

V2126

REPORT NO. MGA-95-N001

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

Nissan
1995 Nissan Maxima
4 Door
NHTSA NO. MS5200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: August 11, 1994

Report Date: September 30, 1994

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF MARKET INCENTIVES
400 SEVENTH STREET, S.W.

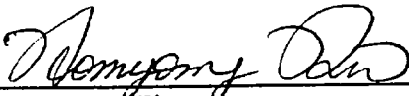
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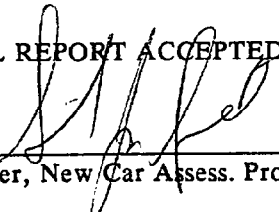
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16. Abstract A 56 kph (35 mph) frontal barrier impact using a 30 load cell barrier was conducted on a 1995 Nissan Maxima 4 Door Sedan at the MGA Proving Grounds and Crash Test Center in Burlington, WI. on August 11, 1994. The barrier impact velocity was 56.6 kph (35.2 mph), and the ambient temperature at the time of impact was 21°C. The post-test maximum static crush was 461 mm. The test vehicle appeared to comply with the requirements of the following Federal Motor Vehicle Safety Standards: 1. FMVSS 212, "Windshield Mounting" 2. FMVSS 219 (partial), "Windshield Zone Intrusion" 3. FMVSS 301, "Fuel System Integrity" With regard to FMVSS 208, "Occupant Crash Protection" injury criteria, the driver's HIC was 746.7 and the 3 msec. Clip (Chest g's) was 50.0 g's. The left and right femur loads for the driver were 1890 and 3434 Newtons, respectively. The passenger's HIC was 783.2 and the 3 msec Clip was 56.8 g's. The left and right femur maximum loads were 3794 and 1296 Newtons respectively.			
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SECTION 1

PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY'95 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-90-D-12121. 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 48 kph (30 mph) FMVSS 208/212/219/301-75 requirements.

The 56 kph (35 mph) frontal barrier impact test was conducted in accordance with the National Highway Traffic Safety Administration (NHTSA) Indicant Test Procedure for New Car Assessment Program (NCAP) dated January 1, 1990. Data for FMVSS No. 212, "Windshield Mounting", FMVSS No. 219 (Partial), "Windshield Zone Intrusion", FMVSS No. 301-75, "Fuel System Integrity," as well as occupant performance data are provided herein.

SECTION 2
SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 30 load cells was impacted by a 1995 Nissan Maxima 4-Door at a velocity of 56.6 kph (35.2 mph). The test was performed at the MGA Proving Grounds and Crash Test Center on August 11, 1994. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 16 high speed cameras. Camera locations and other pertinent camera information can be found in this report. The camera #14 (on-board passenger seat belt) did not run during the test due to a feed-reel jamming.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head and chest triaxial accelerometers, neck load cell, and right/left femur load cells. The driver was also instrumented with right and left lower leg sensors. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver ATD (Serial No. 37) and the right-front passenger ATD (Serial No. 36) were calibrated prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C and D.

The 53 channels of data were recorded on 5 computers and two channels of data (driver and passenger chest deflections) on the tape backup system. During the test, the sixth computer of MGA's main data acquisition system recorded no valid data from all channels connected to it. It seemed that the computer was triggered twice accidentally. Due to this, the data of the brake caliper accelerations, the rear crossmember redundant accelerations, and the shoulder belt spool out displacements were lost. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

The driver's head struck the inflated airbag. The driver HIC was 746.7. The maximum chest deceleration over 3 milliseconds was 50.0 g's. The left and right femur loads were 1890 and 3434 Newtons respectively.

The right front passenger's HIC was 783.2 and maximum chest deceleration over 3 milliseconds was 56.8 g's. The left and right femur loads was 3794 and 1296 Newtons respectively.

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door Sedan

NHTSA No.: MS5200 VIN.: JN1CA21D0ST005534

Body color: Black Emerald Date of Manufacture: 3-94

Engine: 6 Cylinders; C.I.D.; 3.0 liters; CC

 Gas; Diesel; Turbocharged

 Longitudinal; X Transverse

Transmission: 4 Speed; Manual; X Automatic; Overdrive

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

Odometer Reading: 82 miles

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

 X P/seats; X Tilt Wheel; X Cruise Control;

Type of Occupant Restraint: Driver and passenger airbag and type II belt system

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 2.5 kg/cm² (35 Psi) Rear 2.5 kg/cm² (35 Psi)

Recommended Tire Size: P205/65R15

Recommended Cold Tire Pressure: Front 2.5 kg/cm²; Rear 2.5 kg/cm²

Tires on Vehicle: P205/65R15; 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 Adj. With; X Power (driver) X Lever (passenger)

Vehicle Capacity Weight (VCW) = 408 kg. (A)

No. of Occupants x 68.0 kg. = 340 kg. (B)

Rated Cargo Weight (RCW) A-B = 68 kg.

GVWR 1938 kg. GAWR: Front 1067 kg.; Rear 886 kg.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

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

Right Front = 423 kg Right Rear = 243 kg
Left Front = 431 kg Left Rear = 250 kg
TOTAL FRONT WEIGHT = 854 kg (63 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 493 kg (37 % of Total Vehicle Weight)
TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1347 kg

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1347 kg
VCW = Vehicle Capacity Weight 408 kg DSC = Designated Seating Capacity 5
RCW = VCW - 68 (DSC) = 68 *kg
Target Test Weight = UDW + RCW + (2 dummies x 75.8 kg/dummy)
Target Test Weight = 1567 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 470 kg Right Rear = 309 kg
Left Front = 469 kg Left Rear = 313 kg
TOTAL FRONT WEIGHT = 939 kg (60 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 622 kg (40 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 1561 kg
Weight of ballast secured in vehicle trunk area = 0 kg
Vehicle components removed to meet target weight: Rear seat back & cushion,
spare tire, rear bumper, exhaust pipe, tail lamps, jack and tool kit.

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude: RF 721 LF 716 RR 719 LR 718
Test Attitude: RF 719 LF 718 RR 702 LR 691
Wheel Base: 2700 mm; C.G. = 1076 mm rearward of front wheel C/L
Remarks: None

*light trucks and MPVs RCW is 136 kgs or manufacturer's value, whichever is less

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

POST-IMPACT DATA:

Type of Test: 35 mph Frontal Impact Impact Angle: 90°
Date of Test: August 11, 1994 Time of Test: 4:23 p.m.
Ambient Temperature: 21 °C (Spec. Range = 18.8 to 25.6°C)
Temperature in Occupant Compartment: 21° C
Windshield Molding Temperature: 21° C
Required Impact Velocity Range: 55.5 to 57.1 kph
Impact Velocity: primary = 56.6 kph; secondary = 56.8 kph
Distance From Front Bumper to Barrier Face When
Entering Speed Trap: 1210 mm
Exiting Speed Trap: 210 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length: Pre-test = R 4381 C_L 4534 L 4378
Post-test = R 4021 C_L 3997 L 4004
Crush = R 360 C_L 537 L 374

Distance from front of test vehicle to point of impact (rebound):

R 415 mm C_L 432 mm L 400 mm

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>To airbag</u>	<u>To airbag</u>
Chest	<u>To airbag</u>	<u>To airbag</u>
Abdomen	<u>No visible contact</u>	<u>No visible contact</u>
Left Knee	<u>To lower dash panel</u>	<u>To lower dash panel</u>
Right Knee	<u>To lower dash panel</u>	<u>To lower dash panel</u>

GENERAL TEST AND VEHICLE PARAMETER DATA (cont'd)

	<u>Front</u>		<u>Rear</u>	
<u>Door Opening</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
(without use of tools)	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>

	<u>Front</u>		<u>Rear</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Movement	<u>0</u>	<u>0</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (mm)	<u>0</u>	<u>0</u>	<u>N/A</u>	<u>N/A</u>

Glazing Damage

Backlight/Windshield Cracked windshield

Other Notable Impact Effects: None

SECTION 3

SUMMARY OF RESULTS FOR-----

FMVSS 212, "Windshield Mounting"

FMVSS 219 (Partial), "Windshield Zone Intrusion"

FMVSS 301-75, "Fuel System Integrity"

FMVSS NO. 212, "WINDSHIELD MOUNTING", DATA SHEET

Details of windshield mounting such as retention method, trim type, etc.:

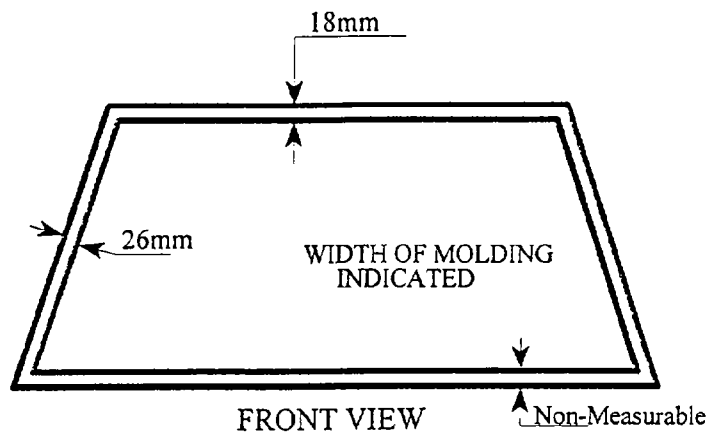
Windshield set in rubber molding within windshield frame

FMVSS 212 Requirements: The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		PERCENT RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2118	2118	100%
LEFT SIDE	2118	2118	100%
TOTAL	4236	4236	100%

AREA OF RETENTION FAILURE:



FAILURE DETAILS: NONE

FMVSS NO. 219, "WINDSHIELD ZONE INTRUSION", DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contact points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

FMVSS 219 TEST DATA:

A= 1162 mm

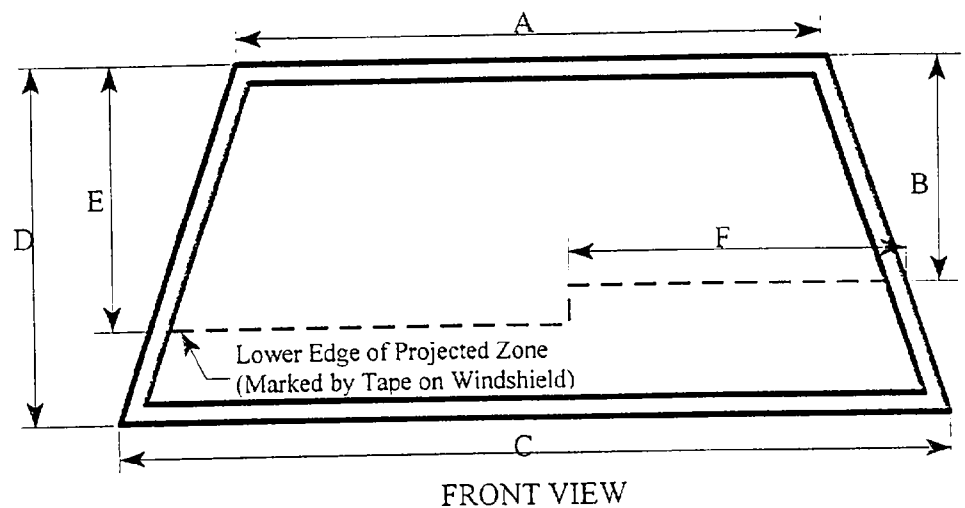
B= 665 mm

C= 1502 mm

D= 786 mm

E= 558 mm

F= 617 mm



DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":
(Show location of penetration)

NONE

FMVSS NO. 301-75, FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: MS5200 Test Date: August 11, 1994

Vehicle Mfg./Make/Model: 1995/Nissan/Maxima/4 Door Sedan

Usable Capacity of Vehicle's Fuel Tank: 67 Liters
(figure furnished by vehicle manufacturer)

TEST REQUIREMENTS:

Test vehicle's engine operated to "run dry" condition, and then a small amount of stoddard solvent which has been dyed red shall be added to the vehicle's fuel tank. Operate the fuel pump enough to completely fill the fuel system ahead of the fuel tank, and add 92 to 94% of the stated USABLE CAPACITY to the fuel tank.

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

62 Liters which is 93 % of the stated USABLE CAPACITY.

TEST VEHICLE IMPACT TYPE: X Frontal (35 mph)

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

 Rear Moving Barrier (30 mph)

Side Impact MDB (33.2 mph)

FUEL SPILLAGE MEASUREMENT:

1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

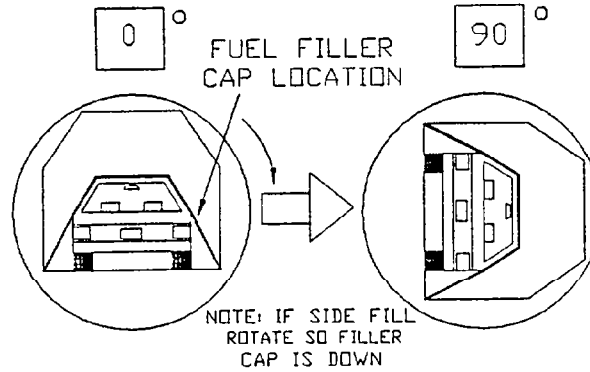
ACTUAL	MAX ALLOWED
Ø	1 OZ
Ø	5 OZ
Ø	1 oz./1 MIN

SOLVENT SPILLAGE DETAILS: None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° - 90°

Vehicle NHTSA ID No.: MS5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 42 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 42 seconds
Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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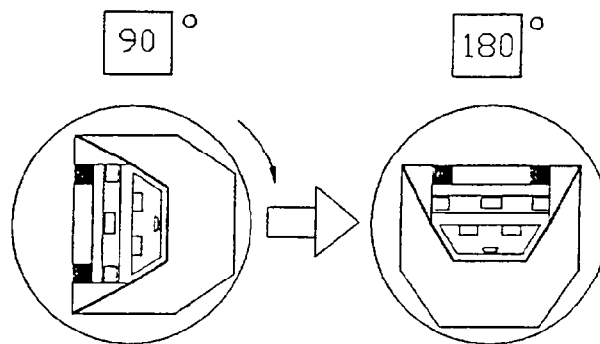
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 90° - 180°

Vehicle NHTSA ID No.: MS5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 34 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 34 seconds
Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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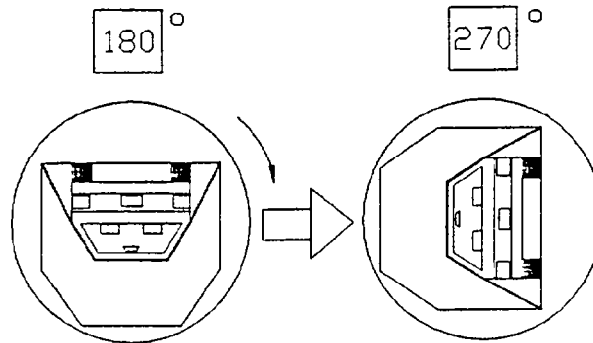
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 180° - 270°

Vehicle NHTSA ID No.: MS5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 26 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 26 seconds
Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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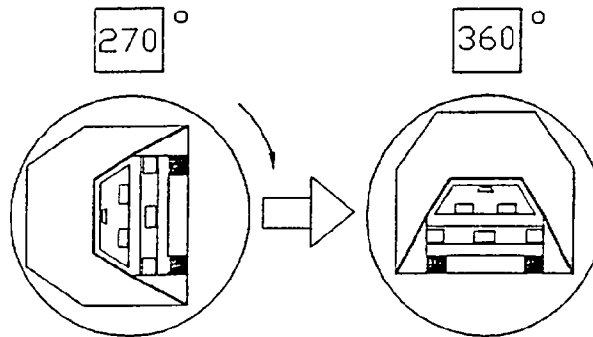
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 270° - 360°

Vehicle NHTSA ID No.: MS5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 50 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 50 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

SECTION 4
OMI FINAL DATA

Occupant and Vehicle Information

I. OMI DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Positioning Data
4. Seat Belt Performance Assessment Data
5. Camera Locations
6. Vehicle Target Locations

II. OVR DATA

1. Load Cell Barrier Data
2. Vehicle Accelerometer Data
3. Test Vehicle Measurements

III. AID DATA

1. Accident Investigation Damage Data Summary

FMVSS NO. 208, "OCCUPANT CRASH PROTECTION", DATA SHEET

VEH. YR./MAKE/MODEL/BODY STYLE: 1995/Nissan/Maxima/4 Door Sedan

VEH. NHTSA NO.: MS5200 TEST DATE: August 11, 1994

MAX. ACCELERATION VALUES: (g's)	DRIVER # <u>37</u>	PASSENGER # <u>36</u>
Head Channel X	-82.0	-55.3
Head Channel Y	-10.2	-8.1
Head Channel Z	22.8	48.8
HEAD RESULTANT	84.6	72.8
Chest Channel X	-51.2	-57.2
Chest Channel Y	-7.8	-6.3
Chest Channel Z	-13.8	12.0
CHEST RESULTANT (CLIP)	50.0	56.8
TIME INTERVAL (msec) [0.003 seconds minimum]	$t_1 = 65.5$ $t_2 = 68.5$	$t_1 = 62.2$ $t_2 = 65.2$

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	746.7	783.2
$t_1 =$ (msec)	58.9	61.1
$t_2 =$ (msec)	91.2	96.8
Avg. Accel. t_1 to t_2 (g's)	55.7	54.5

[The maximum time interval from t_1 to t_2 is 36 milliseconds.]

MAX. COMPRESSIVE FEMUR FORCES:

Right Side (N)	3434	1296
Left Side (N)	1890	3794

MAXIMUM SEAT BELT FORCES:

Lap Belt (N)	7488	4663
Shoulder Belt (N)	7624	10474

NOTE: All values listed must occur during primary impact event.
(Head X,Y,Z and R listed must be during t_1 to t_2 HIC interval)

HYBRID III NECK AND CHEST DATA SHEET

VEHICLE YR./MAKE/MODEL/BODY STYLE: 1995/Nissan/Maxima/4 Door Sedan

VEHICLE NHTSA NO.: MS5200 TEST DATE: August 11, 1994

MAXIMUM VALUES	DRIVER DUMMY #37	PASSENGER DUMMY #36
Neck Load X (N)	463.6	812.9
Neck Load Y (N)	-167.7	-291.1
Neck Load Z (N)	-2243.7	-2540.4
Neck Moment X (N.M)	16.5	-17.5
Neck Moment Y (N.M)	-37.8	-38.5
Neck Moment Z (N.M)	7.4	-9.5
Chest Deflection X (mm)	29.9	39.2
Time of Max. Occurrence	108 msec.	89 msec.

PART 572 DUMMY IN-VEHICLE POSITION

Vehicle NHTSA No.: MS5200 Vehicle: 1995 Nissan Maxima 4 Door

SEAT TYPE:

 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

Driver: Manual
 X Power

 Passenger: X Manual
 Power

BUCKET SEAT BACK TYPE:

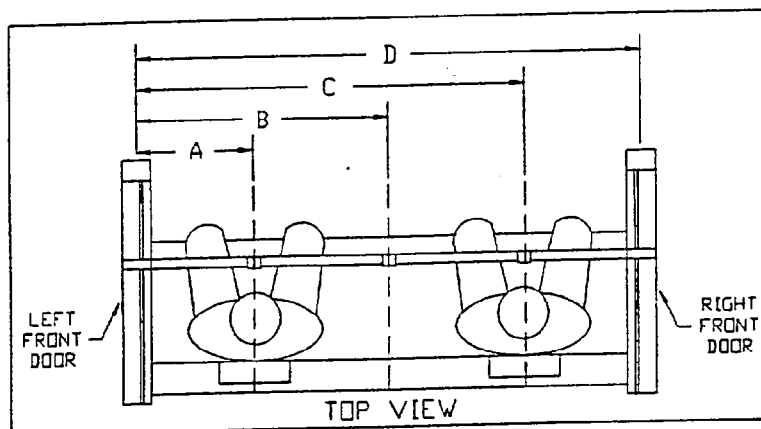
 Fixed
 X Adjustable Reclining

Driver

Adjusted to the mid position

Passenger

Seat notch to 11th from front



37 DUMMY ID 36

A = Left Door to Driver Centerline	<u>423</u> mm
B = Left Door to Center Passenger Centerline	<u>786</u> mm
C = Left Door to Right Passenger Centerline	<u>1146</u> mm
D = Left Door to Right Door	<u>1571</u> mm

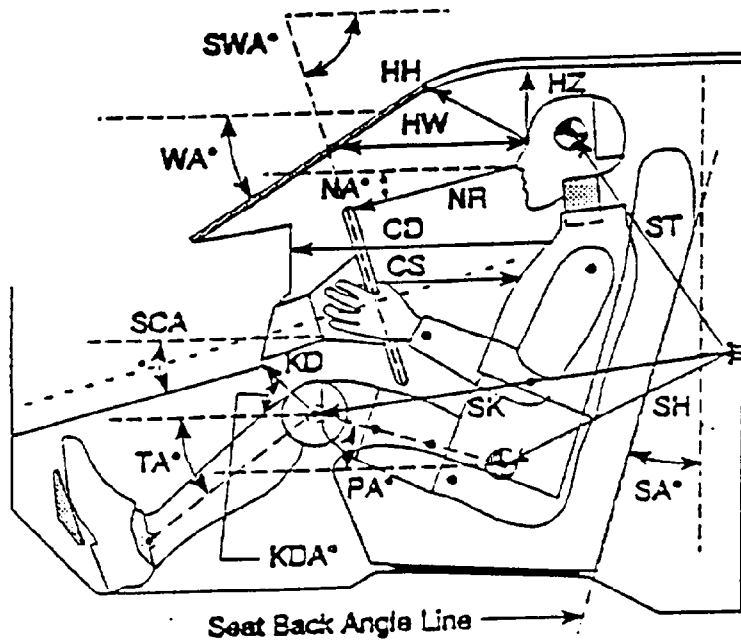
FRONT SEAT MEASUREMENT TABLE

Units (mm)

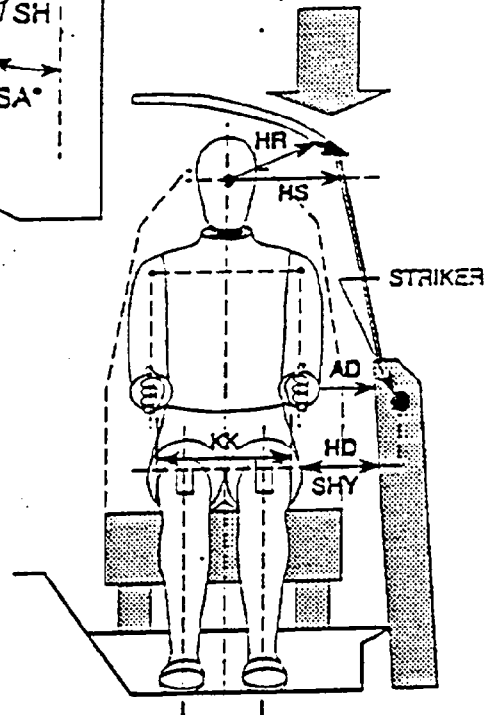
	DRIVER (Serial #37)	PASSENGER (Serial #36)
WA°	28°	
SWA°	66°	N/A
SCA°	N/A	N/A
SA°	23°	23.5°
HZ	184	176
HH	337	328
HW	641	612
HR	250	232
NR	476 Angle 10.4°	N/A
CD	594	689
CS	375	N/A
RA	238	N/A
KDL	222 Angle 23.2°	214
KDR	216	204 Angle 20.1°
PA°	20.1°	21.1°
TA°	32.8°	33.6°
KK	279	247
ST	527 Angle 83.2°	532 Angle 79.0°
SK	615 Angle 4.1°	627 Angle 4.0°
SH	260 Angle 36.4°	258 Angle 34.0°
SHY	257	254
HS	318	307
HD	184	140
AD	133	106

N/A = Not Applicable

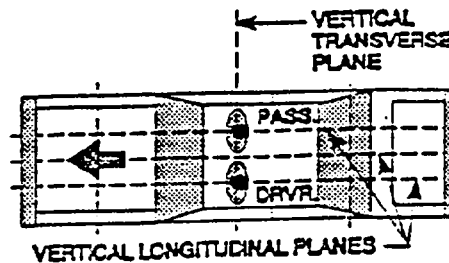
FRONT SEAT MEASUREMENTS



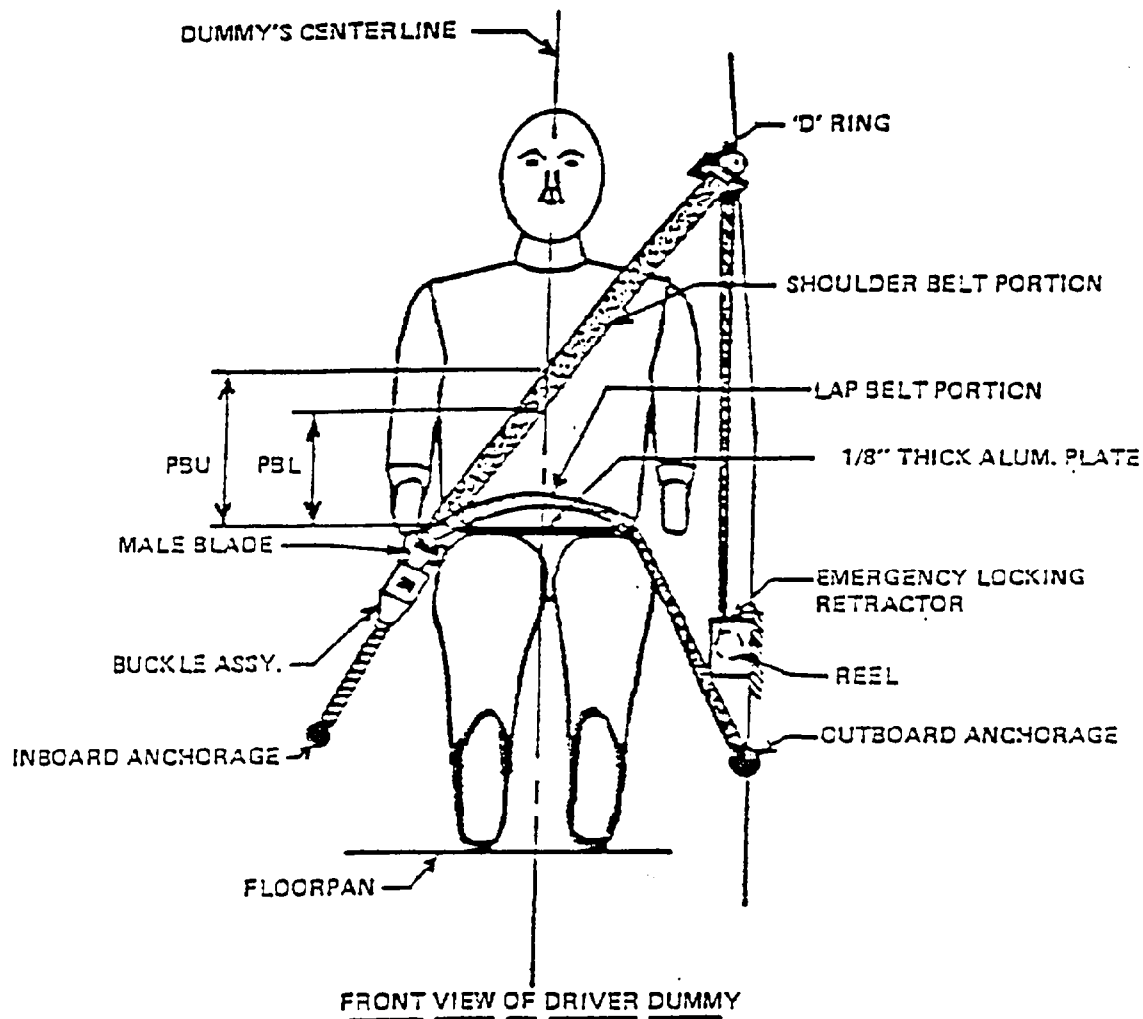
AD - Arm to Door
 HD - H-Point to Door
 HR - Head to Side Header
 HS - Head to Side Window
 KK - Knee to Knee
 SHY - Striker to H-Point (Y Direction)



CD - Chest to Dash
 CS - Steering Wheel to Chest
 HH - Head to Header
 HW - Head to Windshield
 HZ - Head to Roof
 KDA - Knee to Dash Angle
 KDL - Left Knee to Dash
 KDR - Right Knee to Dash
 NA - Nose to Rim Angle
 NR - Nose to Rim
 PA - Pelvic Angle
 RA - Rim to Abdomen
 SA - Seat Back Angle
 SCA - Steering Column Angle
 SH - Striker to H-Point
 SK - Striker to Knee
 ST - Striker to Head
 SWA - Steering Wheel Angle
 TA - Tibial Angle
 WA - Windshield Angle



SEAT BELT POSITIONING DATA



(illustration)

Dimension = mm

		DRIVER DUMMY	PASSENGER DUMMY
<u>PBU</u> --	Top surface of alum. plate to upper edge	355	356
<u>PBL</u> --	Top surface of alum. plate to belt lower edge	273	265

Note: Adjustable "D" ring set in the highest position.

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>218 mm</u>	<u>217 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>865 mm</u>	<u>914 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>790 mm</u>	<u>824 mm</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis	<u>86 mm</u>	<u>NR</u>
As determined mechanically	<u>114 mm</u>	<u>110 mm</u>
As determined electronically	<u>*</u>	<u>*</u>

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>NR</u>	<u>NR</u>
Measured mechanically	<u>0</u>	<u>0</u>

RETRACTOR LOCK-UP TIME:

As determined by shoulder belt spool-off observed in on-board cameras	<u>29 msec</u>	<u>NR</u>
---	----------------	-----------

* Data Loss During Impact

NR = Not Recorded

CAMERA LOCATIONS

VEH. NHTSA NO.: MS5200 ; TEST DATE: August 11, 1994; TIME: 4:23 p.m.

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1995/Nissan/Maxima/4 Door

CAMERA POSITION NO.	VIEW	CAMERA POSITIONS (mm.)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET (mm)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Left Side View	-	-	-	-	-	10	N/A**
2	Left Front View	990	8420	1180	90°	8057	25	1005
3	Steering Column Top	2120	8070	1570	90°	7707	25	1000
4	Steering Column Bottom	2140	8070	1035	90°	7707	25	1190
5	Left Driver Close-up	1690	6150	985	90°	5787	35	990
6	Left Angle	4240	5000	1950	50°		50	909
7	Driver Onboard Seat Belt						35	625
8	Passenger Onboard Seat Belt						35	625
9	Right Overall	2300	-7740	980	90°	7377	13	881
10	Right Front	920	-7730	1140	90°	7367	25	1058
11	Right Passenger Close-up	1520	-6760	1090	90°	6397	50	1000
12	Right Angle	4050	-5180	2180	50°		35	800
13	Top View Wide	400	15	4390			13	1198
14	Top Driver	-320	385	2350			13	1087
15	Top Passenger	-250	-400	2460			13	948
16	Pit Engine	930	0	-3195			13	1010
17	Fuel Tank	2090	0	-3095			13	966

* COORDINATES:

X = film plane to monorail centerline

Y = film plane to barrier face

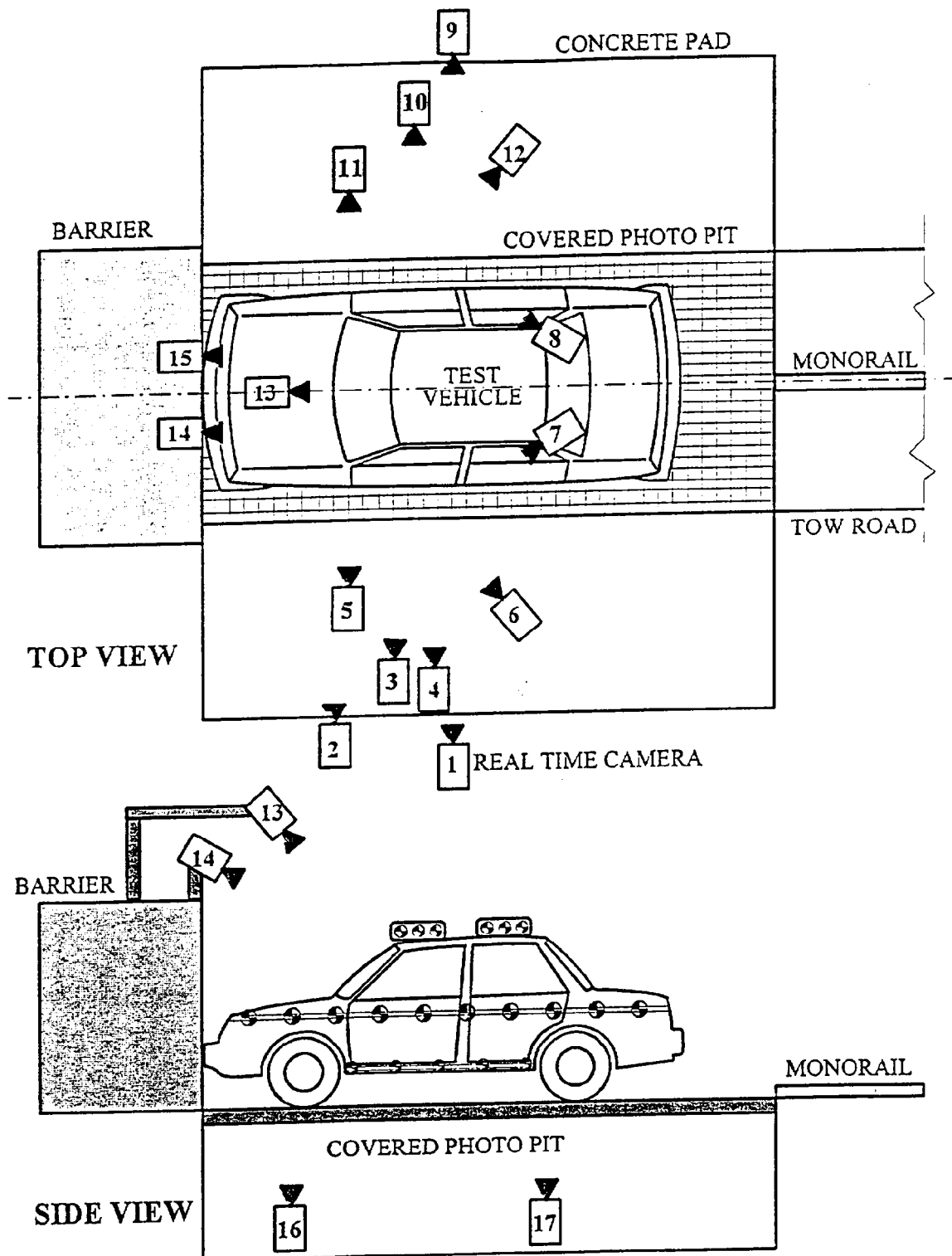
Z = film plane to ground

ORIGIN: For X and Y it is the Impact Point.

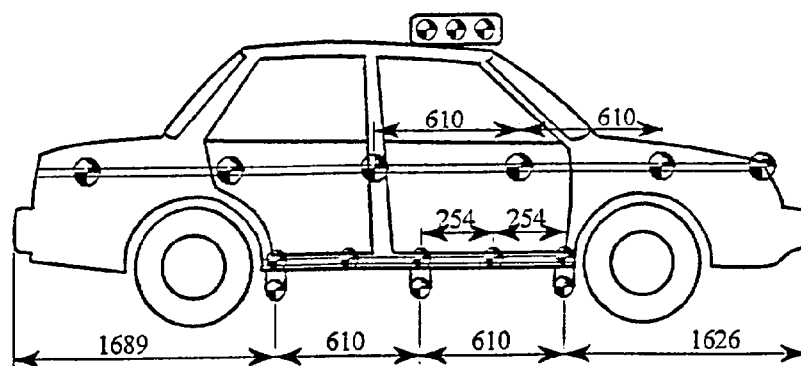
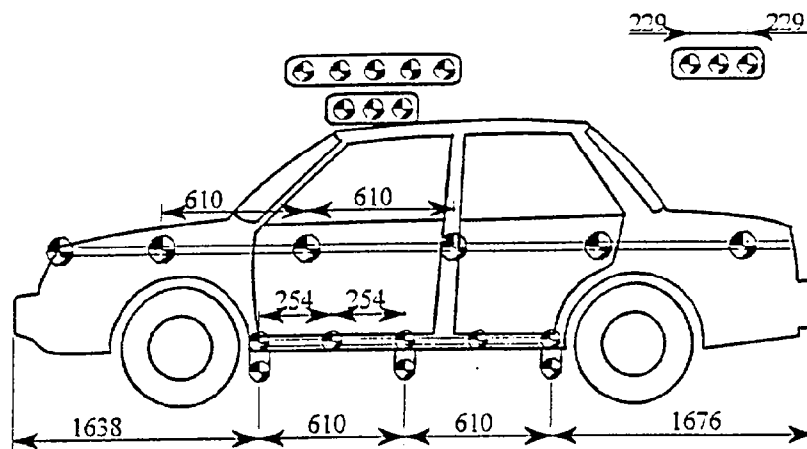
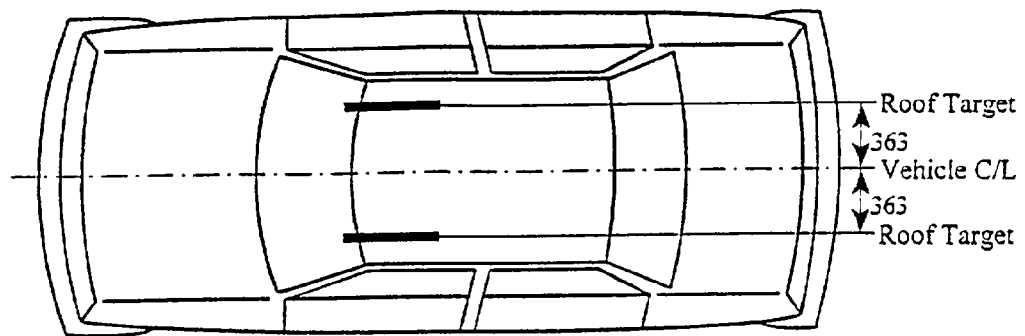
For Z it is the Floor.

** This film was not included because of being over-exposed.

CAMERA LOCATIONS (cont'd)



VEHICLE TARGET LOCATIONS



(DIMENSIONS IN MM)

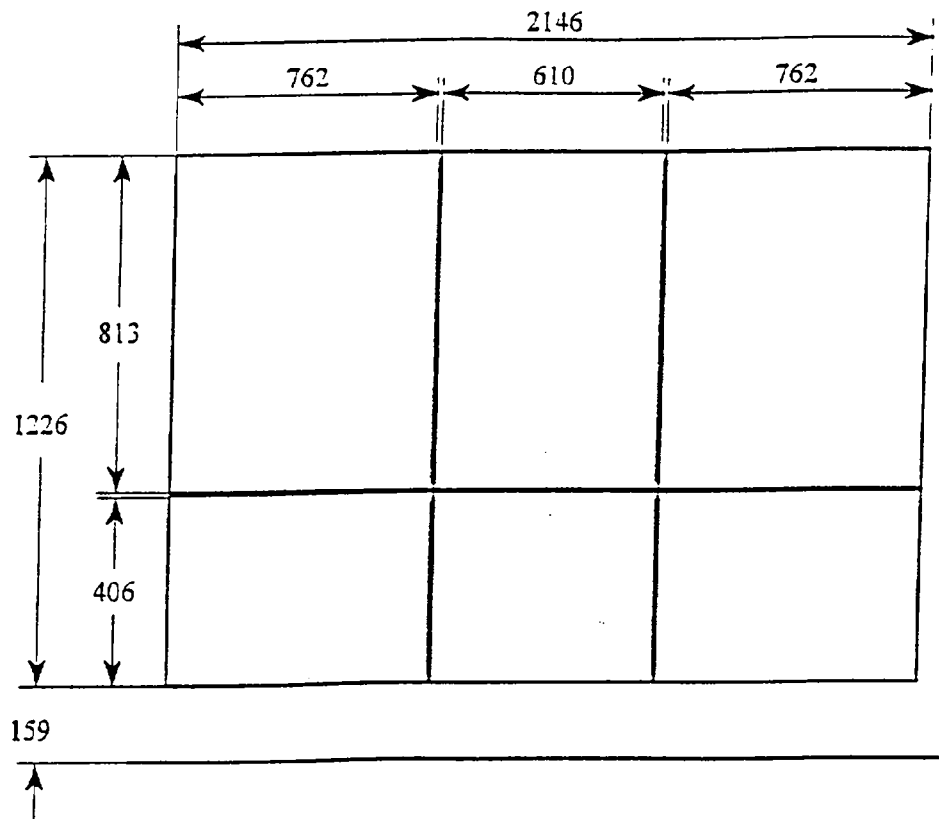
LOAD CELL LOCATIONS ON FIXED BARRIER

30 Load Cells

6 Rows

9 Columns

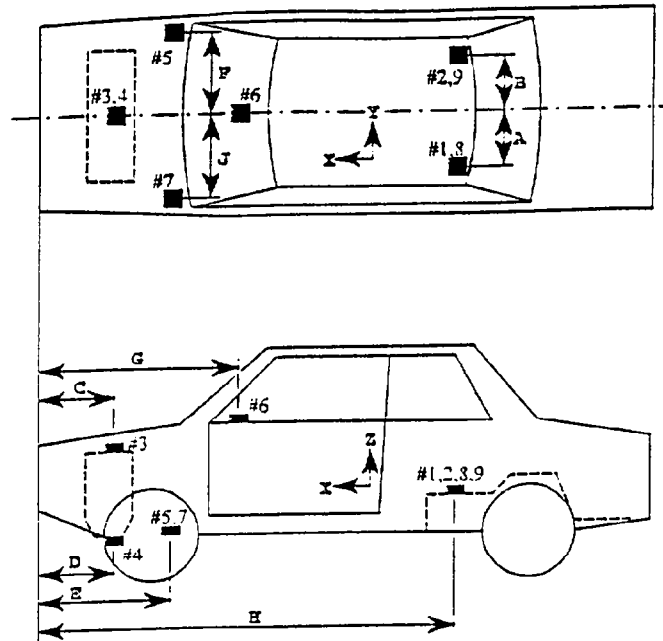
6 Groupings (5 cells/group)



The following data is presented in Appendix B:

- (1) Total or Sum of 30 individual load cells
- (2) Data from 6 Groupings shown above (5 cells/group)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



Units: (mm)

Dimension	Length
A	572
B	557
C	3723
D	3748
E	3651
F	678
G	3023
H	1570
J	678

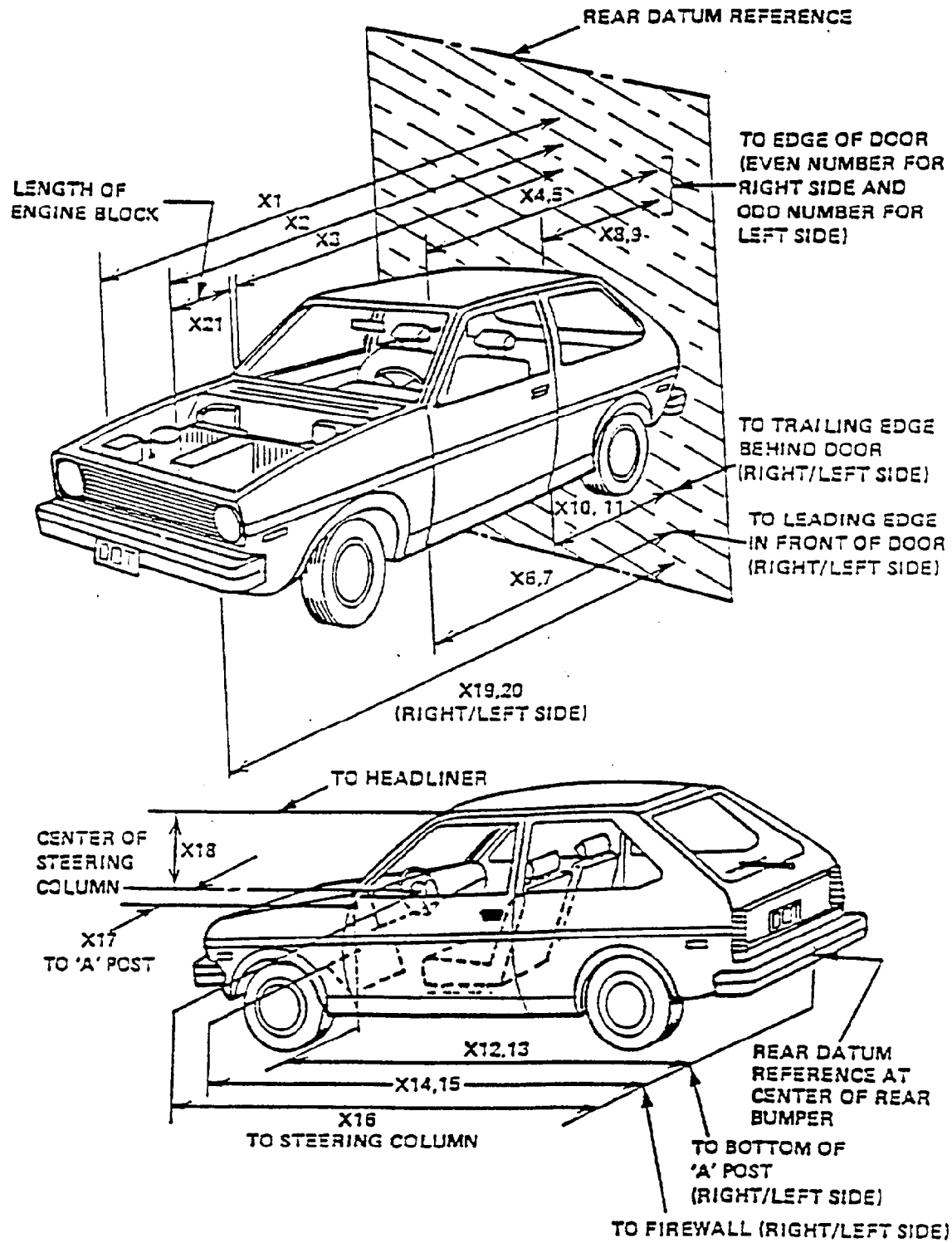
ACCELEROMET	ACCELEROMETER	DIRECTIO
1 and 8	Left Rear Seat Crossmember	X
2 and 9	Right Rear Seat Crossmember	X
3	Top of Engine	X
4	Bottom of Engine	X
5	Right Side Brake Caliper	X
6	Instrument Panel	X
7	Left Disc Brake Caliper	X

* The accelerometer pack number can be correlated with the vehicle response data traces in Appendix B.

TEST VEHICLE MEASUREMENTS

No.	MEASUREMENT DESCRIPTION:	Pre-Test (mm)	Post-Test (mm)	Diff. (mm)
X1	Total Length of Test Vehicle at Centerline	4534	3997	537
X2	Rear Surface of Vehicle to Front of Engine	4037	3777	260
X3	Rear Surface of Vehicle to Firewall	3341	3197	144
X4	Rear Surface to Upr. Leading Edge of Rt. Door	3047	3041	6
X5	Rear Surface to Upr. Leading Edge of Left Door	3045	3035	10
X6	Rear Surface to Lwr. Leading Edge of Rt. Door	3034	3027	7
X7	Rear Surface to Lwr. Leading Edge of Left Door	3030	3030	0
X8	Rear Surface to Upr. Trailing Edge of Rt. Door	1923	1929	-6
X9	Rear Surface to Upr. Trailing Edge of Left Door	1921	1911	10
X10	Rear Surface to Lwr. Trailing Edge of Rt. Door	1923	1924	-1
X11	Rear Surface to Lwr. Trailing Edge of Left Door	1921	1919	2
X12	Rear Surface to Bottom of 'A' Post on Rt. Side	3041	3037	4
X13	Rear Surface to Bottom of 'A' Post on Left Side	3036	3034	2
X14	Rear Surface to Firewall on Right Side	3306	3248	58
X15	Rear Surface to Firewall on Left Side	3285	3262	23
X16	Rear Surface to Steering Column	2568	2532	36
X17	Center of Steering Column to 'A' Post	415	411	4
X18	Center of Steering Column to Headlining	468	403	65
X19	Rear Surface to Right Side of Front Bumper	4381	4021	360
X20	Rear Surface to Left Side of Front Bumper	4378	4004	374
X21	Length of Engine Block	417	417	0

TEST VEHICLE MEASUREMENTS



ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: 1995 Nissan/Maxima/4 Door Sedan

VEH. NHTSA NO.: MS5200 ; VIN: JN1CA21D0ST005534

MODEL YEAR: 1995 ; BUILD DATE: 3-94 ; TEST DATE: 8-11-94

VEH. SIZE CATEGORY: Mid Size ; TEST WEIGHT: 1561 kg

VEH. WHEELBASE: 2700 mm ; FRONT OVERHANG: 965 mm ; OVERALL WIDTH: 1770 mm

ACCELEROMETER DATA:

LOCATION: As per measurements on pages 4-12

CALIBRATION PROCEDURE: As per MGA Calibration Procedure

LINEARITY: >99.9% ; INTEGRATION ALGORITHM: Trapezoidal

VEH. IMPACT SPEED: 56.6 kph ; TIME OF SEPARATION: 78 msec

VELOCITY CHANGE: 65.9 kph

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (Frontal)

CRUSH DEPTH
DIMENSIONS:

C1 = 374 mm

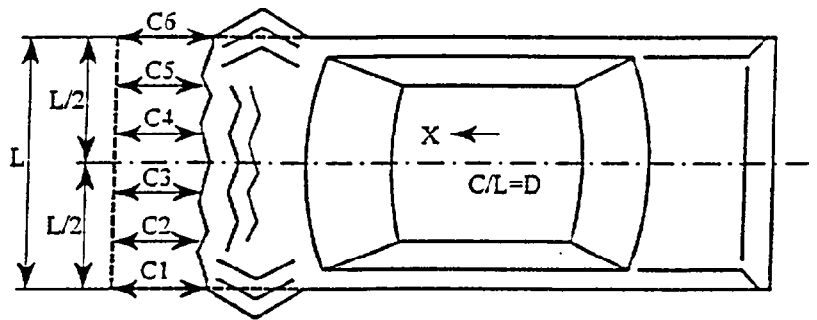
C2 = 461 mm

C3 = 533 mm

C4 = 534 mm

C5 = 502 mm

C6 = 360 mm



MIDPOINT OF
DAMAGE: D = Vehicle Centerline
(Longitude)

LENGTH OF
DAMAGED REGION: L = 1465 mm

APPENDIX A
PHOTOGRAPHS

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Photo No. A-1 - Pre-Test Front View of Test Vehicle

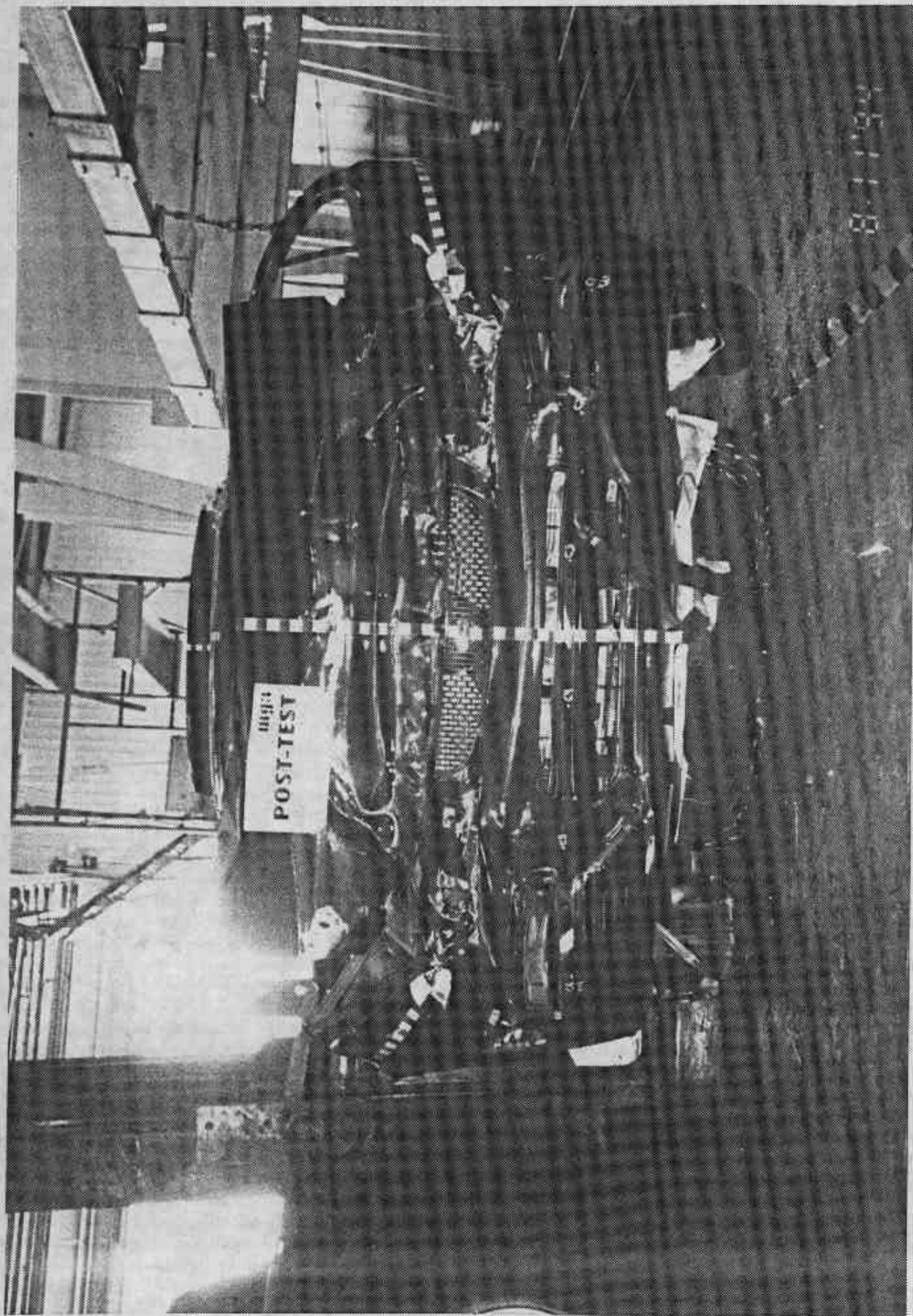


Photo No. A-2 - Post-Test Front View of Test Vehicle

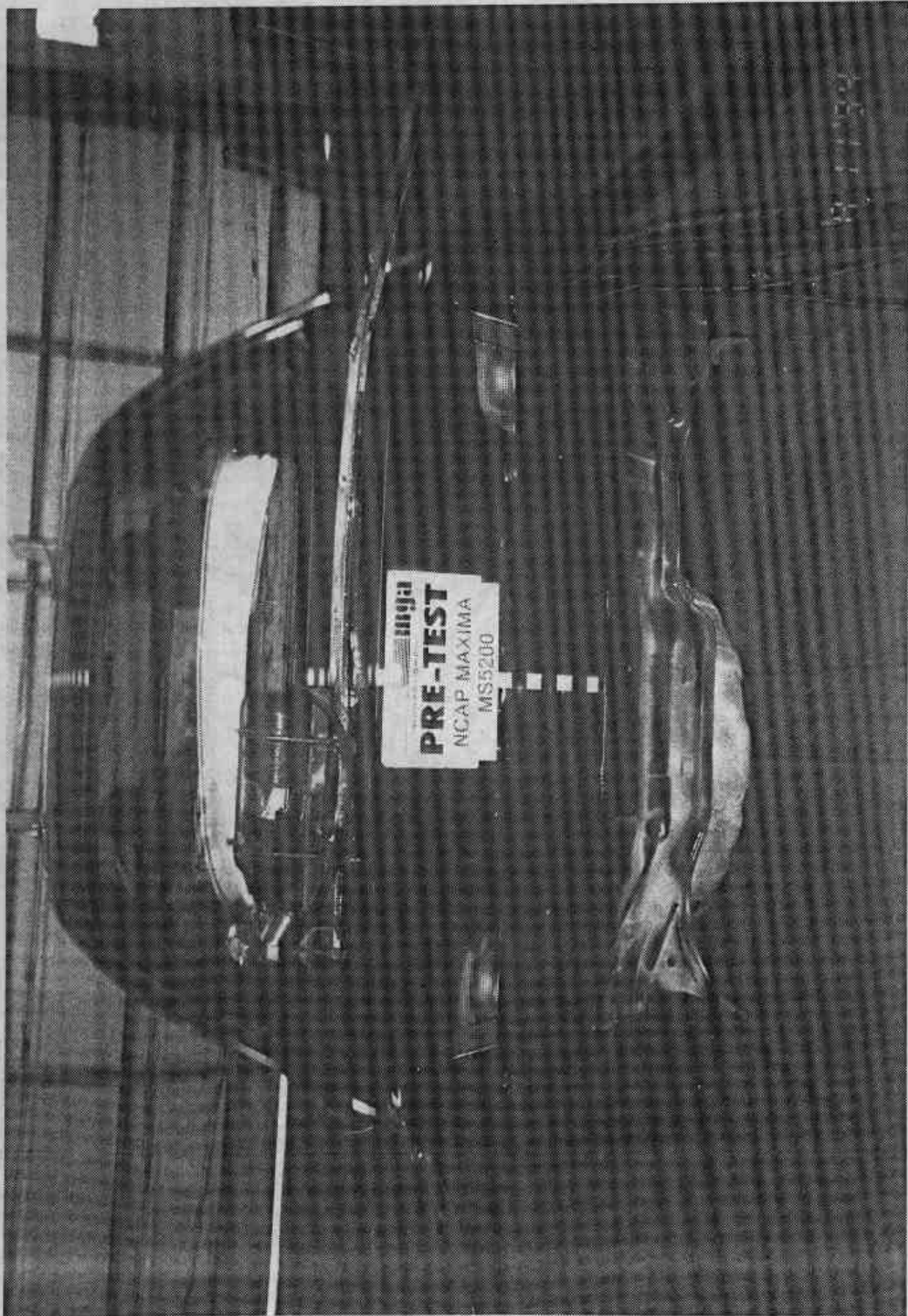


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

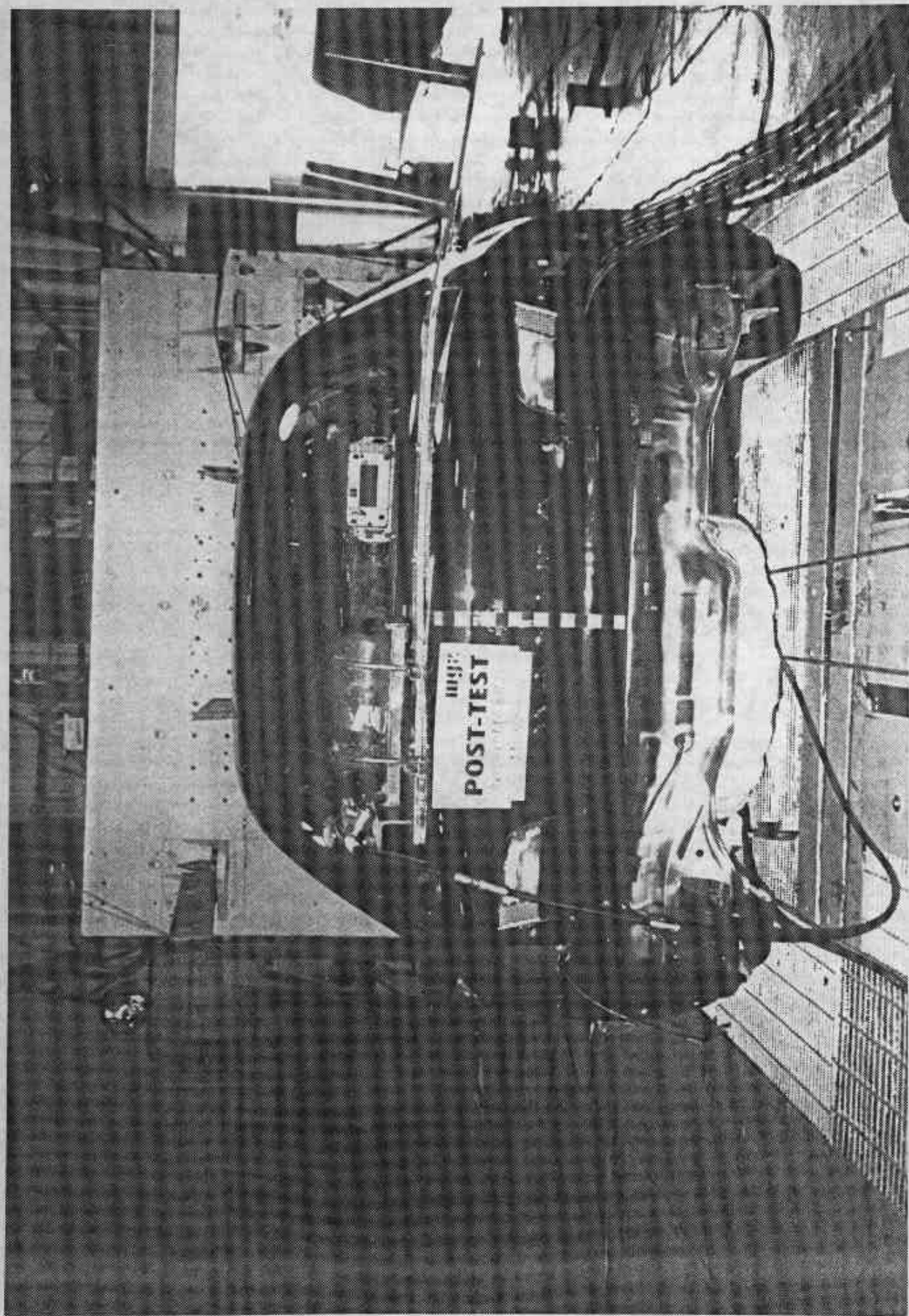


Photo No. A-4 - Post-Test Rear View of Test Vehicle

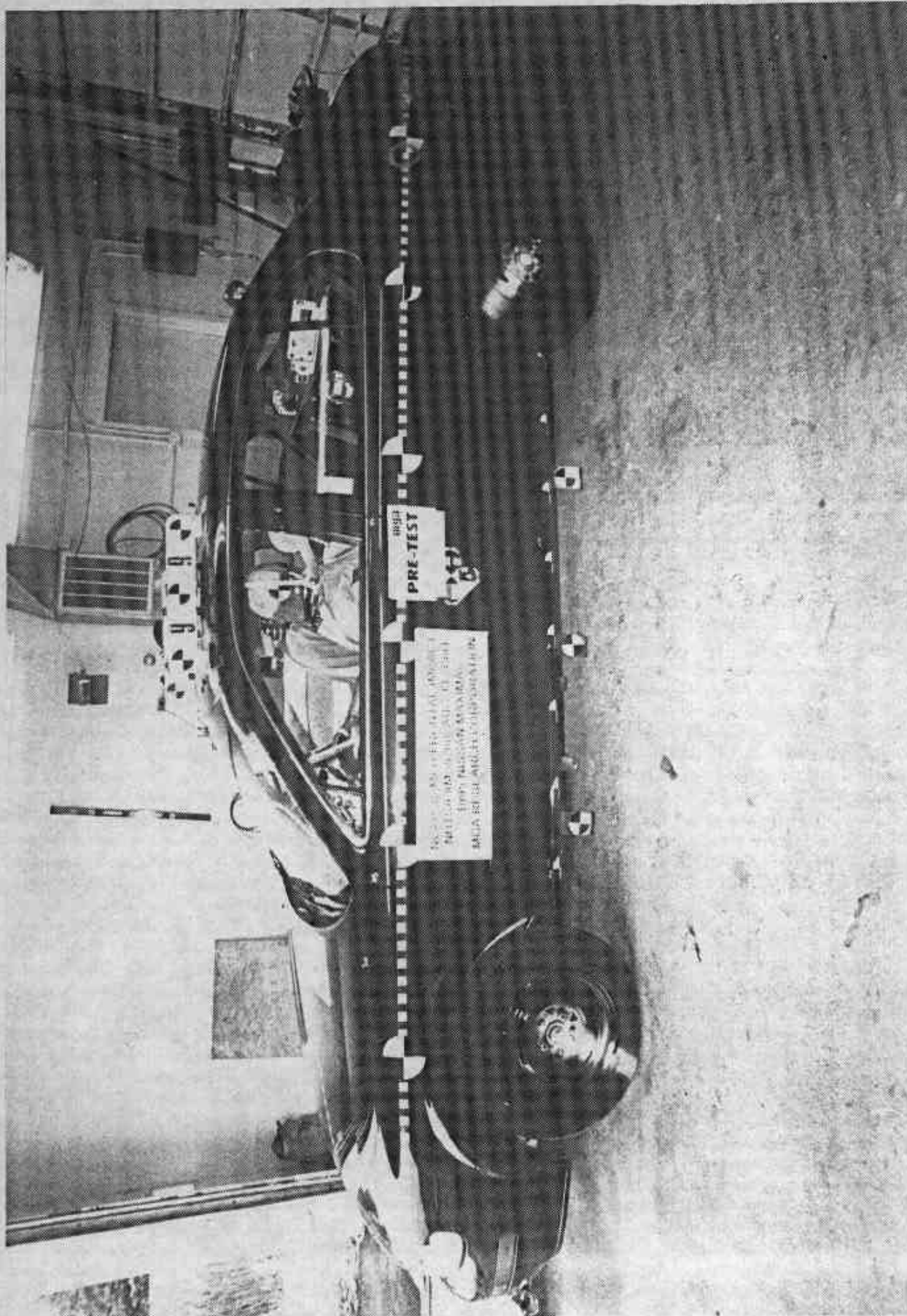


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

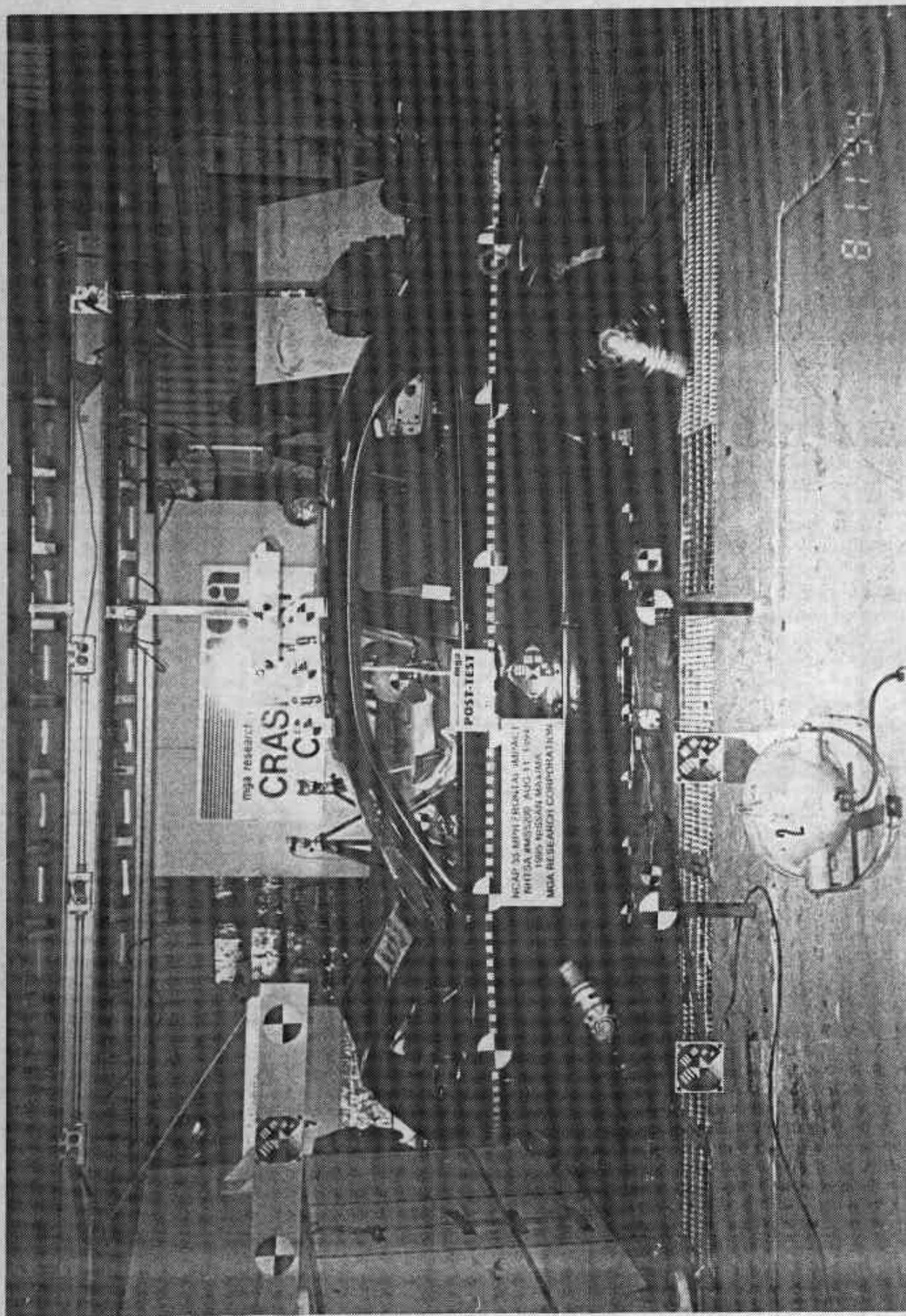


Photo No. A-6 - Post-Test Left Side View of Test Vehicle



A-7

Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

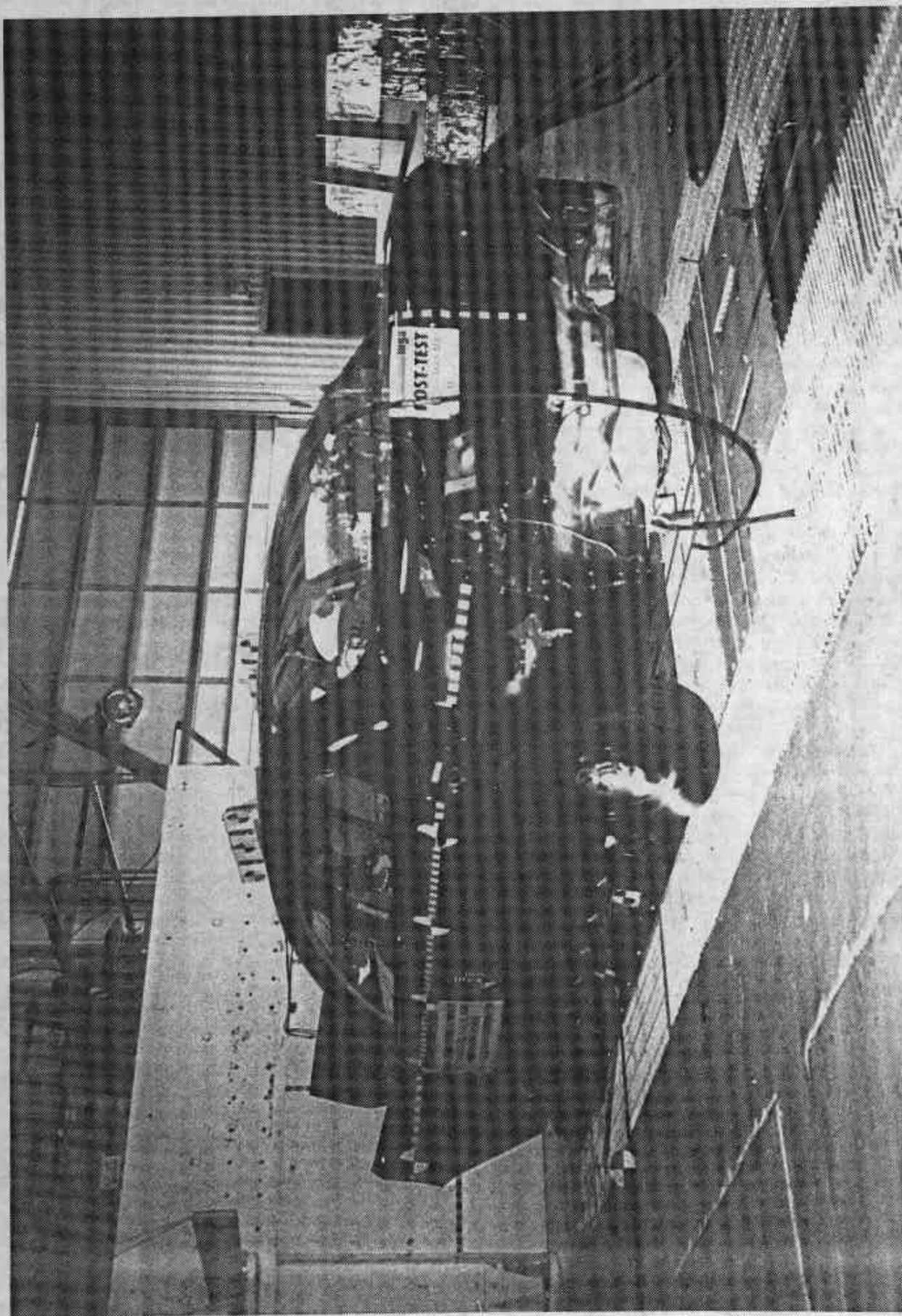


Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle

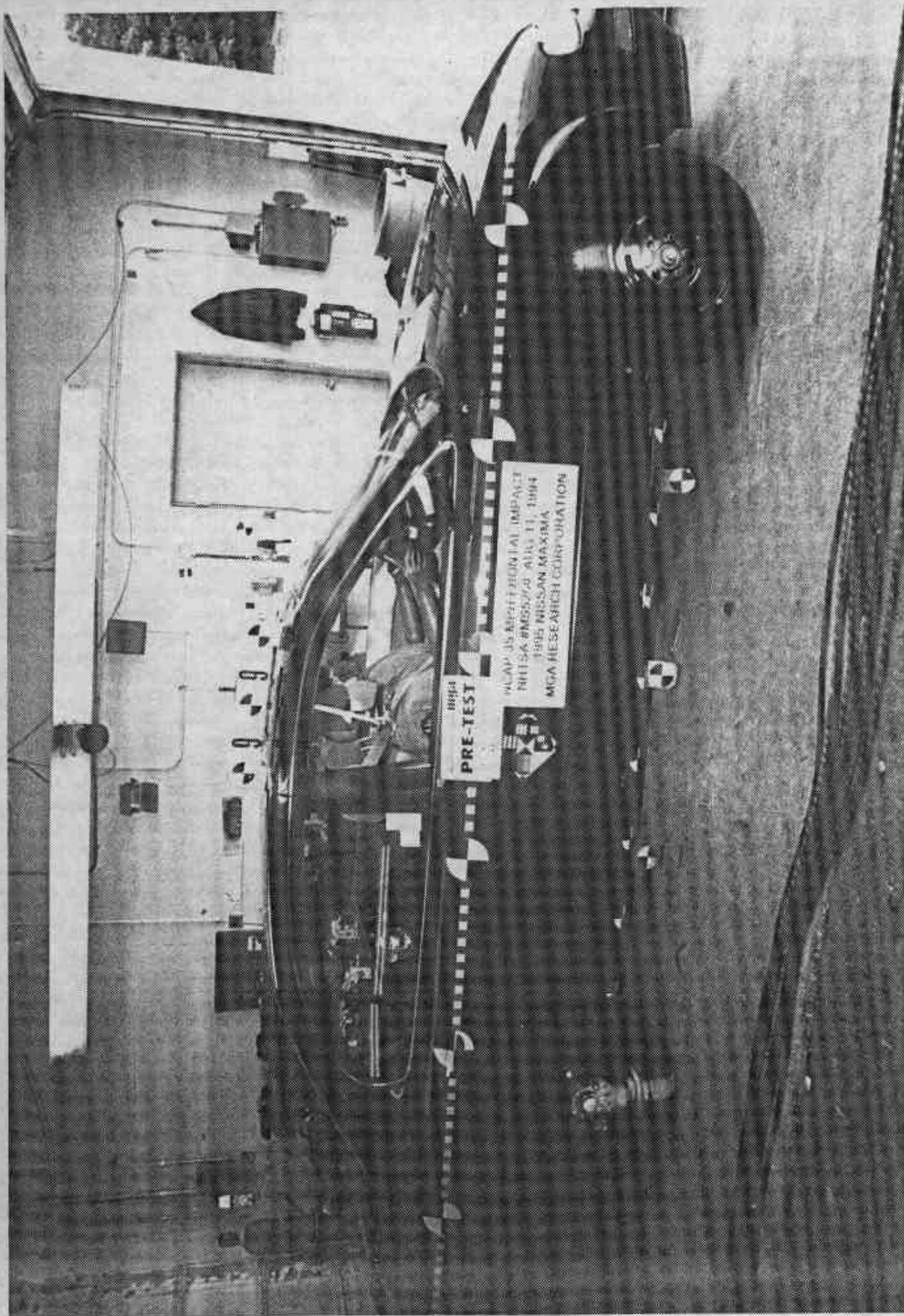


Photo No. A-9 - Pre-Test Right Side View of Test Vehicle

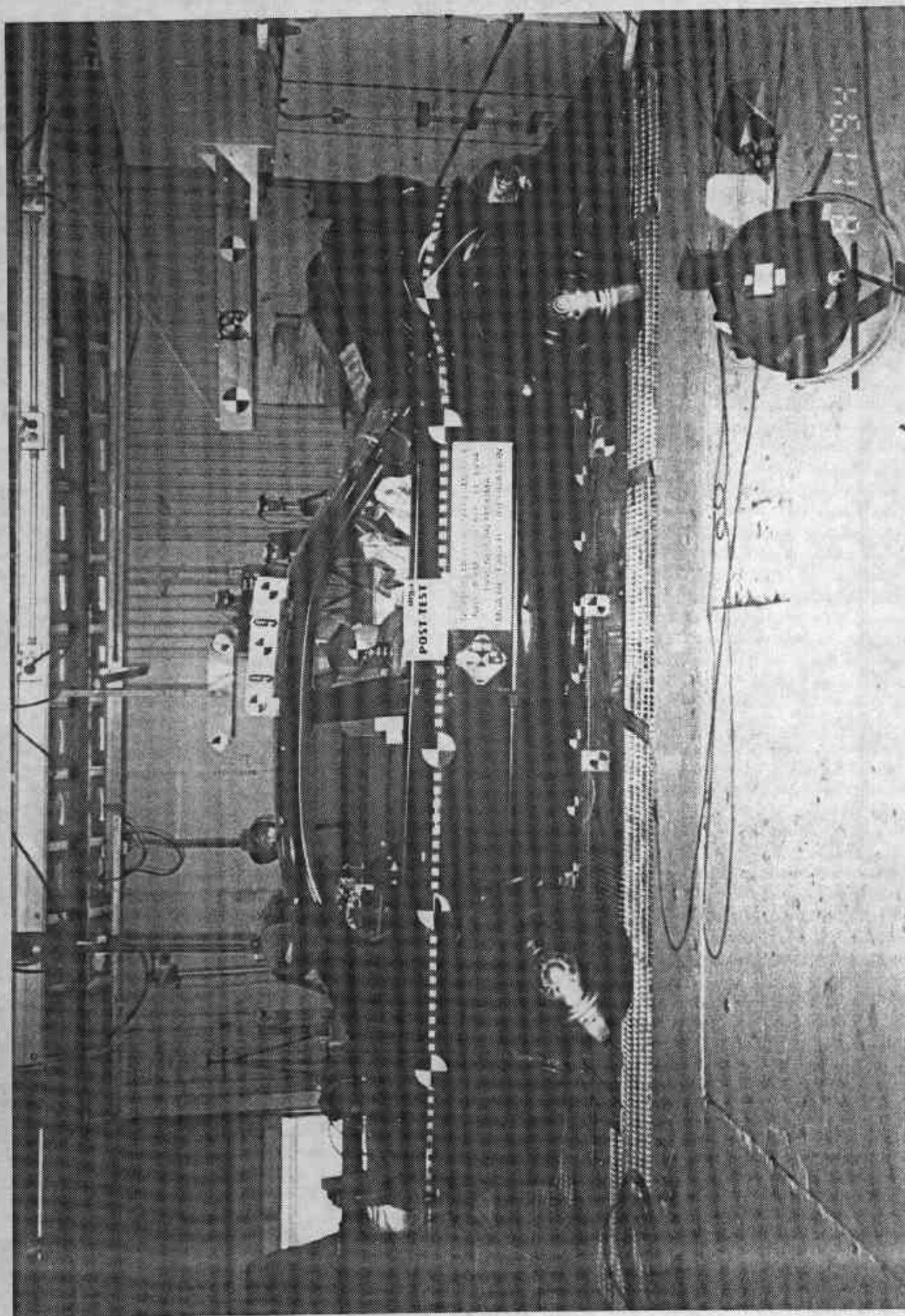


Photo No. A-10 - Post-Test Right Side View of Test Vehicle

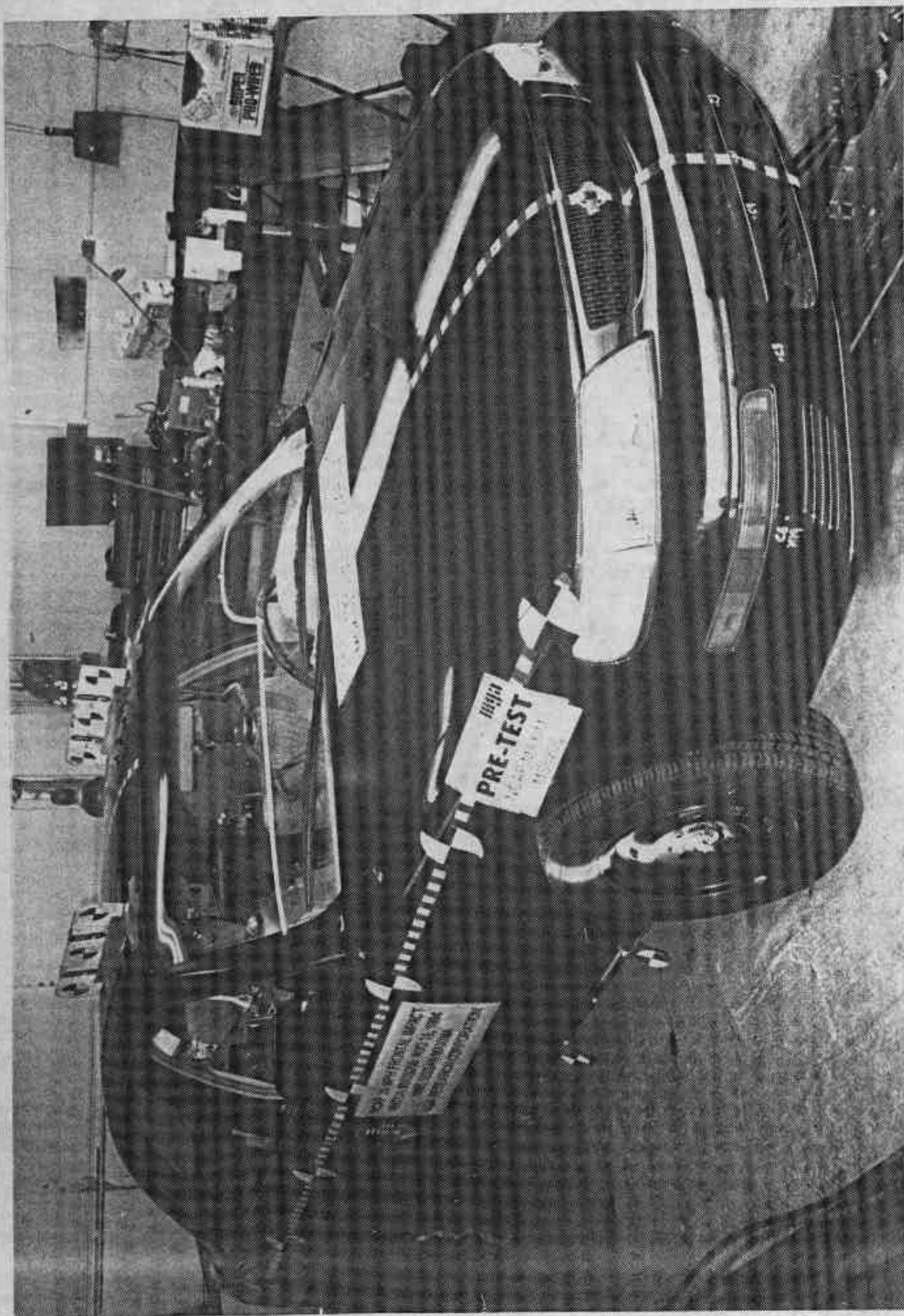


Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle

A-11

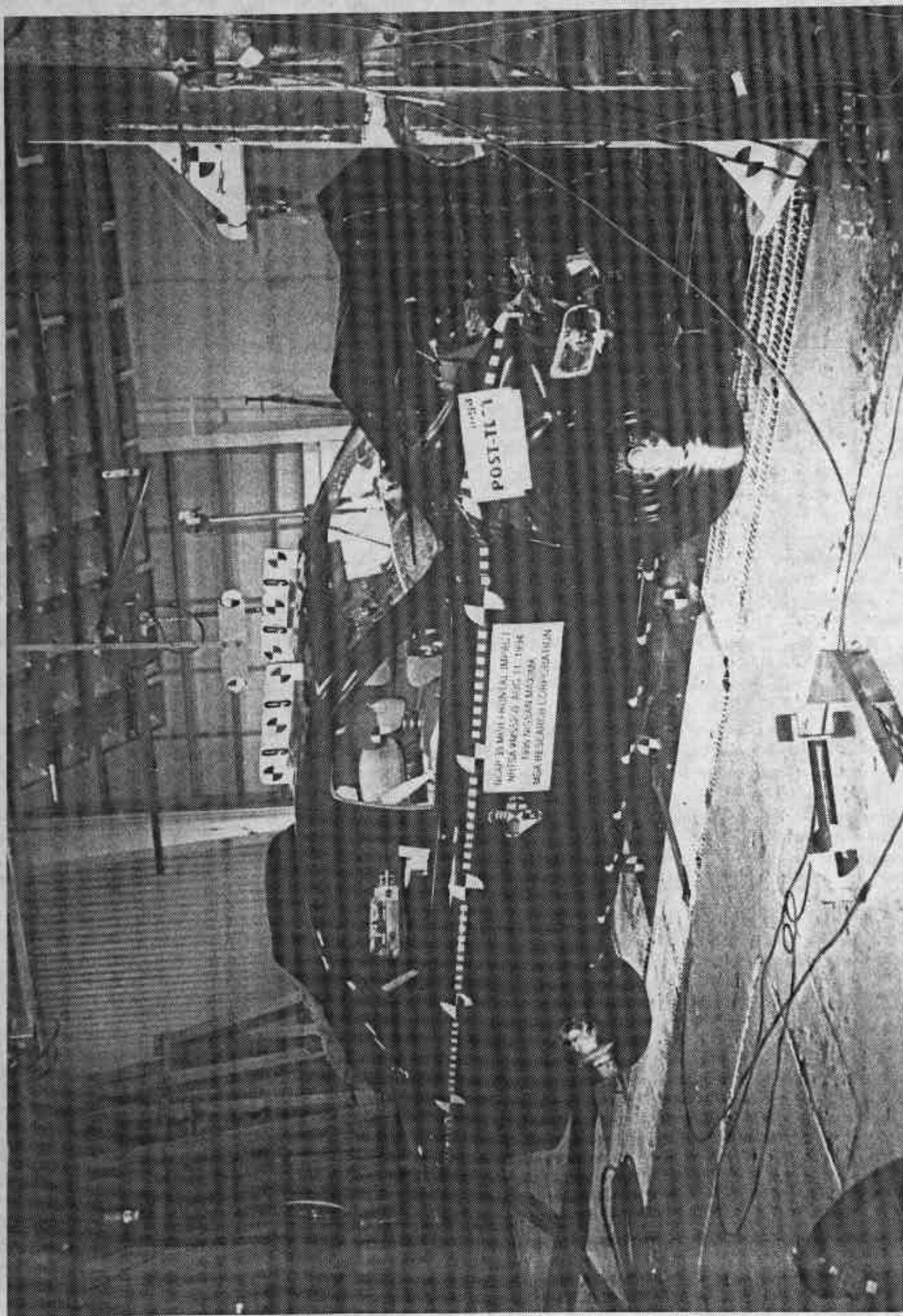


Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle

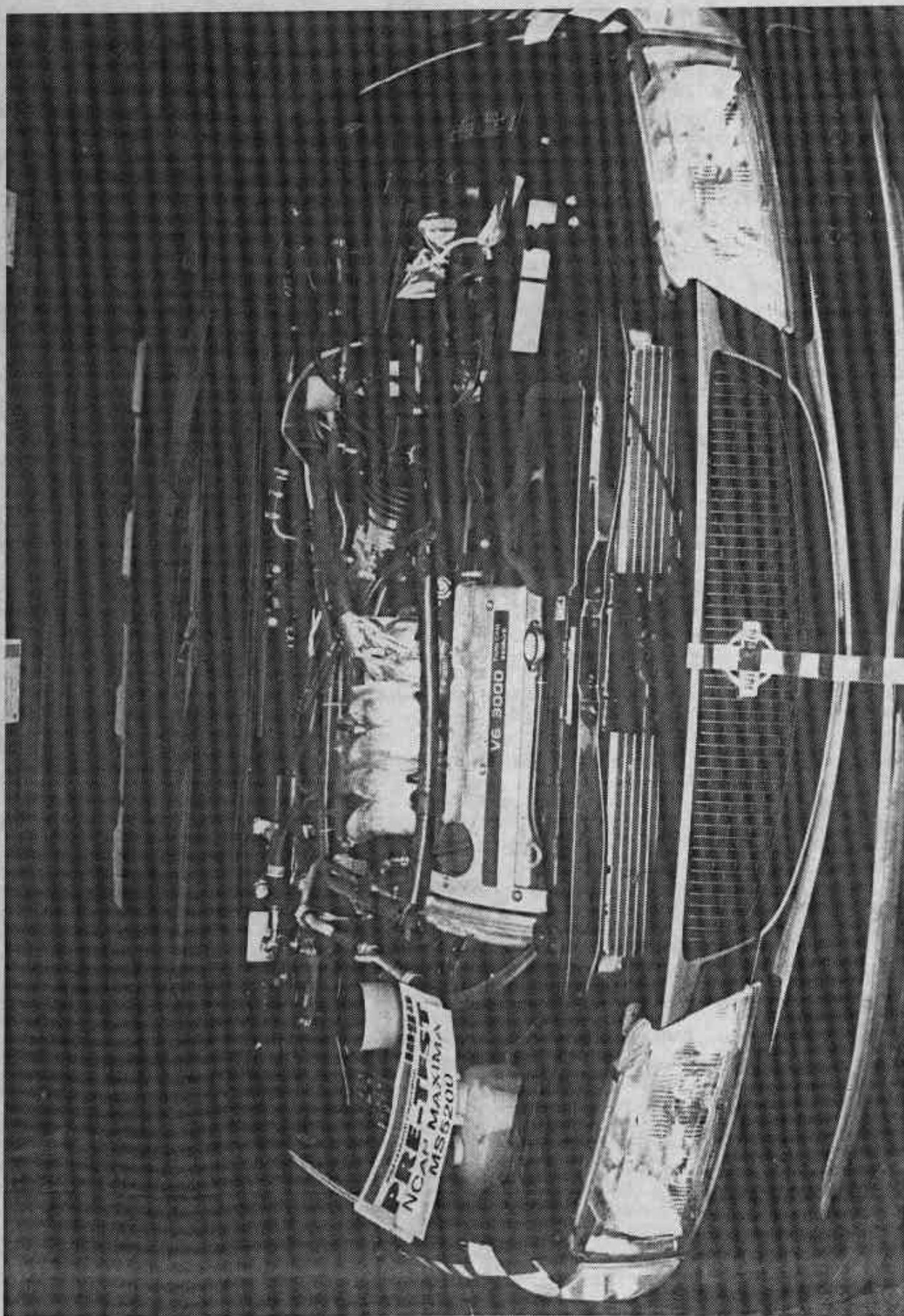


Photo No. A-13 - Pre-Test Engine Compartment View

A-13

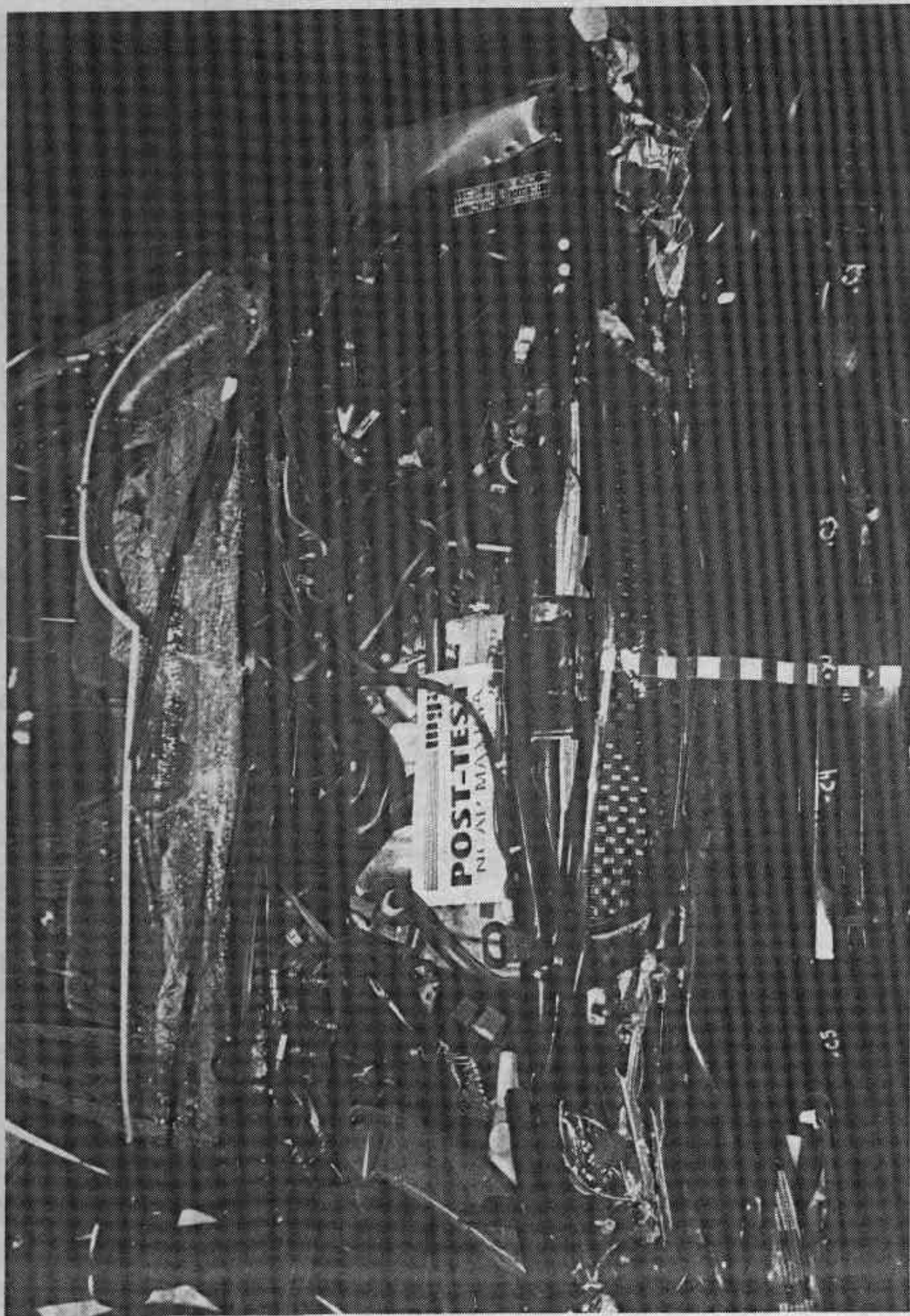
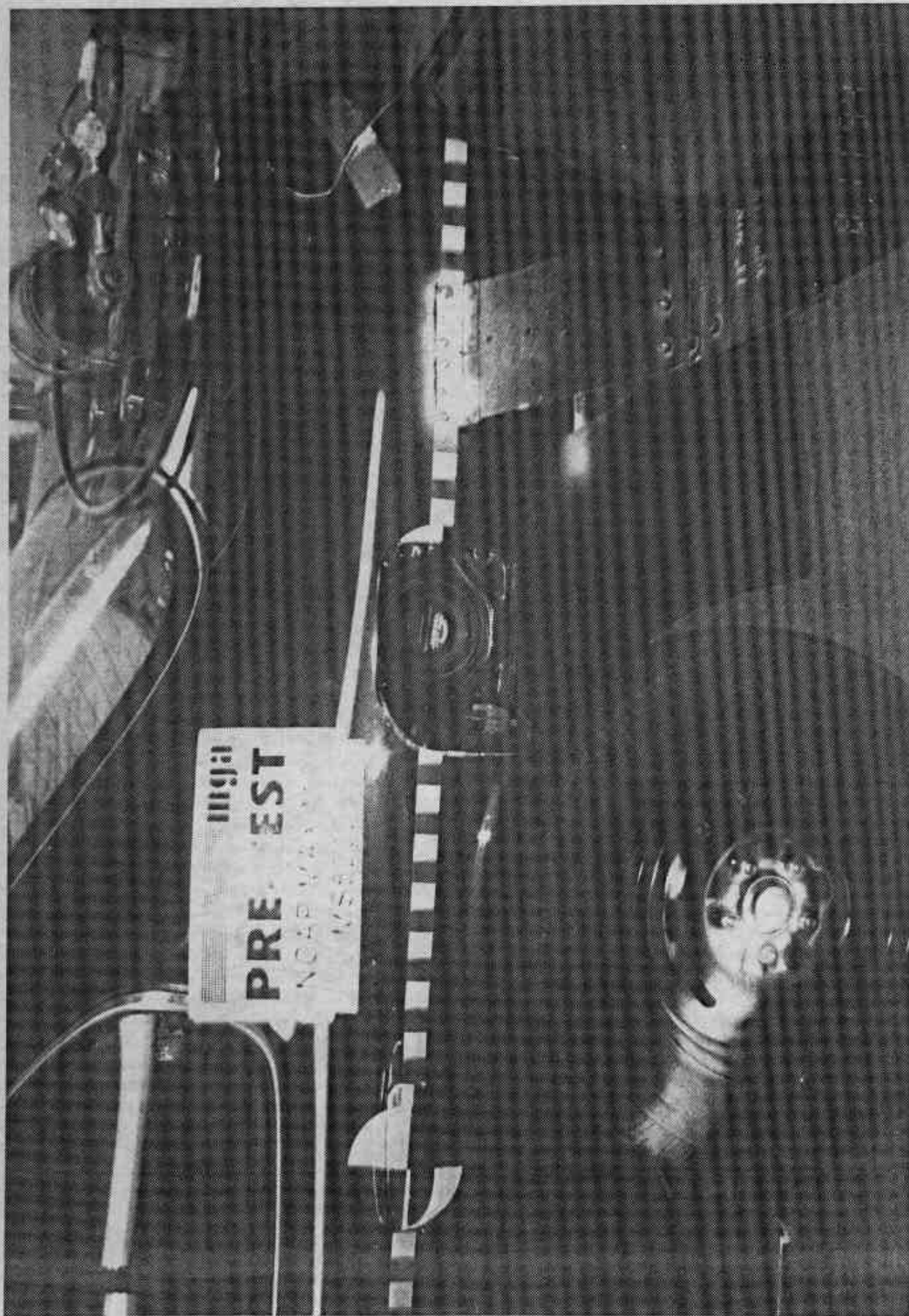


Photo No. A-14 - Post-Test Engine Compartment View

A-14



A-15

Photo No. A-15 - Pre-Test Fuel Filler Cap View

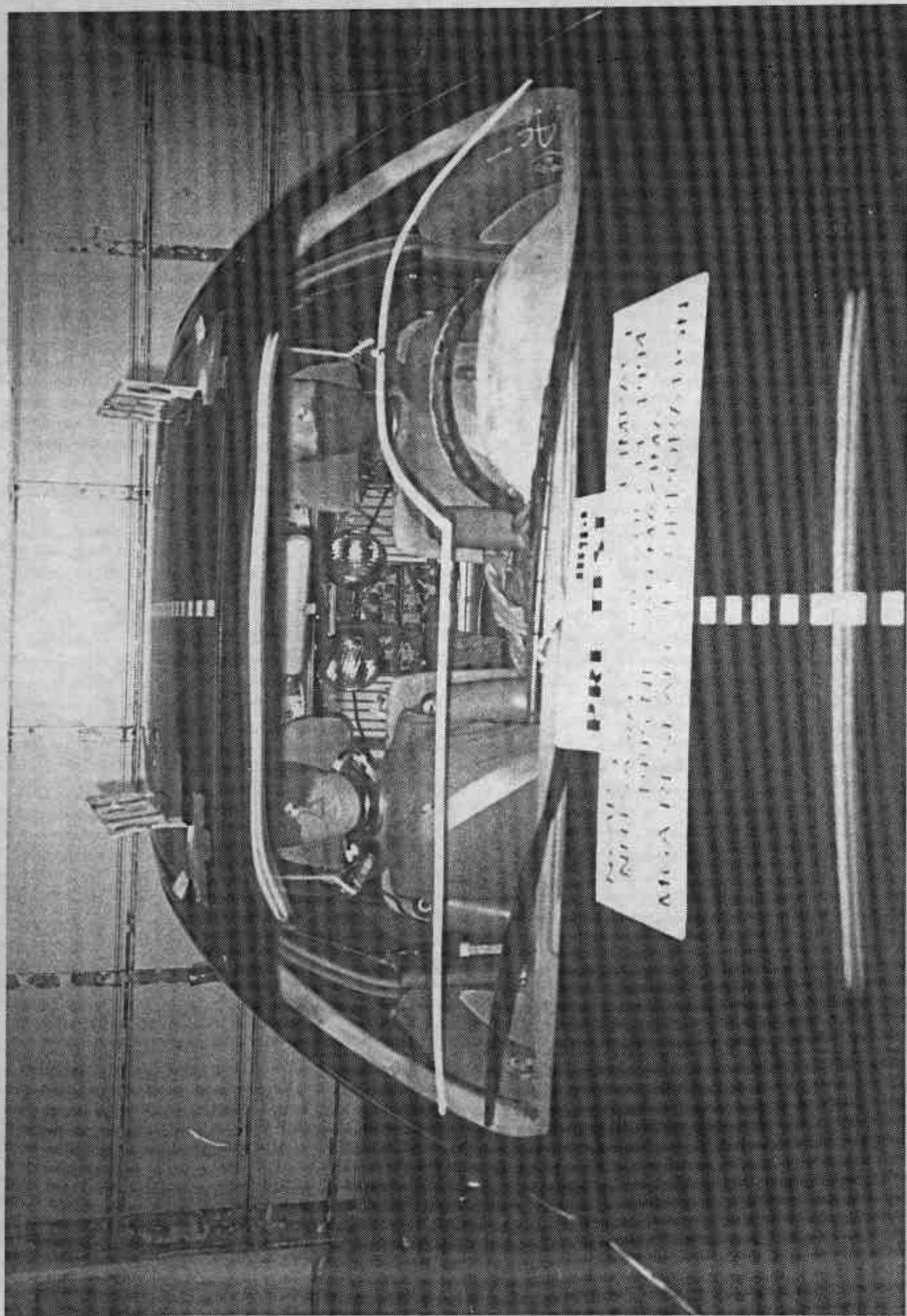
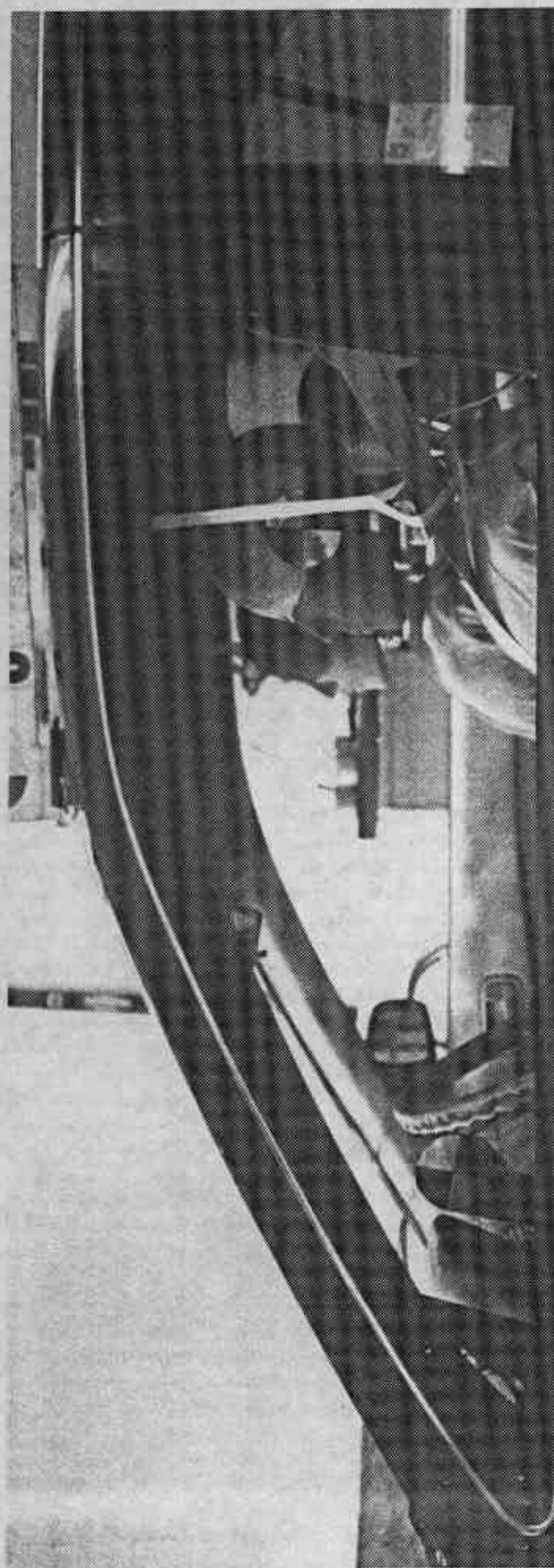


Photo No. A-16 - Pre-Test Windshield View

A-16



Photo No. A-17 - Post-Test Windshield View



ingia
ingia
PRE-TEST
NCAP MAXIMA
MS5200

NCAP 35 MPH FRONTAL IMPACT
NHTSA #MS5200 AUG 11, 1994
1995 NISSAN MAXIMA
INGA RESEARCH CORPORATION

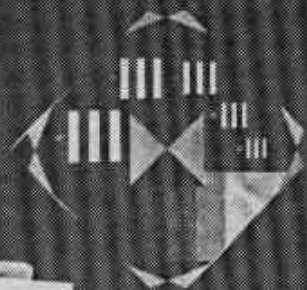


Photo No. A-18 - Pre-Test Driver Dummy Position Left Side View



MPH FRONTAL IMPACT

Photo No. A-19 - Post-Test Driver Dummy Position Left Side View

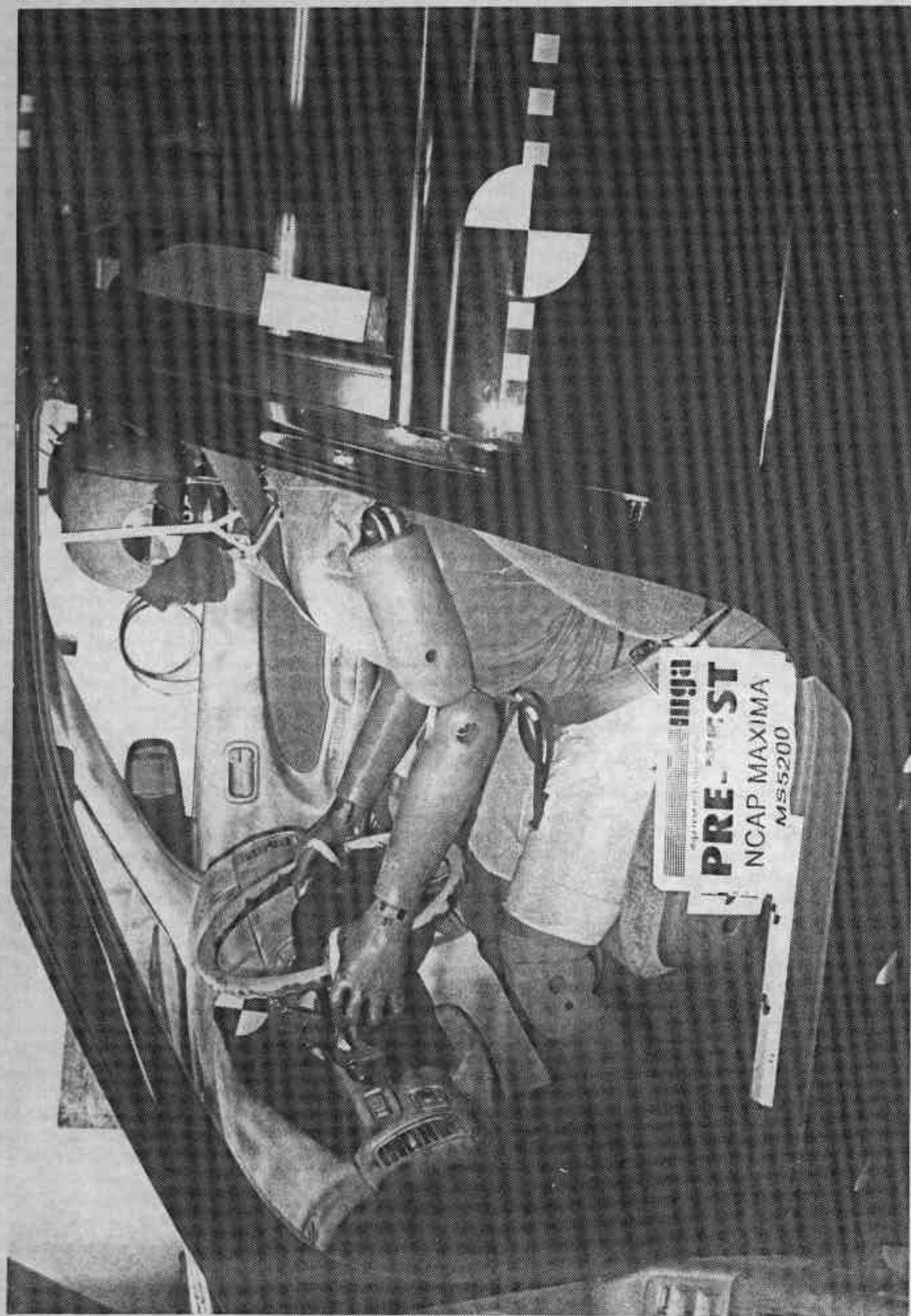


Photo No. A-20 - Pre-Test Driver Dummy Position Left Side View
(Door Open)



Photo No. A-21 - Post-Test Driver Dummy Position Left Side View
(Door Open)

A-21



Photo No. A-22 - Pre-Test Driver Seat Position View



Photo No. A-23 - Post-Test Driver Seat Position View



Photo No. A-24 - Post-Test Driver Dummy Knee Position



Photo No. A-25 - Post-Test Driver Dummy Knee Contact Marks



Photo No. A-26 - Post-Test Driver Airbag Contact Marks

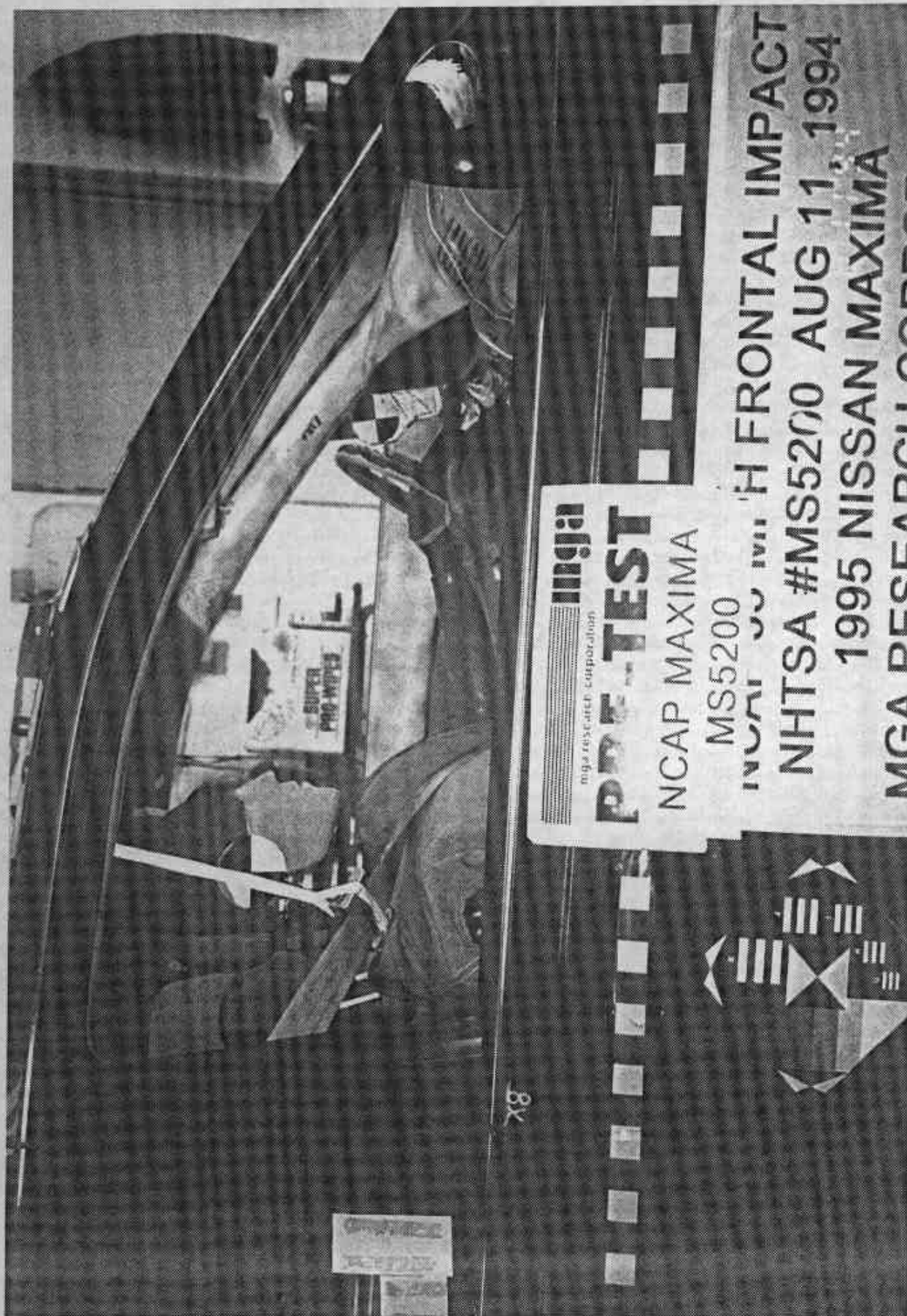


Photo No. A-27 - Pre-Test Passenger Dummy Position Right Side View

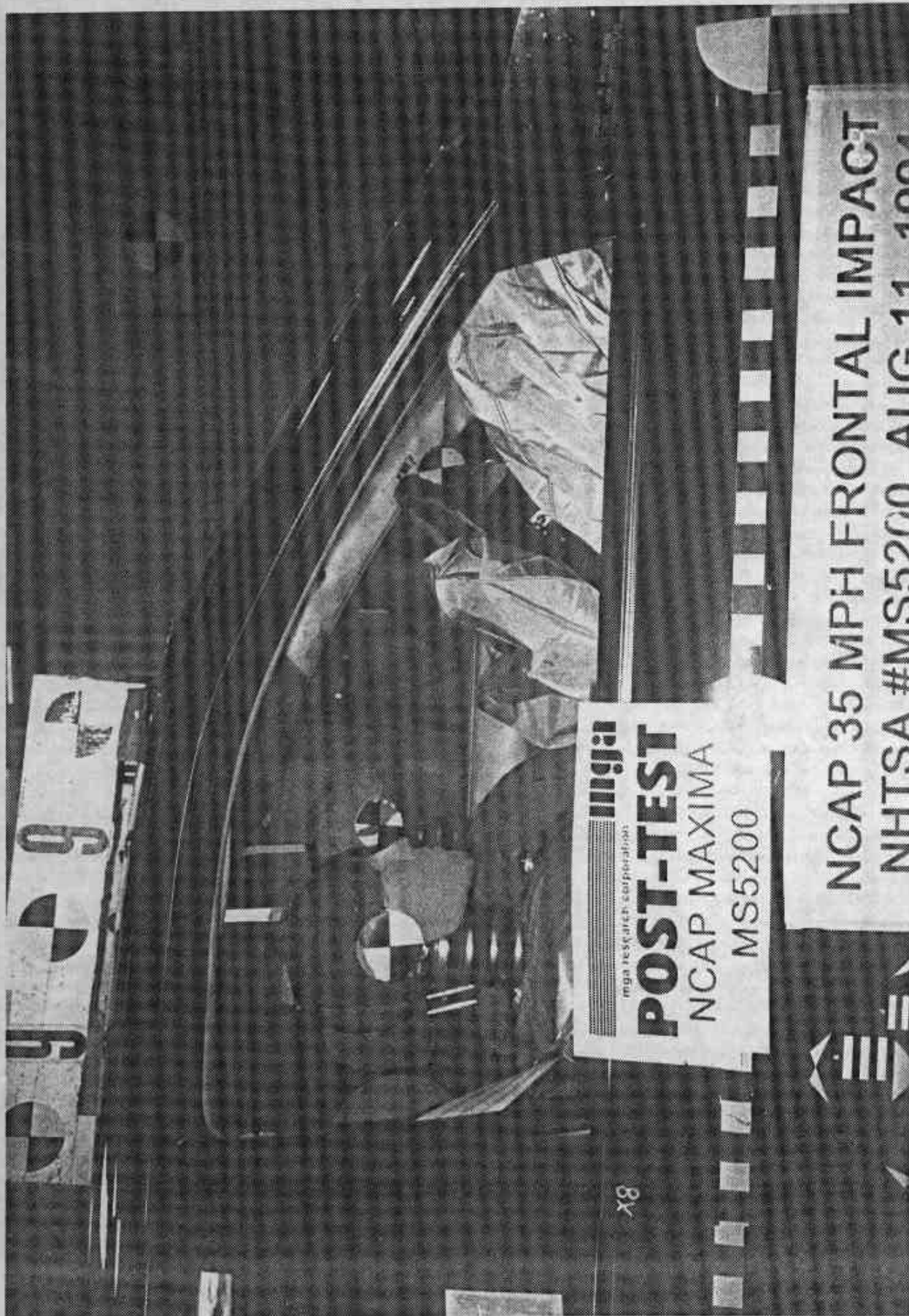


Photo No. A-28 - Post-Test Passenger Dummy Position Right Side View



Photo No. A-29 - Pre-Test Passenger Dummy Position Right Side View (Door Open)

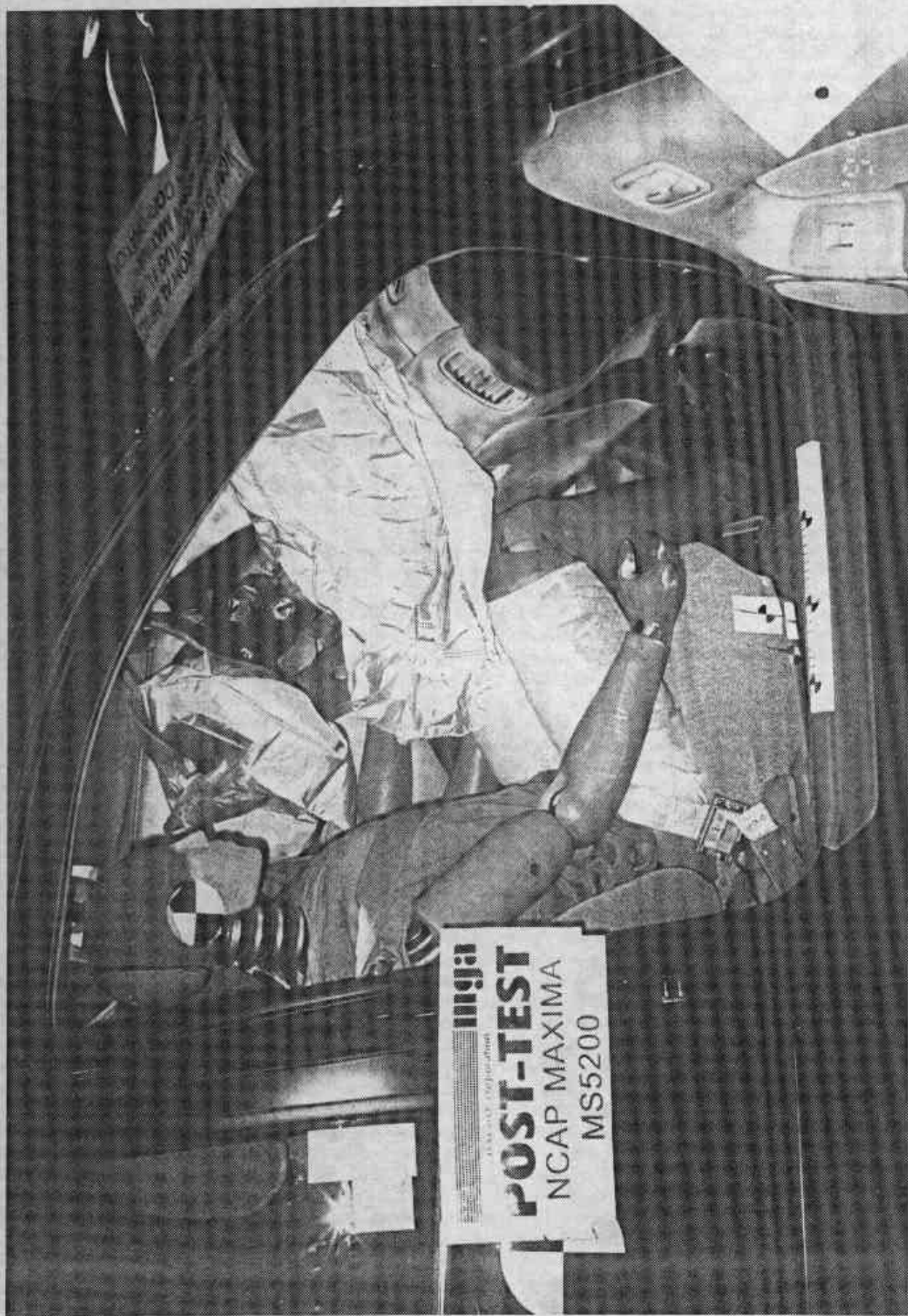


Photo No. A-30 - Post-Test Passenger Dummy Position Right Side View (Door Open)



Photo No. A-31 - Pre-Test Passenger Seat Position View



Photo No. A-32 - Post-Test Passenger Seat Position View

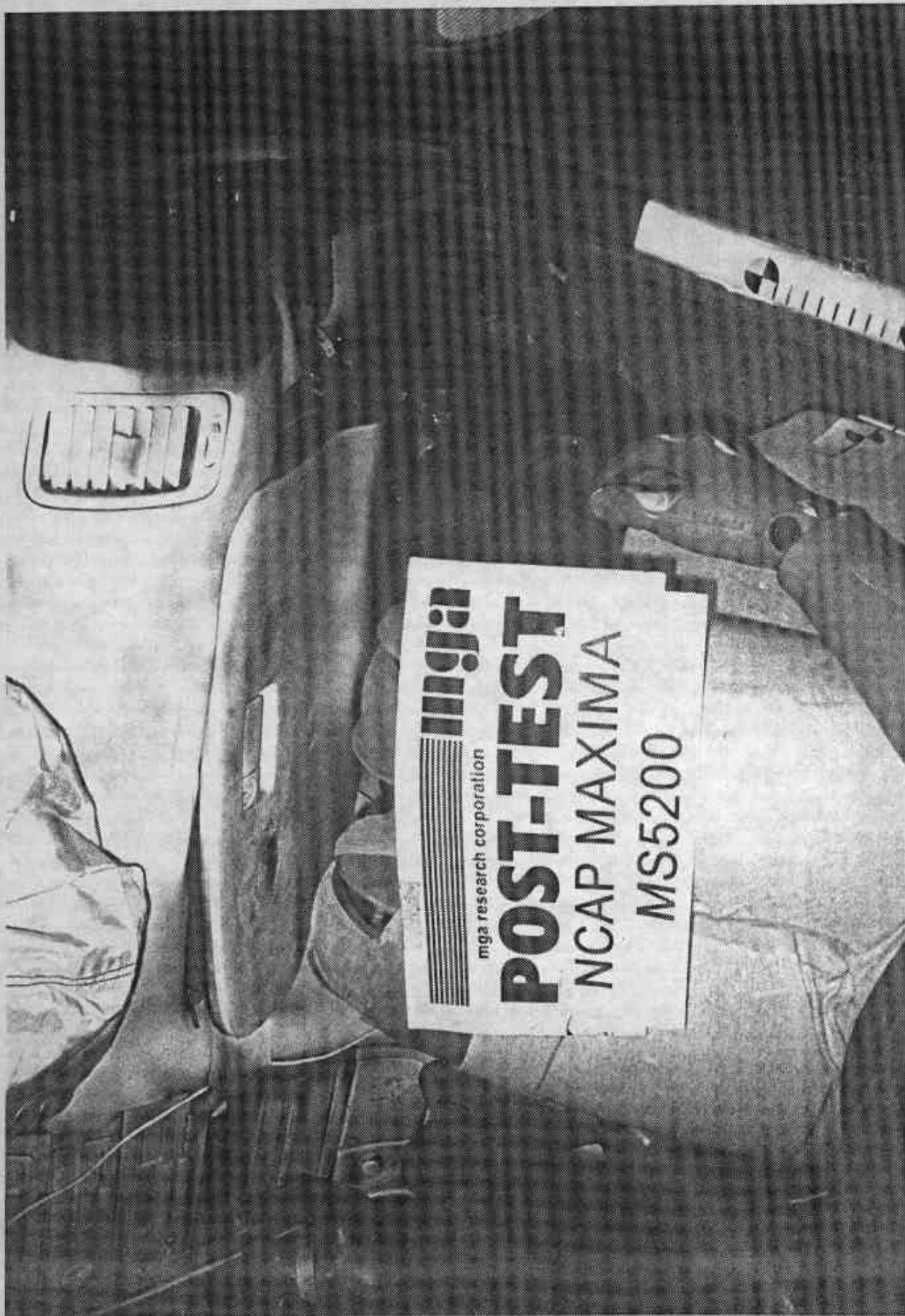


Photo No. A-33 - Post-Test Passenger Dummy Knee Position



Photo No. A-34 - Post-Test Passenger Dummy Knee Contact

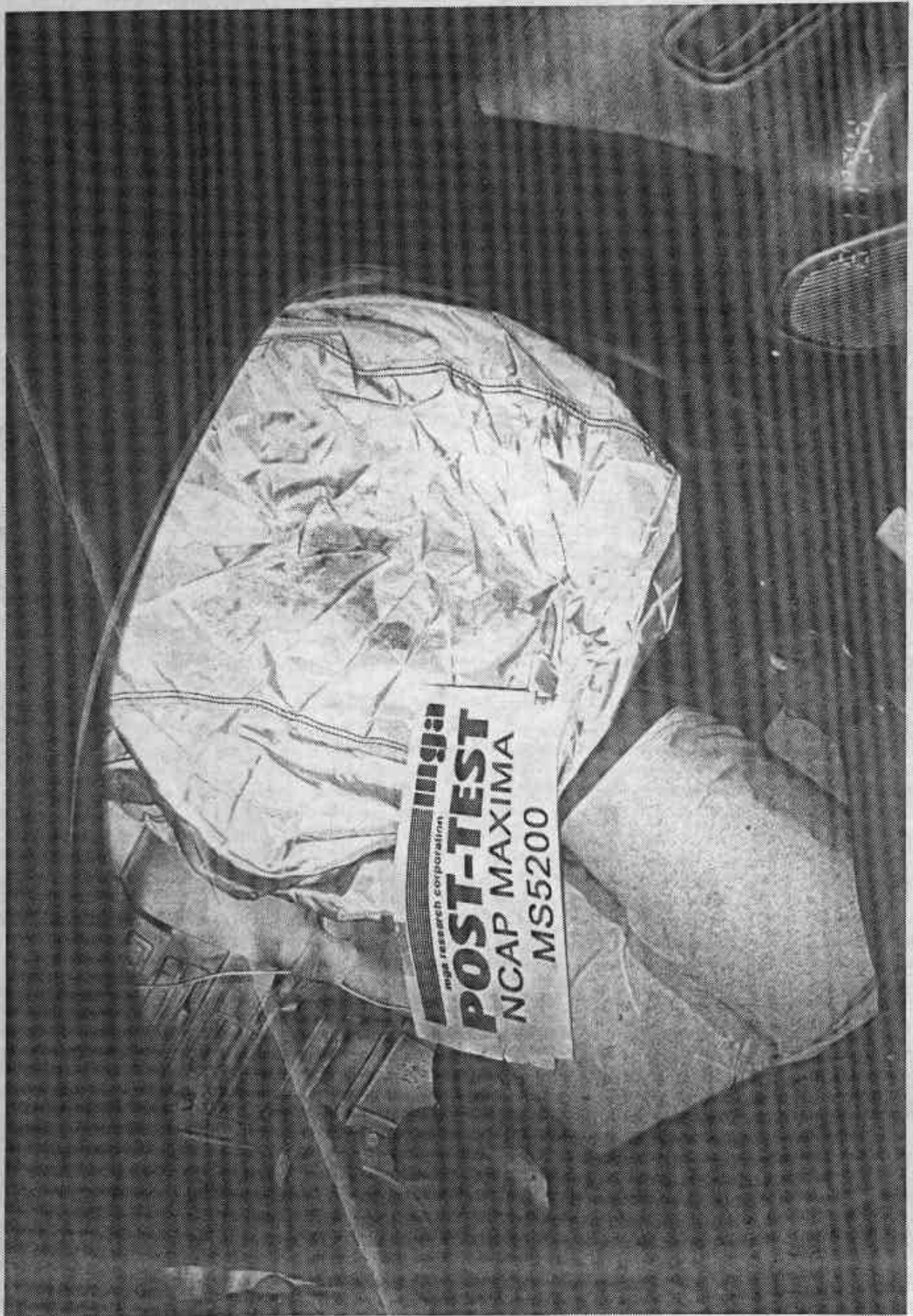
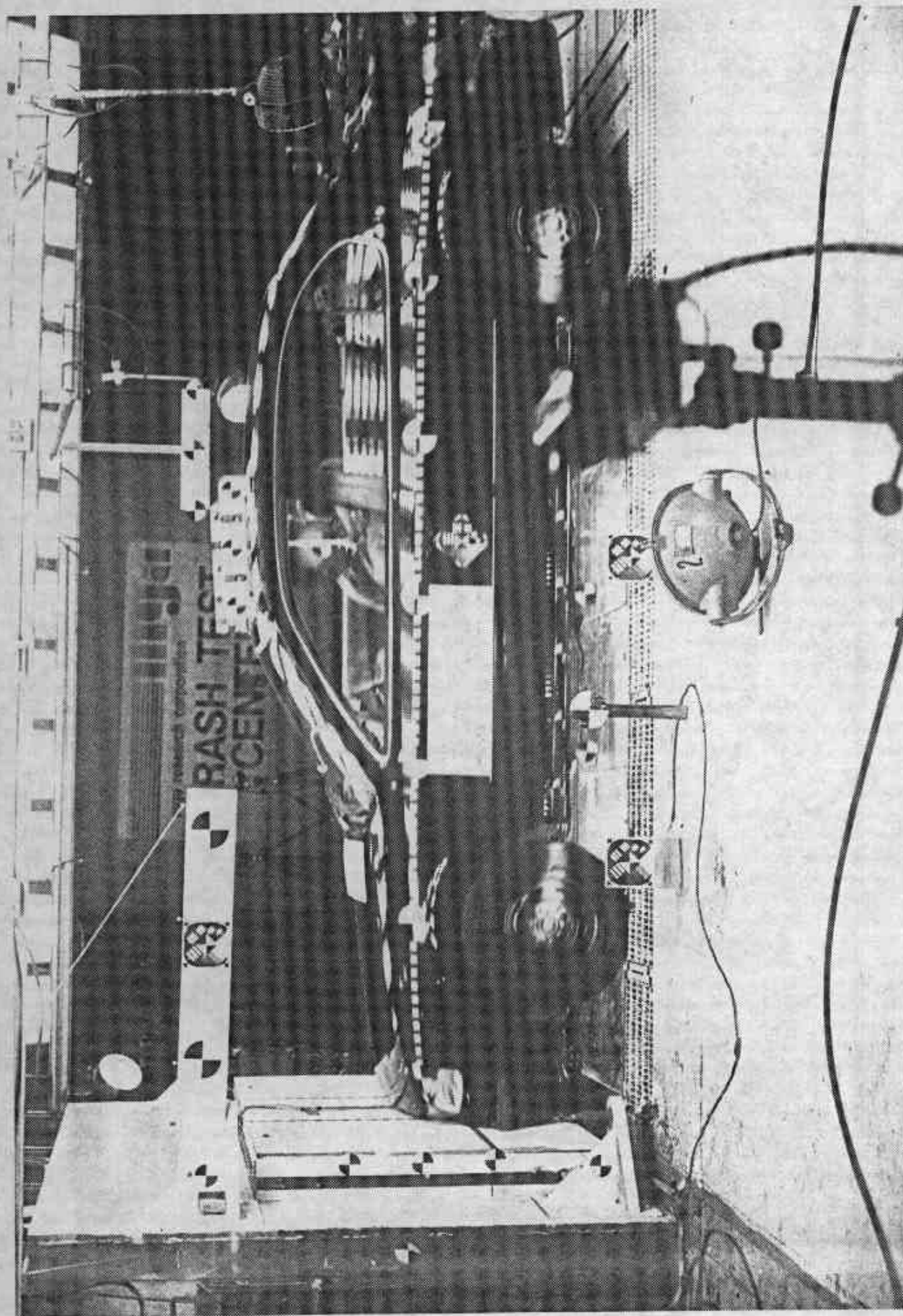


Photo No. A-35 - Post-Test Passenger Airbag Contact



A-36

Photo No. A-36 - Impact

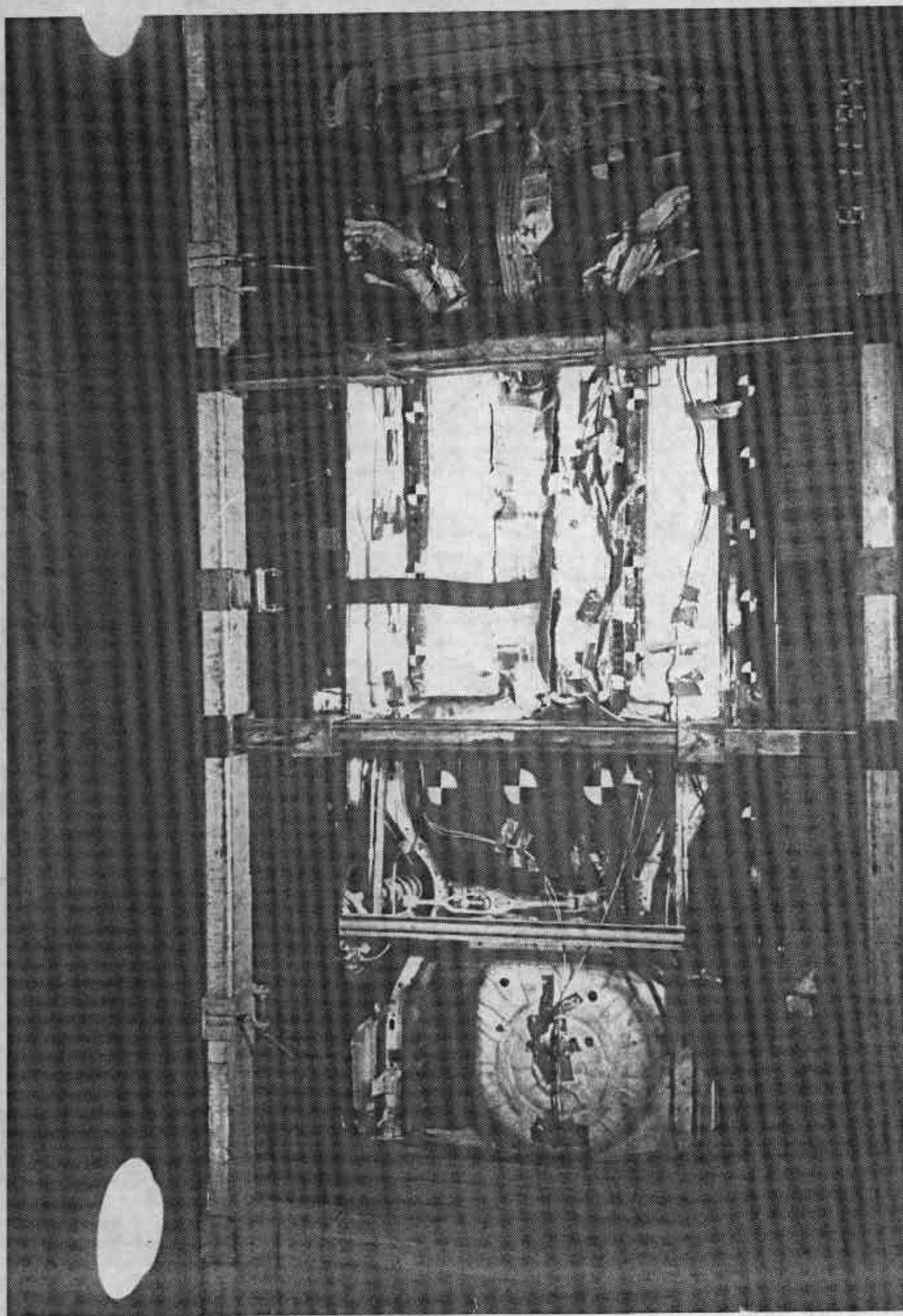


Photo No. A-37 - Rollover 90°

A-37



A-38

Photo No. A-38 - Rollover 180°

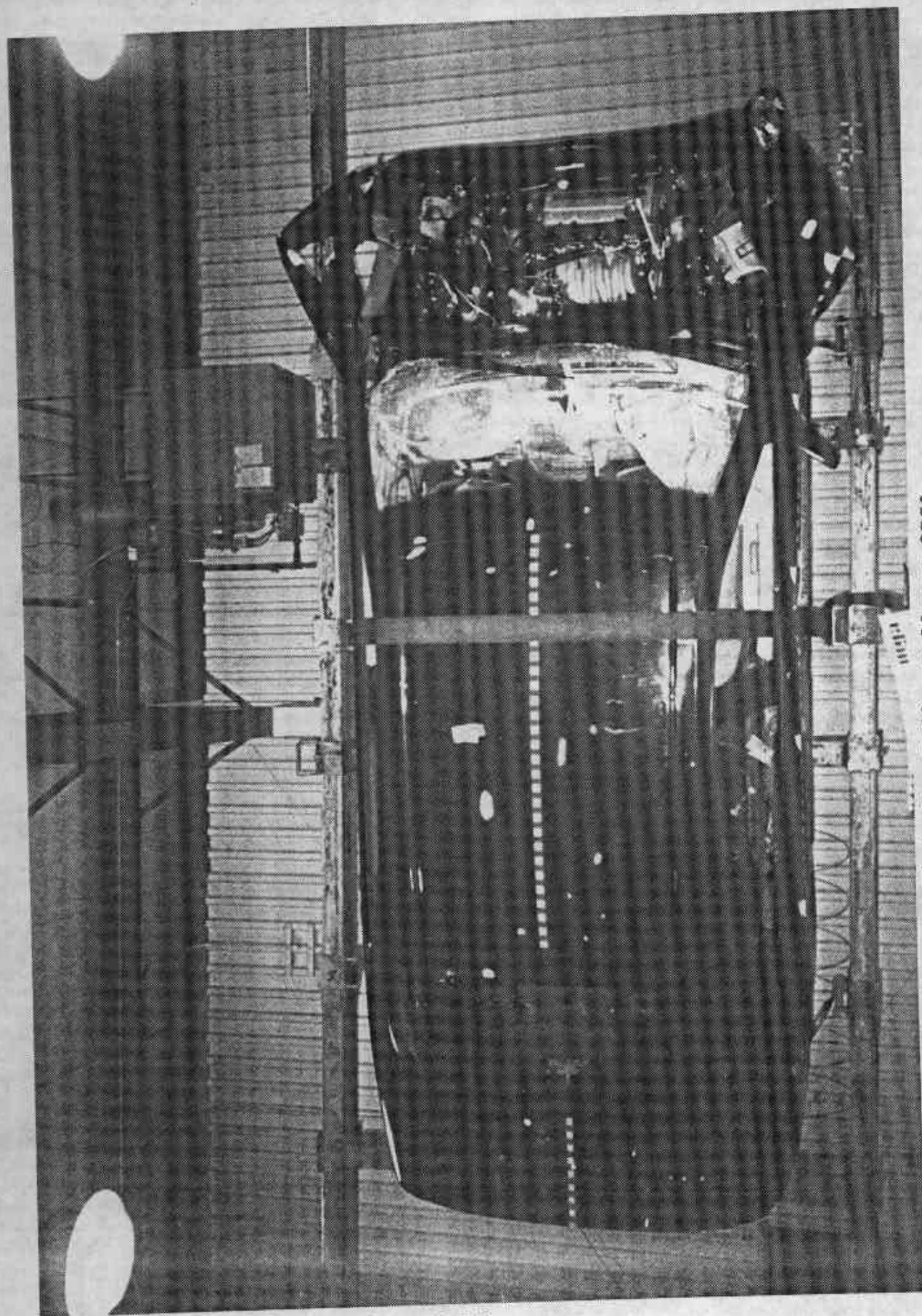


Photo No. A-39 - Rollover 270°

A-39

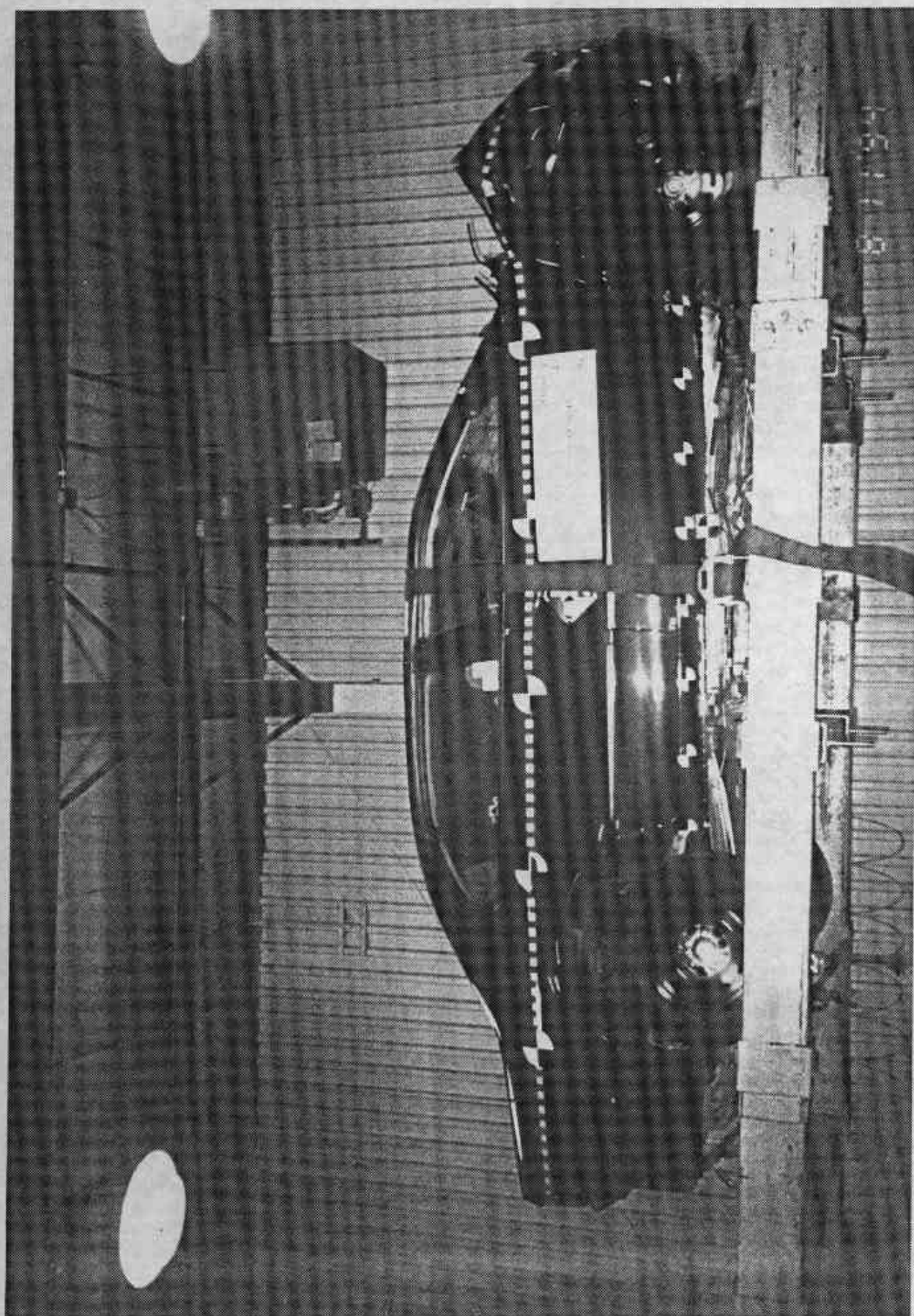


Photo No. A-40 - Rollover 360°

A-40

APPENDIX B

Vehicle, Load Cell Barrier and Dummy Response Data

1995 NISSAN MAXIMA 4-DOOR
NHTSA NO.: MS5200

<u>VEHICLE DATA</u>	<u>FILTER CHANNEL CLASS</u>
Head Accelerations	1000 (1650 Hz)
Chest Accelerometers	180 (300 Hz)
Vehicle Accelerometers	60 (100 Hz)
Barrier Load Cells	60 (100 Hz)
Femur Load Cells	600 (1000 Hz)
Lap and Torso Belts	60 (100 Hz)

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Figure B-22 - Sum of Barrier Forces vs. Time	B-22

<u>Data Plot</u>	<u>Page No.</u>
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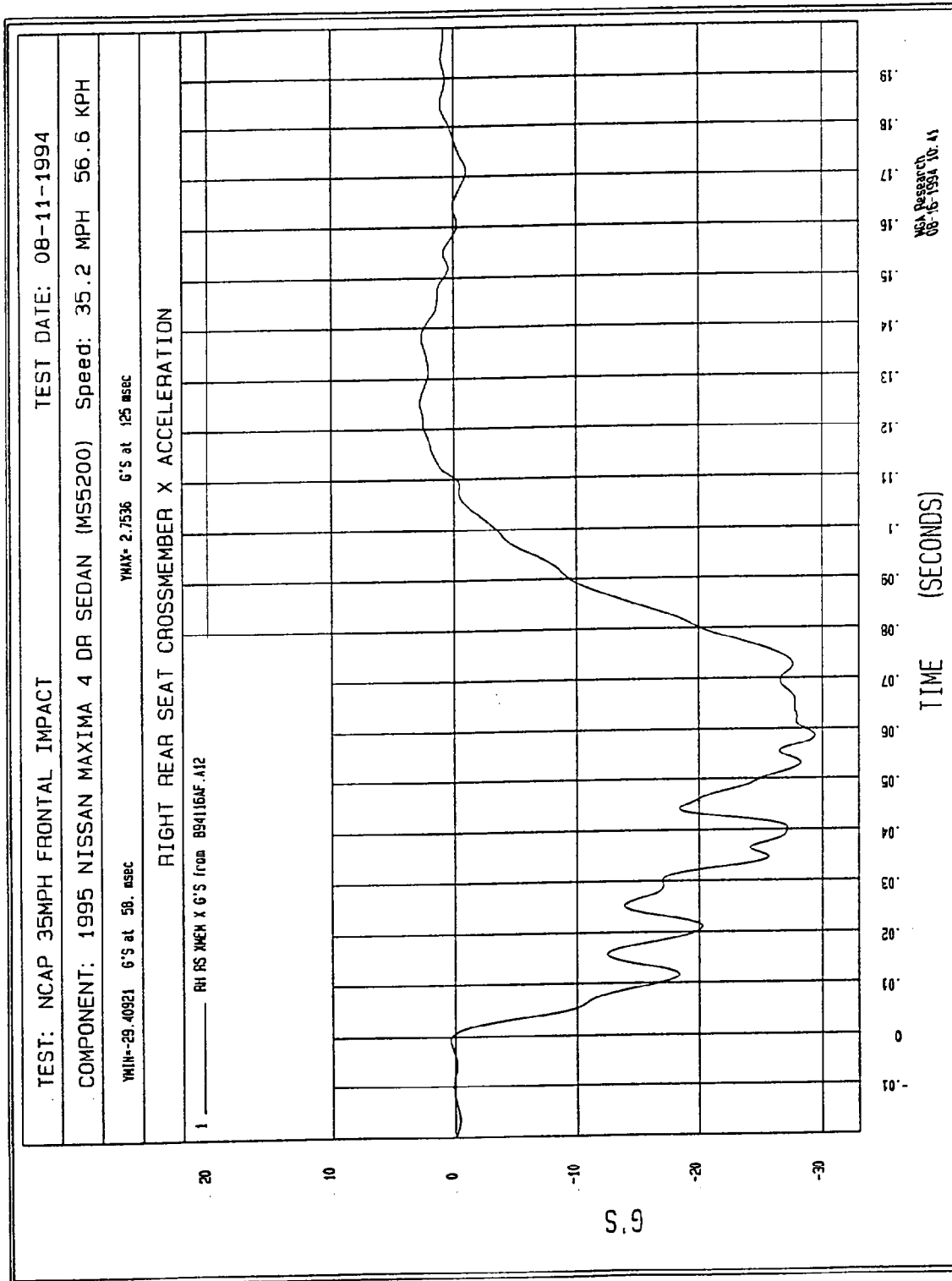


Figure B-1 - Right Rear Seat Crossmember X Accel. vs. Time

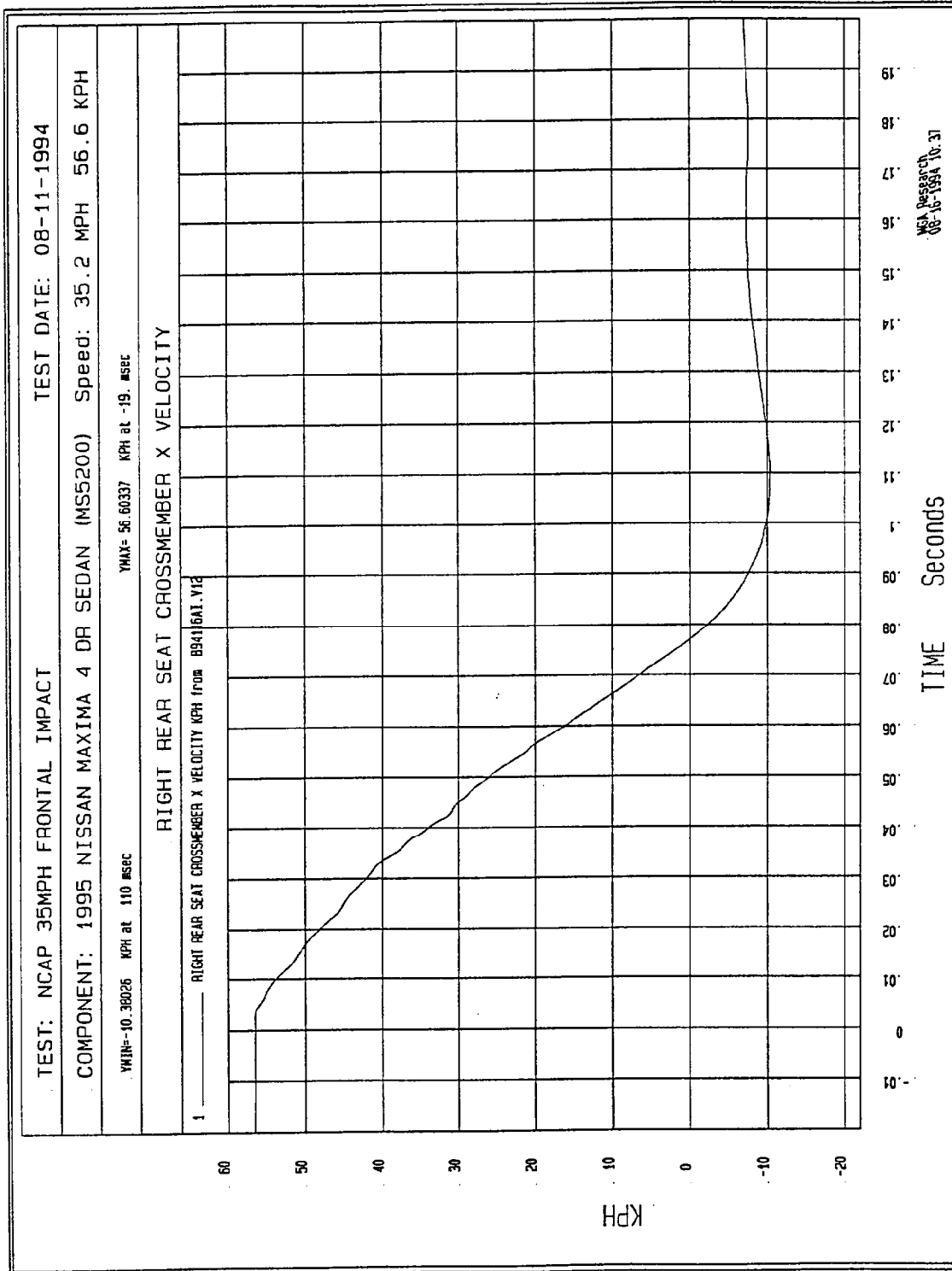


Figure B-2 - Right Rear Seat Crossmember X Velocity vs. Time

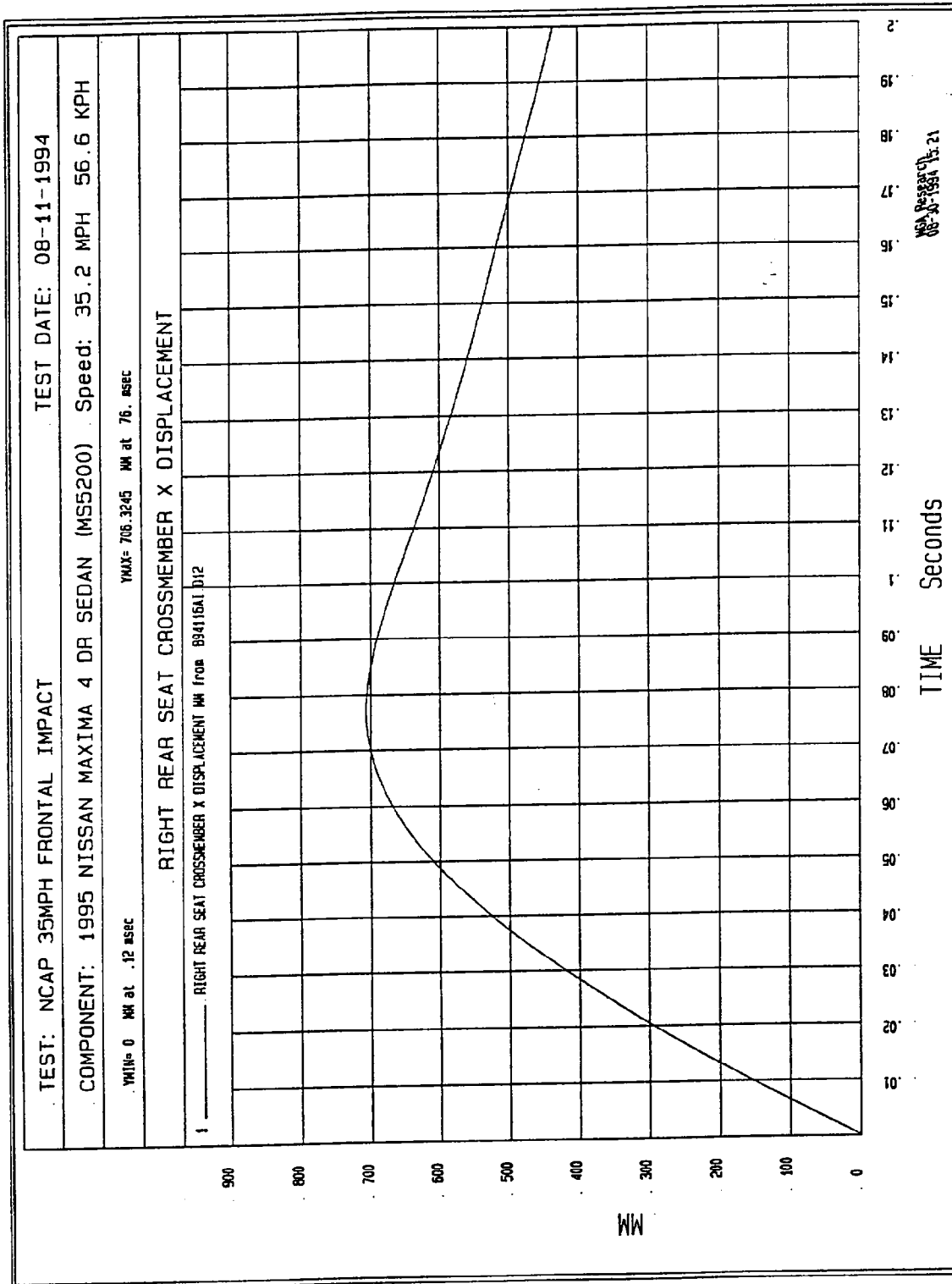


Figure B-3 - Right Rear Seat Crossmember X Displacement vs. Time

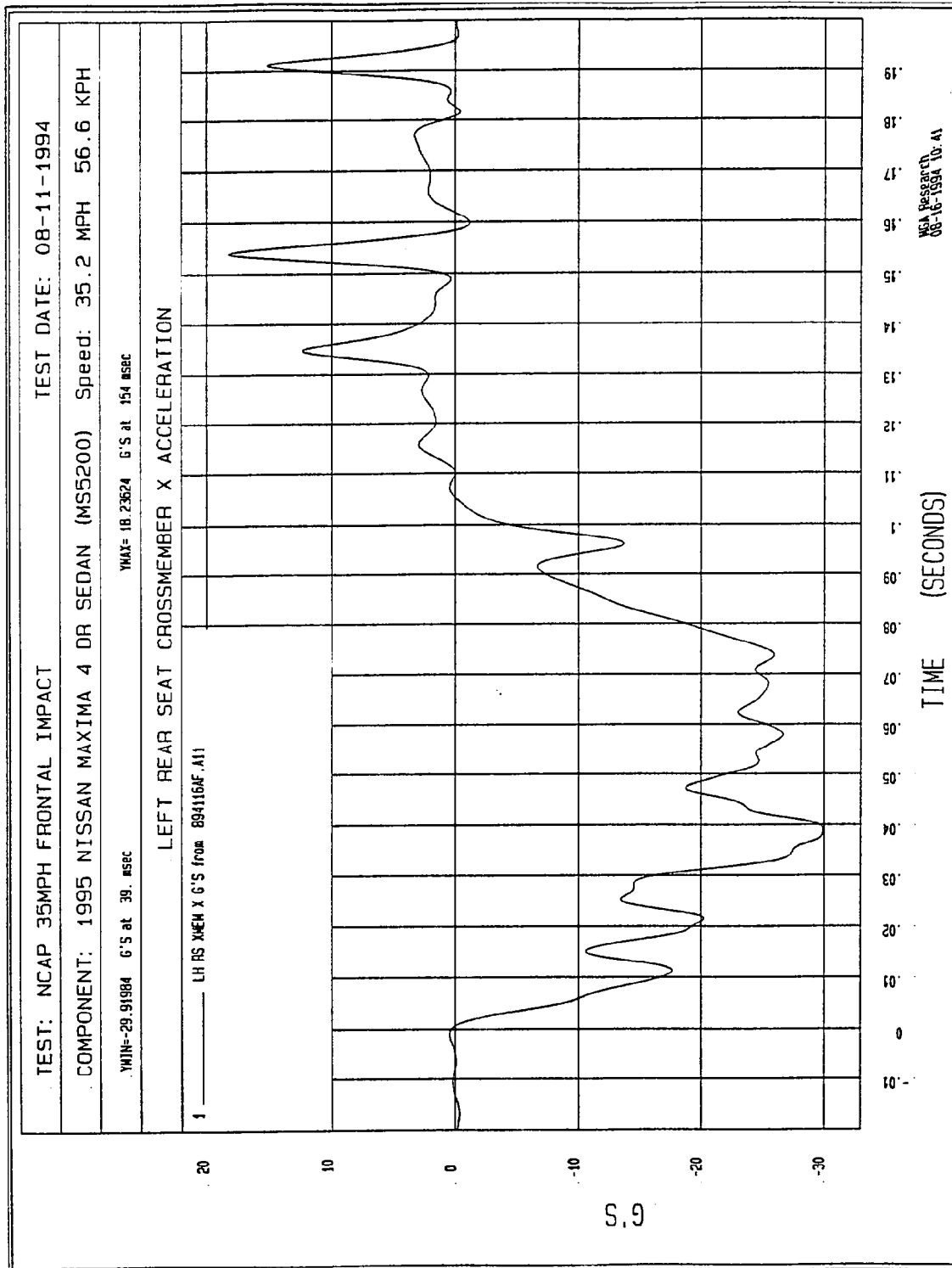


Figure B-4 - Left Rear Seat Crossmember X Acceleration vs. Time

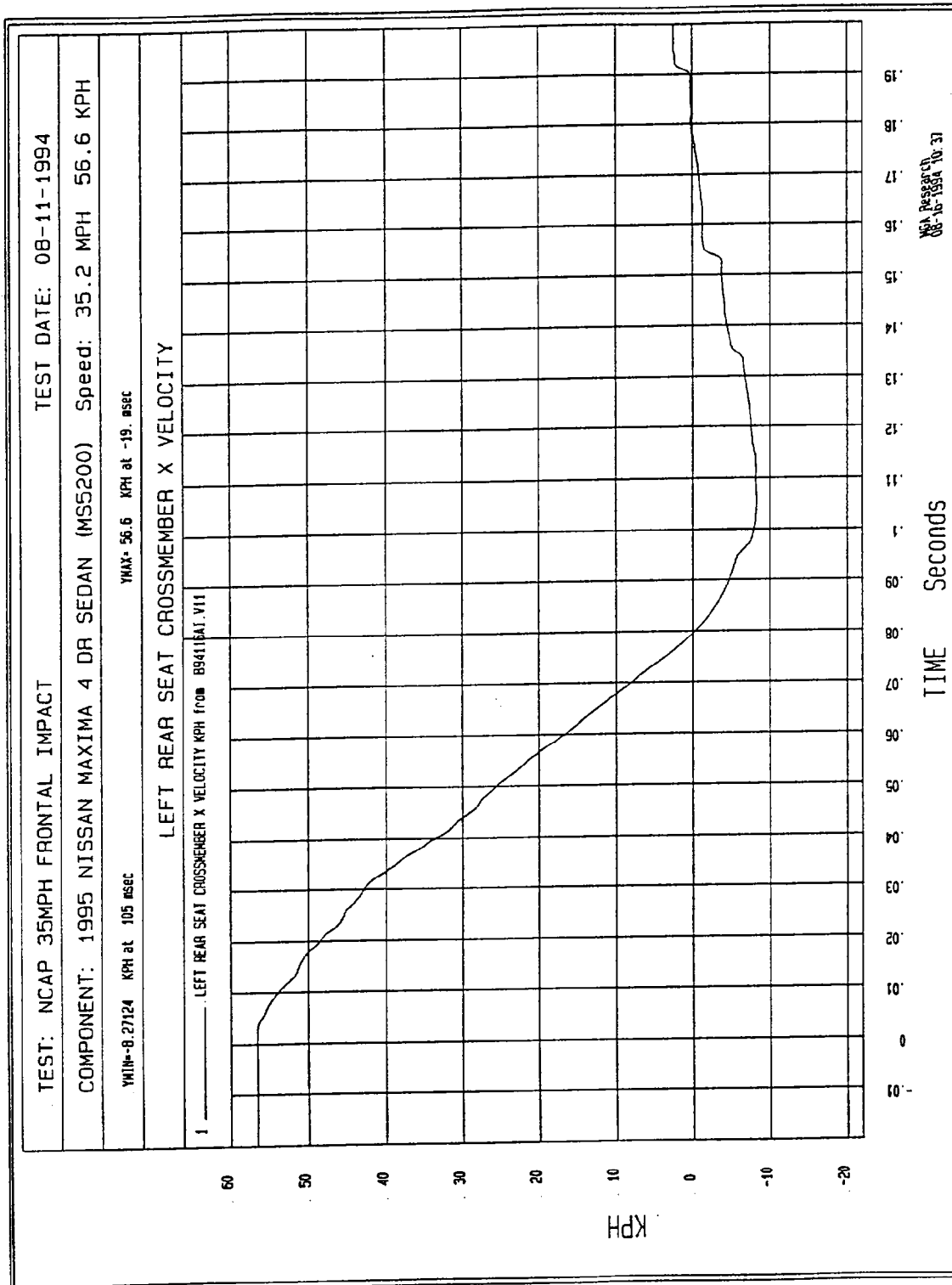


Figure B-5 - Left Rear Seat Crossmember X Velocity vs. Time

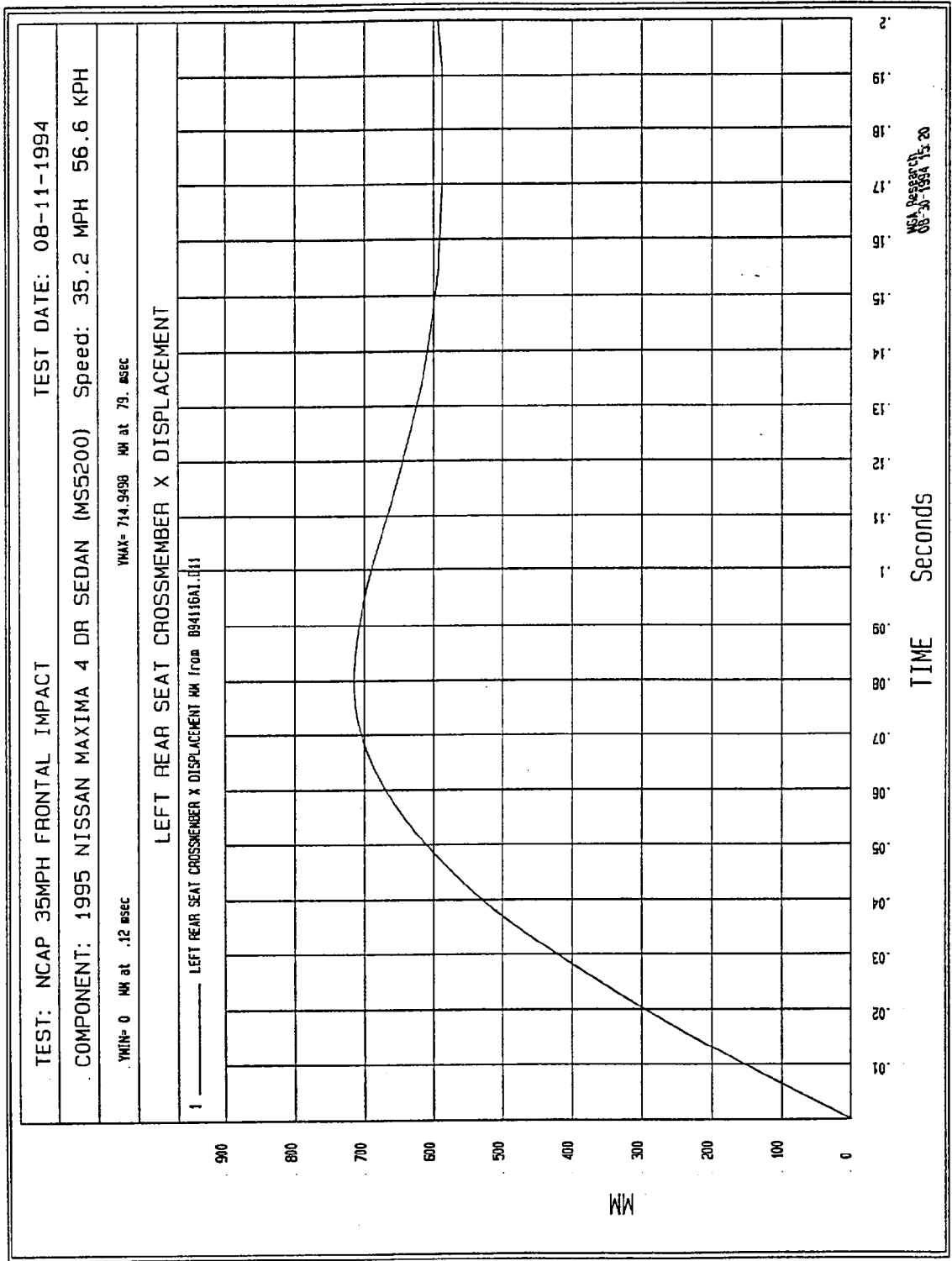


Figure B-6 - Left Rear Seat Crossmember X Displacement vs. Time

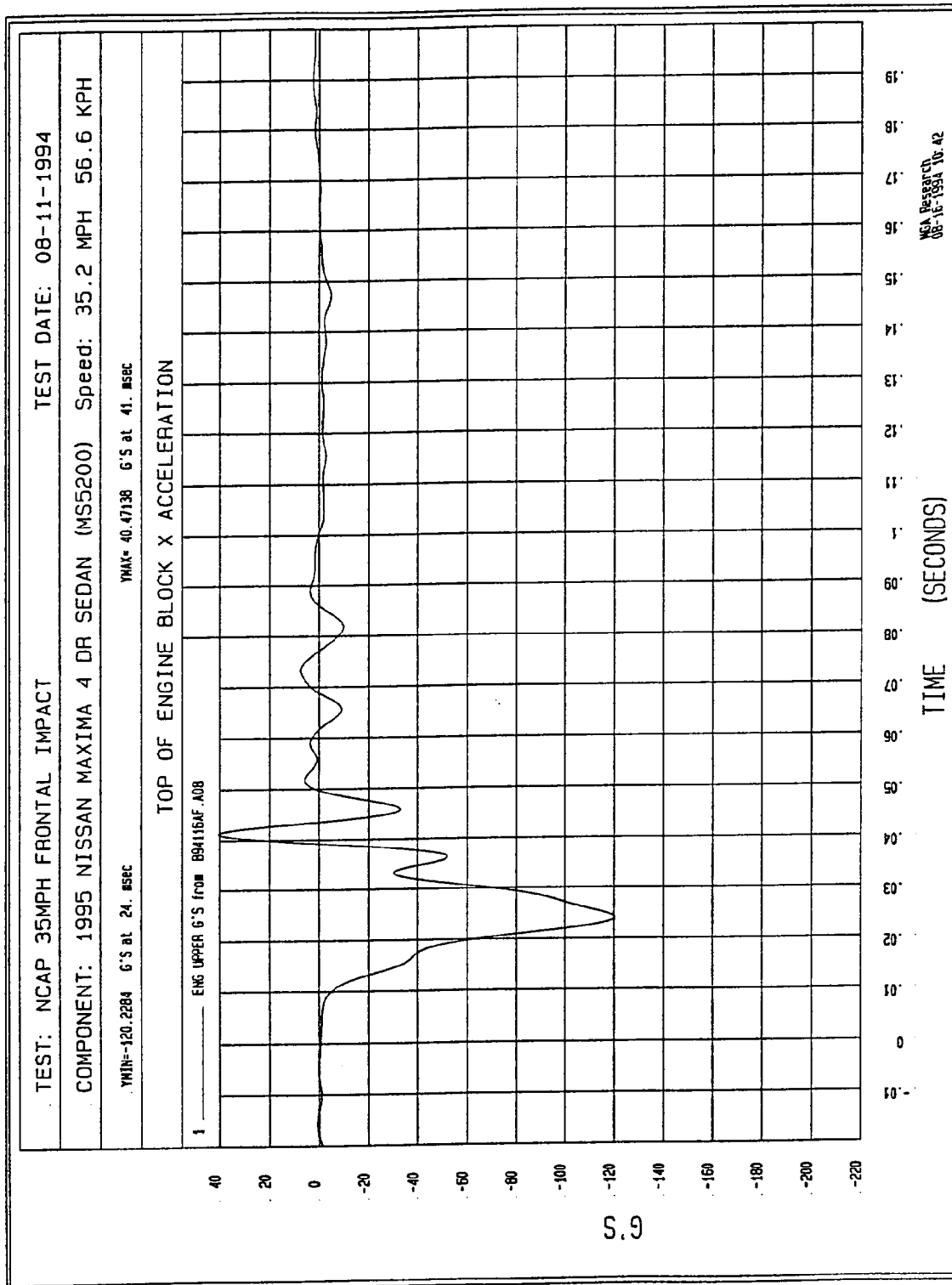


Figure B-7 - Top of Engine Block X Acceleration vs Time

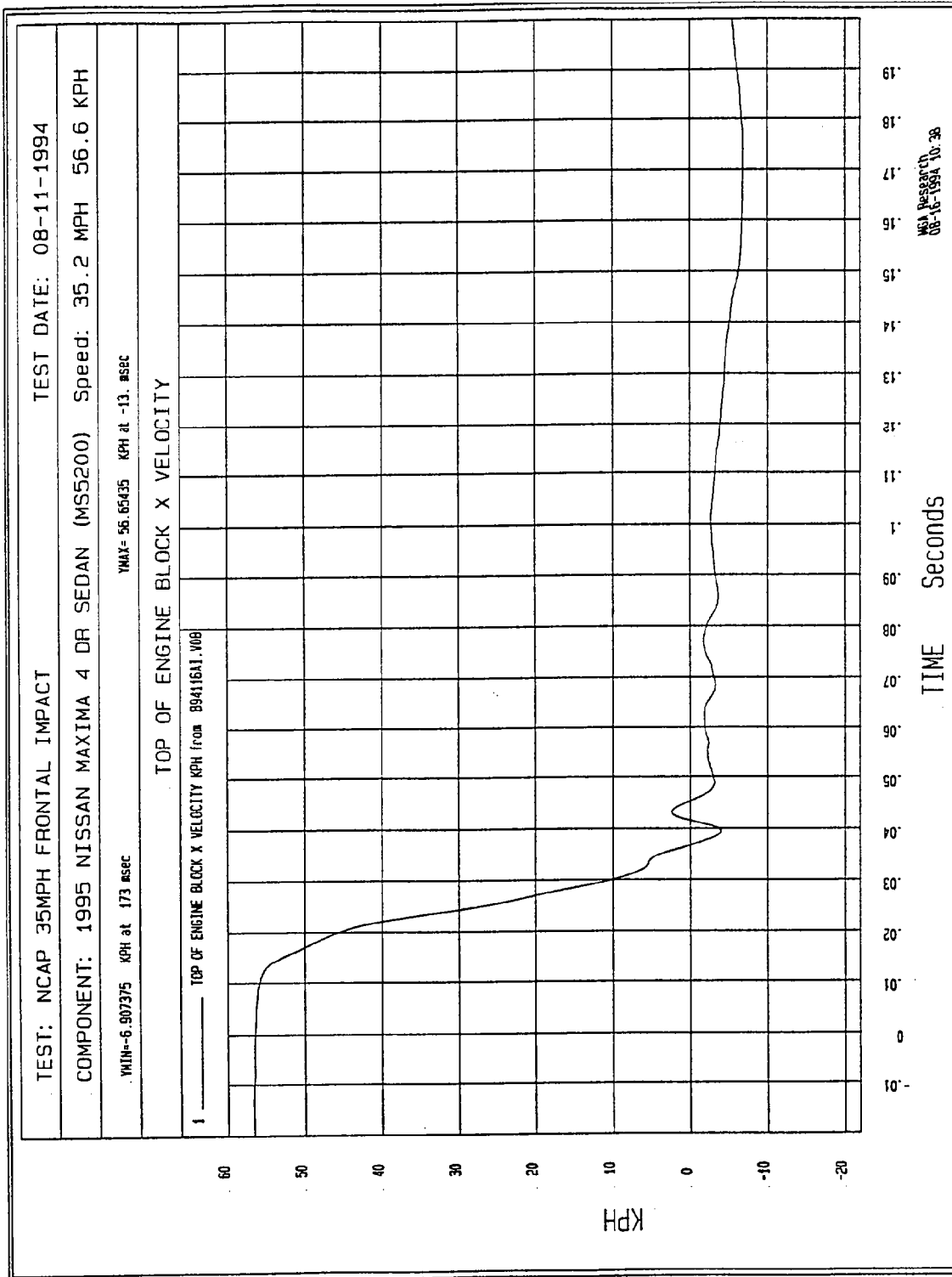


Figure B-8 - Top of Engine Block X Velocity vs. Time

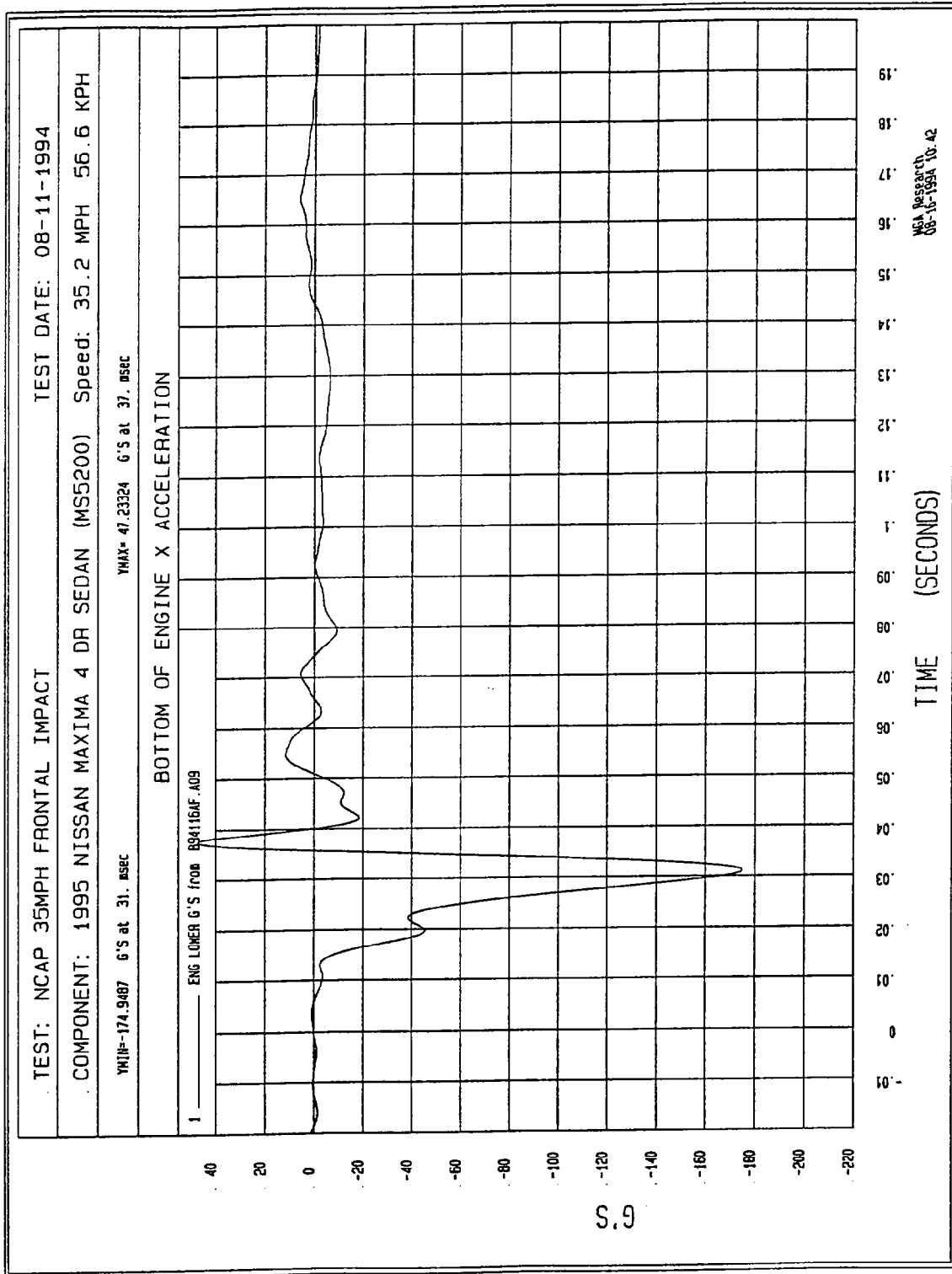


Figure B-9 - Bottom of Engine X Acceleration vs. Time

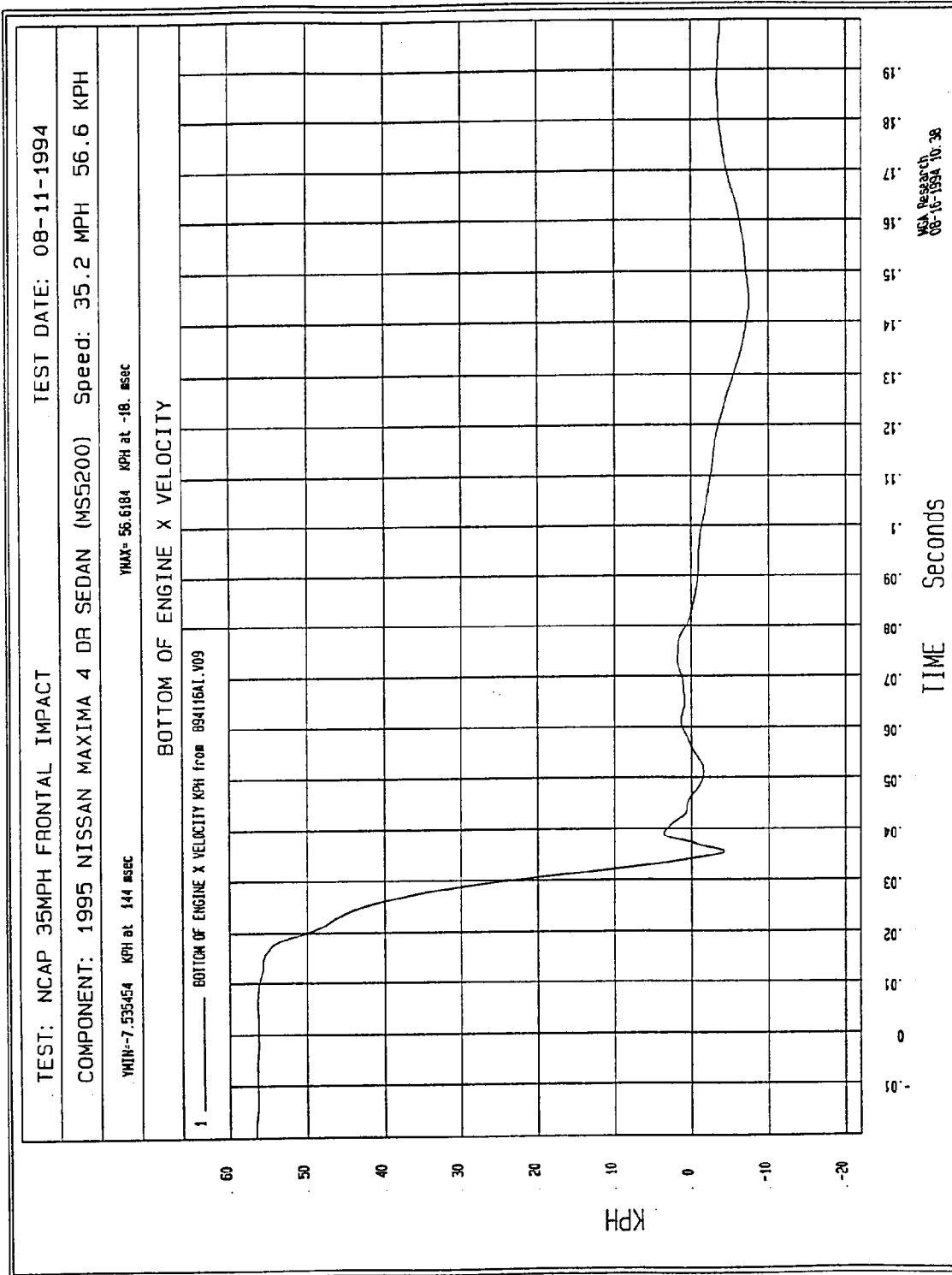


Figure B-10 - Bottom of Engine X Velocity vs. Time

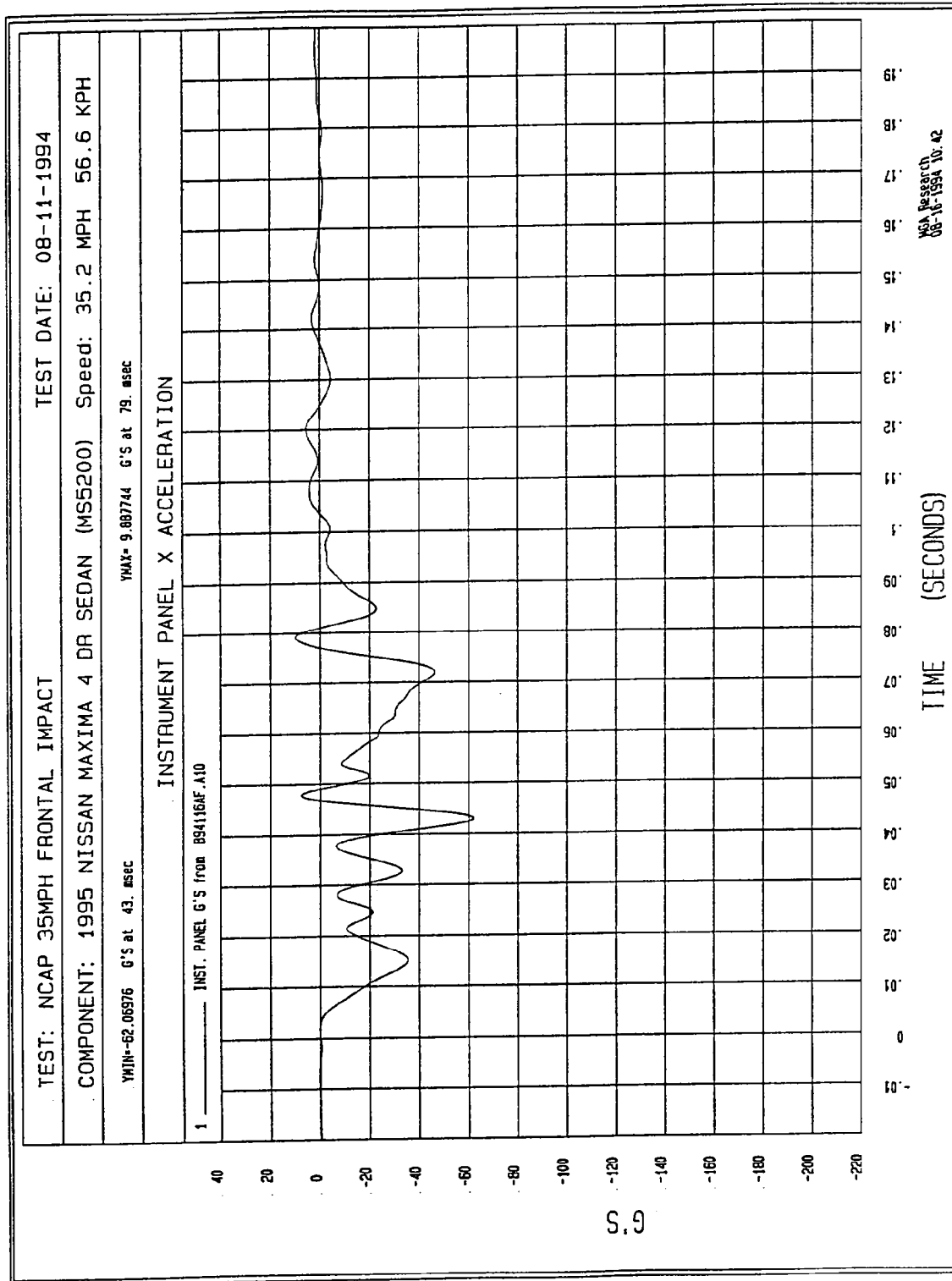


Figure B-11 - Instrument Panel X Acceleration vs. Time

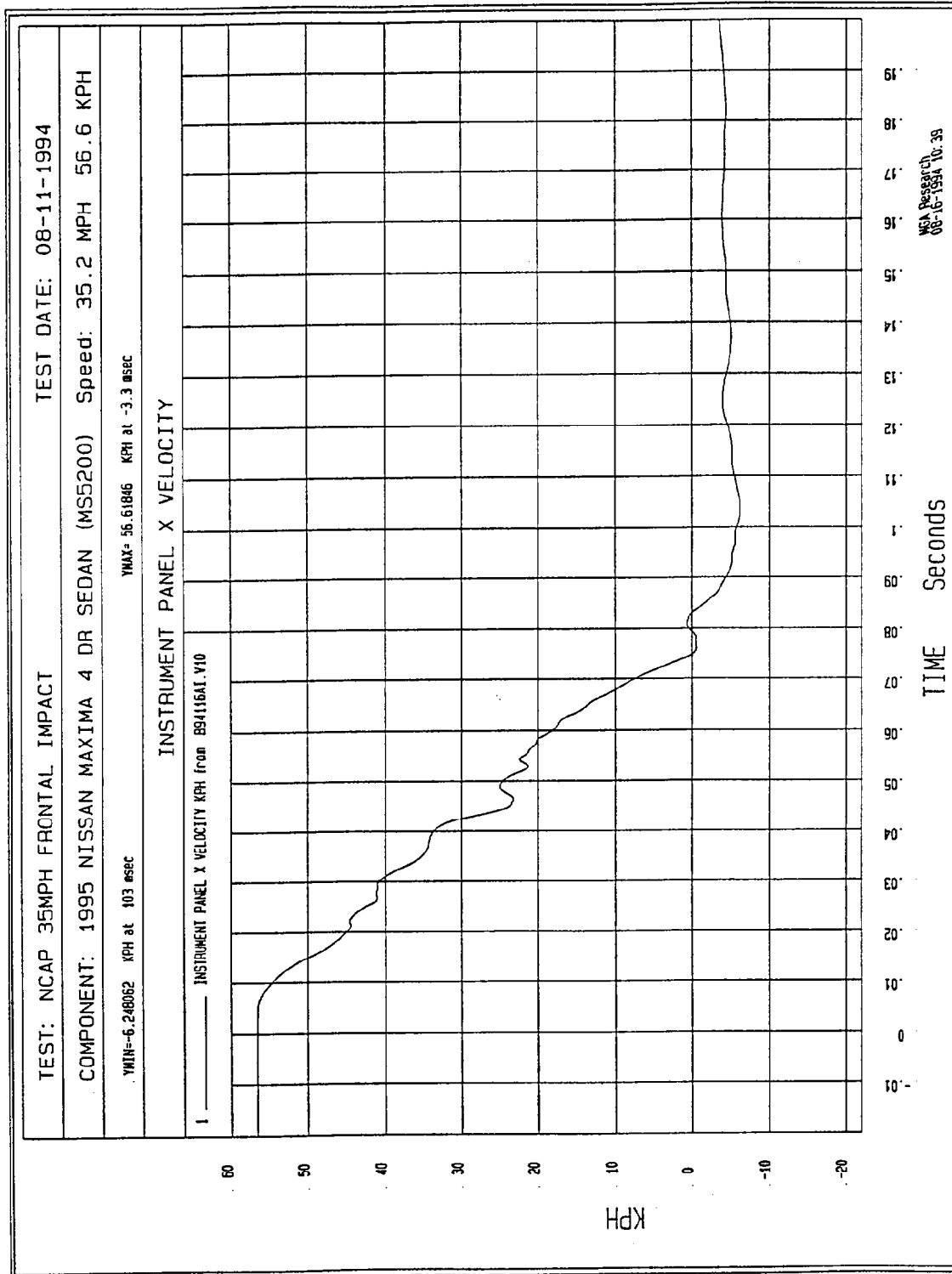


Figure B-12 - Instrument Panel X Velocity vs. Time

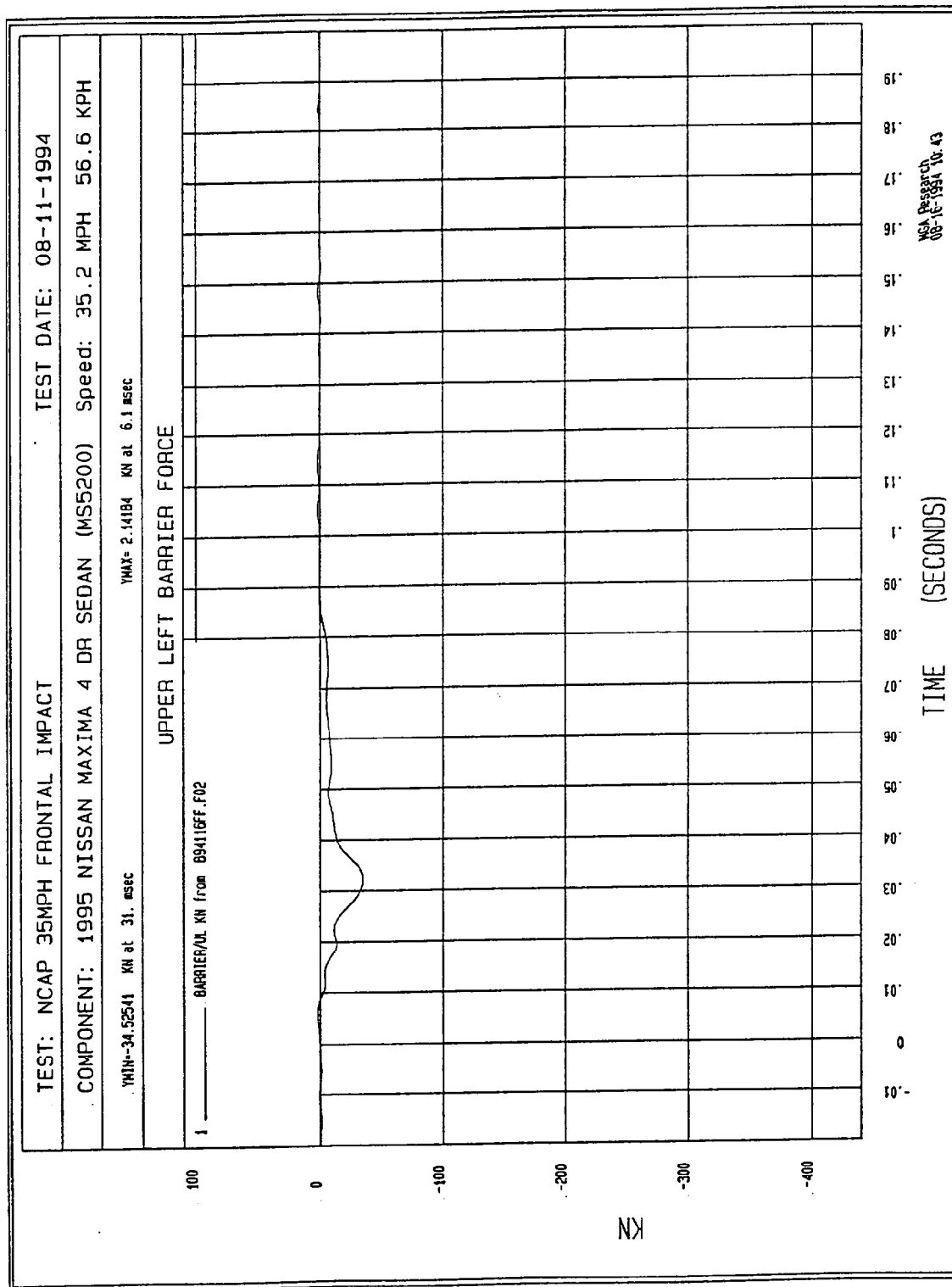


Figure B-13 - Upper Left Barrier Force vs. Time

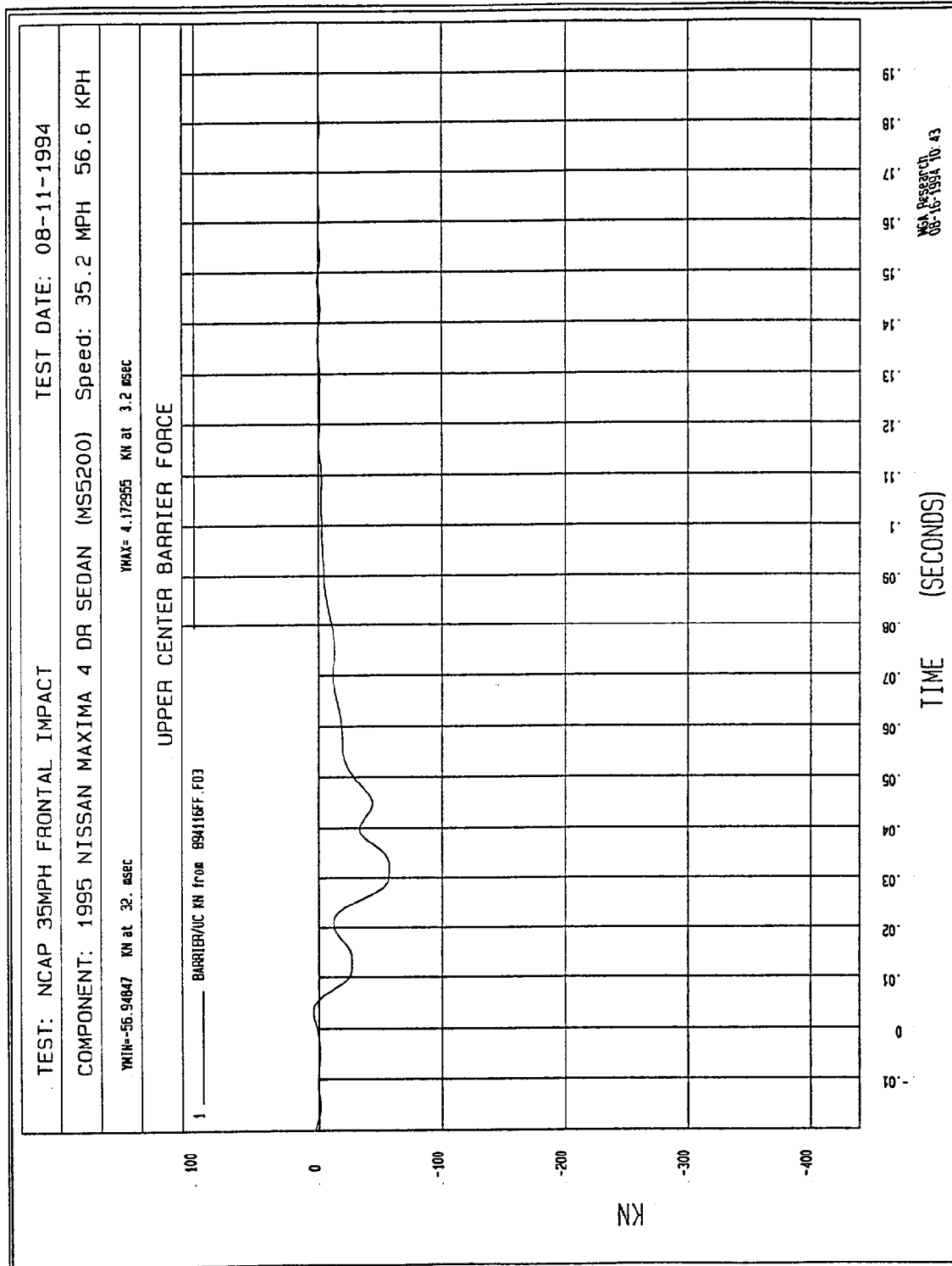
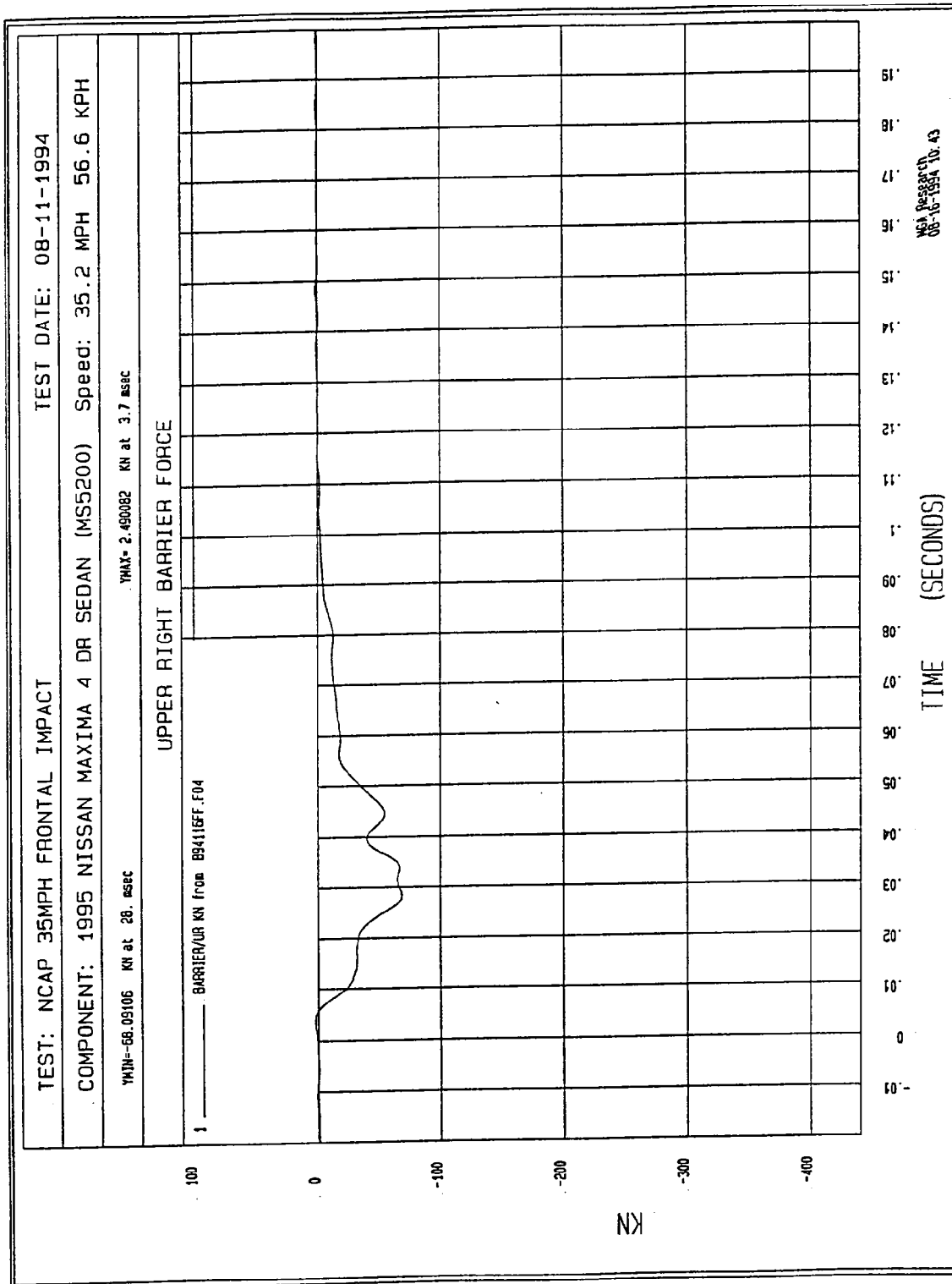


Figure B-14 - Upper Center Barrier Force vs. Time



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Figure B-15 - Upper Right Barrier Force vs. Time

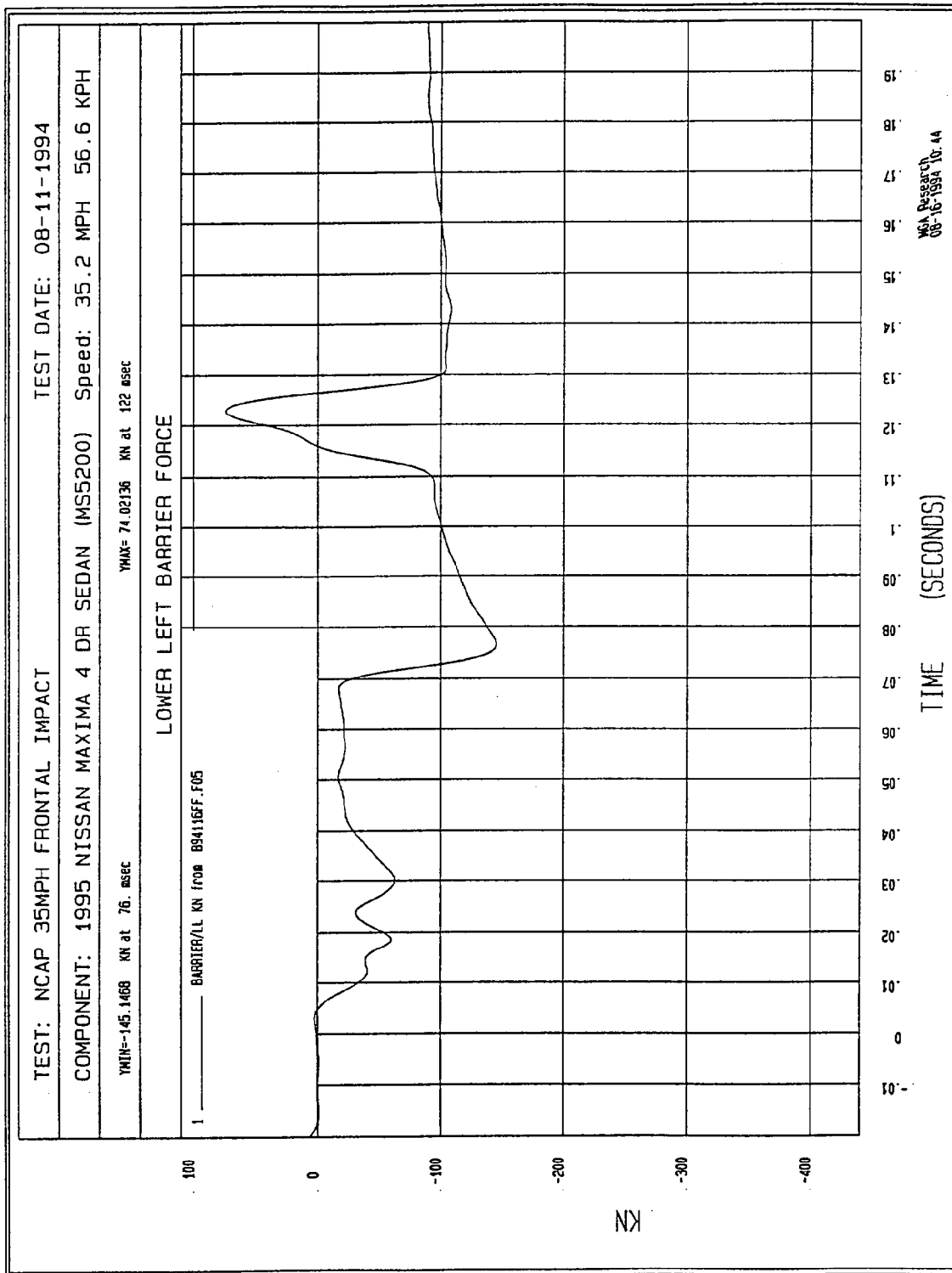


Figure B-16 - Lower Left Barrier Force vs. Time

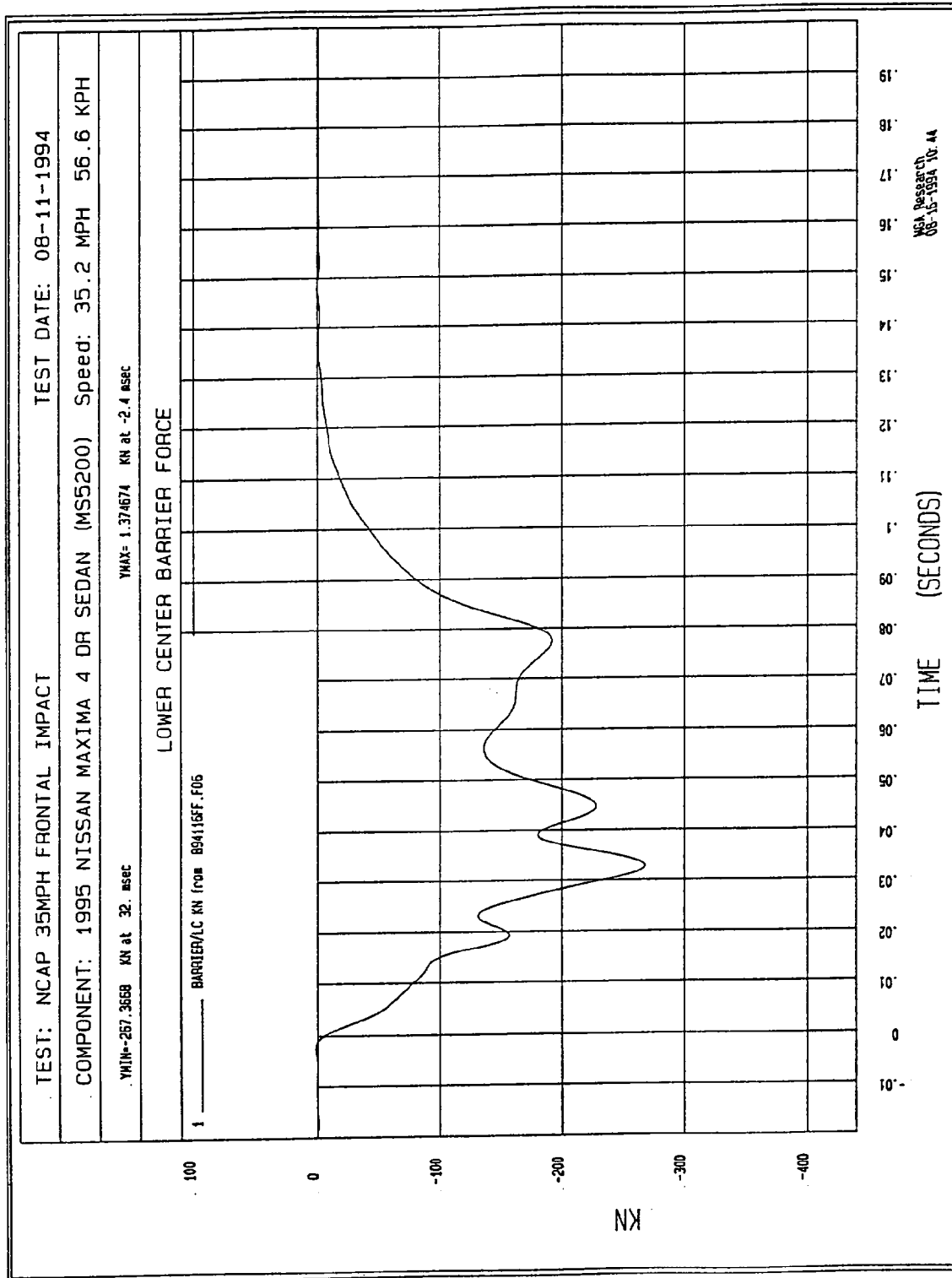


Figure B-17 - Lower Center Barrier Force vs. Time

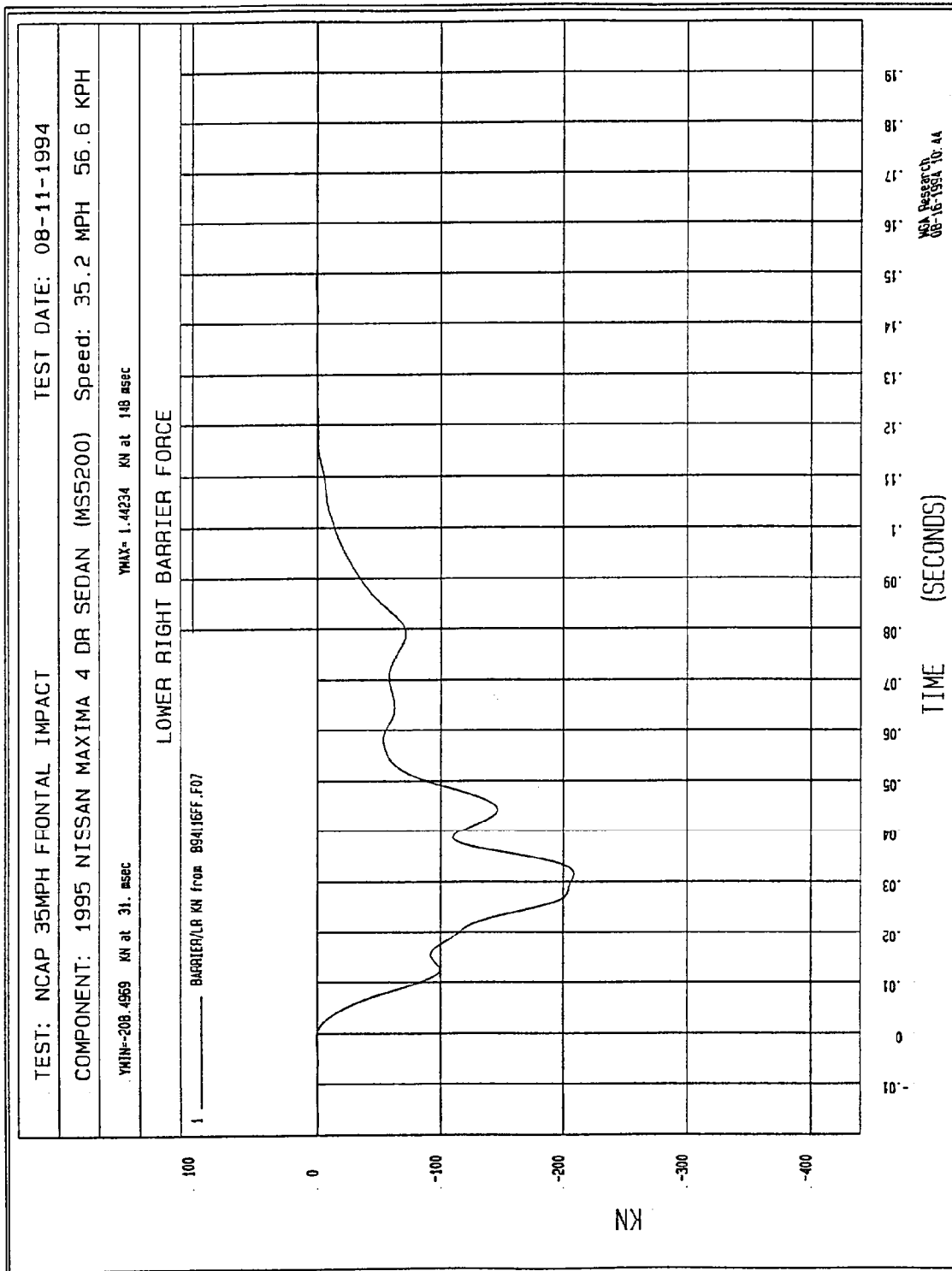


Figure B-18 - Lower Right Barrier Force vs. Time

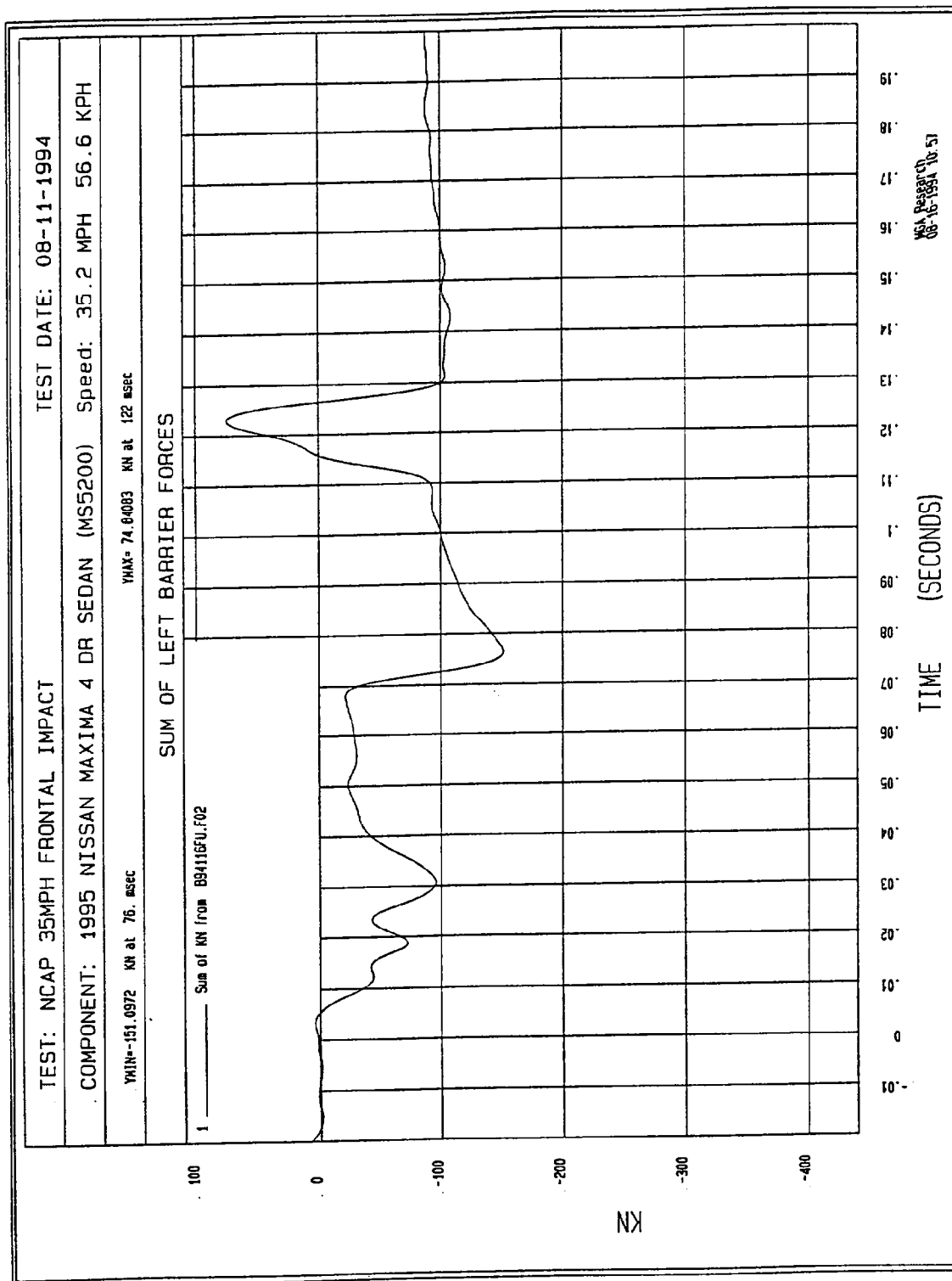


Figure B-19 - Sum of Left Barrier Forces vs. Time

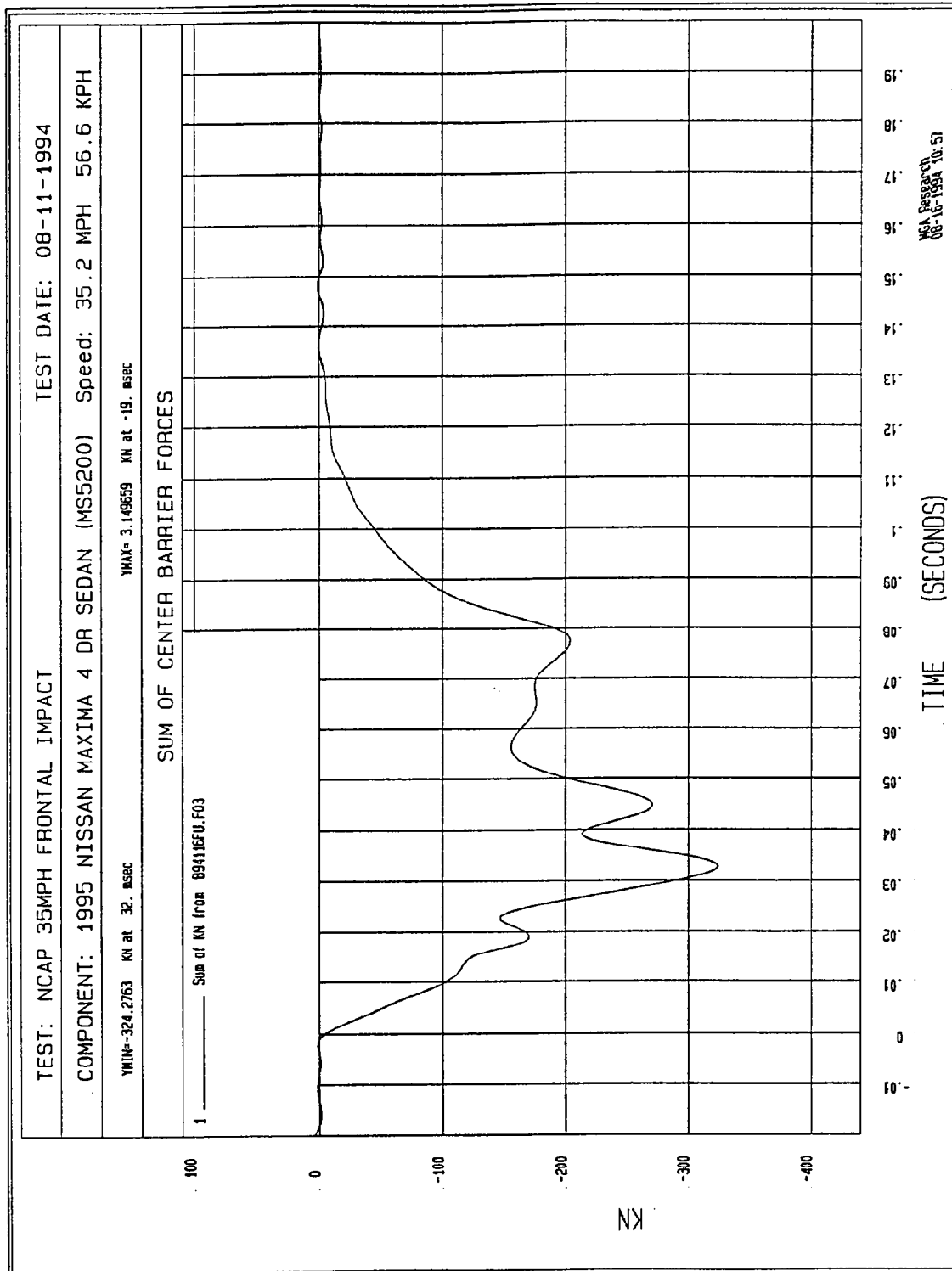


Figure B-20 - Sum of Center Barrier Forces vs. Time

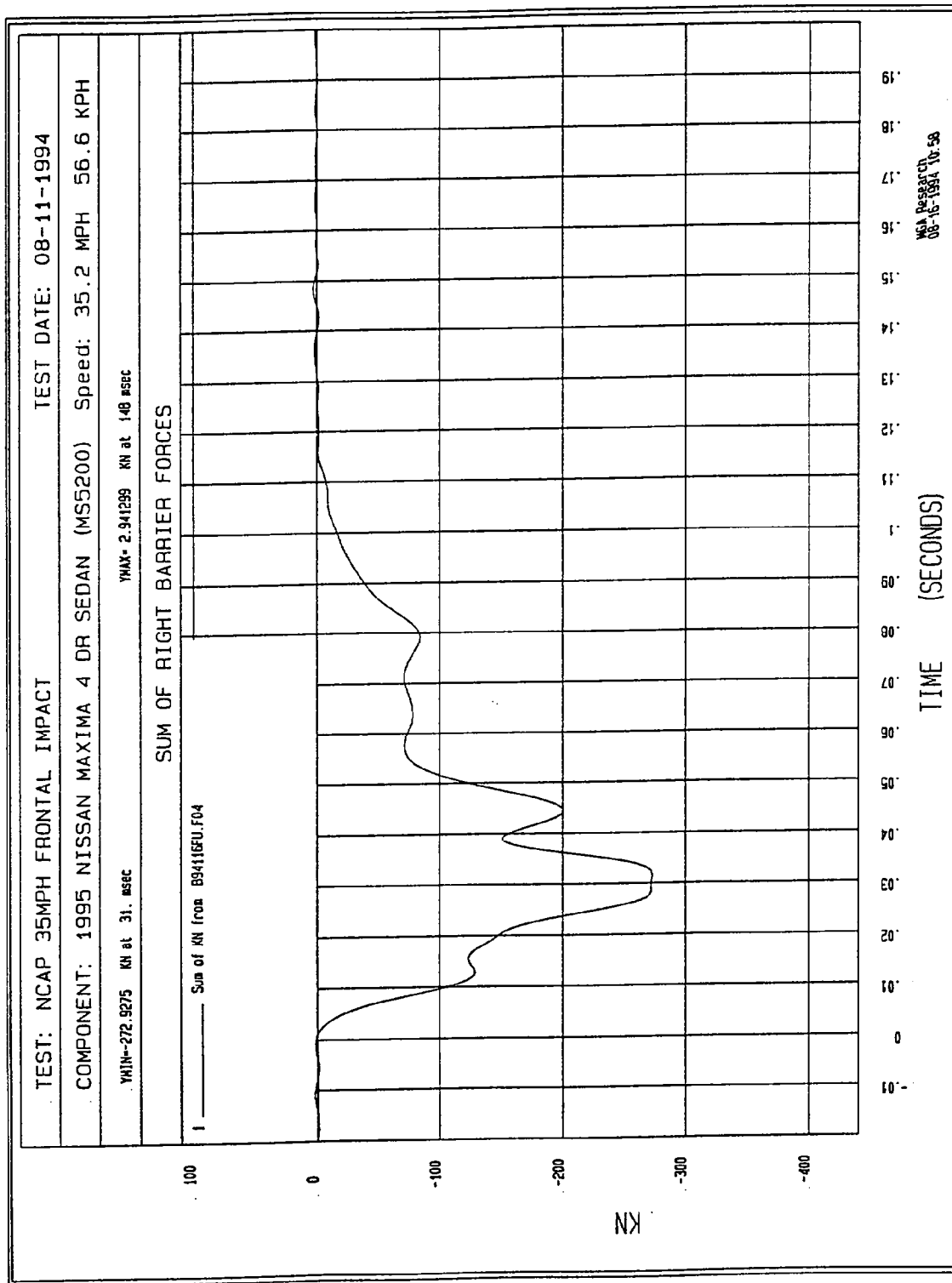


Figure B-21 - Sum of Right Barrier Forces vs. Time

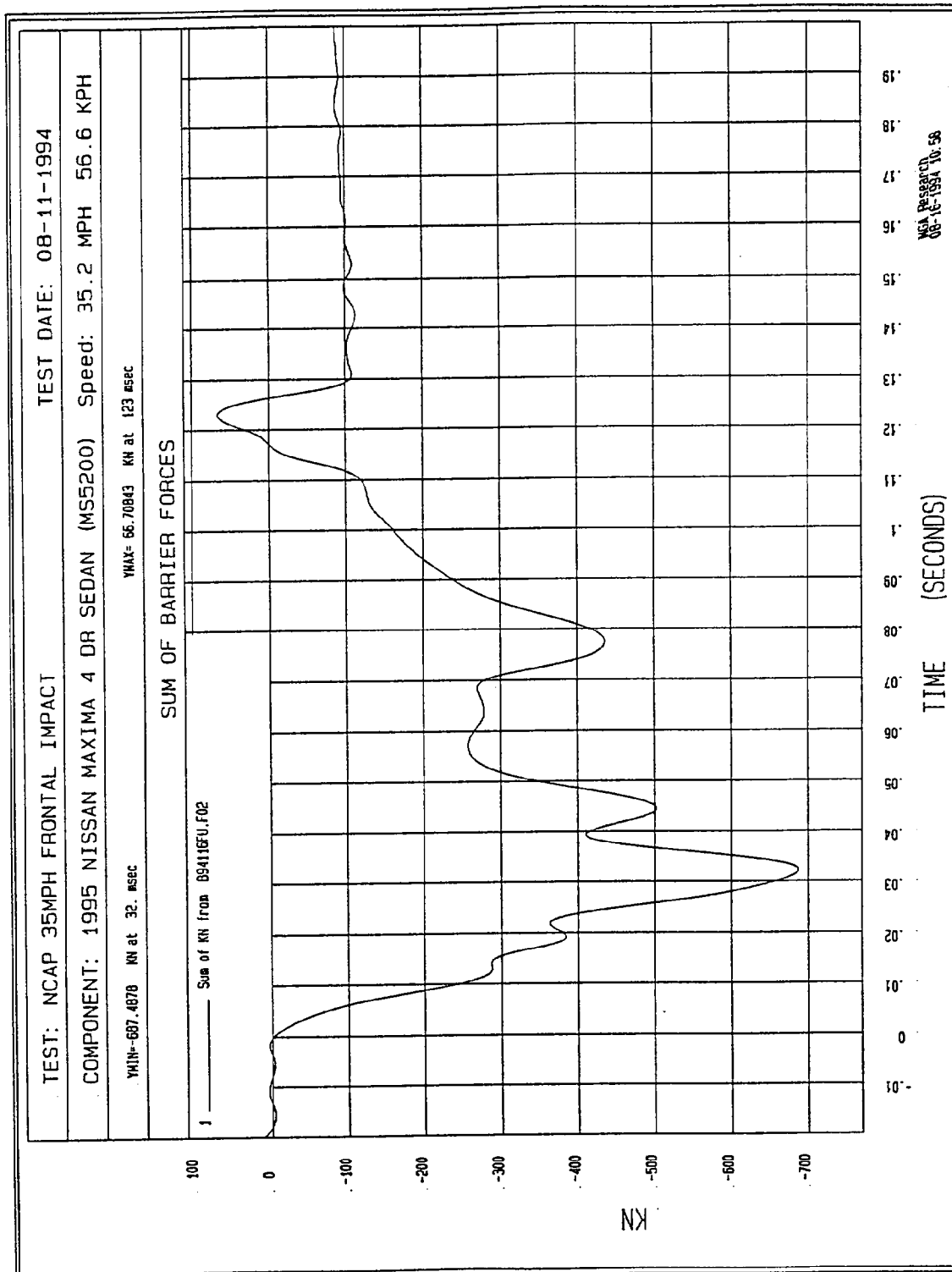
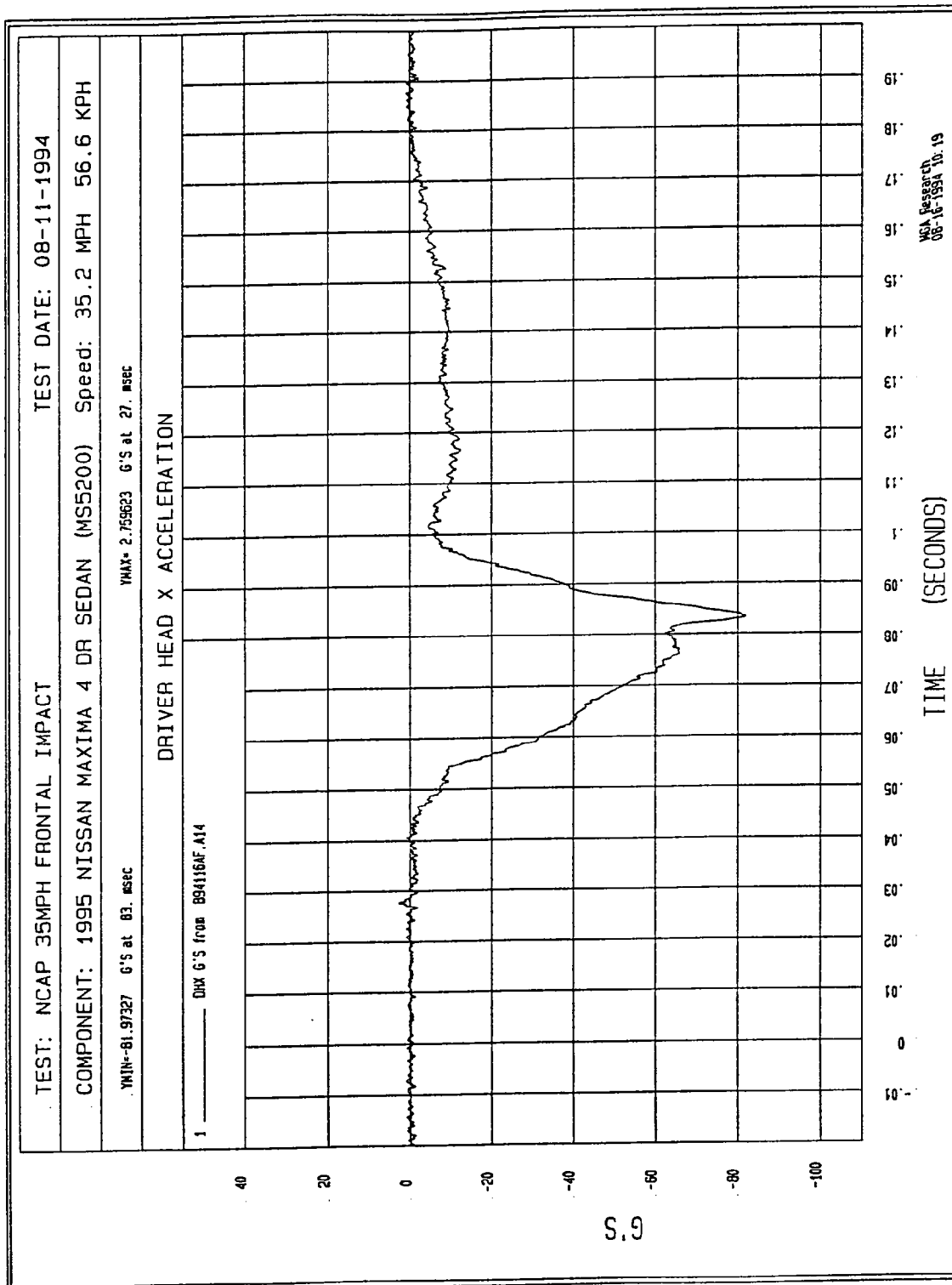


Figure B-22 - Sum of Barrier Forces vs. Time



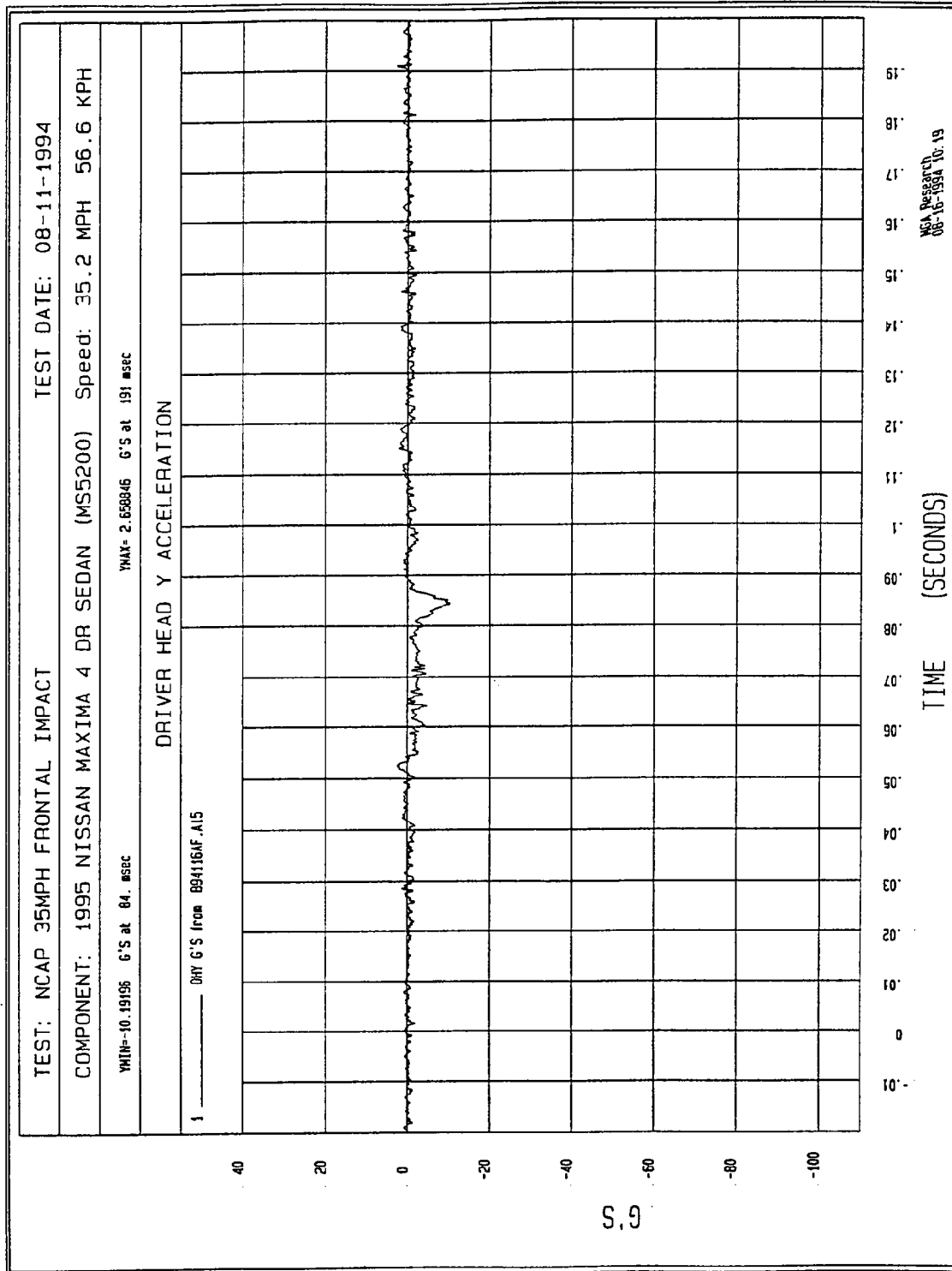


Figure B-24 - Driver Head Y Acceleration vs. Time

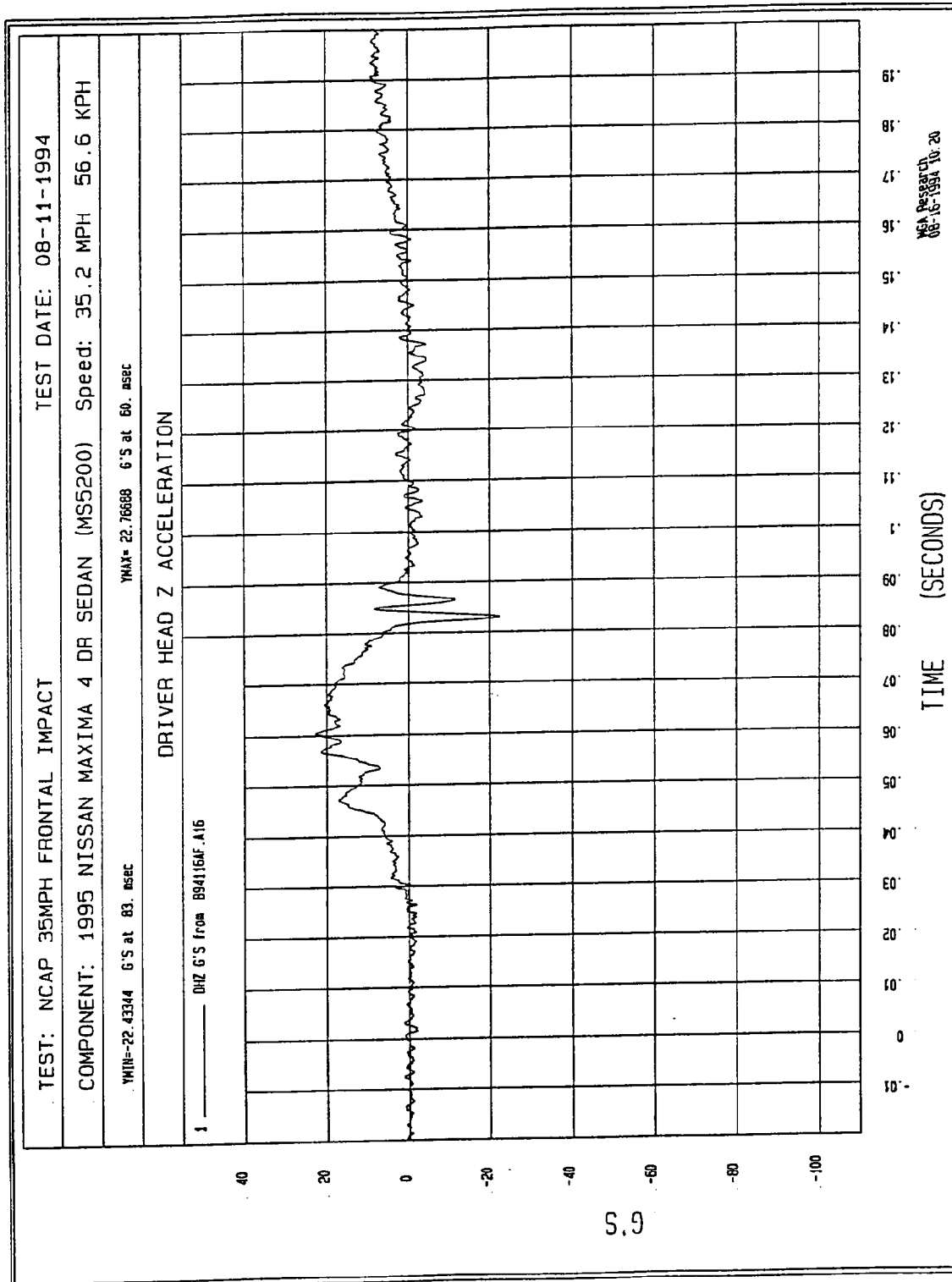


Figure B-25 - Driver Head Z Acceleration vs. Time

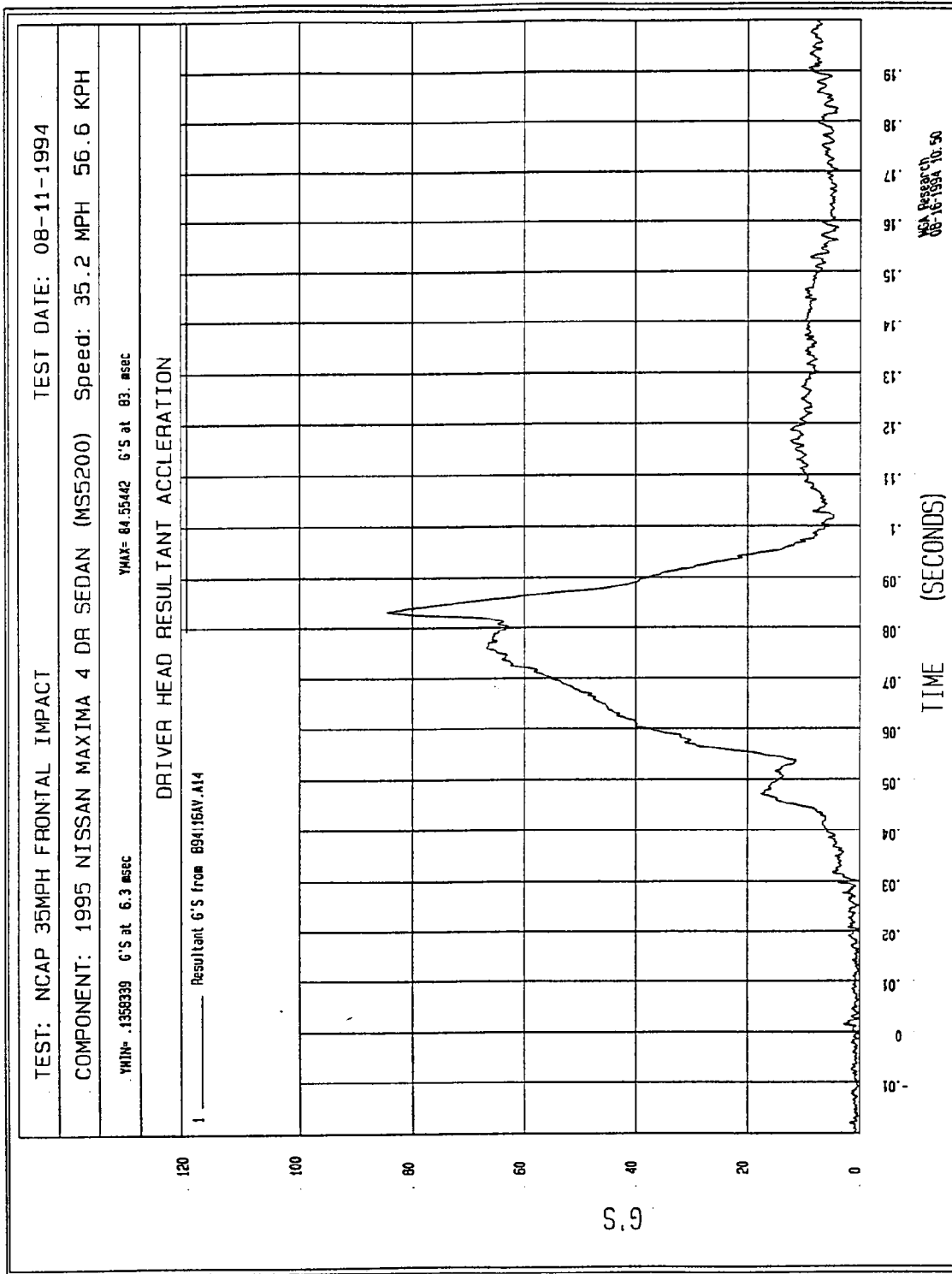


Figure B-26 - Driver Head Resultant Acceleration vs. Time

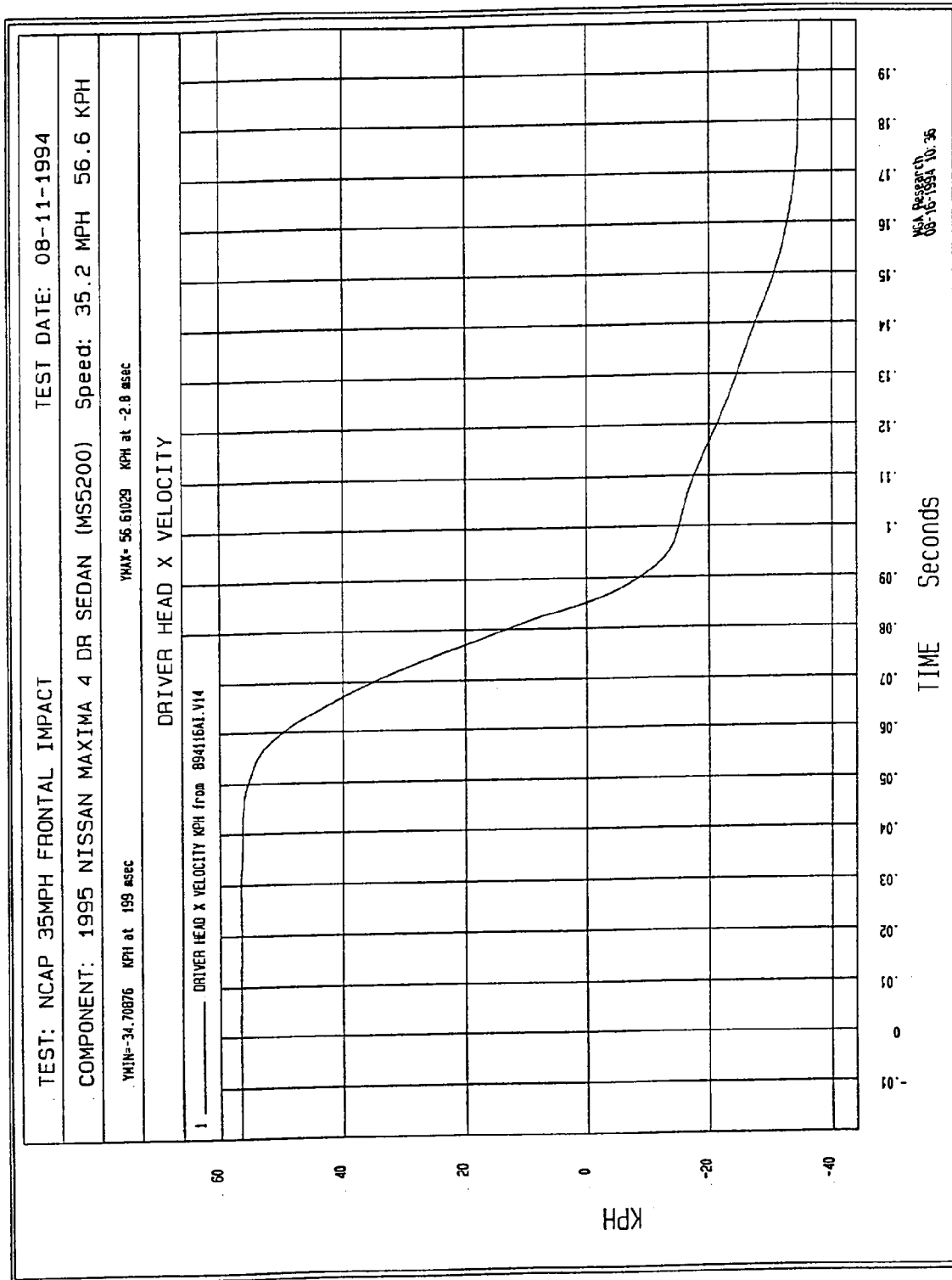


Figure B-27 - Driver Head X Velocity vs. Time

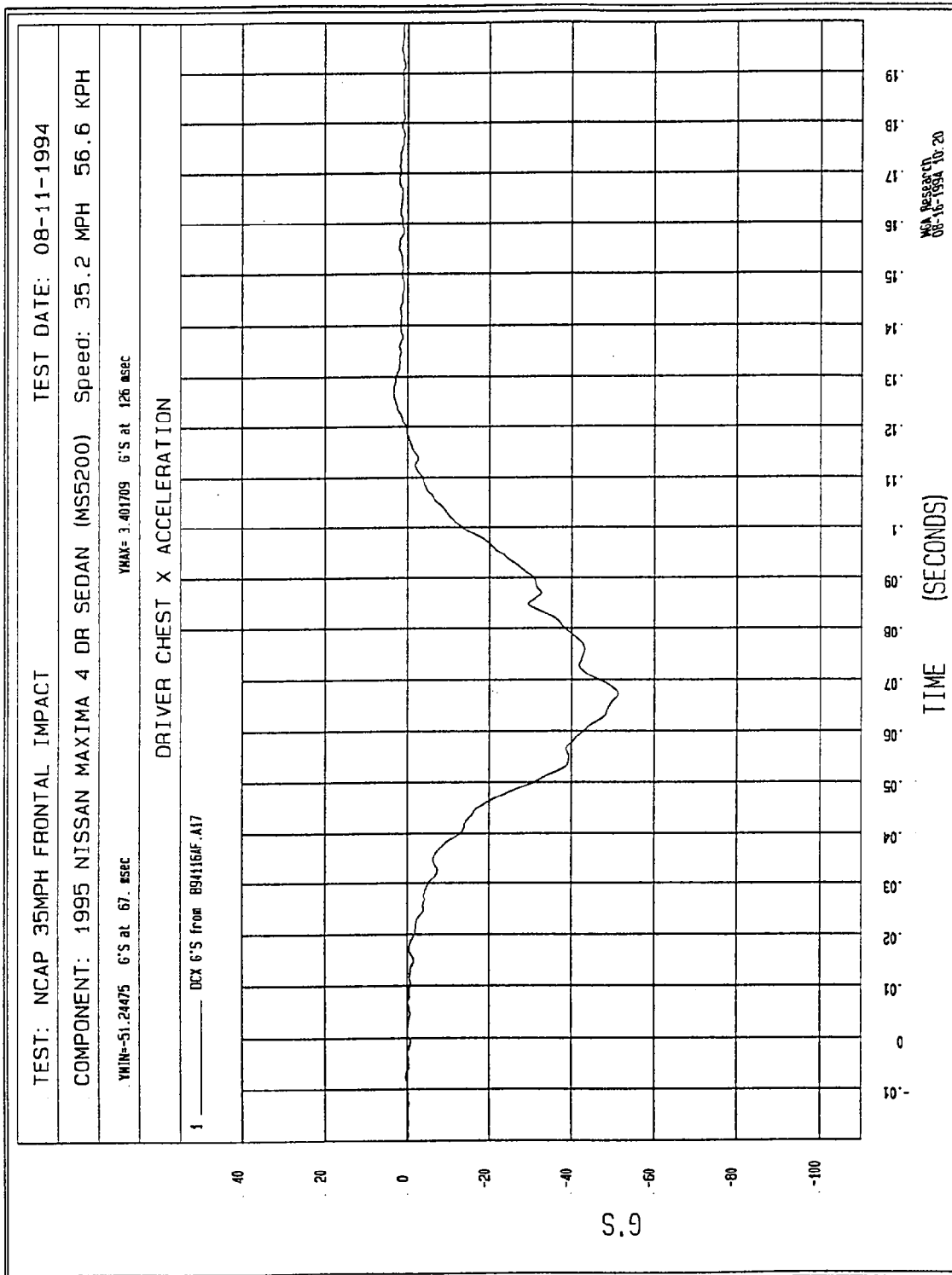


Figure B-28 - Driver Chest X Acceleration vs. Time

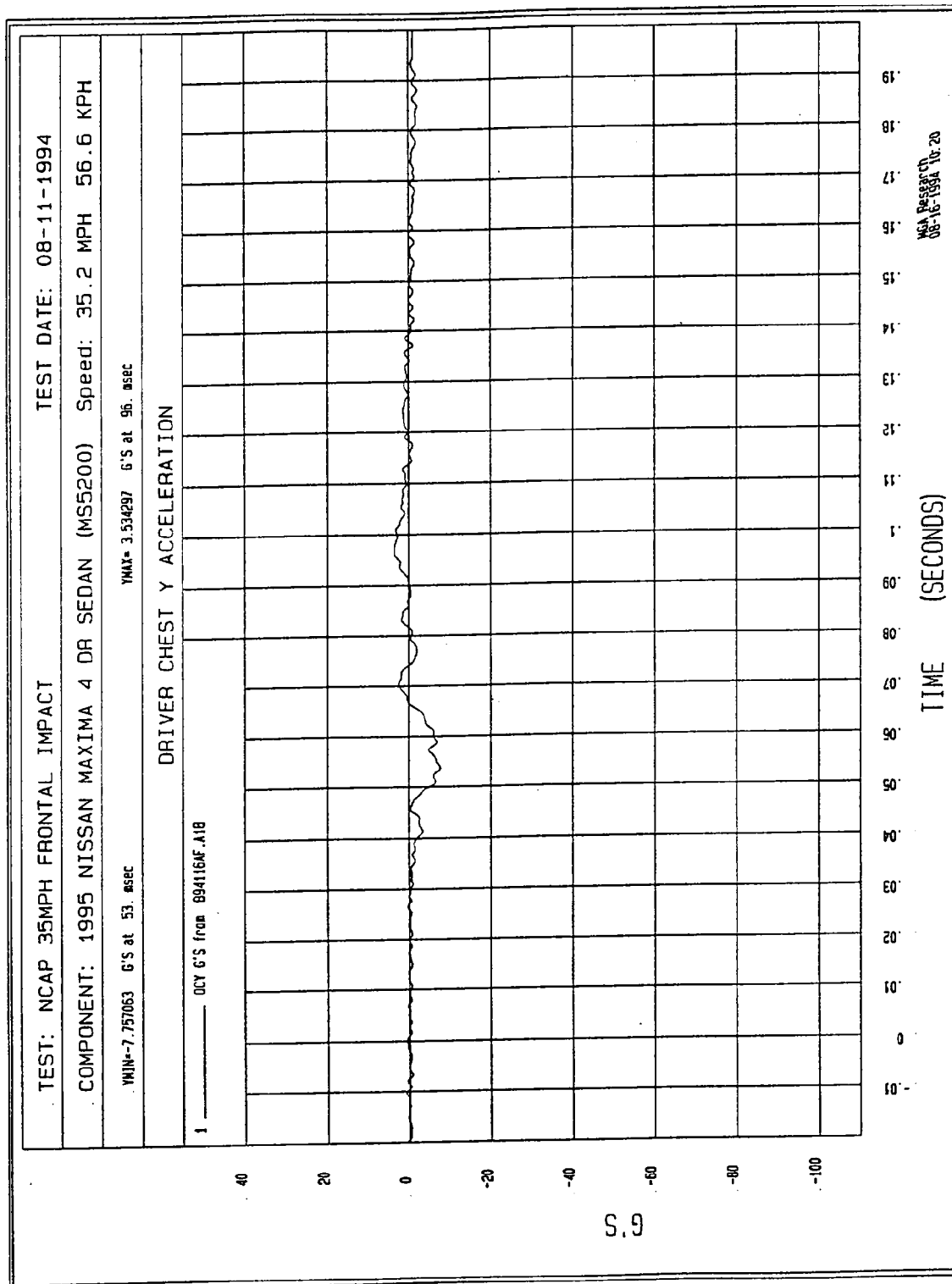


Figure B-29 - Driver Chest Y Acceleration vs. Time

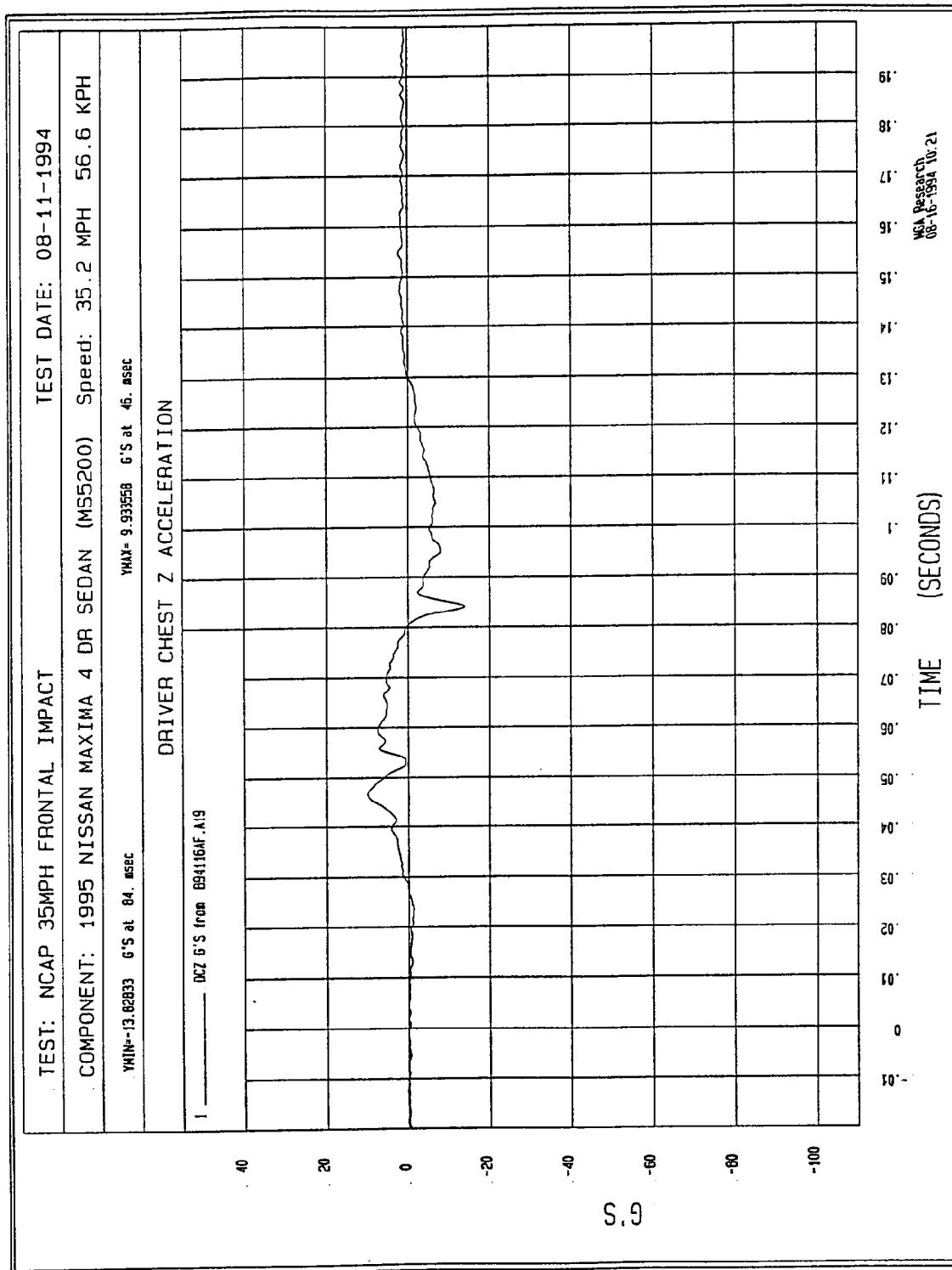


Figure B-30 - Driver Chest Z Acceleration vs. Time

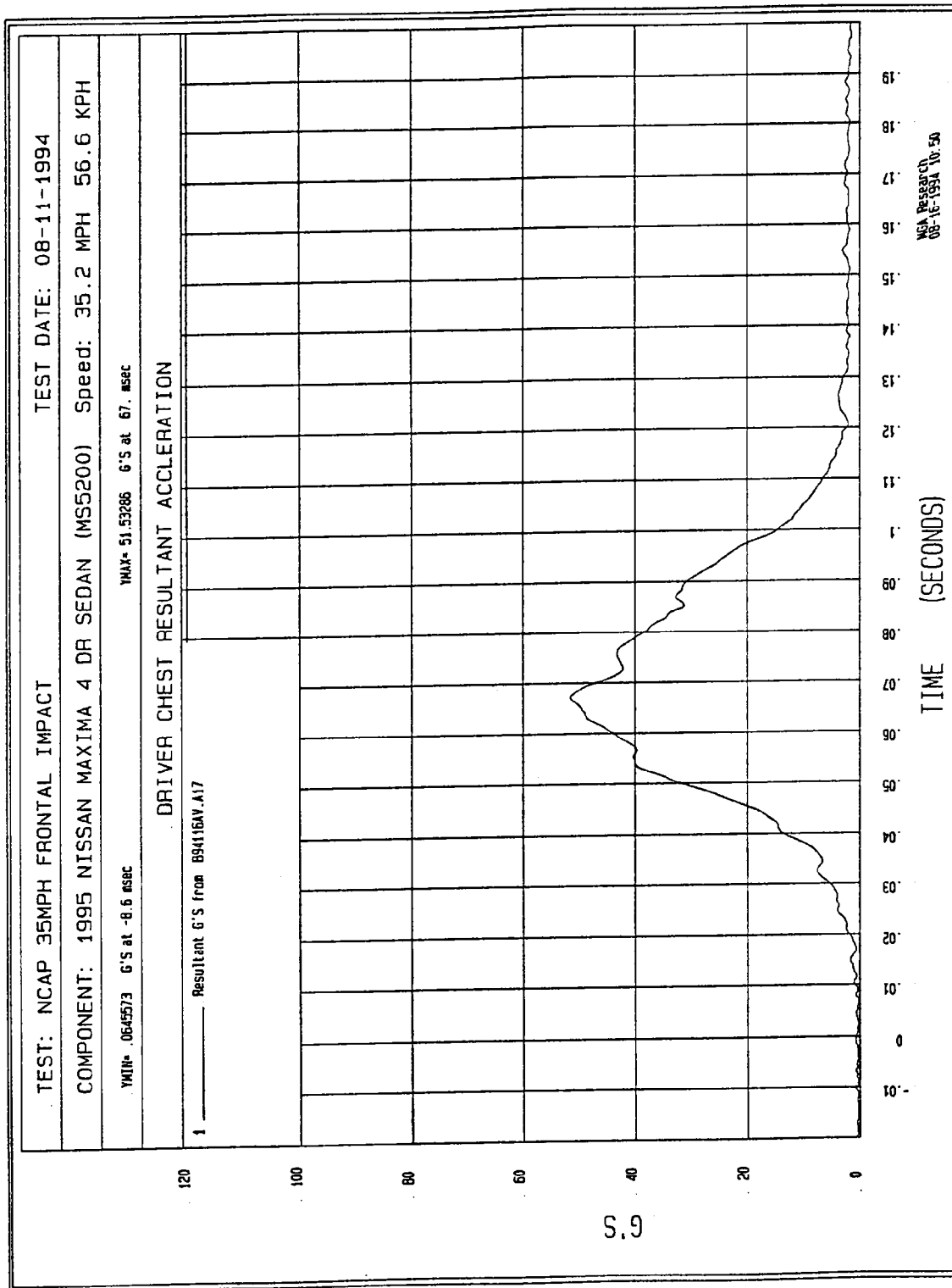
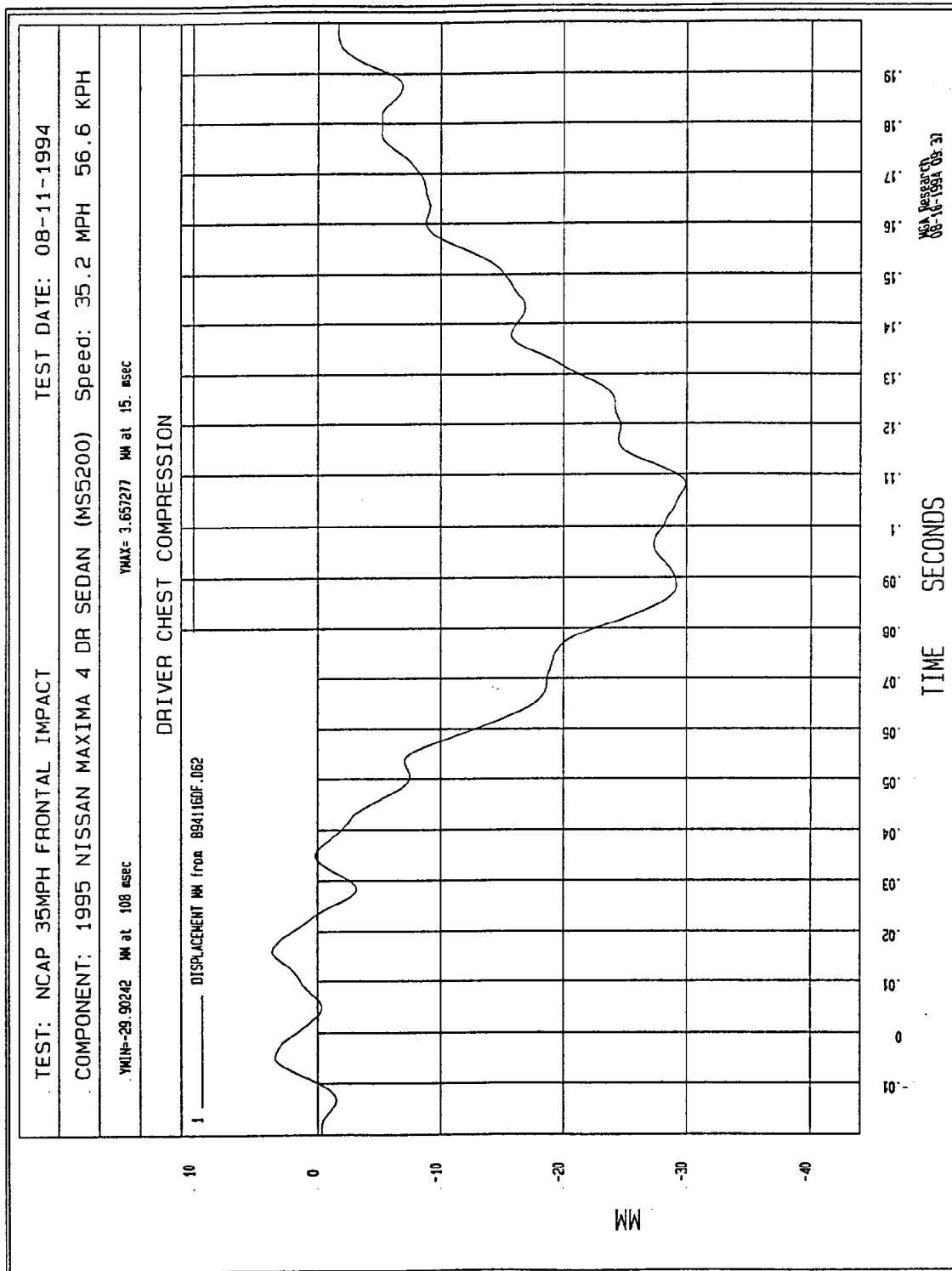


Figure B-31 - Driver Chest Resultant vs. Time



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Figure B-32 - Driver Chest Compression vs. Time

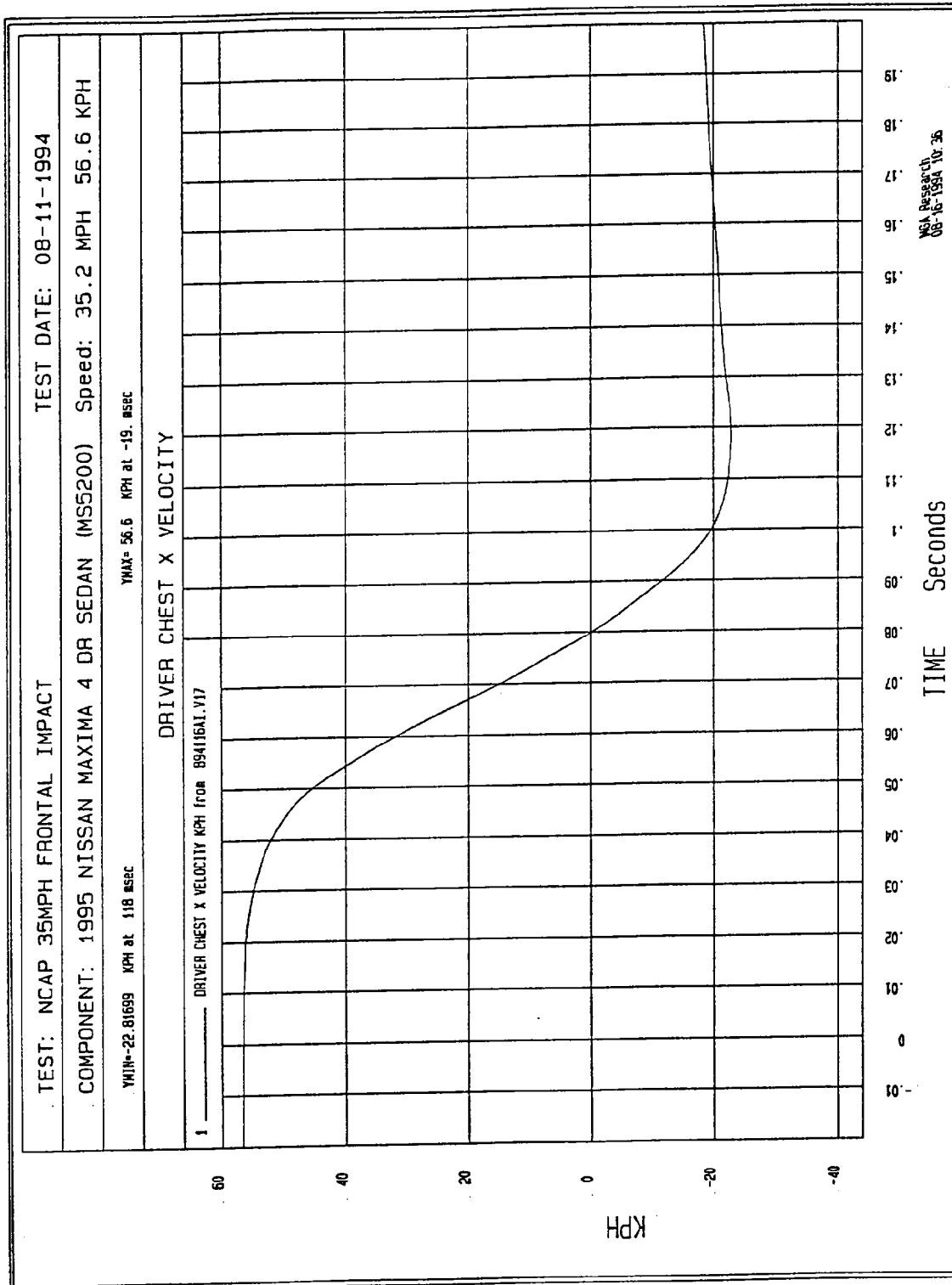


Figure B-33 - Driver Chest X Velocity vs. Time

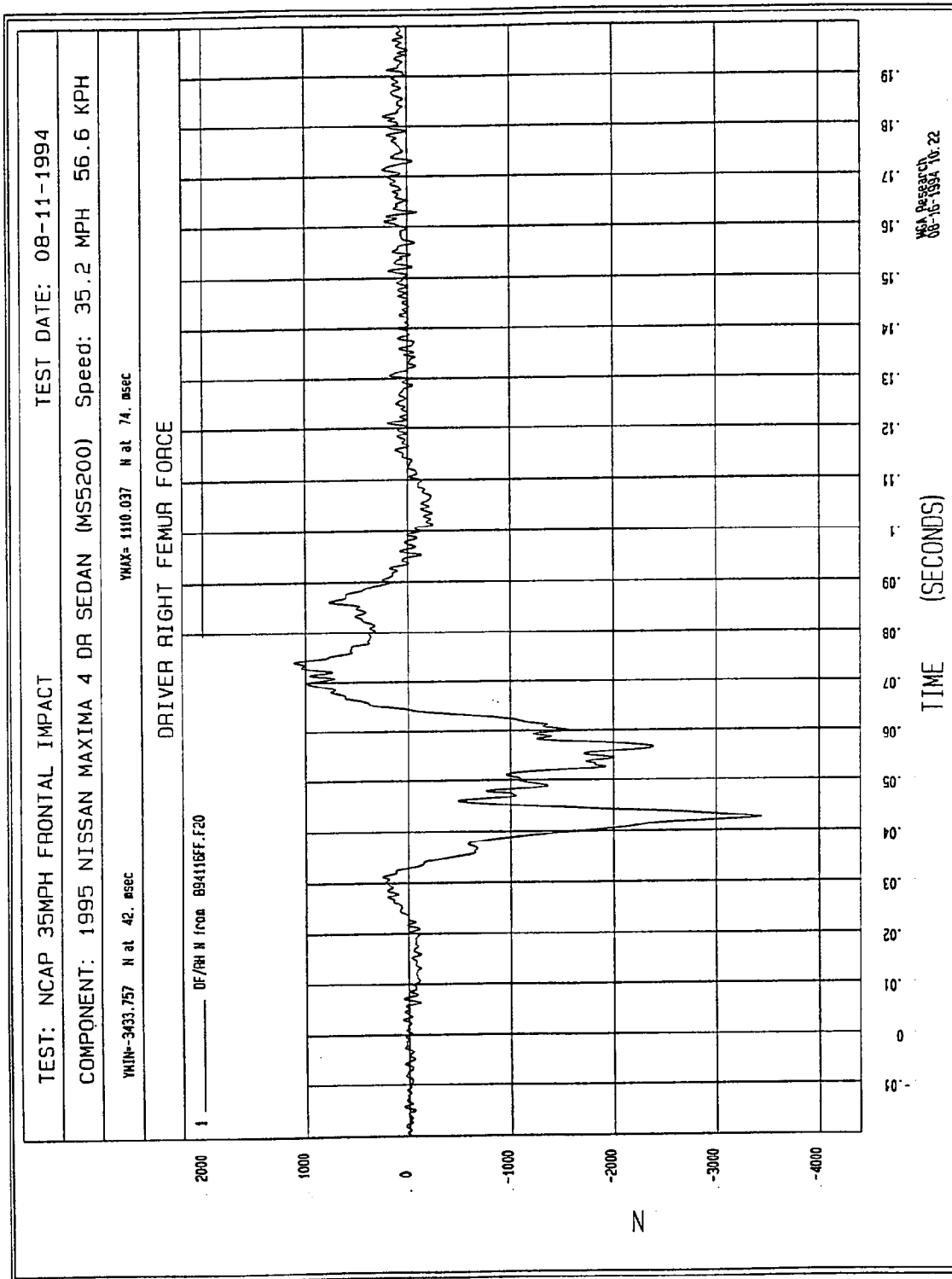


Figure B-34 - Driver Right Femur Force vs. Time

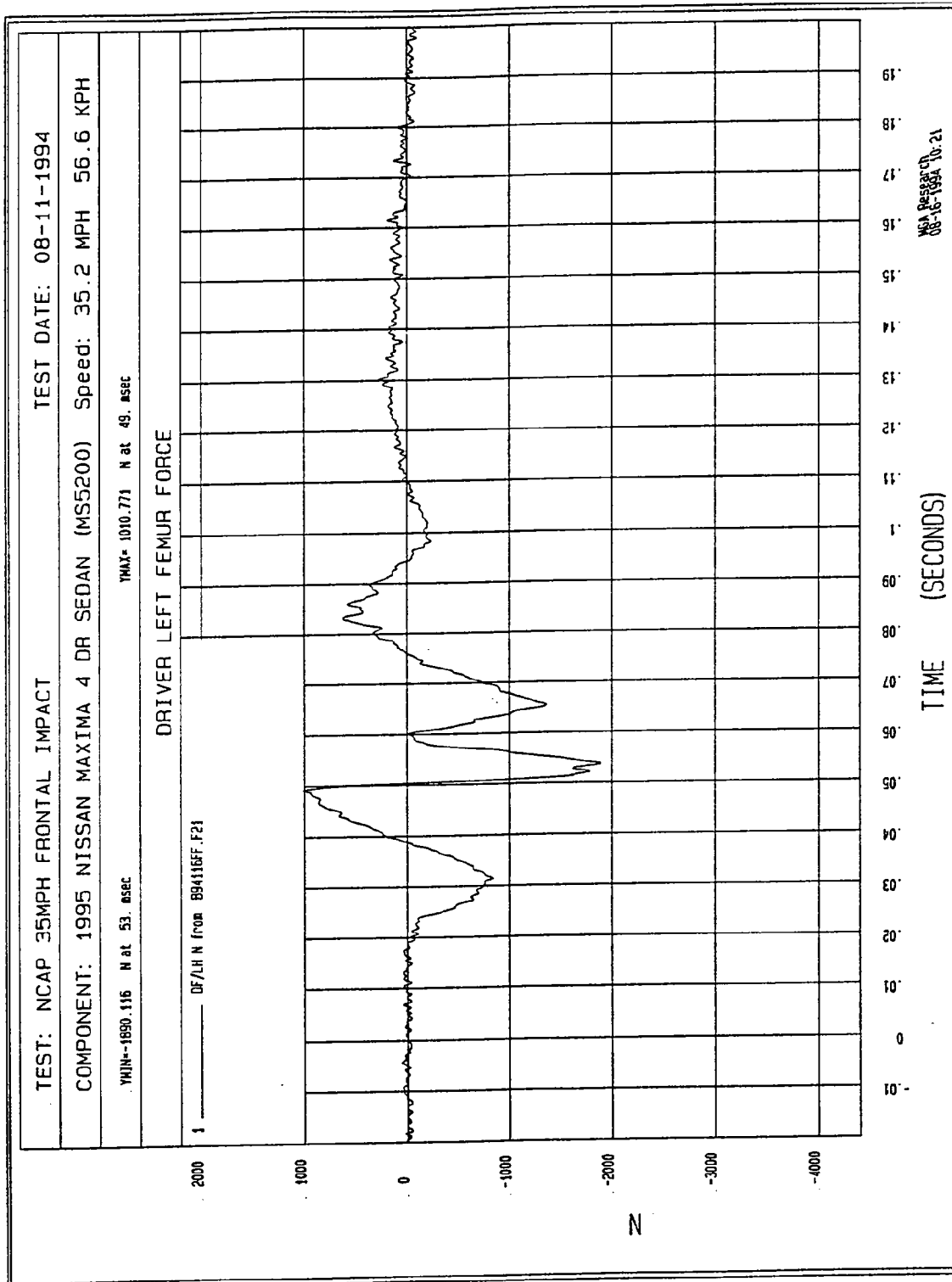
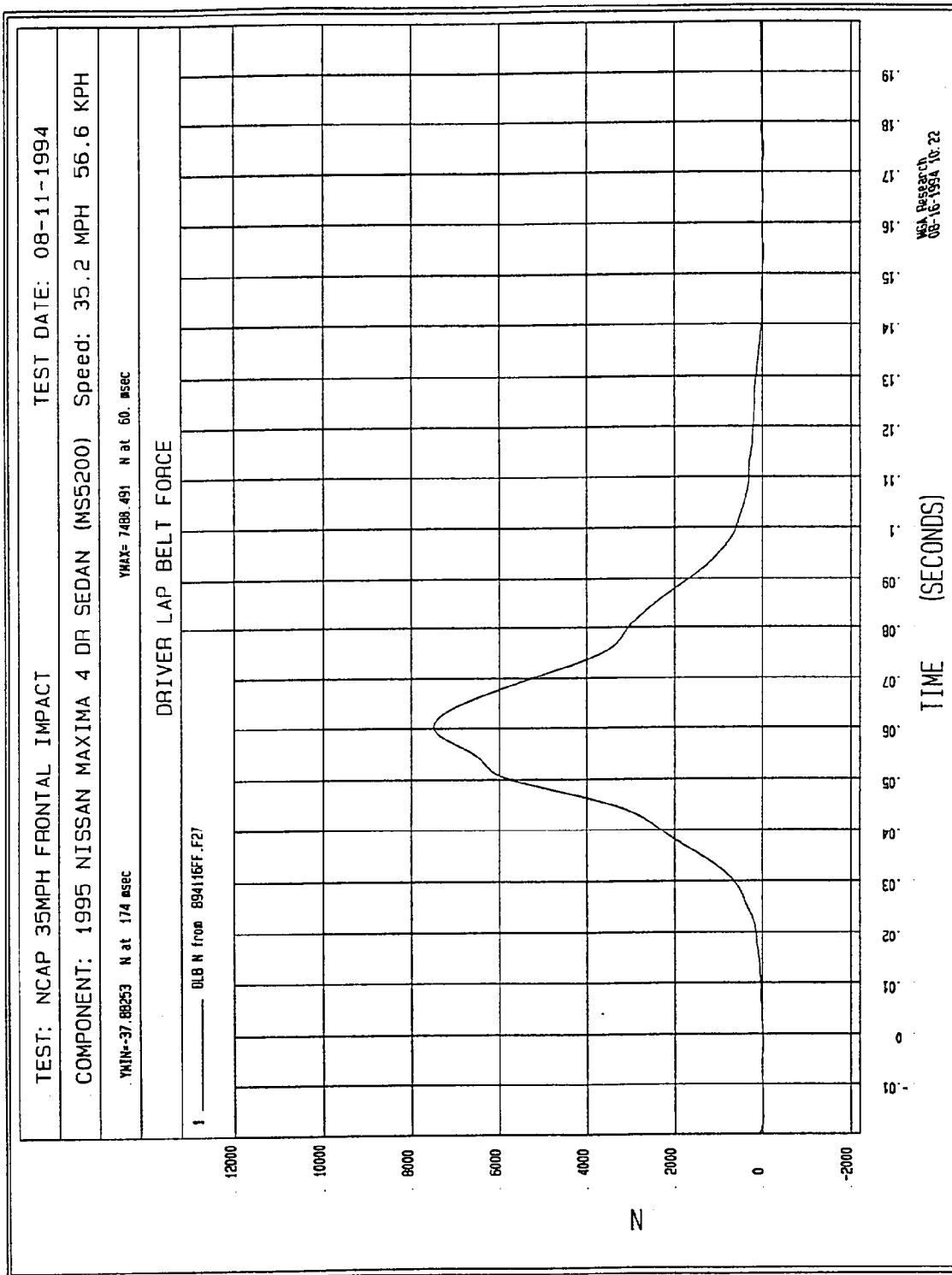


Figure B-35 - Driver Left Femur Force vs. Time



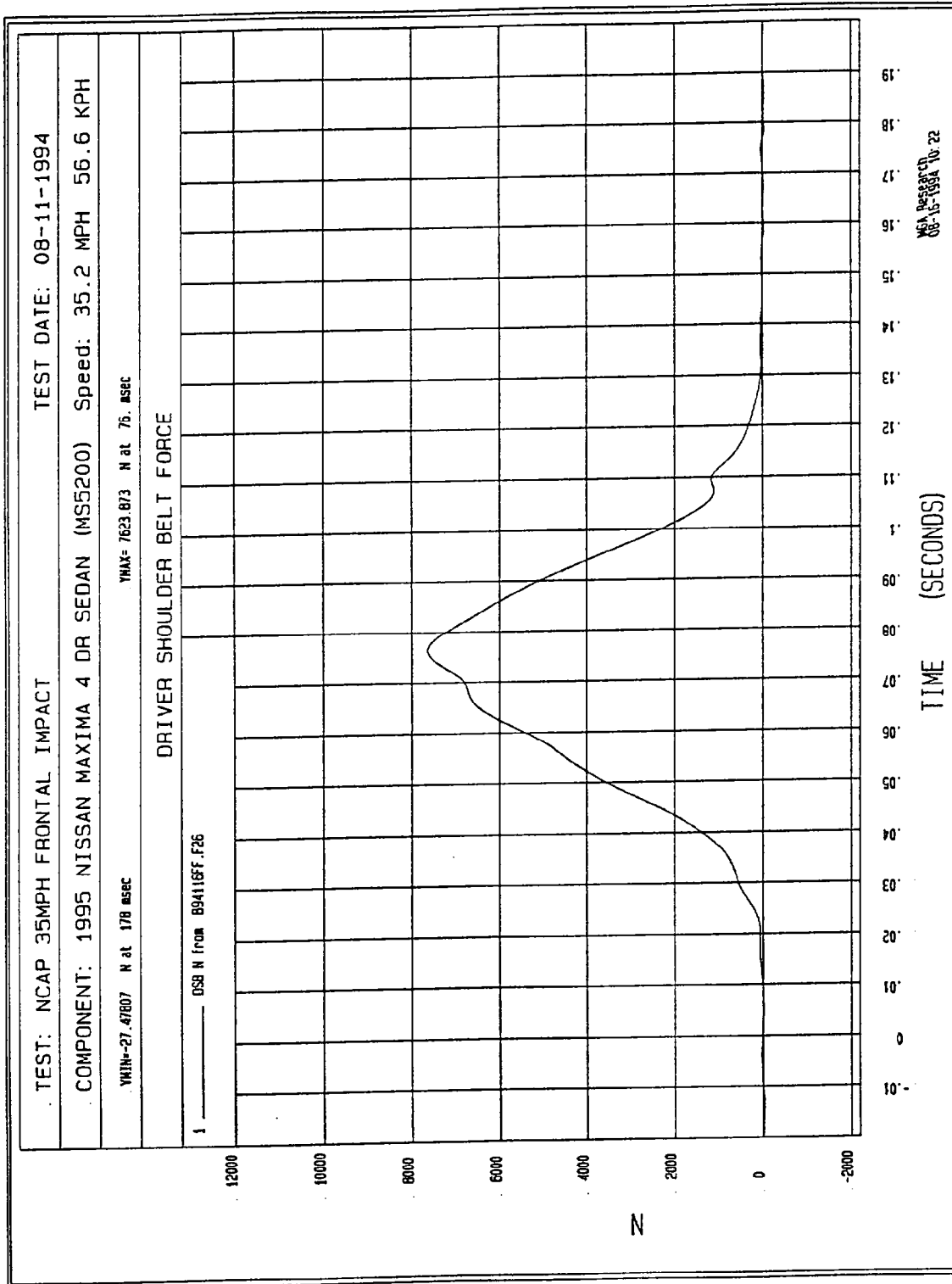


Figure B-37 - Driver Shoulder Belt Force vs. Time

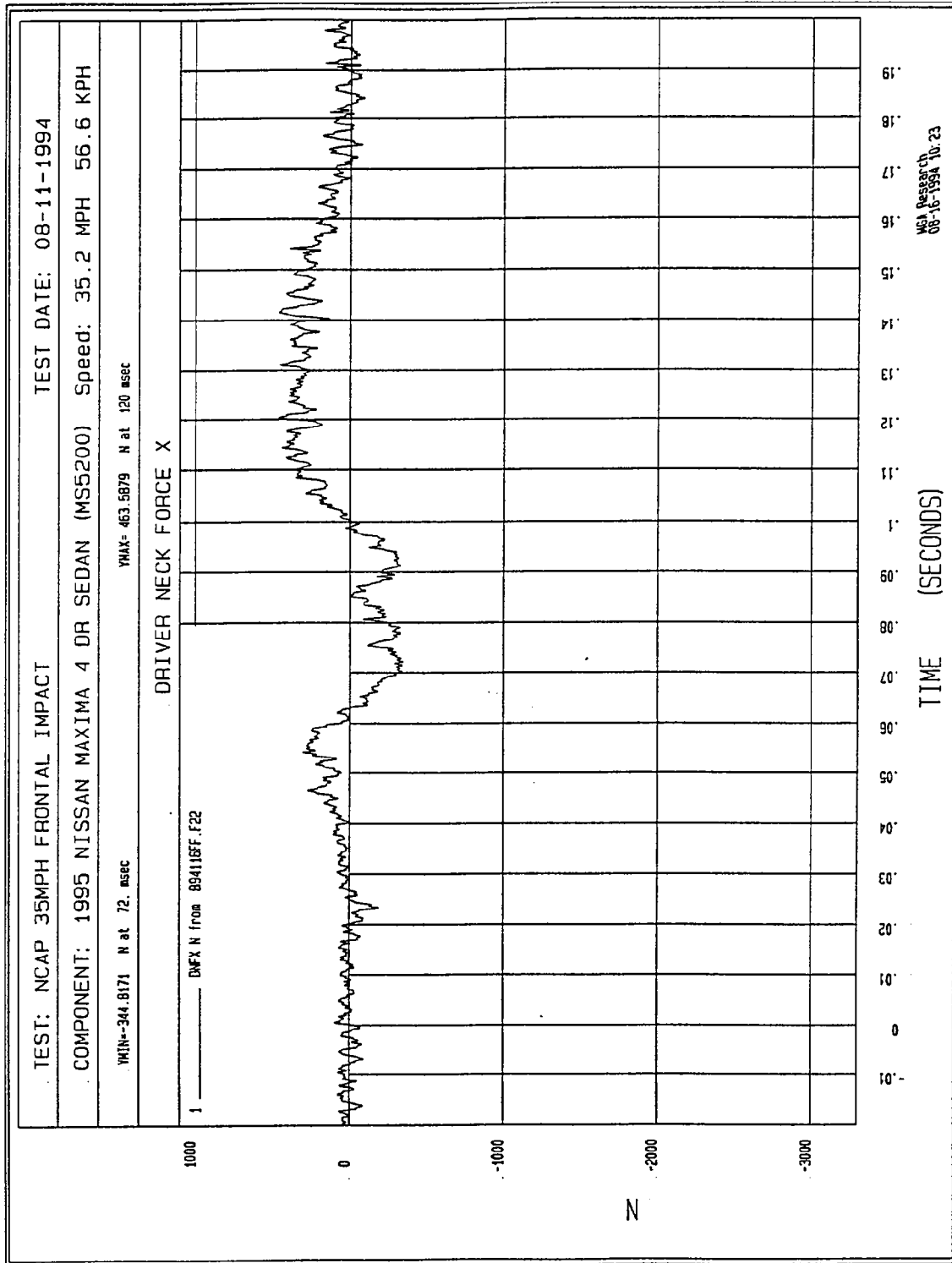


Figure B-38 - Driver Neck Force X vs. Time

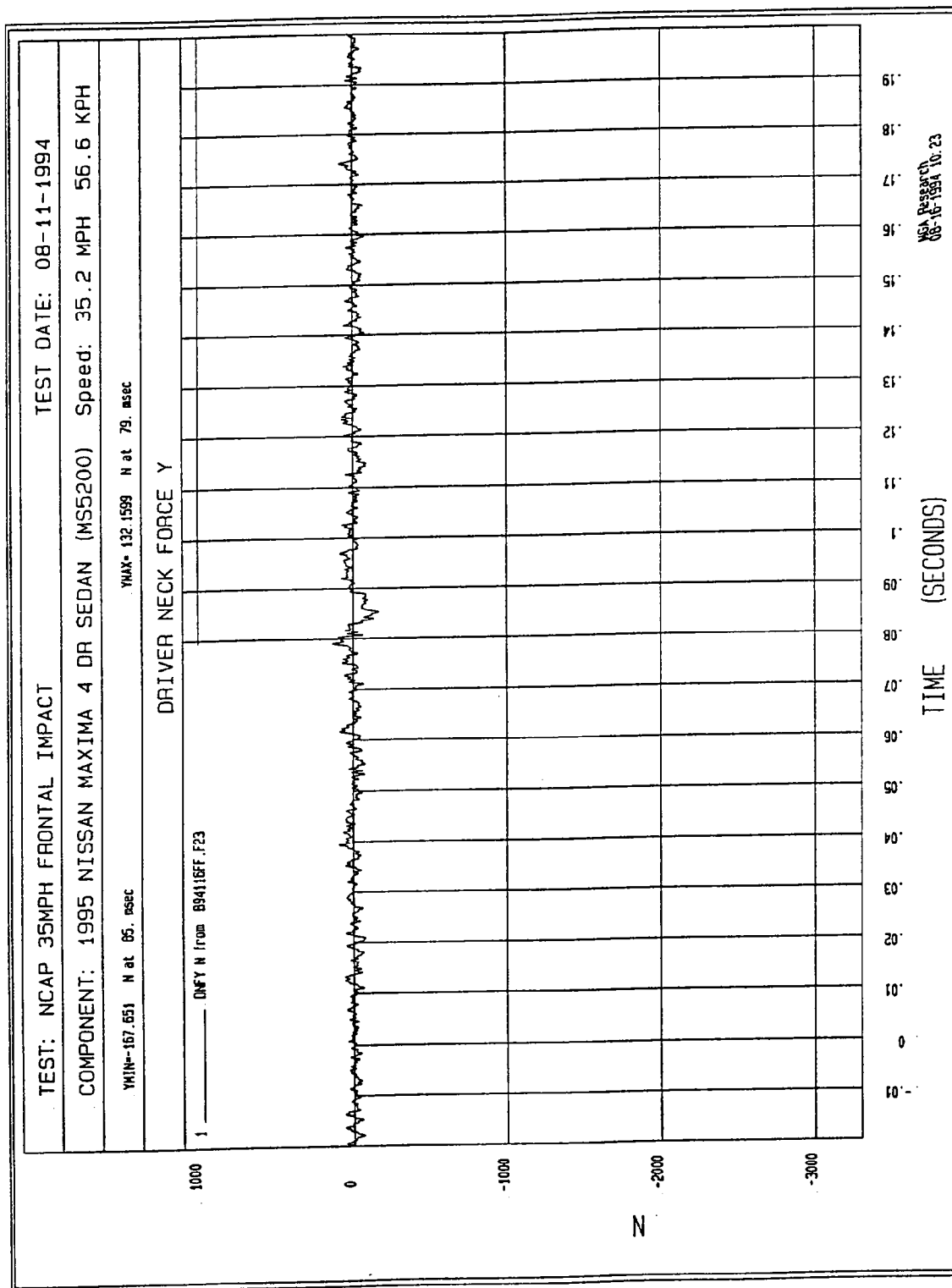
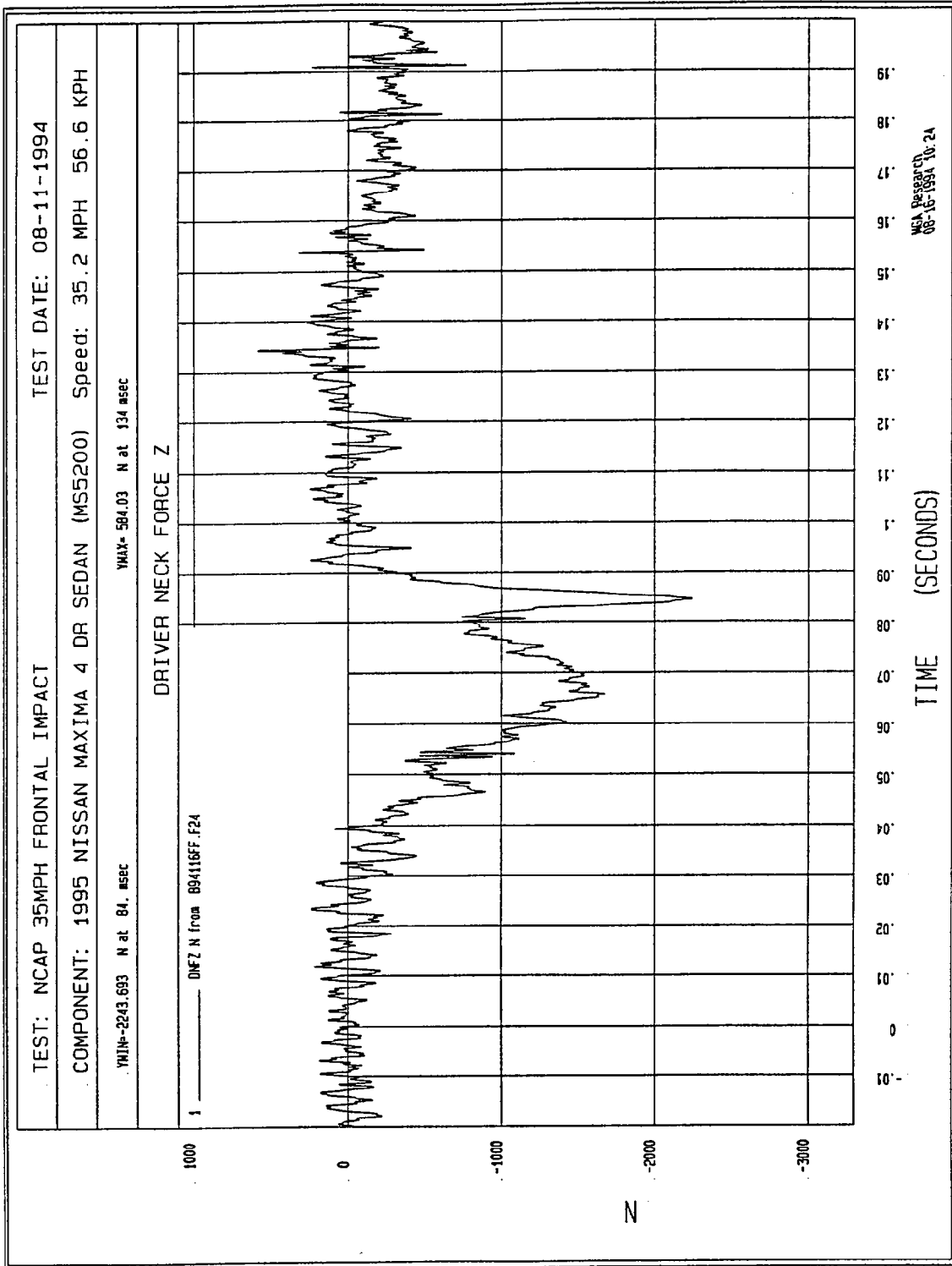


Figure B-39 - Driver Neck Force Y vs. Time



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Figure B-40 - Driver Neck Force Z vs. Time

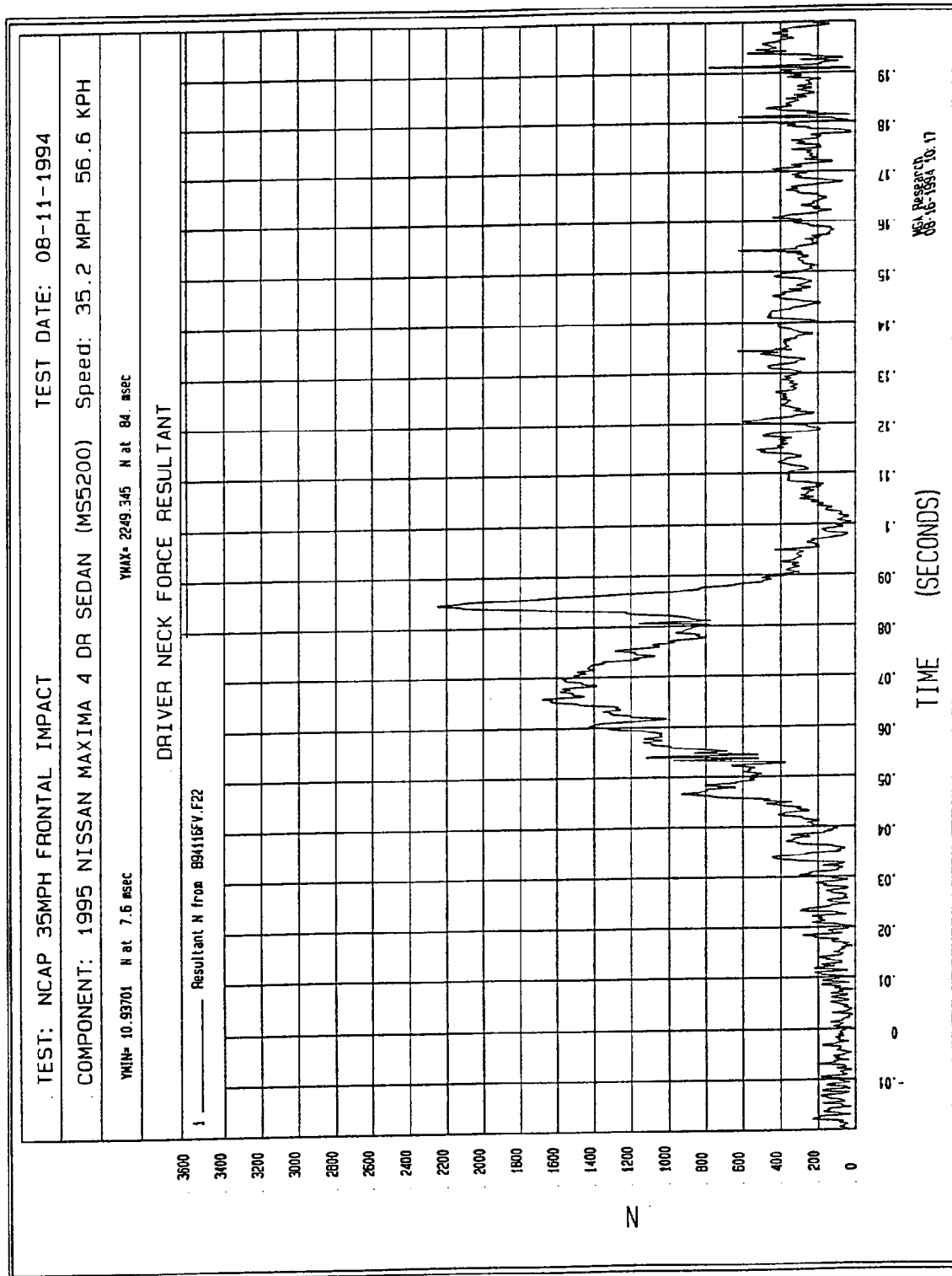


Figure B-41 - Driver Neck Force Resultant vs. Time

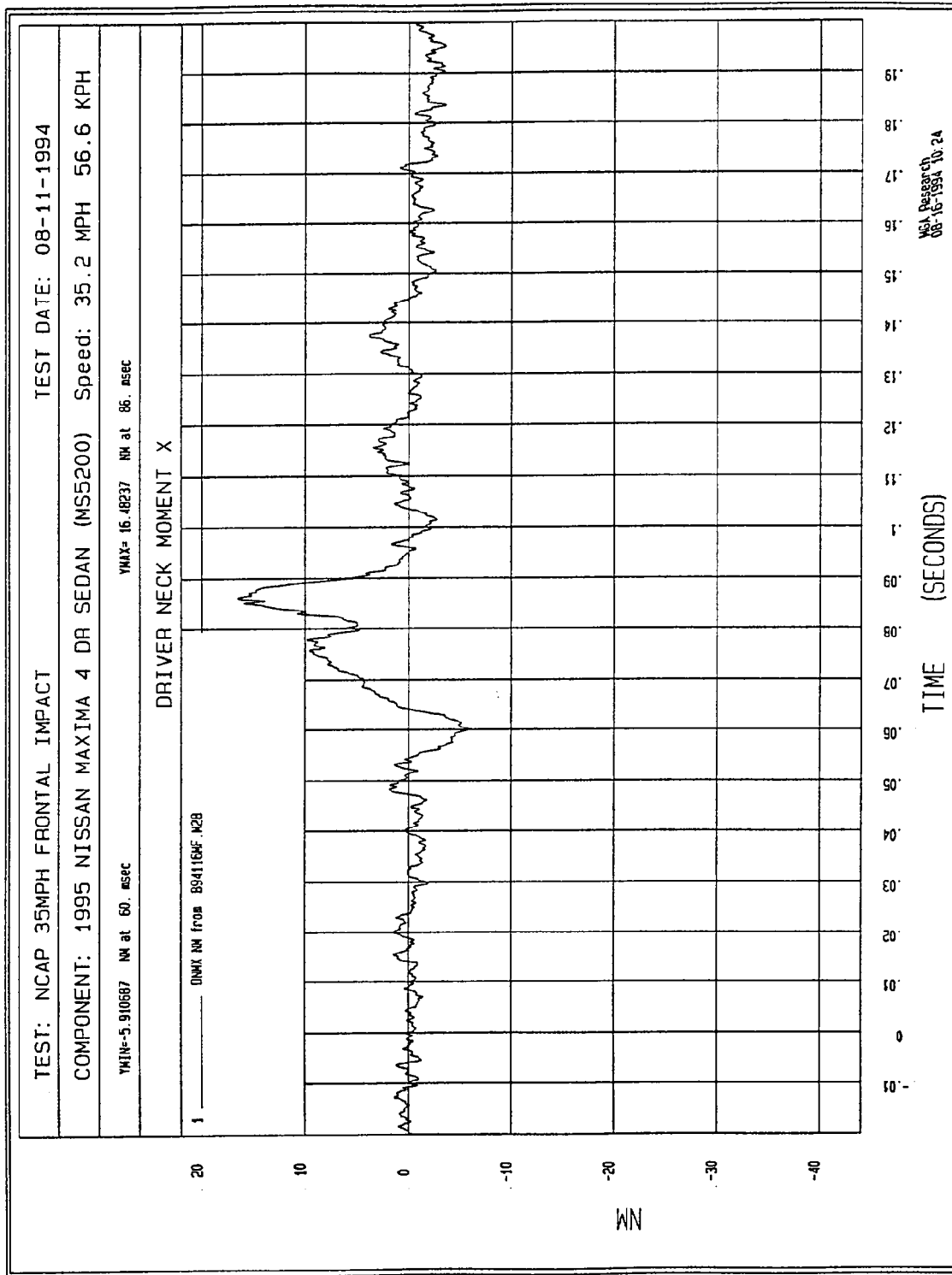


Figure B-42 - Driver Neck Moment X vs. Time

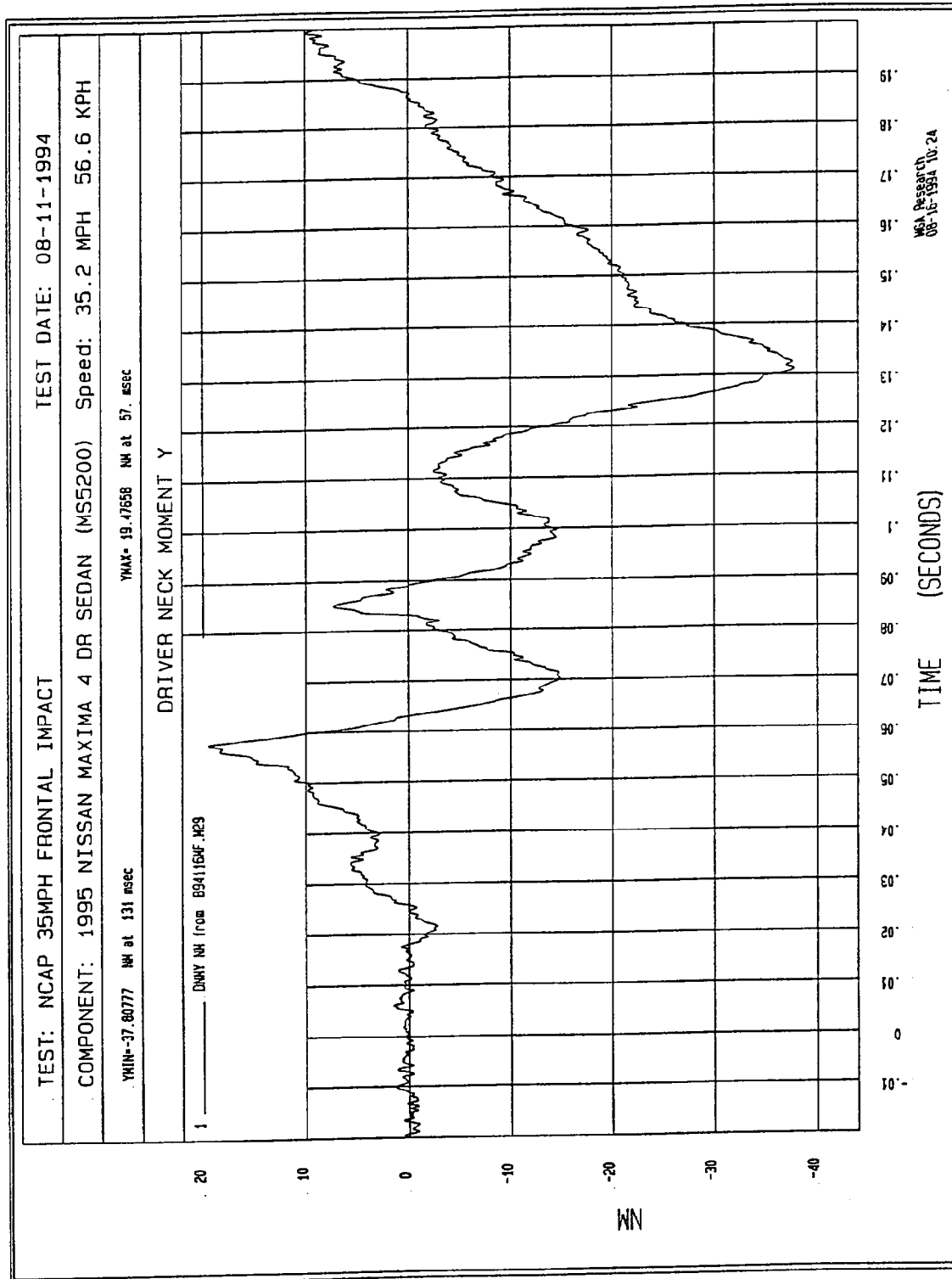


Figure B-43 - Driver Neck Moment Y vs. Time

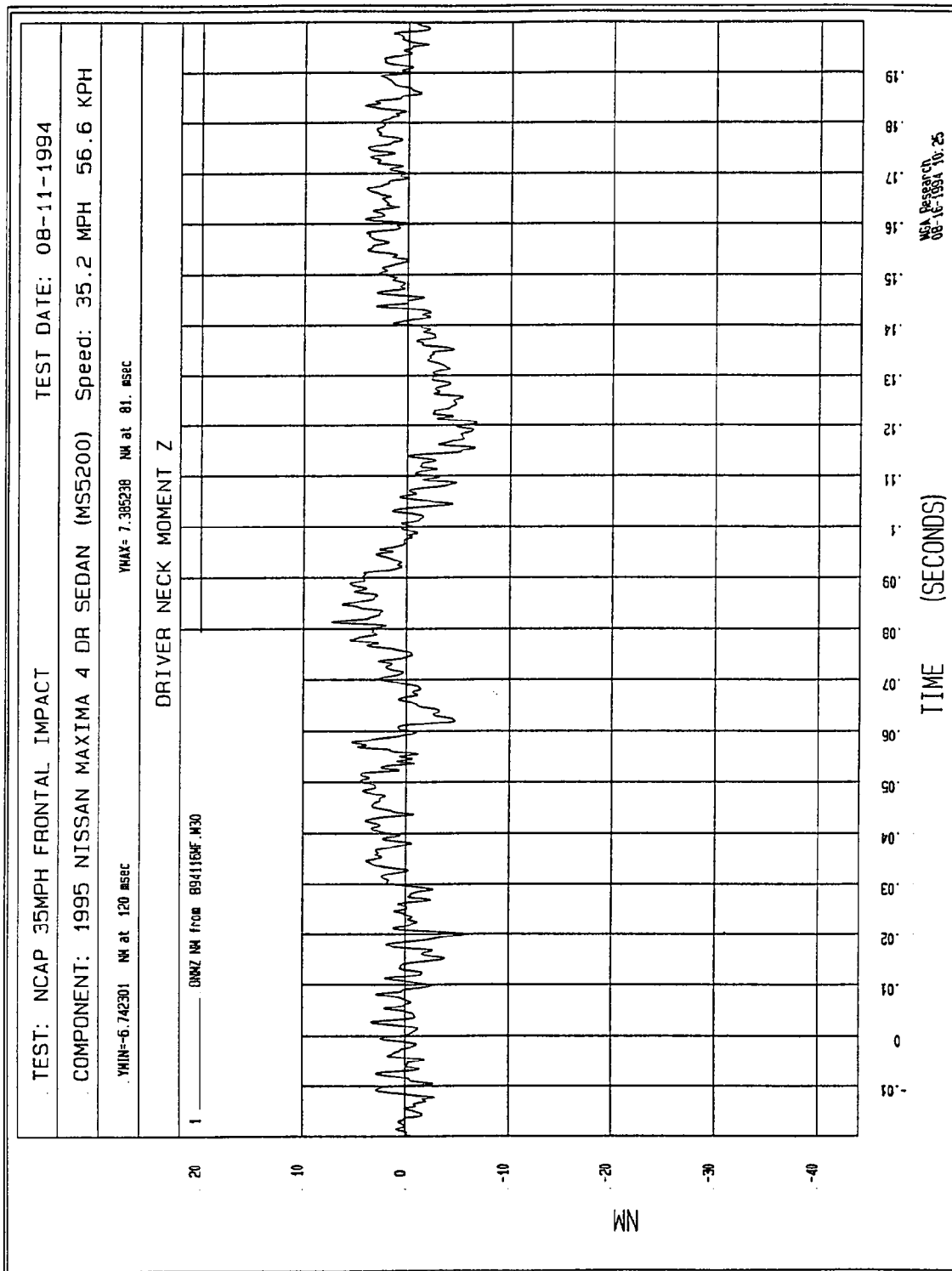


Figure B-44 - Driver Neck Moment Z vs. Time

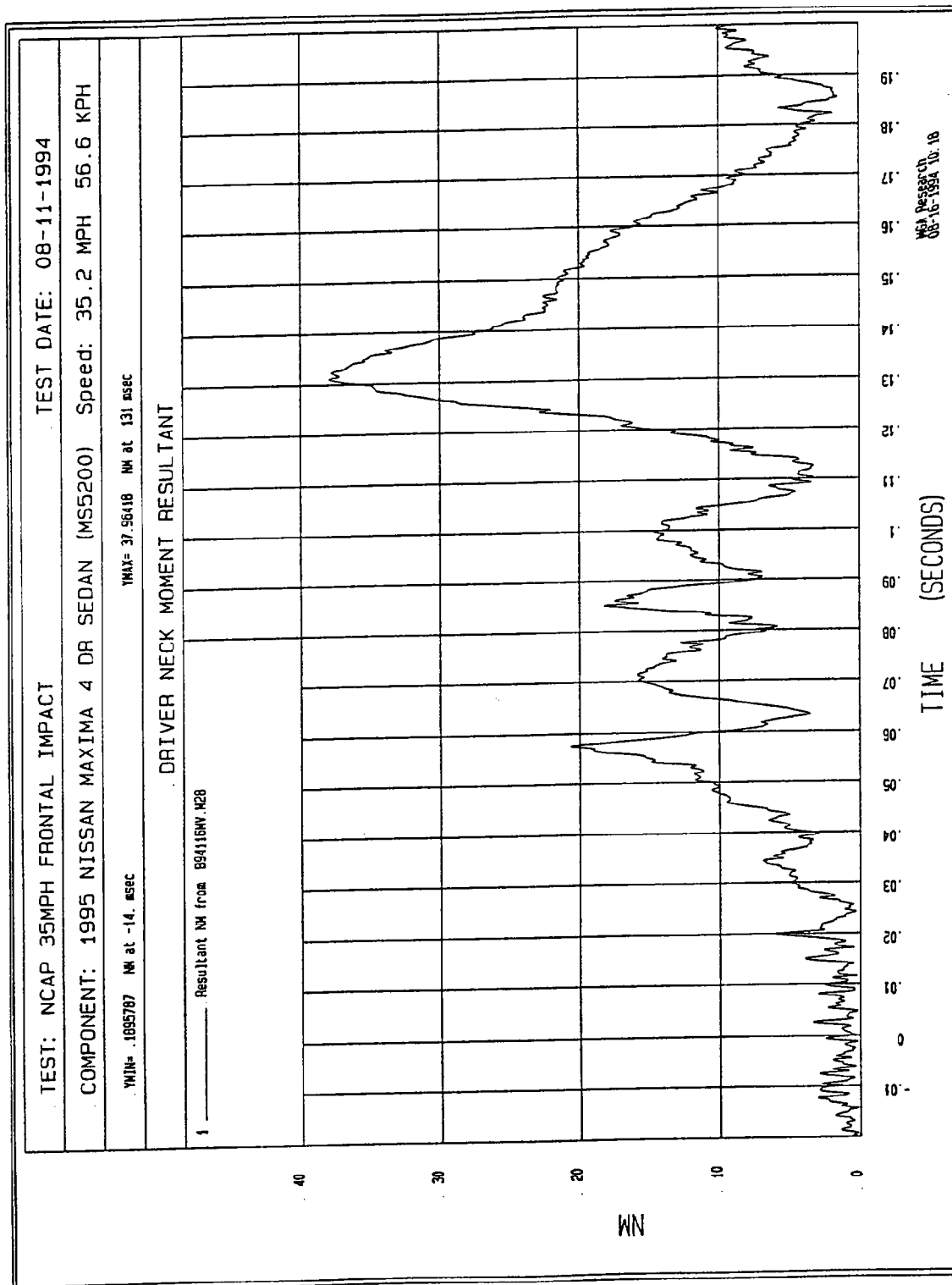
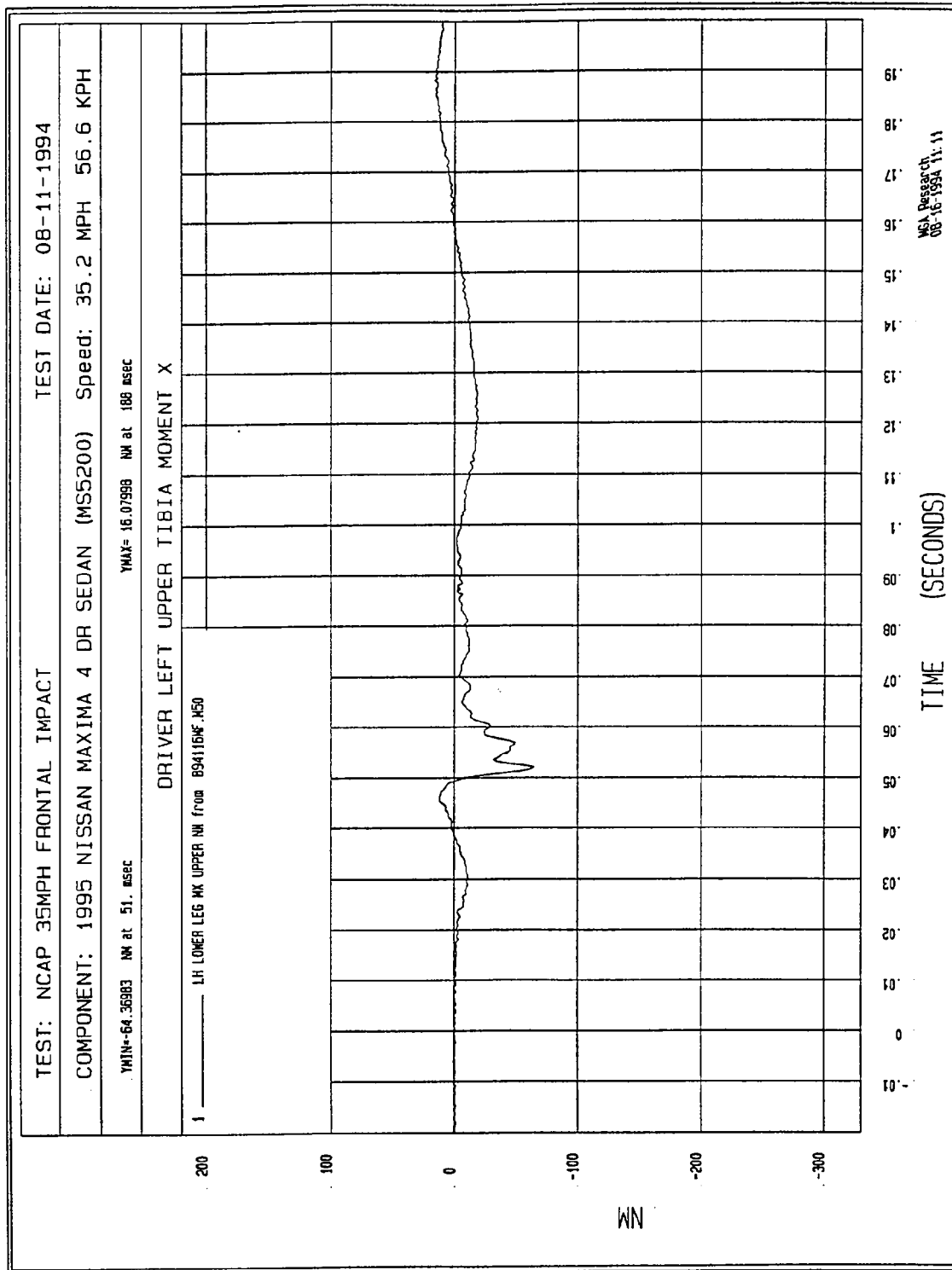


Figure B-45 - Driver Neck Moment Resultant vs. Time



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Figure B-46 - Driver Left Upper Tibia Moment X vs. Time

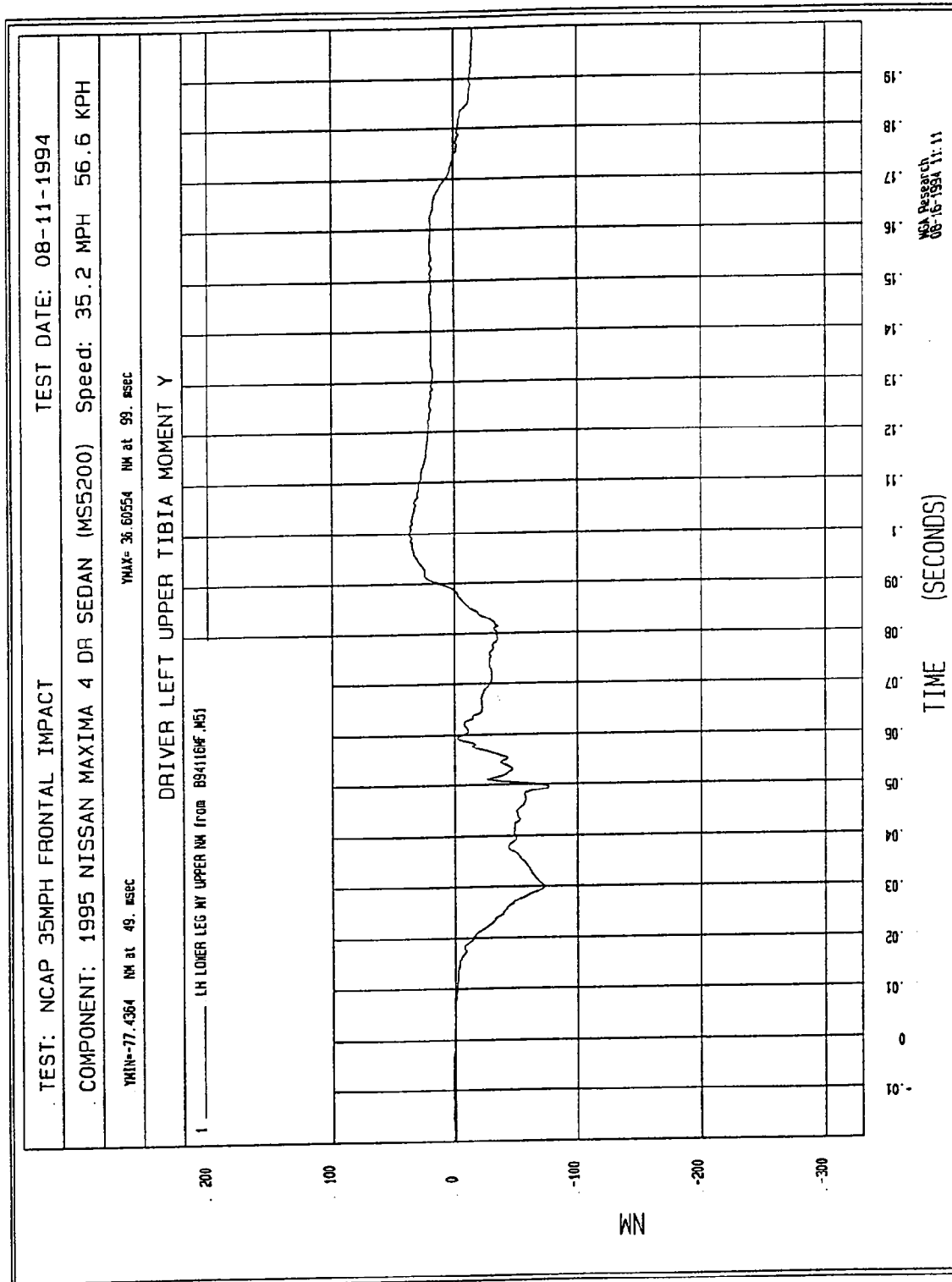


Figure B-47 - Driver Left Upper Tibia Moment Y vs. Time

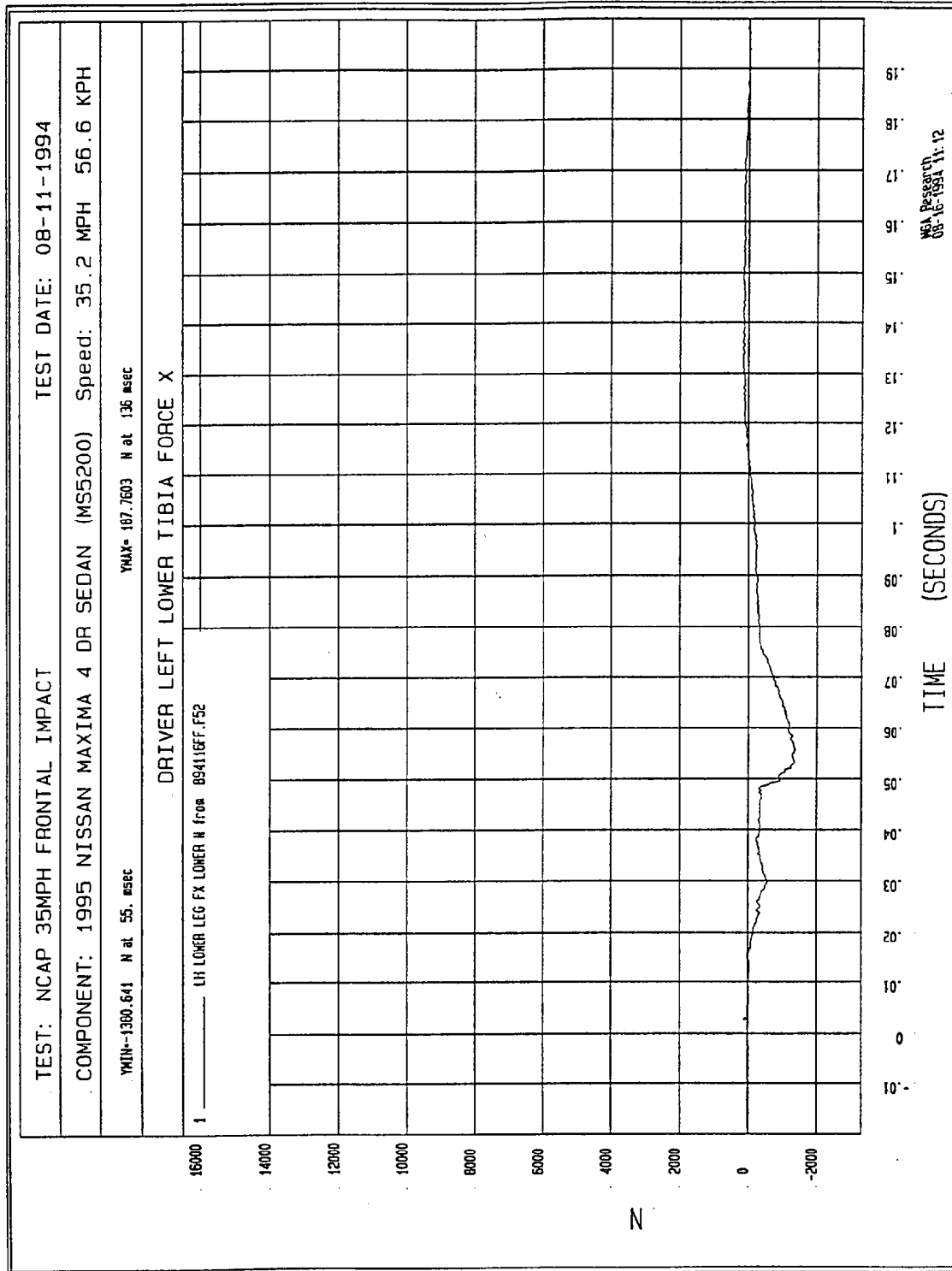
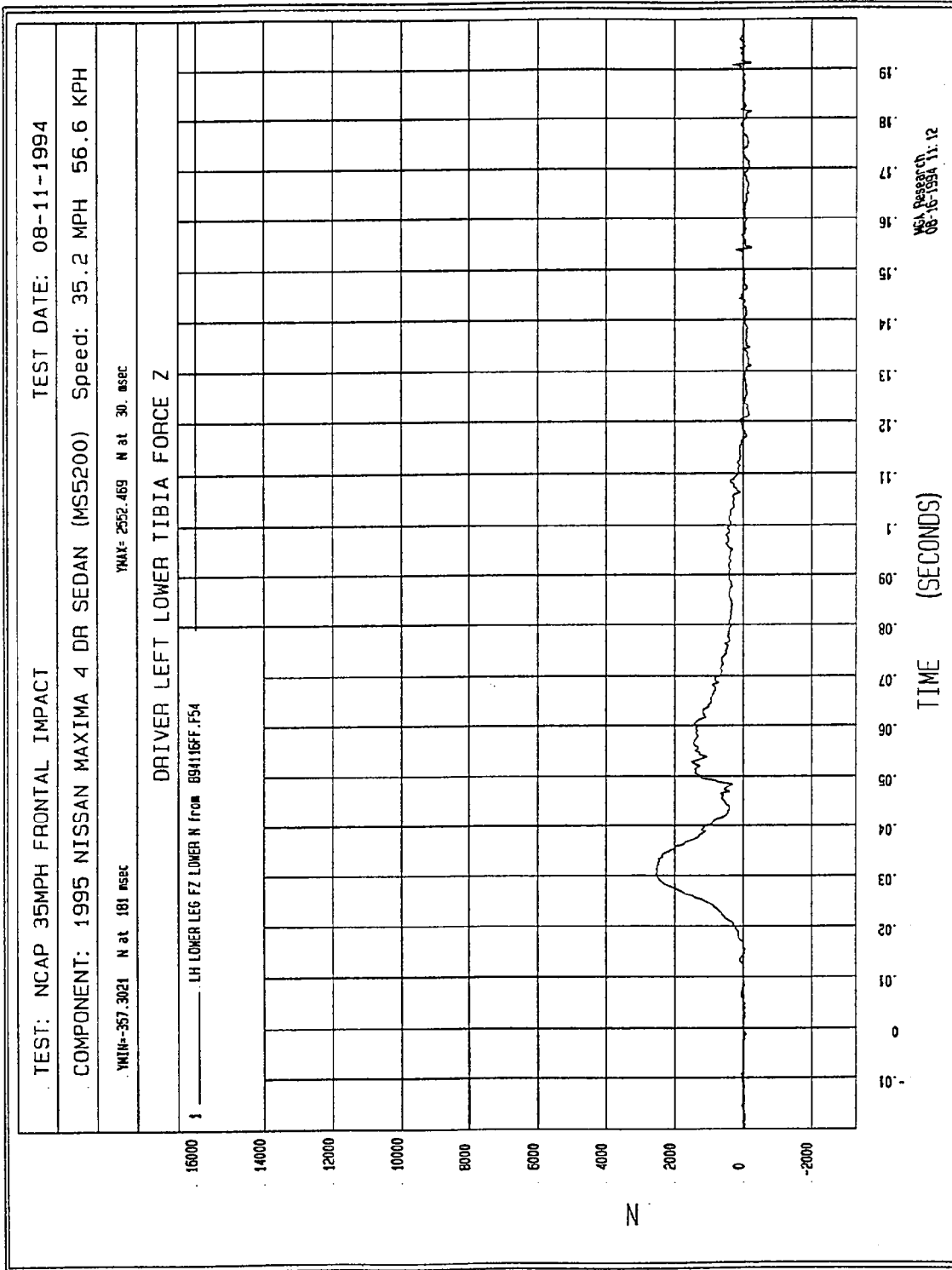


Figure B-48 - Driver Left Lower Tibia Force X vs. Time



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Figure B-50 - Driver Left Lower Tibia Force Z vs. Time

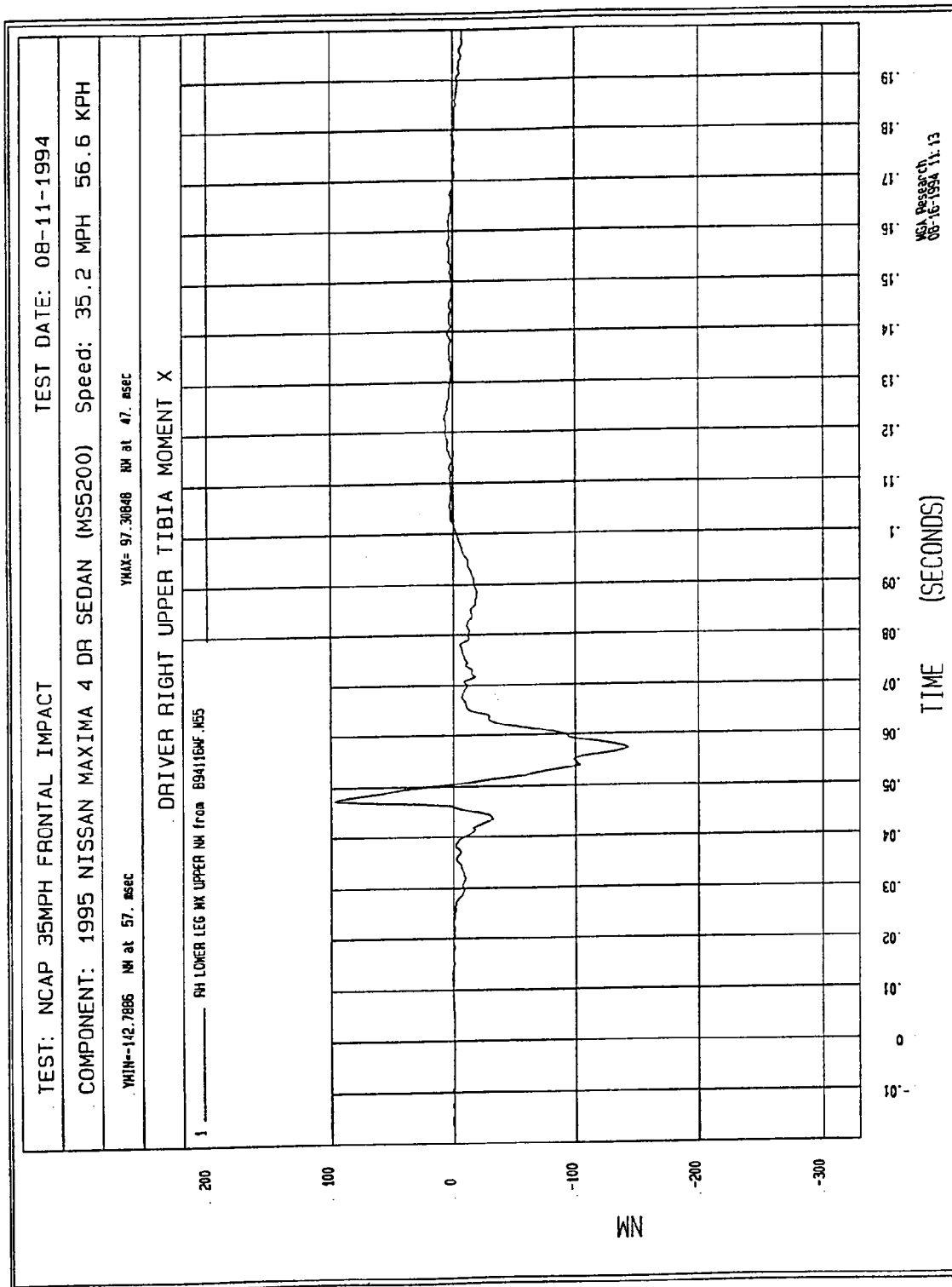


Figure B-51 - Driver Right Upper Tibia Moment X vs. Time

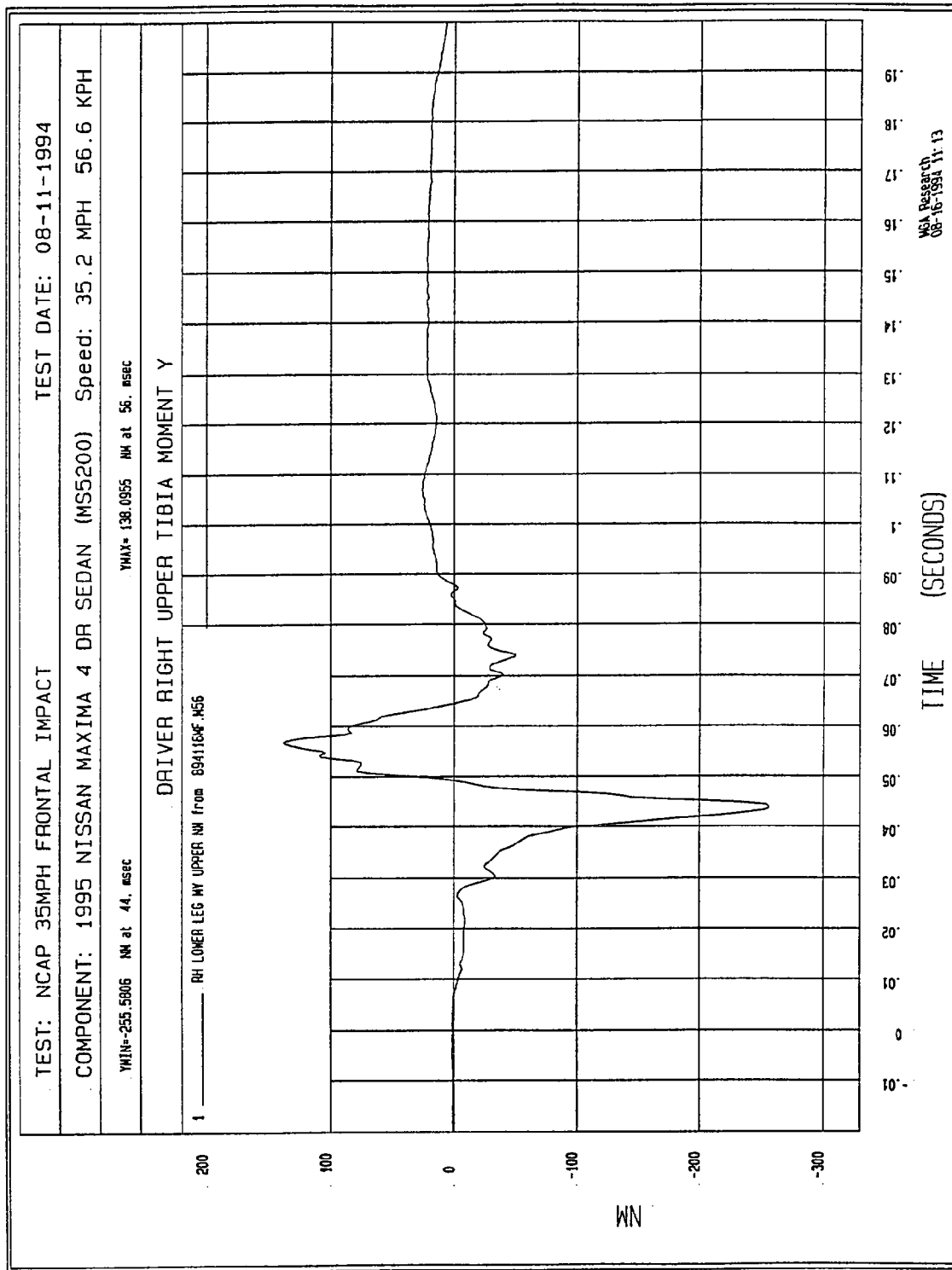


Figure B-52 - Driver Right Upper Tibia Moment Y vs. Time

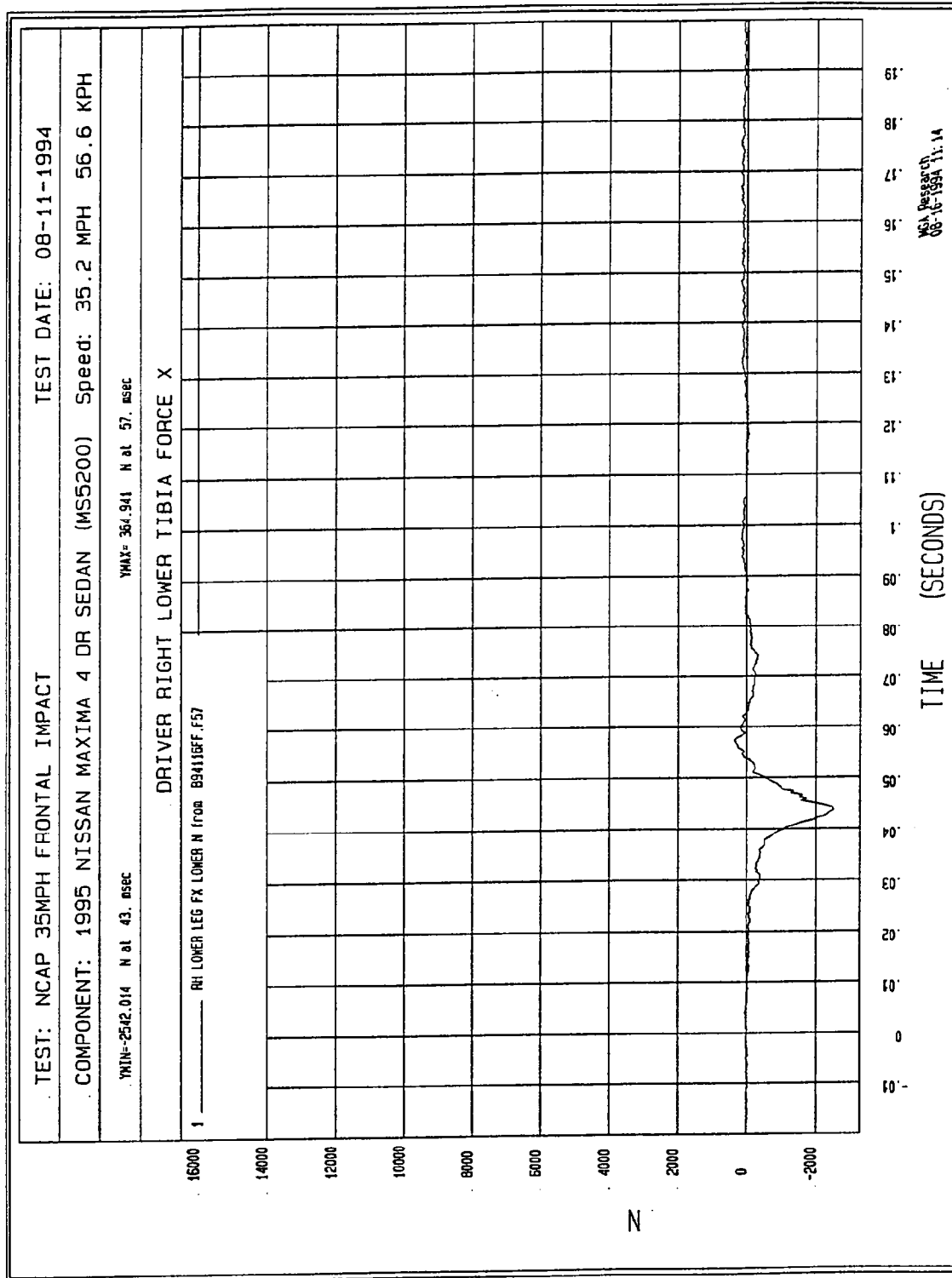
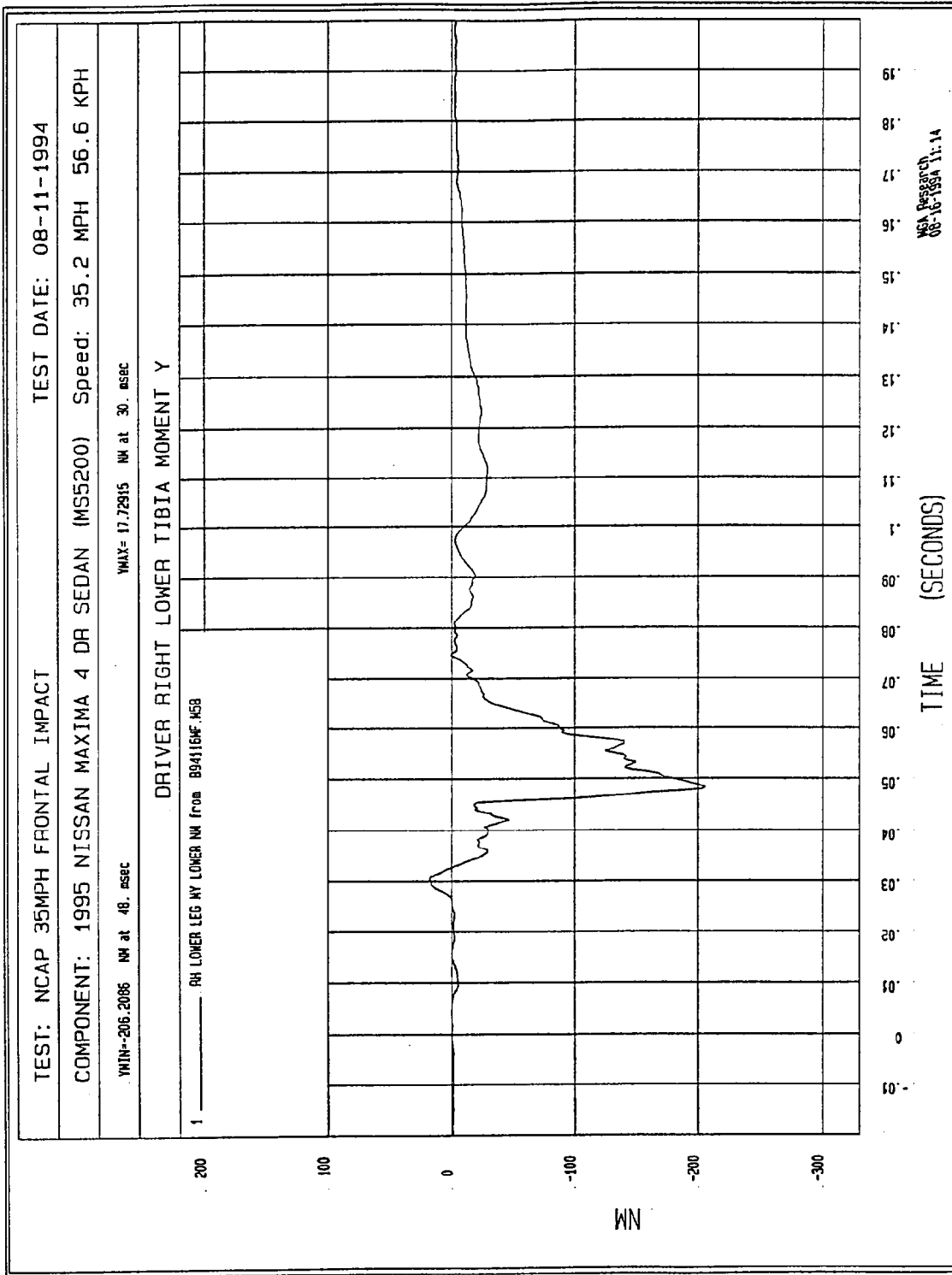


Figure B-53 - Driver Right Lower Tibia Force X vs. Time



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Figure B-54 - Driver Right Lower Tibia Moment Y vs. Time

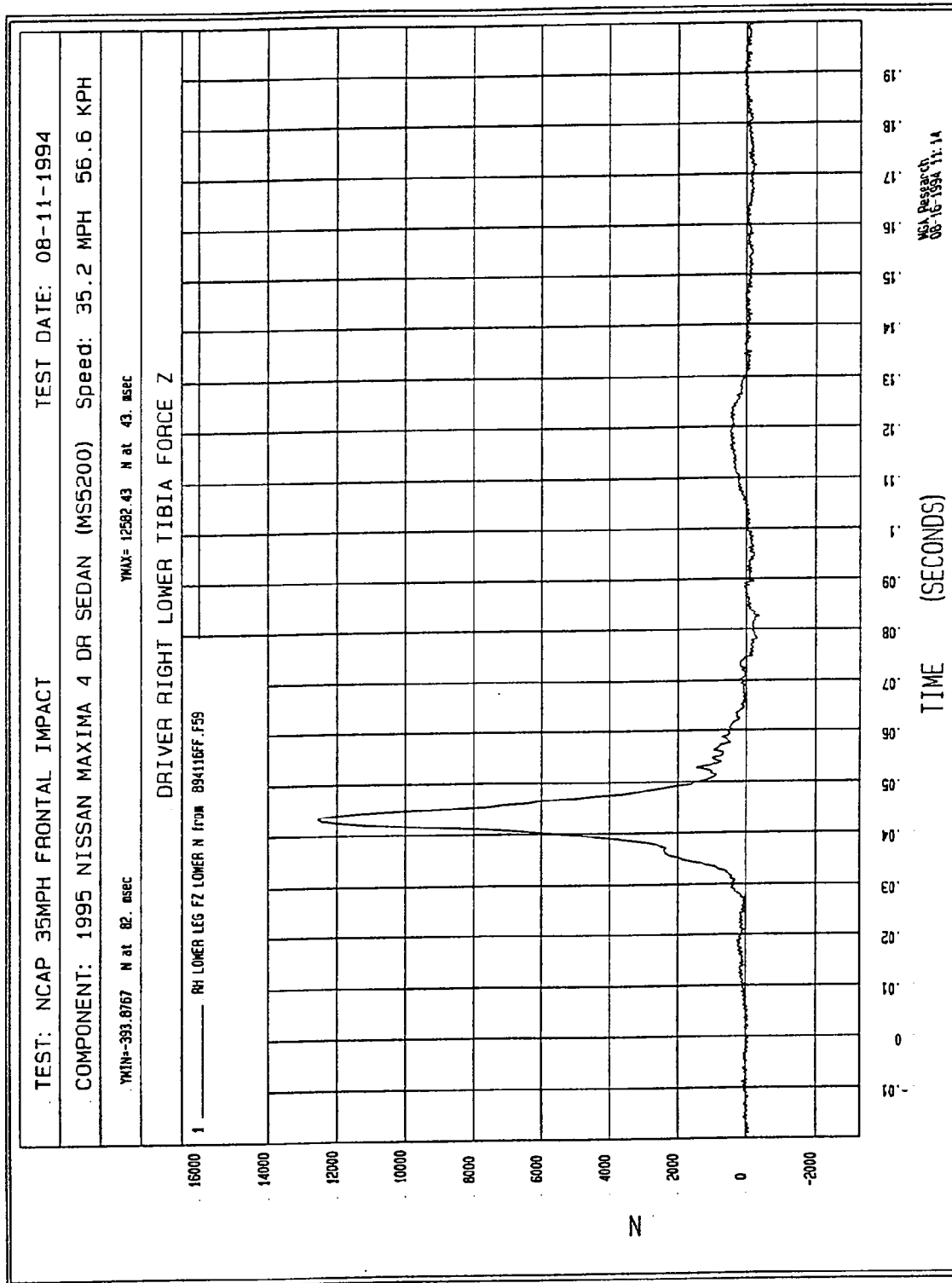


Figure B-55 - Driver Right Lower Tibia Force Z vs. Time

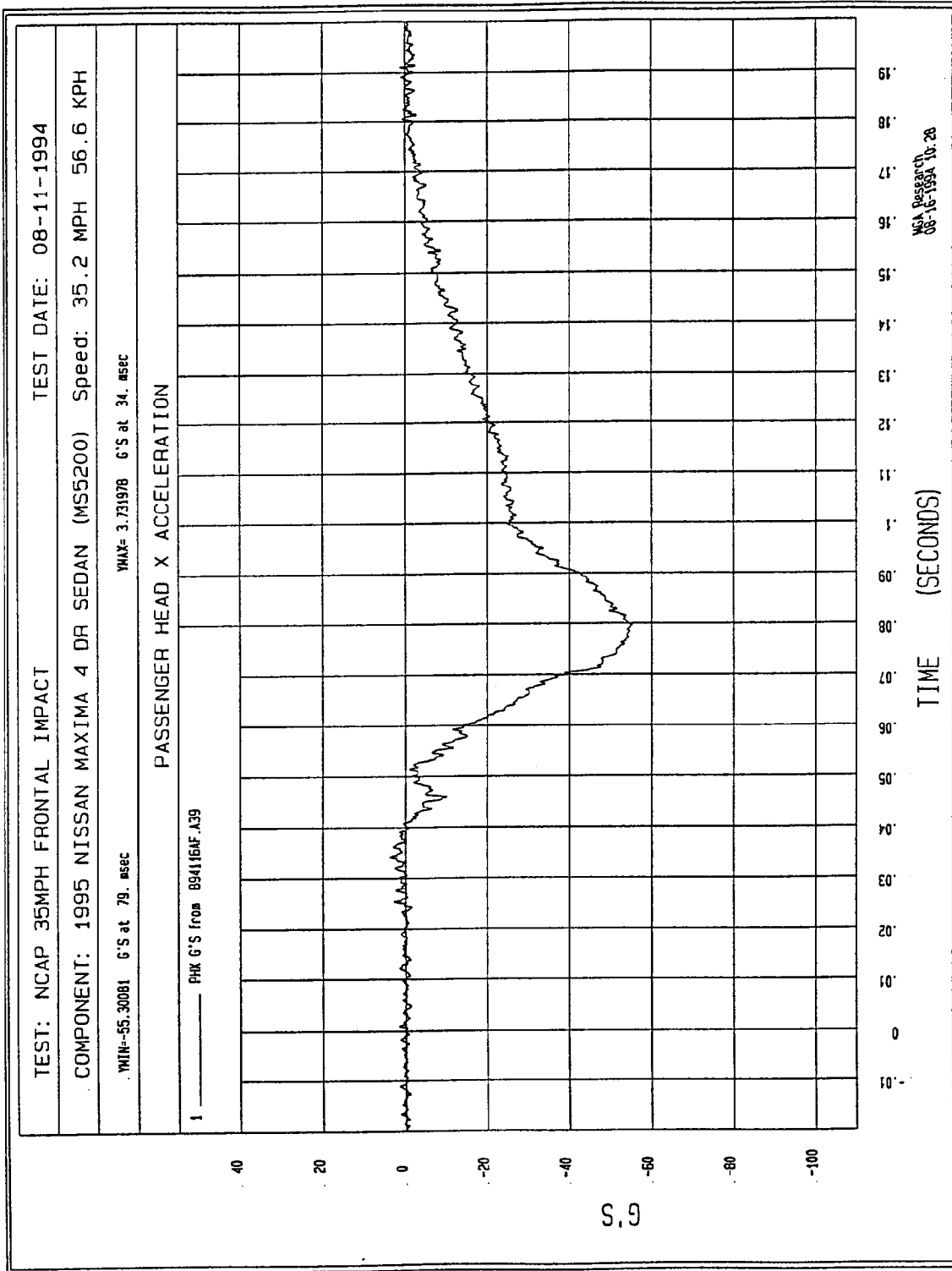


Figure B-56 - Passenger Head X Acceleration vs. Time

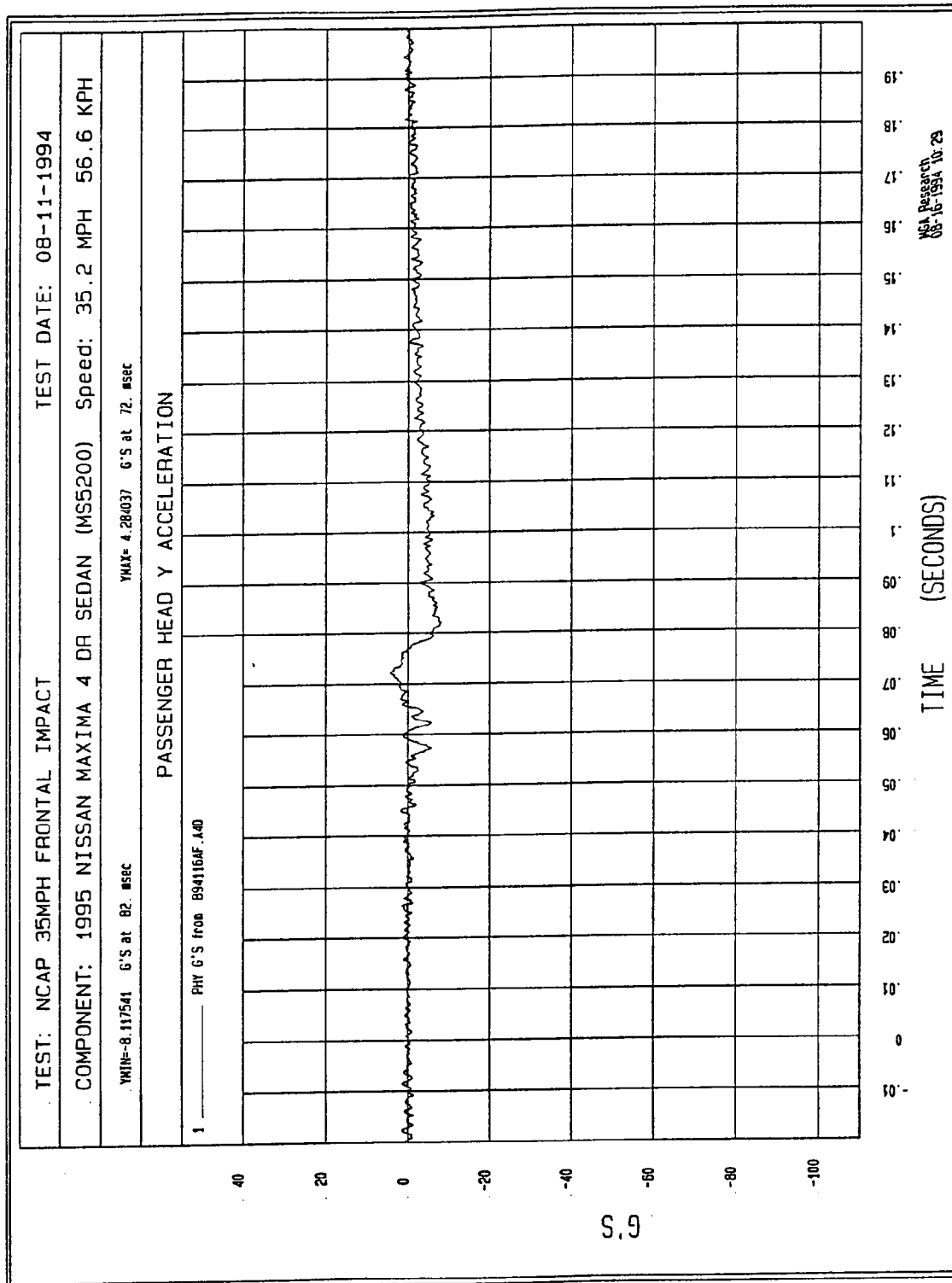


Figure B-57 - Passenger Head Y Acceleration vs. Time

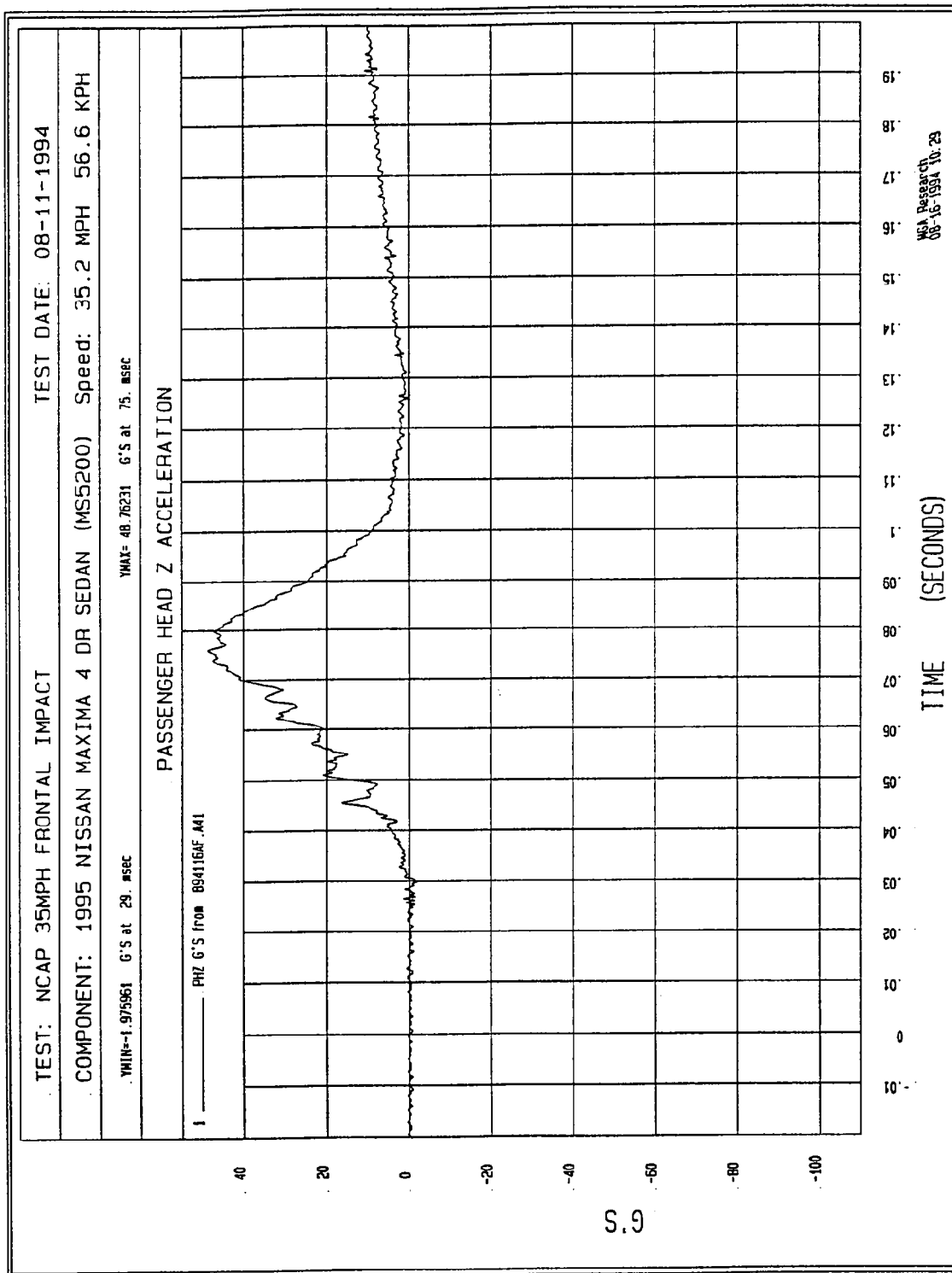


Figure B-58 - Passenger Head Z Acceleration vs. Time

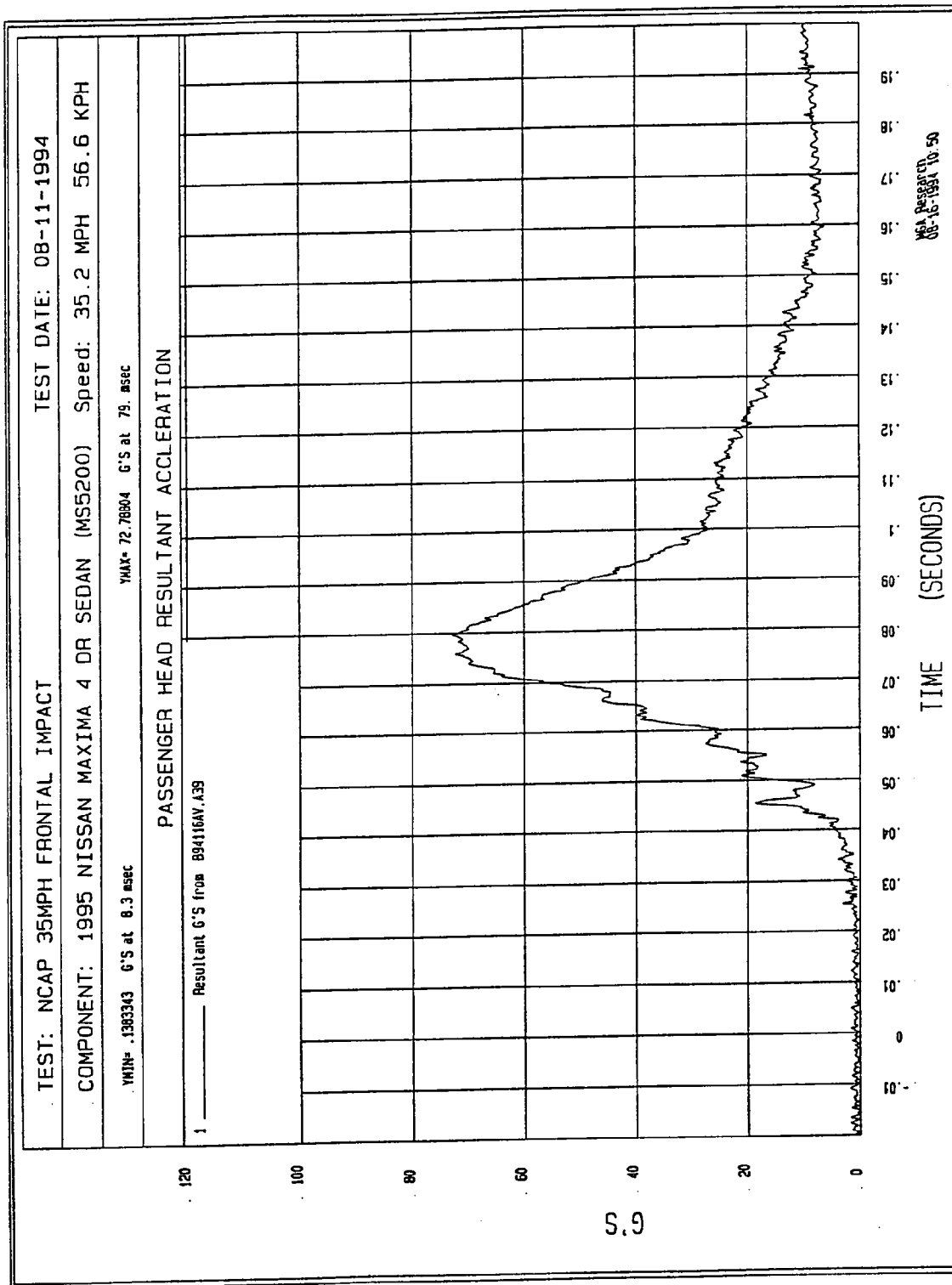


Figure B-59 - Passenger Head Resultant vs. Time

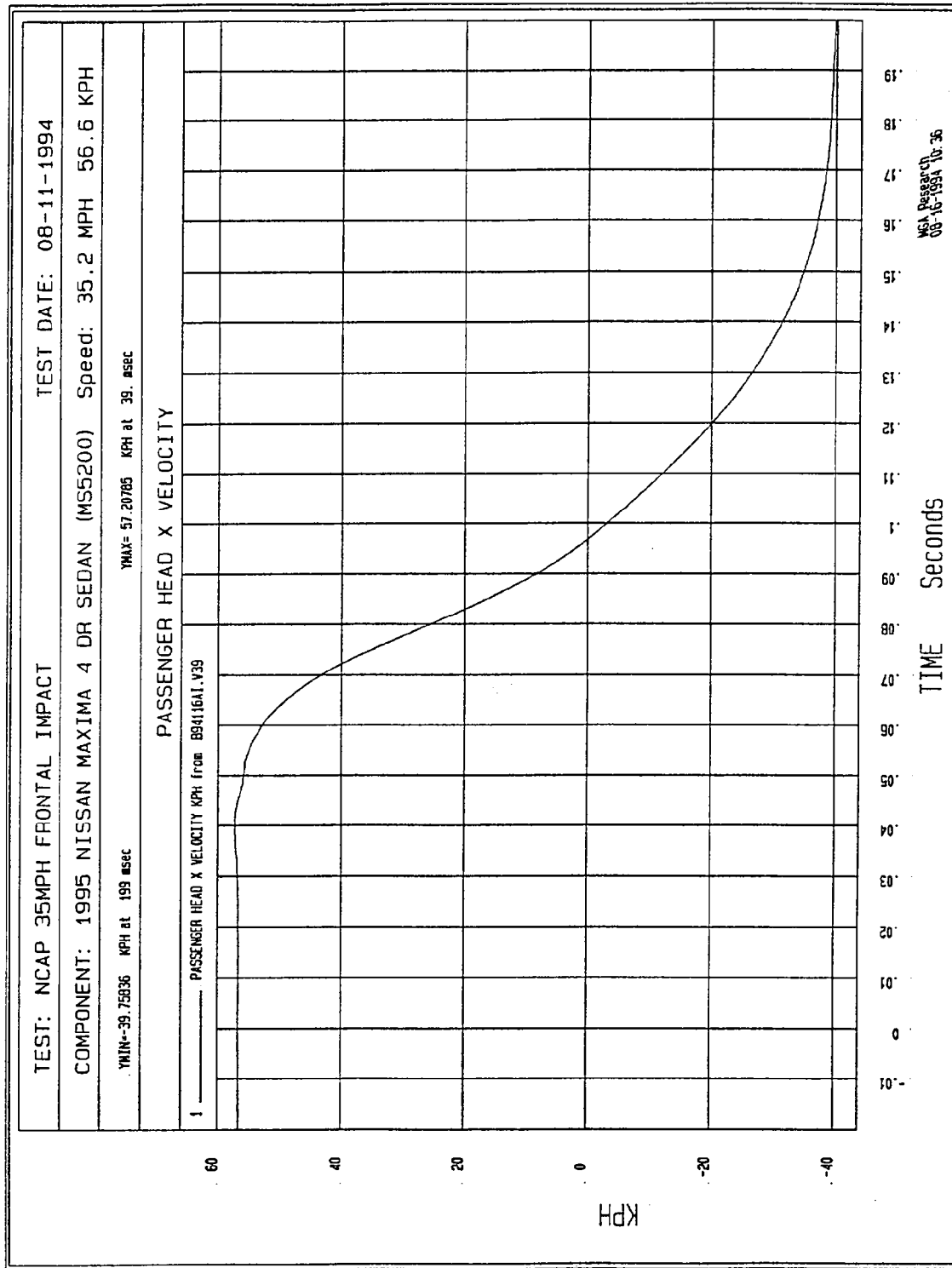


Figure B-60 - Passenger Head X Velocity vs. Time

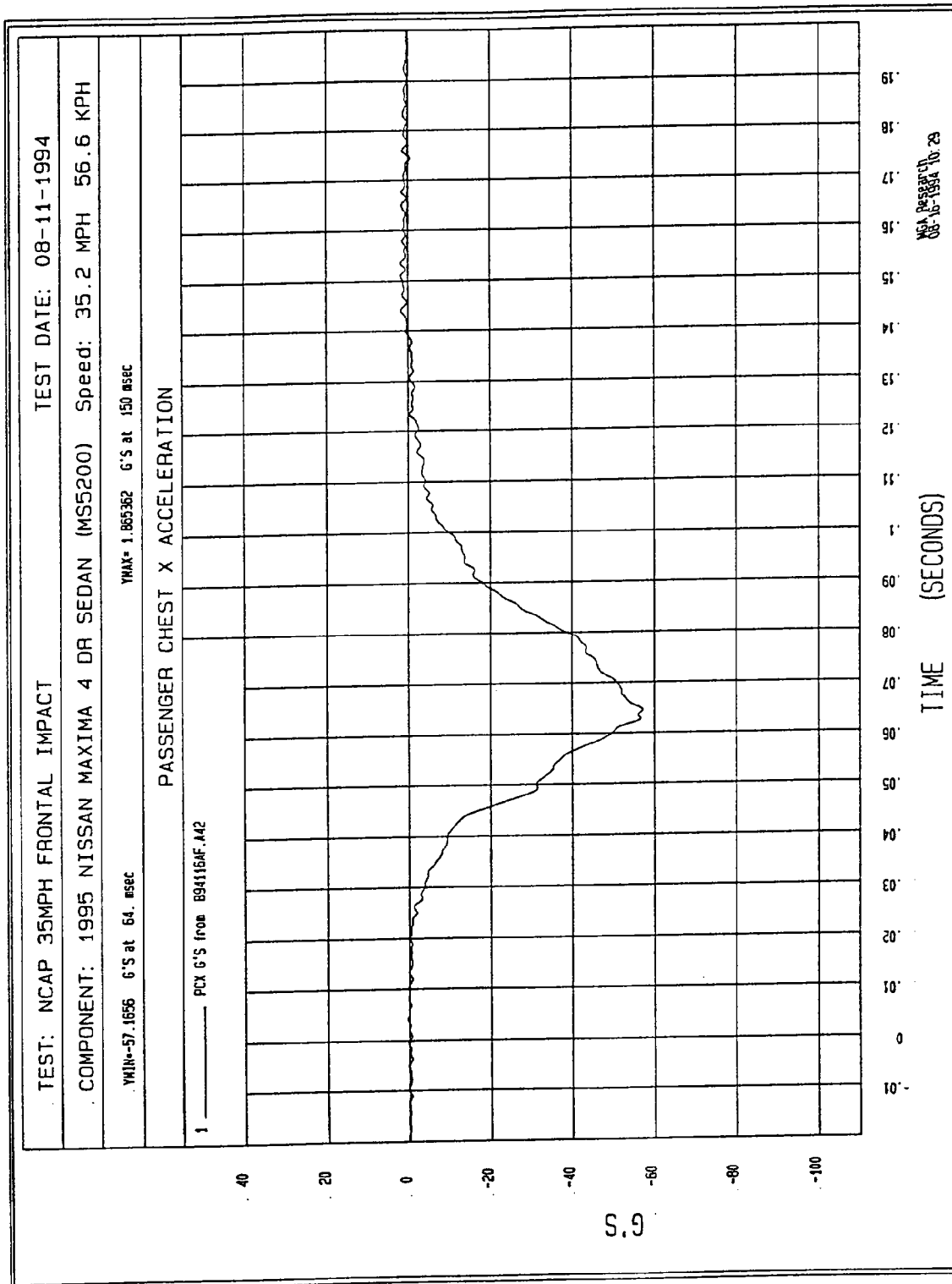


Figure B-61 - Passenger Chest X Acceleration vs. Time

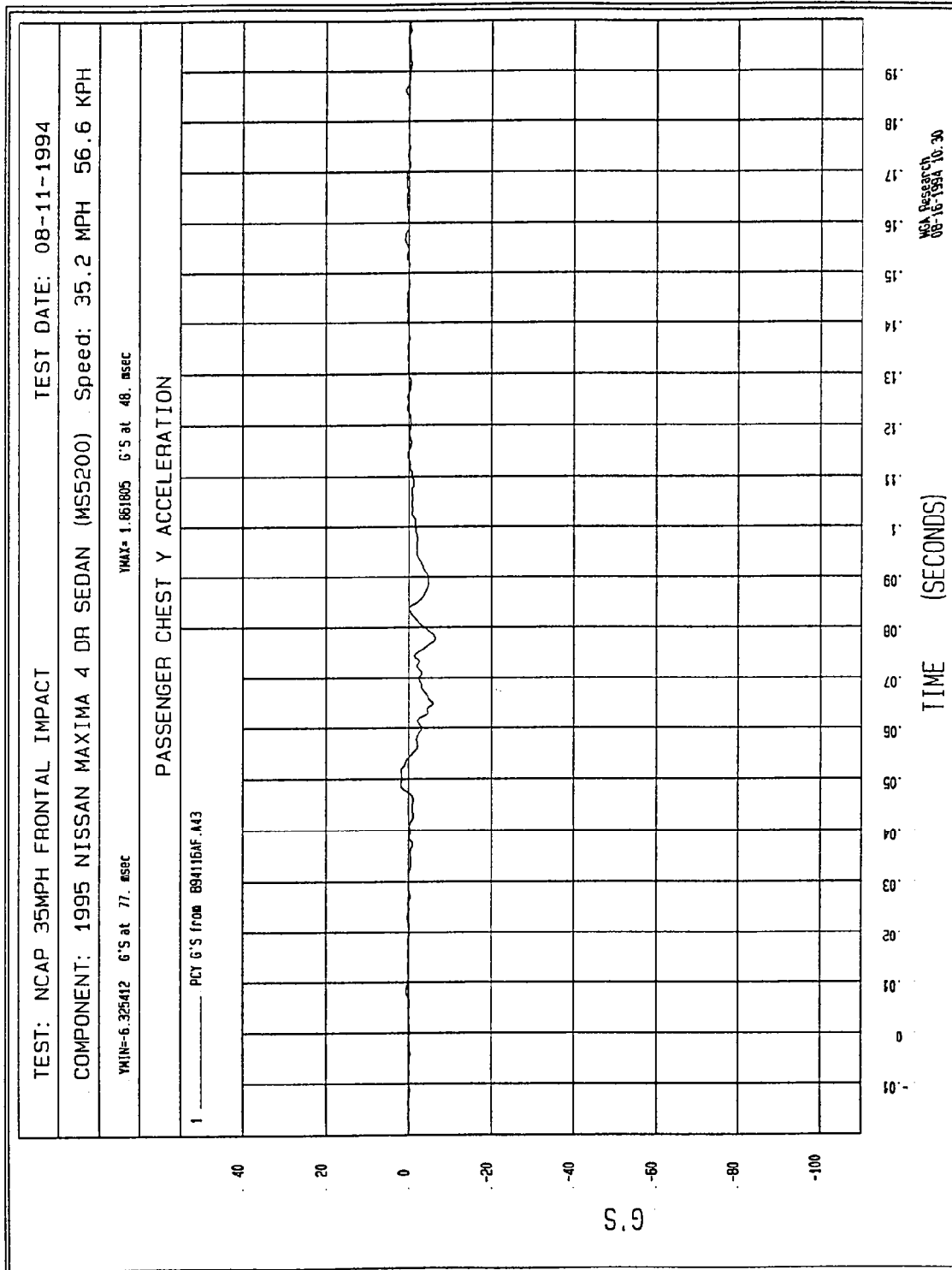


Figure B-62 - Passenger Chest Y Acceleration vs. Time

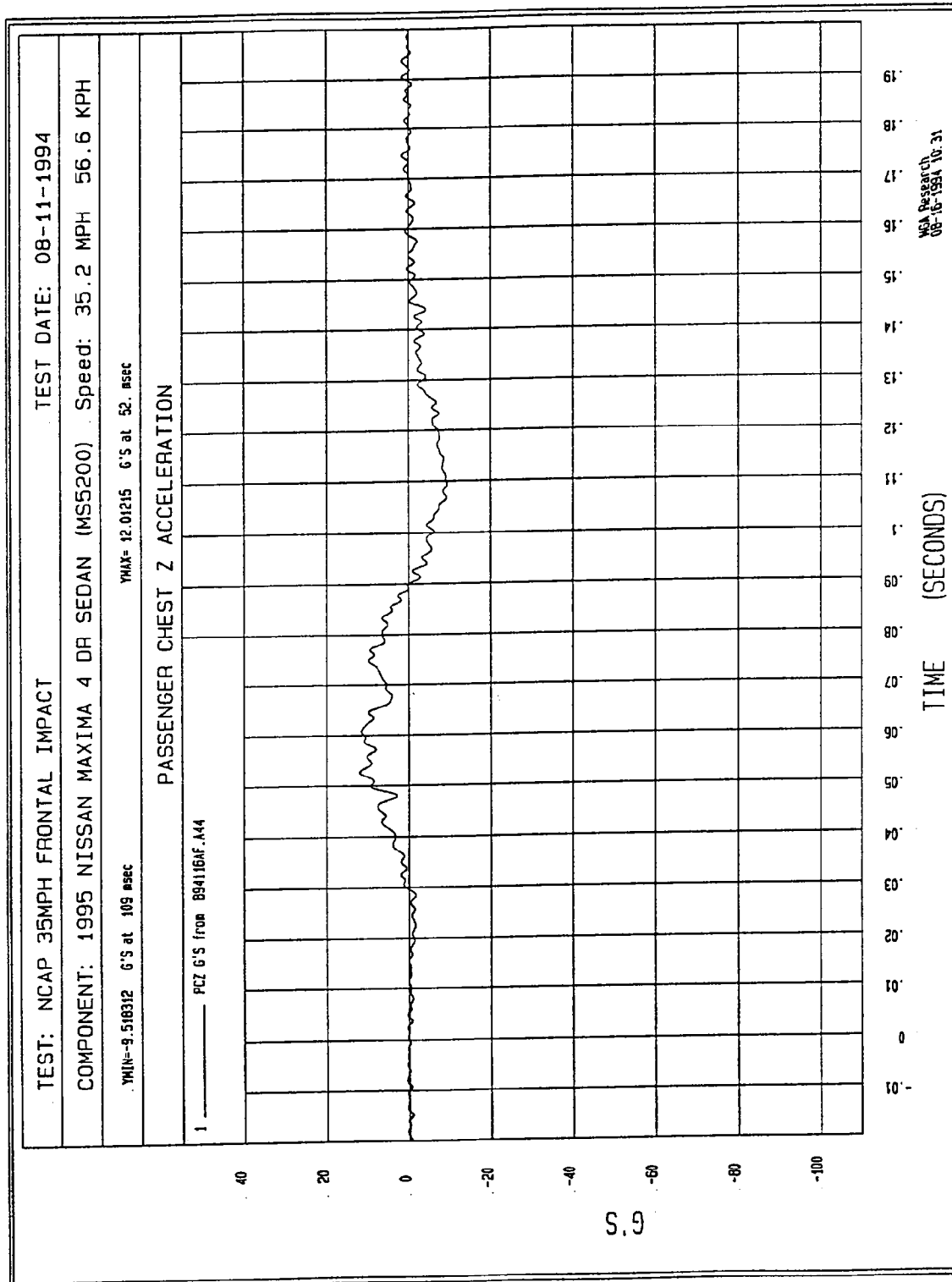


Figure B-63 - Passenger Chest Z Acceleration vs. Time

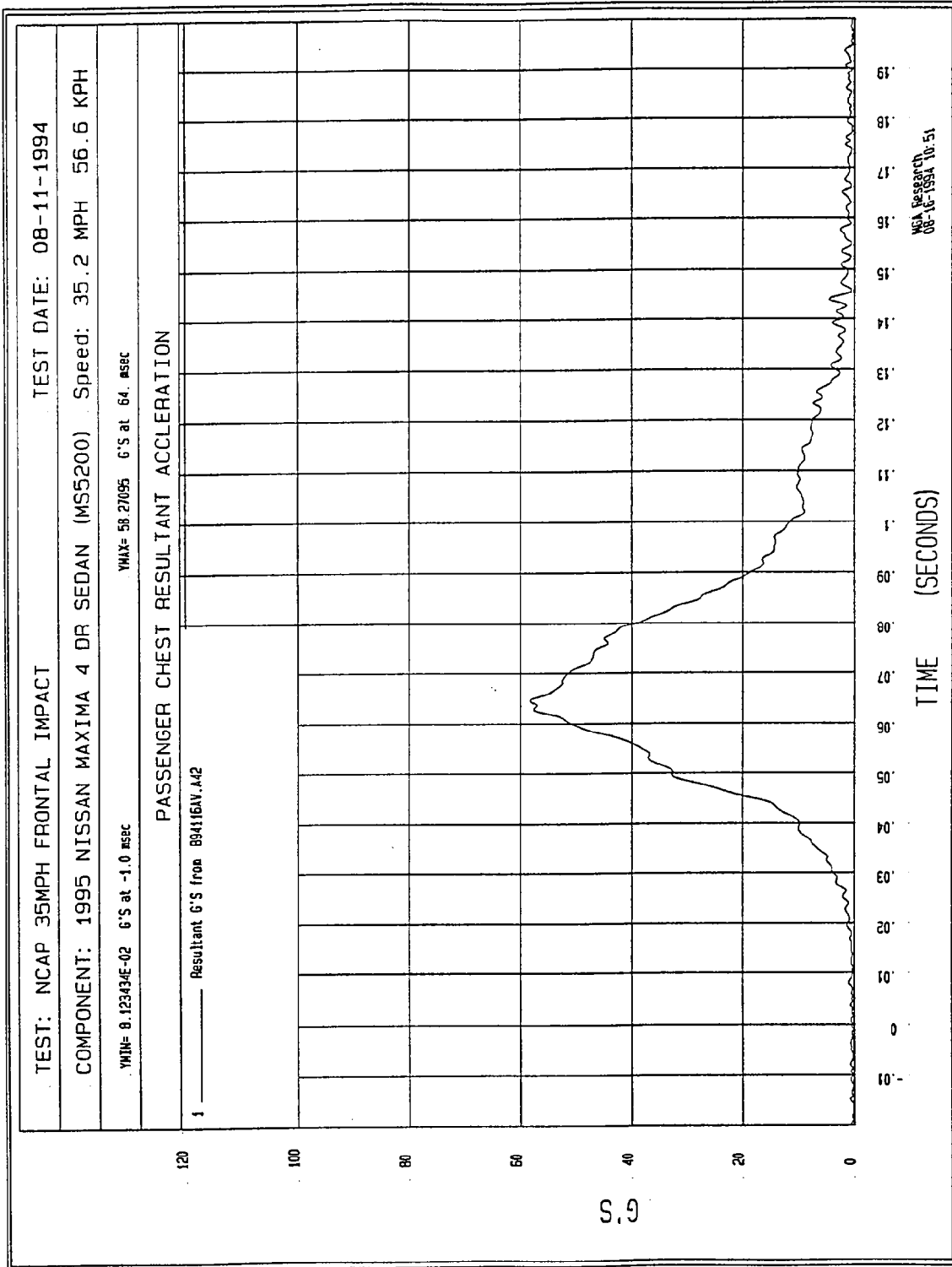


Figure B-64 - Passenger Chest Resultant vs. Time

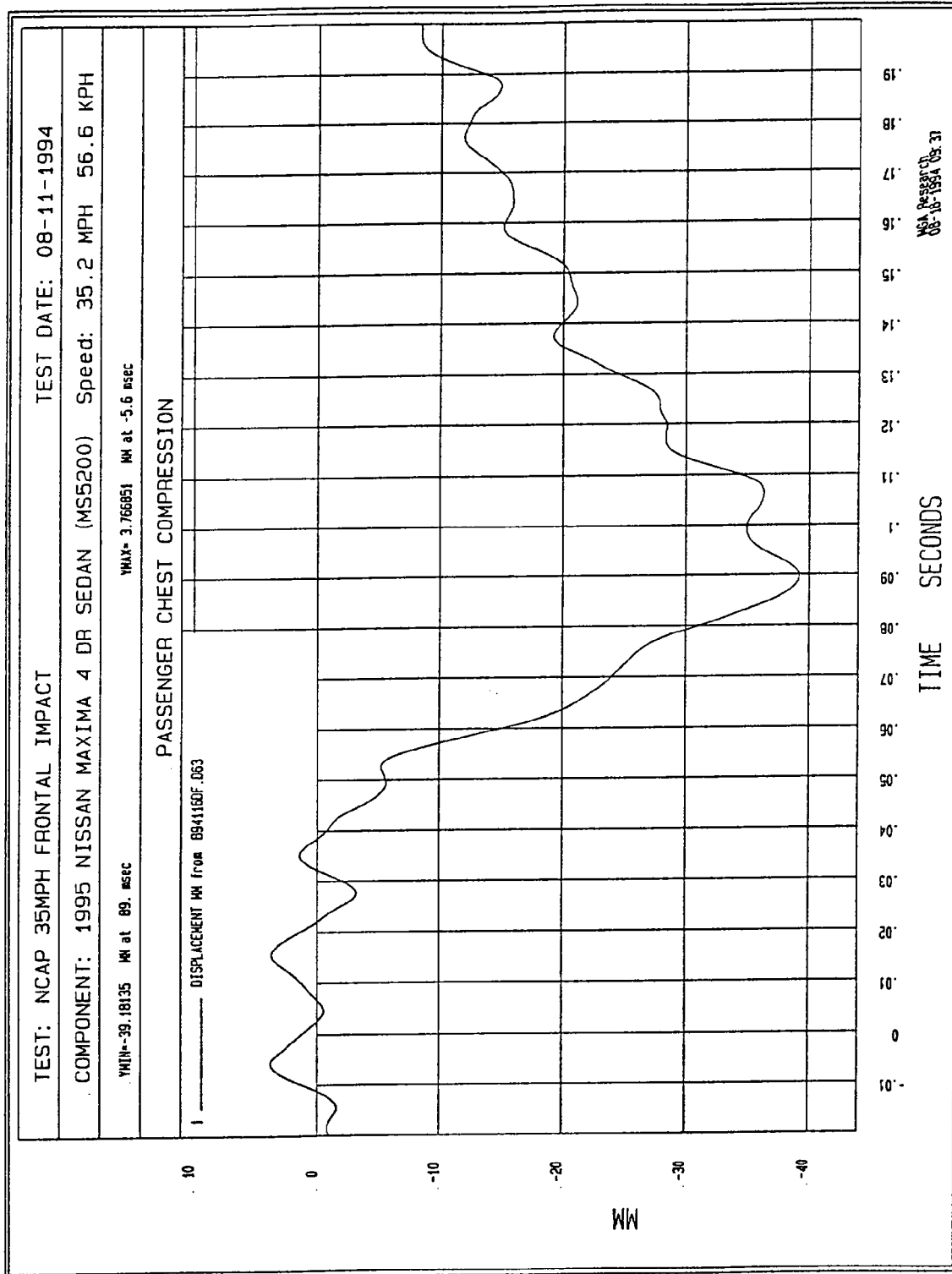


Figure B-65 - Passenger Chest Compression vs. Time

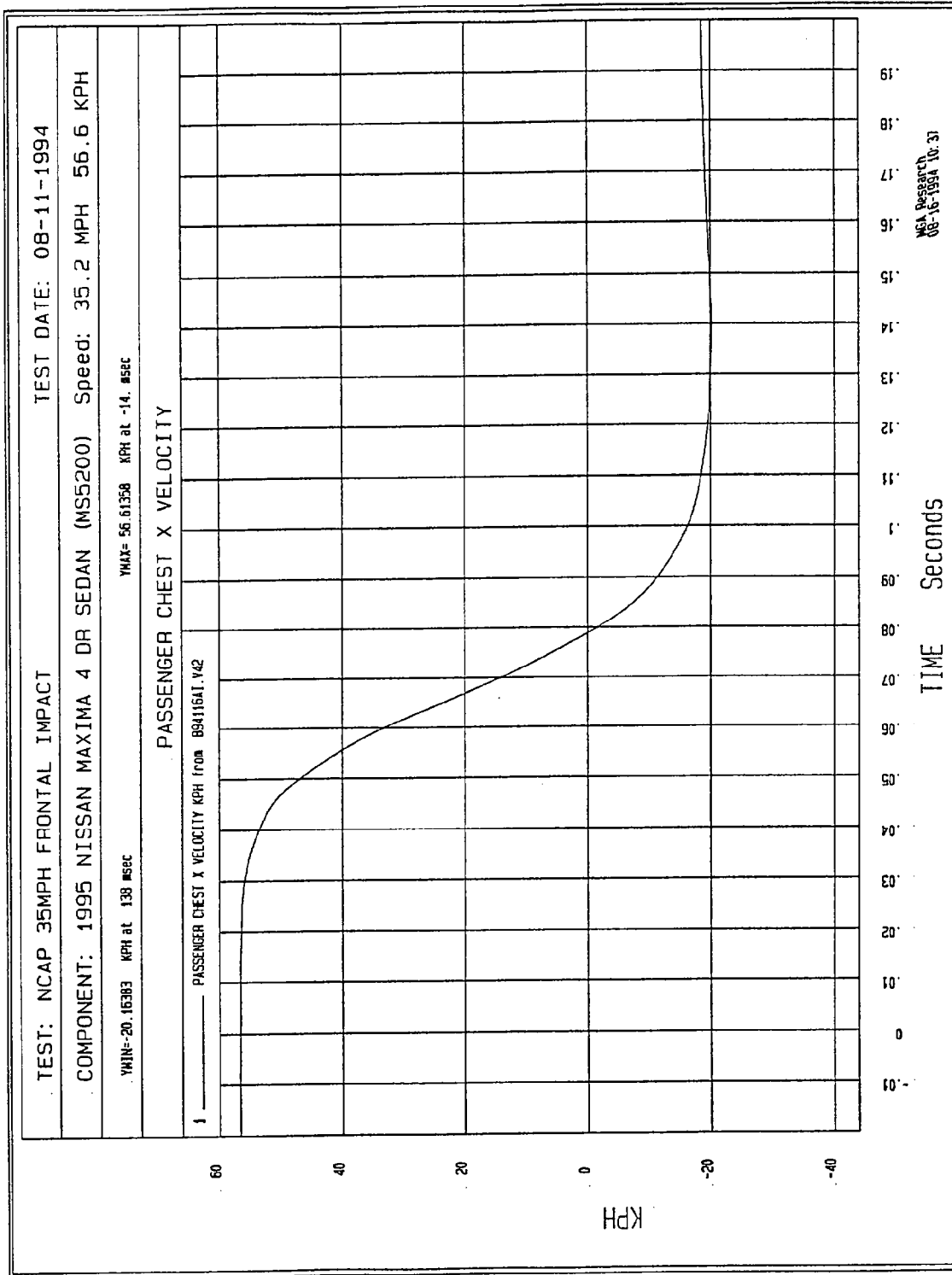


Figure B-66 - Passenger Chest X Velocity vs. Time

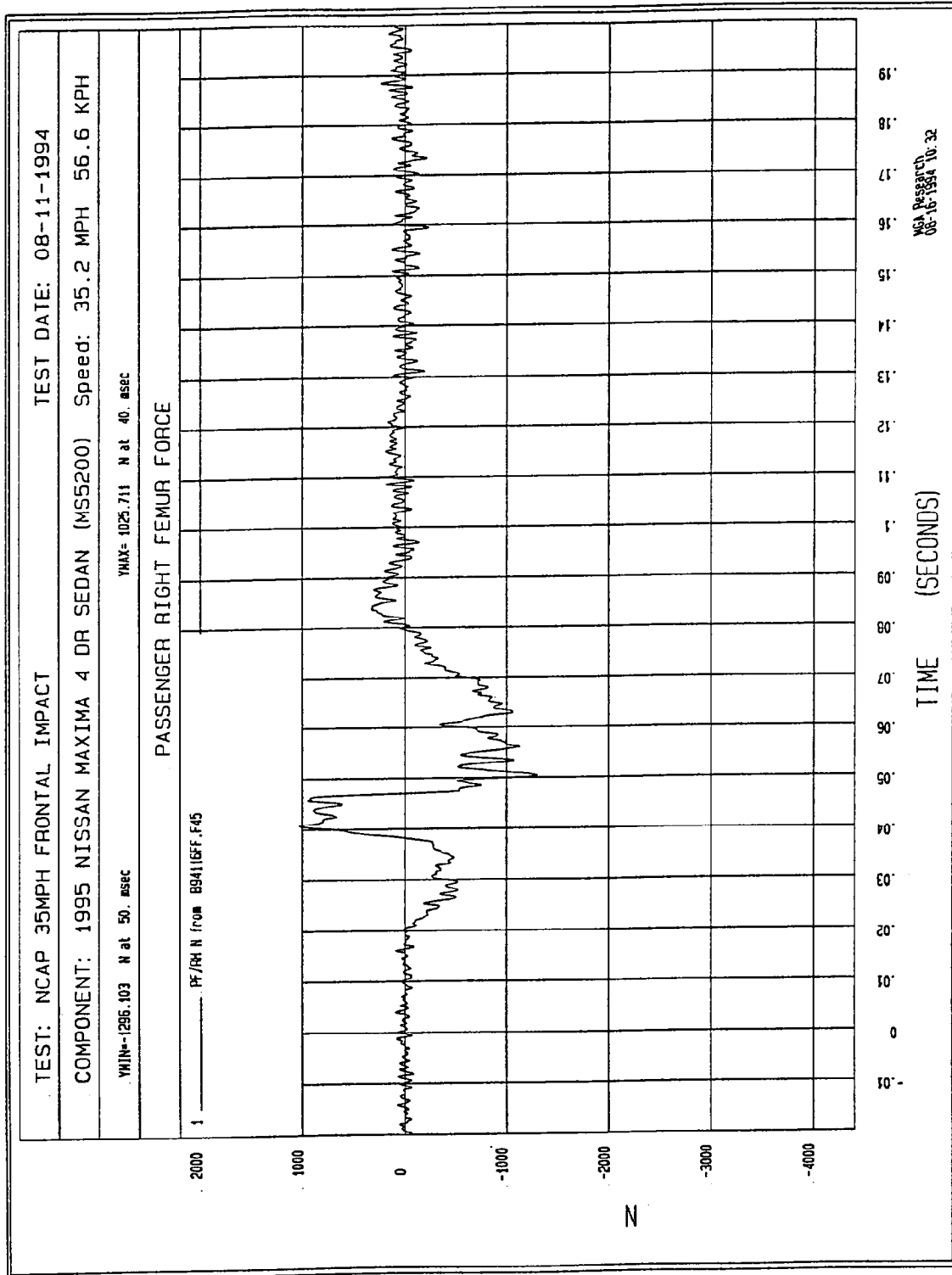
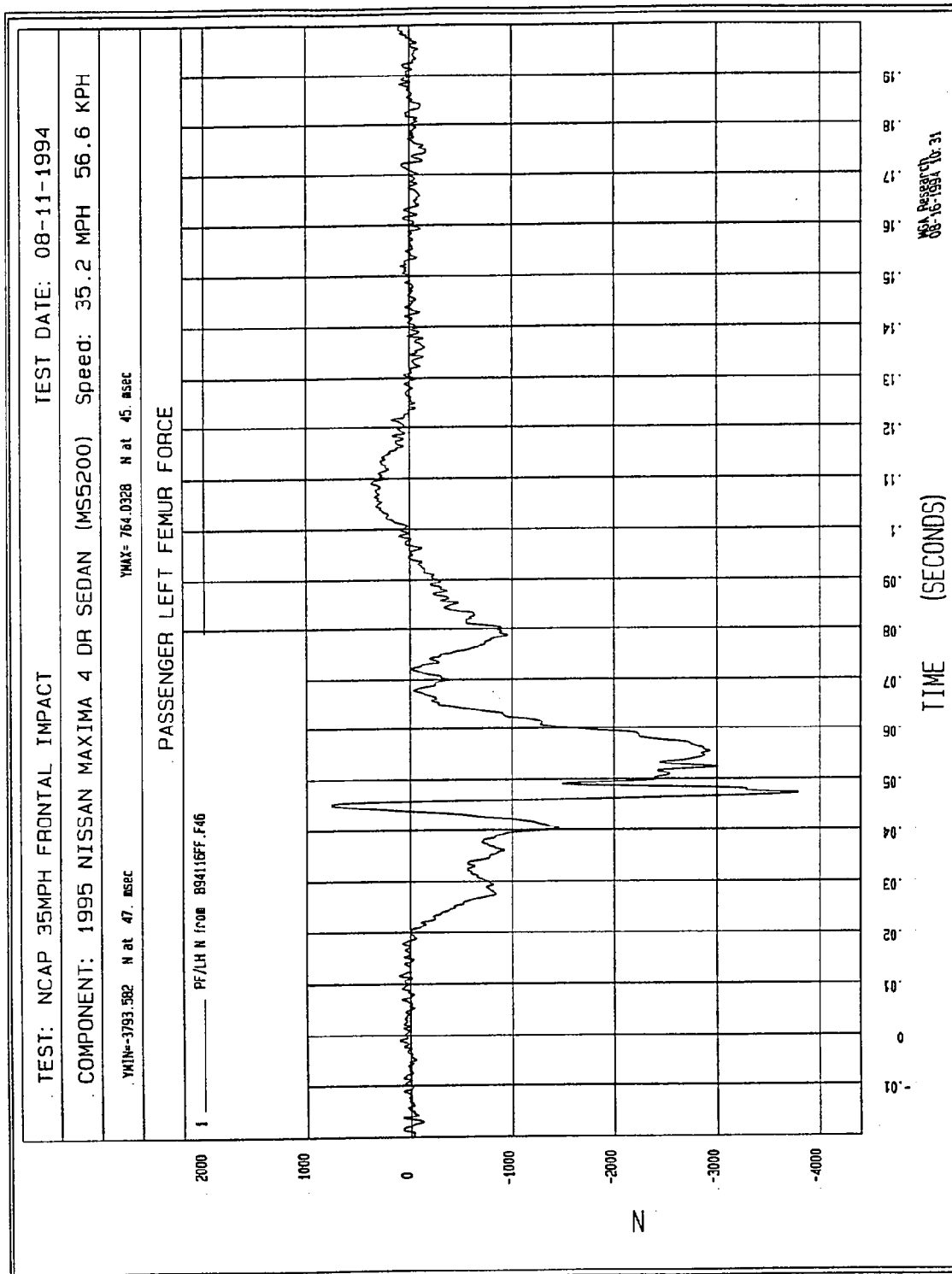


Figure B-67 - Passenger Right Femur Force vs. Time



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Figure B-68 - Passenger Left Femur Force vs. Time

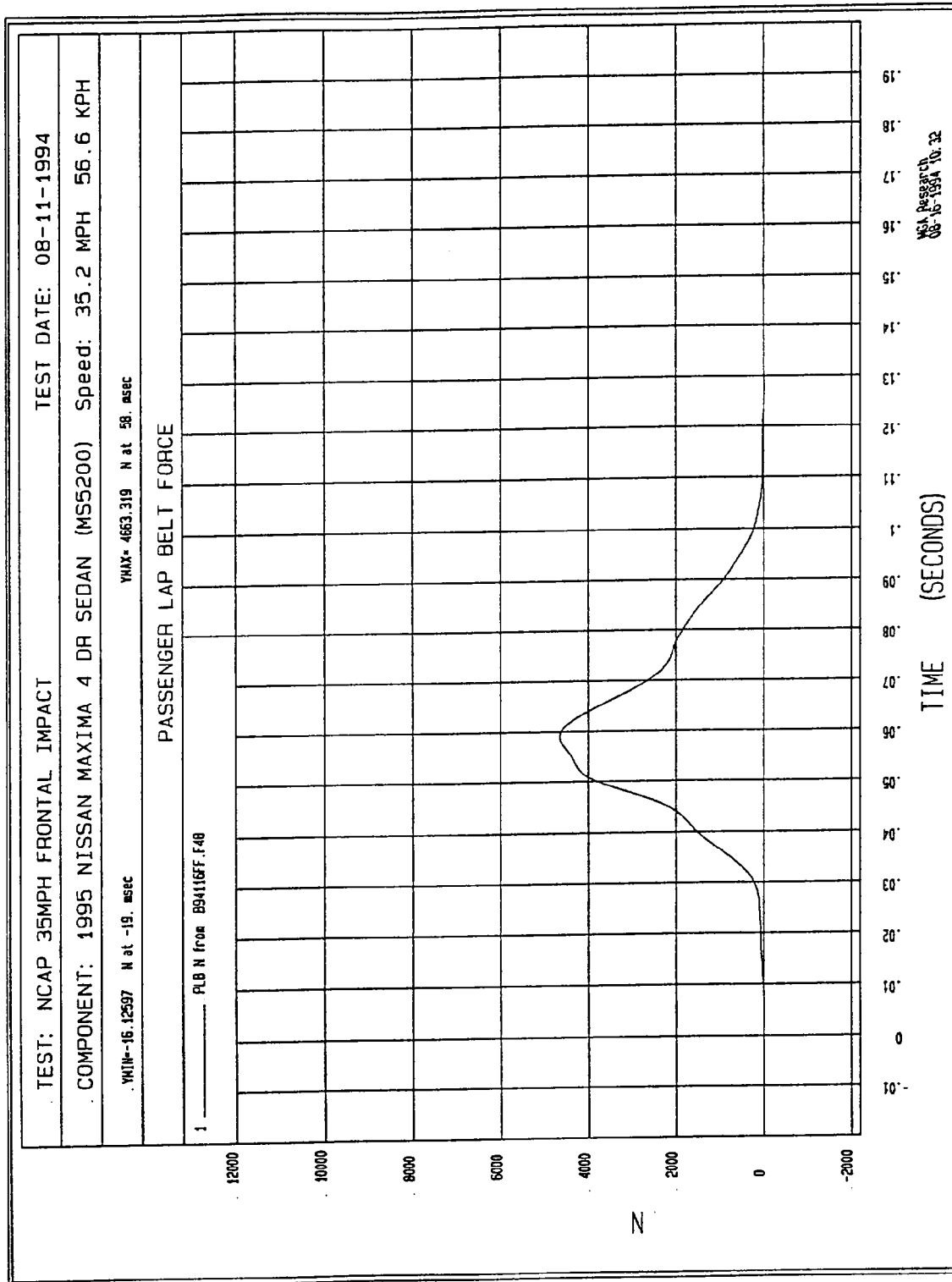


Figure B-69 - Passenger Lap Belt Force vs. Time

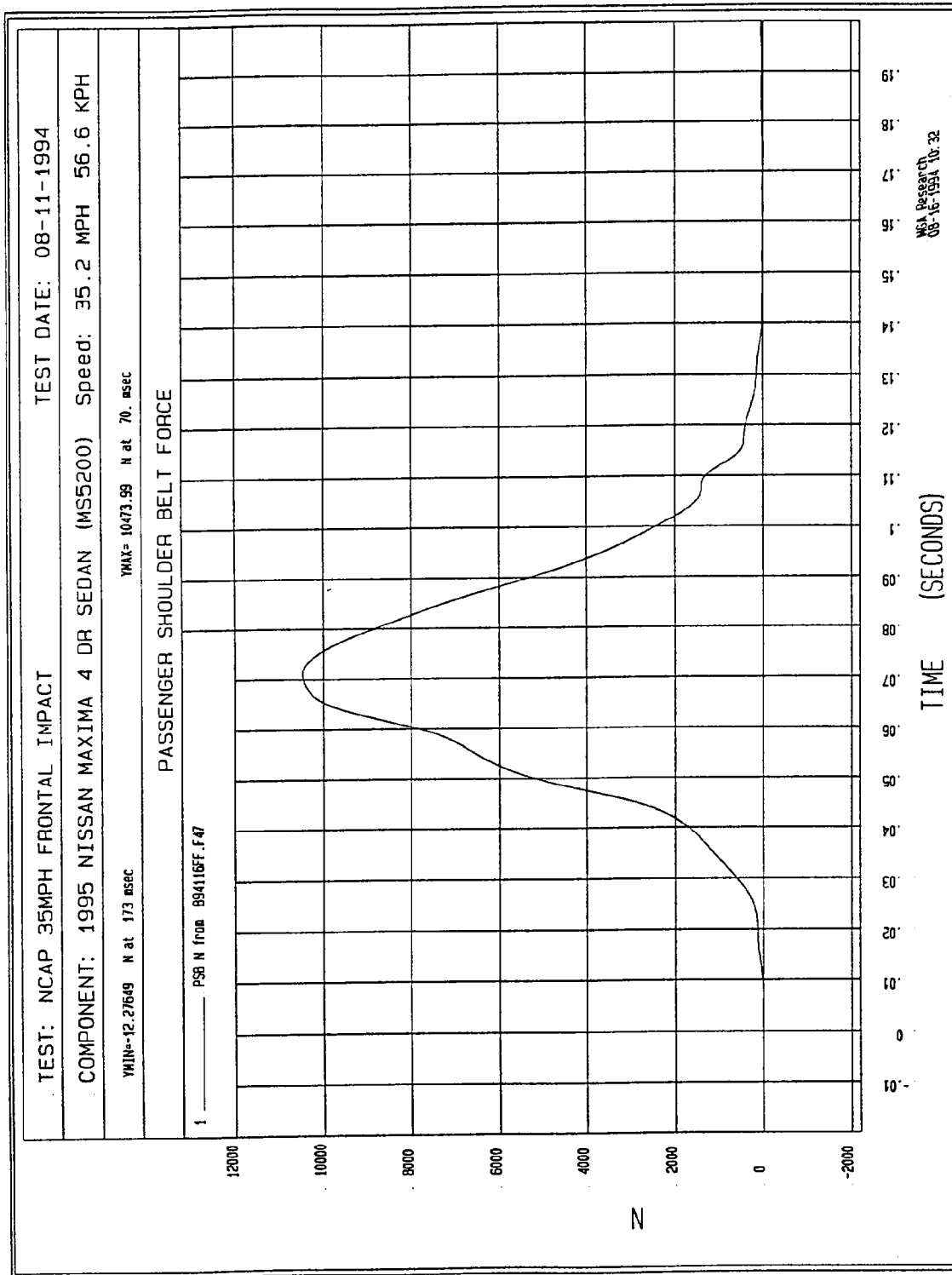


Figure B-70 - Passenger Shoulder Belt Force vs. Time

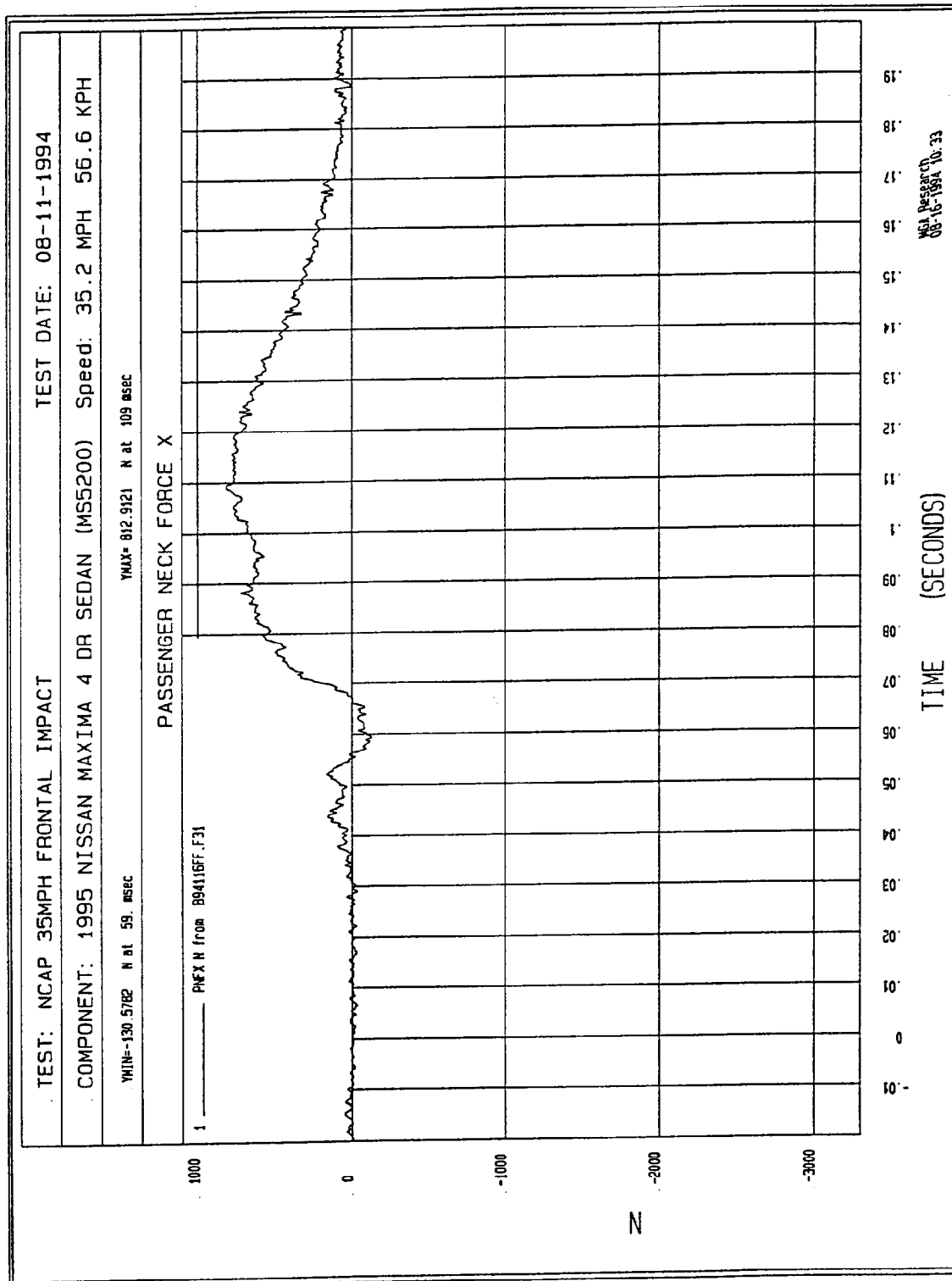


Figure B-71 - Passenger Neck Force X vs. Time

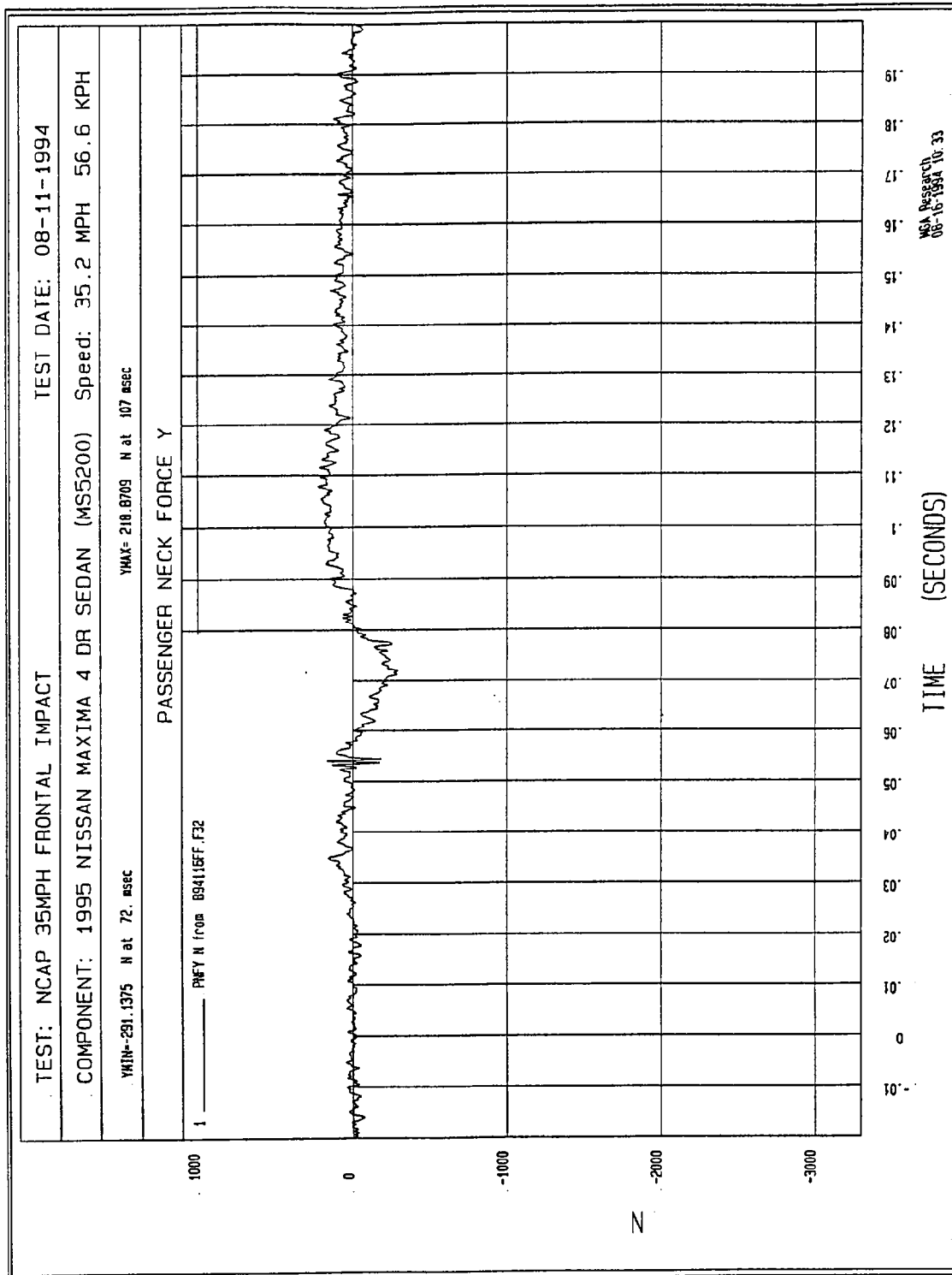


Figure B-72 - Passenger Neck Force Y vs. Time

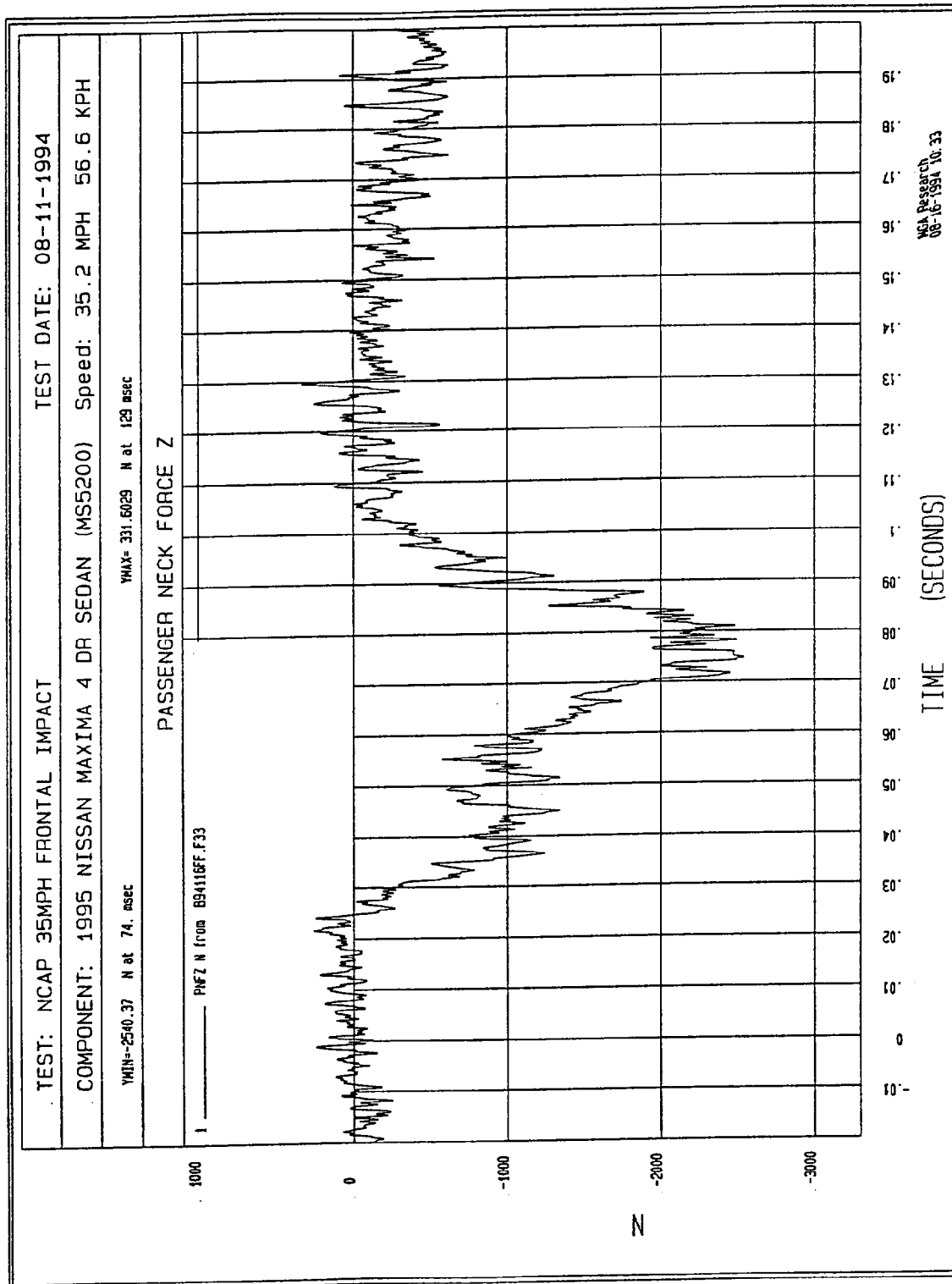


Figure B-73 - Passenger Neck Force Z vs. Time

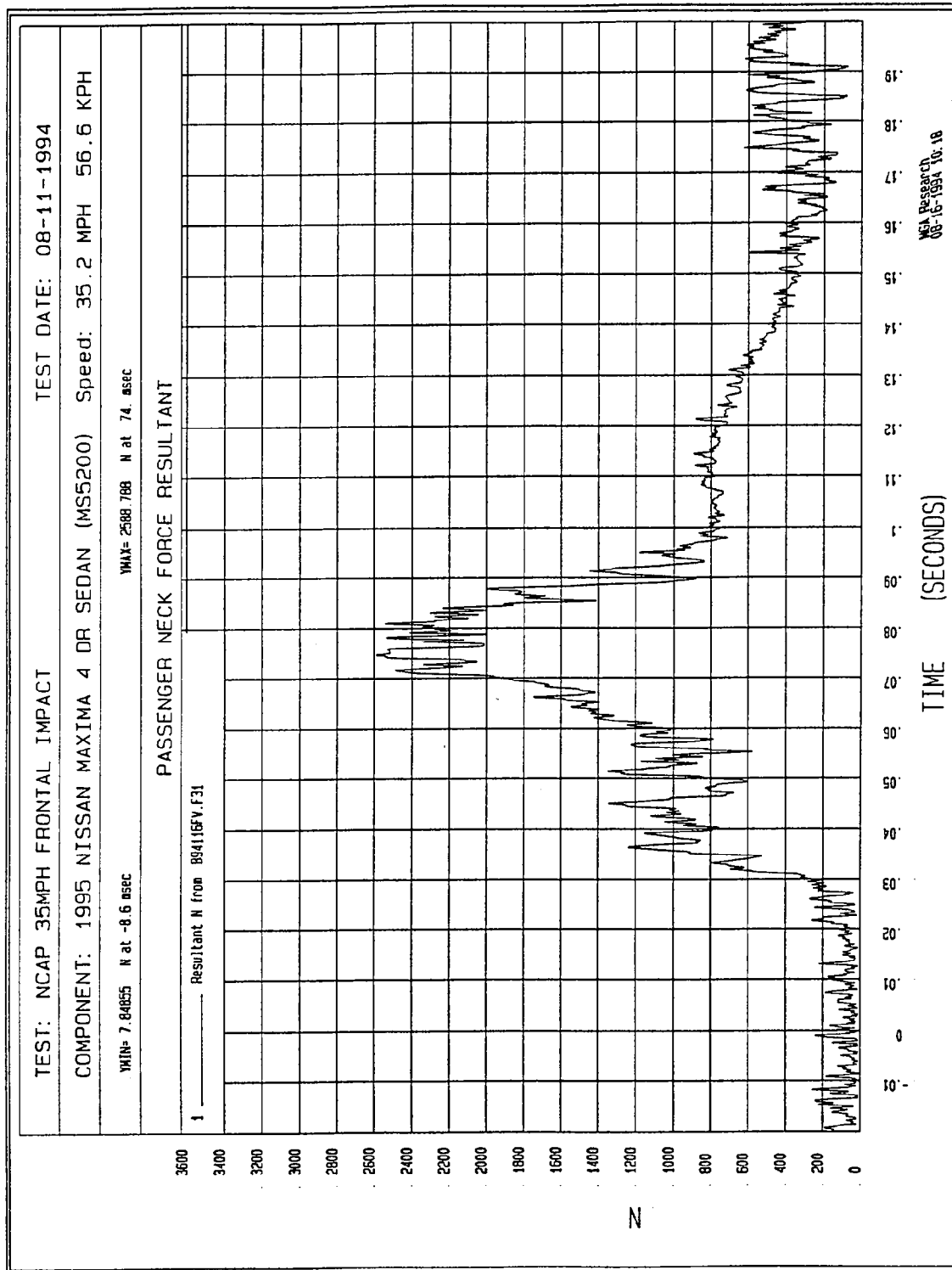


Figure B-74 - Passenger Neck Force Resultant vs. Time

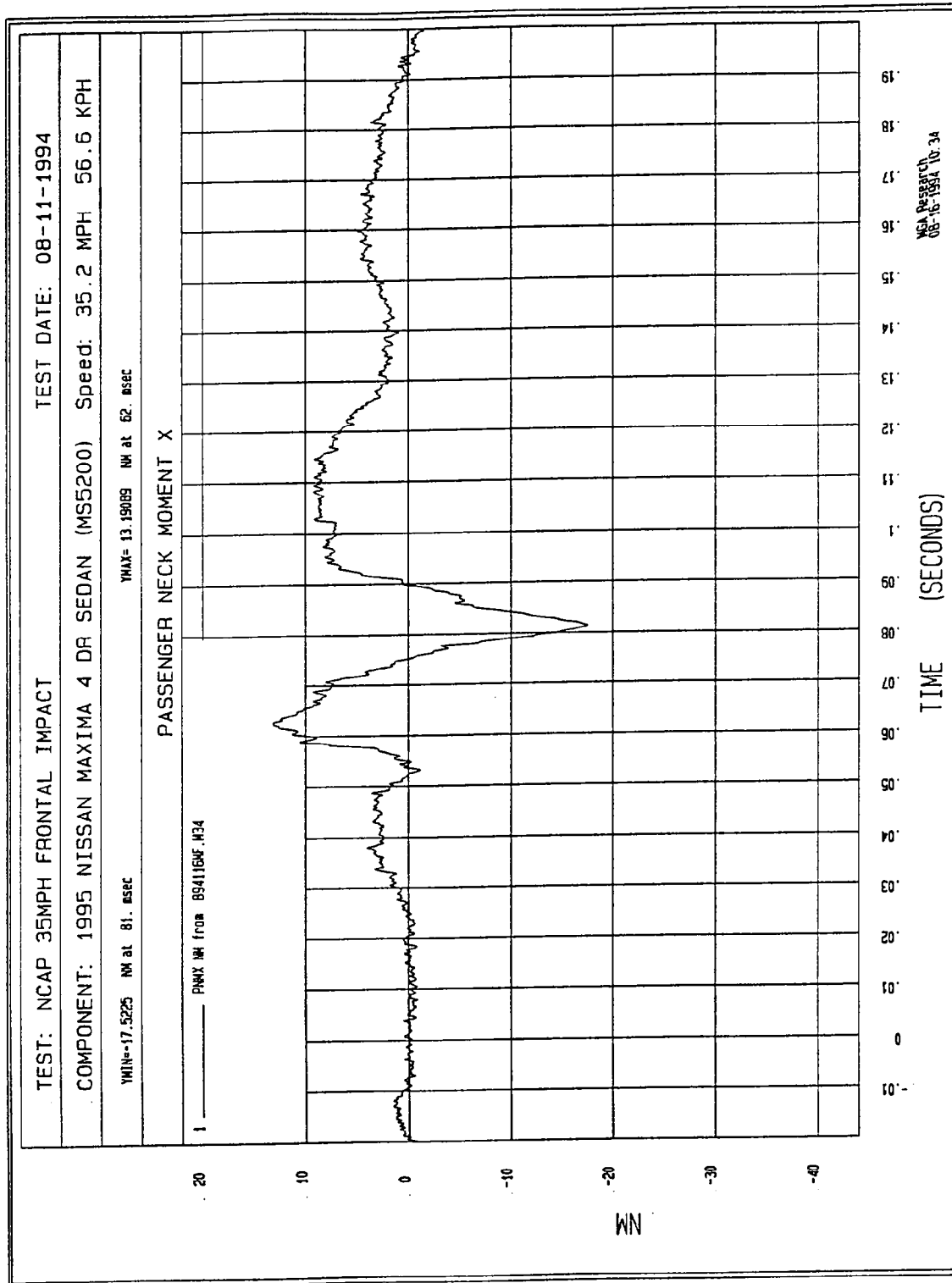


Figure B-75 - Passenger Neck Moment X vs. Time

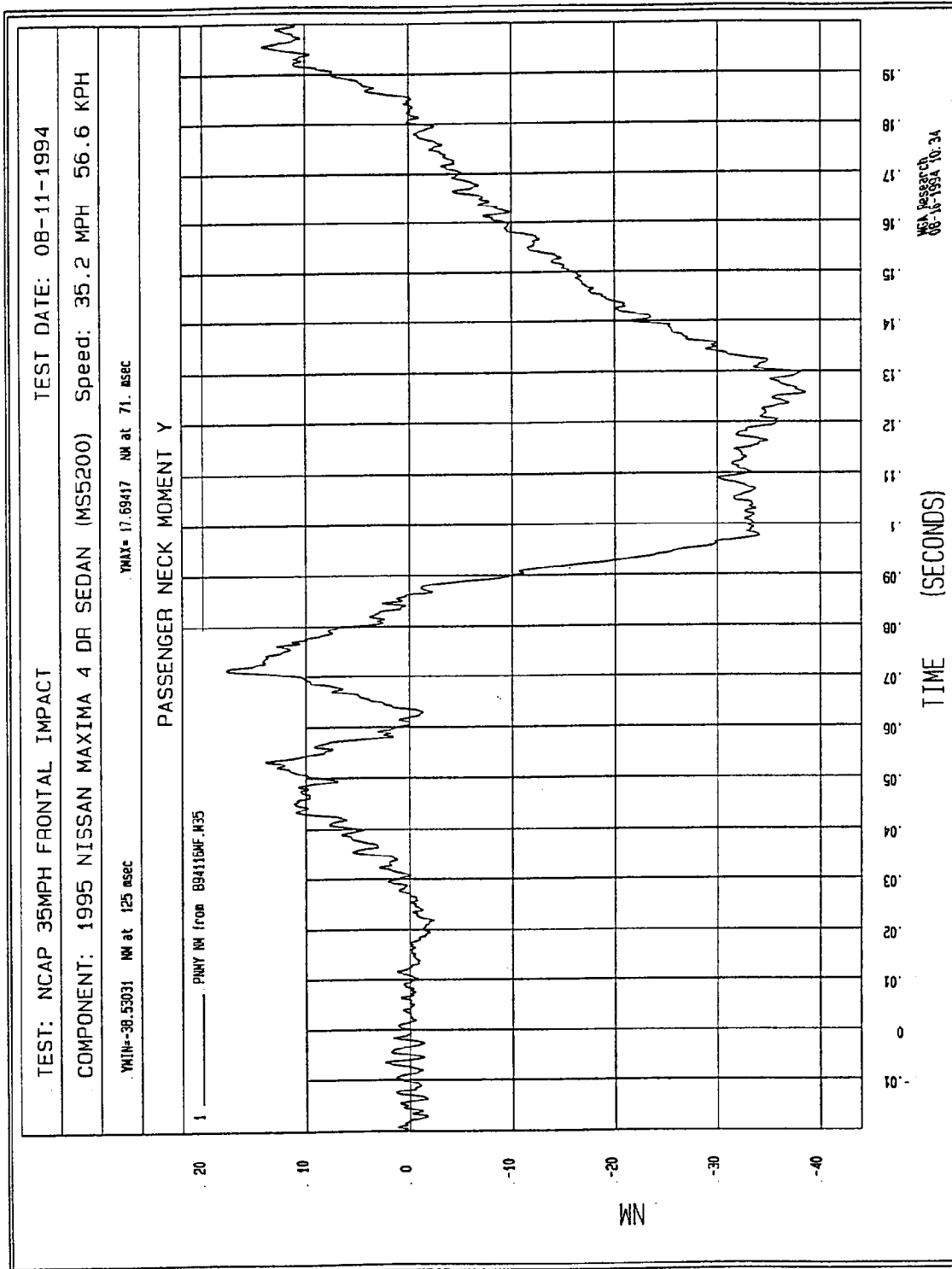


Figure B-76 -- Passenger Neck Moment Y vs. Time

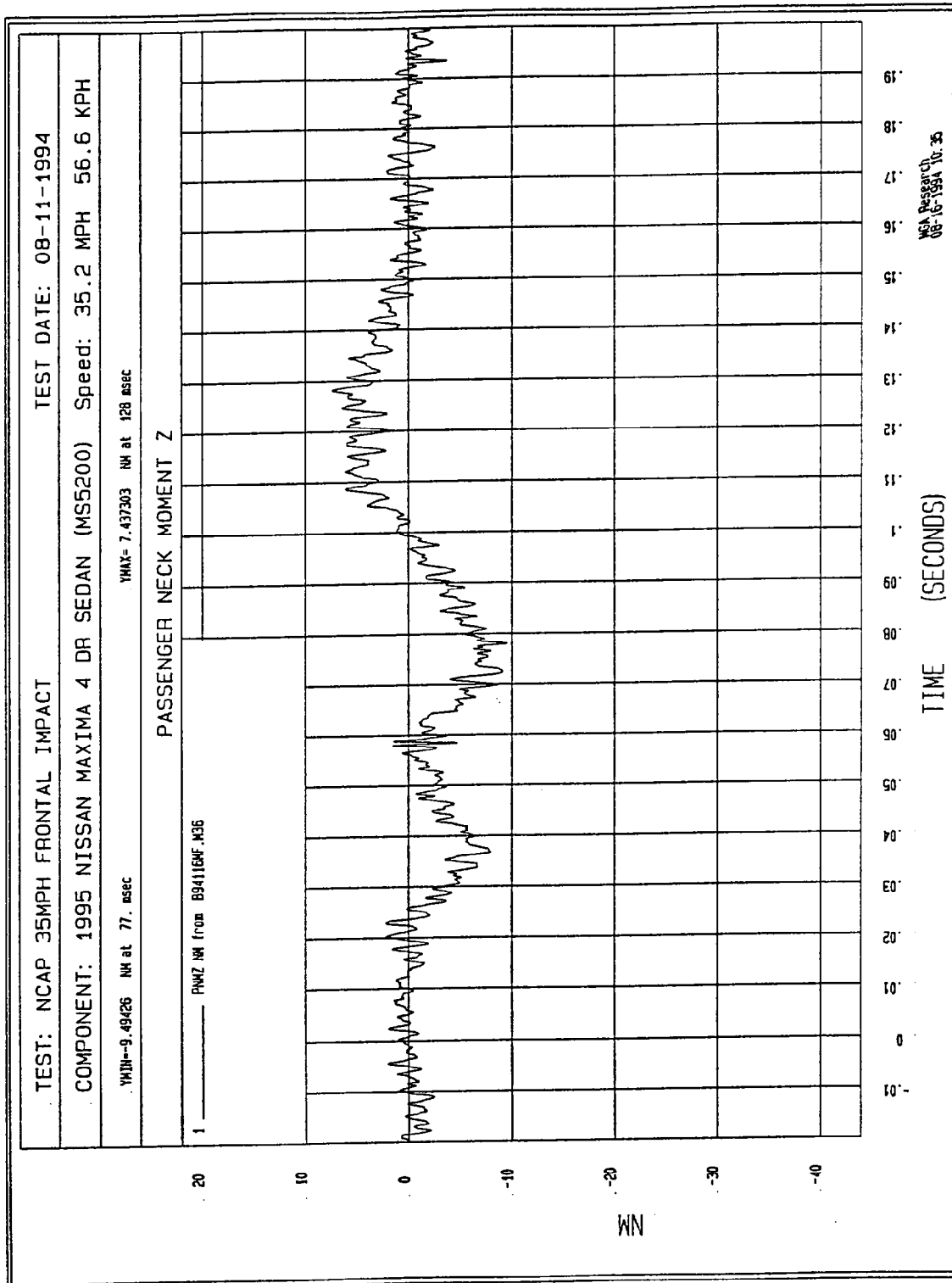


Figure B-77 - Passenger Neck Moment Z vs. Time

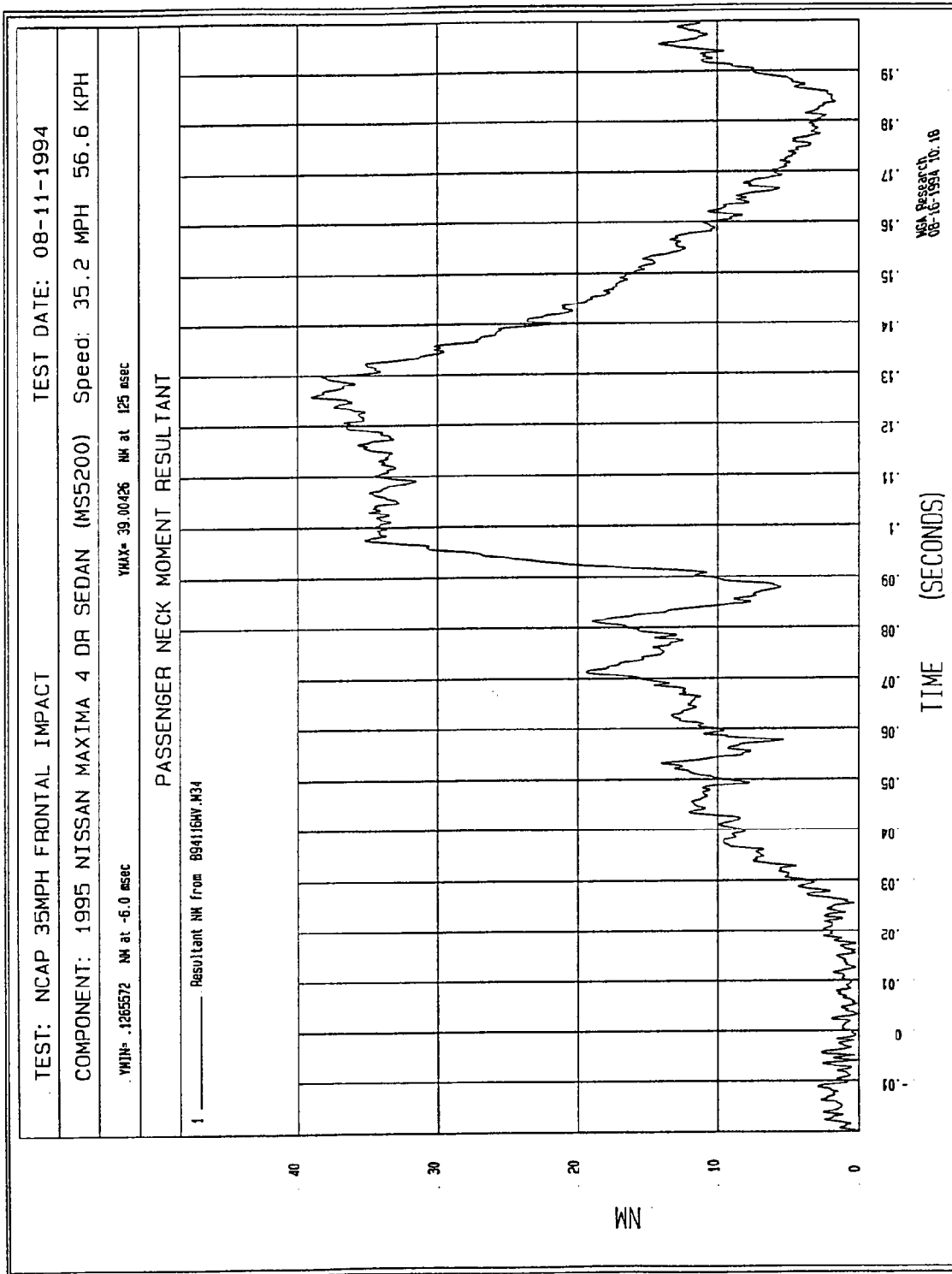


Figure B-78 - Passenger Neck Moment Resultant vs. Time

APPENDIX C
Dummy Configuration & Performance Verification Data

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 37 DUMMY CALIBRATION BY: Rod McClelland

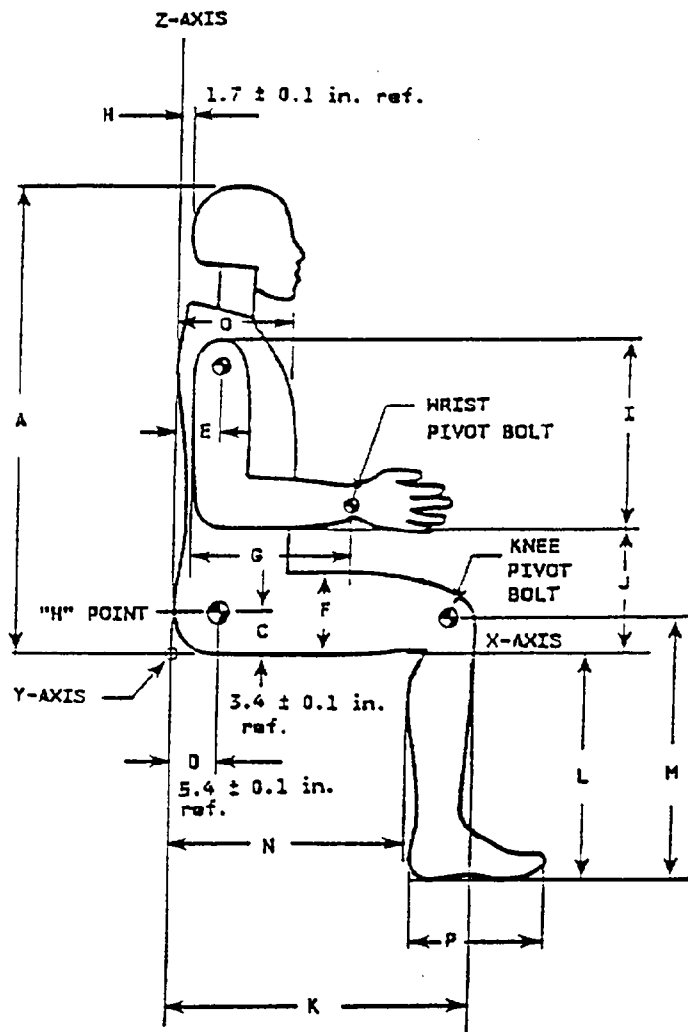
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: 08-03-93

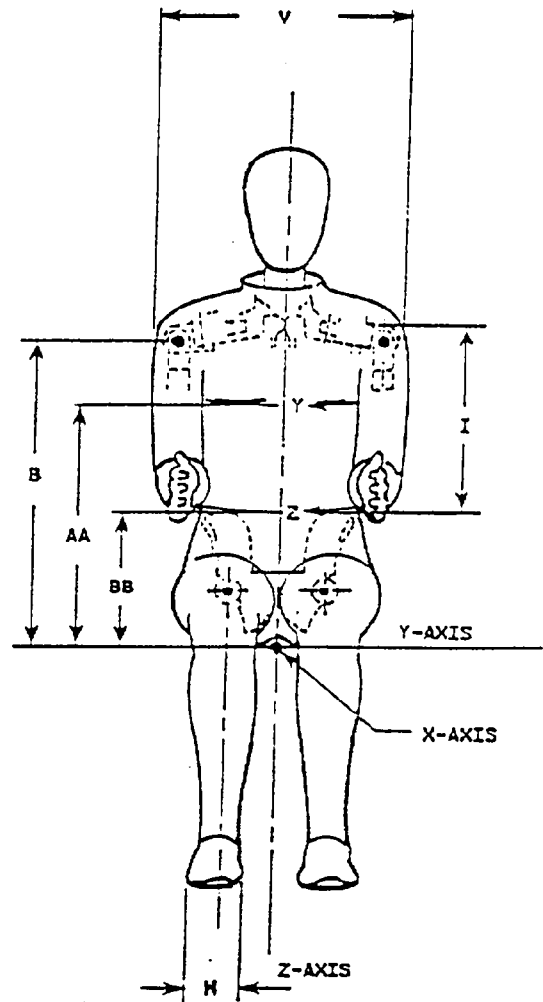
DESCRIPTION	SPECIFICATION (inches)	ACTUAL MEASUREMENT (inch4s)
A - Total Sitting Height	34.6 - 35.0	34.9
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	6.1
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.5
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder - Elbow Length	13.0 - 13.6	13.0
J - Elbow Rest Height	7.5 - 8.3	8.0
K - Buttock to Knee Length	22.8 - 23.8	23.5
L - Popliteal Height	16.9 - 17.9	17.0
M - Knee Pivot Height	19.1 - 19.9	19.5
N - Buttock Popliteal Length	17.8 - 18.8	18.5
O - Chest Depth at 3rd Rib	8.4 - 9.0	8.8
P - Foot Length	9.9 - 10.5	10.3
V - Shoulder Breadth	16.6 - 17.2	16.8
W - Foot Breadth	3.6 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	39.0
Z - Waist Circumference	32.9 - 34.1	33.5

Note: (See next page for external dimensions)

HYBRID III EXTERNAL DIMENSIONS



SIDE VIEW



FRONT VIEW

Note: Figure is referenced to the erect seated position. The curved lumbar does not allow the hybrid III to be positioned in a perfect erect attitude.

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET

DUMMY NO.: 37 DUMMY CALIBRATION BY: Rod McClelland

VERIFICATION DATE: 08-01-94

VERIFICATION LABORATORY TEMPERATURE (66° - 78°): 70°

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	236
Peak Lateral Acceleration	15 G. MAX	8
Time above 100 g.	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	22.9
Pendulum Deceleration	10 MS	22.50 - 27.50 G	23.83
	20 MS	17.60 - 22.60 G	19.55
	30 MS	12.50 - 18.50 G	14.06
Max. Pendulum G Above 30 MS		29.0 G MAX	14.6
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	38
D Plane Rotation	MAX	64 - 78 DEG.	78
	TIME	57 - 64 MS	59
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	119
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	66
	TIME	47 - 58 MS	51
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	105

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	20.08
Pendulum Deceleration	10 MS	17.20 - 21.20 G	19.27
	20 MS	14.00 - 19.00 G	16.07
	30 MS	11.00 - 16.00 G	12.31
Max. Pendulum G Above 30 MS		22 G Max	12
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	43
D Plane Rotation	MAX	81 - 106 DEG.	99
	TIME	72 - 82 MS	79
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	159
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-49.9
	TIME	65 - 79 MS	70
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	140

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	21.9
Peak Deflection	2.50 to 2.86 IN.	2.66
Peak Resistive Force	1160 to 1325 LBS.	1305
Internal Hysteresis	69 to 85%	69

5.0 KNEE IMPACT TESTS

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1297

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1245

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 36 DUMMY CALIBRATION BY: Rod McClelland

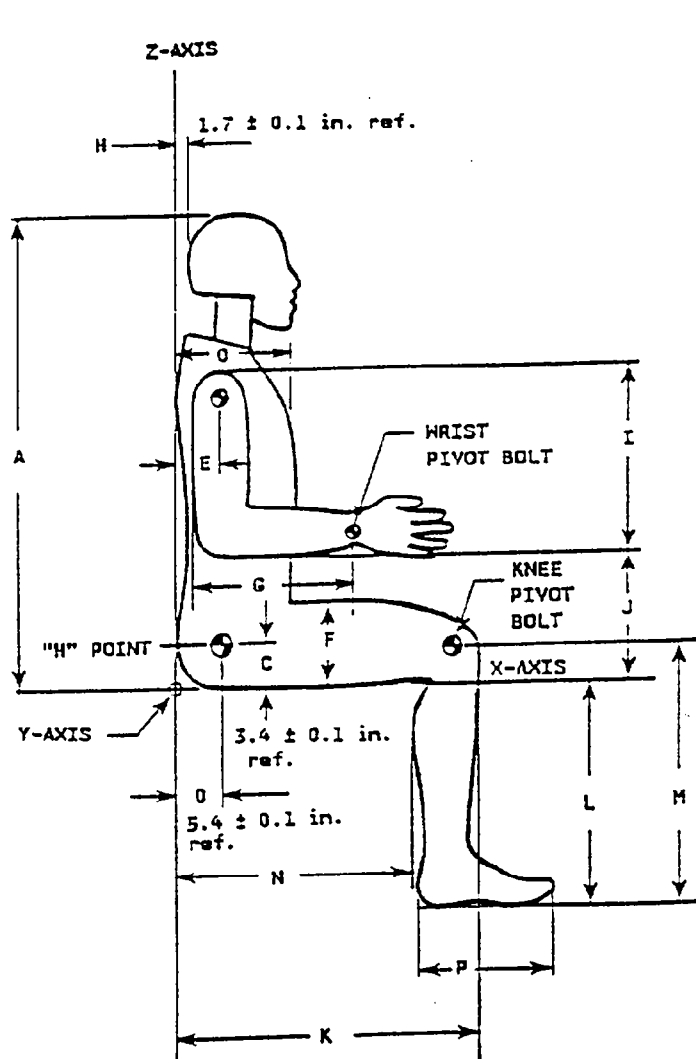
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: 08-03-93

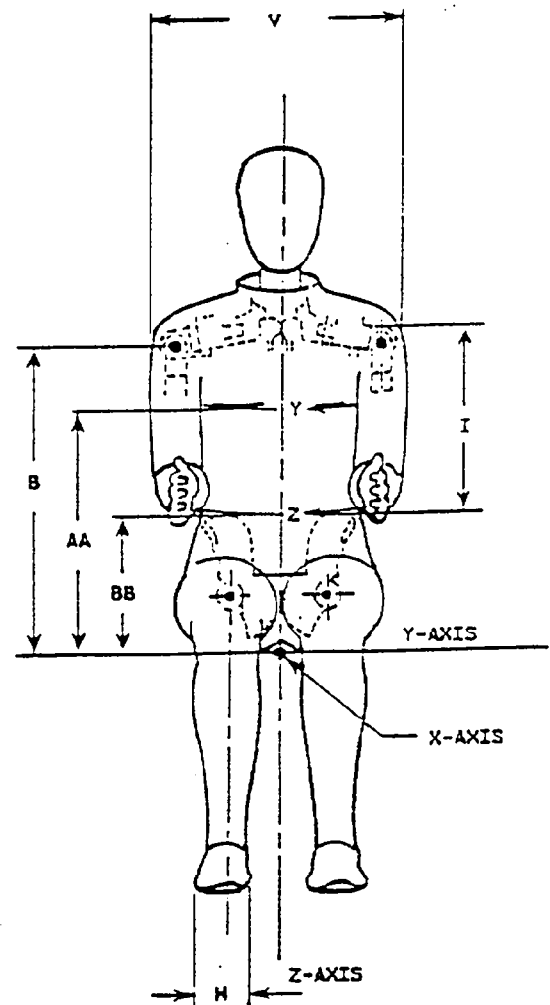
DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.8
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	6.1
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.5
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder Elbow Length	13.0 - 13.6	13.0
J - Elbow Rest Height	7.5 - 8.3	8.0
K - Buttock Knee Length	22.8 - 23.8	23.5
L - Popliteal Height	16.9 - 17.9	17.0
M - Knee Pivot Height	19.1 - 19.9	19.5
N - Buttock Popliteal Length	17.8 - 18.8	18.5
O - Chest Depth at 3rd Rib	8.4 - 9.0	8.8
P - Foot Length	9.9 - 10.5	10.3
V - Shoulder Breadth	16.6 - 17.2	16.8
W - Foot Breadth	3.5 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	39.0
Z - Waist Circumference	32.9 - 34.1	33.5

Note: (See next page for external dimensions)

HYBRID III EXTERNAL DIMENSIONS



SIDE VIEW



FRONT VIEW

Note: Figure is referenced to the erect seated position. The curved lumbar does not allow the hybrid III to be positioned in a perfect erect attitude.

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

DUMMY NO.: 36 DUMMY CALIBRATION BY: Rod McClelland

VERIFICATION DATE: 07-27-93

VERIFICATION LABORATORY TEMPERATURE (66° - 78°): 70°

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	264
Peak Lateral Acceleration	-15 G. MAX	10
Time above 100 g.	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	23.1
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.90
	20 MS	17.60 - 22.60 G	20.87
	30 MS	12.50 - 18.50 G	14.50
Max. Pendulum G Above 30 MS		29.0 G MAX	14.7
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	39
D Plane Rotation	MAX	64 - 78 DEG.	77
	TIME	57 - 64 MS	60
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	113
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	75
	TIME	47 - 58 MS	52
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	102

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	20.10
Pendulum Deceleration	10 MS	17.20 - 21.20 G	19.52
	20 MS	14.00 - 19.00 G	17.27
	30 MS	11.00 - 16.00 G	11.35
Max. Pendulum G Above 30 MS		22 G Max	11
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	43
D Plane Rotation	MAX	81 - 106 DEG.	98
	TIME	72 - 82 MS	75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	153
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-51.3
	TIME	65 - 79 MS	69
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	140

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	22.1
Peak Deflection	2.50 to 2.86 IN.	2.69
Peak Resistive Force	1160 to 1325 LBS.	1263
Internal Hysteresis	69 to 85%	73

5.0 KNEE IMPACT TESTS

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1200

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1245

APPENDIX D

Dummy, Vehicle and Laboratory Calibration Data

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 37

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACCY6	Endevco	7/28/94
Head Y	ACCH1	Endevco	7/28/94
Head Z	AAMW5	Endevco	7/28/94
Chest X	ACCY1	Endevco	7/28/94
Chest Y	ACCC8	Endevco	7/28/94
Chest Z	ACCT7	Endevco	7/28/94
Right Femur Load Cell	261	Denton	8/1/94
Left Femur Load Cell	262	Denton	8/1/94
Neck Load Cell X	443	Denton	7/14/94
Neck Load Cell Y	443	Denton	7/14/94
Neck Load Cell Z	443	Denton	7/14/94
Neck Moment X	443	Denton	7/14/94
Neck Moment Y	443	Denton	7/14/94
Neck Moment Z	443	Denton	7/14/94
Chest Deflection Gauge	37G	Bourns	8/3/94
Lap Belt Load Cell	625	Lebow	5/31/94
Torso Belt Load Cell	657	Lebow	5/31/94

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 37

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	439	Denton	5/9/94
Upper Right Tibia Moment Y	439	Denton	5/9/94
Lower Right tibia Moment Y	427	Denton	5/9/94
Lower Right Tibia Force X	427	Denton	5/9/94
Lower Right Tibia Force Z	427	Denton	5/9/94
Upper Left Tibia Moment X	437	Denton	5/9/94
Upper Left Tibia Moment Y	437	Denton	5/9/94
Lower Left Tibia Moment Y	425	Denton	5/9/94
Lower Left Tibia Force X	425	Denton	5/9/94
Lower Left Tibia Force Z	425	Denton	5/9/94

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 36

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACDE7	Endevco	7/28/94
Head Y	ACC70	Endevco	7/28/94
Head Z	ACCW9	Endevco	7/28/94
Chest X	ACC78	Endevco	7/12/94
Chest Y	ACCE6	Endevco	7/12/94
Chest Z	ACC93	Endevco	7/12/94
Right Femur Load Cell	259	Denton	8/1/94
Left Femur Load Cell	260	Denton	8/1/94
Neck Load Cell X	442	Denton	7/14/94
Neck Load Cell Y	442	Denton	7/14/94
Neck Load Cell Z	442	Denton	7/14/94
Neck Moment X	442	Denton	7/14/94
Neck Moment Y	442	Denton	7/14/94
Neck Moment Z	442	Denton	7/14/94
Chest Deflection Gauge	36G	Bourns	8/3/94
Lap Belt Load Cell	662	Lebow	4/28/94
Torso Belt Load Cell	690	Lebow	4/26/94

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	MGA065	Entran	6/9/94
Right Rear Seat Crossmember X	MGA076	Entran	7/25/94
Top of Engine X	MGA021	Entran	5/16/94
Bottom of Engine X	MGA088	Entran	6/23/94
Left Brake Caliper X	MGA068	Entran	6/14/94
Right Brake Caliper X	MGA157	Entran	5/16/94
Instrument Panel X	MGA042	Entran	6/30/94
Redundant Left Rear Seat Crossmember X	MGA091	Entran	6/2/94
Redundant Right Rear Seat Crossmember X	MGA133	Entran	5/16/94

	LABORATORY INSTRUMENTS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	AGH90	Endevco	5/6/94
Neck Bending Rotary Potentiometer	N/A	Bourns	PRIOR TO USE
Neck Bending Linear Potentiometer	N/A	Bourns	PRIOR TO USE
Femur/Chest/Thorax Probe Accelerometer	403069	Sensotec	3/30/94
Abdomen Compression Force Gauge	N/A	Transducers Inc.	N/A

APPENDIX E

Vehicle Owner's Occupant Restraint System Instructions

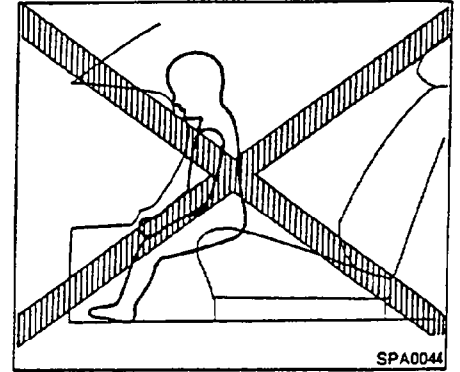
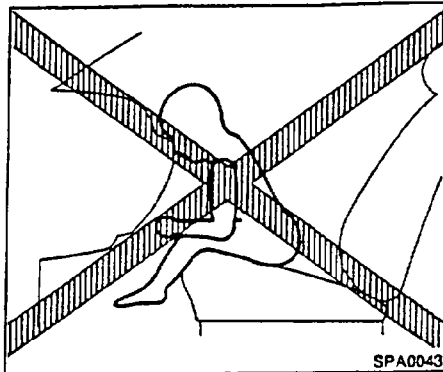
SUPPLEMENTAL RESTRAINT SYSTEM (AIR BAG SYSTEM)

This Supplemental Restraint System section contains important information concerning the driver and passenger air bags. The Supplemental Restraint System Air Bag can help reduce impact force to the driver and to the front passenger in certain frontal collisions. The air bags are designed to supplement the crash protection provided by the driver and passenger seat belts and are not a substitute for them. The seat belts should always be correctly worn and the driver and front passenger seated a suitable distance from the steering wheel and instrument panel. (See "Seat belts" for instructions and precautions on seat belt usage.)

The air bags will operate only when the ignition switch is in the "ON" or "START" position.

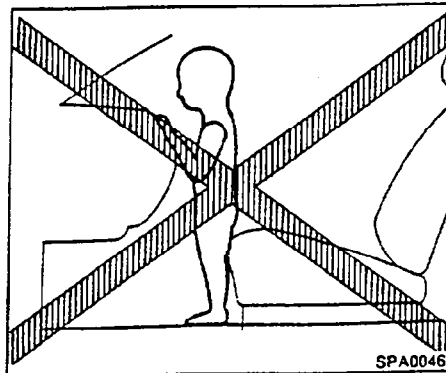
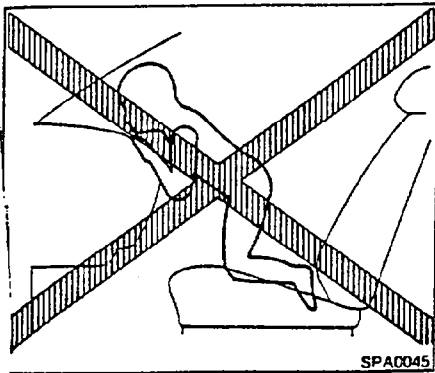
WARNING:

The air bags ordinarily will not inflate in the event of a side impact, rear impact, roll over, or lower severity frontal collision; so always wear your seat belts to help reduce the risk or severity of injury in various kinds of accidents.



WARNING:

The seat belts and the air bags are most effective when you are sitting back and upright in the seat. Air bags inflate with great force. If you are unrestrained, leaning forward, sitting sideways or out of position in any way, you are at greater risk of injury or death in a crash and may also receive serious or fatal injuries from the air bag if you are up against it when it inflates.

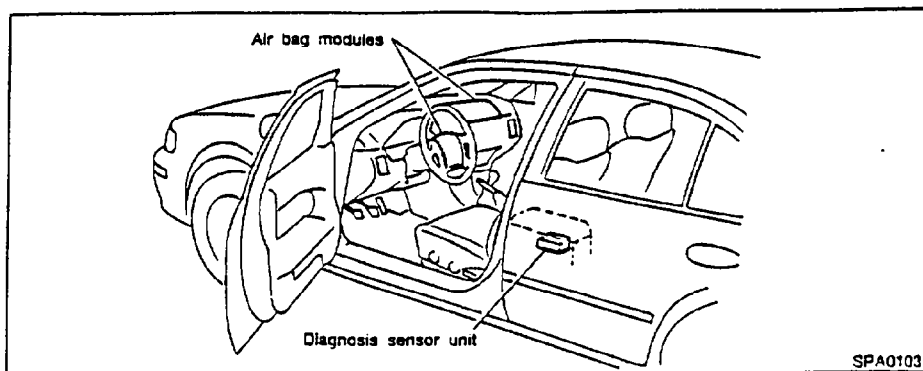


WARNING:

Never let children ride unrestrained as shown in the previous illustrations.

Children may be severely injured or killed when the air bag inflates if they are not properly restrained.

Also, never install a rear-facing child restraint in the front seat. See "Child restraints for infants and small children" for details.



Air bag system

The driver air bag is located in the center of the steering wheel; the front passenger air bag is mounted in the dashboard above the glove box. The air bag system is designed to inflate in higher severity frontal collisions, although it may inflate if the forces in another type of collision are similar to those of a higher severity frontal impact. When the air bag inflates, a fairly loud noise may be heard, followed by release of smoke. This smoke is not harmful and does not indicate a fire, but care should be taken not to intentionally inhale it, as it may cause

irritation and choking. The air bags, along with the use of seat belts, help to cushion the impact force on the face and chest of the occupant.

The seat belts should be correctly worn and the driver and passenger seated upright as far as practical away from the steering wheel or dashboard. Since the air bag inflates quickly in order to help protect the occupant, the force of the air bag inflating can increase the risk of injury if the occupant is too close to or is against the air bag module during inflation. The air bag will deflate quickly after the collision is over.

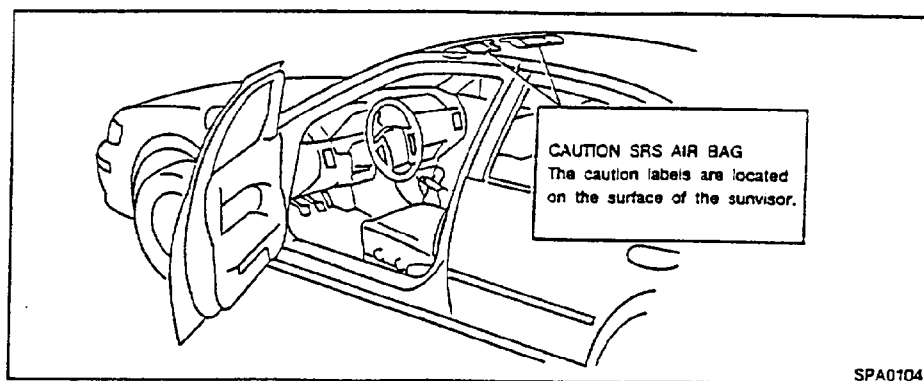
The air bags will operate only when the ignition switch is in the "ON" or "START" position.

WARNING:

- Right after inflation, several air bag system components will be hot. Do not touch them; you may severely burn yourself.
- No unauthorized changes should be made to any components or wiring of the air bag system. This is to prevent accidental inflation of the air bag or damage to the air bag system.
- Tampering with the air bag system may result in serious personal injury. Tampering includes changes to the steering wheel and the instrument panel assembly by placing material over the steering wheel pad and above the dashboard, or by installing additional trim material around the air bag system.
- Do not attach any objects to the steering wheel pad and to the instrument panel. Objects attached to the steering wheel pad and to the instrument panel may become dangerous projectiles and cause injury if the air bag inflates.

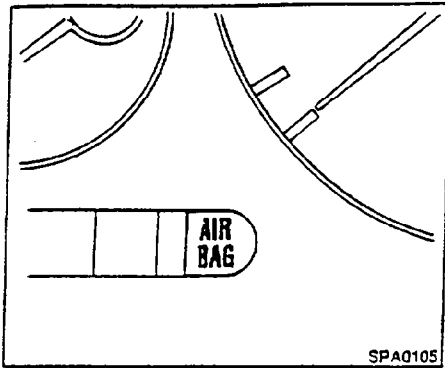
CAUTION AND WARNING LABELS

- Work around and on the air bag system should be done by an authorized NISSAN dealer. Installation of electrical equipment should also be done by an authorized NISSAN dealer. The yellow SRS wiring should not be modified or disconnected. Unauthorized electrical test equipment and probing devices should not be used on the air bag system.



Caution and warning labels about the air bag system are placed in the vehicle.

AIR BAG WARNING LIGHT



The air bag light, displaying "AIR BAG" in the instrument panel, monitors the circuits of the air bag. The circuits monitored by the air bag light are the diagnosis sensor unit, air bag modules and all related wiring.

When the ignition key is in the "ON" or "START" position, the air bag light will illuminate for about 7 seconds and then turn off. This means the system is operational.

If any of the following conditions occurs, the air bag needs servicing and should be taken to your nearest authorized NISSAN dealer:

1. The air bag light does not come on for 7 seconds and then goes off as described above.
2. The air bag light flashes intermittently or remains on.
3. The air bag light does not come on at all.

Under these conditions, the Supplemental Restraint System Air Bag will not operate properly. It must be checked and repaired.

Repair and replacement procedure

The air bag system is designed to inflate on a one-time-only basis. As a reminder, unless it is damaged, the air bag light will remain illuminated after inflation has occurred. Repair and replacement of the air bag system should be done only by authorized NISSAN dealers. To ensure long-term functioning, the system must be inspected 10 years after the date of manufacture as noted on the certification label located on the driver side front pillar.

When maintenance work is required on the

vehicle, the air bag system and related parts should be pointed out to the person conducting the maintenance. The ignition key should always be in the "LOCK" position when working under the hood or inside the vehicle.

WARNING:

- Once the air bag inflates, the air bag module will not function again and must be replaced. The air bag module cannot be repaired.
- After an air bag inflates, the front instrument panel assembly should be replaced by your NISSAN dealer.
- The air bag system should be inspected by an authorized NISSAN dealer if there is any damage to the front end portion of the vehicle or replaced if the air bag has inflated.
- When selling your vehicle, we request that you inform the buyer about the air bag system and guide the buyer to the appropriate sections in this Owner's Manual.
- If you need to dispose of an air bag or scrap the vehicle, contact an authorized

SEAT BELTS

NISSAN dealer. Correct air bag disposal procedures are set forth in the appropriate NISSAN Service Manual. Incorrect disposal procedures could cause personal injury.

PRECAUTIONS ON SEAT BELT USAGE

Your chances of being injured or killed in an accident and/or the severity of injury may be greatly reduced if you are wearing your seat belt and it is properly adjusted. NISSAN strongly encourages you and all of your passengers to buckle up every time you drive, even if your seating position includes an air bag.

Some states, provinces or territories require that seat belts be worn at all times when a vehicle is being driven.

WARNING:

- Every person who drives or rides in this vehicle should wear a seat belt at all times. Children should be in appropriate child restraints.
- The belt should be adjusted to a snug fit. Failure to do so will reduce the effectiveness of the entire restraint system.
- Do not wear the belt inside out or twisted.
- Do not allow more than one person to use the same belt.

- All seat belt assemblies including retractors and attaching hardware should be inspected by your NISSAN dealer after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Seat belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.
- Never carry more people in the vehicle than there are seat belts.

If the seat belt warning lamp glows continuously while the ignition is turned "ON" with all doors closed and all seat belts fastened, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.

Be sure to observe the following cautions when using seat belts. Failure to do so could increase the chance and/or severity of injury in an accident.

- Always route the shoulder belt over your shoulder and across your chest. Never run the belt under your arm. Serious

Injury can occur if the seat belt is not worn properly.

- Position the lap belt as low as possible AROUND THE HIPS, NOT THE WAIST.

Infant or small child

NISSAN recommends that infants or small children be placed in child restraint systems that comply with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. You should choose a child restraint system that fits your vehicle and always follow the manufacturer's instructions for installation and use.

Children

Children who are too large for child restraint systems should be seated and restrained by the seat belts which are provided.

NISSAN recommends that children sit in the rear seat if possible. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat.

If the child's seating position has a shoulder belt that fits close to the face or neck, the

use of a booster seat (commercially available) may help overcome this. The booster seat should raise the child so that the shoulder belt is properly positioned across the top, middle portion of the shoulder and the lap belt is low on the hips. The booster seat should fit the vehicle seat and have a label certifying that it complies with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. Once the child has grown so the shoulder belt is no longer on or near the face and neck, use the shoulder belt without the booster seat.

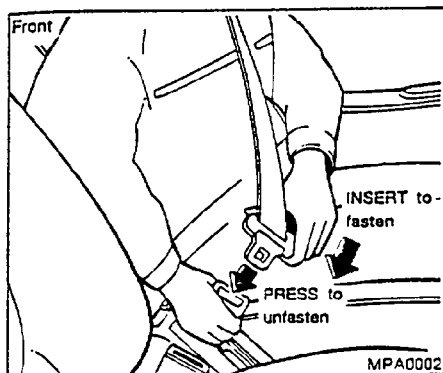
Never let a child stand or kneel on any seat and do not allow a child in the cargo areas while the vehicle is moving.

Pregnant women

NISSAN recommends that pregnant women use seat belts. Contact your doctor for specific recommendations. The lap belt should be worn snug and positioned as low as possible around the hips, not the waist.

Injured persons

NISSAN recommends that injured persons use seat belts, depending on the injury. Check with your doctor for specific recommendations.



3-POINT TYPE SEAT BELT WITH RETRACTOR

WARNING:

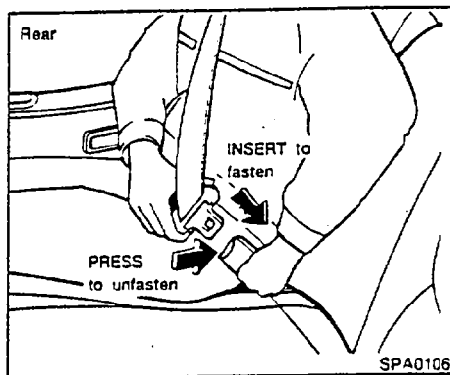
Every person who drives or rides in this vehicle should wear a seat belt at all times.

Fastening the belts

1. Adjust the seat.

WARNING:

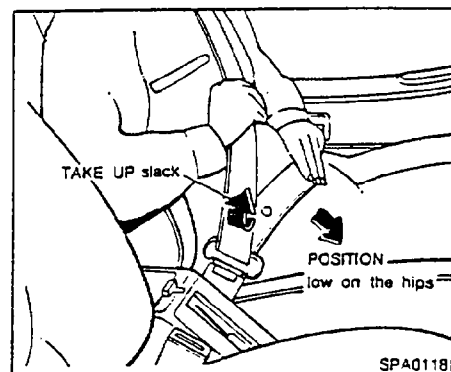
The seatback should not be reclined any more than needed for comfort when the vehicle is moving. Seat belts are most



effective when the passenger sits well back and straight up in the seat. If the seat is reclined, the risk of sliding under the lap belt and being injured is increased.

2. Slowly pull the seat belt out of the retractor and insert the tongue into the buckle until it snaps.

The retractor is designed to lock during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.



3. Position the lap belt portion low on the hips as shown.

4. Pull the shoulder belt portion toward the retractor to take up extra slack.

The front seat passenger side seat belt and rear 3-point seat belts have a cinching mechanism for child seat installation. It is referred to as the automatic locking mode.

When the cinching mechanism is activated the seat belt cannot be withdrawn again until the seat belt tongue is detached from the buckle and fully retracted. Refer to "Child restraints for infants and small

children" later in this section for more information.

WARNING:

- The automatic locking mode should be used only for child seat installation. During normal seat belt use by a passenger, the locking mode should not be activated. If it is activated it may cause uncomfortable seat belt tension.

Unfastening the belts

To unfasten the belt, press the button on the buckle. The seat belt will automatically retract.

**Checking seat belt operation
(3-point type with retractor)**

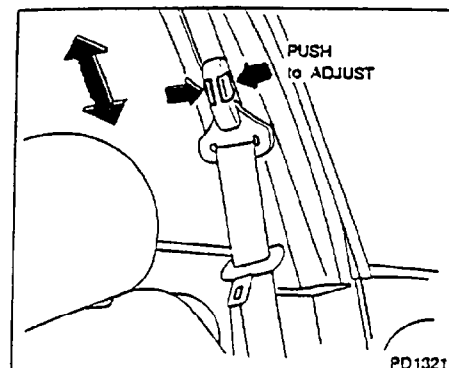
Your seat belt retractors are designed to lock belt movement using two separate methods:

- 1) When the belt is pulled quickly from the retractor.
- 2) When the vehicle slows down rapidly.

To increase your confidence in the belts, check their operation as follows:

- Grasp the shoulder belt and pull quickly forward. The retractor should lock and restrict further belt movement.

If the retractor does not lock during this check or if you have any questions about belt operation, see your NISSAN dealer.

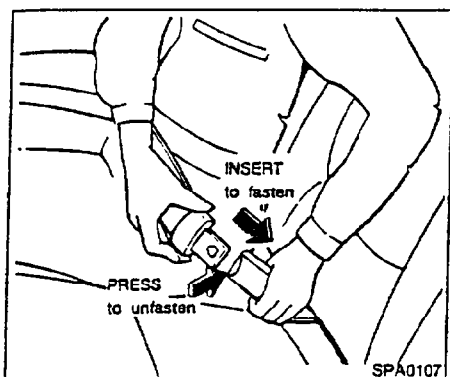


**Shoulder belt height adjustment
(For front seats)**

The shoulder belt anchor height should be adjusted to the position best for you. (See "Precautions on seat belt usage".) To adjust, push the release button, and then move it to the desired position, so that the belt passes over the shoulder.

WARNING:

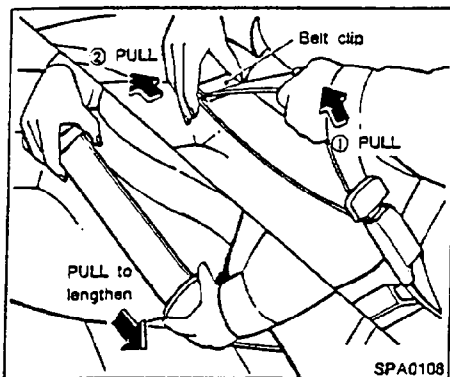
After adjustment, make sure the shoulder belt anchor is securely fixed.



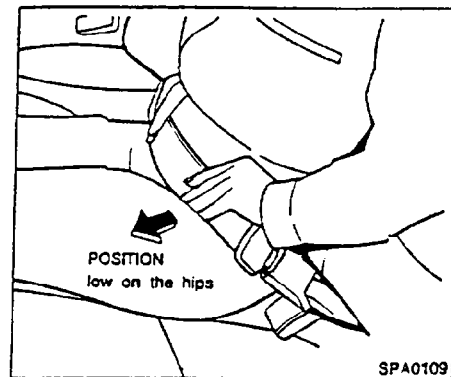
**2-POINT TYPE WITHOUT
RETRACTOR (center position of
rear seat)**

Fastening the belts

1. Insert the tongue into the buckle marked **CENTER** until it snaps.



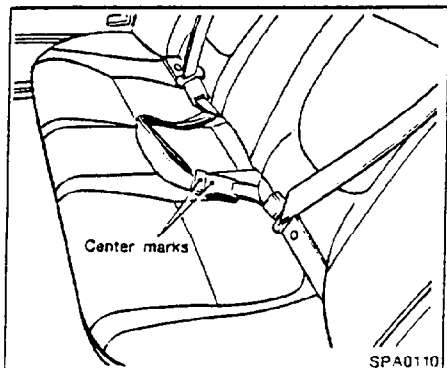
2. To lengthen, hold the tongue at a right angle to the belt and pull on the belt. To shorten, pull the end of the belt attached to the belt clip away from the tongue, and then pull the belt clip to take up the slack.



3. Position the lap belt low on the hips as illustrated.

Unfastening the belts

To unfasten the belt, press the button on the buckle.



Selecting correct set of belts

The center seat belt buckle and tongue are identified by the CENTER label. The center seat belt tongue can be fastened **only** into the center seat belt buckle.

SEAT BELT EXTENDERS

If, because of body size or driving position, it is not possible to properly fit the lap-shoulder belt and fasten it, an extender is available which is compatible with the installed seat belts. The extender adds approximately 8 inches (200 mm) of length and may be used for either the driver or front passenger seating position. See your NISSAN dealer for assistance if the extender is required.

WARNING:

- Only NISSAN belt extenders, made by the same company which made the original equipment belts, should be used with NISSAN belts.
- Persons who can use the standard seat belt should not use an extender. Such unnecessary use could result in serious personal injury in the event of an accident.

SEAT BELT MAINTENANCE

- To clean the belt webbings, apply a mild soap solution or any solution recommended for cleaning upholstery or carpets. Then brush the webbing, wipe it with a cloth and allow it to dry in the shade. Do not allow the belts to retract until they are completely dry.
- Periodically check to see that the belt and the metal components such as buckles, tongues, retractors, flexible wires and anchors work properly. If loose parts, deterioration, cuts or other damage on the webbing is found, the entire belt assembly should be replaced.