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

CALSPAN TEST NUMBER: Y49-2-1307

AUGUST 10, 1993

CALSPAN CORPORATION
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FINAL REPORT

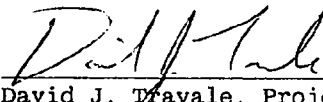
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16. Abstract A 35 mph frontal load cell barrier test of a 1993 Ford Taurus 4-Door GL was performed at Calspan Advanced Technology Center crash test facility in Buffalo, New York on August 10, 1993. The impact velocity was 35.1 MPH and the temperature at the barrier face was 84°F. The test vehicle was a 1993 Ford Taurus 4-Door GL. A 95th percentile Hybrid III Anthropomorphic Test Device (ATD) was placed in the driver's position and a 5th percentile ATD was placed in the passenger's position. Both ATD's were restrained with the vehicle's supplemental restraint systems and manual 3-point seat belts.			
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Section 1

PURPOSE AND TEST PROCEDURE

This 35 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 airbag system and manual 3-point seat belt restraint system.

Section 2
SUMMARY OF TEST

A load cell barrier consisting of 36 load cells was impacted by a 1993 Ford Taurus at velocity of 35.1 mph. The test was performed at the Calspan Corporation Advanced Technology Center on August 10, 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 ATDs were restrained by the vehicle's supplement restraint systems and manual 3-point seat belt system.

The 120 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 driver's head contacted the airbag and sunvisor; the HIC was 584.1. The maximum chest deceleration over 3 milliseconds was 48.0 gs. Femur loads were -1748.9 pounds on the left and -796.2 pounds on the right.

The right front passenger's HIC was 637.1. Maximum chest deceleration was 47.2 gs. Femur loads were -654.7 pounds on the left and -722.2 pounds on the right.

Section 3
VEHICLE AND OCCUPANT INFORMATION

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Year/Make/Model/Body Style: 1993 Ford Taurus 4-Door SedanTest No.: - VIN.: 1FALP52UXPG272360Body Color: Grey Date of Manufacture: 5/93Engine: 6 Cylinders; - C.I.D.; 3.0 Liters; - CCX Gas; - Diesel; - Turbocharged- Longitudinal; X TransverseTransmission: 3 Speed; - Manual; X Automatic; X OverdriveFinal Drive: X Front Wheel; - Rear Wheel; - Four WheelX A/C; X P/S; X P/B; - P/wdo;X Tilt Wheel - P/seats; - Cruise Control*Type of Occupant Restraint: Airbag and manual 3-point belt systemDATA RECORDED FROM VEHICLE'S TIRE PLACARD:Tire Pressure (at capacity): Front 35 psi, Rear 35 psiRecommended Tire Size: P205/70R14Recommended Cold Tire Pressure: Front 35 psi, Rear 35 psiTires on Vehicle: P205/70R14; Manufacturer: FirestoneNumber of Occupants: 3 Front; 3 Rear; - 3rd Seat; 6 TOTALType of Front Seats: - Bucket; - Bench; X Split BenchType of Front Seat Back: - Fixed; X Adj. With X Lever - Rot. KnobVehicle 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 = 1060 lbs. Left Rear = 750 lbs.
TOTAL FRONT WEIGHT = 2090 lbs. (59.2% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1440 lbs. (40.8% of Total Vehicle Weight)
TOTAL TEST WEIGHT = 3530 lbs.
Weight of Ballast Secured in Vehicle Trunk Area = 0 lbs.

TEST VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 29.2 ; LF 28.9 ; RR 27.5 ; LR 27.5
Test Attitude: RF 28.2 ; LF 28.0 ; RR 26.0 ; LR 25.7
Vehicle's Wheel Base = 105.6 in.
Location of Vehicle's C.G. = 43.1" inches rearward of front wheel center

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

POST-IMPACT DATA:

Type of Test: Frontal Barrier Impact Angle: 0°
 Date of Test: 8/10/93 Time of Test: 2:00 PM
 Ambient Temperature: 84°F at impact area
 Temperature in Occupant Compartment: 70°F
 Windshield Molding Temperature: - °F
 Required Impact Velocity Range: 35.5 to 34.5 mph
 Impact Velocity: primary = 35.1 mph, secondary = 35.2 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	<u>Head with airbag,</u> <u>Rear of head with headrest</u>	<u>Head with airbag,</u> <u>Rear of head with headrest</u>
Chest	<u>Chest with Airbag</u>	<u>Chest with Airbag</u>
Abdomen	<u>No Contact</u>	<u>No Contact</u>
Left Knee	<u>Lower dash panel</u>	<u>Glove box door</u>
Right Knee	<u>Lower dash panel</u>	<u>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>Operable</u>	<u>Operable</u>	<u>Operable</u>	<u>Operable</u>

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

Table 3
VEHICLE DUMMY INJURY CRITERIA VALUES

	MAXIMUM ACCELERATION ("G")							
	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DUMMY (1)	-62.3	4.3	30.2	67.7	-48.2	-6.4	-8.8	48.0
DUMMY (2)	-78.0	9.3	34.0	78.4	-69.9	8.9	-13.7	47.2
DUMMY (3)	-	-	-	-	-	-	-	-
DUMMY (4)	-	-	-	-	-	-	-	-

	MAXIMUM FORCE FEMUR LOAD (LBS.)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-796.2	-1748.9
DUMMY (2)	-722.2	-654.7
DUMMY (3)	-	-
DUMMY (4)	-	-

	MAXIMUM FORCE SEAT BELT LOADS (LBS.)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP BELT LOAD	LAP STRAP BELT LOAD
DUMMY (1)	2083.3	2501.7	-
DUMMY (2)	1404.2	683.5	-
DUMMY (3)	-	-	-
DUMMY (4)	-	-	-

	HEAD INJURY CRITERIA (HIC)			
	HIC	t ₁ (SEC)	t ₂ (SEC)	Average Acceleration t ₁ TO t ₂
DUMMY (1)	584.1	56.40	92.28	48.4
DUMMY (2)	637.1	41.04	72.36	52.9
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

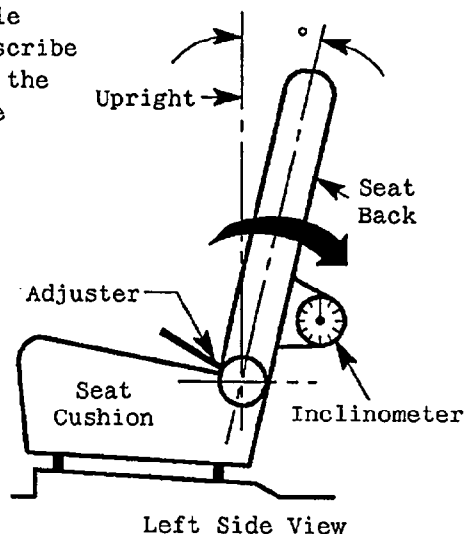
Figure 1

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
ABOVE 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): Position seat in full
front (position #1) position for 5th percentile-female passenger

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

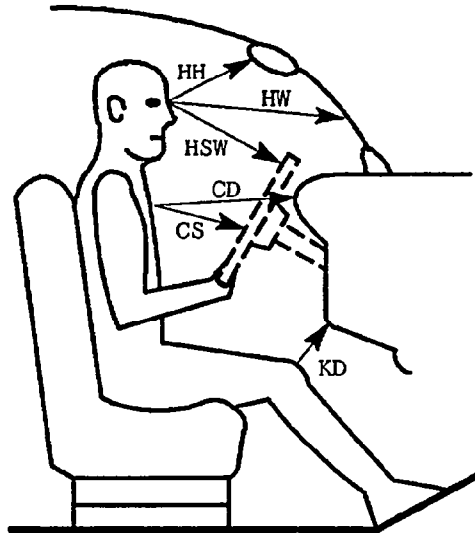
4. Steering Column Position: Mid position

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

Figure 2

OCCUPANT CLEARANCE DIMENSIONS

	DRIVER	PASSENGER
HH	14.8	9.7
HW	19.7	19.6
NSW	17.7	-
NIP	23.8	-
NH	18.0	-
CD	23.5	14.5
CS	14.8	-
KDL	5.5	2.0
KDR	6.3	2.0
1	28.5	-
2	2.0	-
SA	20°	20°
PA	22°*	22°
ULA	100°	102°
LLA	220°	230°

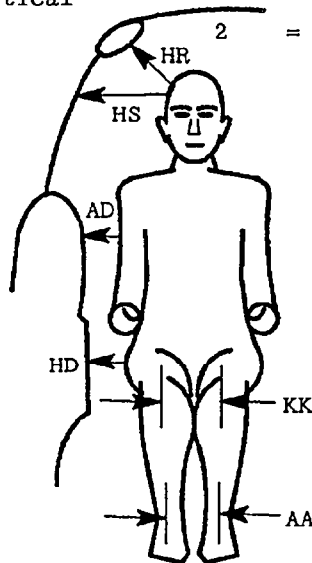


*Estimated from shoulder and H-point location. Standard pelvic bar could not be used due to specialized spine instrumentation.

- 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



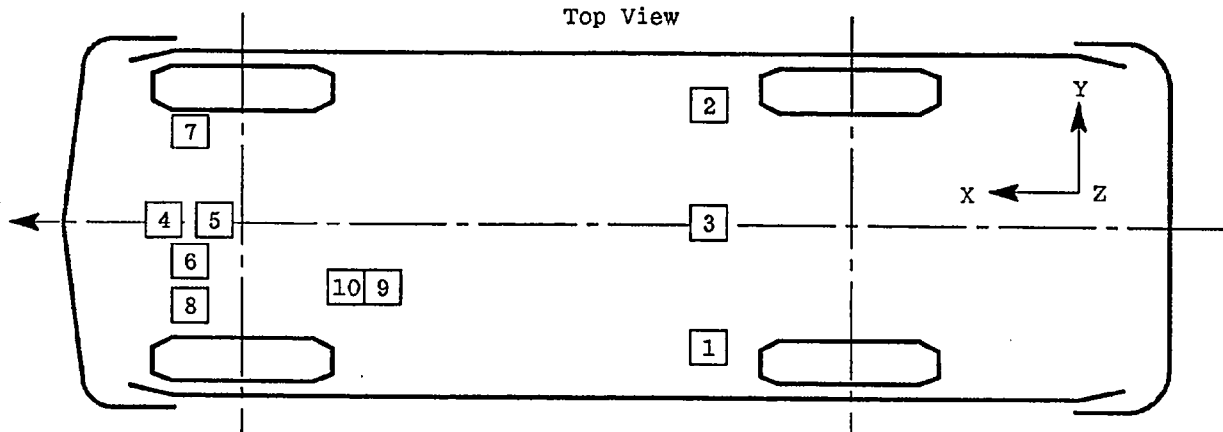
- HR = Head to Side Roof
- HS = Head to Side Window
- AD = Arm to Door
- HD = Hip to Door
- KK = Knee to Knee
- AA = Ankle to Ankle
- DT = Dummy Temperature °F

	DRIVER	PASSENGER
HR	5.6	8.4
HS	9.3	11.1
AD	3.4	6.2
HD	6.2	7.1*
KK	10.5	7.5
AA	12.5	7.0
DT	70°	70°

*To door pocket

Figure 3

SUMMARY OF VEHICLE ACCELEROMETER DATA



Vehicle: 1993 Ford Taurus 4-Door Sedan

Loc. No.	Description	Axis	Maximum Value (g's)*	
			"-"	"+"
1	Rear seat crossmember left side	x	-32.6	2.1
2	Rear seat crossmember right side	x	-31.3	1.8
3	Rear seat crossmember centerline, X	x	-41.9	2.8
3	Rear seat crossmember centerline, Y	y	-6.9	4.8
3	Rear seat crossmember centerline, Z	z	-18.2	19.7
4	Top of engine block	x	-104.3	32.3
5	Bottom of engine block	x	-114.7	27.6
6	Front crossmember	x	-129.1	68.6
7	Right front brake caliper	x	-89.2	11.7
8	Left front brake caliper	x	-86.3	11.6
9	Brake pedal	x	-66.3	29.3
9	Brake pedal	z	-54.5	21.7
10	Toe pan	x	-70.0	38.1

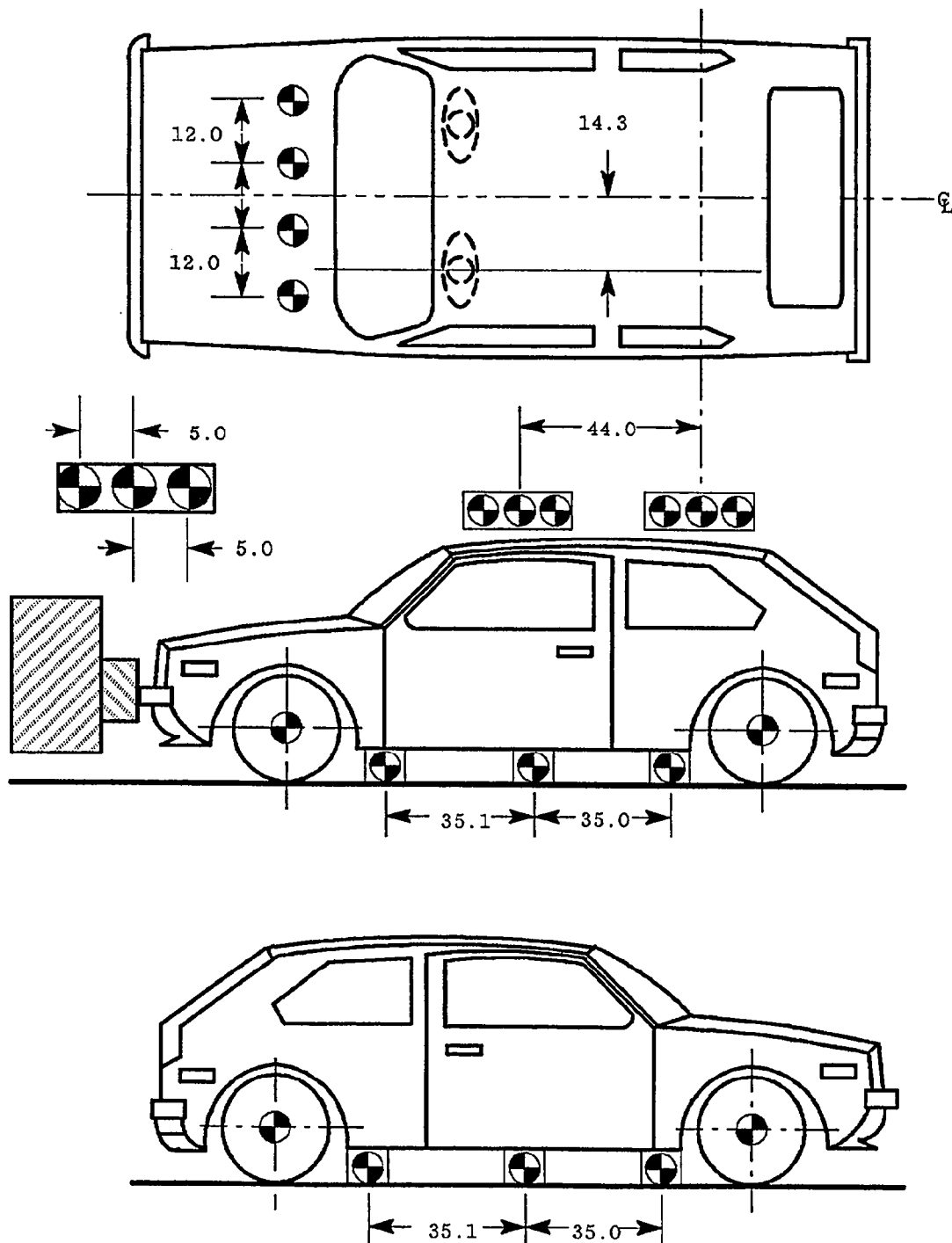
*Values filtered using SAE class 60 filter.

Figure 4
 PRE- AND POST-TEST POSITION OF TEST VEHICLE
 ACCELEROMETER LOCATIONS

Test Description: 35 mph Frontal Vehicle-to-Barrier Impact
 Test Vehicle: 1993 Ford Taurus 4-door sedan
 Reference Plane: Vehicle plane at rear bumper

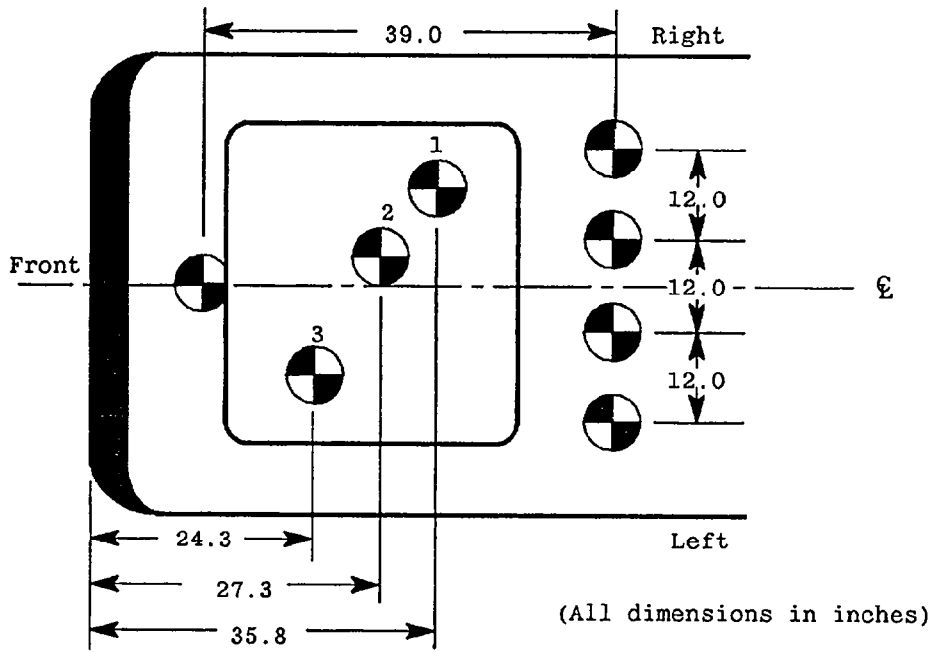
Accelerometer Description	LONGITUDINAL LOCATION (in.)		
	Pre-Test	Post-Test	Change
Rear seat crossmember left side	75.1	73.5	1.6
Rear seat crossmember right side	75.2	73.3	1.9
Rear seat crossmember centerline	73.2	73.1	0.1
Top of engine block	155.9	147.5	8.4
Bottom of engine block	149.6	146.5	3.1
Front suspension crossmember	145.1	141.5	3.6
Right front brake caliper	148.6	144.8	4.1
Left front brake caliper	148.6	143.8	4.8
Toe pan	135.4	131.1	4.3
Brake pedal	133.4	130.4	3.0

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
VEHICLE MEASUREMENT POINTS
(All dimensions in inches)

Figure 6

VEHICLE MEASUREMENT POINTS (continued)

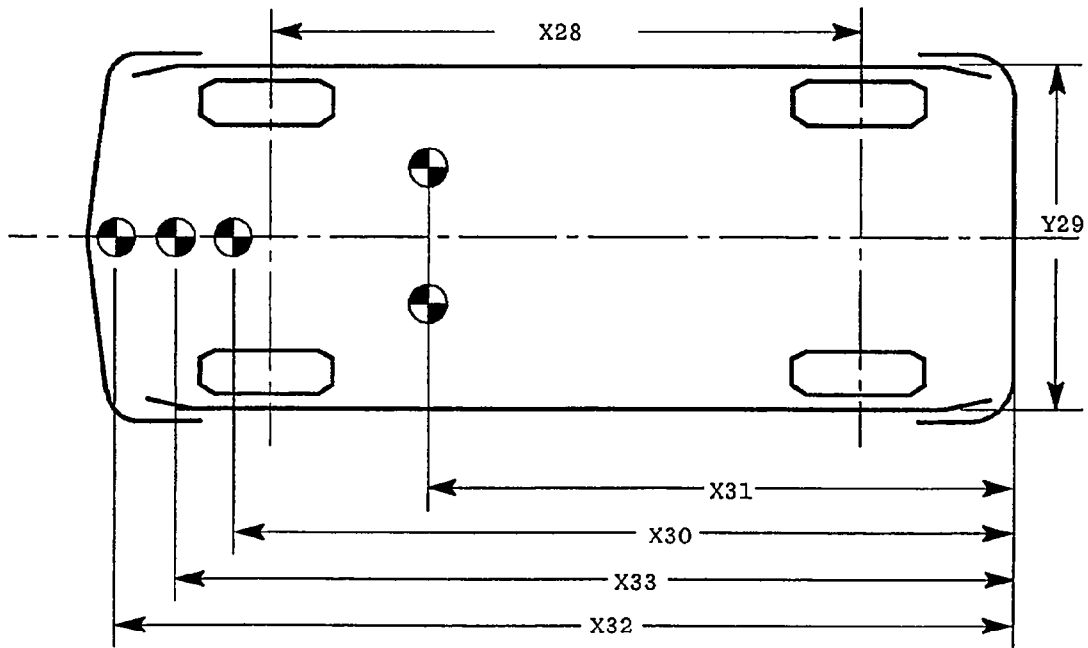
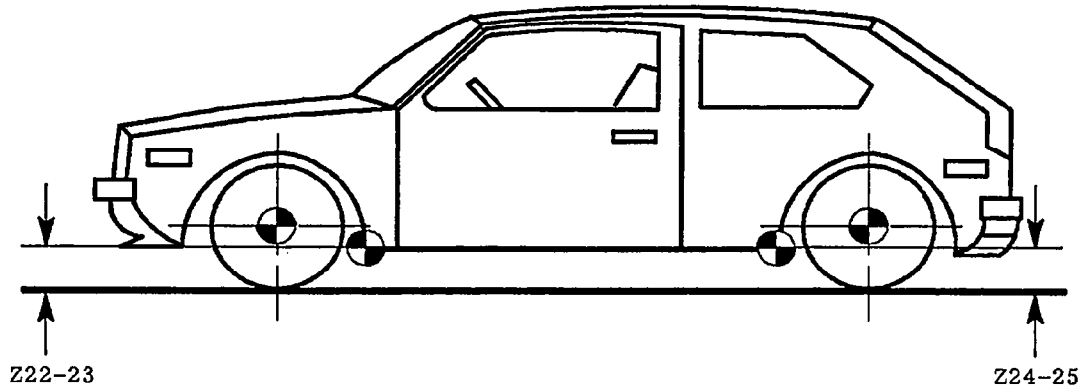


Table 4
VEHICLE MEASUREMENTS

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
X1	Total Length of Vehicle at Centerline	191.9	*172.2
X2	Rear Surface of Vehicle to Engine at Centerline	169.3	161.0
X3	Rear Surface of Vehicle to Firewall	144.1	141.7
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	131.2	131.3
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	132.1	132.0
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	130.2	129.2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	130.4	129.8
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	90.0	89.4
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	90.1	90.0
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	89.2	88.5
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	89.4	89.1
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	131.3	130.6
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	131.2	130.9
X14	Rear Surface of Vehicle to Firewall - Right Side	143.7	139.8
X15	Rear Surface of Vehicle to Firewall - Left Side	142.9	140.7
X16	Rear Surface of Vehicle to Steering Wheel Center	113.4	113.0
Y17	Steering Column to "A" Post	15.5	14.8

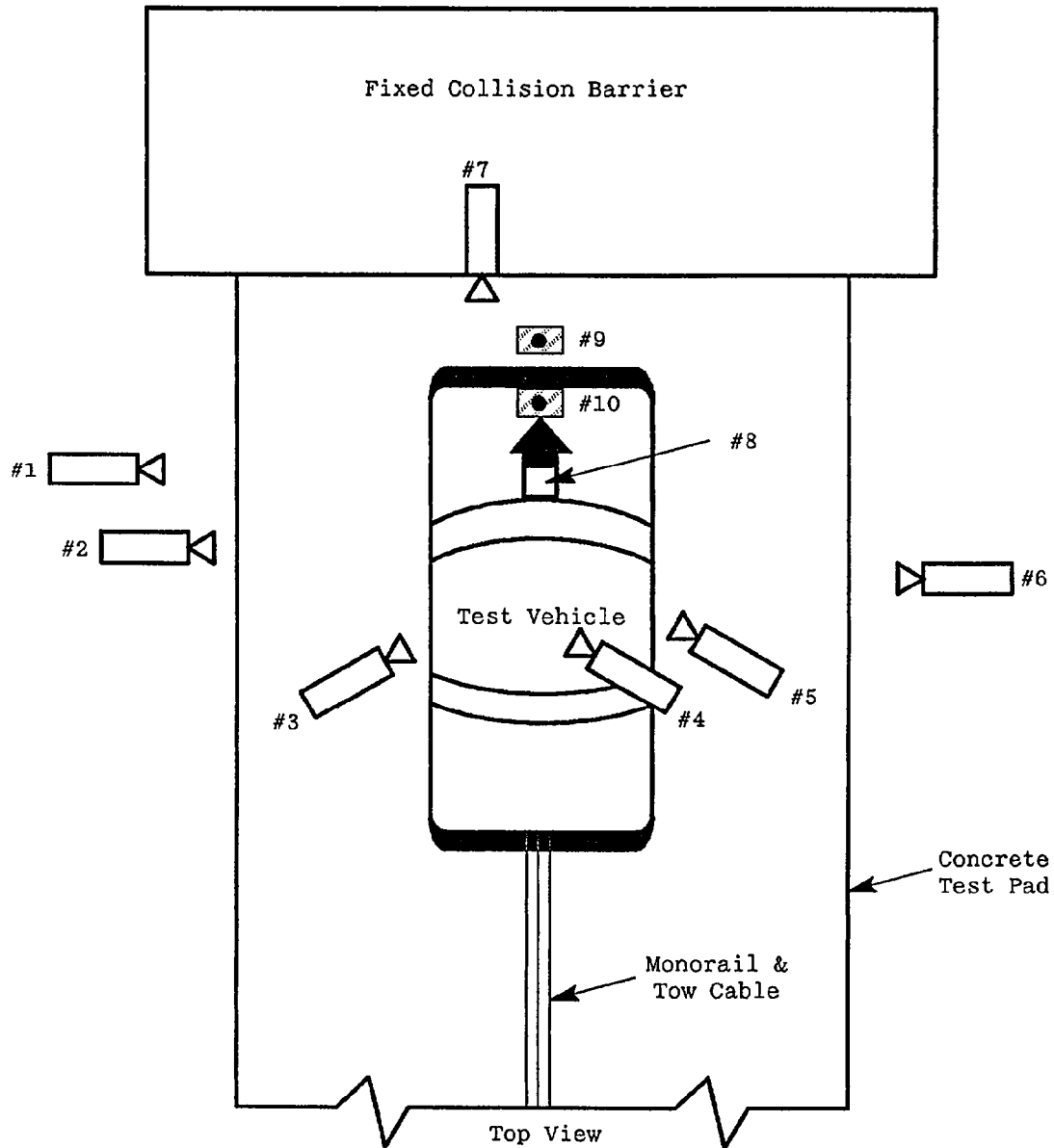
Table 4

VEHICLE MEASUREMENTS (continued)

No.	TYPE OF MEASUREMENT	All Dimensions in Inches	
		Pre-Test	Post-Test
Z18	Rear of Windshield Header to Steering Wheel Column	64.0	63.4
X19	Rear Surface of Vehicle to Right Side of Front Bumper	186.5	169.6
X20	Rear Surface of Vehicle to Left Side of Front Bumper	186.4	170.0
X21	Width of Engine Block	16.0	16.0
Z22	Right Front Sill to Ground Plane	9.3	7.6
Z23	Left Front Sill to Ground Plane	9.4	7.8
Z24	Right Rear Sill to Ground Plane	8.8	8.6
Z25	Left Rear Sill to Ground Plane	8.7	9.3
X26	Firewall to Engine or Transaxle	-	-
Z27	Vertical Dim. from Door Sill to Centerline of Steering Column	23.5	22.3
X28	Wheelbase of Vehicle	106.0	102.3
Y29	Width of Vehicle at Maximum Width Point	68.7	69.2
X30	Rear Surface of Vehicle to Engine Target	149.6	146.5
X31	Rear Surface of Vehicle to Compartment Target	125.4	N/A
X32	Rear Surface of Vehicle to Bumper Target	187.6	167.5
X33	Rear Surface of Vehicle to Frame Crossmember	145.1	141.5

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 8

HIGH-SPEED CAMERA LOCATIONS

CAMERA NO.	VIEW	CAMERA POSITIONS (in)*			ANGLE** (deg)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	--	--	--	--	--	
2	Left Side Overall Camera	253	88	42	-2°	880	
3	Driver and Steering Column View	108	112	69	-19	860	
4	Onboard Seat Belt View	--	--	--	--	--	
5	Onboard Driver View	110	108	69	-19	855	
6	Right Side Overall View	246	79	42	-2	1,000	
7	Driver Front View	22	0	78	-33	860	
8	Windshield View	0	-23	124	-53	895	
9	Underbody View	0	24	-83	90	760	
10	Overhead View	0	11	166	-82	860	

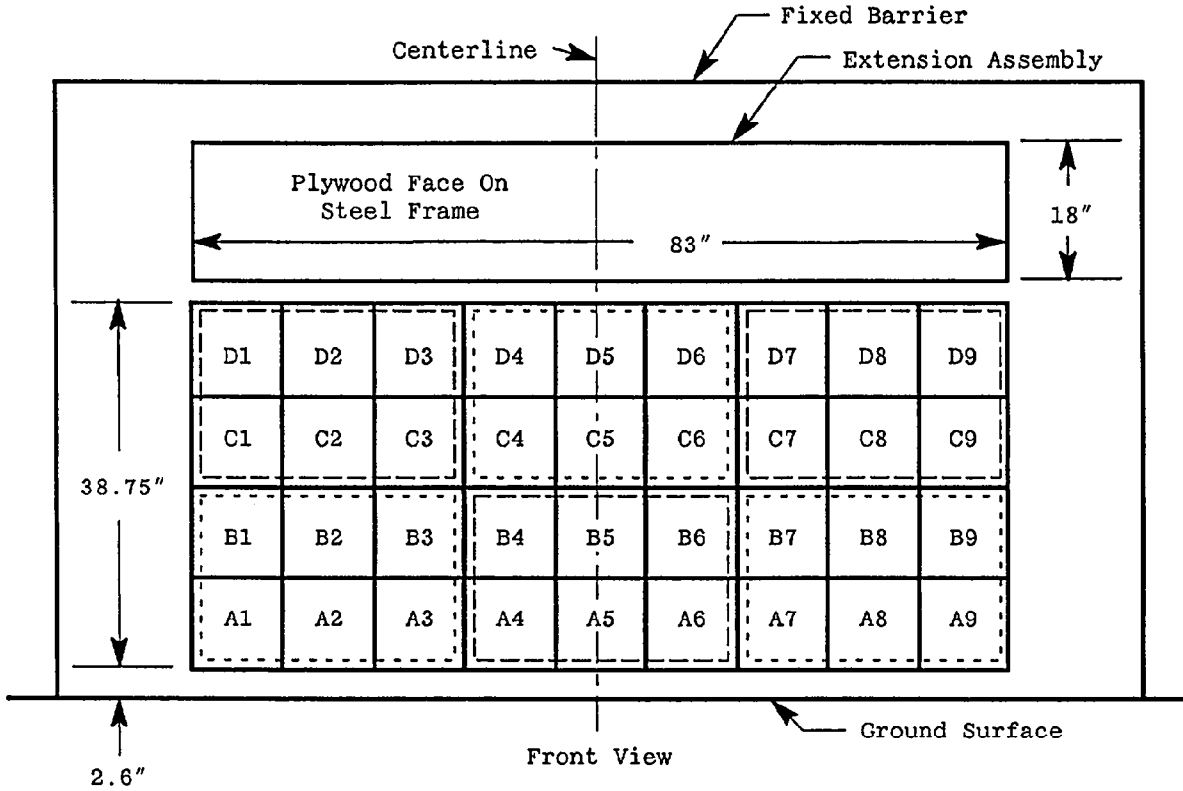
Test No. Y49-2-1307 Vehicle: 1993 Ford Taurus 4-Door Sedan

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

Figure 8

LOAD CELL LOCATIONS ON FIXED BARRIER

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



6 GROUPS OF 6 LOAD CELLS EACH

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

The following data is presented in Appendix B:

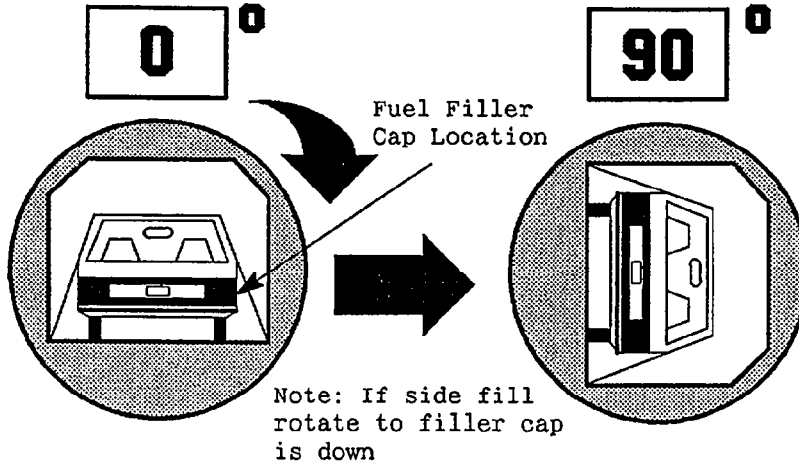
- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

Table 6
STATIC ROLLOVER DATA SHEET

TEST PHASE:

Test No.:

YO49-0020



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	_____ 2 _____	minutes	_____ 05 _____	seconds
FMVSS 301 Position Hold Time +	_____ 5 _____	minutes	_____ 00 _____	seconds
TOTAL	_____ 7 _____	minutes	_____ 05 _____	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):

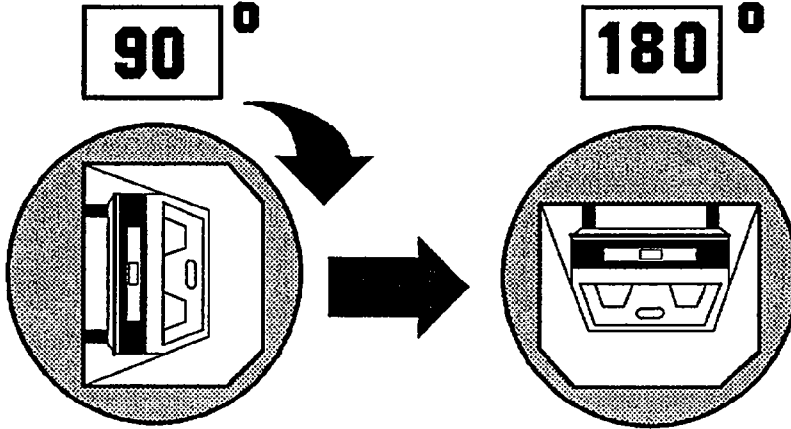
None

Table 6
STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Test No.:

Y049-0020



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	_____ 2 _____	minutes	_____ 10 _____	seconds
FMVSS 301 Position Hold Time +	_____ 5 _____	minutes	_____ 00 _____	seconds
TOTAL	_____ 7 _____	minutes	_____ 10 _____	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):

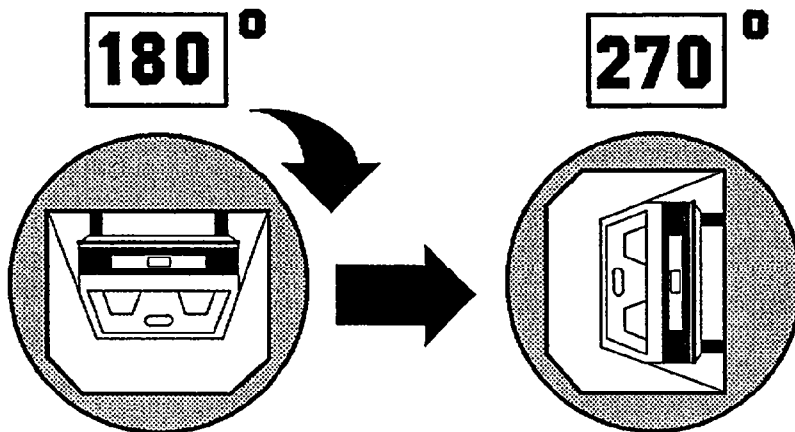
NONE

Table 6
 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Test No.:

Y049-0020



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	_____ 2 _____ minutes _____ 05 _____ seconds
FMVSS 301 Position Hold Time +	_____ 5 _____ minutes _____ 00 _____ seconds

TOTAL	_____ 7 _____ minutes _____ 05 _____ 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):

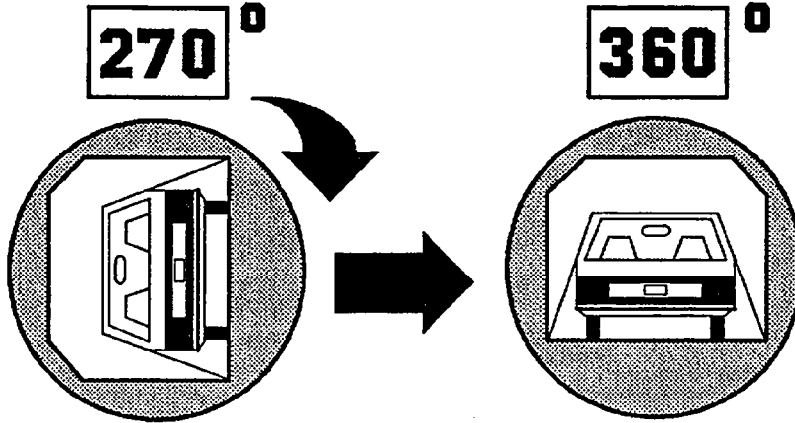
NONE

Table 6
STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Test No.:

Y049-0020



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time _____ 2 _____ minutes _____ 15 _____ seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + _____ 5 _____ minutes _____ 0° _____ seconds

TOTAL _____ 7 _____ minutes _____ 15 _____ 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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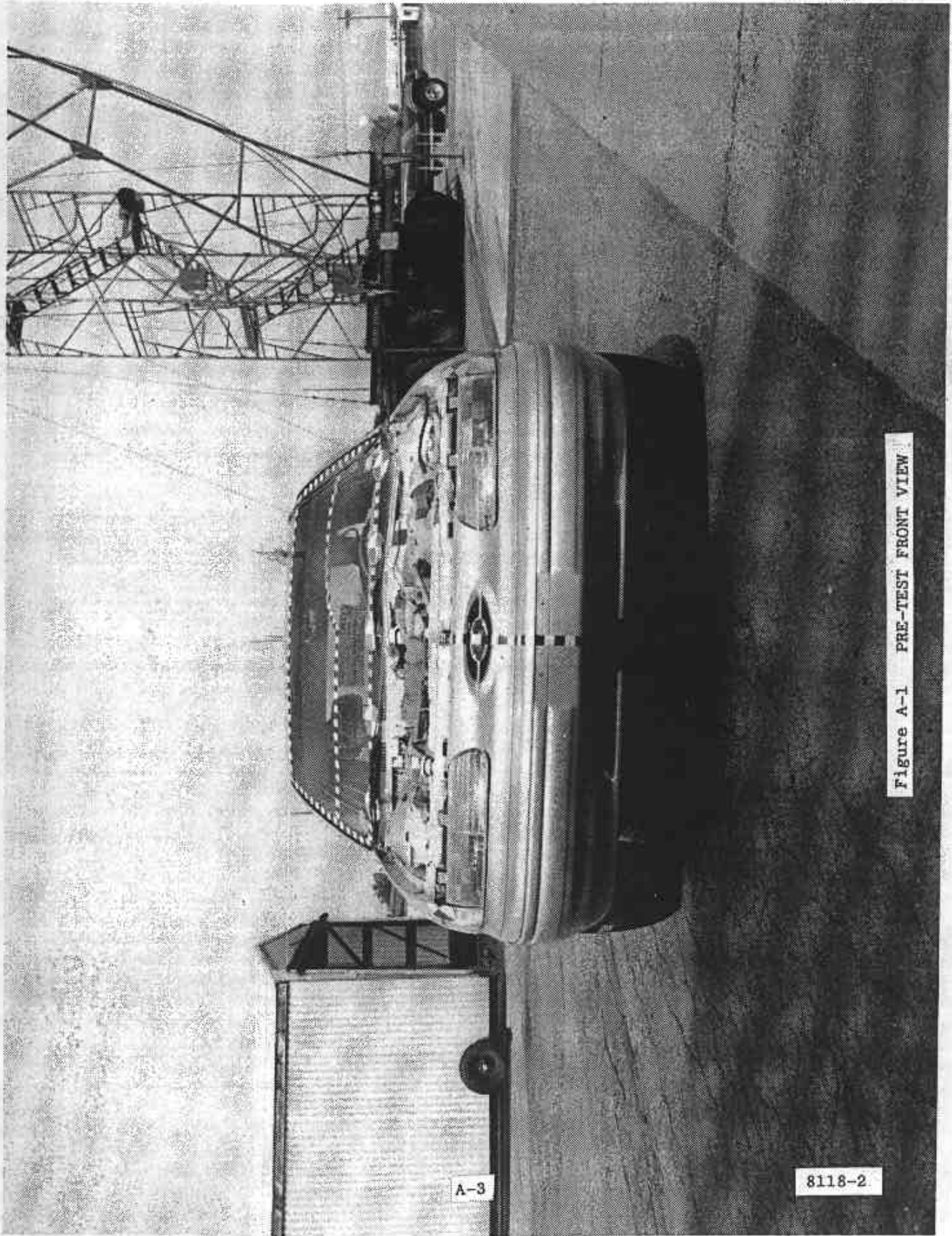


Figure A-1 PRE-TEST FRONT VIEW

A-3

8118-2

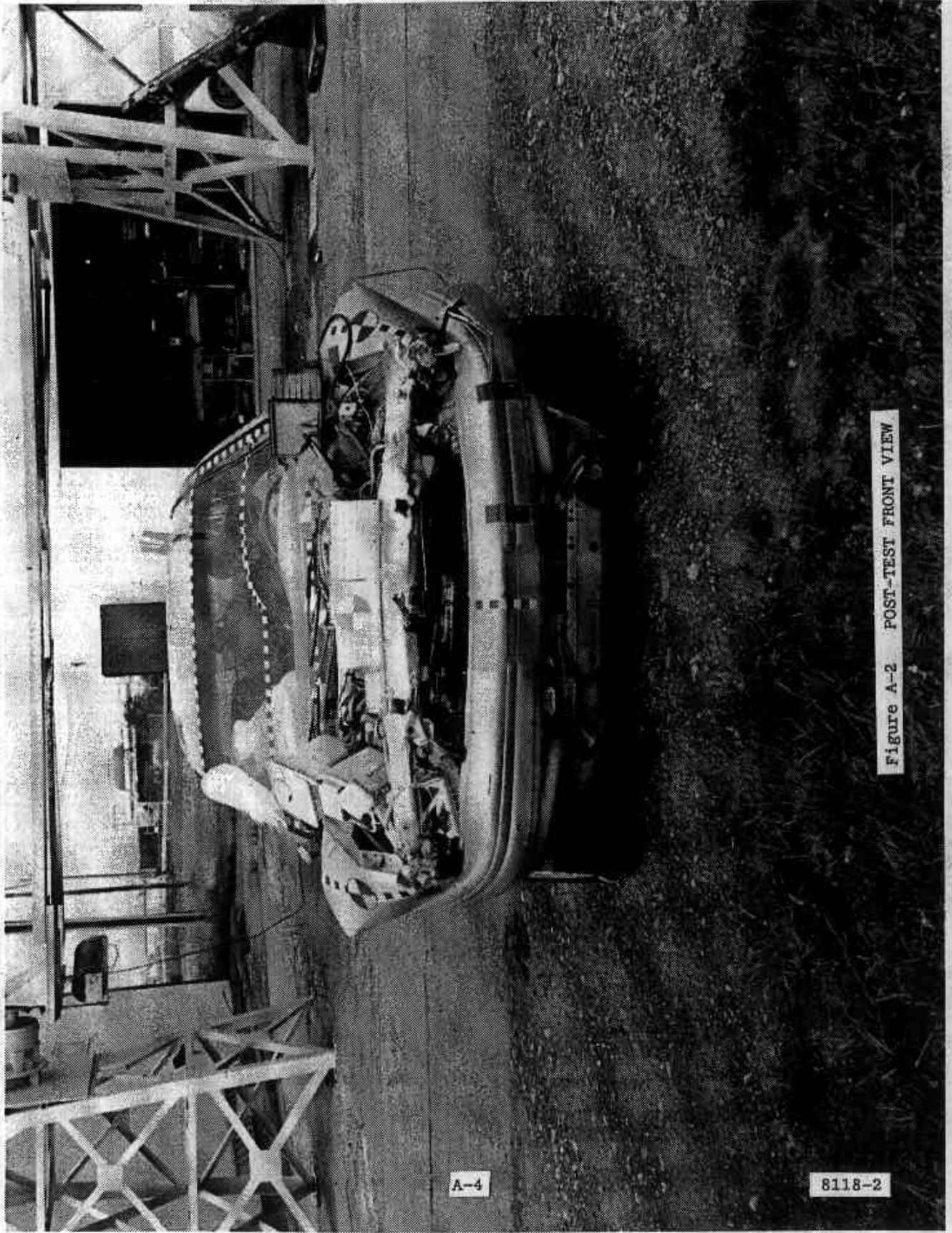


Figure A-2 POST-TEST FRONT VIEW

A-4

8118-2

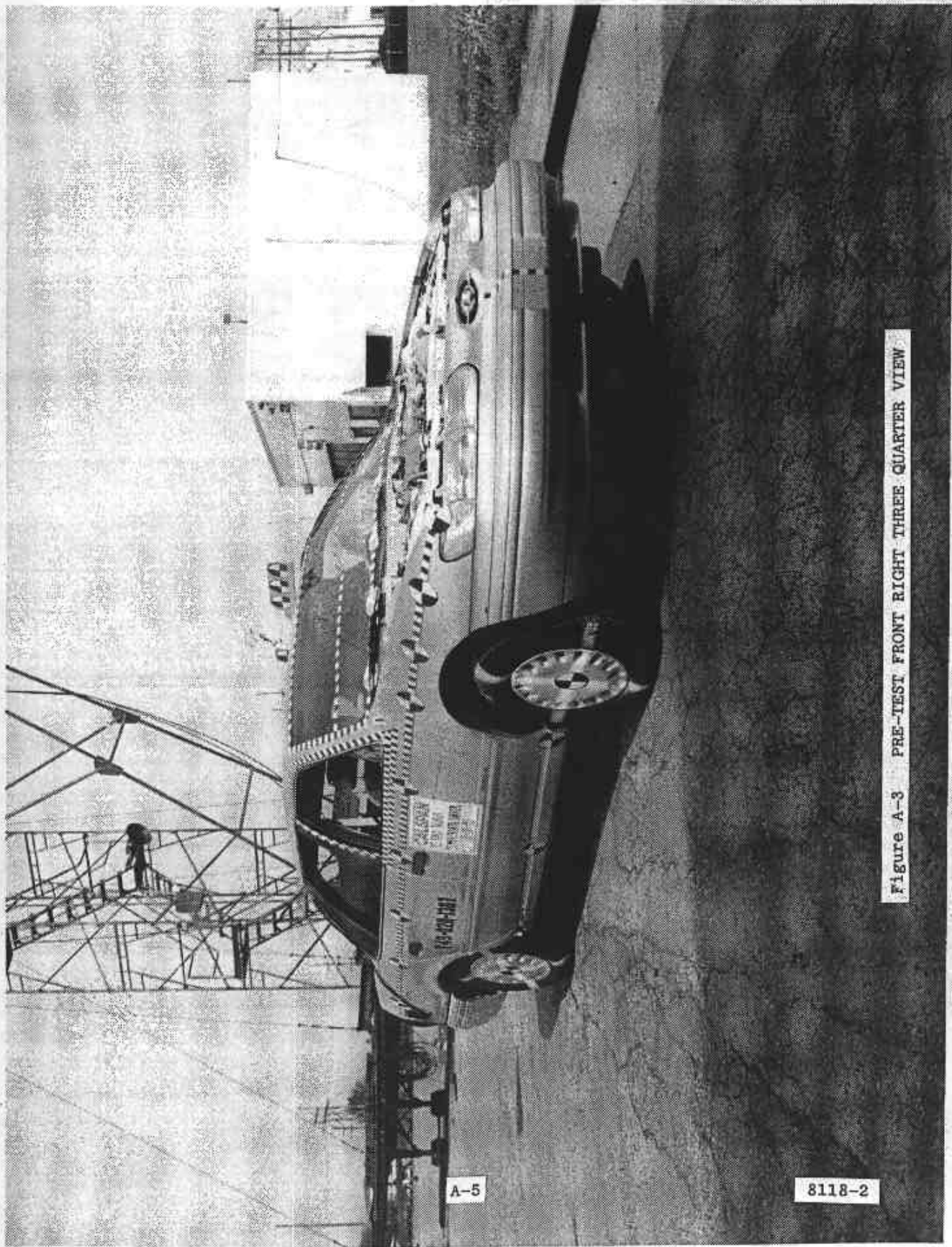


Figure A-3 PRE-TEST FRONT RIGHT THREE QUARTER VIEW

A-5

8118-2



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

A-6

8118-2

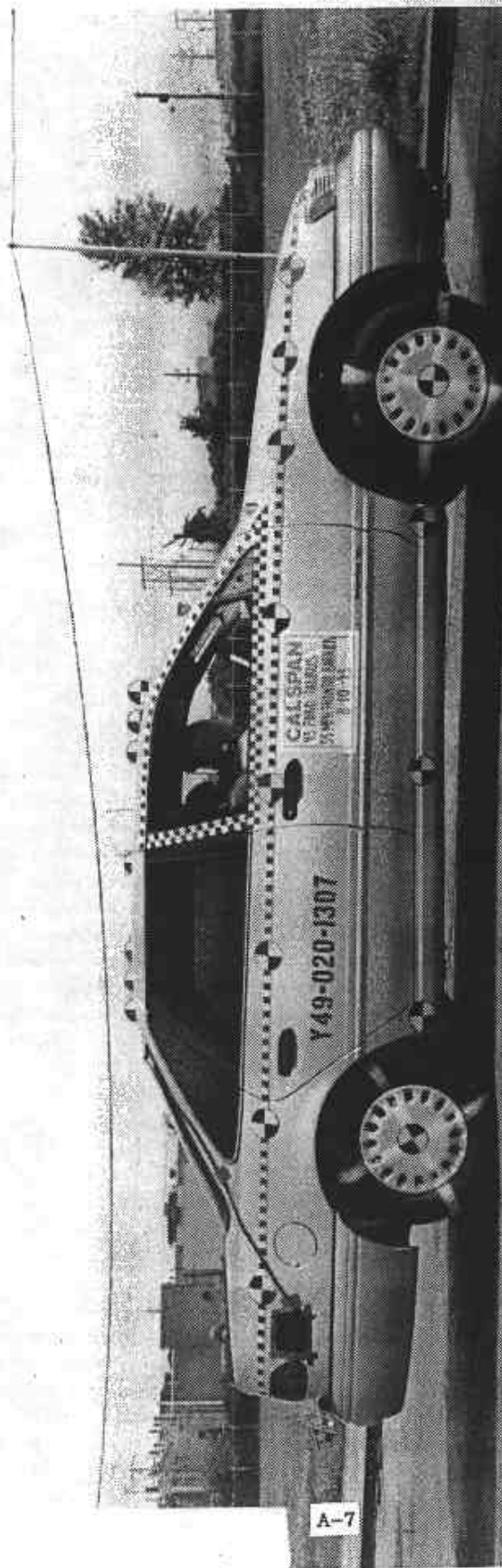


Figure A-5 PRE-TEST RIGHT SIDE VIEW

A-7

8118-2

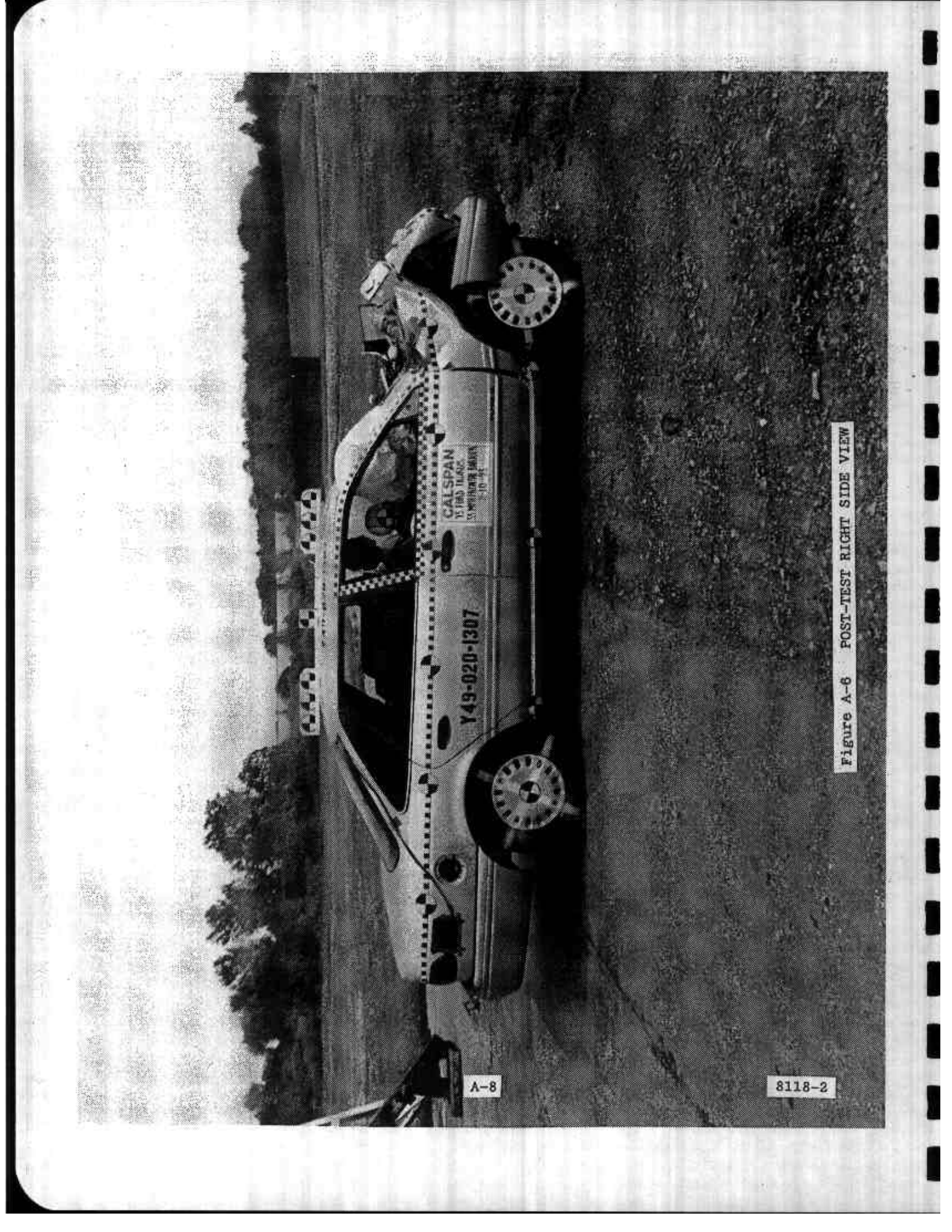


Figure A-6 POST-TEST RIGHT SIDE VIEW

A-8

8118-2

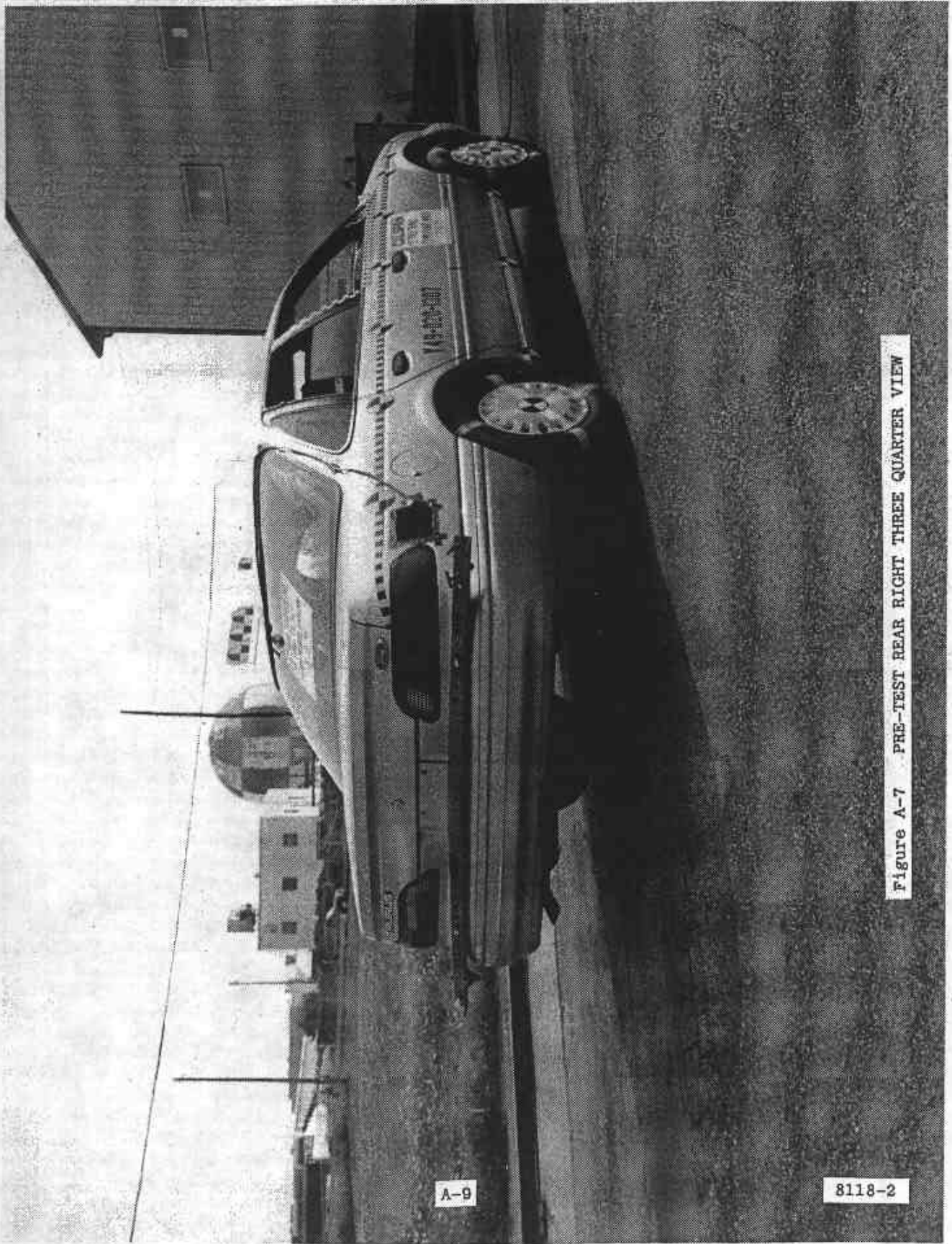
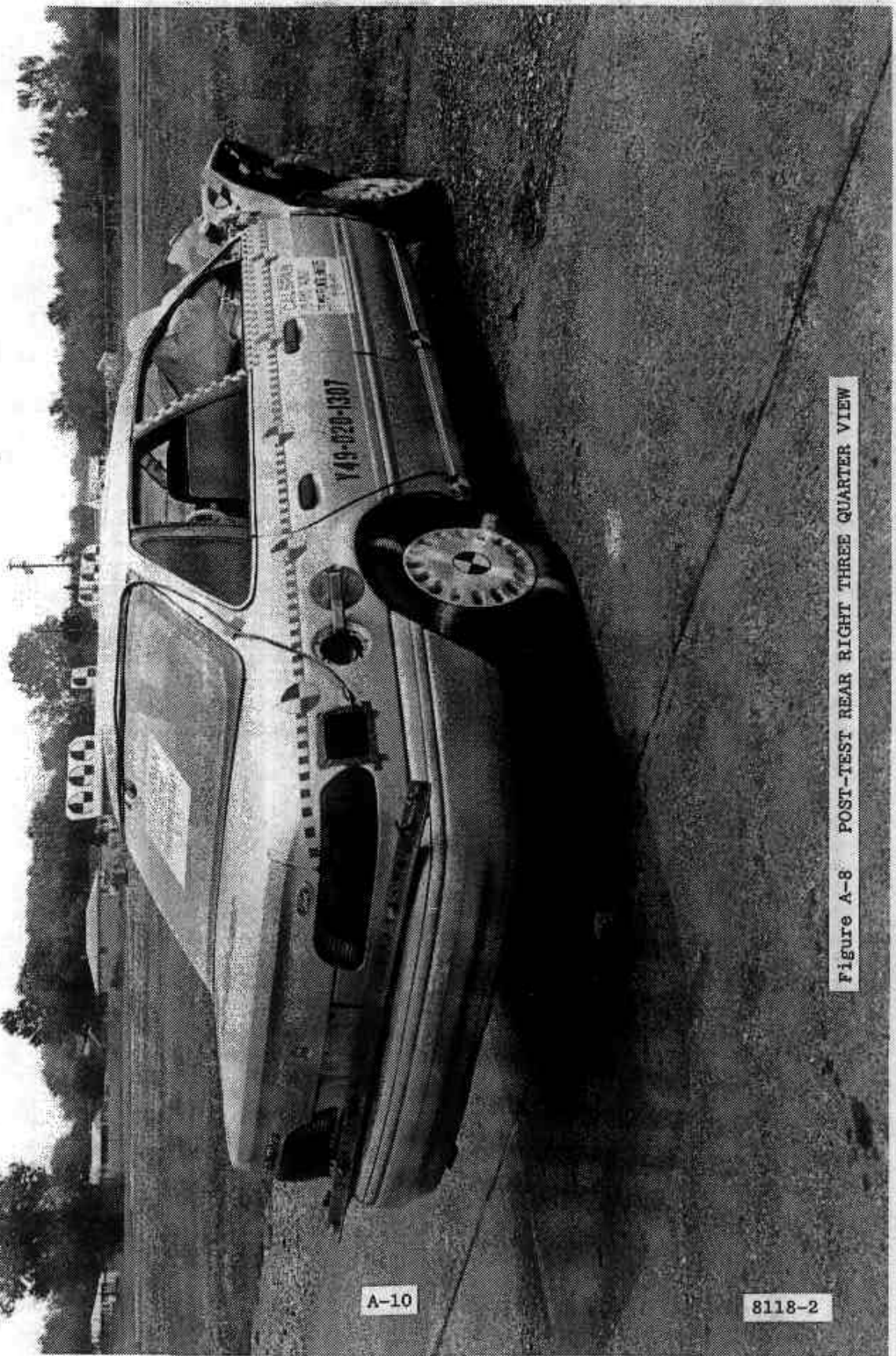


Figure A-7 PRE-TEST REAR RIGHT THREE QUARTER VIEW

A-9

8118-2



A-10

8118-2

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

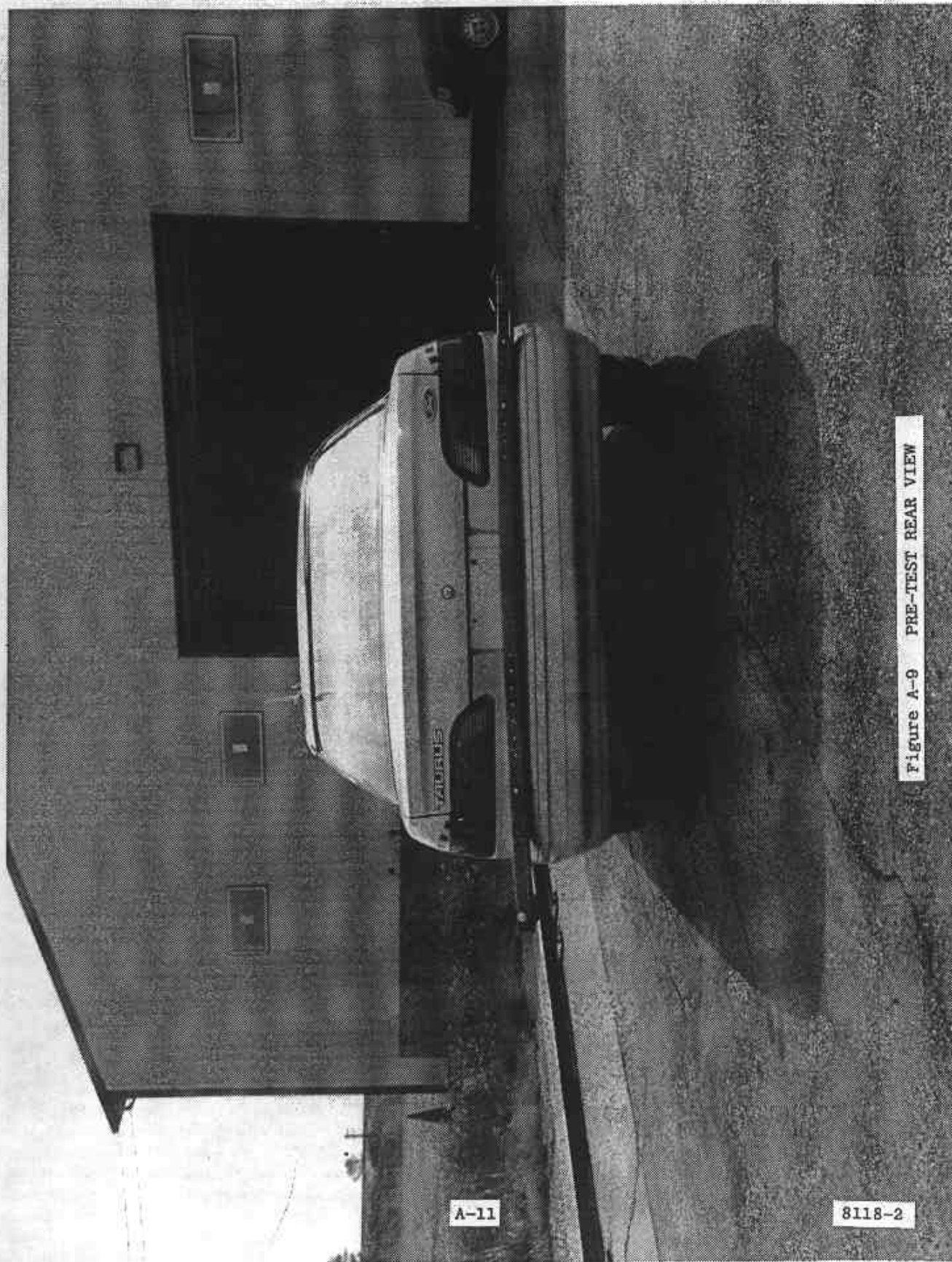


Figure A-9 PRE-TEST REAR VIEW

A-11

8118-2

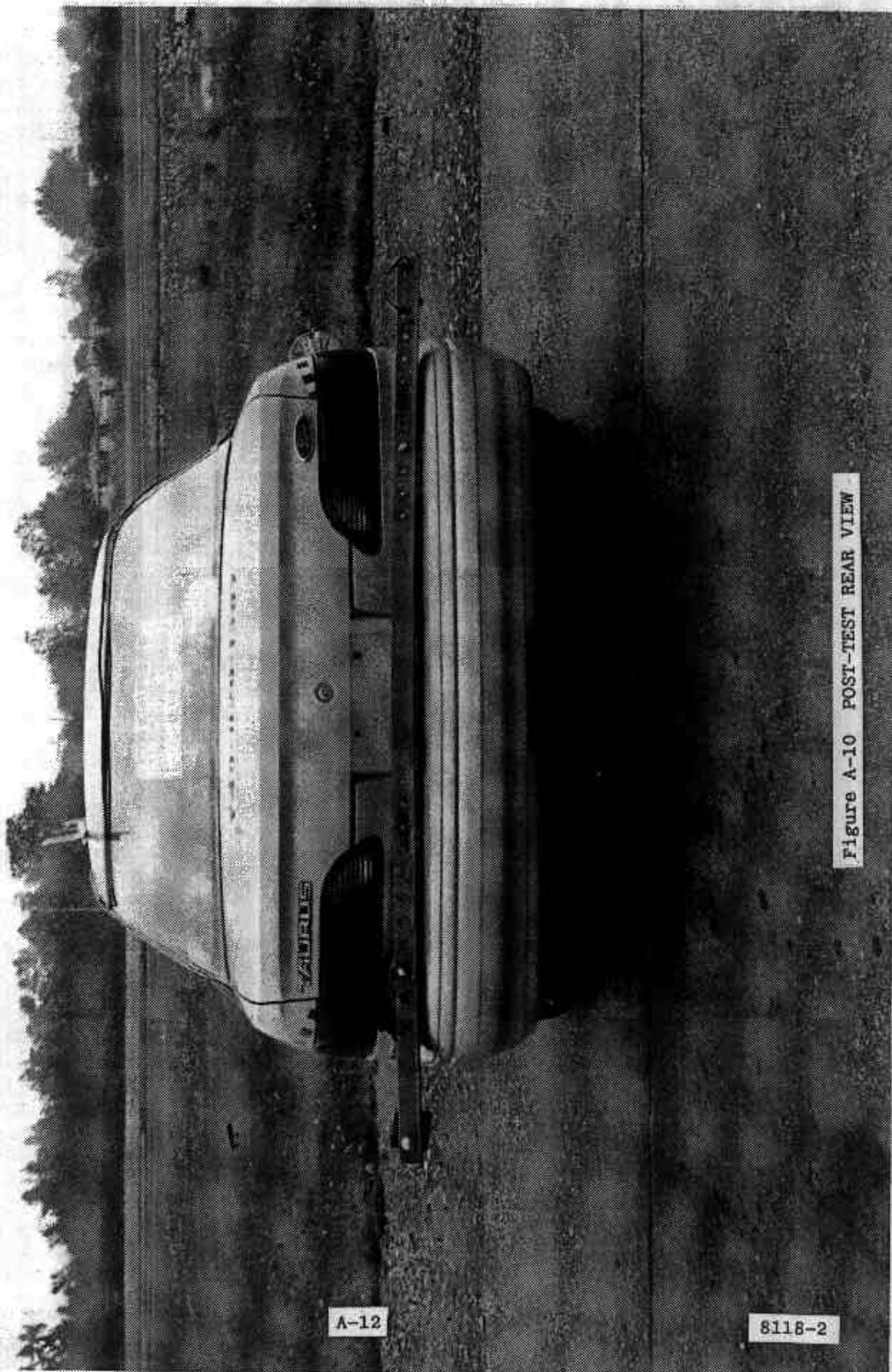


Figure A-10 POST-TEST REAR VIEW

A-12

8118-2

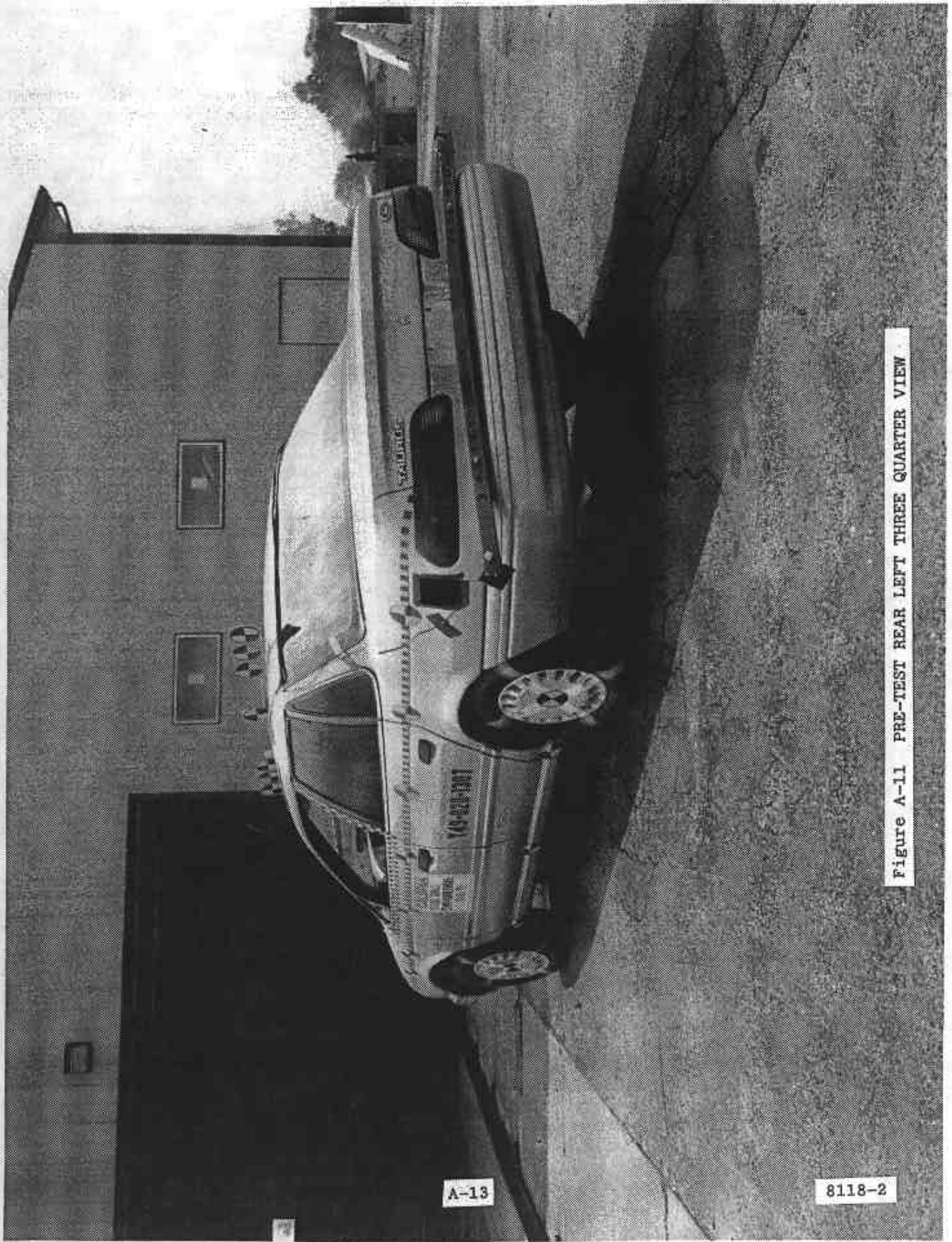


Figure A-11 PRE-TEST REAR LEFT THREE QUARTER VIEW

A-13

8118-2

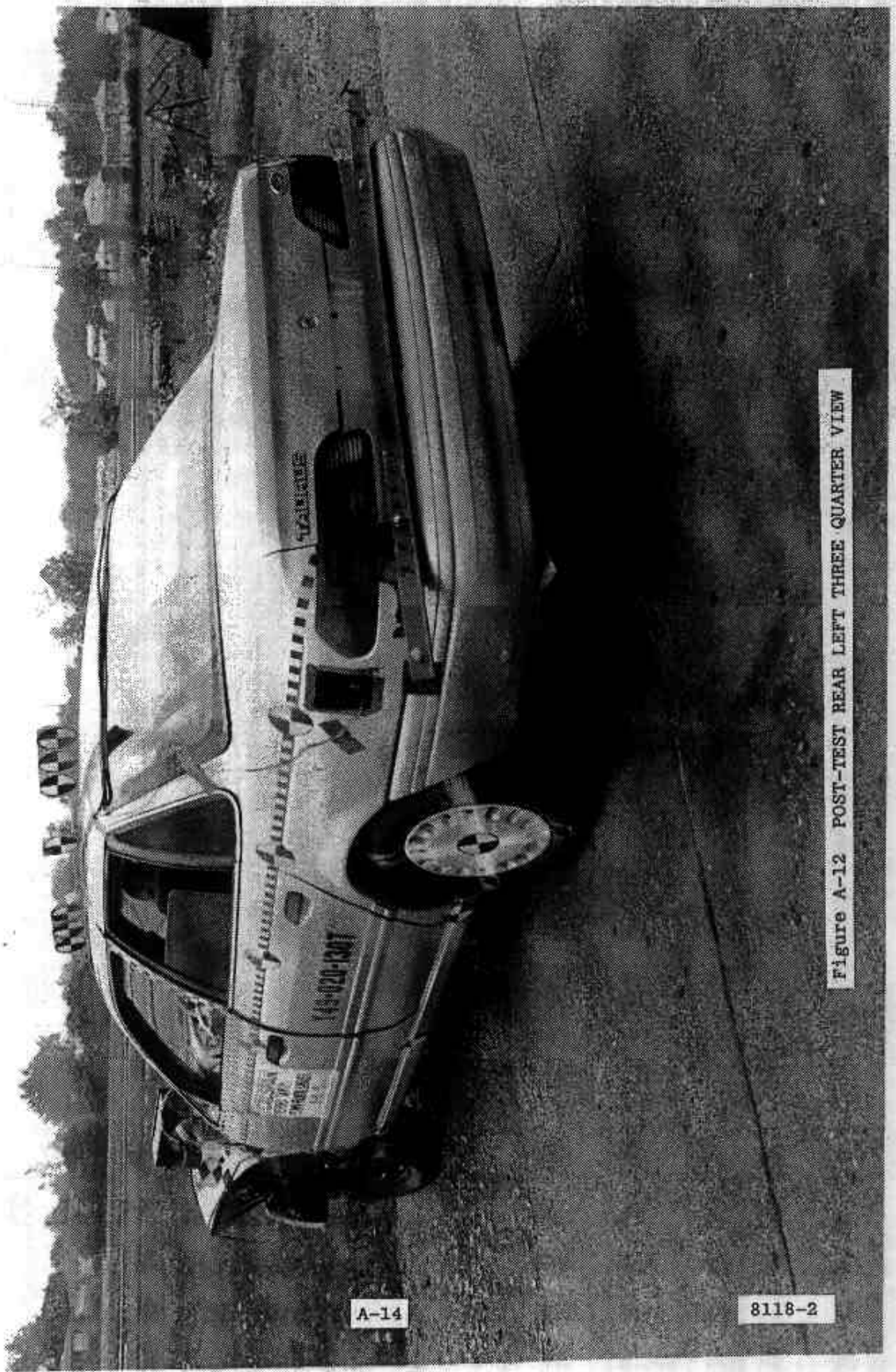


Figure A-12 POST-TEST REAR LEFT THREE QUARTER VIEW

A-14

8118-2

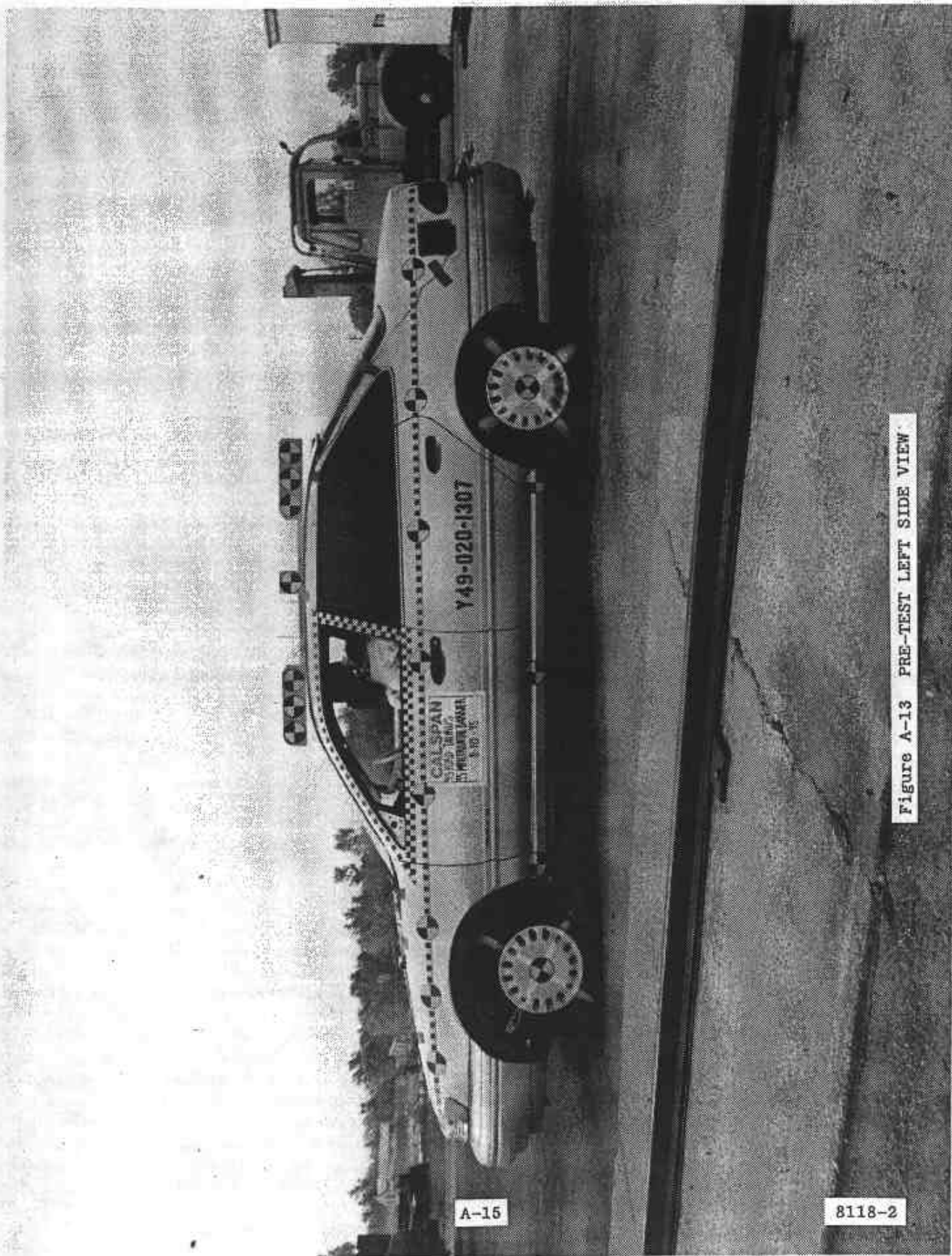


Figure A-13 PRE-TEST LEFT SIDE VIEW

A-15

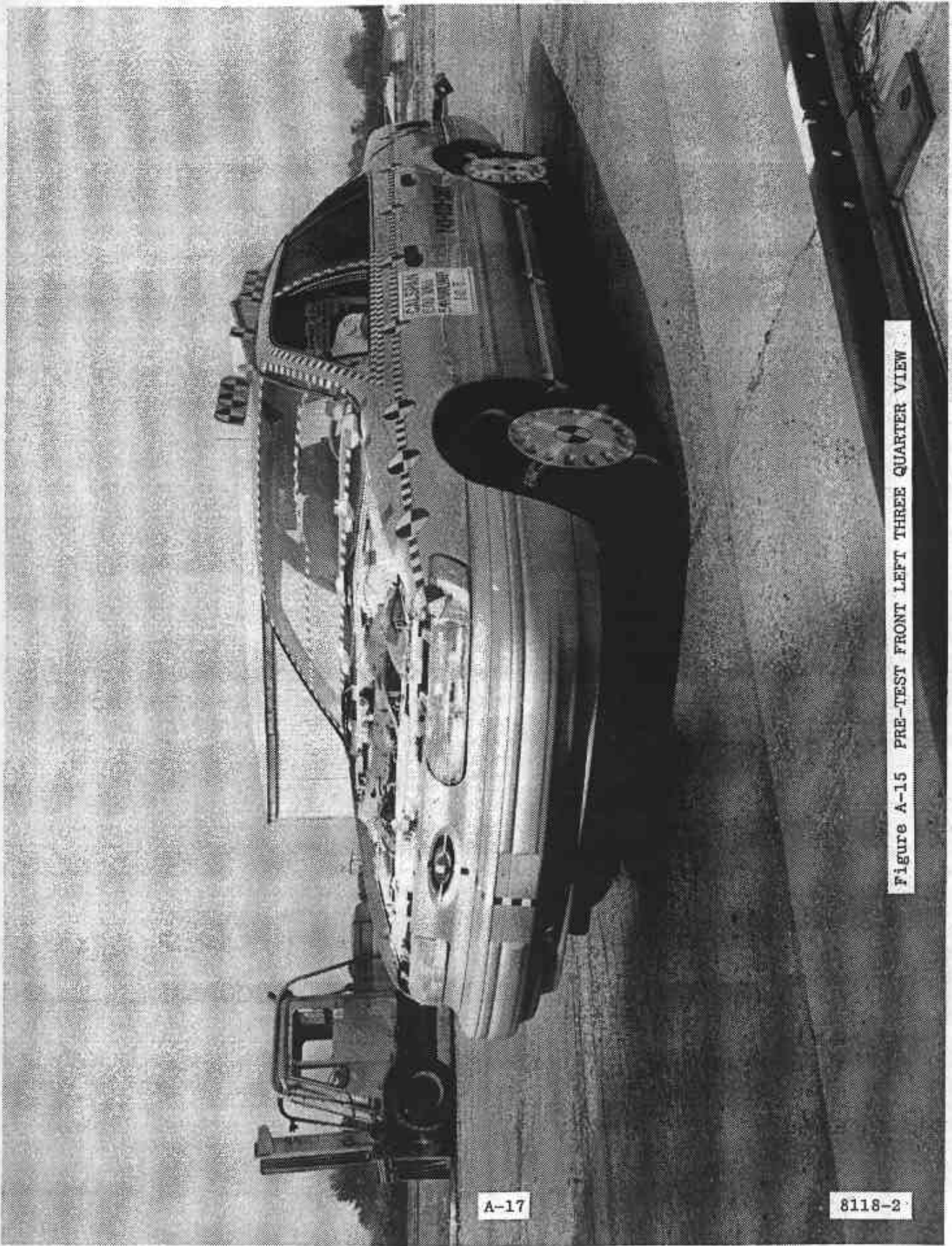
8118-2



Figure A-14 POST-TEST LEFT SIDE VIEW

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8118-2



A-17

8118-2

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



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

A-18

8118-2

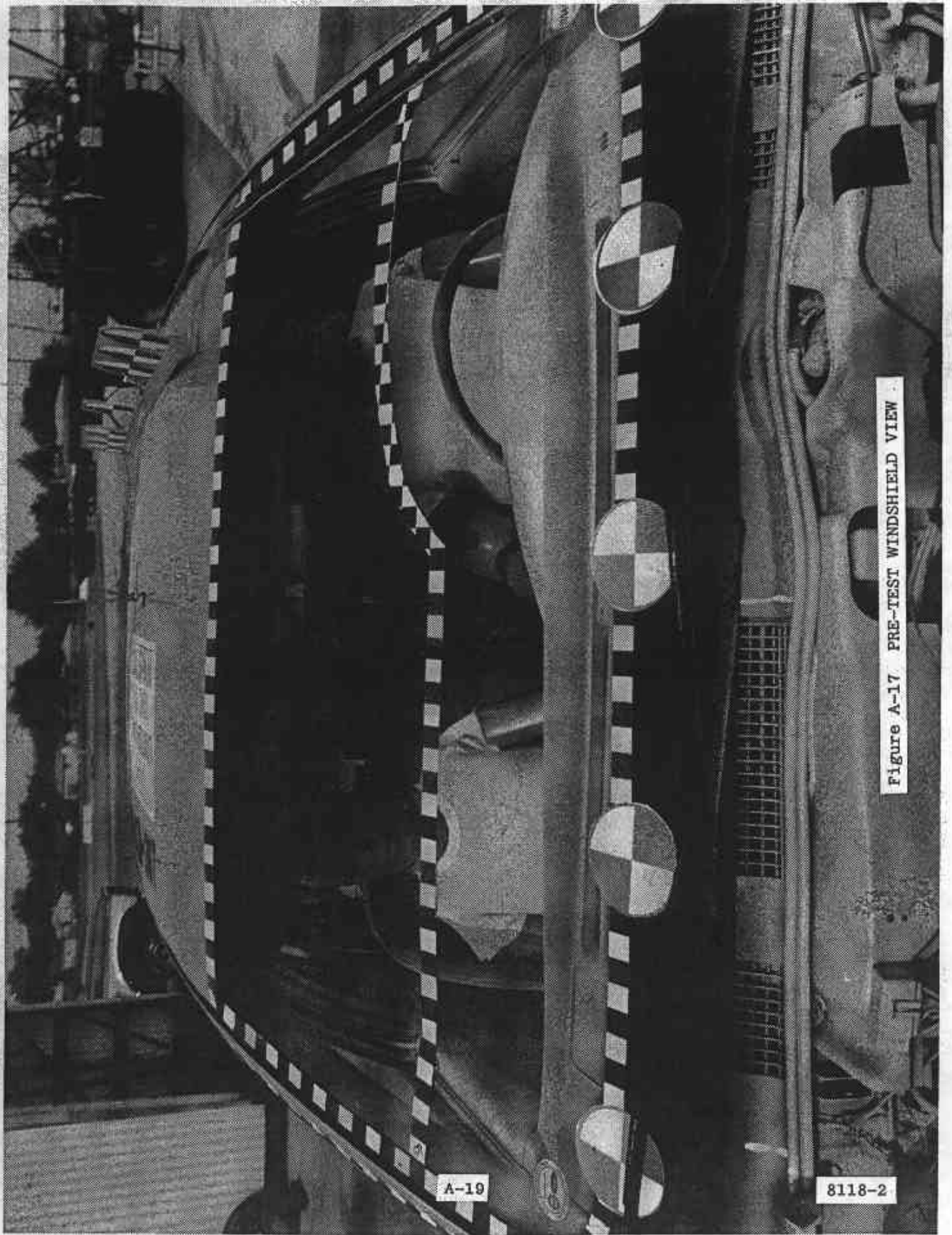


Figure A-17 PRE-TEST WINDSHIELD VIEW

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Figure A-18 POST-TEST WINDSHIELD VIEW

A-20

8118-2

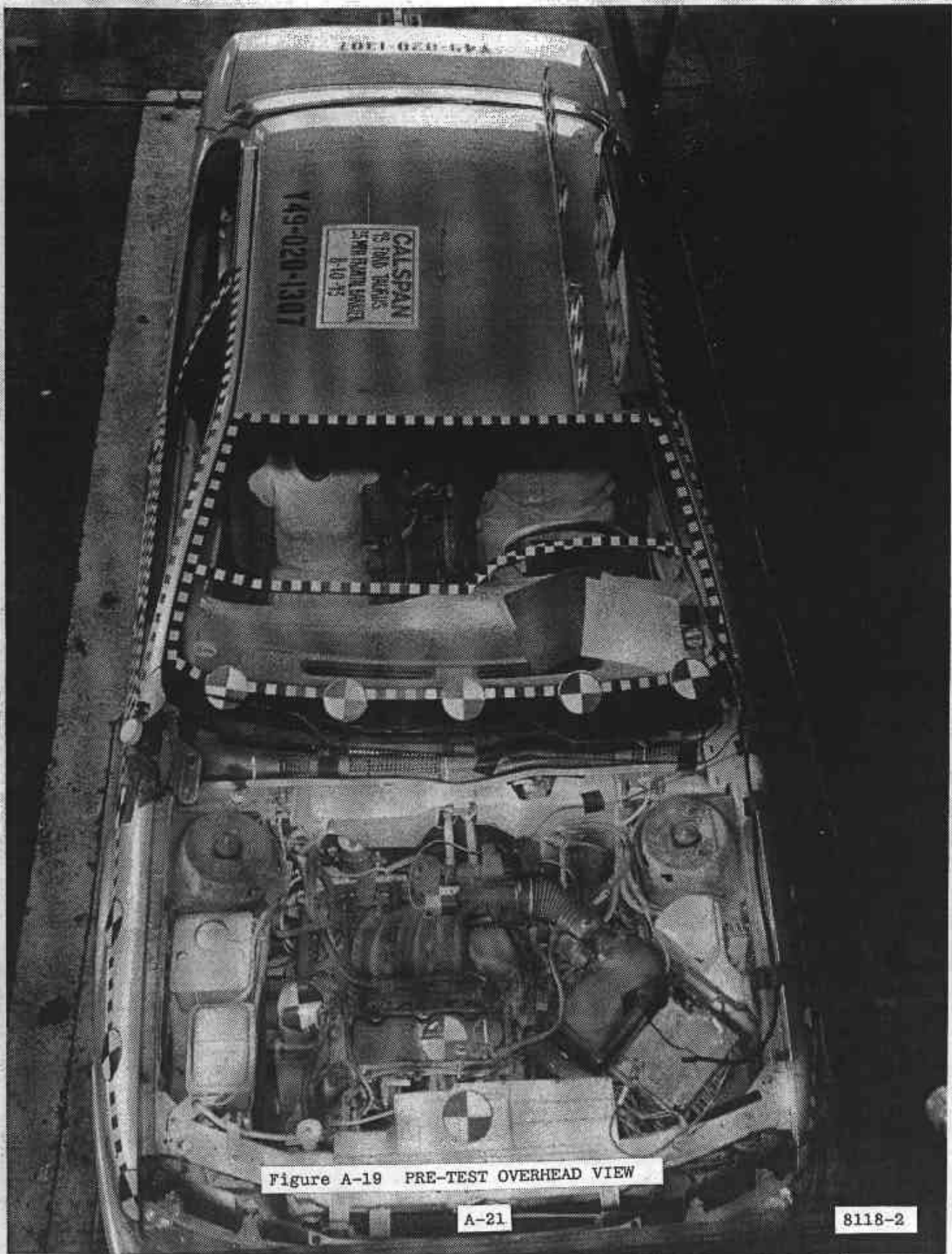


Figure A-19 PRE-TEST OVERHEAD VIEW

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8118-2



Figure A-20 POST-TEST OVERHEAD VIEW

A-22

8118-2

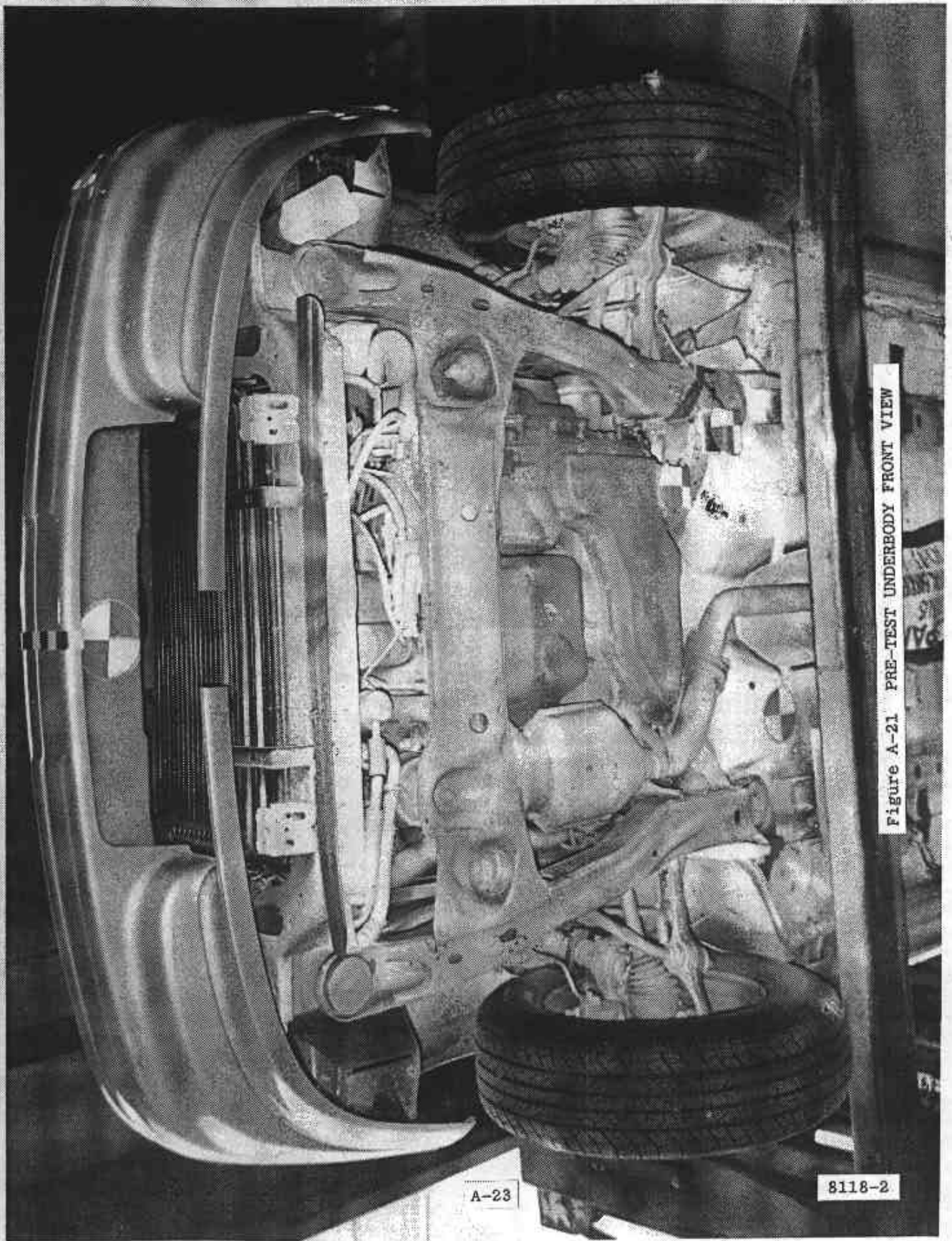


Figure A-21 PRE-TEST UNDERBODY FRONT VIEW

A-23

8118-2



Figure A-22 POST-TEST UNDERBODY FRONT VIEW

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8118-2



Figure A-23 PRE-TEST UNDERBODY FRONT SIDE VIEW

A-25

8118-2

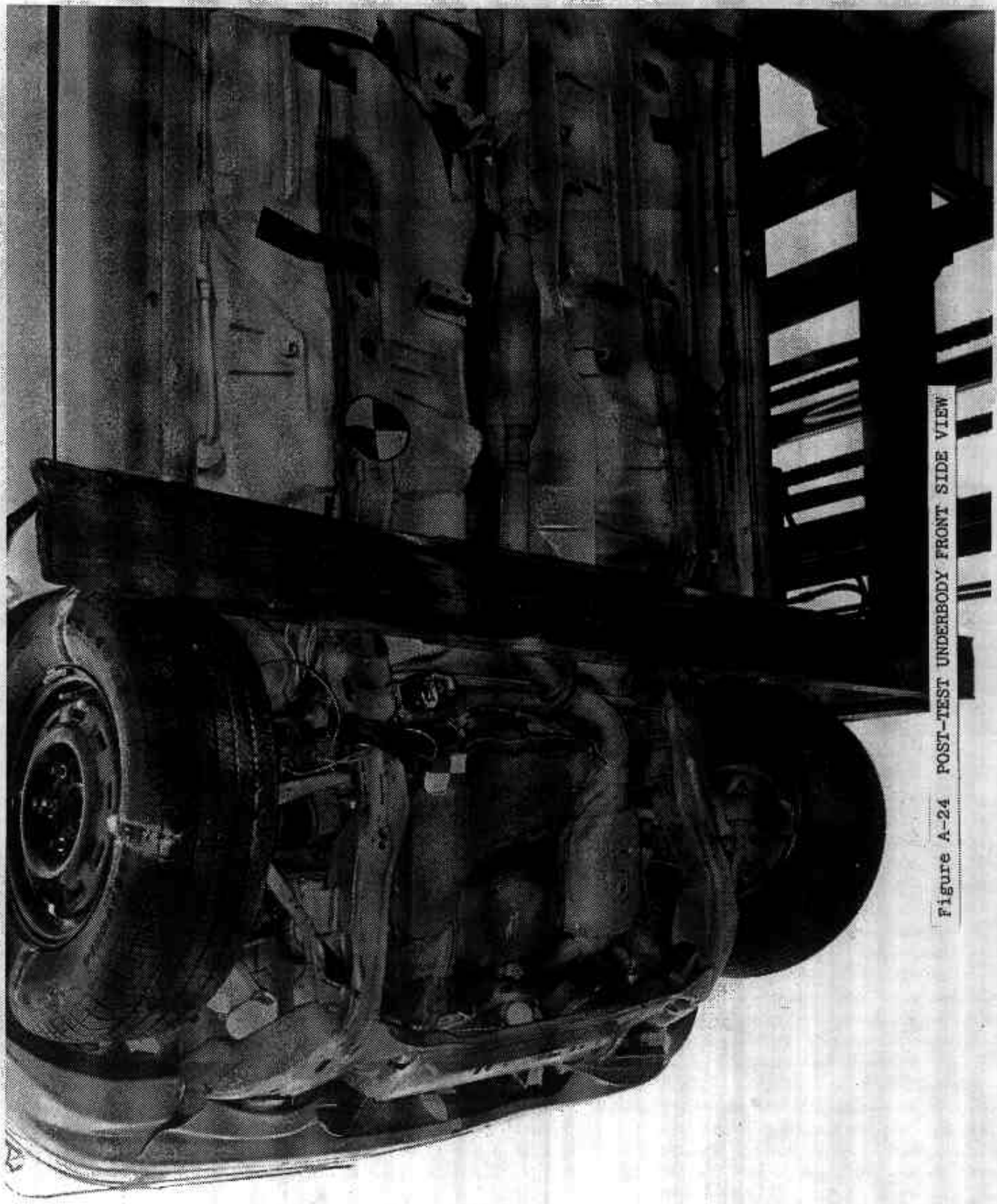


Figure A-24 POSTI-TEST UNDERBODY FRONT SIDE VIEW

A-26

8118-2

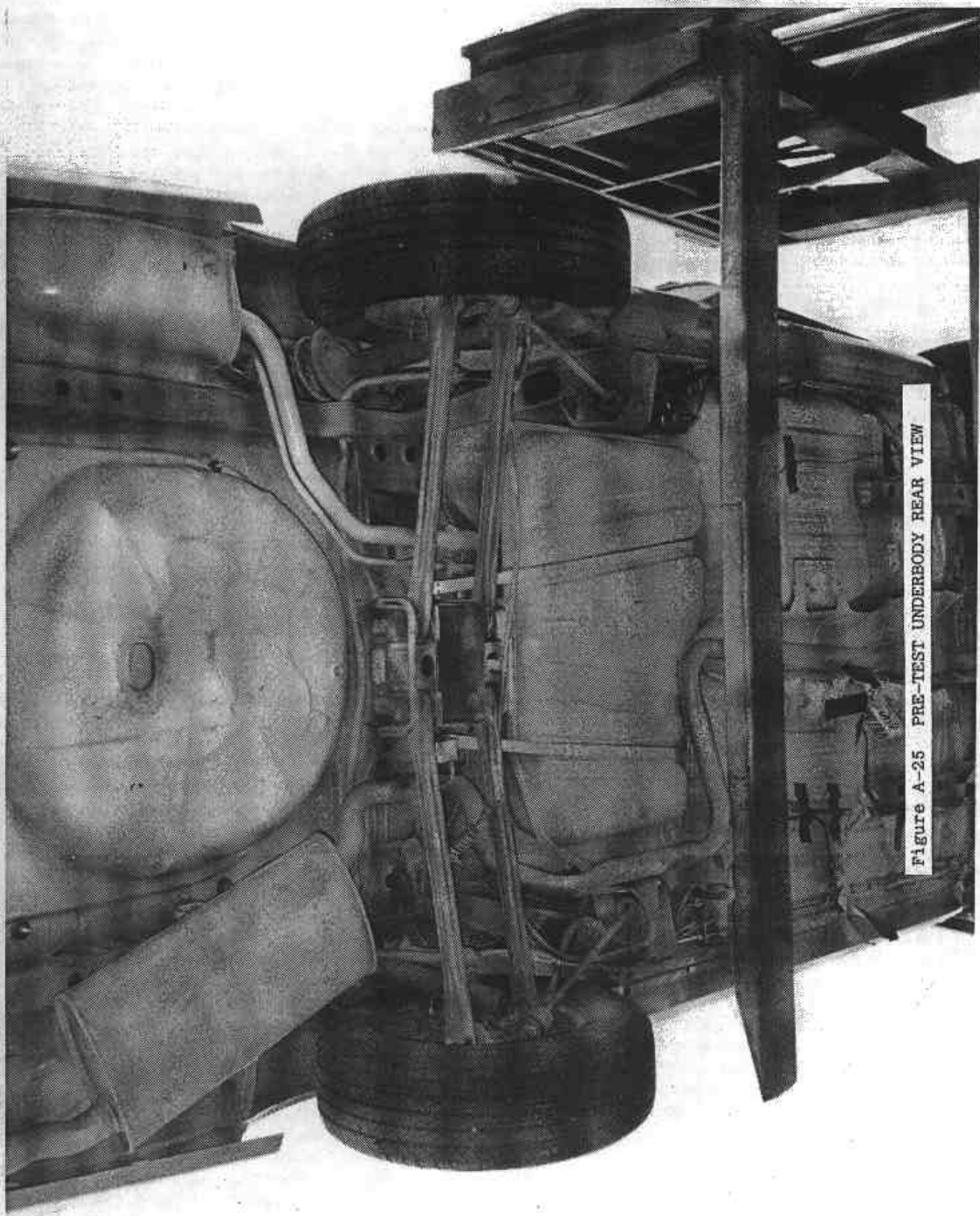


Figure A-25 PRE-TEST UNDERBODY REAR VIEW

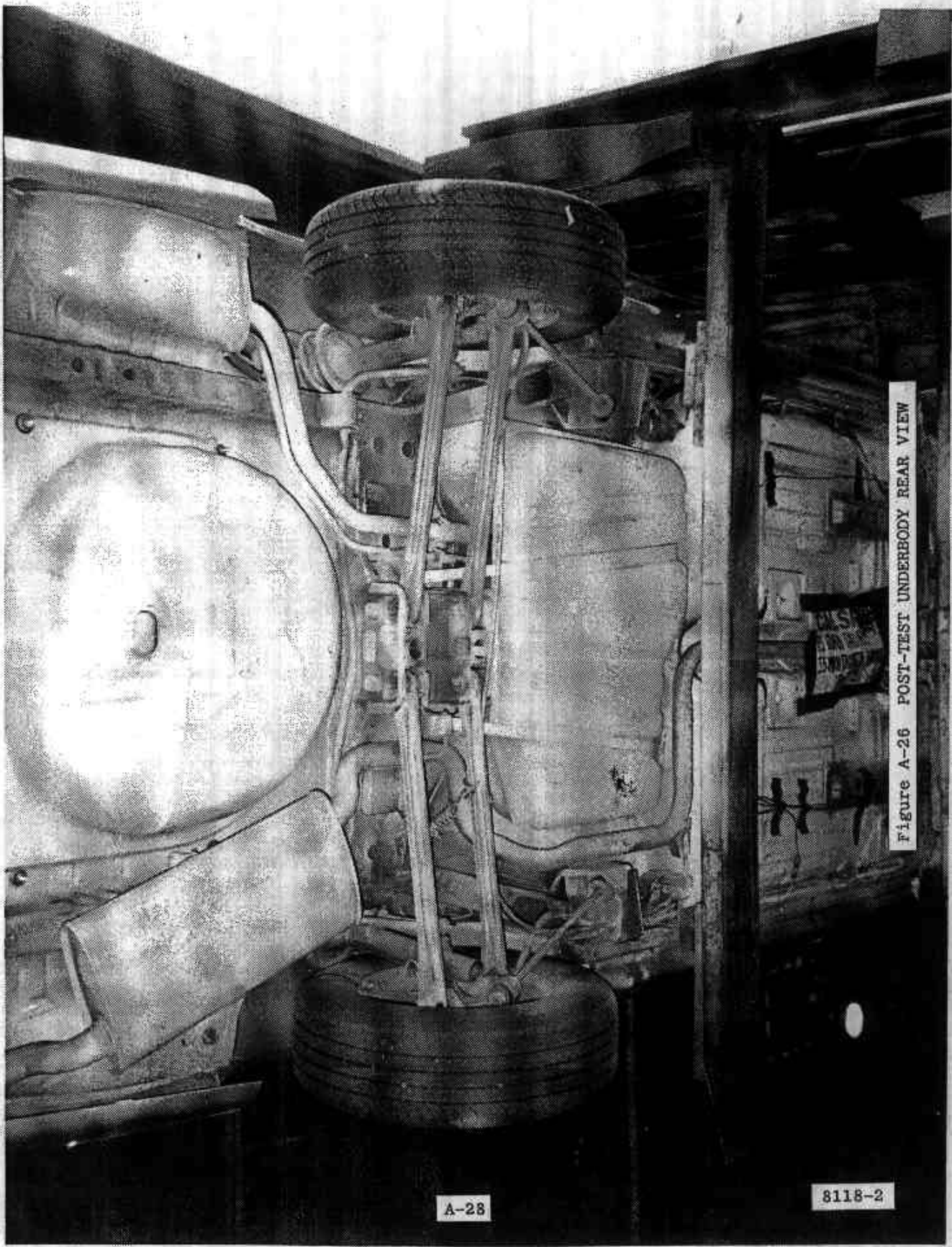


Figure A-26 POST-TEST UNDERBODY REAR VIEW

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Figure A-27 PRE-TEST DRIVER POSITION VIEW

A-29

8118-2



Figure A-28 POST-TEST DRIVER POSITION VIEW

A-30

8118-2



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

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8118-2



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

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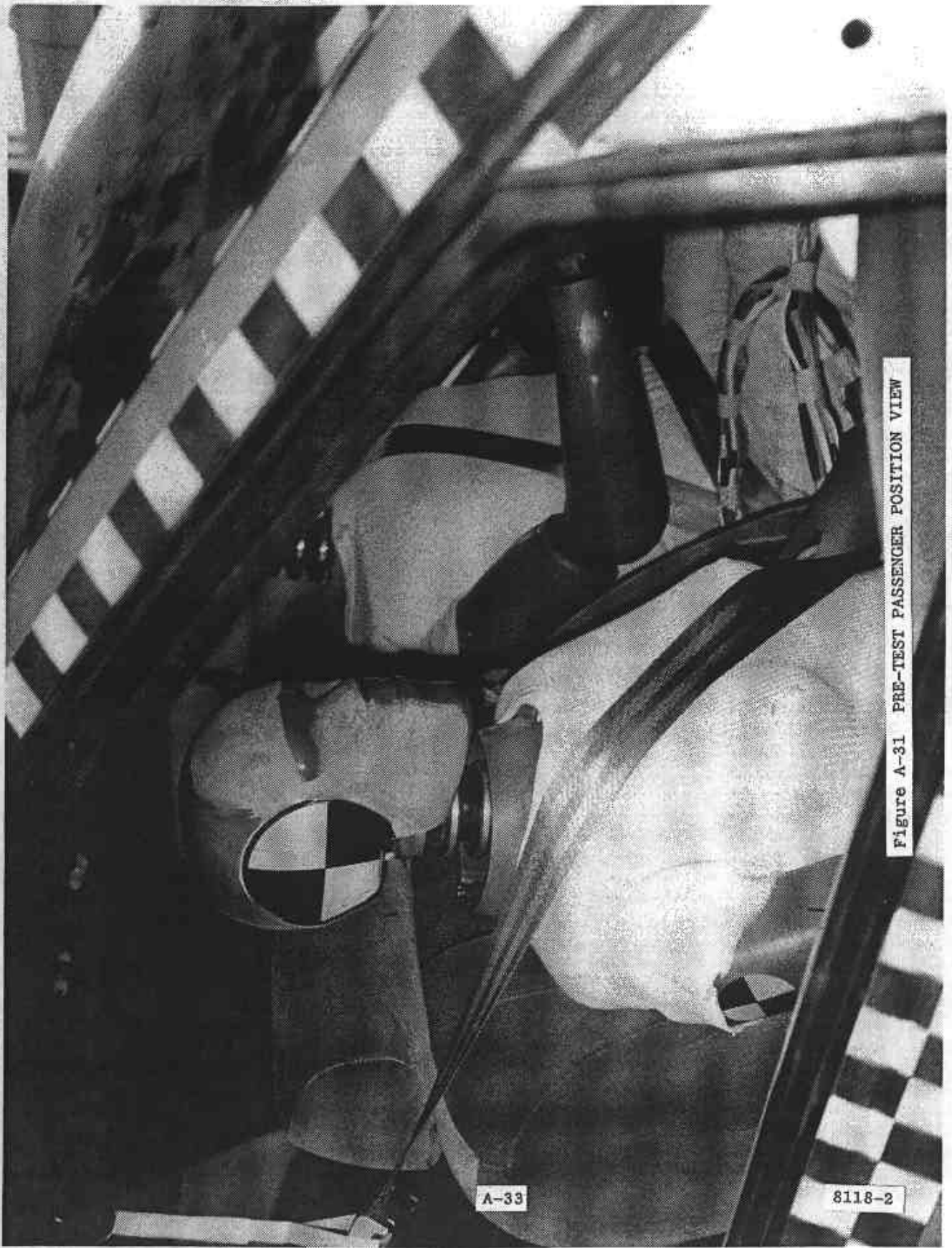


Figure A-31 PRE-TEST PASSENGER POSITION VIEW

A-33

8118-2

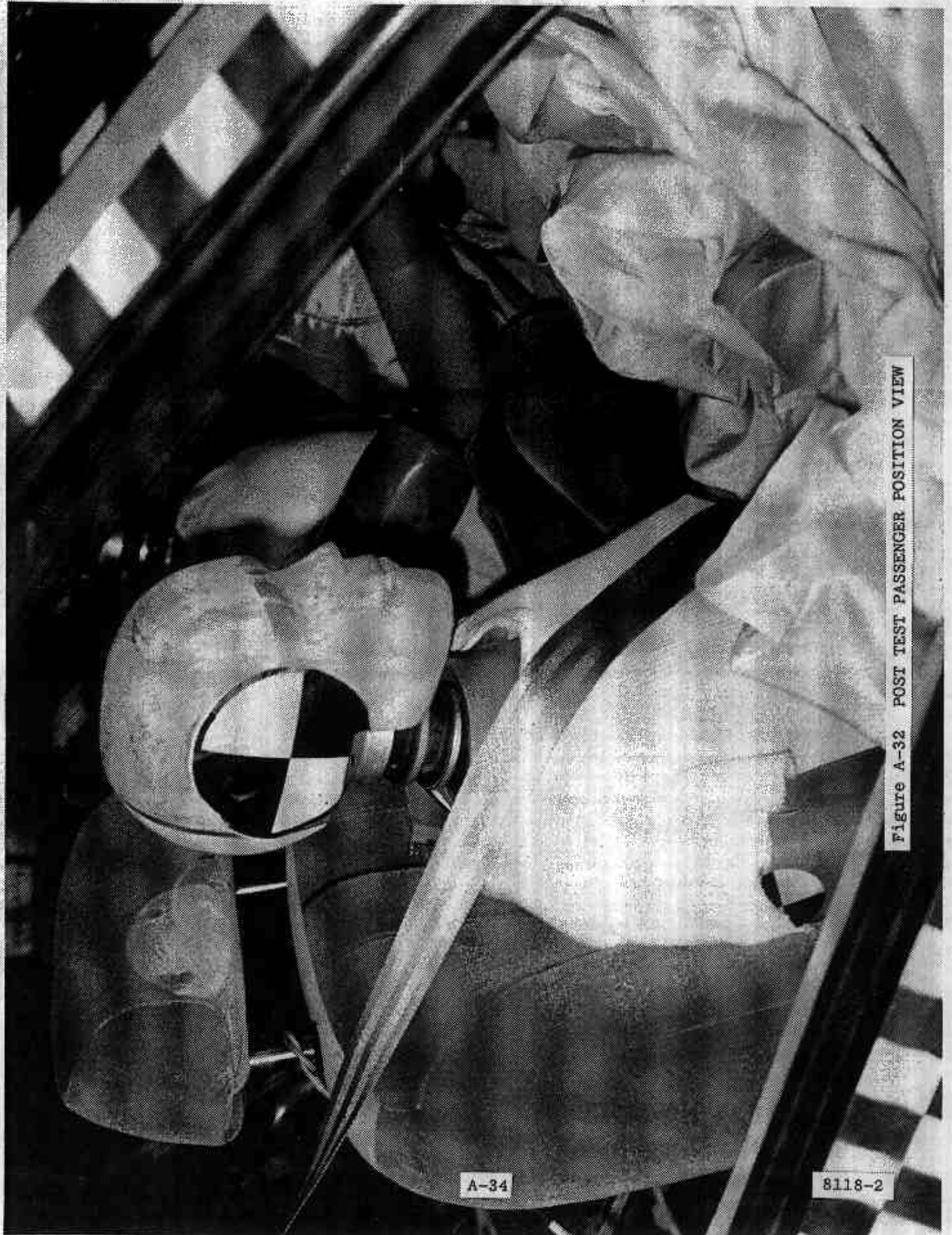


Figure A-32 POST TEST PASSENGER POSITION VIEW

A-34

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

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

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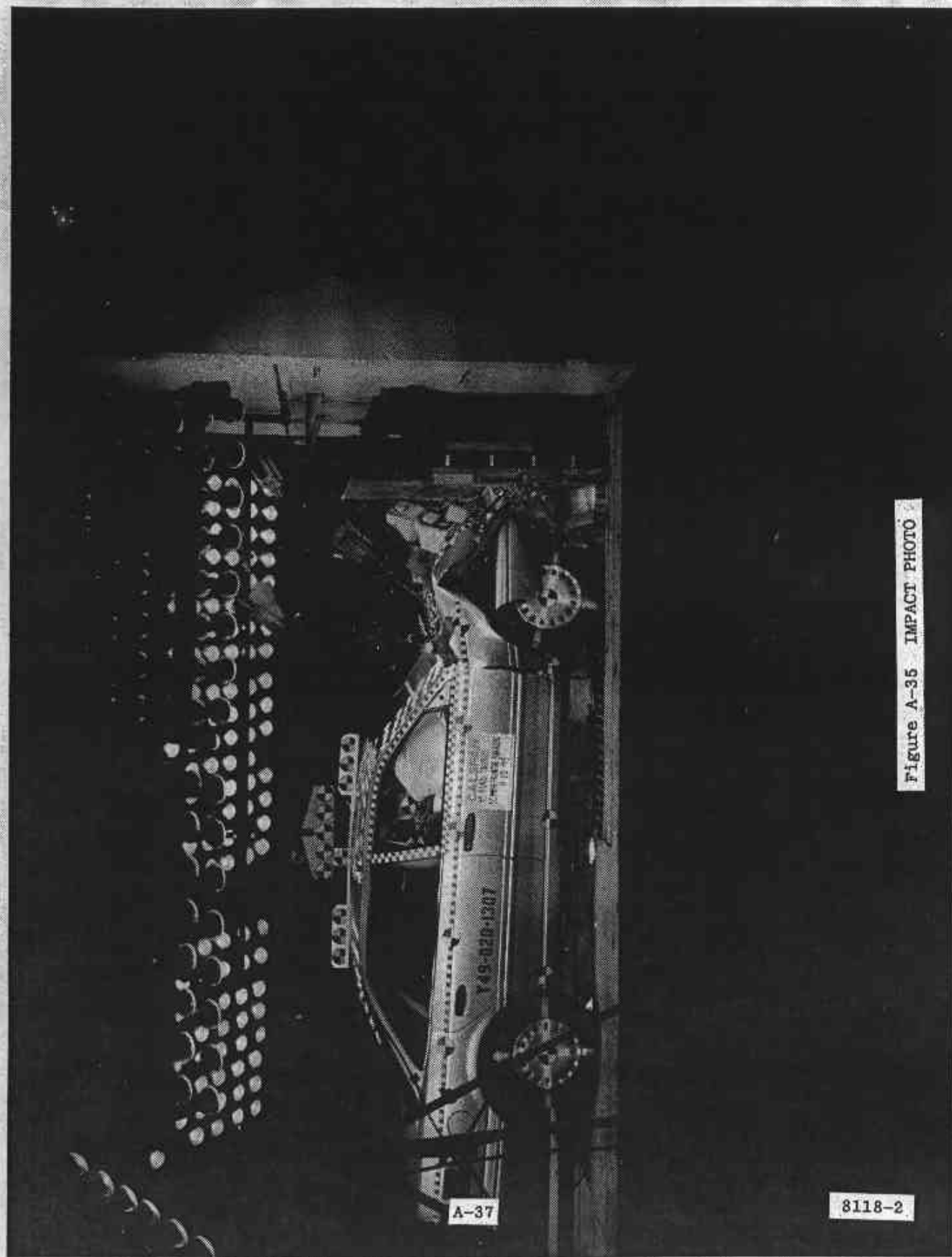


Figure A-35 IMPACT PHOTO

A-37

8118-2

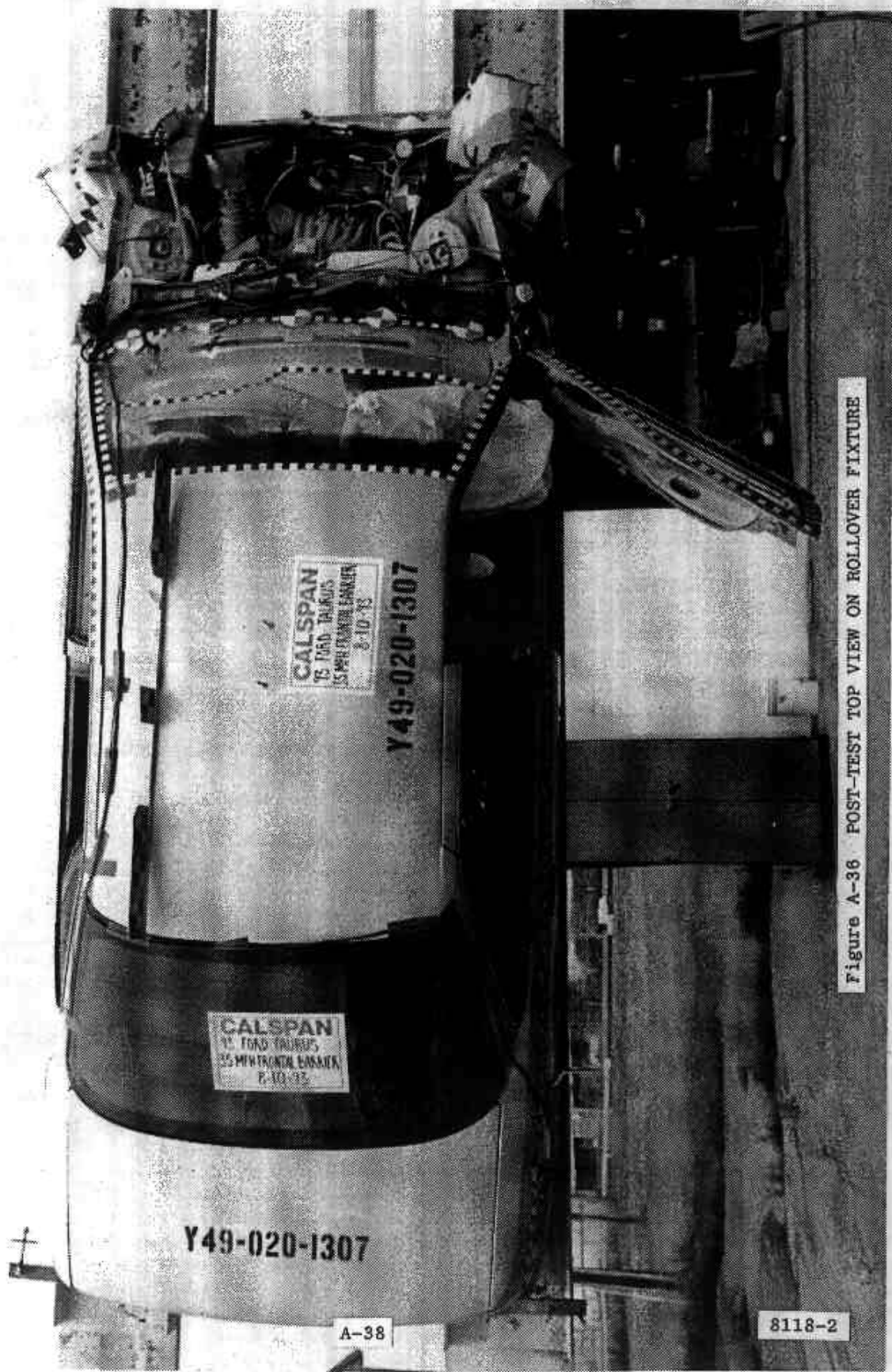


Figure A-36 POST-TEST TOP VIEW ON ROLLOVER FIXTURE

Y49-020-1307

A-38

8118-2

Appendix B

LOAD CELL, VEHICLE AND DUMMY DATA

TEST NO. Y049-2-1307

LOAD CELL BARRIER DATA

SAE FILTER CHANNEL CLASS

60

TEST NO. Y49-2-1307

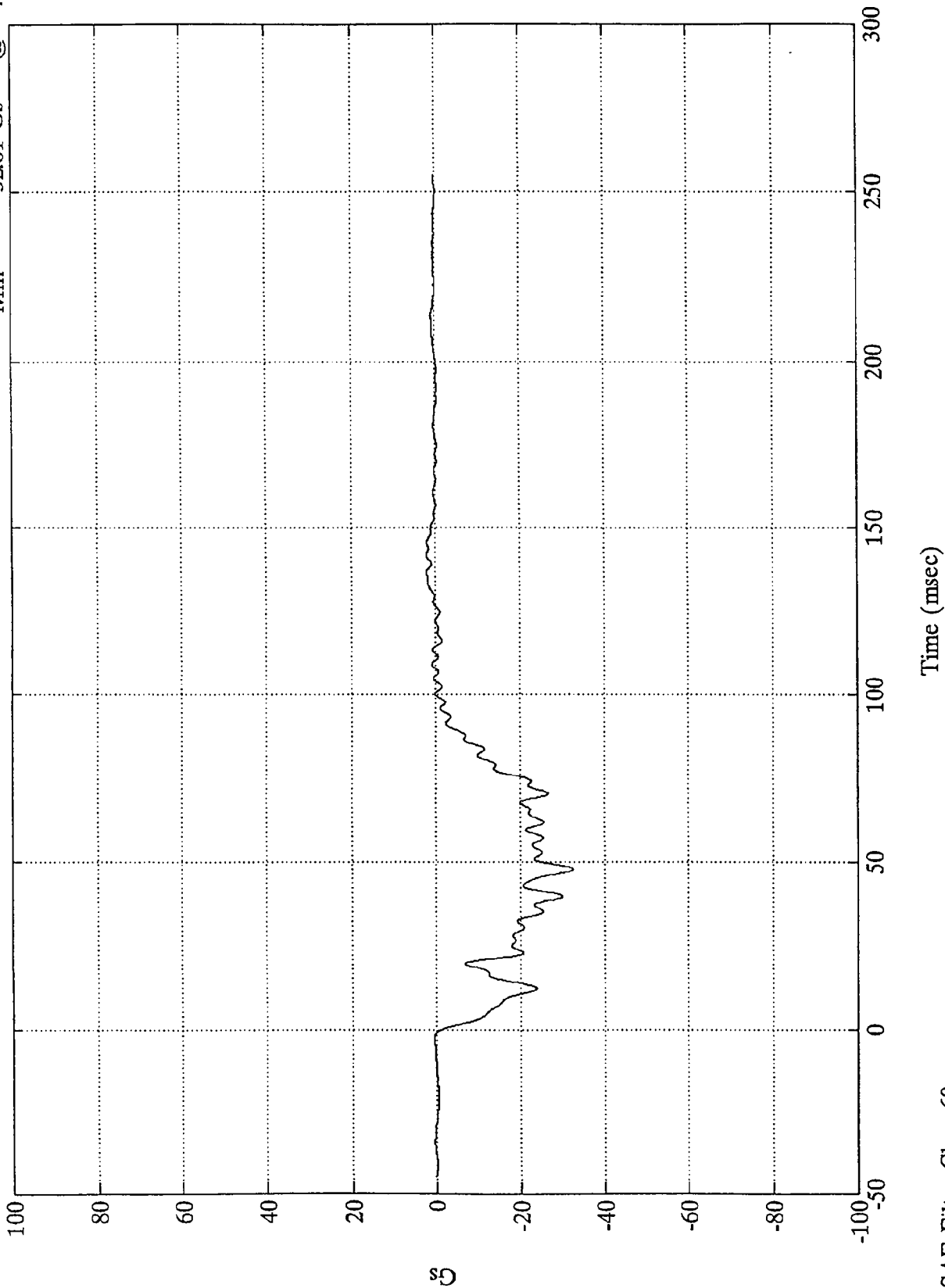
DUMMY DATA

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

TSC Frontal Barrier Test #2 - Ford Taurus

L. Rear Seat X-Member (X)

Max = 2.14 Gs @ 136.91 msec
Min = -32.61 Gs @ 47.76 msec

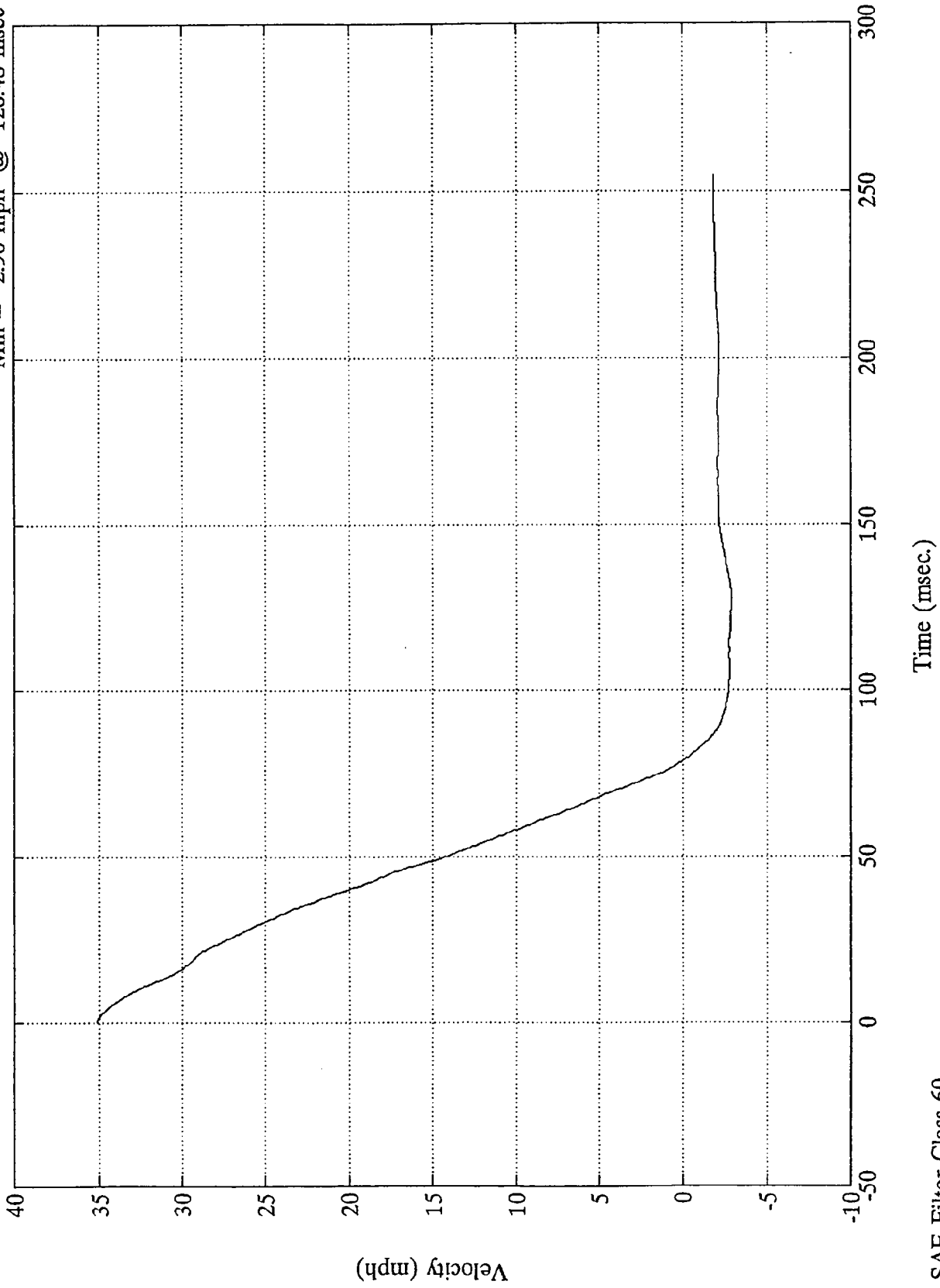


SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

L. Rear Seat X-Member (X)

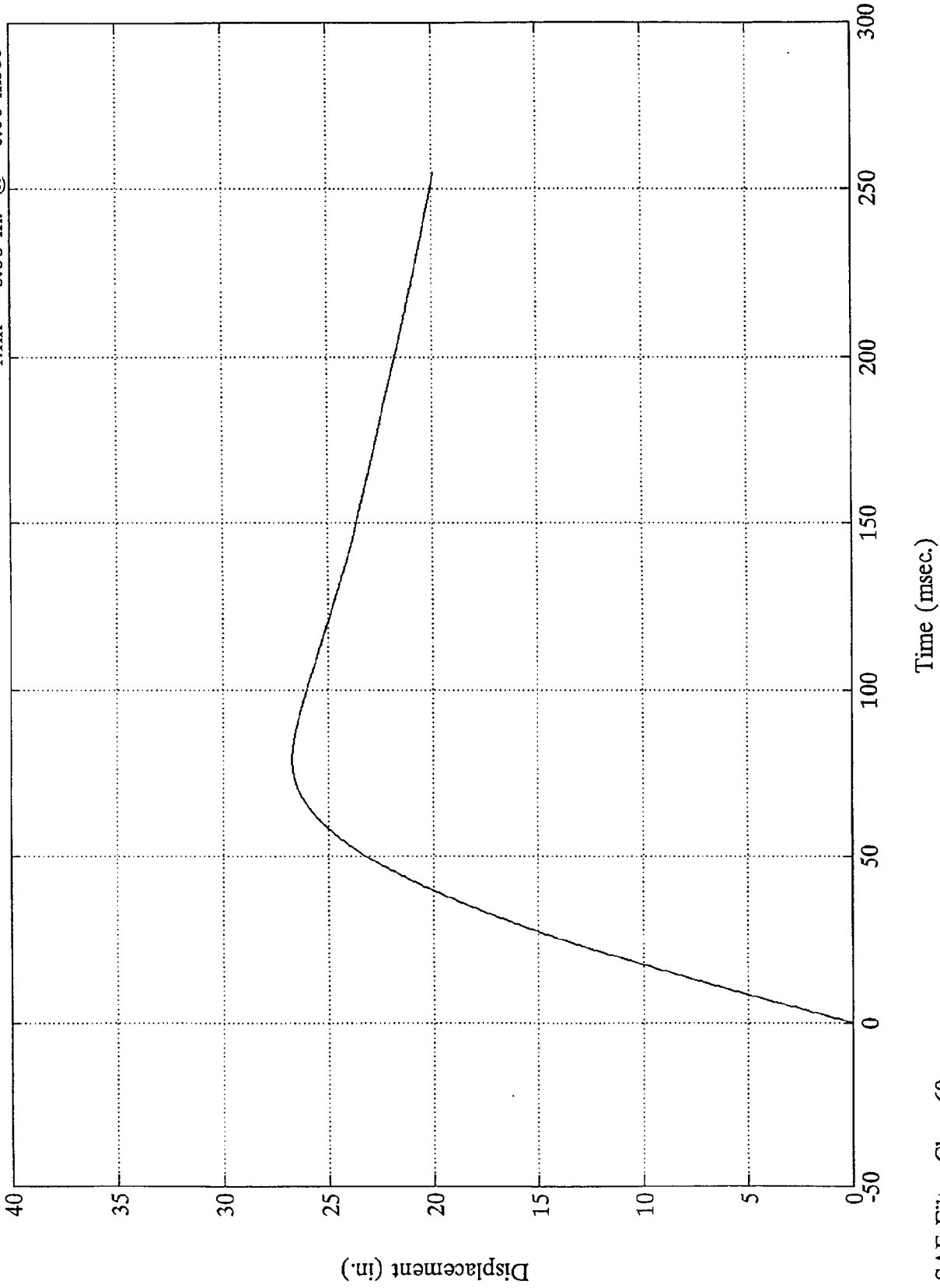
Max = 35.10 mph @ -0.00 msec
Min = -2.90 mph @ 126.48 msec



TSC Frontal Barrier Test #2 - Ford Taurus

L. Rear Seat X-Member (X)

Max = 26.70 in. @ 80.88 msec
Min = 0.00 in. @ -0.00 msec

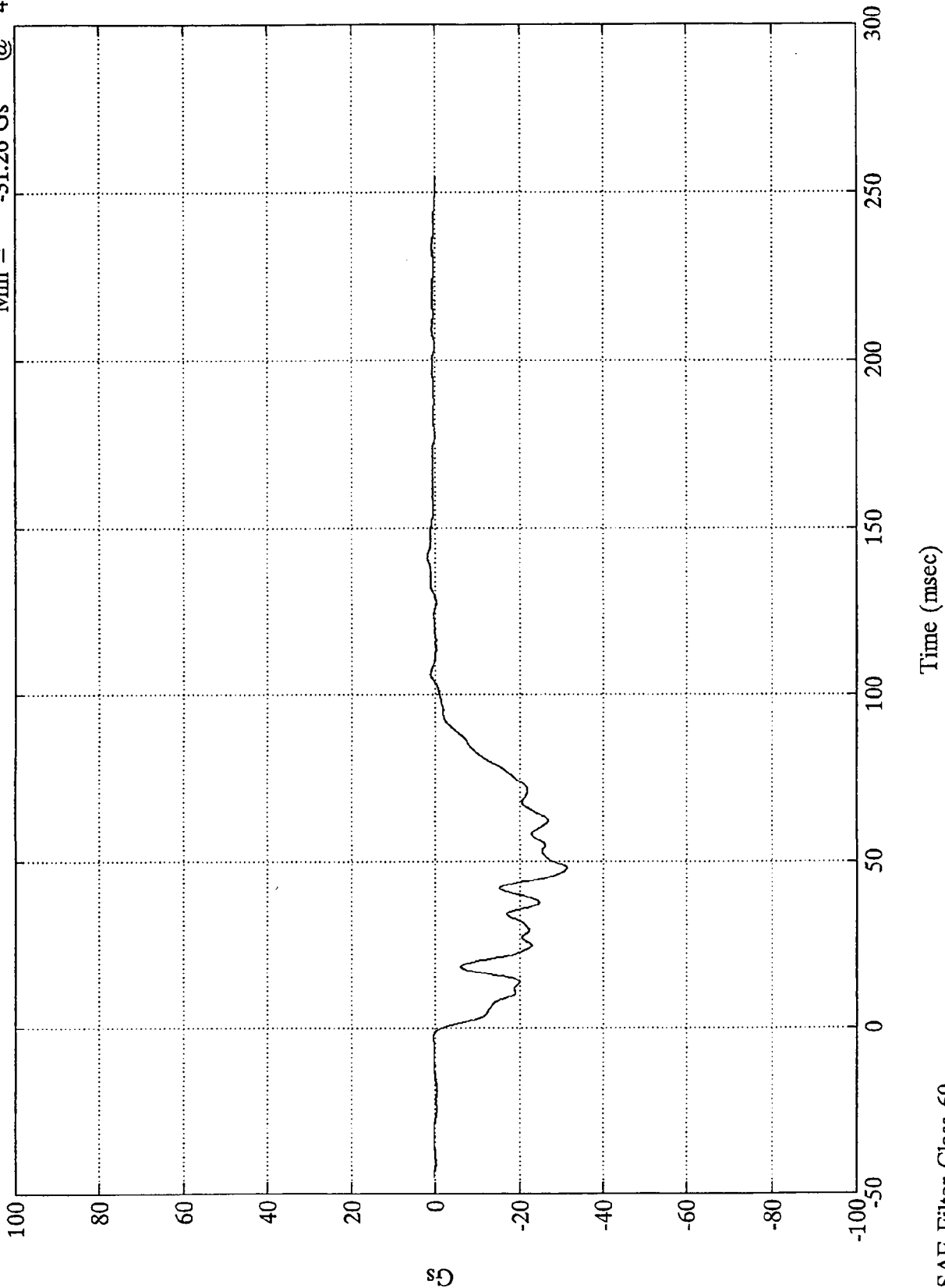


SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

R. Rear Seat X-Member (X)

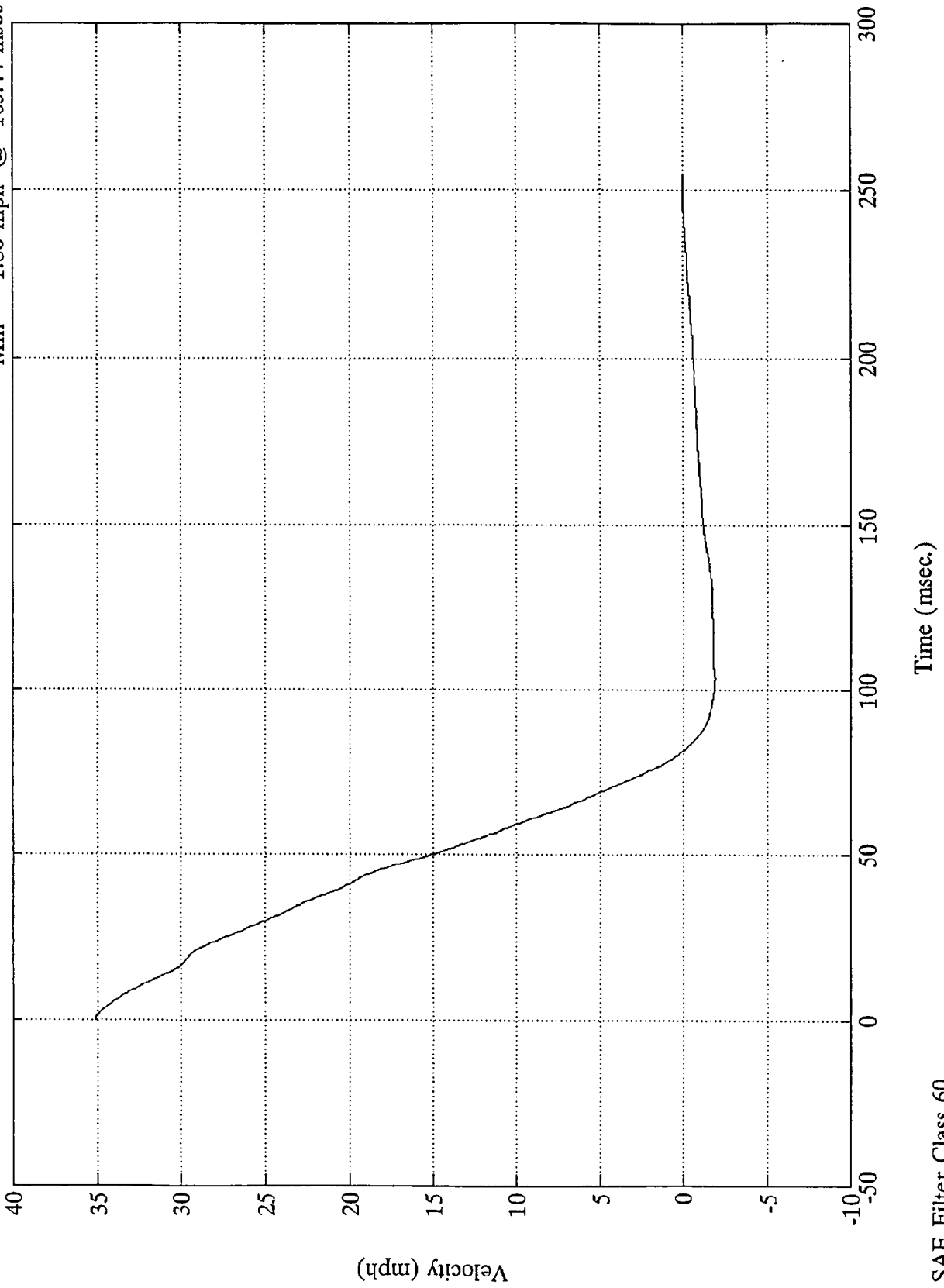
Max = 1.83 Gs @ 141.72 msec
Min = -31.26 Gs @ 48.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

R. Rear Seat X-Member (X)

Max = 35.10 mph @ -0.00 msec
Min = -1.86 mph @ 103.44 msec

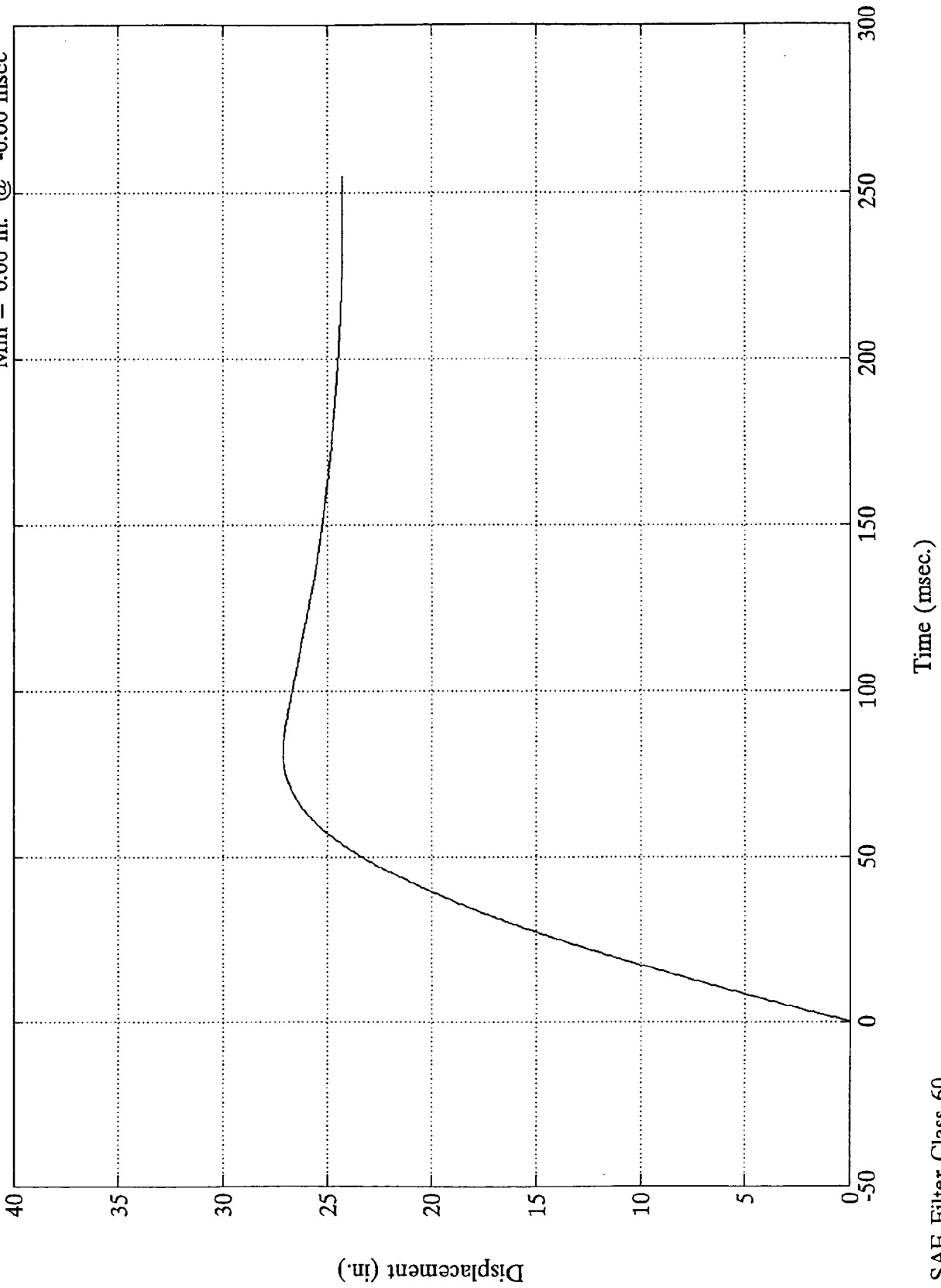


SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

R. Rear Seat X-Member (X)

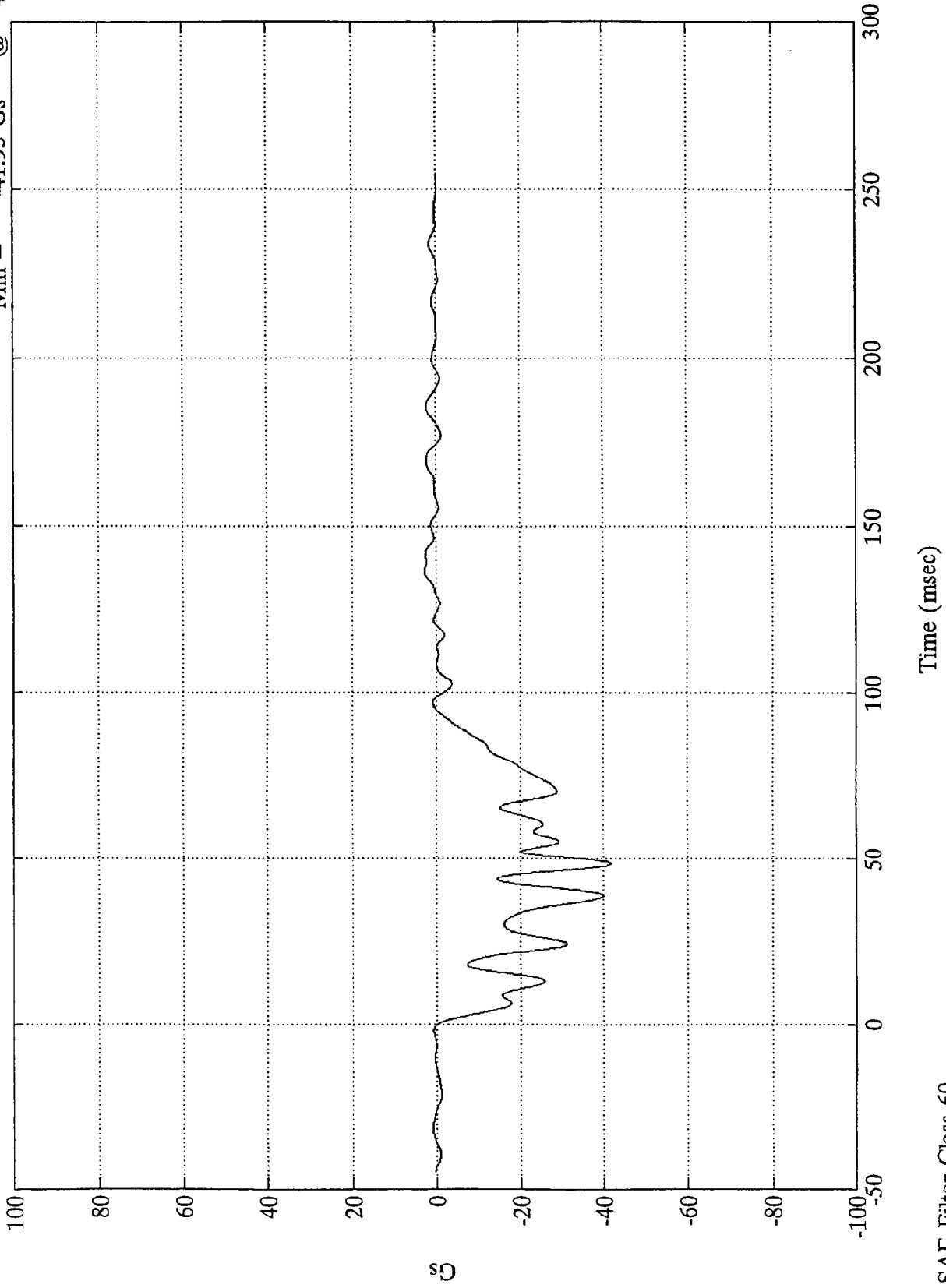
Max = 27.12 in. @ 83.04 msec
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (X)

Max = 2.82 Gs @ 136.32 msec
Min = -41.93 Gs @ 48.47 msec



Gs
B-10

8118-2

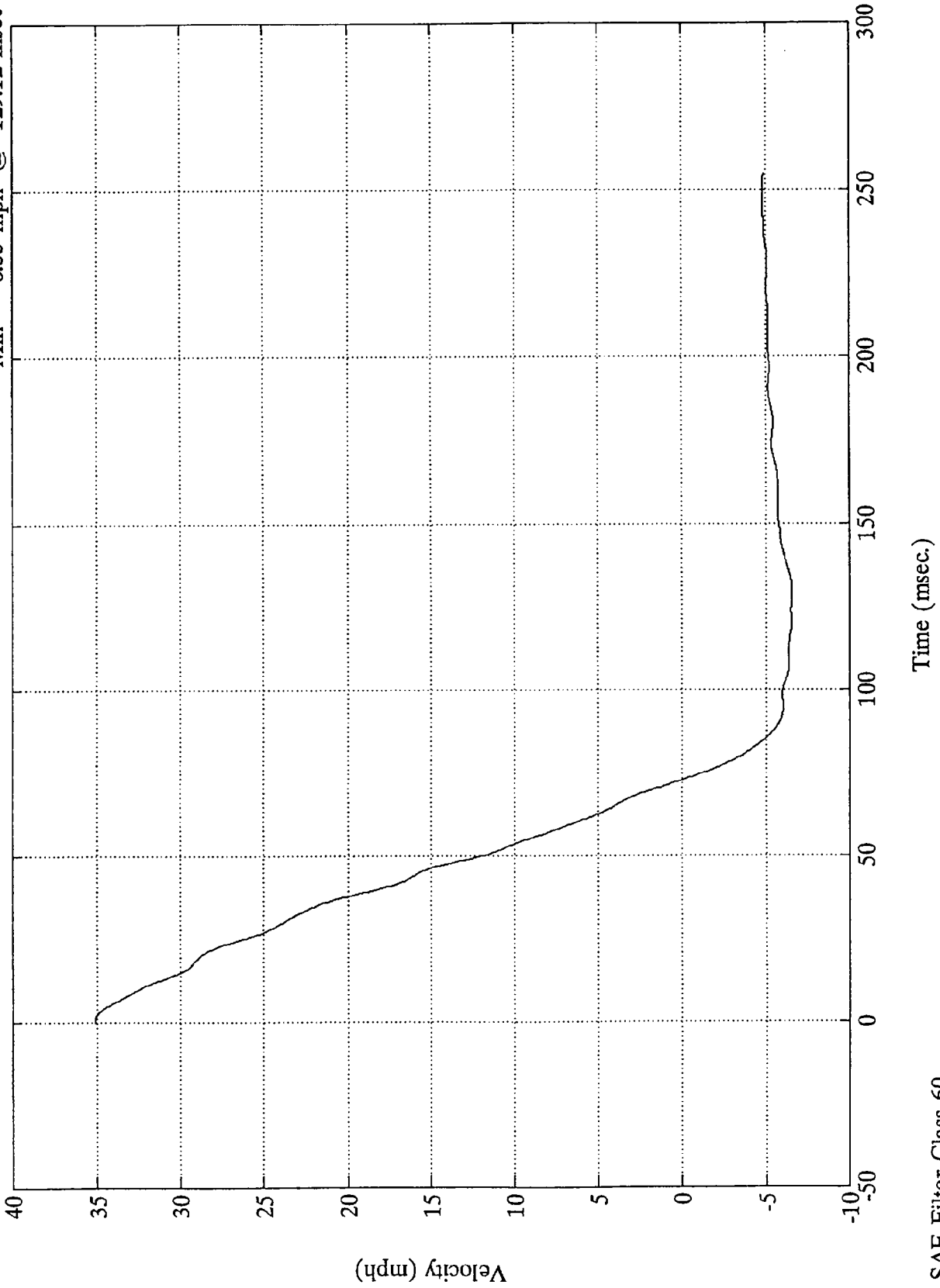
SAE Filter Class 60



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (X)

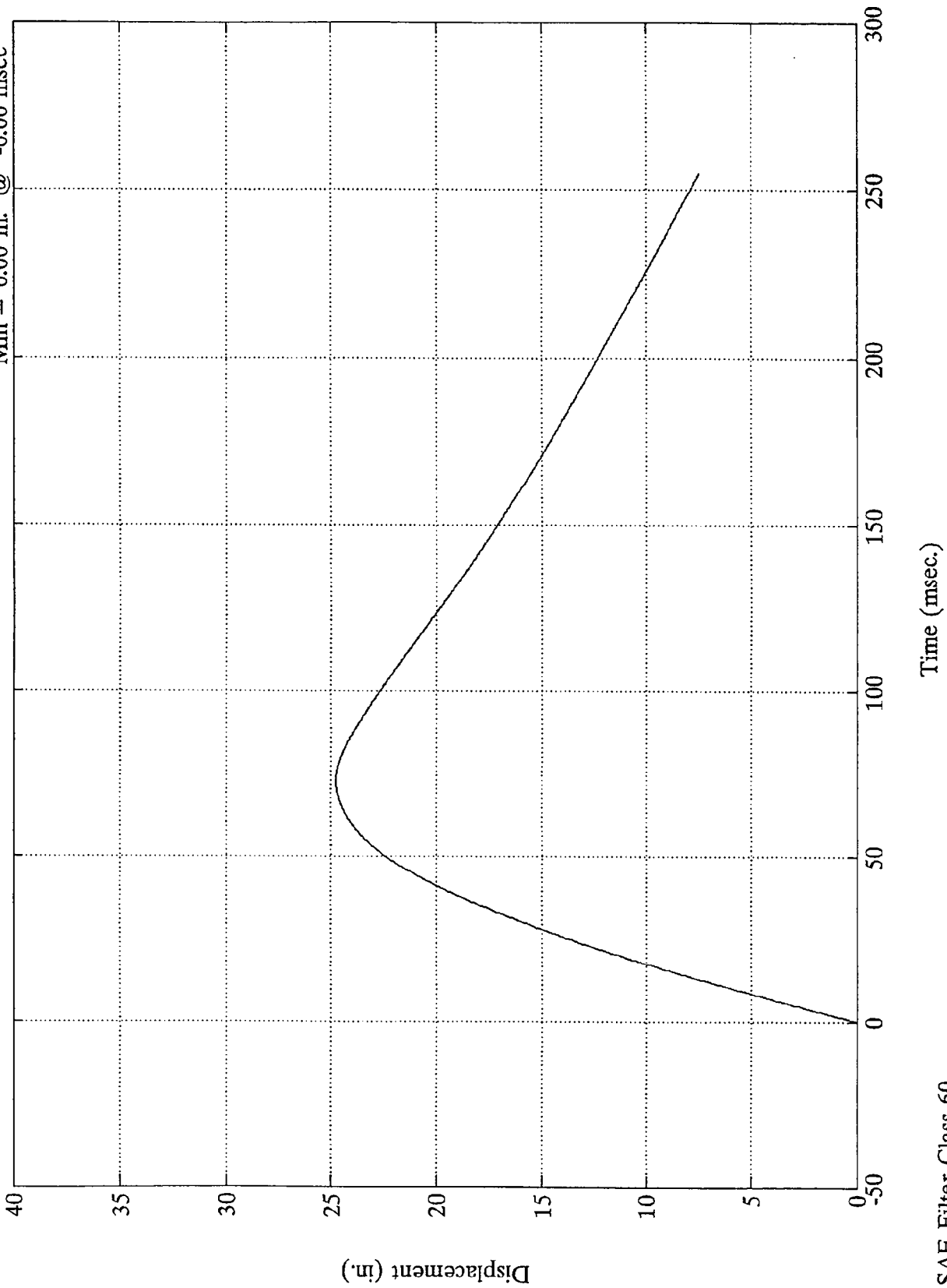
Max = 35.10 mph @ 0.24 msec
Min = -6.55 mph @ 129.12 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (X)

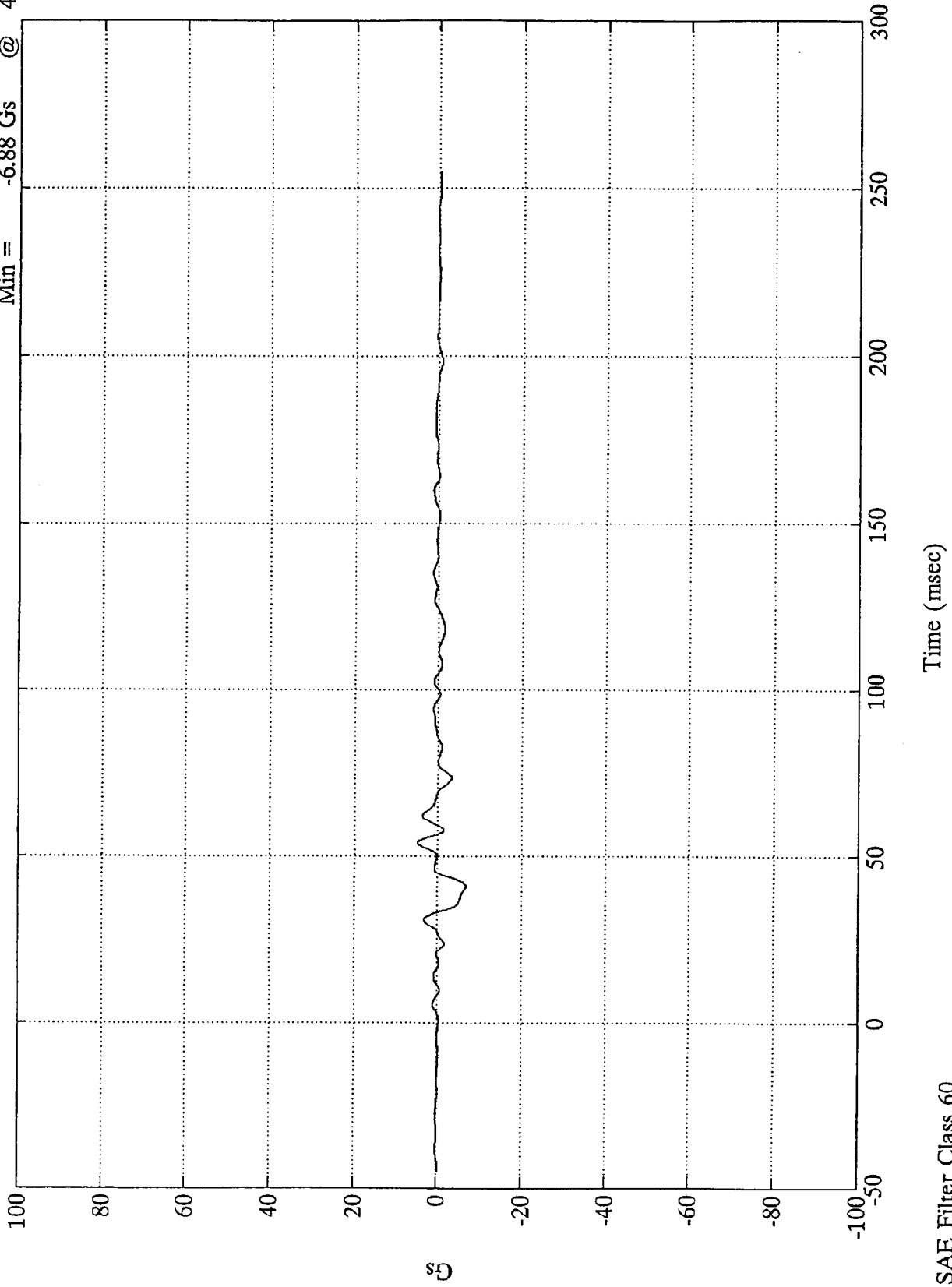
Max = 24.79 in. @ 73.92 msec
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 4.84 Gs @ 53.88 msec
Min = -6.88 Gs @ 40.80 msec

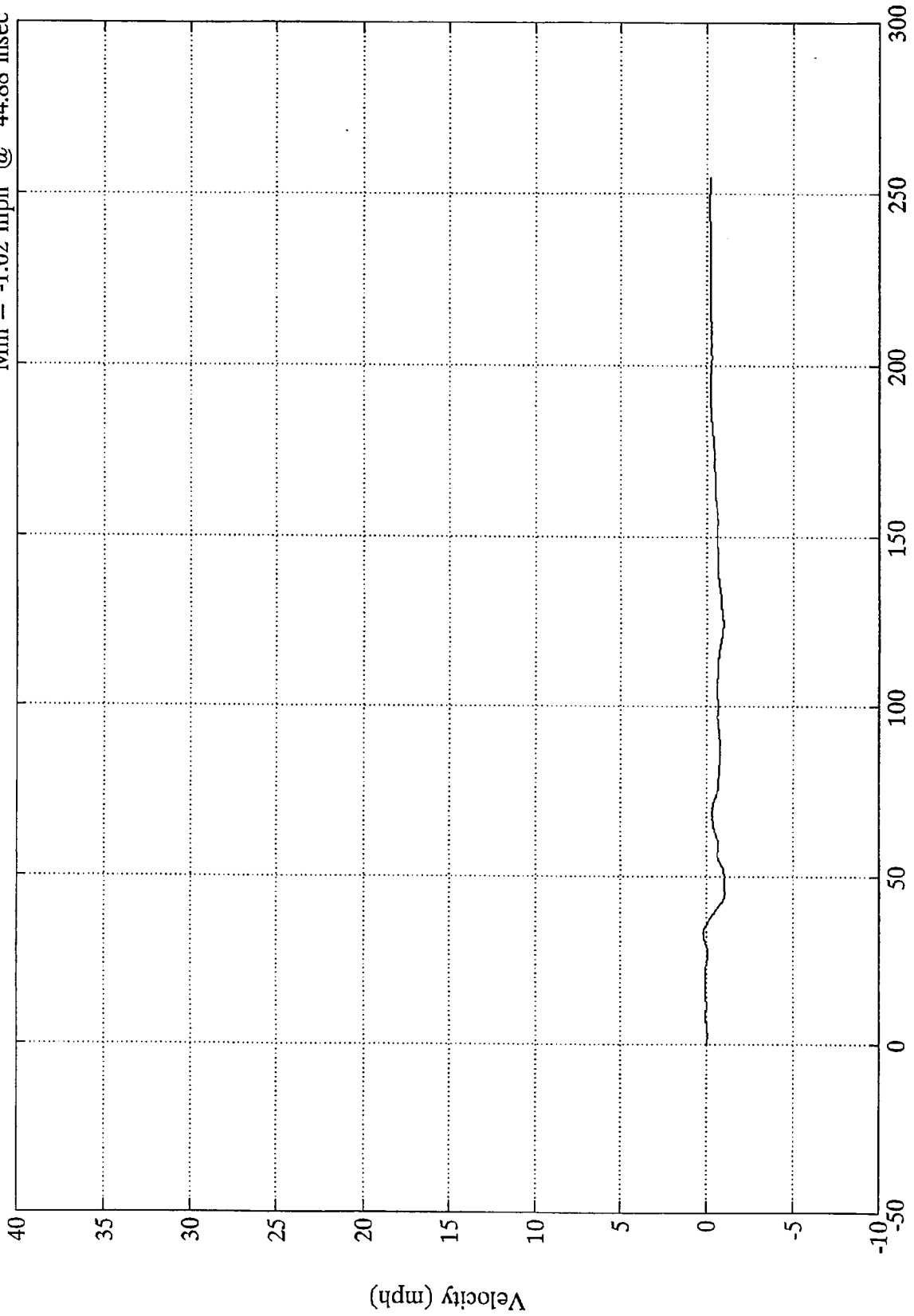
Rear Seat X-Member (Y)



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (Y)

Max = 0.20 mph @ 32.88 msec
Min = -1.02 mph @ 44.88 msec



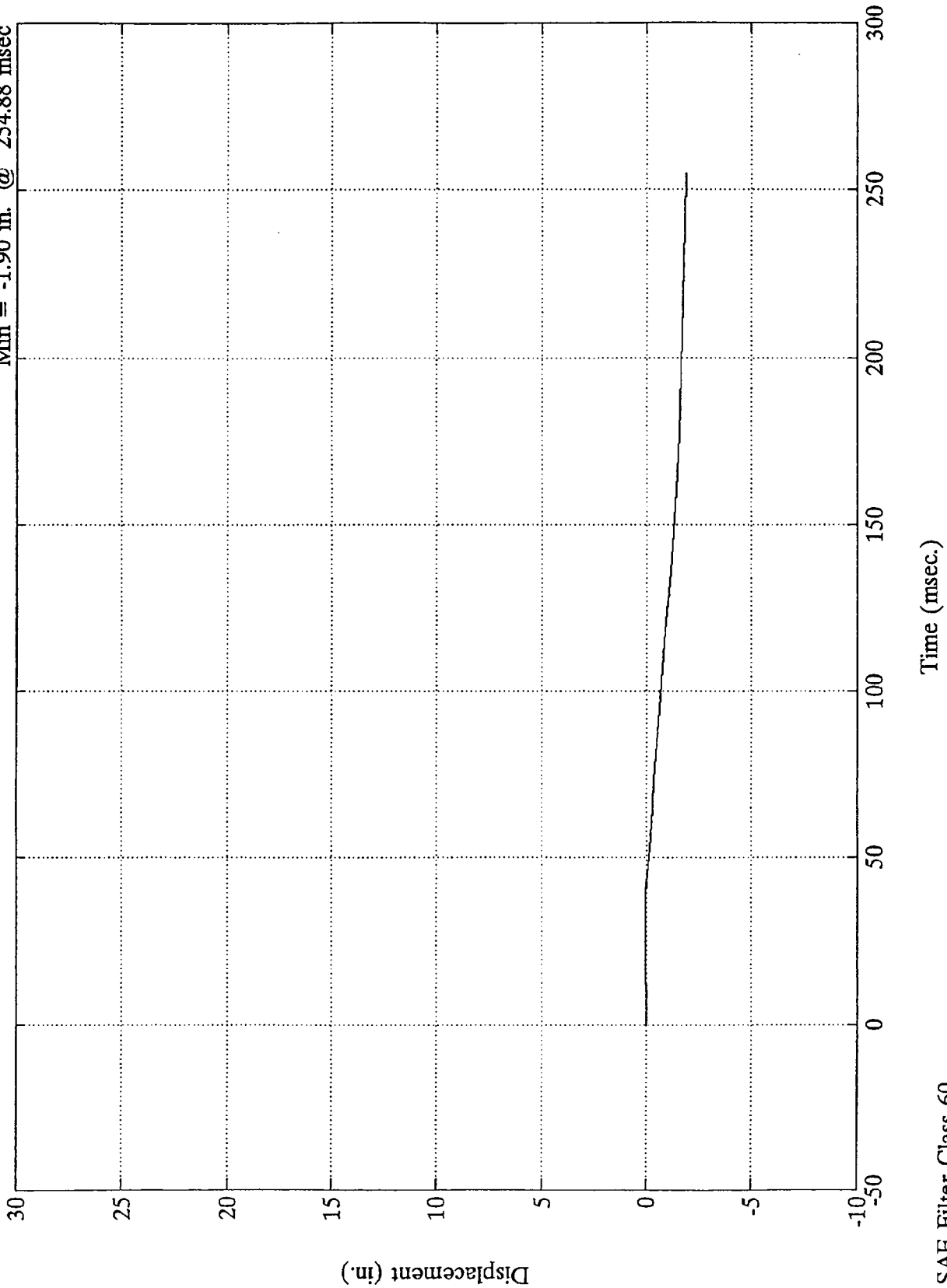
Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (Y)

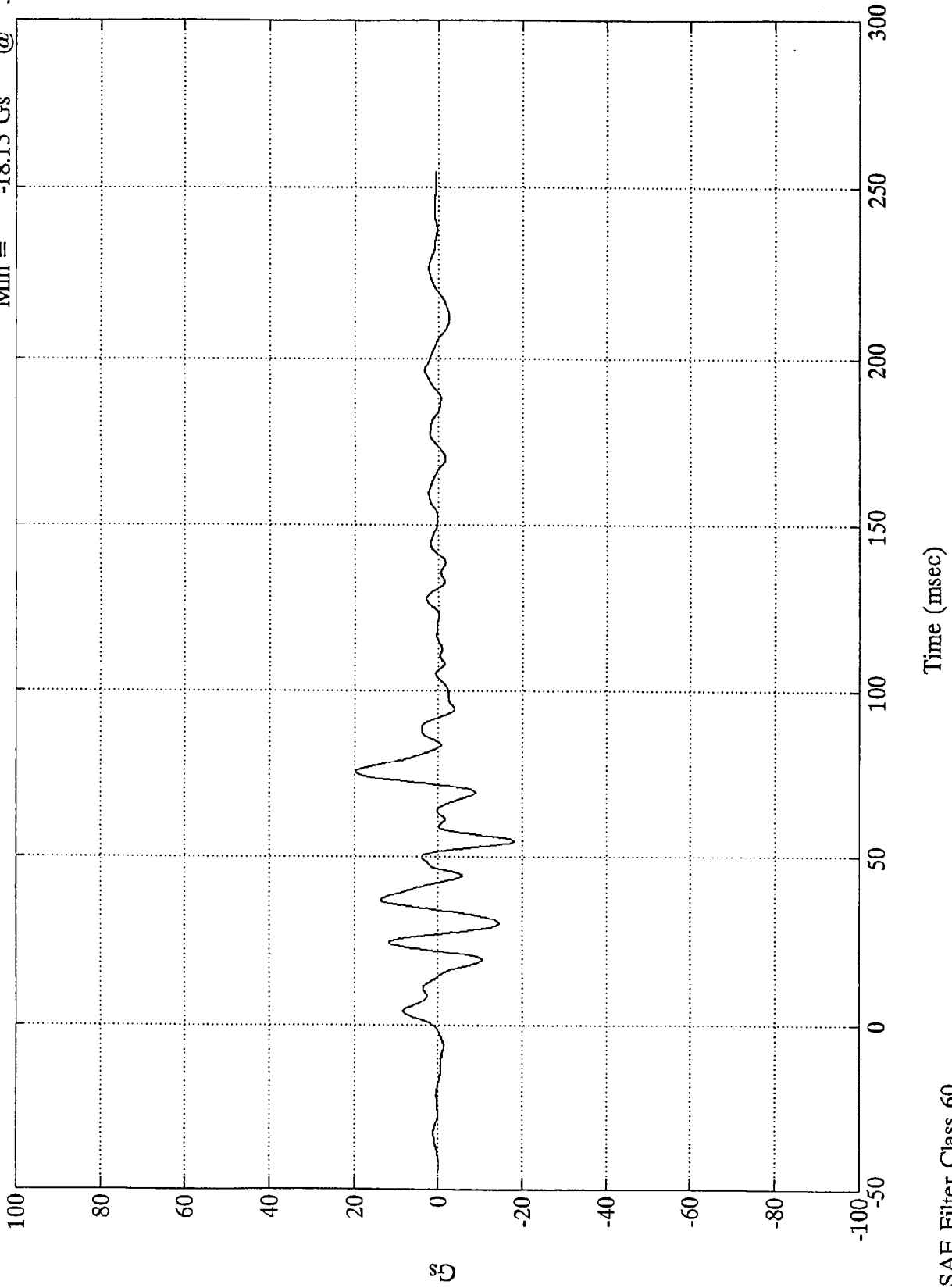
Max = 0.03 in. @ 35.76 msec
Min = -1.90 in. @ 254.88 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (Z)

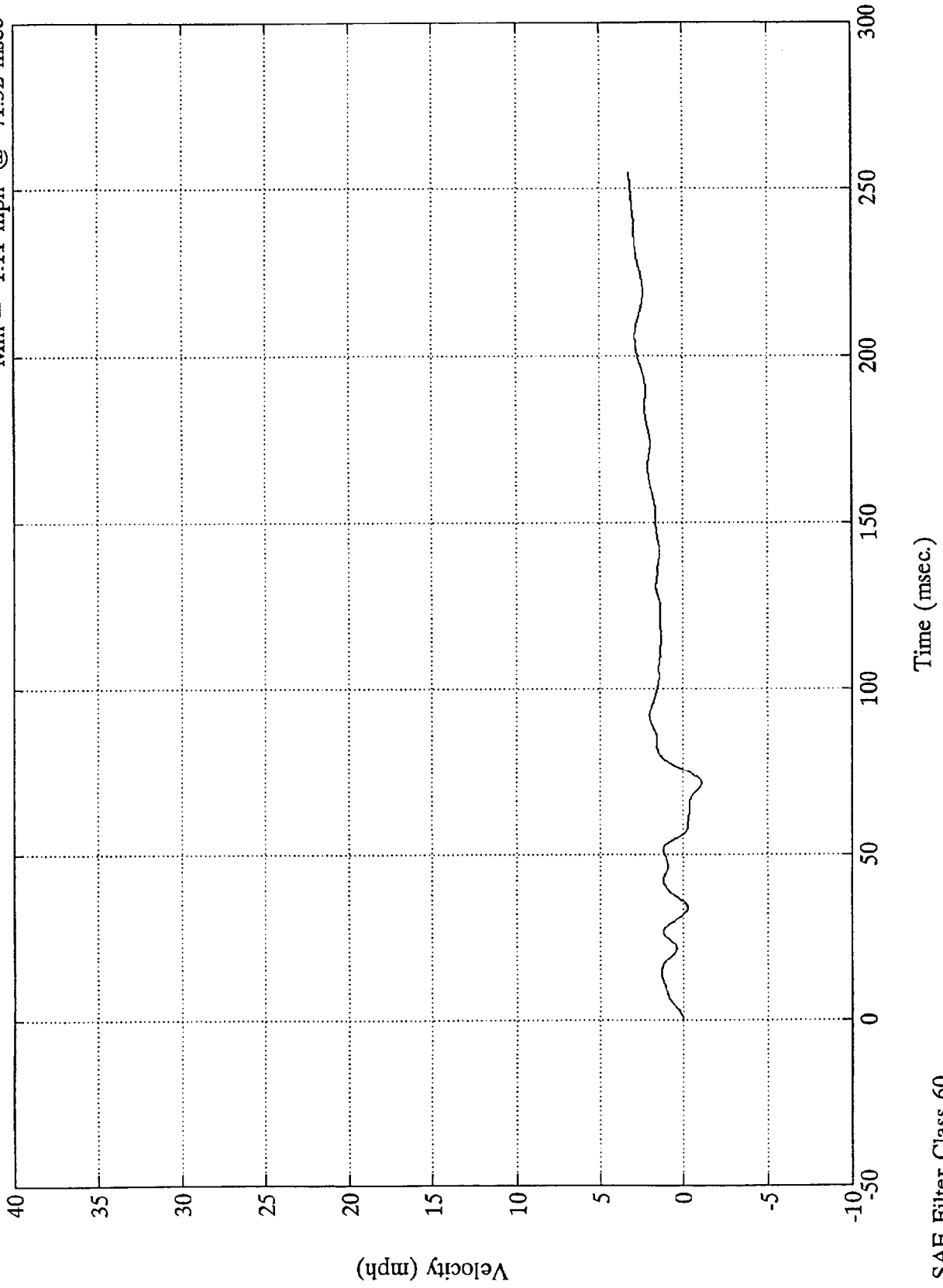
Max = 19.67 Gs @ 75.59 msec
Min = -18.15 Gs @ 54.72 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (Z)

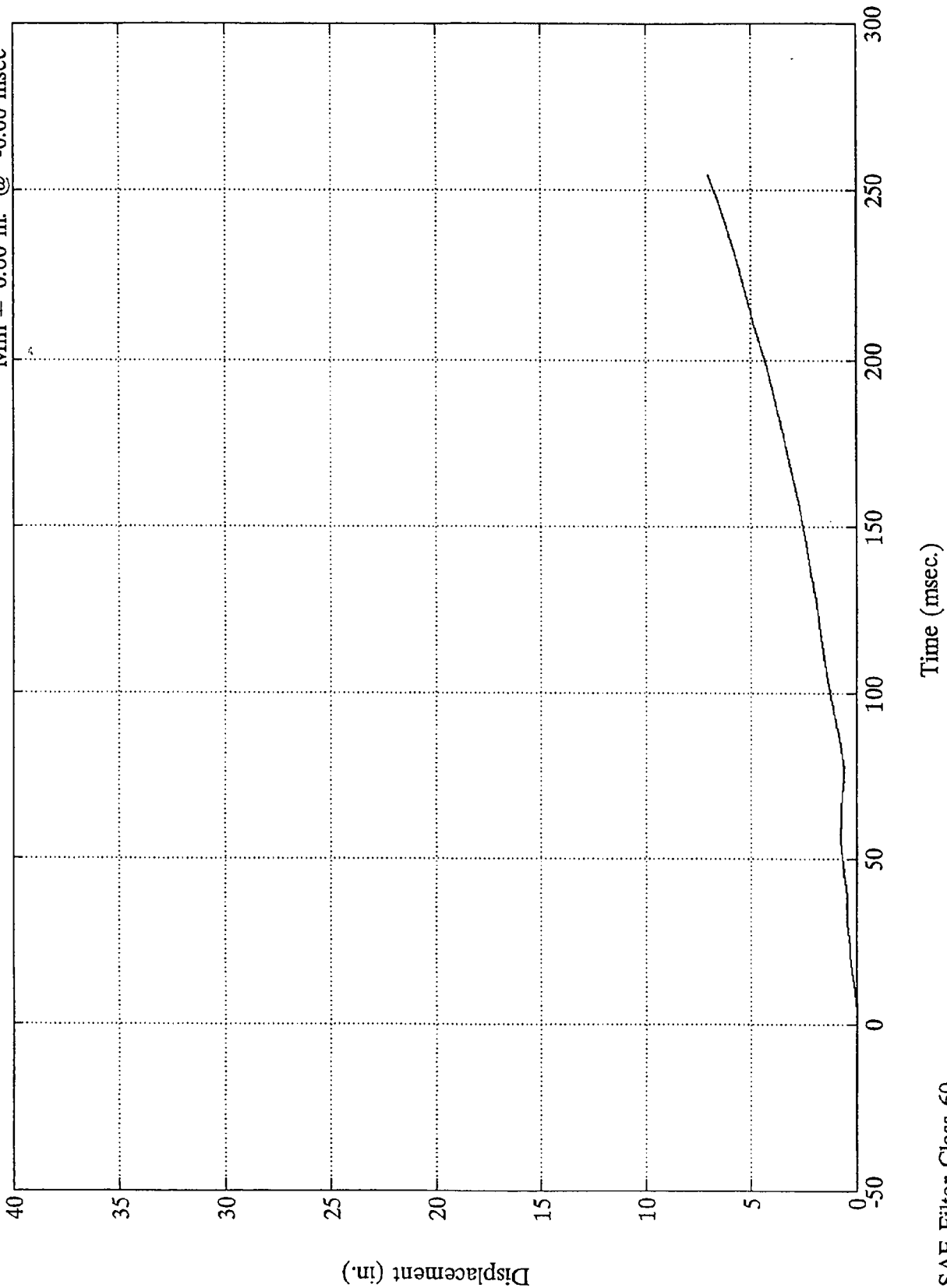
Max = 3.21 mph @ 254.88 msec
Min = -1.11 mph @ 71.52 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Rear Seat X-Member (Z)

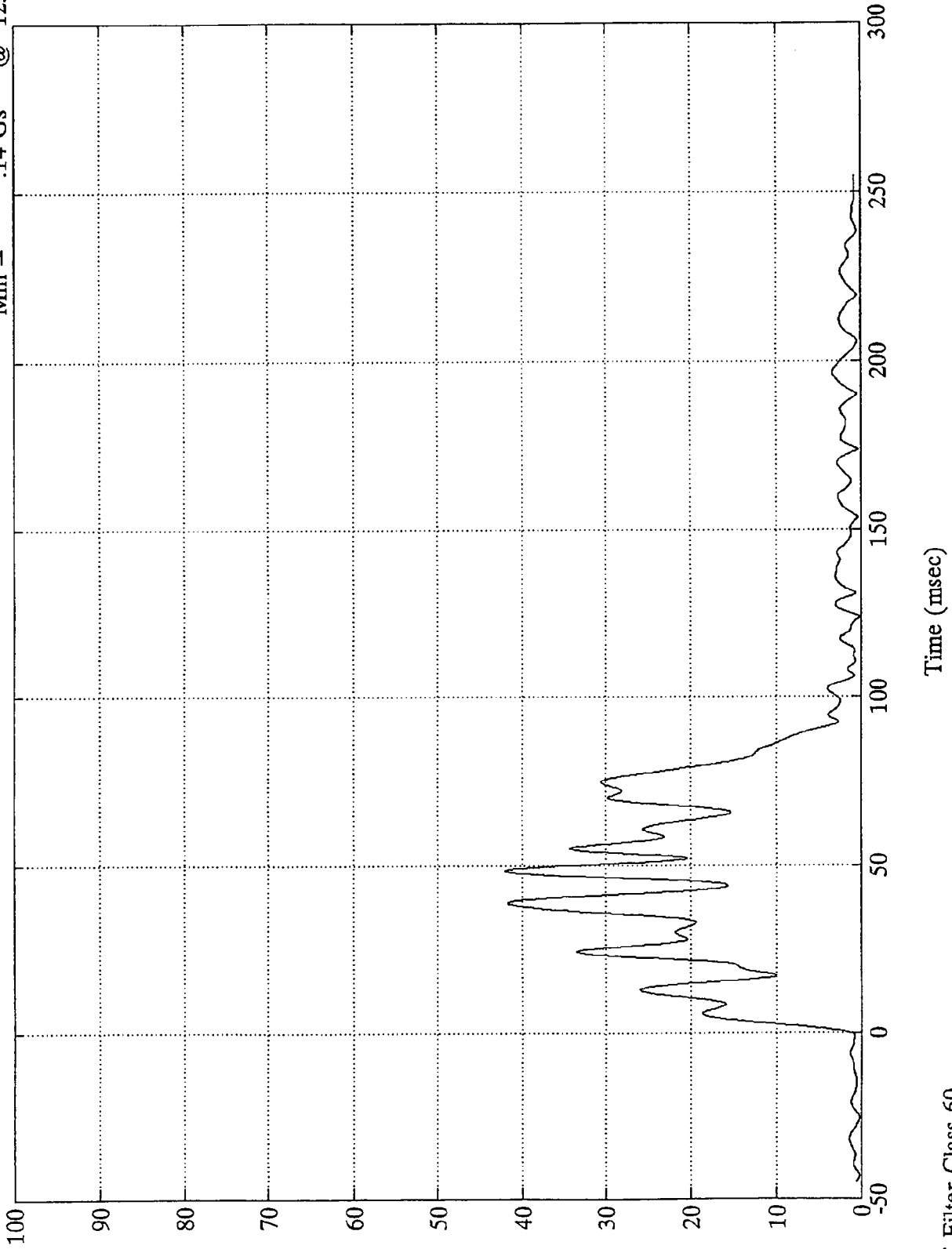
Max = 7.04 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

R. Seat X-Member Result

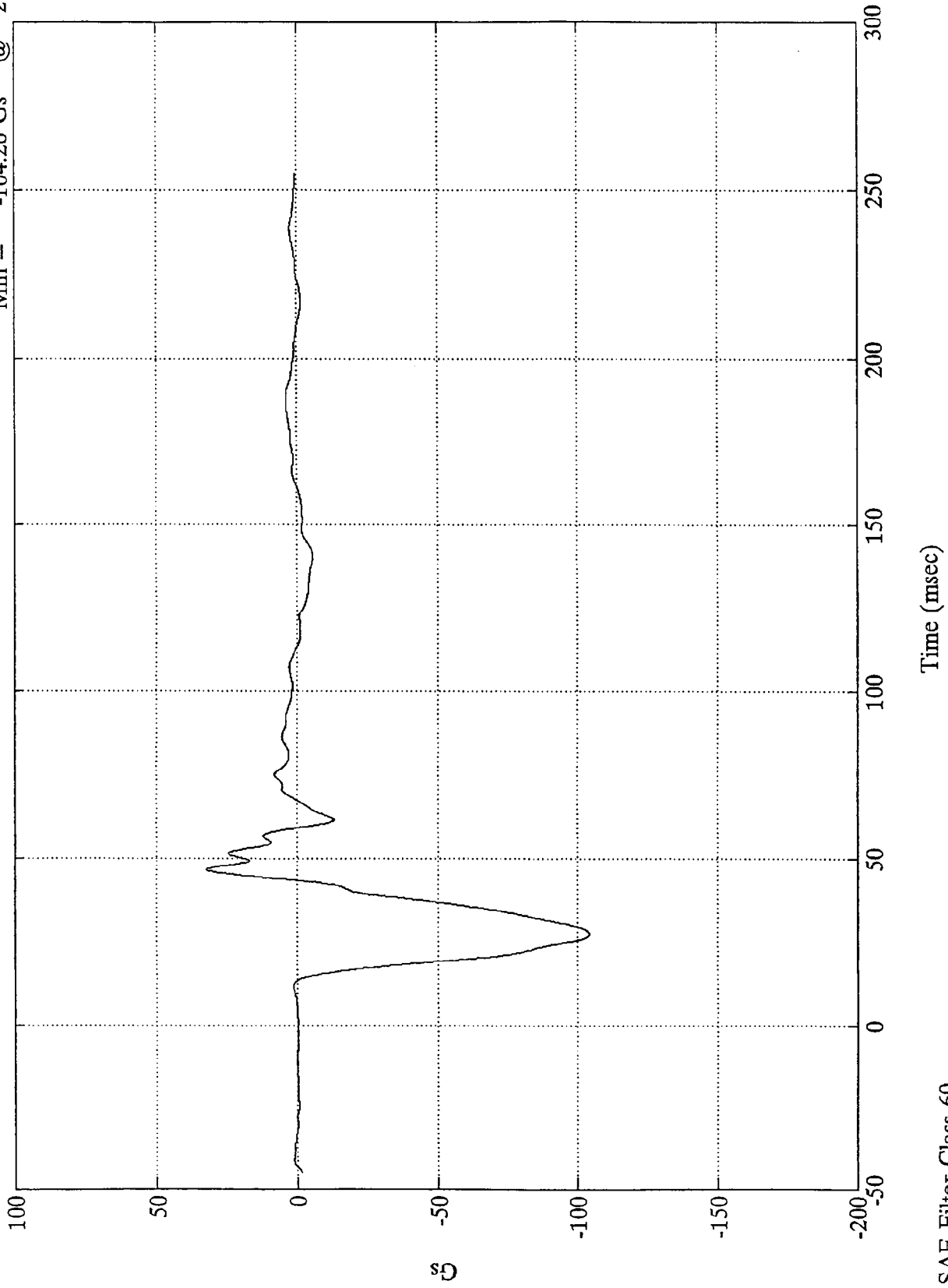
Max = 42.04 Gs @ 48.47 msec
Min = .14 Gs @ 123.96 msec



TSC Frontal Barrier Test #2 - Ford Taurus

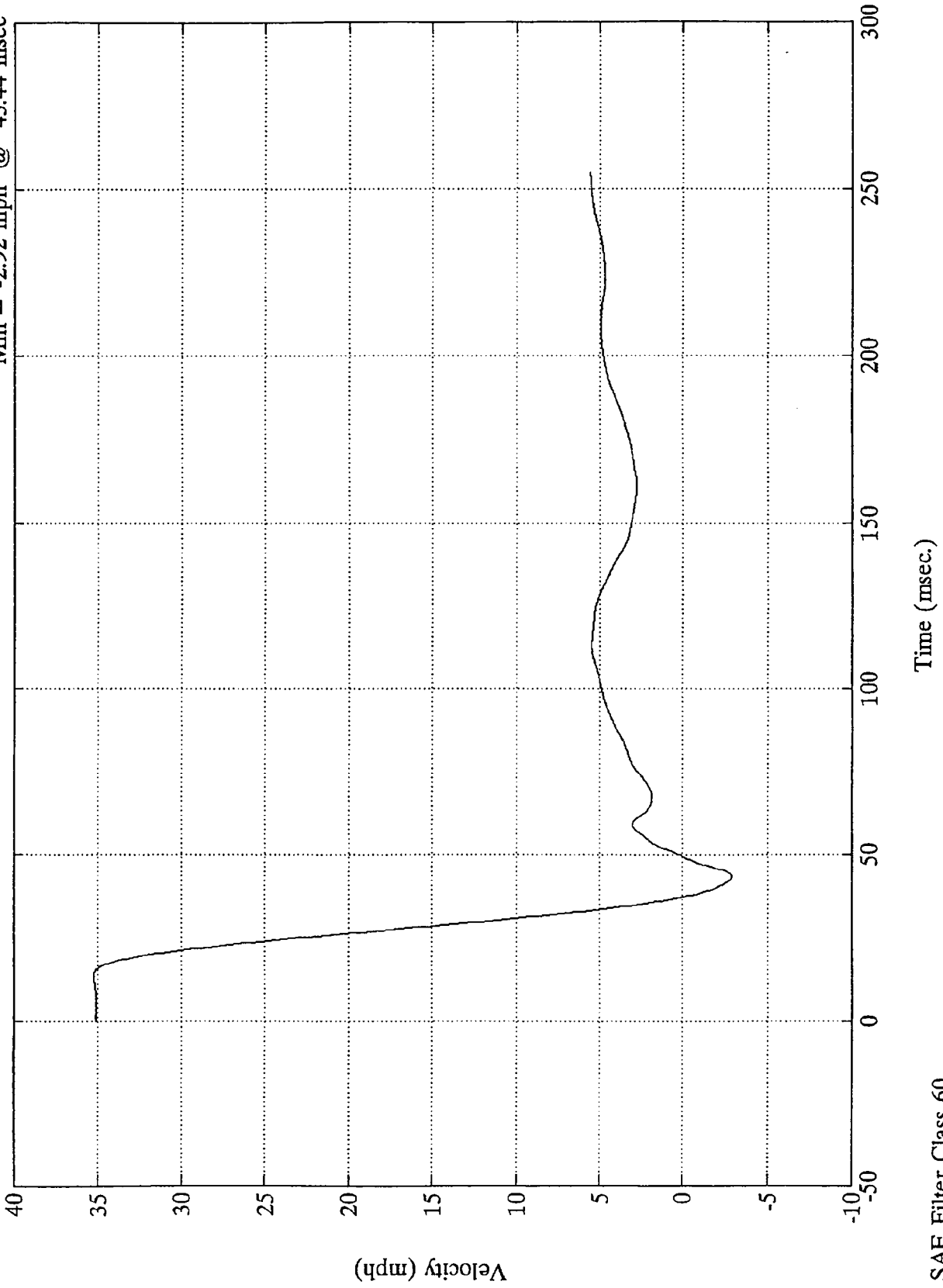
Max = 32.34 Gs @ 46.56 msec
Min = -104.26 Gs @ 27.23 msec

Engine Top (X)



TSC Frontal Barrier Test #2 - Ford Taurus

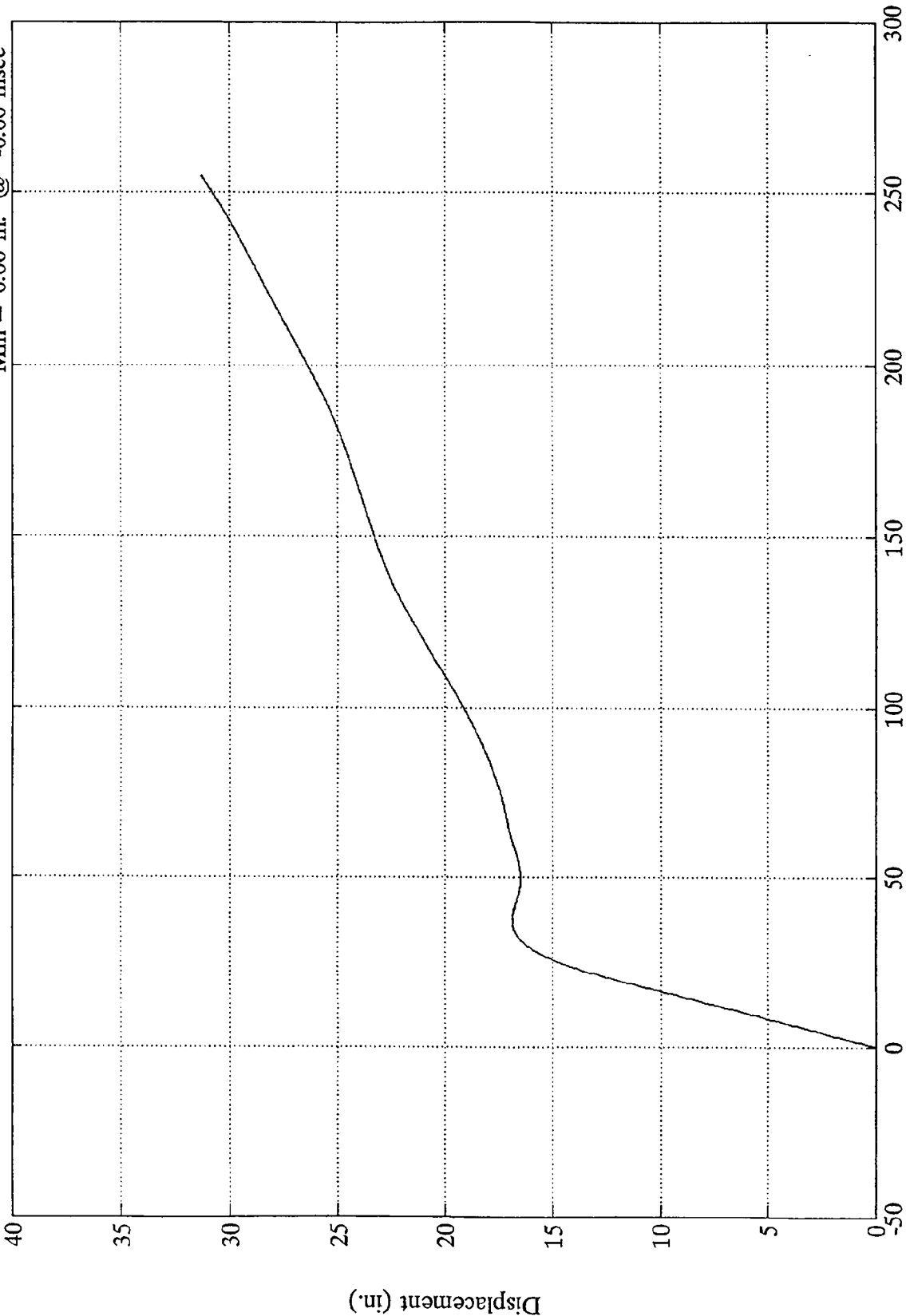
Engine Top (X)
Max = 35.22 mph @ 13.68 msec
Min = -2.92 mph @ 43.44 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 31.25 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec

Engine Top (X)

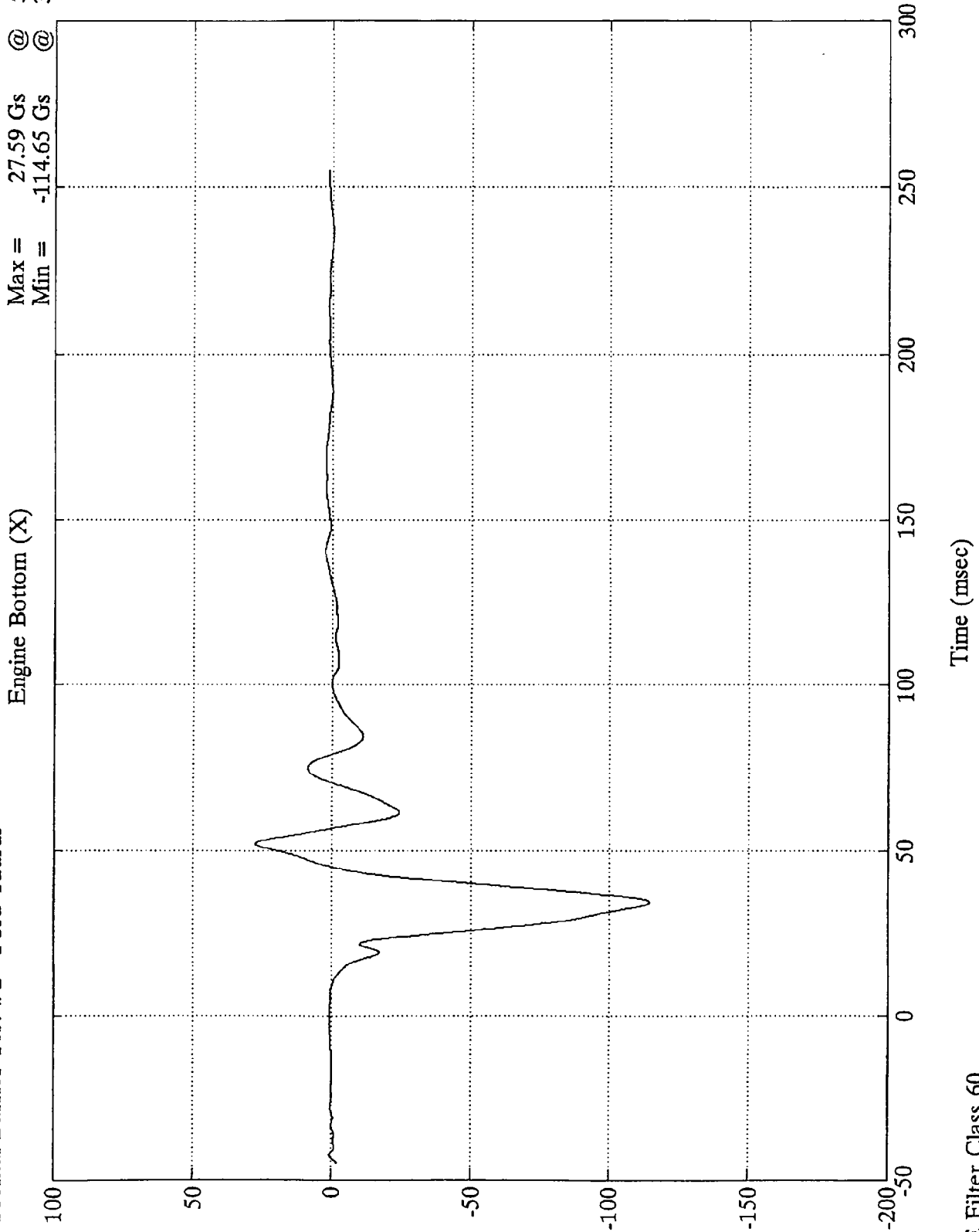


Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

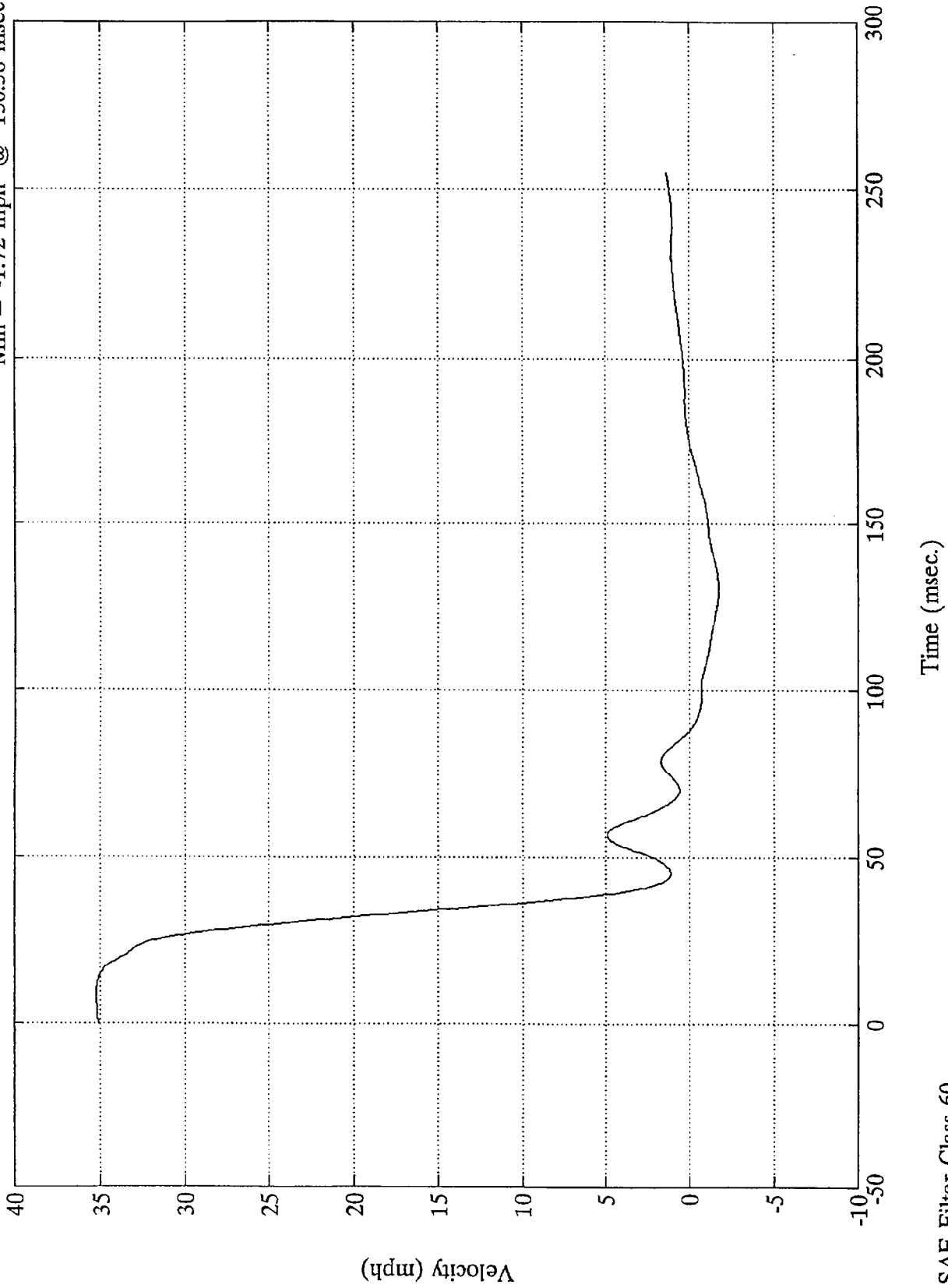
Max = 27.59 Gs @ 52.08 msec
Min = -114.65 Gs @ 34.43 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Engine Bottom (X)

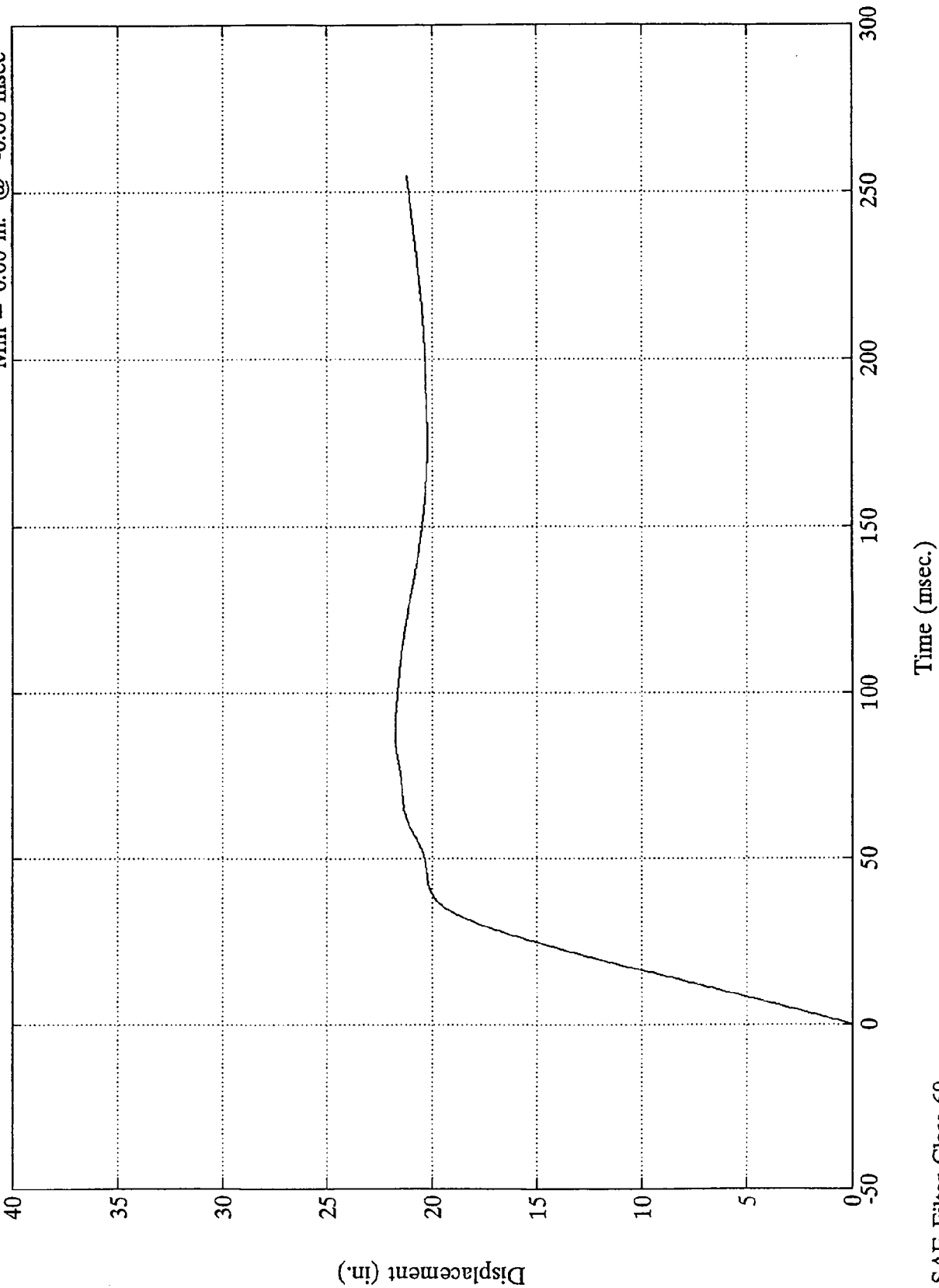
Max = 35.20 mph @ 9.84 msec
Min = -1.72 mph @ 130.56 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 21.76 in. @ 90.48 msec
Min = 0.00 in. @ -0.00 msec

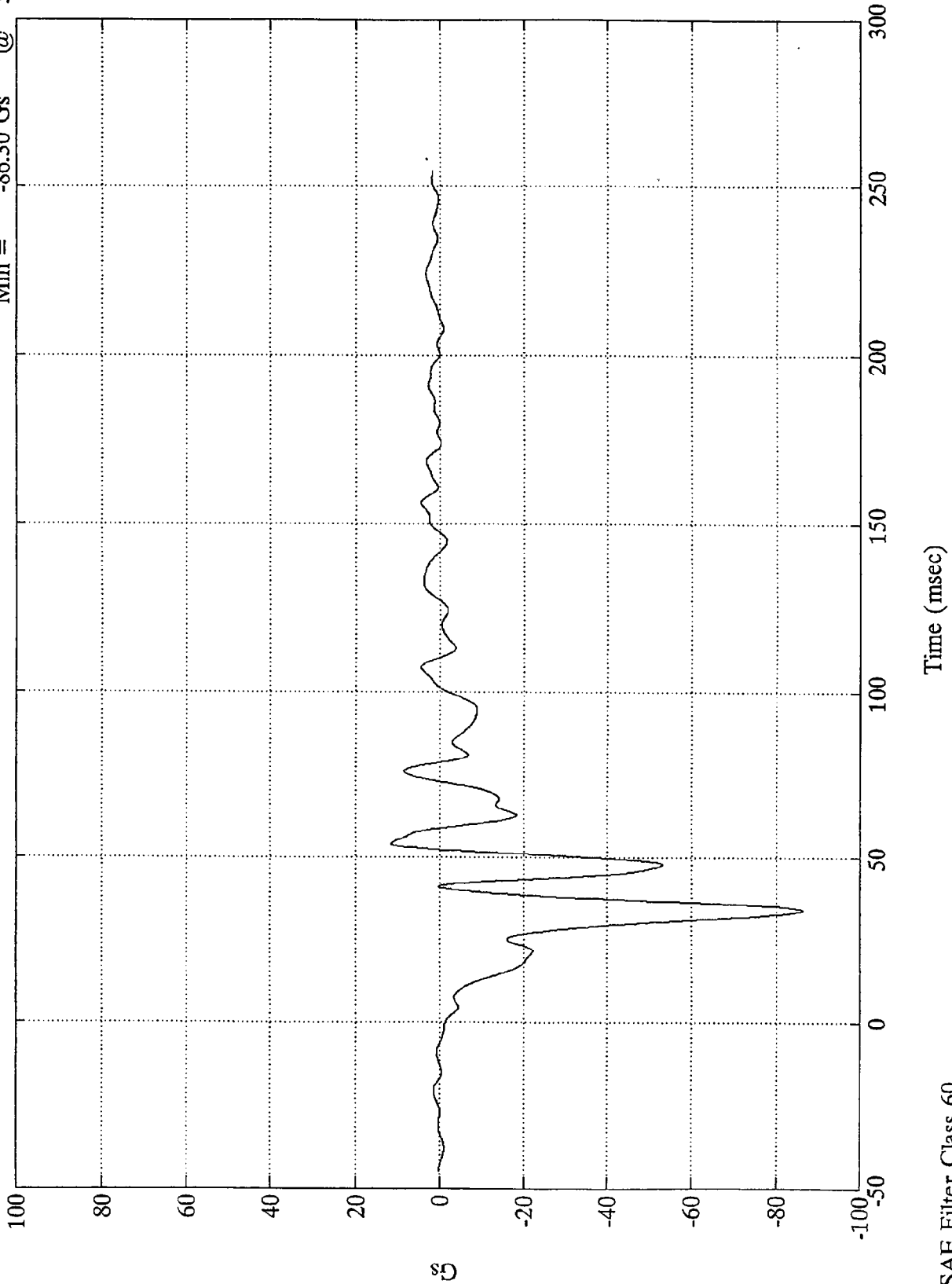
Engine Bottom (X)



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 11.63 Gs @ 54.23 msec
Min = -86.30 Gs @ 34.07 msec

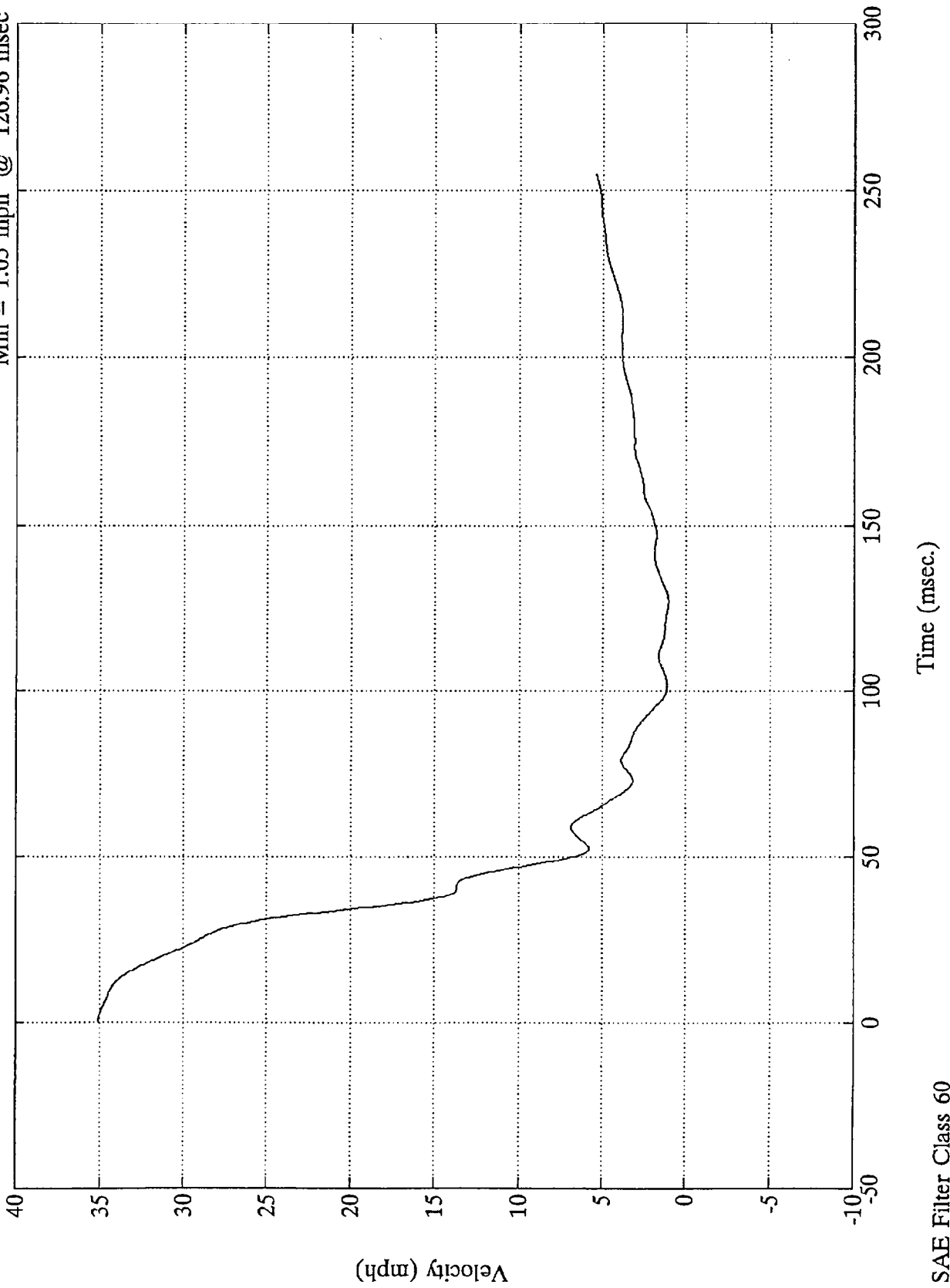
Left Caliper (X)



TSC Frontal Barrier Test #2 - Ford Taurus

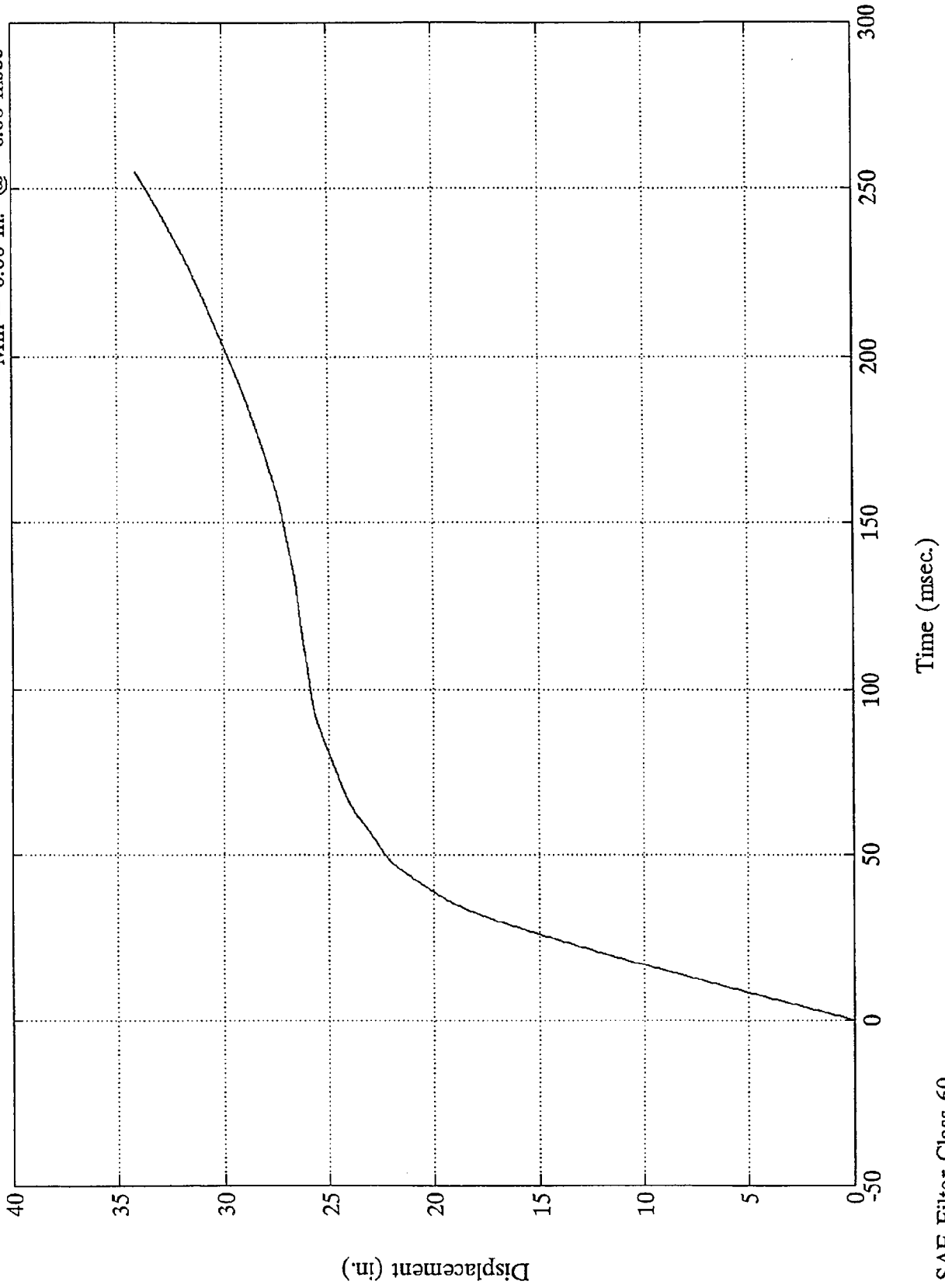
Max = 35.10 mph @ -0.00 msec
Min = 1.05 mph @ 126.96 msec

Left Caliper (X)



TSC Frontal Barrier Test #2 - Ford Taurus

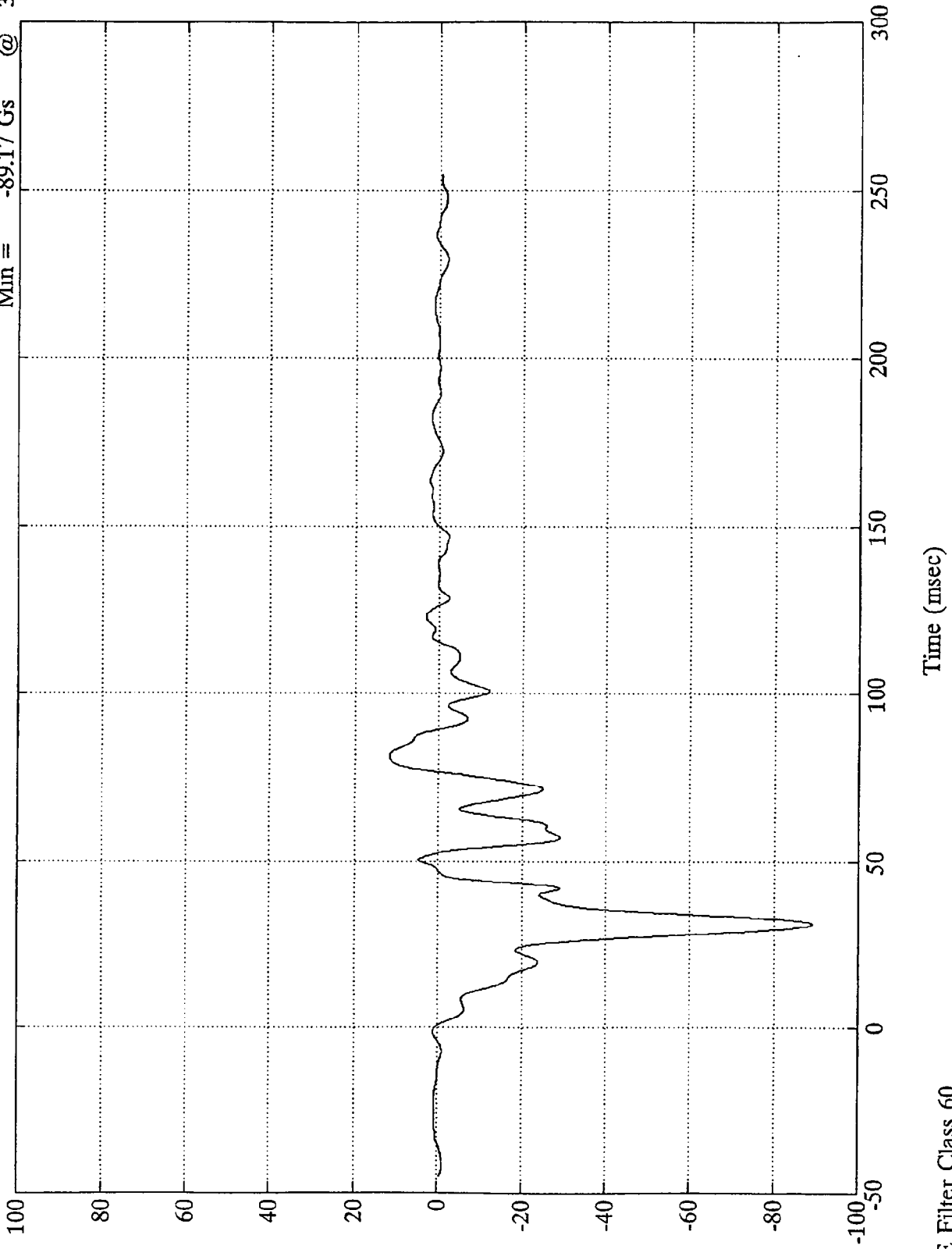
Left Caliper (X)
Max = 34.06 in. @ 254.88 msec
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Right Caliper (X)

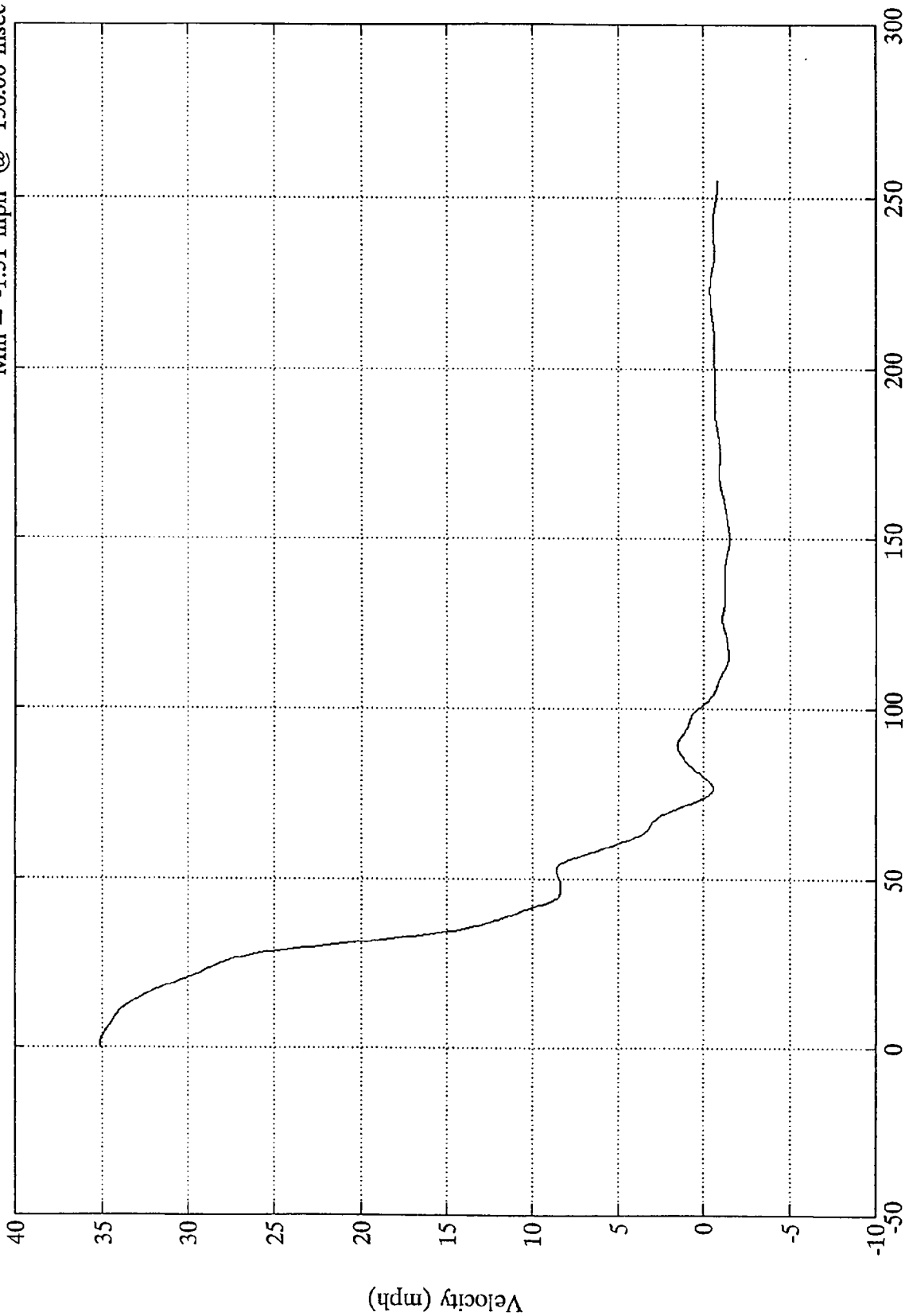
Max = 11.72 Gs @ 81.48 msec
Min = -89.17 Gs @ 31.31 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 35.10 mph @ 0.96 msec
Min = -1.51 mph @ 150.00 msec

Right Caliper (X)

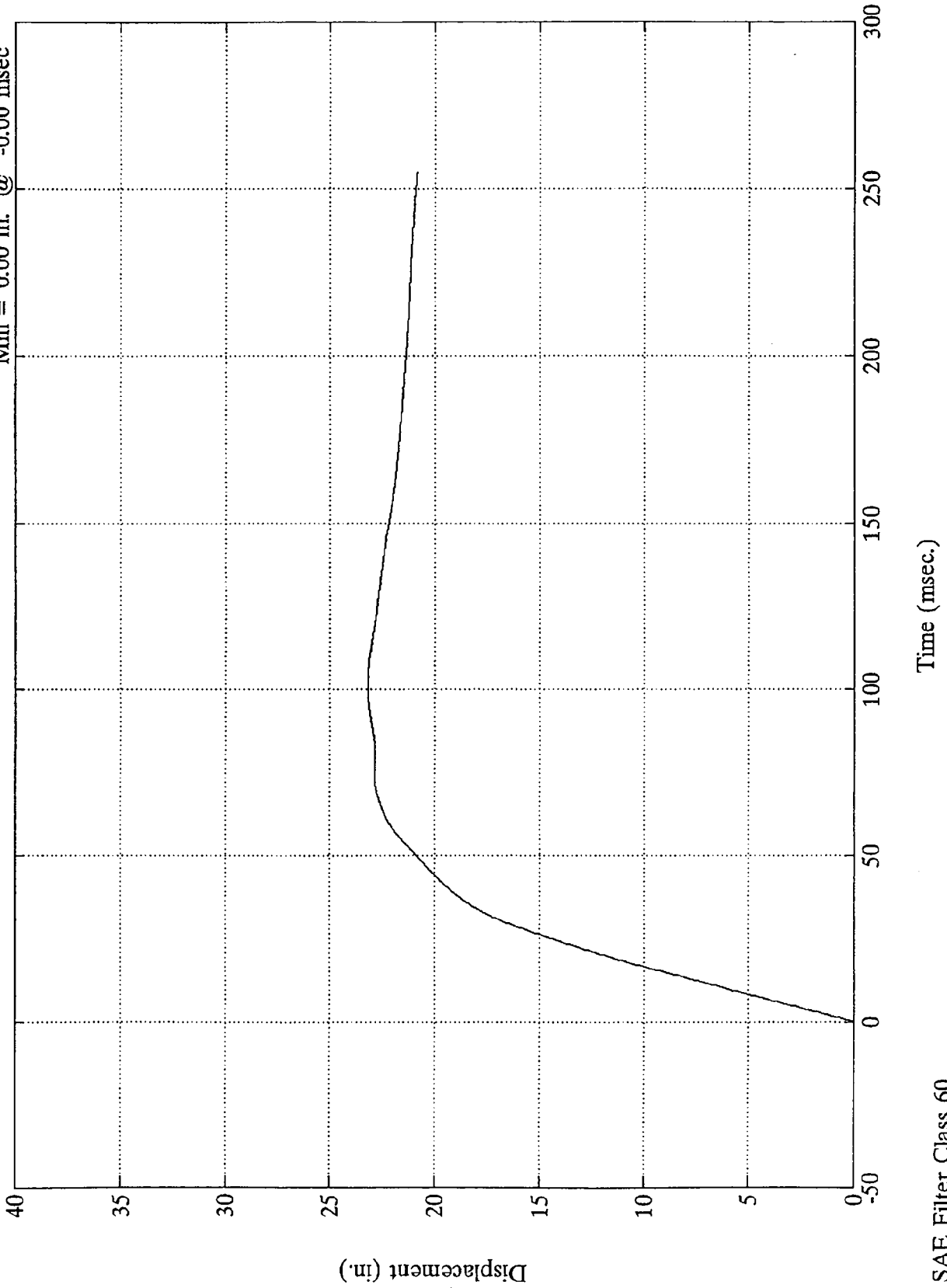


Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

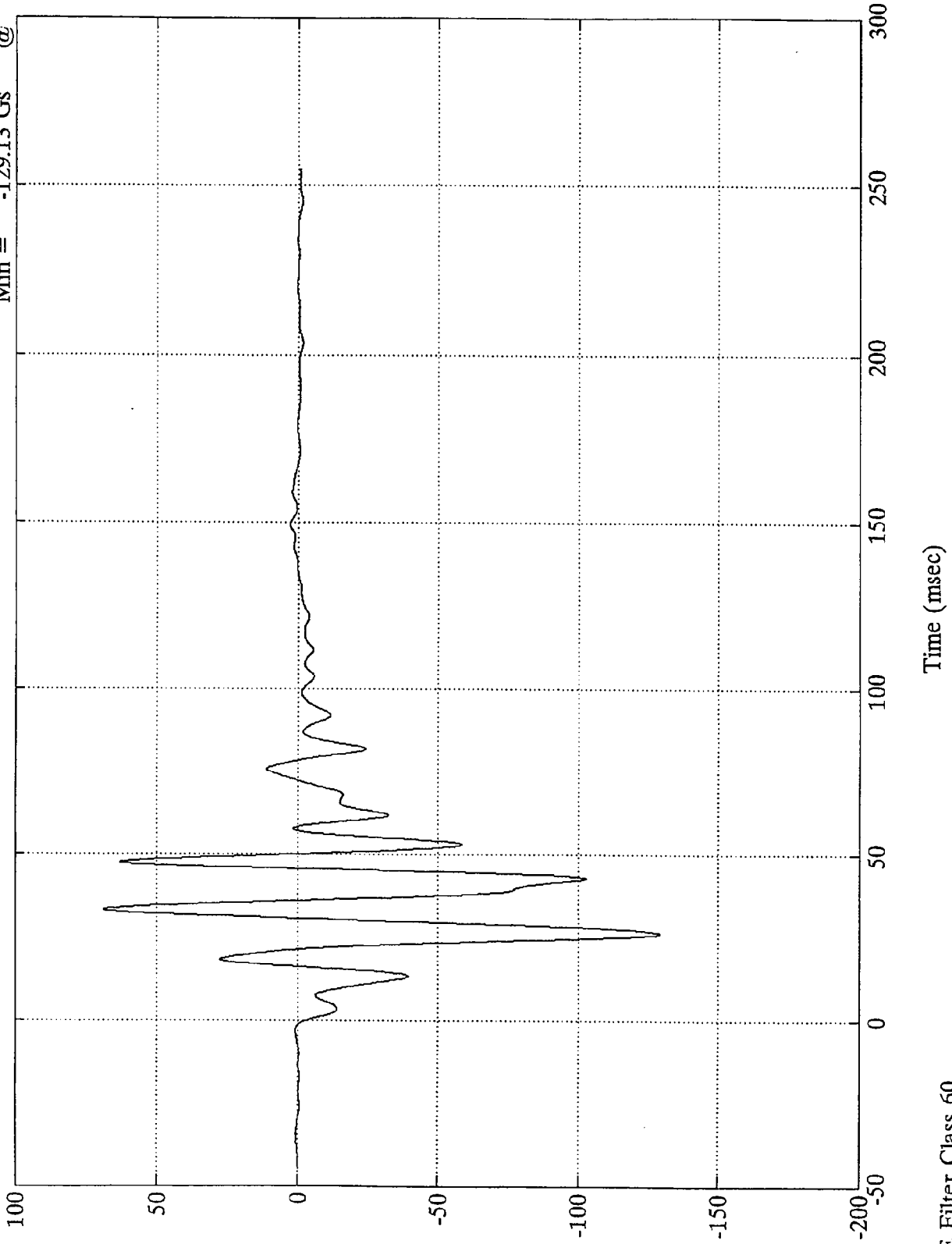
Right Caliper (X)
Max = 23.20 in. @ 102.96 msec
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Front X-Member (X)

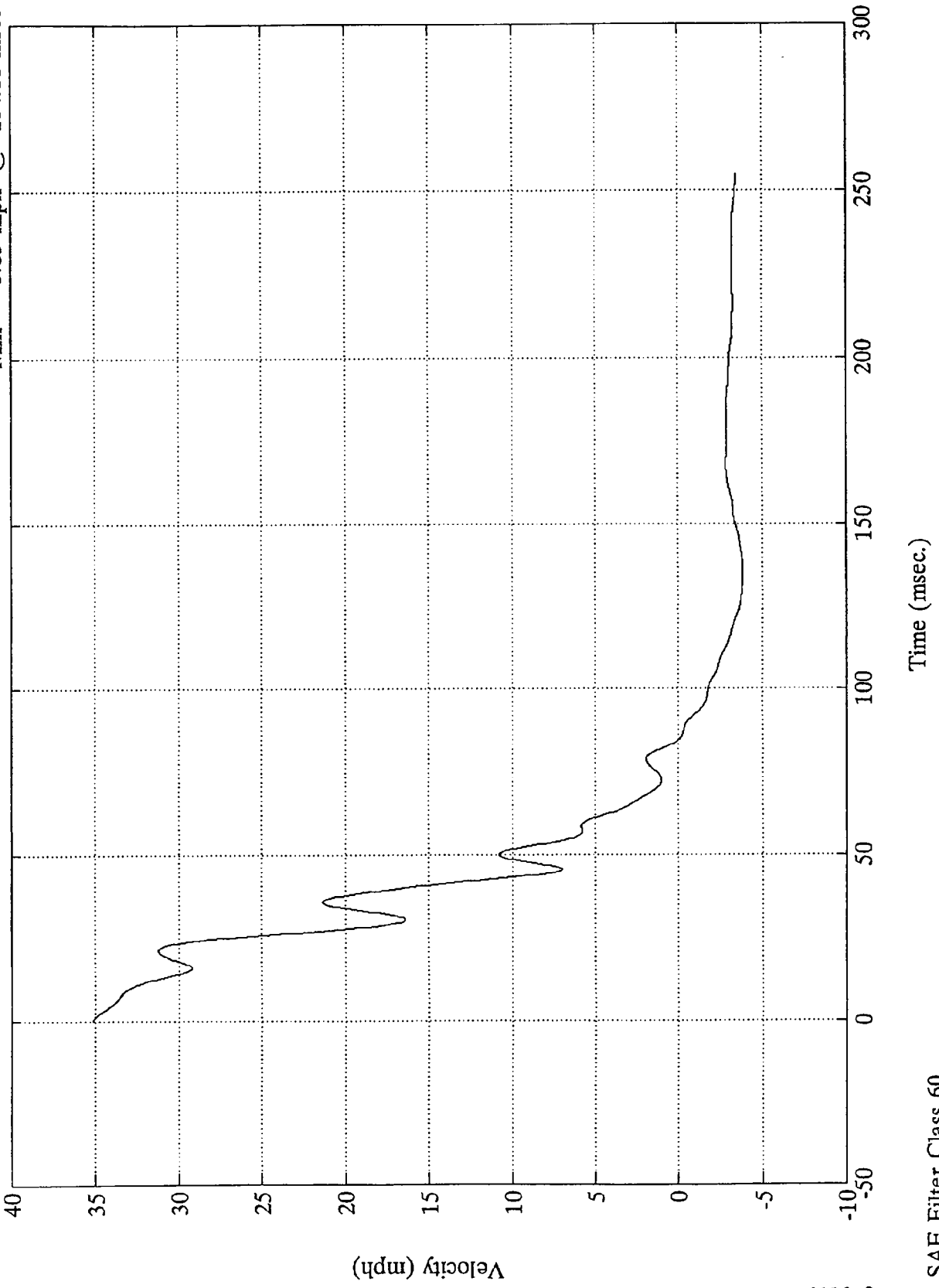
Max = 68.57 Gs @ 33.11 msec
Min = -129.13 Gs @ 26.15 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Front X-Member (X)

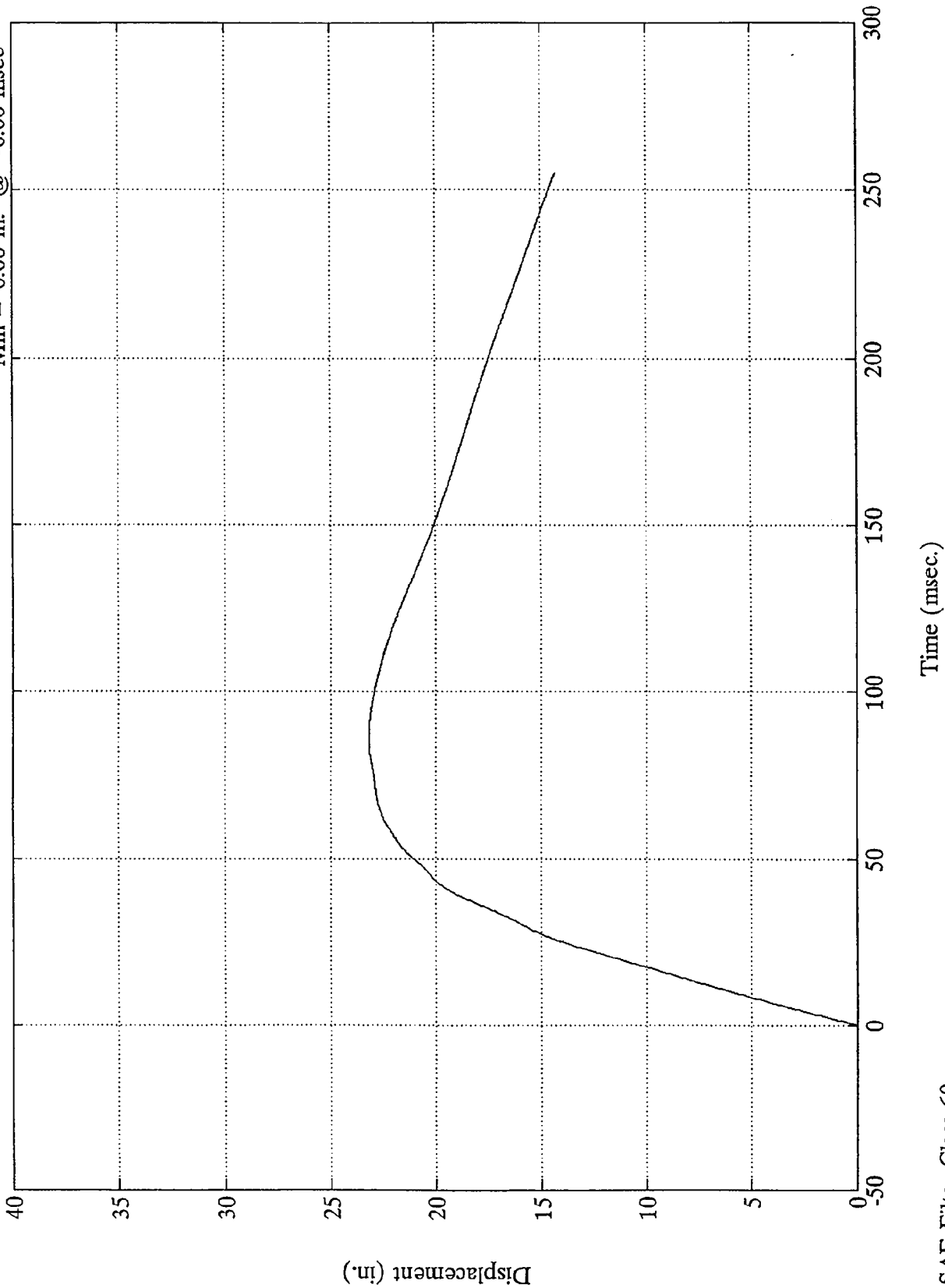
Max = 35.10 mph @ -0.00 msec
Min = -3.85 mph @ 134.88 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 23.20 in. @ 85.44 msec
Min = 0.00 in. @ -0.00 msec

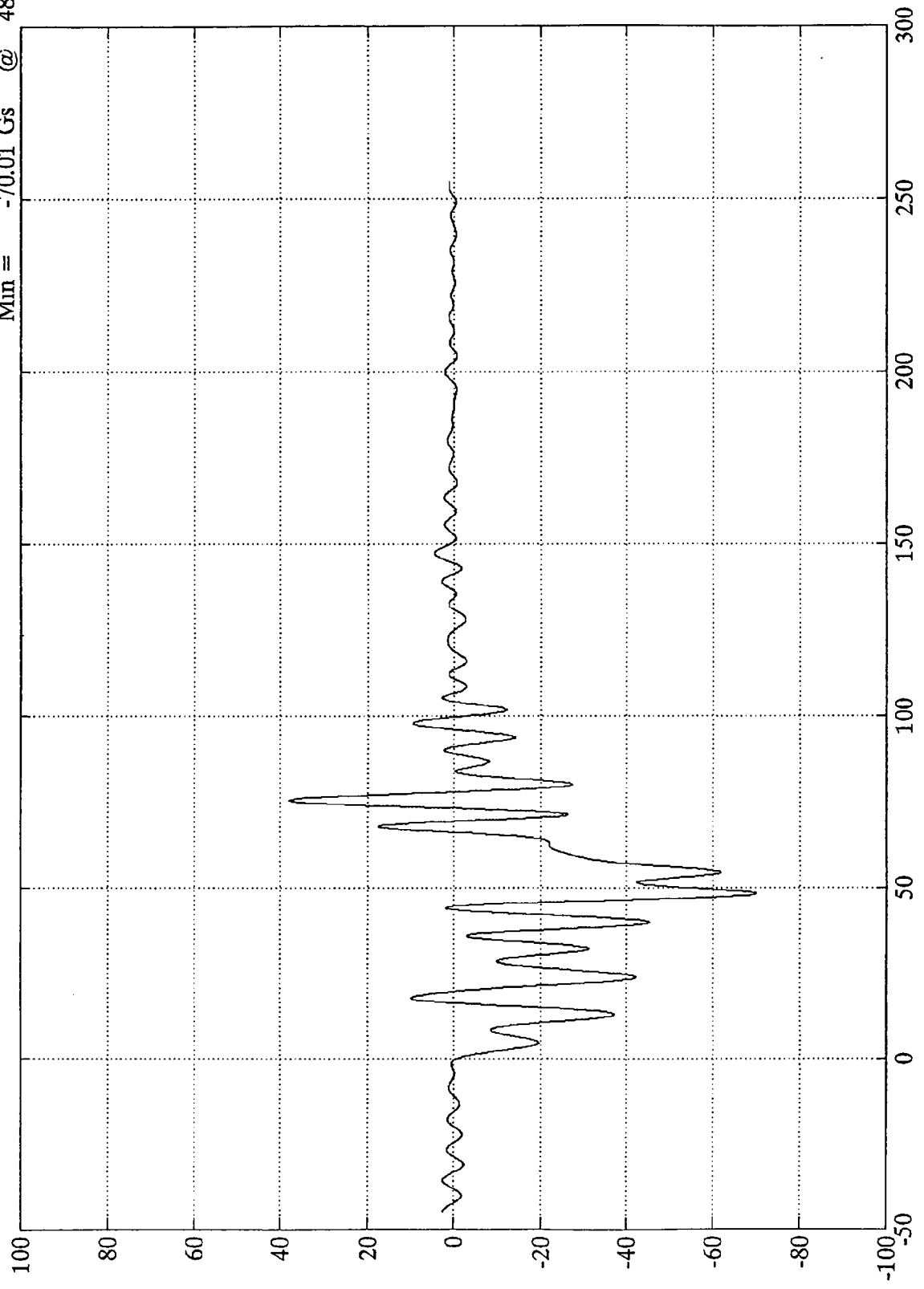
Front X-Member (X)



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 38.06 Gs @ 75.23 msec
Min = -70.01 Gs @ 48.36 msec

Toe Pan (X)



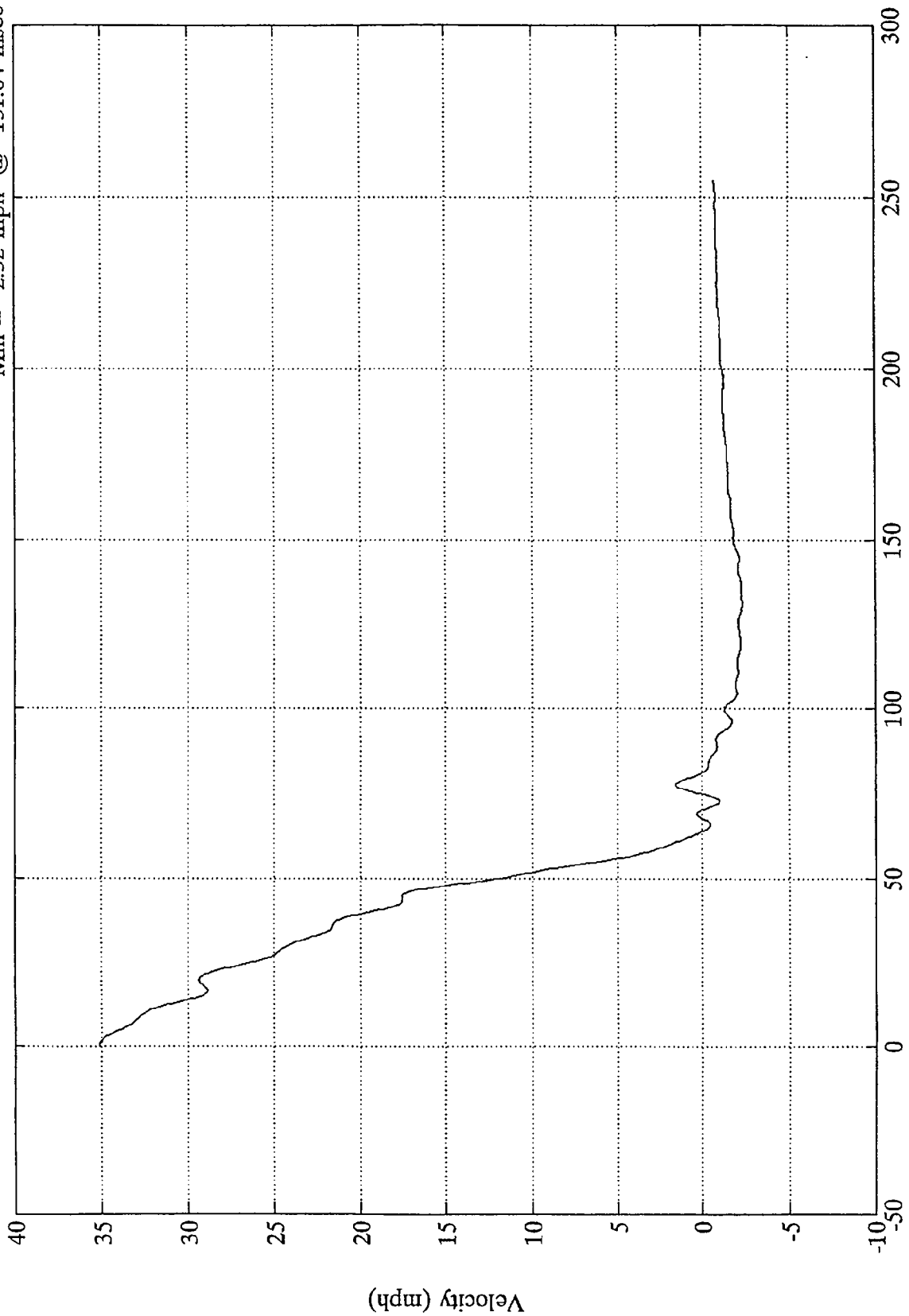
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 35.10 mph @ -0.00 msec
Min = -2.32 mph @ 131.04 msec

Toe Pan (X)



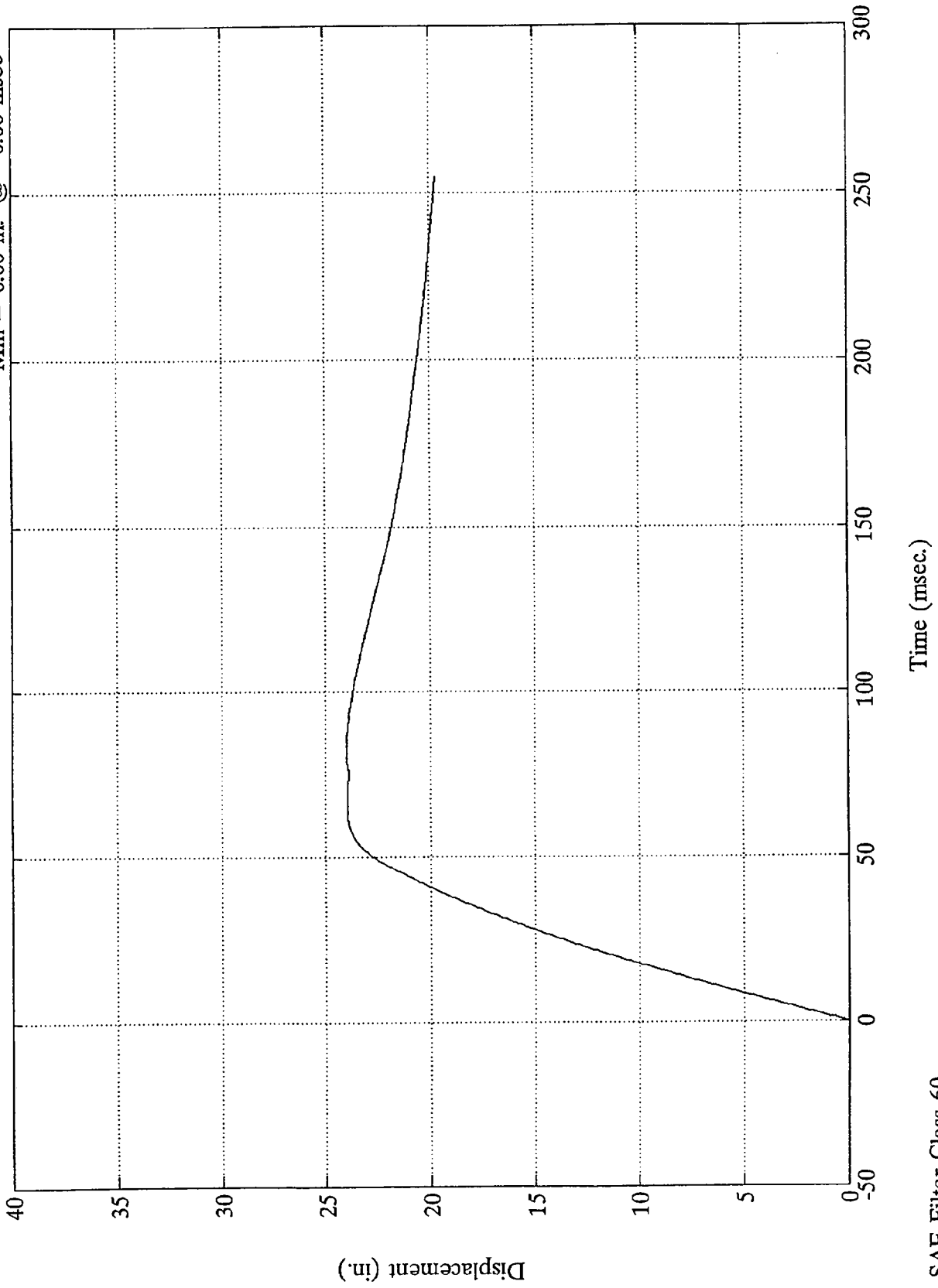
Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

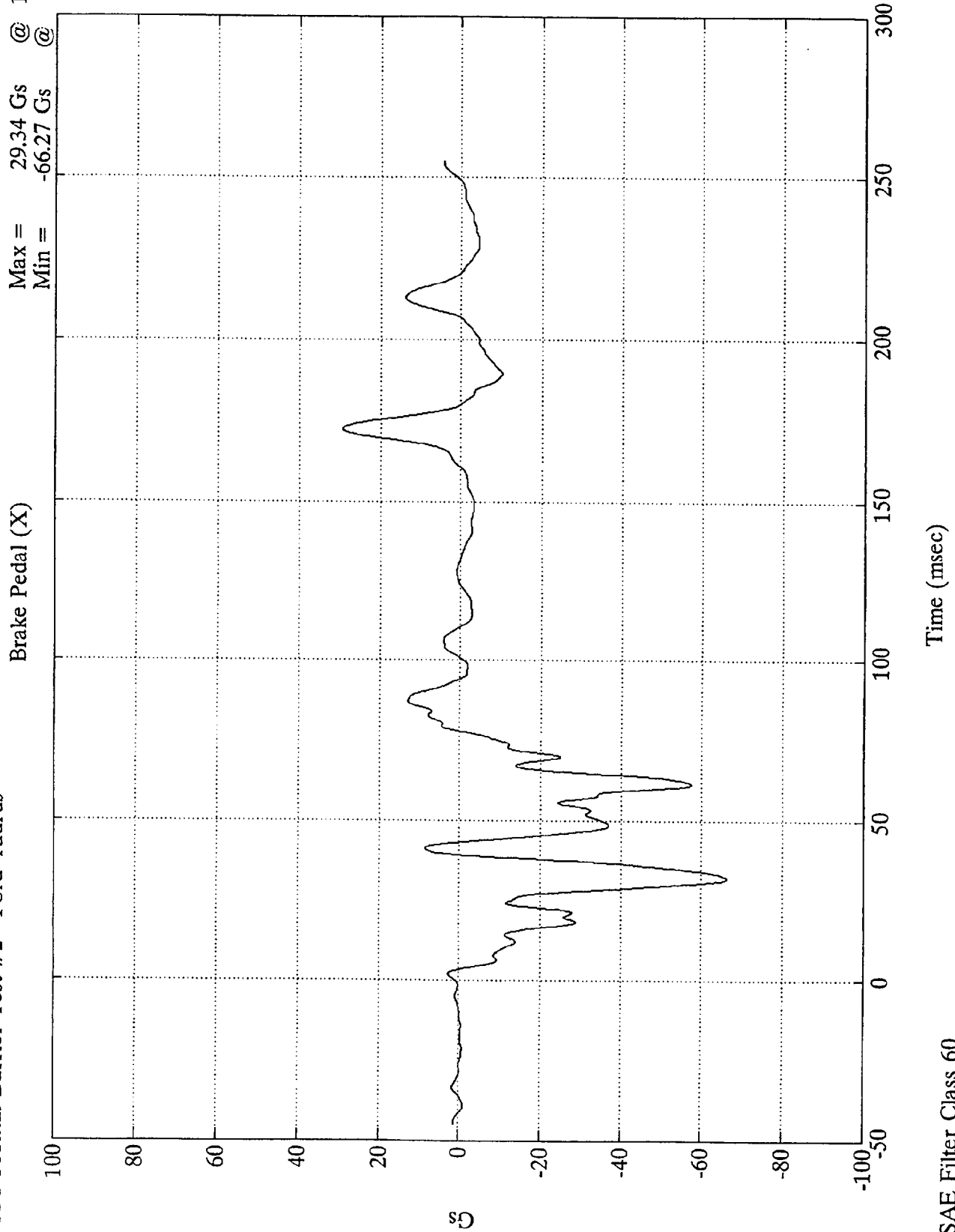
Toe Pan (X)

Max = 24.01 in. @ 83.04 msec
Min = 0.00 in. @ -0.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

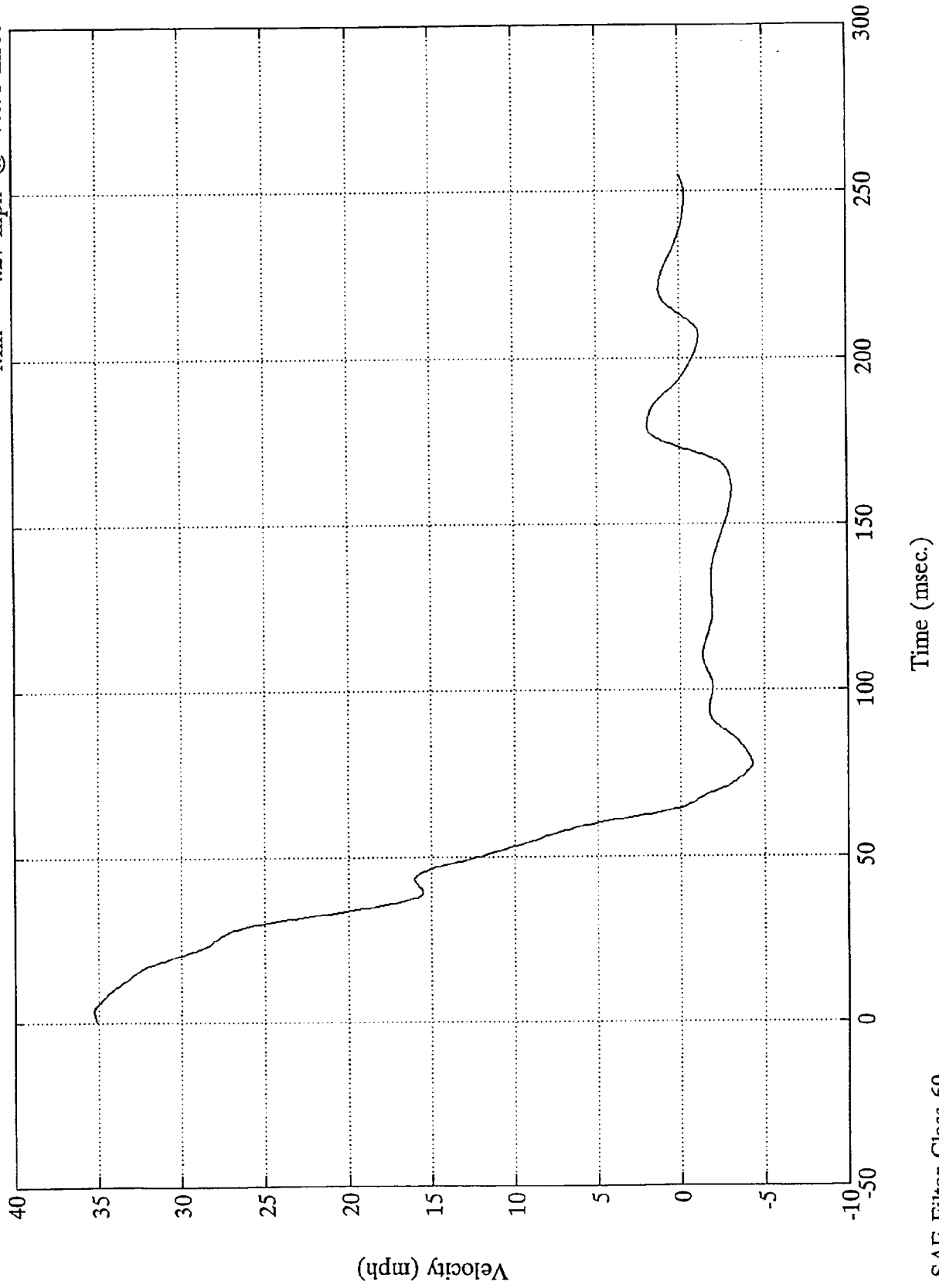
Max = 29.34 Gs @ 172.32 msec
Min = -66.27 Gs @ 32.15 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 35.24 mph @ 3.60 msec
Min = -4.27 mph @ 77.76 msec

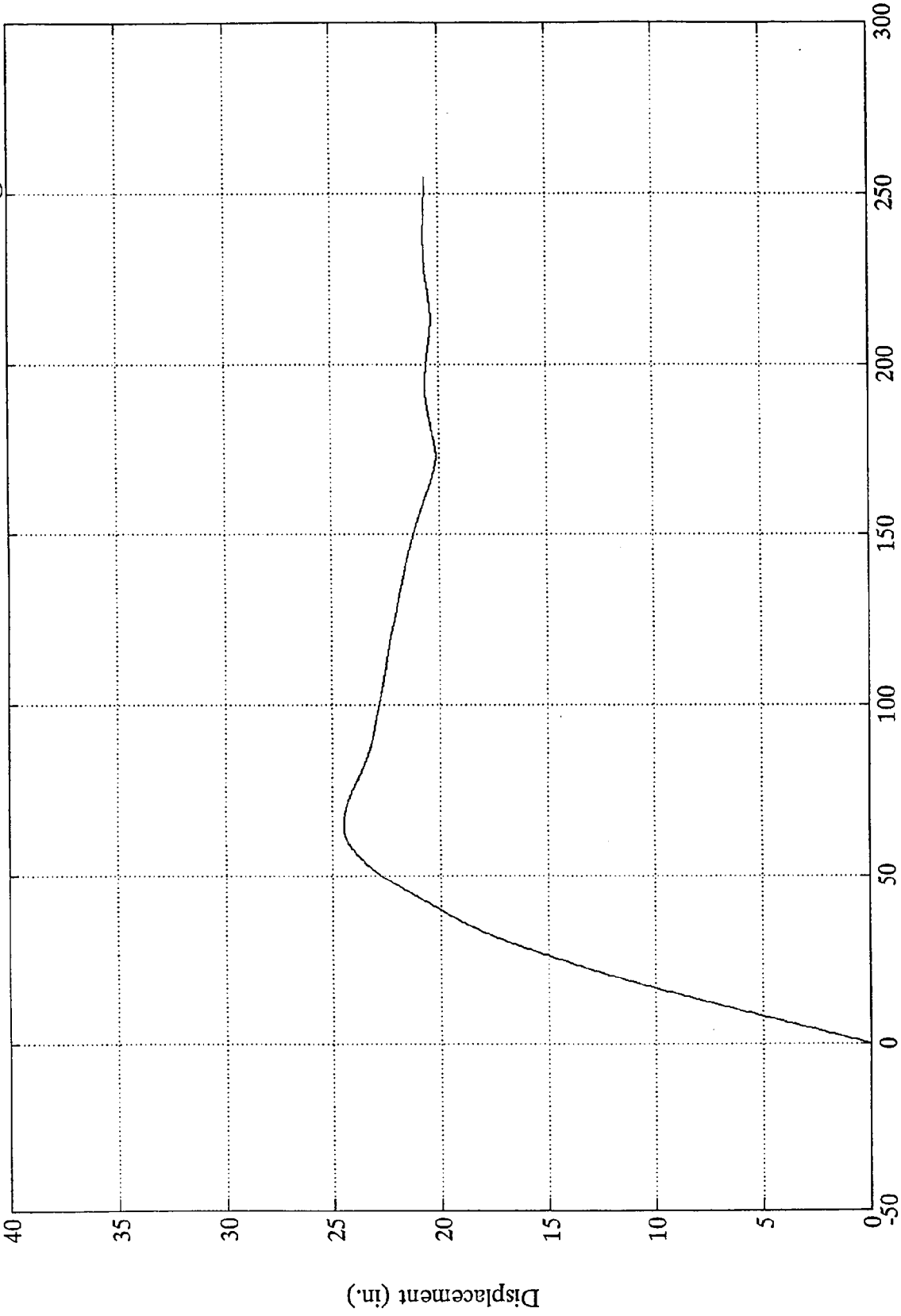
Brake Pedal (X)



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 24.49 in. @ 65.52 msec
Min = 0.00 in. @ -0.00 msec

Brake Pedal (X)



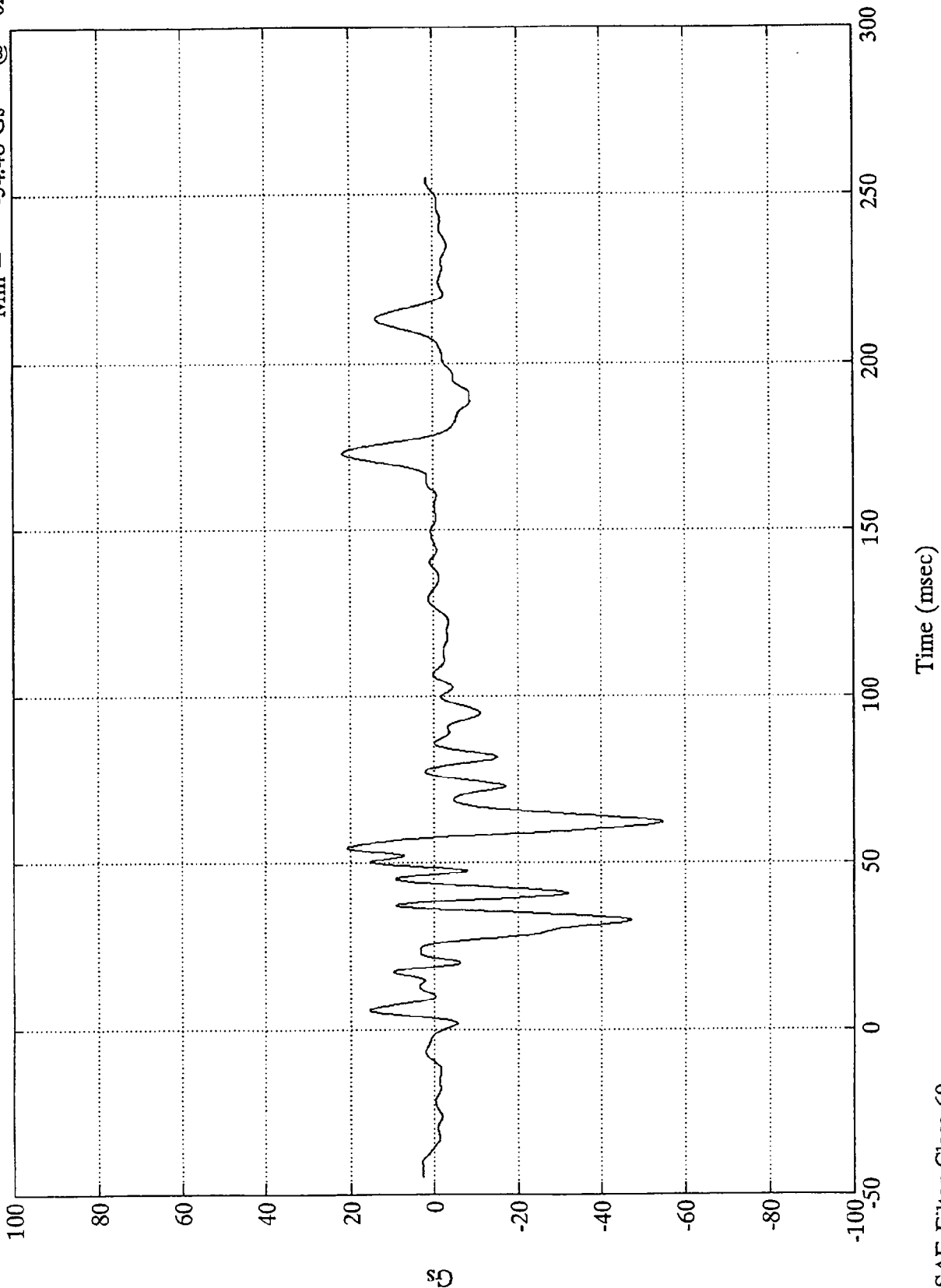
Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 21.70 Gs @ 172.91 msec
Min = -54.48 Gs @ 62.15 msec

Brake Pedal (Z)



B-41

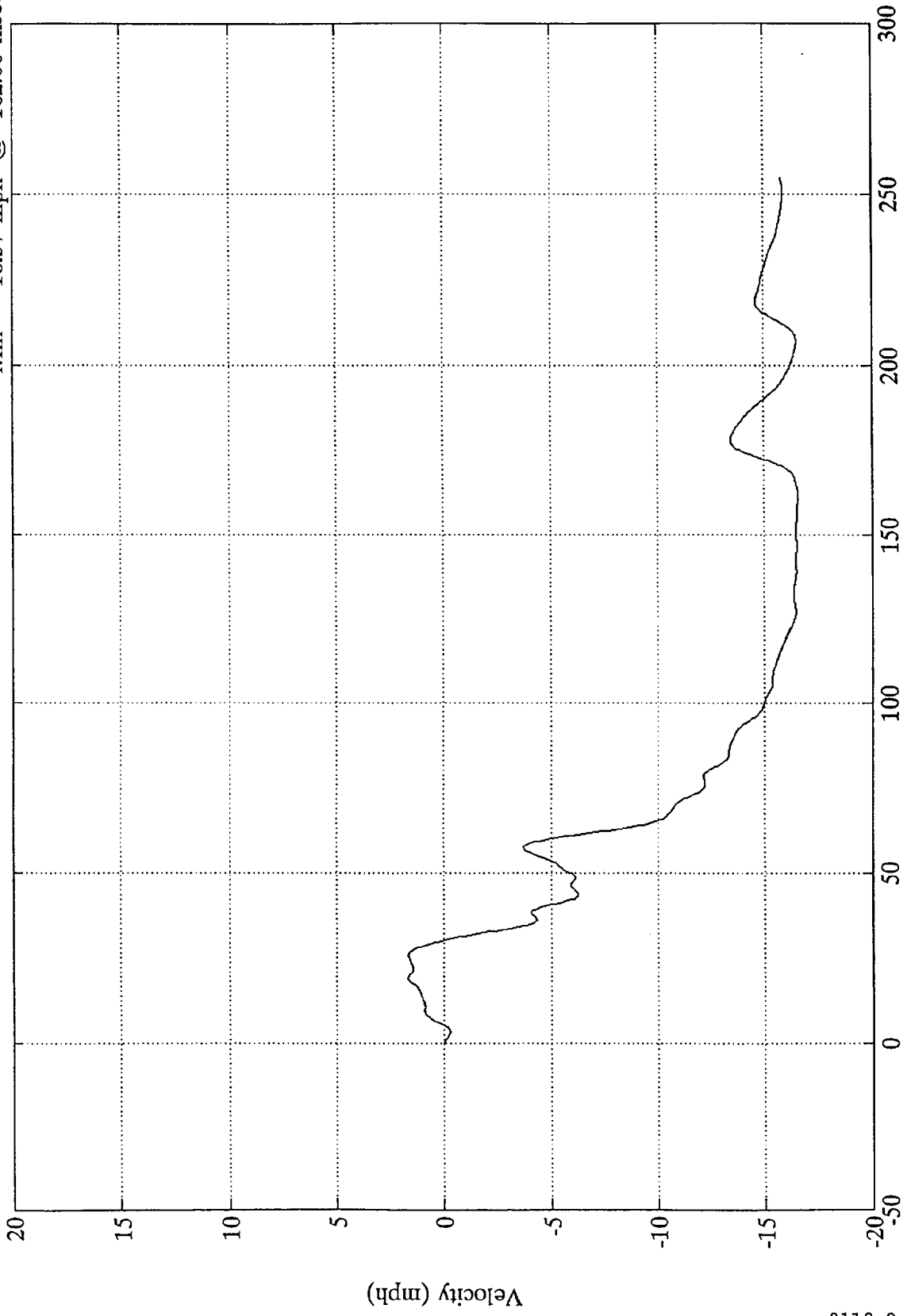
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 1.65 mph @ 18.96 msec
Min = -16.57 mph @ 162.00 msec

Brake Pedal (Z)



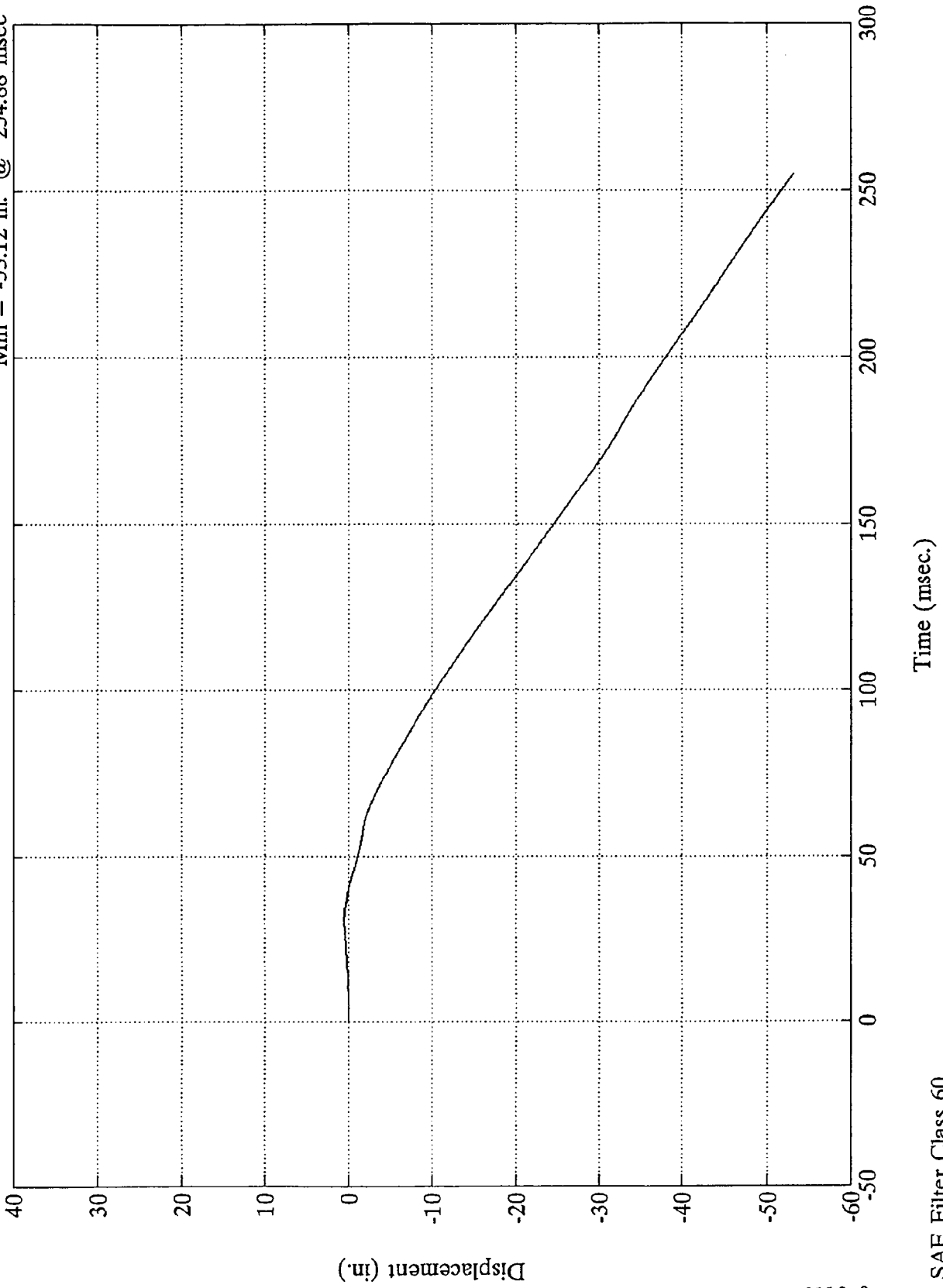
Time (msec.)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 0.49 in. @ 30.24 msec
Min = -53.12 in. @ 254.88 msec

Brake Pedal (Z)



Displacement (in.)

Time (msec.)

SAE Filter Class 60

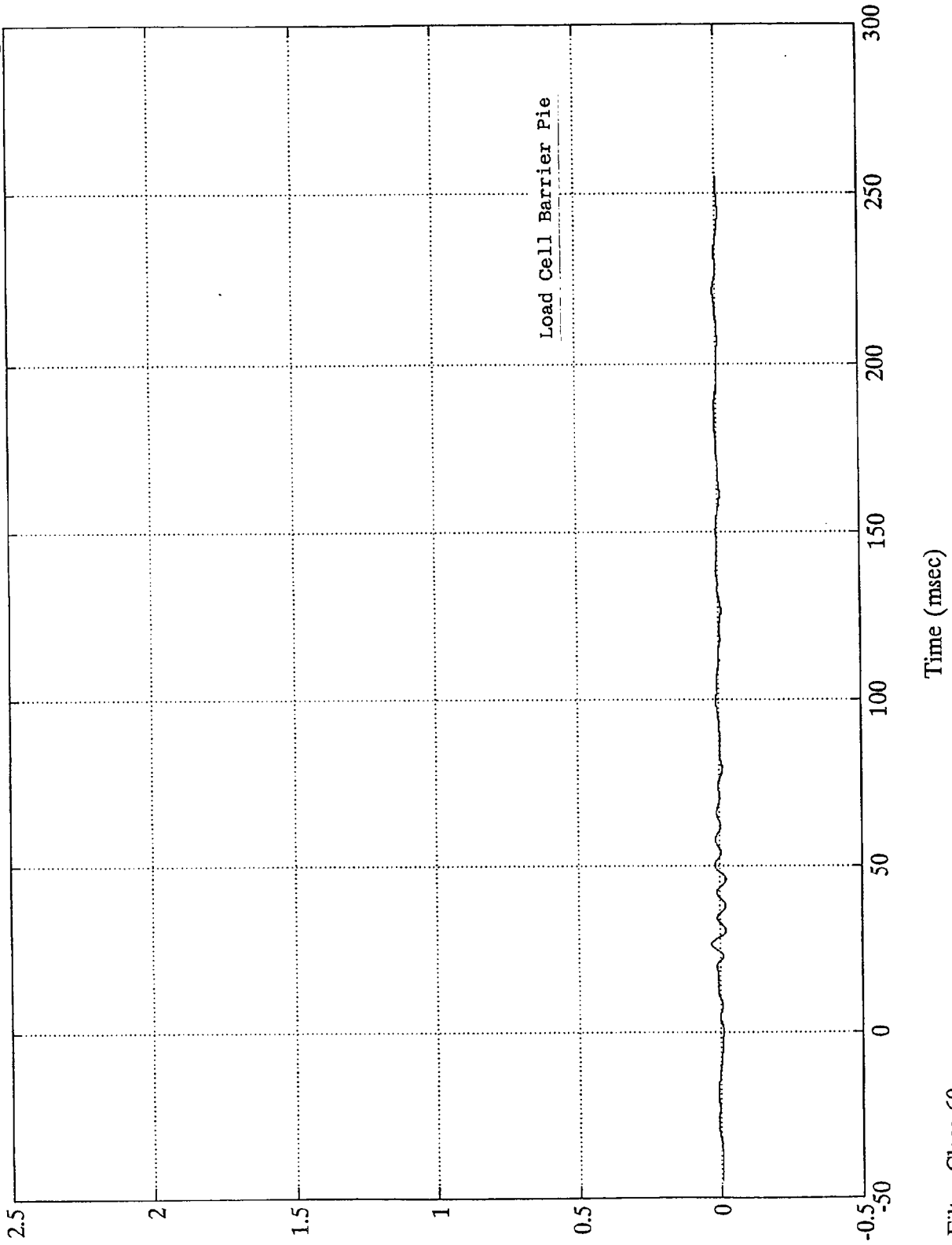
8118-2

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell A1

Max = 309.55 Lbs @ 26.27 msec
Min = -216.38 Lbs @ 45.60 msec

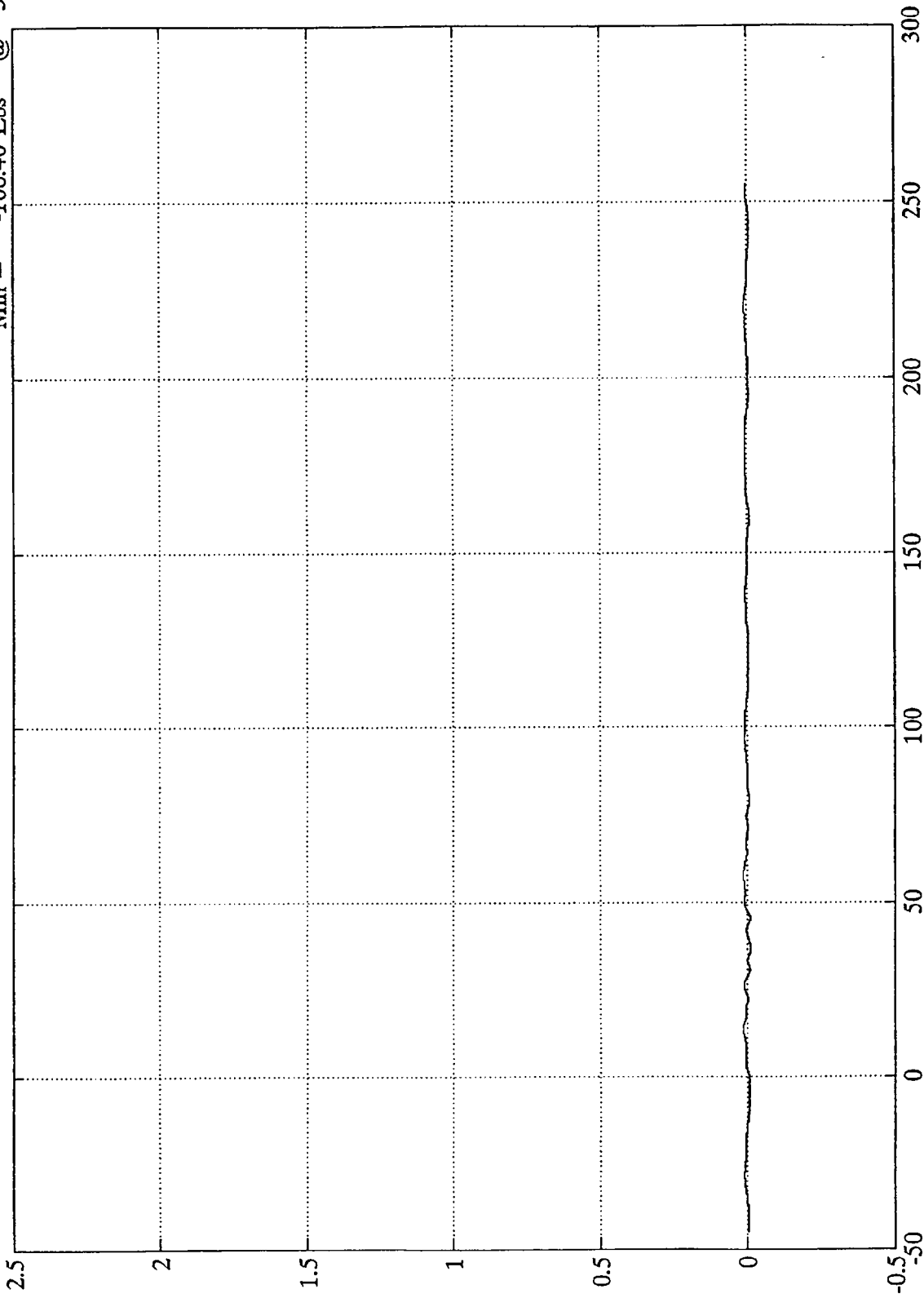
$\times 10^4$



TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 147.15 Lbs @ 13.43 msec
Min = -106.40 Lbs @ 36.60 msec

Barrier Load Cell A2



B-45

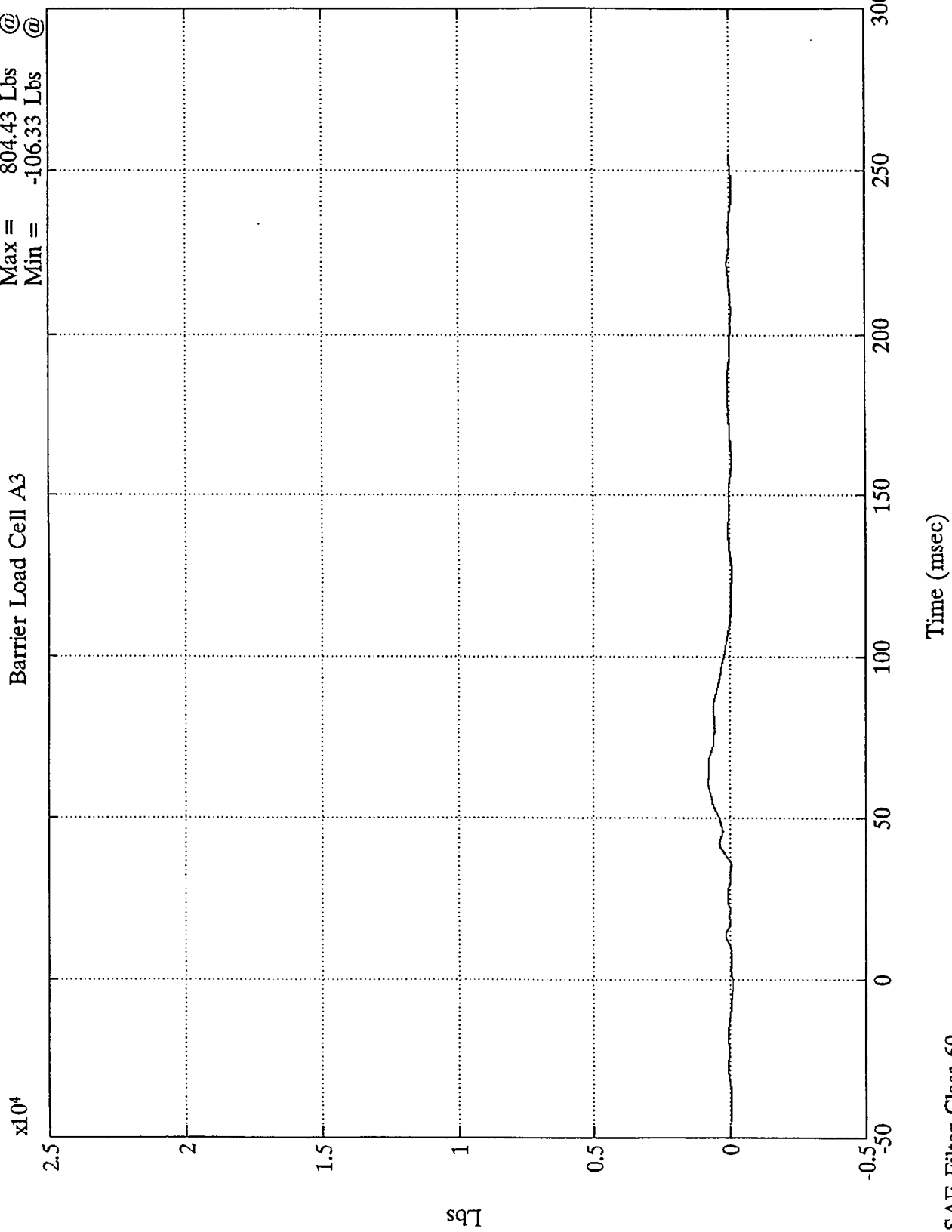
8118-2

SAE Filter Class 60

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell A3
Max = 804.43 Lbs @
Min = -106.33 Lbs @
61.08 msec
-1.44 msec

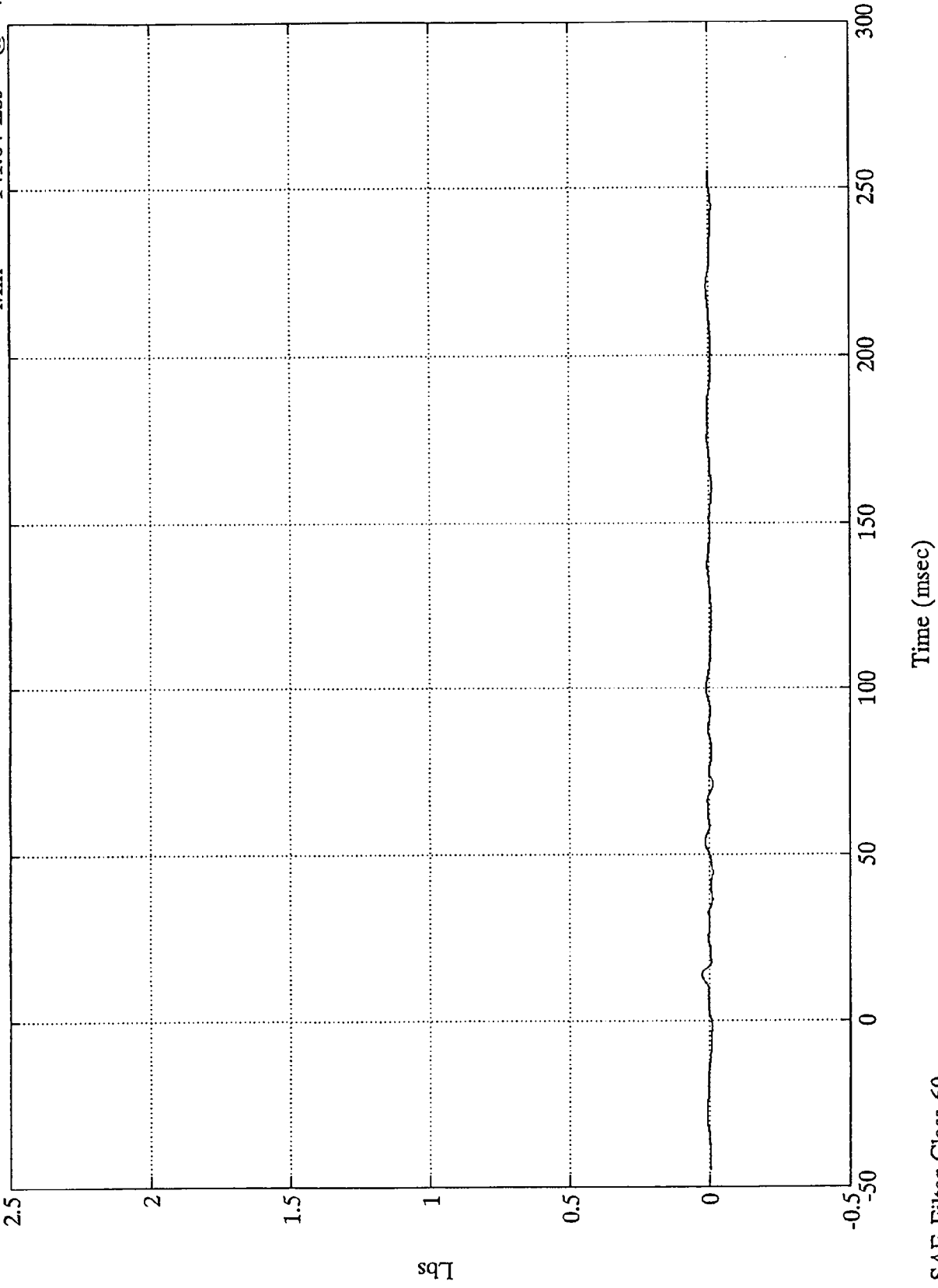


TSC Frontal Barrier Test #2 - Ford Taurus

Max = 275.53 Lbs @ 13.55 msec
Min = -141.64 Lbs @ 70.79 msec

Barrier Load Cell A4

$\times 10^4$



lbs

B-47

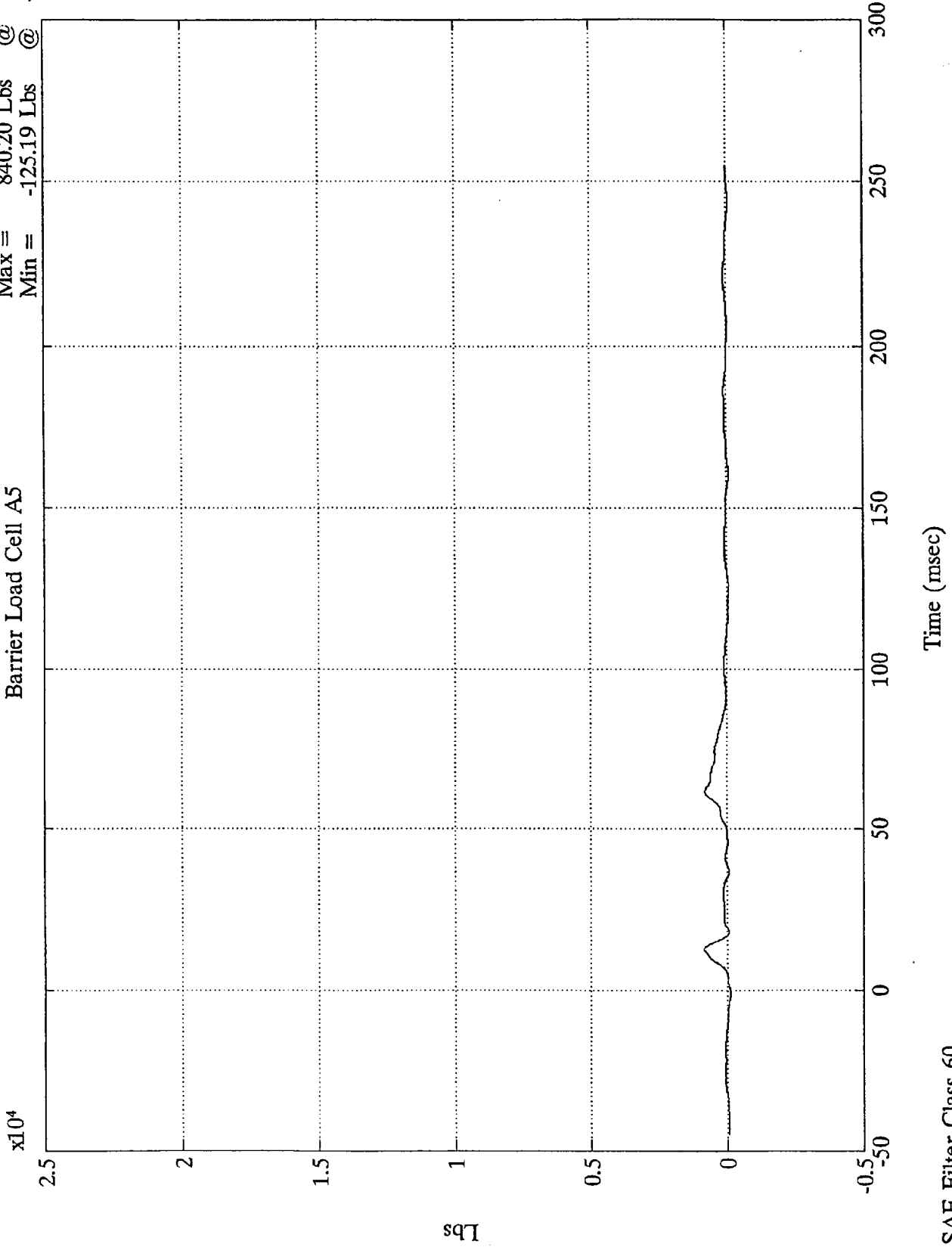
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell A5

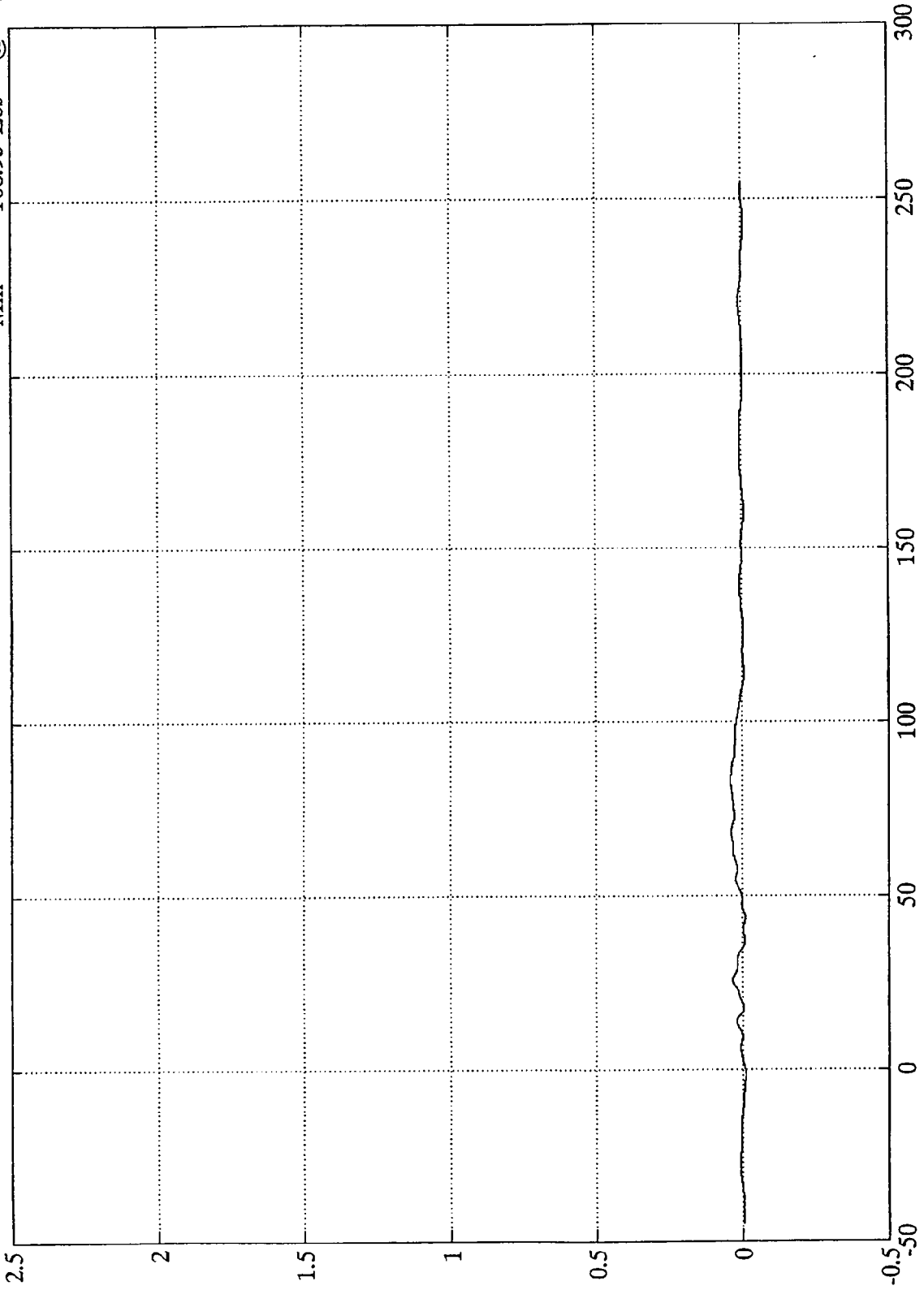
Max = 840.20 Lbs @ 12.47 msec
Min = -125.19 Lbs @ -1.32 msec



TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 400.27 Lbs @ 83.28 msec
Min = -108.95 Lbs @ -1.44 msec

Barrier Load Cell A6



B-49

8118-2

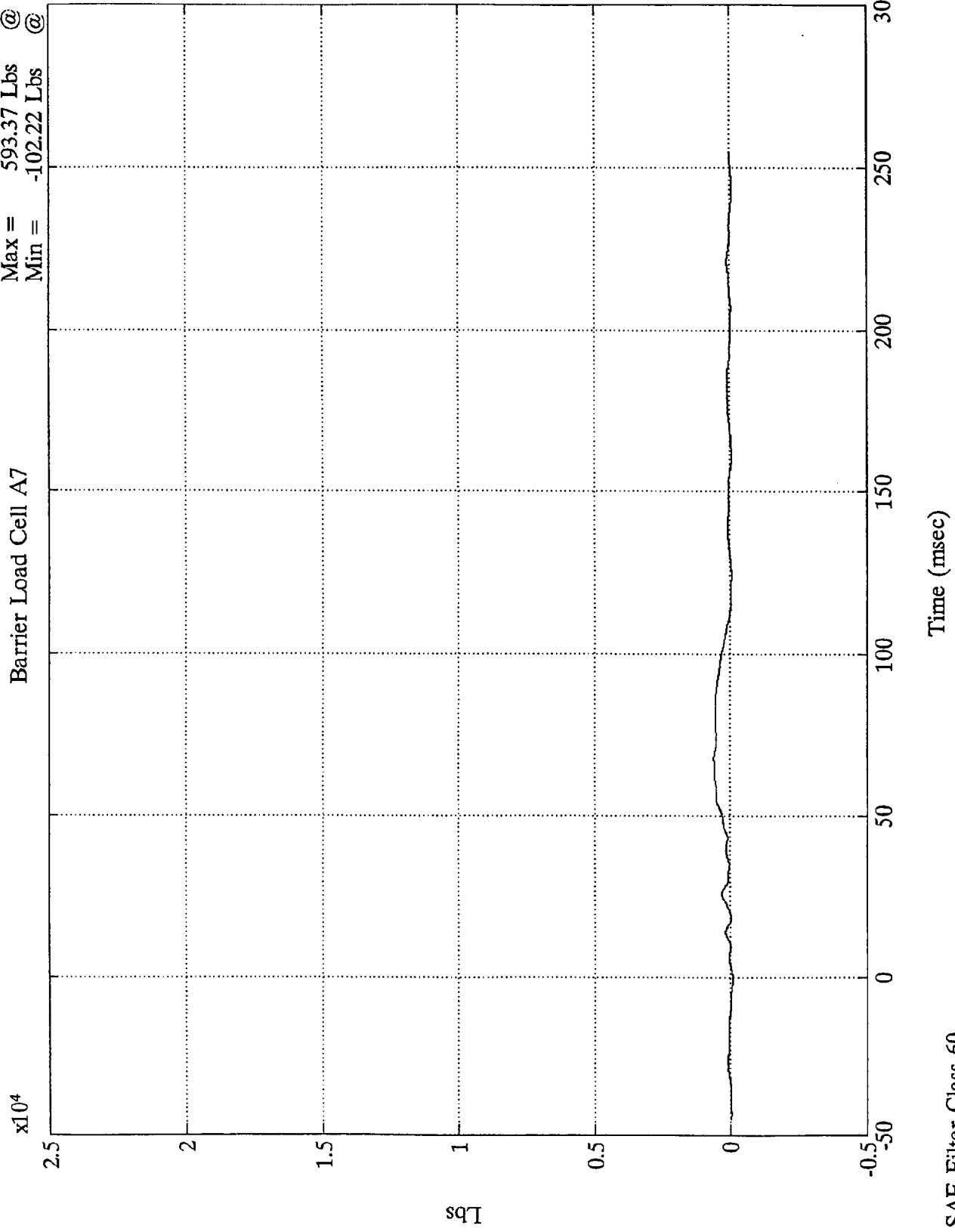
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell A7

Max = 593.37 Lbs @ 67.80 msec
Min = -102.22 Lbs @ -0.96 msec



lbs
B-50

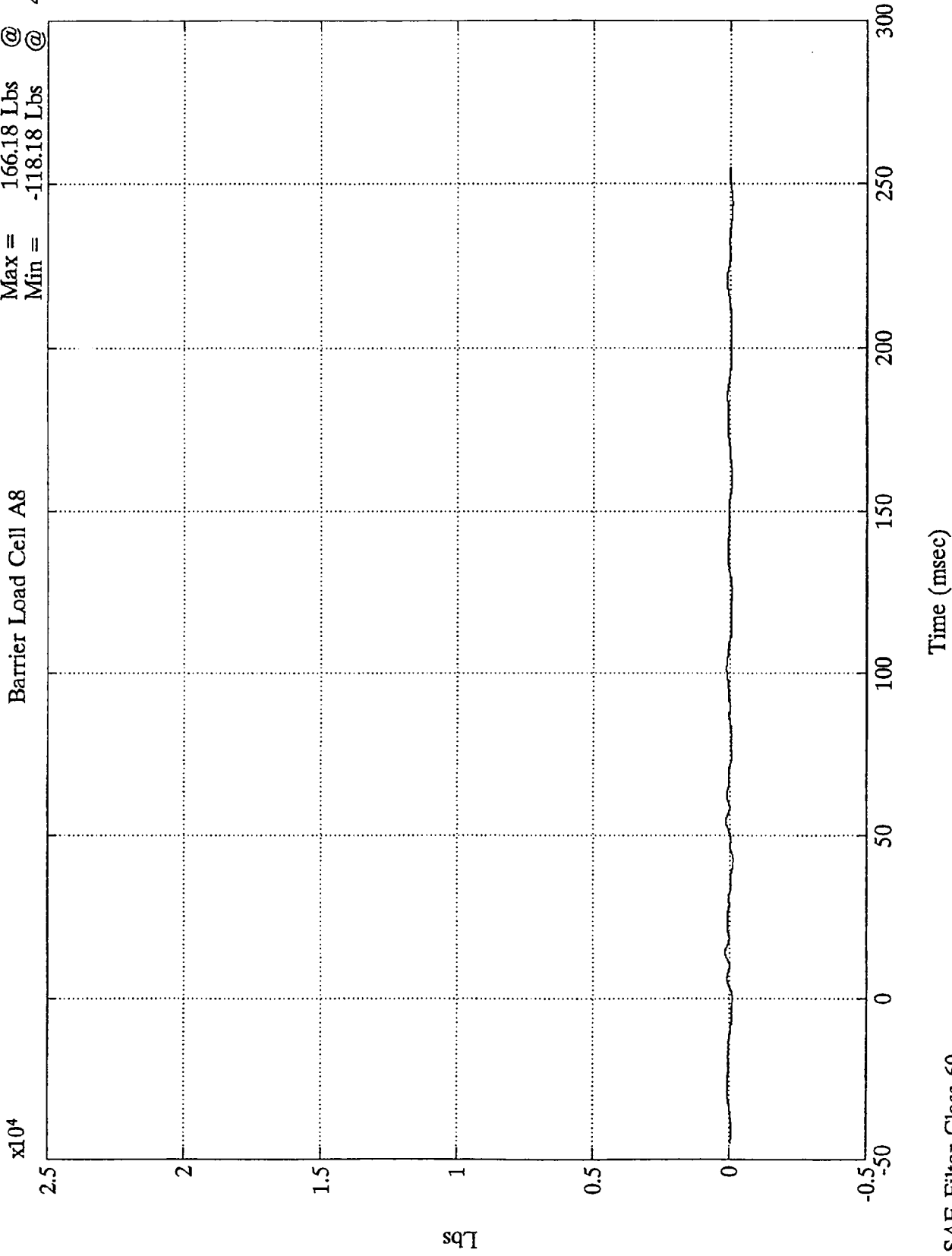
8118-2

SAE Filter Class 60

Time (msec)

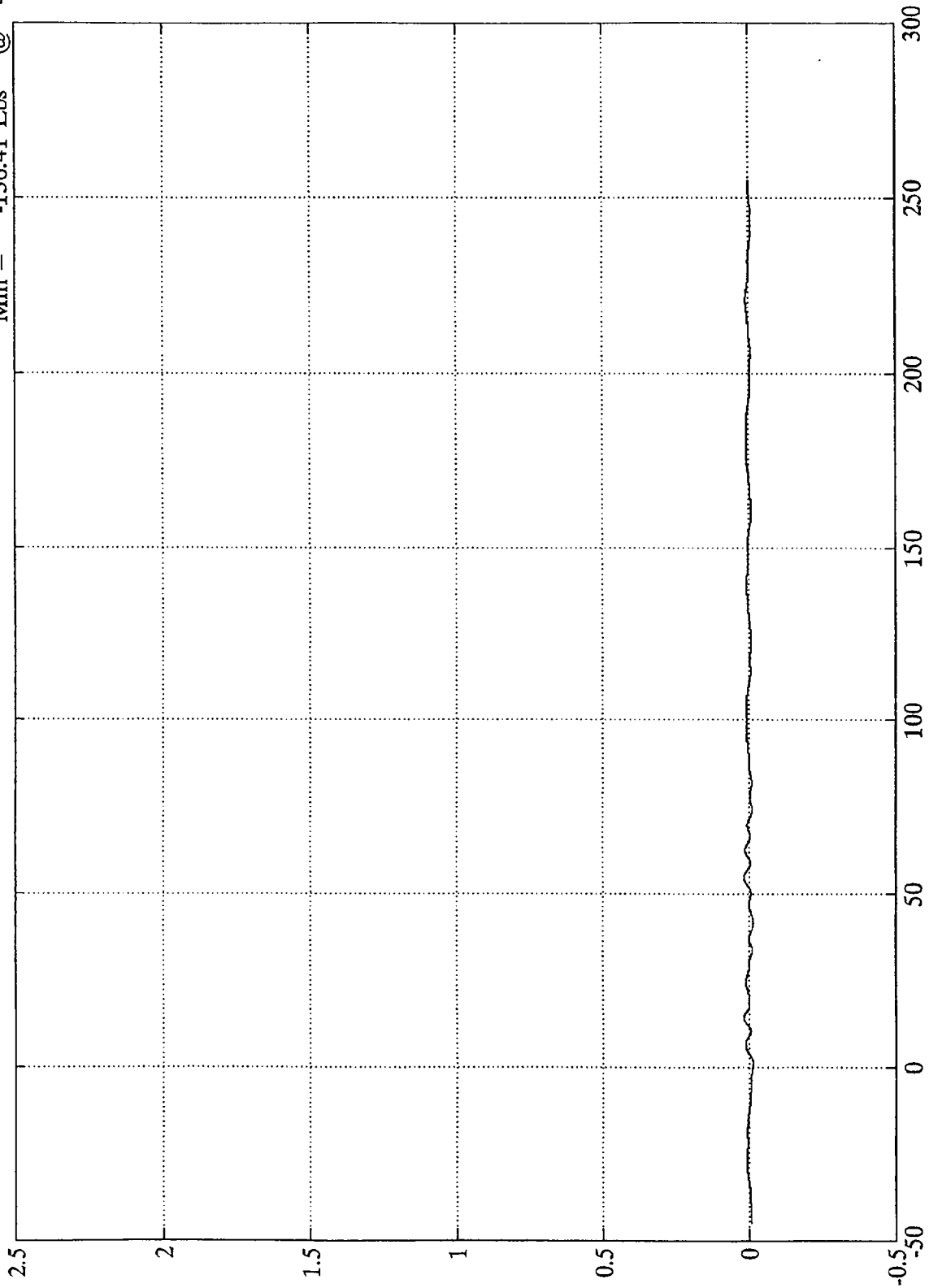
TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell A8
Max = 166.18 Lbs @ 13.79 msec
Min = -118.18 Lbs @ 42.36 msec



TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Barrier Load Cell A9
Max = 178.37 Lbs @ 14.03 msec
Min = -136.41 Lbs @ 41.52 msec

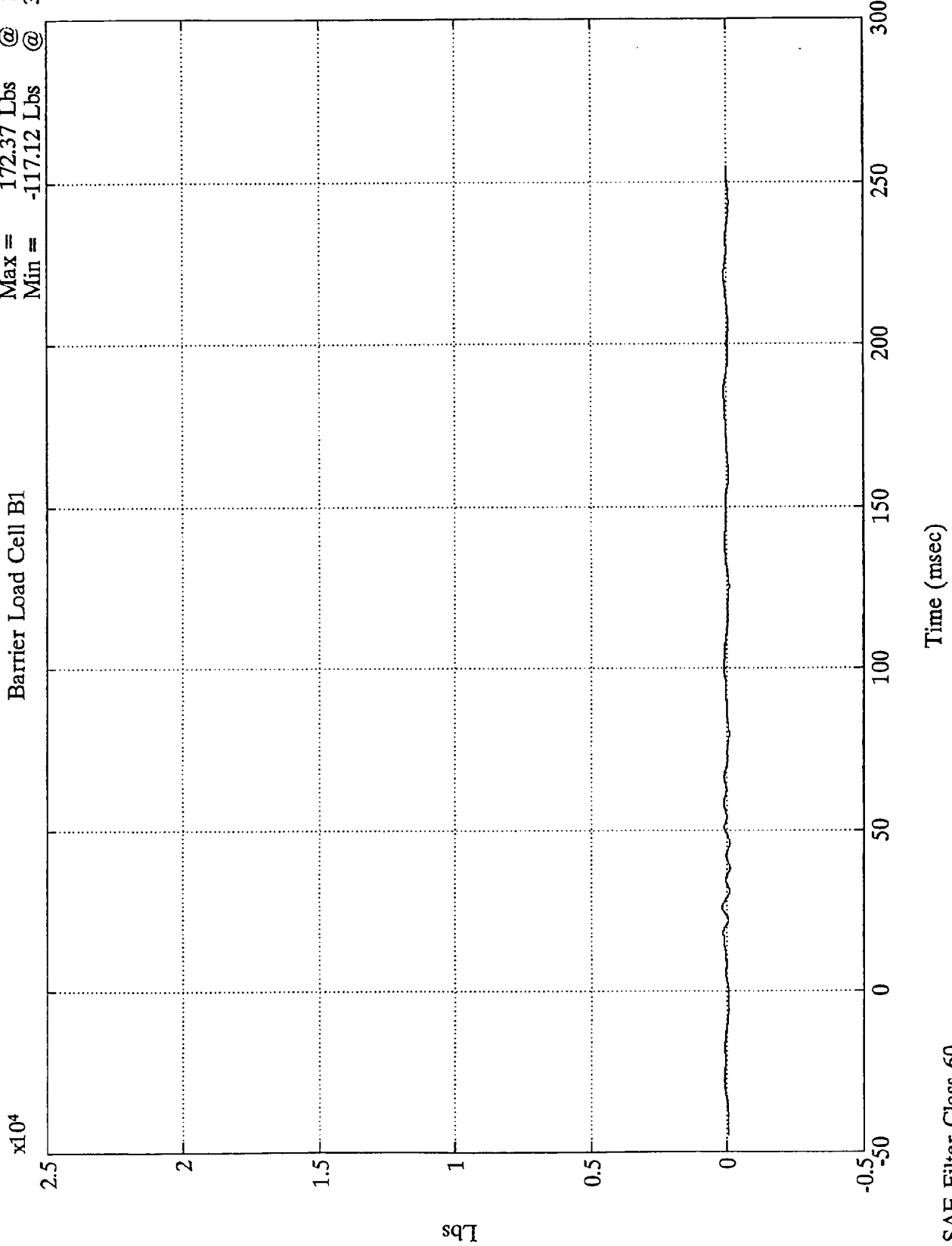


Lbs

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell B1
Max = 172.37 Lbs @ 25.79 msec
Min = -117.12 Lbs @ 38.15 msec



B-53

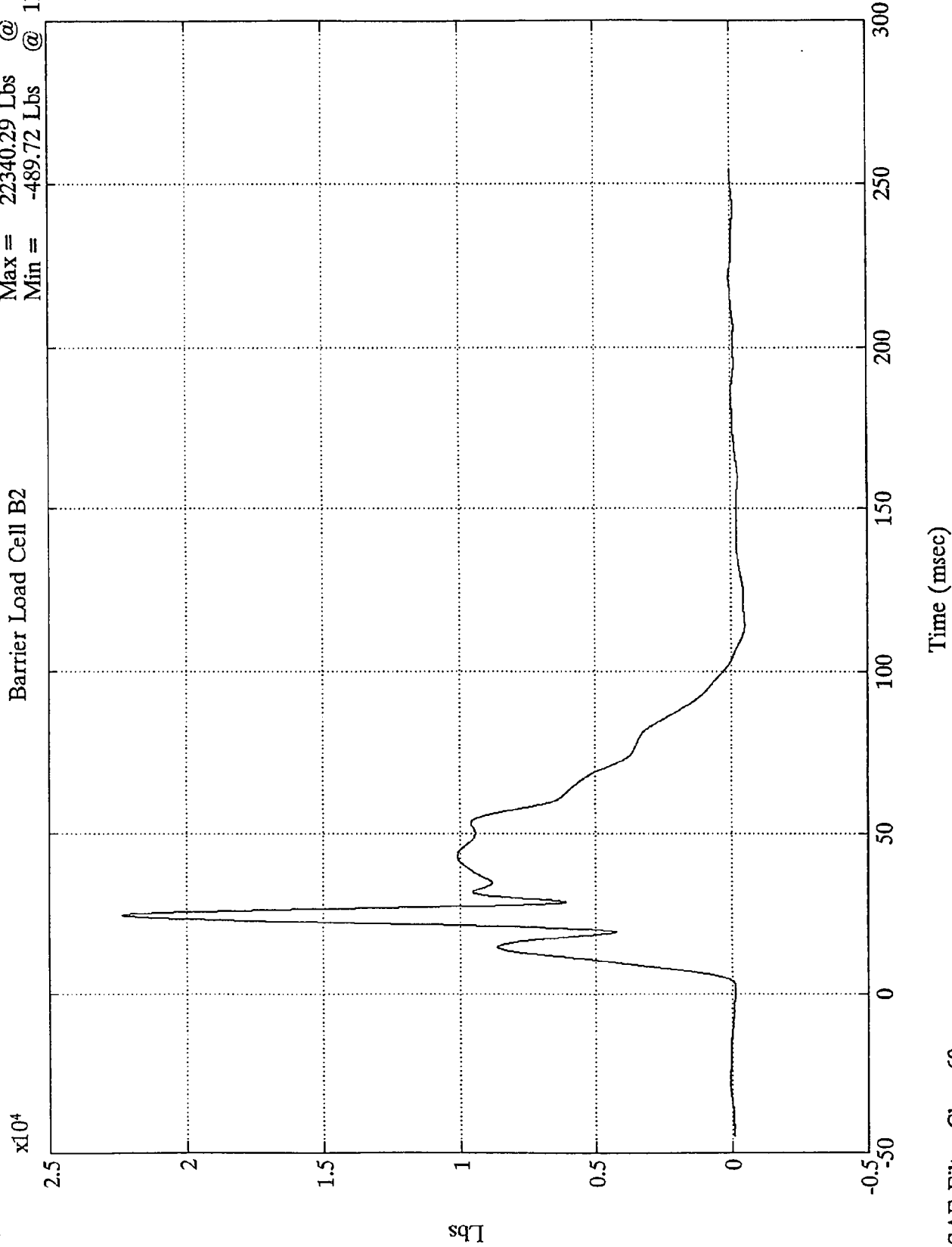
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell B2

Max = 22340.29 Lbs @ 24.47 msec
Min = -489.72 Lbs @ 114.12 msec



B-54

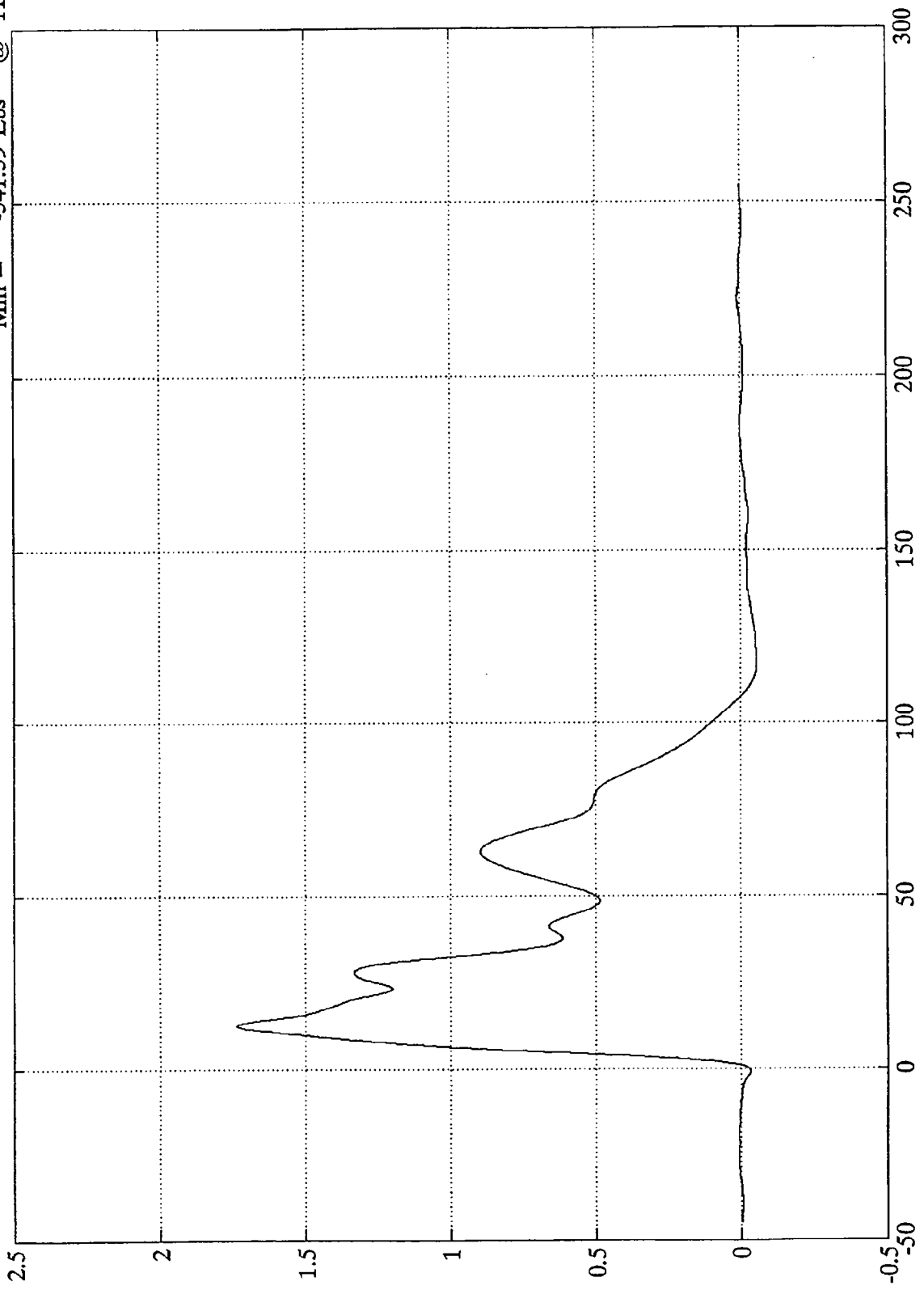
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 17381.43 Lbs @ 12.47 msec
Min = -541.59 Lbs @ 116.87 msec

Barrier Load Cell B3



lbs
B-55

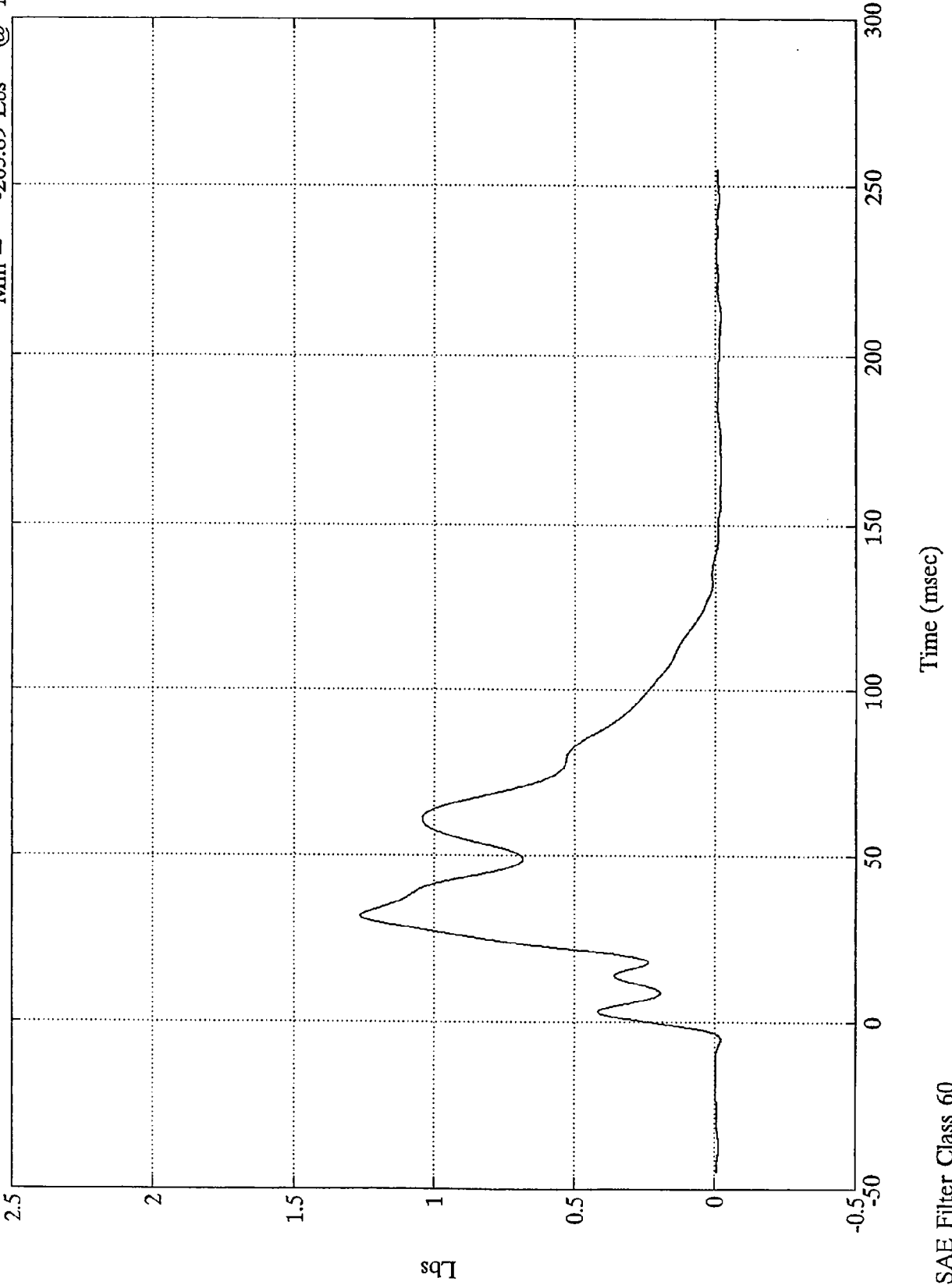
8118-2

SAE Filter Class 60

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

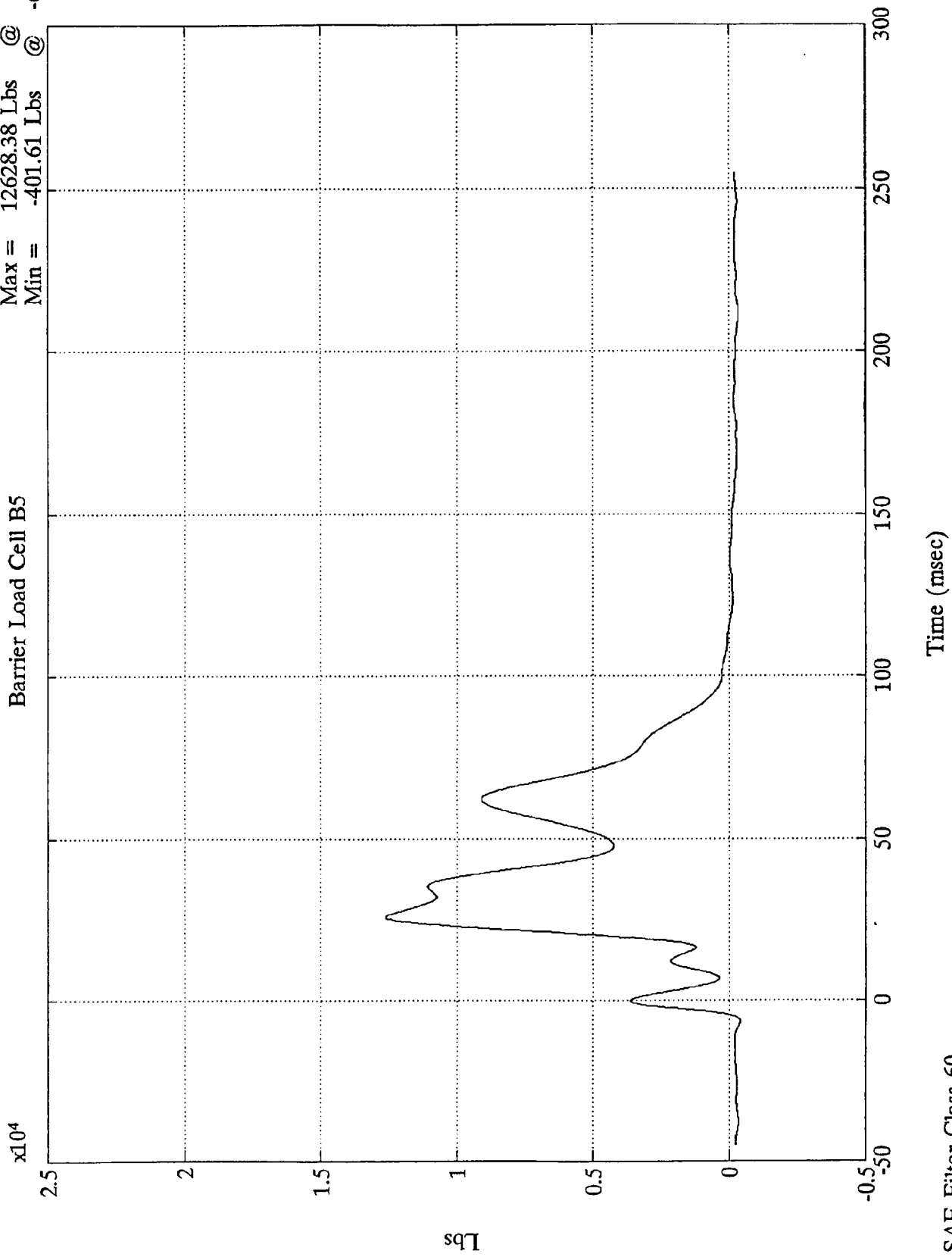
Barrier Load Cell B4
Max = 12660.28 Lbs @ 31.44 msec
Min = -203.89 Lbs @ 167.16 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell B5

Max = 12628.38 Lbs @ 25.68 msec
Min = -401.61 Lbs @ -6.60 msec

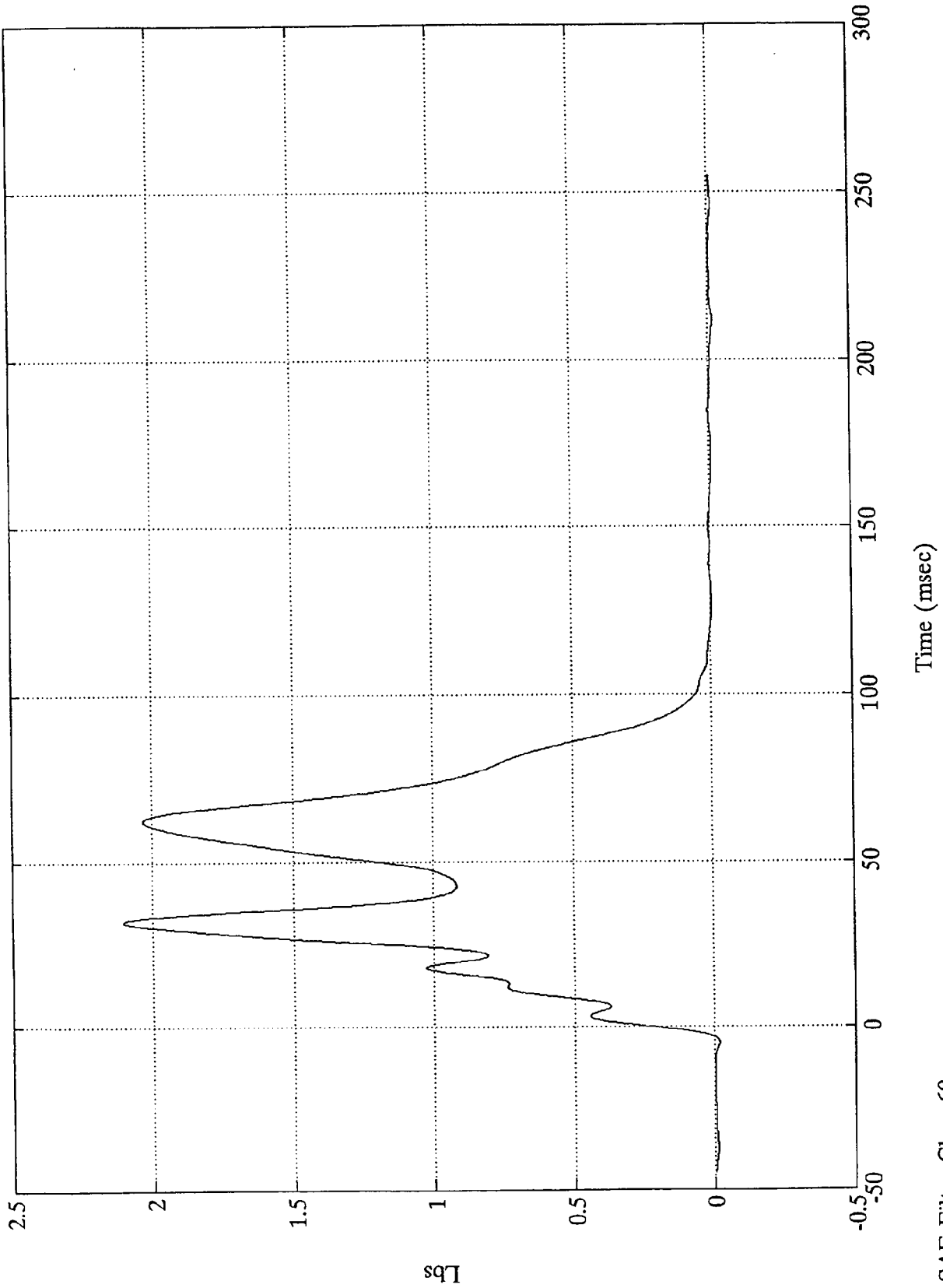


TSC Frontal Barrier Test #2 - Ford Taurus

x10⁴

Barrier Load Cell B6

Max = 21036.97 Lbs @ 32.04 msec
Min = -185.71 Lbs @ -5.16 msec



B-58

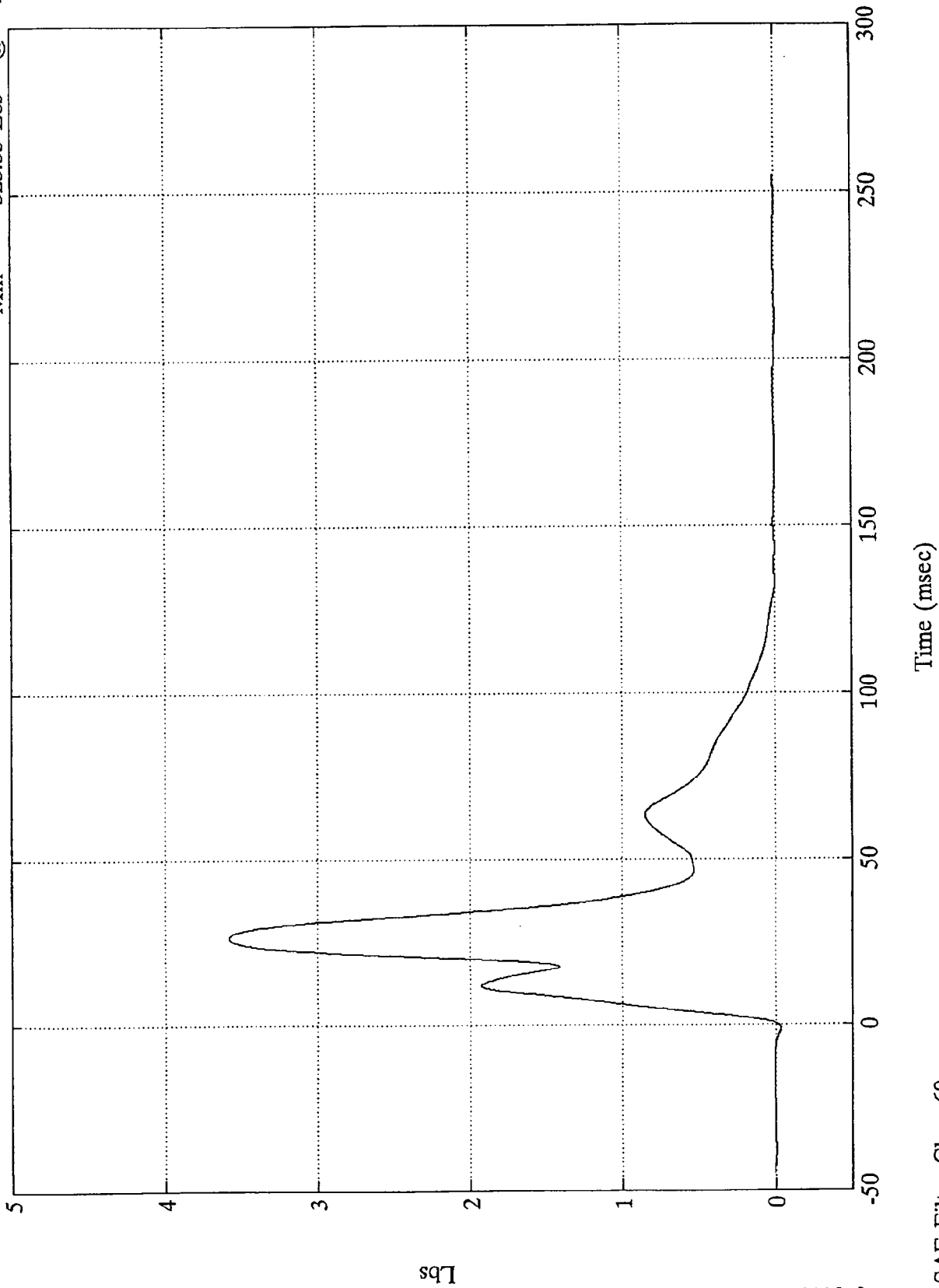
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 35816.11 Lbs @ 26.63 msec
Min = -323.35 Lbs @ -1.32 msec

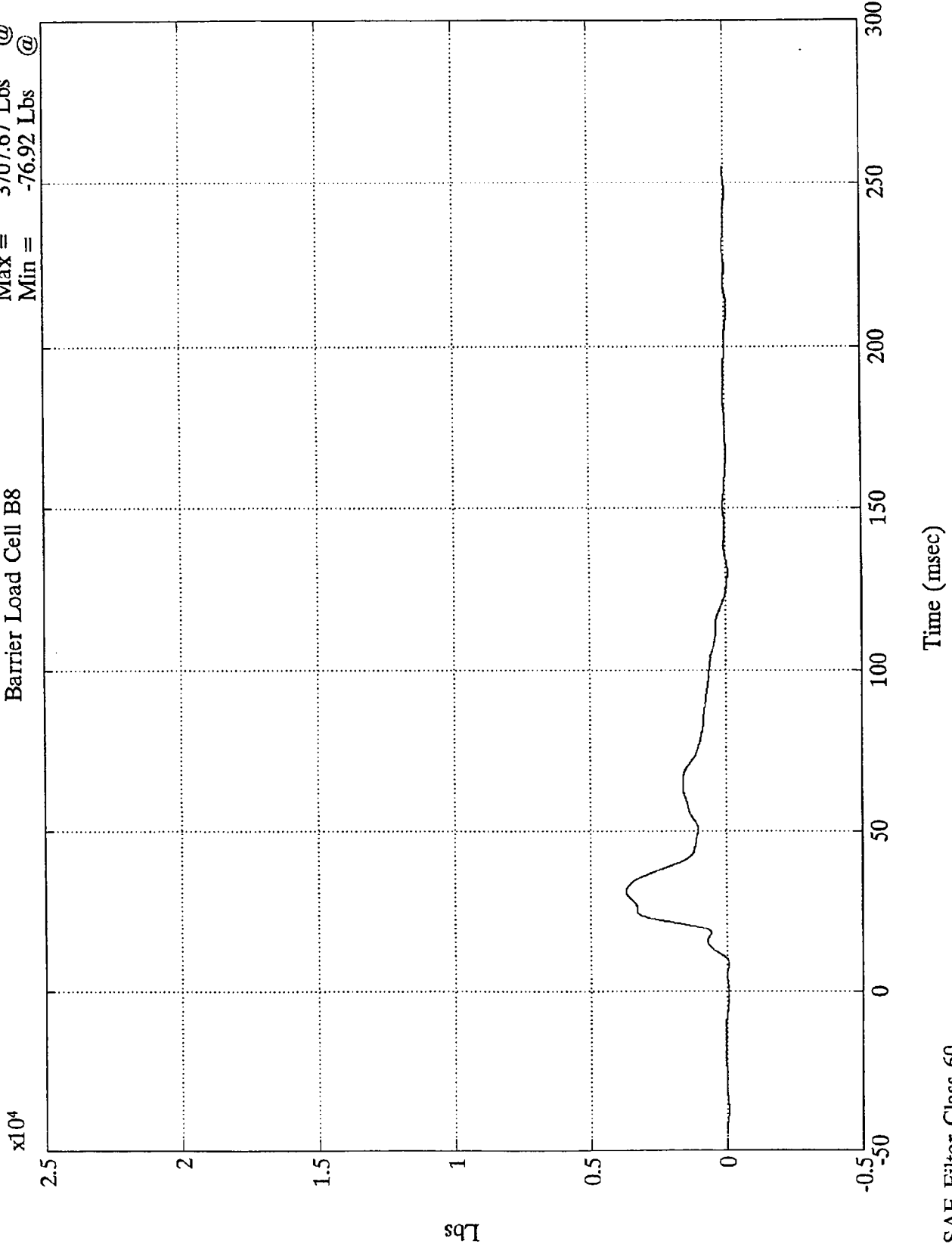
Barrier Load Cell B7



TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell B8

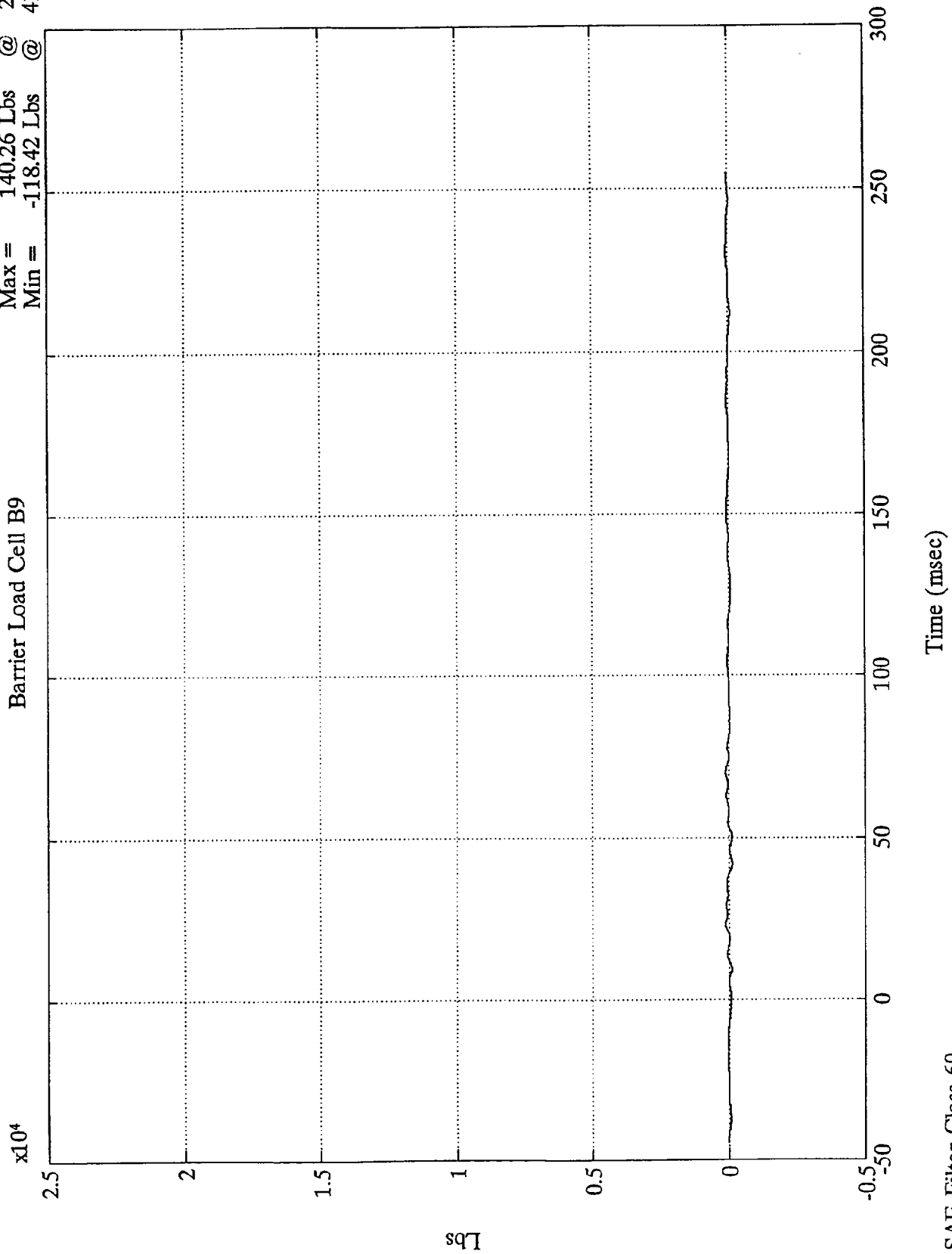
Max = 3707.67 Lbs @ 30.95 msec
Min = -76.92 Lbs @ 8.27 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell B9

Max = 140.26 Lbs @ 23.39 msec
Min = -118.42 Lbs @ 41.88 msec



B-61

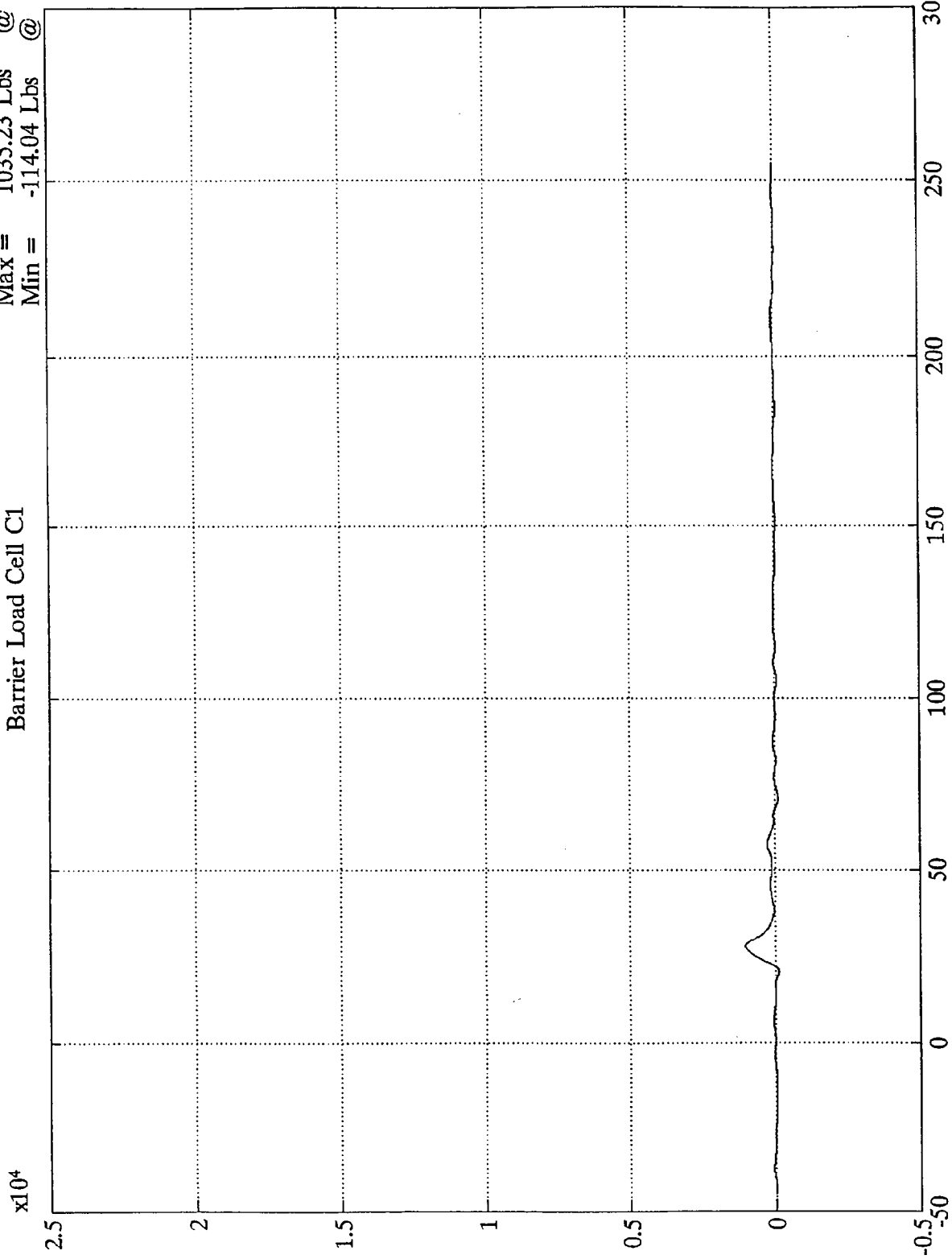
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell C1

Max = 1035.23 Lbs @ 27.96 msec
Min = -114.04 Lbs @ 20.63 msec



B-62
lbs

8118-2

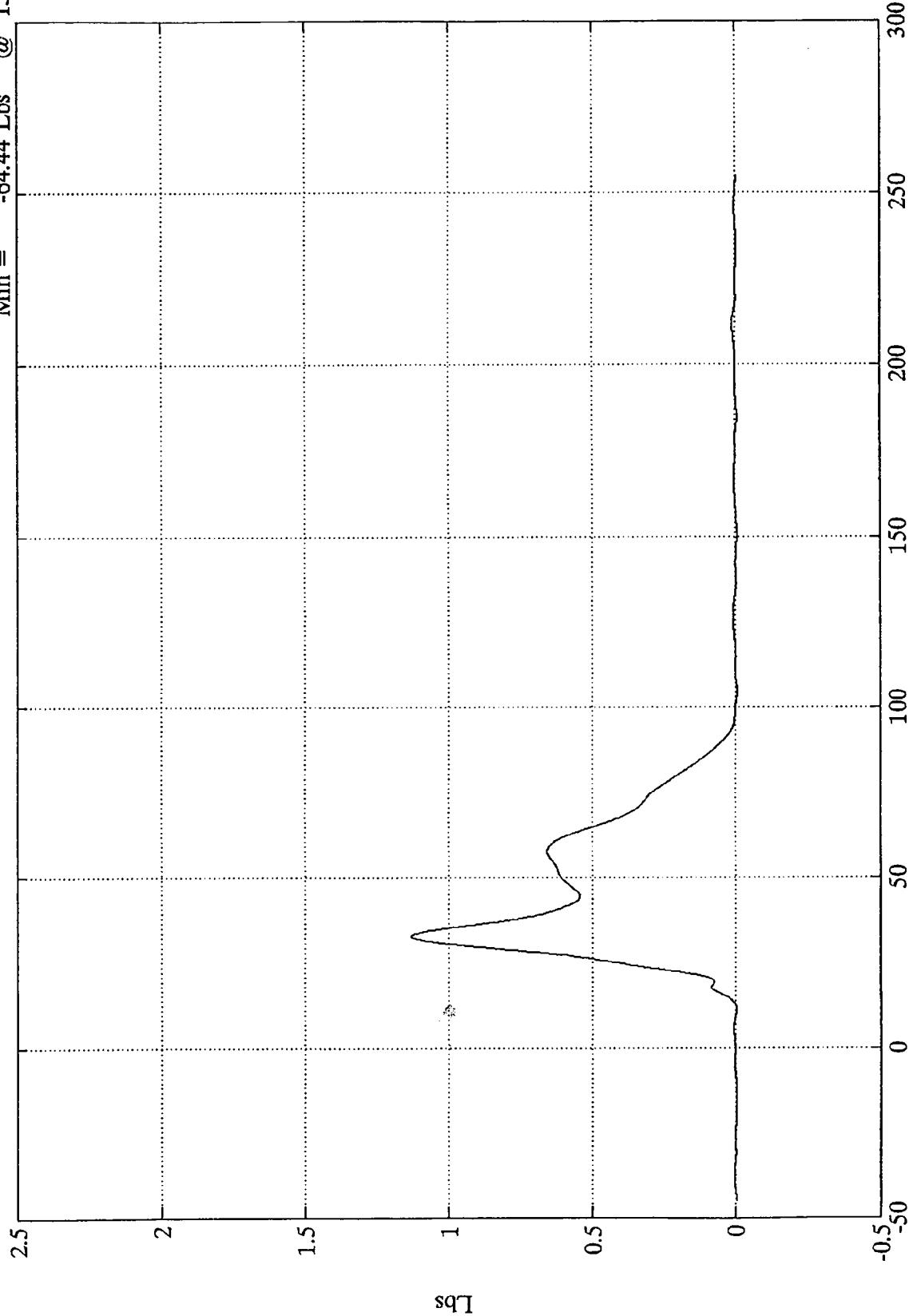
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 11295.12 Lbs @ 32.88 msec
Min = -64.44 Lbs @ 151.56 msec

Barrier Load Cell C2



B-63

8118-2

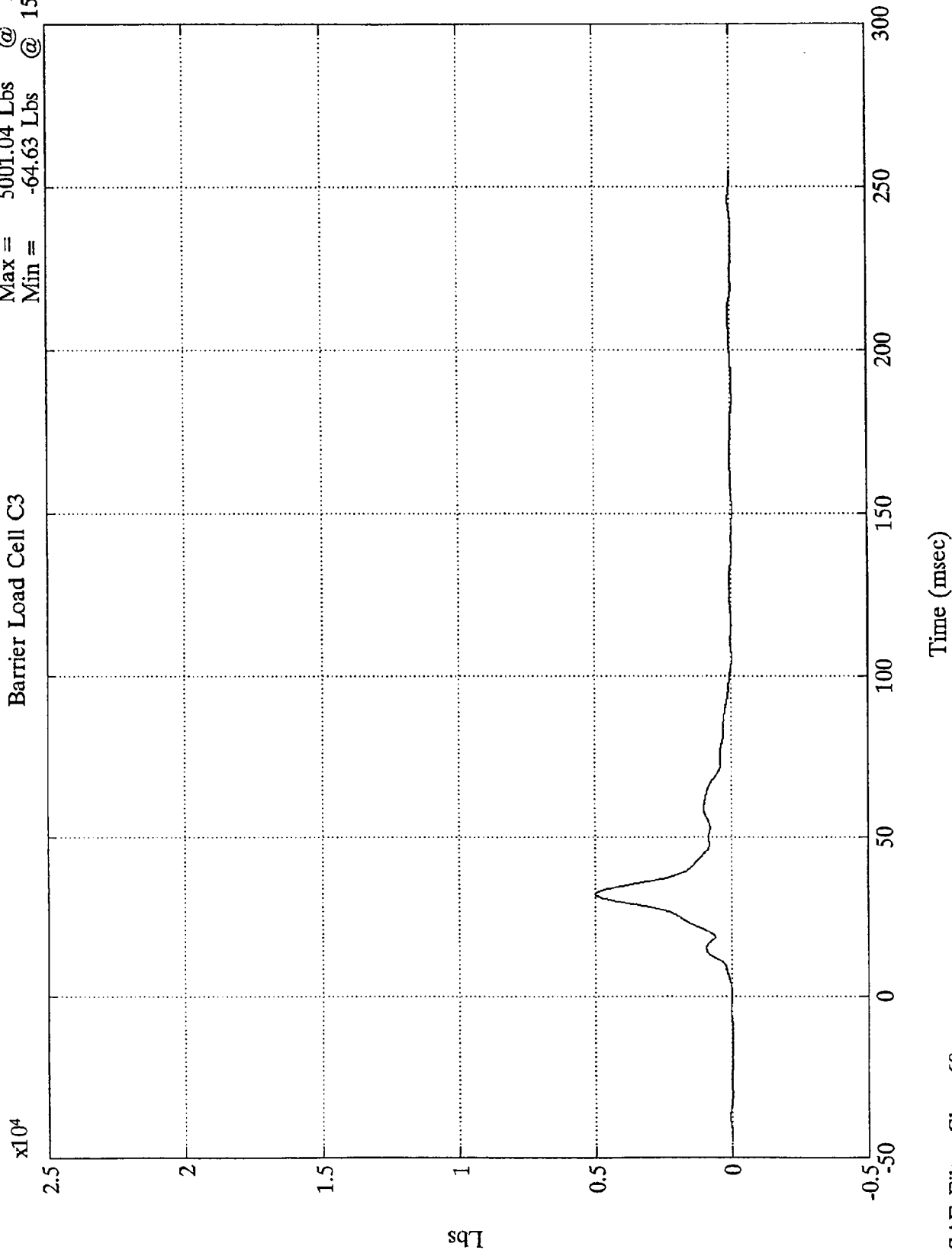
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell C3

Max = 5001.04 Lbs @ 31.92 msec
Min = -64.63 Lbs @ 151.32 msec



B-64

8118-2

SAE Filter Class 60

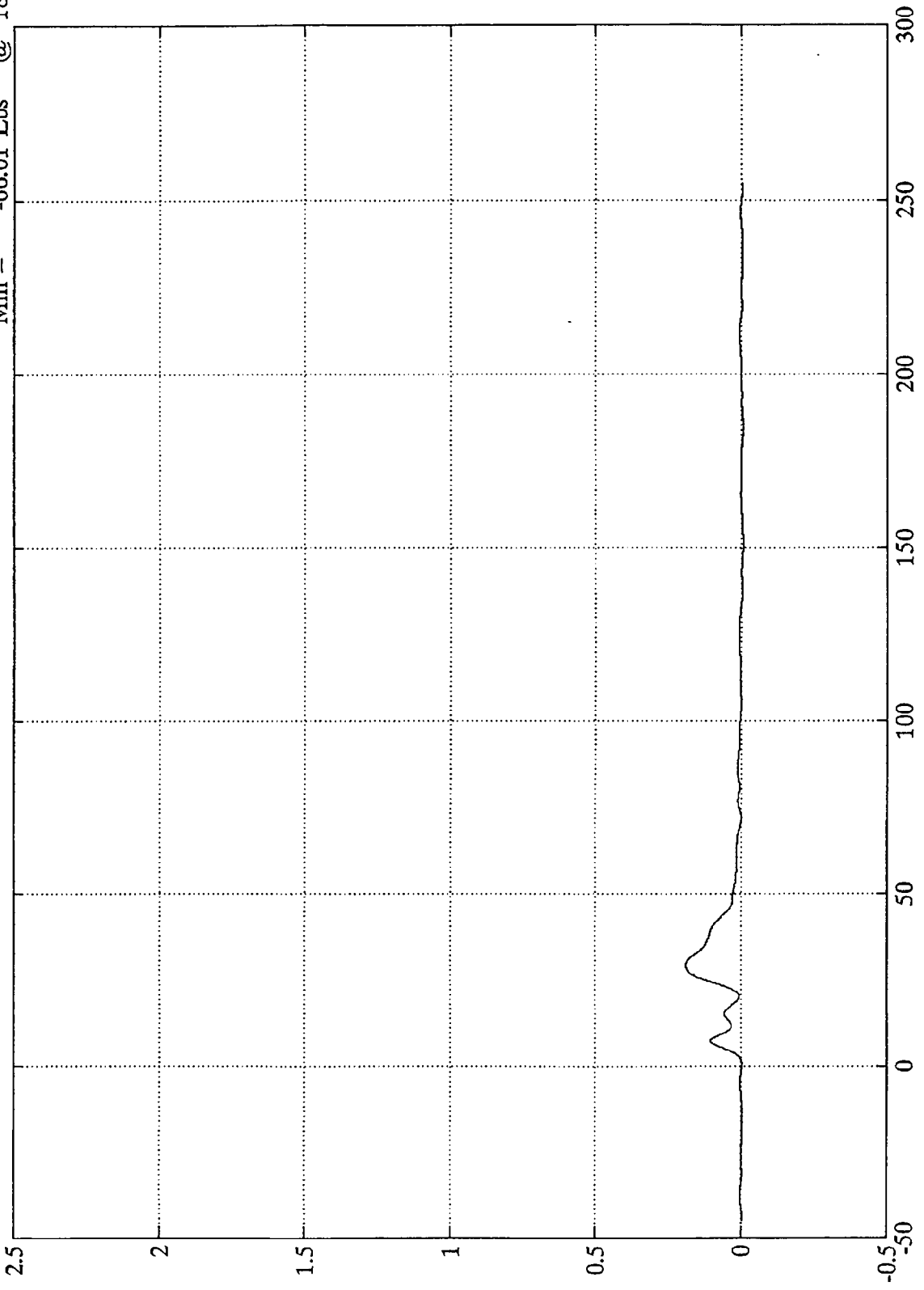


TSC Frontal Barrier Test #2 - Ford Taurus

Max = 1879.67 Lbs @ 29.27 msec
Min = -66.01 Lbs @ 184.55 msec

Barrier Load Cell C4

x10⁴



B-65

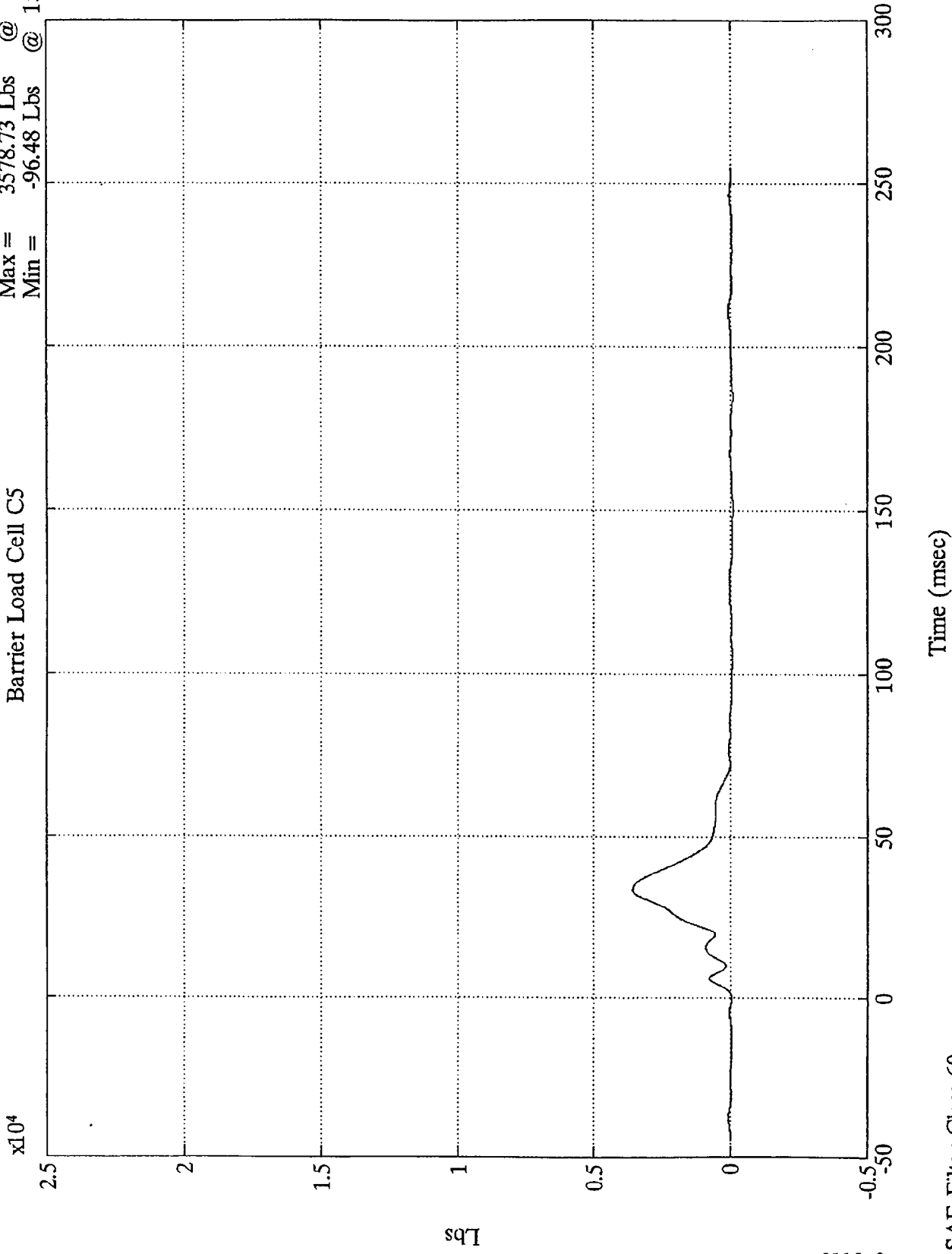
8118-2

SAE Filter Class 60

Time (msec)

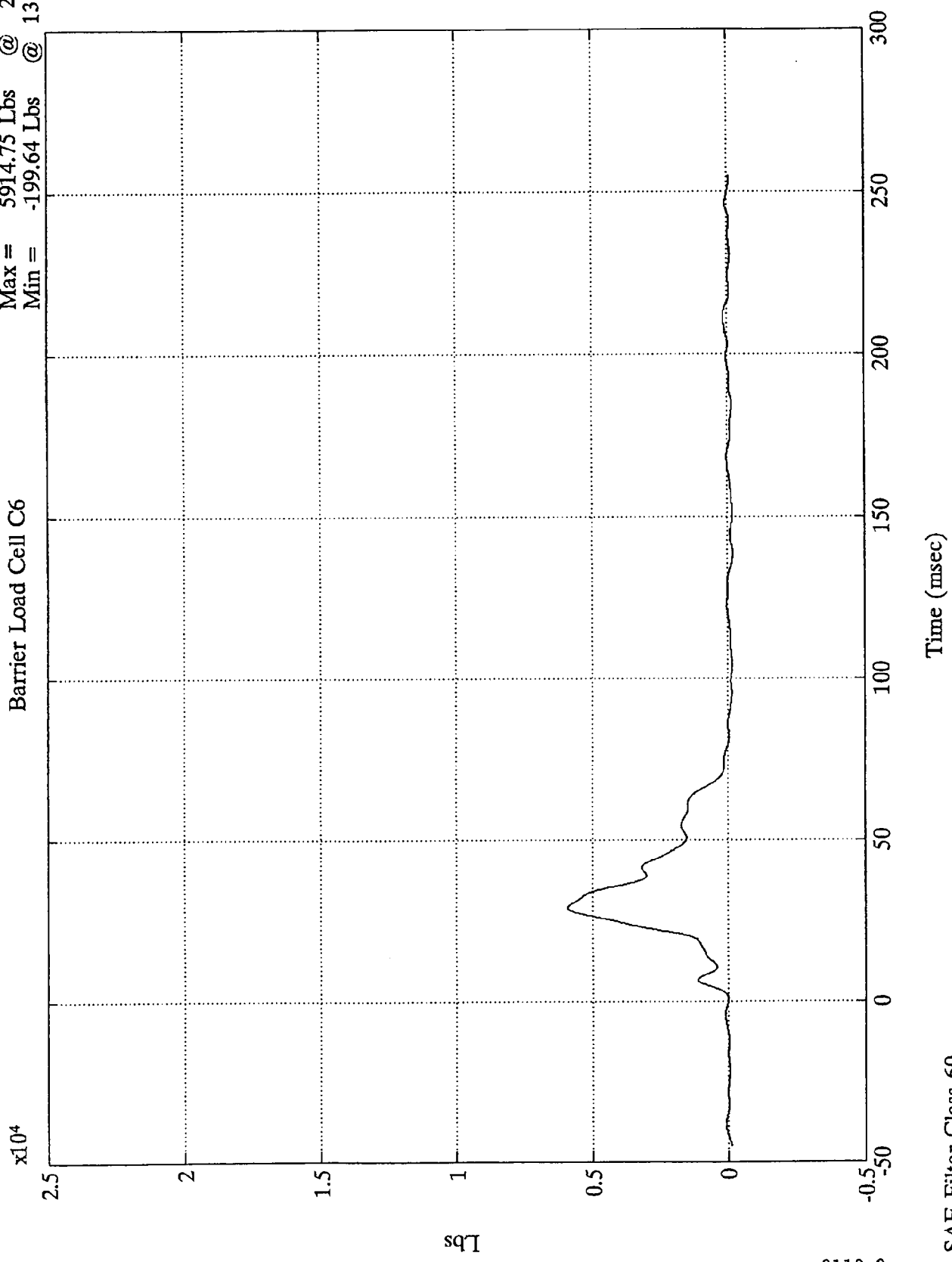
TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell C5
Max = 3578.73 Lbs @ 33.36 msec
Min = -96.48 Lbs @ 150.72 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell C6
Max = 5914.75 Lbs @ 28.92 msec
Min = -199.64 Lbs @ 138.96 msec



89-B

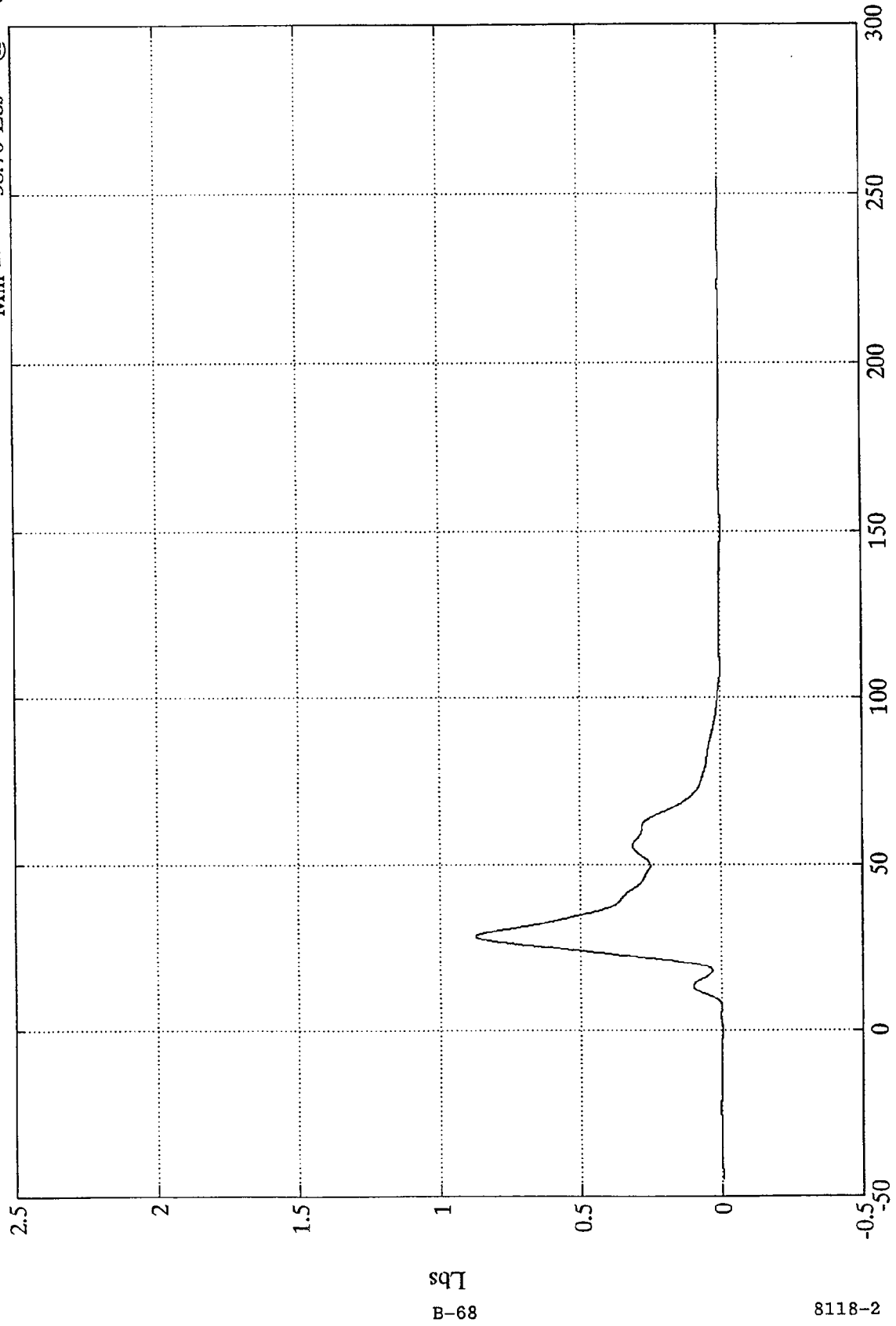
2-8118

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 8736.58 Lbs @ 28.31 msec
Min = -38.70 Lbs @ -0.96 msec

Barrier Load Cell C7



Time (msec)

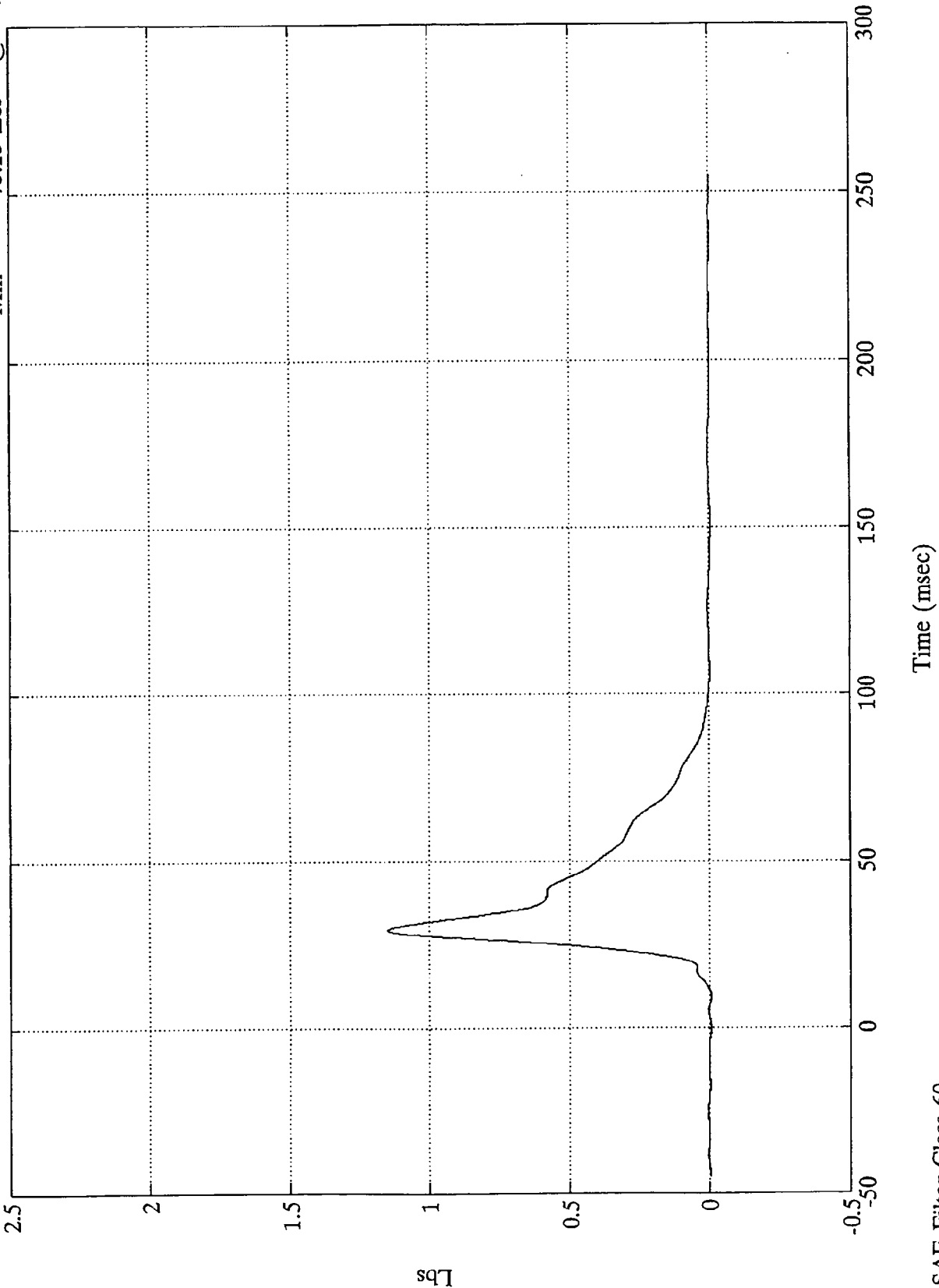
SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell C8

Max = 11499.74 Lbs @ 29.51 msec
Min = -73.13 Lbs @ 9.23 msec

$\times 10^4$



69-B

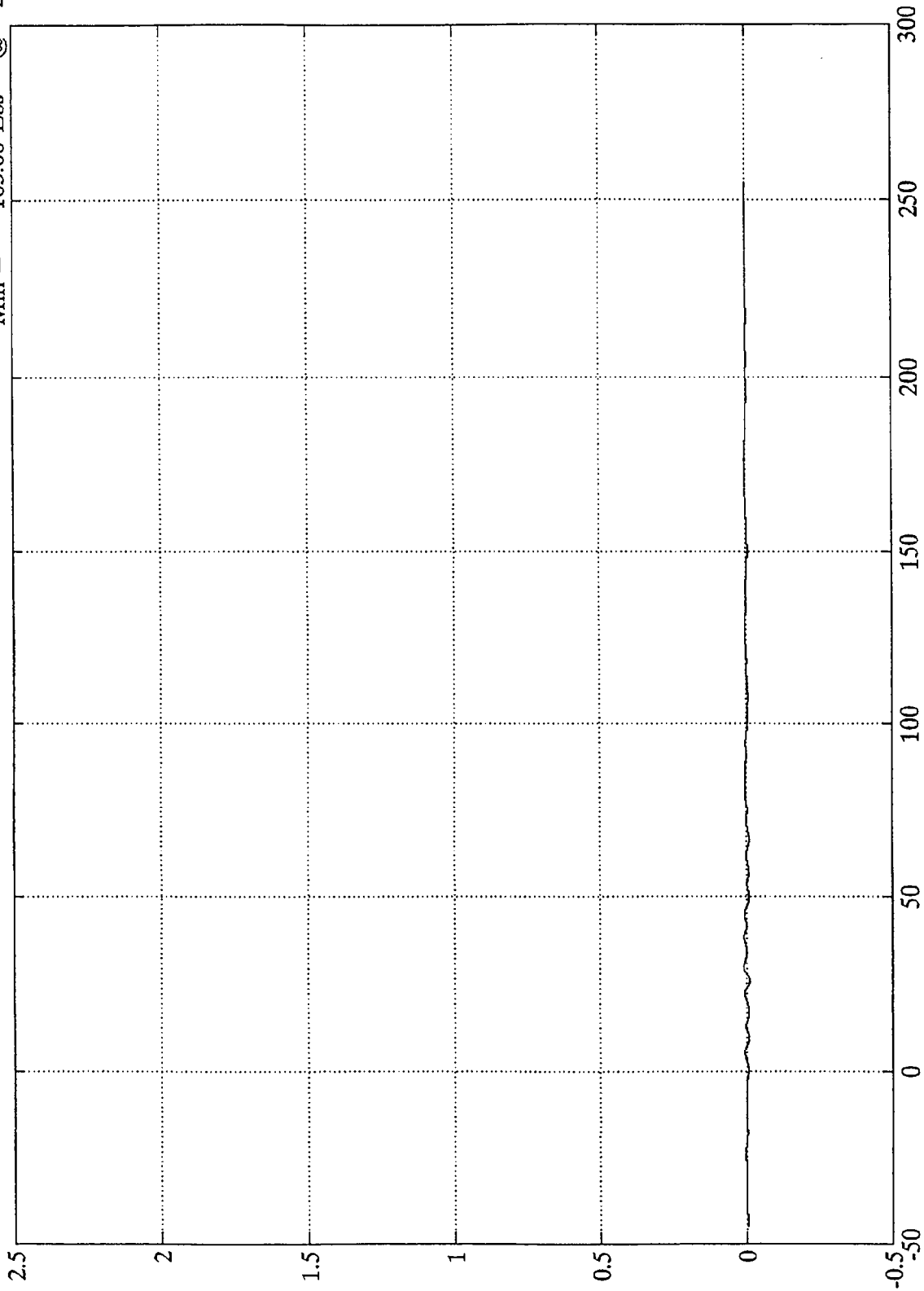
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Barrier Load Cell C9

Max = 113.36 Lbs @ 29.63 msec
Min = -103.00 Lbs @ 25.79 msec



lbs
B-70

8118-2

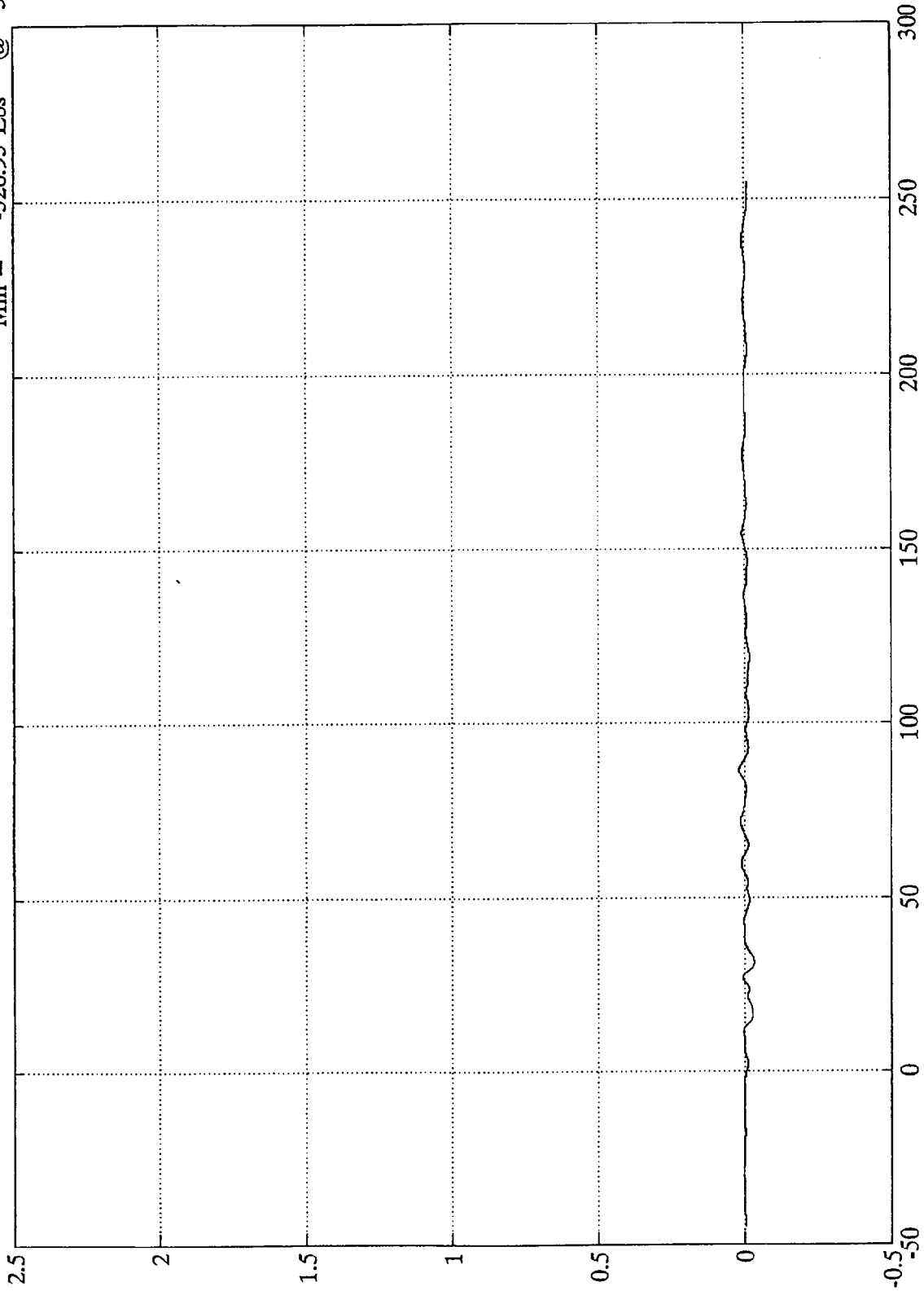
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 194.92 Lbs @ 86.40 msec
Min = -326.95 Lbs @ 31.31 msec

Barrier Load Cell D1



Lbs
B-71

Time (msec)

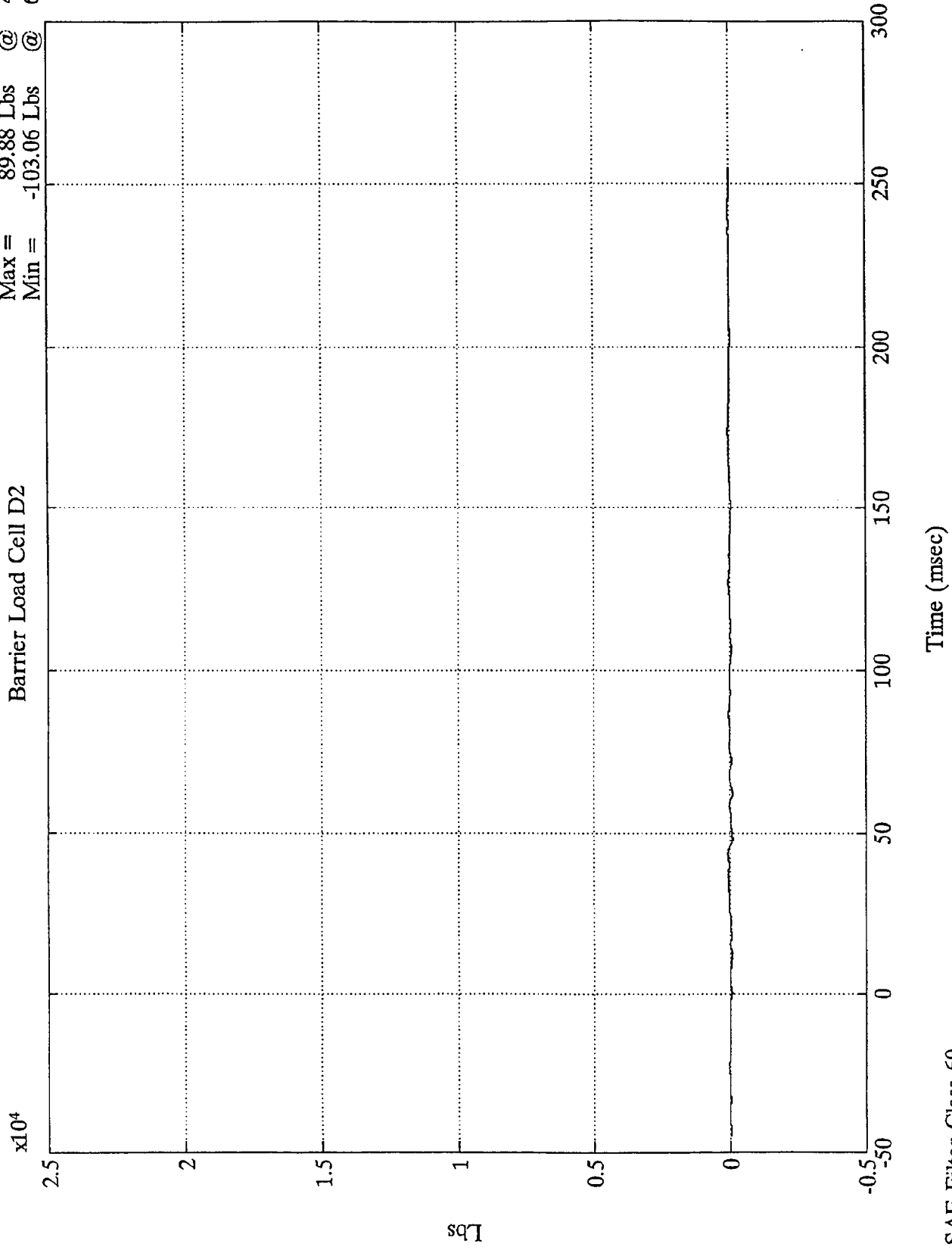
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell D2

Max = 89.88 Lbs @ 43.43 msec
Min = -103.06 Lbs @ 62.40 msec



B-72

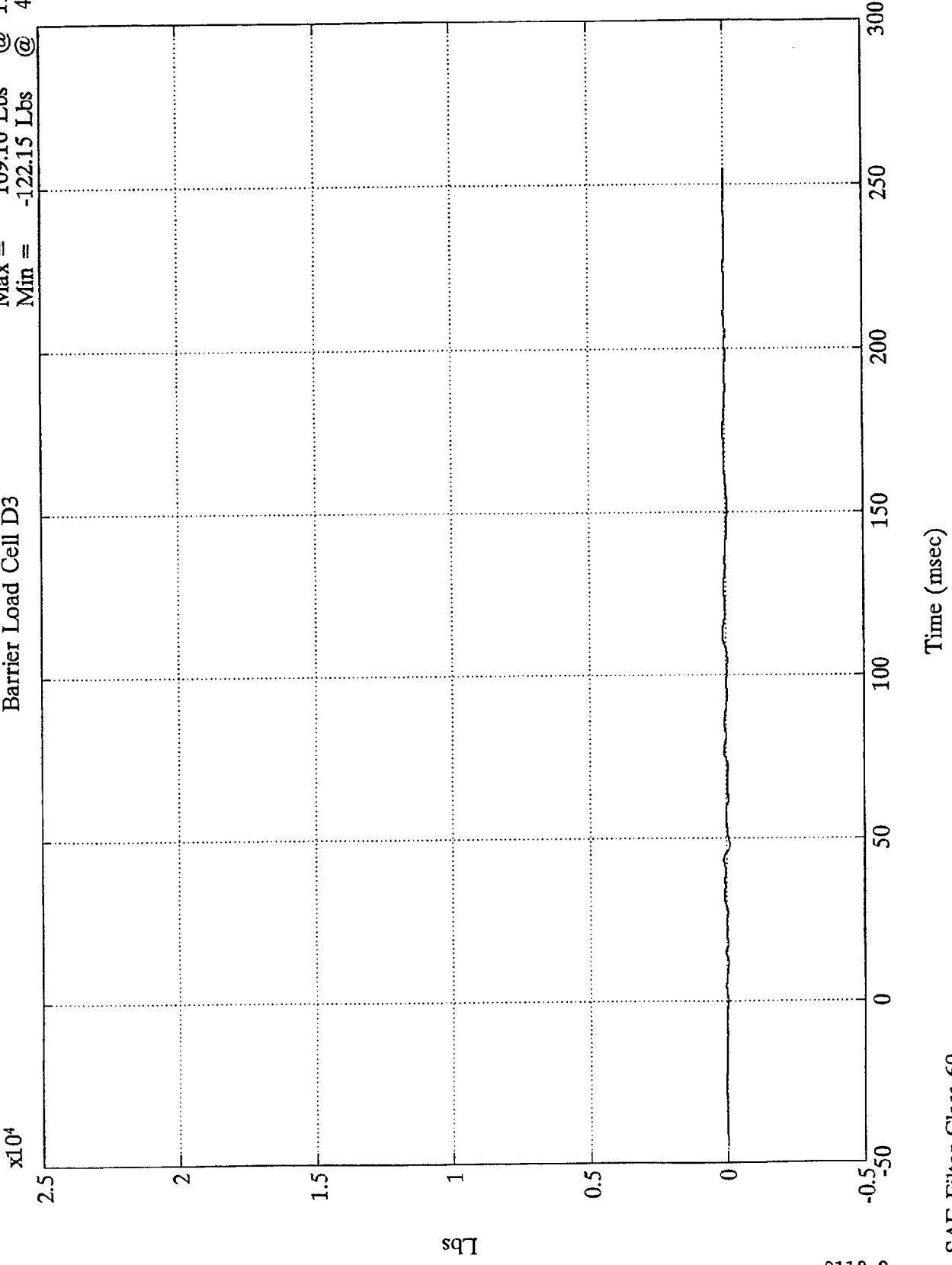
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell D3

Max = 109.10 Lbs @ 112.68 msec
Min = -122.15 Lbs @ 47.88 msec



B-73

8118-2

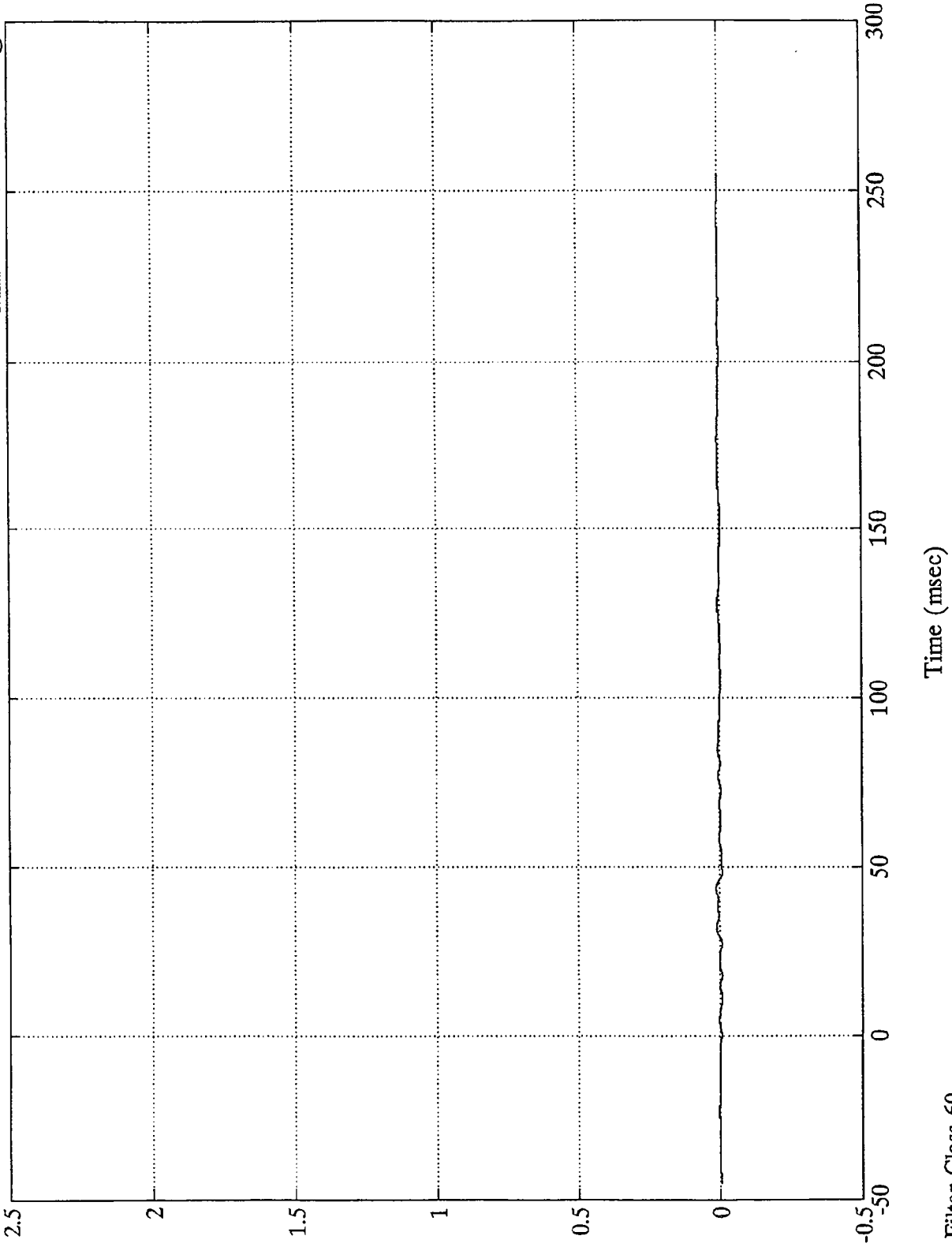
SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Barrier Load Cell D4

Max = 130.73 Lbs @
Min = -90.16 Lbs @

43.31 msec
48.36 msec



lbs
B-74

8118-2

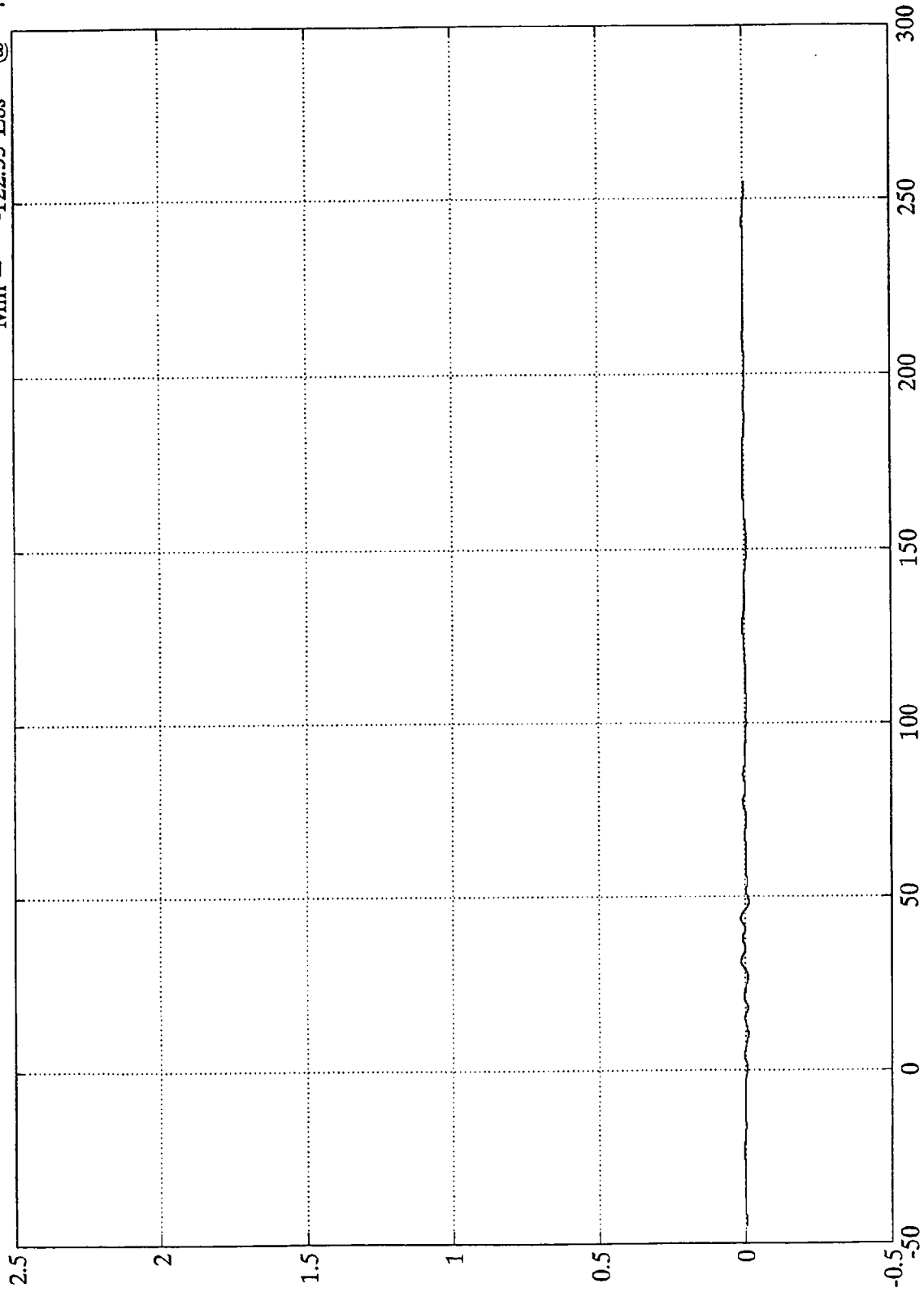
SAE Filter Class 60

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 135.13 Lbs @ 43.56 msec
Min = -122.33 Lbs @ 48.47 msec

Barrier Load Cell D5



B-75

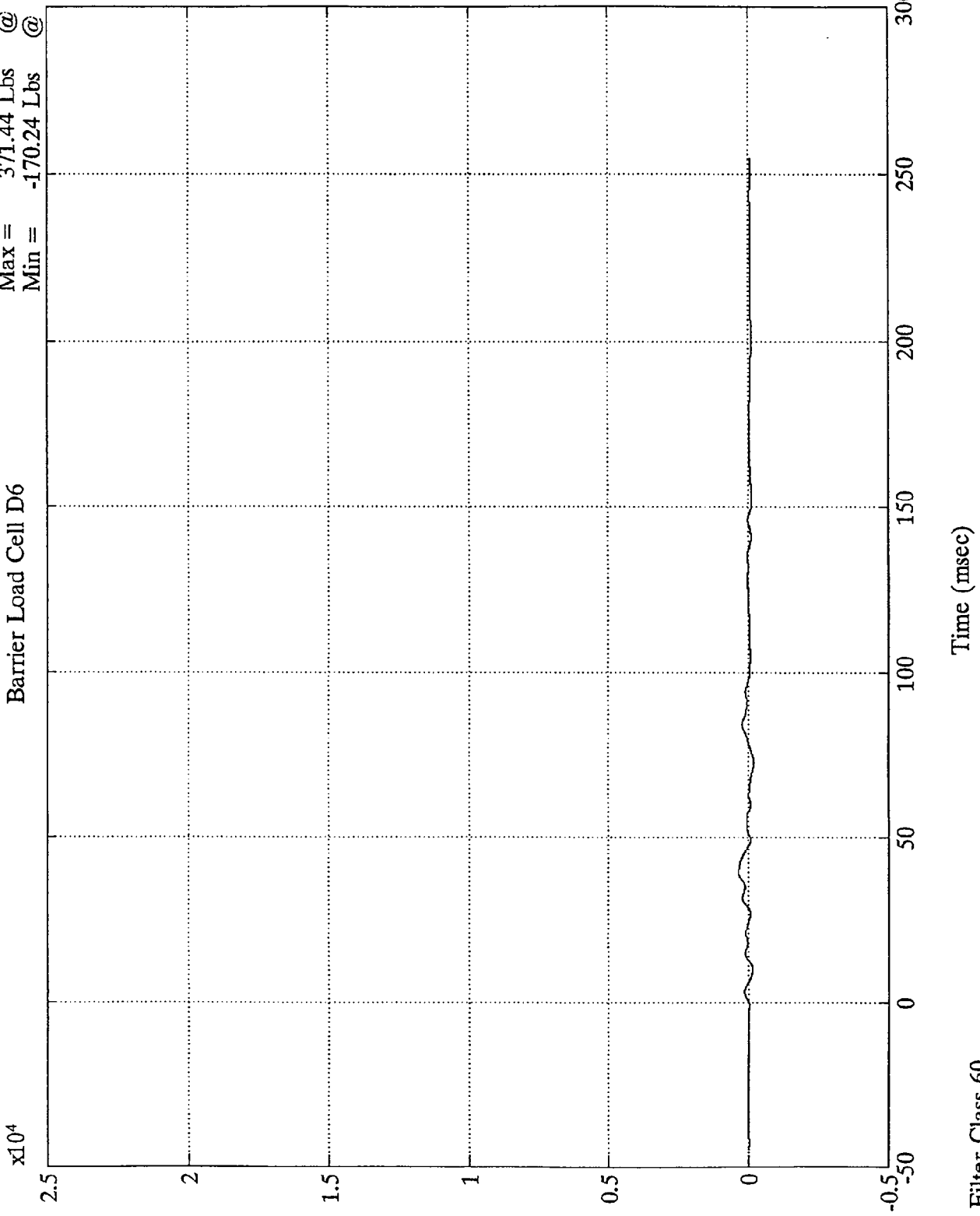
8118-2

Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell D6
Max = 371.44 Lbs @ 39.23 msec
Min = -170.24 Lbs @ 72.83 msec



B-76
Lbs

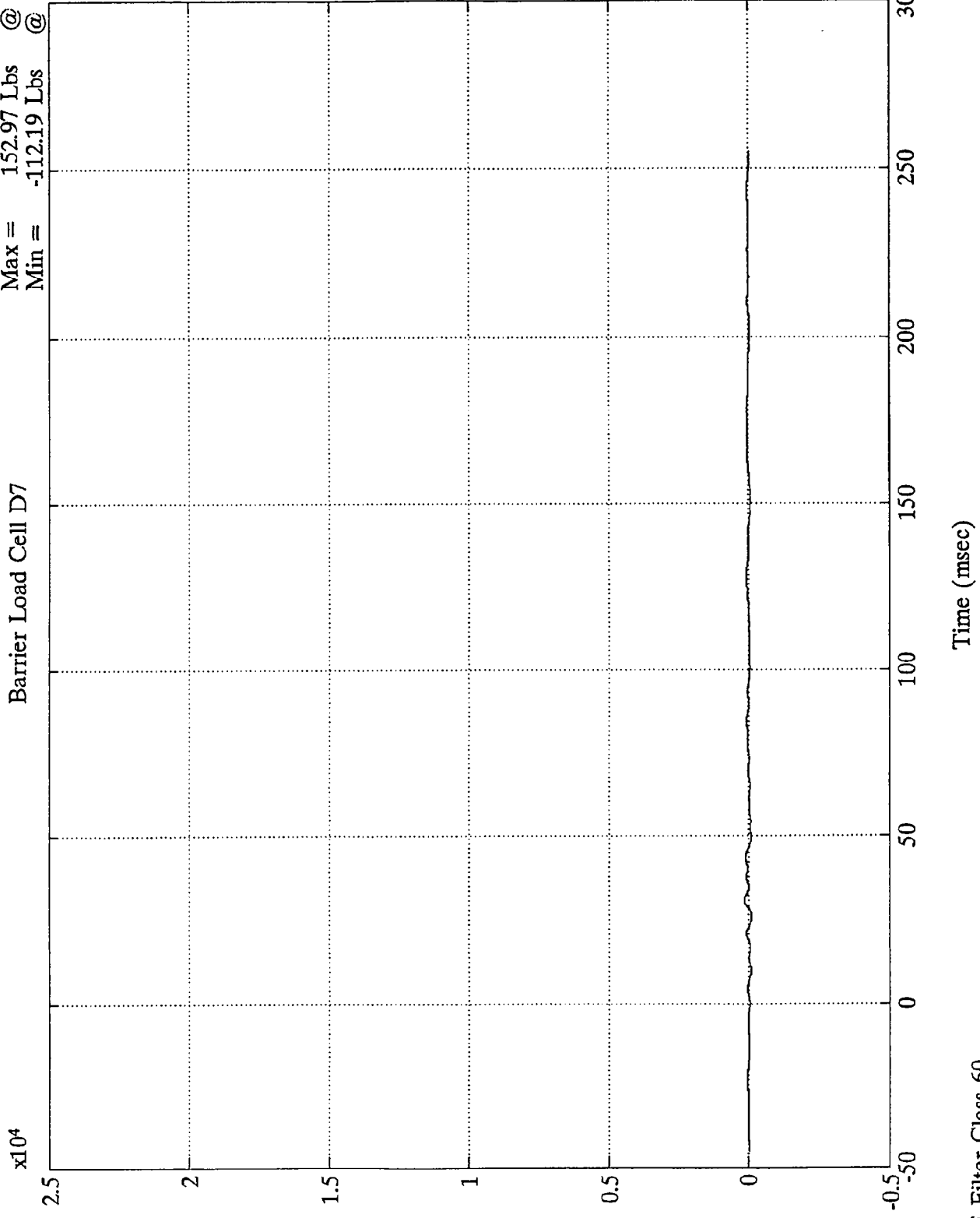
8118-2

SAE Filter Class 60

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

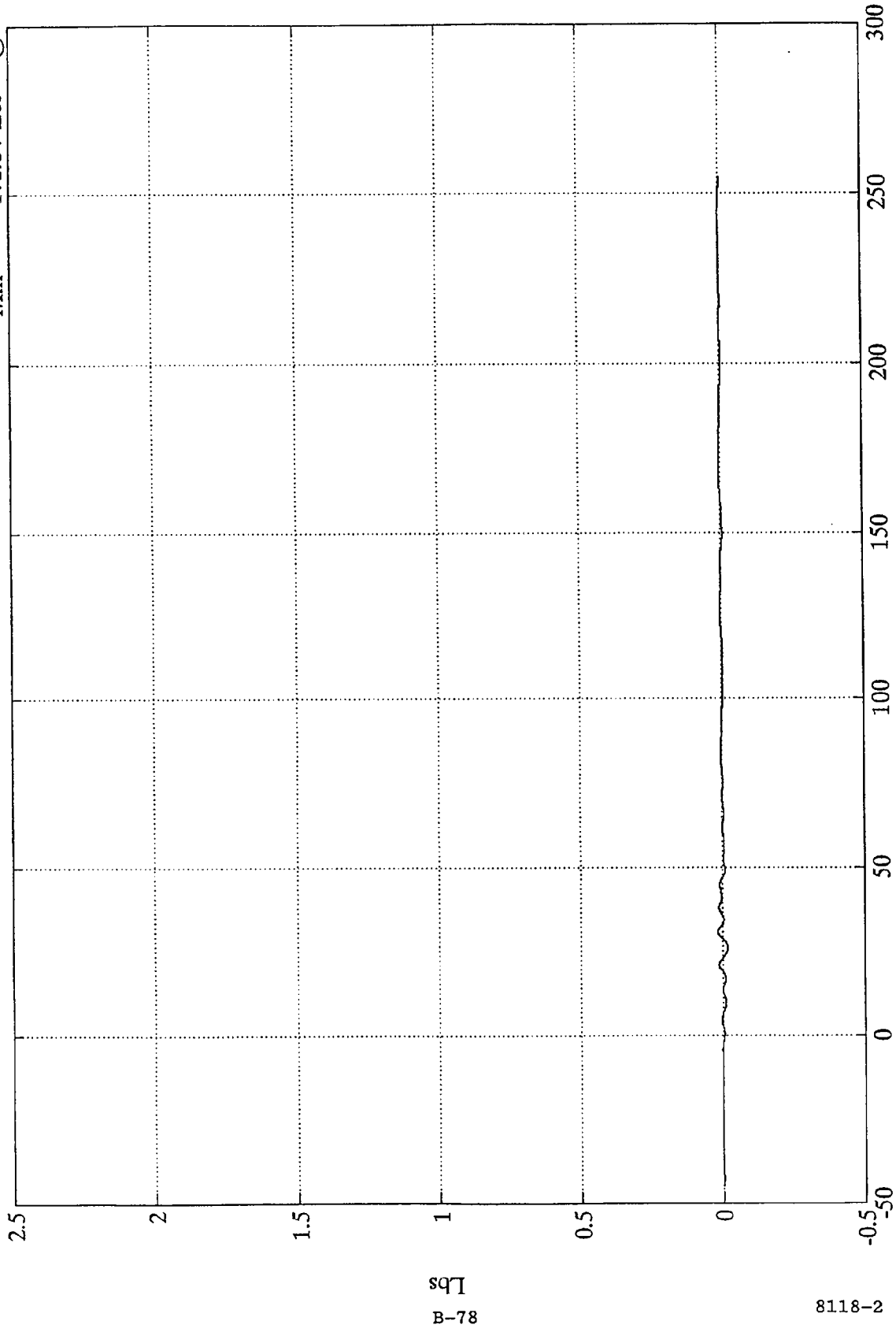
Barrier Load Cell D7
Max = 152.97 Lbs @ 30.71 msec
Min = -112.19 Lbs @ 26.15 msec



TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 163.23 Lbs @ 30.71 msec
Min = -171.84 Lbs @ 25.92 msec

Barrier Load Cell D8



87-B

2-8118

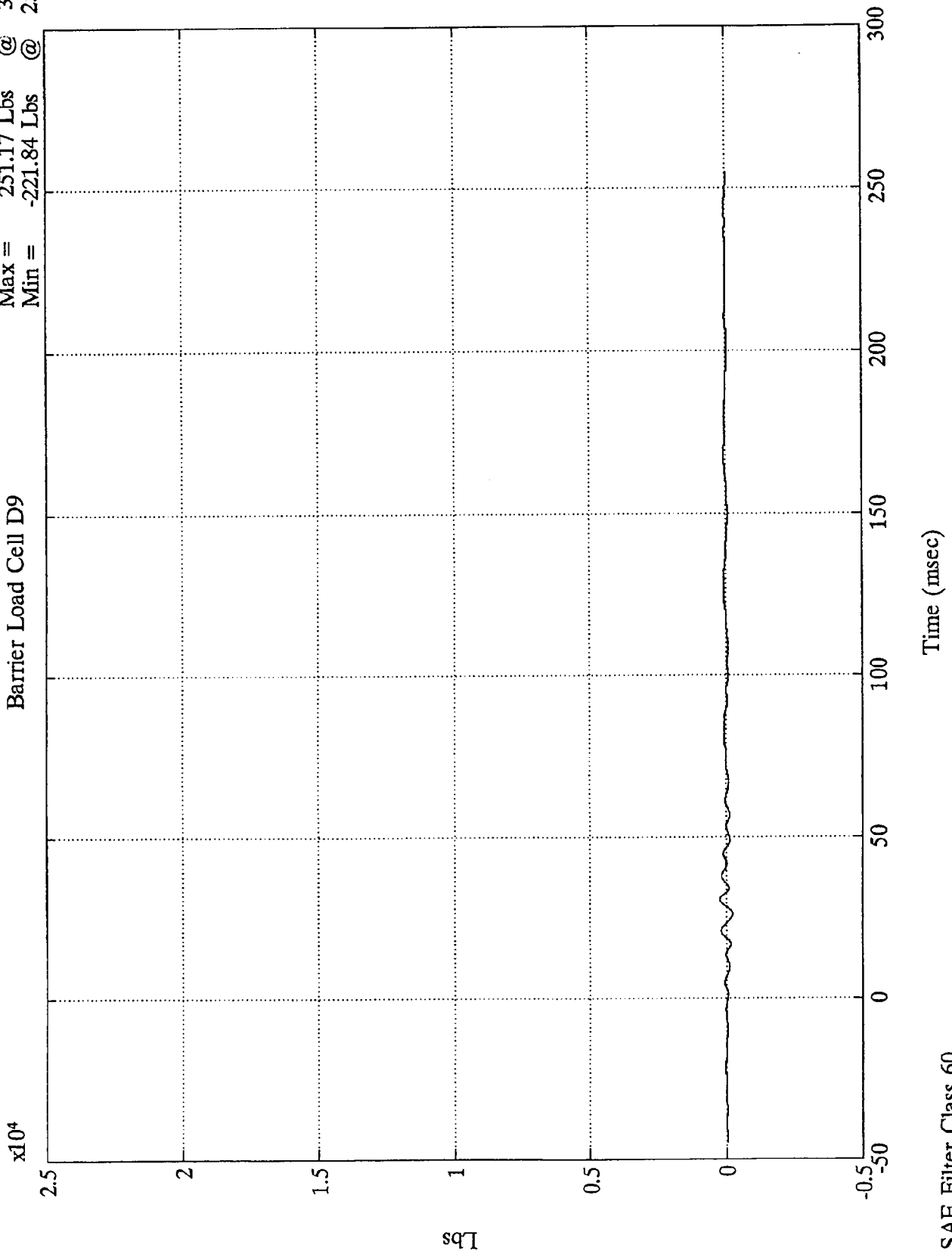
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Barrier Load Cell D9

Max = 251.17 Lbs @ 30.60 msec
Min = -221.84 Lbs @ 25.92 msec



lbs
B-79

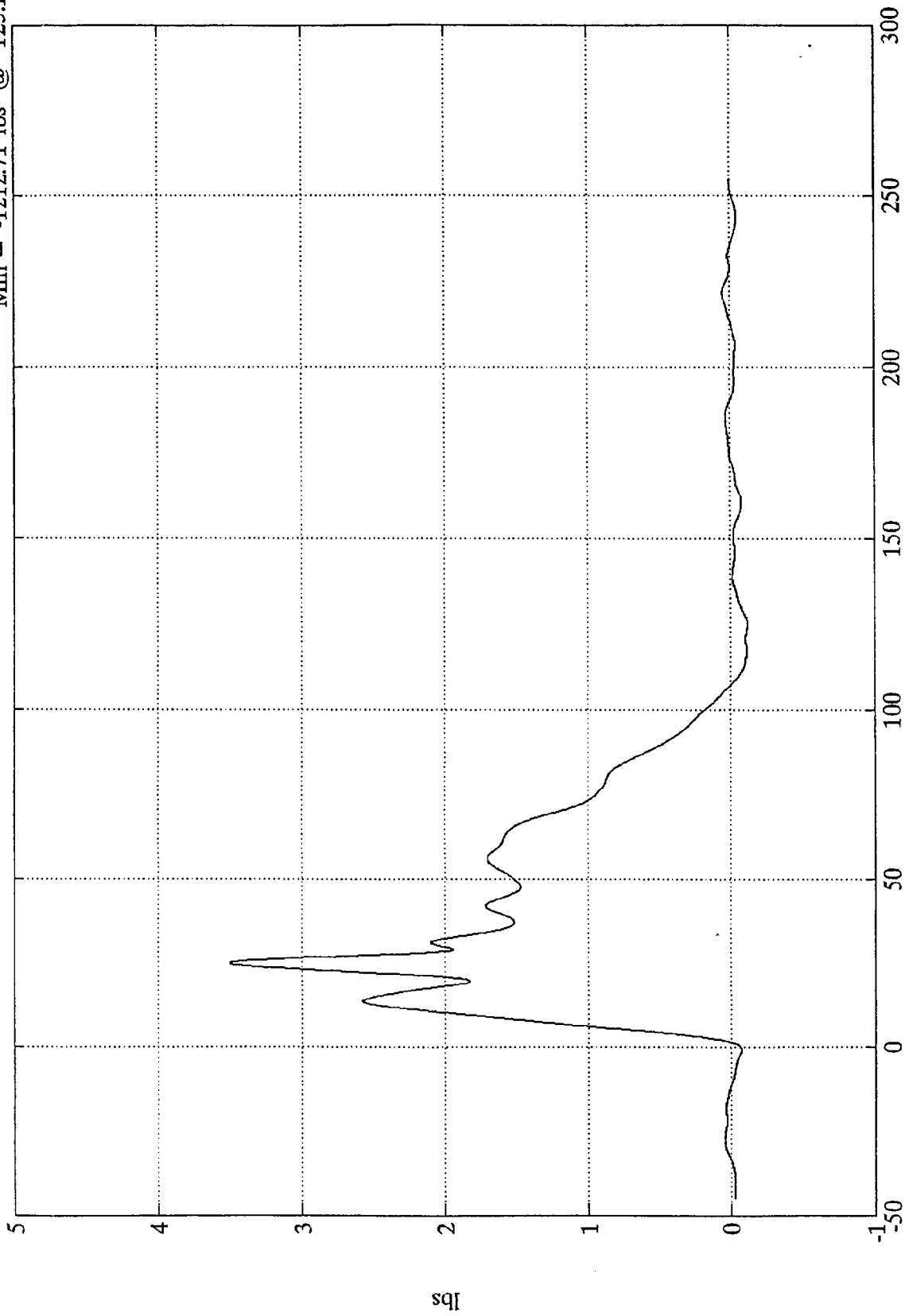
8118-2

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Group 1 Load Cell Sum

Max = 35074.50 lbs @ 24.72 msec
Min = -1212.71 lbs @ 125.16 msec



B-80

8118-2

SAE Filter Class 60

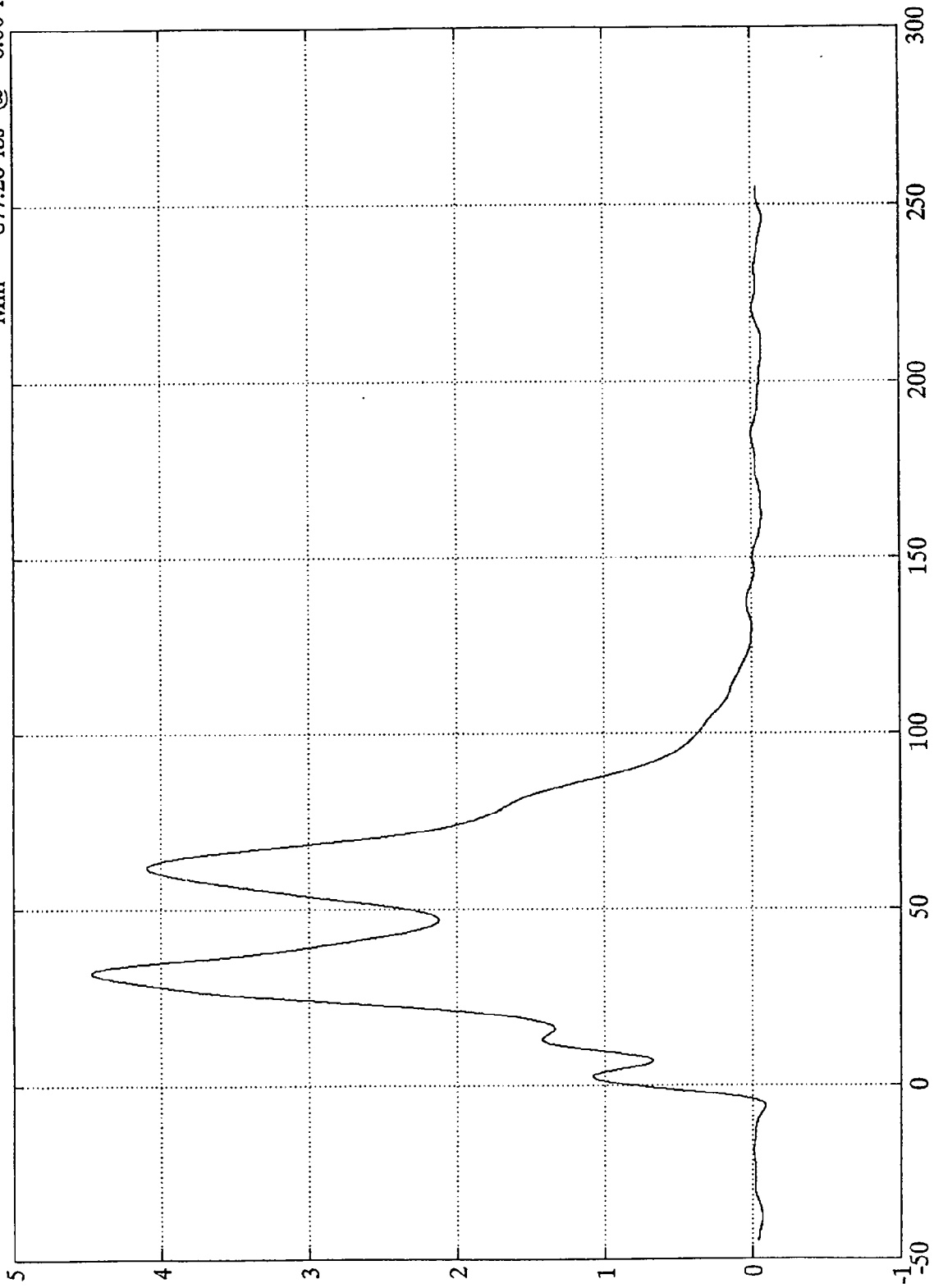
Time (msec)

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

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Group 2 Load Cell Sum

Max = 44724.80 lbs @ 31.92 msec
Min = -877.26 lbs @ -6.00 msec



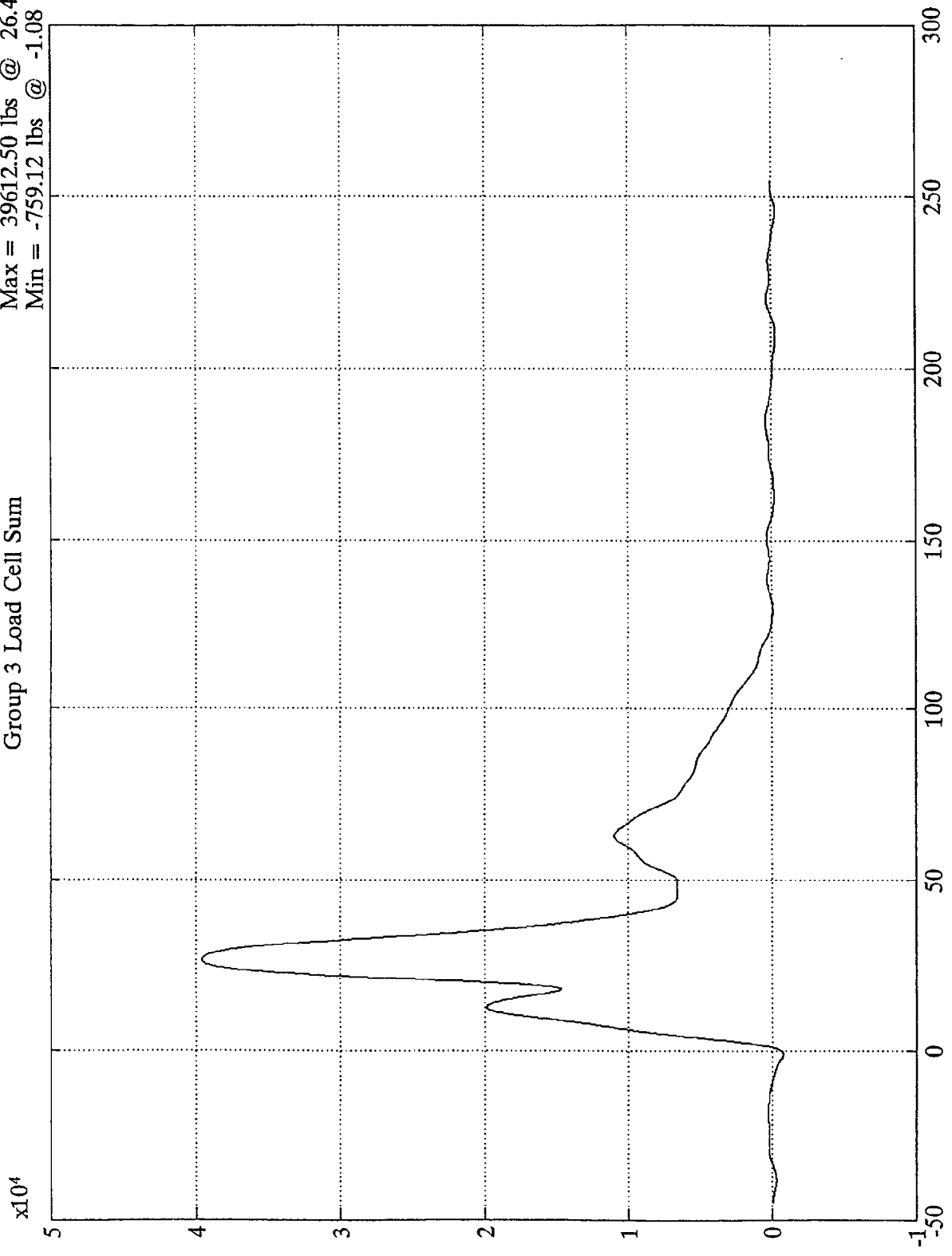
Time (msec)

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

TSC Frontal Barrier Test #2 - Ford Taurus

Group 3 Load Cell Sum

Max = 39612.50 lbs @ 26.40 msec
Min = -759.12 lbs @ -1.08 msec



Time (msec)

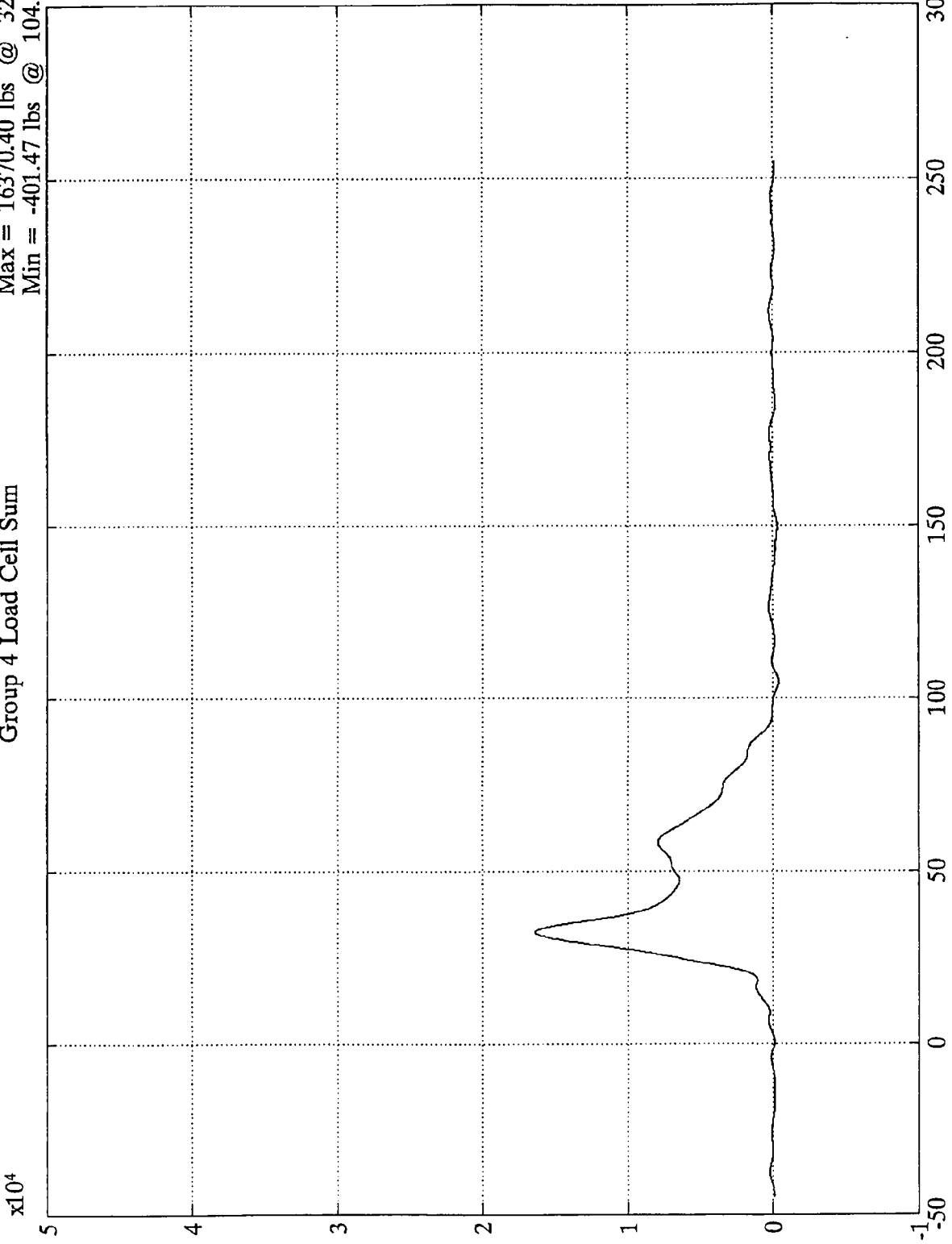
Load Cells (A7,A8,A9,B7,B8,B9)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Group 4 Load Cell Sum

Max = 16370.40 lbs @ 32.40 msec
Min = -401.47 lbs @ 104.88 msec



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

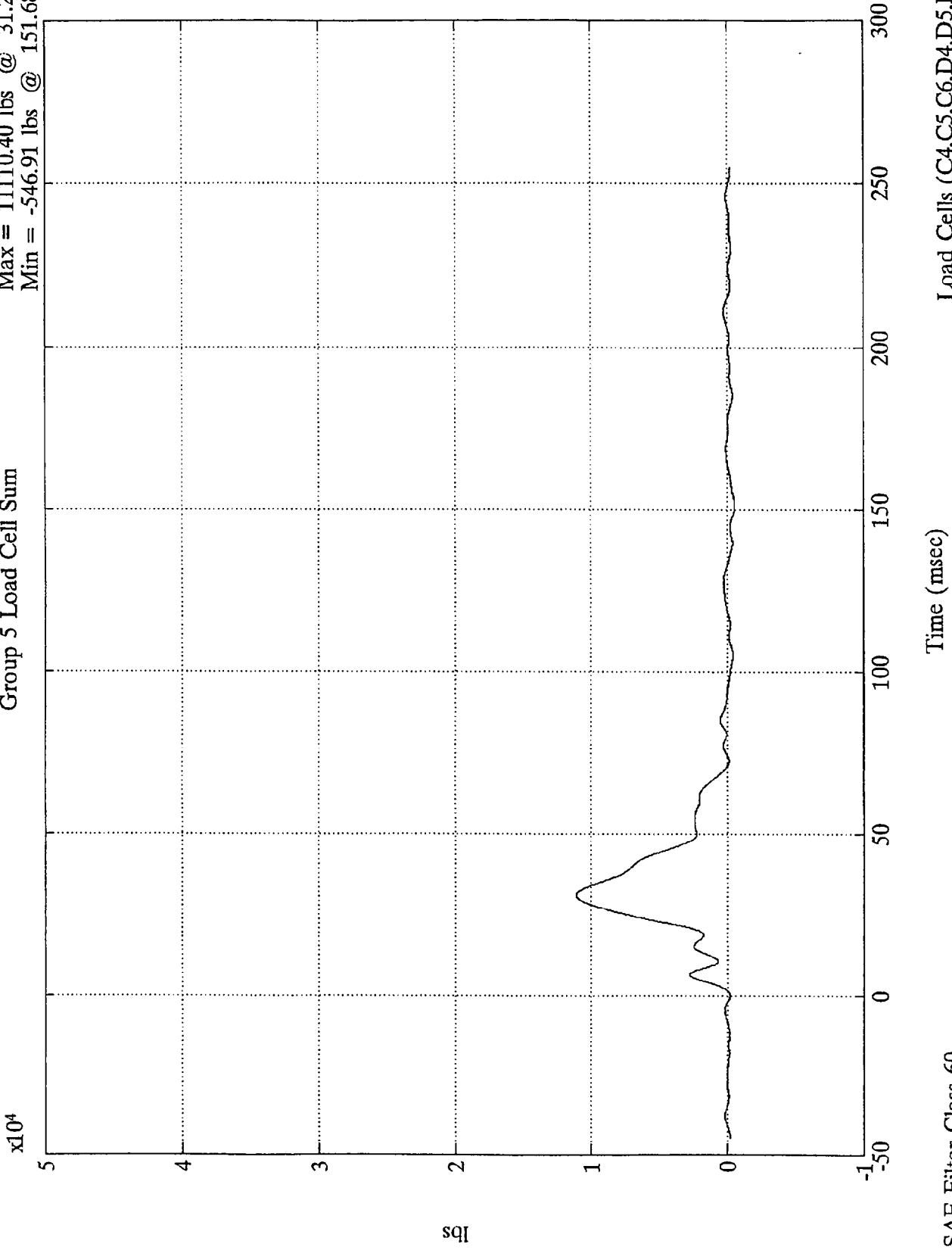
Time (msec)

SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Group 5 Load Cell Sum

Max = 11110.40 lbs @ 31.20 msec
Min = -546.91 lbs @ 151.68 msec

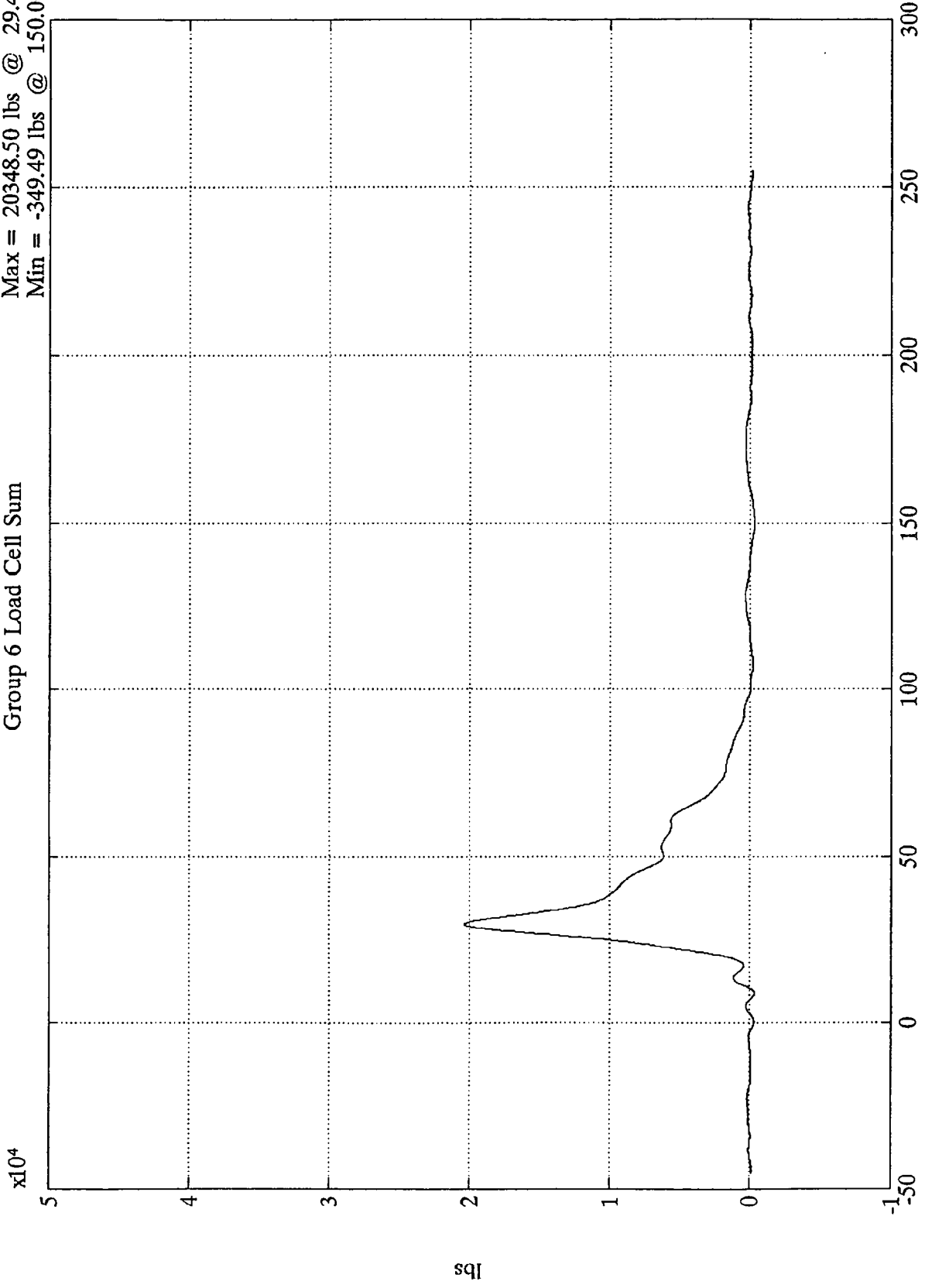


SAE Filter Class 60

TSC Frontal Barrier Test #2 - Ford Taurus

Group 6 Load Cell Sum

Max = 20348.50 lbs @ 29.40 msec
Min = -349.49 lbs @ 150.00 msec



sqi
B-85

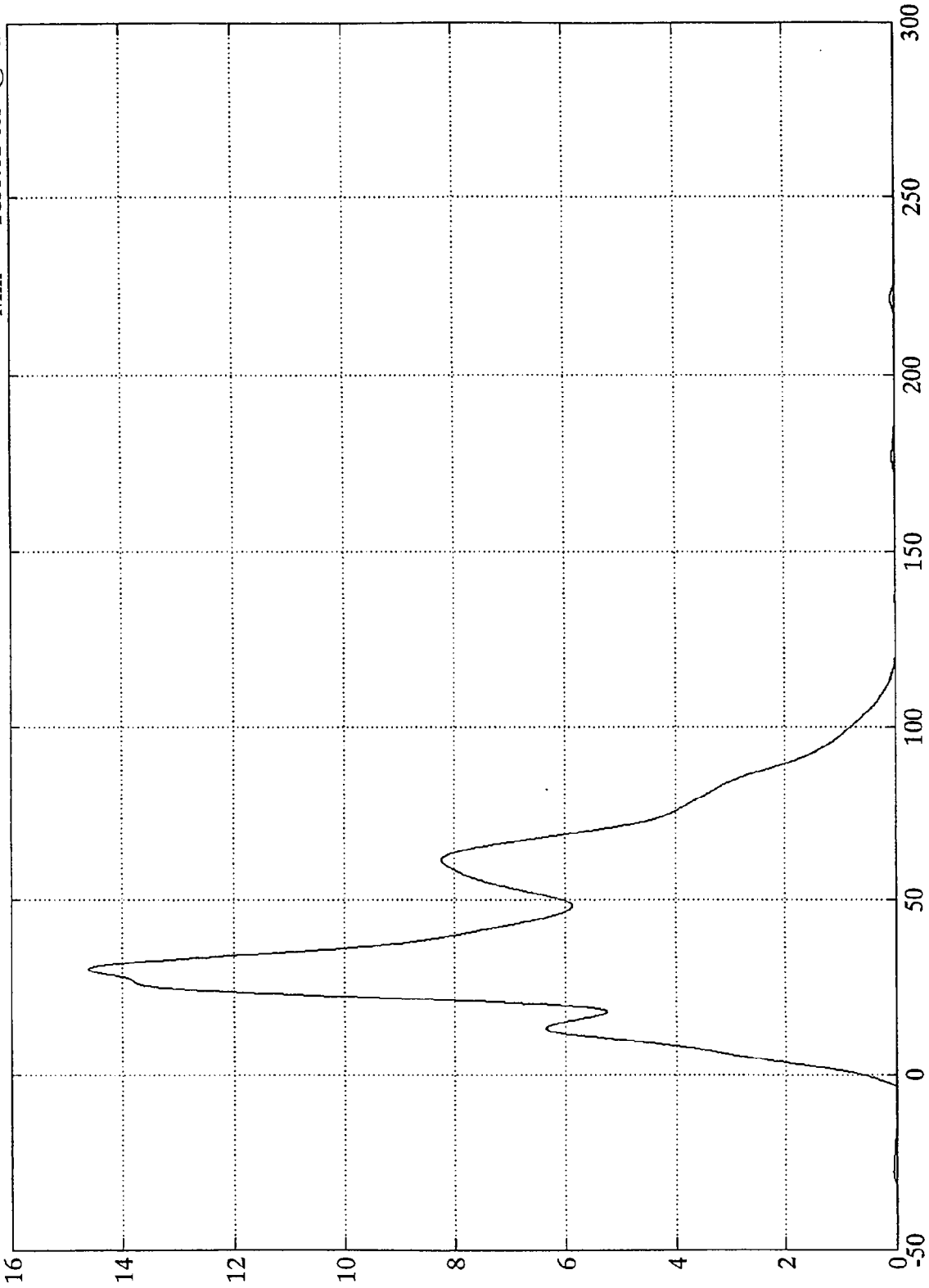
8118-2

SAE Filter Class 60
Load Cells (C7,C8,C9,D7,D8,D9)

TSC Frontal Barrier Test #2 - Ford Taurus
x10⁴

Max = 146067.00 lbs @ 30.36 msec
Min = -1835.01 lbs @ 159.24 msec

Total Load Cell Sum



Time (msec)

SAE Filter Class 60

FACILITY: TRACK
RUN #: 1307
SERIES #: 1

TEST DATE: 10 Aug 1993
TEST TIME: 12:43:27
BOARD: a

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Head X	Gs	17.0	185.8	-62.3	77.2	1000.0
2	Pos. 1 Head Y	Gs	4.3	58.4	-4.2	51.8	1000.0
3	Pos. 1 Head Z	Gs	30.2	72.1	-3.2	121.9	1000.0
4	Pos. 1 Left Femur	Lbs	60.6	100.8	-1748.9	50.6	600.0
5	Pos. 1 Chest X	Gs	5.9	183.8	-48.2	69.1	180.0
6	Pos. 1 Chest Y	Gs	3.1	51.6	-6.4	81.6	180.0
7	Pos. 1 Chest Z	Gs	6.4	59.0	-8.8	95.8	180.0
8	Pos. 1 Right Femur	Lbs	147.0	90.6	-796.2	48.6	600.0
9	Pos. 2 Head X	Gs	15.1	218.2	-78.0	59.5	1000.0
10	Pos. 2 Head Y	Gs	9.3	42.7	-8.8	64.7	1000.0
11	Pos. 2 Head Z	Gs	34.0	44.3	-17.6	117.7	1000.0
12	Pos. 2 Left Femur	Lbs	119.1	28.9	-654.7	52.7	600.0
13	Pos. 2 Chest X	Gs	3.4	178.7	-69.9	43.3	180.0
14	Pos. 2 Chest Y	Gs	8.9	54.4	-2.9	37.4	180.0
15	Pos. 2 Chest Z	Gs	8.9	67.8	-13.7	109.8	180.0
16	Pos. 2 Right Femur	Lbs	63.0	33.1	-722.2	37.7	600.0
17	Pos. 1 Head Resultant	Gs	67.7	76.9	.0	-2.3	1000.0
18	Pos. 1 Chest Resultant	Gs	48.5	69.1	.0	8.3	180.0
19	Pos. 2 Head Resultant	Gs	78.4	59.5	.1	-23.8	1000.0
20	Pos. 2 Chest Resultant	Gs	70.0	43.3	.0	-6.7	180.0

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

hic: 584.07
t1 = 56.400 msec
t2 = 92.280 msec
Average G's Over Hic Duration = 48.38

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

hic: 637.13
t1 = 41.040 msec
t2 = 72.360 msec
Average G's Over Hic Duration = 52.89

CLIP SUMMARY: Pos. 1 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 47.995 G's
Tstart = 67.0800 ms
Tend = 70.2000 ms
CSI = 483.916

CLIP SUMMARY: Pos. 2 Chest Resultant

Peak Resultant (3 ms CLIPPED DURATION) = 47.179 G's
Tstart = 58.8000 ms
Tend = 61.8000 ms
CSI = 493.021

FACILITY: TRACK
RUN #: 1307
SERIES #: 1

TEST DATE: 10 Aug 1993
TEST TIME: 12:43:27
BOARD: b

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Lower Neck Fx	lbs	60.1	203.4	-263.3	74.0	1000.0
2	Pos. 1 Lower Neck Fy	lbs	49.7	46.2	-38.5	77.5	1000.0
3	Pos. 1 Lower Neck Fz	lbs	576.1	71.8	-53.5	121.3	1000.0
4	Pos. 1 Chest Deflection	ins	.0	-29.9	-.2	51.0	180.0
5	Pos. 1 Lower Neck Mx	ft-lbs	12.6	232.9	-18.8	106.9	600.0
6	Pos. 1 Lower Neck My	ft-lbs	56.1	120.4	-52.5	218.4	600.0
7	Pos. 1 Lower Neck Mz	ft-lbs	10.1	116.8	-12.0	75.7	600.0
8	Pos. 2 Chest Deflection	ins	.1	22.1	-1.3	62.2	180.0
9	Pos. 2 Thorax Fx	lbs	121.4	49.0	-120.3	106.7	1000.0
10	Pos. 2 Thorax Fy	lbs	198.5	58.1	-42.8	32.0	1000.0
11	Pos. 2 Thorax Fz	lbs	244.7	44.9	-411.6	110.2	1000.0
12	Toe Pan (X)	G's	38.1	75.2	-70.0	48.4	60.0
13	Pos. 2 Lumbar Fx	lbs	271.5	117.2	-466.9	46.8	1000.0
14	Pos. 2 Lumbar Fy	lbs	225.1	56.6	-77.2	100.4	1000.0
15	Pos. 2 Lumbar Fz	lbs	160.4	56.6	-427.7	103.7	1000.0
16	Engine Top (X)	G's	32.3	46.6	-104.3	27.2	60.0
17	P1 L. Neck Force Result.	lbs	627.4	71.8	.8	-6.8	1000.0
18	P1 L. Neck Moment Result.	ft-lbs	58.1	120.5	.2	-16.7	600.0
19	P2 Thorax Force Result.	lbs	428.0	108.0	1.3	-5.9	1000.0
20	P2 Lumbar Force Result.	lbs	516.9	46.2	2.2	1.6	1000.0

FACILITY: TRACK
RUN #: 1307
SERIES #: 1

TEST DATE: 10 Aug 1993
TEST TIME: 12:43:27
BOARD: c

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Pelvic X	Gs	5.0	126.5	-56.8	49.9	1000.0
2	Pos. 1 Pelvic Y	Gs	8.0	91.1	-12.9	61.7	1000.0
3	Pos. 1 Pelvic Z	Gs	14.8	26.4	-22.9	24.6	1000.0
4	Engine Bottom (X)	Gs	27.6	52.1	-114.7	34.4	60.0
5	Pos. 2 Pelvic X	Gs	8.2	128.3	-61.7	37.2	1000.0
6	Pos. 2 Pelvic Y	Gs	13.2	44.2	-10.0	85.7	1000.0
7	Pos. 2 Pelvic Z	Gs	25.9	37.7	-15.9	95.2	1000.0
8	Left Caliper (X)	Gs	11.6	54.2	-86.3	34.1	60.0
9	Rear Seat X-Member (X)	Gs	2.8	136.3	-41.9	48.5	60.0
10	Rear Seat X-Member (Y)	Gs	4.8	53.9	-6.9	40.8	60.0
11	Rear Seat X-Member (Z)	Gs	19.7	75.6	-18.2	54.7	60.0
12	Right Caliper (X)	Gs	11.7	81.5	-89.2	31.3	60.0
13	Pos. 1 Upper Neck Fx	lbs	114.2	82.0	-99.7	120.8	1000.0
14	Pos. 1 Upper Neck My	ft-lbs	26.6	66.0	-16.3	236.6	600.0
15	Pos. 1 Upper Neck Fz	lbs	375.5	72.1	-21.6	24.5	1000.0
16	Front Seat X-Member (X)	Gs	68.6	33.1	-129.1	26.2	60.0
17	Pos. 1 Pelvic Resultant	Gs	57.1	49.9	.1	-19.8	1000.0
18	Pos. 2 Pelvic Resultant	Gs	62.3	41.6	.0	1.7	1000.0
19	R. Seat X-Member Result.	Gs	42.0	48.5	.1	124.0	60.0

FACILITY: TRACK
RUN #: 1307
SERIES #: 1

TEST DATE: 10 Aug 1993
TEST TIME: 12:43:27
BOARD: d

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 1 Lumbar Fx	lbs	174.0	98.9	-770.0	69.1	1000.0
2	Pos. 1 Lumbar My	ft-lbs	149.7	70.0	-38.6	166.9	1000.0
3	Pos. 1 Lumbar Fz	lbs	141.2	152.3	-500.8	86.2	1000.0
4	Pos. 1 L. Upper Tibia Mx	ft-lbs	32.5	68.5	-68.4	35.6	600.0
5	Pos. 1 L. Upper Tibia My	ft-lbs	80.1	32.3	-94.0	78.5	600.0
6	Pos. 1 L. Lower Tibia Fy	lbs	200.6	32.3	-74.3	79.4	600.0
7	Pos. 1 L. Lower Tibia Fz	lbs	811.5	36.0	-106.8	66.5	600.0
8	Pos. 1 L. Lower Tibia Mx	ft-lbs	34.2	31.2	-40.0	51.2	600.0
9	Pos. 1 R. Upper Tibia Mx	ft-lbs	59.7	59.2	-14.4	50.6	600.0
10	Pos. 1 R. Upper Tibia My	ft-lbs	64.2	78.5	-191.9	48.0	600.0
11	Pos. 1 R. Lower Tibia Fy	lbs	136.7	57.0	-62.7	55.0	600.0
12	Pos. 1 R. Lower Tibia Fz	lbs	115.6	167.4	-2218.0	48.6	600.0
13	Pos. 1 R. Lower Tibia Mx	ft-lbs	19.4	56.8	-27.5	45.8	600.0
14	Pos. 2 Upper Neck Fx	lbs	64.0	110.9	-382.5	57.0	1000.0
15	Pos. 2 Upper Neck Fy	lbs	702.5	51.5	-206.4	167.5	1000.0
16	Pos. 2 Upper Neck Mz	ft-lbs	128.0	59.5	-23.9	115.7	600.0

FACILITY: TAPE
RUN #: 10307
SERIES #: 1

TEST DATE: 11 Aug 1993
TEST TIME: 07:41:50
BOARD: e

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Barrier Load Cell C7	Lbs	8736.6	28.3	-38.7	-1.0	60.0
2	Barrier Load Cell C8	Lbs	11499.7	29.5	-73.1	9.2	60.0
3	Barrier Load Cell C9	Lbs	113.4	29.6	-103.0	25.8	60.0
4	Barrier Load Cell D1	Lbs	194.9	86.4	-327.0	31.3	60.0
5	Barrier Load Cell D2	Lbs	89.9	43.4	-103.1	62.4	60.0
6	Barrier Load Cell D3	Lbs	109.1	112.7	-122.1	47.9	60.0
7	Barrier Load Cell D4	Lbs	130.7	43.3	-90.2	48.4	60.0
8	Barrier Load Cell D5	Lbs	135.1	43.6	-122.3	48.5	60.0
9	Barrier Load Cell D6	Lbs	371.4	39.2	-170.2	72.8	60.0
10	Barrier Load Cell D7	Lbs	153.0	30.7	-112.2	26.2	60.0
11	Barrier Load Cell D8	Lbs	163.2	30.7	-171.8	25.9	60.0
12	Barrier Load Cell D9	Lbs	251.2	30.6	-221.8	25.9	60.0

FACILITY: TAPE
RUN #: 5307
SERIES #: 1

TEST DATE: 10 Aug 1993
TEST TIME: 14:31:04
BOARD: f

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 2 Thorax Mx	ft-lbs	21.8	97.4	-53.1	57.2	1000.0
2	Pos. 2 Thorax My	ft-lbs	65.4	44.6	-109.1	116.9	1000.0
3	Pos. 2 Lumbar Mx	ft-lbs	17.7	156.6	-62.0	54.1	1000.0
4	Pos. 2 Lumbar My	ft-lbs	74.2	103.1	-20.8	229.9	1000.0
5	Pos. 2 Left Iliac Fx	lbs	363.0	46.4	-21.3	130.9	1000.0
6	Pos. 2 Left Iliac My	ft-lbs	11.7	63.0	-1.7	181.0	1000.0
7	NULL	ft-lbs	.0	254.9	.0	254.9	1000.0
8	NULL	lbs	.0	254.9	.0	254.9	1000.0

FACILITY: TAPE
RUN #: 5308
SERIES #: 1

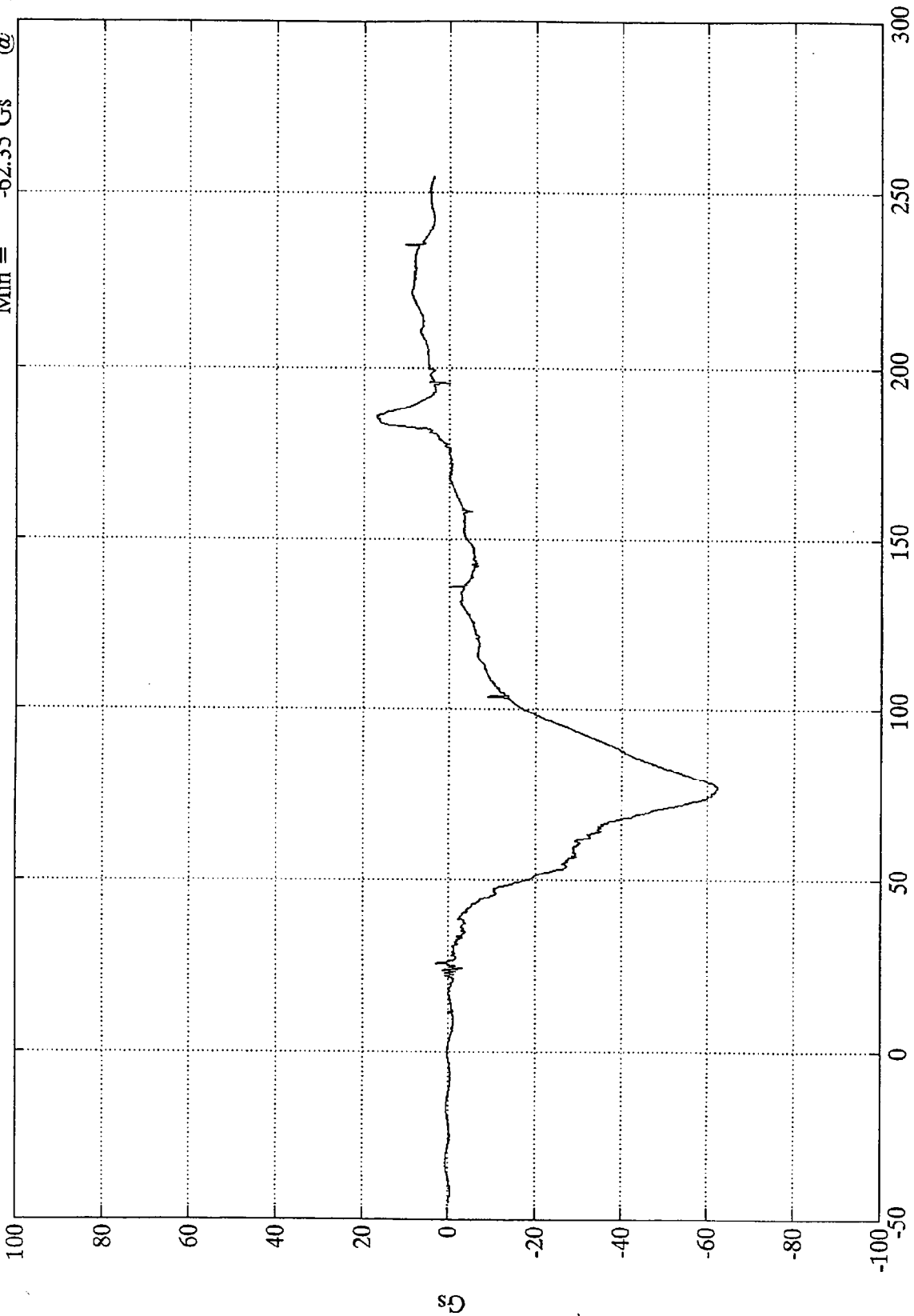
TEST DATE: 10 Aug 1993
TEST TIME: 14:43:08
BOARD: g

TITLE: TSC Frontal Barrier Test #2 - Ford Taurus

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM		MINIMUM		FILTER CLASS
			AMP	msec	AMP	msec	
1	Pos. 2 Right Iliac Fx	lbs	32.1	24.4	-334.1	46.6	1000.0
2	Pos. 2 Right Iliac My	ft-lbs	3.3	24.4	-10.6	58.0	1000.0
3	Pos. 1 Lap Belt	lbs	2501.7	85.8	-82.6	47.0	60.0
4	Pos. 1 Torso Belt	lbs	2083.3	71.6	-544.4	195.2	60.0
5	Pos. 2 Right Knee Displ.	ins	.0	142.4	.0	220.1	180.0
6	Pos. 1 Left Knee Displ.	ins	.1	26.5	-.4	82.1	180.0
7	Pos. 1 Right Knee Displ.	ins	.1	58.4	-.2	78.7	180.0
8	Pos. 2 Lap Belt	lbs	683.5	46.0	-40.5	133.6	60.0
9	Pos. 2 Torso Belt	lbs	1404.2	54.7	-60.4	134.6	60.0
10	NULL	lbs	.0	254.9	.0	254.9	1000.0
11	NULL	lbs	.0	254.9	.0	254.9	1000.0
12	NULL	ft-lbs	.0	254.9	.0	254.9	1000.0

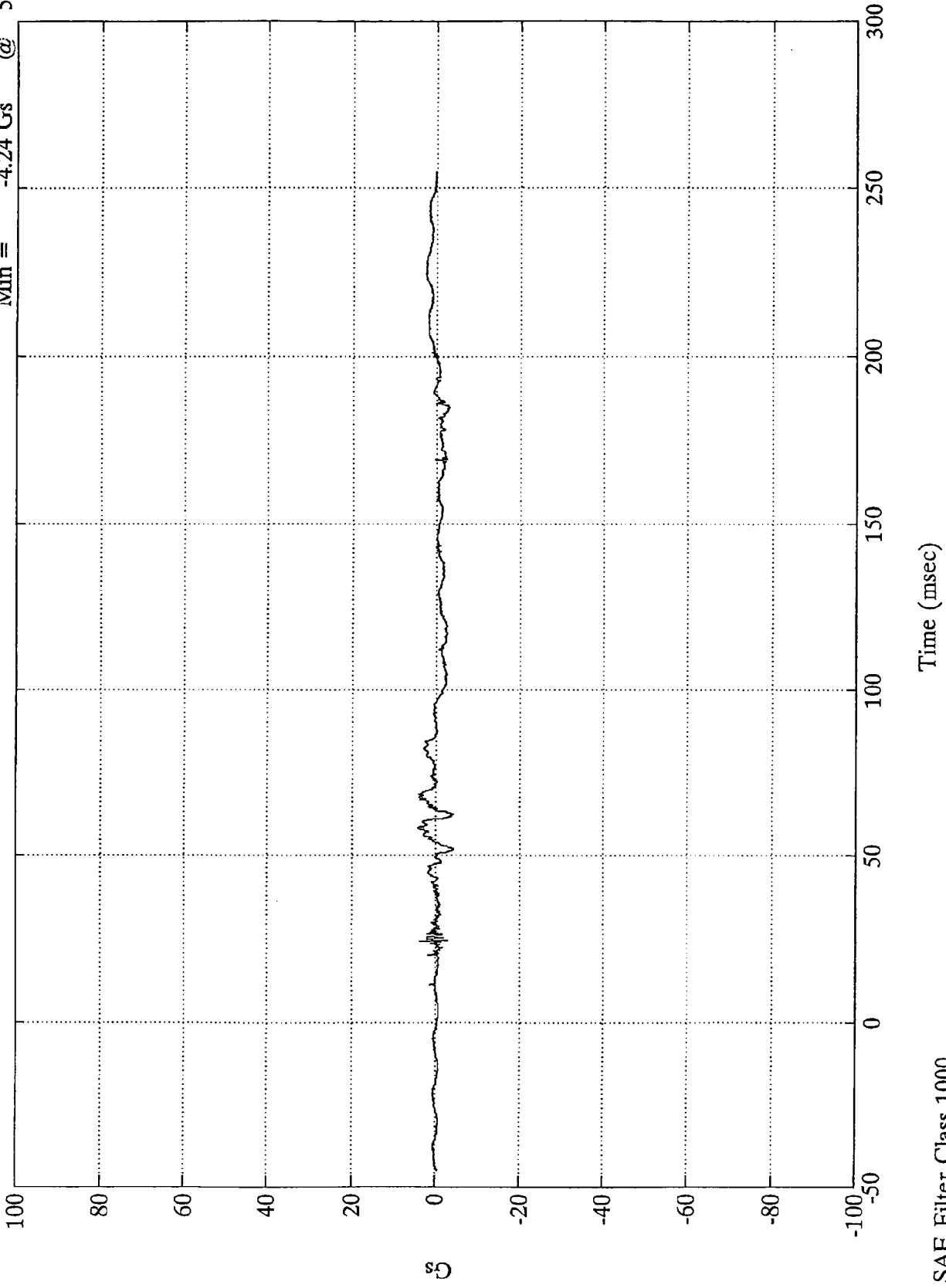
TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Head X
Max = 17.04 Gs @ 185.76 msec
Min = -62.35 Gs @ 77.16 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Head Y
Max = 4.27 Gs @ 58.43 msec
Min = -4.24 Gs @ 51.84 msec



B-95

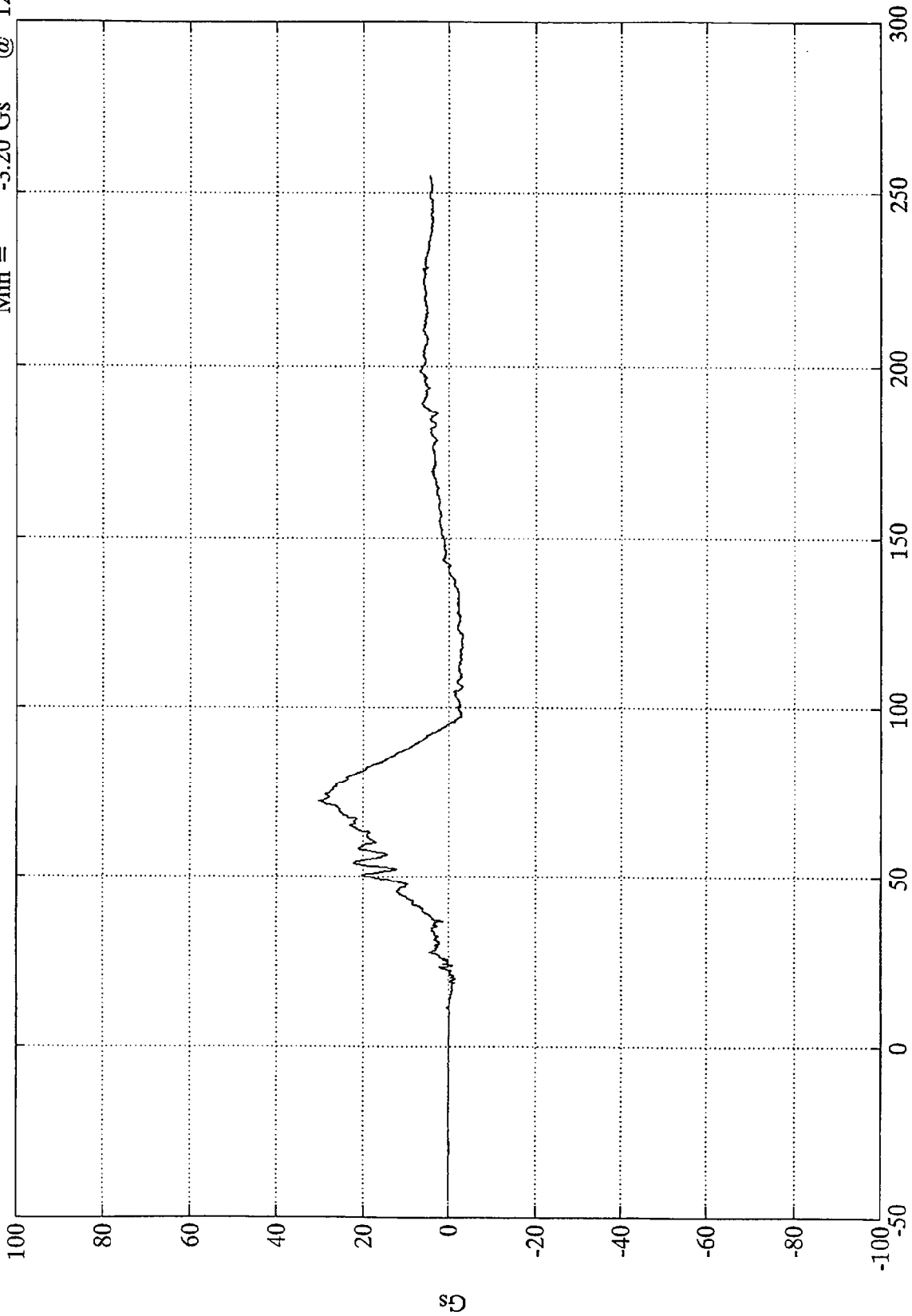
8118-2

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Head Z

Max = 30.19 Gs @ 72.12 msec
Min = -3.20 Gs @ 121.92 msec



B-96

8118-2

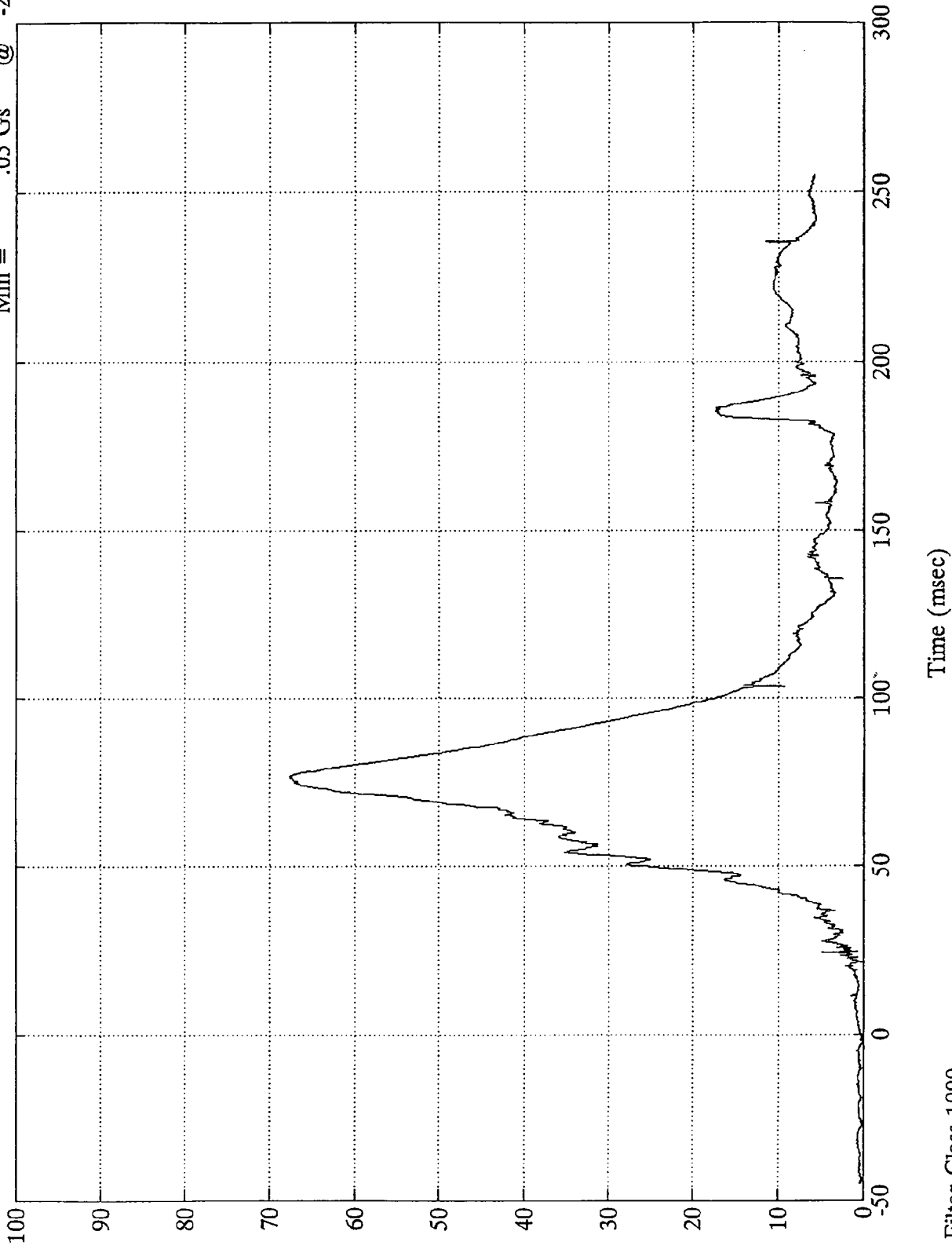
SAE Filter Class 1000

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 67.67 Gs @ 76.92 msec
Min = .05 Gs @ -2.28 msec

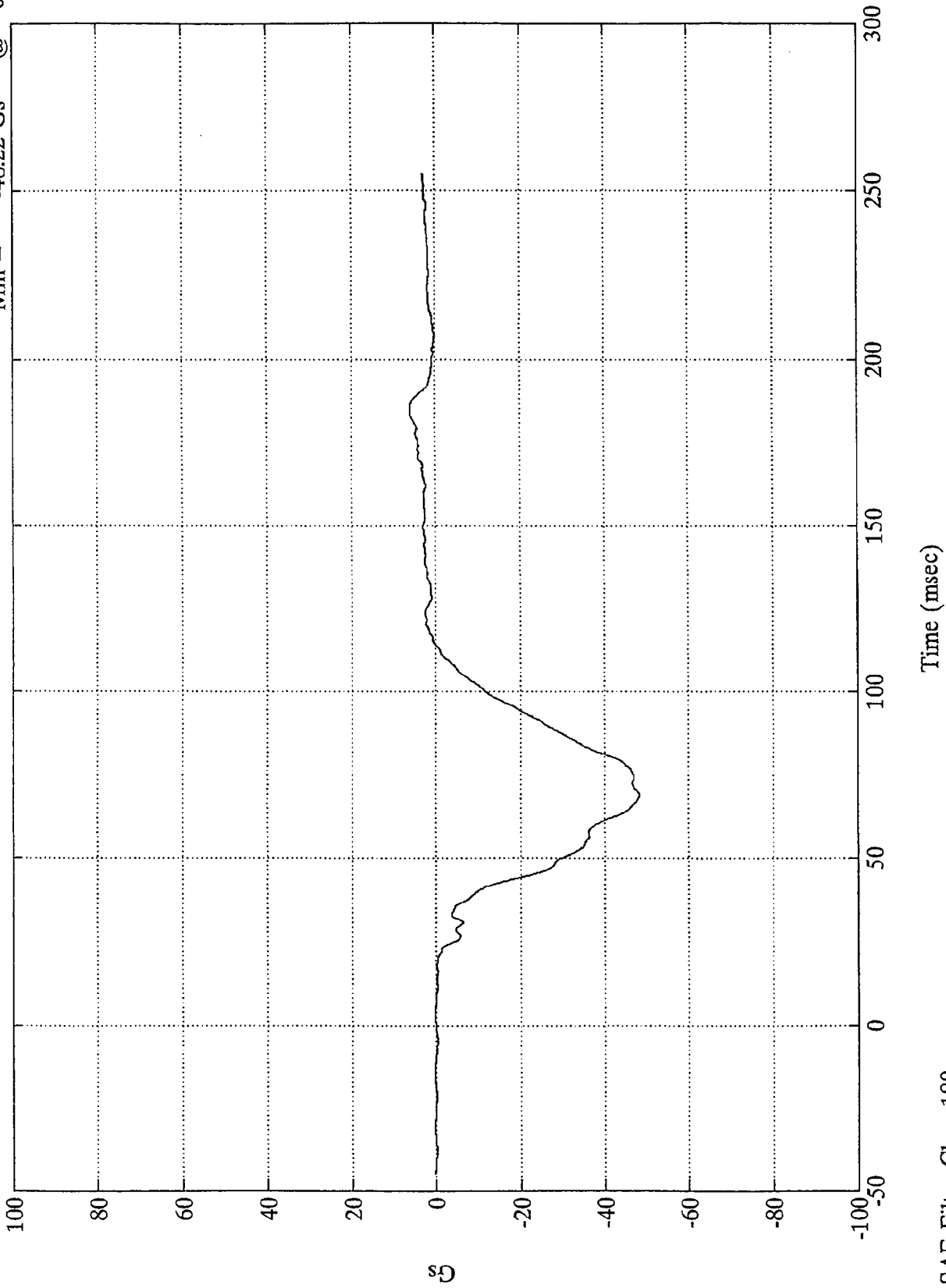
Pos. 1 Head Resultant



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Chest X

Max = 5.88 Gs @ 183.84 msec
Min = -48.22 Gs @ 69.12 msec



8D
B-98

8118-2

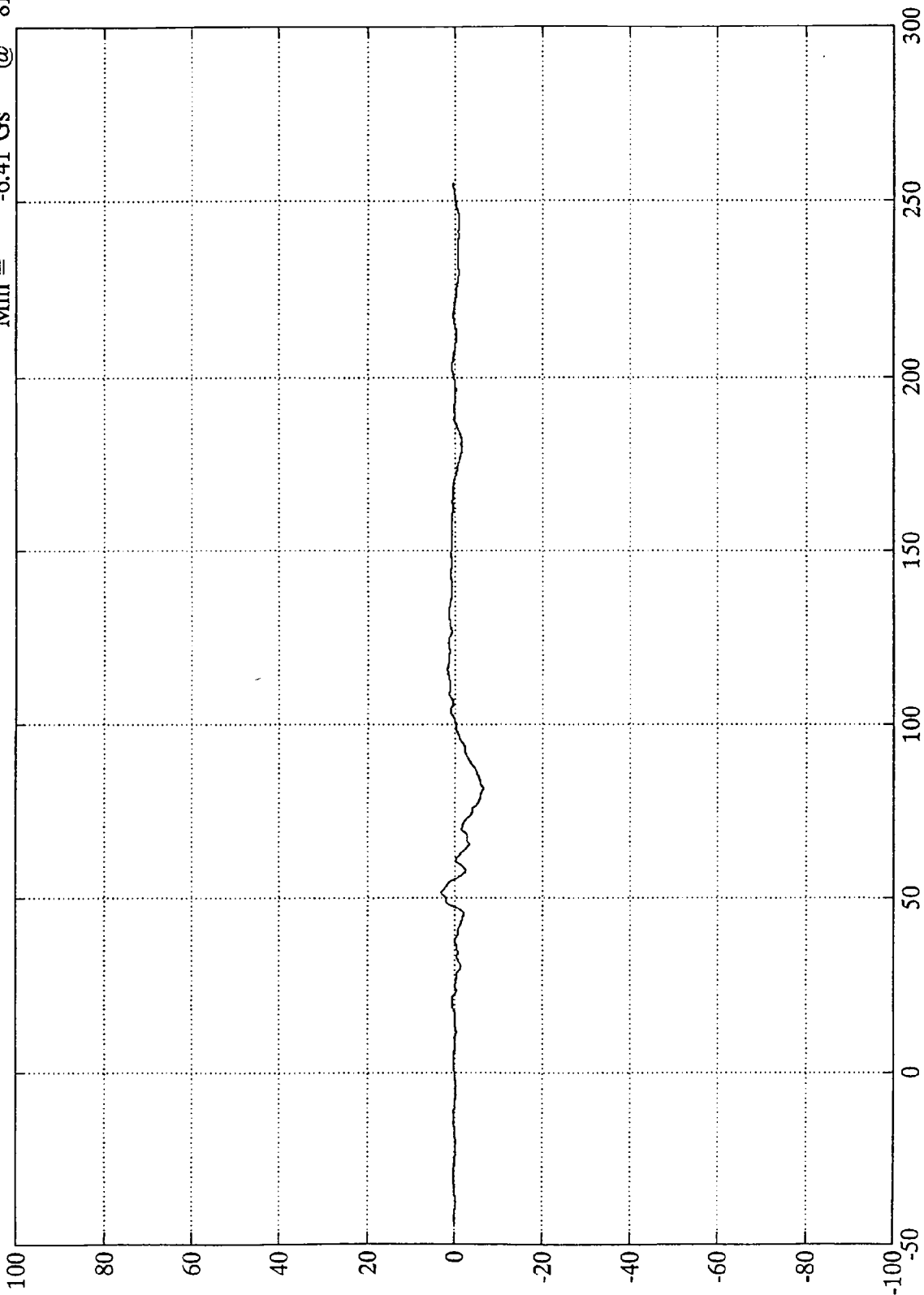
SAE Filter Class 180

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 3.06 Gs @ 51.60 msec
Min = -6.41 Gs @ 81.60 msec

Pos. 1 Chest Y

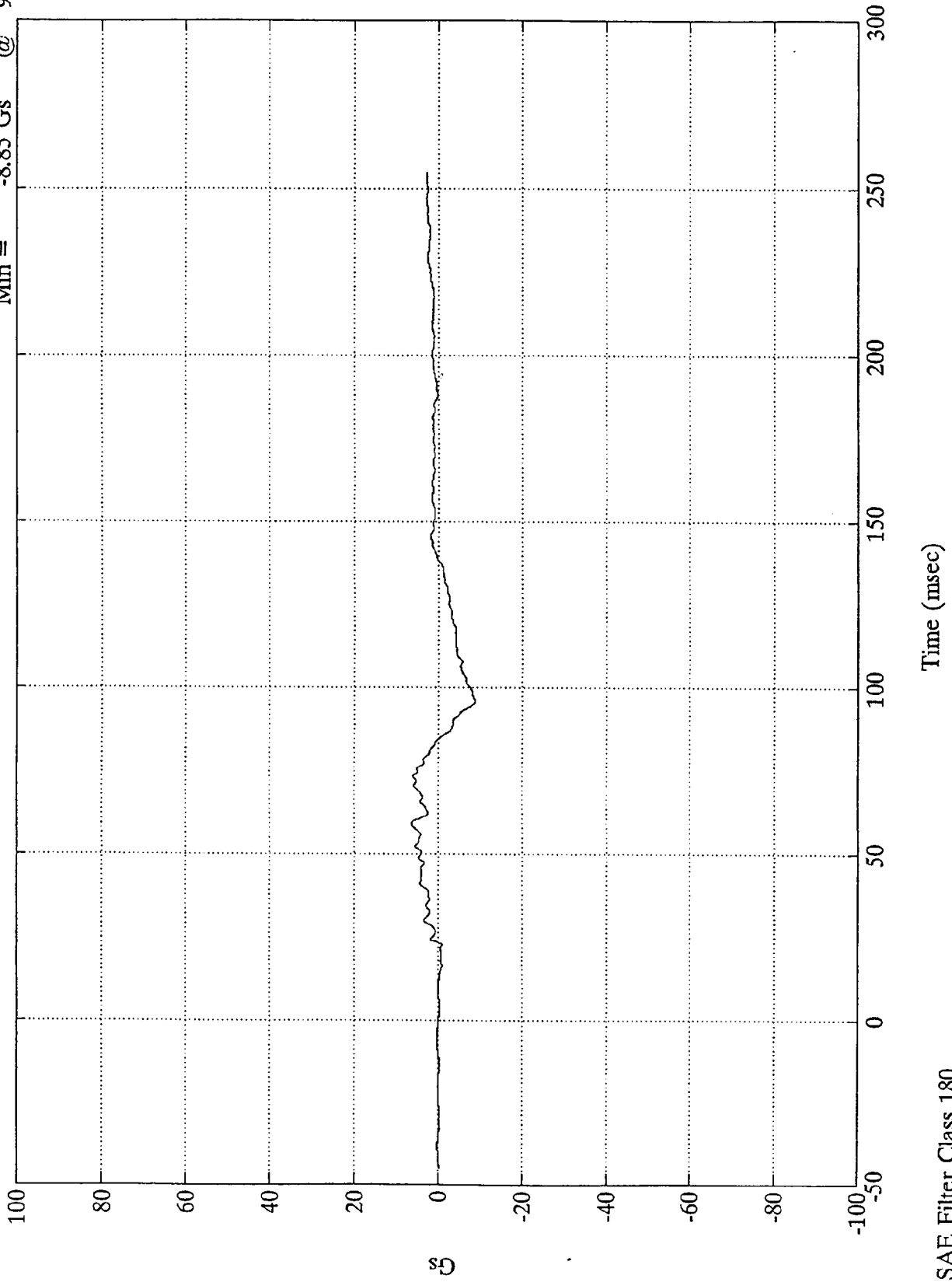


Time (msec)

SAE Filter Class 180

TSC Frontal Barrier Test #2 - Ford Taurus

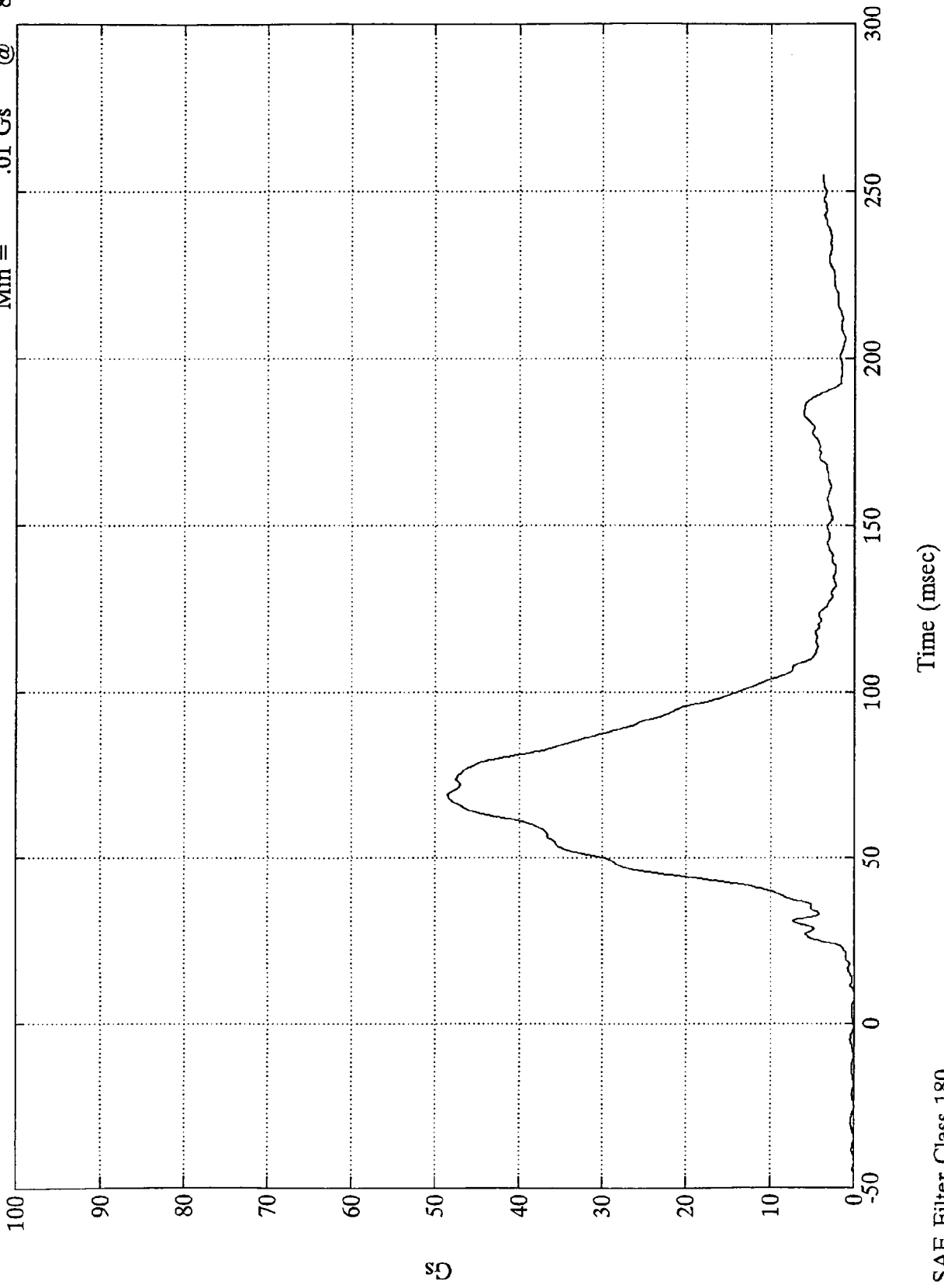
Pos. 1 Chest Z
Max = 6.40 Gs @ 59.04 msec
Min = -8.85 Gs @ 95.76 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 48.51 Gs @ 69.12 msec
Min = .01 Gs @ 8.27 msec

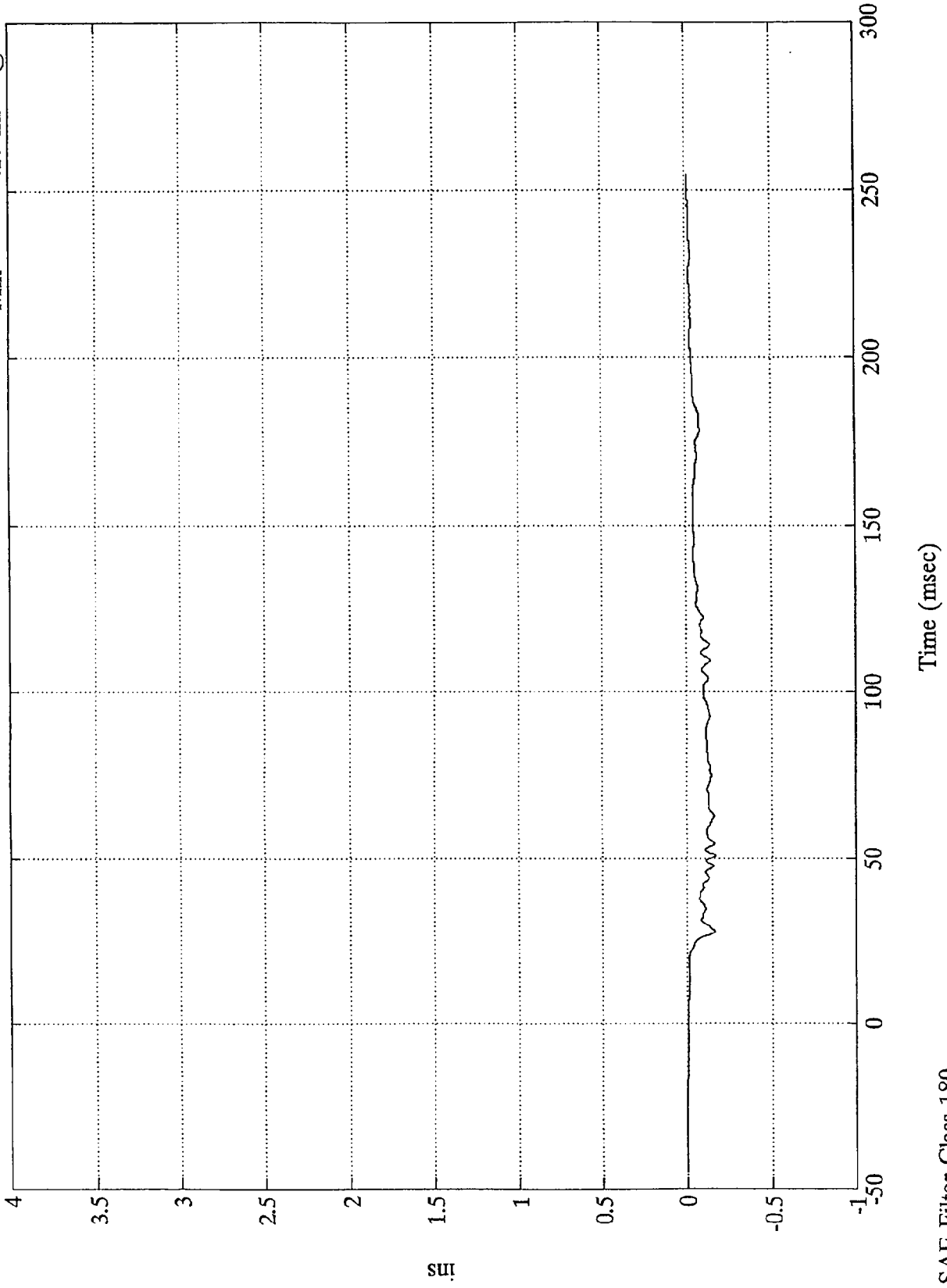
Pos. 1 Chest Resultant



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Chest Deflection

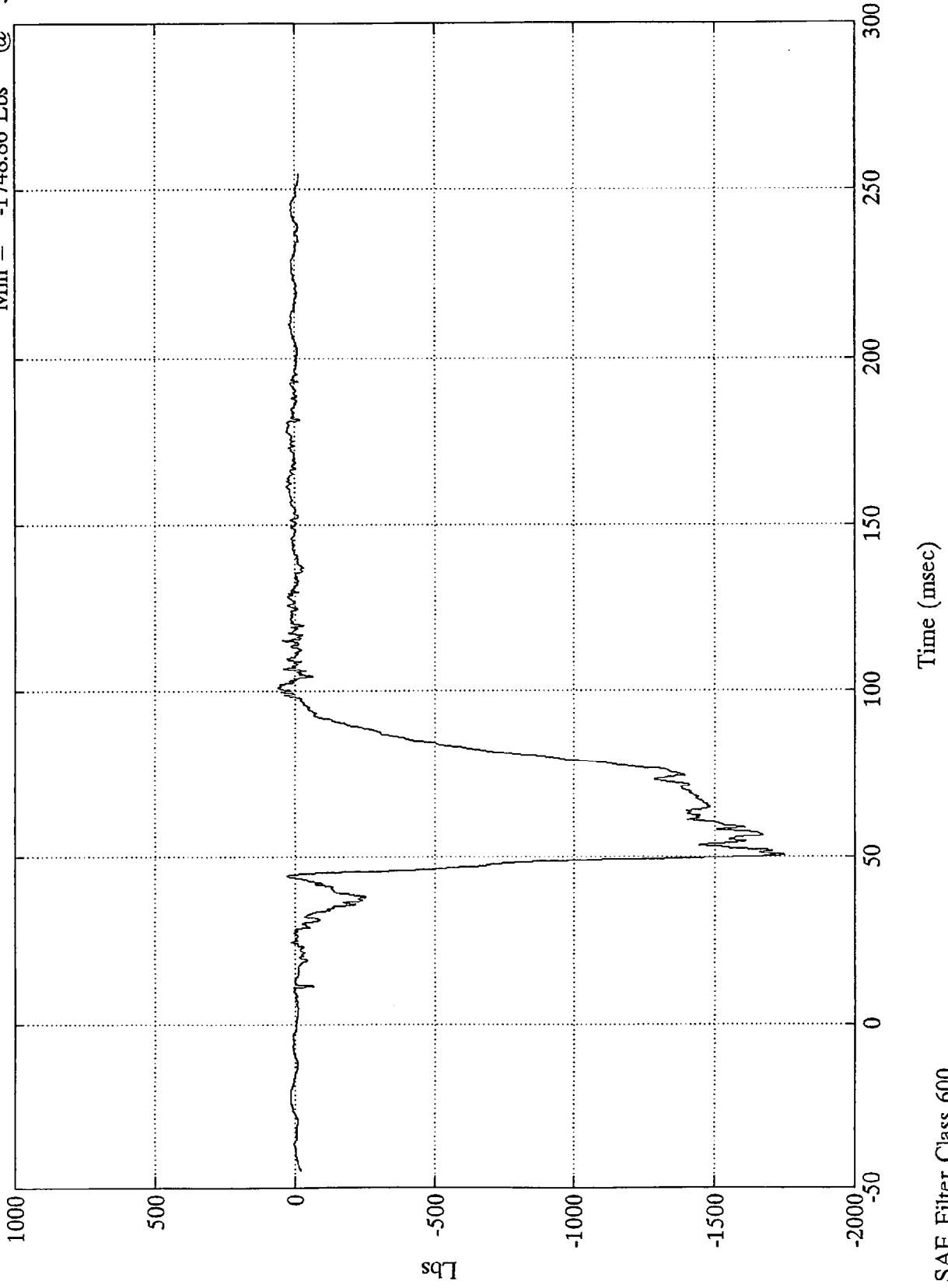
Max = .00 ins @ -29.88 msec
Min = -.17 ins @ 51.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Left Femur

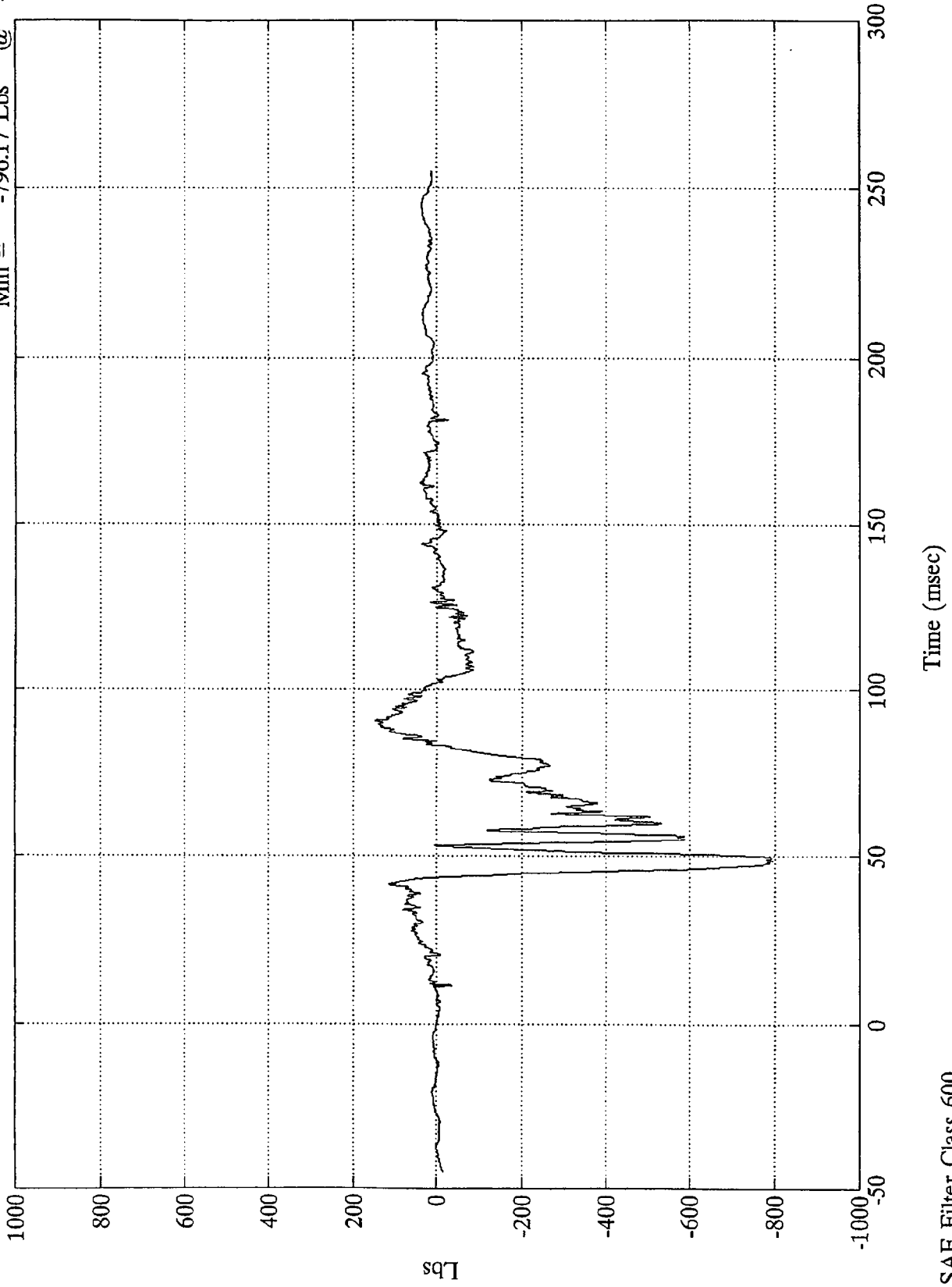
Max = 60.62 Lbs @ 100.80 msec
Min = -1748.86 Lbs @ 50.64 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Right Femur

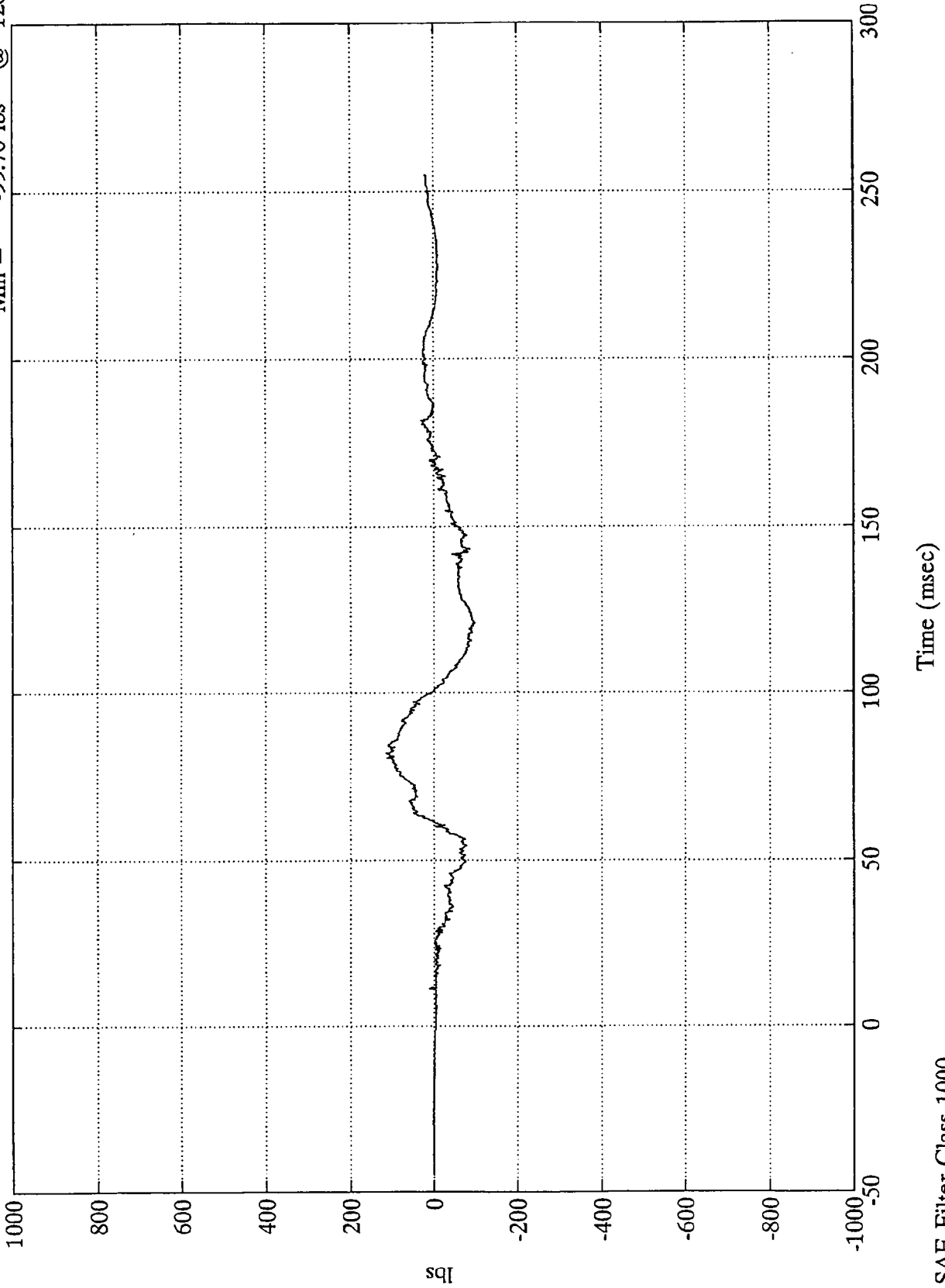
Max = 147.03 Lbs @ 90.59 msec
Min = -796.17 Lbs @ 48.59 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Upper Neck Fx

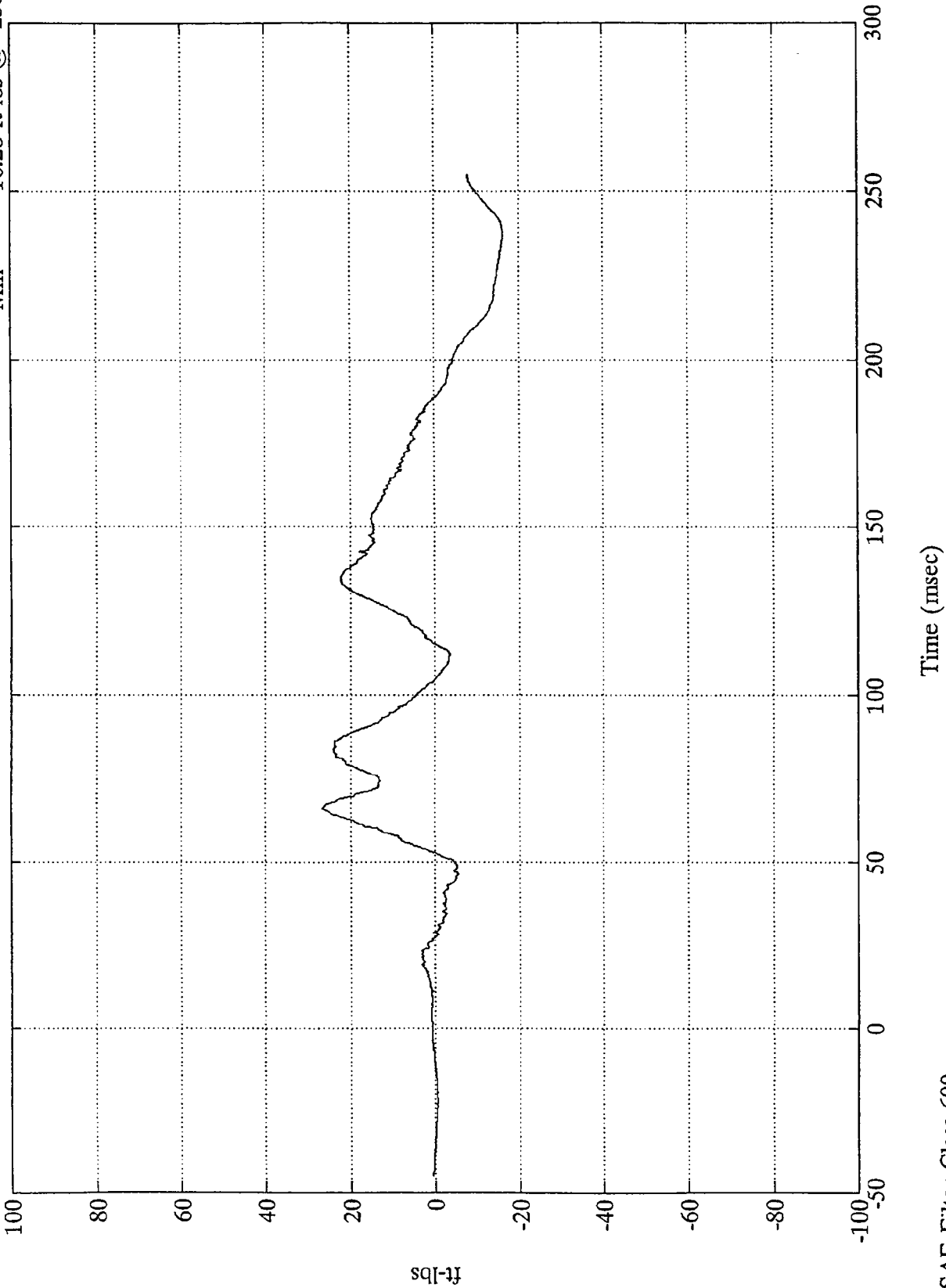
Max = 114.23 lbs @ 81.95 msec
Min = -99.70 lbs @ 120.84 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Upper Neck My

Max = 26.56 ft-lbs @ 66.00 msec
Min = -16.28 ft-lbs @ 236.63 msec



ft-lbs
B-106

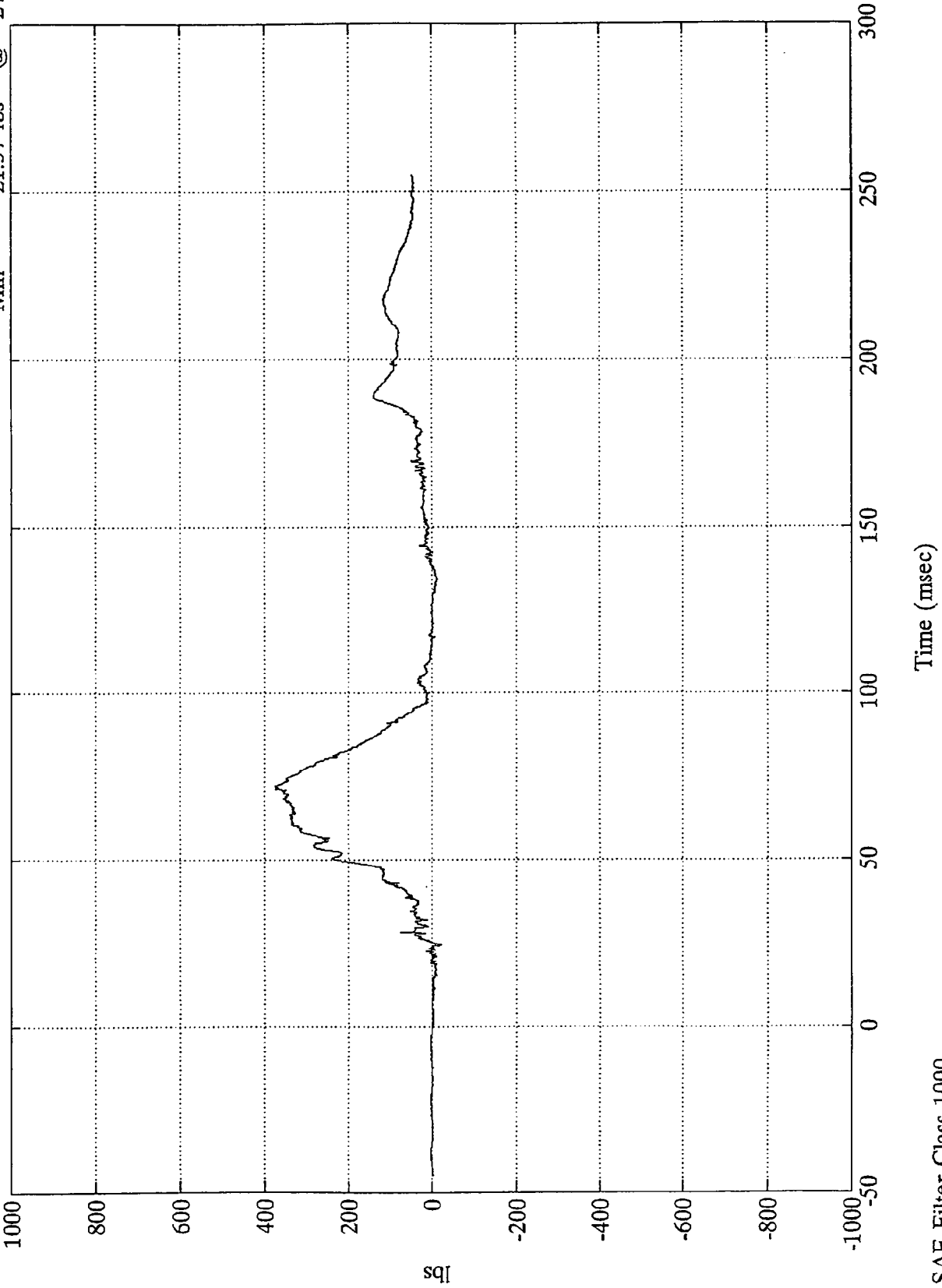
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Upper Neck Fz

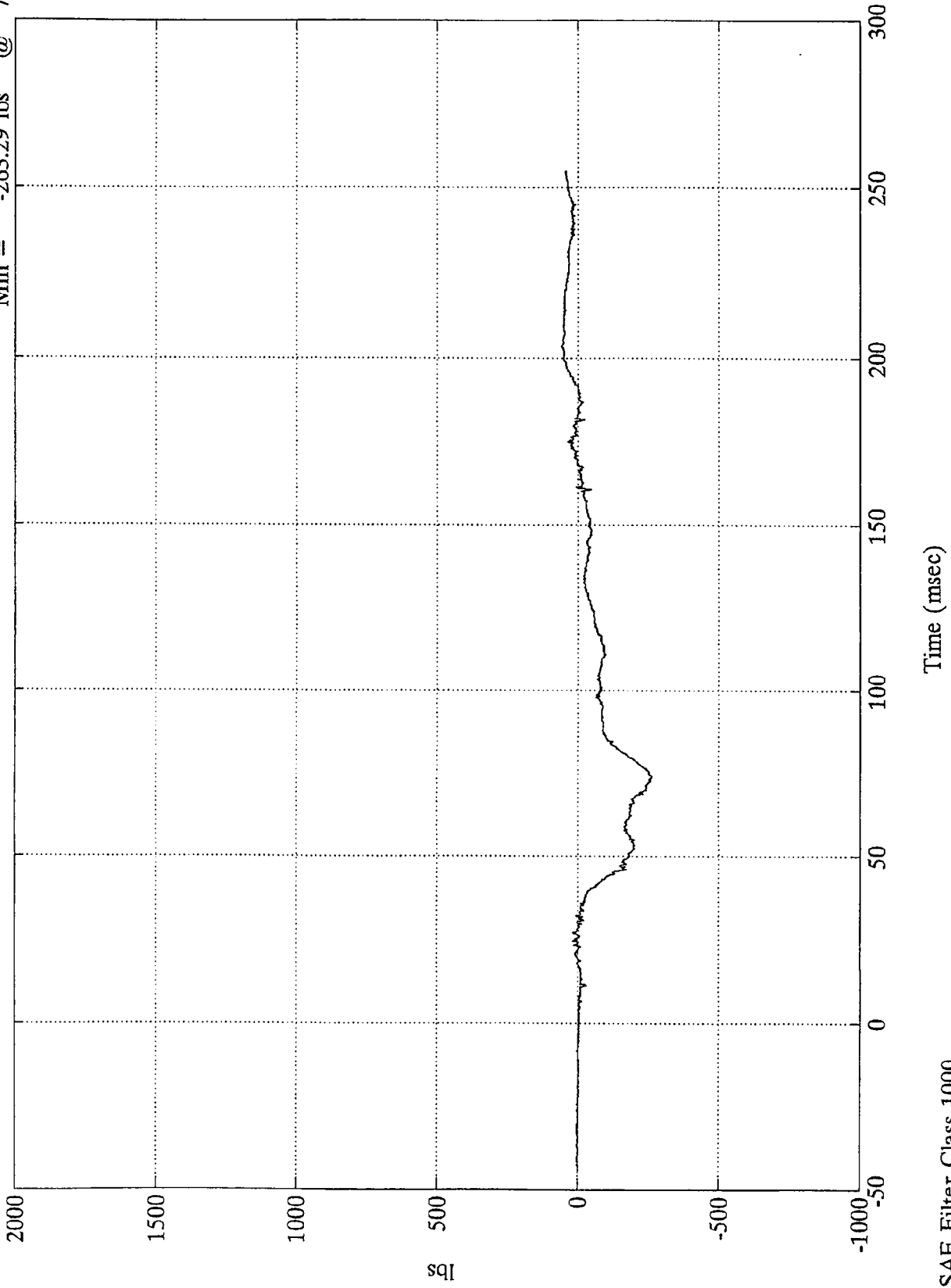
Max = 375.46 lbs @ 72.12 msec
Min = -21.57 lbs @ 24.47 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 60.06 lbs @ 203.39 msec
Min = -263.29 lbs @ 74.04 msec

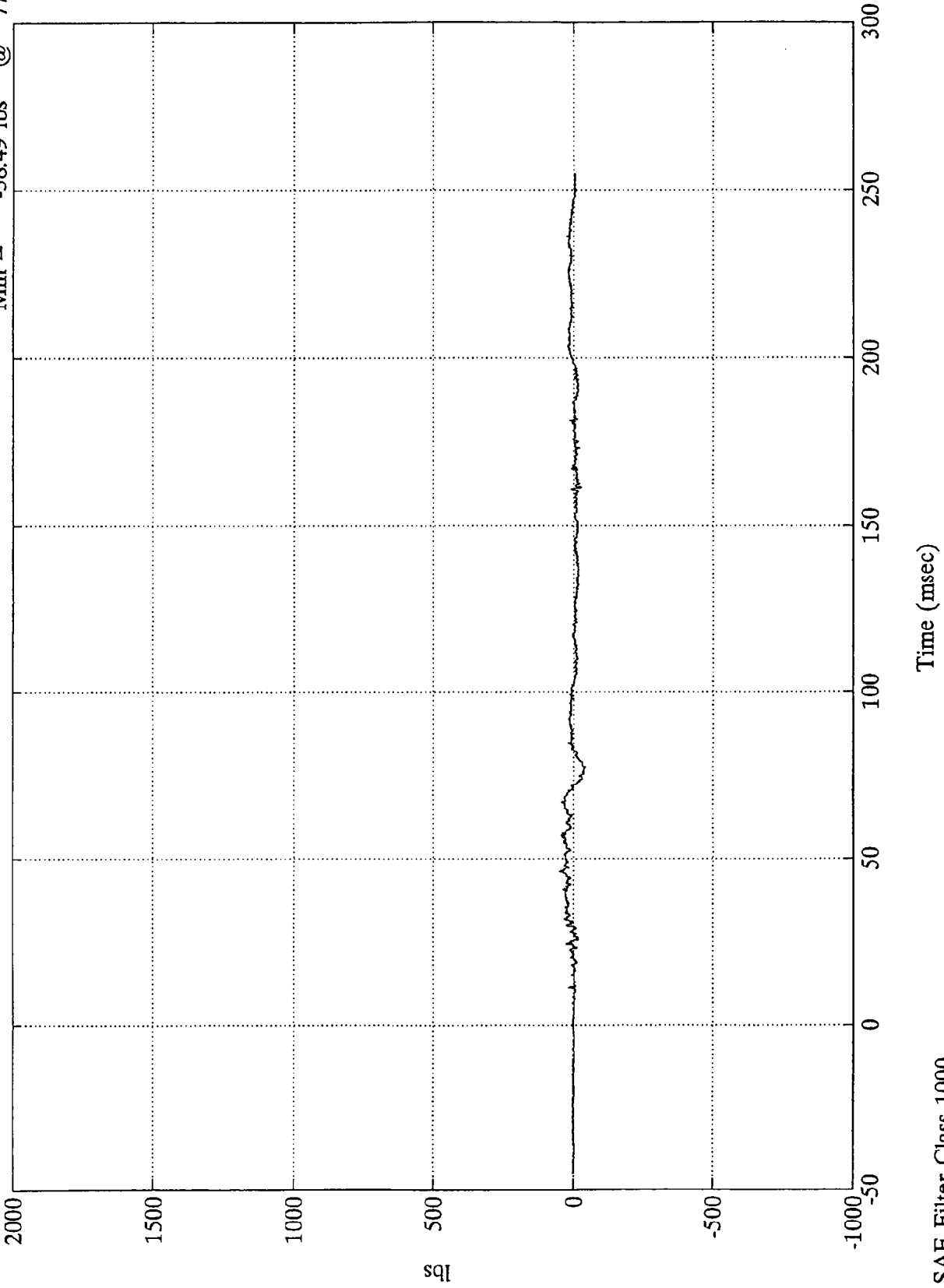
Pos. 1 Lower Neck Fx



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lower Neck Fy

Max = 49.68 lbs @ 46.20 msec
Min = -38.49 lbs @ 77.51 msec

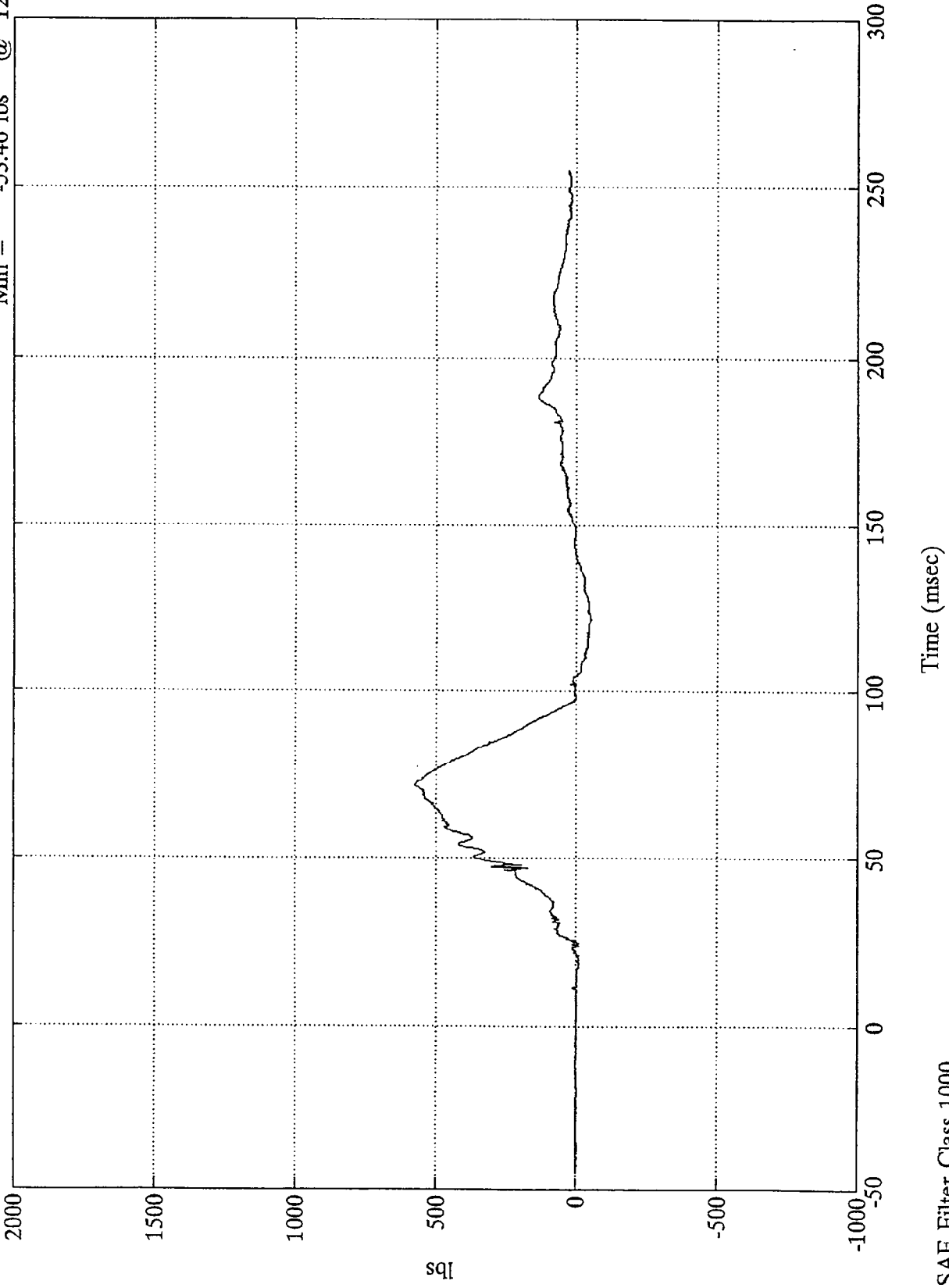


SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 576.06 lbs @ 71.76 msec
Min = -53.46 lbs @ 121.31 msec

Pos. 1 Lower Neck Fz

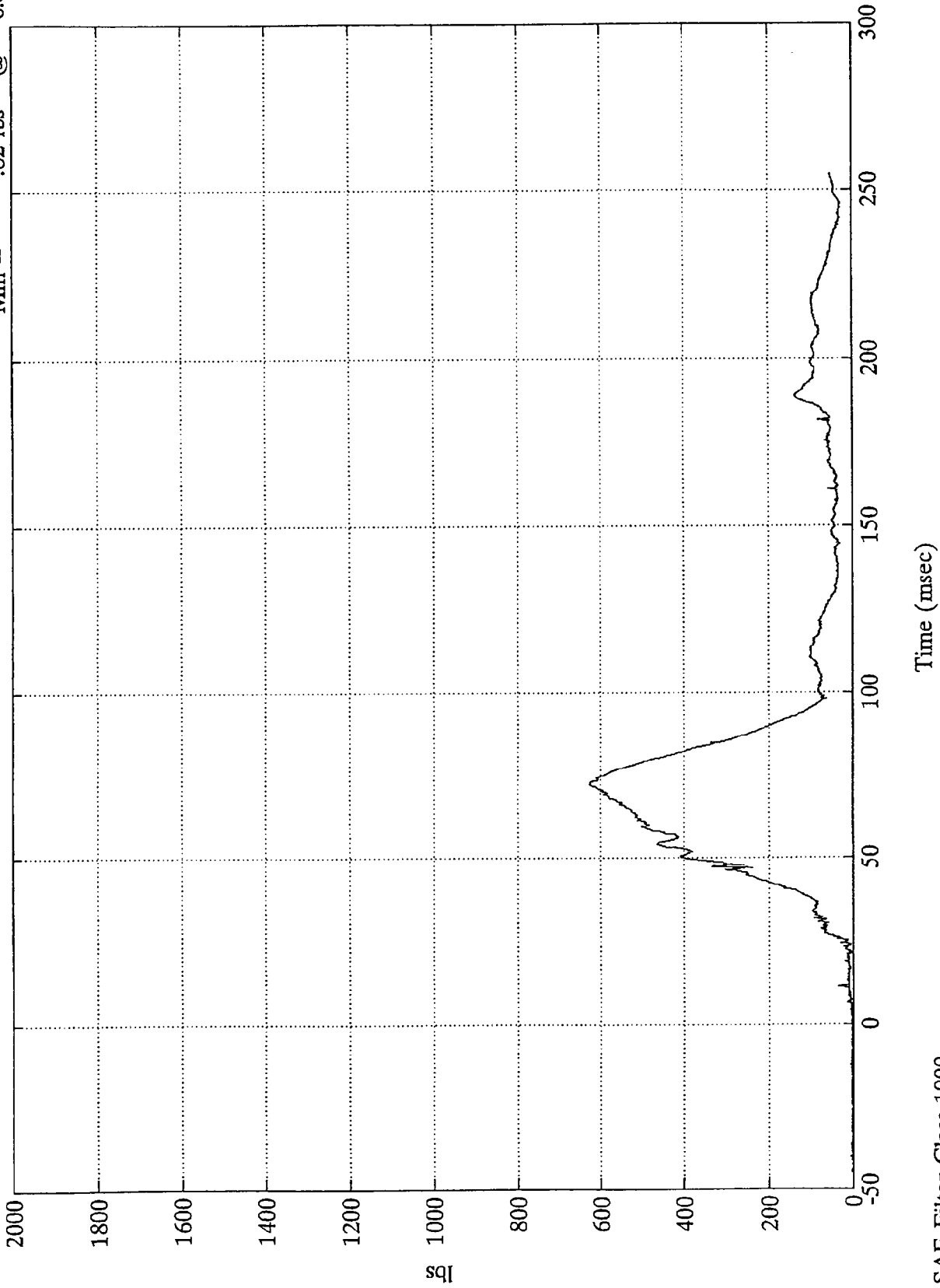


SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

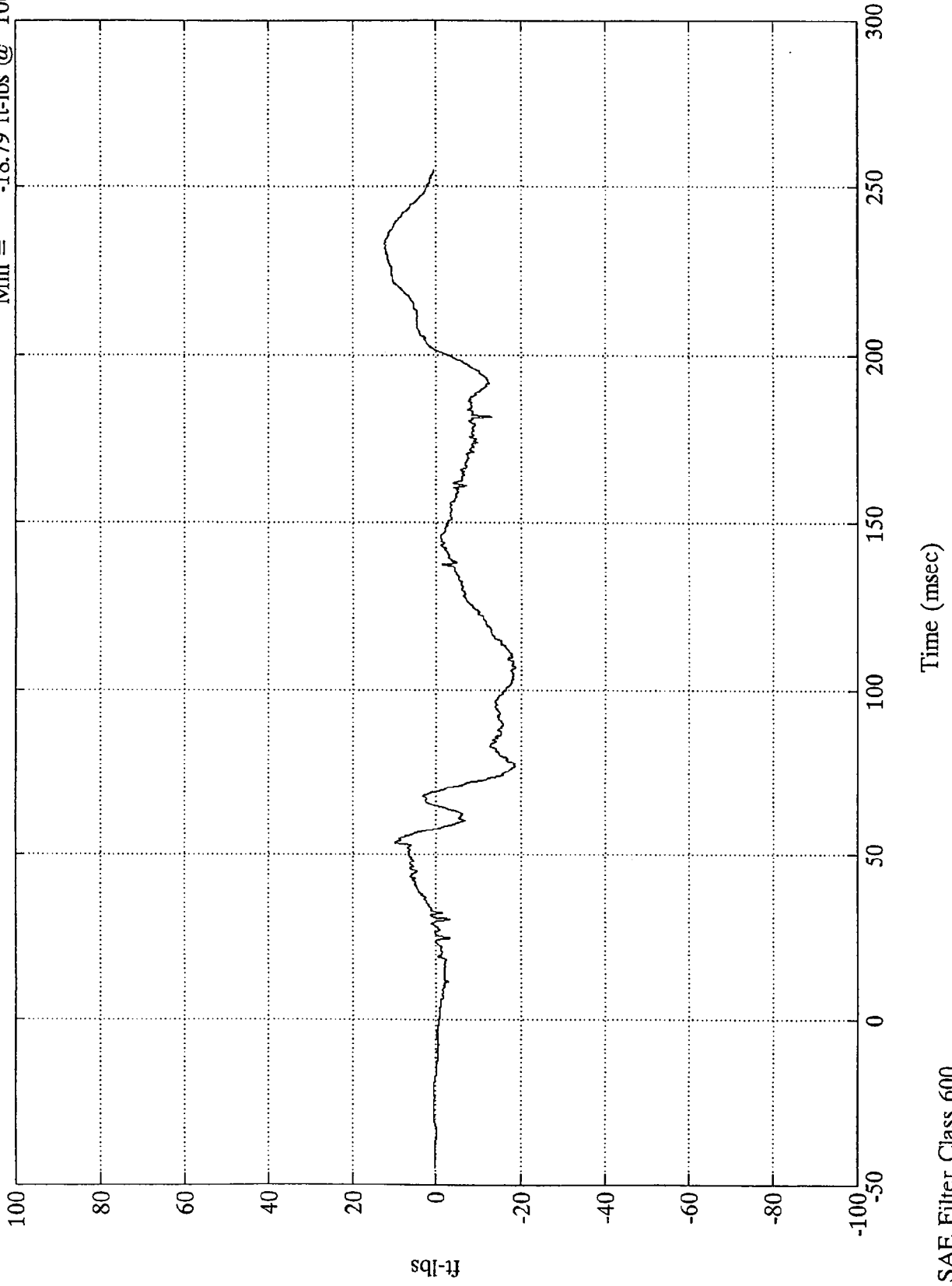
P1 L. Neck Force Result.

Max = 627.43 lbs @ 71.76 msec
Min = .82 lbs @ -6.84 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lower Neck Mx
Max = 12.63 ft-lbs @ 232.92 msec
Min = -18.79 ft-lbs @ 106.92 msec



B-112
ft-lbs

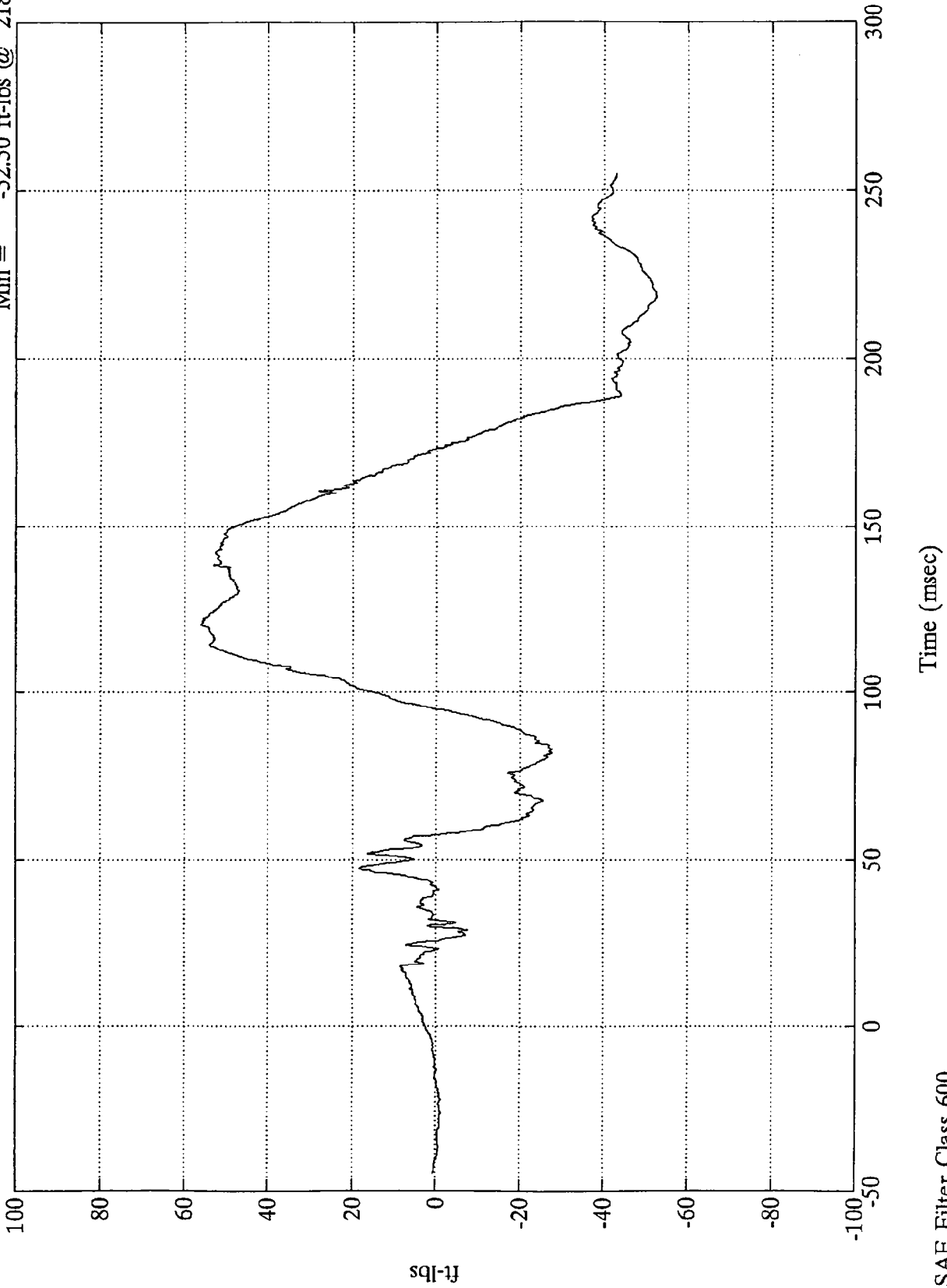
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lower Neck My

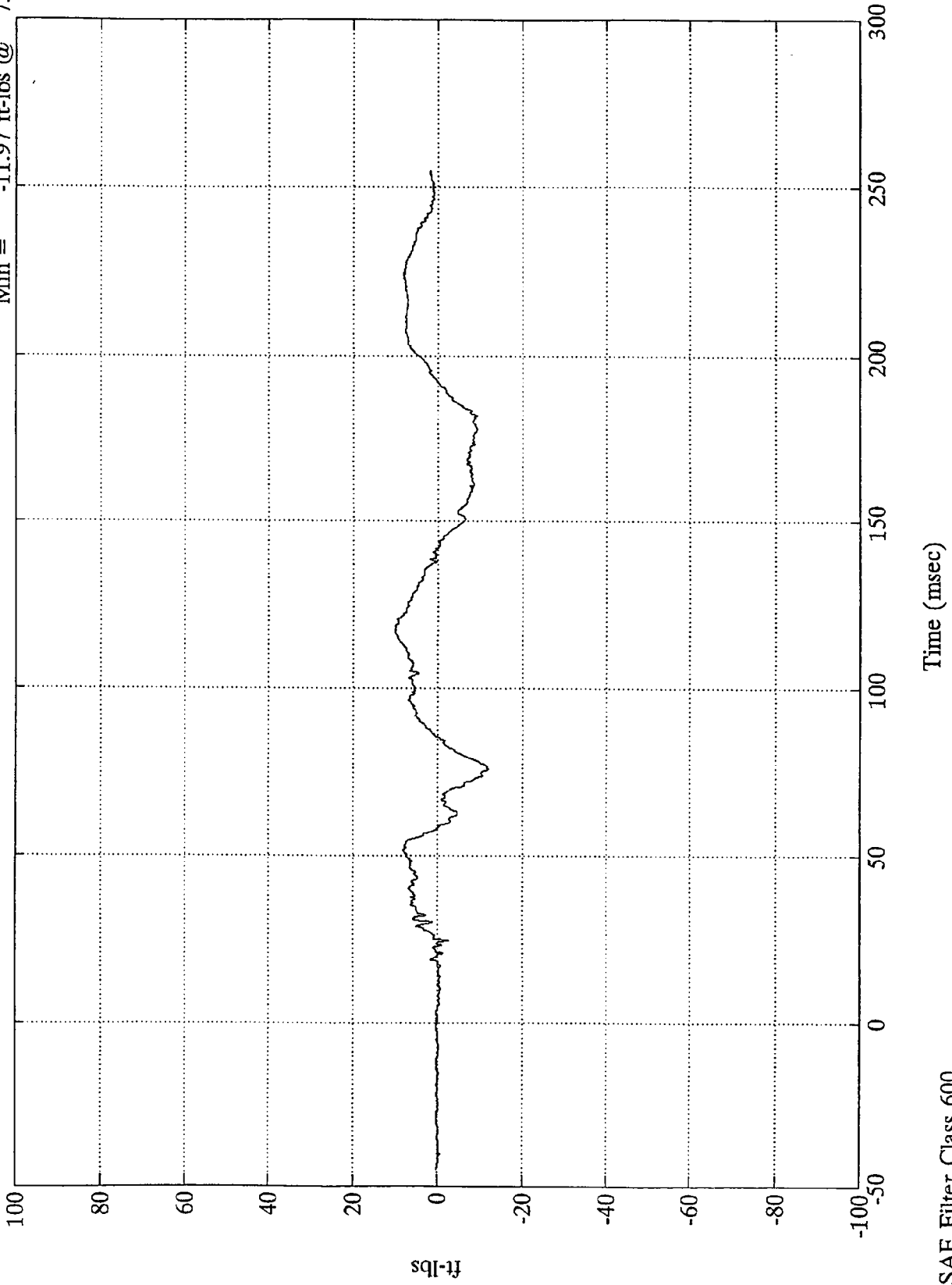
Max = 56.07 ft-lbs @ 120.36 msec
Min = -52.50 ft-lbs @ 218.39 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 10.10 ft-lbs @ 116.76 msec
Min = -11.97 ft-lbs @ 75.72 msec

Pos. 1 Lower Neck Mz



B-114
ft-lbs

8118-2

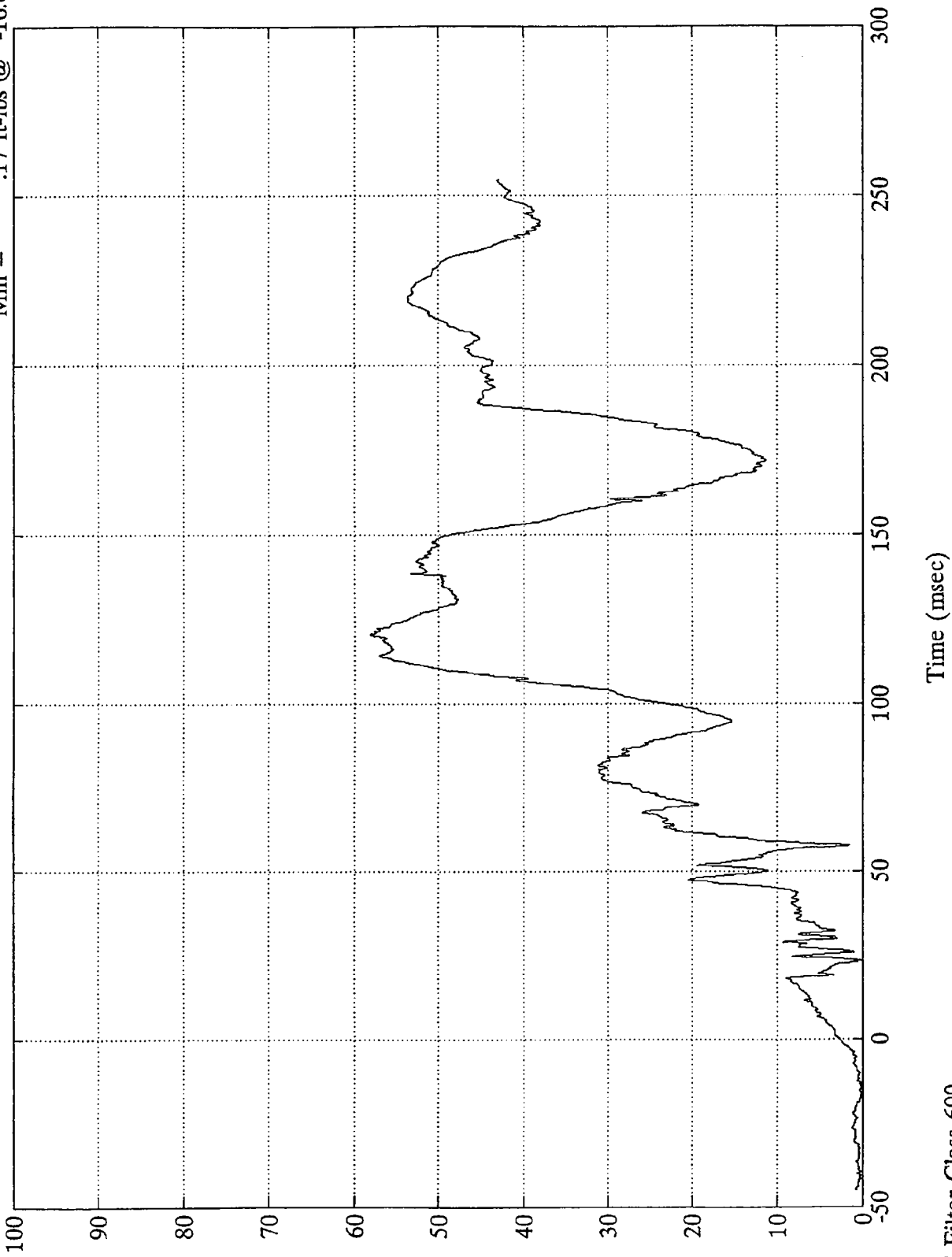
SAE Filter Class 600

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 58.10 ft-lbs @ 120.48 msec
Min = .17 ft-lbs @ -16.68 msec

P1 L. Neck Moment Result.



sqi-tj
B-115

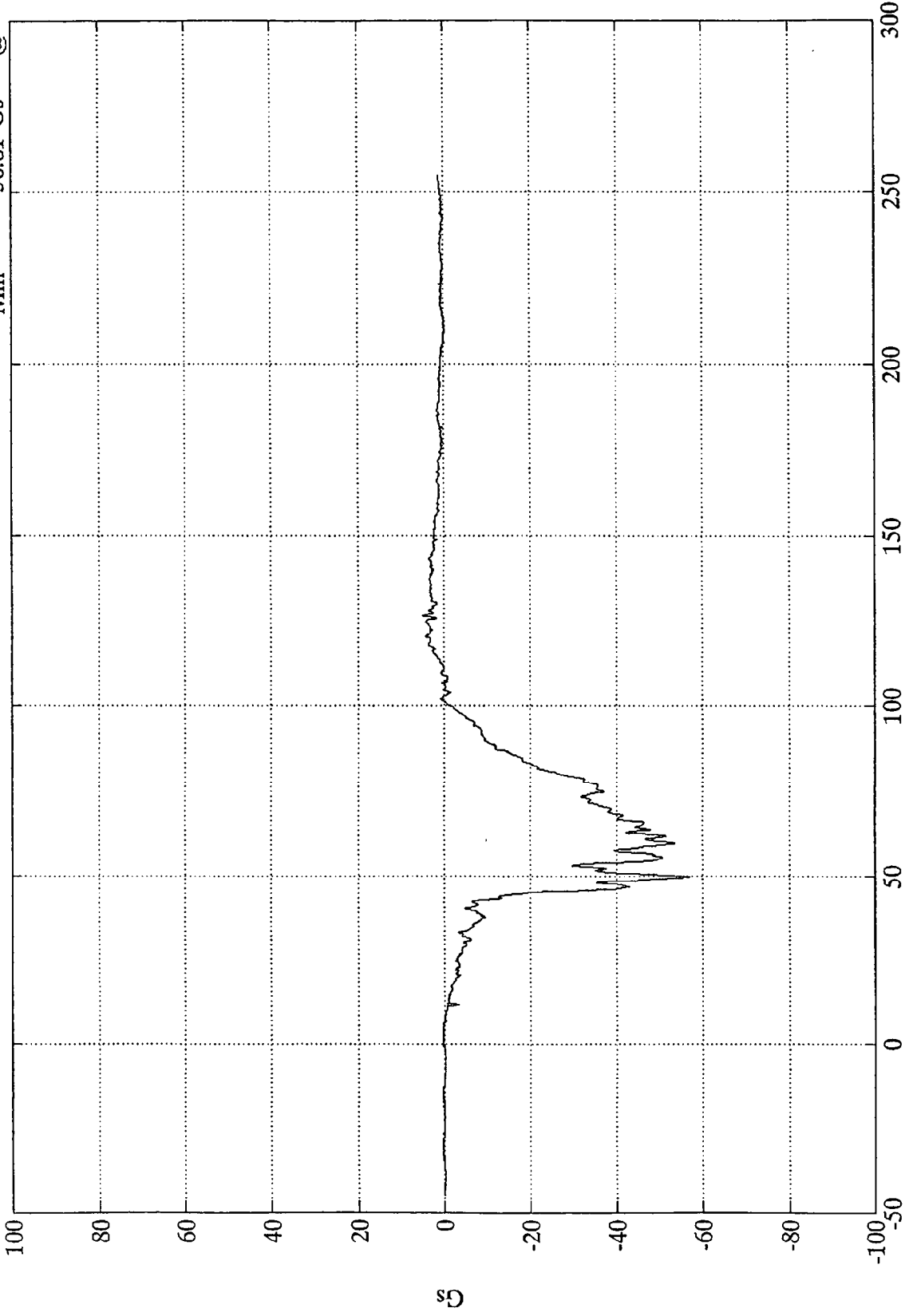
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 5.04 Gs @ 126.47 msec
Min = -56.81 Gs @ 49.92 msec

Pos. 1 Pelvic X



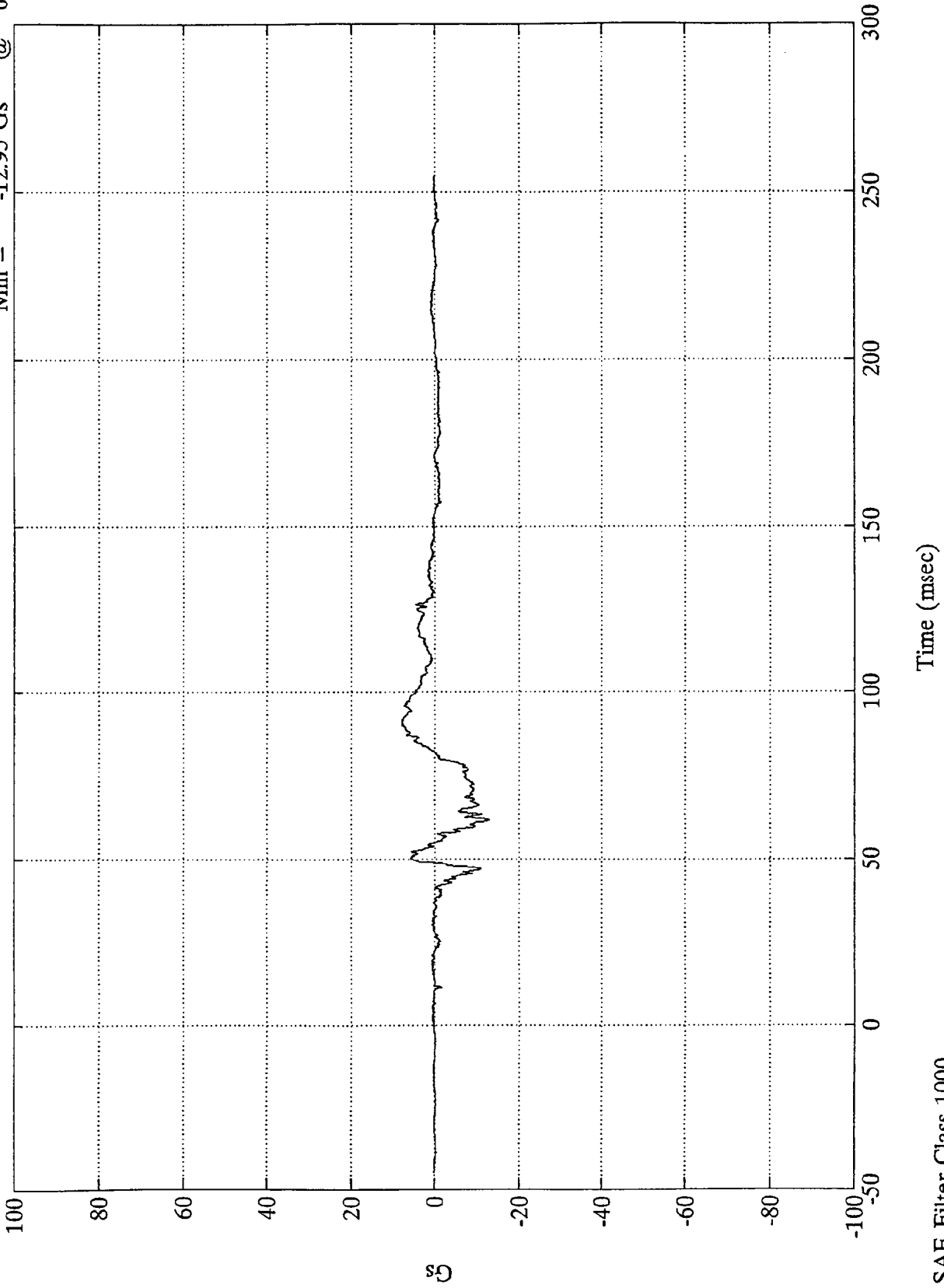
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 7.96 Gs @ 91.08 msec
Min = -12.95 Gs @ 61.68 msec

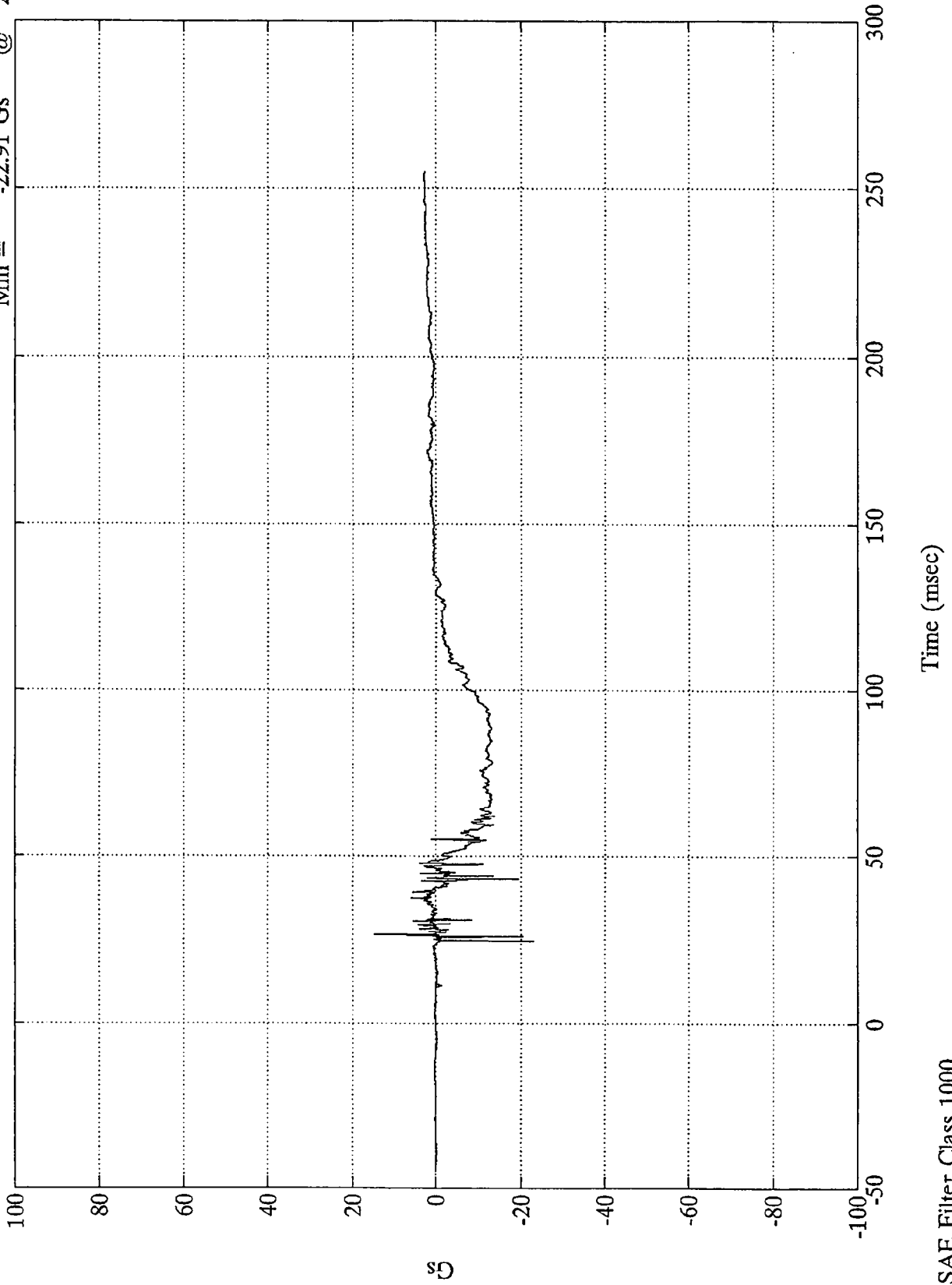
Pos. 1 Pelvic Y



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 14.83 Gs @ 26.39 msec
Min = -22.91 Gs @ 24.59 msec

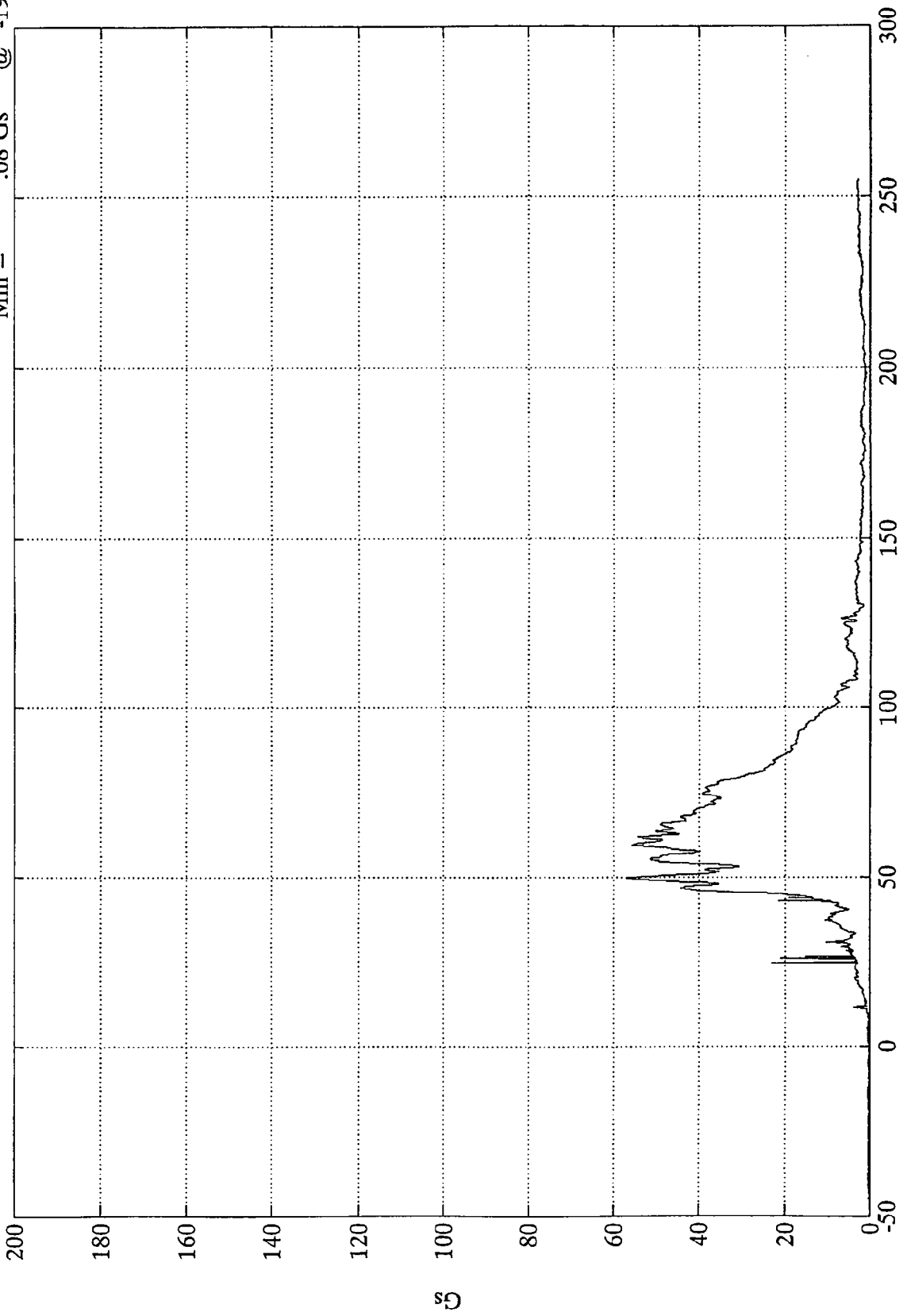
Pos. 1 Pelvic Z



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 57.14 Gs @ 49.92 msec
Min = .08 Gs @ -19.80 msec

Pos. 1 Pelvic Resultant



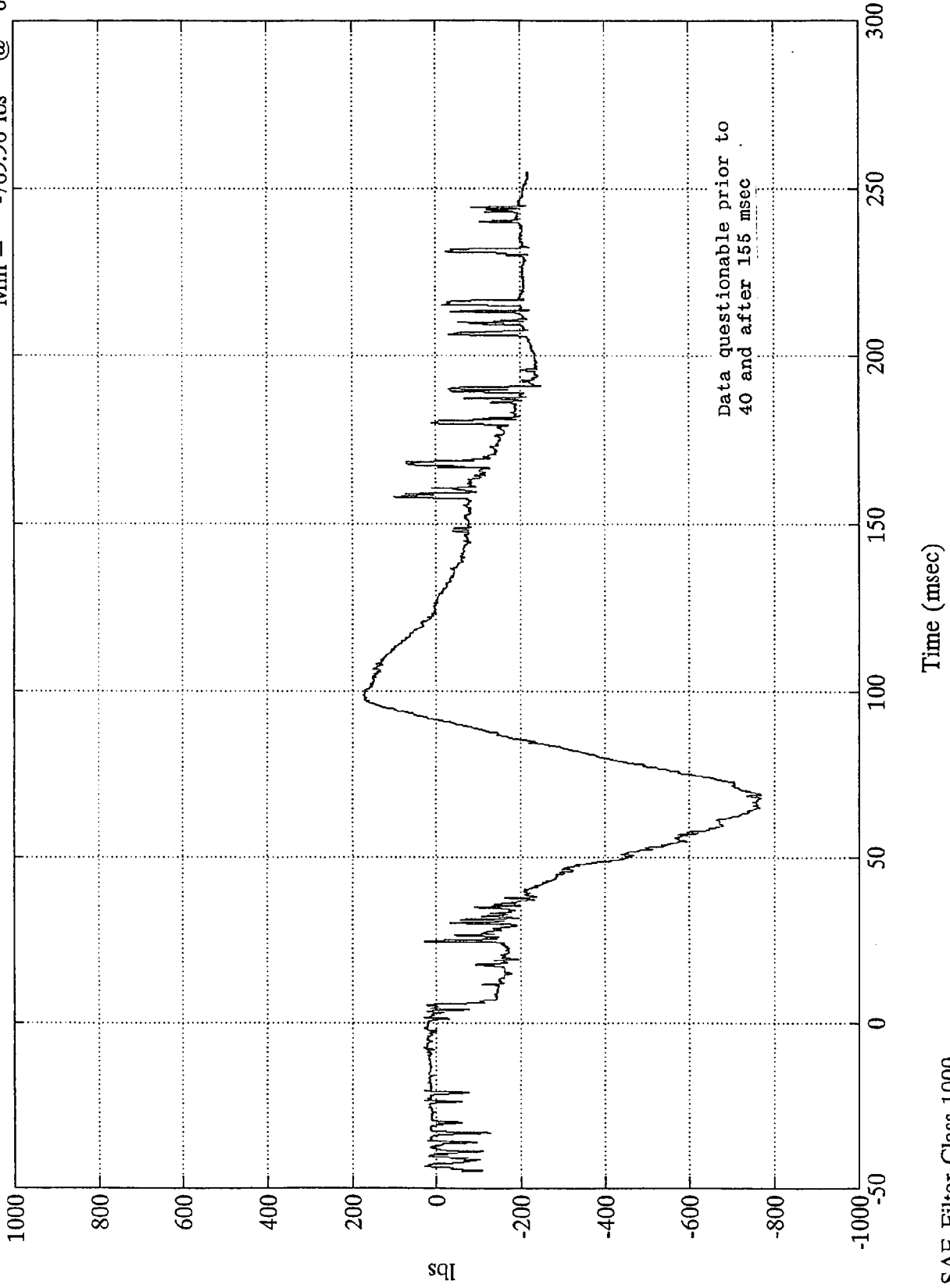
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lumbar Fx

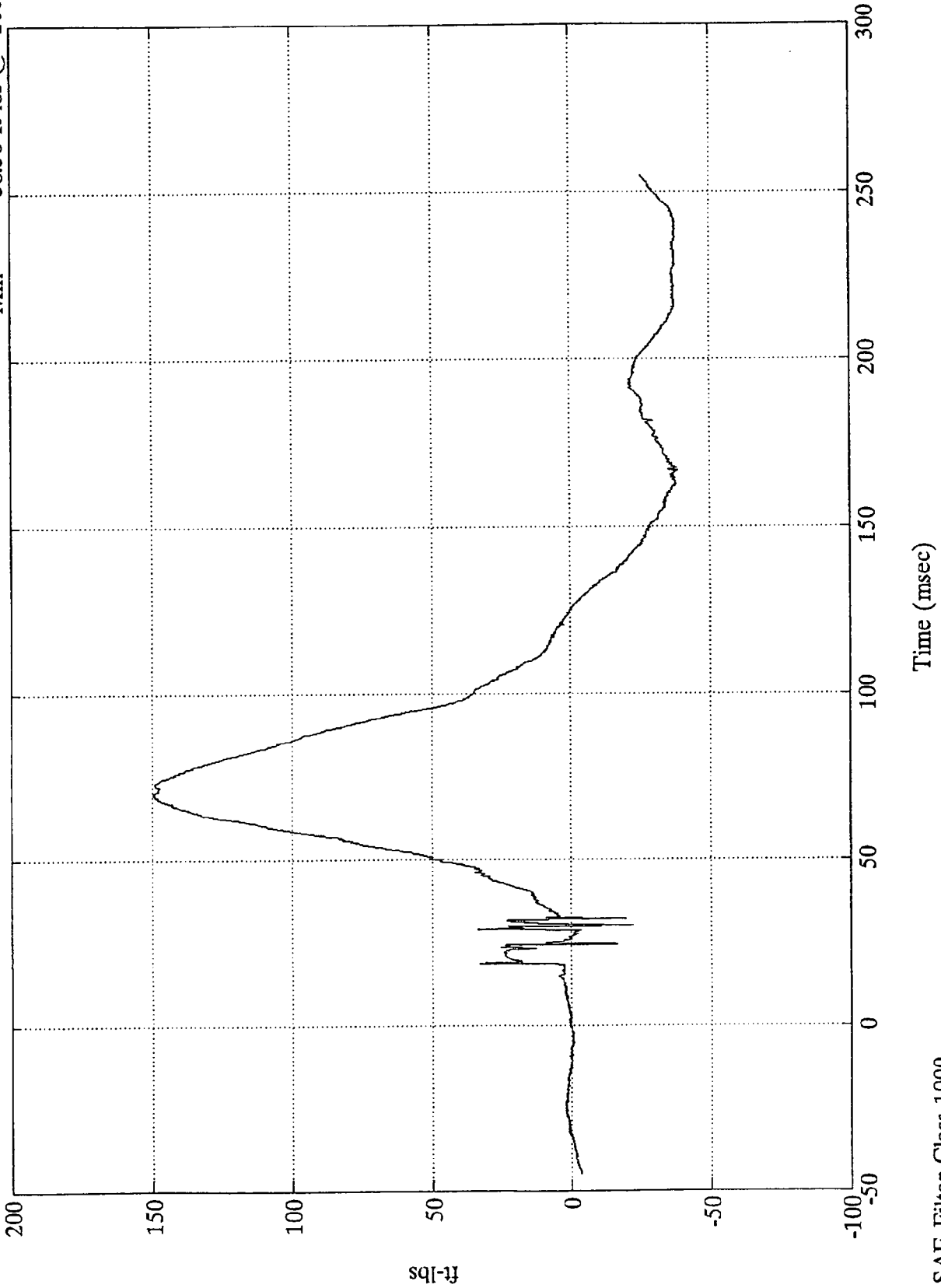
Max = 173.97 lbs @ 98.87 msec
Min = -769.96 lbs @ 69.12 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lumbar My

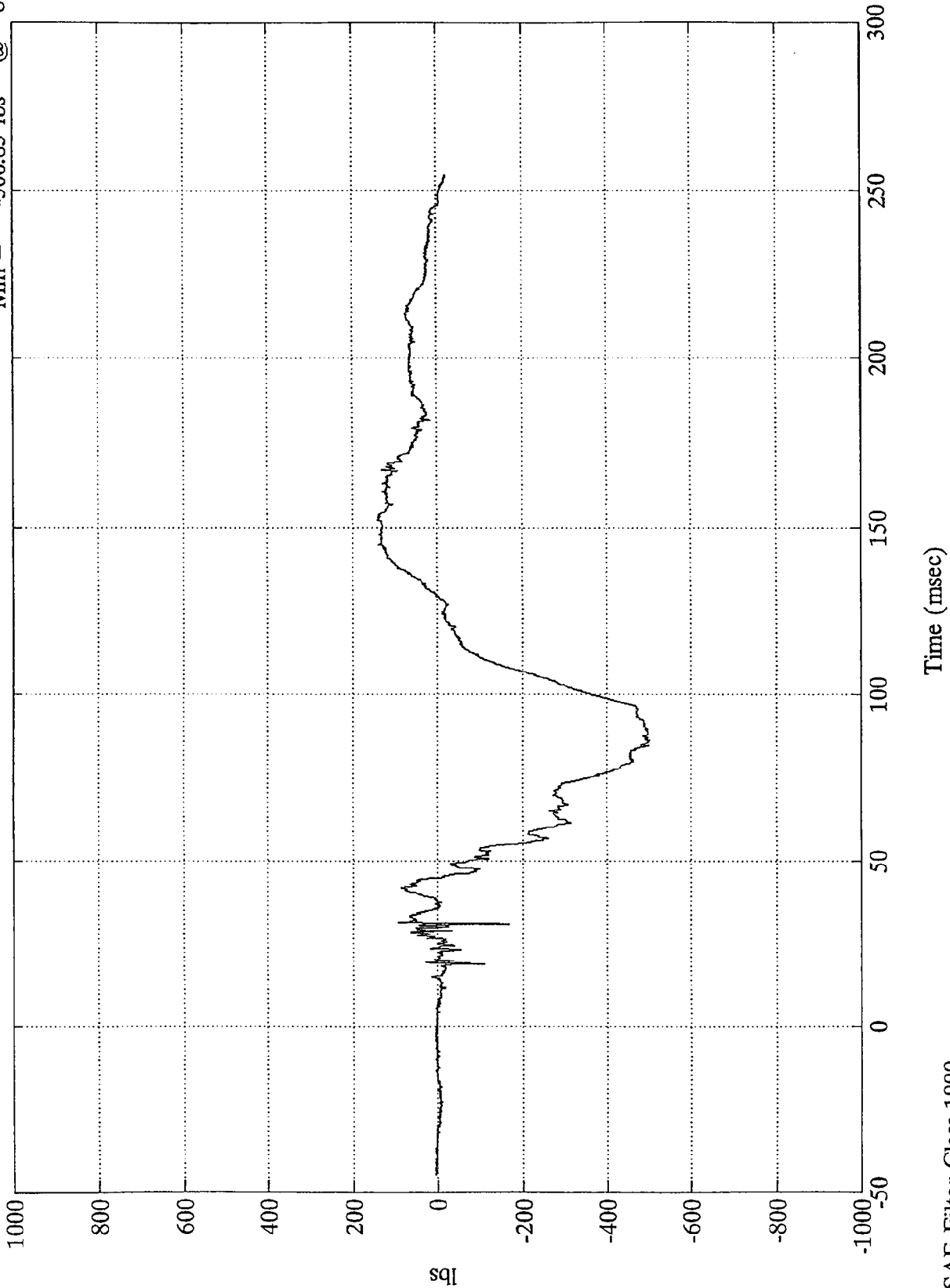
Max = 149.69 ft-lbs @ 69.95 msec
Min = -38.56 ft-lbs @ 166.92 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lumbar Fz

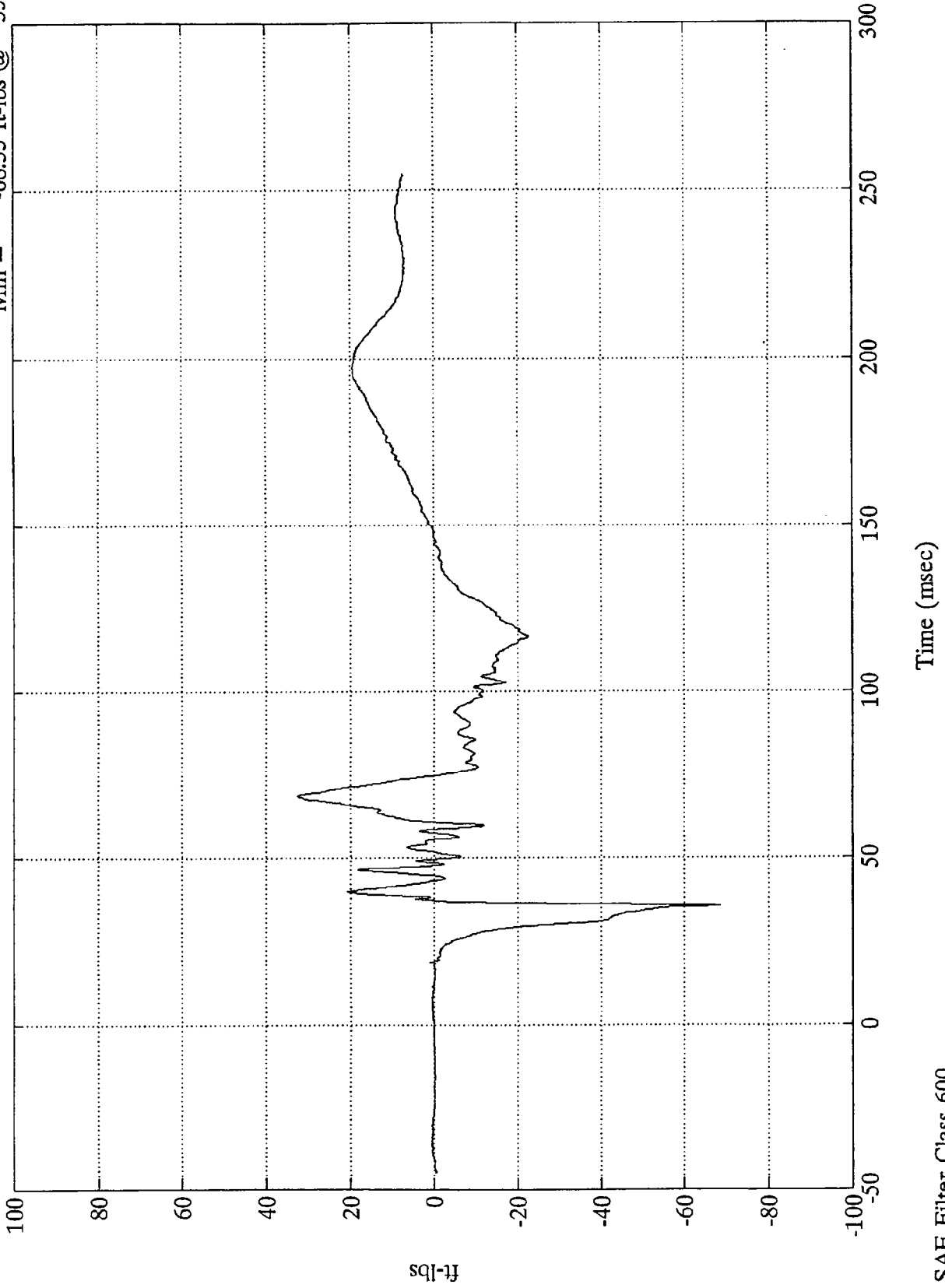
Max = 141.19 lbs @ 152.27 msec
Min = -500.85 lbs @ 86.16 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 L. Upper Tibia Mx

Max = 32.52 ft-lbs @ 68.52 msec
Min = -68.35 ft-lbs @ 35.63 msec



B-123

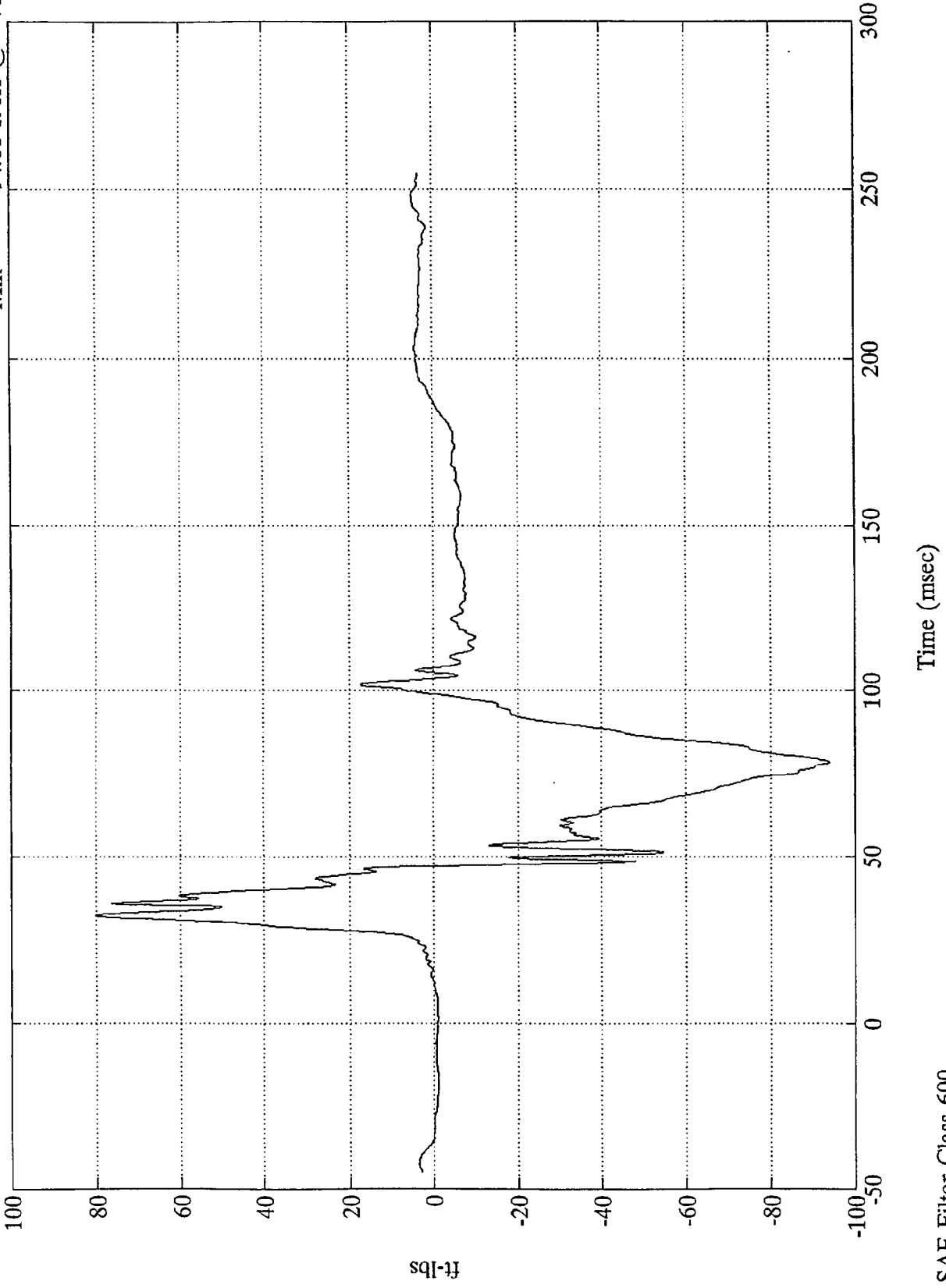
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 L. Upper Tibia My

Max = 80.10 ft-lbs @ 32.28 msec
Min = -94.00 ft-lbs @ 78.48 msec



sq|-1J
B-124

8118-2

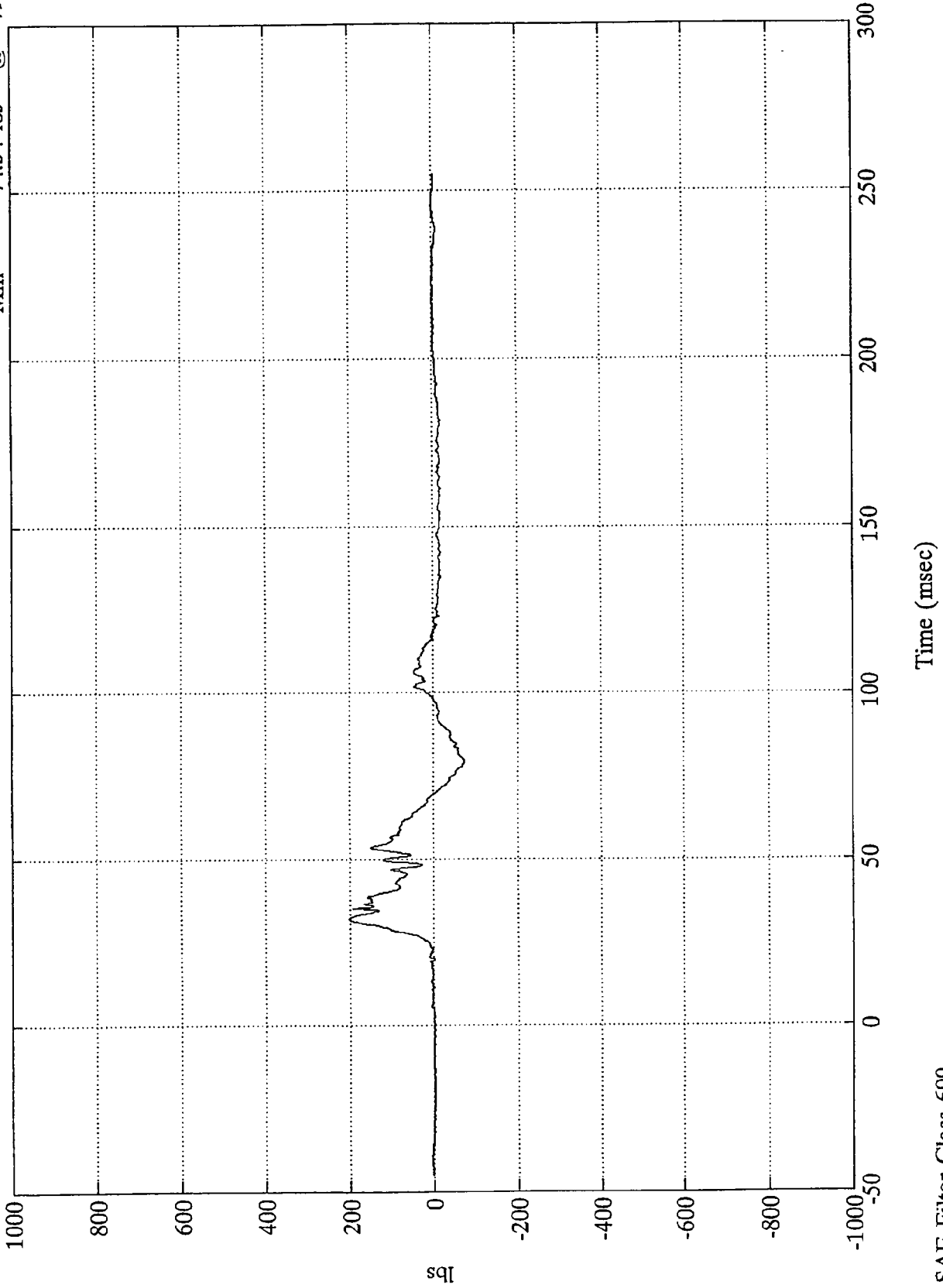
SAE Filter Class 600

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 L. Lower Tibia Fy

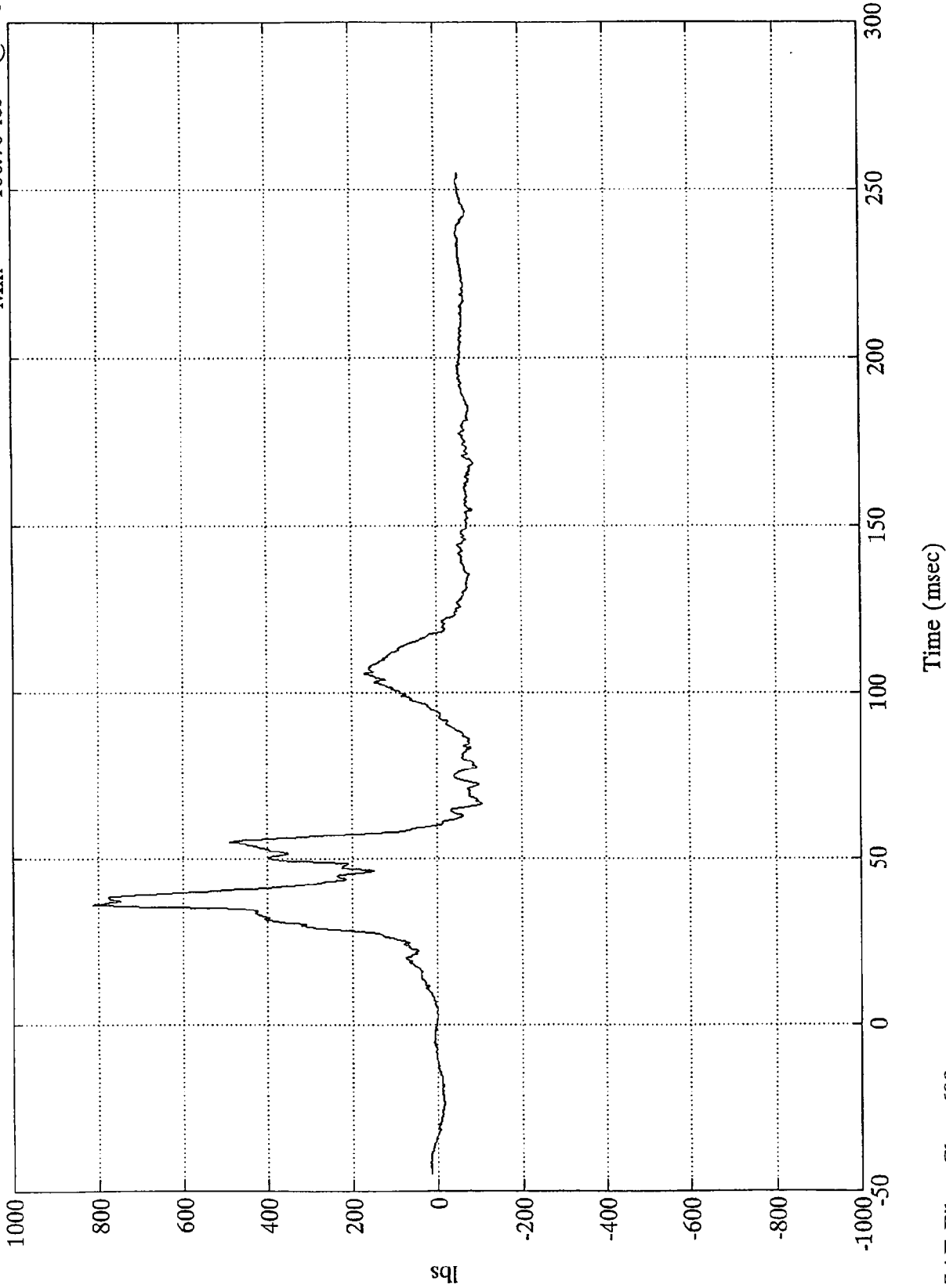
Max = 200.64 lbs @ 32.28 msec
Min = -74.34 lbs @ 79.44 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 L. Lower Tibia Fz

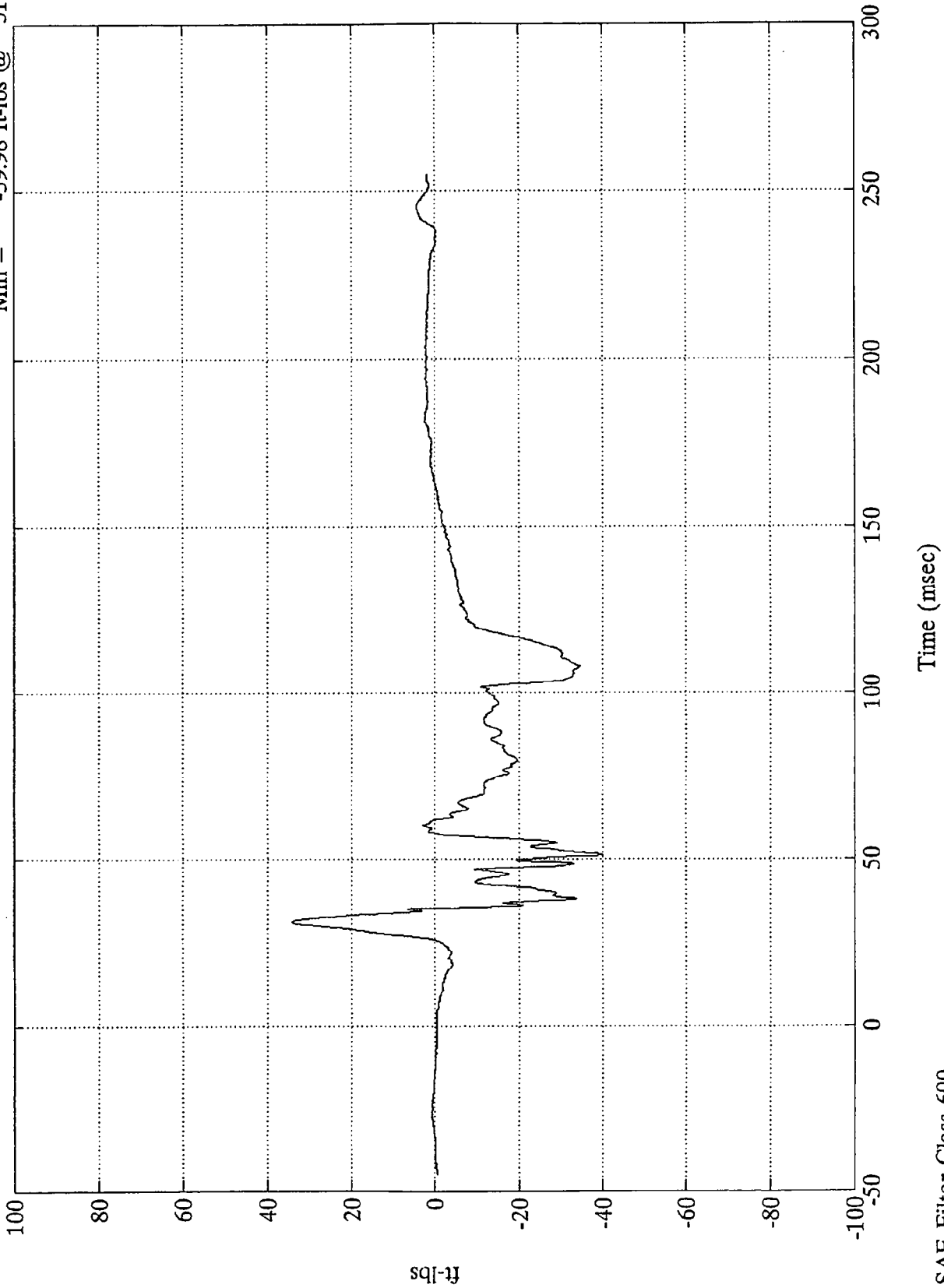
Max = 811.51 lbs @ 36.00 msec
Min = -106.76 lbs @ 66.48 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 L. Lower Tibia Mx

Max = 34.15 ft-lbs @ 31.19 msec
Min = -39.98 ft-lbs @ 51.24 msec



sq[-1] ft-lbs

B-127

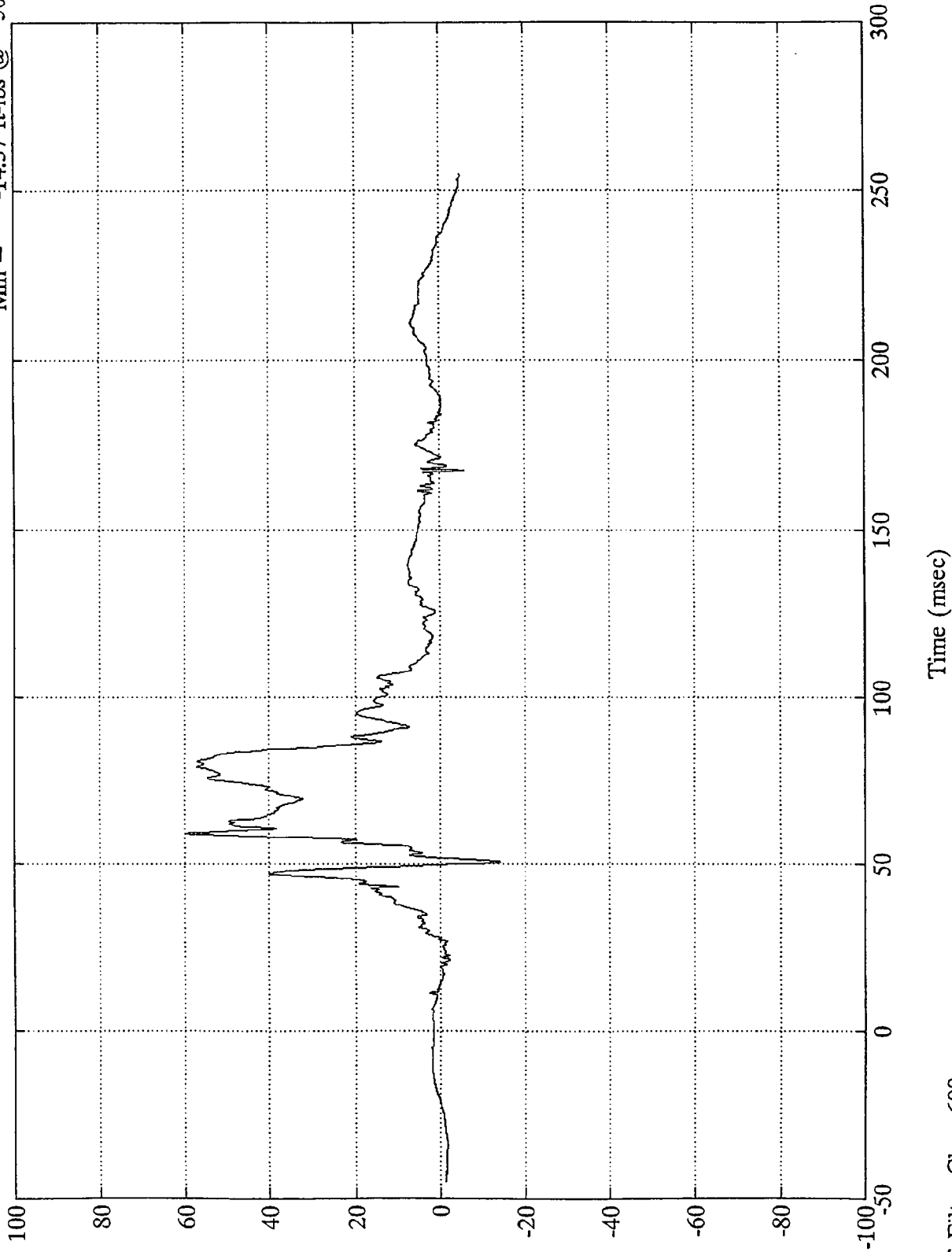
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 R. Upper Tibia Mx

Max = 59.68 ft-lbs @ 59.15 msec
Min = -14.37 ft-lbs @ 50.64 msec



sqi-1j

B-128

8118-2

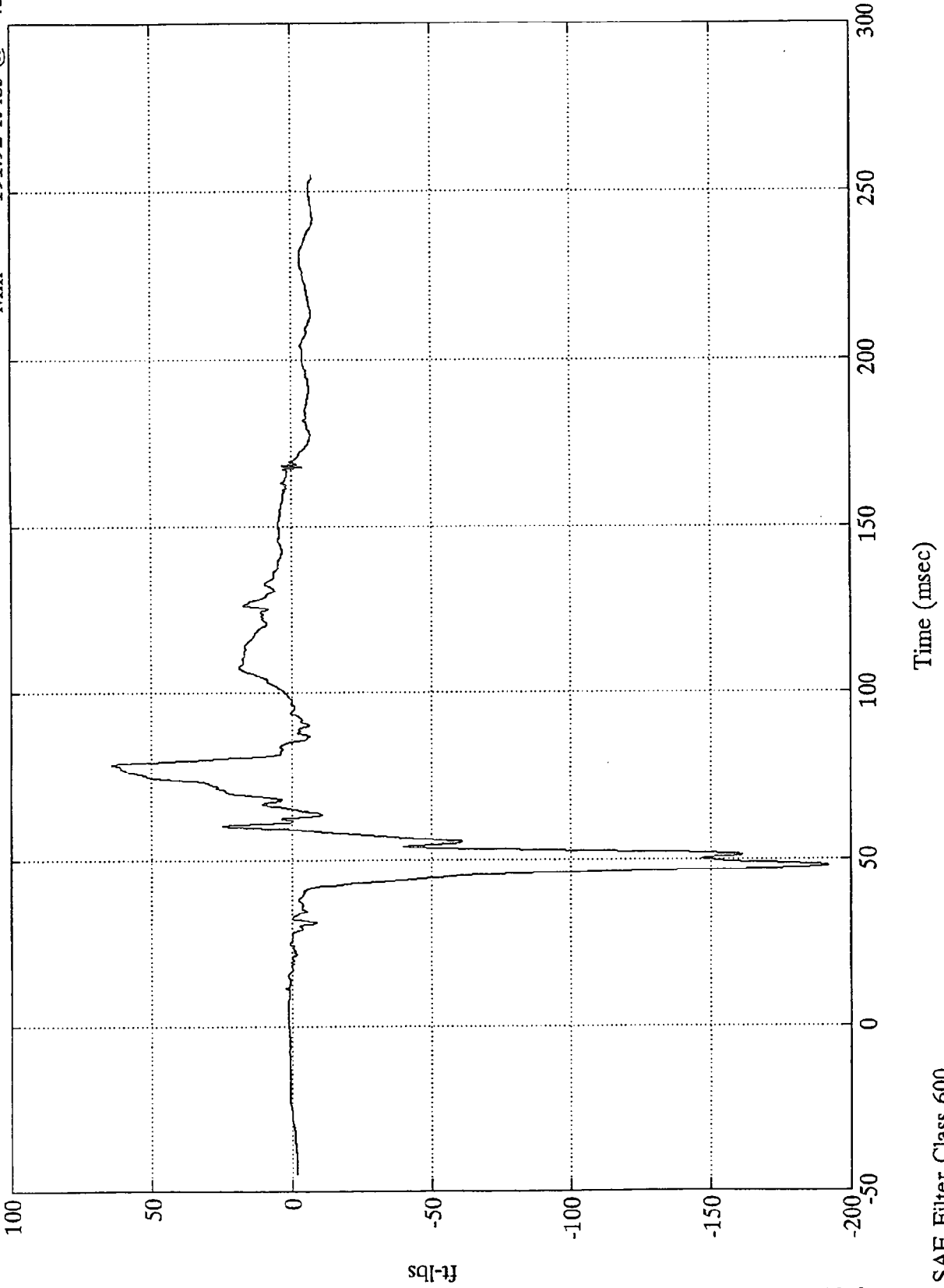
SAE Filter Class 600

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 R. Upper Tibia My

Max = 64.22 ft-lbs @ 78.48 msec
Min = -191.92 ft-lbs @ 48.00 msec



B-129

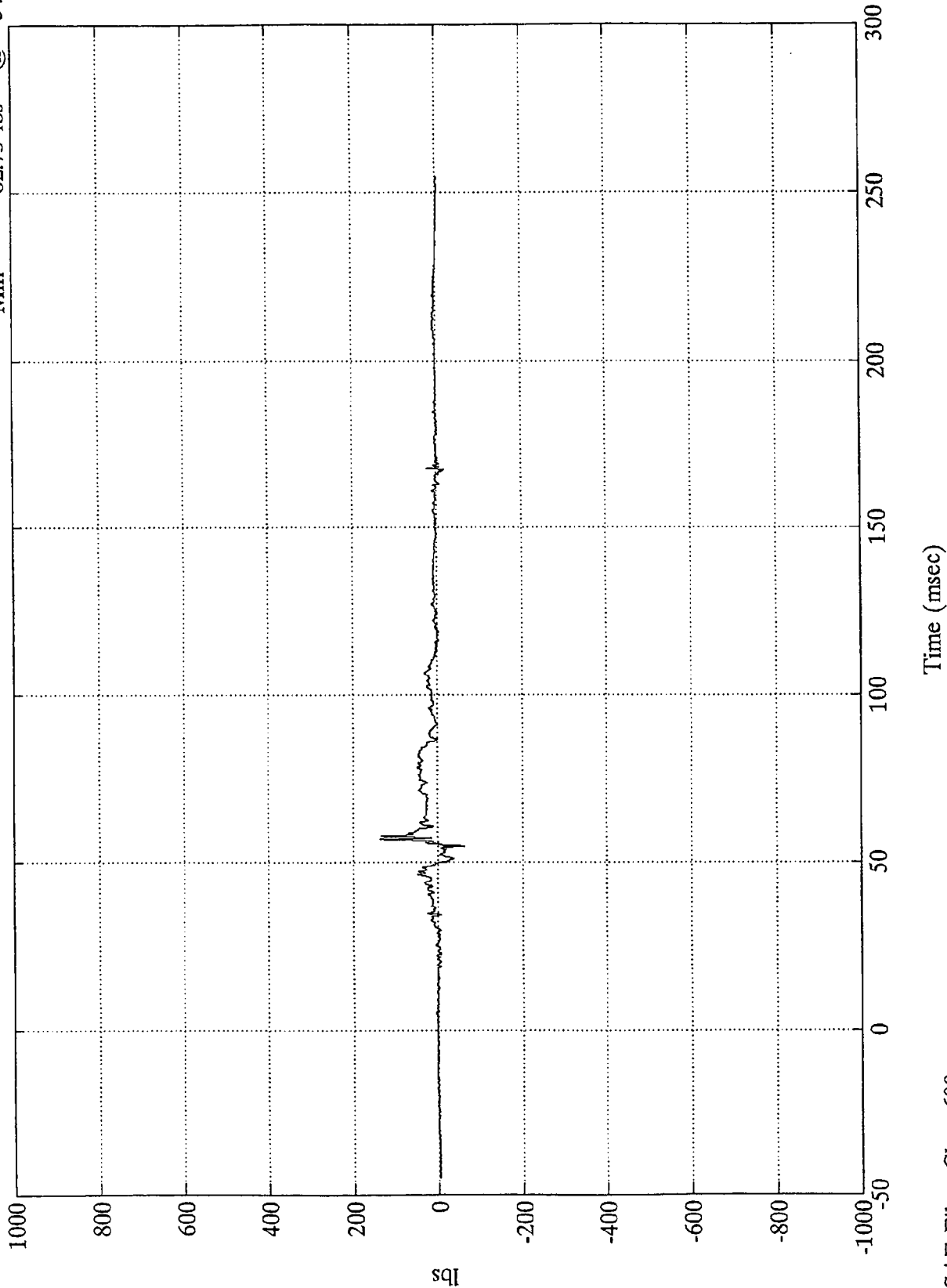
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 R. Lower Tibia Fy

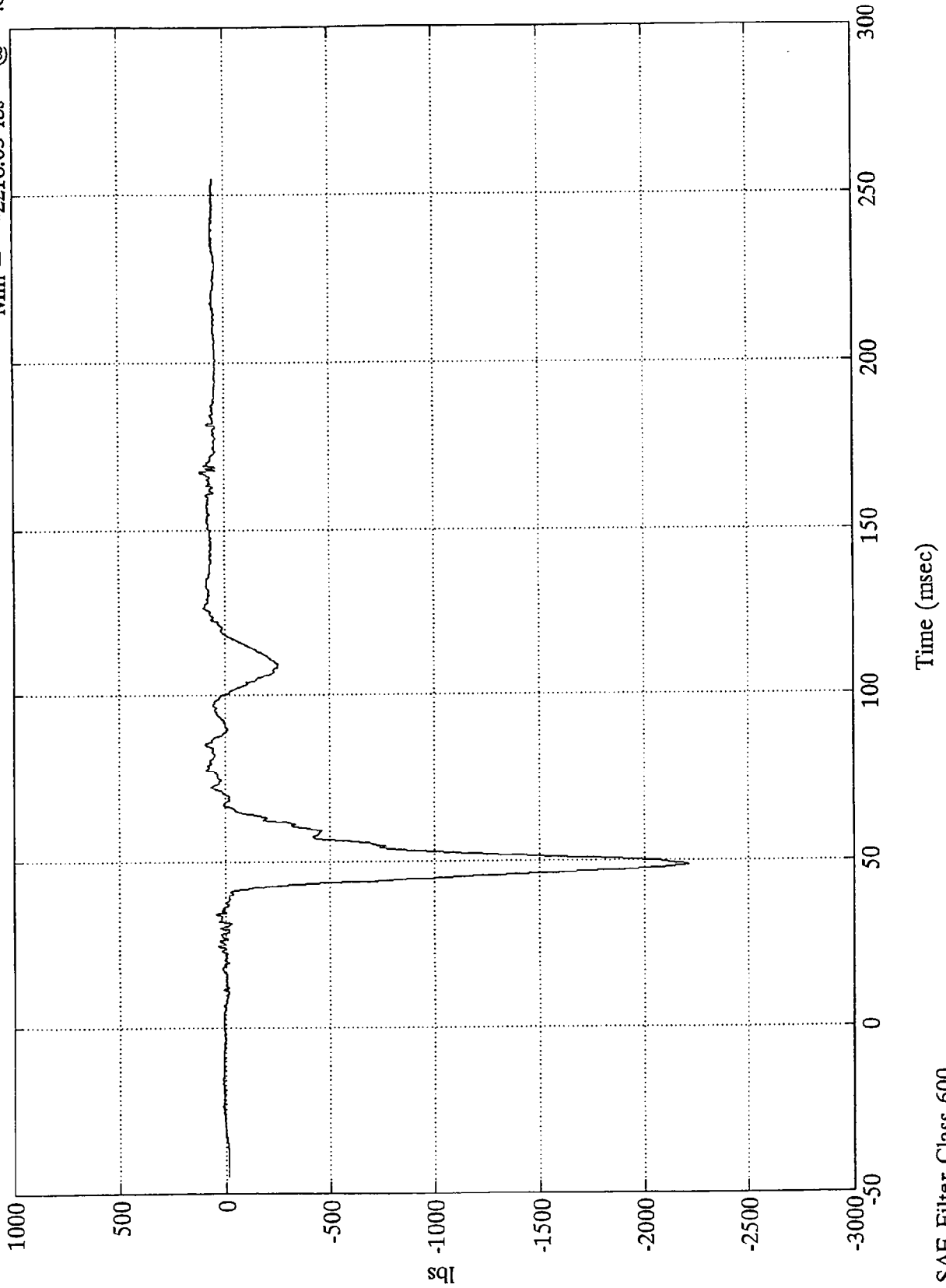
Max = 136.70 lbs @ 57.00 msec
Min = -62.73 lbs @ 54.96 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 R. Lower Tibia Fz

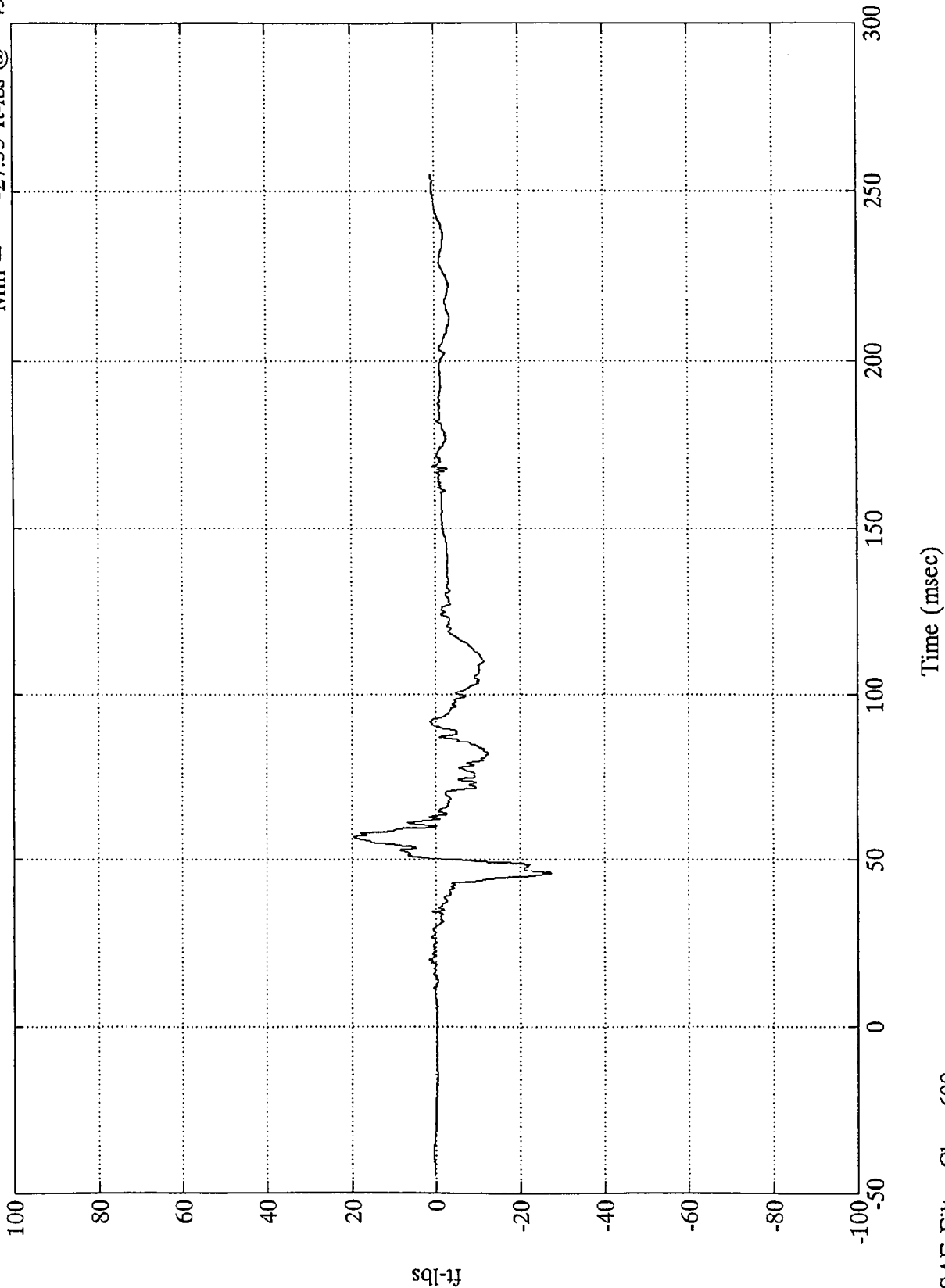
Max = 115.56 lbs @ 167.40 msec
Min = -2218.03 lbs @ 48.59 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 R. Lower Tibia Mx

Max = 19.43 ft-lbs @ 56.76 msec
Min = -27.55 ft-lbs @ 45.84 msec



sq[-1]
B-132

8118-2

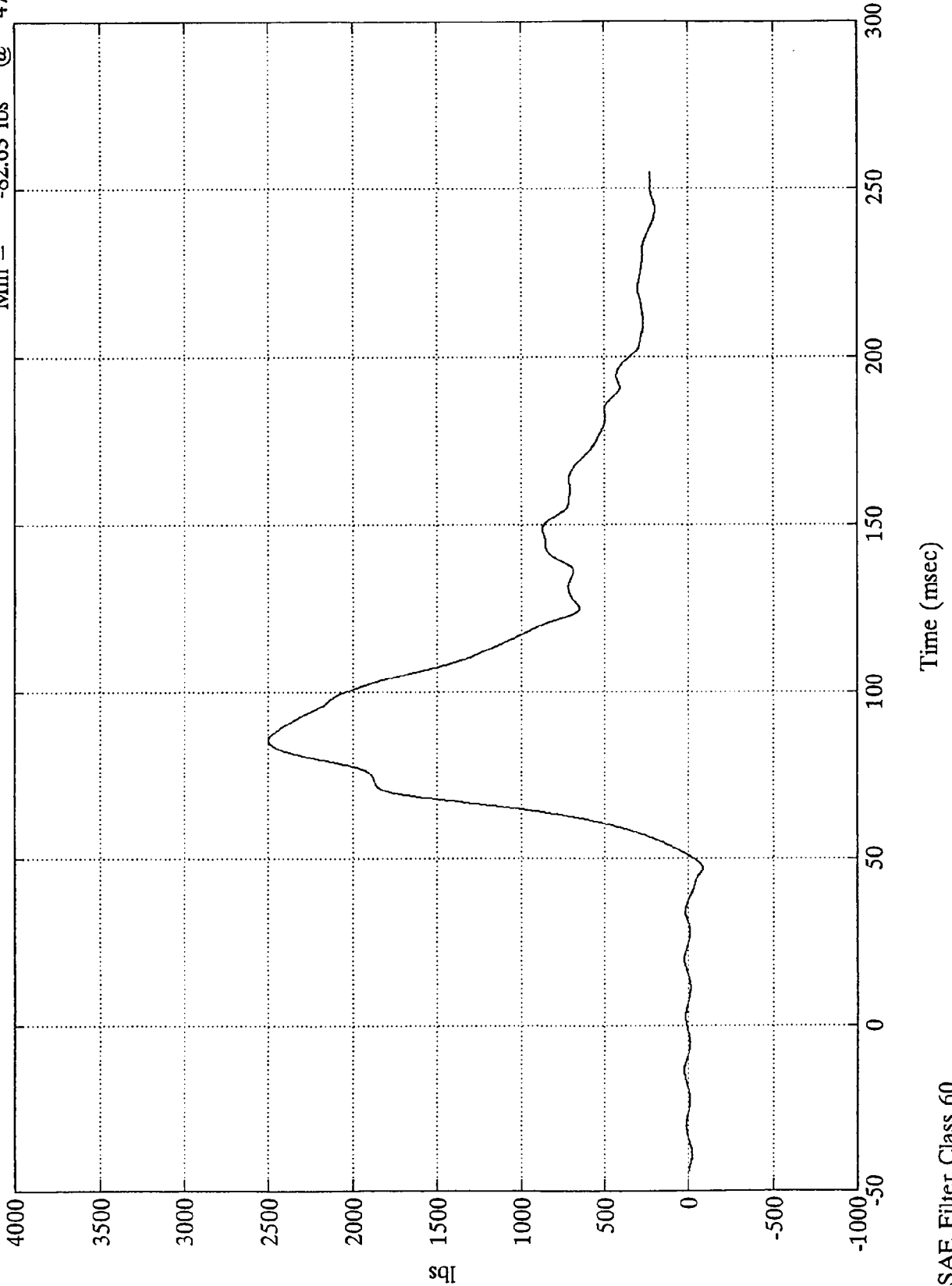
SAE Filter Class 600



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Lap Belt

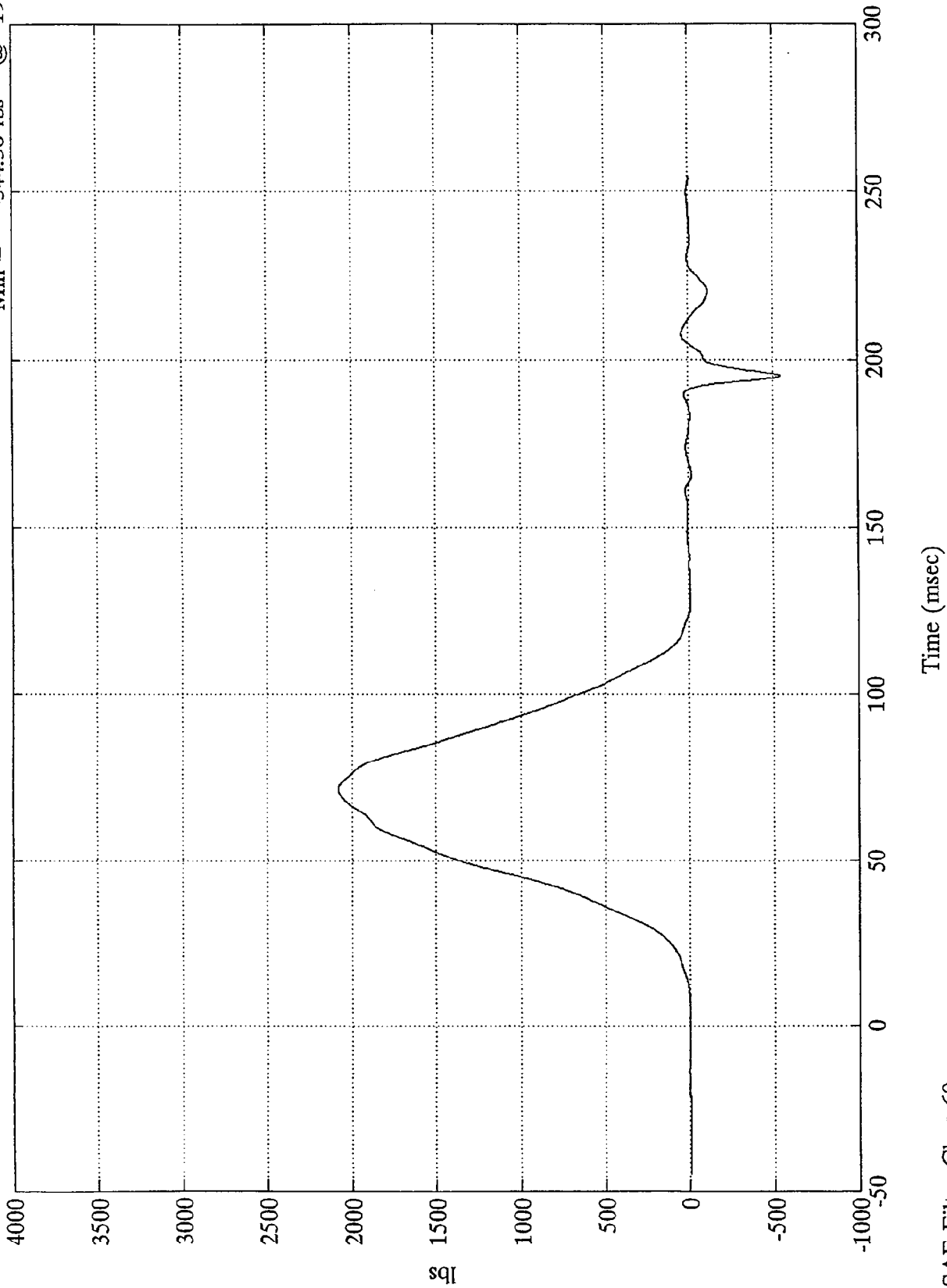
Max = 2501.67 lbs @ 85.80 msec
Min = -82.63 lbs @ 47.04 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Torso Belt

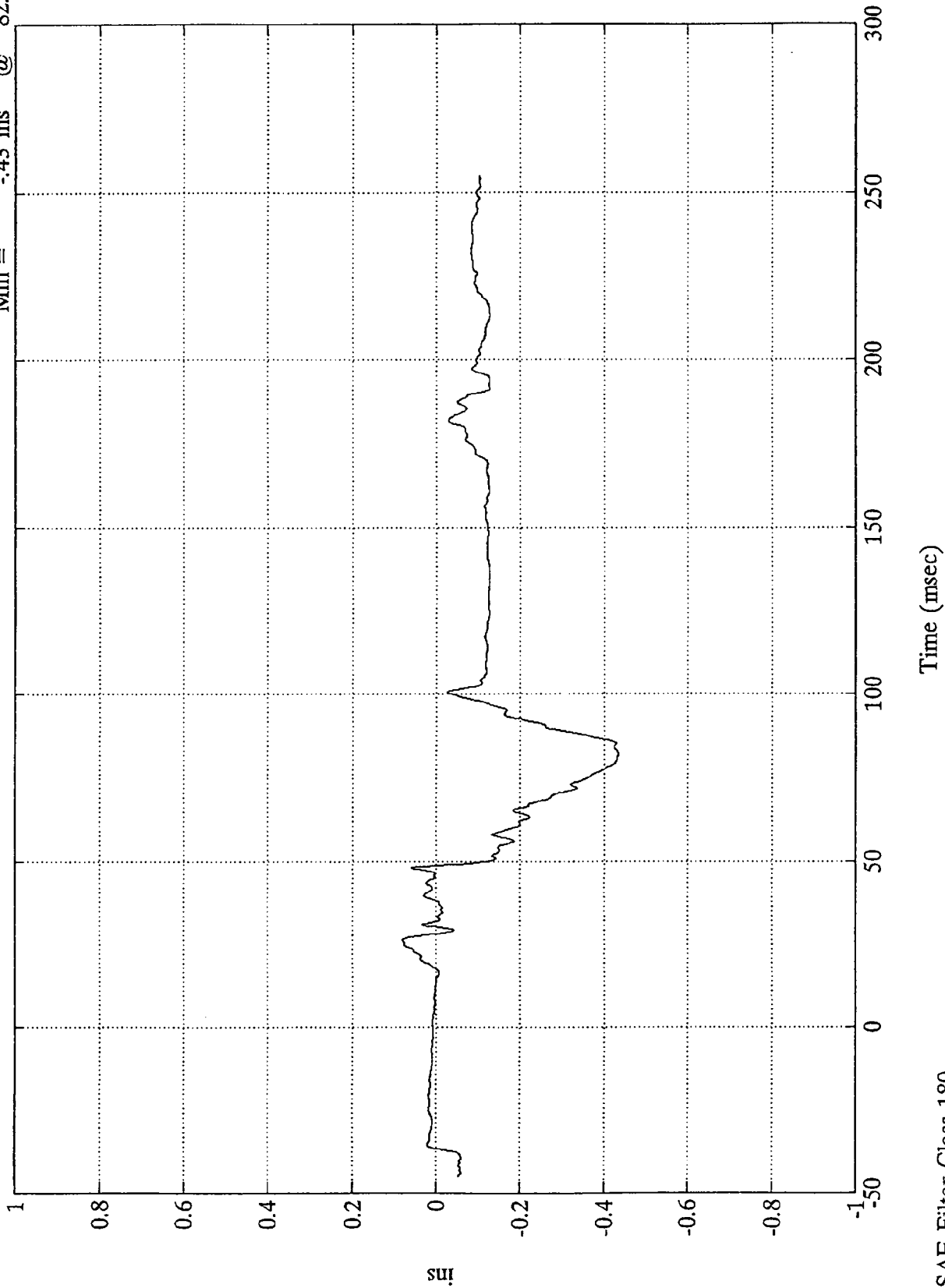
Max = 2083.29 lbs @ 71.63 msec
Min = -544.36 lbs @ 195.24 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Left Knee Displ.

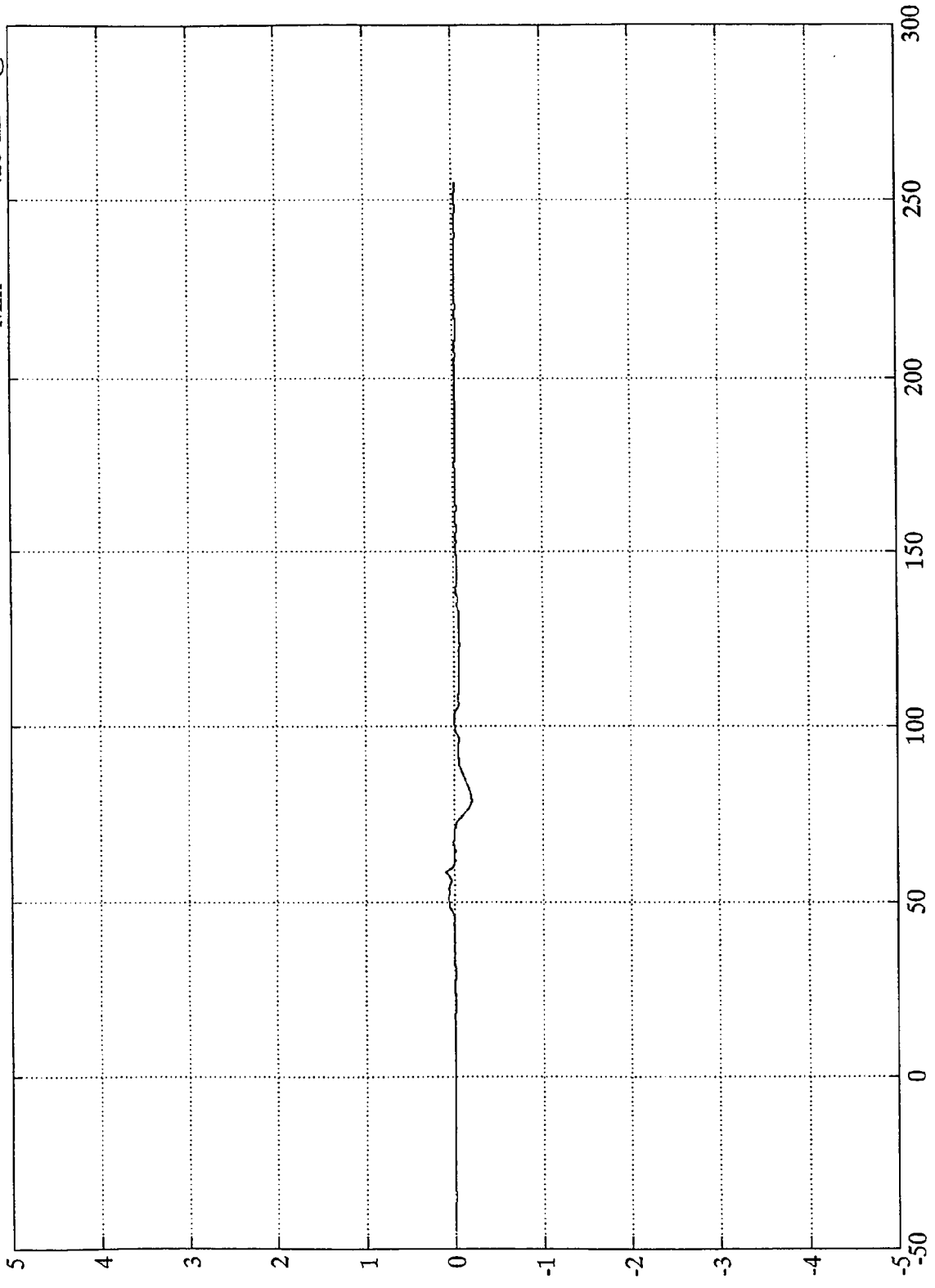
Max = .08 ins @ 26.51 msec
Min = -.43 ins @ 82.08 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 1 Right Knee Displ.

Max = .10 ins @ 58.43 msec
Min = -.20 ins @ 78.72 msec



su!
B-136

8118-2

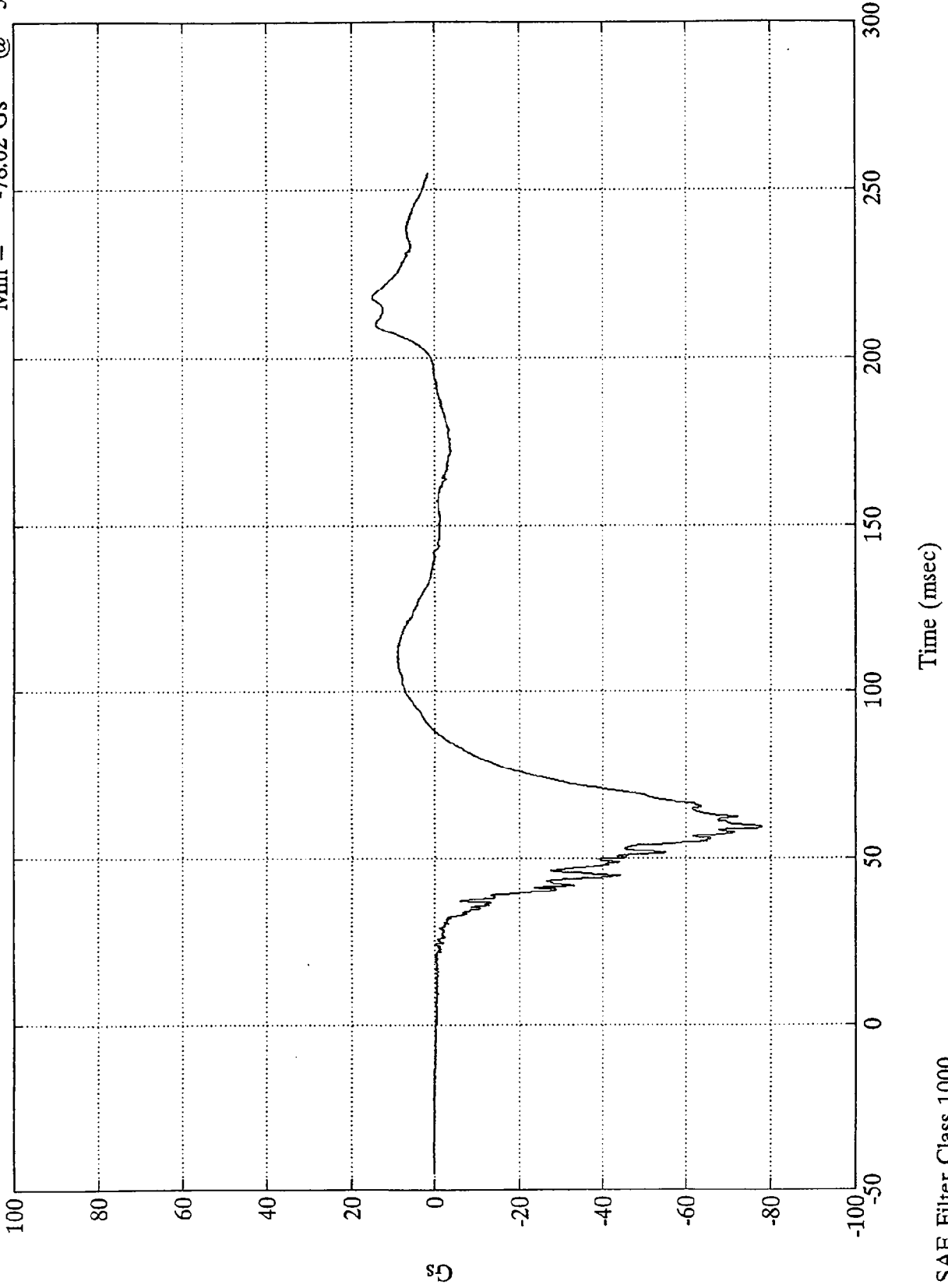
SAE Filter Class 180

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

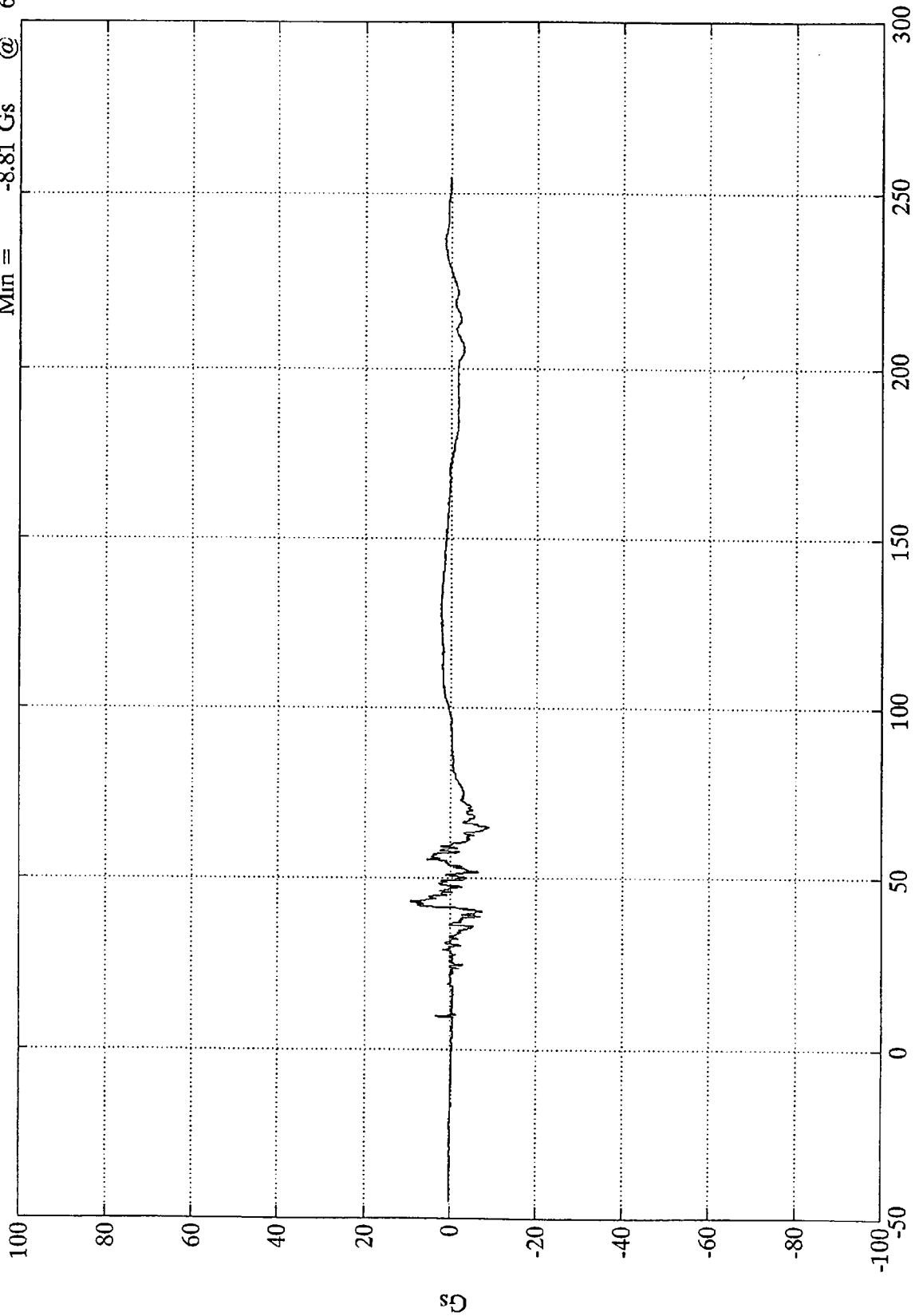
Pos. 2 Head X

Max = 15.06 Gs @ 218.16 msec
Min = -78.02 Gs @ 59.52 msec



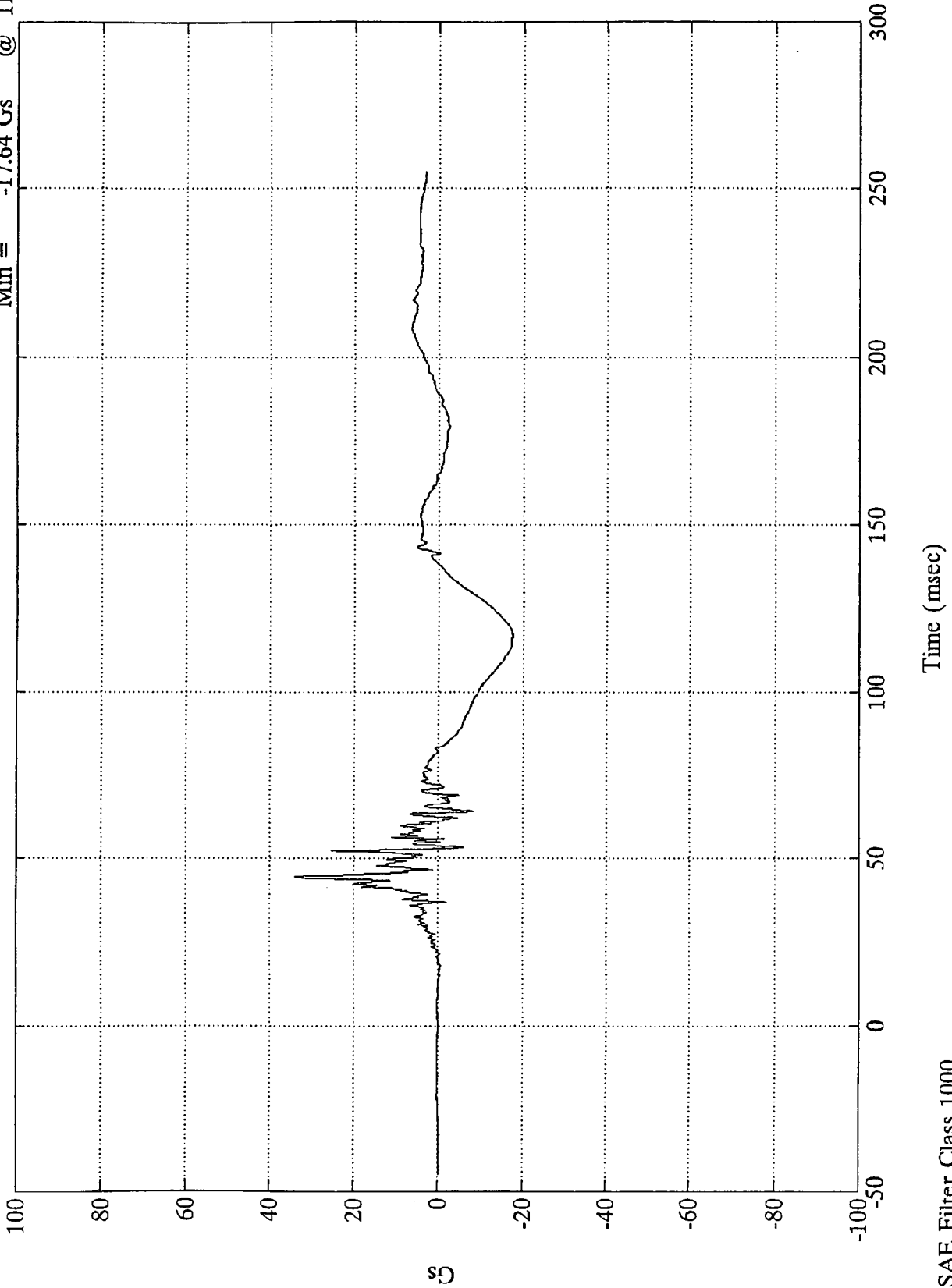
TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Head Y
Max = 9.26 Gs @ 42.72 msec
Min = -8.81 Gs @ 64.68 msec



TSC Frontal Barrier Test #2 - Ford Taurus

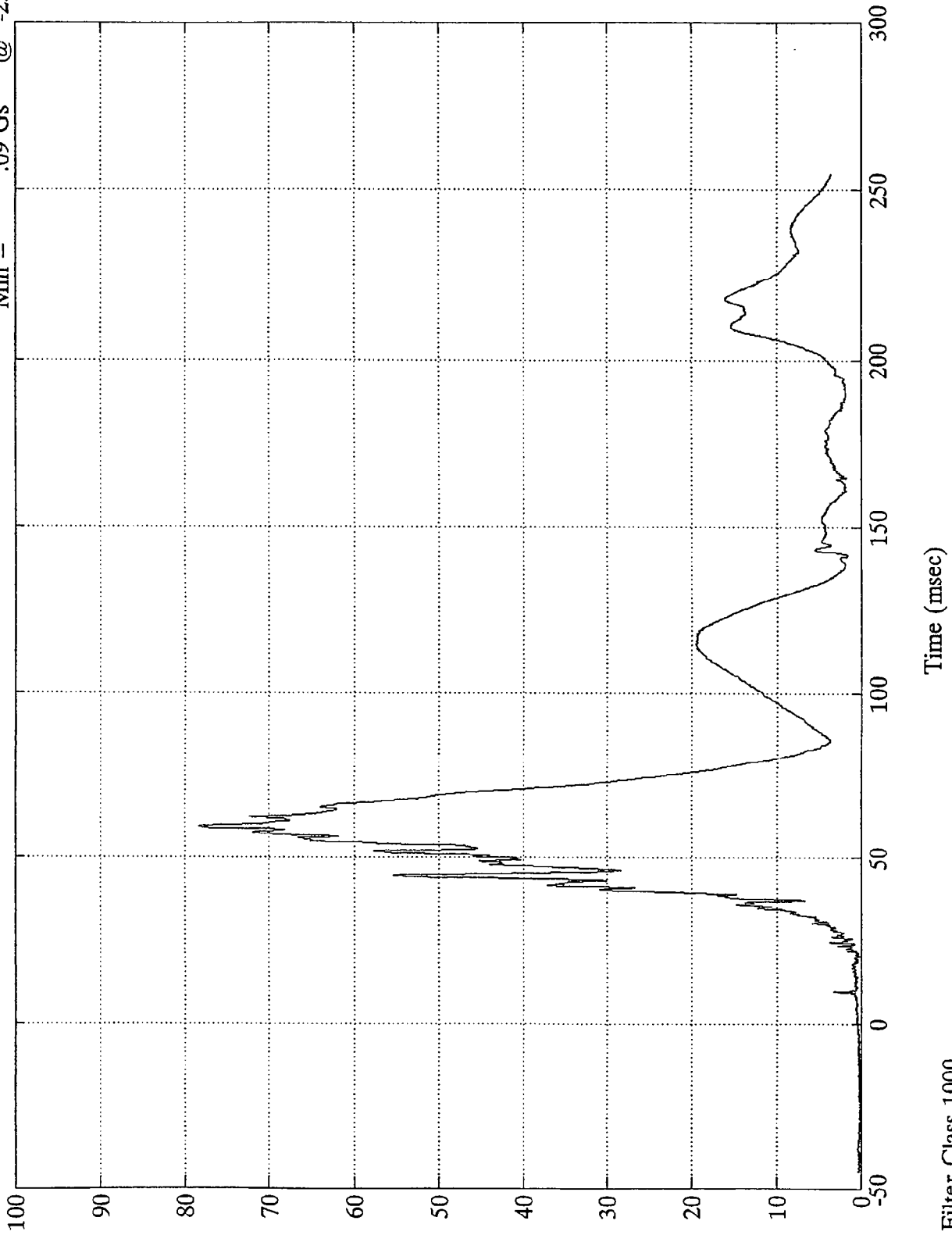
Pos. 2 Head Z
Max = 34.00 Gs @ 44.27 msec
Min = -17.64 Gs @ 117.72 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Head Resultant

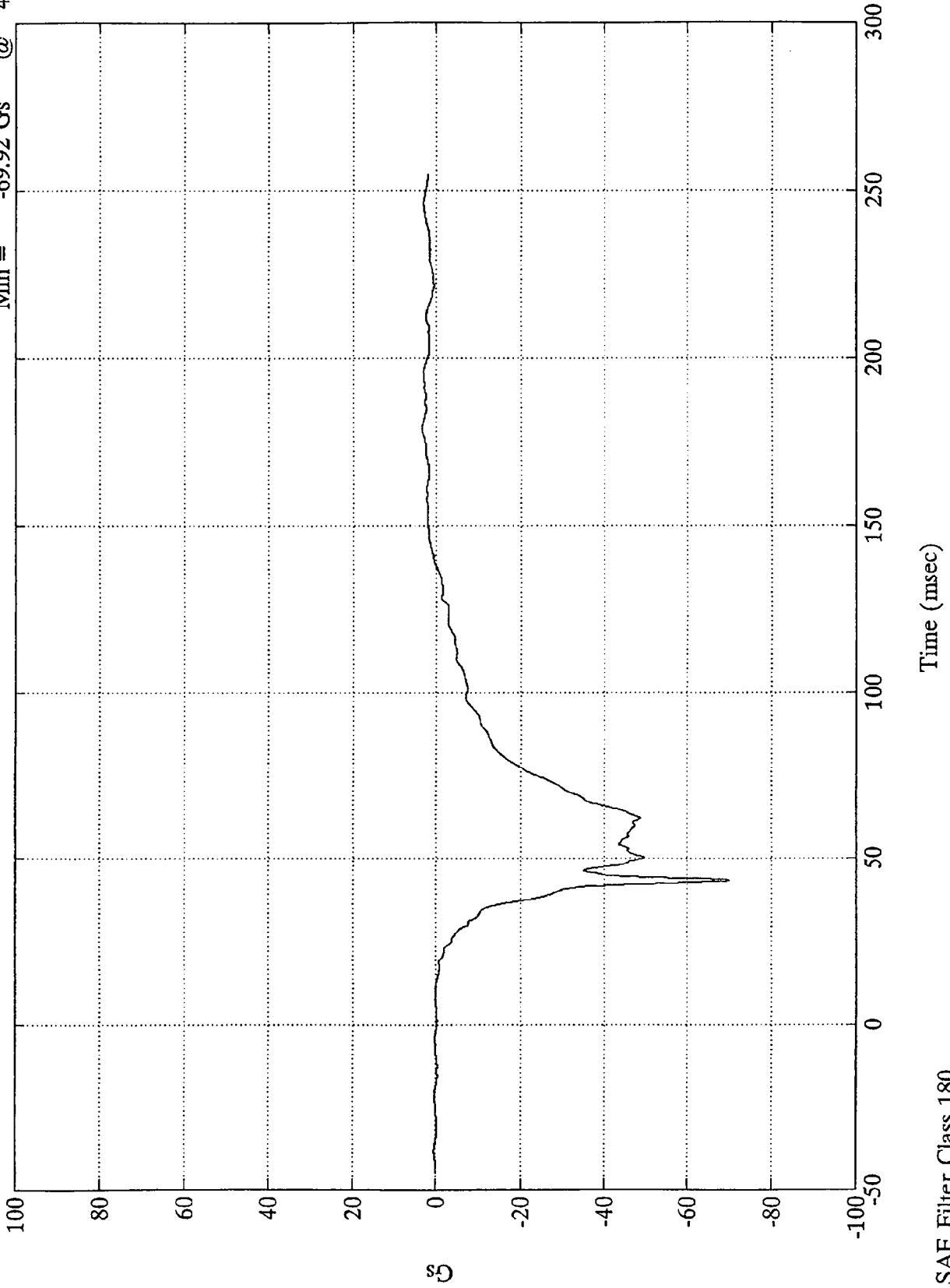
Max = 78.44 Gs @ 59.52 msec
Min = .09 Gs @ -23.76 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Chest X

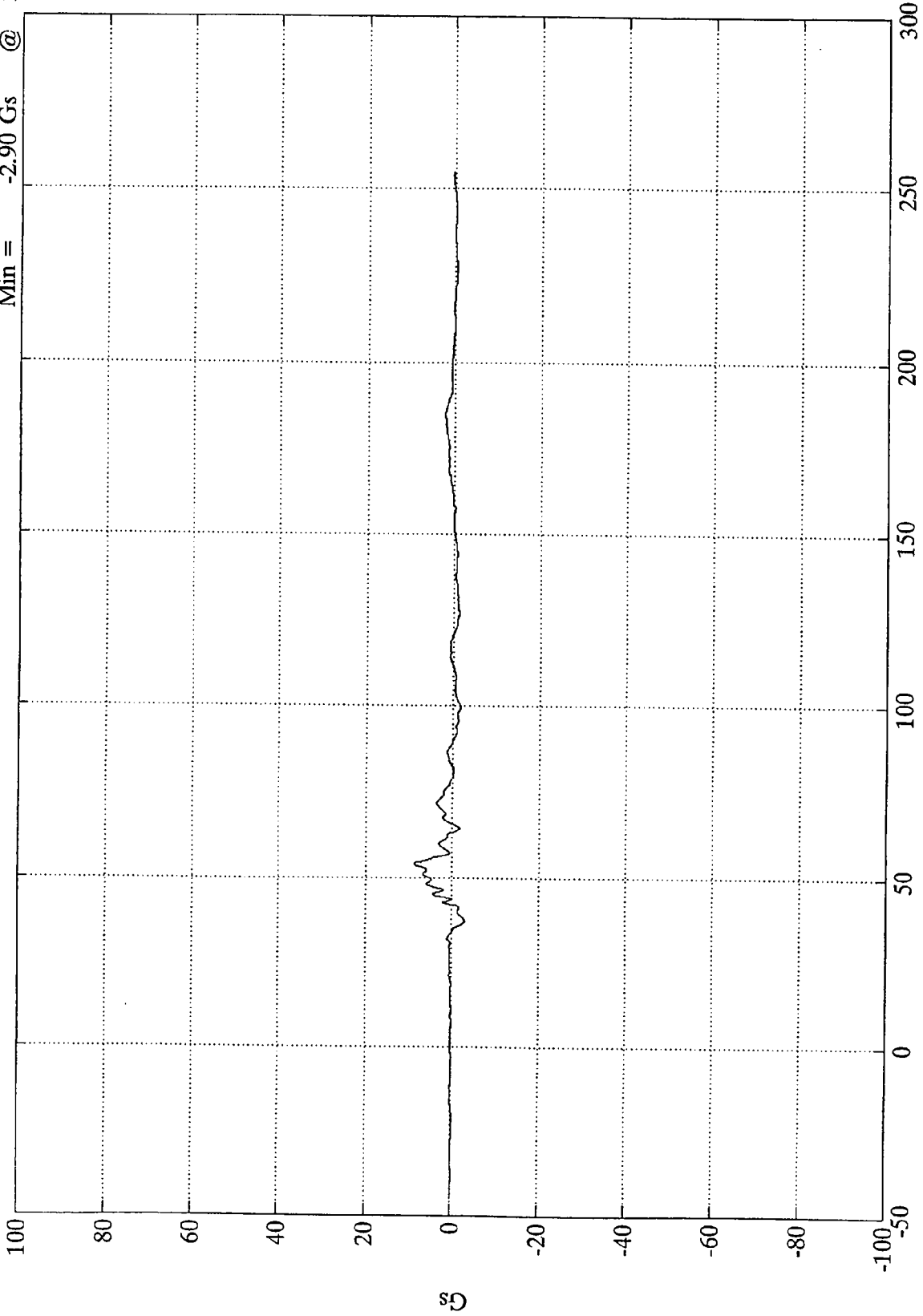
Max = 3.38 Gs @ 178.68 msec
Min = -69.92 Gs @ 43.31 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 8.86 Gs @ 54.36 msec
Min = -2.90 Gs @ 37.44 msec

Pos. 2 Chest Y



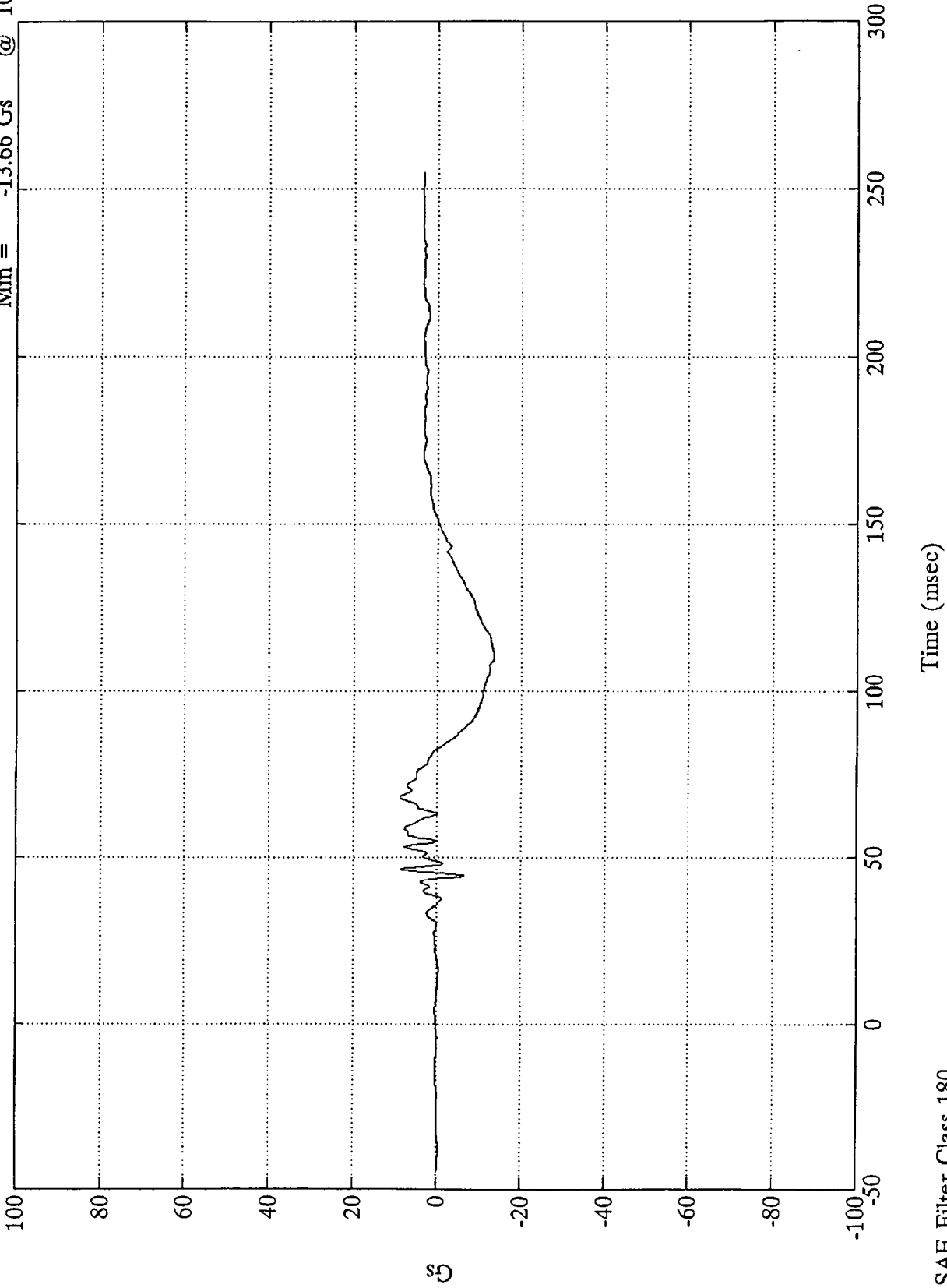
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 8.86 Gs @ 67.80 msec
Min = -13.66 Gs @ 109.80 msec

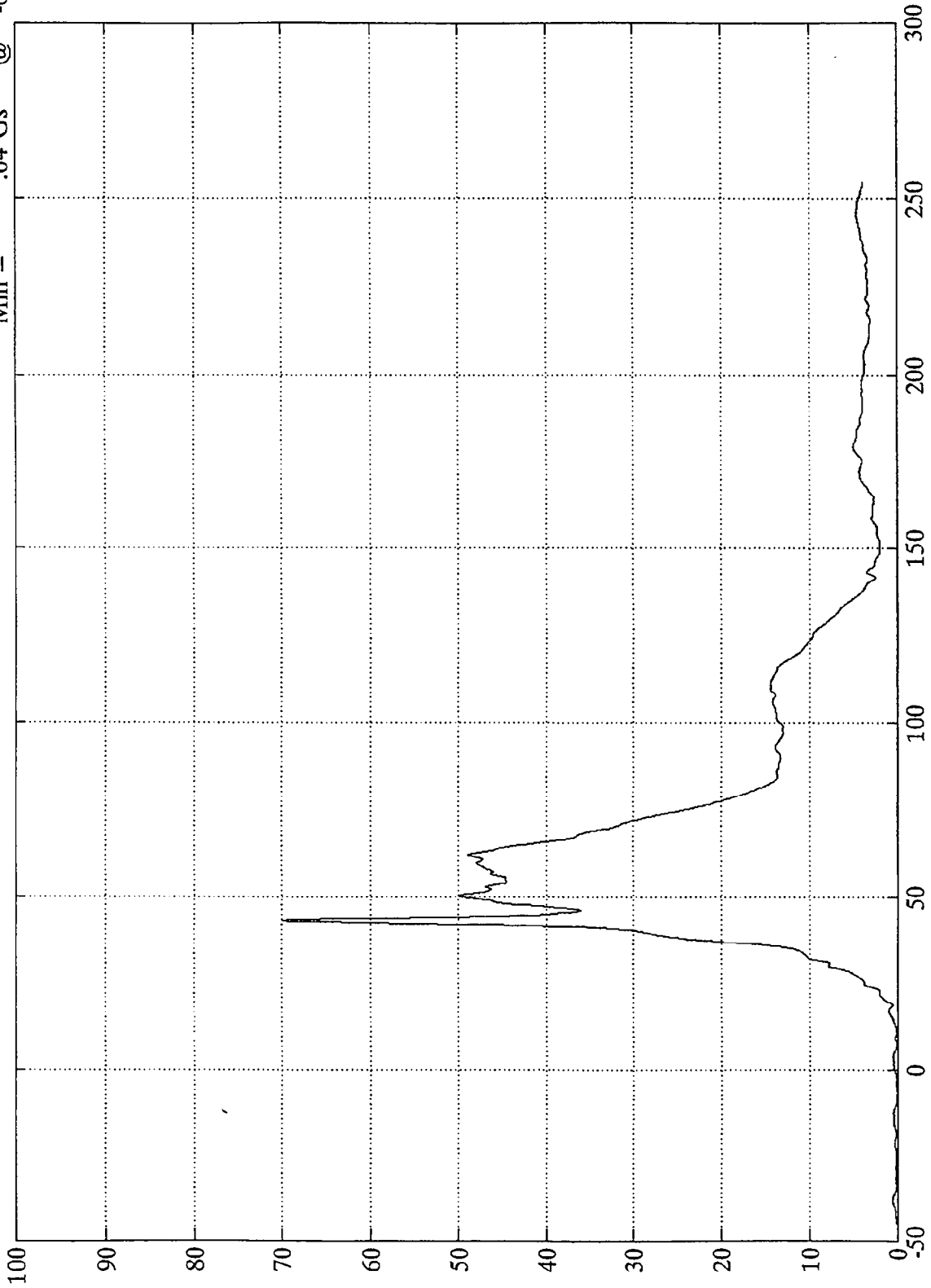
Pos. 2 Chest Z



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 69.97 Gs @ 43.31 msec
Min = .04 Gs @ -6.72 msec

Pos. 2 Chest Resultant



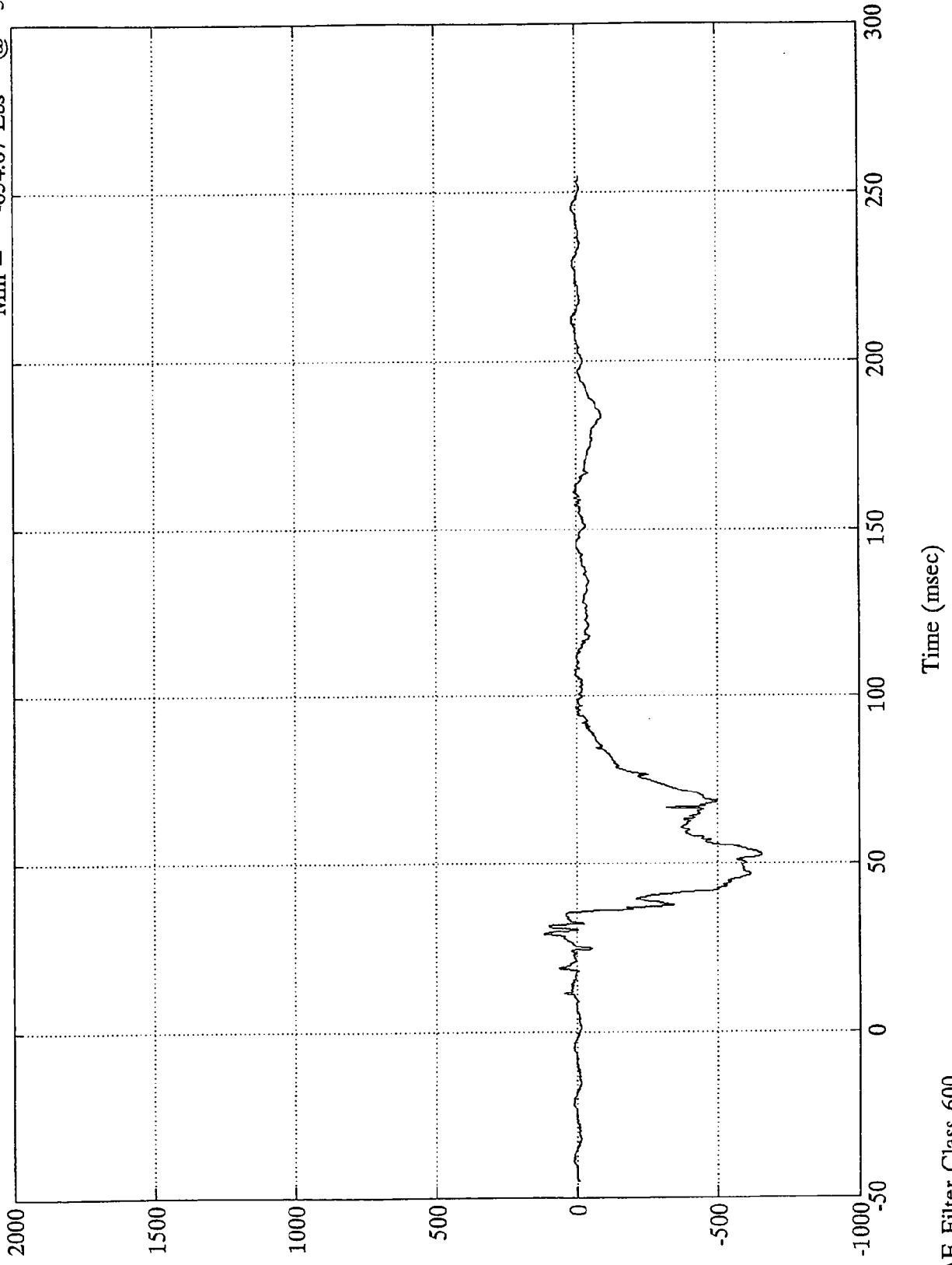
Time (msec)

SAE Filter Class 180

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 119.06 Lbs @ 28.92 msec
Min = -654.67 Lbs @ 52.68 msec

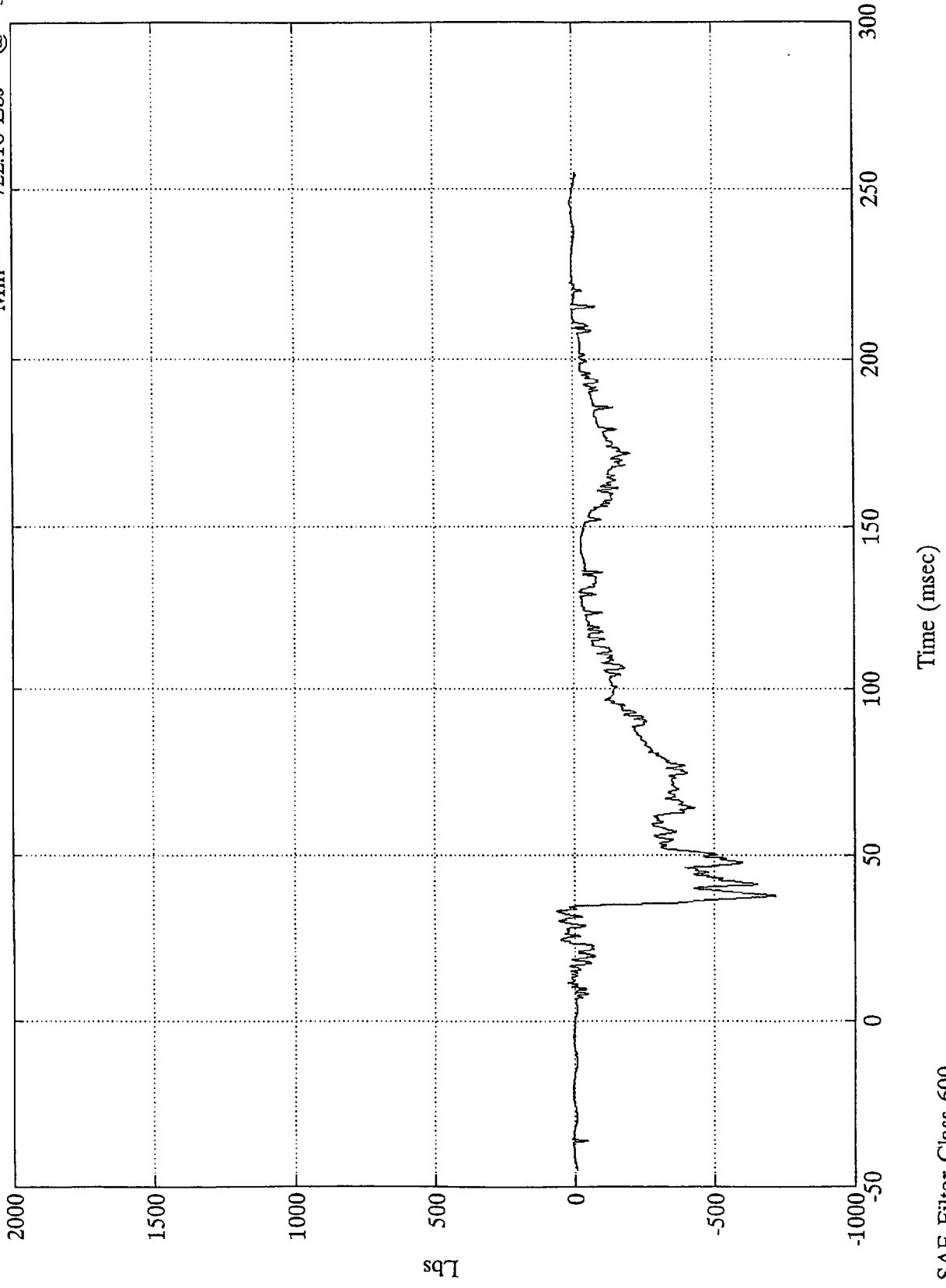
Pos. 2 Left Femur



TSC Frontal Barrier Test #2 - Ford Taurus

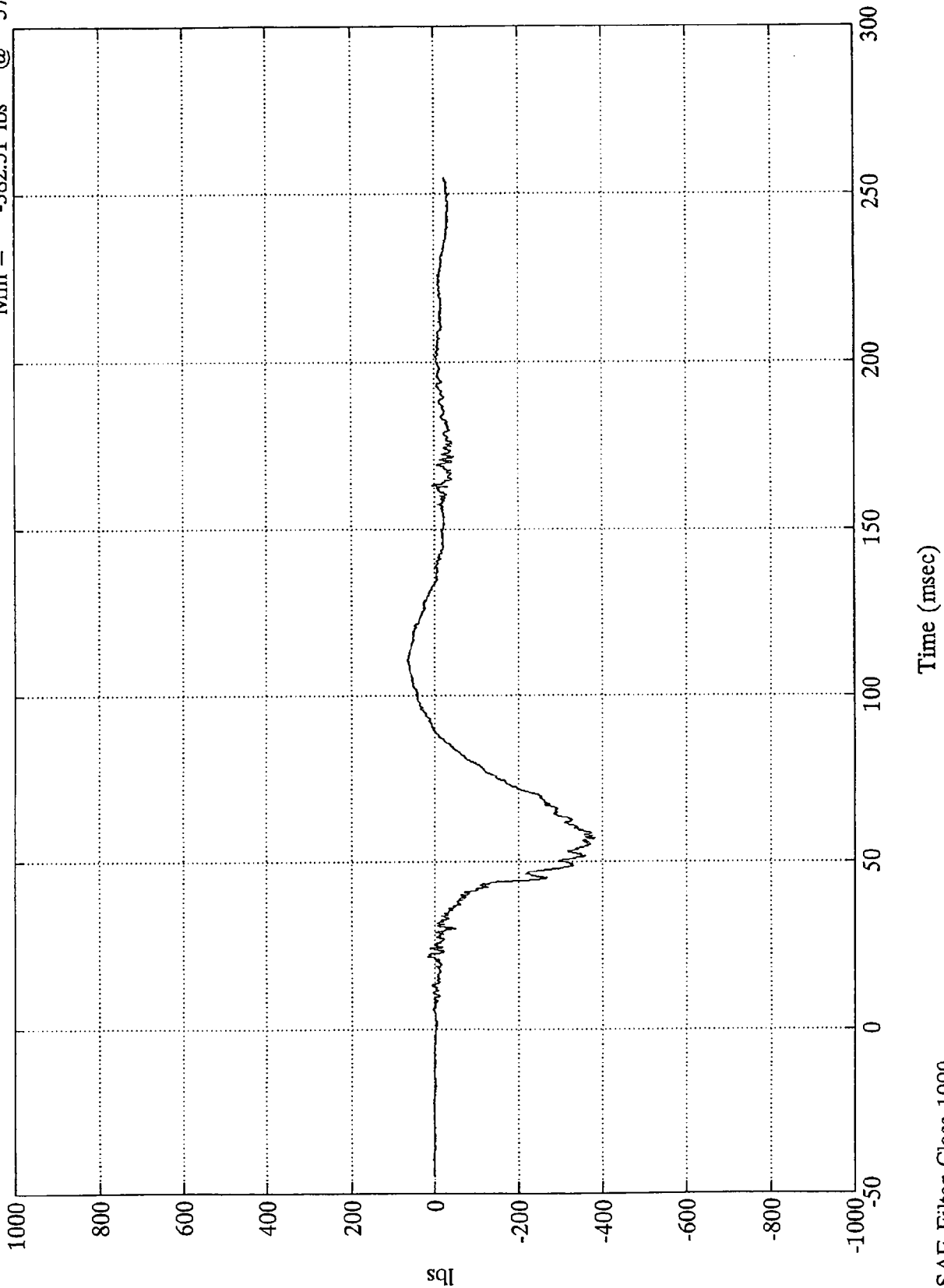
Pos. 2 Right Femur

Max = 62.99 Lbs @ 33.11 msec
Min = -722.16 Lbs @ 37.68 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Upper Neck Fx
Max = 64.04 lbs @ 110.88 msec
Min = -382.51 lbs @ 57.00 msec



TSC Frontal Barrier Test #2 - Ford Taurus

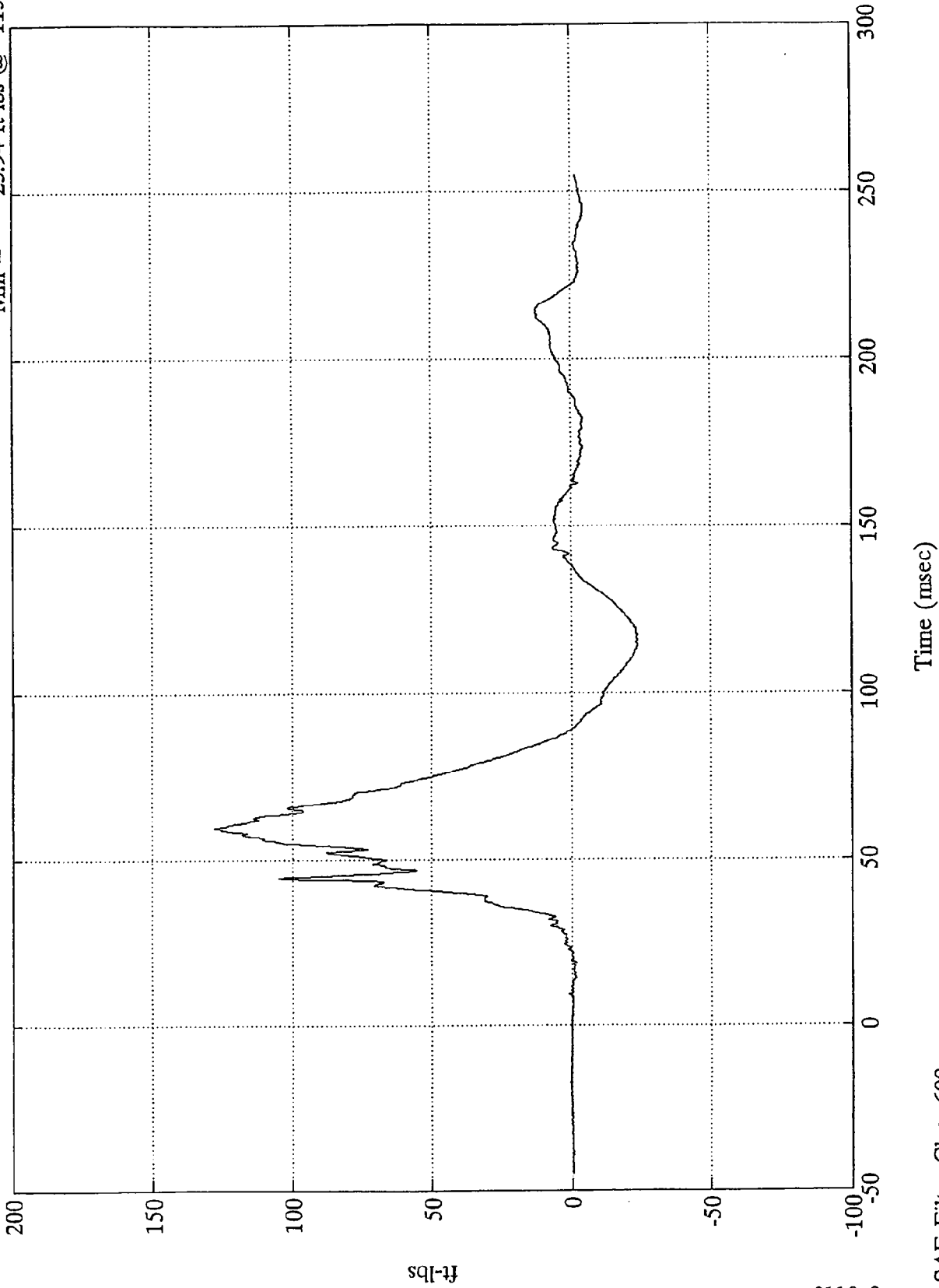
Pos. 2 Upper Neck Fy
Max = 702.51 lbs @ 51.47 msec
Min = -206.41 lbs @ 167.52 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Upper Neck Mz

Max = 127.99 ft-lbs @ 59.52 msec
Min = -23.94 ft-lbs @ 115.68 msec



B-149

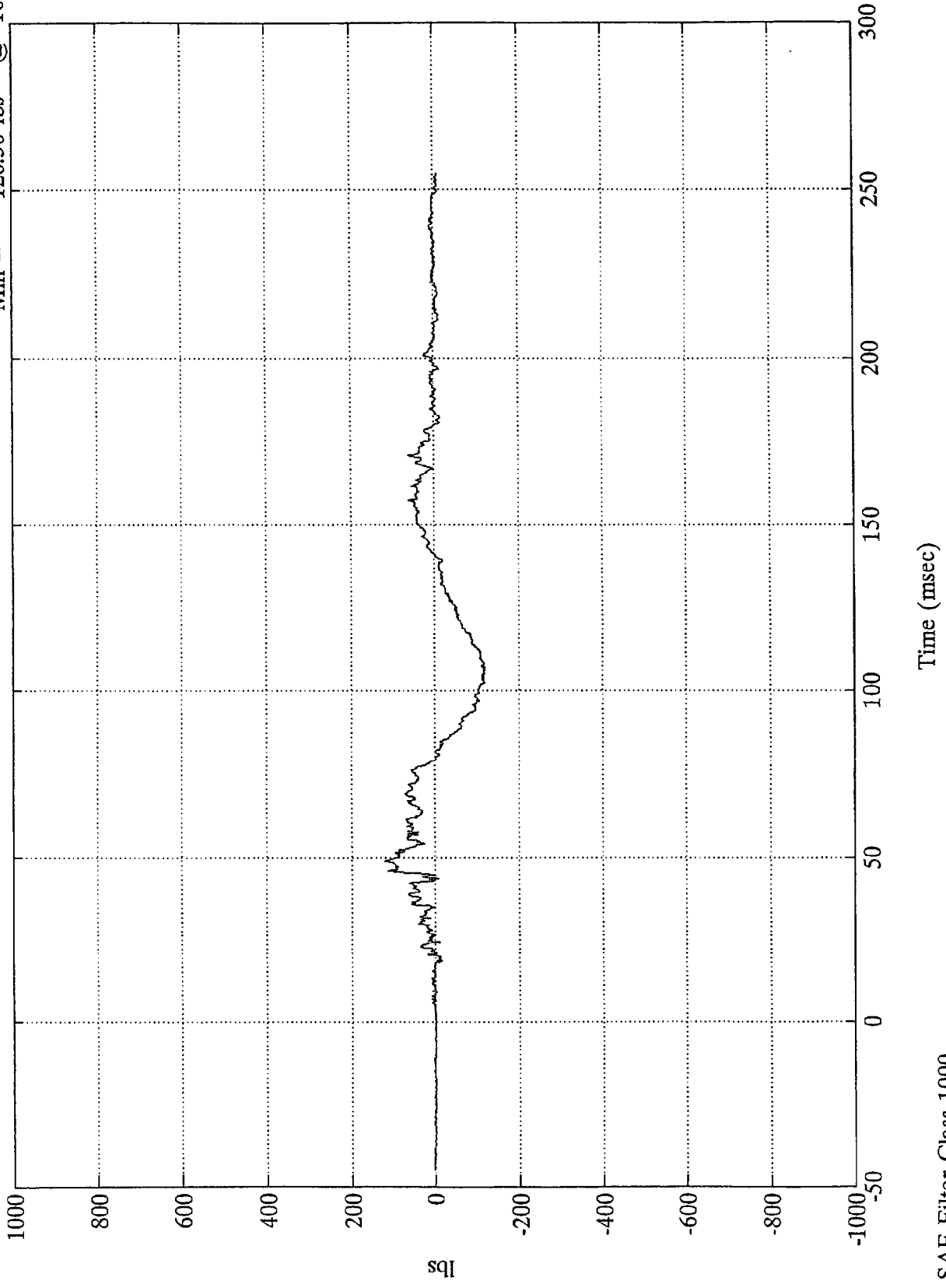
8118-2

SAE Filter Class 600

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 121.41 lbs @ 48.95 msec
Min = -120.30 lbs @ 106.68 msec

Pos. 2 Thorax Fx



B-150

8118-2

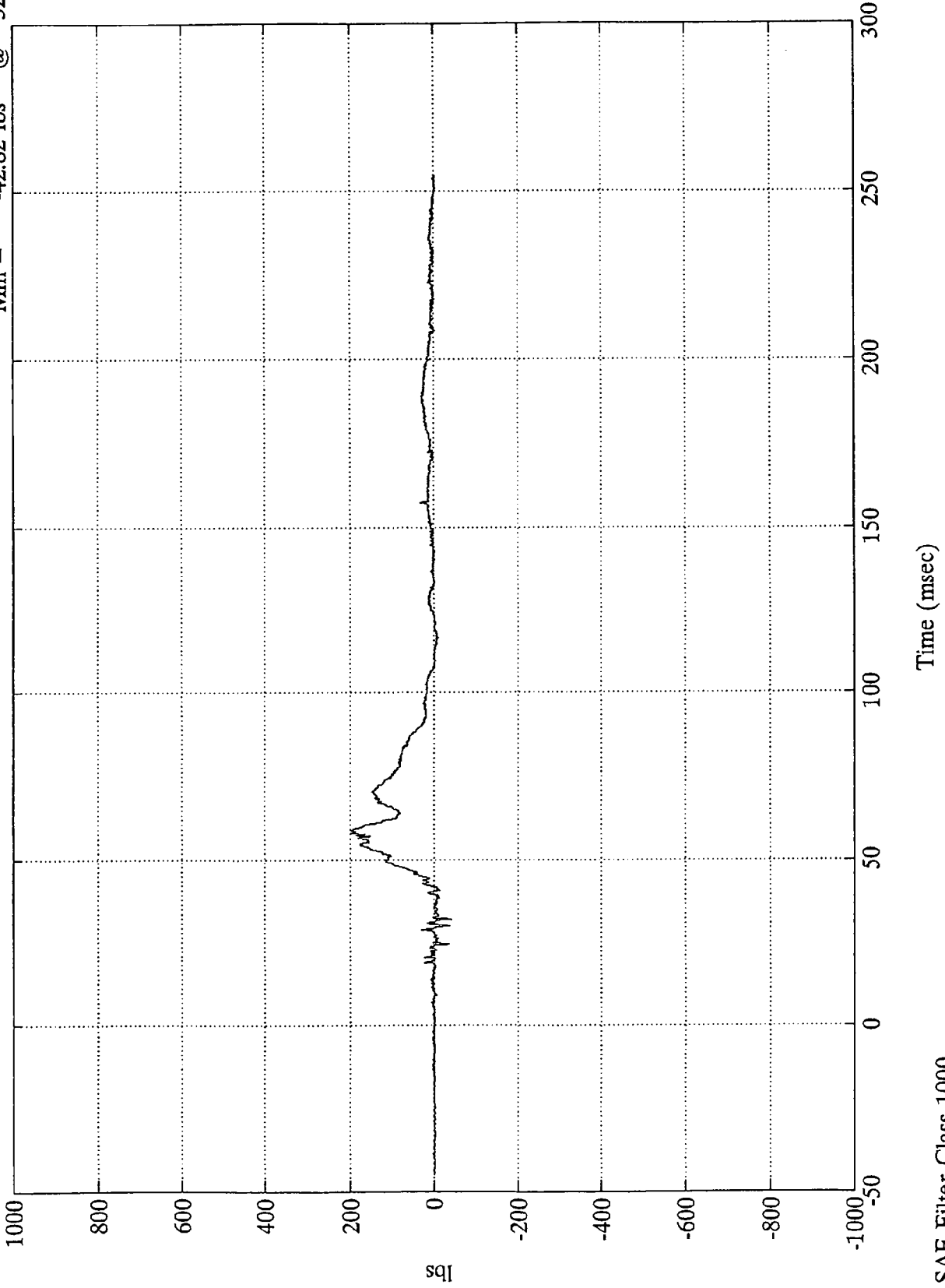
SAE Filter Class 1000

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

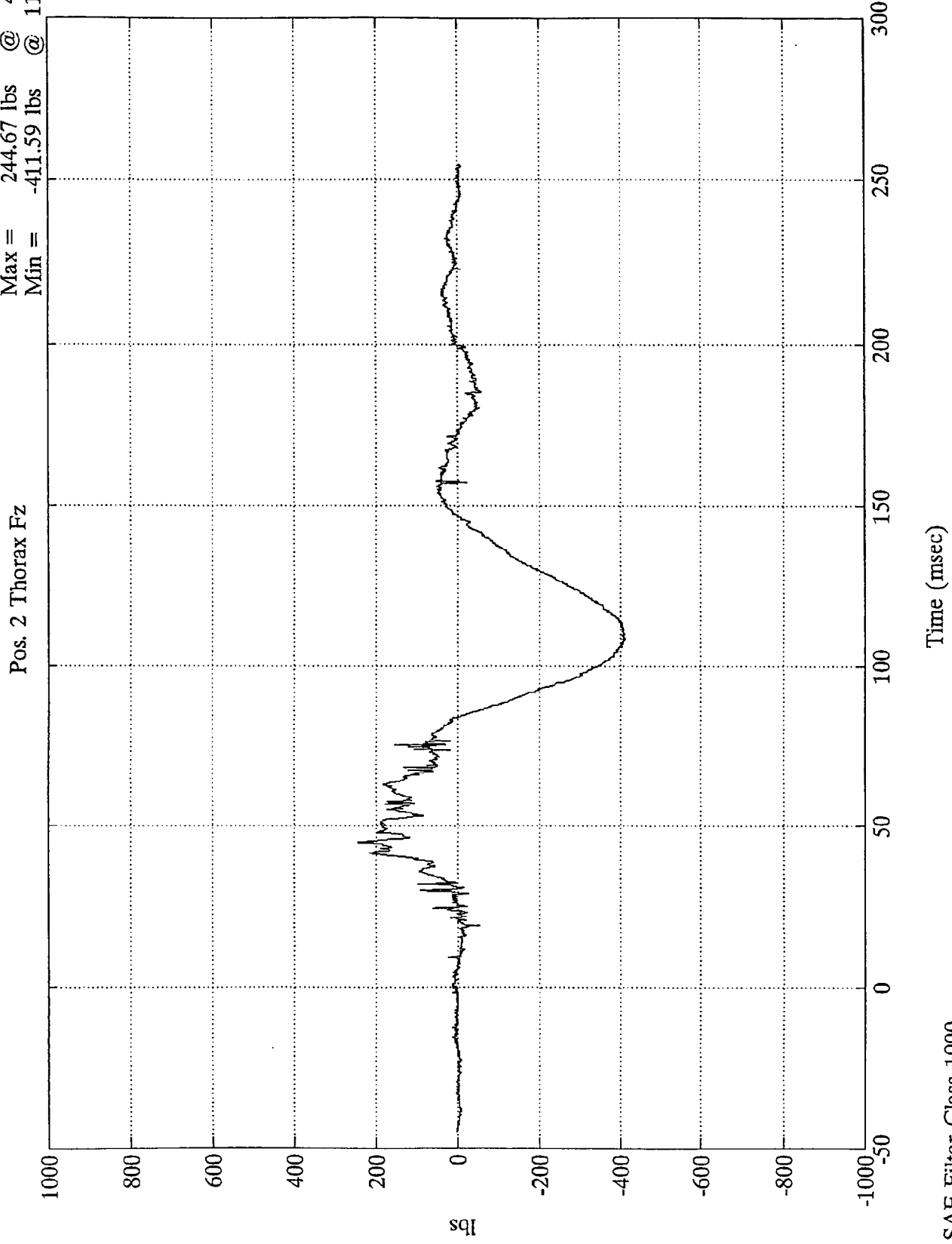
Pos. 2 Thorax Fy

Max = 198.55 lbs @ 58.08 msec
Min = -42.82 lbs @ 32.04 msec



TSC Frontal Barrier Test #2 - Ford Taurus

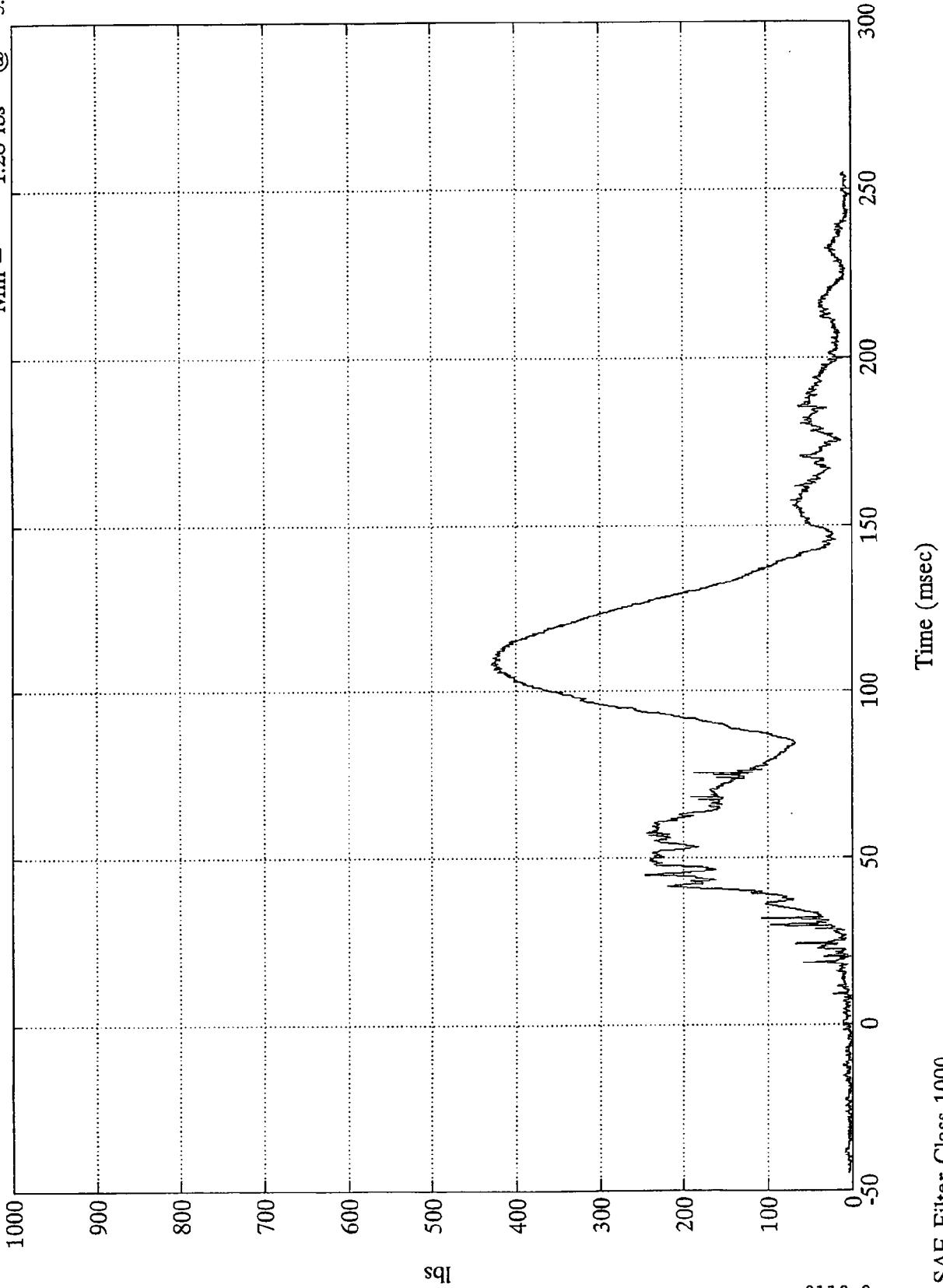
Max = 244.67 lbs @ 44.87 msec
Min = -411.59 lbs @ 110.16 msec



TSC Frontal Barrier Test #2 - Ford Taurus

P2 Thorax Force Result.

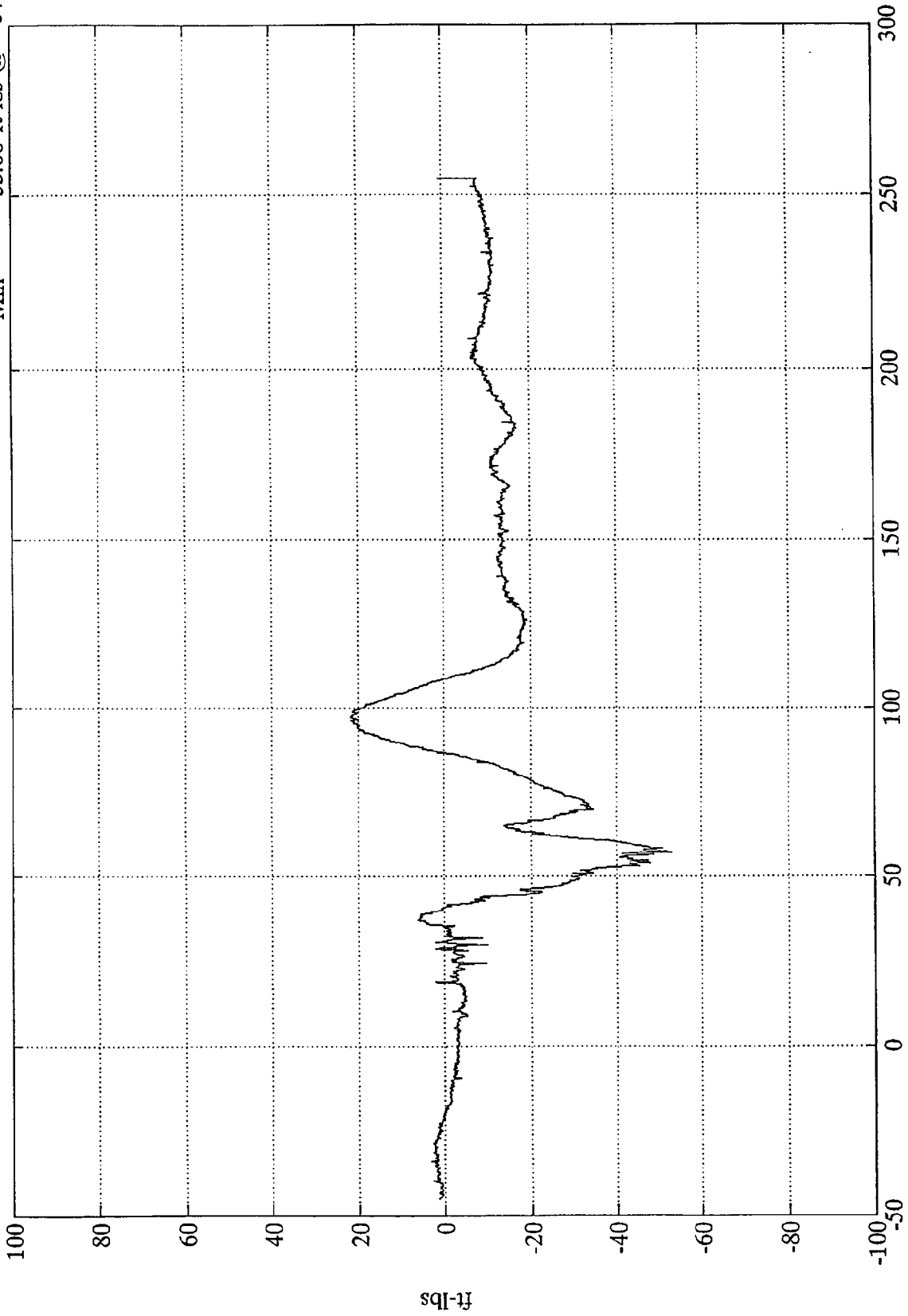
Max = 428.04 lbs @ 108.00 msec
Min = 1.28 lbs @ -5.88 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 21.79 ft-lbs @ 97.44 msec
Min = -53.06 ft-lbs @ 57.24 msec

Pos. 2 Thorax Mx



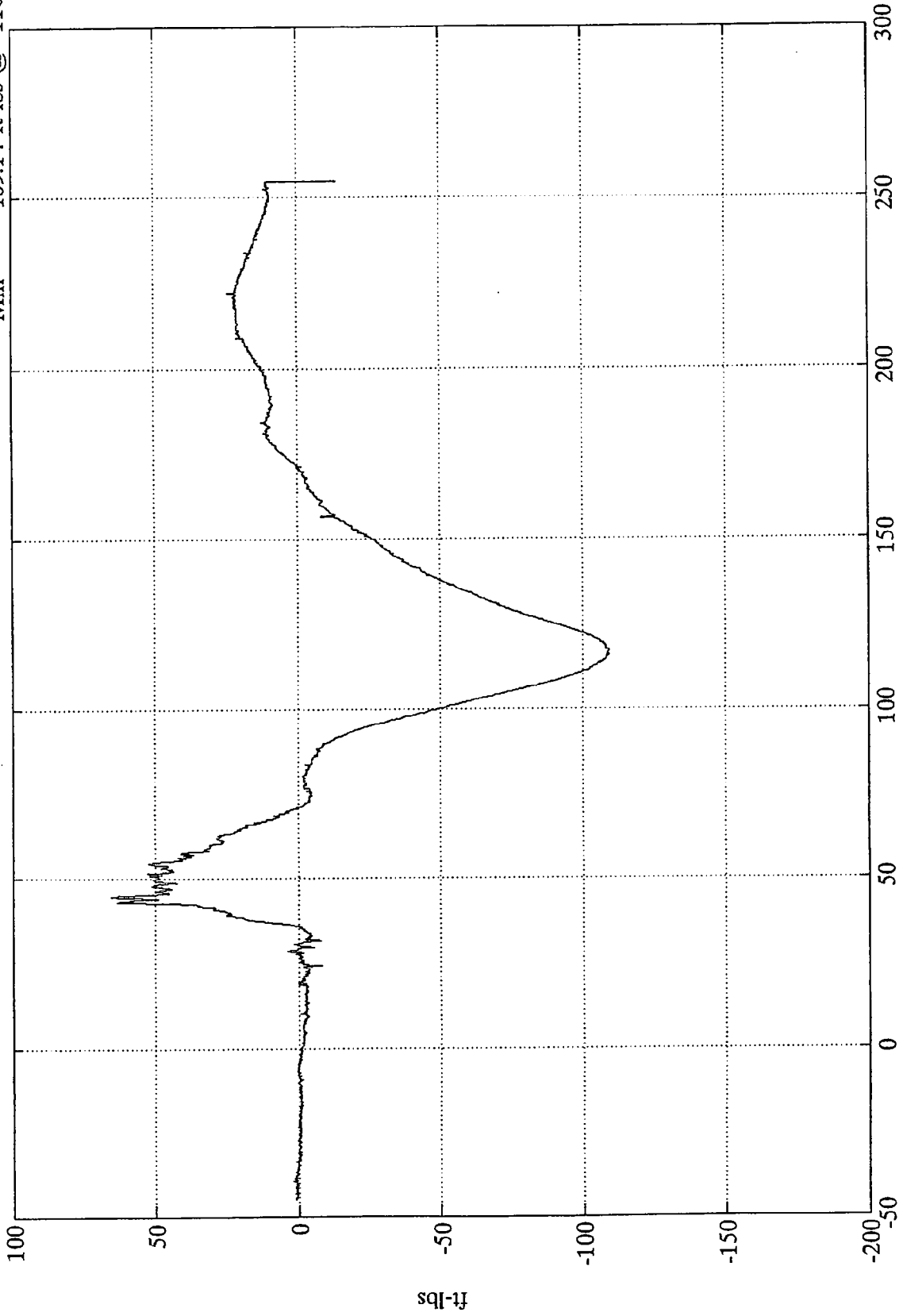
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Thorax My

Max = 65.37 ft-lbs @ 44.63 msec
Min = -109.14 ft-lbs @ 116.87 msec



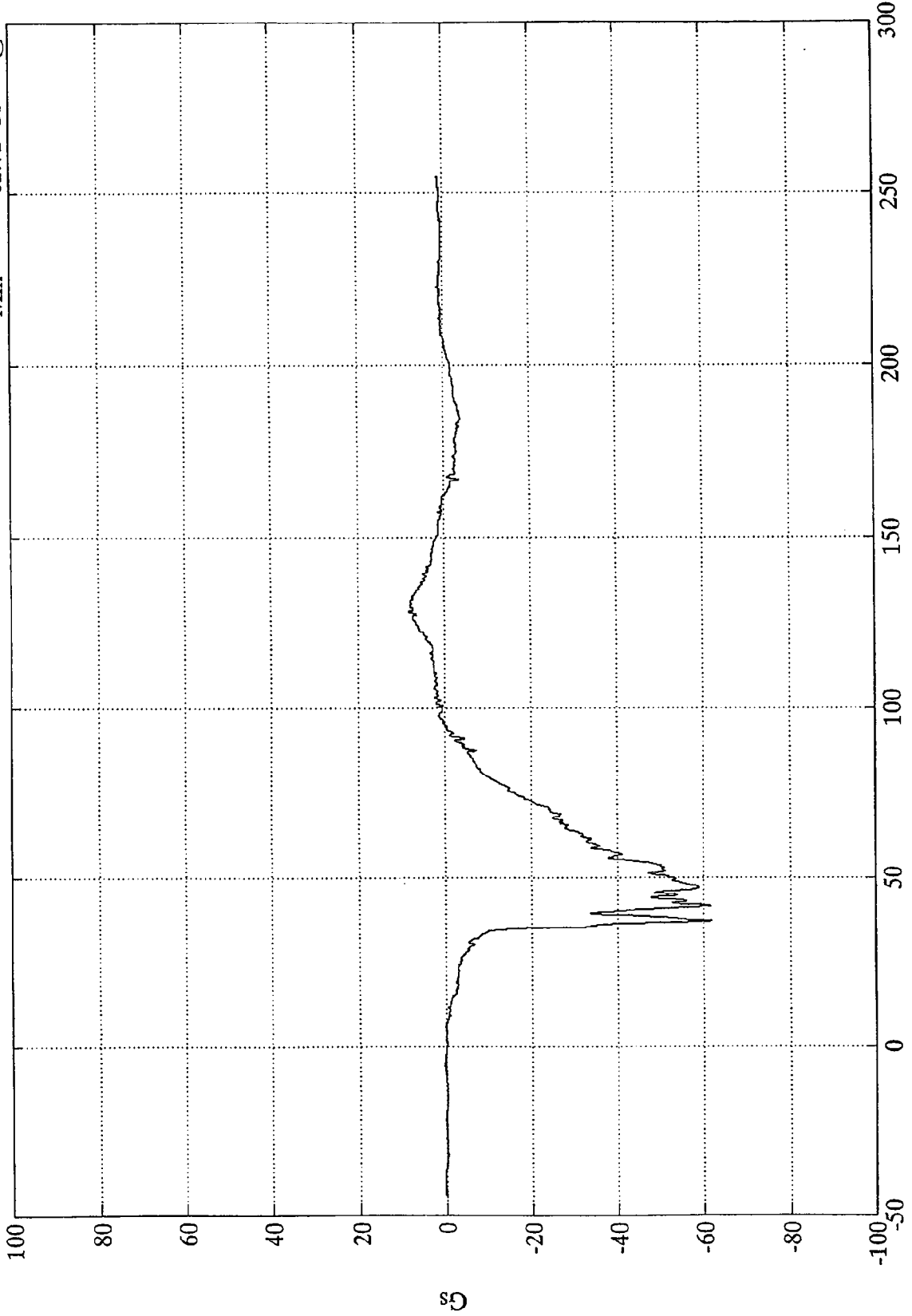
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Pelvic X

Max = 8.21 Gs @ 128.27 msec
Min = -61.71 Gs @ 37.20 msec



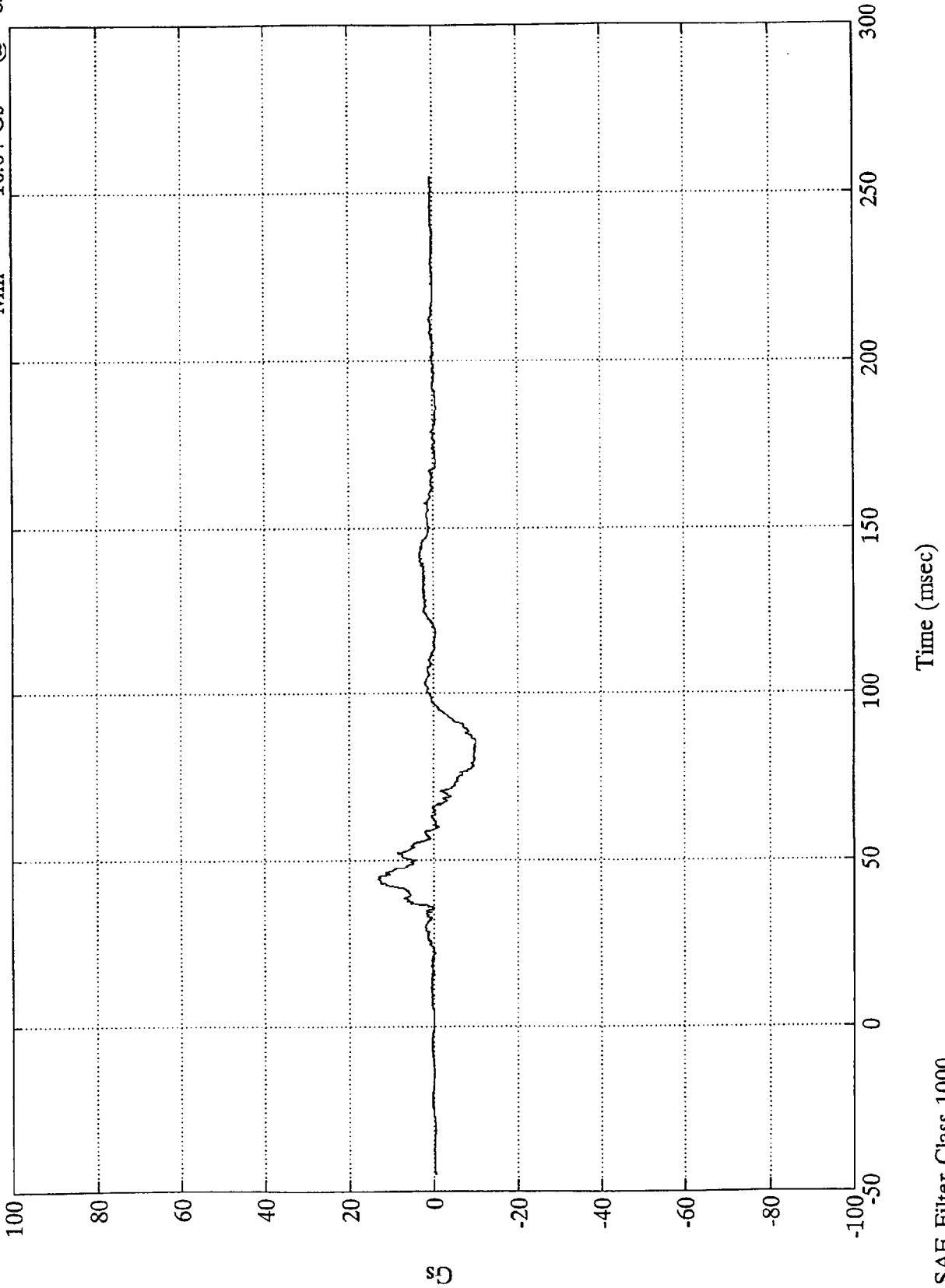
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Pelvic Y

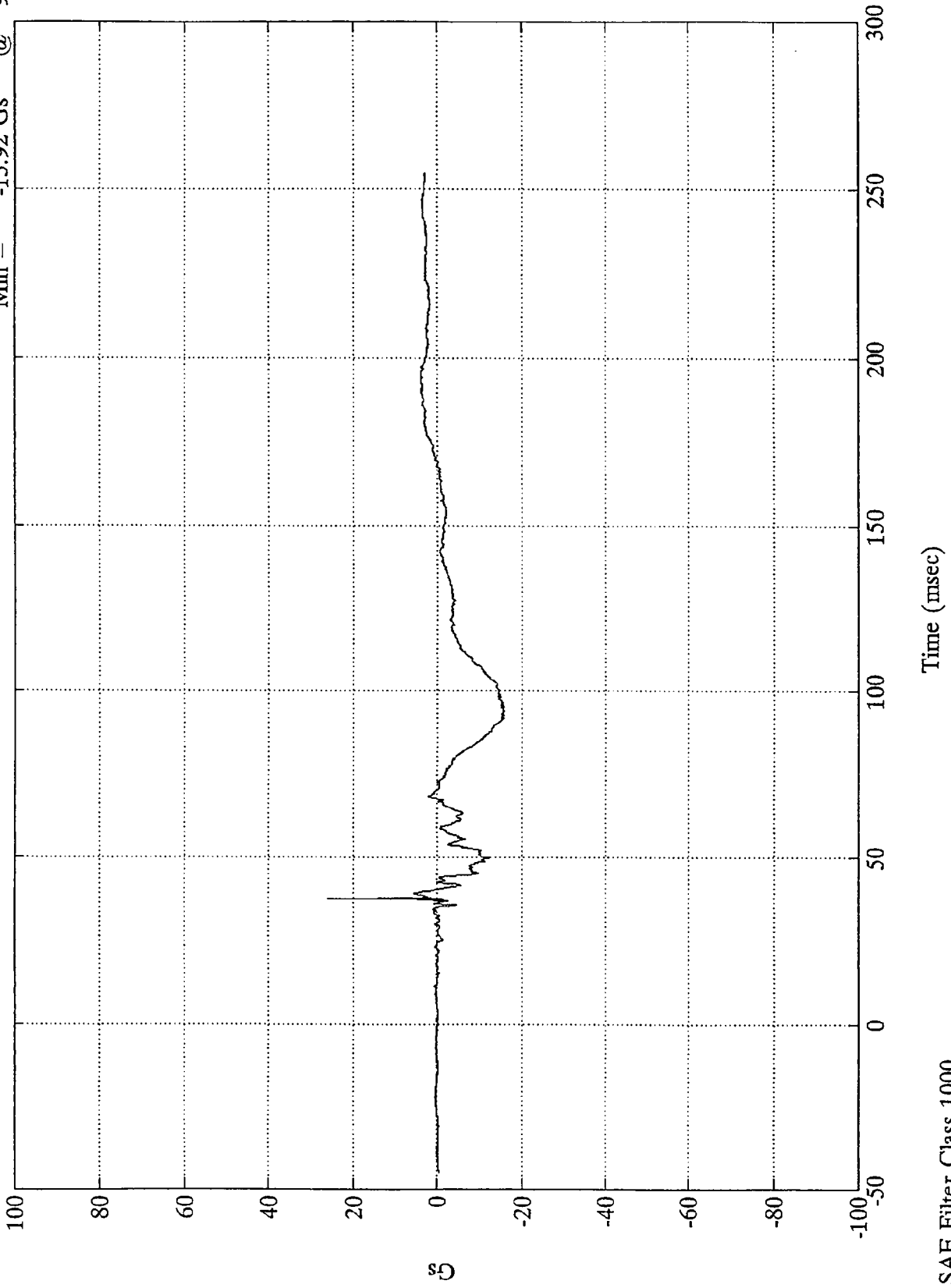
Max = 13.21 Gs @ 44.15 msec
Min = -10.04 Gs @ 85.68 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Pelvic Z

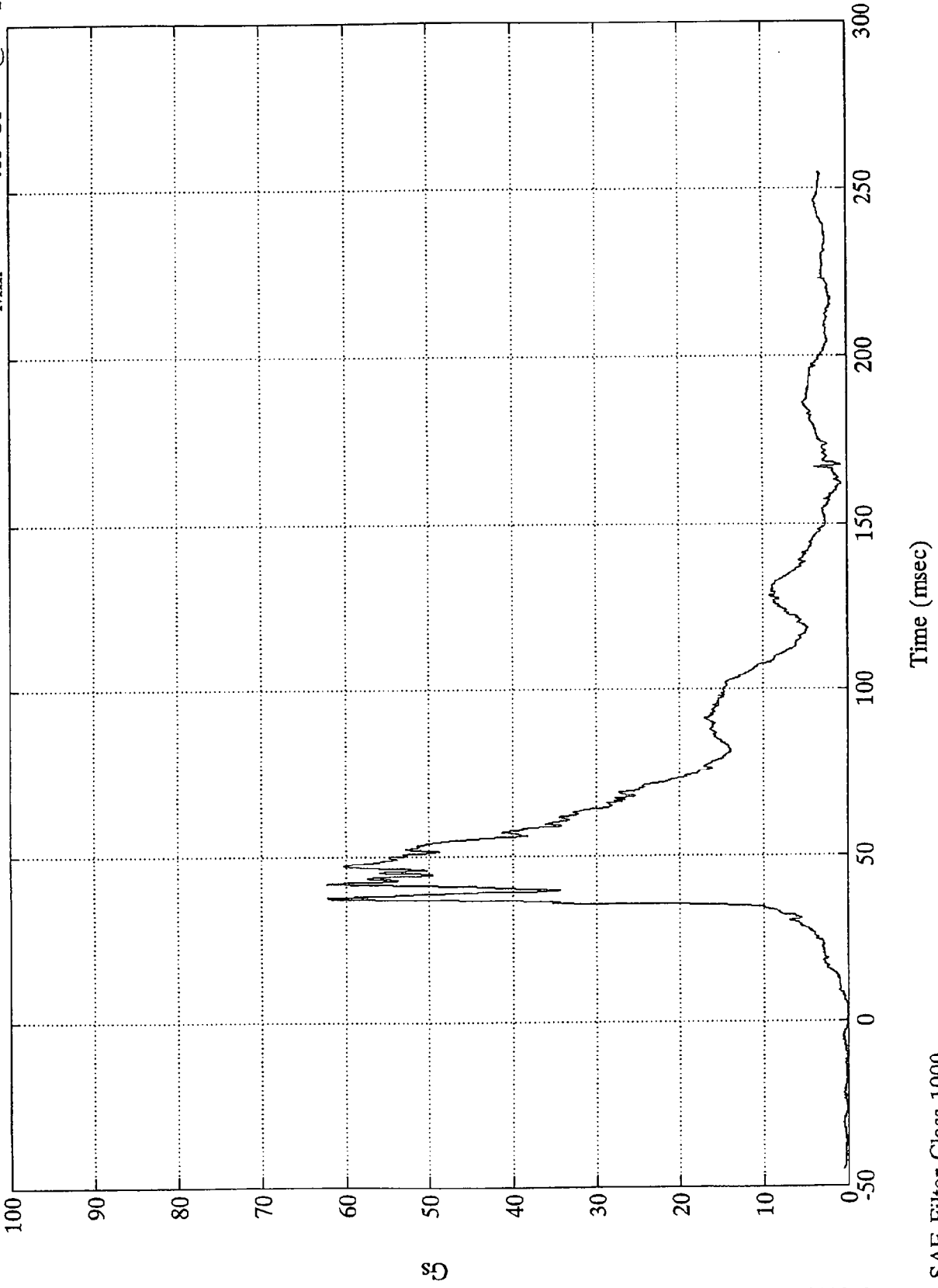
Max = 25.87 Gs @ 37.68 msec
Min = -15.92 Gs @ 95.16 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Pelvic Resultant

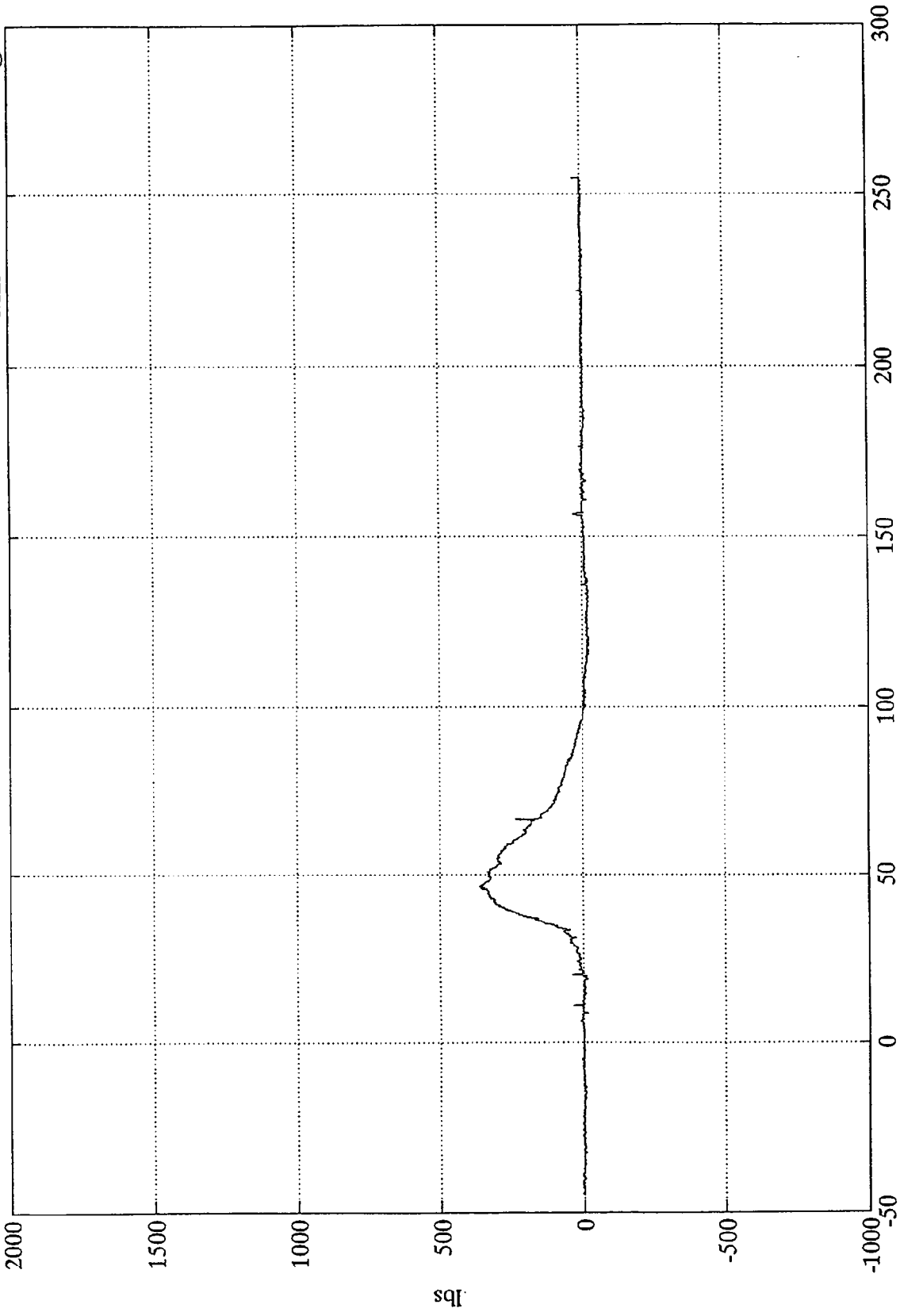
Max = 62.29 Gs @ 41.63 msec
Min = .03 Gs @ 1.67 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 363.01 lbs @ 46.44 msec
Min = -21.29 lbs @ 130.92 msec

Pos. 2 Left Iliac Fx



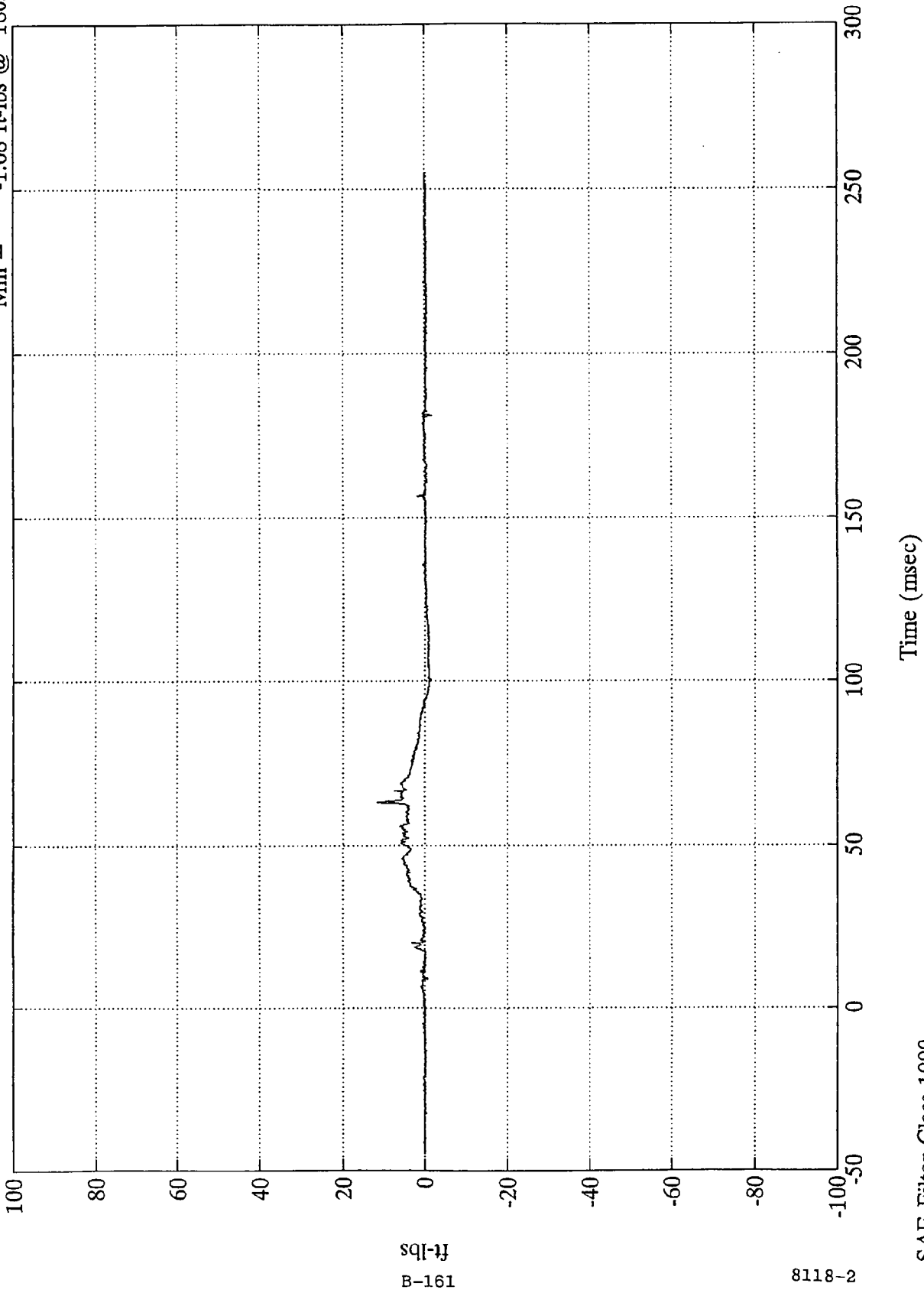
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Left Iliac My

Max = 11.73 ft-lbs @ 63.00 msec
Min = -1.68 ft-lbs @ 180.96 msec



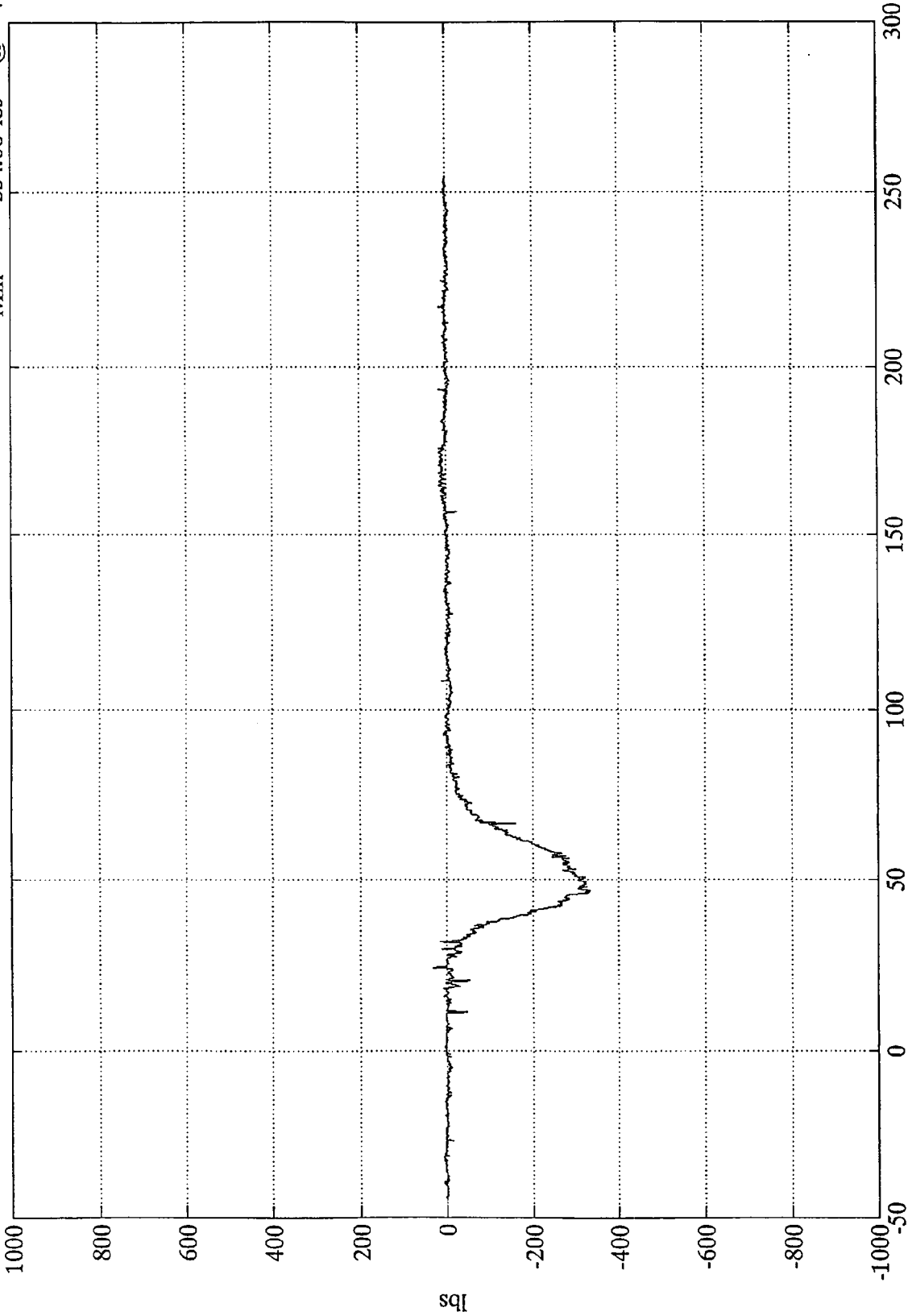
sq|-1|
B-161

8118-2

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Right Iliac Fx
Max = 32.07 lbs @ 24.35 msec
Min = -334.06 lbs @ 46.56 msec



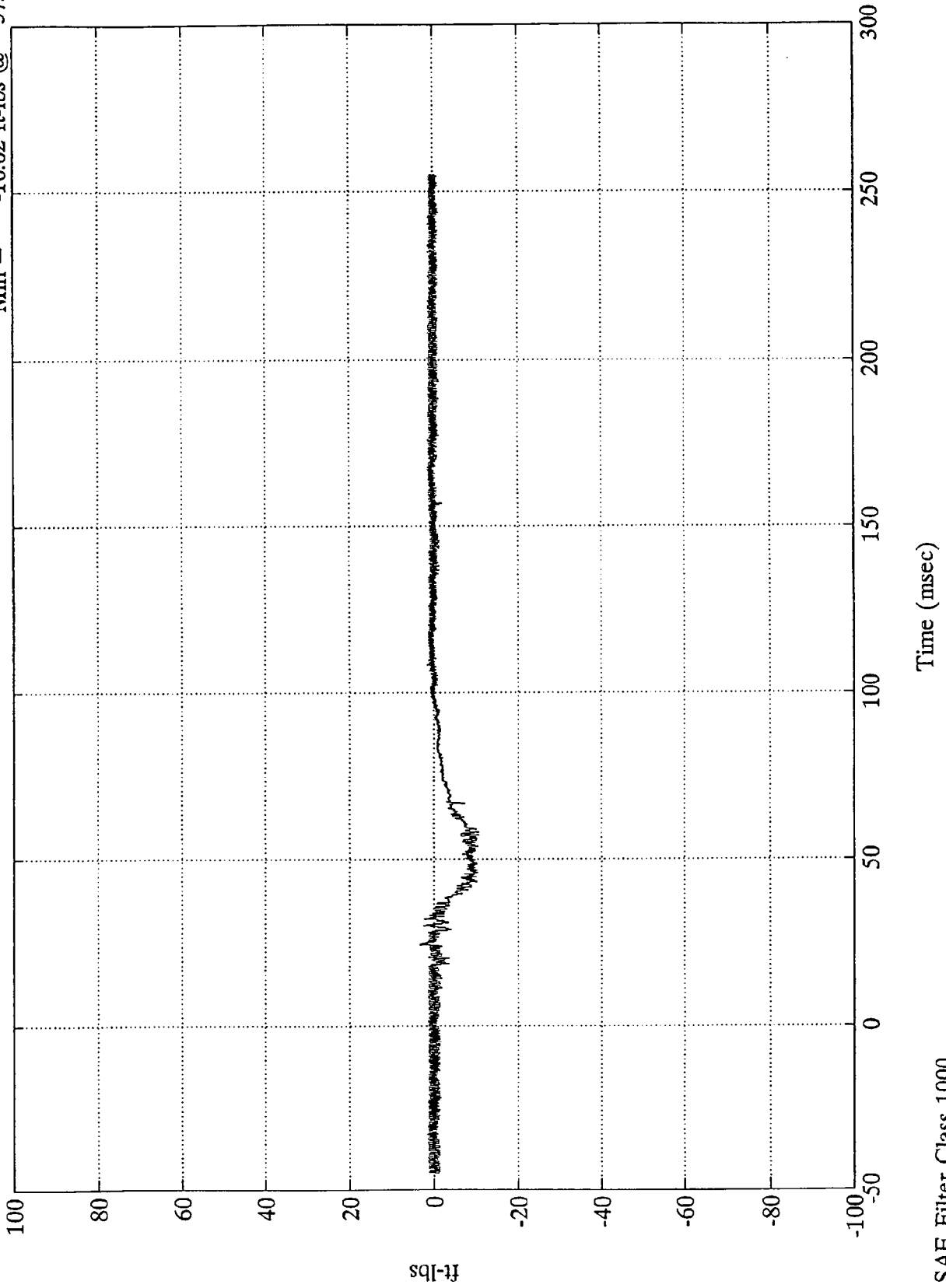
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Right Iliac My

Max = 3.33 ft-lbs @ 24.35 msec
Min = -10.62 ft-lbs @ 57.95 msec



sq[1]j
B-163

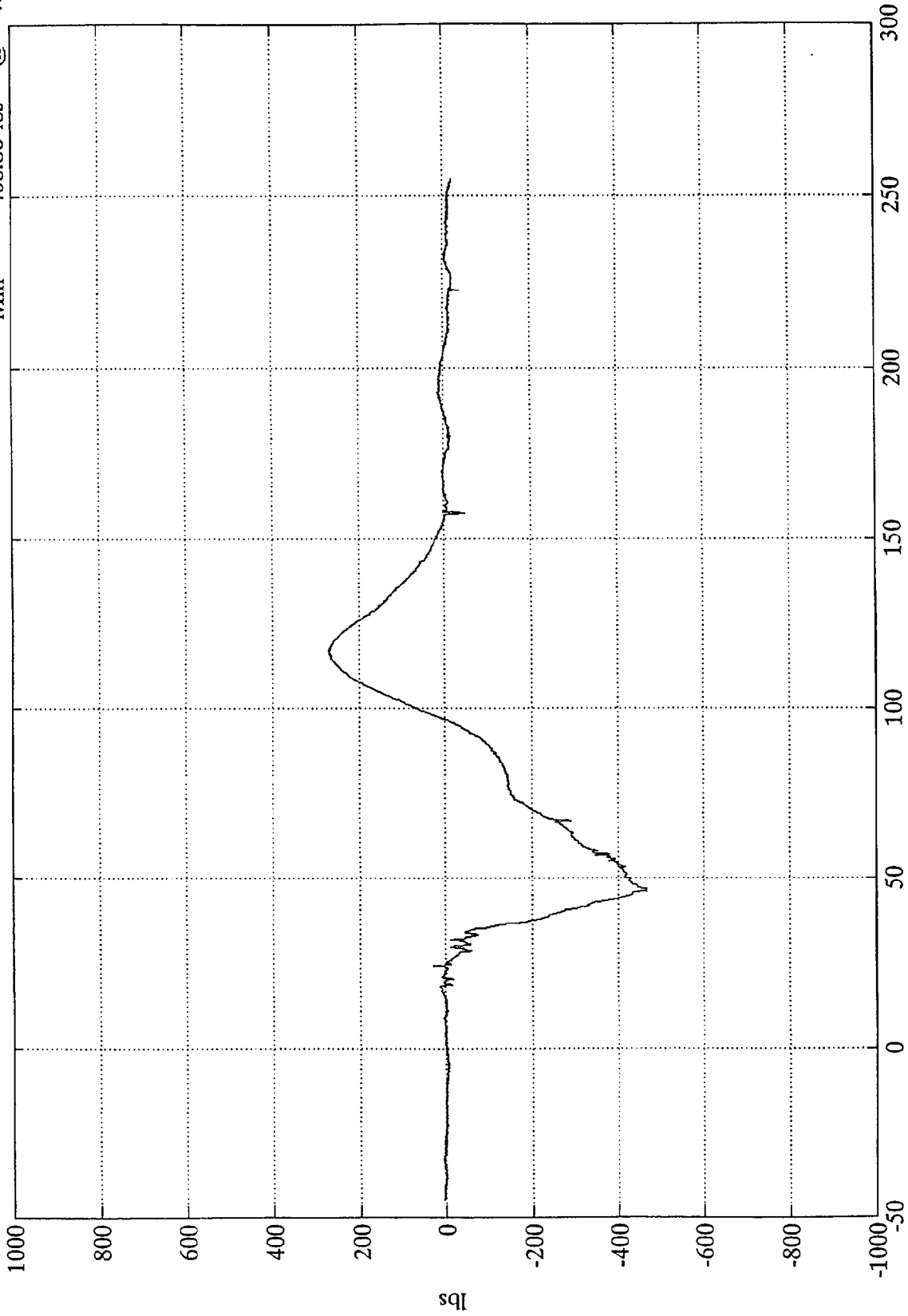
8118-2

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Max = 271.55 lbs @ 117.24 msec
Min = -466.86 lbs @ 46.79 msec

Pos. 2 Lumbar Fx

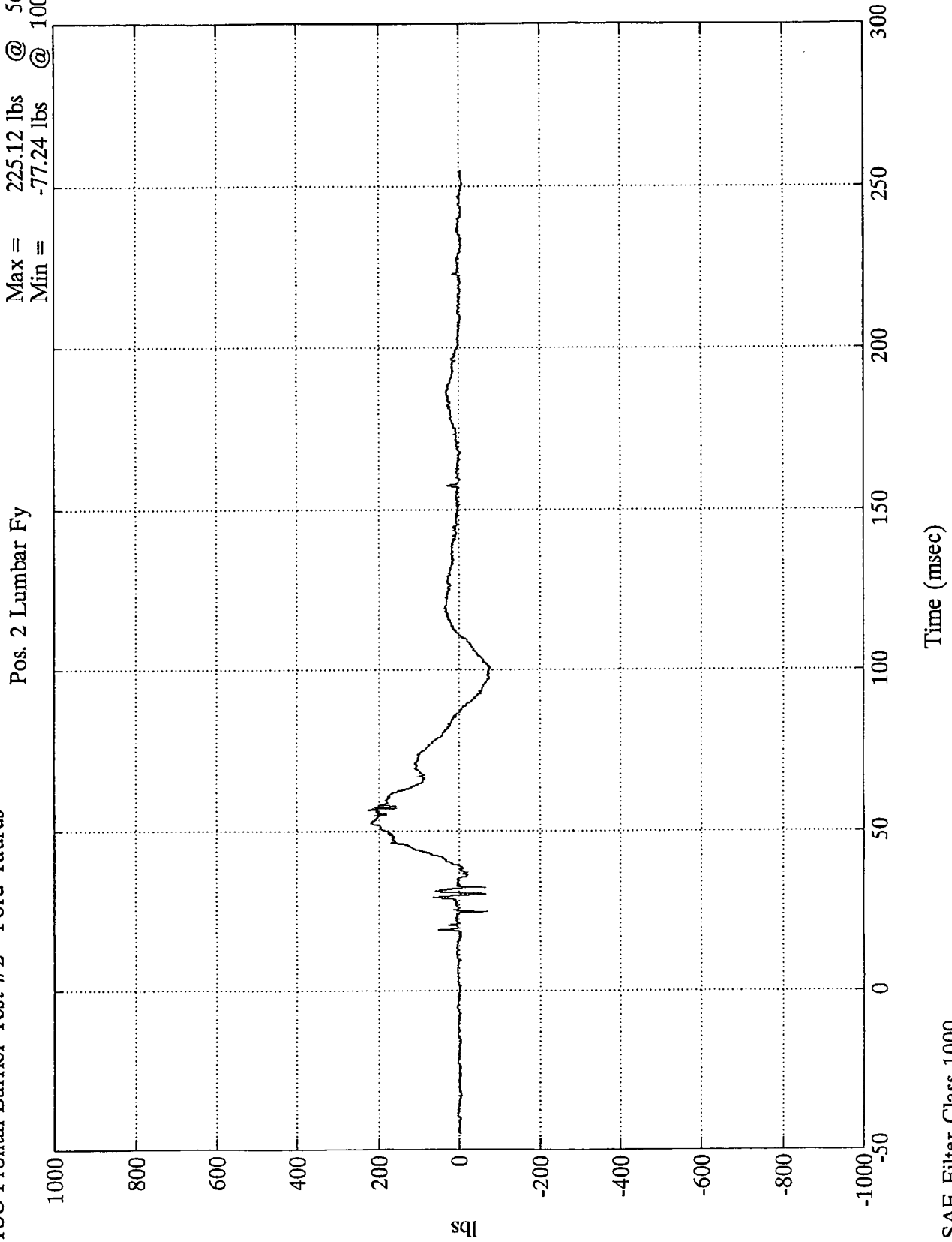


Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

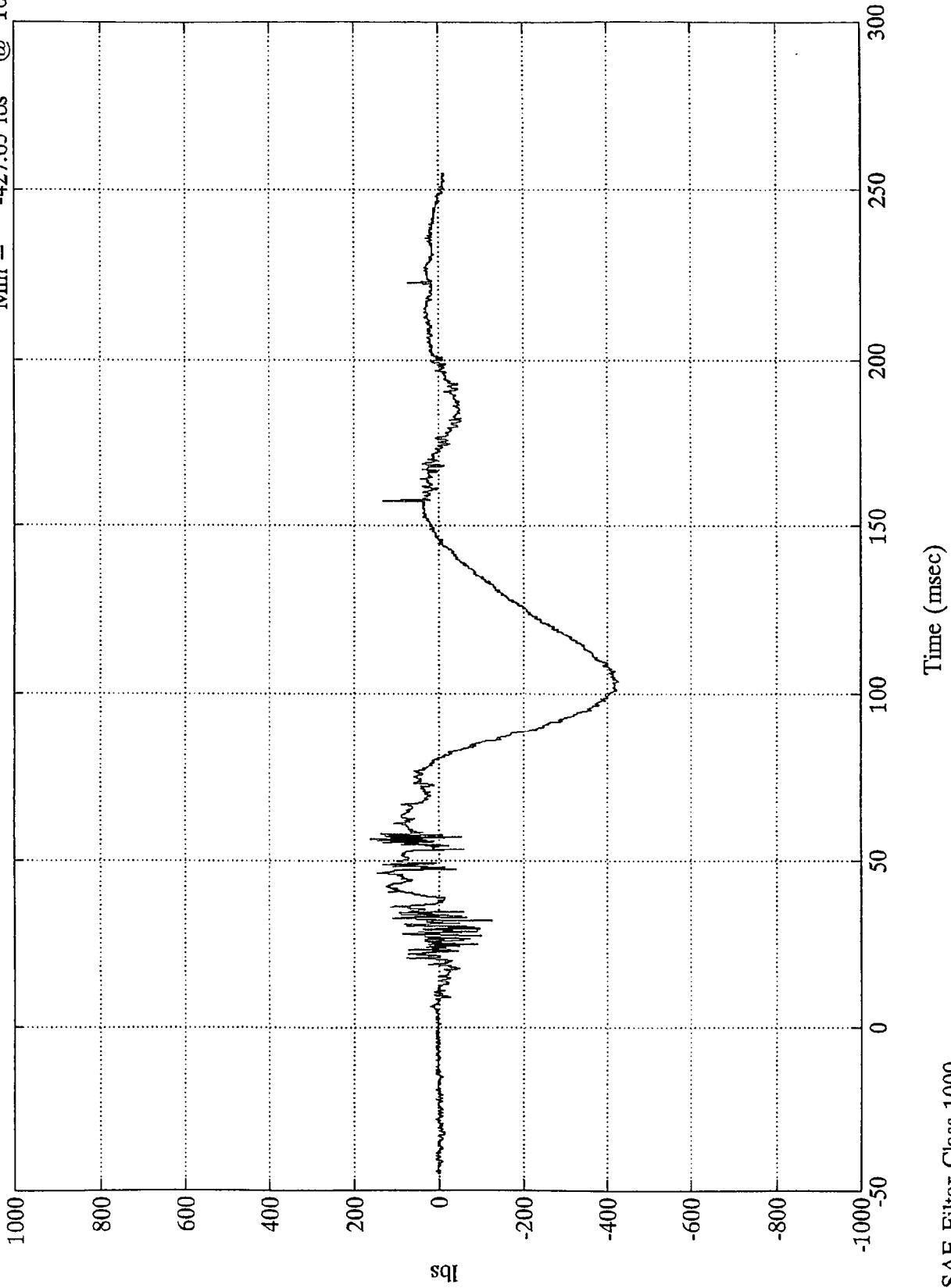
Max = 225.12 lbs @ 56.63 msec
Min = -77.24 lbs @ 100.44 msec



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 160.44 lbs @ 56.63 msec
Min = -427.65 lbs @ 103.68 msec

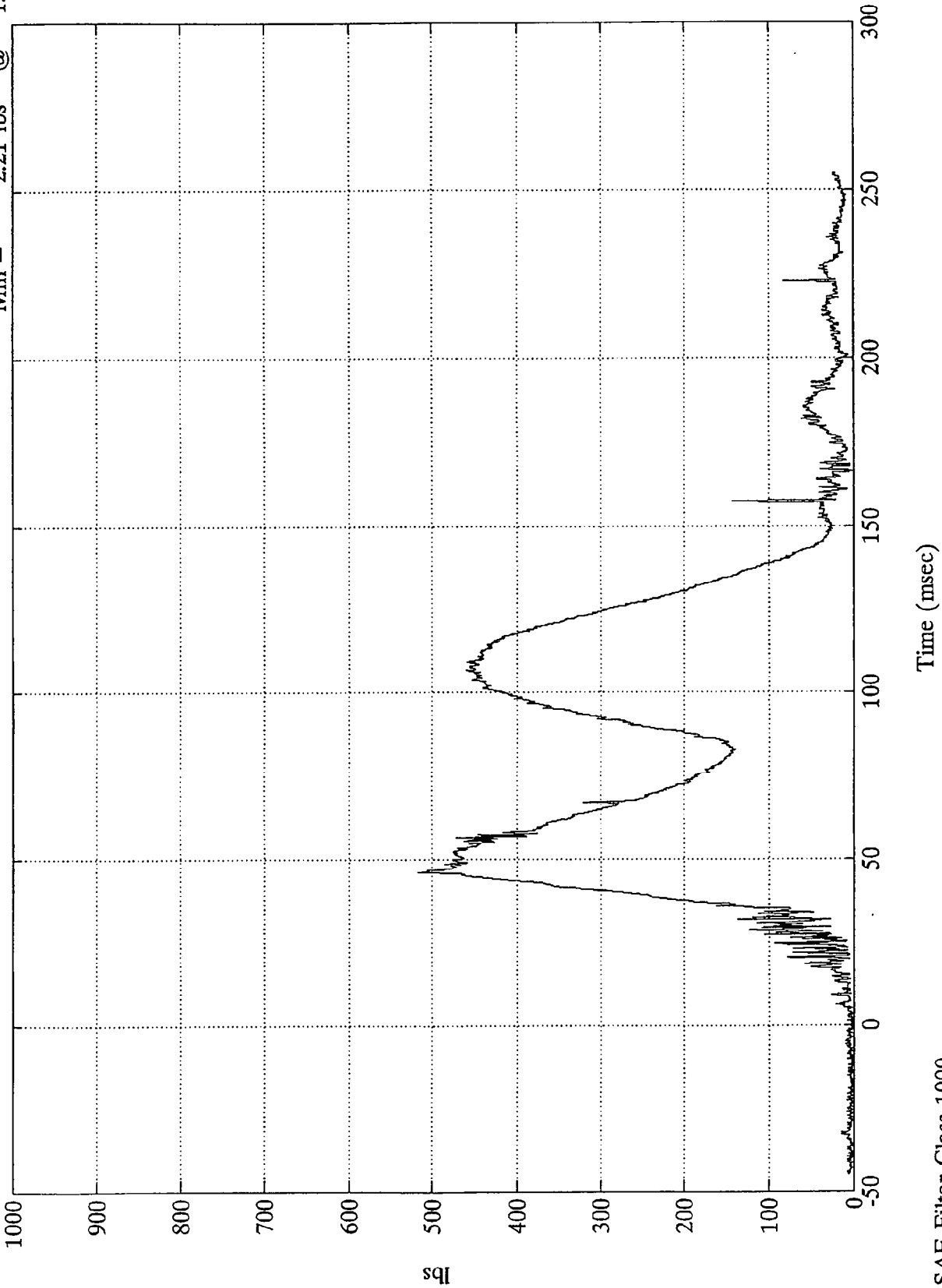
Pos. 2 Lumbar Fz



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 516.89 lbs @ 46.20 msec
Min = 2.21 lbs @ 1.55 msec

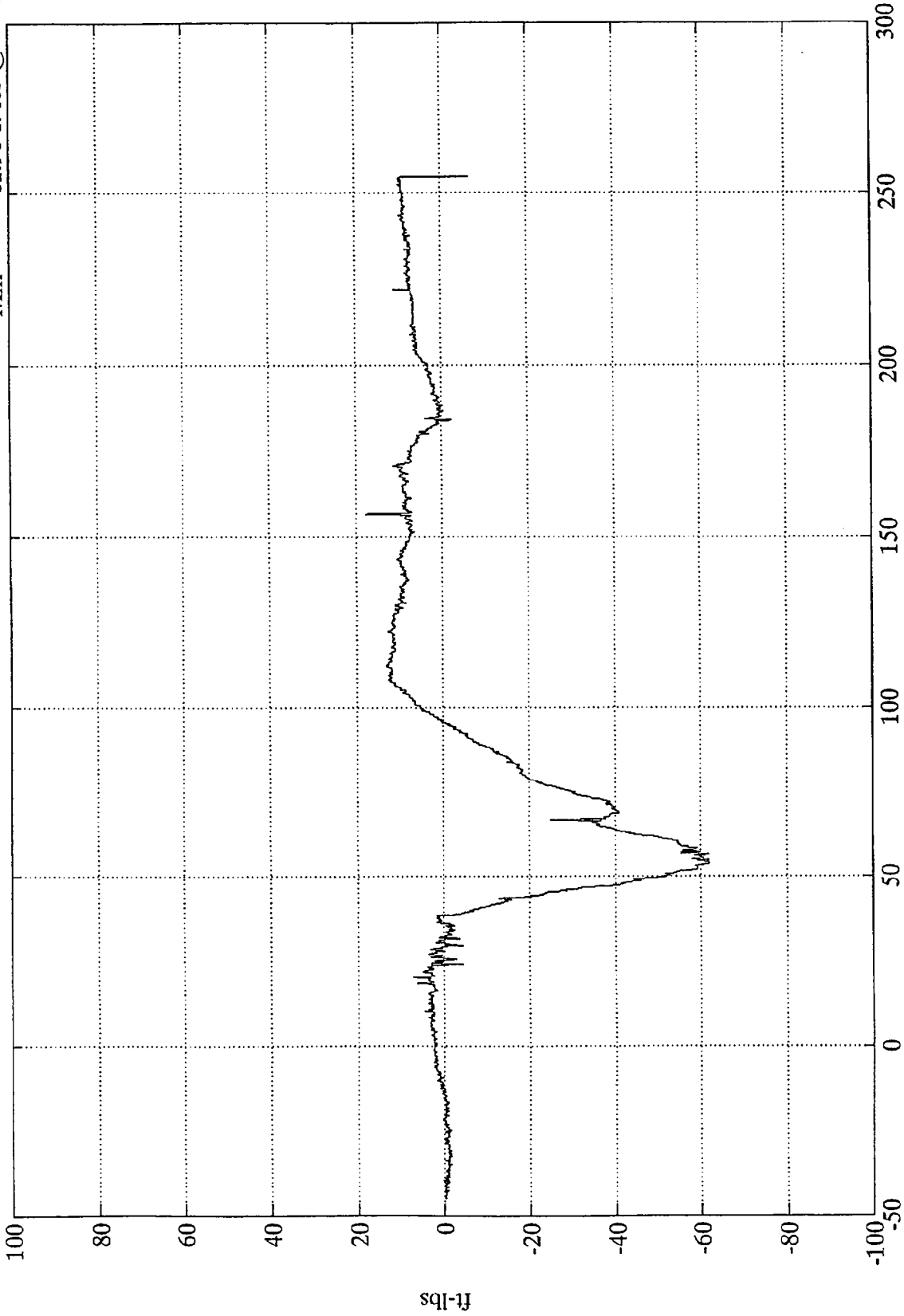
P2 Lumbar Force Result.



TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Lumbar Mx

Max = 17.65 ft-lbs @ 156.60 msec
Min = -61.96 ft-lbs @ 54.11 msec



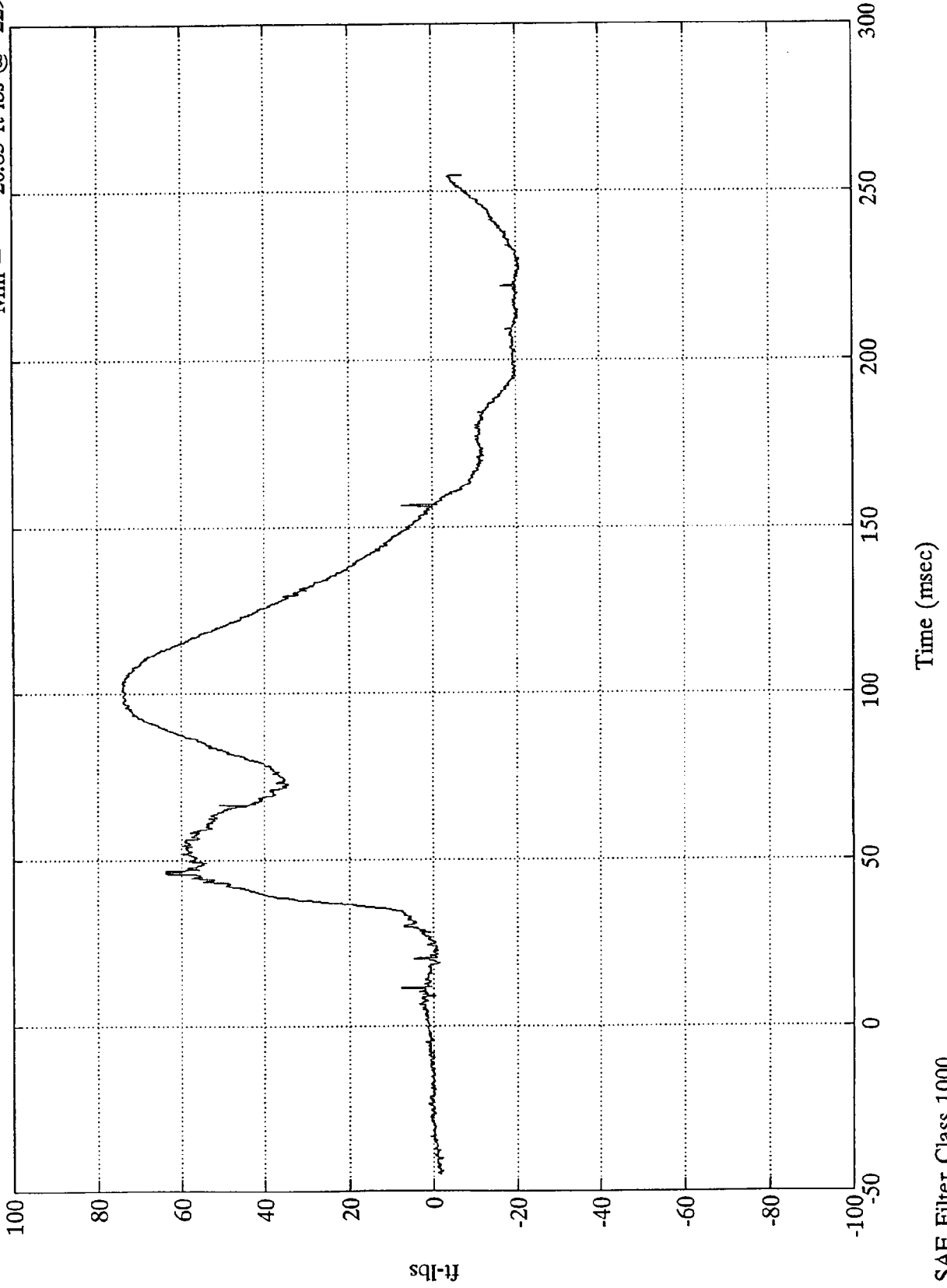
Time (msec)

SAE Filter Class 1000

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Lumbar My

Max = 74.17 ft-lbs @ 103.08 msec
Min = -20.83 ft-lbs @ 229.91 msec



B-169
ft-lbs

8118-2

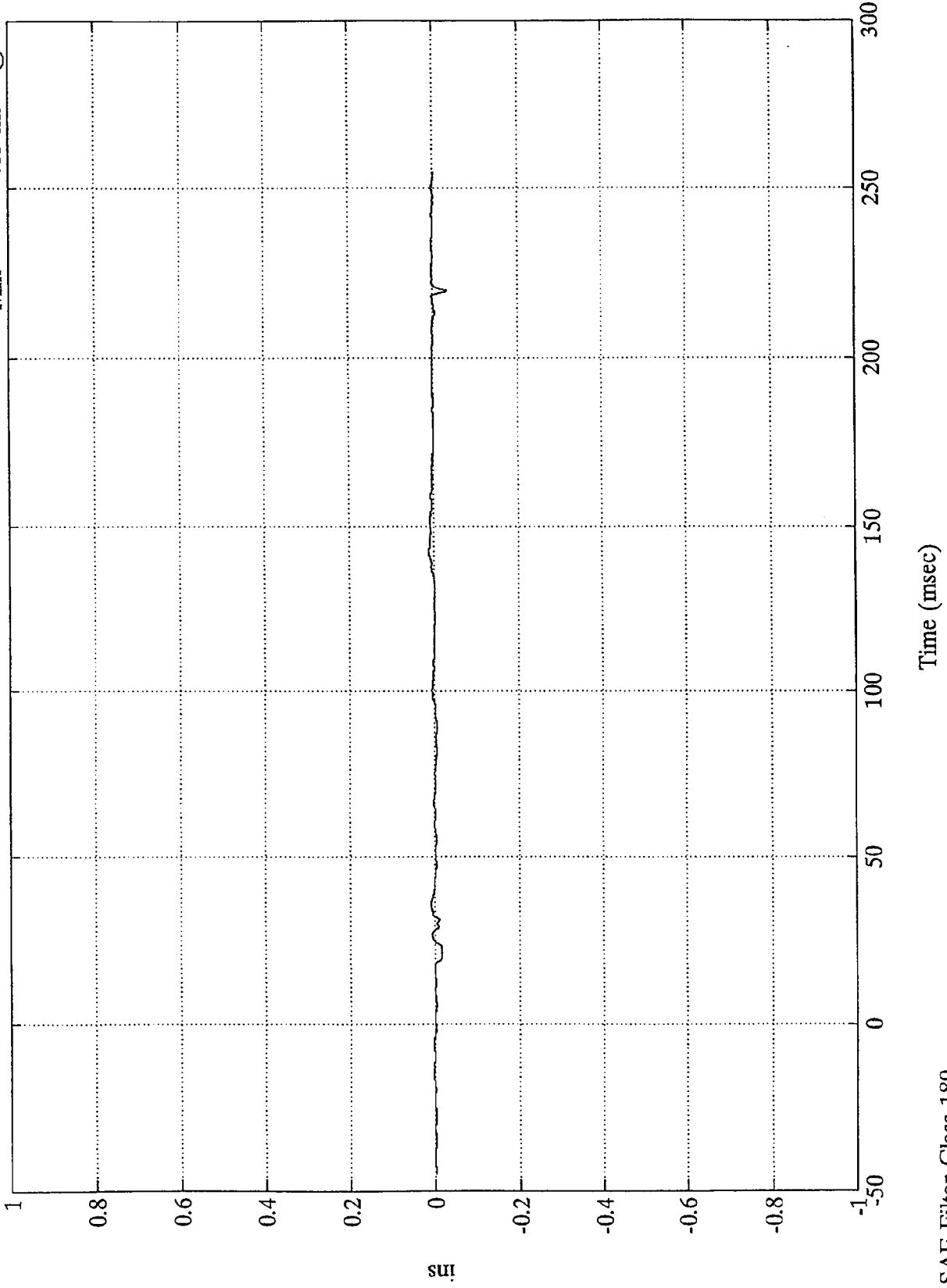
SAE Filter Class 1000

Time (msec)

TSC Frontal Barrier Test #2 - Ford Taurus

Pos. 2 Right Knee Displ.

Max = .01 ins @ 142.44 msec
Min = -.03 ins @ 220.08 msec



SUI
B-170

8118-2

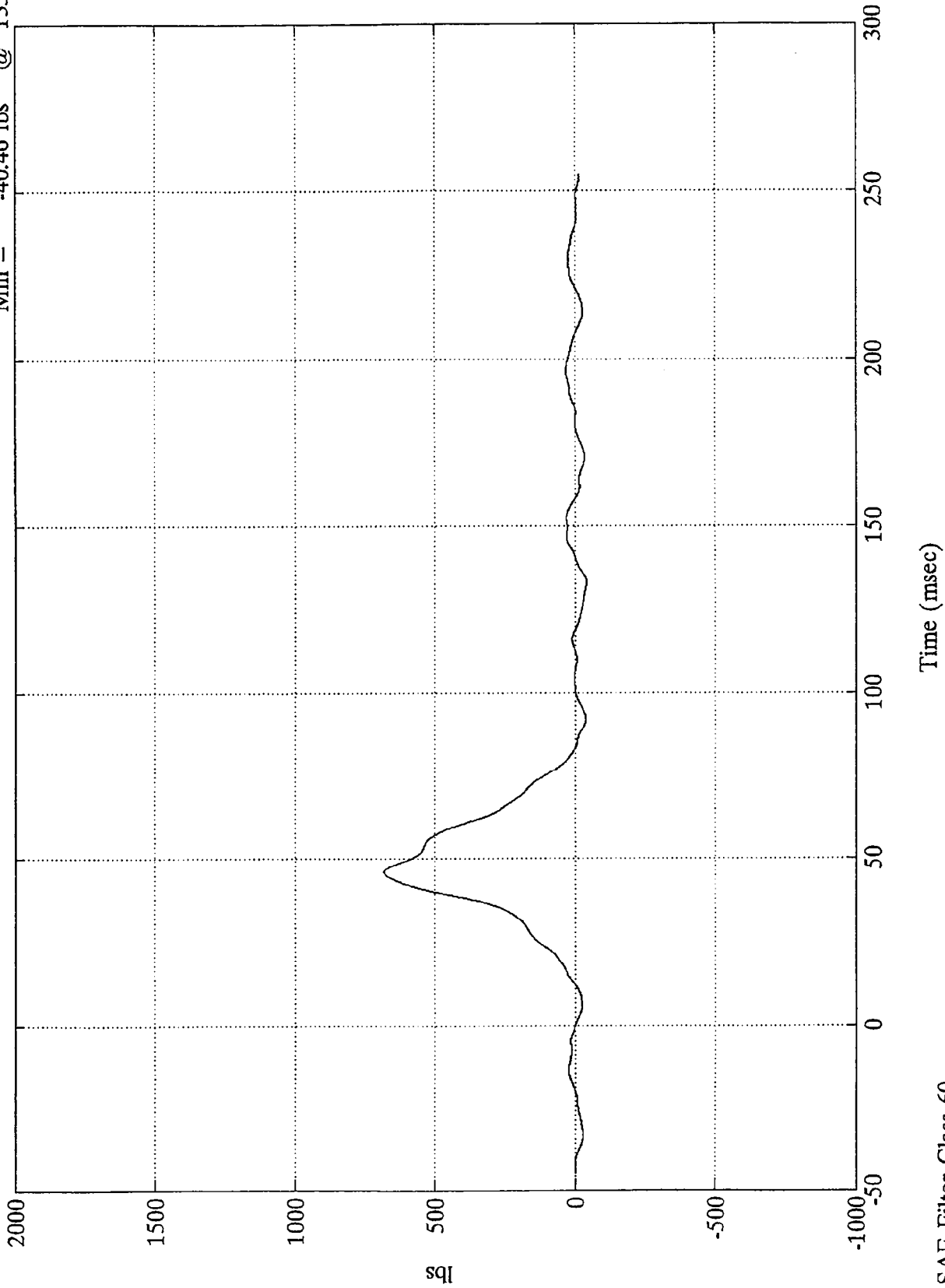
SAE Filter Class 180



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 683.51 lbs @ 45.96 msec
Min = -40.46 lbs @ 133.55 msec

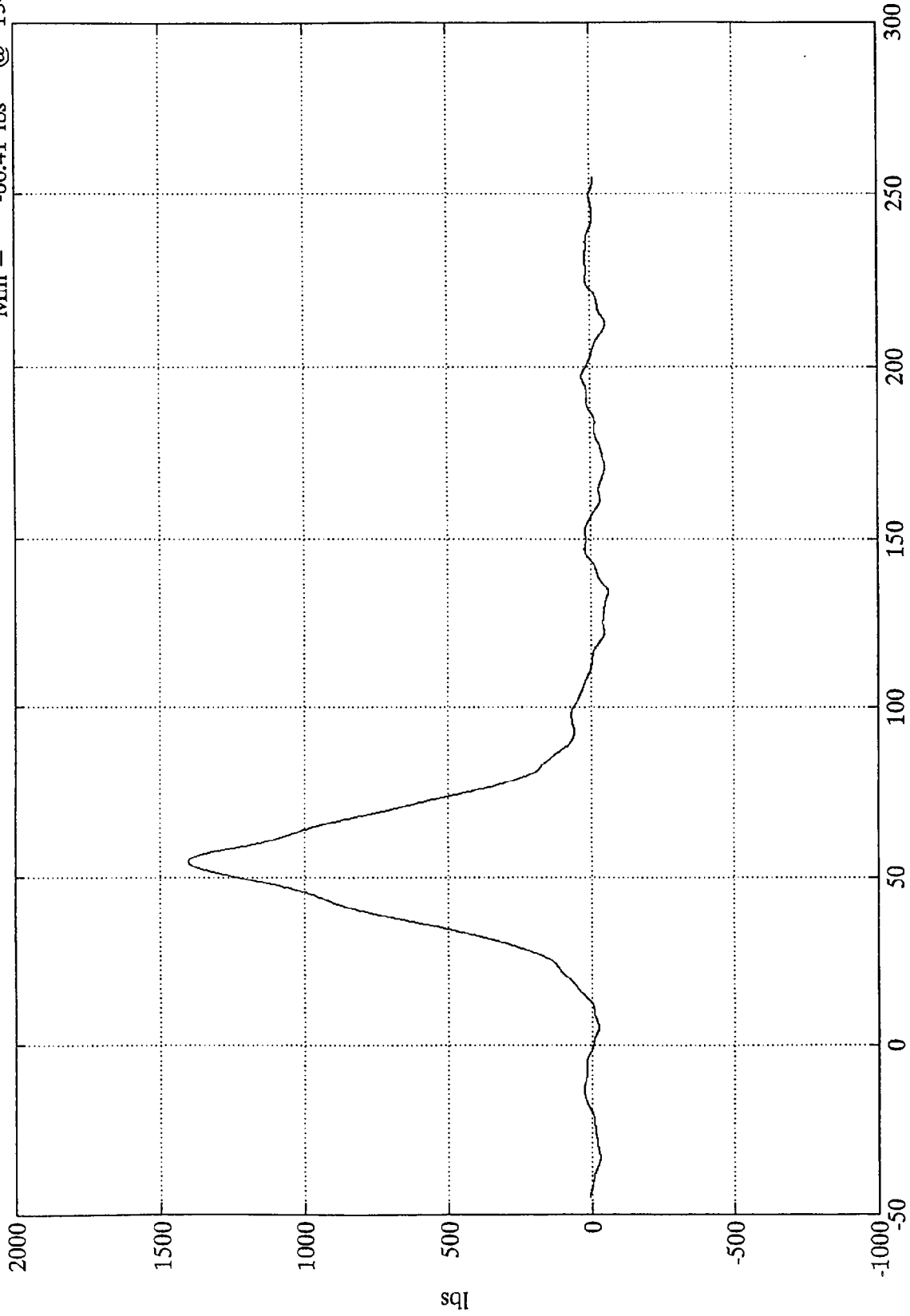
Pos. 2 Lap Belt



TSC Frontal Barrier Test #2 - Ford Taurus

Max = 1404.19 lbs @ 54.72 msec
Min = -60.41 lbs @ 134.64 msec

Pos. 2 Torso Belt



Time (msec)

SAE Filter Class 60

Appendix C

HYBRID III 5TH FEMALE AND 95TH MALE

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° . 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)

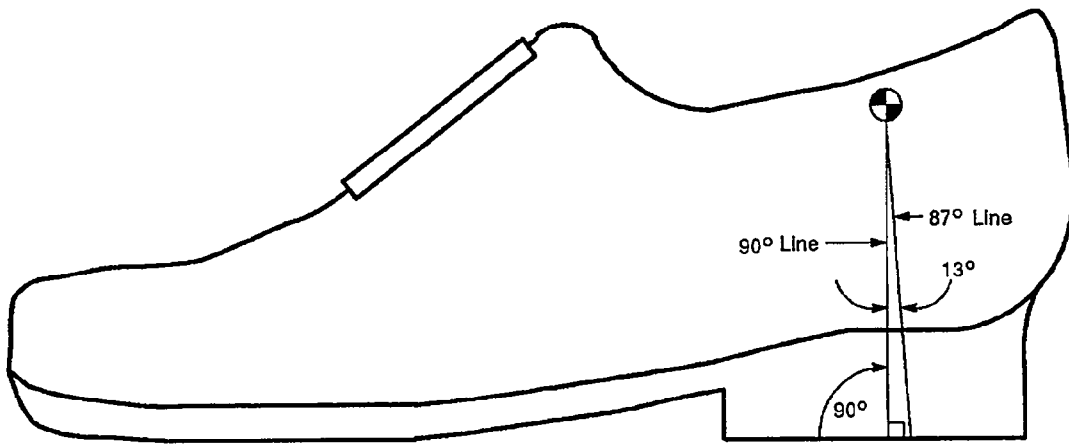


Figure C-1 TEMPLATE FOR SMALL FEMALE FOOT WITH SHOE