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CALSPAN REPORT NUMBER: 8109-2

SIDE IMPACT PROTECTION STUDY IN PRODUCTION VEHICLES
30/15 MPH 90° SIDE IMPACT TEST OF A
1993 MITSUBISHI MIGHTY MAX
2-DOOR PICKUP TRUCK WITH A MODIFIED MDB

CALSPAN TEST NUMBER: Y48-2-1289

MAY 26, 1993

CALSPAN CORPORATION
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FINAL REPORT

PREPARED FOR:

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16. Abstract

A 30/15 mph 90° Impact (Moving Deformable Barrier) Test was conducted on the subject 1993 Mitsubishi Mighty Max Pickup Truck in accordance with the specifications of the Test Procedure TP-214D-02. The test was conducted at the Calspan Corporation Advanced Technology Center Crash Test Facility in Buffalo, New York, on May 26,1993. The MDB honeycomb top height was raised to 37 inches and 600 pounds of weight was added to the cart for this test. One SID was placed in the driver seating position.

The impact velocity of the Moving Deformable Barrier (MDB) was 33.5 mph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 61°F. The target vehicle post-test maximum crush was 10.6 inches at level 2. The MDB struck the vehicle 0.4 inches forward of the target.

The test or target vehicle's performance is given below:

	Driver SID
Left Upper Rib Acceleration	88.7 g's
Left Lower Rib Acceleration	76.0 g's
Upper Sping Acceleration	65.6 g's
Lower Spine Acceleration	115.6 g's
Thoracic Trauma Index (TTI)	102.2 g's
Pelvis Acceleration	105.0 g's

The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door did not open during side impact event. No fuel leaked from the vehicle during the test or the static rollover.

17. Key Words	18. Distribution Statement
OMI Side Impact Protection Study Side Impact Dummy (SID)	Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division Docket Section, Room 5108 400 Seventh St., S.W., Washington, DC 20590

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Section 1

PURPOSE AND TEST PROCEDURE

This side impact test is part A Side Impact Protection Study Program sponsored by the National Highway Traffic Safety Administration (NHTSA) through the Research and Special Programs Administration, Volpe National Transportation Systems Center under Contract No. DTRS57-90-C-00104 (TTD #6). The purpose of this test was to evaluate side impact protection in a 1993 Mitsubishi Mighty Max Pickup Turck.

The side impact test was conducted in accordance with the FMVSS 214D Side Impact Test Procedure, TP-214-02 with modifications to the moving deformable barrier.

Section 2

SUMMARY OF SIDE IMPACT TEST Y48-2-1289

A stationary 1993 Mitsubishi Mighty Max MACROCAB Pickup Truck was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 33.5 mph on May 26, 1993. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are shown in Appendix A.

Side impact test procedure TP-214D-02 was used to prepare this test with the following modifications to the crabbed MDB. The top of the aluminum honeycomb face was raised 4 inches from the nominal 33 inch position to 37 inches. Also, the weight of the MDB was increased by approximately 600 lbs over the procedure target weight of 2960 lbs. The actual weight was 3570 lbs.

One restrained Side Impact Dummy (SID) was placed in the driver (Pos. #1) designated seating position according to instructions specified in the TP-214D-02 Side Impact Test Procedure which is dated May 26, 1992. The side impact event was documented by ten (10) high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Upper Thoracic Spine (T_1) uniaxial accelerator (Y-direction)
4. Lower Thoracic Spine (T_{12}) uniaxial accelerometer (Y-direction)
5. Head assembly triaxial accelerometer (X,Y,Z-directions)
6. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

A summary of the side impact dummy (SID) configuration and performance verification test data can be found in Appendix C.

A total of 34 channels of data were recorded. Appendix B contains the vehicle and dummy response data traces. The head X data channel contained noise

but this did not affect the HIC calculation. Also, accelerometers on the left lower "A" and "B" pillars were damaged during the impact event.

SID Thorax contacted the left door and "B" pillar. After thorax contact, head rotated to also contact "B" pillar. The SID was then pushed laterally inboard but restrained in the seat by the belt system.

The SID driver HIC was 1289 and the Thoracic Trauma Index (TTI) was 102.2 gs. Maximum pelvic Y acceleration was 105.0 gs.

No fuel leaked from the vehicle during the test or the static rollover.

Section 3

SUMMARY OF TEST RESULTS

Table 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1993 Mitsubishi Mighty Max MACROCAB 2-Door Pickup

Vehicle NHTSA No.: - VIN: JA7LS23GOPP004219

Vehicle Body Color: Baja Red Month & Year of Manufacture: 1/93

Engine Data: 4 cylinders; - CID; 2.4 Liters; - cc

Placement -X- Longitudinal; or -- Lateral

Transmission: 5 speed; X Manual; - Automatic; X Overdrive

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

Odometer Reading 78 miles

Options: - A/C; X Power Steering.; X Pwr. Brakes; - Pwr. Windows

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 26 psi FRONT

26 psi REAR

Recommended Tire Size: P205/75R14

Tires on Test Vehicle: P205/75R14 ; Manufacturer: YOKOHAMA

Vehicle Capacity Data:

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

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

Type of Front Seat Back: - Fixed; X Adjustable with X Lever

Vehicle Maximum Capacity Loading = - lbs. (A)

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

Cargo Capacity (A-B) = 300 lbs.

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front =	740 lbs.	Right Rear =	640 lbs.
Left Front =	830 lbs.	Left Rear =	660 lbs.
TOTAL FRONT =	1570 lbs.	TOTAL REAR =	1300 lbs.

% of Total Vehicle Weight = 54.7 %; % of Total Weight = 45.3%

TOTAL WEIGHT = 2870 lbs.

Table 2

TEST VEHICLE DATA

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	=	2870 lbs.
Maximum Cargo Carrying Capacity of Test Vehicle	=	300 lbs.
Weight of 1 Side Impact Dummy (168 lbs.)	=	168 lbs.
TEST VEHICLE TARGET WEIGHT:	=	3346* lbs.

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front =	830 lbs.	Right Rear =	800 lbs.
Left Front =	880 lbs.	Left Rear =	830 lbs.
TOTAL FRONT =	1710 lbs.	TOTAL REAR =	1630 lbs.
% of Total Weight =	51.2 %	% of Total Weight =	48.8 %

TOTAL TEST WEIGHT = 3340 lbs.

100 pounds of ballast was added to vehicle.

TEST VEHICLE ATTITUDE (all dimensions in inches):

AS DELIVERED:

right front 29.8 left front 29.5 right rear 32.3 left rear 31.5

READY FOR TEST:

right front 28.9 left front 28.6 right rear 30.9 left rear 30.2

Test Vehicle Wheelbase: 116.3 inches

C.G. = 56.8 inches rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

	PRE-TEST	POST-TEST
Right Side =	187.6 inches	187.7 inches
Left Side =	187.6 inches	187.2 inches
Centerline =	188.7 inches	188.2 inches

*Used for NHTSA Test No. RK5600.

Figure 1

PRE-TEST CONDITIONS

VEHICLE IDENTIFICATION:

Vehicle: 1993 Mitsubishi Mighty Max 2-Door Pickup

NHTSA No. ____-____

FRONT SEAT CUSHION PLACEMENT: Mid position (11th detent)

Total Length of Adjustment Travel: 7.8 inches

Total Number of Adjustment Positions or Detents: 21 detents

FRONT SEAT BACK ADJUSTMENT POSITION: Adjust recliner to 23° per Mitsubishi Motors

Seat Back Angle = 23 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: not adjustable inches

Seat Back Adjustment Position: not adjustable

ADJUSTABLE STEERING COLUMN POSITION:

Mid position

WINDOW POSITIONS: Left Front closed Left Rear N/A

Right Front open Right Rear N/A

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

14.8 gallons (92 to 94% of Usable Capacity)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase: = 116.3 inches

Impact Point is 21.2 inches rearward of front axle centerline

(which is 37 inches forward of the wheelbase midpoint)

Table 3

CRASH TEST SUMMARY FOR TEST VEHICLE

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 1993 Mitsubishi Mighty Max

Body Style: Pickup Truck VIN: JA7LS23G0PP004219

NHTSA No.: - Test Date: May 26, 1993

Overall Length = 188.7 inches; Overall Width = 65.2 inches

TEST WEIGHT:

Left Front	= 880 lbs.	Left Rear	= 830 lbs.
Right Front	= 830 lbs.	Right Rear	= 800 lbs.
TOTAL FRONT	= 1710 lbs.	TOTAL REAR	= 1630 lbs.

TOTAL VEHICLE WEIGHT 3340 lbs.

Wheelbase = 116.3 inches

Longitudinal C.G. from Center of Front Axle = 56.8 inches

Impact Angle with Respect to Impactor = 90 degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (13.0 in. above ground) = 6.9 inches
2. LEVEL 2 (25.9 in. above ground) = 10.6 inches
3. LEVEL 3 (26.8 in. above ground) = 10.1 inches
4. LEVEL 4 (36.0 in. above ground) = 7.5 inches
5. LEVEL 5 (58.0 in. above ground) = 0.7 inches

Maximum Post-Test Intrusion = 10.6 inches

OCCUPANTS:	Front Passenger	Rear Passenger
Type of Dummy	SID	N/A
Restraints Used	3-point manual belt	N/A

INSTRUMENTATION:

Number of Vehicle Data Channels:	=	14
Number of Cameras: Onboard	=	2
Offboard	=	7
TOTAL	=	9

Table 4

CRASH TEST SUMMARY FOR SIDE IMPACTOR

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	=	49.25	inches
Overall Length of MDB (incl. honeycomb impact face)	=	162.0	inches
Wheelbase of Framework Carriage	=	102.0	inches
Tread of Framework Carriage (Front & Rear)	=	74.0	inches
C.G. Location Rearward of Front Axle	=	45.1	inches

MDB WEIGHT: (measured in crabbed position)

Left Front	= 1090 lbs.		Left Rear	= 700	lbs.
Right Front	= 900 lbs.		Right Rear	= 880	lbs.
TOTAL FRONT	= 1990 lbs.		TOTAL REAR	= 1580	lbs.

TOTAL MDB WEIGHT 3570 lbs.

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degrees

Impact Speed = 33.5 mph

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A at Bumper Level = 7.0 inches
2. Row B at Mid-Stack Level = 5.6 inches
3. Row C at Top of Stack Level = 4.4 inches

INSTRUMENTATION:

Number of MDB Data Channels = 5

BARRIER HEIGHT:

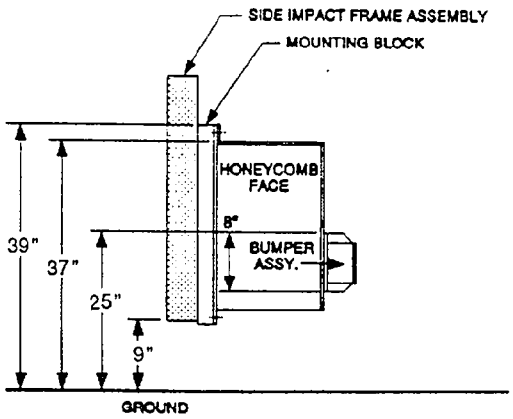


Table 5

POST-TEST OBSERVATIONS

TEST VEHICLE: 1993 Mitsubishi Mighty Max NHTSA No. -

VISIBLE DUMMY CONTACT POINTS:

	LEFT FRONT SID	LEFT REAR SID
Head	Left "B" Pillar	N/A
Chest	Left "B" pillar and door	-
Abdomen	Left door arm rest	-
Left Knee	Left door	-
Right Knee	-	-

DOOR OPENING:

	LEFT SIDE	RIGHT SIDE
Front	Closed	Closed
Rear	N/A	N/A

MDB DISTANCE FROM TARGET IMPACT POINT: 0.4" forward of target

ARM REST LOCATIONS:

Front: Abdomen between pelvis and thorax.

Rear: N/A

SEAT MOVEMENT:

Seat cushion rolled up between door and left leg.

GLAZING DAMAGE:

Left door glass broken. Rear window glass popped out of cab.

PILLAR FAILURE:

None

SILL SEPARATION:

None

OTHER NOTABLE IMPACT EFFECTS:

None

Section 4

OCCUPANT AND VEHICLE INFORMATION

Table 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARY

Vehicle: 1993 Mitsubishi Might Max Test Date: May 26, 1993

	Front Dummy ID #906				Rear Dummy ID #N/A			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
HEAD ACCELERATIONS:								
Longitudinal X	-	-	-28.2	39.0	-			
Lateral ..... Y	202.8	40.1	-11.3	31.6	-			
Vertical ..... Z	30.3	38.8	-28.9	45.7	-			
RESULTANT ..... R	204.1	38.6	0	0				
HIC	1288.5							
RIB ACCELERATIONS:*								
Upper Rib Lateral .... Y	88.7	26.3	-10.4	76.3	-			
Upper Rib Lateral .. Y(R)	76.3	26.9	-10.7	76.9	-			
Lower Rib Lateral .... Y	76.0	27.5	-14.9	60.6	-			
Lower Rib Lateral .. Y(R)	84.0	26.9	-16.1	61.3	-			
SPINE ACCELERATIONS:*								
Upper Lateral ..... Y	65.6	33.8	-22.5	66.9	-			
Upper Lateral ..... Y (R)	68.6	33.8	-22.2	67.5	-			
Lower Lateral ..... Y	115.6	30.6	-11.3	66.9	-			
Lower Lateral ..... Y (R)	118.4	31.3	-15.9	68.8	-			
PELVIC ACCELERATIONS:								
Lateral ..... Y	105.0	28.1	-6.3	114.4	-			
Lateral ..... Y(R)	105.0	28.1	-6.8	115.0	-			

REFERENCE: Positive Direction - Longitudinal (X) = forward
Lateral (Y) = to right
Vertical (Z) = up

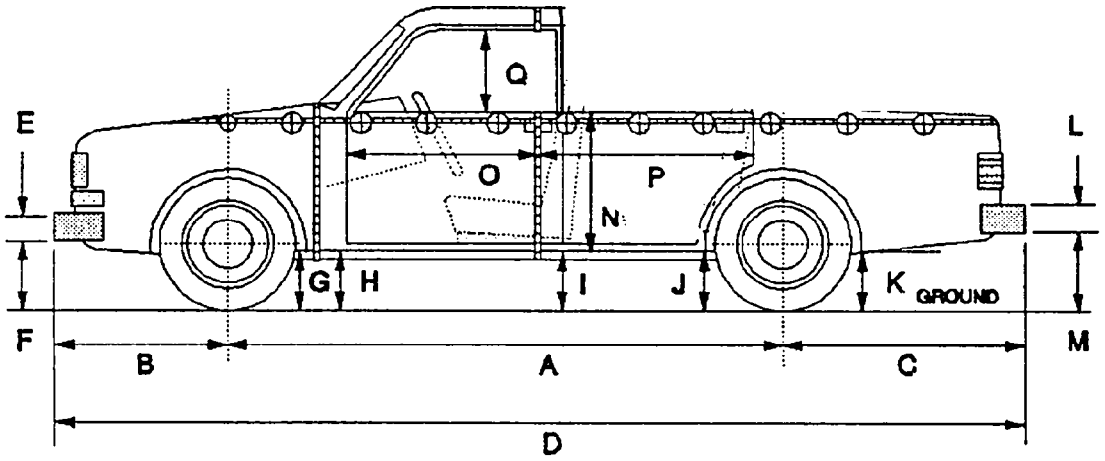
Negative Direction - Longitudinal (X) = rearward
Lateral (Y) = to left
Vertical (Z) = down

Note: Y(R) denotes redundant Y direction accelerometer.

*Denotes QFIR filtered data

Figure 2

PRE- AND POST-TEST MEASUREMENTS



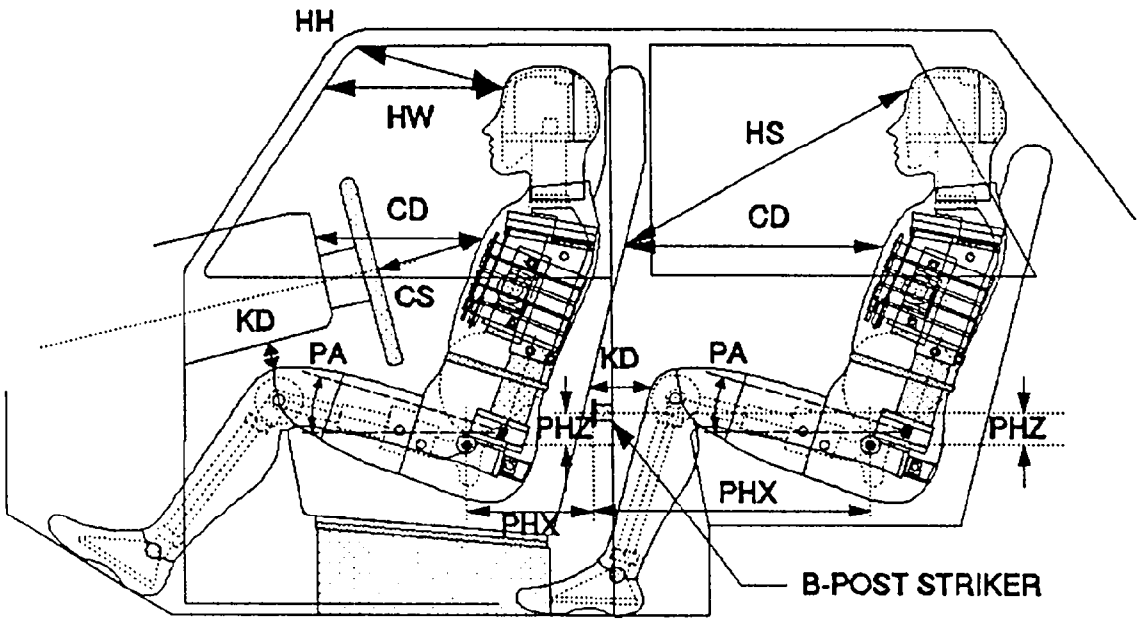
LEFT SIDE VIEW

NOTE: All dimensions are in inches

	PRE-TEST	POST-TEST	Δ CHANGE
A	116.3	115.8	0.5
B	29.9	29.9	0.0
C	41.9	41.9	0.0
D	188.7	188.2	0.5
E	9.6	9.6	0.0
F	13.4	12.7	0.7
G	10.5	10.8	-0.3
H	10.6	11.3	-0.7
I	11.3	12.1	-0.8
J	12.4	14.4	-2.0
K	15.3	16.1	-0.8
L	-	-	-
M	16.5	17.2	-0.7
N	24.7	20.8	3.9
O	34.0	31.4	2.6
P	-	-	-
Q	18.1	17.6	0.5

Figure 3

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

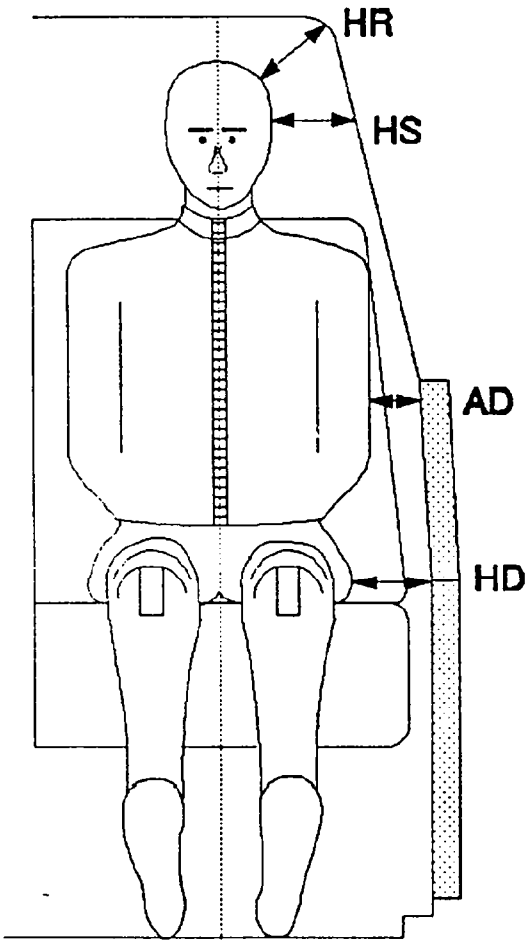
NOTE: All dimensions are in inches

	DRIVER ID # 906	LEFT REAR PASSENGER ID # N/A
HH	20.6	–
HW	26.2	–
HS	–	–
CD	25.8	–
CS	15.4	–
KDL	5.7	–
KDR	6.6	–
PA	24°	–
PHX	6.8	–
PHZ	3.0 below	–

Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Figure 4

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS

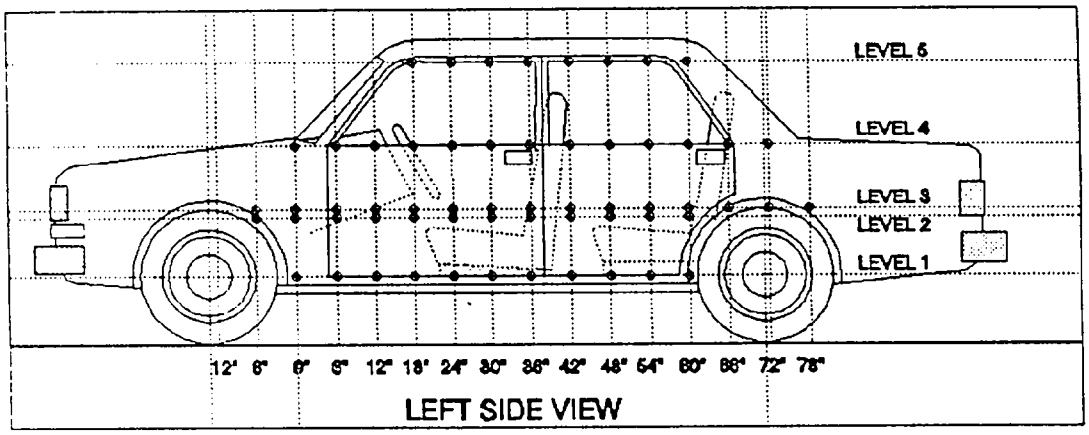


NOTE: All dimensions are in inches

	DRIVER ID # 906	LEFT REAR PASSENGER ID # N/A
HR	6.6	-
HS	7.4	-
AD	3.4	-
HD	6.1	-

Figure 5

VEHICLE SIDE MEASUREMENT



Pre-Test Profile Measurements Along the Vertical 30" Line Shown Above:

	30" Side Profile
Level 5 @ Window Top	= 58.0 inches
Level 4 @ Window Sill	= 36.0 inches
Level 3 @ Mid Door	= 26.8 inches
Level 2 @ Occupant H-Point	= 25.9 inches
Level 1 @ Axle Centerline Height (or Sill Top Height	= 13.0 inches

Measurement plane is 48 inches from test vehicle longitudinal centerline.

Table 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE* AND STATIC CRUSH DATA

Test Date: May 25, 1993 Vehicle: 1993 Mitsubishi Mighty Max Pickup

SIDE IMPACT CRUSH PROFILE

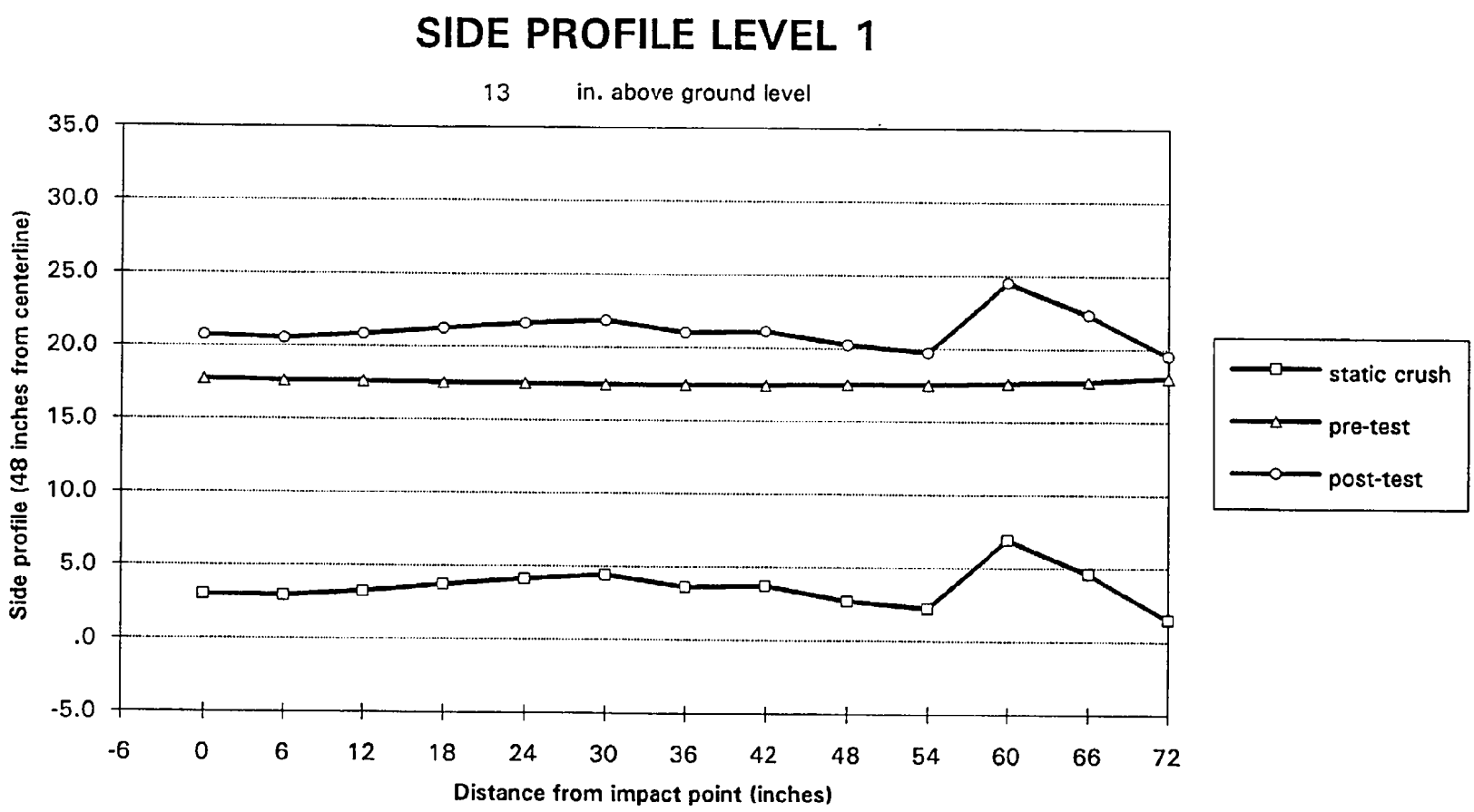
English units		Impact pt.													
		-6	0	6	12	18	24	30	36	42	48	54	60	66	72
level 1	post-test	#N/A	20.7	20.5	20.8	21.2	21.6	21.8	21.0	21.1	20.2	19.7	24.5	22.3	19.5
Height(in)	pre-test	#N/A	17.7	17.6	17.6	17.5	17.5	17.4	17.4	17.4	17.5	17.5	17.6	17.7	18.0
13	crush	#N/A	3.0	2.9	3.2	3.7	4.1	4.4	3.6	3.7	2.7	2.2	6.9	4.6	1.5
level 2	post-test	19.6	22.6	26.6	26.2	25.8	25.5	25.2	24.7	24.5	23.4	22.6	21.0	22.3	19.2
Height(in)	pre-test	16.2	16.1	16.0	15.9	15.8	15.9	15.9	15.8	15.9	15.9	16.0	16.2	16.2	16.2
25.9	crush	3.4	6.5	10.6	10.3	10.0	9.6	9.3	8.9	8.6	7.5	6.6	4.8	6.1	3.0
level 3	post-test	19.6	22.3	26.1	25.7	25.2	24.8	24.5	23.8	23.7	23.1	22.2	20.9	22.4	19.4
Height(in)	pre-test	16.2	16.0	16.0	16.0	15.9	15.8	15.8	15.8	15.8	15.8	15.8	16.2	16.2	16.2
26.8	crush	3.4	6.3	10.1	9.7	9.3	9.0	8.7	8.0	7.9	7.3	6.4	4.7	6.2	3.2
level 4	post-test	17.9	19.2	21.8	23.9	23.8	23.8	23.7	23.4	23.7	23.9	23.3	21.3	23.4	21.4
Height(in)	pre-test	17.3	17.0	16.8	16.7	16.6	16.5	16.3	16.4	16.4	16.4	16.4	16.7	16.6	16.6
36	crush	.6	2.2	5.0	7.2	7.2	7.3	7.4	7.0	7.3	7.5	6.9	4.6	6.8	4.8
level 5	post-test	#N/A	#N/A	#N/A	#N/A	24.5	24.6	24.6	24.8	24.8	24.9	24.5	#N/A	#N/A	#N/A
Height(in)	pre-test	#N/A	#N/A	#N/A	#N/A	24.3	24.3	24.3	24.3	24.1	24.3	24.3	#N/A	#N/A	#N/A
58	crush	#N/A	#N/A	#N/A	#N/A	.2	.3	.3	.5	.7	.6	.2	#N/A	#N/A	#N/A

*Reference plane is parallel to and 48 inches from test vehicle longitudinal centerline

Given Dimensions = Reference Plane to Car Body.

Figure 6

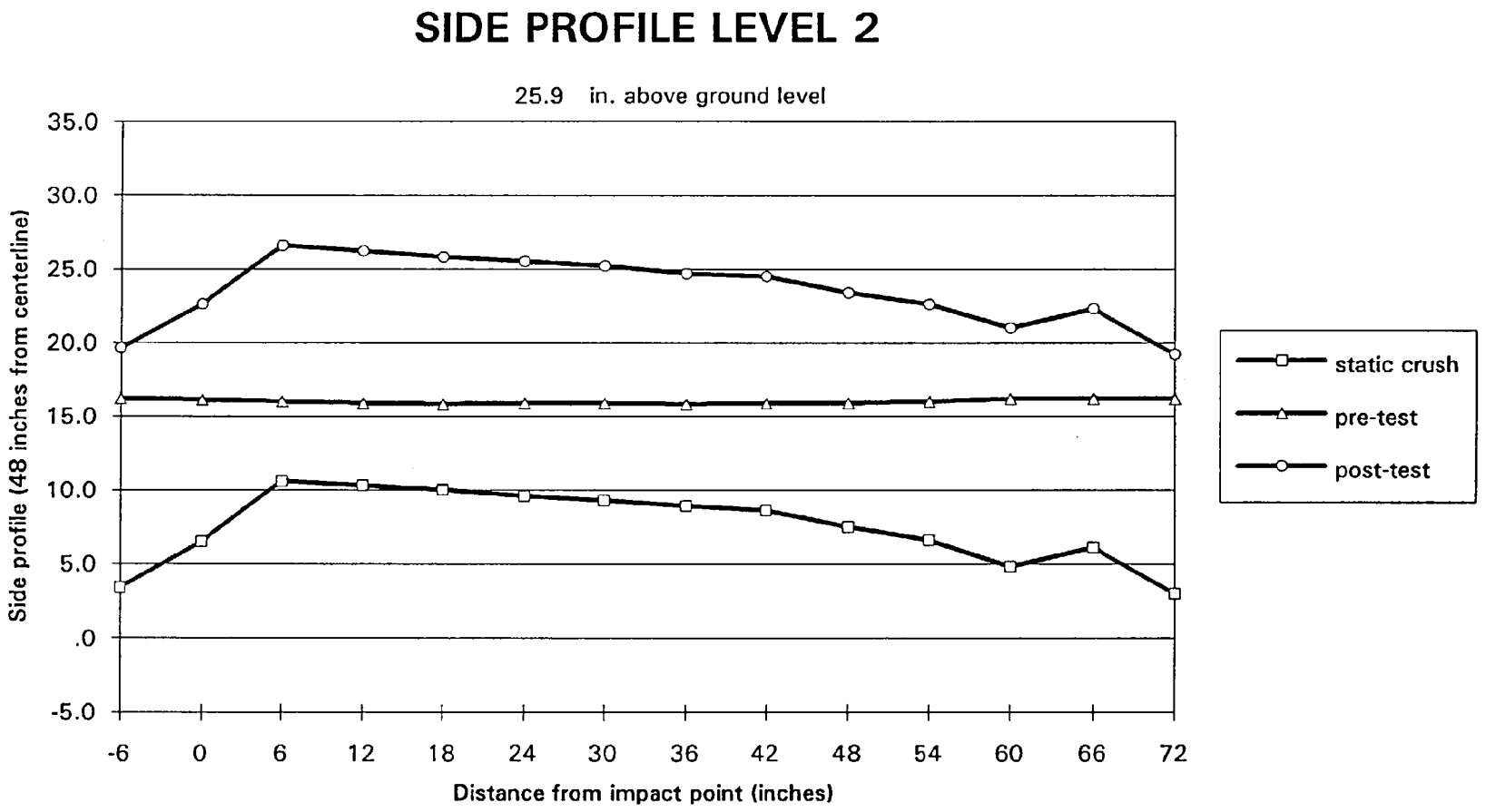
VEHICLE EXTERIOR STATIC CRUSH



Note: All measurements in inches
Left side of vehicle only

Figure 6

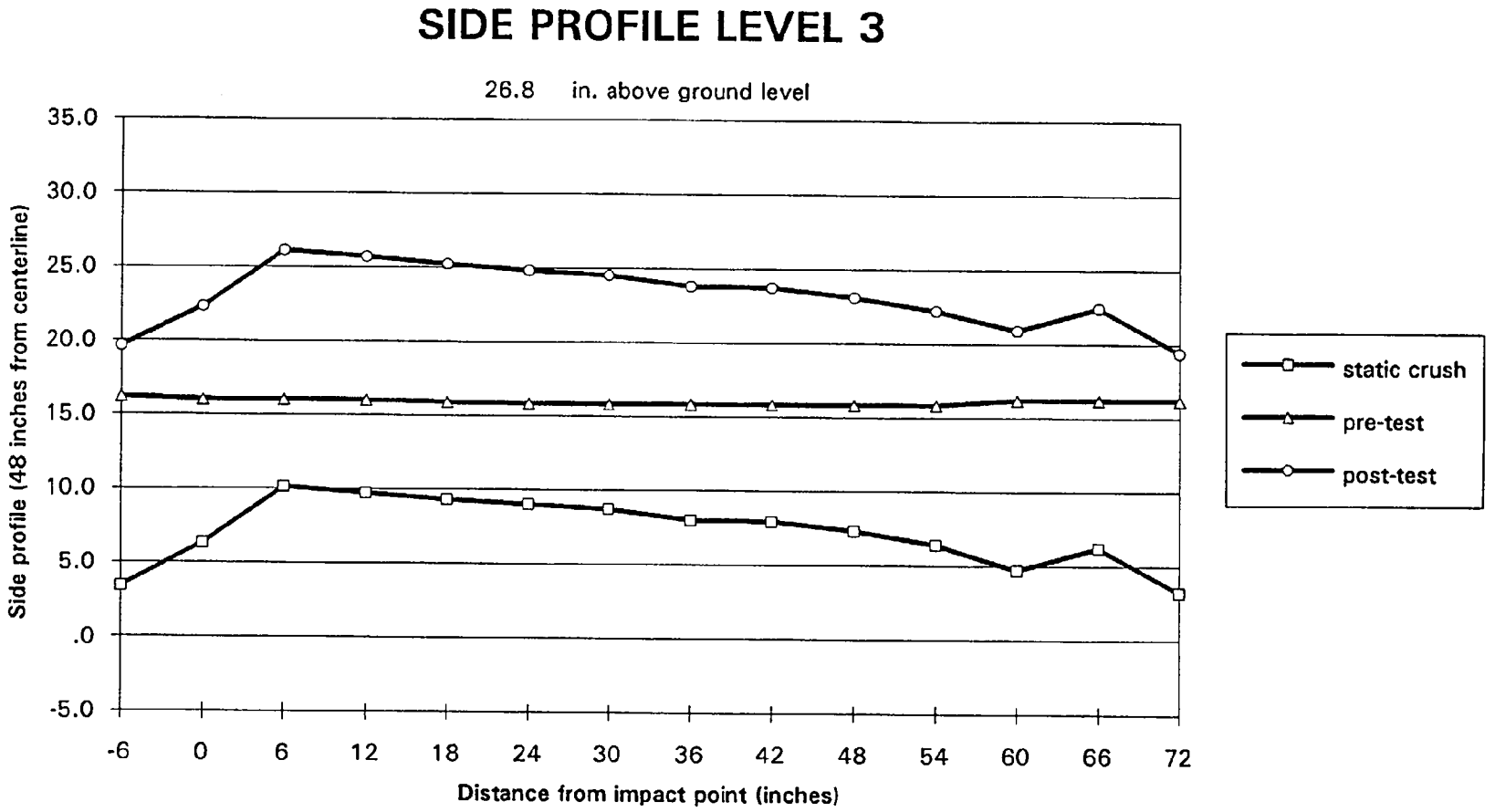
VEHICLE EXTERIOR STATIC CRUSH (cont.)



Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

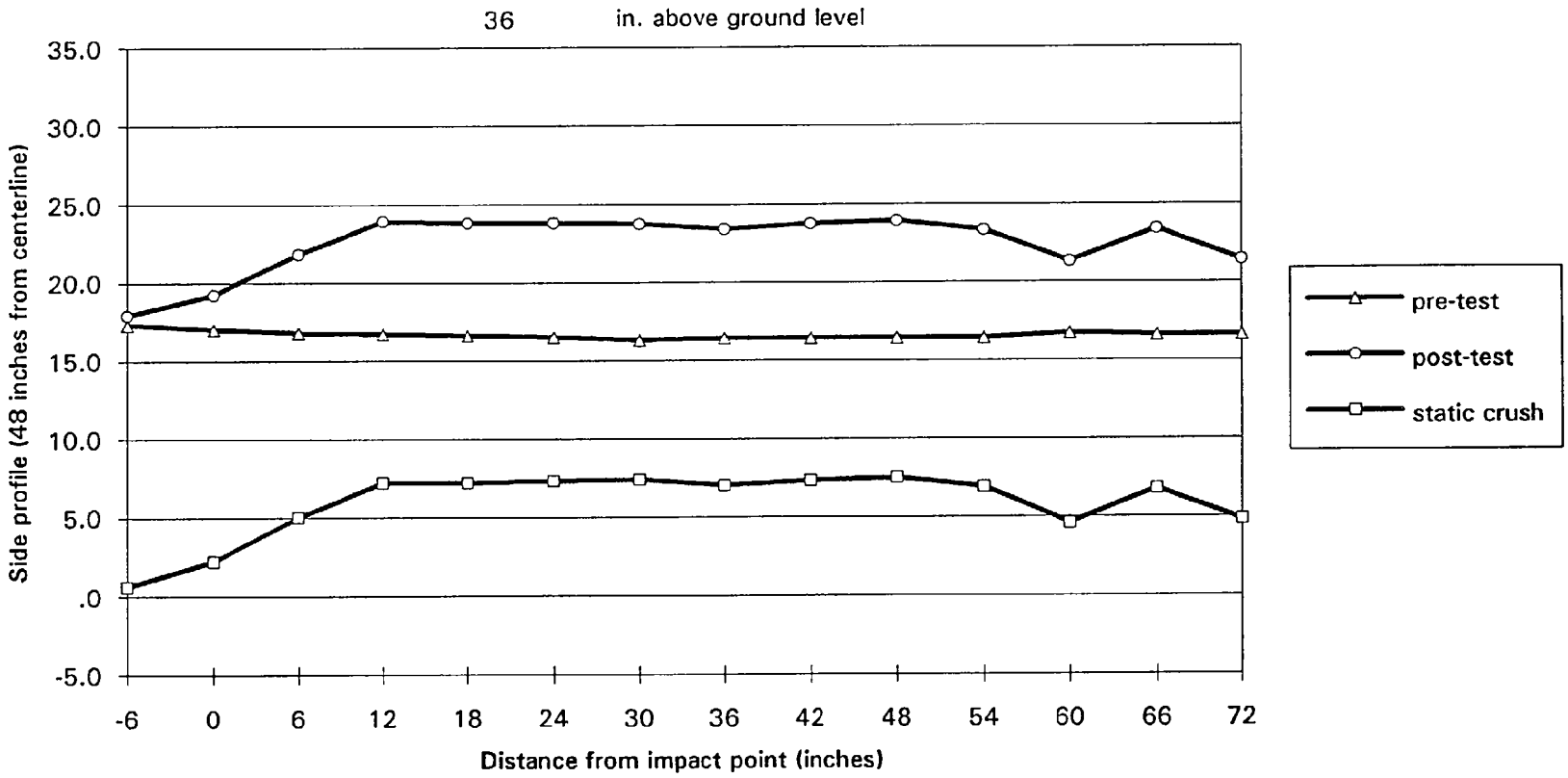


Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

SIDE PROFILE LEVEL 4

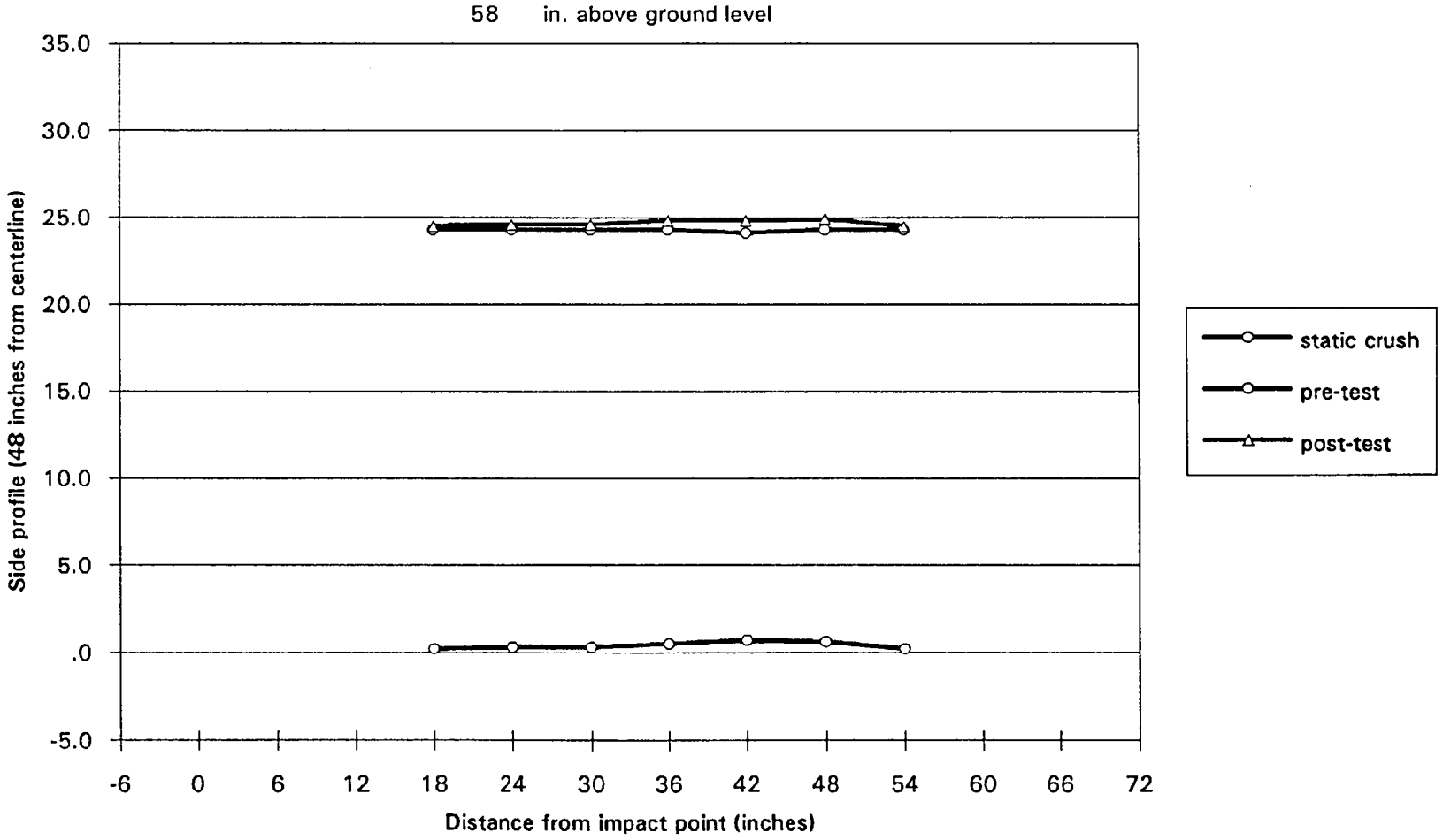


Note: All measurements in inches
Left side of vehicle only

Figure 6

VEHICLE EXTERIOR STATIC CRUSH (cont.)

SIDE PROFILE LEVEL 5



Note: All measurements in inches
Left side of vehicle only

Table 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

(Grid as looking at MDB from front.)

Test Date: May 26, 1993

Vehicle: 1993 Mitsubishi Mighty Max Pickup Truck

		Distances Right of Center									Distances Left of Center							
Location	Height at C_L*	32″	28″	24″	20″	16″	12″	8″	4″	0″	4″	8″	12″	16″	20″	24″	28″	32″
Top of Stack Level	36″	1.9	2.4	4.4	1.9	1.1	0.8	0.7	0.8	2.0	0.7	0.3	0.2	0.2	0.3	0.5	2.1	4.1
Mid-Stack Level	26″	4.5	5.6	4.5	3.3	2.8	2.5	2.2	1.9	1.5	1.3	1.0	0.9	0.7	0.5	0.4	0.3	0.5
Bumper Level	21″	6.6	7.0	6.5	5.0	4.4	4.0	3.6	3.3	3.0	2.8	2.5	2.3	2.1	1.8	1.6	1.4	1.2

*Heights measured above ground level.
**Impact side.

Figure 7

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 1993 Mitsubishi Mighty Max NHTSA No.: -

Test Date: May 26, 1993

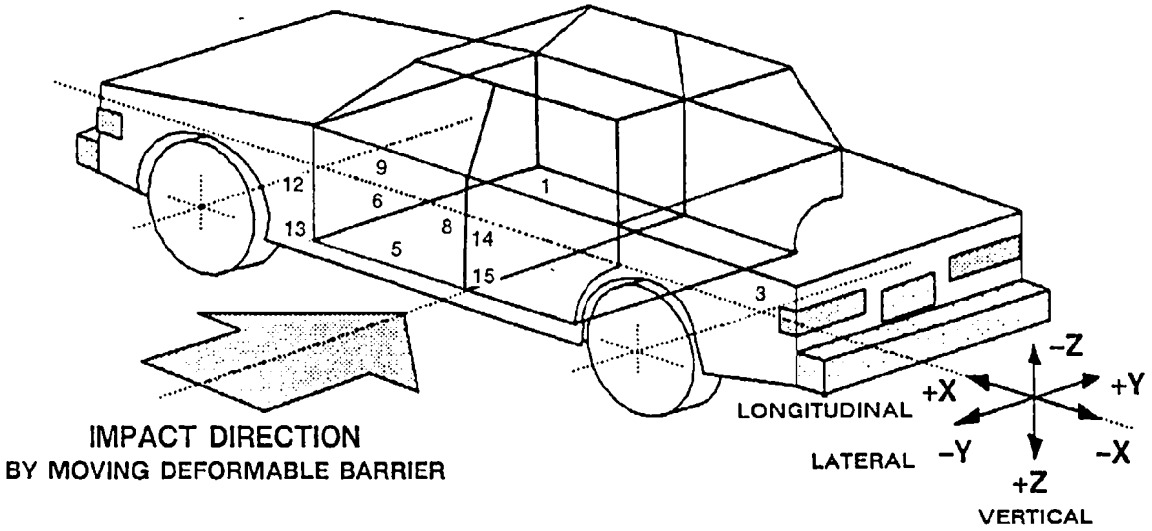


Table 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

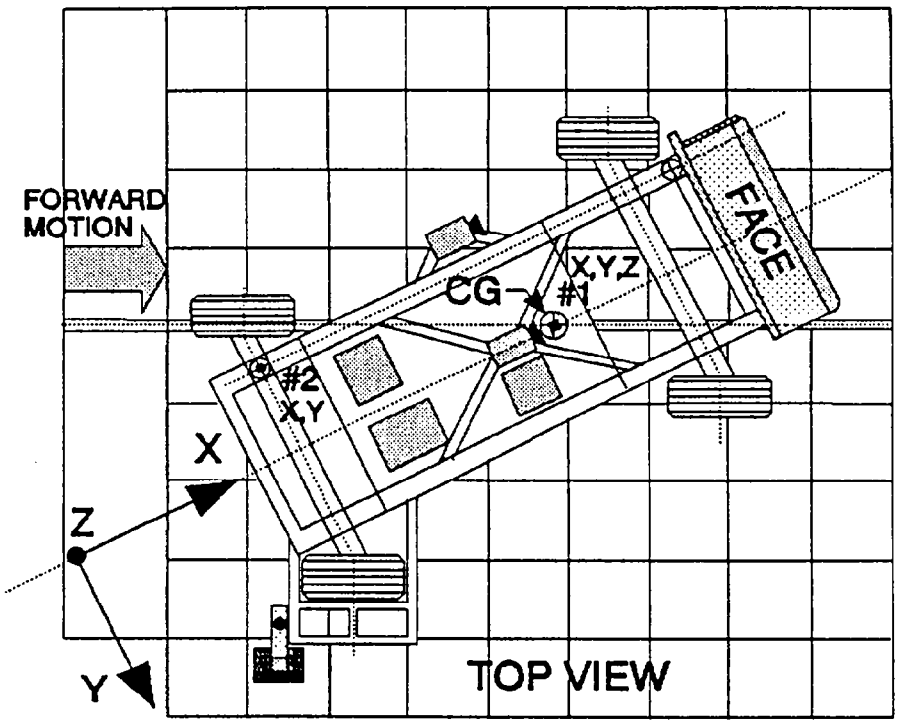
Accel. Time No.	Location	Coordinates (")			Long. (X) Pos./Neg.		Lat. (Y) Pos./Neg.		Vert. (Z) Pos./Neg.		Resultant Pos./Neg.	
		X*	Y*	Z*	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Tim (msec)	Max (g)	(msec)
(1)	Right Front Sill at Front Seat	126.5	26.5	16.0	8/ -13	25/ 50	24/ -11	9/ 61	15/ -14	61/ 20	27	9
2	Right Rear Sill at Rear Seat	–	–	–	–	–	–	–	–	–	–	–
3	Rear Floorpan Above Axle	39.0	0.0	30.0	6/ -14	58/ 28	30/ -3	29/ 110	11/ -19	25/ 61	33	29
4	Left Side Sill at Rear Seat	–	–	–	–	–	–	–	–	–	–	–
(5)	Left Side Sill at Front Seat	128.0	26.5	16.0	–	–	83/ -61	4/ 15	–	–	–	–
(6)	Left Front Door on Centerline	120.3	27.5	23.5	–	–	106/ -54	7/ 26	–	–	–	–
7	Right Rear Occupant Compartment	–	–	–	–	–	–	–	–	–	–	–
(8)	Midrear of Left Front Door	111.0	27.5	27.5	–	–	135/ -149	3/ 21	–	–	–	–
(9)	Left Front Door Upper Centerline	121.2	27.5	29.0	–	–	175/ -128	30/ 24	–	–	–	–
10	Midrear of Left Rear Door	–	–	–	–	–	–	–	–	–	–	–
11	Left Rear Door Upper Centerline	–	–	–	–	–	–	–	–	–	–	–
12	Left Upper A Pillar	138.0	-26.5	25.5	–	–	103/ -24	4/ 17	–	–	–	–
13	Left Lower A Pillar	138.0	-26.5	21.0	–	–	89/ –	4/ –	–	–	–	–
14	Left Upper B Pillar	98.5	-26.5	21.0	–	–	114/ -77	3/ 25	–	–	–	–
15	Left Lower B Pillar	98.5	-26.5	31.0	–	–	126/ –	2/ –	–	–	–	–

*Reference: X – Rear Bumper (+ Forward)
Y – Vehicle Centerline (+ To right)
Z – Ground Level (+ Up)

Figure 8

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Test Vehicle: 1993 Mitsubishi Mighty Max Pickup Truck Test Date: May 26, 1993

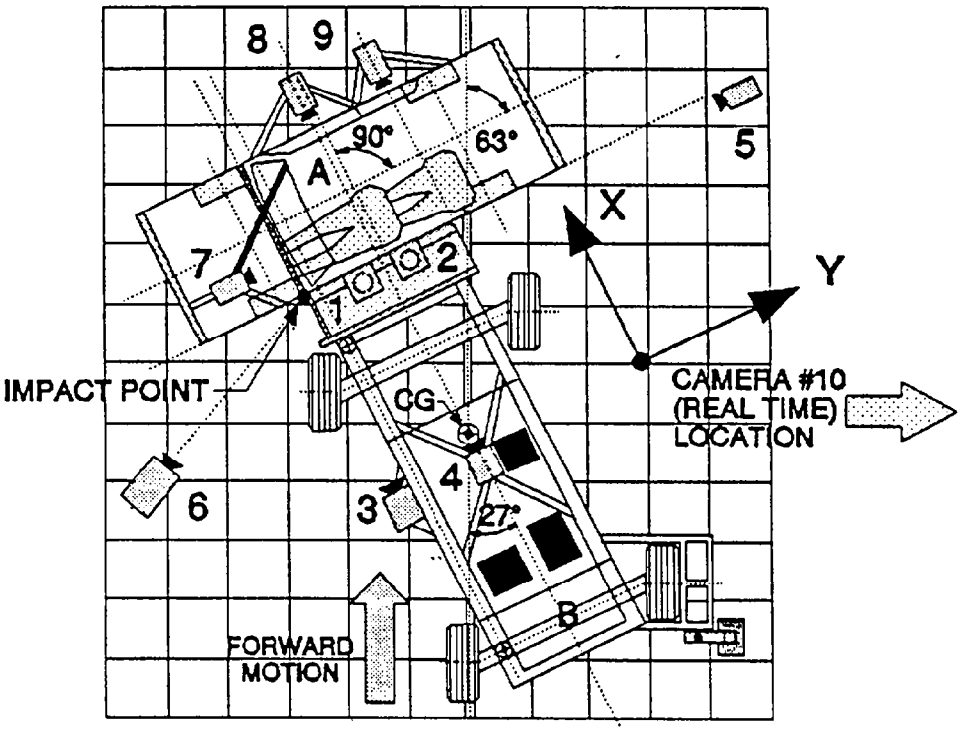


Accel. No.	Location	Coordinates (in.) X*	Y*	Z*	Pos. Direct. Max (g)	Pos. Direct. Time (msec)	Neg. Direct. Max (g)	Neg. Direct. Time (msec)
1	MDB Center of Gravity							
	Longitudinal ... X				8.2	112.9	-15.5	42.8
	Lateral ..... Y	73.2	0.0	13.0	91.3	112.7	-5.1	19.4
	Vertical ..... Z				70.0	112.8	-14.6	46.7
	Resultant ..... R				115.3	112.7		
2	Rear Frame Member							
	Longitudinal ... X				1.8	90.4	-18.8	28.6
	Laterl ..... Y	15.2	-26.0	26.0	2.4	32.5	-2.6	57.0

*Reference: X = Rear Bumper (+Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Up)

Figure 9

HIGH SPEED CAMERA LOCATIONS AND DATA



Camera No.	View	Coordinates (mm) X*	Y*	Z*	Angle	Lens (mm)	Film Speed (fps)
1	Overhead Overall View	10	52	386	-90	13	570
2	Overhead Closeup View of Impact	16	60	386	-90	25	580
3	MDB Onboard Closeup of Impact	-	-	-	-	8	**
4	MDB Onboard View of Dummy	-	-	-	-	8	**
5	Right Side Ground Overall View	-6	392	42	-1	13	550
6	Left Side Ground Overall View	-97	-289	40	-1	25	610
7	Test Vehicle Onboard Driver Front View	19	-23	56	-14	13	625
8	Test Vehicle Onboard Driver Side View	76	20	49	-6	8	575
9	Test Vehicle Onboard Passenger Side View	-	-	-	-	-	-
10	Real Time	-	-	-	-	-	24

*Reference: (from point of impact)
+X = Forward
+Y = To Right
+Z = Upward

**Camera did not operate

Table 10

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: --- TEST DATE: May 26, 1993

Vehicle Mfgr./Make/Model: 1993 Mitsubishi Mighty Max Pickup Truck

Test vehicle fuel tank filled to 92% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

_____ Frontal (30 mph)

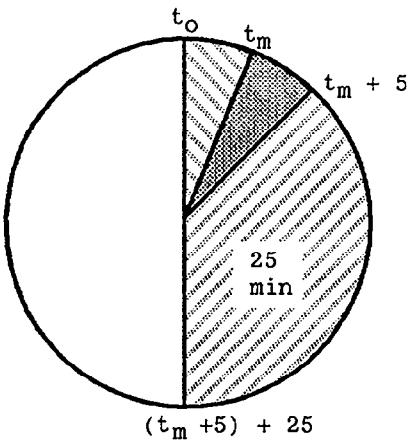
_____ Oblique (30 mph) with _____° barrier face first contacting _____ (driver/passenger) side

_____ Rear Moving Barrier (30 mph)

_____ Lateral Moving Barrier (20 mph)

__X__ 30/15 90° Side Impact

FUEL SPILLAGE MEASUREMENT:



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

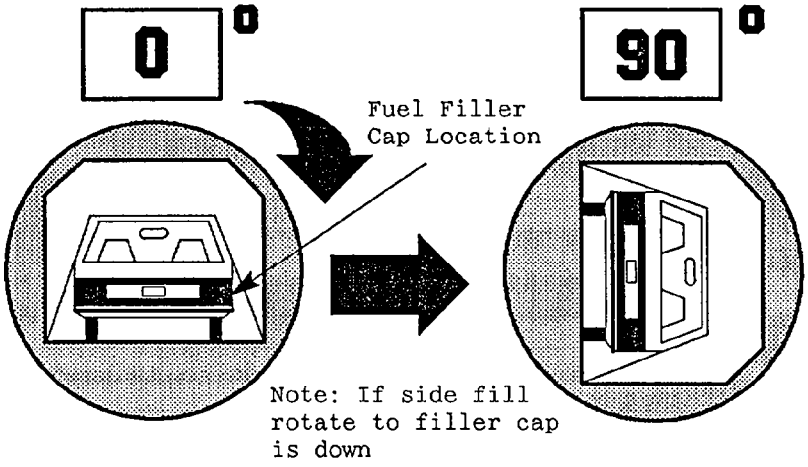
SOLVENT SPILLAGE DETAILS:

None

Table 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: Vehicle NHTSA ID No.: _____-_____



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

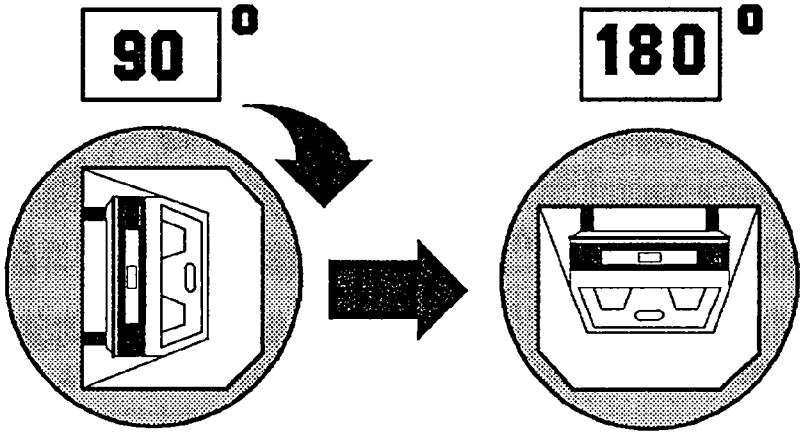
None

Table 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.: _____



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):

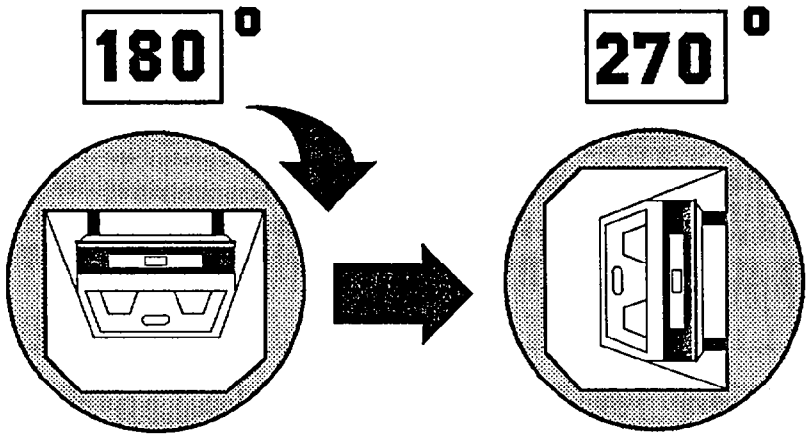
None

Table 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.: _____-_____



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

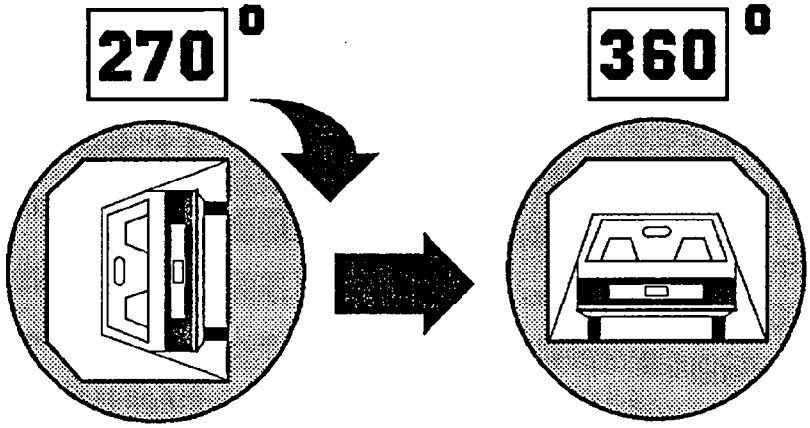
None

Table 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE:

Vehicle NHTSA ID No.: _____



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1 minutes	55 seconds
FMVSS 301 Position Hold Time +	5 minutes	00 seconds
TOTAL	6 minutes	55 seconds
Next whole minute interval	7 minutes	

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

None

Appendix A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

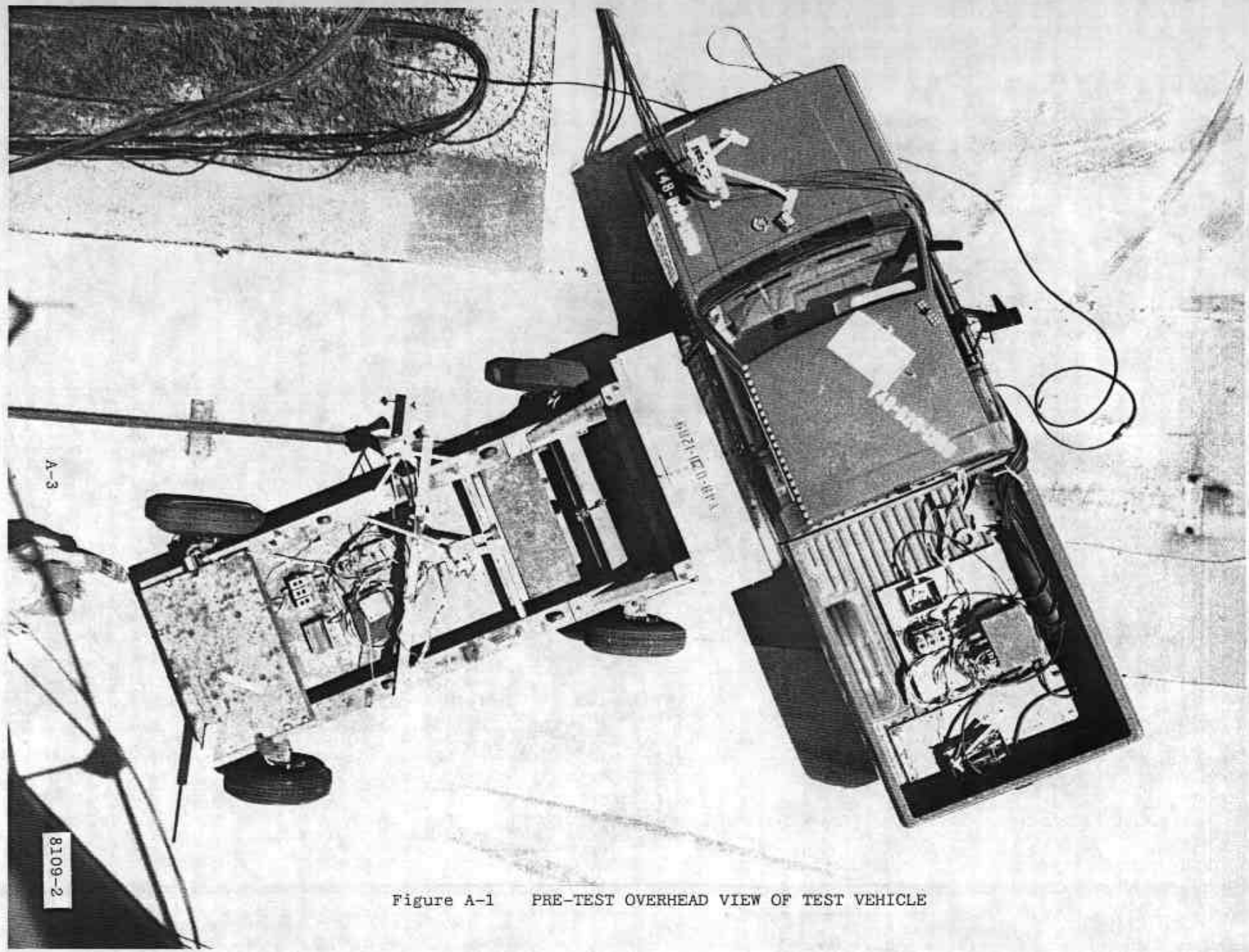


Figure A-1 PRE-TEST OVERHEAD VIEW OF TEST VEHICLE

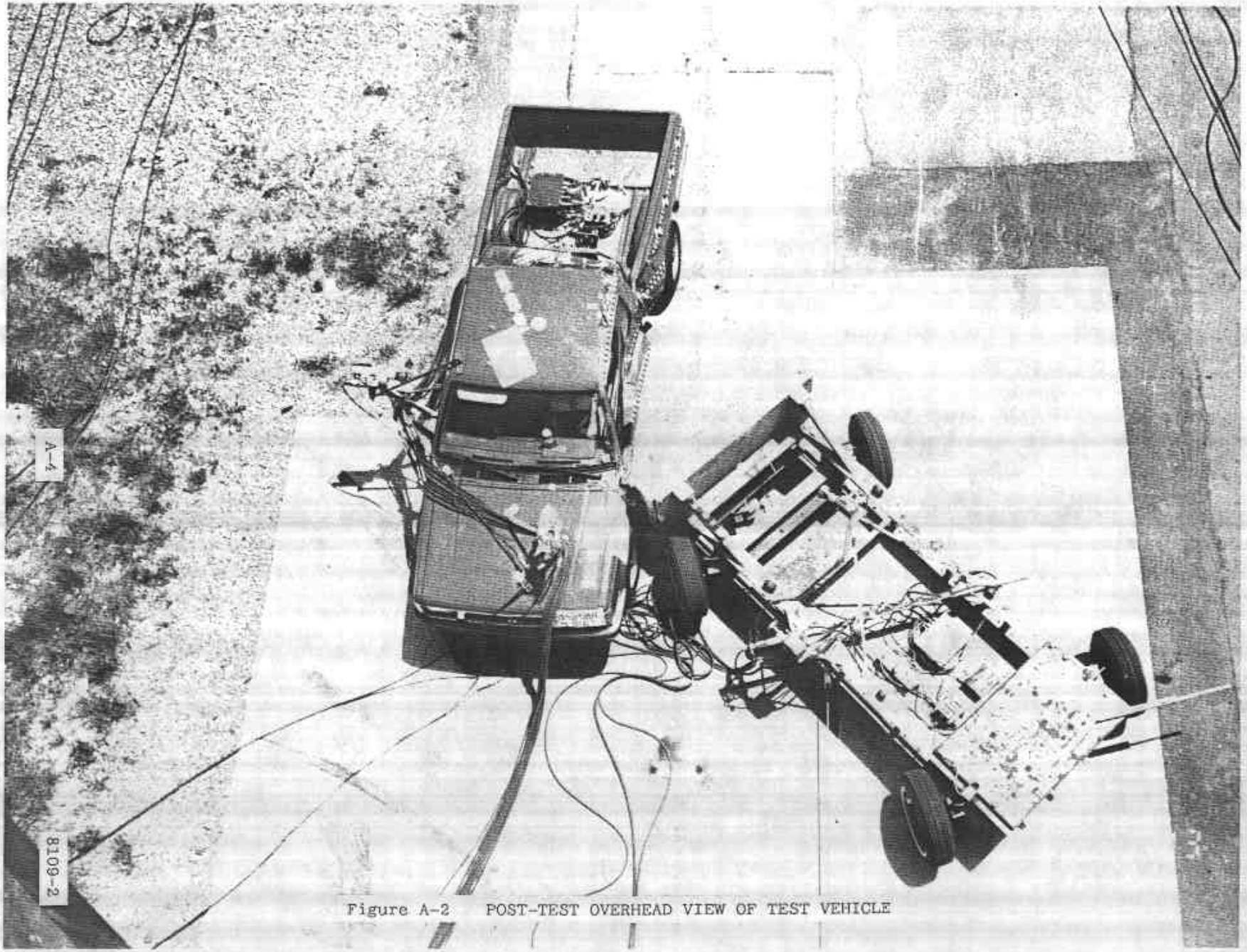


Figure A-2 POST-TEST OVERHEAD VIEW OF TEST VEHICLE

Figure A-3 PRE-TEST FRONT VIEW OF TEST VEHICLE

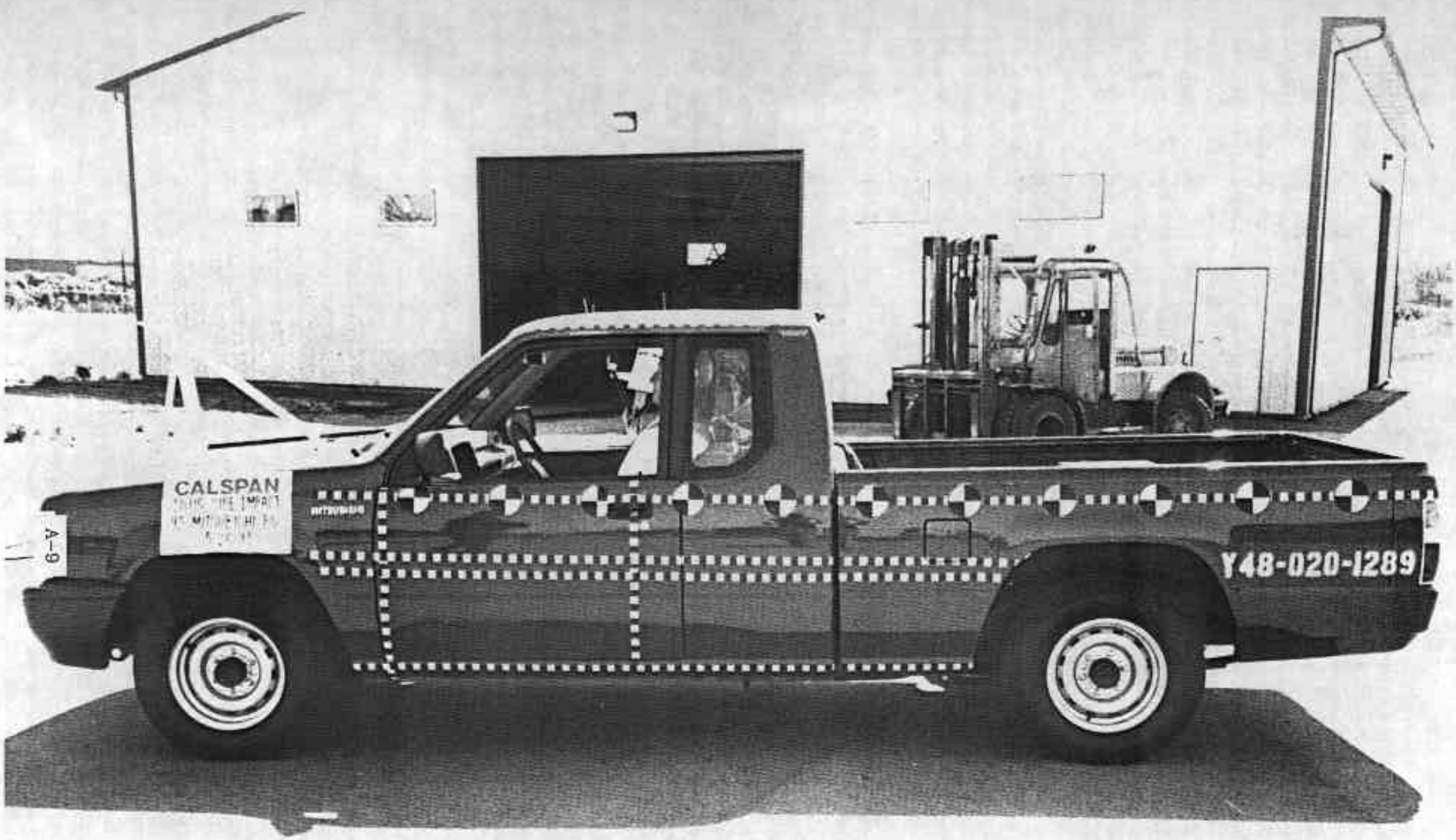
8109-2

Figure A-4 POST TEST FRONT VIEW OF TEST VEHICLE

Figure A-5 PRE-TEST REAR VIEW OF TEST VEHICLE

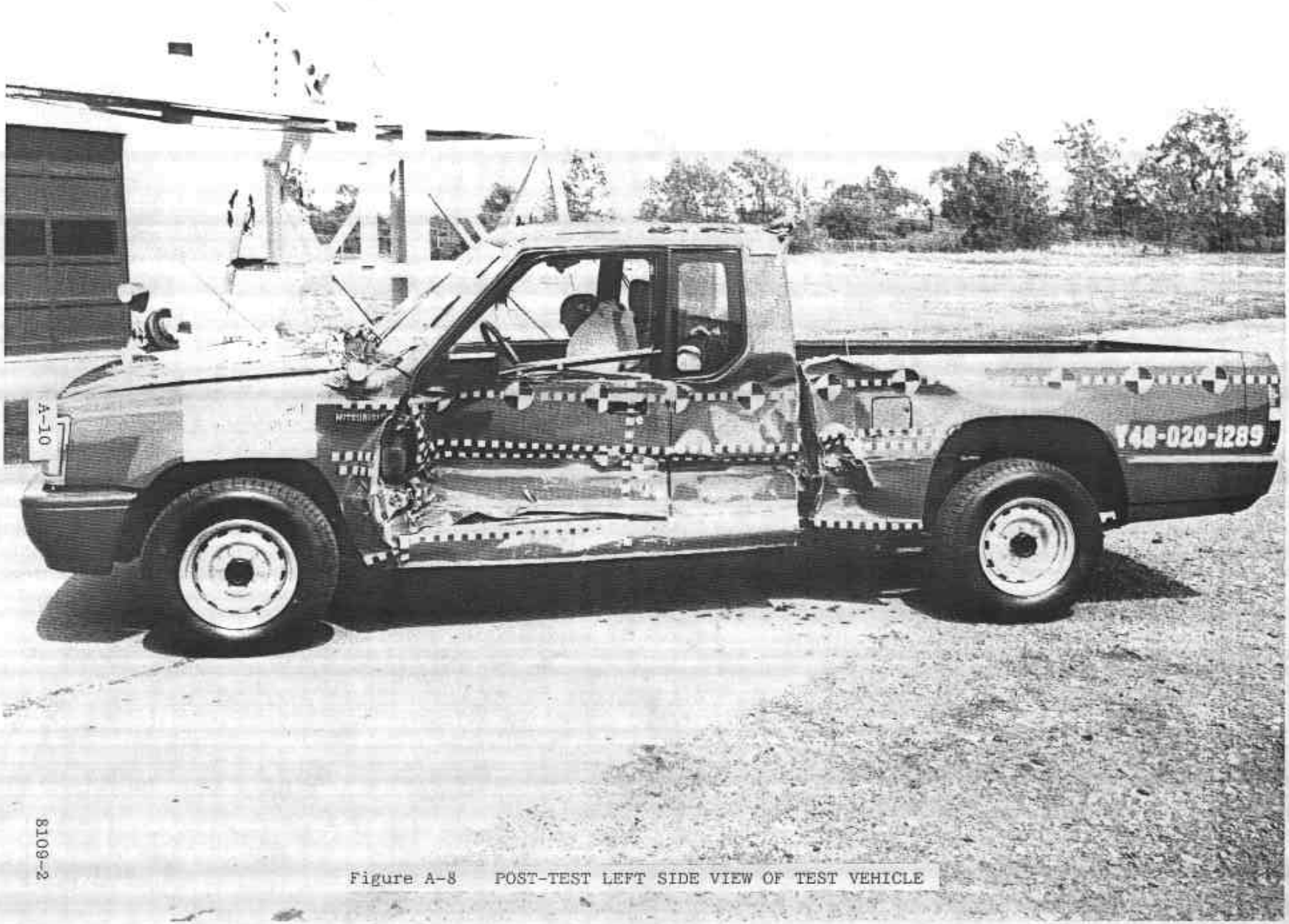
8109-2

Figure A-6 POST-TEST REAR VIEW OF TEST VEHICLE



8109-2

Figure A-7 PRE-TEST LEFT SIDE VIEW OF TEST VEHICLE



8109-2

Figure A-8 POST-TEST LEFT SIDE VIEW OF TEST VEHICLE

A-11

8109-2

Figure A-9 PRE-TEST LEFT FRONT THREE QUARTER VIEW

A-12

8109-2

Figure A-10 POST-TEST LEFT FRONT THREE QUARTER VIEW

A-13

8106-2

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

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

8109-2

Figure A-13 PRE-TEST MDB AND VEHICLE LEFT SIDE FRONT VIEW

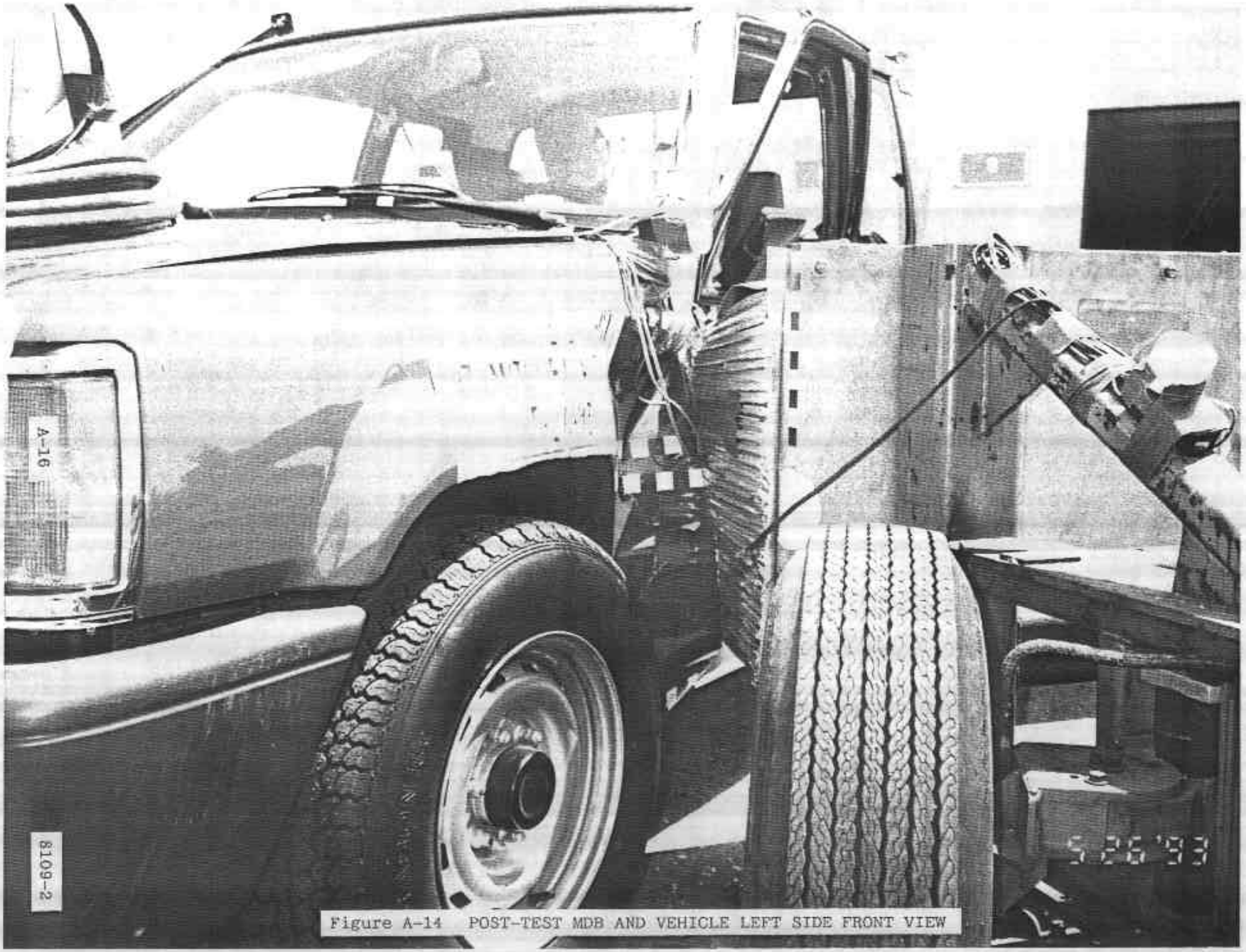


Figure A-14 POST-TEST MDB AND VEHICLE LEFT SIDE FRONT VIEW

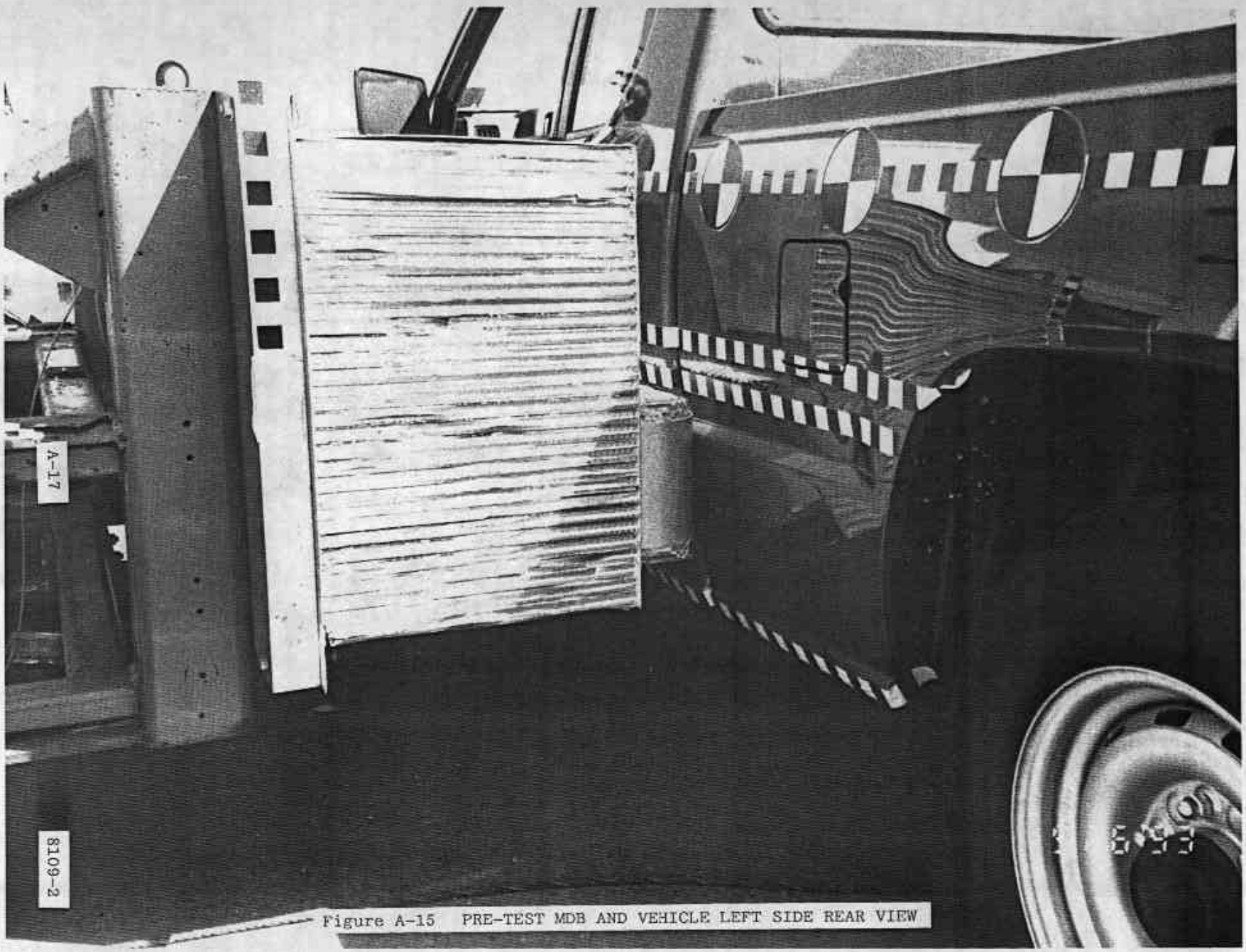


Figure A-15 PRE-TEST MDB AND VEHICLE LEFT SIDE REAR VIEW

8109-2

Figure A-16 POST-TEST MDB AND VEHICLE LEFT SIDE REAR VIEW

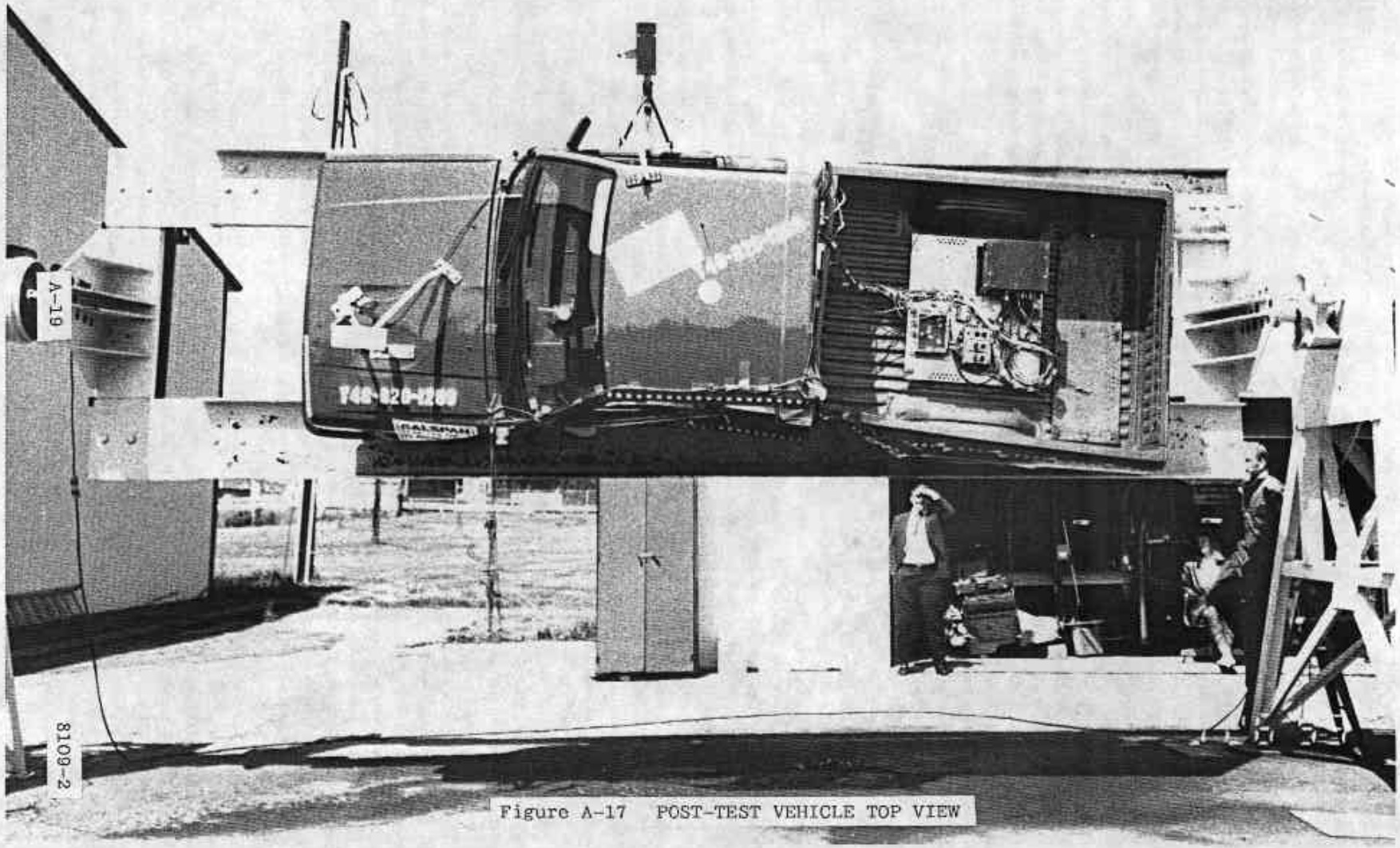


Figure A-17 POST-TEST VEHICLE TOP VIEW

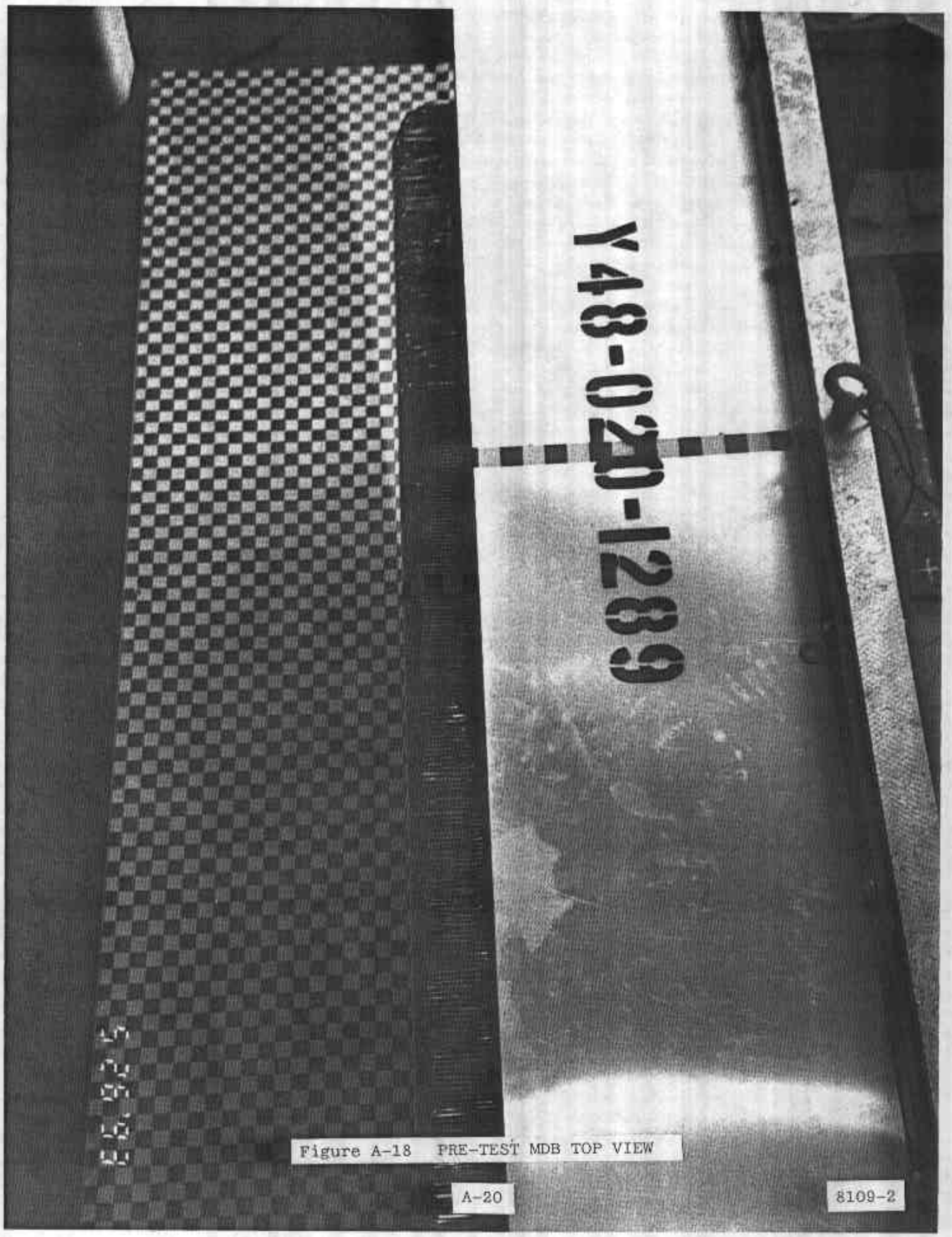


Figure A-18 PRE-TEST MDB TOP VIEW

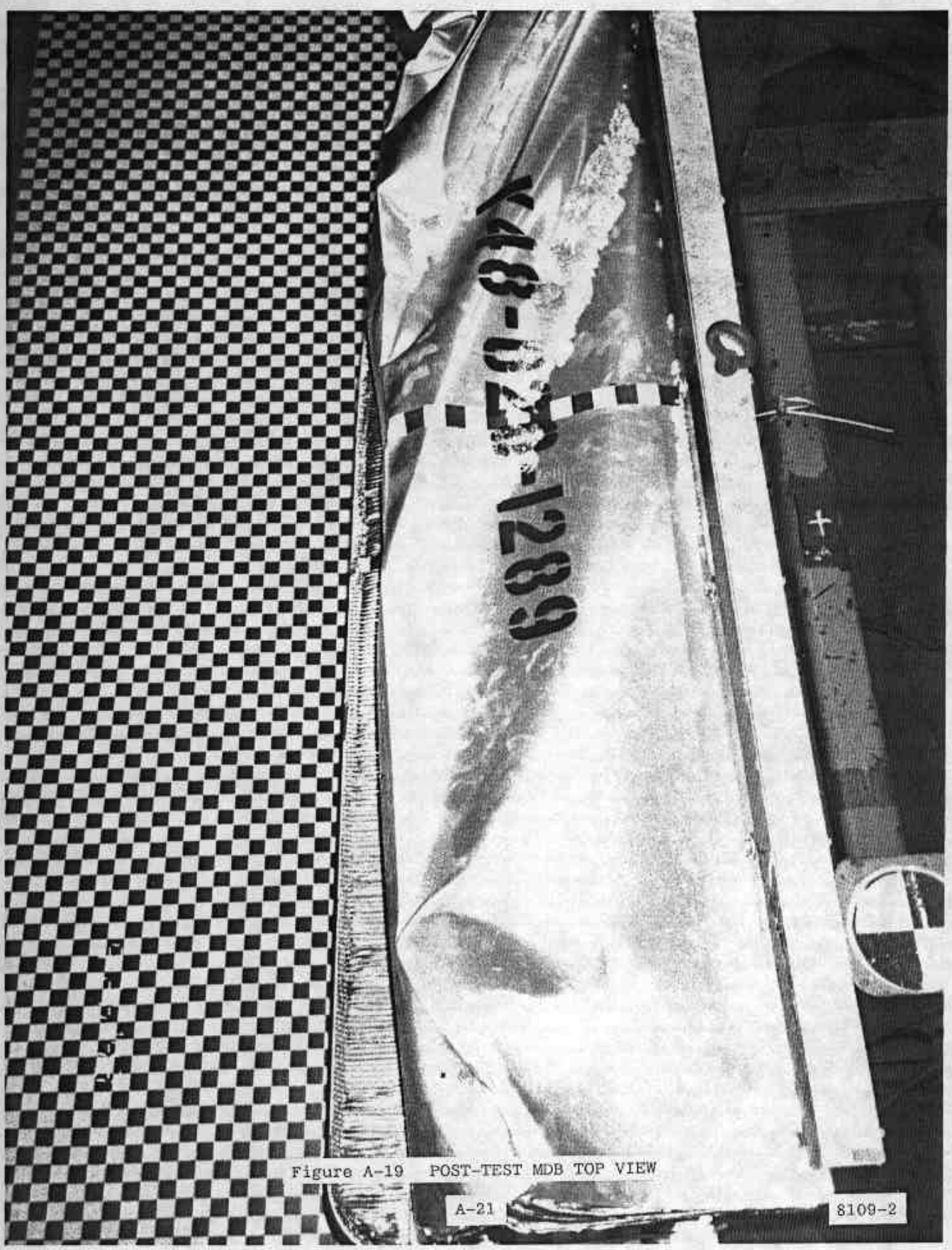


Figure A-19 POST-TEST MDB TOP VIEW

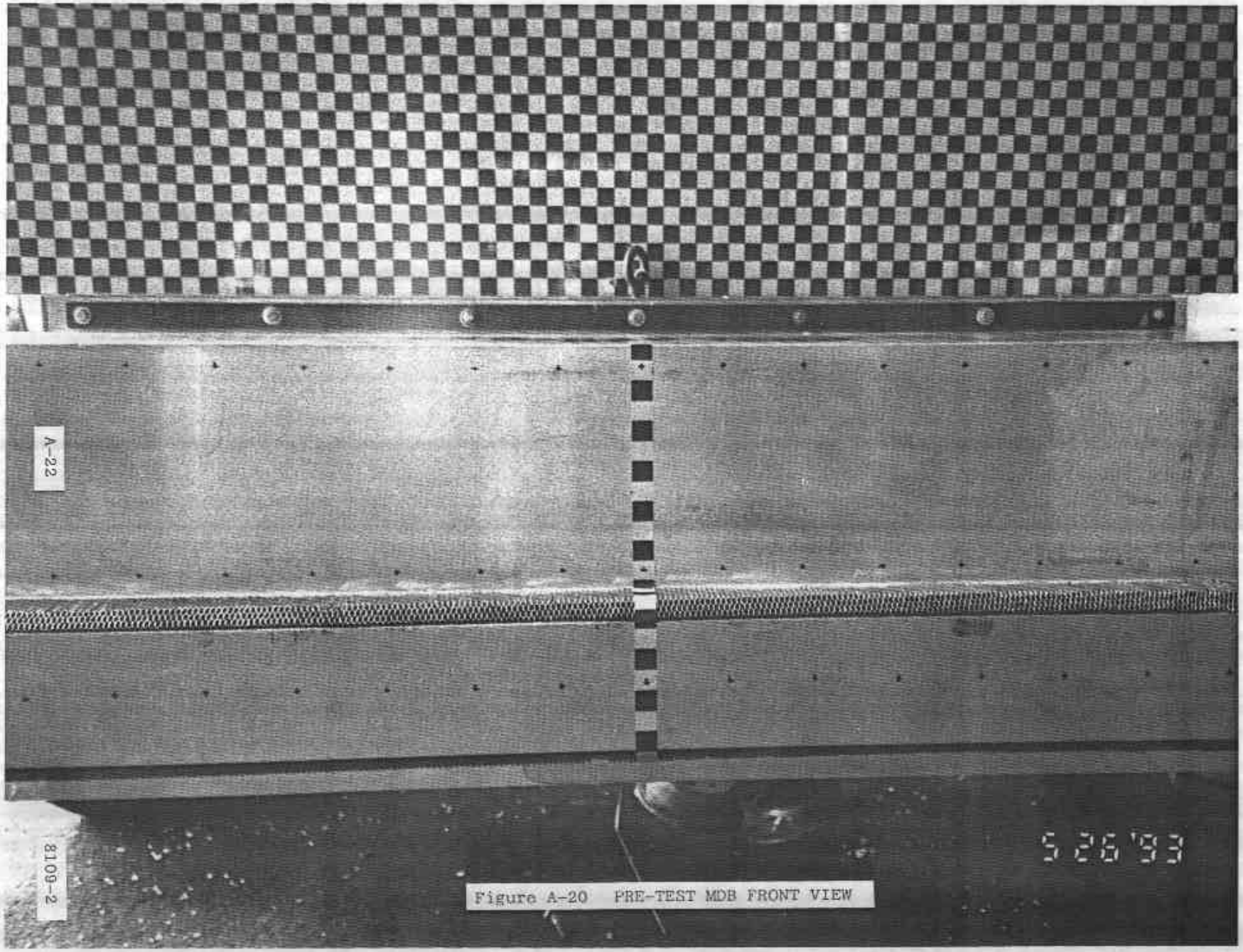


Figure A-20 PRE-TEST MDB FRONT VIEW

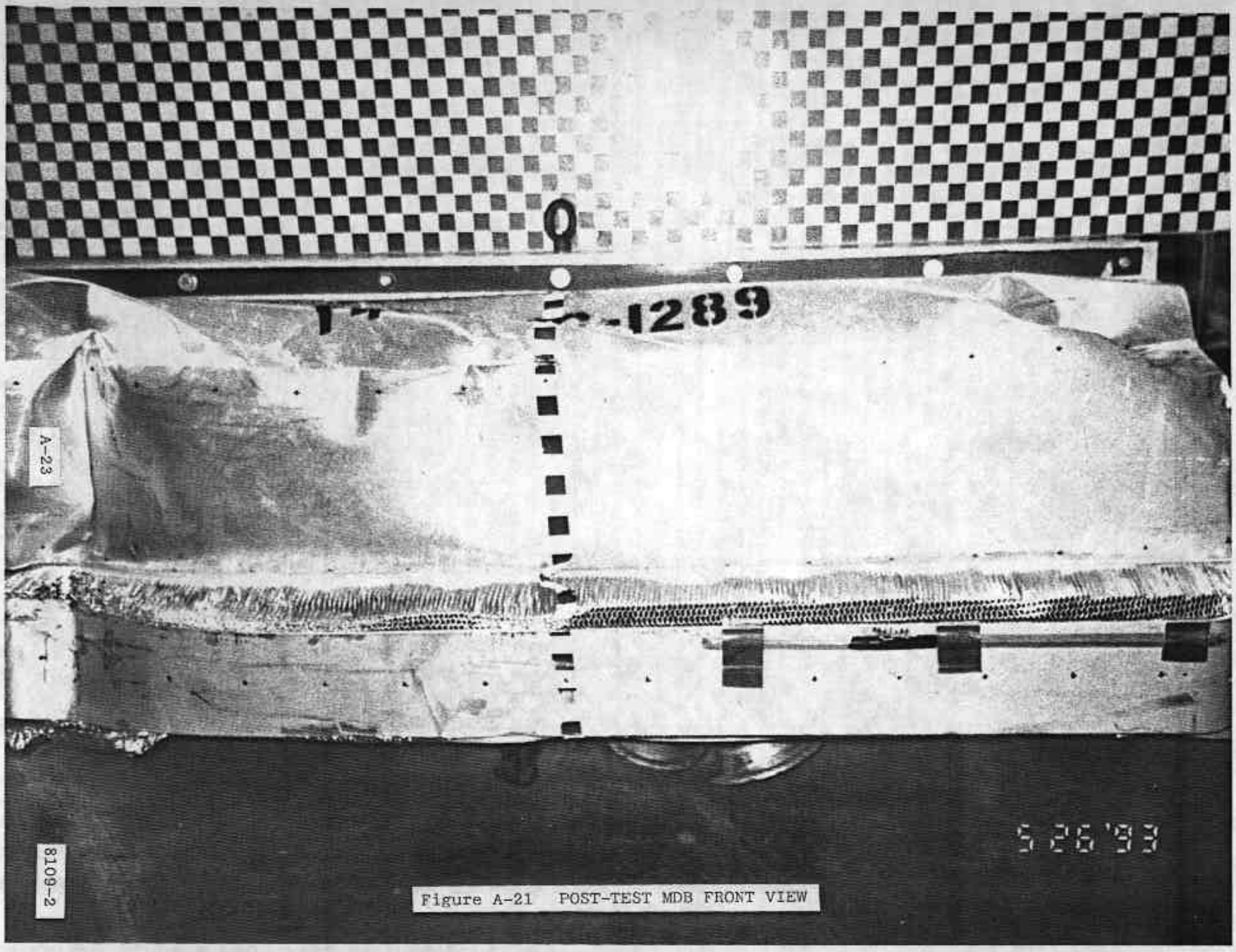


Figure A-21 POST-TEST MDB FRONT VIEW

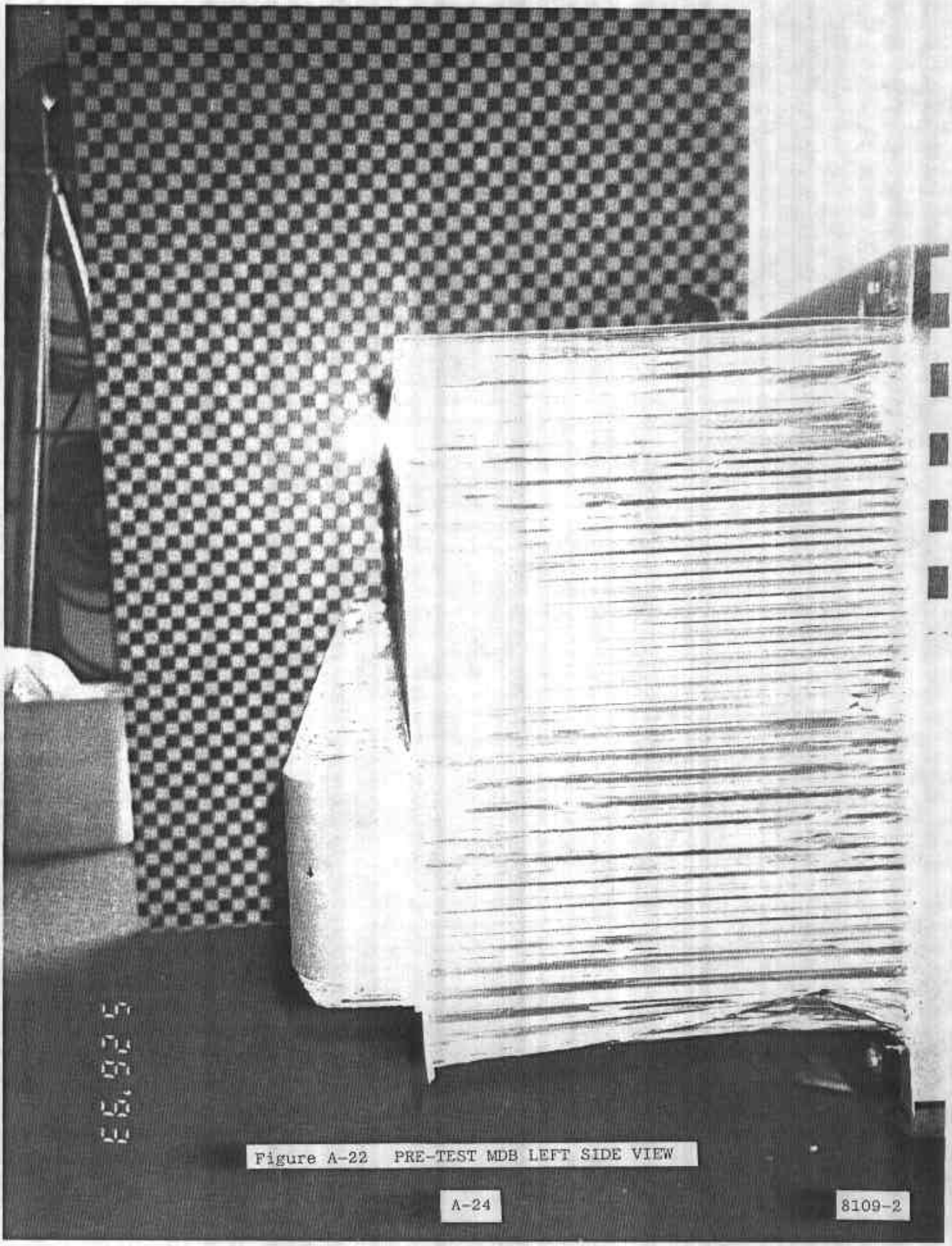


Figure A-22 PRE-TEST MDB LEFT SIDE VIEW

Figure A-23 POST-TEST MDB LEFT SIDE VIEW

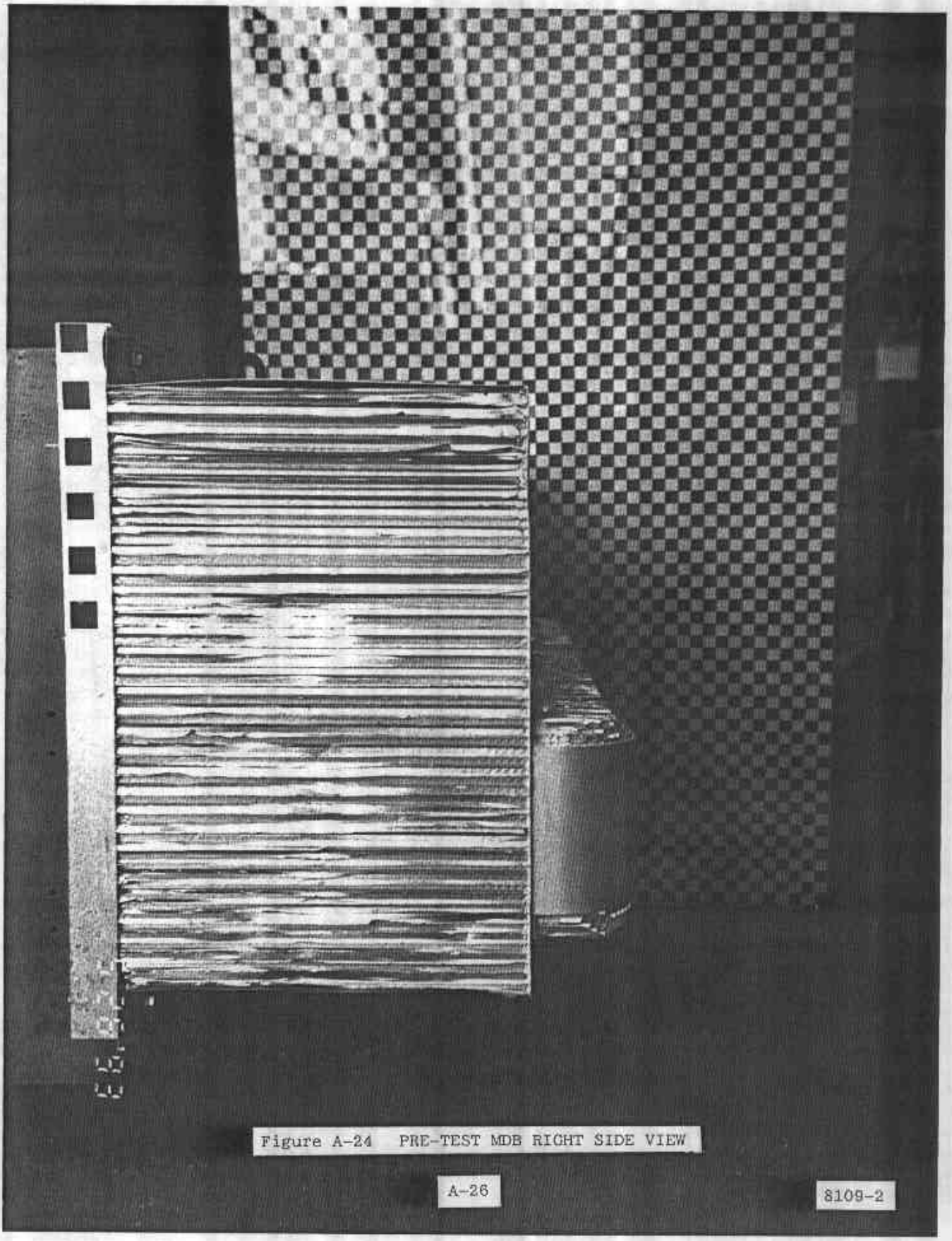


Figure A-24 PRE-TEST MDB RIGHT SIDE VIEW

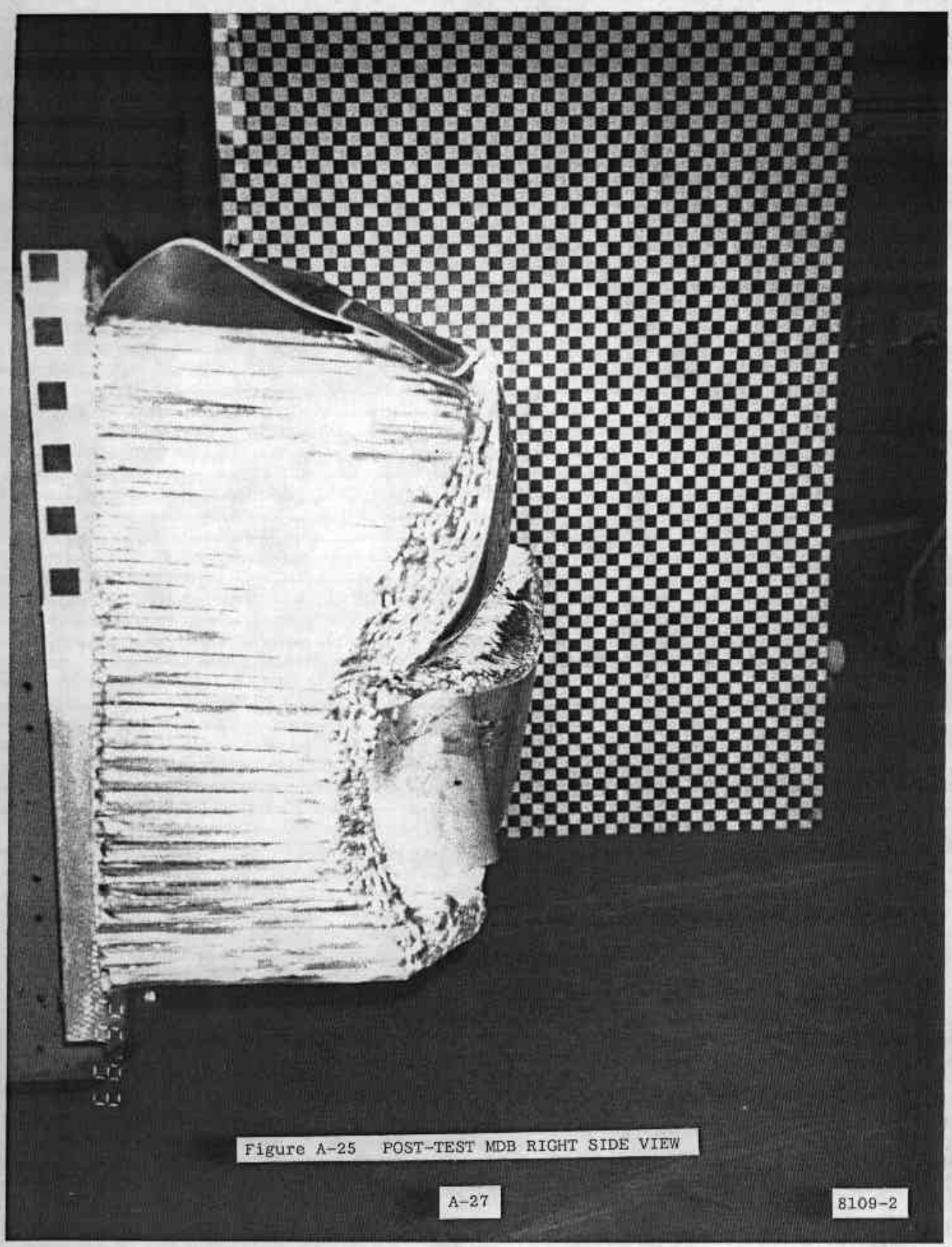


Figure A-25 POST-TEST MDB RIGHT SIDE VIEW

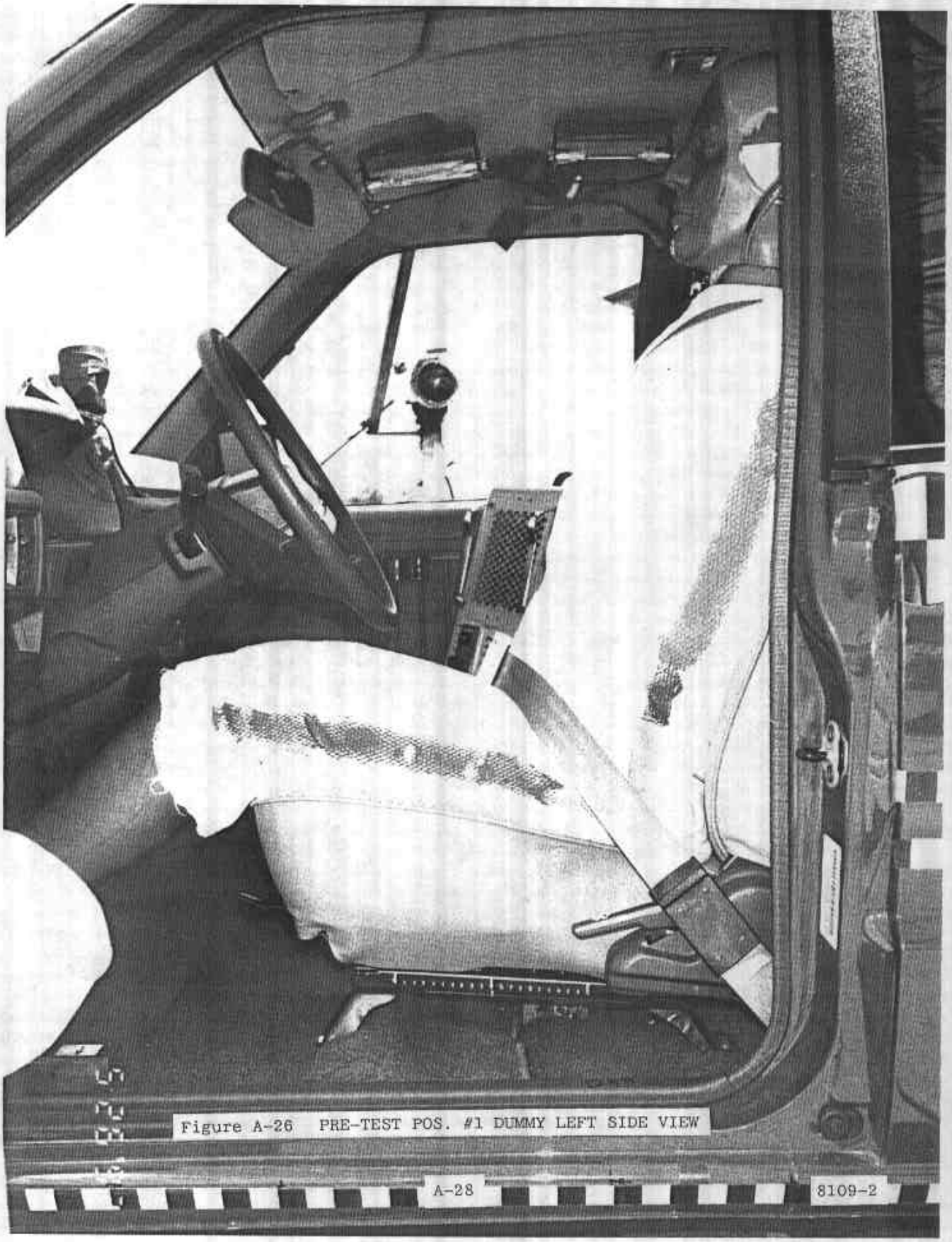


Figure A-26 PRE-TEST POS. #1 DUMMY LEFT SIDE VIEW

POST-TEST POS. #1 DUMMY LEFT SIDE VIEW

NOT AVAILABLE

Figure A-28 PRE-TEST POS. #1 DUMMY RIGHT SIDE VIEW

Figure A-29 POST-TEST POS. #1 DUMMY RIGHT SIDE VIEW

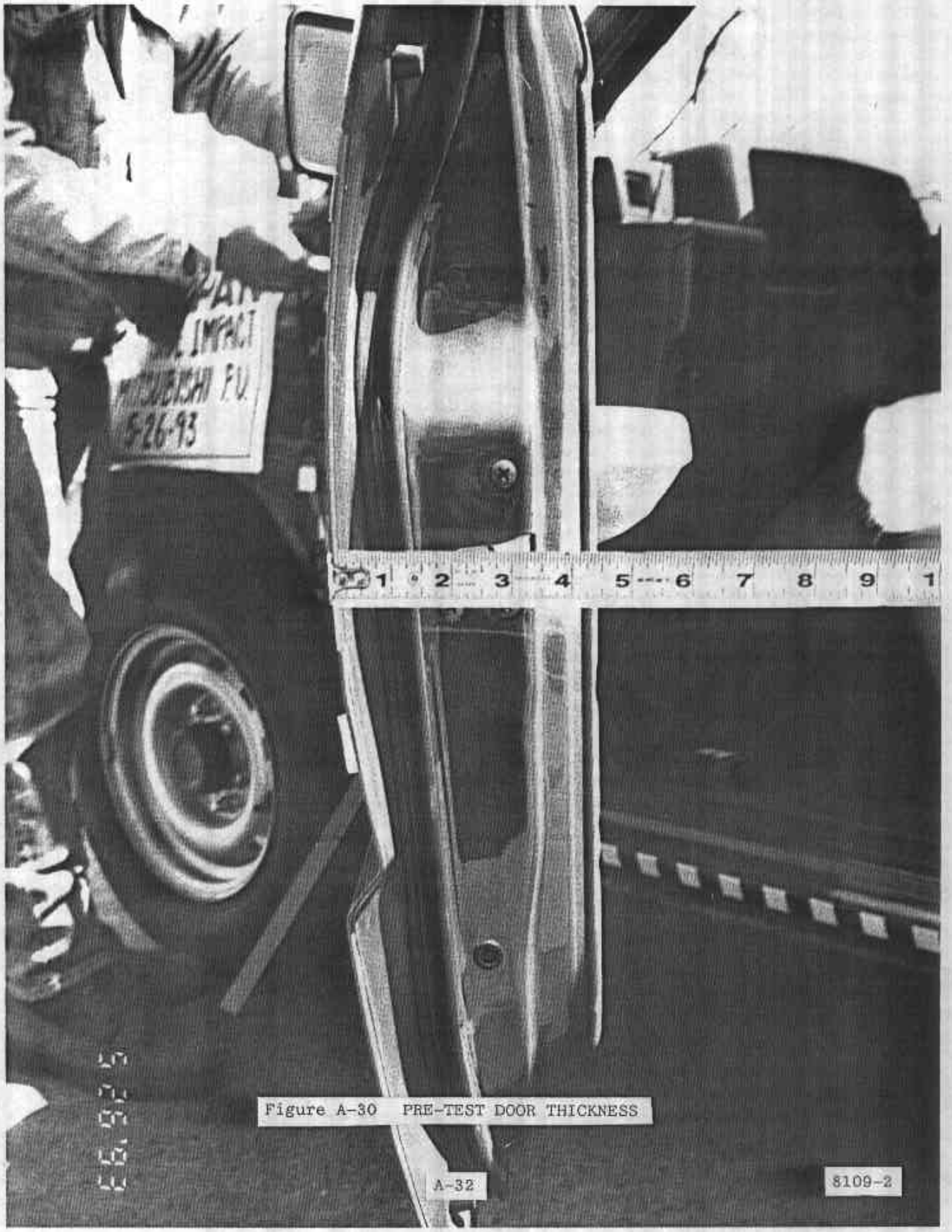


Figure A-30 PRE-TEST DOOR THICKNESS

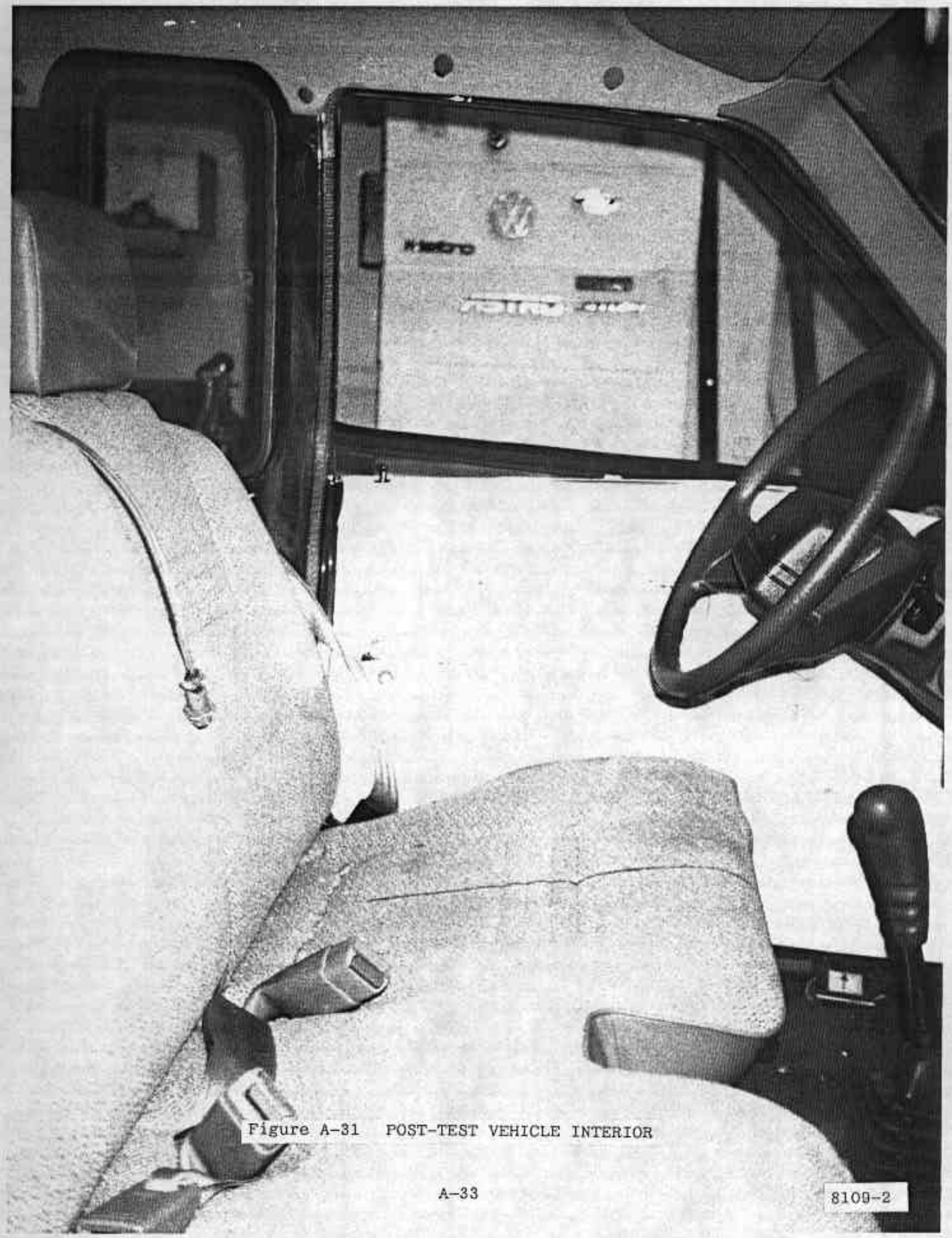


Figure A-31 POST-TEST VEHICLE INTERIOR

8109-2

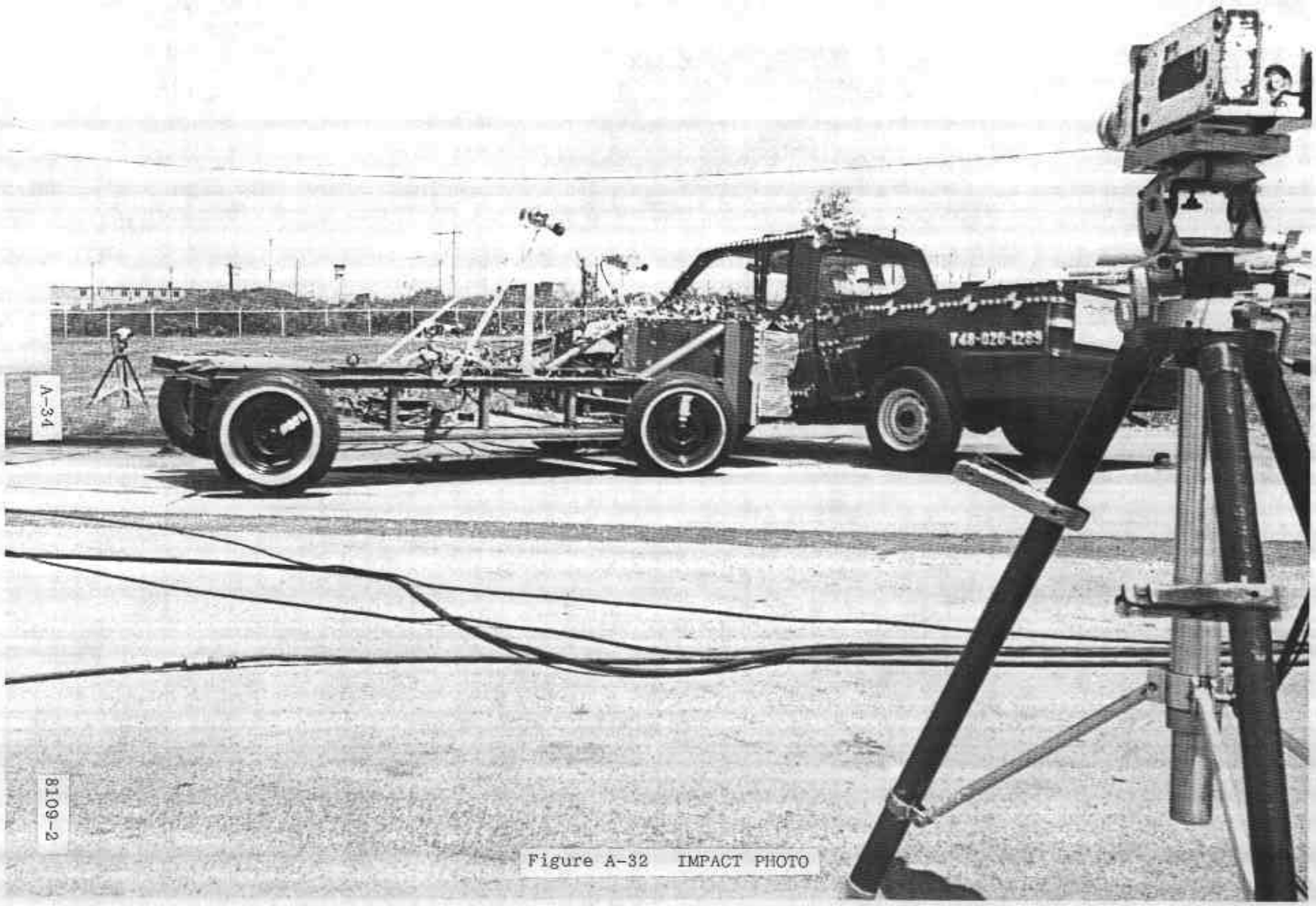


Figure A-32 IMPACT PHOTO

Appendix B

DATA PLOTS

All vehicle data and dummy head and chest deflection data were filtered following SAE J211b. Data from the Side Impact Dummies' thorax and pelvis were filtered in the following manner:

a. Filter the data with a 300 Hz SAE Class 180 filter;

b. Subsample the data to a 1600 Hz sampling rate; and

c. Filter the data with a Finite Impulse Response (FIR) filter having the following characteristics:

1.	Passband frequency	100 Hz
2.	Stopband frequency	189 Hz
3.	Stopband gain	-50 dB
4.	Passband ripple	0.0225 dB

FIR filtered data is so noted in this appendix.

POS 1. SID TEST DATA

FACILITY: TRACK TEST DATE: 26 May 1993
RUN #: 1289 TEST TIME: 11:36:25
SERIES #: 1 BOARD: A

TITLE: Side Impact 1 - 1993 Mitsubishi Pickup

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	P1 Head X	Gs	92.2	112.7	-28.2	39.0	1000.0
2	P1 Head Y	Gs	202.8	40.1	-11.3	31.6	1000.0
3	P1 Head Z	Gs	30.3	38.8	-28.9	45.7	1000.0
4	P1 Upper Rib Y	Gs	98.4	27.4	-24.9	77.0	1000.0
5	P1 Upper Rib Y(R)	Gs	90.1	27.4	-26.5	77.0	1000.0
6	P1 Lower Rib Y	Gs	85.2	25.7	-31.9	171.5	1000.0
7	P1 Lower Rib Y(R)	Gs	102.3	25.6	-28.9	171.5	1000.0
8	P1 Upper Spine Y	Gs	86.1	33.8	-38.5	66.6	1000.0
9	P1 Upper Spine Y(R)	Gs	80.3	33.1	-37.7	66.5	1000.0
10	P1 Lower Spine Y	Gs	123.7	31.1	-19.7	68.5	1000.0
11	P1 Lower Spine Y(R)	Gs	123.5	31.1	-25.3	68.5	1000.0
12	P1 Pelvic Y	Gs	113.1	27.6	-8.8	52.7	1000.0
13	P1 Pelvic Y(R)	Gs	112.5	28.1	-8.6	52.7	1000.0
14	P1 Lap Belt	Lbs	224.4	110.2	-42.8	51.4	60.0
15	P1 Torso Belt	Lbs	387.3	46.7	-1.0	5.5	60.0
16	NULL	Gs	.0	256.8	.0	256.8	1000.0
17	P1 Head Resultant	Gs	204.1	38.6	.1	-5.9	1000.0

36 ms Fixed Duration HIC SUMMARY: P1 Head Resultant

hic: 1288.50
t1 = 38.040 msec
t2 = 43.200 msec
Average G's Over Hic Duration = 144.20

FACILITY: TRACK TEST DATE: 26 May 1993

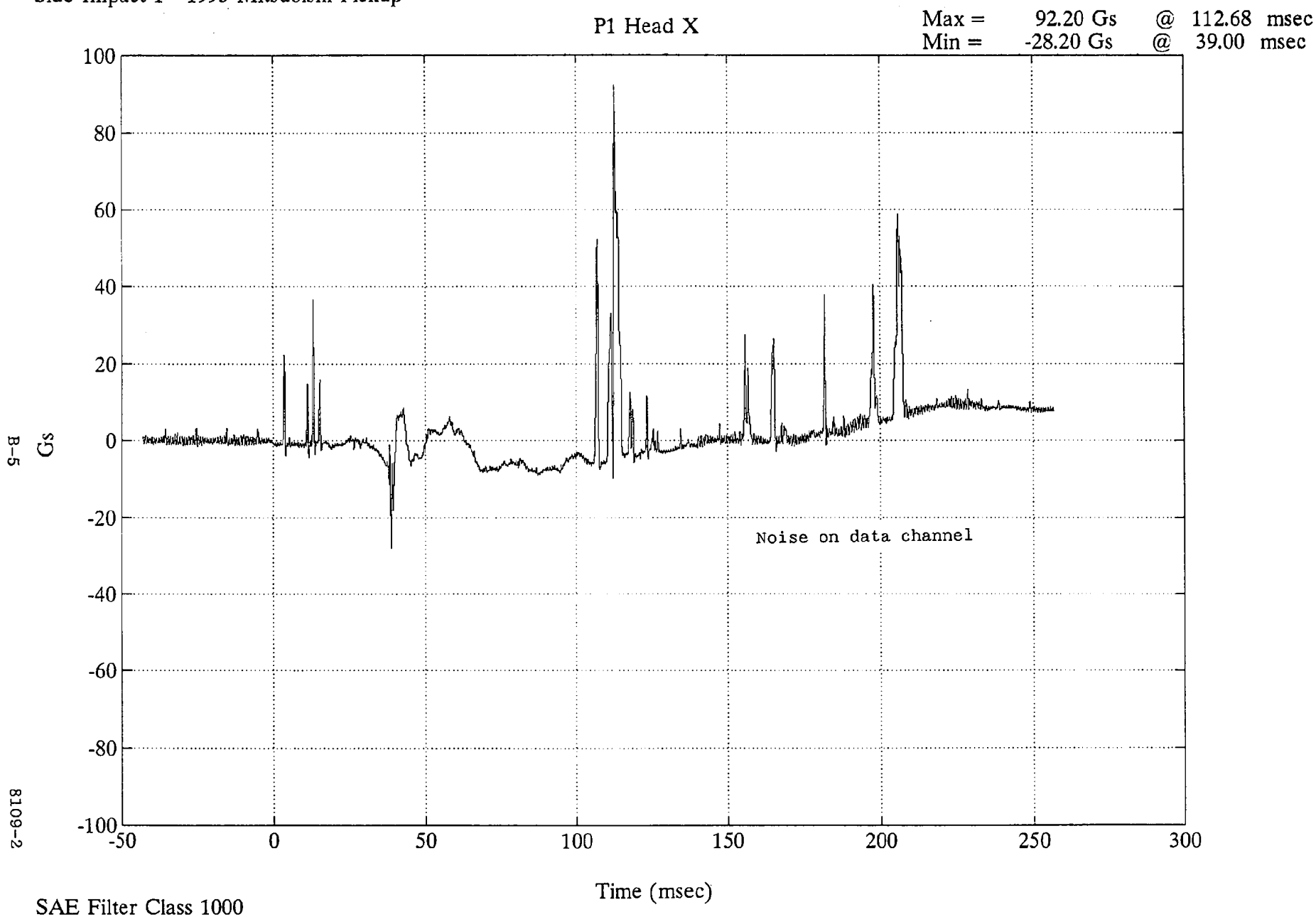
RUN #: 1289 TEST TIME: 11:36:25
SERIES #: 1 BOARD:

TITLE: Side Impact 1 - 1993 Mitsubishi Pickup

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
4	P1 Upper Rib Y	Gs	88.7243	26.3	-10.3541	76.3	FIR
5	P1 Upper Rib Y(R)	Gs	76.2973	26.9	-10.7156	76.9	FIR
6	P1 Lower Rib Y	Gs	75.9745	27.5	-14.8714	60.6	FIR
7	P1 Lower Rib Y(R)	Gs	84.0196	26.9	-16.0567	61.3	FIR
8	P1 Upper Spine Y	Gs	65.6220	33.8	-22.4921	66.9	FIR
9	P1 Upper Spine Y(R)	Gs	68.5870	33.8	-22.1720	67.5	FIR
10	P1 Lower Spine Y	Gs	115.5862	30.6	-11.2791	66.9	FIR
11	P1 Lower Spine Y(R)	Gs	118.4237	31.3	-15.8830	68.8	FIR
12	P1 Pelvic Y	Gs	104.9818	28.1	-6.2578	114.4	FIR
13	P1 Pelvic Y(R)	Gs	105.0076	28.1	-6.7941	115.0	FIR

Position 1 (driver) TTI = 102.2 Gs

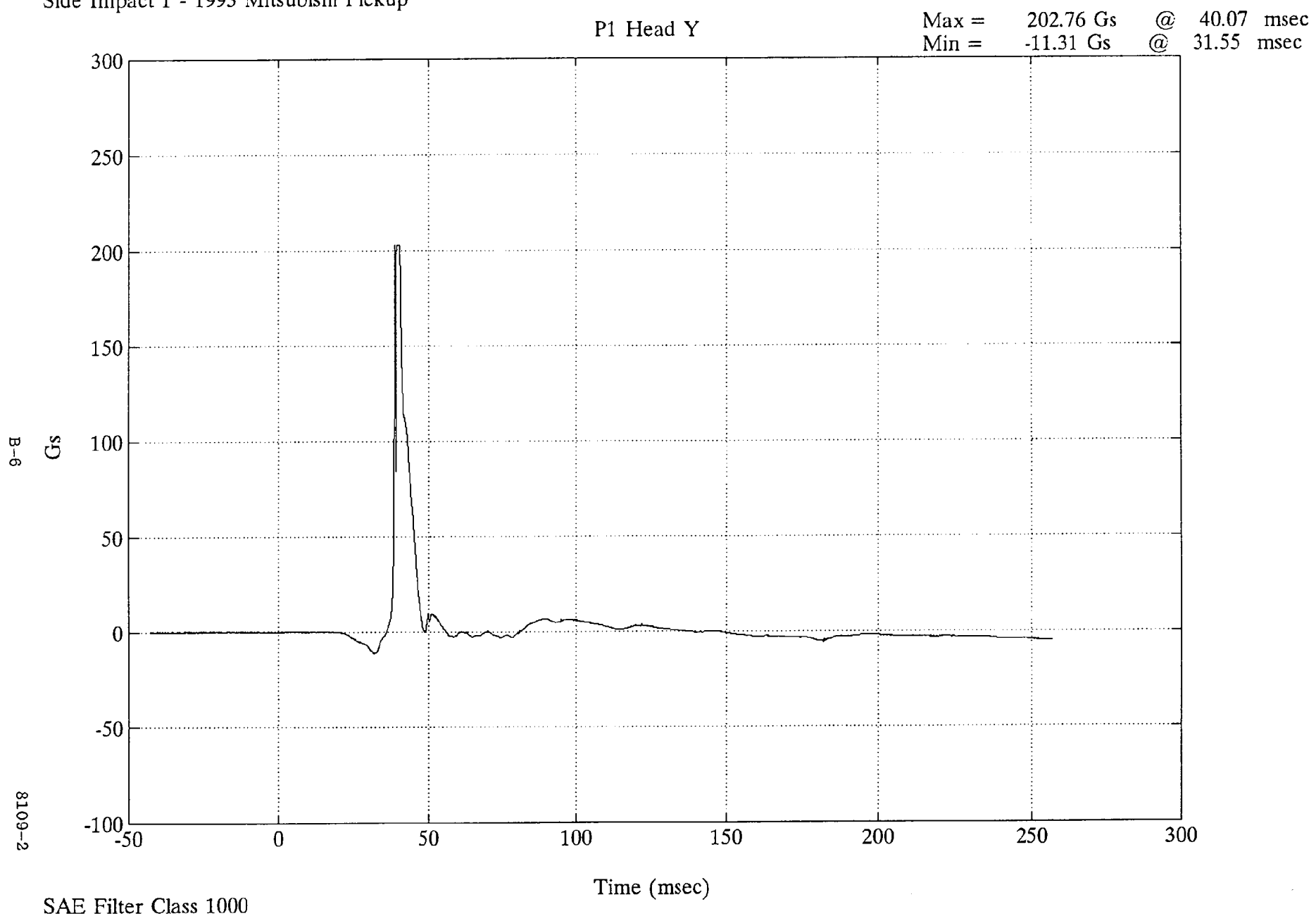
Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

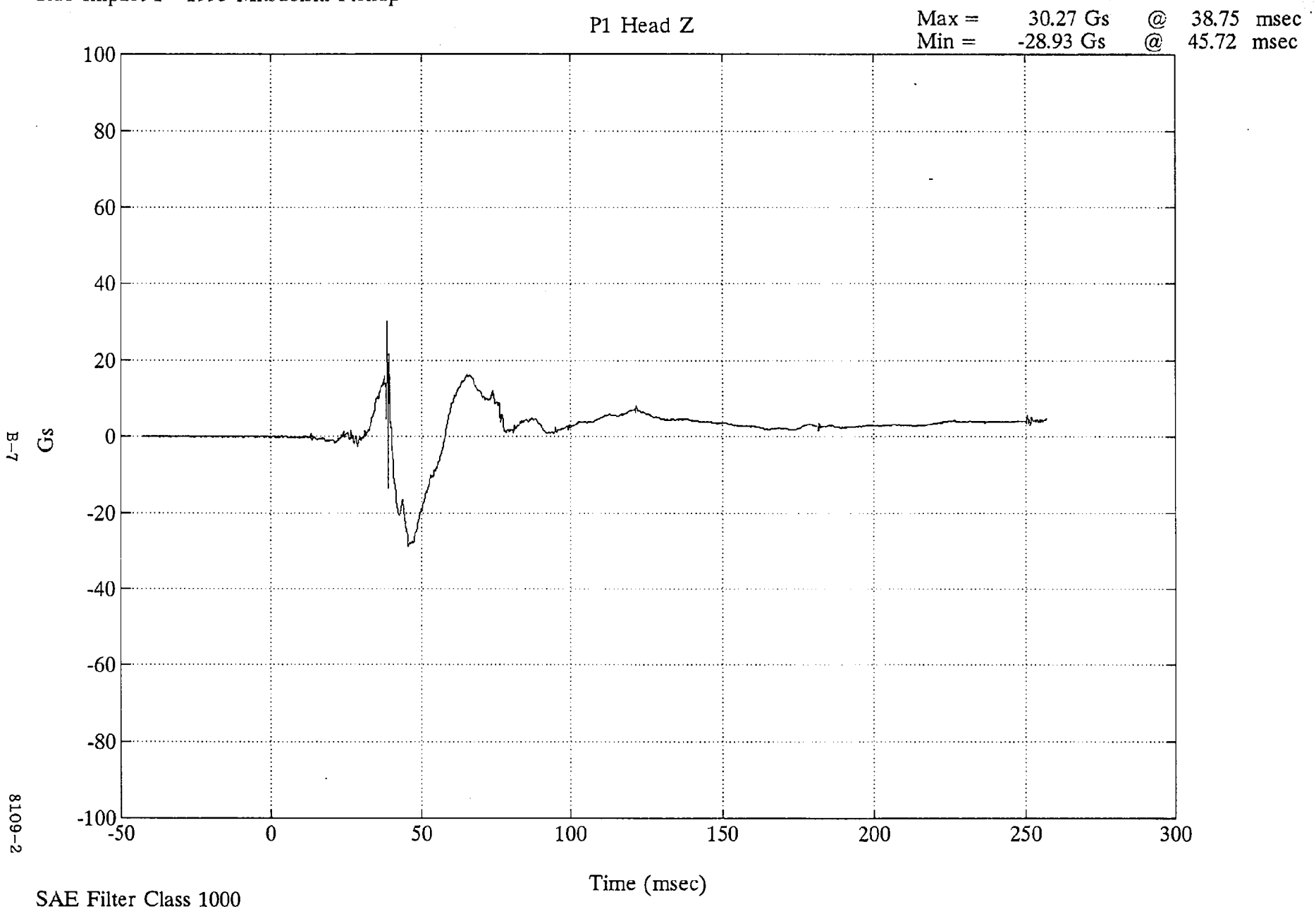
Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

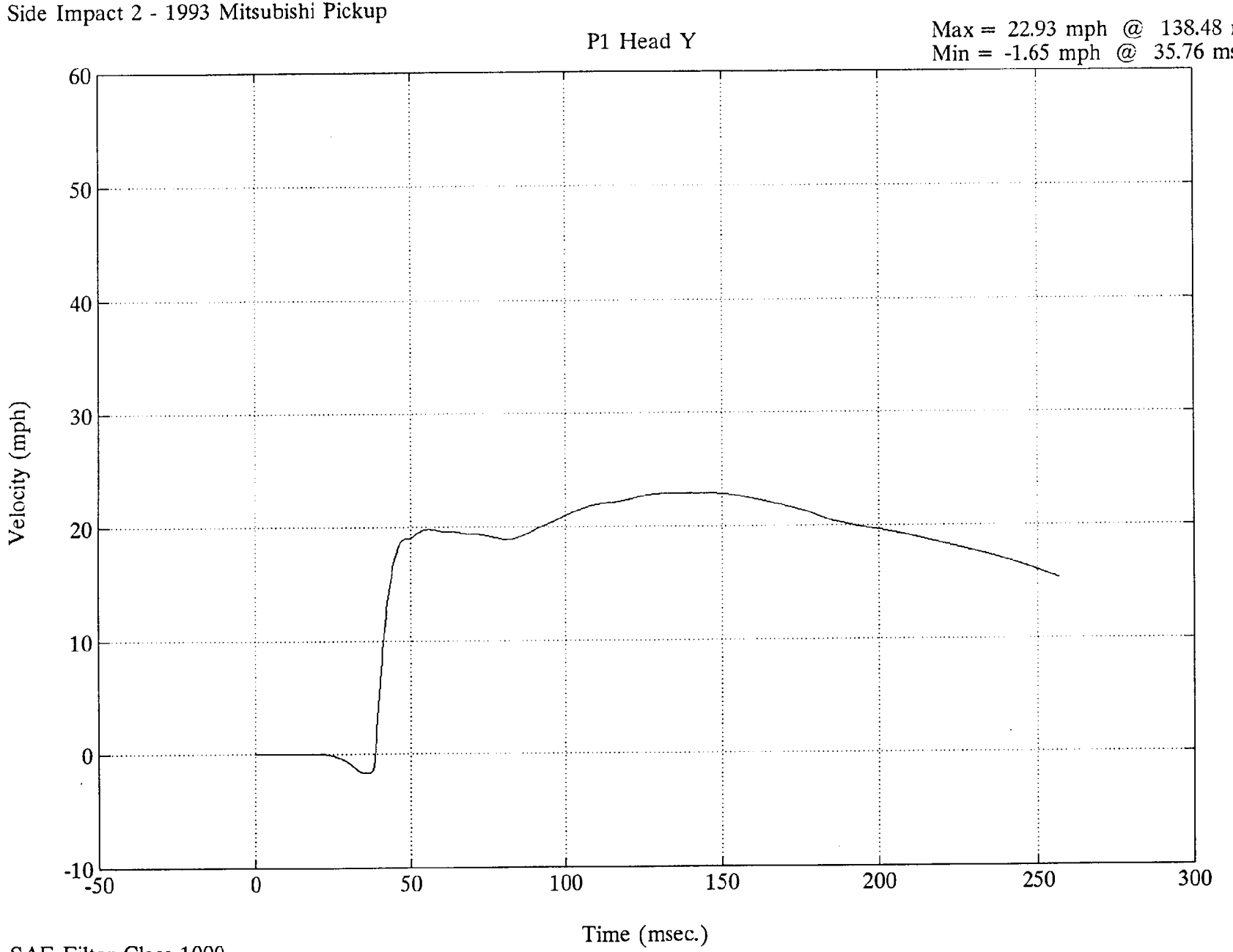
Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

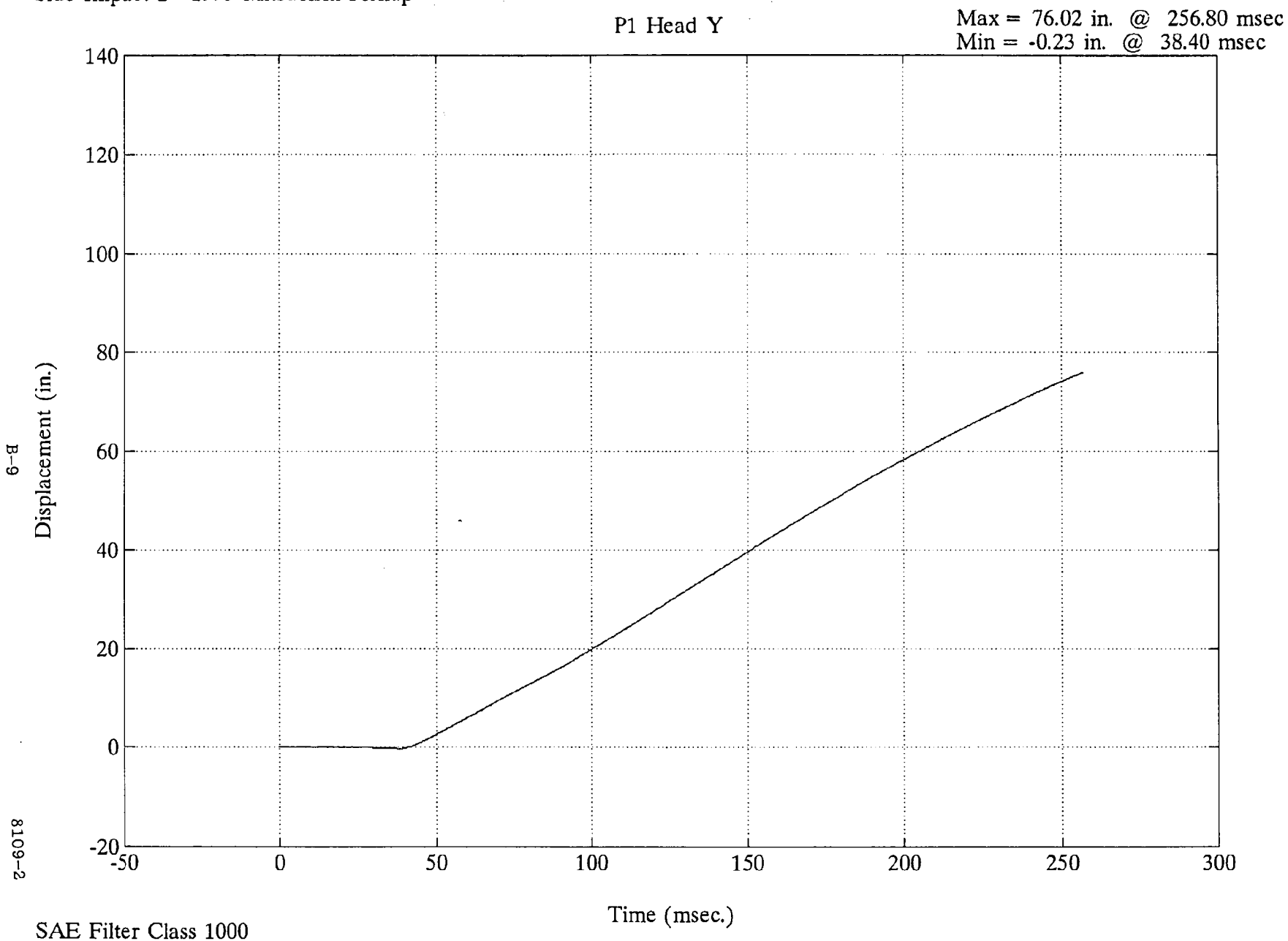
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

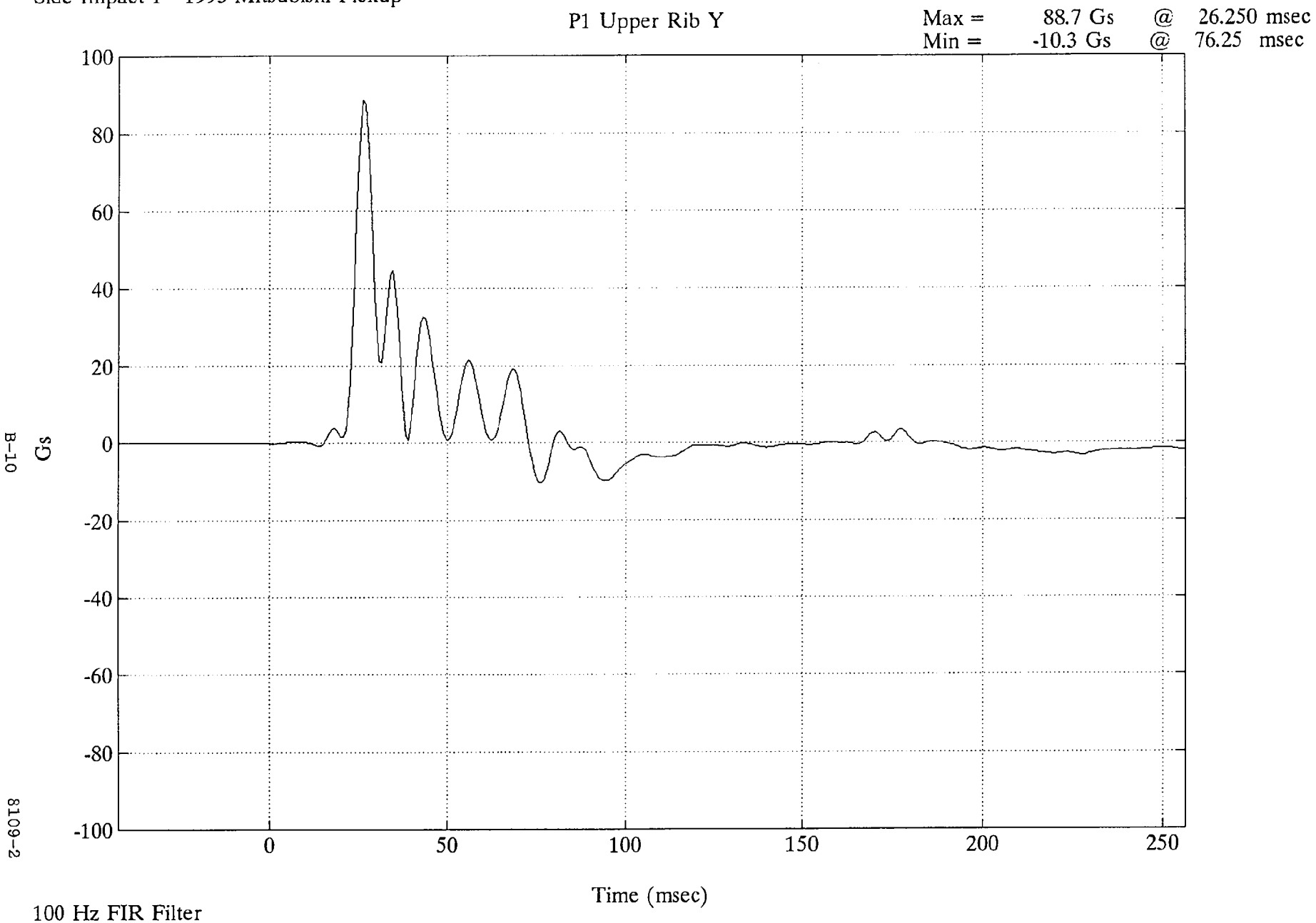
8109-2

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

Side Impact 1 - 1993 Mitsubishi Pickup

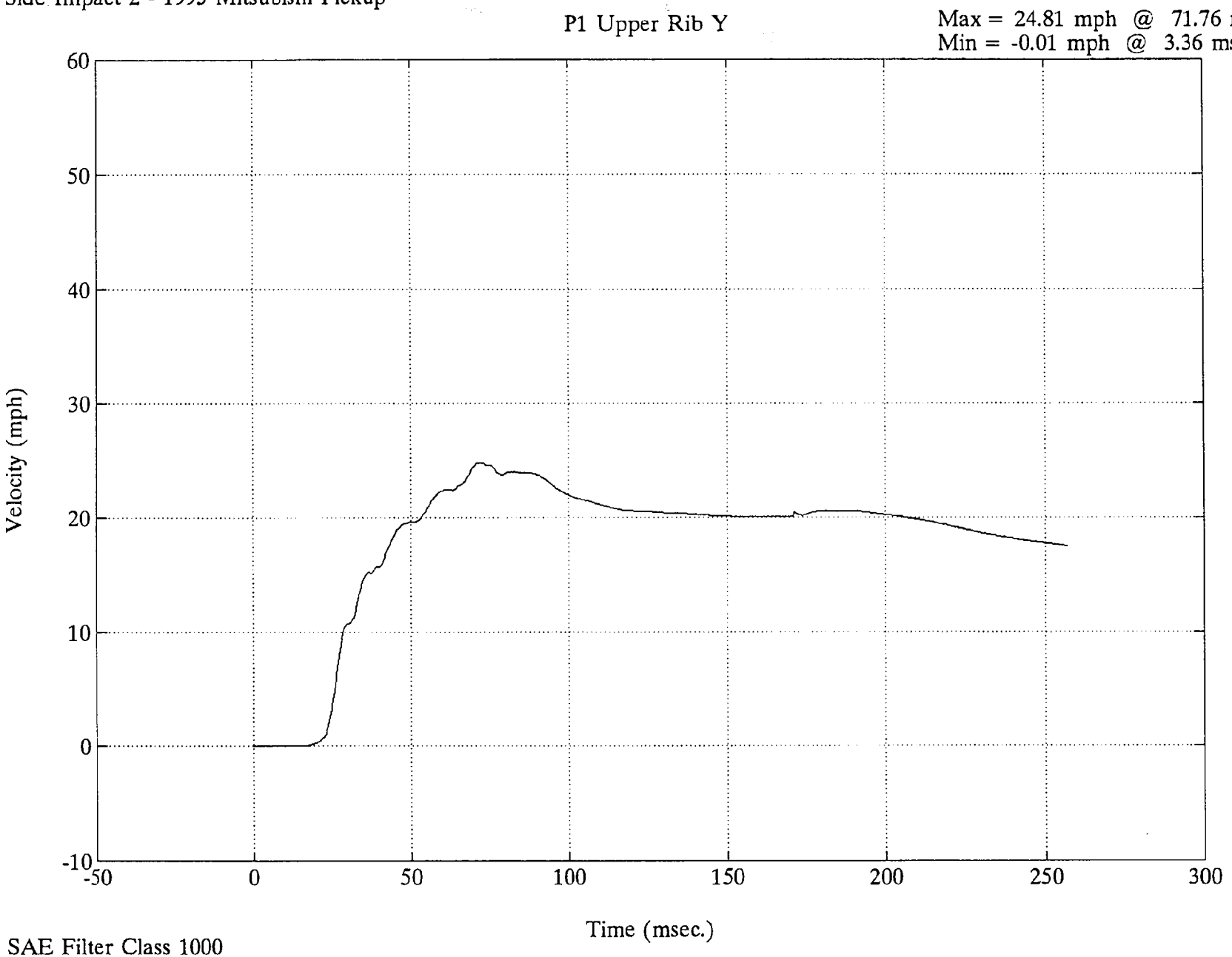


B-10

8109-2

100 Hz FIR Filter

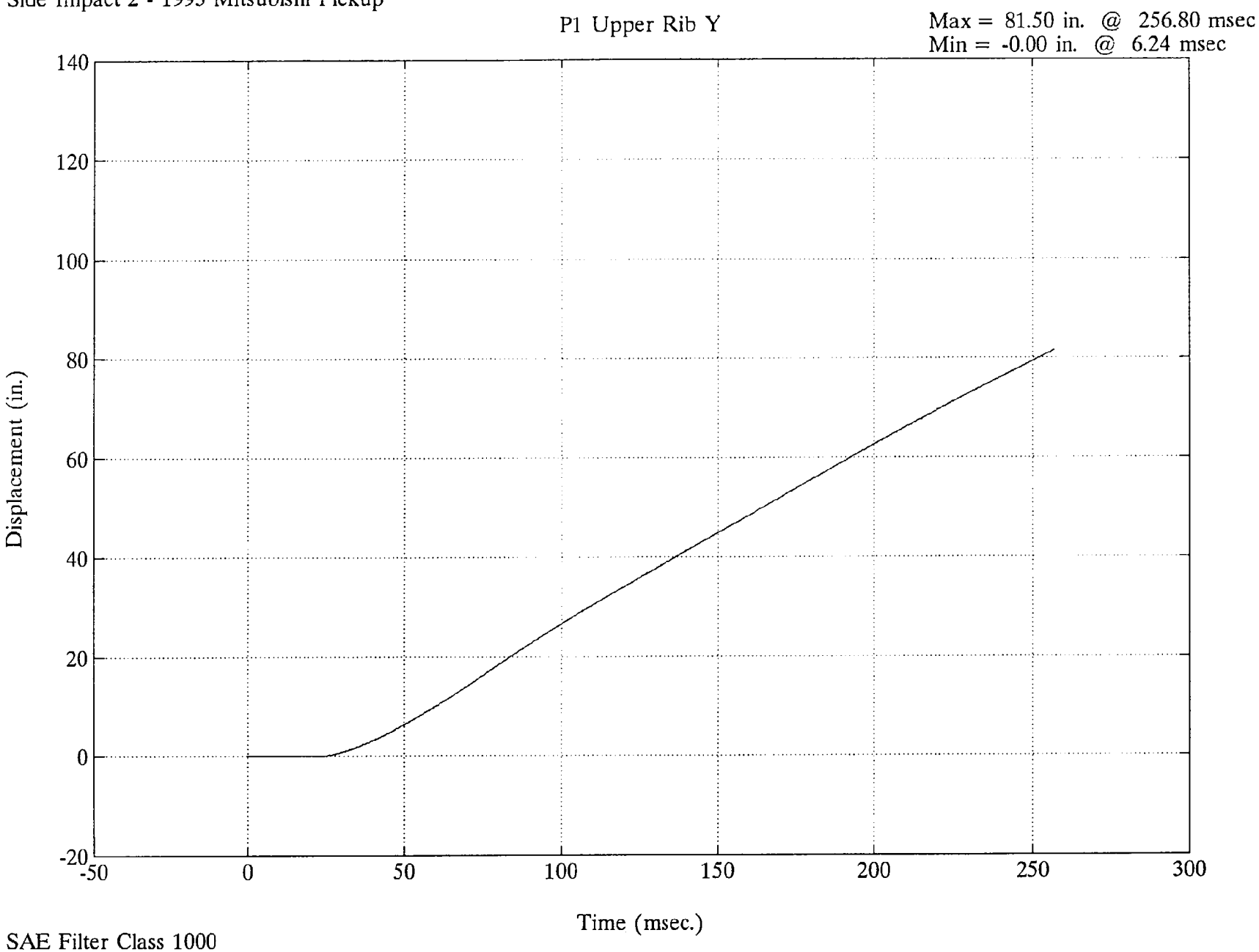
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

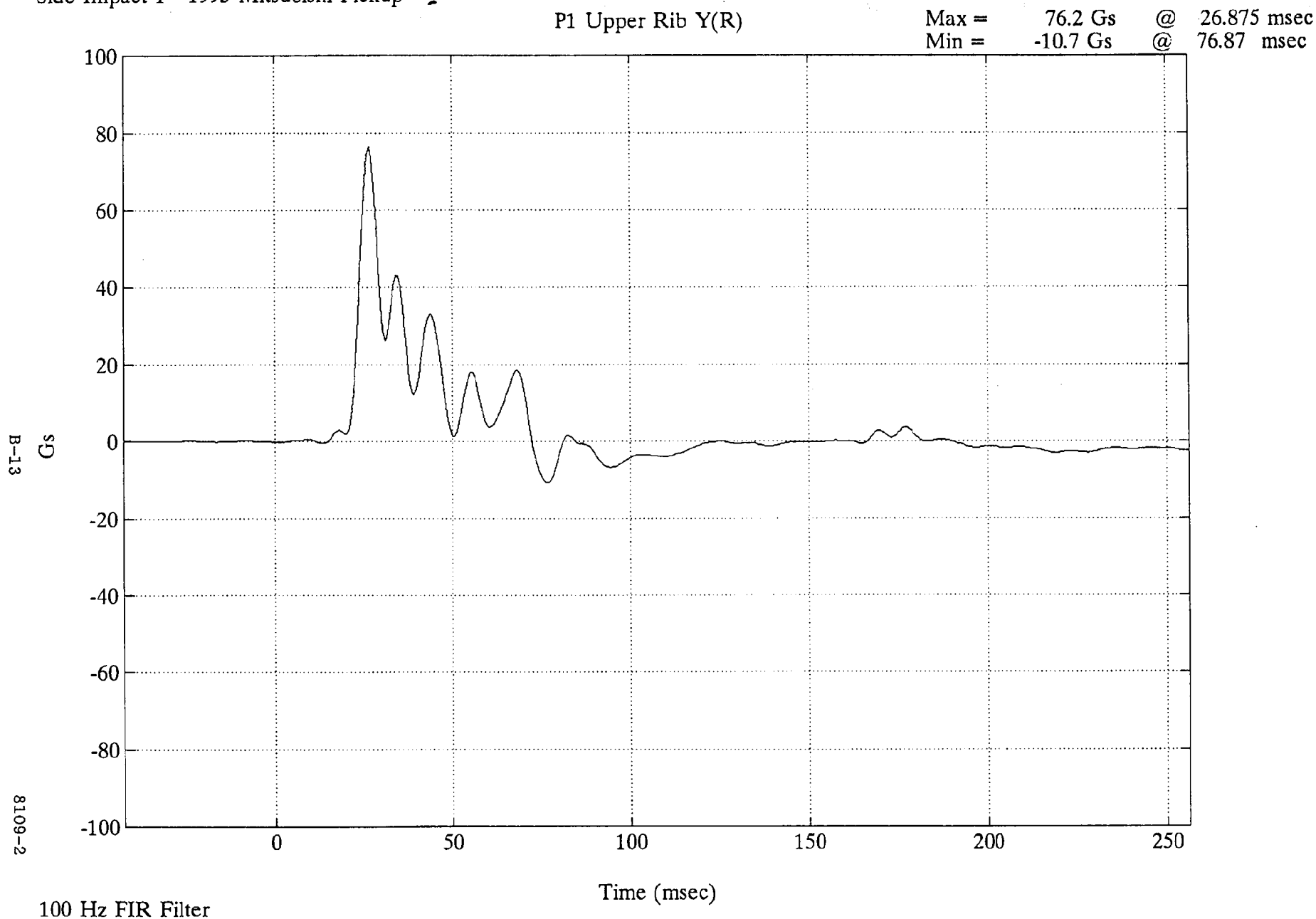
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

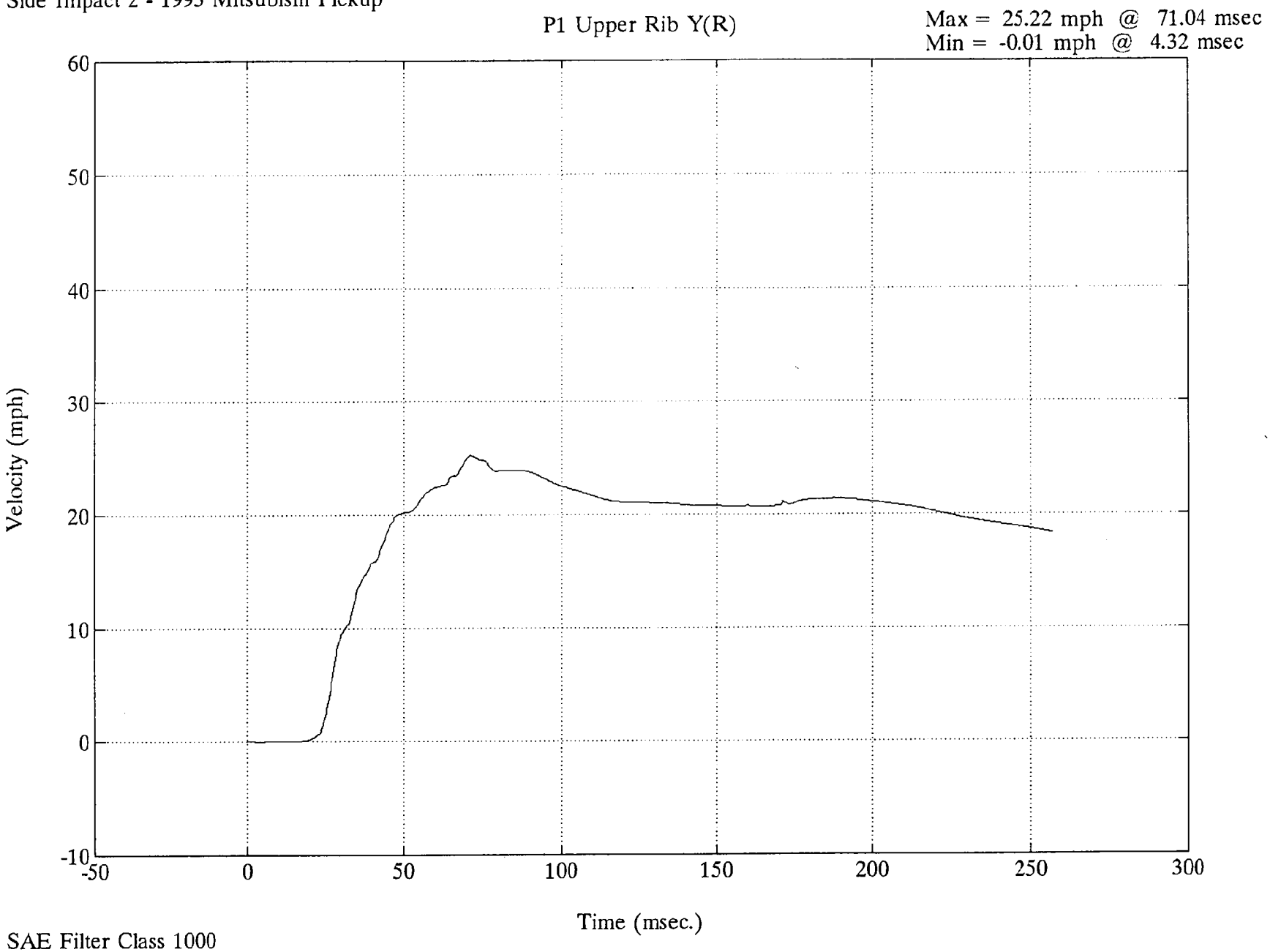
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



100 Hz FIR Filter

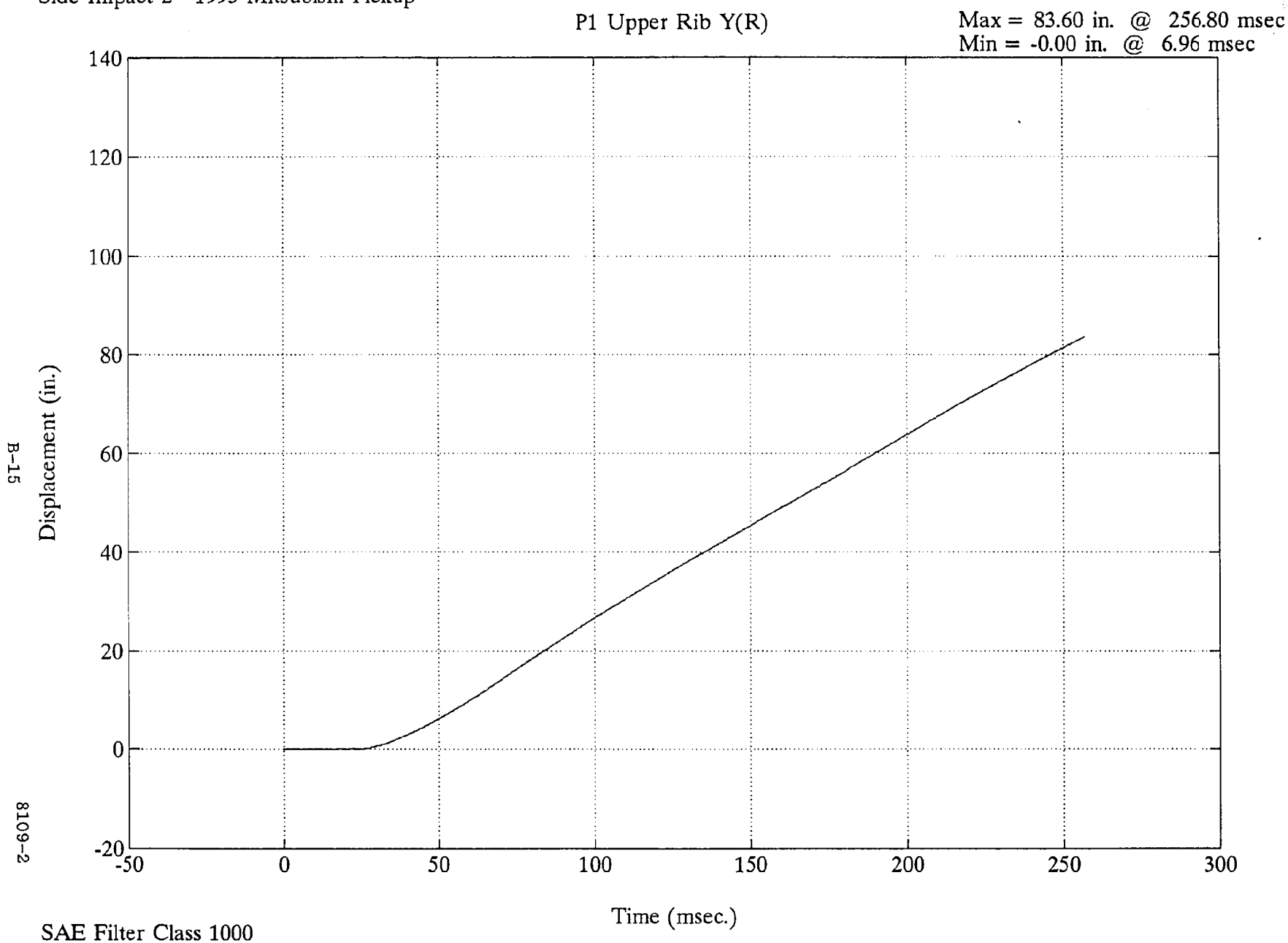
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

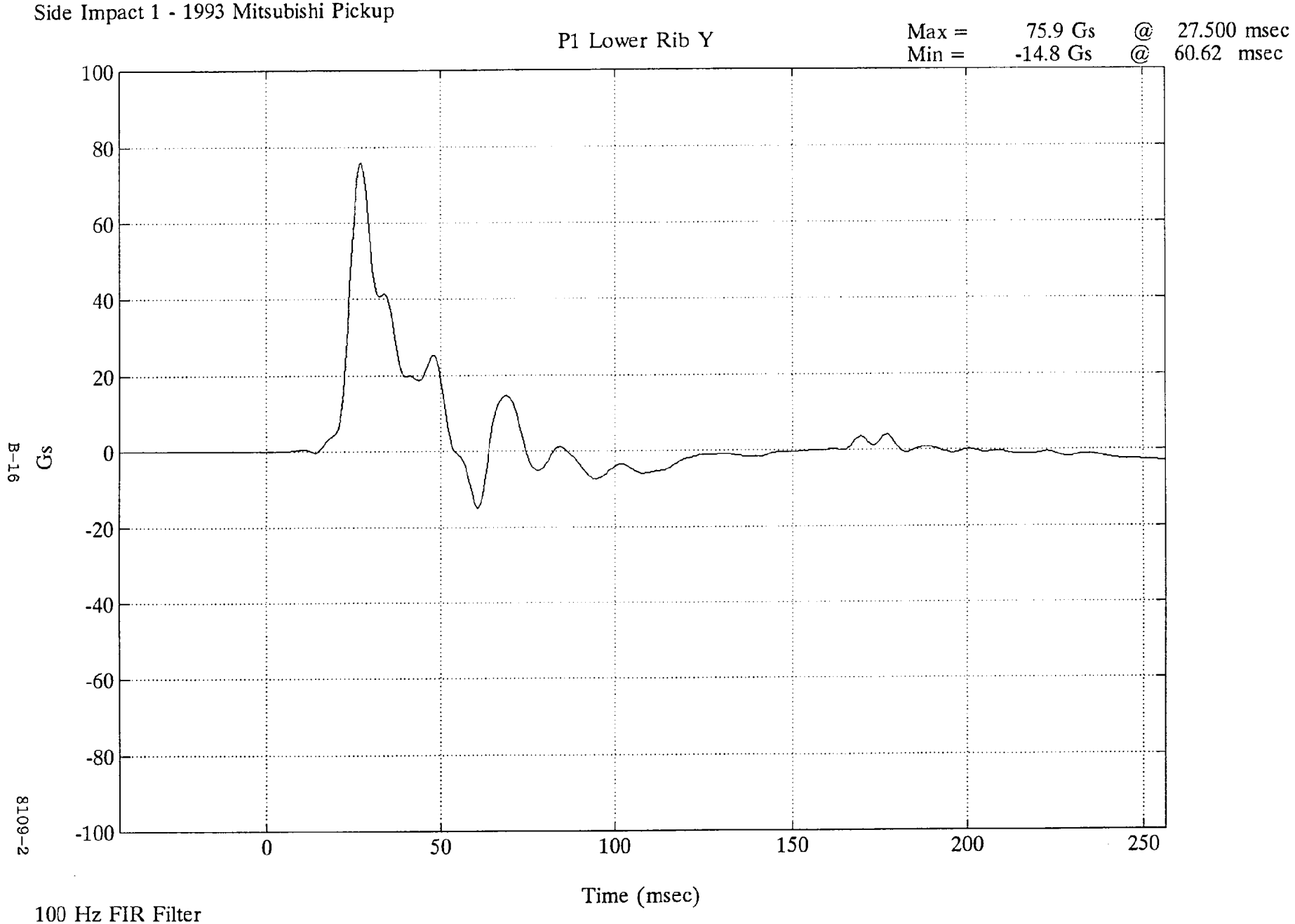
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

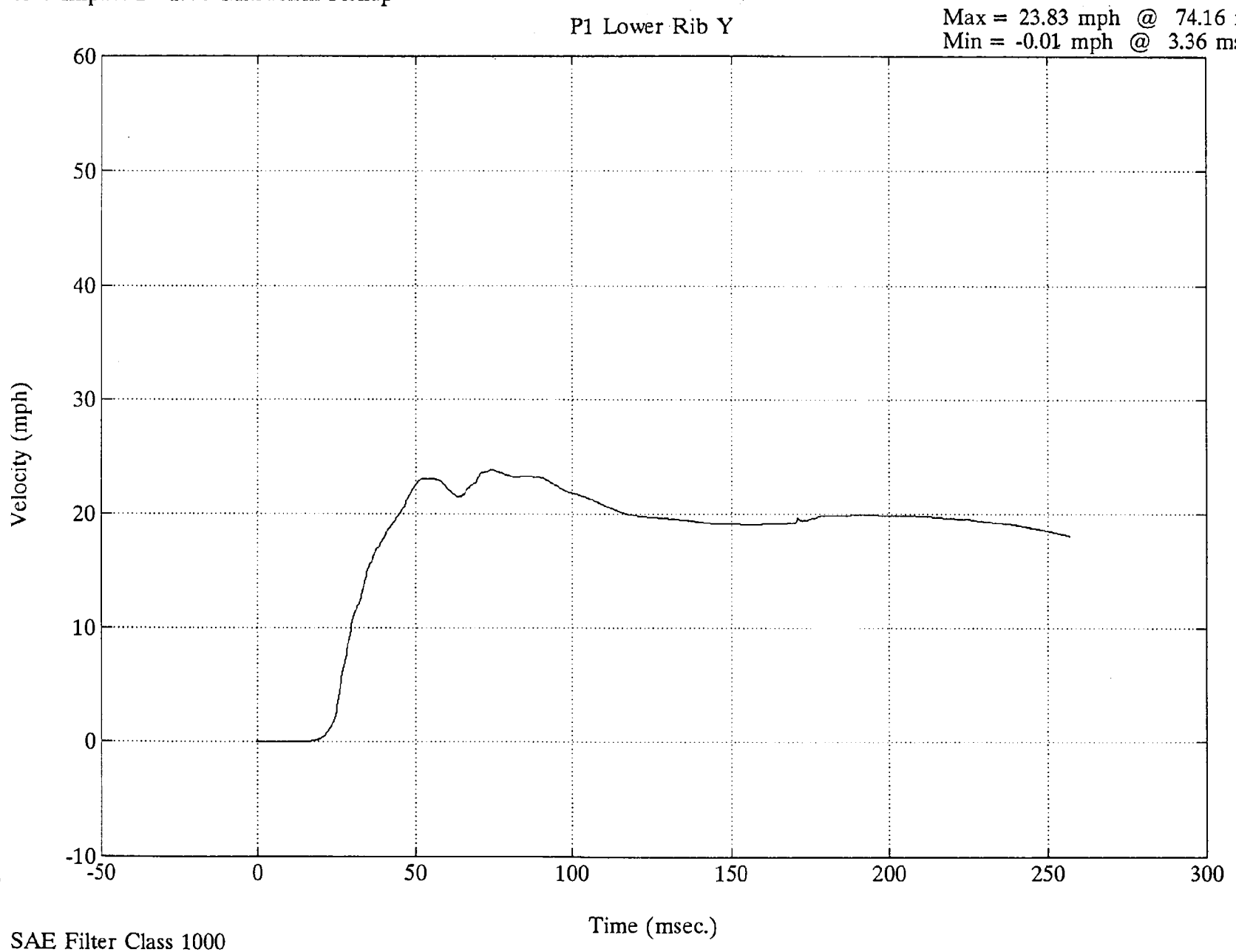
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



100 Hz FIR Filter

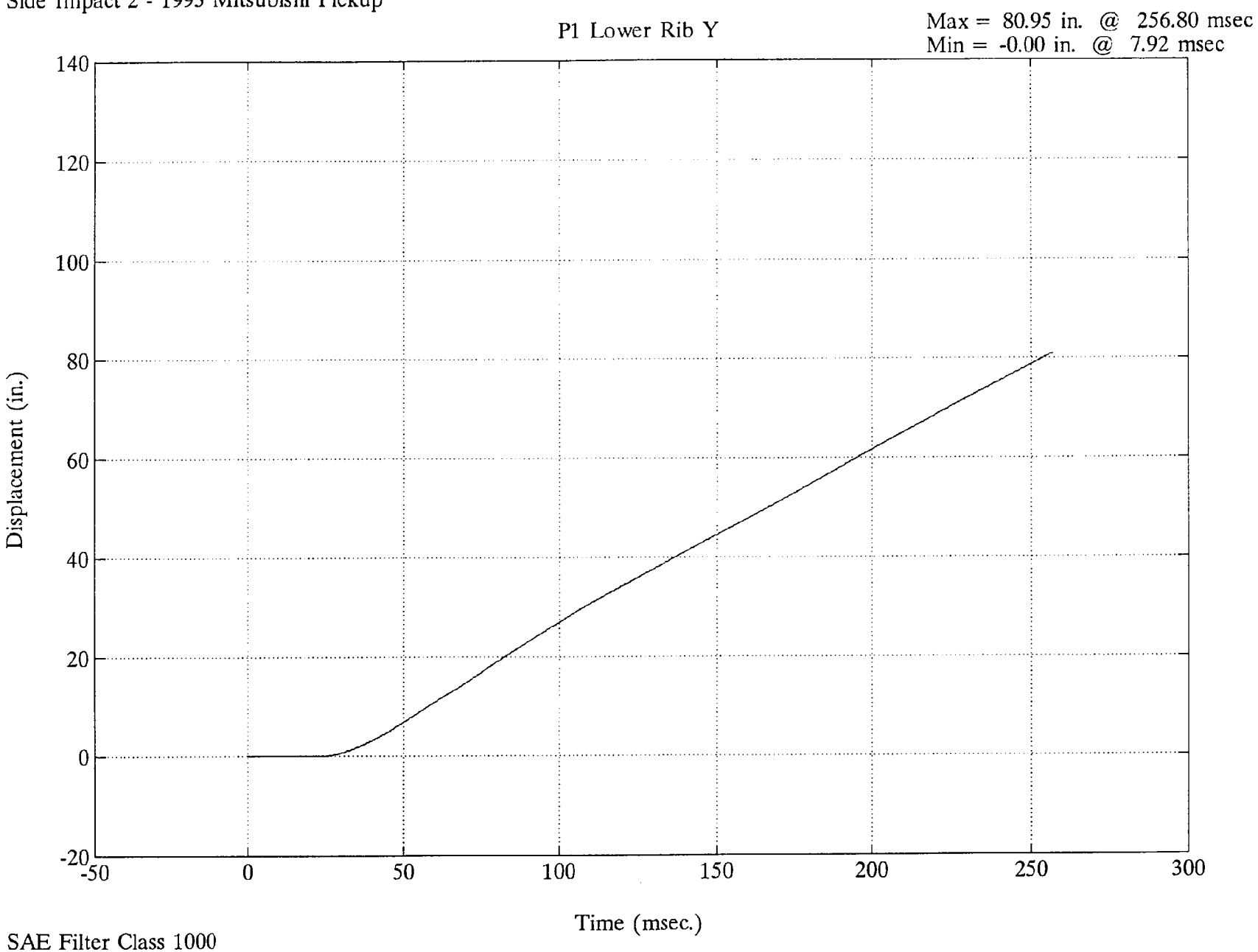
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

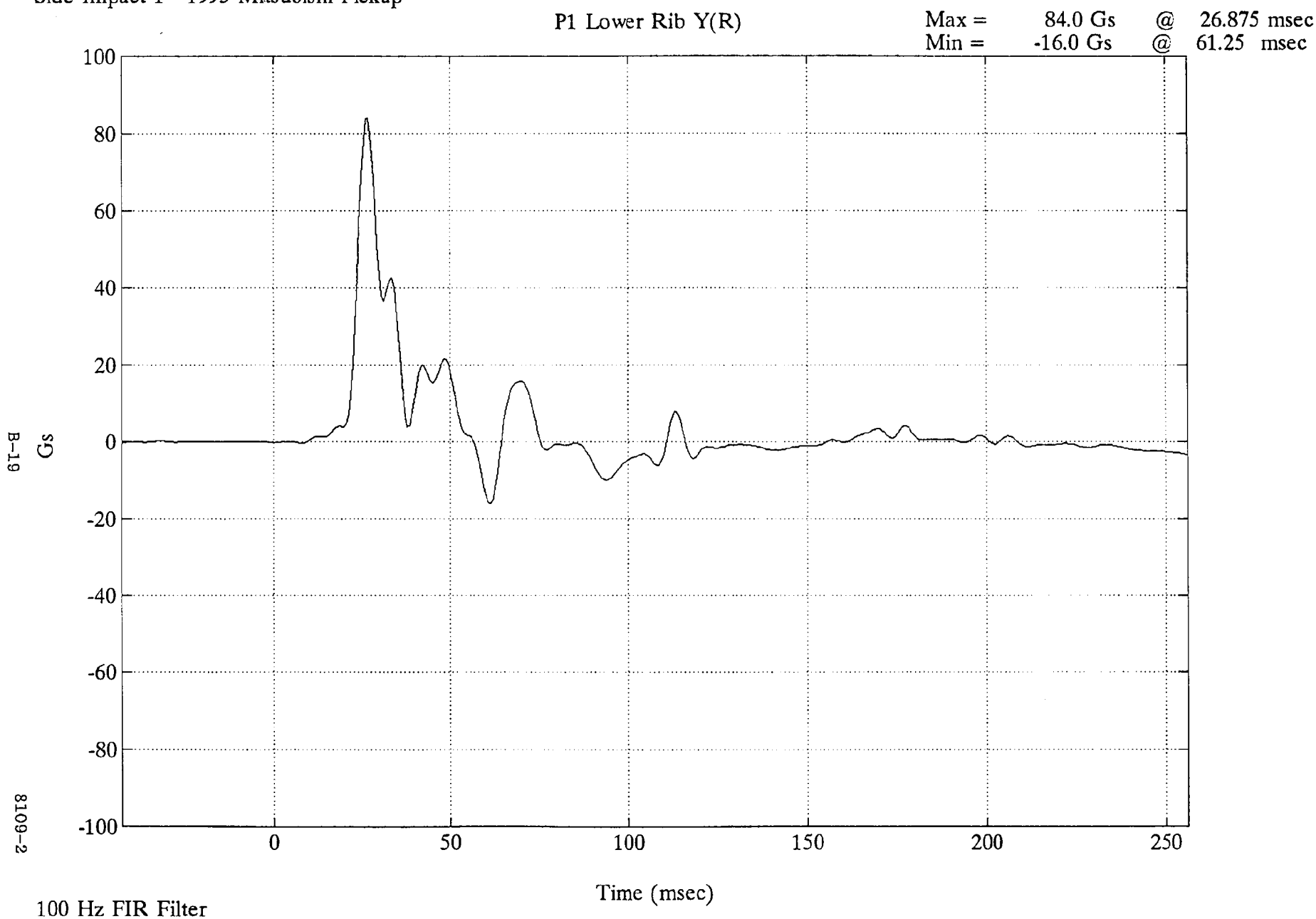
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

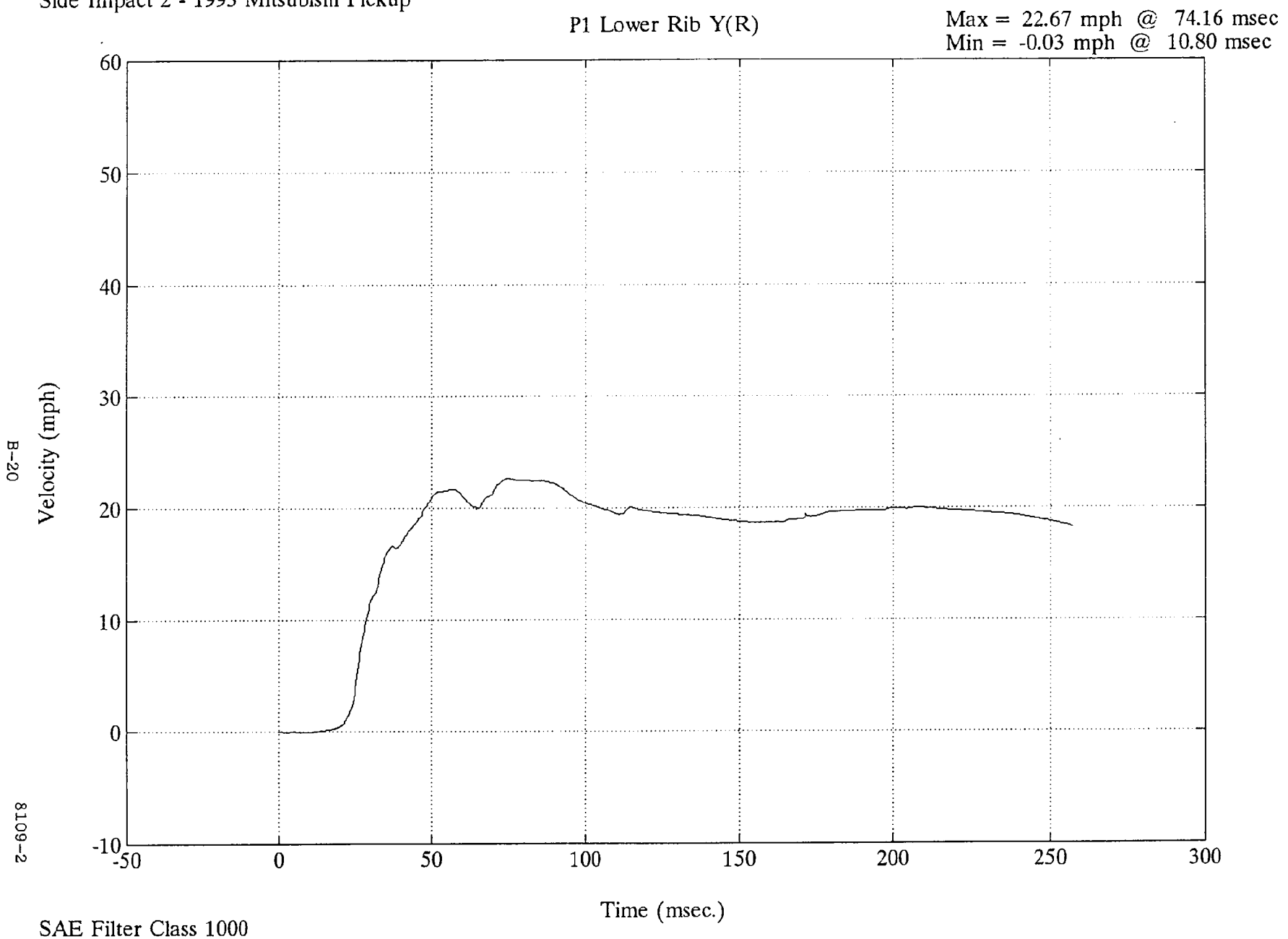


B-19

8109-2

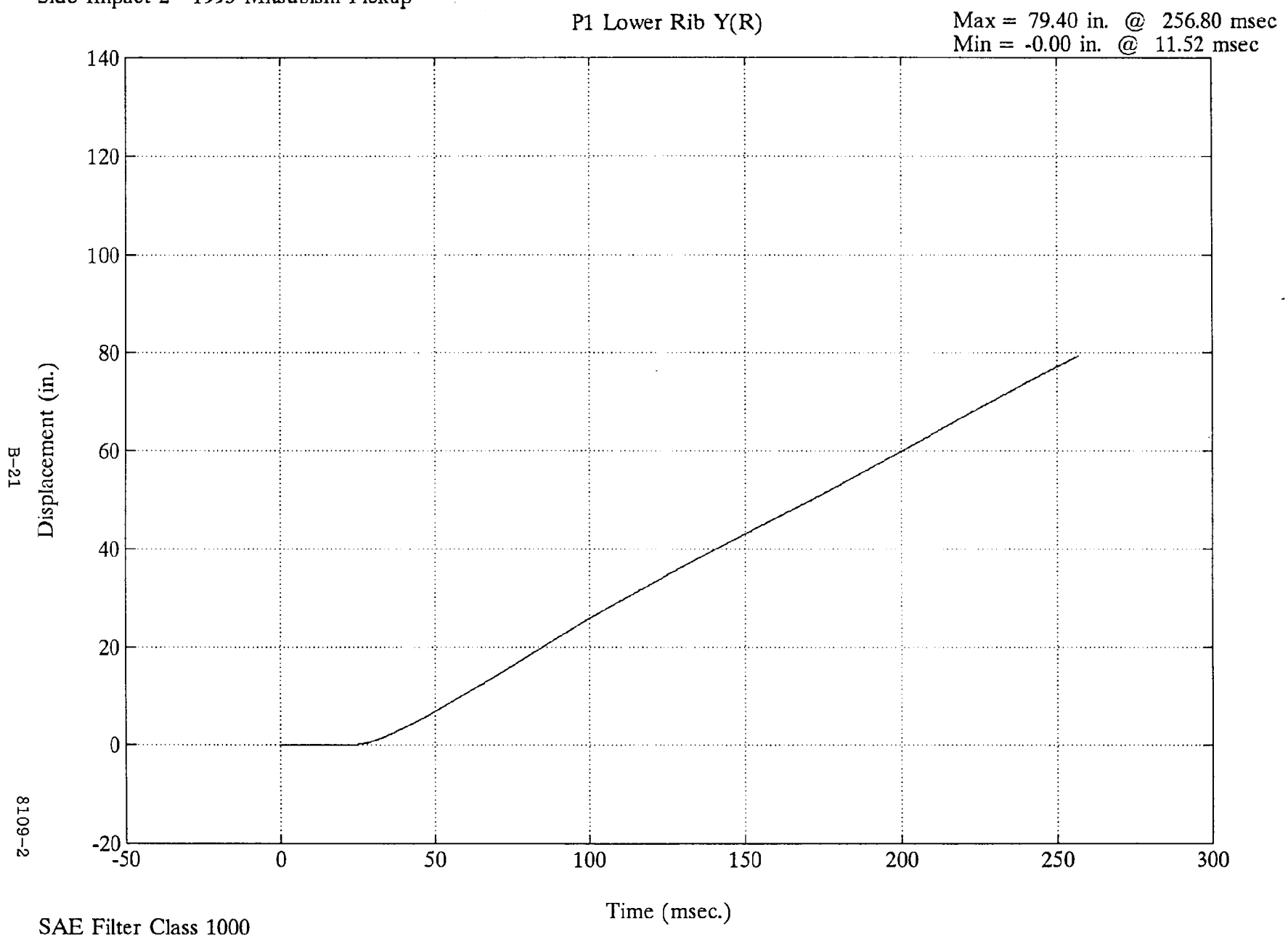
100 Hz FIR Filter

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

Side Impact 2 - 1993 Mitsubishi Pickup



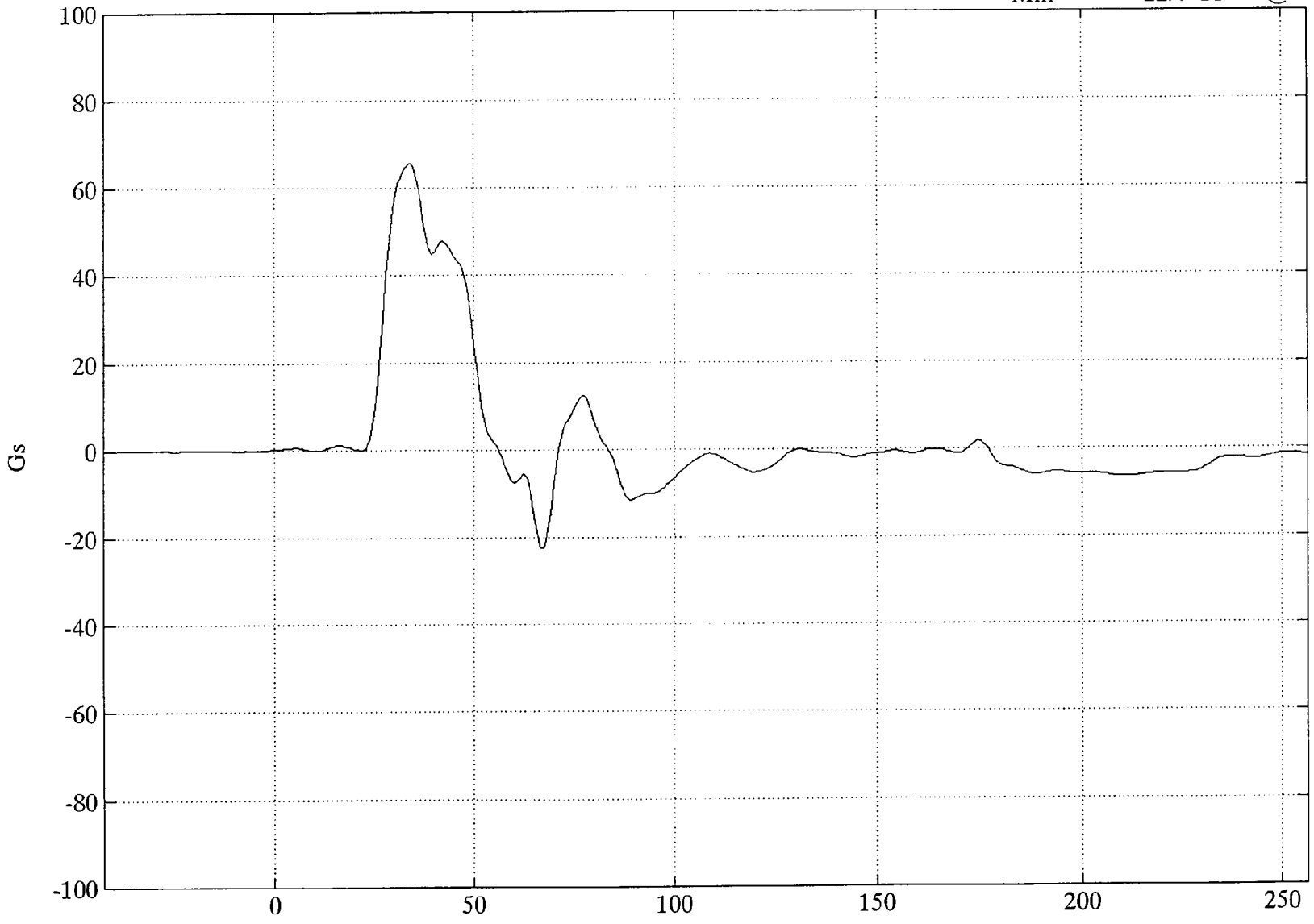
SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

P1 Upper Spine Y

Max = 65.6 Gs @ 33.750 msec
Min = -22.4 Gs @ 66.87 msec

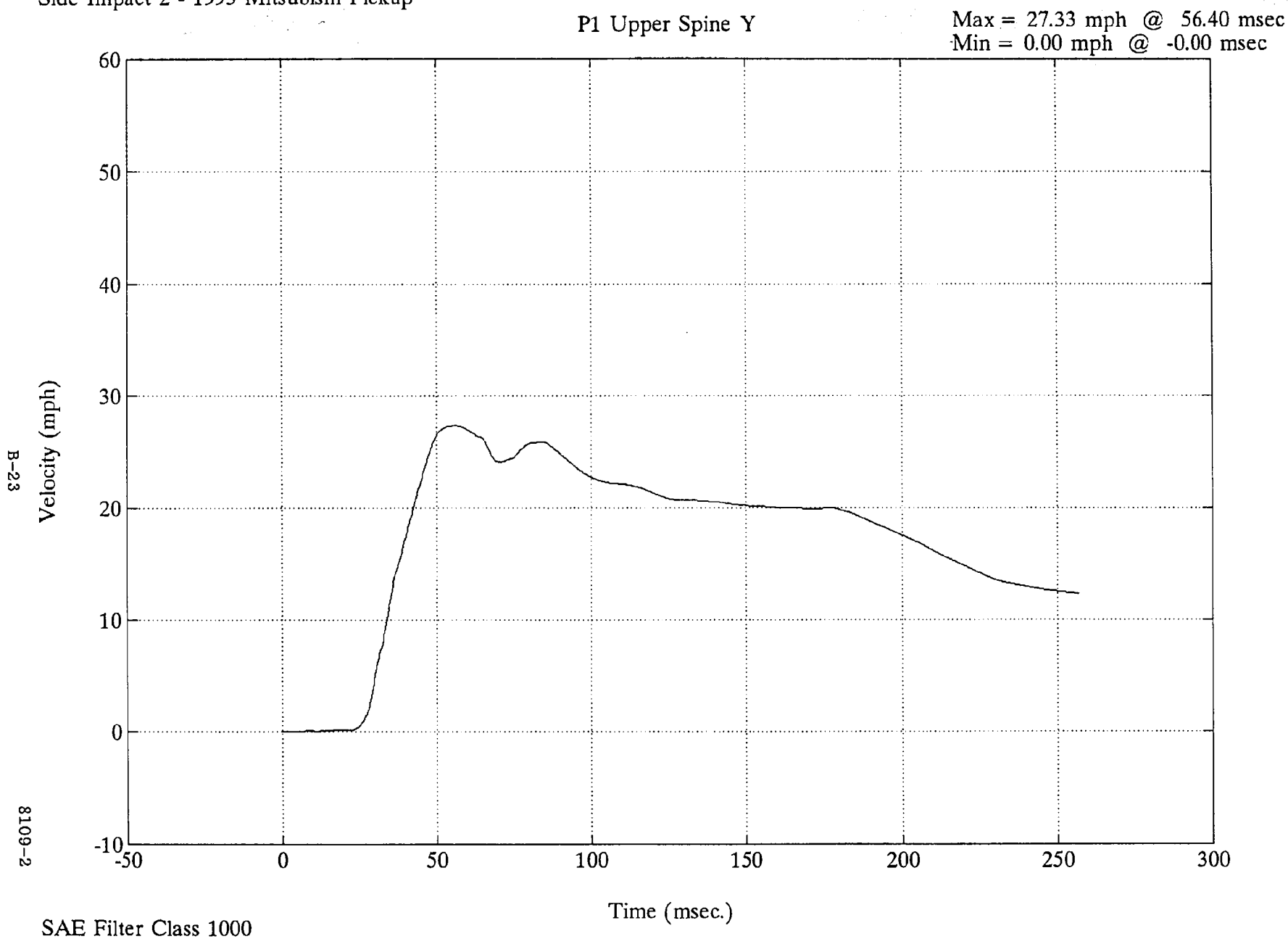


B-22

8109-2

100 Hz FIR Filter

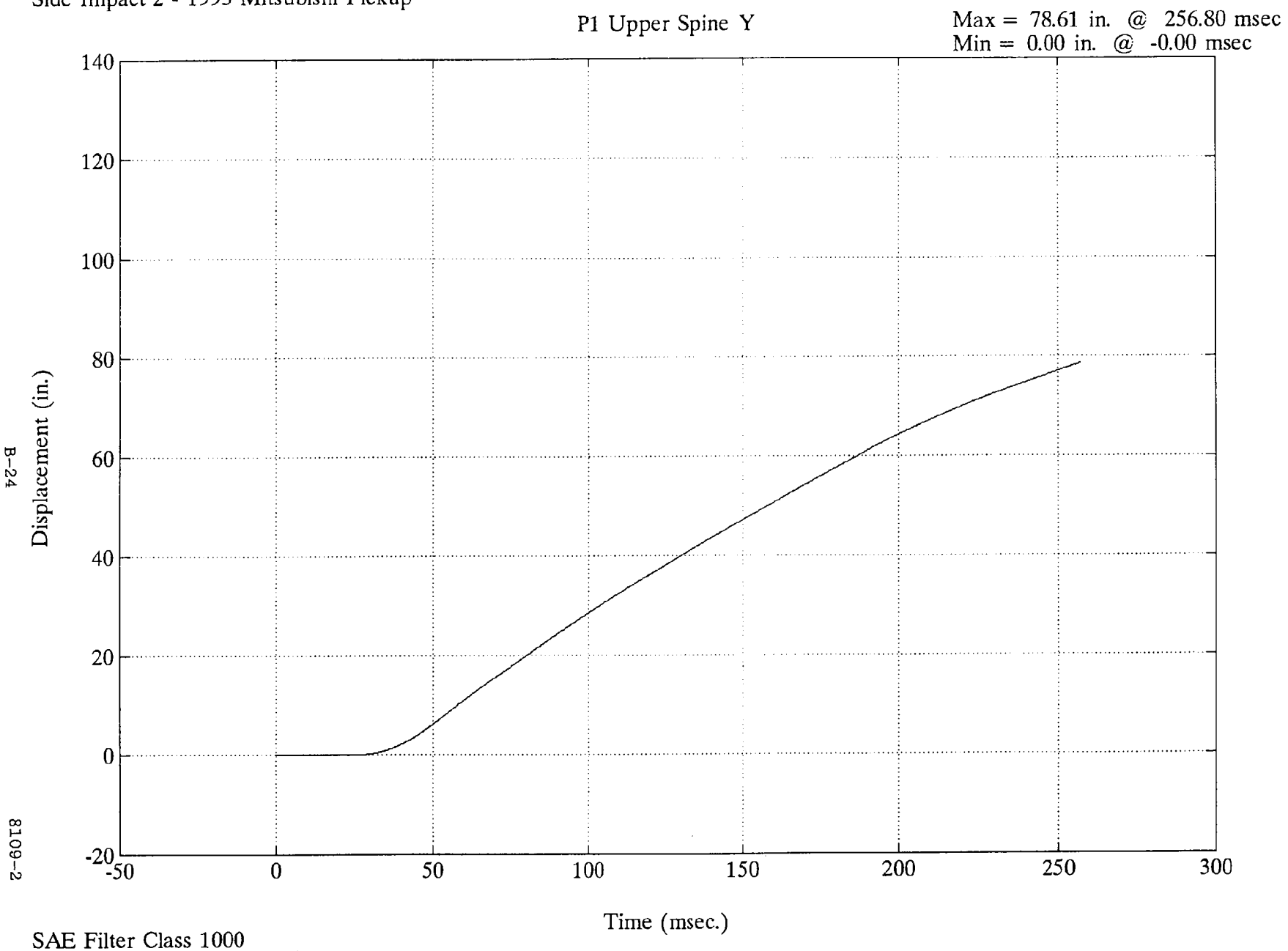
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

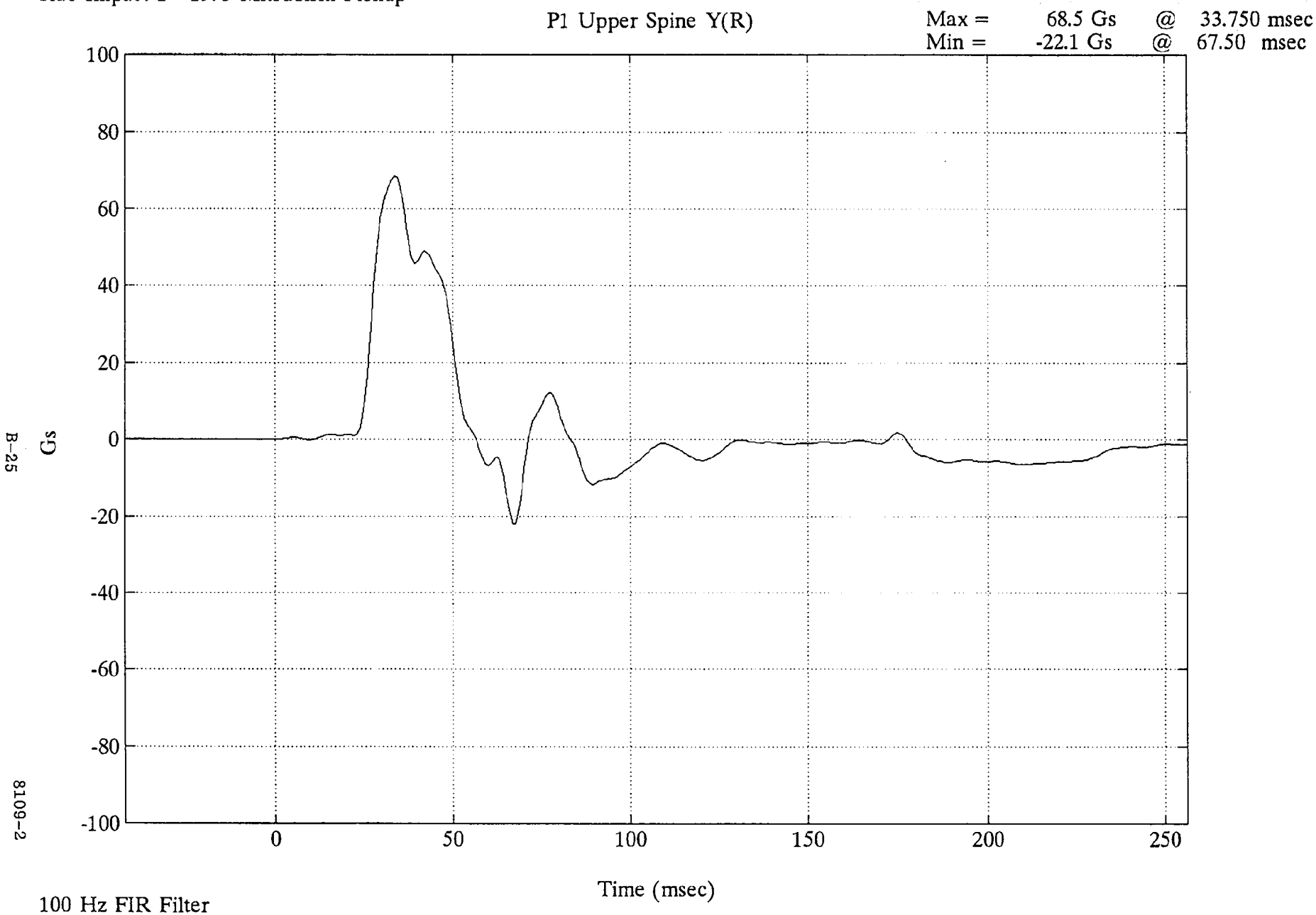
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



B-25

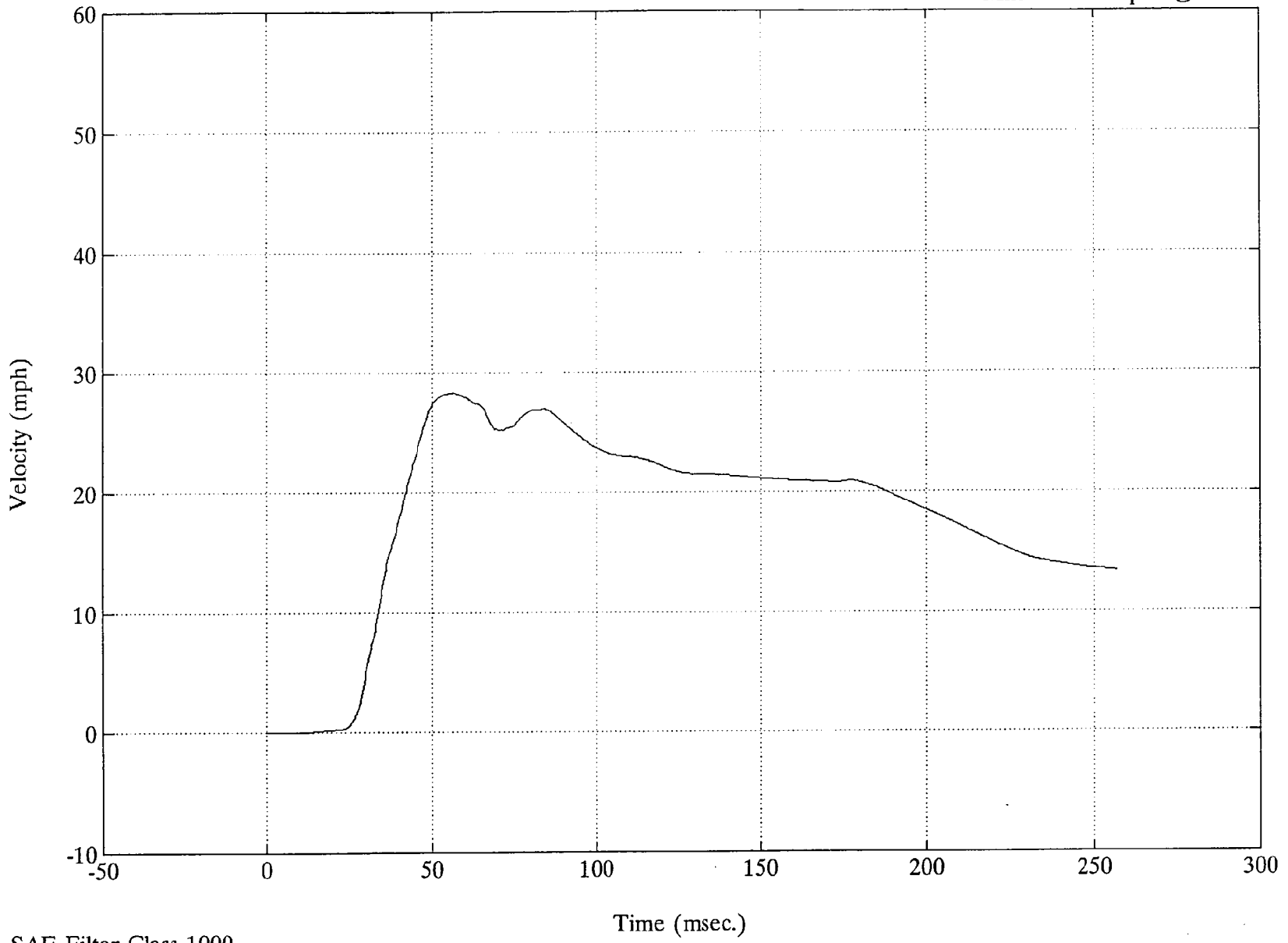
8109-2

100 Hz FIR Filter

Side Impact 2 - 1993 Mitsubishi Pickup

P1 Upper Spine Y(R)

Max = 28.30 mph @ 56.40 msec
Min = 0.00 mph @ -0.00 msec

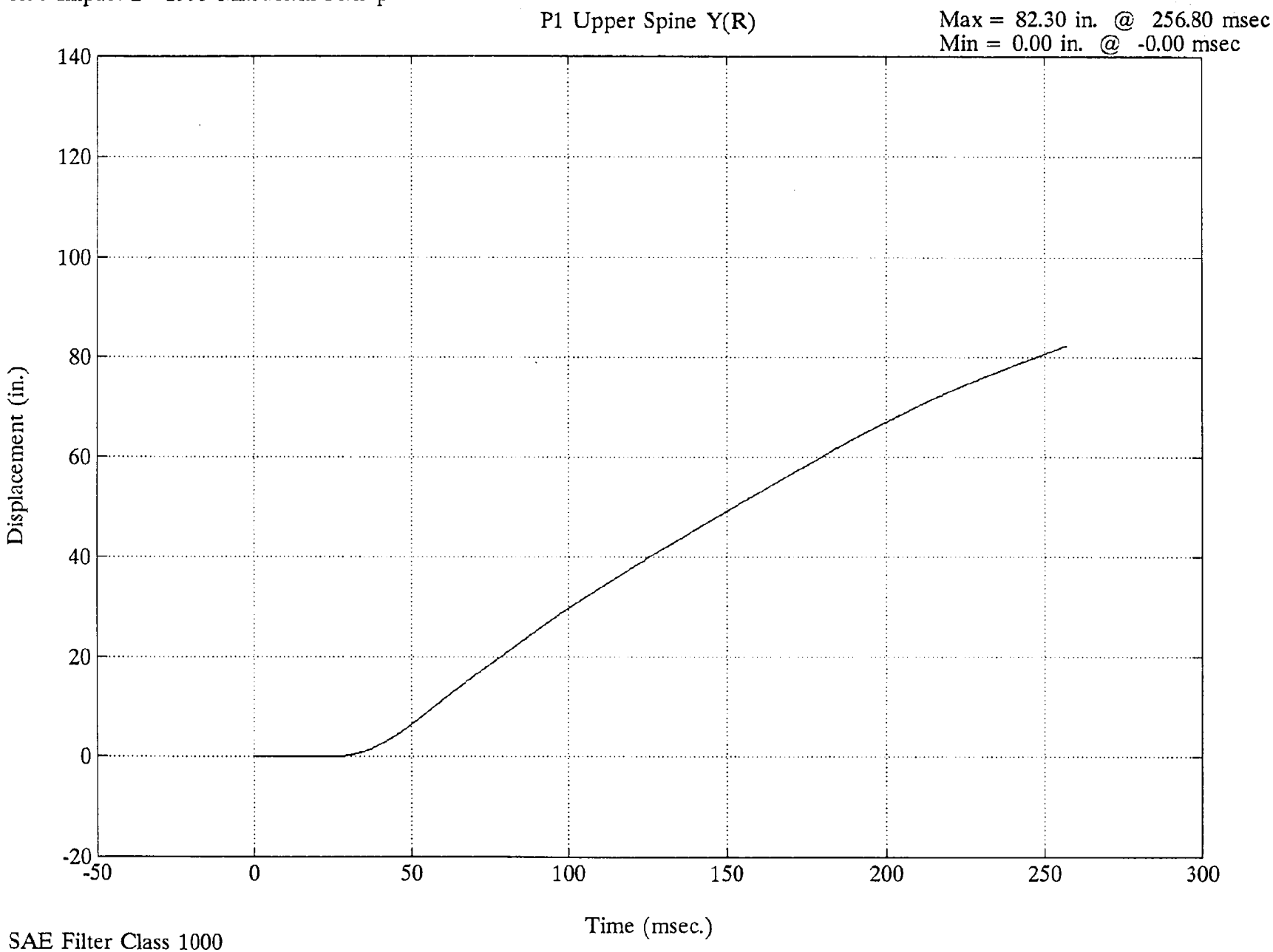


B-26

8109-2

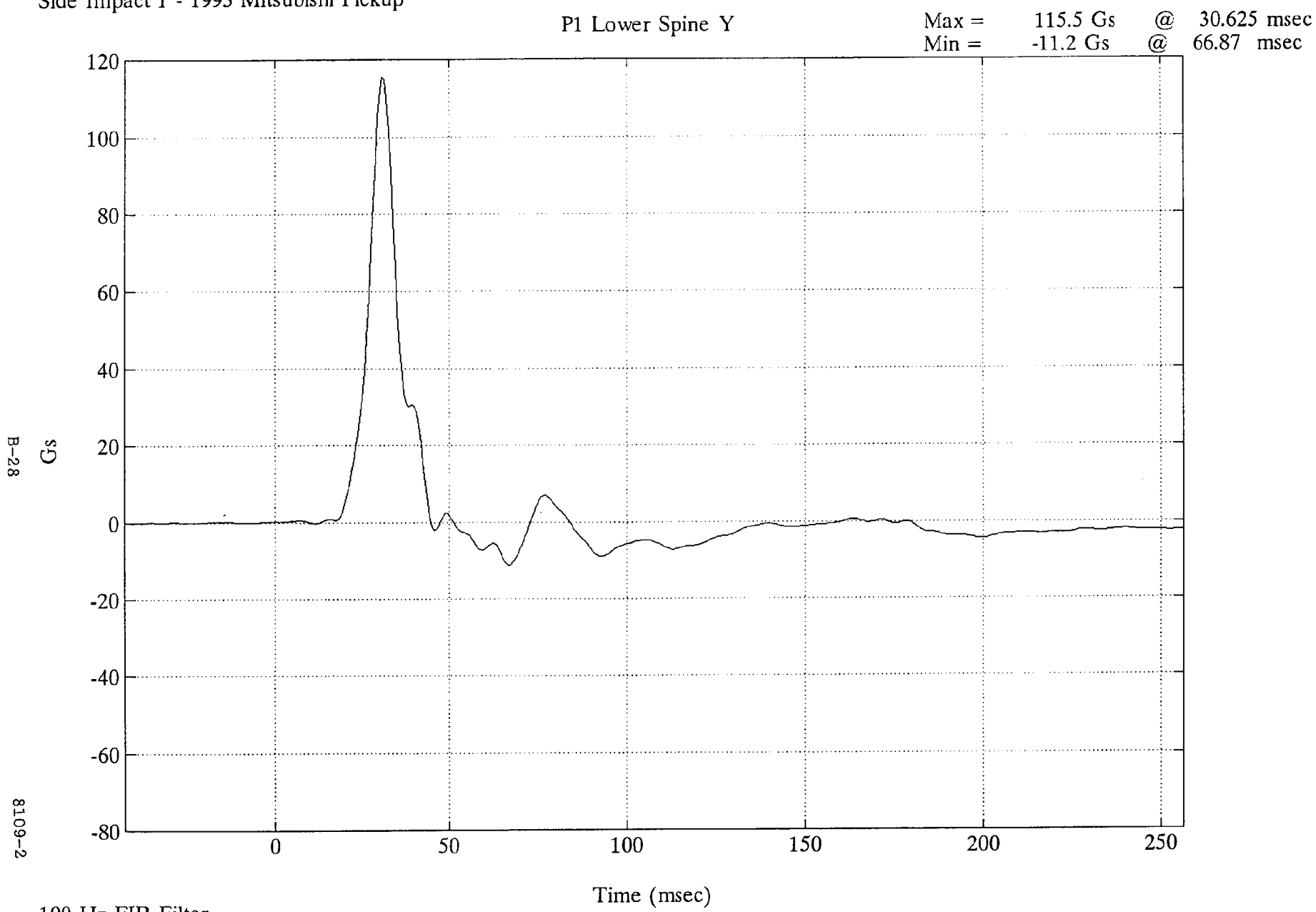
SAE Filter Class 1000

Side Impact 2 - 1993 Mitsubishi Pickup



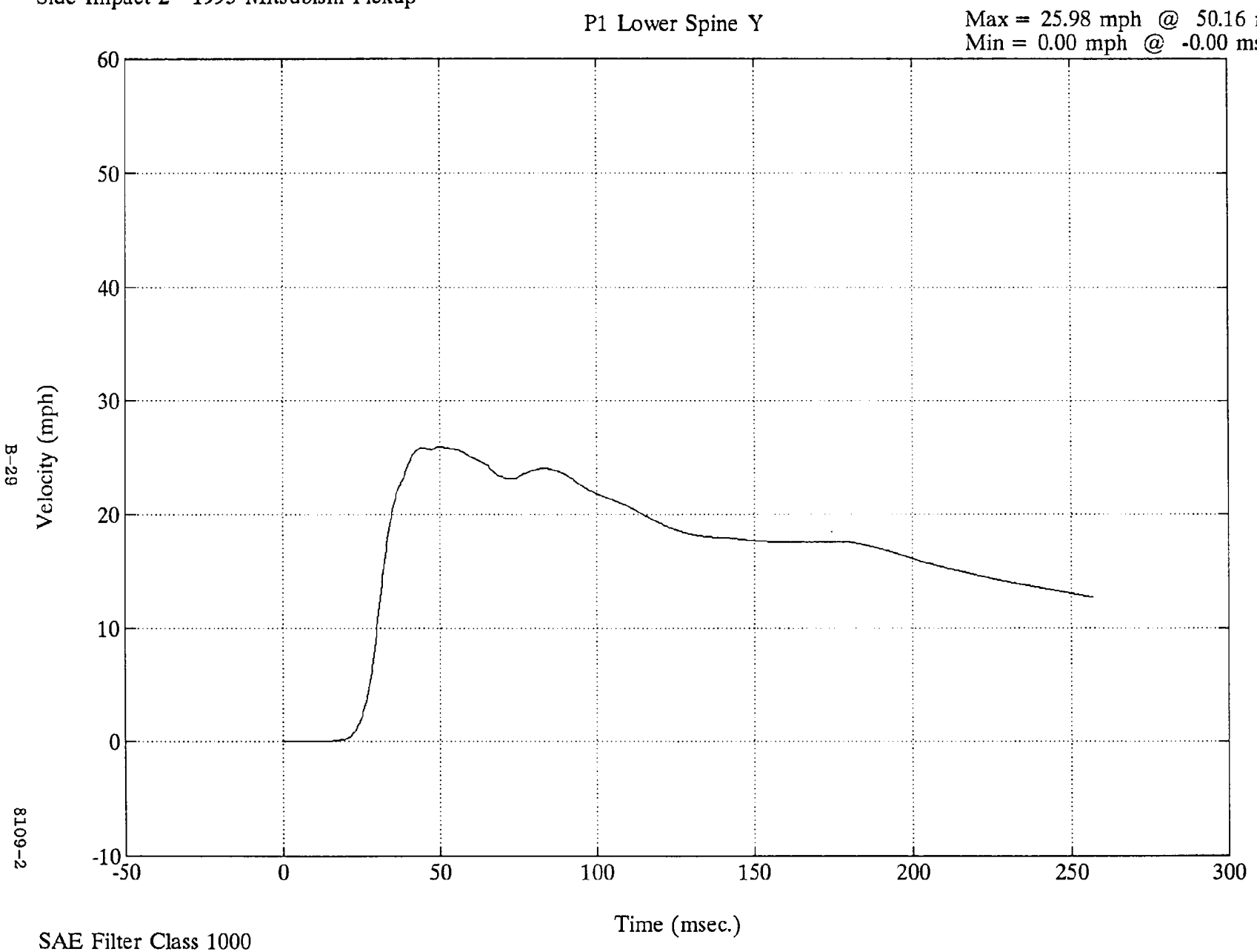
SAE Filter Class 1000

Side Impact 1 - 1993 Mitsubishi Pickup



100 Hz FIR Filter

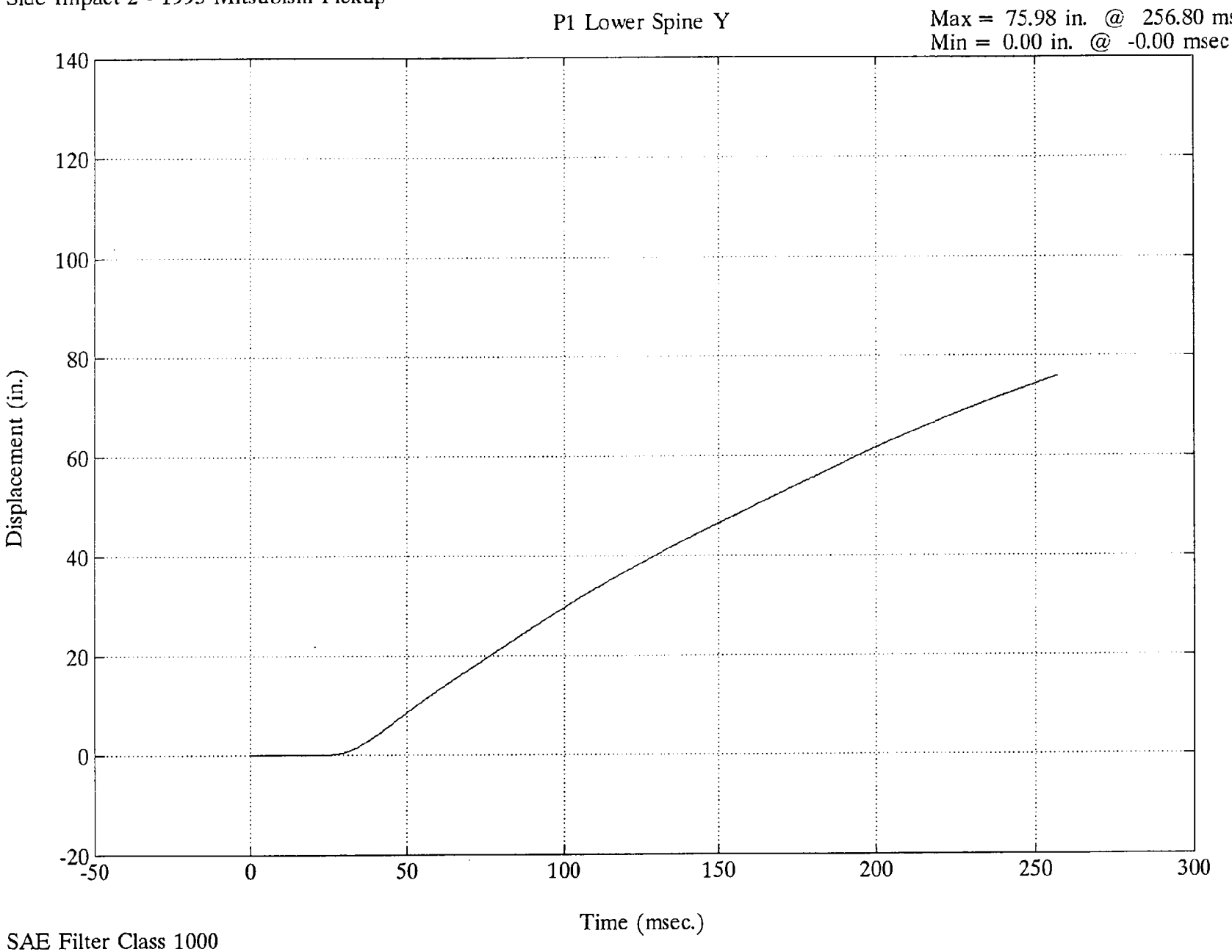
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

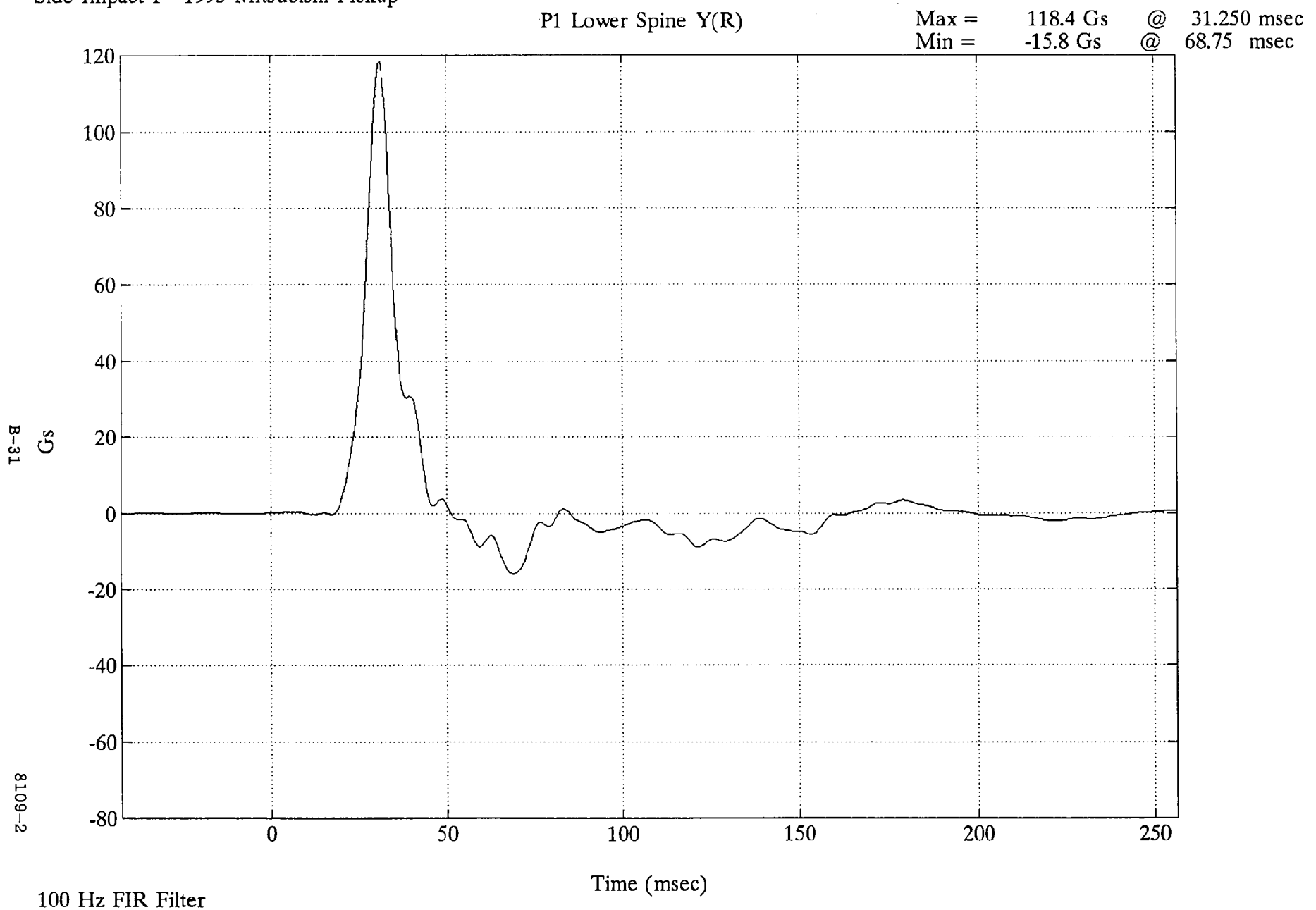
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

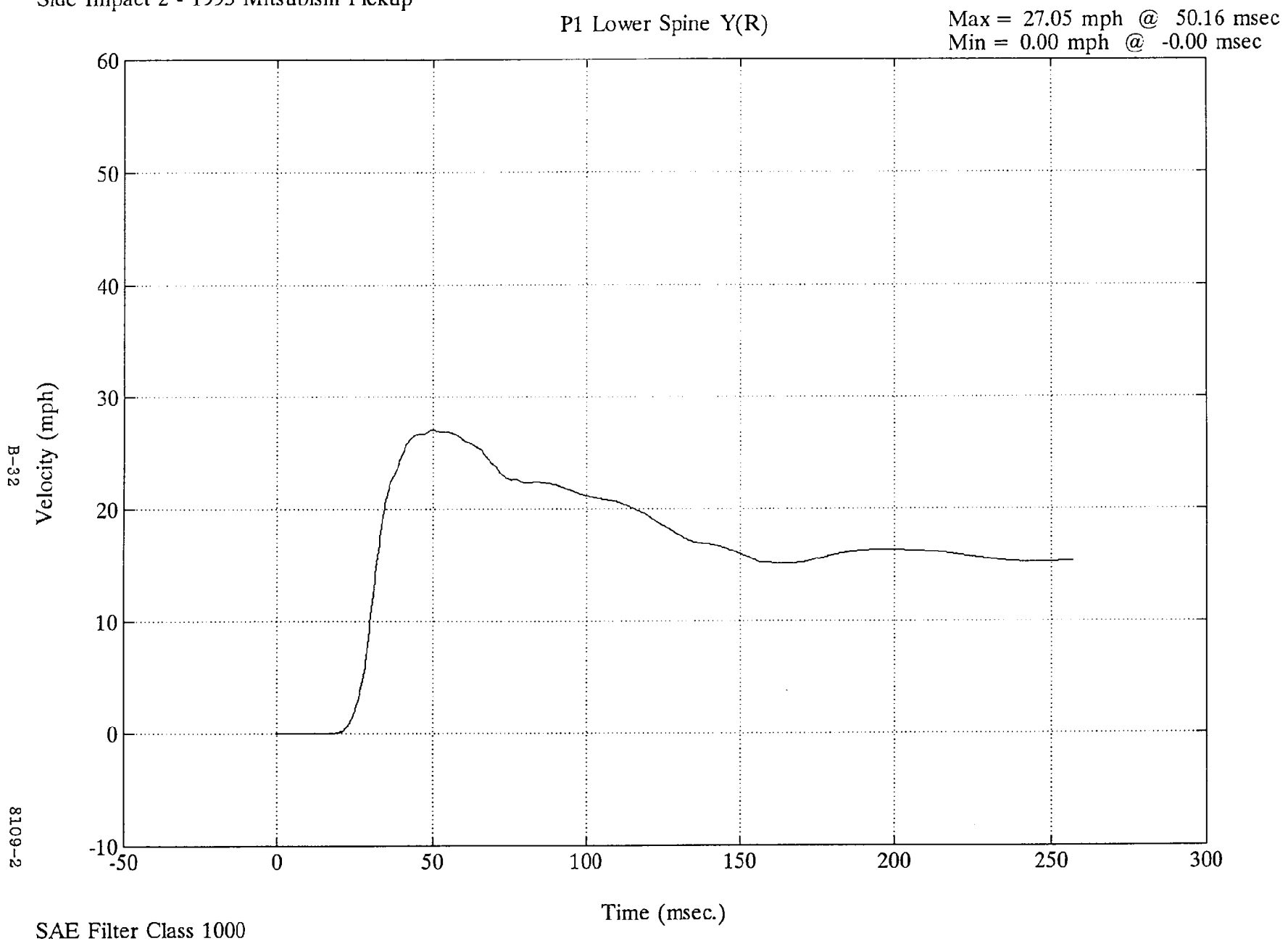


B-31

8109-2

100 Hz FIR Filter

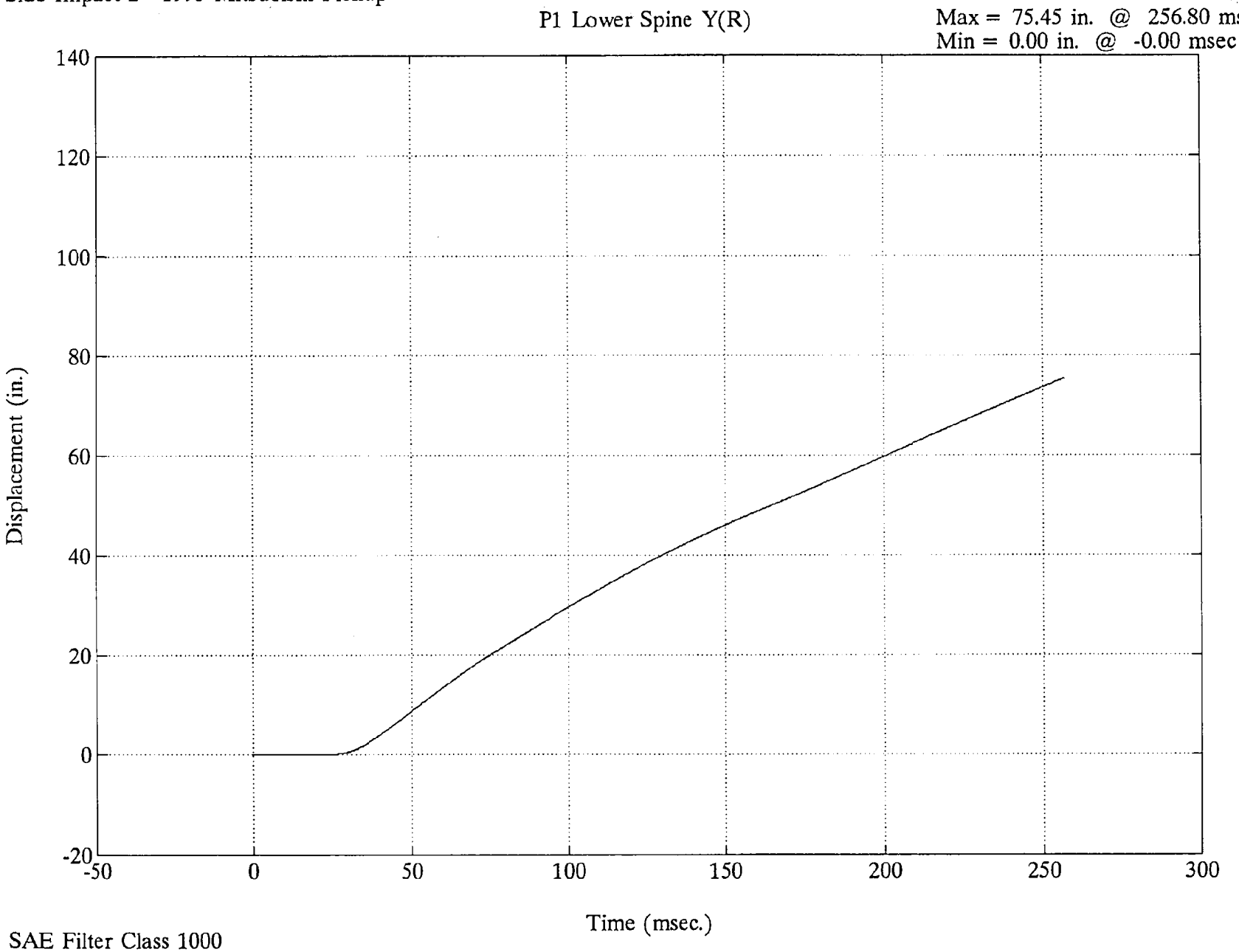
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8106-2

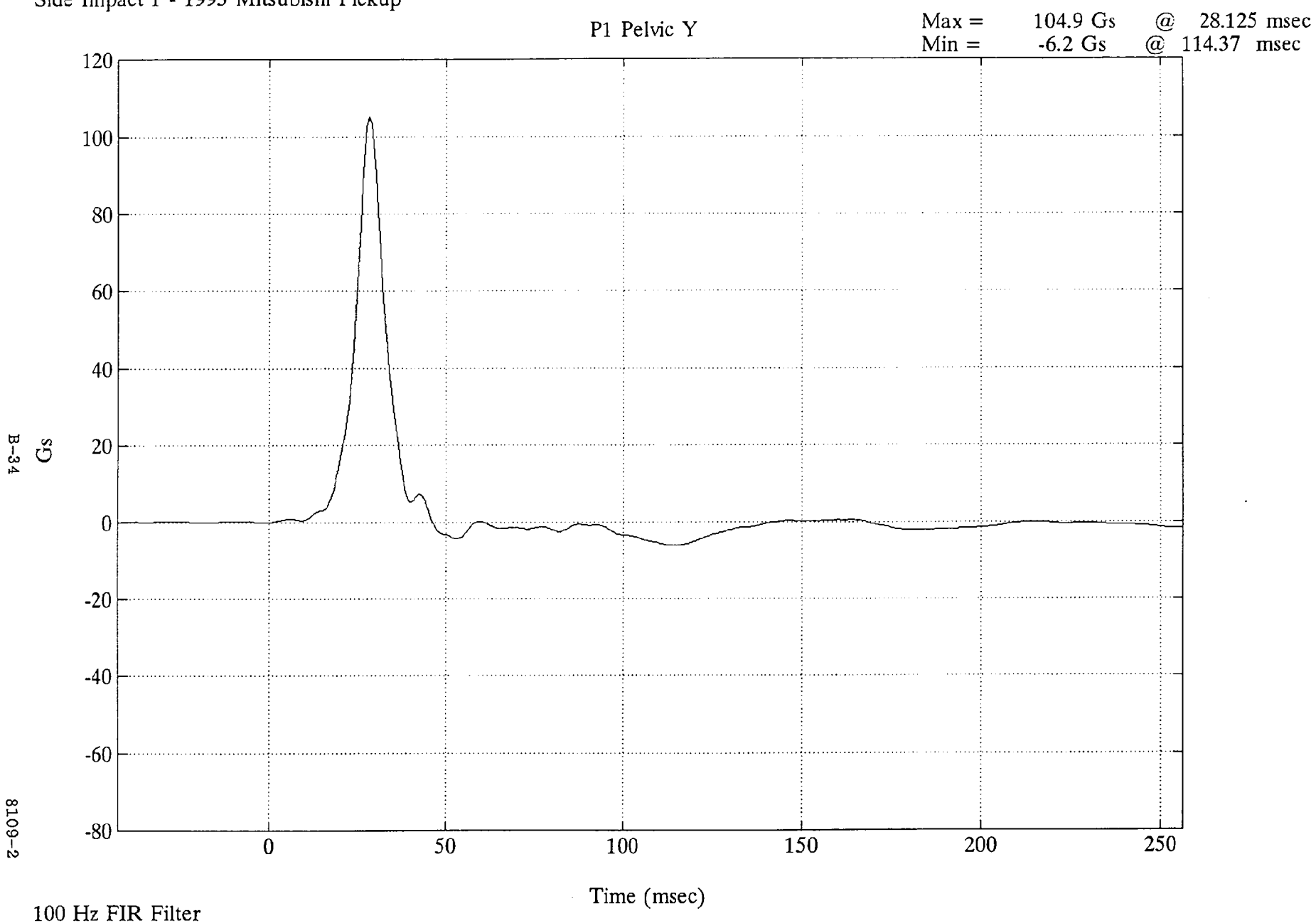
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

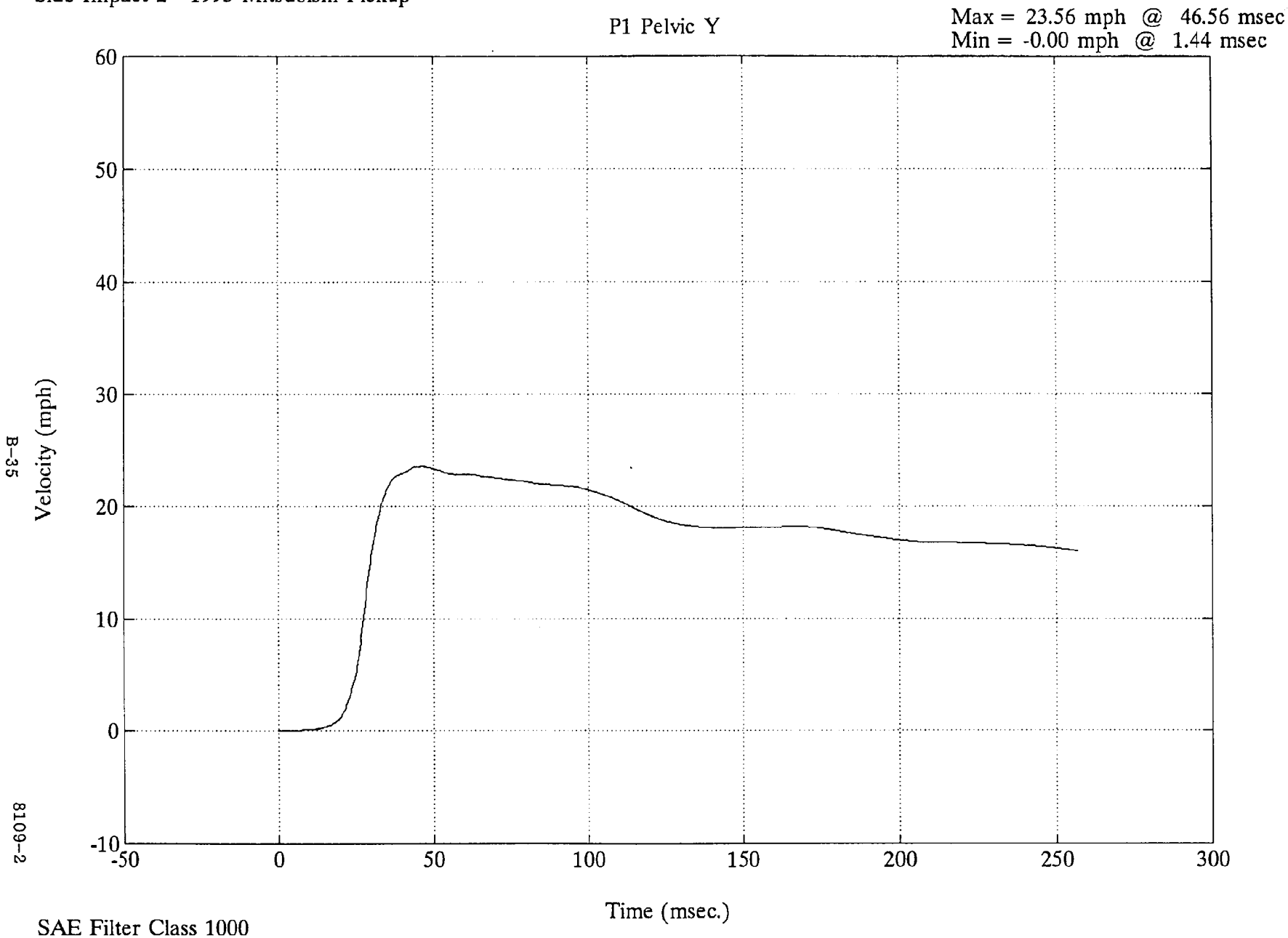


B-34

8109-2

100 Hz FIR Filter

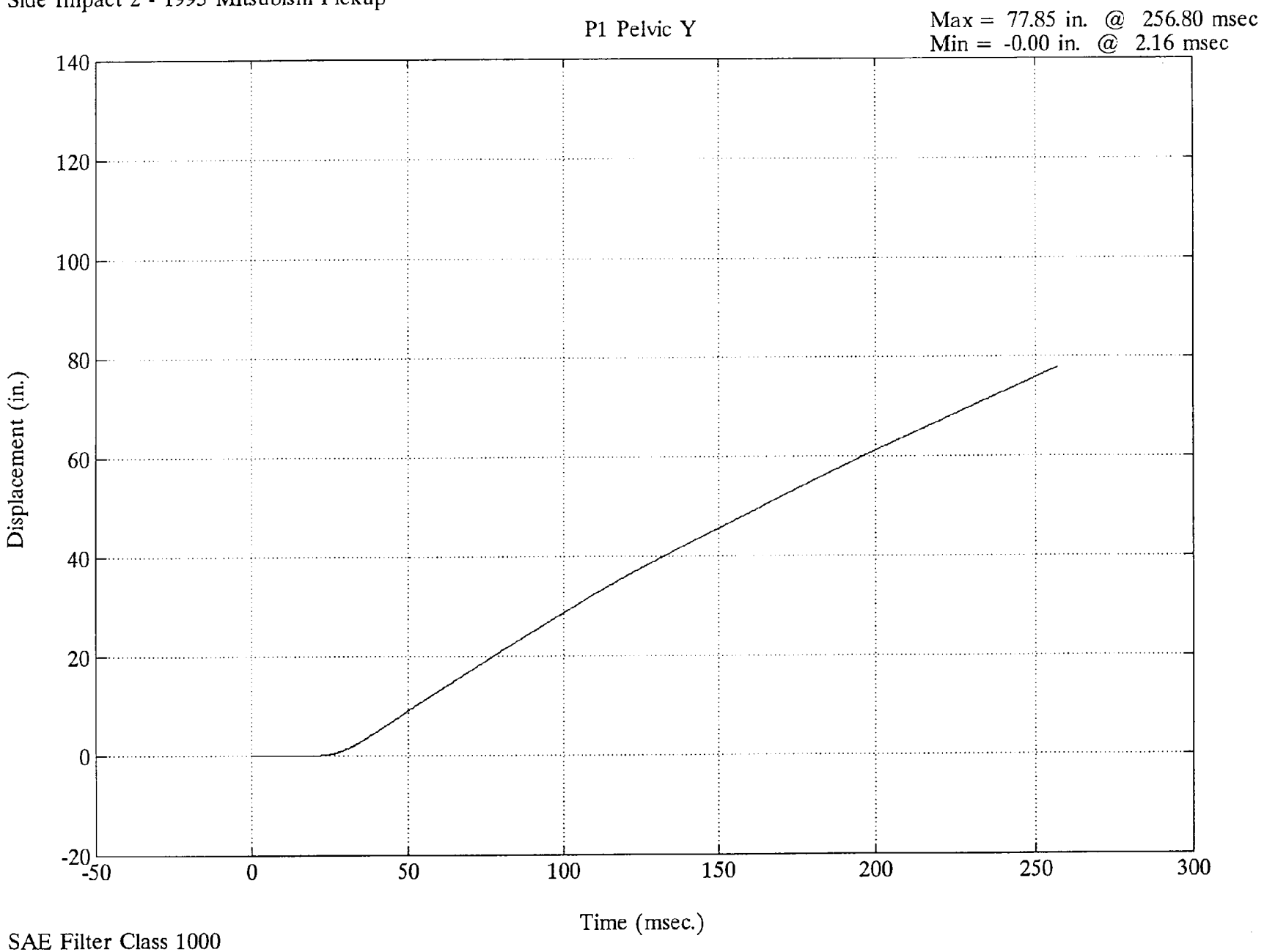
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

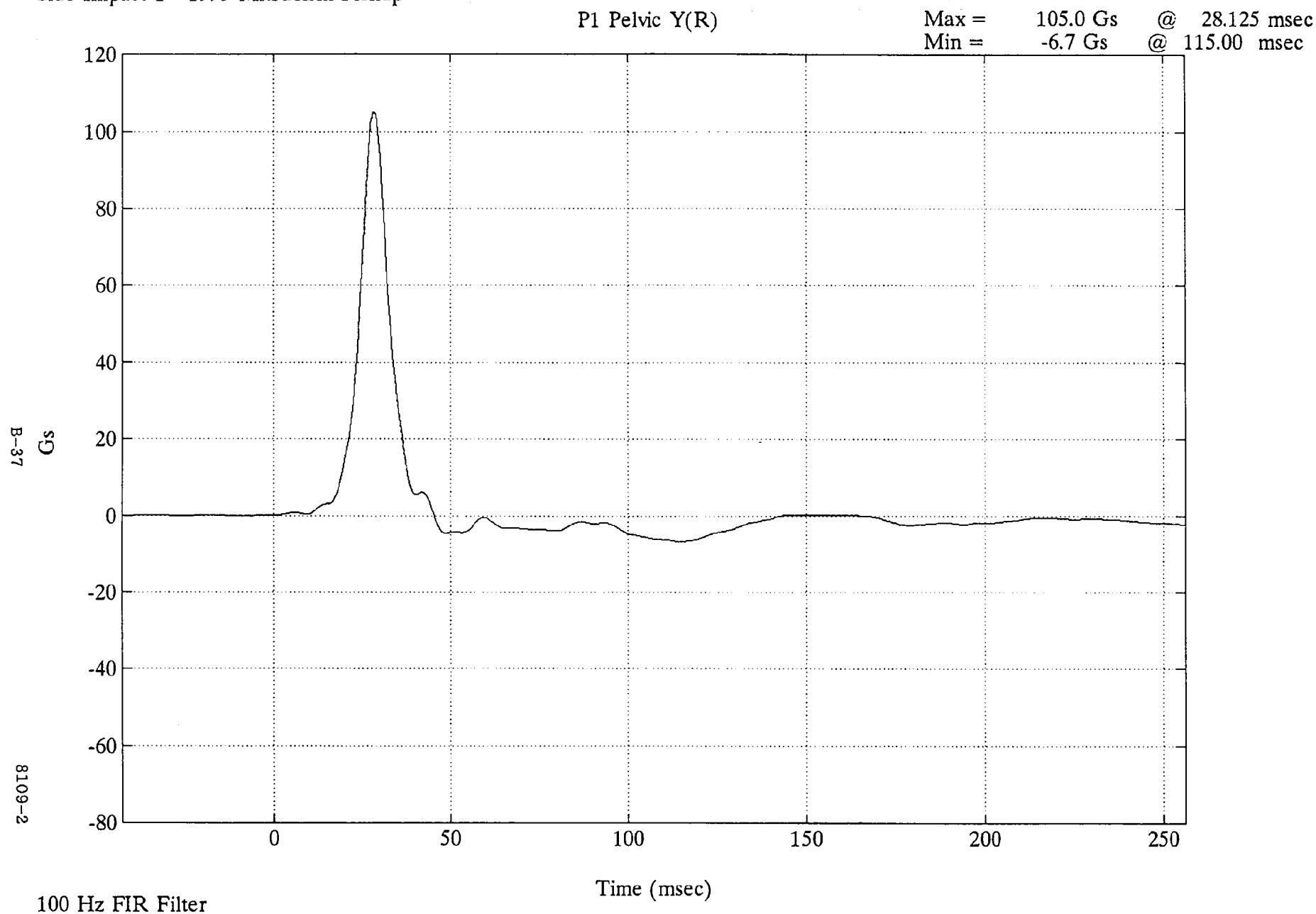
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

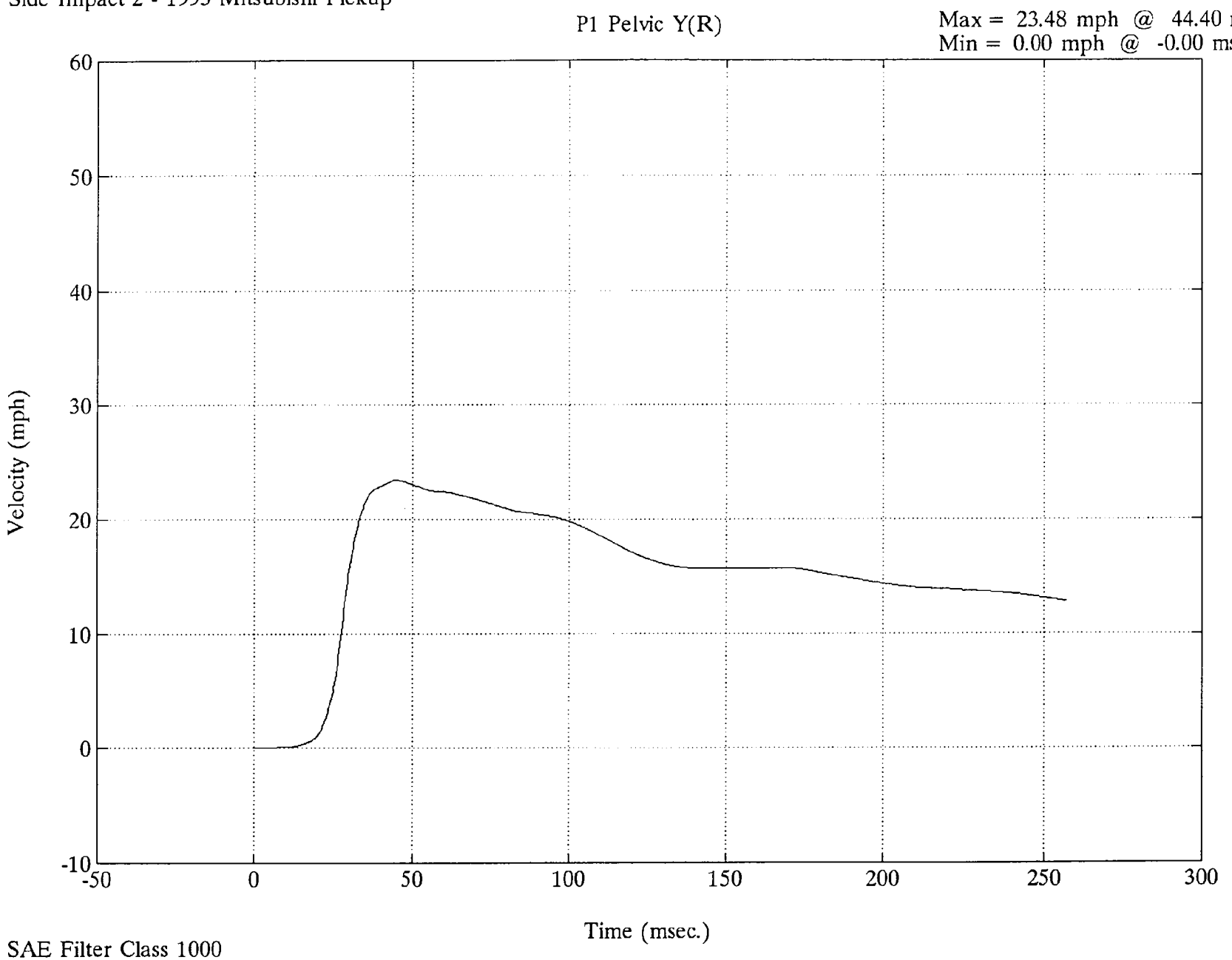


B-37

8109-2

100 Hz FIR Filter

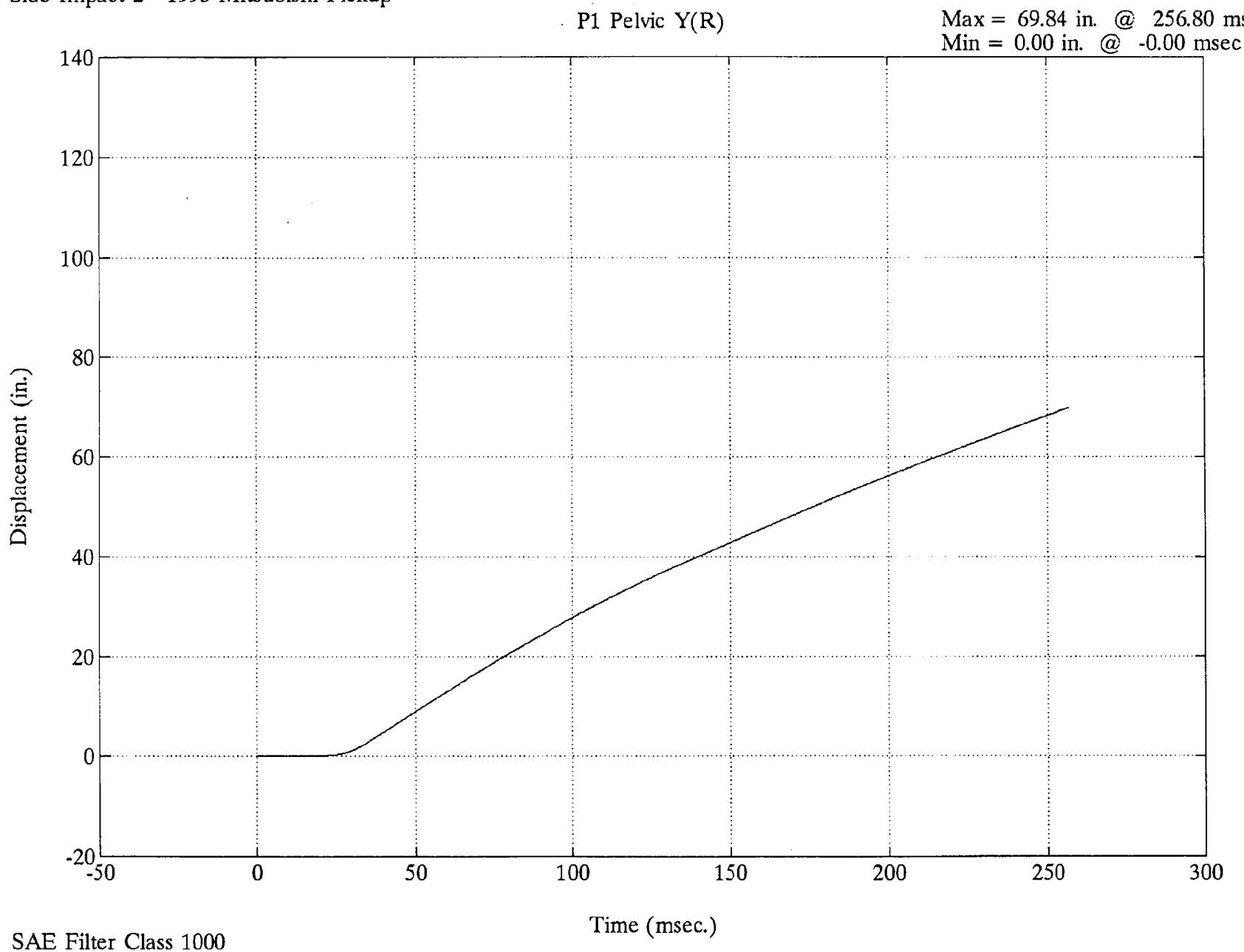
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

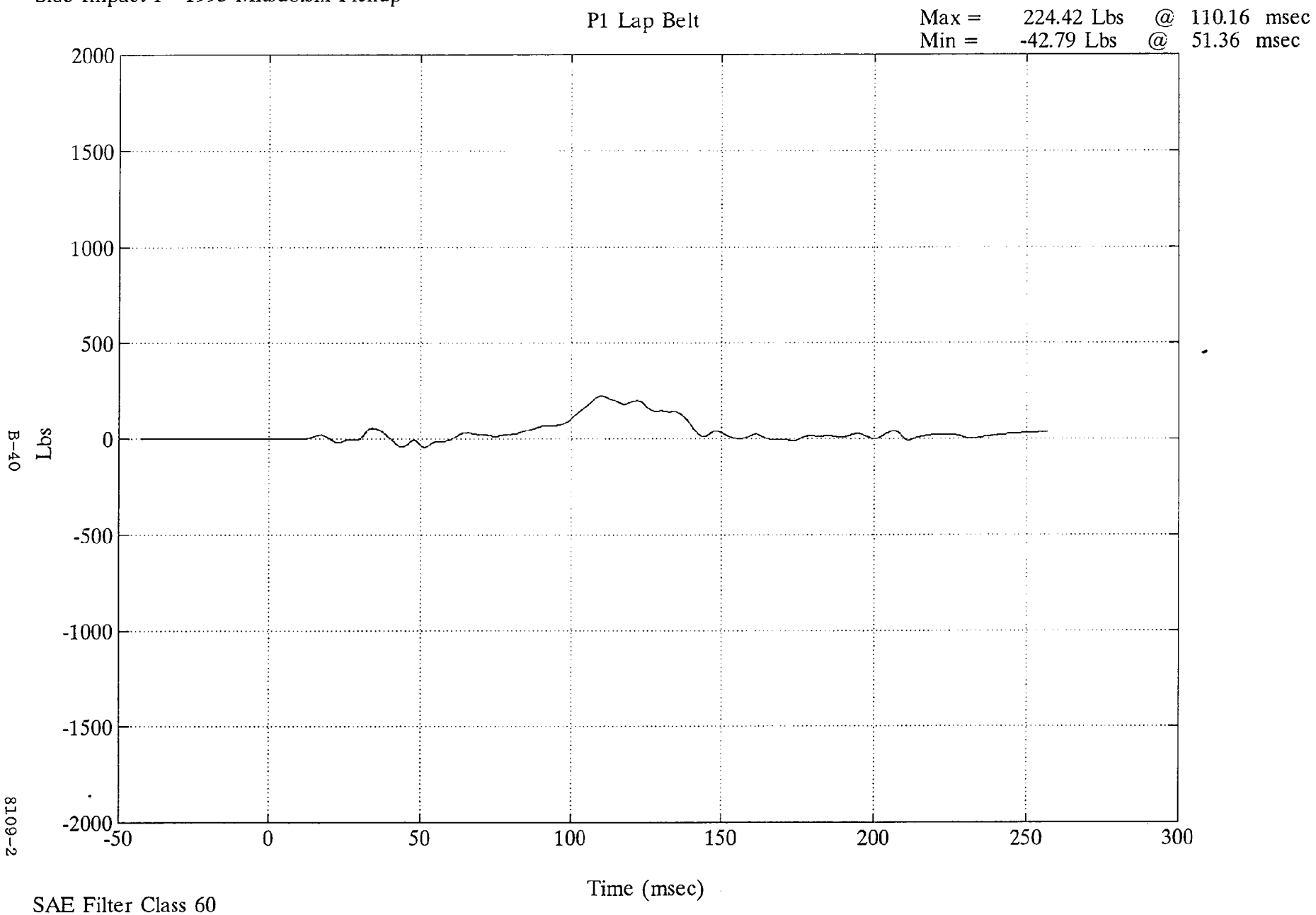
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 1000

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

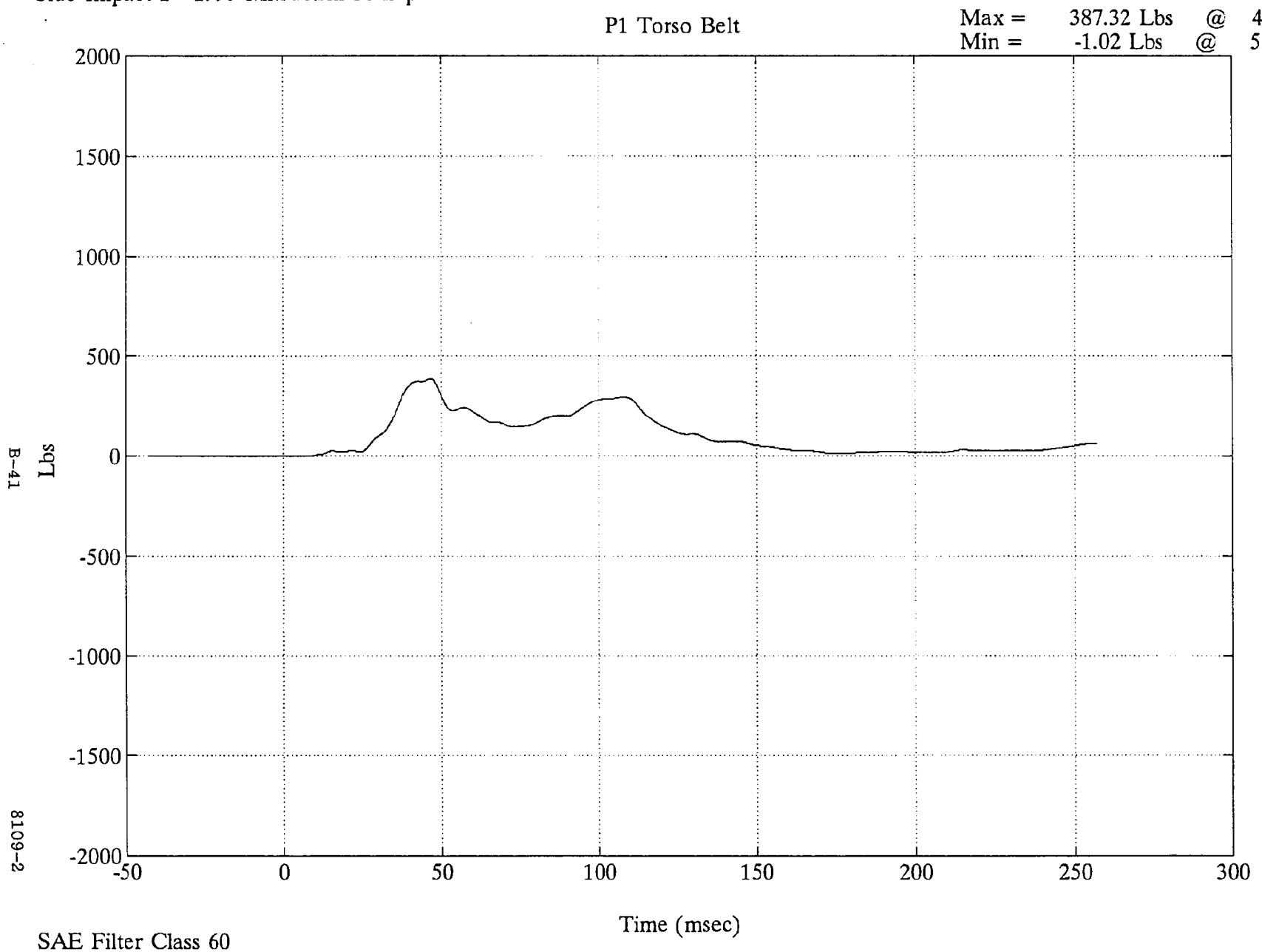


B-40

8109-2

SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

B-41

8109-2

FACILITY: TRACK TEST DATE: 26 May 1993
RUN #: 1289 TEST TIME: 11:36:25
SERIES #: 1 BOARD: B

TITLE: Side Impact 1 - 1993 Mitsubishi Pickup

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	RF Sill X	Gs	7.9	24.7	-13.0	50.0	60.0
2	RF Sill Y	Gs	24.4	8.5	-11.0	61.1	60.0
3	RF Sill Z	Gs	15.1	60.8	-13.7	20.4	60.0
4	LF Sill Y	Gs	83.1	3.5	-60.9	15.4	60.0
5	Trunk C/L X	Gs	6.1	58.2	-13.8	28.4	60.0
6	Trunk C/L Y	Gs	29.7	29.2	-3.2	109.6	60.0
7	Trunk C/L Z	Gs	11.0	24.6	-19.3	60.7	60.0
8	LF Door C/L Y	Gs	105.6	7.2	-54.1	25.7	60.0
9	LF Door Mid Rear Y	Gs	135.4	3.1	-148.7	20.9	60.0
10	LF Door Upper C/L Y	Gs	174.5	29.9	-128.0	24.1	60.0
11	LU A-Pillar Y	Gs	102.9	3.8	-24.3	17.3	60.0
12	LL A-Pillar Y	Gs	89.1	3.6	-269.8	57.0	60.0
13	LU B-Pillar Y	Gs	113.7	2.6	-77.4	25.1	60.0
14	LL B-Pillar Y	Gs	126.4	2.2	-268.4	14.9	60.0
15	NULL	Lbs	.0	256.8	.0	256.8	1000.0
16	NULL	Lbs	.0	256.8	.0	256.8	1000.0
17	RF Sill Resultant	Gs	27.1	8.8	.0	-21.1	60.0
18	Trunk C/L Resultant	Gs	32.5	28.9	.0	-9.5	60.0

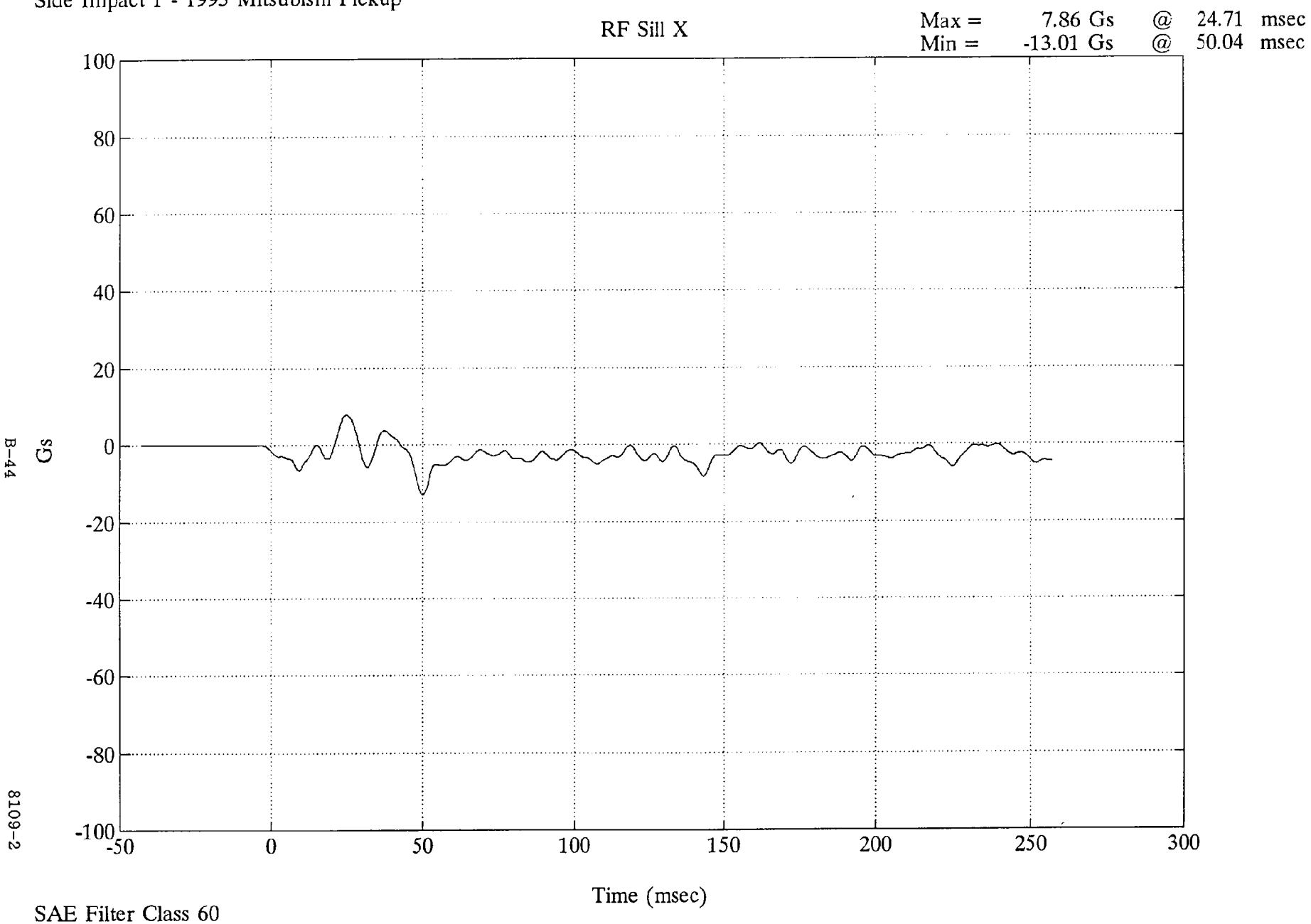
FACILITY: TRACK TEST DATE: 26 May 1993

RUN #: 1289 TEST TIME: 11:36:25
SERIES #: 1 BOARD: C

TITLE: Side Impact 1 - 1993 Mitsubishi Pickup

CHANNEL NUMBER	DESCRIPTION	ENGR UNIT	MAXIMUM AMP	MAXIMUM msec	MINIMUM AMP	MINIMUM msec	FILTER CLASS
1	MDB C.G. X	Gs	8.2	112.9	-15.5	42.8	60.0
2	MDB C.G. Y	Gs	91.3	112.7	-5.1	19.4	60.0
3	MDB C.G. Z	Gs	70.0	112.8	-14.6	46.7	60.0
4	MDB Left Rear Rail X	Gs	1.8	90.4	-18.8	28.6	60.0
5	MDB Left Rear Rail Y	Gs	2.4	32.5	-2.6	57.0	60.0
6	NULL		.0	256.8	.0	256.8	1000.0
7	NULL		.0	256.8	.0	256.8	1000.0
8	NULL		.0	256.8	.0	256.8	1000.0
17	MDB C.G. Resultant	Gs	115.3	112.7	.0	175.9	60.0

Side Impact 1 - 1993 Mitsubishi Pickup

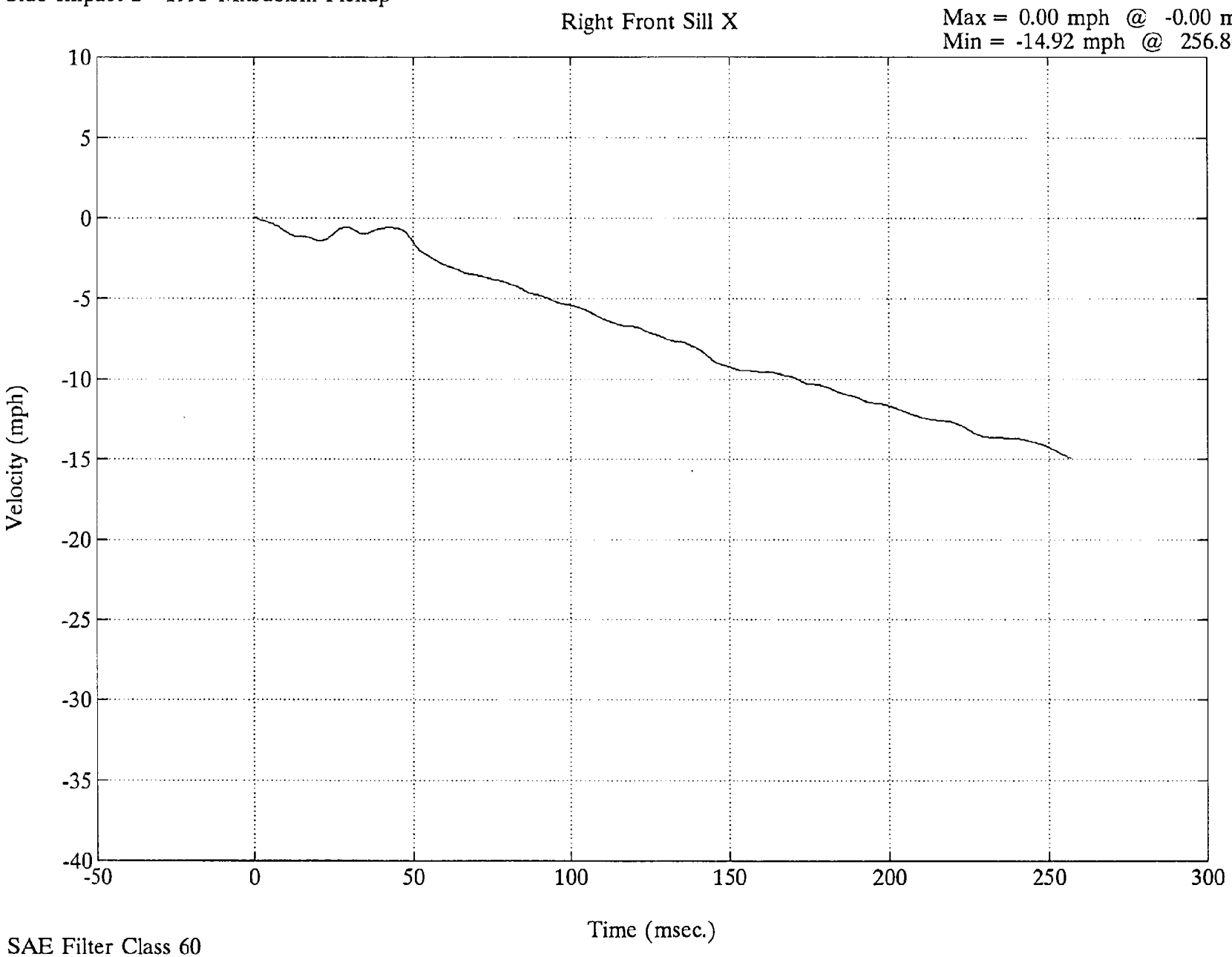


B-44

8109-2

SAE Filter Class 60

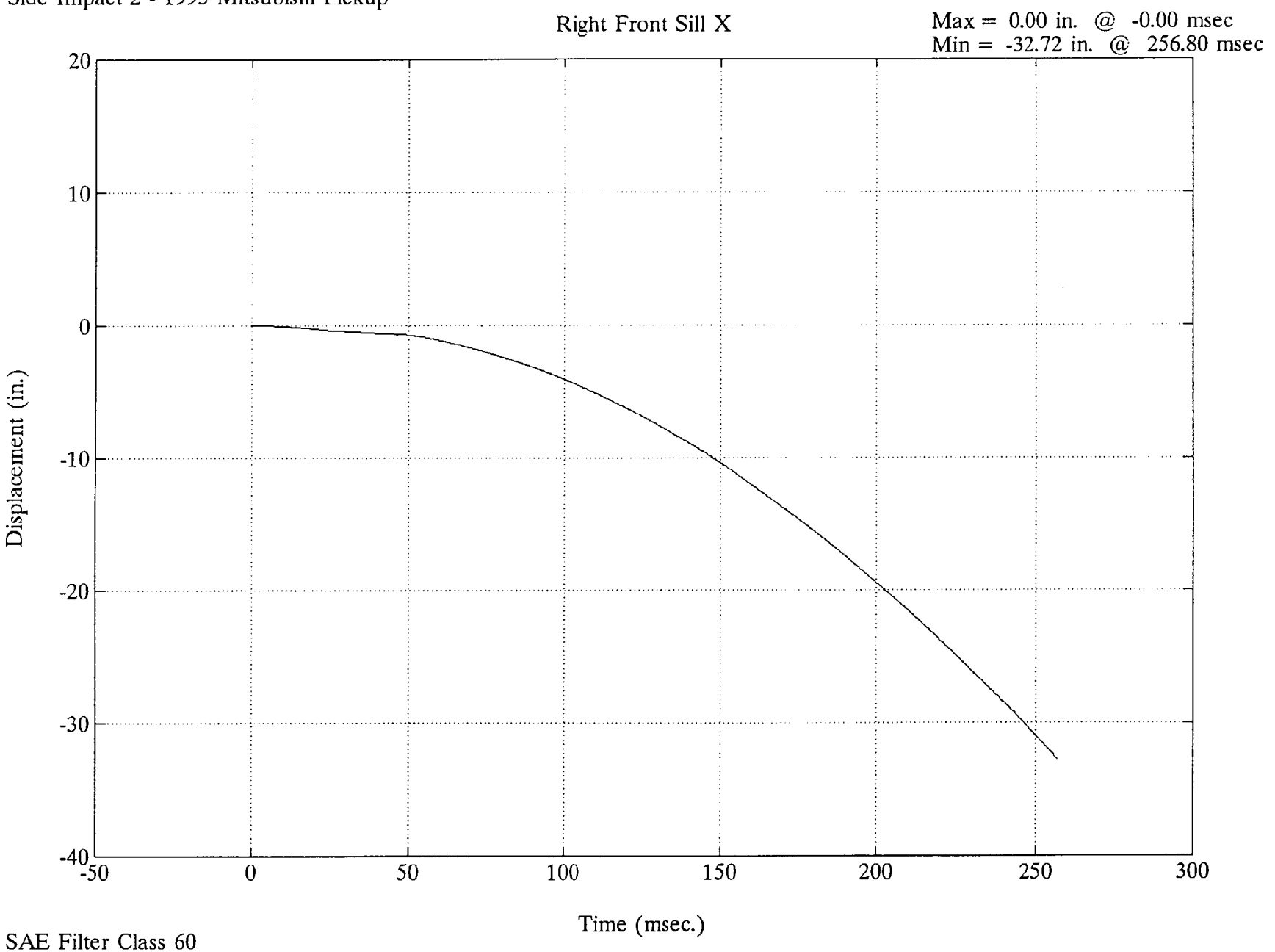
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

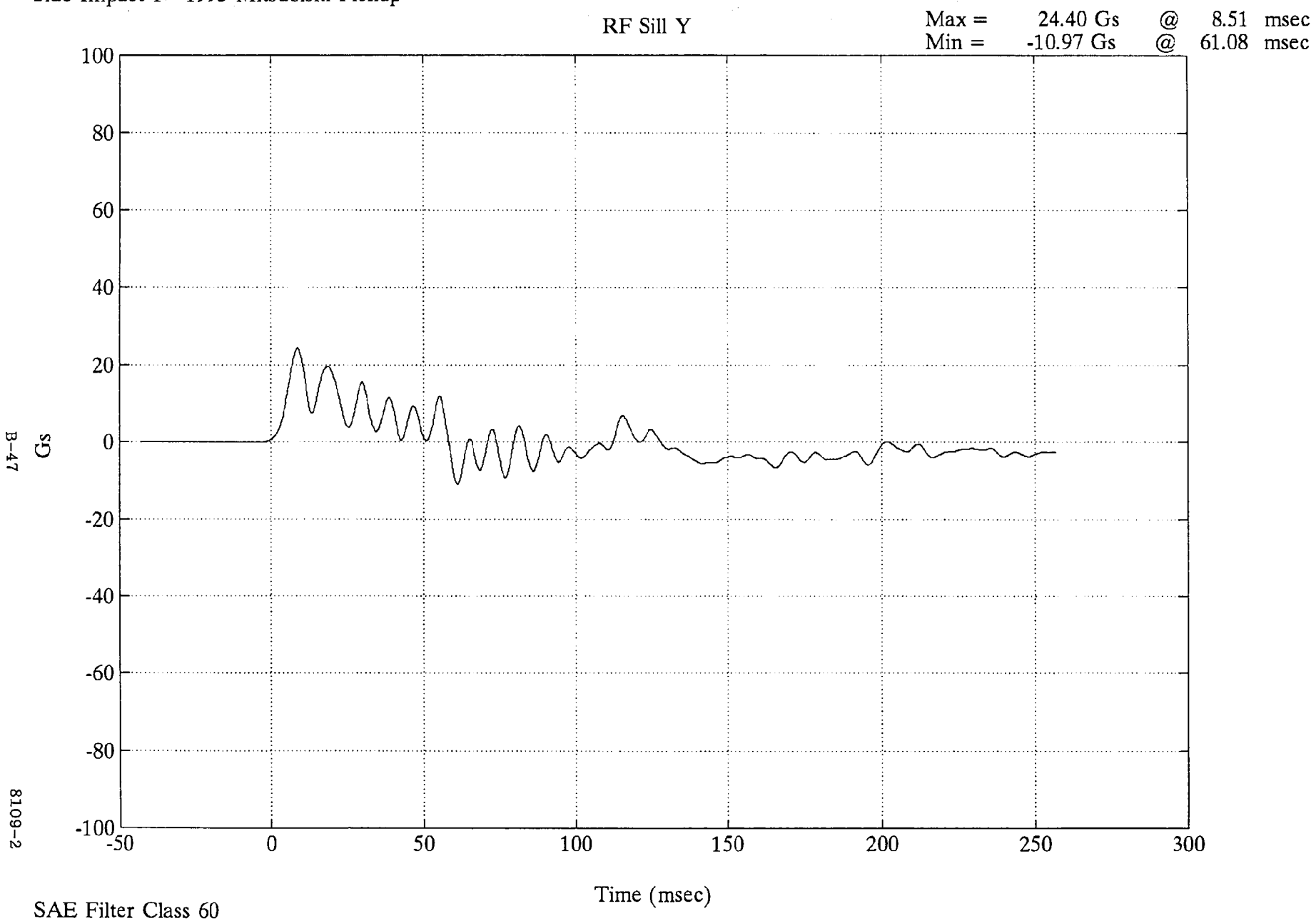
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

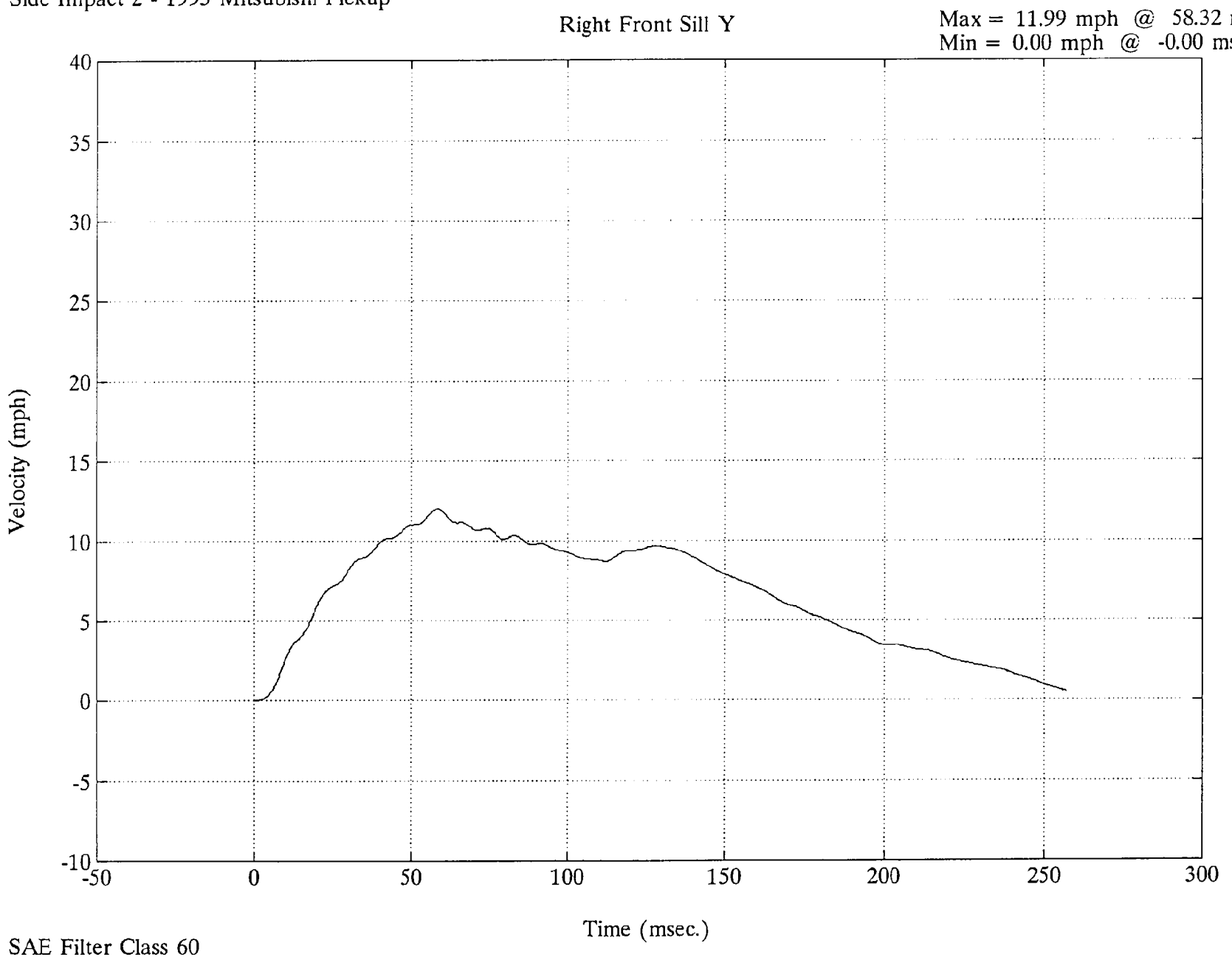
Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

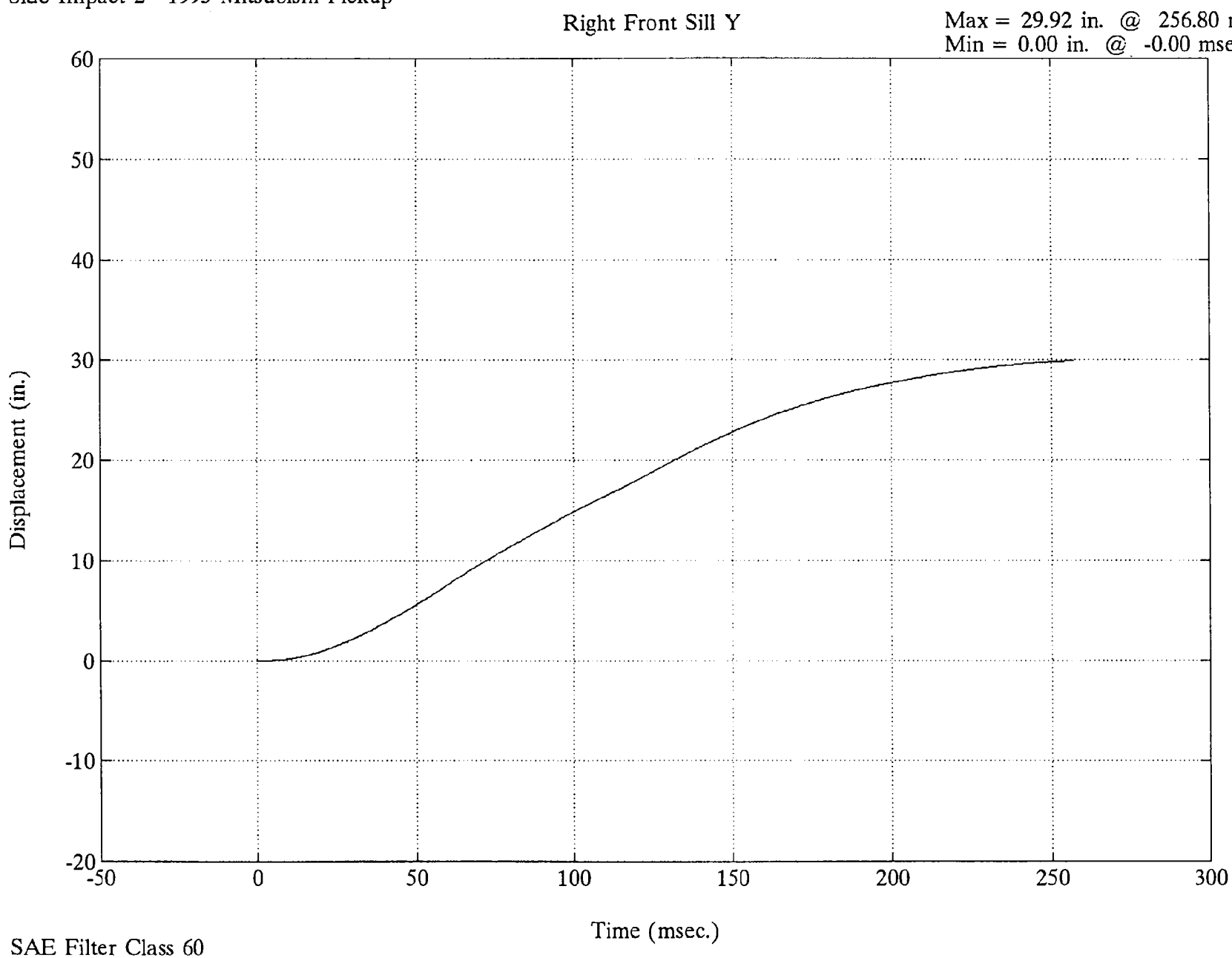
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

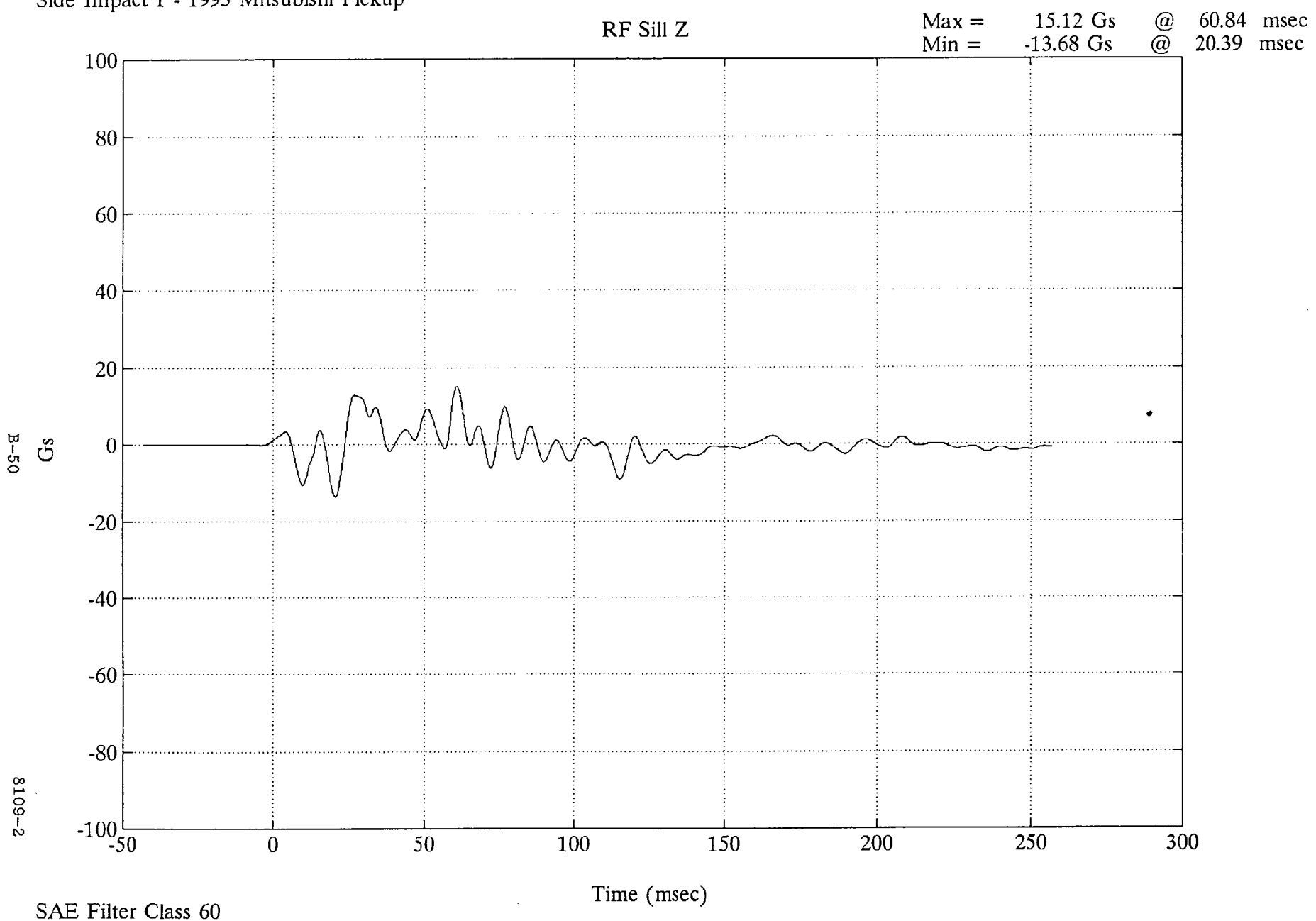
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

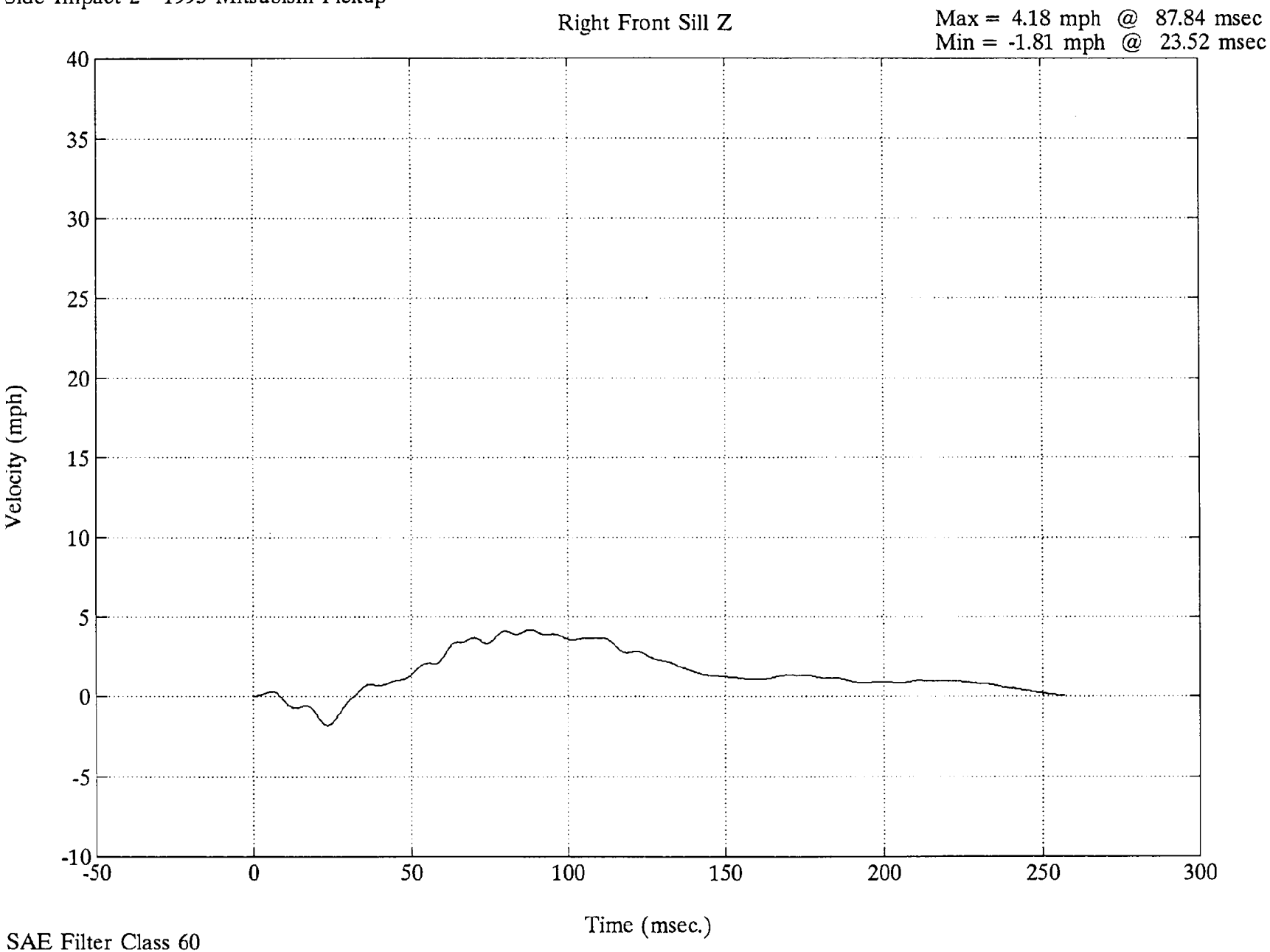
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

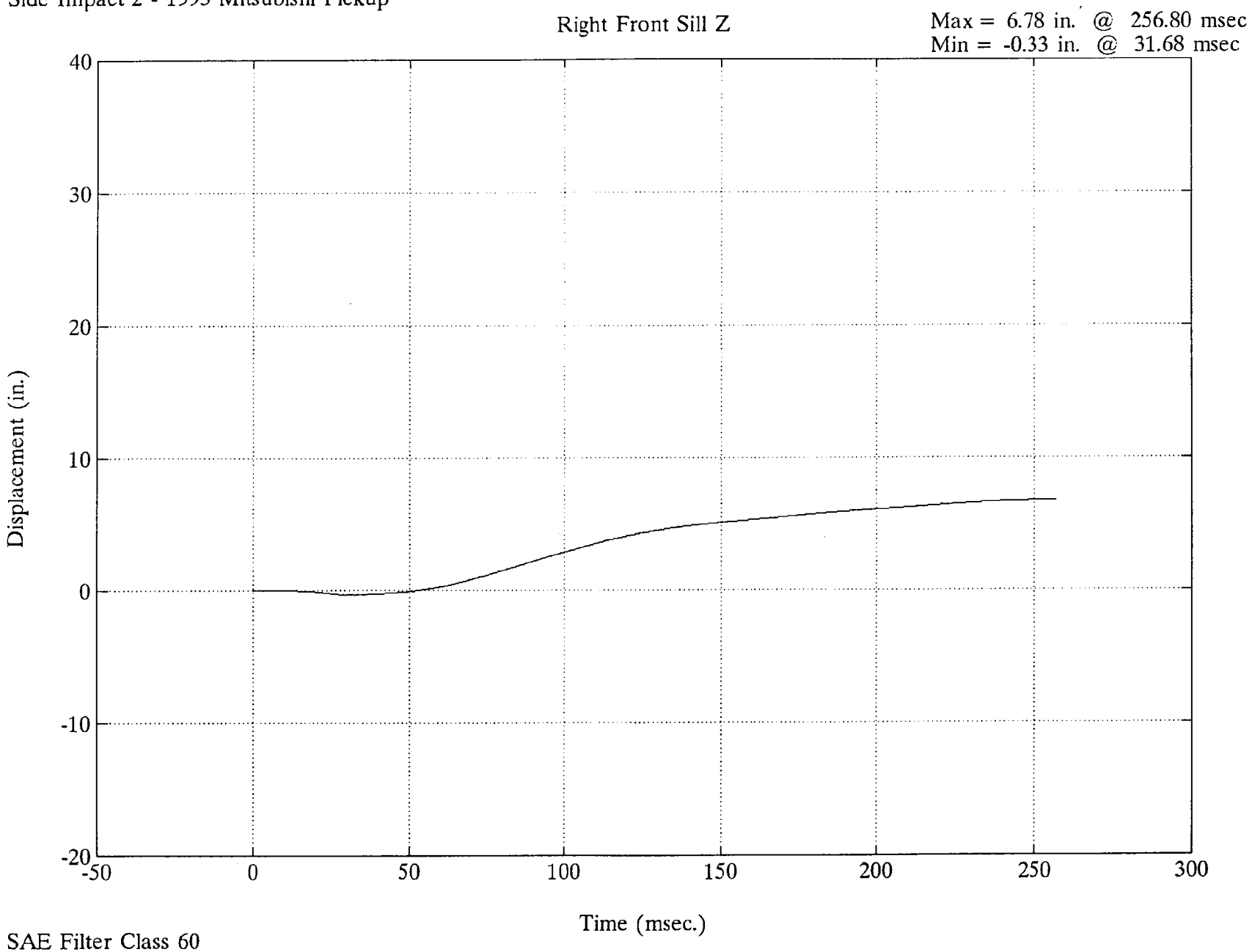
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

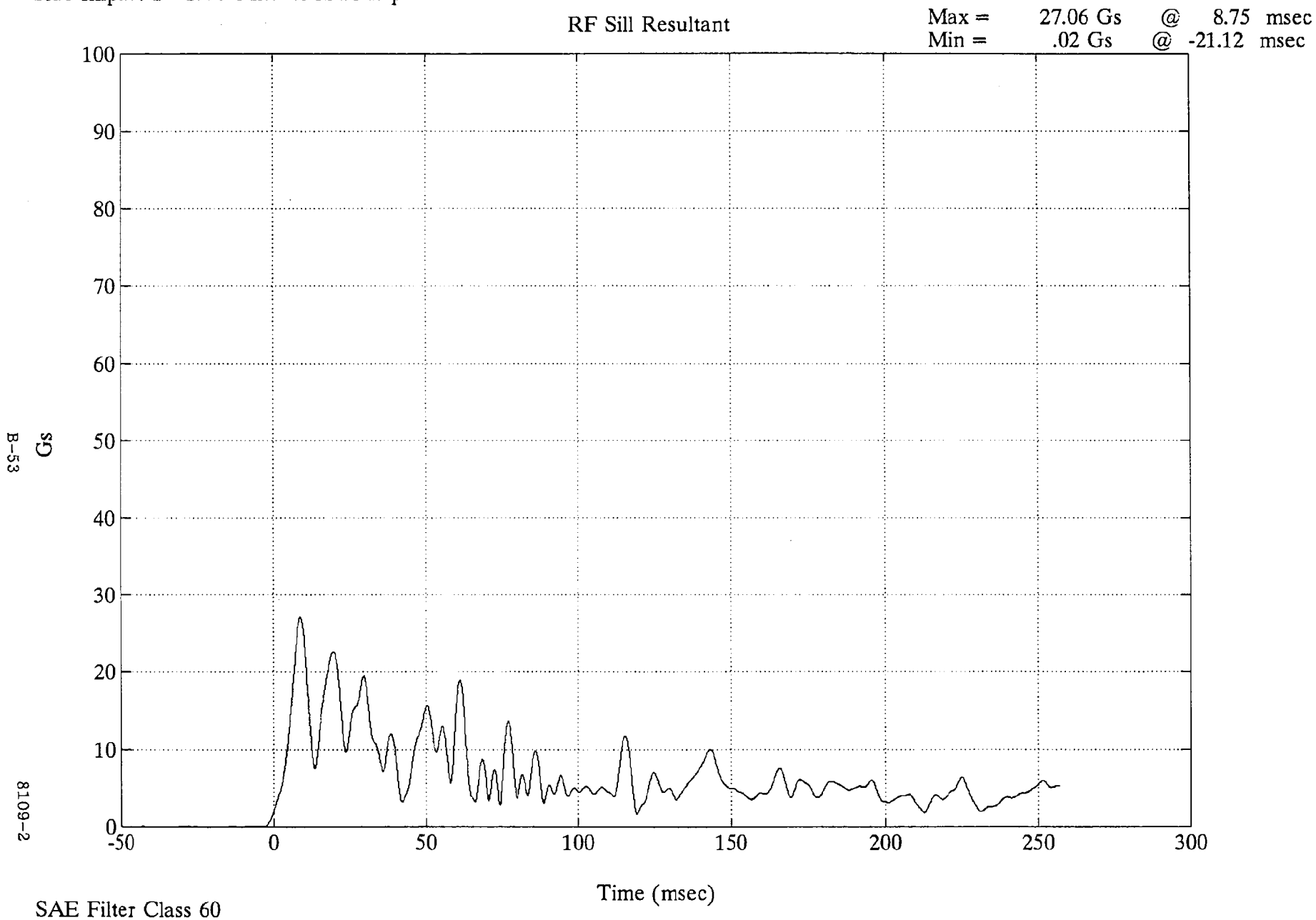
8109-2

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup

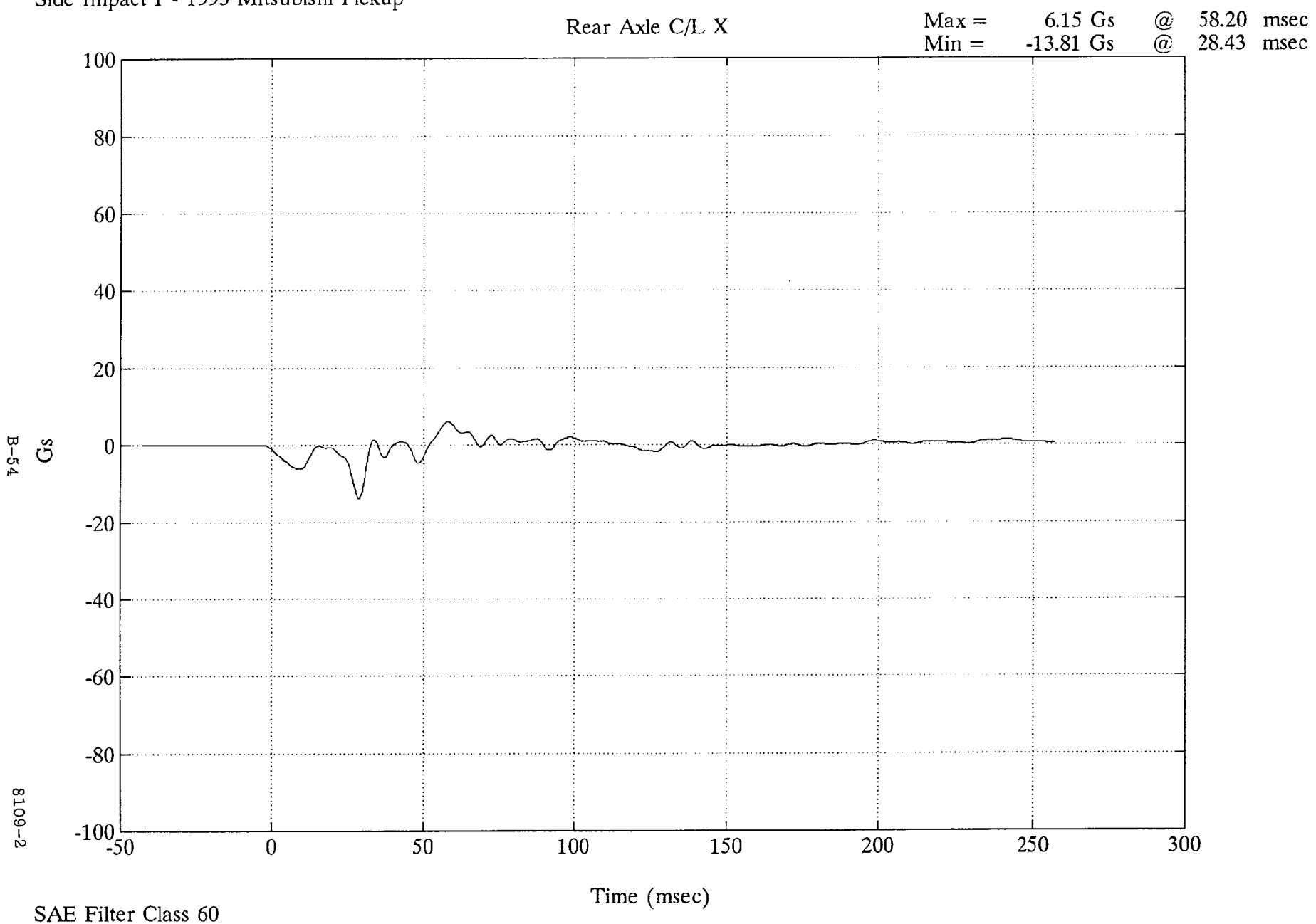


B-53

8109-2

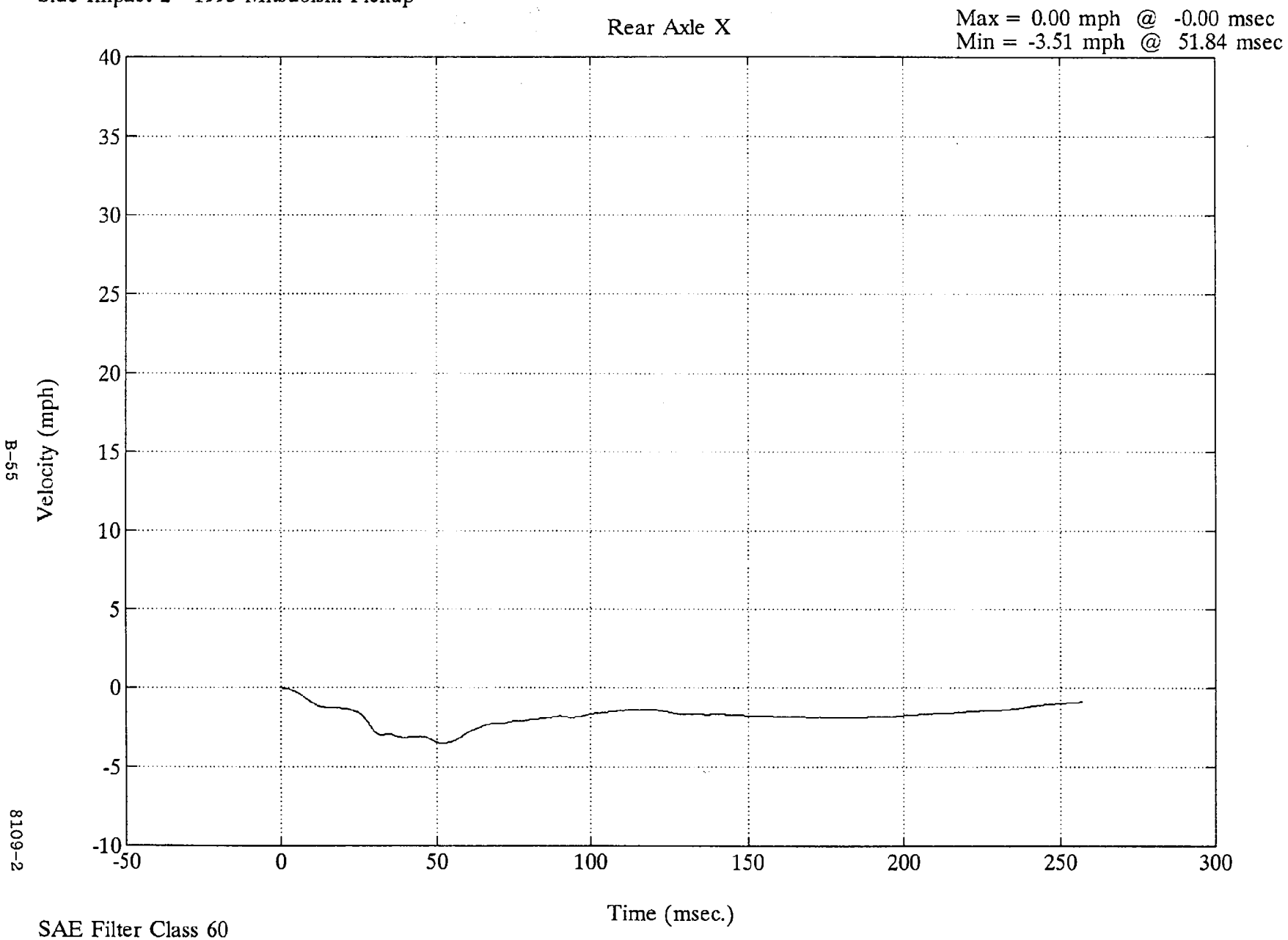
SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

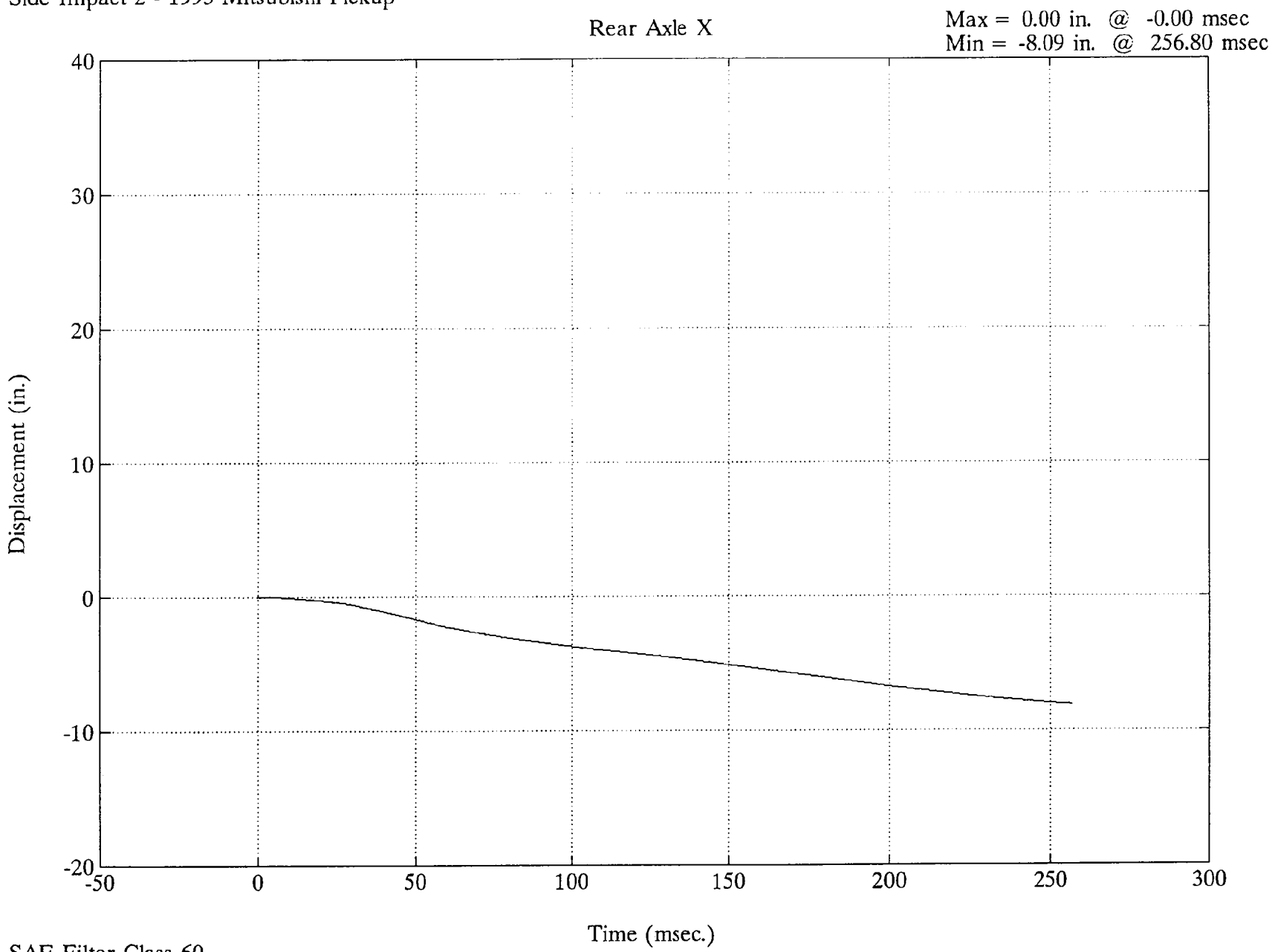


B-55

8109-2

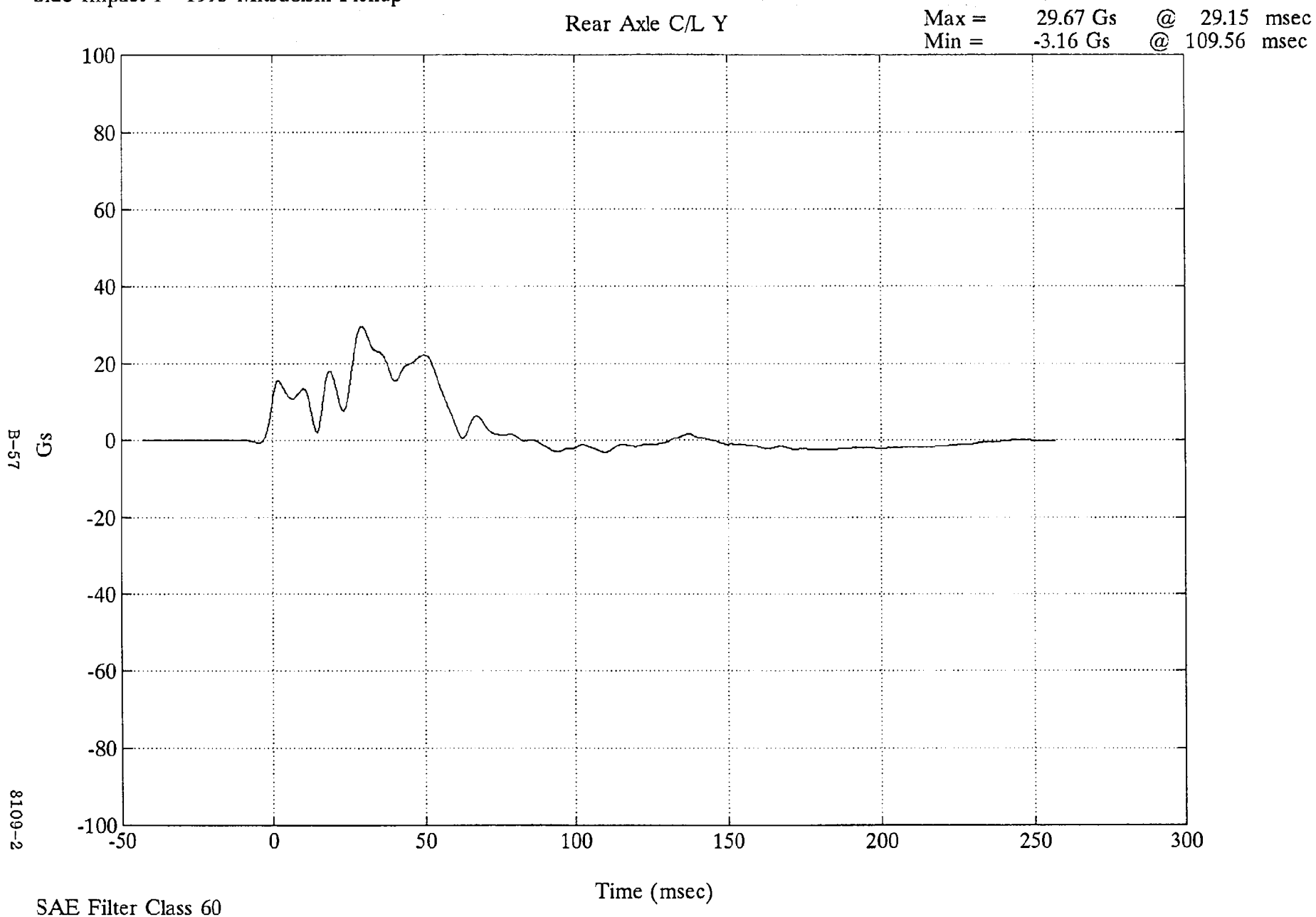
SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup

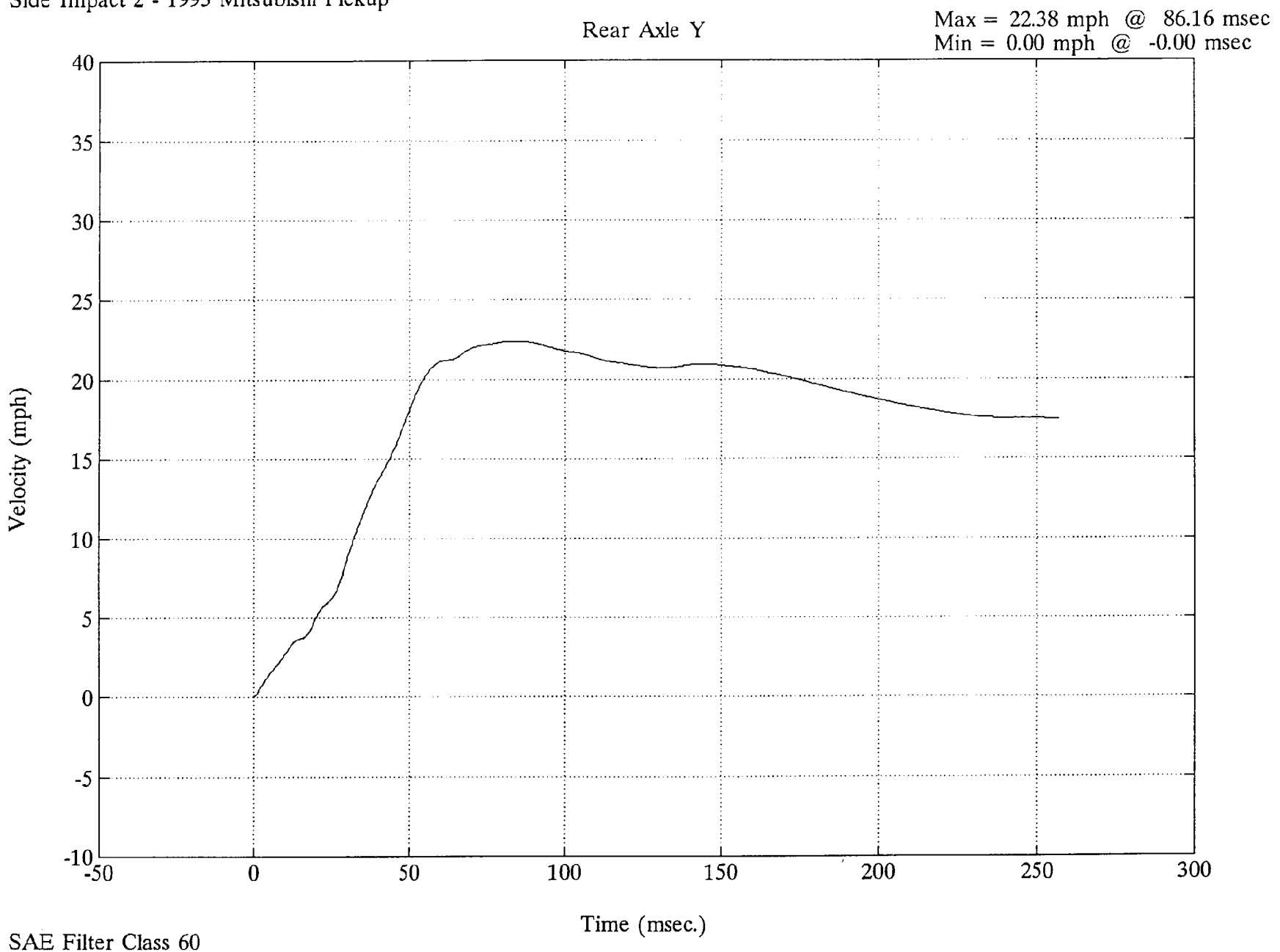


B-57

8109-2

SAE Filter Class 60

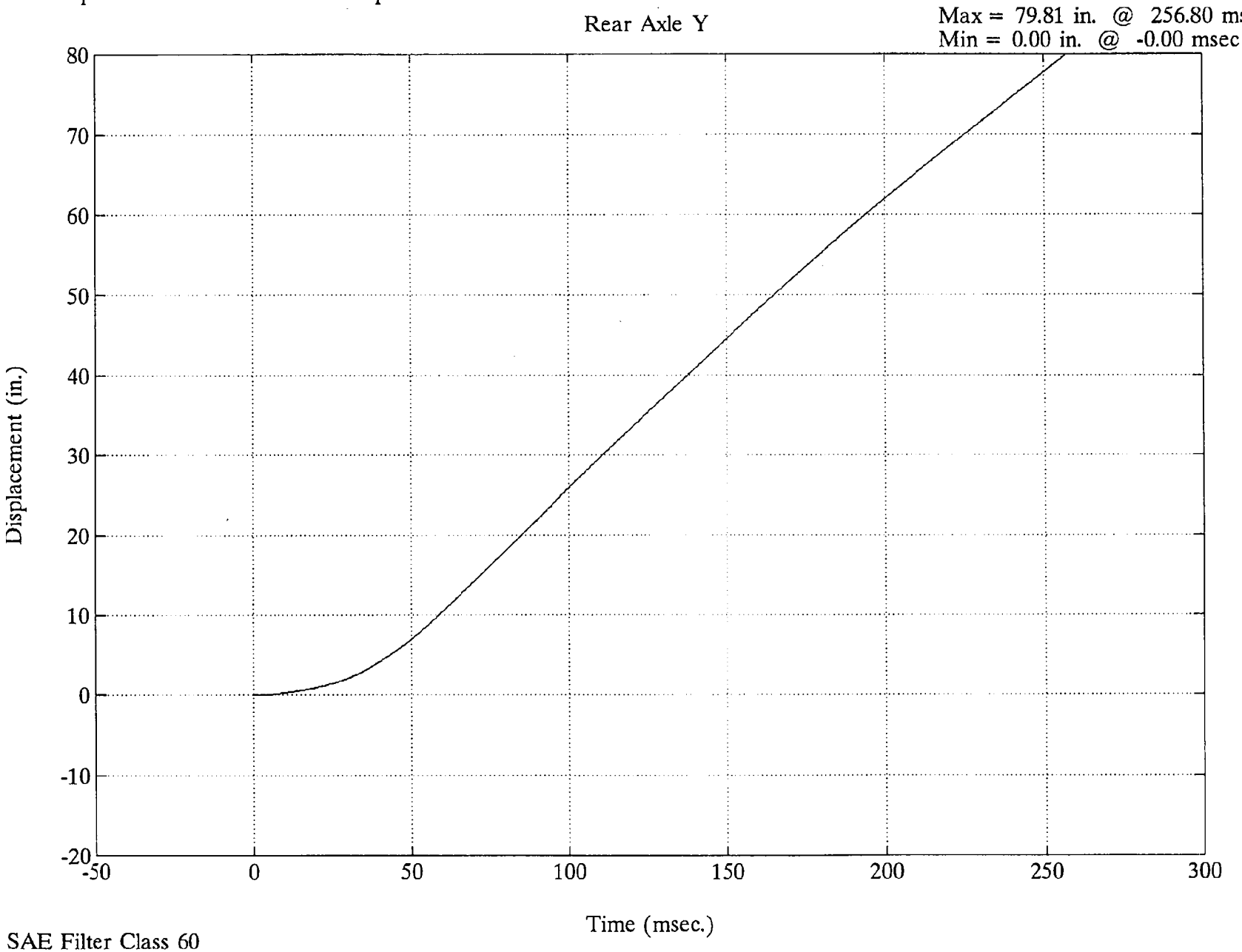
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

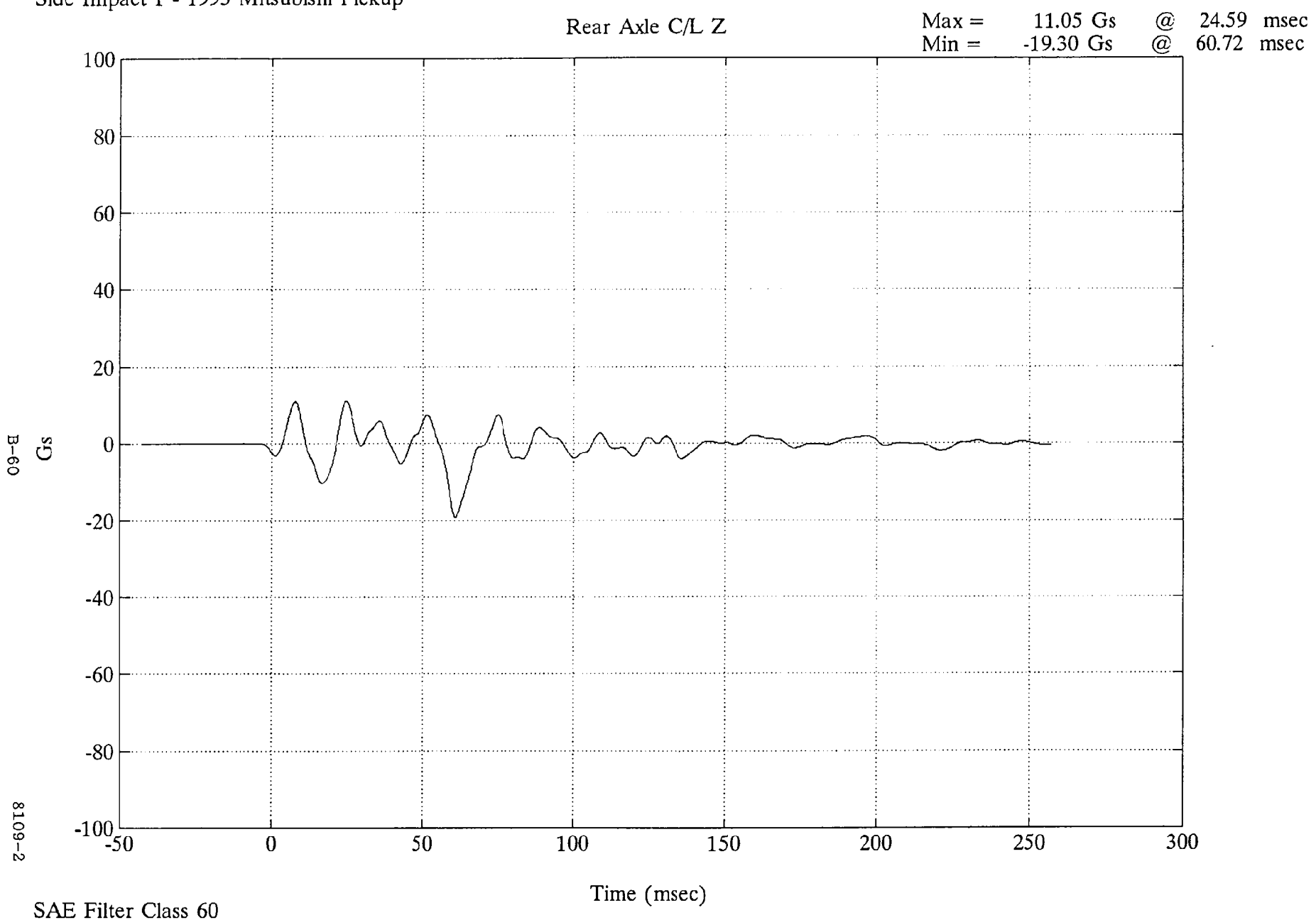
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

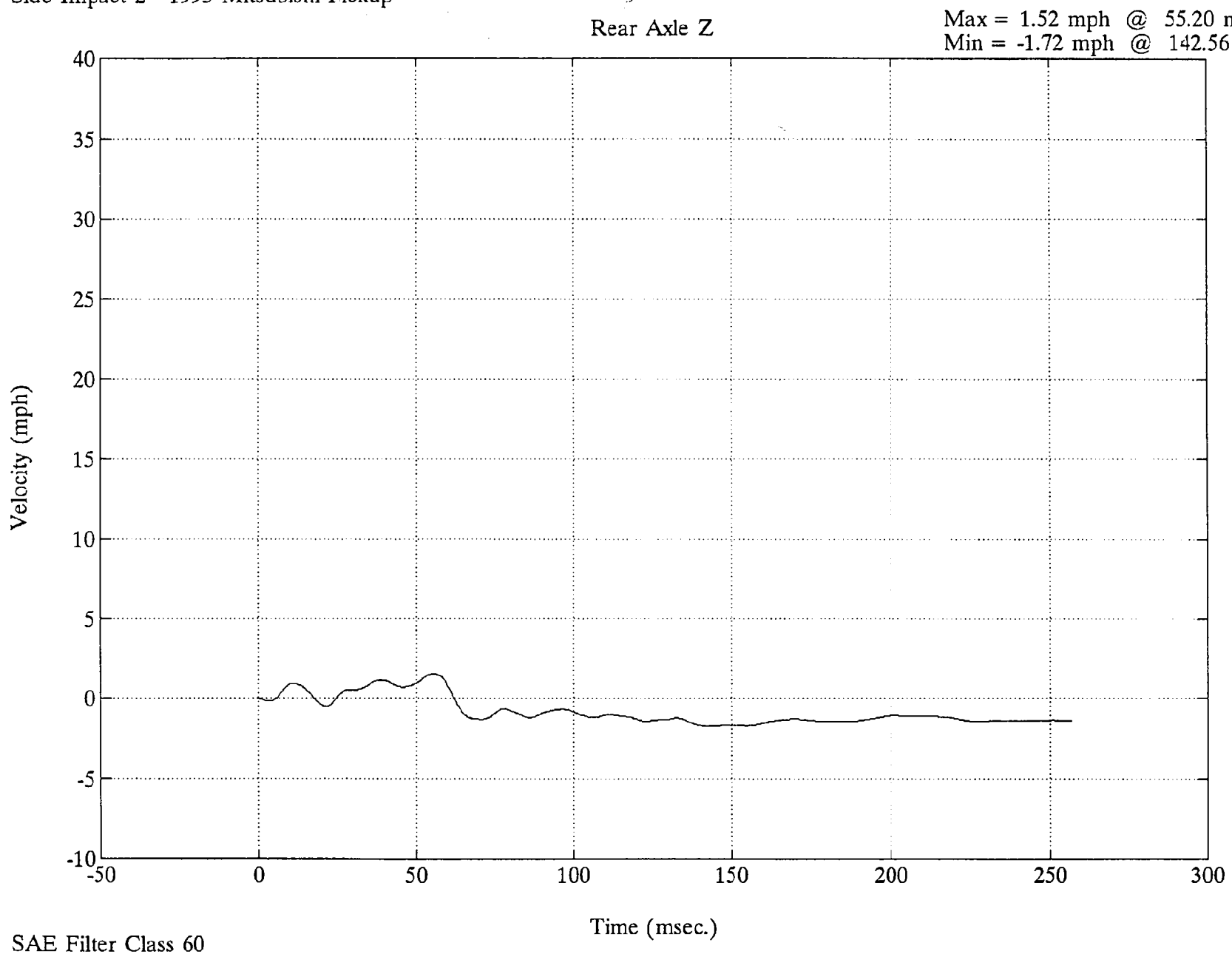
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

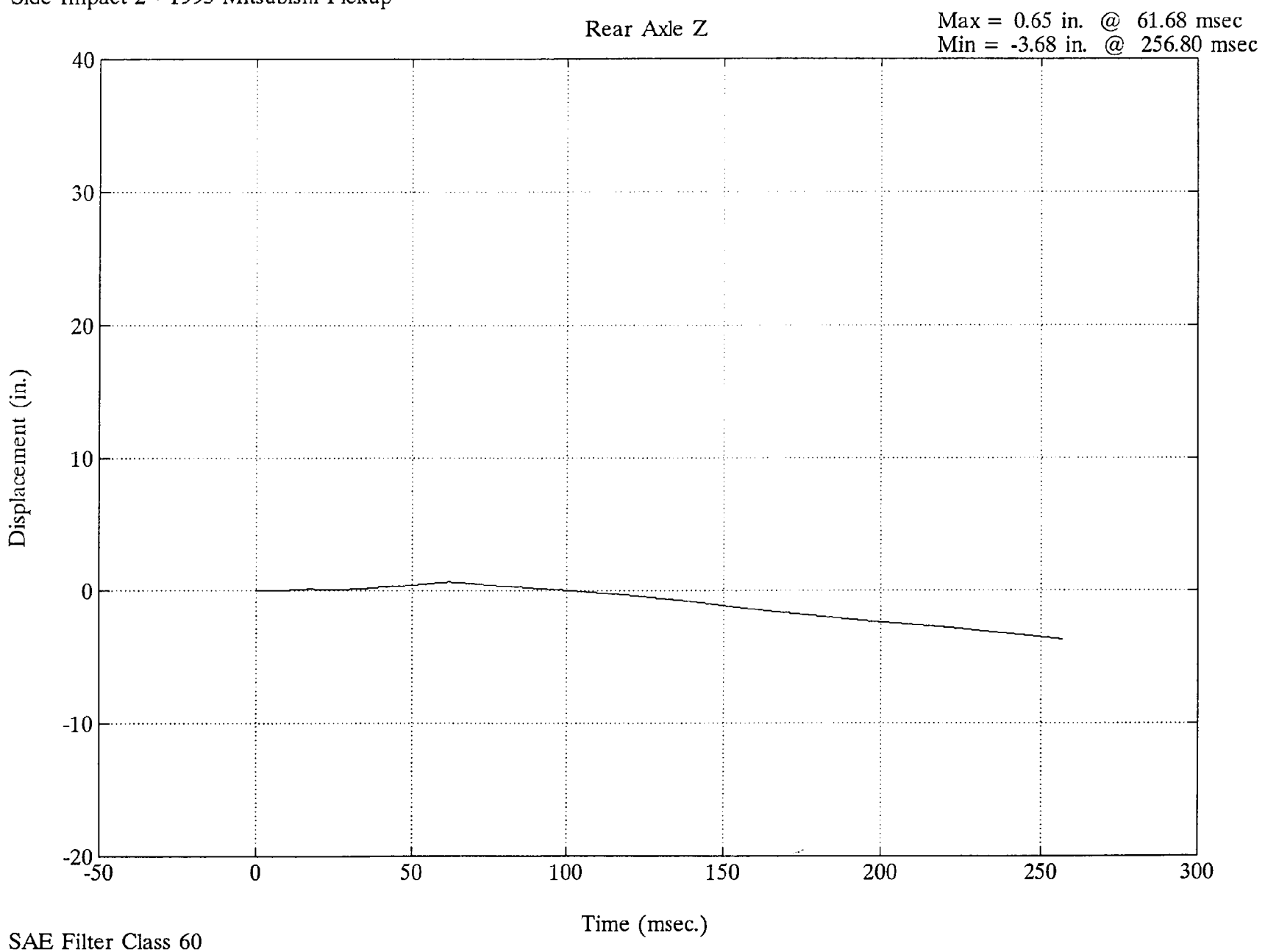
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

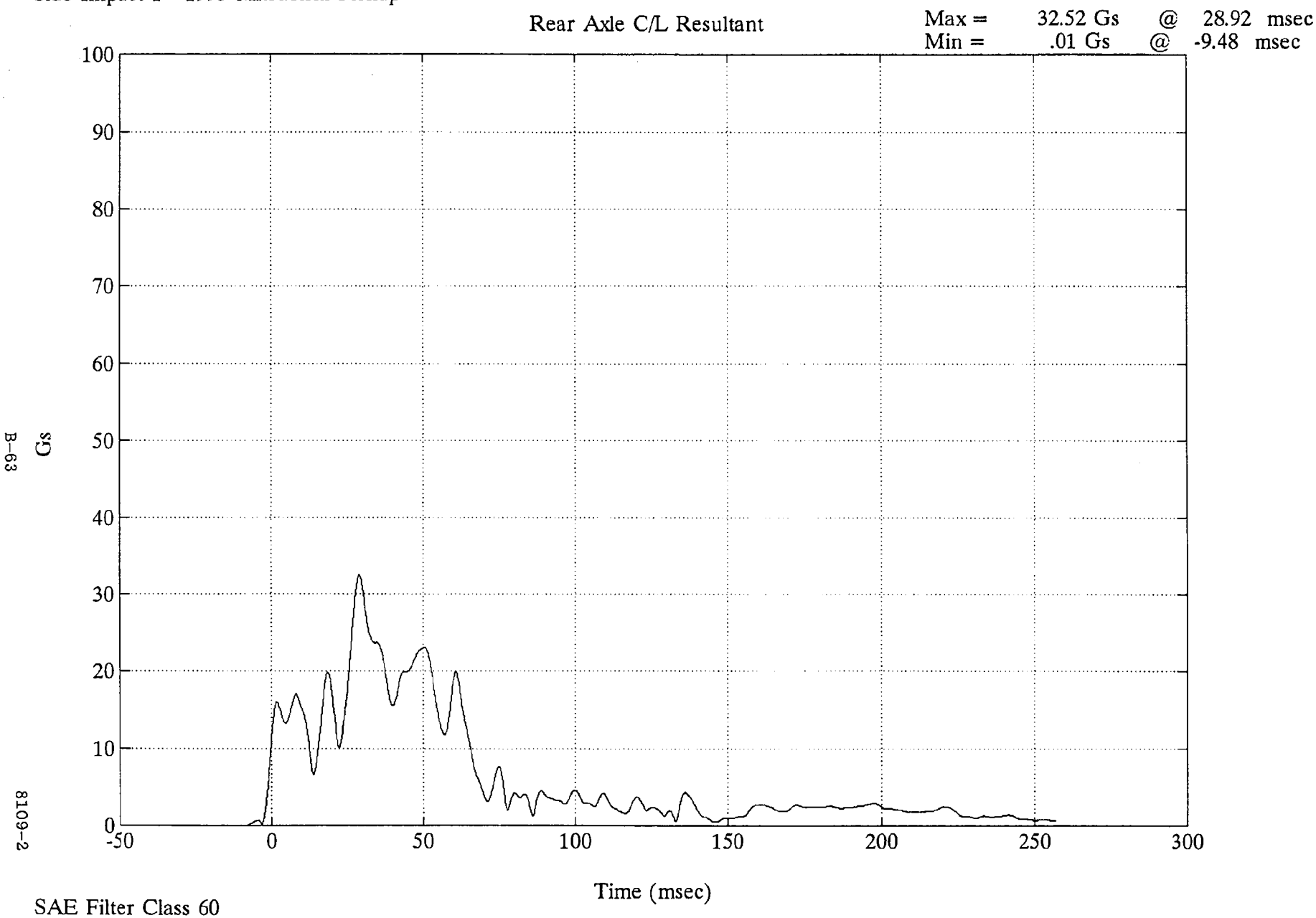
8109-2

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup

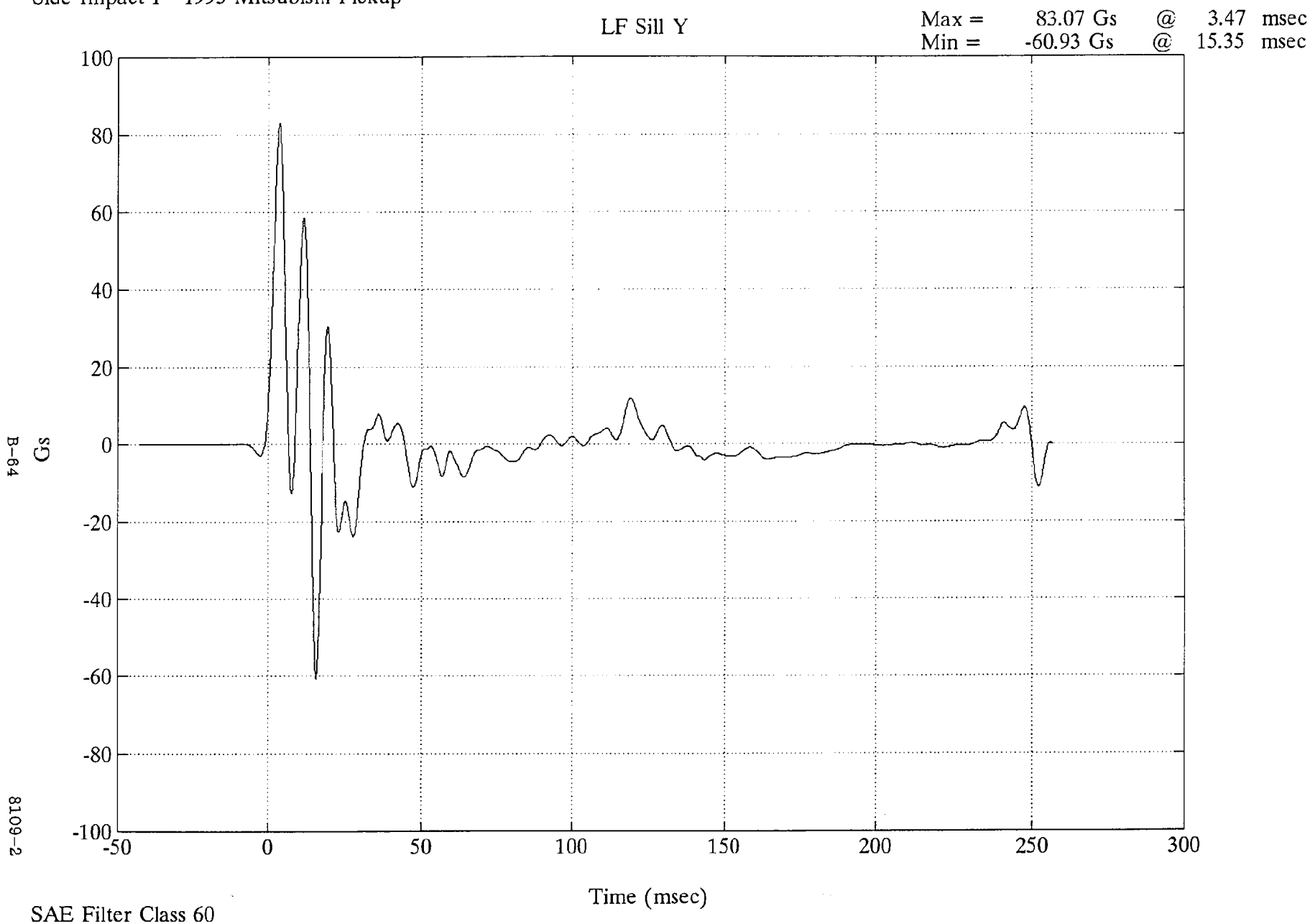


B-63

8109-2

SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup

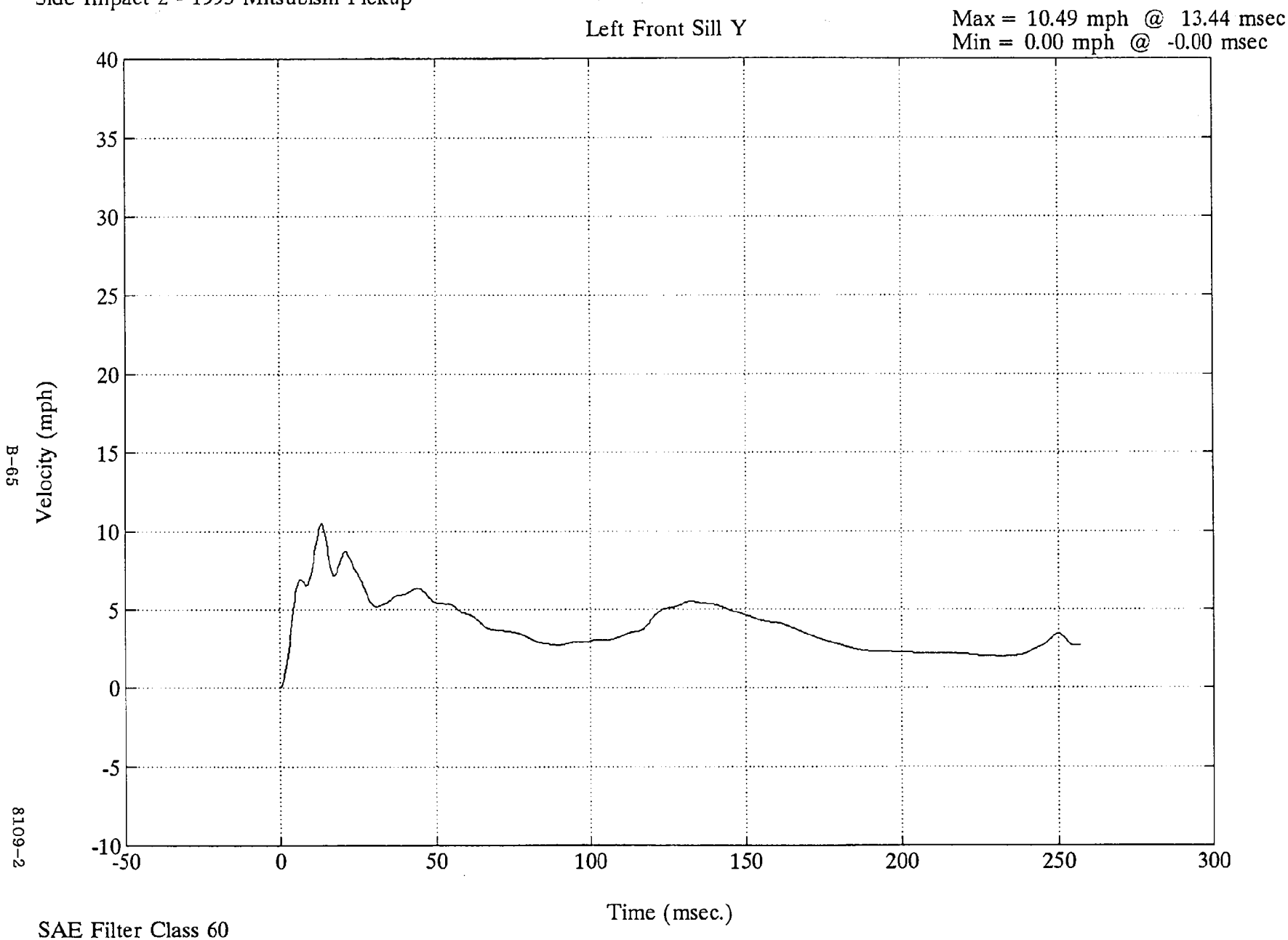


B-64

8109-2

SAE Filter Class 60

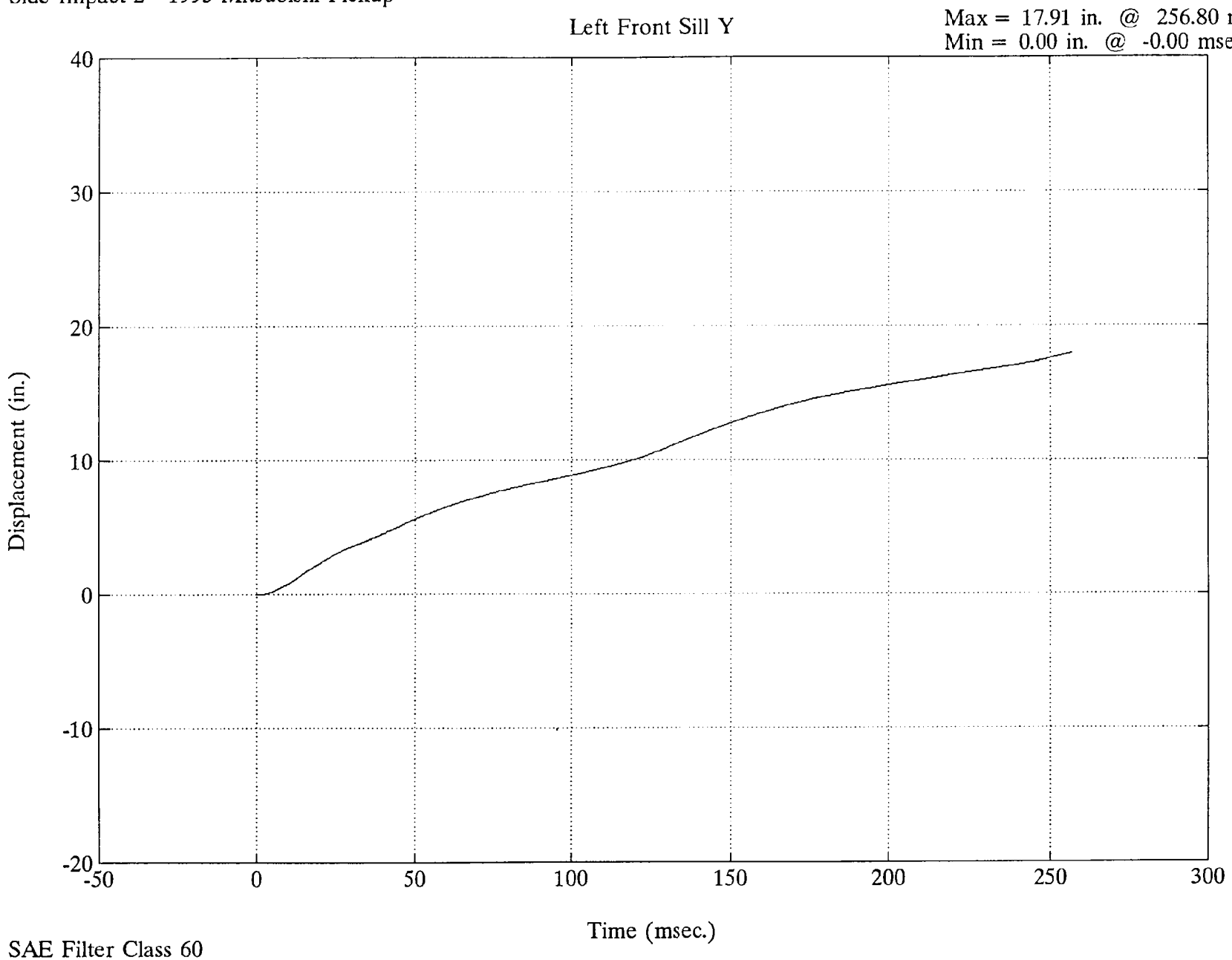
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

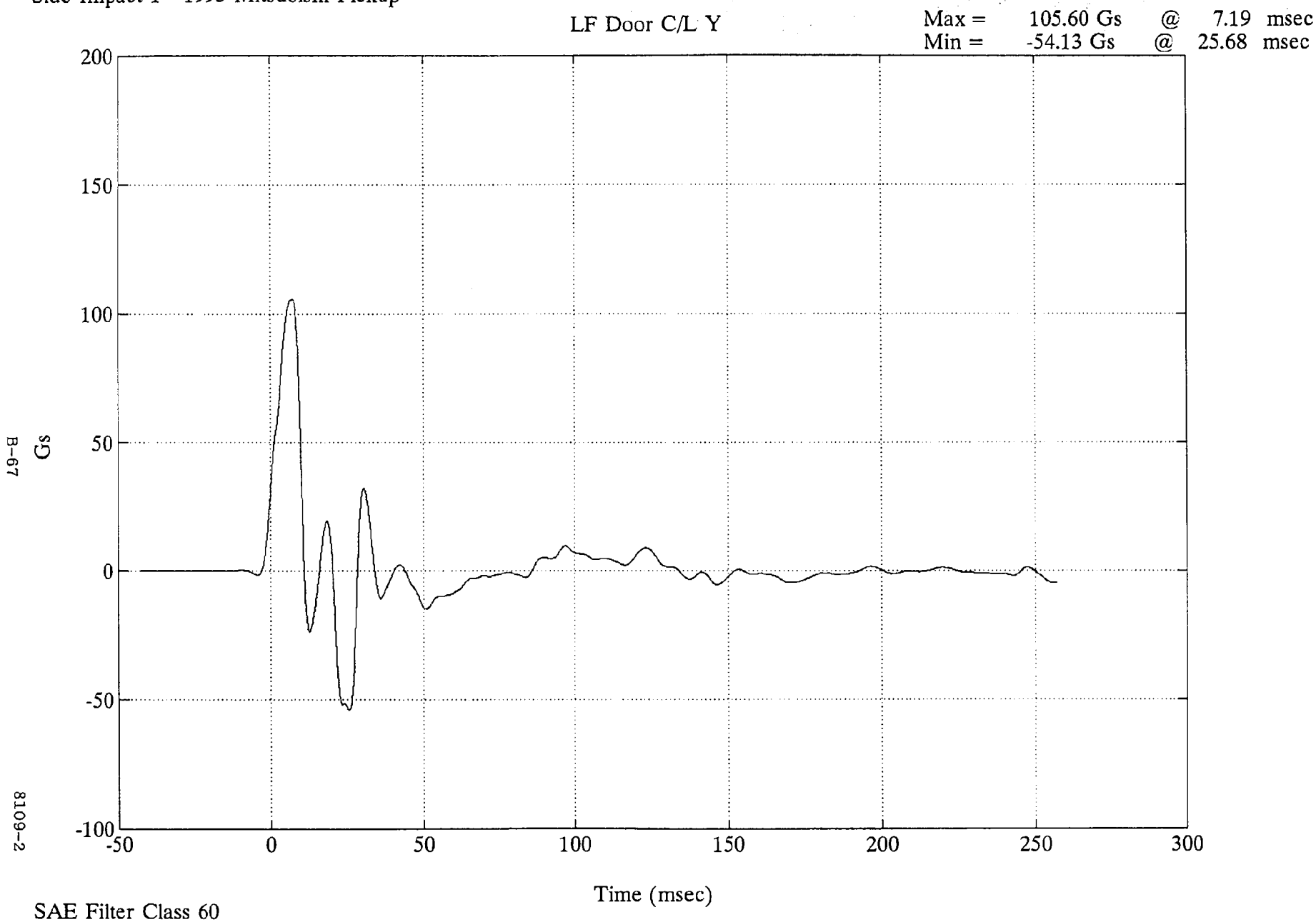
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

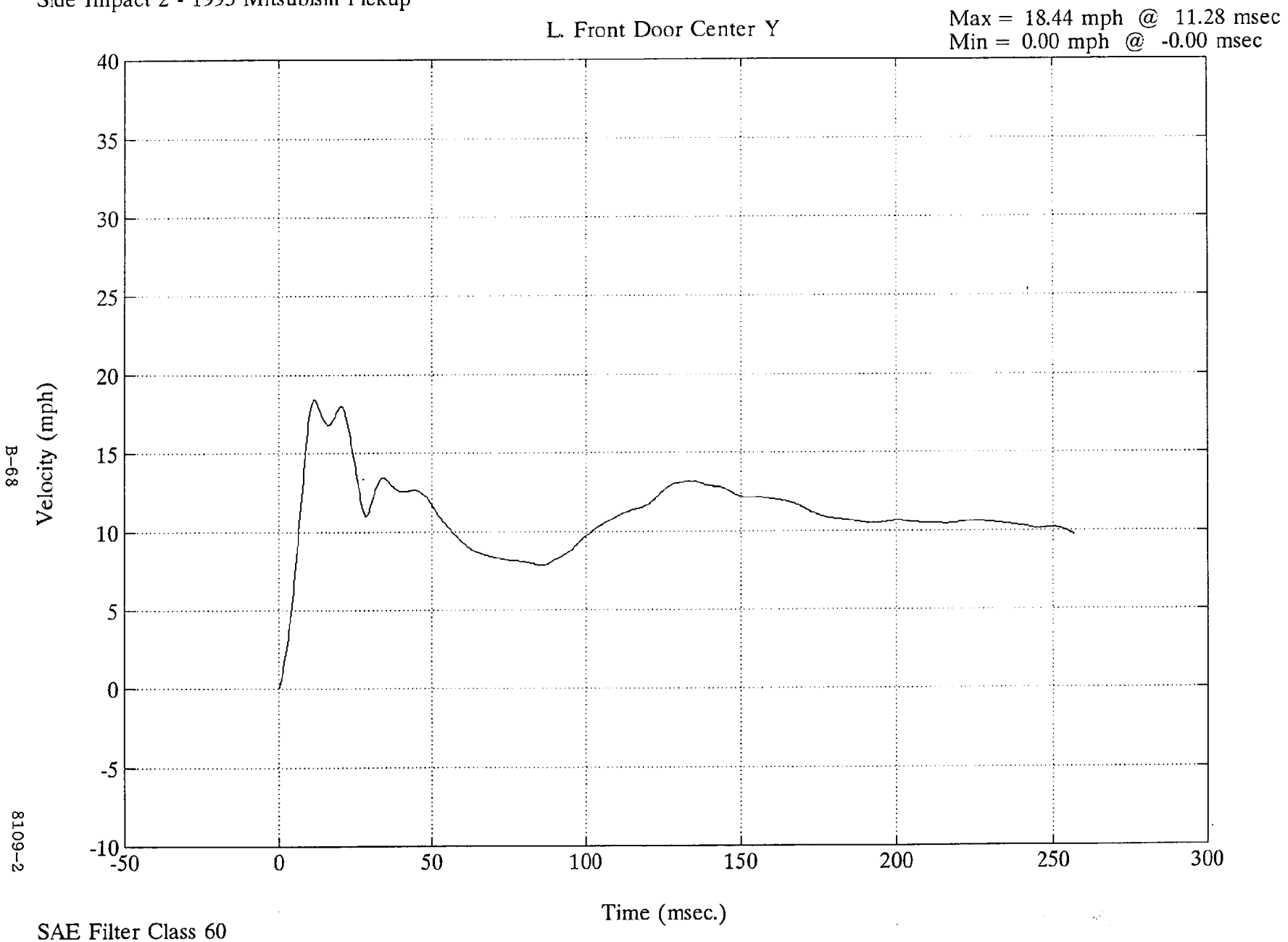
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

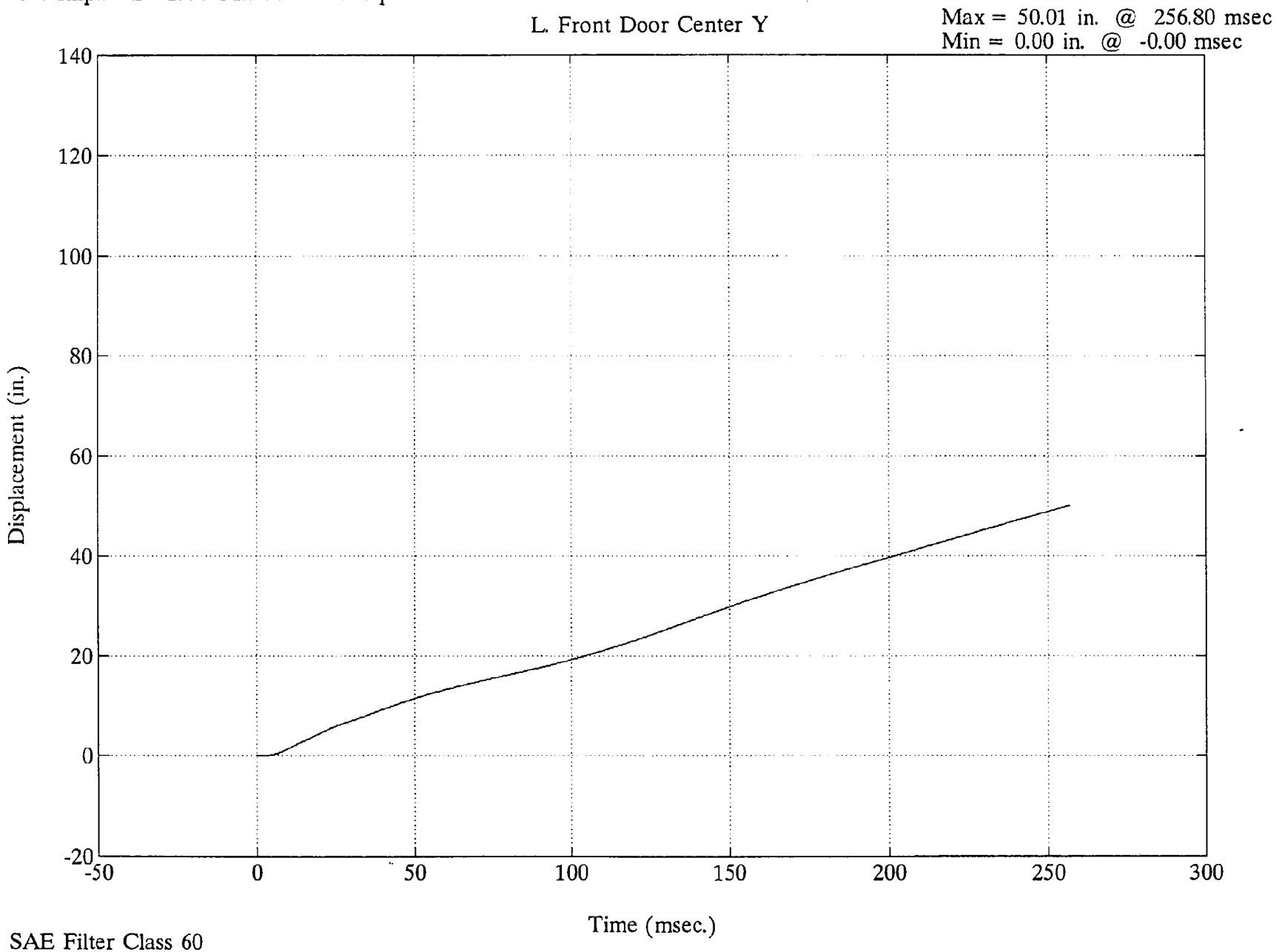
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

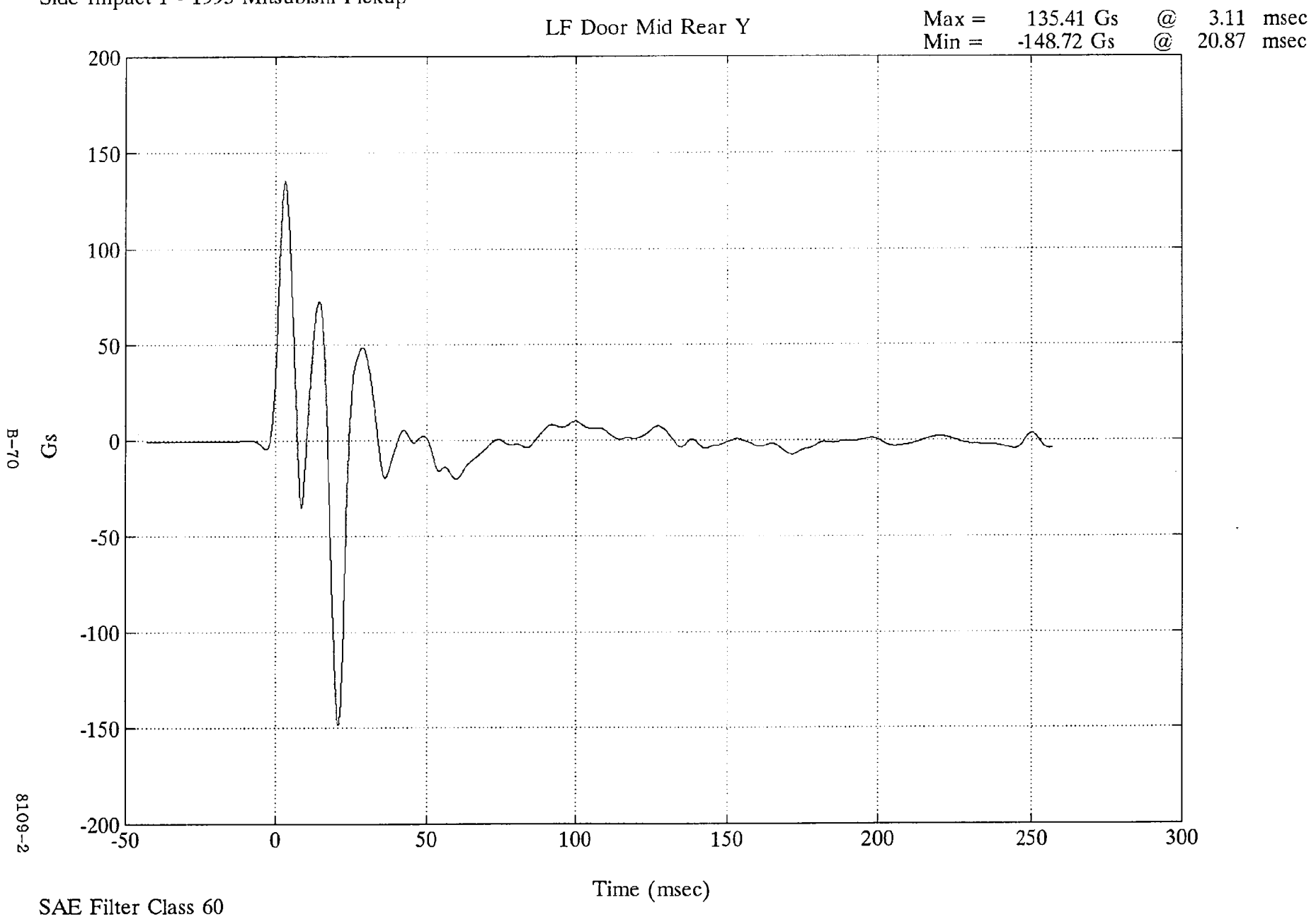
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



B-70

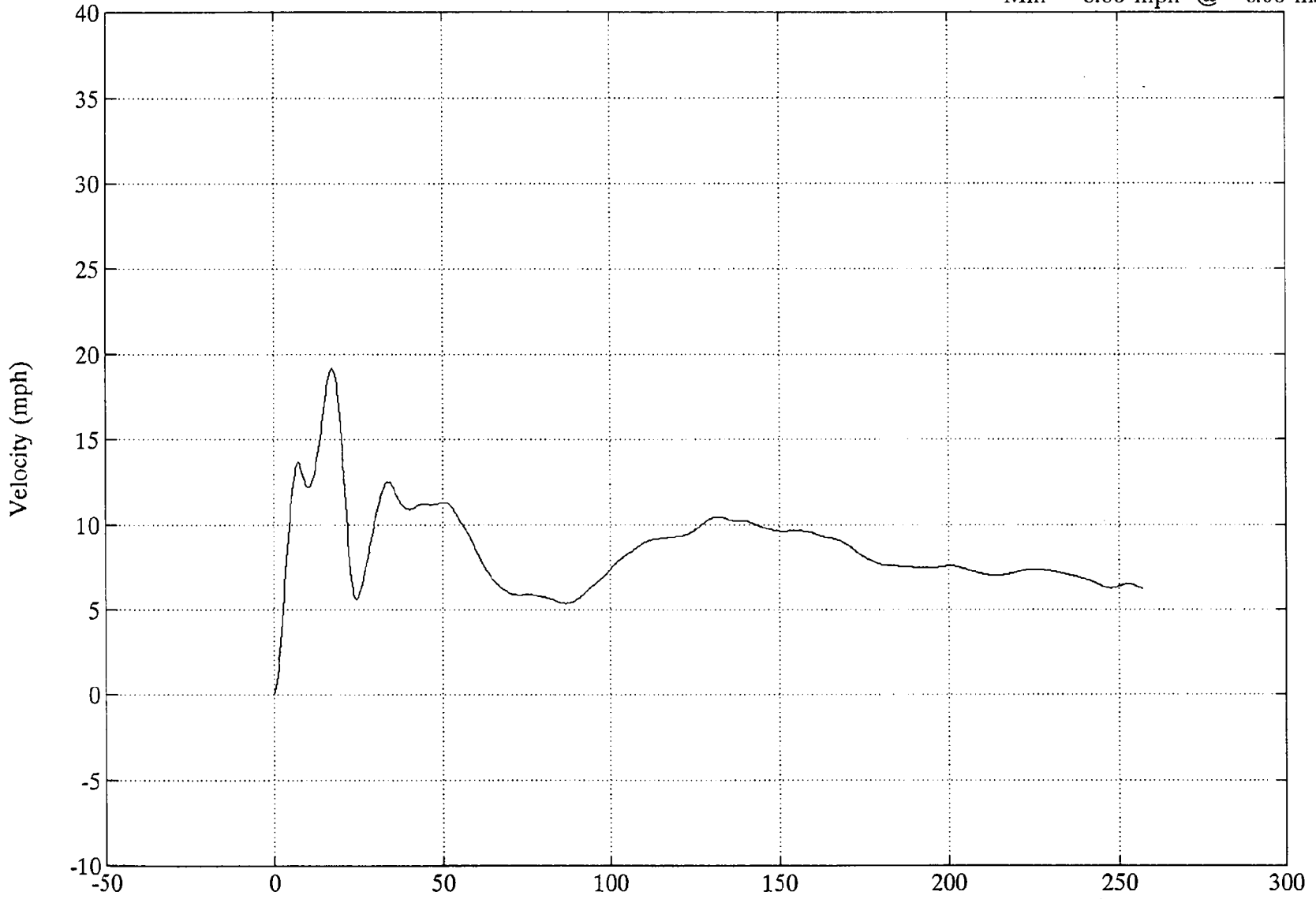
8109-2

SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

L. Front Door Mid Rear Y

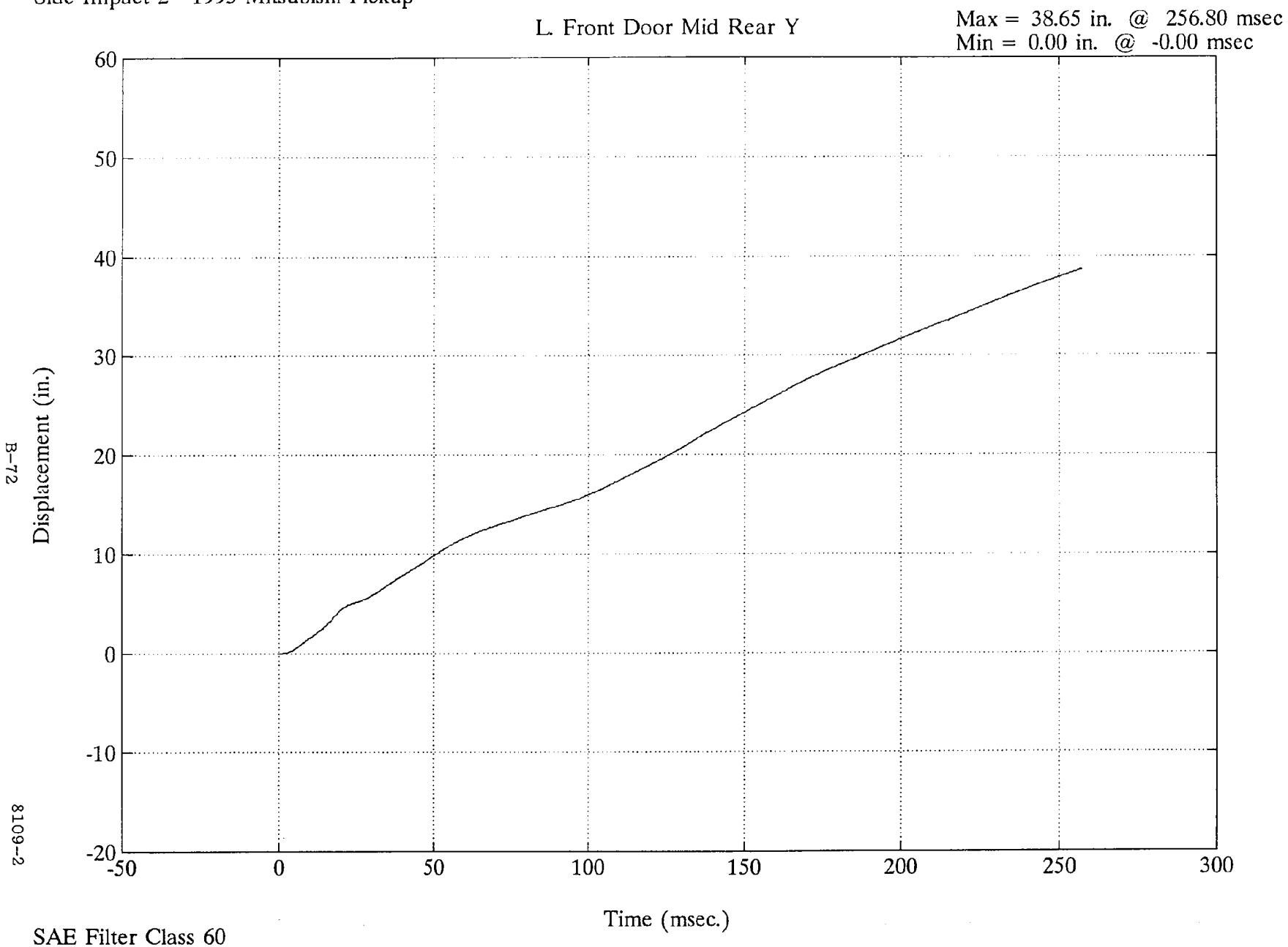
Max = 19.18 mph @ 17.28 msec
Min = 0.00 mph @ -0.00 msec



SAE Filter Class 60

8109-2

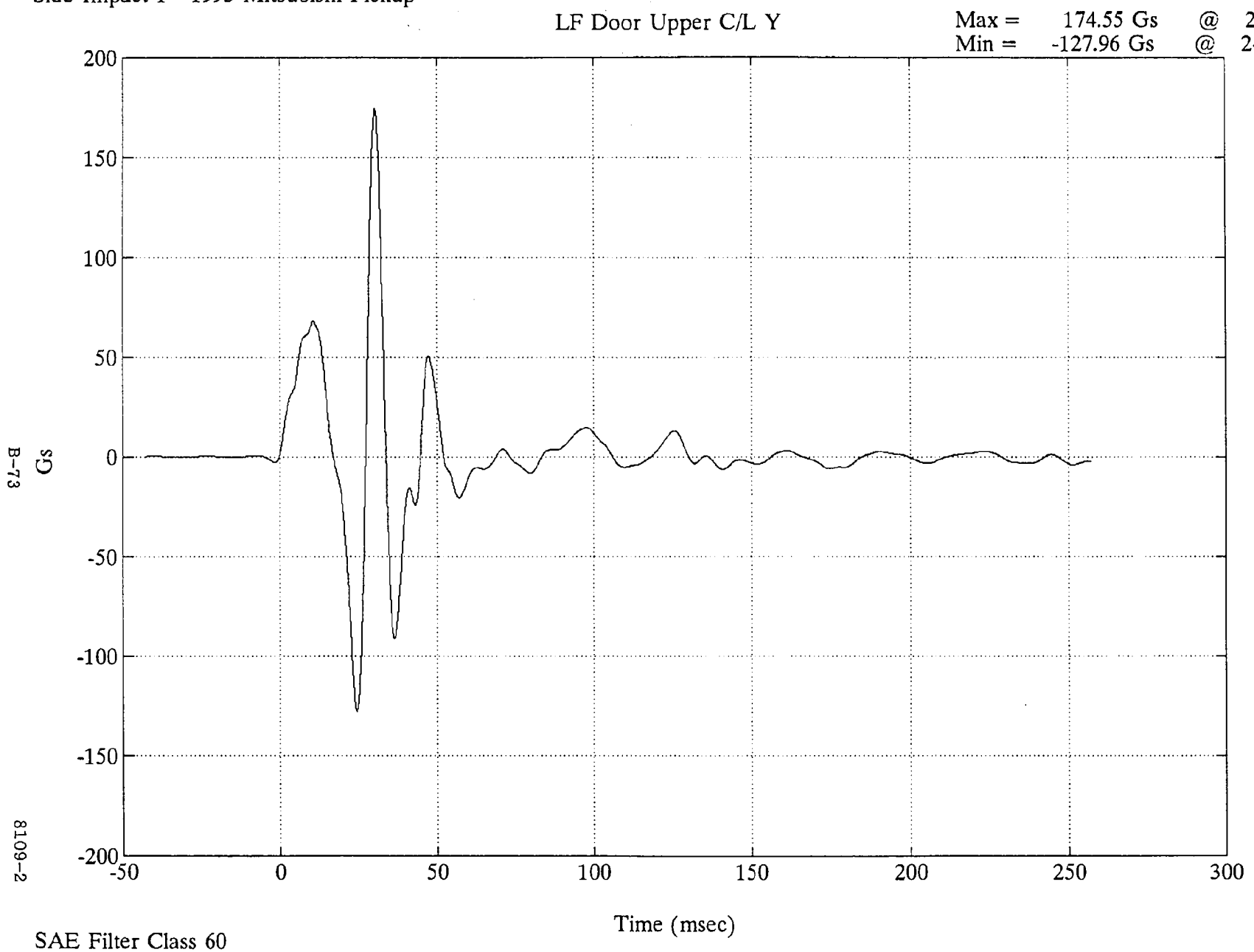
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

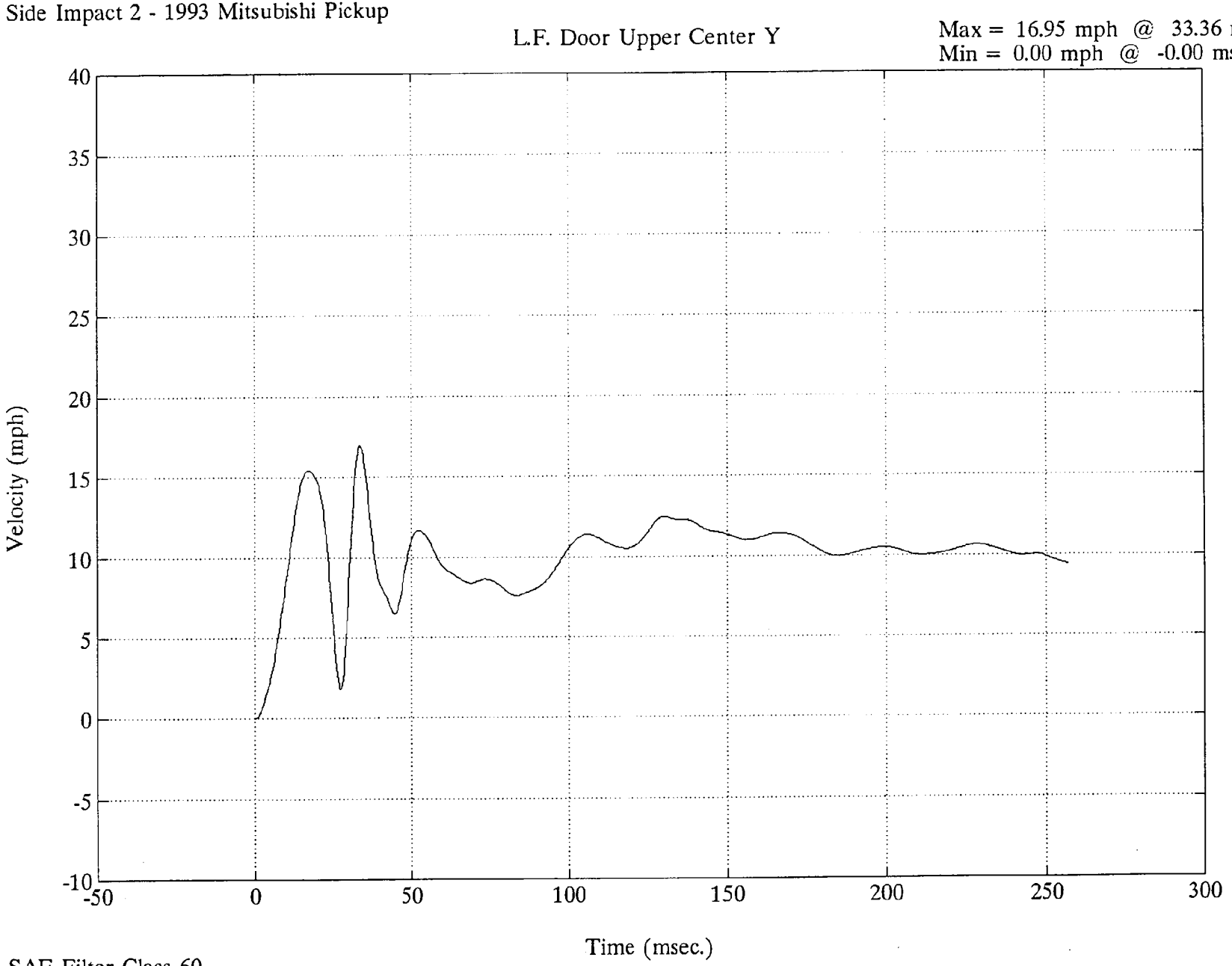


SAE Filter Class 60

B-73

8109-2

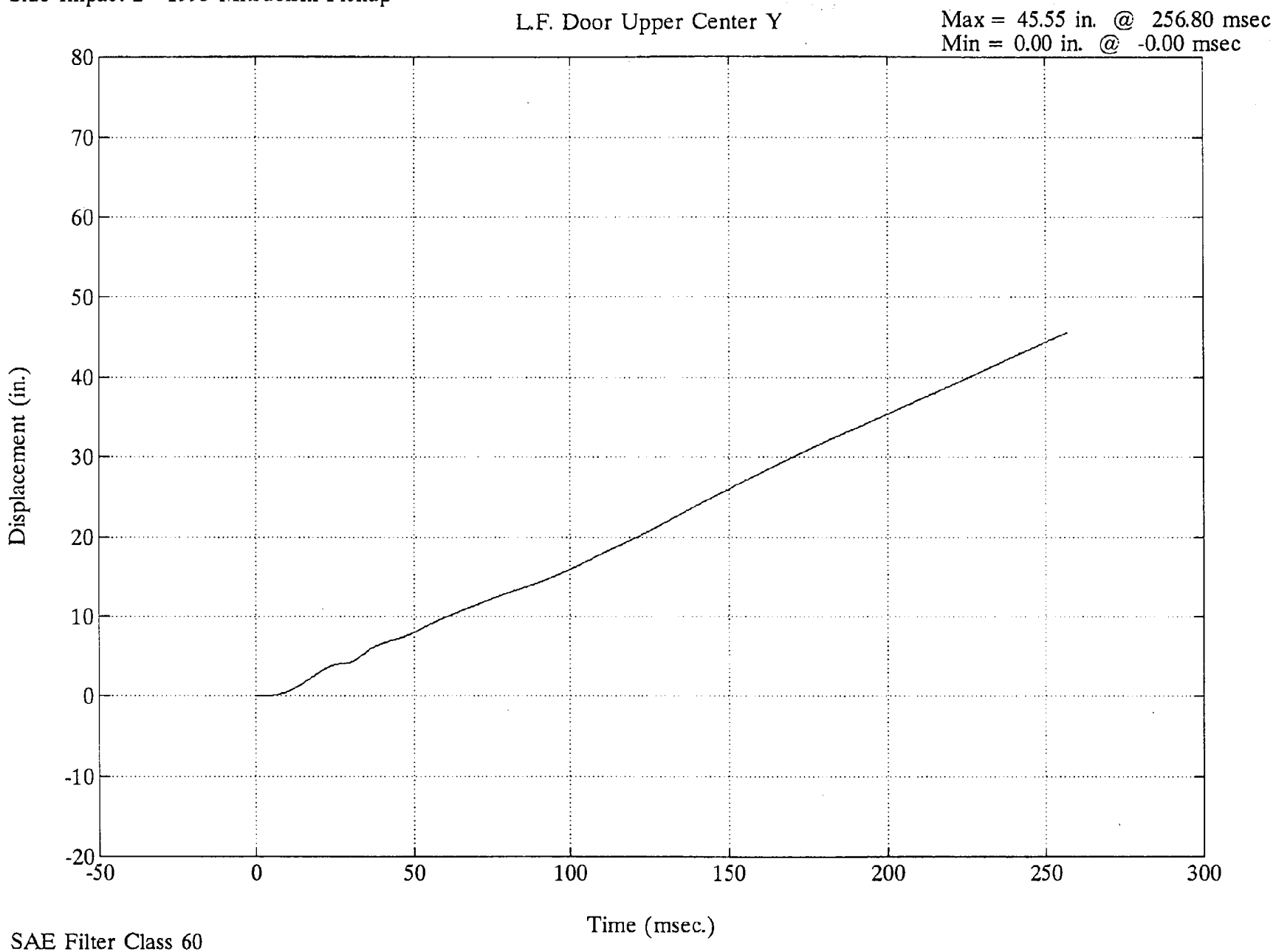
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

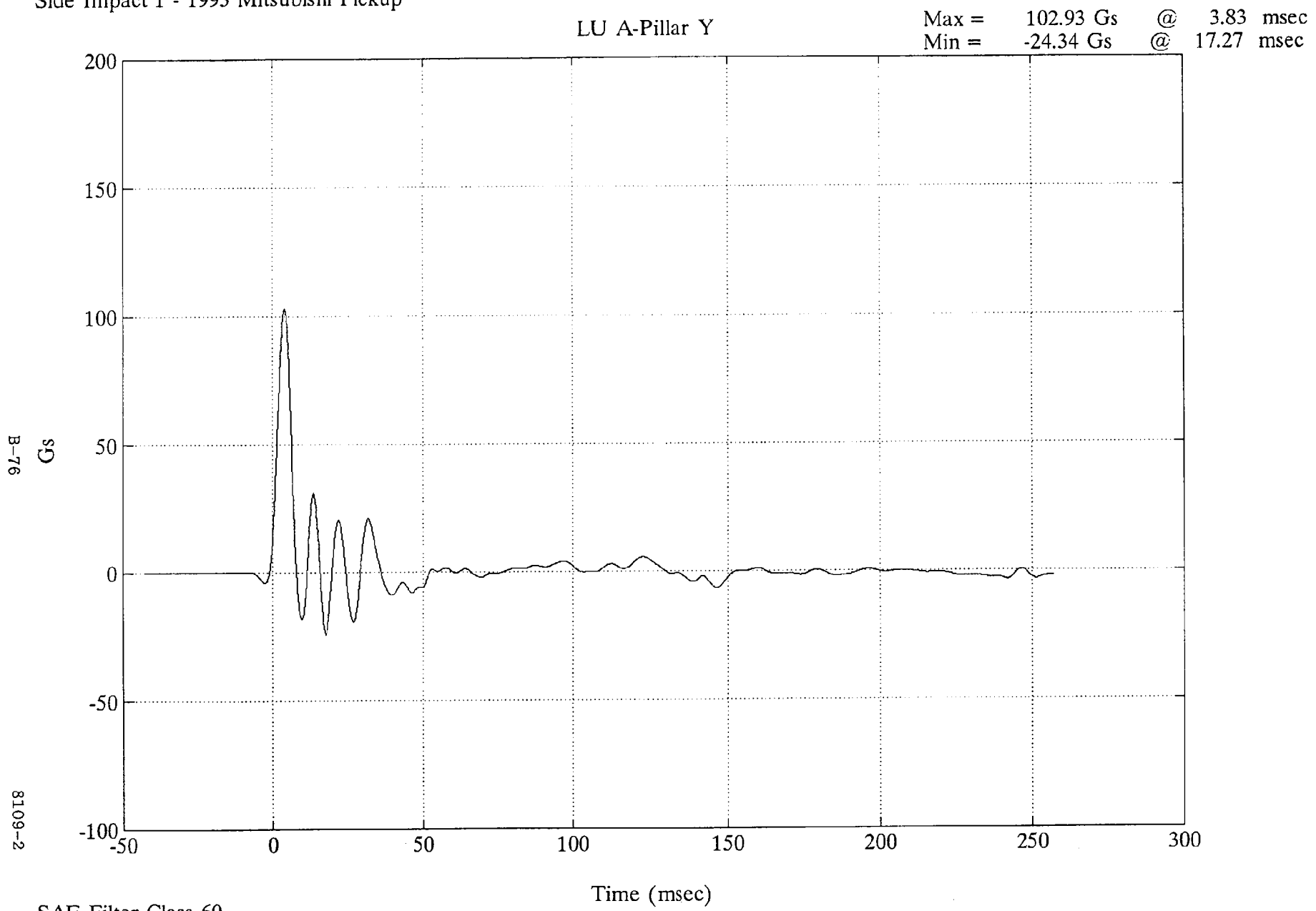
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

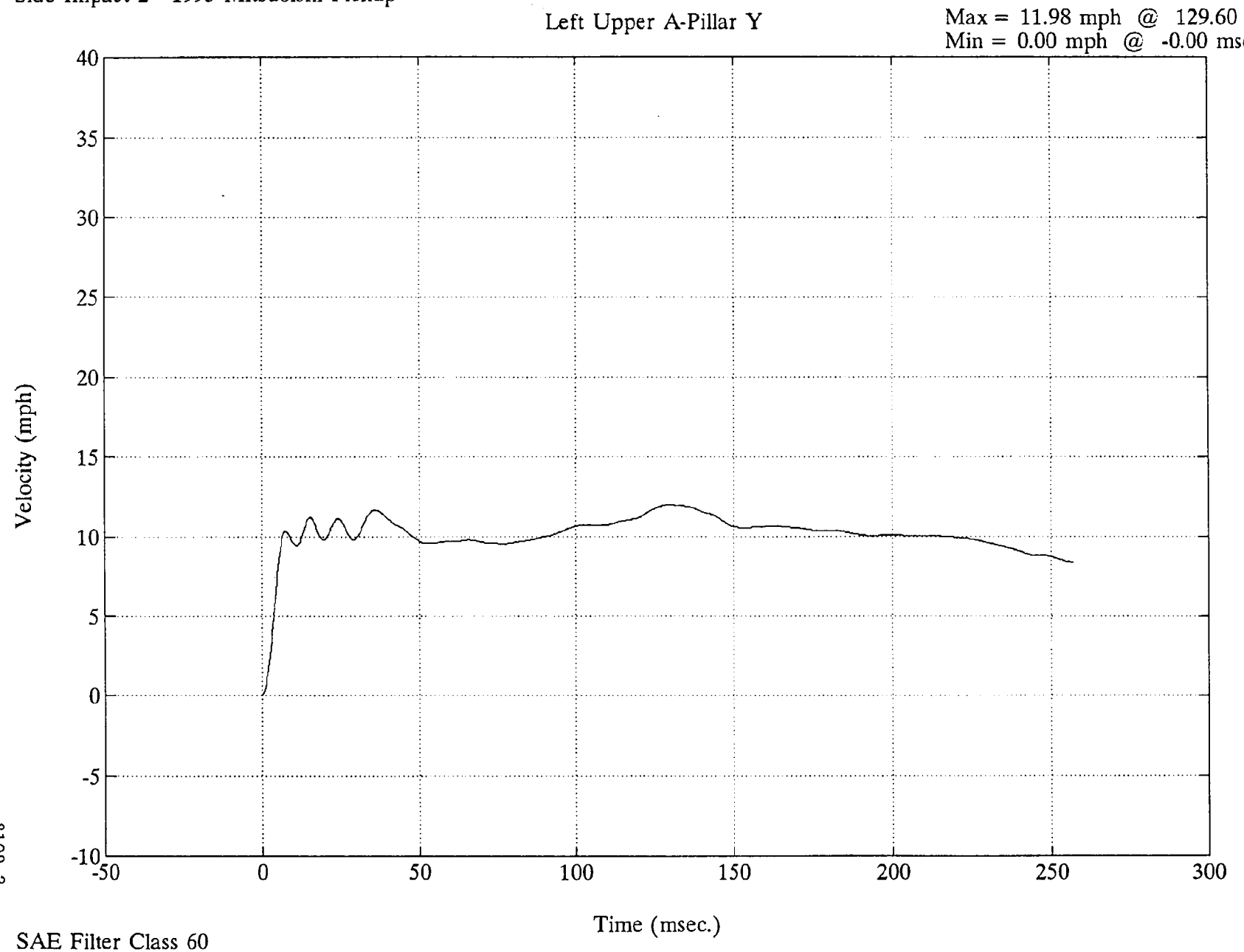
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

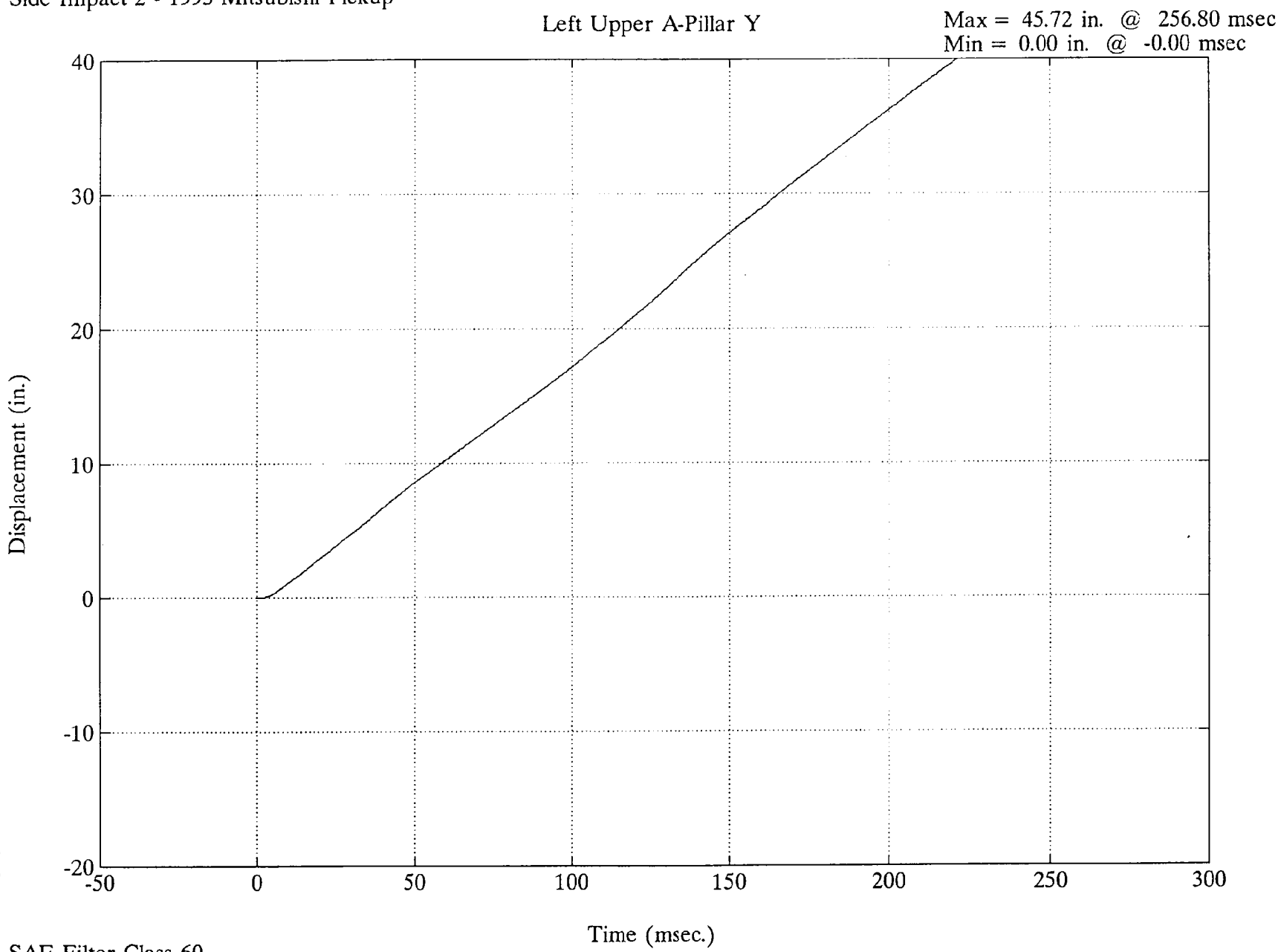
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

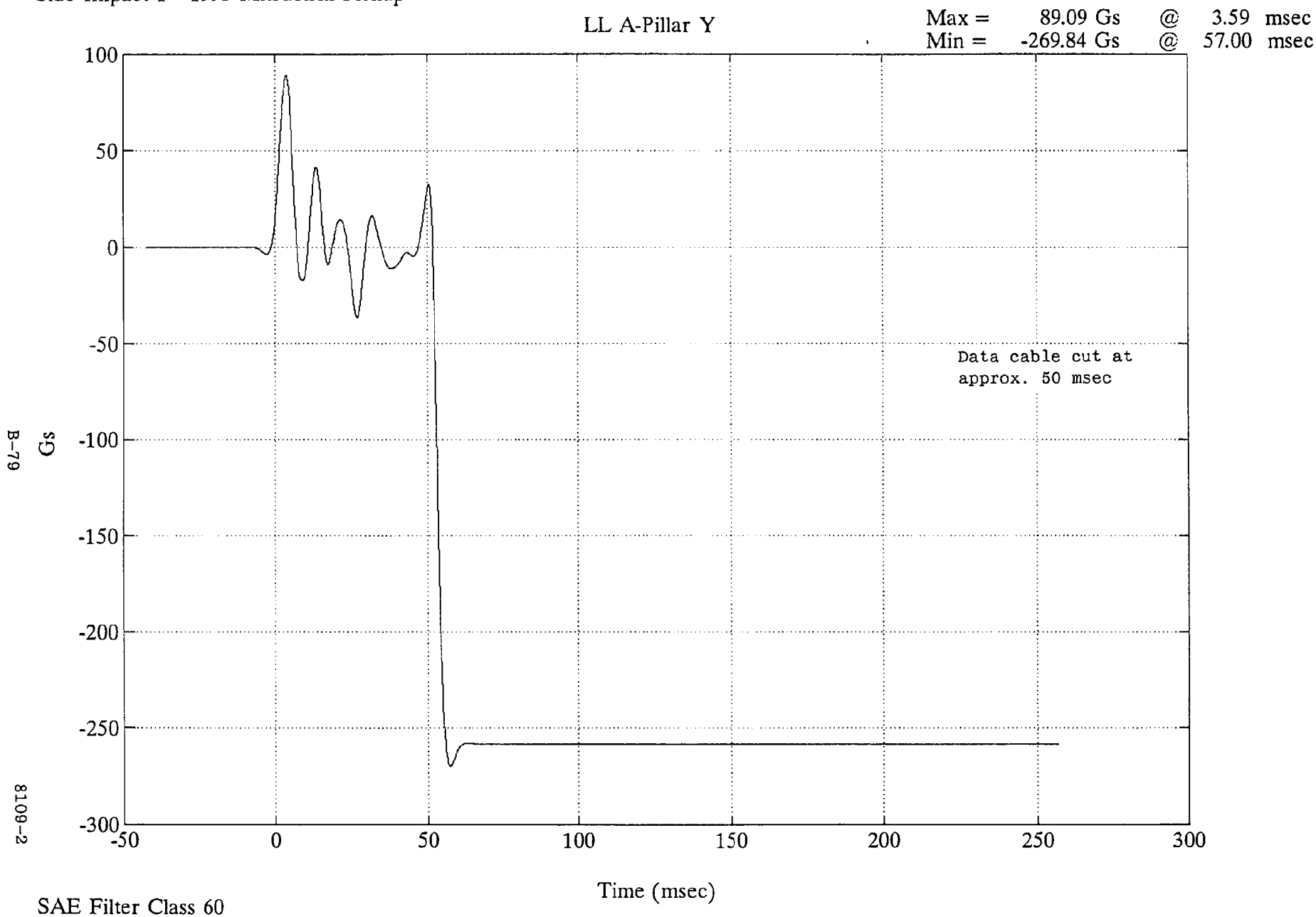
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

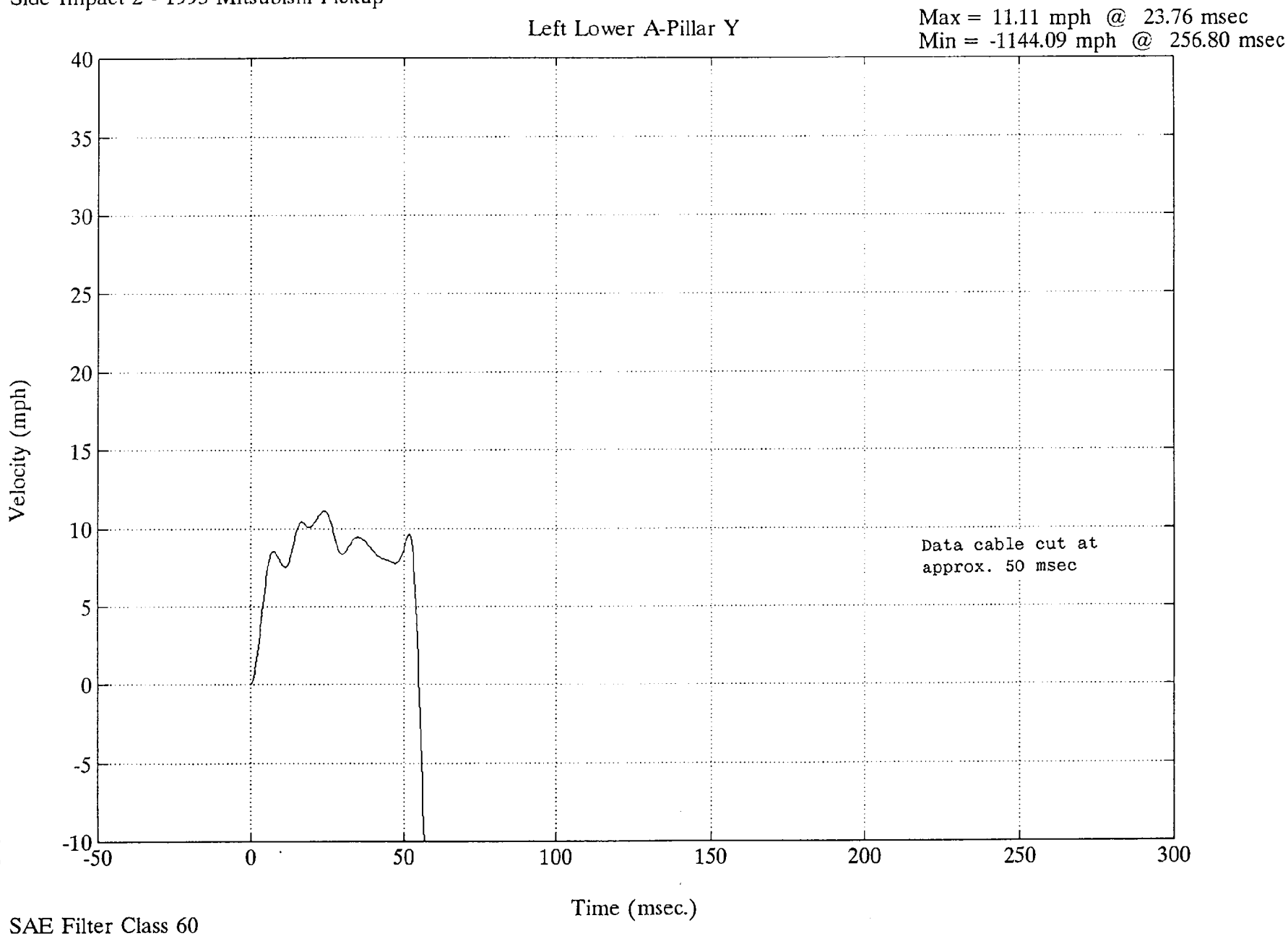


SAE Filter Class 60

B-79

8109-2

Side Impact 2 - 1993 Mitsubishi Pickup

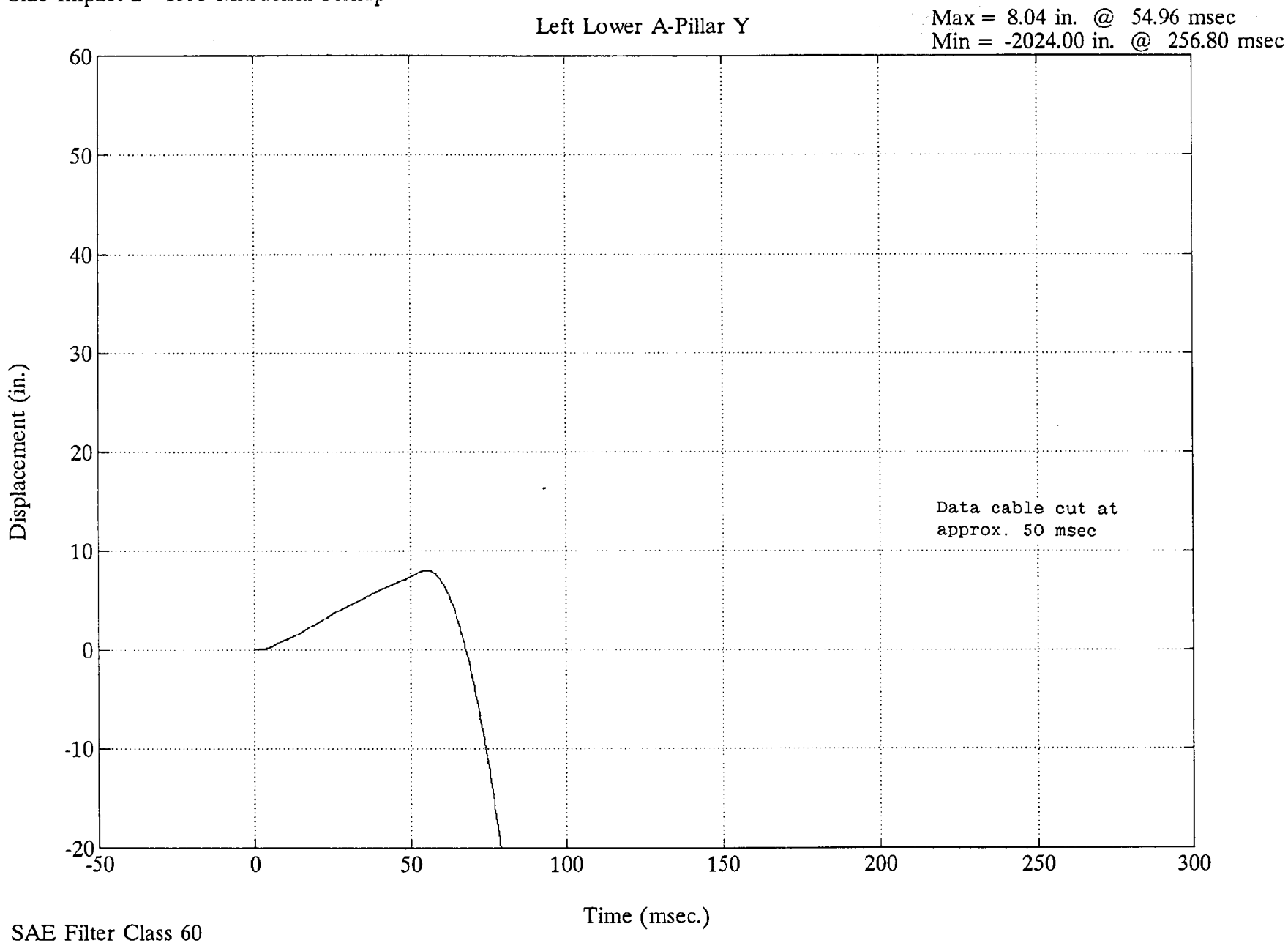


SAE Filter Class 60

B-80

8109-2

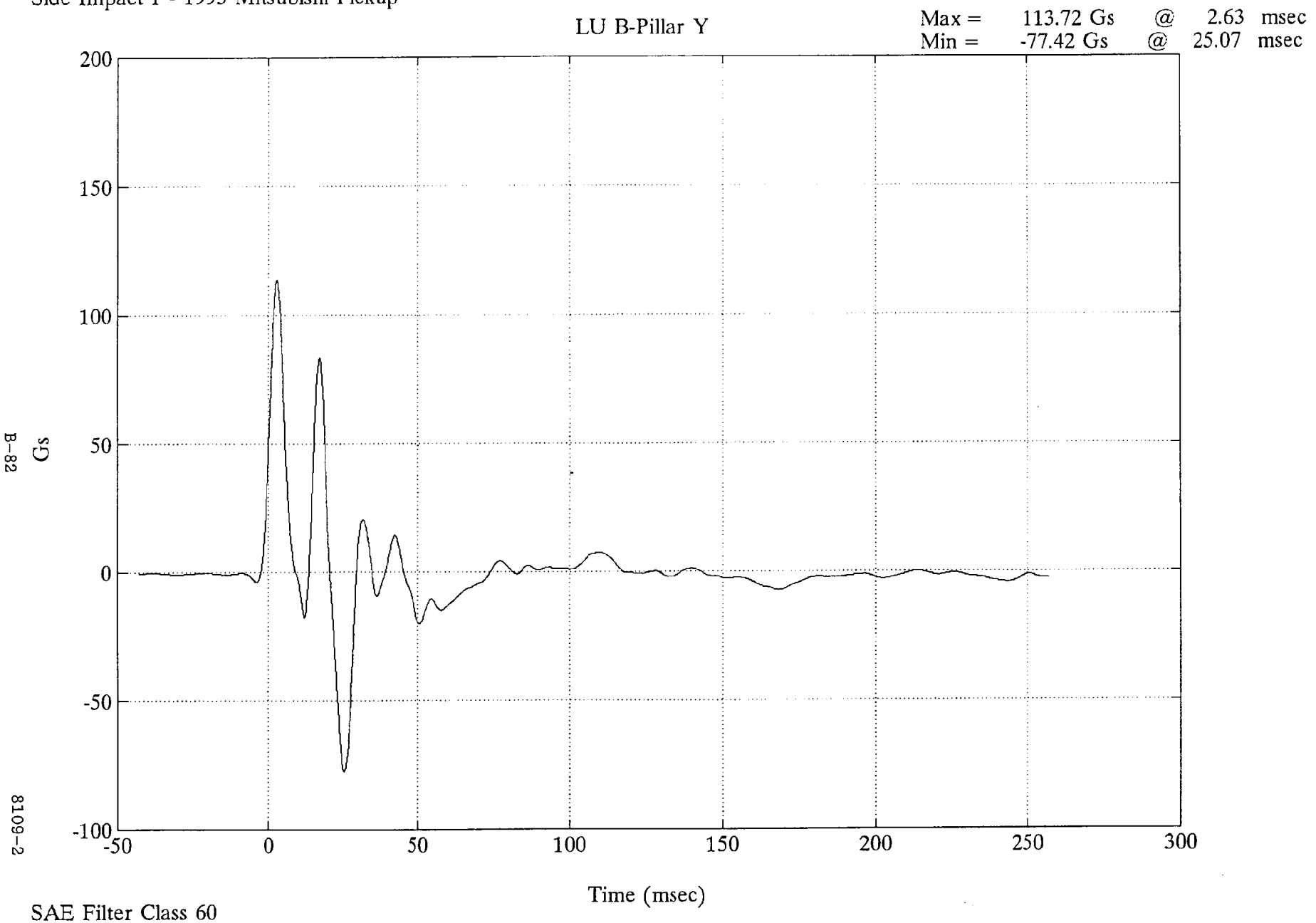
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

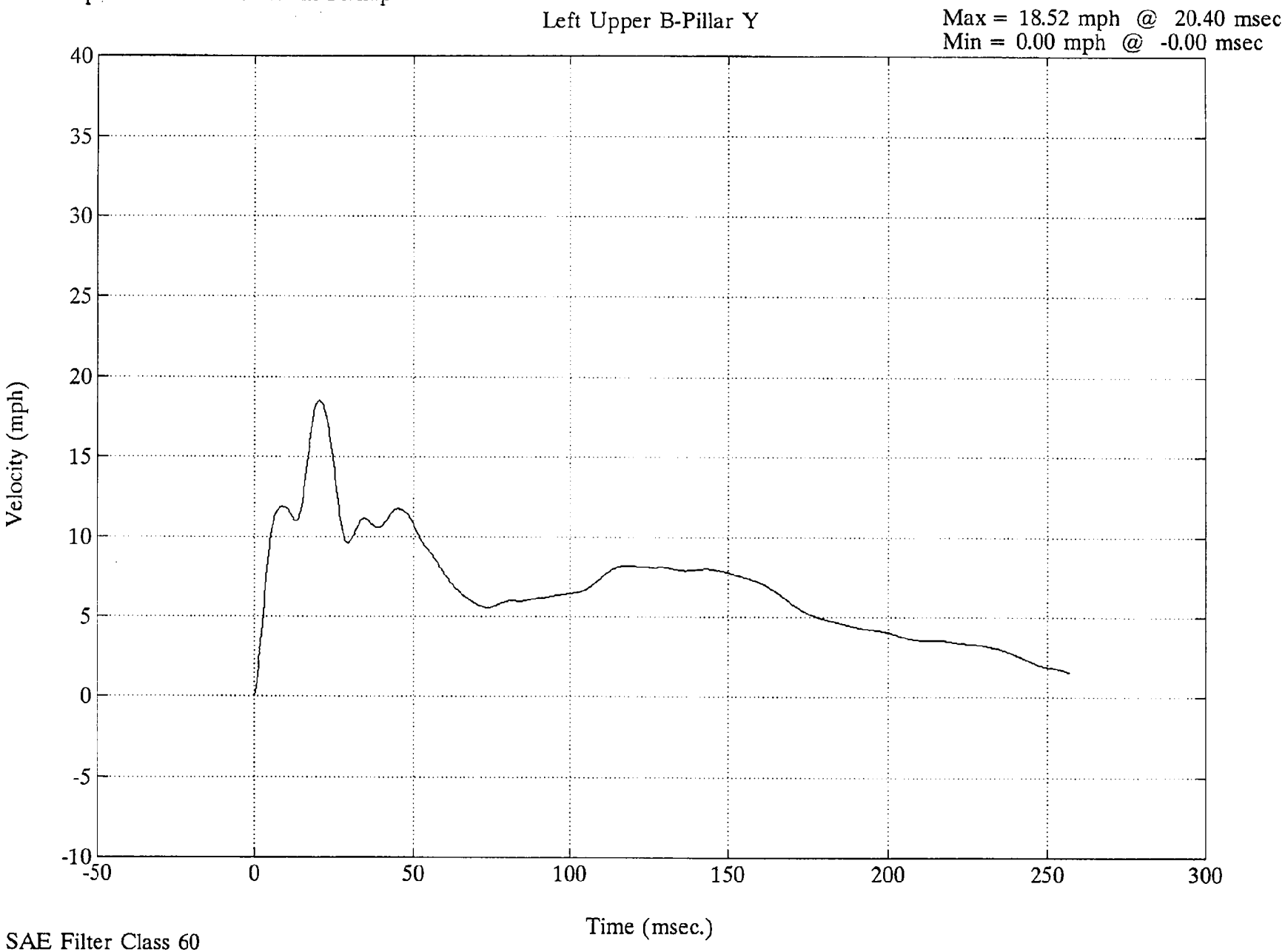
81092

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

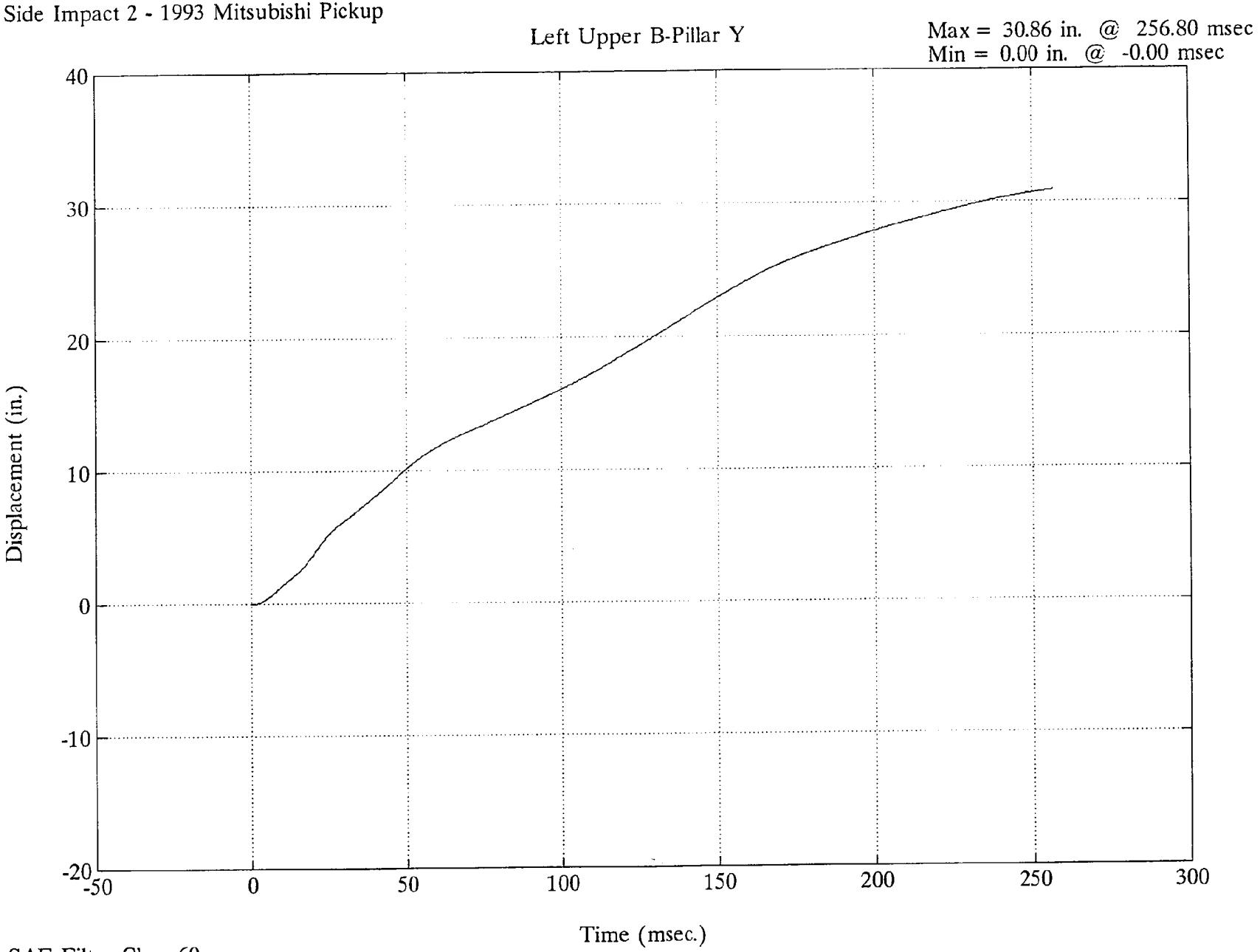
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

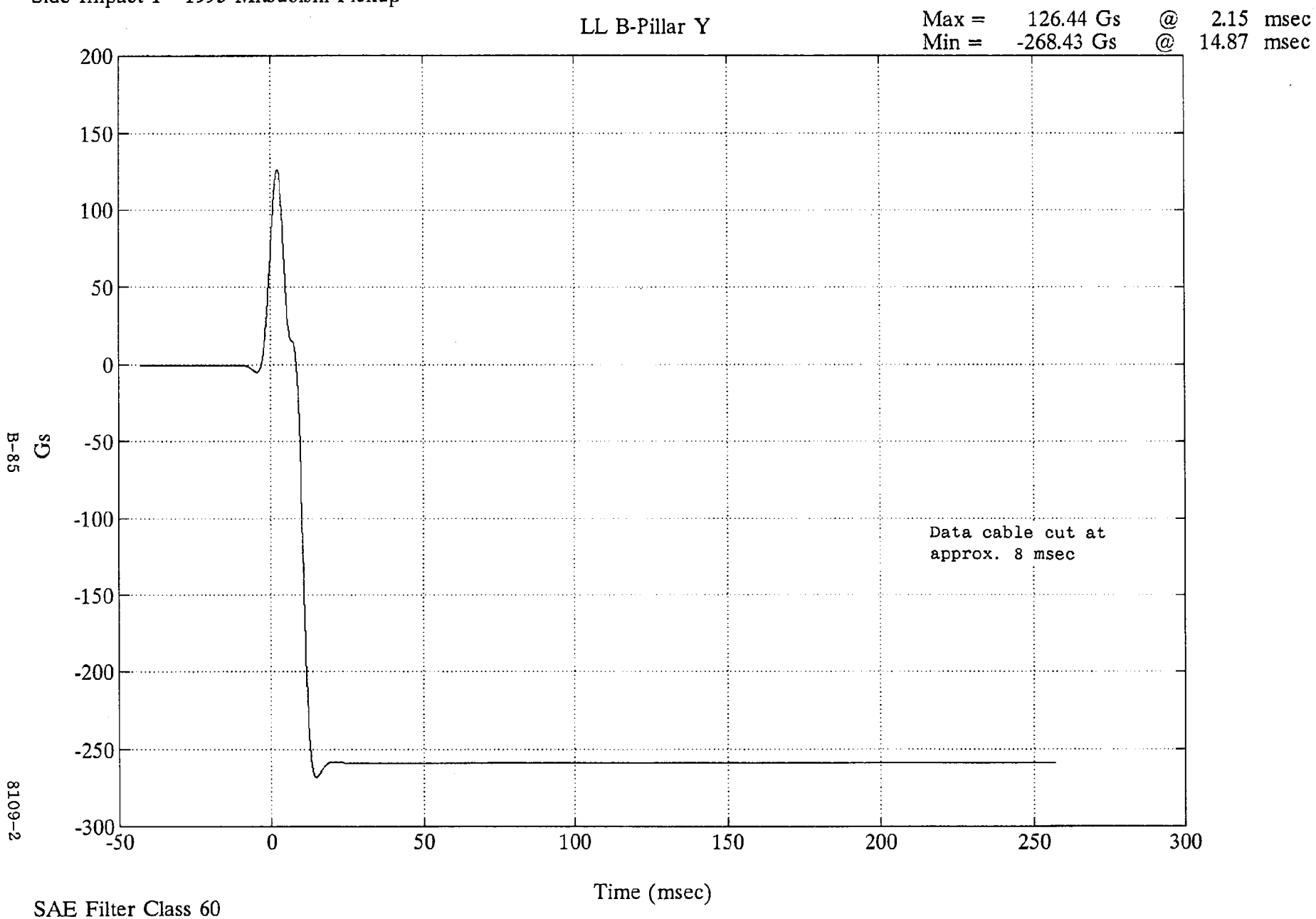
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

Side Impact 1 - 1993 Mitsubishi Pickup

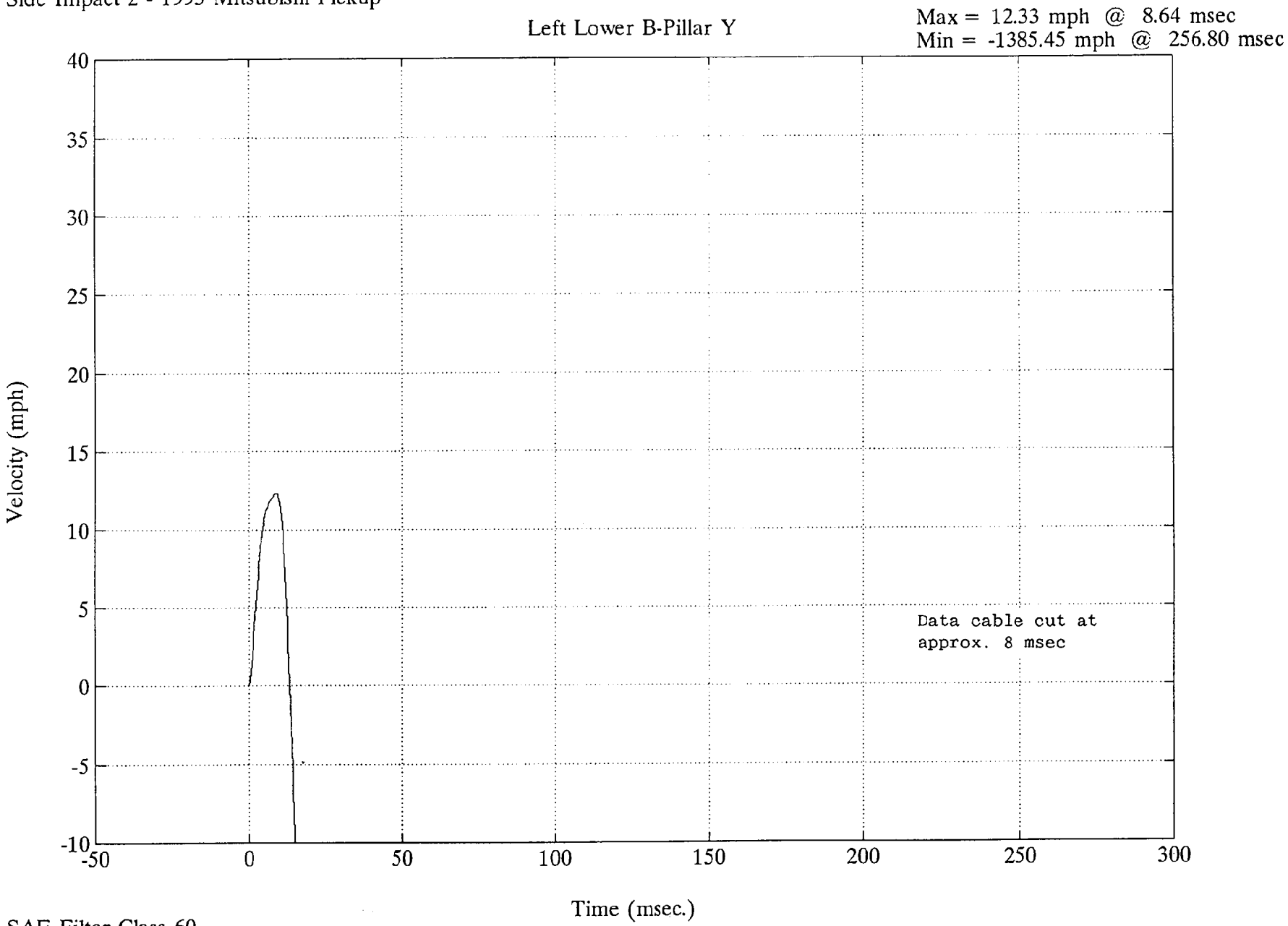


B-85

8109-2

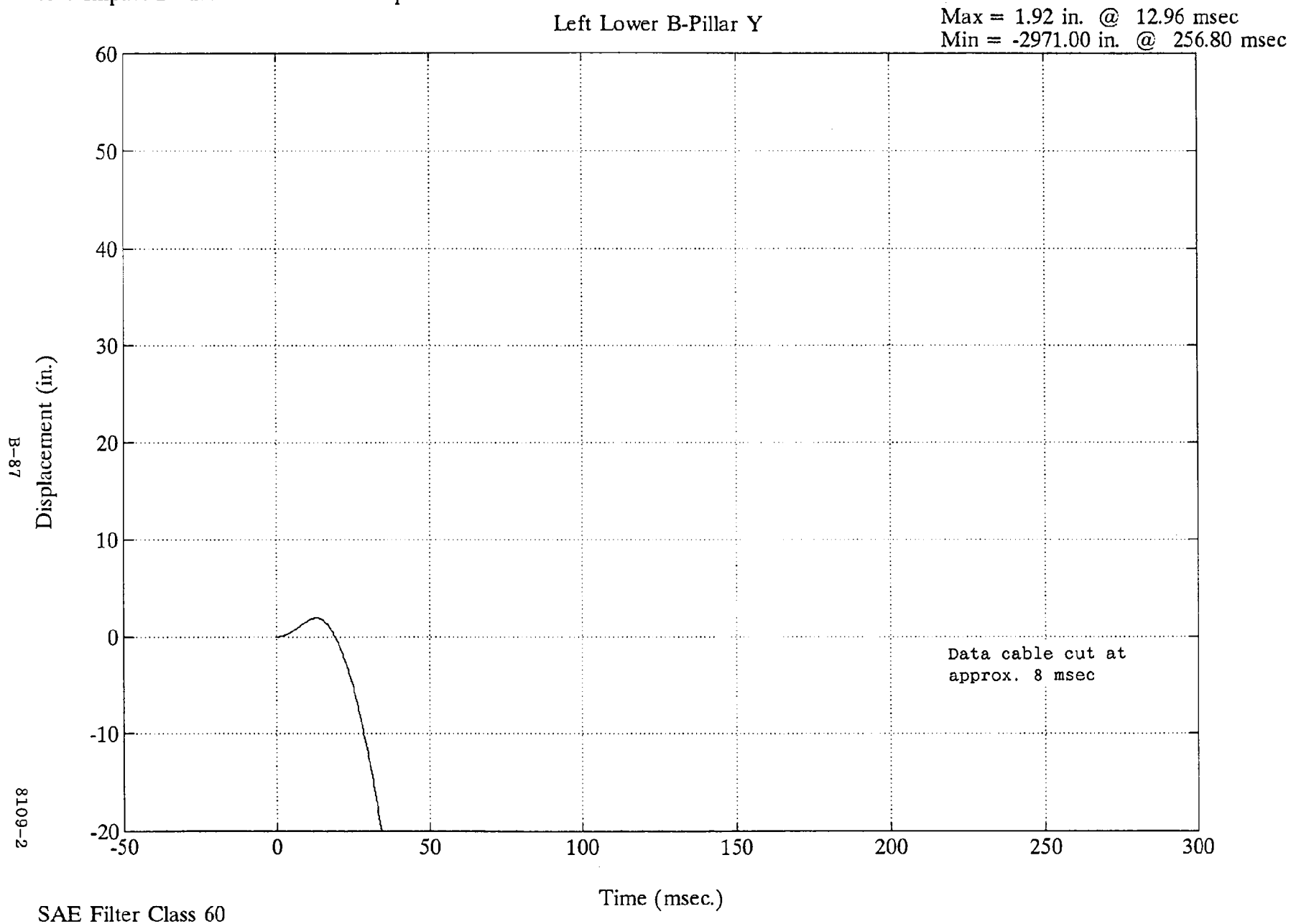
SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

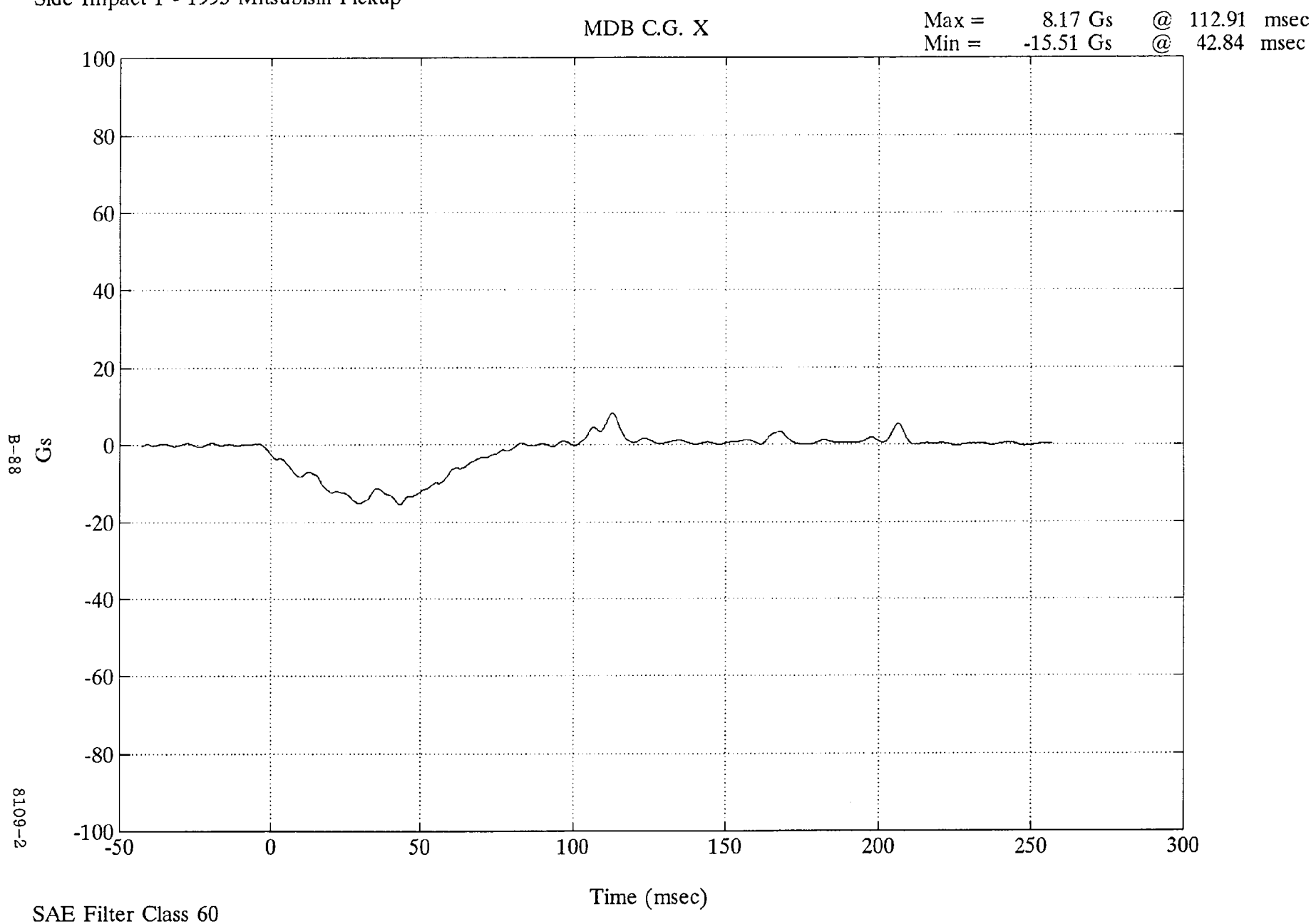
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

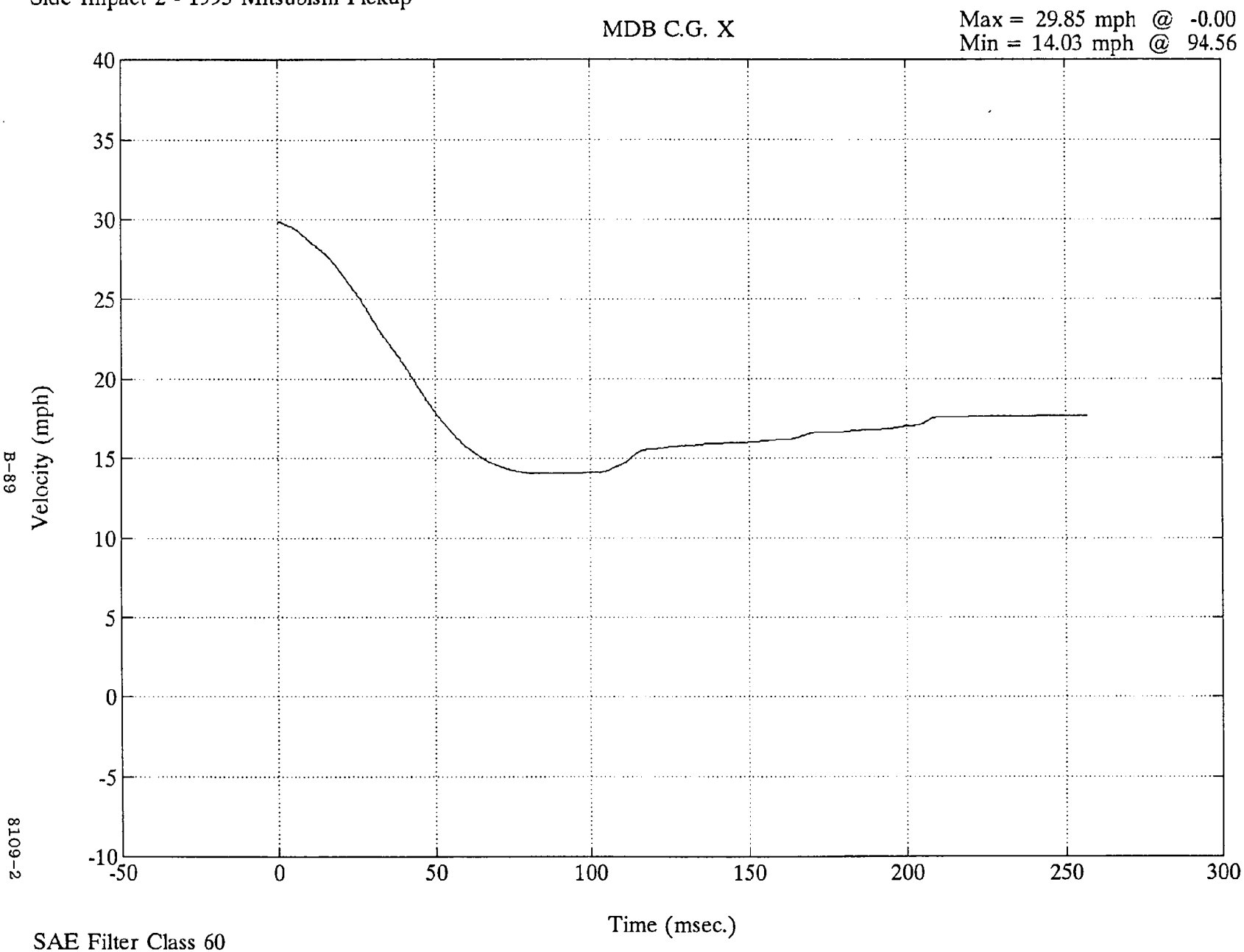
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

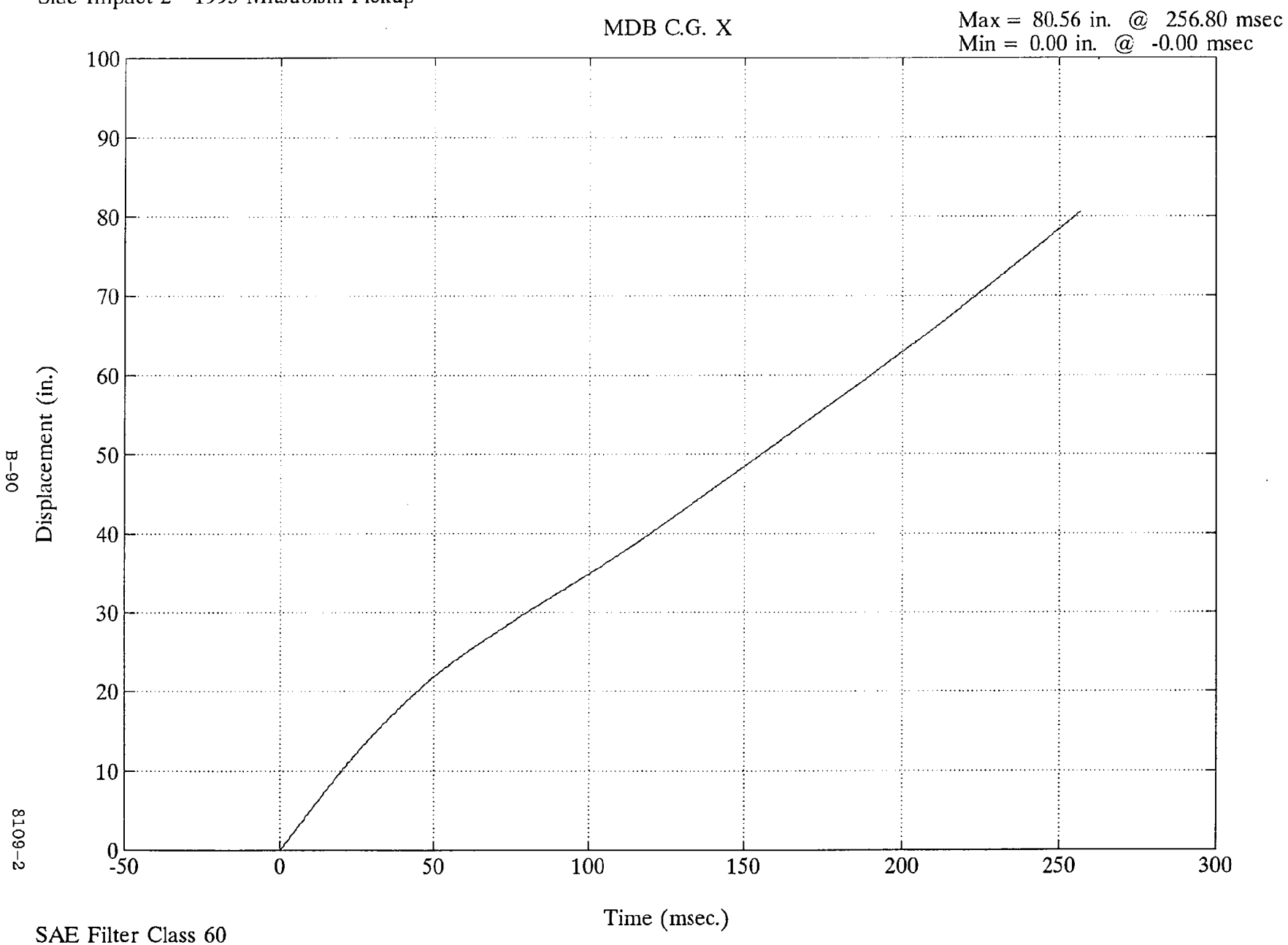
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

8109-2

Side Impact 2 - 1993 Mitsubishi Pickup

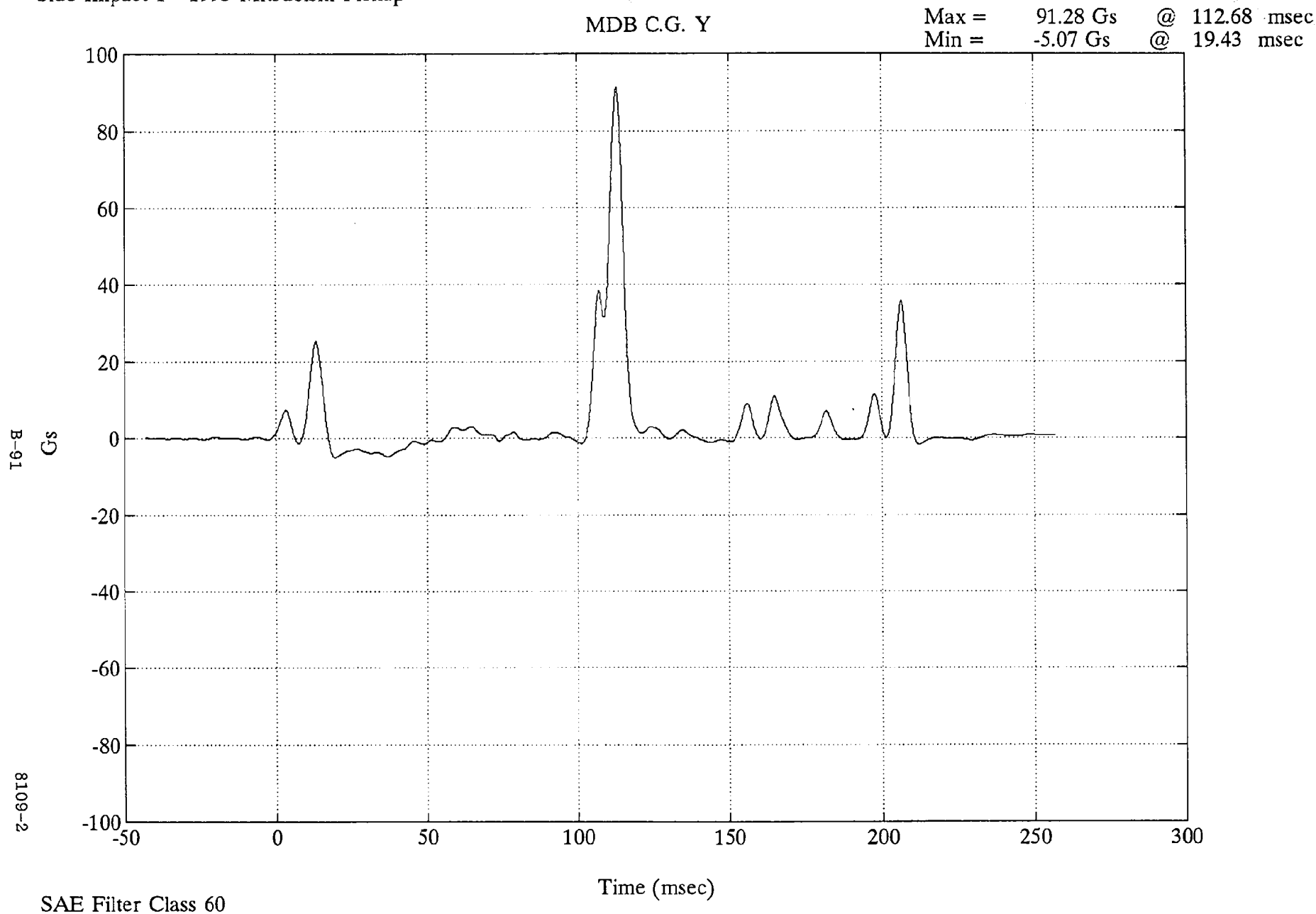


B-90

81092-2

SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup

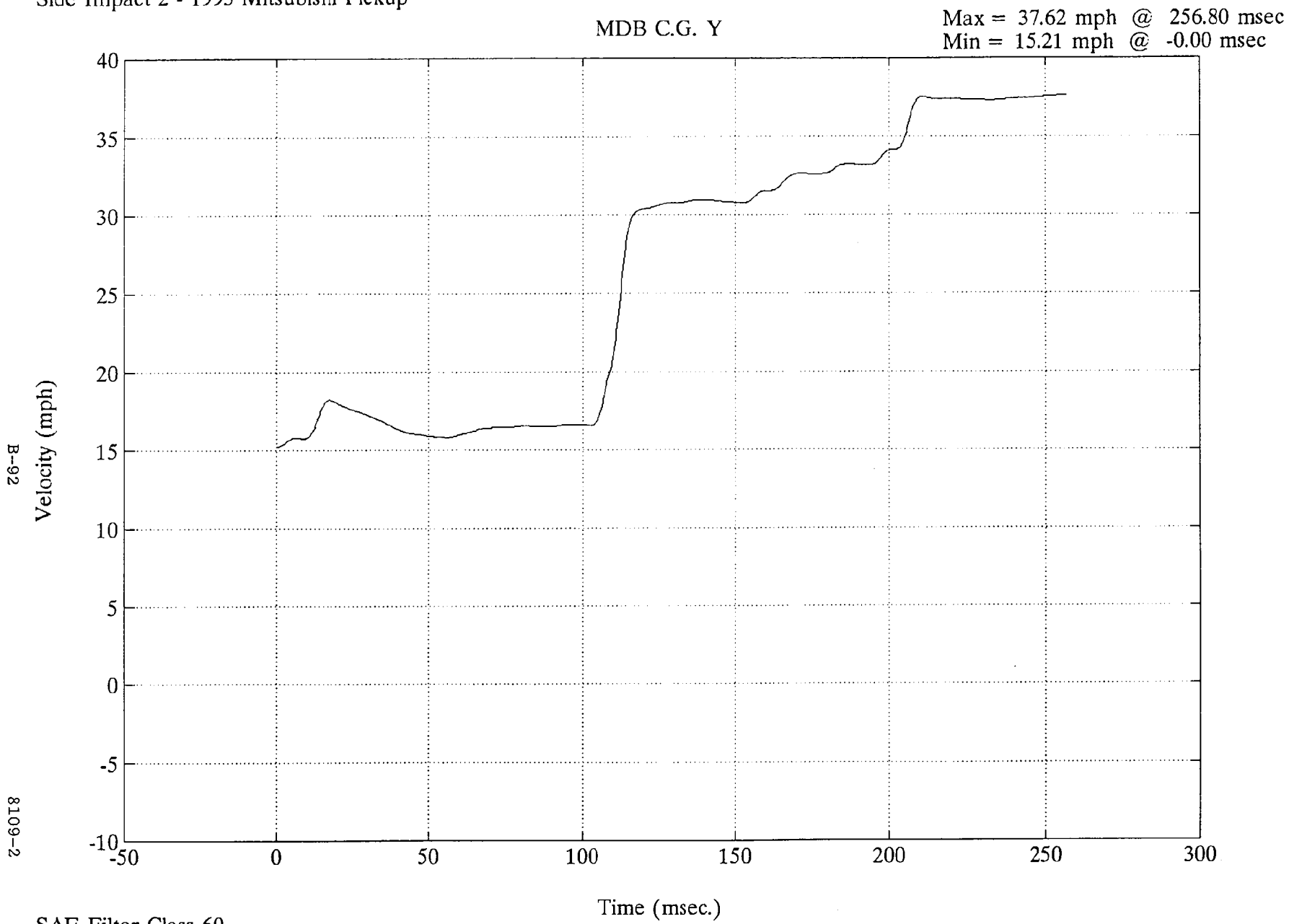


B-91

8109-2

SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

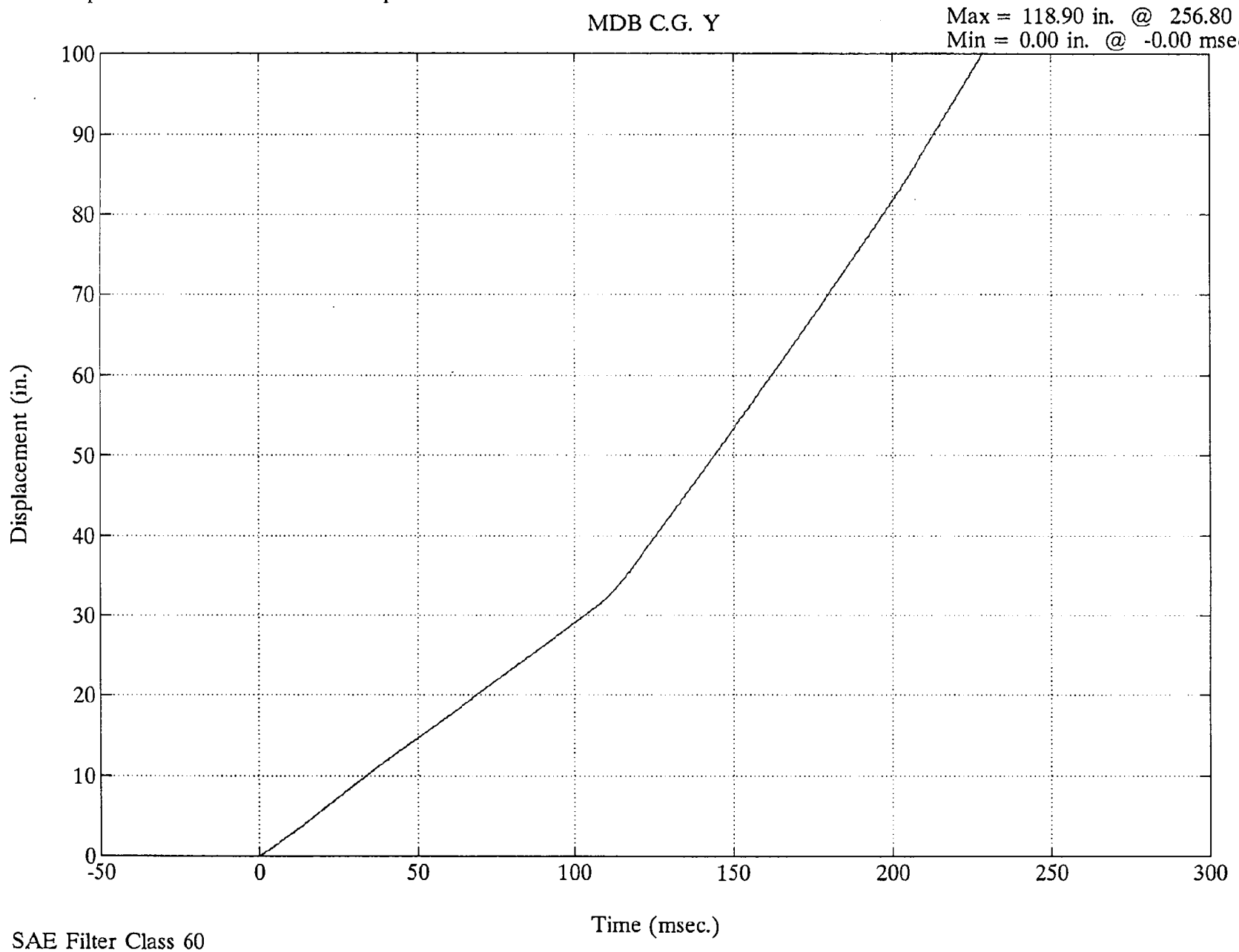


B-92

8109-2

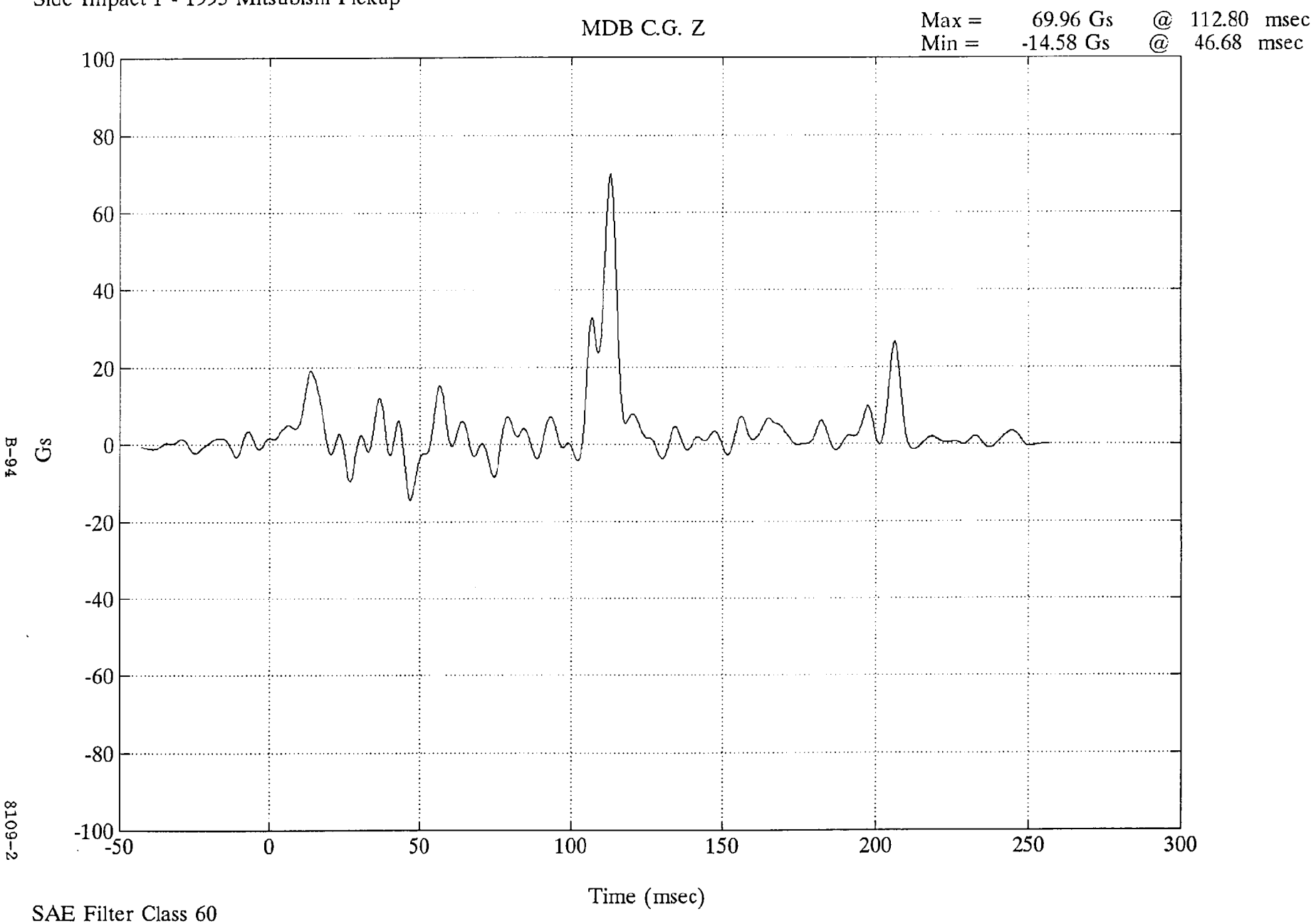
SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup

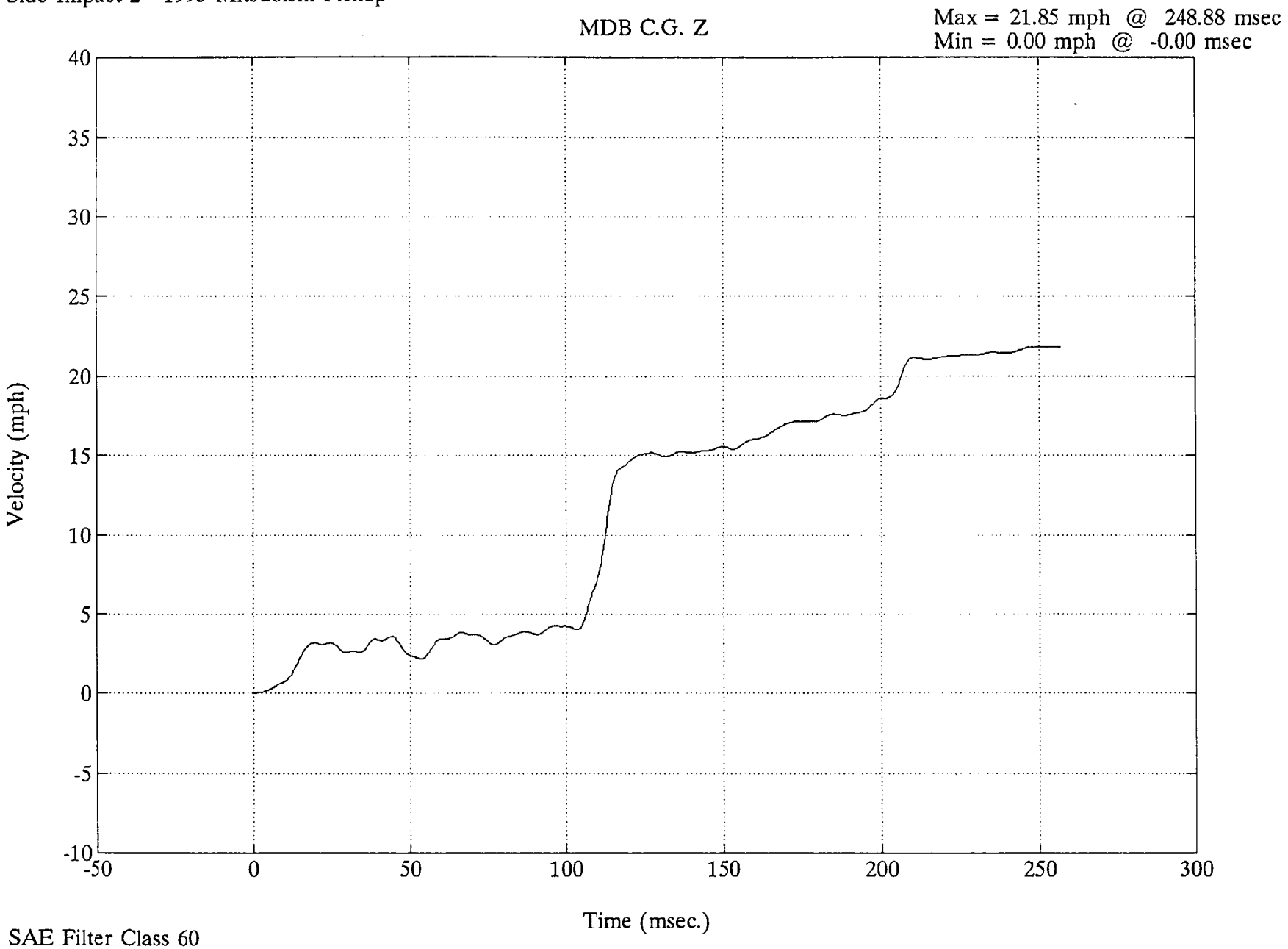


B-94

8109-2

SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

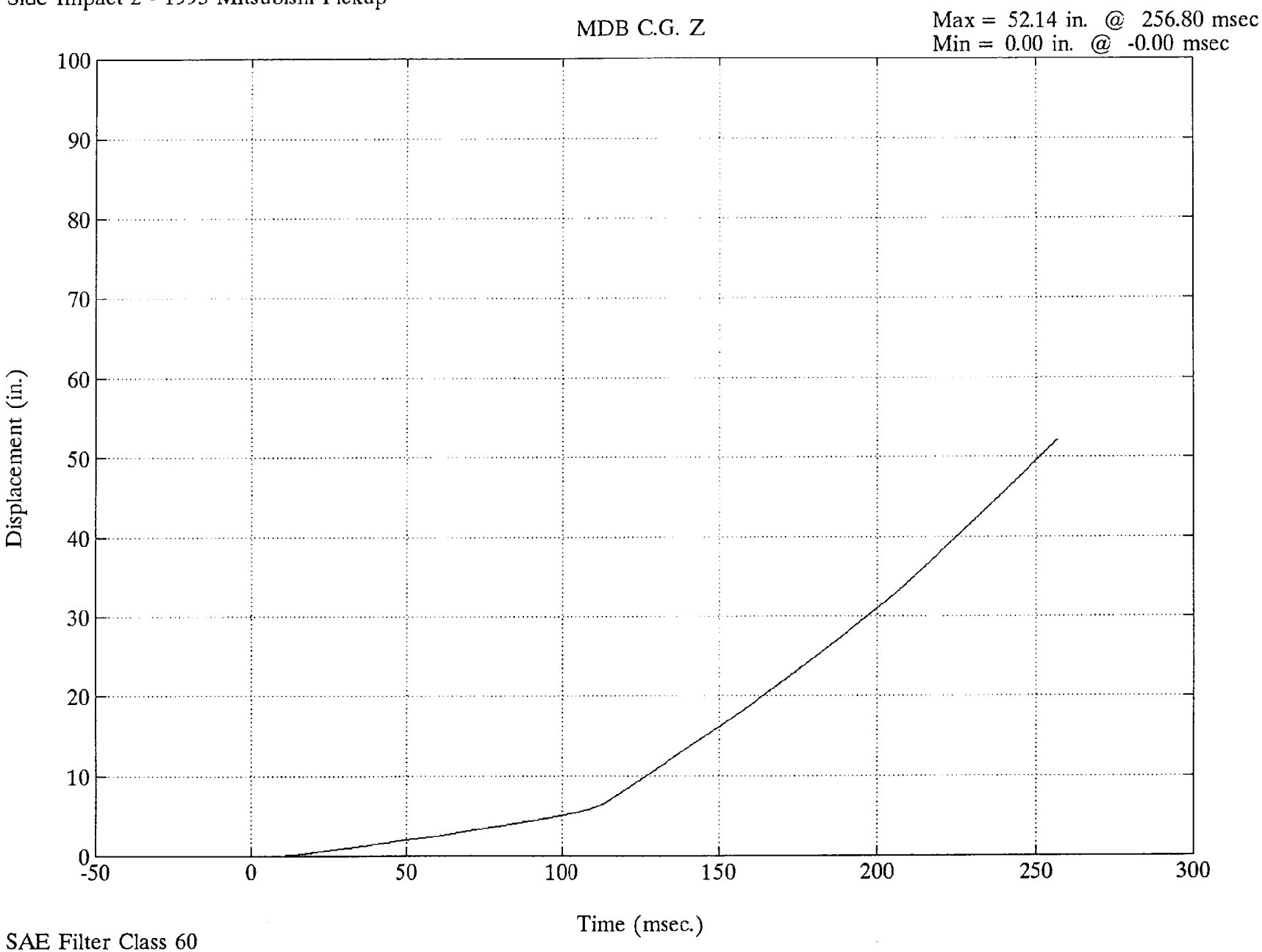


B-95

8109-2

SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

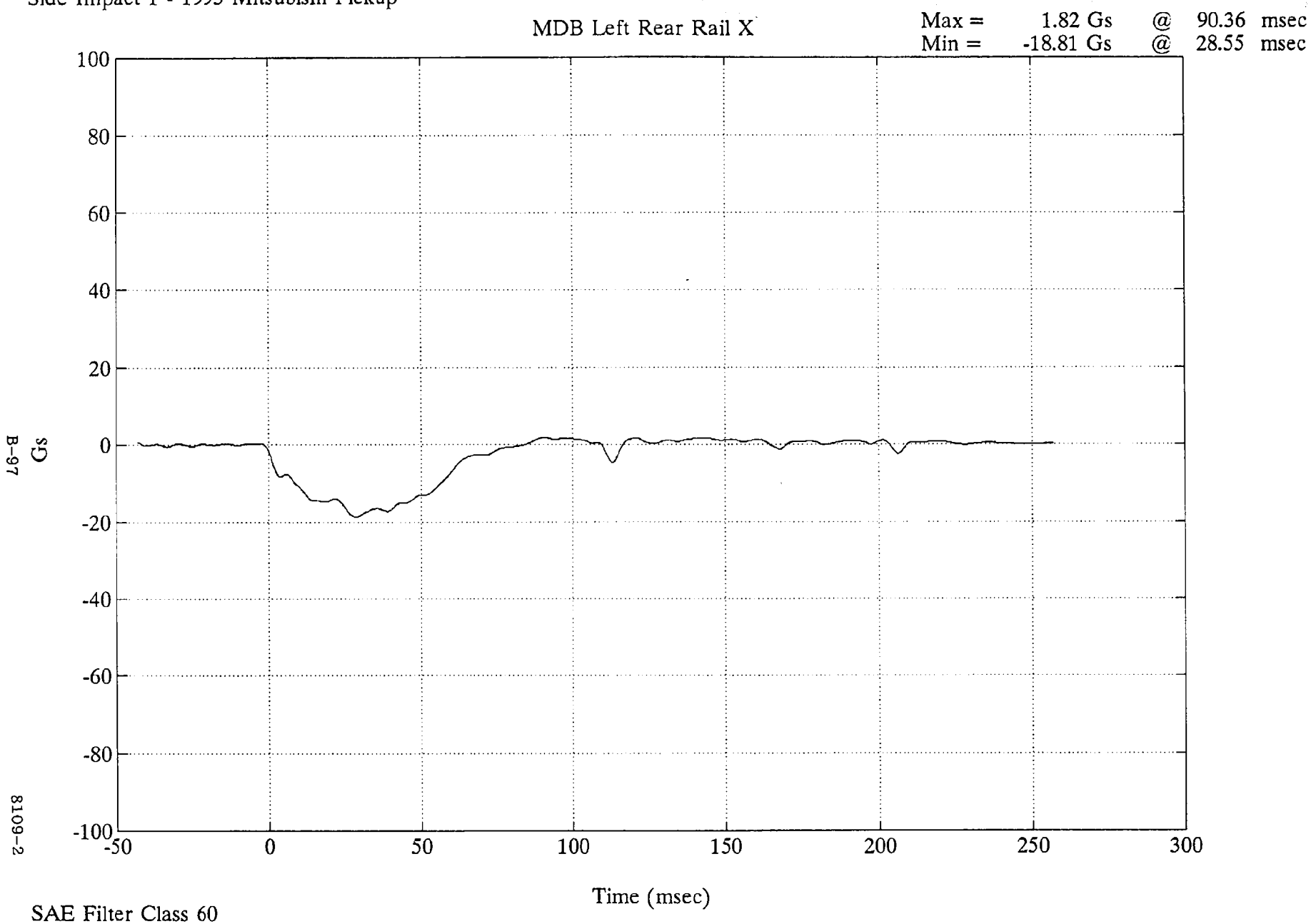


B-96

8109-2

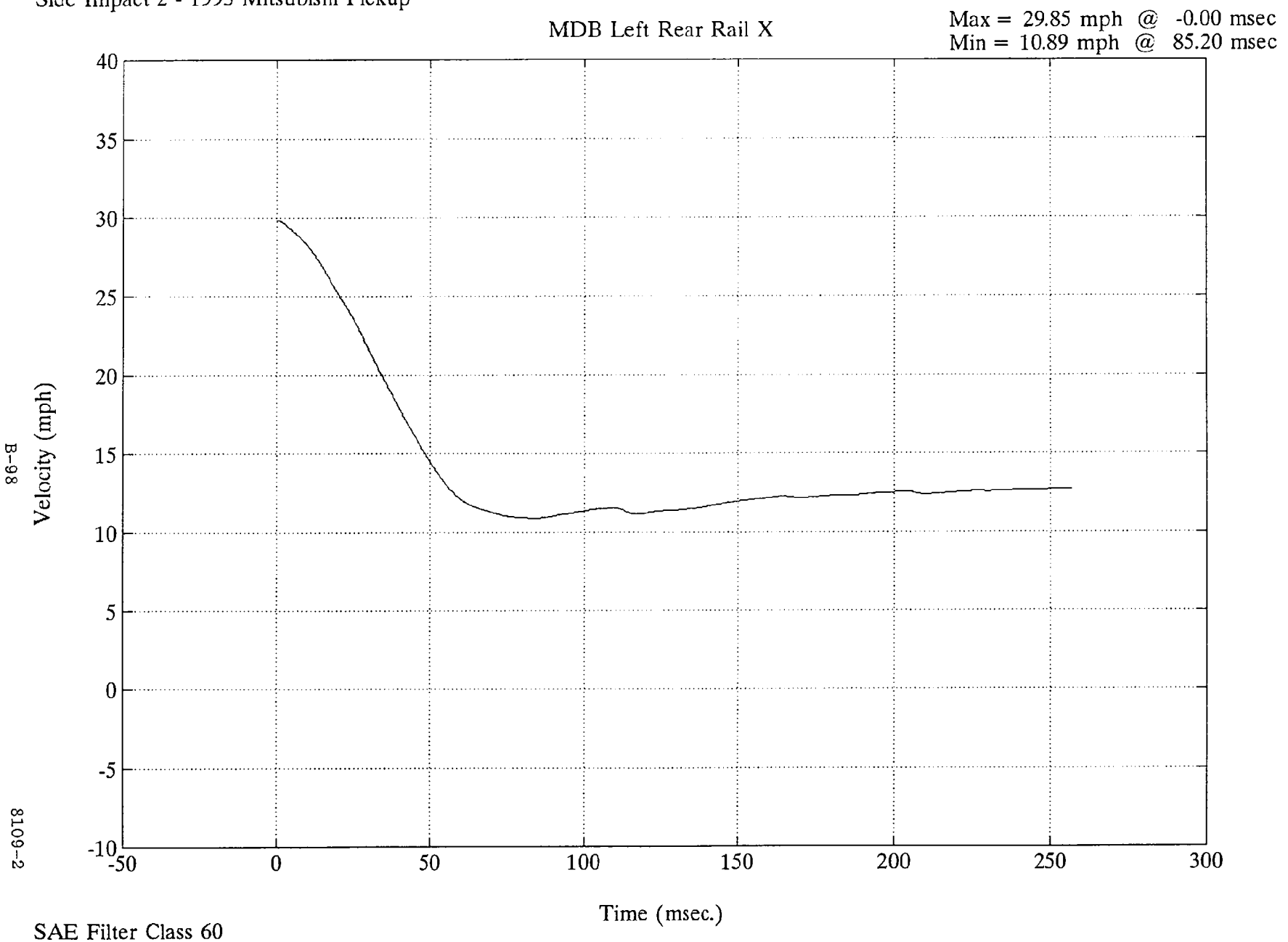
SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

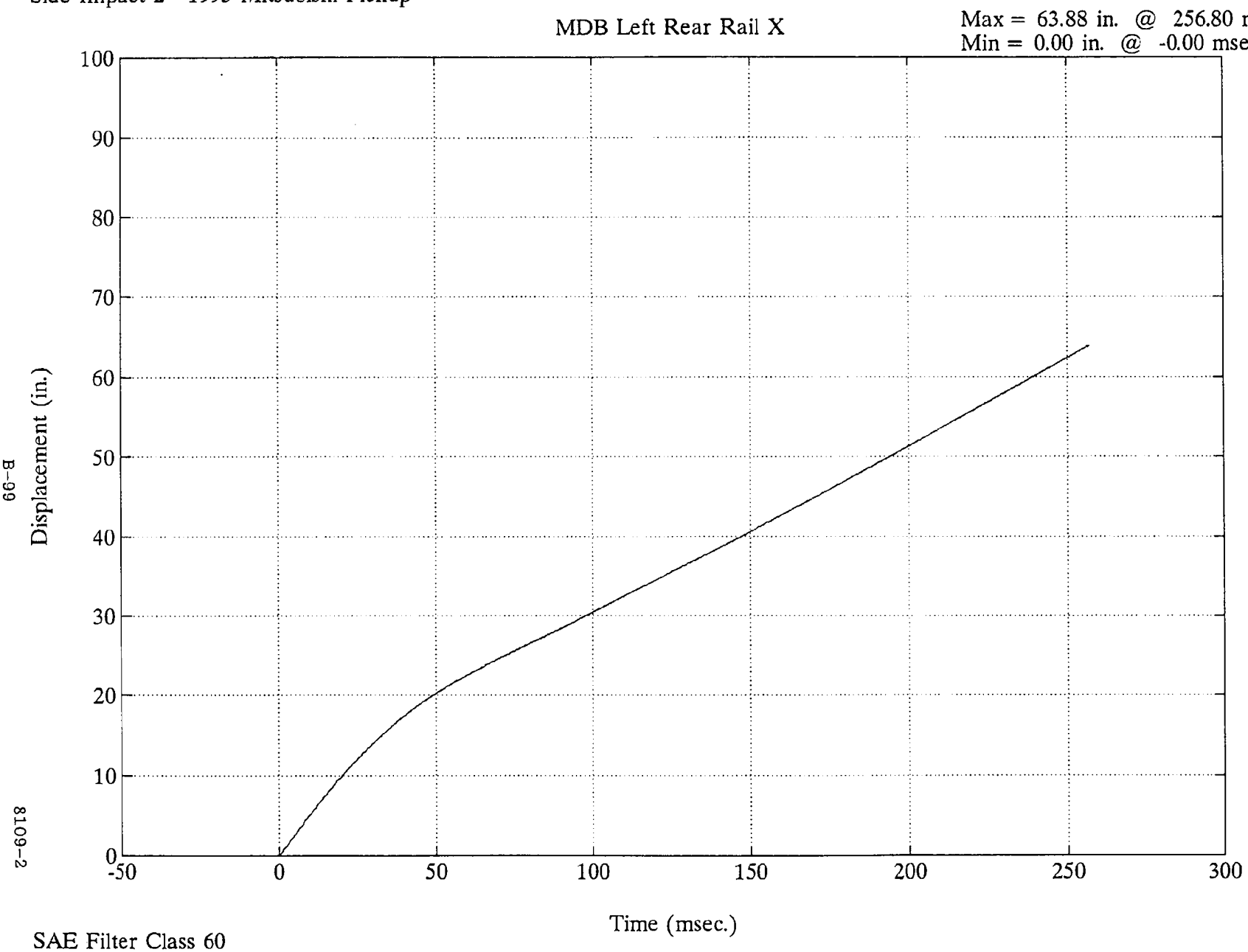


B-98

8109-2

SAE Filter Class 60

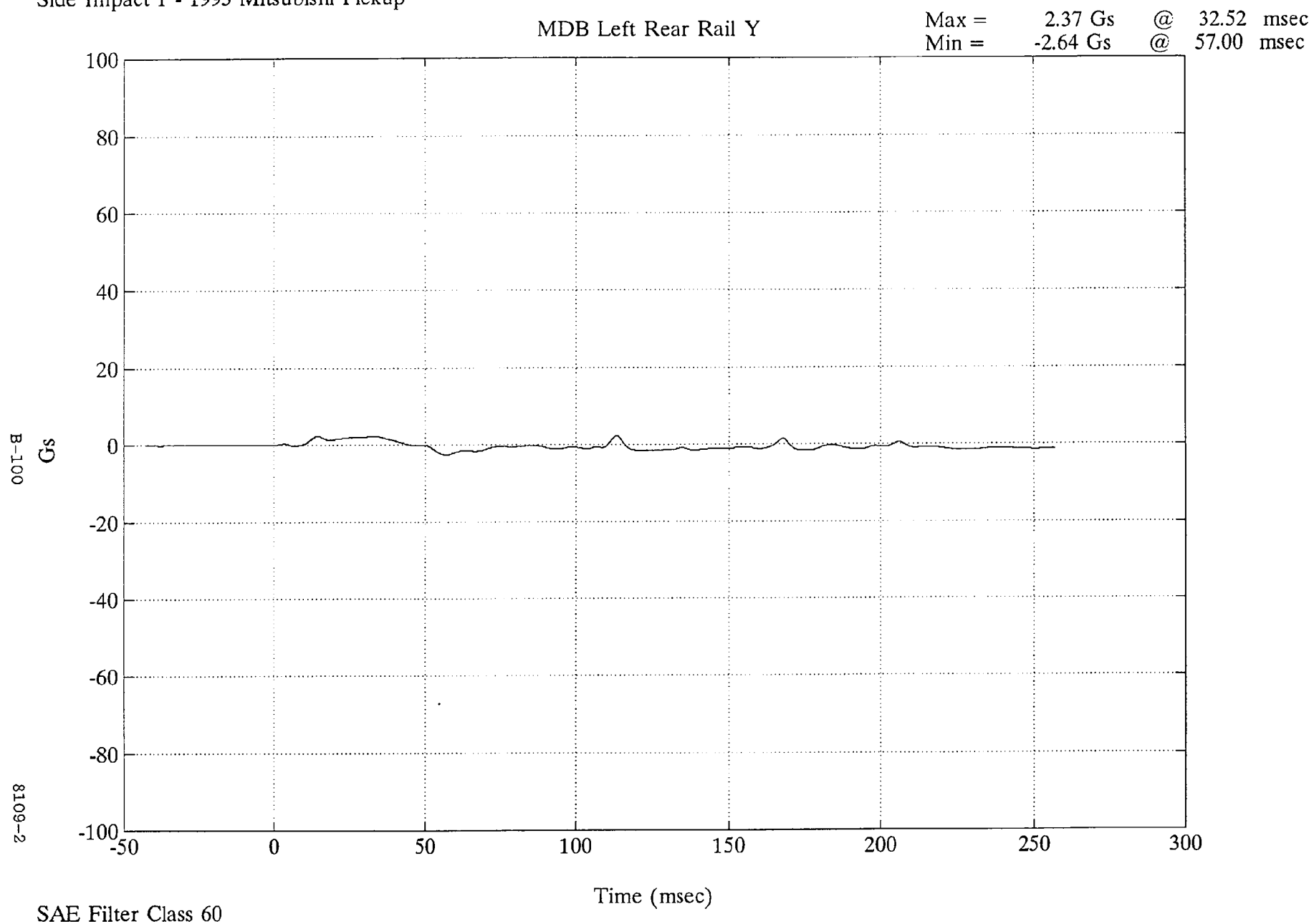
Side Impact 2 - 1993 Mitsubishi Pickup



SAE Filter Class 60

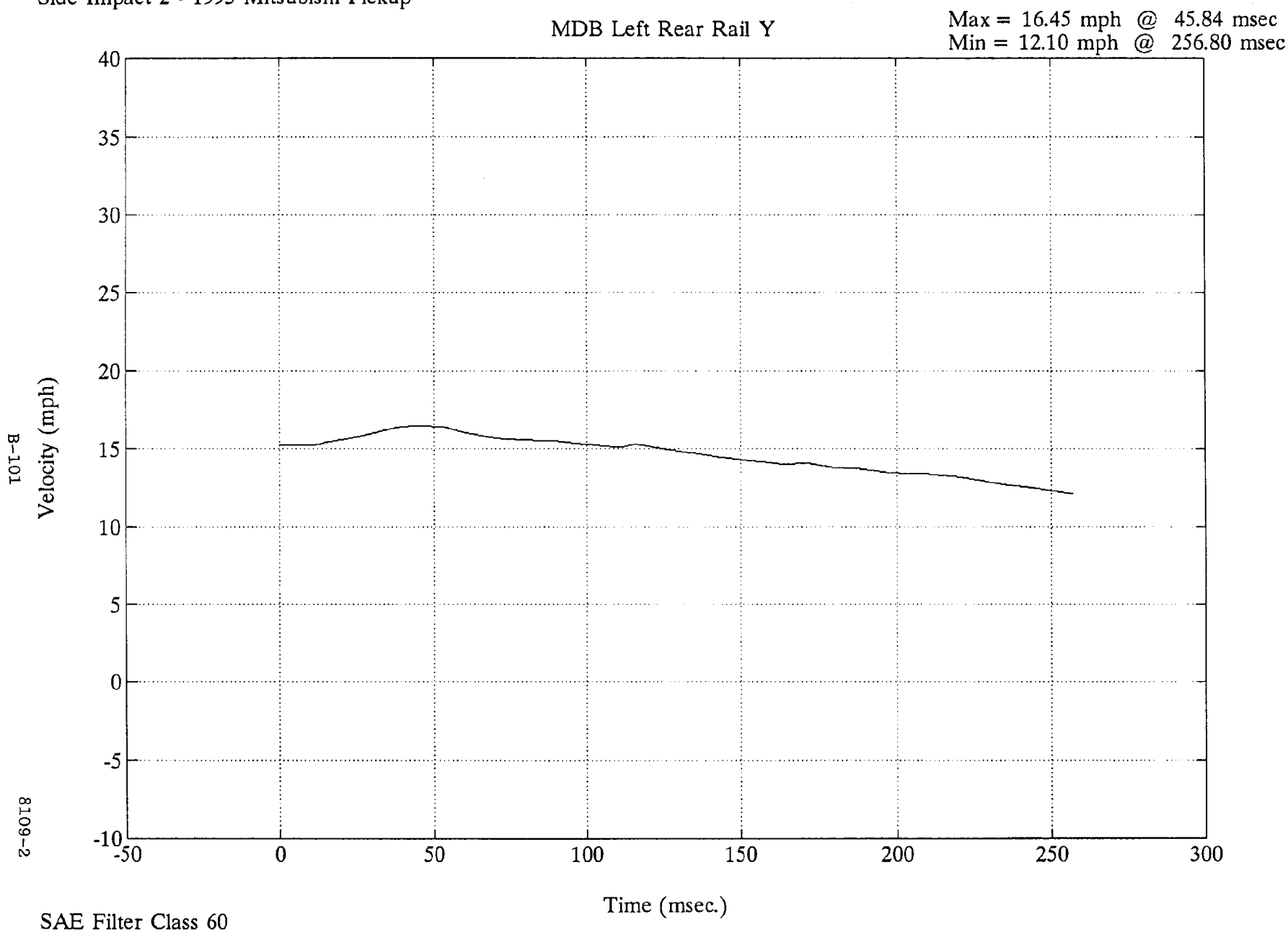
8109-2

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

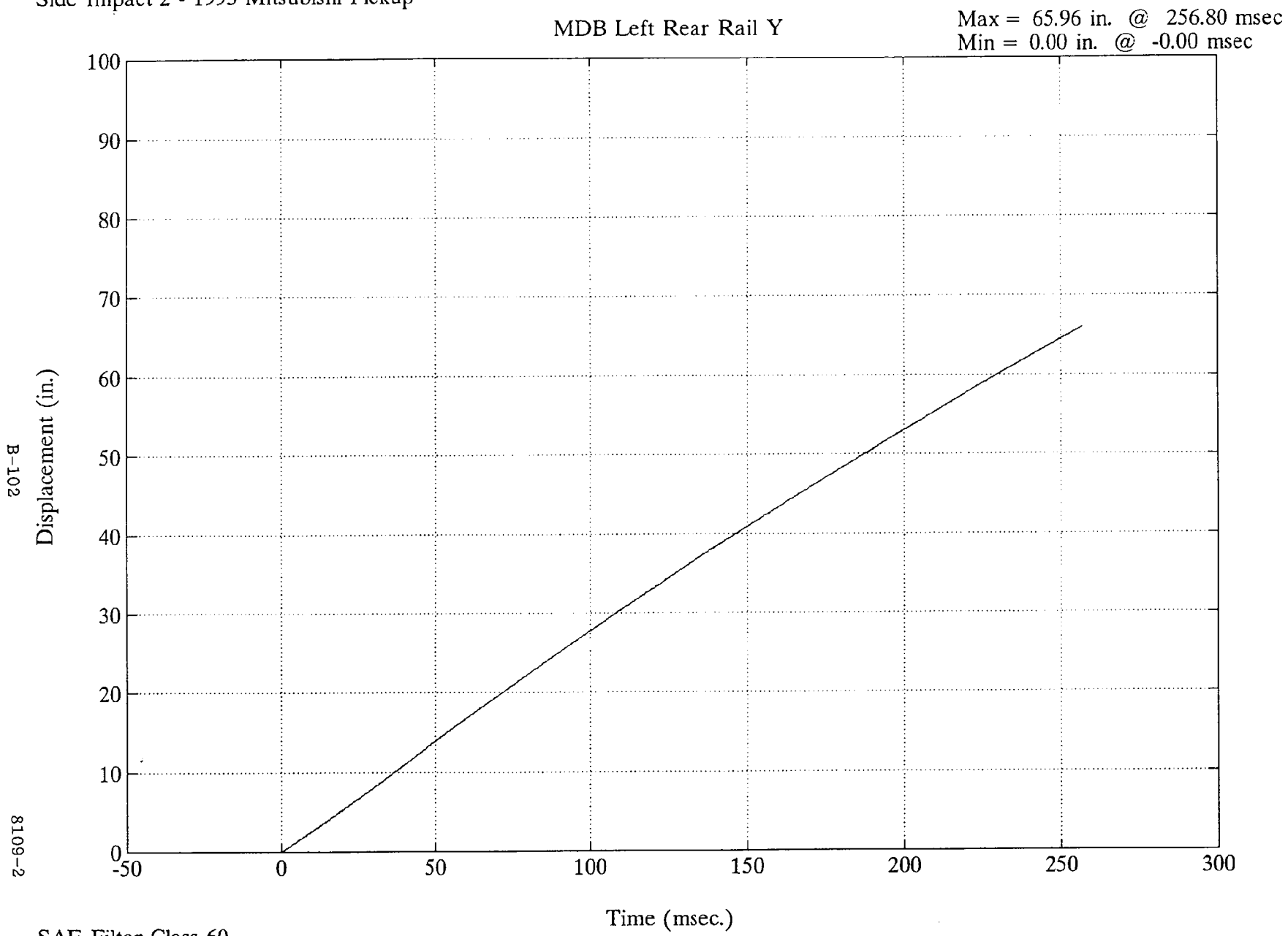


B-101

8109-2

SAE Filter Class 60

Side Impact 2 - 1993 Mitsubishi Pickup

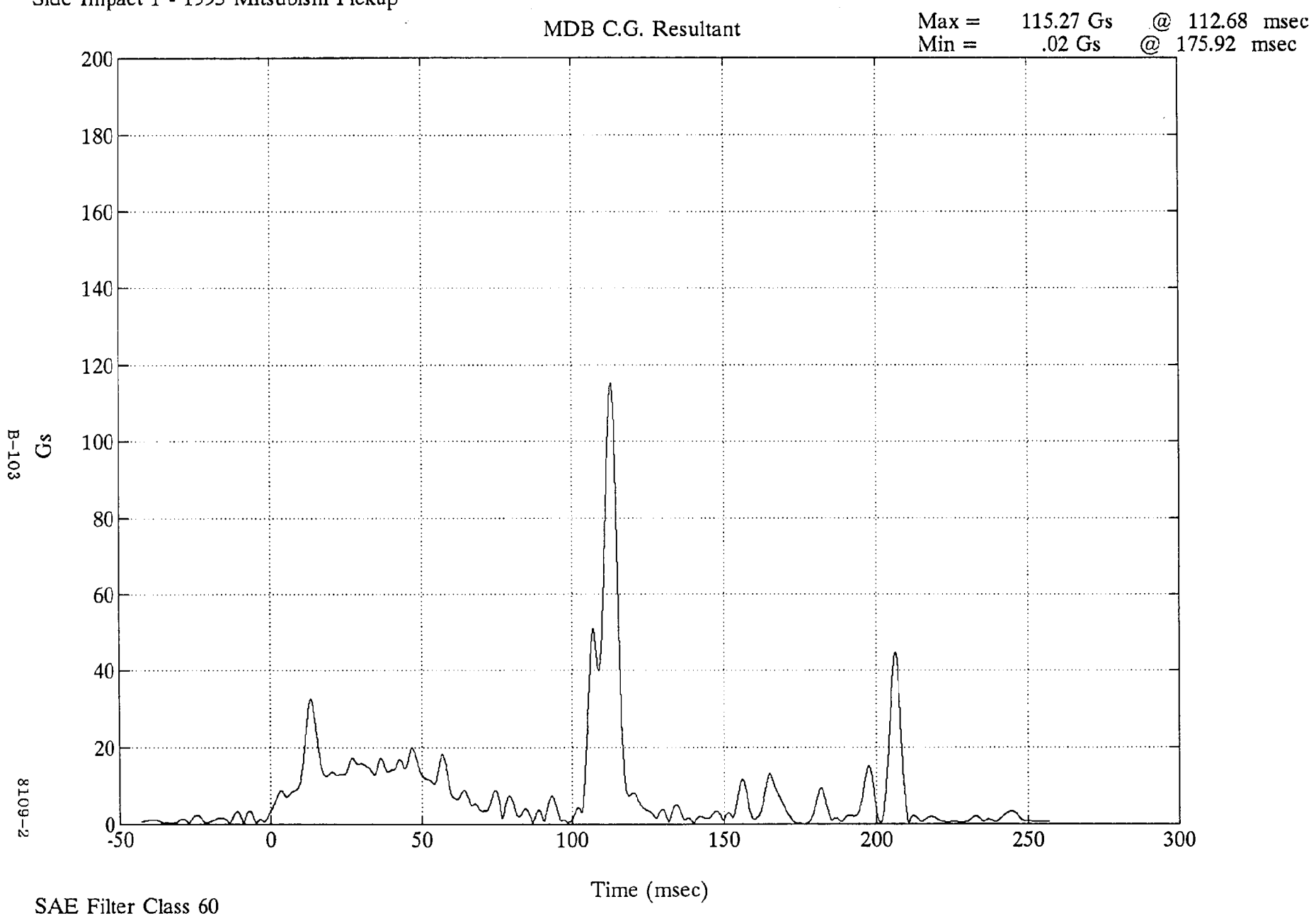


B-102

8109-2

SAE Filter Class 60

Side Impact 1 - 1993 Mitsubishi Pickup



SAE Filter Class 60

Appendix C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SID PRE-TEST INSPECTION

Prior to each test, each SID is inspected to ensure the integrity of its components. The inspection includes observation of the head and neck areas for lacerations and/or reduction in stiffness. Inspection of the legs is performed to adjust joints to the specified torques and to identify any component failures. Inspection of the thorax is performed to verify the integrity of the SID outer jacket; location of "arm" foam; rib wrap assembly, rib anti-sag device; rib assembly; piston, and spine. The abdomen is inspected to identify any reduction in stiffness.

These inspections are performed prior to every test in addition to the verification tests performed on the following pages at the selected intervals.

SID IMPACT CALIBRATION SUMMARY SHEET

Serial No. 906

Test Parameter	Requirement	Date/ Velocity/ Temp	Pretest Cal.
Thorax Impact Test:		5/25/93 13.83 ft/sec	
Accelerations		69°F	
A. Upper Rib	37-46 g's		45.0 g's
B. Lower Rib	37-46 g's		43.2 g's
C. Lower Spine	15-22 g's		20.4 g's
Pelvic Impact Test:		5/24/93 13.85 ft/sec	
Pelvic Acceleration	40-60 g's	70°F	45.5 g's