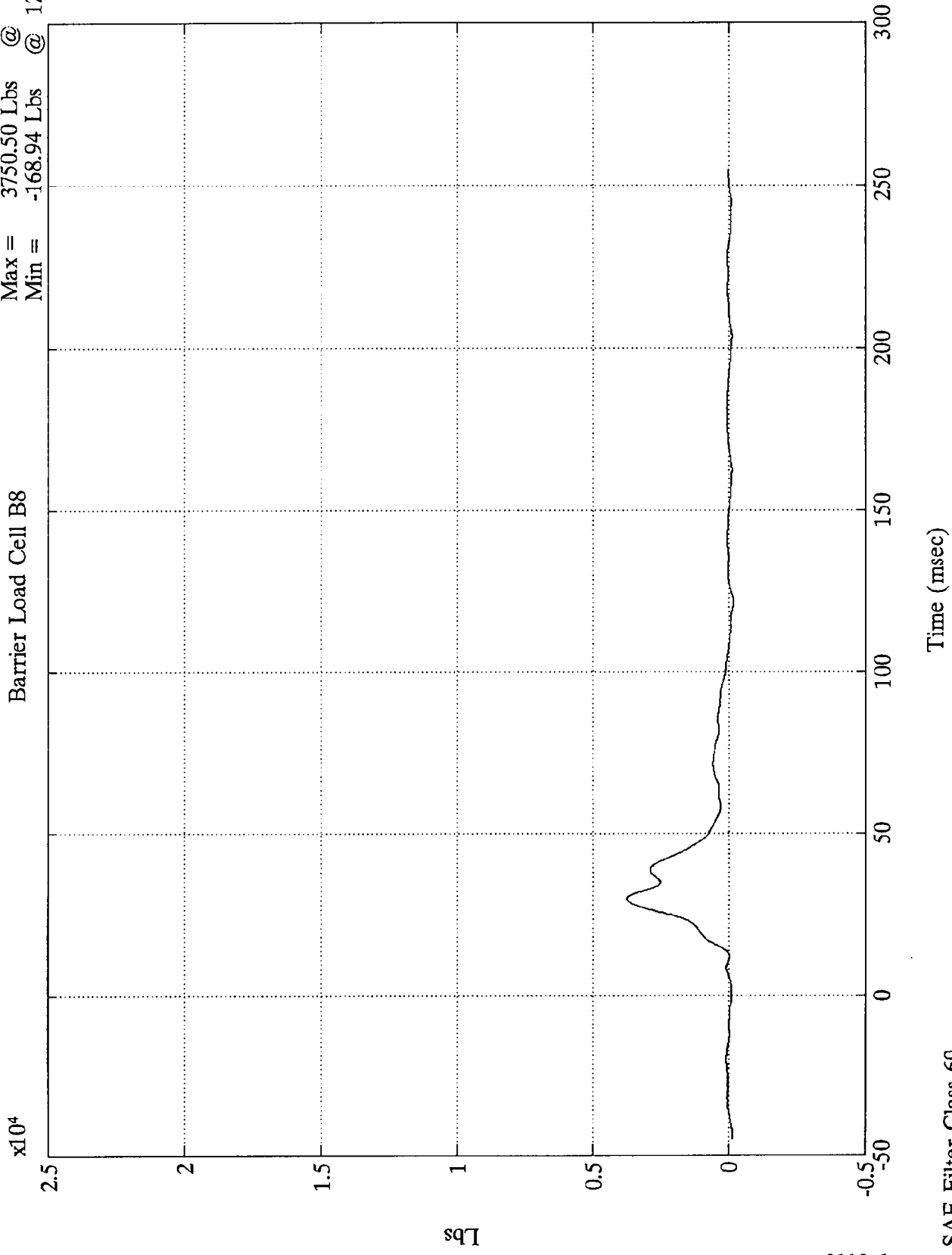
Barrier Load Cell B7



TSC Frontal Barrier - Ford Taurus

Barrier Load Cell B8

Max = 3750.50 Lbs @ 29.76 msec  
Min = -168.94 Lbs @ 121.68 msec



61-18-B

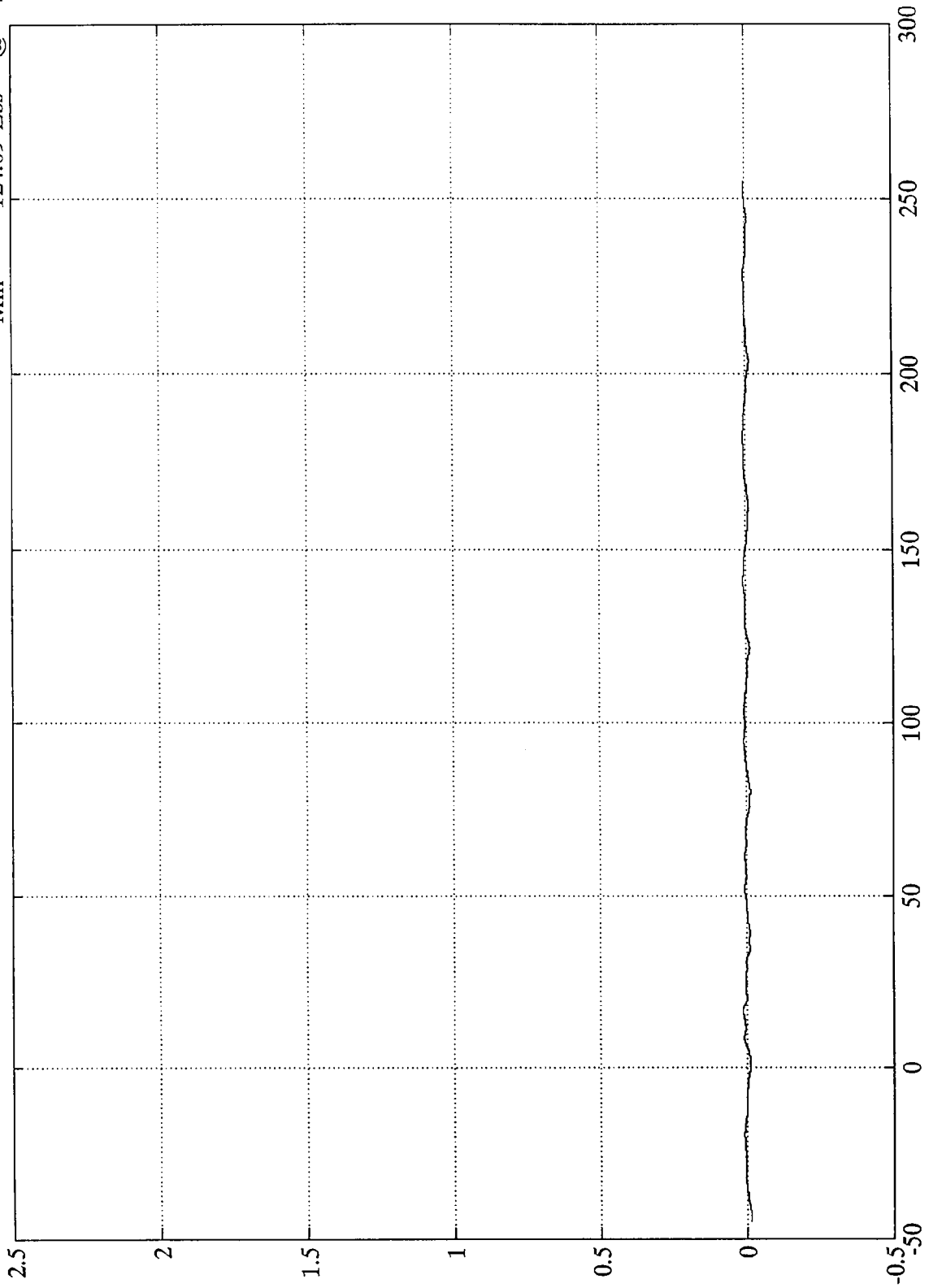
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus  
x10<sup>4</sup>

Barrier Load Cell B9

Max = 132.30 Lbs @ 16.31 msec  
Min = -124.09 Lbs @ -43.08 msec



B-20

8118-1

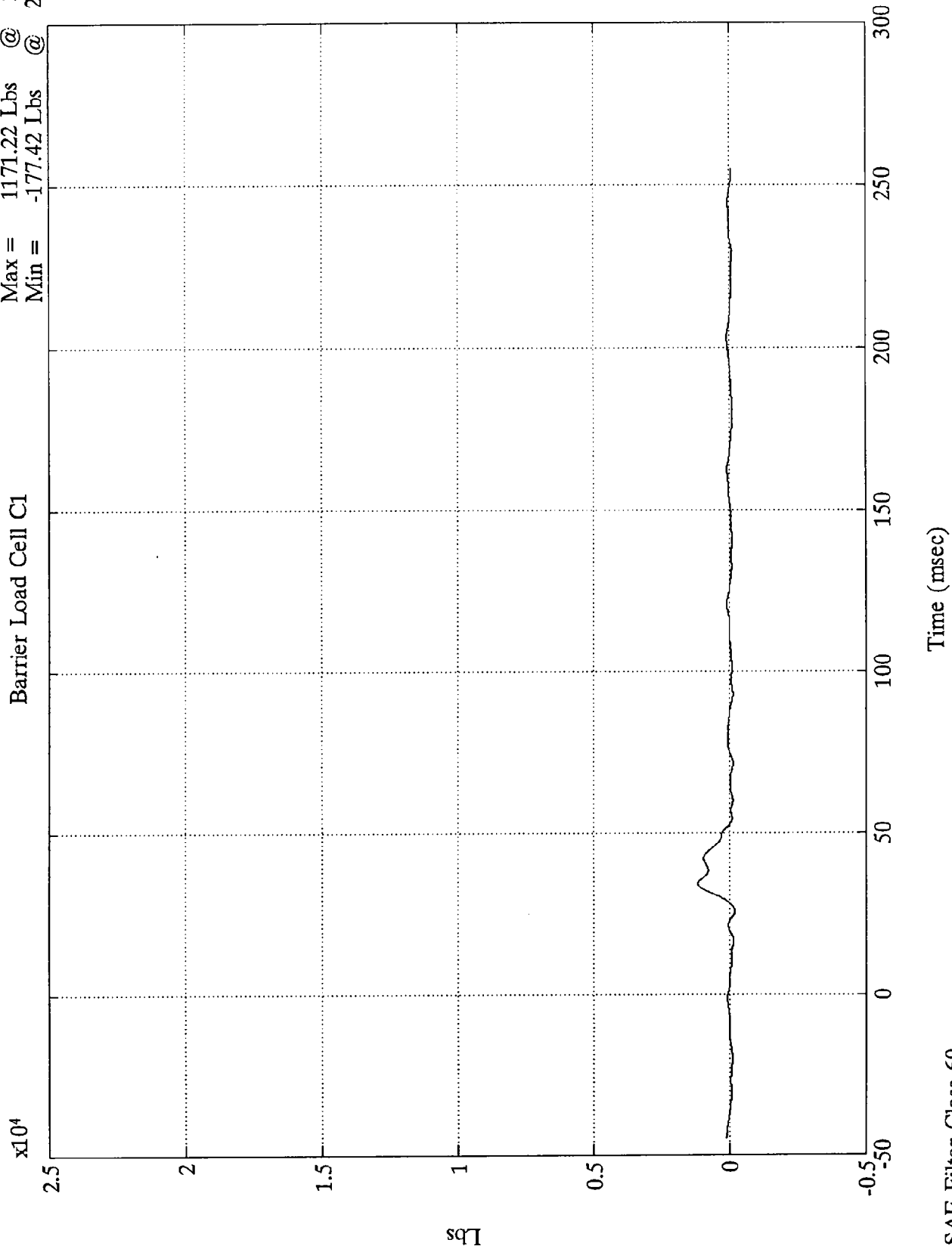
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell C1

Max = 1171.22 Lbs @ 34.20 msec  
Min = -177.42 Lbs @ 25.68 msec



lbs  
B-21

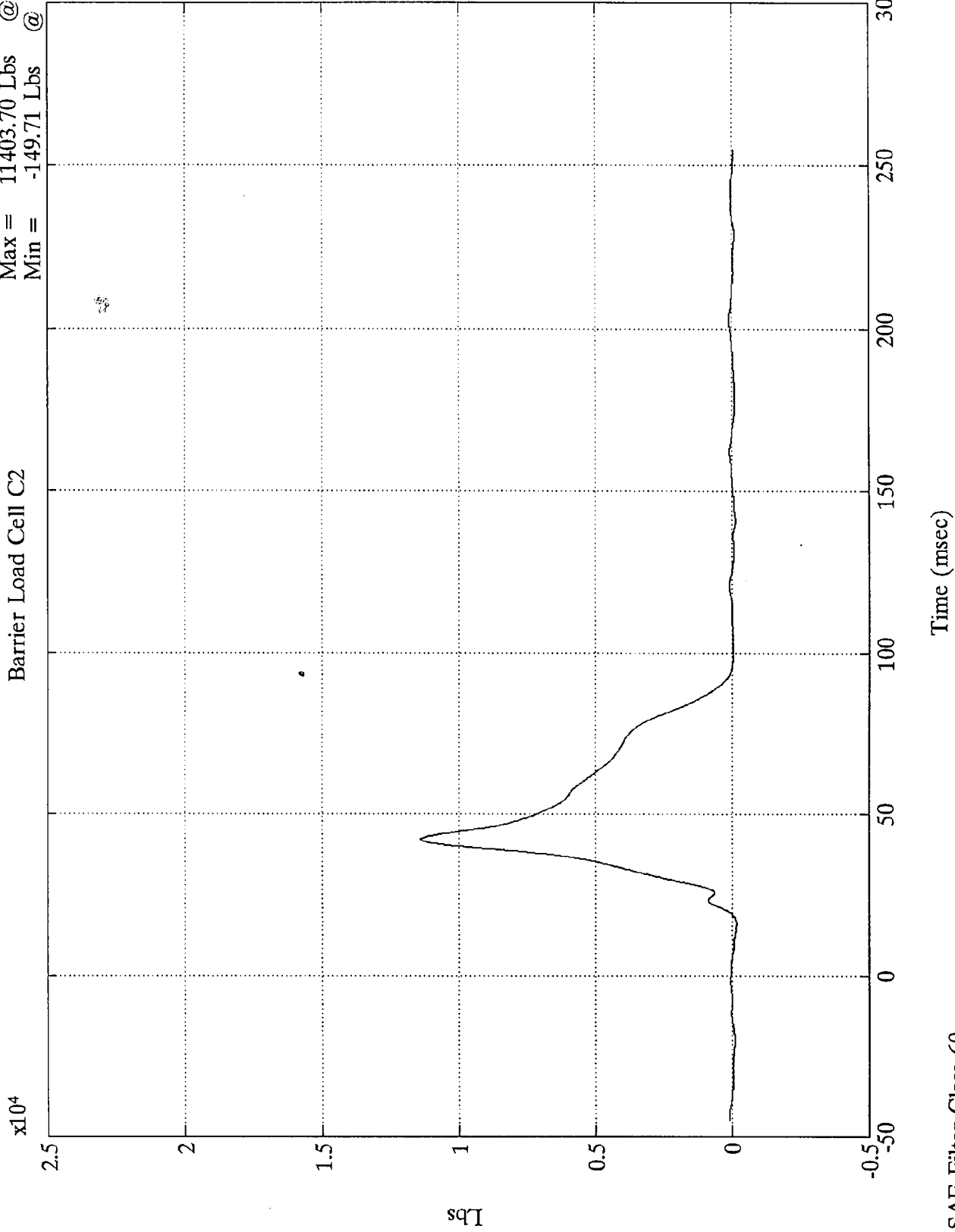
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Max = 11403.70 Lbs @ 41.88 msec  
Min = -149.71 Lbs @ 15.83 msec

Barrier Load Cell C2

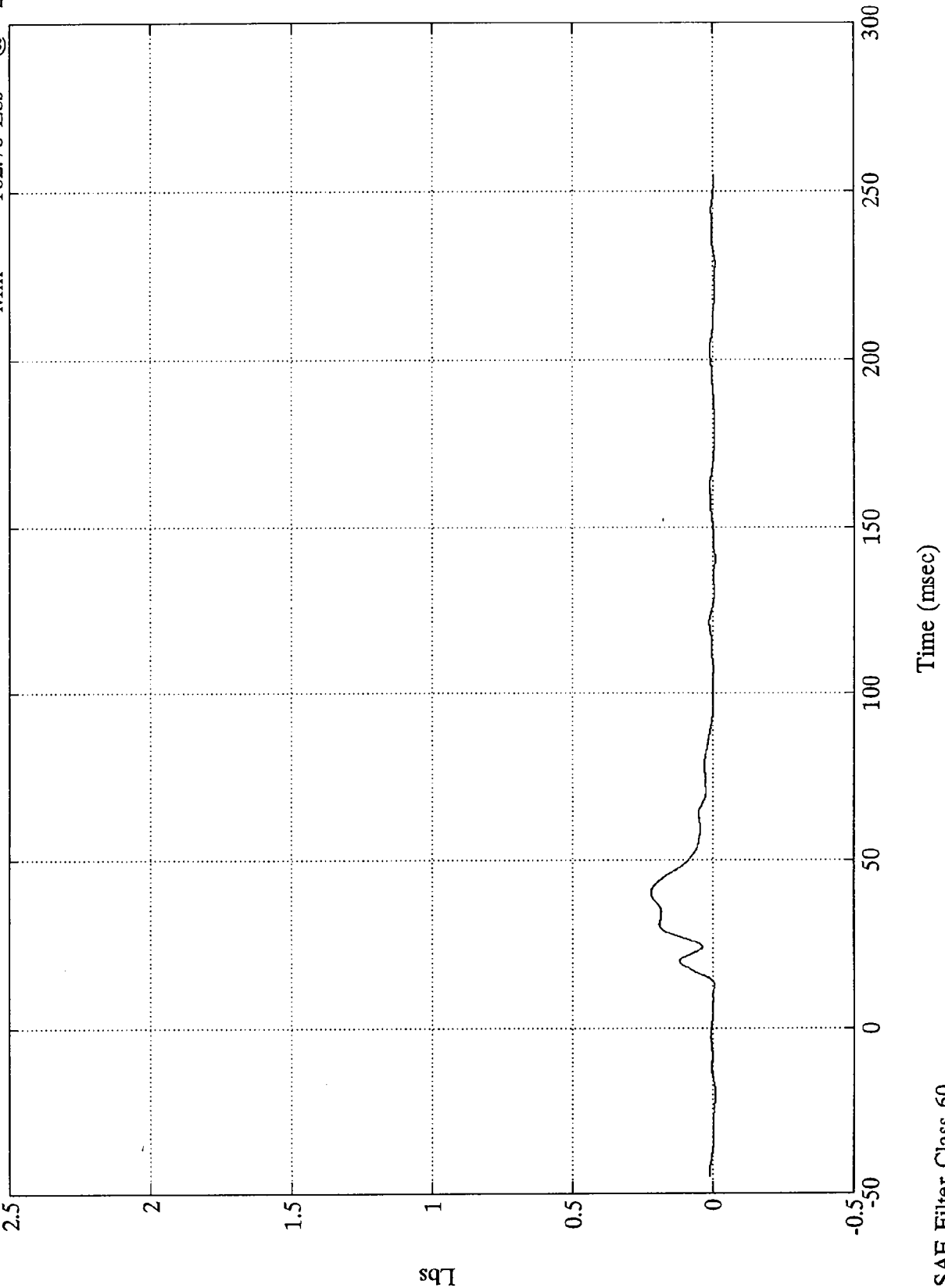


TSC Frontal Barrier - Ford Taurus

Barrier Load Cell C3

Max = 2187.47 Lbs @ 40.19 msec  
Min = -102.70 Lbs @ -20.04 msec

$\times 10^4$



Lbs

Time (msec)

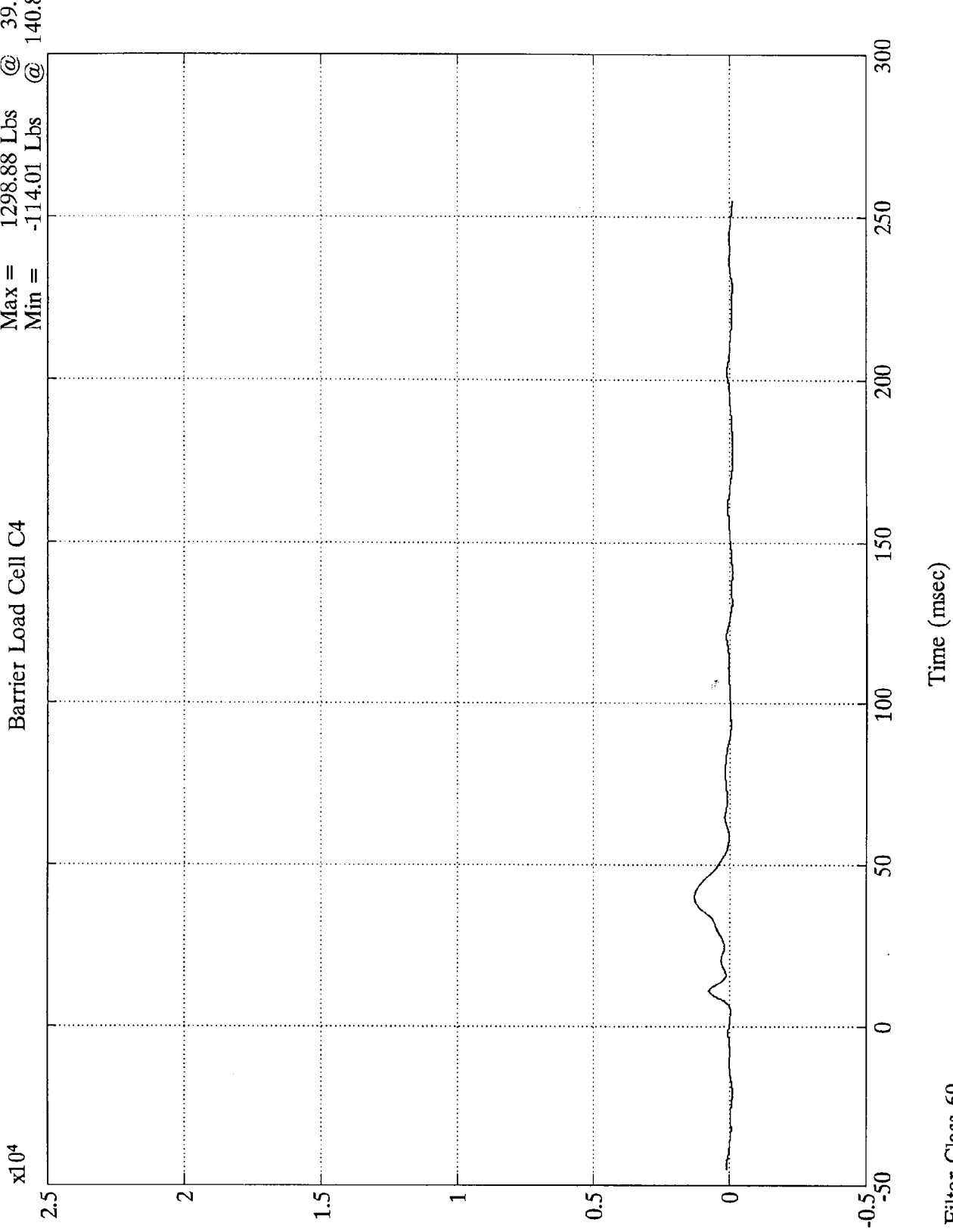
SAE Filter Class 60

8118-1

B-23

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell C4  
Max = 1298.88 Lbs @ 39.95 msec  
Min = -114.01 Lbs @ 140.88 msec

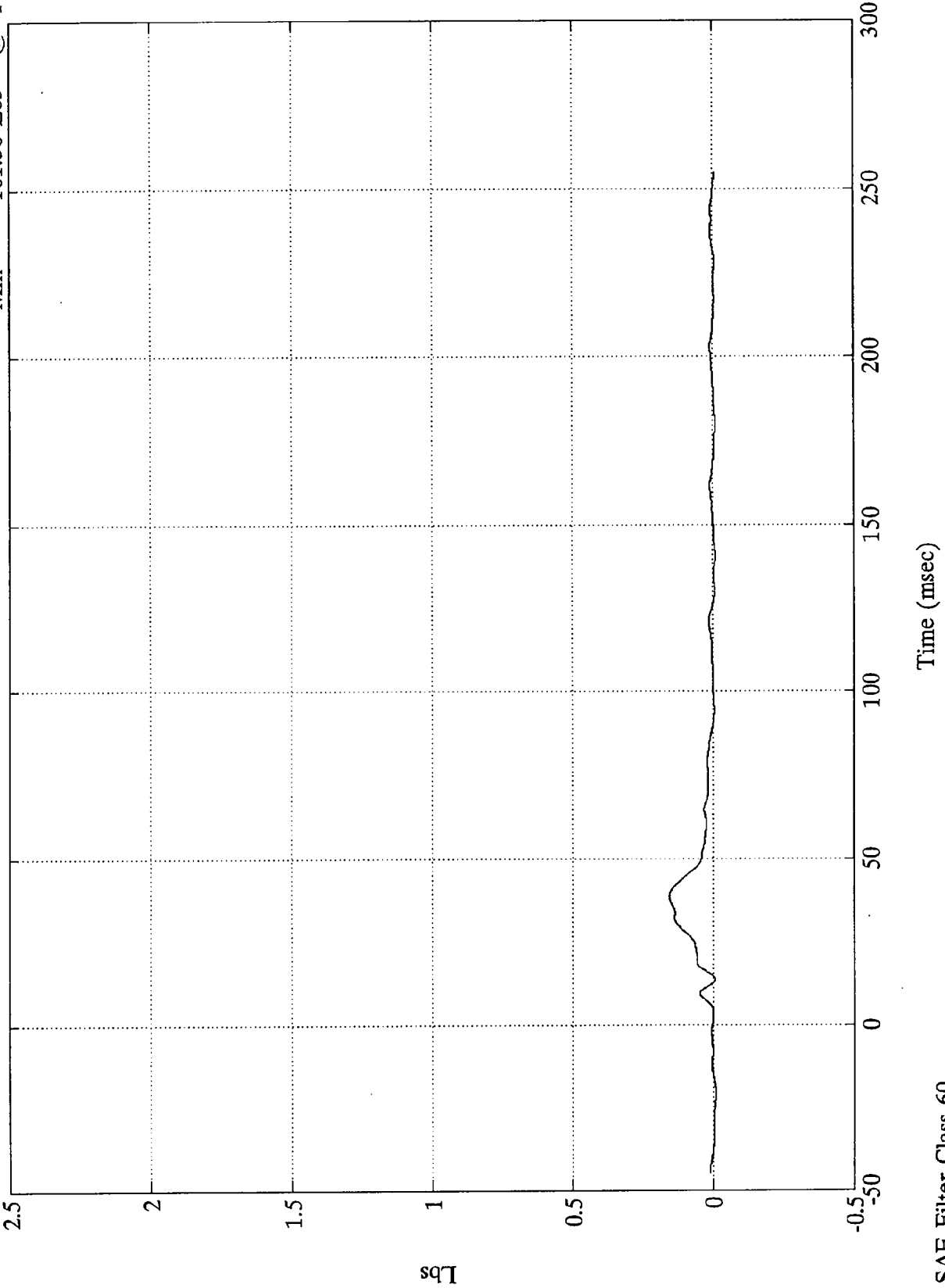


TSC Frontal Barrier - Ford Taurus

Barrier Load Cell C5

Max = 1559.19 Lbs @ 38.27 msec  
Min = -101.36 Lbs @ 140.76 msec

$\times 10^4$

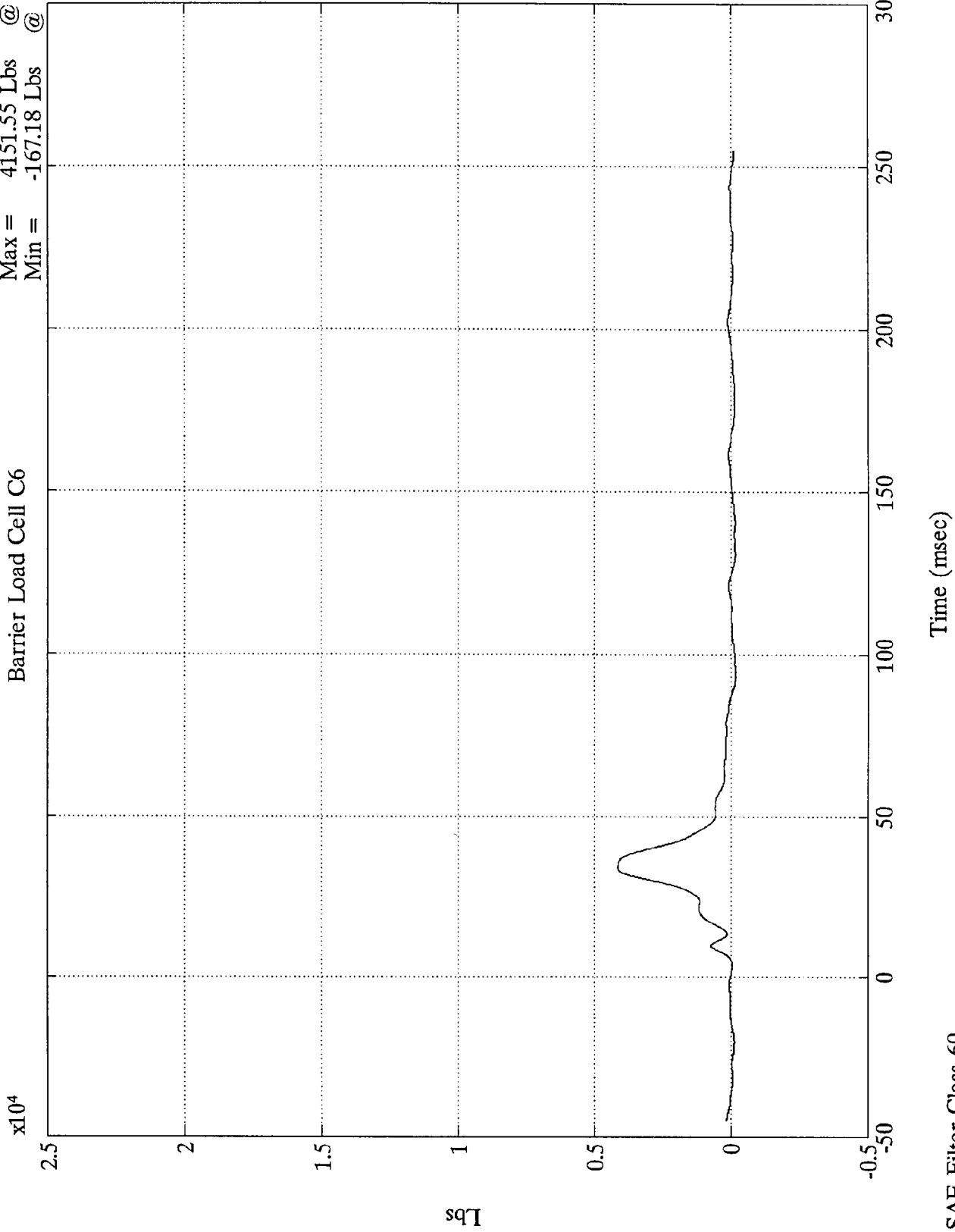


Lbs

Time (msec)

TSC Frontal Barrier - Ford Taurus

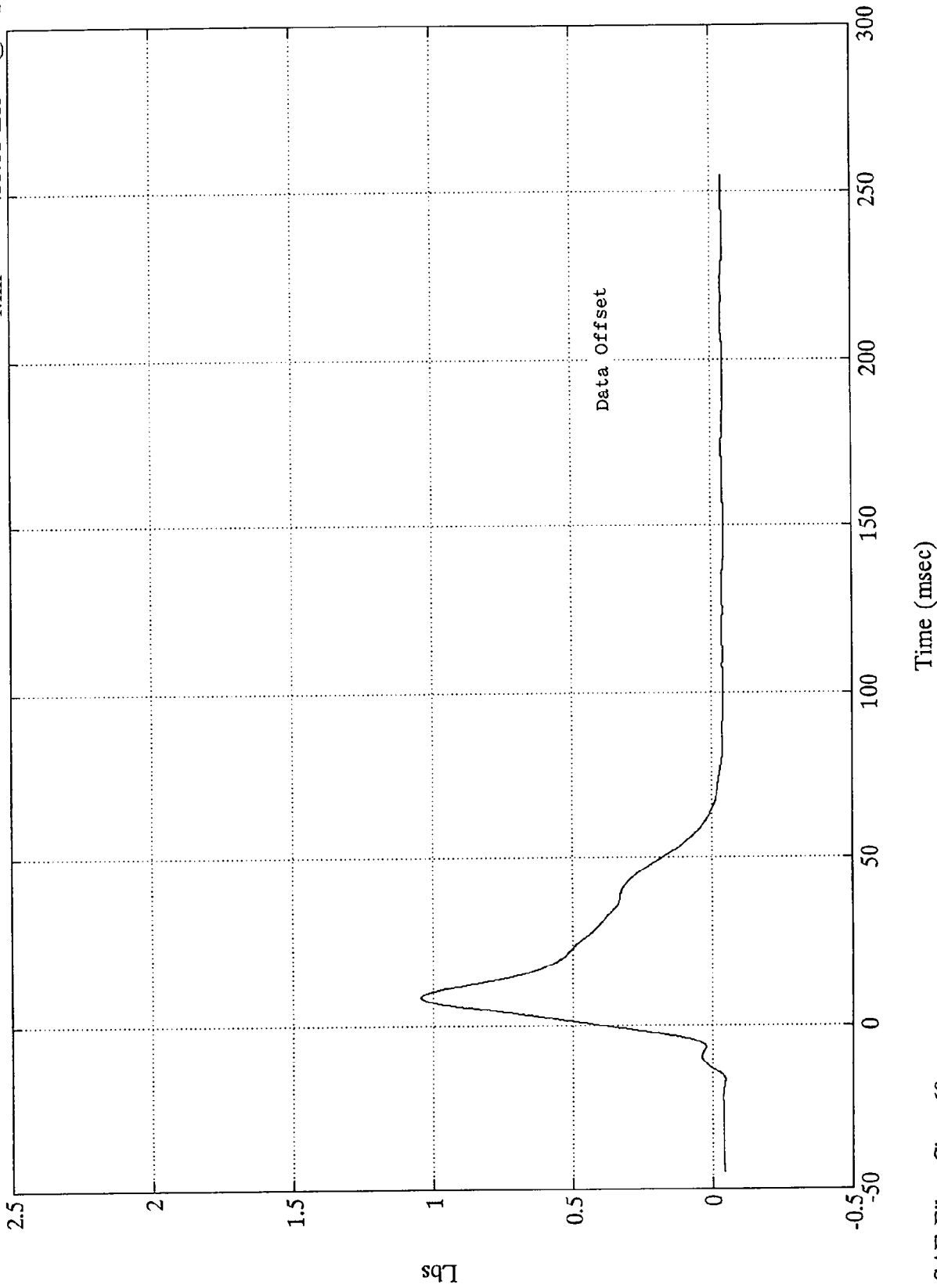
Barrier Load Cell C6  
Max = 4151.55 Lbs @ 33.84 msec  
Min = -167.18 Lbs @ 94.31 msec



TSC Frontal Barrier - Ford Taurus  
x10<sup>4</sup>

Barrier Load Cell C7

Max = 10431.31 Lbs @ 8.27 msec  
Min = -453.68 Lbs @ -16.68 msec

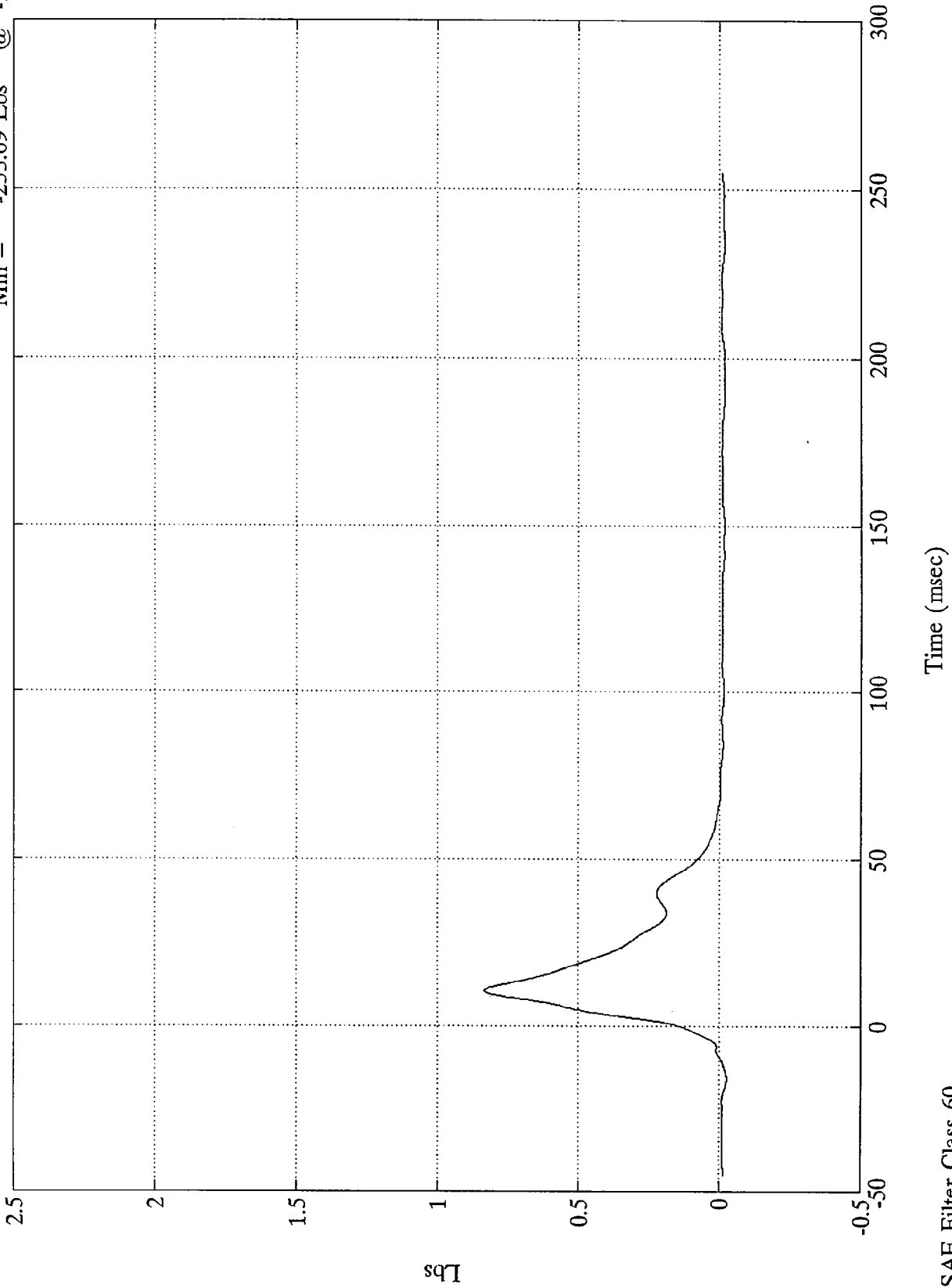


TSC Frontal Barrier - Ford Taurus

$\times 10^4$

Barrier Load Cell C8

Max = 8347.42 Lbs @ 10.43 msec  
Min = -253.09 Lbs @ -15.84 msec



Lbs

B-28

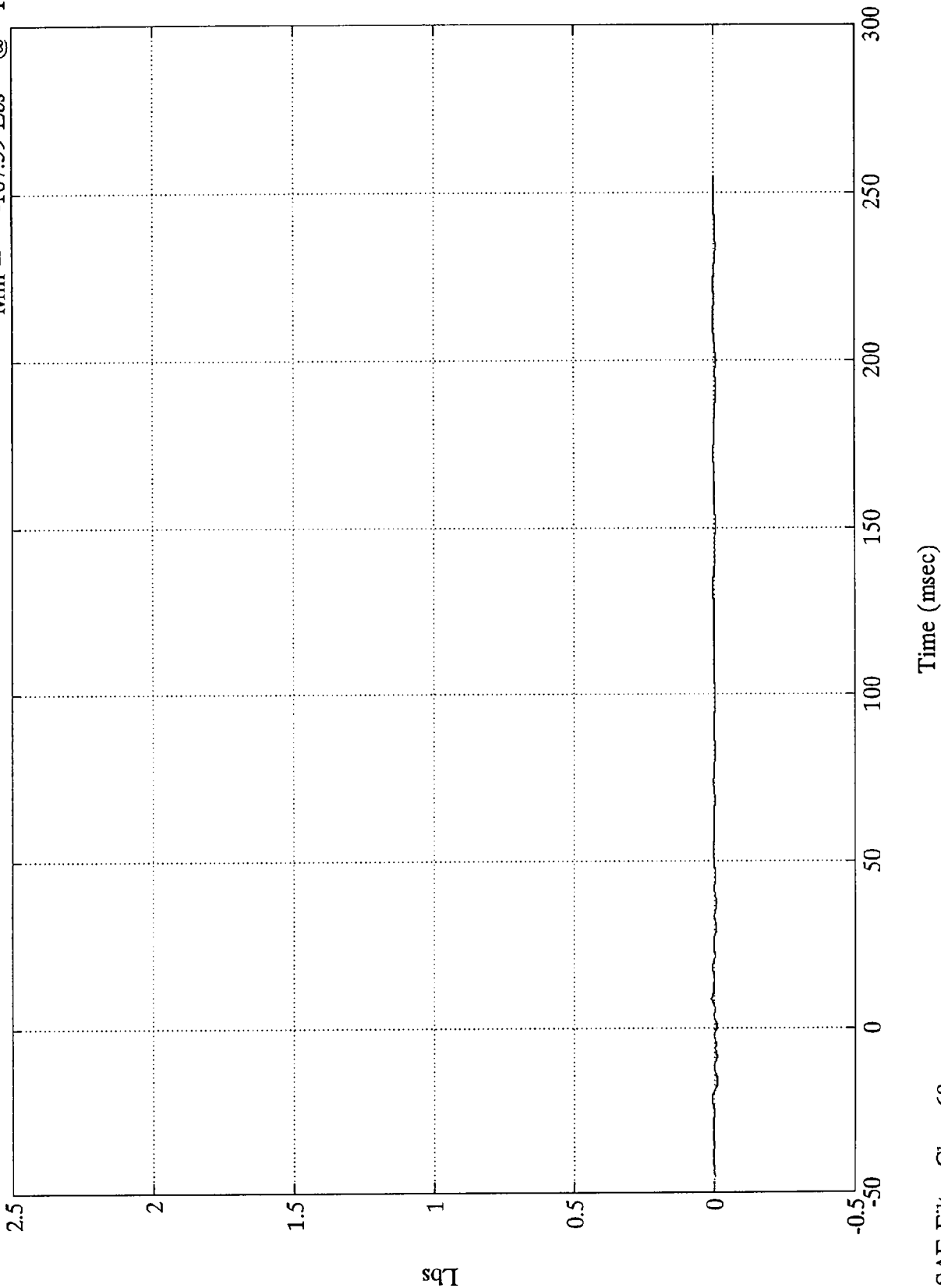
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell C9

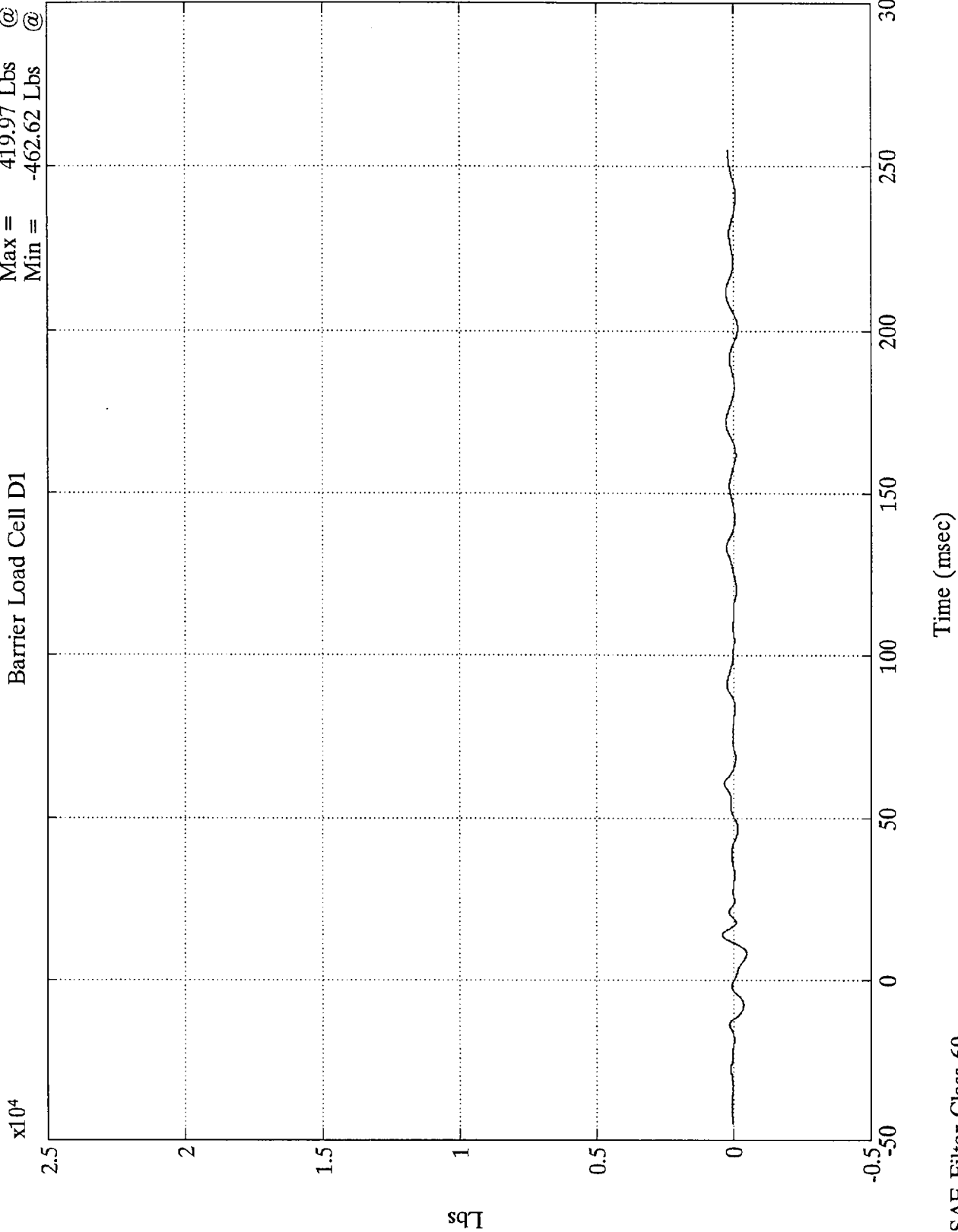
Max = 92.09 Lbs @ 8.63 msec  
Min = -107.39 Lbs @ -16.44 msec



TSC Frontal Barrier - Ford Taurus

Max = 419.97 Lbs @ 13.67 msec  
Min = -462.62 Lbs @ 8.03 msec

Barrier Load Cell D1



B-30

8118-1

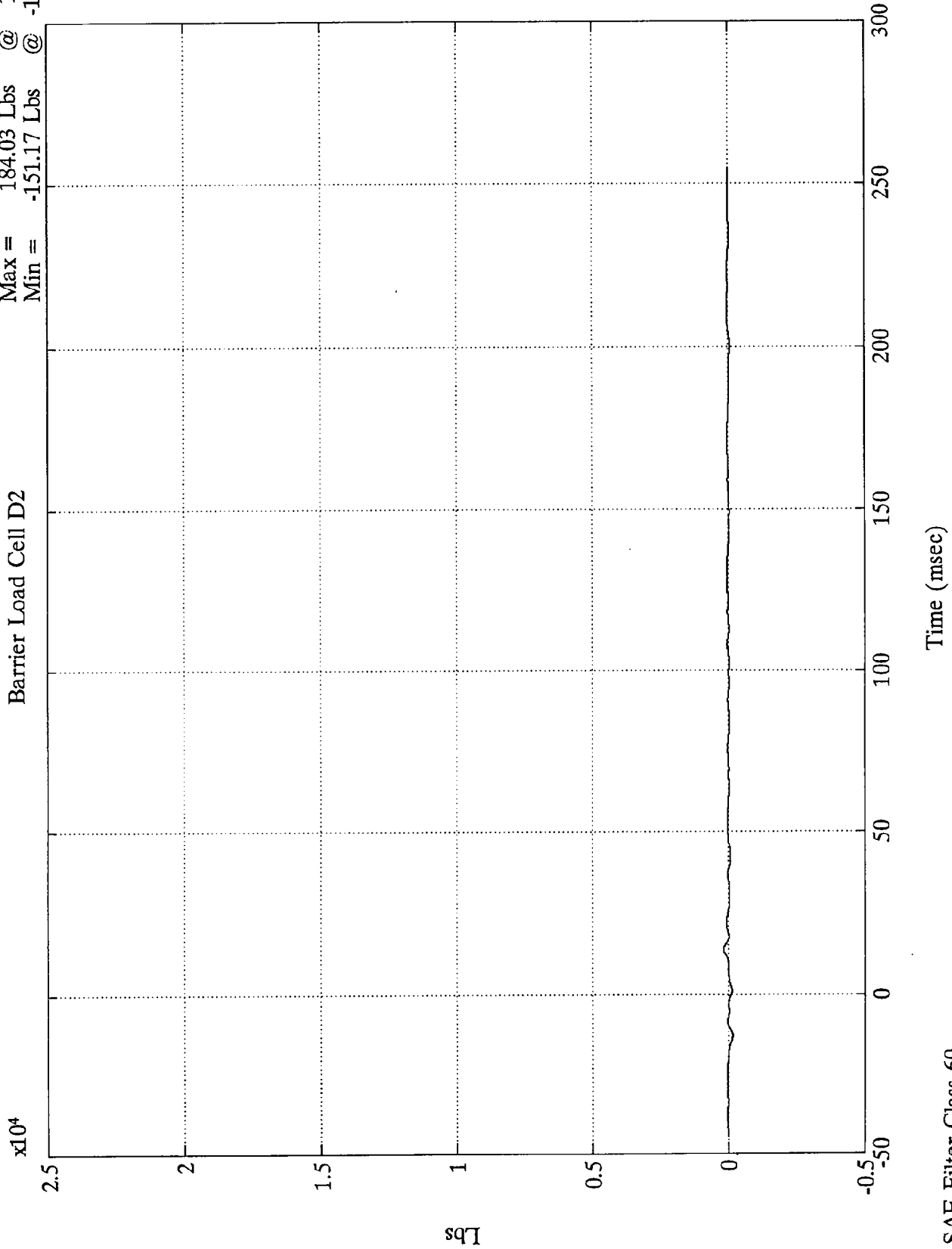
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell D2

Max = 184.03 Lbs @ 13.55 msec  
Min = -151.17 Lbs @ -13.08 msec



B-31  
Lbs

8118-1

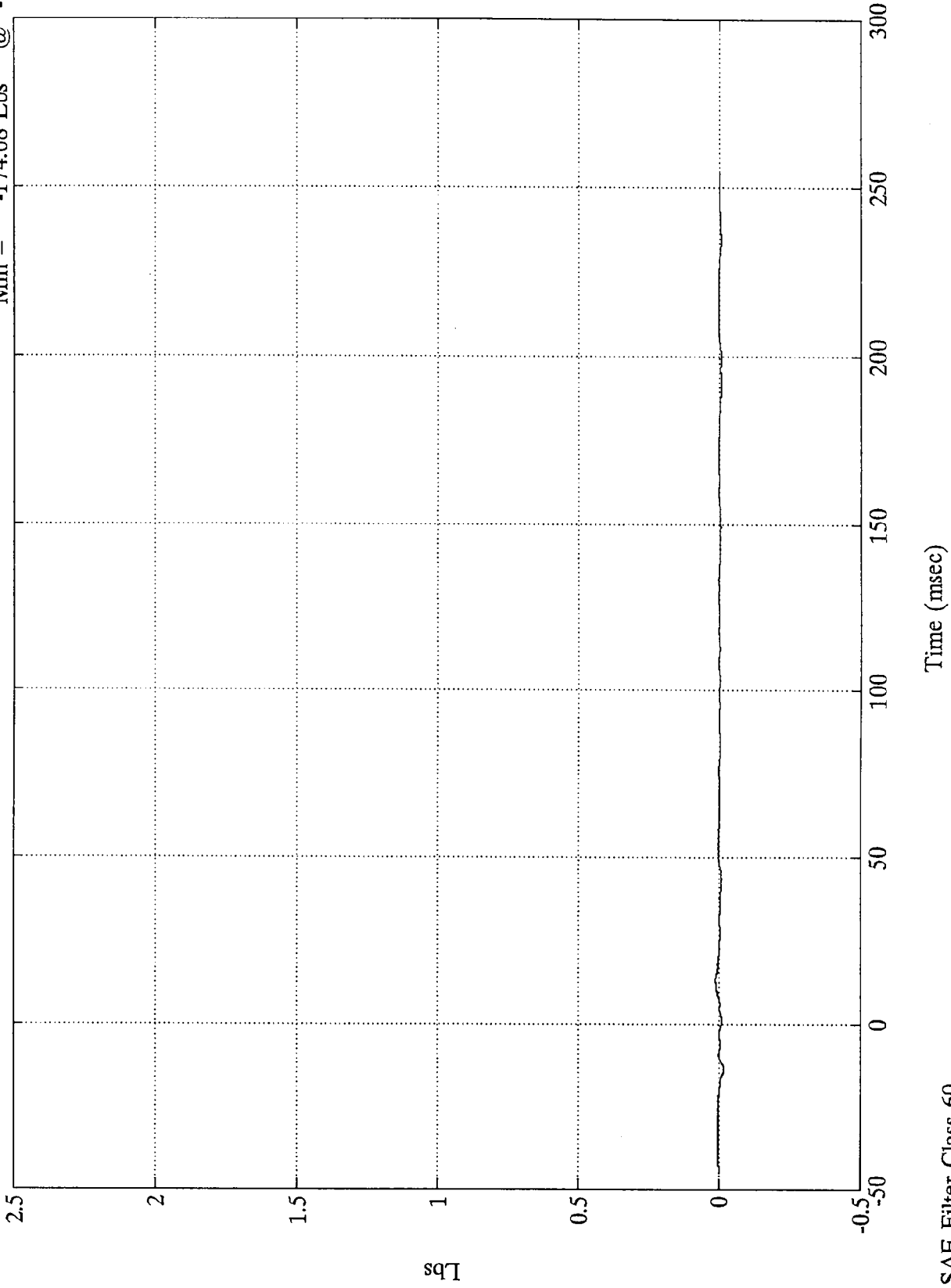
SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

$\times 10^4$

Barrier Load Cell D3

Max = 126.45 Lbs @ 12.95 msec  
Min = -174.08 Lbs @ -13.56 msec



B-32

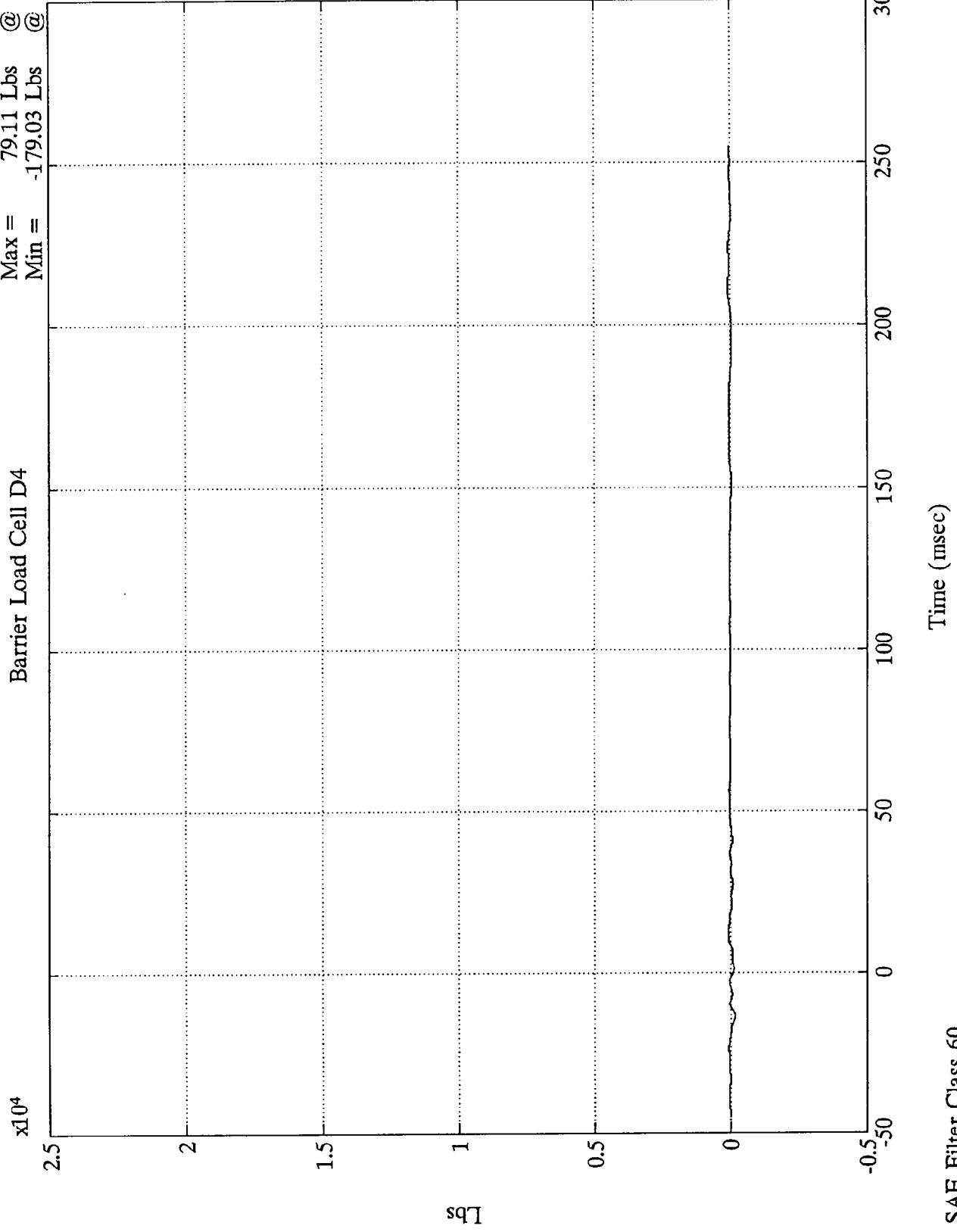
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell D4

Max = 79.11 Lbs @ 10.55 msec  
Min = -179.03 Lbs @ -13.68 msec



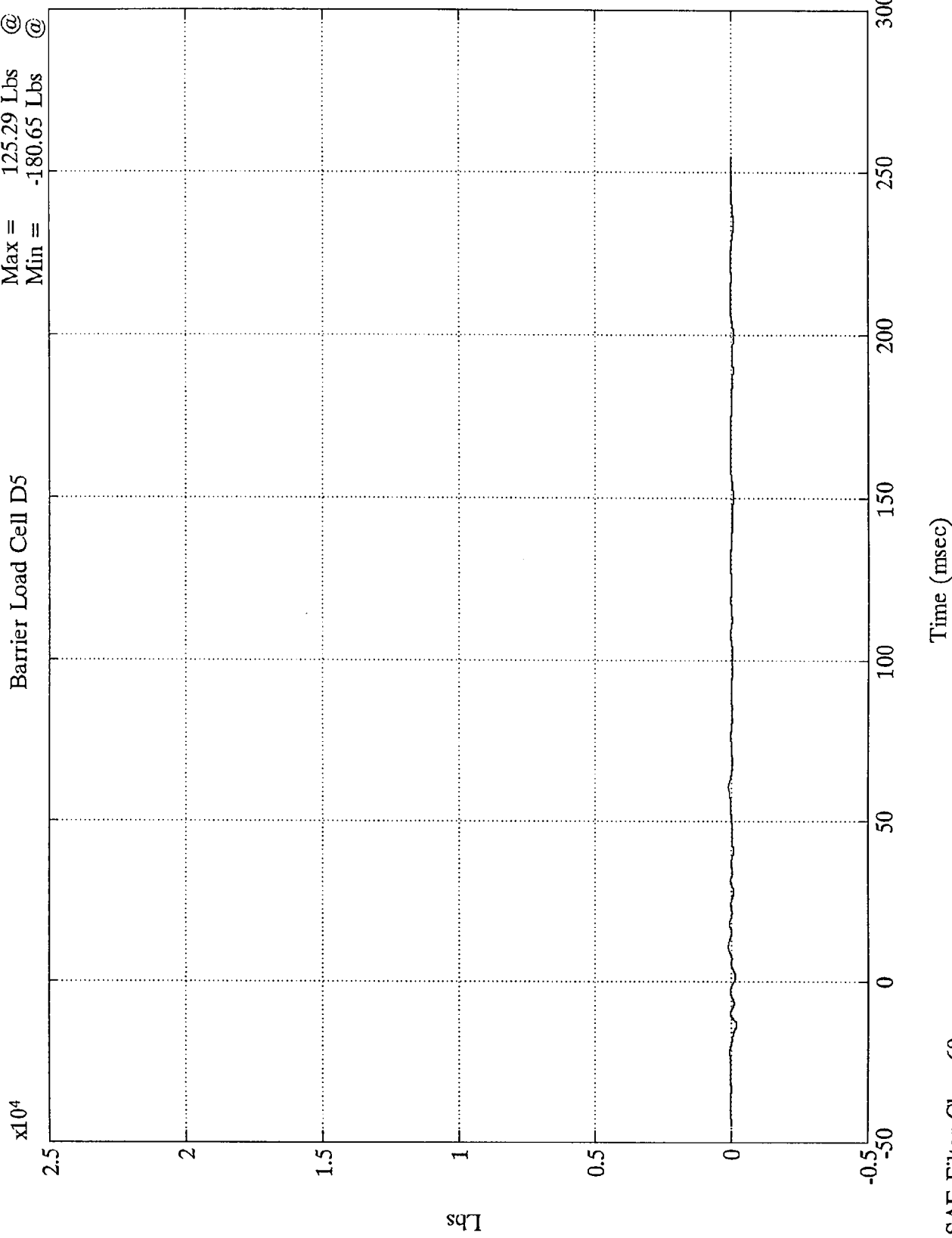
B-33

8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Barrier Load Cell D5  
Max = 125.29 Lbs @ 10.55 msec  
Min = -180.65 Lbs @ -13.56 msec

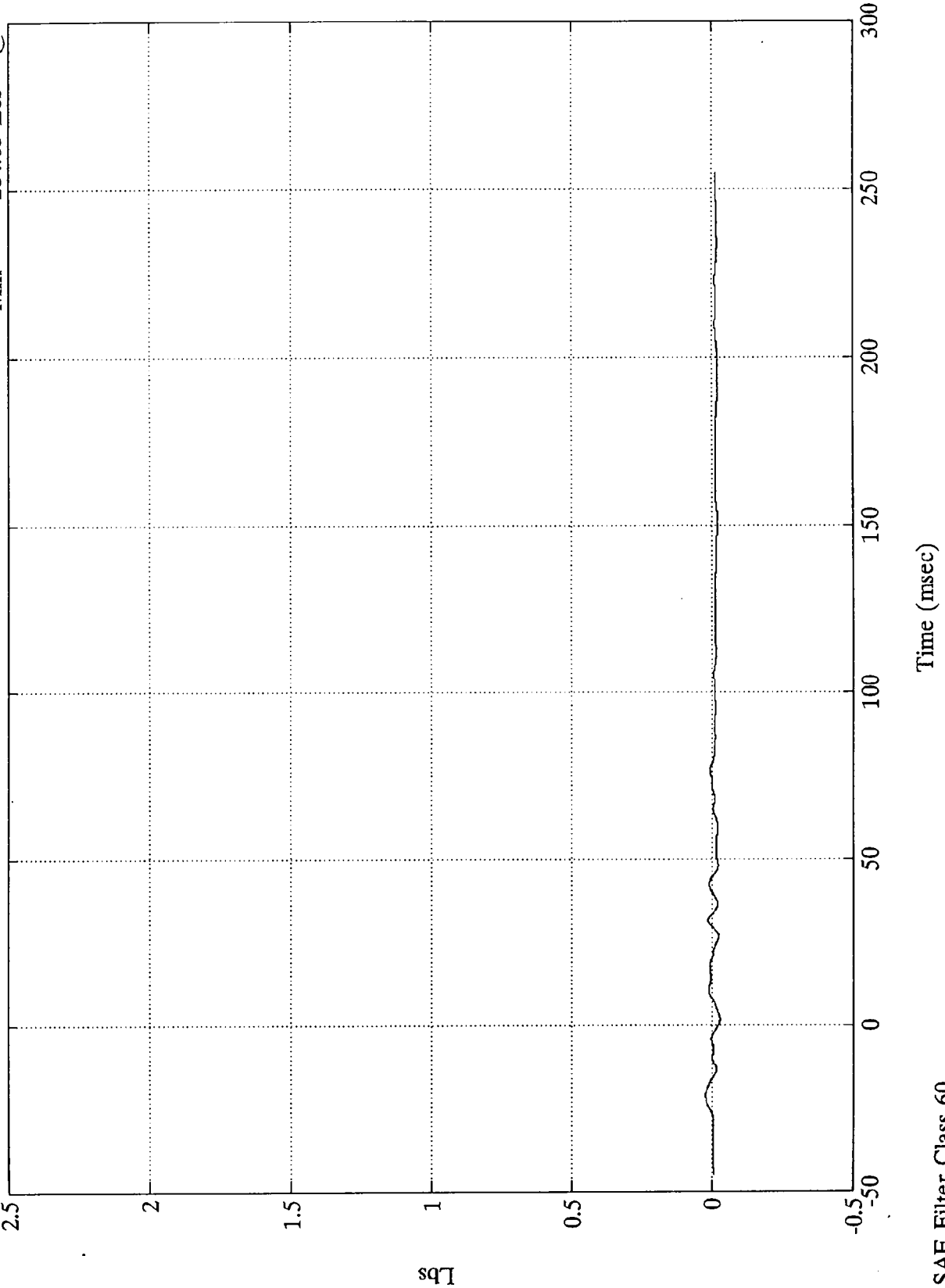


TSC Frontal Barrier - Ford Taurus

Barrier Load Cell D6

Max = 228.00 Lbs @ -21.12 msec  
Min = -284.03 Lbs @ 1.55 msec

$\times 10^4$



B-35

8118-1

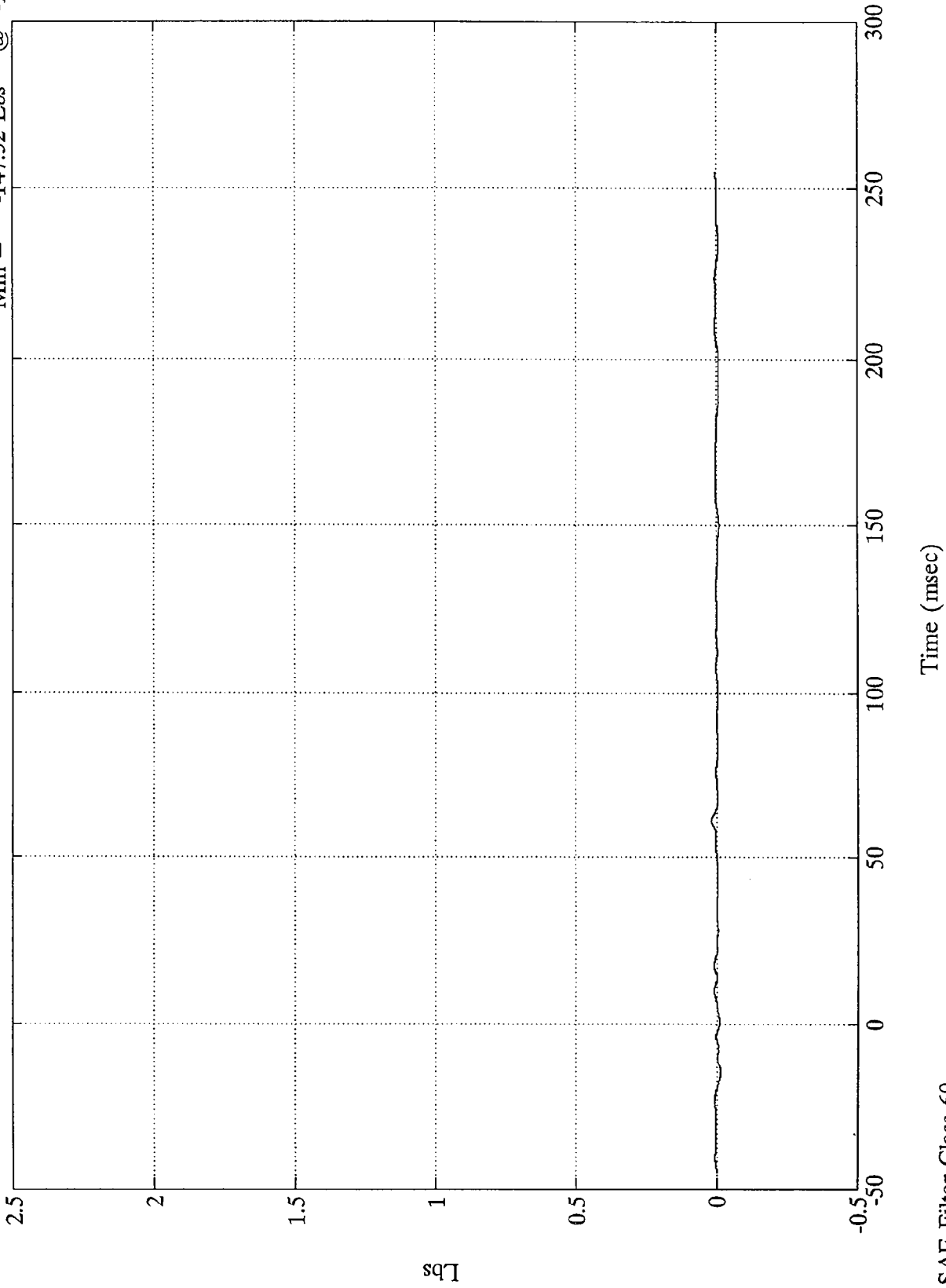
SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

$\times 10^4$

Barrier Load Cell D7

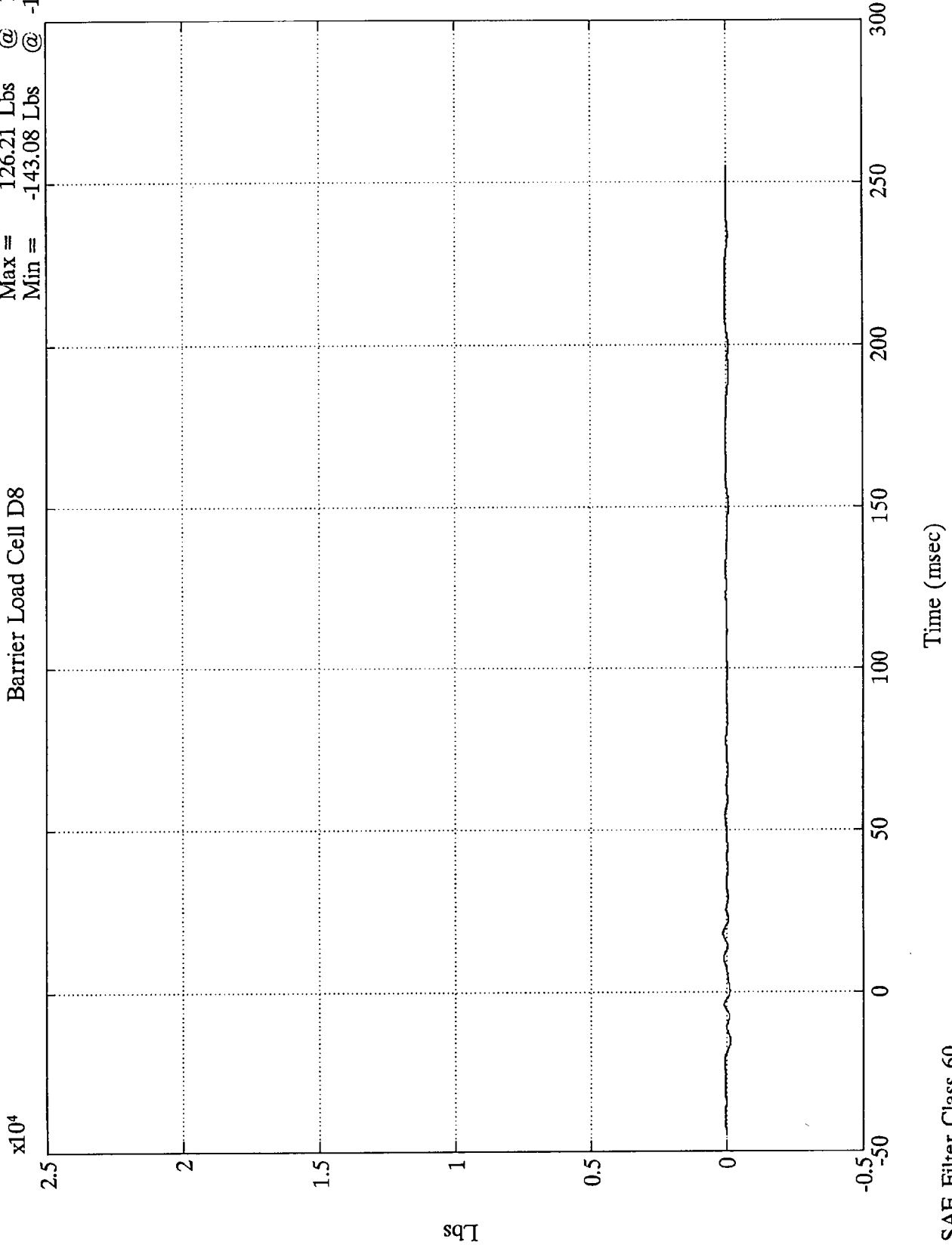
Max = 192.31 Lbs @ 60.84 msec  
Min = -147.32 Lbs @ -14.52 msec



TSC Frontal Barrier - Ford Taurus

Barrier Load Cell D8

Max = 126.21 Lbs @ 18.00 msec  
Min = -143.08 Lbs @ -15.60 msec



B-37

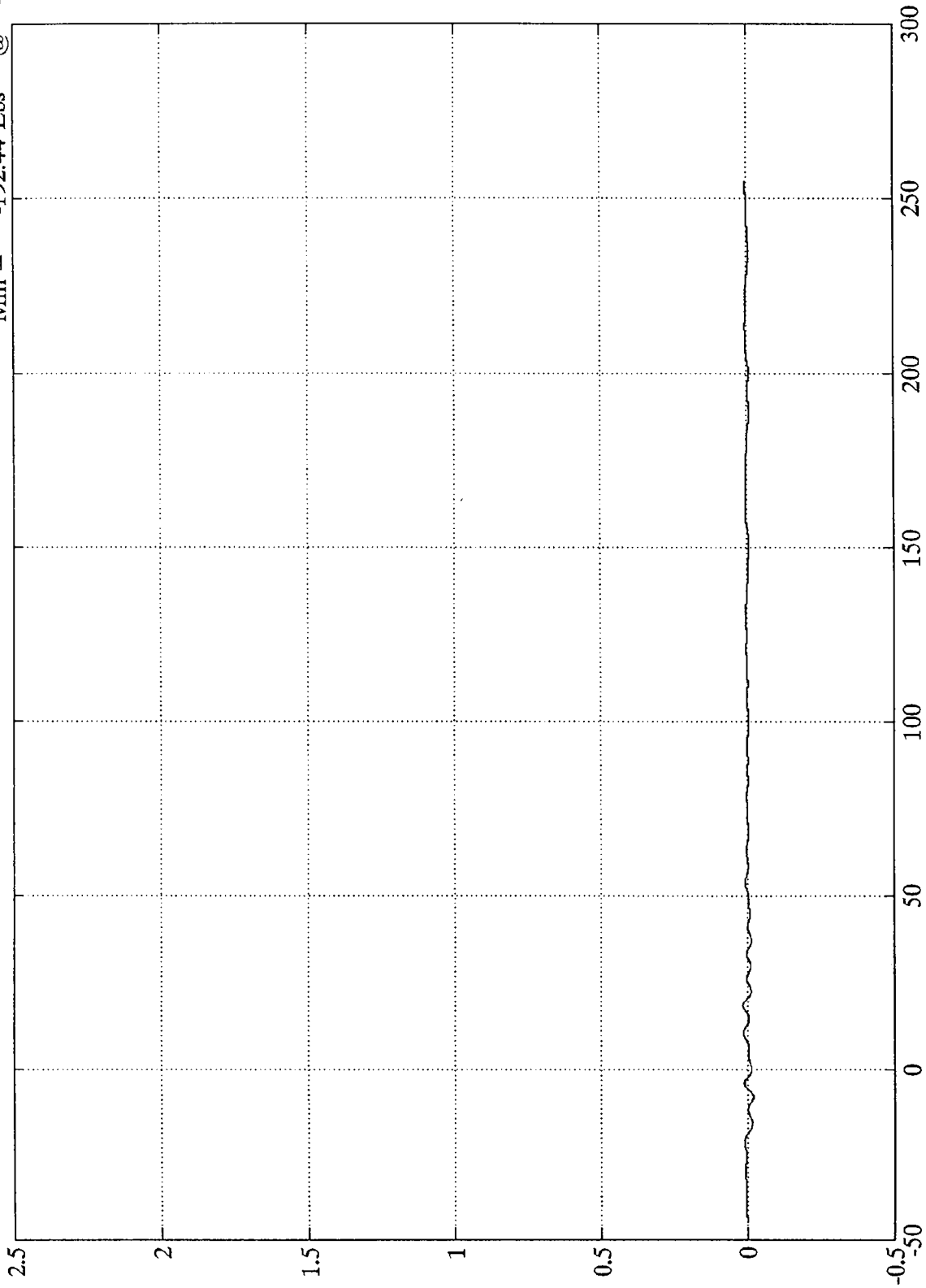
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus  
x10<sup>4</sup>

Barrier Load Cell D9

Max = 166.38 Lbs @ 18.23 msec  
Min = -192.44 Lbs @ -8.04 msec



B-38

8118-1

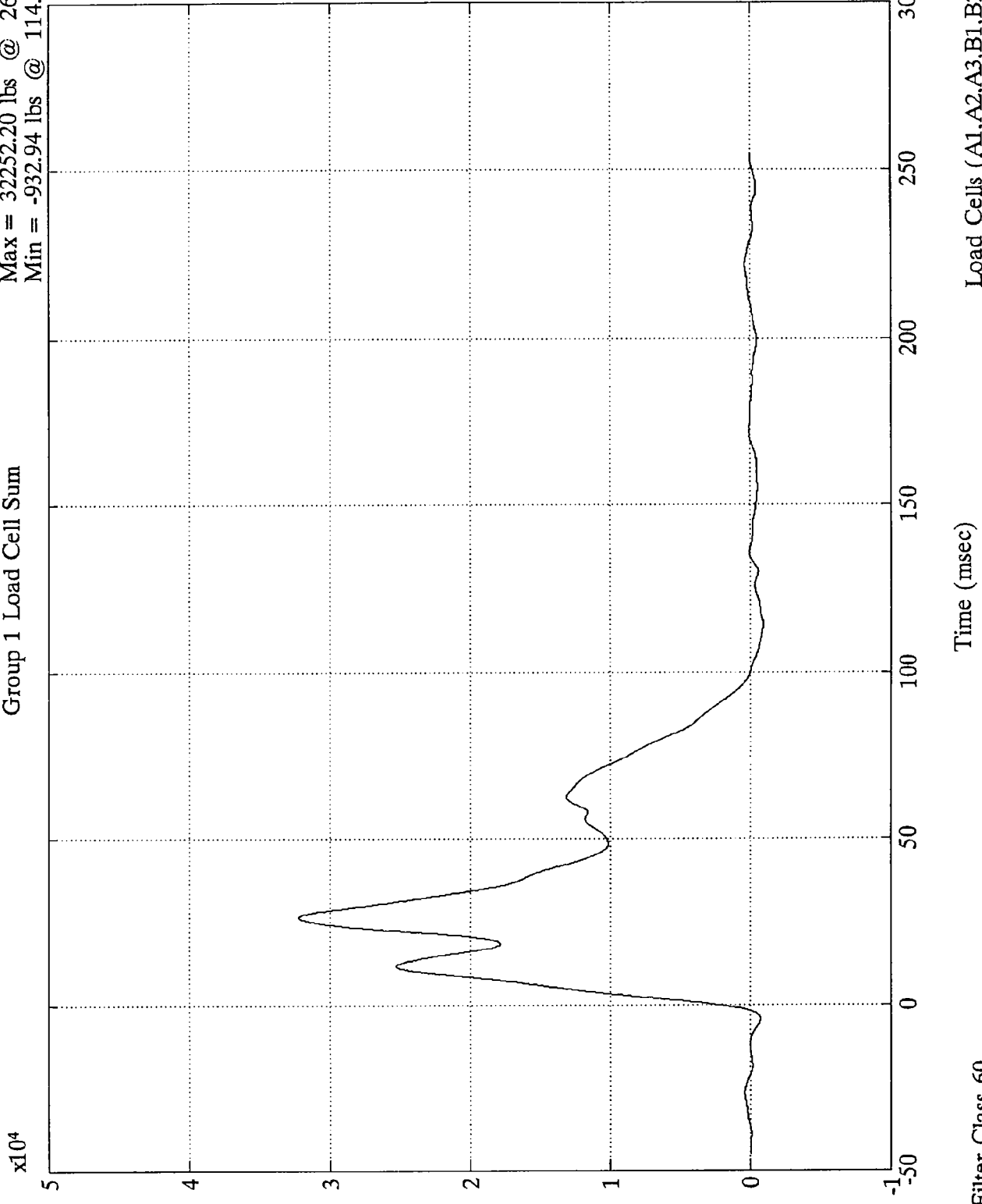
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier - Ford Taurus

Group 1 Load Cell Sum

Max = 32252.20 lbs @ 26.52 msec  
Min = -932.94 lbs @ 114.36 msec



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

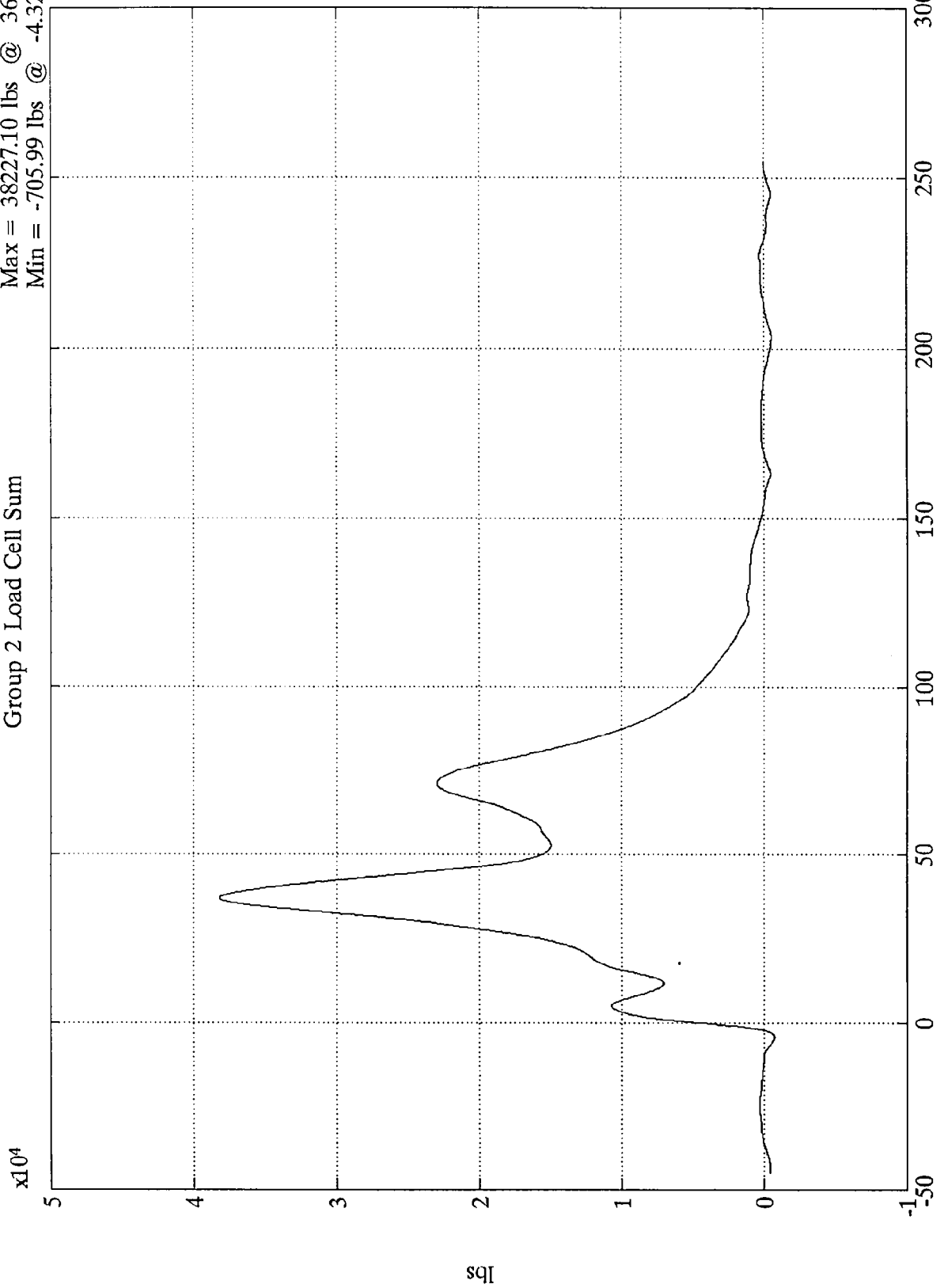
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Group 2 Load Cell Sum

Max = 38227.10 lbs @ 36.72 msec  
Min = -705.99 lbs @ -4.32 msec



Time (msec)

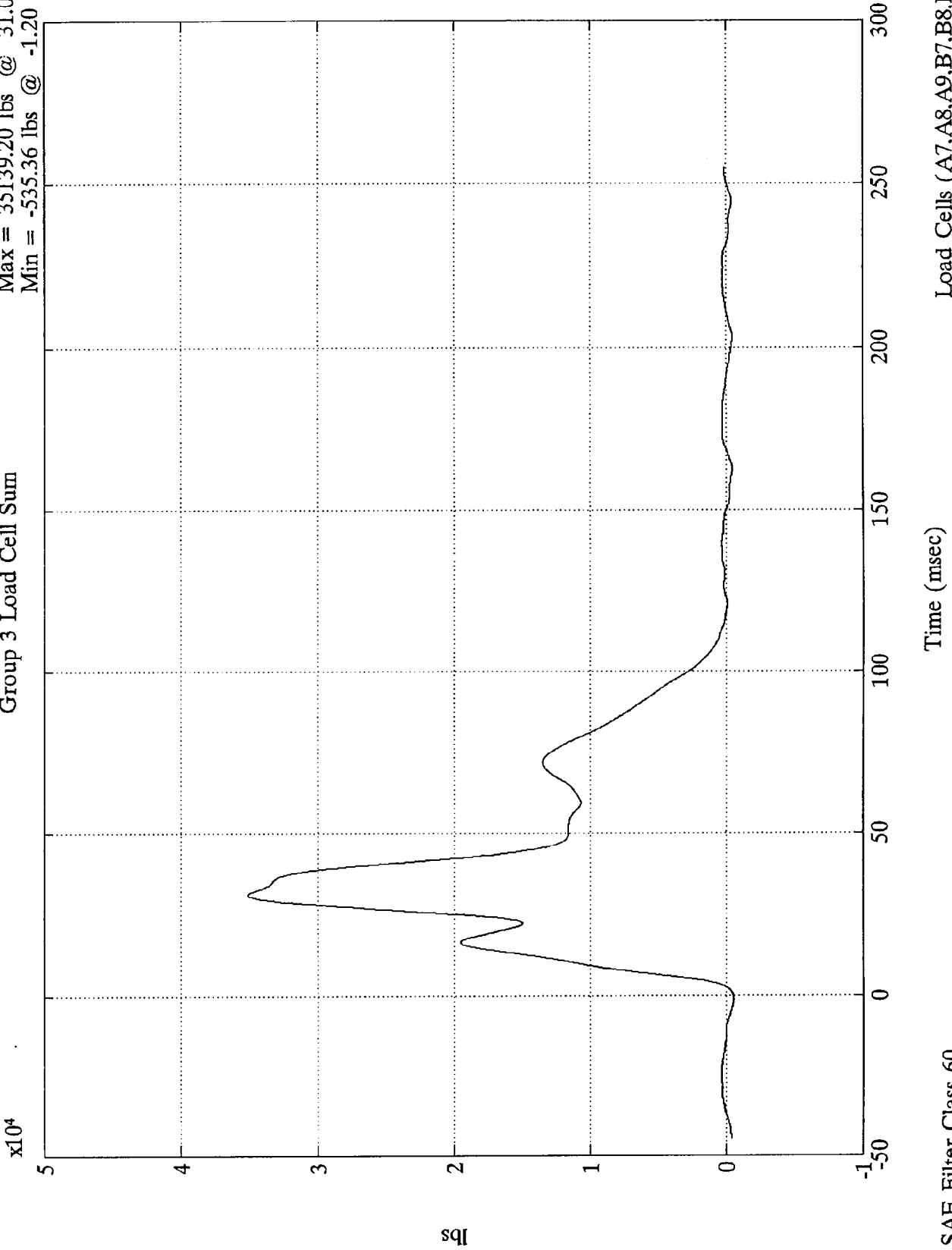
Load Cells (A4,A5,A6,B4,B5,B6)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Group 3 Load Cell Sum

Max = 35139.20 lbs @ 31.08 msec  
Min = -535.36 lbs @ -1.20 msec



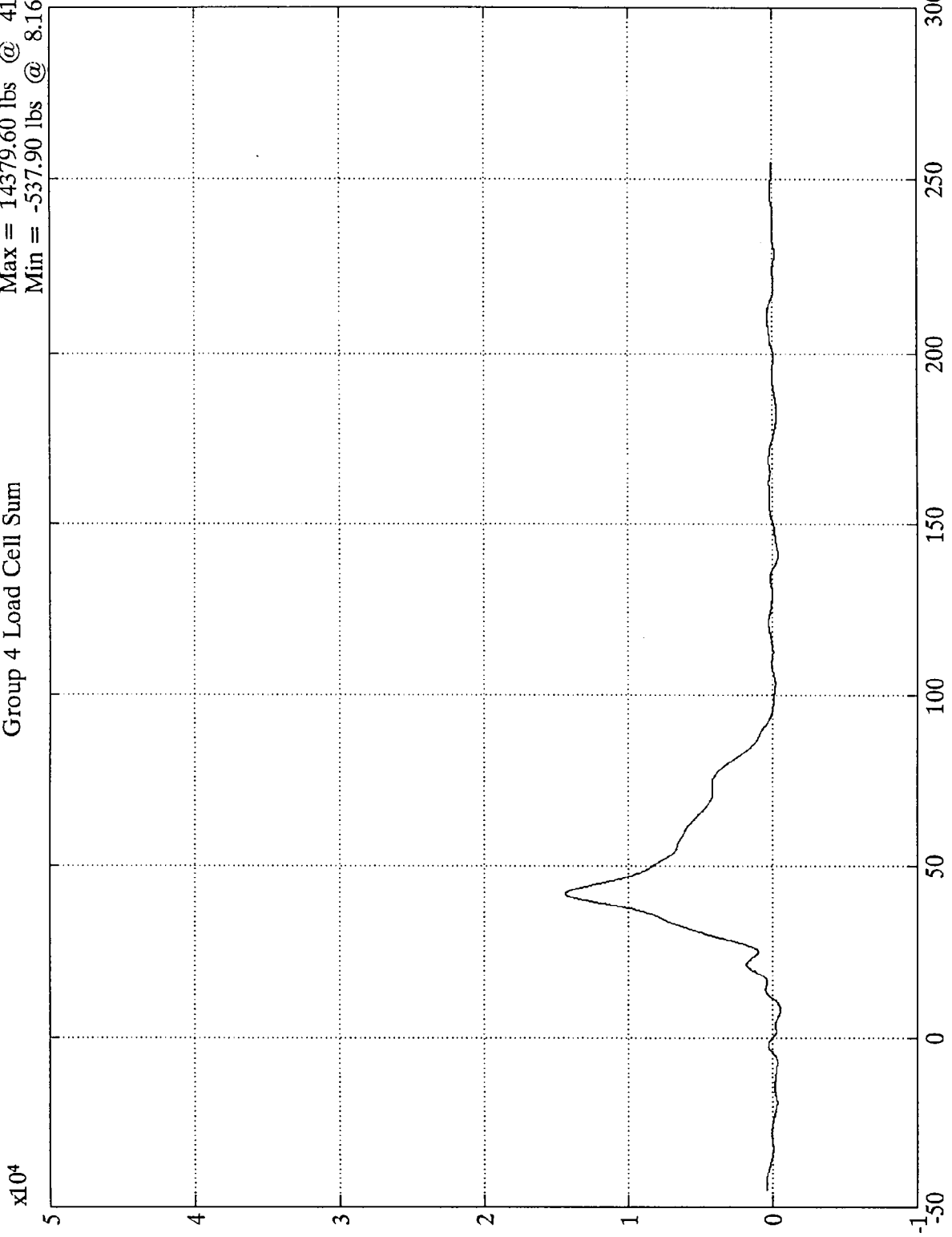
Load Cells (A7,A8,A9,B7,B8,B9)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Group 4 Load Cell Sum

Max = 14379.60 lbs @ 41.64 msec  
Min = -537.90 lbs @ 8.16 msec



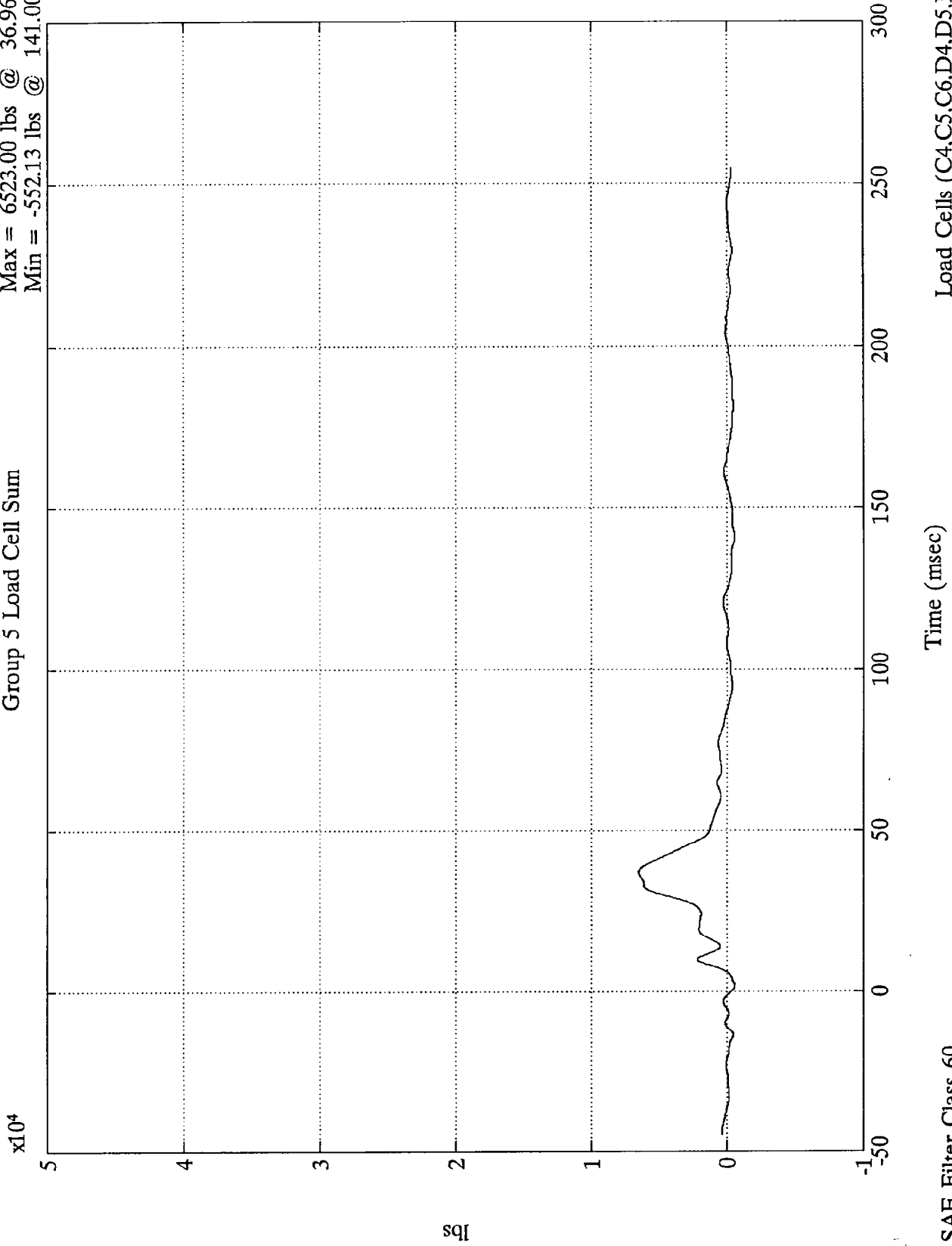
Load Cells (C1,C2,C3,D1,D2,D3)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Group 5 Load Cell Sum

Max = 6523.00 lbs @ 36.96 msec  
Min = -552.13 lbs @ 141.00 msec



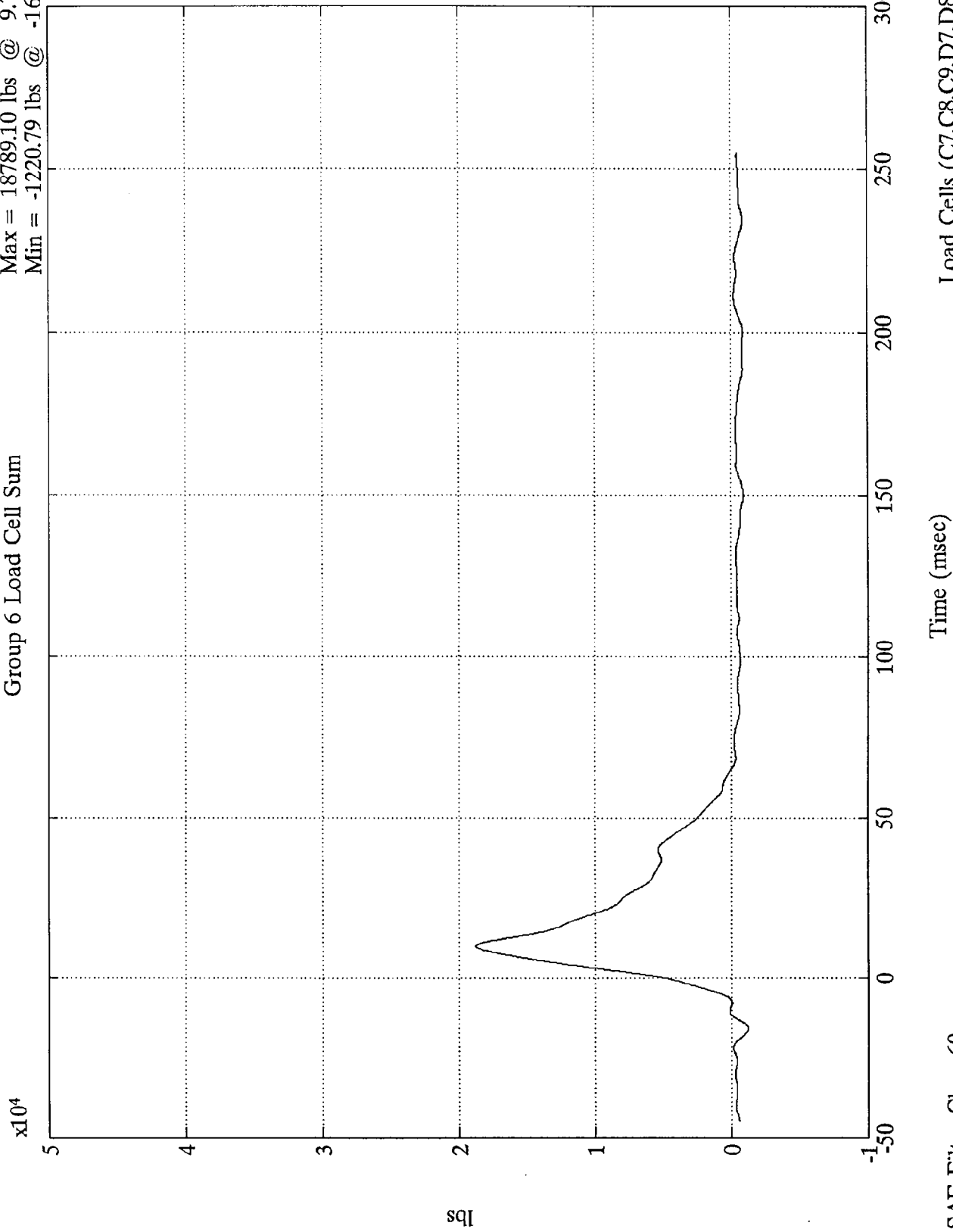
Load Cells (C4,C5,C6,D4,D5,D6)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Group 6 Load Cell Sum

Max = 18789.10 lbs @ 9.72 msec  
Min = -1220.79 lbs @ -16.08 msec



SAE Filter Class 60

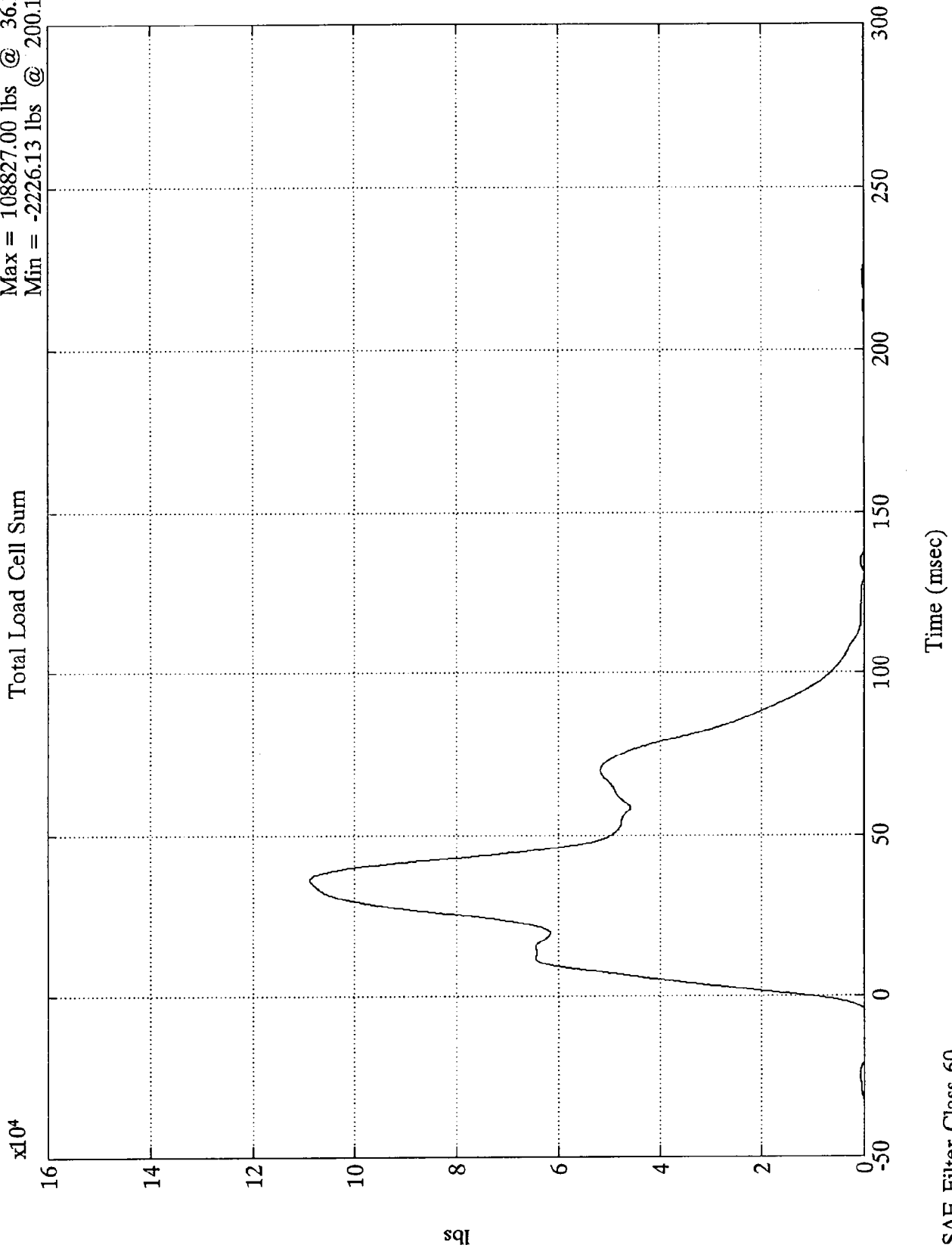
Time (msec)

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

TSC Frontal Barrier - Ford Taurus

Total Load Cell Sum

Max = 108827.00 lbs @ 36.12 msec  
Min = -2226.13 lbs @ 200.16 msec



lbs

B-45

8118-1

SAE Filter Class 60

TEST NO. YO49-0010-1306

VEHICLE DATA

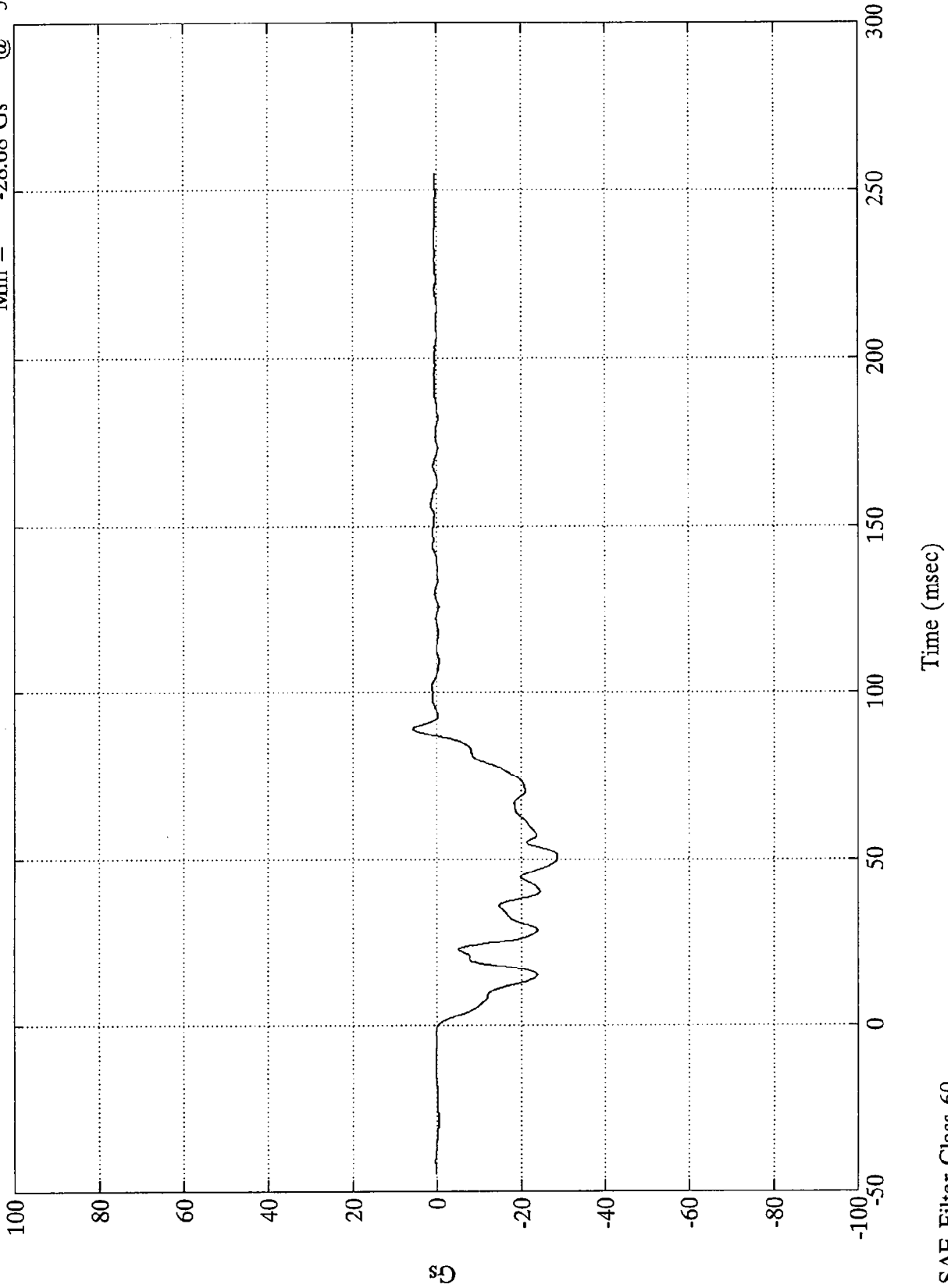
SAE FILTER CHANNEL CLASS

60

TSC Frontal Barrier - Ford Taurus

L. Rear Seat X-Member (X)

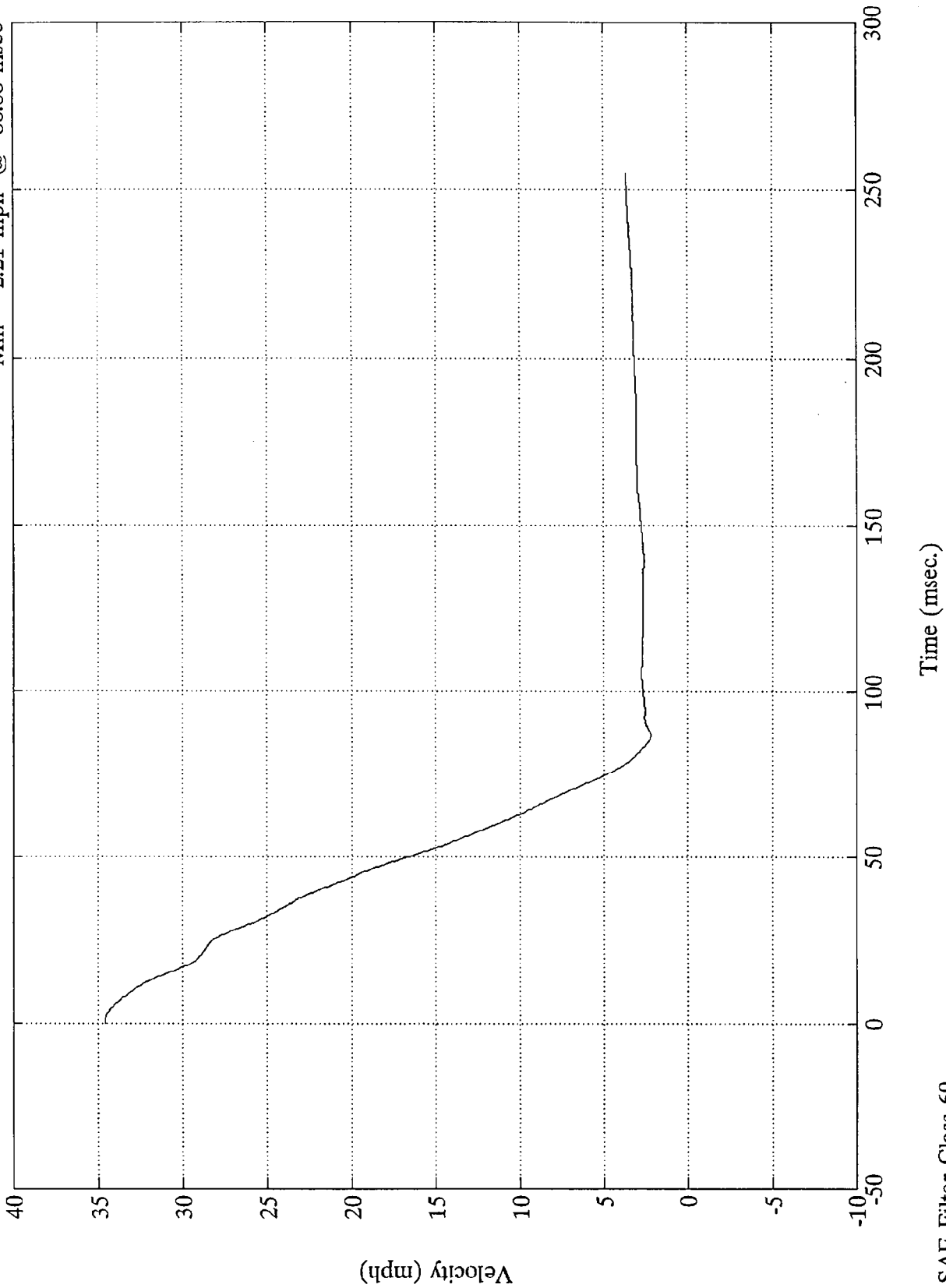
Max = 5.63 Gs @ 88.80 msec  
Min = -28.68 Gs @ 51.00 msec



TSC Frontal Barrier - Ford Taurus

L. Rear Seat X-Member (X)

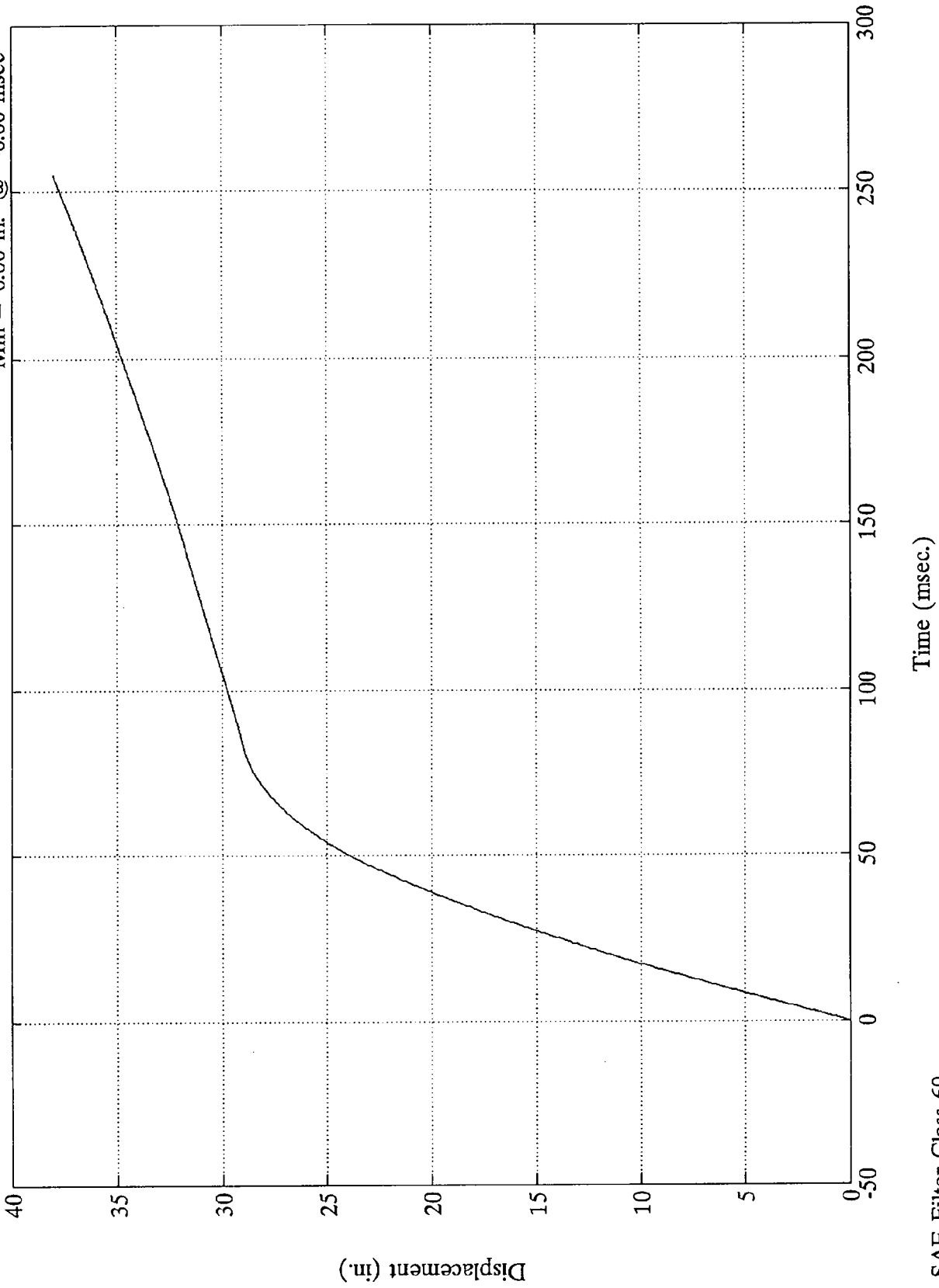
Max = 34.60 mph @ -0.00 msec  
Min = 2.21 mph @ 86.88 msec



TSC Frontal Barrier - Ford Taurus

L. Rear Seat X-Member (X)

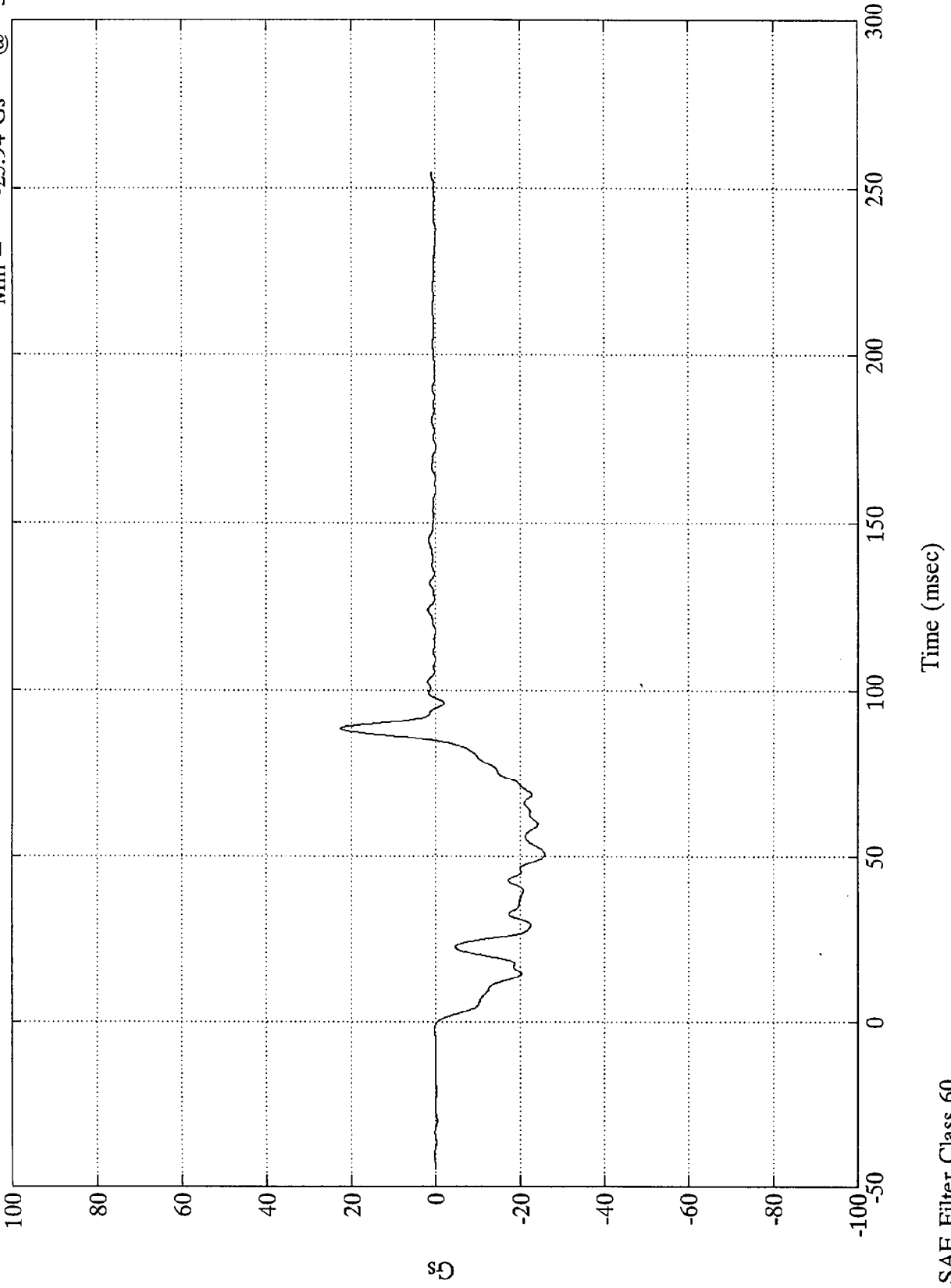
Max = 38.00 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier - Ford Taurus

R. Rear Seat X-Member (X)

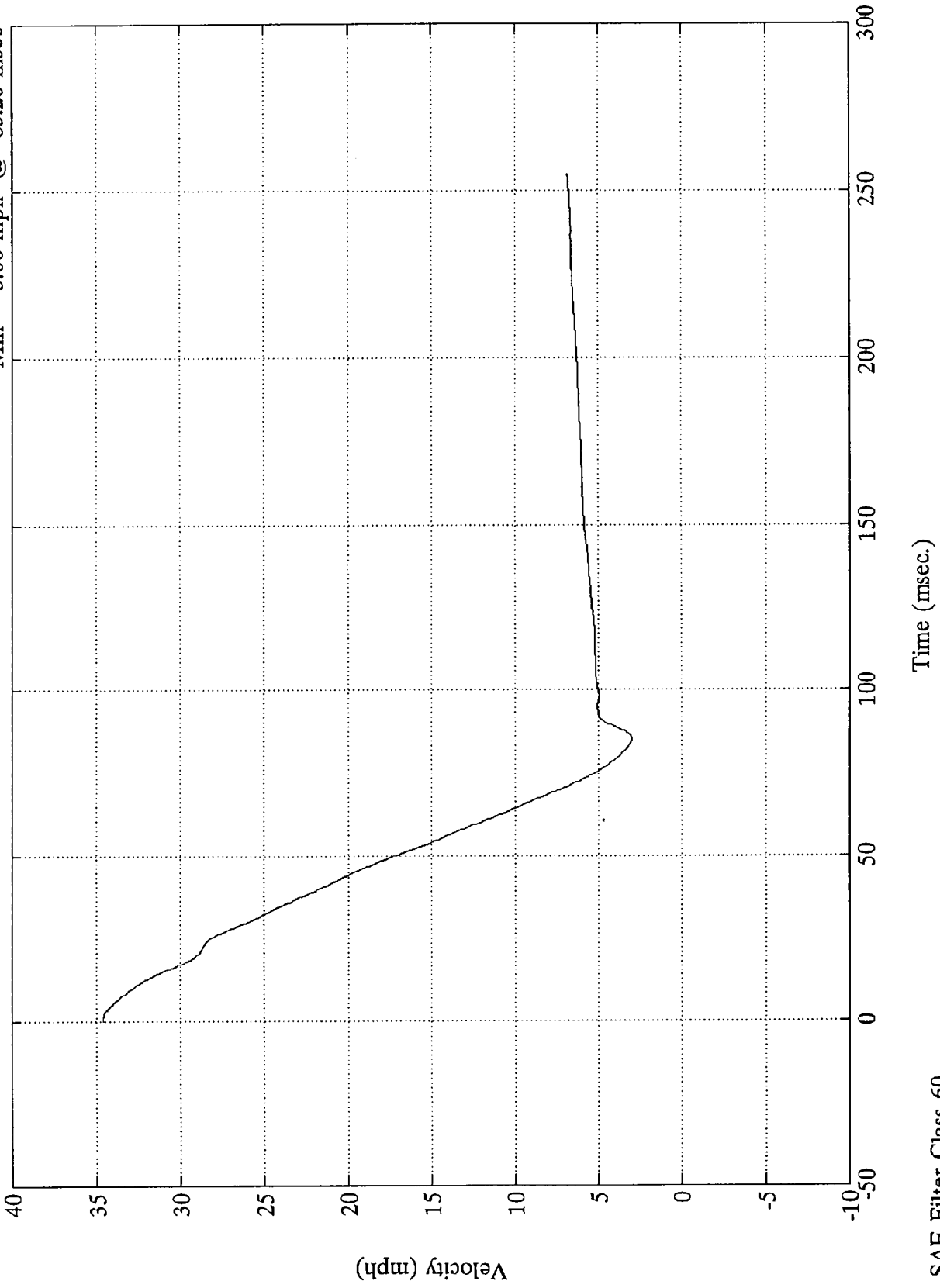
Max = 22.60 Gs @ 88.68 msec  
Min = -25.94 Gs @ 50.64 msec



TSC Frontal Barrier - Ford Taurus

R. Rear Seat X-Member (X)

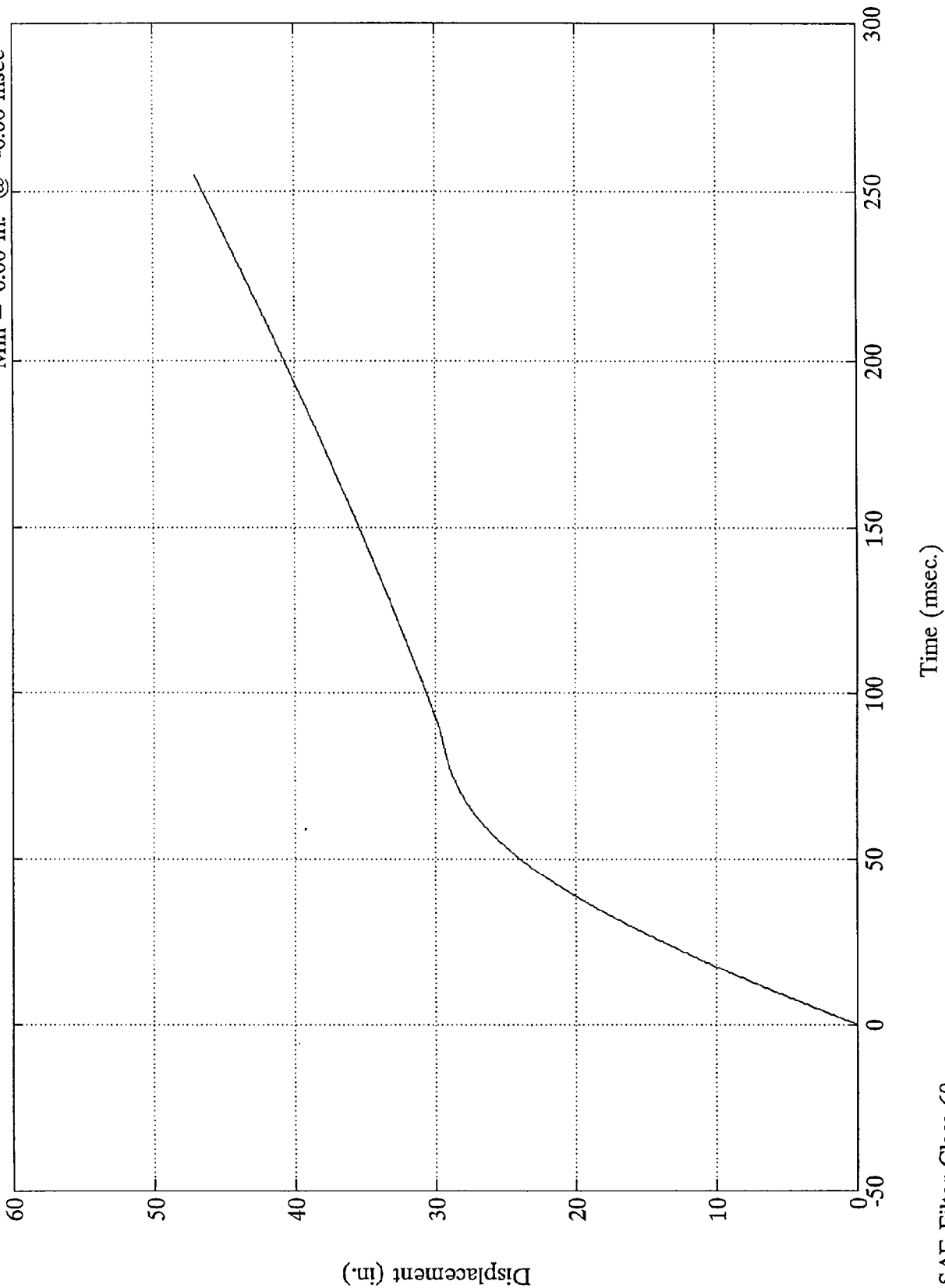
Max = 34.60 mph @ -0.00 msec  
Min = 3.00 mph @ 85.20 msec



TSC Frontal Barrier - Ford Taurus

R. Rear Seat X-Member (X)

Max = 47.08 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec

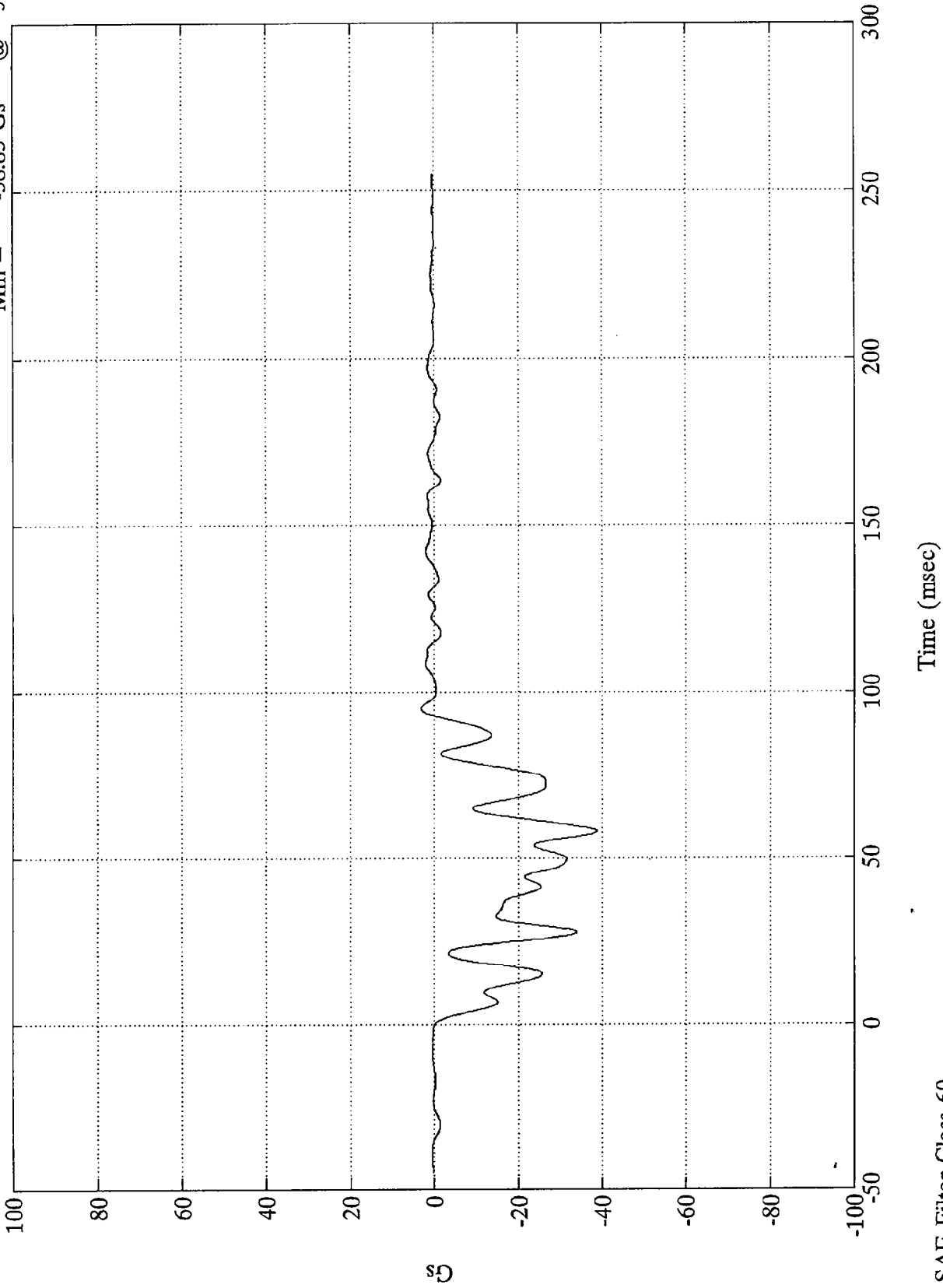


SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Rear Seat X-Member (X)

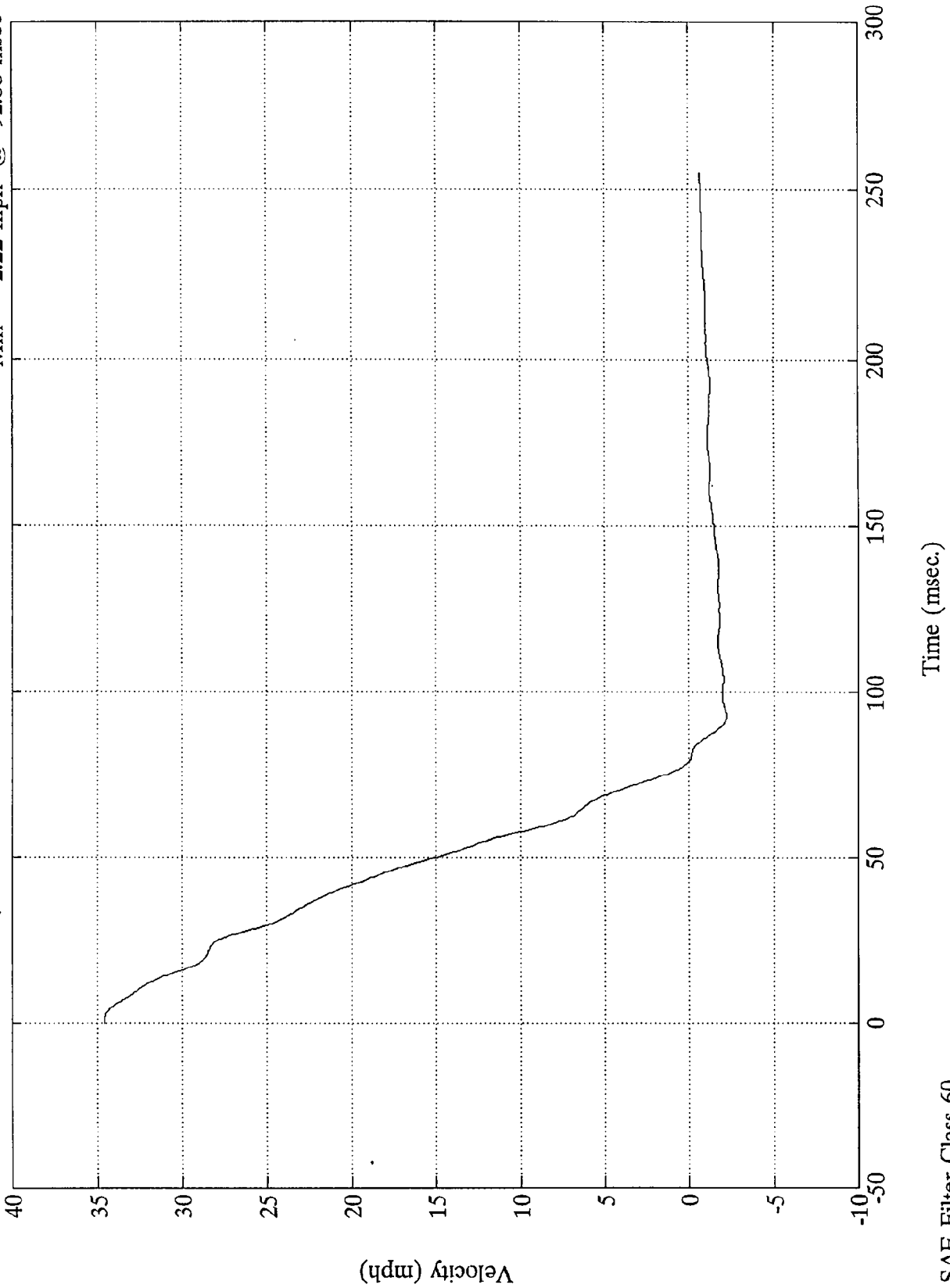
Max = 3.18 Gs @ 94.91 msec  
Min = -38.83 Gs @ 58.08 msec



TSC Frontal Barrier - Ford Taurus

Rear Seat X-Member (X)

Max = 34.60 mph @ 0.24 msec  
Min = -2.22 mph @ 92.88 msec

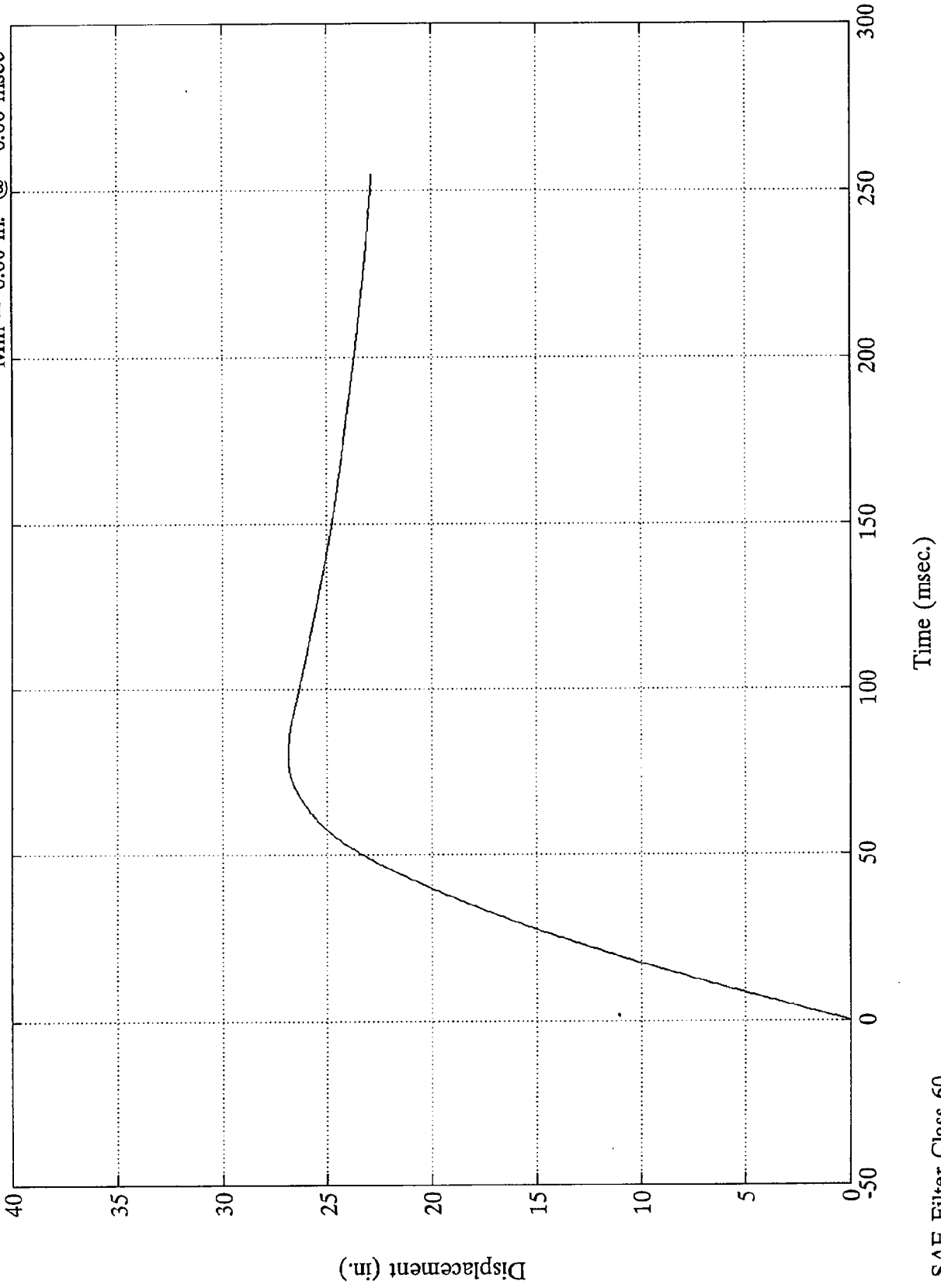


SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Rear Seat X-Member (X)

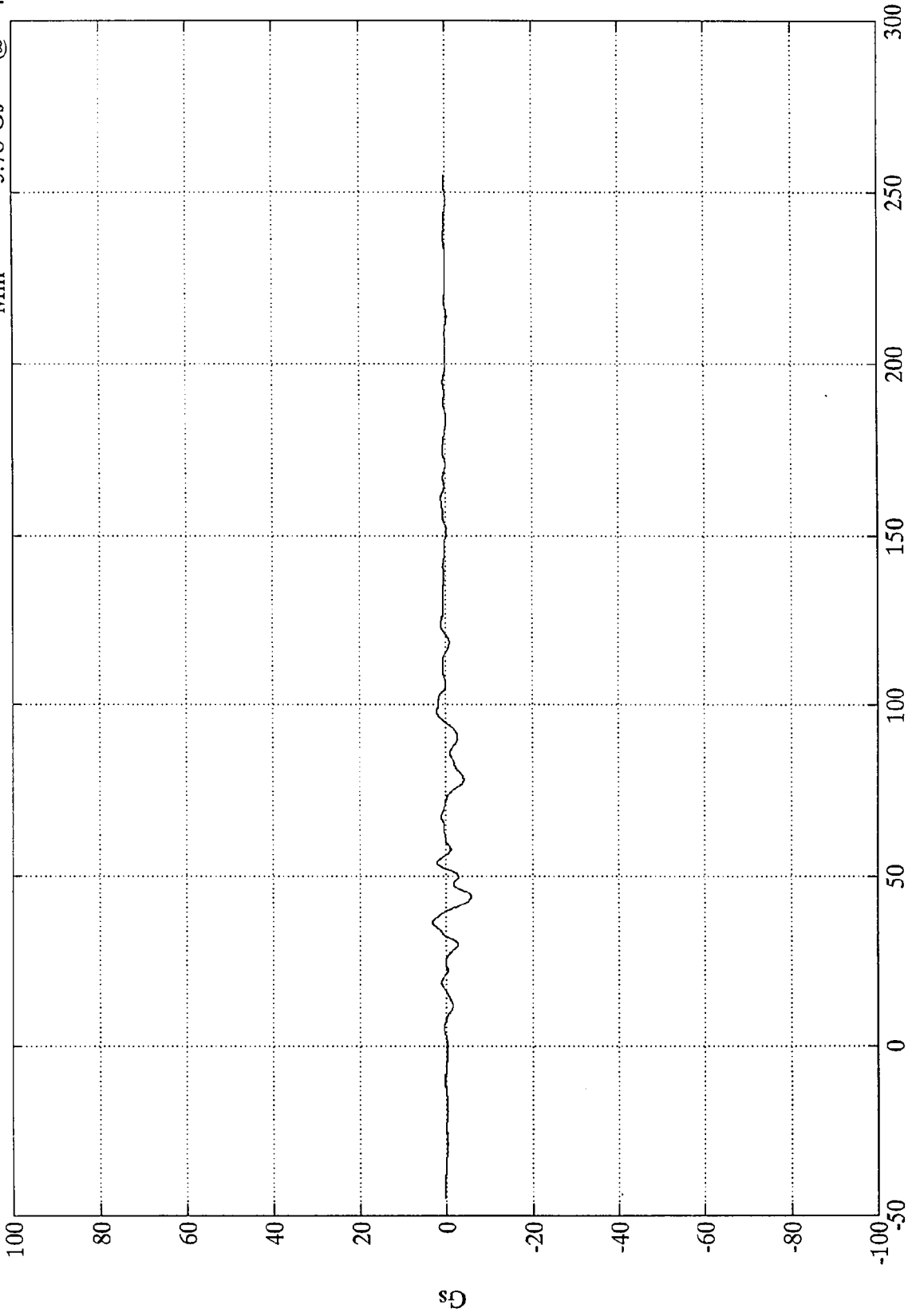
Max = 26.84 in. @ 81.36 msec  
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier - Ford Taurus

Rear Seat X-Member (Y)

Max = 3.25 Gs @ 36.12 msec  
Min = -5.78 Gs @ 43.79 msec



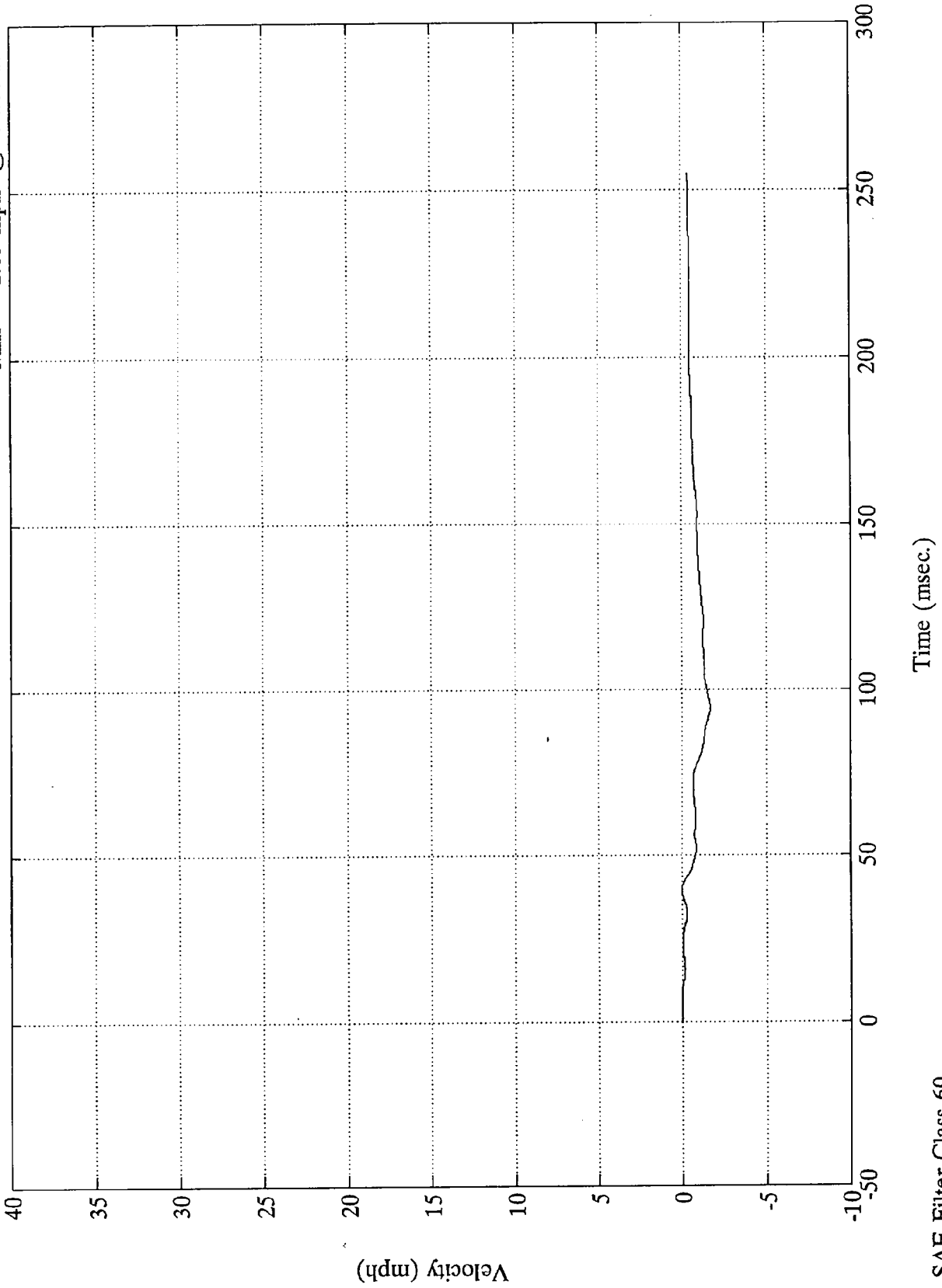
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Rear Seat X-Member (Y)

Max = 0.03 mph @ 39.60 msec  
Min = -1.65 mph @ 94.80 msec

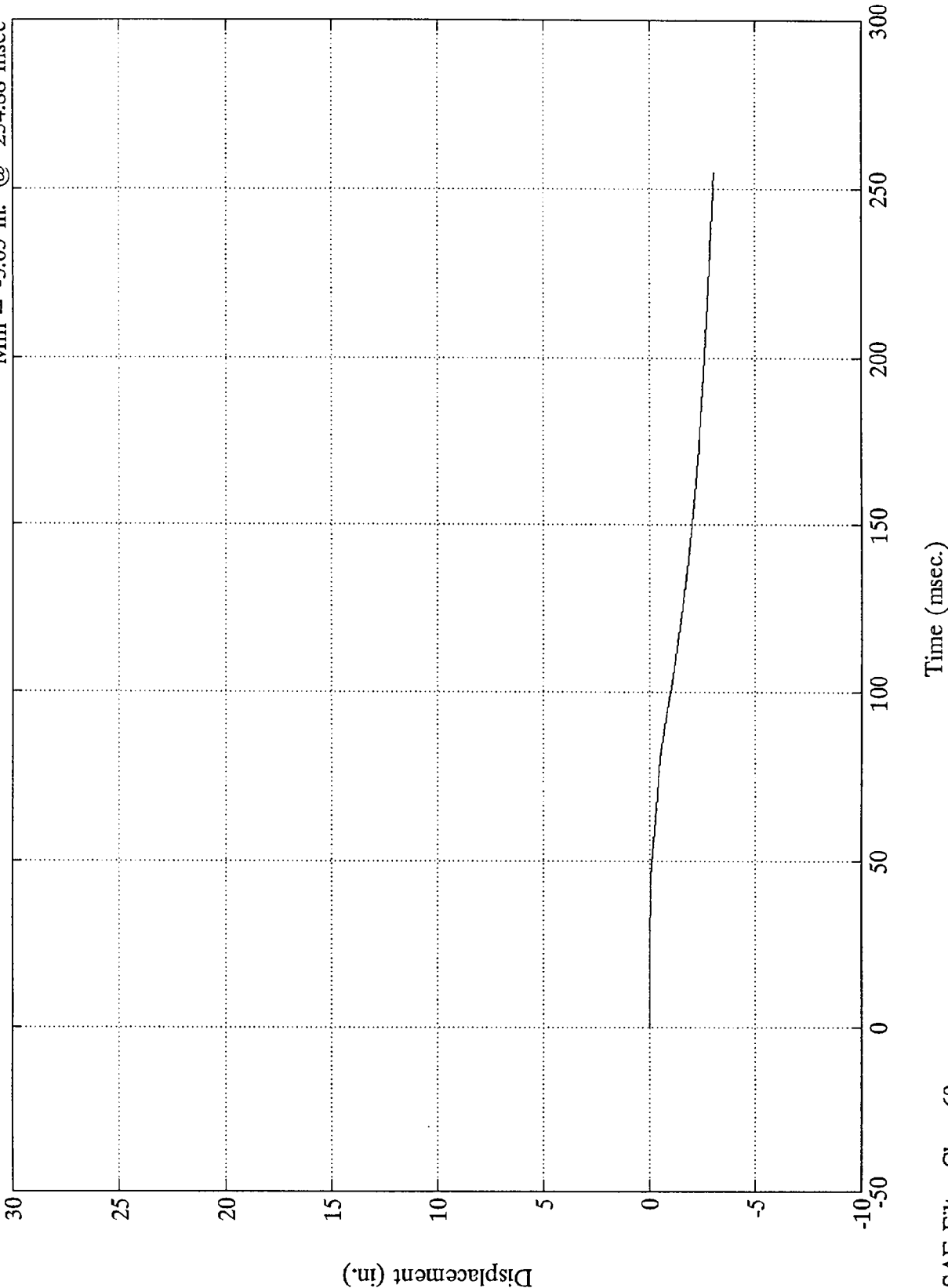


SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Rear Seat X-Member (Y)

Max = 0.00 in. @ 10.08 msec  
Min = -3.05 in. @ 254.88 msec

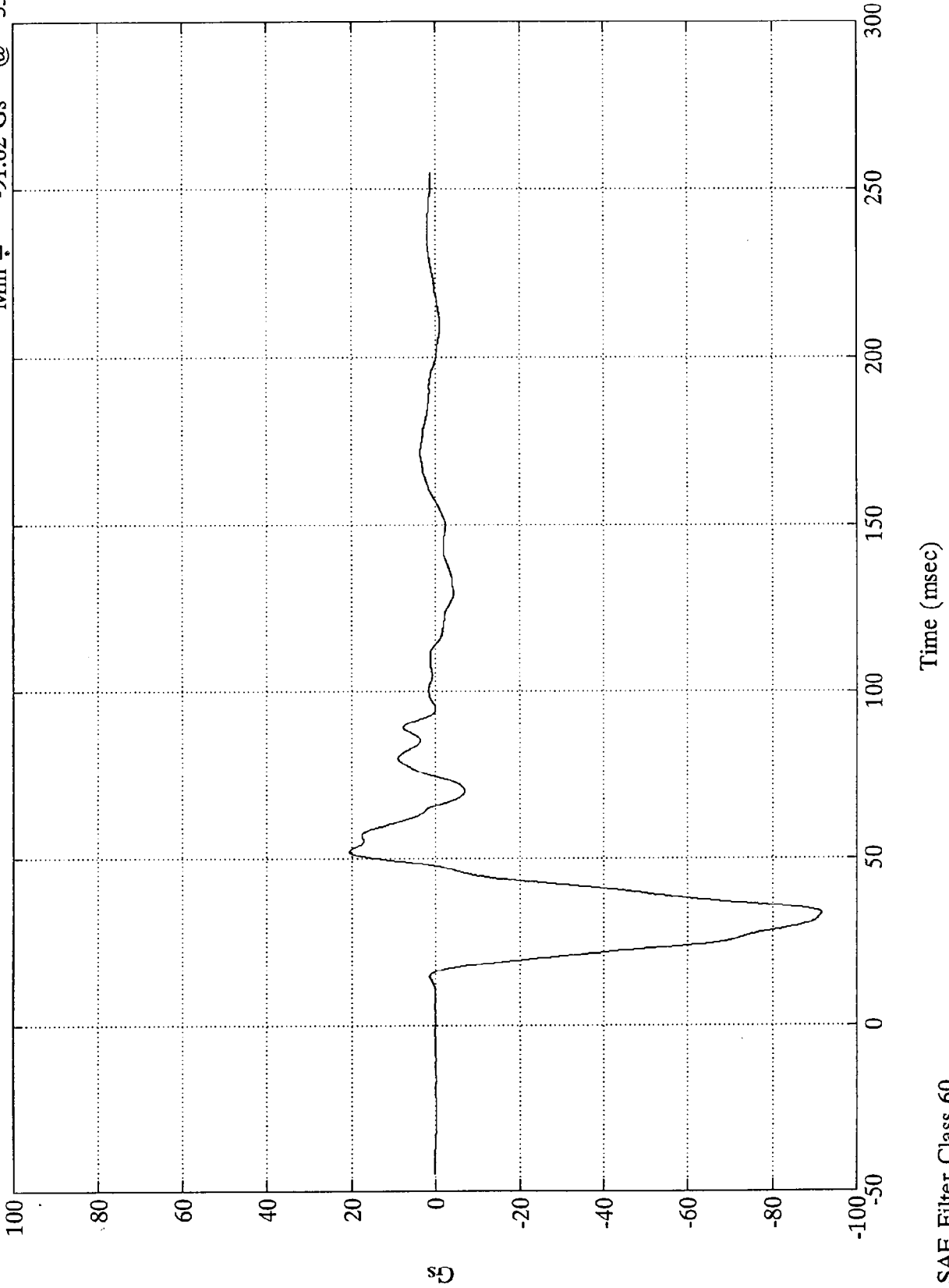


SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Engine Top (X)

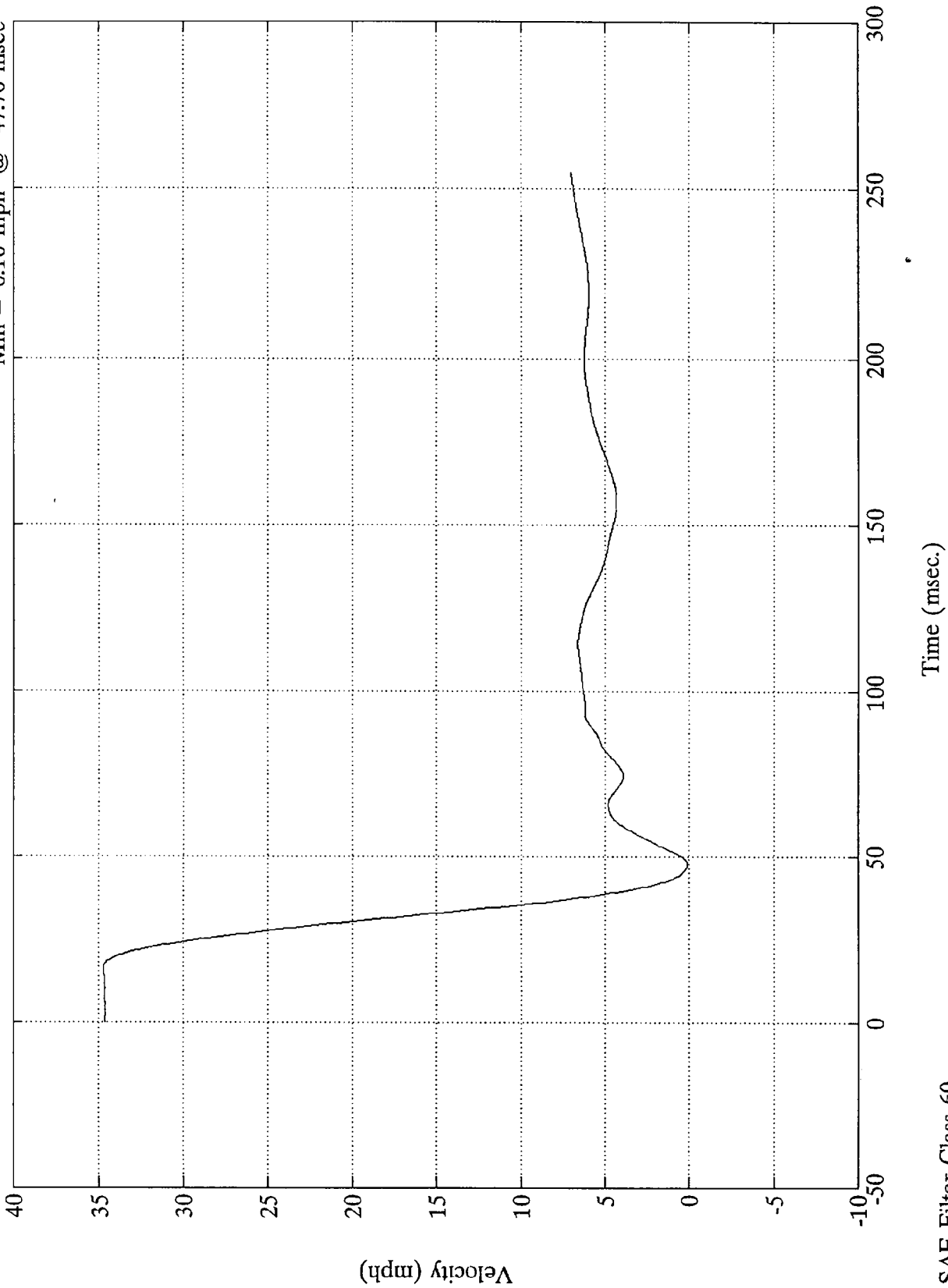
Max = 20.43 Gs @ 52.08 msec  
Min = -91.62 Gs @ 33.47 msec



TSC Frontal Barrier - Ford Taurus

Max = 34.70 mph @ 16.08 msec  
Min = 0.10 mph @ 47.76 msec

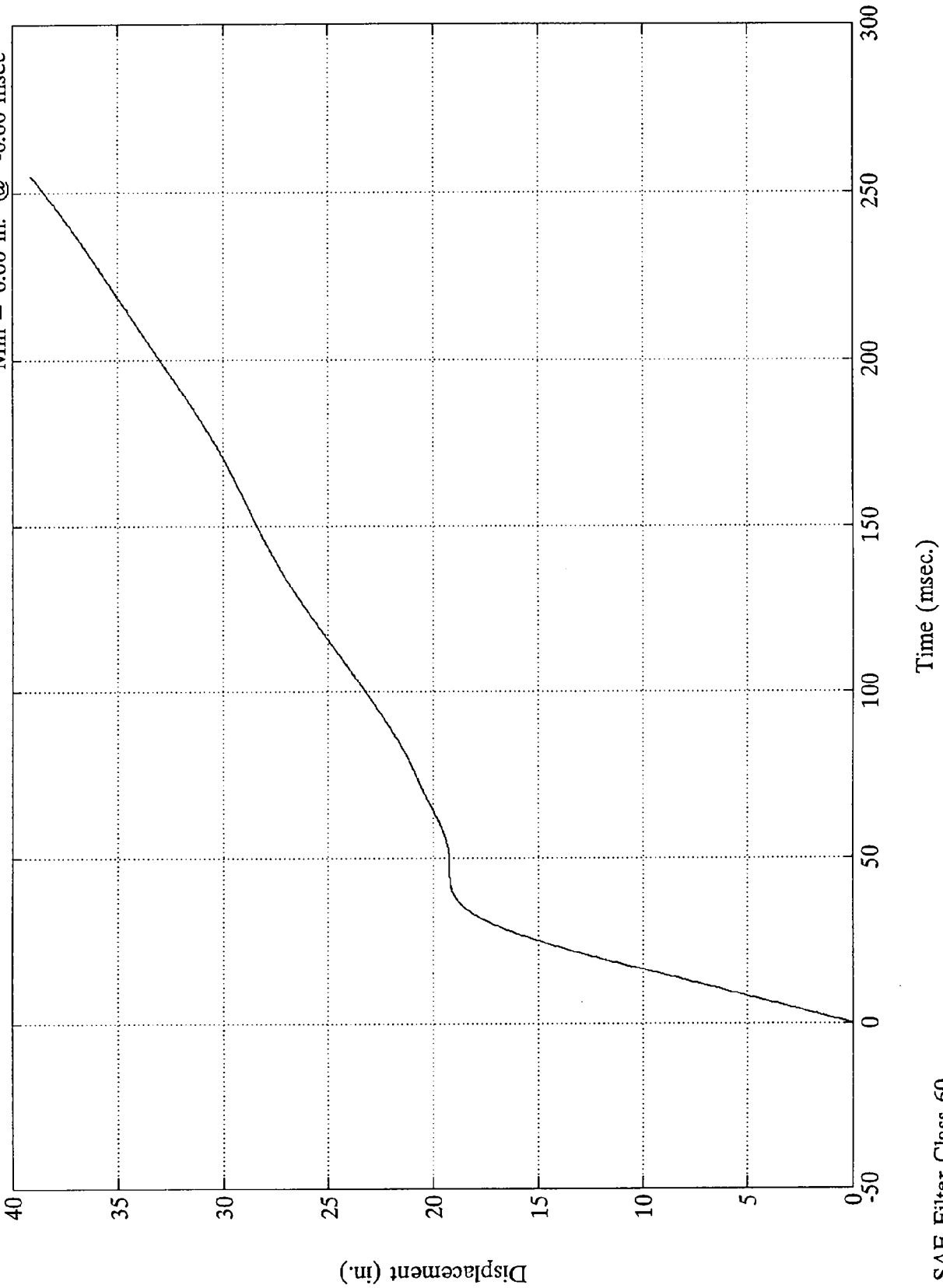
Engine Top (X)



TSC Frontal Barrier - Ford Taurus

Engine Top (X)

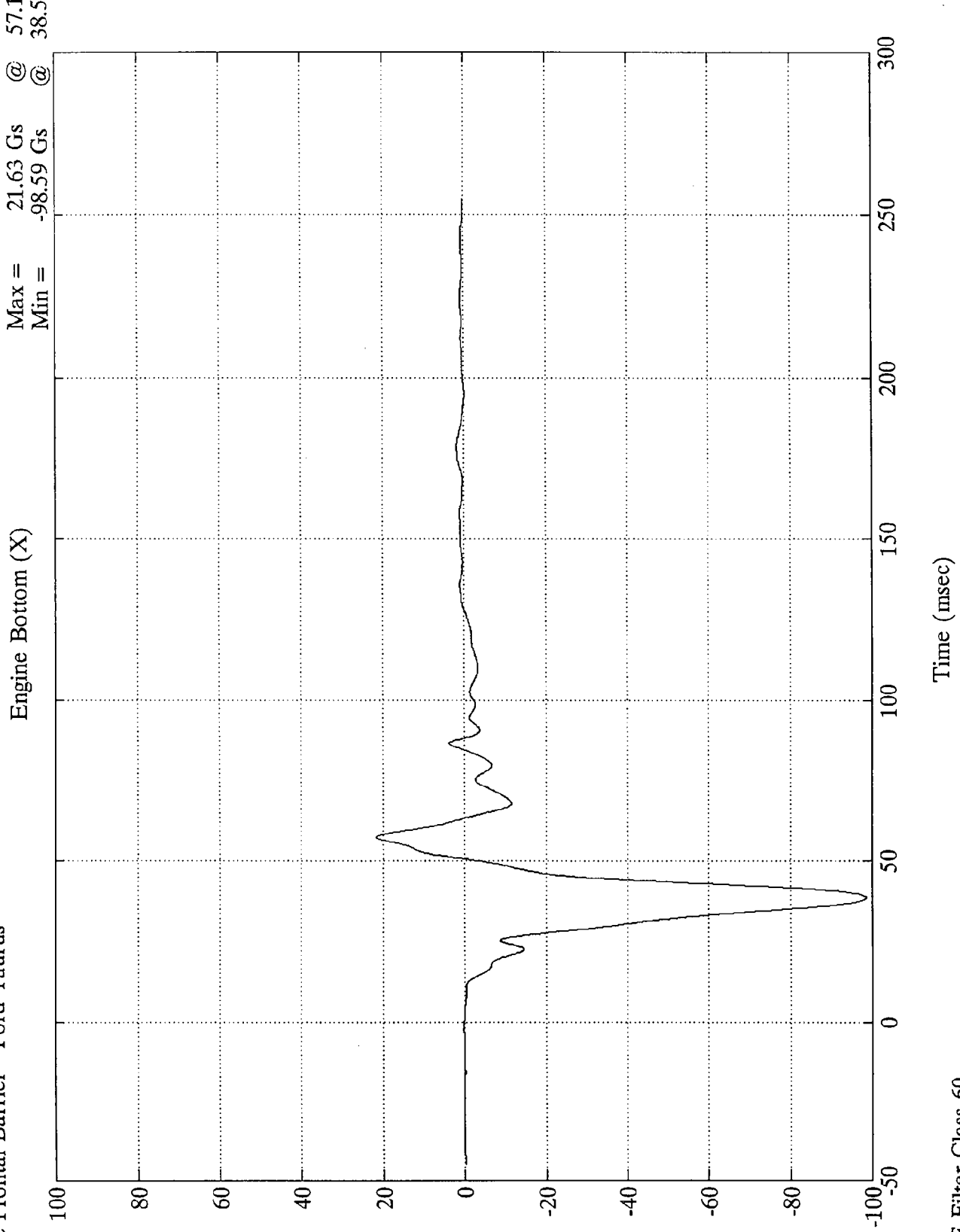
Max = 39.09 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Max = 21.63 Gs @ 57.11 msec  
Min = -98.59 Gs @ 38.52 msec

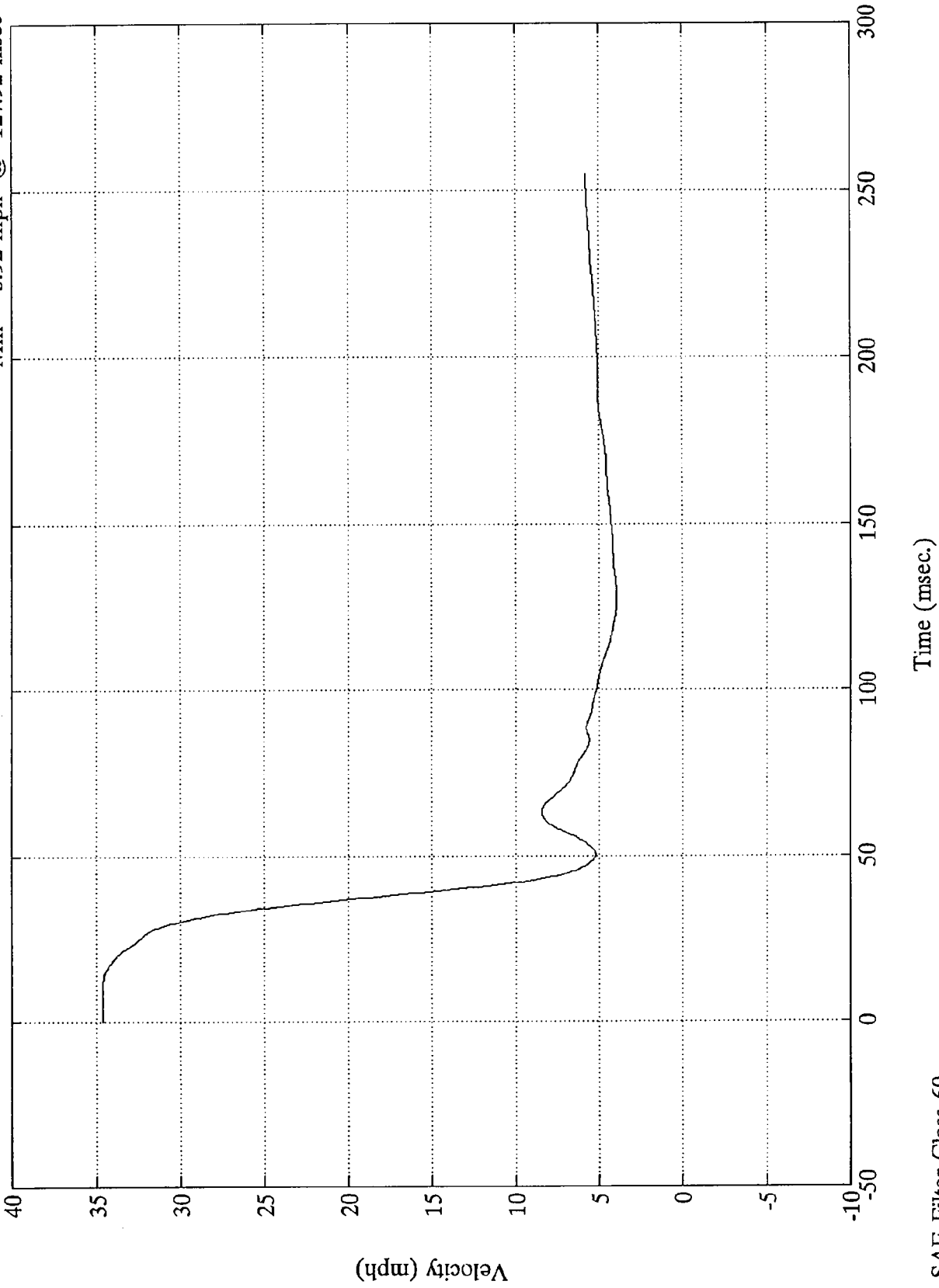


Engine Bottom (X)

TSC Frontal Barrier - Ford Taurus

Engine Bottom (X)

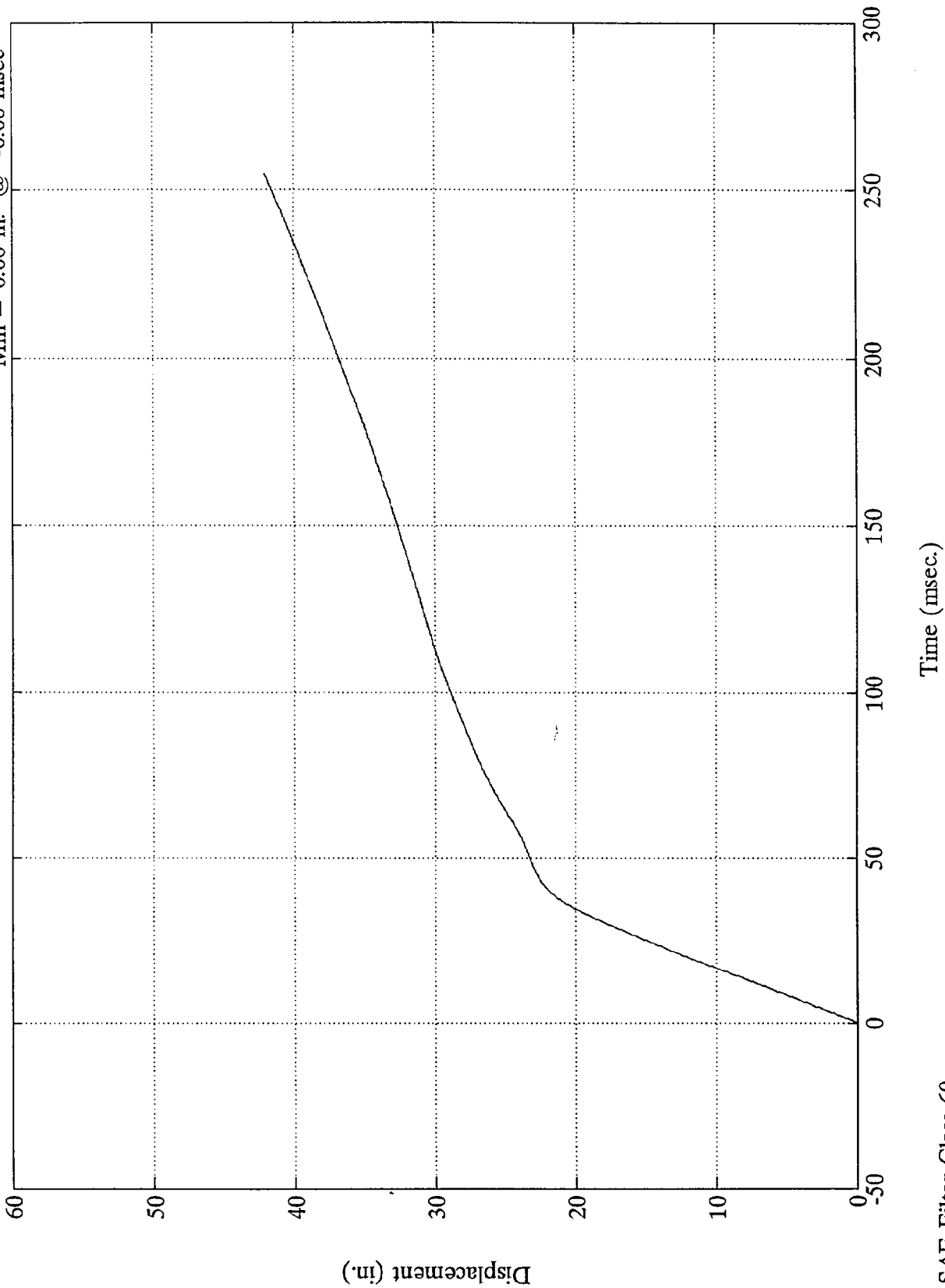
Max = 34.61 mph @ 4.80 msec  
Min = 3.92 mph @ 127.92 msec



TSC Frontal Barrier - Ford Taurus

Engine Bottom (X)

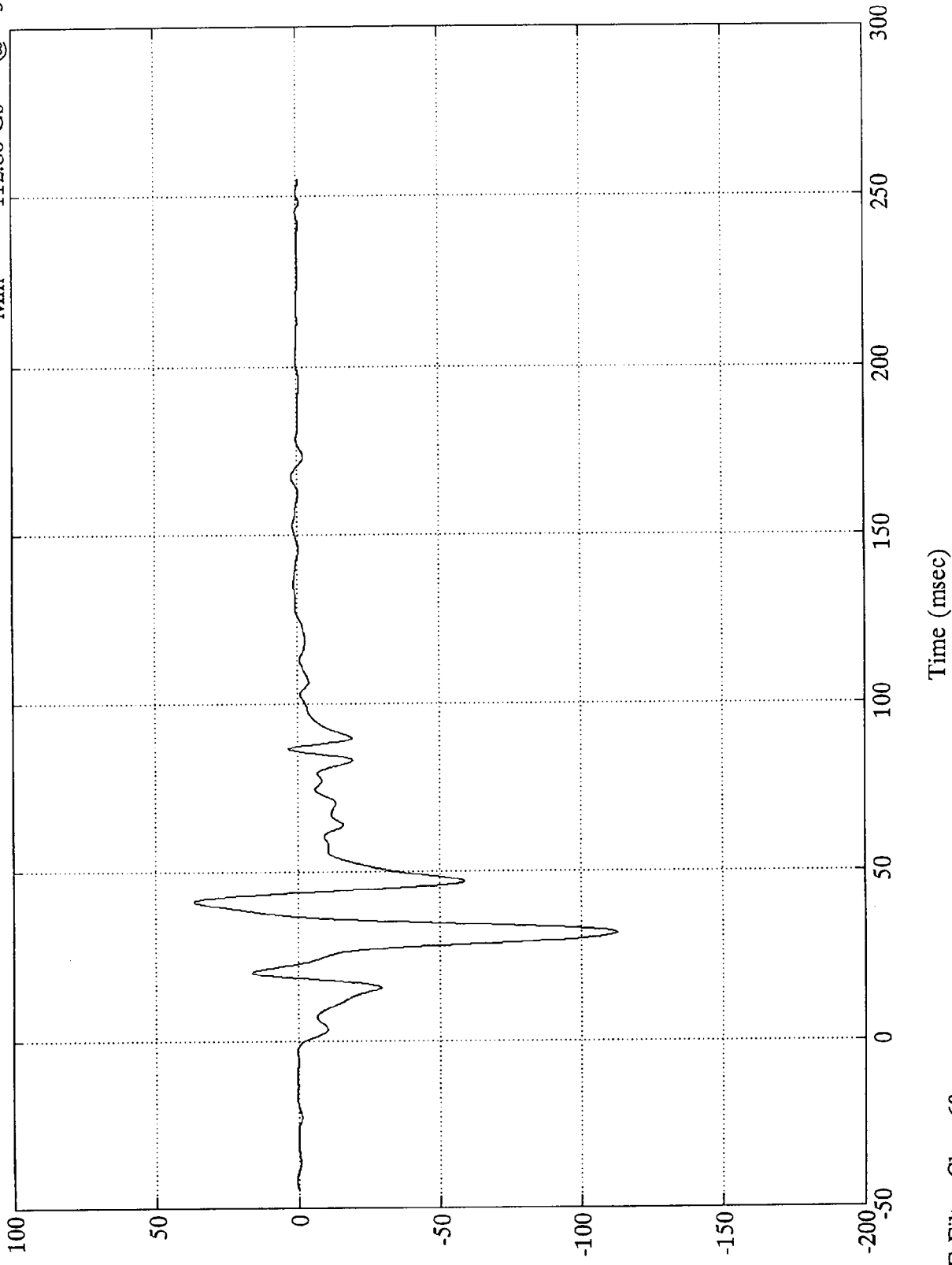
Max = 42.09 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier - Ford Taurus

Front Seat X-Member (X)

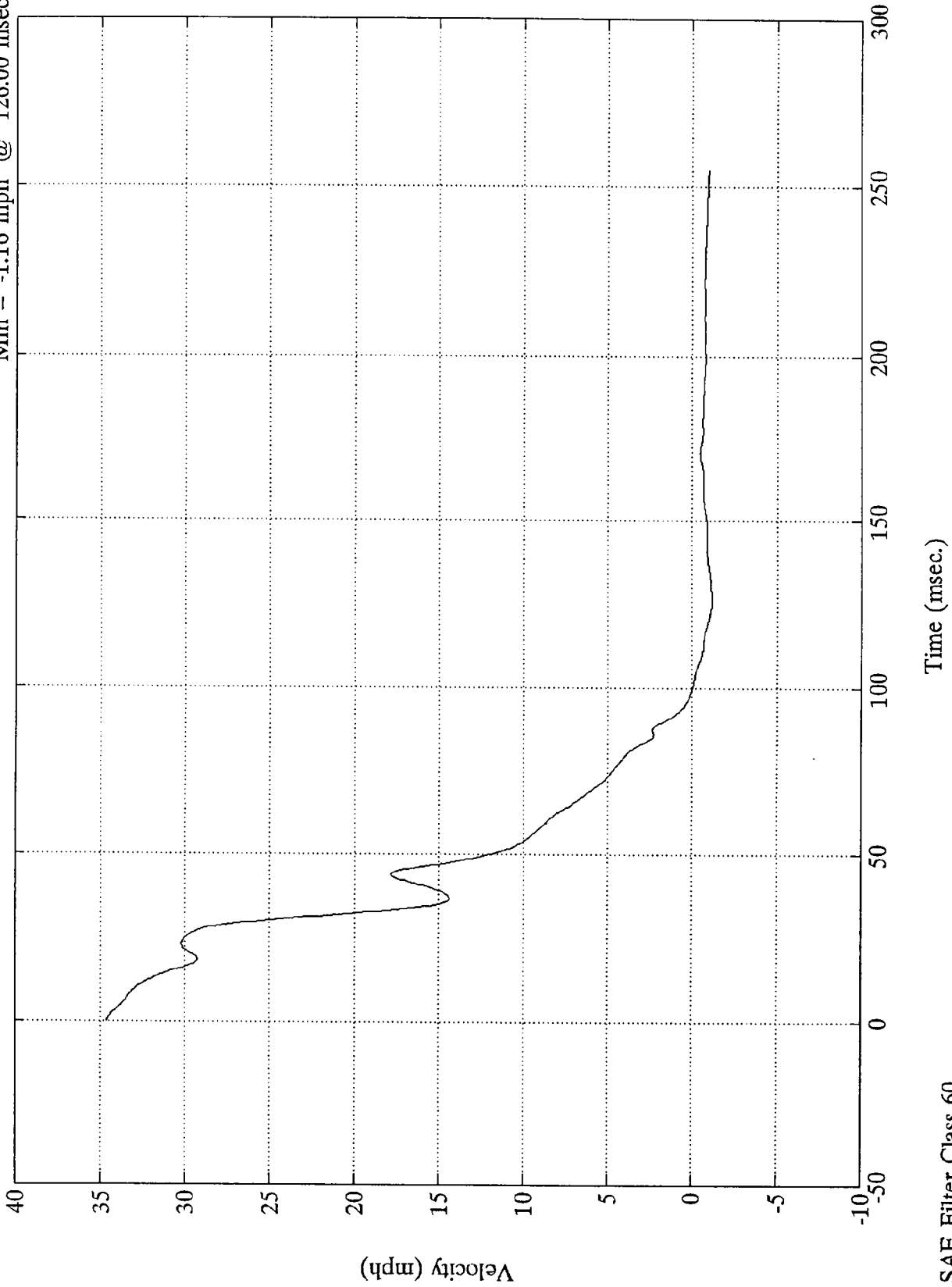
Max = 36.77 Gs @ 41.15 msec  
Min = -112.80 Gs @ 31.79 msec



TSC Frontal Barrier - Ford Taurus

Front Seat X-Member (X)

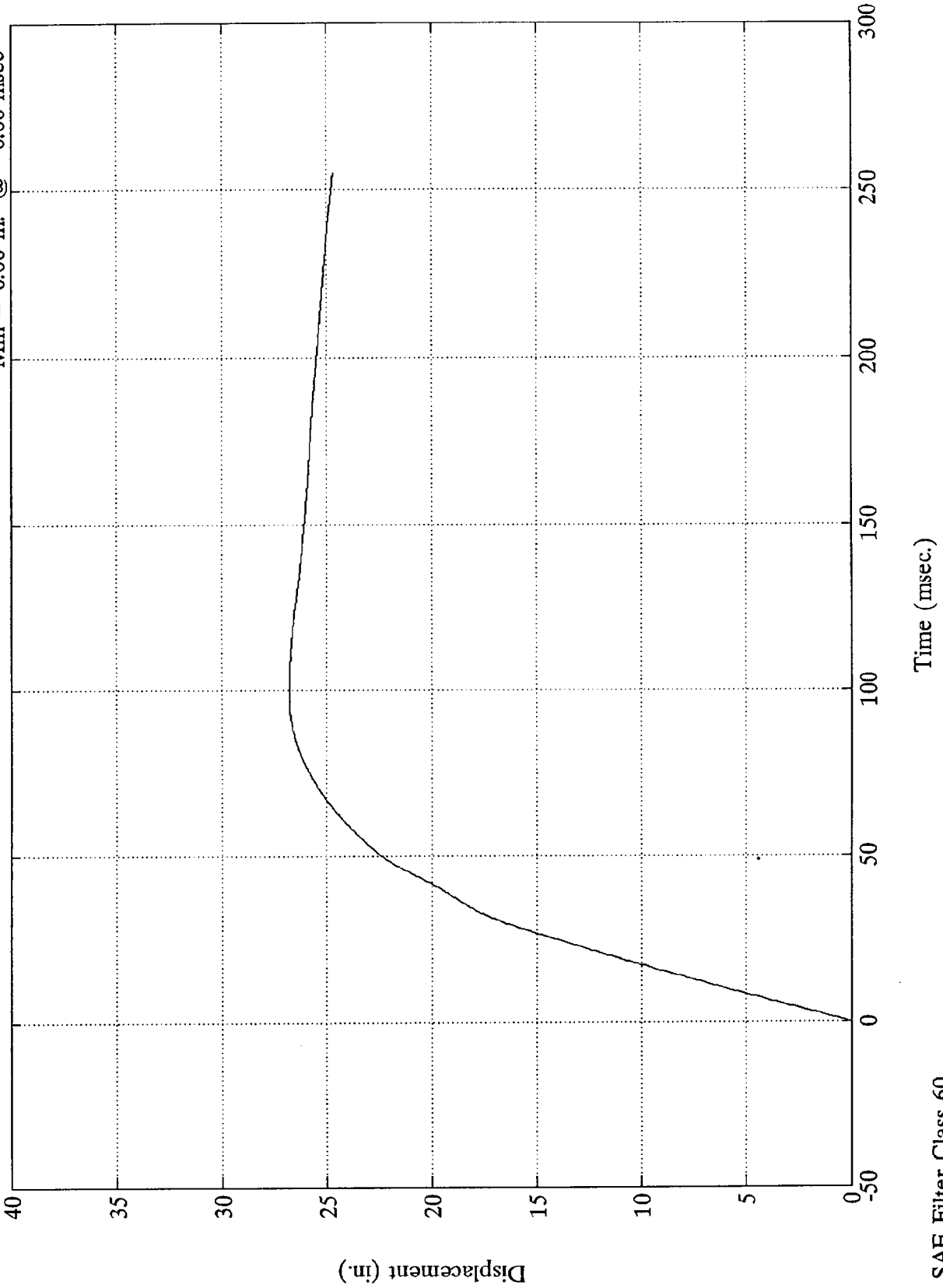
Max = 34.60 mph @ -0.00 msec  
Min = -1.16 mph @ 126.00 msec



TSC Frontal Barrier - Ford Taurus

Front Seat X-Member (X)

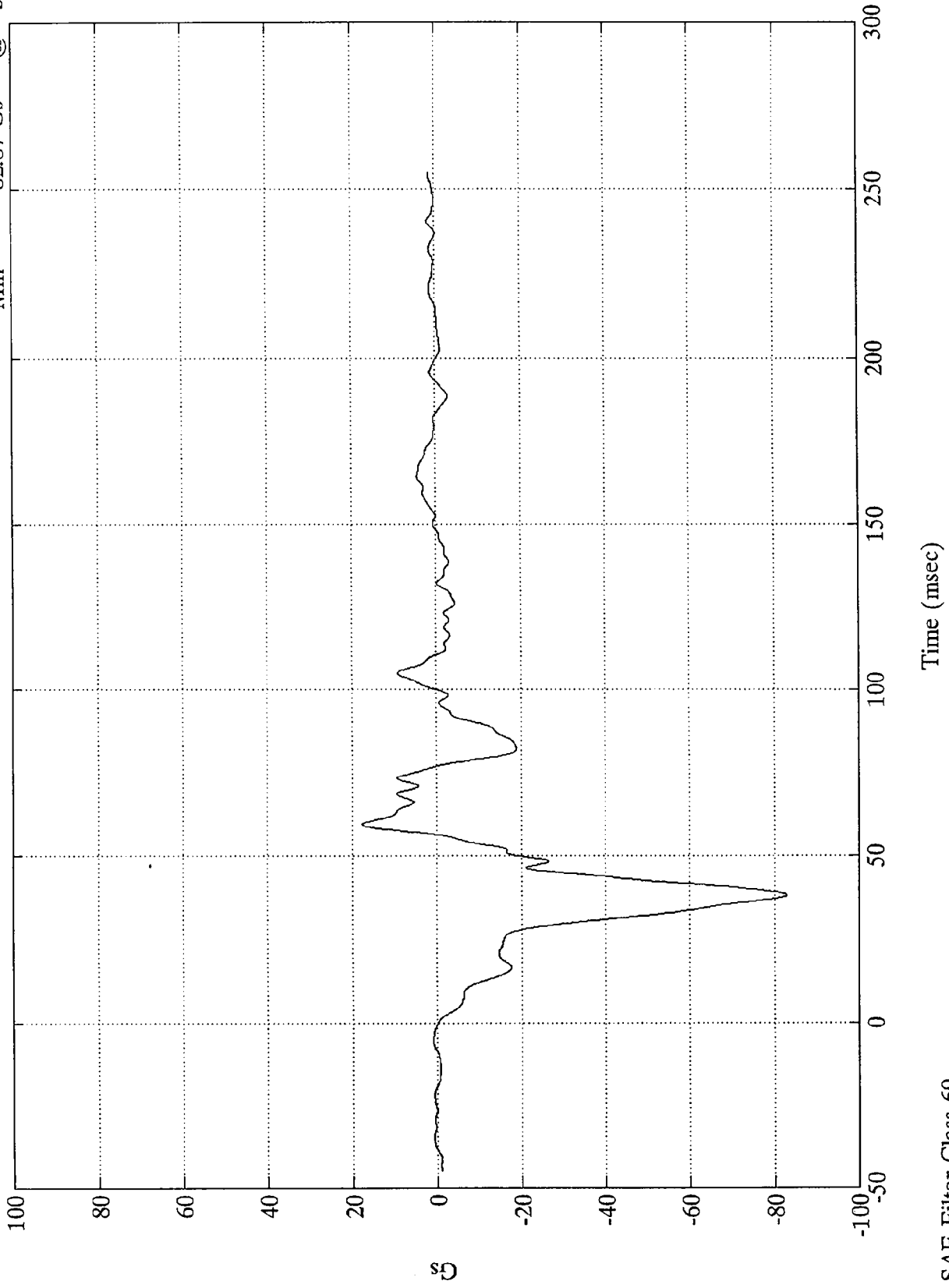
Max = 26.77 in. @ 104.40 msec  
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier - Ford Taurus

Right Caliper (X)

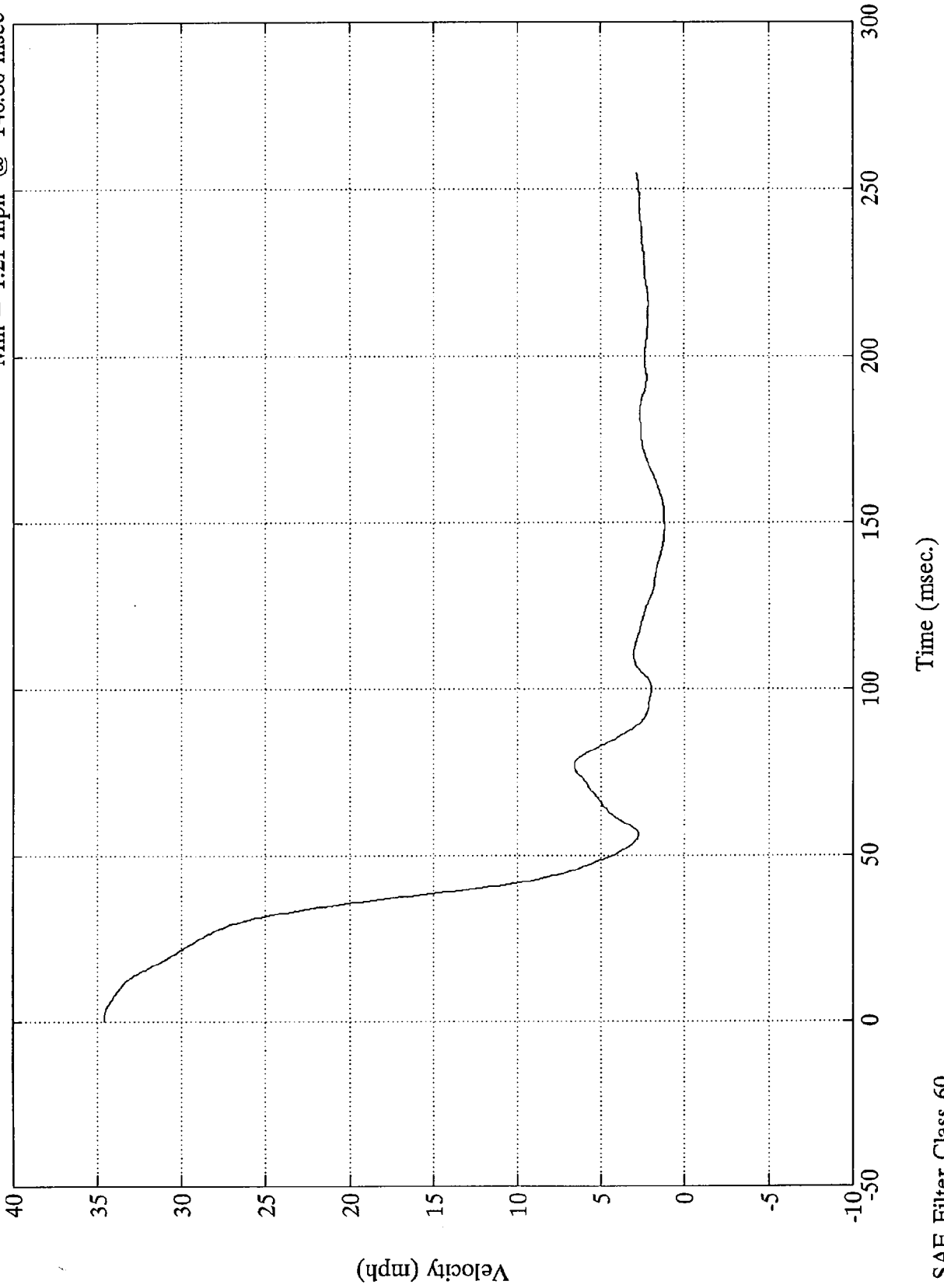
Max = 17.75 Gs @ 59.40 msec  
Min = -82.87 Gs @ 37.92 msec



TSC Frontal Barrier - Ford Taurus

Right Caliper (X)

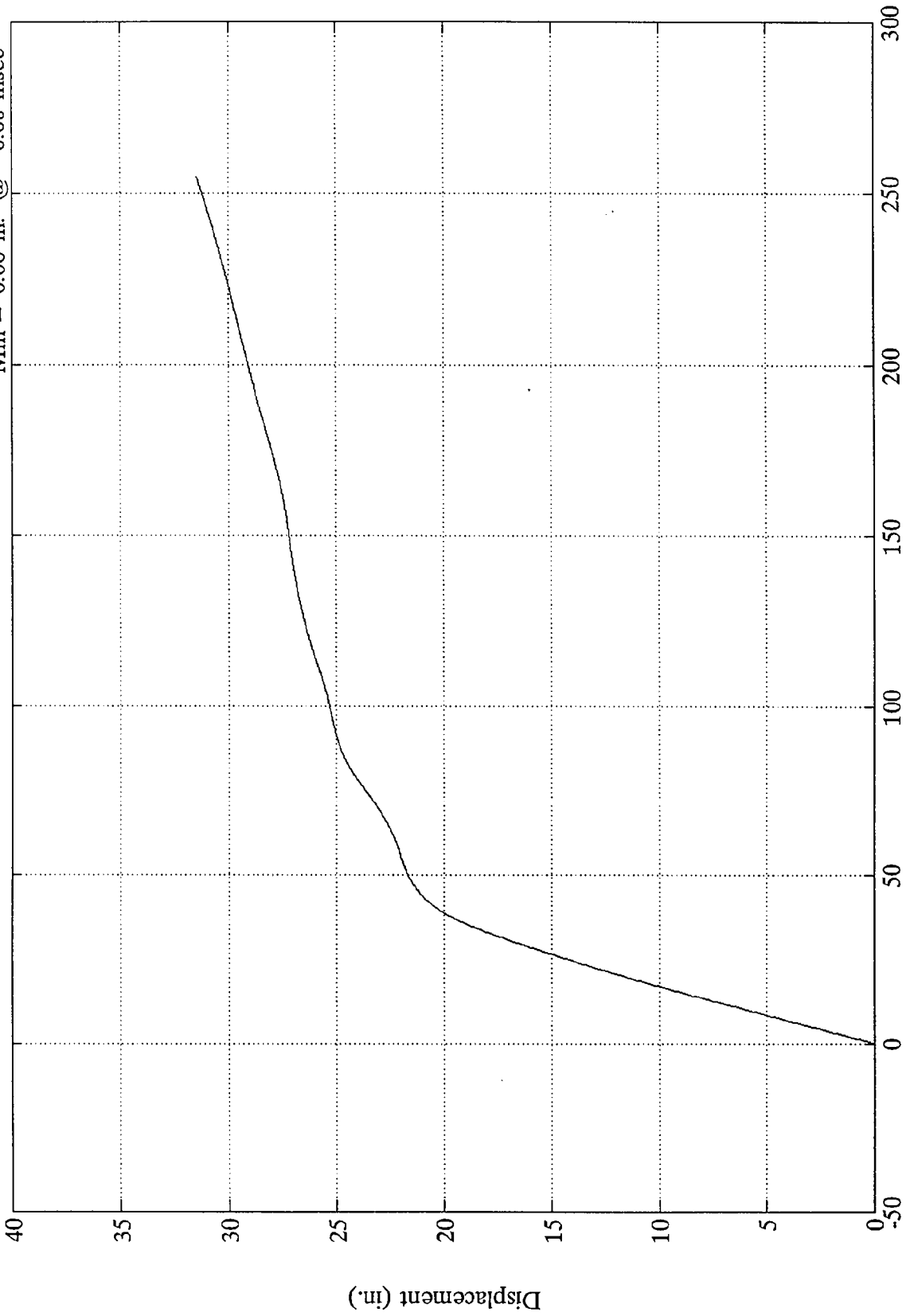
Max = 34.60 mph @ -0.00 msec  
Min = 1.21 mph @ 148.80 msec



TSC Frontal Barrier - Ford Taurus

Max = 31.44 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec

Right Caliper (X)



B-70

8118-1

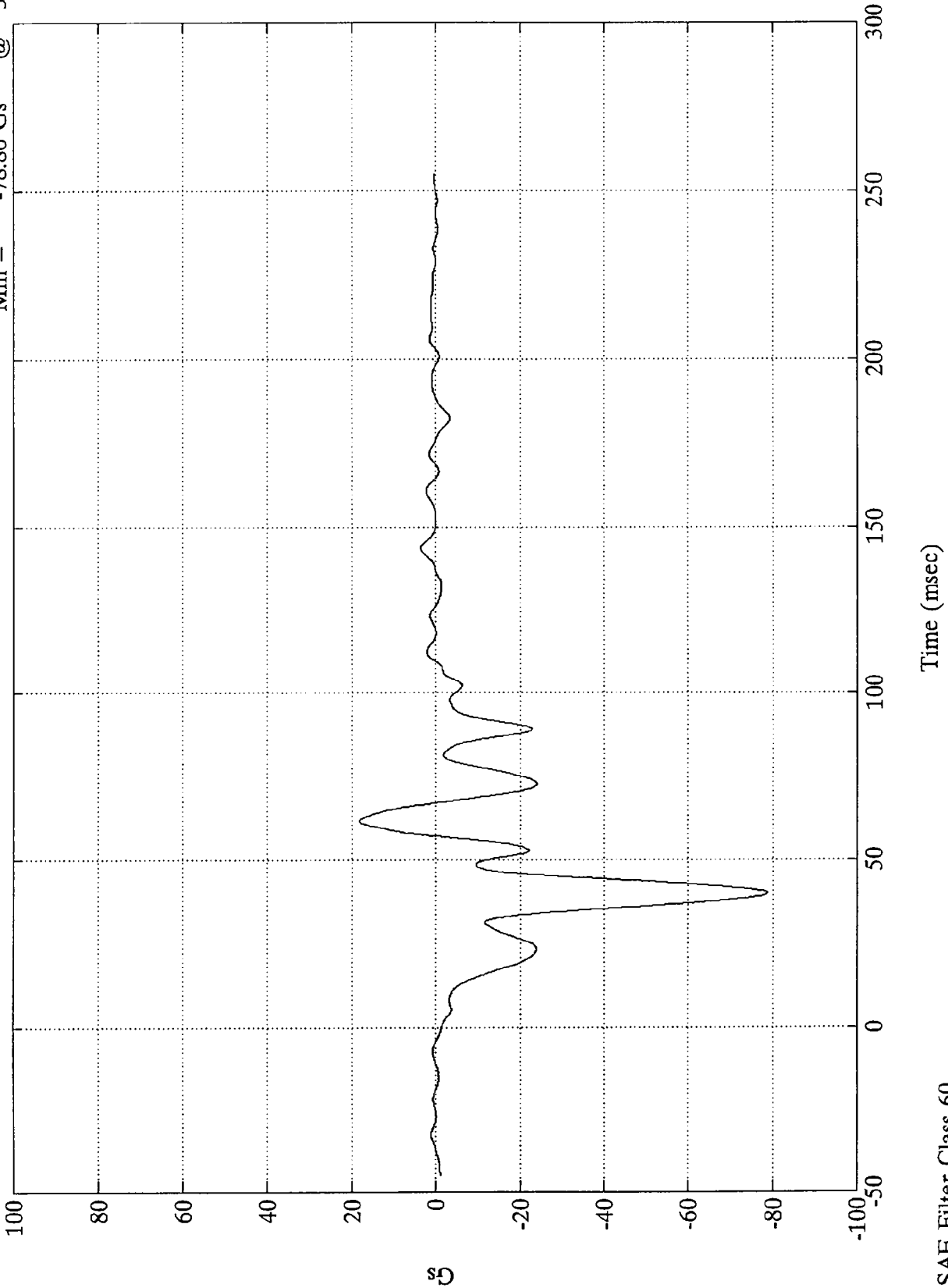
Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Left Caliper (X)

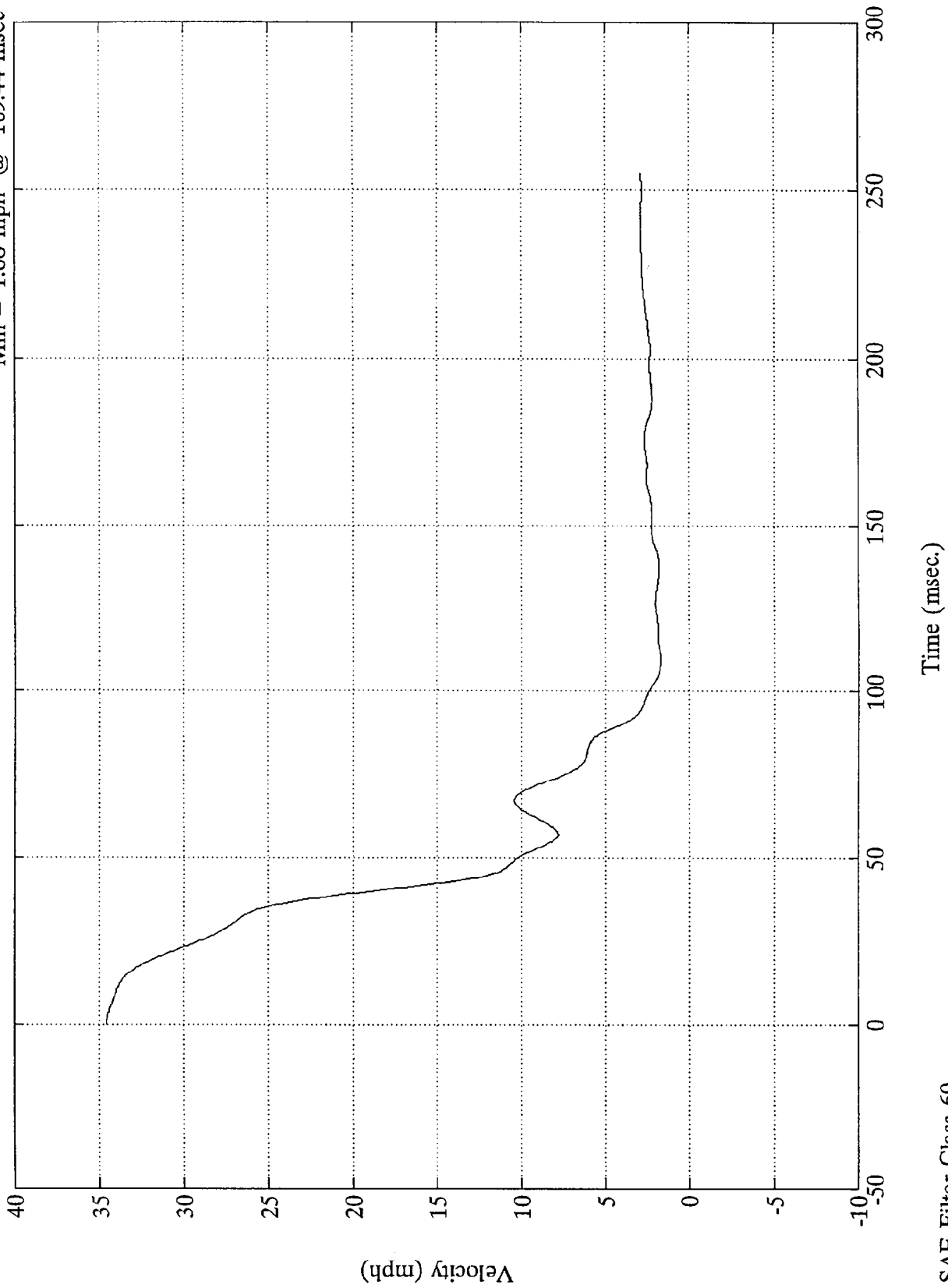
Max = 18.15 Gs @ 61.79 msec  
Min = -78.80 Gs @ 39.95 msec



TSC Frontal Barrier - Ford Taurus

Max = 34.60 mph @ -0.00 msec  
Min = 1.68 mph @ 109.44 msec

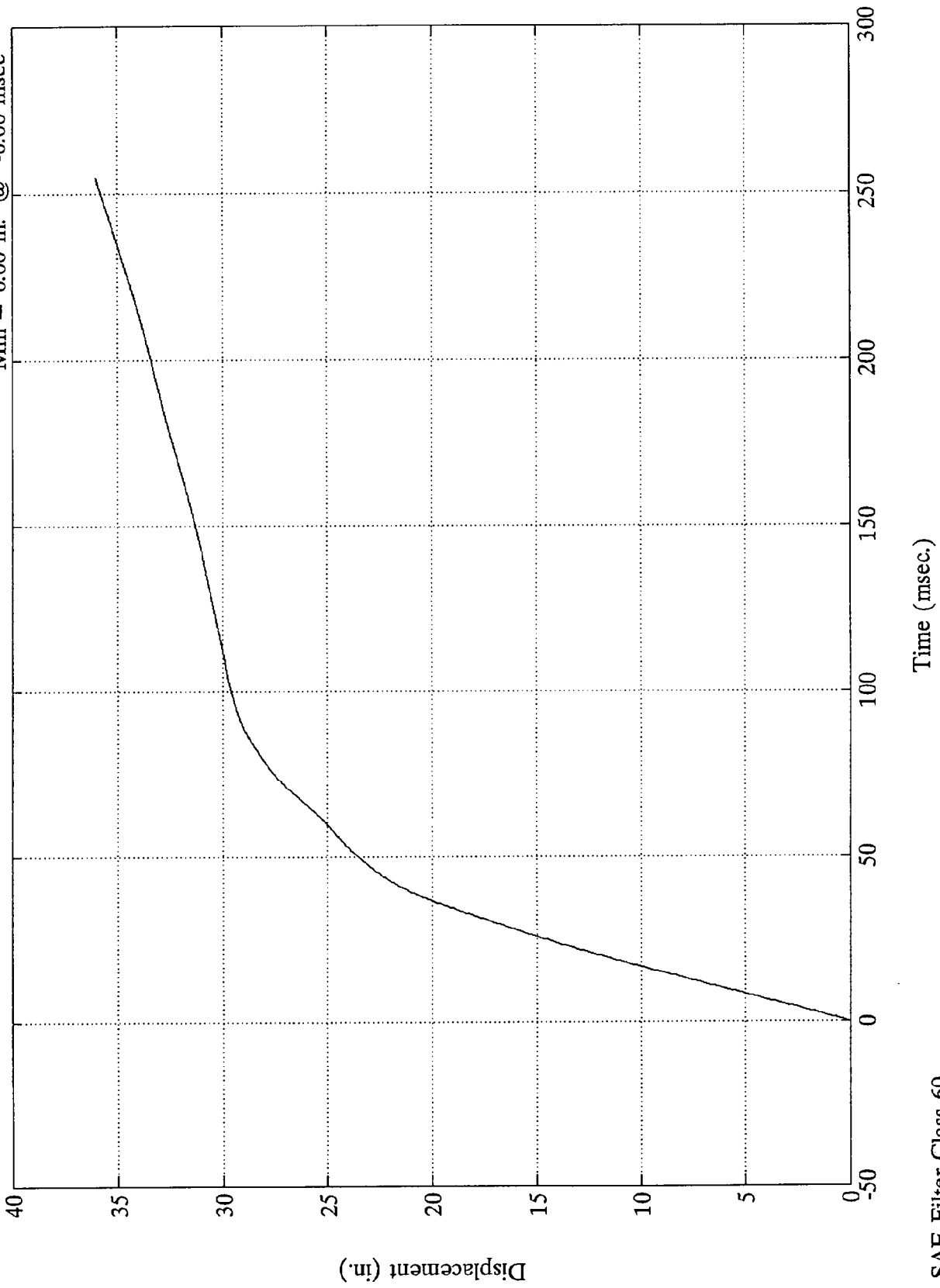
Left Caliper (X)



SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Left Caliper (X)  
Max = 36.01 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



B-73

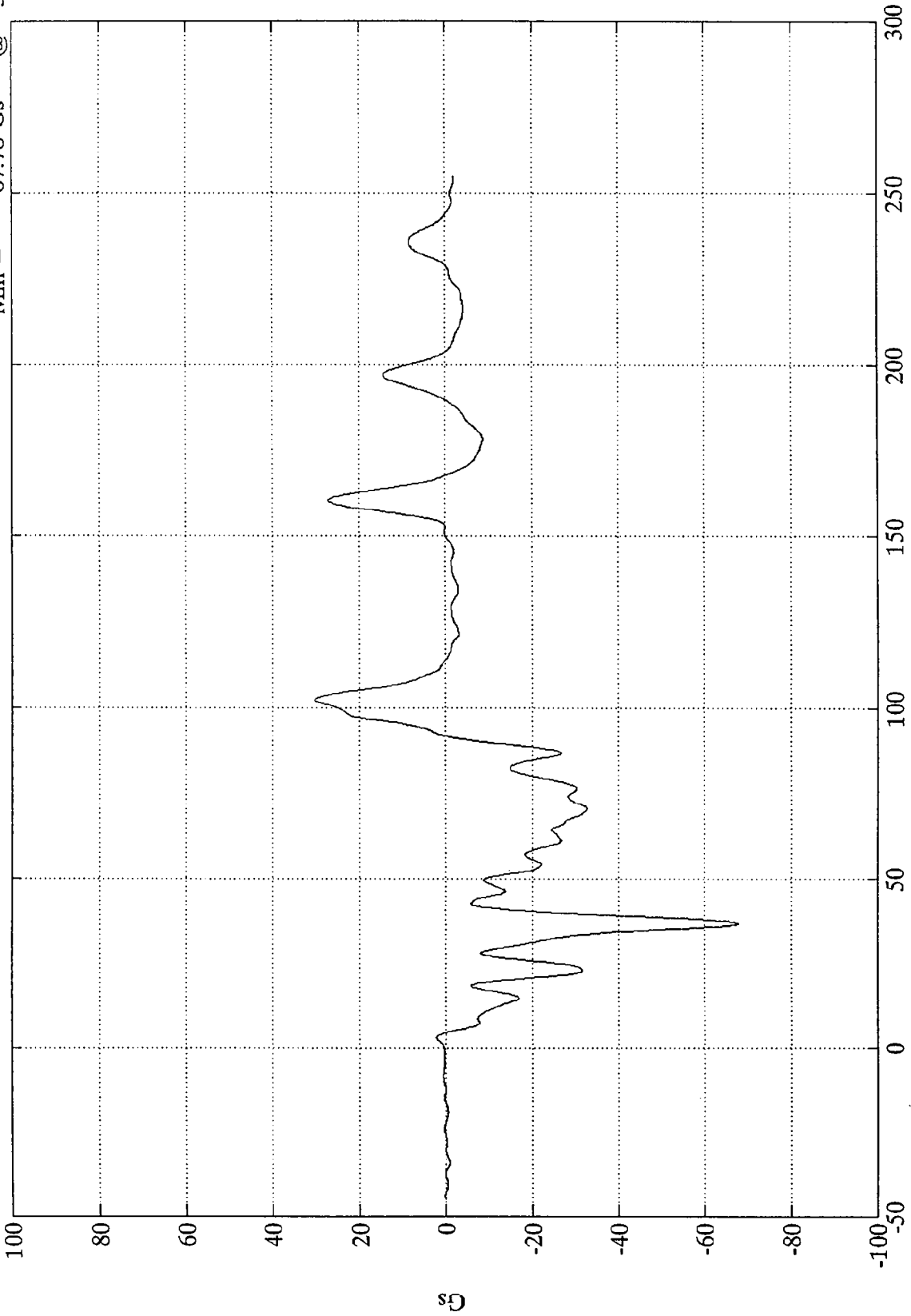
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Max = 30.23 Gs @ 102.36 msec  
Min = -67.78 Gs @ 36.84 msec

Brake Pedal (X)



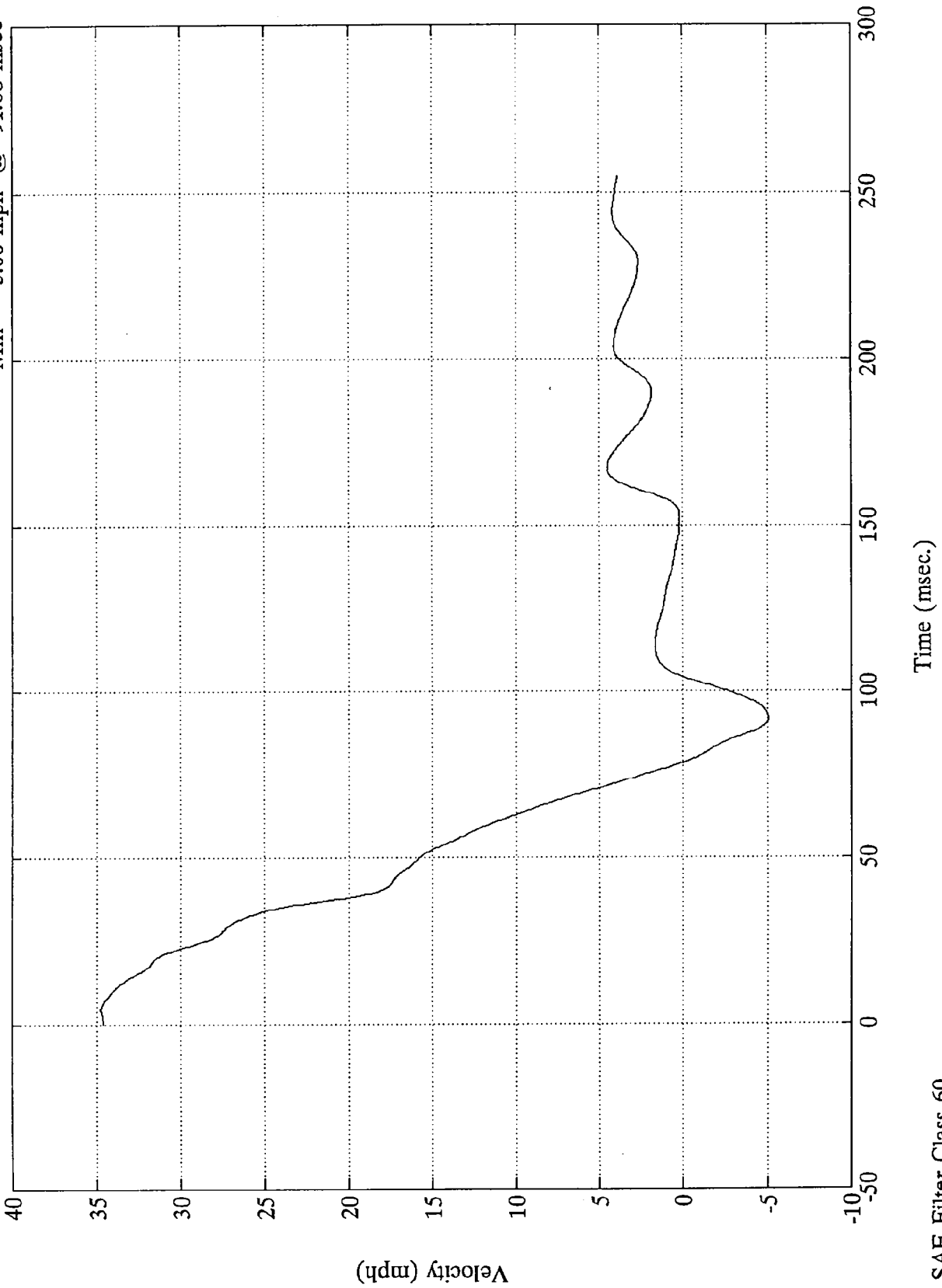
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Brake Pedal (X)

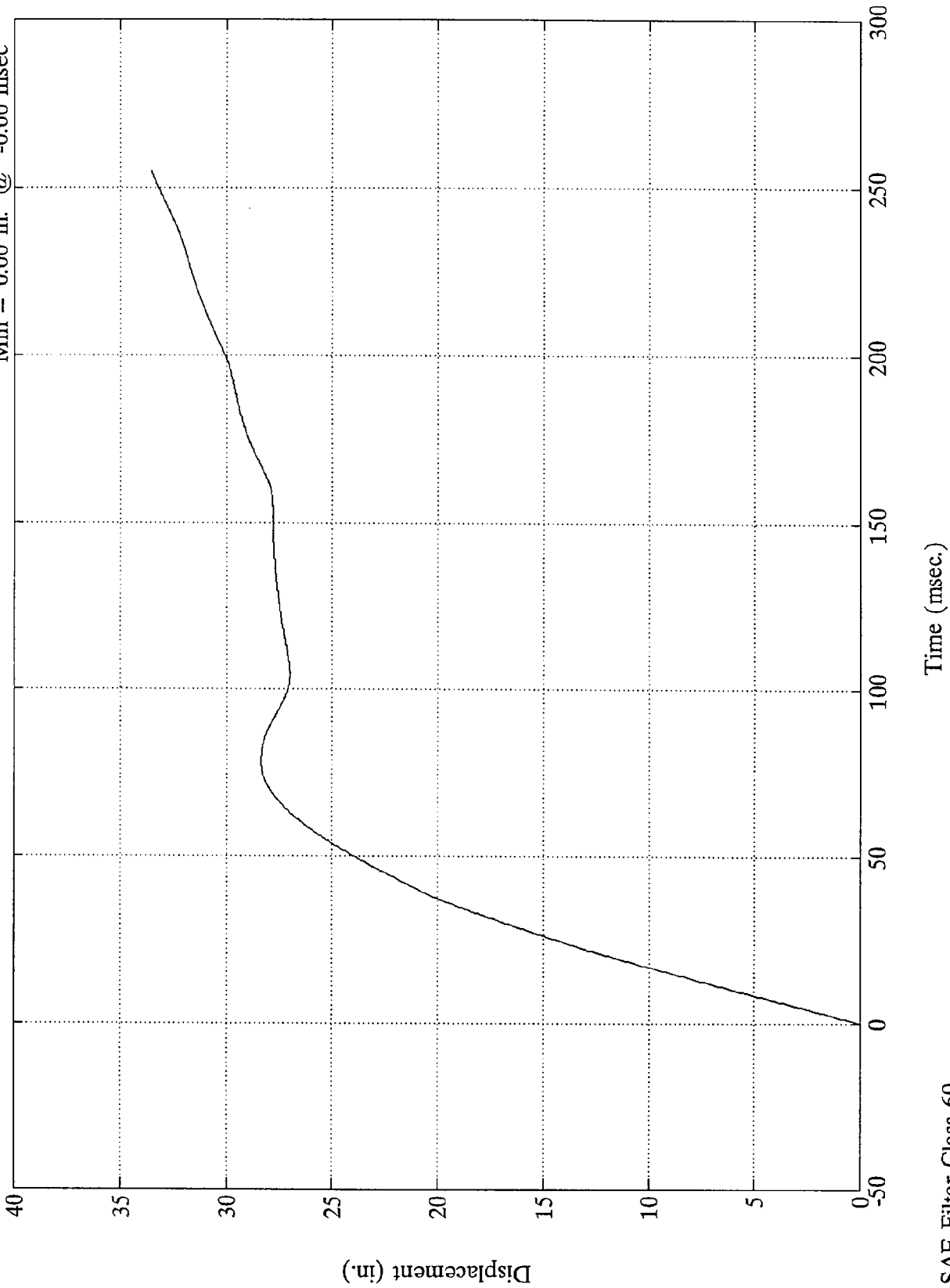
Max = 34.73 mph @ 4.56 msec  
Min = -5.06 mph @ 91.68 msec



SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Brake Pedal (X)  
Max = 33.53 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec

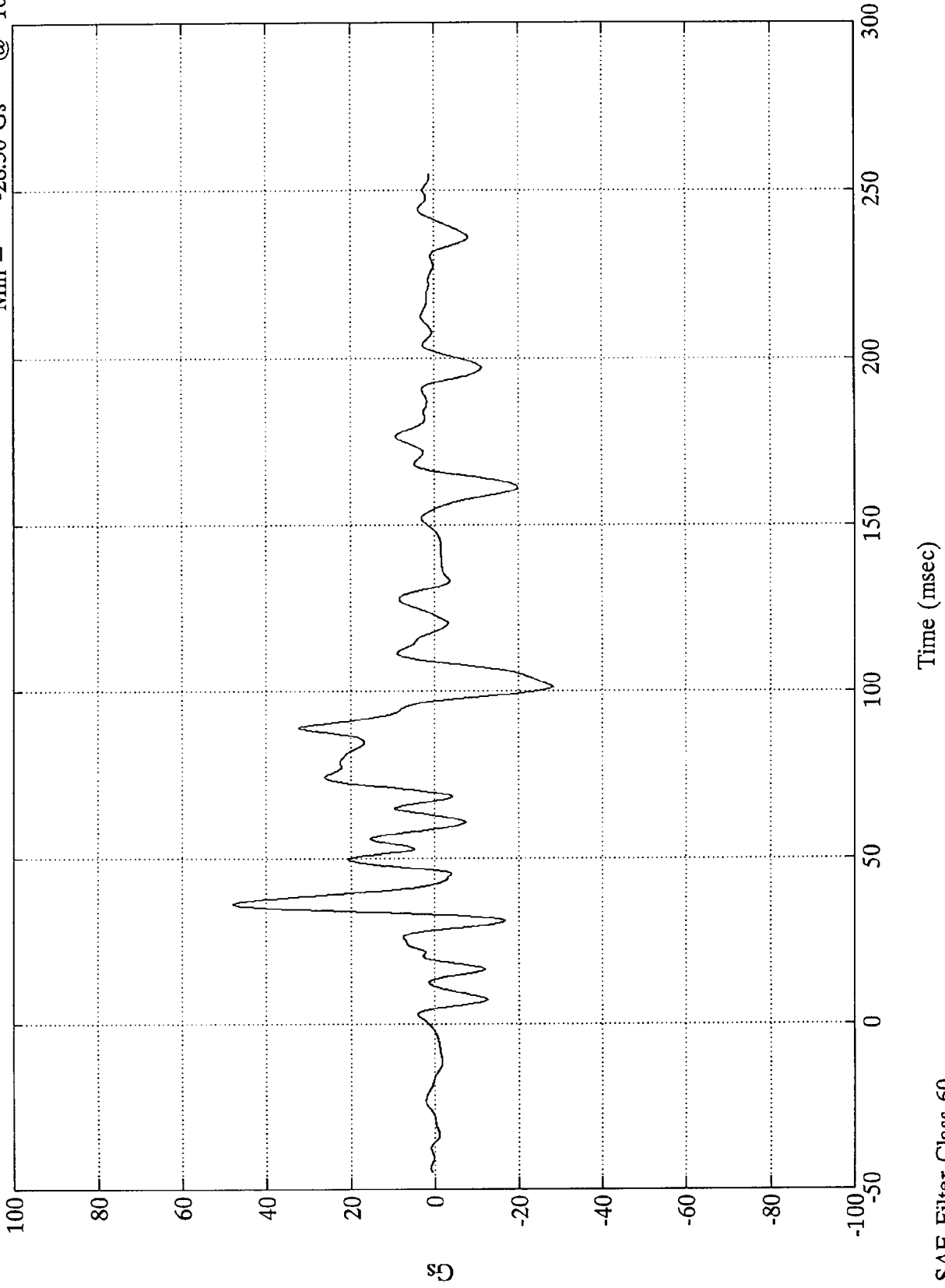


SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Max = 47.93 Gs @ 36.00 msec  
Min = -28.30 Gs @ 101.16 msec

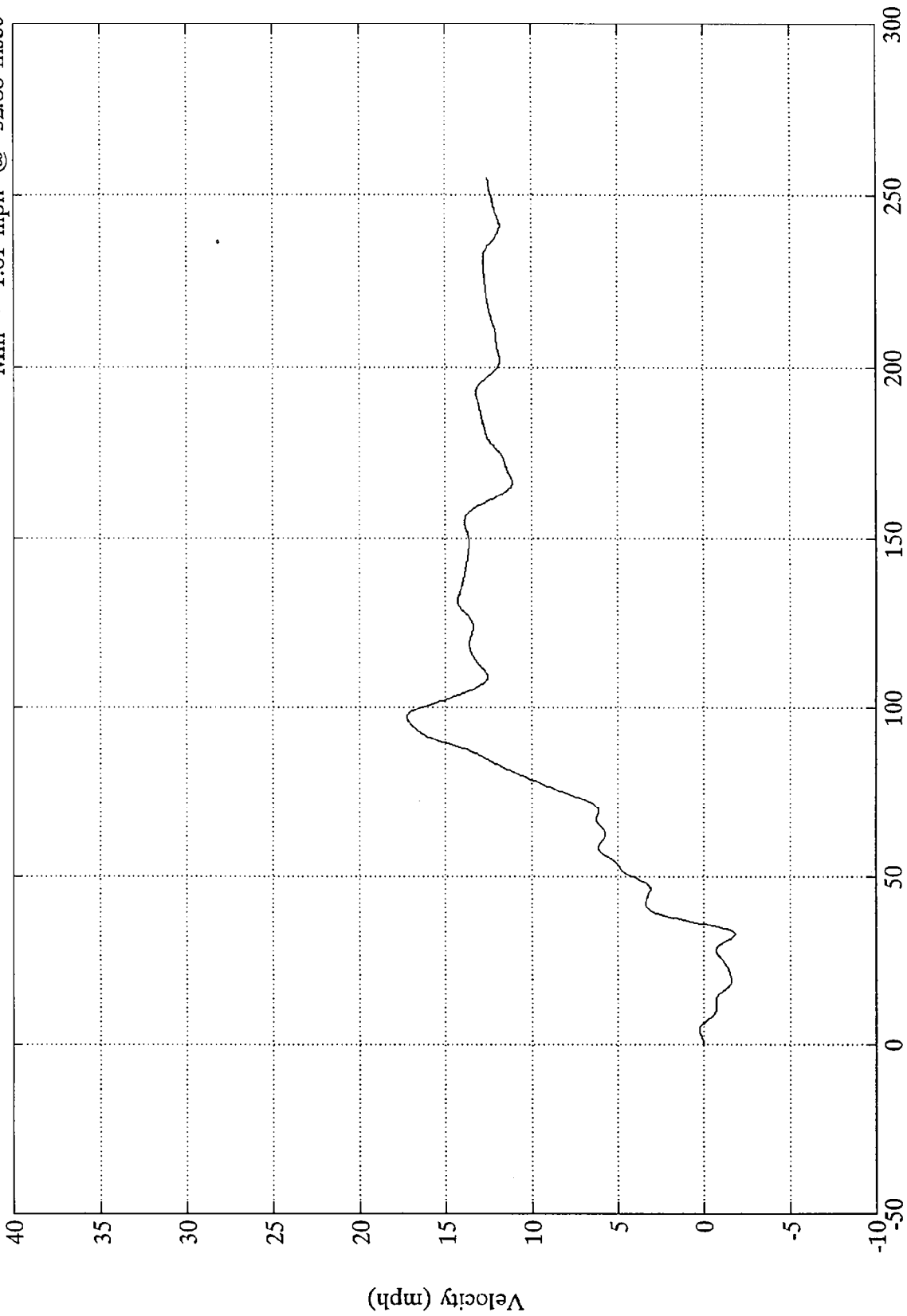
Brake Pedal (Z)



TSC Frontal Barrier - Ford Taurus

Max = 17.24 mph @ 96.96 msec  
Min = -1.81 mph @ 32.88 msec

Brake Pedal (Z)



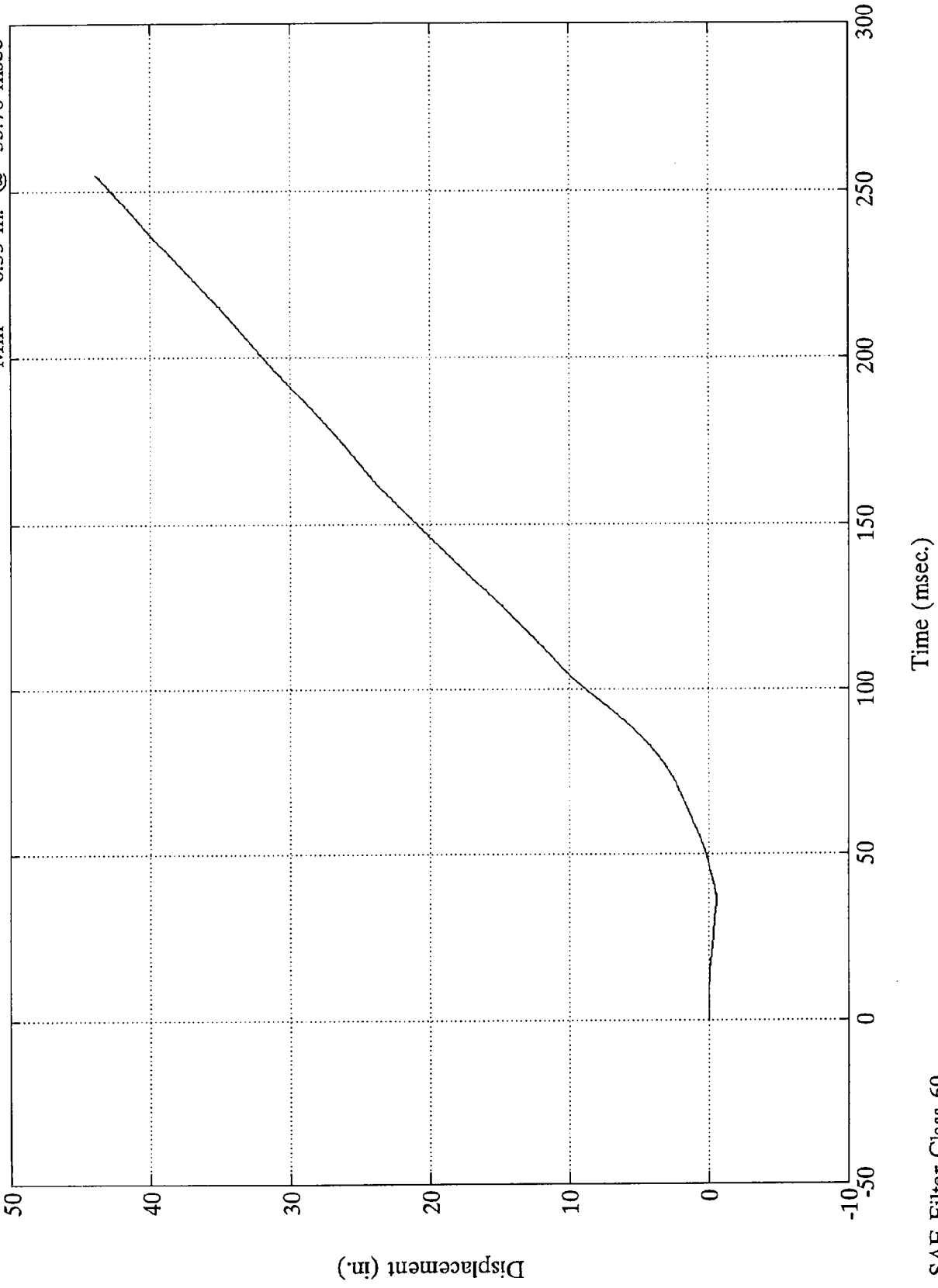
Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

Brake Pedal (Z)

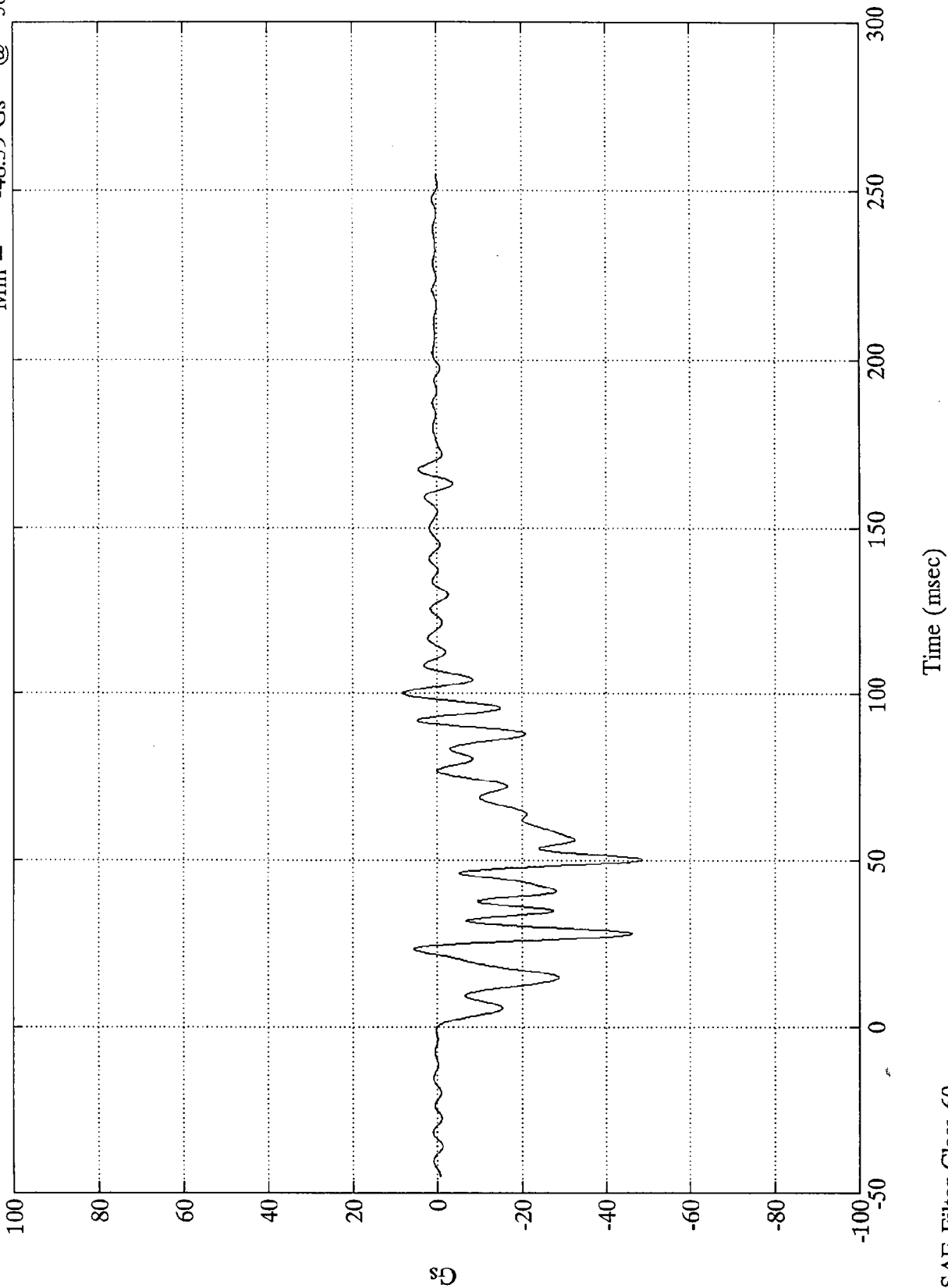
Max = 43.87 in. @ 254.88 msec  
Min = -0.53 in. @ 35.76 msec



TSC Frontal Barrier - Ford Taurus

Toe Pan (X)

Max = 8.09 Gs @ 99.84 msec  
Min = -48.59 Gs @ 50.28 msec



B-80

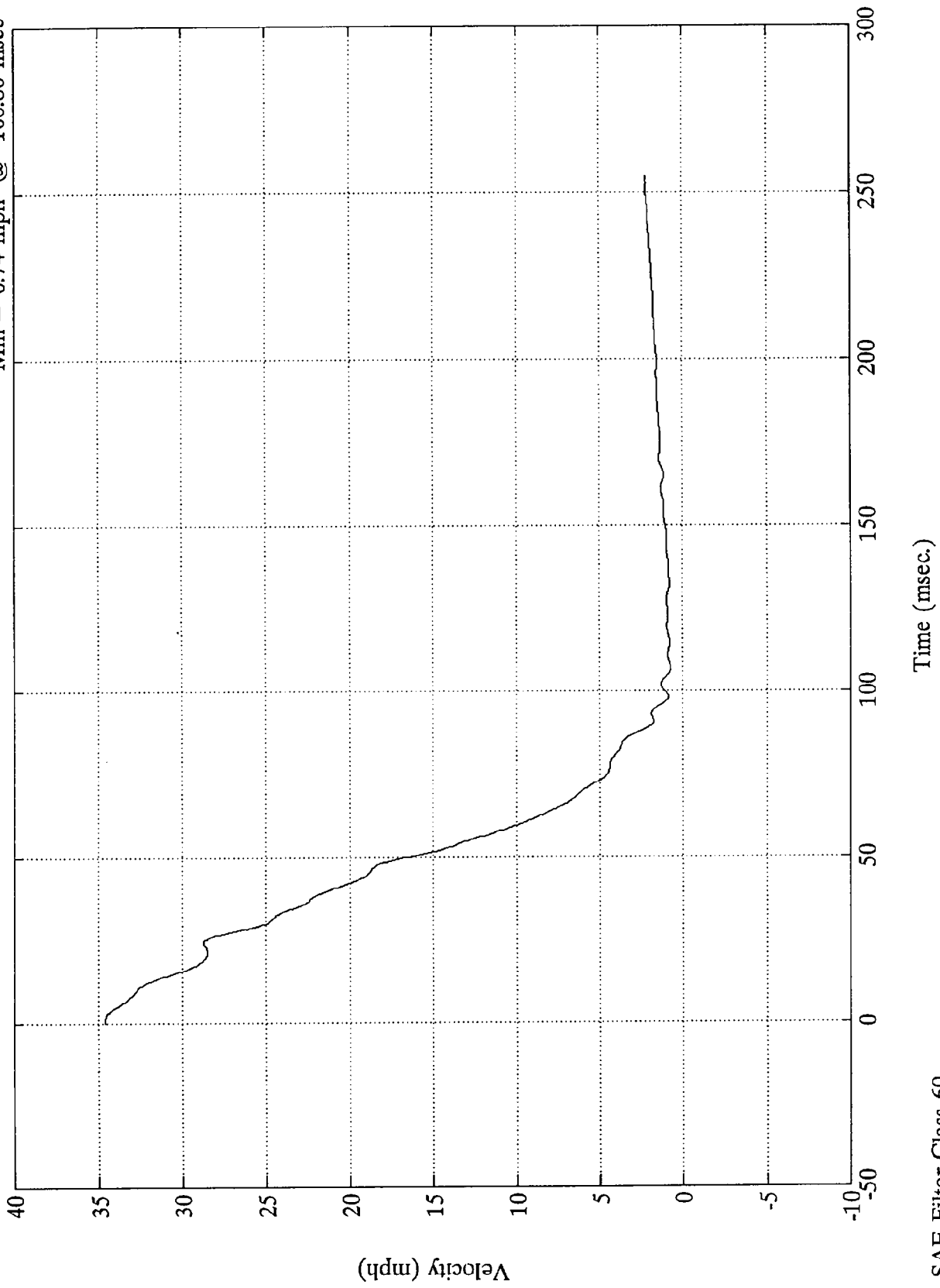
8118-1

SAE Filter Class 60

TSC Frontal Barrier - Ford Taurus

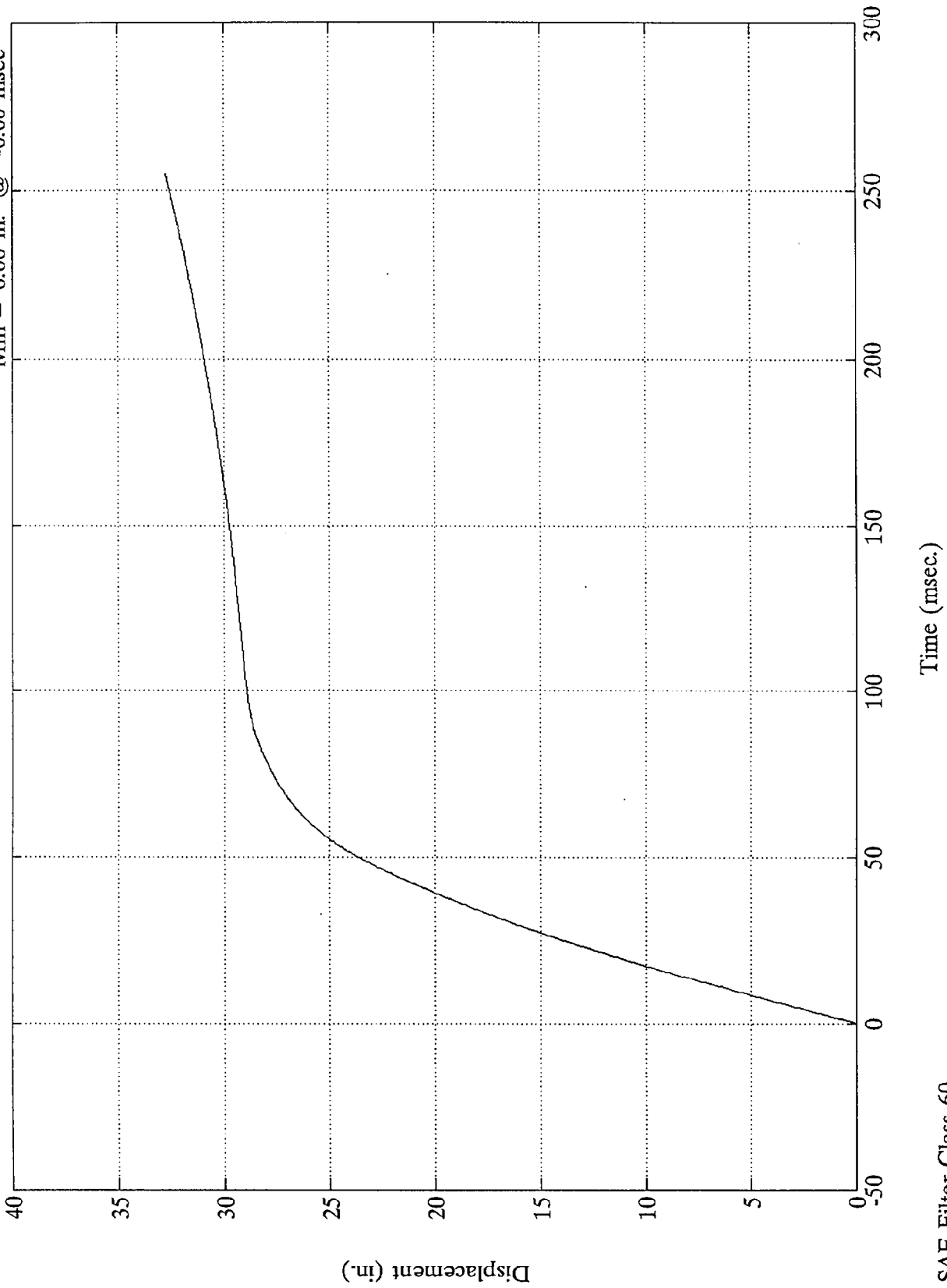
Toe Pan (X)

Max = 34.60 mph @ 0.24 msec  
Min = 0.74 mph @ 106.80 msec



TSC Frontal Barrier - Ford Taurus

Toe Pan (X)  
Max = 32.73 in. @ 254.88 msec  
Min = 0.00 in. @ -0.00 msec



TEST NO. Y49-1-1306

DUMMY DATA

CHANNEL	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Femur Forces	600
Torso Belt	60
Chest Displacement	.180
Neck Forces	1000
Neck Moments	600
Tibia Forces, Moments	600

FACILITY: TRACK  
 RUN #: 1306  
 SERIES #: 1

TEST DATE: 06 Aug 1993  
 TEST TIME: 11:00:58  
 BOARD: a

TITLE: TSC Frontal Barrier - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Head X	Gs	8.5	126.6	-61.5	68.4	1000.0
2	Pos. 1 Head Y	Gs	22.8	63.7	-21.7	38.6	1000.0
3	Pos. 1 Head Z	Gs	27.0	79.4	-33.0	103.0	1000.0
4	Pos. 1 Left Femur	Lbs	65.6	47.8	-2187.4	89.5	600.0
5	Pos. 1 Chest X	Gs	2.8	181.3	-46.9	89.2	180.0
6	Pos. 1 Chest Y	Gs	5.5	103.9	-4.0	56.3	180.0
7	Pos. 1 Chest Z	Gs	19.2	96.2	-6.2	61.4	180.0
8	Pos. 1 Right Femur	Lbs	134.4	178.4	-1486.9	68.9	600.0
9	Pos. 2 Head X	Gs	19.3	102.0	-62.0	58.6	1000.0
10	Pos. 2 Head Y	Gs	15.2	44.4	-10.0	254.9	1000.0
11	Pos. 2 Head Z	Gs	17.7	161.9	-19.4	40.9	1000.0
12	Pos. 2 Left Femur	Lbs	90.0	90.8	-1081.7	47.6	600.0
13	Pos. 2 Chest X	Gs	3.3	176.2	-52.0	62.5	180.0
14	Pos. 2 Chest Y	Gs	5.6	79.0	-3.9	52.9	180.0
15	Pos. 2 Chest Z	Gs	8.3	42.0	-13.7	76.9	180.0
16	Pos. 2 Right Femur	Lbs	40.0	18.5	-847.9	50.9	600.0
17	Pos. 1 Head Resultant	Gs	63.5	70.7	.1	7.6	1000.0
18	Pos. 1 Chest Resultant	Gs	47.2	89.2	.0	-9.2	180.0
19	Pos. 2 Head Resultant	Gs	63.8	58.6	.0	-21.5	1000.0
20	Pos. 2 Chest Resultant	Gs	53.1	62.5	.0	-17.2	180.0

36 ms Fixed Duration HIC SUMMARY: Pos. 1 Head Resultant

hic: 462.07  
 t1 = 62.880 msec  
 t2 = 86.640 msec  
 Average G's Over Hic Duration = 51.95

36 ms Fixed Duration HIC SUMMARY: Pos. 2 Head Resultant

hic: 319.03  
 t1 = 51.360 msec  
 t2 = 70.440 msec  
 Average G's Over Hic Duration = 48.90

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 43.439 G's  
 Tstart = 87.3600 ms  
 Tend = 90.4800 ms  
 CSI = 372.710

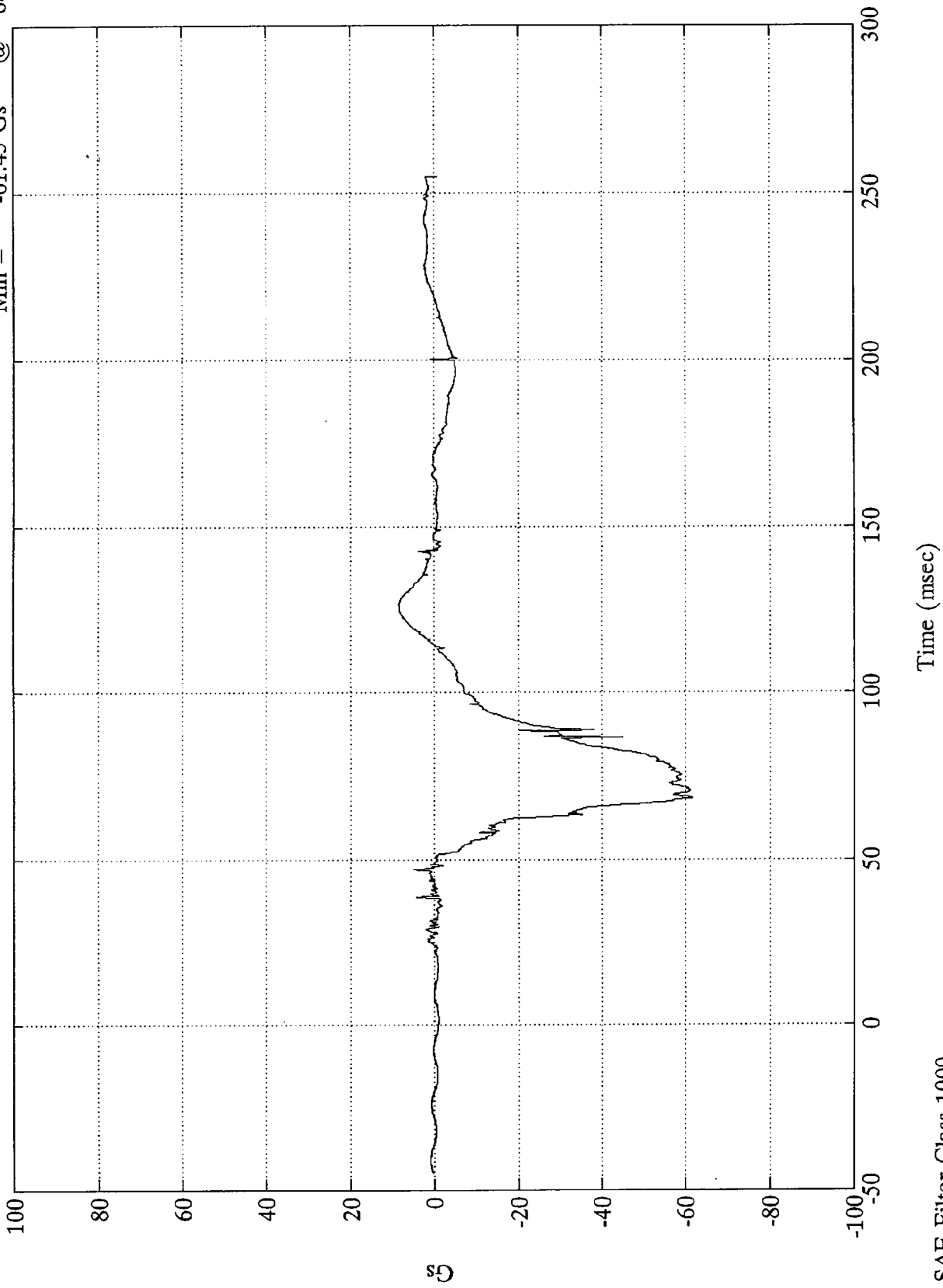
CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 49.935 G's  
 Tstart = 61.4400 ms  
 Tend = 64.5600 ms  
 CSI = 334.236

TSC Frontal Barrier - Ford Taurus

Pos. 1 Head X

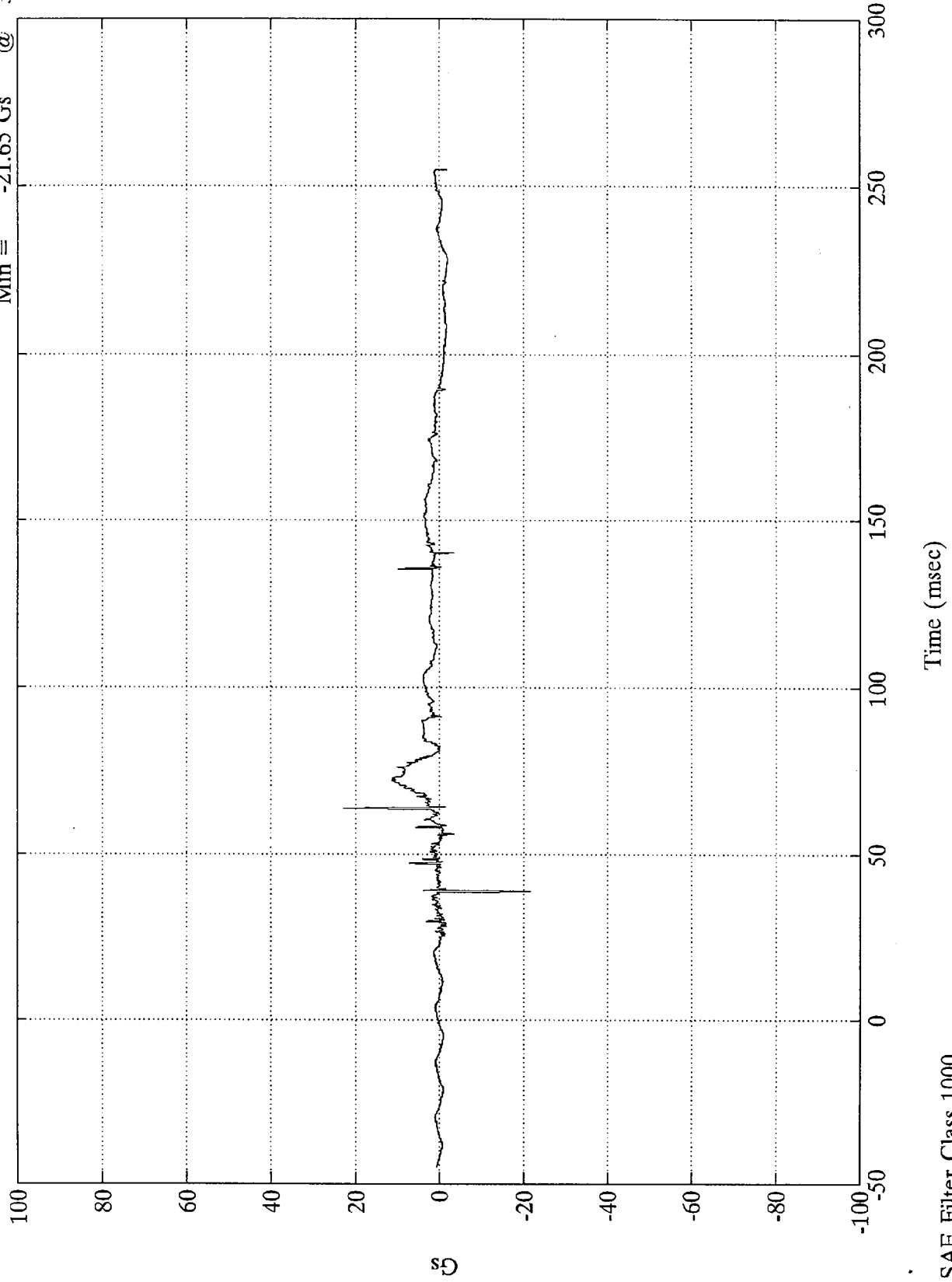
Max = 8.51 Gs @ 126.59 msec  
Min = -61.45 Gs @ 68.40 msec



TSC Frontal Barrier - Ford Taurus

Max = 22.83 Gs @ 63.72 msec  
Min = -21.65 Gs @ 38.63 msec

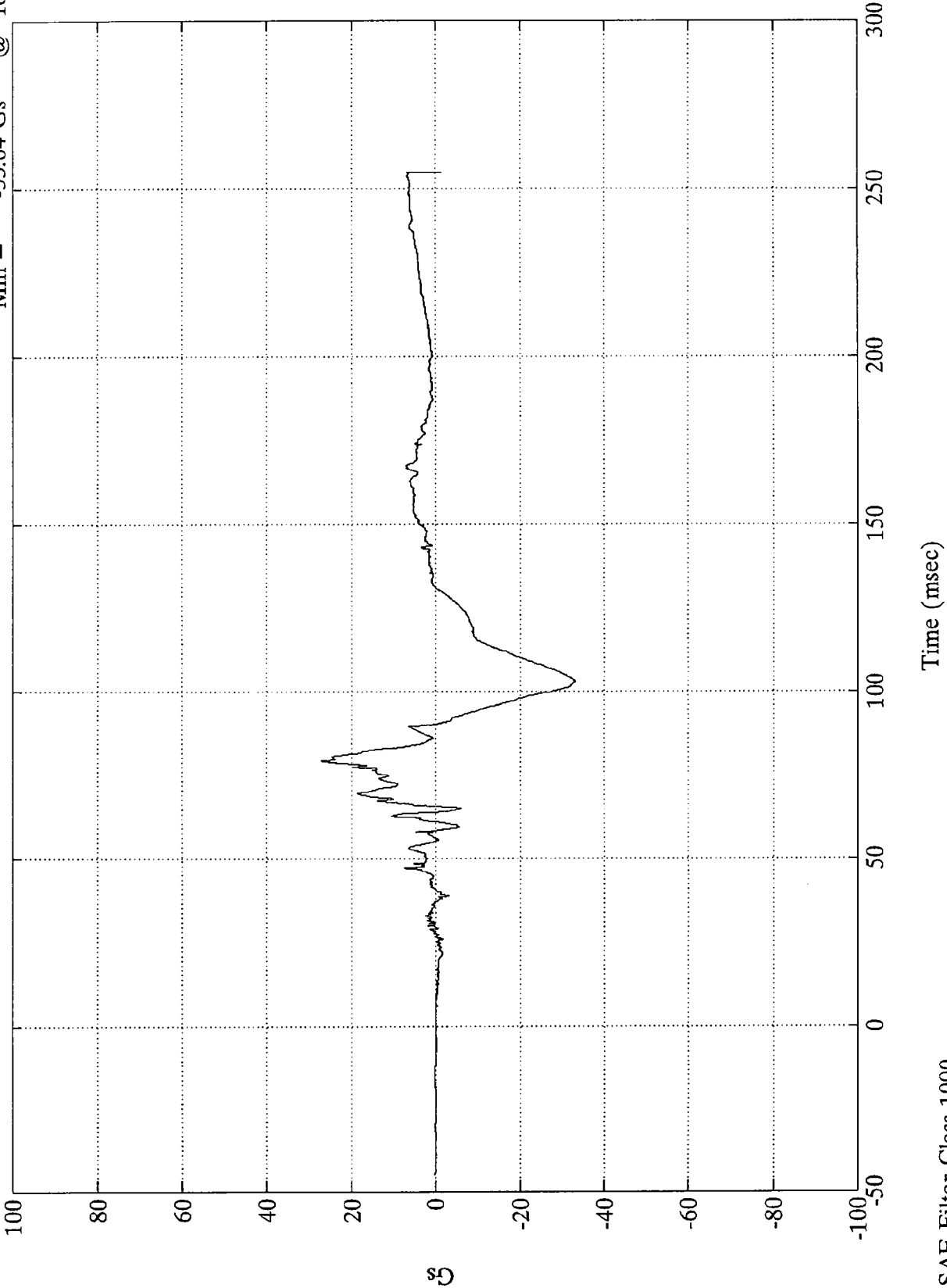
Pos. 1 Head Y



TSC Frontal Barrier - Ford Taurus

Max = 27.02 Gs @ 79.44 msec  
Min = -33.04 Gs @ 102.96 msec

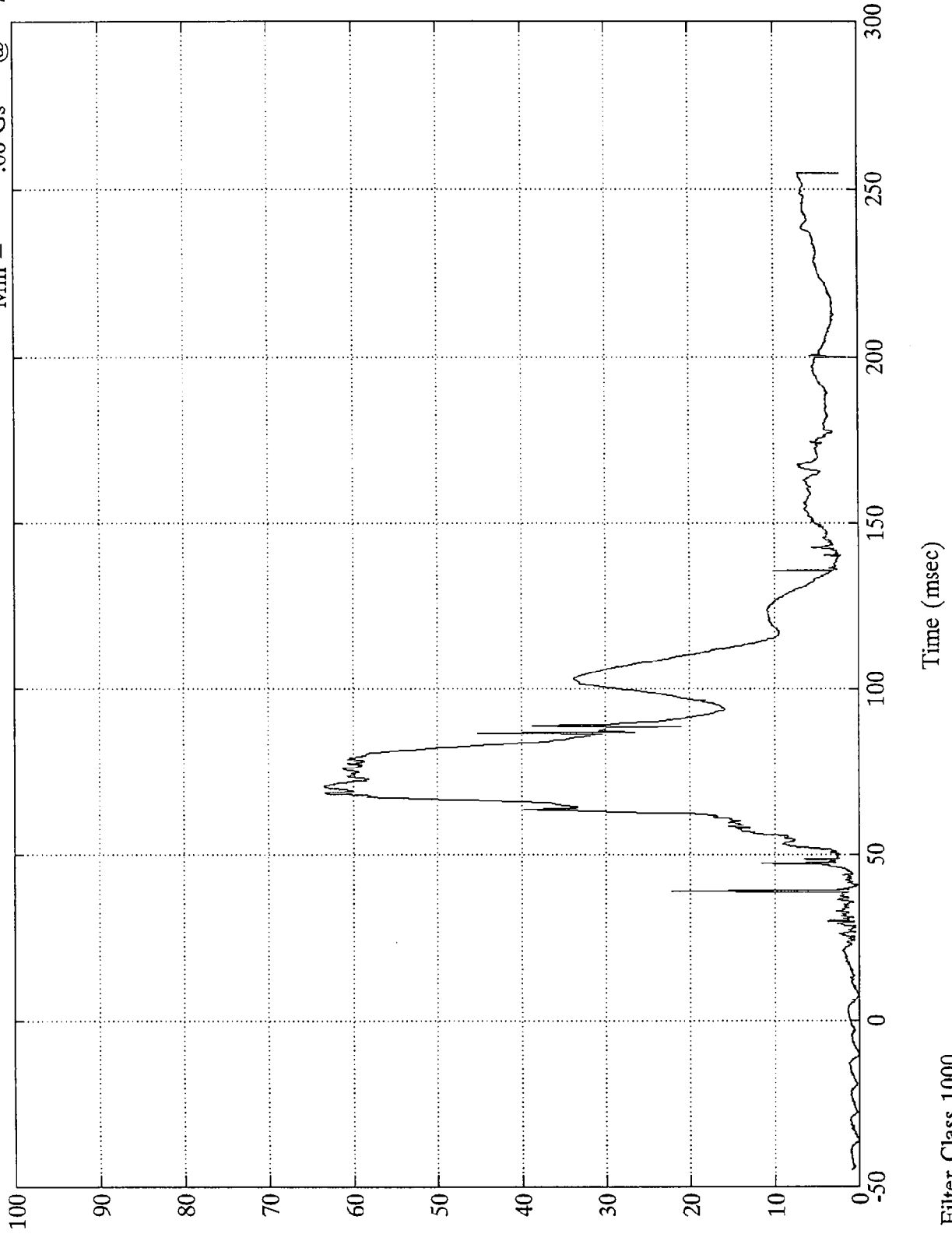
Pos. 1 Head Z



TSC Frontal Barrier - Ford Taurus

Pos. 1 Head Resultant

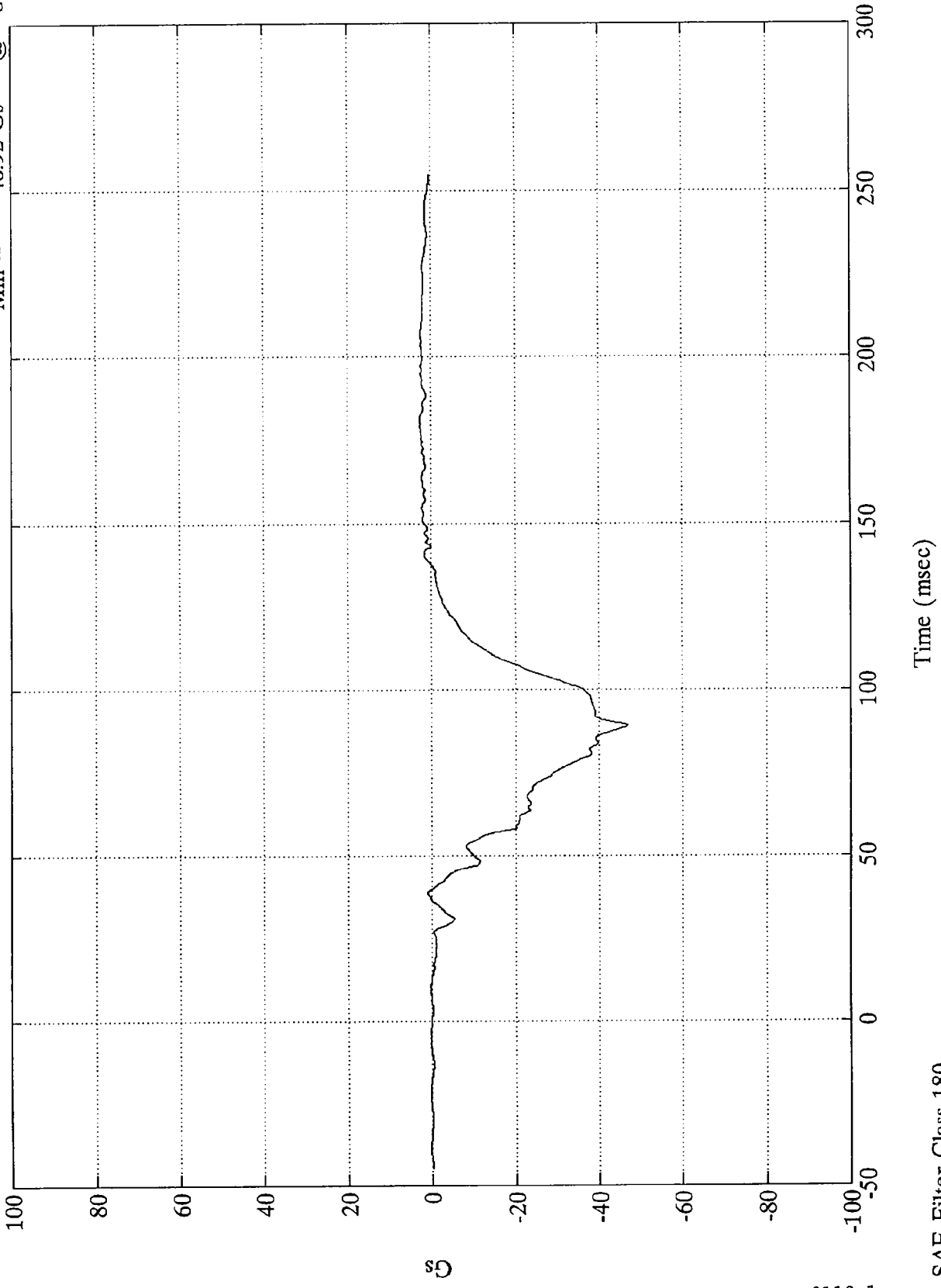
Max = 63.45 Gs @ 70.68 msec  
Min = .06 Gs @ 7.55 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 Chest X

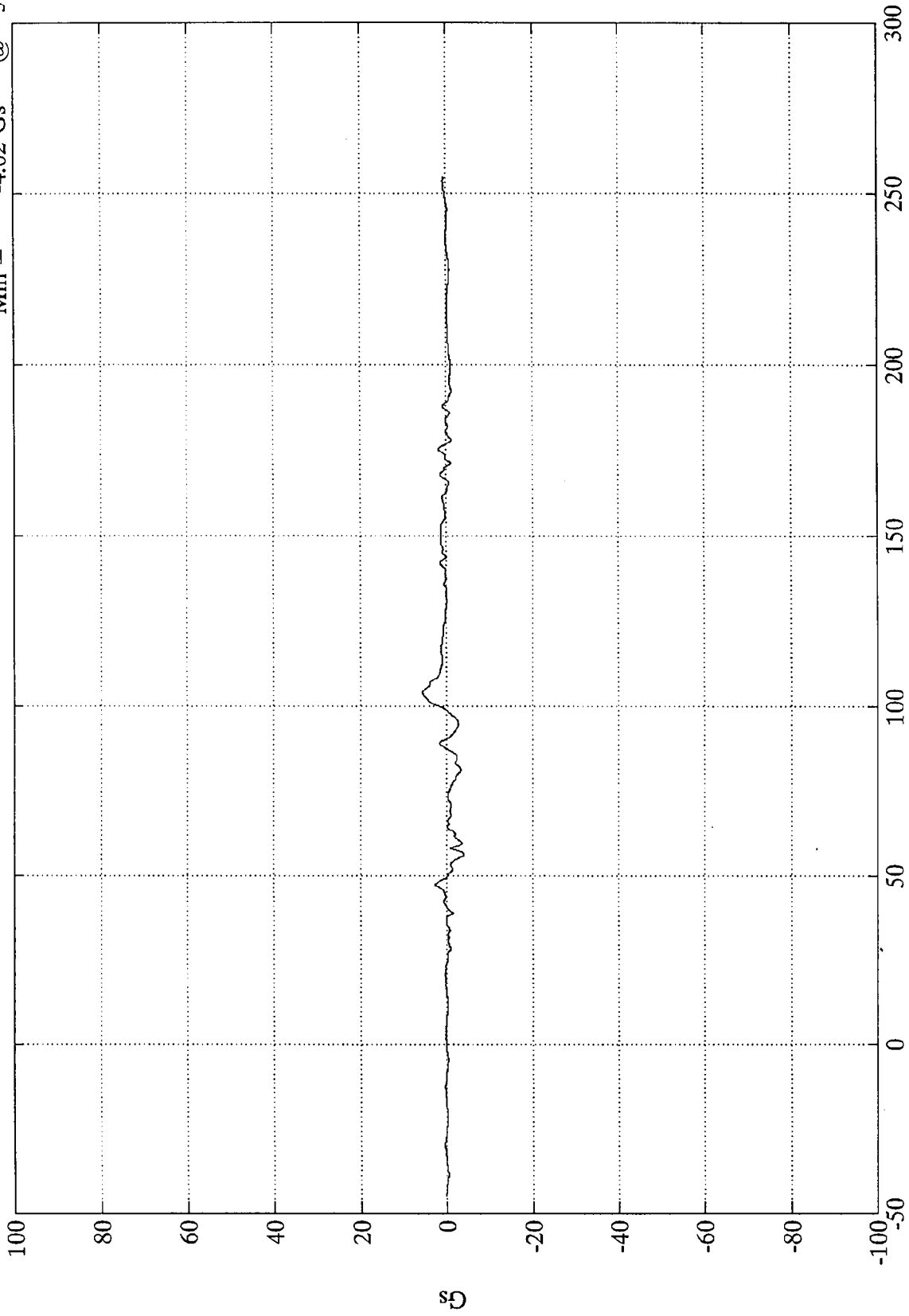
Max = 2.78 Gs @ 181.32 msec  
Min = -46.92 Gs @ 89.16 msec



TSC Frontal Barrier - Ford Taurus

Max = 5.55 Gs @ 103.92 msec  
Min = -4.02 Gs @ 56.28 msec

Pos. 1 Chest Y



B-90

8118-1

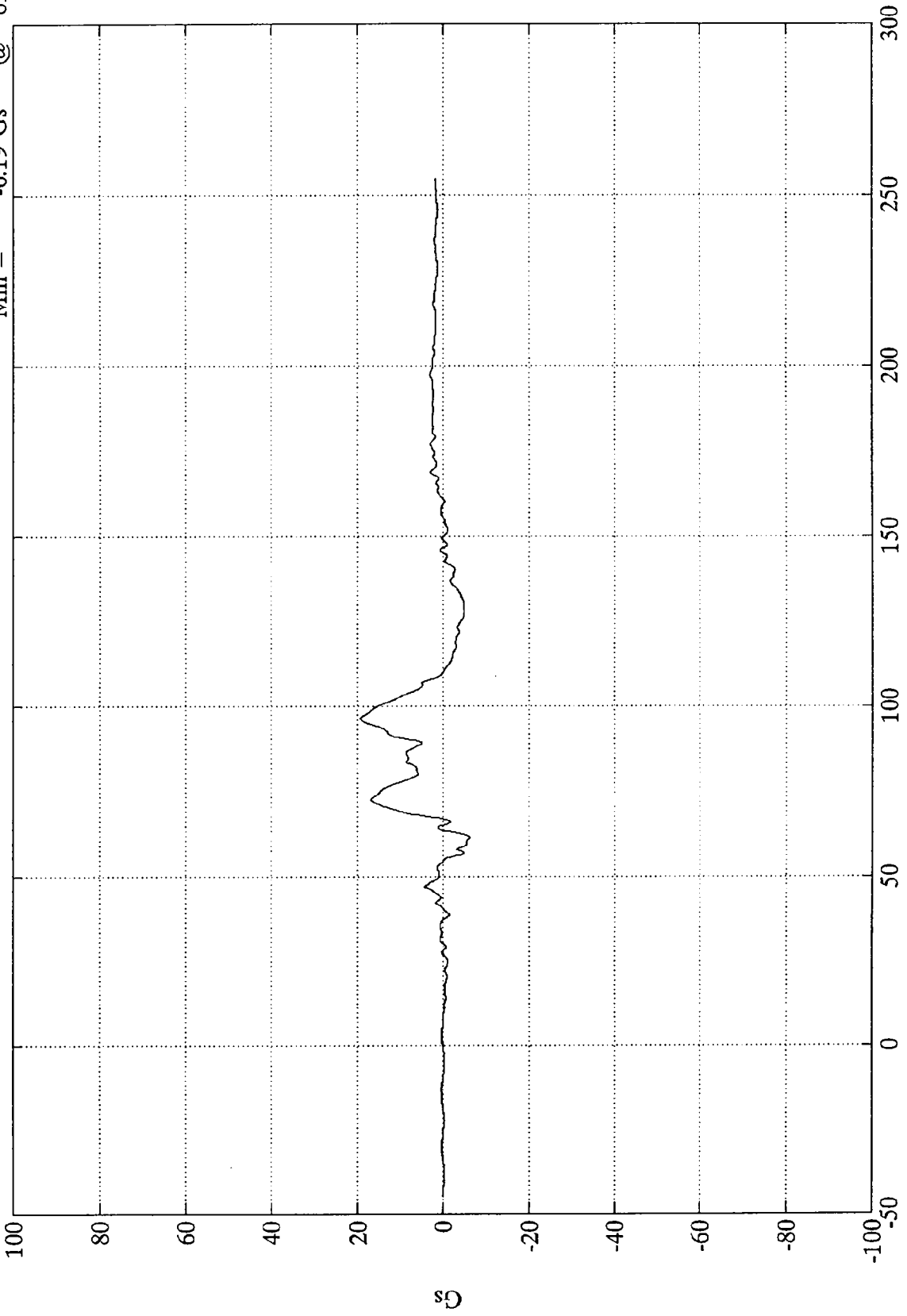
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier - Ford Taurus

Max = 19.19 Gs @ 96.23 msec  
Min = -6.19 Gs @ 61.44 msec

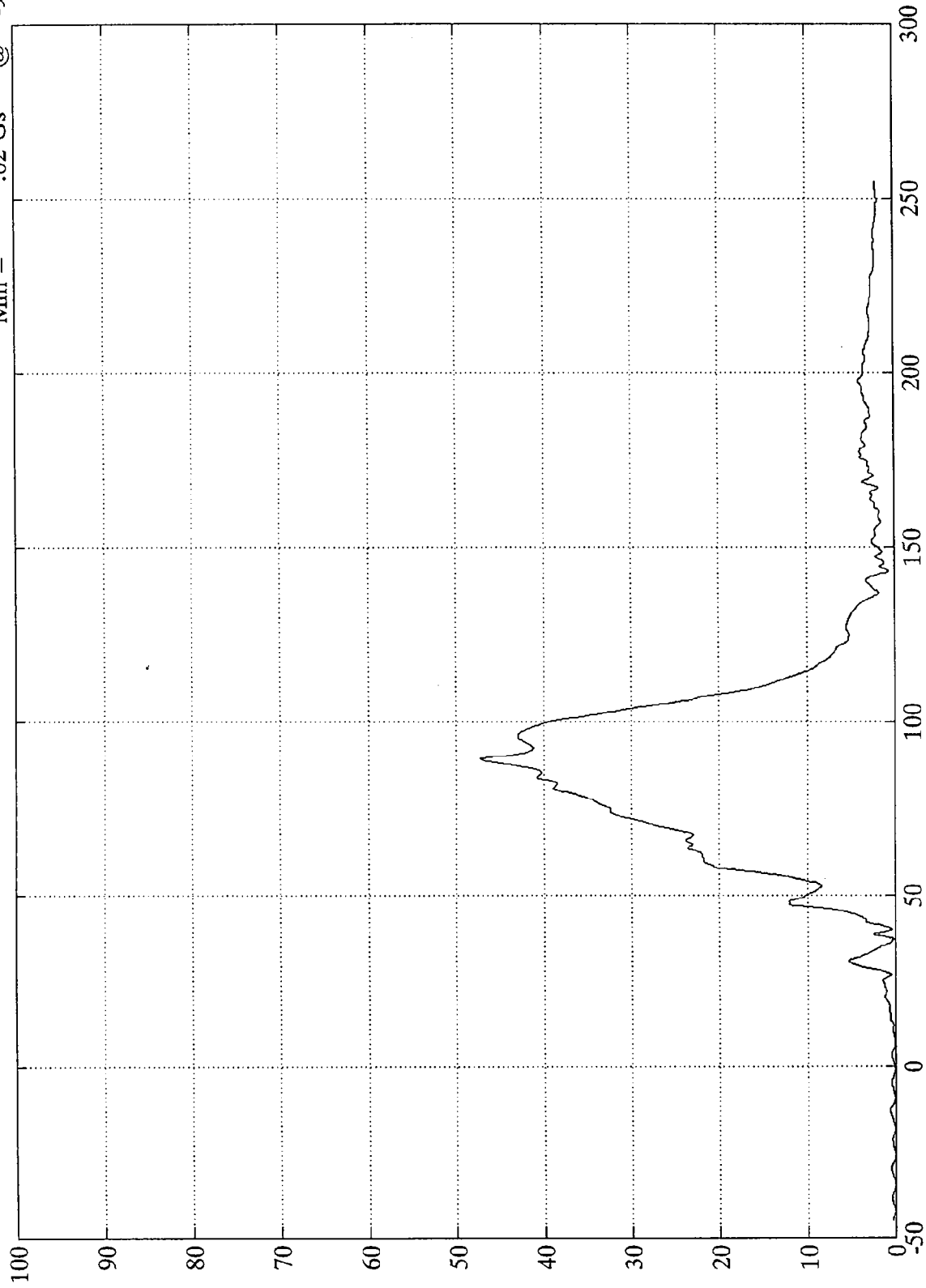
Pos. 1 Chest Z



TSC Frontal Barrier - Ford Taurus

Max = 47.20 Gs @ 89.16 msec  
Min = .02 Gs @ -9.24 msec

Pos. 1 Chest Resultant



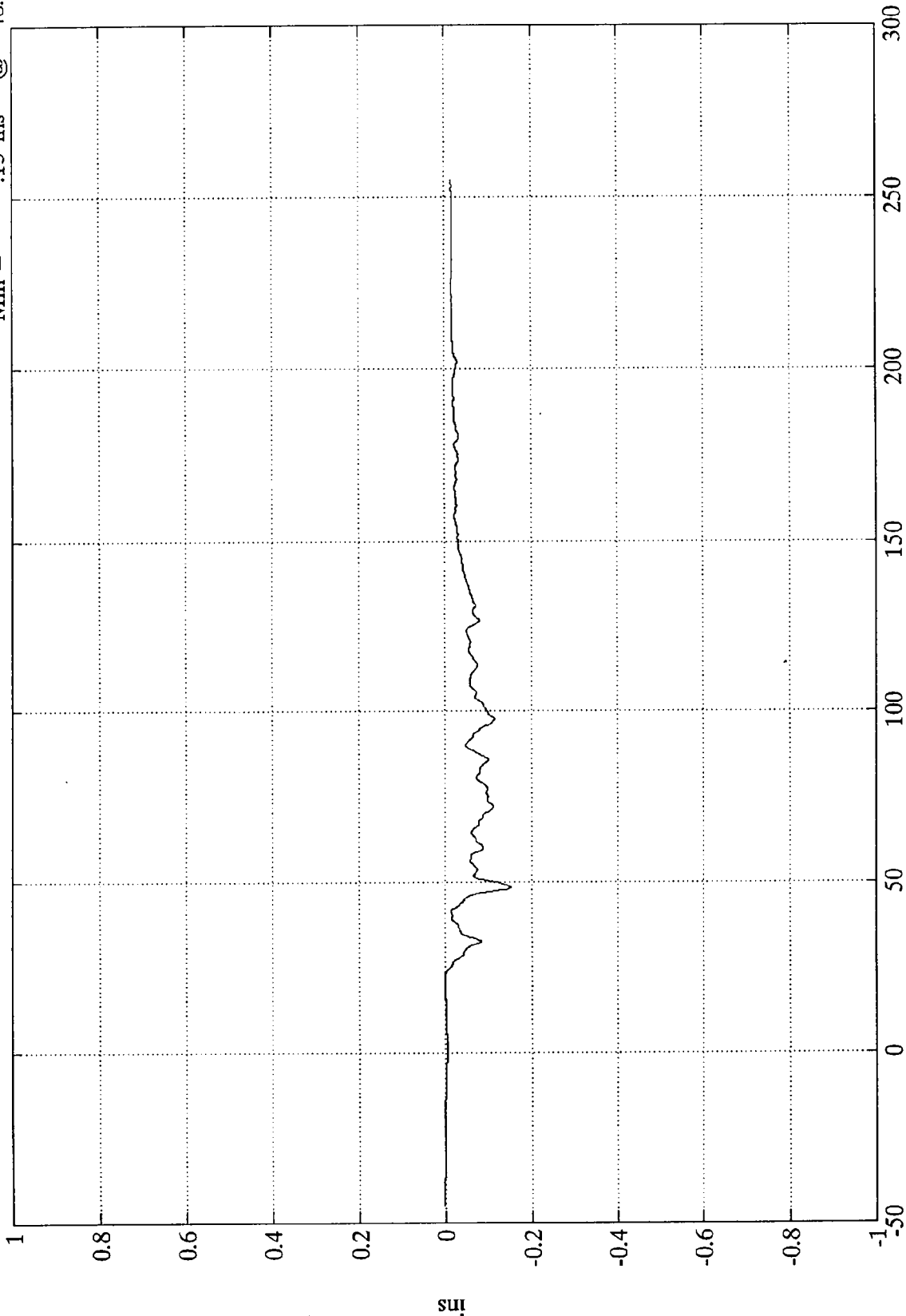
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier - Ford Taurus

Pos. 1 Chest Deflection

Max = .00 ins @ -42.96 msec  
Min = -.15 ins @ 48.47 msec



B-93

8118-1

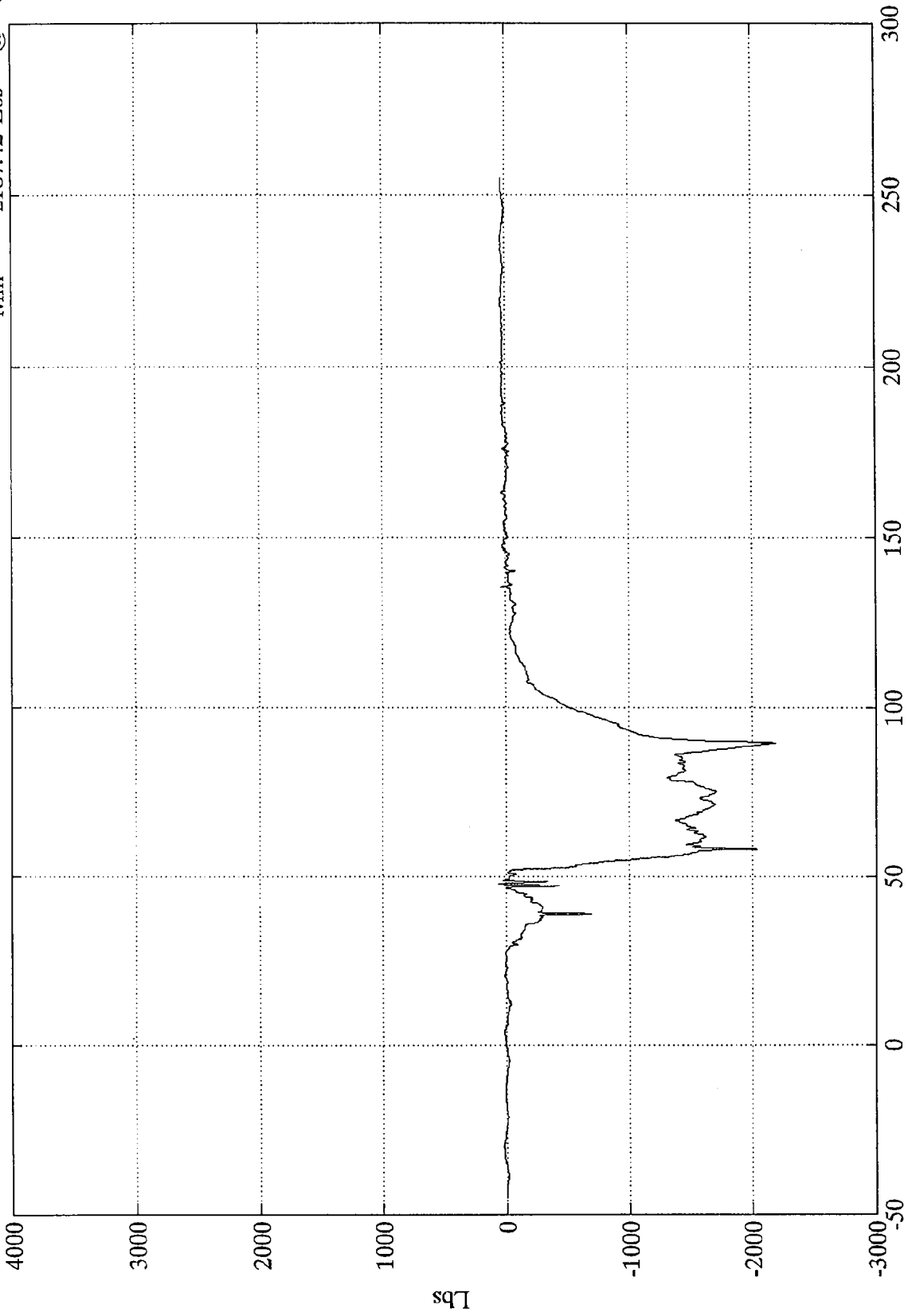
SAE Filter Class 180

Time (msec)

TSC Frontal Barrier - Ford Taurus

Pos. 1 Left Femur

Max = 65.60 Lbs @ 47.76 msec  
Min = -2187.42 Lbs @ 89.51 msec



B-94

8118-1

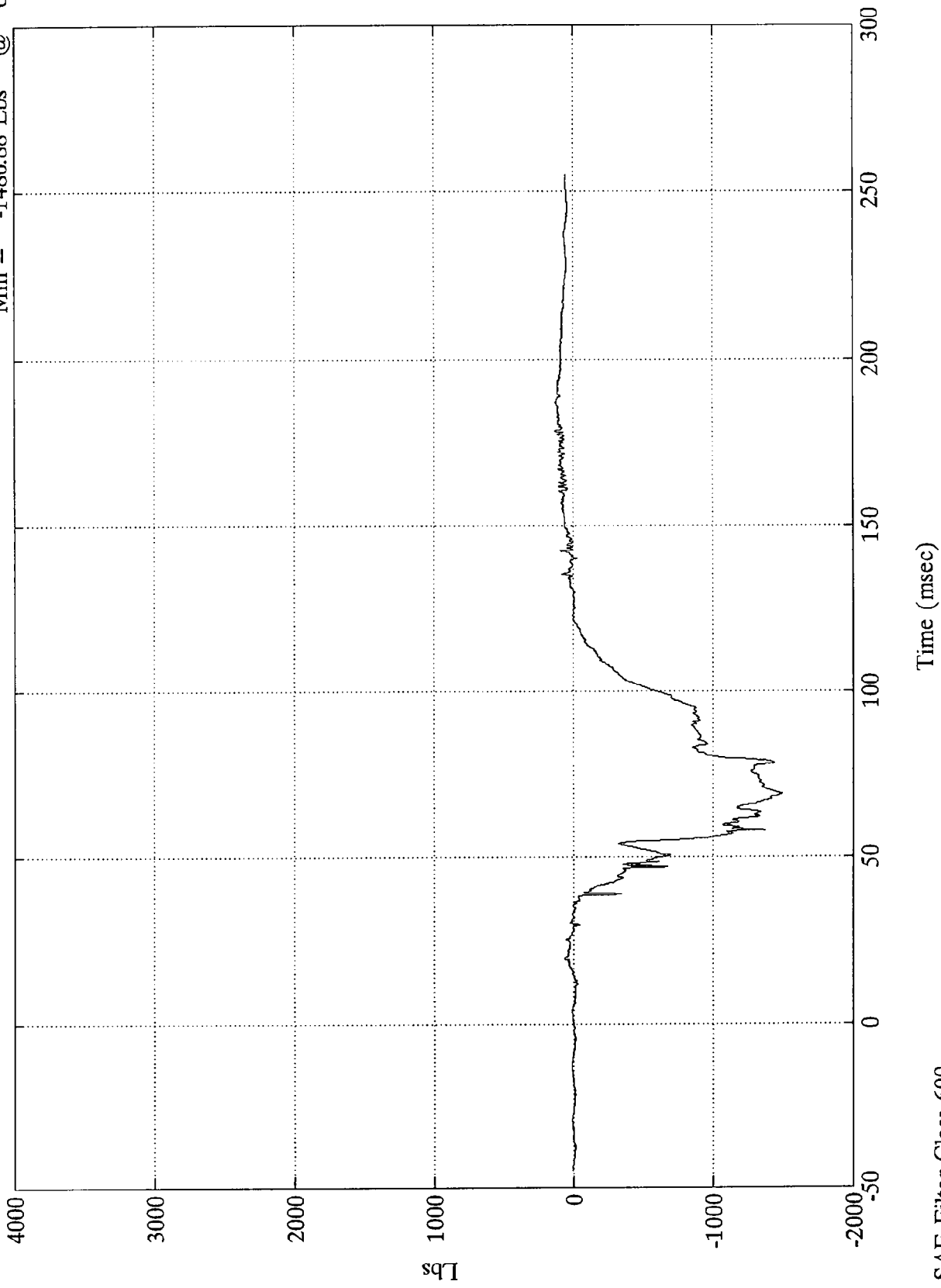
SAE Filter Class 600

Time (msec)

TSC Frontal Barrier - Ford Taurus

Pos. 1 Right Femur

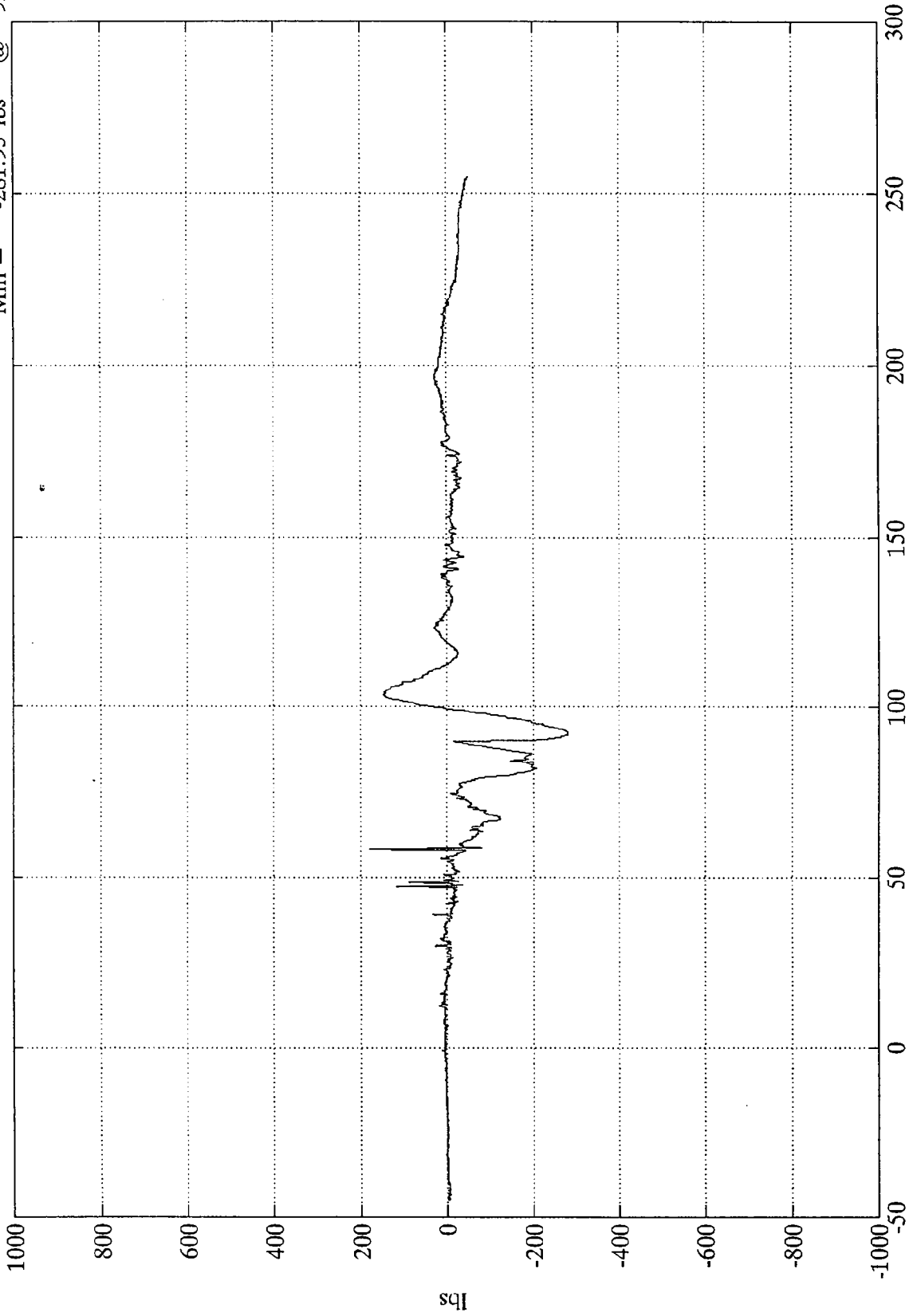
Max = 134.40 Lbs @ 178.44 msec  
Min = -1486.88 Lbs @ 68.87 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 Lower Neck Fx

Max = 178.16 lbs @ 58.20 msec  
Min = -281.95 lbs @ 92.51 msec



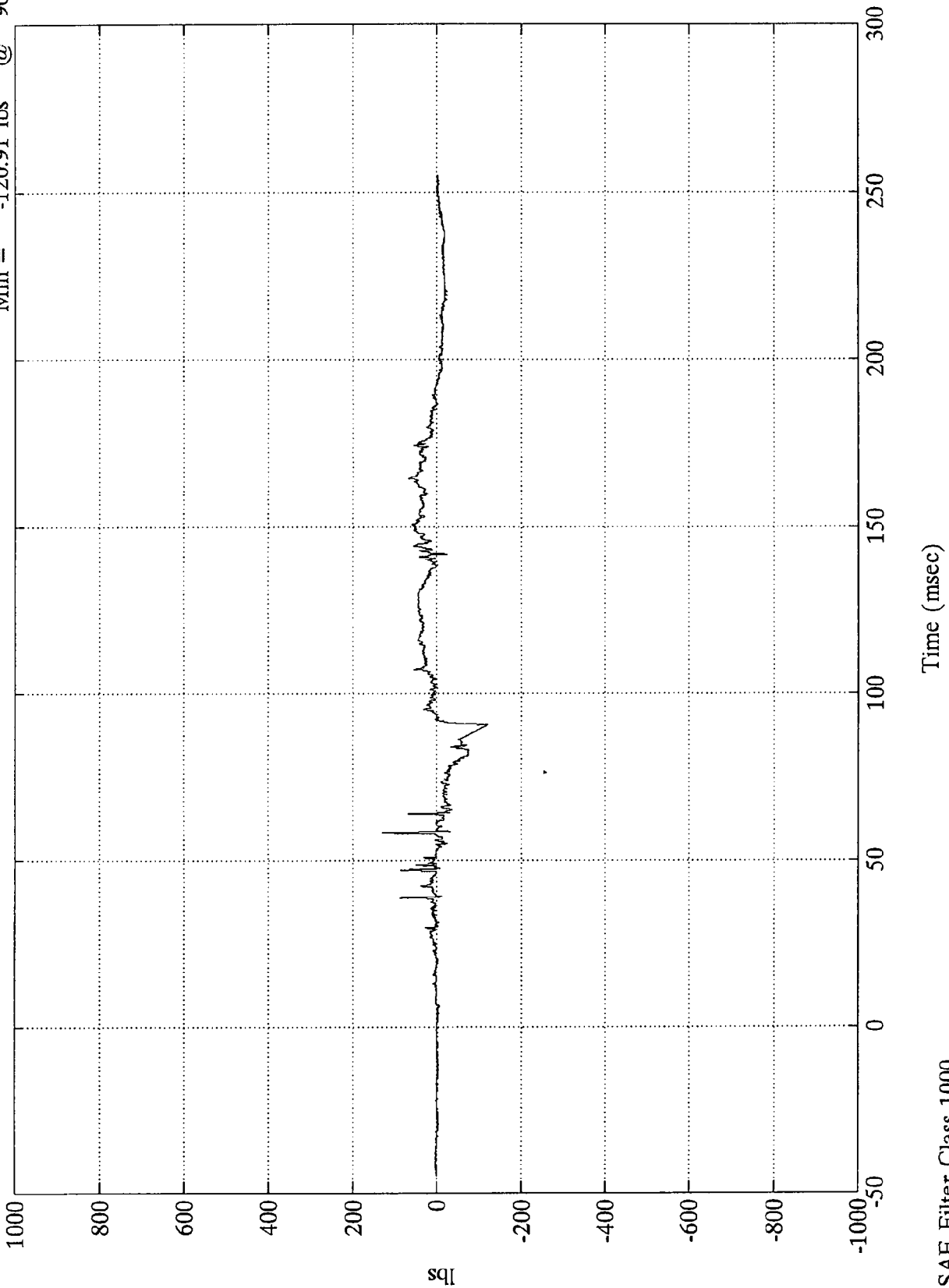
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Lower Neck Fy

Max = 129.54 lbs @ 58.20 msec  
Min = -120.91 lbs @ 90.48 msec



sqi  
B-97

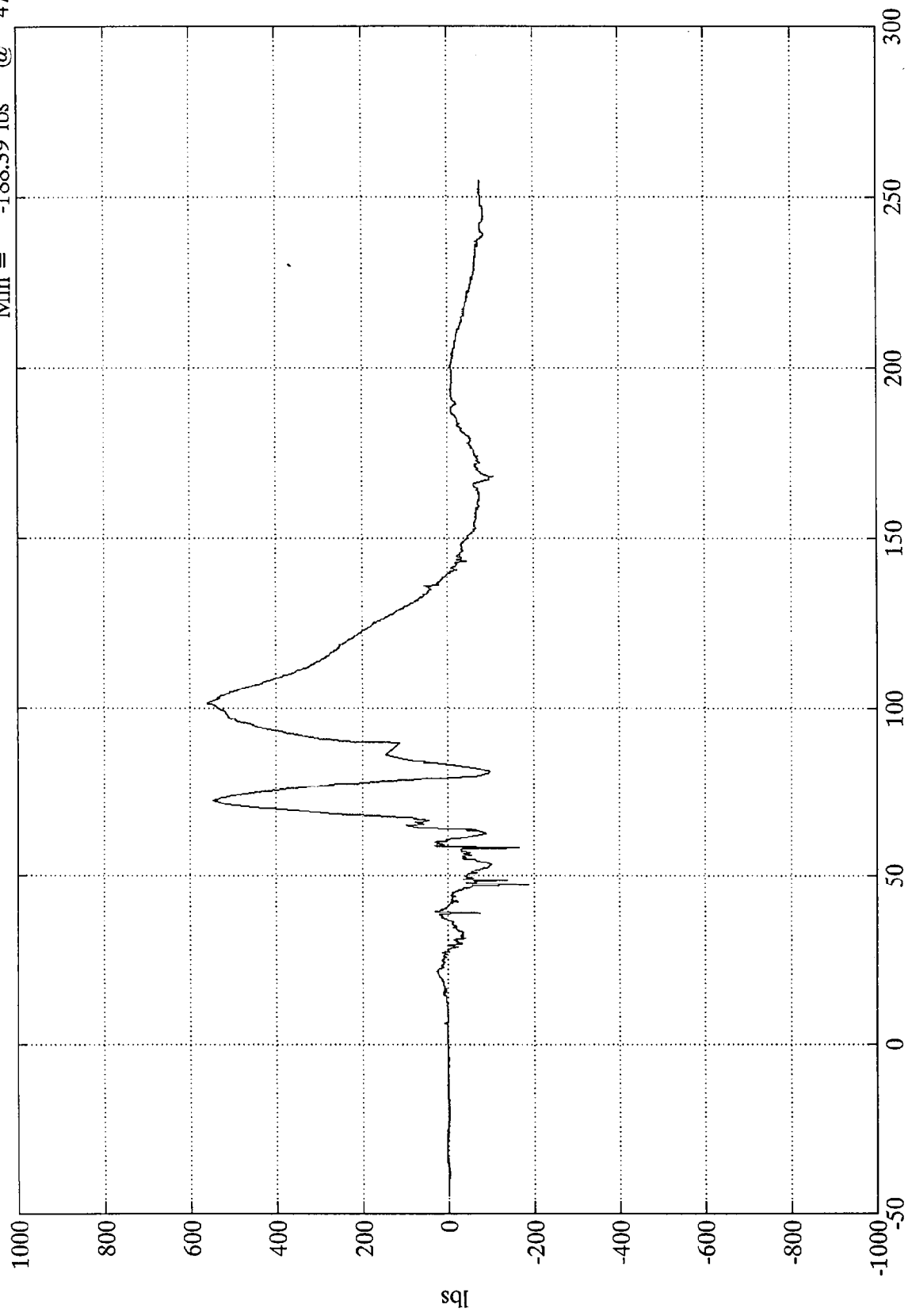
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Lower Neck Fz

Max = 559.53 lbs @ 101.28 msec  
Min = -188.39 lbs @ 47.27 msec



sq|  
B-98

8118-1

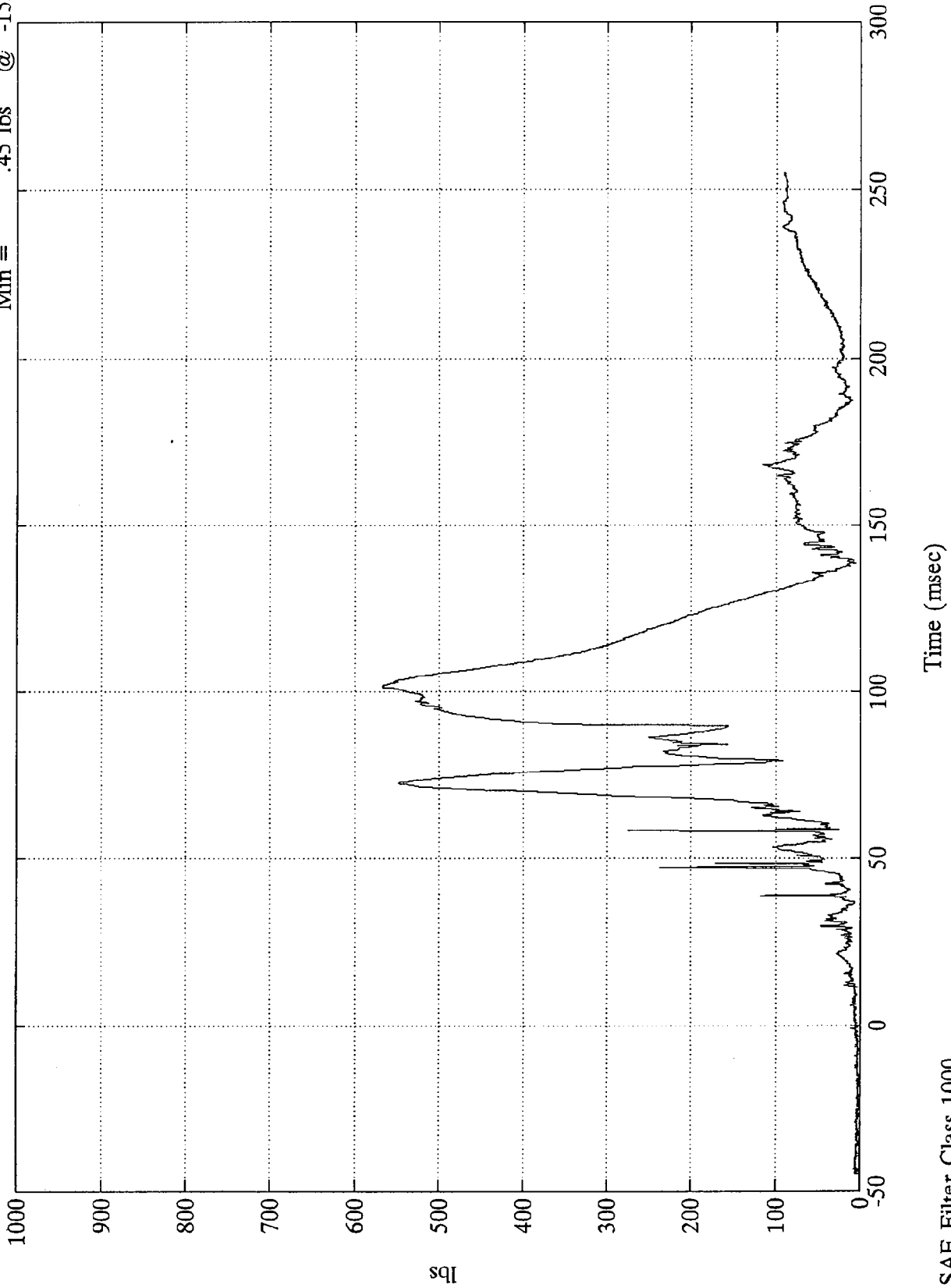
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

P1 L. Neck Force Result.

Max = 567.37 lbs @ 101.28 msec  
Min = .45 lbs @ -15.48 msec



B-99

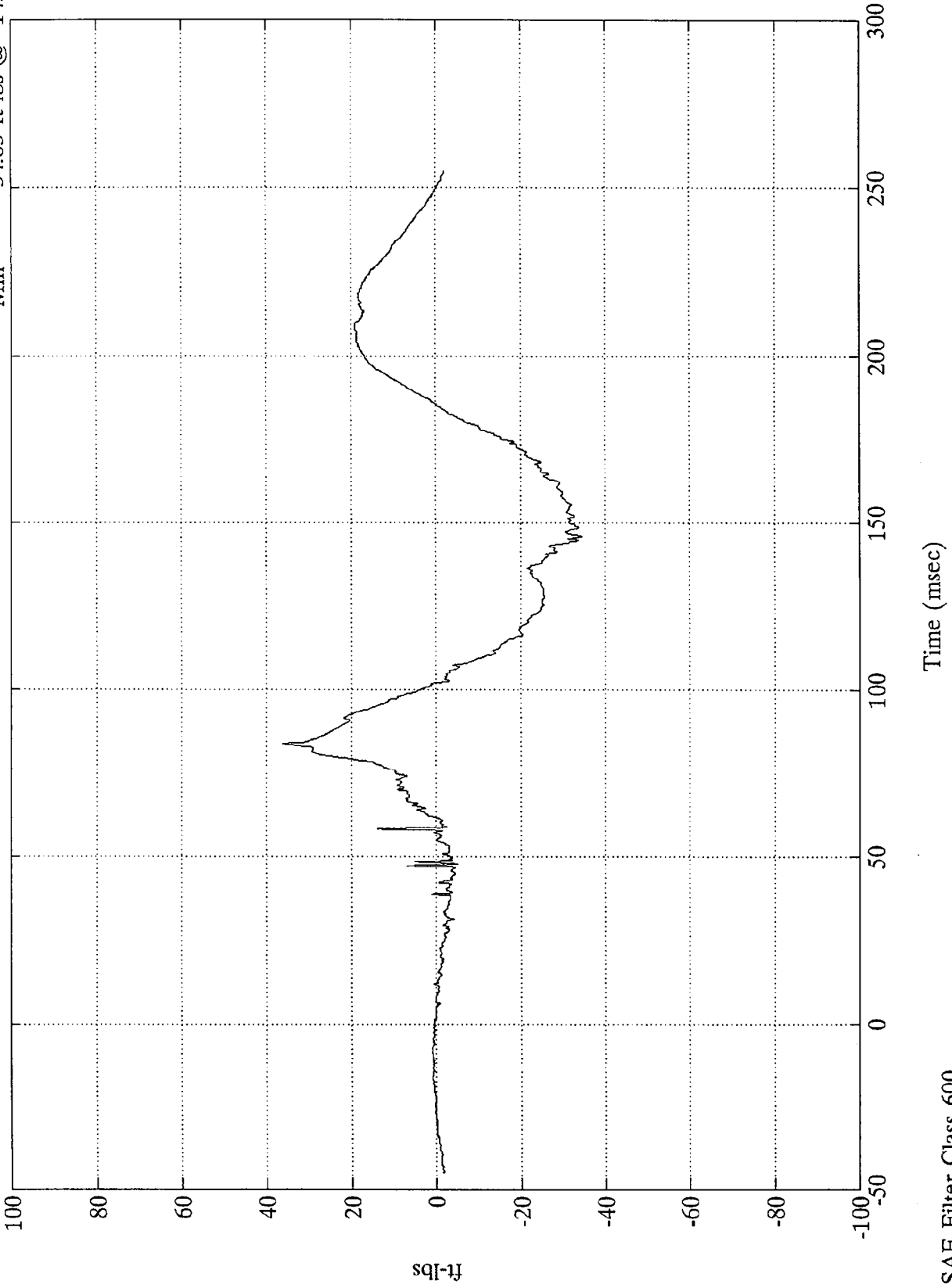
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Lower Neck Mx

Max = 36.19 ft-lbs @ 84.00 msec  
Min = -34.63 ft-lbs @ 145.92 msec



B-100

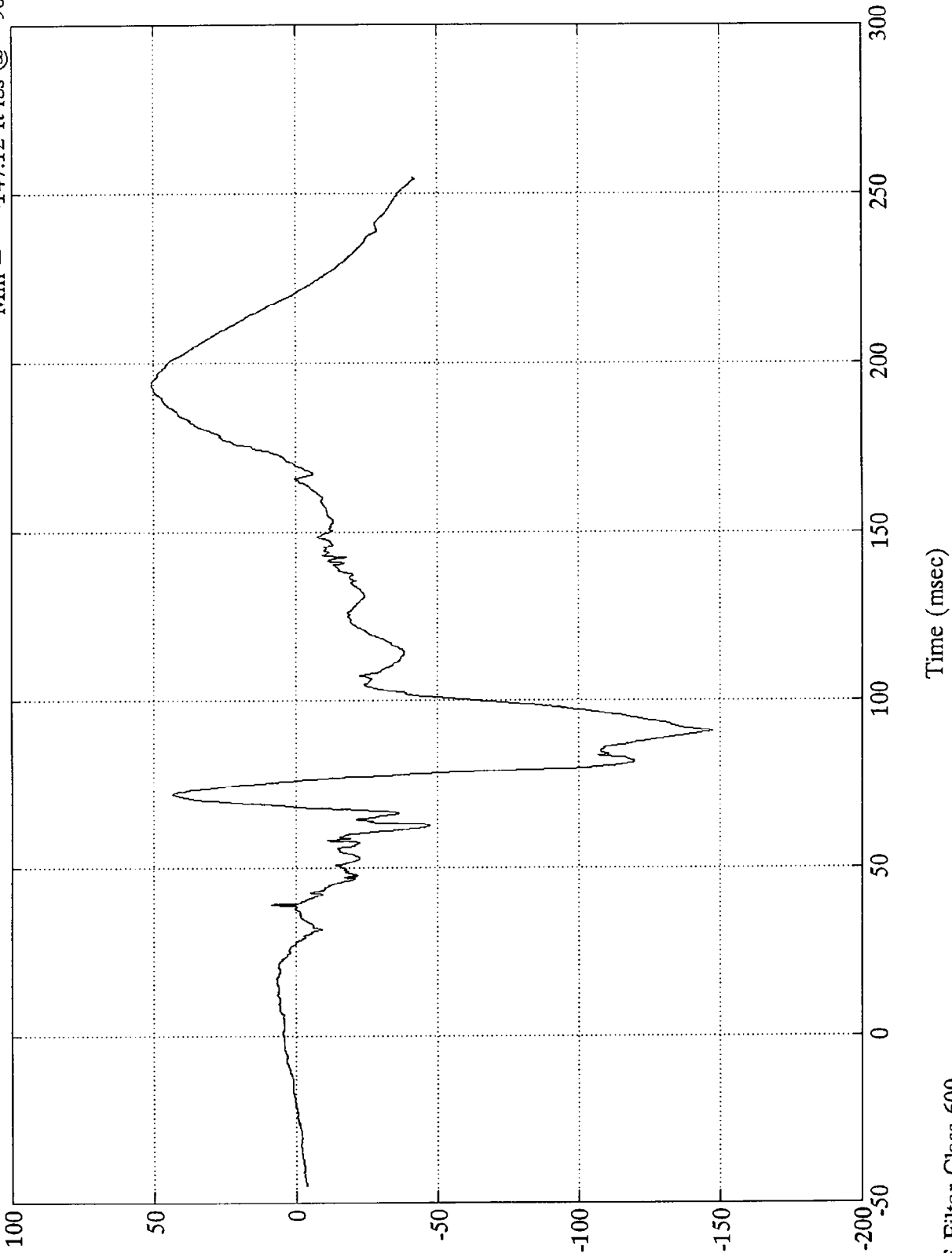
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 Lower Neck My

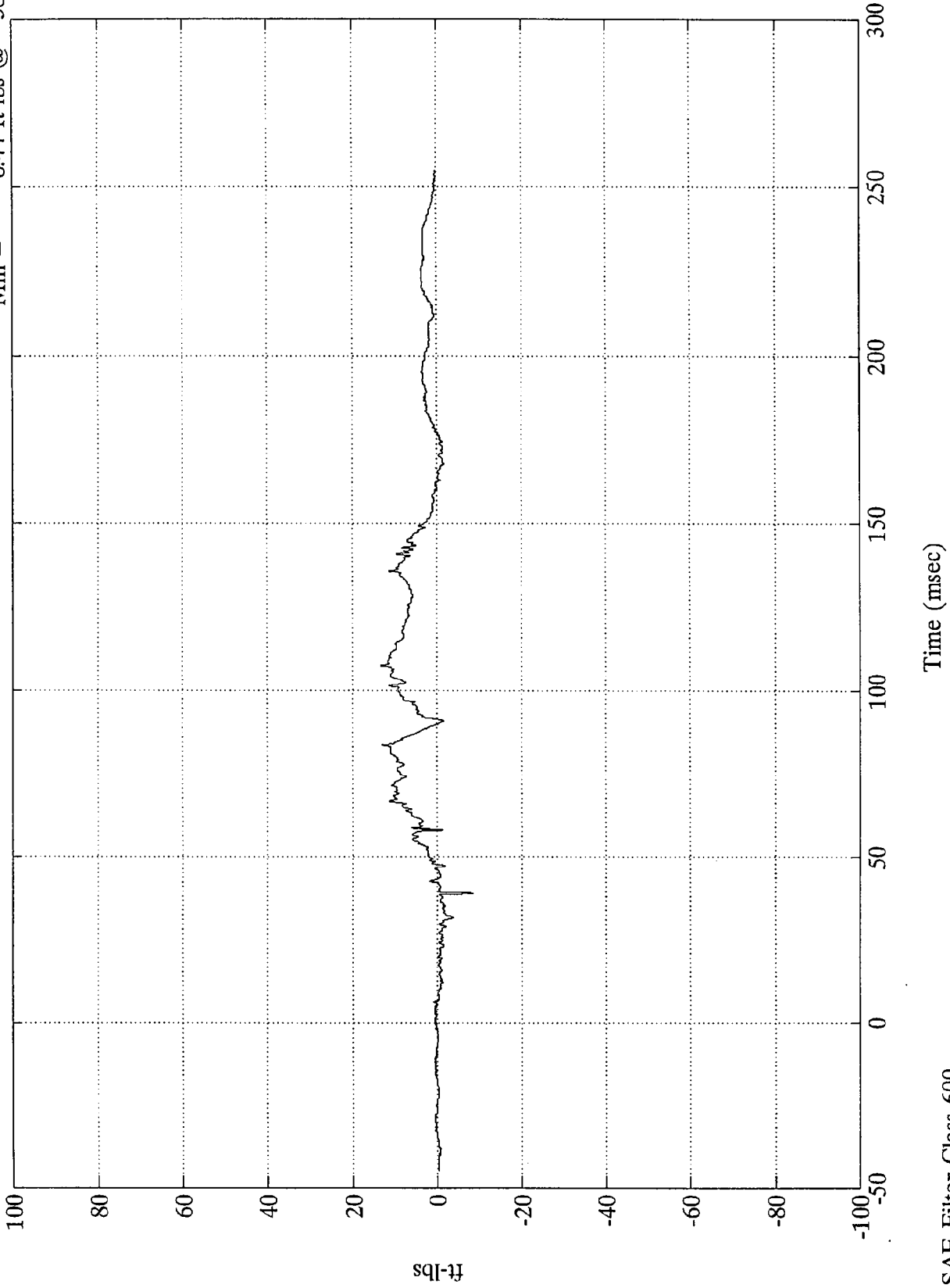
Max = 50.72 ft-lbs @ 193.44 msec  
Min = -147.12 ft-lbs @ 90.84 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 Lower Neck Mz

Max = 13.19 ft-lbs @ 107.40 msec  
Min = -8.44 ft-lbs @ 38.75 msec



sq|tj

B-102

8118-1

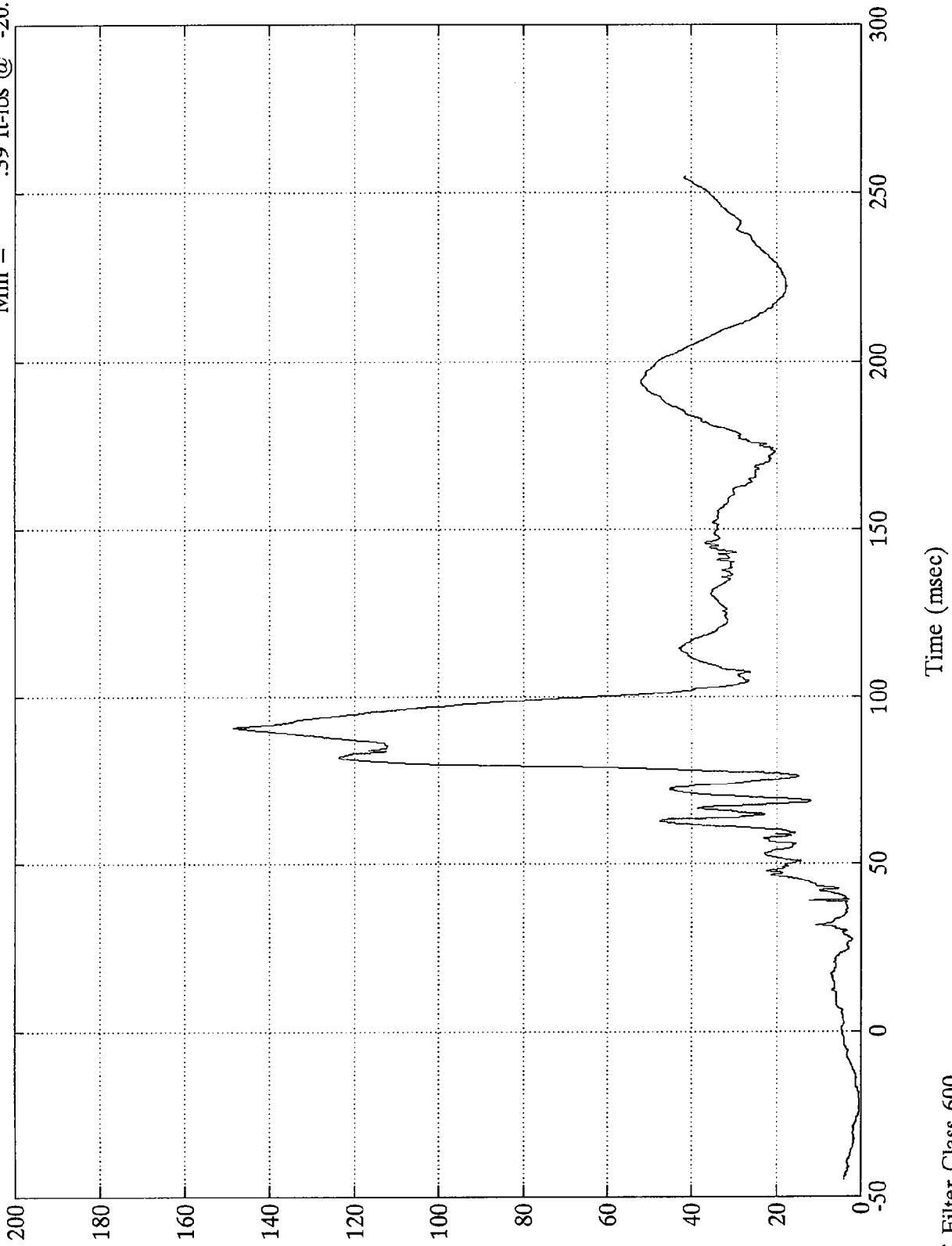
SAE Filter Class 600



TSC Frontal Barrier - Ford Taurus

P1 L Neck Moment Result.

Max = 148.52 ft-lbs @ 90.84 msec  
Min = .39 ft-lbs @ -20.76 msec



sq[-tj  
B-103

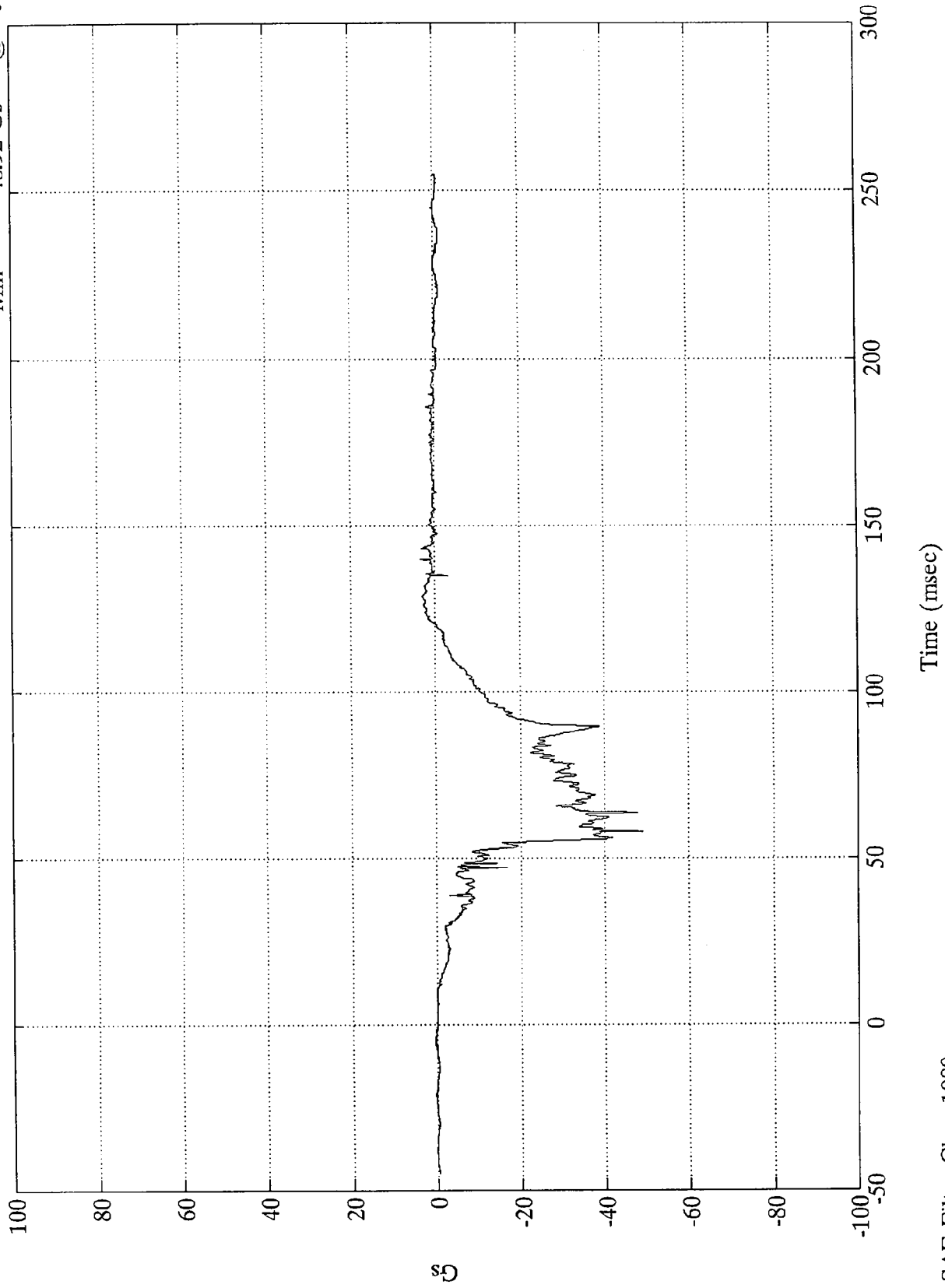
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 Pelvic X

Max = 3.35 Gs @ 140.28 msec  
Min = -48.92 Gs @ 58.08 msec



B-104

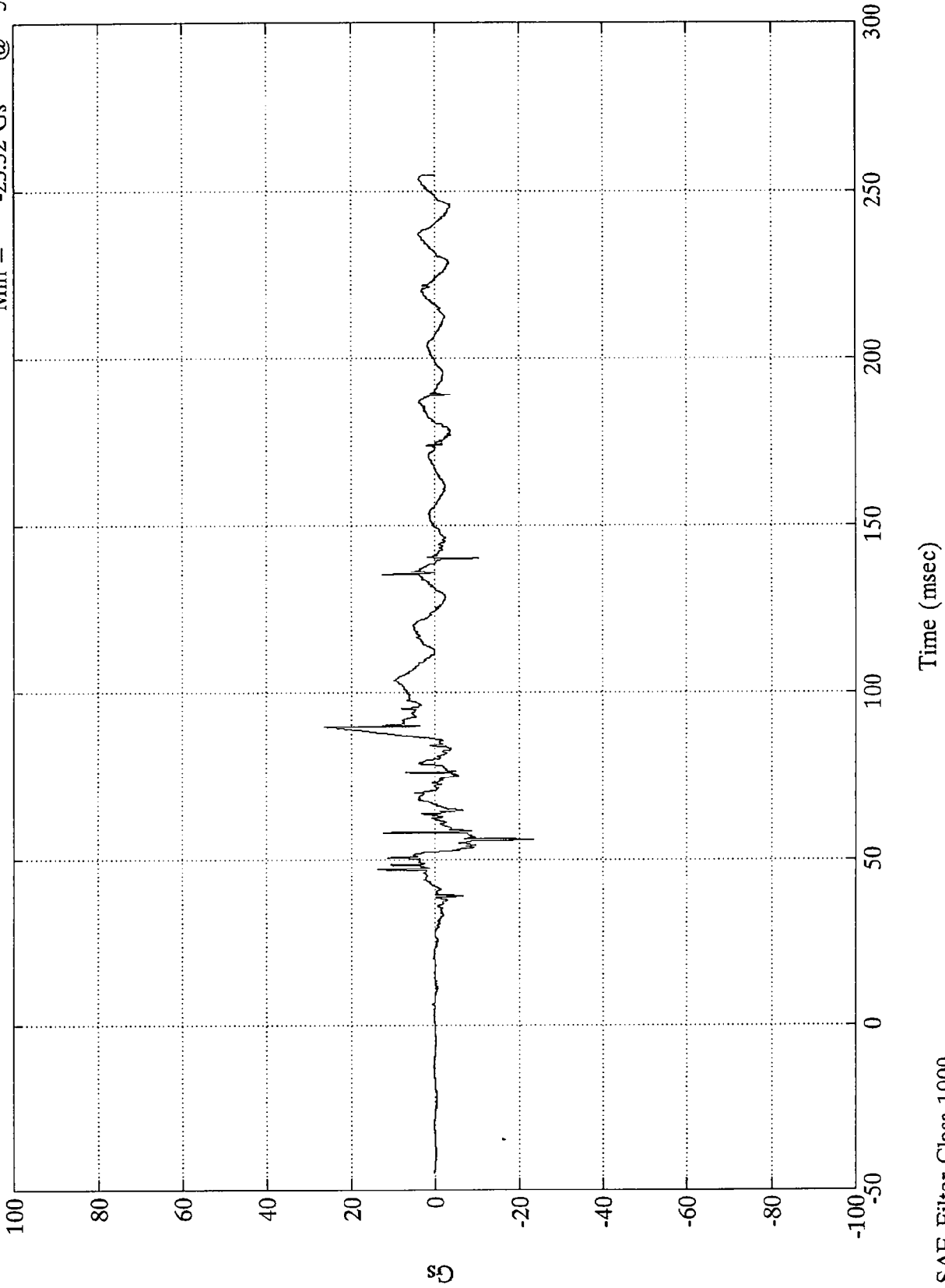
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Pelvic Y

Max = 26.42 Gs @ 89.63 msec  
Min = -23.52 Gs @ 56.04 msec



B-105

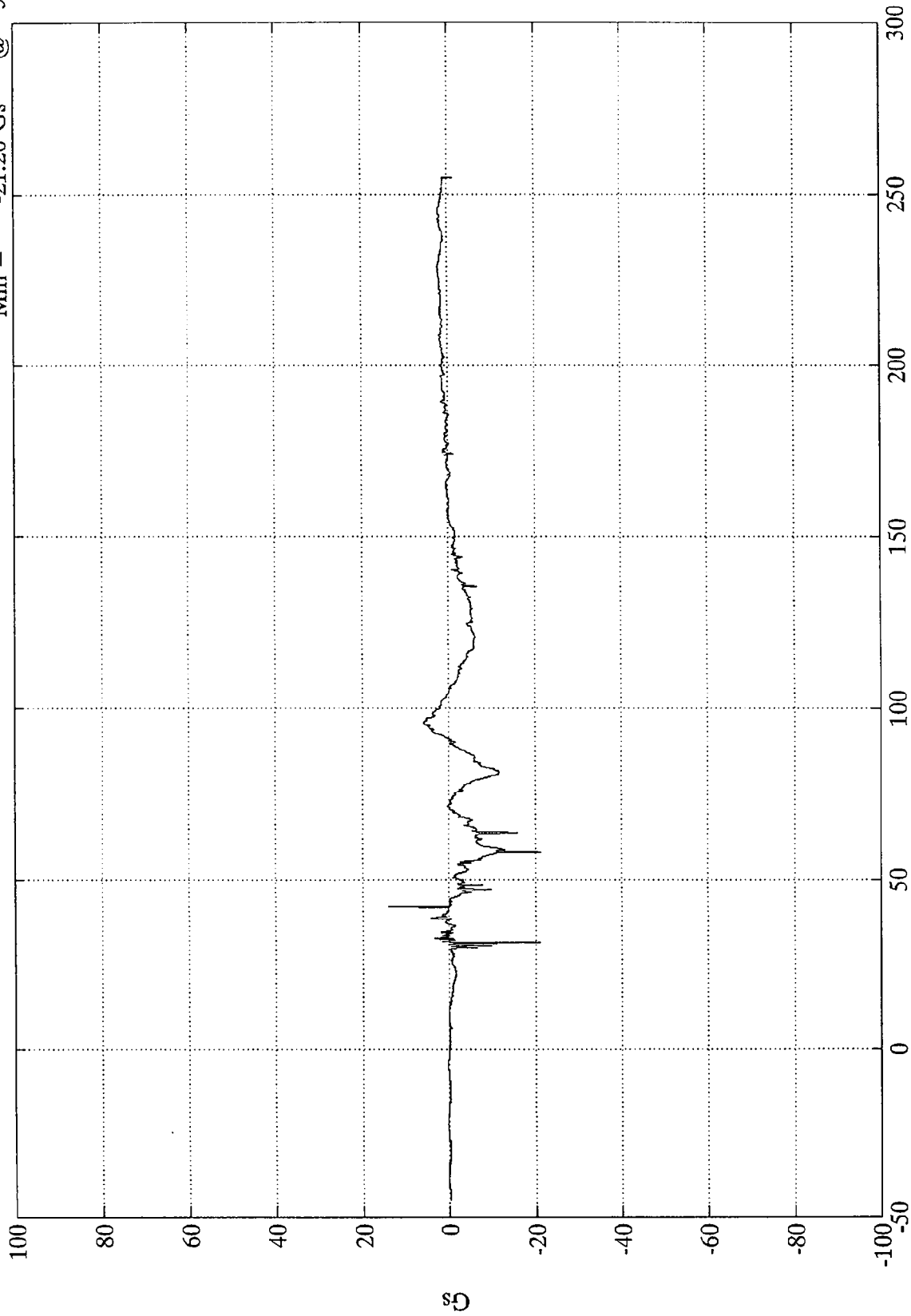
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Max = 14.13 Gs @ 42.00 msec  
Min = -21.20 Gs @ 58.08 msec

Pos. 1 Pelvic Z



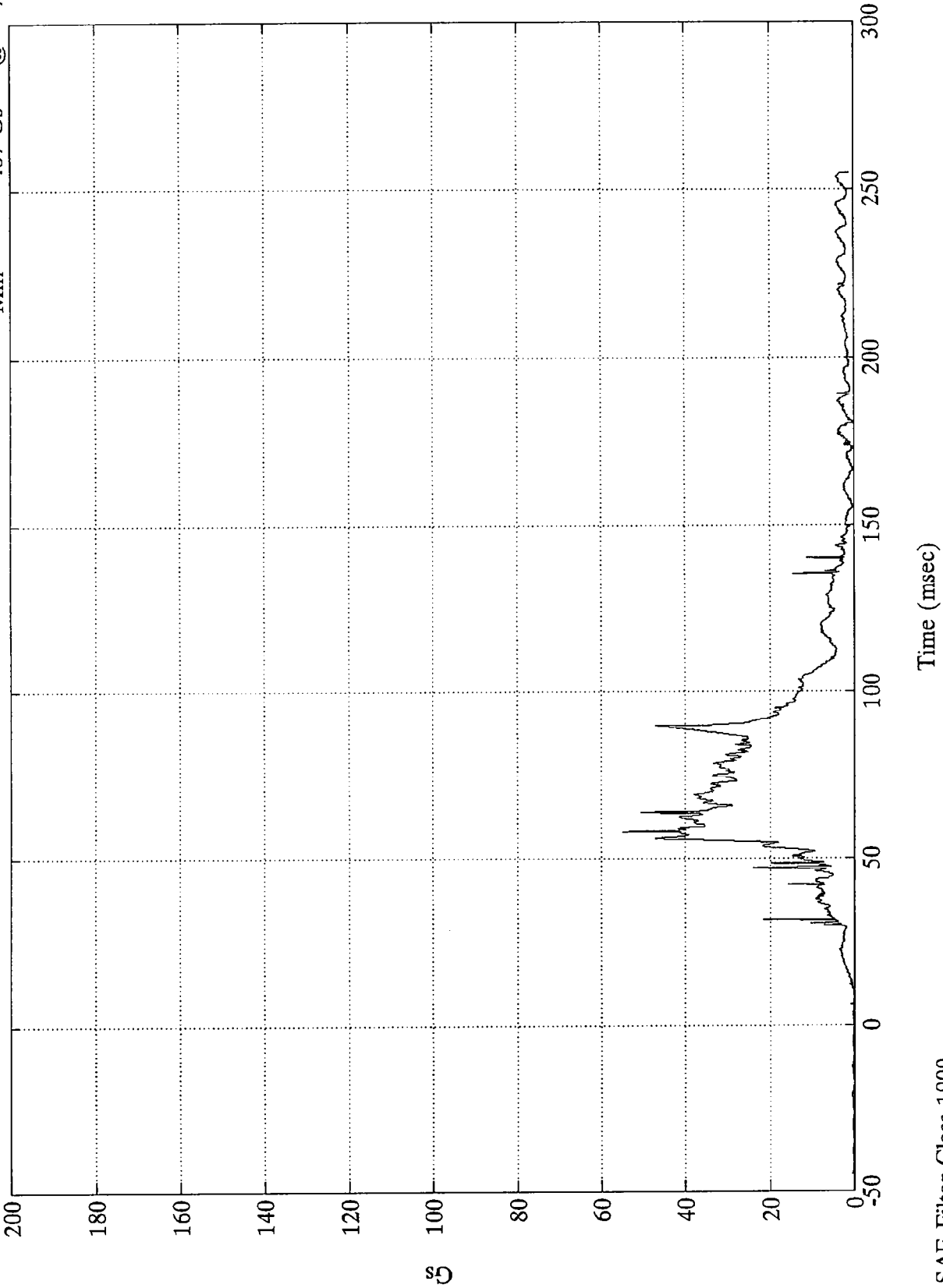
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Pelvic Resultant

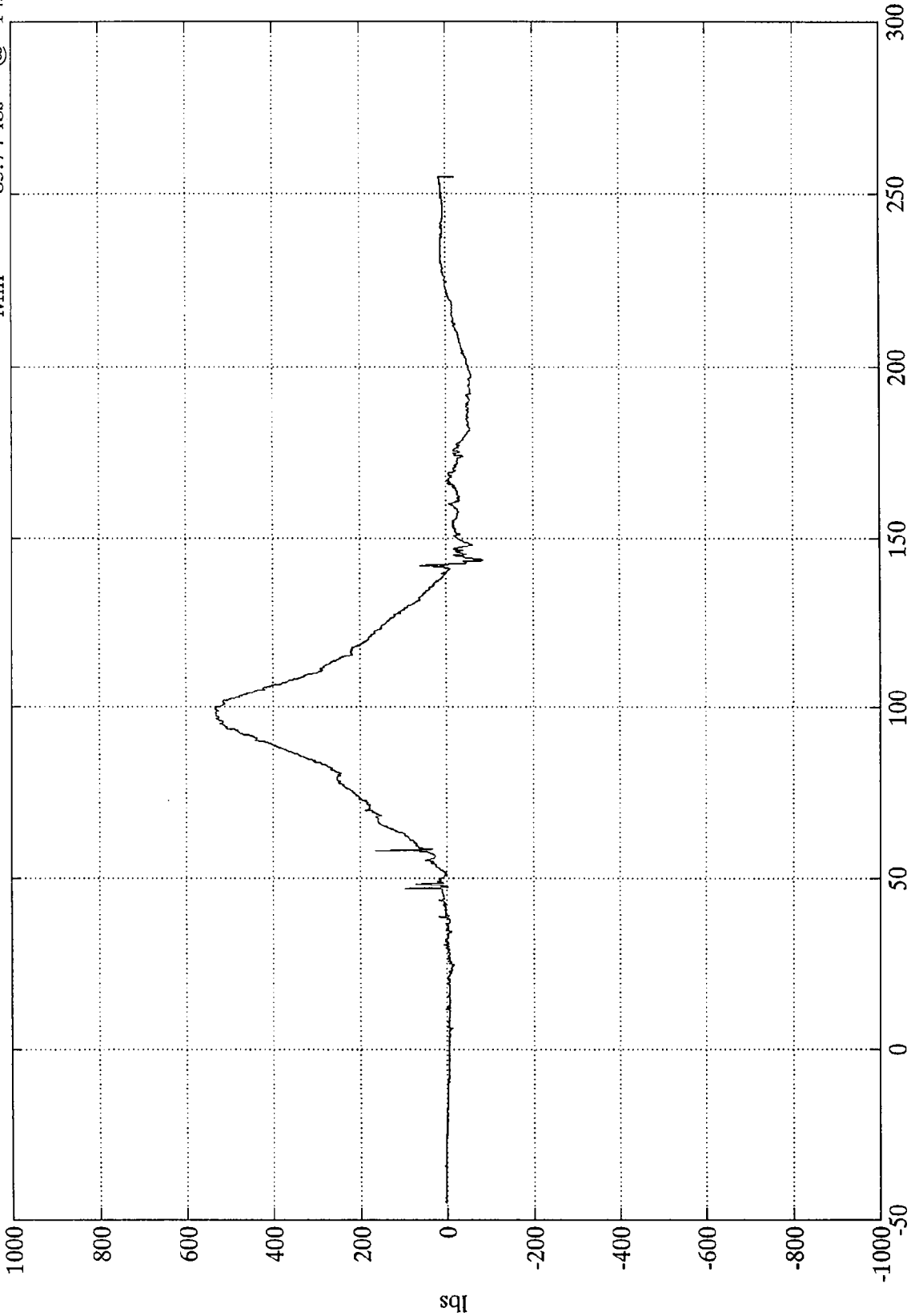
Max = 54.73 Gs @ 58.08 msec  
Min = .07 Gs @ 7.67 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 Upper Neck Fx

Max = 532.83 lbs @ 99.48 msec  
Min = -85.74 lbs @ 143.76 msec



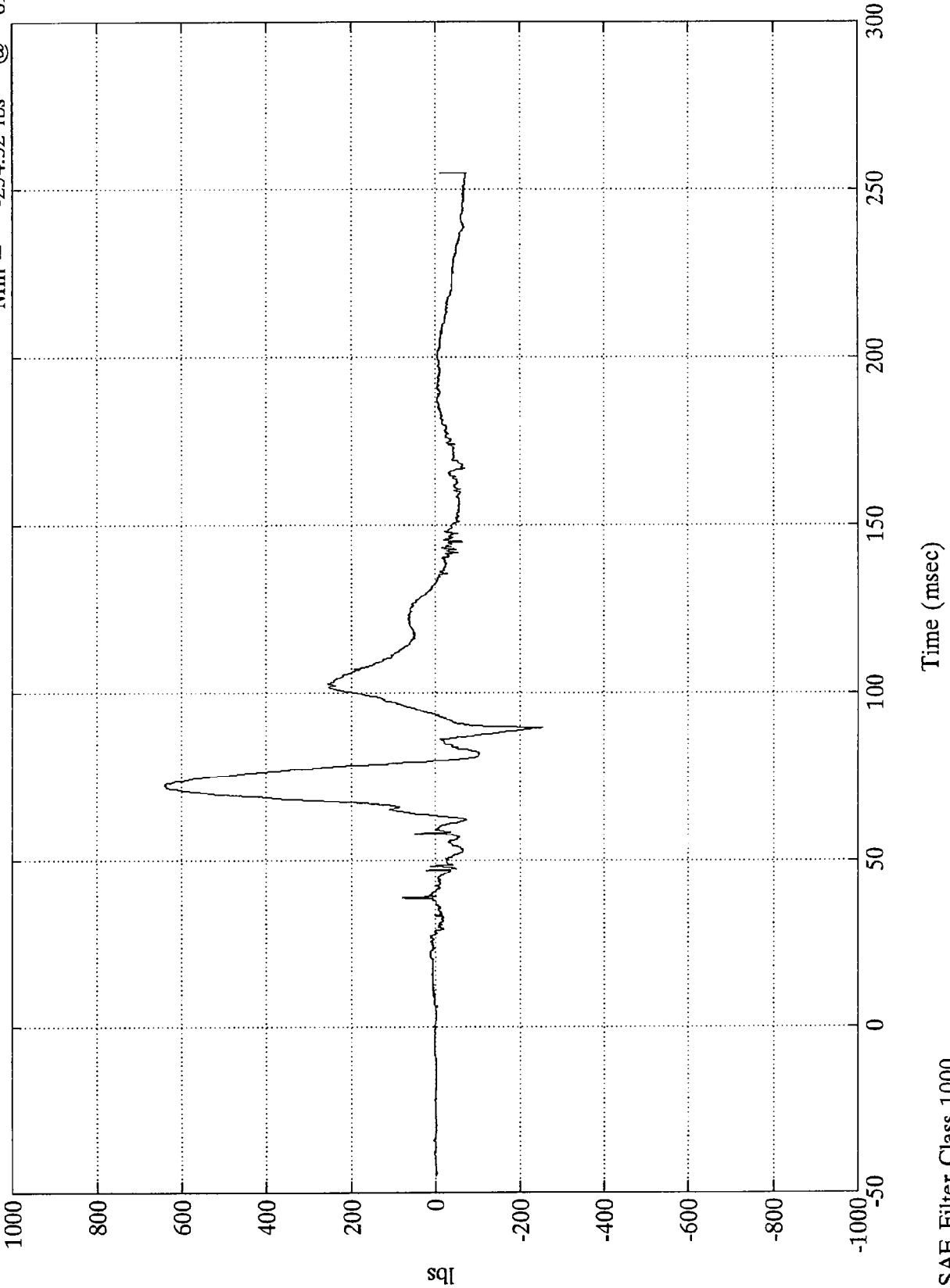
SAE Filter Class 1000

Time (msec)

TSC Frontal Barrier - Ford Taurus

Pos. 1 Upper Neck Fz

Max = 641.05 lbs @ 72.12 msec  
Min = -254.52 lbs @ 89.63 msec



B-109

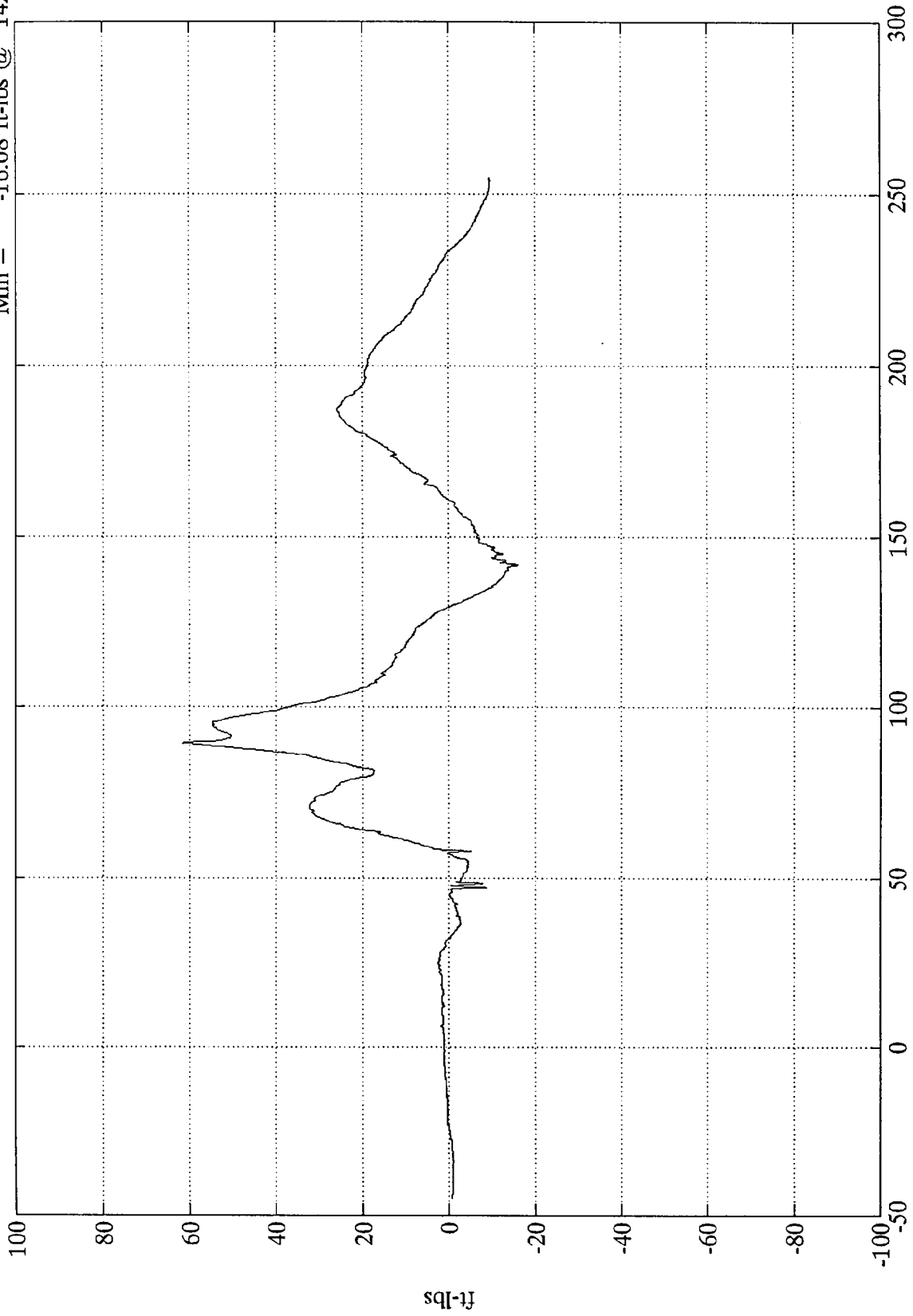
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Upper Neck My

Max = 61.44 ft-lbs @ 89.51 msec  
Min = -16.08 ft-lbs @ 142.08 msec



B-110

8118-1

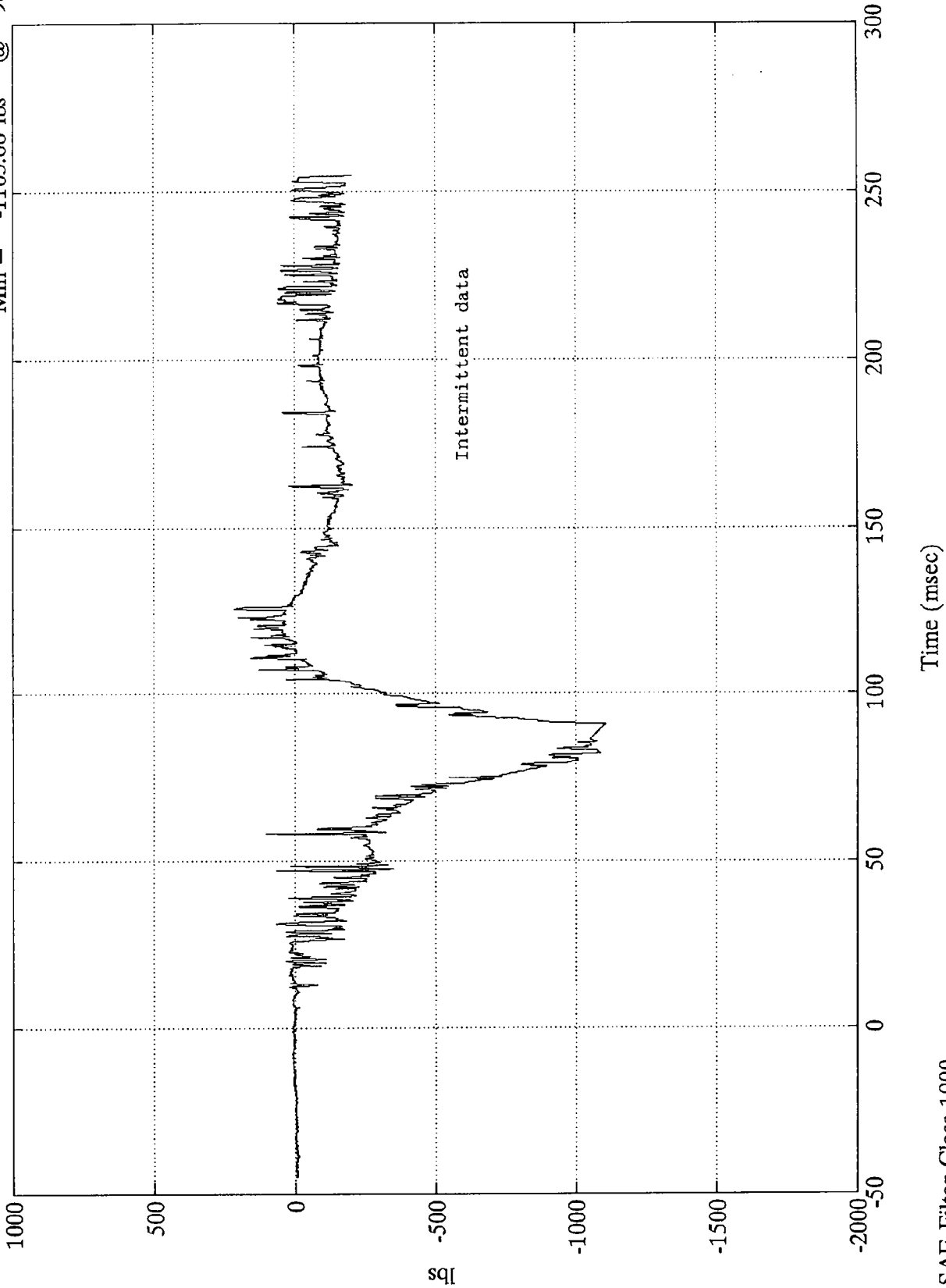
Time (msec)

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 Lumbar Fx

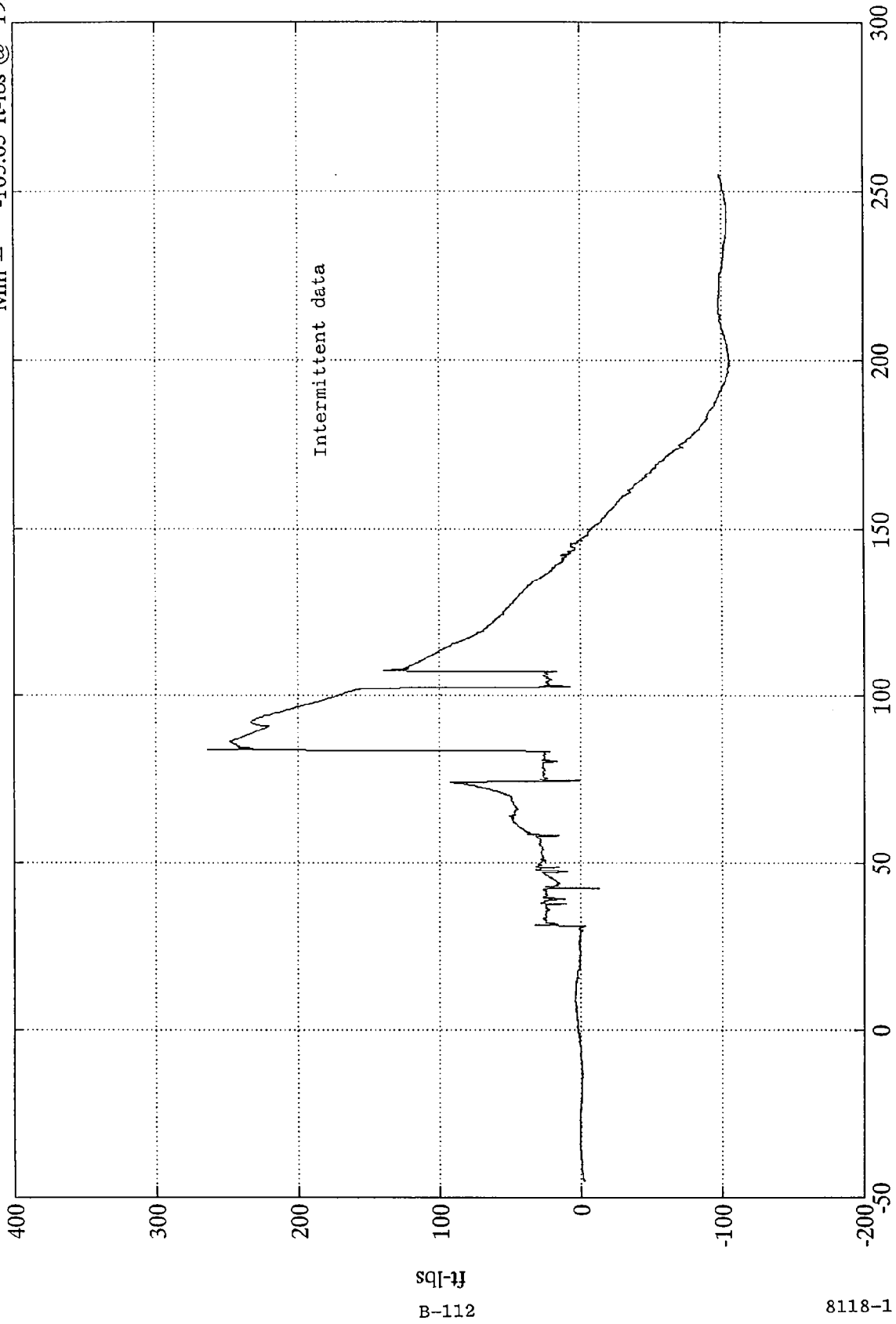
Max = 214.14 lbs @ 125.76 msec  
Min = -1103.66 lbs @ 90.72 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 Lumbar My

Max = 264.00 ft-lbs @ 83.76 msec  
Min = -105.65 ft-lbs @ 199.80 msec



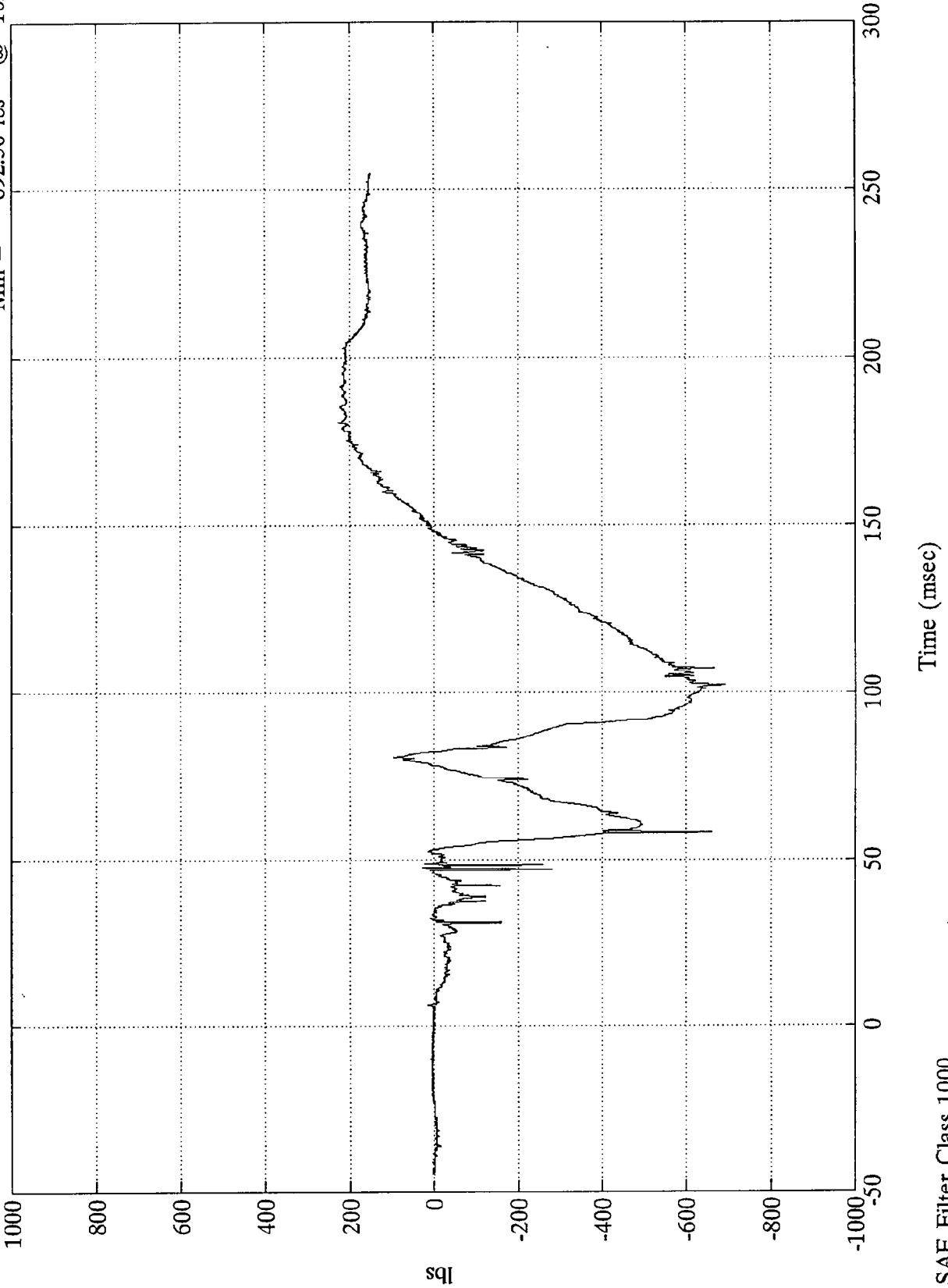
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 Lumbar Fz

Max = 225.99 lbs @ 180.60 msec  
Min = -692.30 lbs @ 102.12 msec



B-113

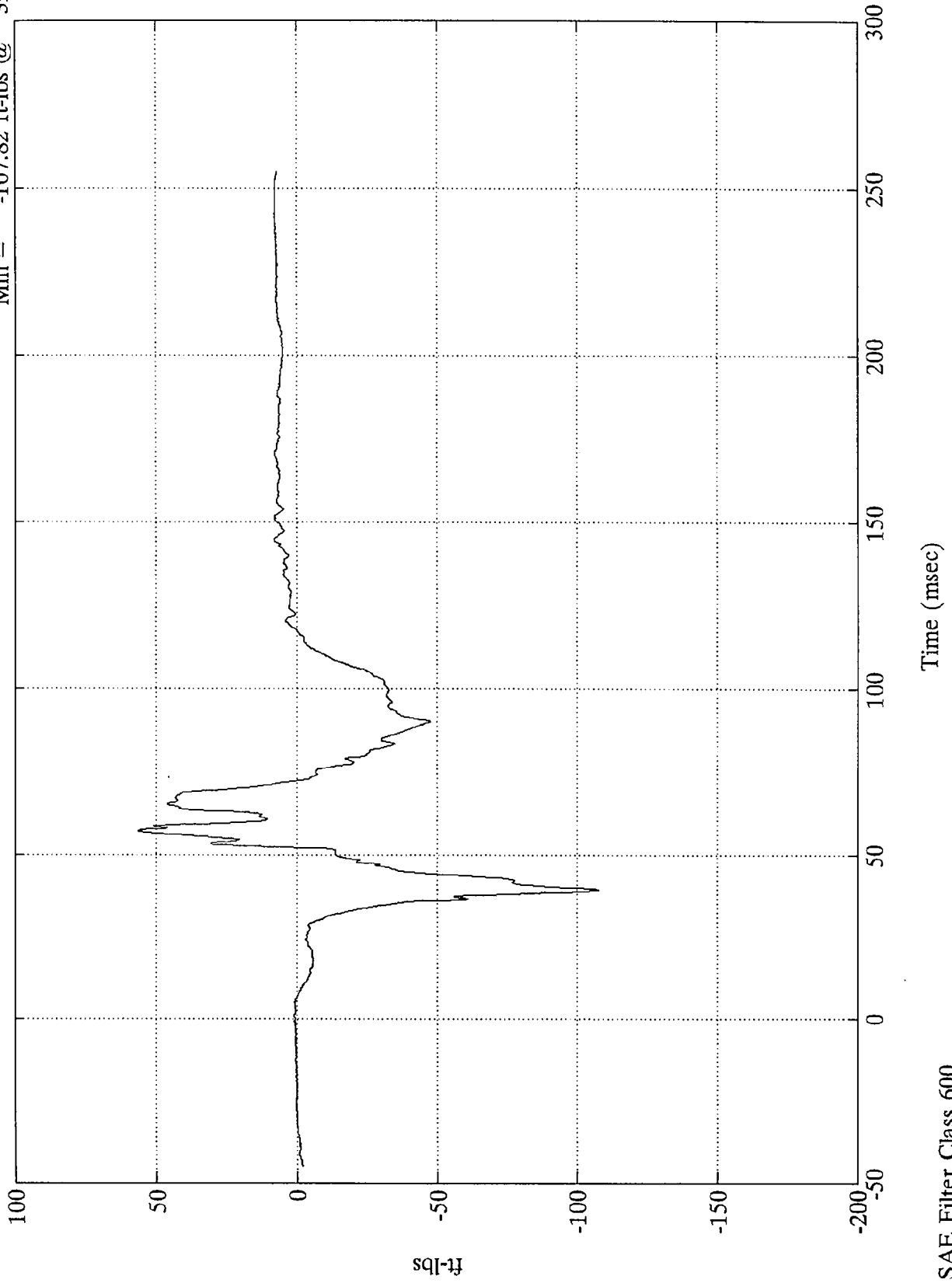
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 1 L. Upper Tibia Mx

Max = 56.46 ft-lbs @ 57.36 msec  
Min = -107.82 ft-lbs @ 39.23 msec



ft-lbs  
B-114

8118-1

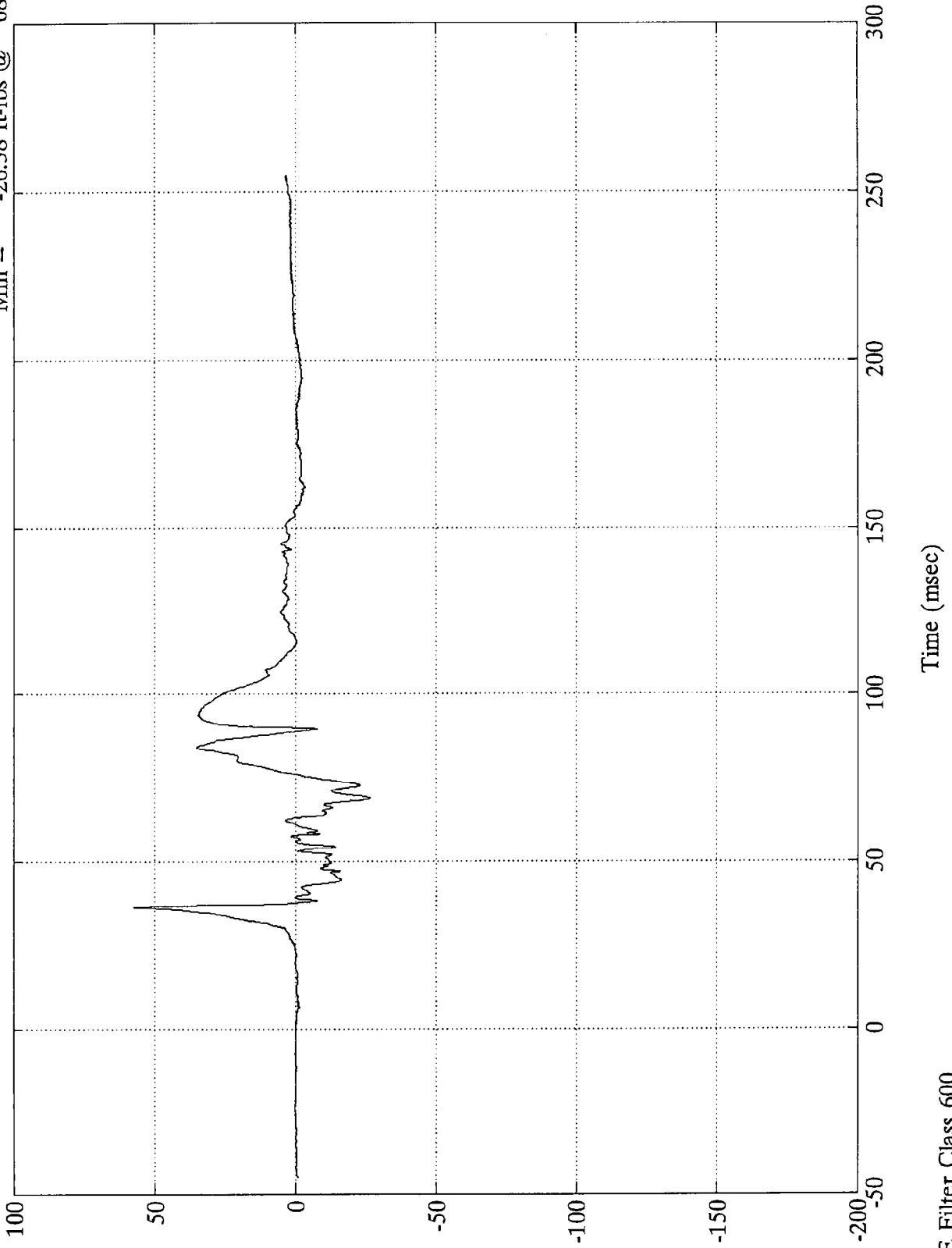
SAE Filter Class 600

Time (msec)

TSC Frontal Barrier - Ford Taurus

Pos. 1 L. Upper Tibia My

Max = 57.48 ft-lbs @ 36.12 msec  
Min = -26.38 ft-lbs @ 68.87 msec



B-115  
sq[-1]

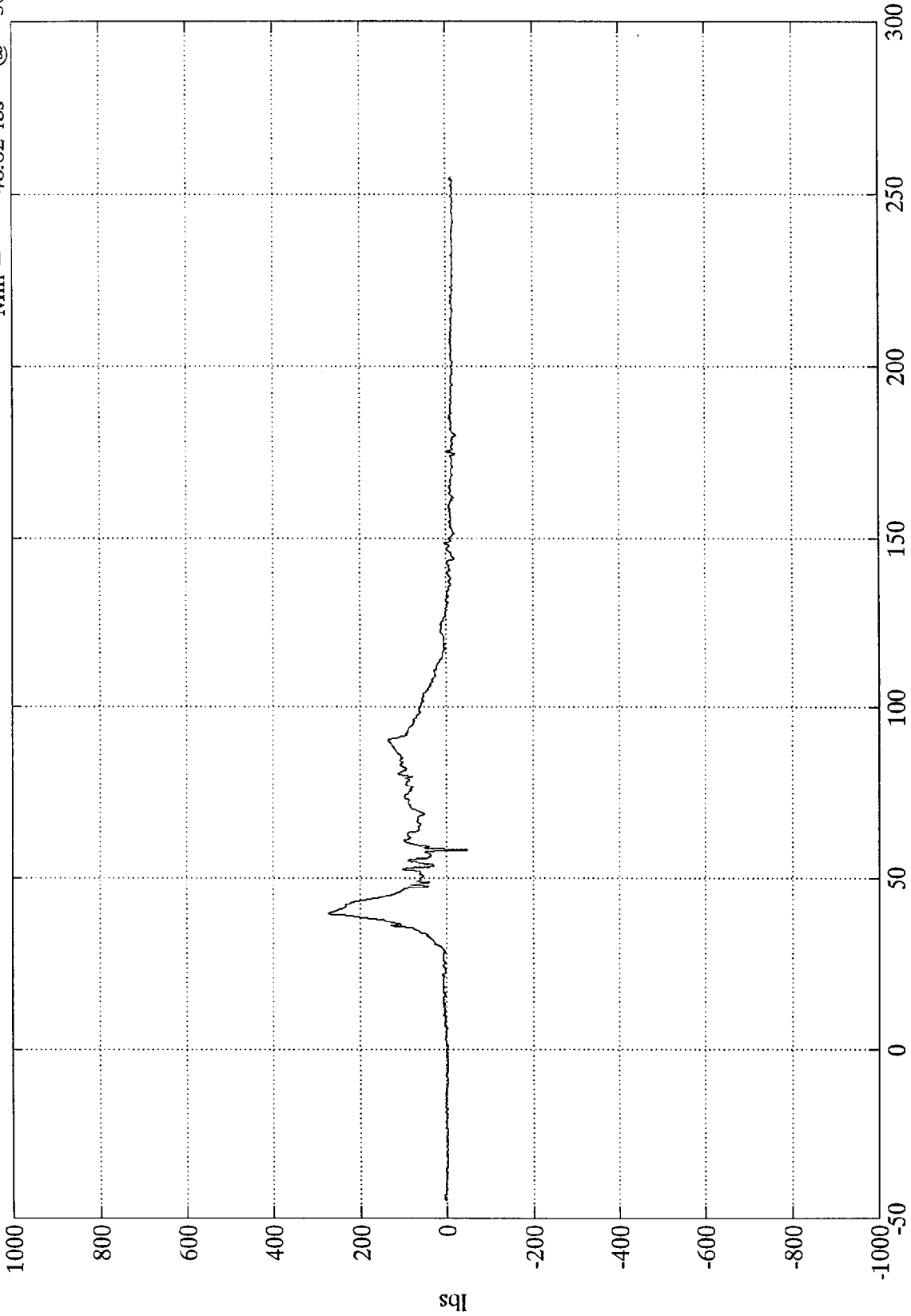
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 L. Lower Tibia Fy

Max = 273.86 lbs @ 39.36 msec  
Min = -46.62 lbs @ 58.08 msec



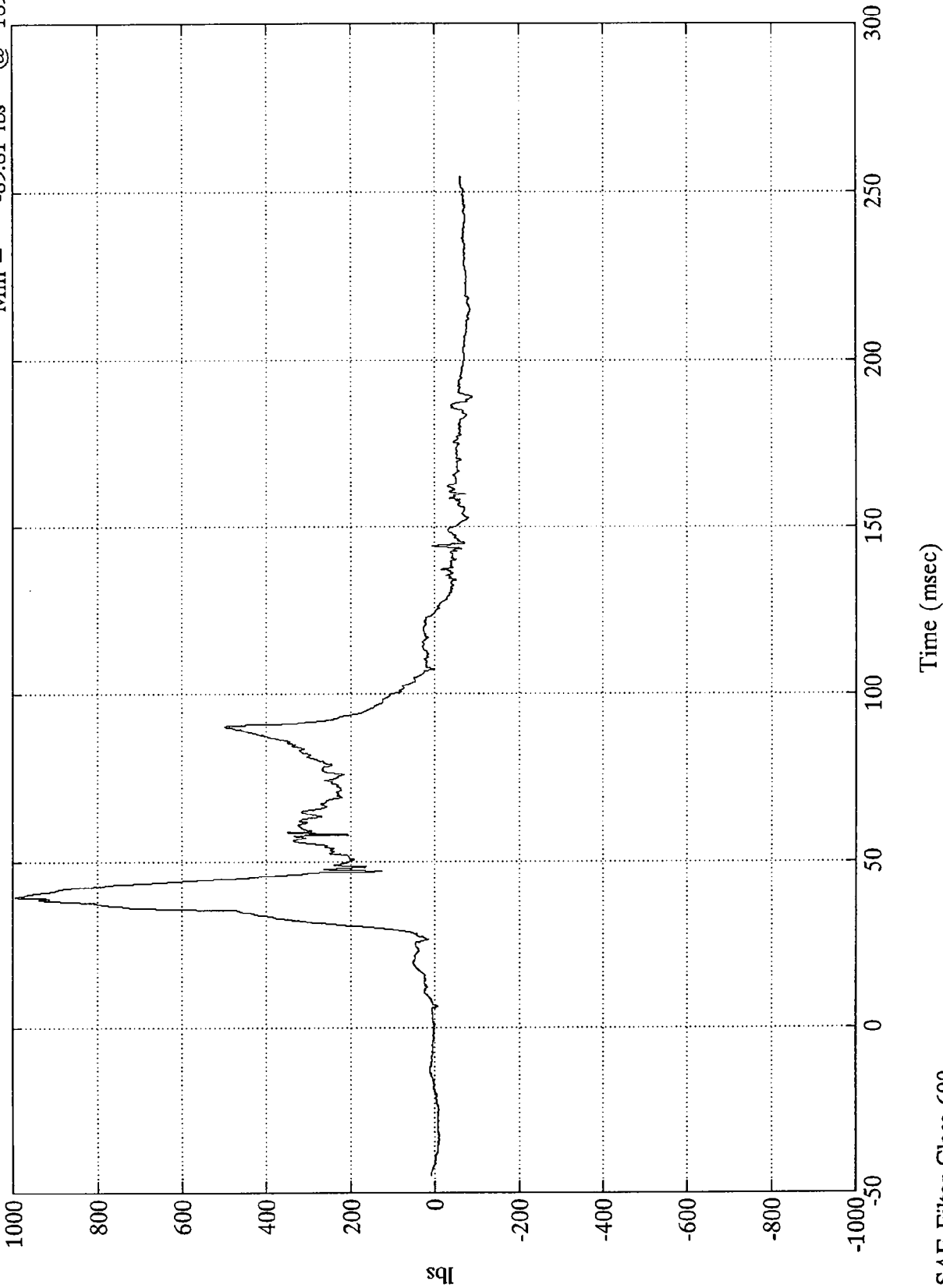
Time (msec)

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 L. Lower Tibia Fz

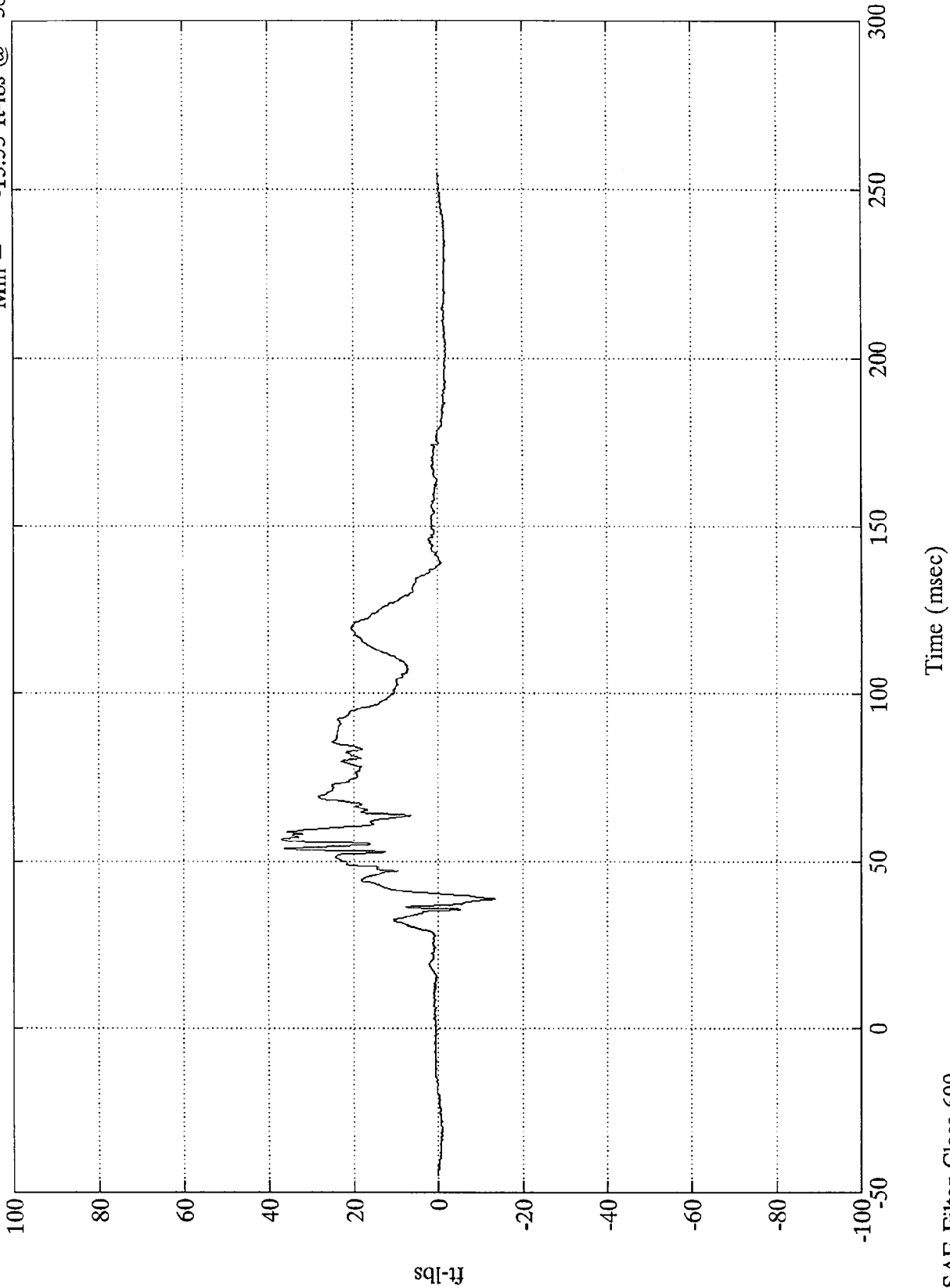
Max = 994.58 lbs @ 39.23 msec  
Min = -89.81 lbs @ 189.24 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 L. Lower Tibia Mx

Max = 36.96 ft-lbs @ 56.63 msec  
Min = -13.53 ft-lbs @ 38.75 msec



sq[-1J  
B-118

8118-1

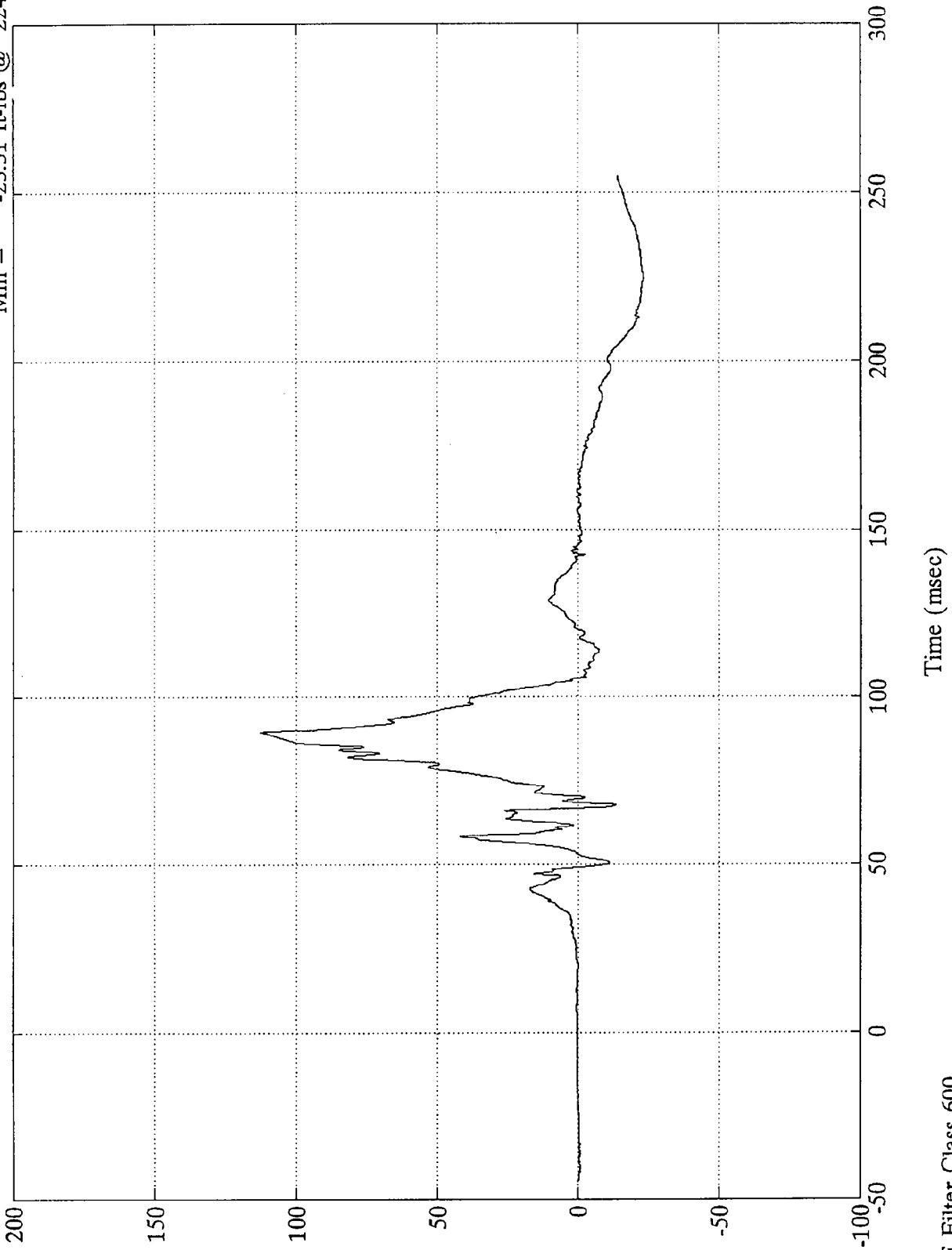
SAE Filter Class 600

Time (msec)

TSC Frontal Barrier - Ford Taurus

Pos. 1 R. Upper Tibia Mx

Max = 112.65 ft-lbs @ 89.40 msec  
Min = -23.31 ft-lbs @ 224.40 msec



B-119

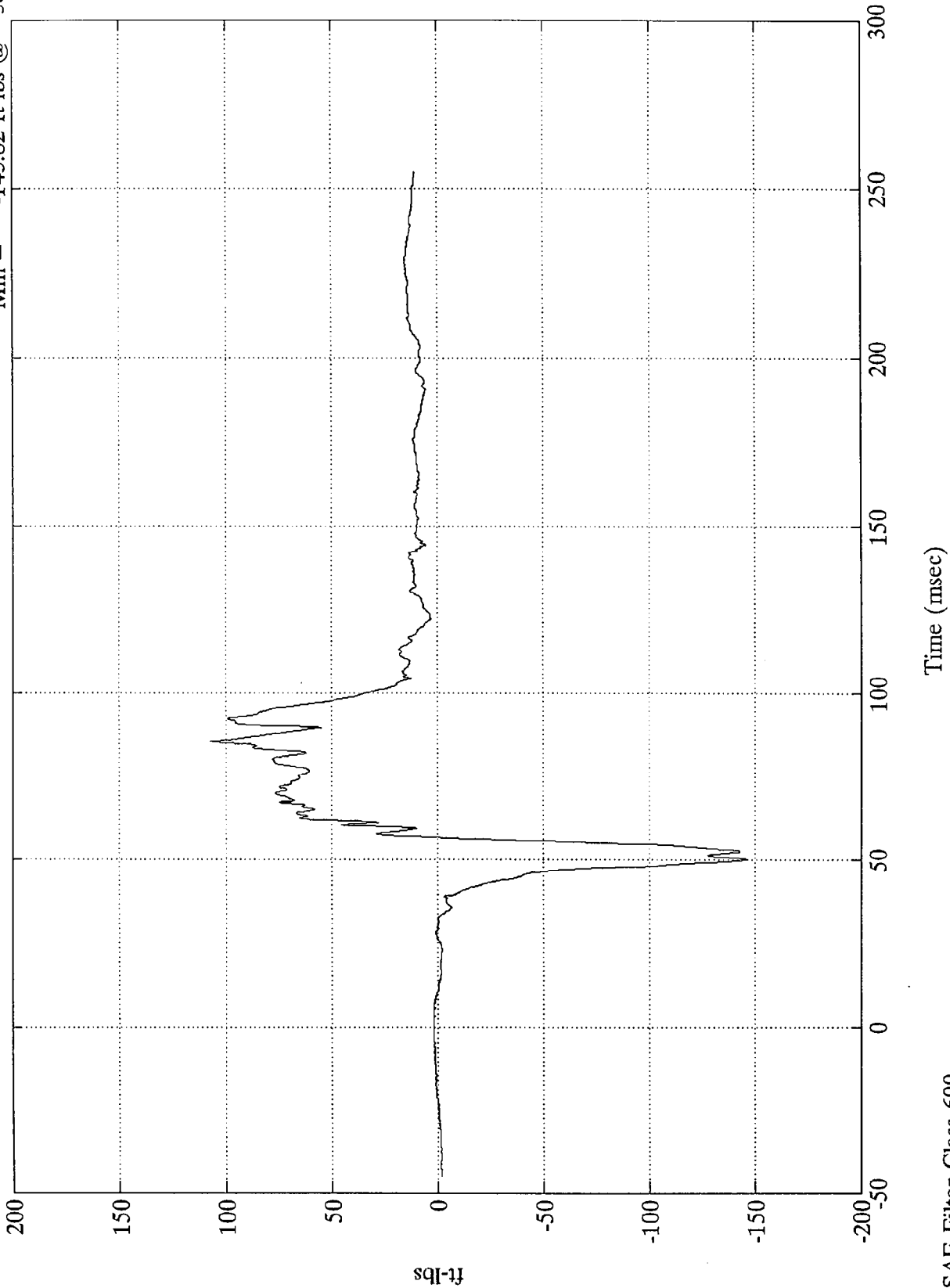
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 R. Upper Tibia My

Max = 106.93 ft-lbs @ 85.31 msec  
Min = -145.82 ft-lbs @ 50.16 msec



B-120

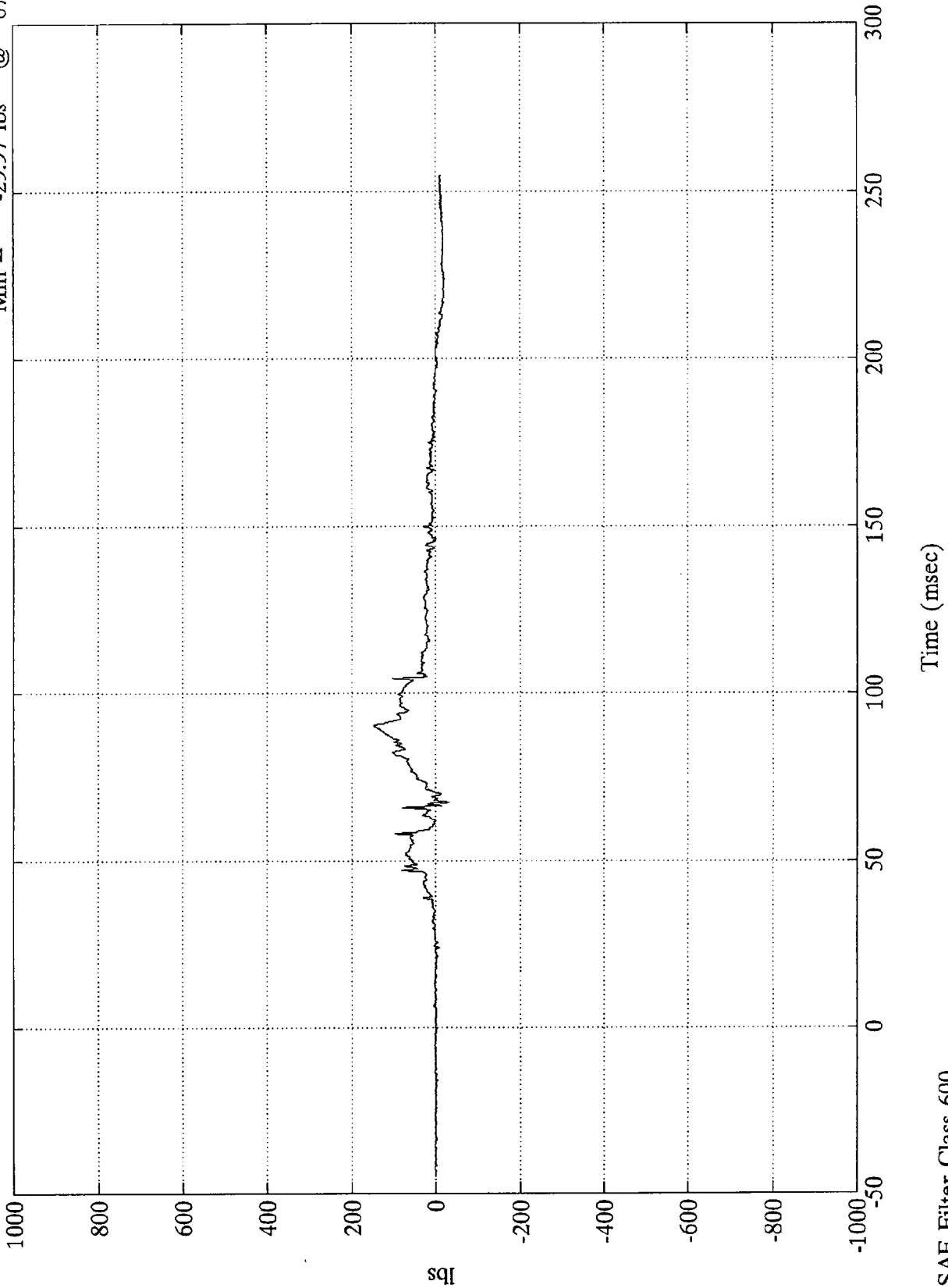
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 R. Lower Tibia Fy

Max = 148.40 lbs @ 90.36 msec  
Min = -29.97 lbs @ 67.56 msec



B-121

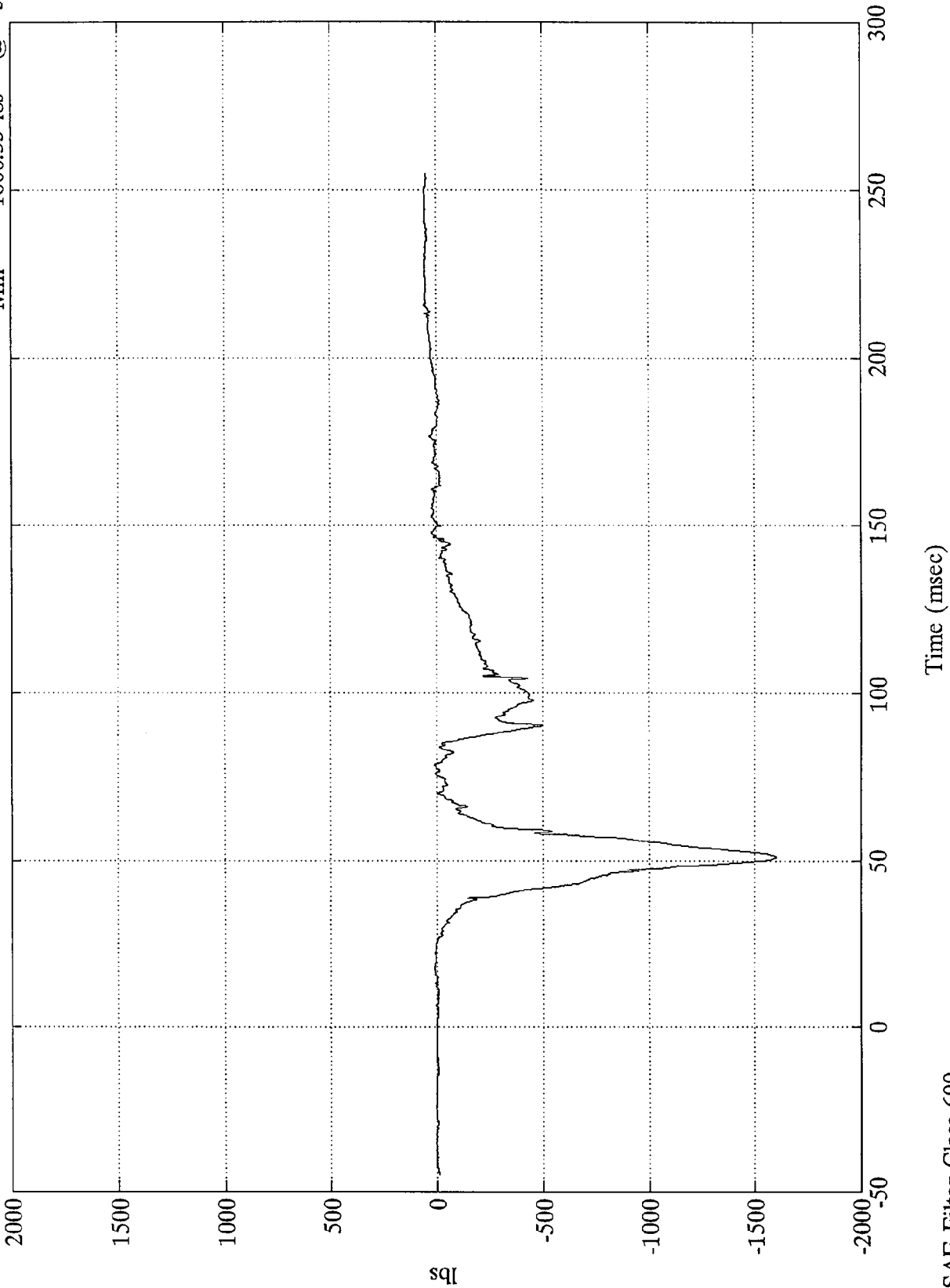
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 1 R. Lower Tibia Fz

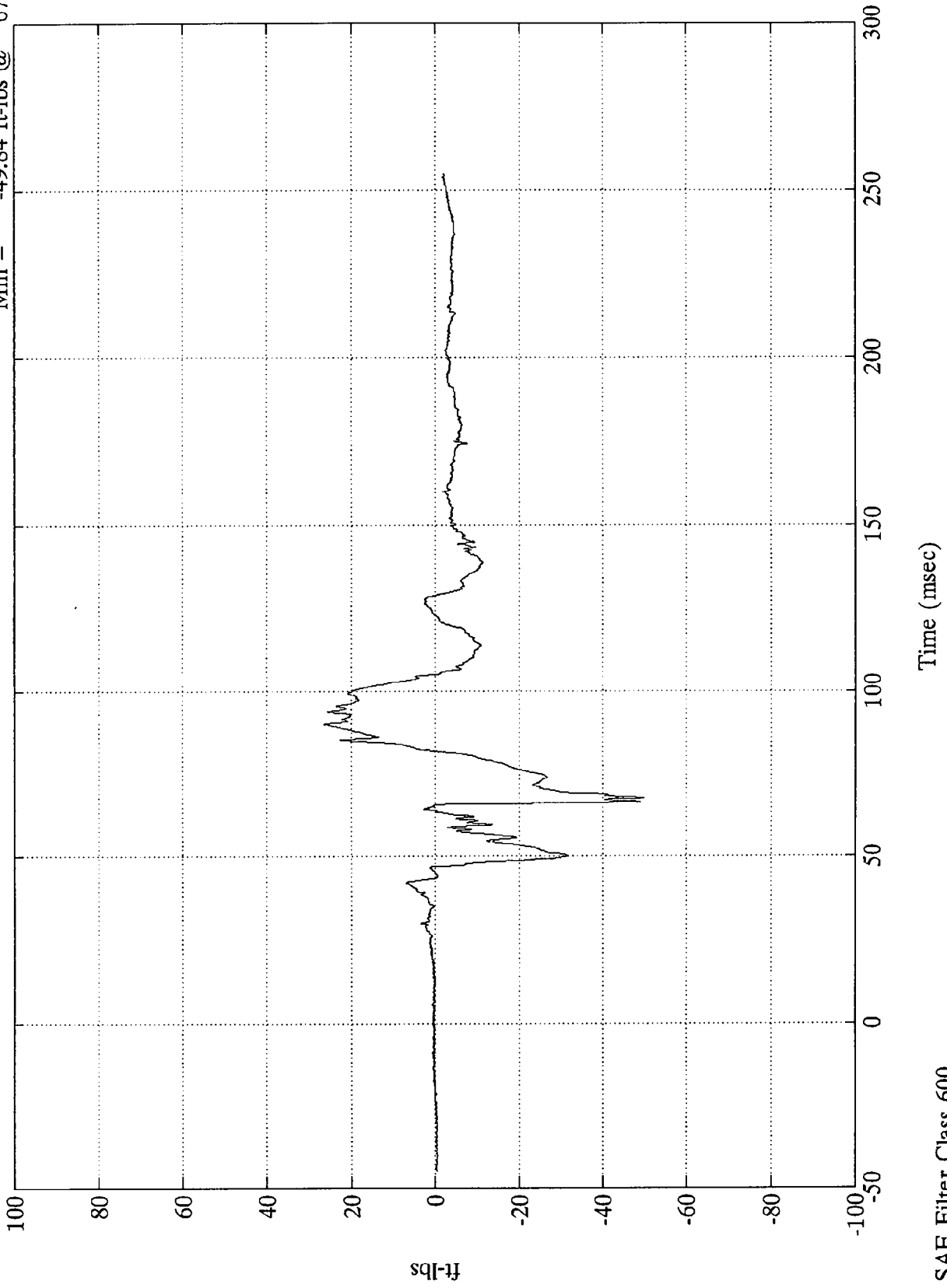
Max = 56.66 lbs @ 215.88 msec  
Min = -1600.33 lbs @ 51.12 msec



TSC Frontal Barrier - Ford Taurus

Pos. 1 R. Lower Tibia Mx

Max = 26.50 ft-lbs @ 90.12 msec  
Min = -49.84 ft-lbs @ 67.56 msec



B-123

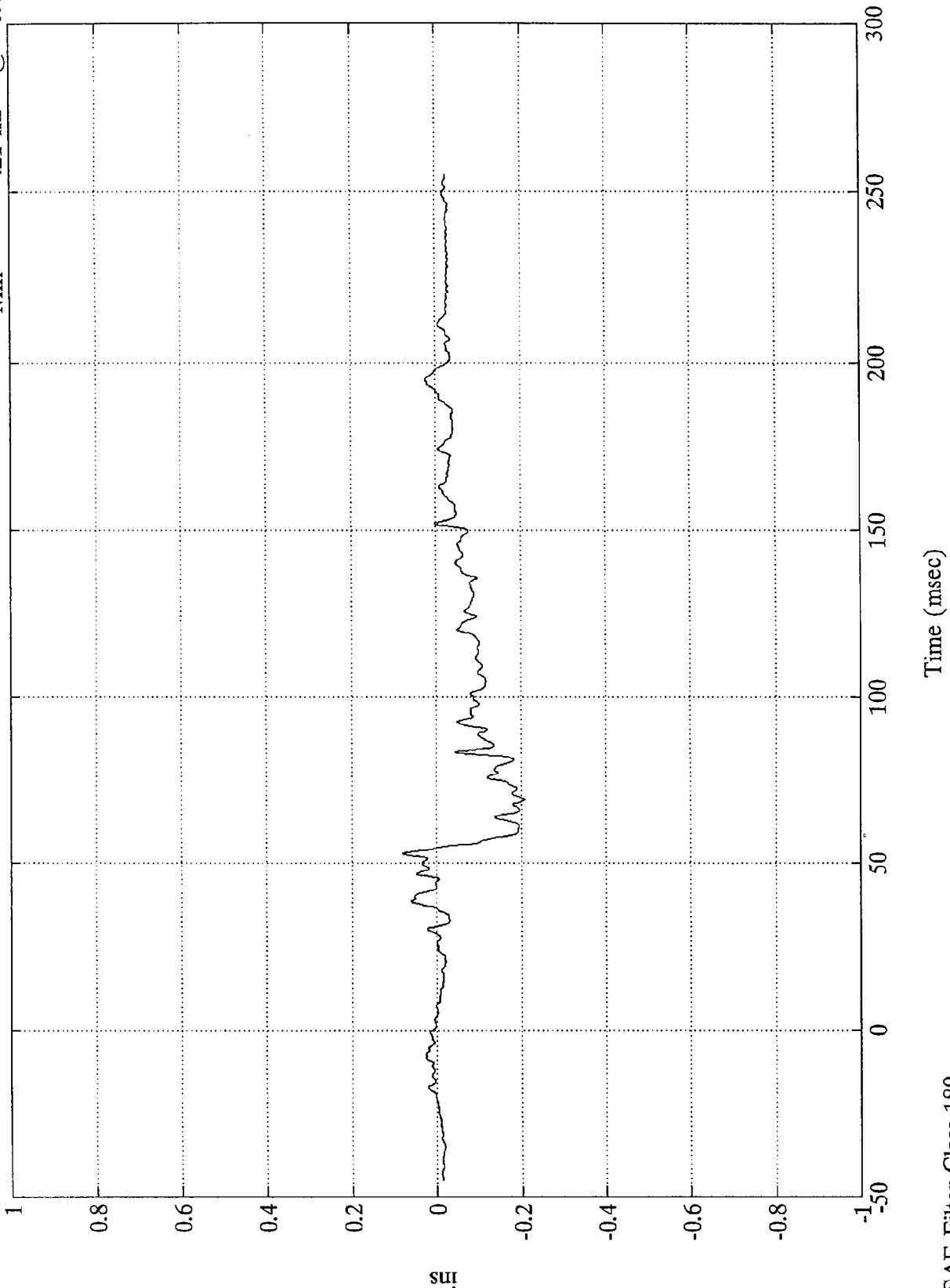
8118-1

SAE Filter Class 600

TSC Frontal Barrier Test #1 - Ford Tauru

Pos. 1 Left Knee Displ.

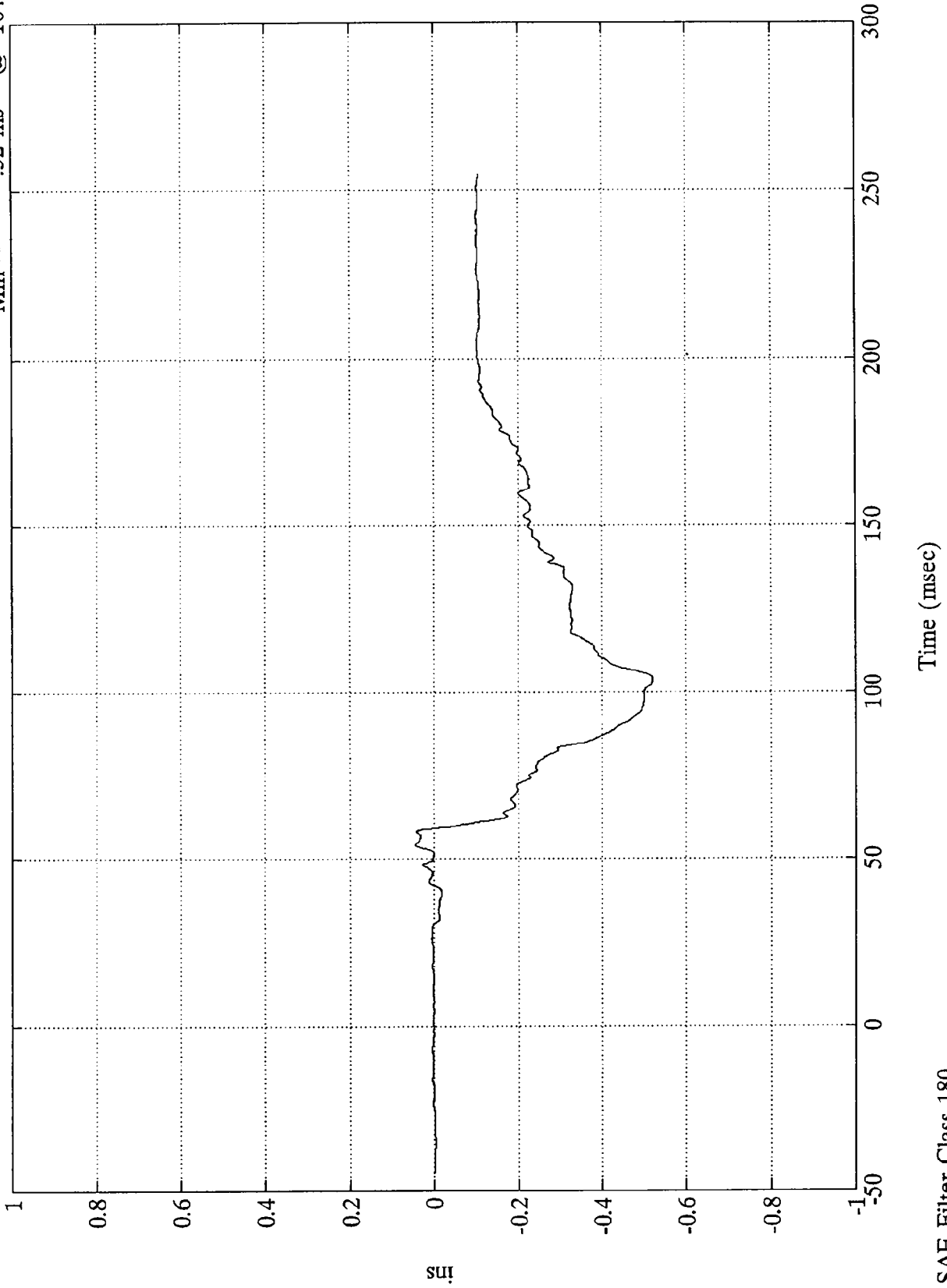
Max = .08 ins @ 53.15 msec  
Min = -.21 ins @ 69.12 msec



TSC Frontal Barrier Test #1 - Ford Taurus

Pos. 1 Right Knee Displ.

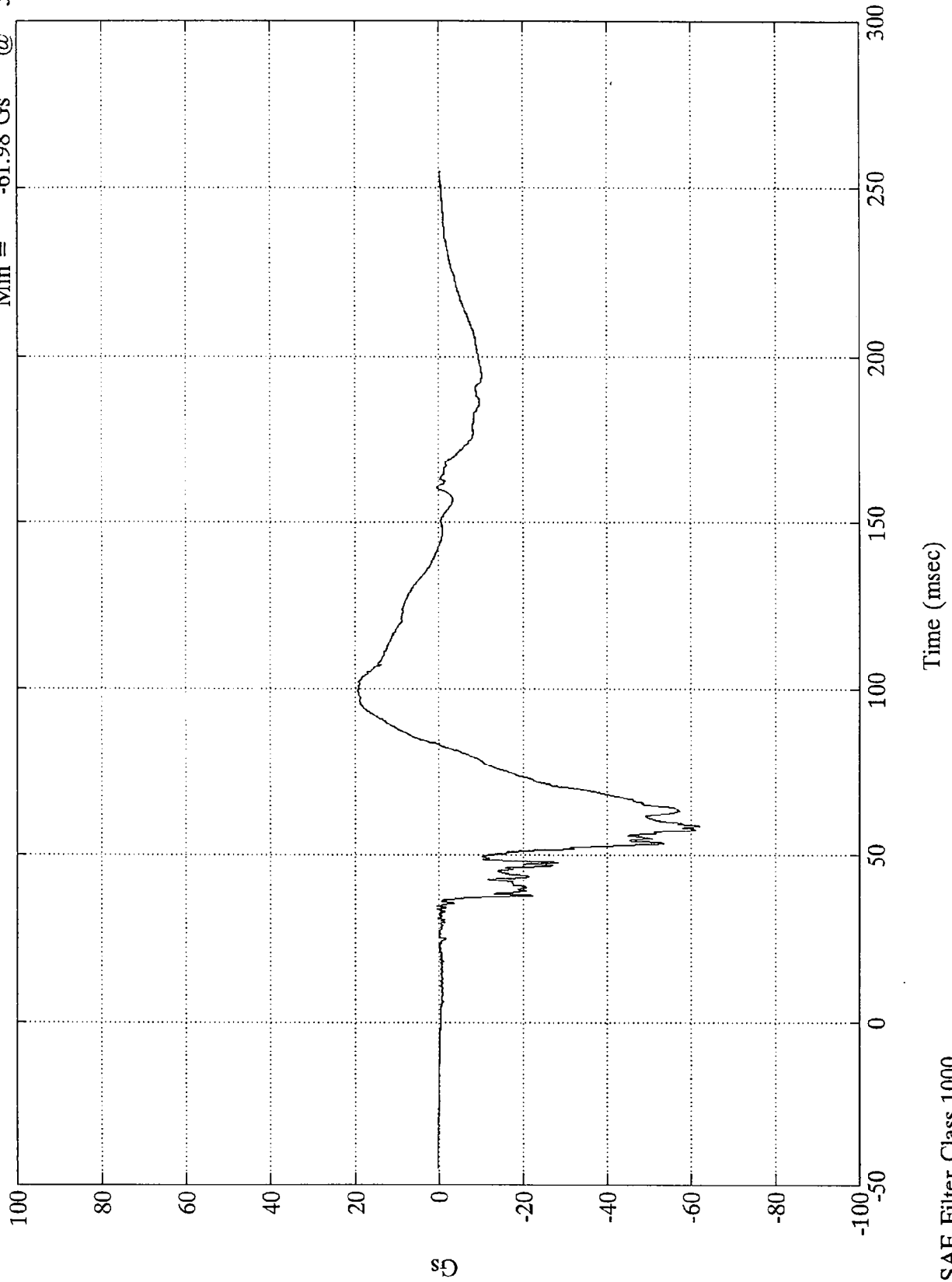
Max = .05 ins @ 54.23 msec  
Min = -.52 ins @ 104.27 msec



TSC Frontal Barrier - Ford Taurus

Max = 19.35 Gs @ 102.00 msec  
Min = -61.98 Gs @ 58.56 msec

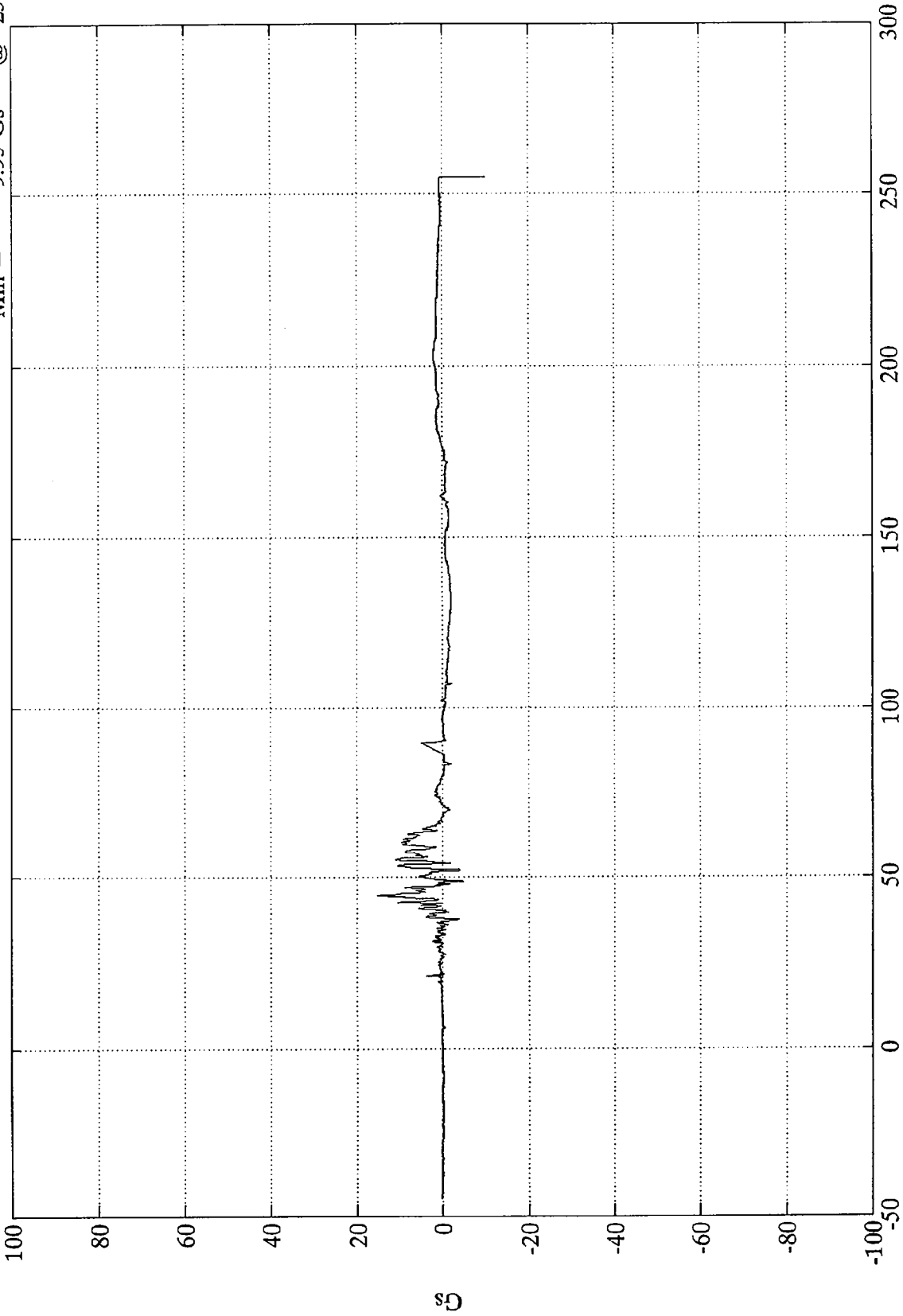
Pos. 2 Head X



TSC Frontal Barrier - Ford Taurus

Pos. 2 Head Y

Max = 15.18 Gs @ 44.39 msec  
Min = -9.95 Gs @ 254.88 msec



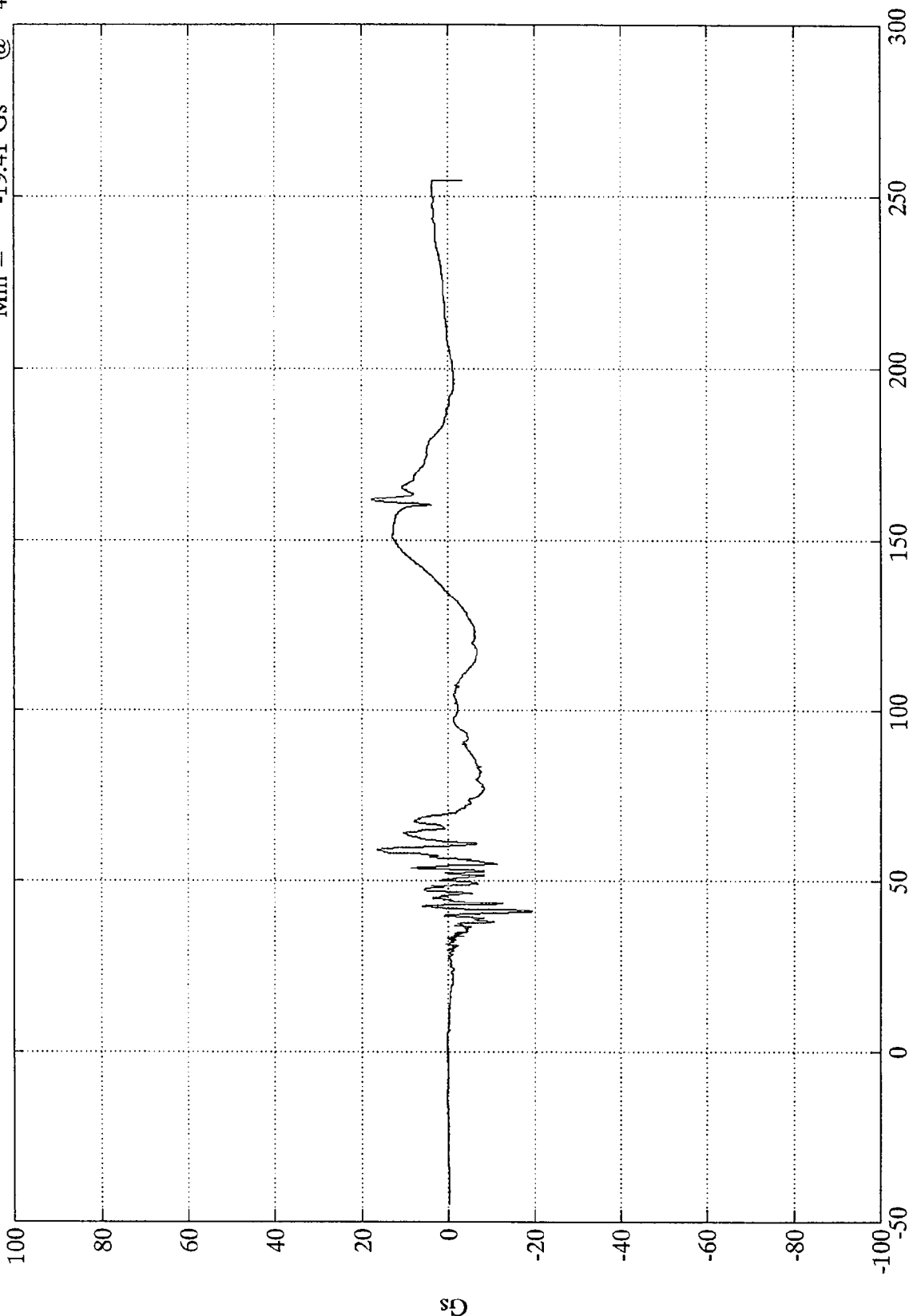
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Max = 17.68 Gs @ 161.88 msec  
Min = -19.41 Gs @ 40.92 msec

Pos. 2 Head Z



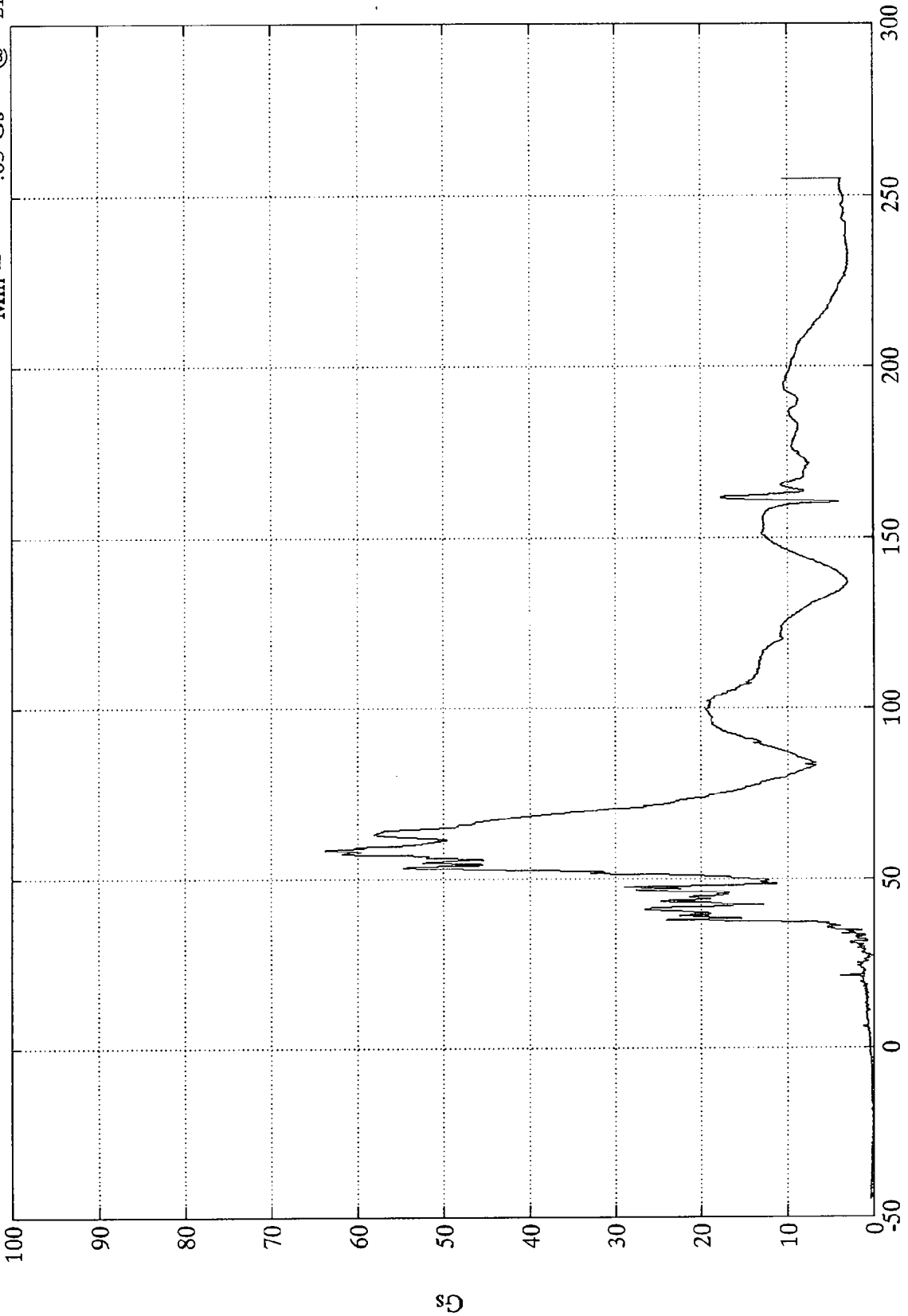
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Head Resultant

Max = 63.80 Gs @ 58.56 msec  
Min = .03 Gs @ -21.48 msec



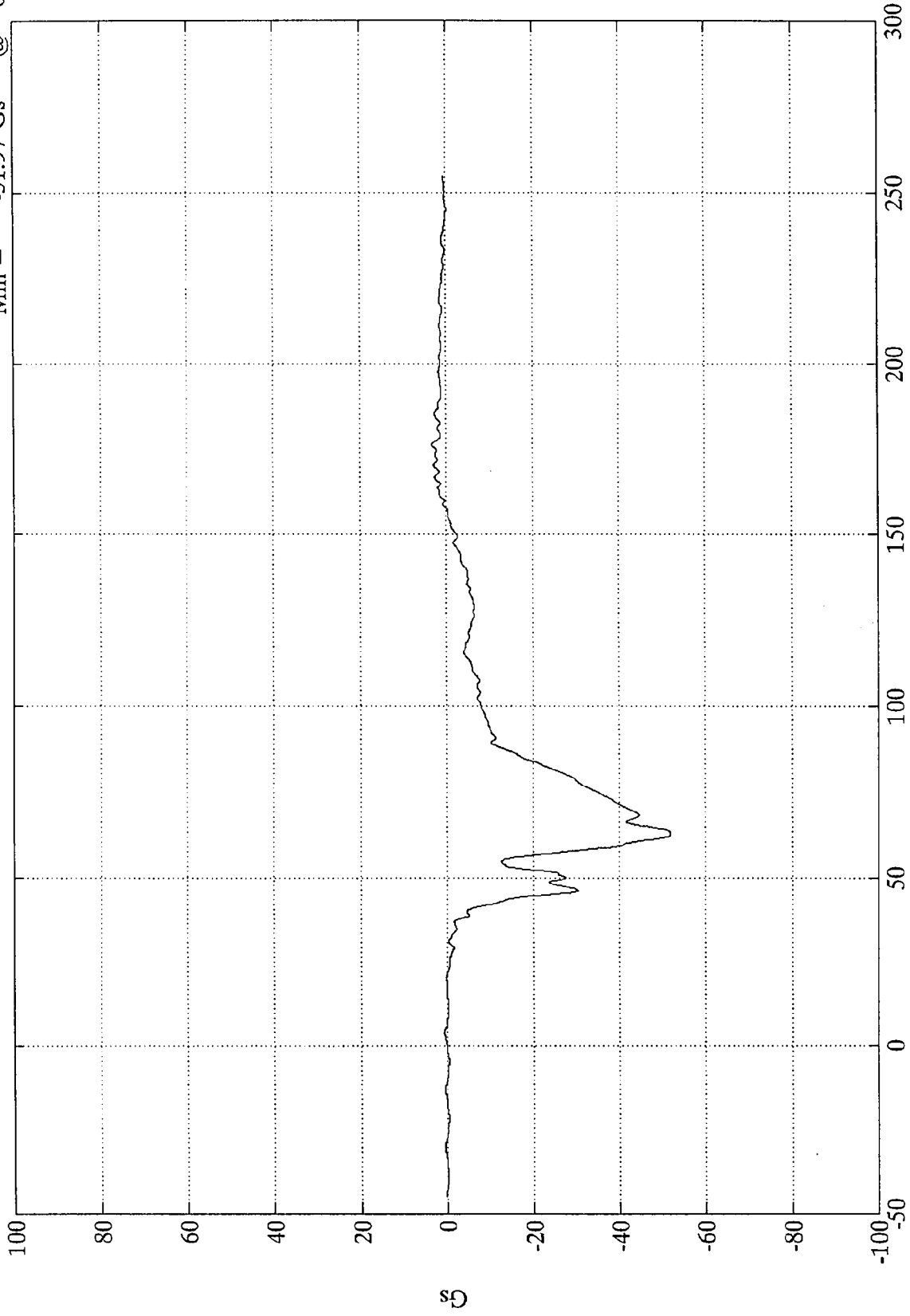
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Max = 3.31 Gs @ 176.16 msec  
Min = -51.97 Gs @ 62.51 msec

Pos. 2 Chest X



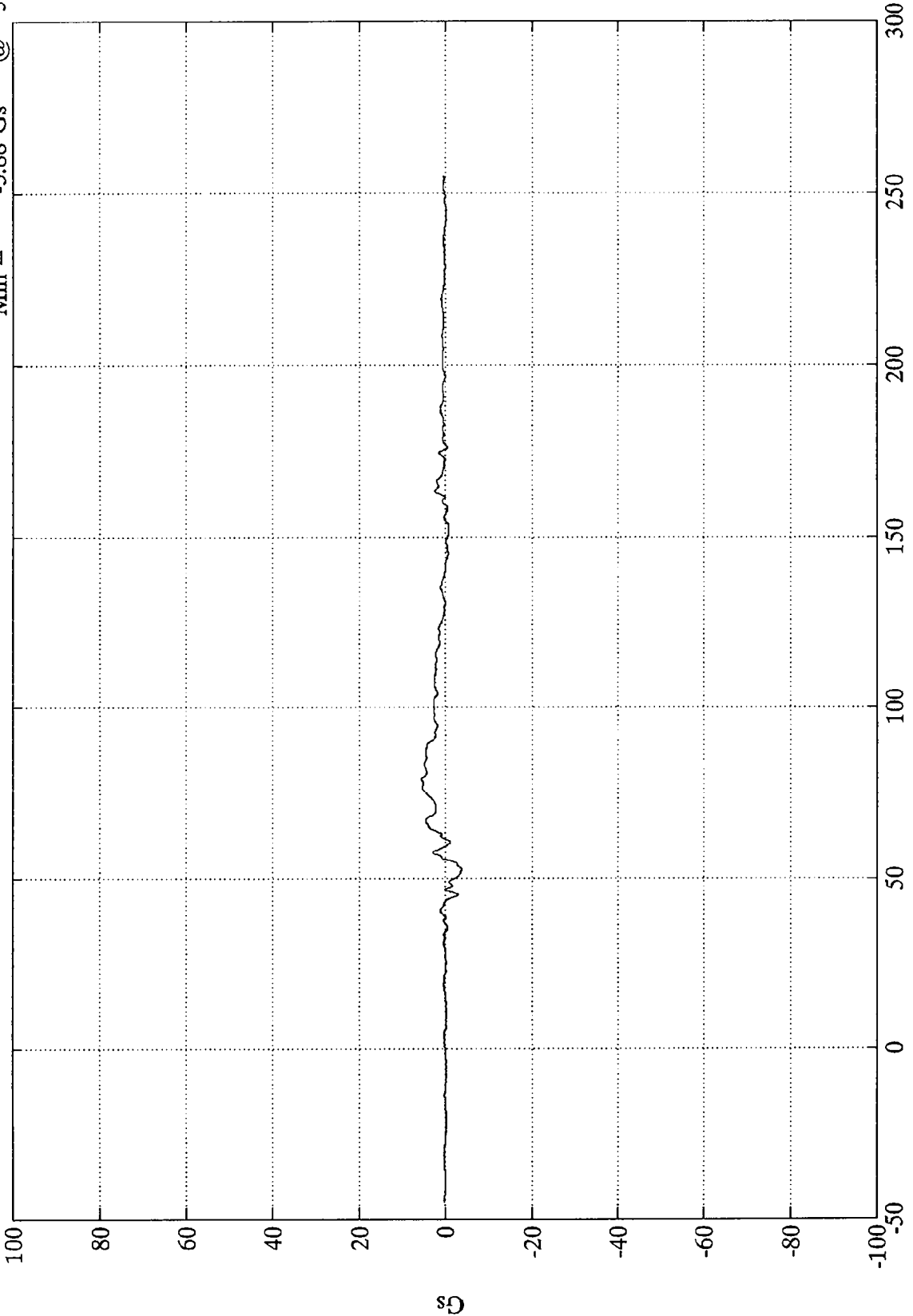
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier - Ford Taurus

Max = 5.59 Gs @ 78.95 msec  
Min = -3.88 Gs @ 52.92 msec

Pos. 2 Chest Y



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8118-1

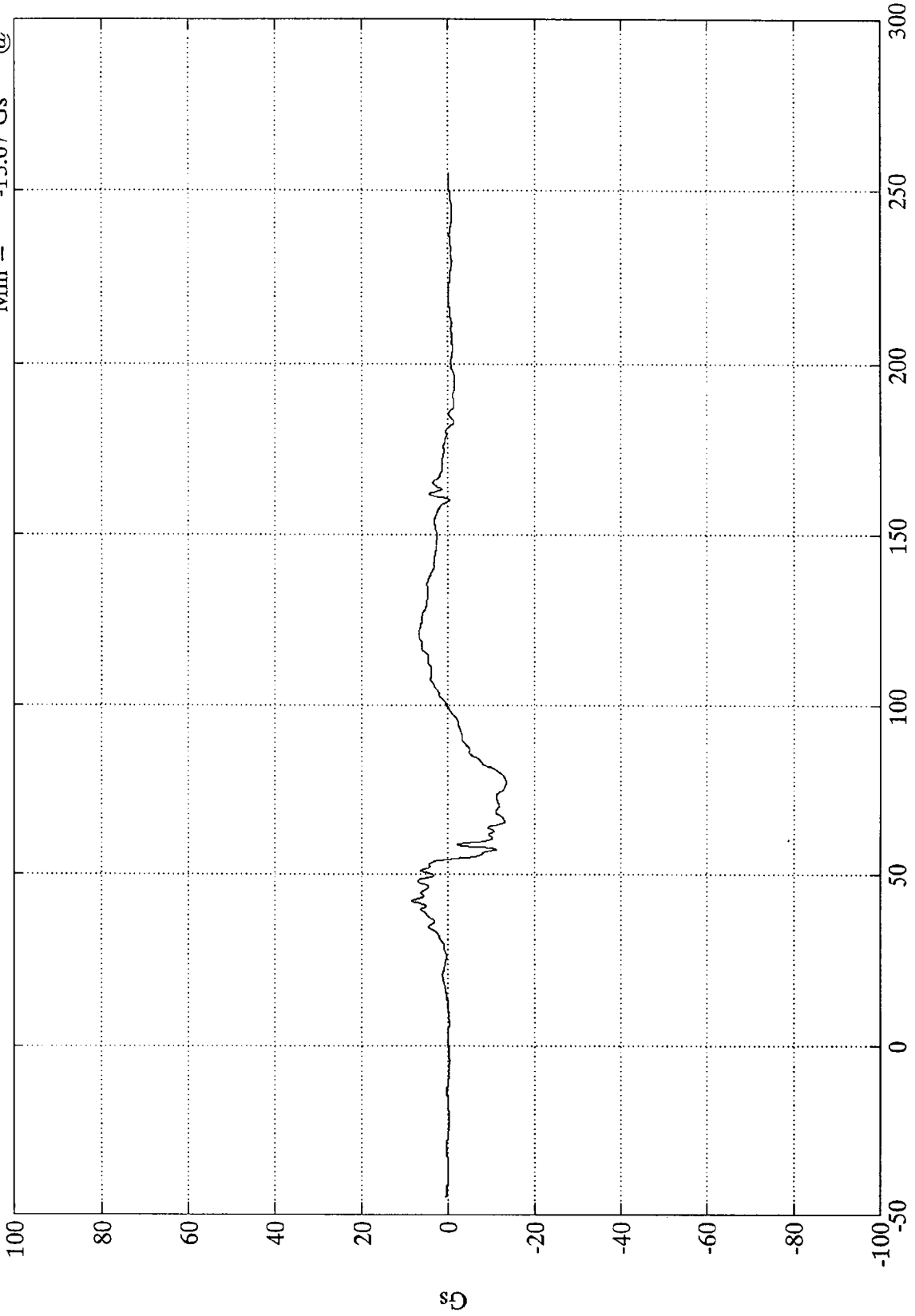
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier - Ford Taurus

Max = 8.31 Gs @ 42.00 msec  
Min = -13.67 Gs @ 76.92 msec

Pos. 2 Chest Z



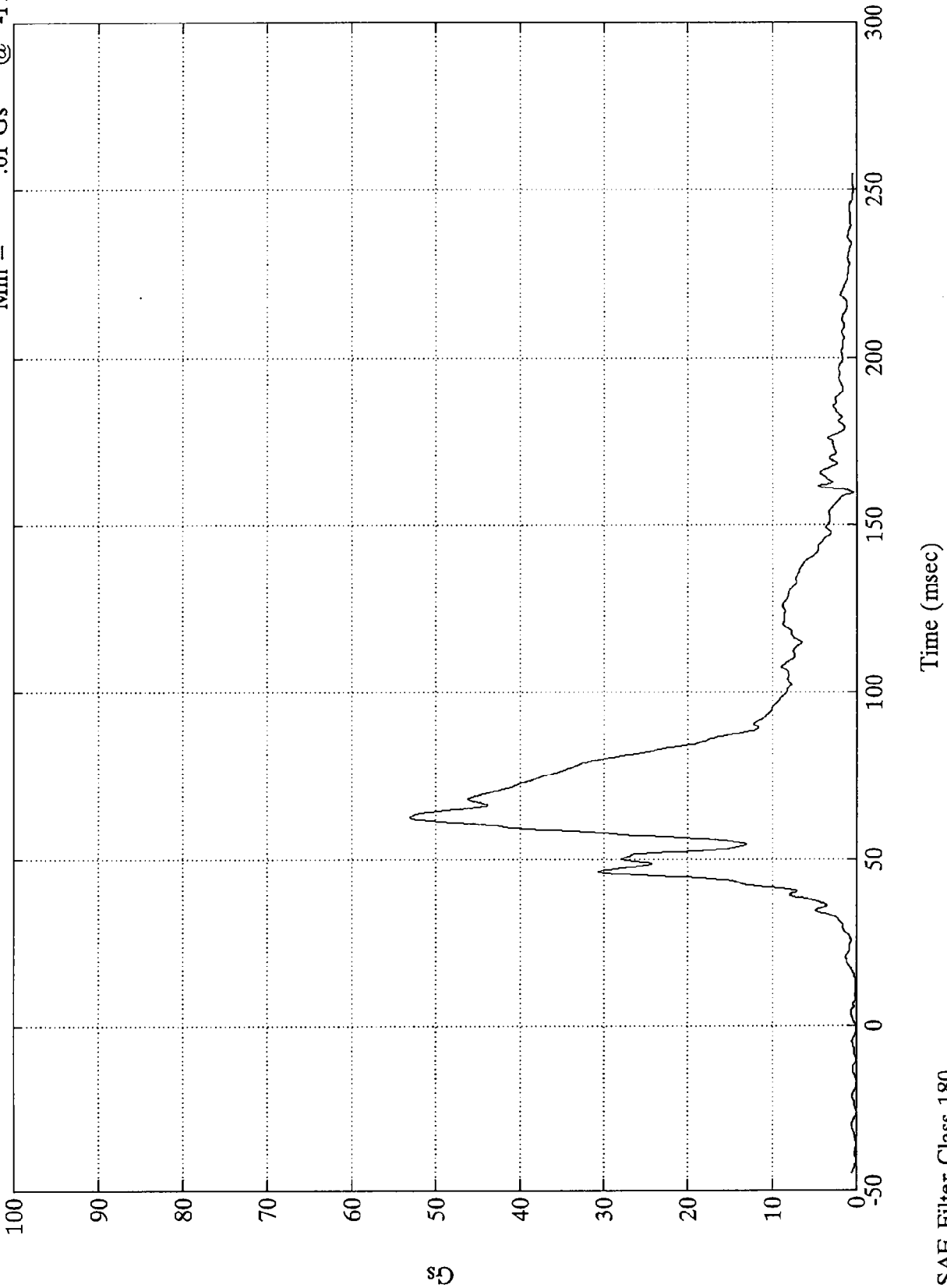
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier - Ford Taurus

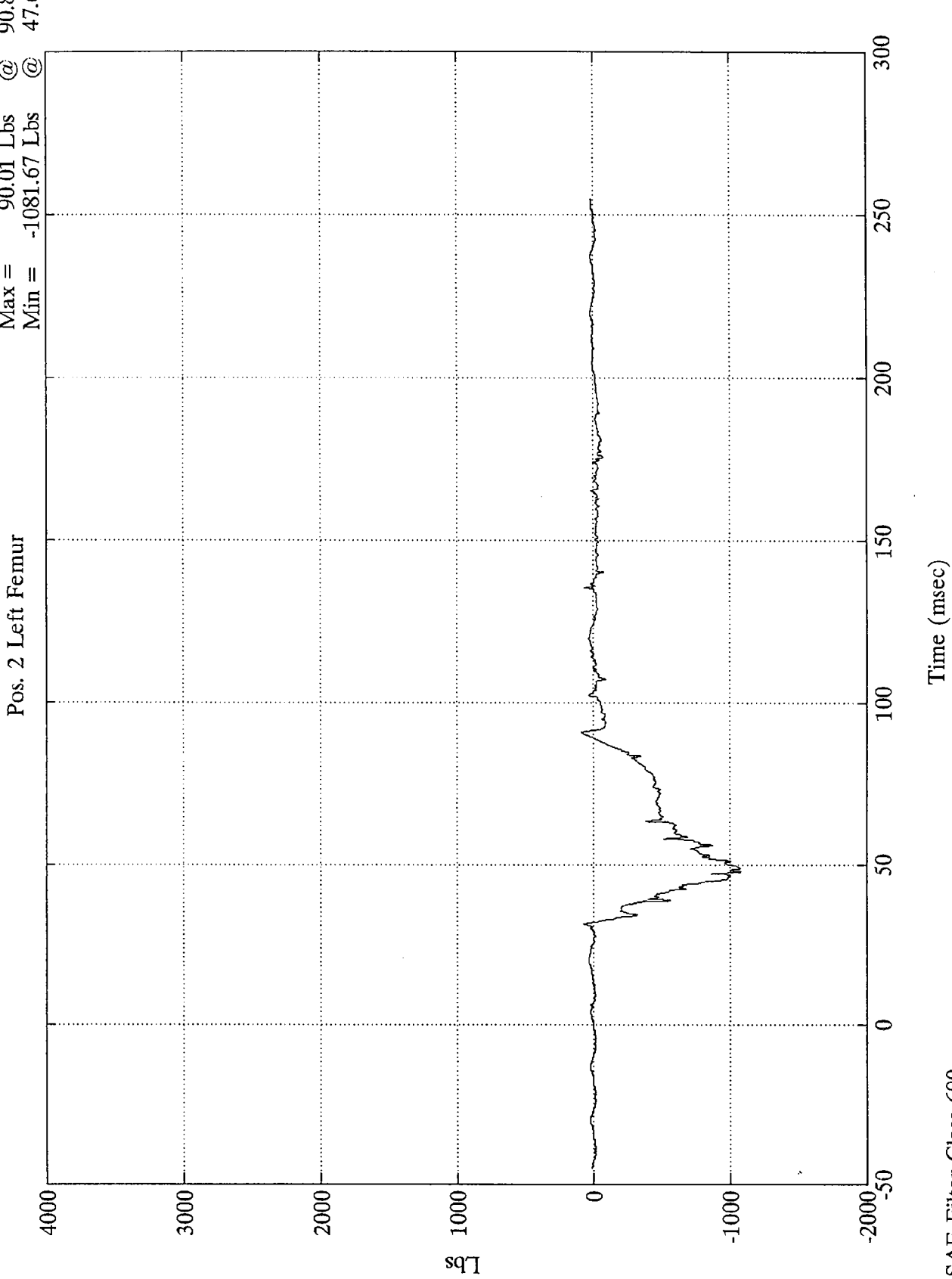
Pos. 2 Chest Resultant

Max = 53.05 Gs @ 62.51 msec  
Min = .01 Gs @ -17.16 msec



TSC Frontal Barrier - Ford Taurus

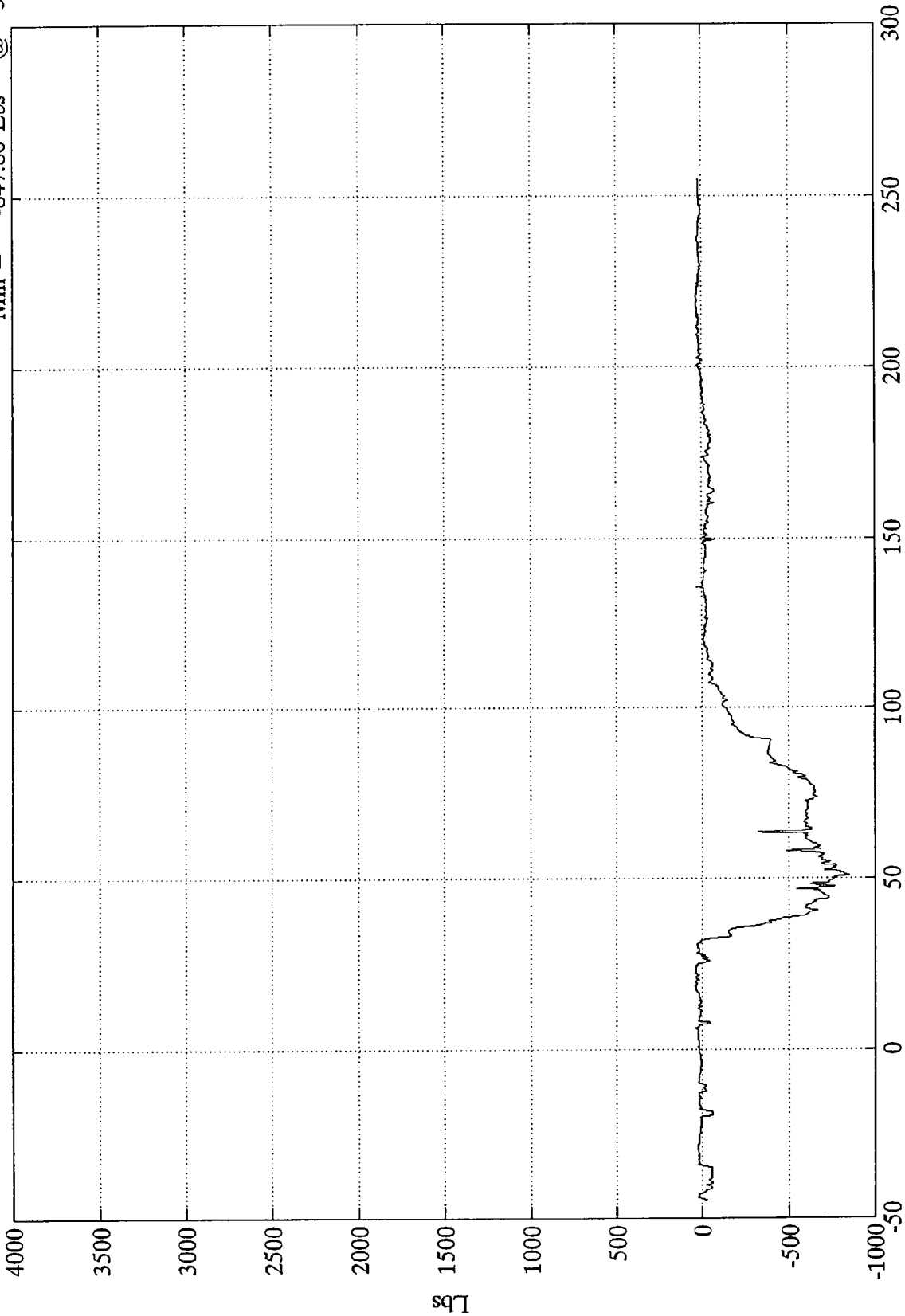
Max = 90.01 Lbs @ 90.84 msec  
Min = -1081.67 Lbs @ 47.63 msec



TSC Frontal Barrier - Ford Taurus

Pos. 2 Right Femur

Max = 39.98 Lbs @ 18.47 msec  
Min = -847.86 Lbs @ 50.88 msec



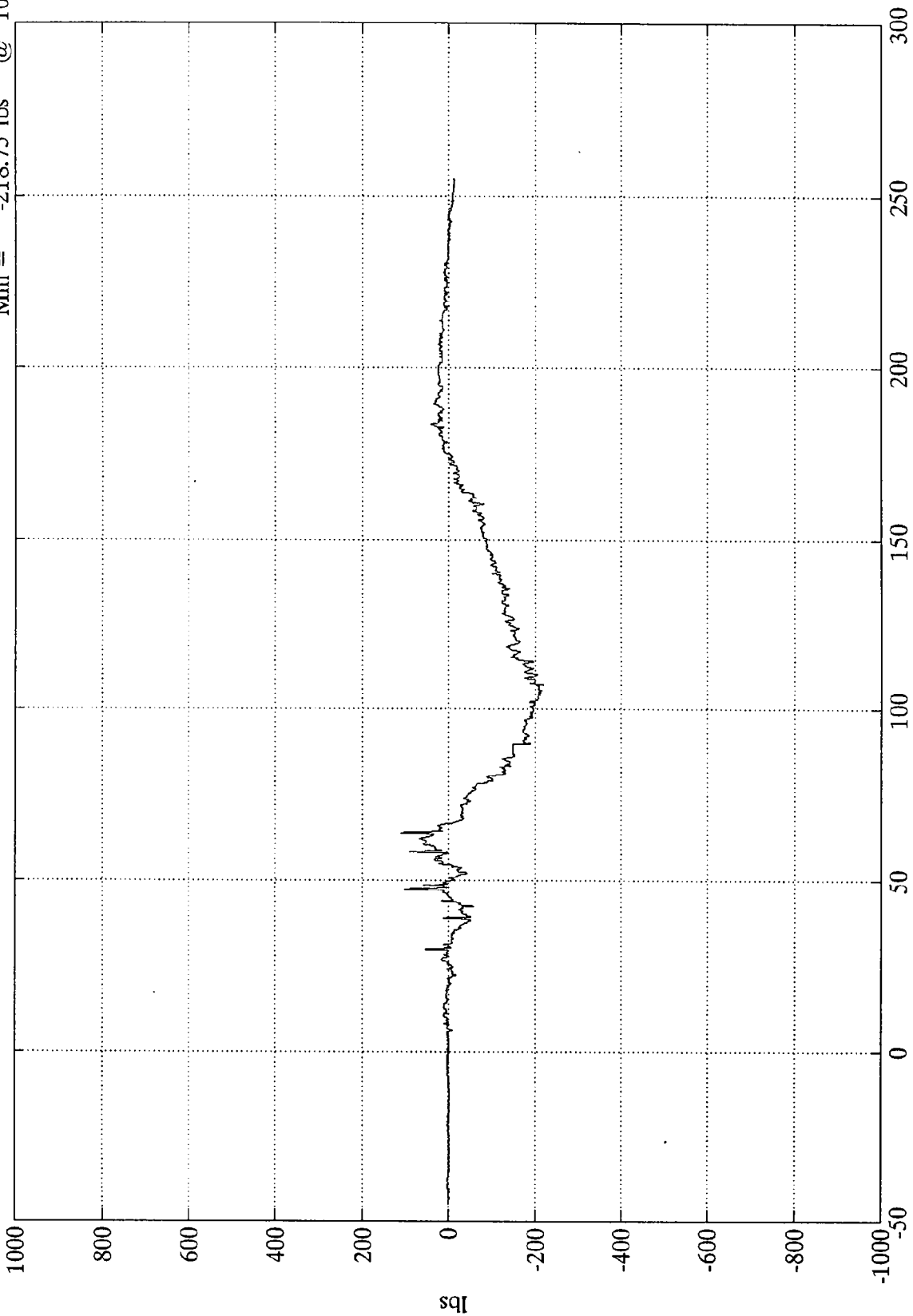
Time (msec)

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Max = 109.68 lbs @ 63.72 msec  
Min = -218.75 lbs @ 107.27 msec

Pos. 2 Thorax Fx



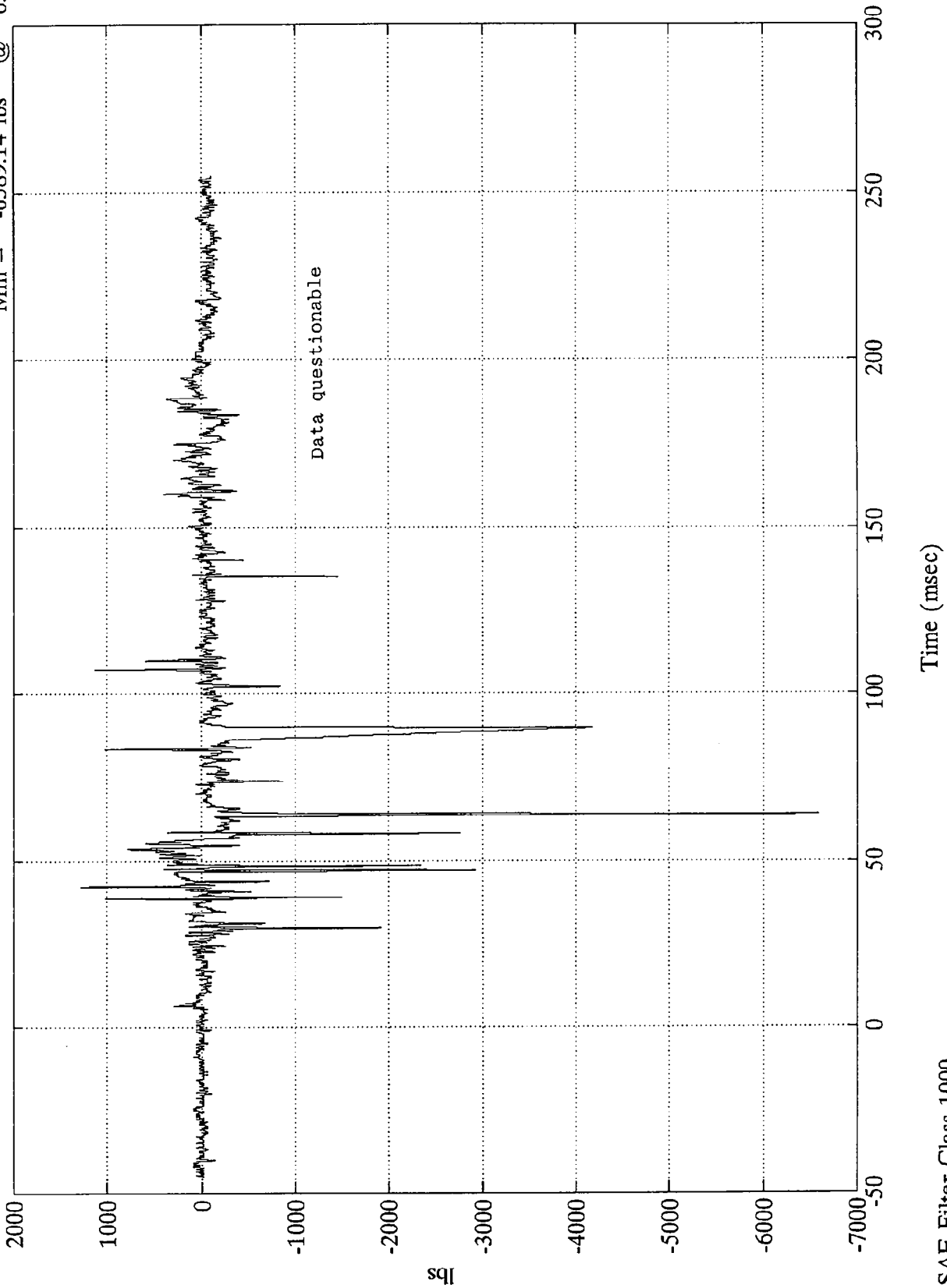
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Thorax Fy

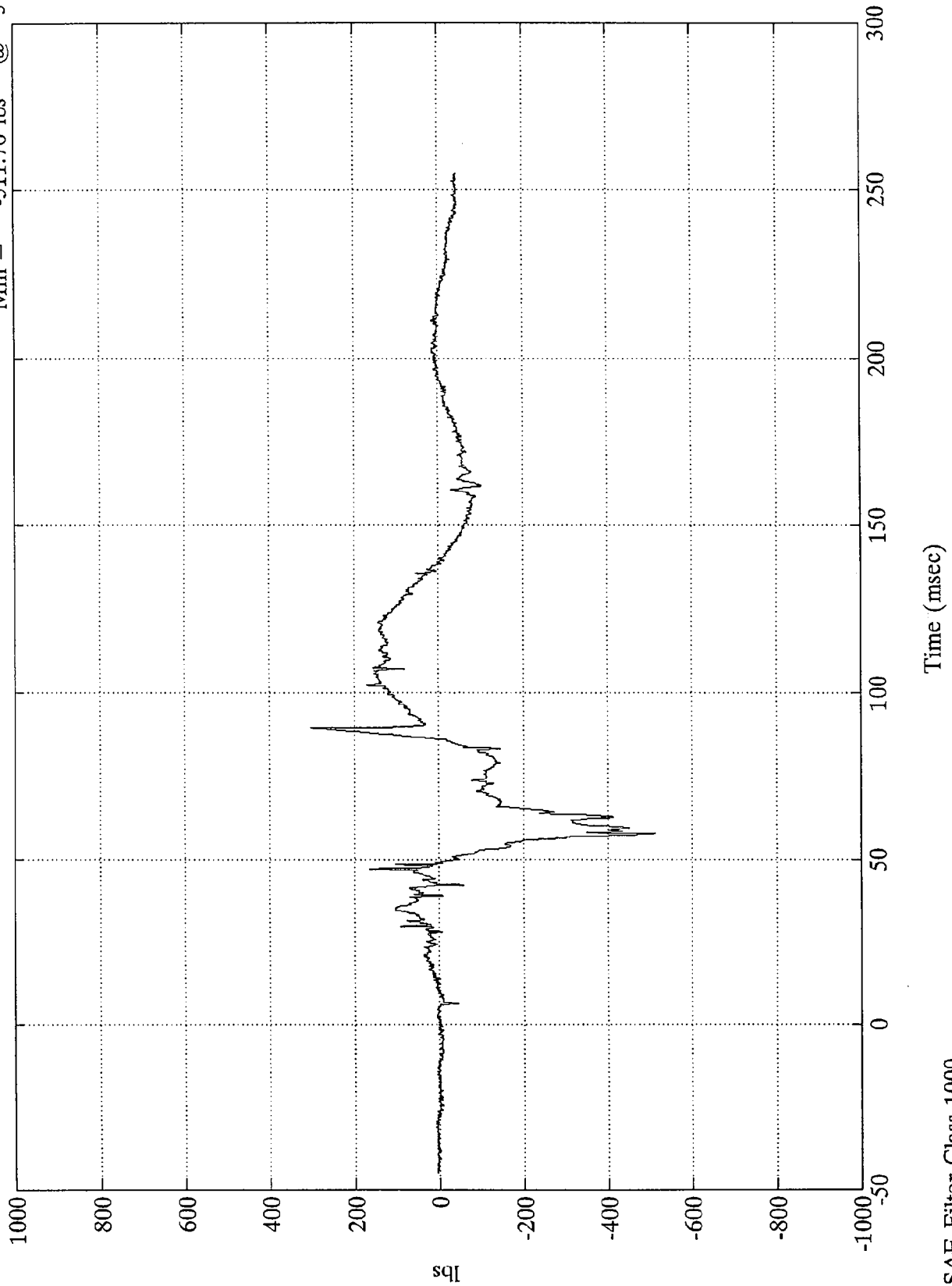
Max = 1290.32 lbs @ 42.24 msec  
Min = -6589.14 lbs @ 63.84 msec



TSC Frontal Barrier - Ford Taurus

Max = 303.24 lbs @ 89.63 msec  
Min = -511.76 lbs @ 57.84 msec

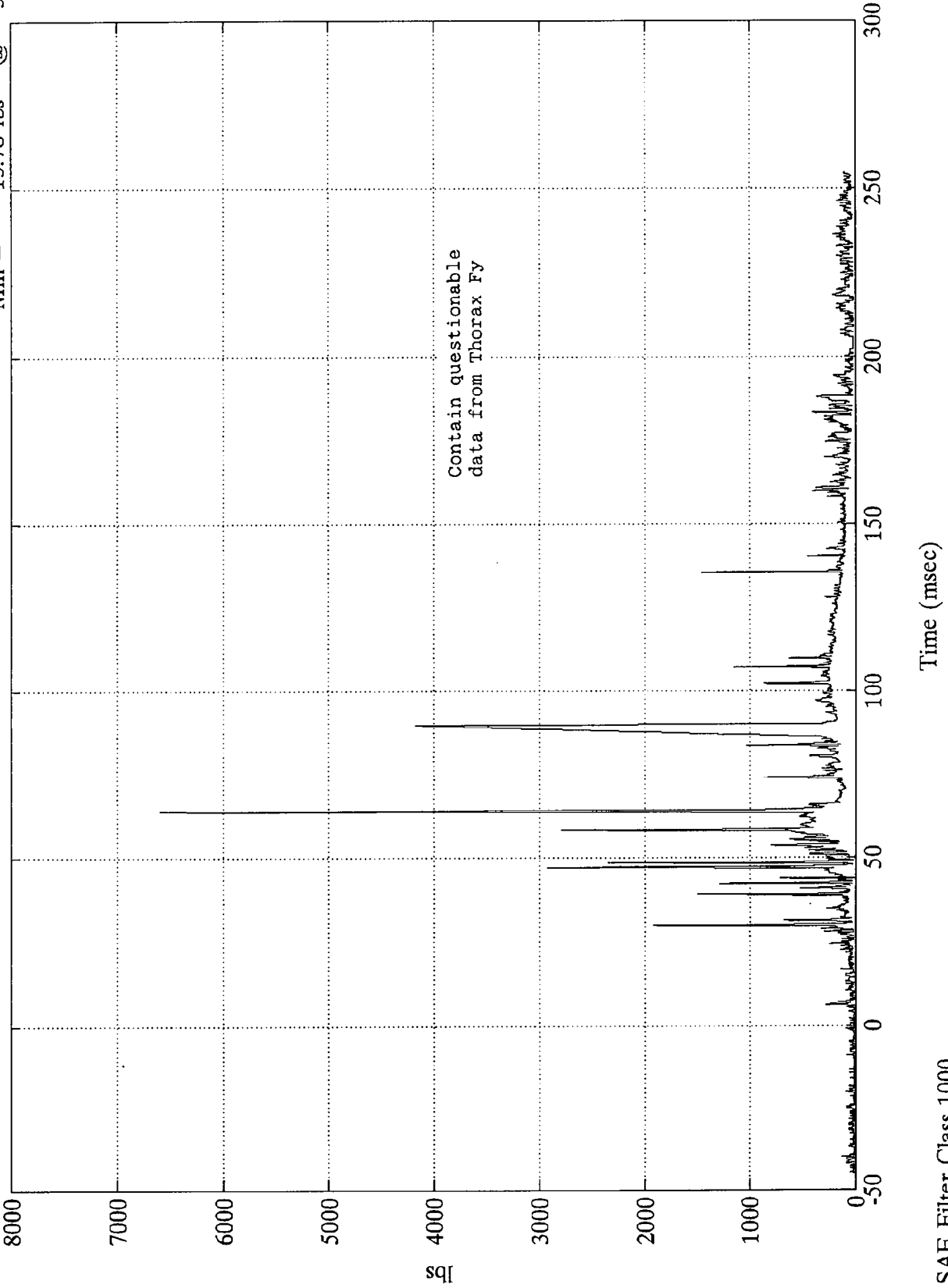
Pos. 2 Thorax Fz



TSC Frontal Barrier - Ford Taurus

P2 Thorax Force Result.

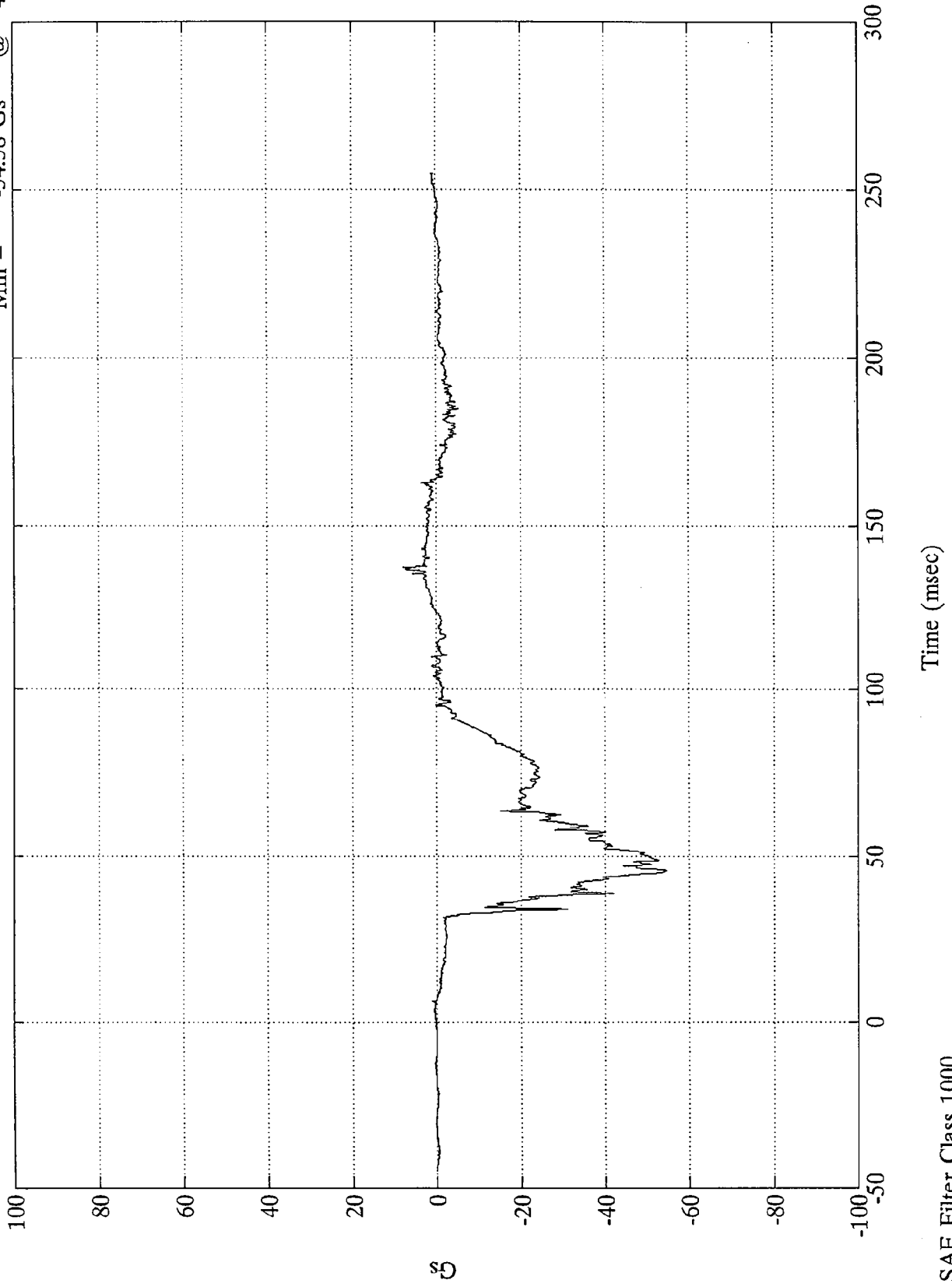
Max = 6594.18 lbs @ 63.84 msec  
Min = 15.78 lbs @ 3.35 msec



TSC Frontal Barrier - Ford Taurus

Pos. 2 Pelvic X

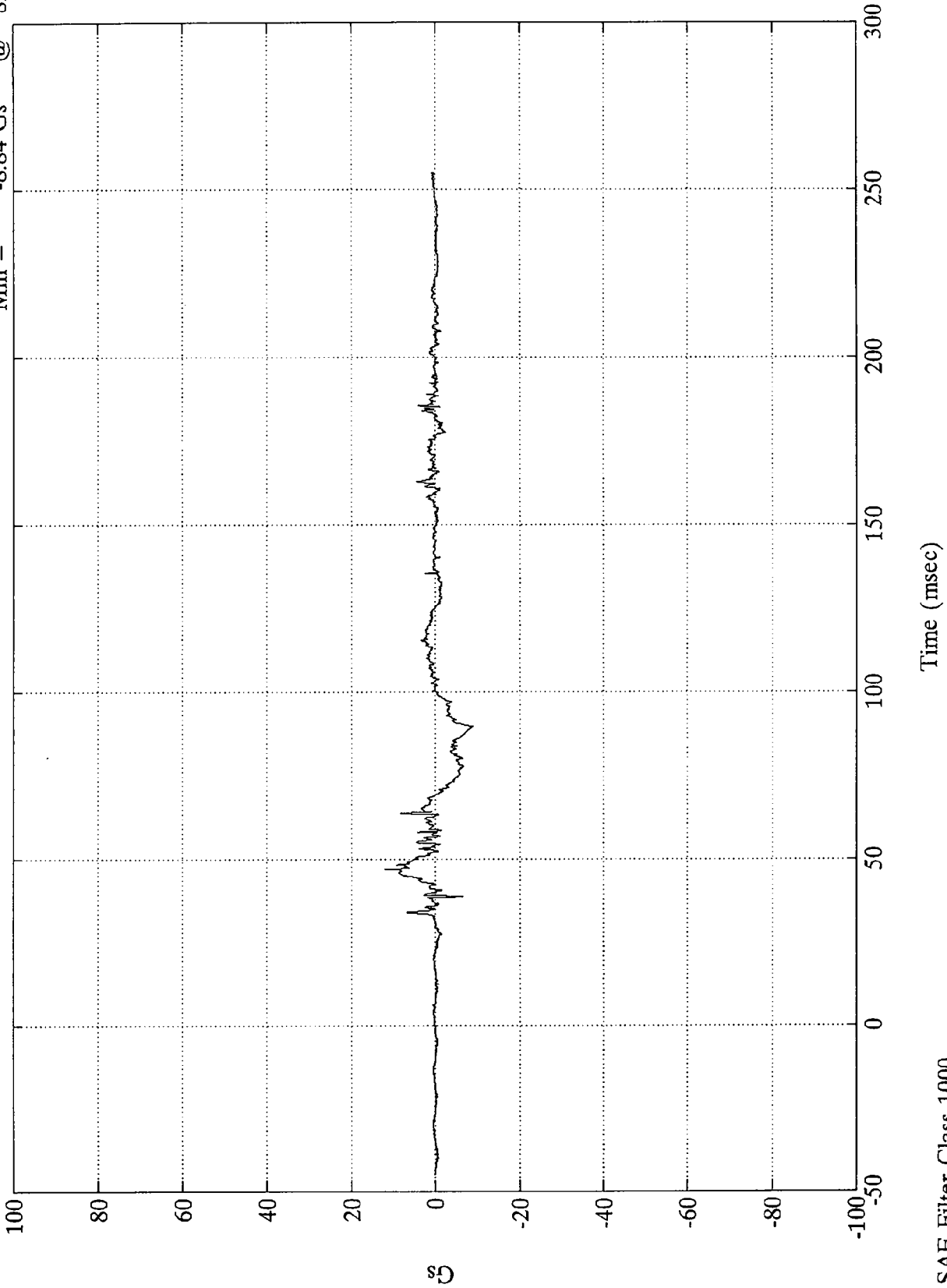
Max = 7.83 Gs @ 137.52 msec  
Min = -54.58 Gs @ 45.60 msec



TSC Frontal Barrier - Ford Taurus

Pos. 2 Pelvic Y

Max = 12.11 Gs @ 47.15 msec  
Min = -8.84 Gs @ 89.63 msec



B-141

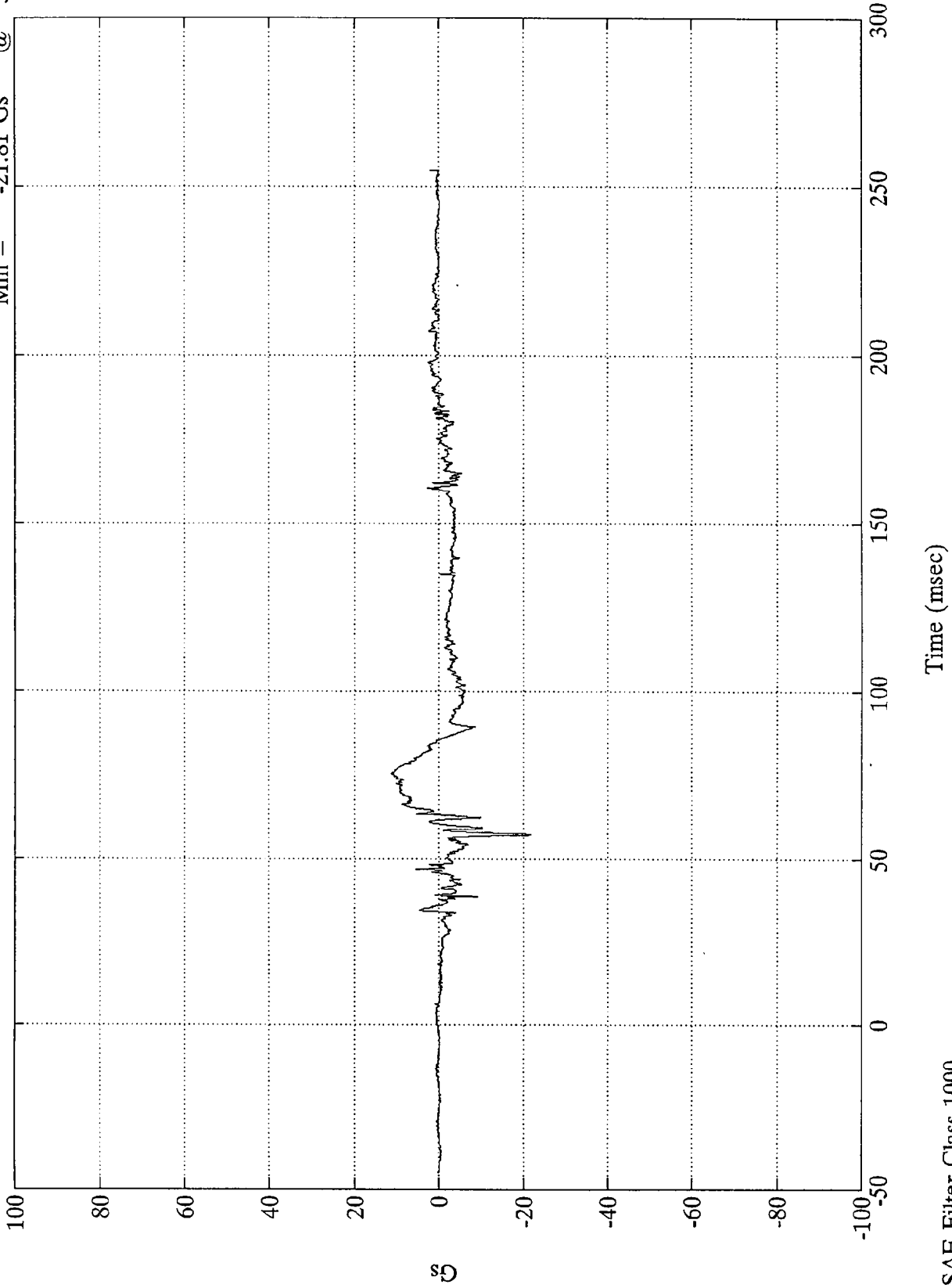
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Max = 11.17 Gs @ 75.59 msec  
Min = -21.81 Gs @ 57.36 msec

Pos. #2 Pelvic Z



B-142

8118-1

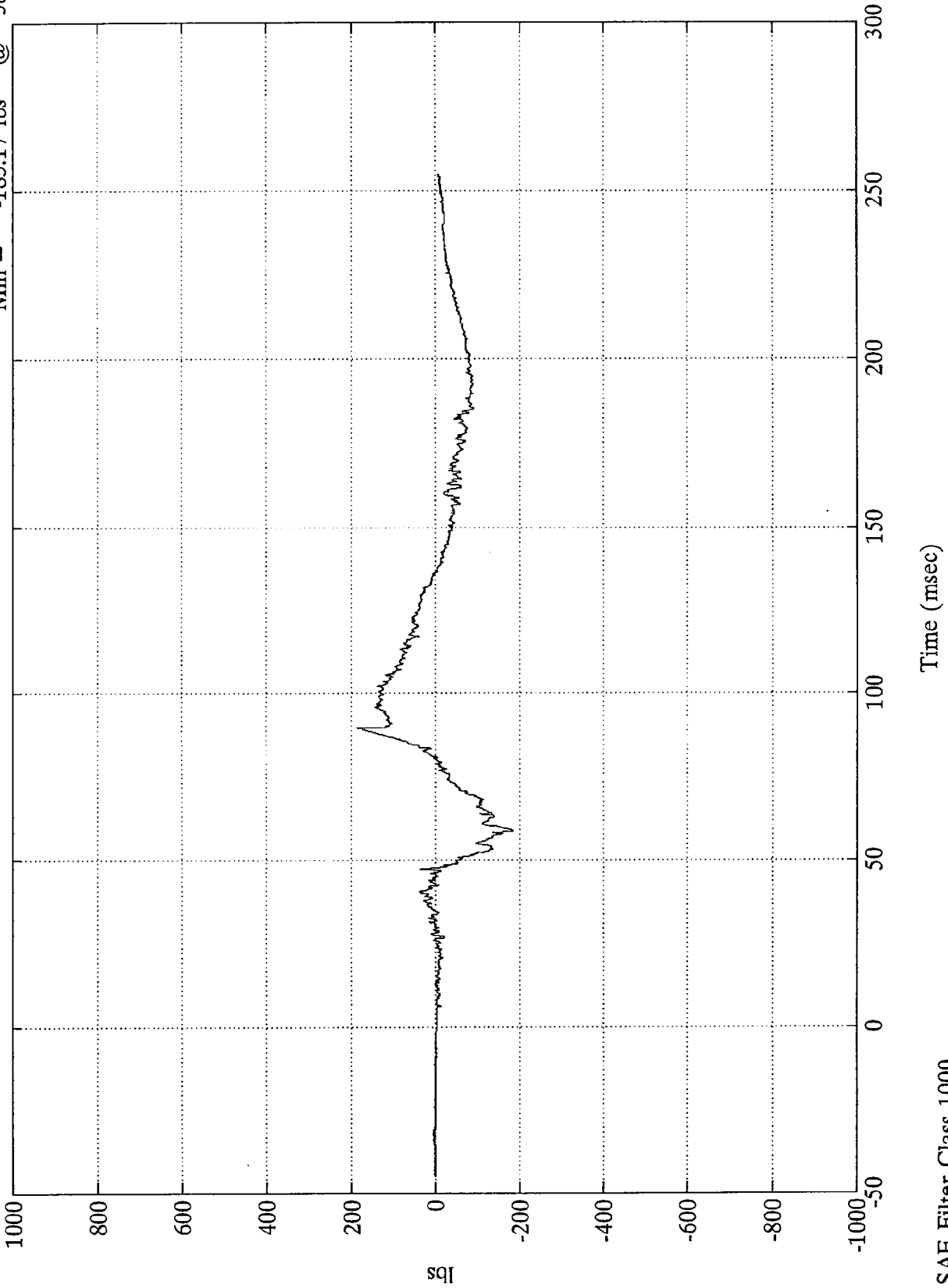
SAE Filter Class 1000

Time (msec)

TSC Frontal Barrier - Ford Taurus

Pos. 2 Upper Neck Fx

Max = 186.13 lbs @ 89.63 msec  
Min = -185.17 lbs @ 58.68 msec



B-143

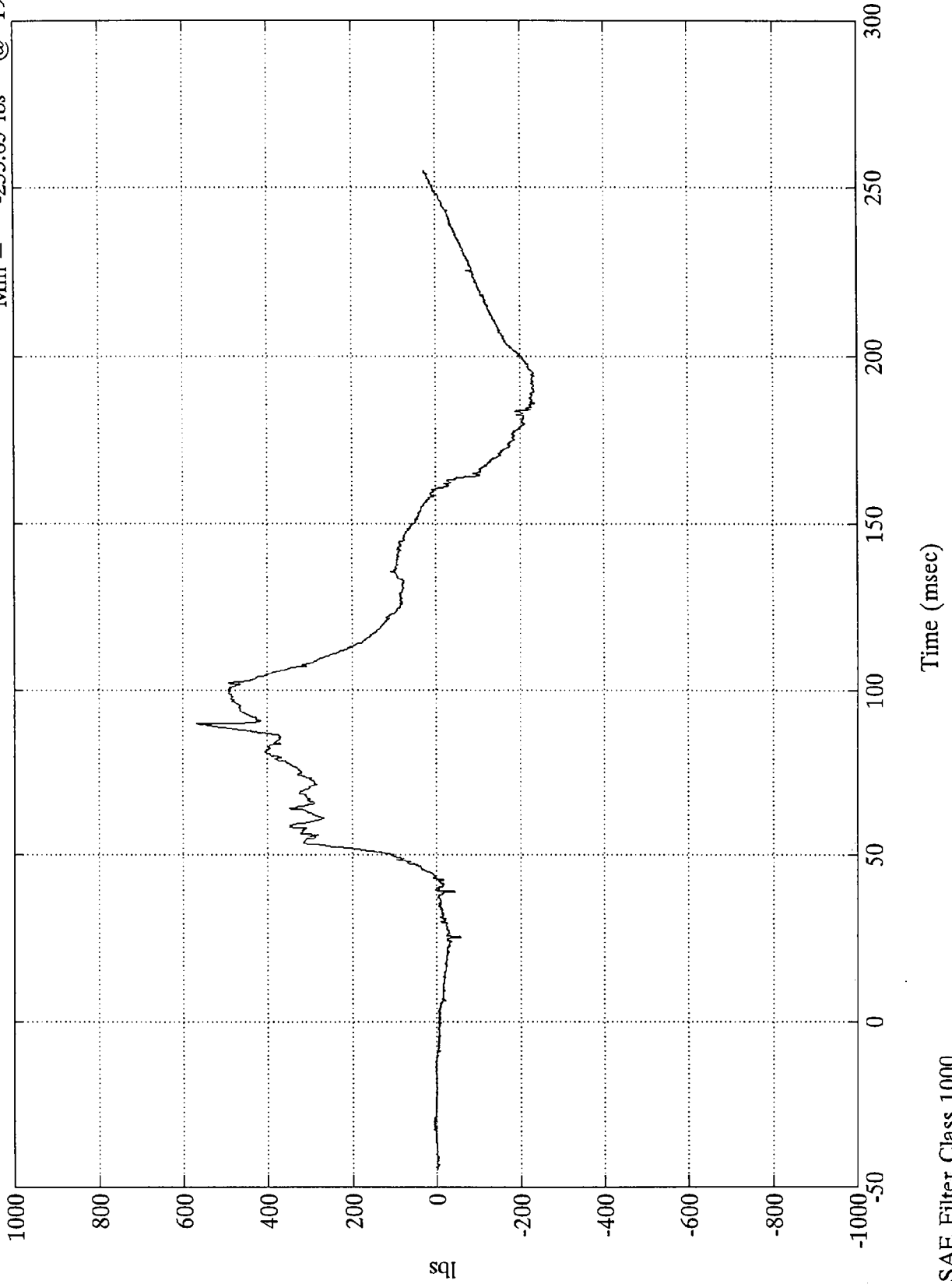
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Upper Neck Fy

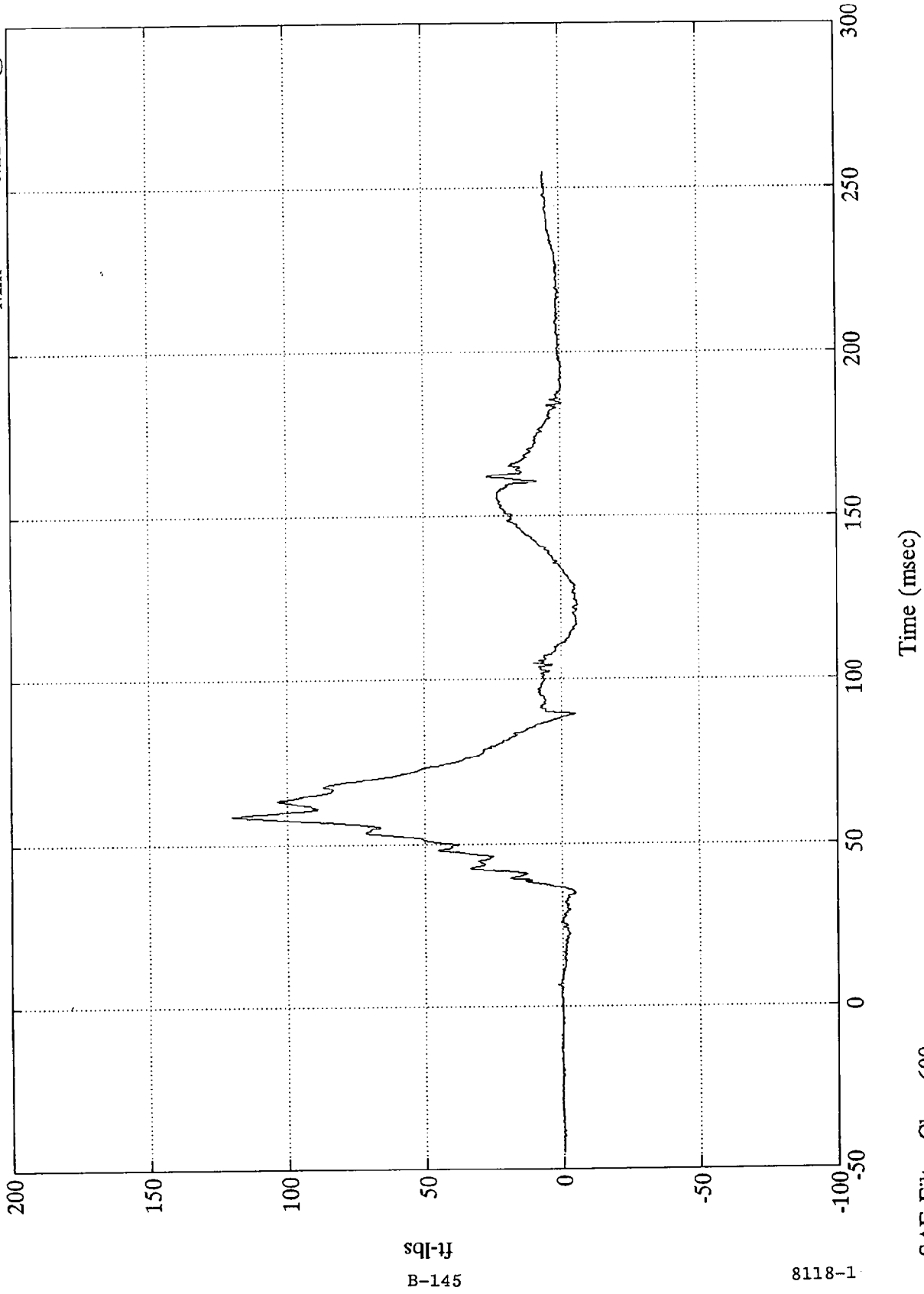
Max = 568.60 lbs @ 89.63 msec  
Min = -233.65 lbs @ 194.03 msec



TSC Frontal Barrier - Ford Taurus

Pos. 2 Upper Neck Mz

Max = 120.15 ft-lbs @ 58.68 msec  
Min = -6.11 ft-lbs @ 122.76 msec



B-145

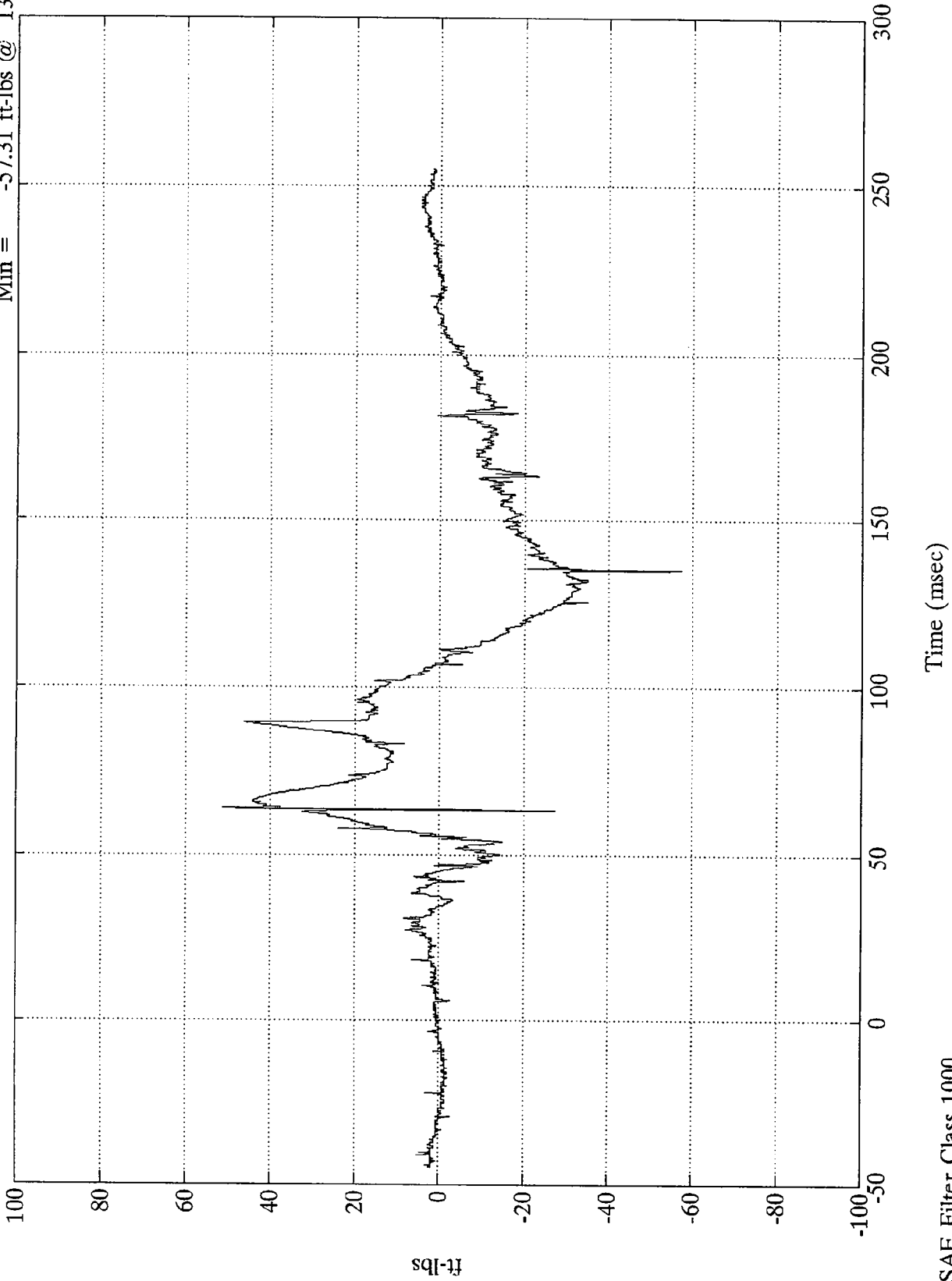
8118-1

SAE Filter Class 600

TSC Frontal Barrier - Ford Taurus

Pos. 2 Thorax Mx

Max = 51.34 ft-lbs @ 63.84 msec  
Min = -57.31 ft-lbs @ 135.24 msec



sqi-tj  
B-146

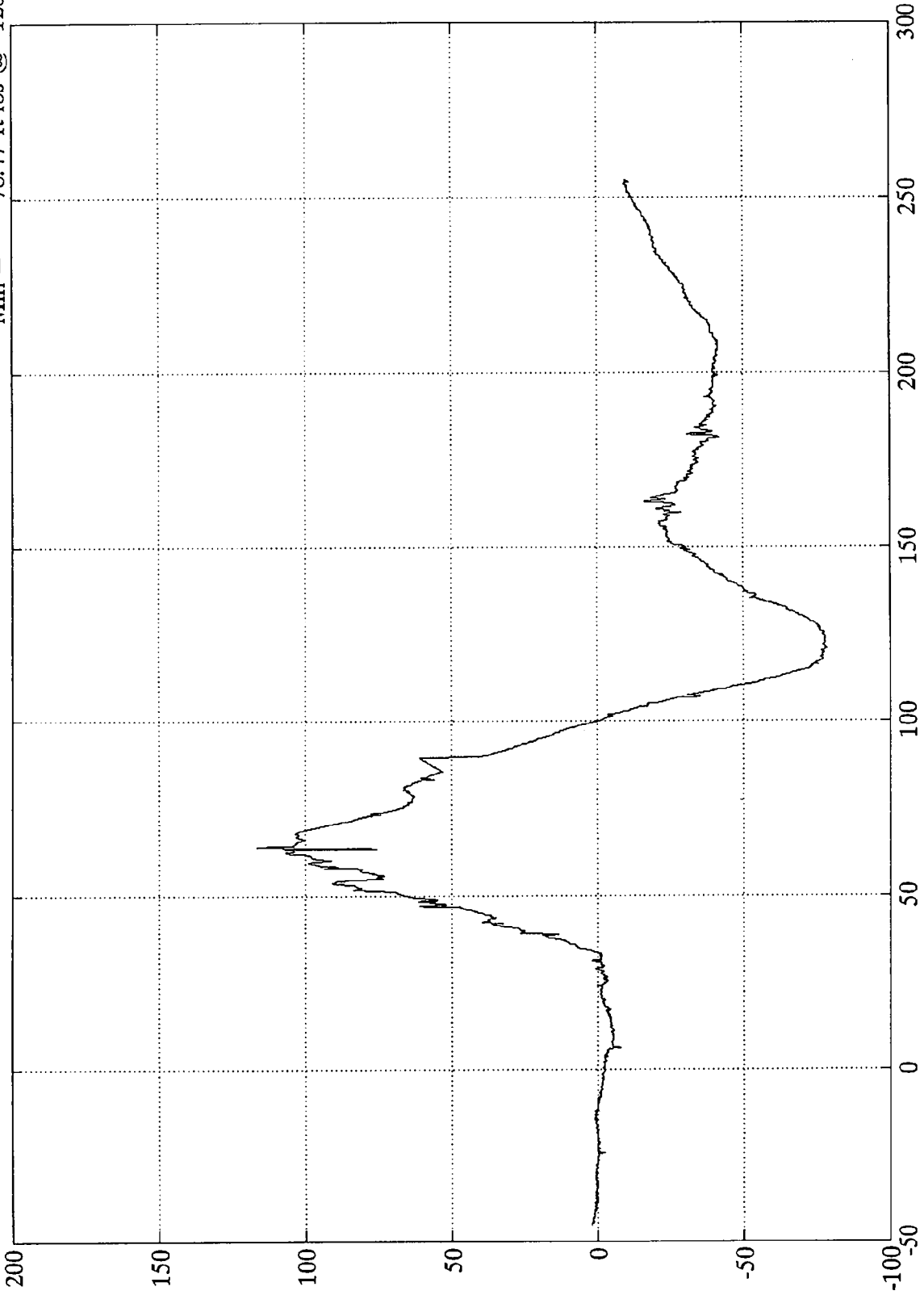
8118-1

SAE Filter Class 1000

TSC Frontal Barrier Test #1 - Ford Tauru

Pos. #2 Thorax My

Max = 116.38 ft-lbs @ 63.95 msec  
Min = -78.47 ft-lbs @ 120.59 msec



sqi-ij  
B-147

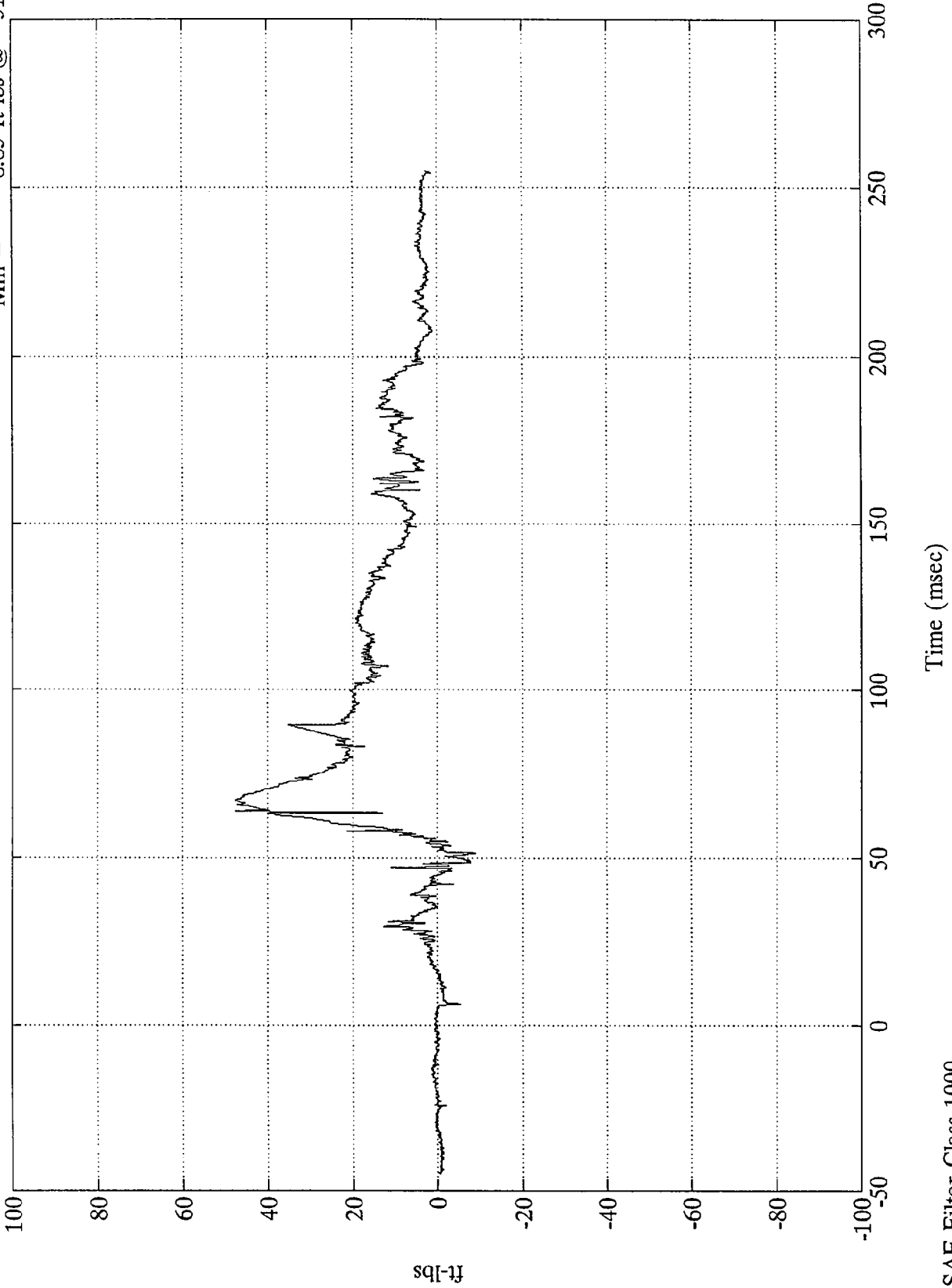
8118-1

SAE Filter Class 1000

TSC Frontal Barrier Test #1 - Ford Taurus

Pos. #2 Lumbar Mx

Max = 47.64 ft-lbs @ 67.08 msec  
Min = -8.85 ft-lbs @ 51.47 msec



ft-lbs  
B-148

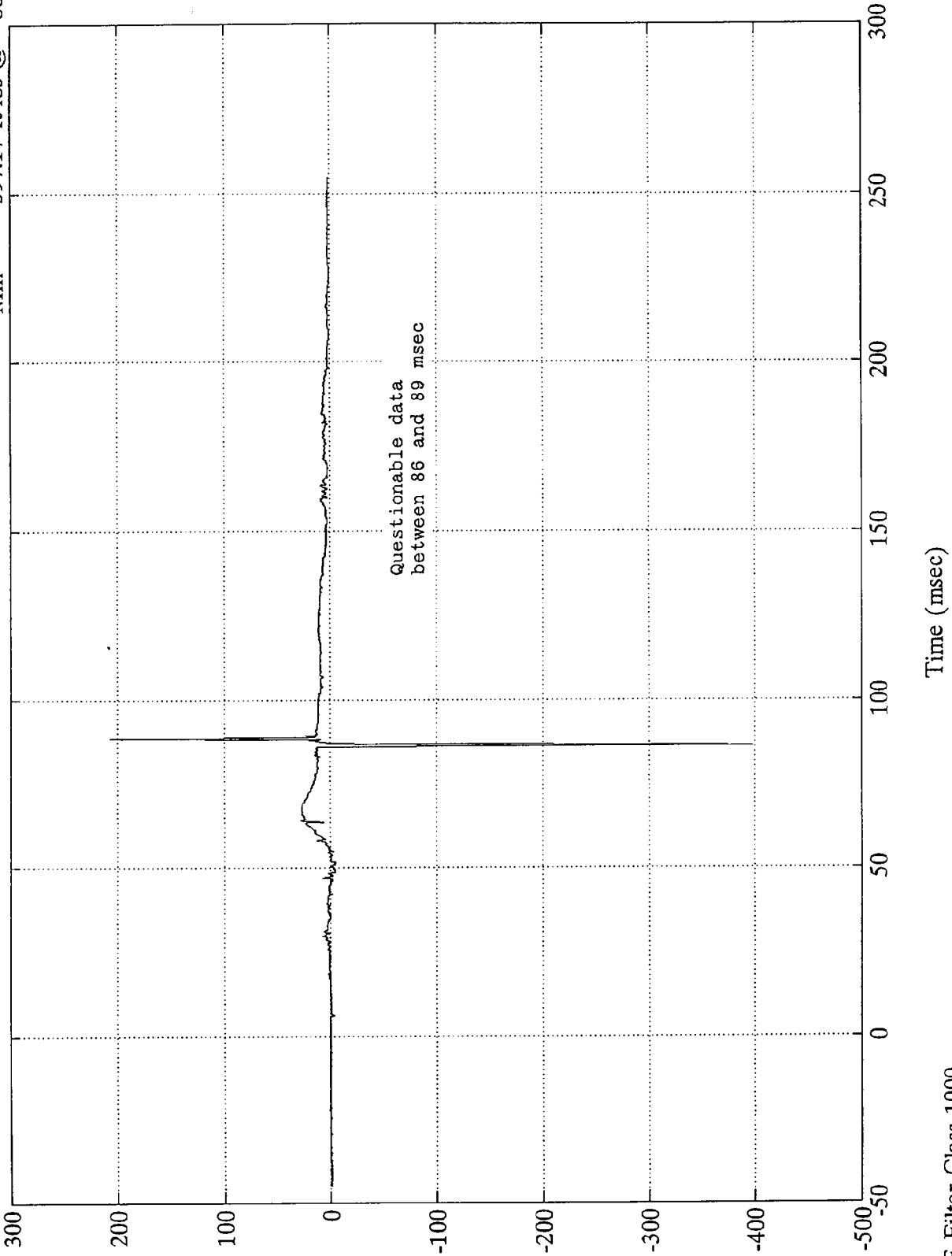
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Lumbar Mx

Max = 206.96 ft-lbs @ 88.55 msec  
Min = -397.17 ft-lbs @ 86.40 msec



ft-lbs  
B-149

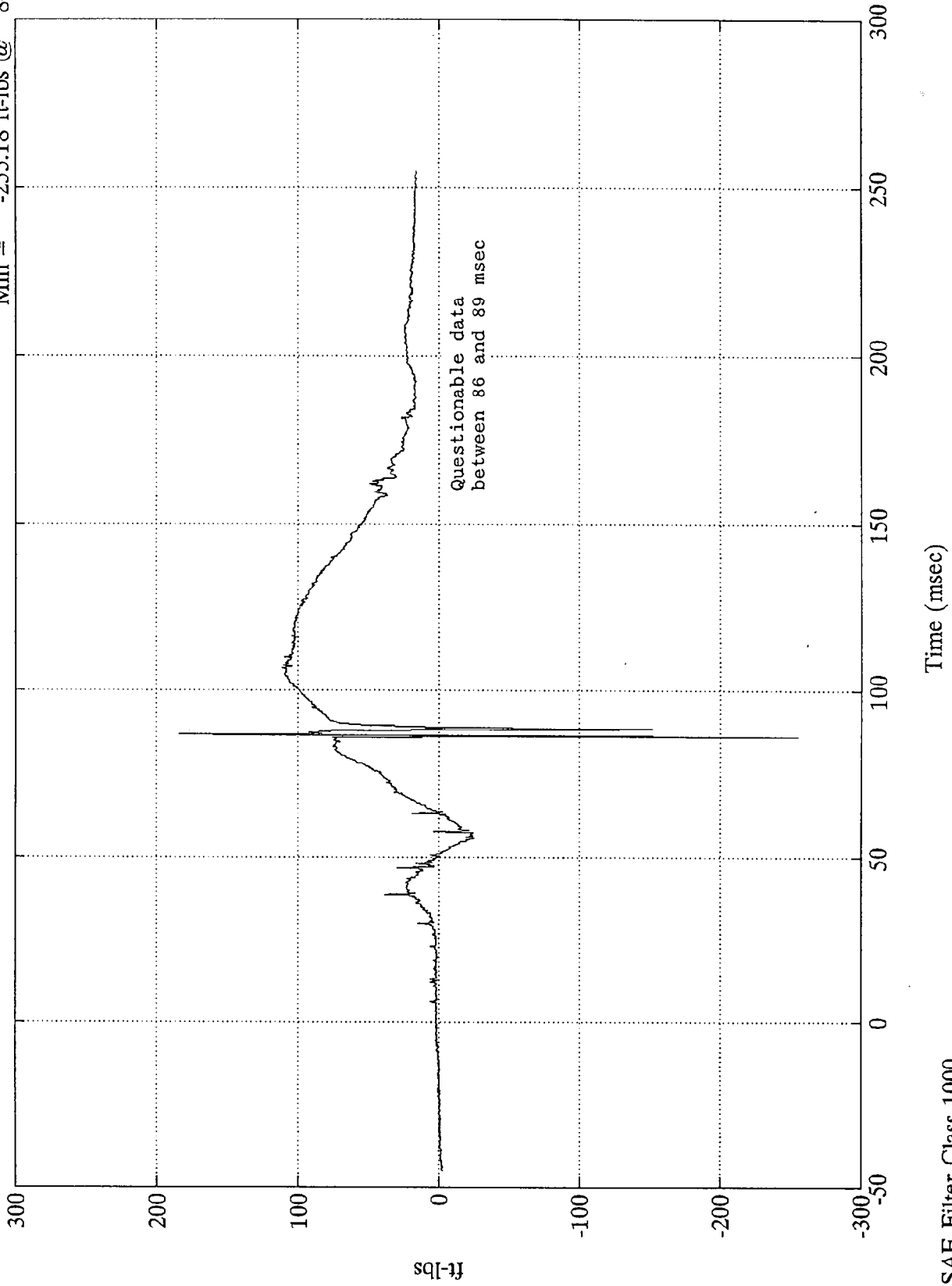
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Lumbar My

Max = 184.26 ft-lbs @ 86.76 msec  
Min = -255.18 ft-lbs @ 86.40 msec



ft-lbs  
B-150

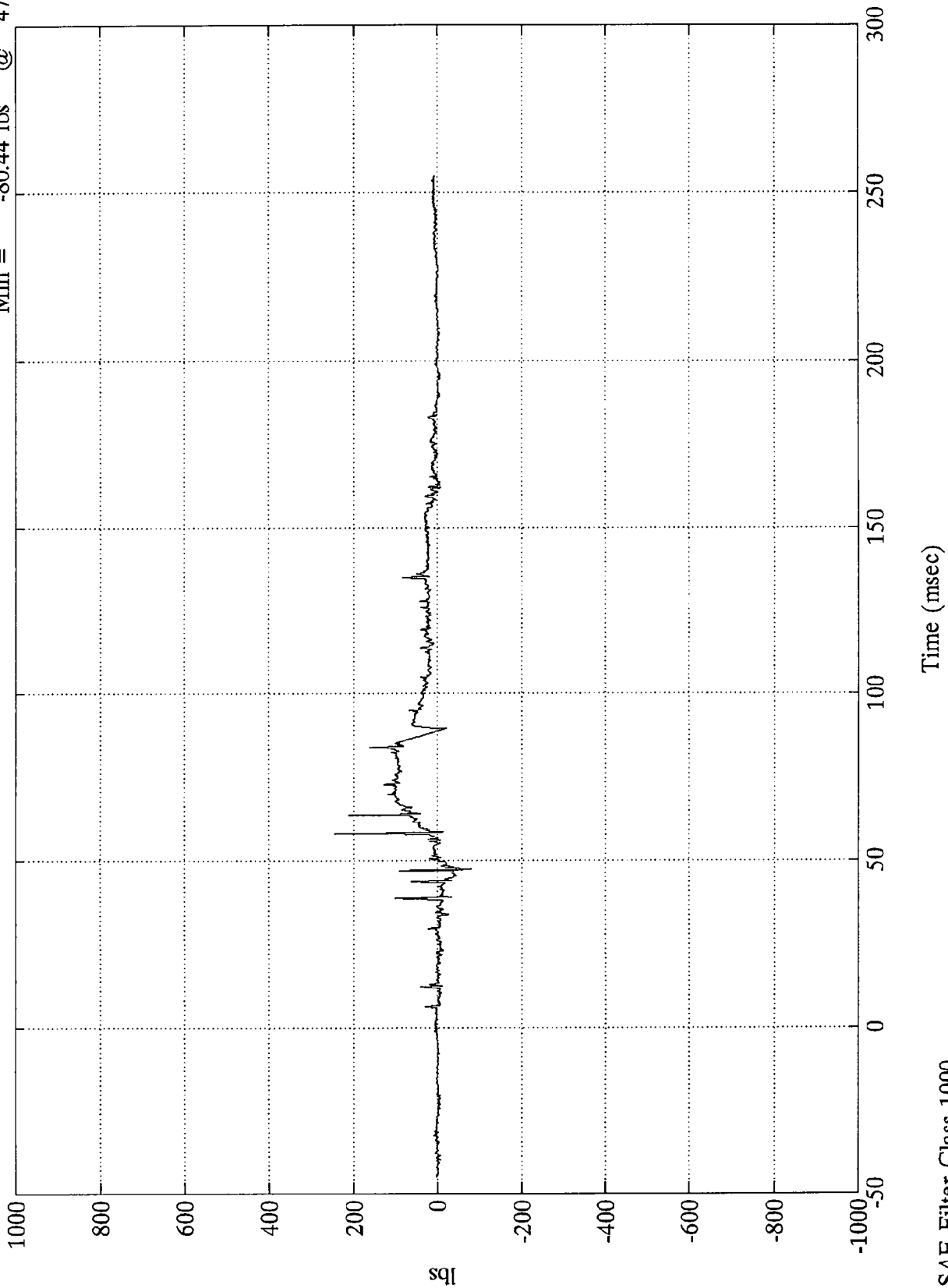
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Left Iliac Fx

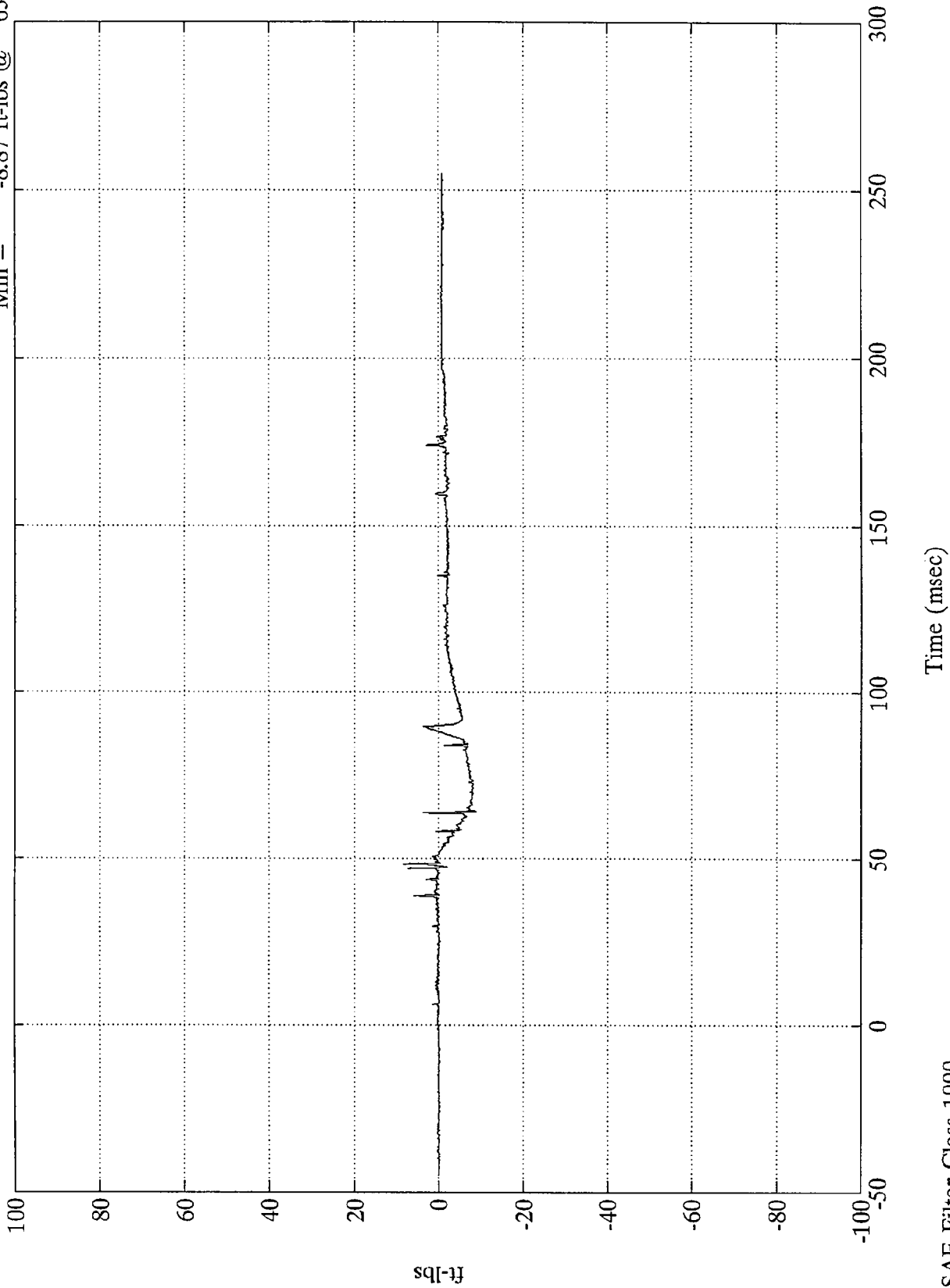
Max = 243.03 lbs @ 57.95 msec  
Min = -80.44 lbs @ 47.40 msec



TSC Frontal Barrier - Ford Taurus

Pos. 2 Left Iliac My

Max = 8.36 ft-lbs @ 48.36 msec  
Min = -8.87 ft-lbs @ 63.95 msec



sq[-1]  
B-152

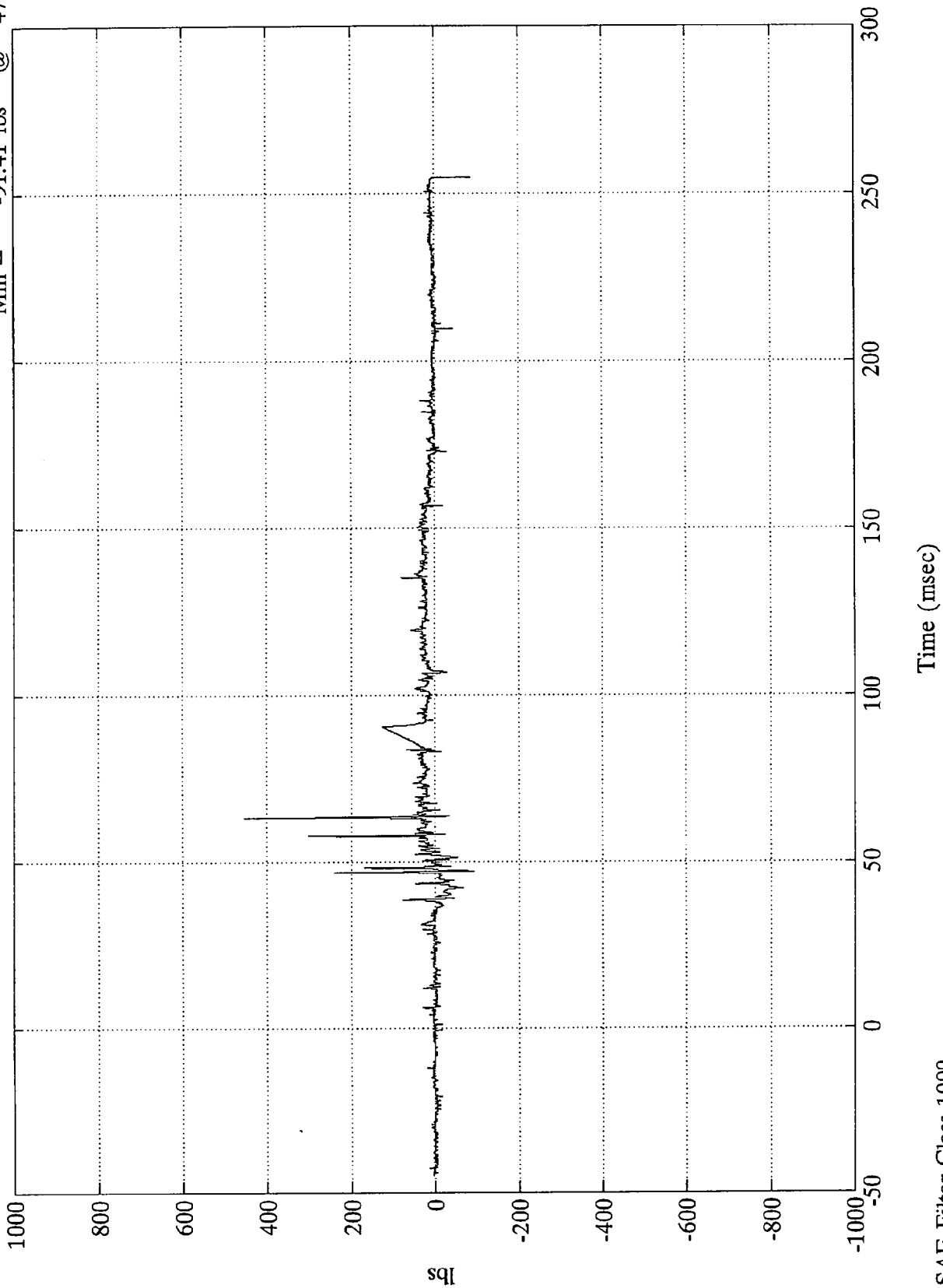
8118-1

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Right Iliac Fx

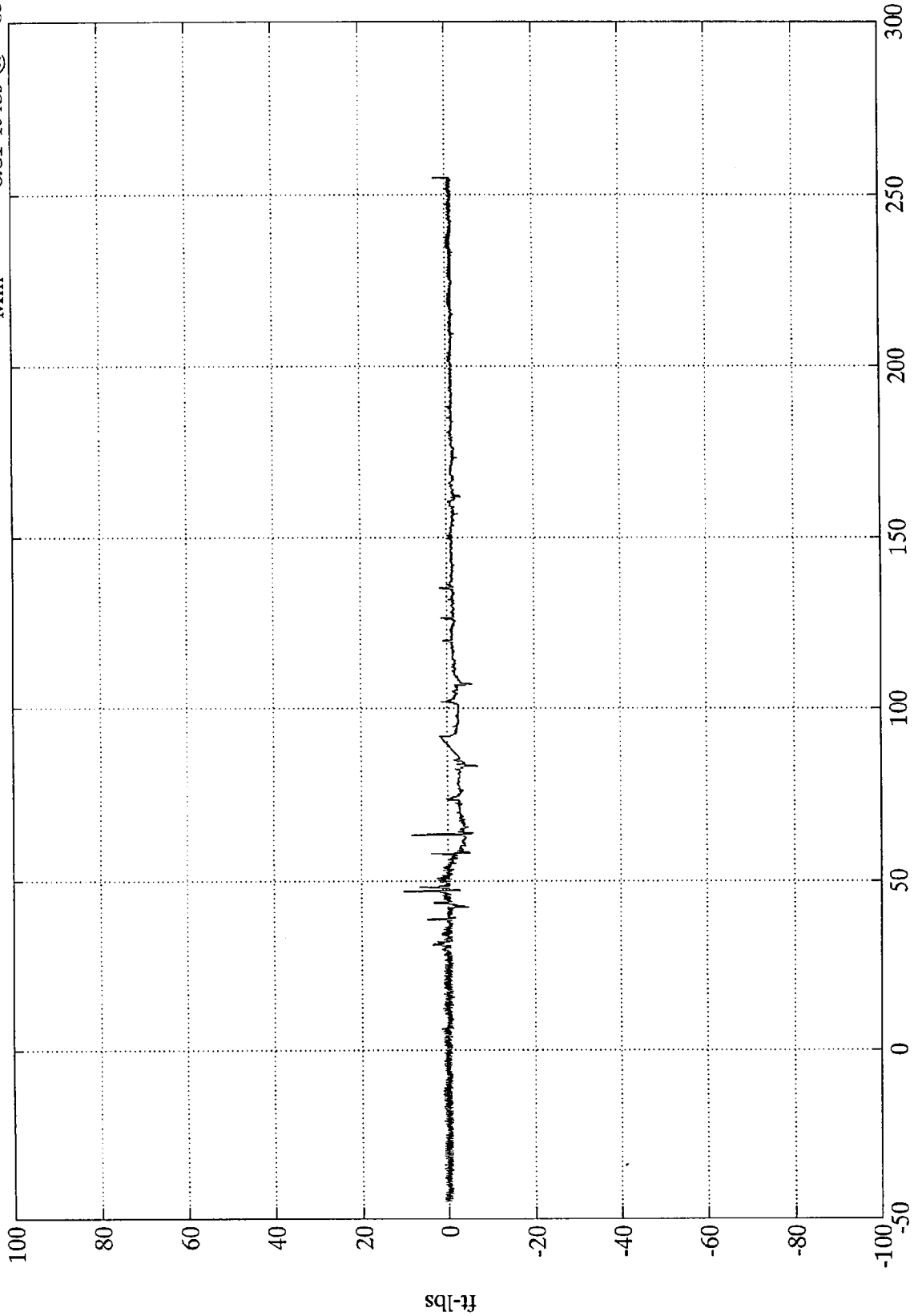
Max = 454.87 lbs @ 63.35 msec  
Min = -91.41 lbs @ 47.27 msec



TSC Frontal Barrier - Ford Taurus

Pos. 2 Right Iliac My

Max = 10.07 ft-lbs @ 46.92 msec  
Min = -6.81 ft-lbs @ 83.28 msec



ft-lbs  
B-154

8118-1

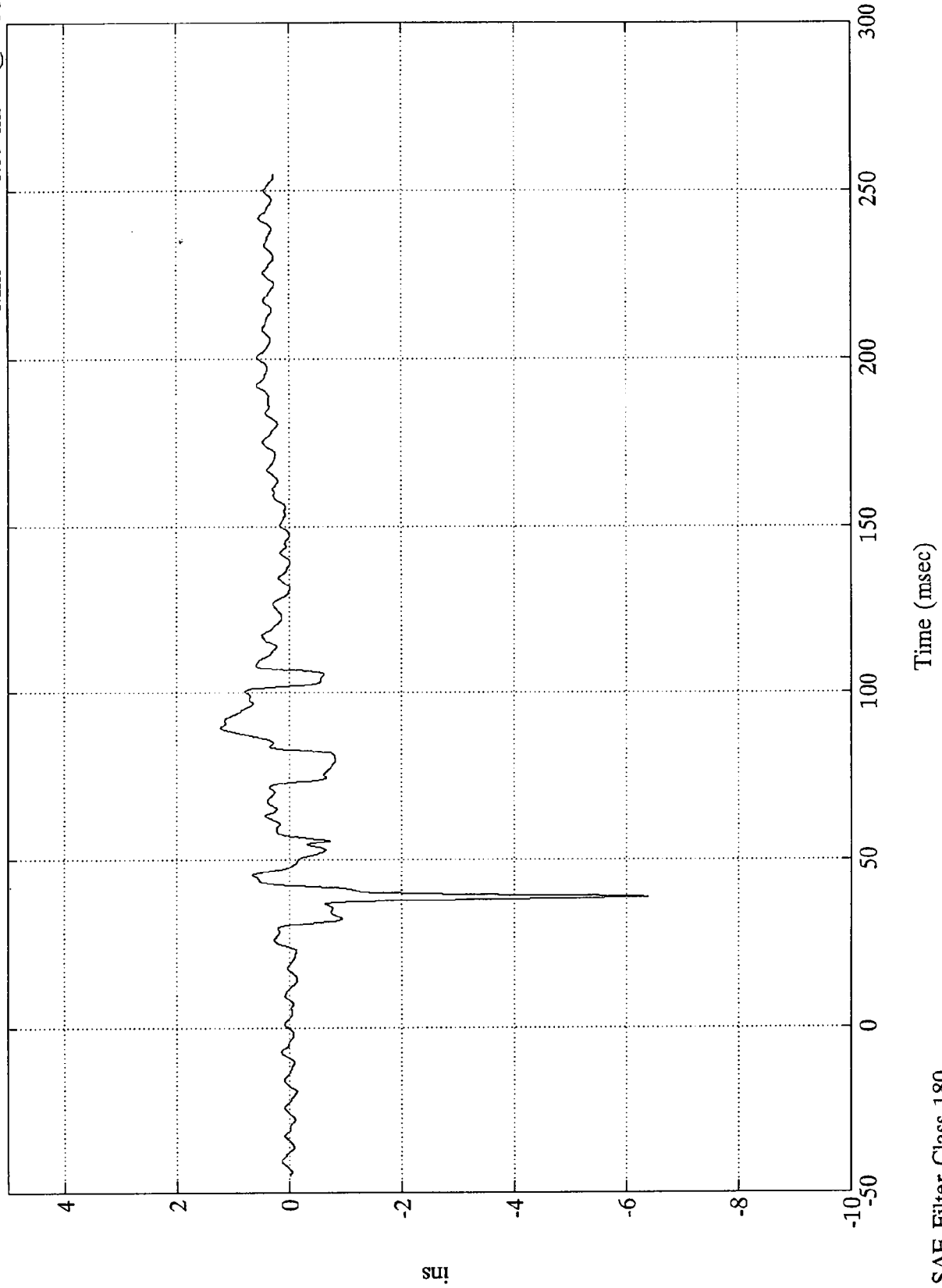
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Pos. 2 Left Knee Displ.

Max = 1.22 ins @ 89.51 msec  
Min = -6.39 ins @ 38.52 msec



su  
B-155

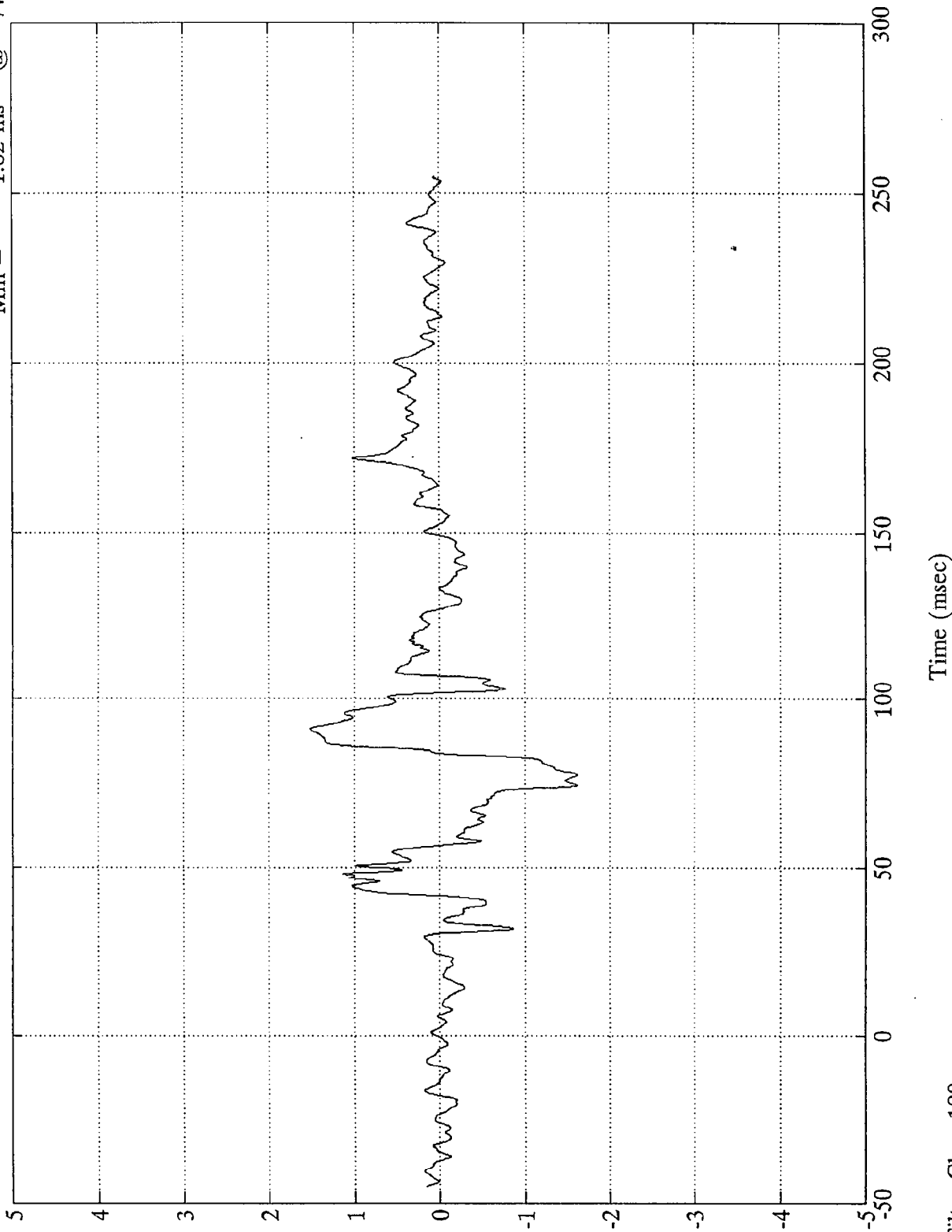
8118-1

SAE Filter Class 180

TSC Frontal Barrier - Ford Taurus

Pos. 2 Right Knee Displ.

Max = 1.52 ins @ 90.84 msec  
Min = -1.62 ins @ 74.40 msec



SUI  
B-156

8118-1

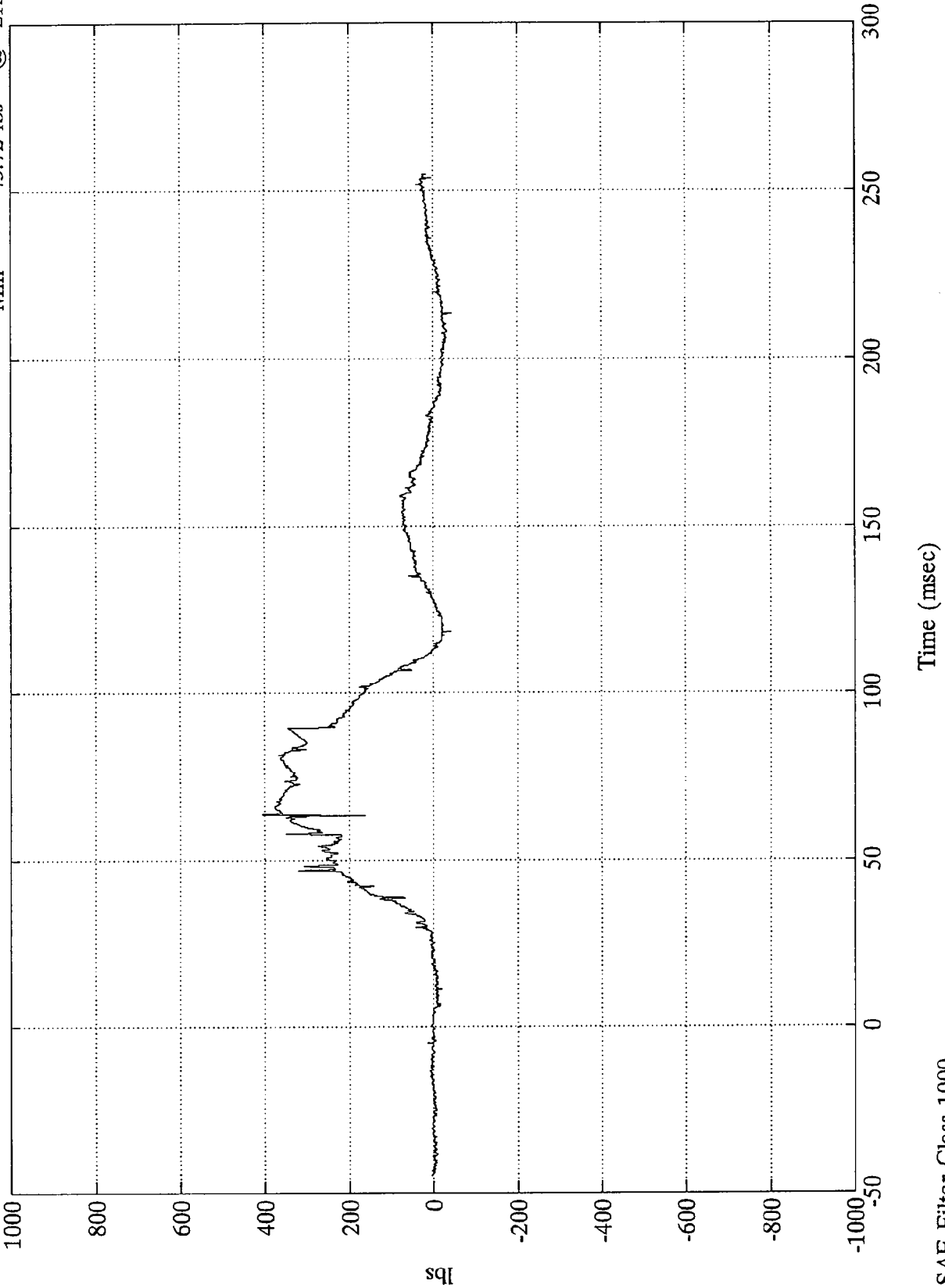
SAE Filter Class 180



TSC Frontal Barrier - Ford Taurus

Pos. #2 Lumbar Fx

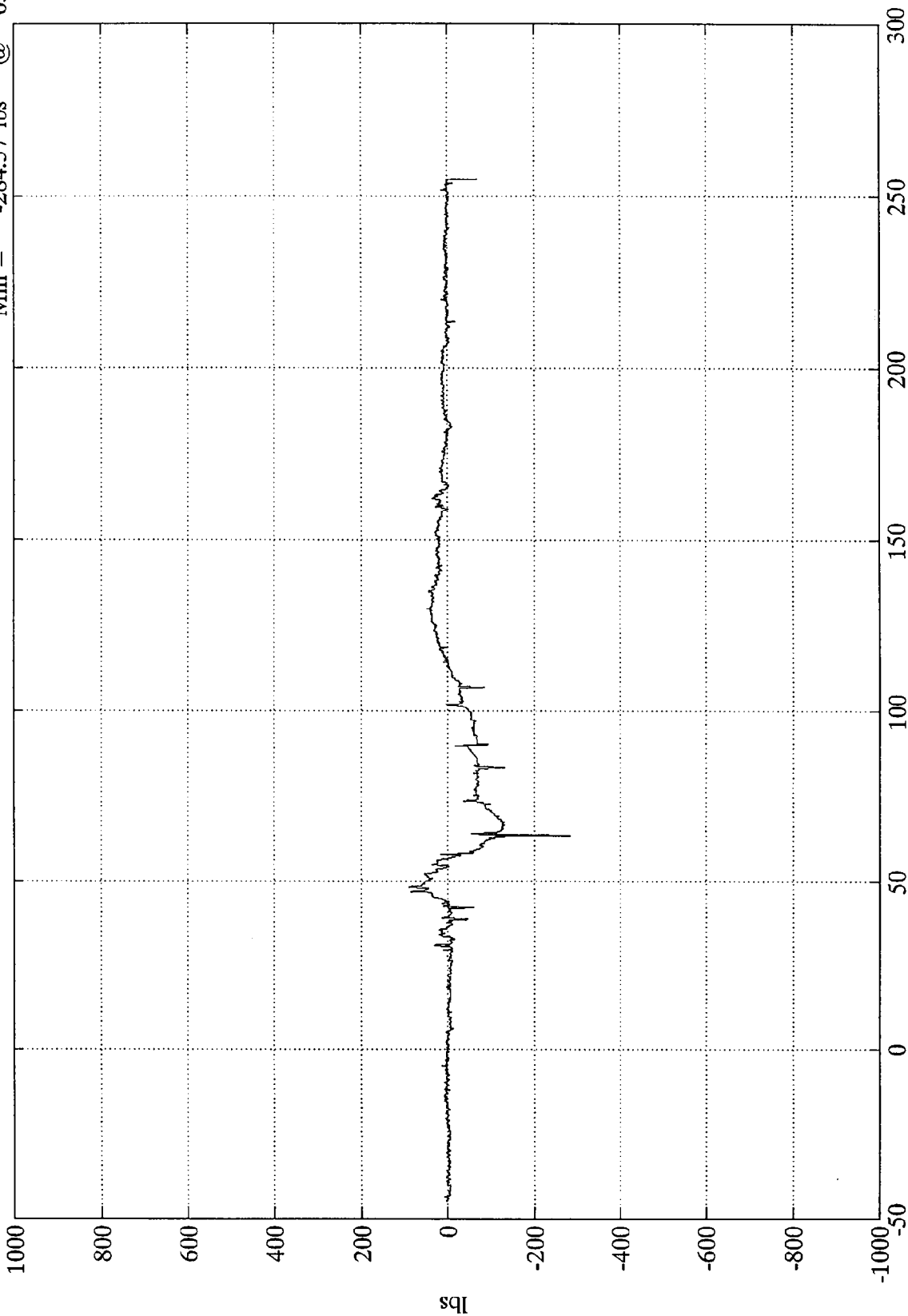
Max = 405.57 lbs @ 63.84 msec  
Min = -43.72 lbs @ 213.12 msec



TSC Frontal Barrier - Ford Taurus

Pos. #2 Lumbar Fy

Max = 90.45 lbs @ 48.36 msec  
Min = -284.57 lbs @ 63.48 msec



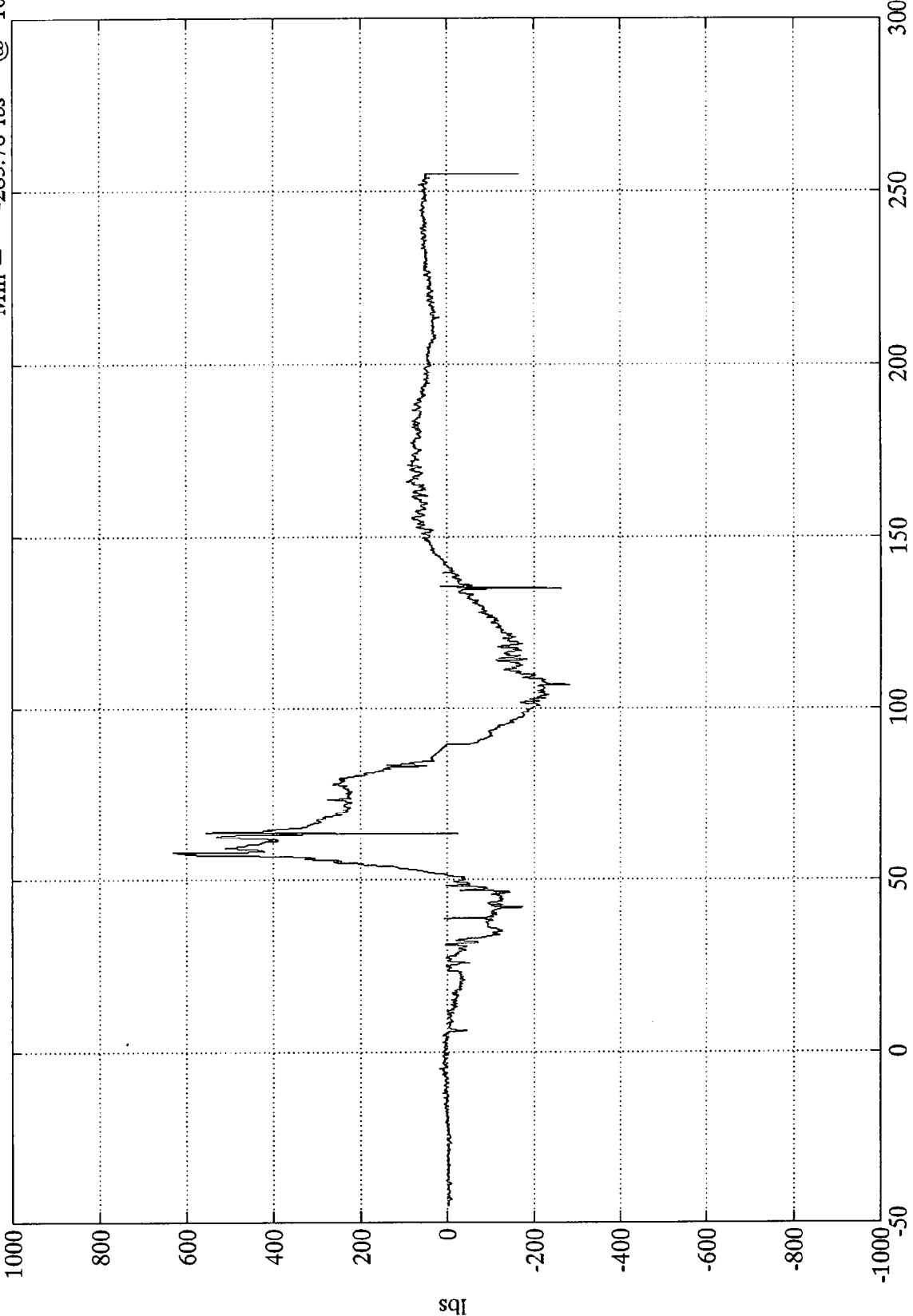
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier - Ford Taurus

Max = 630.73 lbs @ 57.84 msec  
Min = -283.76 lbs @ 106.80 msec

Pos. #2 Lumbar Fz



Time (msec)

SAE Filter Class 1000

Appendix C

SMALL FEMALE AND LARGE MALE DUMMY

SEATING PROCEDURE

3D H-Point Machine Setup and Adjustments from Standard SAE-J826 Procedure

The H-point and seat location shall be determined using the equipment and procedures specified in SAE-J826 (April 1980) except for the following changes:

1. The distance between the H-point and centerline of the knee joint T-bar shall be:

380 mm (small female)

452 mm (large male)

2. The distance between the centerline of the knee joint T-bar and the centerline of the ankle pivot shall be adjusted to:

342 mm (small female)

460 mm (large male)

3. The standard 3D H-Point Machine feet shall be utilized for the large male setup. The feet shall be locked at 87° relative to the tibia. For the small female, the template shown in Figure 1 shall be fabricated from 6.4 mm (1/4") thick aluminum plate. The same template shall be used to fabricate both the left and right feet. The fabricated feet shall then be installed in place of the standard H-Point Machine feet and locked at the 87° position relative to the tibia.

4. The initial leg spacing shall be adjusted to:

142 mm (small female)

168 mm (large male)

from the centerline of the torso to the centerline of each leg.

5. The total weight of the 3D H-Point Machine shall be adjusted to:

104 ± 2 lbs (small female\*)

226 ± 2 lbs (large male)

\* with small female feet described in Section 3 above.

For the small female, all weight shall be symmetrically distributed within the seat pan. For the large male, all standard H-Point Machine weights shall be utilized plus additional weights totaling 226 lbs distributed symmetrically throughout the seat pan.

#### Initial Vehicle Setup

The vehicle shall be initially configured as follows:

1. Seat back positioned at manufacturer's specification or at 25° if not specified.
2. Seat full rearward initially.
3. Seat pan full down.
4. Tilt wheel at mid position.
5. Telescoping wheel at mid position.

#### H-Point / Seat Location Procedure

Follow SAE-J826 except as specified above. Align the right leg centerline with the centerline of the accelerator pedal and adjust the left leg laterally to clear the wheel housing or brake pedal to permit the right foot to contact the accelerator pedal. Once the H-Point Machine is installed at the full rearward position, move the seat forward until a point between the ball and toe of the foot is tangent to, but not depressing, the accelerator pedal. The heels should maintain contact with the floor after the seat has been moved. Rotate the lower leg through its arc to check for accelerator depression and verify proper seat placement.

Record seat detent from full forward and distance of seat from full forward position. Also, record the horizontal and vertical location of the H-point.

Dummy Installation

The H-point of the driver and passenger dummies shall coincide within 13 mm (1/2") in the vertical dimension and 13 mm in the horizontal dimension of a point 6 mm below the position of the H-point as determined in the section above entitled "H-point/Seat Location Procedure."

For the pelvis, as determined using the pelvic angle gage (GM drawing 78051-532) which is inserted into the H-point gaging hole of the dummy, the angle measured from the horizontal on the 76 mm (3") flat surface of the gage shall be  $22.5^\circ \pm 2.5^\circ$ .

The transverse instrumentation platform of the seat shall be horizontal within  $0.5^\circ$ . Use the head adjustment specified in FMVSS 208 S11.1 if necessary.

The hands shall be set as specified in FMVSS 208 S11.3. The upper torso shall be set as in FMVSS 208 S11.4.1 and S11.4.2.

The centerline of the left knee of the driver test dummy to the centerline of the torso shall be:

- 81 mm (small female)
- 168 mm (large male)

For placement of the right foot and leg of the driver, refer to FMVSS 208 S11.6.

For a passenger test dummy, the distance between the centerline of the knees shall be

- 150 mm (small female)
- 336 mm (large male)

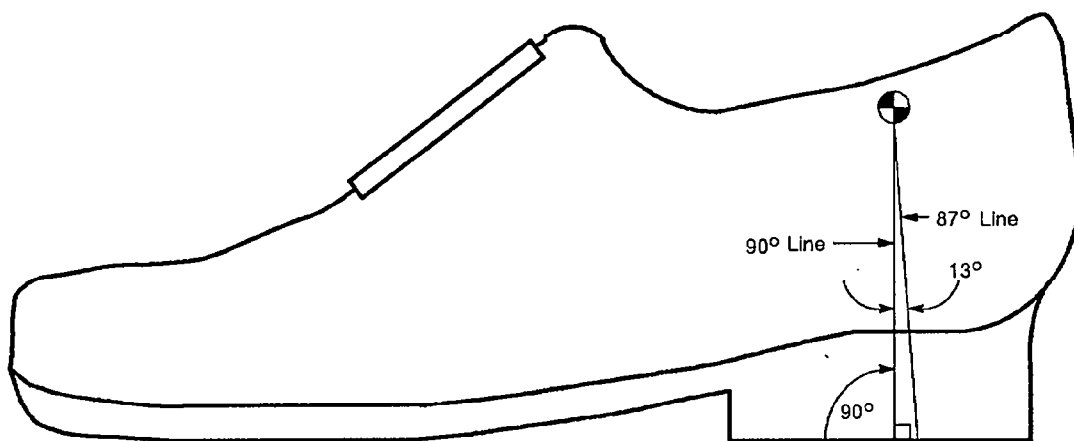


Figure C-1 TEMPLATE FOR SMALL FEMALE FOOT WITH SHOE