

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

ISUZU MOTORS LIMITED
1989 ISUZU TROOPER II S
5 DOOR 4 WHEEL DRIVE MPV
NHTSA NO. MK5701

MOBILITY SYSTEMS AND EQUIPMENT COMPANY
9920 LA CIENEGA BOULEVARD SUITE 708
INGLEWOOD, CALIFORNIA 90301



JUNE 19, 1989

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF MARKET INCENTIVES

400 Seventh Street, S.W.

Room No. 5313 (NRM-22)

Washington, DC 20590

This Final Report was prepared for the U. S. Department of Transportation, National Highway Traffic Safety Administration under Contract No. DTNH22-87-D-02009. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

PREPARED BY: A. V. Khadilkar, Program Manager

S. Pruitt, Test Engineer

T. Kippen, Test Engineer

G. Fladmark, Test Engineer

MOBILITY SYSTEMS AND EQUIPMENT COMPANY

APPROVED BY:


Dr. Anil V. Khadilkar, Program Manager

DATE:

19 June 1989

FINAL REPORT ACCEPTED BY:

Vincent Quarles

MANAGER, New Car Assessment, Program

Date of Report Acceptance

1. Report No. MSE-89-N011		2. Government Accession No.		3. Recipient's Catalog No.																			
4. Title and Subtitle NEW CAR ASSESSMENT PROGRAM (NCAP) FRONTAL BARRIER IMPACT TEST 1989 ISUZU TROOPER II S, 5 DOOR, 4 WHEEL DRIVE MPV NHTSA NO. MK0306				5. Report Date June 19, 1989																			
				6. Performing Organization Code																			
7. Author(s) Dr. Anil Khadilkar/S. D. Pruitt/T. Kippen/G. Fladmark				8. Performing Organization Report No. R8107-N011																			
9. Performing Organization Name and Address MOBILITY SYSTEMS AND EQUIPMENT COMPANY 9920 La Cienega Boulevard, Suite 708 Inglewood, California 90301				10. Work Unit No. (TRAIS)																			
				11. Contract or Grant No. DTNH22-87-D-02009, D.O. NO. 3																			
12. Sponsoring Agency Name and Address U.S. DEPARTMENT OF TRANSPORTATION National Highway Traffic Safety Administration Office of Market Incentives 400 Seventh Street, S.W. Washington, D.C. 20590				13. Type of Report and Period Covered FINAL Jan. - June 1989																			
				14. Sponsoring Agency Code DOT/NHTSA/RM/OMI																			
15. Supplementary Notes																							
16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1989 Isuzu Trooper II S, 5 Door, 4 Wheel Drive, MPV, at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA, on 23 May 1989. The barrier impact velocity was 35.1 mph, and the ambient temperature at the barrier face at the time of impact was 90°F. The posttest vehicle crush maximum was 15.0 in. A summary of occupant injury measure data from the test appears below:																							
<table border="1"> <thead> <tr> <th>Injury Criteria</th> <th>Driver Dummy</th> <th>Passenger Dummy</th> </tr> </thead> <tbody> <tr> <td>Threshold Value</td> <td></td> <td></td> </tr> <tr> <td>Head Injury Criterion HIC = 1000</td> <td>1,269</td> <td>1,520</td> </tr> <tr> <td>Chest Resultant Peak 60 Gs (3 ms clip)</td> <td>73</td> <td>59</td> </tr> <tr> <td>Femur Load Left 2250 Pounds</td> <td>932</td> <td>322</td> </tr> <tr> <td>Right</td> <td>804</td> <td>262</td> </tr> </tbody> </table>						Injury Criteria	Driver Dummy	Passenger Dummy	Threshold Value			Head Injury Criterion HIC = 1000	1,269	1,520	Chest Resultant Peak 60 Gs (3 ms clip)	73	59	Femur Load Left 2250 Pounds	932	322	Right	804	262
Injury Criteria	Driver Dummy	Passenger Dummy																					
Threshold Value																							
Head Injury Criterion HIC = 1000	1,269	1,520																					
Chest Resultant Peak 60 Gs (3 ms clip)	73	59																					
Femur Load Left 2250 Pounds	932	322																					
Right	804	262																					
TYPE OF RESTRAINT SYSTEM: 3-point continuous webbing system at each front outboard seating position.																							
17. Key Words 35 MPH FRONTAL BARRIER IMPACT TEST NEW CAR ASSESSMENT PROGRAM (NCAP) 1989/ISUZU TROOPER II S/ 5 DOOR 4 WHEEL DRIVE, MPV				18. Distribution Statement Copies of this report are available from Technical Reference Division Nat'l Hwy. Traffic Safety Admn. Room 5108, Nassif Building 400 7th St. S.W. Wash. DC 20590																			
19. Security Classif. (of this report) UNCLASSIFIED		20. Security Classif. (of this page) UNCLASSIFIED		21. No. of Pages 34	22. Price																		

TABLE OF CONTENTS

<u>SECTIONS</u>		<u>PAGES</u>
1	Purpose and Test Procedure	1
2	Summary of Frontal Barrier Impact Test	3
2.1	General Comments	4
3	Occupant and Vehicle Information	11
 <u>DATA TABLES</u>		
1	Test Vehicle Data	6
2	Post Crash Test Data	8
3	FMVSS 208 Occupant Crash Protection Data	12
4	Test Dummy Positioning Data	13
5	Seat Belt Positioning Data	15
6	Seat Belt Performance Assessment Test Data	16
7	Driver Dummy Positioning Data	17
8	Camera Location Data	18
9	Vehicle Accelerometer Location and Data Summary	20
10	Test Vehicle Measurements	21
11	Pretest Vehicle Target Locations	23
12	Load Cell Locations on Fixed Barrier	24
 <u>APPENDICES</u>		
A	Photographs	25
B-1	Vehicle and Dummy Response Data	27
B-2	Load Cell Barrier Data	29
C	Dummy Configuration and Performance Verification Data	31
D	Restraint Instructions from Vehicle Owner's Manual	33

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is a part of the FY'89 Vehicle Barrier Impact and Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-87-D-02009. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph FMVSS 208/212/219/301-75 requirements.

This 35 mph frontal barrier impact test was conducted in accordance with the Office of Market Incentives (OMI) Laboratory Indicant Test Procedure, dated 01 September 1986.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2

SUMMARY OF FRONTAL BARRIER IMPACT TESTS

A load cell barrier consisting of 36 cell units was impacted by a 1989 Isuzu Trooper II S, 5 Door 4 Wheel Drive MPV, NHTSA No. MK5701, at a velocity of 35.1 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 23 May 1989. The general test and vehicle description information is presented in Tables 1 and 2. Pretest and posttest photographs of the test vehicle and dummies are shown in Appendix A.

Two (2) Part 572 50th percentile adult male Anthropomorphic Test Devices (ATD's) were placed in the driver and right front passenger designated seating positions (DSP's) according to the NHTSA test requirements.

The ATD's were instrumented with head and chest triaxial accelerometers and right/left femur load cells. In addition, load cells were placed on the driver's and passenger's lap and shoulder belts to measure dummy upper torso and pelvic section belt loading. A summary of dummy configuration and performance verification test data is presented in Appendix C.

The frontal impact event was documented by one (1) real time camera and fifteen (15) high-speed cameras. The camera location data are presented in Table 8.

Sixty-seven (67) channels of crash parameters were recorded using five (5) FM tape recorders and associated data acquisition system. Time history plots of all recorded channels are presented in Appendix B.

2.1 GENERAL COMMENTS

The 1989 Isuzu Trooper II S, 5 Door 4 Wheel Drive MPV, was equipped with a 159 cubic inch, 4 cylinder engine and 5 speed manual transmission. The test weight of the 1989 Isuzu Trooper II S, 5 Door 4 Wheel Drive Truck with two (2) 50th percentile male dummies, instrumentation, and cameras was 4,310 pounds.

The 1989 Isuzu Trooper II S MPV, was involved in a frontal load cell barrier crash at a velocity of 35.1 mph.

The maximum static crush for the vehicle of 15.0 inches occurred at the center line of the front bumper. The windshield was not cracked, and the vehicle glazing remained intact. Both the driver's and passenger's front doors opened without aid of tools.

The driver ATD's head hit the steering wheel rim and the center hub. The driver's left and right knees hit the dash panel. The driver ATD had a HIC value of 1,269, the maximum chest acceleration (resultant clipped) was 73 g's, and the maximum femur loads were 932 (left) and 804 (right) pounds.

The passenger ATD's head hit the glove box door and both of his knees hit the dash panel. The HIC value for the passenger ATD was 1,520, the maximum chest acceleration (resultant clipped) was 59 g's, and the maximum femur loads were 322 (left) and 262 (right) pounds.

Seat belt spool out, measured by high-speed film analysis, was 8.0 inches for the driver and 8.5 inches for the passenger.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1989/ISUZU/TROOPER II S/5 DOOR 4 WHEEL DRIVE MPV

VEHICLE NHTSA NO.:

M	K	5	7	0	1
---	---	---	---	---	---

VIN:

J	A	C	C	H	5	8	E	6	K	8	9	0	7	4	5	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

VEHICLE BODY COLOR: FRENCH VANILLA; MONTH & YEAR OF MANUFACTURE: 11/88

ENGINE: 4 cylinders; 159 C.I.D.; 2.6 Liters; CC

X Gas; Diesel; Turbocharged

PLACEMENT— X Longitudinal; Transverse (Lateral)

TRANSMISSION: 5 speed; X Manual; Automatic; Overdrive

FINAL DRIVE: Front Wheel Drive Rear Wheel Drive; X Four Wheel Drive

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 01/27/89

ODOMETER READING: 27 miles; OPTIONS: A/C; X P/S; P/Wdo.;

 Tilt Whl.; Cruise Control

DATA RECORD FROM VEHICLE'S TIRE PLACARD:

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

Recommended Tire Size: P235/75R15 M+S

Tires on Vehicle: P235/75R15; Manufacturer: GENERAL

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

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

Type of Front Seat Back: Fixed; X Adjustable With X Lever/Rotating Knob

Vehicle Maximum Capacity Loading = 1055* lbs. (A)

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

Cargo Capacity (A - B) - - - - = 305 lbs.

* GVWR - Delivered Weight

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Right Front = 920 lbs.

Left Front = 995 lbs.

Right Rear = 860 lbs.

Left Rear = 910 lbs.

TOTAL WEIGHT = 3685 lbs.

TOTAL FRONT = 1915 lbs. (52.0 % of TOTAL)

TOTAL REAR = 1770 lbs. (48.0 % of TOTAL)

Data Table No. 1 (Con't) Test Vehicle Data

CALCULATION OF TEST VEHICLE TARGET WEIGHT:

Total Test Vehicle Delivered Weight With Maximum Fluids =	<u>3685</u>	lbs.
Maximum Cargo Carrying Capacity of Test Vehicle*- - - - -	<u>300*</u>	lbs.
Weight of Two P.572 Dummies (2 x 164 lbs.)- - - - -	<u>328</u>	lbs.
TEST VEHICLE TARGET WEIGHT	<u>4313</u>	lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front =	<u>972</u>	lbs.	TOTAL FRONT =	<u>2023</u>	lbs. (46.9% of TOTAL)
Left Front =	<u>1051</u>	lbs.			
Right Rear =	<u>1088</u>	lbs.	TOTAL REAR =	<u>2287</u>	lbs. (53.1% of TOTAL)
Left Rear =	<u>1199</u>	lbs.			
TOTAL WEIGHT=	<u>4310</u>	lbs. (which includes <u>175</u> lbs. of cargo ballast weight placed in the cargo/luggage area)			

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

1. X Spare Tire, Jack, Jack Stand
2. Rear Bumper Assembly
3. X Tail lamp hsg. Rt. Side X Left Side
4. Back Seats

TEST VEHICLE ATTITUDE:

As Delivered—Right Front =	<u>34.8</u>	inches;	Ready For Test—Right Front =	<u>34.6</u>	in.
Left Front =	<u>34.3</u>	inches	Left Front =	<u>34.1</u>	in.
Right Rear =	<u>35.0</u>	inches	Right Rear =	<u>34.0</u>	in.
Left Rear =	<u>34.5</u>	inches	Left Rear =	<u>33.2</u>	in.
Test Vehicle Wheelbase:	<u>104.5</u>	inches; C.G.=	<u>55.5</u>	inches rearward of front wheel centerline	

Total Vehicle Length:

Right Side =	<u>170.8</u>	inches
Left Side =	<u>170.8</u>	inches
Centerline =	<u>172.0</u>	inches

Data Table No. 2 Post Crash Test Data

DATA OF 35 MPH FRONTAL BARRIER IMPACT RATING TEST: 05/23/89

TIME OF TEST: 2:15 PM; AMBIENT TEMPERATURE AT BARRIER FACE: 90 °F

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 72 °F (spec. Range = 66 to 78° F.)

VEHICLE WINDSHIELD HOLDING TEMPERATURE: 72 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 35.10 mph

Secondary Speed Trap 35.10 mph

(Specified Range = 34.5 to 35.5 mph)

Distance from vehicle's front bumper forwardmost surface to barrier face when—

(a) entering the speed trap = 5.0 ft

(b) exiting the speed trap = 1.0 ft

VEHICLE STATIC CRUSH:

Vehicle Pre-test Length— Right Side = 170.8"; C/Line = 172.0"; Left Side = 170.8"

Vehicle Post-test Length—Right Side = 157.8"; C/Line = 157.0"; Left Side = 156.0"

Vehicle Static Crush — Right Side = 13.0"; C/Line = 15.0"; Left Side = 14.8"

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 41.7 inches

Vehicle Centerline = 43.2 inches

Vehicle Left Side = 42.8 inches

VEHICLE DUMMY CONTACT POINTS:

DRIVER (I.D. No. 465)

	Strg.Col. Hub	Strg. Wheel	Instru. Panel
HEAD - - - - -	YES	YES	NO
RIGHT KNEE - - -	////////	////	YES
LEFT KNEE - - -	////////	////	YES

PASSENGER (I.D. No. 466)

Instru. Panel	Knee Assy.	Glove Box Door
NO	NO	YES
YES	////	NO
YES	////	NO

VEHICLE DOOR OPENING INFORMATION:

	RIGHT SIDE	
	OPENED	JAMMED
FRONT DOORS- - - - -	YES	NO
REAR DOORS - - - - -	YES	NO

LEFT SIDE	
OPENED	JAMMED
YES	NO
YES	NO

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH EVENT:

Seat Cushion Shift - - - - -	0.0 "	0.0 "	forward
Seat Adjuster Failure - - - - -	NO ;	NO	

Details Of Any Failure: N/A

OTHER NOTABLE IMPACT EFFECTS:

Interior rear view mirror broke off.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

I. OMI DATA

Dummy Injury Criteria Data Summary

Dummy Positioning Data

Seat Belt Positioning Data

Seat Belt Performance Assessment Data

Driver Dummy to Steering Column Dimensions

Camera Locations

II. OVR DATA

Load Cell Barrier Data

Vehicle Accelerometer Data

Data Table No. 3 FMVSS No. 208 Occupant Crash Protection Data Sheet

VEH. YR./MAKE/MODEL/BODY STYLE: 1989/ISUZU/TROOPER 11 S/5 DOOR 4 WHEEL DRIVE MPV

VEH. NHTSA NO.: MK5701 ; TEST DATE: 05/23/89

MAXIMUM ACCELERATION VALUES:		DRIVER DUMMY # 465	PASSENGER DUMMY # 466
Head Channel X	HEAD X	-114.36	-93.38
Head Channel Y	Y	-18.42	26.21
Head Channel Z	Z	-76.73	-76.03
HEAD RESULTANT		122.73	109.85
Chest Channel X	CHEST X	-77.51	-70.60
Chest Channel Y	Y	-14.50	25.79
Chest Channel Z	Z	-28.18	-24.39
CHEST RESULTANT		72.80	59.16
TIME INTERVAL (seconds)		0.06678 to 0.06978	0.05792 to 0.06092

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	HIC	1269.43	1520.43
t_1 (seconds)		56.20	67.30
t_2 (seconds)		92.20	103.30
Avg. Accel. t_1 to t_2		65.85	70.78

MAXIMUM FEMUR FORCES:

Right Side (lbs.)	FR	803.82	262.44
Left Side (lbs.)	FL	932.34	322.45

MAXIMUM SEAT BELT FORCES:

Lap Belt	LAP	2189.90	2234.40
Shoulder Belt	SHLDR	3271.40	1618.30

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

Lap/Shoulder Belt Combination		10.50	11.2
-------------------------------	--	-------	------

Data Table No. 4 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: ISUZU/TROOPER II
 Body Style: 5 DOOR 4 WHEEL DRIVE MPV Model Year: 1989
 NHTSA No.: MK5701 Color: BEIGE

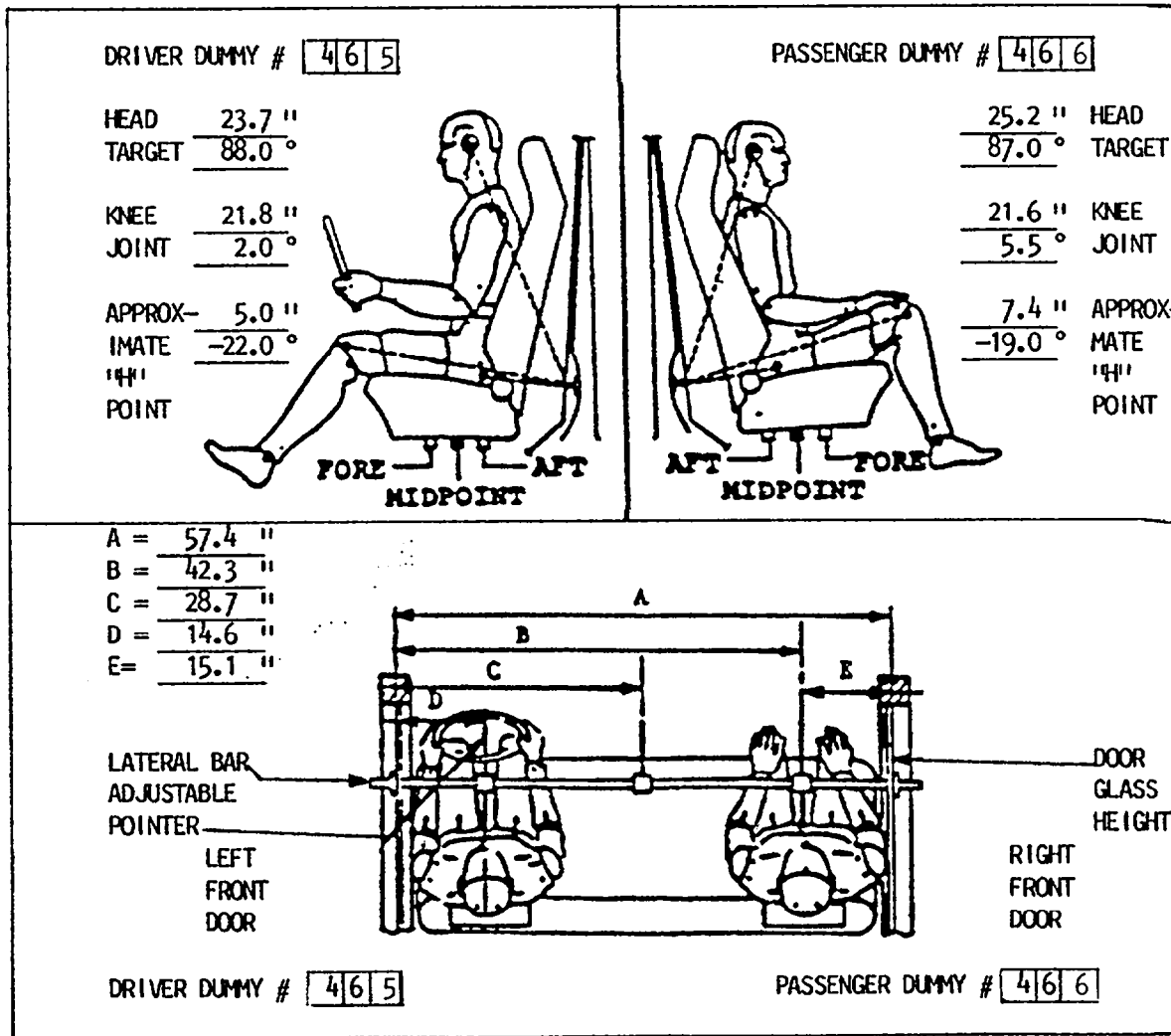
DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: ISUZU MOTORS LIMITED
 Date of Manufacture: 11/88 ; VIN: JACCH58E6K8907454

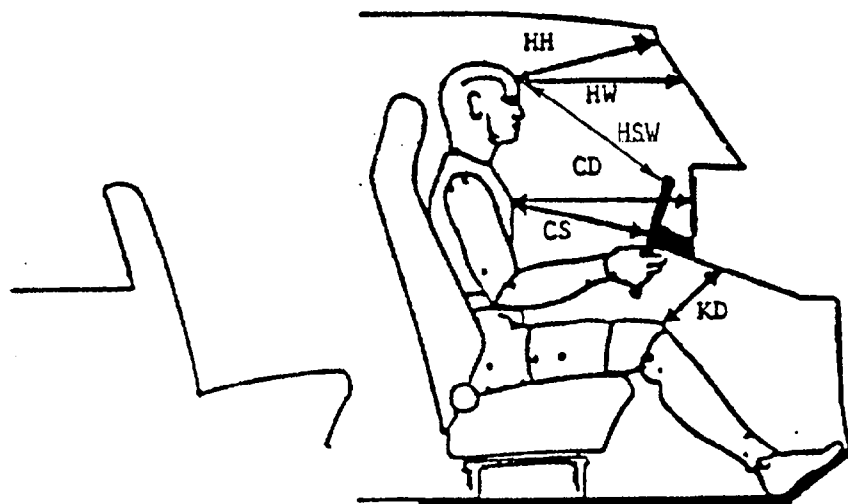
POST-IMPACT DATA:

Date of Test: 05/23/89 Time: 2:15 PM Temperature: 90° F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.10 mph Secondary = 35.10 mph
 Seat Type: Bucket Adjuster Type: Yes/Lever
 Bucket Seat Back Type: Headrest

TECHNICIANS: Enrique Marin



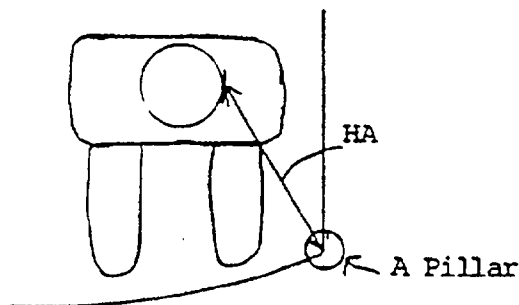
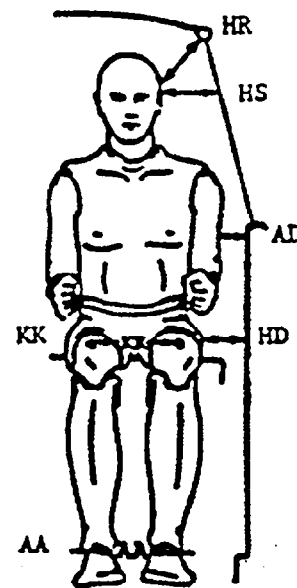
Data Table No. 4 (Cont'd) Test Dummy Positioning Data



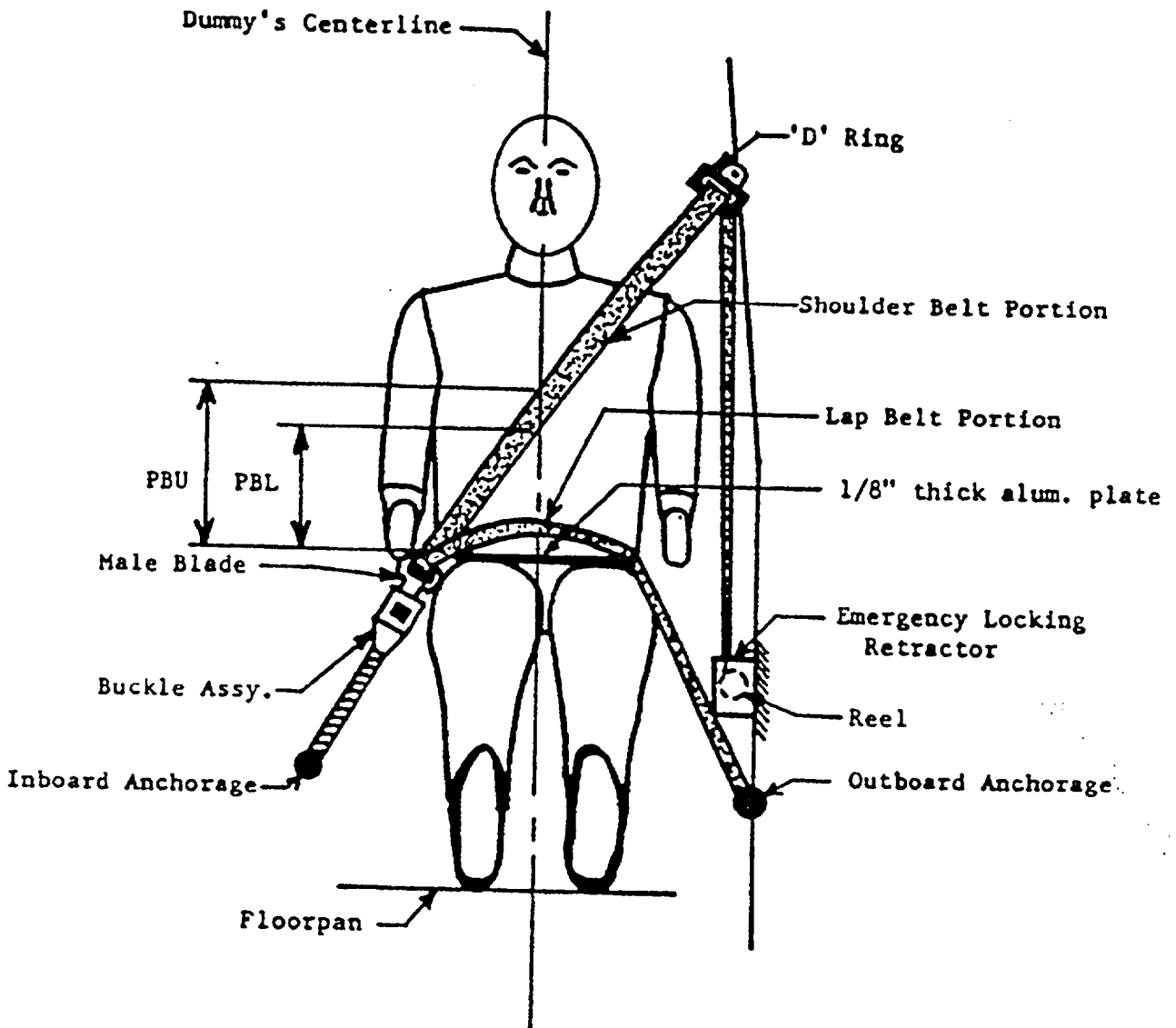
	Driver	Passenger
HH	18.3	15.6
HW	22.3	19.2
CD	21.1	19.2
CS	14.1	N/A
KD L-	5.2	L- 4.9
KD R-	3.9	R- 5.4
Torso Angle	18.0	Torso Angle 15.0
Seat Back Angle	4.0	Seat Back Angle 4.0
HSW	19.4	N/A

- HSW = Head to Steering Wheel (in.)
 - HA = Head Target to A pillar (in.)
 - HH = Head to Windshield Header (in.)
 - HW = Head to Windshield (in.)
 - CD = Chest to Dash (in.)
 - CS = Chest to Steering Wheel (in.)
 - KD = Knees to Dash (in.)
 - HR = Head to Side Roof (in.)
 - HS = Head to Side Window (in.)
 - AD = Arm to Door (in.)
 - HD = Hip to Door (in.)
 - KK = Knee to Knee (in.)
- Torso and seat back angles (deg.) are relative to vertical.

REMARKS:



	Driver	Passenger
HR	11.8	9.2
HS	9.6	10.0
AD	3.7	3.8
HD	8.5	7.4
KK	14.5	11.7
AA	14.0	10.5
HA	26.1	22.5



FRONT VIEW OF DRIVER DUMMY

	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> --Top surface of alum. plate to belt upper edge	14.8	14.2
<u>PBL</u> --Top surface of alum. plate to belt lower edge	11.2	10.3
<u>LAP BELT TENSION, POUNDS</u>	3.0	3.0
<u>SHOULDER BELT TENSION, POUNDS</u>	3.0	3.0

Data Table No. 6 Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

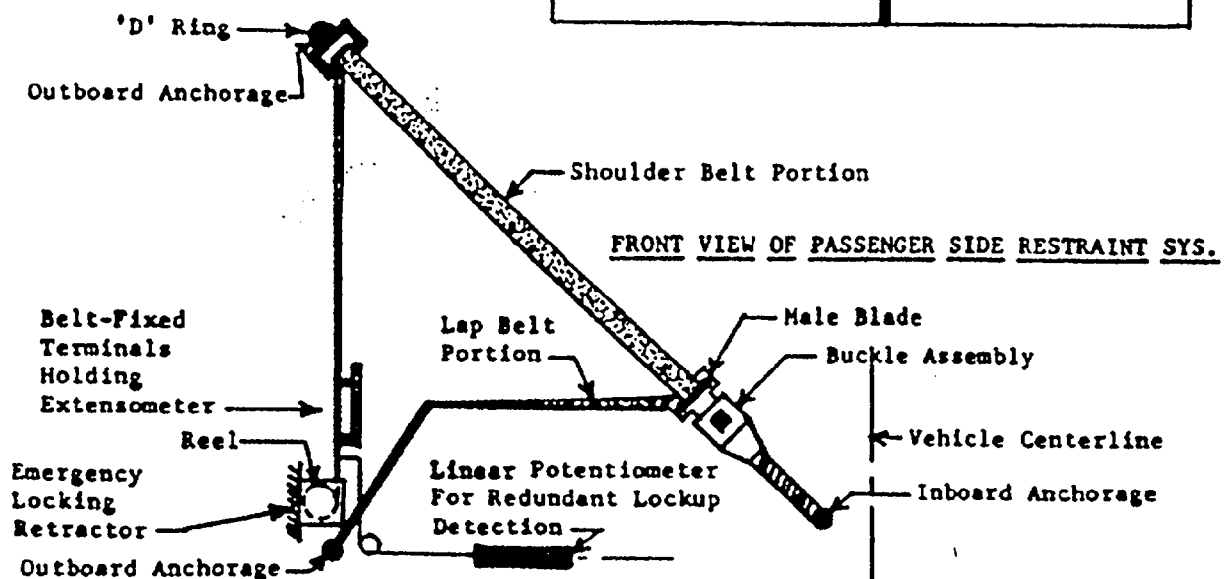
	DRIVER SIDE		PASSENGER SIDE	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Total belt length from retractor reel to bolt hole anchor point for continuous webbing systems	116.2	116.2	115.5	115.5
Retractor reel to 'D' ring as measured on Part 572 dummy	15.3	15.5	15.3	15.3
Shoulder belt length as measured on Part 572 dummy	33.0	38.3	34.3	40.2
Lap belt length as measured on Part 572 dummy	34.3	35.0	34.8	36.2
Remainder of belt webbing left on retractor reel	33.6	27.4	31.1	23.8

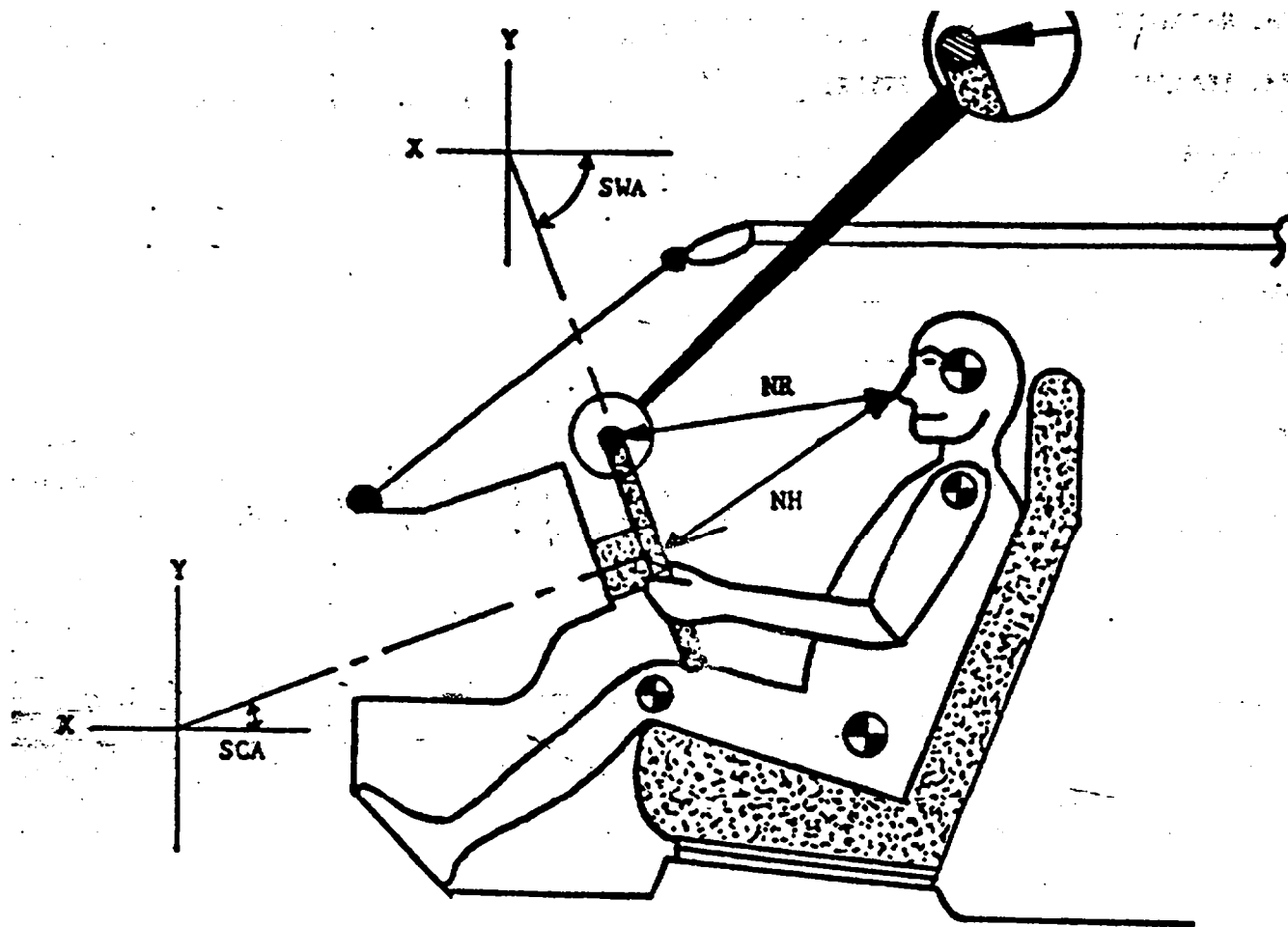
BELT SPOOL-OFF DATA:

As determined by film analysis	8.00	8.50
As determined electronically	8.91	7.6
As determined mechanically	10.50	11.2

BELT STRAIN DATA:

Measured between retractor reel and 'D' ring	0.11	0.12
--	------	------





LEFT SIDE VIEW

		MEASUREMENTS	
<u>NR</u> --Distance from tip of dummy's nose to top rear surface of steering wheel rim		17.4	Inches
<u>NH</u> --Distance from tip of dummy's nose to center of steering column hub		17.7	Inches
<u>SCA</u> --Angle of steering column relative to the horizontal X axis		35.0	Degrees
<u>SWA</u> --Angle of steering wheel relative to the horizontal X axis.		61.0	Degrees

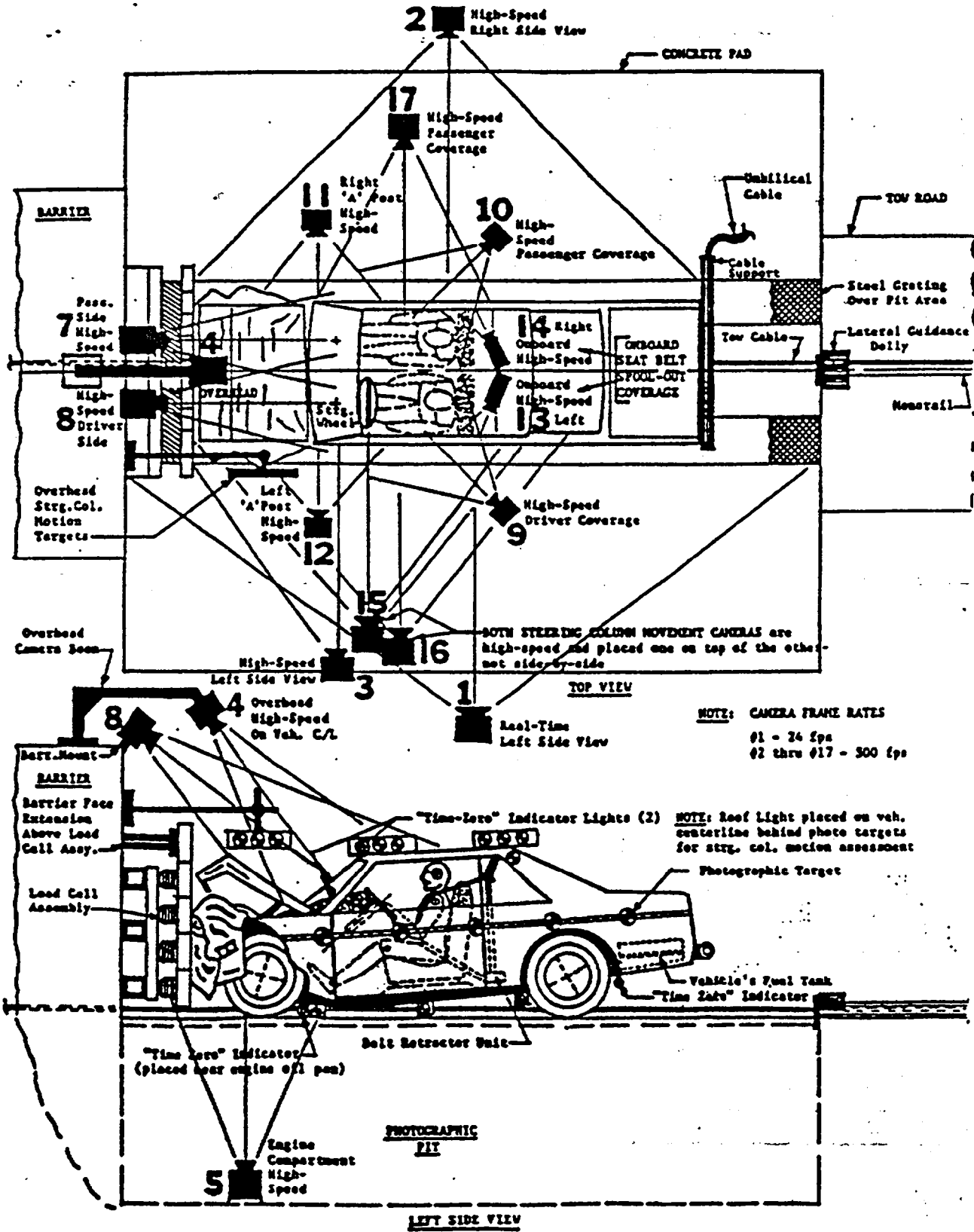
Data Table No. 8 Camera Location Data

VEH. NHTSA NO.: MK5701 ; TEST DATE: 05/23/89 ; TIME: 2:15 PMVEH. YEAR/MAKE/MODEL/BODY STYLE: 1989/ISUZU/TROOPER 11 S/5 DOOR 4 WHEEL DRIVE MPV

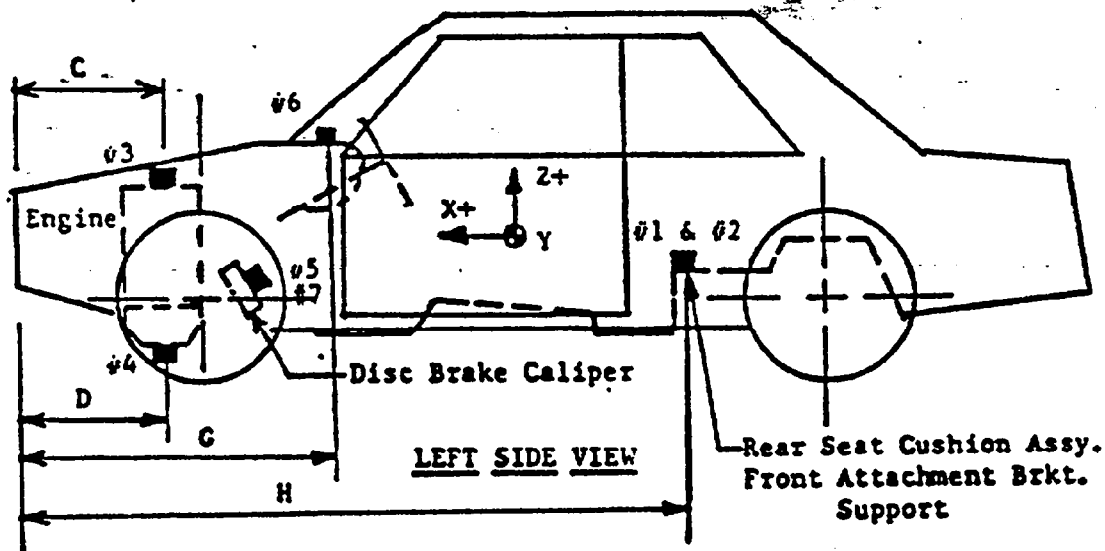
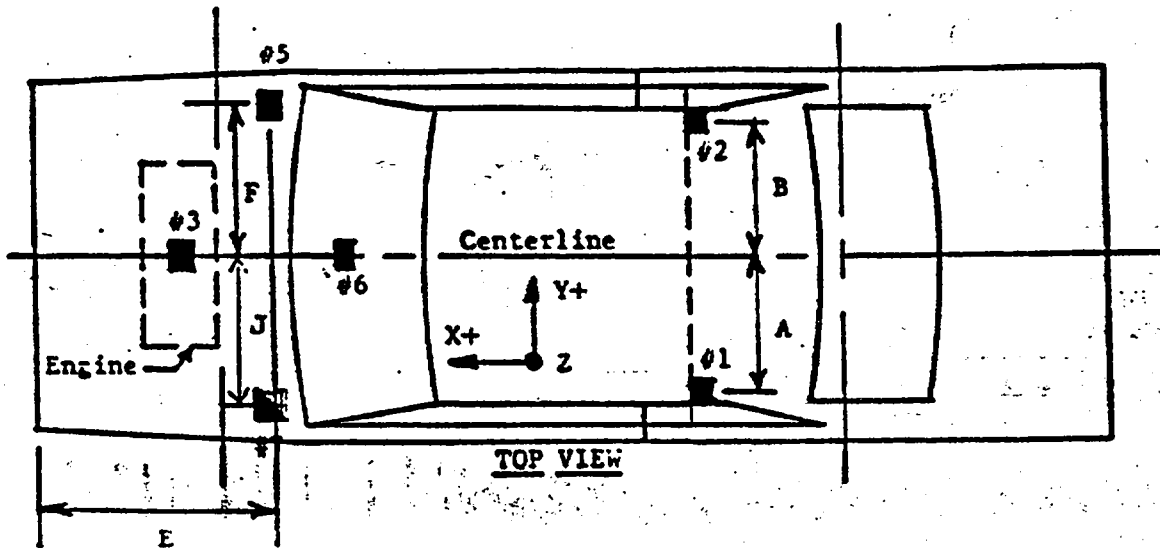
CAMERA NO.	VIEW	CAMERA POSITIONS (in.)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Left Side View	-676	268	57	3	684	15-70 ZOOM	24
2	Right Side View	256	54	56	1	240	13	462
3	Left Side View	-1140	78	41	0	1122	50	560
4	Overhead	-1	-4	124	65	101	13	697
5	Pit-Engine	2	42	-54	40	---	13	520
6	Pit-Fuel Tank	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
7	Front-Passenger	13	-14	104	53	104	16	616
8	Front-Driver	-12	-14	104	48	104	16	620
9	Left Side-Driver	-91	111	81	16	82	16	615
10	Right Side-Passenger	-93	106	79	17	83	16	600
11	Right Side-'A' Post	173	17	55	-2	168	28	591
12	Left Side-'A' Post	-358	-24	48	-1	345	50	570
13	Onboard-Left Side	-12	115	36	18	43	13	270
14	Onboard-Right Side	13	115	36	19	43	13	270
15	Left Side-Steering Col.	-442	84	127	10	429	28	600
16	Left Side-Steering Col.	-441	82	105	13	425	28	635
17	Right Side-Passenger	135	93	55	1	119	16	635

- * X = film plane to monorail centerline
- Y = film plane to barrier face
- Z = film plane to ground

Data Table No. 8 (Cont'd) Camera Location Data



Data Table No. 9 Vehicle Accelerometer Location and Data Summary



Dimension	Length (in.)
A	20.4
B	20.8
C	28.0
D	47.2
E	35.2
F	22.3
G	60.9
H	112.8
J	22.3

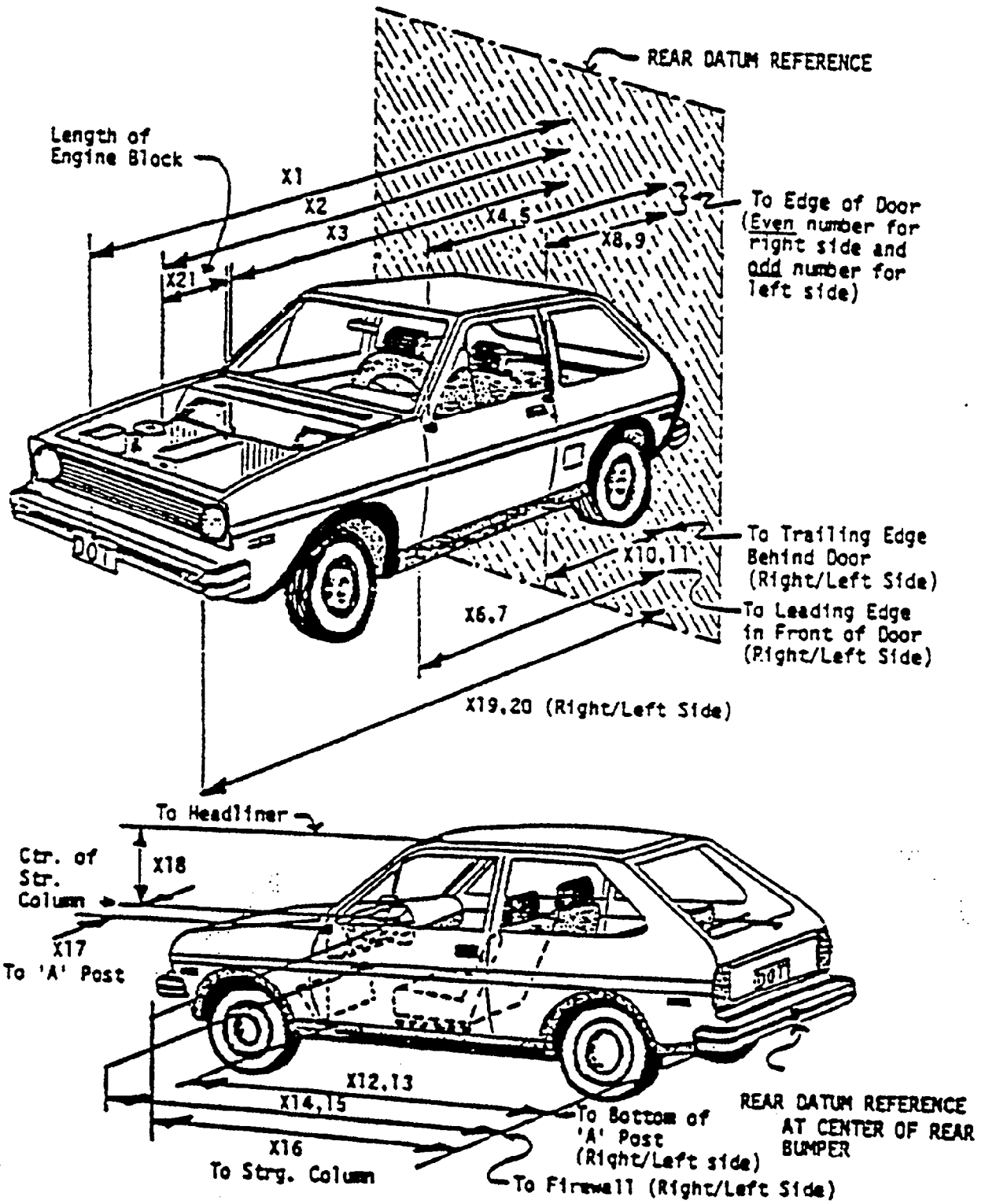
Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	-37.98	45.2	5.83	74.6
2	Rear seat X-member @ Right Side	-39.32	44.0	6.08	72.3
3	Top of Engine Block	-178.82	31.7	45.44	40.1
4	Bottom of Engine	ND	ND	ND	ND
5	Disc Brake Caliper @ Right Side	-90.58	40.5	55.51	56.1
6	Instrument Panel	-75.55	31.6	55.14	62.0
7	Disc Brake Caliper @ Left Side	-127.20	40.9	51.53	47.7

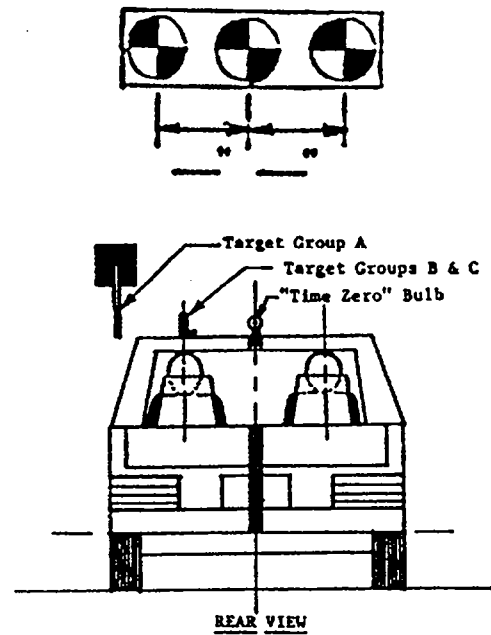
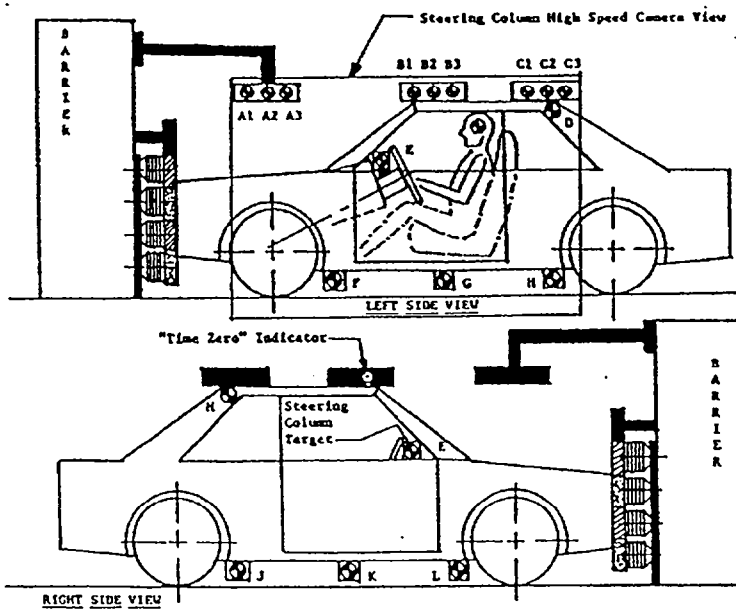
ND = No Data

Data Table No. 10 Test Vehicle Measurements

NO.	MEASUREMENT DESCRIPTION	Pre-Test (in.)	Post-Test (in.)	Diff. (in.)
X1	Total Length of Test Vehicle at Centerline	172.0	157.0	15.0
X2	Rear Surface of Vehicle to Front of Engine	153.5	150.3	3.2
X3	Rear Surface of Vehicle to Firewall	130.6	128.3	2.3
X4	Rear Surface to Upr. Leading Edge of Right Door	120.3	121.8	-1.5
X5	Rear Surface to Upr. Leading Edge of Left Door	120.3	123.5	-3.2
X6	Rear Surface to Lwr. Leading Edge of Right Door	119.8	121.3	-1.5
X7	Rear Surface to Lwr. Leading Edge of Left Door	119.8	123.0	-3.2
X8	Rear Surface to Upr. Trailing Edge of Right Door	83.0	84.8	-1.8
X9	Rear Surface to Upr. Trailing Edge of Left Door	83.0	84.5	-1.5
X10	Rear Surface to Lwr. Trailing Edge of Right Door	83.0	84.5	-1.5
X11	Rear Surface to Lwr. Trailing Edge of Left Door	83.0	86.3	-3.3
X12	Rear Surface to Bottom 'A' Post on Right Side	115.0	119.0	-4.0
X13	Rear Surface to Bottom 'A' Post on Left Side	115.0	119.0	-4.0
X14	Rear Surface to Firewall on Right Side	130.9	127.8	3.1
X15	Rear Surface to Firewall on Left Side	130.5	128.5	2.0
X16	Rear Surface to Steering Column	115.5	110.5	-5.0
X17	Center of Steering Column to 'A' Post	15.0	14.0	1.0
X18	Center Steering Column to Headlining	22.0	25.3	-3.3
X19	Rear Surface to Right Side of Front Bumper	170.8	157.8	13.0
X20	Rear Surface to Left Side of Front Bumper	170.8	156.0	14.8
X21	Length of Engine Block	18.0	18.0	0.0

Data Table No. 10 (Cont'd) Test Vehicle Measurements



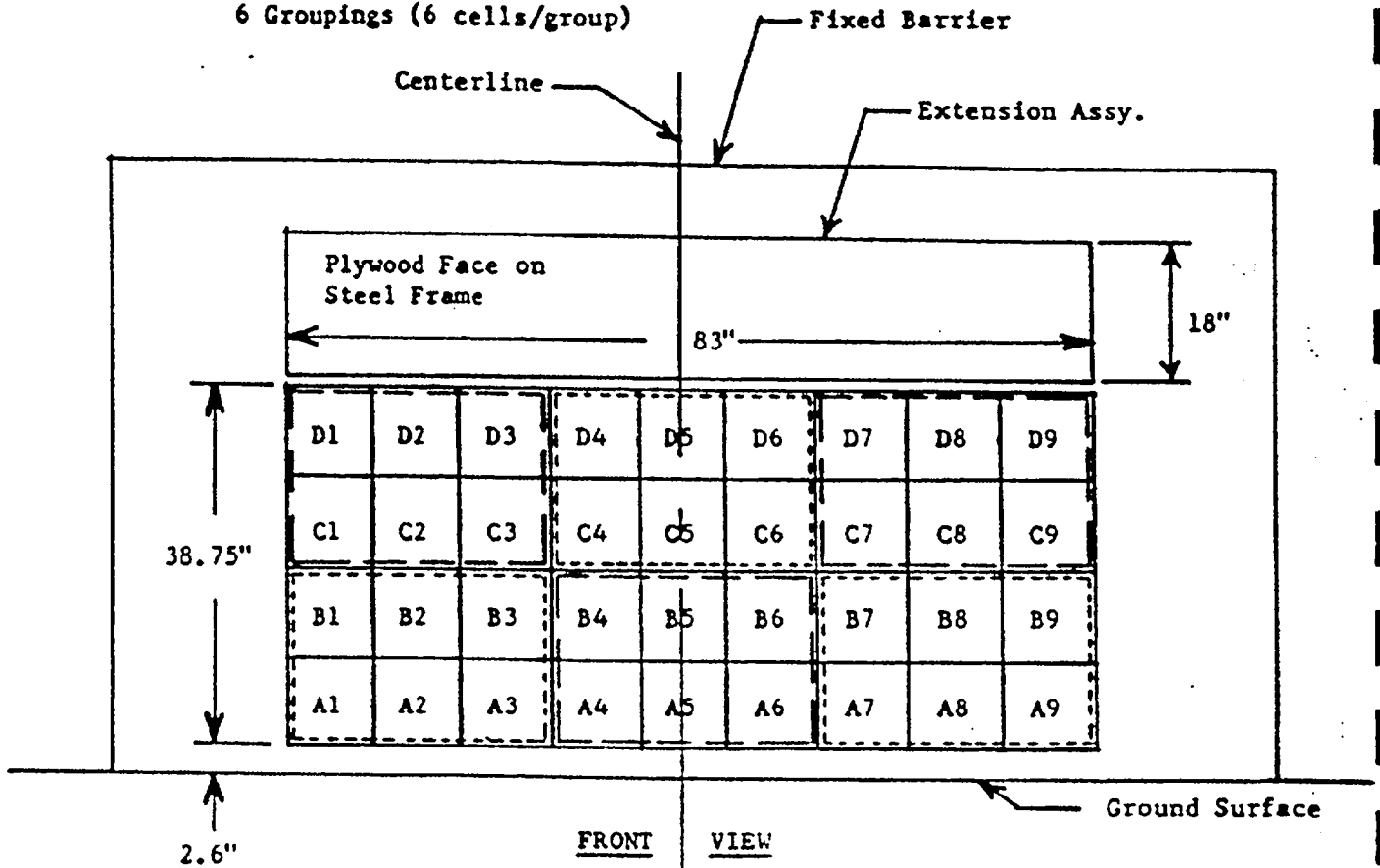


BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
A-1	53.5	21.0	84.0
A-2	57.5	21.0	84.0
A-3	61.5	21.0	84.0
BARRIER TARGETS	'X' From Imag. Barrier Face Vertical Plane	'Y' From Monorail C/L	'Z' Above Ground
B-1	65.9	14.0	71.5
B-2	69.9	14.0	71.5
B-3	73.9	14.0	71.5
C-1	150.6	14.0	72.4
C-2	154.6	14.0	72.4
C-3	158.6	14.0	72.4
D	159.0	26.5	64.5
E	61.5	13.0	48.5
F	50.5	26.8	11.6
G	82.0	26.8	12.0
H	113.5	27.0	12.5
J	113.1	27.0	13.1
K	81.6	26.8	12.7
L	50.2	26.8	12.3
M	159.0	26.5	64.5

NOTE: Diameter of all photo targets is 4".

Data Table No. 12 Load Cell Locations on Fixed Barrier

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



6 GROUPINGS OF 6 LOAD CELLS EACH

C1 thru D3	C4 thru D6	C7 thru D9
A1 thru B3	A4 thru B6	A7 thru B9

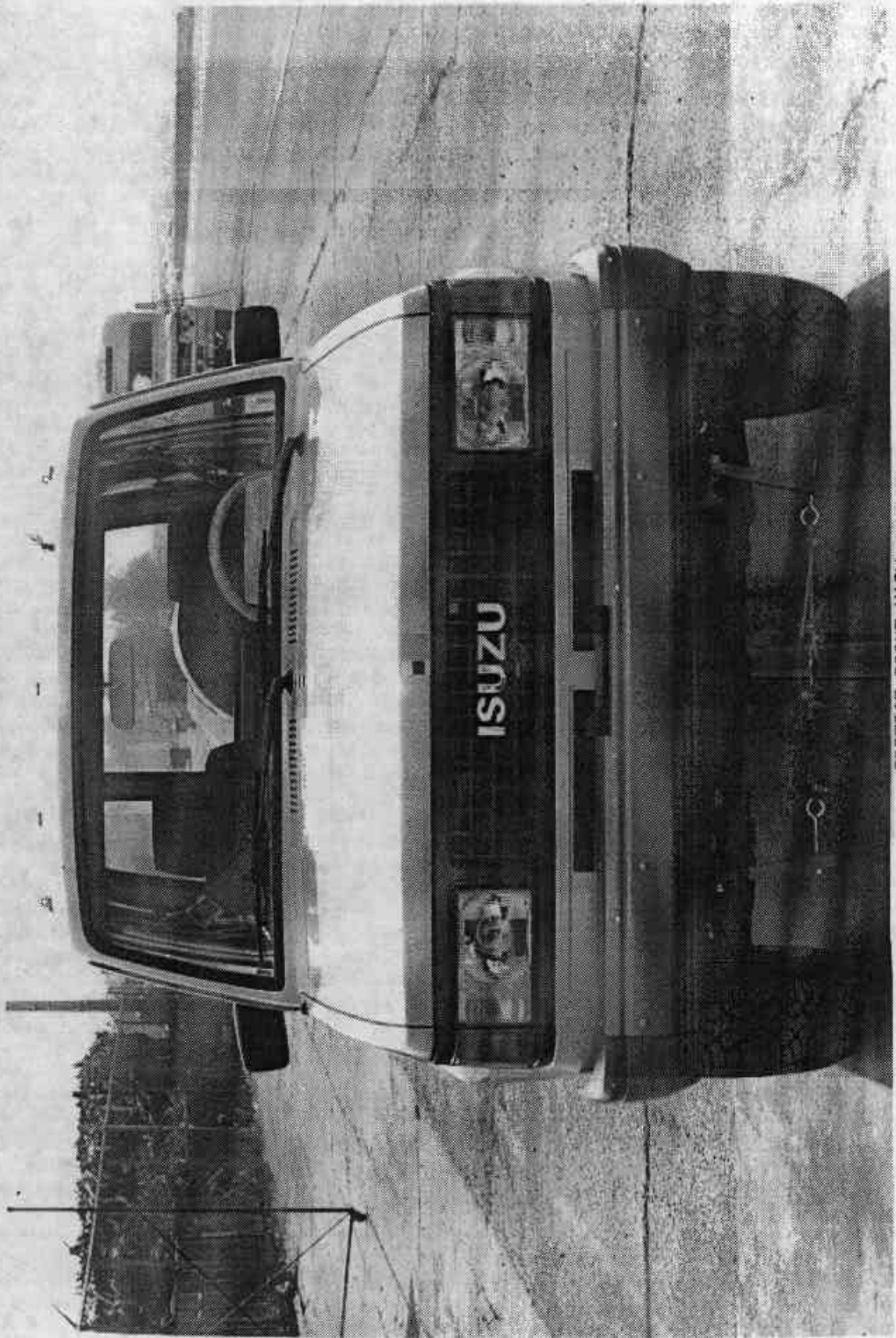
- DATA REQUIREMENTS:**
- (1) Data from 36 individual load cells
 - (2) Total or Sum of 36 individual load cells
 - (3) Data from 6 Groupings shown above (6 cells/group)

APPENDIX A

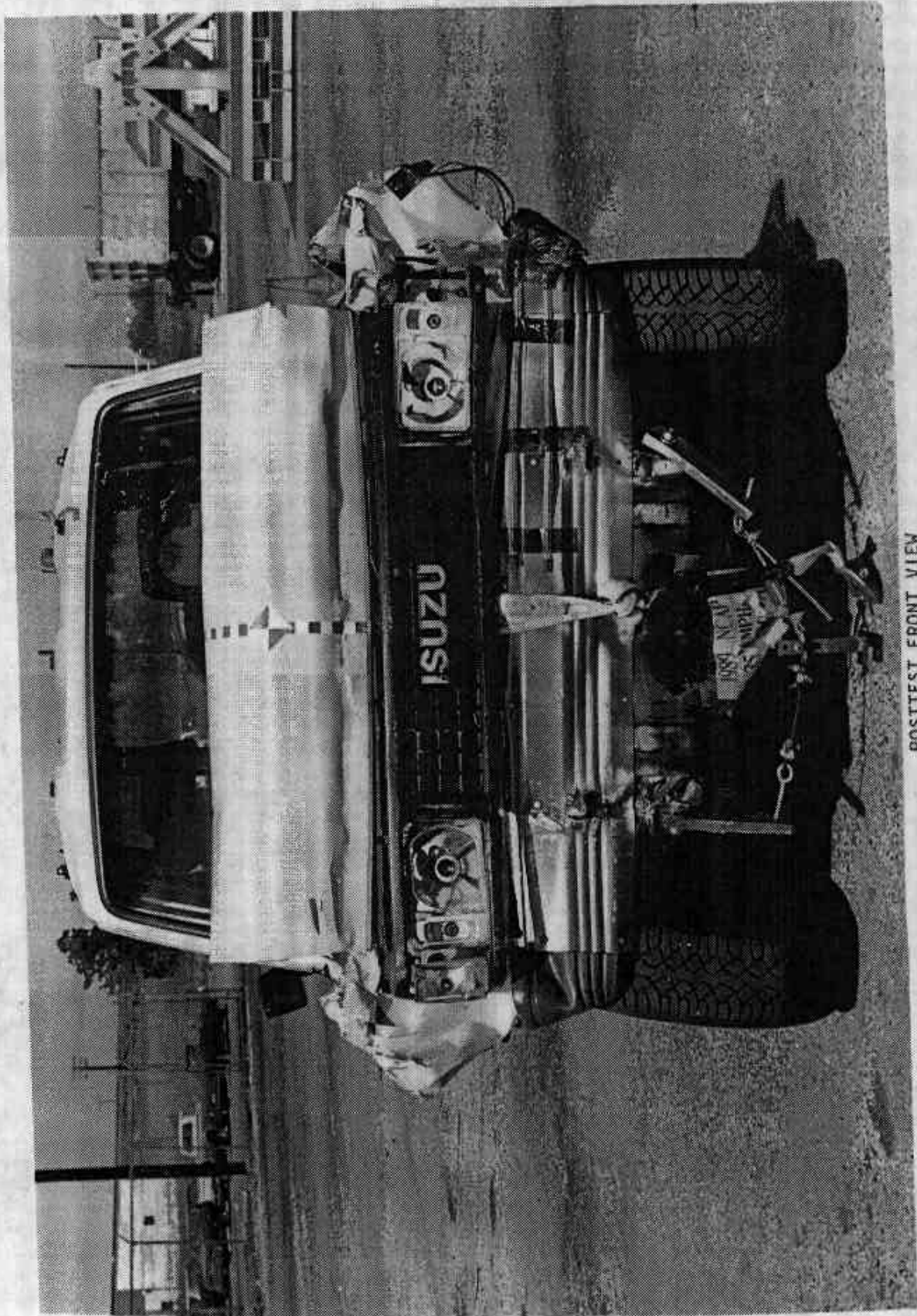
PHOTOGRAPHS

PRETEST FRONT VIEW
POSTTEST FRONT VIEW
PRETEST LEFT SIDE VIEW
POSTTEST LEFT SIDE VIEW
PRETEST RIGHT SIDE VIEW
POSTTEST RIGHT SIDE VIEW
PRETEST RIGHT FRONT 3/4 VIEW
POSTTEST RIGHT FRONT 3/4 VIEW
PRETEST LEFT REAR 3/4 VIEW
POSTTEST LEFT REAR 3/4 VIEW
PRETEST WINDSHIELD VIEW
POSTTEST WINDSHIELD VIEW
PRETEST ENGINE COMPARTMENT VIEW
POSTTEST ENGINE COMPARTMENT VIEW
PRETEST FRONT UNDERBODY VIEW
POSTTEST FRONT UNDERBODY VIEW
PRETEST REAR UNDERBODY VIEW
POSTTEST REAR UNDERBODY VIEW
PRETEST DRIVER DUMMY POSITION VIEW
POSTTEST DRIVER DUMMY POSITION VIEW
PRETEST PASSENGER DUMMY POSITION VIEW
POSTTEST PASSENGER DUMMY POSITION VIEW
PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
PRETEST PASSENGER & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
POSTTEST DRIVER DUMMY (ATD) HEAD AREA
POSTTEST DRIVER DUMMY (ATD) KNEE CONTACT AREA
POSTTEST PASSENGER DUMMY (ATD) HEAD/KNEE CONTACT

THIS PAGE INTENTIONALLY LEFT BLANK



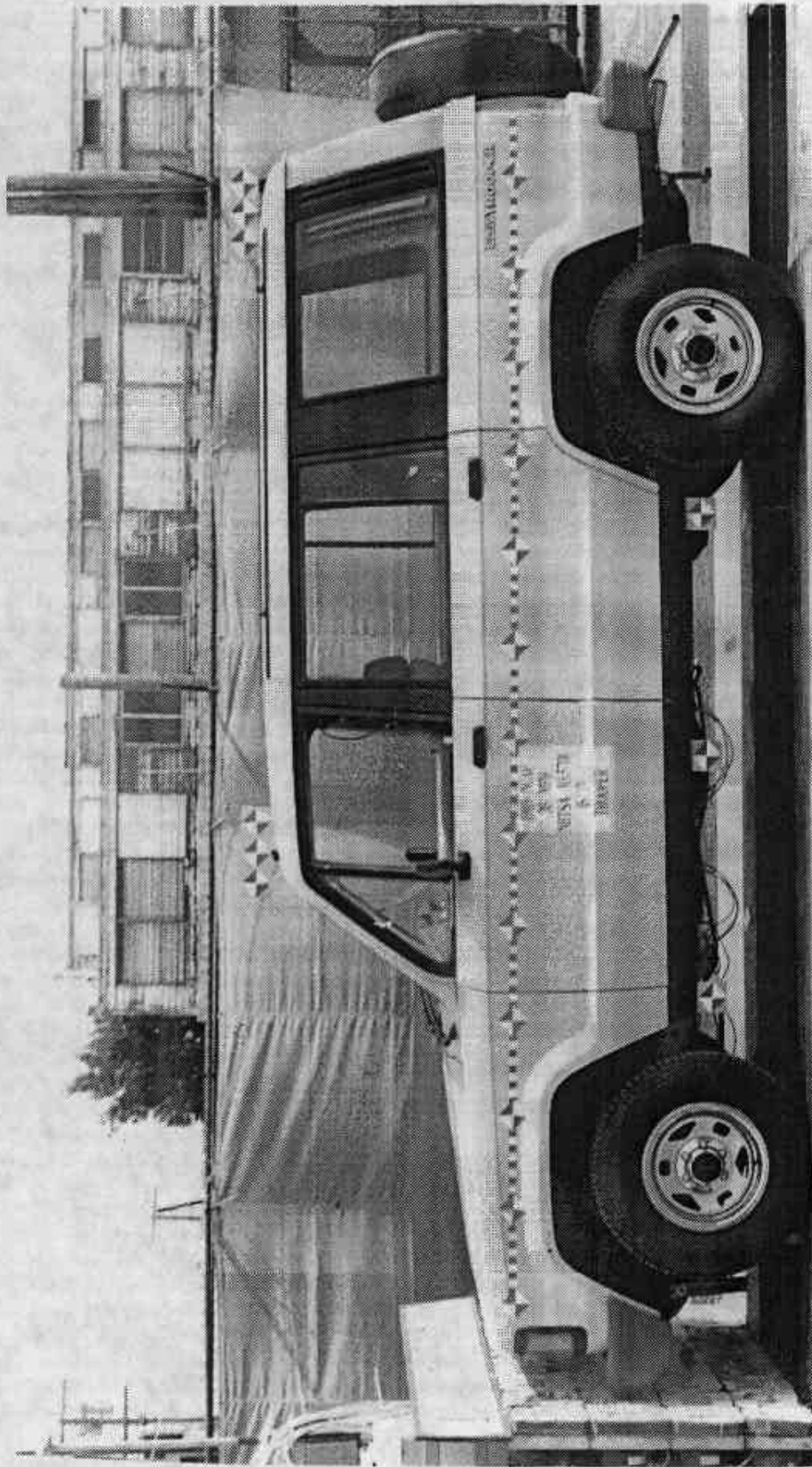
PRETEST FRONT VIEW



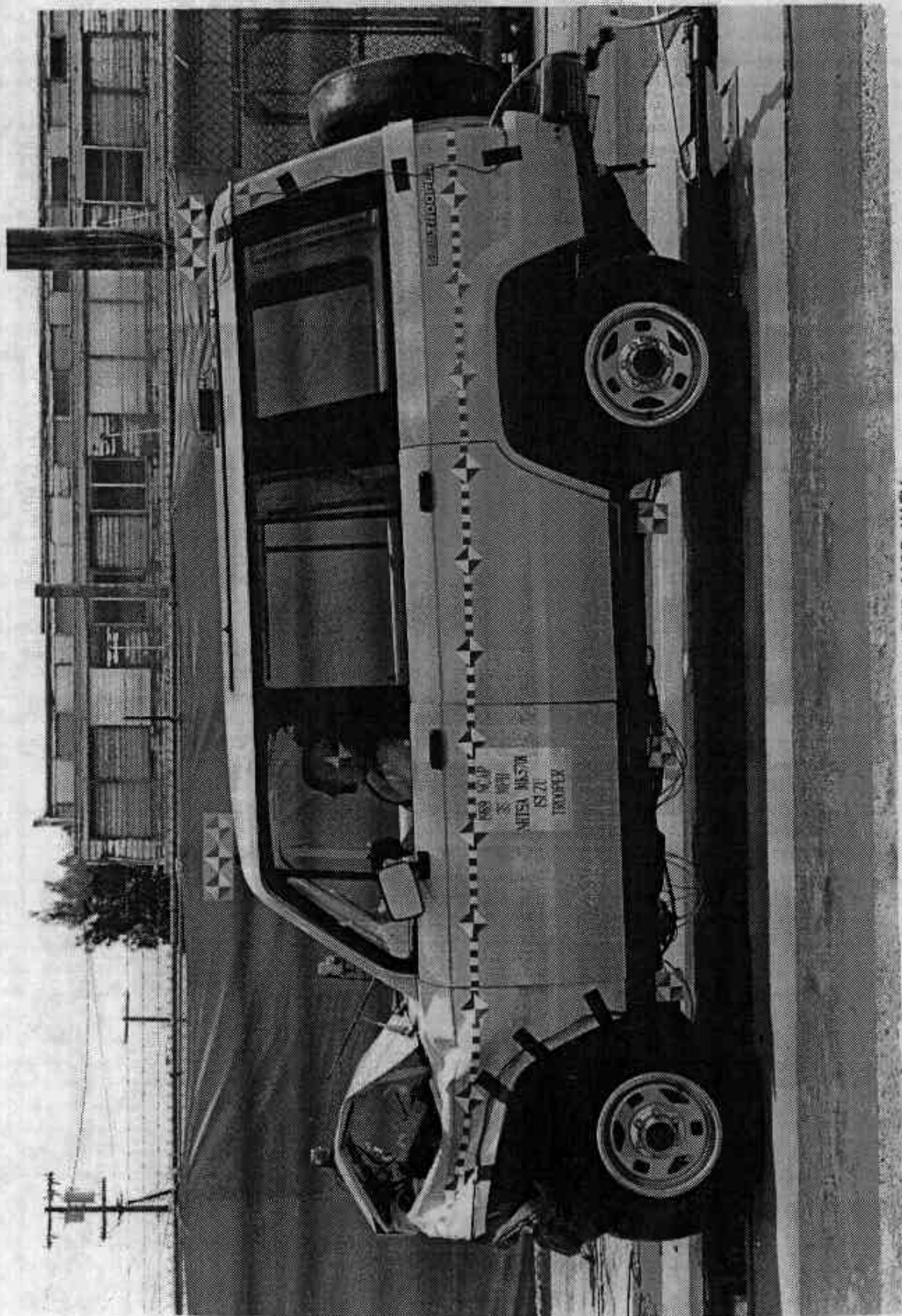
POSTTEST FRONT VIEW

A-2

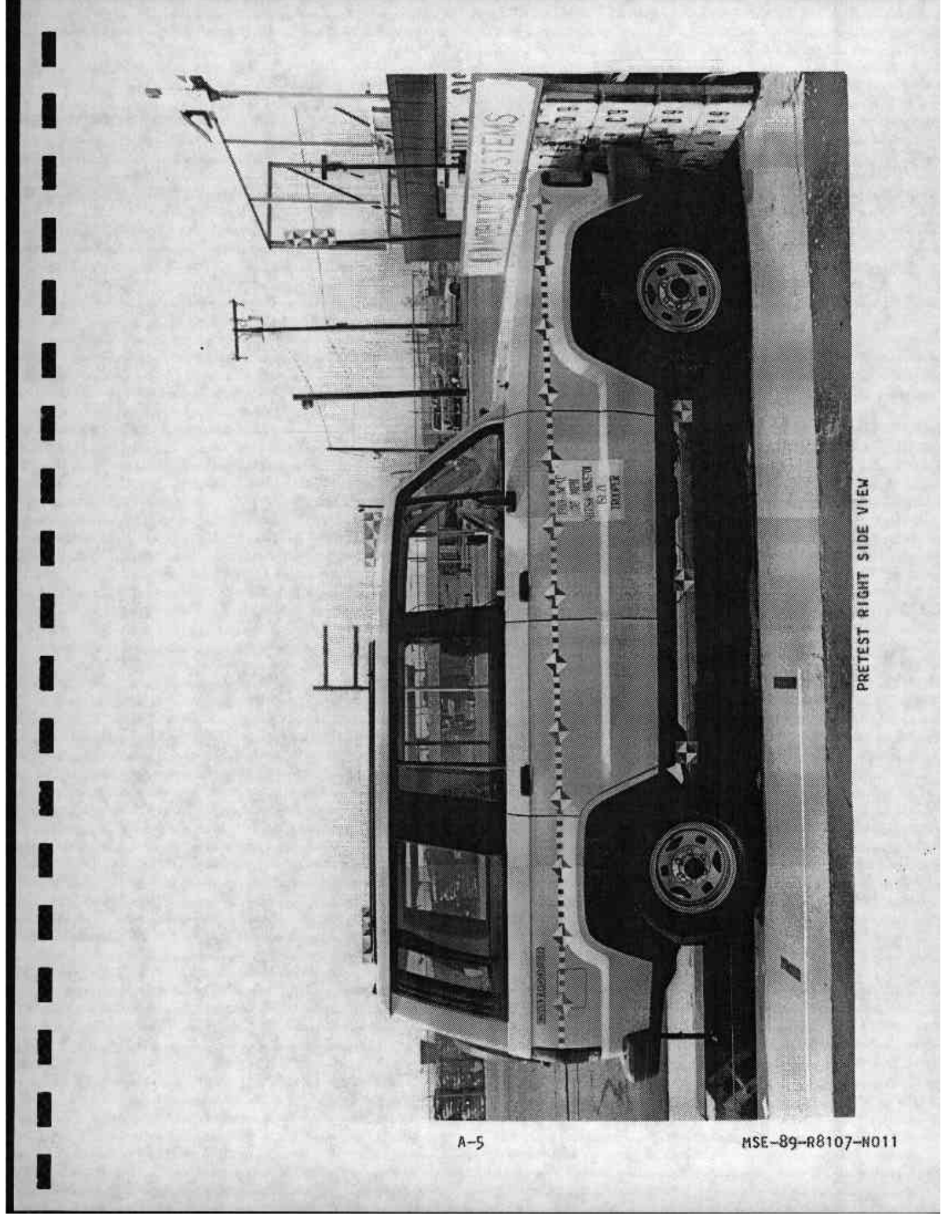
MSE-89-R8107-N011



PRETEST LEFT SIDE VIEW



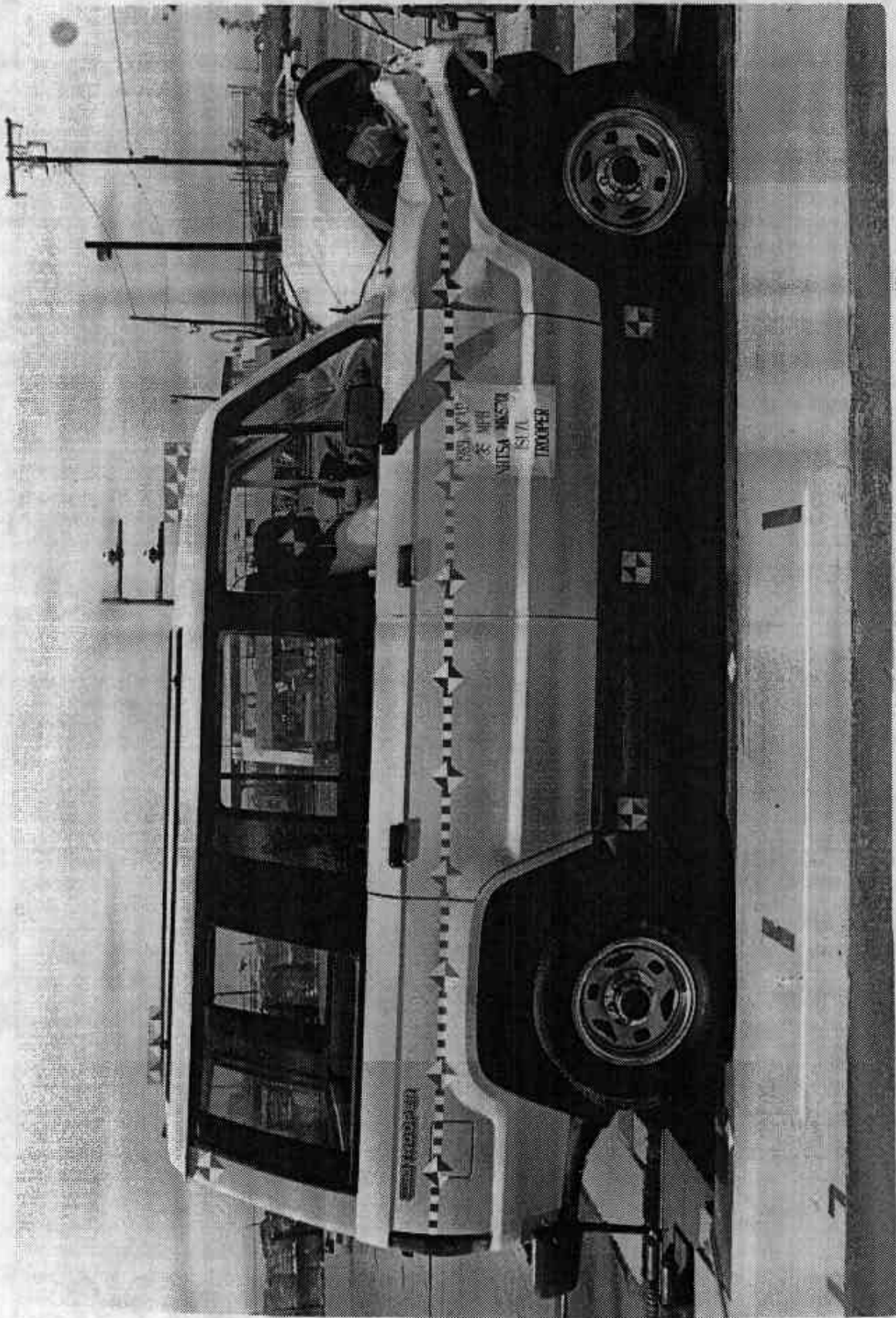
POSTTEST LEFT SIDE VIEW



PRETEST RIGHT SIDE VIEW

A-5

MSE-89-R8107-M011



POSTTEST RIGHT SIDE VIEW



PRETEST RIGHT FRONT 3/4 VIEW



POSTTEST RIGHT FRONT 3/4 VIEW



PRETEST LEFT REAR 3/4 VIEW

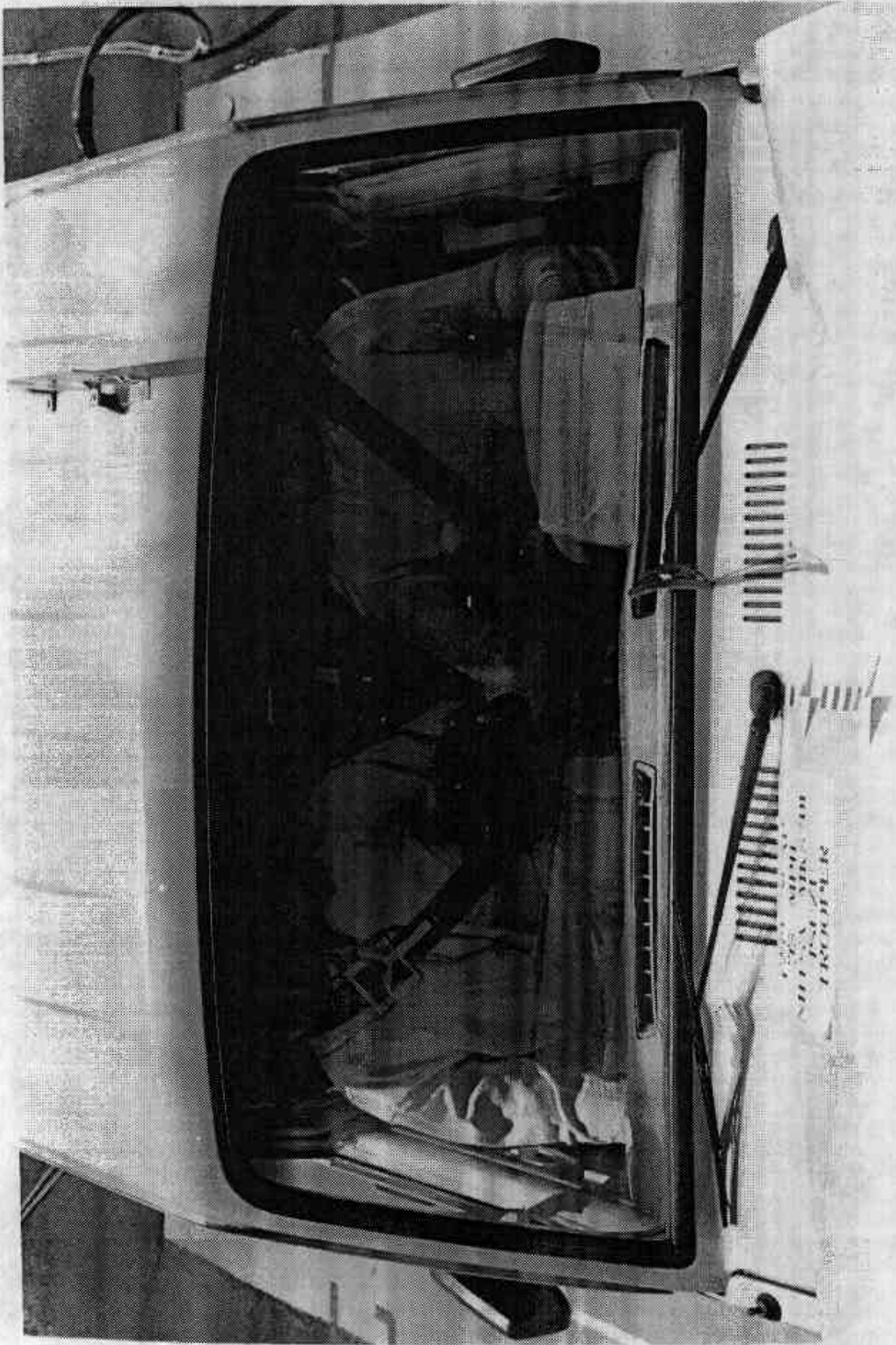


POSTTEST LEFT REAR 3/4 VIEW

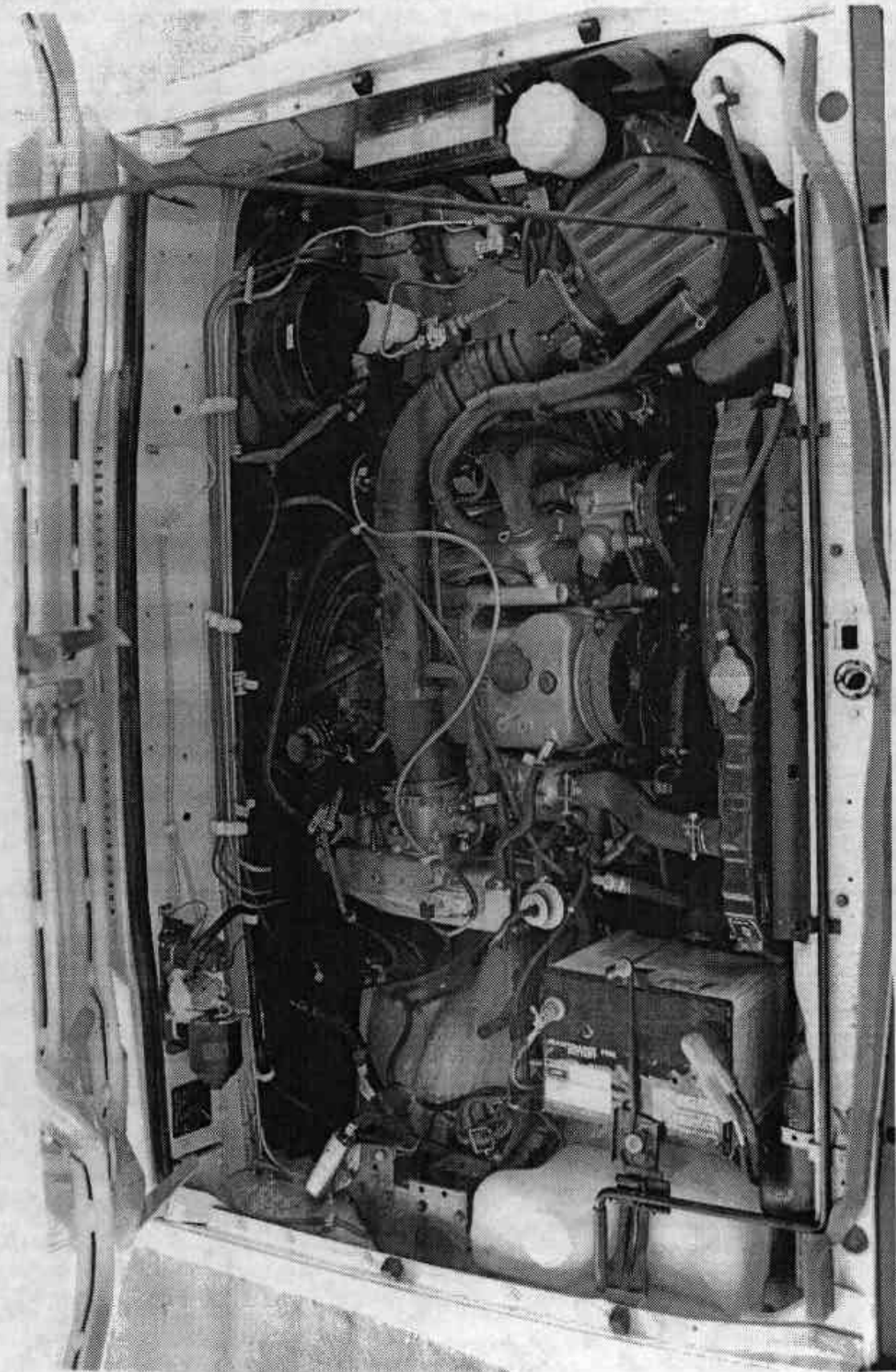


PRETEST WINDSHIELD VIEW

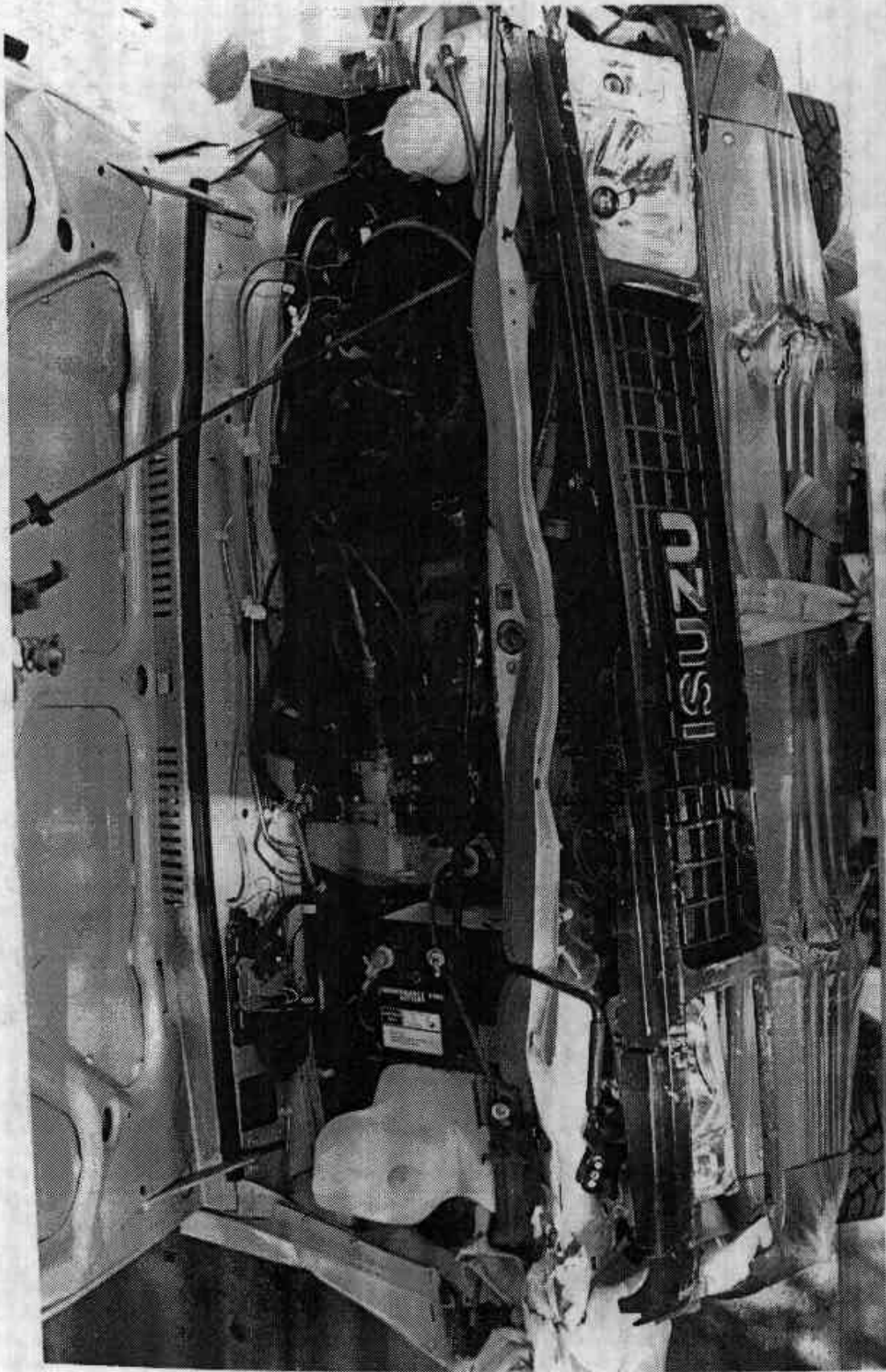
1989 Acura



POSTTEST WINDSHIELD VIEW



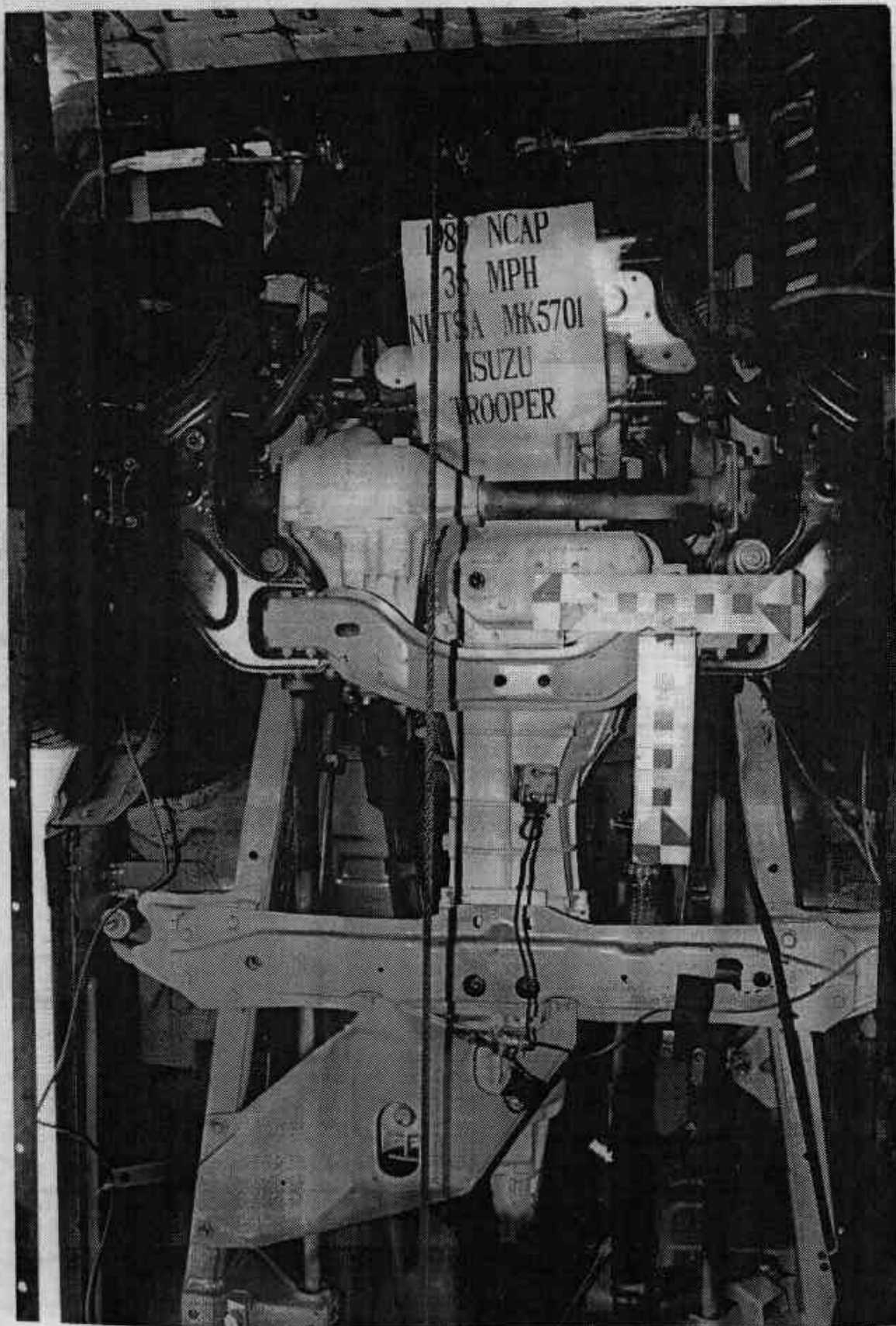
PRETEST ENGINE COMPARTMENT VIEW



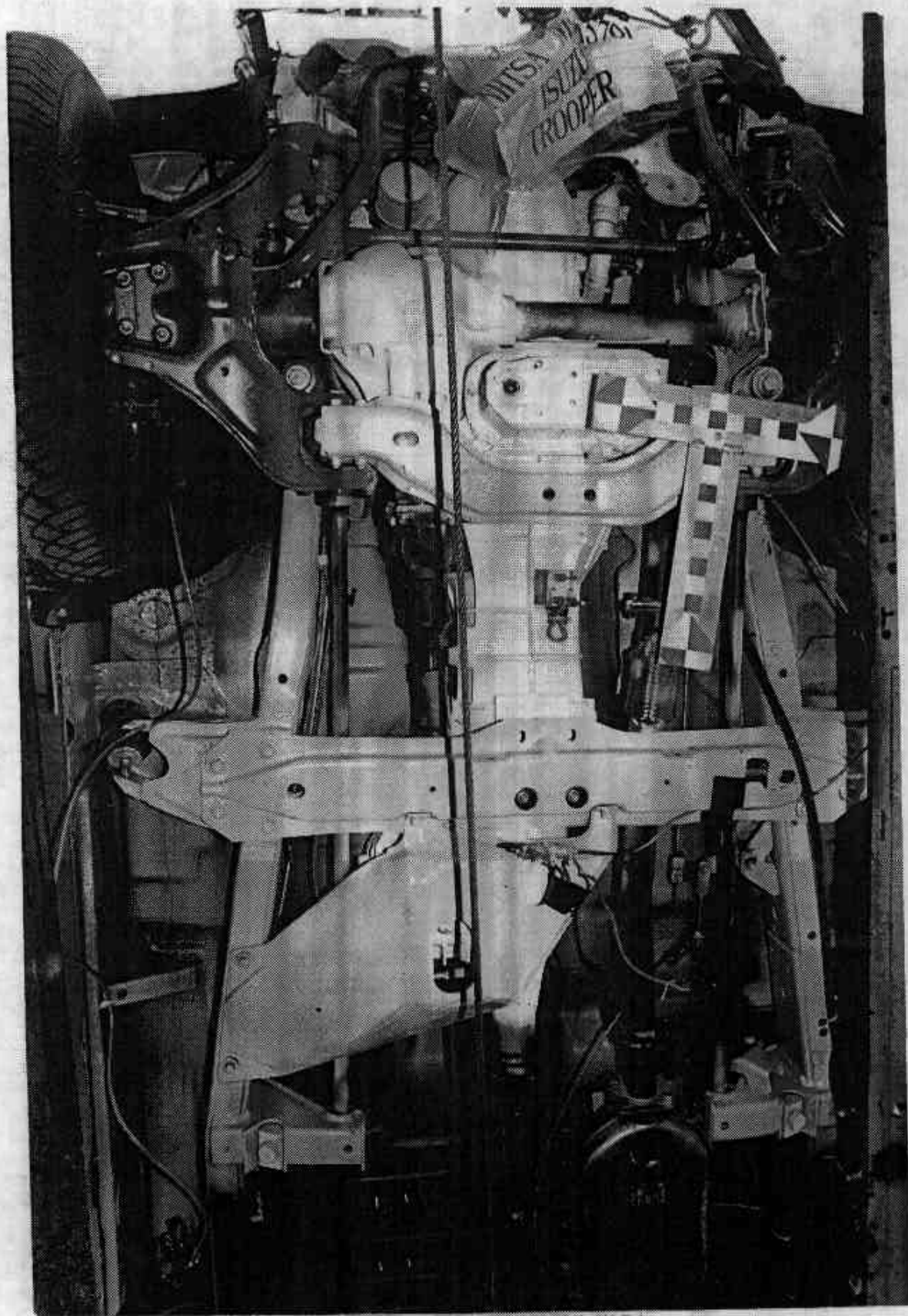
POSTTEST ENGINE COMPARTMENT VIEW

A-14

MSE-89-R8107-N011



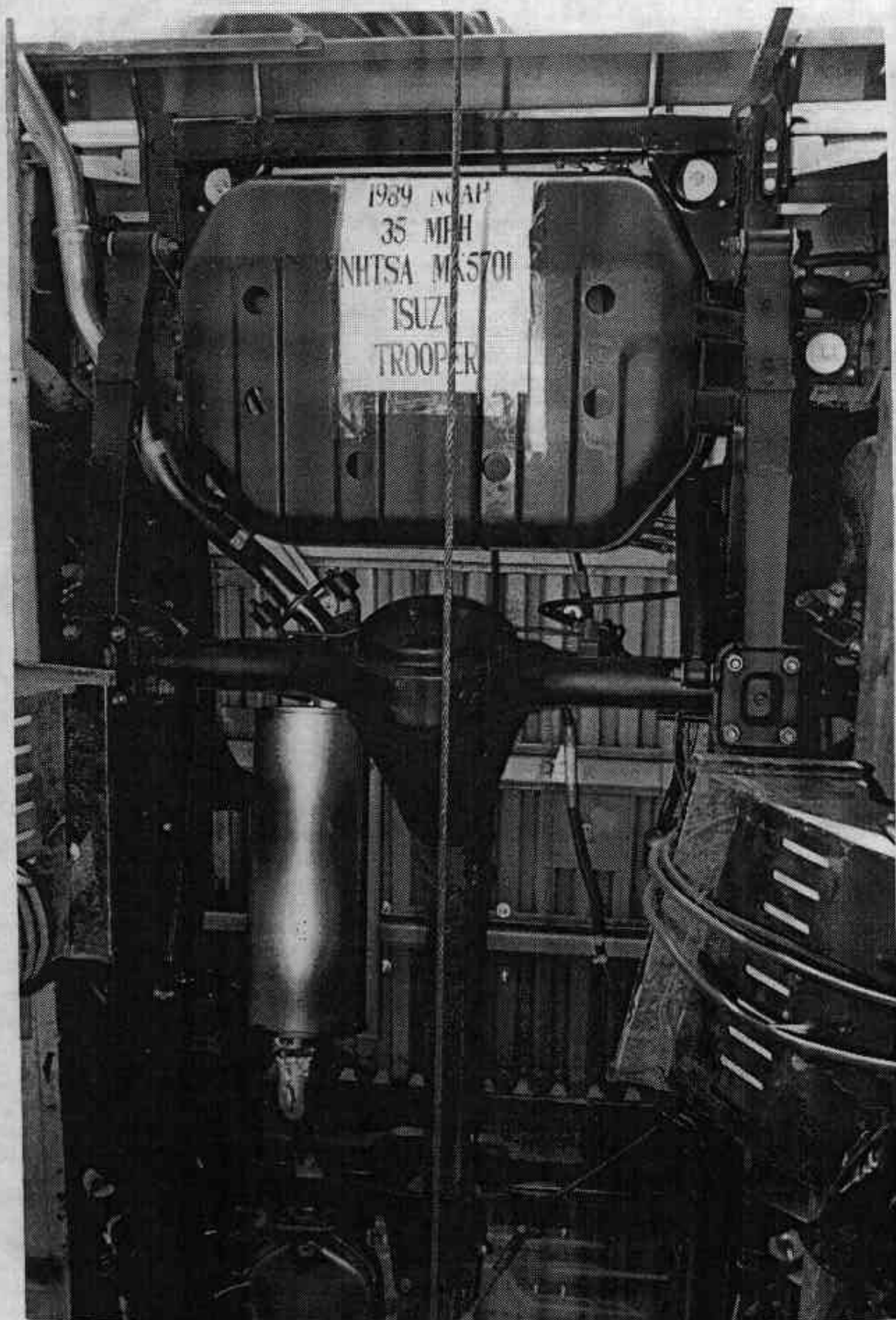
PRETEST FRONT UNDERBODY VIEW



POSTTEST FRONT UNDERBODY VIEW

A-16

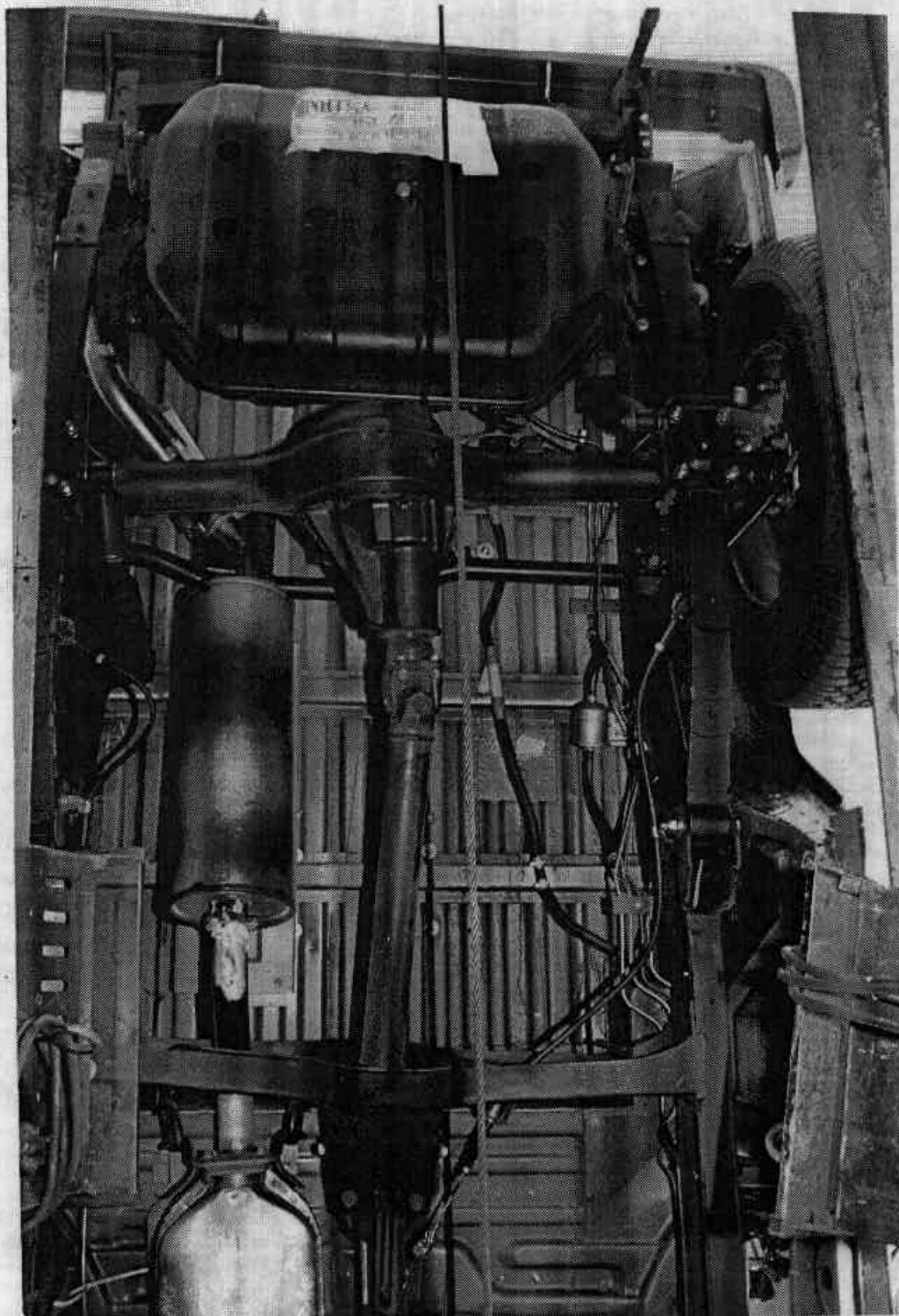
MSE-89-R8107-N011



PREYEST REAR UNDERBODY VIEW

A-17

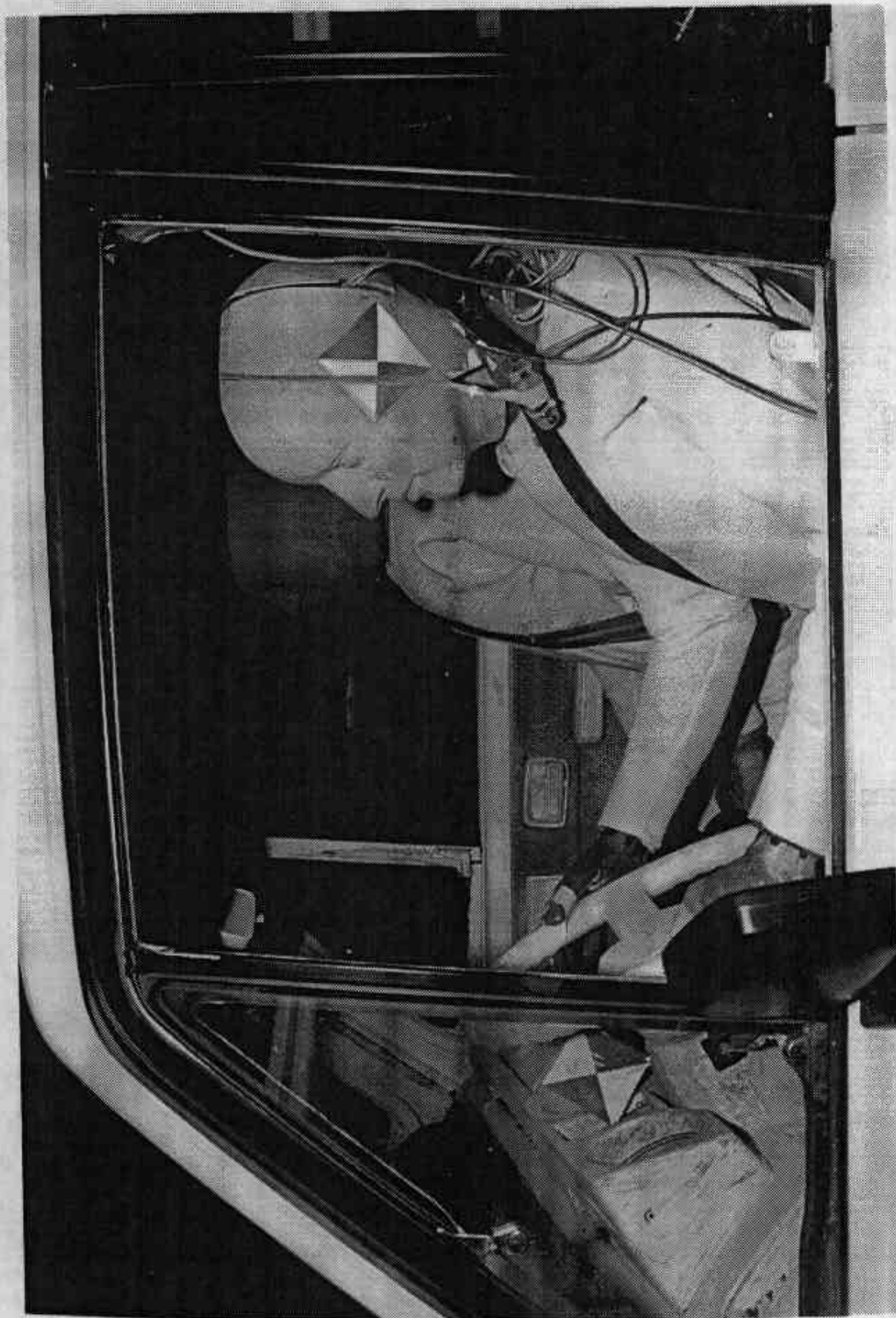
MSE-89-R8107-N011



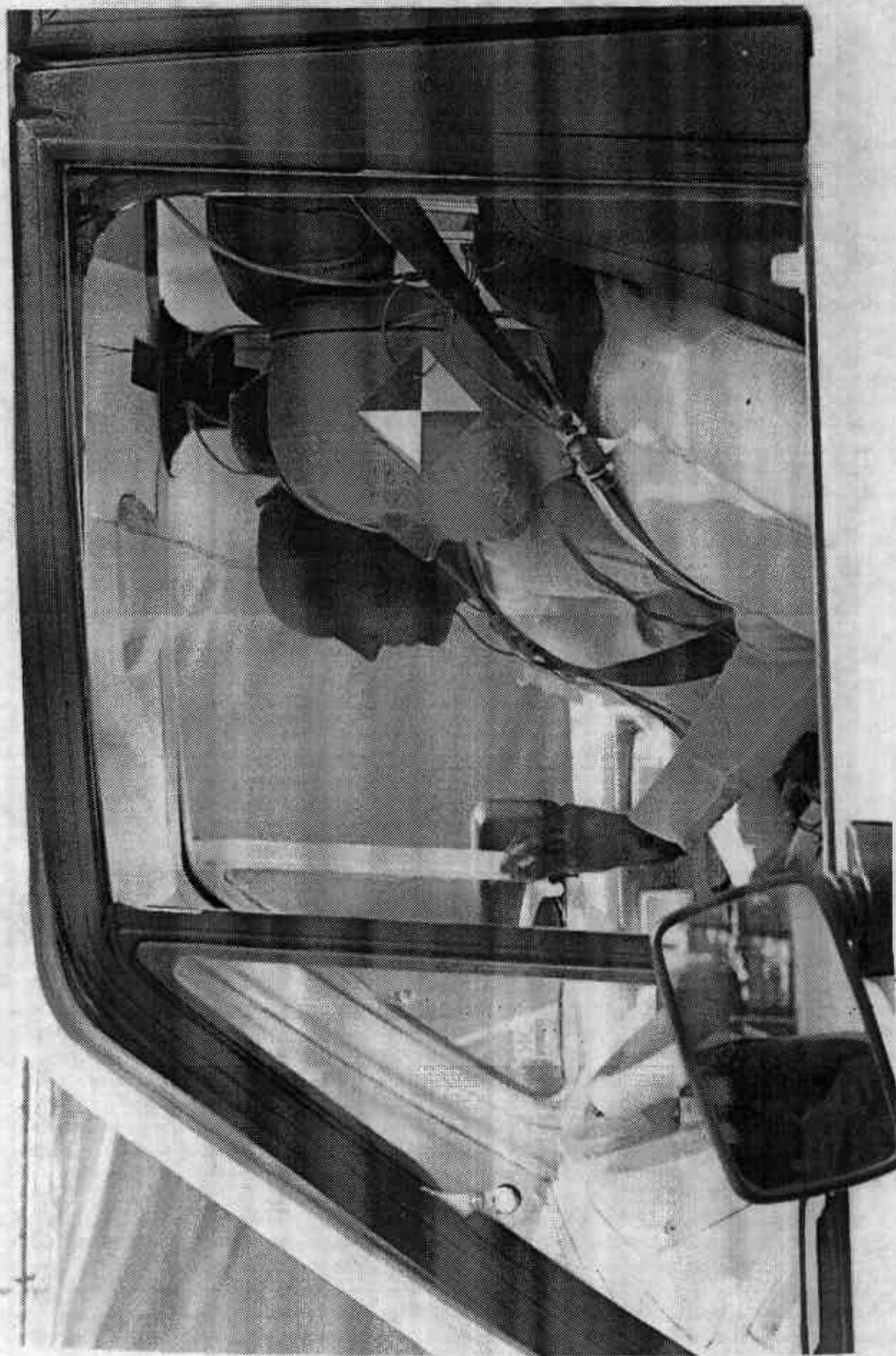
POSTTEST REAR UNDERBODY VIEW

A-18

MSE-89-R8107-NO11



PRETEST DRIVER DUMMY POSITION VIEW



POSTTEST DRIVER DUMMY POSITION VIEW

A-20

MSE-89-R8107-N011



PRETEST PASSENGER DUMMY POSITION VIEW



POSTTEST PASSENGER DUMMY POSITION VIEW

A-22

HSE-89-R8107-N011



PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)
A-23 NSE-89-R8107-N011



POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-24

MSE-89-R8107-N011



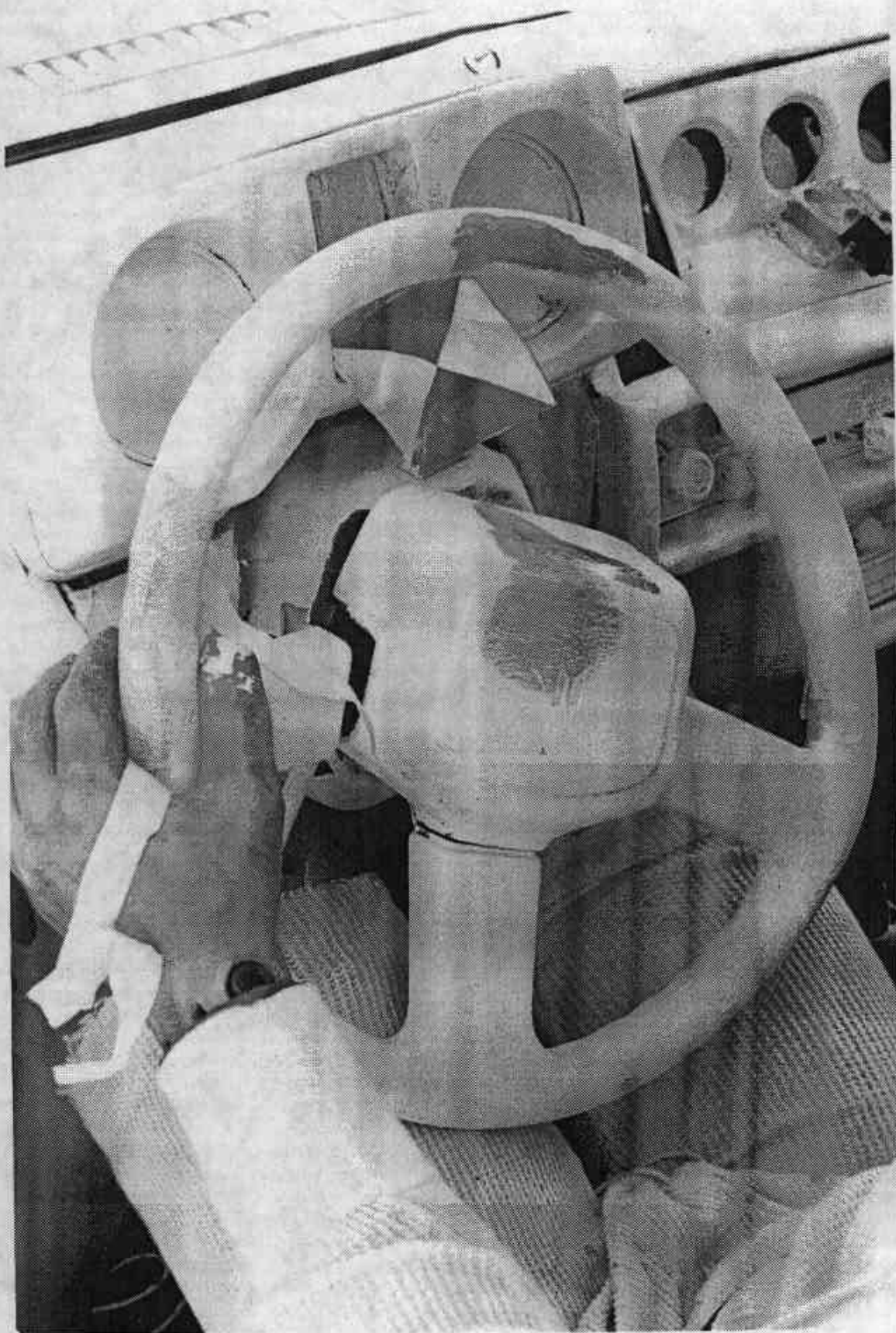
PRETEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-25

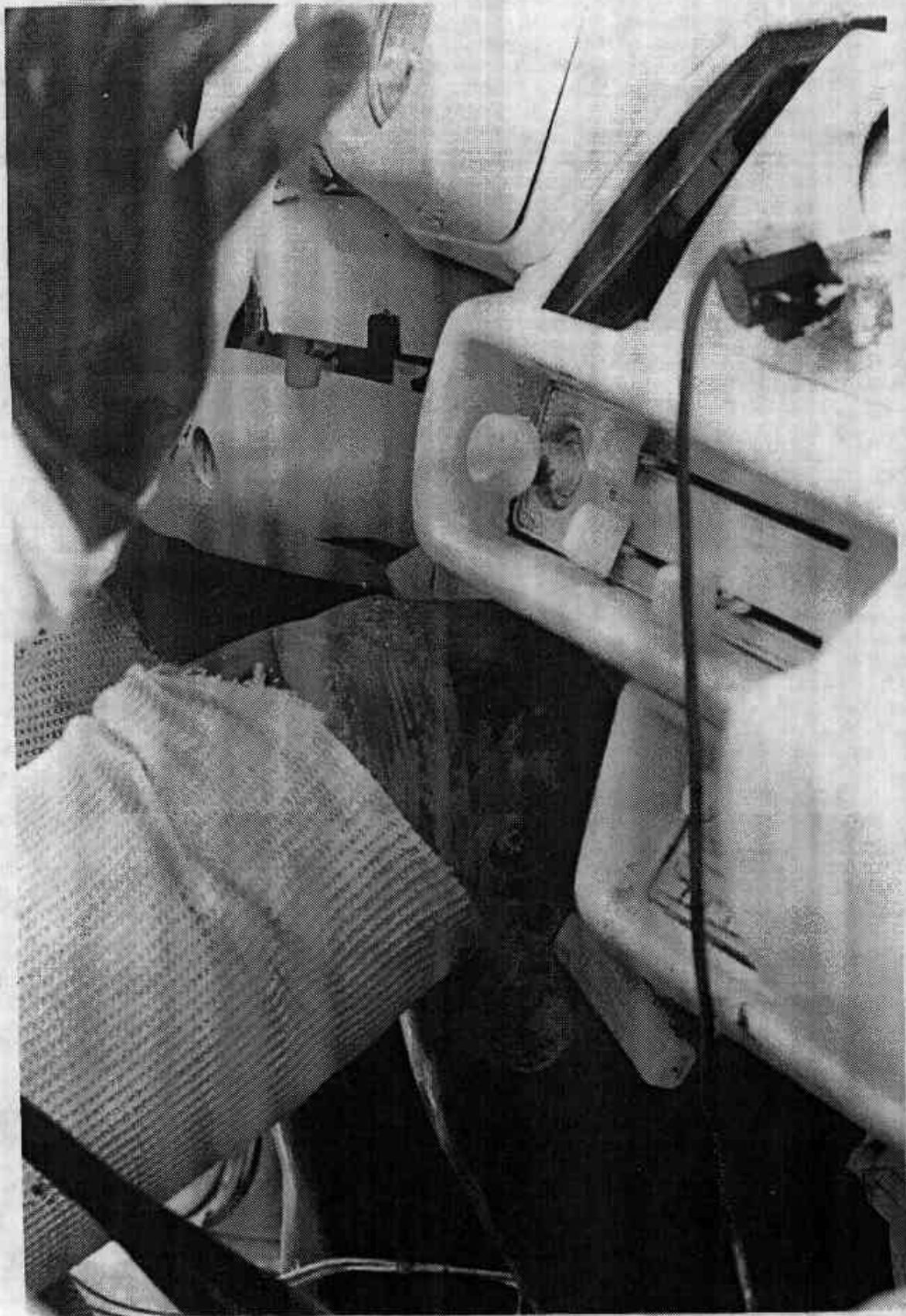
MSE-89-R8107-N011



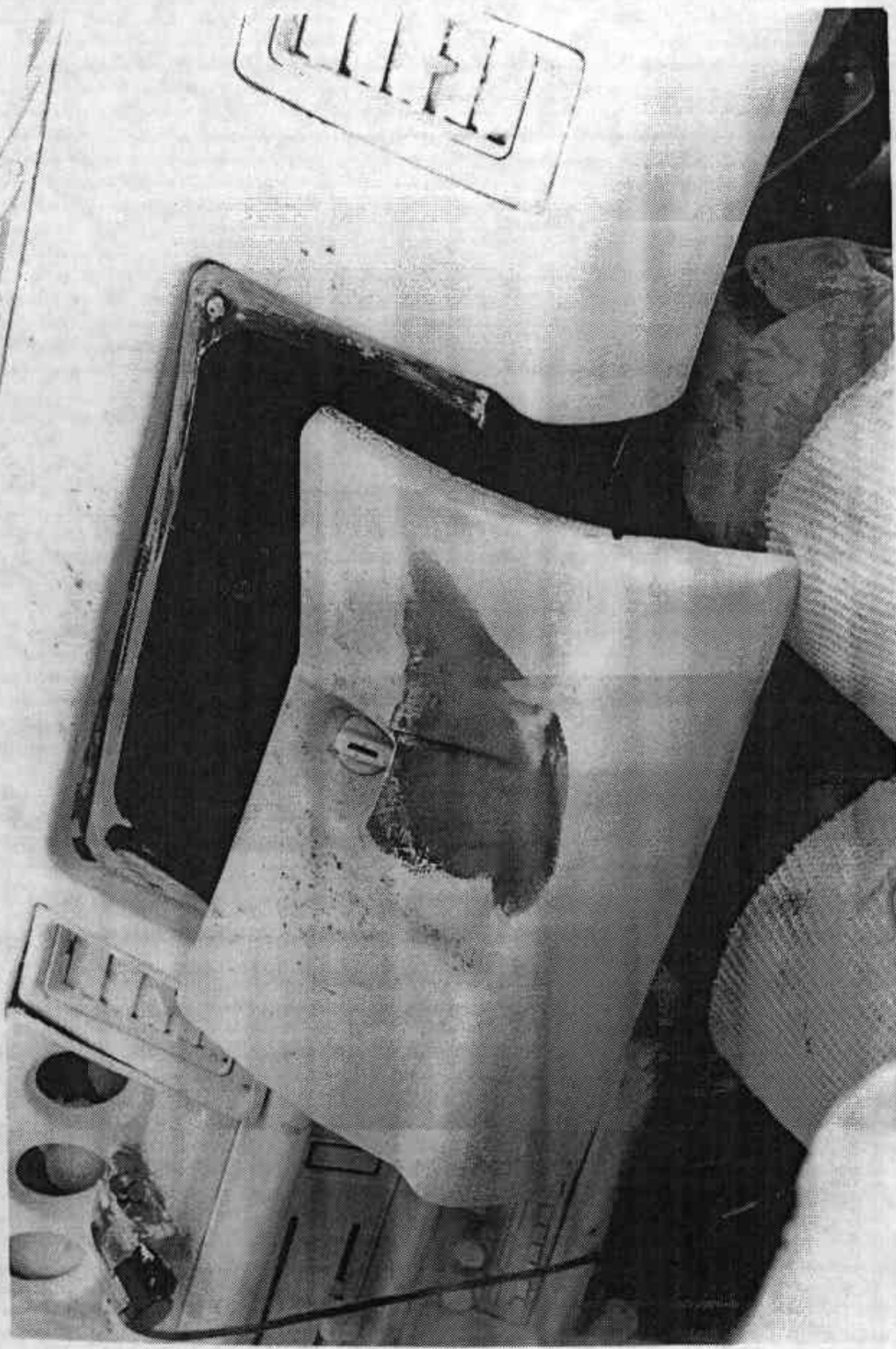
POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST DRIVER DUMMY (ATD) HEAD CONTACT AREA



POSTTEST DRIVER DUMMY (ATD) KNEE CONTACT AREA



POSTTEST PASSENGER (ATD) HEAD/KNEE CONTACT

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B-1

VEHICLE AND DUMMY (ATD) RESPONSE DATA

DATA FILTERING:

ATD Head Channels	- Class 1000
ATD Chest Channels	- Class 180
ATD Femur Channels	- Class 600
Vehicle Channels	- Class 60

THIS PAGE INTENTIONALLY LEFT BLANK

General Test Information

VERSNO: V2 TGID: 1
TITLE: 1989 35MPH NCAP FRONTAL BARRIER IMPACT
TSTOBJ: ACQUIRE NCAP DATA USING TWO INSTR. DUMMIES AND LOAD CELL BARRIER
TSTDAT: 23/MAY/89 TSTPRF: MSE CONNO: DTNH22-87-D-02009
TSTREF: NCA119 TSTTYP: NCA TSTCFN: VTB
TKSURF: ASH TKCOND: DRY TEMP: 90 RECTYP: FMT
LINK: UMB CLSSPD: 35.1 IMPANG: 0 OFFSET: 0.0
IMPNT: 9999.9 MEASUR: ENG TOTCRV: 67
TSTCOM: NO COMMENTS

Vehicle Information

VGID: 2 VEHNO: 1 MAKE: 42 MODEL: 04 YEAR: 89 BODY: TR
VIN: JACCH58E6K8907454 ENGINE: 4CIF ENGDSP: 159 CID TRANSM: M4
VEHTWT: 4310 WHLBAS: 104.5 VEHLN: 172.0 VEHWID: 64.3
VEHCG: 58.3 STRSEP: NA COLMEC: EXA MODIND: P
MODDSC: UNMODIFIED

BX

1: 172.0
2: 153.5
3: 130.6
4: 120.3
5: 120.3
6: 119.8
7: 119.8
8: 83.0
9: 83.0
10: 83.0
11: 83.0
12: 115.0
13: 115.0
14: 130.9
15: 130.5
16: 115.5
17: 15.0
18: 22.0
19: 170.8
20: 170.8
21: 18.0

VEHSPD: 35.1 CRBANG: 0 PDOF: 0 BMPENG: NA
SILENG: NA APLENG: NA

DPD

1:999.9
2:999.9
3:999.9
4:999.9
5:999.9
6:999.9

VD1: 12FCAW9 LENCNT: 62.0 DAMDST: 0.0 CRHDST: 15.0

AX

1: 157.0
2: 150.3
3: 128.3
4: 121.8
5: 123.5
6: 121.3
7: 123.0
8: 84.8
9: 86.5
10: 84.5
11: 86.3
12: 119.0
13: 119.0
14: 127.8
15: 128.5
16: 110.5
17: 14.0
18: 25.3
19: 157.8
20: 156.0
21: 18.0

CARANG: 999 VEHOR: 999
VEHCOM: NO COMMENTS

Barrier Information

Barrier ID: 3

BARRIG: R

BARSHP: LCB

BARANG: 0

BARDIA: 999.9

BARCOM: 36 50KLB LOAD CELLS ARRANGED IN A 9 WIDE BY 4 HIGH MATRIX.

Occupant Information

Occupant Group ID: 4 VEHNO: 1
OCCLOC: 01 OCCTYP: P5 OCCAGE: 99 OCCSEX: M OCCHT: 999 OCCWT: 999
MTRCAL: P5 DUMSIZ: 50
DUMMAN: MFG: HUMANOID SYSTEMS, S/N 465
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 18.3 HW: 22.3 HR: 11.8 HS: 9.6 CD: 21.1 CS: 14.1 AD: 3.7 HD: 8.5
KD: 3.9 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: 3PT RESTR2: SWN
REXTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: SR CNTRH2: SH CNTRC1: SW CNTRC2: NO CNTRL1: DP CNTRL2: NO
HIC: 1269. T1: 56.200 T2: 92.200
CLIP3M: 72.8 LFEM: 932. RFEM: 804. CSI: 891. LBELT: 2190. SBELT: 3271.
OCCCOM: NO COMMENTS

Occupant Information

Occupant Group ID: 4 VEHNO: 1
OCCLOC: 02 OCCTYP: P5 OCCAGE: 99 OCCSEX: M OCCHT: 999 OCCWT: 999
MTHCAL: P5 DUMSIZ: 50
DUMMAN: MFG: HUMANOID SYSTEMS, S/N 466
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 15.6 HW: 19.2 HR: 9.2 HS: 10.0 CD: 19.2 CS:999.9 AD: 3.8 HD: 7.4
KD: 4.9 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: 3PT RESTR2: DPL
REXTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: OT CNTRH2: NO CNTRC1: NO CNTRC2: NO CNTRL1: DP CNTRL2: NO
HIC: 1520. T1: 67.300 T2: 103.300
CLIP3M: 59.2 LFEM: 322. RFEM: 262. CSI: 602. LBELT: 2234. SBELT: 1618.
OCCCOM: CNTRH1 IS GLOVE BOX

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 001
SENTYP: AC SENLOC: 01 SENATT: HDCG
AXIS: XL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BF83H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 57 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 002
SENTYP: AC SENLOC: 01 SENATT: HDCG
AXIS: YL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BJ15H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 9 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 003
SENTYP: AC SENLOC: 01 SENATT: HDCG
AXIS: ZL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: BG29H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 38 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 004
SENTYP: AC SENLOC: 01 SENATT: CHST
AXIS: XL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD76
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 43 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 005
SENTYP: AC SENLOC: 01 SENATT: CHST
AXIS: YL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD99
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 24 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 006
SENTYP: AC SENLOC: 01 SENATT: CHST
AXIS: ZL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: B160H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 16 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 007
SENTYP: LC SENLOC: 01 SENATT: FMRL
AXIS: XL UNITS: LBS PREFIL: 1650
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 701
CALDAT: 10/FEB/89 INSRAT: 3000 CHLMAX: 43 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 008
SENTYP: LC SENLOC: 01 SENATT: FMRR
AXIS: XL UNITS: LBS PREFIL: 1650
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 707
CALDAT: 10/FEB/89 INSRAT: 3000 CHLMAX: 27 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 009
SENTYP: AC SENLOC: 02 SENATT: HDCG
AXIS: XL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD61
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 47 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 010
SENTYP: AC SENLOC: 02 SENATT: HDCG
AXIS: YL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AE09
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 13 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 011
SENTYP: AC SENLOC: 02 SENATT: HDCG
AXIS: ZL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: AD98
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 38 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 012
SENTYP: AC SENLOC: 02 SENATT: CHST
AXIS: XL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: B119H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 39 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 013
SENTYP: AC SENLOC: 02 SENATT: CHST
AXIS: YL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: B114H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 45 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 014
SENTYP: AC SENLOC: 02 SENATT: CHST
AXIS: ZL UNITS: G'S PREFIL: 1650
INSMAN: MFG: ENDEVCO, MODEL: 7264-200, S/N: B192H
CALDAT: 17/APR/89 INSRAT: 200 CHLMAX: 28 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 015
SENTYP: LC SENLOC: 02 SENATT: FMRL
AXIS: XL UNITS: LBS PREFIL: 1650
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 709
CALDAT: 10/FEB/89 INSRAT: 3000 CHLMAX: 13 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 016
SENTYP: LC SENLOC: 02 SENATT: FMRR
AXIS: XL UNITS: LBS PREFIL: 1650
INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 710
CALDAT: 10/FEB/89 INSRAT: 3000 CHLMAX: 12 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 017
SENTYP: LC SENLOC: 01 SENATT: LPBO
AXIS: OT UNITS: LBS PREFIL: 1650
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 333
CALDAT: 30/AUG/88 INSRAT: 3500 CHLMAX: 63 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 018
SENTYP: LC SENLOC: 01 SENATT: SHBT
AXIS: OT UNITS: LBS PREFIL: 1650
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 327
CALDAT: 30/AUG/88 INSRAT: 3500 CHLMAX: 97 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 019
SENTYP: LC SENLOC: 02 SENATT: LPBO
AXIS: OT UNITS: LBS PREFIL: 1650
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 330
CALDAT: 30/AUG/88 INSRAT: 3500 CHLMAX: 64 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 020
SENTYP: LC SENLOC: 02 SENATT: SHBT
AXIS: OT UNITS: LBS PREFIL: 1650
INSMAN: MFG: LEBOW, MODEL: 3371, S/N: 308
CALDAT: 30/AUG/88 INSRAT: 3500 CHLMAX: 54 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 021
SENTYP: DS SENLOC: 01 SENATT: SHBE
AXIS: OT UNITS: INS PREFIL: 1650
INSMAN: MFG: MSE, MODEL: 24 IN. LIN, S/N: 112
CALDAT: 30/AUG/88 INSRAT: 24 CHLMAX: 37 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 022
SENTYP: DS SENLOC: 01 SENATT: SHBT
AXIS: OT UNITS: INS PREFIL: 1650
INSMAN: MFG: BOURNS, MODEL: 2051414101/0.5 IN LIN, S/N: NAV
CALDAT: 30/AUG/88 INSRAT: 30 CHLMAX: 37 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM: SEAT BELT ELONGATION, UNITS ARE INCHES/IN. (PERCENTAGE BELT STRETCH)

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 023
SENTYP: DS SENLOC: 02 SENATT: SHBE
AXIS: OT UNITS: INS PREFIL: 1650
INSMAN: MFG: MSE, MODEL: 24 IN. LIN, S/N: 113
CALDAT: 30/AUG/88 INSRAT: 24 CHLMAX: 32 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 024
SENTYP: DS SENLOC: 02 SENATT: SHBT
AXIS: OT UNITS: OTH PREFIL: 1650
INSMAN: MFG: BOURNS, MODEL: 2051414101/0.5 IN LIN, S/N: NAV
CALDAT: 30/AUG/88 INSRAT: 30 CHLMAX: 41 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM: SEAT BELT ELONGATION, UNITS ARE INCHES/IN. (PERCENTAGE BELT STRETCH)

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 025
SENTYP: AC SENLOC: NA SENATT: SULF
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 111, S/N: 1108
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 87 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 026
SENTYP: AC SENLOC: NA SENATT: SURF
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 111, S/N: 1109
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 121 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 027
SENTYP: AC SENLOC: NA SENATT: ENGN
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 111, S/N: 1123
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 10 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: CF
INSCOM: ACCEL. WIRE SEVERED AT DISCONNECT (BEFORE T=0)

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 028
SENTYP: AC SENLOC: NA SENATT: ENGN
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 113B, S/N: 1875
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 98 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 029
SENTYP: AC SENLOC: NA SENATT: DPLC
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 111, S/N: 1102
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 70 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 030
SENTYP: AC SENLOC: NA SENATT: FLLR
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 113B, S/N: 1876
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 32 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 031
SENTYP: AC SENLOC: NA SENATT: FLRR
AXIS: XG UNITS: G'S PREFIL: 1650
INSMAN: MFG: SETRA, MODEL: 113B, S/N: 1878
CALDAT: 20/DEC/88 INSRAT: 250 CHLMAX: 42 INIVEL: 35.1
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 032
SENTYP: LC SENLOC: NA SENATT: LCA1
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19349
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 6 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 033
SENTYP: LC SENLOC: NA SENATT: LCA2
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19324
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 5 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 034
SENTYP: LC SENLOC: NA SENATT: LCA3
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19283
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 16 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 035
SENTYP: LC SENLOC: NA SENATT: LCA4
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19263
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 6 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 036
SENTYP: LC SENLOC: NA SENATT: LCA5
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19265
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 11 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 037
SENTYP: LC SENLOC: NA SENATT: LCA6
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19266
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 29 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 038
SENTYP: LC SENLOC: NA SENATT: LCA7
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19317
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 3 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 039
SENTYP: LC SENLOC: NA SENATT: LCA8
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19270
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 4 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 040
SENTYP: LC SENLOC: NA SENATT: LCA9
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19428
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 3 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 041
SENTYP: LC SENLOC: NA SENATT: LCB1
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19273
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 7 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 042
SENTYP: LC SENLOC: NA SENATT: LCB2
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19276
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 9 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 043
SENTYP: LC SENLOC: NA SENATT: LCB3
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19258
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 102 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 044
SENTYP: LC SENLOC: NA SENATT: LCB4
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19278
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 23 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 045
SENTYP: LC SENLOC: NA SENATT: LCB5
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19279
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 44 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 046
SENTYP: LC SENLOC: NA SENATT: LCB6
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19282
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 99 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 047
SENTYP: LC SENLOC: NA SENATT: LCB7
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19262
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 6 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 048
SENTYP: LC SENLOC: NA SENATT: LCB8
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19285
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 6 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 049
SENTYP: LC SENLOC: NA SENATT: LCB9
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19286
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 3 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 050
SENTYP: LC SENLOC: NA SENATT: LCC1
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19287
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 8 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 051
SENTYP: LC SENLOC: NA SENATT: LCC2
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19288
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 16 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 052
SENTYP: LC SENLOC: NA SENATT: LCC3
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19289
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 68 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 053
SENTYP: LC SENLOC: NA SENATT: LCC4
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19291
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 69 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 054
SENTYP: LC SENLOC: NA SENATT: LCC5
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19324
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 59 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 055
SENTYP: LC SENLOC: NA SENATT: LCC6
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19313
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 42 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 056
 SENTYP: LC SENLOC: NA SENATT: LCC7
 AXIS: XG UNITS: LBS PREFIL: 1650
 INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19314
 CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 21 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 057
 SENTYP: LC SENLOC: NA SENATT: LCC8
 AXIS: XG UNITS: LBS PREFIL: 1650
 INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19315
 CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 5 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 058
 SENTYP: LC SENLOC: NA SENATT: LCC9
 AXIS: XG UNITS: LBS PREFIL: 1650
 INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19316
 CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 3 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 059
 SENTYP: LC SENLOC: NA SENATT: LCD1
 AXIS: XG UNITS: LBS PREFIL: 1650
 INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19460
 CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 5 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 060
 SENTYP: LC SENLOC: NA SENATT: LCD2
 AXIS: XG UNITS: LBS PREFIL: 1650
 INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19318
 CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 24 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 061
SENTYP: LC SENLOC: NA SENATT: LCD3
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19322
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 16 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 062
SENTYP: LC SENLOC: NA SENATT: LCD4
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19323
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 13 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 063
SENTYP: LC SENLOC: NA SENATT: LCD5
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19260
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 11 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 064
SENTYP: LC SENLOC: NA SENATT: LCD6
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19325
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 12 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

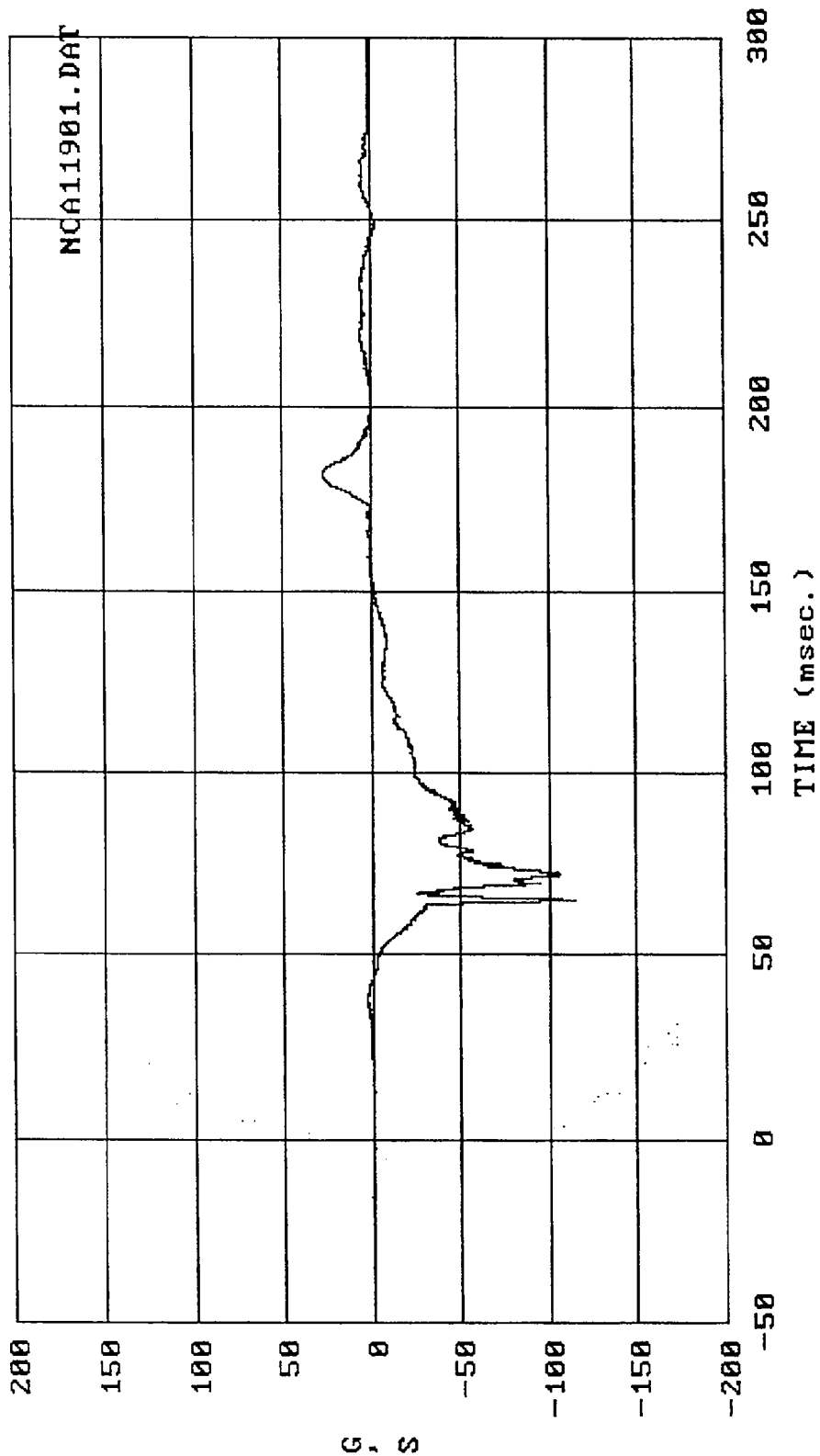
Inst. Group ID: 5 VEHNO: 0 CURNO: 065
SENTYP: LC SENLOC: NA SENATT: LCD7
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19332
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 21 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

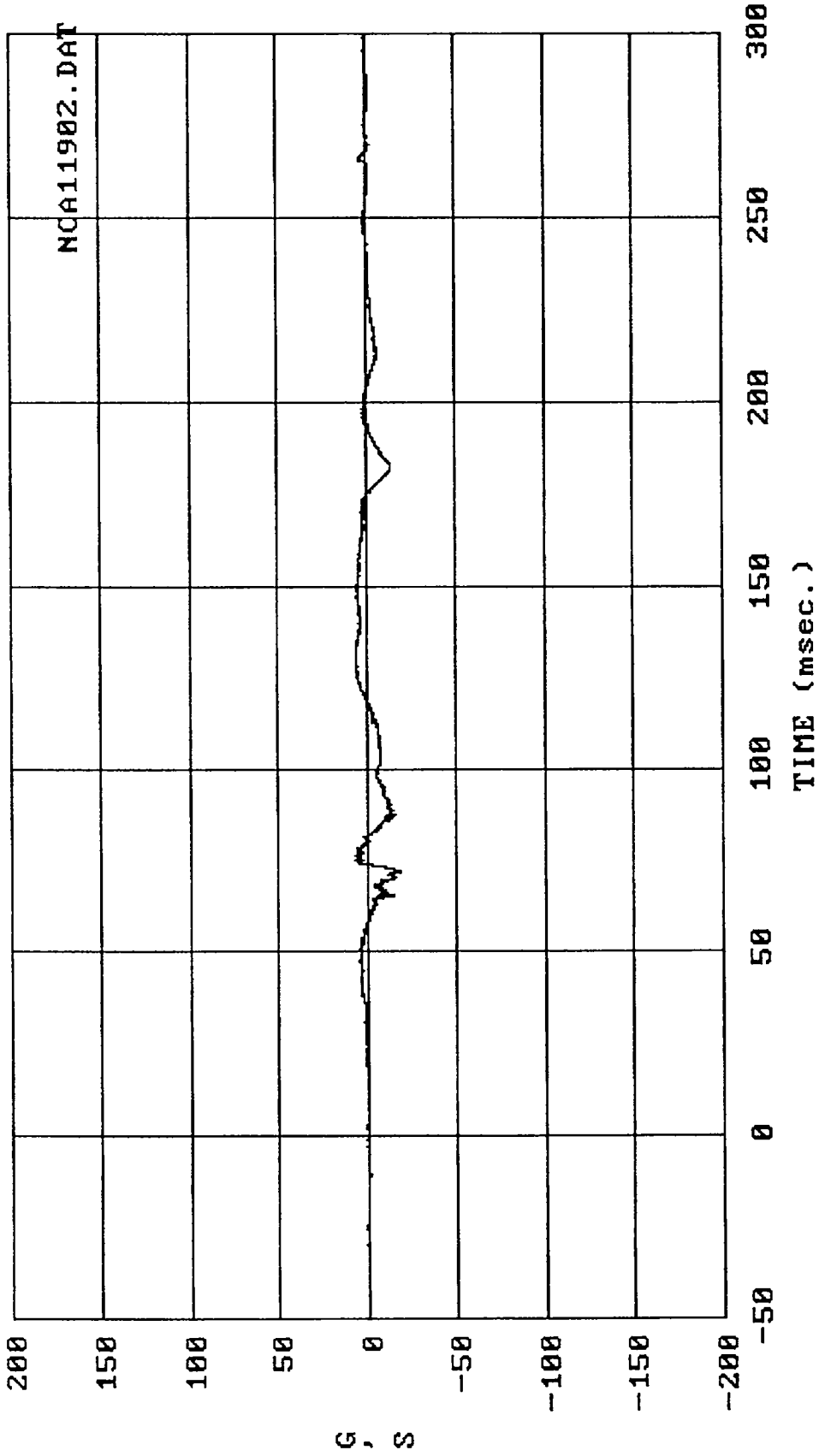
Inst. Group ID: 5 VEHNO: 0 CURNO: 066
SENTYP: LC SENLOC: NA SENATT: LCD8
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19333
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 18 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

Instrumentation Information

Inst. Group ID: 5 VEHNO: 0 CURNO: 067
SENTYP: LC SENLOC: NA SENATT: LCD9
AXIS: XG UNITS: LBS PREFIL: 1650
INSMAN: MFG: INTERFACE, MODEL: 1220-FS, S/N: 19466
CALDAT: 14/MAY/85 INSRAT: 50000 CHLMAX: 7 INIVEL: 0.0
NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
INSCOM:

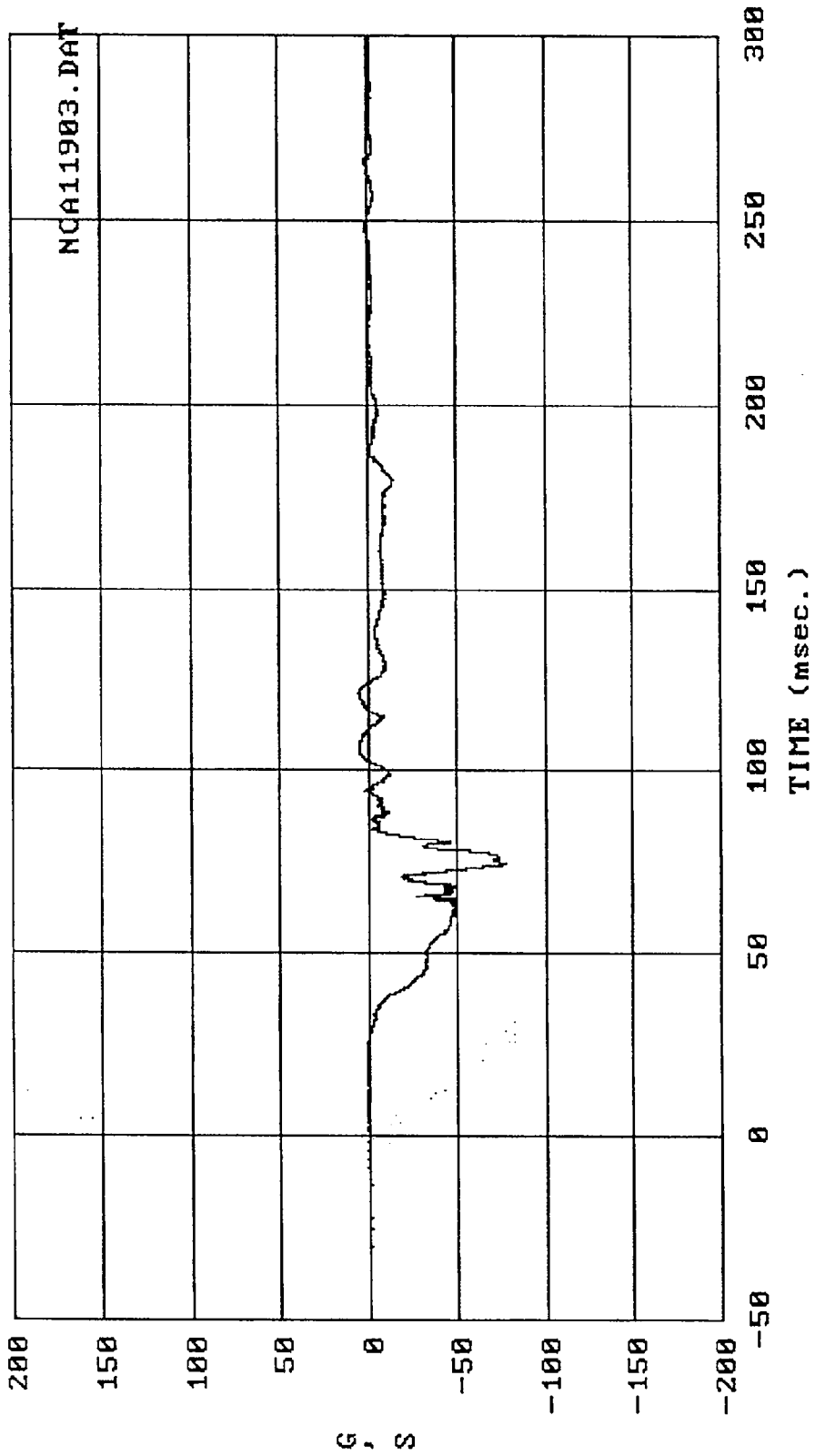


Filter: SAE CLASS 1000 Max = 28.224 Min = -114.36
 MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Head accel., X-axis

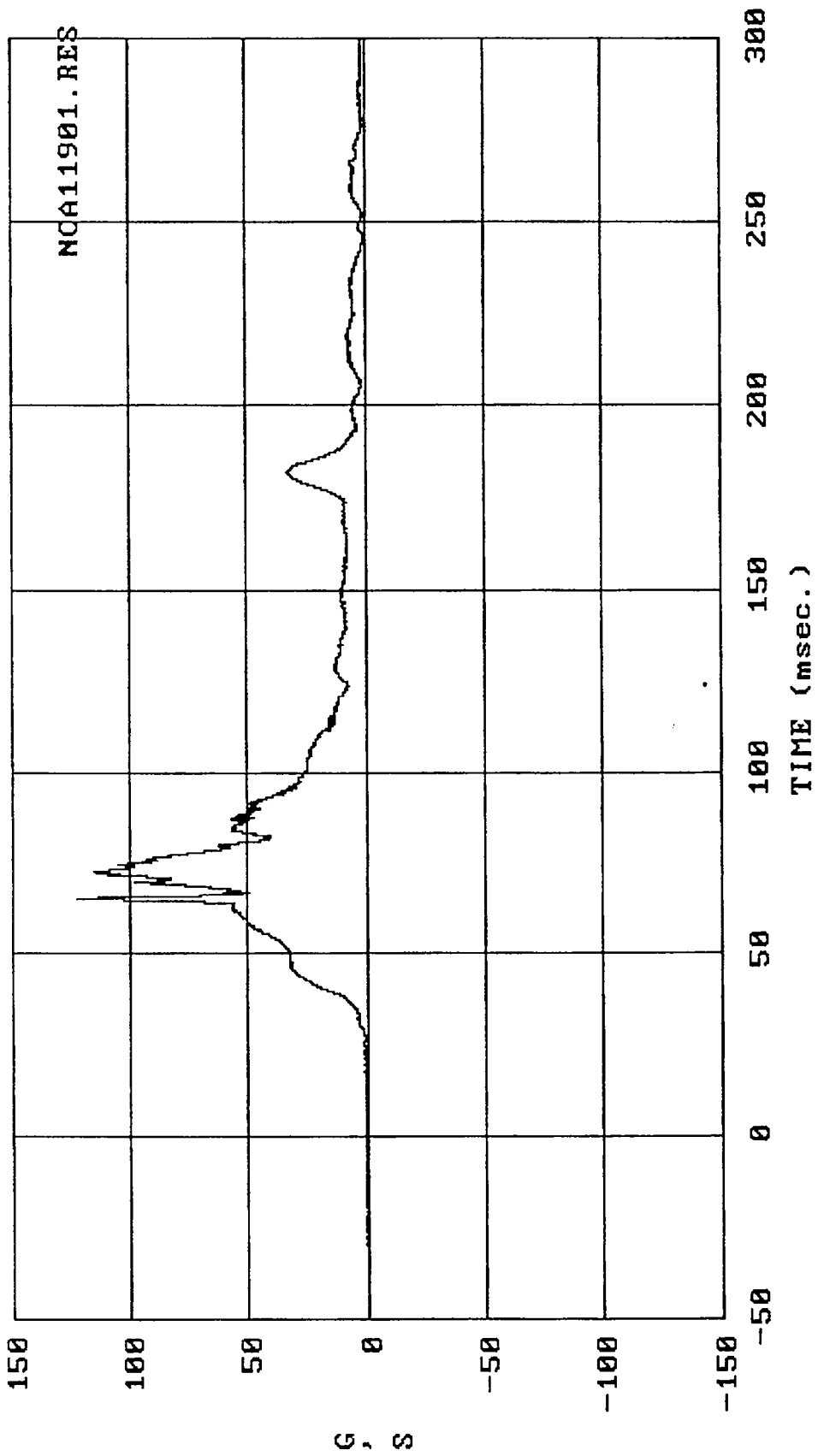


Filter: SAE CLASS 1000 Max = 7.5569 Min = -18.416

MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Head accel., Y-axis

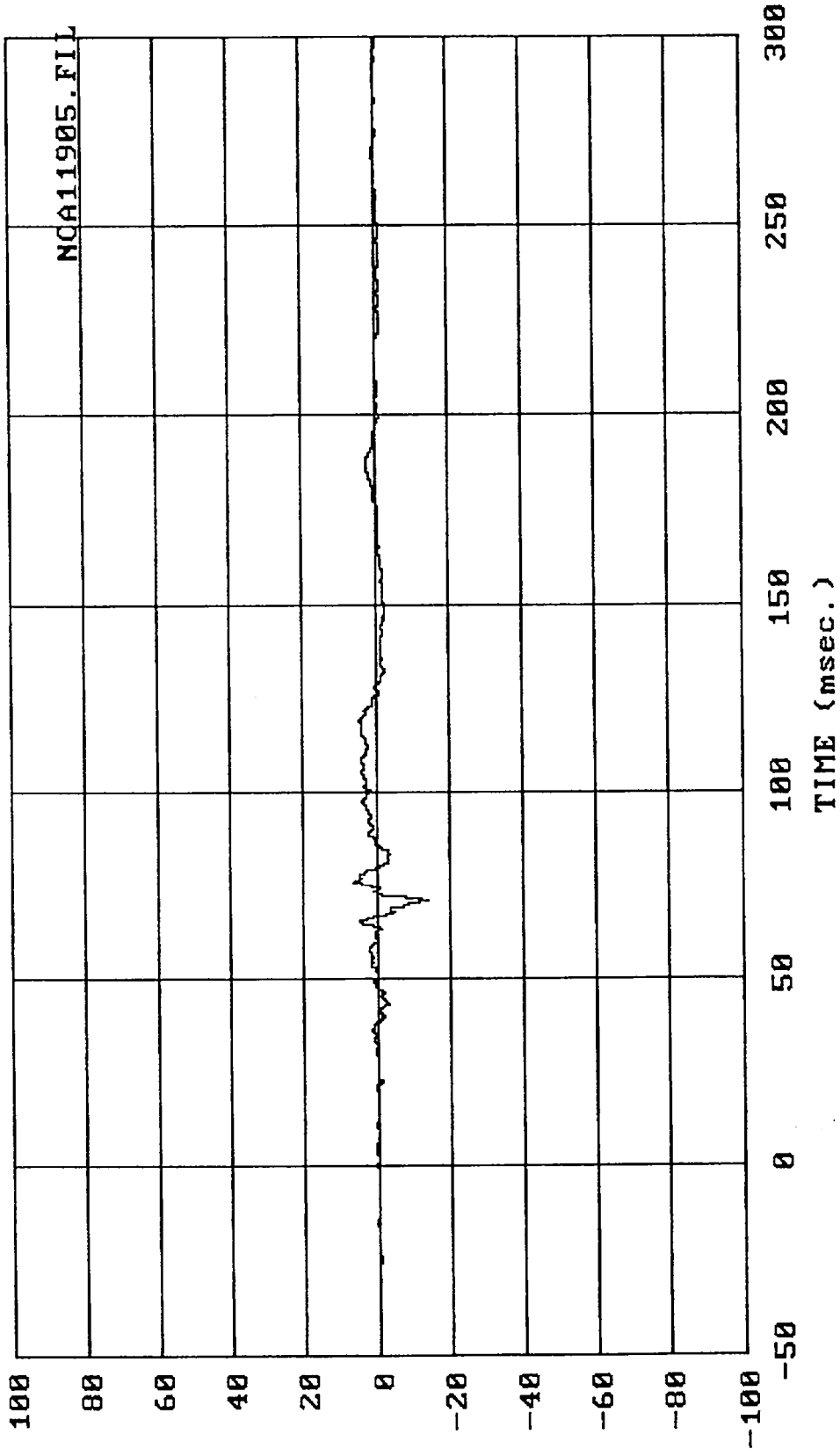


Filter: SAE CLASS 1000 Max = 5.4566 Min = -76.728
 MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Head accel., Z-axis



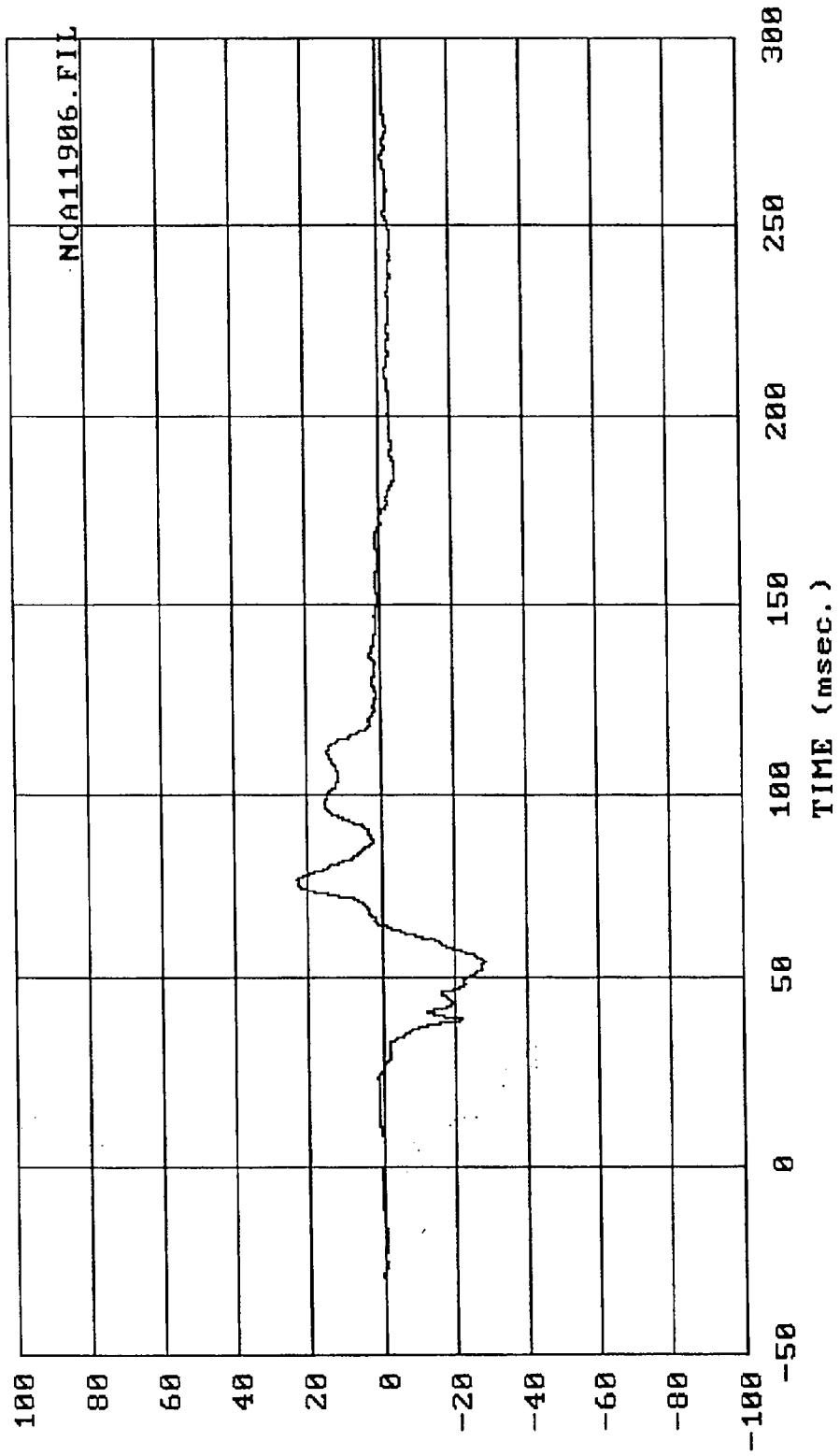
Filter: SAE CLASS 1000 Max = 122.73 Min = .29456

MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Head resultant accel.

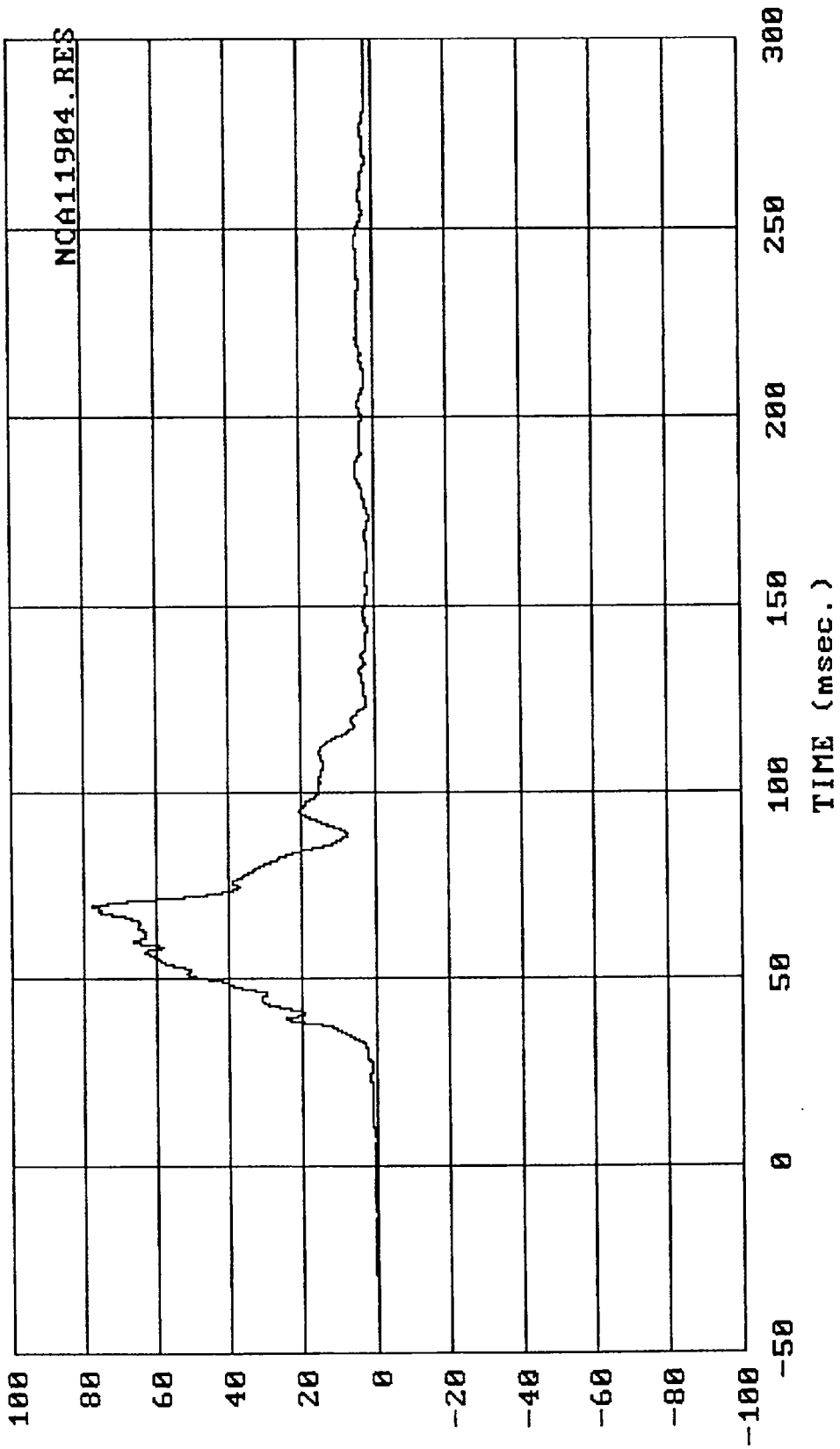


Filter: SAE CLASS 180 Max = 6.5028 Min = -14.582

MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Chst accel., Y-axis

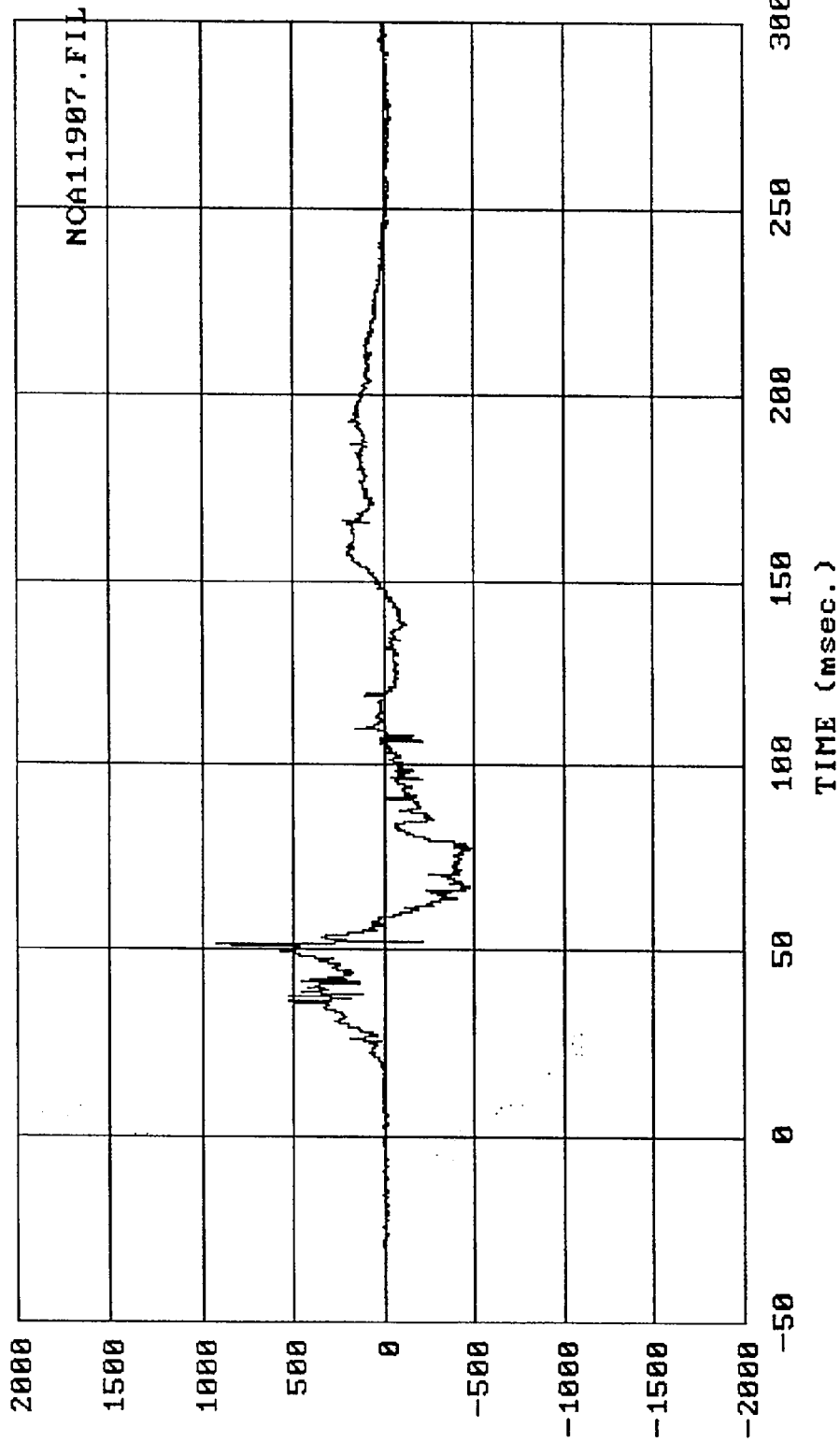


Filter: SAE CLASS 180 Max = 23.227 Min = -28.181
 MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Chst accel., Z-axis



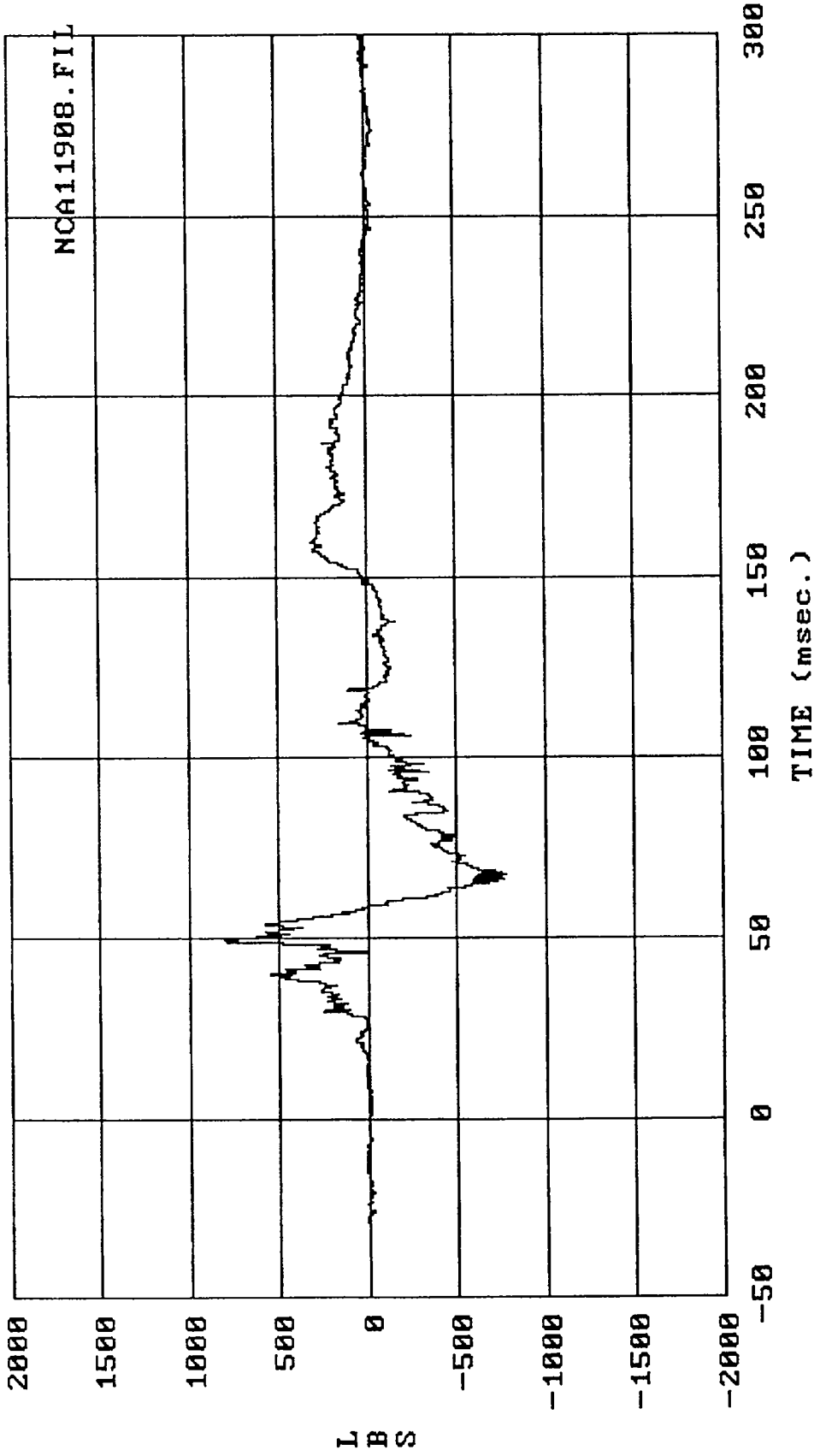
Filter: SAE CLASS 180 Max = 77.928 Min = .23284

MSE 05/23/89 --- 1989 Isuzu Trooper : Driver Chst resultant accel.

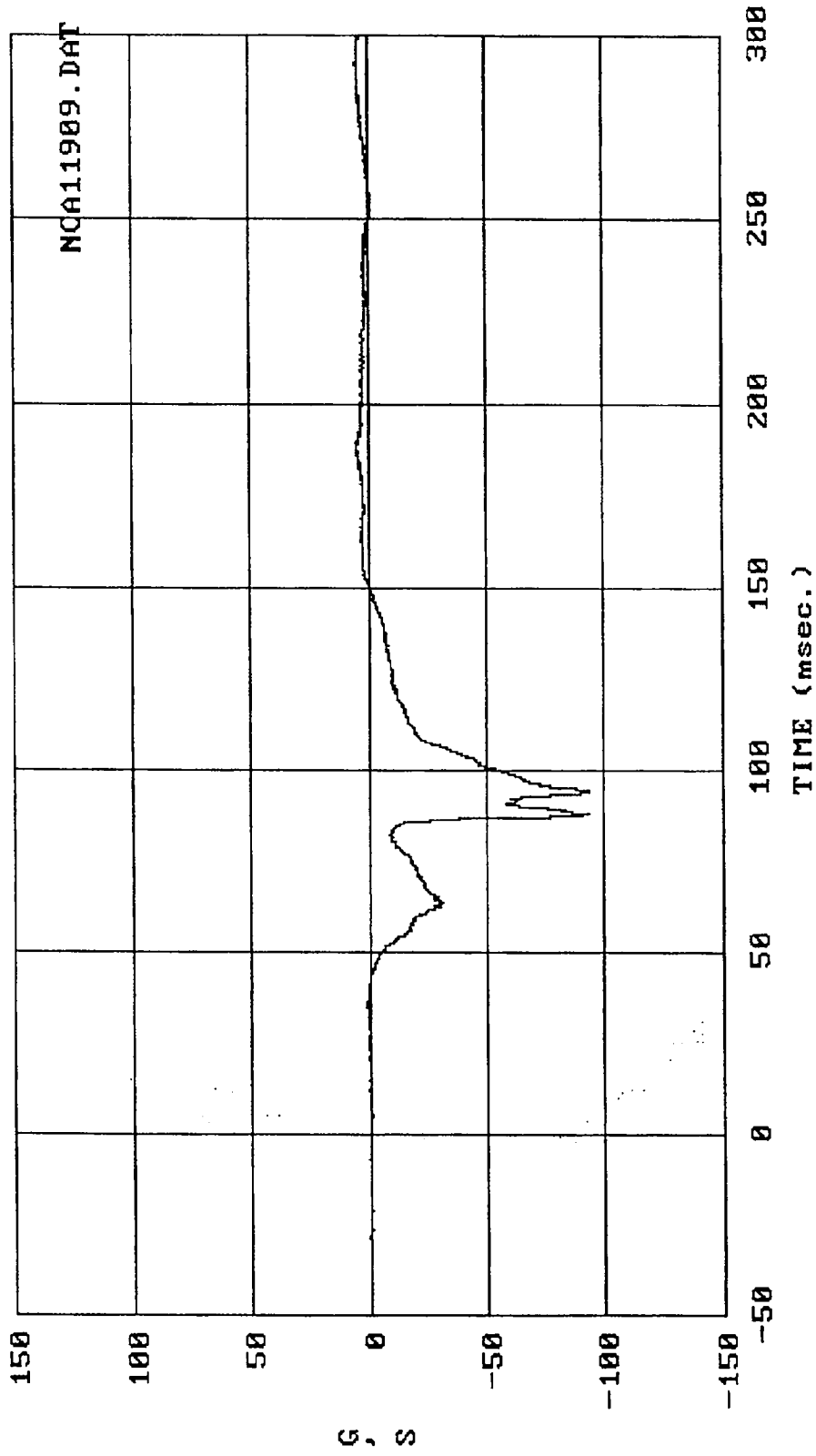


Filter: SAE CLASS 600 Max = 932.34 Min = -485.30
 MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Left Femur force

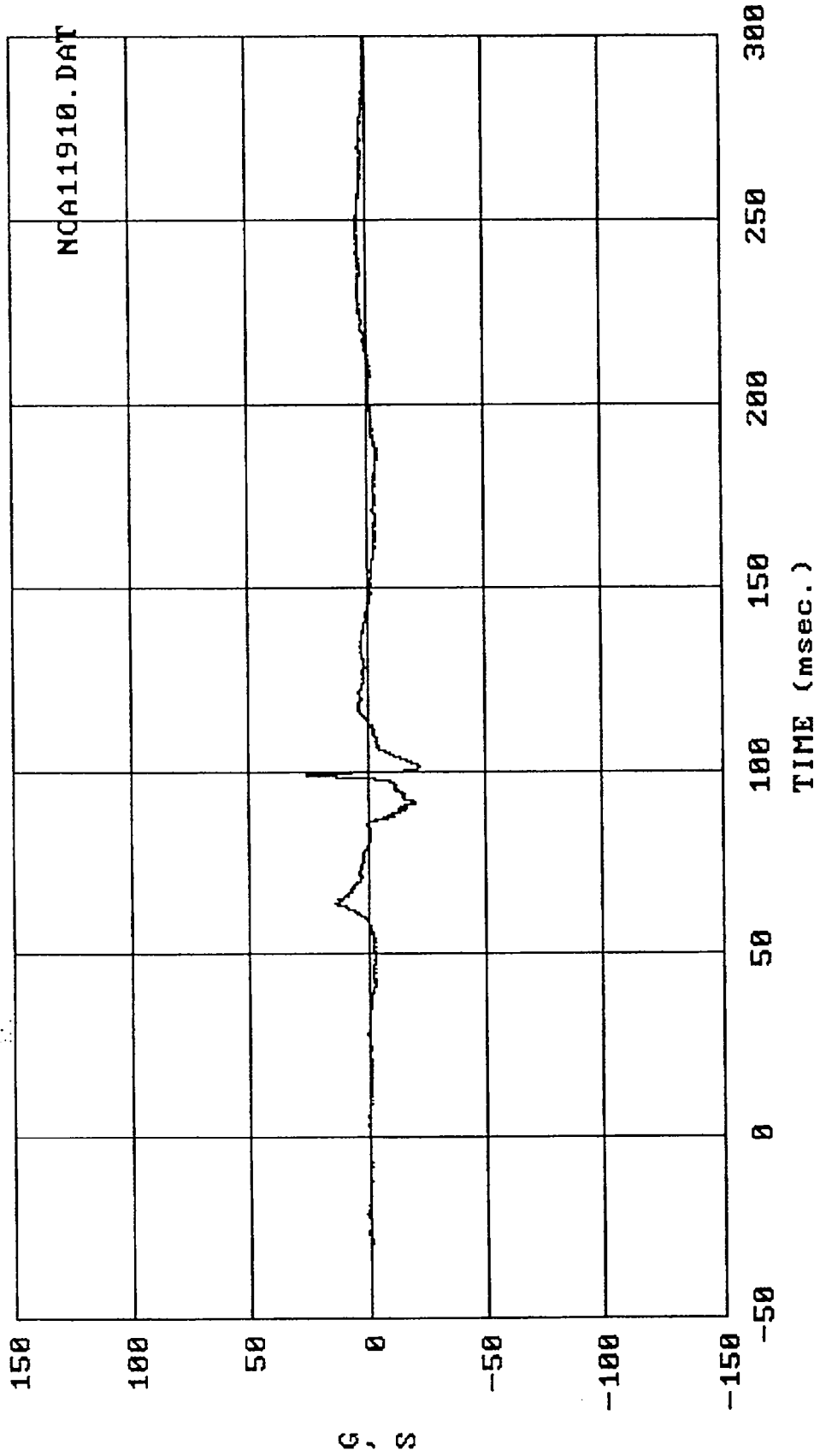
L
B
S



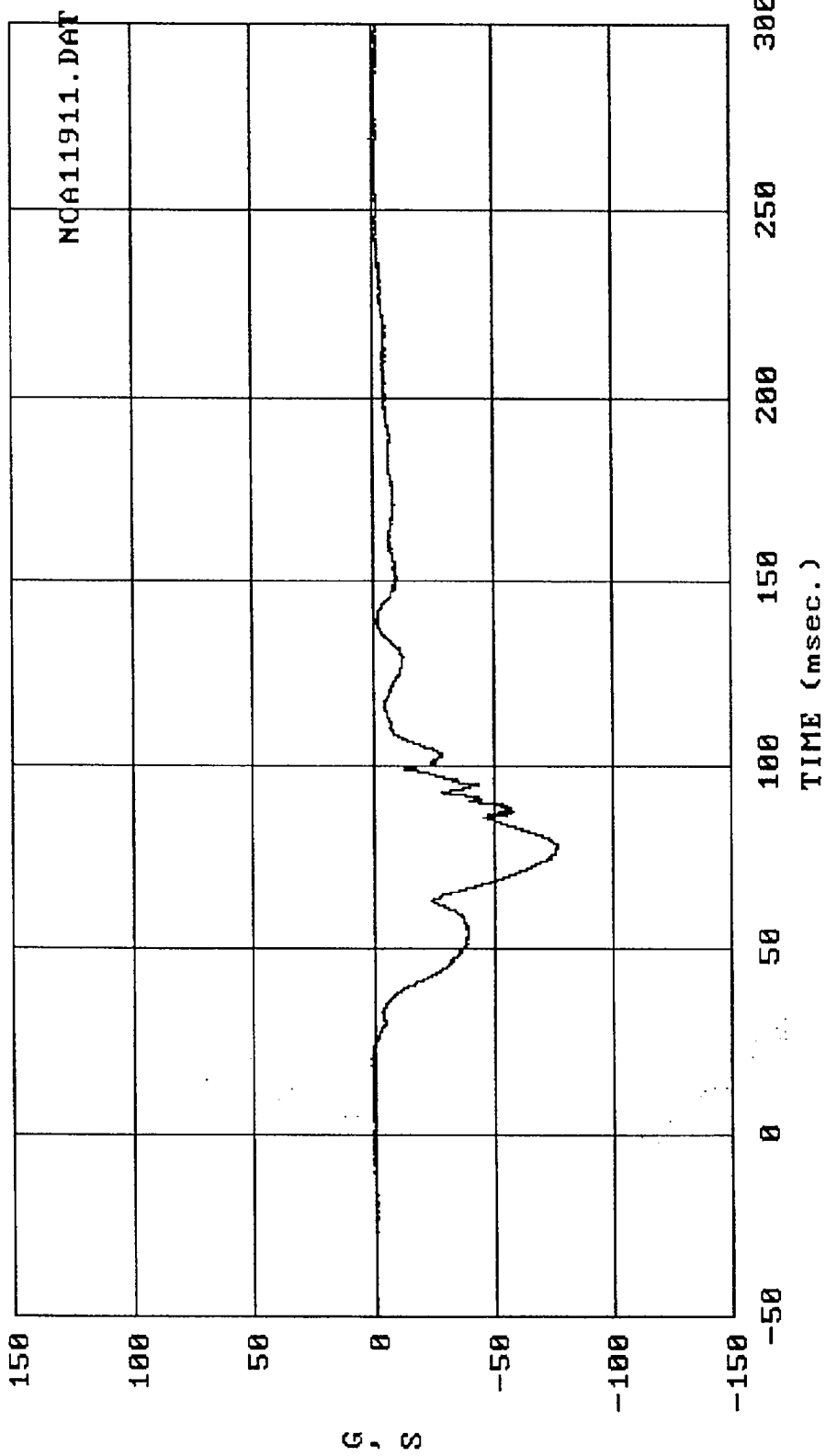
Filter: SAE CLASS 600 Max = 803.82 Min = -769.13
 MSE 05/23/89 --- 1989 Isuzu Trooper : Driver Right Femur force



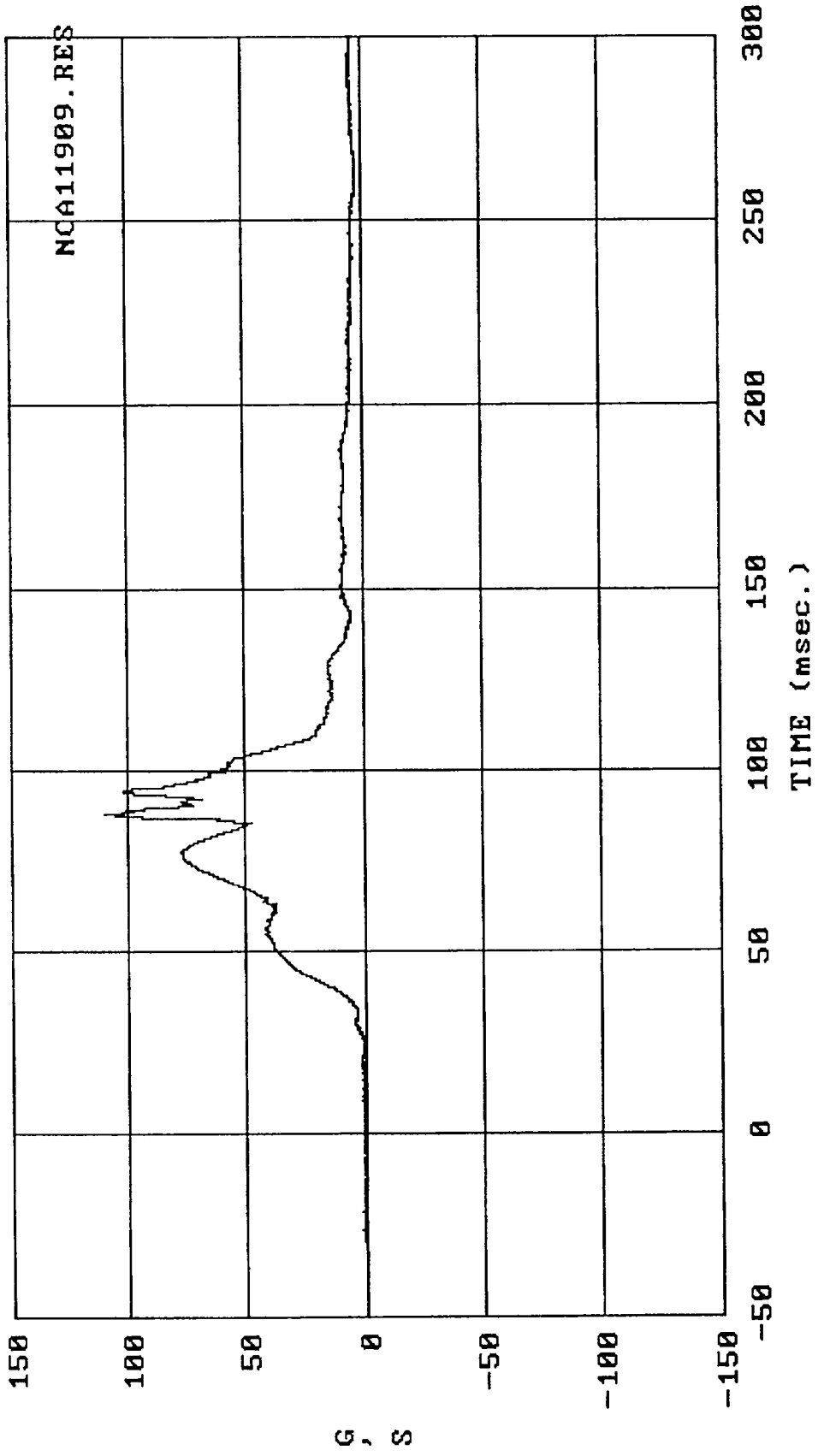
Filter: SAE CLASS 1000 Max = 5.6467 Min = -93.382
 MSE 05/23/89 --- 1989 Isuzu Trooper : Pasngr Head accel., X-axis



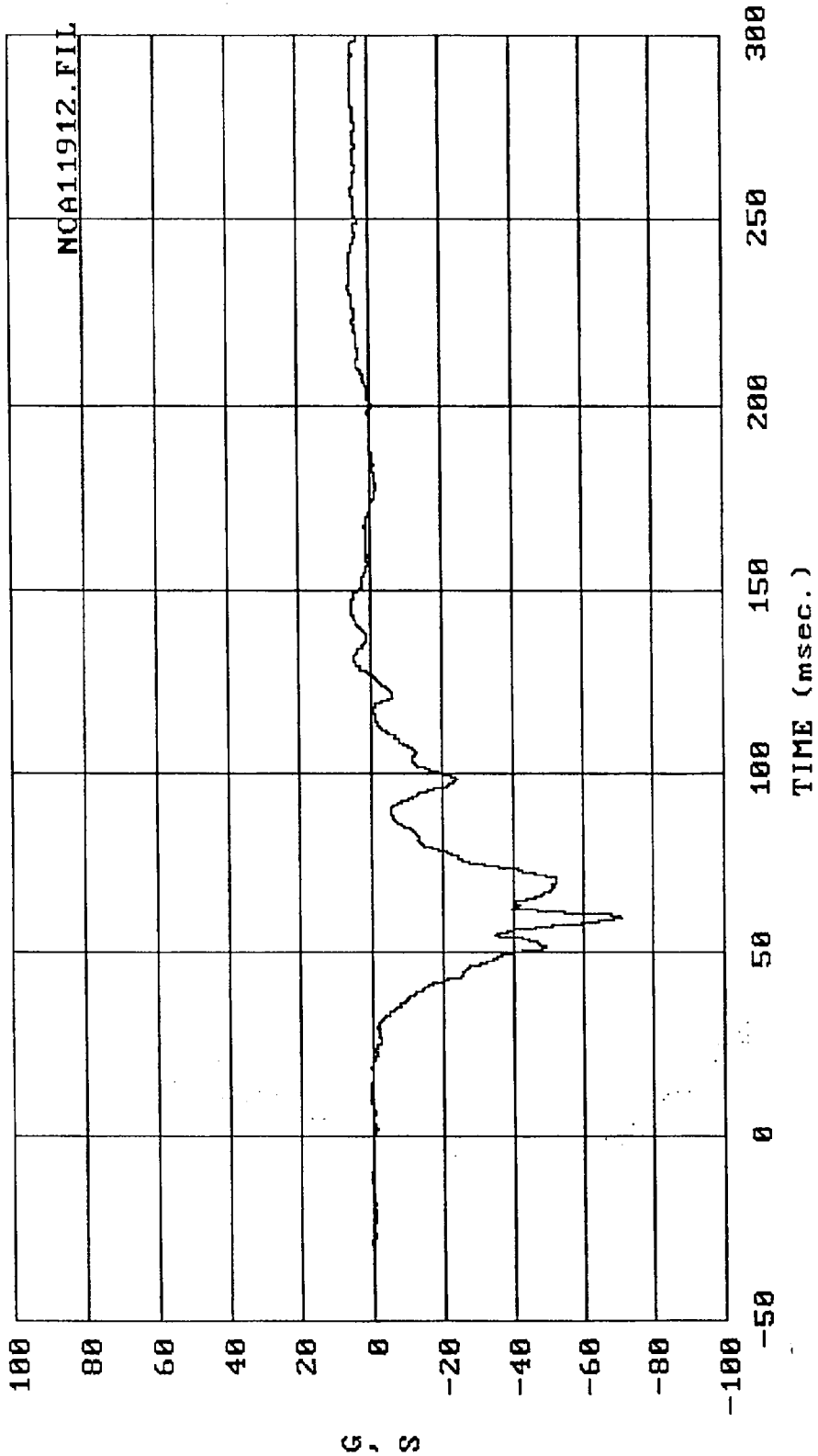
Filter: SAE CLASS 1000 Max = 26.208 Min = -21.923
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Head accel., Y-axis



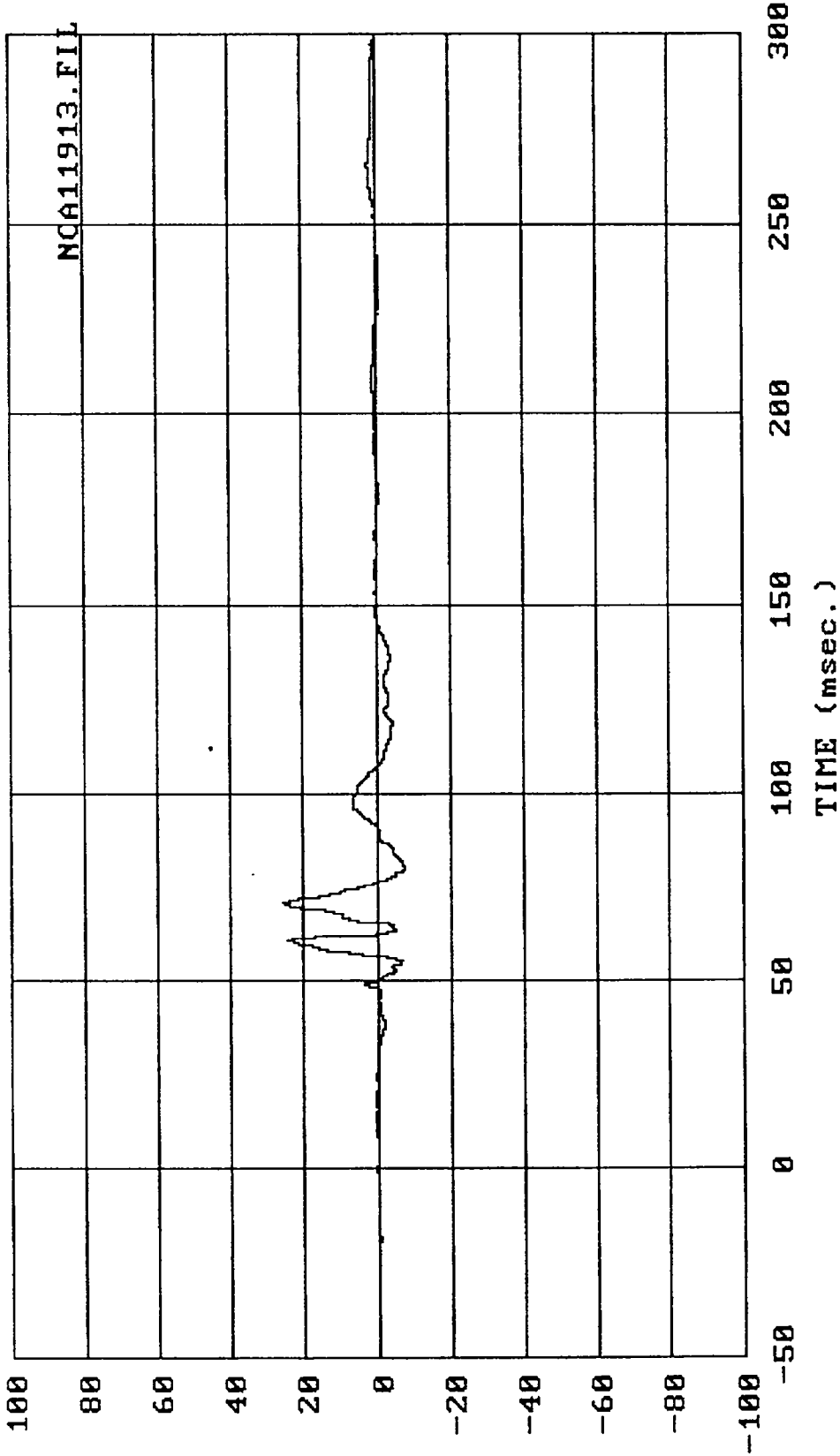
Filter: SAE CLASS 1000 Max = 1.4732 Min = -76.026
 MSE 05/23/89 --- 1989 Isuzu Trooper : Pasngr Head accel., Z-axis



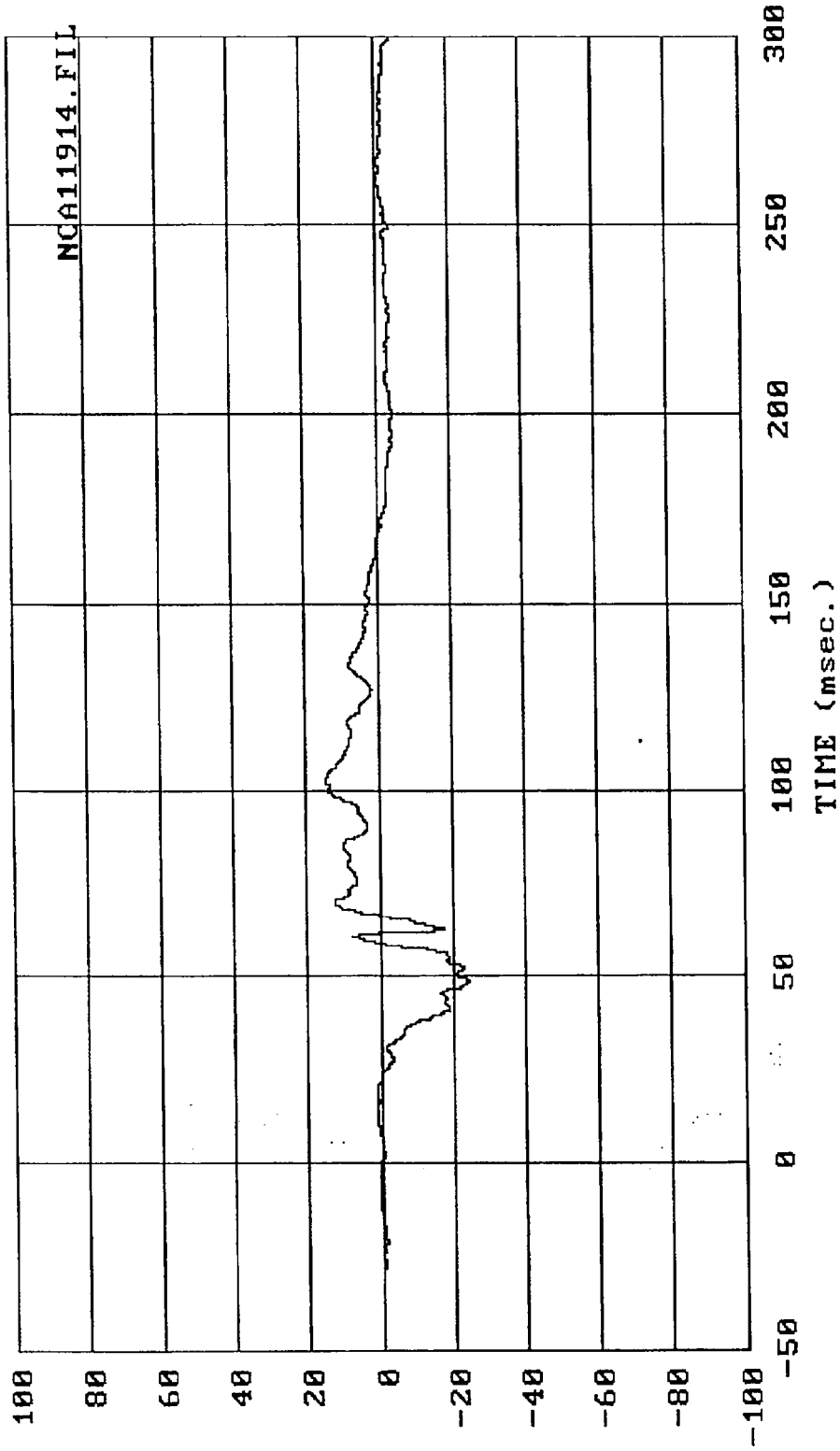
Filter: SAE CLASS 1000 Max = 109.85 Min = .17940
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Head resultant acc.



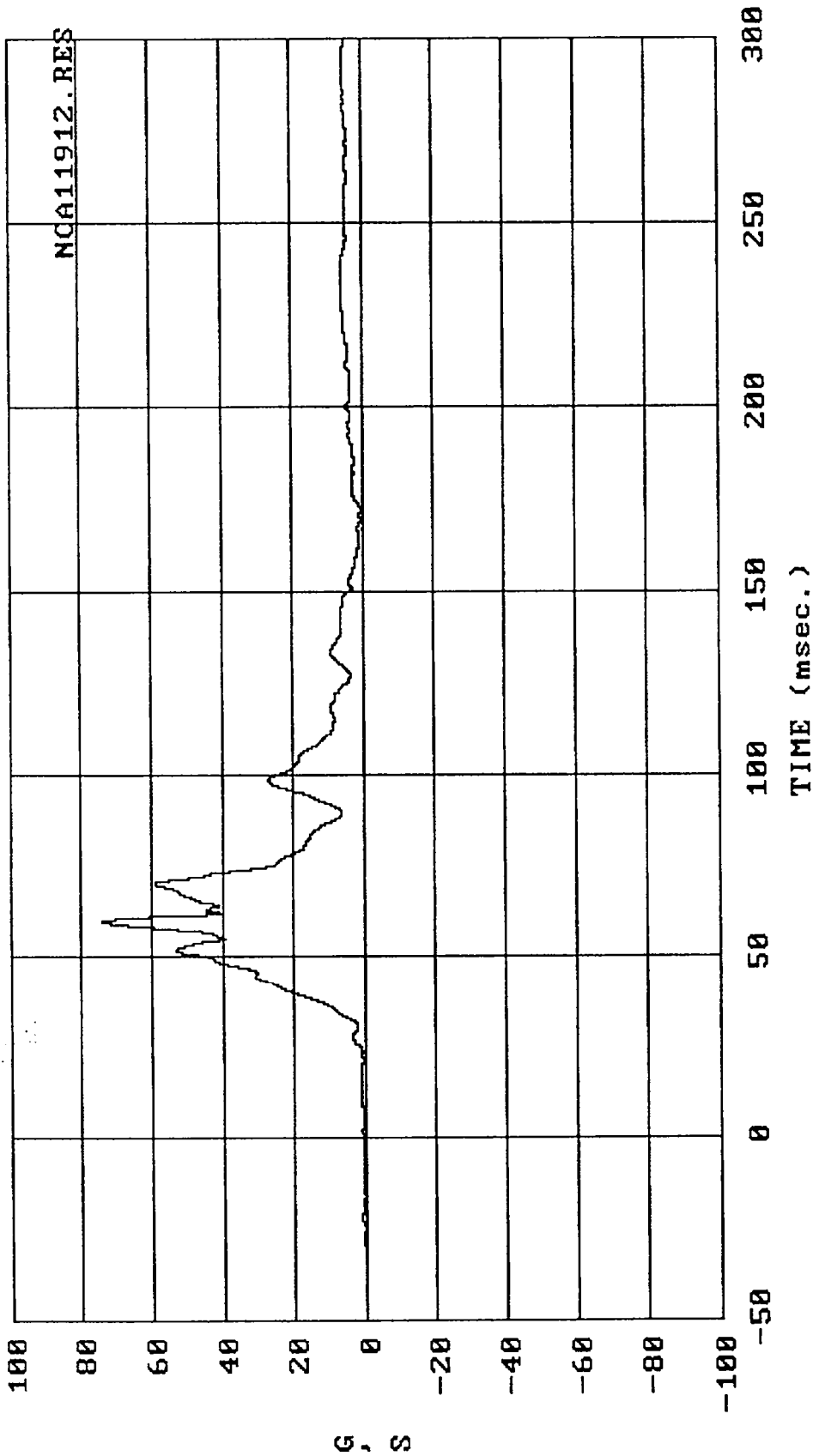
Filter: SAE CLASS 180 Max = 5.8423 Min = -70.604
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Chst accel., X-axis



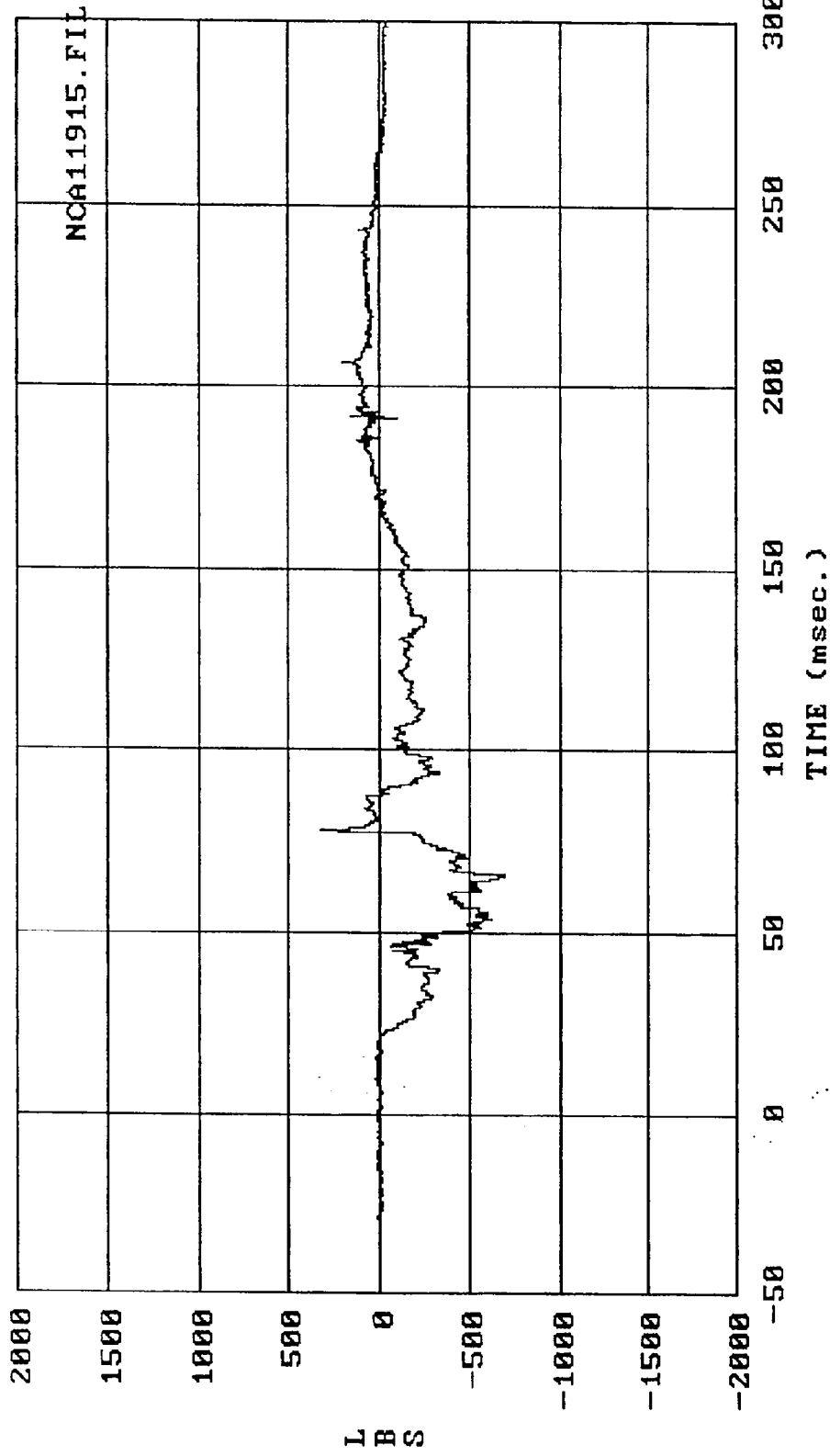
Filter: SAE CLASS 180 Max = 25.790 Min = -7.1175
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Chst accel., Y-axis



Filter: SAE CLASS 180 Max = 15.103 Min = -24.390
 MSE 05/23/89 --- 1989 Isuzu Trooper : Pasngr Chst accel., Z-axis

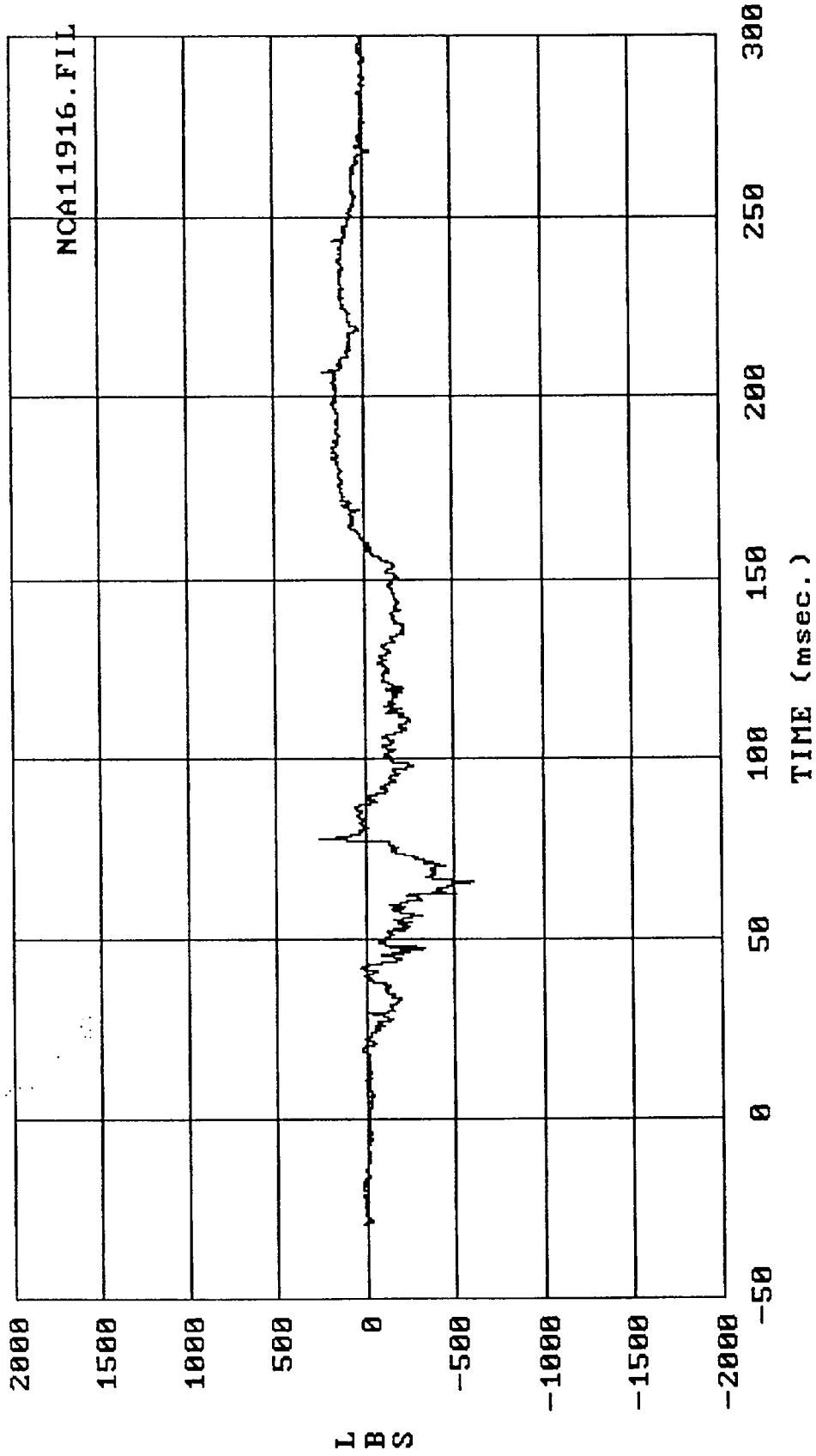


Filter: SAE CLASS 180 Max = 73.826 Min = .30957
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Chst resultant acc.

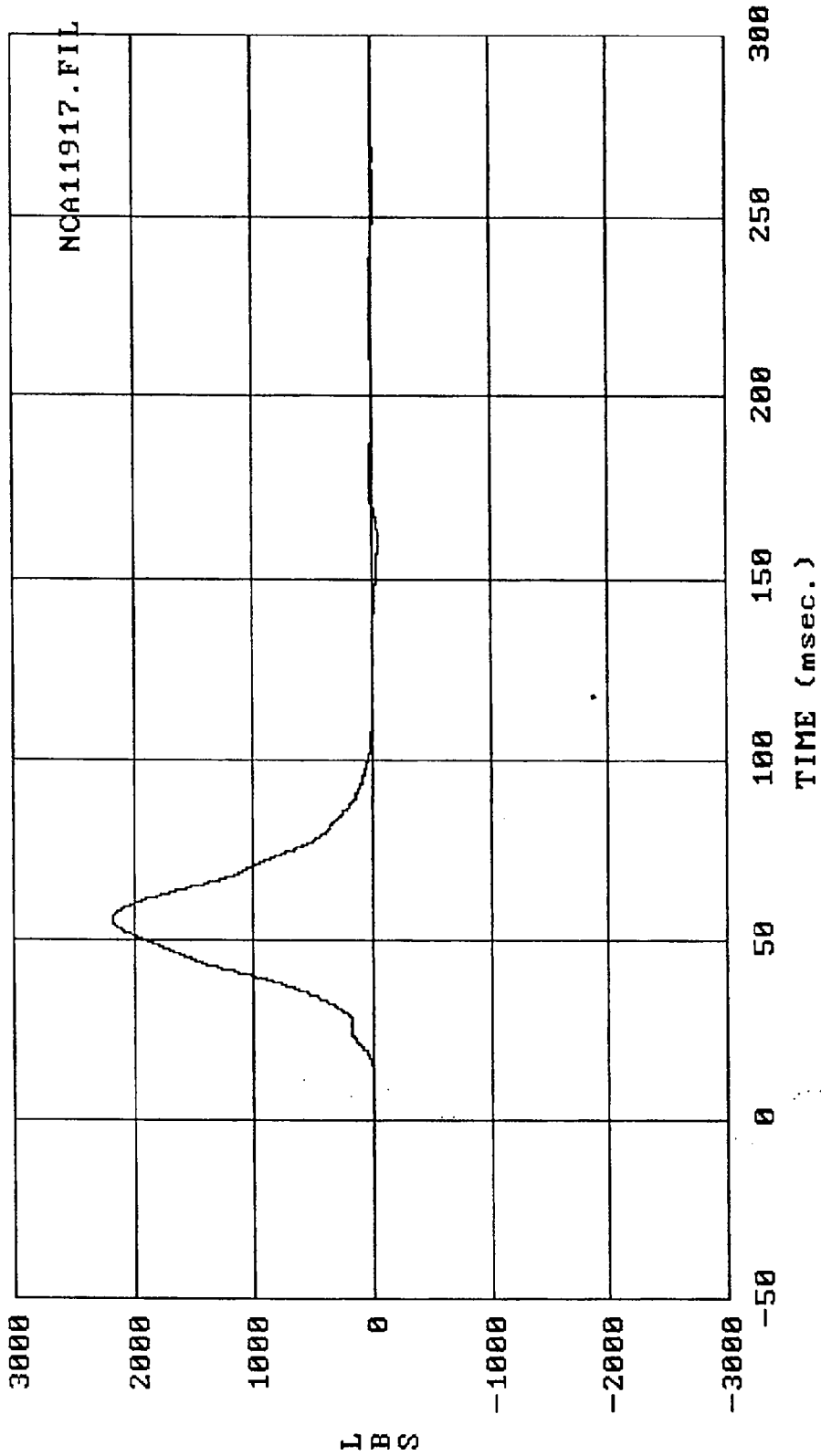


Filter: SAE CLASS 600 Max = 322.45 Min = -688.88

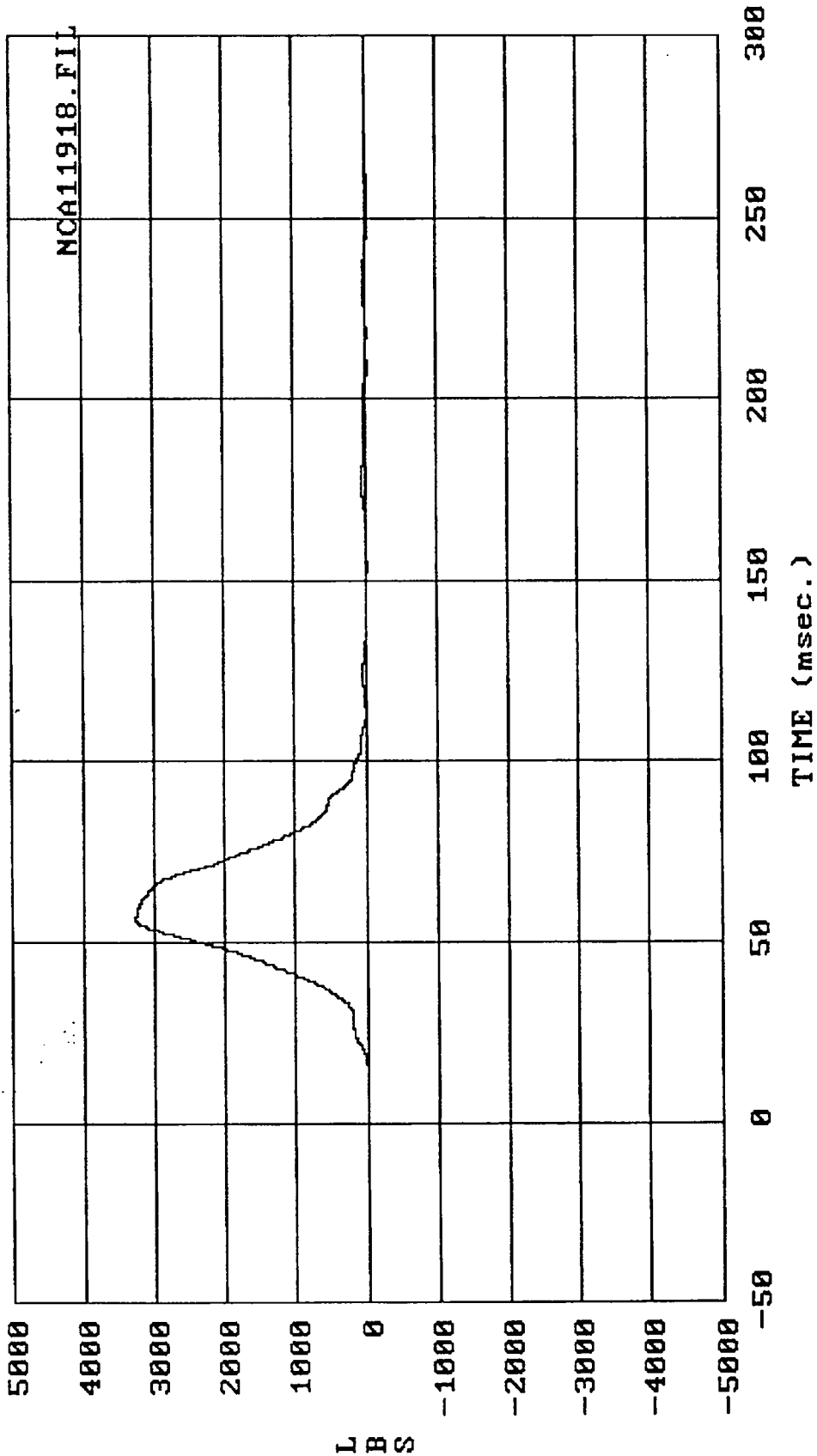
MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Left Femur force



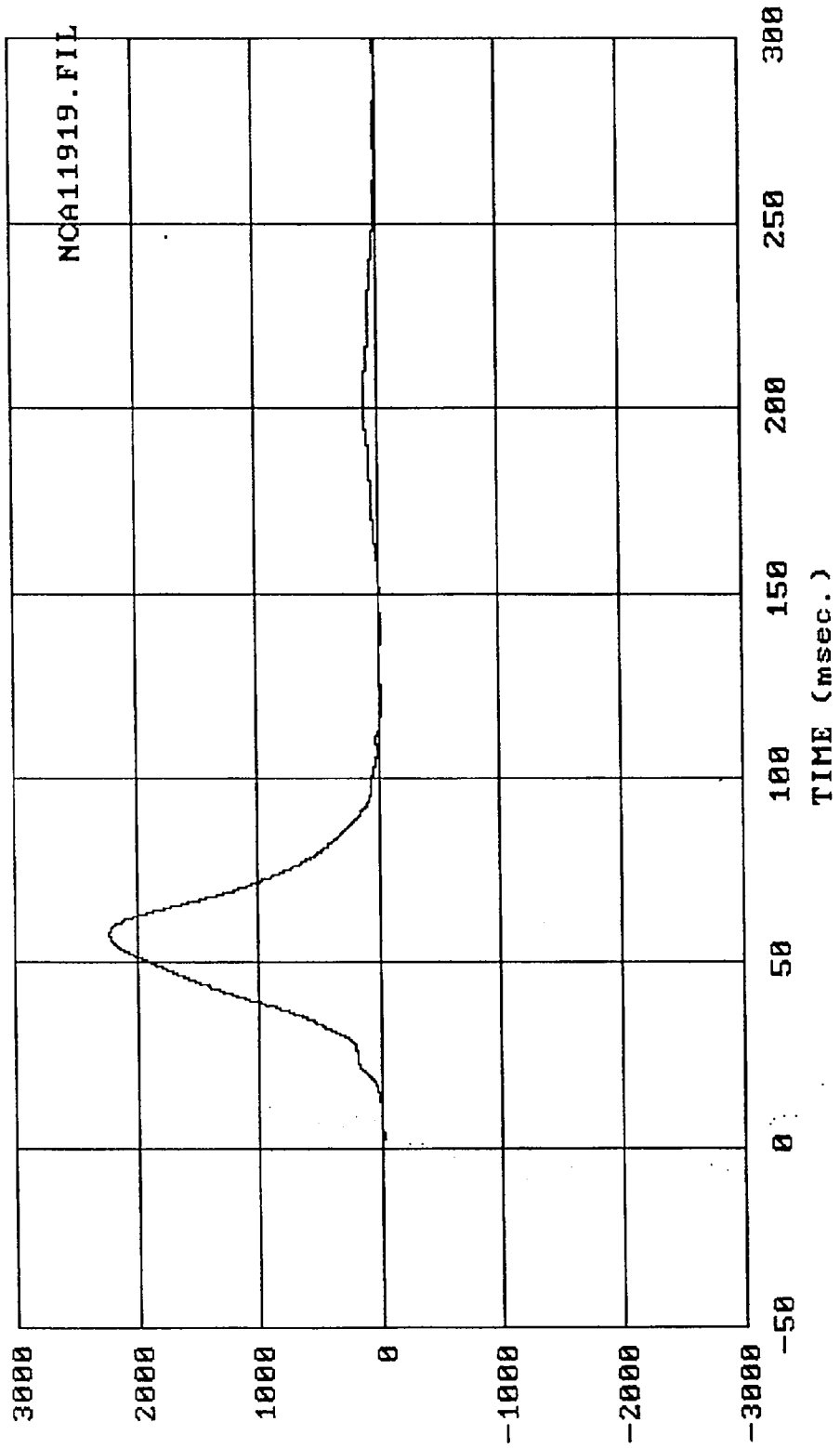
Filter: SAE CLASS 600 Max = 262.44 Min = -603.32
 MSE 05/23/89 --- 1989 Isuzu Trooper : Pasngr Right Femur force



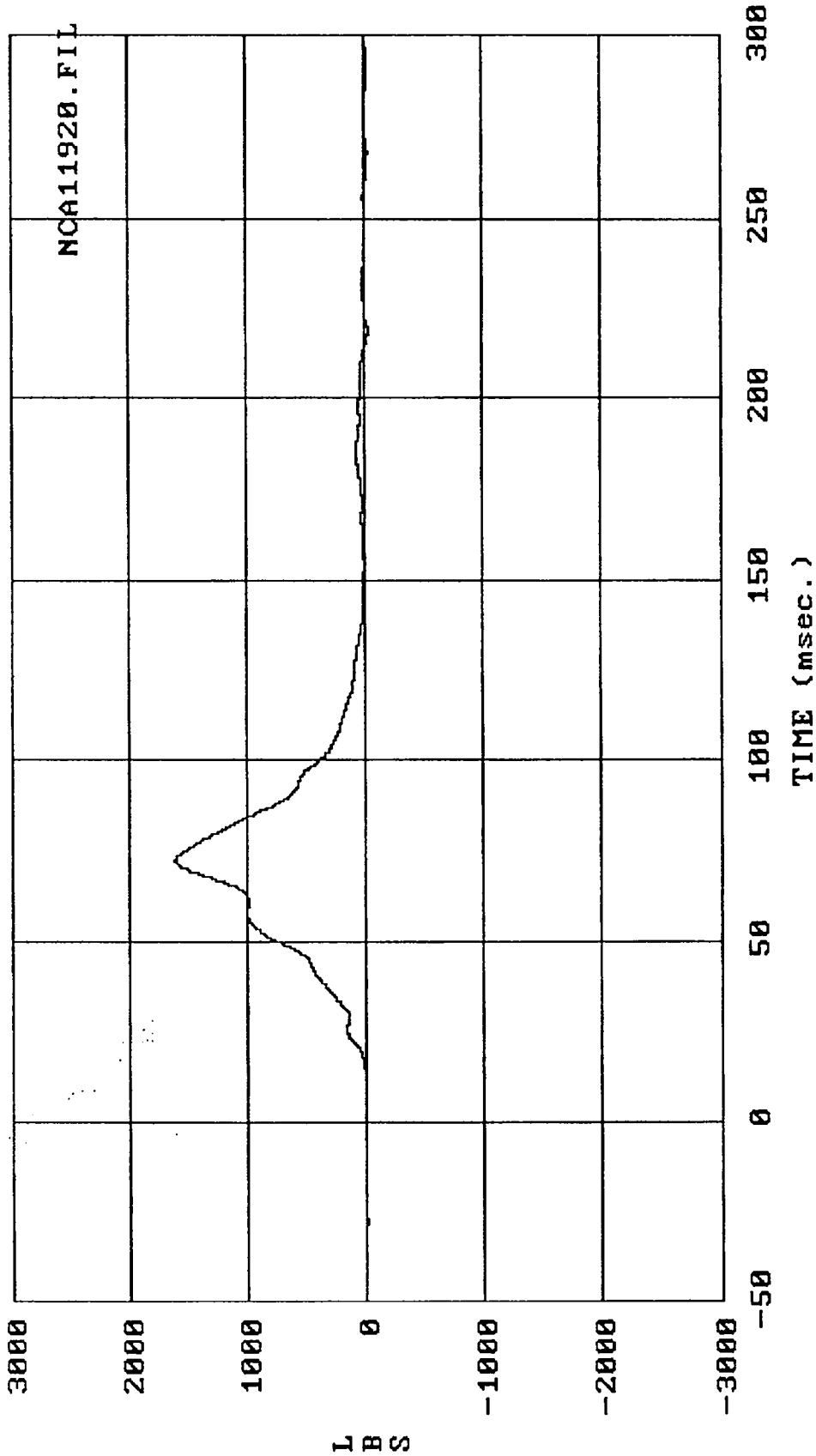
Filter: SAE CLASS 60 Max = 2189.9 Min = -50.525
 MSE 05/23/89 --- 1989 Isuzu Trooper : Driver Lap Belt force



Filter: SAE CLASS 60 Max = 3271.4 Min = -27.700
 MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Shoulder Belt force

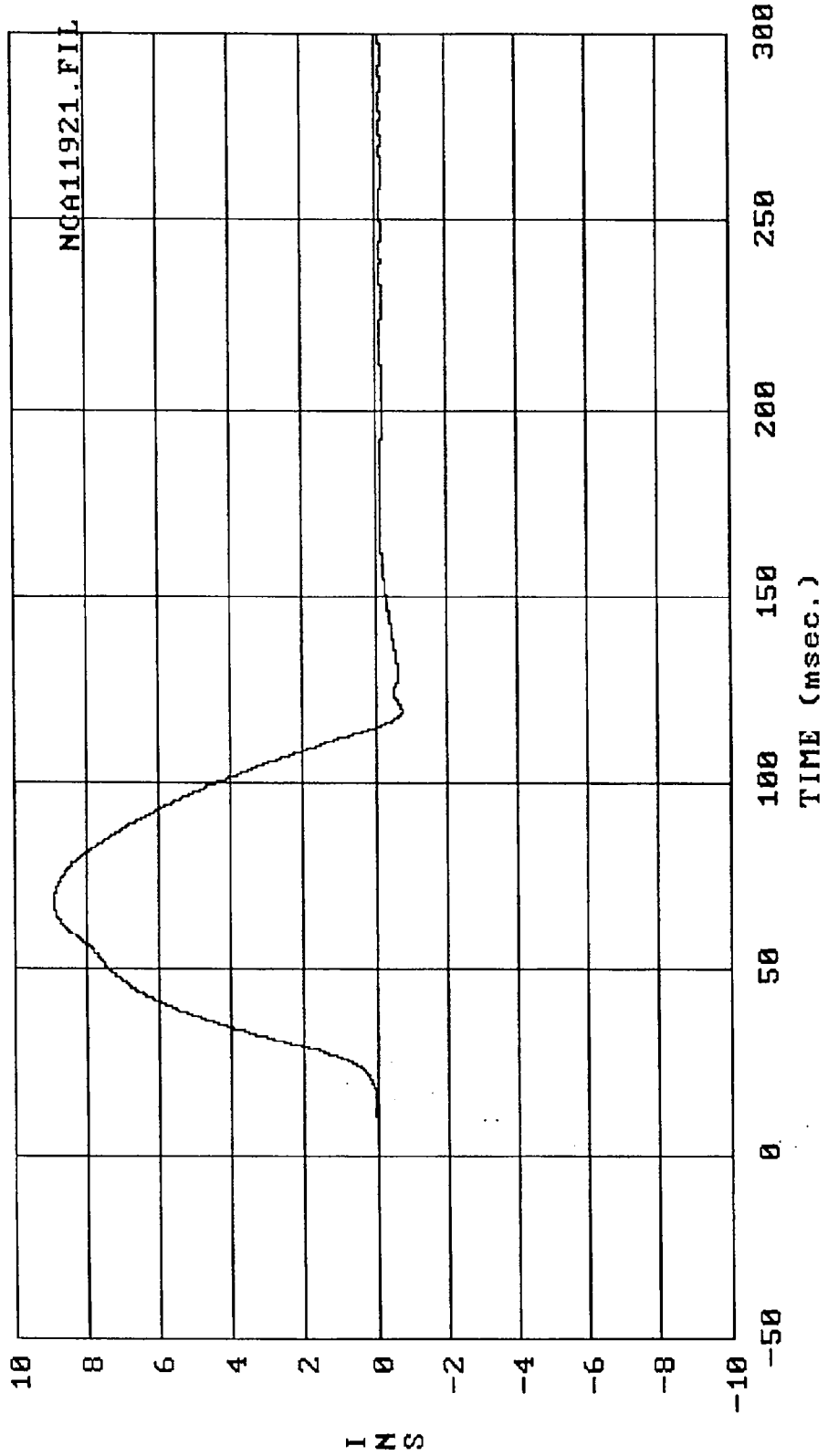


Filter: SAE CLASS 60 Max = 2234.4 Min = -18.538
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Lap Belt force

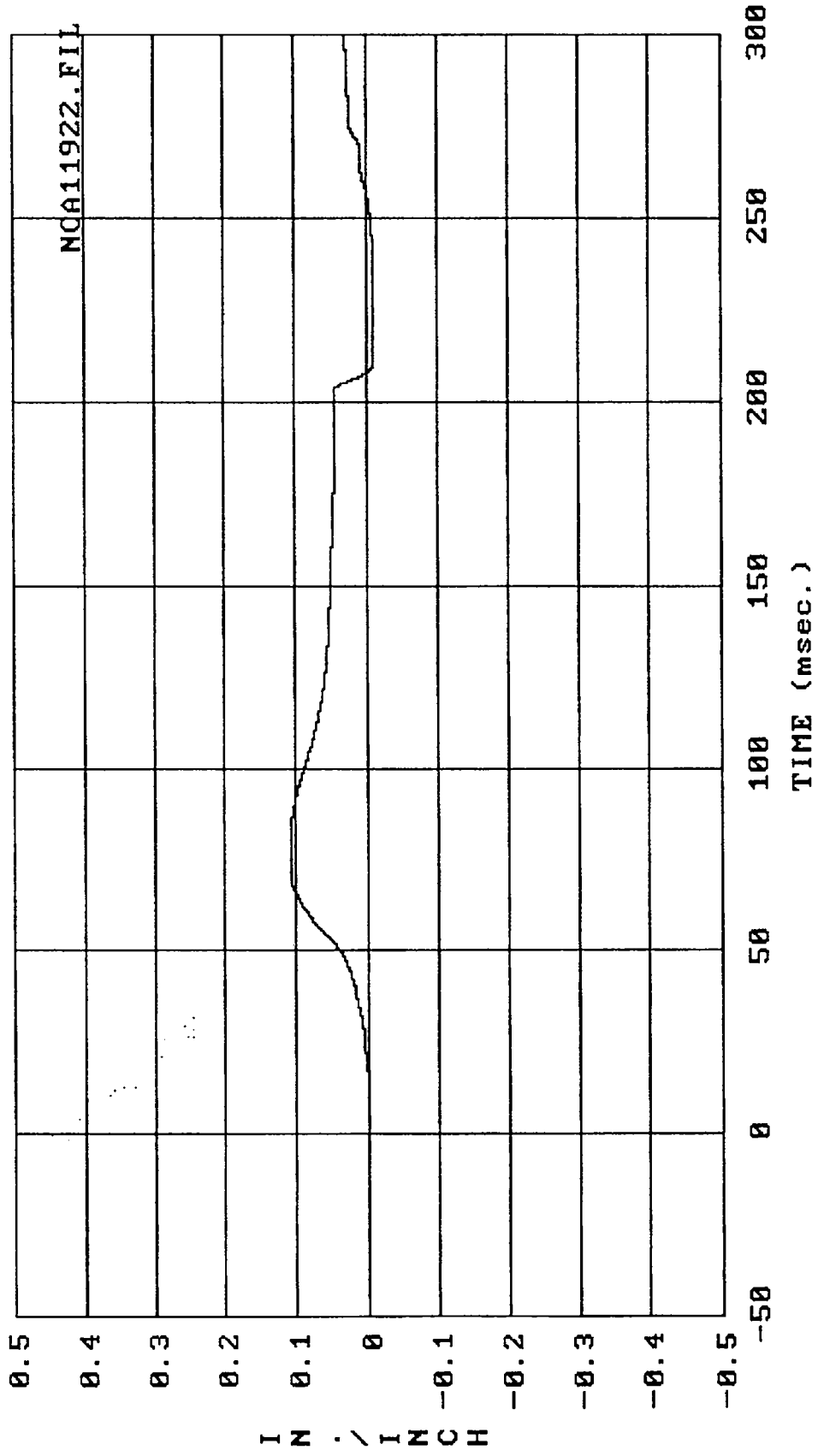


Filter: SAE CLASS 60 Max = 1618.3 Min = -34.093

MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Shoulder Belt force

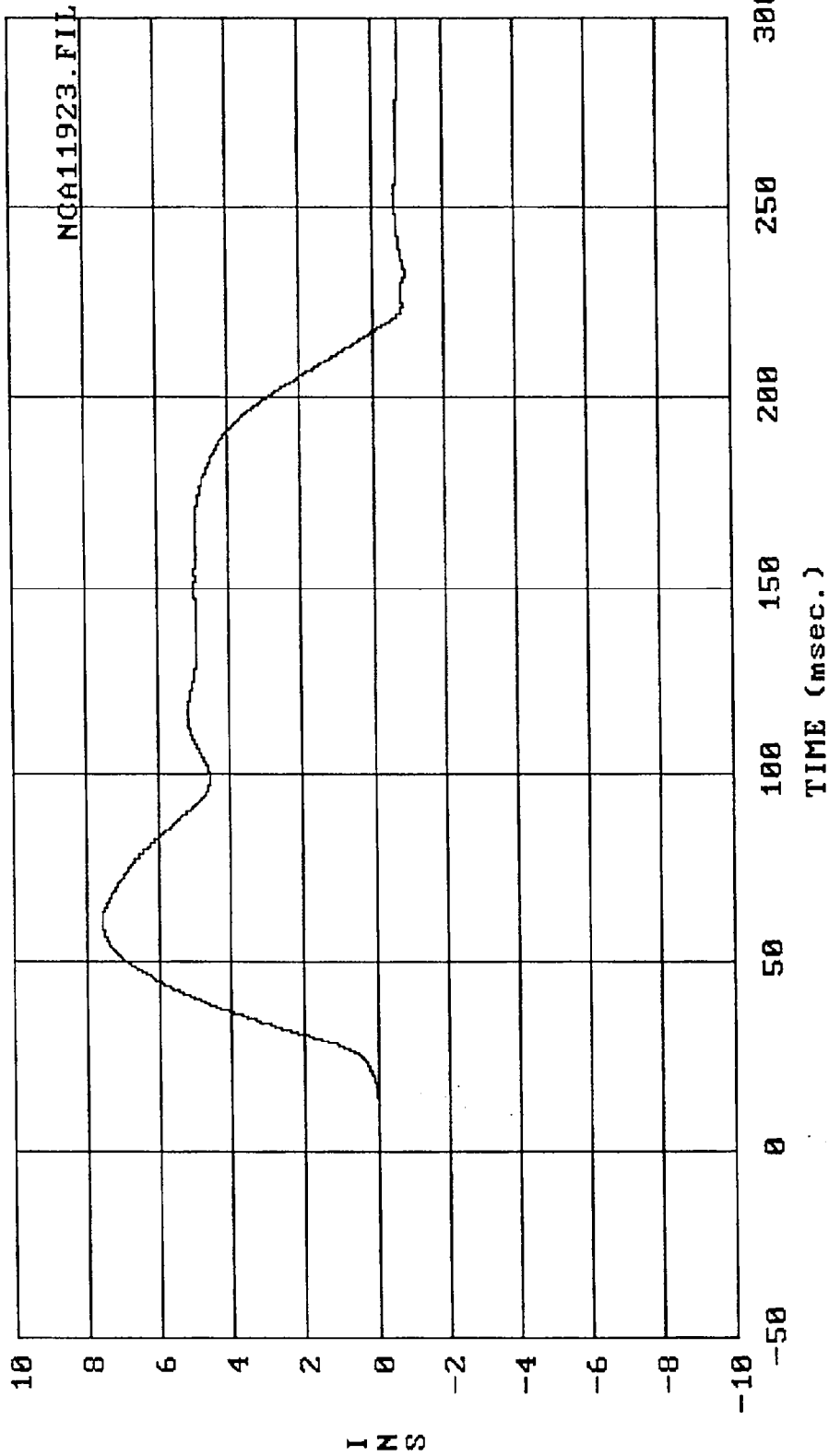


Filter: SAE CLASS 60 Max = 8.9143 Min = -.70736
 MSE 05/23/89 --- 1989 Isuzu Trooper : Driver Belt pullout

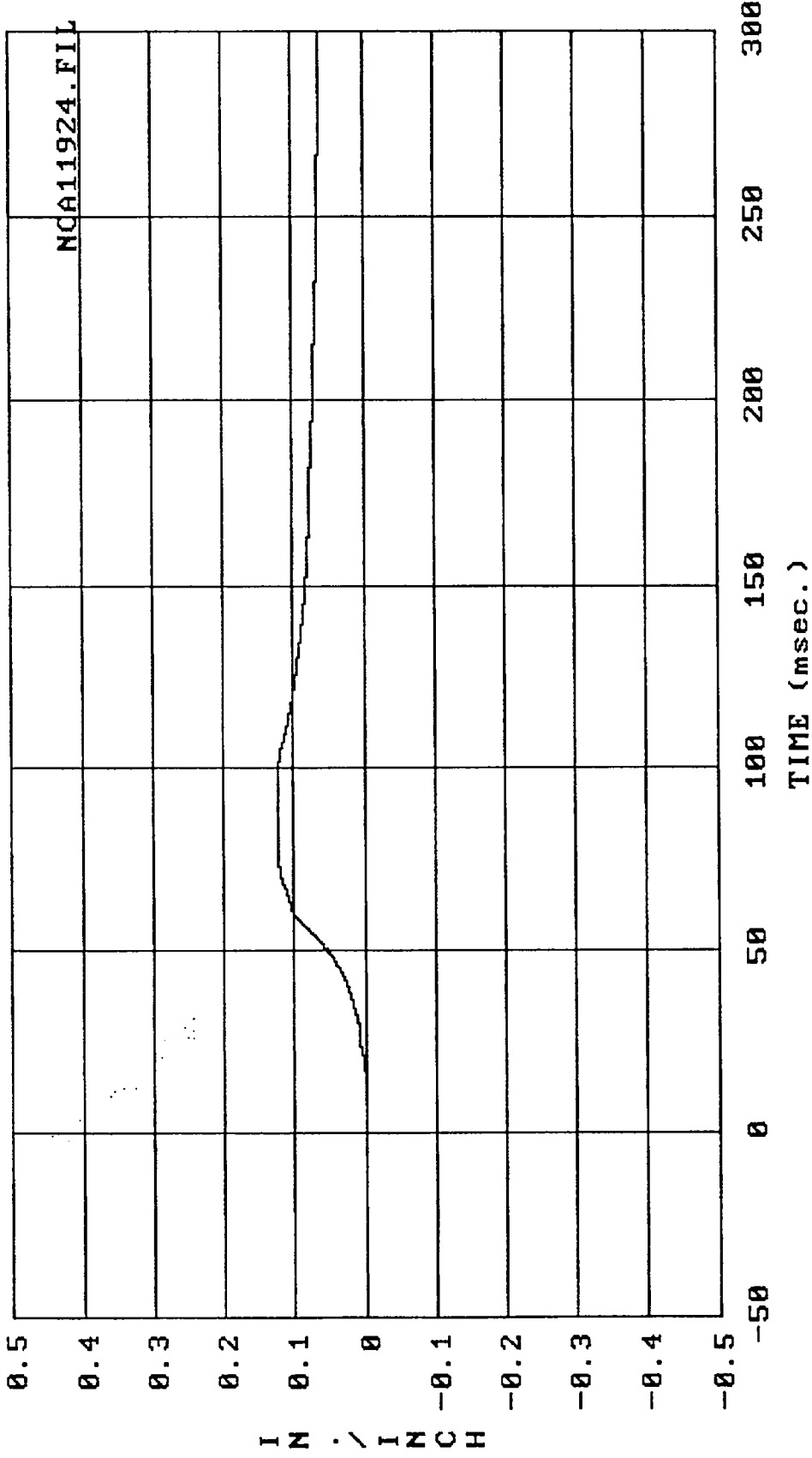


Filter: SAE CLASS 60 Max = .10936 Min = -.10156E-01

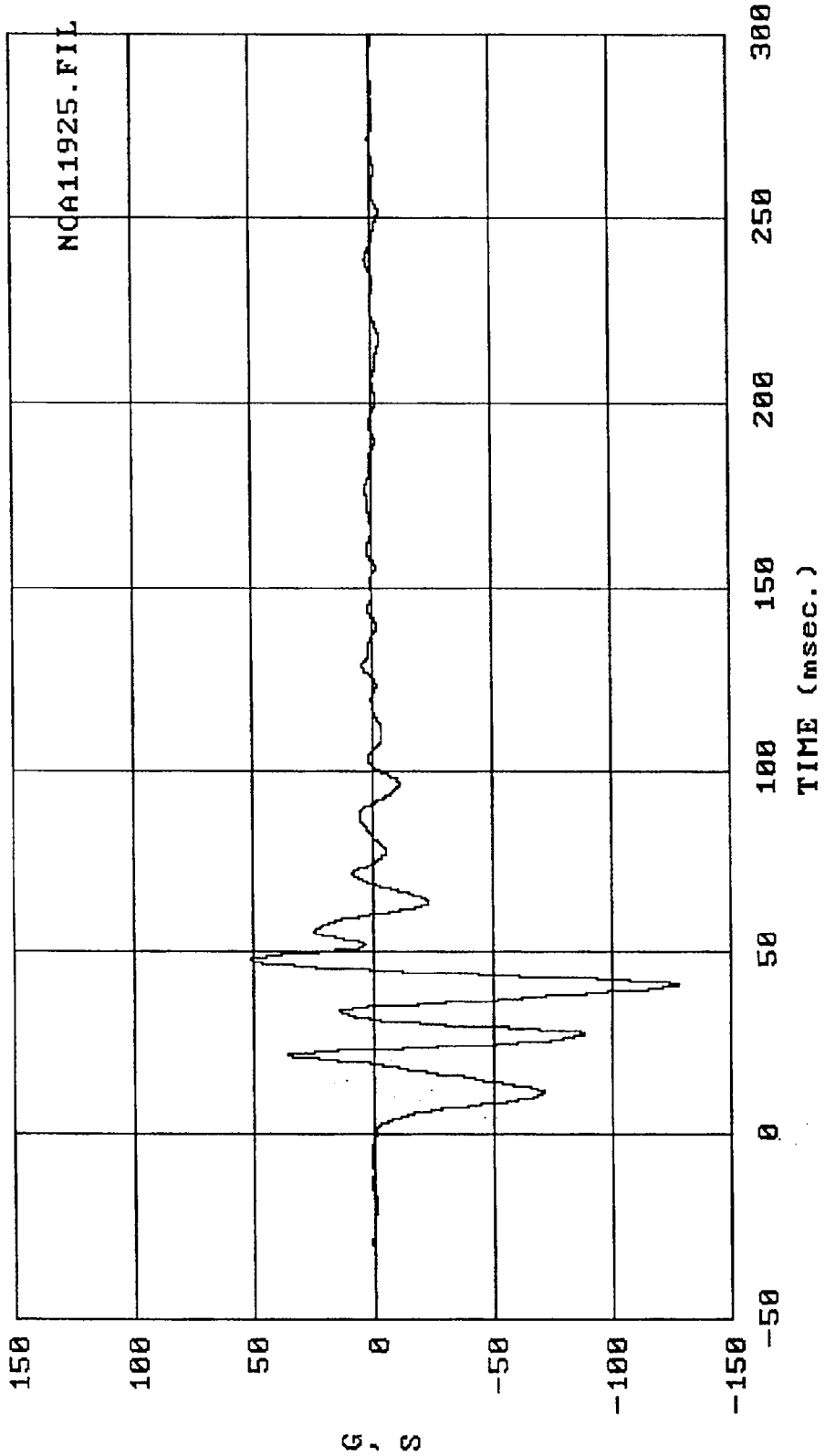
MSE 05/23/89 -- 1989 Isuzu Trooper : Driver Belt elongation



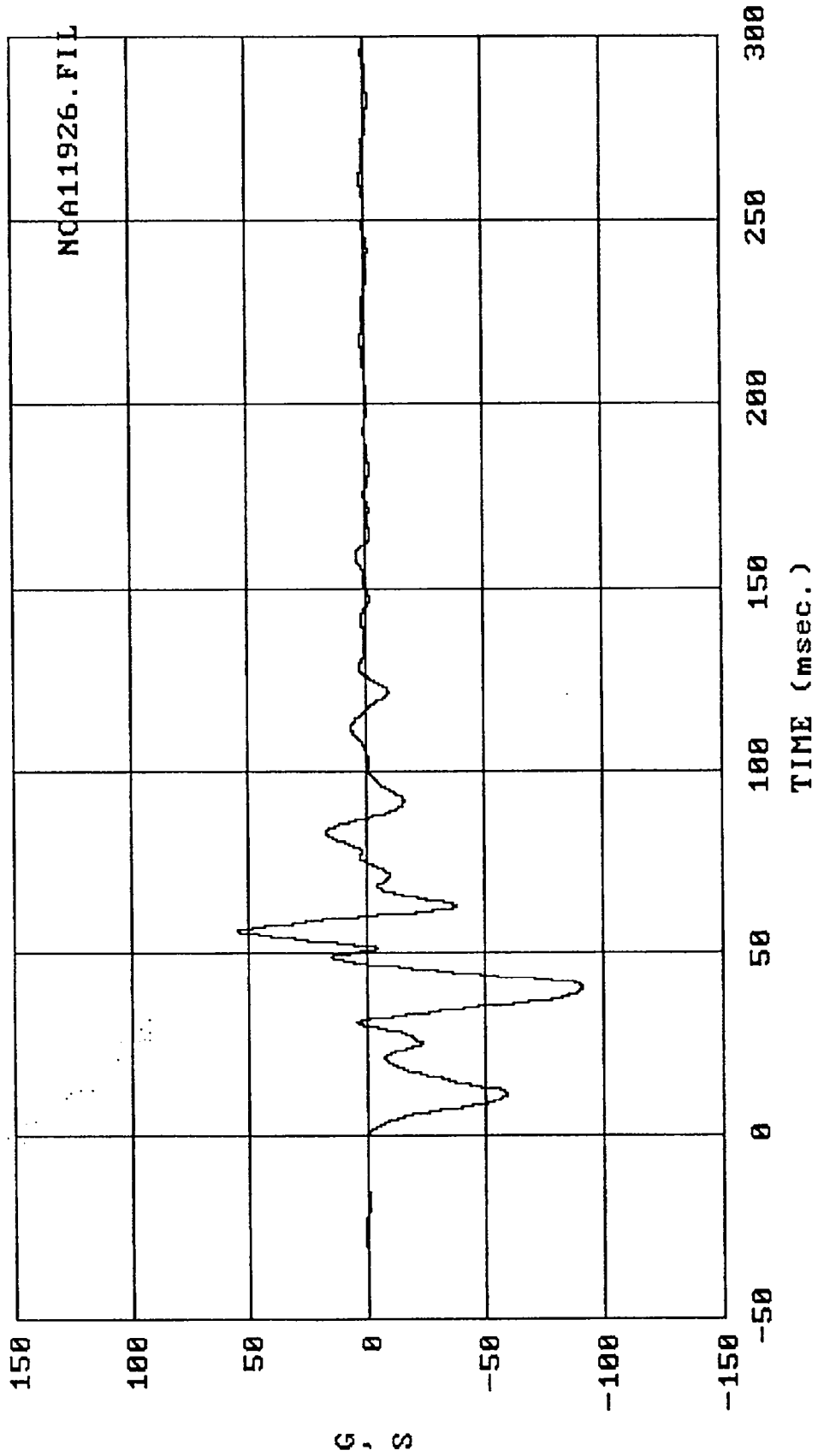
Filter: SAE CLASS 60 Max = 7.5909 Min = -.88990
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Belt pullout



Filter: SAE CLASS 60 Max = .12312 Min = -.28646E-03
 MSE 05/23/89 -- 1989 Isuzu Trooper : Pasngr Belt elongation

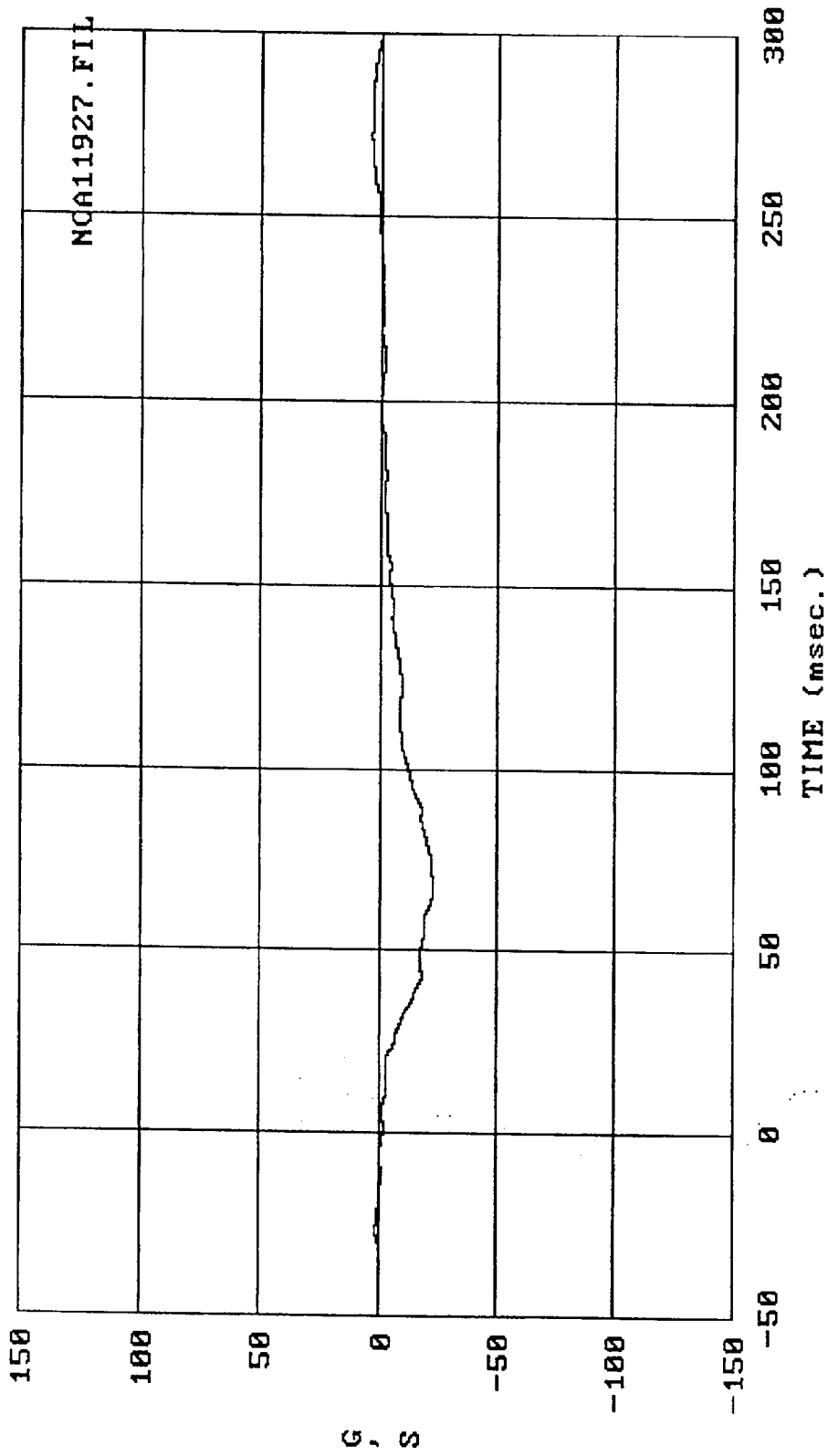


Filter: SAE CLASS 60 Max = 51.527 Min = -127.20
 MSE 05/23/89 --- 1989 Isuzu Trooper : Left front caliper accel.

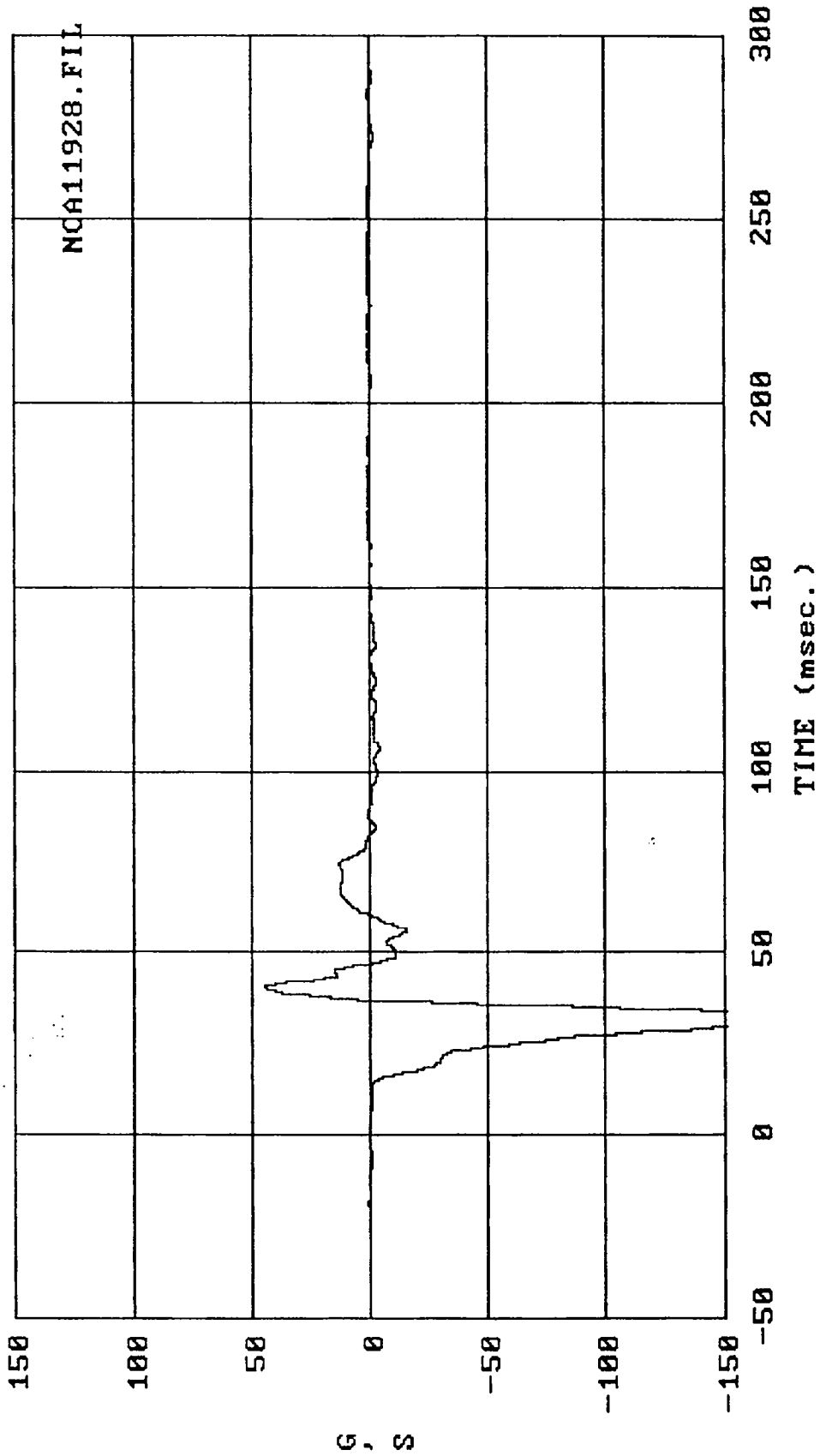


Filter: SAE CLASS 60 Max = 55.506 Min = -90.581

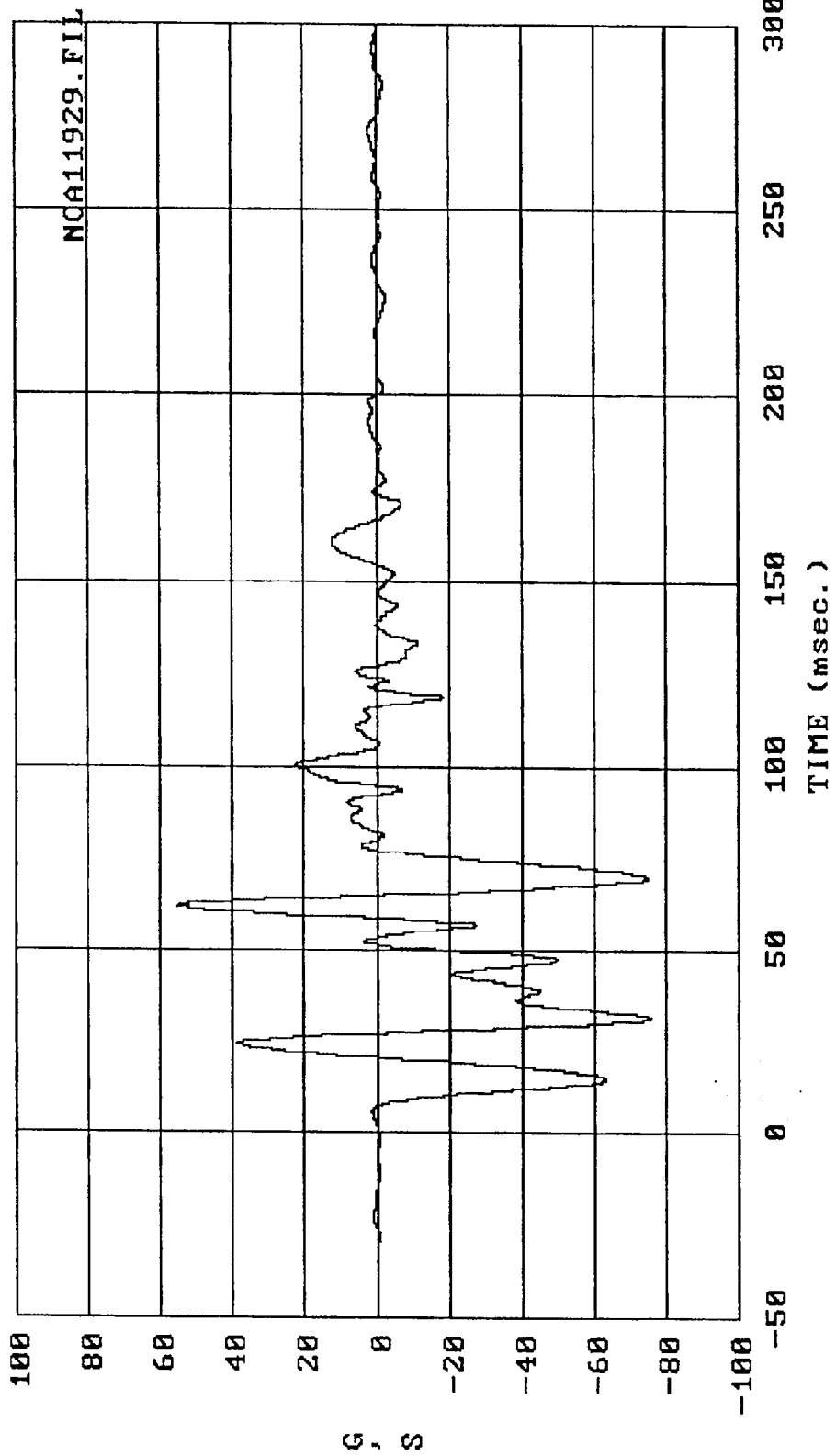
MSE 05/23/89 -- 1989 Isuzu Trooper : Right front caliper accel.



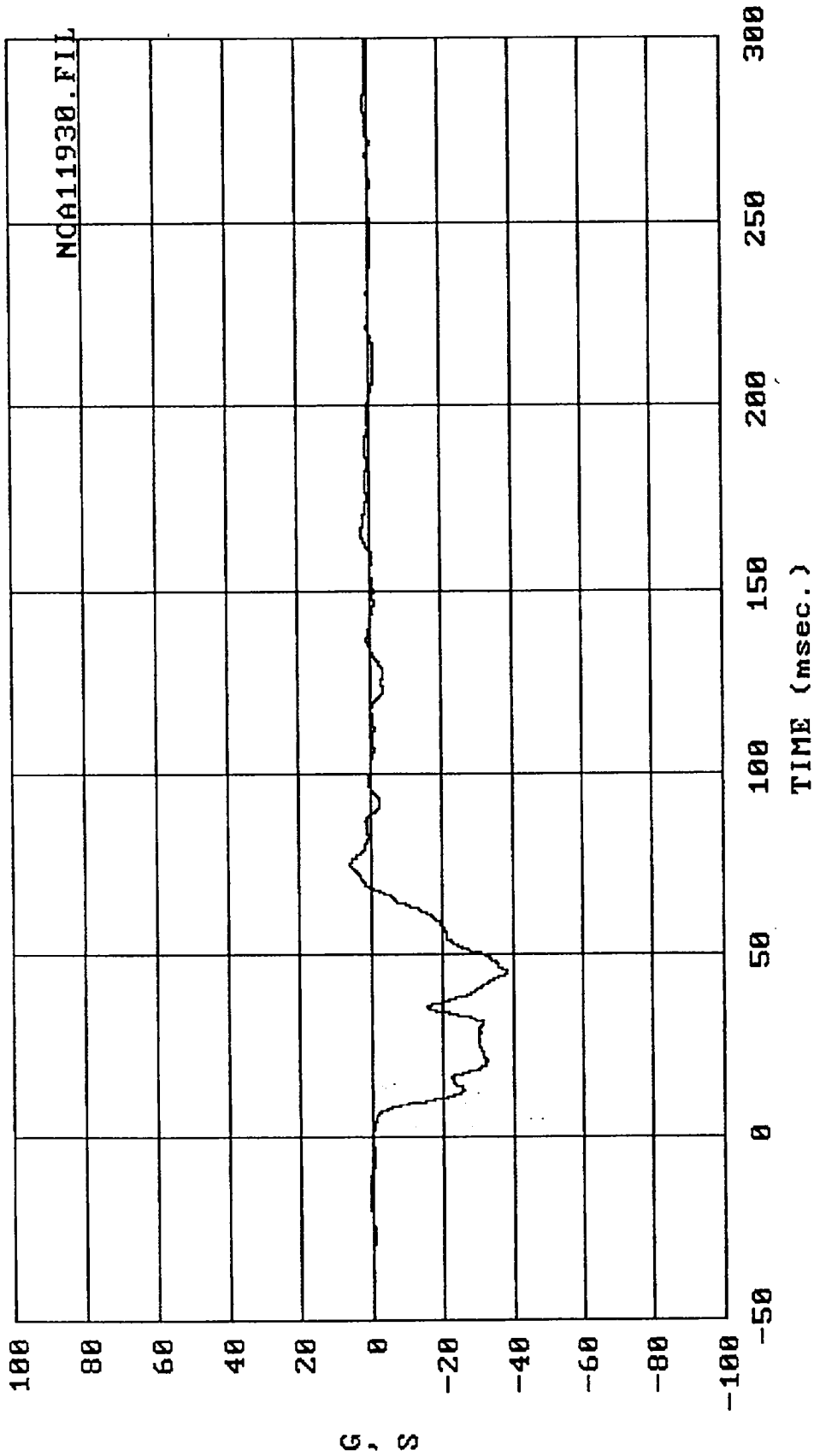
Filter: SAE CLASS 60 Max = 4.1258 Min = -22.857
 MSE 05/23/89 -- 1989 Isuzu Trooper : Engine bottom acceleration
 (failed)



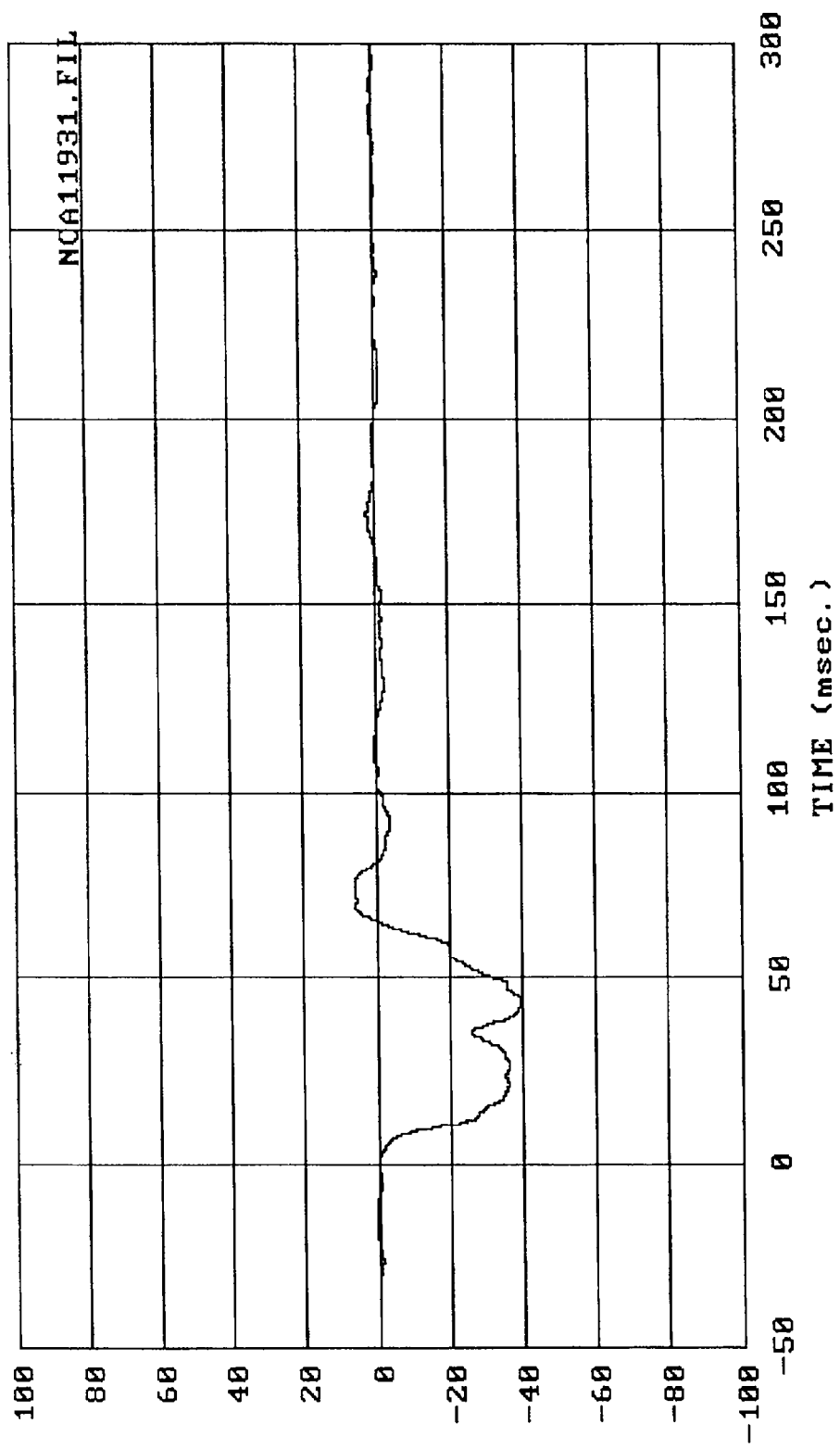
Filter: SAE CLASS 60 Max = 45.440 Min = -178.82
 MSE 05/23/89 --- 1989 Isuzu Trooper : Engine top acceleration



Filter: SAE CLASS 60 Max = 55.142 Min = -75.554
 MSE 05/23/89 --- 1989 Isuzu Trooper : Instrument panel accel.



Filter: SAE CLASS 60 Max = 5.8260 Min = -37.984
 MSE 05/23/89 -- 1989 Isuzu Trooper : Left-rear seat X-member accel.



Filter: SAE CLASS 60 Max = 6.0764 Min = -39.316
 MSE 05/23/89 -- 1989 Isuzu Trooper : Right-rear seat X-member accel.

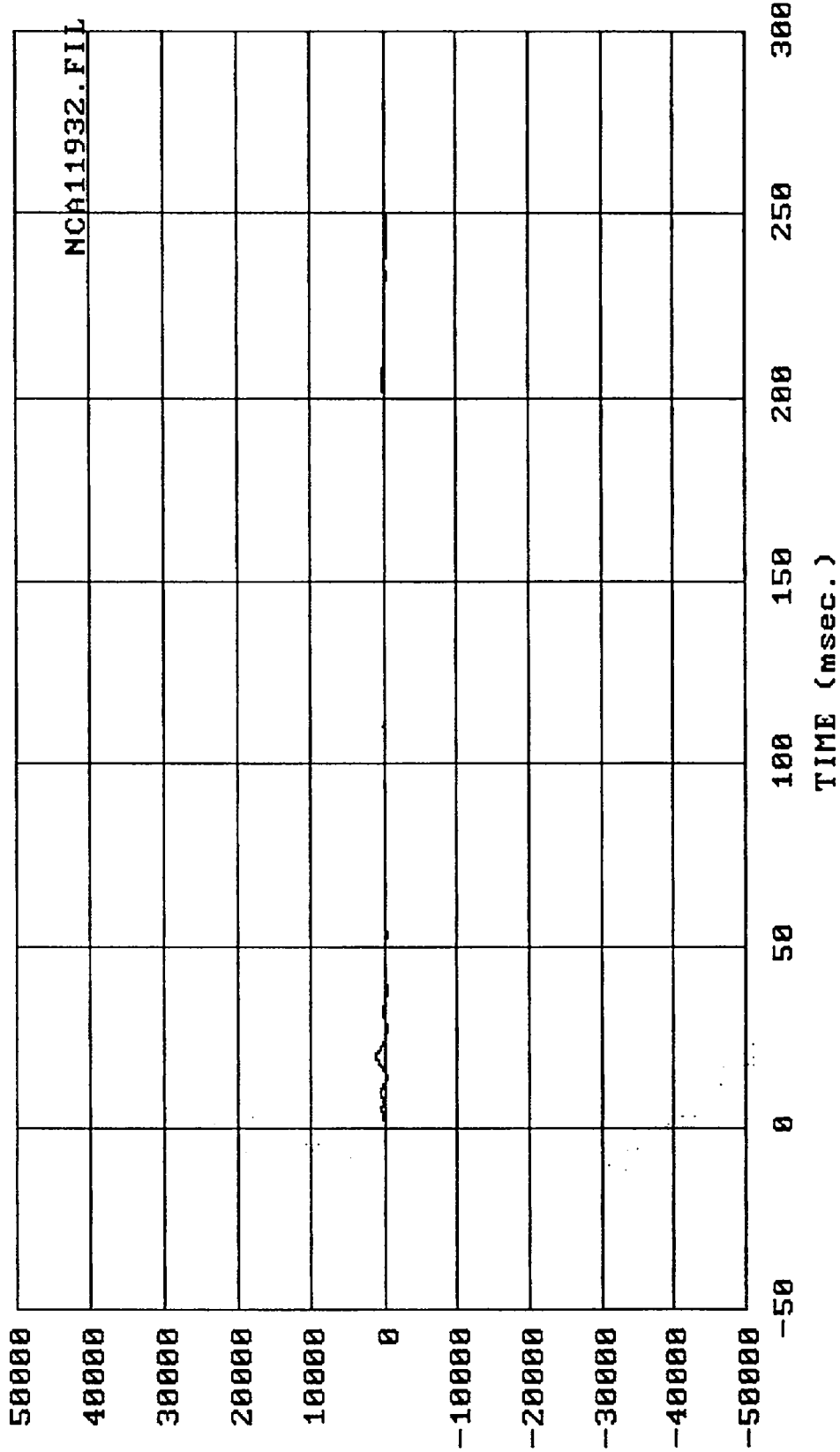
APPENDIX B-2

LOAD CELL BARRIER DATA

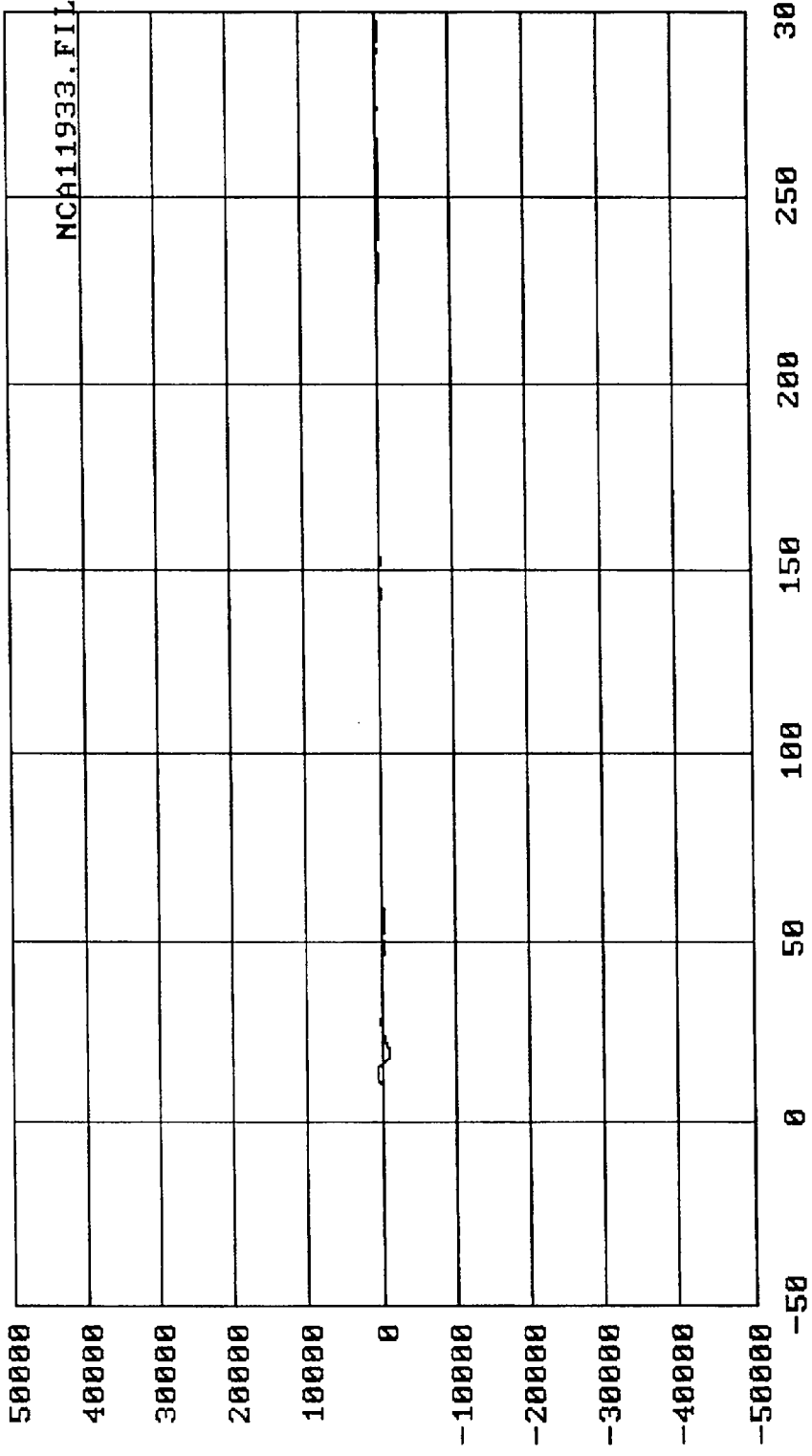
DATA FILTERING:

Load Cell Barrier Channels - Class 60

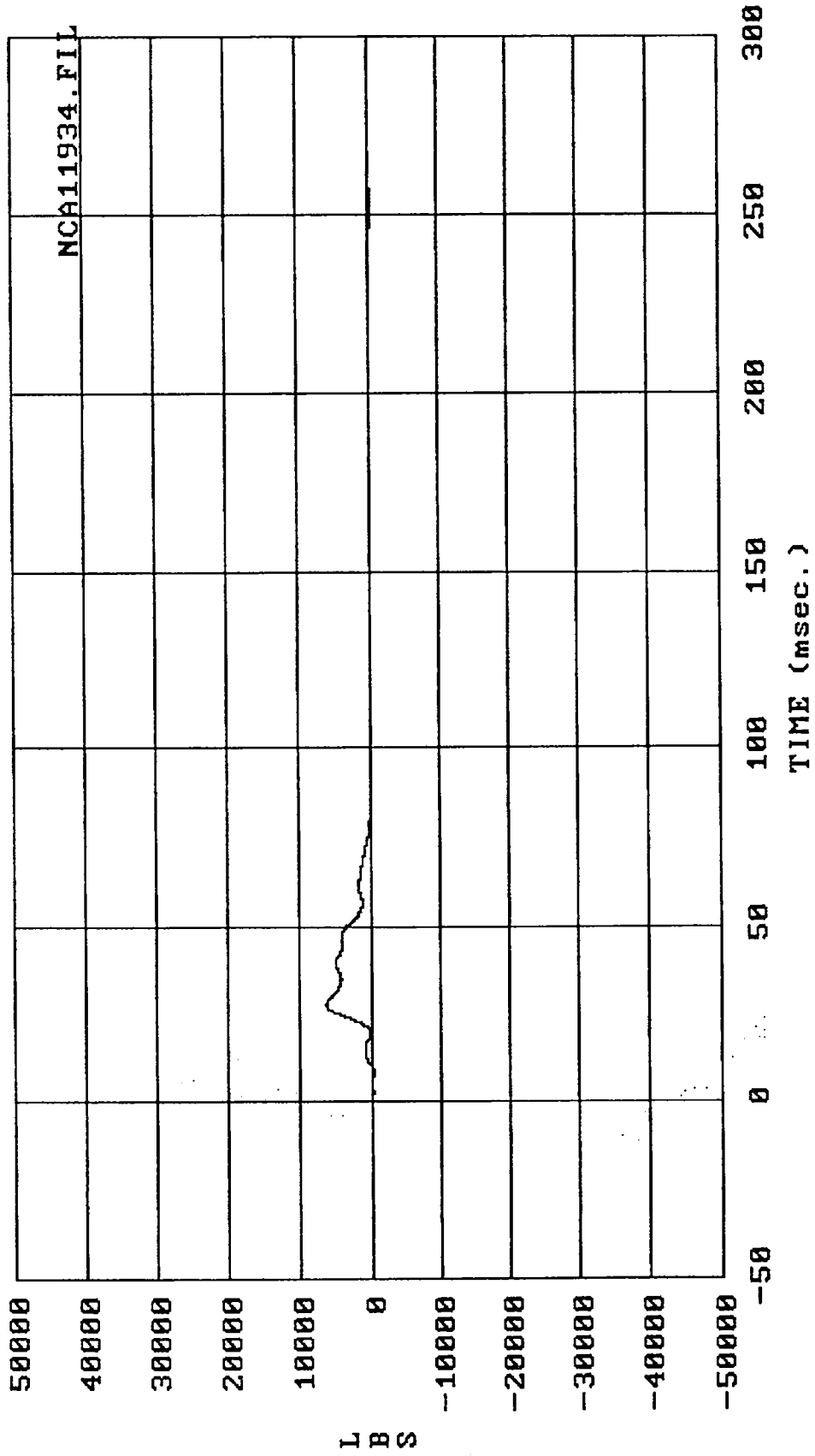
THIS PAGE INTENTIONALLY LEFT BLANK



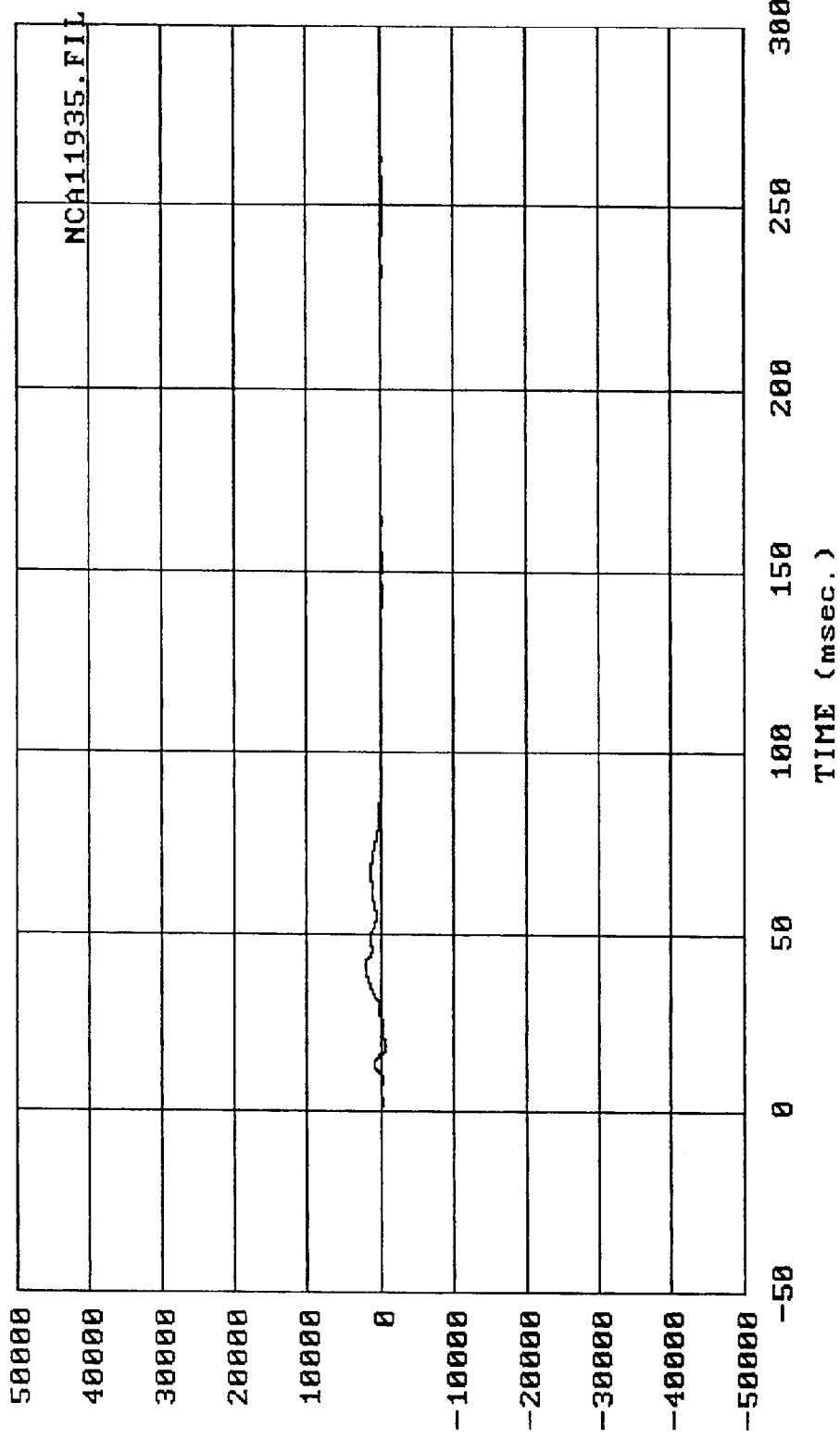
Filter: SAE CLASS 60 Max = 1201.9 Min = -226.10
MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A1



Filter: SAE CLASS 60 Max = 725.50 Min = -931.33
MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A2



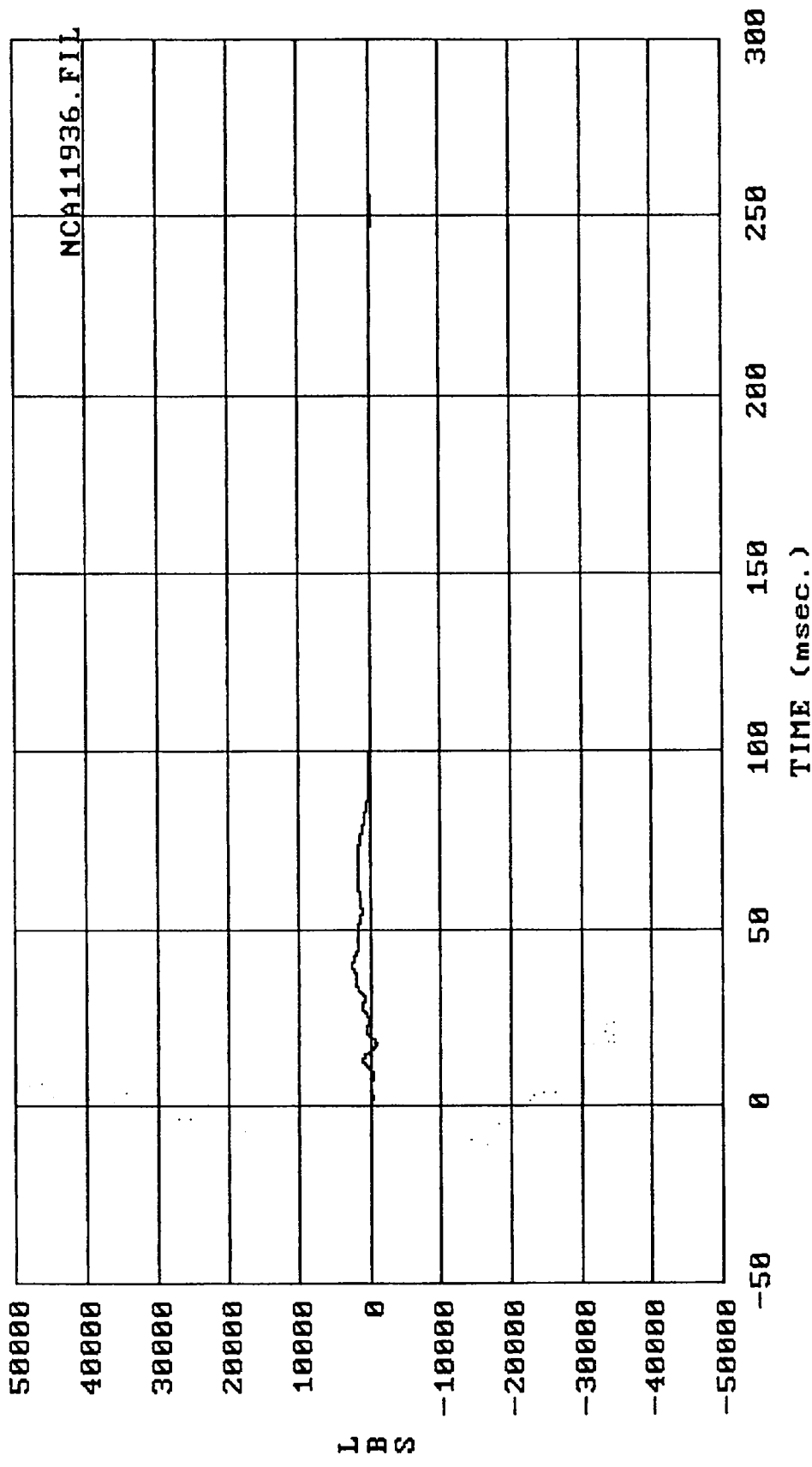
Filter: SAE CLASS 60 Max = 6502.7 Min = -271.43
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A3



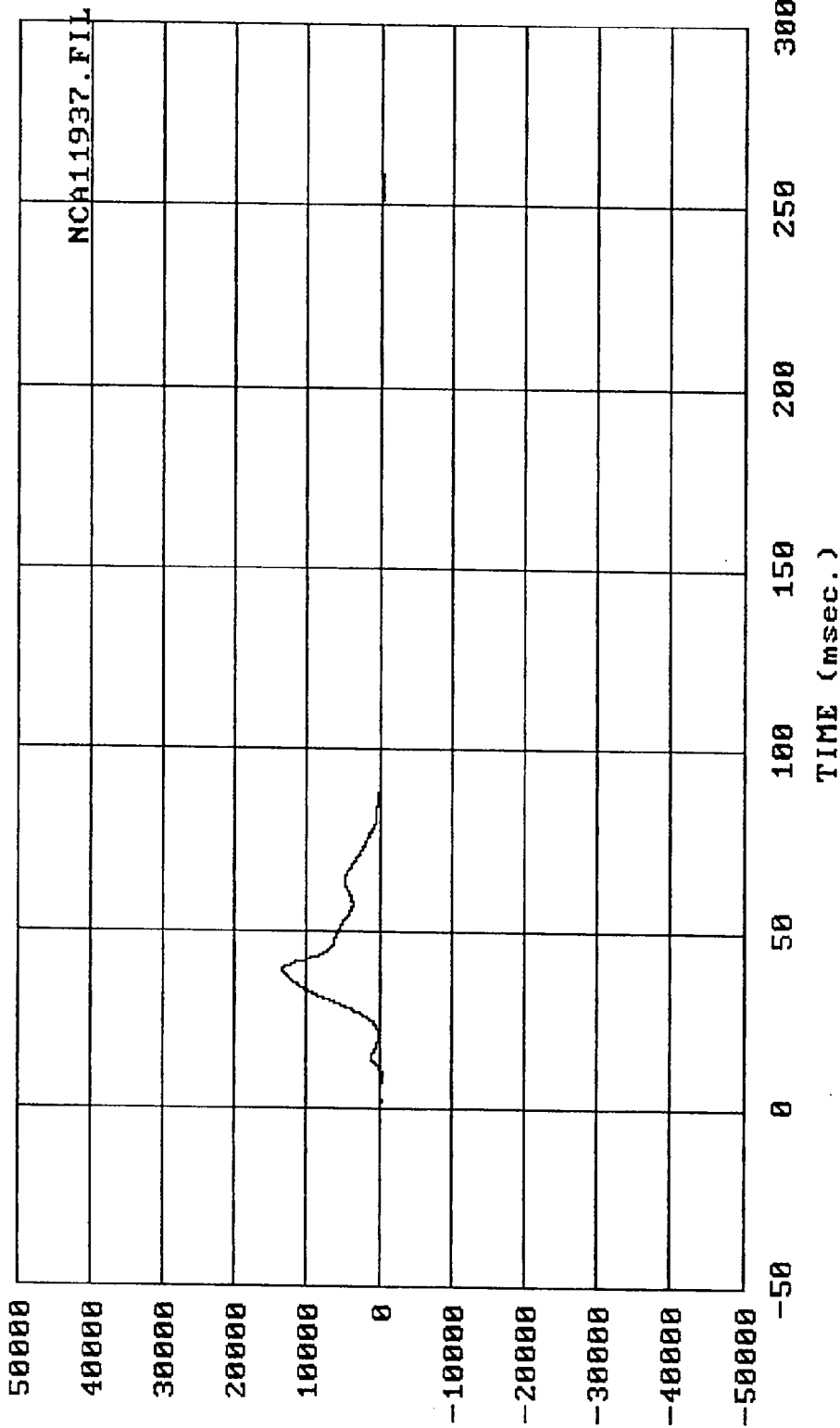
NCA11935.FIL

L
B
S

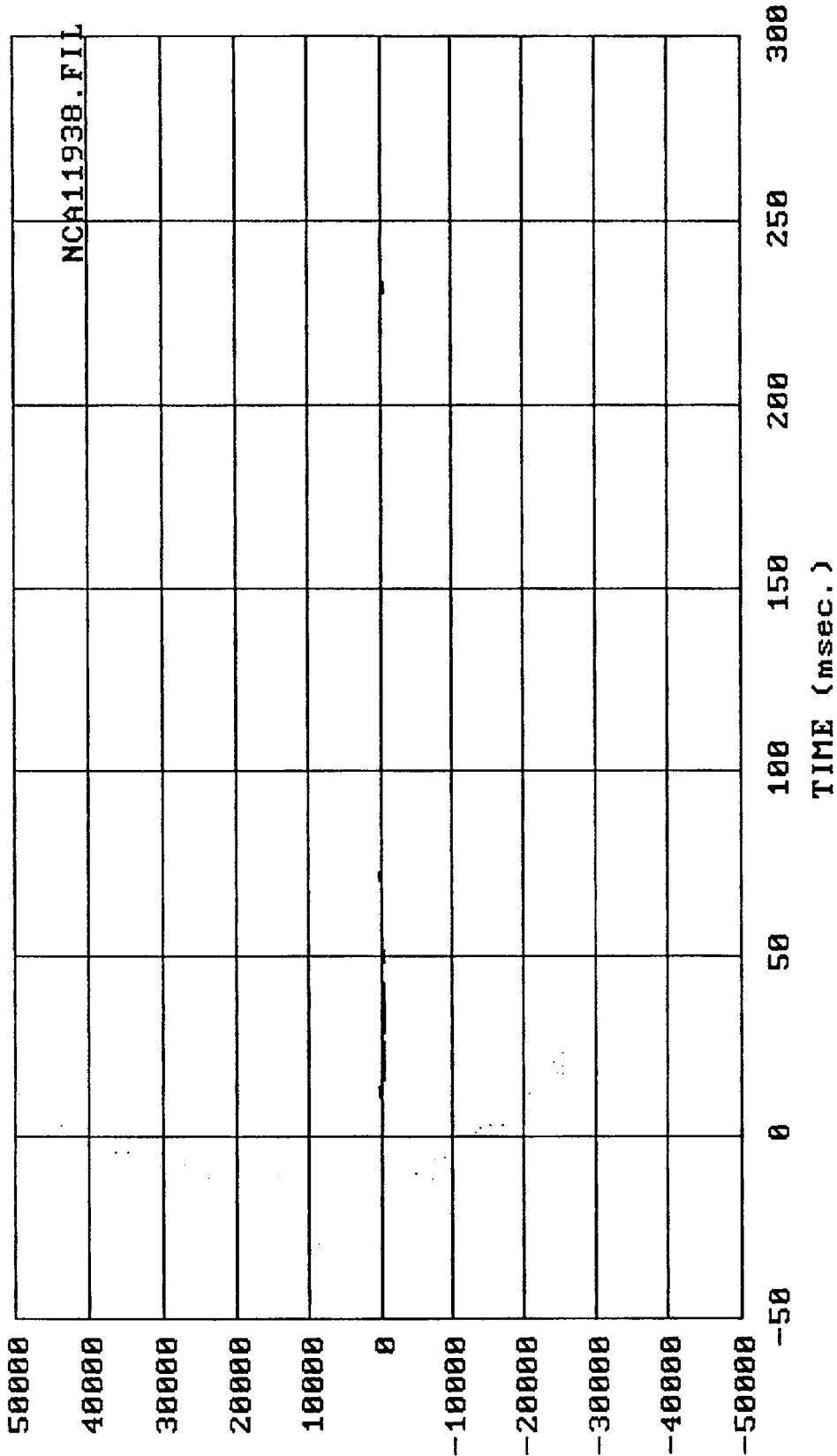
Filter: SAE CLASS 60 Max = 2210.5 Min = -710.74
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A4



Filter: SAE CLASS 60 Max = 2585.1 Min = -781.47
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A5

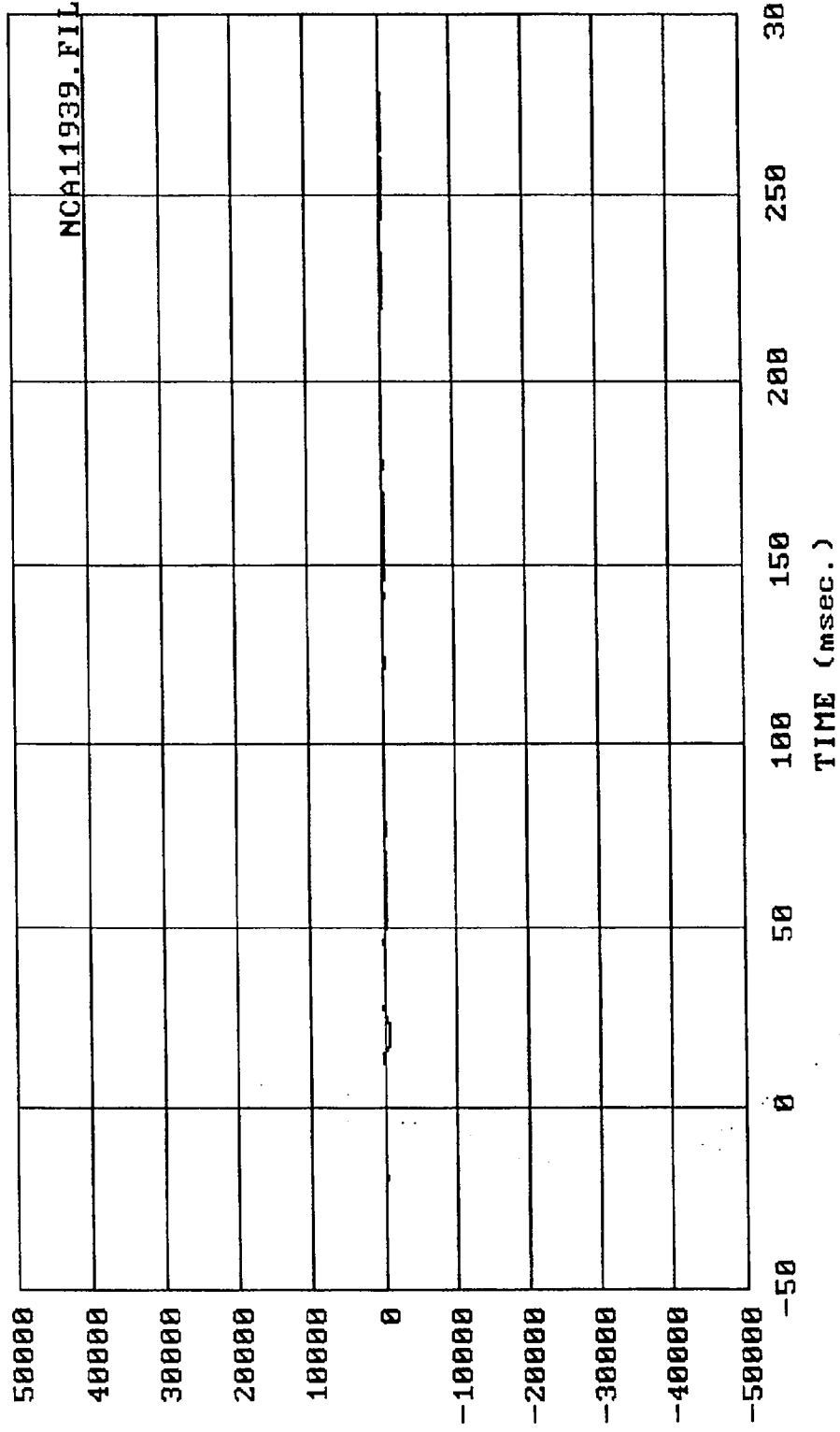


Filter: SAE CLASS 60 Max = 13482. Min = -340.57
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A6



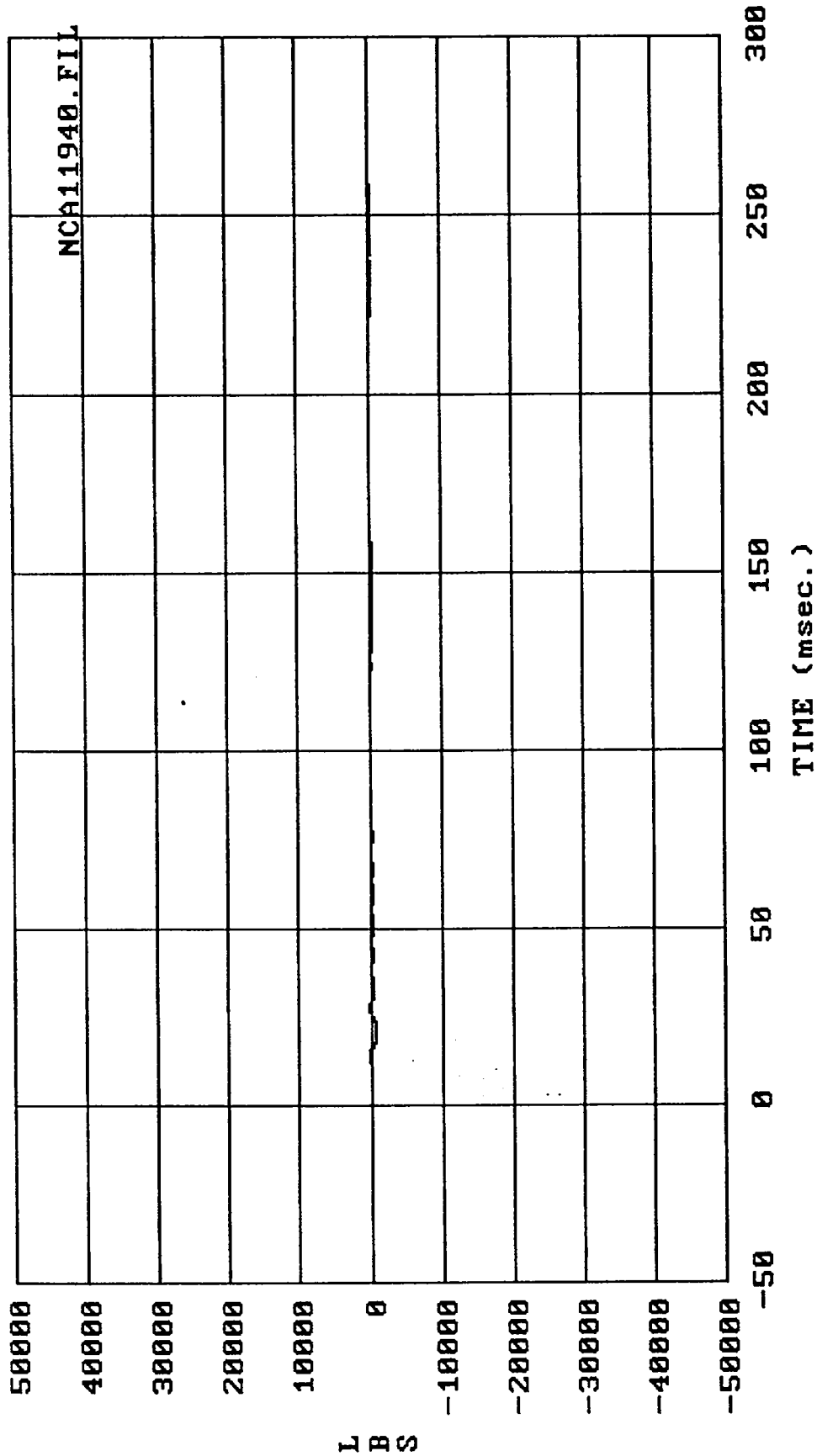
Filter: SAE CLASS 60 Max = 221.37 Min = -448.19

MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A7

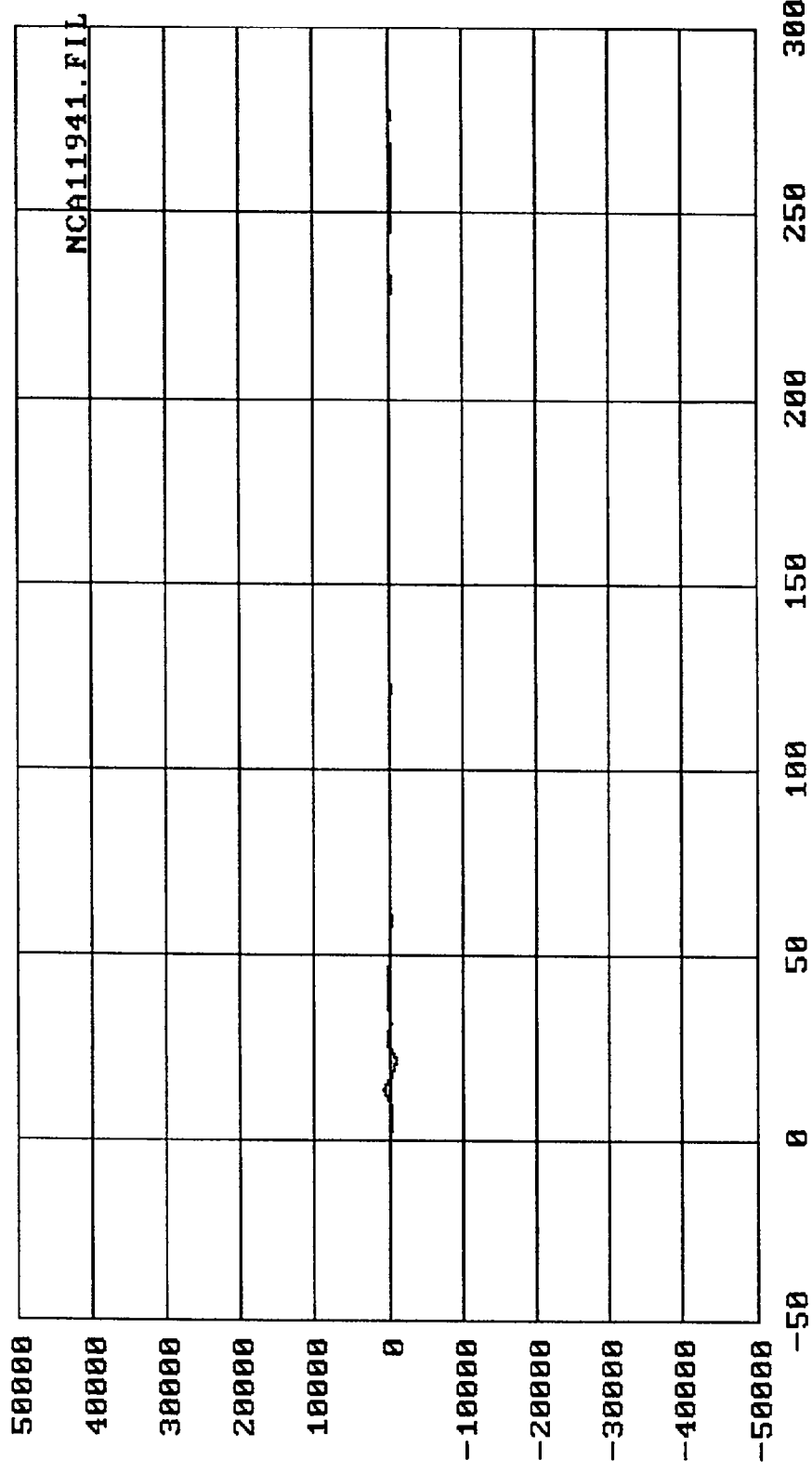


Filter: SAE CLASS 60 Max = 349.69 Min = -733.73
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A8

L
B
S

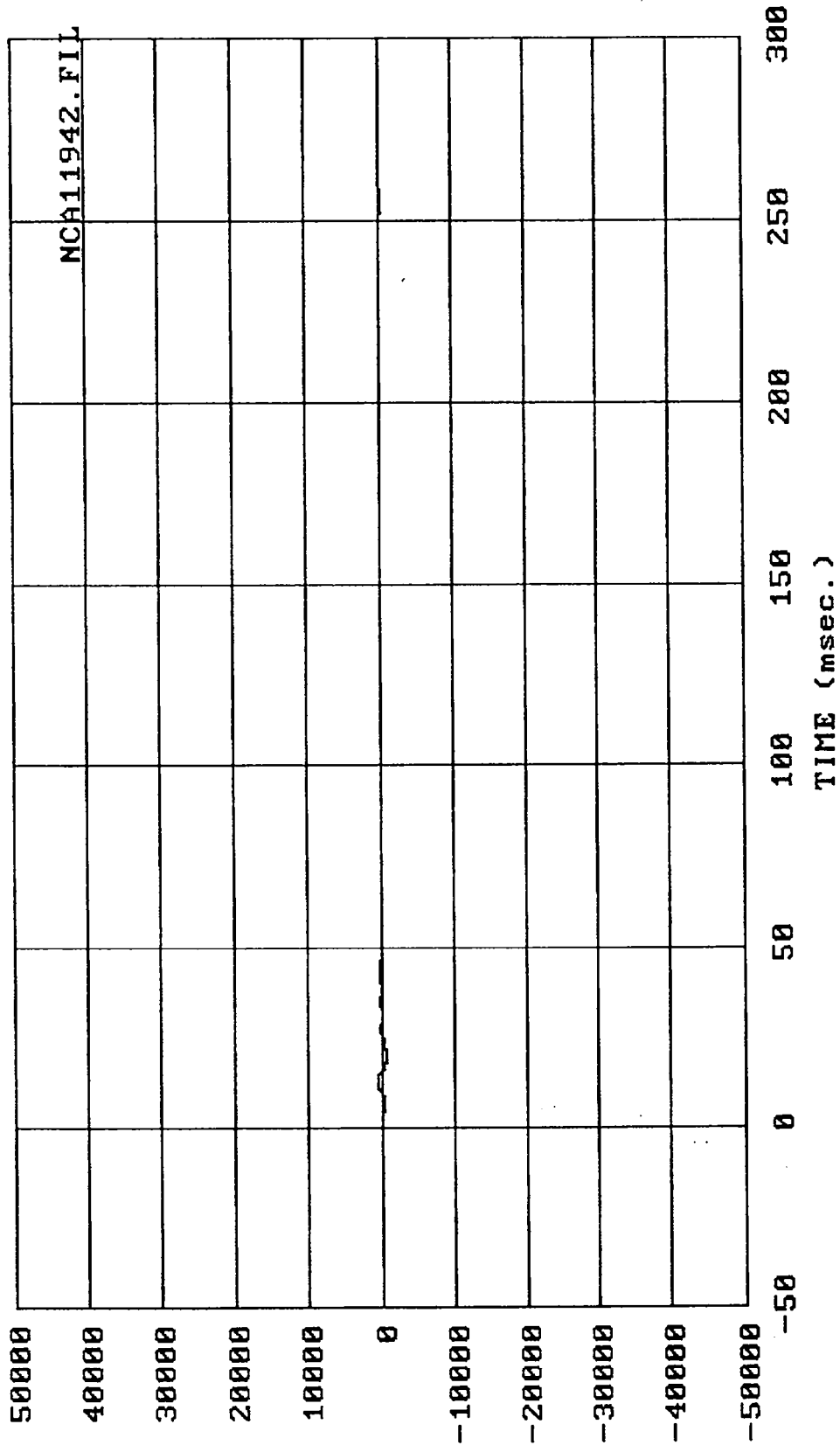


Filter: SAE CLASS 60 Max = 313.95 Min = -664.50
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell A9



Filter: SAE CLASS 60 Max = 747.16 Min = -804.53
MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B1

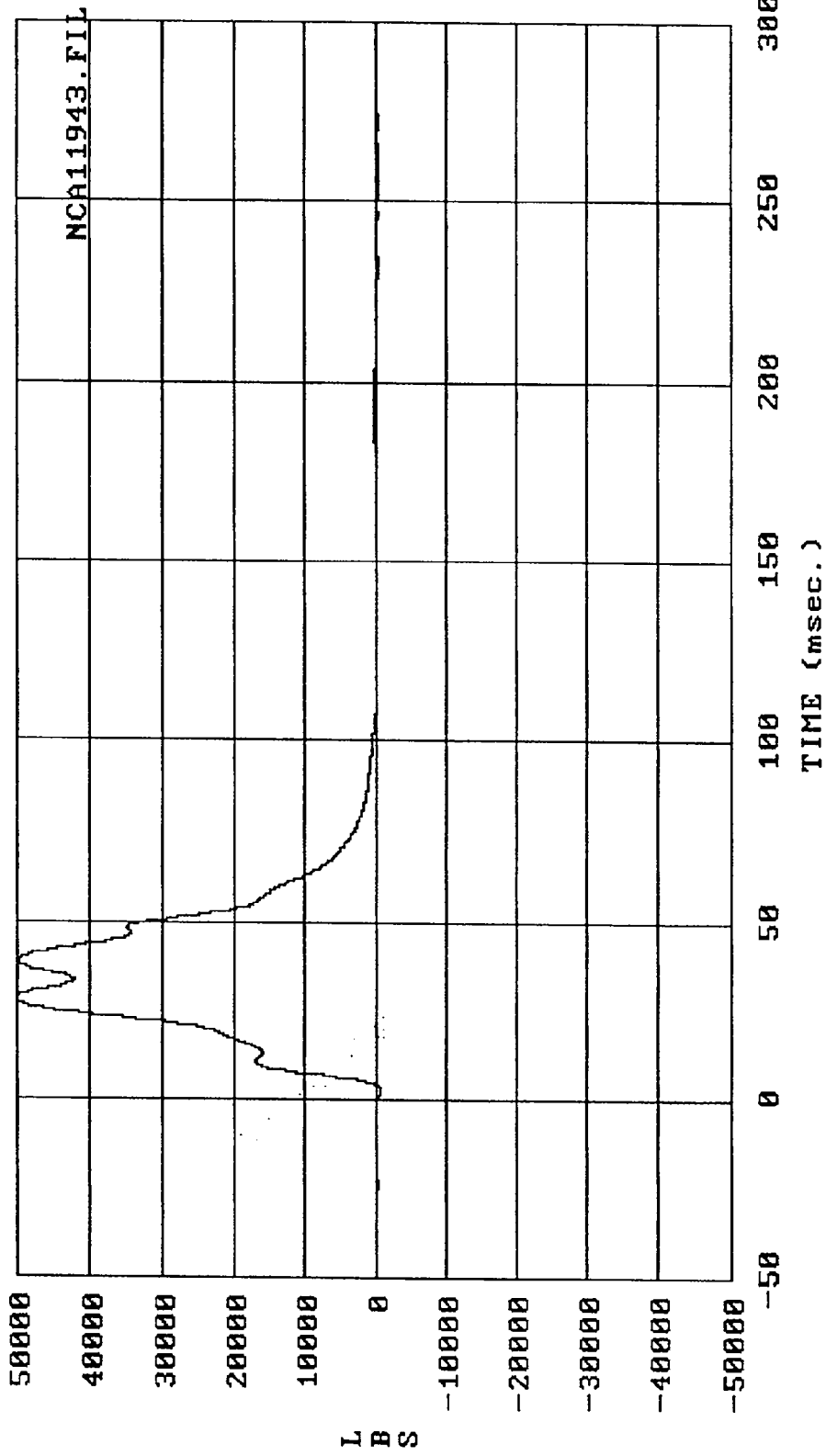
L
B
S



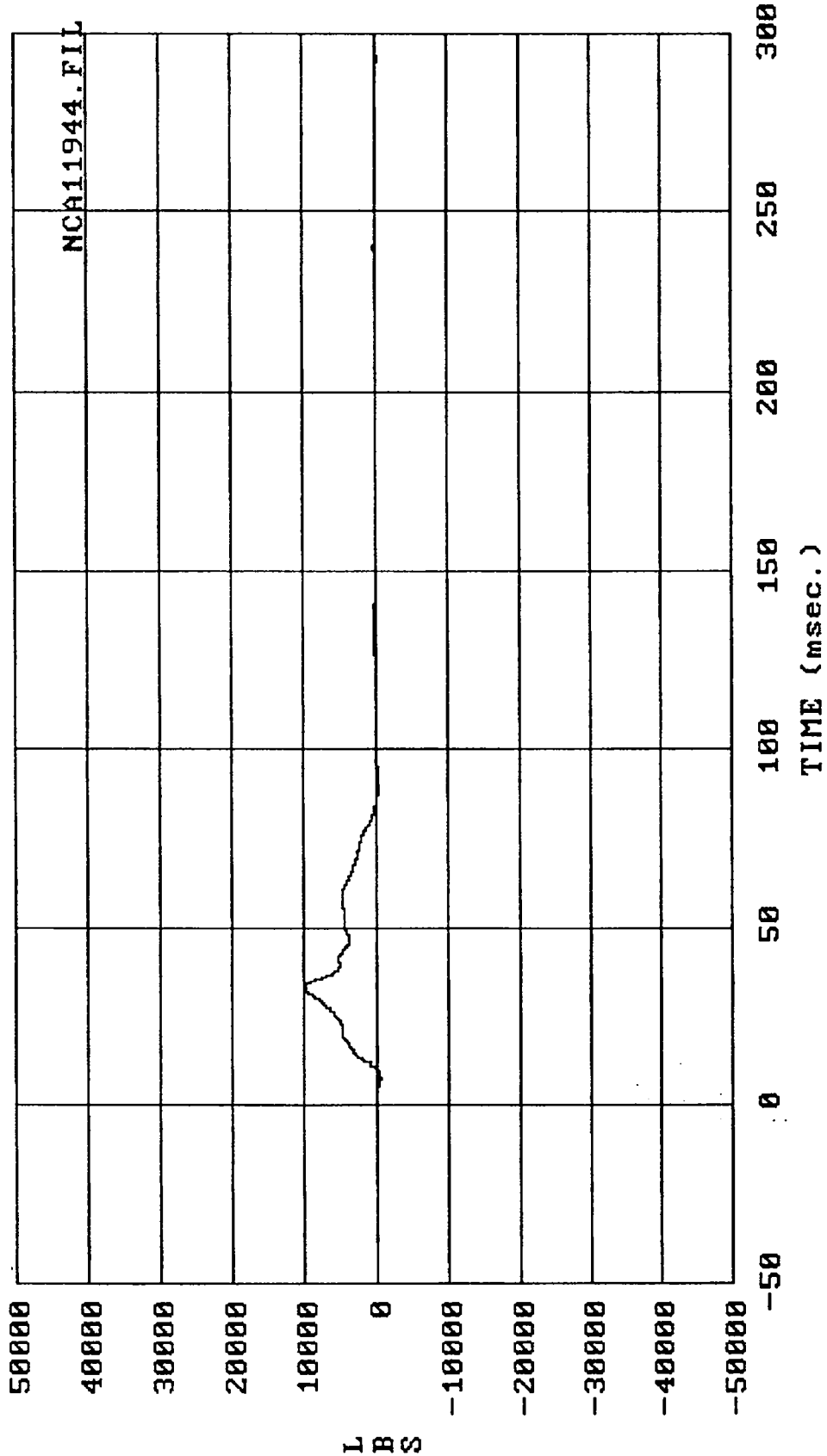
Filter: SAE CLASS 60 Max = 727.94 Min = -501.16

MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B2

L
B
S

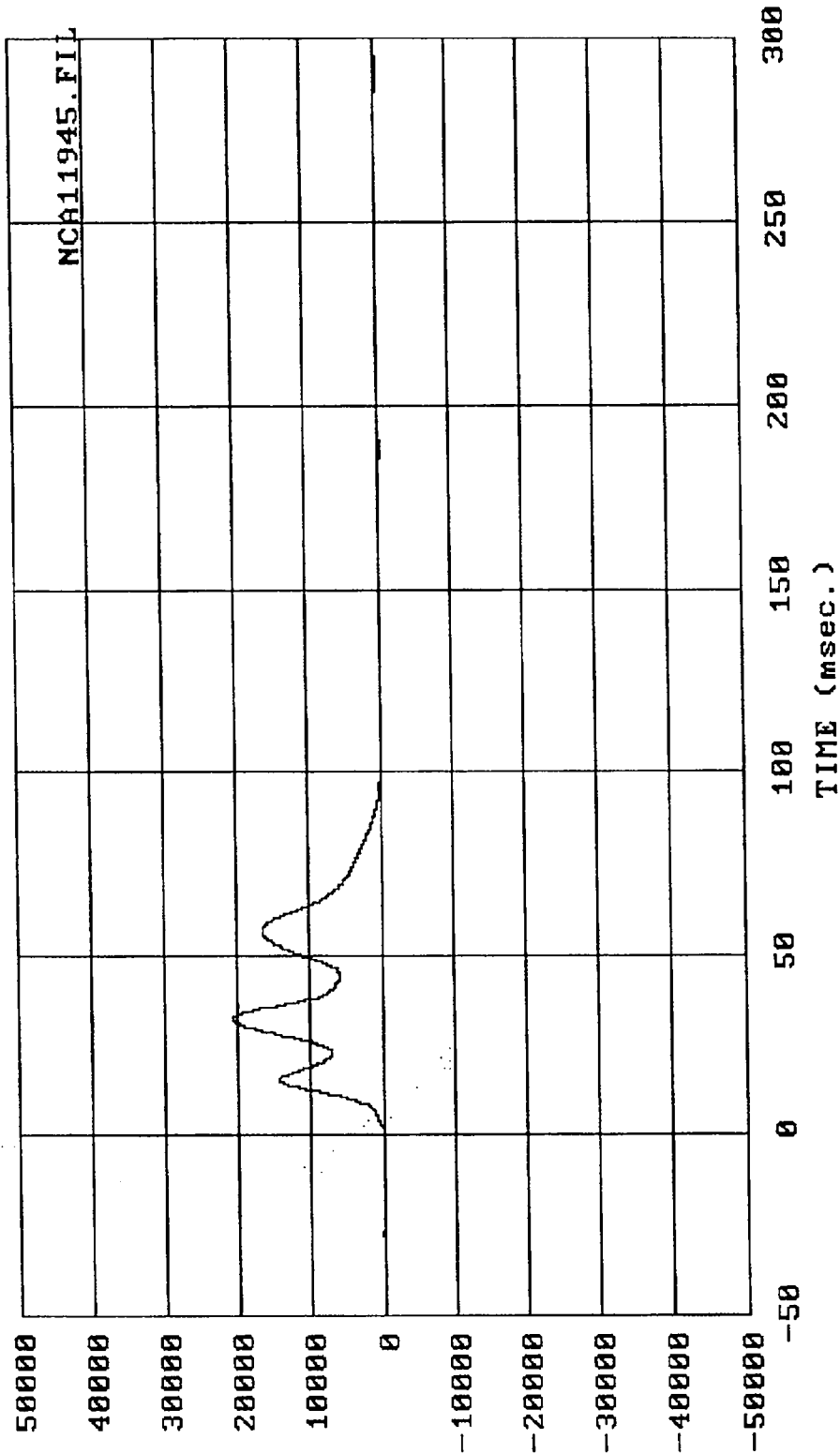


Filter: SAE CLASS 60 Max = 50319. Min = -673.76
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B3



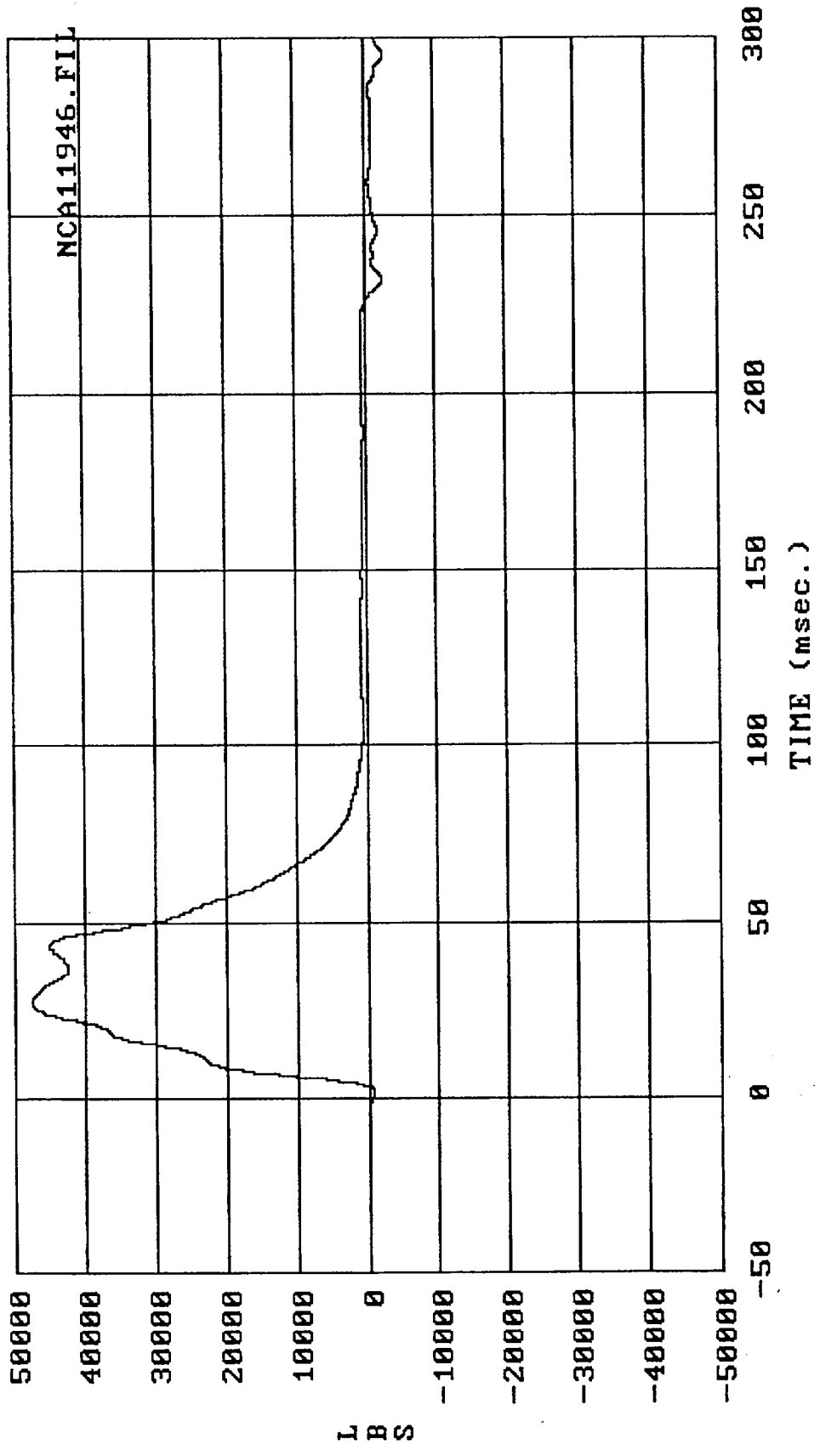
Filter: SAE CLASS 60 Max = 10123. Min = -455.90

MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B4

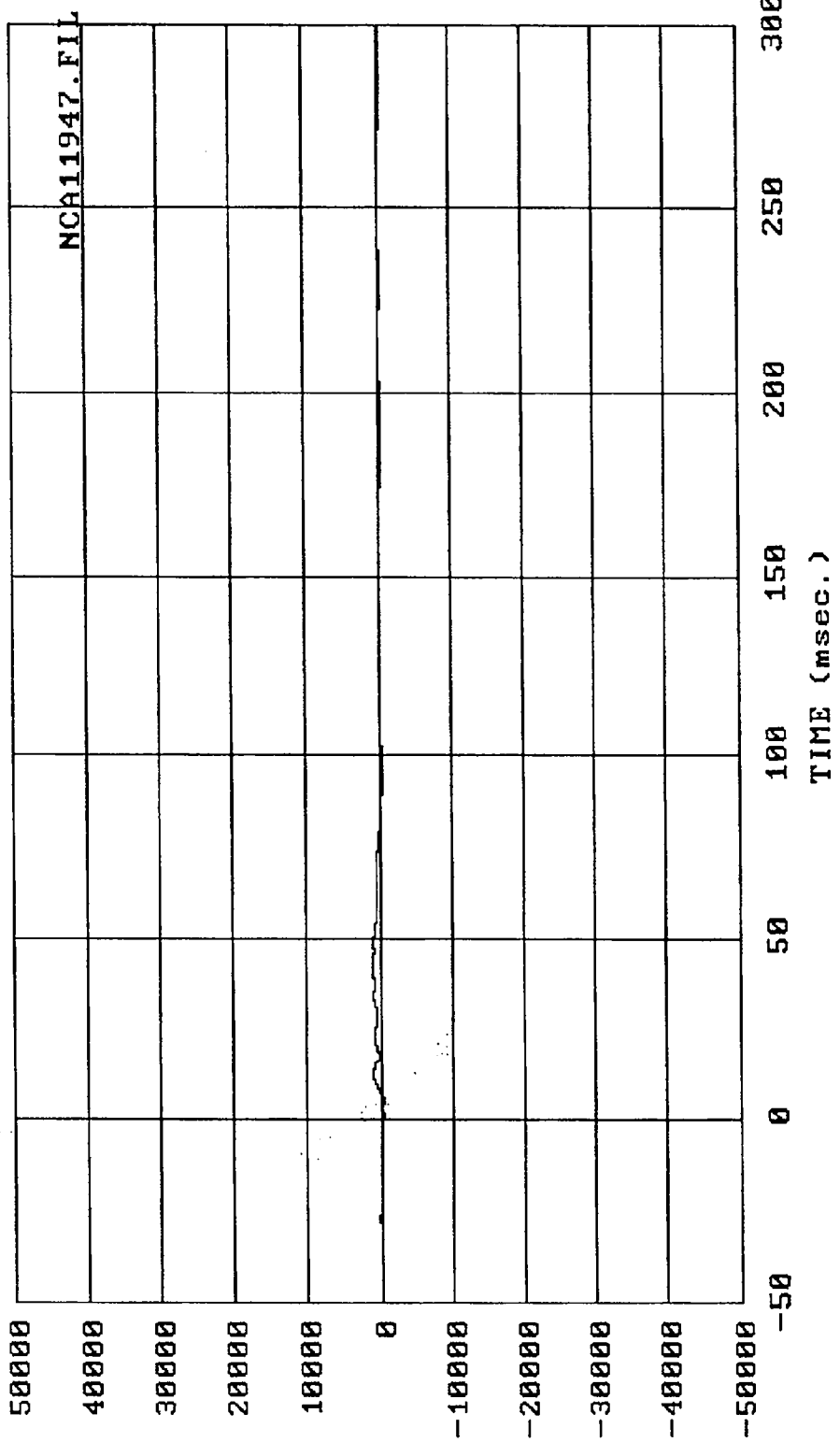


L
B
S

Filter: SAE CLASS 60 Max = 20828. Min = -198.85
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B5

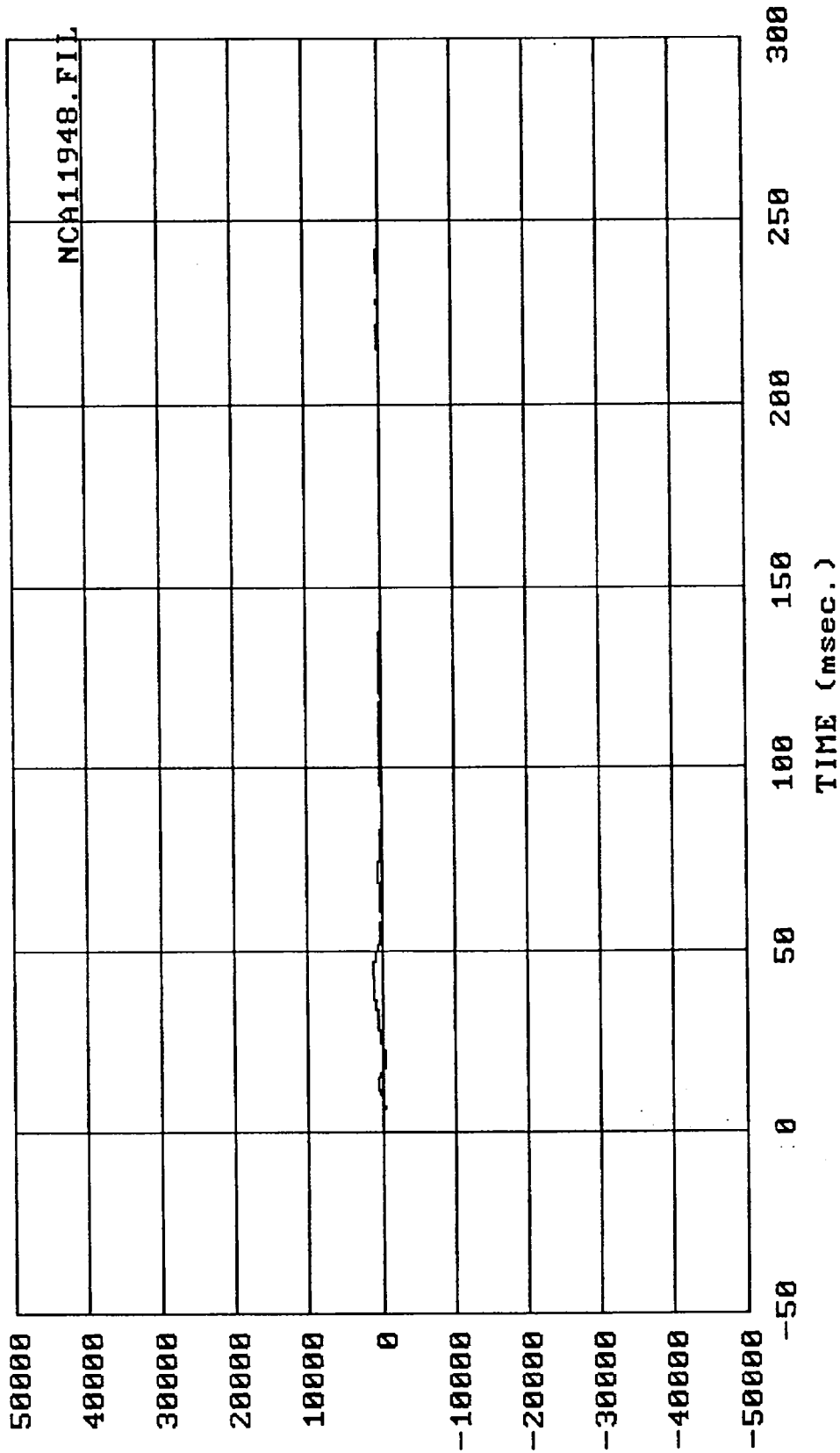


Filter: SAE CLASS 60 Max = 47582. Min = -2814.5
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B6

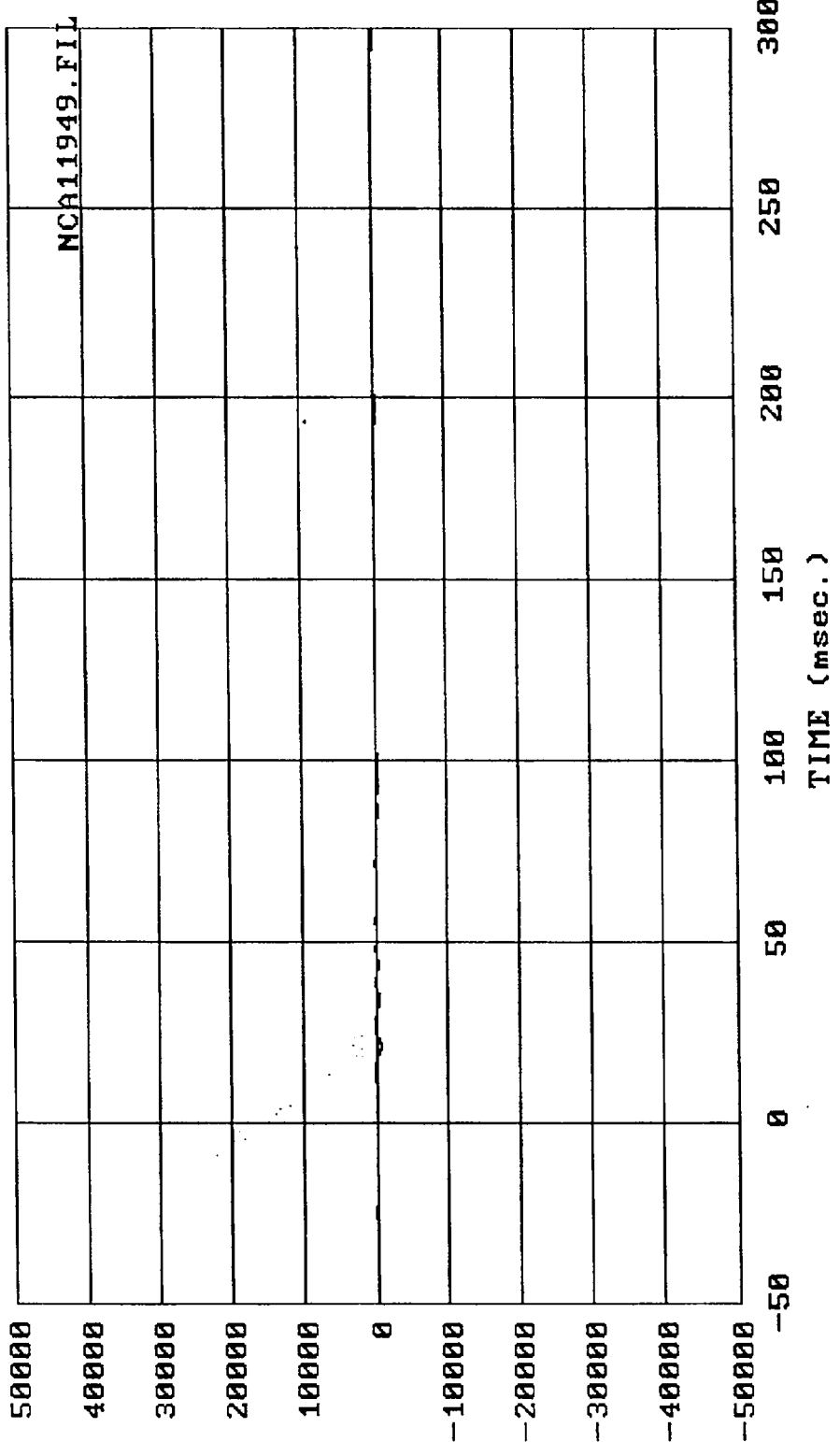


L
B
S

Filter: SAE CLASS 60 Max = 1318.4 Min = -347.56
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B7

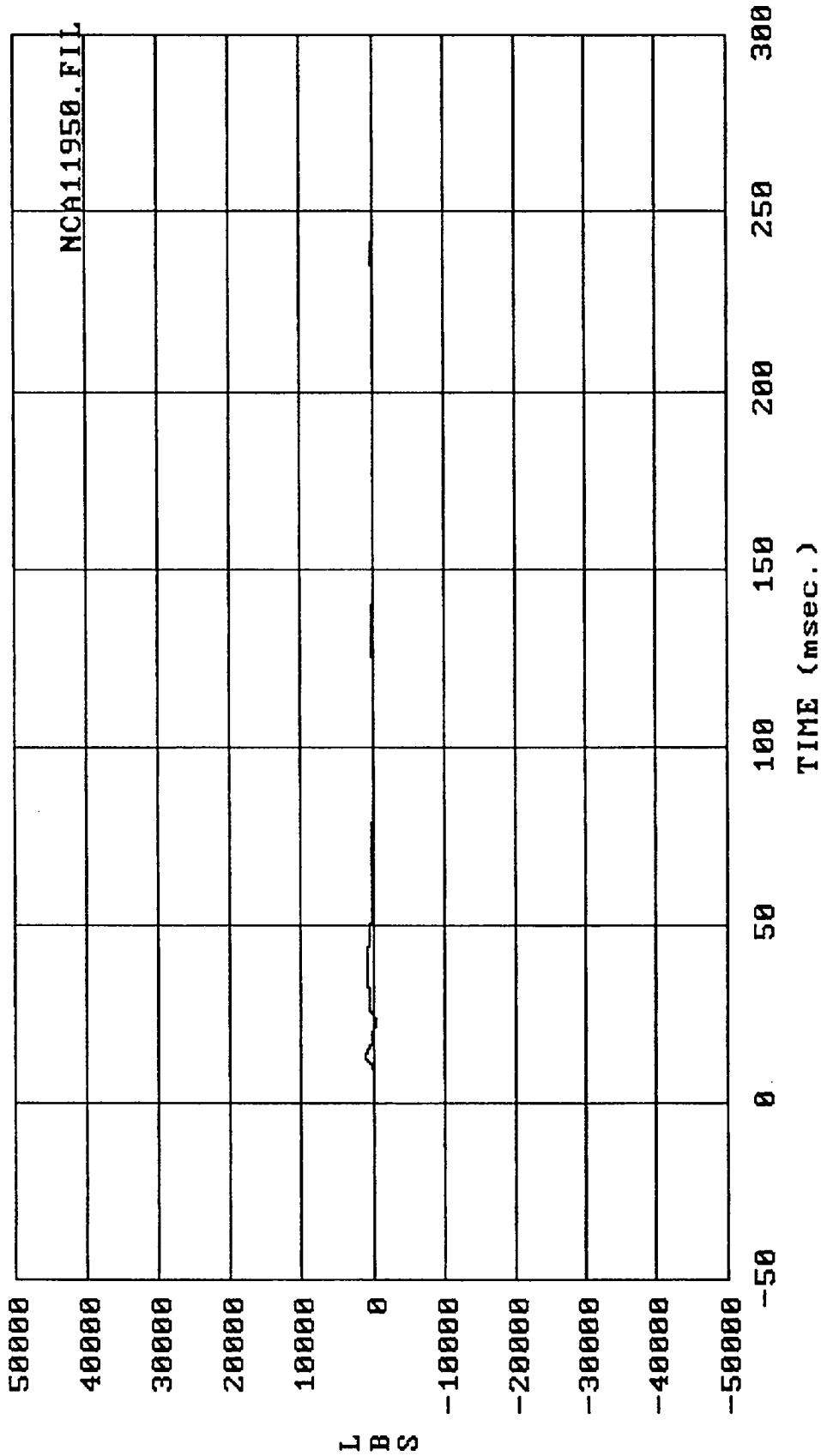


Filter: SAE CLASS 60 Max = 1342.4 Min = -341.07
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell B8



Filter: SAE CLASS 60 Max = 308.19 Min = -523.04
 MSE 05/23/89 --- 1989 Isuzu Trooper : Barrier force - Load cell B9

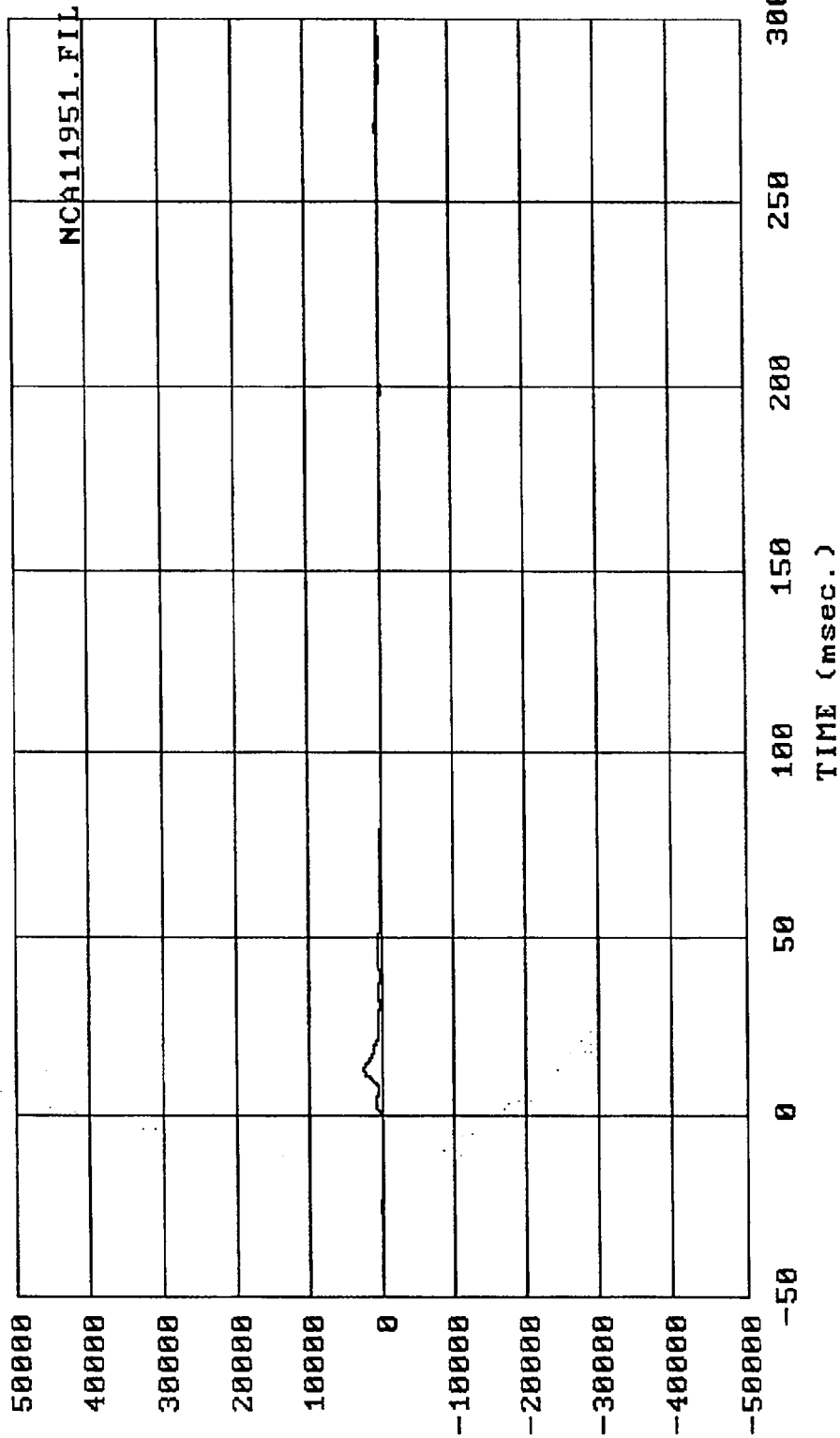
L
B
S



Filter: SAE CLASS 60 Max = 1194.0 Min = -252.46

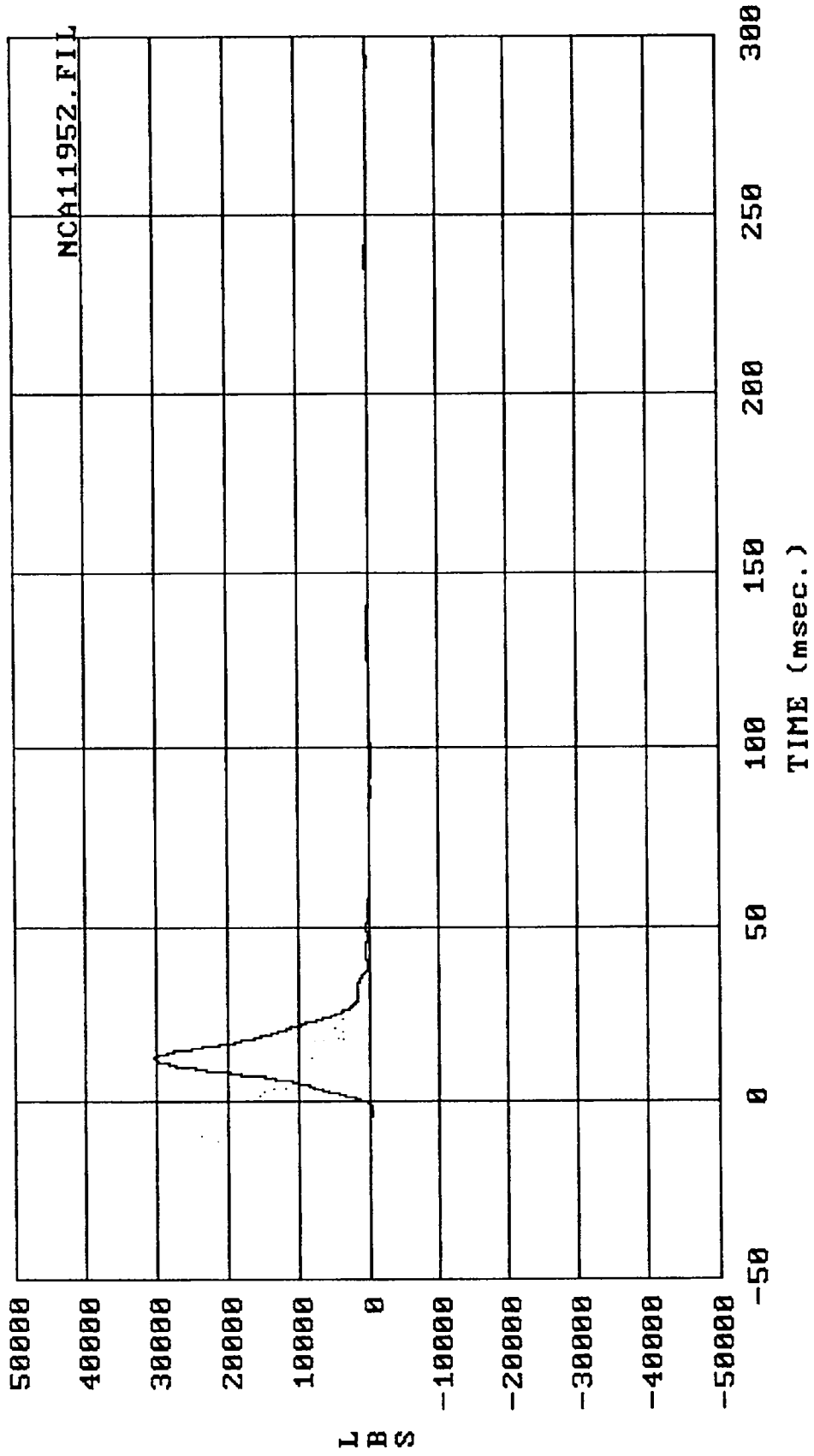
MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell C1

L
B
S



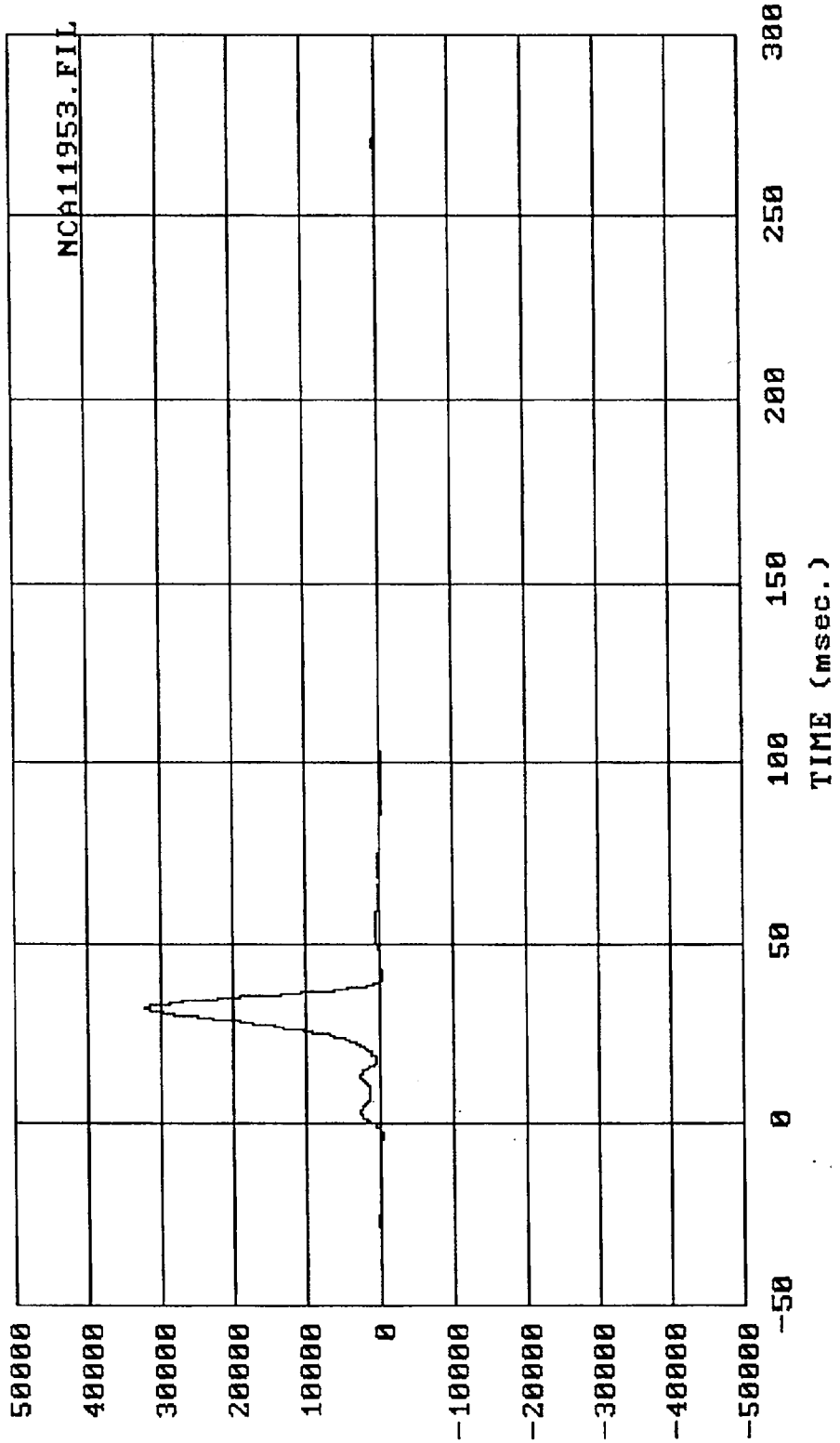
L
B
S

Filter: SAE CLASS 60 Max = 2686.7 Min = -218.55
 MSE 05/23/89 --- 1989 Isuzu Trooper : Barrier force - Load cell C2



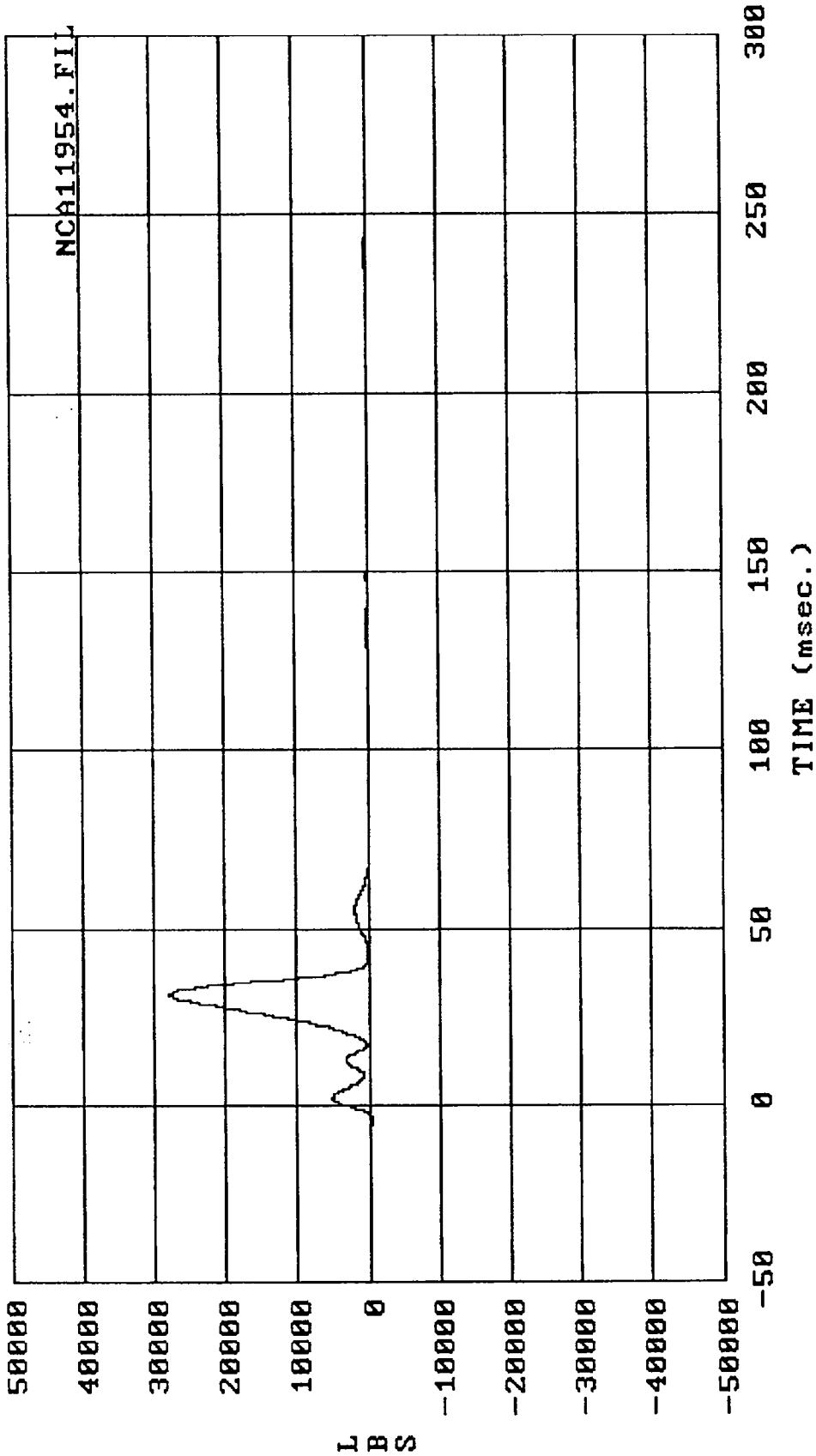
Filter: SAE CLASS 60 Max = 30396. Min = -238.26

MSE 05/23/89 --- 1989 Isuzu Trooper : Barrier force - Load cell C3

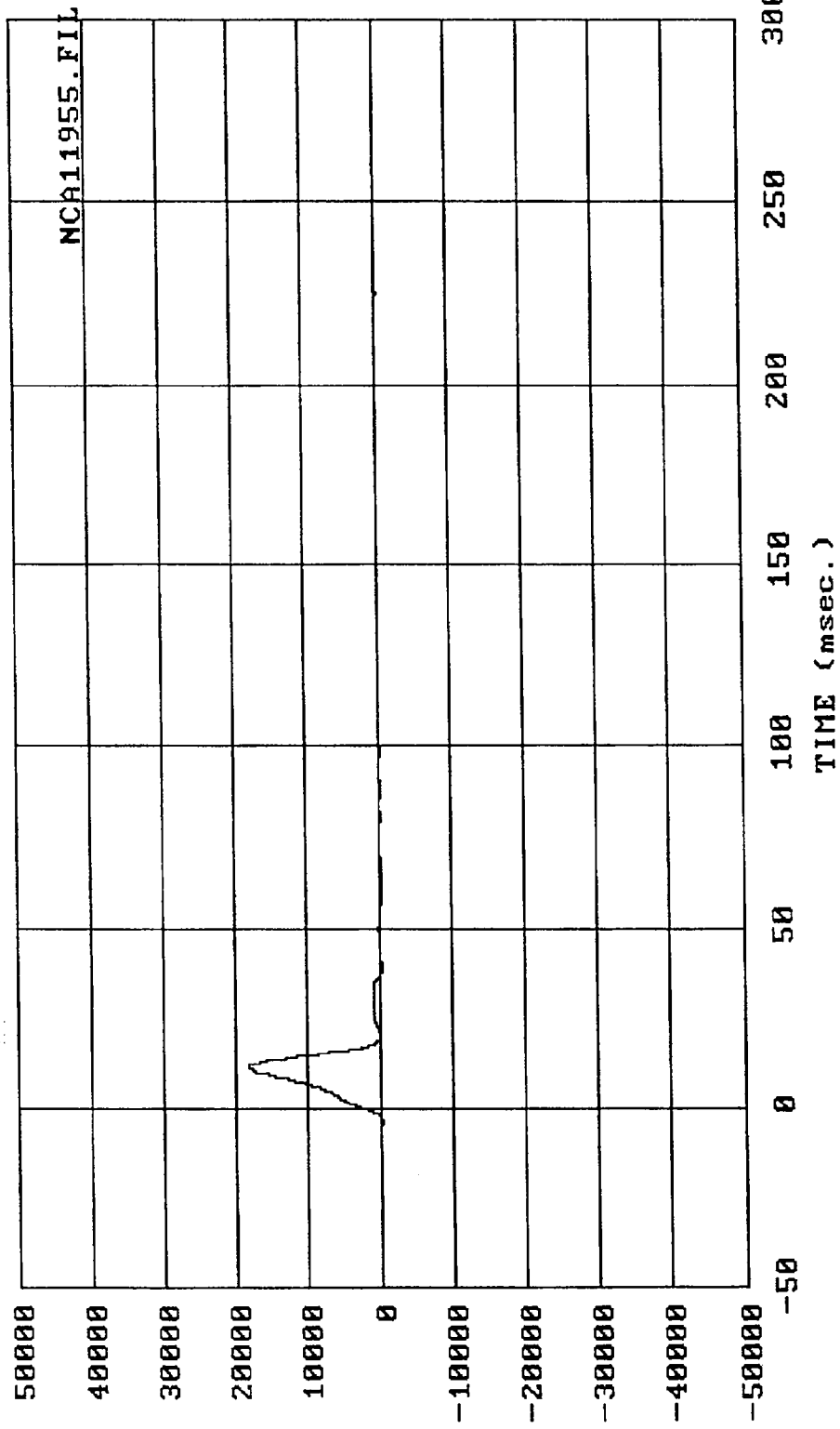


Filter: SAE CLASS 60 Max = 32093. Min = -420.20
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell C4

L
B
S

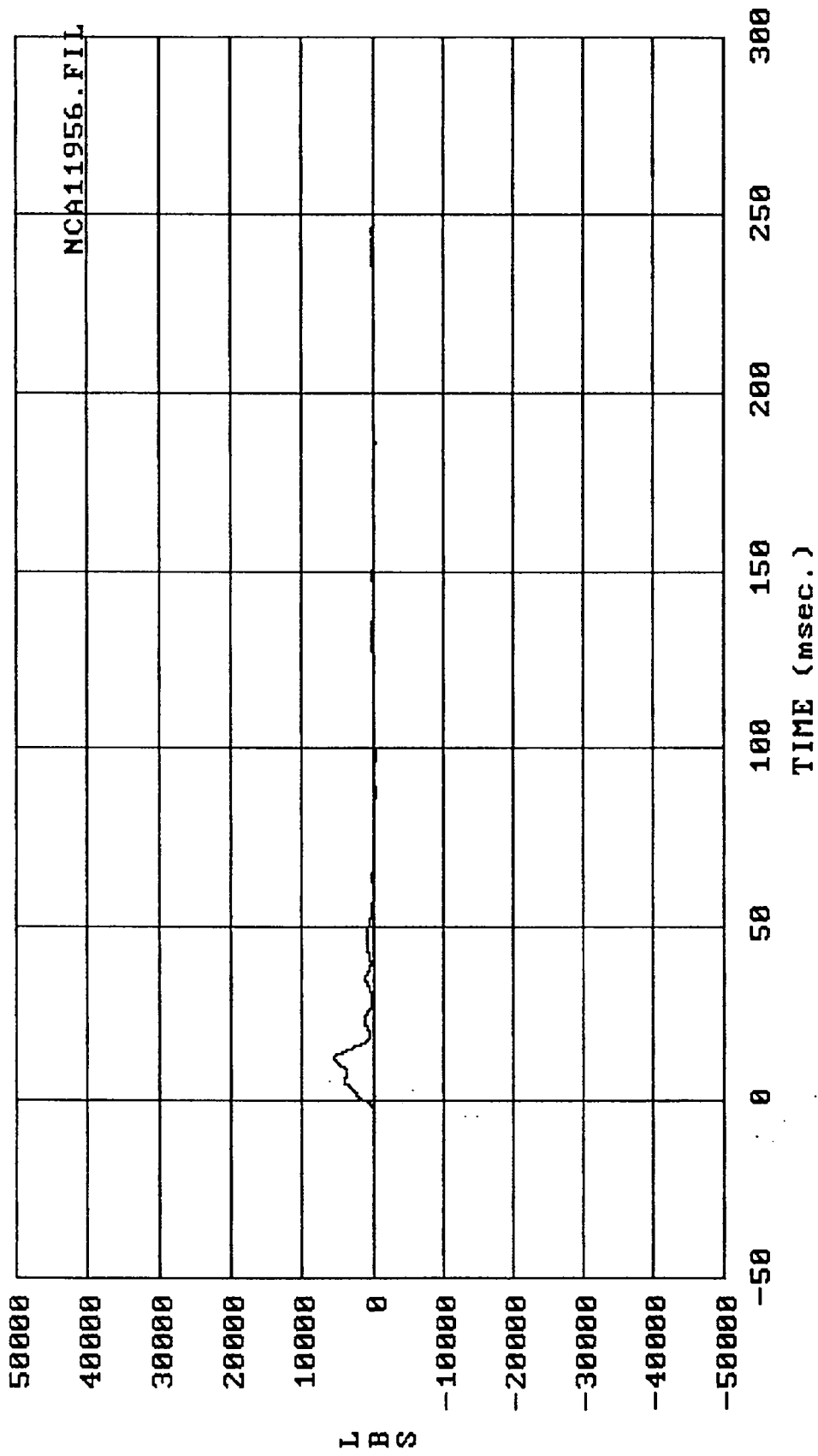


Filter: SAE CLASS 60 Max = 27999. Min = -156.35
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell C5



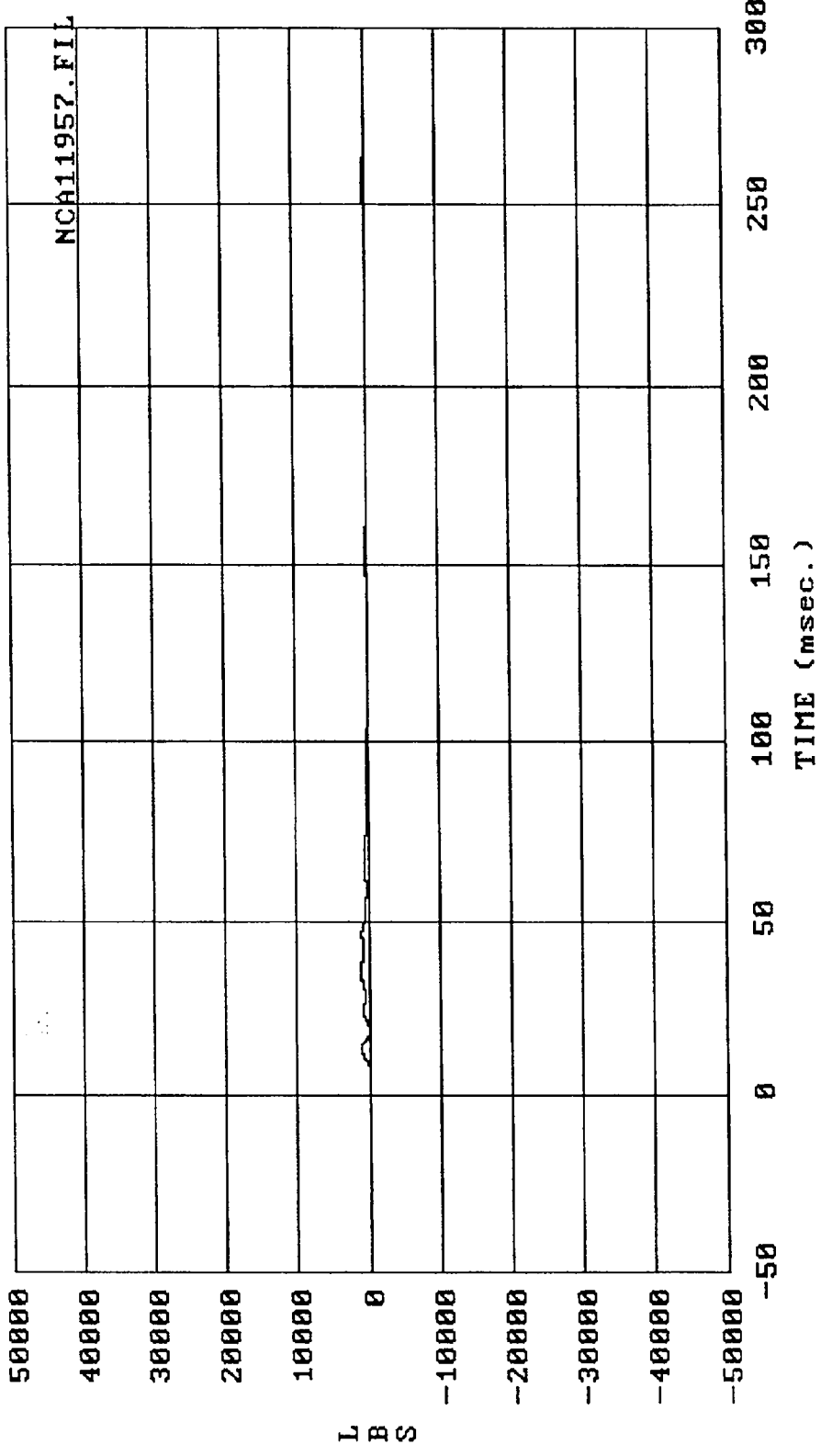
Filter: SAE CLASS 60 Max = 18362. Min = -322.51
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell C6

L
B
S

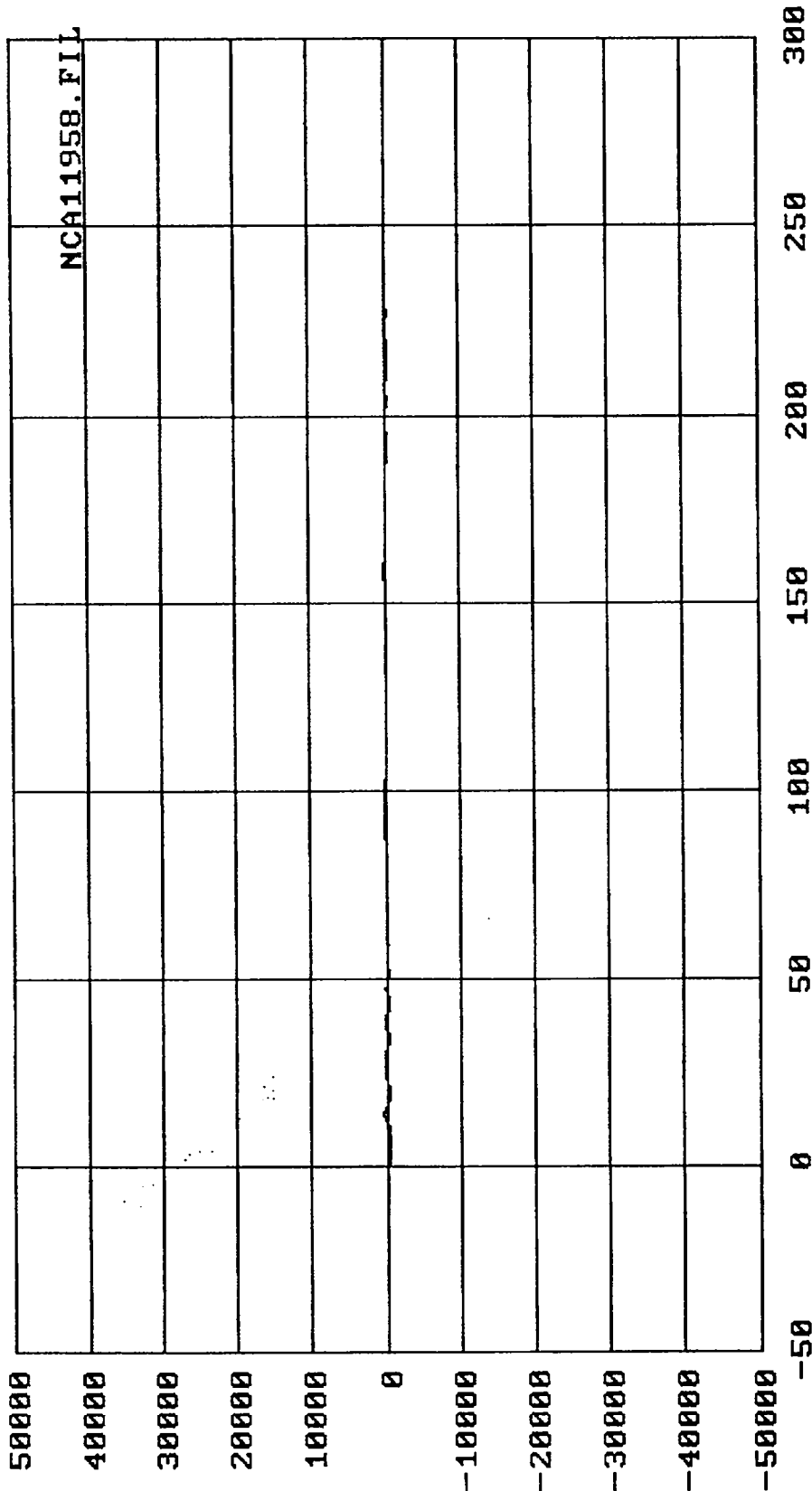


Filter: SAE CLASS 60 Max = 5730.8 Min = -186.08

MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell C7



Filter: SAE CLASS 60 Max = 1331.1 Min = -140.16
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell C8

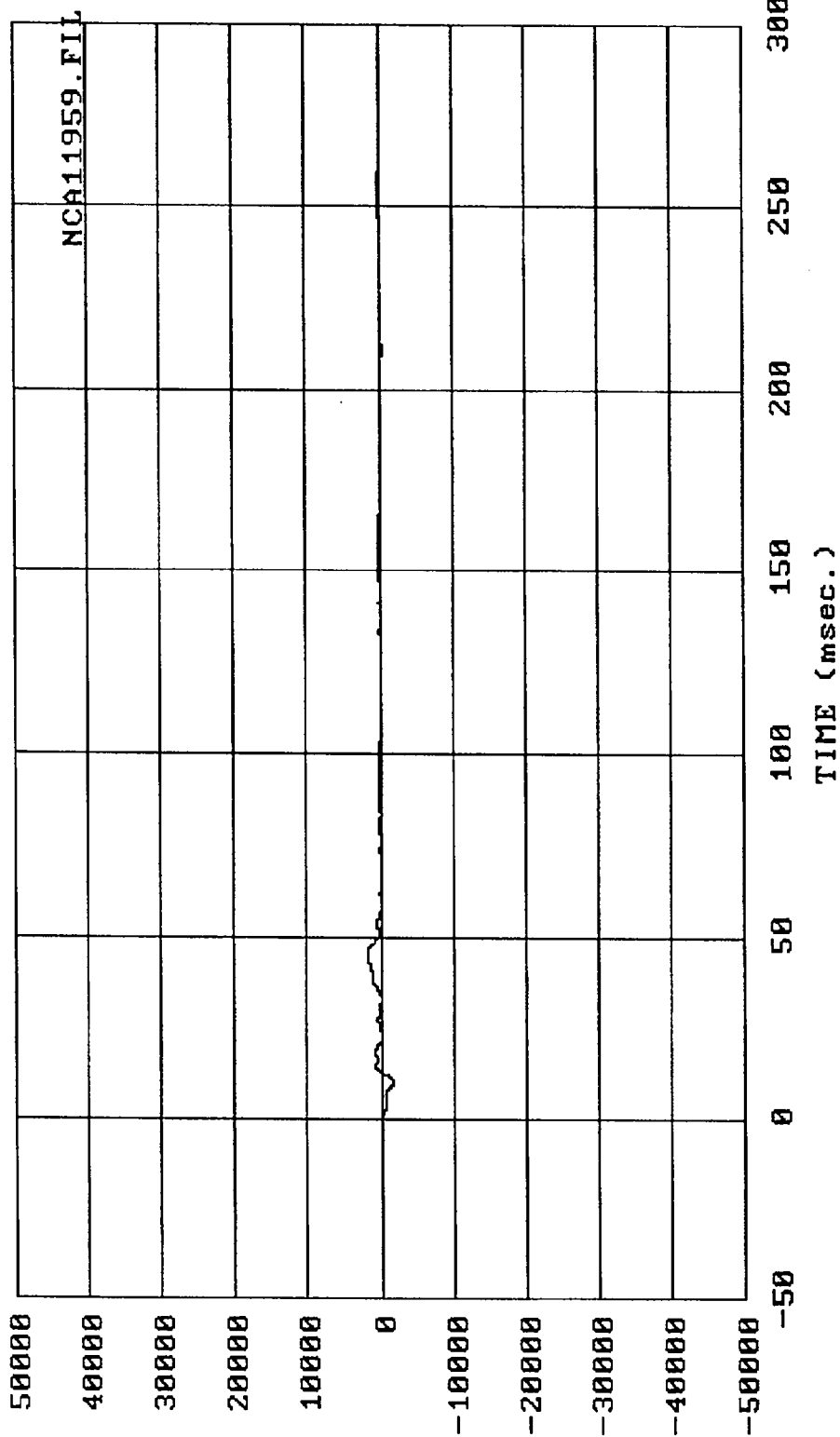


TIME (msec.)

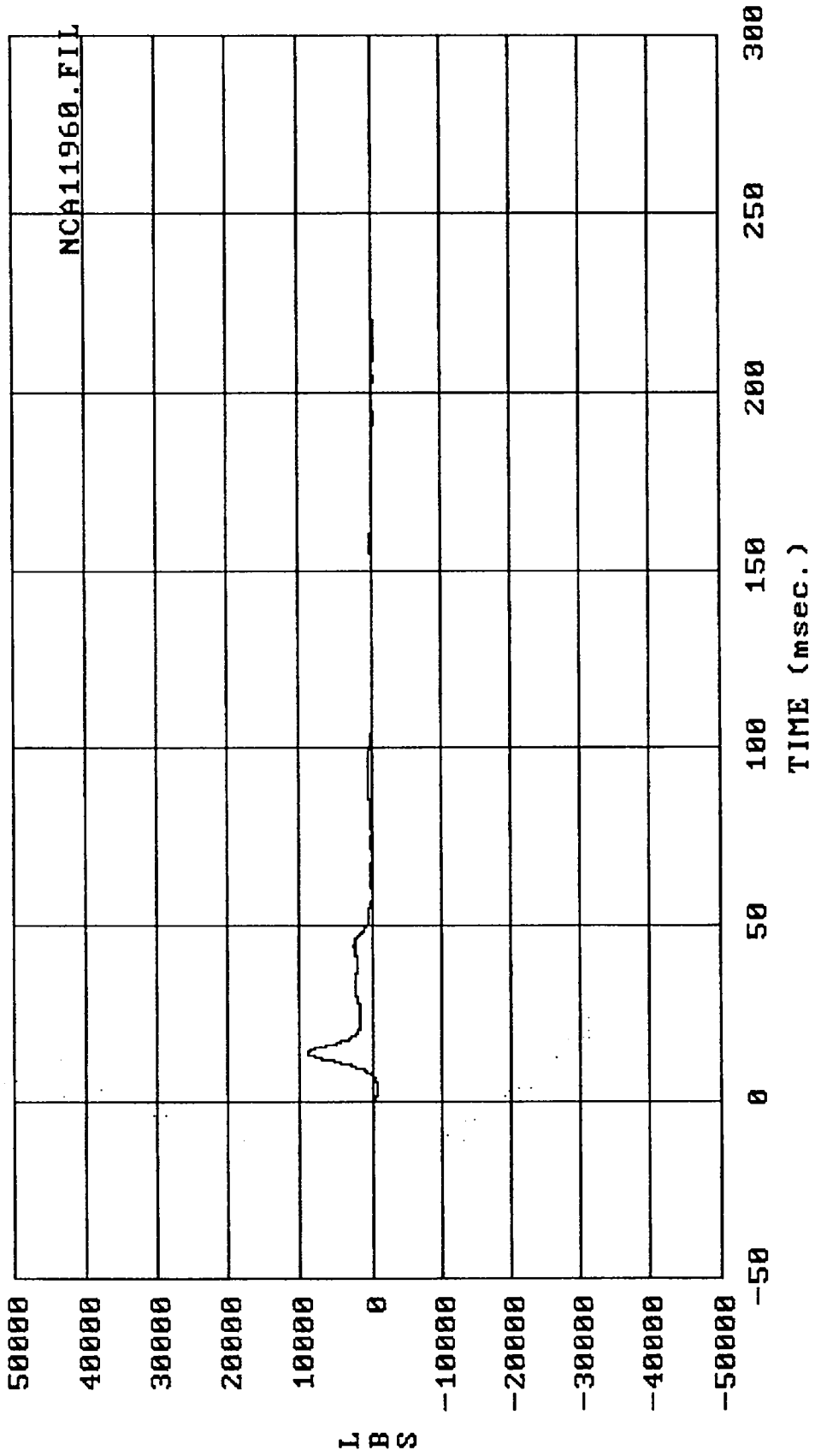
Filter: SAE CLASS 60 Max = 454.57 Min = -442.27

MSE 05/23/89 --- 1989 Isuzu Trooper : Barrier force - Load cell C9

L B S

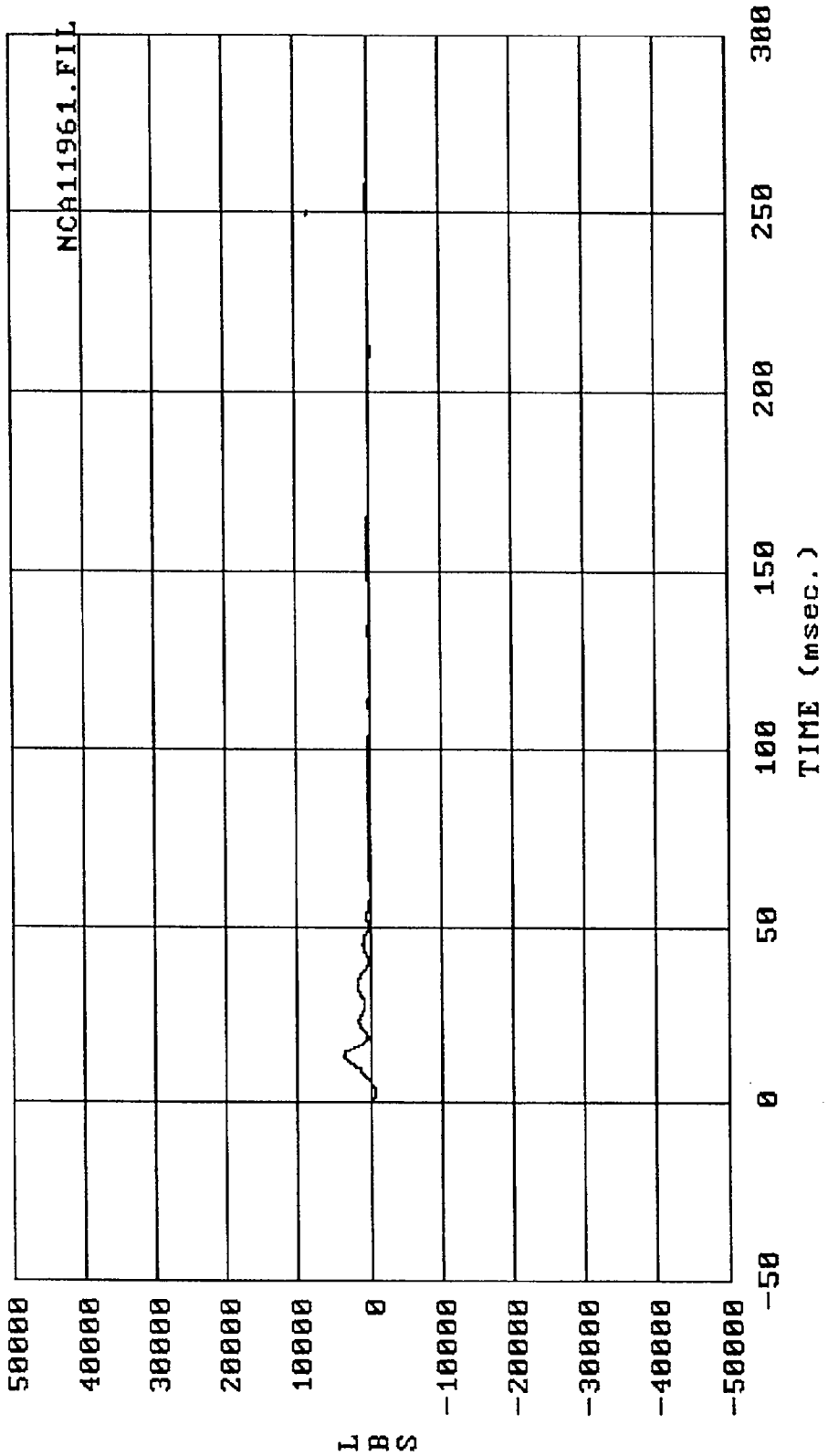


Filter: SAE CLASS 60 Max = 1938.2 Min = -1599.5
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D1

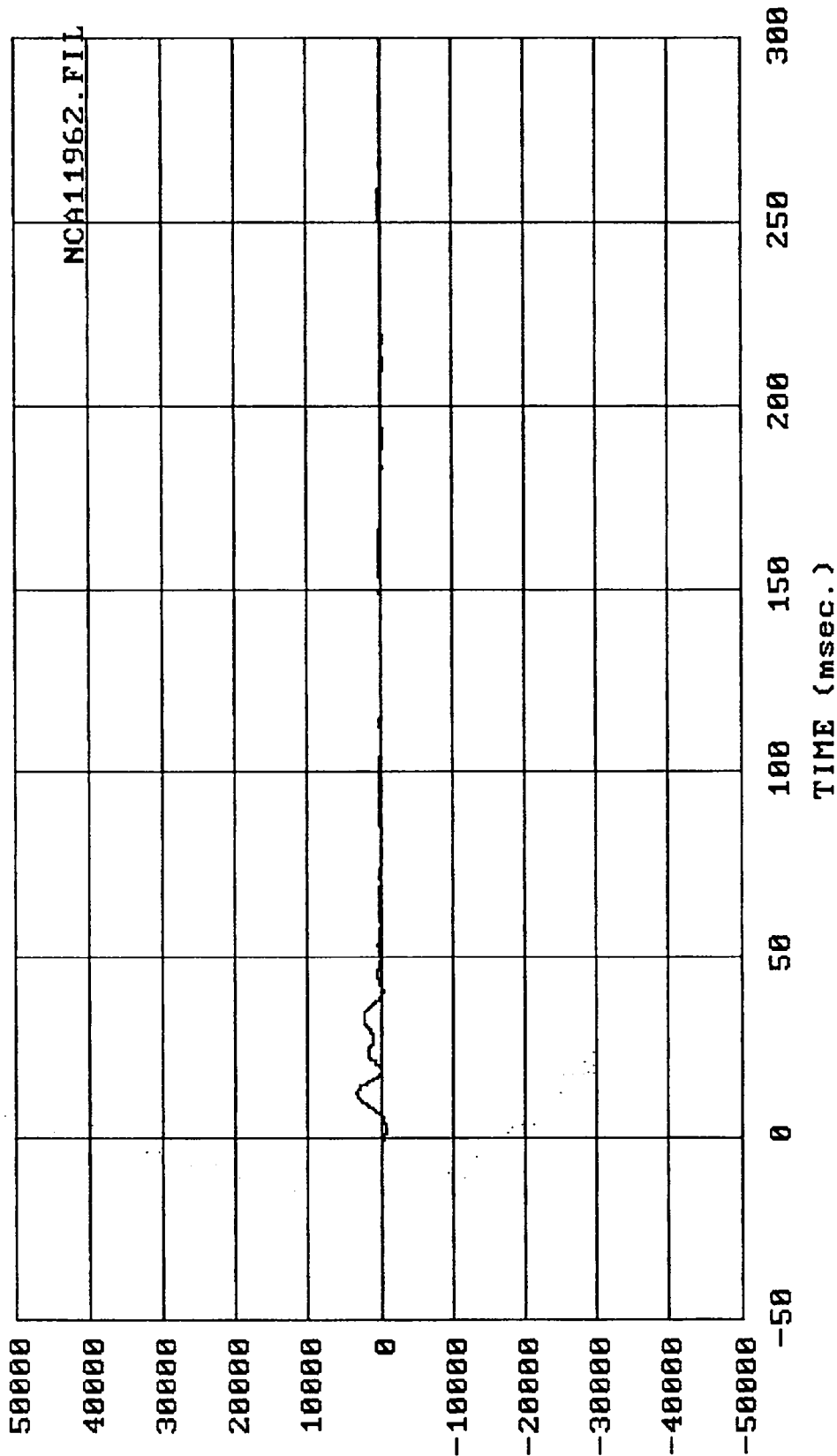


Filter: SAE CLASS 60 Max = 9129.9 Min = -628.27

MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D2

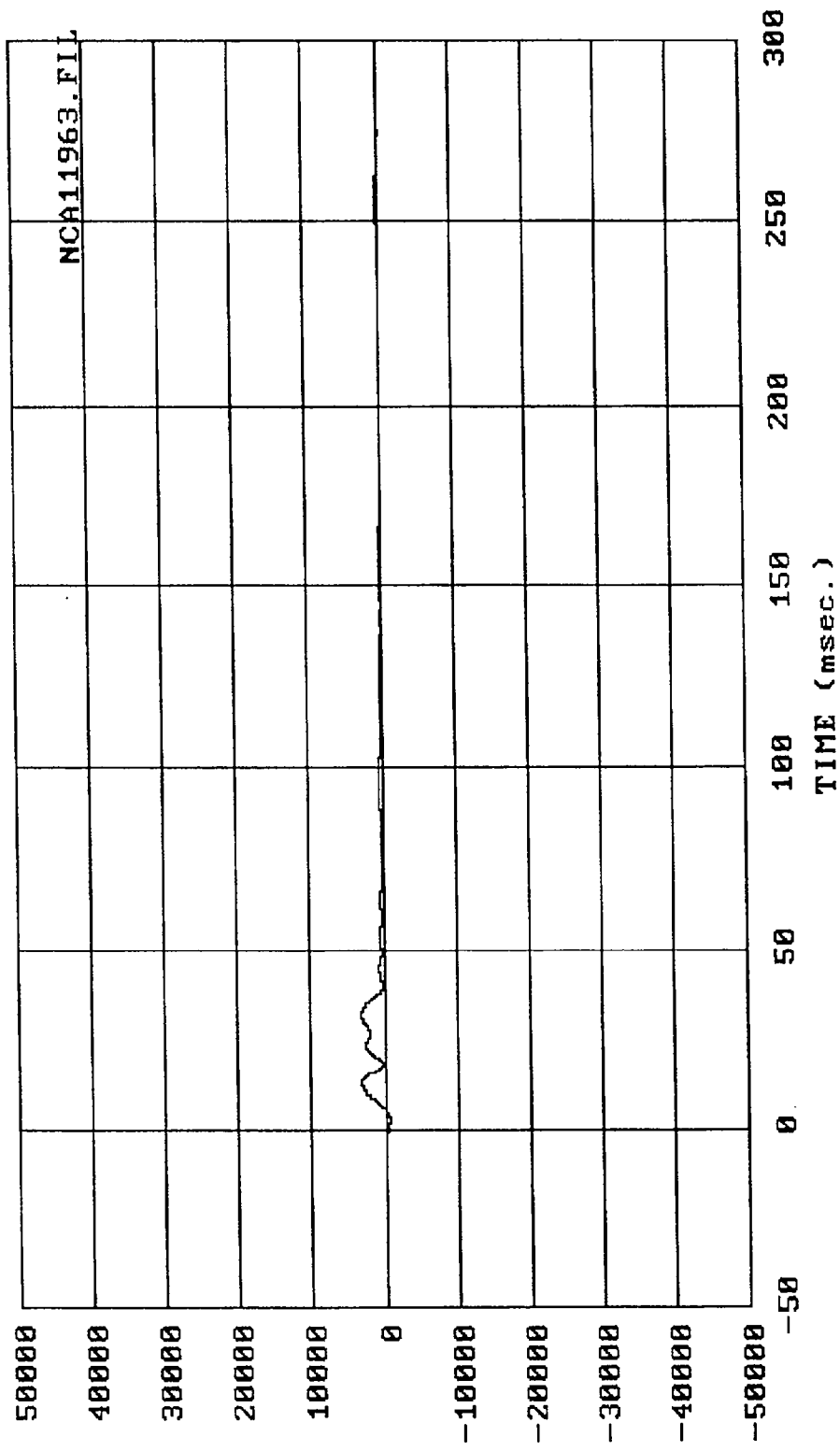


Filter: SAE CLASS 60 Max = 3828.6 Min = -614.35
 MSE 05/23/89 --- 1989 Isuzu Trooper : Barrier force - Load cell D3



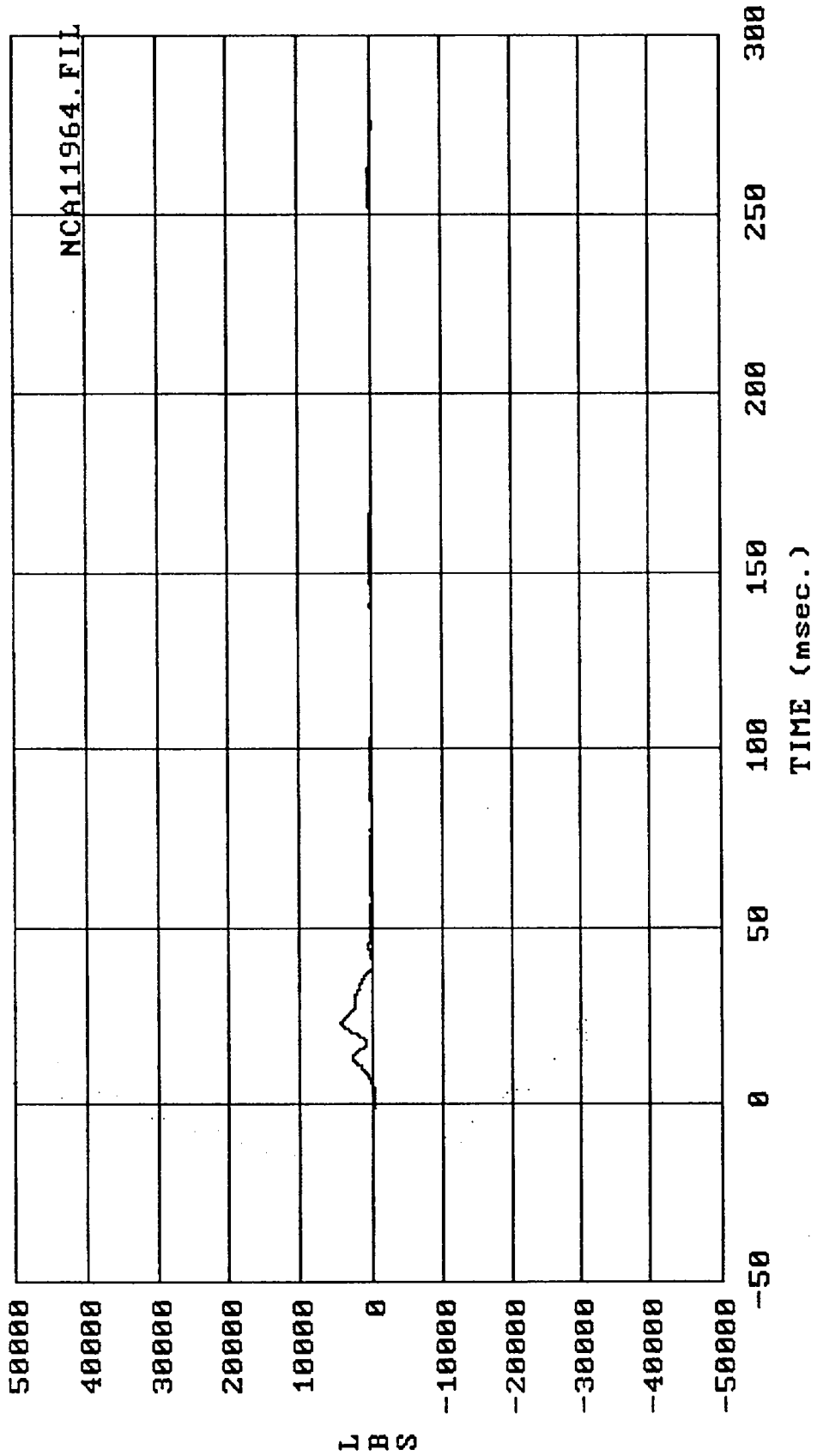
Filter: SAE CLASS 60 Max = 3467.5 Min = -554.86

MSE 05/23/89 --- 1989 Isuzu Trooper : Barrier force - Load cell D4

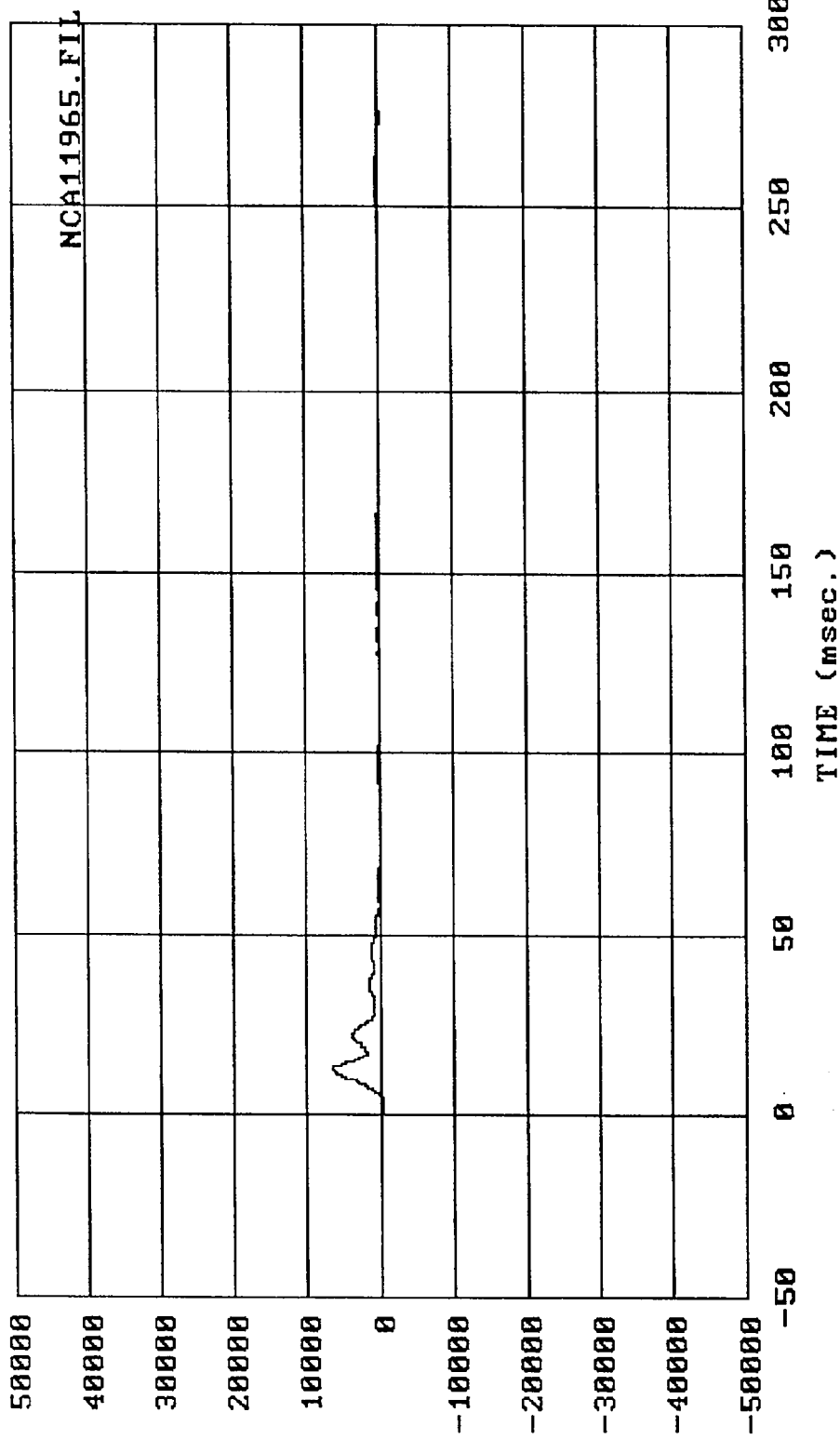


Filter: SAE CLASS 60 Max = 3244.4 Min = -481.18
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D5

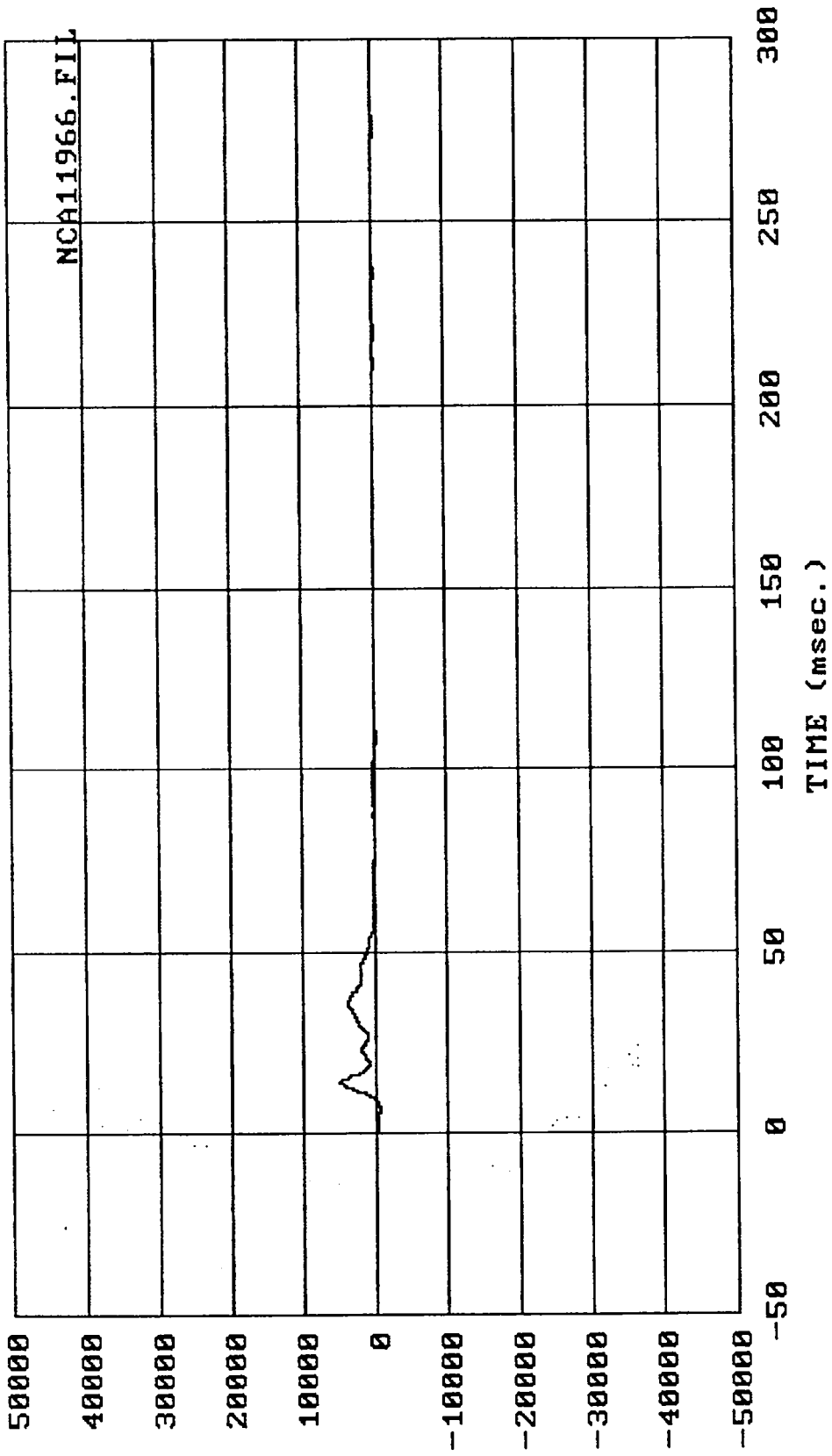
L
B
S



Filter: SAE CLASS 60 Max = 4389.7 Min = -429.52
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D6

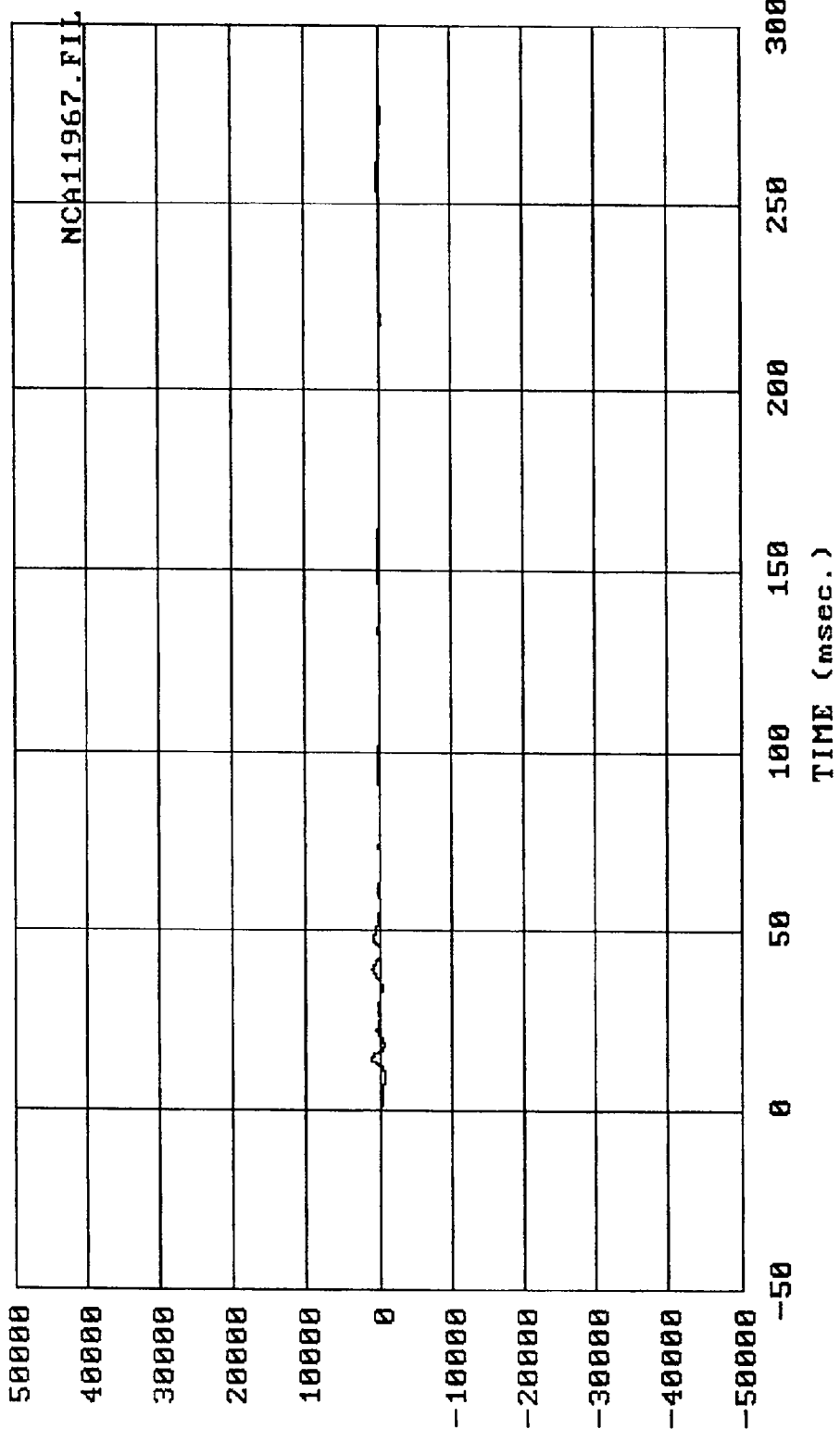


Filter: SAE CLASS 60 Max = 6741.8 Min = -423.52
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D7



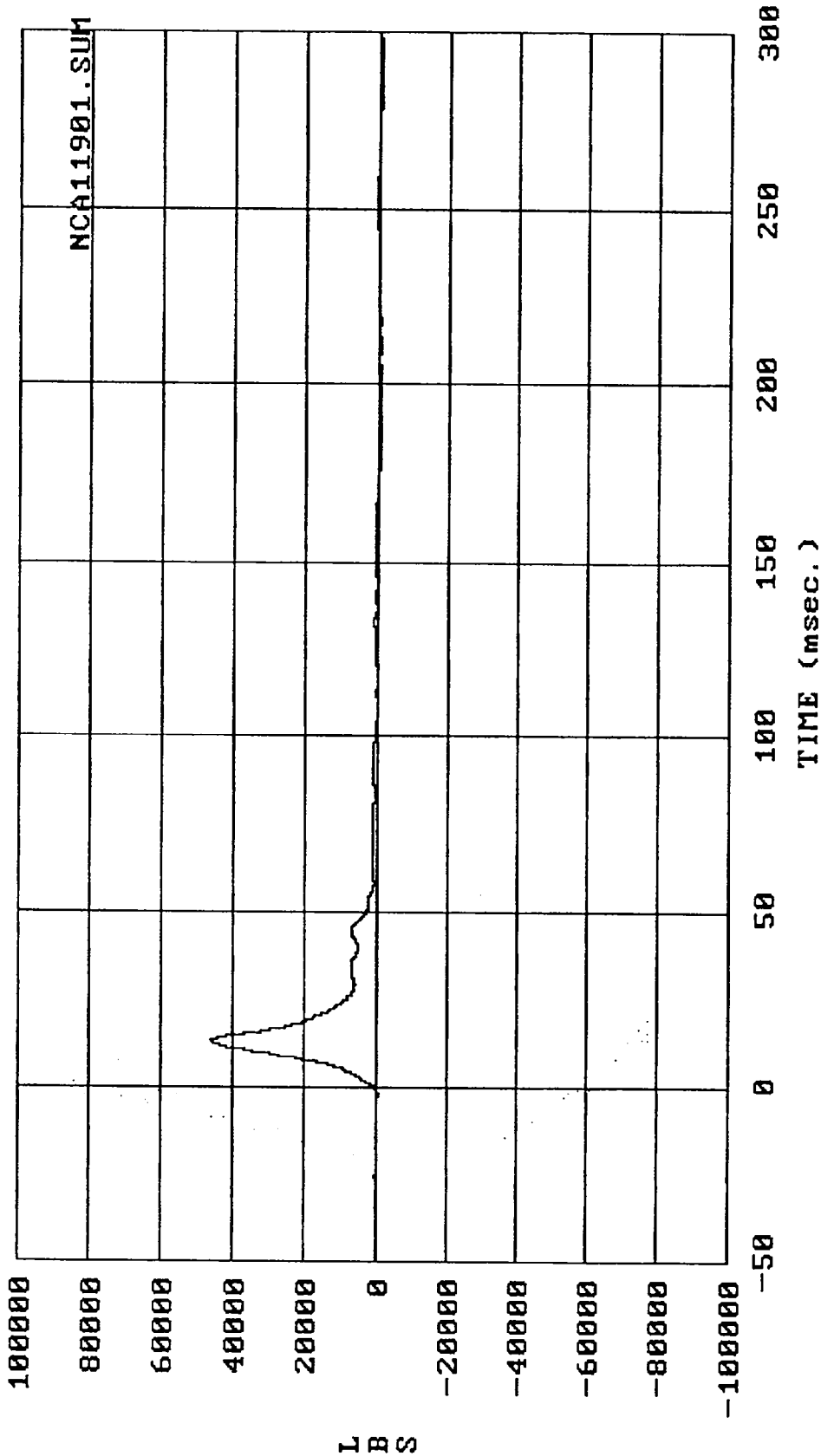
Filter: SAE CLASS 60 Max = 5006.5 Min = -506.24

MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D8



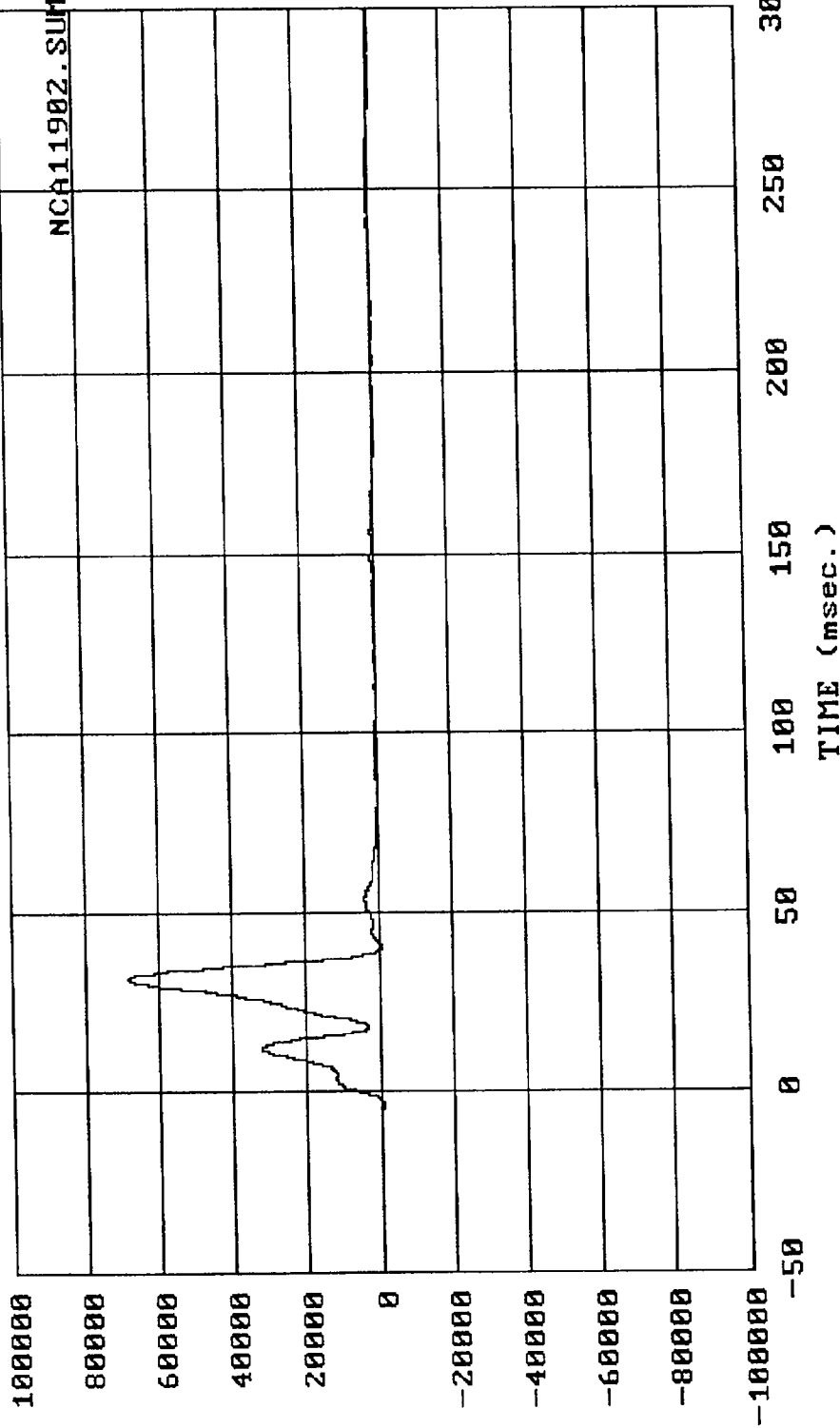
L
B
S

Filter: SAE CLASS 60 Max = 1186.3 Min = -723.40
 MSE 05/23/89 -- 1989 Isuzu Trooper : Barrier force - Load cell D9



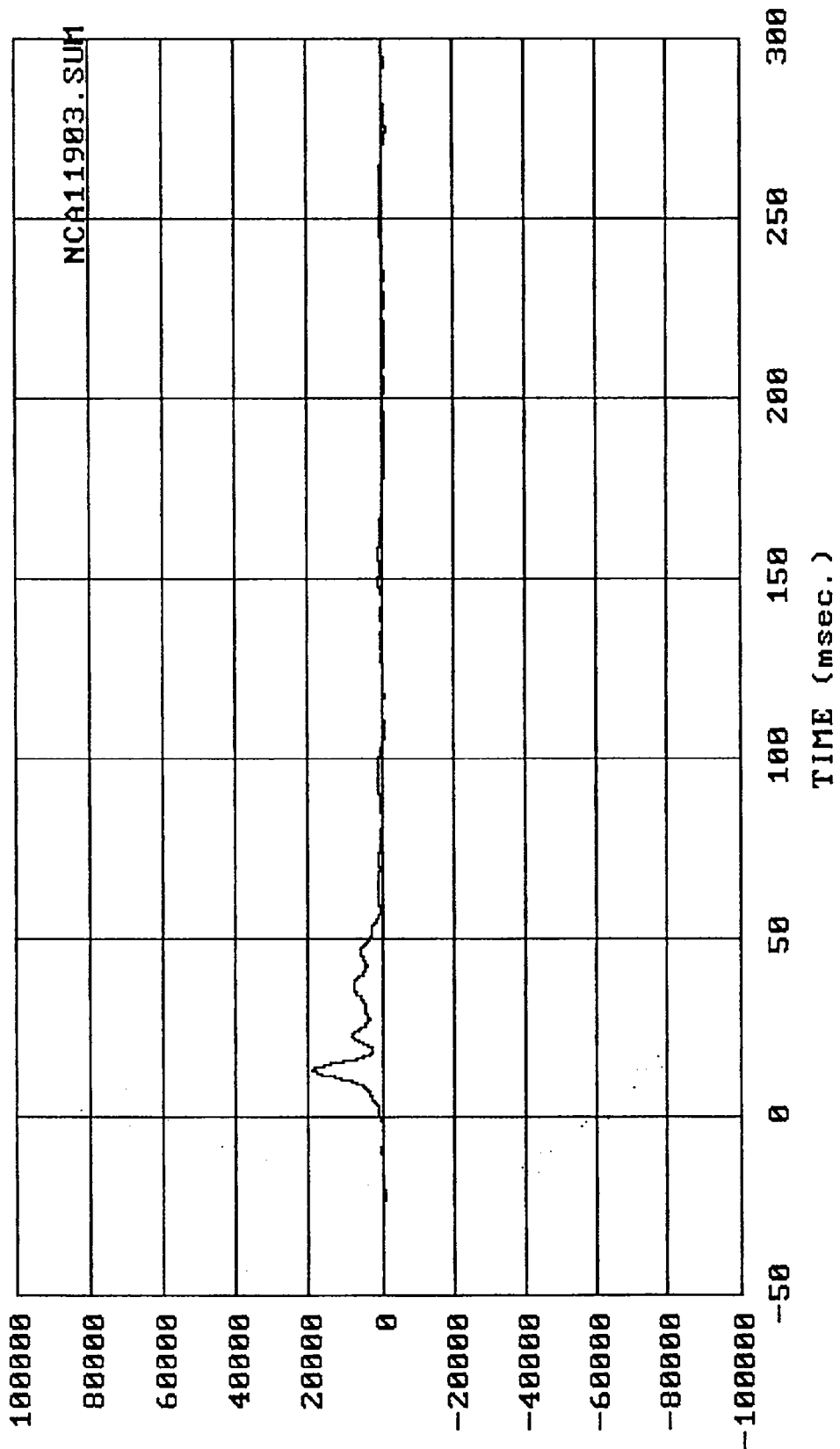
Filter: SAE CLASS 60 Max = 46152. Min = -728.16

MSE 05/23/89 -- 1989 Isuzu Trooper : LCB sum frc C1, C2, C3, D1, D2, D3
Group_1



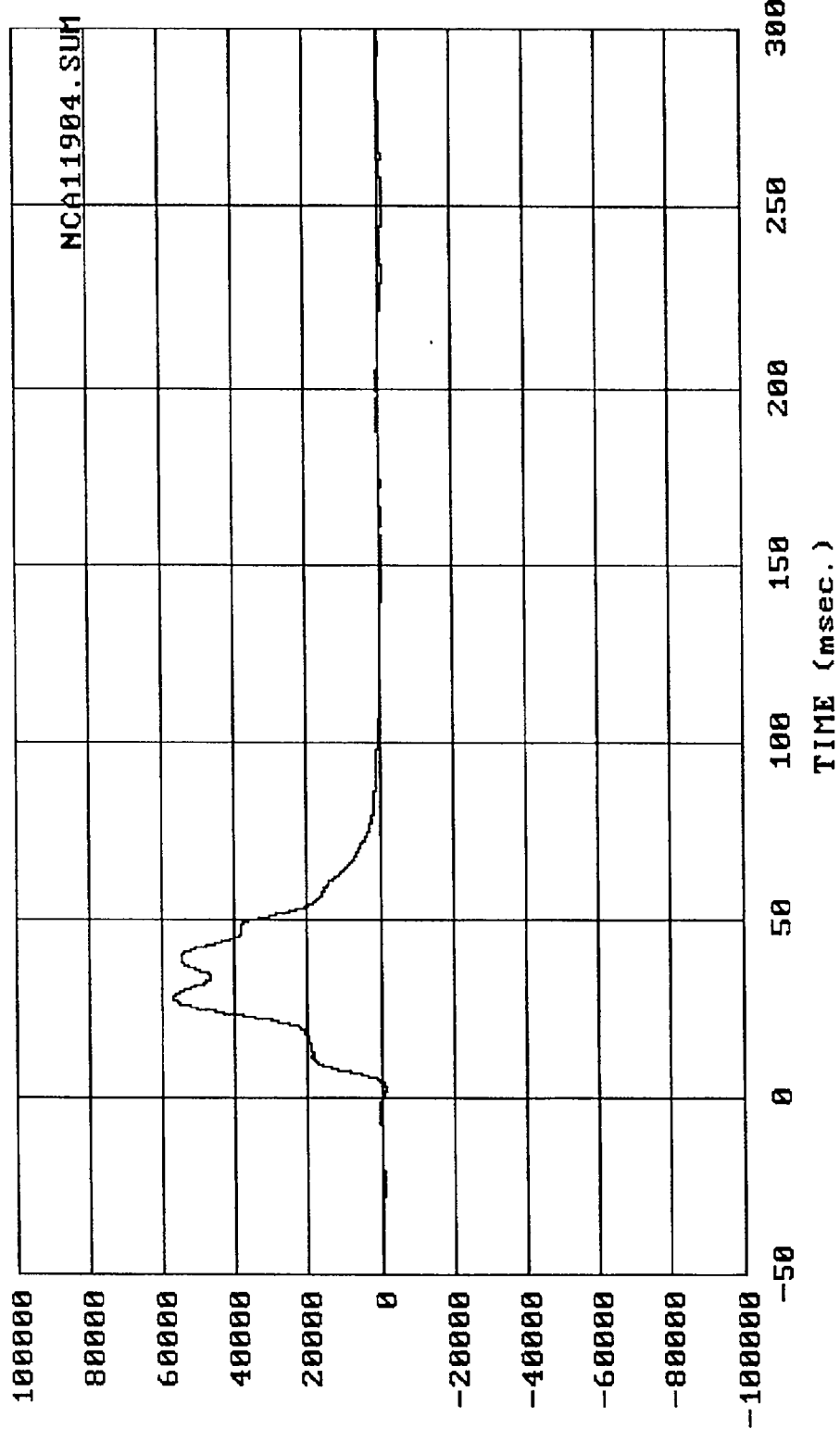
Filter: SAE CLASS 60
 MSE 05/23/89 --- 1989 Isuzu Trooper : LCB sum frc C4,C5,C6,D4,D5,D6
 Group_2

LBS

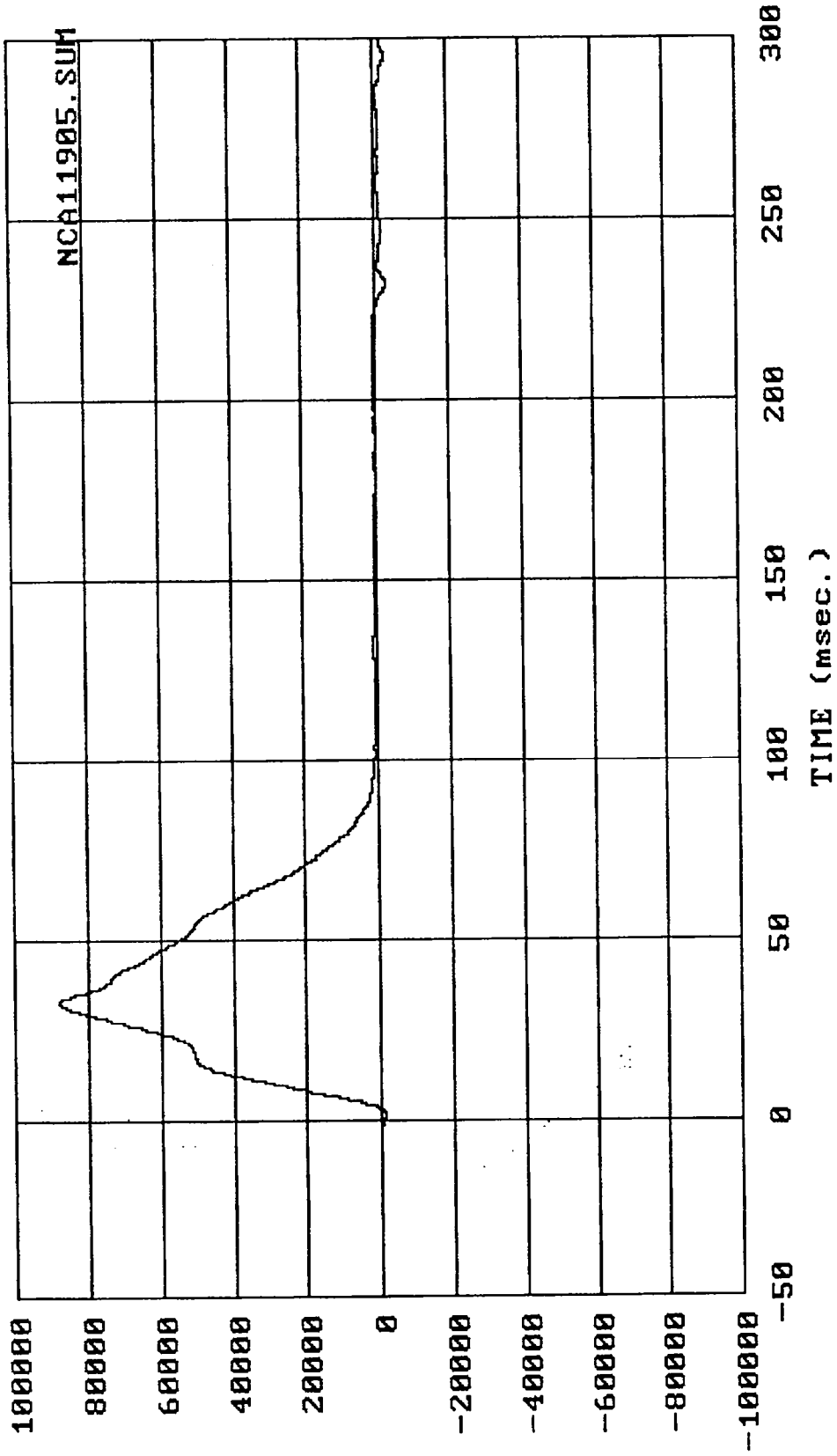


Filter: SAE CLASS 60 Max = 18988. Min = -955.38

MSE 05/23/89 -- 1989 Isuzu Trooper : LCB sum frc C7,C8,C9,D7,D8,D9
Group_3

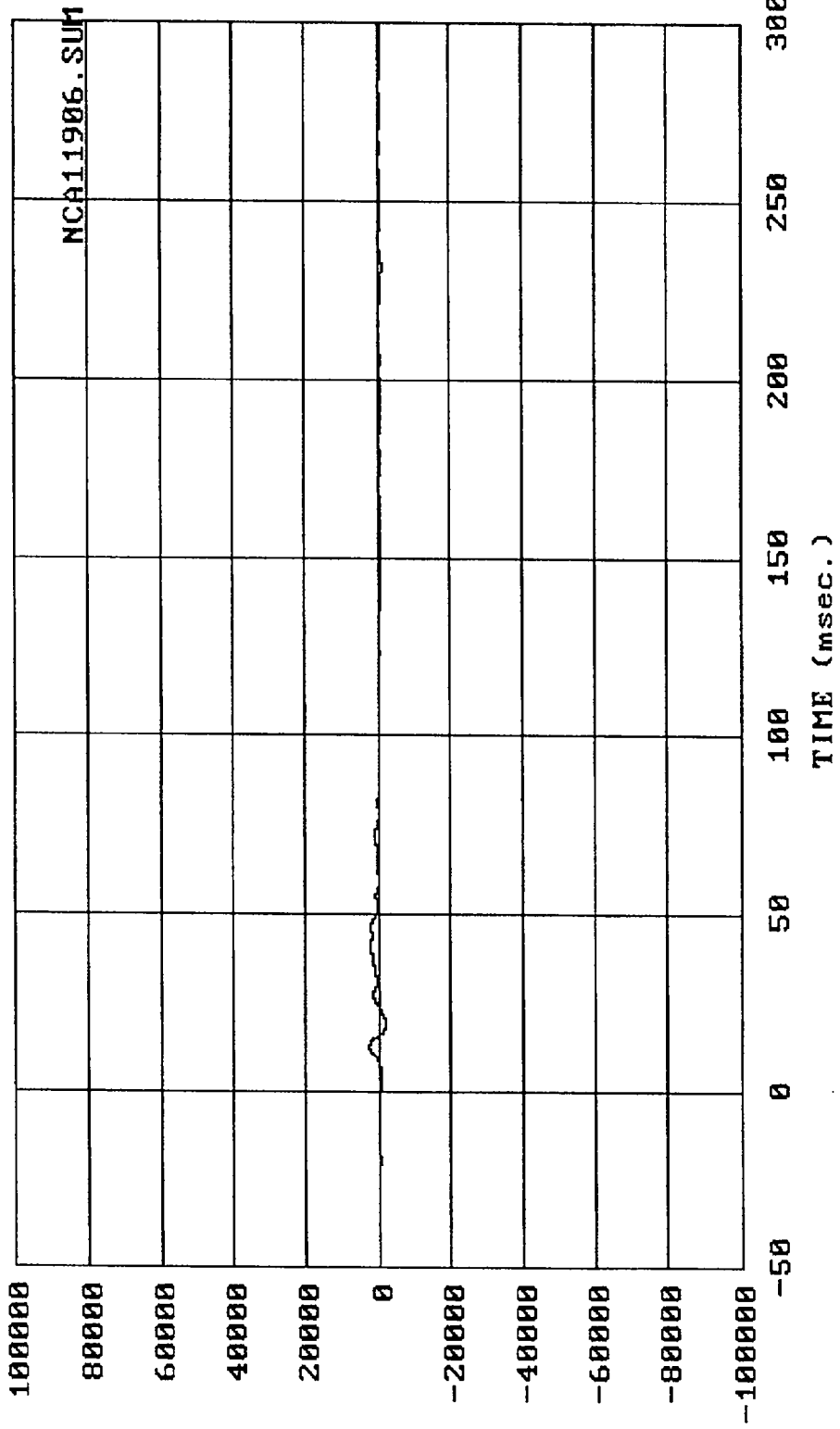


Filter: SAE CLASS 60 Max = 57257. Min = -1278.5
 MSE 05/23/89 -- 1989 Isuzu Trooper : LCB sum frc A1,A2,A3,B1,B2,B3
 Group_4



Filter: SAE CLASS 60 Max = 88167. Min = -3148.7

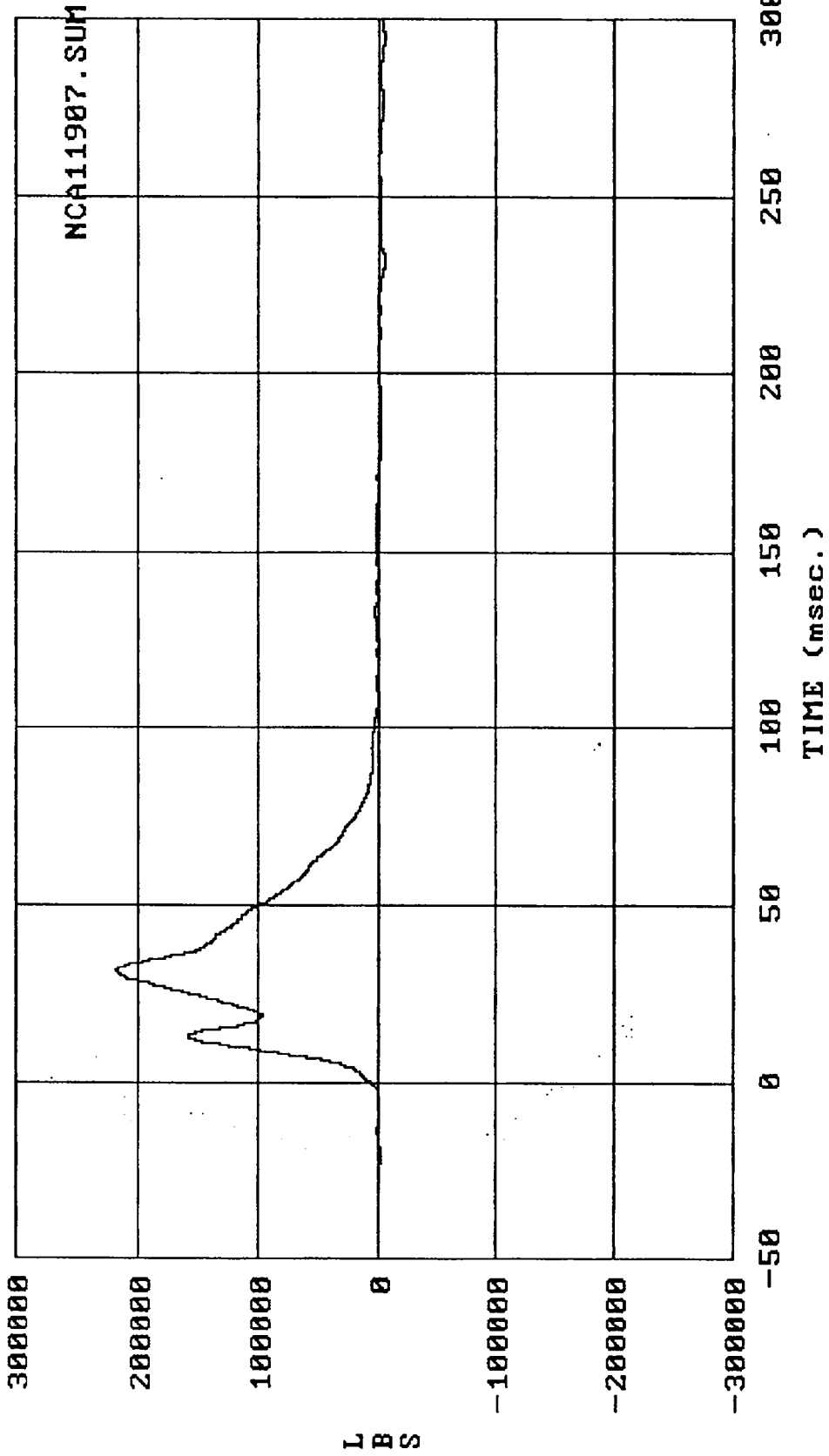
MSE 05/23/89 --- 1989 Isuzu Trooper : LCB sum frc A4, A5, A6, B4, B5, B6
Group_5



L
B
S

Filter: SAE CLASS 60 Max = 2831.8 Min = -1786.5

MSE 05/23/89 -- 1989 Isuzu Trooper : LCB sum frc A7,A8,A9,B7,B8,B9
Group_6



Filter: SAE CLASS 60 Max = .21838E+06 Min = -5771.8

MSE 05/23/89 -- 1989 Isuzu Trooper : Load Cell Barrier total force

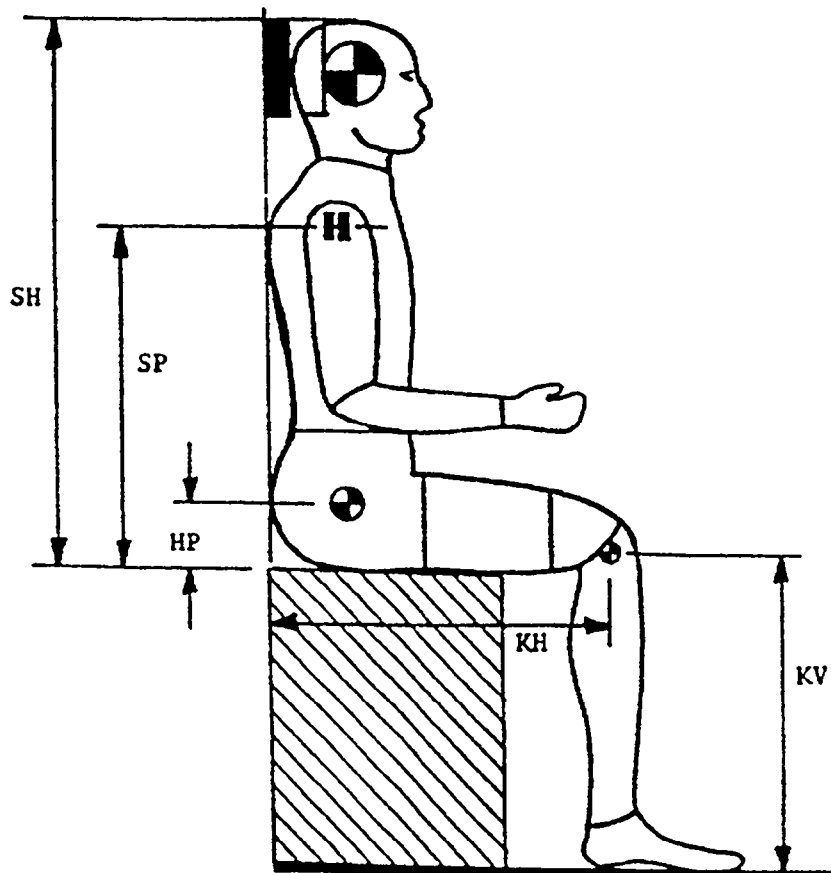
THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C

PART 572 DUMMY CONFIGURATION AND
PERFORMANCE VERIFICATION TESTS

THIS PAGE INTENTIONALLY LEFT BLANK

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		05/05/89	
VERIFICATION NUMBER FOR DUMMY*		03	
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	21.8	
HP - Hip Pivot Height- - - - -	3.9" ref.	3.9	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.5	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.3	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.2	
HW - Hip Width- - - - -	14.0 to 15.4"	14.95	

TECHNICIAN'S NAME: MARK WALKER

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA:

NHTSA DUMMY I.D. NO.:

4	6	5
---	---	---

TECHNICIAN'S NAME: MARK WALKER

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		05/05 - 05/07/89'	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		03	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		66-72 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		60-65 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	241.0	
b. Peak Lateral Accel.- -	- 10G	7.75	
c. Time above 100G- - - -	0.9 to 1.5ms	1.0	
2. NECK BENDING TEST--			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.29	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	22.35	
c. Peak Resultant Head Acceleration - - - - -	26G max.	24.8	
d. Pendulum Decel.(t ₂ -t ₁)	- 3ms	1.0	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	29.6	
f. Pendulum Decel.(t ₄ -t ₃)	- 10ms	10.0	
g. Max. Head Rotation - -	63 to 73°	63.9	
h. Chordal Displacement-- Head Rotation Angle-			
0°	Time- -	-2 to 2 ms	2.0
	Displ.-	-.5 to .5"	0.0
30°	Time- -	25.6 to 34.4ms	33.0
	Displ.-	2.1 to 3.1"	2.47
60°	Time- -	40.3 to 51.7ms	51.4
	Displ.-	4.3 to 5.3"	4.87
Maximum (61.0°)	Time- -	53.2 to 66.8ms	61.0
	Displ.-	5.0 to 6.0"	5.25

*beginning with "1" at the start of each fiscal year's crash test program

TECHNICIAN'S NAME: MARK WALKER

DATE: 11/10/89 TIME: 10:00

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST....			
<u>Continued:</u>			
h. Chordal Displacement:			
Head Rotation Angle--			
60°	Time	67.0 to 83.0 ms	70.0
	Displ.	4.3 to 5.3 in.	4.88
30°	Time	85.4 to 104.6 ms	87.4
	Displ.	2.1 to 3.1 in.	2.23
0°	Time	101.0 to 123.0 ms	101.0
	Displ.	-.5 to 0.5 in.	0.0
3. ABDOMINAL COMPRESSION TEST:			
(Preload = 10 pounds)			
a. Force @ .5" - - - - -	23 to 36 lbs.	26.0	
b. Force @ .75" - - - - -	36 to 50 lbs.	39.0	
c. Force @ 1.0" - - - - -	50 to 63 lbs.	55.0	
d. Force @ 1.3" - - - - -	73 to 88 lbs.	83.0	
4. LUMBAR FLEXION TEST:			
a. Force @ 20° - - - - -	22 to 34 lbs.	27.5	
b. Force @ 30° - - - - -	34 to 46 lbs.	40.2	
c. Force @ 40° - - - - -	46 to 58 lbs.	56.0	
d. Return Angle - - - - -	12° maximum	10.8	
5. CHEST IMPACT TESTS:			
a. High Speed			
(1) Probe Speed- - - - -	21.78-22.22 fps	21.80	
(2) Peak Deflection- - - - -	1.7" maximum	1.70	
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	2051.0	
(4) Internal Hysteresis - - - - -	50 to 70%	70.0	
b. Low Speed			
(1) Probe Speed- - - - -	13.86-14.14 fps	13.89	
(2) Peak Deflection- - - - -	1.1" maximum	1.05	
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1324.5	
(4) Internal Hyster. - - - - -	50 to 70%	70.0	

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

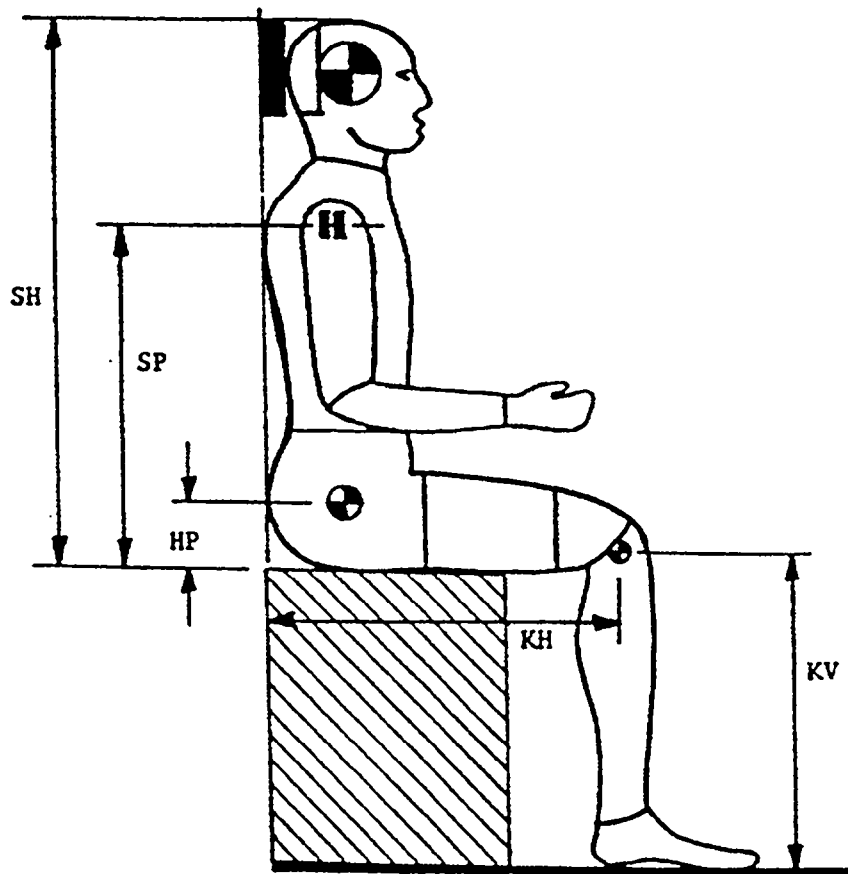
4	6	5
---	---	---

TECHNICIAN'S NAME: MARK WALKER

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.91	
(2) Maximum Force - -	1850 to 2500 lbs.	2411.0	
(3) Time Above 1000#	1.7 ms minimum	1.75	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.95	
(2) Maximum Force - -	1850 to 2500 lbs.	2472.8	
(3) Time Above 1000#	1.7 ms minimum	1.70	

REMARKS:

1. CONFIGURATION VERIFICATION DATA:



	P. 572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		05/20/89	
VERIFICATION NUMBER FOR DUMMY*		03	
SH - Seated Height- - - - -	35.6 to 35.8"	35.6	
SP - Shoulder Pivot Height- - - -	21.8 to 22.4"	21.9	
HP - Hip Pivot Height - - - - -	3.9" ref.	3.9	
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.5	
KV - Knee Pivot from floor- - - -	19.3 to 19.9"	19.3	
SW - Shoulder Width - - - - -	17.8 to 18.4"	18.35	
HW - Hip Width- - - - -	14.0 to 15.4"	15.0	

TECHNICIAN'S NAME: M. WALKER

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

II. PERFORMANCE VERIFICATION DATA:

TECHNICIAN'S NAME: M. WALKER

NHTSA DUMMY I.D. NO.:

4	6	6
---	---	---

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		05/20 - 05/22/89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		03	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		67-72 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		38-65 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	221.7	
b. Peak Lateral Accel.- -	≤ 10G	7.91	
c. Time above 100G- - - -	0.9 to 1.5ms	1.2	
2. NECK BENDING TEST--			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	22.48	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	24.0	
c. Peak Resultant Head Acceleration - - - - -	26G max.	23.5	
d. Pendulum Decel.(t ₂ -t ₁)	≤ 3ms	2.8	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	28.6	
f. Pendulum Decel.(t ₄ -t ₃)	≤ 10ms	10.0	
g. Max. Head Rotation - -	63 to 73°	69.10	
h. Chordal Displacement--			
Head Rotation Angle-			
0°	Time- - -2 to 2 ms	1.0	
	Displ.- -.5 to .5"	0.0	
30°	Time- - 25.6 to 34.4ms	30.4	
	Displ.- 2.1 to 3.1"	2.36	
60°	Time- - 40.3 to 51.7ms	47.0	
	Displ.- 4.3 to 5.3"	4.61	
Maximum (60.4°)	Time- - 53.2 to 66.8ms	60.4	
	Displ.- 5.0 to 6.0"	5.30	

*beginning with "1" at the start of each fiscal year's crash test program

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
2. NECK BENDING TEST.....			
Continued:			
h. Chordal Displacement:			
Head Rotation Angle--			
60°	Time	67.0 to 83.0 ms	74.6
	Displ.	4.3 to 5.3 in.	4.58
30°	Time	85.4 to 104.6 ms	91.0
	Displ.	2.1 to 3.1 in.	2.10
0°	Time	101.0 to 123.0 ms	102.4
	Displ.	-.5 to 0.5 in.	0.15
3. ABDOMINAL COMPRESSION TEST:			
(Preload = 10 pounds)			
a. Force @ .5" - - - -	23 to 36 lbs.	29.0	
b. Force @ .75" - - - -	36 to 50 lbs.	42.0	
c. Force @ 1.0" - - - -	50 to 63 lbs.	58.0	
d. Force @ 1.5" - - - -	73 to 88 lbs.	86.0	
4. LUMBAR FLEXION TEST:			
a. Force @ 20° - - - -	22 to 34 lbs.	28.9	
b. Force @ 30° - - - -	34 to 46 lbs.	38.33	
c. Force @ 40° - - - -	46 to 58 lbs.	51.77	
d. Return Angle - - - -	12° maximum	10.0	
5. CHEST IMPACT TESTS:			
a. High Speed			
(1) Probe Speed- - -	21.78-22.22 fps	21.86	
(2) Peak Deflection- -	1.7" maximum	1.56	
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	2240.6	
(4) Internal Hysteresis - - -	50 to 70%	55.1	
b. Low Speed			
(1) Probe Speed- - -	13.86-14.14 fps	13.97	
(2) Peak Deflection- -	1.1" maximum	1.04	
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1335.4	
(4) Internal Hyster. - - -	50 to 70%	50.0	

DUMMY CONFIG. & PERF. VERIF. DATA....Continued:

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

4	6	6
---	---	---

TECHNICIAN'S NAME: M. WALKER

TEST PARAMETER	SPECIFICATION	Pre-Test (if required)	Post-Test (if required)
6. KNEE IMPACT TESTS:			
a. Right Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.89	
(2) Maximum Force - -	1850 to 2500 lbs.	2095.6	
(3) Time Above 1000#	1.7 ms minimum	1.70	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.89	
(2) Maximum Force - -	1850 to 2500 lbs.	2482.5	
(3) Time Above 1000#	1.7 ms minimum	1.70	

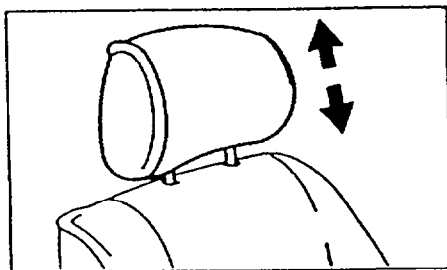
REMARKS:

APPENDIX D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

THIS PAGE INTENTIONALLY LEFT BLANK

HEAD RESTRAINT



Head restraints are designed to help reduce the risk of neck injuries. Choose the position which places the top of the head restraint closest to the top of your ears. Pull the head restraint up to raise it. Release the lock to lower the head restraint.

WARNING

- Do not attempt to adjust the driver's head restraint while the vehicle is in motion.
- Do not operate the vehicle with the head restraint removed.

FRONT SEAT LAP/ SHOULDER BELT

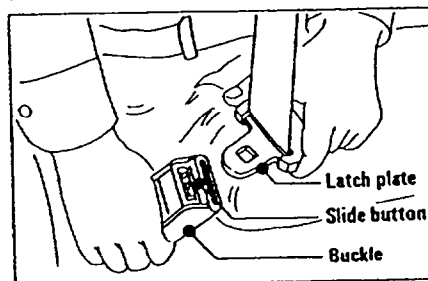
The National Safety Council's statistics clearly indicate that the use of seat belts

drastically reduces the probability of serious injury or even fatality in the event of an accident or a sudden stop. Prior to starting the vehicle, ensure that all passengers have properly adjusted and latched their seat belts.

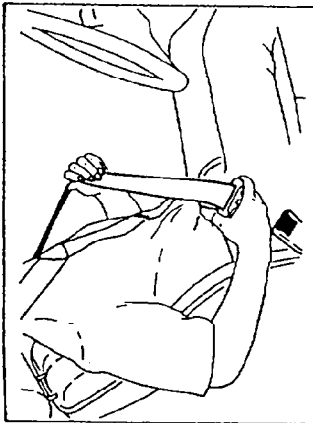
There is a seat belt provided for each position designated for occupant seating. Lap-shoulder belts are located in the front seats. In the four door models, lap-shoulder belts are also provided for the rear outboard seating positions.

- NOTE**
- Special instructions for use of seat belts for children and pregnant women are on the following pages.

FRONT AND REAR SEAT LAP-SHOULDER BELTS



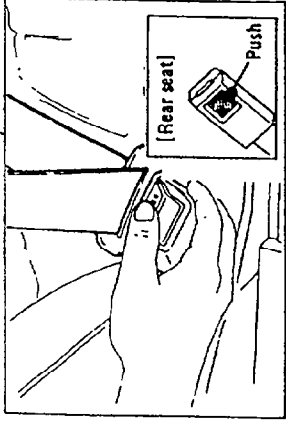
- Taking the latch plate, pull the lap-shoulder belt across your body. Insert the latch plate latches in the buckle. Push firmly until the plate latches in the buckle.
- Position the "lap" portion of the belt across your lap as **LOW ON THE HIPS** as possible. Then, adjust it to a **SNUG FIT** by grasping the "shoulder" portion of the seat belt and pulling it **UPWARD** through the latch plate until the lap portion is snug across your lap. This reduces the risk of sliding under the belt during an accident.



- A snug fit with the lap belt positioned low on the hips is necessary to help lessen the chance and/or severity of injury in an accident. This spreads the force of the lap belt over the hip bone instead of across the abdomen.

CAUTION

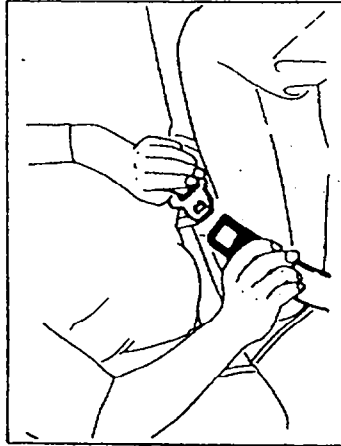
- Never use the same belt for more than one person at a time. Do not wear belts twisted, and do not let belts or belt hardware become damaged by pinching them in the seat or door.
- Do not remove the retractor. These are intricate mechanisms and require special skills to correct or repair. If the retractor does not work properly take your vehicle to your Isuzu dealer for repair or replacement.
- The lap-shoulder belts are designed to permit normal free forward body movement. However, when they are subjected to sudden and harsh impact, the retractor mechanisms will engage, restricting the passengers' forward movement.
- Too much shoulder belt slack could reduce the amount of protection because the belt may not be able to properly restrain you in an accident.
- Do not wear the shoulder portion of the belt under your arm nearest the door or otherwise out of position. Such use could increase the chance and/or the severity of injury in an accident.
- To unfasten the belts, push in the slide button in the center of the buckle (**Front**).
- To unfasten the belts, push in the button in the side of the buckle (**4-door Rear**).



- When no longer in use, seat belts should be stowed by letting them rewind into their retractors. If necessary, move the keeper along the front seat belt webbing to let the belt retract fully. This will also put the latch plate within easy reach on the door pillar.

REAR SEAT LAP BELT (RETRACTOR TYPE)

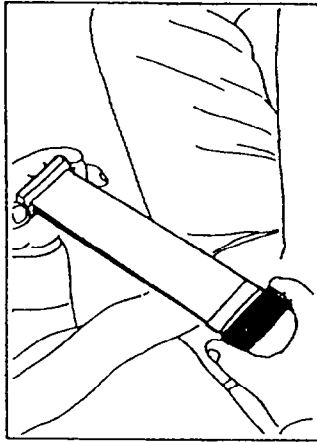
- The rear seat is provided with three sets of lap belts (for the right, center and left side seat occupants).
- The right and left side lap belts are equipped with an individual retractor which is designed to take up extra webbing automatically.



- To use the rear seat belts, hold the latch plate and pull out the webbing until it reaches the buckle. Push the latch plate into the buckle until it clicks.
- After fastening, check that the belt is SNUG by pulling the belt firmly across the lap toward the lap belt retractor. This will allow the retractor to take up slack.
- To unfasten the belts, push in the button in the center of the buckle.

REAR SEAT LAP BELT (NON-RETRACTOR TYPE)

- The rear center seat belts are provided with a non-retractable type lap belt at center.
- To fasten the lap belt, insert the latch plate into the buckle.



- You will hear a click when the latch plate locks into the buckle. Make sure the connection is secure and the belt is not twisted. If the belt is too short for you, hold the latch plate at a right angle to the belt and pull on the latch plate.
- To lengthen a lap belt, place the latch plate at right angles to the belt webbing and pull on the latch plate: the belt should then slide easily through the latch plate.
- To unfasten the belts, push the button in the center of buckle.

SEAT BELT INSPECTION

- Occasionally check that the belts, buckles, latch plates, retractors, reminder systems, guide loops, keepers, and anchors work properly. Also check for damage that

could keep the restraint system from doing its job.

- Keep sharp edges and damaging objects away from the belts and other parts of the restraint system.
- Replace belts if cut, weakened, or frayed. Also, have belts replaced if they have been worn in a collision.
- If there is any doubt have all related parts including belts replaced.
- Keep belts clean and dry.
- Clean only with mild soap and lukewarm water.
- Do not bleach or dye belts since this may badly weaken them.

RESTRAINT OF PREGNANT WOMEN

It is recommended that pregnant women use seat belts. Check with your doctor for specific recommendations. The lap belt should be snug and positioned as low as possible around the hips. Do not position the lap belt around the waist. This can be very dangerous in the event of an accident or sudden stop.

CHILD RESTRAINT

Children in vehicles should be restrained to help lessen the chance and/or severity of in-

jury in accidents or sudden stops. Never let a child of any age stand or kneel on any seat. Use of infant or child restraint systems which conform to federal motor vehicle safety standards and which are installed according to their instructions is the surest way of minimizing the risk of injury to young passengers. Child restraint systems are designed to be secured in vehicle seats by lap belt or the lap belt portion of a lap-shoulder belt. Children could be endangered in a crash if their child restraints are not properly secured in the vehicle.

According to accident statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions. Older children should be placed on a seat and restrained with the seat belts provided with your vehicle. Both lap and shoulder belts should be used.

The use of infant or child restraint systems may be required by the laws of your state. You should check with the appropriate state authorities to ensure that you are in compliance with these laws.

WARNING

• For effective protection in automobile accidents and sudden stops, children should not be transported unrestrained. The preferred restraints for small children are child

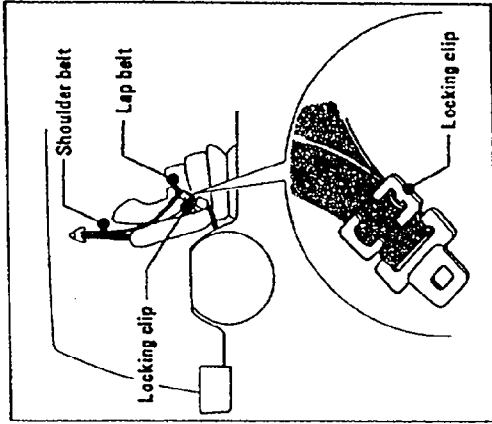
restraint system. If these are not available, children should be placed in the rear seat and restrained with the lap belt if they are old enough to sit alone.

• Holding a child in your arms is dangerous. In an accident, a child held in a person's arms can be struck or crushed by any unrestrained occupant. An unrestrained child also can be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact.

• If an adult must sit in the rear seat of a 2-door model, do not use a child restraint system on the front seat as this would block the adult's emergency exit. Instead, place the child in the rear seat with the adult.

Installation on Rear Seat

1. Place the shoulder belt between the vehicle seat back and child restraint system.
2. Fully extend the lap belt.
3. Fasten the lap belt over the child restraint system.
4. Keep slack out of the lap portion of the belt by pulling shoulder belt.
5. Install a locking clip near the tab of the lap and shoulder belt.



Installation on Front Seat

1. Slide the seat to the rearmost position.
2. Place the shoulder belt between the vehicle seatback and the child restraint system.
3. Fully extend the lap belt.

WARNING

• You must fully extend the lap belt to change its locking operation and make it suitable

for use with a child seat.

4. Fasten the lap belt over the child restraint system.
5. Keep slack out of the lap portion of the belt by pulling shoulder belt.
6. Install a locking clip near the tab of the lap and shoulder belt.
7. Slide the seat forward so that the lap belt is fully extended.

