

NEW CAR ASSESSMENT PROGRAM (NCAP) FRONTAL BARRIER IMPACT TEST

HONDA MOTOR COMPANY, LIMITED
1990 ACURA INTEGRA RS
4 DOOR SEDAN (ACP)
NHTSA NO. ML5300

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



OCTOBER 12, 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: 10/12/1989

FINAL REPORT ACCEPTED BY:

Vincent Quarles

MANAGER, New Car Assessment Program

JAN 8 1990

Date of Report Acceptance

1. Report No. MSE-90-N01	2. Government Accession No.	3. Recipient's Catalog No.																
4. Title and Subtitle NEW CAR ASSESSMENT PROGRAM (NCAP) FRONTAL BARRIER IMPACT TEST 1990 ACURA INTEGRA RS NHTSA NO. ML5300		5. Report Date OCTOBER 12, 1989	6. Performing Organization Code MSE															
7. Author(s) Dr. A. V. Khadilkar/S.D. Pruitt/T. Kippen G. Fladmark		8. Performing Organization Report No. R9063-01																
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.															
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, DC 20590		13. Type of Report and Period Covered FINAL																
15. Supplementary Notes		14. Sponsoring Agency Code DOT/NHTSA/RM/OMI																
16. Abstract A 35 mph frontal barrier impact test using a load cell barrier was conducted on a 1990 Acura Integra, 4 Door Sedan at the Mobility Systems and Equipment Company (MSE) crash test facility in Mira Loma, CA, on 12 September 1989. The barrier impact velocity was 34.7 mph, and the ambient temperature at the barrier face at the time of impact was 85 deg. F. The post-test vehicle crush maximum was 19.8 in. A summary of occupant injury measure data from the test appears below:																		
<table border="1"> <thead> <tr> <th>Injury Criteria Threshold Value</th> <th>Driver Dummy</th> <th>Passenger Dummy</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criterion HIC = 1000</td> <td>585</td> <td>637</td> </tr> <tr> <td>Chest Resultant Peak 60 Gs (3 ms clip)</td> <td>N.D.*</td> <td>42.2</td> </tr> <tr> <td>Femur Load Left</td> <td>1545</td> <td>1301</td> </tr> <tr> <td>2250 Pounds Right</td> <td>1684</td> <td>1877</td> </tr> </tbody> </table>				Injury Criteria Threshold Value	Driver Dummy	Passenger Dummy	Head Injury Criterion HIC = 1000	585	637	Chest Resultant Peak 60 Gs (3 ms clip)	N.D.*	42.2	Femur Load Left	1545	1301	2250 Pounds Right	1684	1877
Injury Criteria Threshold Value	Driver Dummy	Passenger Dummy																
Head Injury Criterion HIC = 1000	585	637																
Chest Resultant Peak 60 Gs (3 ms clip)	N.D.*	42.2																
Femur Load Left	1545	1301																
2250 Pounds Right	1684	1877																
TYPE OF RESTRAINT SYSTEM: A motorized 2-point belt system and knee bolster as a passive restraint system and an active lap belt at each front outboard seating position. * Resultant not computed as a result loss of chest Z channel after about 72 milliseconds into impact event.																		
17. Key Words 35 MPH FRONTAL BARRIER IMPACT TEST NEW CAR ASSESSMENT PROGRAM (NCAP) 1990 ACURA/INTEGRA/4 DOOR SEDAN AUTOMATIC CRASH PROTECTION		18. Distribution Statement COPIES OF THIS REPORT ARE AVAILABLE FROM: Technical Reference Division Nat'l Highway Traffic Safety Admin. 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 32	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	3
3	Occupant and Vehicle Information	9
 <u>DATA TABLES</u>		
1	Test Vehicle Data	5
2	Post Crash Test Data	7
3	FMVSS 208 Occupant Crash Protection Data	10
4	Test Dummy Positioning Data	11
5	Seat Belt Positioning Data	13
6	Seat Belt Performance Assessment Test Data	14
7	Driver Dummy Positioning Data	15
8	Camera Location Data	16
9	Vehicle Accelerometer Locations and Data Summary	18
10	Test Vehicle Measurements	19
11	Pretest Vehicle Target Locations	21
12	Load Cell Locations on Fixed Barrier	22
 <u>APPENDICES</u>		
A	Photographs	23
B-1	Vehicle and Dummy Response Data	25
B-2	Load Cell Barrier Data	27
C	Dummy Configuration and Performance Verification Data	29
D	Restraint Instructions from Vehicle Owner's Manual	31

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is a part of the FY 90 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 1990 Acura Integra RS, 4 Door Sedan, NHTSA No. ML5300, at a velocity of 34.7 mph. The frontal impact test was conducted by Mobility Systems and Equipment Company (MSE) on 12 September 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 (ATDs) 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-five (65) channels of crash parameters were recorded using two (2) FM tape recorders, three (3) computers and associated data acquisition system. Time history plots of all recorded channels are presented in Appendix B.

2.1 GENERAL COMMENTS

The 1990 Acura Integra RS, 4 Door Sedan, was equipped with a 112 cubic inch, 4 cylinder engine and 5 speed manual transmission. The test weight of the 1990 Acura Integra RS, 4 Door Sedan, with two (2) 50th percentile male dummies, instrumentation, and cameras was 2,915 pounds.

The 1990 Acura Integra RS was involved in a frontal load cell barrier crash at a velocity of 34.7 mph.

The maximum static crush for the vehicle of 19.8 inches occurred at the centerline of the front bumper. The windshield was cracked, but otherwise the vehicle glazing remained intact. Both the driver's and passenger's front doors were opened without the aid of tools.

The driver ATD's head hit the steering wheel rim. The driver's left and right knees hit the dash panel and steering column. The driver ATD had a HIC value of 585, the maximum chest acceleration (resultant clipped) was not computed because of loss of driver chest z-channel data after 72 milliseconds in the impact event. The maximum femur loads were 1,545 (left) and 1,684 (right) pounds.

The passenger ATD's head did not contact vehicle interior and both of his knees hit dash panel. The HIC value for the passenger ATD was 637, the maximum chest acceleration (resultant clipped) was 42.2 g's, and the maximum femur loads were 1,301 (left) and 1,877 (right) pounds.

Seat belt spool out, measured by high-speed film analysis, was 2.0 inches for the driver and 3.0 inches for the passenger.

There were no apparent visual indications of any standard solvent leaks.

Each of the test vehicle's front outboard seating position was equipped with a 2-point, motorized belt system with a knee bolster as vehicle's Automatic Crash Protection System. Additionally each position had an active lap belt. The vehicle was tested with both the active lap belt and the ACP system.

Data Table No. 1 Test Vehicle Data

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1990/ACURA/INTEGRA/RS/4-DOOR

VEHICLE NHTSA NO.: M L 5 3 0 0 VIN: J H 4 D B 1 5 4 0 L S 0 0 7 5 1 8

VEHICLE BODY COLOR: GOLD; MONTH & YEAR OF MANUFACTURE: 06/89

ENGINE: 4 Cylinders; 112 C.I.D; Liters; 1834 CC
X Gas; Diesel; Turbocharged
PLACEMENT-- Longitudinal; X Transverse (Lateral)

TRANSMISSION: 5 Speed; X Manual; Automatic; Overdrive
FINAL DRIVE: X Front Wheel Drive Rear Wheel Drive;
X Four Wheel Drive

DATE VEHICLE AVAILABLE FOR 35 MPH CRASH TESTING: 08/11/89

ODOMETER READING: 106 miles; OPTIONS: A/C; X P/S; P/Wdo.;
X Tilt Whl.; Cruise Control

DATA RECORD FROM VEHICLE'S TIRE PLACARD:

=====

Tire Pressure (at capacity): 28 psi Front; 28 psi Rear
Recommended Tire Size: 195/60R14 85H
Tires on Vehicle: 195/60R14 85H; Manufacturer: YOKOHAMA
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 = 850 lbs. (A)
No. of Occupants x 150 lbs.- - - = 750 lbs. (B)
Cargo Capacity (A - B)- - - - - = 100 lbs.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

=====

Right Front	=	<u>762</u>	lbs.	
Left Front	=	<u>787</u>	lbs.	TOTAL FRONT = <u>1549</u> lbs. (62.2% of TOTAL)
Right Rear	=	<u>461</u>	lbs.	
Left Rear	=	<u>480</u>	lbs.	
TOTAL WEIGHT	=	<u>2490</u>	lbs.	TOTAL REAR = <u>941</u> lbs. (37.8 % 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>2490</u>	lbs.
Maximum Cargo Carrying Capacity of Test Vehicle*- - - - -	<u>100</u>	lbs.
Weight of Two P.572 Dummies (2 x 164 lbs.)- - - - -	<u>328</u>	lbs.
TEST VEHICLE TARGET WEIGHT	<u>2918</u>	lbs.

*300 lbs. for light trucks and MPVs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front =	<u>861</u>	lbs.	TOTAL FRONT =	<u>1739</u>	lbs. (59.7% of TOTAL)
Left Front =	<u>878</u>	lbs.			
Right Rear =	<u>578</u>	lbs.	TOTAL REAR =	<u>1176</u>	lbs. (40.3% of TOTAL)
Left Rear =	<u>598</u>	lbs.			

TOTAL WEIGHT= 2915 lbs. (which includes 0 lbs. of cargo ballast weight placed in the cargo/luggage area)

VEHICLE COMPONENTS REMOVED TO MEET TARGET WEIGHT:

1. <u>X</u> Spare Tire	3. <u>X</u> Tail lamp hsg. <u>X</u> Rt.Side <u>X</u> Left Side
2. <u> </u> Rear Bumper Assembly	4. <u> </u> Rear Seat Assembly

TEST VEHICLE ATTITUDE:

As Delivered----Right Front = 26.9 inches
Left Front = 26.7 inches
Right Rear = 26.1 inches
Left Rear = 25.9 inches

Ready For Test--Right Front = 26.3 inches
Left Front = 26.3 inches
Right Rear = 25.5 inches
Left Rear = 25.3 inches

Test Vehicle Wheelbase: 103.0 inches; C.G.= 41.6 inches rearward of front wheel centerline

Total Vehicle Length:

Right Side =	<u>169.0</u>	inches
Left Side =	<u>168.3</u>	inches
Centerline =	<u>176.0</u>	inches

Data Table No. 2 Post Crash Test Data

DATE OF 35 MPH FRONTAL BARRIER IMPACT RATING TEST: 09/12/89

TIME OF TEST: 2:15 PM: AMBIENT TEMPERATURE AT BARRIER FACE: 85 °F

VEHICLE'S OCCUPANT COMPARTMENT TEMPERATURE: 70 °F

(spec. Range = 66 to 78 F.)

VEHICLE WINDSHIELD HOLDING TEMPERATURE: 72 °F.

VEHICLE IMPACT VELOCITY: Primary Speed Trap = 34.74 mph
Secondary Speed Trap 34.75 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 = 169.0"; C/Line=176.0"; Left Side=168.3"
Vehicle Post-test Length-Right Side=151.0"; C/Line=156.2"; Left Side=151.8"
Vehicle Static Crush --- Right Side=18.0"; C/Line=19.8"; Left Side=16.5"

VEHICLE REBOUND FROM BARRIER FACE:

Vehicle Right Side = 19.8 inches
Vehicle Centerline = 20.3 inches
Vehicle Left Side = 21.0 inches

VEHICLE DUMMY CONTACT POINTS:

	DRIVER (I.D. No. 465)			PASSENGER (I.D. No. 466)		
	Strg.Col. Hub	Strg. Wheel	Instru. Panel	Instru. Panel	Knee Assy.	Glove Box Door
HEAD - - - - -		YES				
RIGHT KNEE - -	////	////	YES	YES	////	YES
LEFT KNEE - -	////	////	YES	YES	////	YES

VEHICLE DOOR OPENING INFORMATION:		RIGHT SIDE		LEFT SIDE	
		OPENED	JAMMED	OPENED	JAMMED
FRONT DOORS - - - - -		YES		YES	
REAR DOORS - - - - -		YES		YES	

Data Table No. 2 (Cont'd) Post Crash Test Data

VEHICLE'S FRONT SEAT MOVEMENT DURING CRASH EVENT:

Seat Cushion Shift - - - - -	0.0 "	0.0 " forward
Seat Adjuster Failure- - - - -	None ;	None

Details Of Any Failure: N/A

OTHER NOTABLE IMPACT EFFECTS:

No windshield separation. Hood contacted windshield.

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: 1990/ACURA/INTEGRA RS/4 DOOR SEDAN

VEH. NHTSA NO.: ML5300 ; TEST DATE: 09/12/89

MAXIMUM ACCELERATION VALUES:		DRIVER DUMMY # 465	PASSENGER DUMMY # 466
Head Channel X	HEAD X	-113.23	-25.90
Head Channel Y	Y	-17.68	19.54
Head Channel Z	Z	75.80	60.93
HEAD RESULTANT	R	136.65	65.63
Chest Channel X	CHEST X	-48.90	-44.76
Chest Channel Y	Y	-16.64	-21.13
Chest Channel Z	Z	N.D.	-16.39
CHEST RESULTANT (3 ms clip)	R	N.D.	42.24
TIME INTERVAL (seconds)		N.D.	0.0634 to 0.0664

N.D. - Driver chest Z data lost about 72 milliseconds in impact event.

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	HIC	584.85	637.12
t_1 (seconds)		0.0665	0.0663
t_2 (seconds)		0.1025	0.1023
Avg. Accel. t_1 to t_2		48.29	49.99

MAXIMUM FEMUR FORCES:

Right Side (lbs.)	FR	1684.10	1876.70
Left Side (lbs.)	FL	1545.40	1300.50

MAXIMUM SEAT BELT FORCES:

Lap Belt	LAP	636.23	656.87
Shoulder Belt	SHLDR	2291.10	2344.90

MAXIMUM SEAT BELT WEBBING SPOOL-OUT:

Lap/Shoulder Belt Combination	2.0	3.0
-------------------------------	-----	-----

Data Table No. 4 Test Dummy Positioning Data

PRE-IMPACT DATA:

Make/Model: ACURA/INTEGRA RS

Body Style: 4 DOOR SEDAN

Model Year: 1990

NHTSA No.: ML5300

Color: GOLD

DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: HONDA MOTOR COMPANY, LIMITED

Date of Manufacture: 06/89; VIN: JH4DB1540LS007518

POST-IMPACT DATA:

Date of Test: 09/12/89 Time: 5:30 PM Temperature: 85 °F

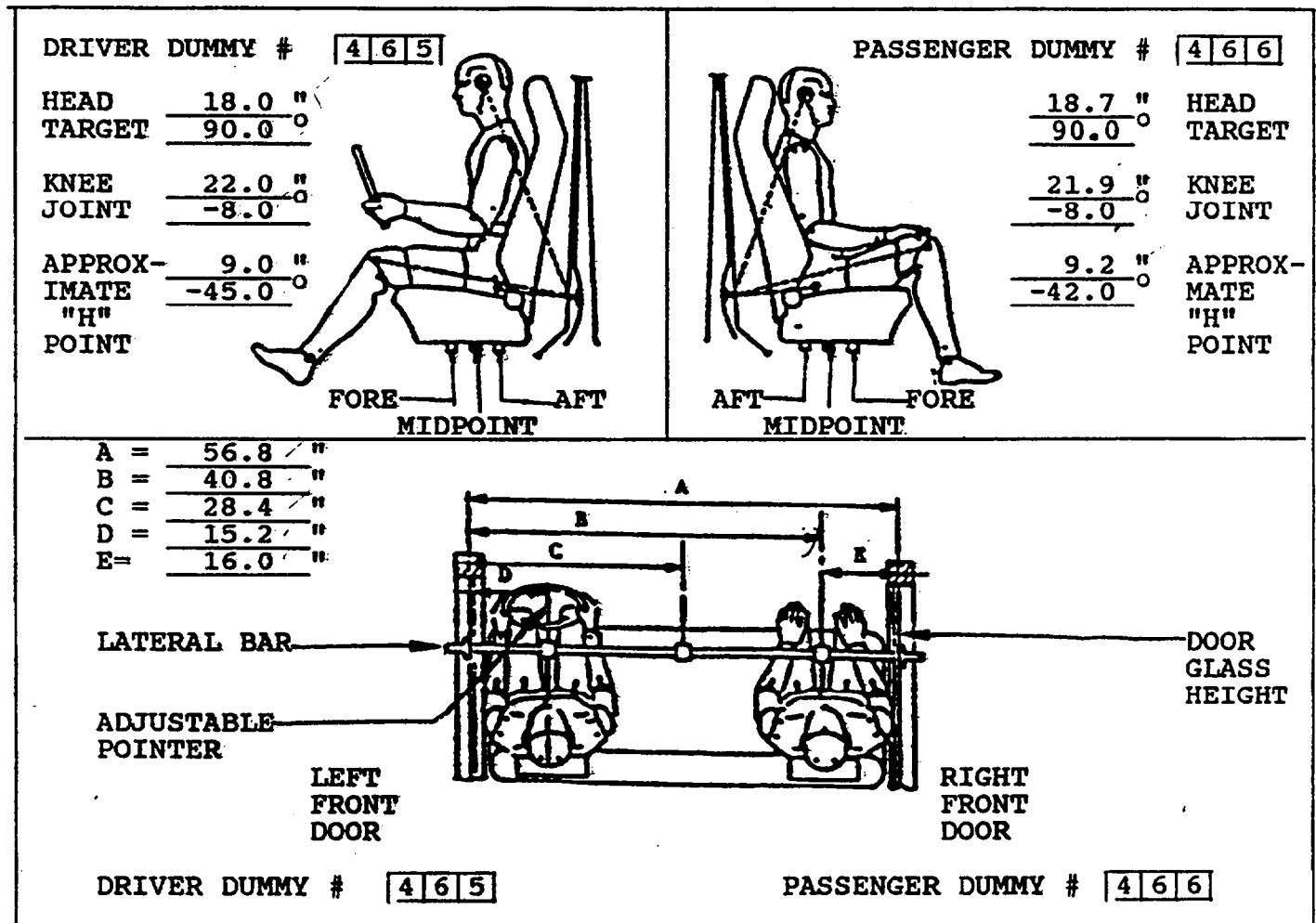
Required Impact Velocity Range: 34.5 to 35.5 mph

Impact Velocity: Primary = 34.74 mph Secondary = 34.75 mph

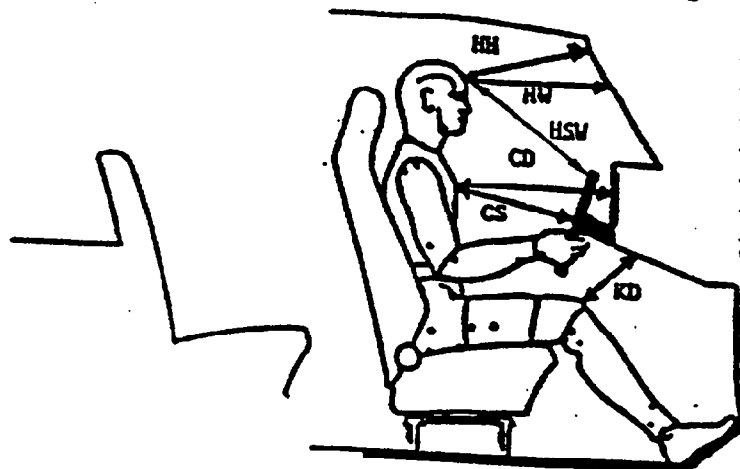
Seat Type: Bucket Adjuster Type: Yes/Lever

Bucket Seat Back Type: Individually adjustable headrest

TECHNICIANS: Enrique Marin

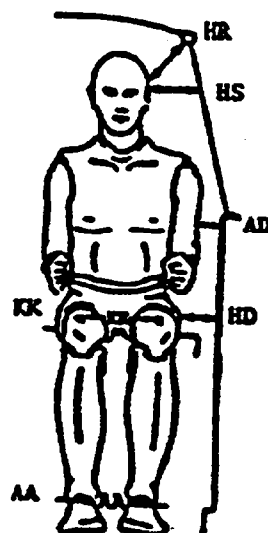


Data Table No. 4 (Cont'd) Test Dummy Positioning Data

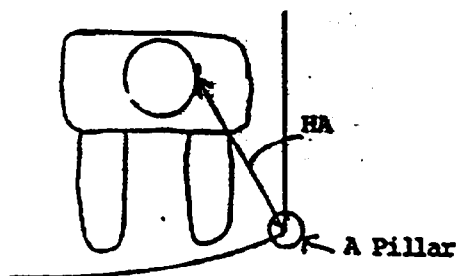


	Driver	Passenger
HH	14.2	14.5
HW	22.0	22.0
CD	24.2	24.3
CS	16.0	N/A
KD L-	4.9	L- 5.1
KD R-	5.2	R- 5.8
Torso Angle	18.0	Torso Angle 17.0
Seat Back Angle	25.0	Seat Back Angle 25.0
HSW	22.0	N/A

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.)
 HR = Head to Side Roof
 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
 are relative to vertical. (deg.)

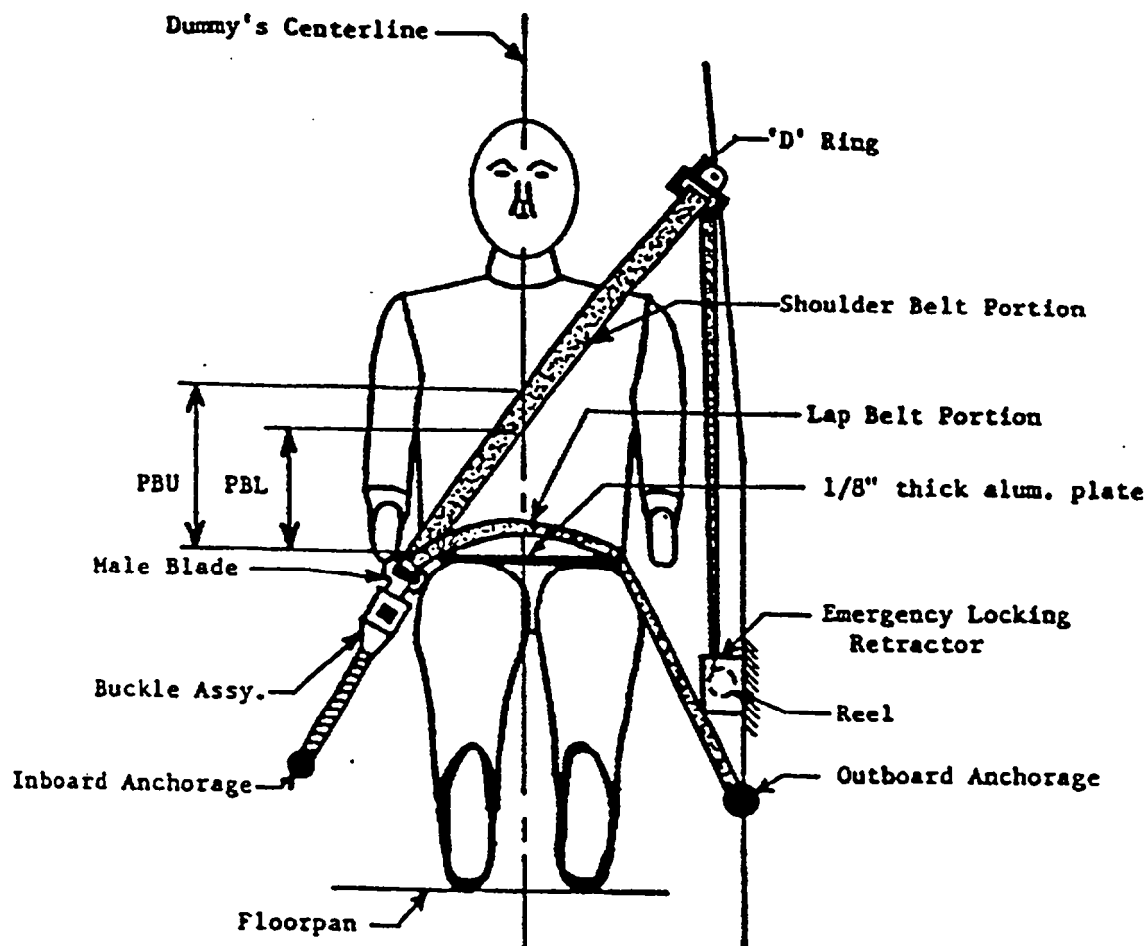


REMARKS



	Driver	Passenger
HR	7.0	6.9
HS	9.8	10.0
AD	4.5	5.0
HD	7.3	7.0
KK	14.5	11.7
AA	14.5	10.5
HA	22.2	23.0

Data Table No. 5 Seat Belt Positioning Data



FRONT VIEW OF DRIVER DUMMY

	DRIVER DUMMY (inches)	PASSENGER DUMMY (inches)
<u>PBU</u> -- Top surface of alum. plate to belt upper edge	13.0	13.0
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	10.0	9.5
<u>LAP BELT TENSION, POUNDS</u>	< 3.0	< 3.0
<u>SHOULDER BELT TENSION, POUNDS</u>	< 3.0	< 3.0

Data Table 6 Seat Belt Performance Assessment Test Data

BELT LENGTH DATA:

Total belt length from retractor reel to bolt hole anchor point for continuous webbing systems _____

Retractor to buckle assembly _____

Shoulder belt length as measured on Part 572 dummy _____

Lap belt length as measured on Part 572 dummy _____

Remainder of belt webbing left on retractor reel _____

DRIVER SIDE		PASSENGER SIDE	
PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
S-59.0 L-54.5	S-59.0 L-54.5	S-60.0 L-56.5	S-60.0 L-56.5
34.5	34.5	34.5	34.5
35.0	35.0	35.5	36.0
33.5	34.5	33.5	34.0
S-24.0 L-21.0	S-24.0 L-20.0	S-24.5 L-23.0	S-24.5 L-22.0

BELT SPOOL-OFF DATA:

As determined by film analysis _____

As determined by electronically _____

As determined mechanically _____

2.0 in	3.0 in
Not Measured	Not Measured
1.7 in	2.7 in

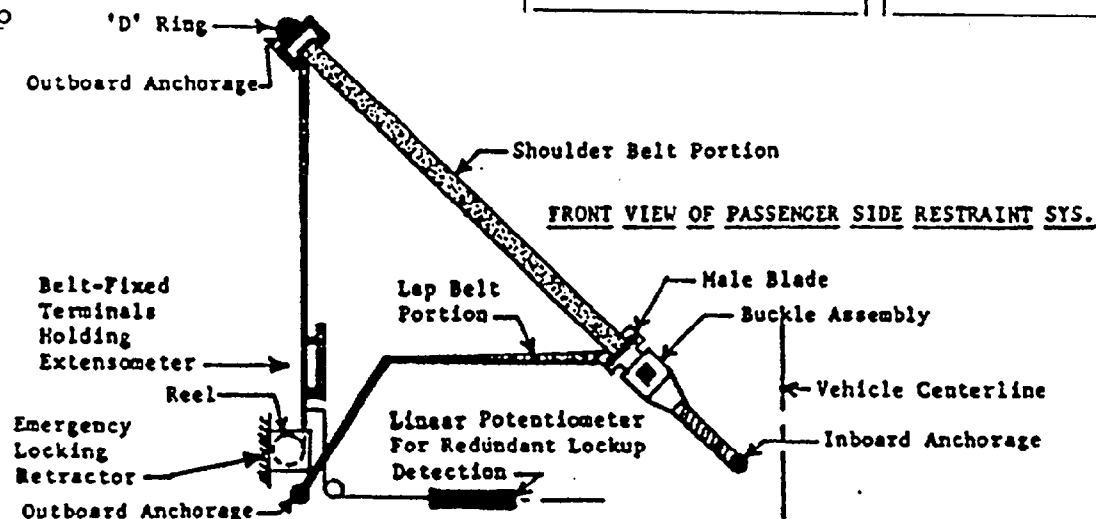
BELT STRAIN DATA:

Measured between retractor reel and 'D' ring _____

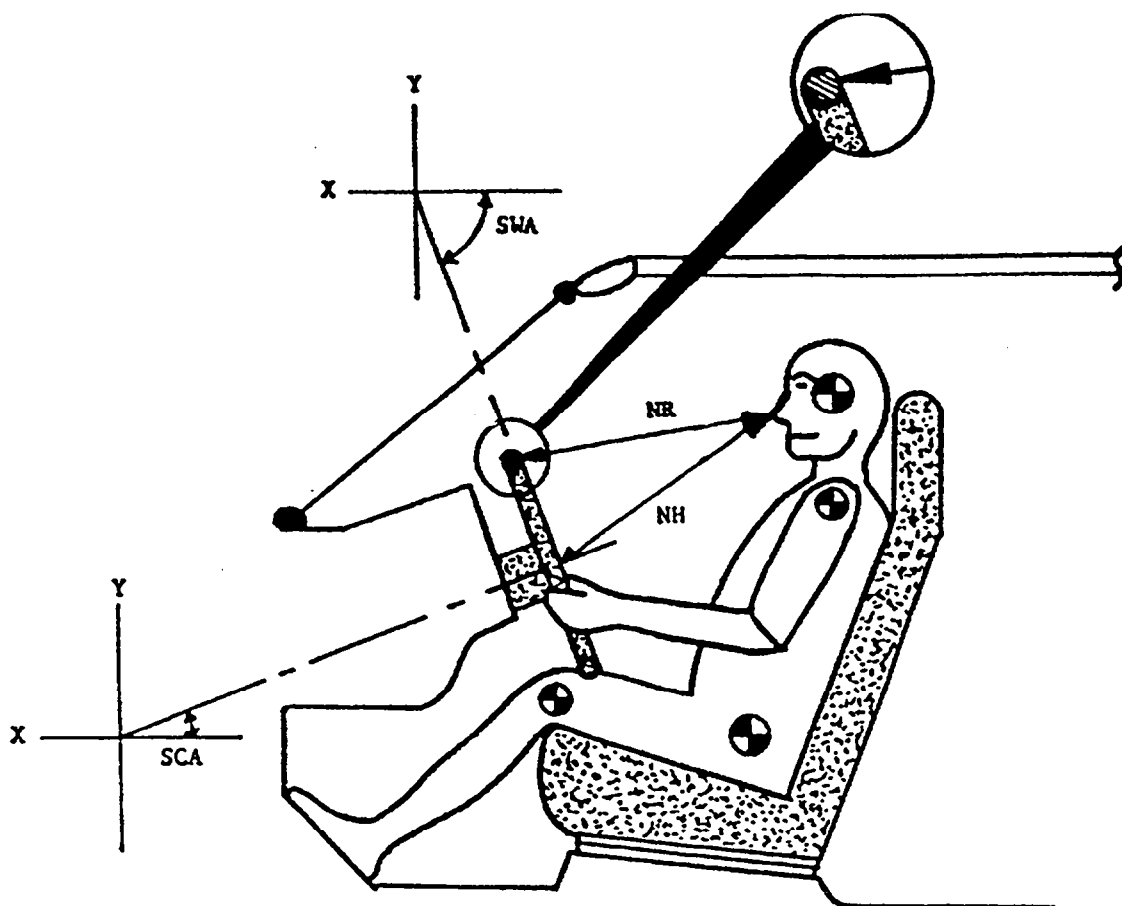
*S Shoulder

L Lap

7.2 Percent	3.8 Percent
-------------	-------------



Data Table No. 7 Driver Dummy to Steering Wheel Positioning



LEFT SIDE VIEW

MEASUREMENTS	
<u>NR</u> --Distance from tip of dummy's nose to Top Rear surface of steering wheel rim.	20.0 Inches
<u>NH</u> --Distance from tip of dummy's nose to center of steering column hub.	22.3 Inches
<u>SCA</u> --Angle of steering column relative to the horizontal X axis.	19.5 Degrees
<u>SWA</u> --Angle of steering wheel relative to the horizontal X axis.	66.0 Degrees

Data Table 8 Camera Location Data

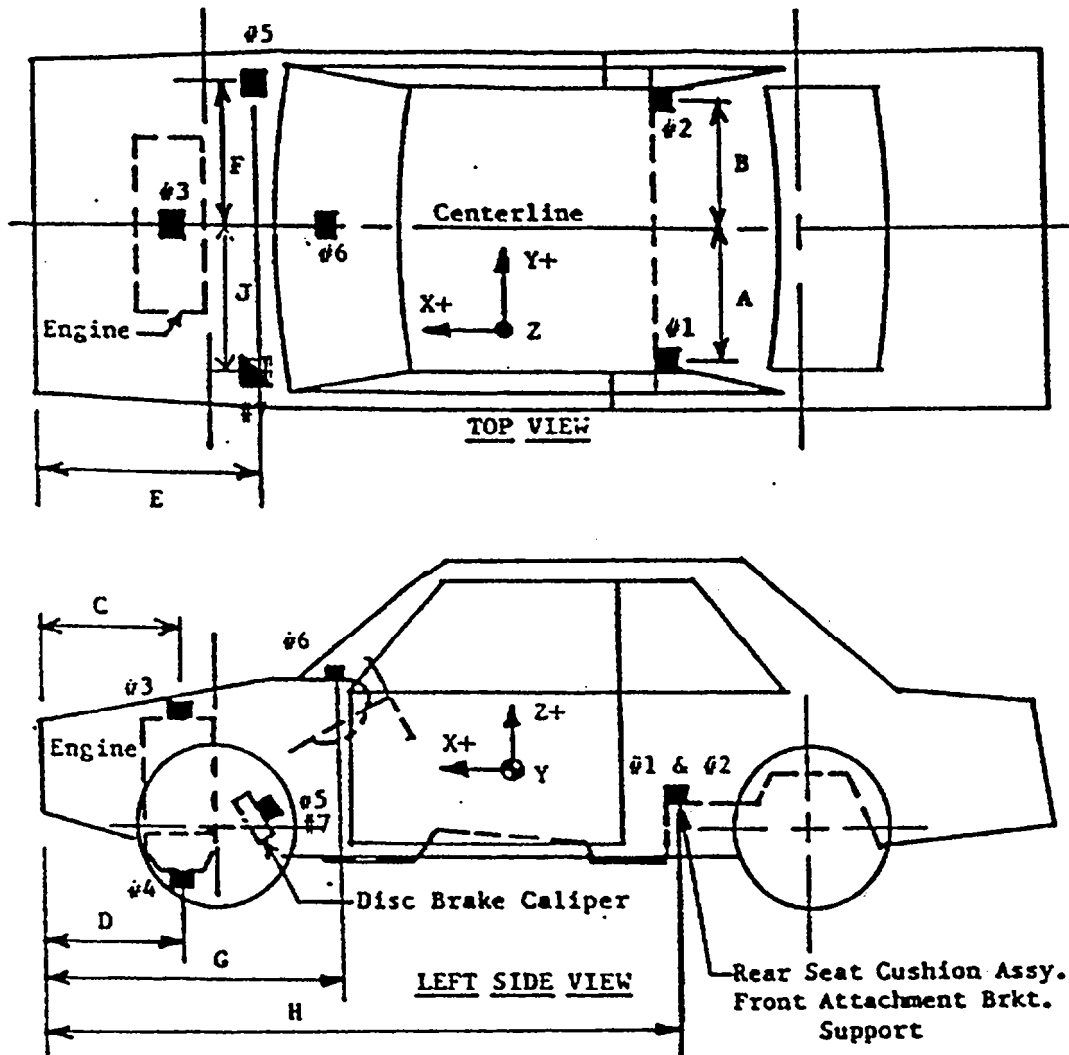
VEH. NHTSA NO.: ML5300 ; TEST DATE: 09/12/89 ; TIME: 5:30 PMVEH. YEAR/MAKE/MODEL/BODY STYLE: 1990/ACURA INTEGRA RS/4 DOOR SEDAN

CAMERA NO.	VIEW	CAMERA POS. (in.)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Left Side View	-676	268	57	3	688	15-70 ZOOM	24
2	Right Side View	244	62	52	2	235	13	616
3	Left Side View	-358	44	38	0	349	16	513
4	Overhead	-1	-2	129	66	123	13	513
5	Pit-Engine	2	42	-54	40	**	13	410
6	Pit-Fuel Tank	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
7	Front-Passenger	12	-13	105	48	117	16	513
8	Front-Driver	-12	-14	106	47	118	16	616
9	Left Side-Driver	-91	115	79	23	90	16	667
10	Right Side-Passenger	100	108	81	21	99	16	667
11	Right Side-'A' Post	168	10	52.5	2	176	28	513
12	Left Side-'A' Post	-350	-24	49.5	2	356	50	973
13	Onboard-Left Side	-18	112	20.5	-5	36	13	718
14	Onboard-Right Side	16	112	20.5	-5	35	13	718
15	Left Side-Steering Col.	-441	82	128	11	437	25.0	410
16	Left Side-Steering Col.	-442	81	110	11	435	25.4	616
17	Right Side Passenger	148	90	52.5	7	138	16	718

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

** Pit camera uses refractor mirror for film imagery

Data Table No. 9 Vehicle Accelerometer Location and Data Summary



Dimension	Length (in.)
A	23.0
B	22.0
C	28.0
D	26.0
E	29.5
F	25.2
G	58.0
H	112.5
J	25.2

Loc. No.	Description	Maximum Value			
		X-	msec.	X+	msec.
1	Rear seat X-member @ Left Side	-53.7	37.8	3.8	115.3
2	Rear seat X-member @ Right Side	-33.7	36.5	3.3	115.7
3	Top of Engine Block	-154.1	29.0	28.1	38.2
4	Bottom of Engine	-144.8	30.4	63.8	37.9
5	Disc Brake Caliper Right Side	-99.3	41.9	46.5	53.0
6	Instrument Panel	-119.9	106.5	41.2	112.1
7	Disc Brake Caliper @Left Side	-96.2	39.0	40.8	54.2

TOP VIEW

CONCRETE PAD

High-Speed Right Side View

High-Speed Passenger Coverage

High-Speed Passenger Coverage

High-Speed Driver Coverage

High-Speed Onboard High-Speed Onboard High-Speed Left

ONBOARD SEAT BELT SPOOL-OUT COVERAGE

Umbilical Cable

TOW ROAD

Steel Grating Over Pit Area

Lateral Guidance Dolly

Monorail

Pass. Side High-Speed

High-Speed Driver Side

Overhead Strg. Col. Motion Targets

Overhead Camera Boom

Barr. Mount

Barrier Face Extension Above Load Cell Assy.

Load Cell Assembly

Time-Zero Indicator (placed near engine oil pan)

Engine Compartment High-Speed

Belt Retractor Unit

Vehicle's Fuel Tank

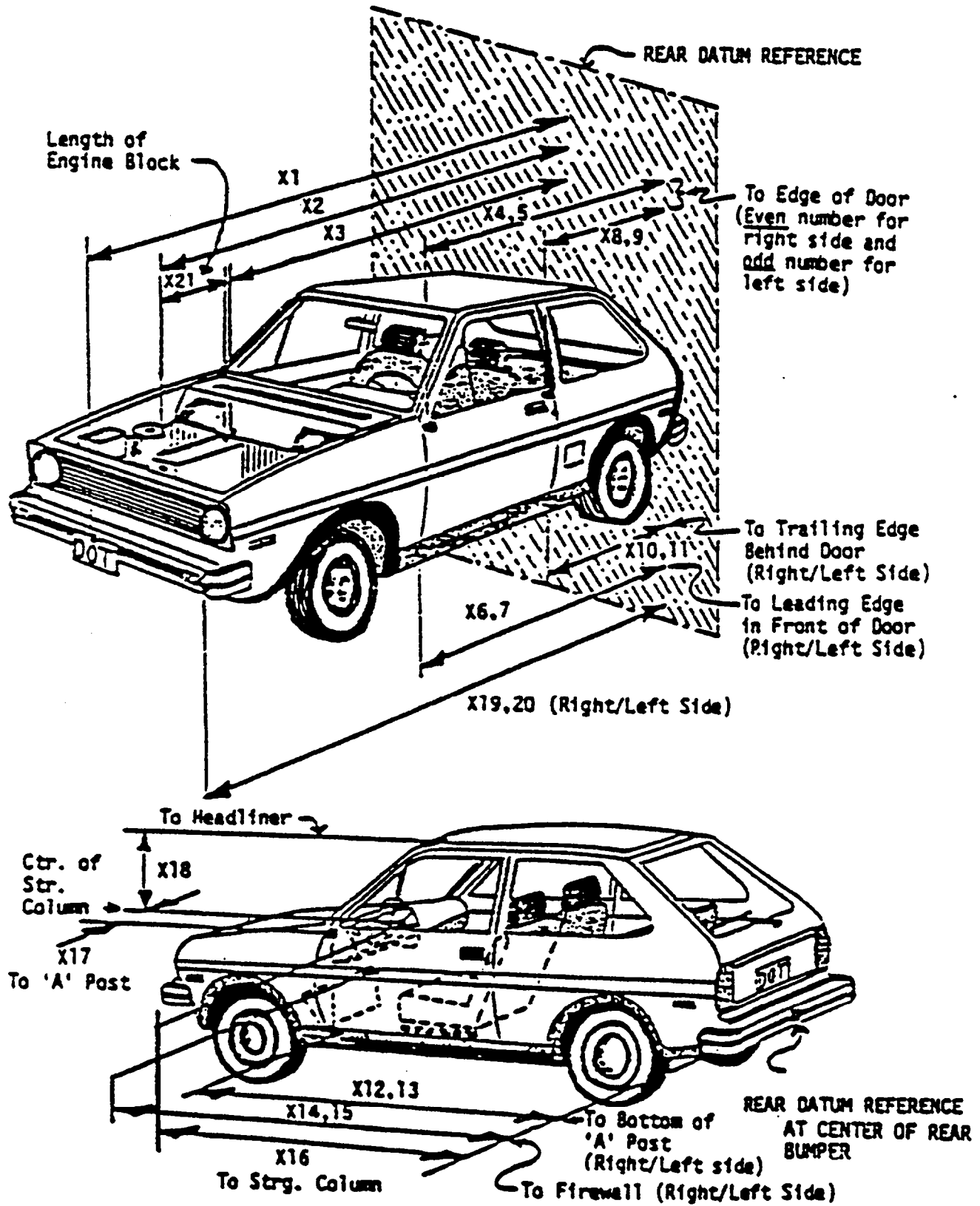
Time Zero Indicator

PHOTOGRAPHIC PIT

LEFT SIDE VIEW

NOTE: CAMERA FRAME RATES
#1 - 24 fps
#2 thru #17 - 500 fps

NOTE: Roof Light placed on veh. centerline behind photo targets for strg. col. motion assessment



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	176.0	156.2	19.8
X2	Rear Surface of Vehicle to Front of Engine	155.6	147.7	7.9
X3	Rear Surface of Vehicle to Firewall	133.8	129.2	4.6
X4	Rear Surface to Upr. Leading Edge of Right Door	119.6	118.8	0.8
X5	Rear Surface to Upr. Leading Edge of Left Door	121.3	119.9	1.4
X6	Rear Surface to Lwr. Leading Edge of Right Door	120.3	119.3	1.0
X7	Rear Surface to Lwr. Leading Edge of Left Door	120.5	119.3	1.2
X8	Rear Surface to Upr. Trailing Edge of Right Door	79.6	78.8	0.8
X9	Rear Surface to Upr. Trailing Edge of Left Door	80.5	79.4	1.1
X10	Rear Surface to Lwr. Trailing Edge of Right Door	80.5	79.5	1.0
X11	Rear Surface to Lwr. Trailing Edge of Left Door	81.0	79.5	1.5
X12	Rear Surface to Bottom 'A' Post on Right Side	120.0	118.8	1.2
X13	Rear Surface to Bottom 'A' Post on Left Side	120.0	119.0	1.0
X14	Rear Surface to Firewall on Right Side	132.4	128.5	3.9
X15	Rear Surface to Firewall on Left Side	132.8	130.0	2.8
X16	Rear Surface to Steering Column	104.0	101.5	2.5
X17	Center of Steering Column to 'A' Post	16.0	15.0	1.0
X18	Center Steering Column to Headlining	18.2	19.0	-0.8
X19	Rear Surface to Right Side of Front Bumper	169.0	151.0	18.0
X20	Rear Surface to Left Side of Front Bumper	168.3	151.8	16.5
X21	Length of Engine Block	8.5	8.5	0.0

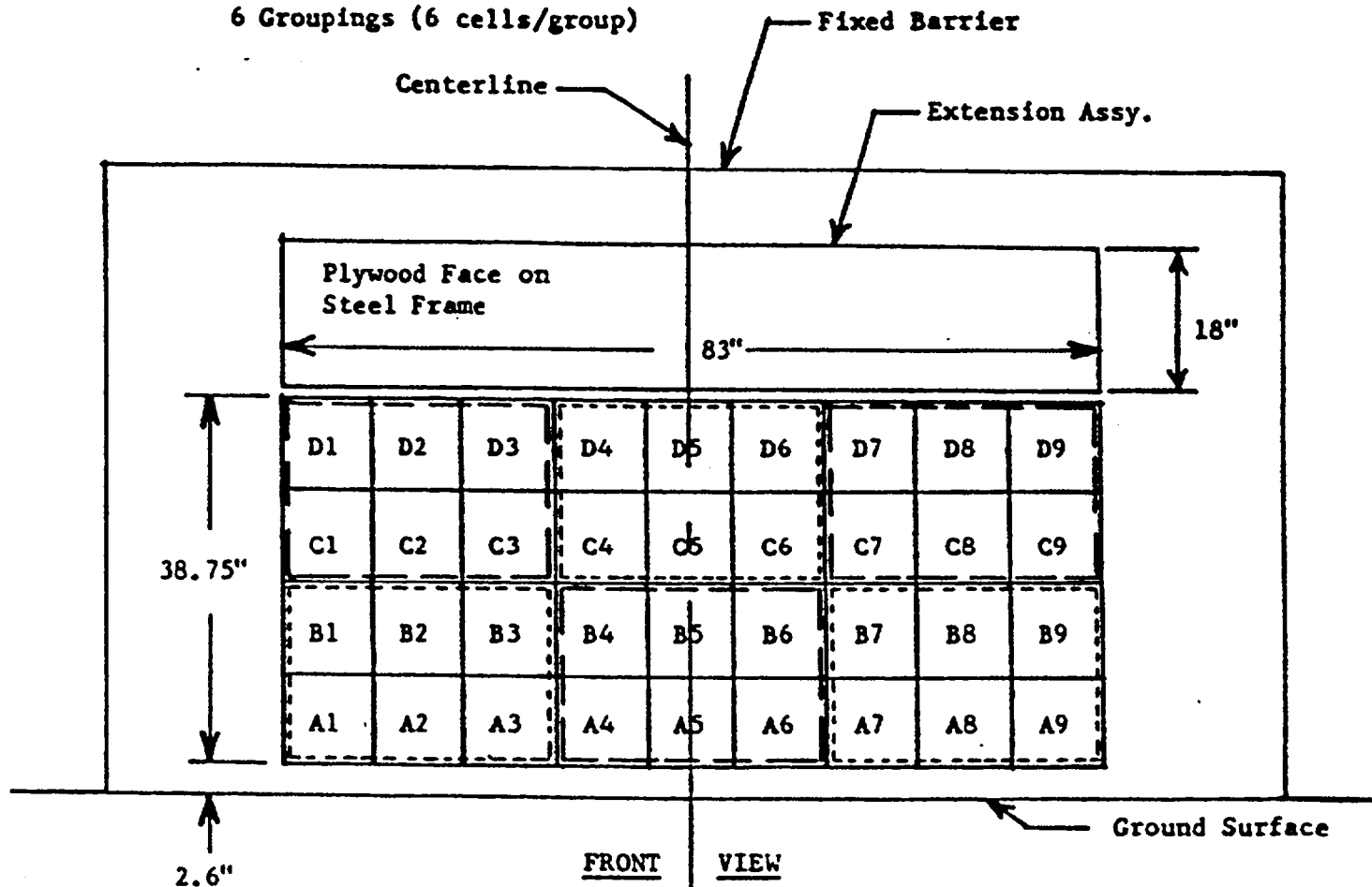
Data Table No. 12 Load Cell Locations on Fixed Barrier

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)

1. **Introduction**

2. **Background**

3. **Method**

4. **Results**

5. **Conclusion**

6. **References**

7. **Appendix**

8. **Table 1**

9. **Table 2**

10. **Table 3**

11. **Table 4**

12. **Table 5**

13. **Table 6**

14. **Table 7**

15. **Table 8**

16. **Table 9**

17. **Table 10**

18. **Table 11**

19. **Table 12**

20. **Table 13**

21. **Table 14**

22. **Table 15**

23. **Table 16**

24. **Table 17**

25. **Table 18**

26. **Table 19**

27. **Table 20**

28. **Table 21**

29. **Table 22**

30. **Table 23**

31. **Table 24**

32. **Table 25**

33. **Table 26**

34. **Table 27**

35. **Table 28**

36. **Table 29**

37. **Table 30**

38. **Table 31**

39. **Table 32**

40. **Table 33**

41. **Table 34**

42. **Table 35**

43. **Table 36**

44. **Table 37**

45. **Table 38**

46. **Table 39**

47. **Table 40**

48. **Table 41**

49. **Table 42**

50. **Table 43**

51. **Table 44**

52. **Table 45**

53. **Table 46**

54. **Table 47**

55. **Table 48**

56. **Table 49**

57. **Table 50**

58. **Table 51**

59. **Table 52**

60. **Table 53**

61. **Table 54**

62. **Table 55**

63. **Table 56**

64. **Table 57**

65. **Table 58**

66. **Table 59**

67. **Table 60**

68. **Table 61**

69. **Table 62**

70. **Table 63**

71. **Table 64**

72. **Table 65**

73. **Table 66**

74. **Table 67**

75. **Table 68**

76. **Table 69**

77. **Table 70**

78. **Table 71**

79. **Table 72**

80. **Table 73**

81. **Table 74**

82. **Table 75**

83. **Table 76**

84. **Table 77**

85. **Table 78**

86. **Table 79**

87. **Table 80**

88. **Table 81**

89. **Table 82**

90. **Table 83**

91. **Table 84**

92. **Table 85**

93. **Table 86**

94. **Table 87**

95. **Table 88**

96. **Table 89**

97. **Table 90**

98. **Table 91**

99. **Table 92**

100. **Table 93**

101. **Table 94**

102. **Table 95**

103. **Table 96**

104. **Table 97**

105. **Table 98**

106. **Table 99**

107. **Table 100**

108. **Table 101**

109. **Table 102**

110. **Table 103**

111. **Table 104**

112. **Table 105**

113. **Table 106**

114. **Table 107**

115. **Table 108**

116. **Table 109**

117. **Table 110**

118. **Table 111**

119. **Table 112**

120. **Table 113**

121. **Table 114**

122. **Table 115**

123. **Table 116**

124. **Table 117**

125. **Table 118**

126. **Table 119**

127. **Table 120**

128. **Table 121**

129. **Table 122**

130. **Table 123**

131. **Table 124**

132. **Table 125**

133. **Table 126**

134. **Table 127**

135. **Table 128**

136. **Table 129**

137. **Table 130**

138. **Table 131**

139. **Table 132**

140. **Table 133**

141. **Table 134**

142. **Table 135**

143. **Table 136**

144. **Table 137**

145. **Table 138**

146. **Table 139**

147. **Table 140**

148. **Table 141**

149. **Table 142**

150. **Table 143**

151. **Table 144**

152. **Table 145**

153. **Table 146**

154. **Table 147**

155. **Table 148**

156. **Table 149**

157. **Table 150**

158. **Table 151**

159. **Table 152**

160. **Table 153**

161. **Table 154**

162. **Table 155**

163. **Table 156**

164. **Table 157**

165. **Table 158**

166. **Table 159**

167. **Table 160**

168. **Table 161**

169. **Table 162**

170. **Table 163**

171. **Table 164**

172. **Table 165**

173. **Table 166**

174. **Table 167**

175. **Table 168**

176. **Table 169**

177. **Table 170**

178. **Table 171**

179. **Table 172**

180. **Table 173**

181. **Table 174**

182. **Table 175**

183. **Table 176**

184. **Table 177**

185. **Table 178**

186. **Table 179**

187. **Table 180**

188. **Table 181**

189. **Table 182**

190. **Table 183**

191. **Table 184**

192. **Table 185**

193. **Table 186**

194. **Table 187**

195. **Table 188**

196. **Table 189**

197. **Table 190**

198. **Table 191**

199. **Table 192**

200. **Table 193**

201. **Table 194**

202. **Table 195**

203. **Table 196**

204. **Table 197**

205. **Table 198**

206. **Table 199**

207. **Table 200**

208. **Table 201**

209. **Table 202**

210. **Table 203**

211. **Table 204**

212. **Table 205**

213. **Table 206**

214. **Table 207**

215. **Table 208**

216. **Table 209**

217. **Table 210**

218. **Table 211**

219. **Table 212**

220. **Table 213**

221. **Table 214**

222. **Table 215**

223. **Table 216**

224. **Table 217**

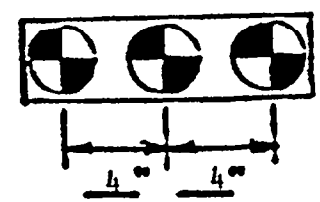
225. **Table 218**

226. **Table 219**

227. **Table 220**

228. **Table 221**

229. <

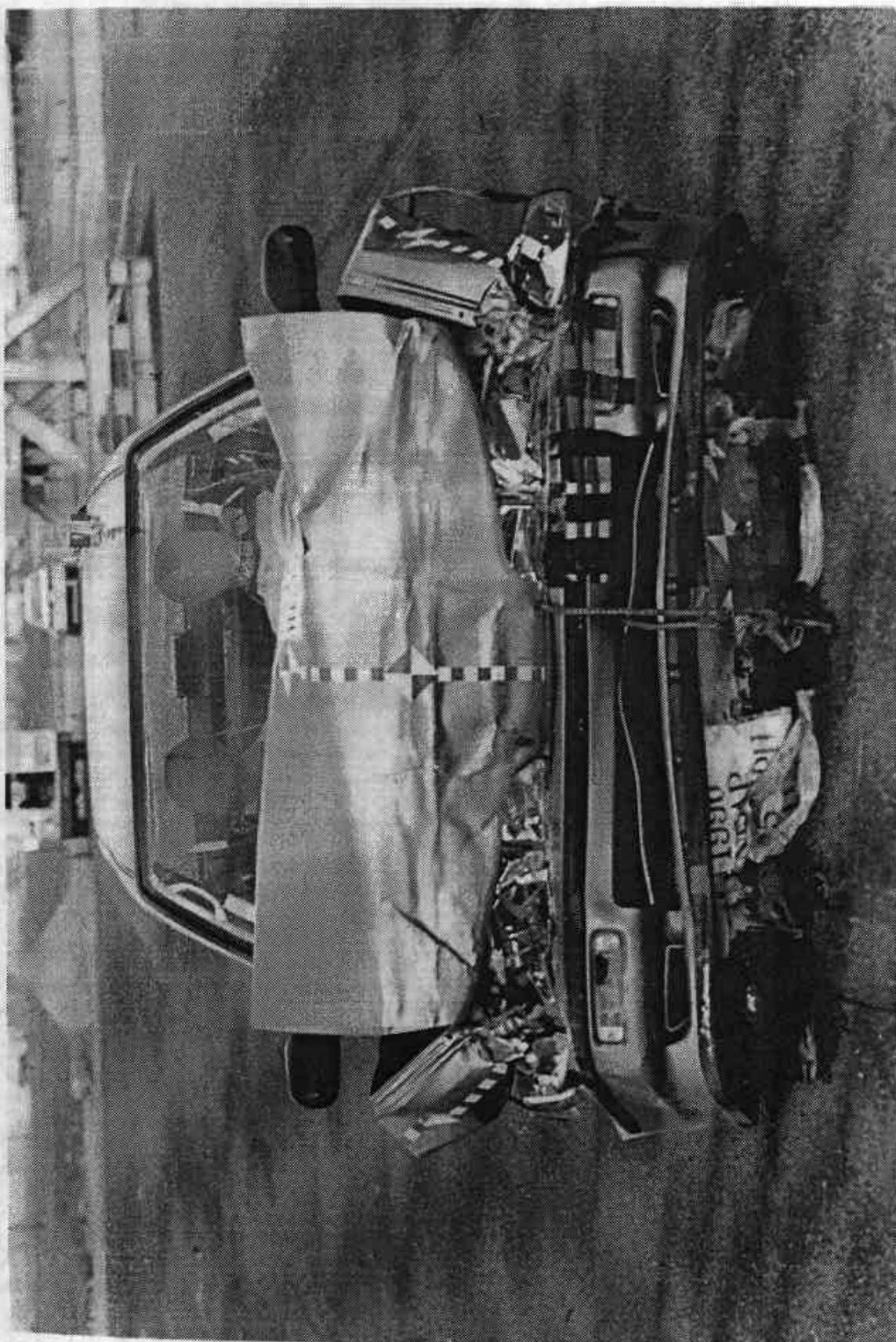


NOTE: Diameter of all photo targets is 4".

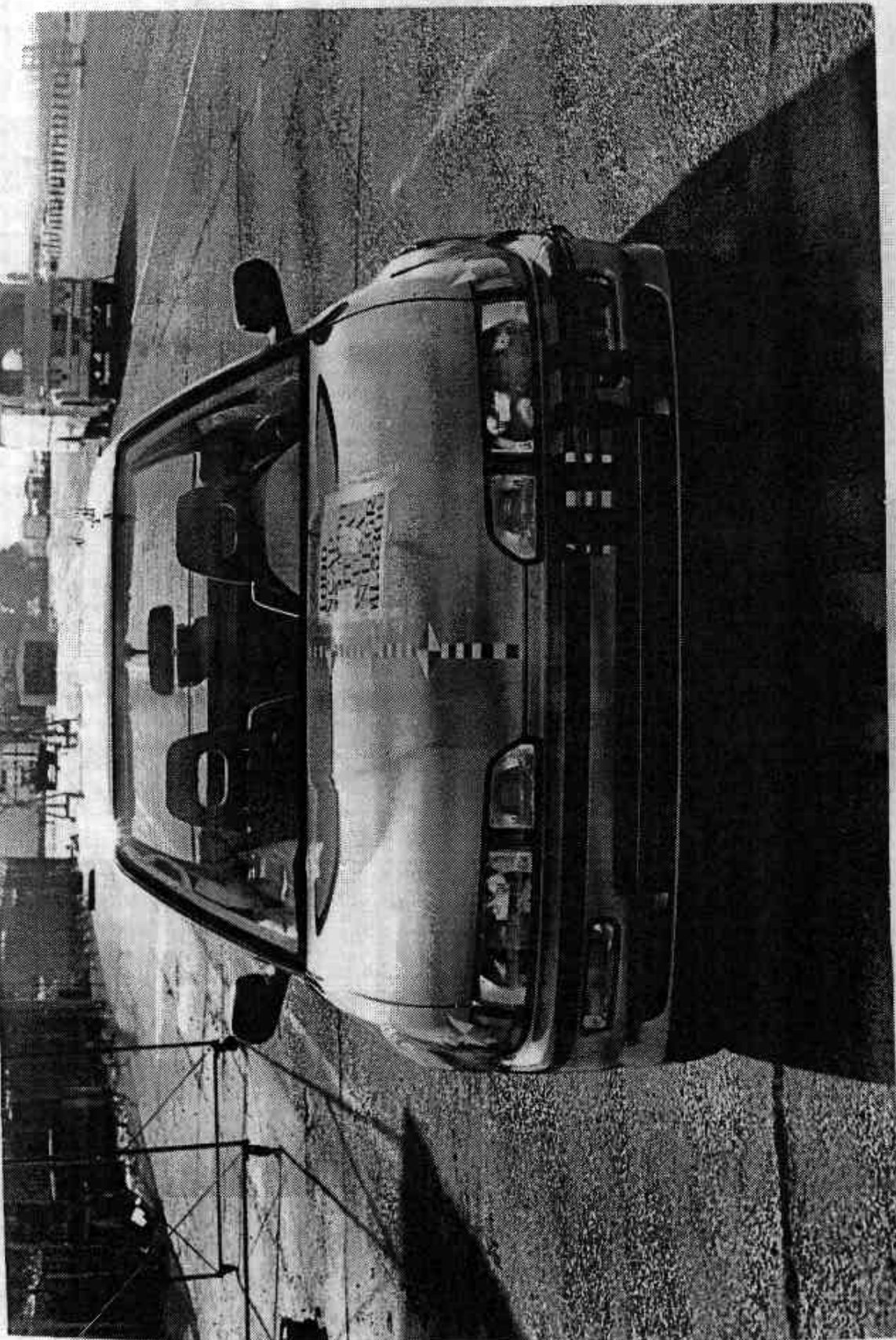
THIS PAGE INTENTIONALLY LEFT BLANK

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 CONTACT AREA
POSTTEST DRIVER DUMMY (ATD) KNEE CONTACT AREA
POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT AREA



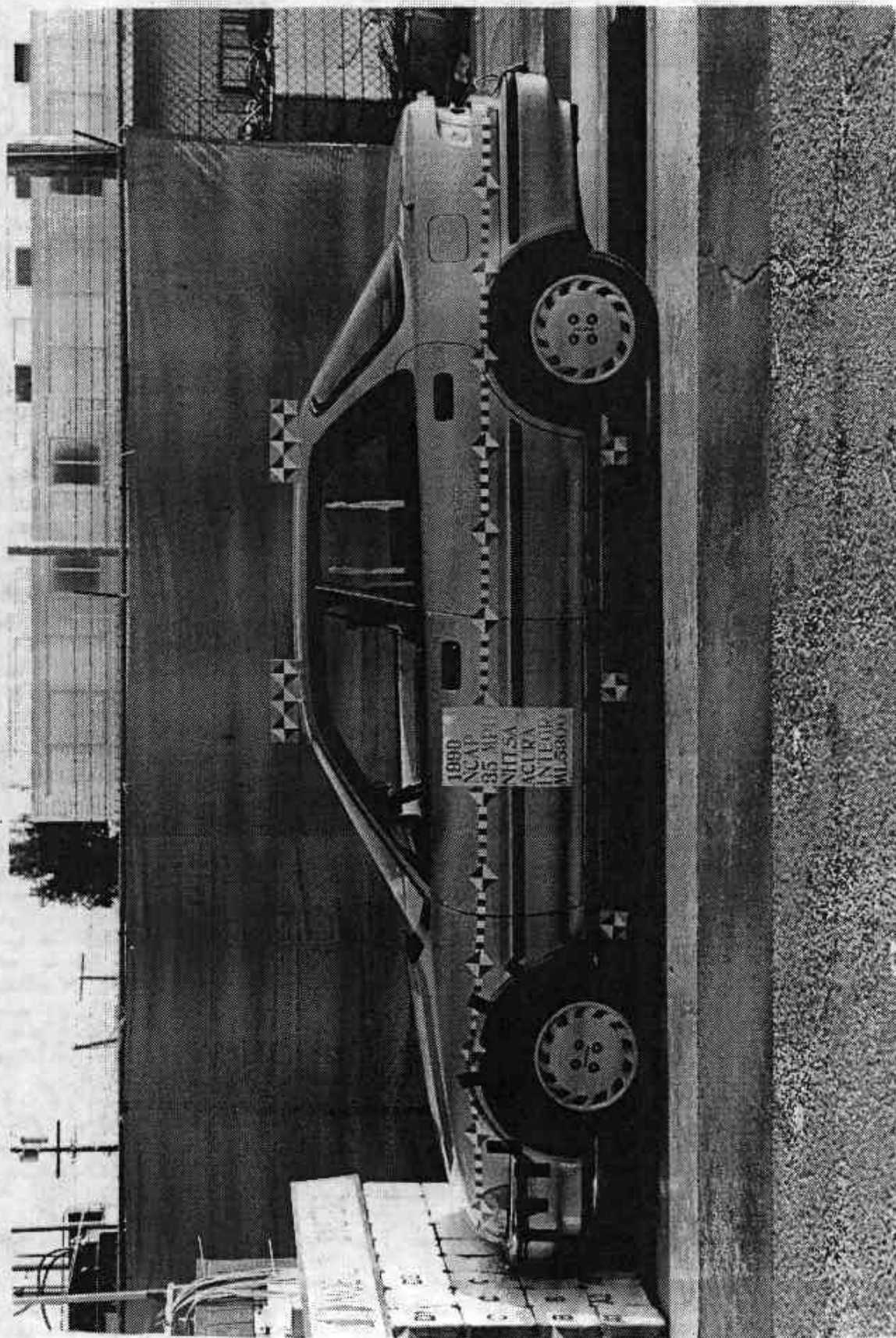
POSTTEST FRONT VIEW



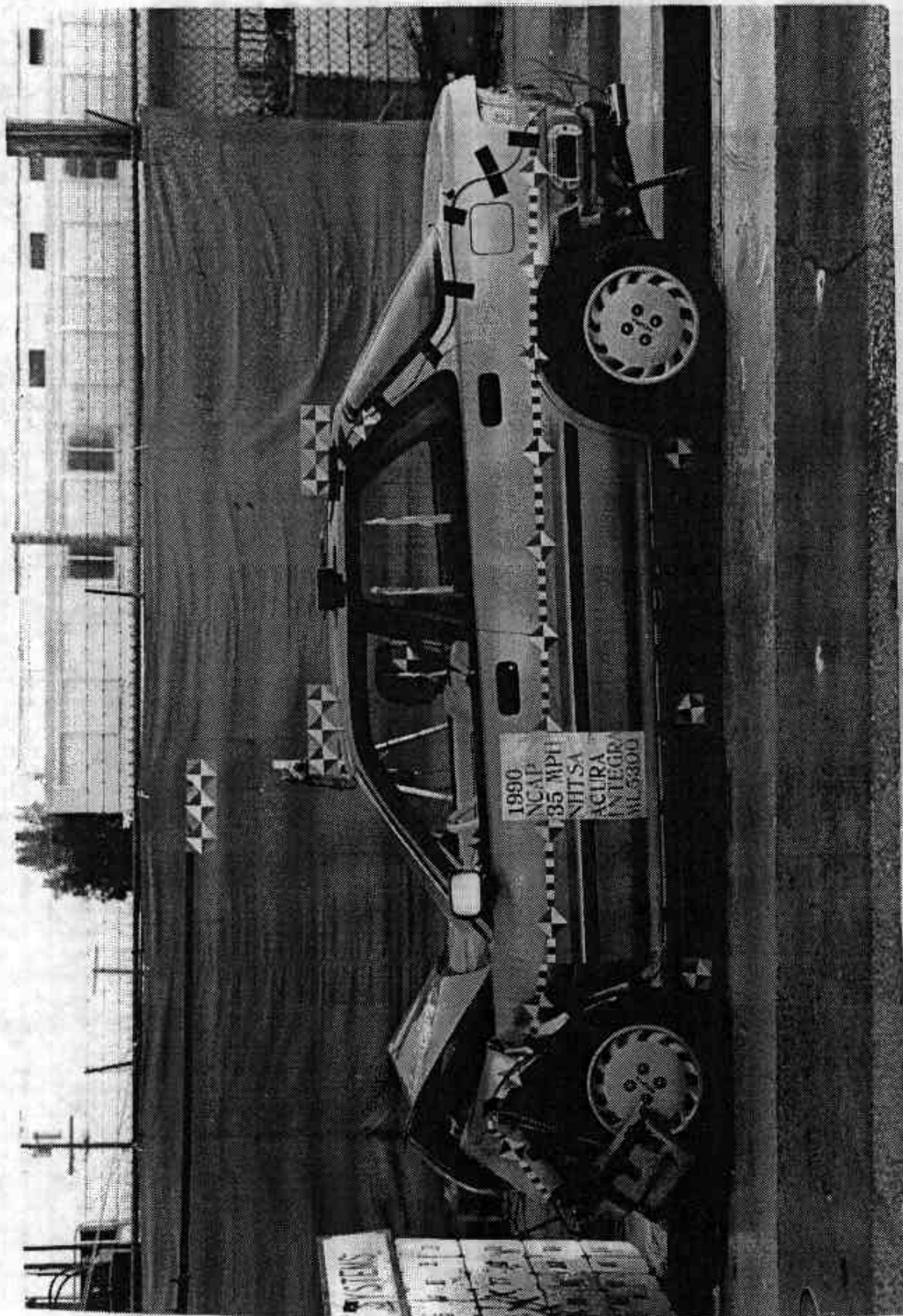
PRETEST FRONT VIEW

A-1

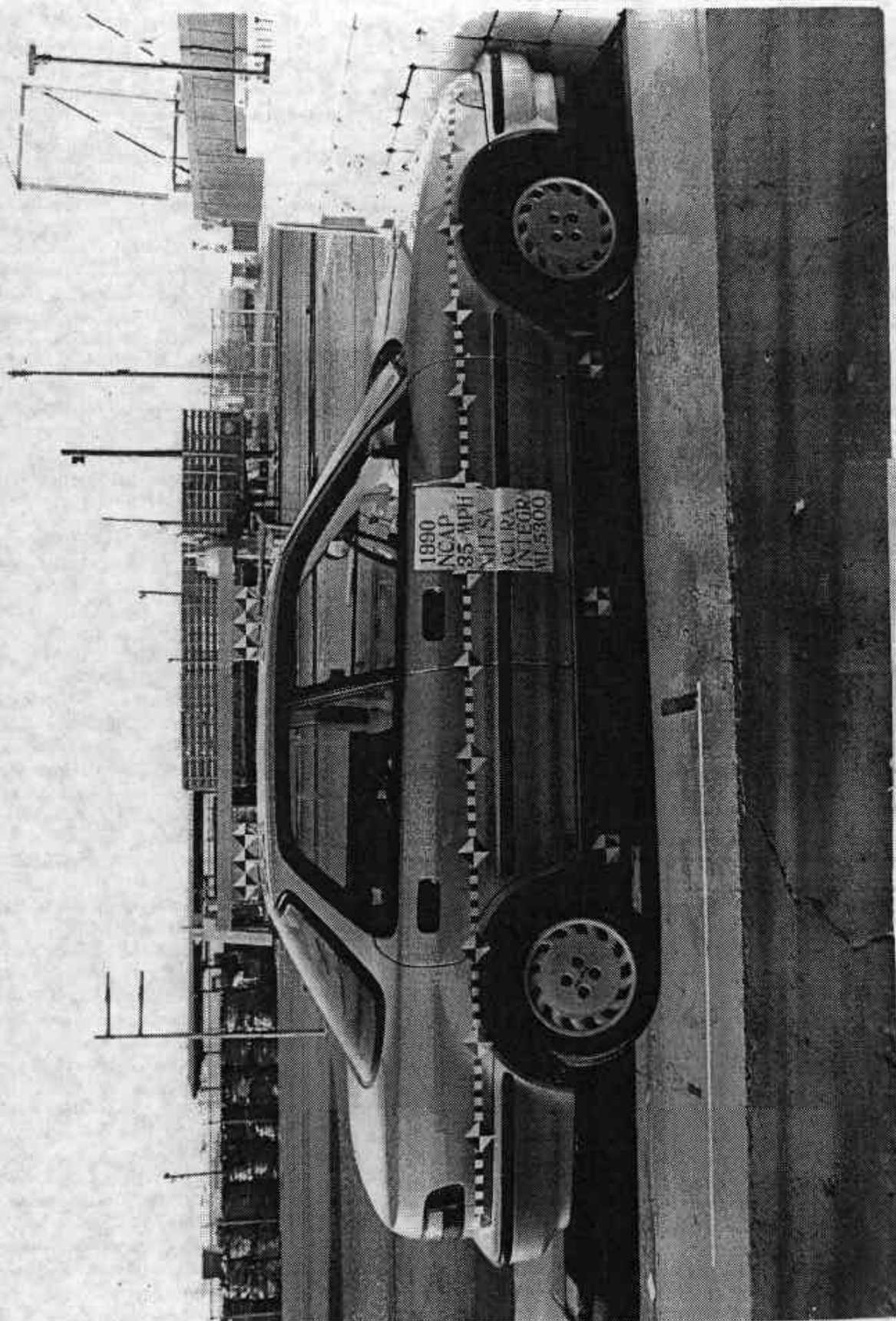
MSE-90-R9063-N01



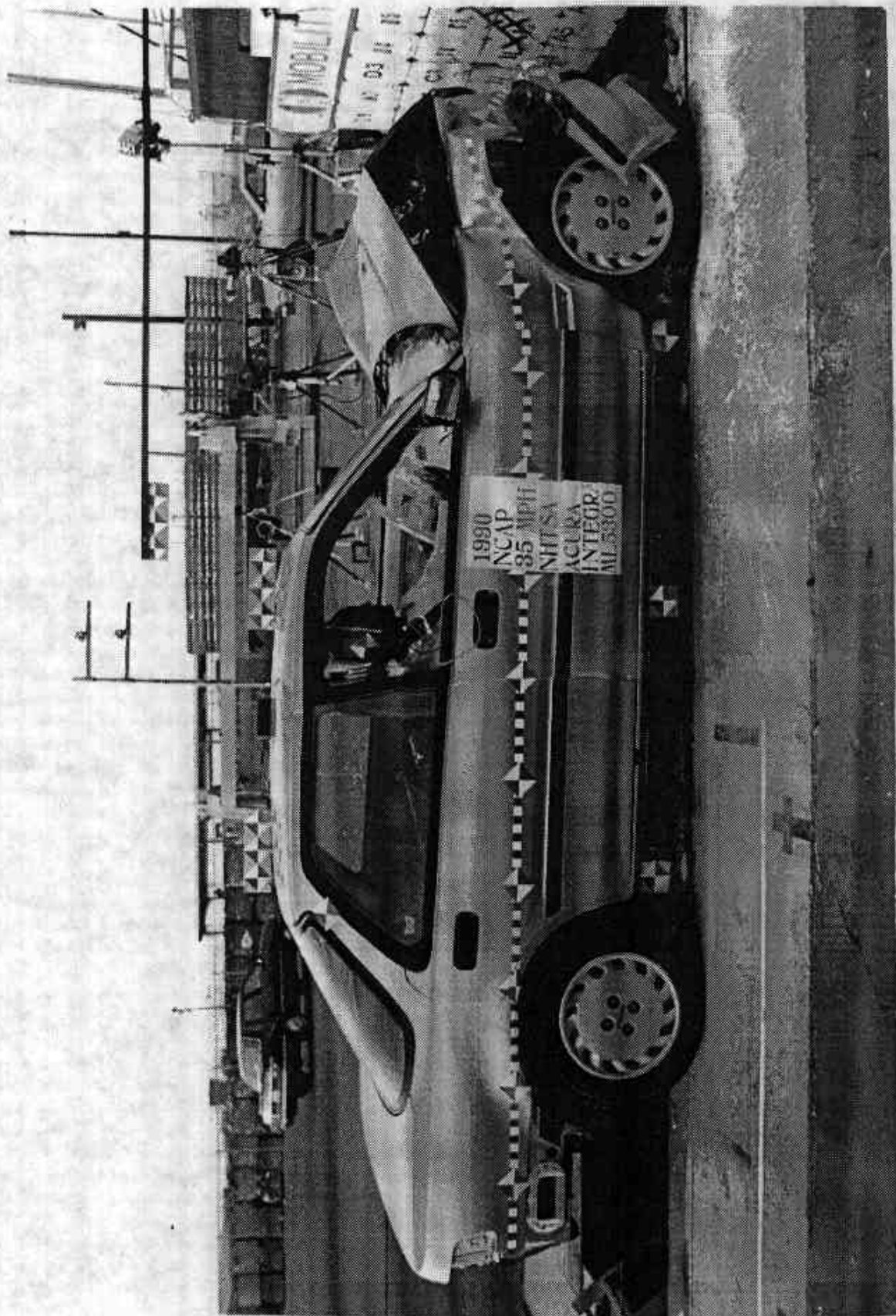
PRETEST LEFT SIDE VIEW



POSTTEST LEFT SIDE VIEW



PRETEST RIGHT SIDE VIEW



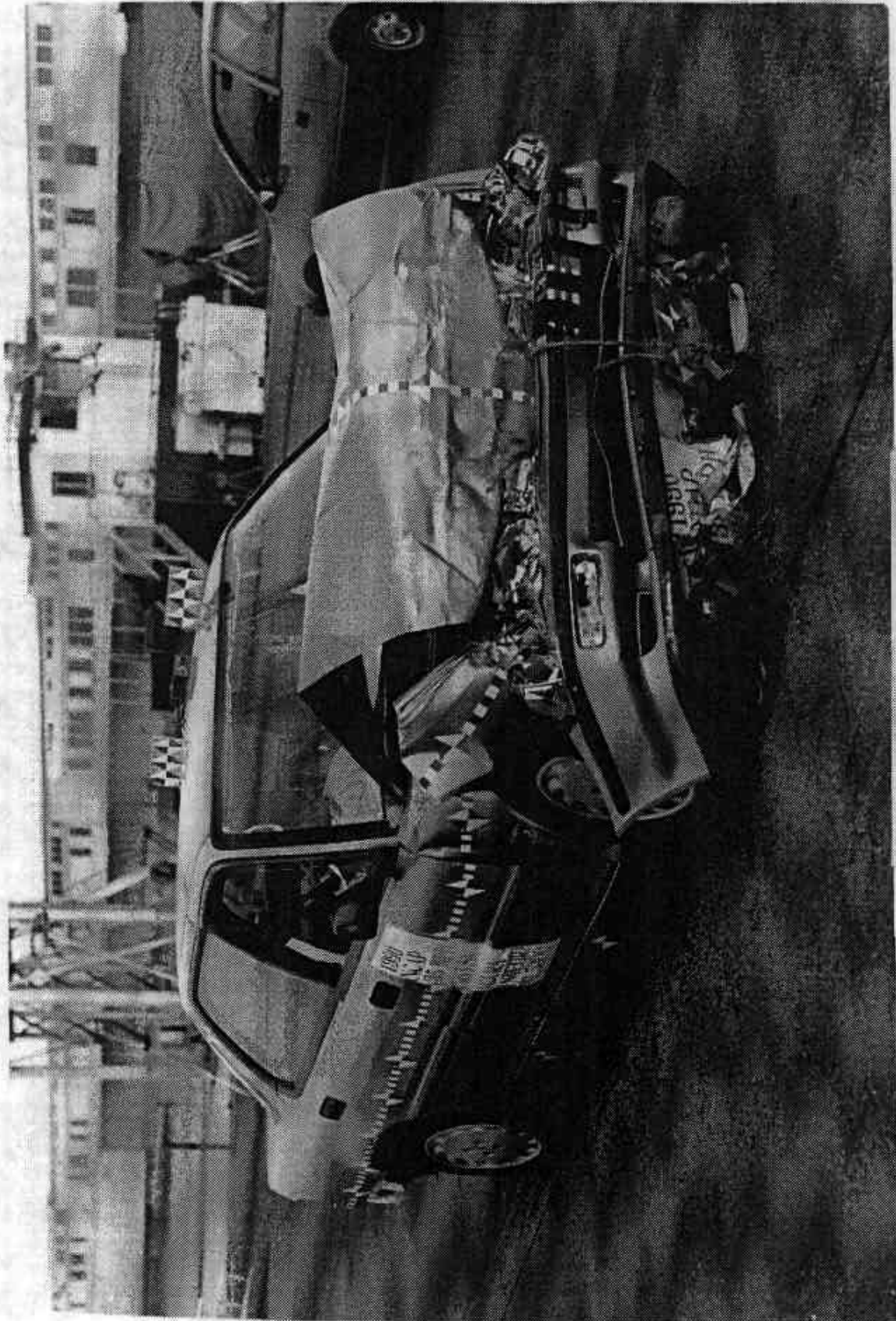
POSTTEST RIGHT SIDE VIEW



PRETEST RIGHT FRONT 3/4 VIEW

A-7

MSE-90-R9063-N01



POSTTEST RIGHT FRONT 3/4 VIEW

A-8

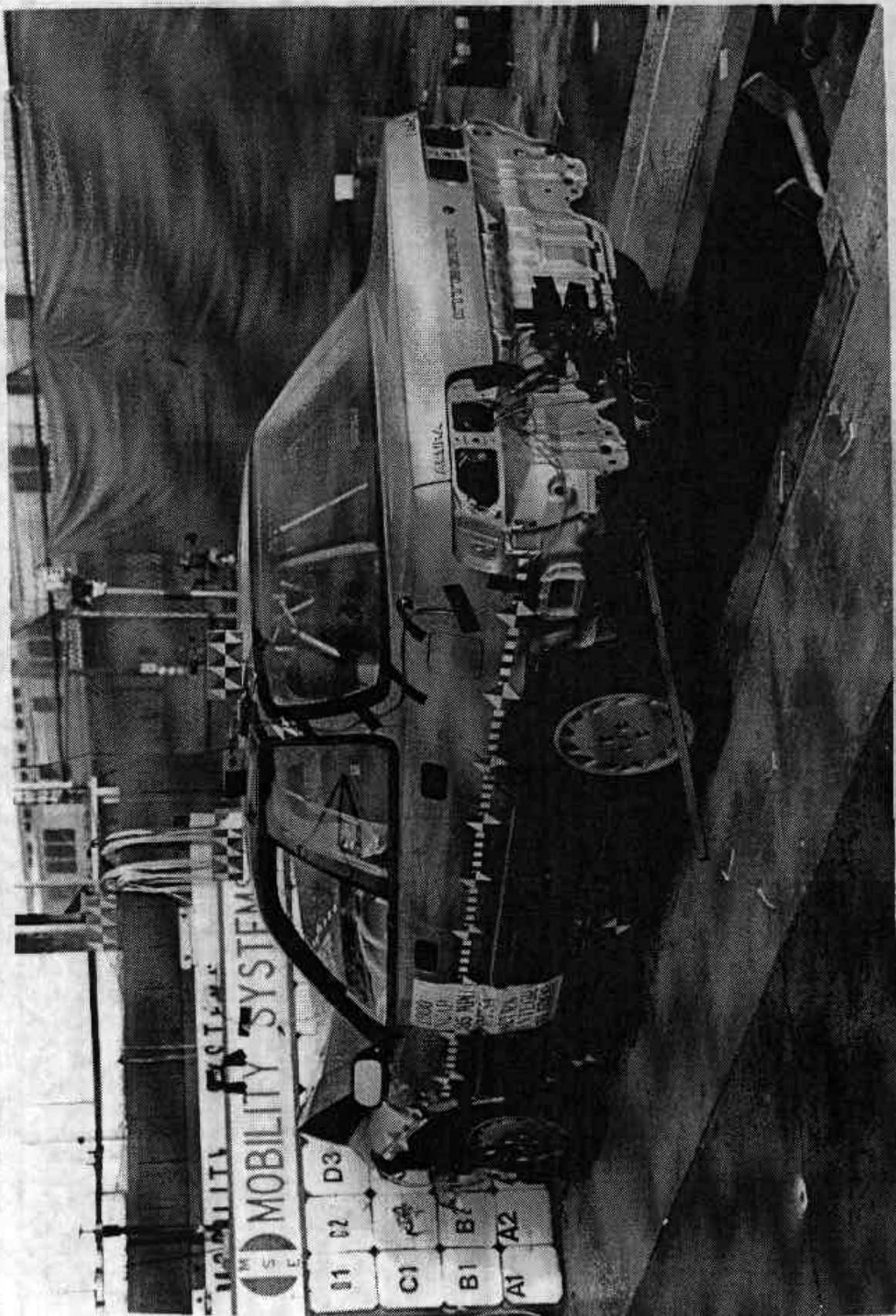
MSE-90-R9063-N01



PRETEST LEFT REAR 3/4 VIEW

A-9

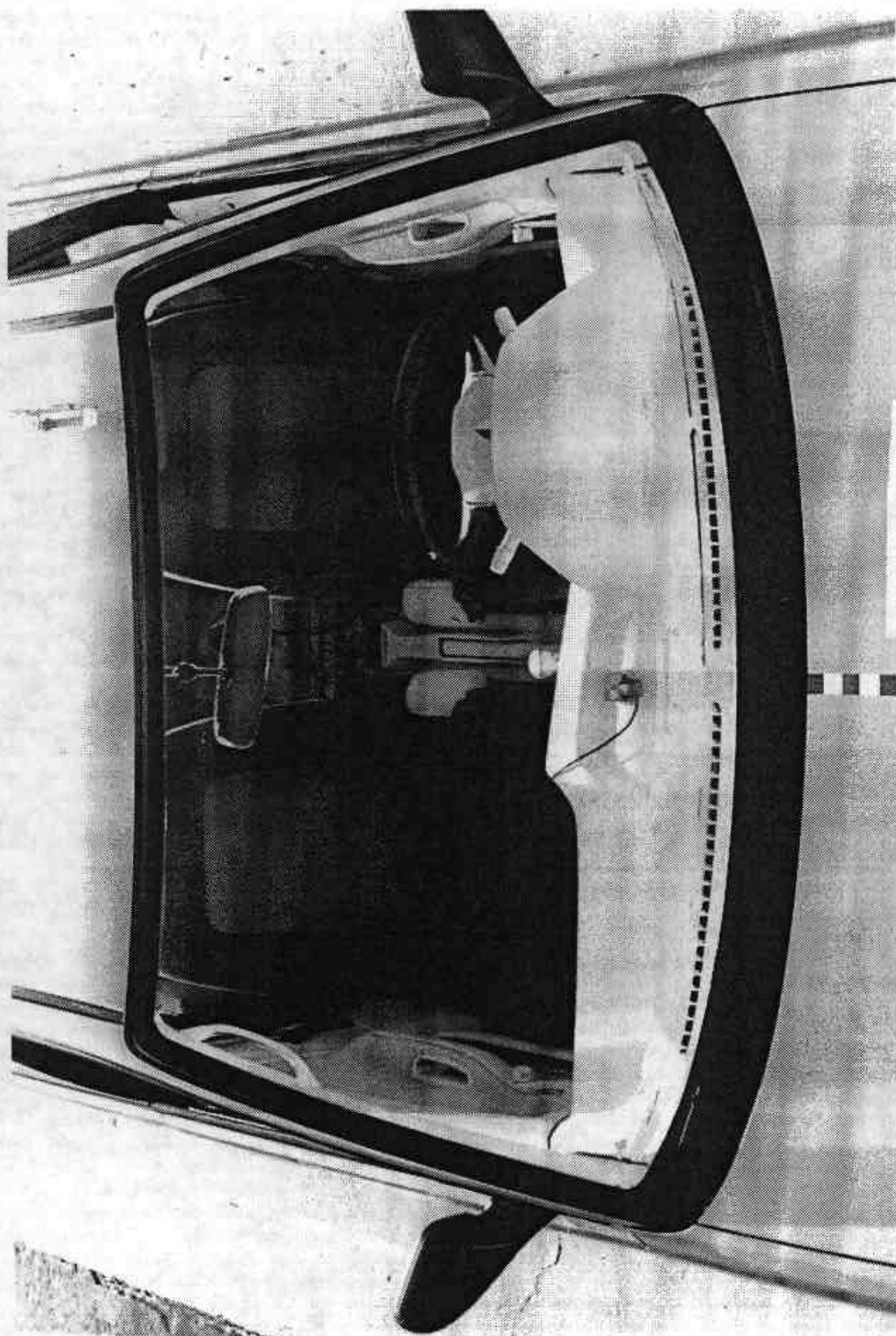
MSE-90-R9063-N01



POSTTEST LEFT REAR 3/4 VIEW

A-10

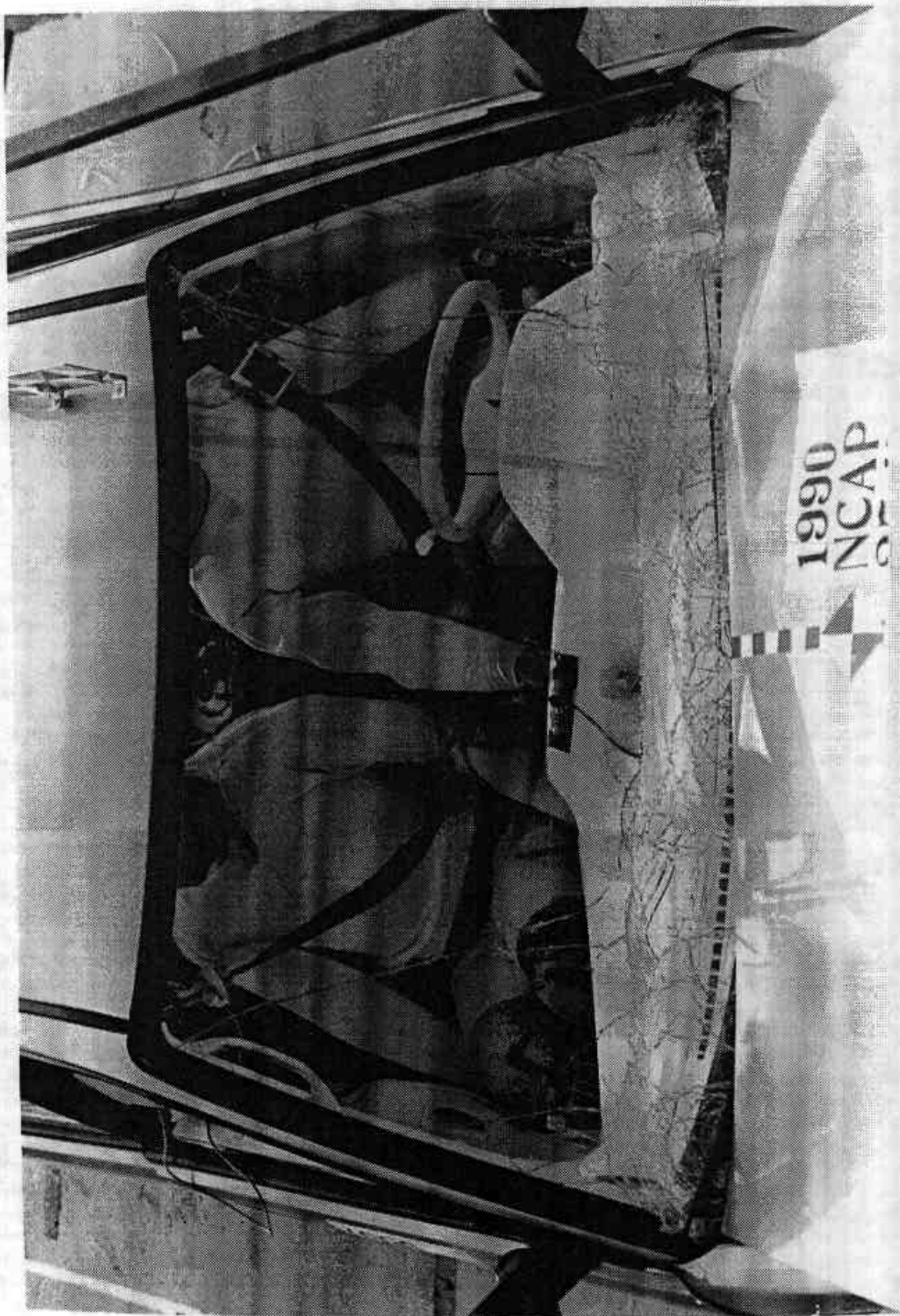
MSE-90-R9063-N01



PRETEST WINDSHIELD VIEW

A-11

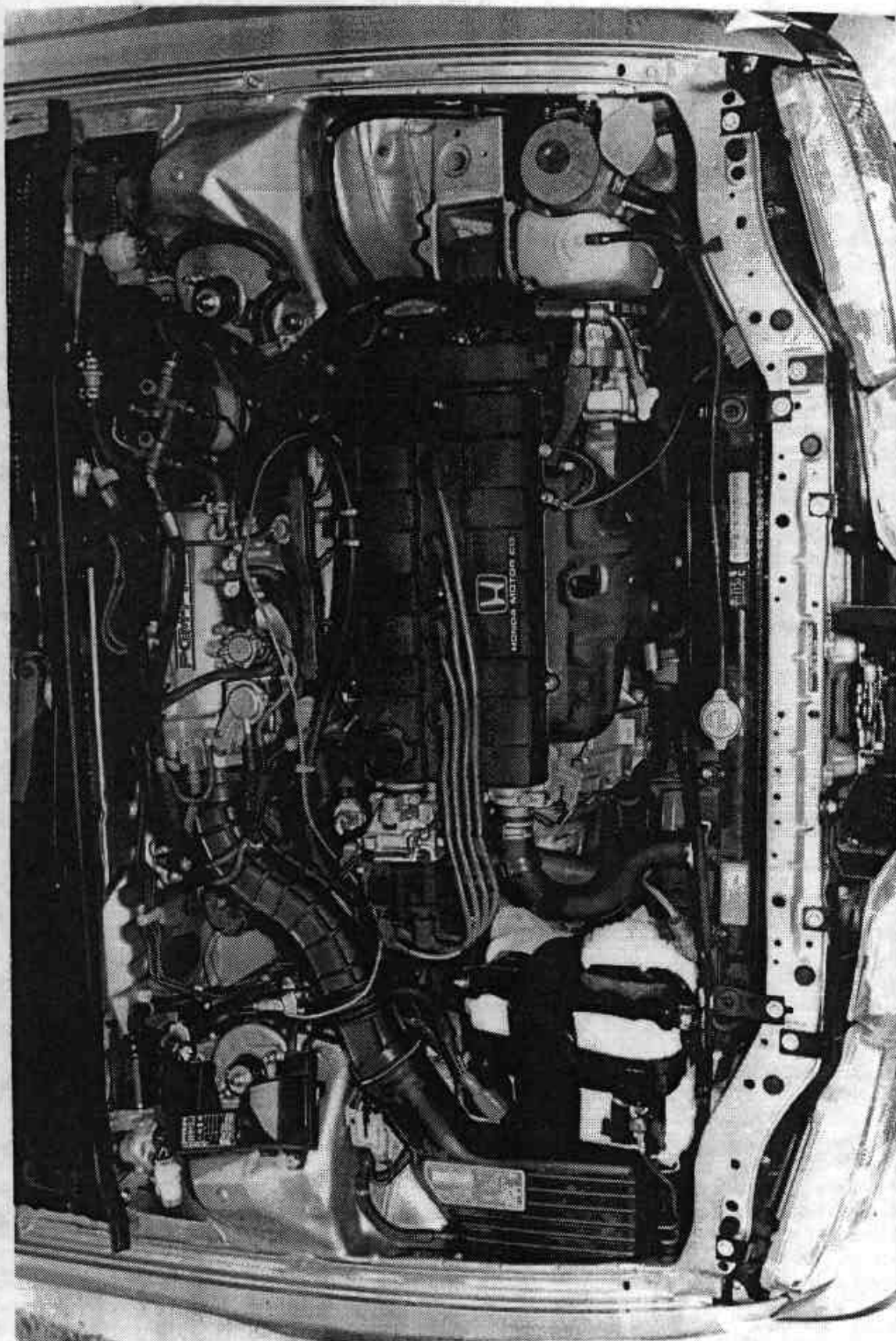
MSE-90-R9063-N01



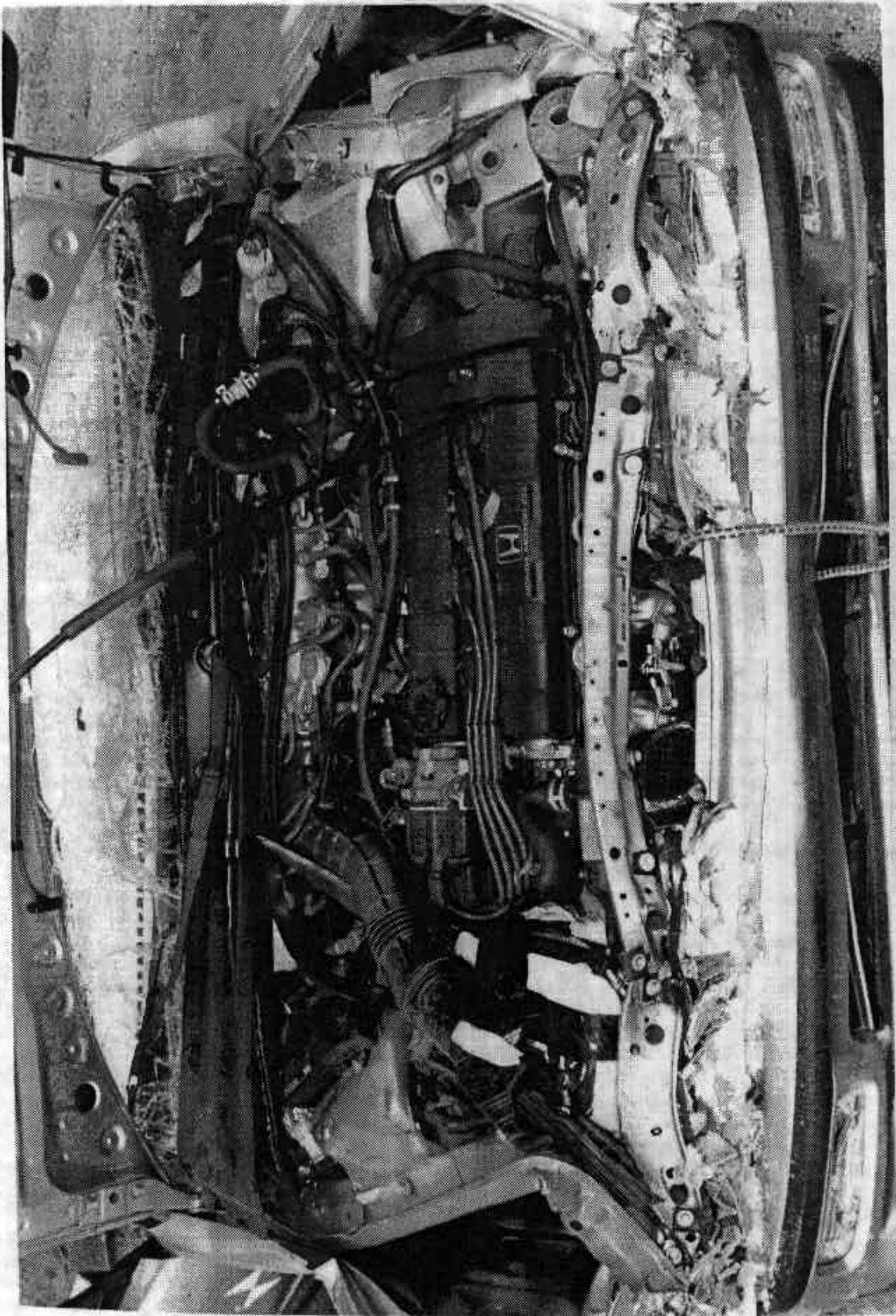
POSTTEST WINDSHIELD VIEW

A-12

MSE-90-R9063-N01



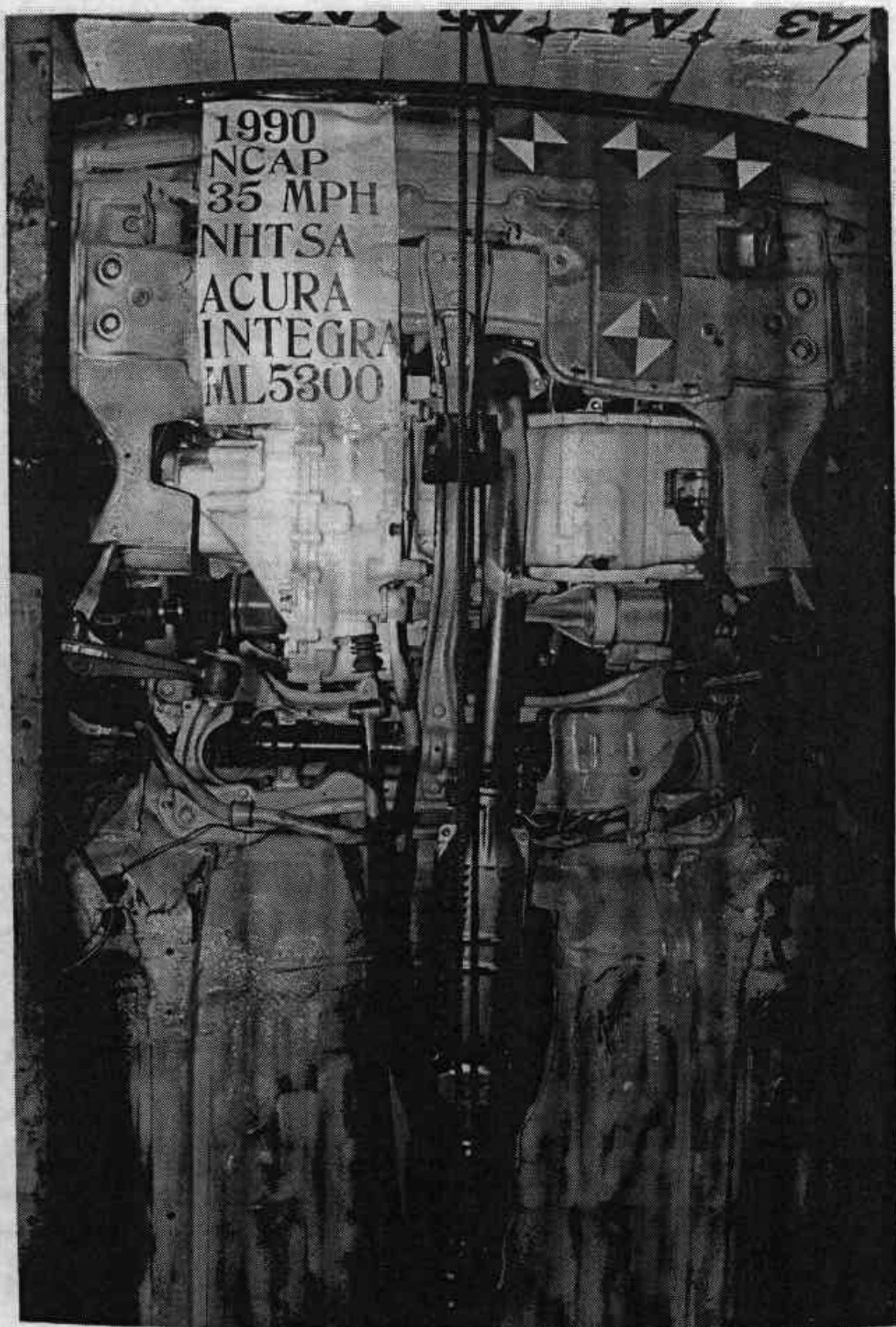
PRETEST ENGINE COMPARTMENT VIEW



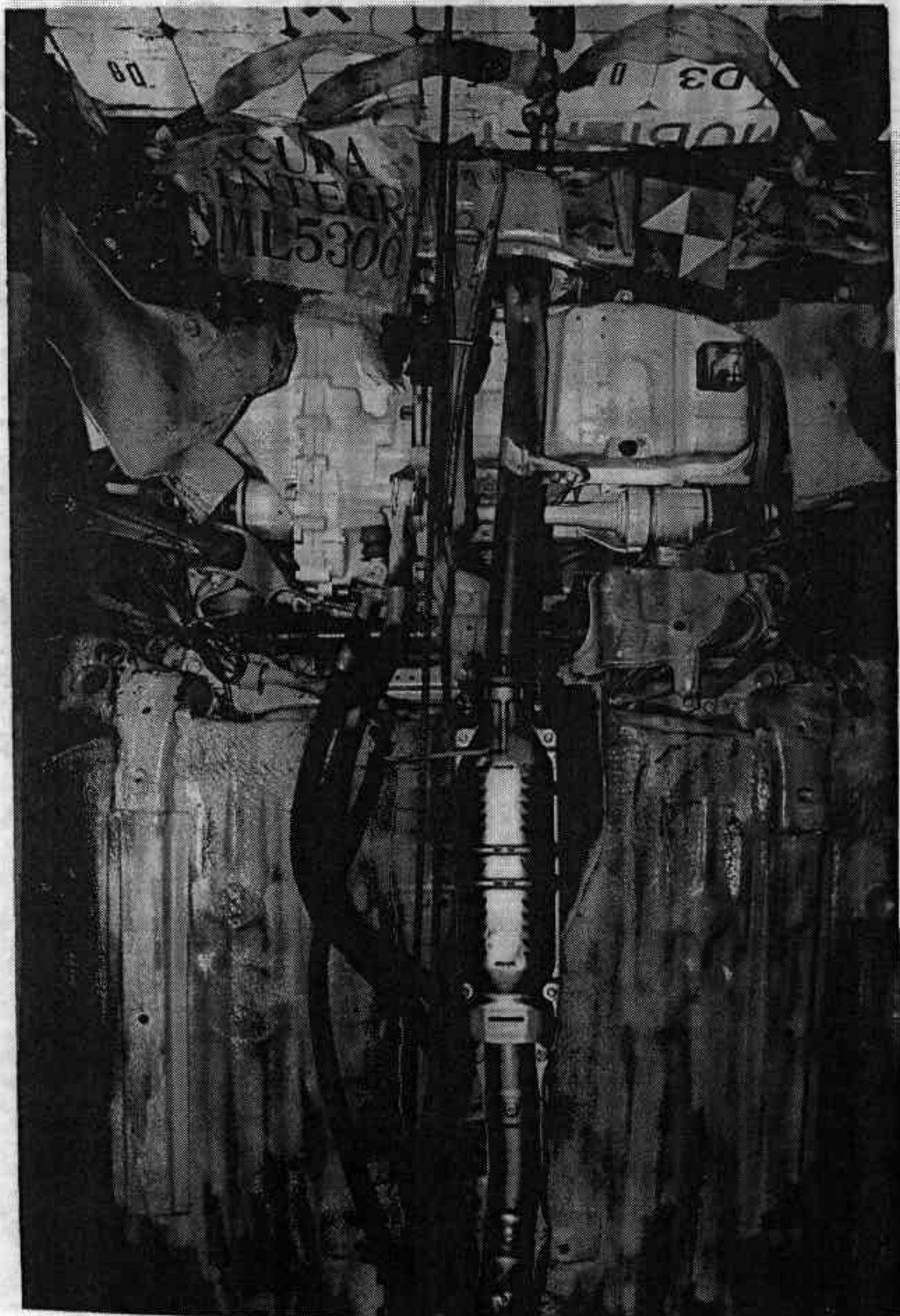
POSTTEST ENGINE COMPARTMENT VIEW

A-14

MSE-90-R9063-N01



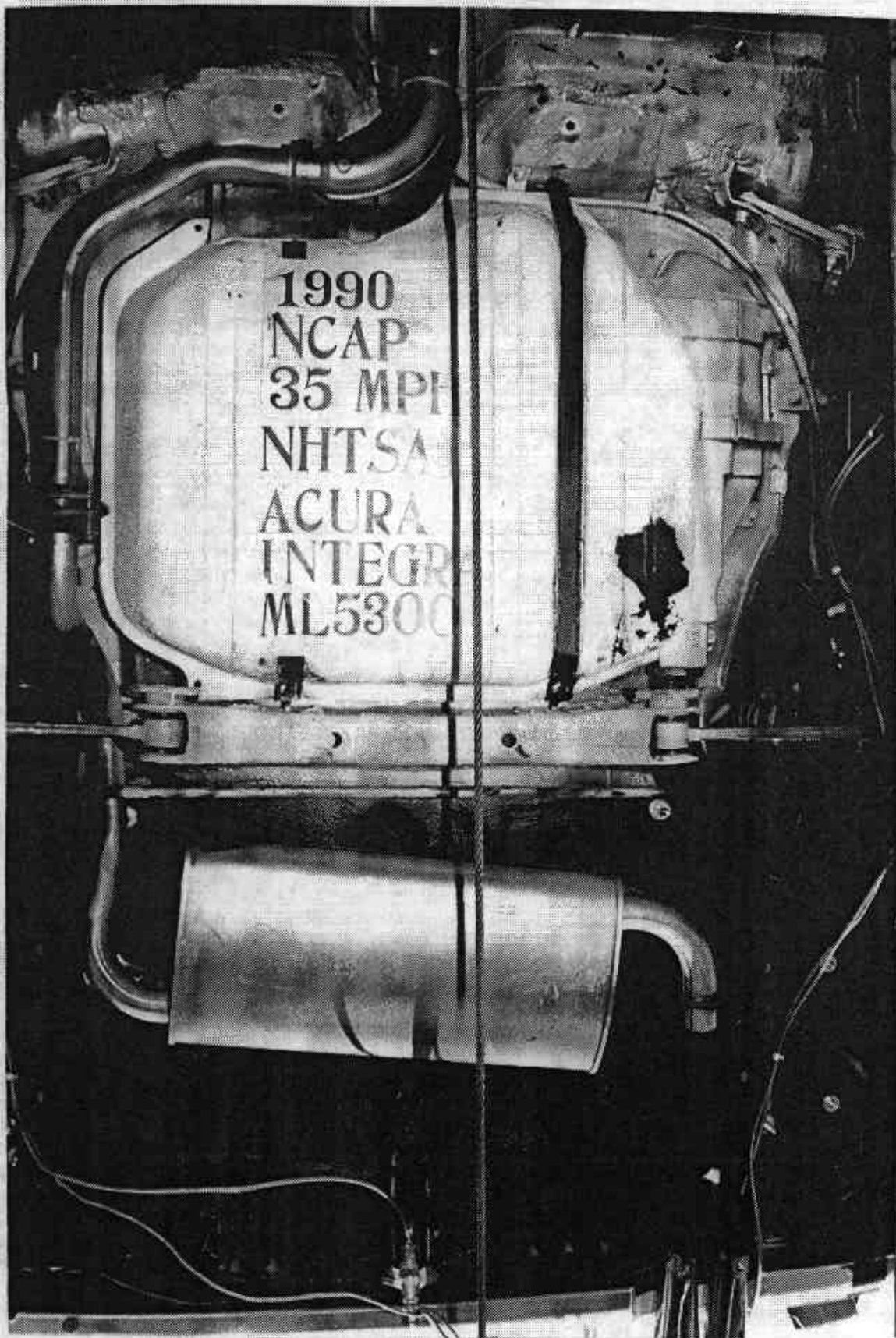
PRETEST FRONT UNDERBODY VIEW



POSTTEST FRONT UNDERBODY VIEW

A-16

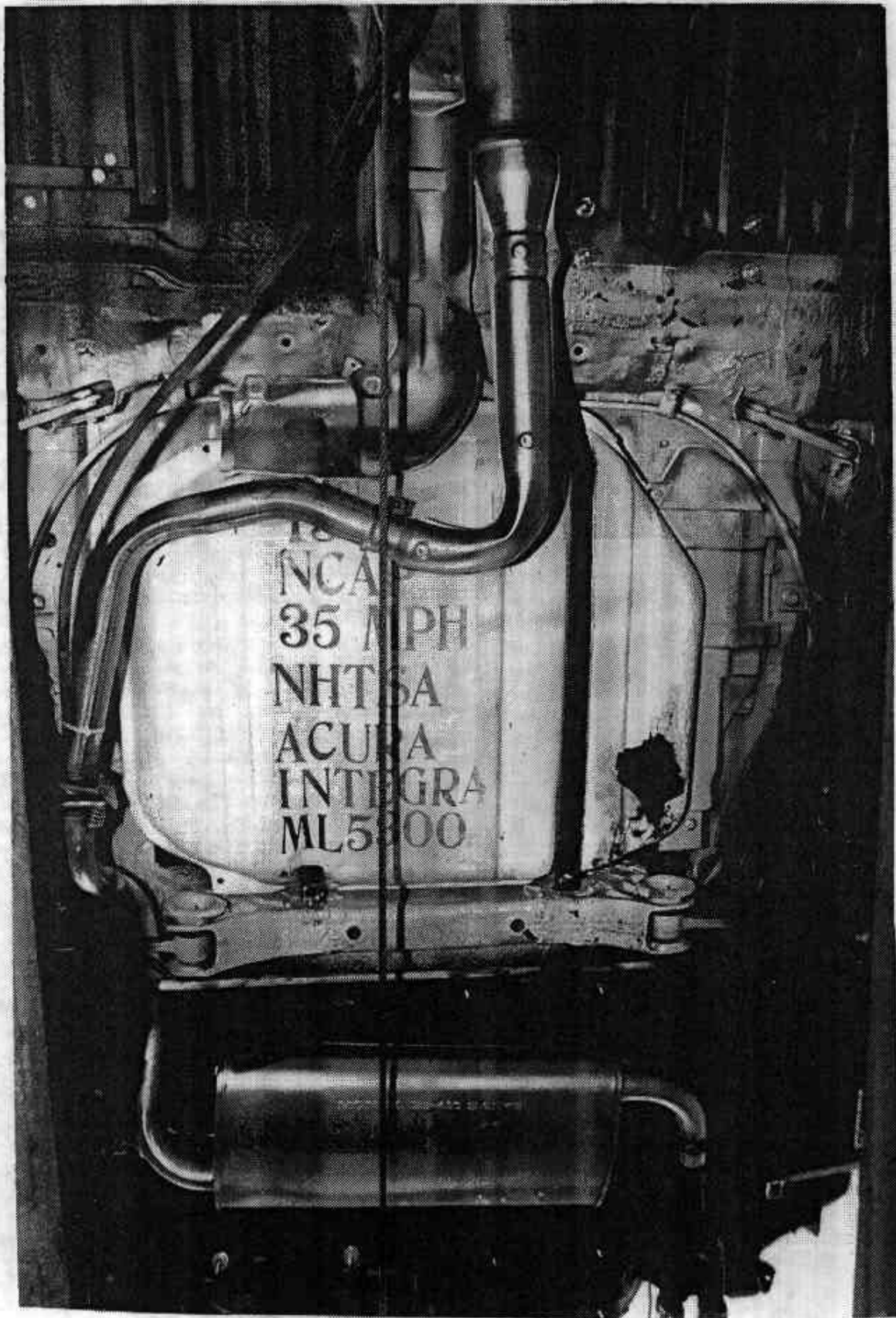
MSE-90-R9063-N01



PRETEST REAR UNDERBODY VIEW

A-17

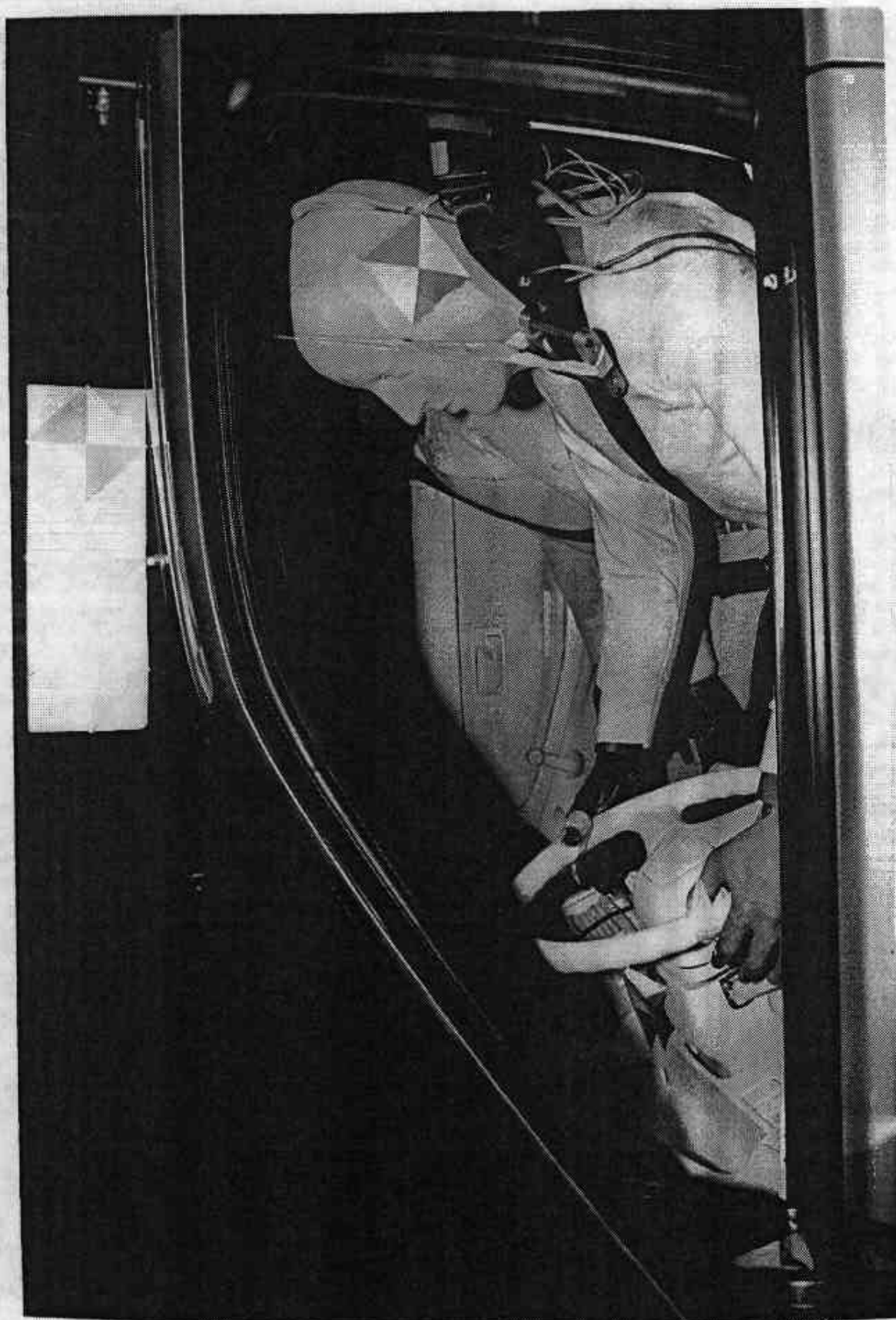
MSE-90-R9063-N01



POSTTEST REAR UNDERBODY VIEW

A-18

MSE-90-R9063-N01



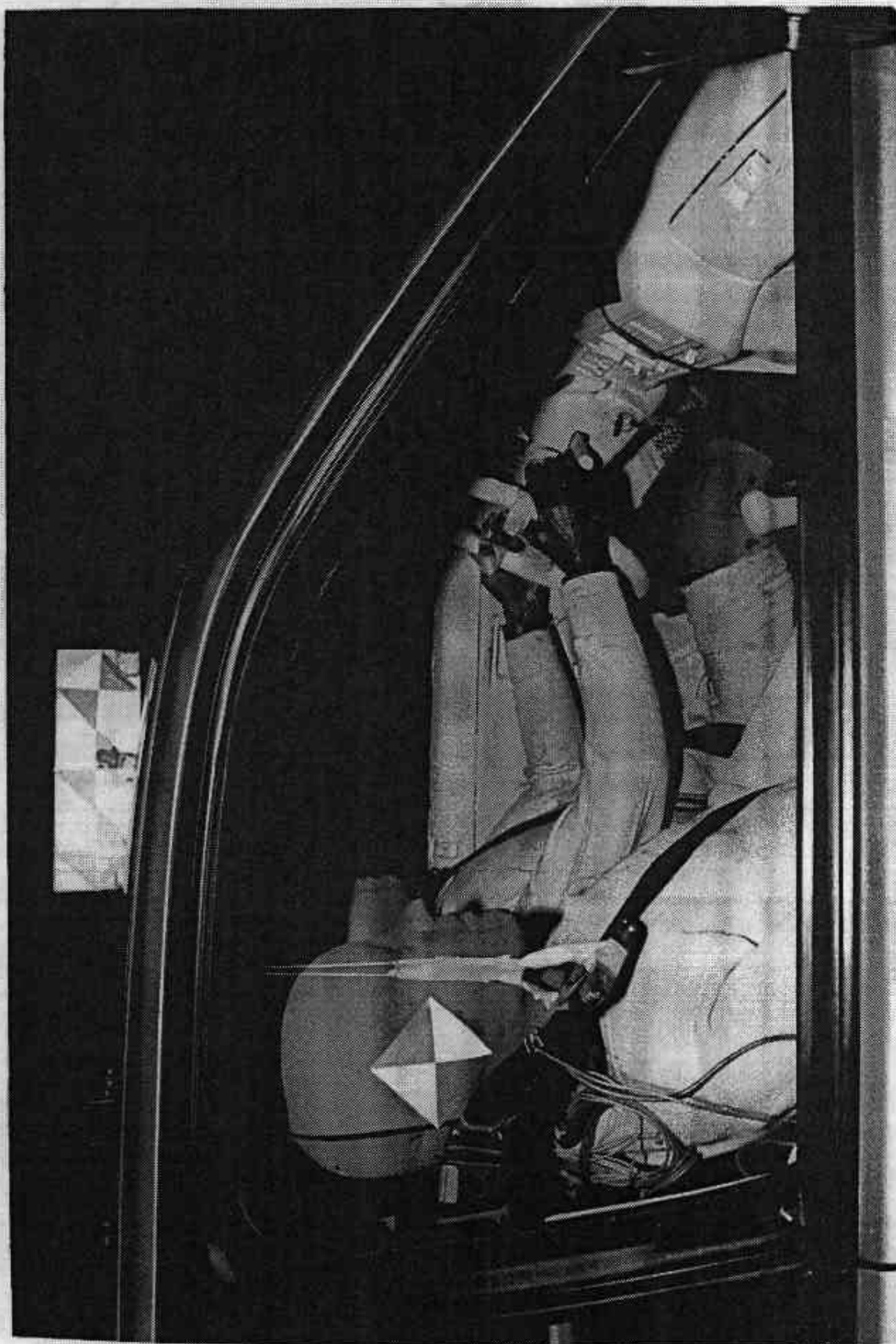
PRETEST DRIVER DUMMY POSITION VIEW



POSTTEST DRIVER DUMMY POSITION VIEW

A-20

MSE-90-R9063-N01



PRETEST PASSENGER DUMMY POSITION VIEW



POSTTEST PASSENGER DUMMY POSITION VIEW

A-22

MSE-90-R9063-N01



PRETEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-23

MSE-90-R9063-N01



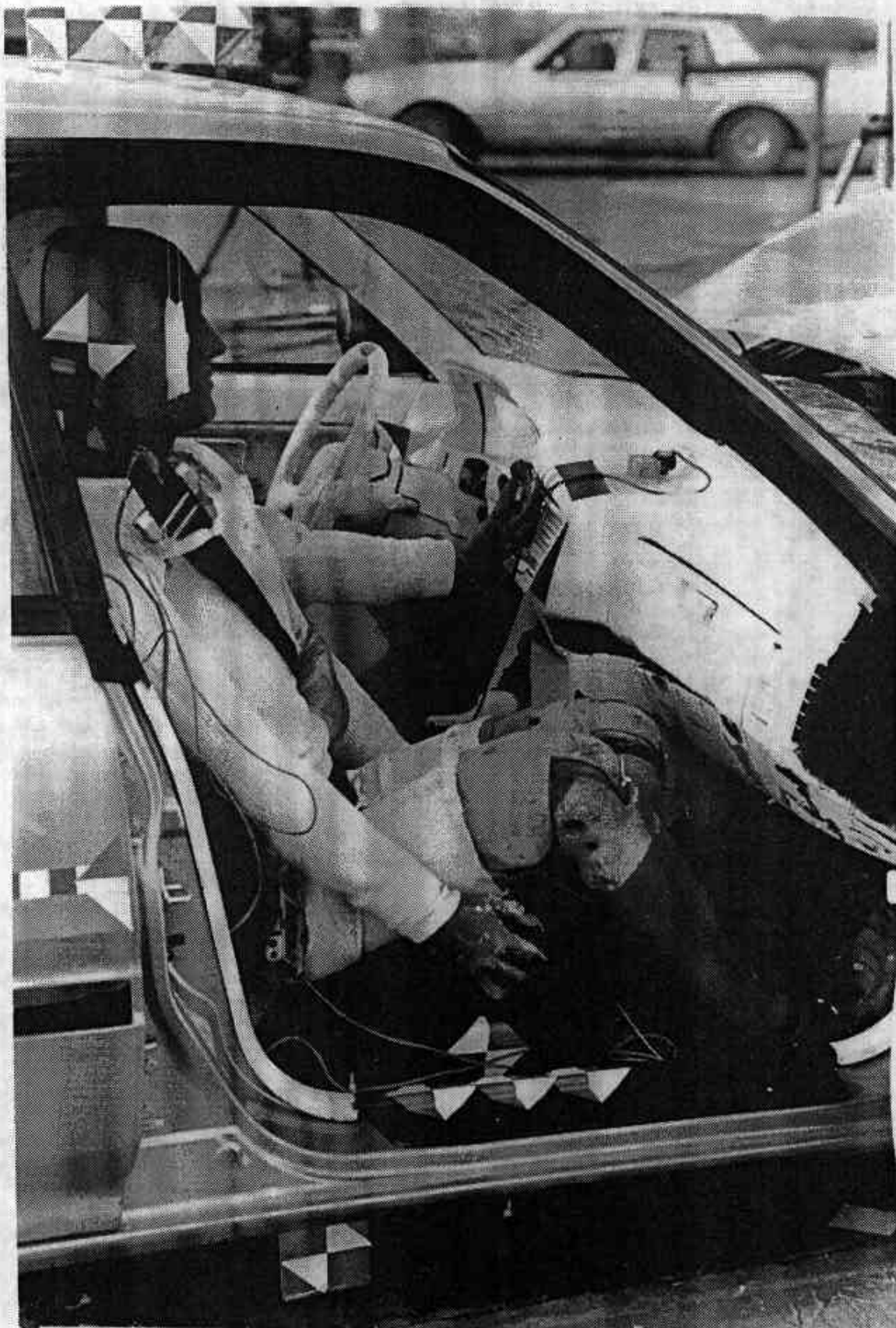
POSTTEST DRIVER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-24

MSE-90-R9063-N01



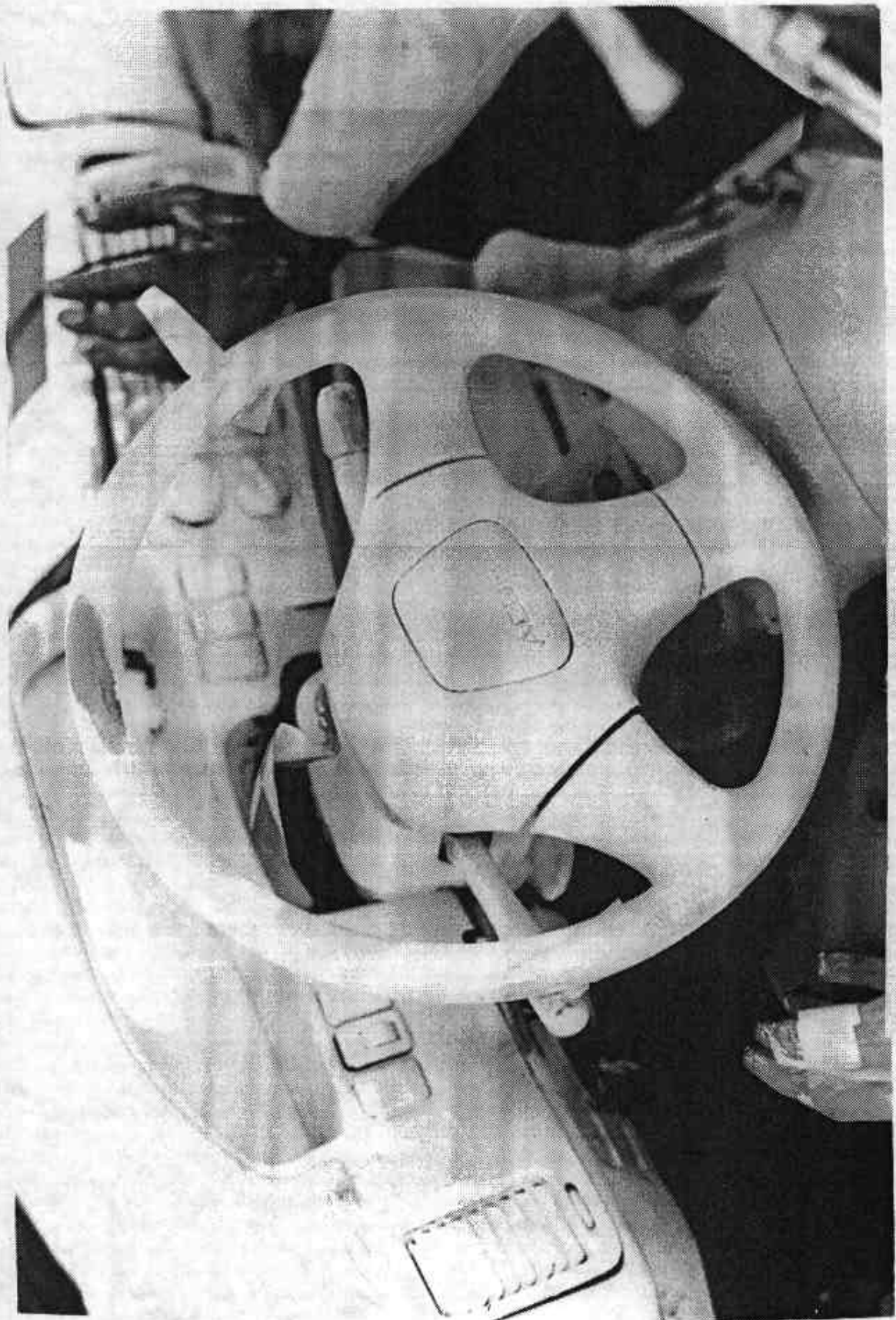
PRETEST PASSENGER & VEHICLE INTERIOR VIEW (Door Open)



POSTTEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW (Door Open)

A-26

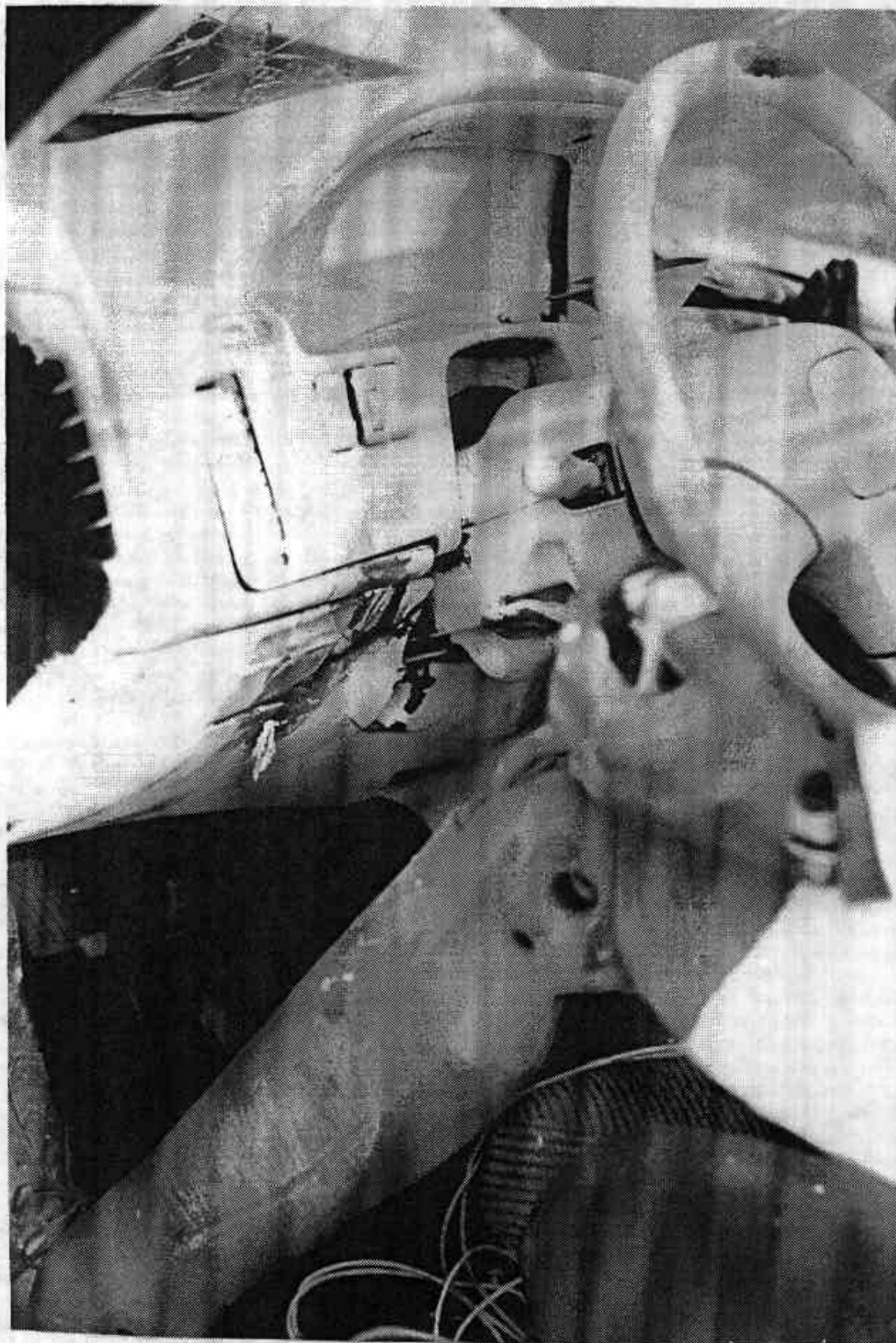
MSE-90-R9063-N01



POSTTEST DRIVER DUMMY (ATD) HEAD CONTACT AREA

A-27

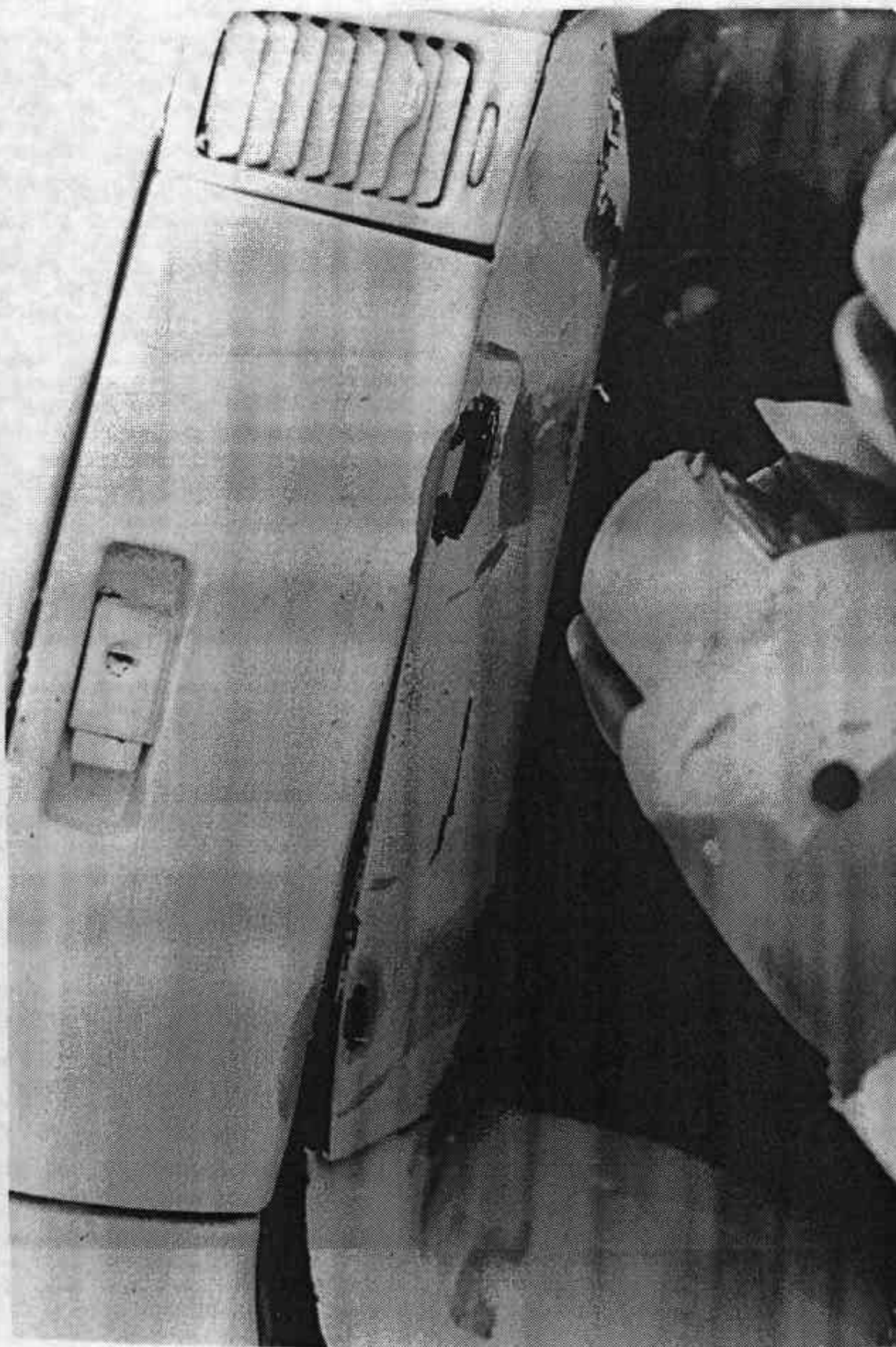
MSE-90-R9063-N01



POSTTEST DRIVER DUMMY (ATD) KNEE CONTACT AREA

A-28

MSE-90-R9063-N01



POSTTEST PASSENGER DUMMY (ATD) KNEE CONTACT AREA

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: 1990 35MPH NCAP FRONTAL BARRIER IMPACT
TSTOBJ: ACQUIRE NCAP DATA USING TWO INSTR. DUMMIES AND LOAD CELL BARRIER
TSTDAT: 12/SEP/89 TSTPRF: MSE CONNO: DTNH22-87-D-02009
TSTREF: NCAP10 TSTTYP: NCA TSTCFN: VTB
TKSURF: ASH TKCOND: DRY TEMP: 85 RECTYP: FMT
LINK: UMB CLSSPD: 34.7 IMPANG: 0 OFFSET: 0.0
IMPPNT: 9999.9 MEASUR: ENG TOTCRV: 67
TSTCOM: NO COMMENTS

Vehicle Information

VGID: 2 VEHNO: 1 MAKE: 23 MODEL: 03 YEAR: 90 BODY: 4S
 VIN: JH4DB1540LS007518 ENGINE: 4CTF ENGDISP: 1834 CC TRANSM: MF
 VEHTWT: 2915 WHLBAS: 103.0 VEHLN: 176.0 VEHWID: 61.6
 VEHCG: 41.6 STRSEP: NO COLMEC: OTH MODIND: P
 MODDSC: UNMODIFIED

BX

1: 176.0
 2: 155.6
 3: 133.8
 4: 119.6
 5: 121.3
 6: 120.3
 7: 120.5
 8: 79.6
 9: 80.5
 10: 80.5
 11: 81.0
 12: 120.0
 13: 120.0
 14: 132.4
 15: 132.8
 16: 104.0
 17: 16.0
 18: 18.2
 19: 169.0
 20: 168.3
 21: 8.5

VEHSPD: 34.7 CRBANG: 0 PDOF: 0 BMPENG: NA
 SILENG: NA APLENG: NA

DPD

1: 18.0
 2: 19.5
 3: 19.9
 4: 19.8
 5: 19.6
 6: 18.0

VDI: 12FCAW9 LENCNT: 61.6 DAMDST: 0.0 CRHDST: 19.9

AX

1: 156.2
 2: 147.7
 3: 129.2
 4: 118.8
 5: 119.9
 6: 119.3
 7: 119.3
 8: 78.8
 9: 79.4
 10: 79.5
 11: 79.5
 12: 118.8
 13: 119.0
 14: 128.5
 15: 130.0
 16: 101.5
 17: 15.0
 18: 19.0
 19: 151.0
 20: 151.8
 21: 8.5

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
MTHCAL: P5 DUMSIZ: 50
DUMMAN: MFG: HUMANOID SYSTEMS. S/N 465
DUMMOD: UNMODIFIED
DUMDSC: NO COMMENTS
HH: 14.2 HW: 22.0 HR: 7.0 HS: 9.8 CD: 24.2 CS: 16.0 AD: 4.5 HD: 7.3
KD: 4.9 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: PS2 RESTR2: OTH
REXTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: SR CNTRH2: NO CNTRC1: SW CNTRC2: NO CNTRL1: DP CNTRL2: OT
HIC: 585. T1: 66.500 T2: 102.500
CLIP3M: 47.1 LFEM: 1545. RFEM: 1684. CSI: 412. LBELT: 636. SBELT: 2291.
OCCCOM: CNTRL2 IS STEERING COLUMN; RESTR2 IS PASSIVE LAP BELT

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: 14.5 HW: 22.0 HR: 6.9 HS: 10.0 CD: 24.3 CS:999.9 AD: 5.0 HD: 7.0
KD: 5.1 HB:999.9 NB:999.9 CB:999.9 KB:999.9
RESTR1: PS2 RESTR2: OTH
REXTXT: NO COMMENTS
SEPOSN: CN AIRDEP: NA
CNTRH1: NO CNTRH2: NO CNTRC1: NO CNTRC2: NO CNTRL1: DP CNTRL2: NO
HIC: 637. T1: 66.500 T2: 102.500
CLIP3M: 42.2 LFEM: 1301. RFEM: 1877. CSI: 315. LBELT: 657. SBELT: 2345.
OCCCOM: RESTR2 IS PASSIVE LAP BELT

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 001	
SENTYP: AC	SENLOC: 01	SENATT: HOCG	
AXIS: XL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: BF83H		
CALDAT: 30/AUG/89	INSRAT: 200	CHLMAX: 57	INIVEL: 34.7
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

Instrumentation Information

Inst. Group ID: 5	VEHNO: 1	CURNO: 002	
SENTYP: AC	SENLOC: 01	SENATT: HOCG	
AXIS: YL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: BJ15H		
CALDAT: 30/AUG/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: HOCG	
AXIS: ZL	UNITS: G'S	PREFIL: 1650	
INSMAN: MFG: ENDEVCO, MODEL: 7264-200,	S/N: BG29H		
CALDAT: 30/AUG/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: 30/AUG/89	INSRAT: 200	CHLMAX: 26	INIVEL: 34.7
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: 30/AUG/89	INSRAT: 200	CHLMAX: 10	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: 30/AUG/89 INSRAT: 200 CHLMAX: 7 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: DUMMY WIRE BROKEN AT CONNECTOR DURING IMPACT; DATA VALID TO 71.5 MSEC

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: 28/AUG/89 INSRAT: 3000 CHLMAX: 52 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: YL UNITS: G'S PREFIL: 1650
 INSMAN: MFG: GSE INC, MODEL: 2430, S/N: 707
 CALDAT: 28/AUG/89 INSRAT: 3000 CHLMAX: 56 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 125 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: 30/AUG/89 INSRAT: 200 CHLMAX: 13 INIVEL: 34.7
 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: 30/AUG/89 INSRAT: 200 CHLMAX: 10 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: 30/AUG/89	INSRAT: 200	CHLMAX: 31	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: 30/AUG/89	INSRAT: 200	CHLMAX: 26	INIVEL: 34.7
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: 30/AUG/89	INSRAT: 200	CHLMAX: 19	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: 30/AUG/89	INSRAT: 200	CHLMAX: 12	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: 28/AUG/89	INSRAT: 3000	CHLMAX: 44	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: 28/AUG/89	INSRAT: 3000	CHLMAX: 65	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: 25/AUG/89	INSRAT: 3500	CHLMAX: 19	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: 25/AUG/89	INSRAT: 3500	CHLMAX: 66	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: 25/AUG/89	INSRAT: 3500	CHLMAX: 20	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: 25/AUG/89	INSRAT: 3500	CHLMAX: 68	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: 12/SEP/89 INSRAT: 24 CHLMAX: 0 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: DRIVER BELT PULLOUT (NOT USED)

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: 12/SEP/89 INSRAT: 30 CHLMAX: 24 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: UNITS ARE INCHES/IN. (PERCENT STRETCH);

Instrumentation Information

Inst. Group ID: 5 VEHNO: 1 CURNO: 023
 SENTYP: DS SENLOC: 02 SENATT: SHBE
 AXIS: OT UNITS: OTH PREFIL: 1650
 INSMAN: MFG: MSE; MODEL: 24 IN LIN, S/N: 113
 CALDAT: 12/SEP/89 INSRAT: 8 CHLMAX: 0 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: CHANNEL NOT USED

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: 12/SEP/89 INSRAT: 30 CHLMAX: 17 INIVEL: 0.0
 NFP: -300 NLP: 2999 DELT: 100 DASTAT: AM
 INSCOM: UNITS ARE INCHES/IN. (PERCENT 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: 10/JUL/89 INSRAT: 250 CHLMAX: 128 INIVEL: 34.7
 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: 10/JUL/89	INSRAT: 250	CHLMAX: 100	INIVEL: 34.7
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: 1113		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 109	INIVEL: 34.7
NFP: -300	NLP: 2999	DELT: 100	DASTAT: AM
INSCOM:			

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: 1138, S/N: 1878		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 92	INIVEL: 34.7
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: 1105		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 85	INIVEL: 34.7
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: 1138, S/N: 1875		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 45	INIVEL: 34.7
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: 1871		
CALDAT: 10/JUL/89	INSRAT: 250	CHLMAX: 21	INIVEL: 34.7
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: 2	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 3	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 14	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 19	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 30	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 20	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 125	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 2	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: -250	NLP: 2499	DELT: 120	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: 47	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 31	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 50	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 24	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 39	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 11	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 2	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 2	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 22	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 15	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 17	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 12	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 15	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 18	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 24	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: -250	NLP: 2499	DELT: 120	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: 3	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 6	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 120-FS,	S/N: 19260		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 7	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	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: 4	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

Instrumentation Information

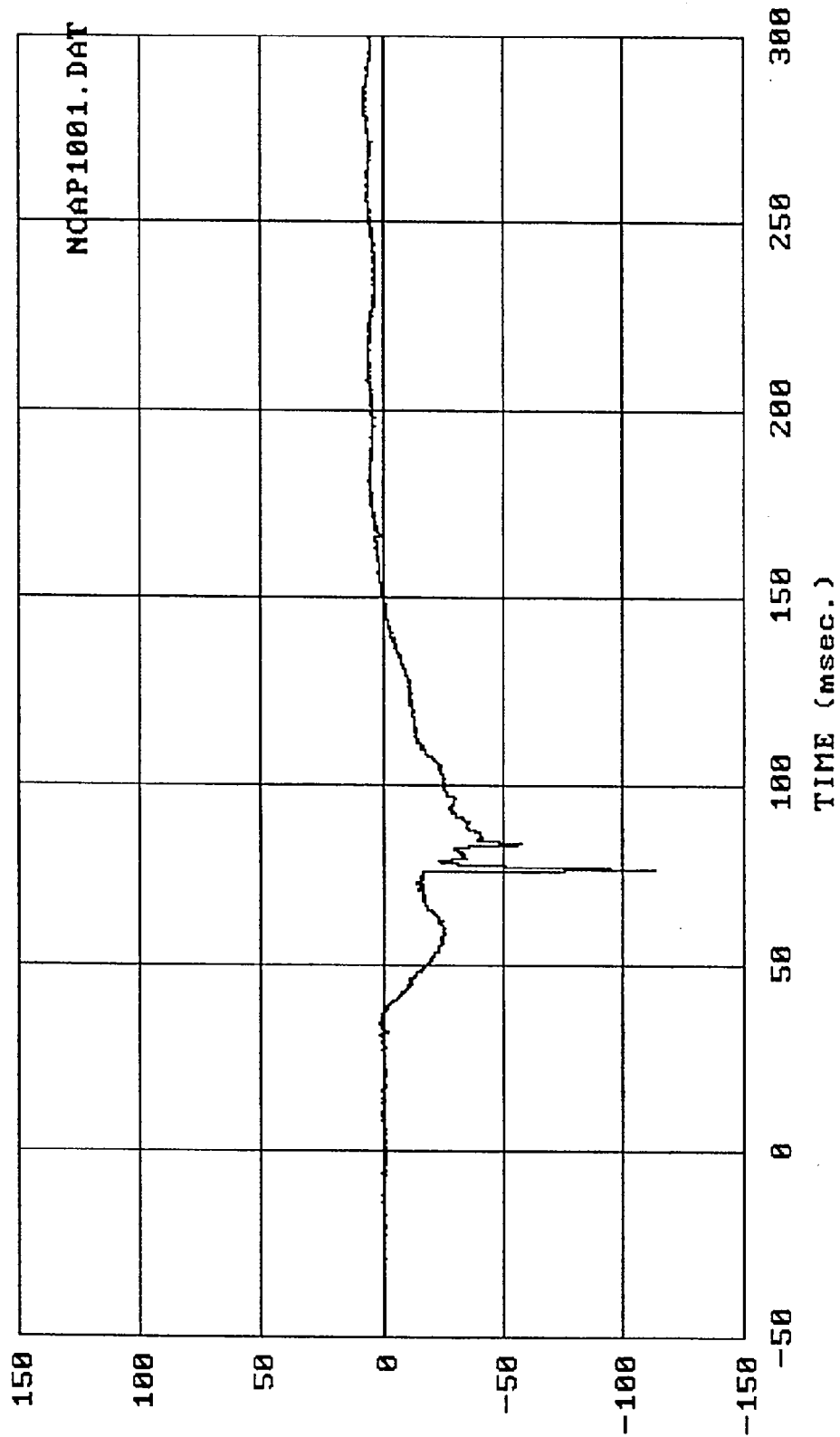
Inst. Group ID: 5	VEHNO: 0	CURNO: 065	
SENTYP: LC	SENLOC: NA	SENATT: LCD7	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19332		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

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: 5	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			

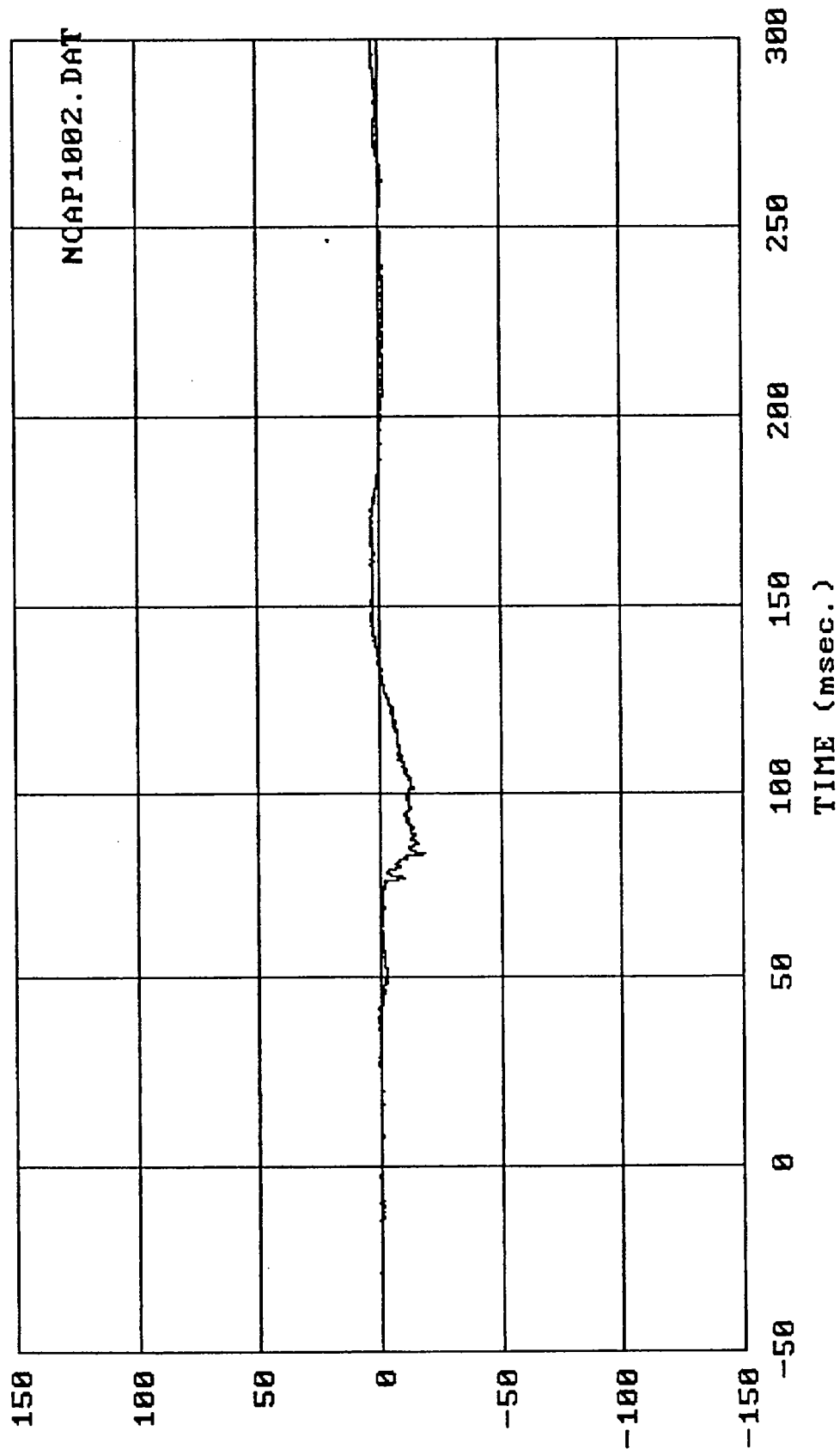
Instrumentation Information

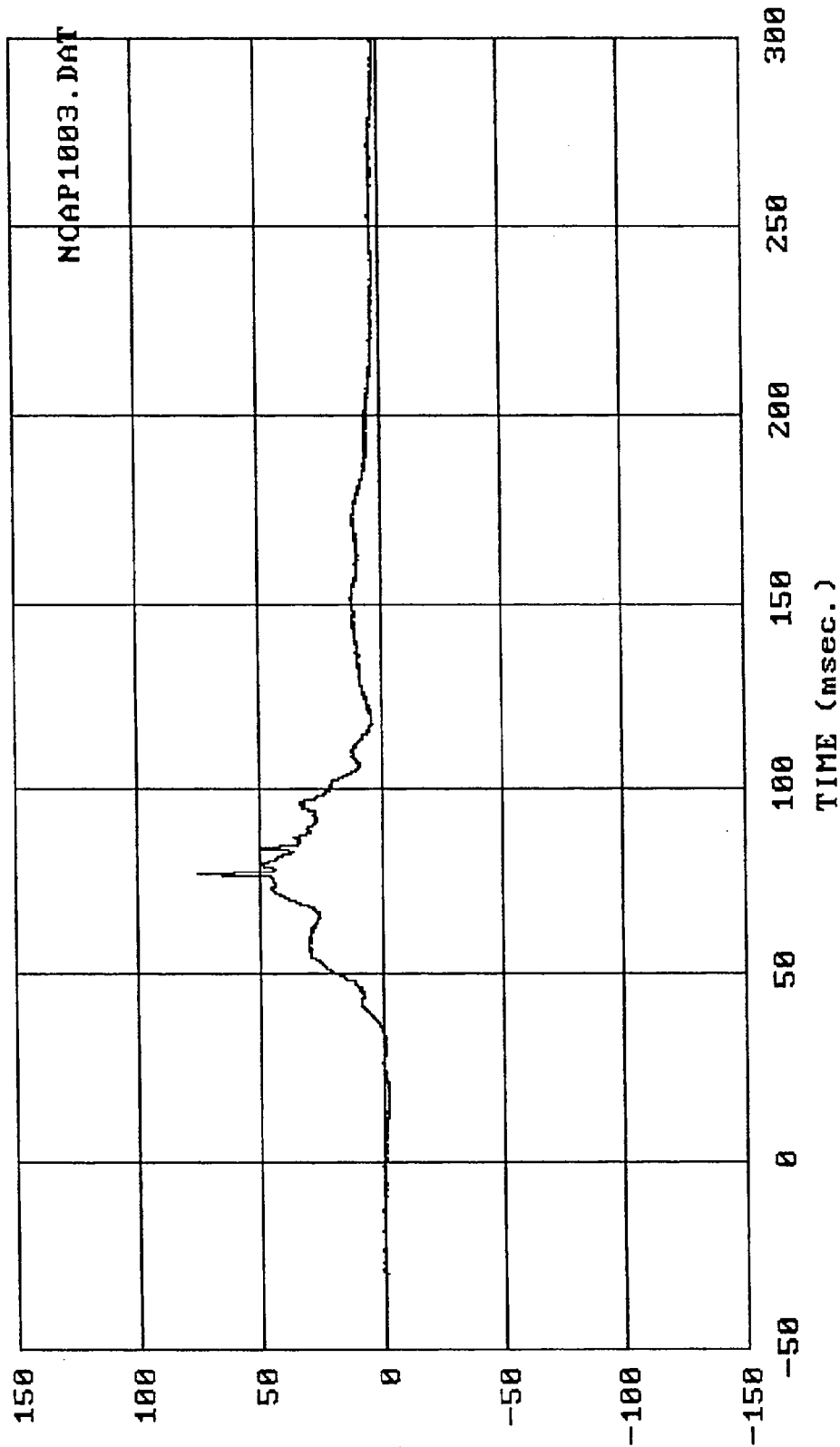
Inst. Group ID: 5	VEHNO: 0	CURNO: 067	
SENTYP: LC	SENLOC: NA	SENATT: LCD9	
AXIS: XG	UNITS: LBS	PREFIL: 1650	
INSMAN: MFG: INTERFACE, MODEL: 1220-FS,	S/N: 19466		
CALDAT: 14/MAY/85	INSRAT: 50000	CHLMAX: 3	INIVEL: 0.0
NFP: -250	NLP: 2499	DELT: 120	DASTAT: AM
INSCOM:			



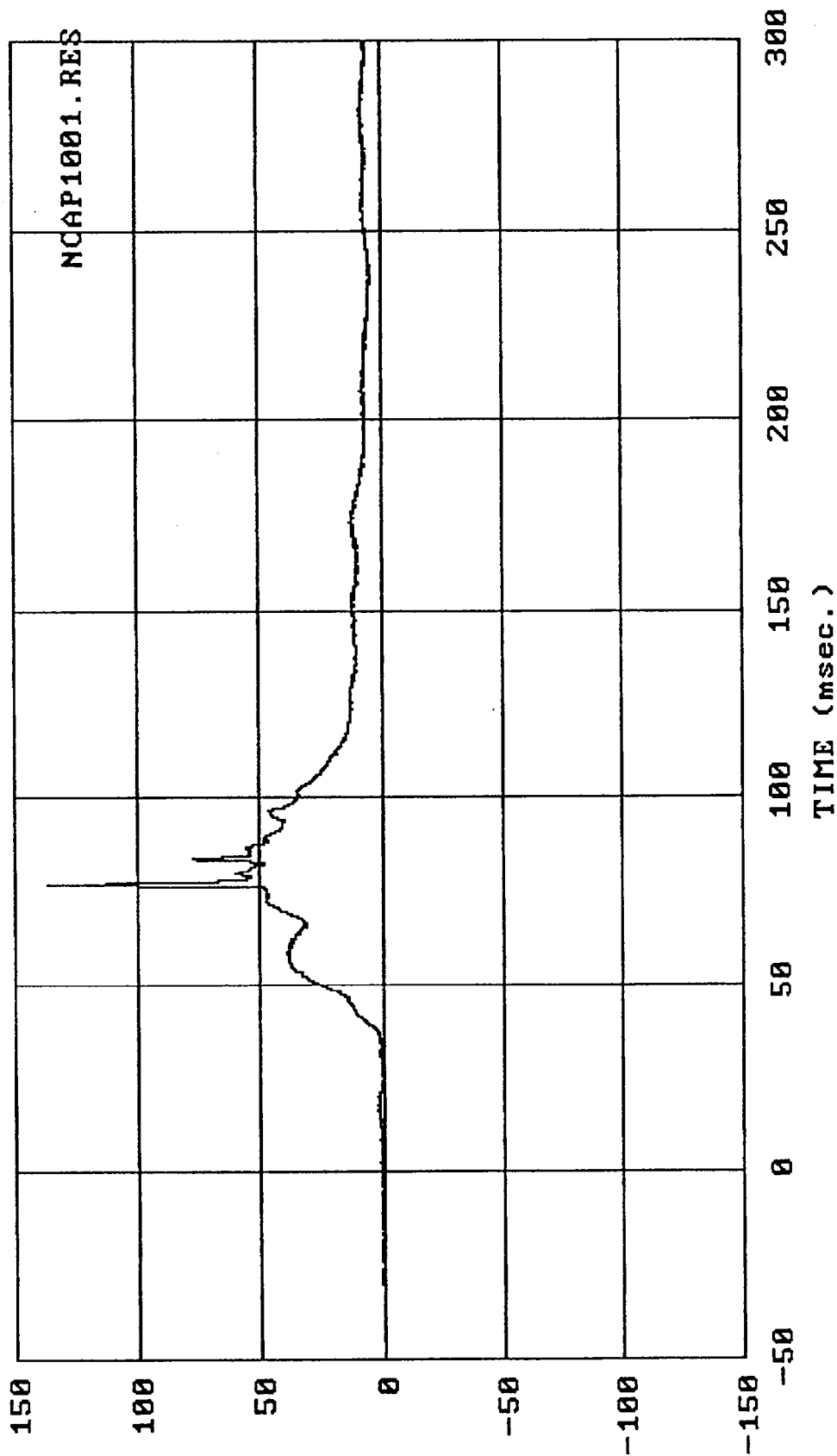
Filter: SAE CLASS 1000 Max = 8.3948 Min = -113.23

MSE 09/12/89 -- 1990 Acura Integra : Driver Head accel., X-axis



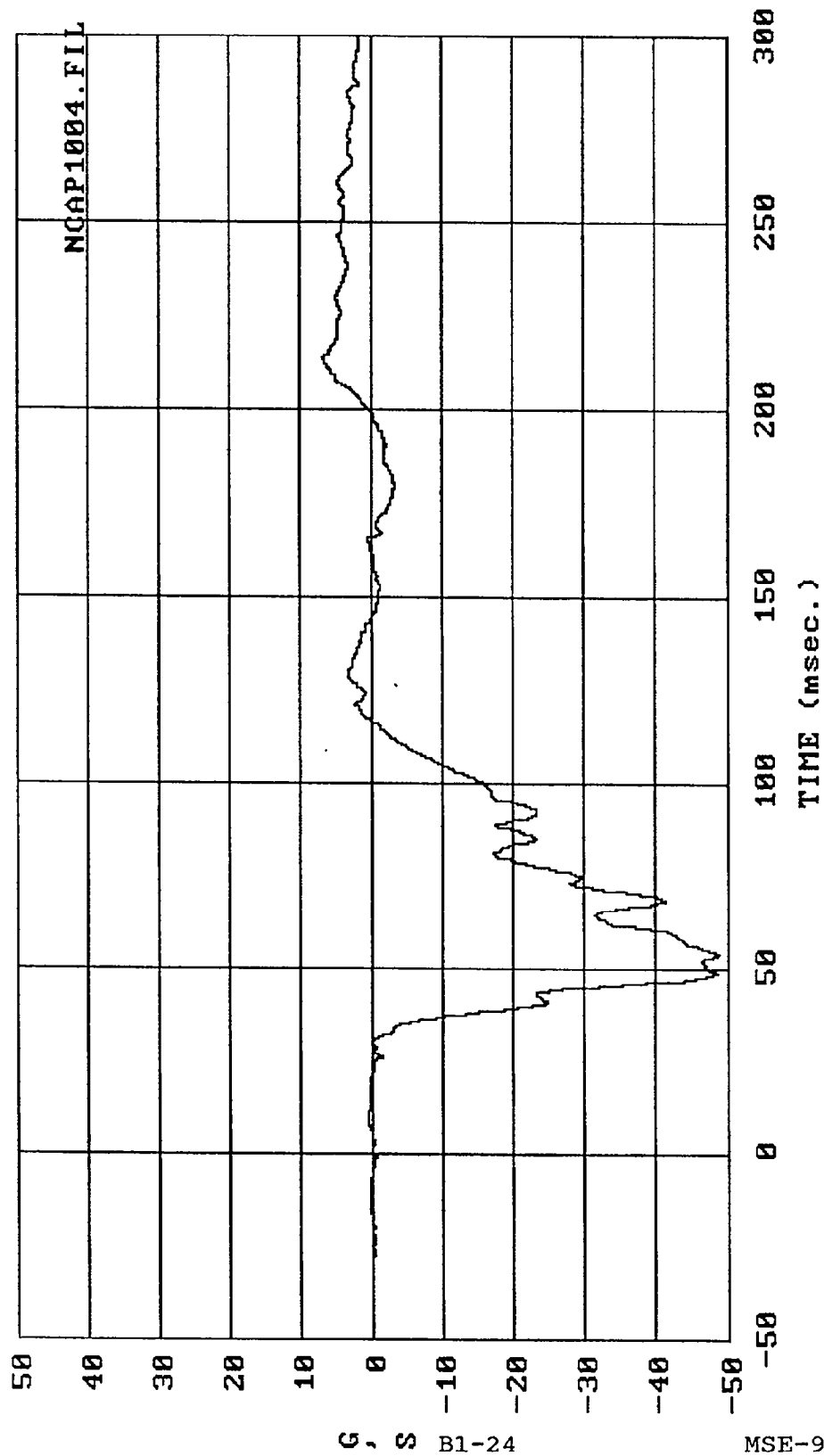


Filter: SAE CLASS 1000 Max = 75.802 Min = -2.2848
 MSE 09/12/89 -- 1990 Acura Integra : Driver Head accel., Z-axis

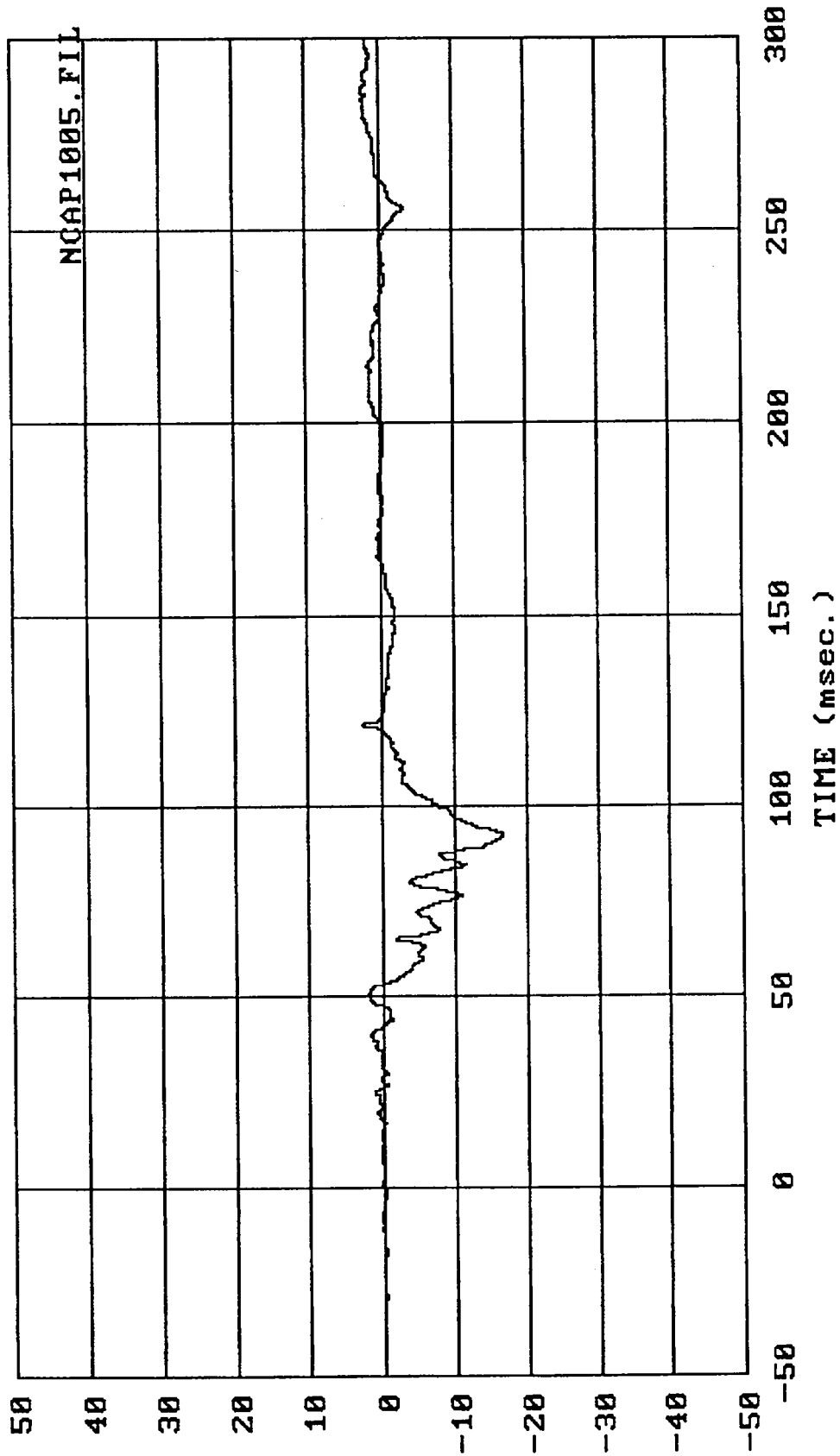


Filter: SAE CLASS 1000 Max = 136.65 Min = .17486

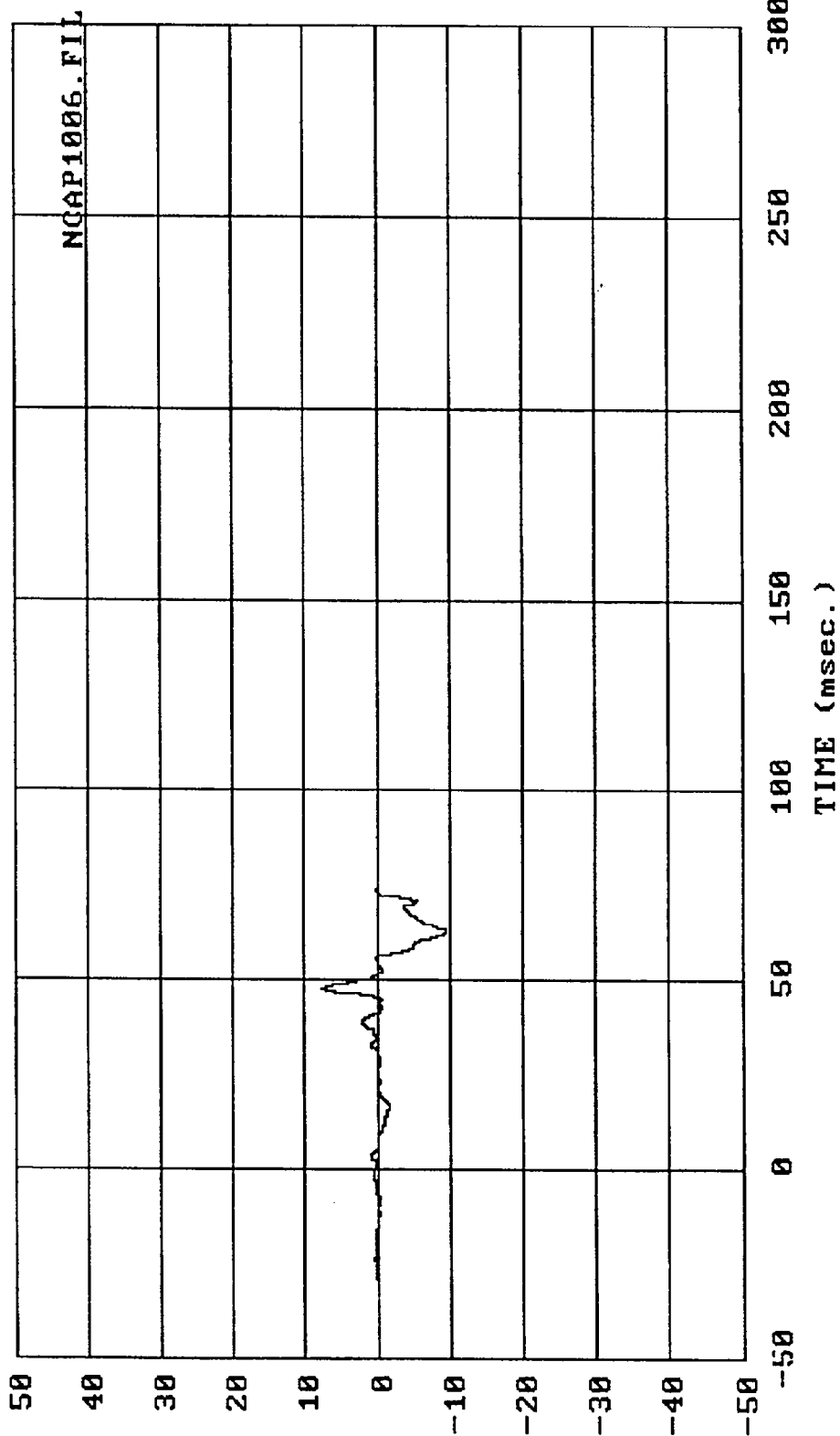
MSE 09/12/89 -- 1990 Acura Integra : Driver Head resultant accel.



Filter: SAE CLASS 180 Max = 6.8113 Min = -48.902
MSE 09/12/89 -- 1990 Acura Integra : Driver Chst accel., X-axis

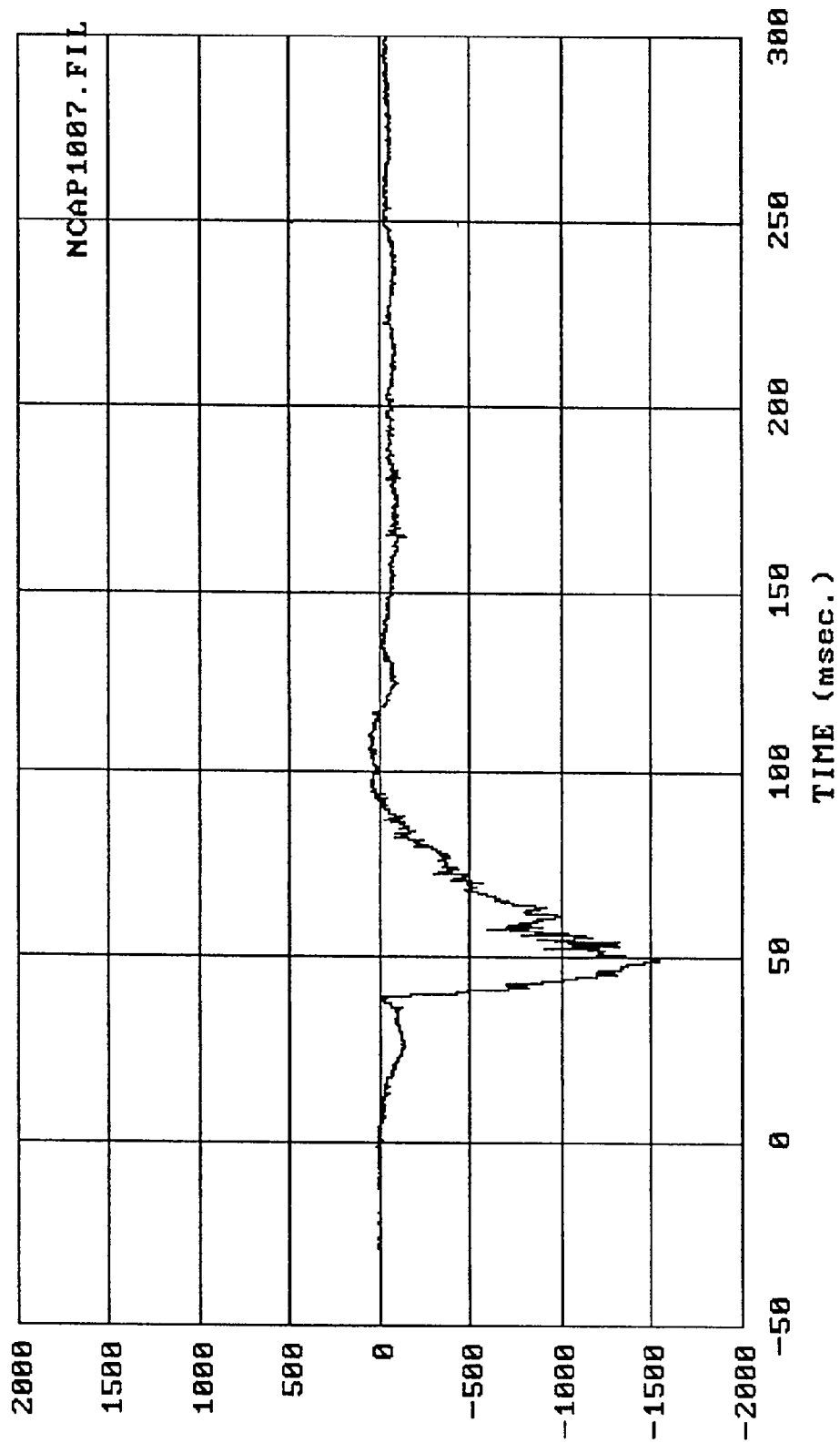


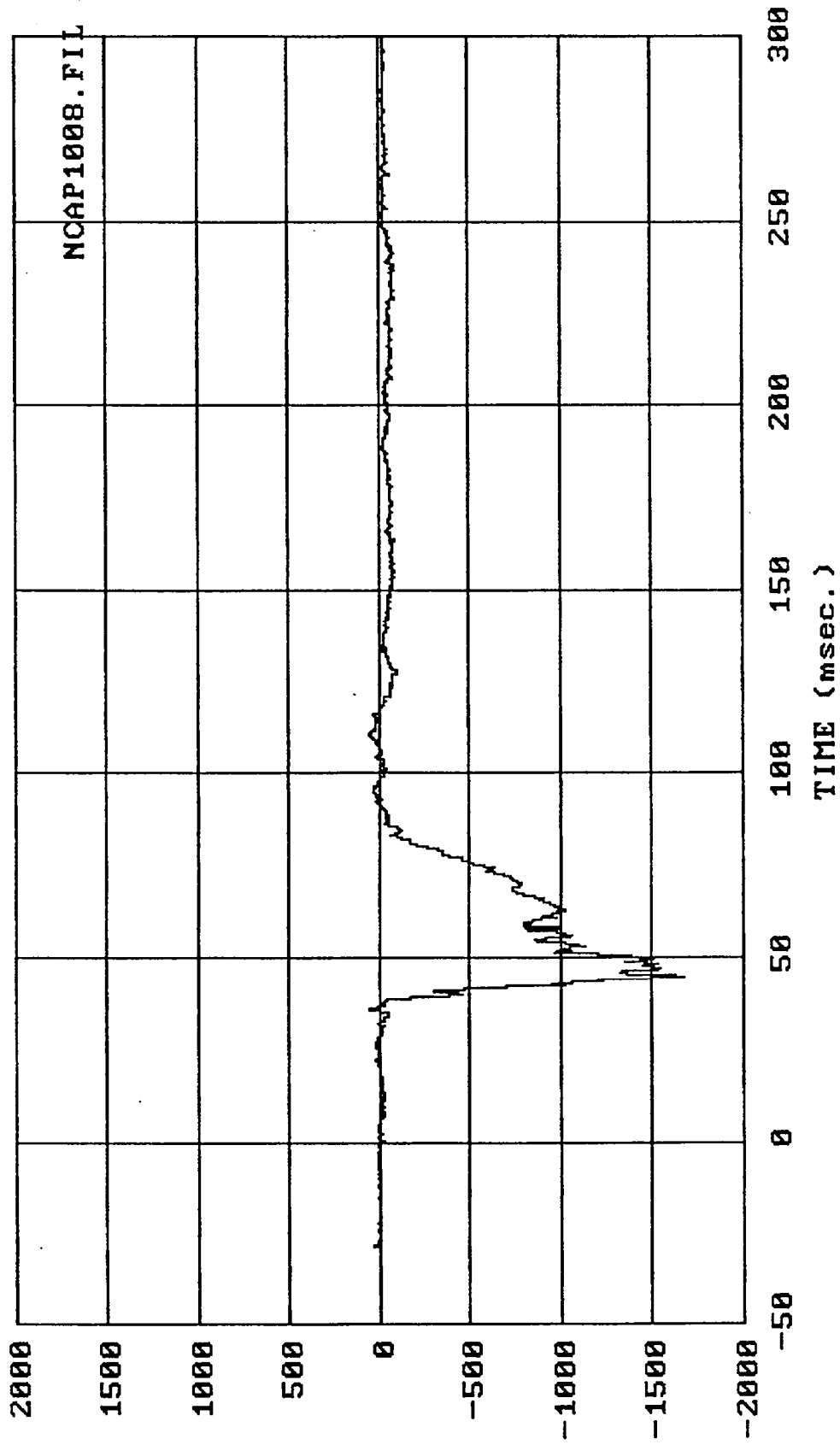
Filter: SAE CLASS 180 Max = 2.5572 Min = -16.637
MSE 09/12/89 -- 1990 Acura Integra : Driver Chst accel., Y-axis



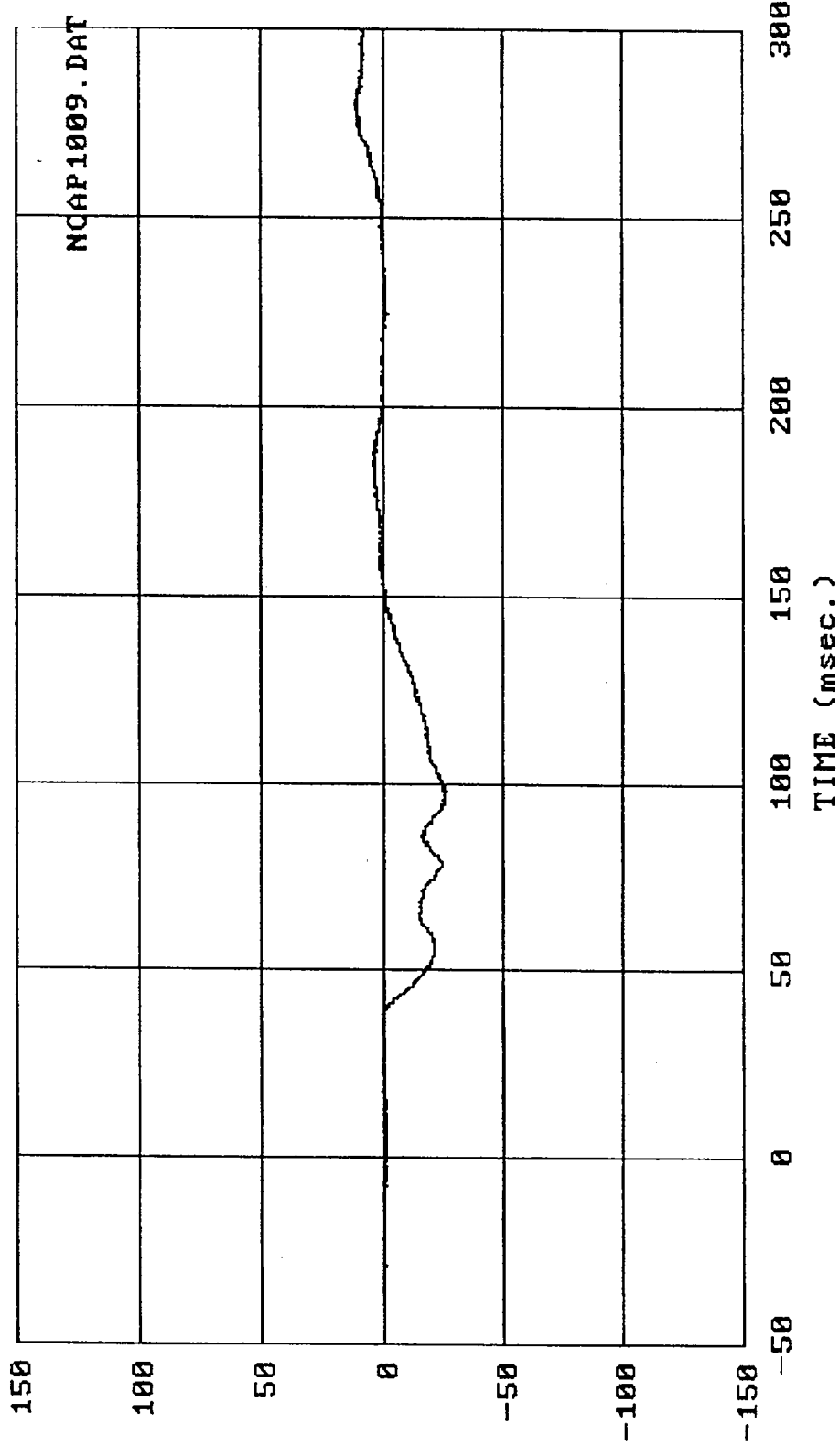
Filter: SAE CLASS 180 Max = 7.7121 Min = -9.3203
 MSE 09/12/89 -- 1990 Acura Integra : Driver Chst accel., Z-axis
 DATA CHANNEL LOST AFTER ABOUT 72 MILLISECONDS INTO THE IMPACT EVENT.

RESULTANT NOT COMPUTED AS A RESULT OF LOSS OF DRIVER CHEST Z-CHANNEL
DATA AFTER ABOUT 72 MILLISECONDS INTO IMPACT EVENT.

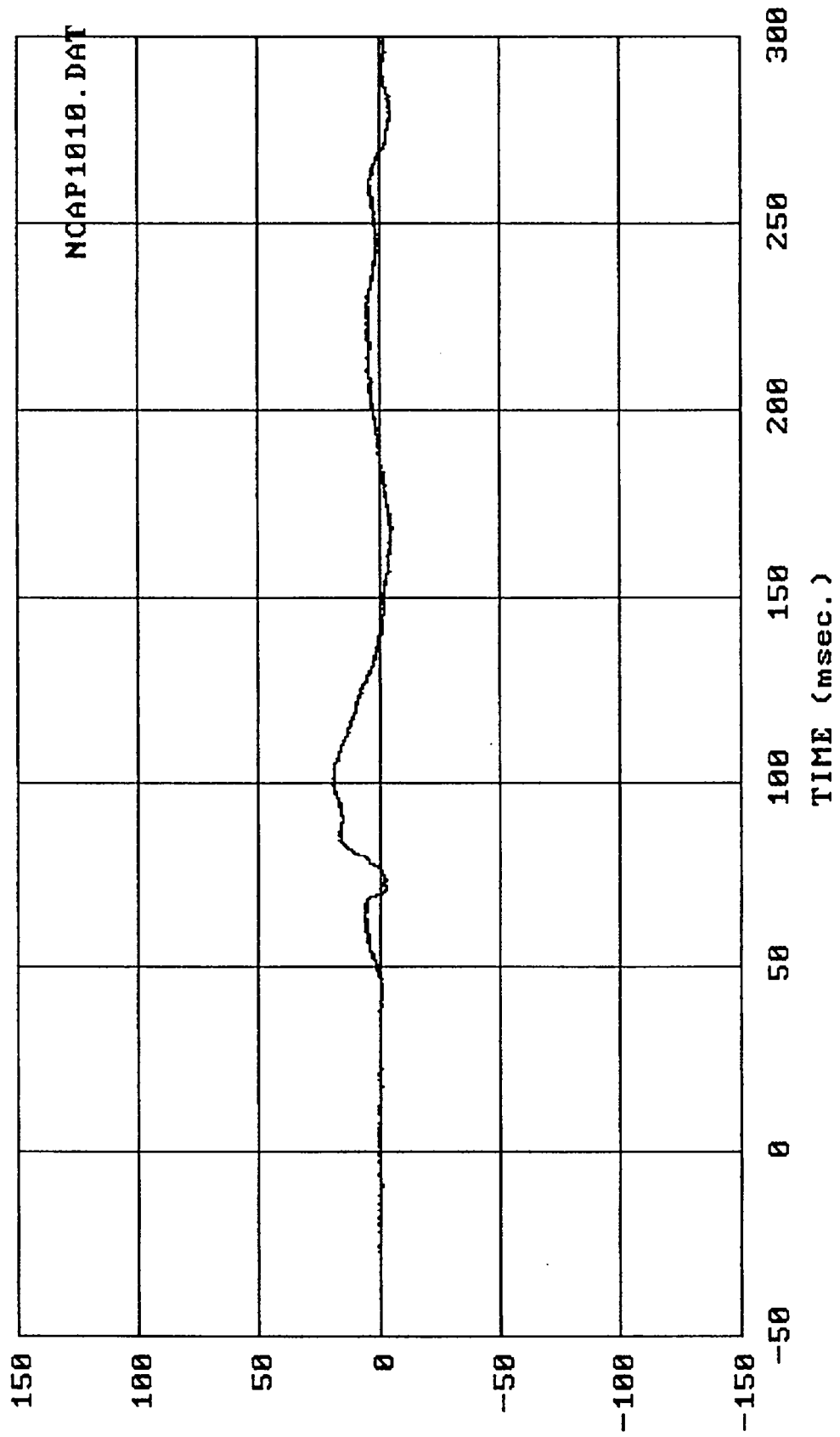




Filter: SAE CLASS 600 Max = 59.167 Min = -1684.1
MSE 09/12/89 -- 1990 Acura Integra : Driver Rght Femur force

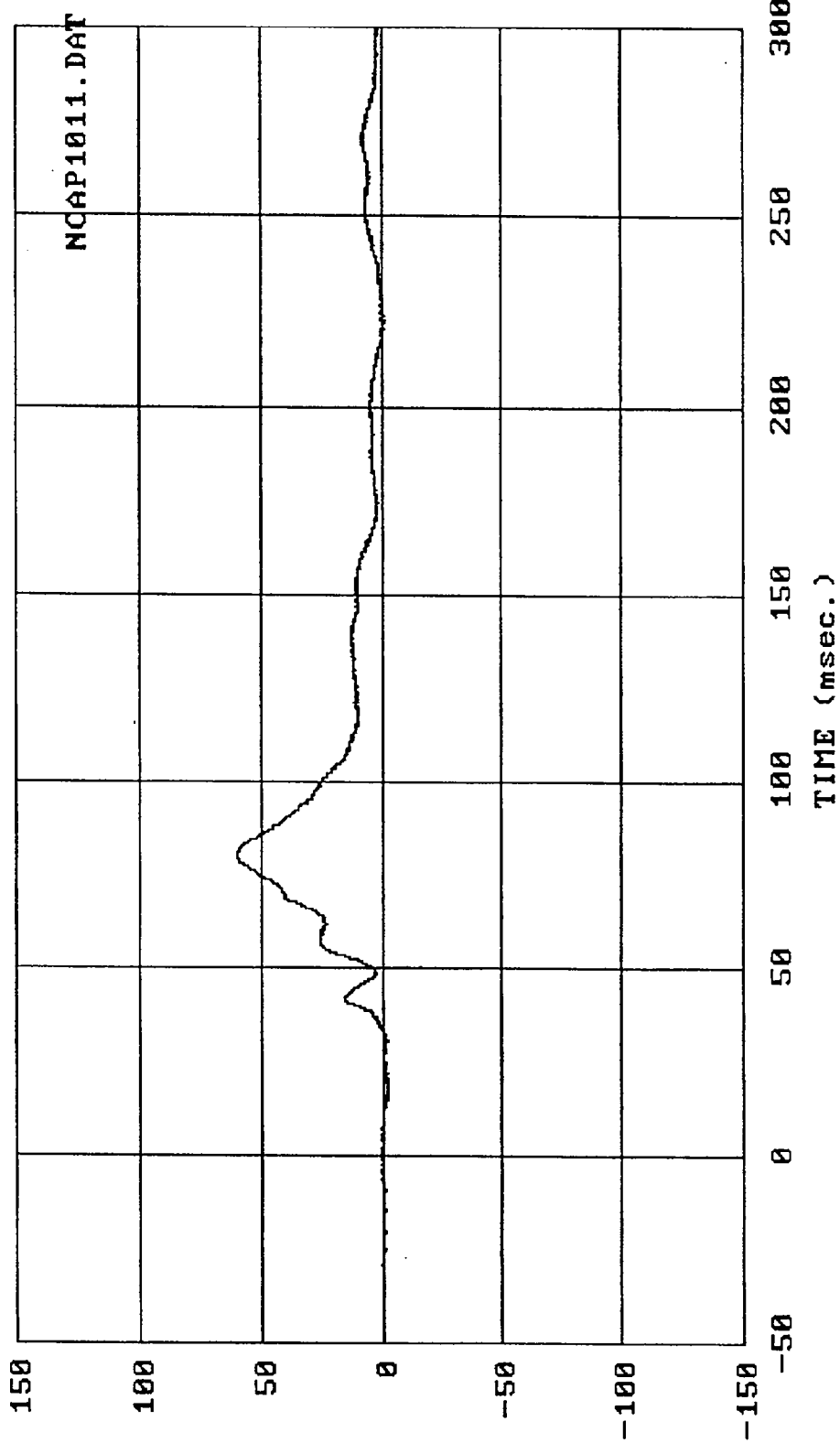


Filter: SAE CLASS 1000 Max = 11.566 Min = -25.897
 MSE 09/12/89 -- 1990 Acura Integra : Pasngr Head accel., X-axis

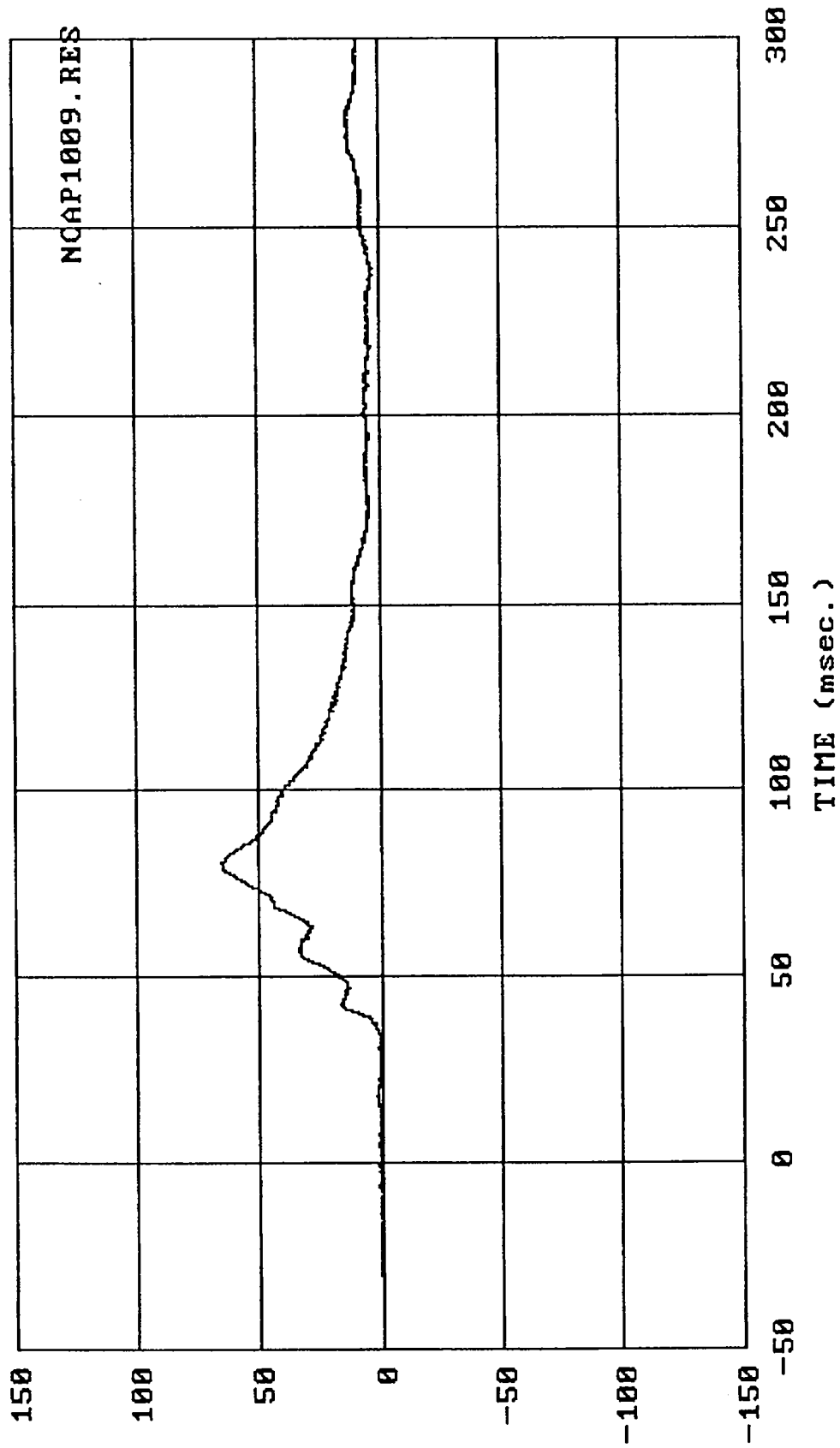


Filter: SAE CLASS 1000 Max = 19.544 Min = -5.0687

MSE 09/12/89 -- 1990 Acura Integra : Pasngr Head accel., Y-axis

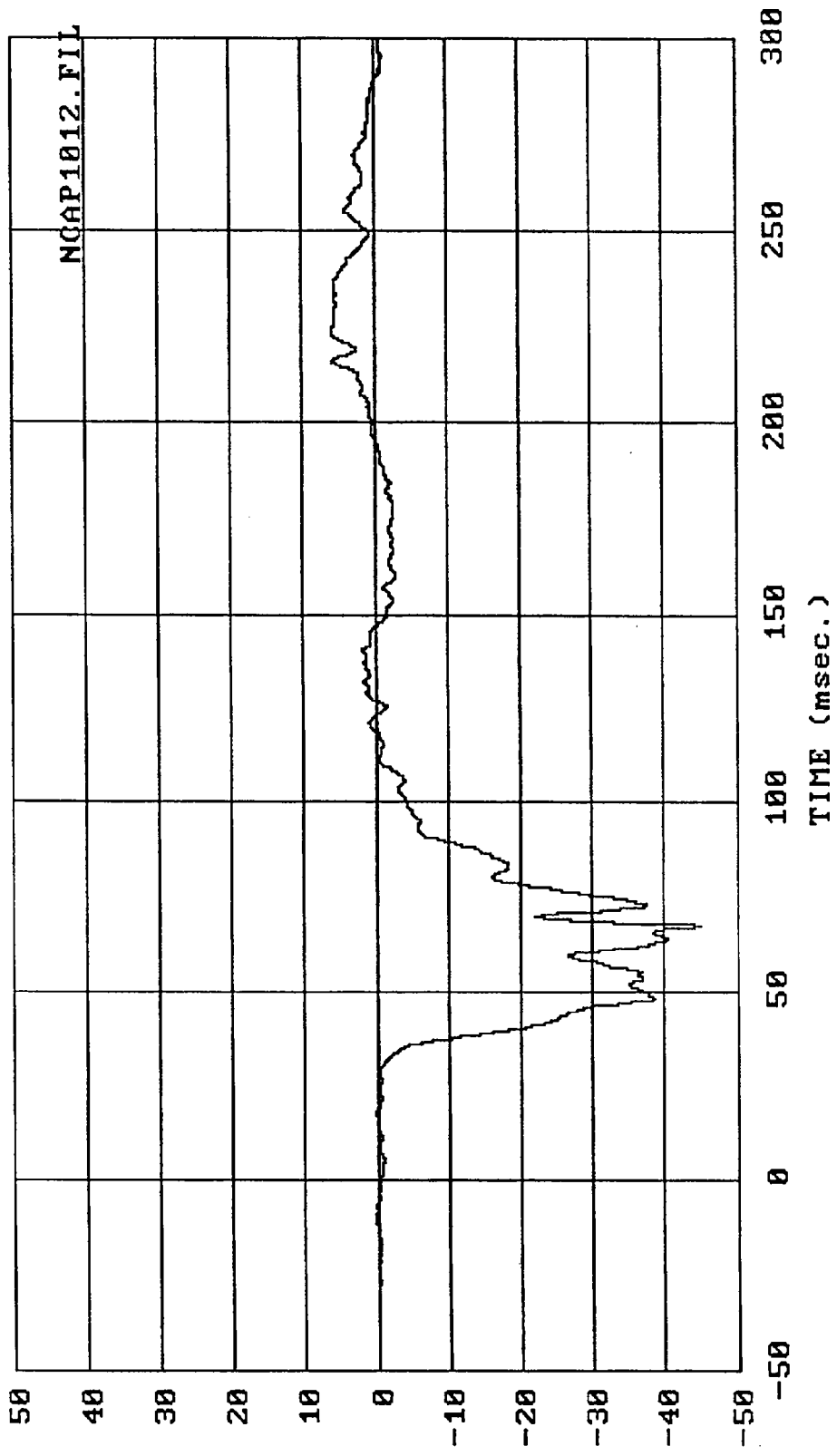


Filter: SAE CLASS 1000 Max = 60.923 Min = -2.2823
 MSE 09/12/89 --- 1990 Acura Integra : Pasngr Head accel., Z-axis

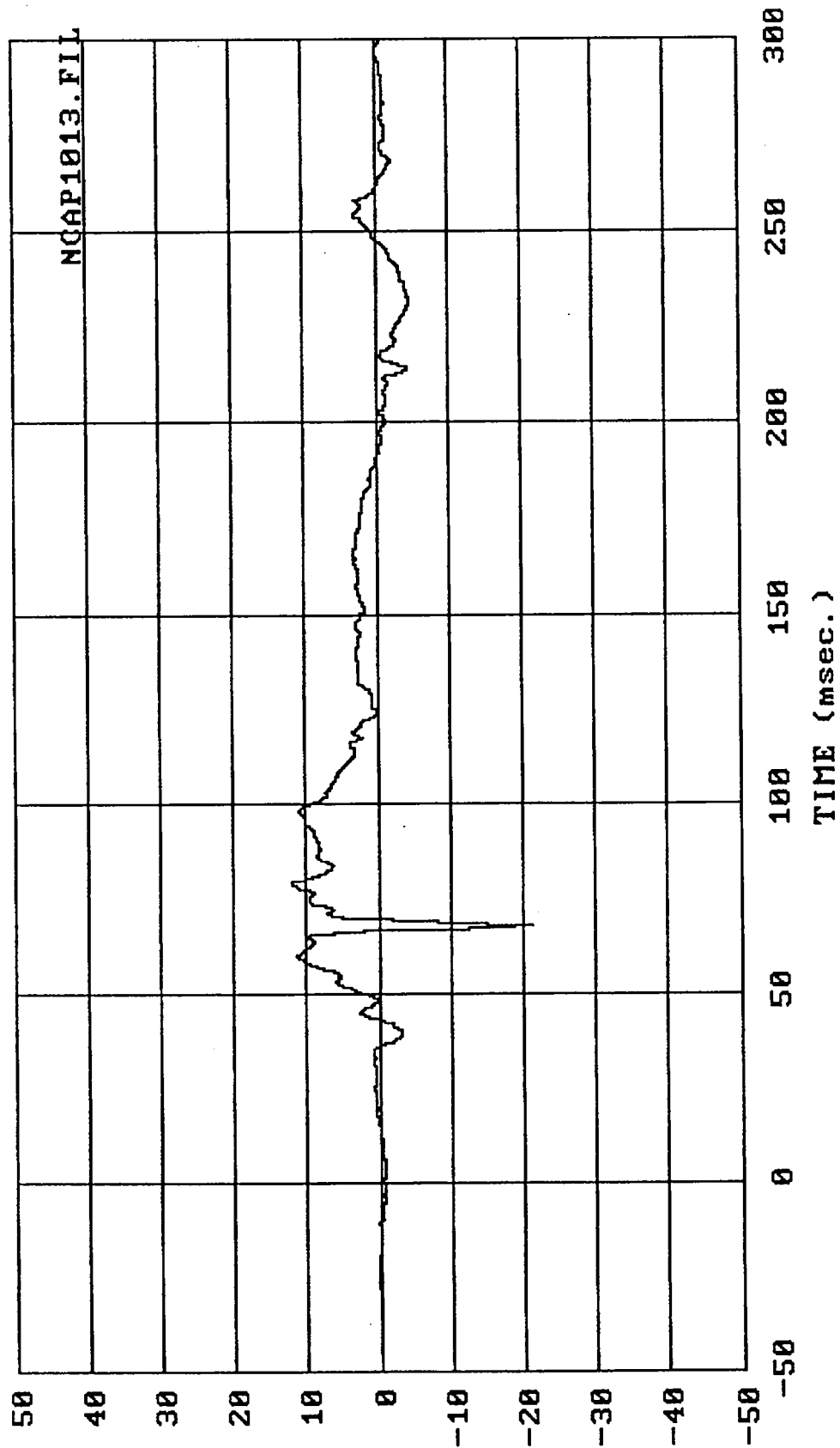


Filter: SAE CLASS 1000 Max = 65.627 Min = .18633

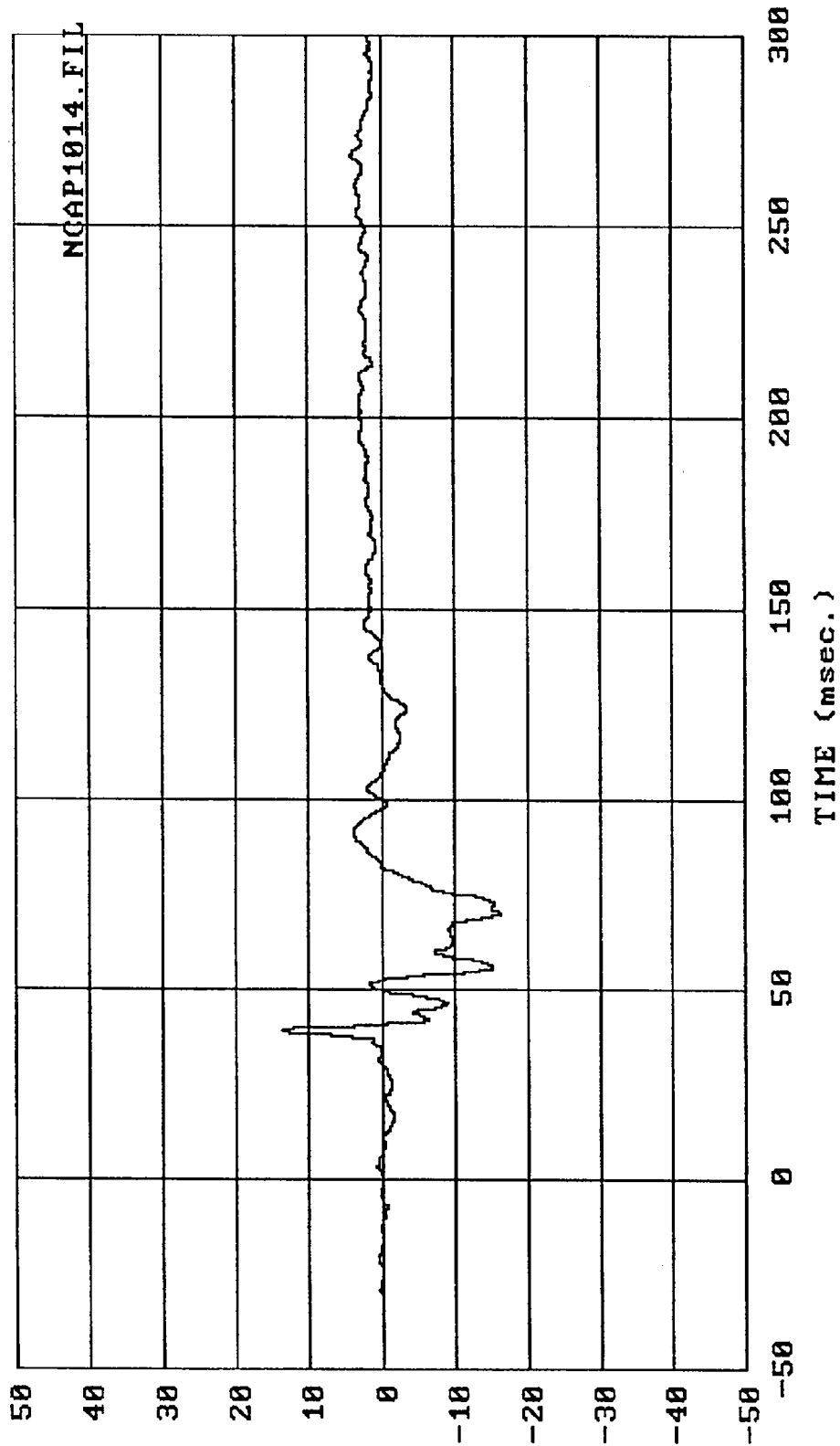
MSE 09/12/89 -- 1990 Acura Integra : Pasngr Head resultant acc.



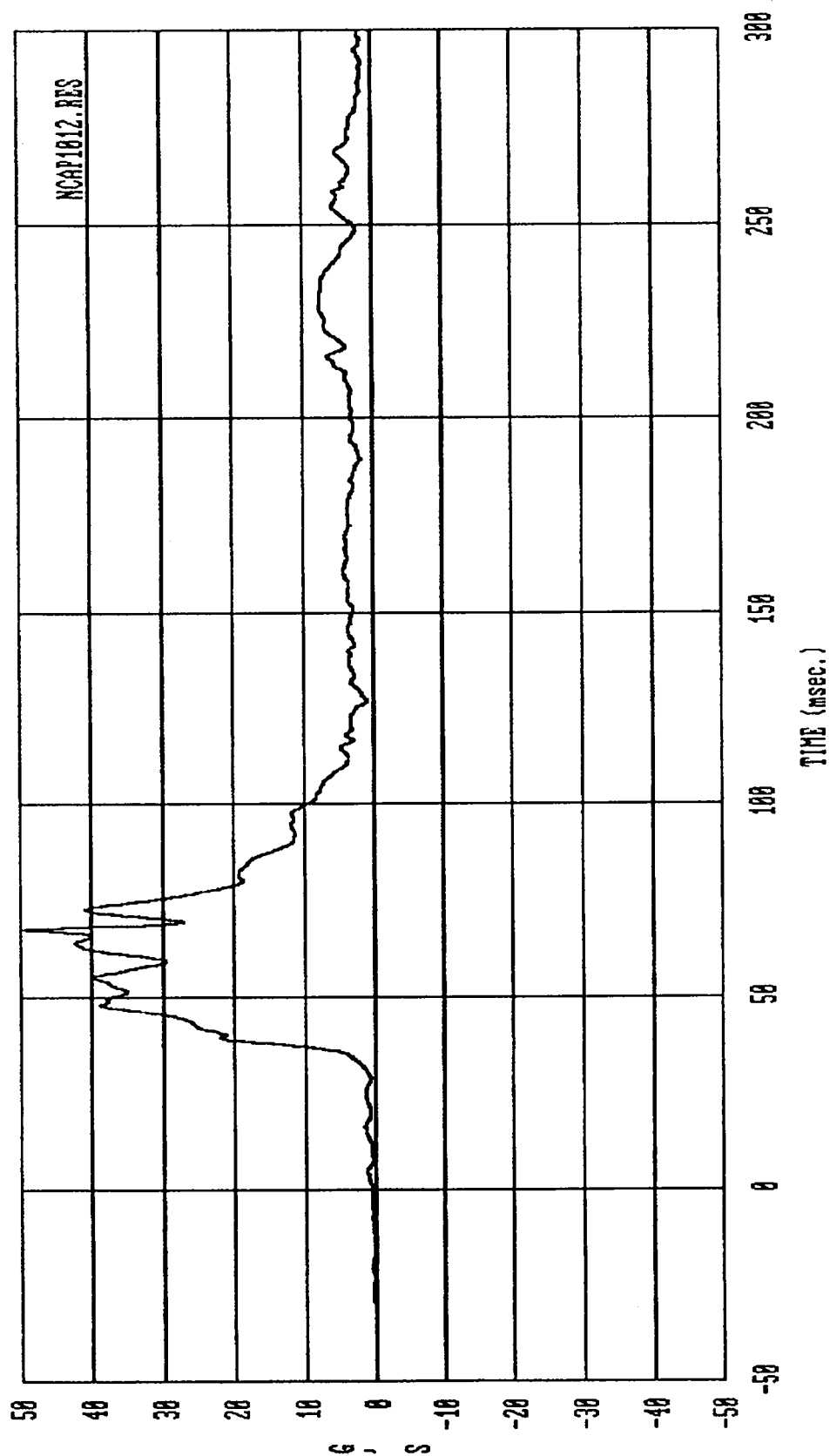
Filter: SAE CLASS 180 Max = 6.0650 Min = -44.758
MSE 09/12/89 -- 1990 Acura Integra : Pasngr Chst accel., X-axis



Filter: SAE CLASS 180 Max = 12.171 Min = -21.132
MSE 09/12/89 -- 1990 Acura Integra : Pasngr Chst accel., Y-axis

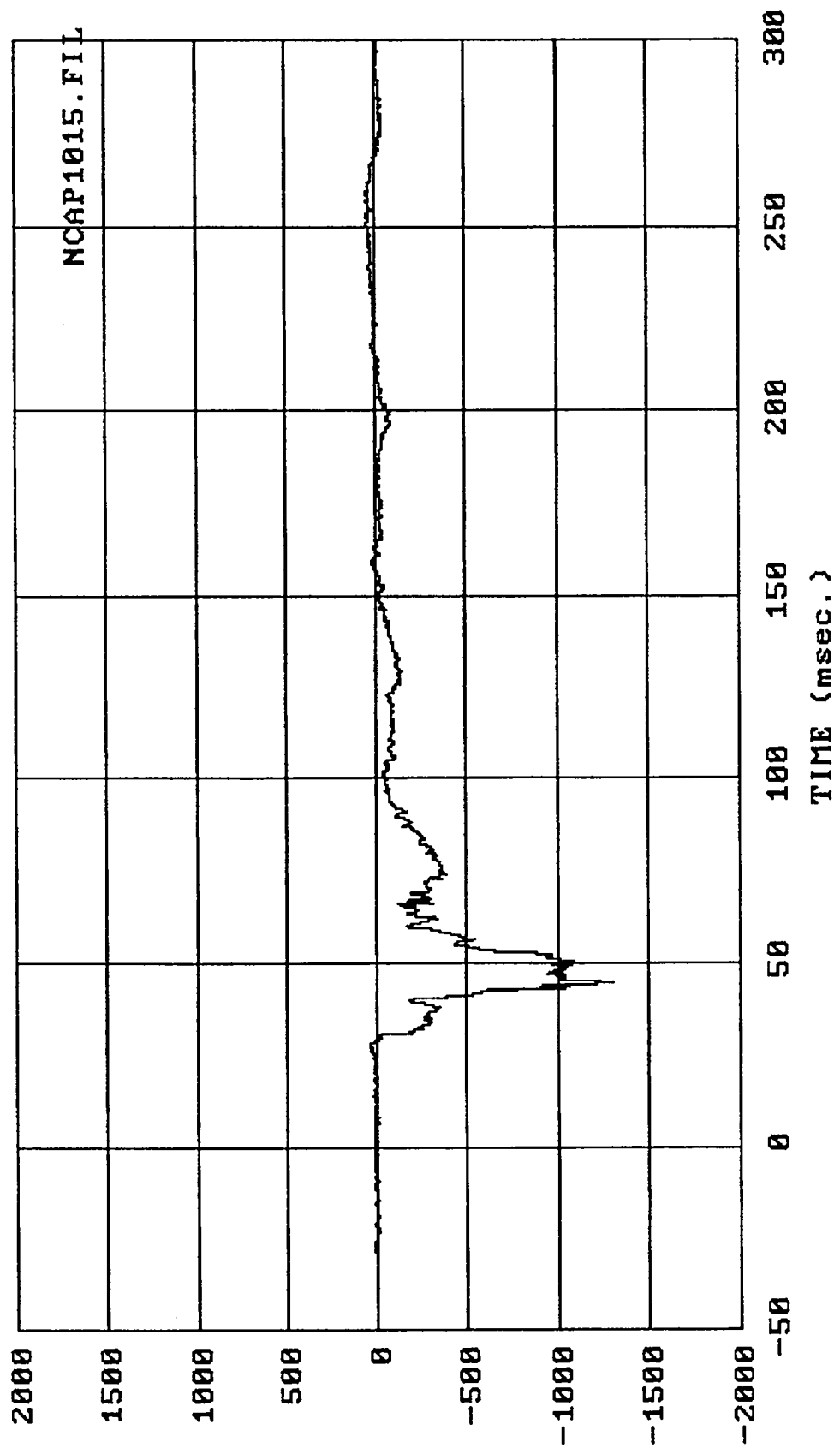


Filter: SAE CLASS 180 Max = 13.977 Min = -16.386
 MSE 09/12/89 -- 1990 Acura Integra : Pasngr Chst accel., Z-axis

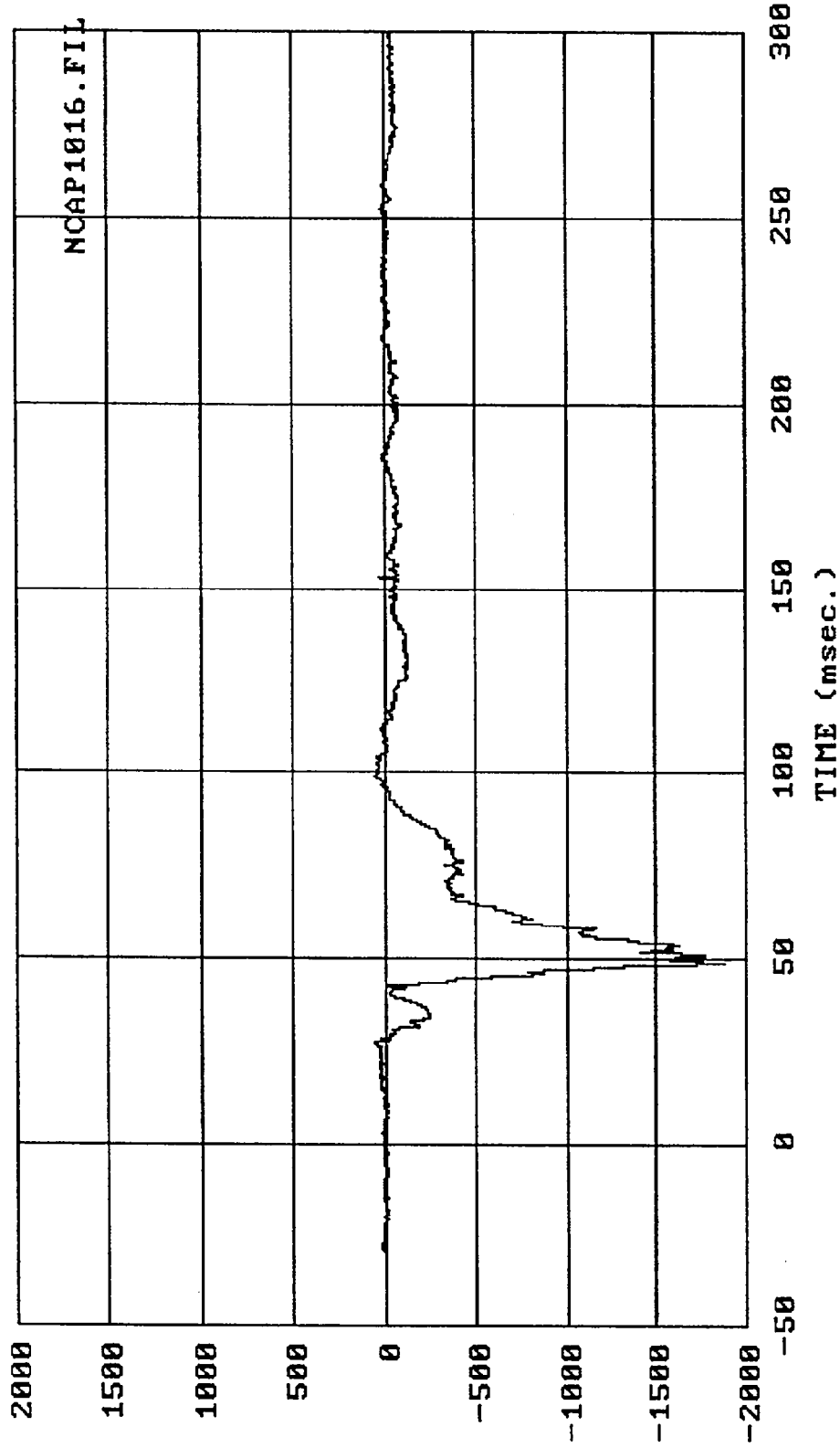


Curve: Passenger Chest resultant acceleration Filter: SAE CLASS 100 Max = 49.434 Min = .44259
 MSE Date: 9/12/89 Program: 1990 New Car Assessment #1 Vehicle: 1990 Acura Integra

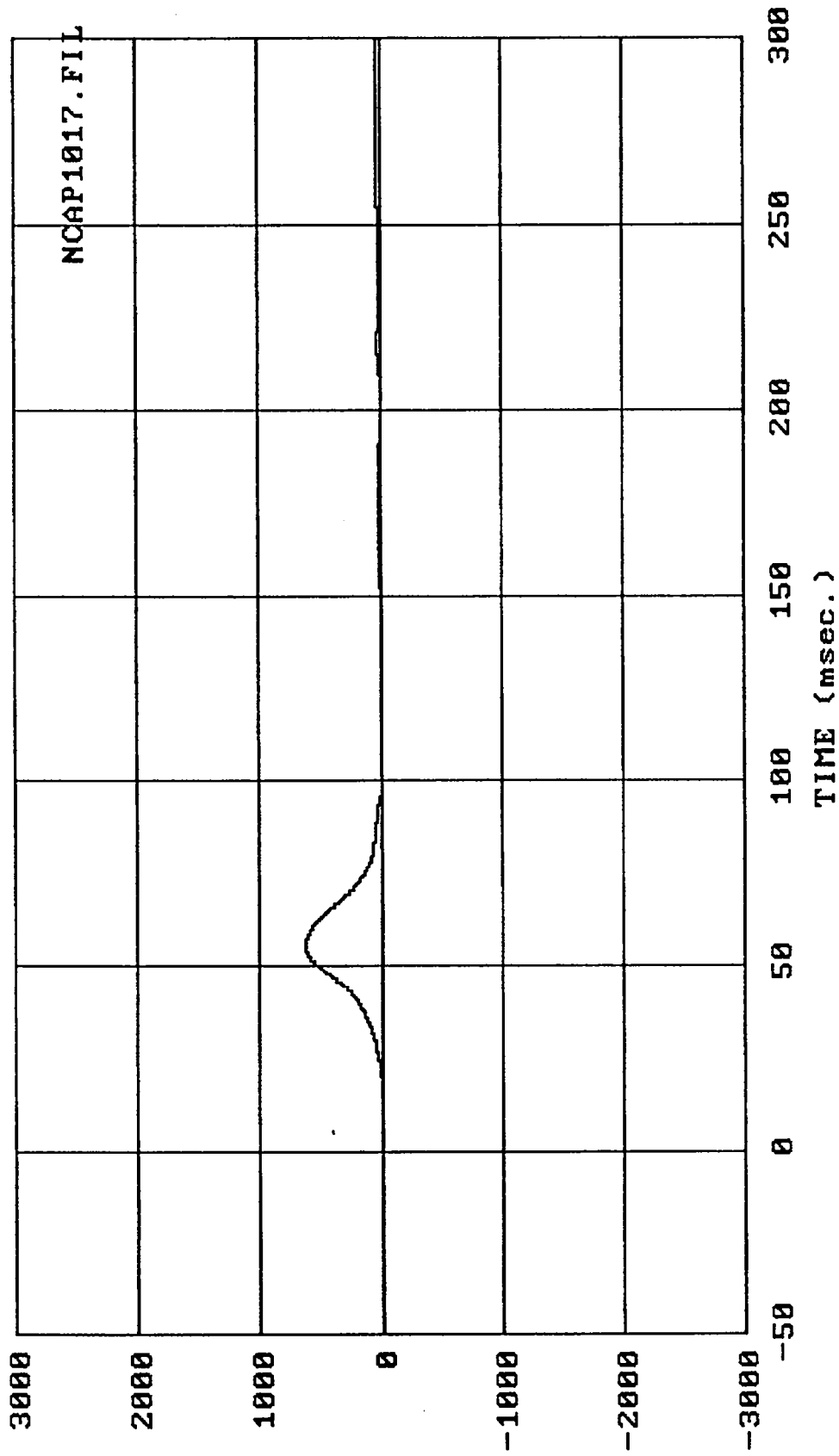
THIS PAGE INTENTIONALLY LEFT BLANK



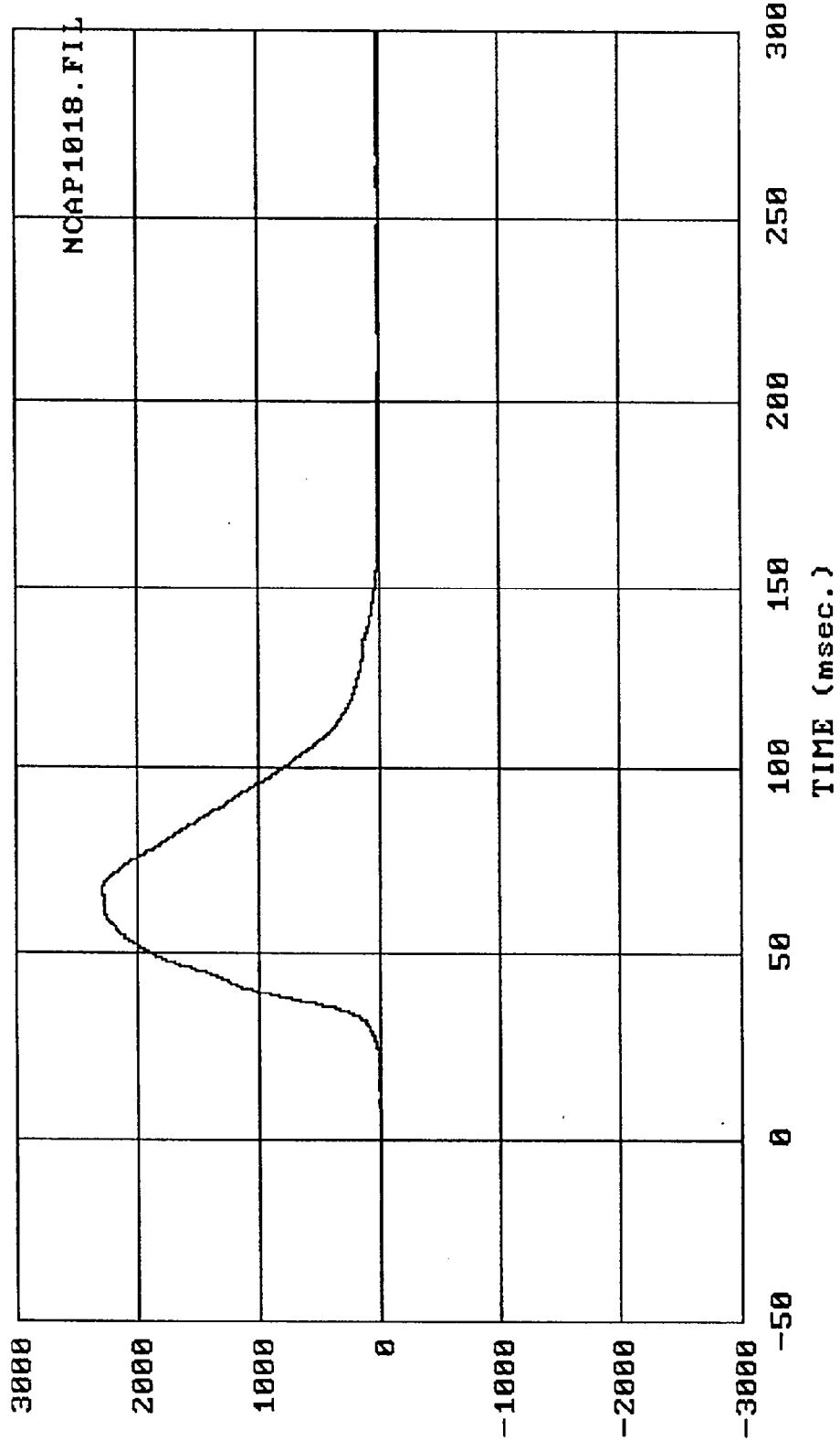
Filter: SAE CLASS 600 Max = 51.545 Min = -1300.5
MSE 09/12/89 -- 1990 Acura Integra : Pasngr Left Femur force



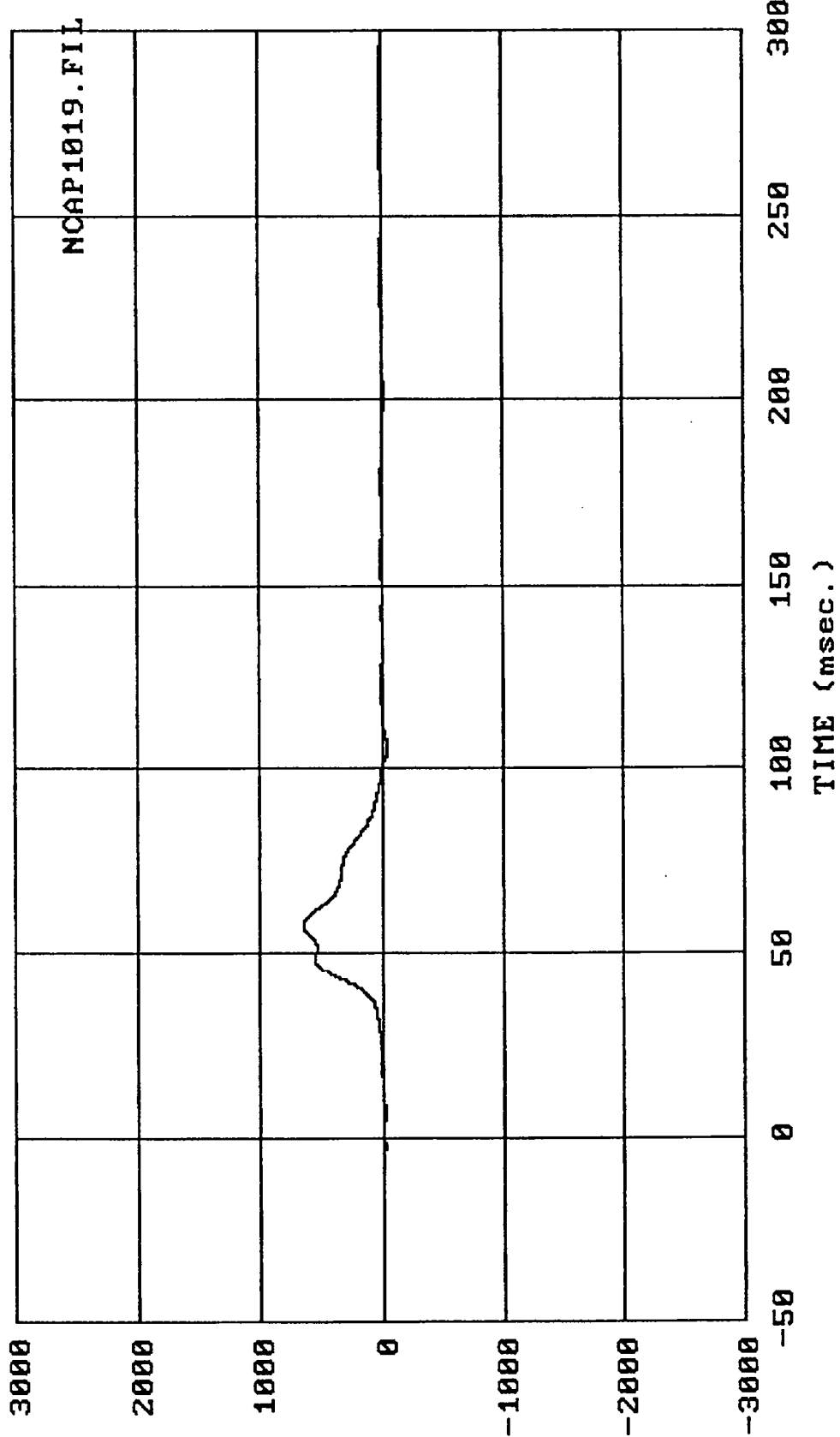
Filter: SAE CLASS 600 Max = 61.960 Min = -1876.7
 MSE 09/12/89 --- 1990 Acura Integra : Pasngr Rght Femur force



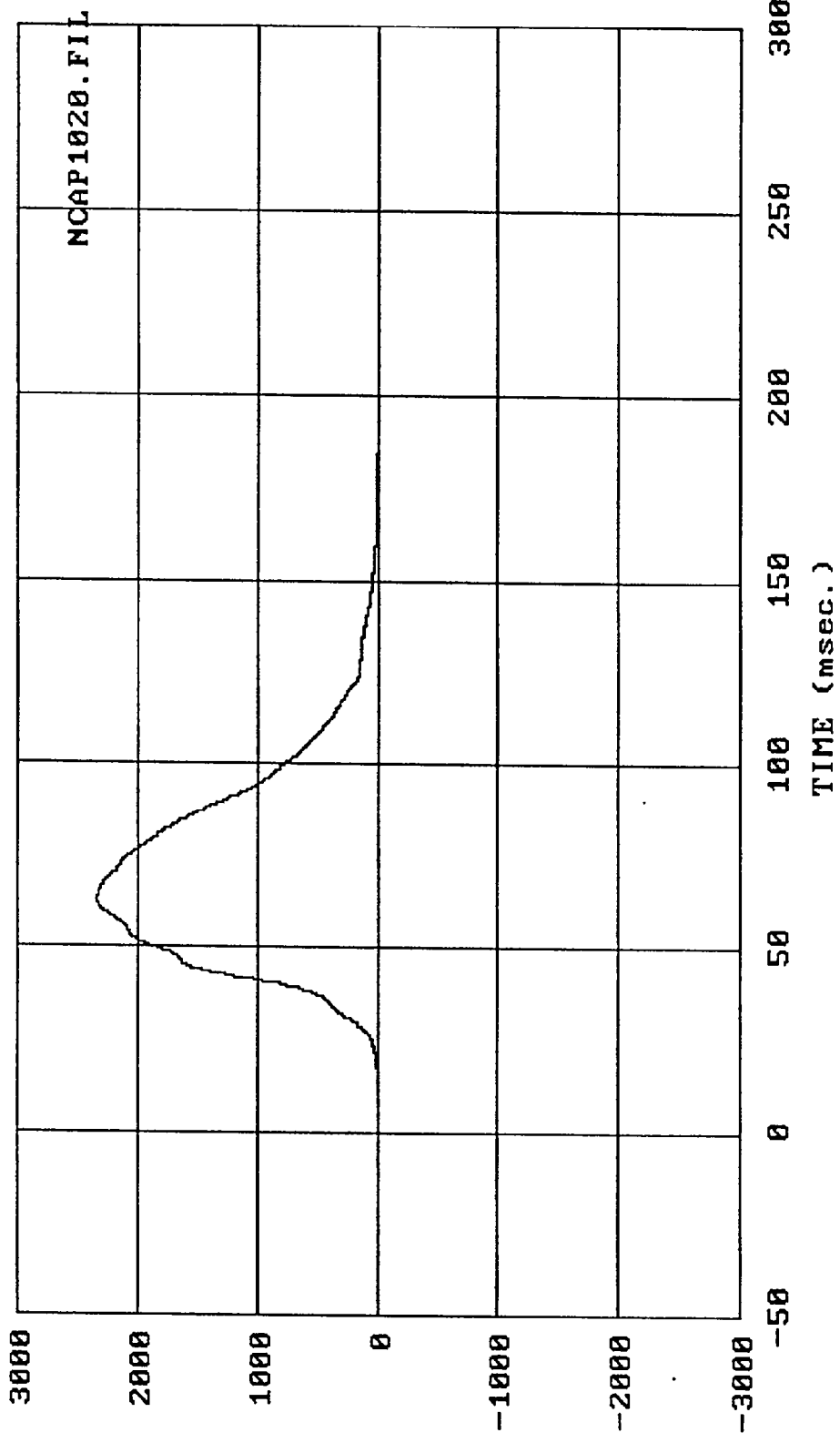
Filter: SAE CLASS 60 Max = 636.23 Min = -7.5352
 MSE 09/12/89 -- 1990 Acura Integra : Driver Lap Belt force



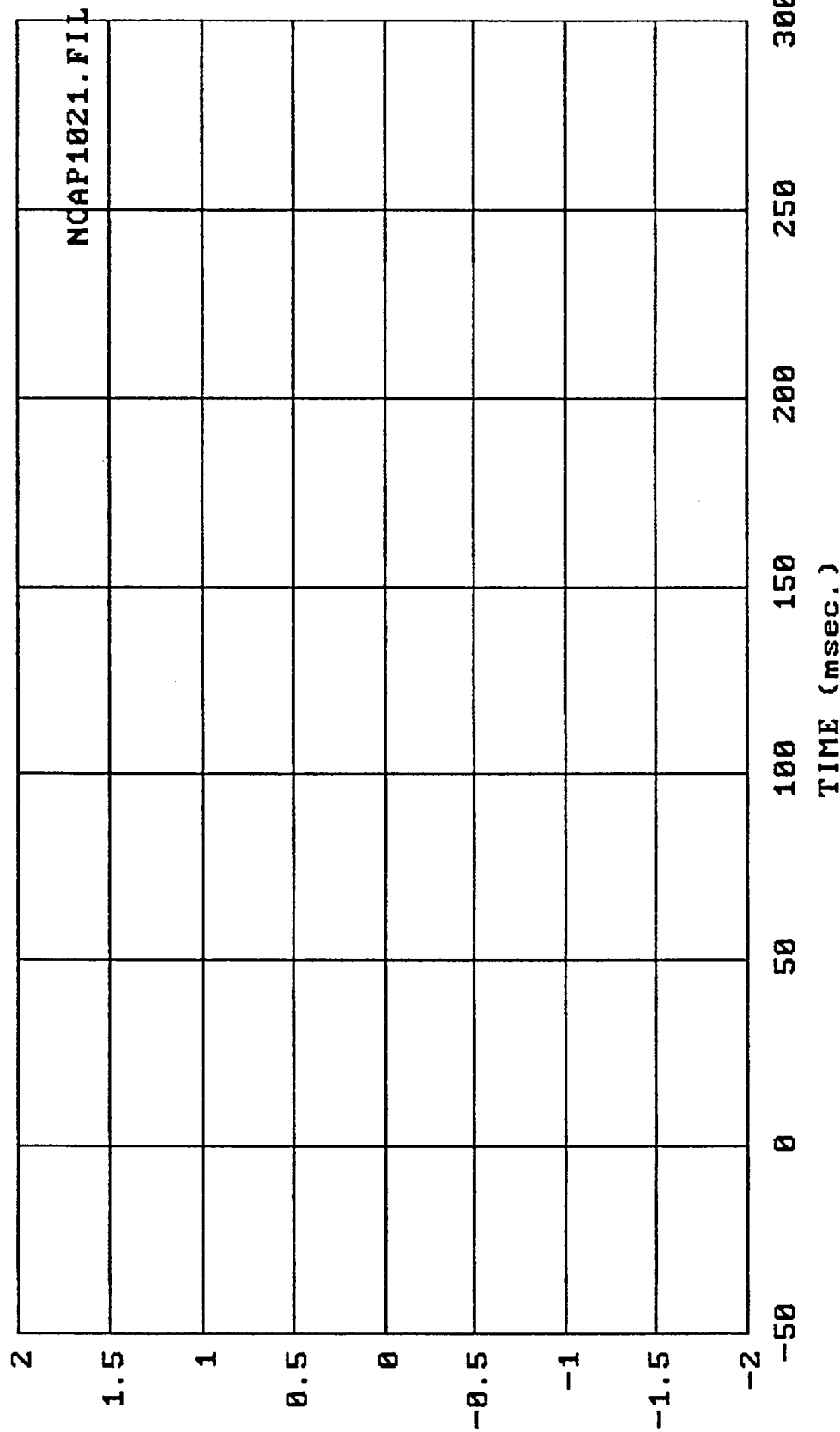
Filter: SAE CLASS 60 Max = 2291.1 Min = -2.2596
MSE 09/12/89 -- 1990 Acura Integra : Driver Shoulder Belt force



Filter: SAE CLASS 60 Max = 656.87 Min = -39.740
 MSE 09/12/89 -- 1990 Acura Integra : Pasngr Lap Belt force

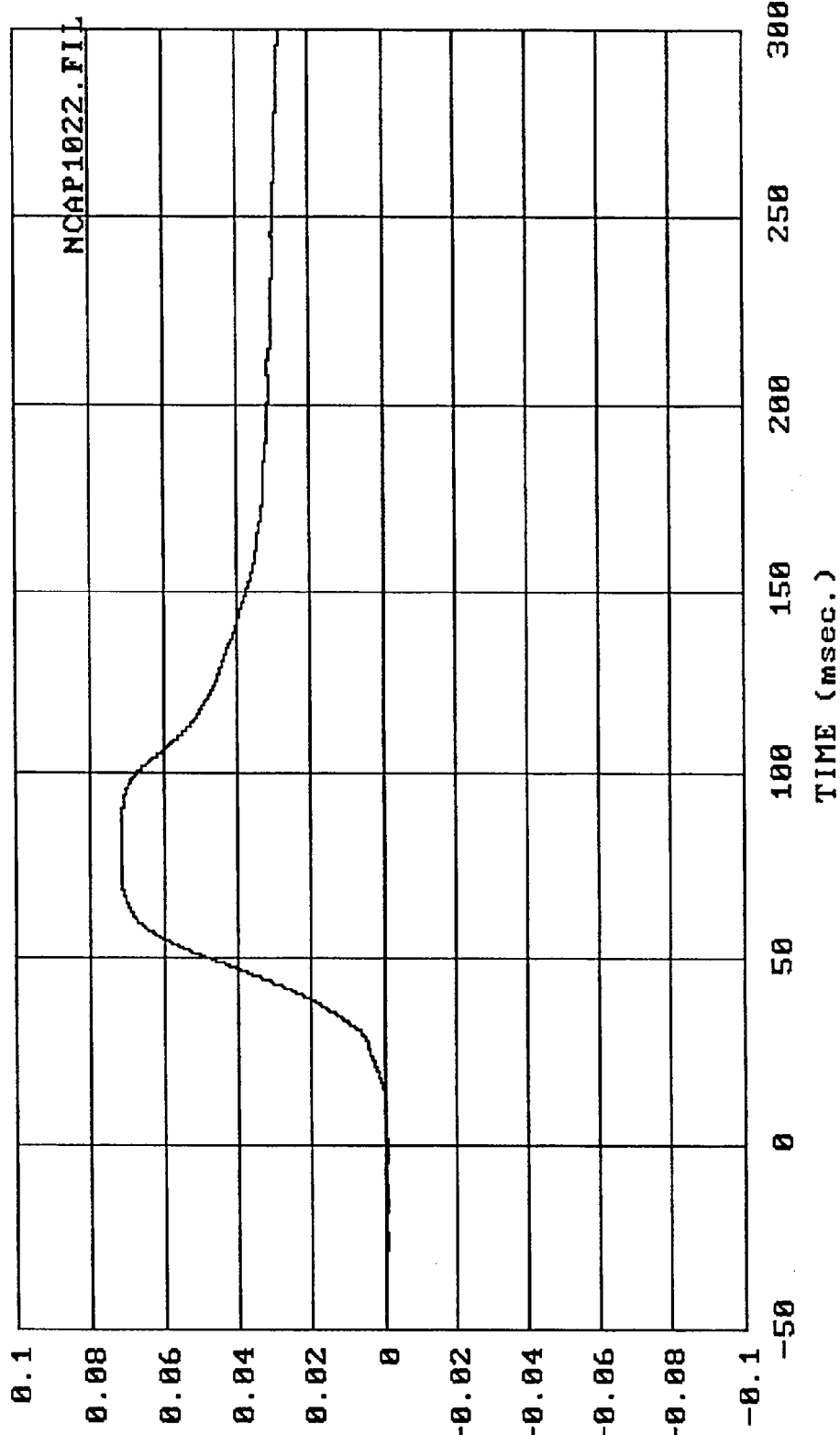


Filter: SAE CLASS 60 Max = 2344.9 Min = -8.9450
 MSE 09/12/89 -- 1990 Acura Integra : Pasngr Shoulder Belt force

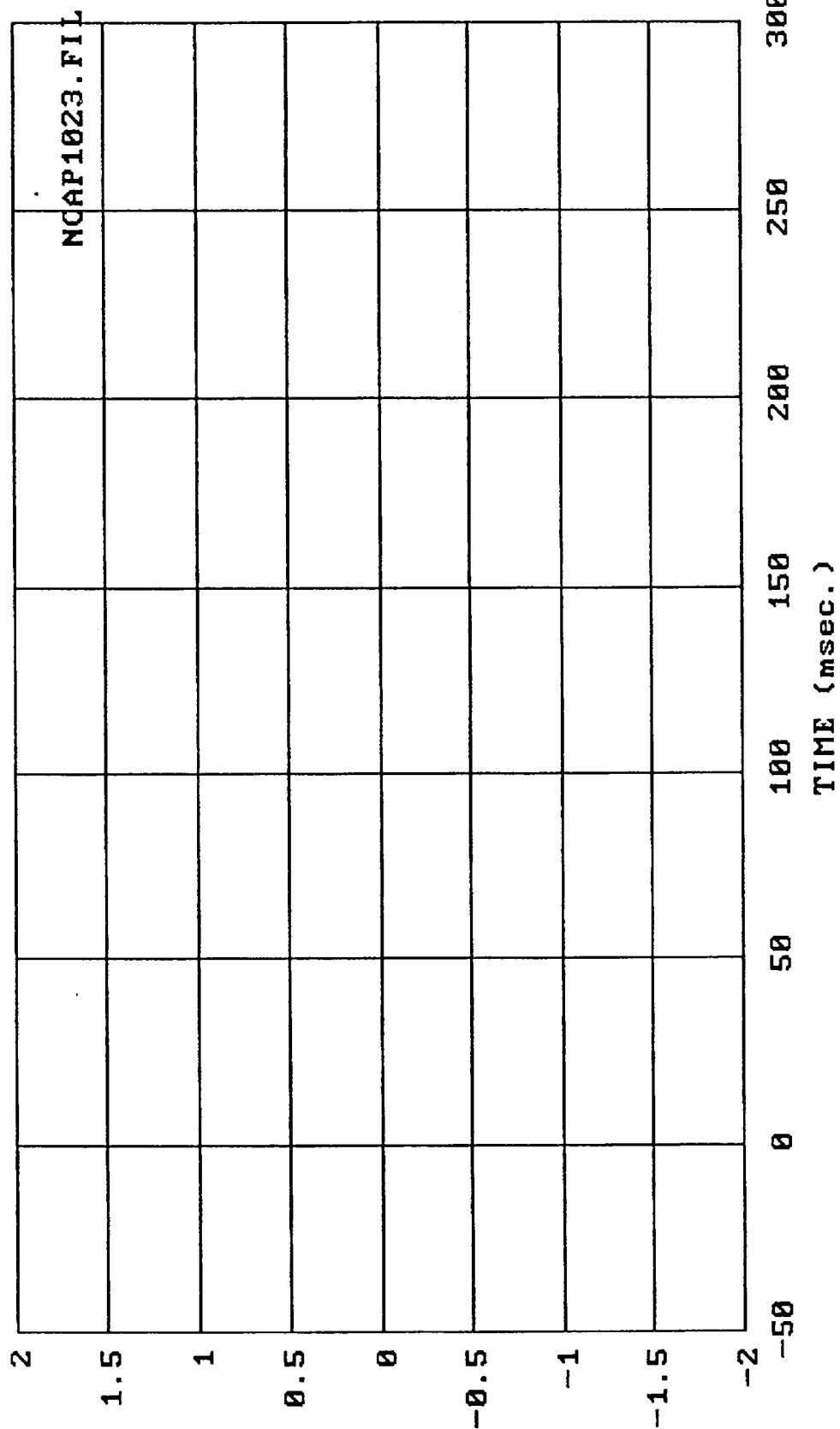


Filter: SAE CLASS 60 Max = .00000 Min = .00000

MSE 09/12/89 -- 1990 Acura Integra : Driver Belt pullout (not used)

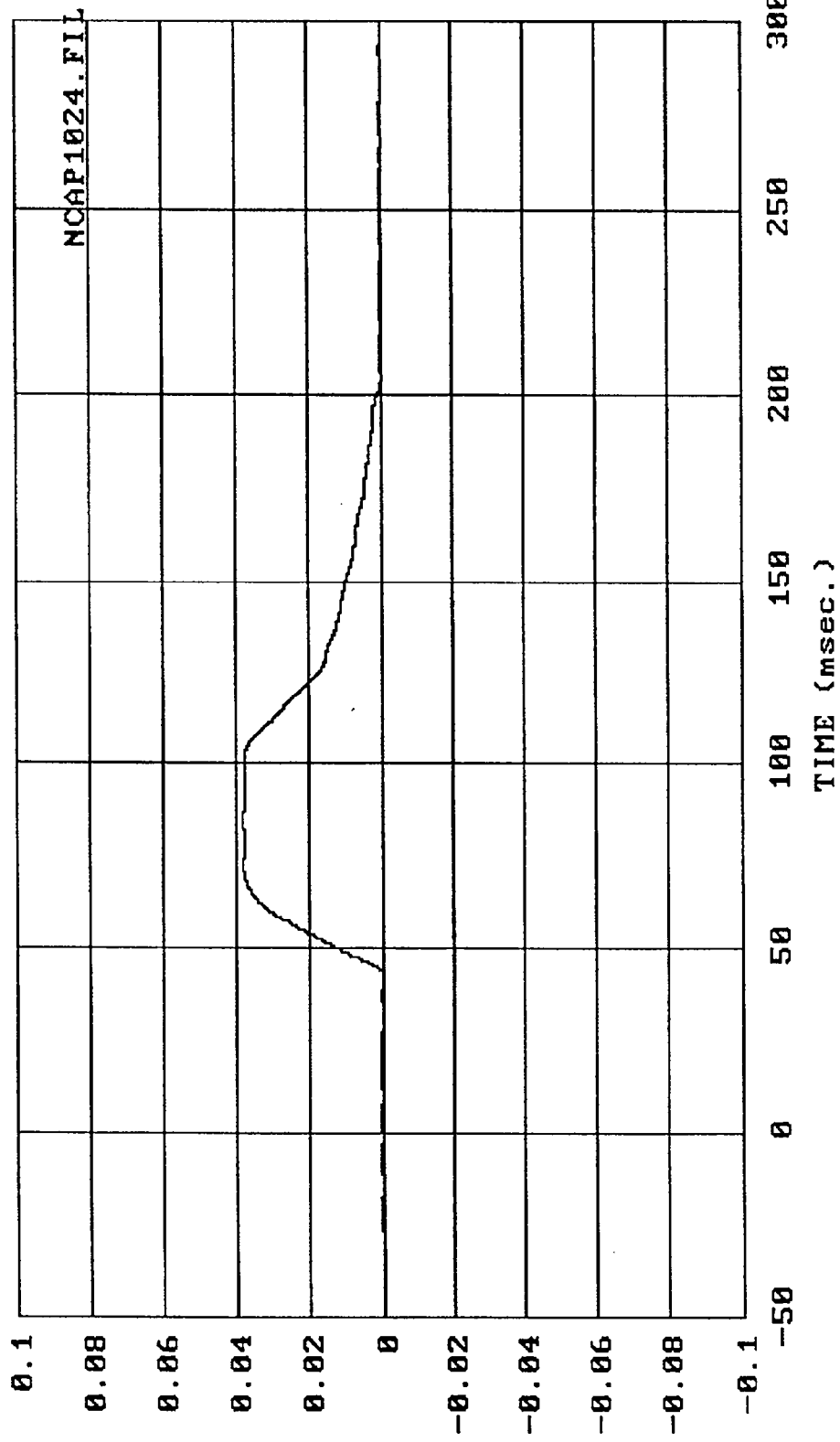


Filter: SAE CLASS 60 Max = .71811E-01 Min = -.27751E-03
MSE 09/12/89 -- 1990 Acura Integra : Driver Belt percent elongation



Filter: SAE CLASS 60 Max = .00000 Min = .00000

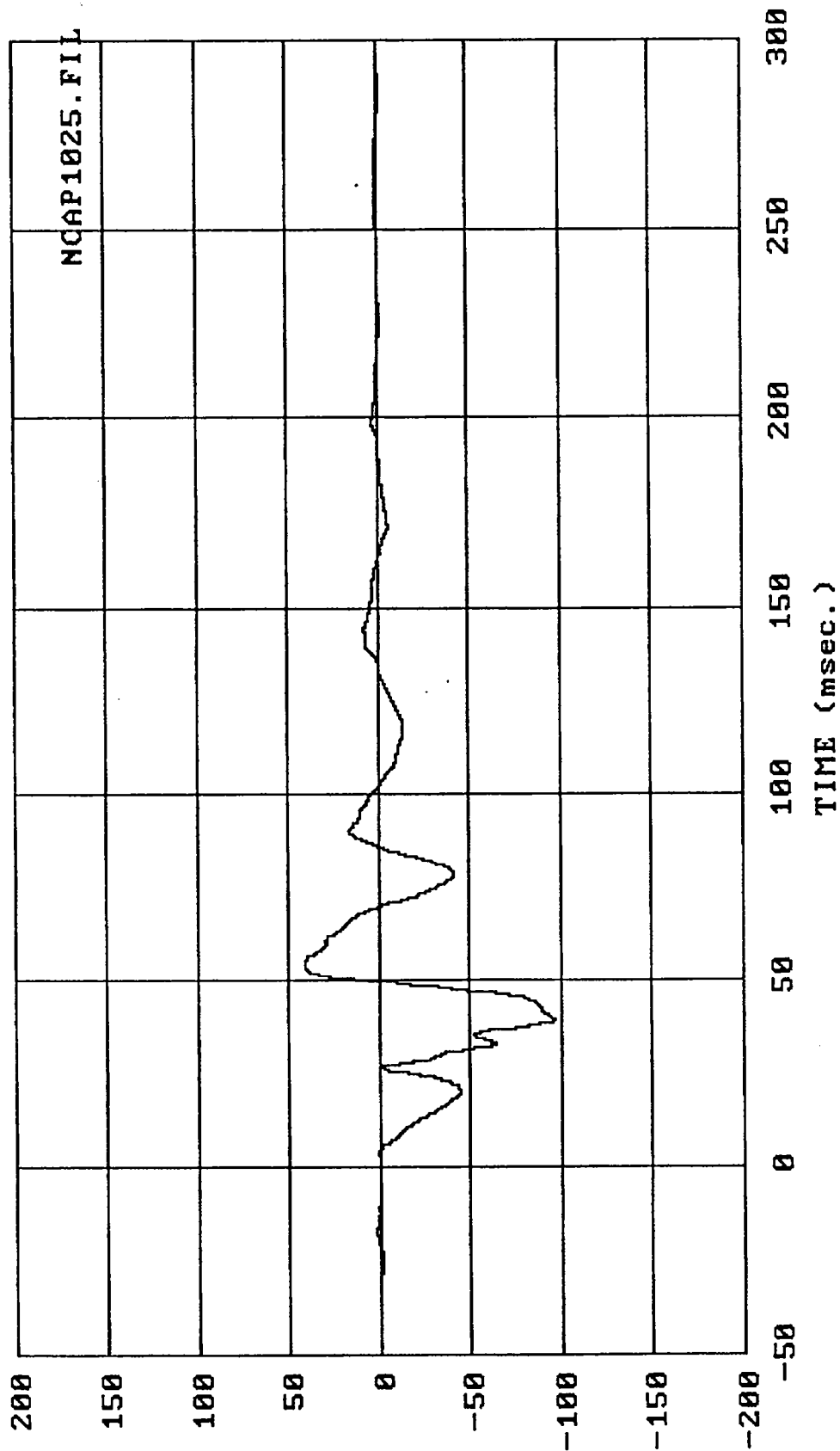
MSE 09/12/89 -- 1990 Acura Integra : Pasngr Belt pullout (not used)



Filter: SAE CLASS 60 Max = .38399E-01 Min = -.20451E-03
MSE 09/12/89 -- 1990 Acura Integra : Pasngr Belt percent elongation

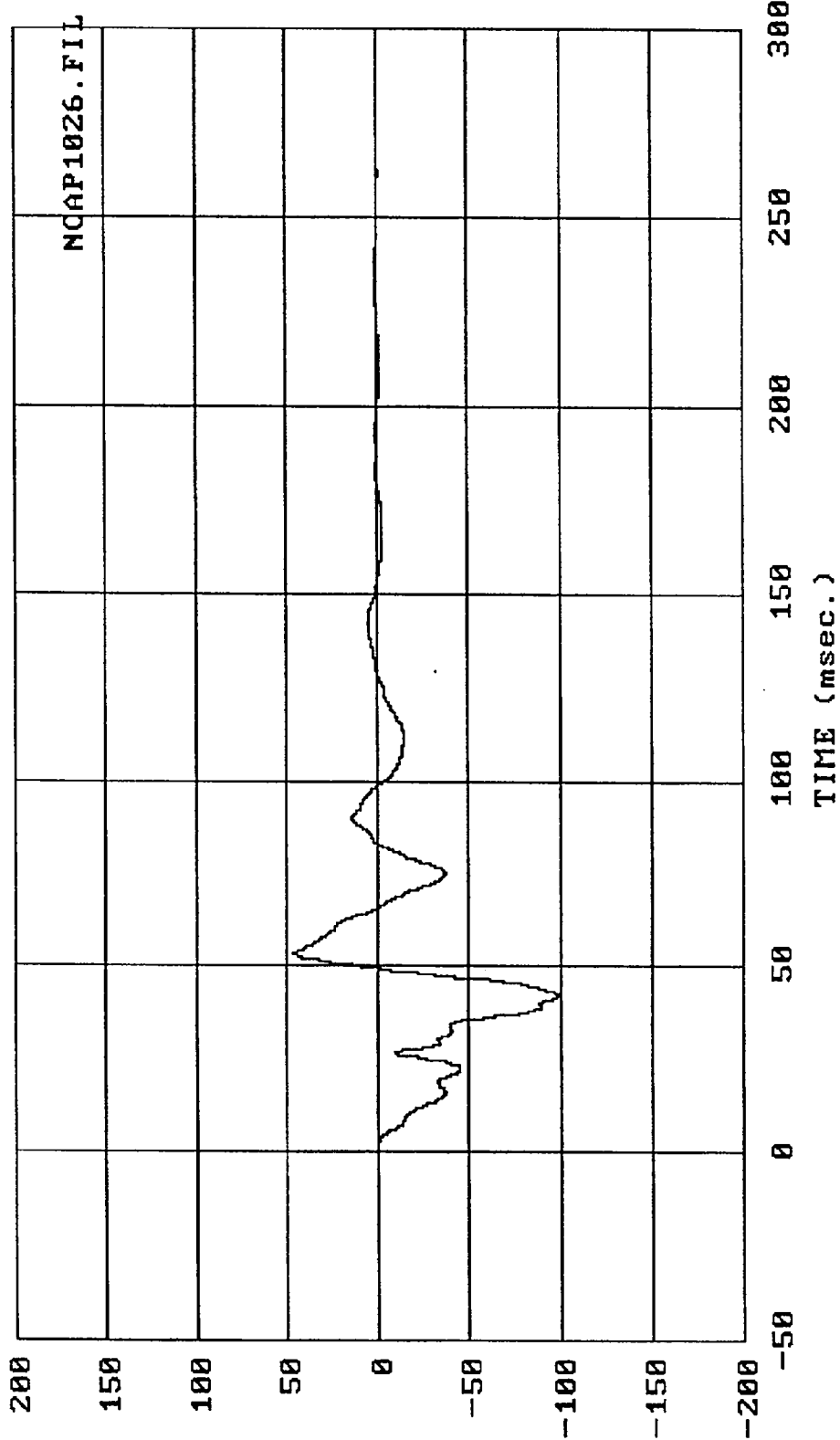
IN · IN
CGH
Bl-46

MSE-90-R9063-N01

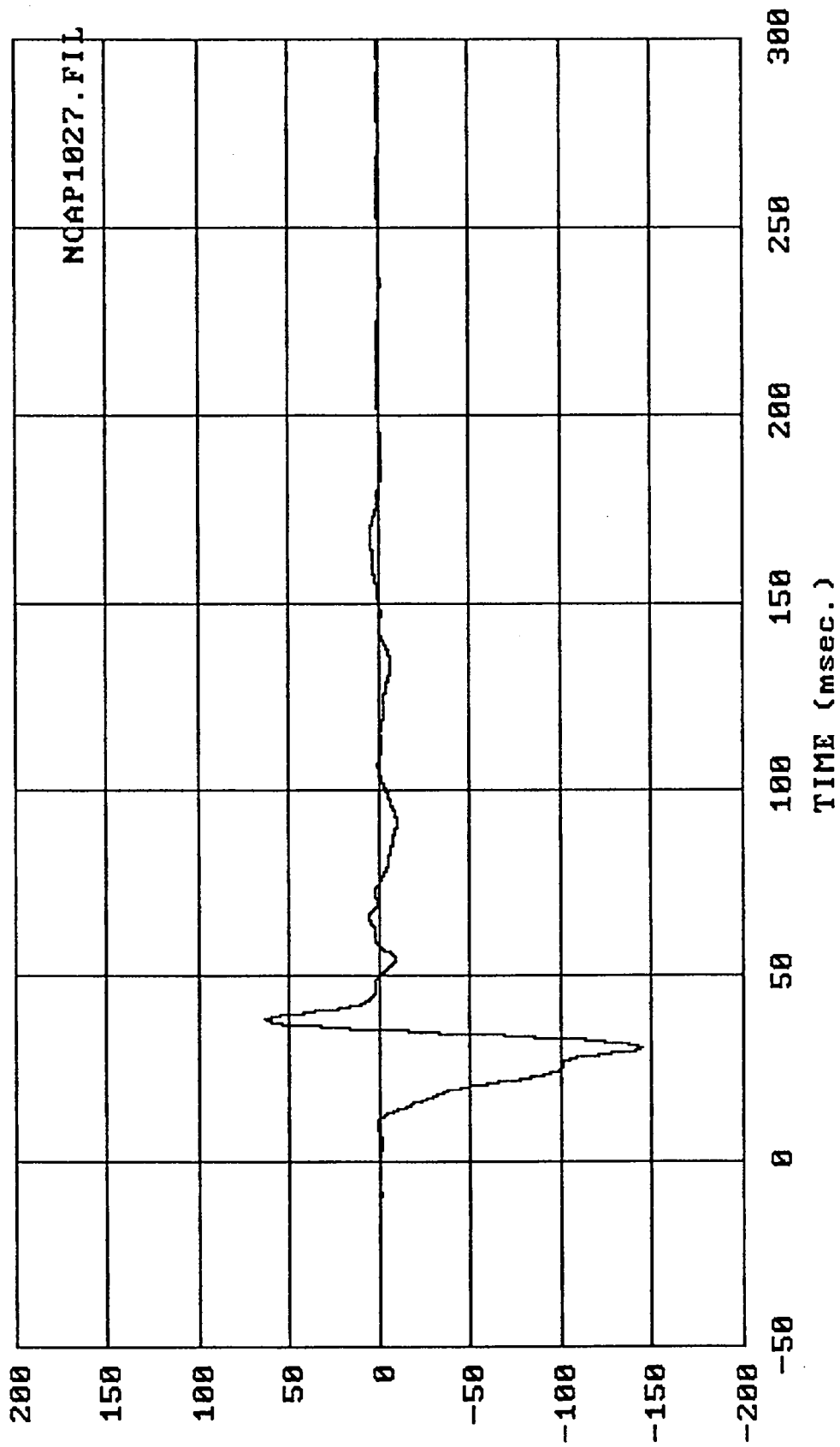


Filter: SAE CLASS 60 Max = 40.830 Min = -96.204

MSE 09/12/89 --- 1990 Acura Integra : Left front caliper accel.

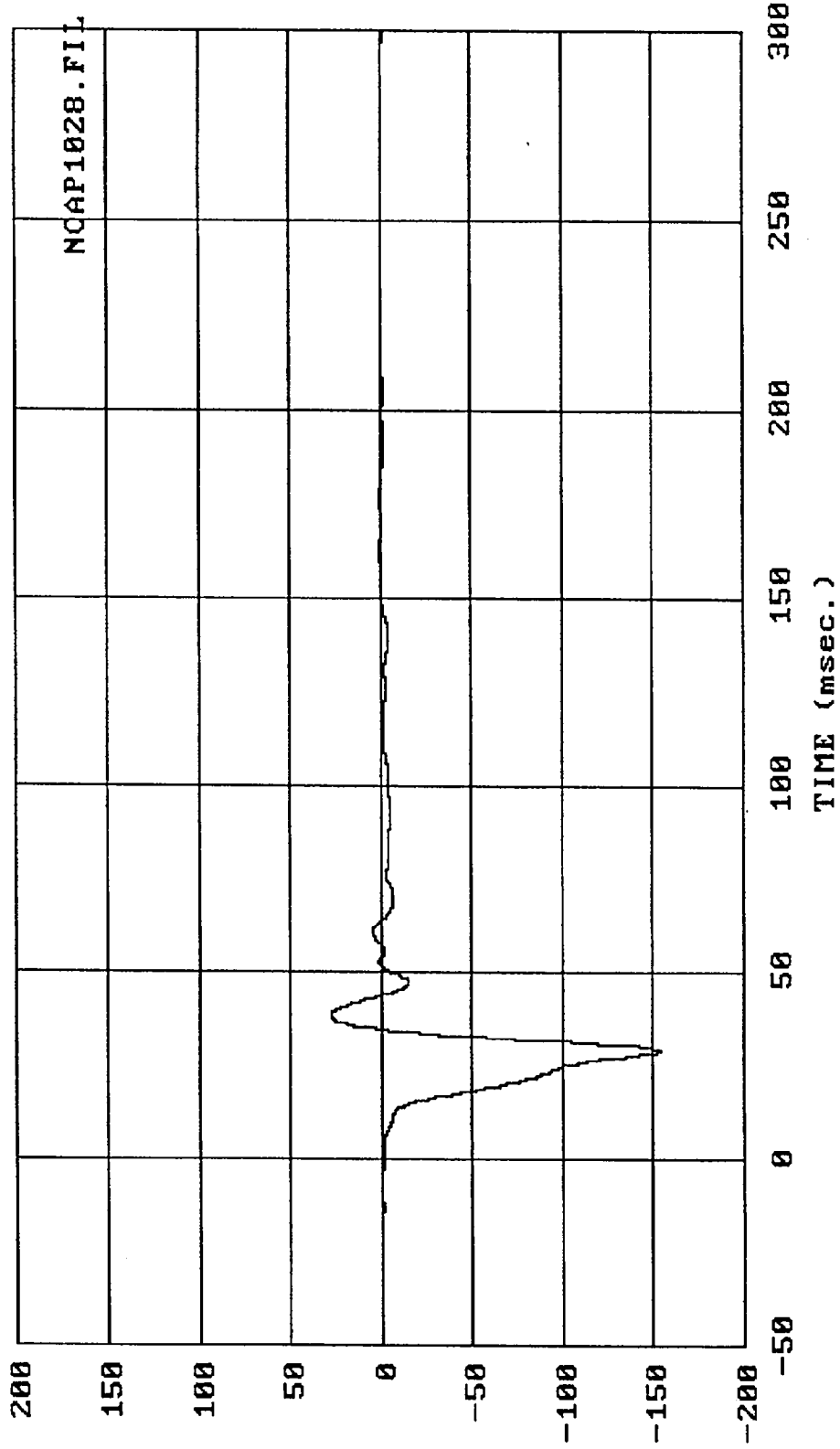


Filter: SAE CLASS 60 Max = 46.494 Min = -99.315
 MSE 09/12/89 -- 1990 Acura Integra : Right front caliper accel.

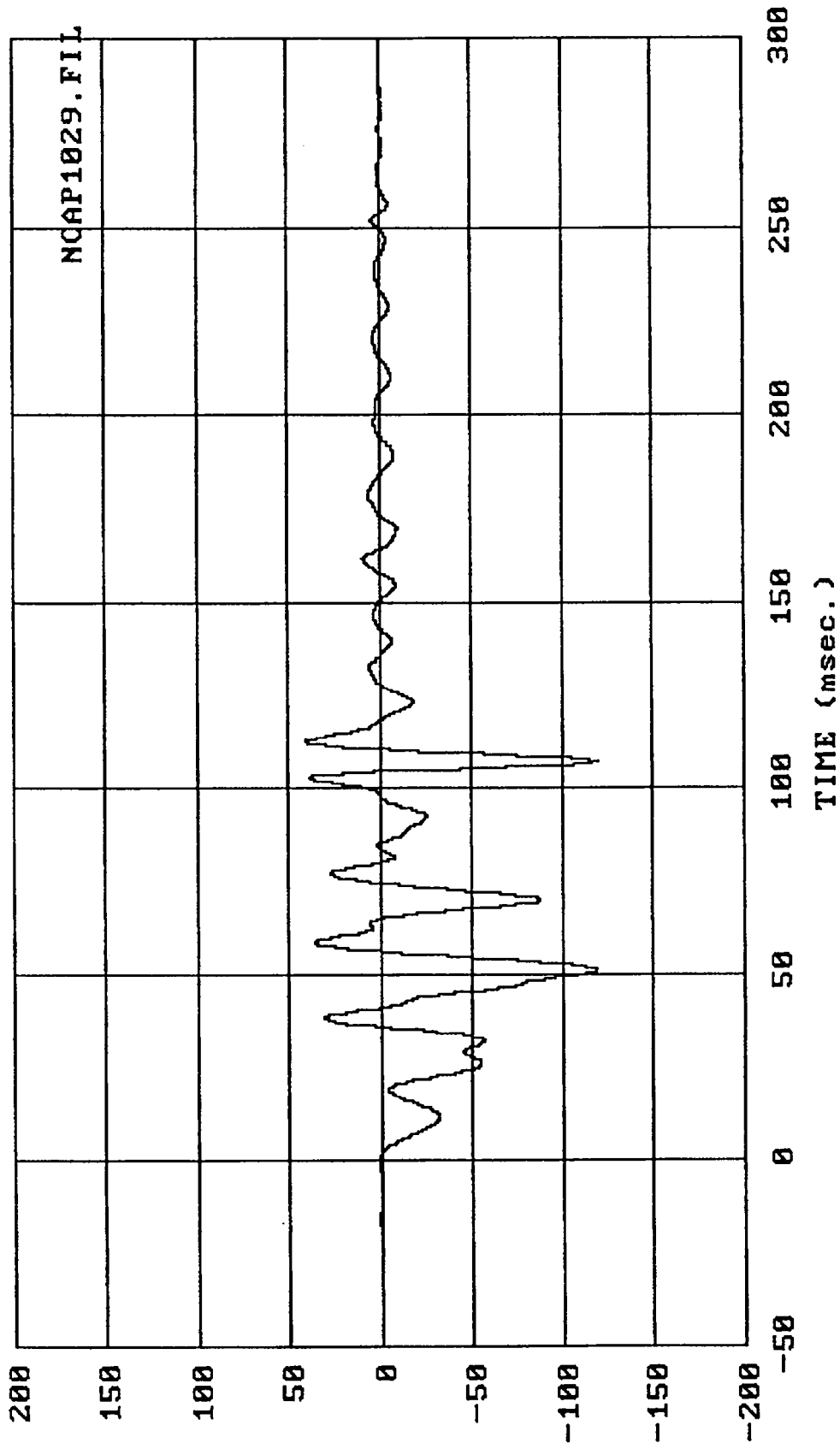


Filter: SAE CLASS 60 Max = 63.768 Min = -144.82

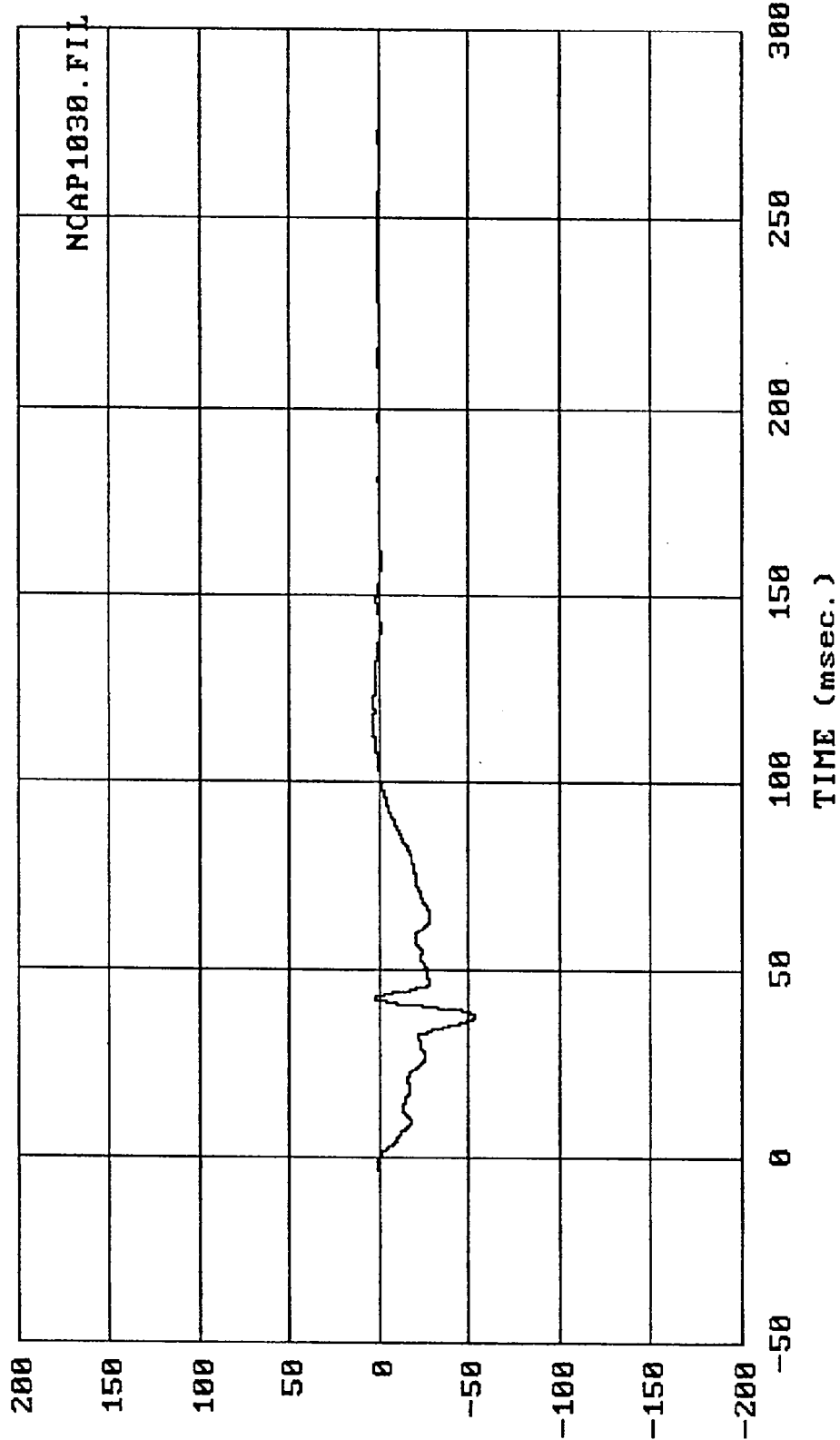
MSE 09/12/89 -- 1990 Acura Integra : Engine bottom acceleration



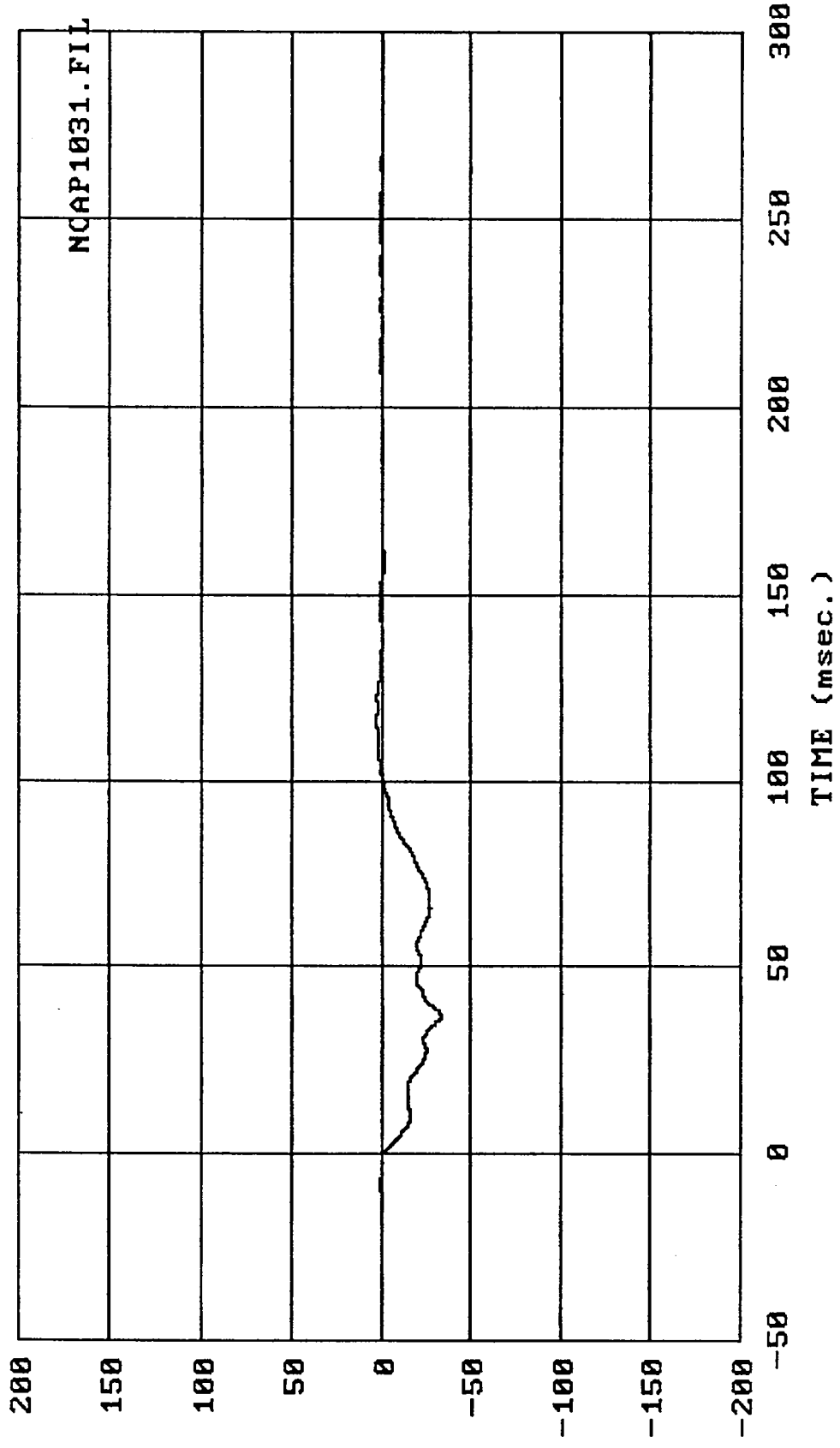
Filter: SAE CLASS 60 Max = 28.089 Min = -154.11
MSE 09/12/89 -- 1990 Acura Integra : Engine top acceleration



Filter: SAE CLASS 60 Max = 41.242 Min = -119.93
MSE 09/12/89 --- 1990 Acura Integra : Instrument panel accel.



Filter: SAE CLASS 60 Max = 3.7708 Min = -53.749
 MSE 09/12/89 -- 1990 Acura Integra : Left-rear seat X-member accel.



Filter: SAE CLASS 60 Max = 3.2863 Min = -33.720

MSE 09/12/89 -- 1990 Acura Integra : Right-rear seat X-member accel.

B1-54

MSE-90-R9063-N01

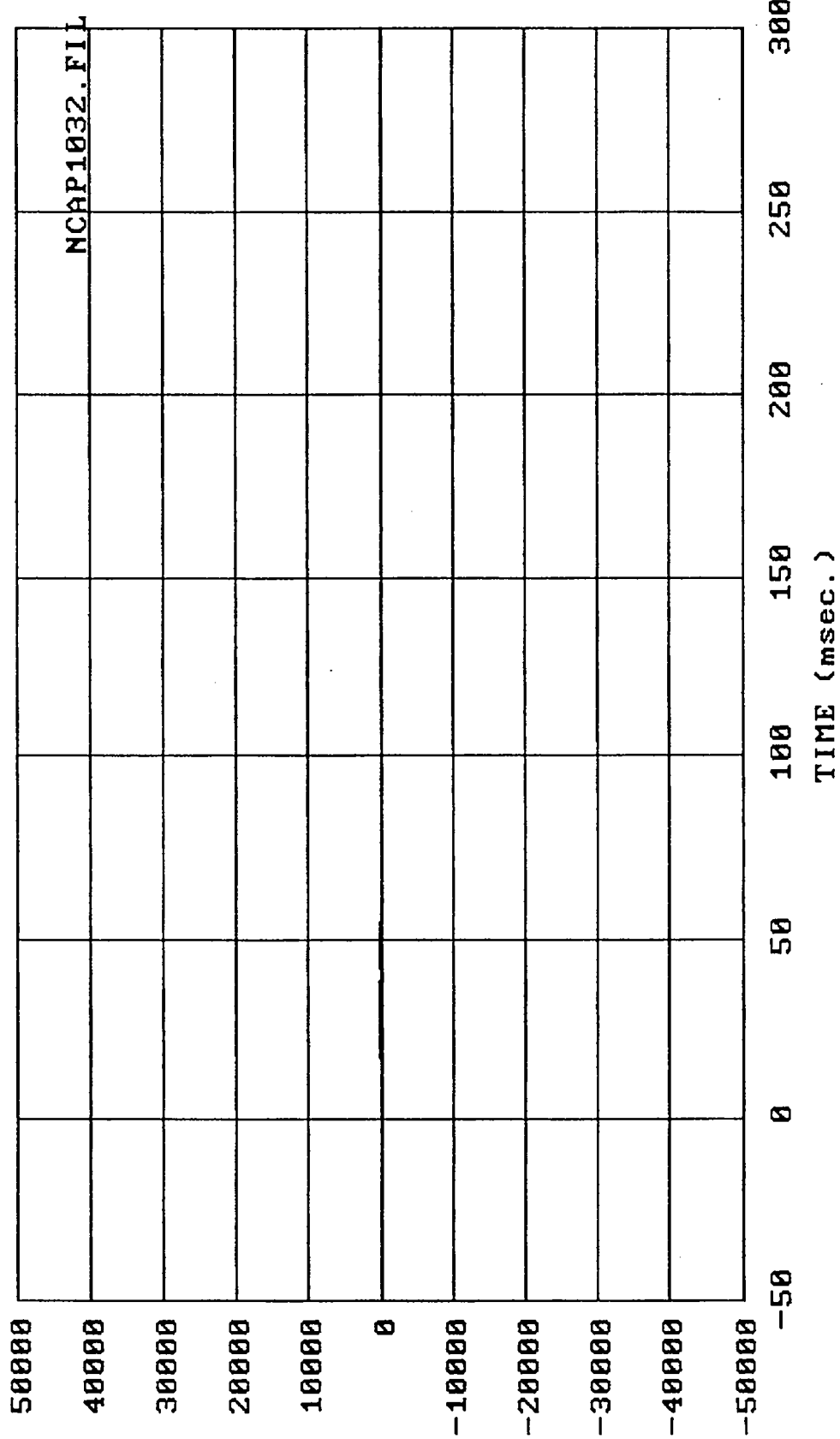
APPENDIX B-2

LOAD CELL BARRIER DATA

DATA FILTERING:

Load Cell Barrier Channels - Class 60

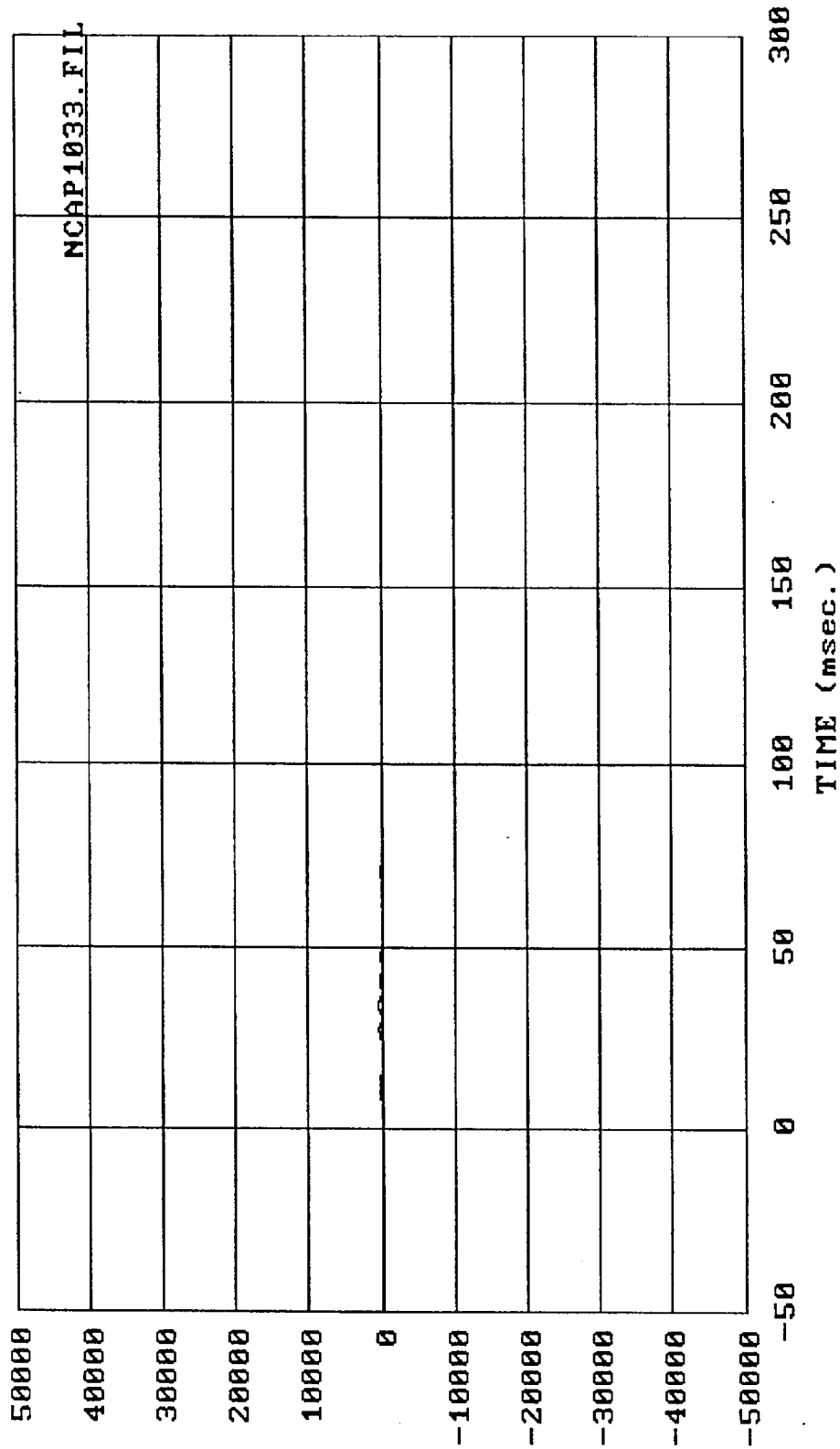
THIS PAGE INTENTIONALLY LEFT BLANK



LBS B2-1

MSE-90-R9063-N01

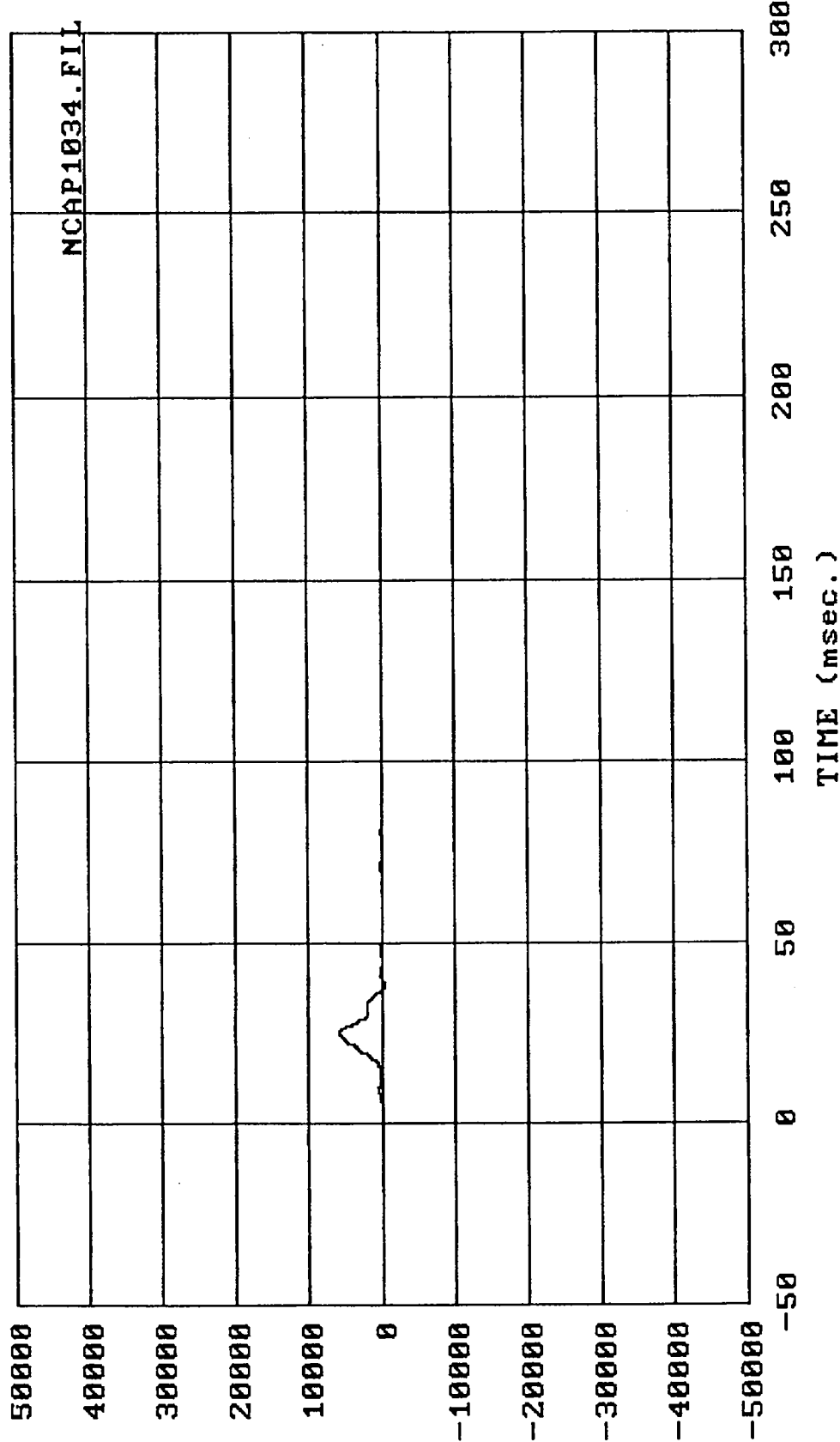
Filter: SAE CLASS 60 Max = 381.15 Min = -57.603
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A1



LBS B2-2

MSE-90-R9063-N01

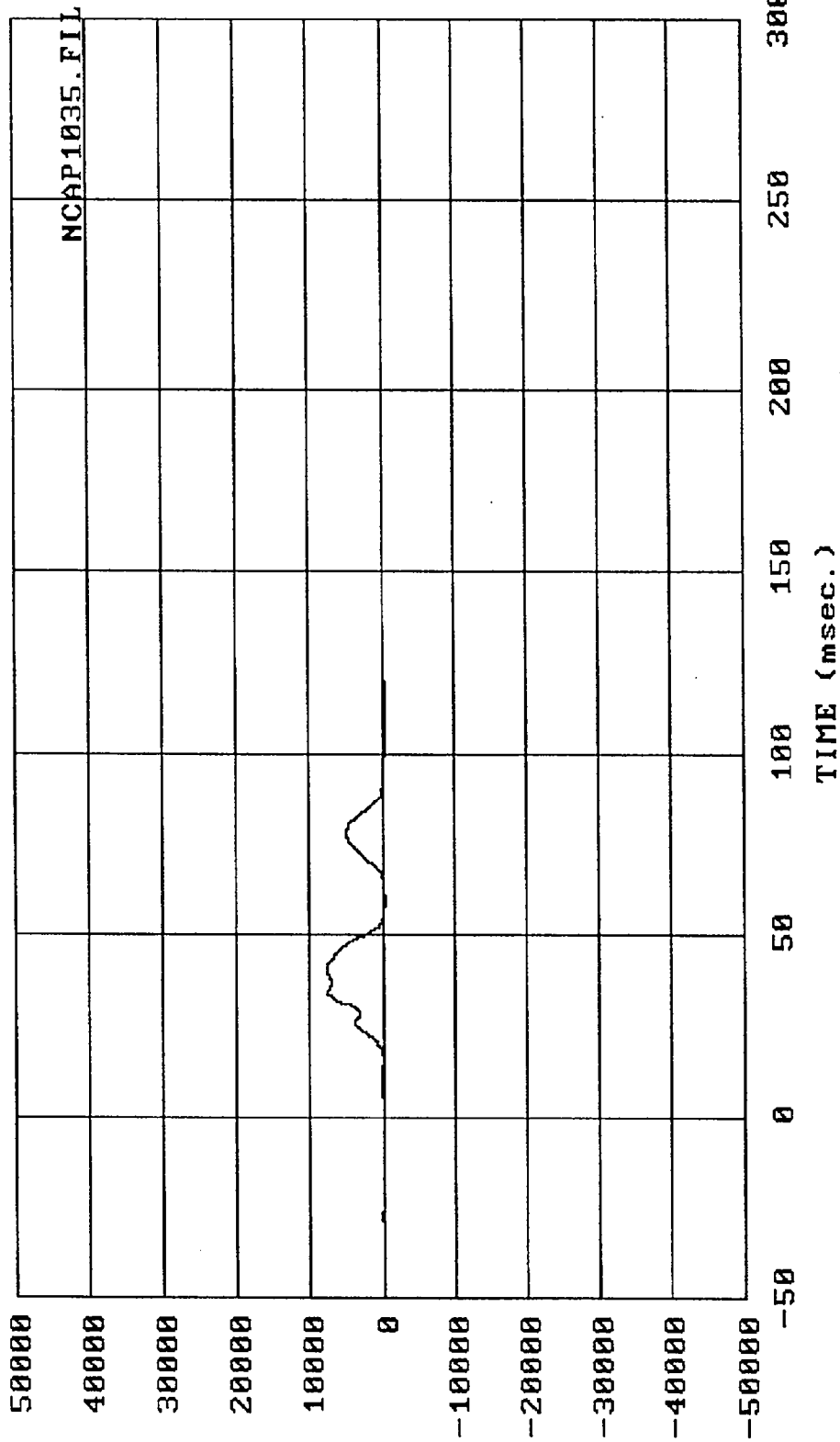
Filter: SAE CLASS 60 Max = 561.38 Min = -138.28
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A2



LBS B2-3

MSE-90-R9063-N01

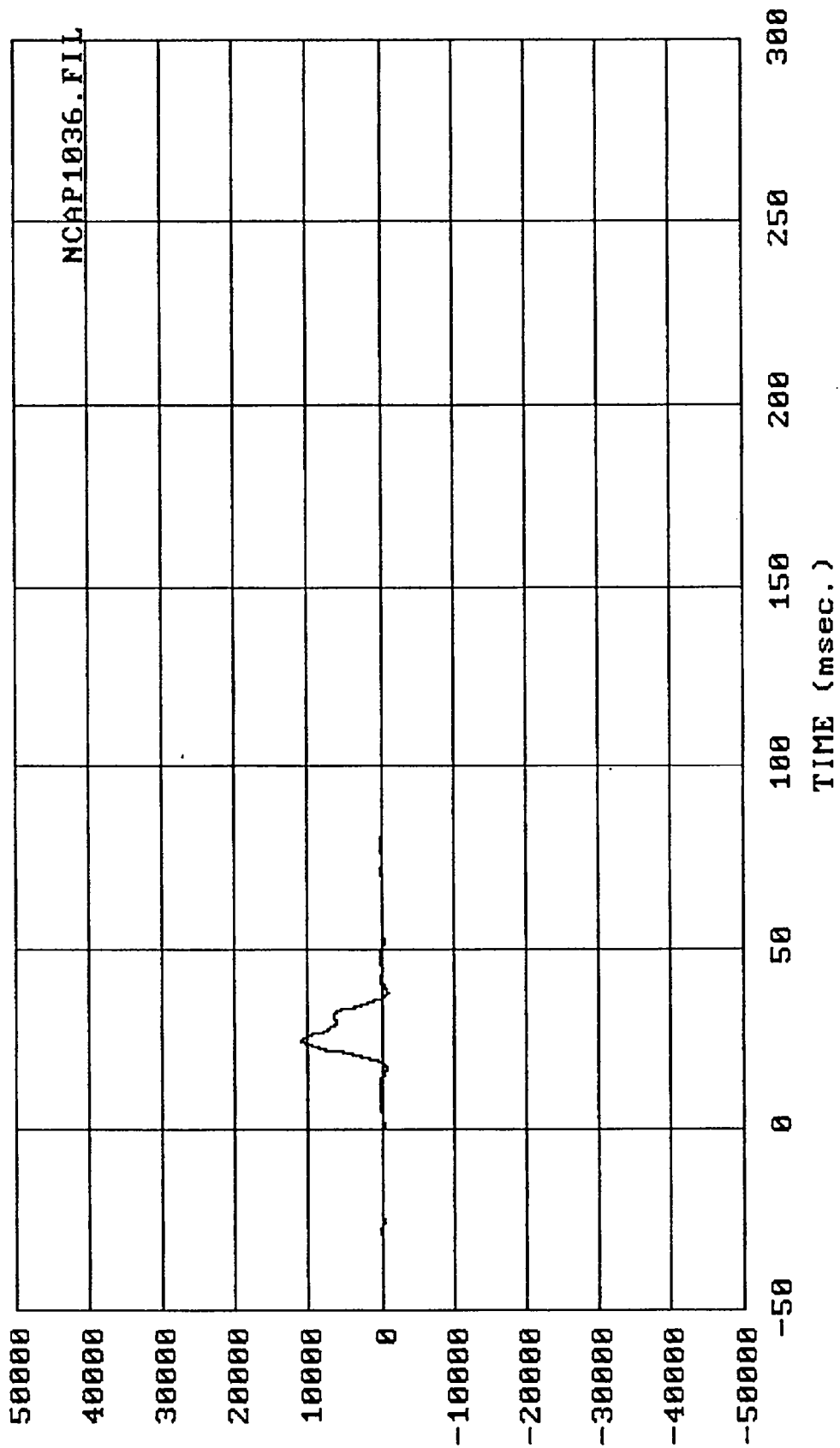
Filter: SAE CLASS 60 Max = 5919.9 Min = -262.24
 MSE 09/12/89 --- 1990 Acura Integra : Barrier force - Load cell A3



LBS B2-4

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 7917.9 Min = -372.82
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A4

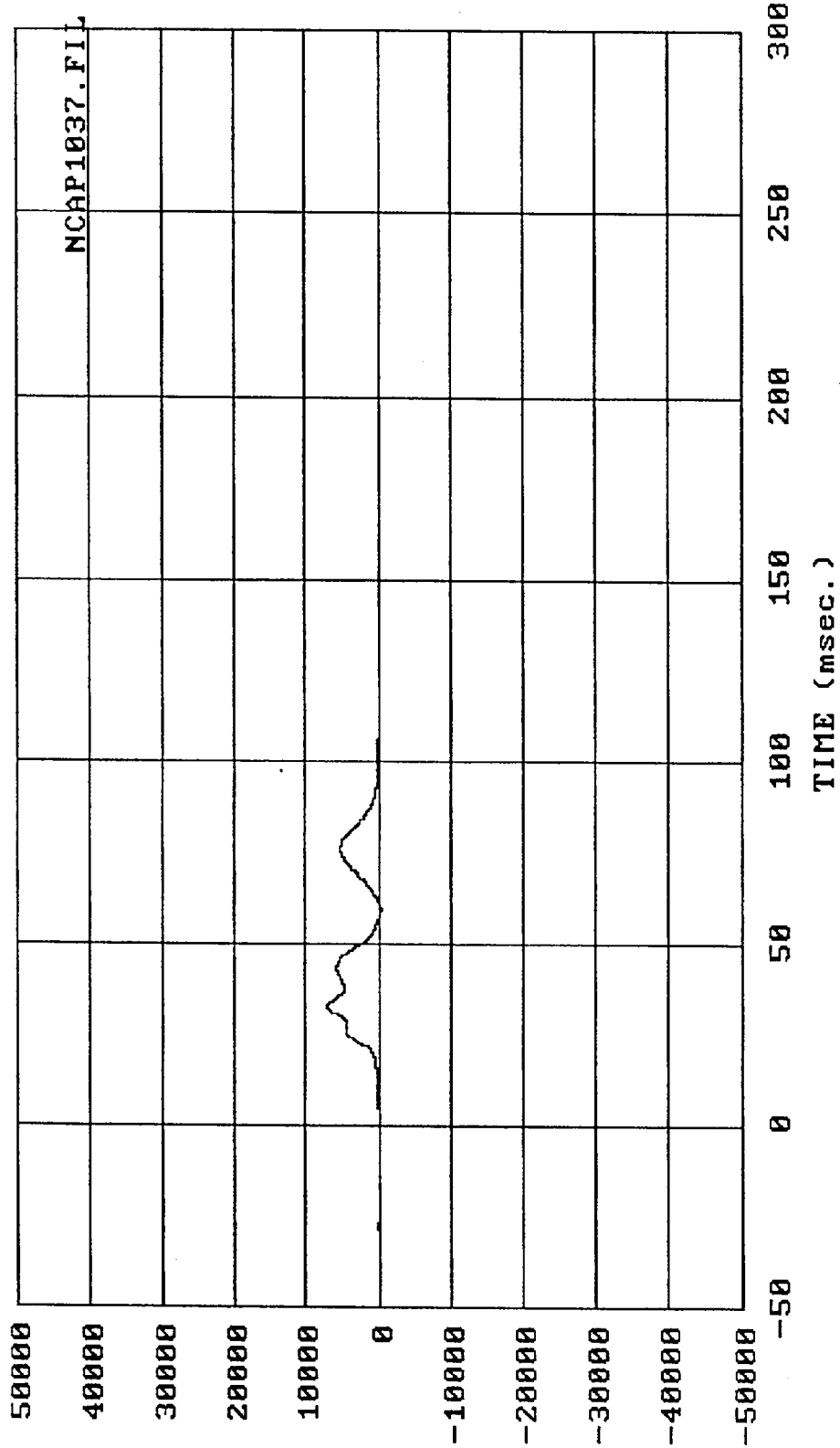


LBS B2-5

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 11036. Min = -791.90

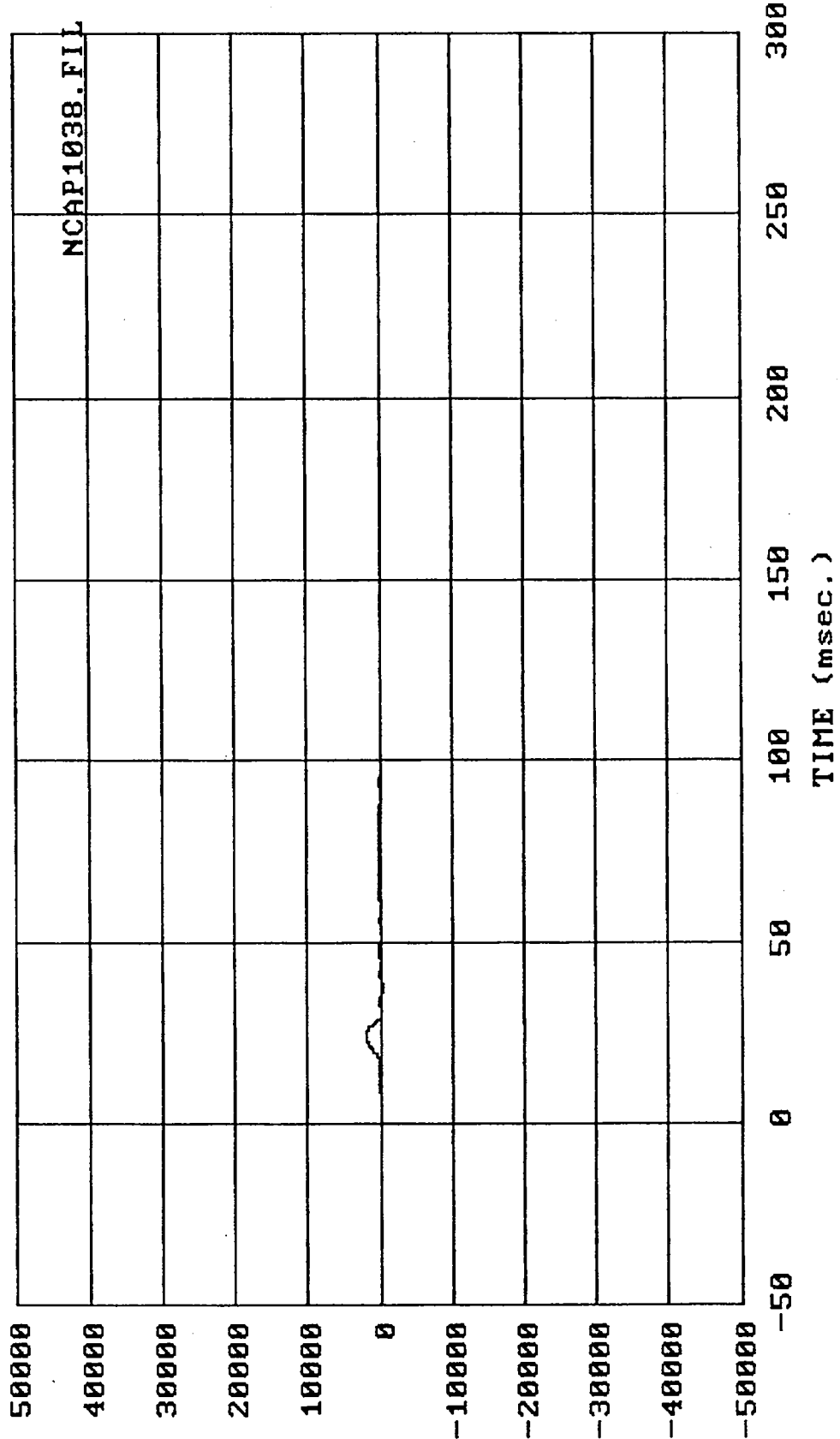
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A5



LBS B2-6

MSE-90-R9063-N01

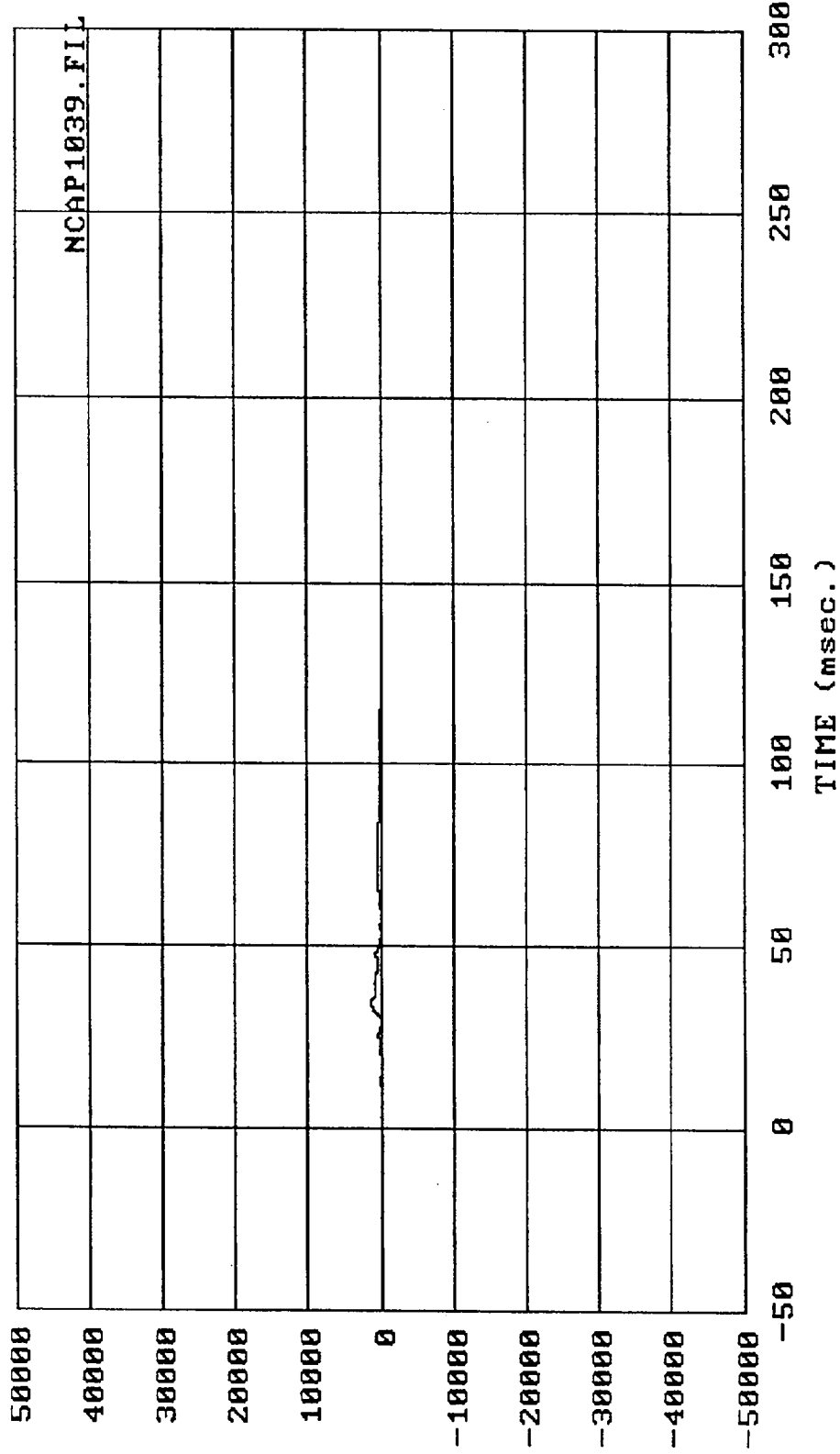
Filter: SAE CLASS 60 Max = 7298.5 Min = -162.21
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A6



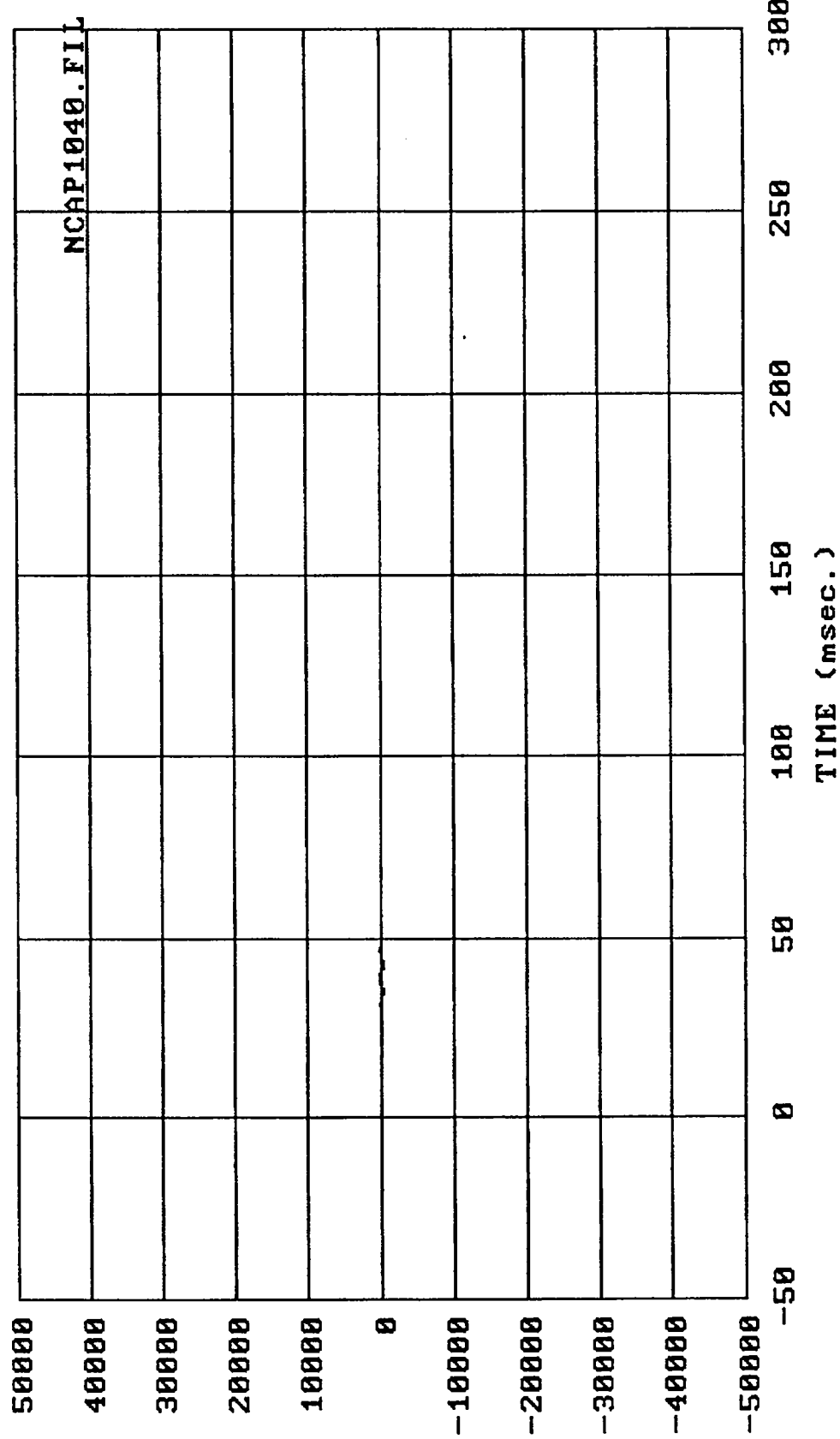
LBS B2-7

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 2090.1 Min = -264.83
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A7



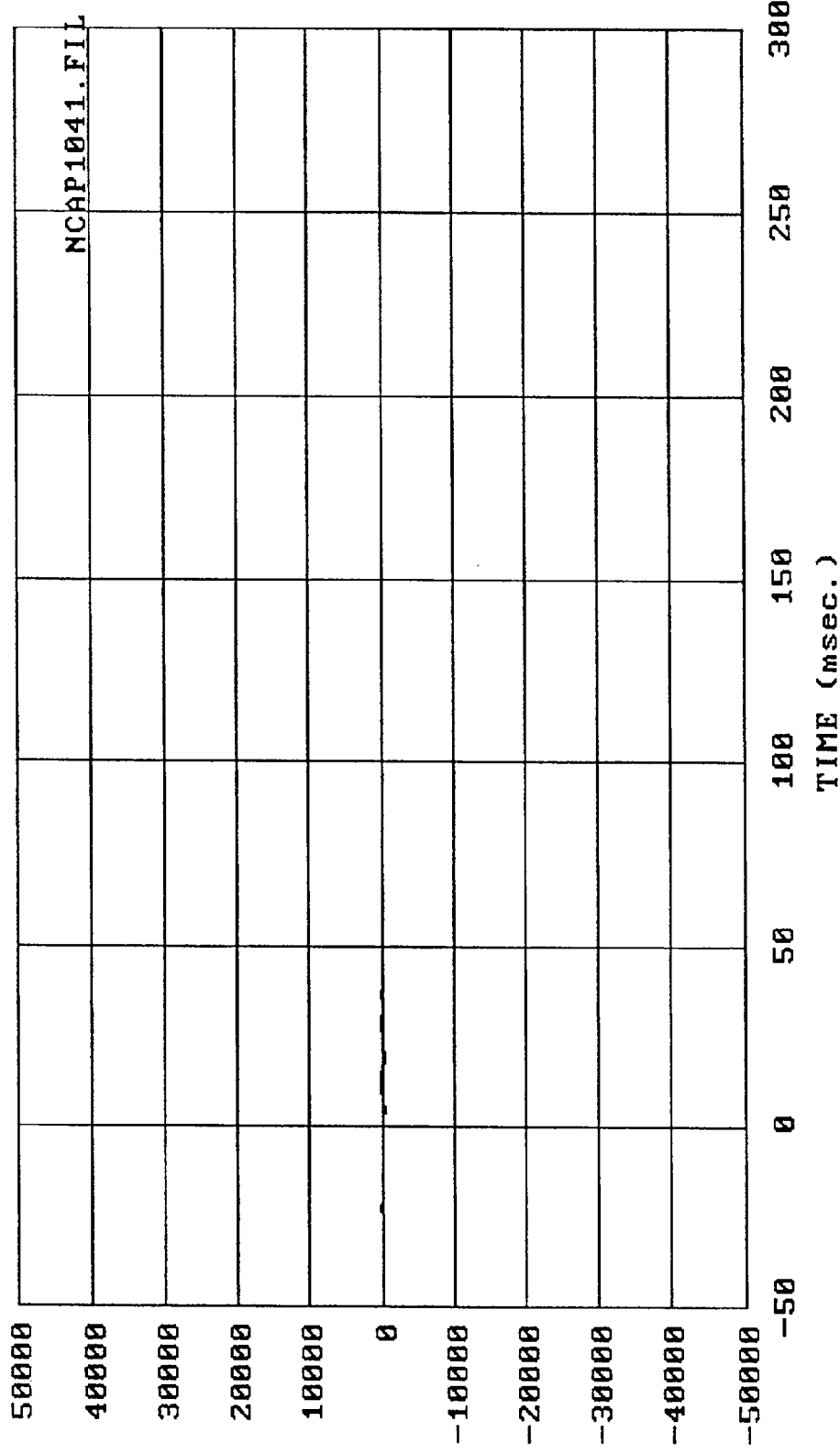
Filter: SAE CLASS 60 Max = 1565.6 Min = -87.216
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A8



LBS B2-9

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 390.28 Min = -225.47
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell A9



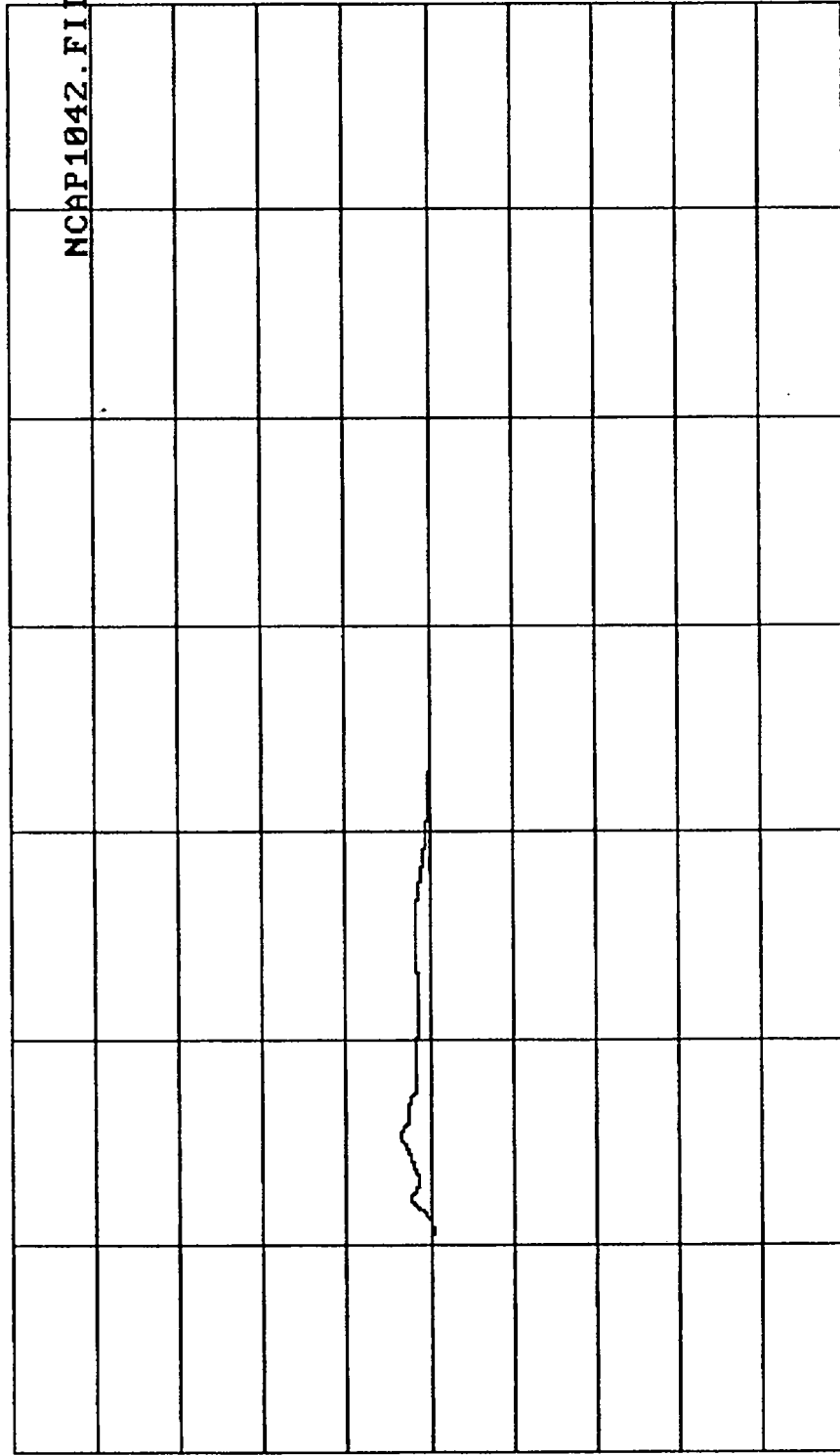
LBS B2-10

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 310.73 Min = -232.35
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B1

50000
40000
30000
20000
10000
0
-10000
-20000
-30000
-40000
-50000

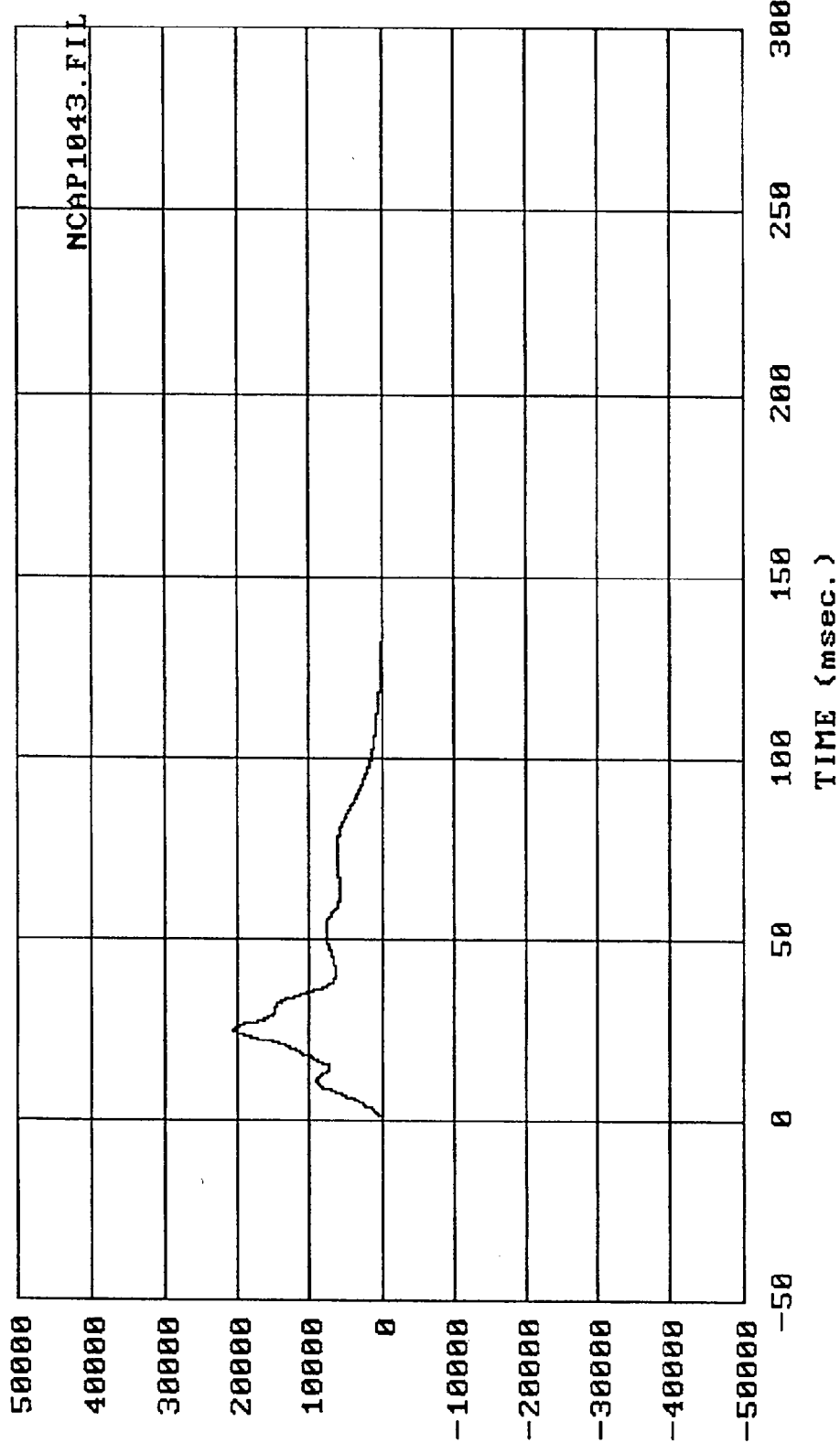
L B S B2-11



MSE-90-R9063-N01

-50 0 50 100 150 200 250 300
TIME (msec.)

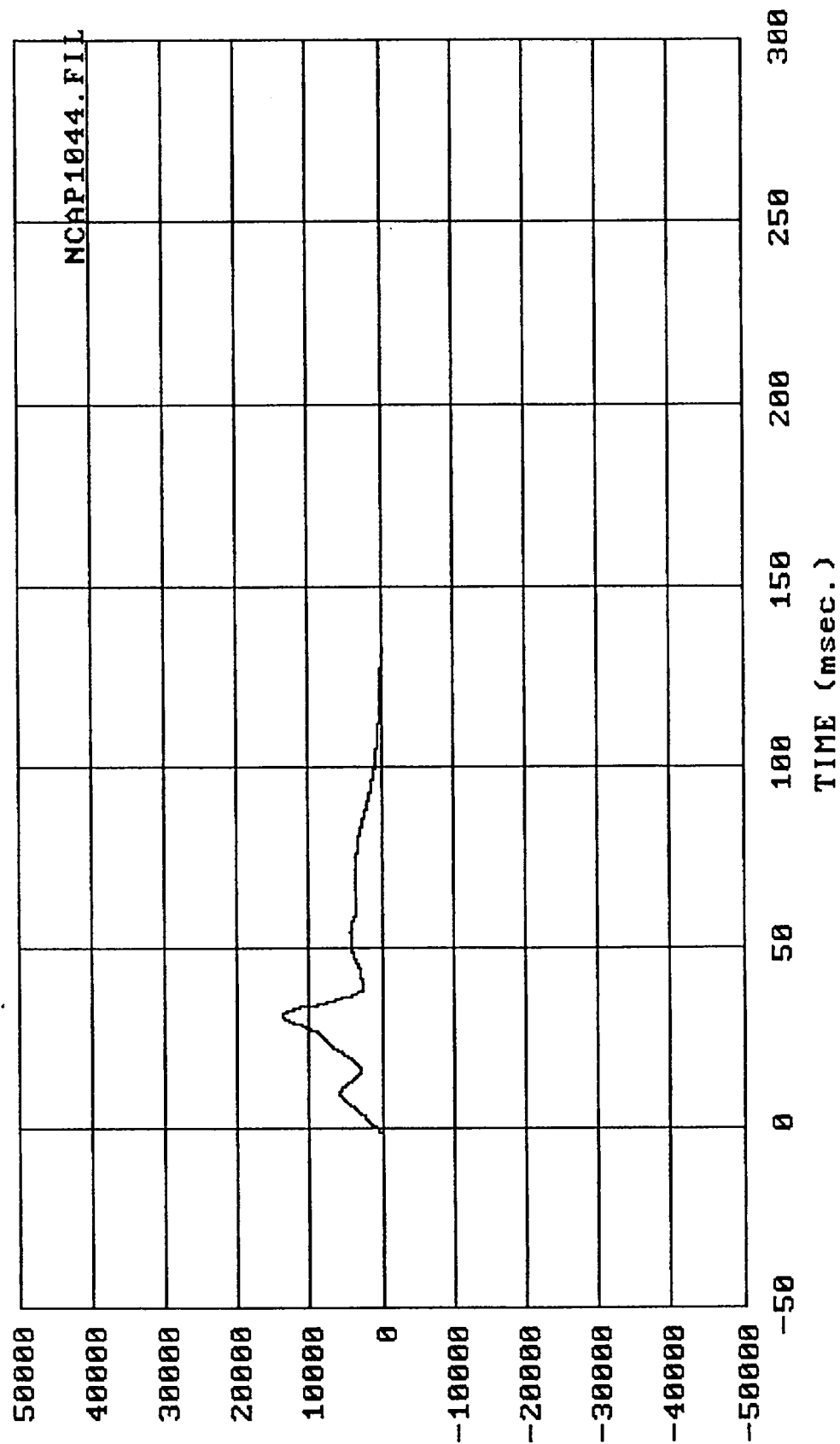
Filter: SAE CLASS 60 Max = 3604.5 Min = -167.99
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B2



LBS B2-12

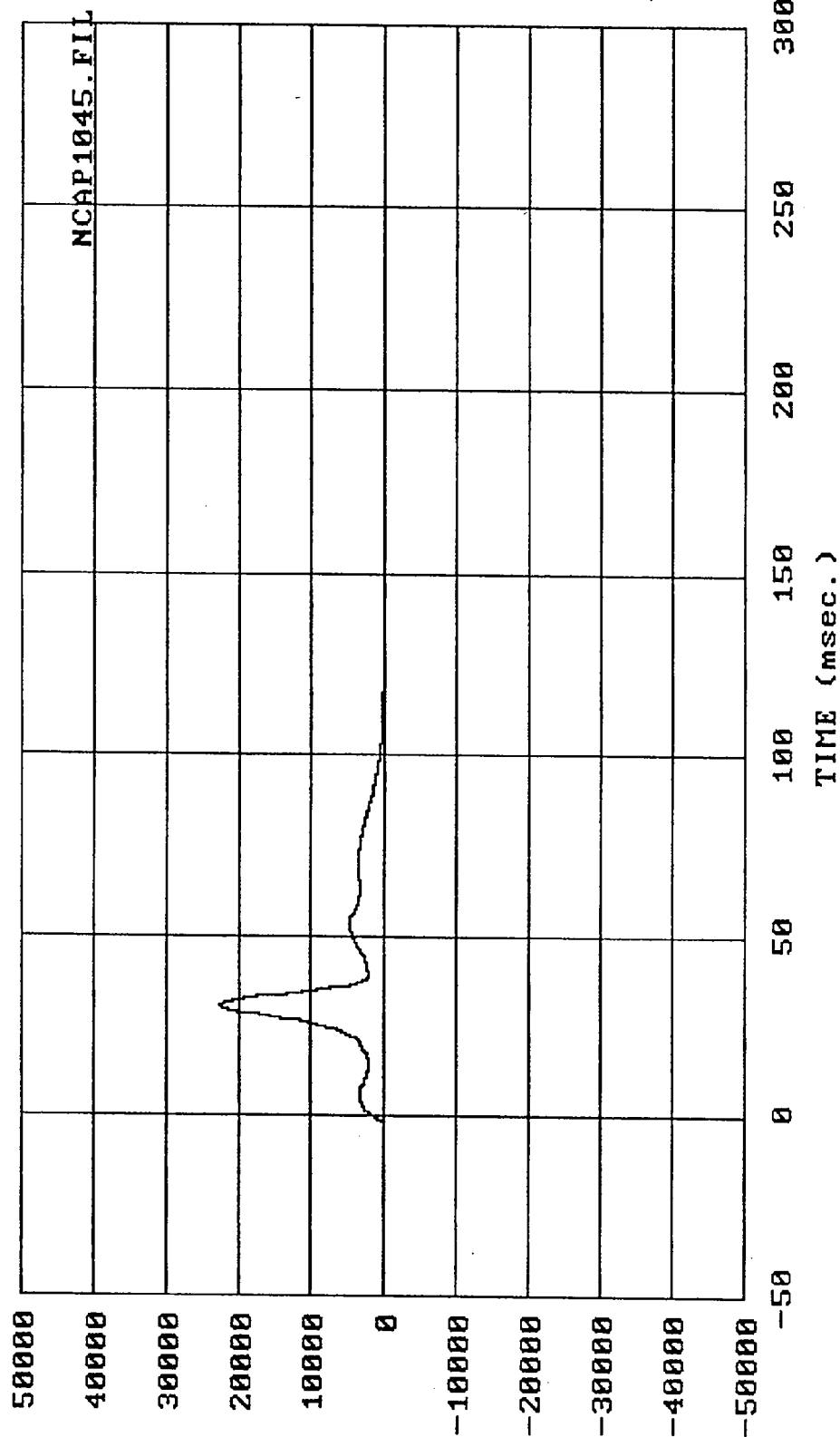
MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 20716. Min = 2.6083
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B3

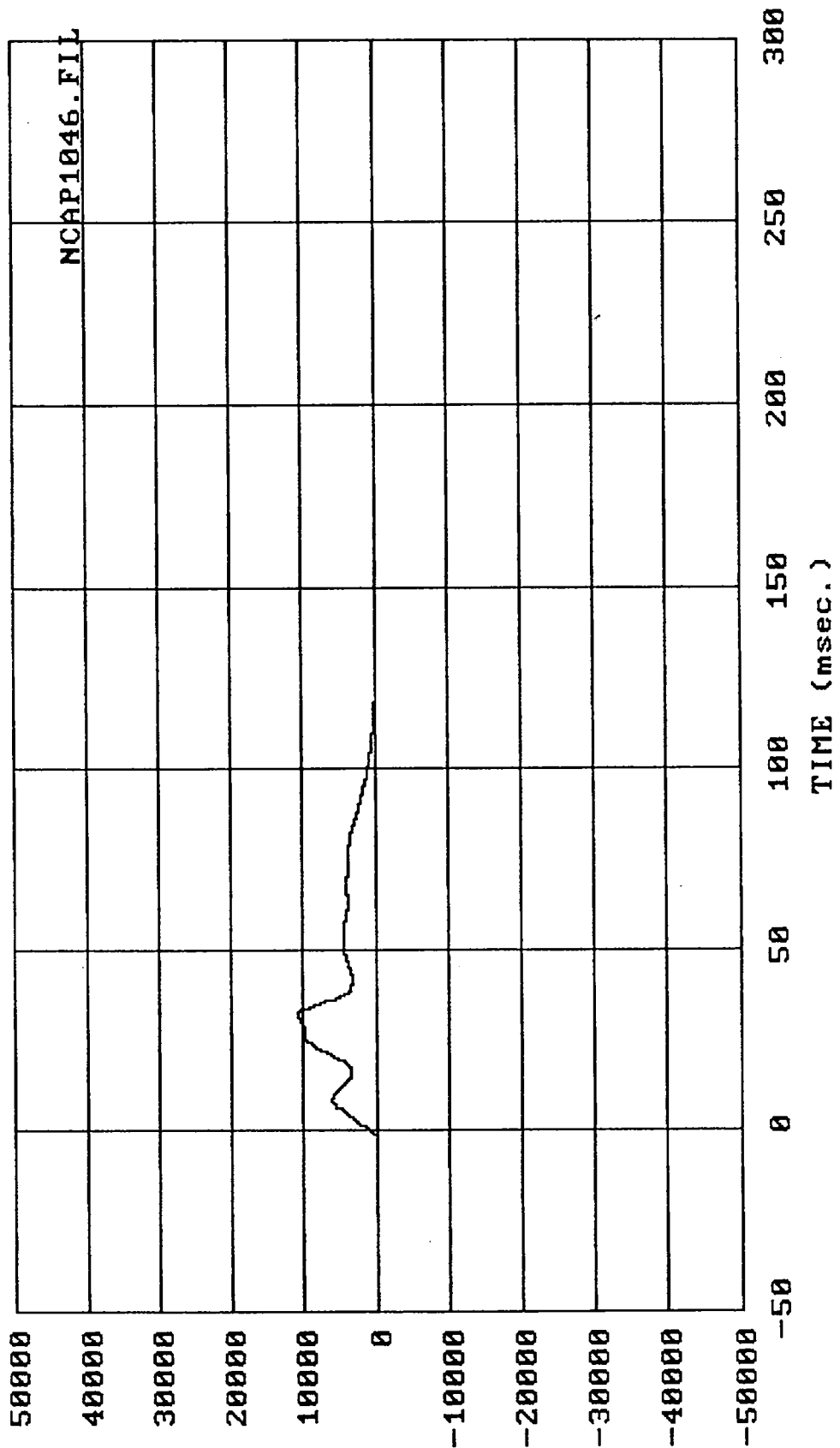


Filter: SAE CLASS 60 Max = 13880. Min = -3.6624

MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B4

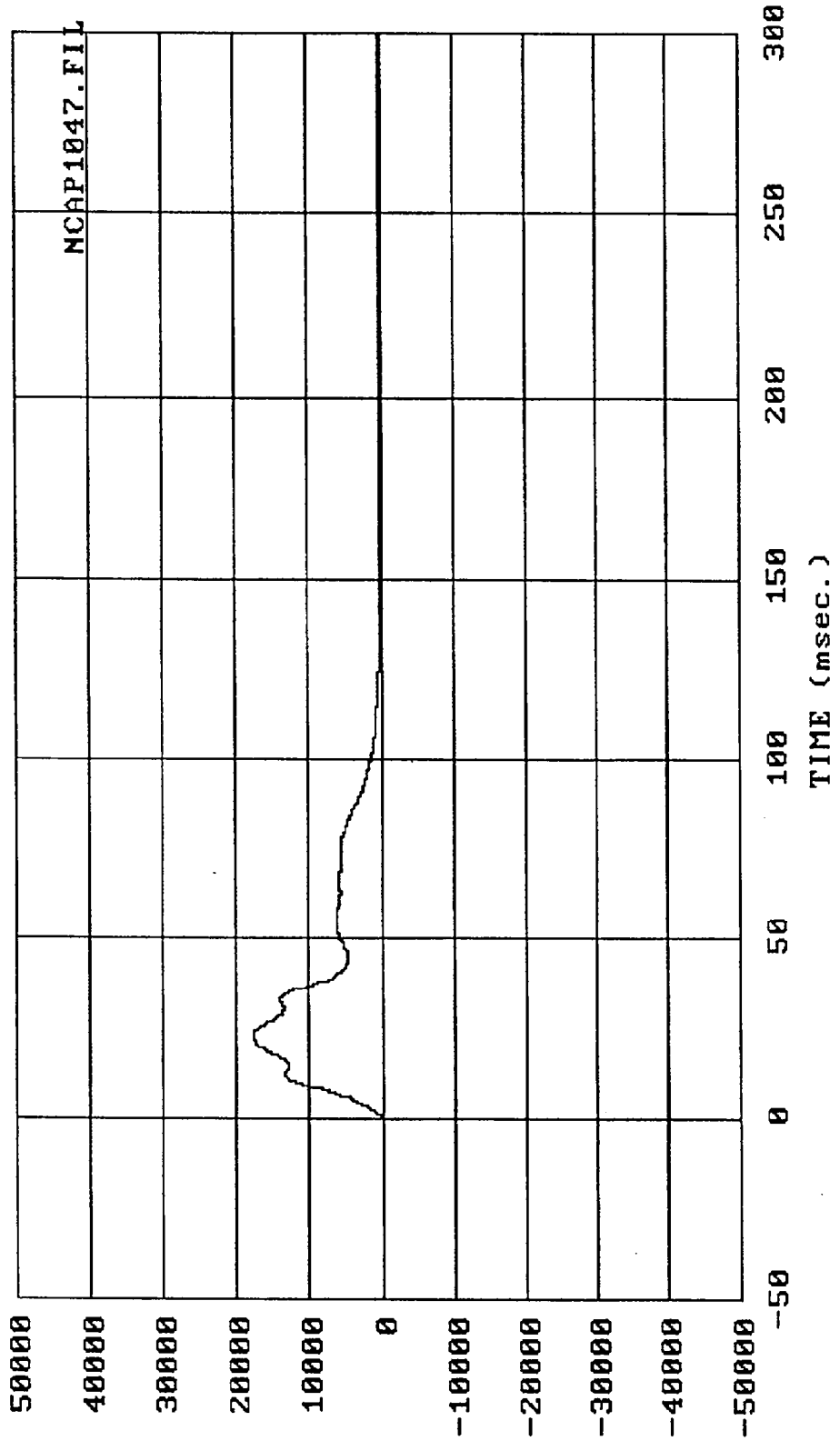


Filter: SAE CLASS 60 Max = 22978. Min = -4.9118
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B5

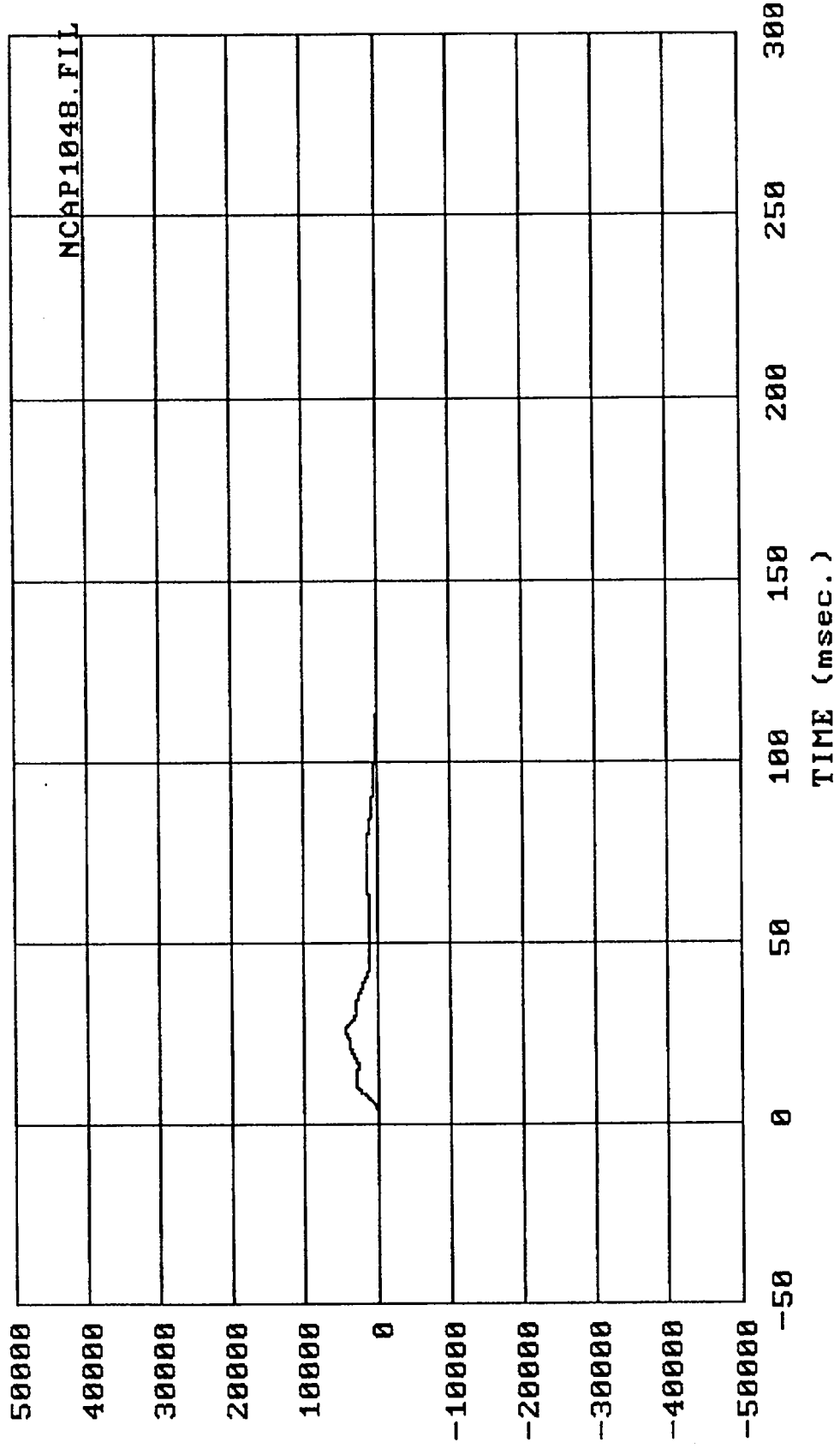


LBS B2-15

Filter: SAE CLASS 60 Max = 10947. Min = -12.011
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B6

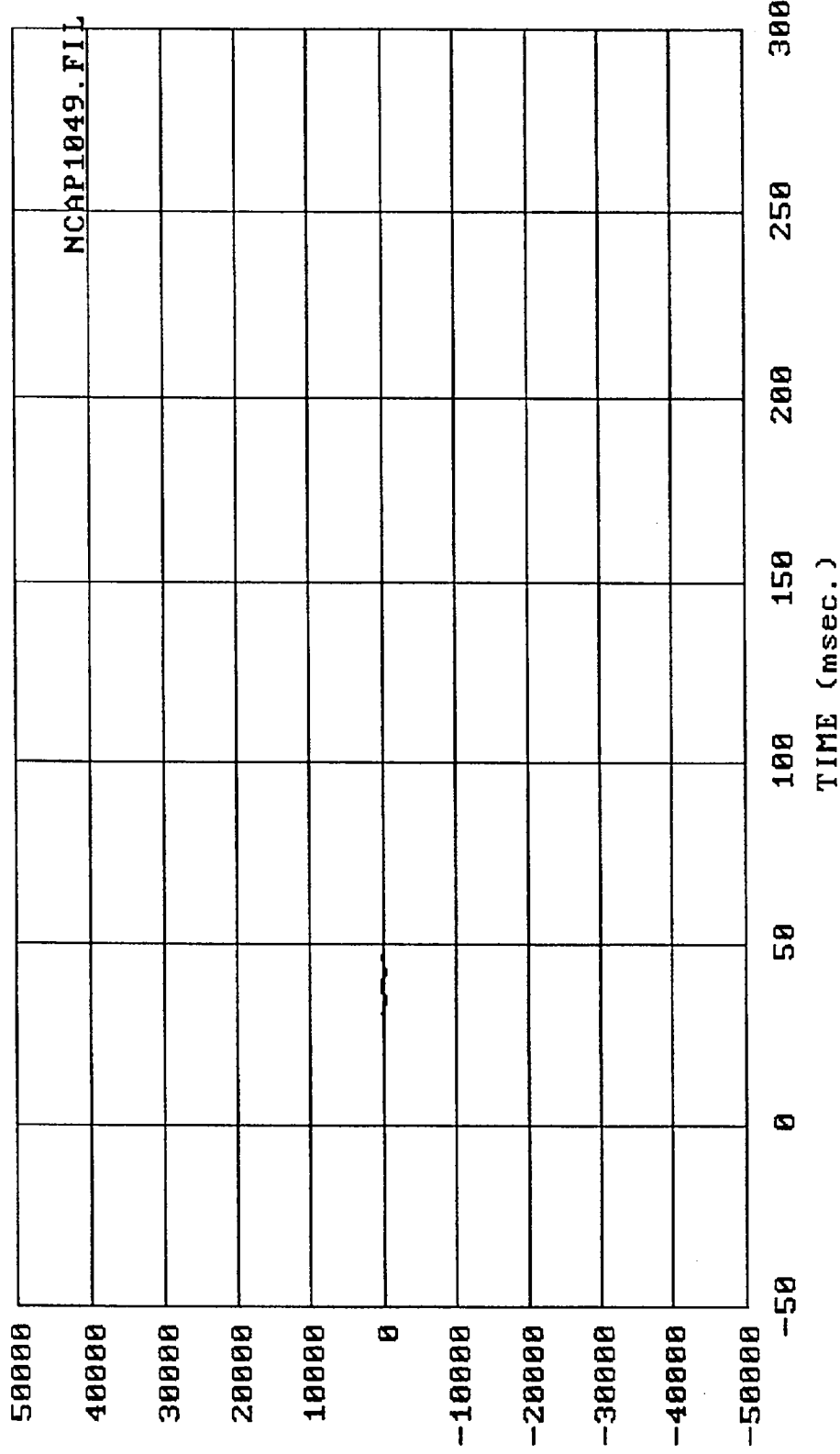


Filter: SAE CLASS 60 Max = 17835. Min = 10.625
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B7



LBS B2-17

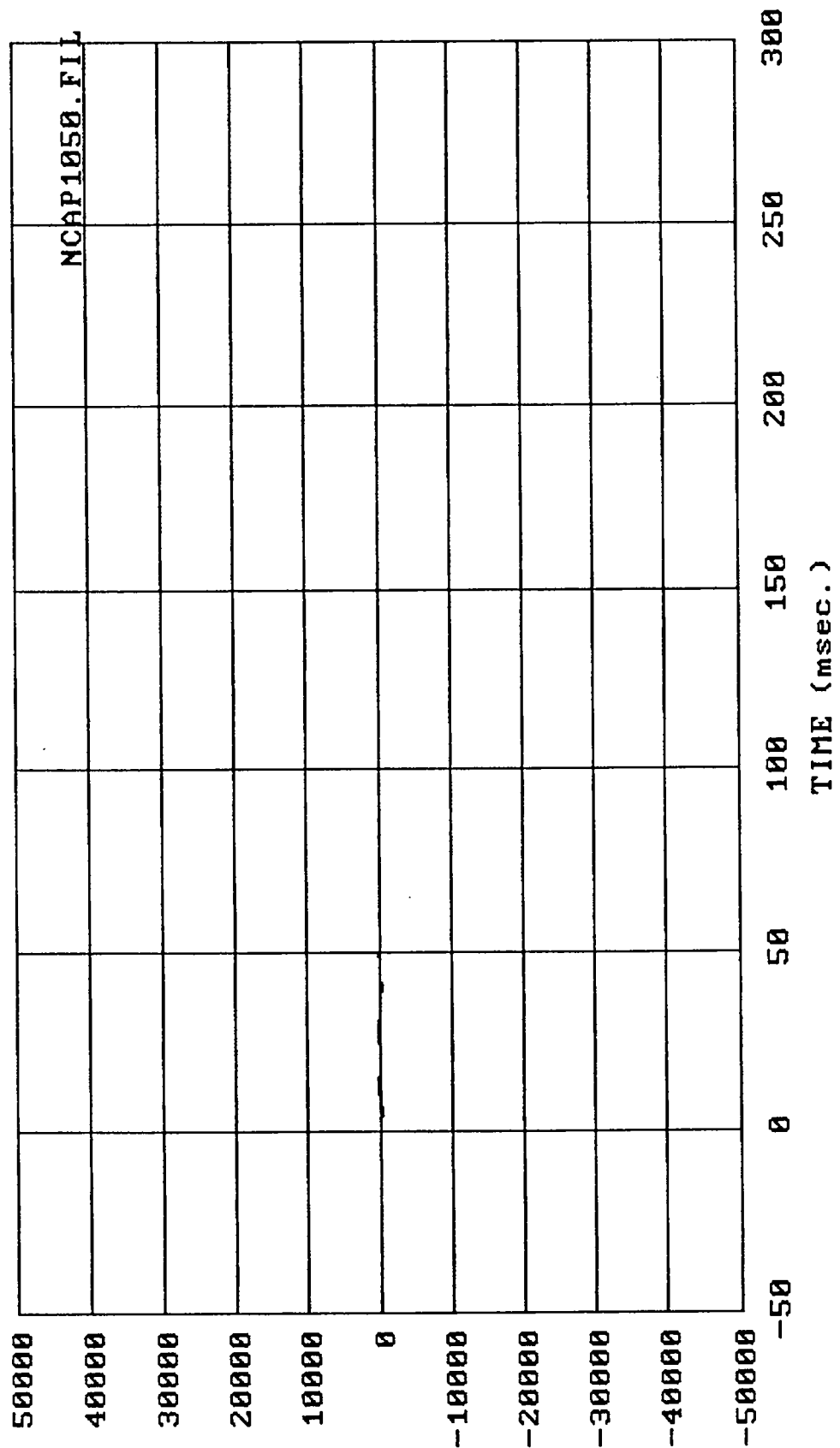
Filter: SAE CLASS 60 Max = 4421.0 Min = -140.76
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B8



L B S B2-18

MSE-90-R9063-N01

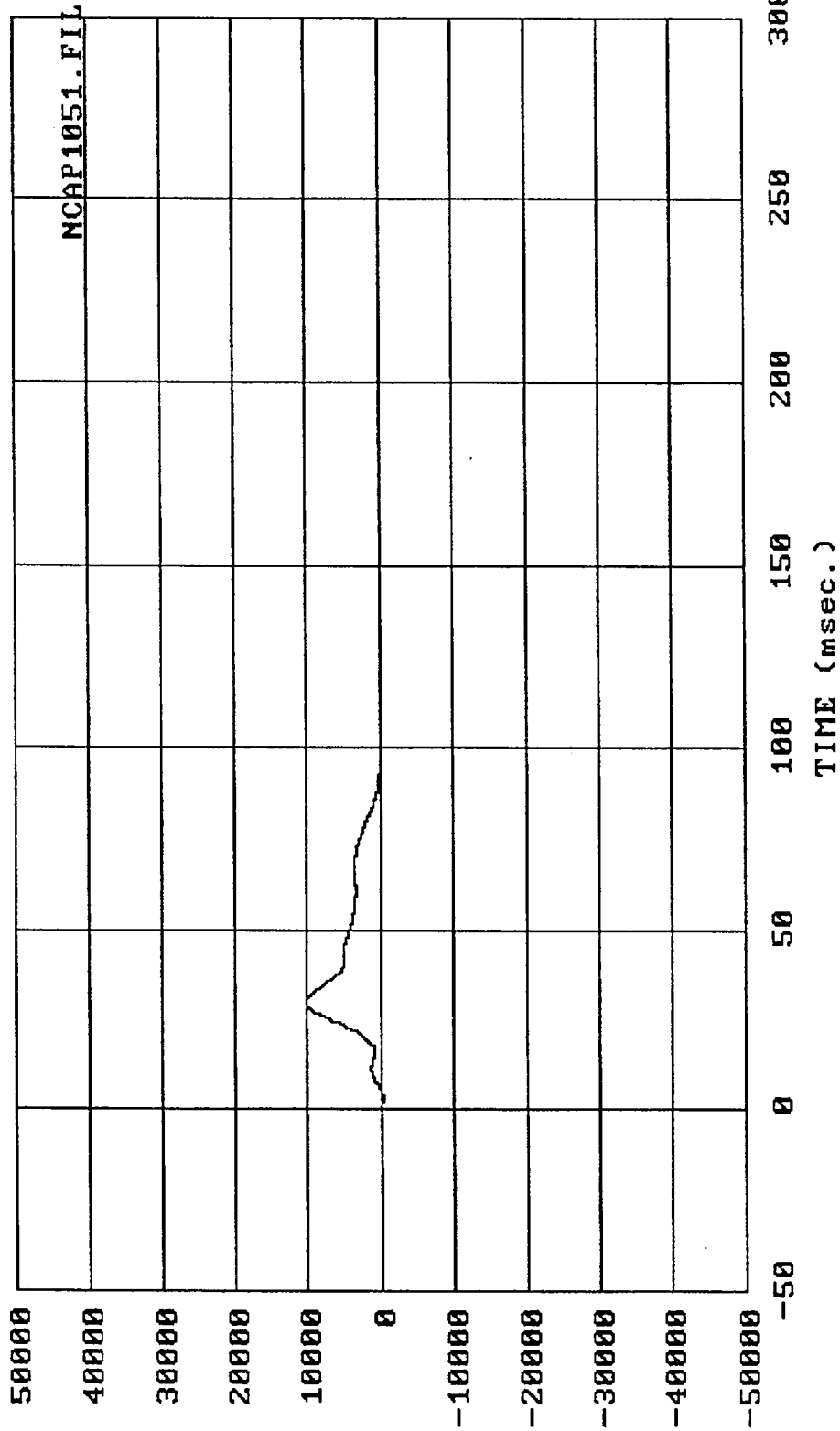
Filter: SAE CLASS 60 Max = 389.58 Min = -222.27
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell B9



LBS B2-19

MSE-90-R9063-N01

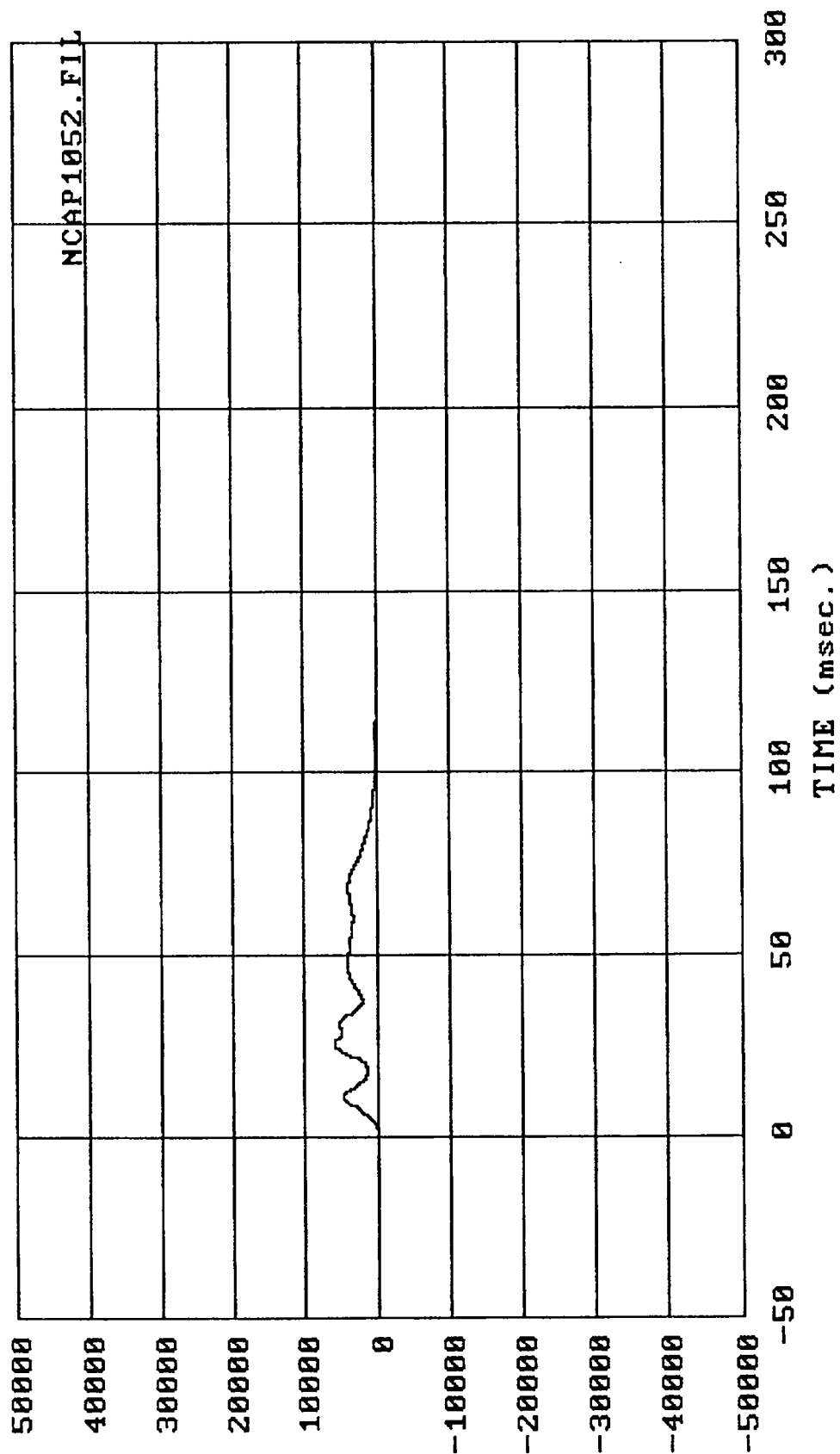
Filter: SAE CLASS 60 Max = 329.71 Min = -234.25
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C1



LBS B2-20

MSE-90-R9063-N01

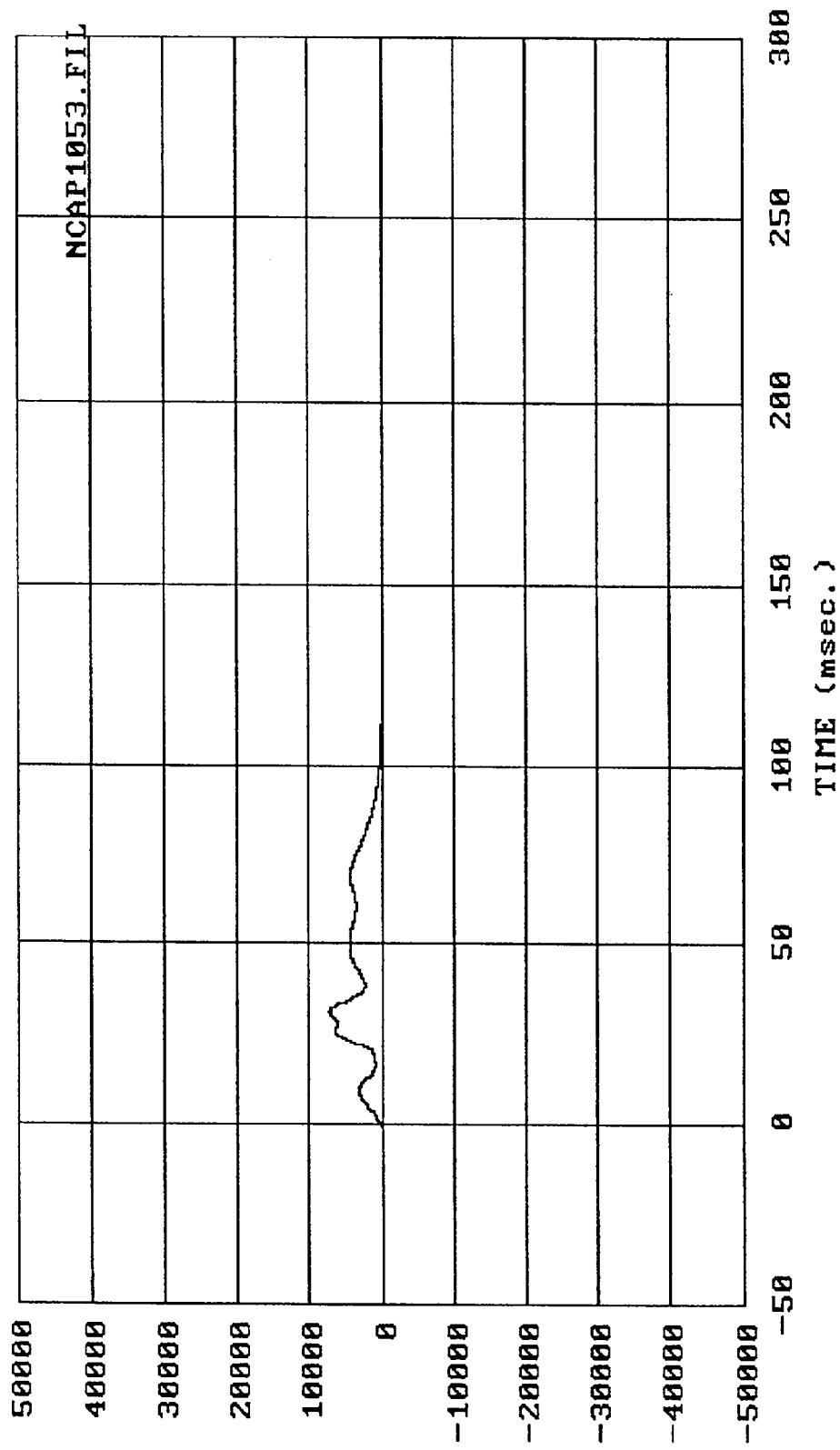
Filter: SAE CLASS 60 Max = 10369. Min = -167.56
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C2



LBS B2-21

MSE-90-R9063-N01

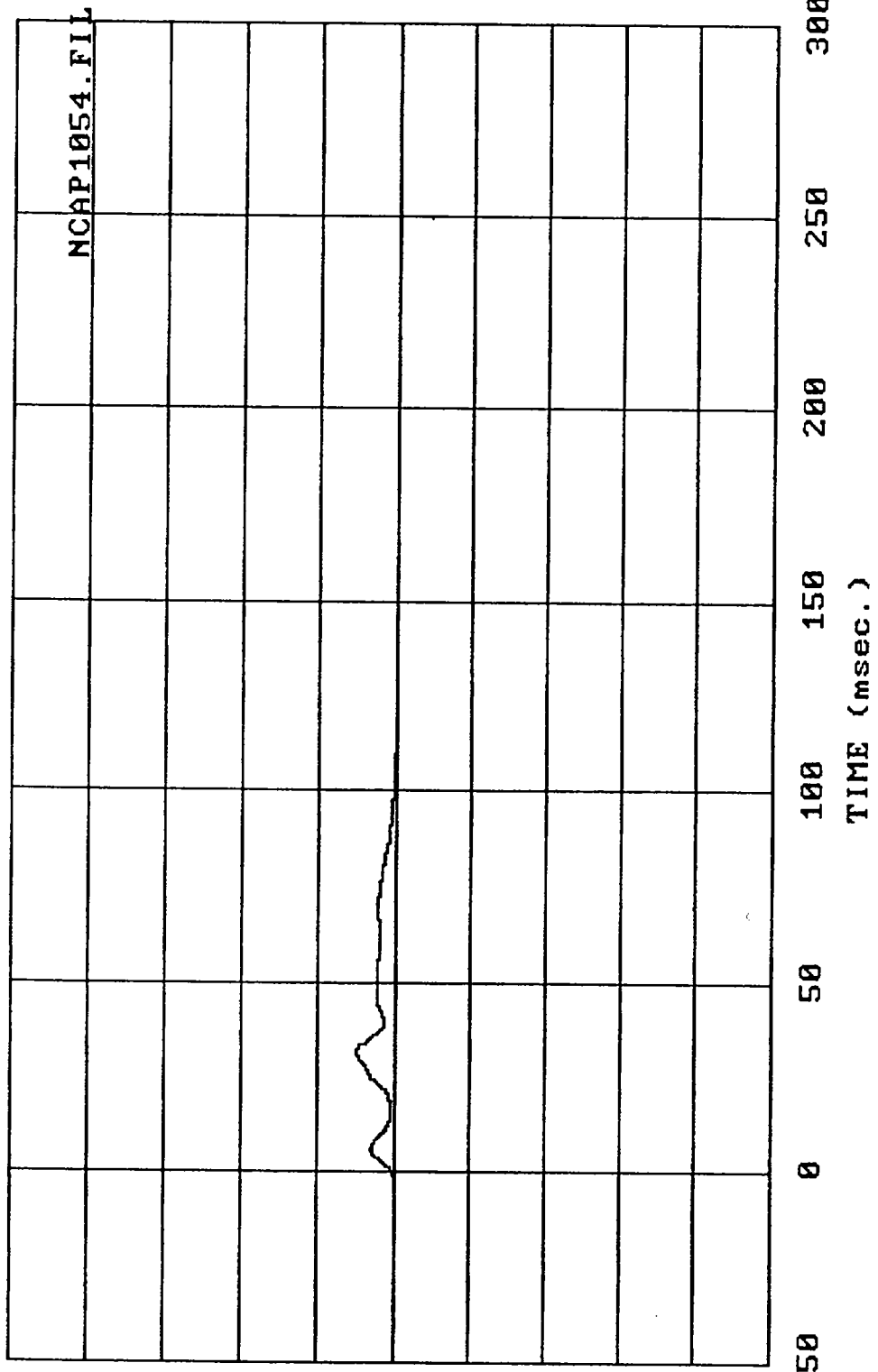
Filter: SAE CLASS 60 Max = 6075.7 Min = -125.88
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C3



Filter: SAE CLASS 60 Max = 7371.0 Min = 2.3458
 MSE 09/12/89 --- 1990 Acura Integra : Barrier force - Load cell C4

50000
40000
30000
20000
10000
0
-10000
-20000
-30000
-40000
-50000

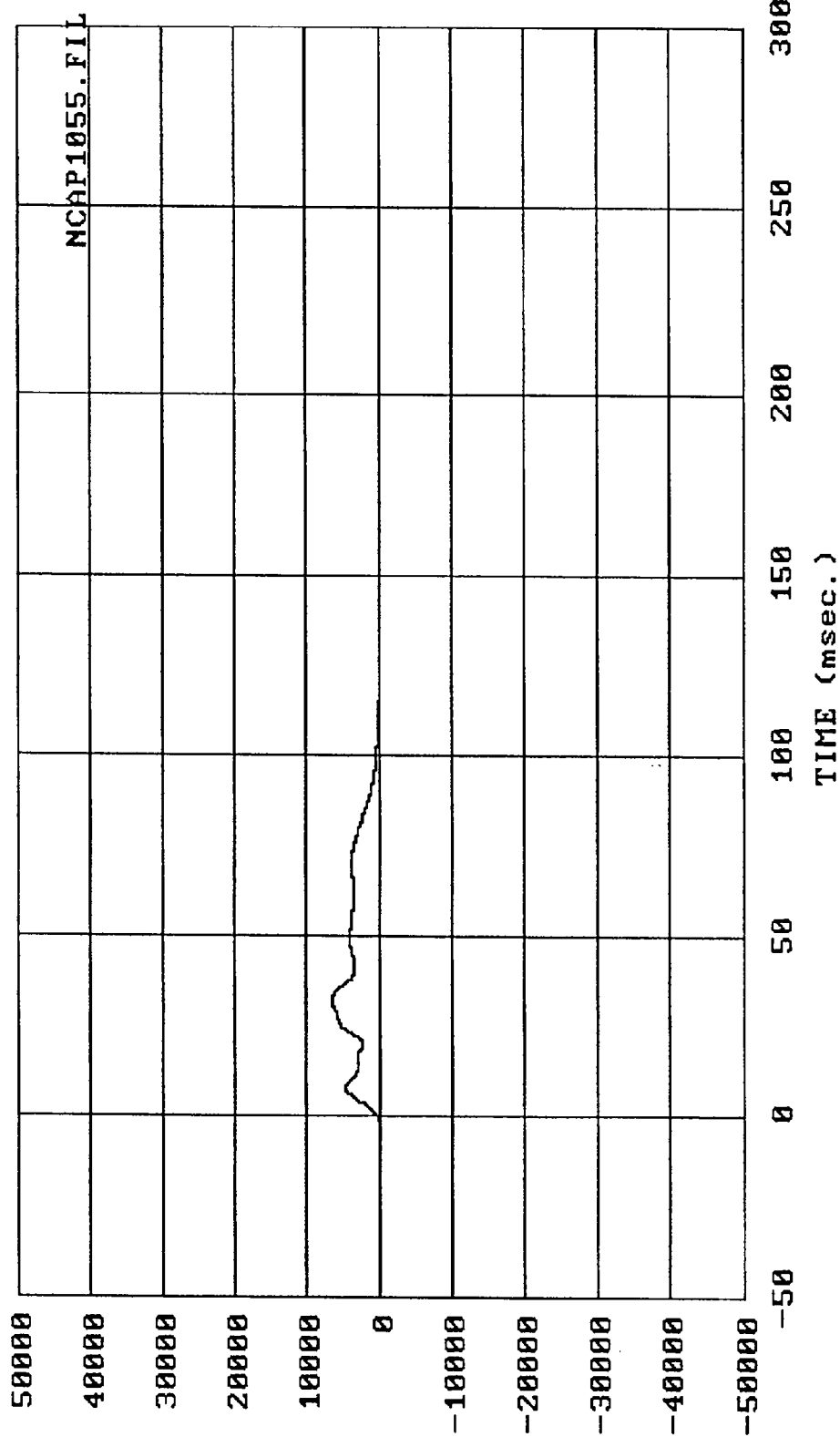
LBS B2-23



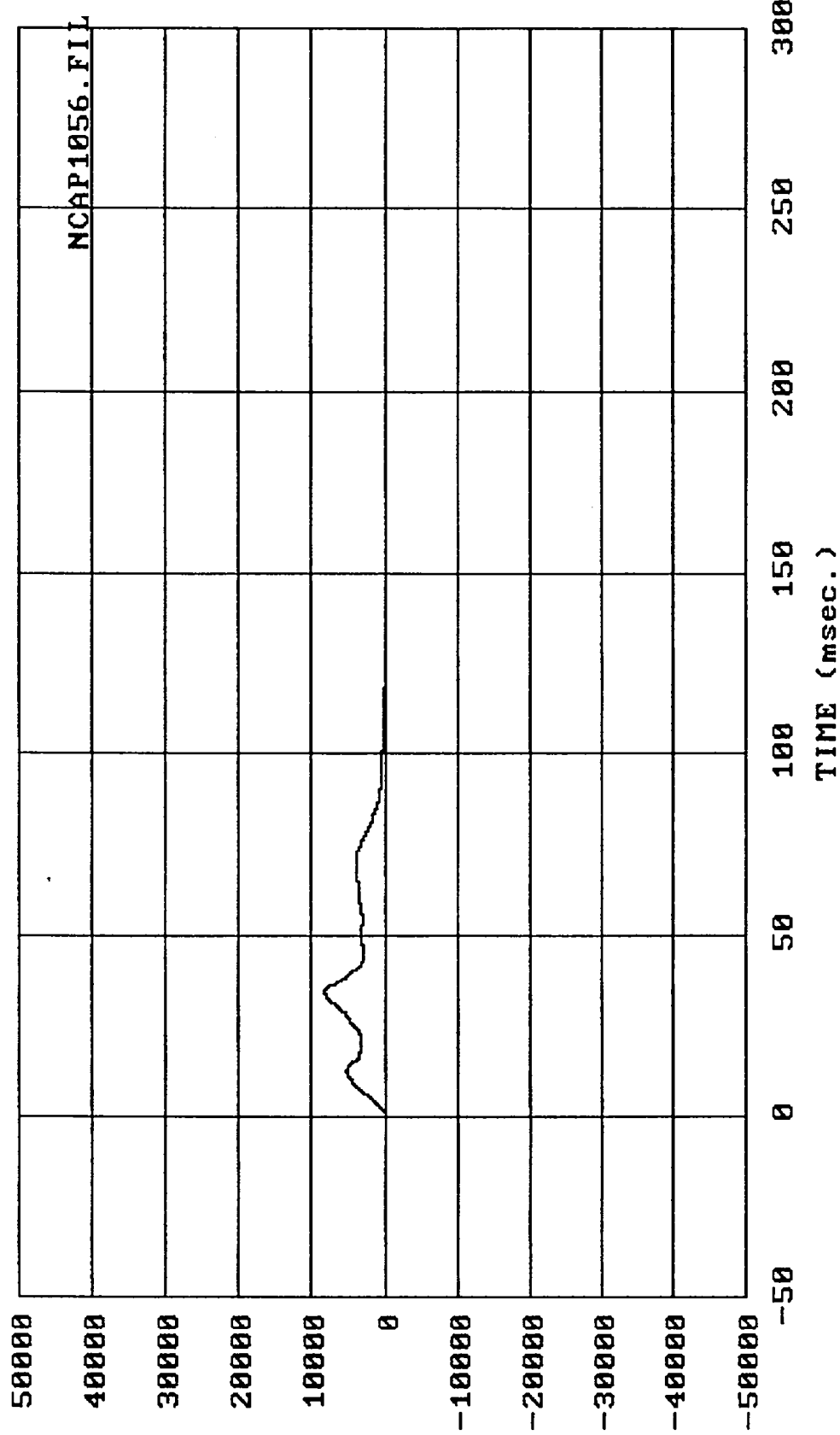
MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 5069.9 Min = -25.122

MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C5



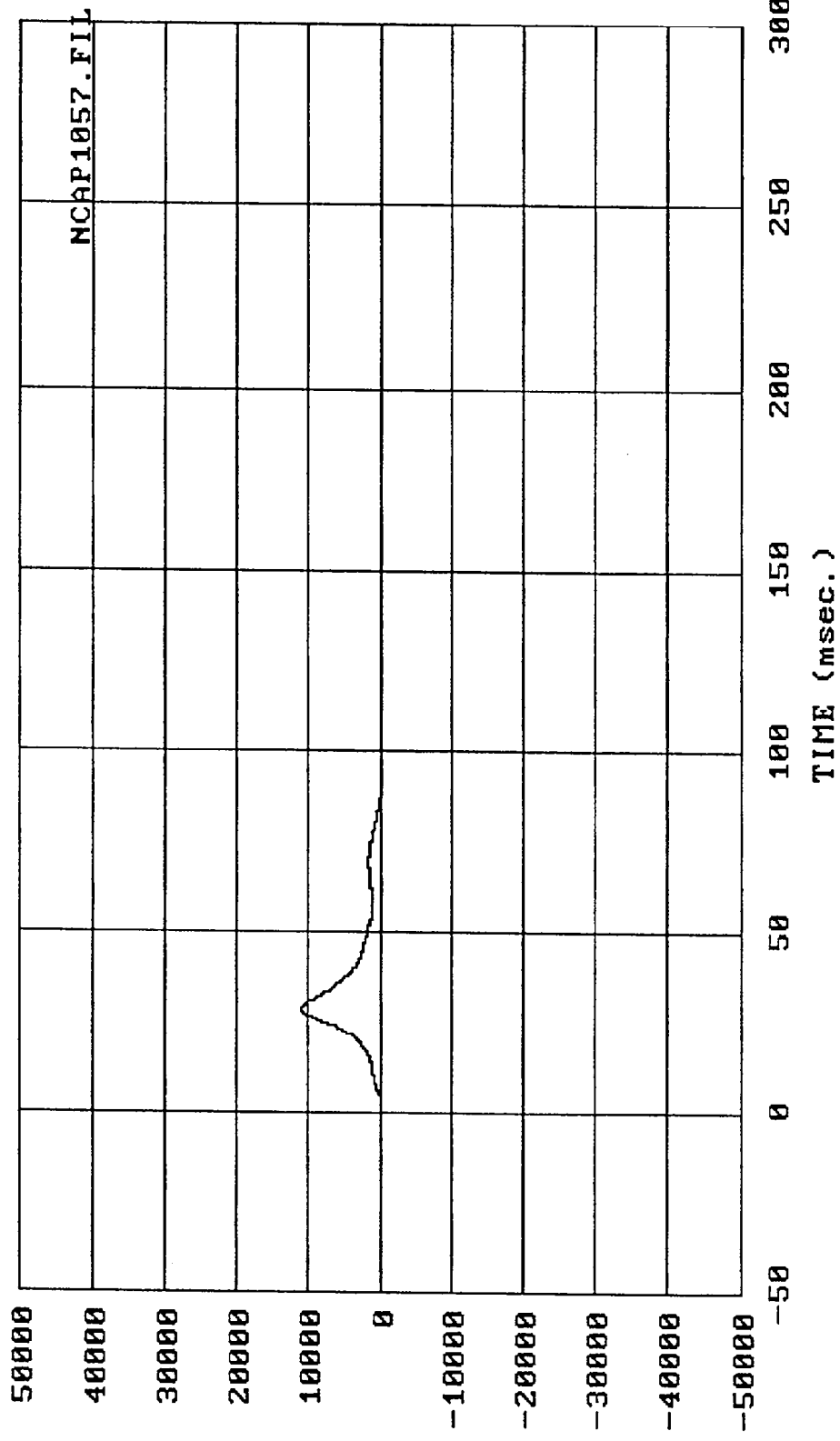
Filter: SAE CLASS 60 Max = 6669.4 Min = -12.475
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C6



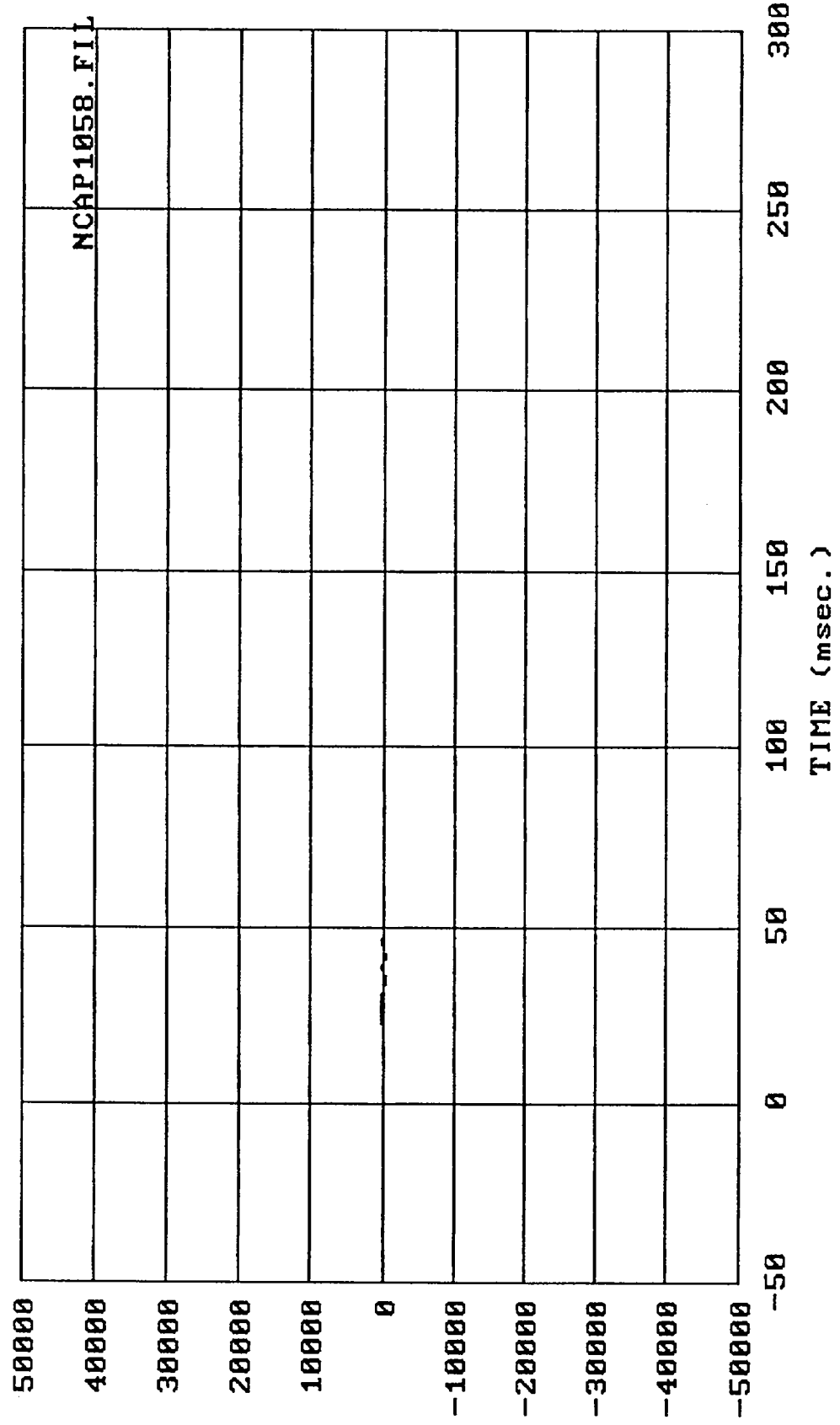
LBS B2-25

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 8337.4 Min = 2.2259
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C7



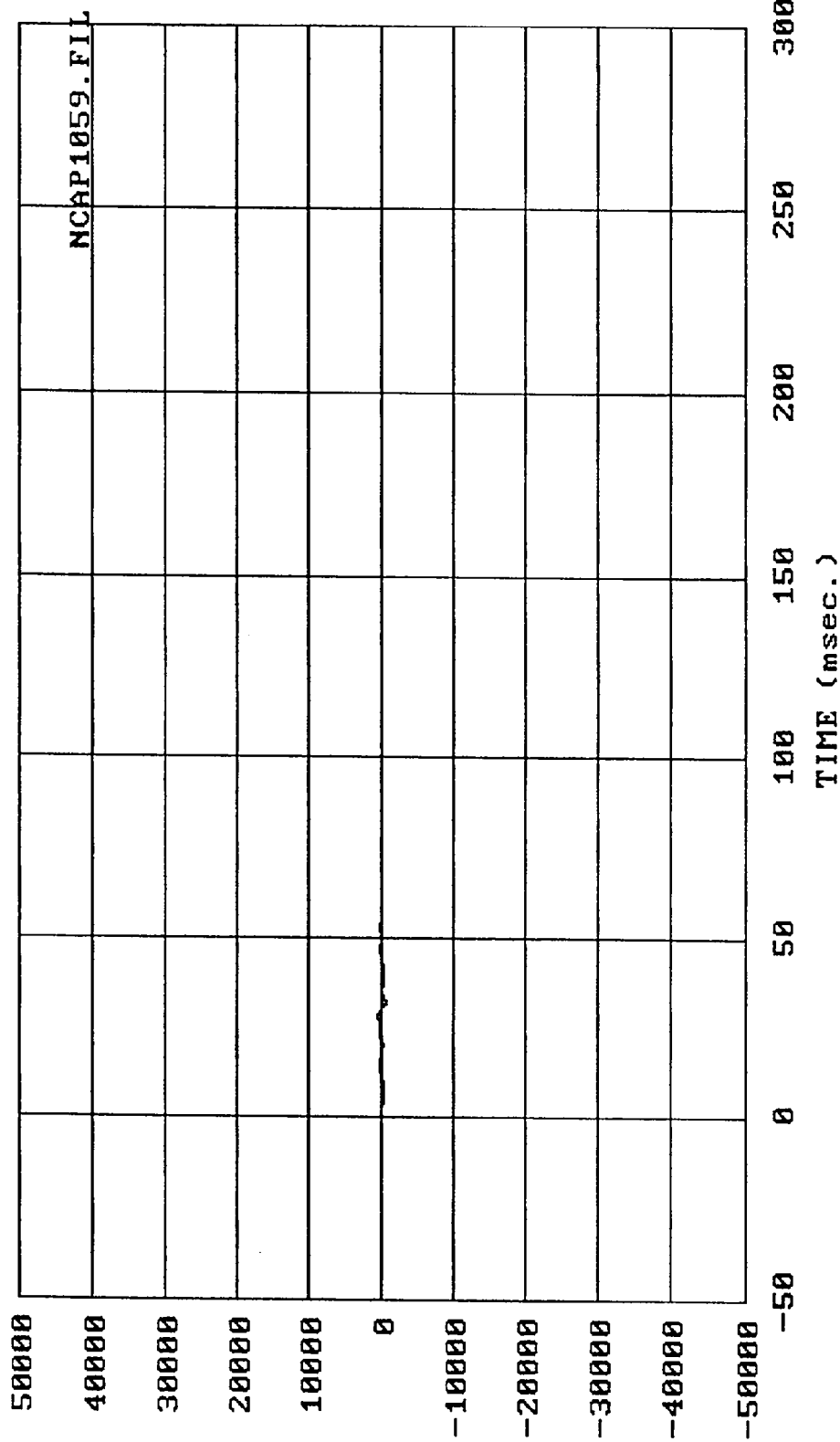
Filter: SAE CLASS 60 Max = 11079. Min = -115.87
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C8



LBS B2-27

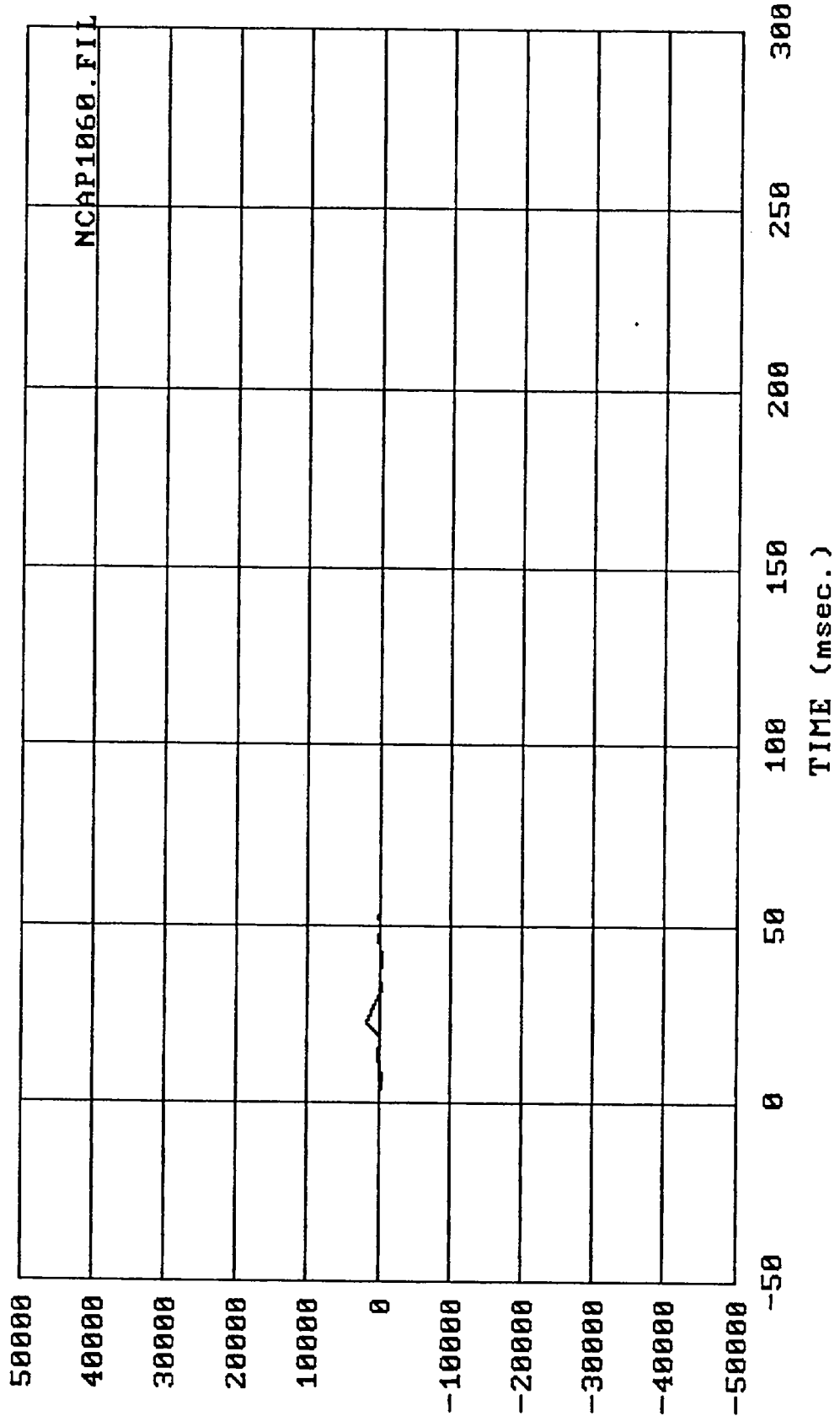
MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 236.58 Min = -251.83
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell C9



L B S B2-28

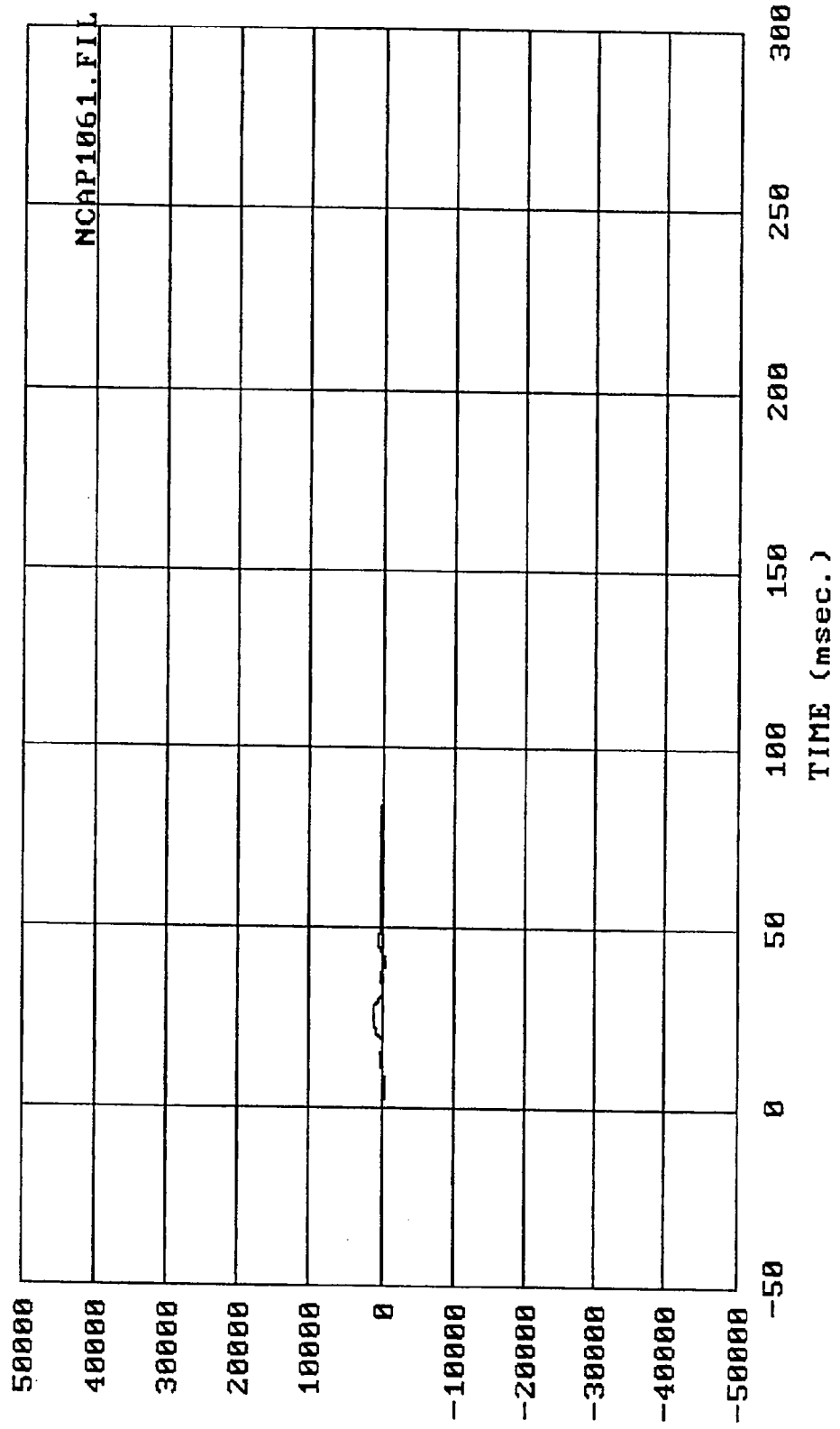
Filter: SAE CLASS 60 Max = 533.78 Min = -479.96
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D1



LBS B2-29

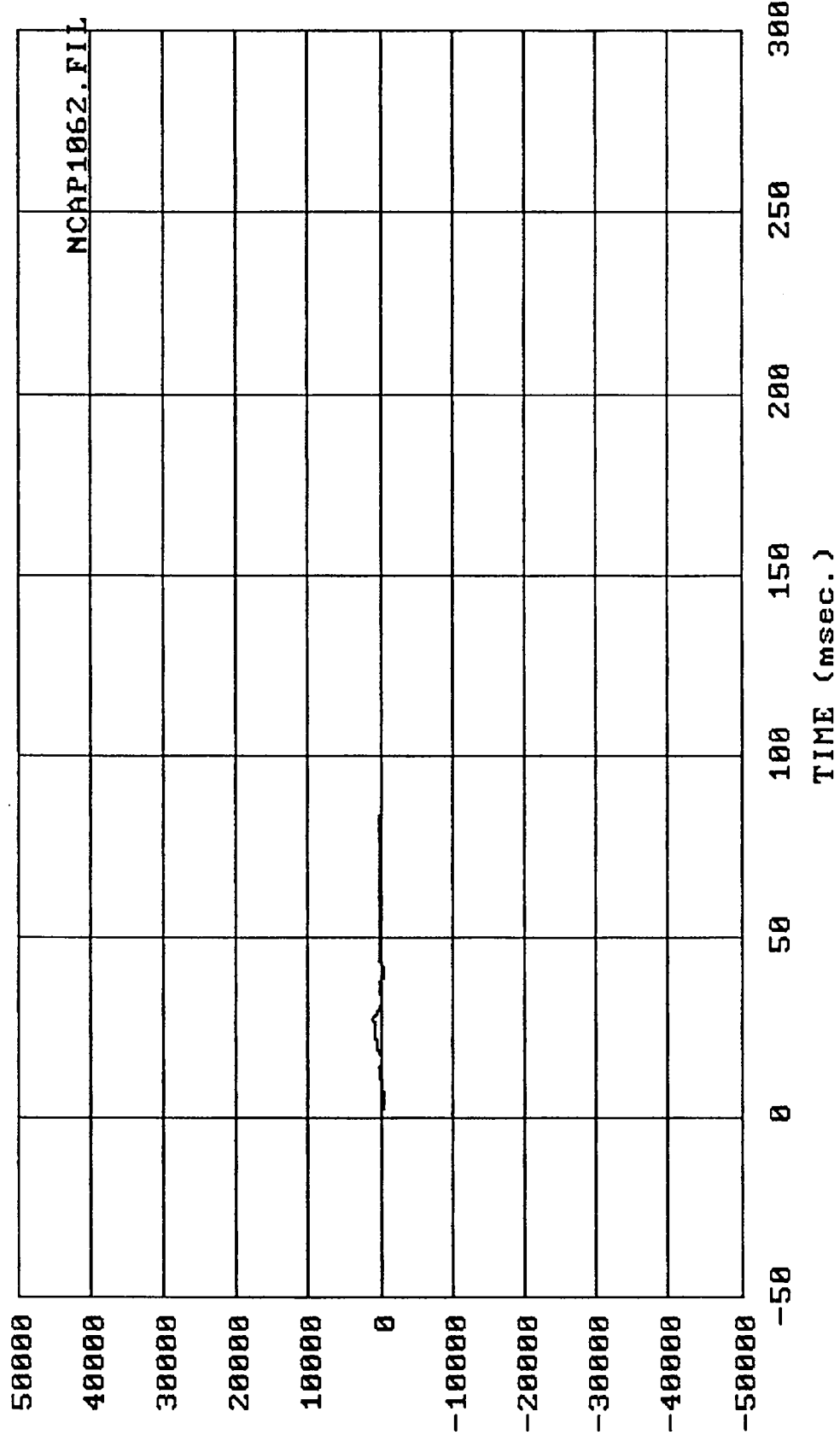
MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 1679.5 Min = -368.35
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D2



L B S B2-30

Filter: SAE CLASS 60 Max = 1246.0 Min = -391.52
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D3

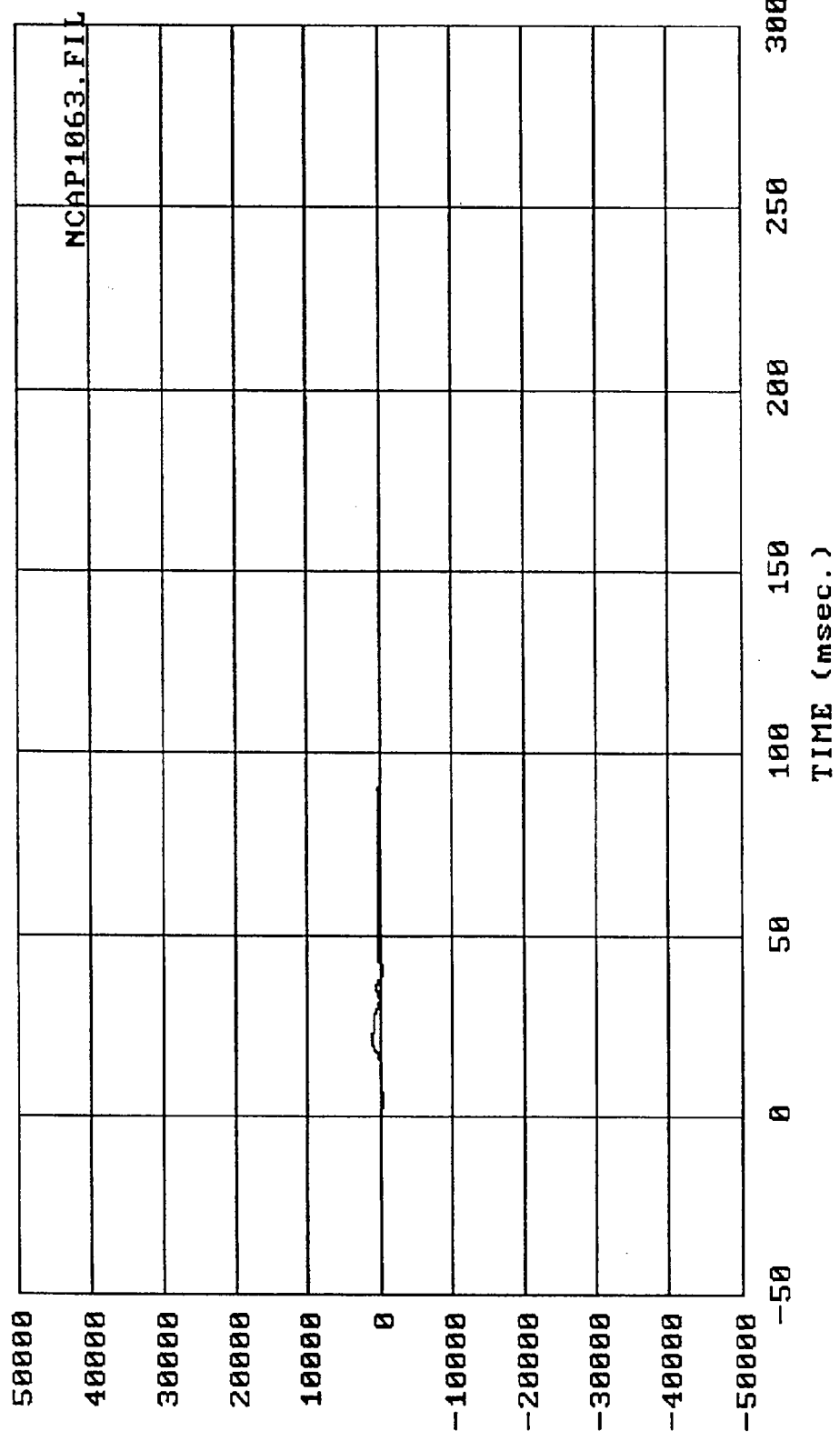


LBS B2-31

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 1095.5 Min = -396.53

MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D4

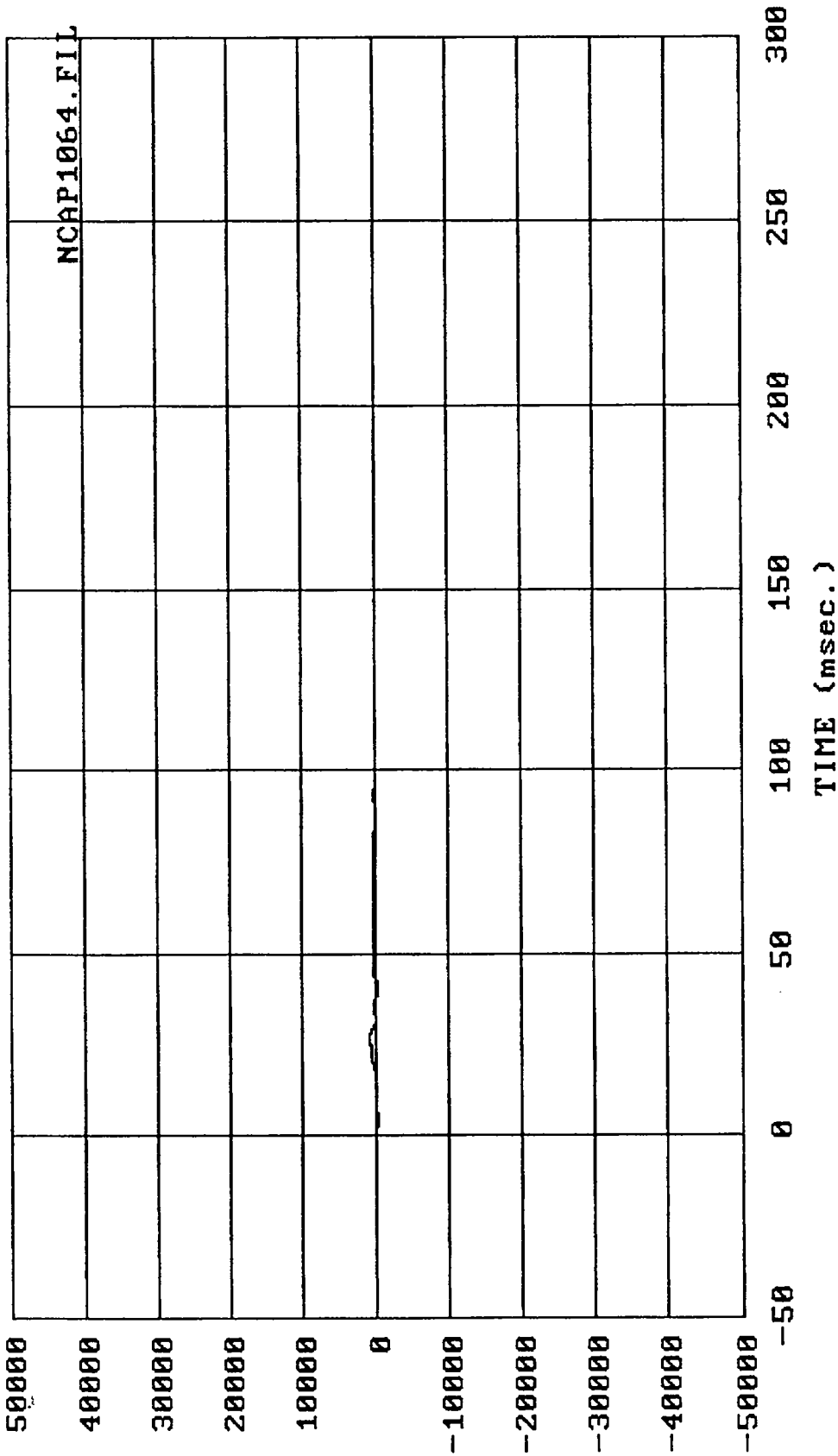


L B S B2-32

Filter: SAE CLASS 60 Max = 1344.0 Min = -310.37
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D5

50000
40000
30000
20000
10000
0
-10000
-20000
-30000
-40000
-50000

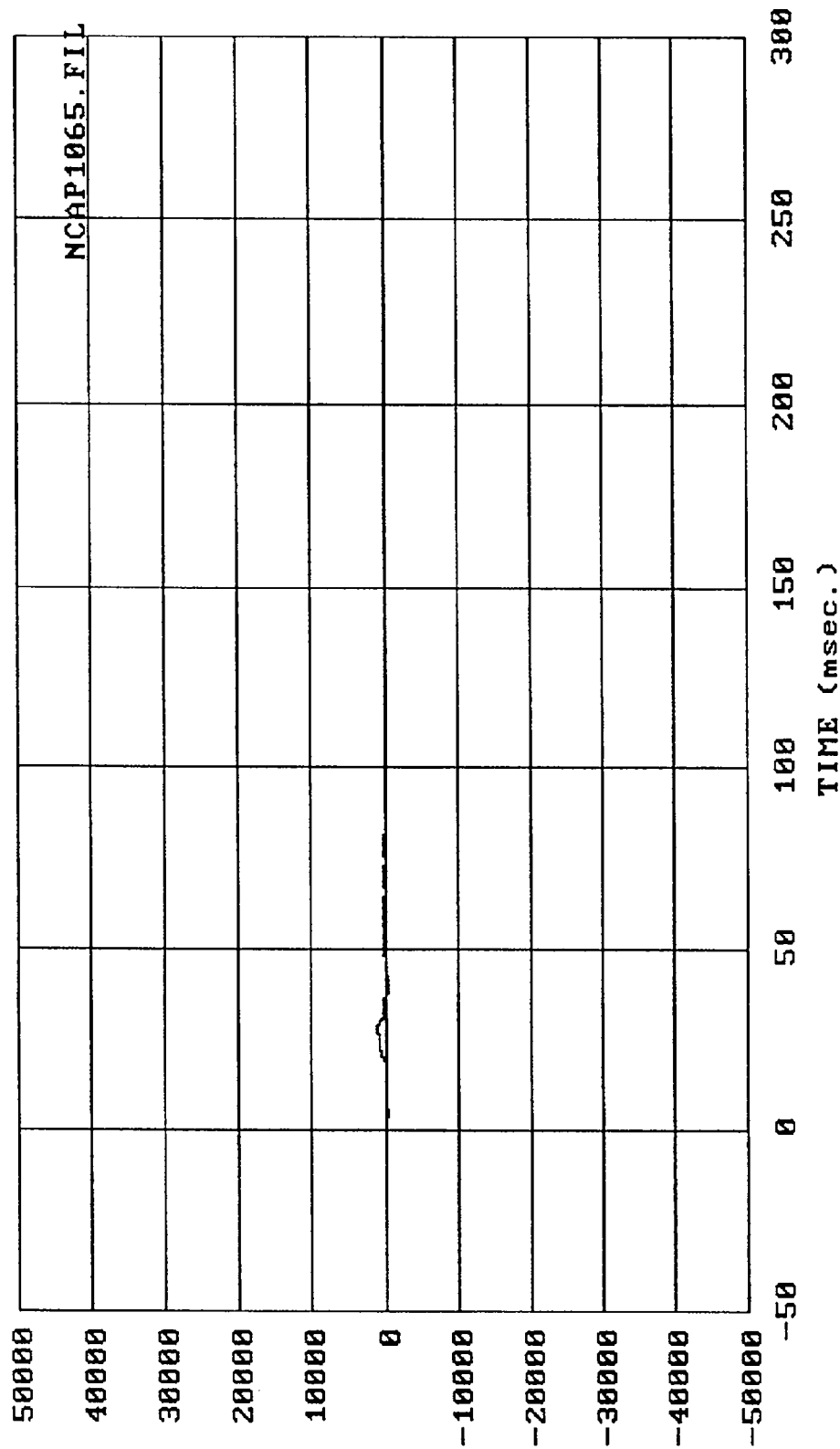
L B S B2-33



Filter: SAE CLASS 60 Max = 788.08 Min = -420.66

MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D6

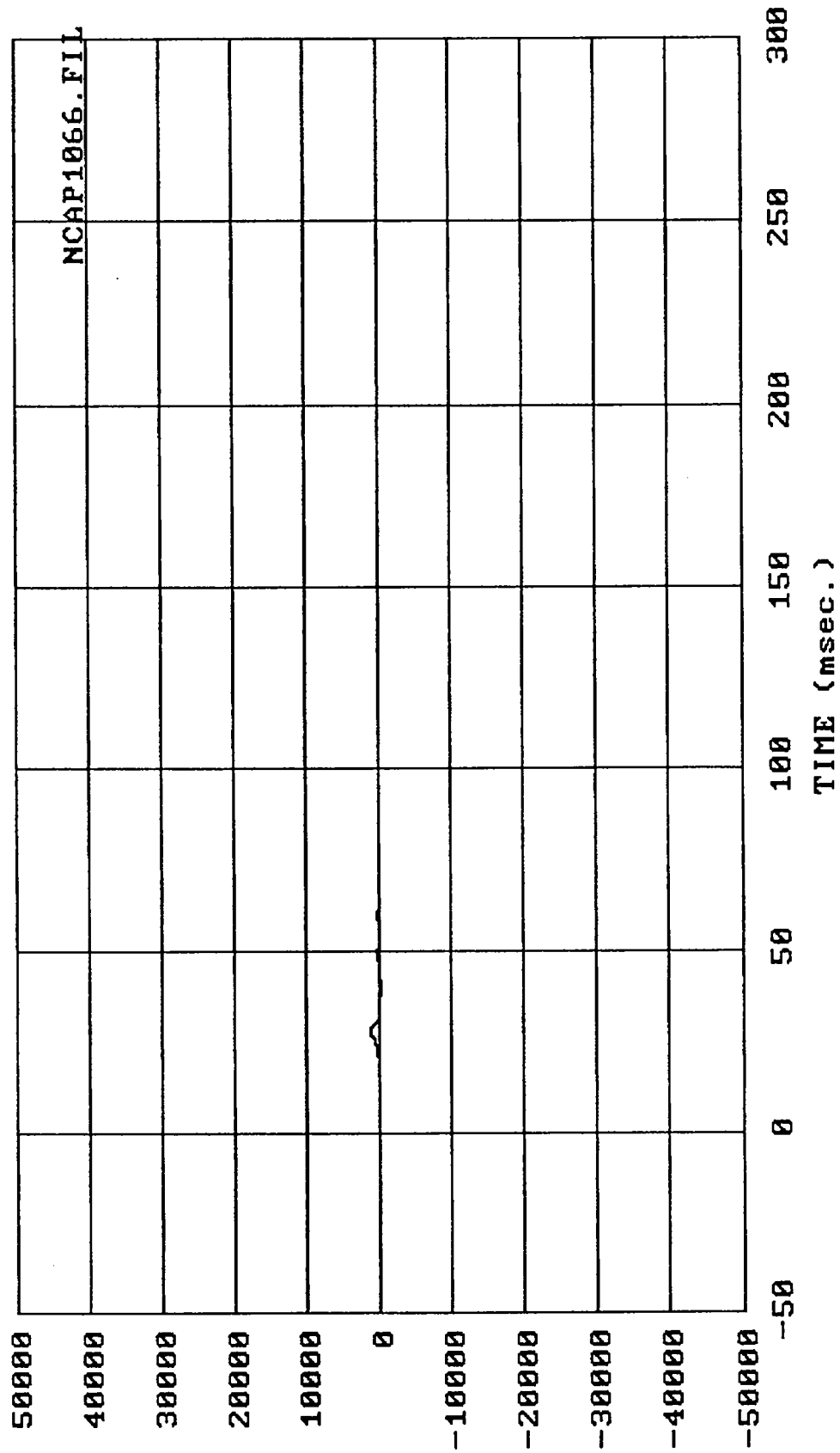
MSE-90-R9063-N01



LBS B2-34

MSE-90-R9063-N01

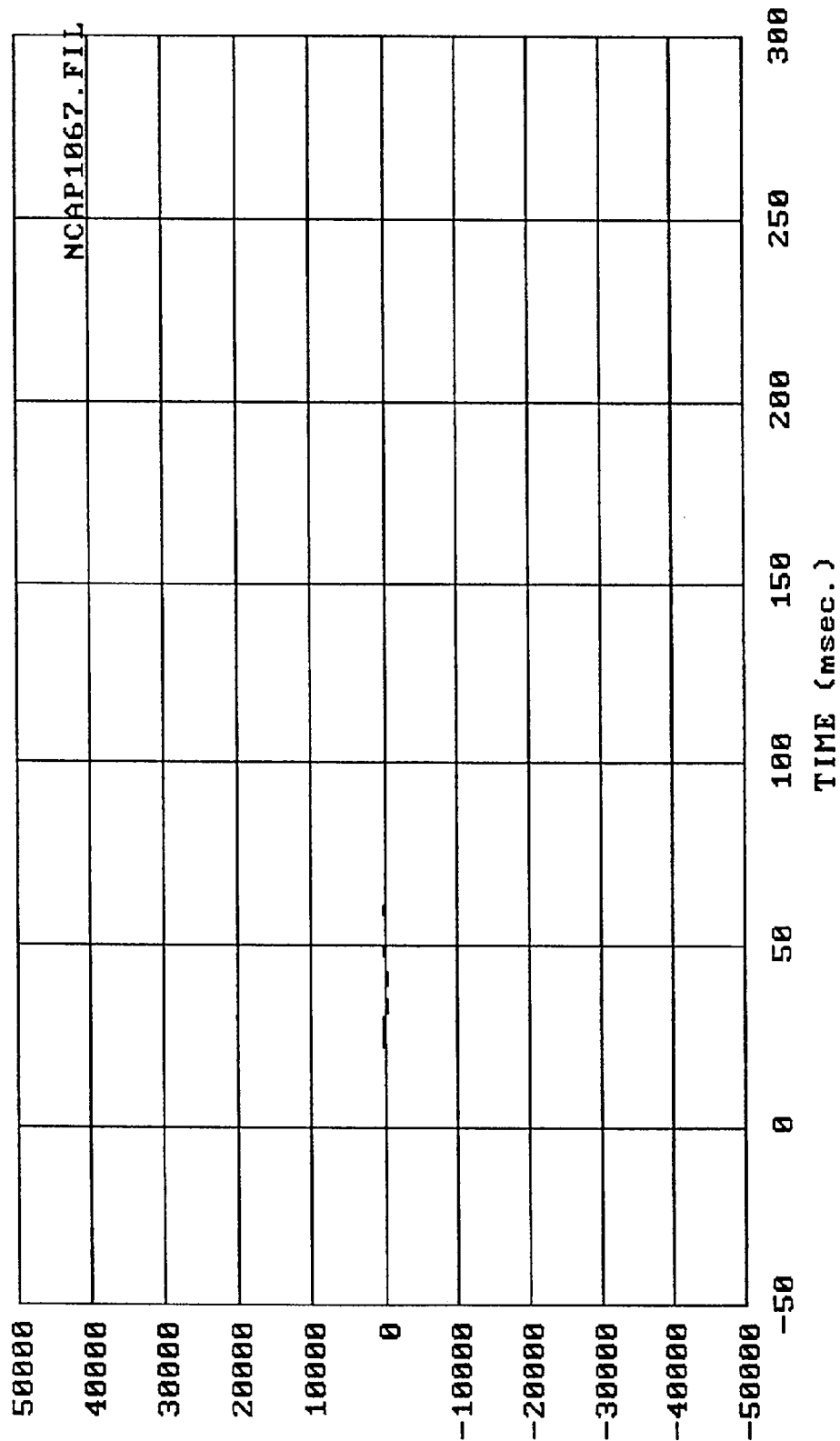
Filter: SAE CLASS 60 Max = 1196.8 Min = -427.04
 MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D7



LBS B2-35

MSE-90-R9063-N01

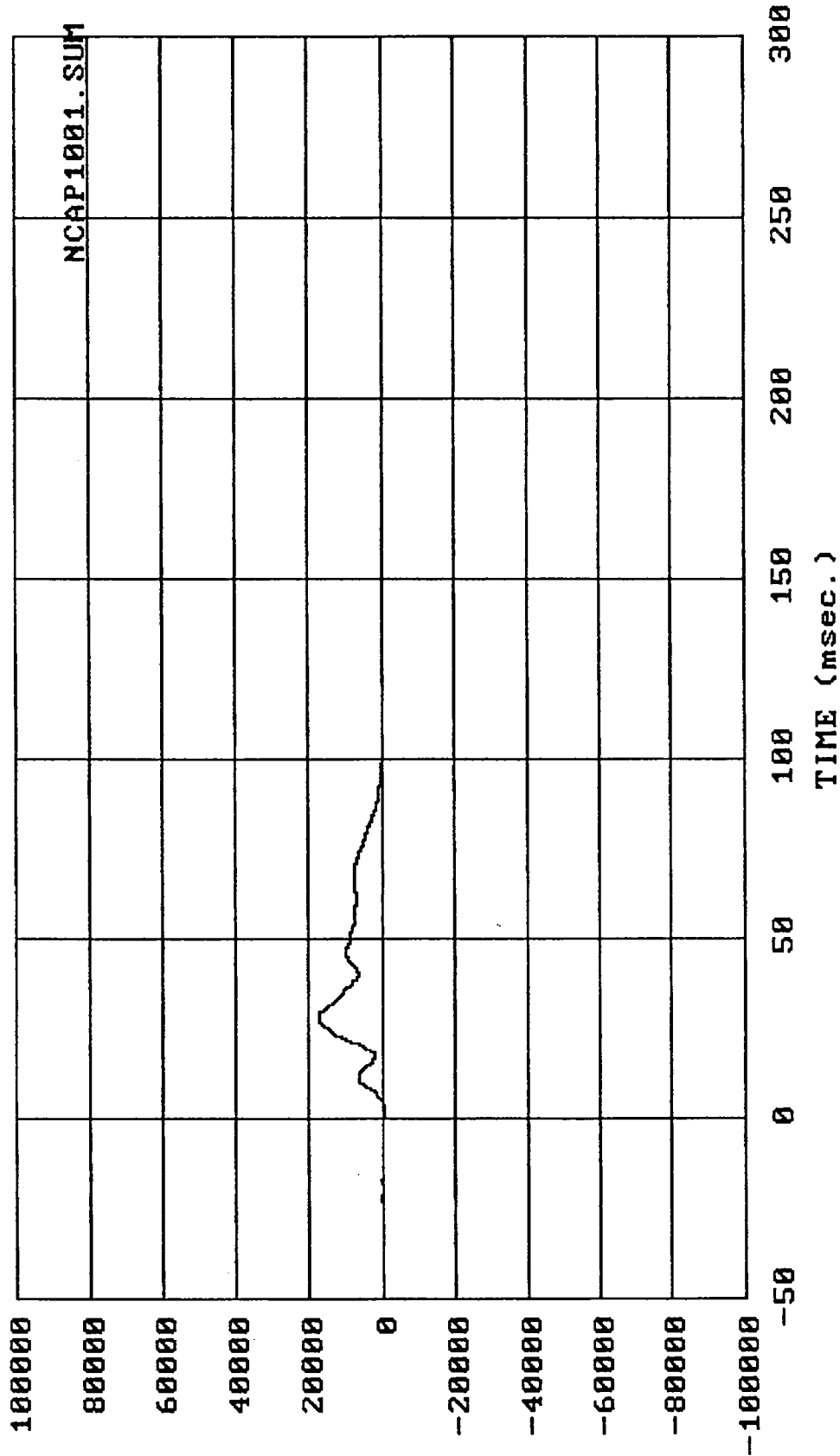
Filter: SAE CLASS 60 Max = 1269.4 Min = -310.08
 MSE 09/12/89 --- 1990 Acura Integra : Barrier force - Load cell D8



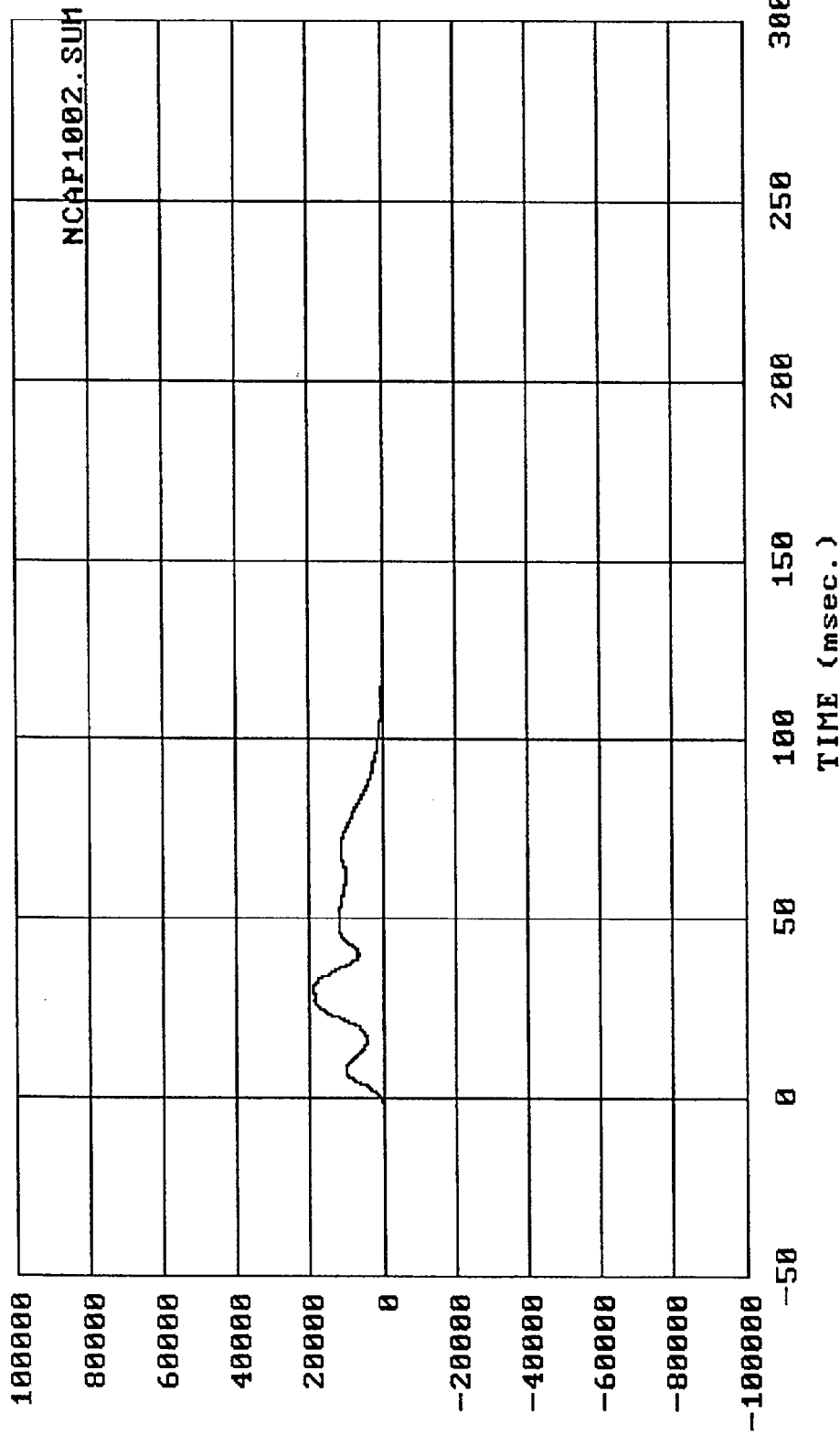
LBS B2-36

MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = 407.17 Min = -288.11
MSE 09/12/89 -- 1990 Acura Integra : Barrier force - Load cell D9

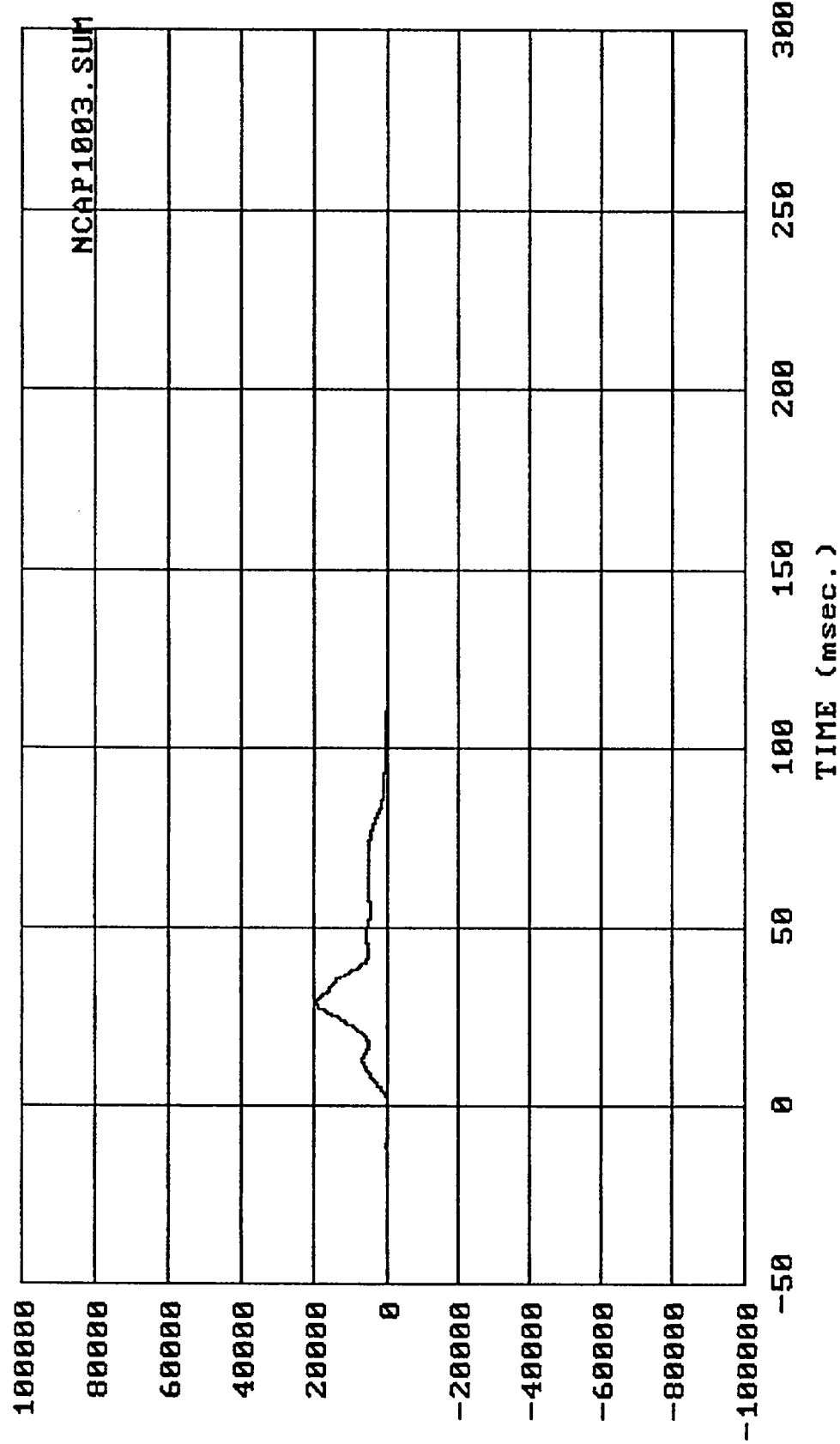


Filter: SAE CLASS 60 Max = .1761E+05 Min = -523.0 Axis:
MSE 09/12/89 -- 1990 Acura Integra : LCB sum frc C1,C2,C3,D1,D2,D3
(Group1)



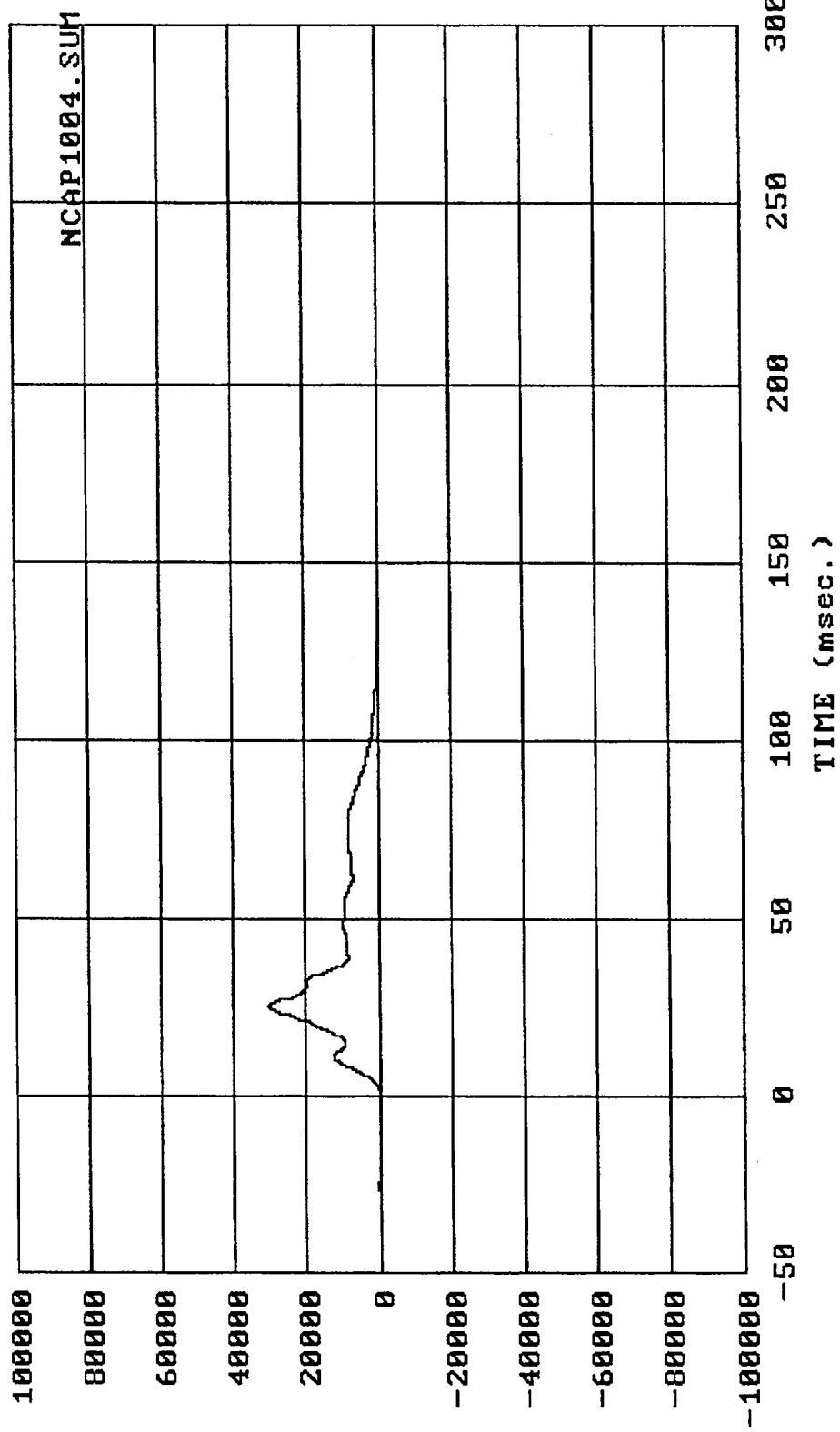
Filter: SAE CLASS 60 Max = .1942E+05 Min = -80.89 Axis:

MSE 09/12/89 -- 1990 Acura Integra : LCB sum frc C4,C5,C6,D4,D5,D6 (Group2)

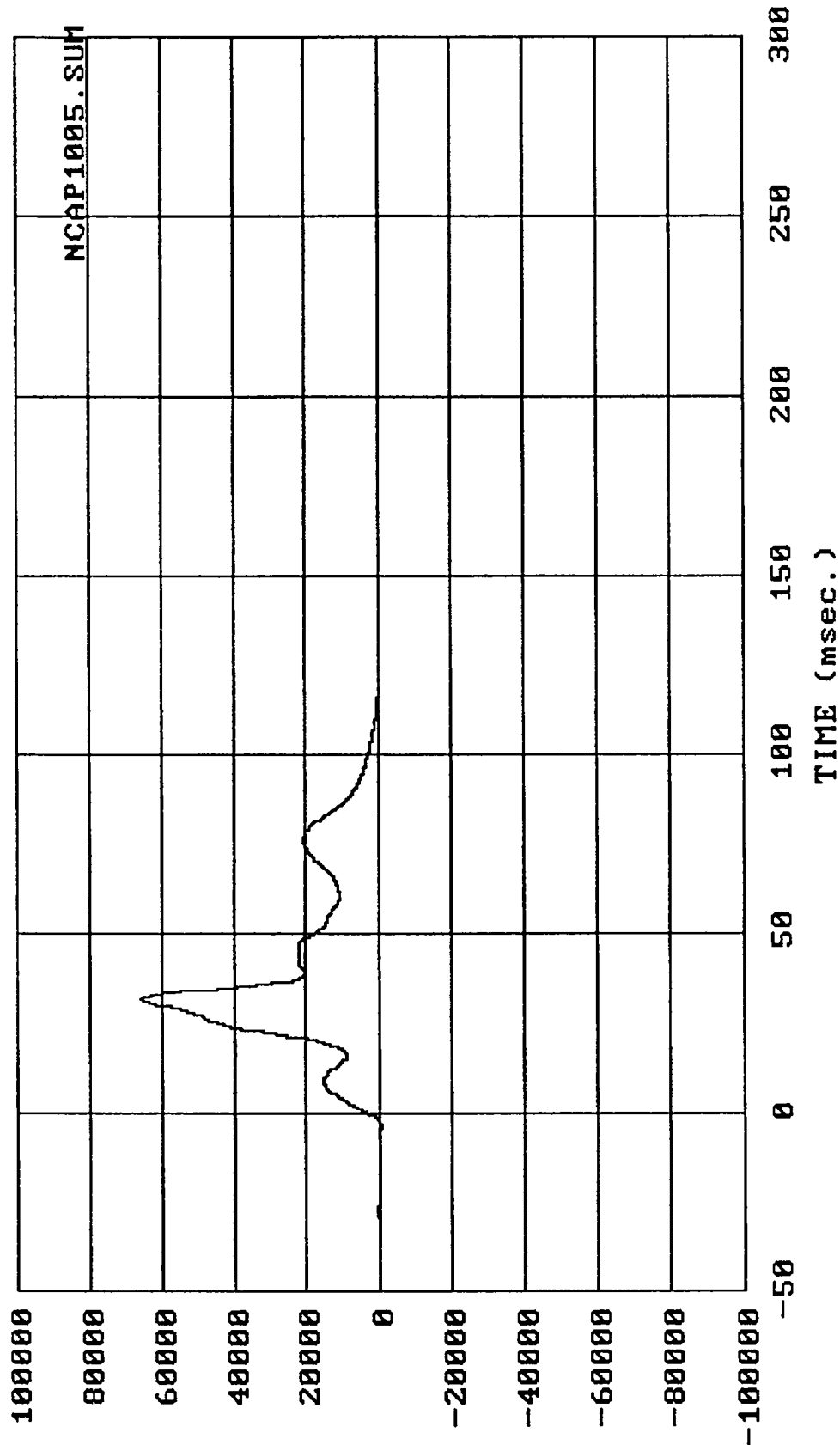


Filter: SAE CLASS 60 Max = .1977E+05 Min = -147.5 Axis:

MSE 09/12/89 --- 1990 Acura Integra : LCB sum frc C7,C8,C9,D7,D8,D9 (Group3)



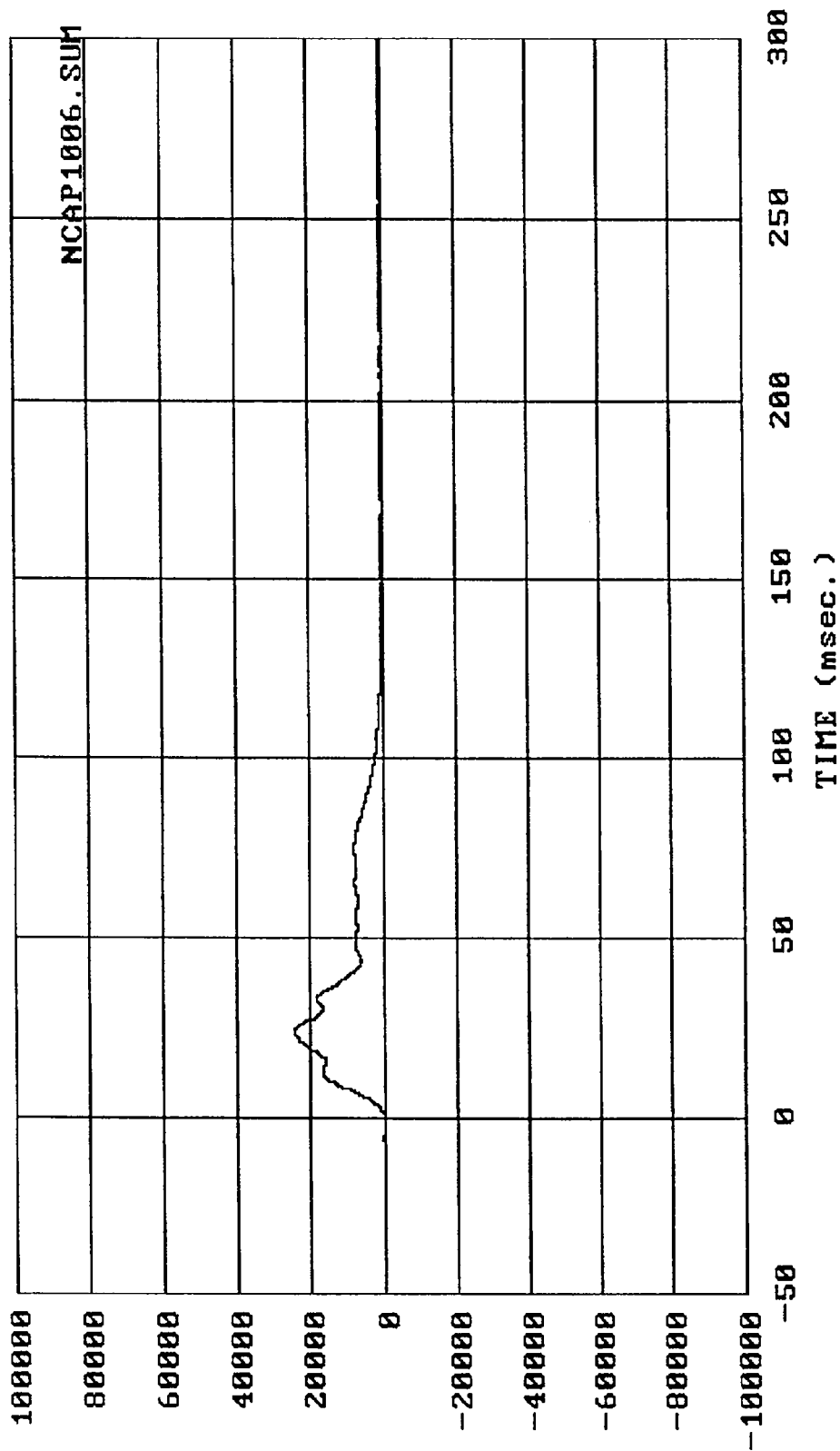
Filter: SAE CLASS 60 Max = .3064E+05 Min = -34.80 Axis:
MSE 09/12/89 -- 1990 Acura Integra : LCB sum frc A1,A2,A3,B1,B2,B3
(Group4)



LBS B2-41

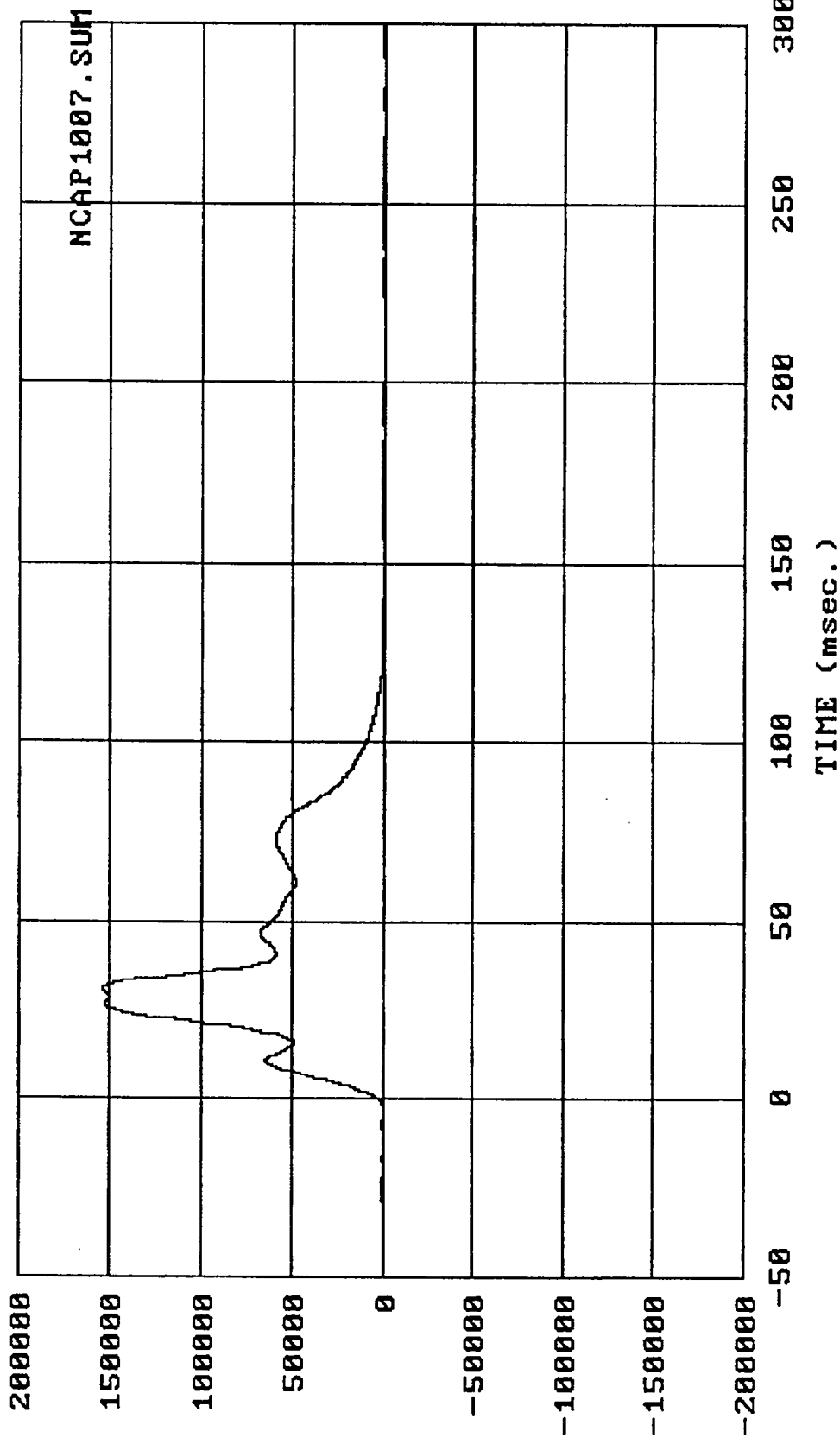
MSE-90-R9063-N01

Filter: SAE CLASS 60 Max = .6619E+05 Min = 20.05 Axis:
MSE 09/12/89 -- 1990 Acura Integra : LCB sum frc A4,A5,A6,B4,B5,B6
(Group5)



Filter: SAE CLASS 60 Max = .2453E+05 Min = 249.3 Axis:

MSE 09/12/89 -- 1990 Acura Integra : LCB sum frc A7,A8,A9,B7,B8,B9
(Group6)



Filter: SAE CLASS 60 Max = .1548E+06 Min = 139.5 Axis:

MSE 09/12/89 -- 1990 Acura Integra : Load Cell Barrier total force (Group7)

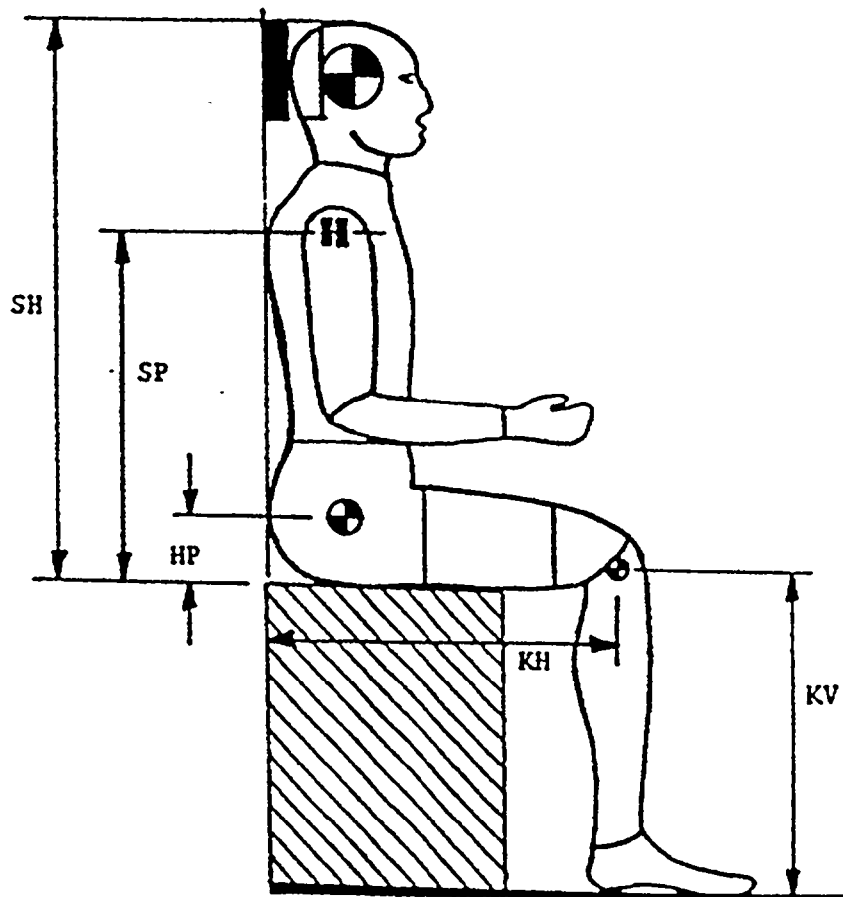
THIS PAGE INTENTIONALLY LEFT BLANK

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		08/04/89	
VERIFICATION NUMBER FOR DUMMY*		01	
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"	15.0	

TECHNICIAN'S NAME: APURVA MAPARA

* 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: APURVA MAPARA

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		07/21/89 - 08/01/89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		01	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		68 - 74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		60 - 70 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	257.78	
b. Peak Lateral Accel.-	- 10G	4.99	
c. Time above 100G- - -	0.9 to 1.5ms	1.2	
2. NECK BENDING TEST--			
a. Pendulum Speed - - -	21.5 to 25.5 fps	21.8	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	21.3	
c. Peak Resultant Head Acceleration - - - -	26G max.	23.4	
d. Pendulum Decel.(t ₂ -t ₁)	- 3ms	2.8	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	27.4	
f. Pendulum Decel.(t ₄ -t ₃)	- 10ms	9.6	
g. Max. Head Rotation -	63 to 73°	63.9	
h. Chordal Displacement-- Head Rotation Angle-			
0°	Time- - -2 to 2 ms	0.0	
	Displ.- -.5 to .5"	0.003	
30°	Time- - 25.6 to 34.4ms	34.0	
	Displ.- 2.1 to 3.1"	2.24	
60°	Time- - 40.3 to 51.7ms	51.7	
	Displ.- 4.3 to 5.3"	4.3	
Maximum (62.4°)	Time- - 53.2 to 66.8ms	62.4	
	Displ.- 5.0 to 6.0"	5.0	

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

TECHNICIAN'S NAME: APURVA MAPARA

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	
	Displ.	4.3 to 5.3 in.	4.3	
30°	Time	85.4 to 104.6 ms	88.6	
	Displ.	2.1 to 3.1 in.	2.1	
0°	Time	101.0 to 123.0 ms	101.0	
	Displ.	-.5 to 0.5 in.	0.081	
3. ABDOMINAL COMPRESSION TEST:				
(Preload = 10 pounds)				
a. Force @ .5" - - - - -		23 to 36 lbs.	25.75	
b. Force @ .75" - - - - -		36 to 50 lbs.	36.75	
c. Force @ 1.0" - - - - -		50 to 63 lbs.	54.0	
d. Force @ 1.5" - - - - -		73 to 88 lbs.	78.7	
4. LUMBAR FLEXION TEST:				
a. Force @ 20° - - - - -		22 to 34 lbs.	33.0	
b. Force @ 30° - - - - -		34 to 46 lbs.	41.2	
c. Force @ 40° - - - - -		46 to 58 lbs.	54.2	
d. Return Angle - - - - -		12° maximum	11.0	
5. CHEST IMPACT TESTS:				
a. High Speed				
(1) Probe Speed- - - - -	21.78-22.22 fps	21.81		
(2) Peak Deflection- - - - -	1.7" maximum	1.64		
(3) Peak Resistive Force- - - - -	2250 lbs. maximum	2156.2		
(4) Internal Hysteresis - - - - -	50 to 70%	68.3		
b. Low Speed				
(1) Probe Speed- - - - -	13.86-14.14 fps	14.13		
(2) Peak Deflection- - - - -	1.1" maximum	1.05		
(3) Peak Resistive Force- - - - -	1450 lbs. maximum	1385.35		
(4) Internal Hyster. - - - - -	50 to 70%	65.7		

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

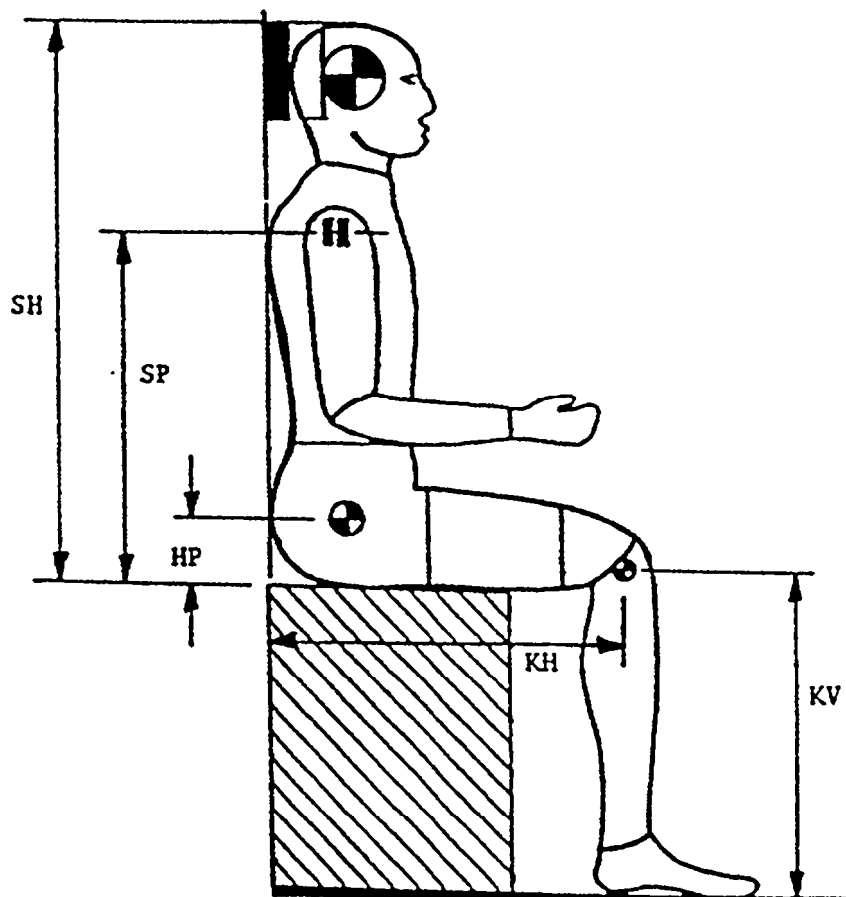
4	6	5
---	---	---

TECHNICIAN'S NAME: APURVA MAPARA

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	6.83	
(2) Maximum Force - -	1850 to 2500 lbs.	2352.53	
(3) Time Above 1000g--	1.7 ms minimum	1.9	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.84	
(2) Maximum Force - -	1850 to 2500 lbs.	2382.06	
(3) Time Above 1000g--	1.7 ms minimum	1.8	

REMARKS:

I. CONFIGURATION VERIFICATION DATA:



	P.572 SPECIFICATION	PRE-TEST (if required)	POST-TEST (if required)
DATE OF CONFIGURATION VERIFICATION		08/03/89	
VERIFICATION NUMBER FOR DUMMY*		01	
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"	18.4	
HW - Hip Width- - - - -	14.0 to 15.4"	15.0	

TECHNICIAN'S NAME: APURVA MAPARA

* 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	6
---	---	---

TECHNICIAN'S NAME: APURVA MAPARA

		PRE-TEST (if required)	POST-TEST (if required)
DATE OF PERFORMANCE VERIFICATION-----		07/21/89-08/02/89	
SEQUENTIAL VERIFICATION NUMBER FOR DUMMY*-----		01	
VERIF. LAB. TEMPERATURE (66 to 78°F Range)-----		68 - 74 °F.	°F.
VERIF. LAB. HUMIDITY (10 to 70% Range)		60 - 70 %	%
TEST PARAMETER	SPECIFICATION		
1. HEAD DROP TEST--			
a. Peak Resultant Accel.-	210 to 260G	222.9	
b. Peak Lateral Accel.- -	- 10G	6.34	
c. Time above 100G- - - -	0.9 to 1.5ms	1.25	
2. NECK BENDING TEST--			
a. Pendulum Speed - - - -	21.5 to 25.5 fps	21.89	
b. Pend. Avg. Decel. over t ₃ - t ₂	20 to 24G	22.69	
c. Peak Resultant Head Acceleration - - - - -	26G max.	25.4	
d. Pendulum Decel.(t ₂ -t ₁)	- 3ms	2.3	
e. Pendulum Decel.(t ₃ -t ₂)	25 to 30 ms	29.3	
f. Pendulum Decel.(t ₄ -t ₃)	- 10ms	8.4	
g. Max. Head Rotation - -	63 to 73°	65.765	
h. Chordal Displacement-- Head Rotation Angle-			
0°	Time- - -2 to 2 ms	- 2.0	
	Displ.- -.5 to .5"	0.008	
30°	Time- - 25.6 to 34.4ms	31.8	
	Displ.- 2.1 to 3.1"	2.256	
60°	Time- - 40.3 to 51.7ms	49.3	
	Displ.- 4.3 to 5.3"	4.45	
Maximum (60 °)	Time- - 53.2 to 66.8ms	60.0	
	Displ.- 5.0 to 6.0"	5.1	

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

TECHNICIAN'S NAME: APURVA MAPARA

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	
	Displ.	4.3 to 5.3 in.	
30°	Time	85.4 to 104.6 ms	
	Displ.	2.1 to 3.1 in.	
0°	Time	101.0 to 123.0 ms	
	Displ.	-.5 to 0.5 in.	
		70.2	
		4.4	
		87.1	
		2.1	
		102.0	
		0.169	
3. ABDOMINAL COMPRESSION TEST:			
(Preload = 10 pounds)			
a. Force @ .5" - - - - -	23 to 36 lbs.	28.0	
b. Force @ .75" - - - - -	36 to 50 lbs.	43.0	
c. Force @ 1.0" - - - - -	50 to 63 lbs.	58.0	
d. Force @ 1.5" - - - - -	73 to 88 lbs.	84.5	
4. LUMBAR FLEXION TEST:			
a. Force @ 20° - - - - -	22 to 34 lbs.	28.6	
b. Force @ 30° - - - - -	34 to 46 lbs.	40.3	
c. Force @ 40° - - - - -	46 to 58 lbs.	52.6	
d. Return Angle - - - - -	12° maximum	11.0	
5. CHEST IMPACT TESTS:			
a. High Speed			
(1) Probe Speed - - - - -	21.78-22.22 fps	21.8	
(2) Peak Deflection - - - - -	1.7" maximum	1.69	
(3) Peak Resistive Force - - - - -	2250 lbs. maximum	2145.68	
(4) Internal Hysteresis - - - - -	50 to 70%	68.2	
b. Low Speed			
(1) Probe Speed - - - - -	13.86-14.14 fps	13.88	
(2) Peak Deflection - - - - -	1.1" maximum	1.02	
(3) Peak Resistive Force - - - - -	1450 lbs. maximum	1388.97	
(4) Internal Hyster. - - - - -	50 to 70%	58.6	

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

II. PERFORMANCE VERIFICATION DATA (Continued)

NHTSA DUMMY I.D. NO.:

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

TECHNICIAN'S NAME: APURVA MAPARA

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	6.88	
(2) Maximum Force - -	1850 to 2500 lbs.	2099.69	
(3) Time Above 1000g--	1.7 ms minimum	2.1	
b. Left Side--			
(1) Probe Speed - - -	6.76 to 7.04 fps	6.83	
(2) Maximum Force - -	1850 to 2500 lbs.	2130.35	
(3) Time Above 1000g--	1.7 ms minimum	1.9	

REMARKS:

APPENDIX D

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT SYSTEM INSTRUCTIONS

THIS PAGE INTENTIONALLY LEFT BLANK

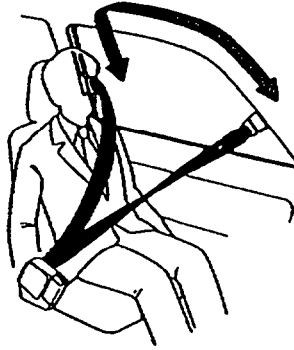
Front Seat Belts

The front seats have an automatic ("passive") restraint system consisting of a shoulder belt, and a knee bolster, as well as a manual lap belt. The belts have emergency locking retractors designed to lock only during a sudden stop or impact. Otherwise, they allow you some freedom of movement in the seat.

Always wear the lap belt in addition to the shoulder belt for full protection. The shoulder belt portion should remain permanently latched.

Operation

1. Enter the car and close the door completely. Move the seat to a comfortable position; sit erect and well back in the seat.
2. Turn the ignition ON. The shoulder belt buckle will move to its rear locked position. The length of the shoulder belt will adjust automatically to your body and seating position.



(cont'd)

Seat Belts (cont'd)

⚠ WARNING Normal movement of the shoulder belt buckle may cause injury. Be sure all parts of your body, especially fingers and hands, are clear of the shoulder buckle while it is moving.

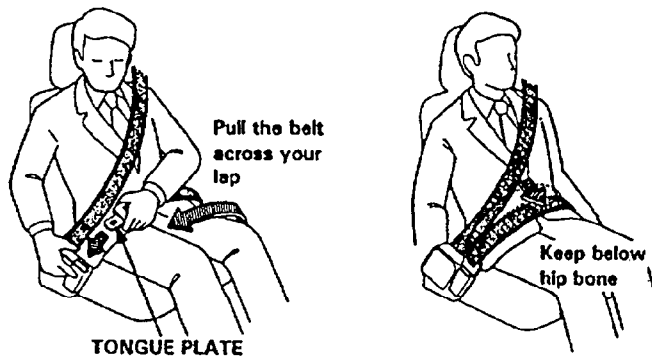
NOTE:

- If the door is not closed completely, the shoulder belt buckle will not move and the door warning light will come on (see page 21).
- If the door is opened with the ignition on, the buckle will release itself from its locked position and move forward.
- If the shoulder belt buckle stops halfway or does not move at all, see page 117 for shoulder belt buckle operation.

3. Take hold of the tongue plate of the lap belt and pull it from its retractor. Be sure the belt is not twisted or caught on anything.

NOTE: If pulled too fast, the belt will lock. If this happens, allow the belt to retract then pull it out more slowly.

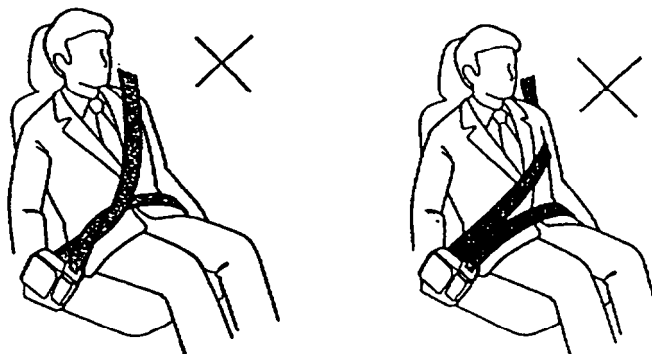
4. Push the tongue plate into the buckle until it clicks locked, then position the belt across your lap, as low on your hips as possible.



⚠ WARNING

- Avoid placing the lap belt across your abdomen. In the event of a collision, the pressure of the belt on the abdomen may increase the extent of injury.
- Never use one belt for more than one person, child or adult.
- Comfort clips sold on the open market are not recommended since they could impair the function and safety of the belts.

-
- Make sure the strap of the shoulder belt and the lap belt are not crossed.
 - Do not wear the shoulder portion of the belt under your arm or out of position. Such use could increase the chance and amount of injury in an accident.

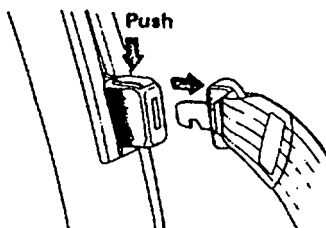


Releasing the Seat Belts

1. To release the manual lap belt, push the "PRESS" button in the buckle, the belt should retract automatically when released.
2. The driver's shoulder belt buckle will release and travel to its off position when the key is removed from the ignition.
3. The shoulder belt buckle will also release and travel to its off position when the door is opened.

Emergency Belt Release

The shoulder belt should always remain buckled. In case of an emergency, however, the shoulder belt can be released from the shoulder belt buckle by pushing the button.



Relatch the shoulder belt before operating the car, making sure the belt is not twisted.

⚠ WARNING Driving with a twisted seat belt can increase your chance and extent of injury during a collision. Be sure the shoulder belt is not twisted before driving the car. (cont'd)

Seat Belts (cont'd)

Buckling the Rear Seat Combination Lap/Shoulder Belts

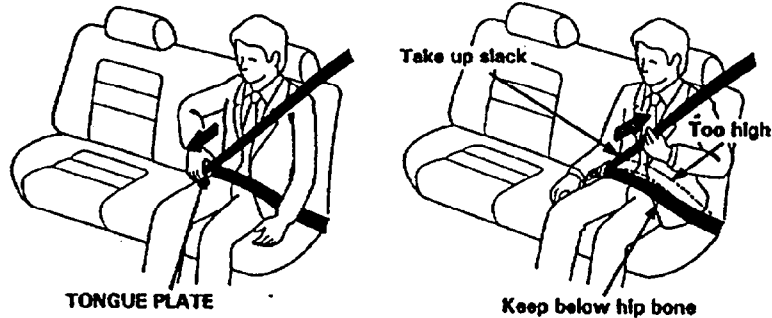
In the rear seat, there are two one-piece combination lap/shoulder belts and a center lap belt. The seat-backs and seat belts provide best restraint when the occupant is sitting well back and straight up in the seat.

The combination lap/shoulder belts with emergency locking retractors are designed to lock only during a sudden stop or impact. Otherwise, they allow you some freedom of movement in the seat.

NOTE: The emergency locking system of the rear seat belts will also be activated if you pull the belt too fast. If this happens, release the belt slightly then pull it out more slowly.

1. Take hold of the tongue plate and pull the belt across your lap. Be sure the belt is not twisted or caught on anything.

Pull the belt across your lap



2. Push the tongue plate into the buckle until it clicks locked. Position the belt across your lap as low on your hips as possible.

WARNING Avoid placing the lap belt across your abdomen. In the event of a collision, the pressure of the belt on the abdomen may increase the extent of injury.

3. To release the seat belt, push the "PRESS" button in the buckle; the belt should retract automatically when released. If the belt does not fully retract, pull it out and check for kinks or twists.

CAUTION: Make sure both rear shoulder belts are positioned in front of the rear seat-backs whenever the seat-backs are in their upright position.

Rear Center Seat Belt

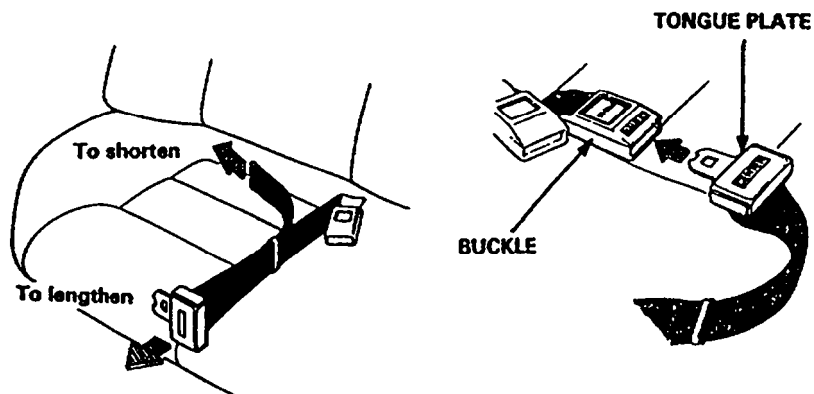
Adjust the center lap belt length to fit snugly but comfortably when buckled.

A slack belt will greatly reduce the protection afforded to the wearer. Hold the tongue plate perpendicular to the belt as shown.

- * To shorten, pull the end of the belt away from the tongue plate.
- * To lengthen, pull the tongue plate.

Push the tongue plate into the buckle until it clicks locked and position the belt across your lap, not your abdomen, as low on your hips as possible.

If worn across your abdomen, pressure of the seat belt on your abdomen may increase the extent of injury in the event of an accident.



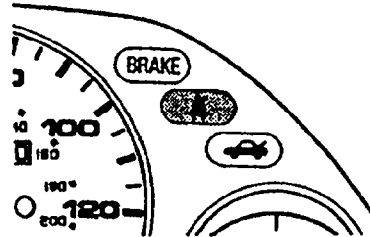
(cont'd)

Seat Belts (cont'd)

Fasten Seat Belt Warning Light and Warning Beeper

Lap Belt Warning Indicator:

Both the  light and the warning beeper will go on for about six seconds if the ignition switch is turned on when the driver's lap belt is not fastened. The beeper will not go on if the driver's lap belt is fastened, but the warning light will come on for about six seconds each time, to remind the driver to have passengers put their belts on.



Automatic Shoulder Belt Warning Indicator:

The warning light will come on if either of the automatic shoulder belts is unlatched with the ignition ON. The beeper will sound for approximately six seconds while the warning light is ON. Relatch the belt: the light should go off when the belt is latched. The warning light will also come on while the shoulder belt buckle moves from its front off position to its rear locked position.

Automatic Shoulder Belt Malfunction Indicator:

The warning light will flash and the beeper will sound rapidly if either shoulder belt buckle stops before completing its full cycle (see page 117 for normal operation).

NOTE: If the shoulder belt's tensioner mechanism locks and prevents the buckle from moving fully forward when you want to get out, recycle the system by closing the door and reopening it. The buckle should move fully forward; if it does not, recline the seat-back and use Emergency Belt Release (see page 11). When the system does not function by either method, have the system checked by an authorized Acura dealer.

WARNING

If the warning light and beeper do not function at all, or if they come on even with the belts latched and doors fully closed, it indicates a malfunction in the front seat belt system. In the event of a collision, severe personal injury could result. The system should be checked immediately by an authorized Acura dealer.

Child Restraint

Children riding in the car should be restrained to minimize the risk of injury in an accident, sudden stop or sudden maneuver. According to accident statistics provided to the National Highway Traffic Safety Administration (NHTSA), children are safer when properly restrained in the rear seating positions than in the front seat. Larger children should use one of the seat belts provided.

For smaller children, we strongly recommend the use of a commercially available child restraint system that meets the Federal Motor Vehicle Safety Standard (FMVSS) because it offers the most protection against injury. All states now have laws which require that small children must be seated in a child passenger seat restraint system. Check local laws.

Before buying a particular child restraint system, make sure it fits your car seat and seat belts, and fits your child. Follow all the instructions that come with the system.

⚠ WARNING

- Children should never ride unrestrained in an automobile.
- Never use an infant carrier or child safety seat that "hooks" over a seat-back; it may not provide adequate security in an accident.
- Never allow a child to be held in a person's arms while they are in the moving vehicle. Holding a child in a moving vehicle does not provide the child with any means of protection during an accident, even if the person holding the child is wearing a seat belt.

Installation of Child Seat

All child restraint systems are designed to be secured by lap belts or the lap belt portion of a lap-shoulder belt. The automatic shoulder belt system at the front passenger seat should not be used to secure the child restraint system. If a child seat must be installed on the front seat, place the shoulder portion of the belt behind the child seat and secure the child seat with the lap belt only.

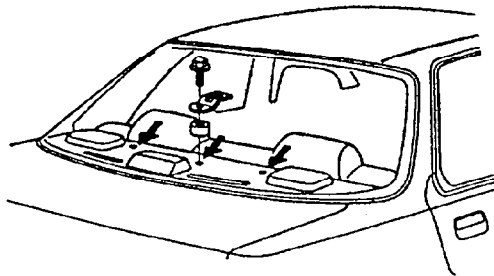
Children could be endangered in a crash, if their child restraints are not properly secured. Follow the child seat manufacturer's instructions when installing the seat.

(cont'd)

Seat Belts (cont'd)

Your Acura automobile is equipped with attachment points specifically for a rear seat mounted child restraint system which uses a top tether.

The tether attachment points are located on the rear tray, just behind the rear seat-back.



⚠ WARNING When the child restraint system is not in use, remove it from the car or secure it with the seat belt to keep it from becoming a projectile in the event of an accident.

NOTE: See your Acura dealer for installation of the child restraint system.

Pregnant Women

A pregnant woman should use the shoulder and lap belts to help lessen the chance of injury and/or the amount of injury in an accident.

⚠ WARNING It is desirable that a pregnant woman ask her doctor at each medical check-up if she can drive, and also ask about the most appropriate way of wearing the lap/shoulder belt. Lap belts should be worn as low and snugly as possible over the hips.

Inspection

All parts of the seat belts, including the belt fabric, should be regularly inspected for fraying, loosening, wear and other damage. Keep the belts in good condition at all times to reduce the chance of being injured in an accident, and to minimize any injuries that do occur. Make sure the buckles, retractors, tongue plates, guides and anchors all work properly.

Don't let anything get inside the buckle or the retractor; it could cause latch or retractor failure.

Cleaning

The belts should always be kept clean and dry; wet or damp belts can cause rewinding problems. To clean the belts, pull them all the way out of their retractors and scrub them with warm water and a mild soap; then let them air-dry fully extended, in the shade, with the car windows open.

⚠ WARNING

- Never bleach, dye or clean the belts with chemical solvents; it will weaken the fabric.
- Do not remove the seat belts from the car to wash them.

Replacement

Replace the seat belt if:

1. The belting is cut, punctured, burned, etc.
2. The buckle or retractor does not work properly.
3. It was being worn at the time of a collision (also check for damage at the seat belt anchor points).
4. Its condition is questionable.