

V2130

REPORT NO. MGA-95-N003

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

Ford Motor Company
1995 Ford Windstar
Wagon
NHTSA NO. MS0200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: August 17, 1994

Report Date: October 5, 1994

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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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 Ford Windstar Wagon at the MGA Proving Grounds and Crash Test Center in Burlington, WI. on August 17, 1994. The barrier impact velocity was 56.1 kph (34.8 mph), and the ambient temperature at the time of impact was 21°C. The post-test maximum static crush was 587 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 518 and the 3 msec. Clip (Chest g's) was 42 g's. The left and right femur loads for the driver were -5000 and -3180 Newtons, respectively. The passenger's HIC was 231 and the 3 msec Clip was 42 g's. The left and right femur maximum loads were -2534 and -3799 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 Ford Windstar Wagon at a velocity of 56.1 kph (34.8 mph). The test was performed at the MGA Proving Grounds and Crash Test Center on August 17, 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.

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. 066) and the right-front passenger ATD (Serial No. 065) 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. 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 518. The maximum chest deceleration over 3 milliseconds was 42 g's. The left and right femur loads were -5000 and -3180 Newtons respectively.

The right front passenger's HIC was 231 and maximum chest deceleration over 3 milliseconds was 42 g's. The left and right femur loads were -2534 and -3799 Newtons respectively.

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1995/Ford/Windstar/Wagon

NHTSA No.: MS0200 VIN.: 2FMDA514XSBA75024

Body color: Red Date of Manufacture: 6-94

Engine: 6 Cylinders; C.I.D.; 3.8 liter; CC
 Gas; Diesel; Turbocharged
 Longitudinal; X Transverse

Transmission: 4 Speed; Manual; X Automatic; X Overdrive

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

Odometer Reading: 71 miles

 X A/C; X P/S; X P/B; X P/wdo;
 P/seats; Tilt Wheel; X Cruise Control;

Type of Occupant Restraint: Driver and passenger airbag and type II belt system with adjustable "D" Ring

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 241 kPa (35 Psi) Rear 241 kPa (35 Psi)

Recommended Tire Size: P205/70R1554

Recommended Cold Tire Pressure: Front 241 kPa (35 Psi) Rear 241 kPa (35 Psi)

Tires on Vehicle: P205/75R1554; Manufacturer: Michelin

Number of Occupants: 2 Front; 2 Rear; 3 3rd Seat; 7 TOTAL

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

Type of Front Seat Back: Fixed; X Adj. With; Power; X Lever

GVWR 2297 kg. GAWR: Front 1200 kg.; Rear 1118 kg.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

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

Right Front = 535.2 kg Right Rear = 333.8 kg
Left Front = 529.8 kg Left Rear = 325.7 kg
TOTAL FRONT WEIGHT = 1065.0 kg (61.8% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 659.5 kg (38.2% of Total Vehicle Weight)
TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1724.5 kg

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1724.5 kg
DSC = Designated Seating Capacity 7
RCW = VCW - 68 (DSC) = 136 *kg
Target Test Weight = UDW + RCW + (2 dummies x 75.8 kg/dummy)
Target Test Weight = 2012 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 588.3 kg Right Rear = 417.8 kg
Left Front = 582.0 kg Left Rear = 417.3 kg
TOTAL FRONT WEIGHT = 1170.3 kg (58.4% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 835.1 kg (41.6% of Total Vehicle Weight)
TOTAL TEST WEIGHT = 2005.4 kg
Weight of ballast secured in vehicle cargo area = 91 kg
Vehicle components removed to meet target weight: Spare tire, jack, tool kit,
middle bench seat, interior trim panels on right side

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude: RF 738 LF 740 RR 783 LR 789
Test Attitude: RF 722 LF 729 RR 746 LR 749
Wheel Base: 3073 mm; C.G. = 1279 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)

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

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

Glazing Damage

Backlight/Windshield Windshield cracked

Other Notable Impact Effects: Both driver & passenger airbag deployed

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.:

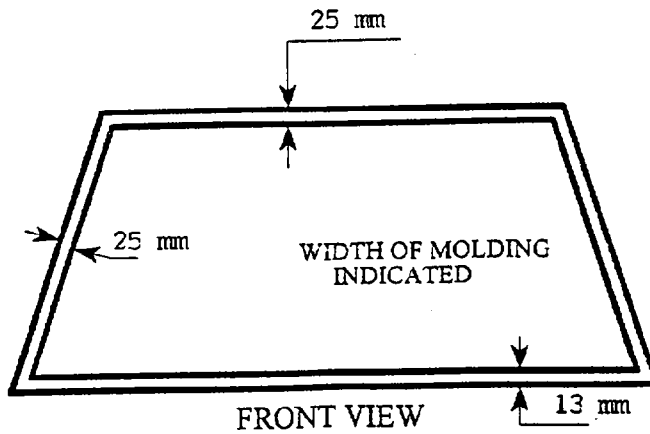
Windshield set in rubber molding within windshield frame

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		
	PRE-TEST (mm)	POST-TEST (mm)	PERCENT RETENTION
RIGHT SIDE	2344	2344	100%
LEFT SIDE	2344	2344	100%
TOTAL	4688	4688	100%

AREA OF RETENTION FAILURE: None



FAILURE DETAILS: NONE

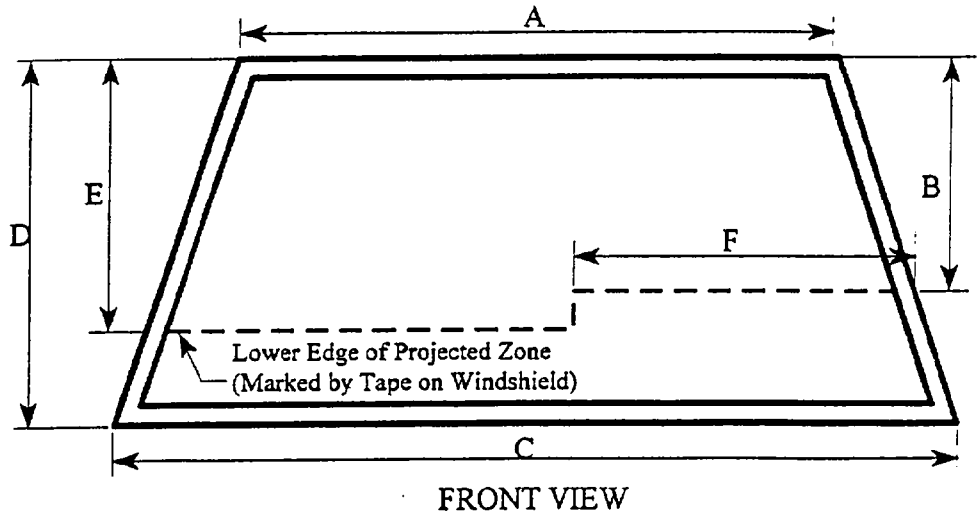
FMVSS NO. 219, "WINDSHIELD ZONE INTRUSION", DATA SHEET

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= 1315 mm
B= 516 mm
C= 1737 mm
D= 819 mm
E= 538 mm
F= 826 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.: MS0200 Test Date: August 17, 1994

Vehicle Mfgr./Make/Model: 1995/Ford/Windstar/Wagon

Usable Capacity of Vehicle's Fuel Tank: 75.7 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:

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

TEST VEHICLE IMPACT TYPE:

- 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

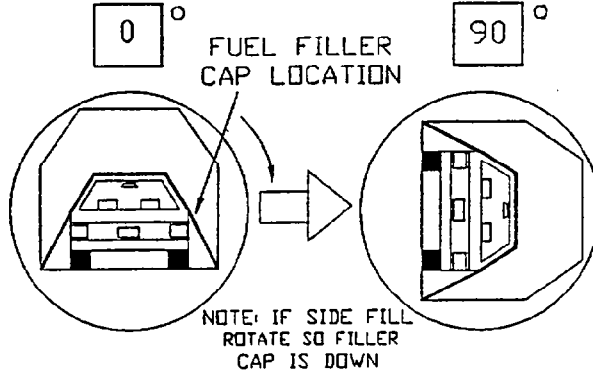
ACTUAL	MAX ALLOWED
0	1 OZ
0	5 OZ
0	1 oz./1 MIN

SOLVENT SPILLAGE DETAILS: None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° - 90°

Vehicle NHTSA ID No.: MS0200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 45 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 45 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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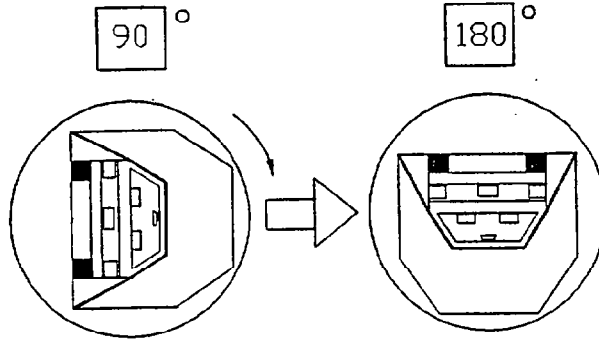
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 90° - 180°

Vehicle NHTSA ID No.: MS0200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 47 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 47 seconds
 Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

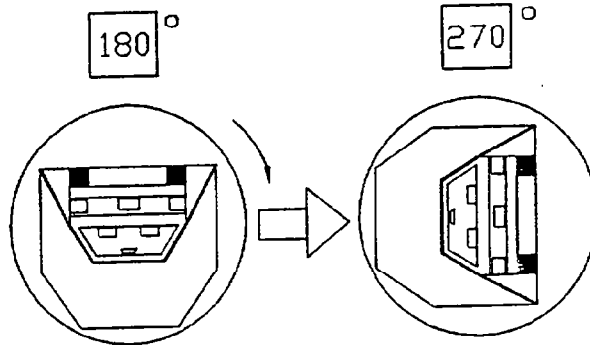
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 180° - 270°

Vehicle NHTSA ID No.: MS0200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 30 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 30 seconds
 Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

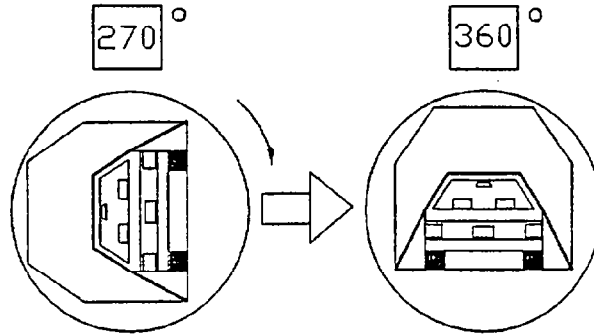
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 270° - 360°

Vehicle NHTSA ID No.: MS0200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 27 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
 TOTAL 7 minutes 27 seconds
 Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

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

IV. SOLVENT SPILLAGE 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/Ford/Windstar/Wagon

VEH. NHTSA NO.: MS0200 TEST DATE: August 17, 1994

MAX. ACCELERATION VALUES: (g's)	DRIVER #066	PASSENGER #065
Head Channel X	-57.1	-35.0
Head Channel Y	3.4	-14.3
Head Channel Z	19.7	13.8
HEAD RESULTANT	58.1	38.1
Chest Channel X	-43.0	-42.4
Chest Channel Y	3.8	-5.1
Chest Channel Z	-13.1	-11.0
CHEST RESULTANT (CLIP)	42.1	41.5
TIME INTERVAL (msec) [0.003 seconds minimum]	t ₁ = 65.3 t ₂ = 68.3	t ₁ = 73.5 t ₂ = 76.6

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	518.2	230.6
t ₁ = (msec)	60.2	66.8
t ₂ = (msec)	96.2	102.8
Avg. Accel. t ₁ to t ₂ (g's)	46.1	33.3

[The maximum time interval from t₁ to t₂ is 36 milliseconds.]

MAX. COMPRESSIVE FEMUR FORCES:

Right Side (N)	-3180	-3799
Left Side (N)	-5000	-2534

MAXIMUM SEAT BELT FORCES:

Lap Belt (N)	3014	1870
Shoulder Belt (N)	6096	9669

NOTE: All values listed must occur during primary impact event.
(Head X,Y,Z and R listed must be during t₁ to t₂ HIC interval)

HYBRID III NECK AND CHEST DATA SHEET

VEHICLE YR./MAKE/MODEL/BODY STYLE: 1995/Ford/Windstar/Wagon

VEHICLE NHTSA NO.: MS0200 TEST DATE: August 17, 1994

MAXIMUM VALUES	DRIVER DUMMY #066	PASSENGER DUMMY #065
Neck Load X (N)	394.0	769.0
Neck Load Y (N)	183.0	268.0
Neck Load Z (N)	-1313.0	-2156.0
Neck Moment X (N.M)	6.6	17.2
Neck Moment Y (N.M)	-42.5	45.2
Neck Moment Z (N.M)	-7.7	-25.7
Chest Deflection X (mm)	-31.0	-34.0
Time of Max. Occurrence	86 msec.	75 msec.

PART 572 DUMMY IN-VEHICLE POSITION

Vehicle NHTSA No.: MS0200 Vehicle: 1995 Ford Windstar Wagon

SEAT TYPE:

 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

Driver: X Manual
 Power

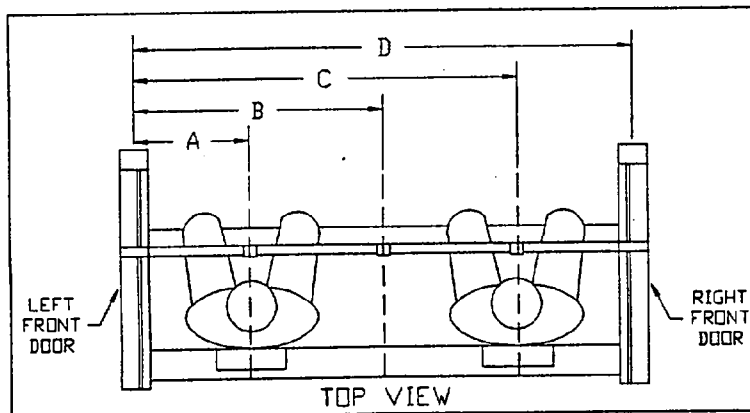
Passenger: X Manual
 Power

BUCKET SEAT BACK TYPE:

 Fixed
 X Adjustable Reclining

Driver
Adjusted to the mid position
10th position of 19

Passenger
Adjusted to mid position
10th position of 19



066 DUMMY ID 065

- | | |
|---|----------------|
| A = Left Door to Driver Centerline | <u>457</u> mm |
| B = Left Door to Centerline | <u>860</u> mm |
| C = Left Door to Right Passenger Centerline | <u>1282</u> mm |
| D = Left Door to Right Door | <u>1721</u> mm |

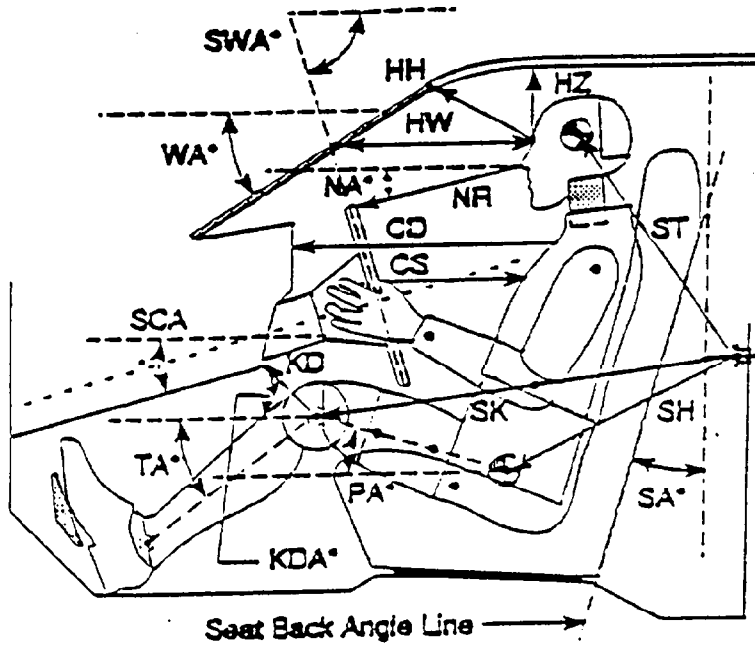
FRONT SEAT MEASUREMENT TABLE

Units (mm)

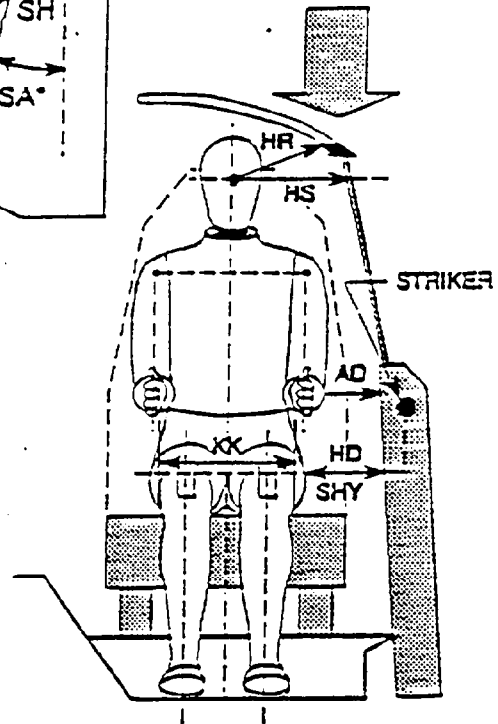
	DRIVER (Serial #066)	PASSENGER (Serial #065)
WA°	30.2°	
SWA°	24°	N/A
SCA°	N/A	N/A
SA°	21.1°	21.1°
HZ	191	194
HH	400	427
HW	629	637
HR	238	219
NR	441 Angle -12.3°	N/A
CD	565	784
CS	346	N/A
RA	225	N/A
KDL	168 Angle 22.2°	156
KDR	162	162 Angle 12.4°
PA°	20.5°	22.5°
TA°	-51.8°	-55.4°
KK	295	243
ST	649 Angle 98.3°	622 Angle 83.3°
SK	597 Angle 174.5°	600 Angle 173.5°
SH	192 Angle 189.7°	213 Angle 179.8°
SHY	286	270
HS	333	287
HD	165	146
AD	114	95

N/A = Not Applicable

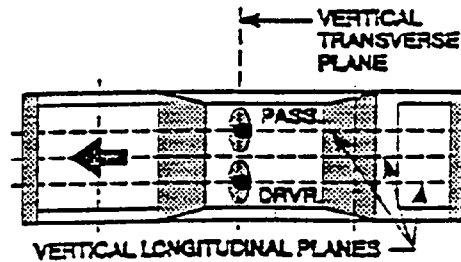
FRONT SEAT MEASUREMENTS



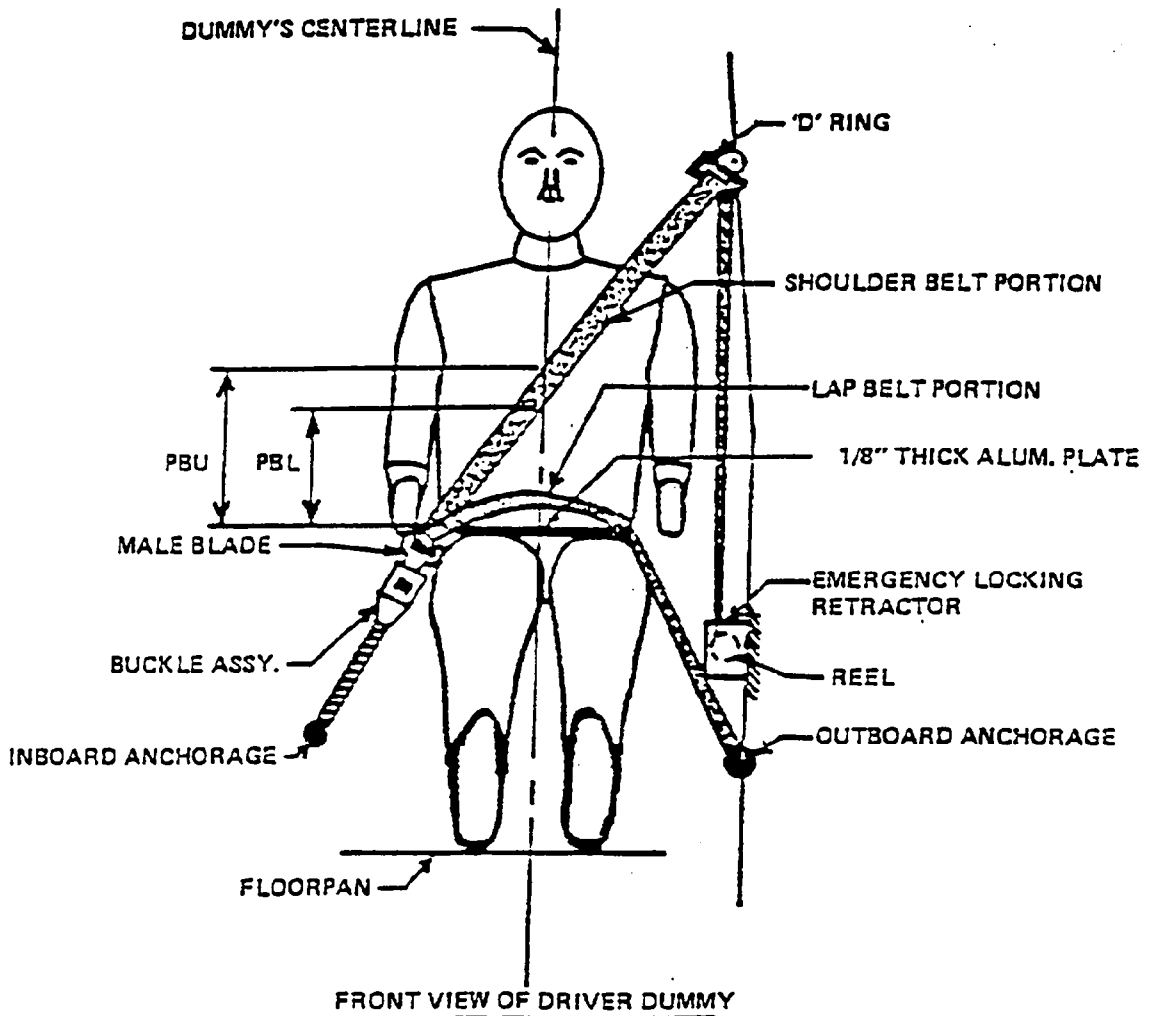
- AD - Arm to Door
- HD - H-Point to Door
- HR - Head to Side Header
- HS - Head to Side Window
- KK - Knee to Knee
- SHY- Striker to H-Point (Y Direction)



- CD - Chest to Dash
- CS - Steering Wheel to Chest
- HE - 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	320	340
<u>PBL</u> --	Top surface of alum. plate to belt lower edge	240	267

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

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

<u>BELT LENGTH DATA:</u>	<u>Driver</u>	<u>Passenger</u>
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	<u>176 mm</u>	<u>189 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>875 mm</u>	<u>890 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>959 mm</u>	<u>980 mm</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis	<u>63 mm</u>	<u>45 mm</u>
As determined mechanically	<u>64 mm</u>	<u>61 mm</u>
As determined electronically	<u>N/R</u>	<u>N/R</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>*</u>	<u>*</u>
---	----------	----------

N/R = Not Recorded

* No contact on high speed film.

CAMERA LOCATIONS

VEH. NHTSA NO.: MS0200 ; TEST DATE: August 17, 1994; TIME: 3:55 p.m.

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1995/Ford/Windstar/Wagon

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	24
3	Left Front View	950	8050	1180	90°	7631	25	926
15	Steering Column Top	2200	8440	1565	90°	8021	25	N/A
16	Steering Column Bottom	2200	8440	1035	90°	8021	25	1087
12	Left Driver Close-up	1750	6540	1205	90°	6121	35	1000
9	Left Angle	4240	5000	1965	50°		50	888
13	Driver Onboard Seat Belt						35	416
14	Passenger Onboard Seat Belt						35	727
2	Right Overall	2490	-8300	985	90°	7881	13	952
17	Right Front	940	-7720	1250	90°	7301	25	1000
11	Right Passenger Close-up	1520	-7400	1250	90°	6981	50	1005
10	Right Angle	4210	-5310	2195	50°		35	800
4	Top View Wide	400	15	4390			13	1111
8	Top Driver	-320	385	2350			13	1111
7	Top Passenger	-250	-400	2460			13	1053
5	Pit Engine	930	0	-3195			13	1010
6	Fuel Tank	2090	0	-3095			13	1010

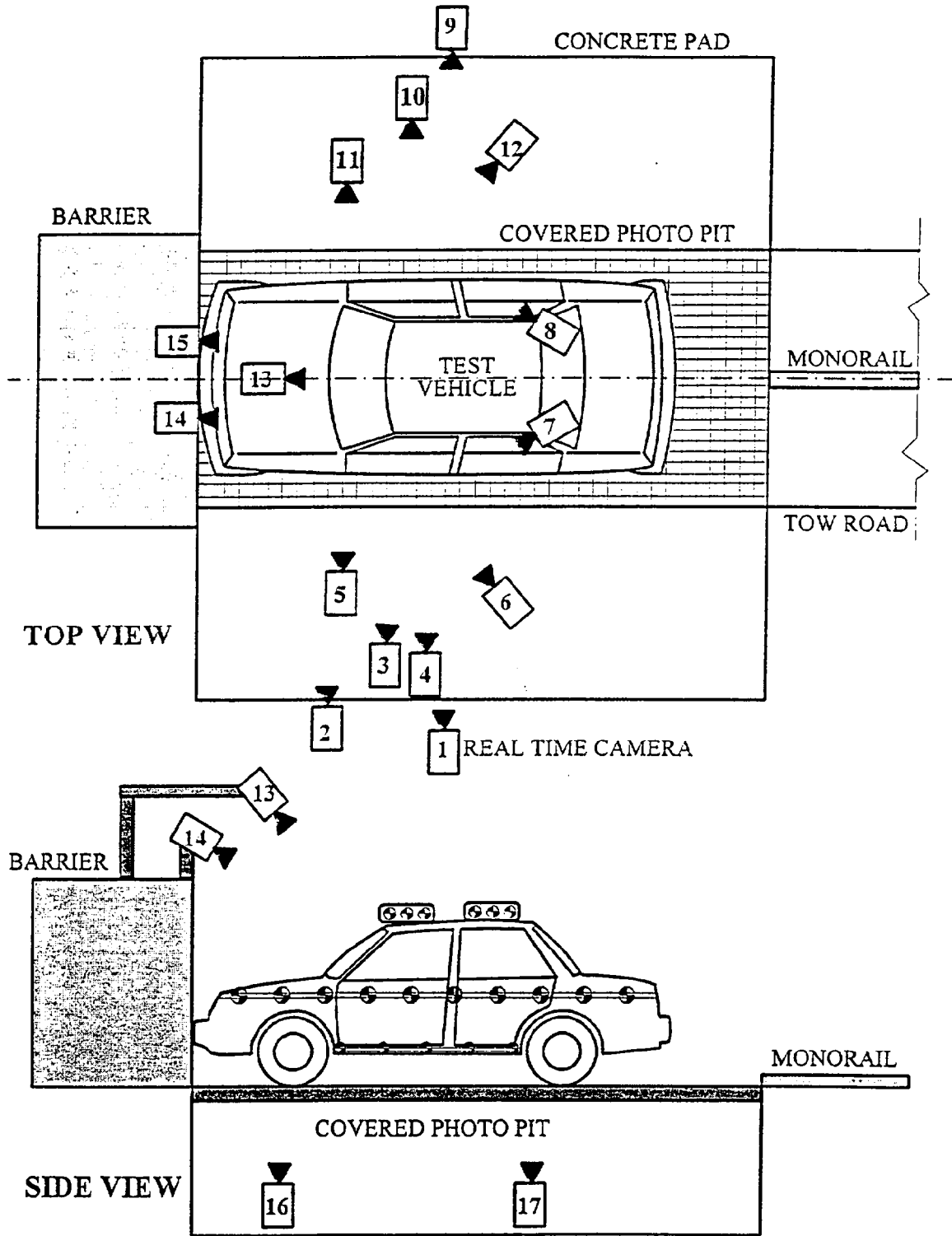
COORDINATES:

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

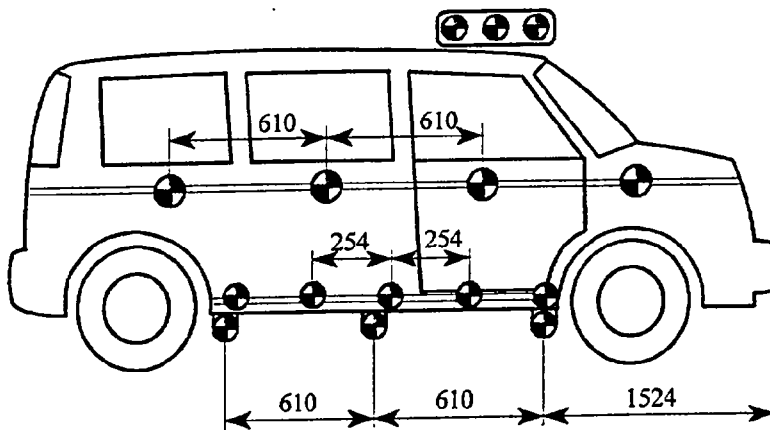
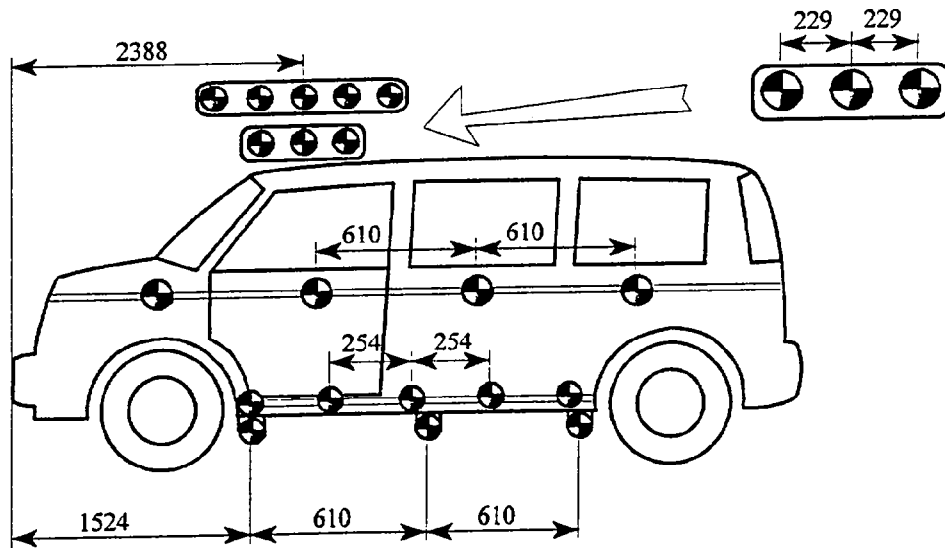
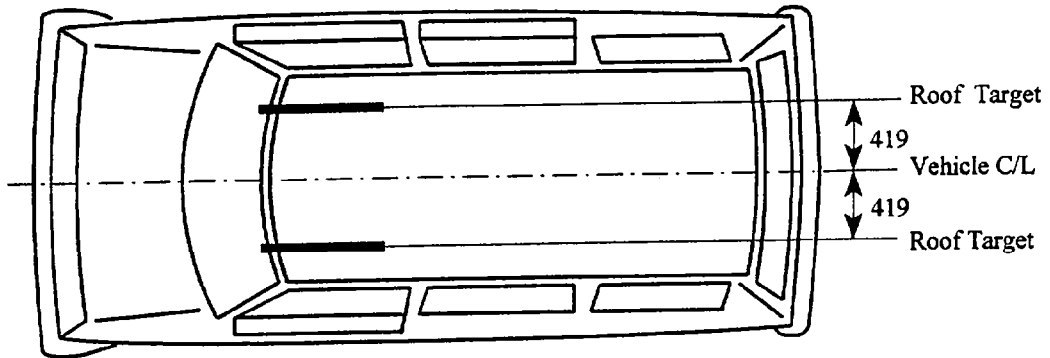
ORIGIN: For X and Y it is the Impact Point. For Z it is the Floor.

N/A = Not available

CAMERA LOCATIONS (cont'd)



VEHICLE TARGET LOCATIONS



(DIMENSIONS IN MM)

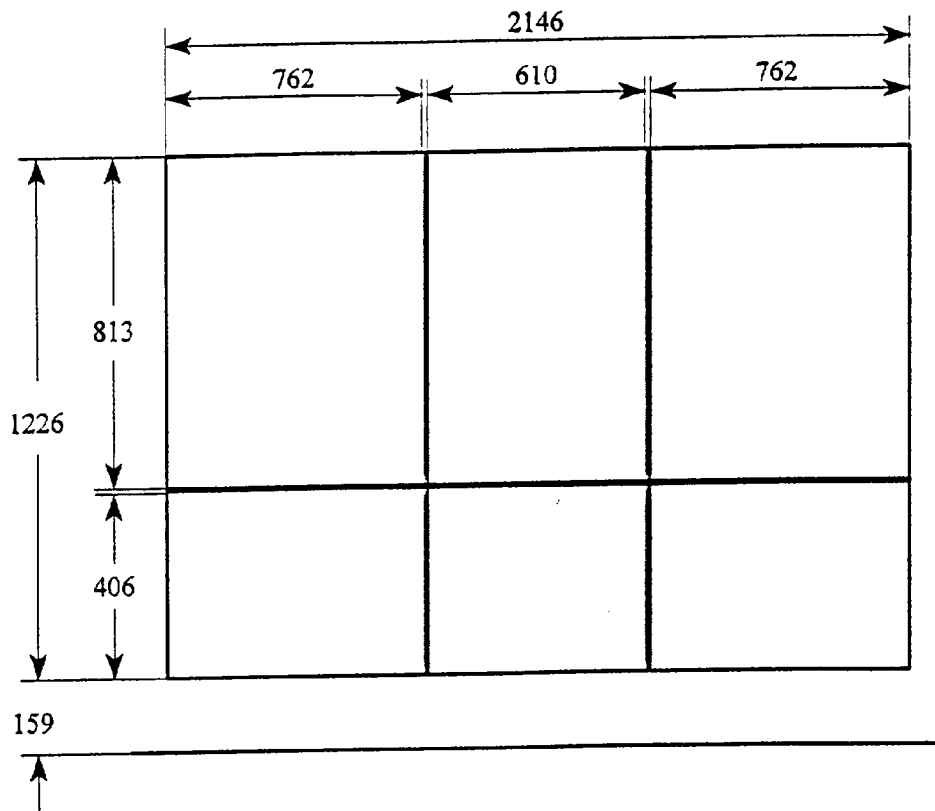
LOAD CELL LOCATIONS ON FIXED BARRIER

30 Load Cells

6 Rows

9 Columns

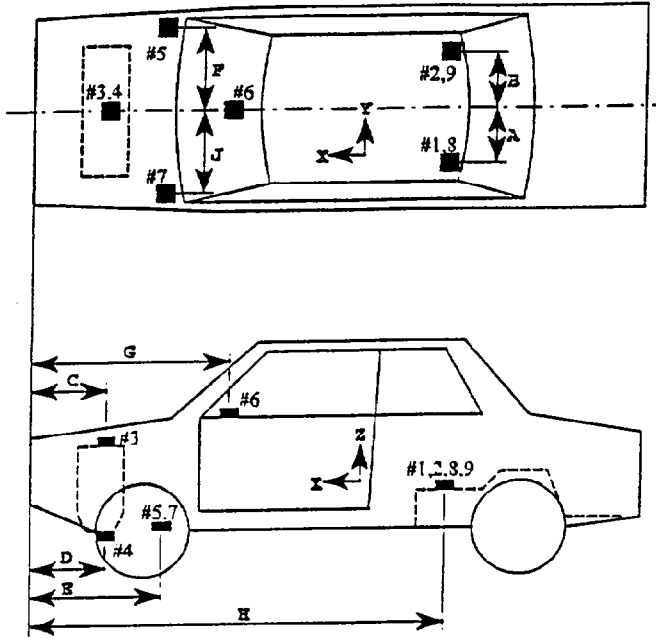
6 Groupings (5 cells/group)



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	-375
B	375
C	707
D	834
E	910
F	724
G	1545
H	2947
J	-724

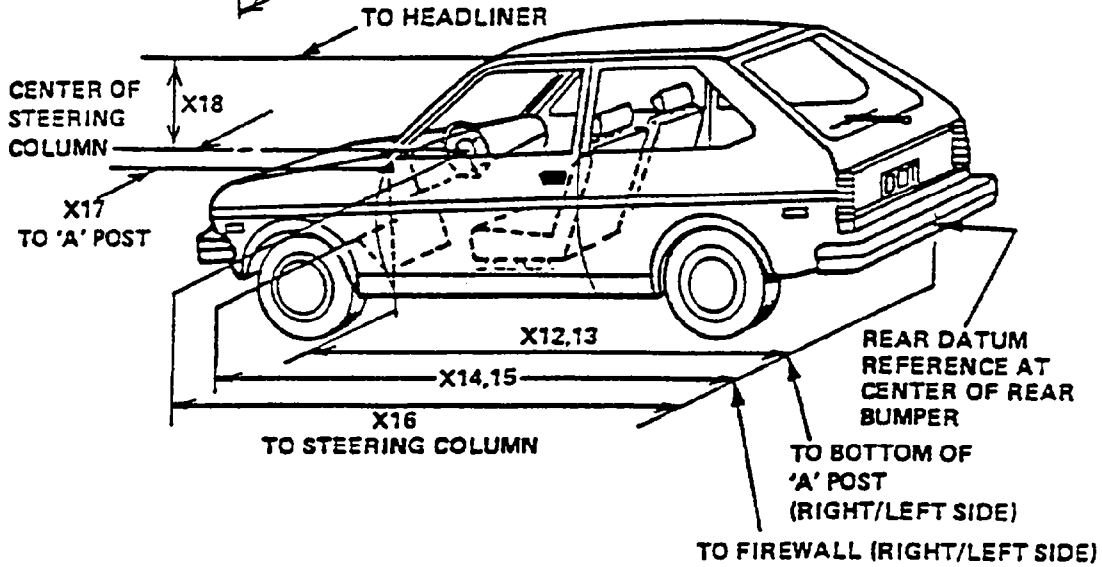
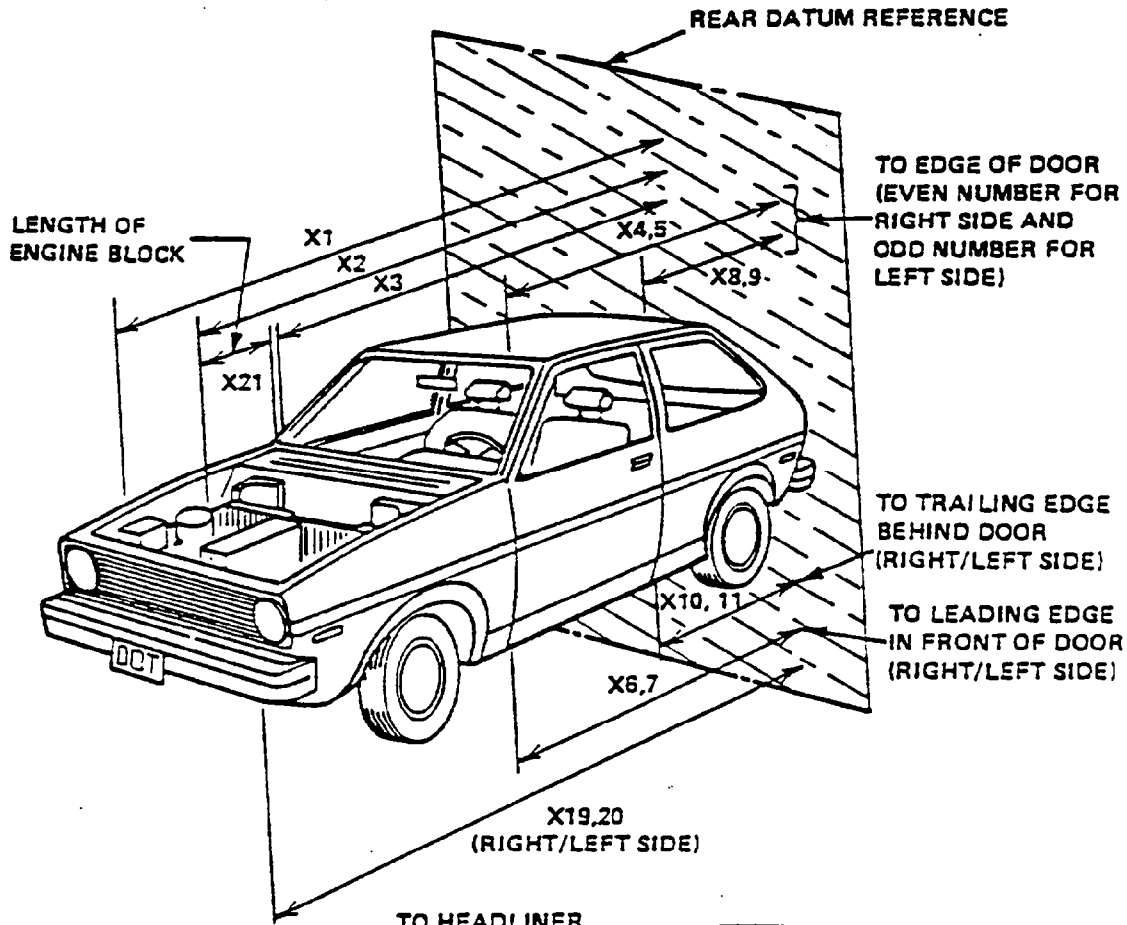
ACCELEROMETER	ACCELEROMETER	DIRECTION
1 and 8	Left Rear Seat Crossmember	X
2 and 9	Right Rear Seat Crossmember	X
3	Top of Engine	X
4	Bottom of Engine	X
5	Right Side Brake Caliper	X
6	Instrument Panel	X
7	Left Disc Brake Caliper	X

* 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	5063	4591	472
X2	Rear Surface of Vehicle to Front of Engine	4528	4058	470
X3	Rear Surface of Vehicle to Firewall	3835	3981	-146
X4	Rear Surface to Upr. Leading Edge of Rt. Door	3620	3608	12
X5	Rear Surface to Upr. Leading Edge of Left Door	3620	3608	12
X6	Rear Surface to Lwr. Leading Edge of Rt. Door	3521	3518	3
X7	Rear Surface to Lwr. Leading Edge of Left Door	3521	3518	3
X8	Rear Surface to Upr. Trailing Edge of Rt. Door	2416	2408	8
X9	Rear Surface to Upr. Trailing Edge of Left Door	2416	2408	8
X10	Rear Surface to Lwr. Trailing Edge of Rt. Door	2457	2451	6
X11	Rear Surface to Lwr. Trailing Edge of Left Door	2457	2451	6
X12	Rear Surface to Bottom of 'A' Post on Rt. Side	3521	3524	-3
X13	Rear Surface to Bottom of 'A' Post on Left Side	3521	3524	-3
X14	Rear Surface to Firewall on Right Side	3829	3832	-3
X15	Rear Surface to Firewall on Left Side	3829	3830	-1
X16	Rear Surface to Steering Column	3061	3073	-12
X17	Center of Steering Column to 'A' Post	400	356	44
X18	Center of Steering Column to Headlining	451	394	57
X19	Rear Surface to Right Side of Front Bumper	4903	4445	458
X20	Rear Surface to Left Side of Front Bumper	4903	4496	407
X21	Length of Engine Block	365	365	0

TEST VEHICLE MEASUREMENTS



ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

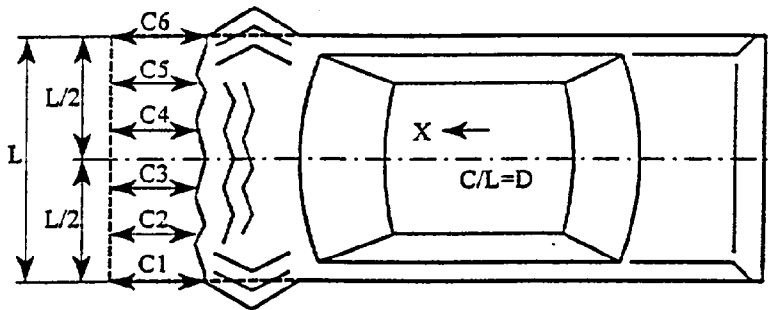
VEHICLE MAKE/MODEL/BODY STYLE: 1995 Ford/Windstar/Wagon
 VEH. NHTSA NO.: MS0200 ; VIN: 2FMDA514XSBA75024
 MODEL YEAR: 1995 ; BUILD DATE: 6-94 ; TEST DATE: 8-17-94
 VEH. SIZE CATEGORY: MPV ; TEST WEIGHT: 2005 kg
 VEH. WHEELBASE: 3073 mm ; FRONT OVERHANG: 991 mm ; OVERALL WIDTH: 1667 mm

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: 56.1 kph ; TIME OF SEPARATION: 110 msec
 VELOCITY CHANGE: 69 kph
 COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

F (Frontal)

CRUSH DEPTH DIMENSIONS:
 C1 = 406 mm
 C2 = 448 mm
 C3 = 467 mm
 C4 = 470 mm
 C5 = 486 mm
 C6 = 463 mm



MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitude)

LENGTH OF DAMAGED REGION: L = 1677 mm

APPENDIX A
PHOTOGRAPHS

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

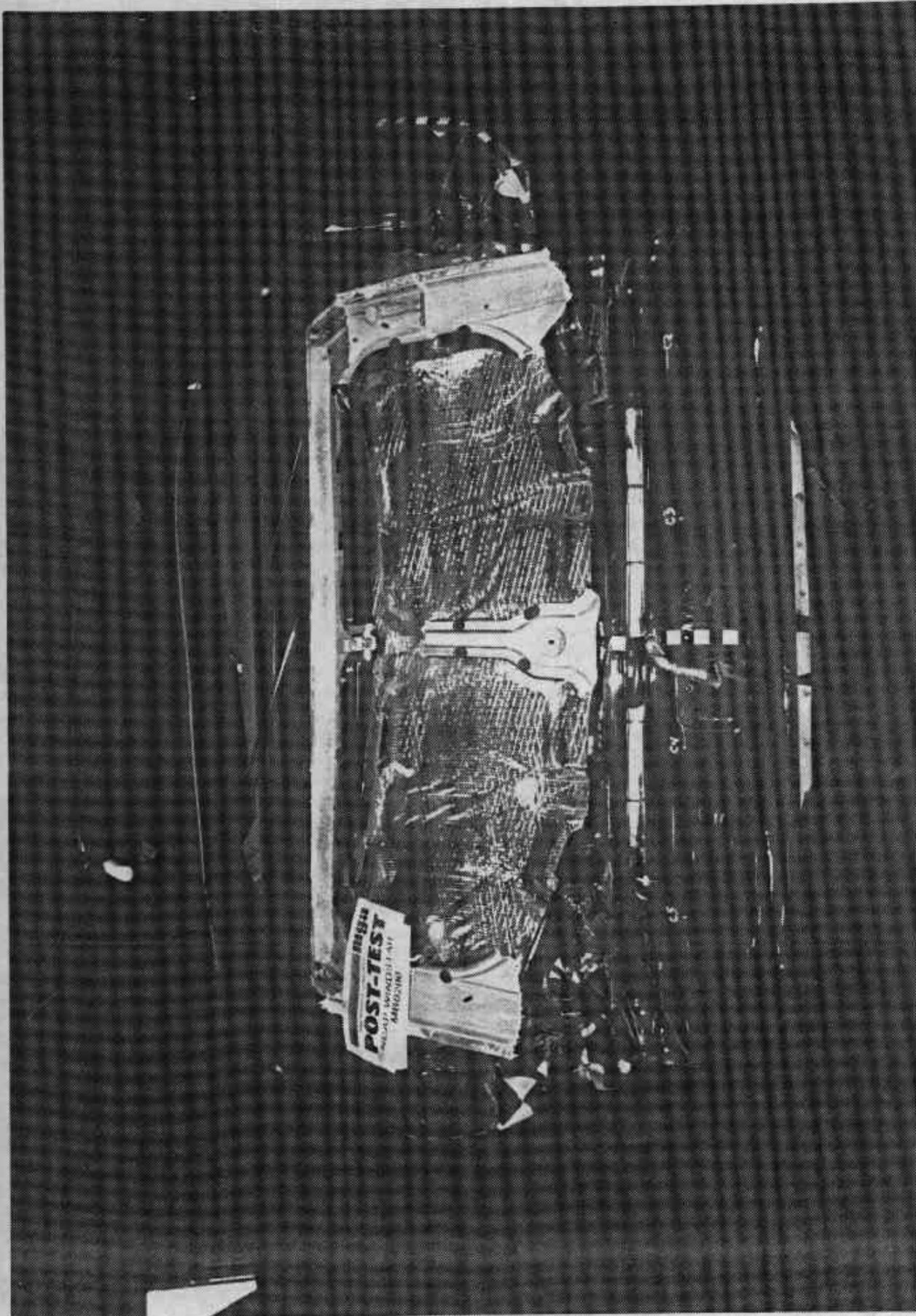


Photo No. A-2 - Post-Test Front View of Test Vehicle

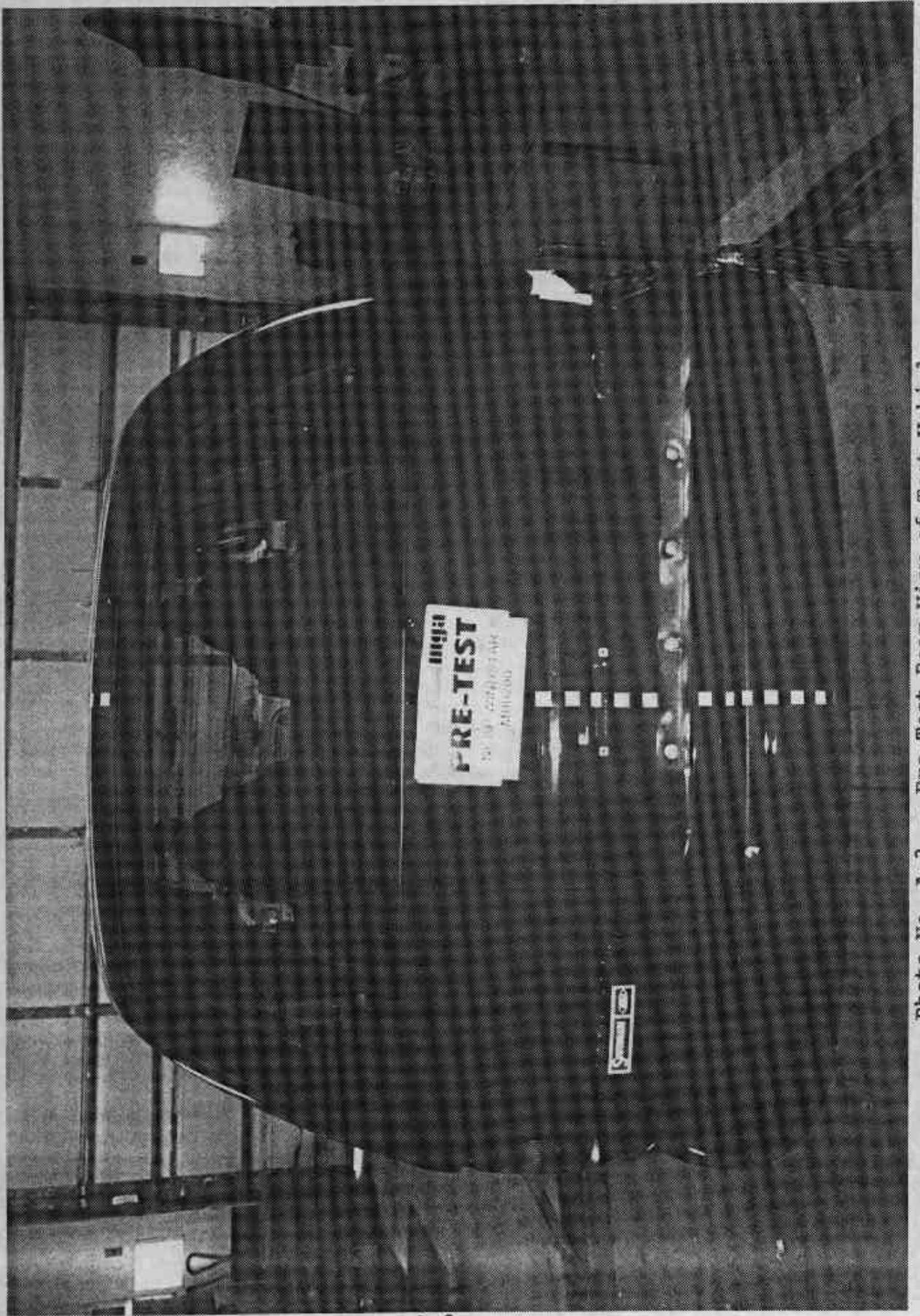


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

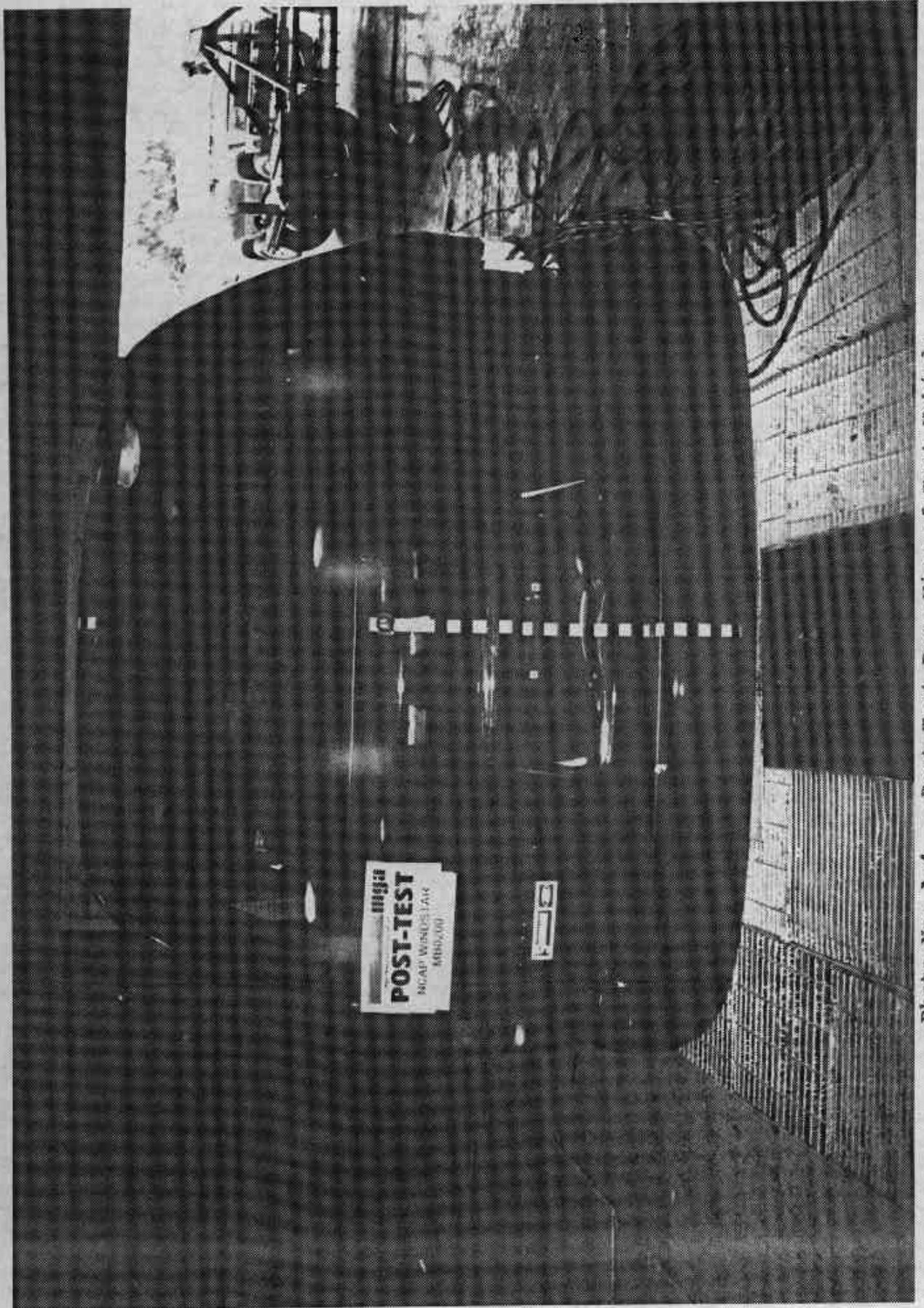
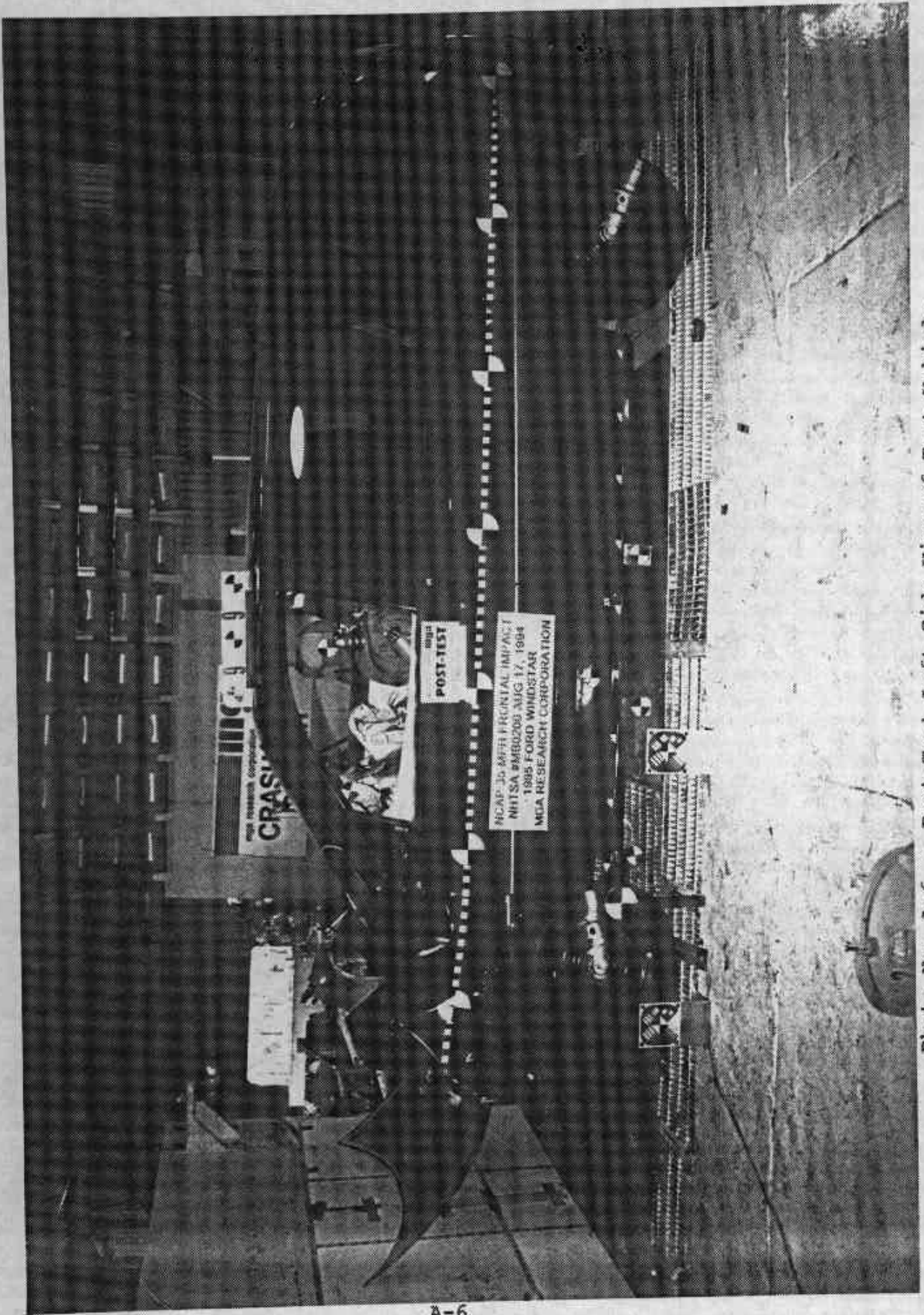


Photo No. A-4 - Post-Test Rear View of Test Vehicle



A-5

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



A-6

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

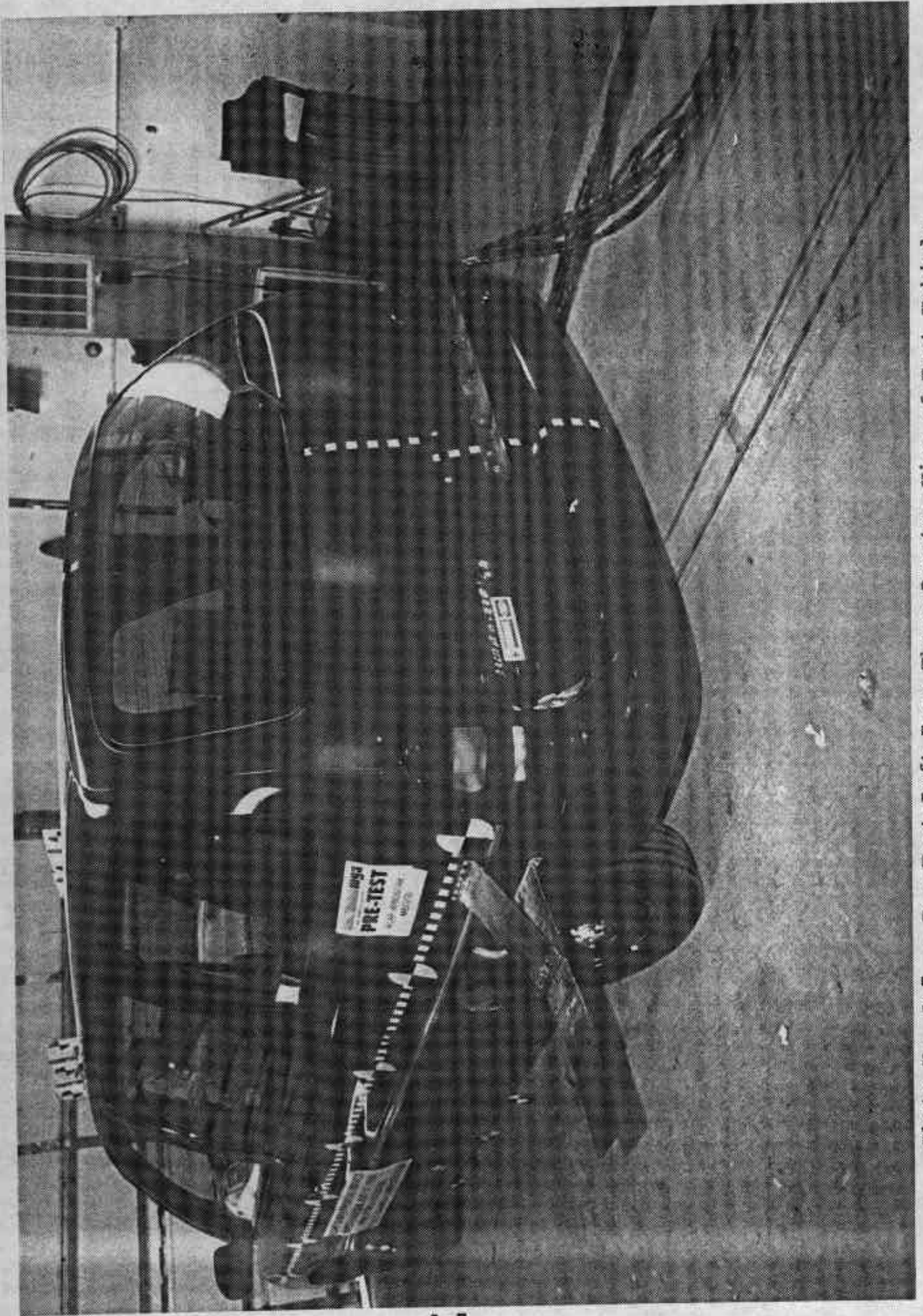


Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

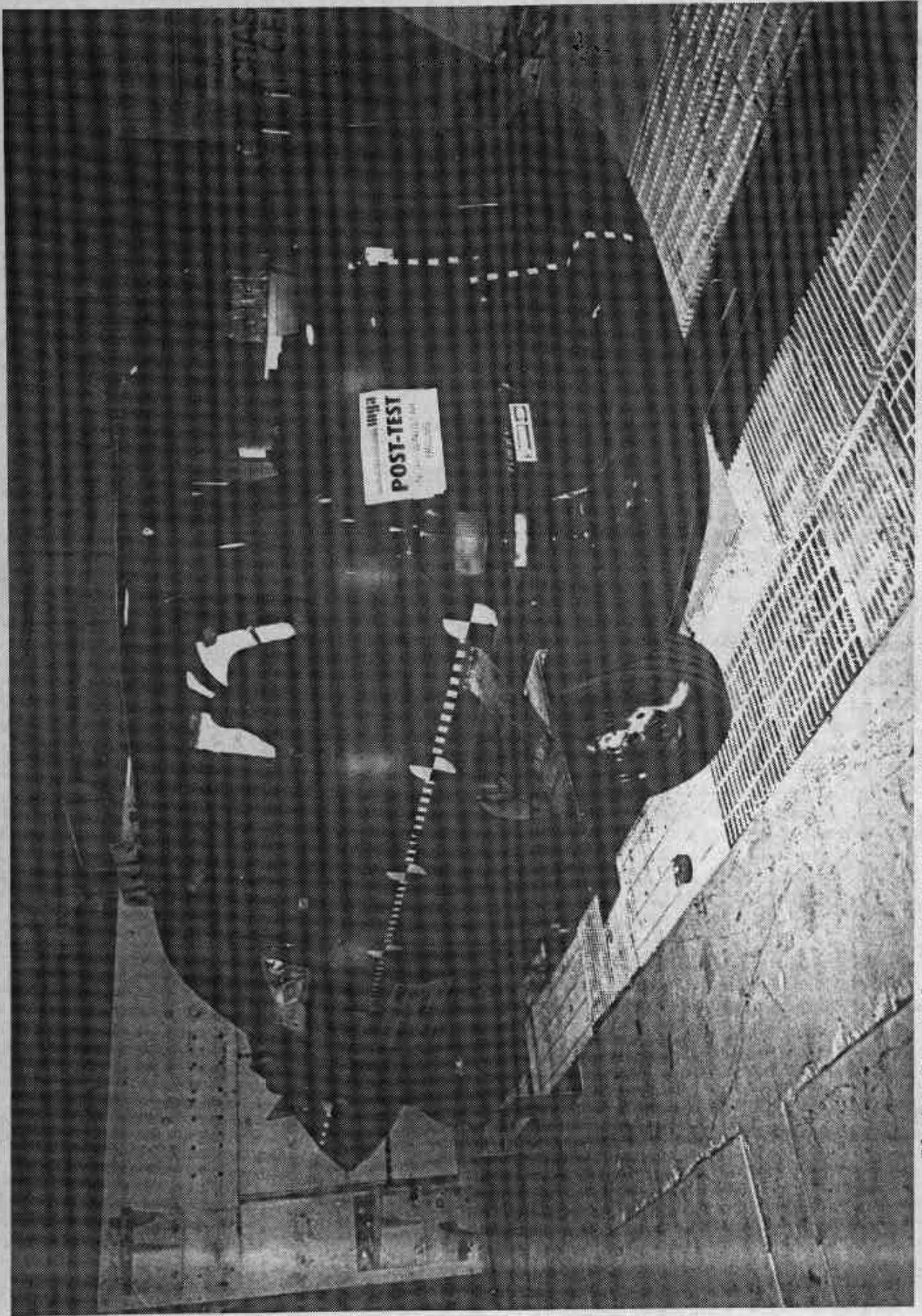
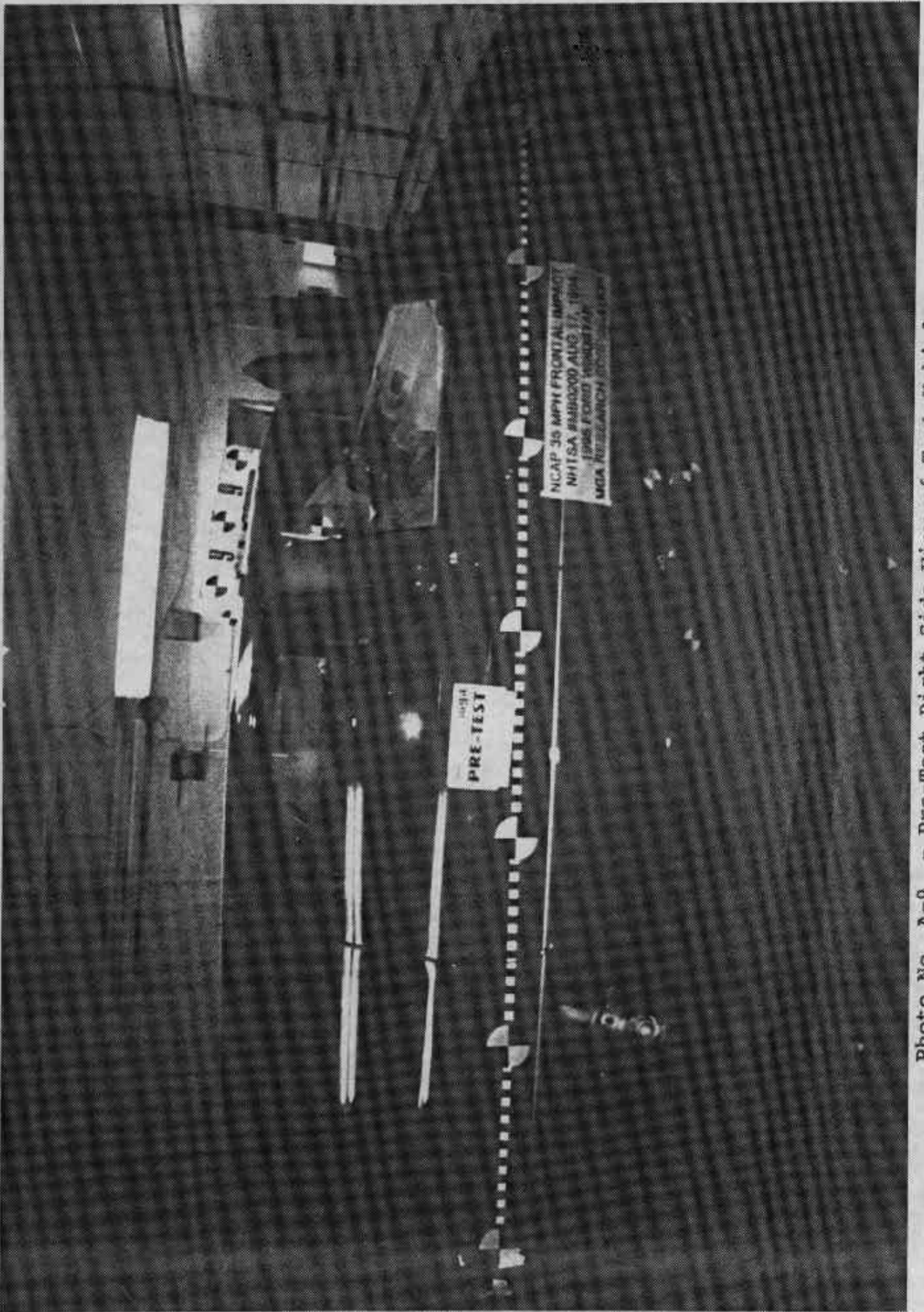
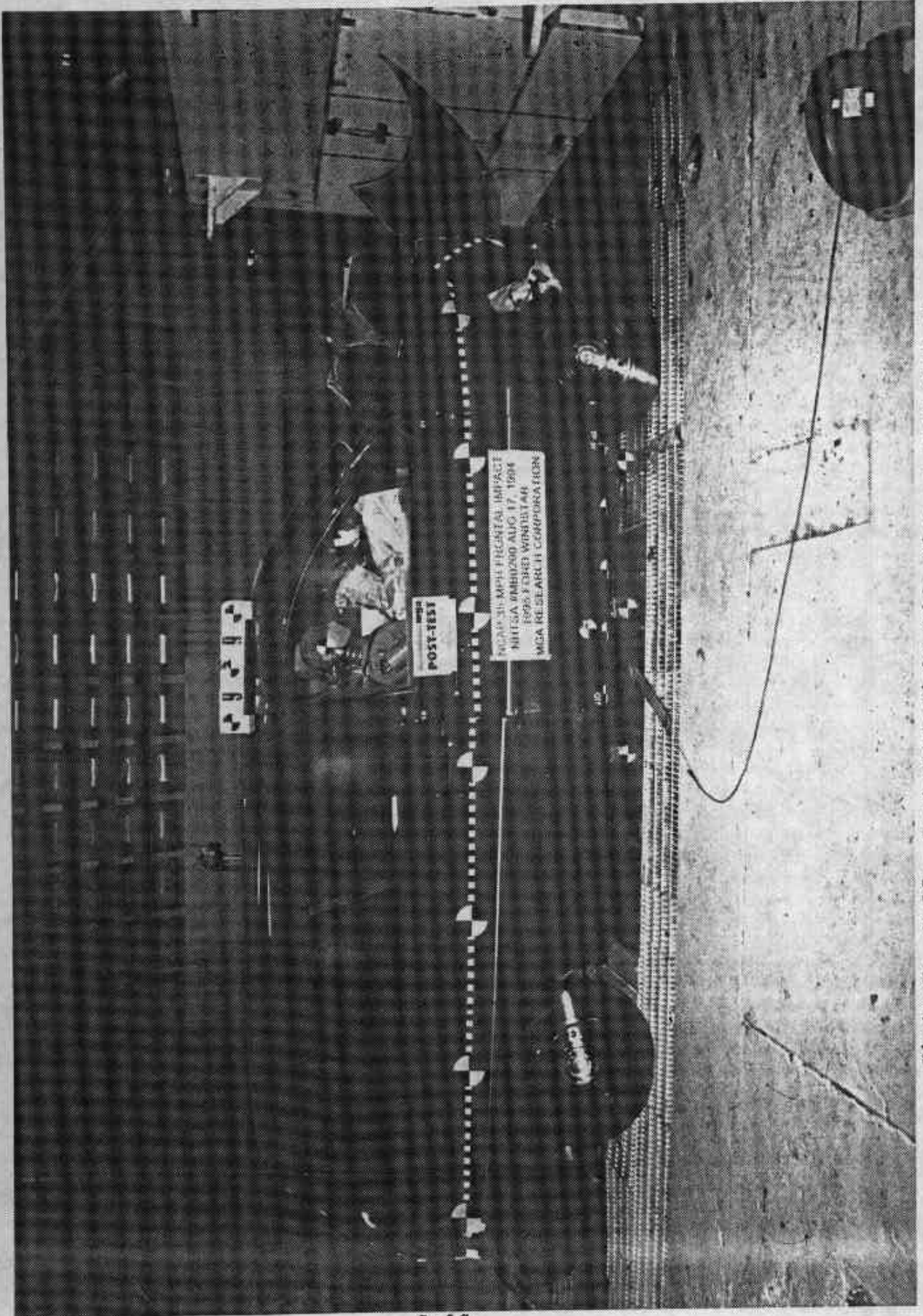


Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle



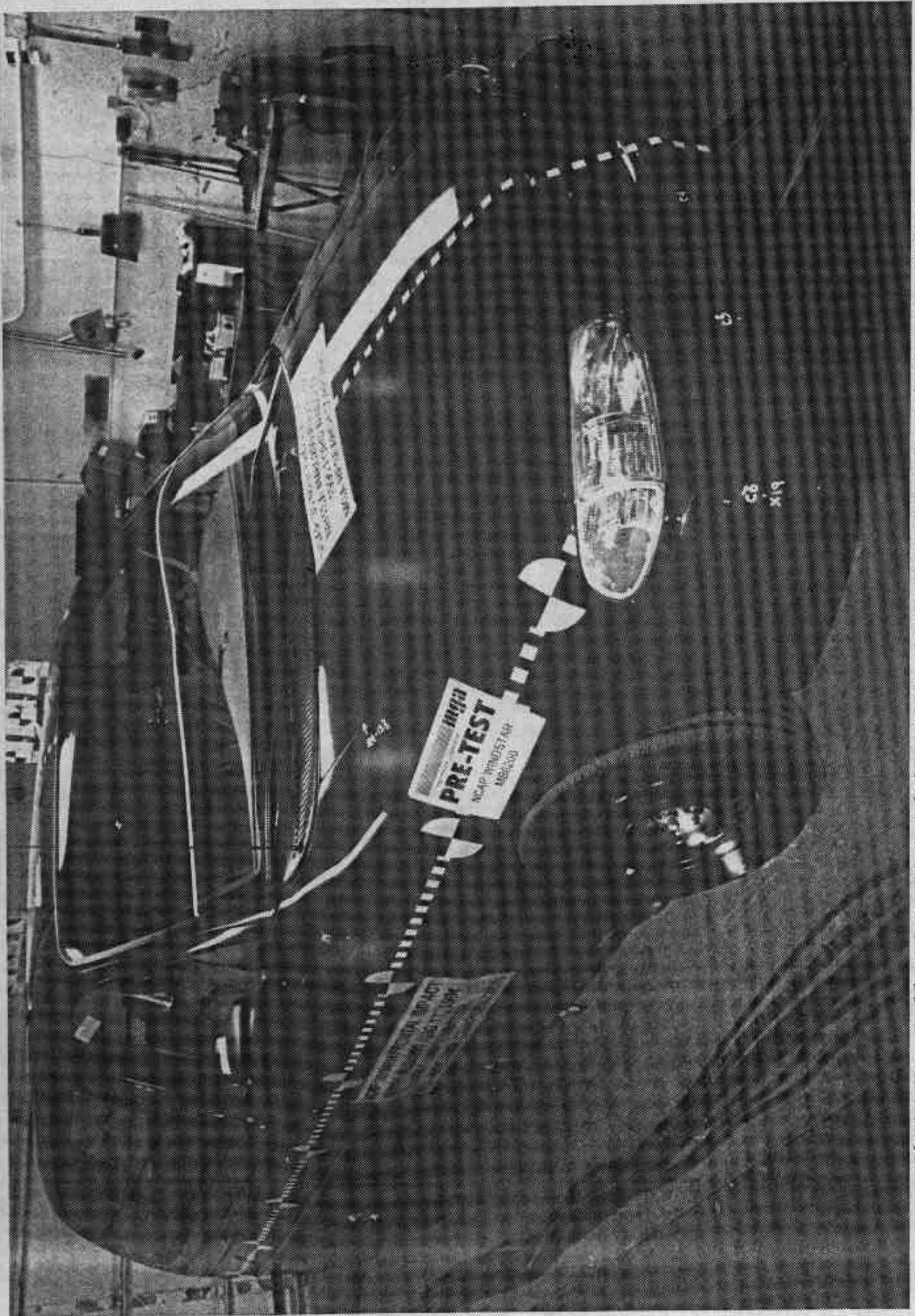
A-9

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



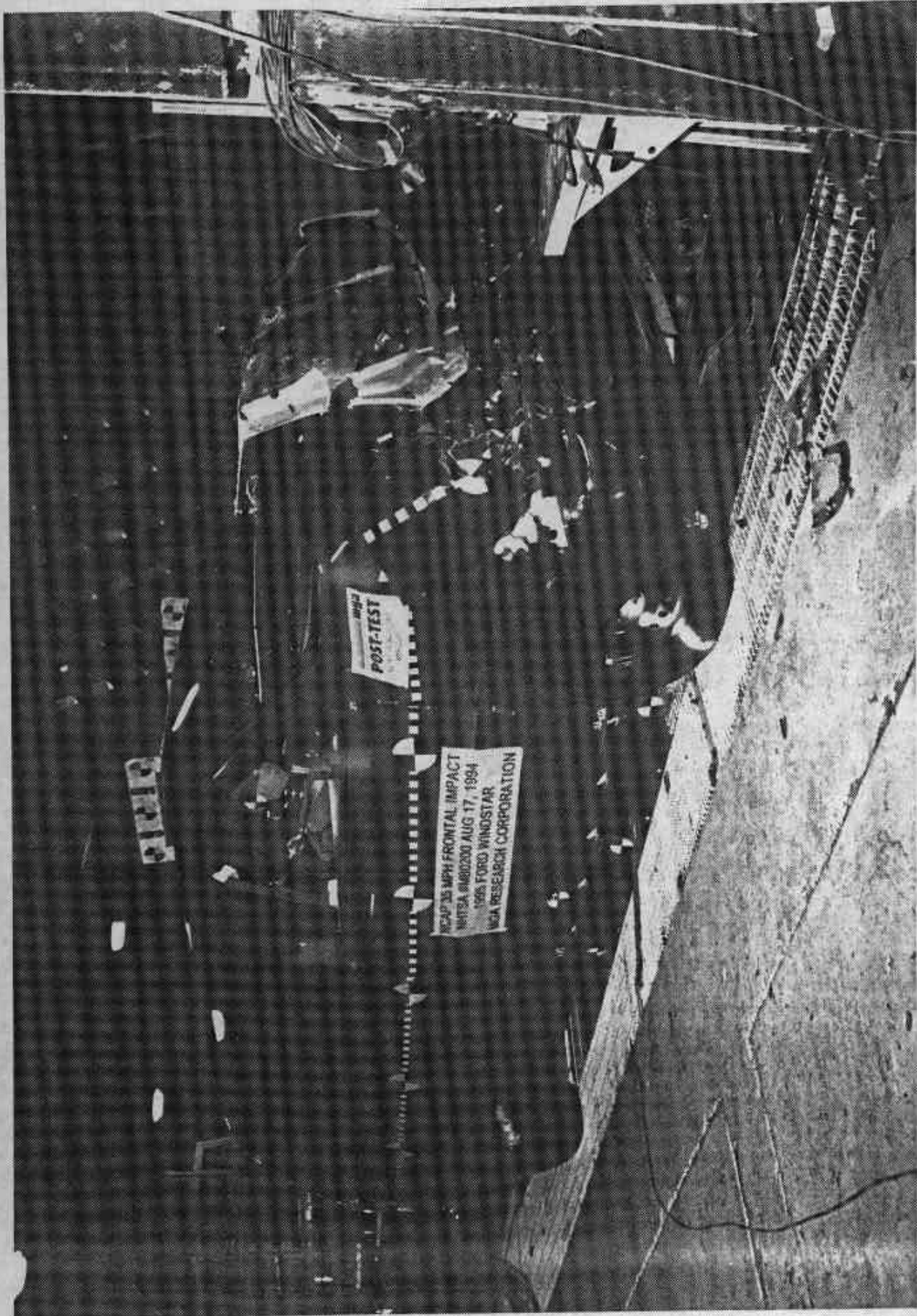
A-10

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



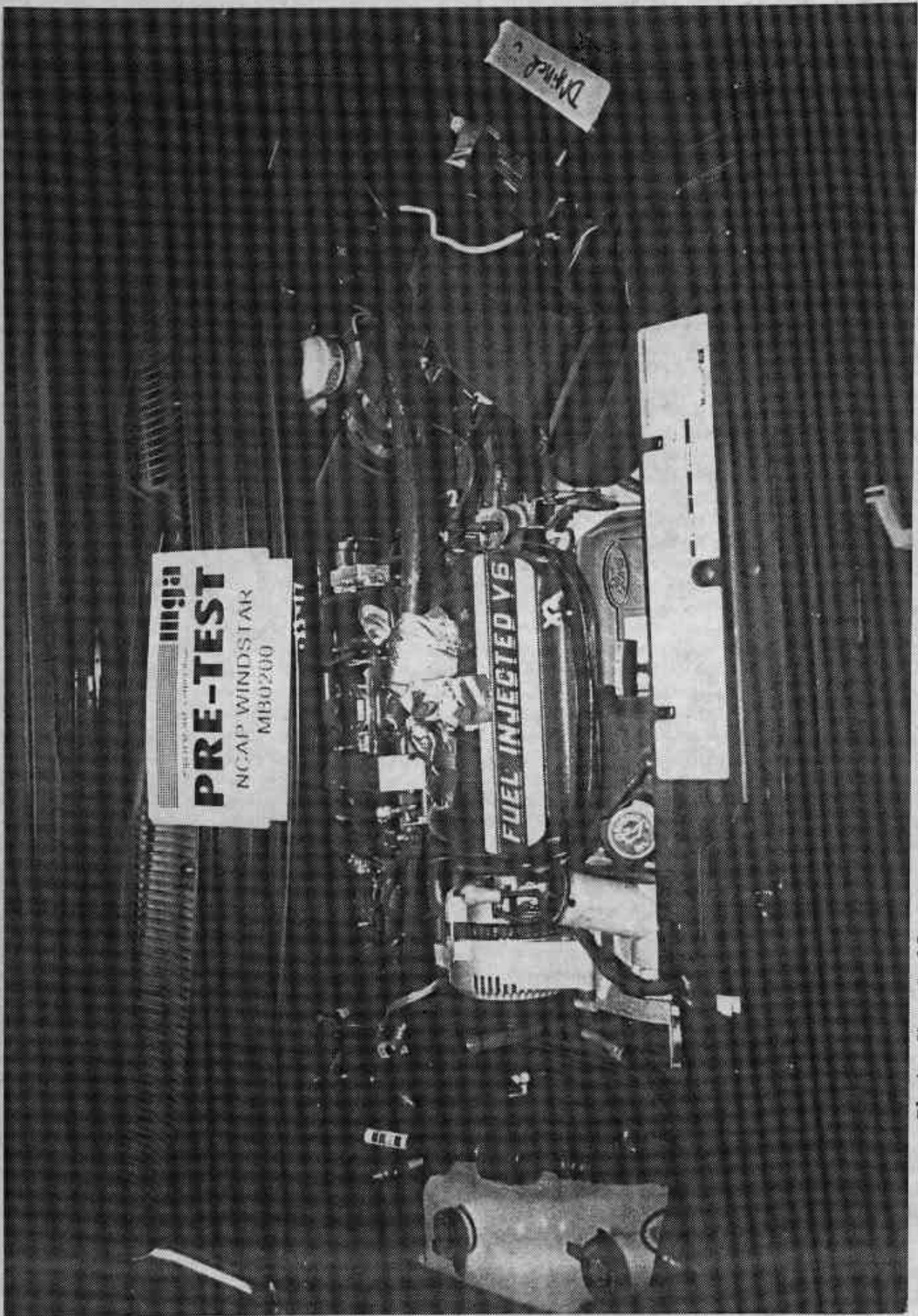
A-11

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



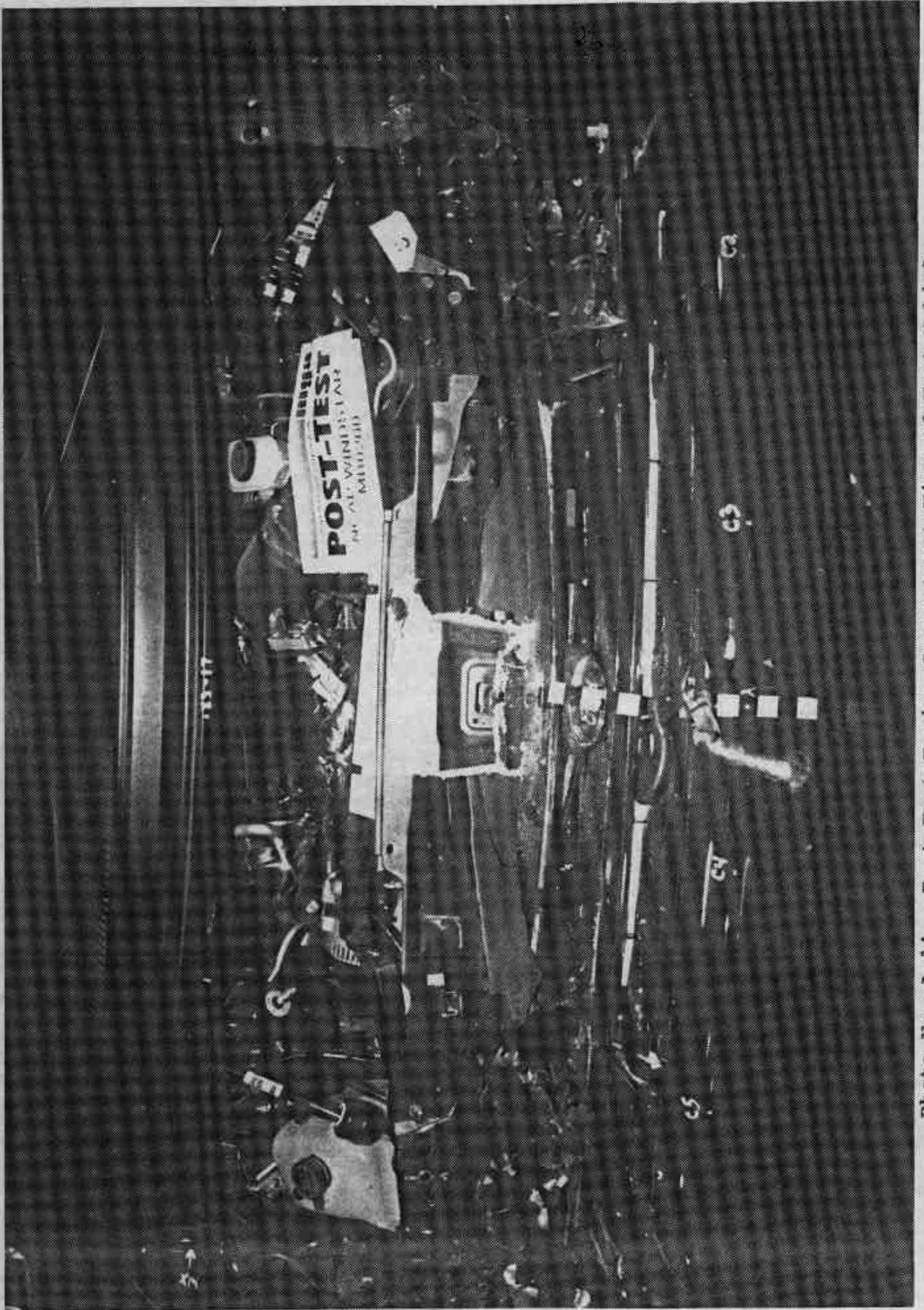
A-12

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



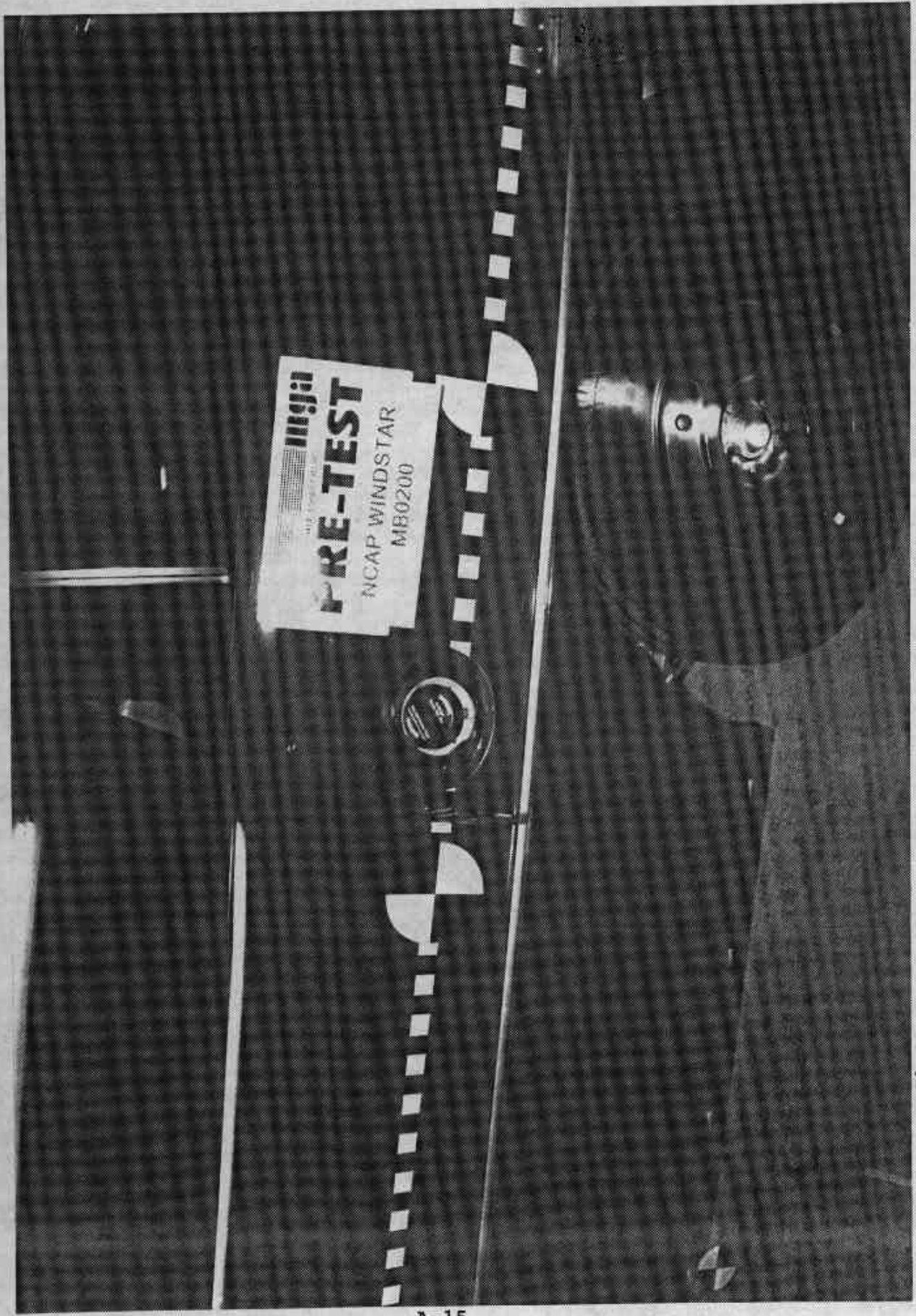
A-13

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



A-14

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



A-15

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

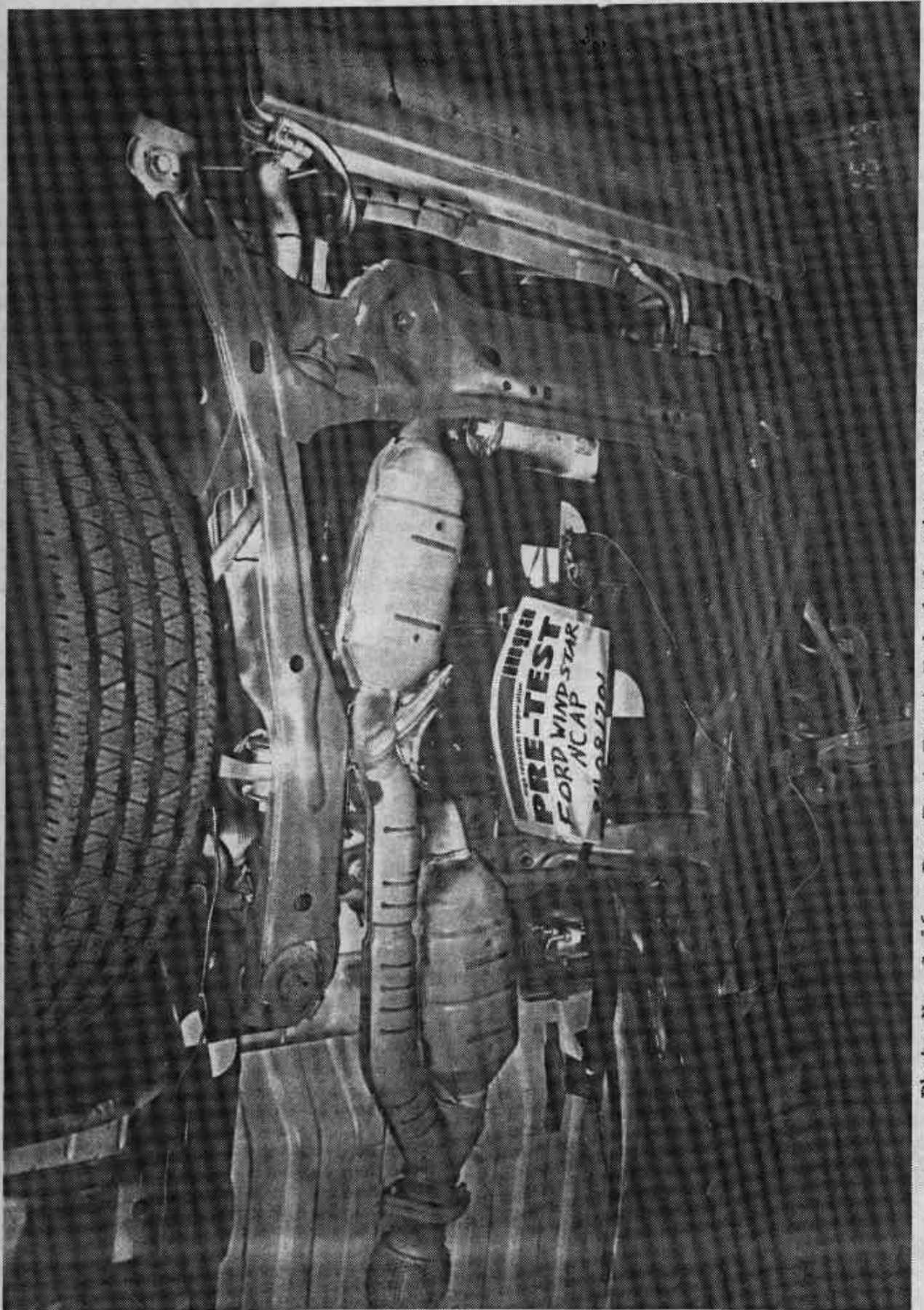
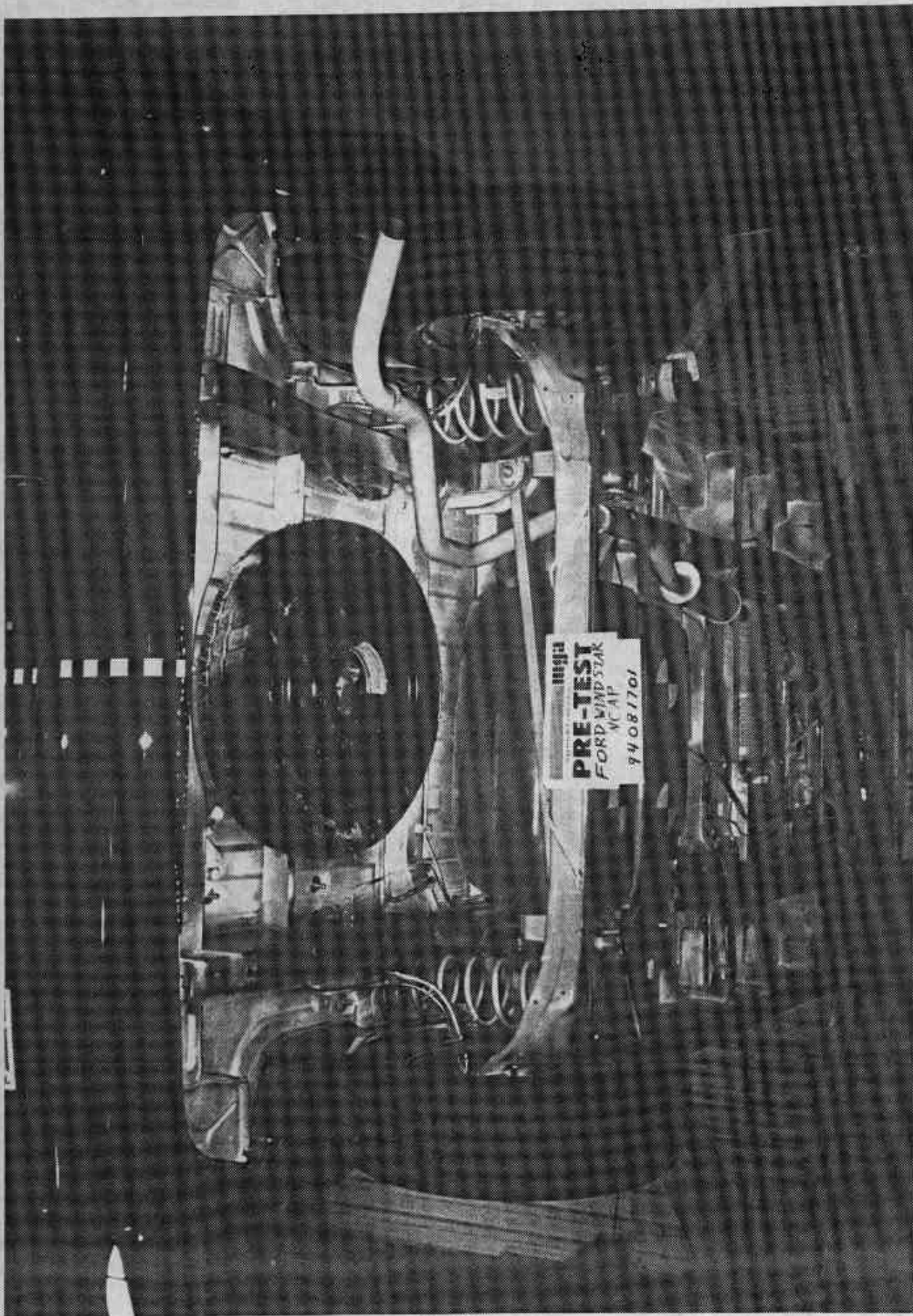


Photo No. A-16 - Pre-Test Front Underbody View of Test Vehicle



Photo No. A-17 - Post-Test Front Underbody View of Test Vehicle

A-17



A-18

Photo No. A-18 - Pre-Test Rear Underbody View of Test Vehicle

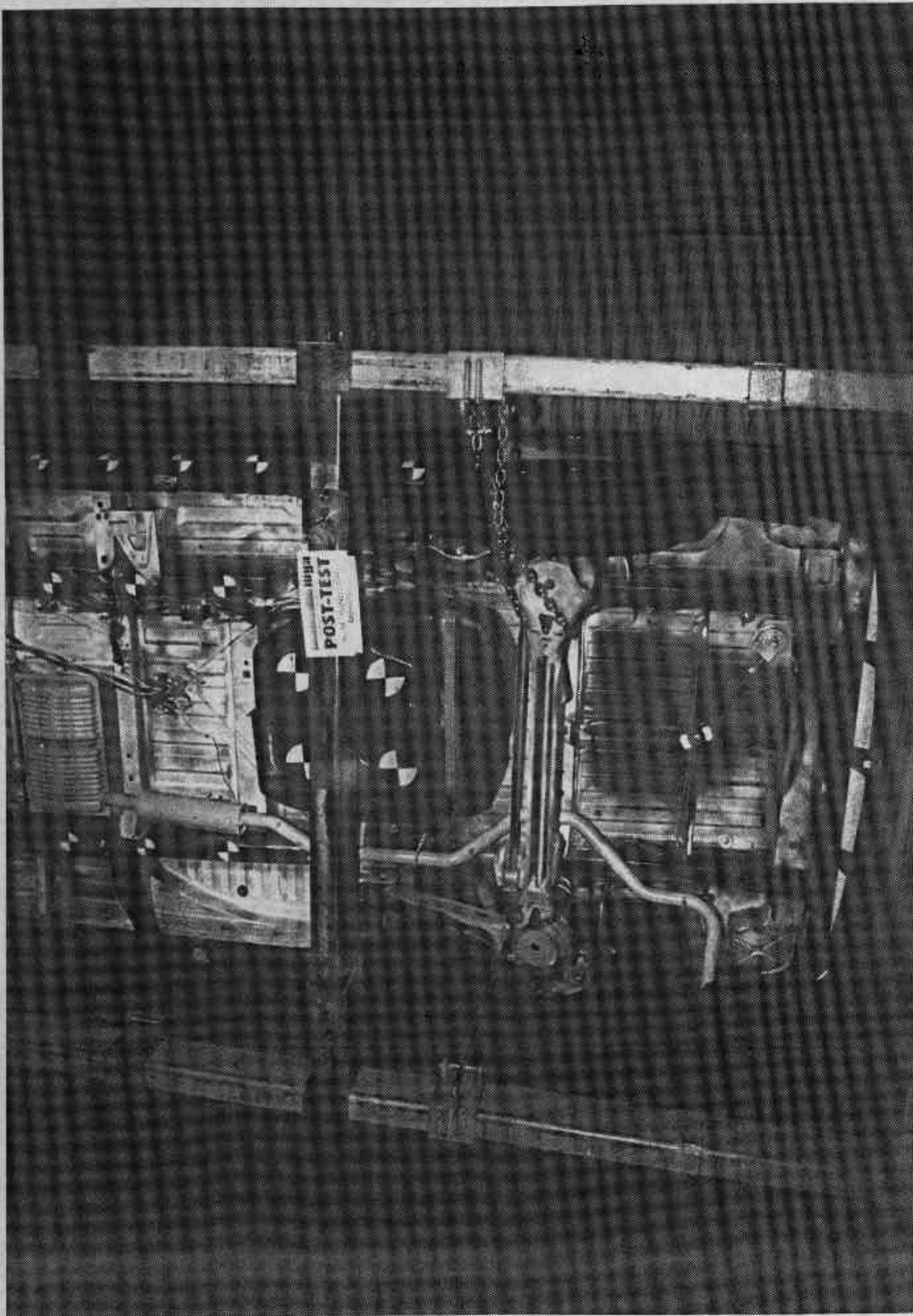
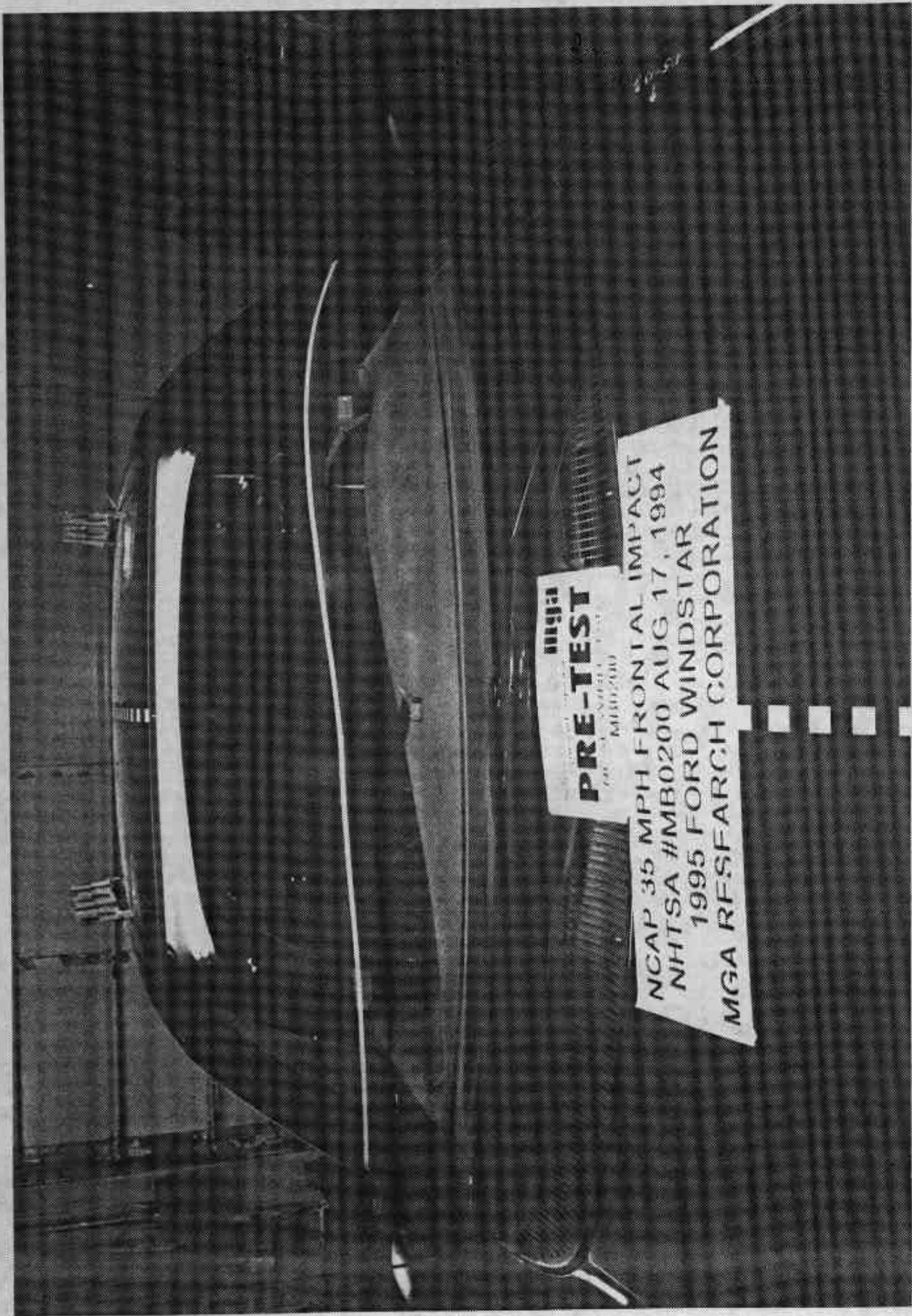
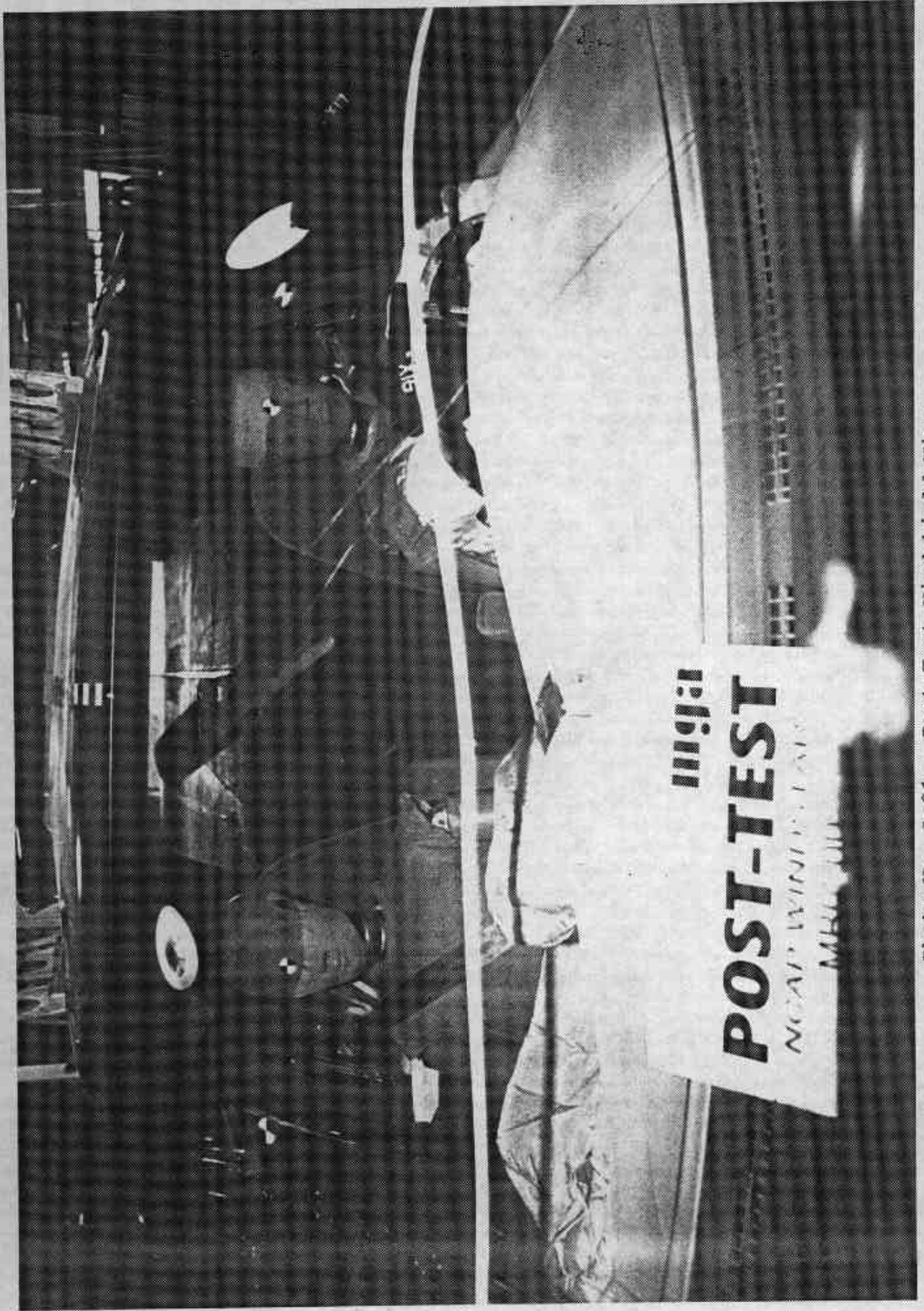


Photo No. A-19 - Post-Test Rear Underbody View of Test Vehicle



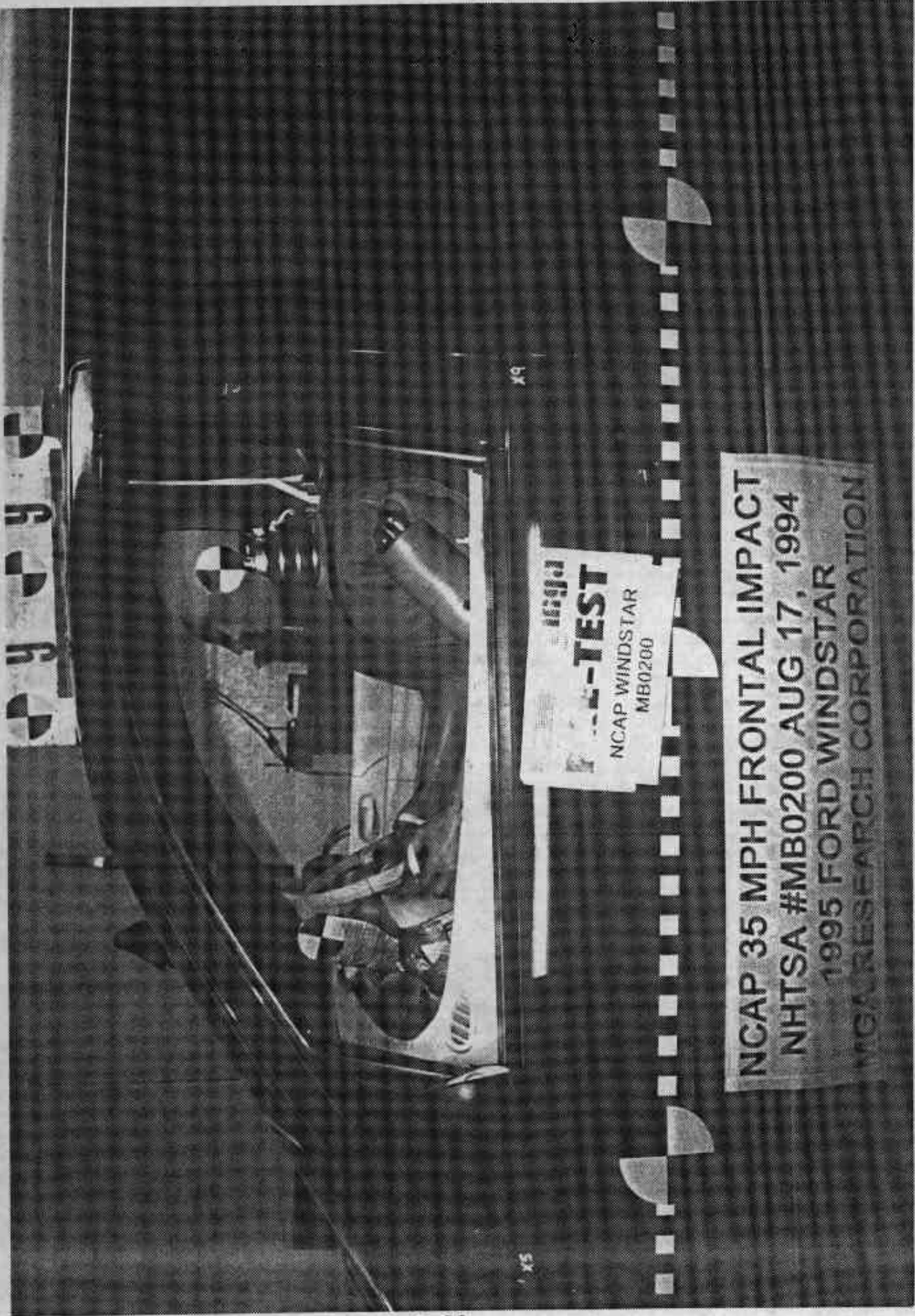
A-20

Photo No. A-20 - Pre-Test Windshield View



A-21

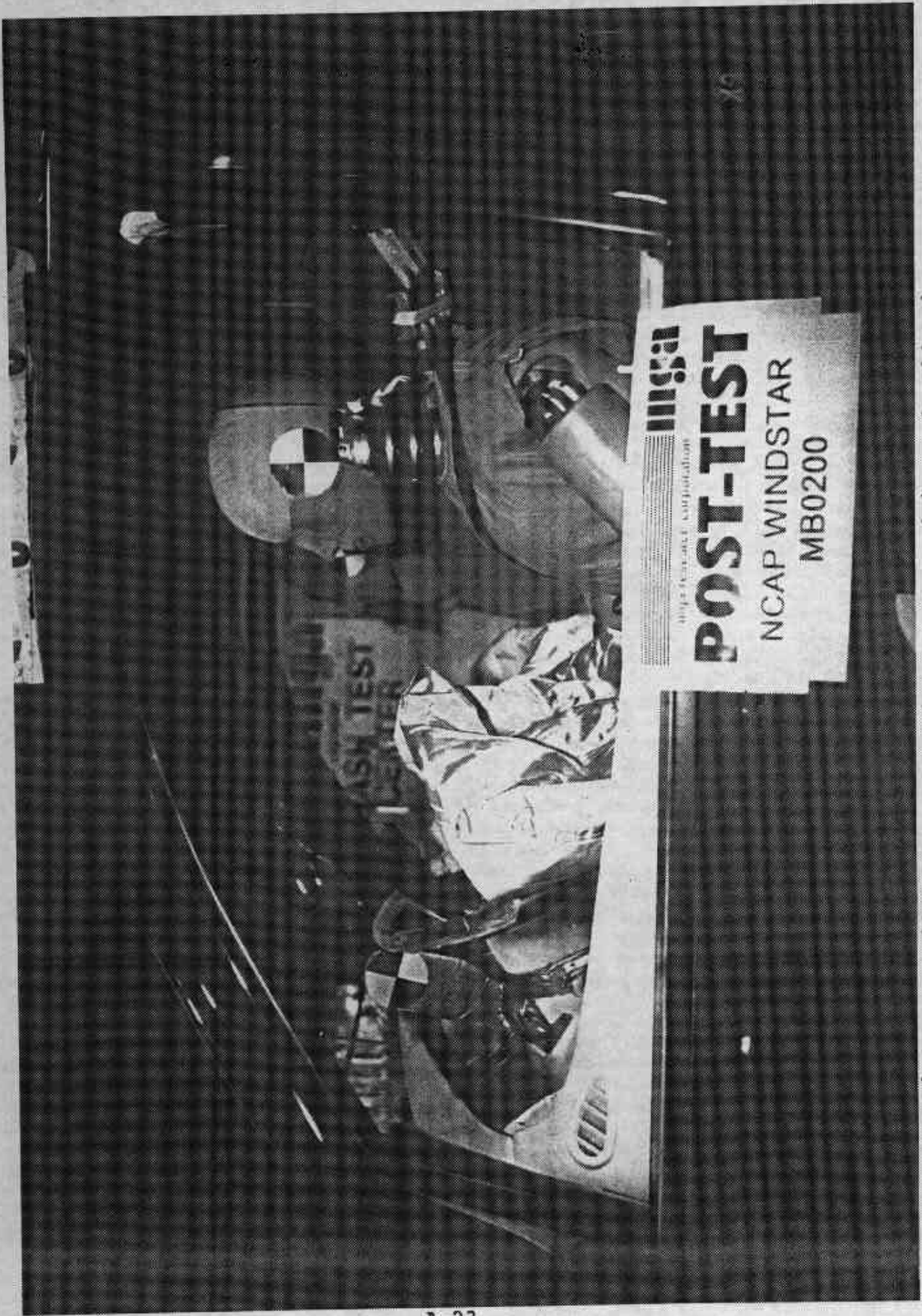
Photo No. A-21 - Post-Test Windshield View



A-22

NCAP 35 MPH FRONTAL IMPACT
NHTSA #MB0200 AUG 17, 1994
MGA RESEARCH CORPORATION

Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View



A-23

Photo No. A-23 - Post-Test Driver Dummy Position Left Side View

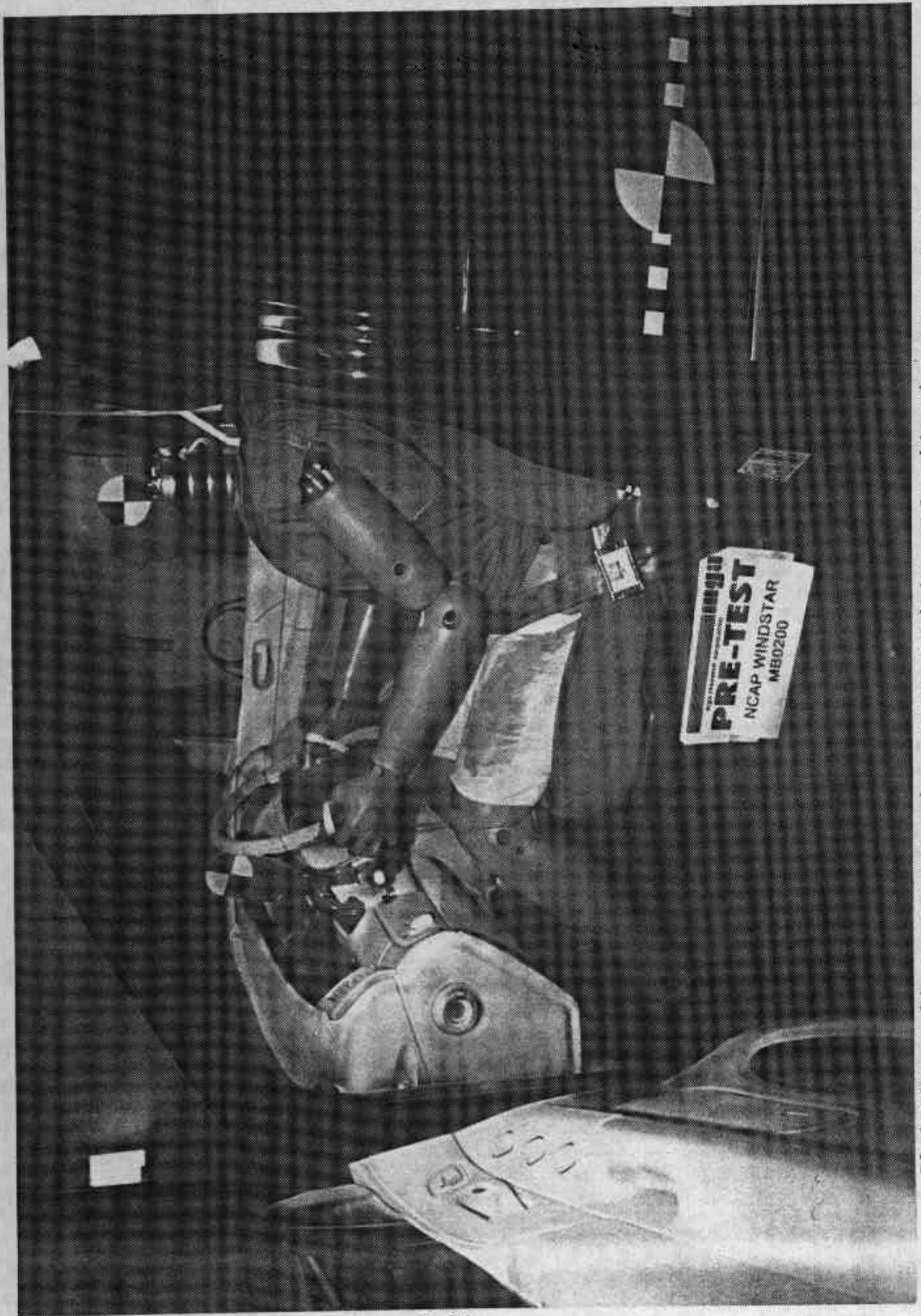


Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)

A-24



A-25

Photo No. A-25 - Post-Test Driver Dummy Position Left Side View (Door Open)



Photo No. A-26 - Pre-Test Driver Seat Position View

A-26



Photo No. A-27 - Post-Test Driver Seat Position View

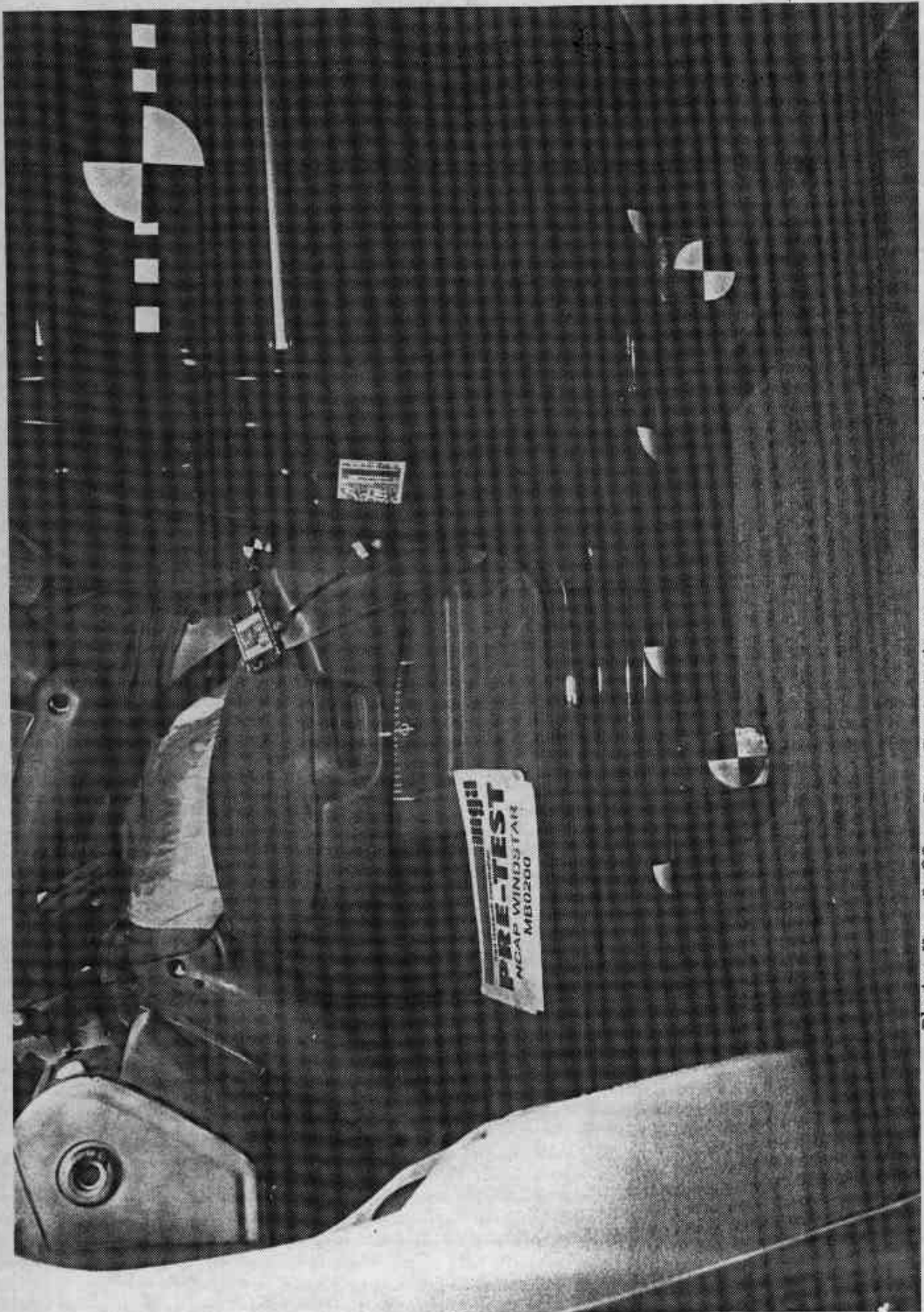
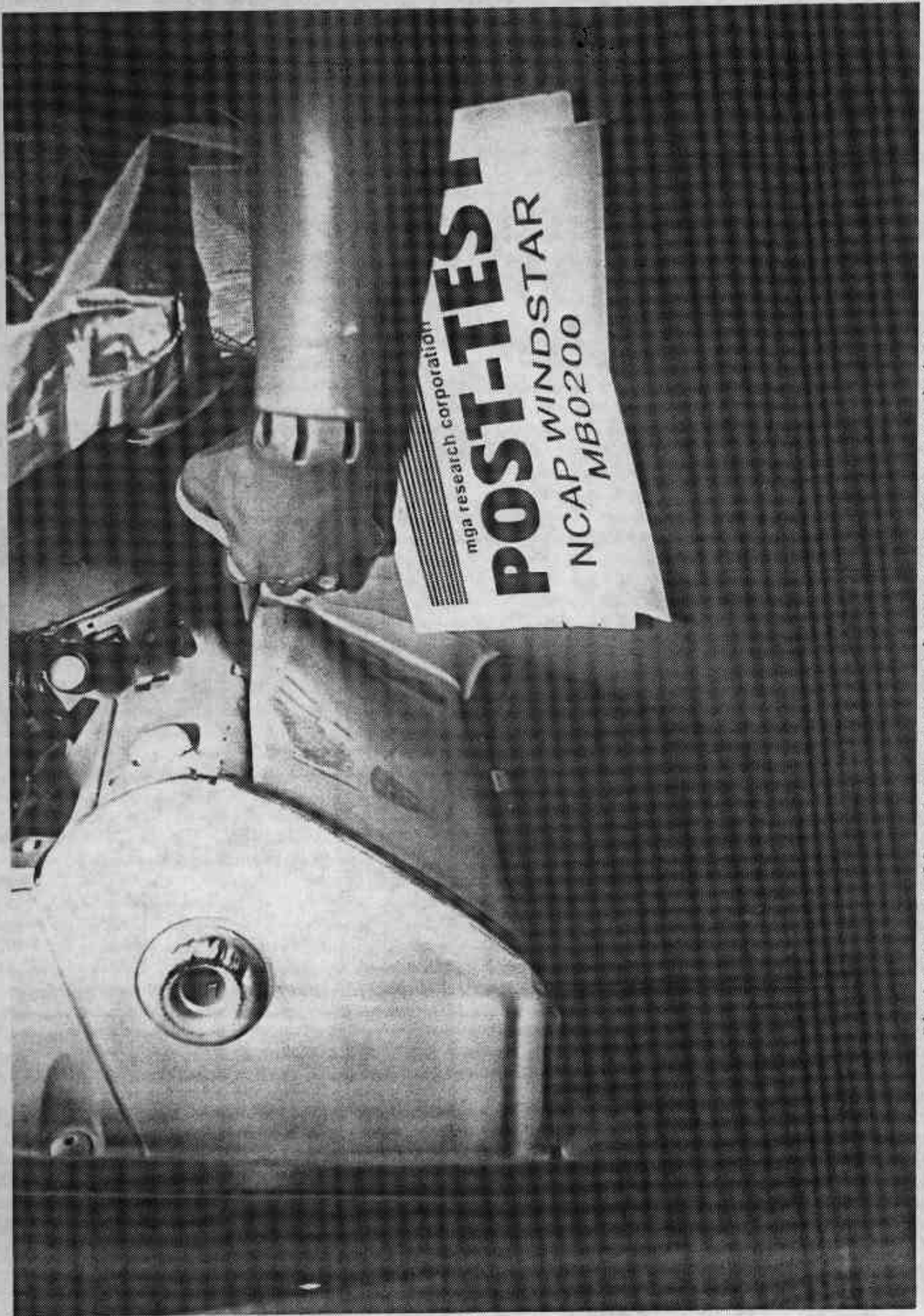


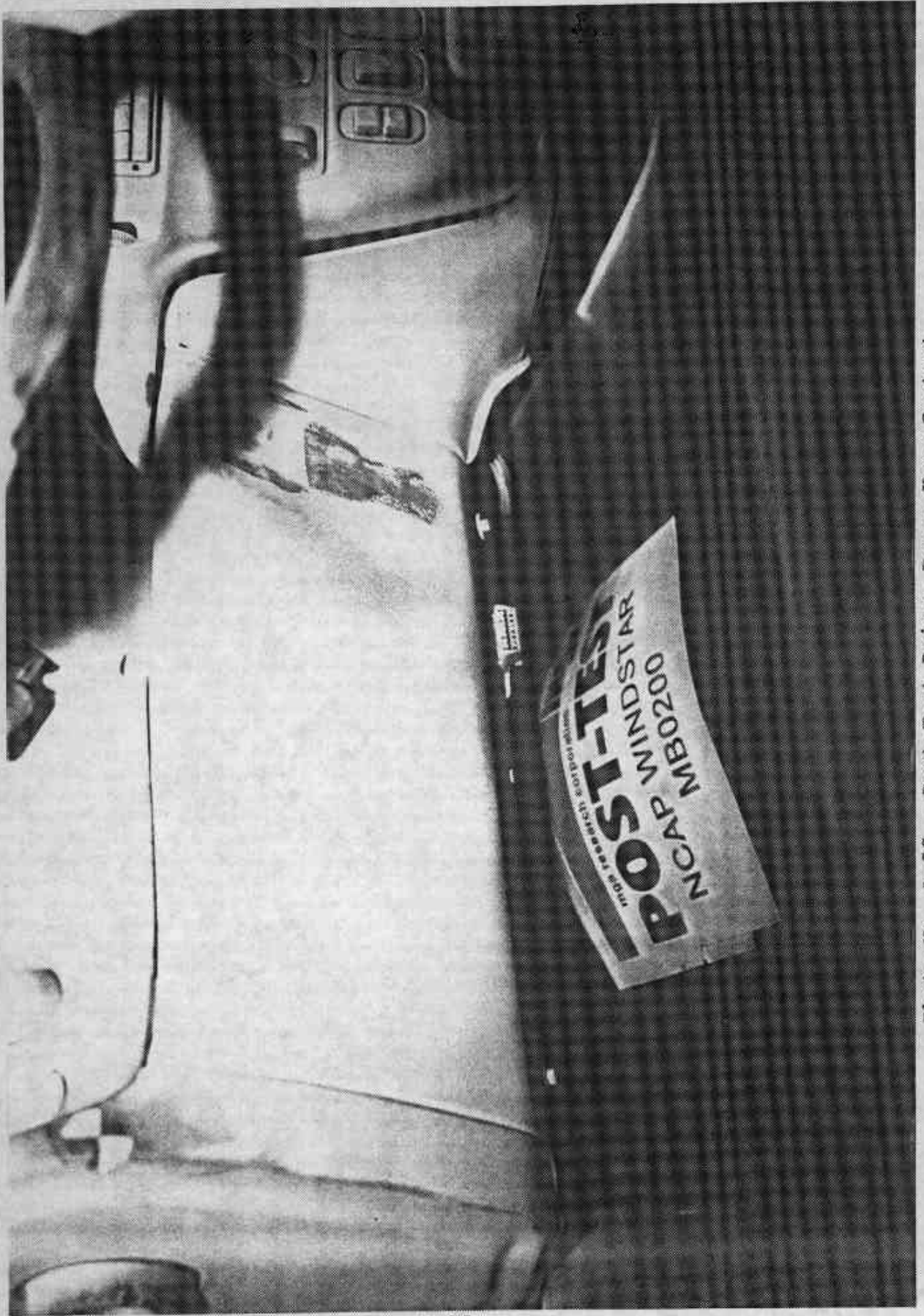
Photo No. A-28 - Pre-Test Driver Dummy Knee Position

A-28



A-29

Photo No. A-29 - Post-Test Driver Dummy Knee Position

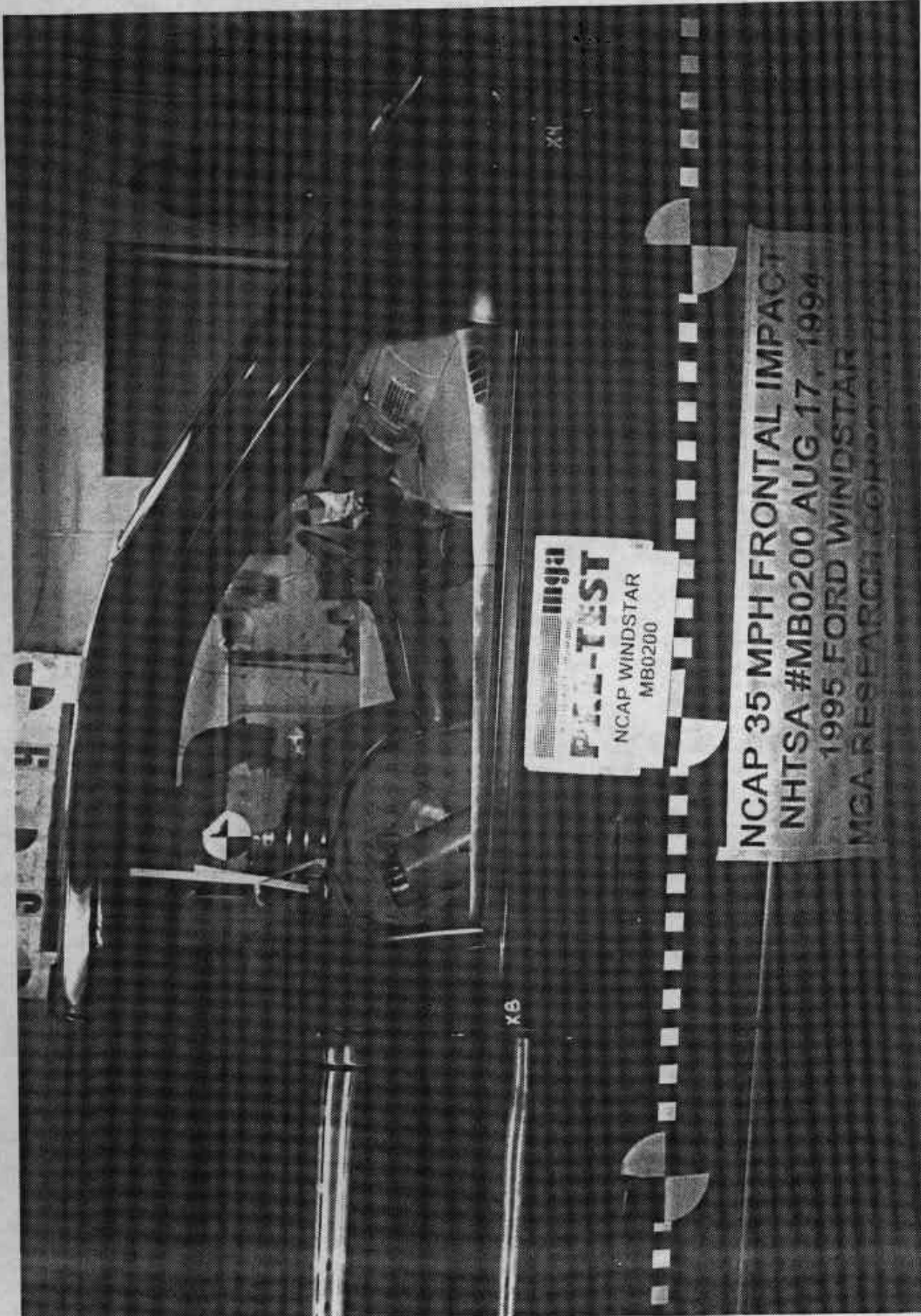


A-30

Photo No. A-30 - Post-Test Driver Dummy Knee Contact



Photo No. A-31 - Post-Test Driver Airbag Contact



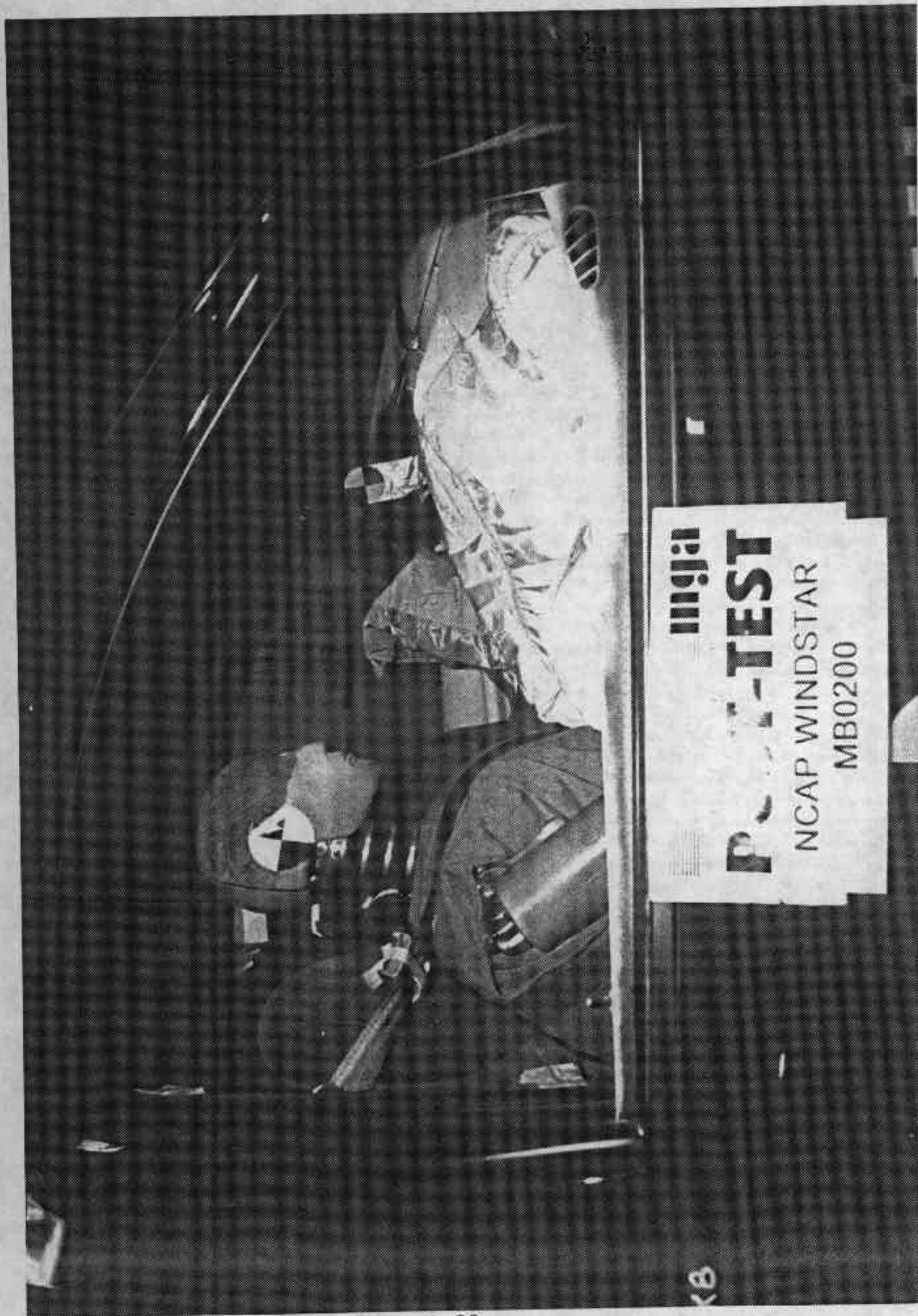
XN

XB

NCAP 35 MPH FRONTAL IMPACT
NHTSA #MB0200 AUG 17, 1994
1995 FORD WINDSTAR
MGA RESEARCH CORPORATION

A-32

Photo No. A-32 - Pre-Test Passenger Dummy Position Right Side View



A-33

Post-TEST
NCAP WINDSTAR
MB0200

Photo No. A-33 - Post-Test Passenger Dummy Position Right Side View



Photo No. A-34 - Pre-Test Passenger Dummy Position Right Side View (Door Open)

A-34



A-35

Photo No. A-35 - Post-Test Passenger Dummy Position Right Side View (Door Open)



A-36

Photo No. A-36 - Pre-Test Passenger Seat Position View



A-37

Photo No. A-37 - Post-Test Passenger Seat Position View



A-38

Photo No. A-38 - Pre-Test Passenger Dummy Knee Position



Photo No. A-39 - Post-Test Passenger Dummy Knee Position



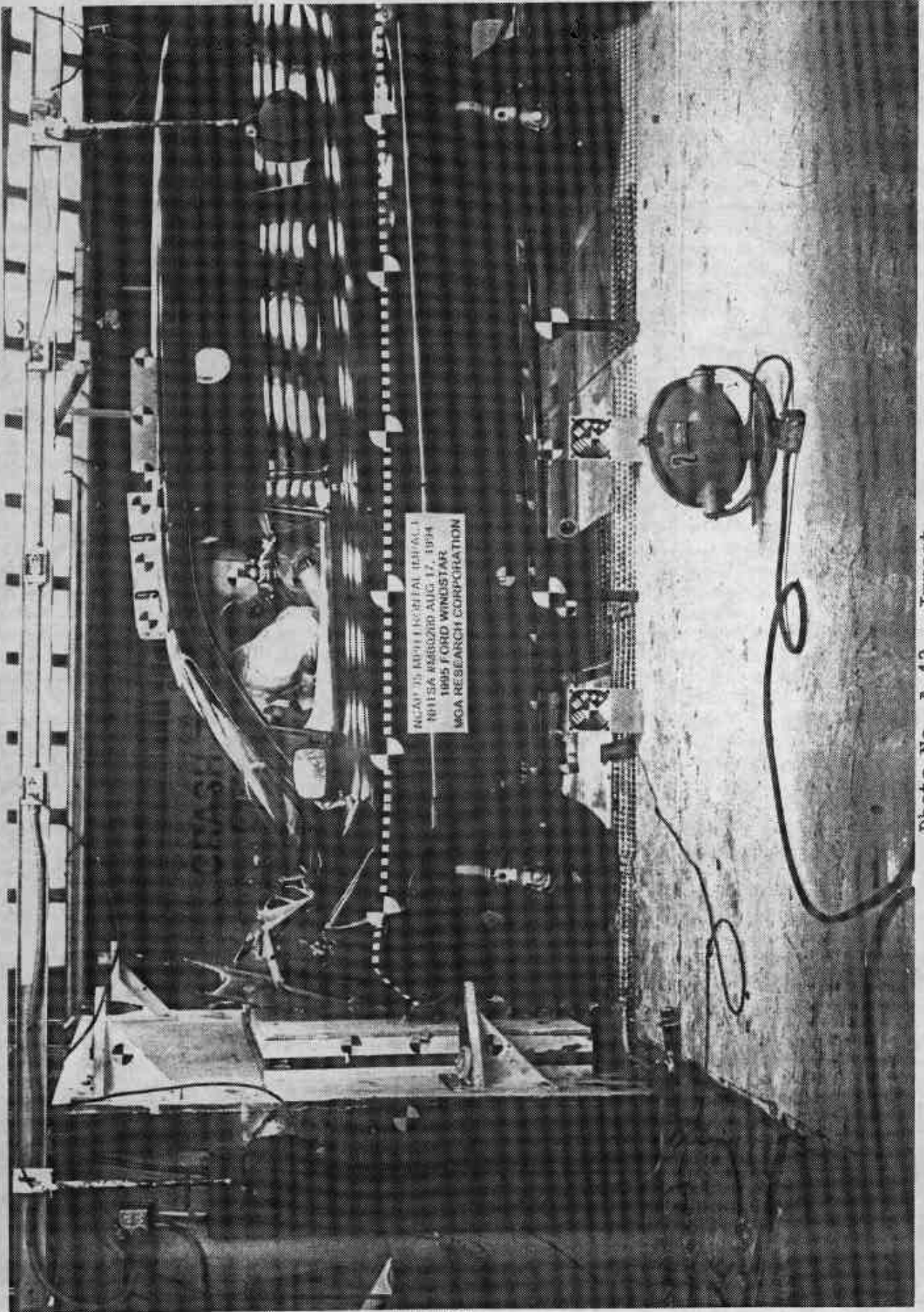
A-40

Photo No. A-40 - Post-Test Passenger Dummy Knee Contact



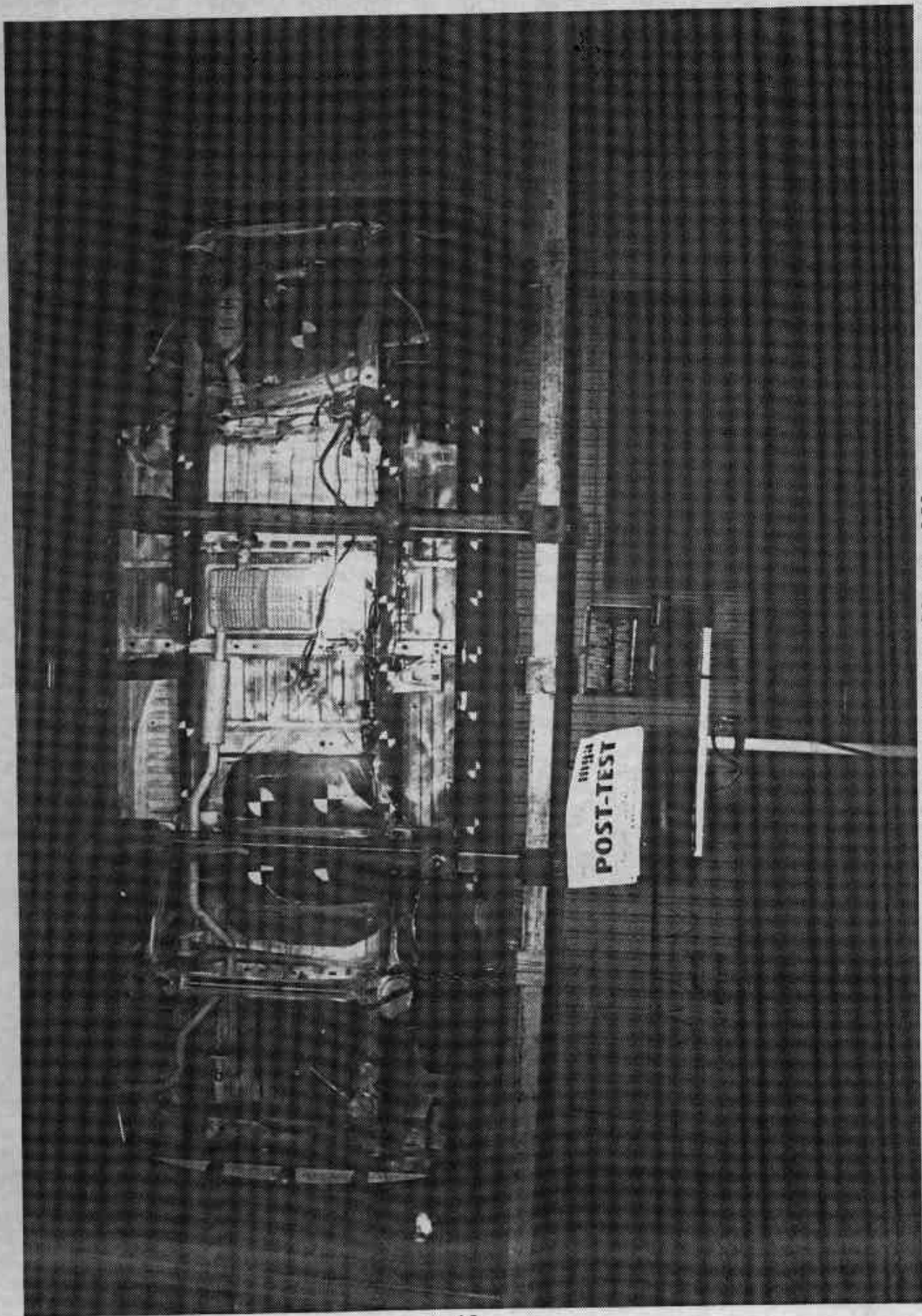
Photo No. A-41 - Post-Test Passenger Airbag Contact

A-41



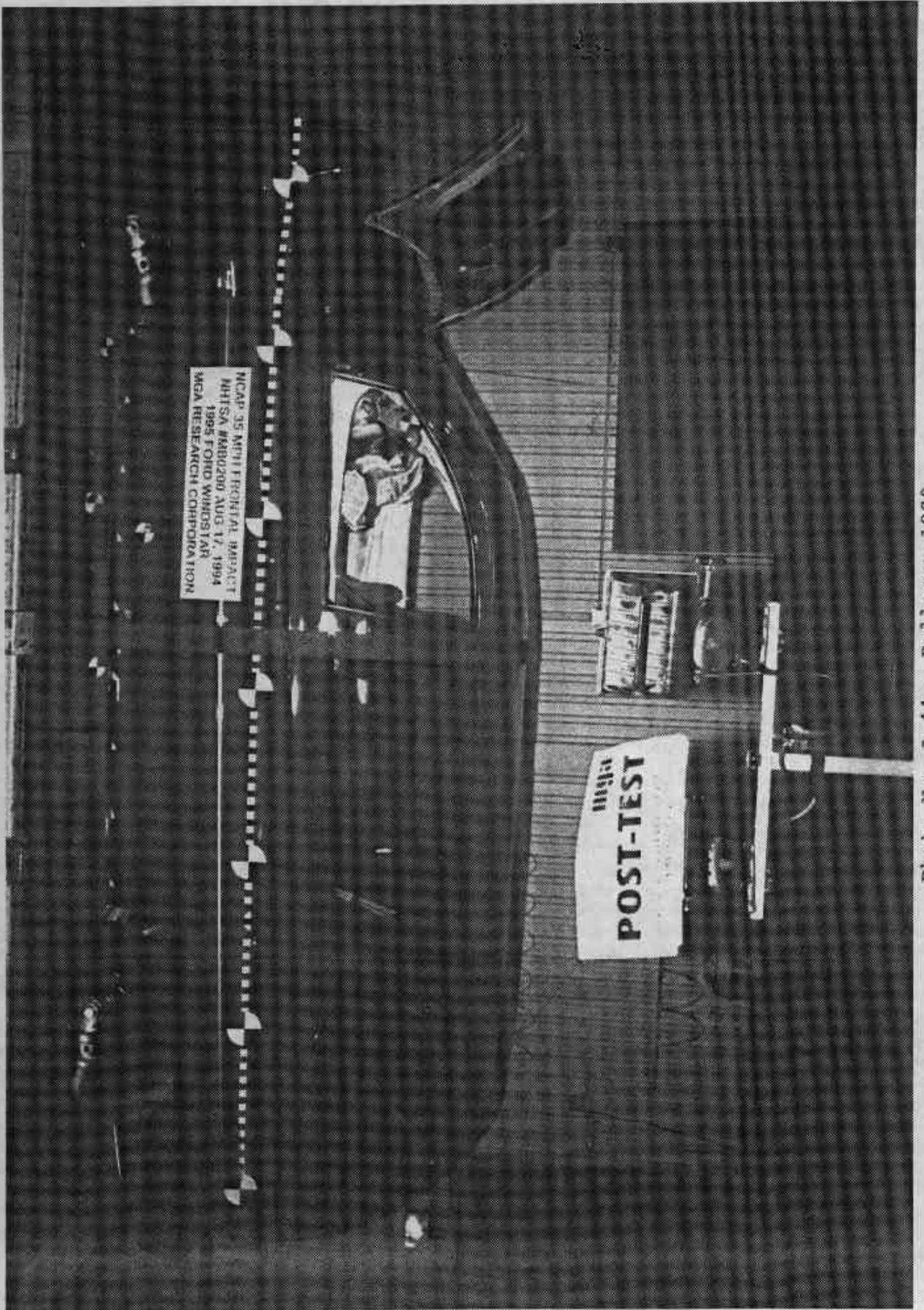
A-42

Photo No. A-42 - Impact



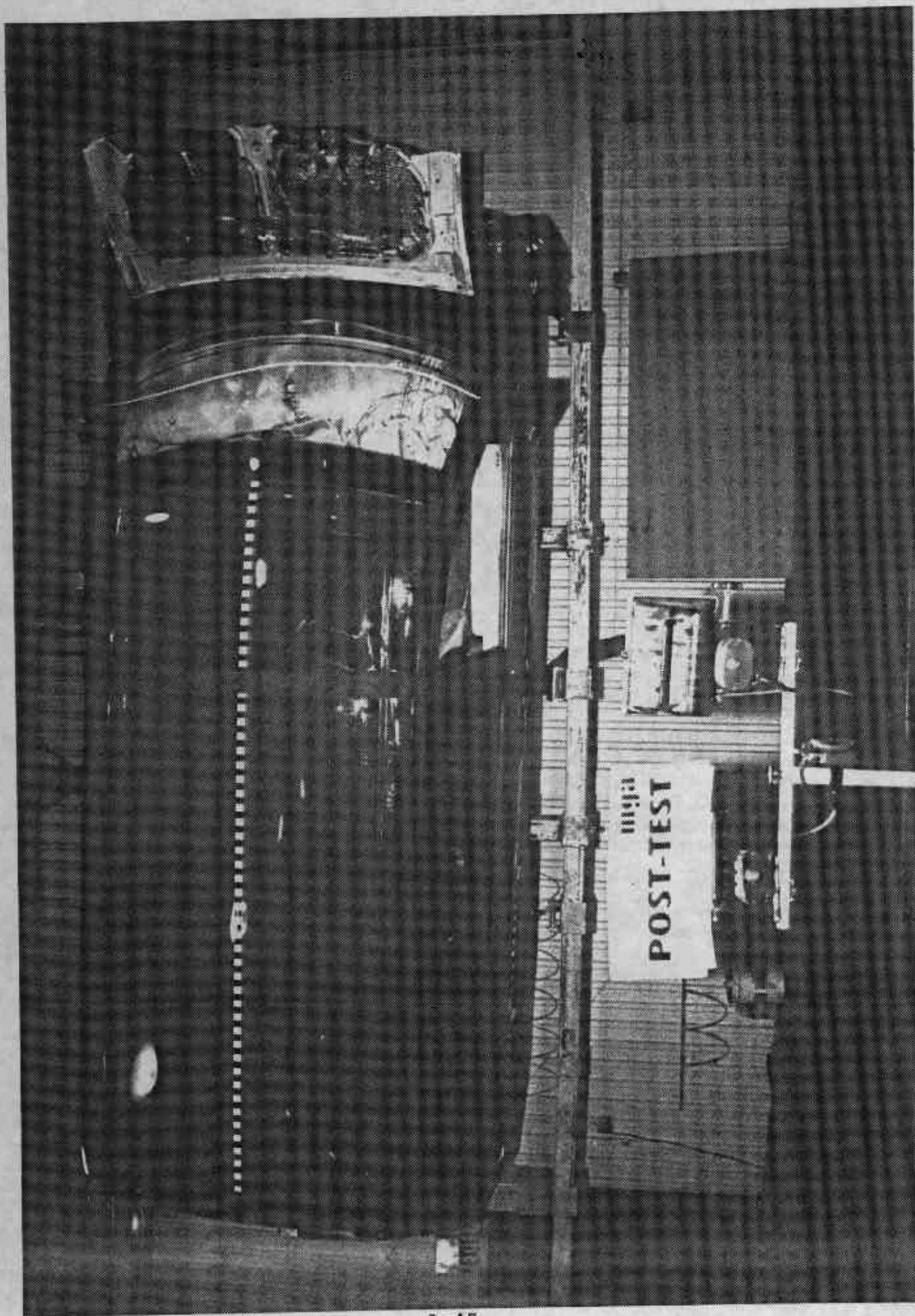
A-43

Photo No. A-43 - Rollover 90°



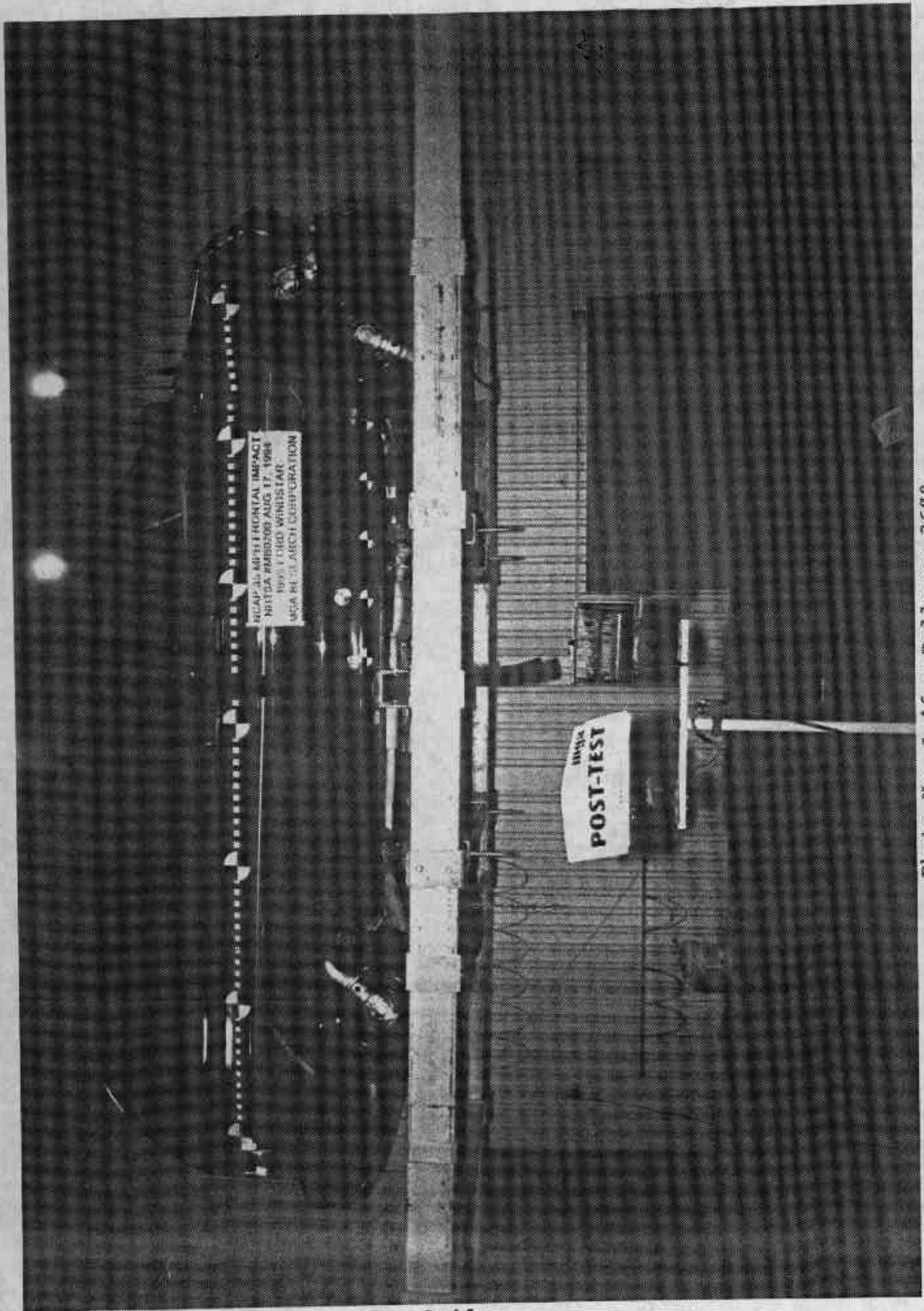
A-44

Photo No. A-44 - Rollover 180°



A-45

Photo No. A-45 - Rollover 270°



A-46

Photo No. A-46 - Rollover 360°

APPENDIX B

Vehicle, Load Cell Barrier and Dummy Response Data

1995 NISSAN MAXIMA 4-DOOR

NHTSA NO.: MS0200

<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)

<u>Data Plot</u>	<u>Page No.</u>
Figure B-1 - Right Rear Seat Crossmember X Accel. vs. Time	B-1
Figure B-2 - Right Rear Seat Crossmember X Velocity vs. Time	B-2
Figure B-3 - Right Rear Seat Crossmember X Displacement vs. Time	B-3
Figure B-4 - Left Rear Seat Crossmember X Acceleration vs. Time	B-4
Figure B-5 - Left Rear Seat Crossmember X Velocity vs. Time	B-5
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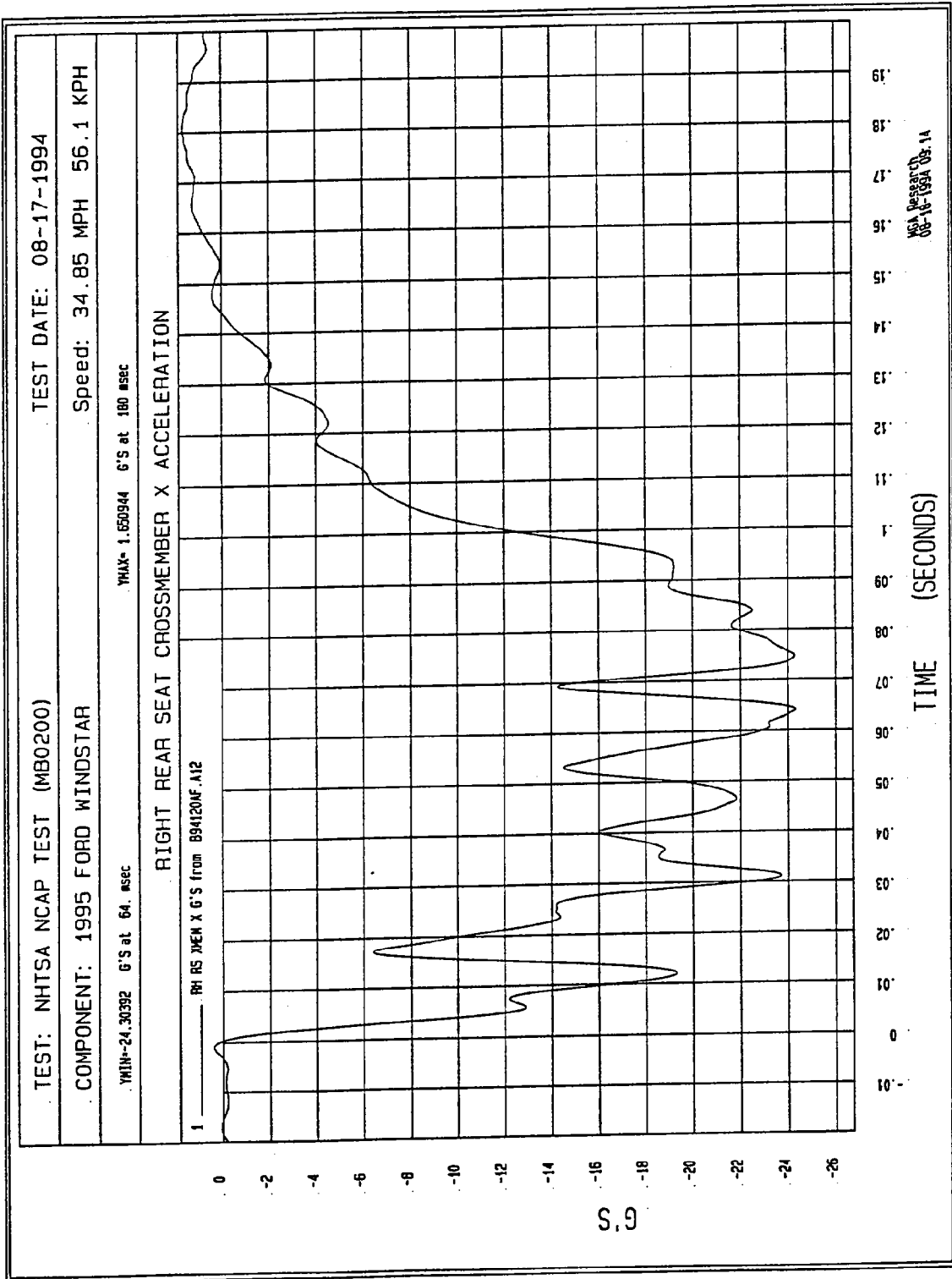


Figure B-1 - Right Rear Seat Crossmember X Accel. vs. Time

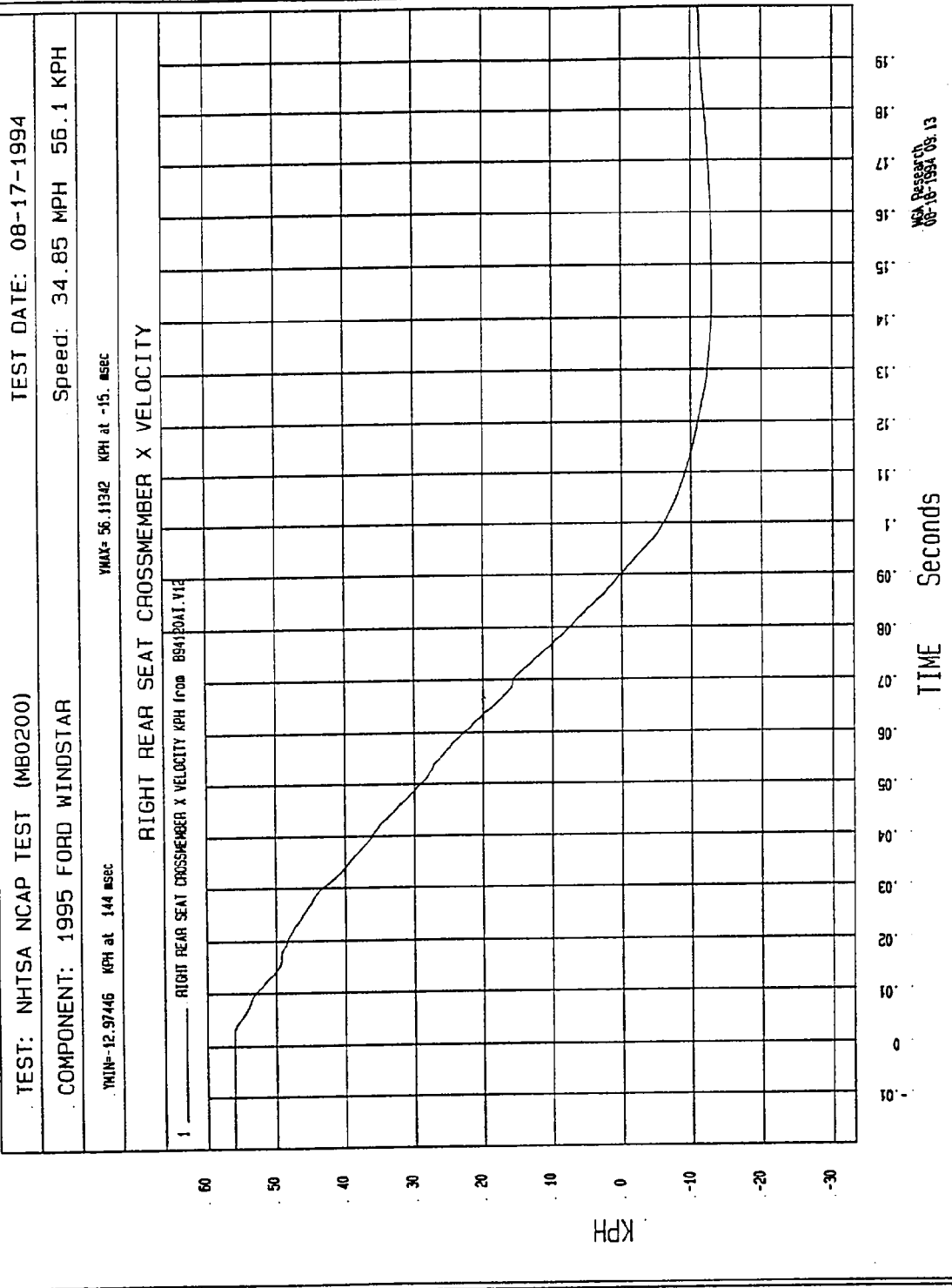
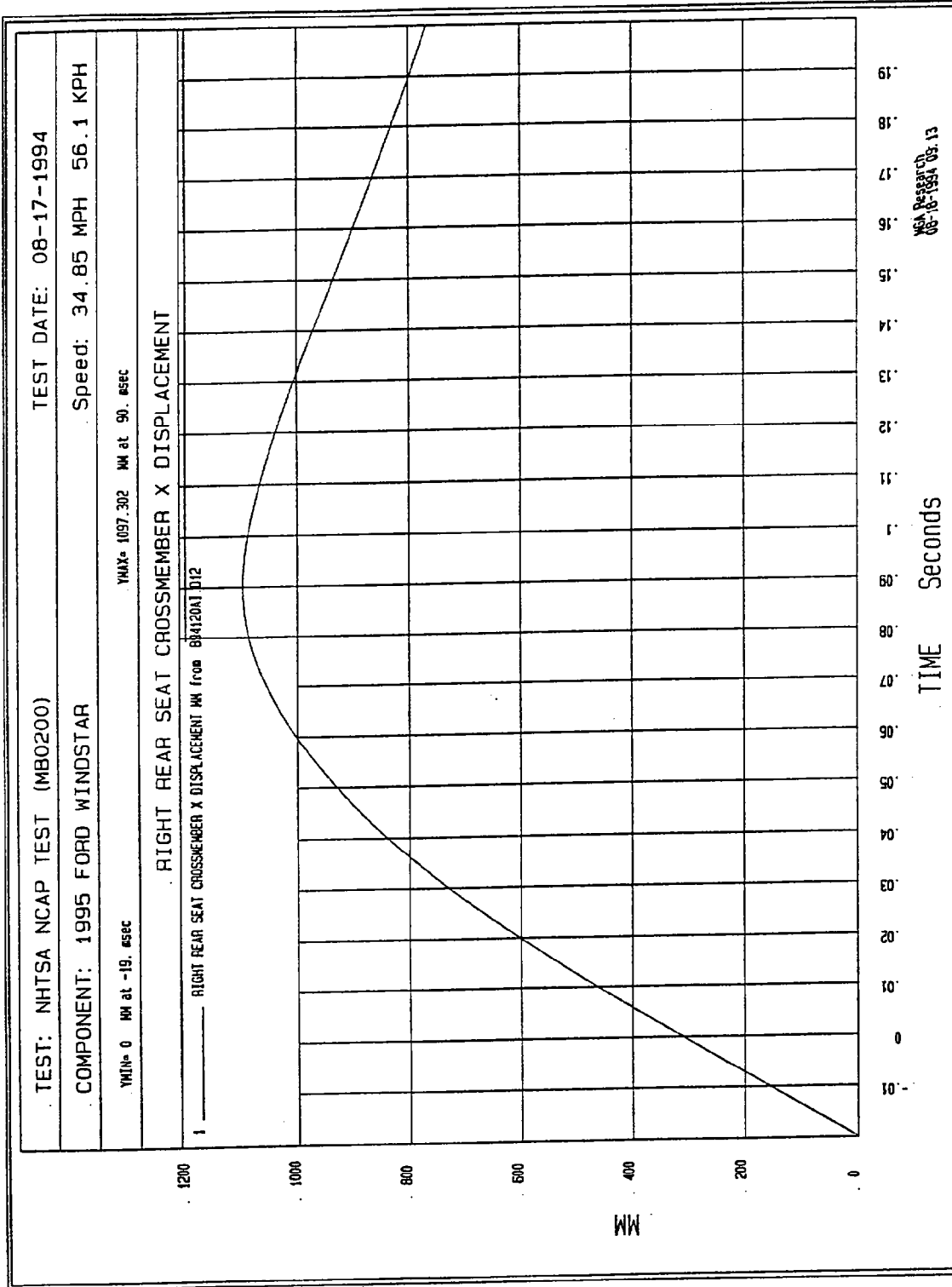


Figure B-2 - Right Rear Seat Crossmember X Velocity vs. Time



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

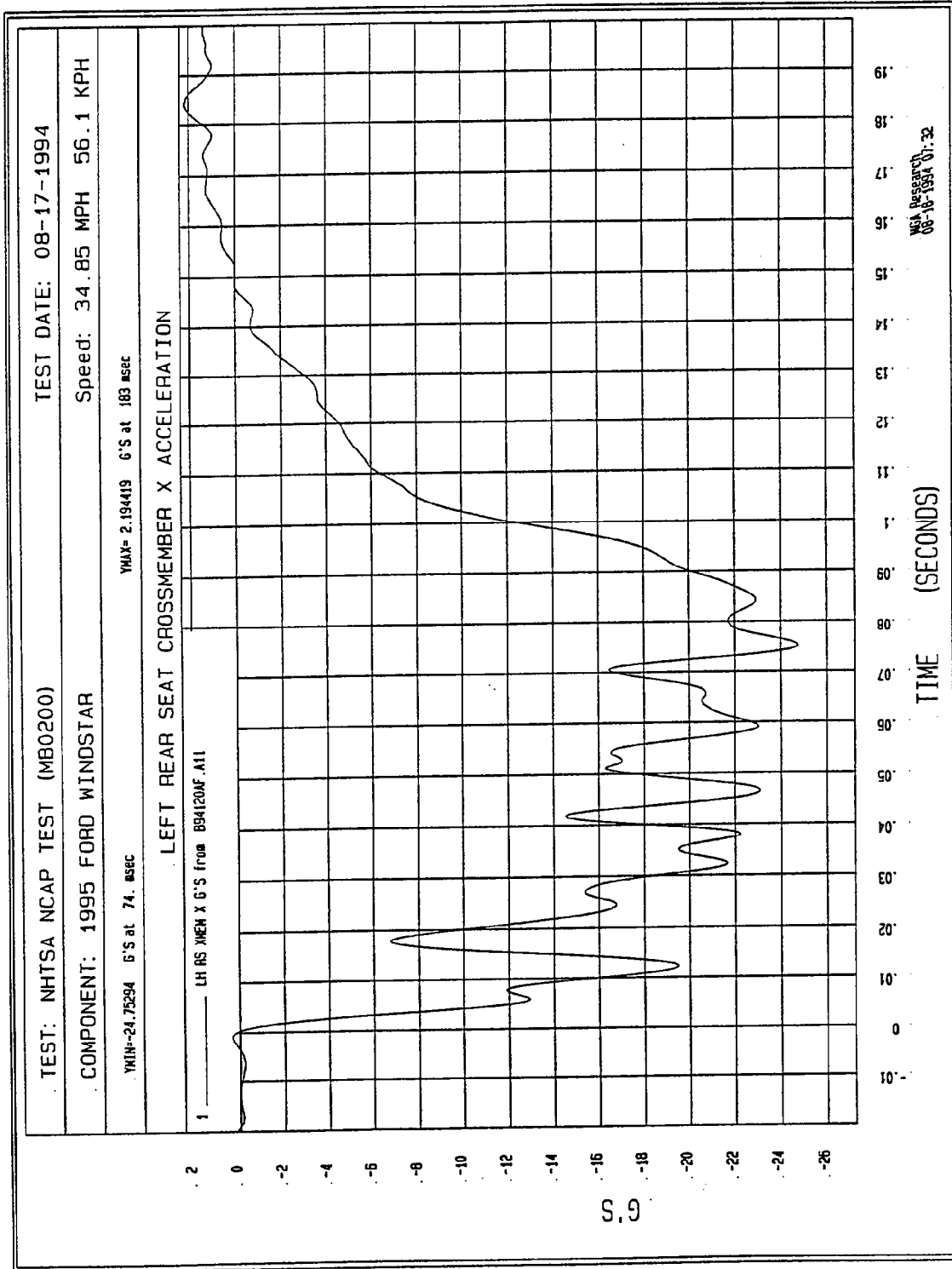


Figure B-4 - Left Rear Seat Crossmember X Acceleration vs. Time

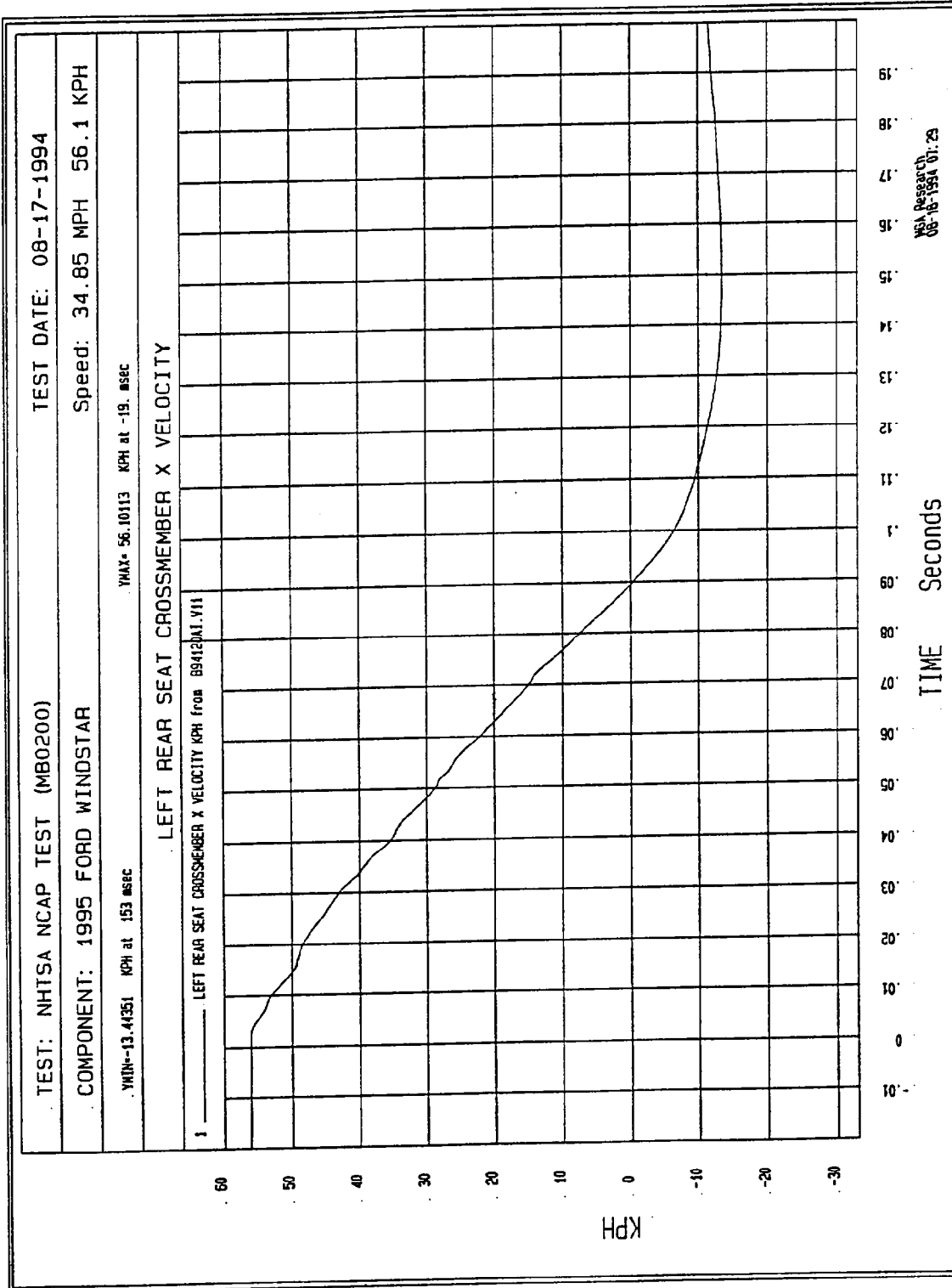
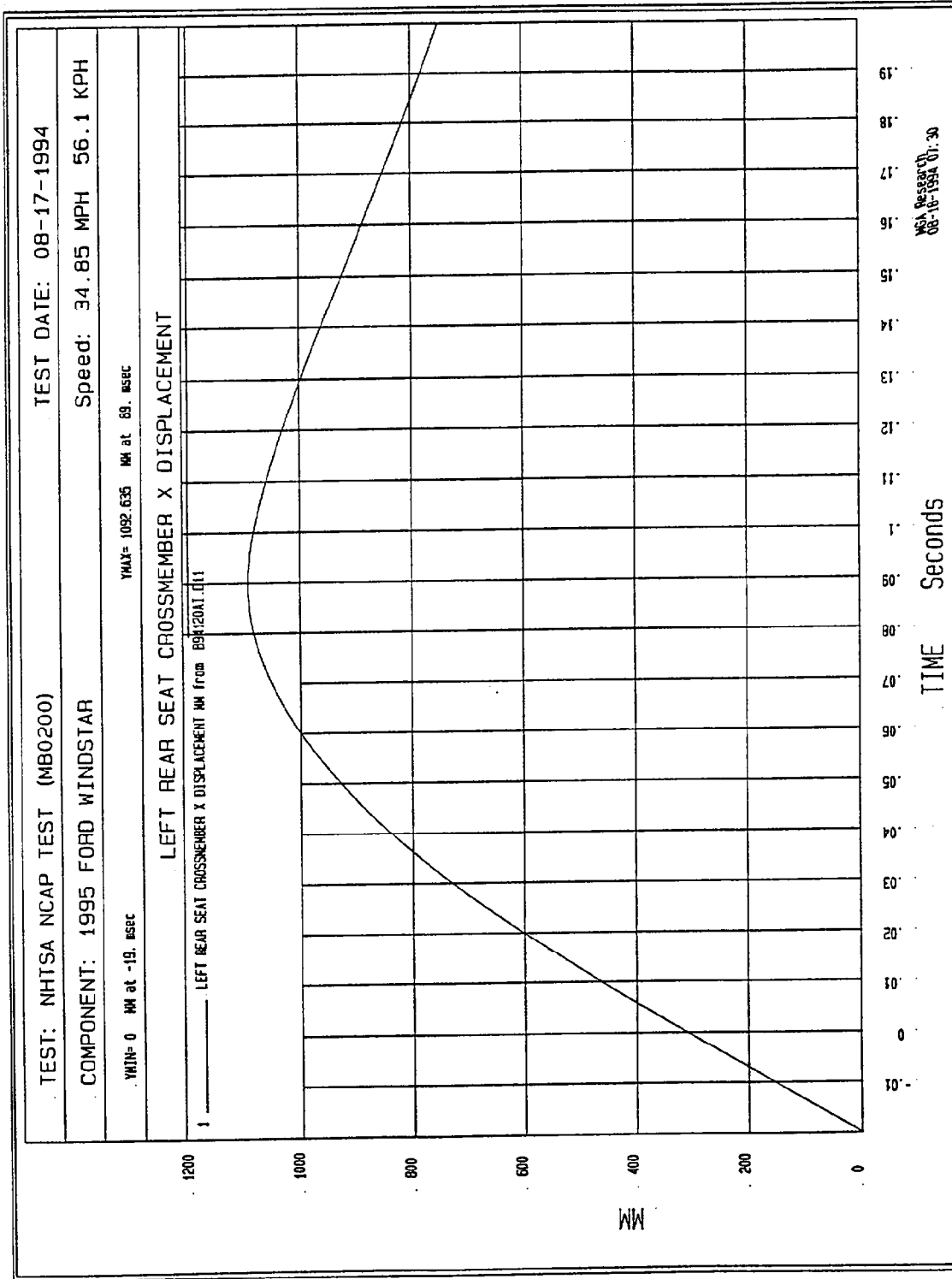


Figure B-5 - Left Rear Seat Crossmember X Velocity vs. Time



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

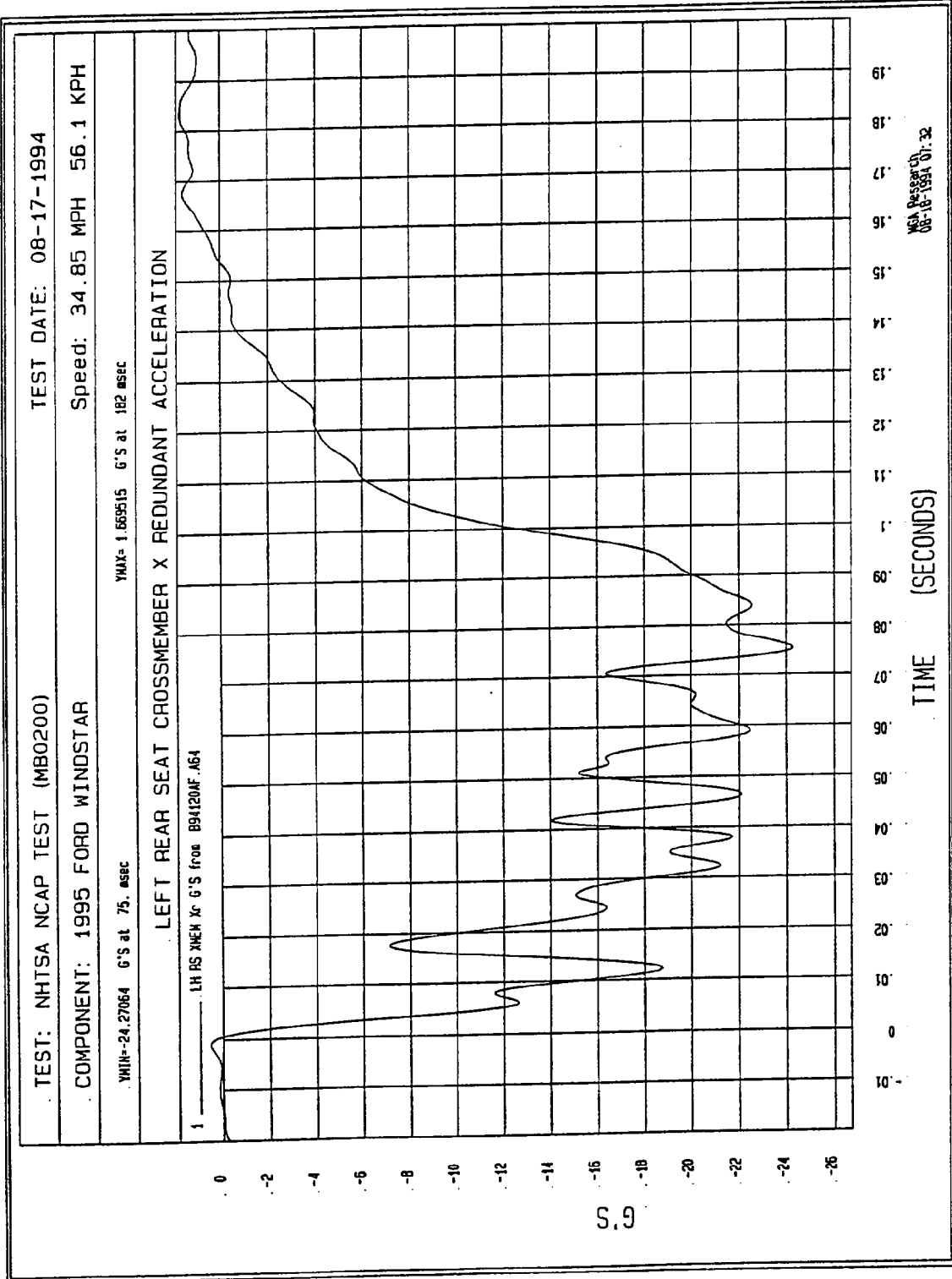


Figure B-7 - Left Rear Seat Crossmember X Redundant Acceleration vs. Time

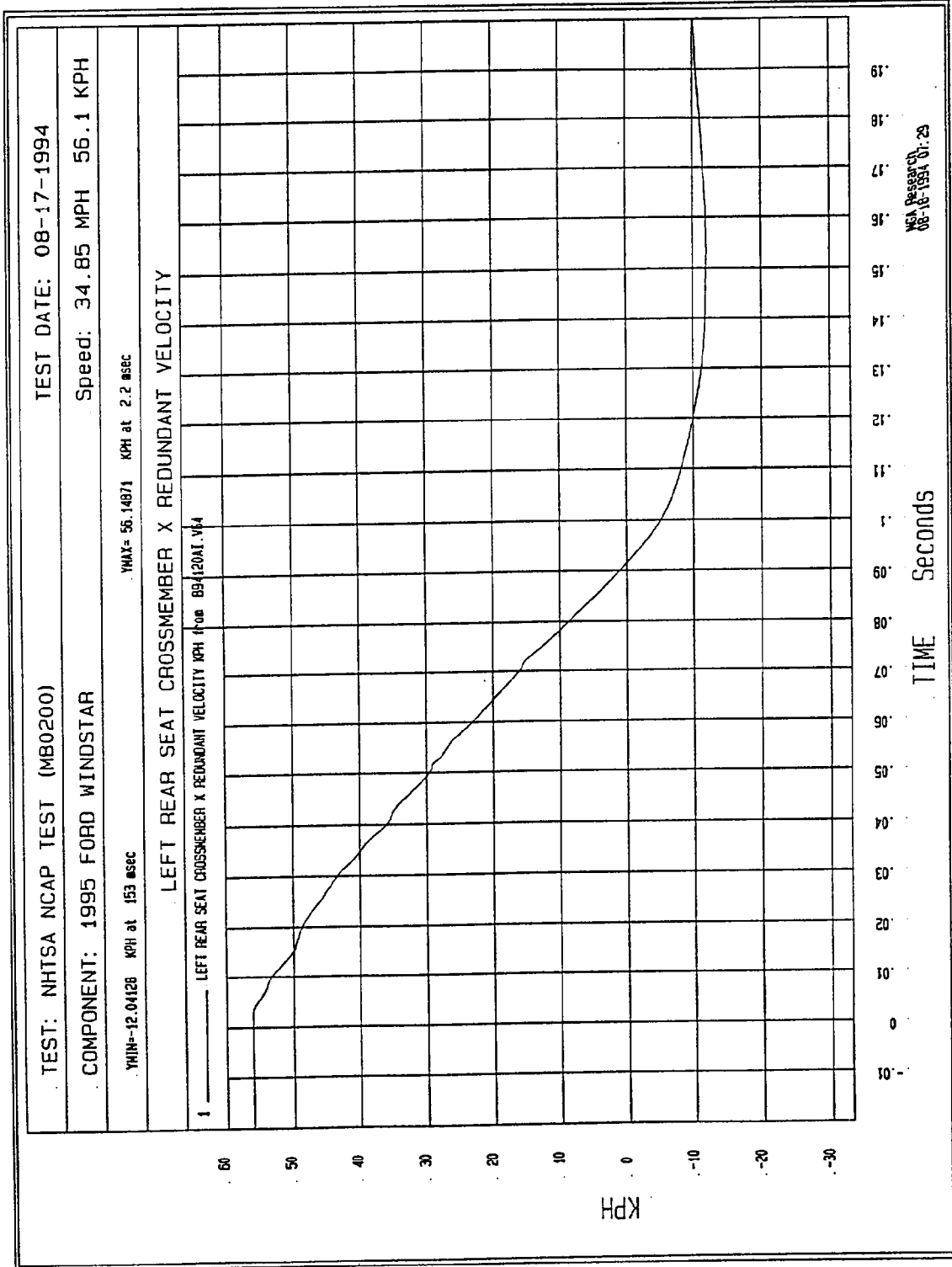


Figure B-8 - Left Rear Seat Crossmember X Redundant Velocity vs. Time

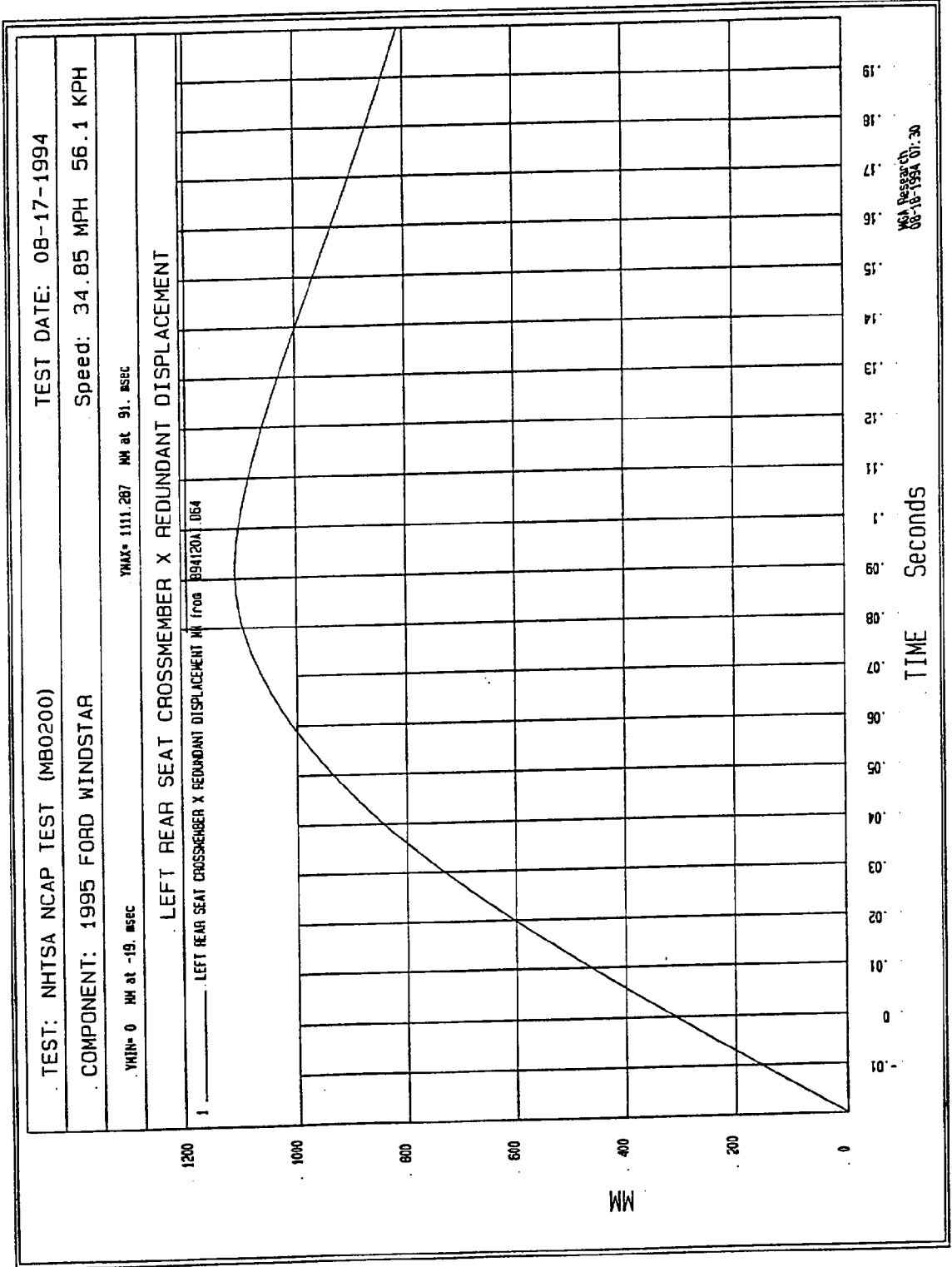


Figure B-9 - Left Rear Seat Crossmember X Redundant Displacement vs. Time

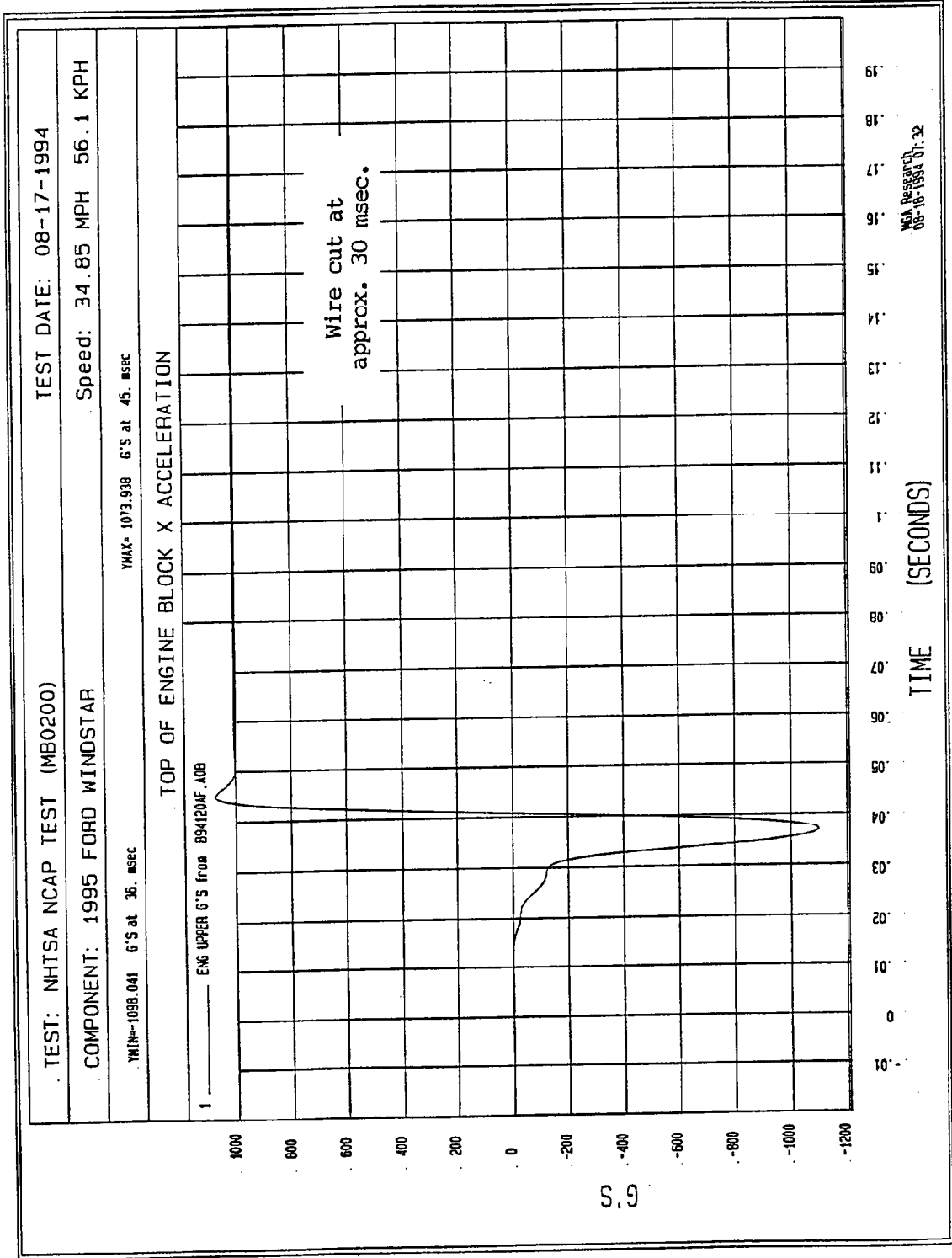
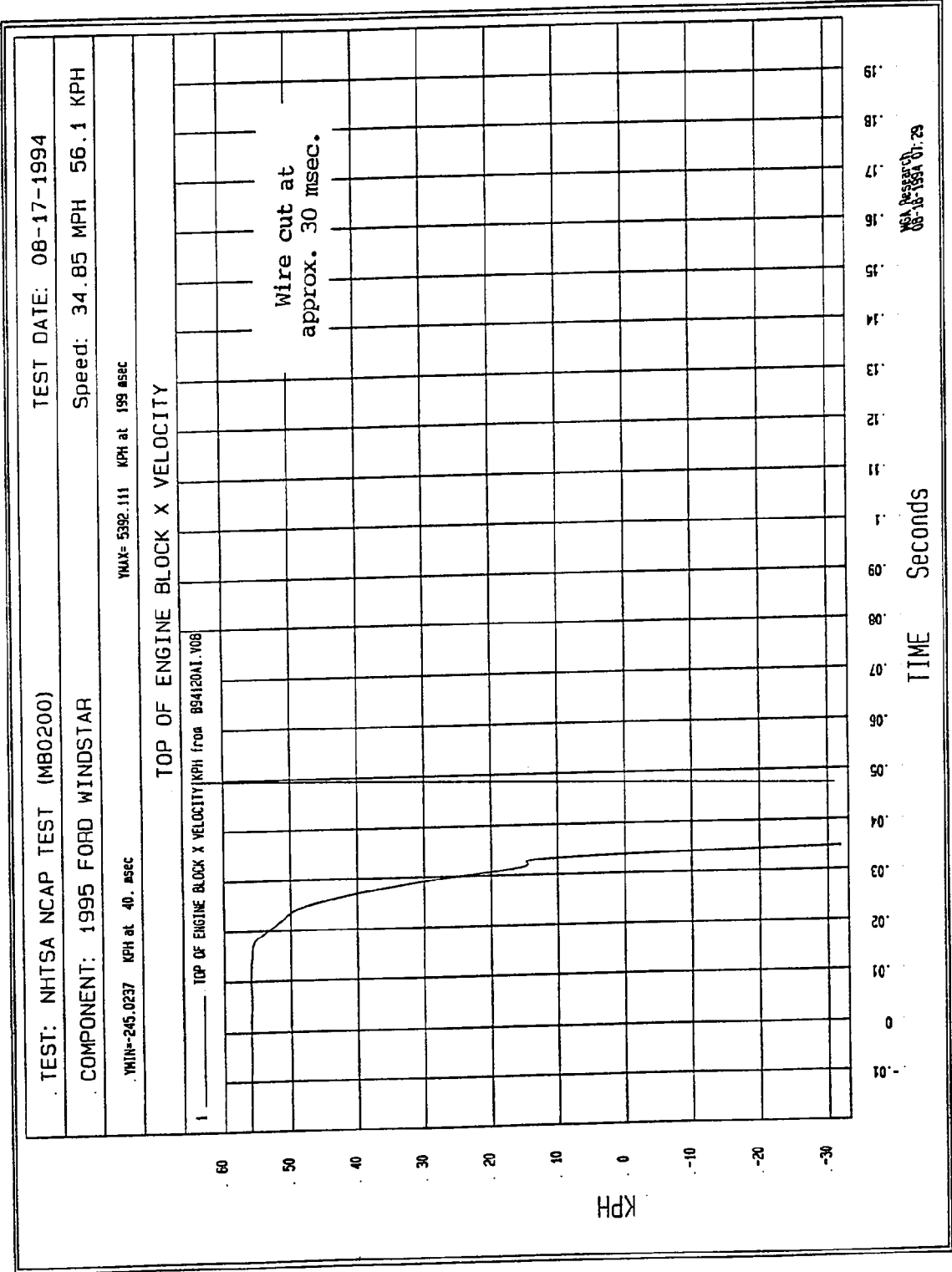


Figure B-10 - Top of Engine Block X Acceleration vs. Time



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Figure B-11 - Top of Engine Block X Velocity vs. Time

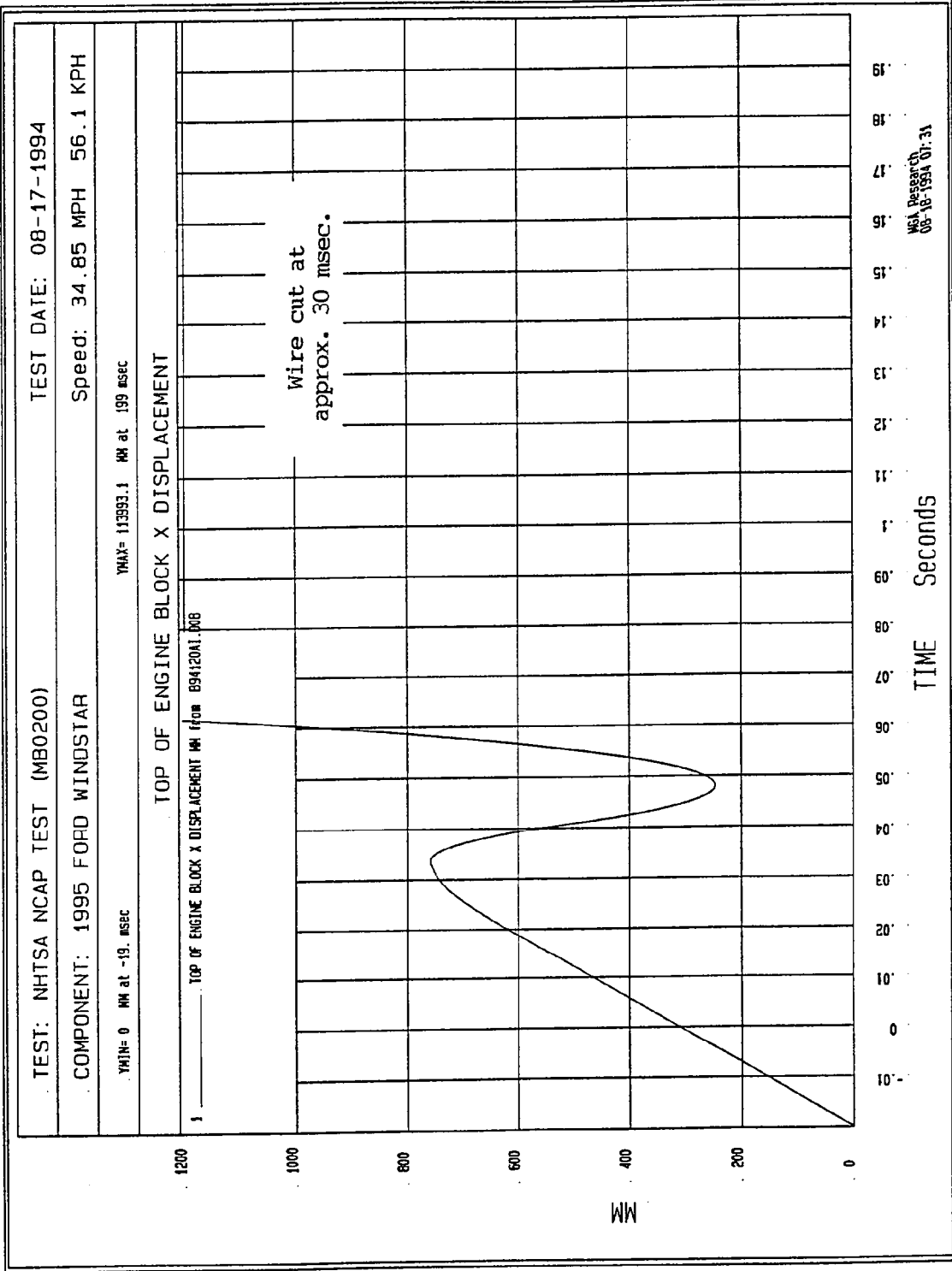


Figure B-12 - Top of Engine Block X Displacement vs. Time

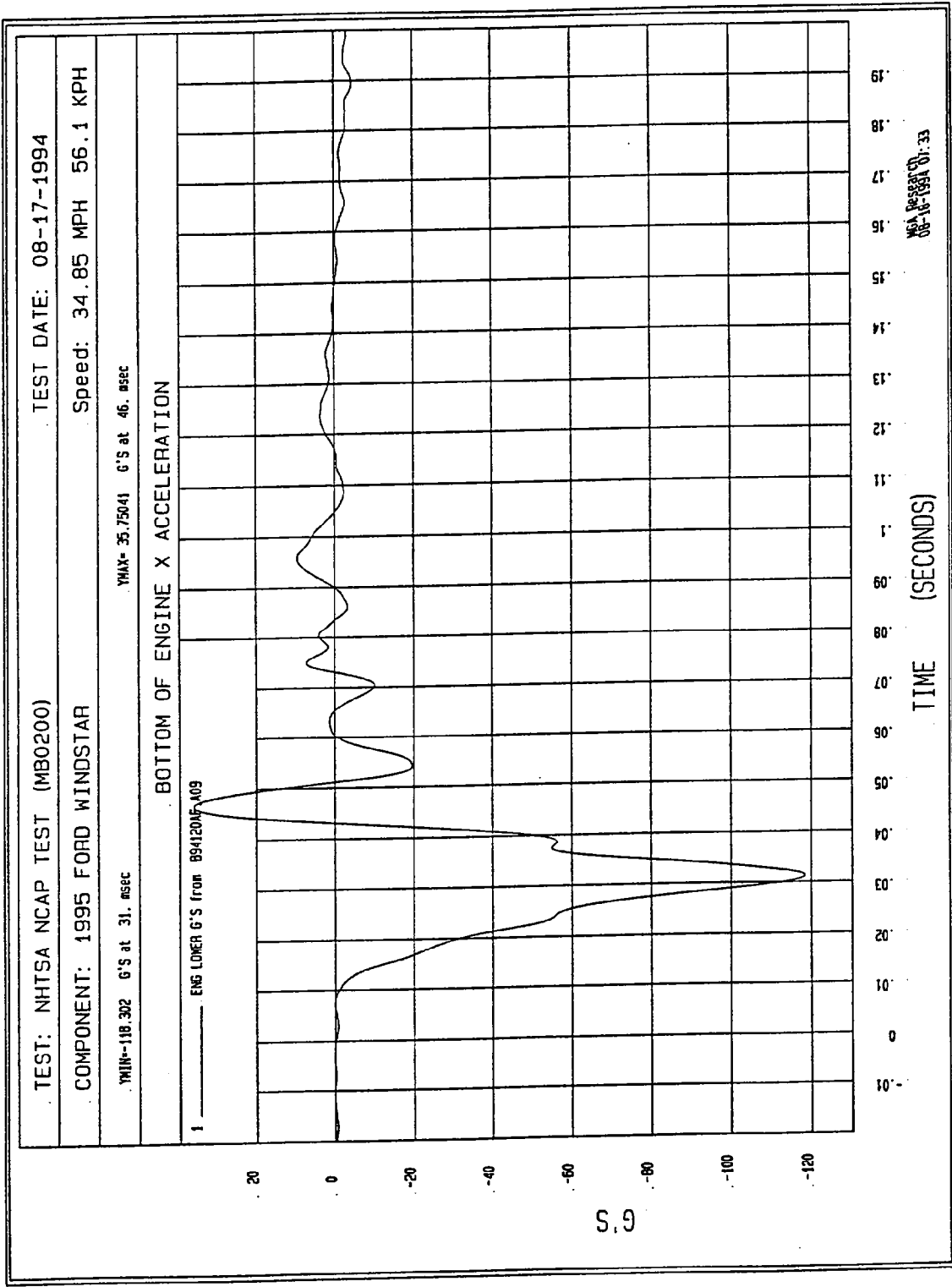


Figure B-13 - Bottom of Engine X Acceleration vs. Time

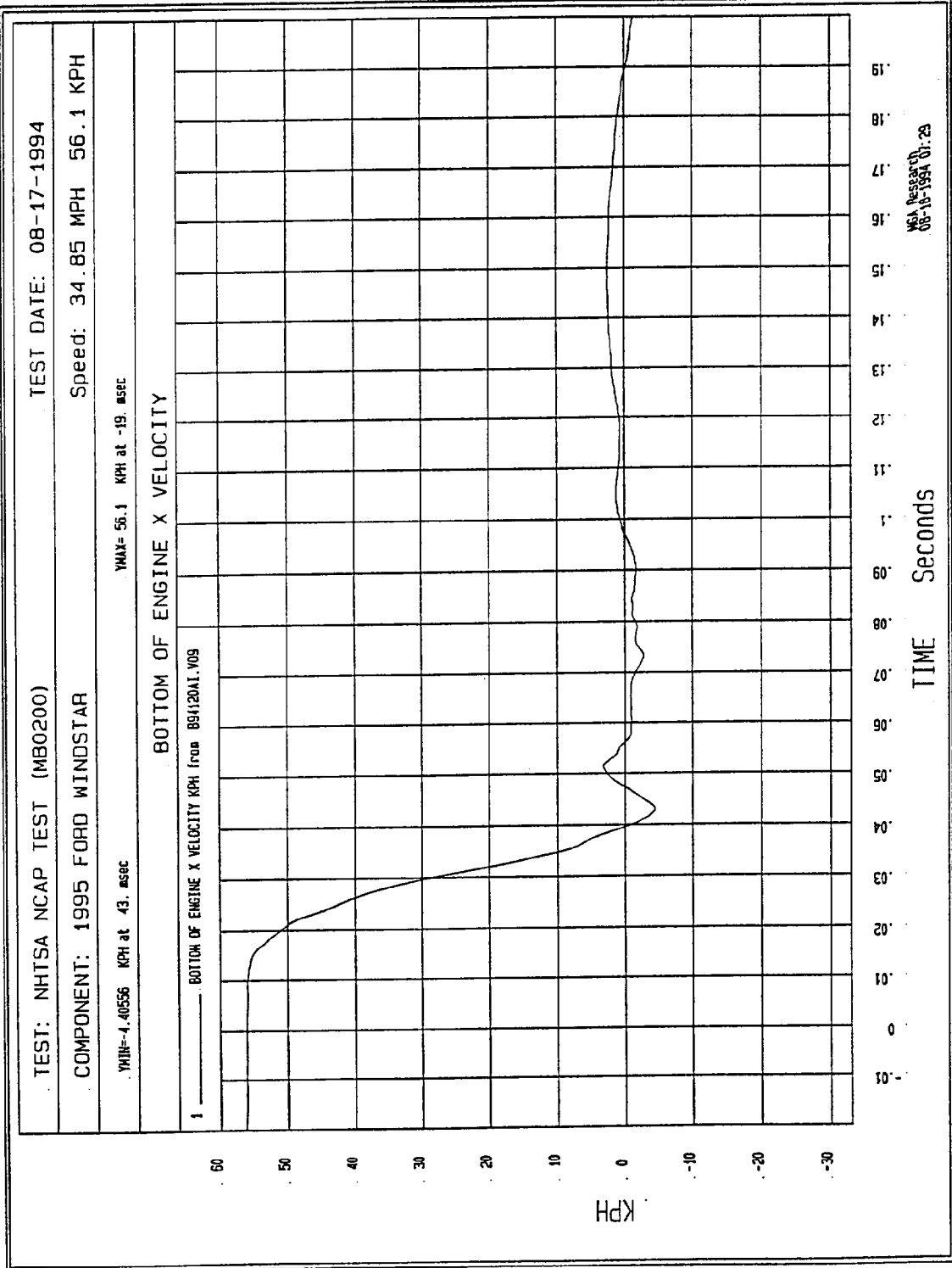


Figure B-14 - Bottom of Engine X Velocity vs. Time

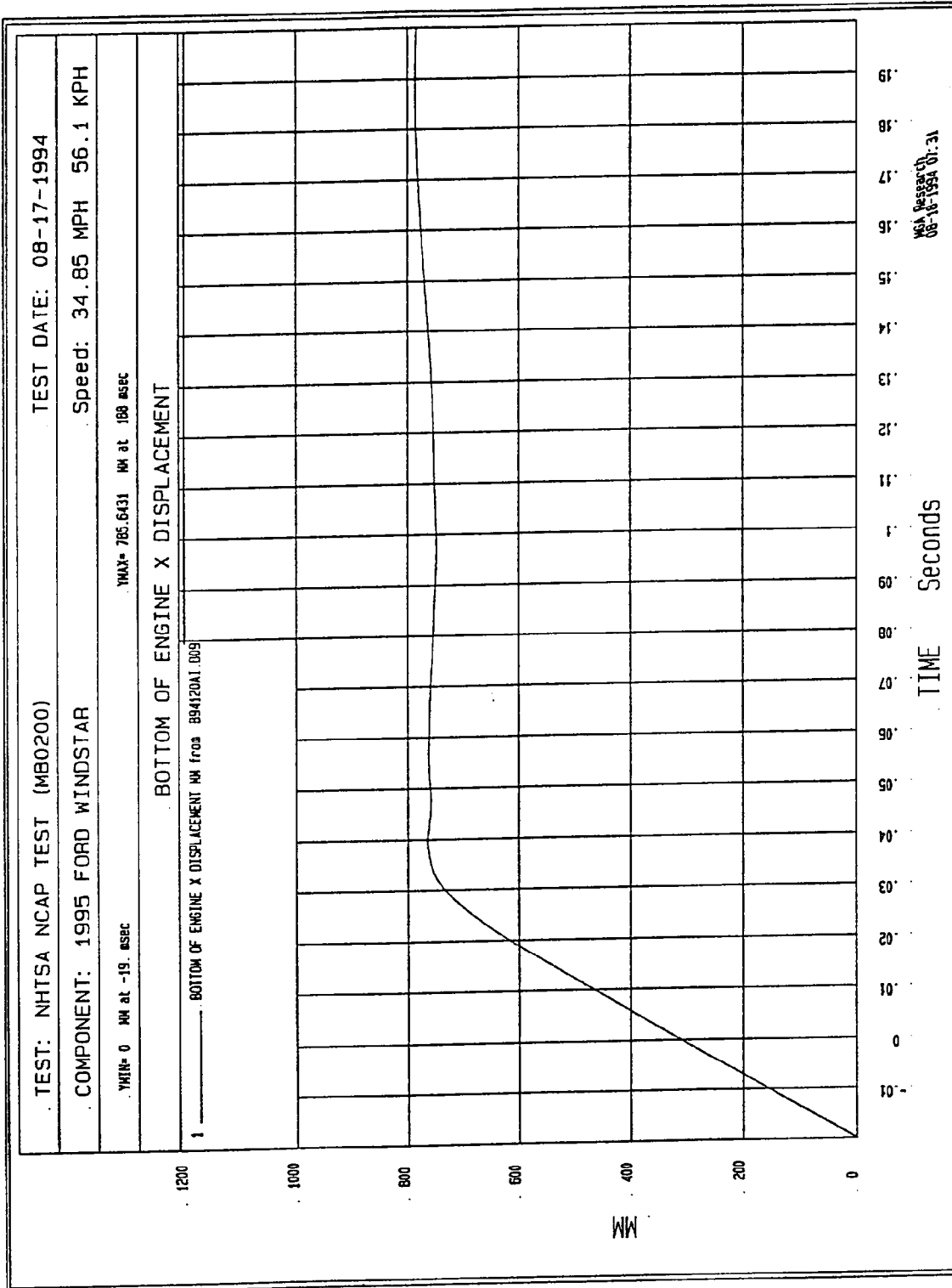


Figure B-15 - Bottom of Engine X Displacement vs. Time

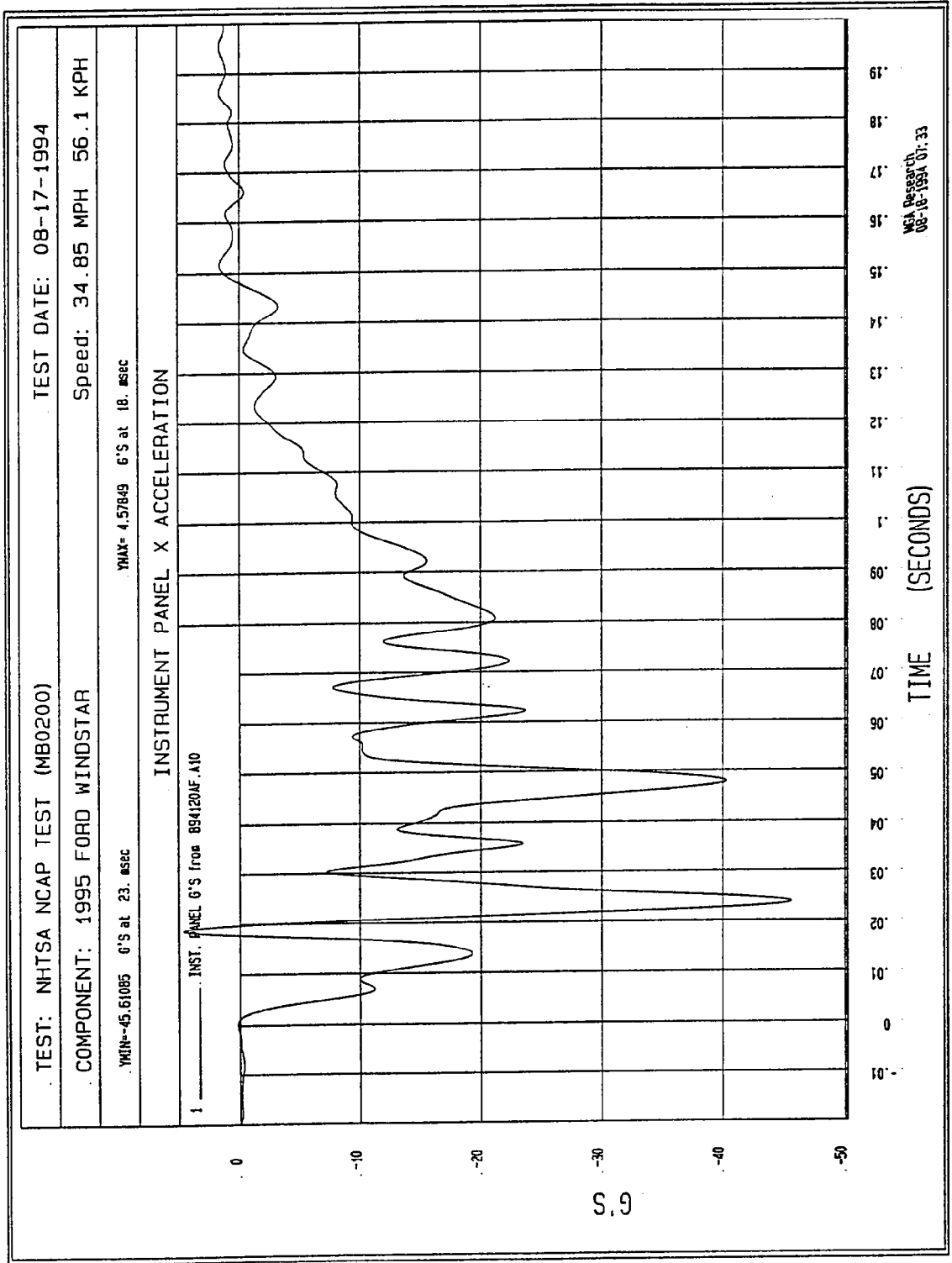


Figure B-16 - Instrument Panel X Acceleration vs. Time

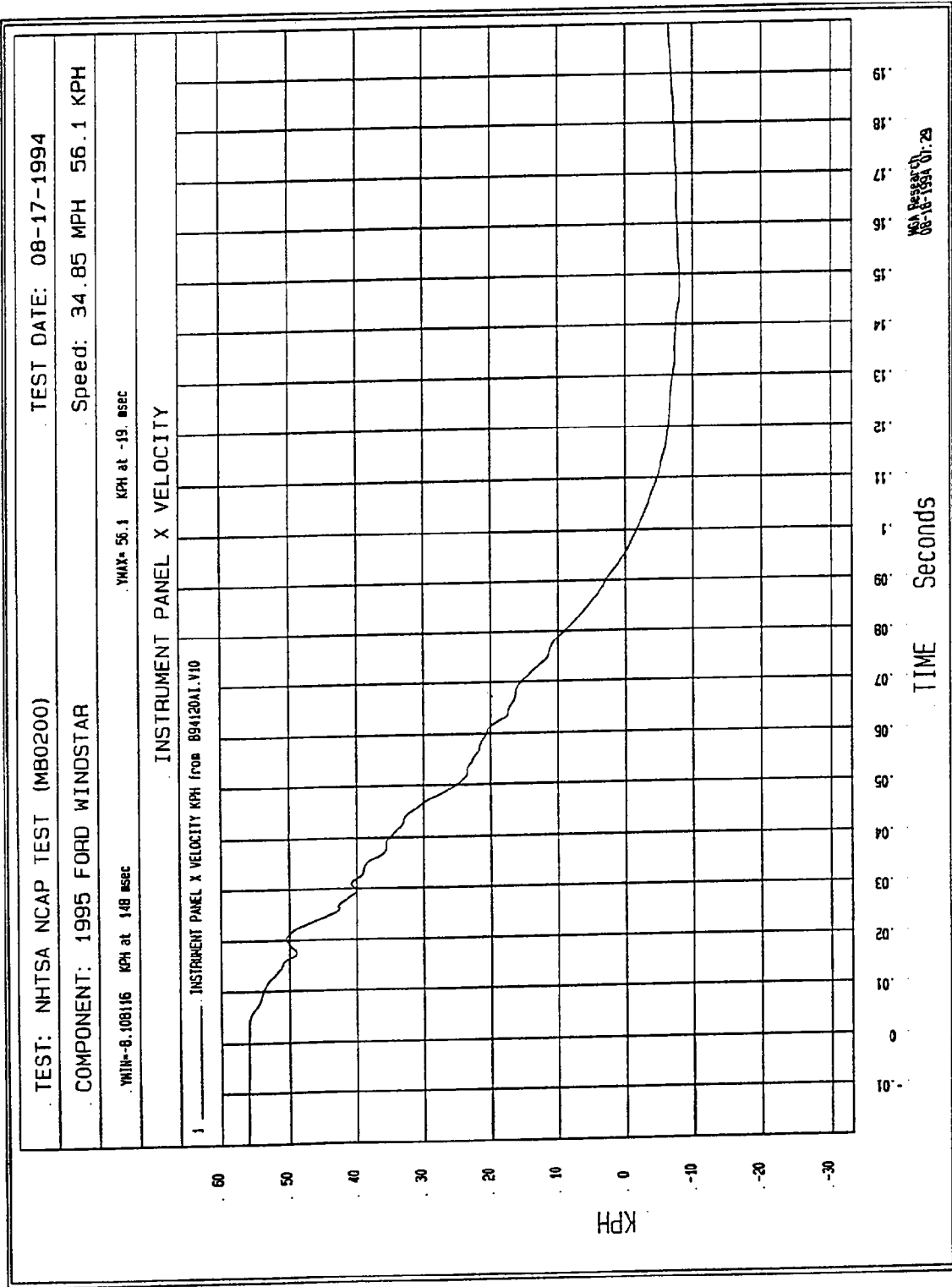


Figure B-17 -- Instrument Panel X Velocity vs. Time

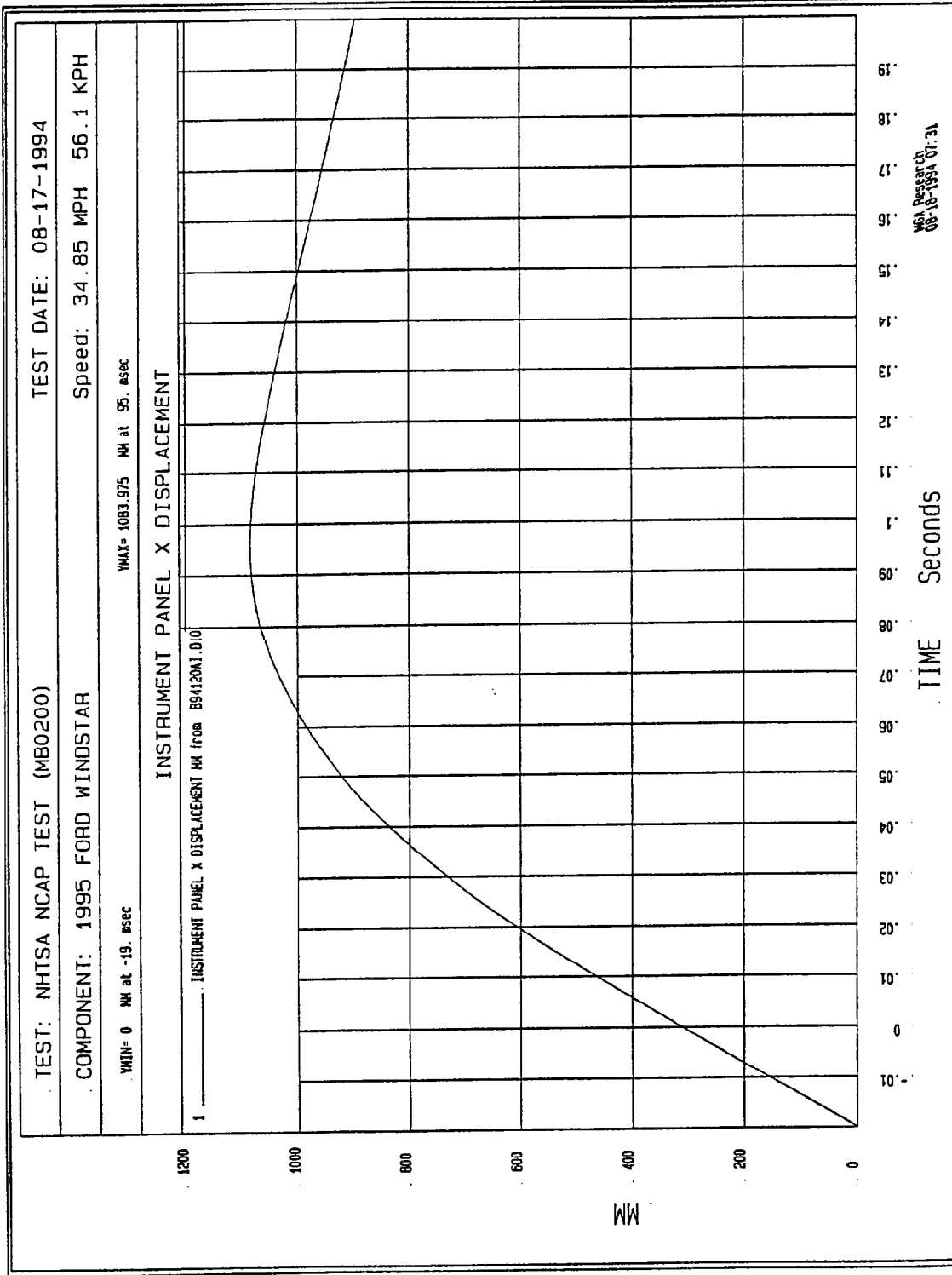


Figure B-18 - Instrument Panel X Displacement vs. Time

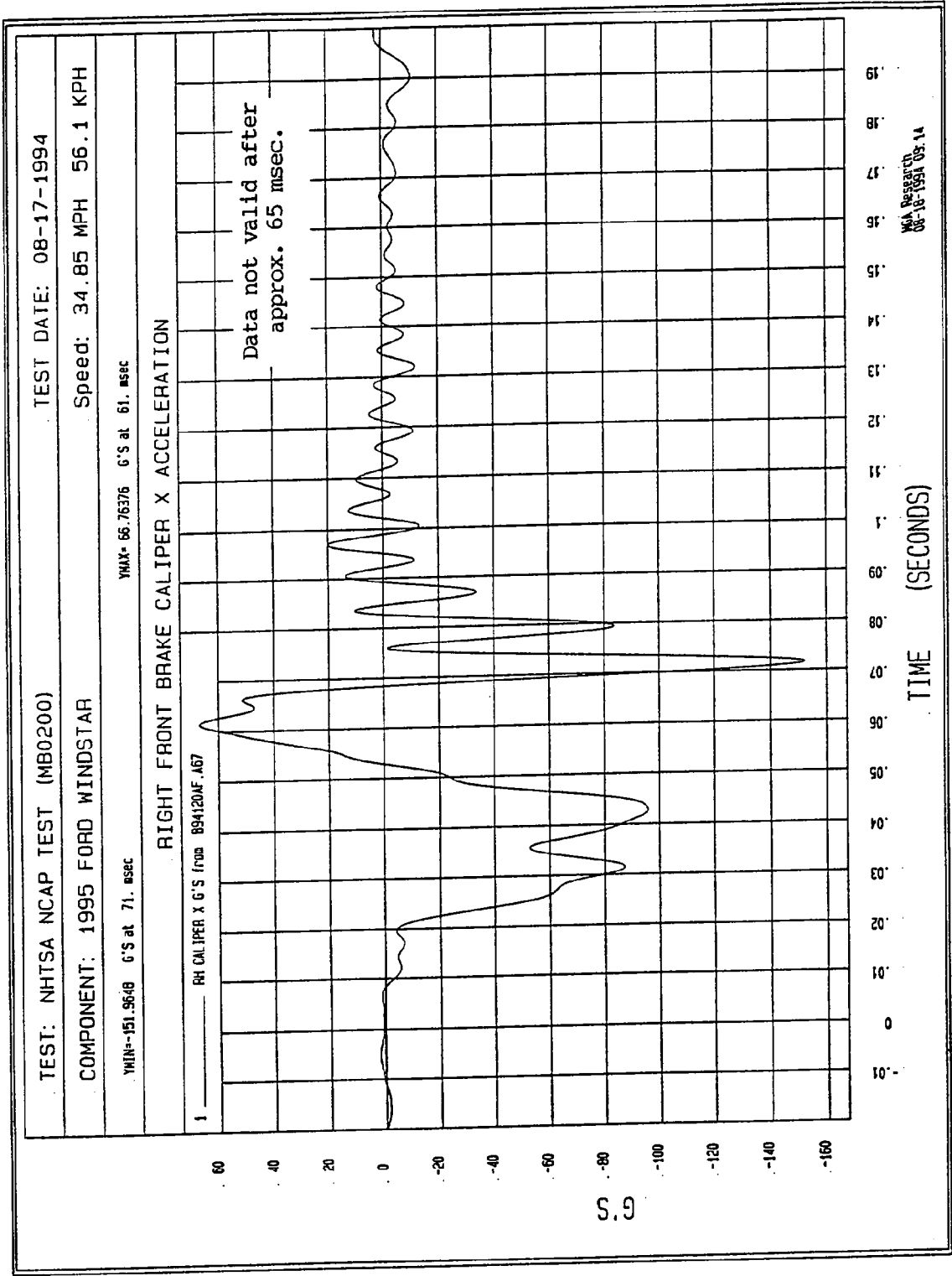


Figure B-19 - Right Front Brake Caliper X Acceleration vs. Time

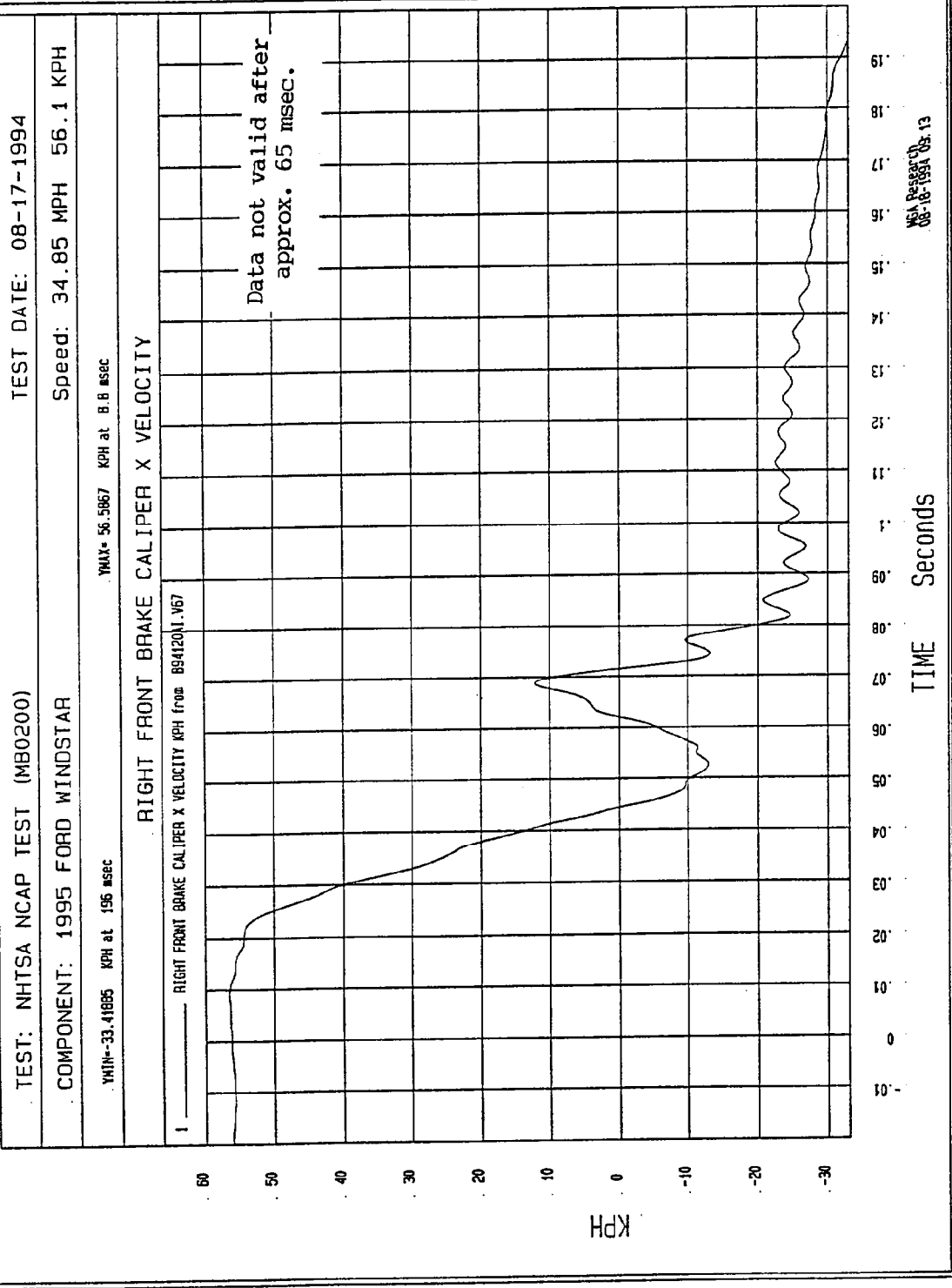


Figure B-20 - Right Front Brake Caliper X Velocity vs. Time

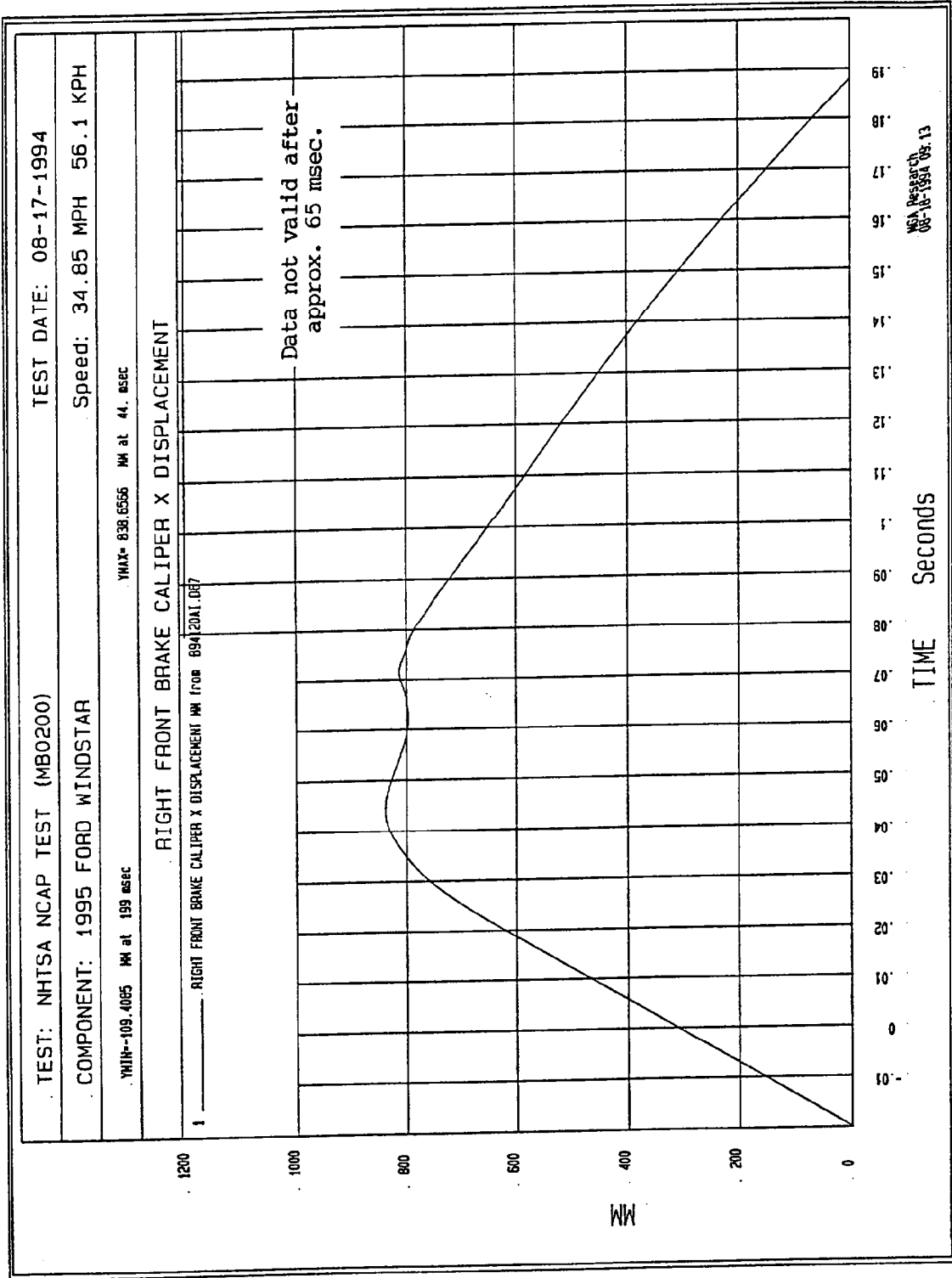


Figure B-21 - Right Front Brake Caliper X Displacement vs. Time

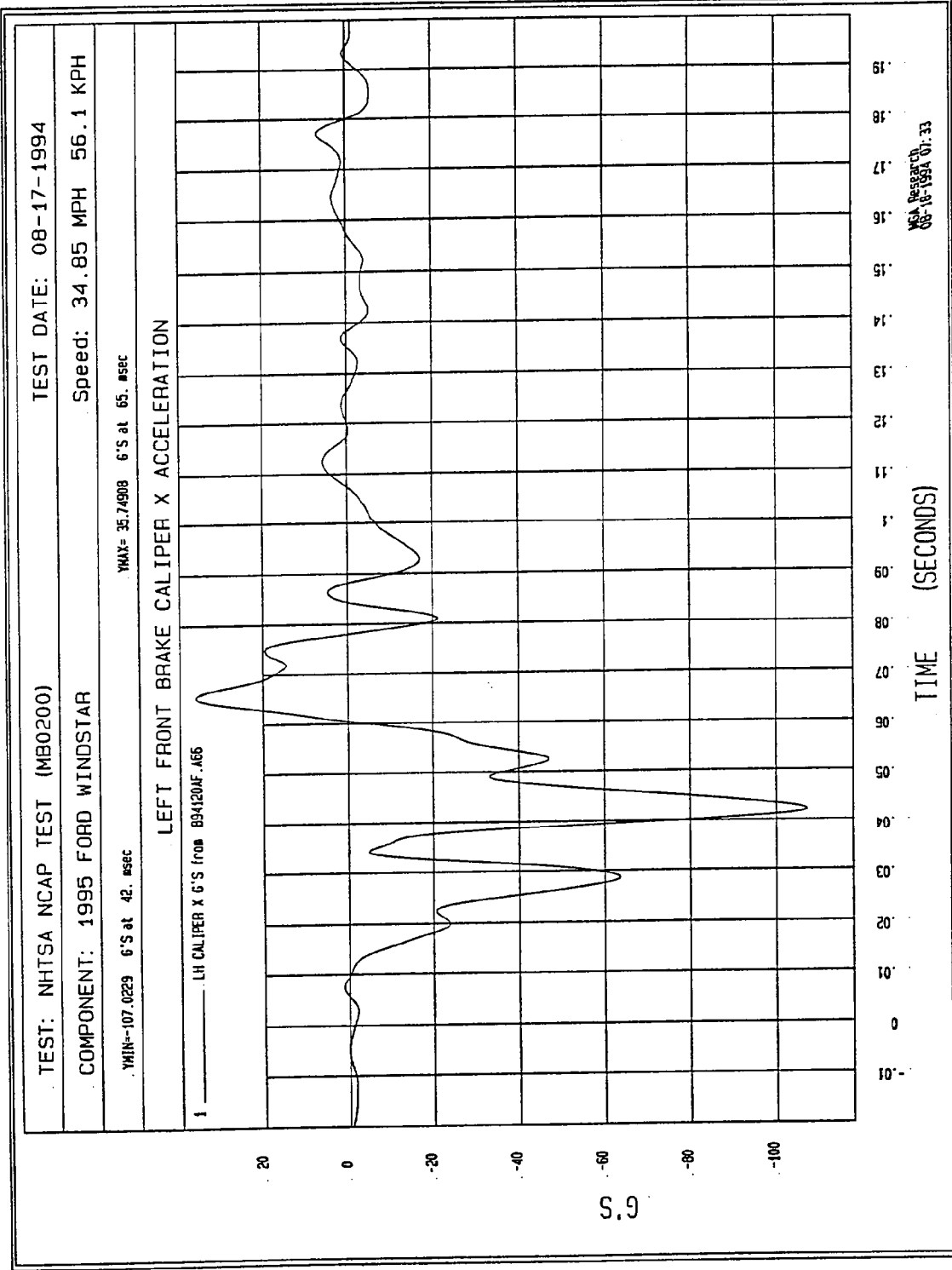
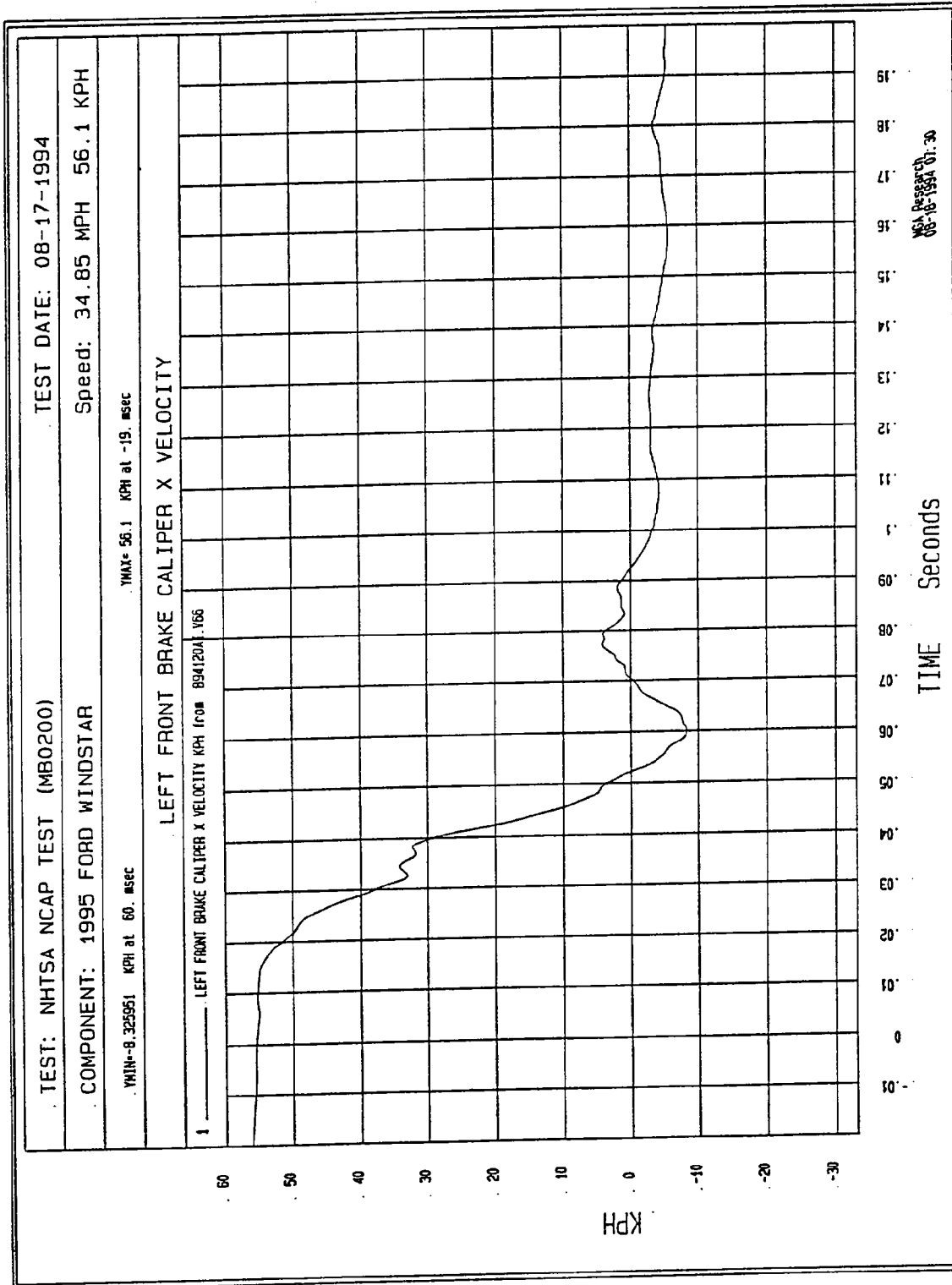


Figure B-22 - Left Front Brake Caliper X Acceleration vs. Time



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Figure B-23 - Left Front Brake Caliper X Velocity vs. Time

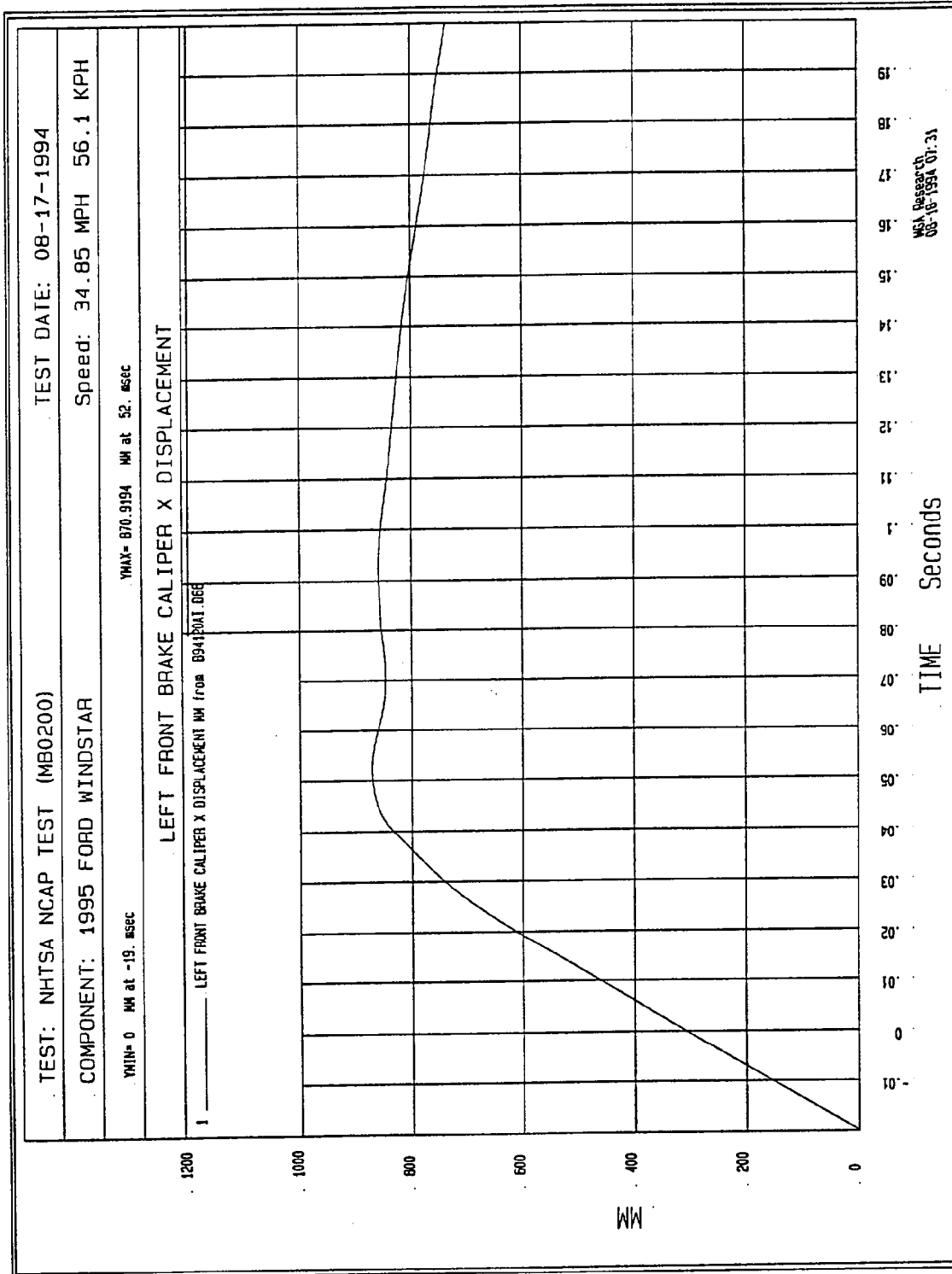


Figure B-24 - Left Front Brake Caliper X Displacement vs. Time

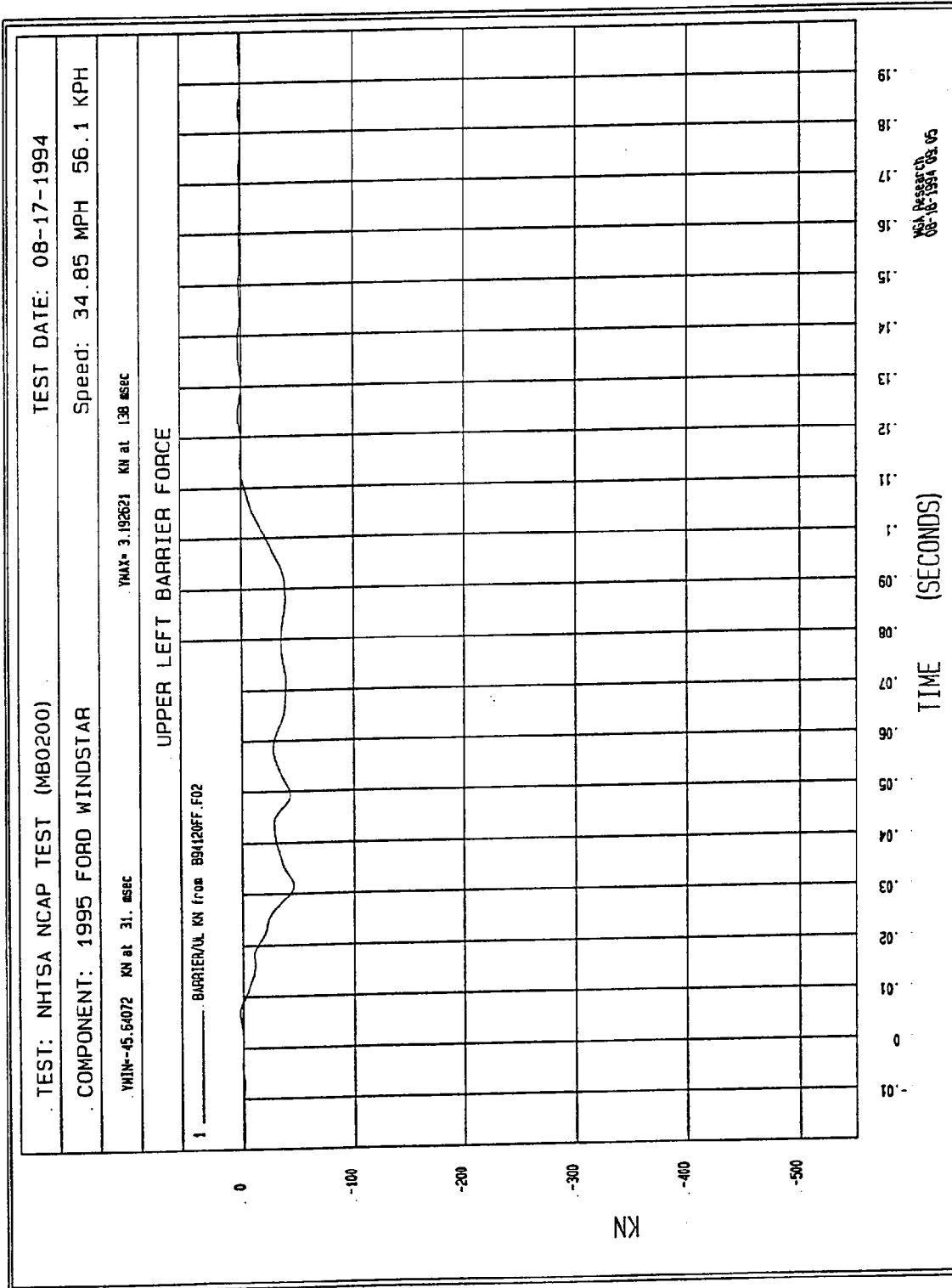


Figure B-25 - Upper Left Barrier Force vs. Time

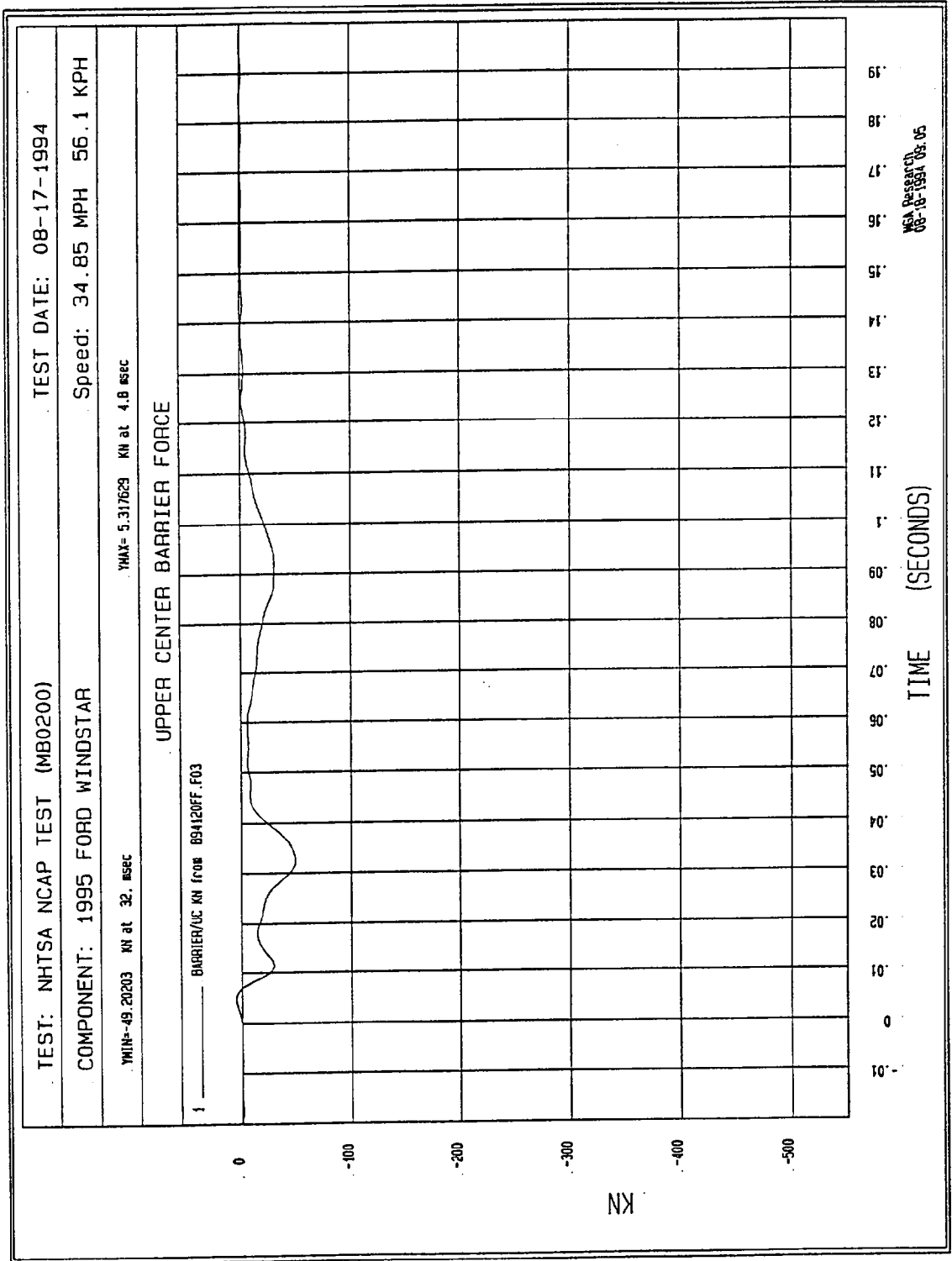


Figure B-26 - Upper Center Barrier Force vs. Time

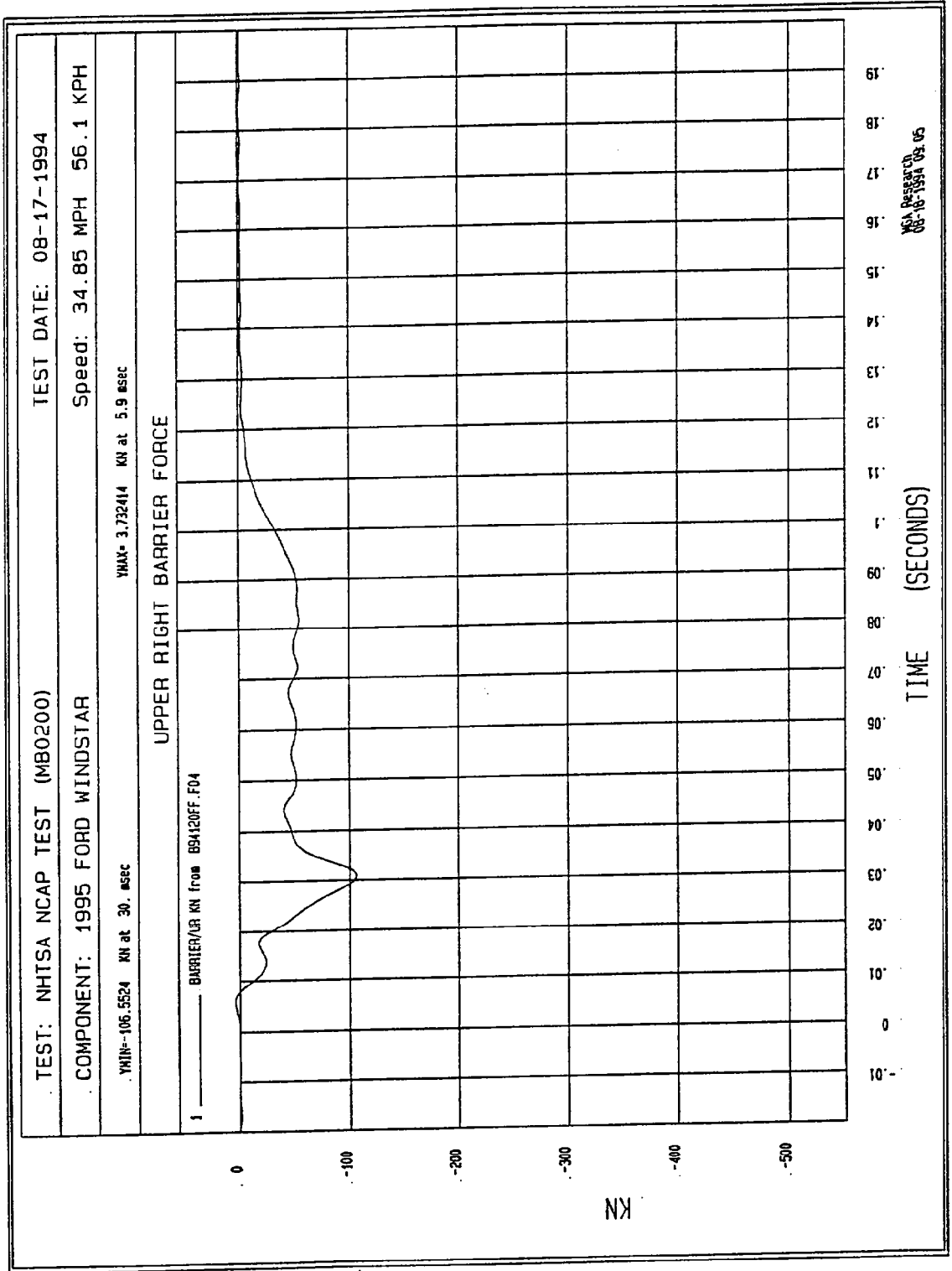


Figure B-27 - Upper Right Barrier Force vs. Time

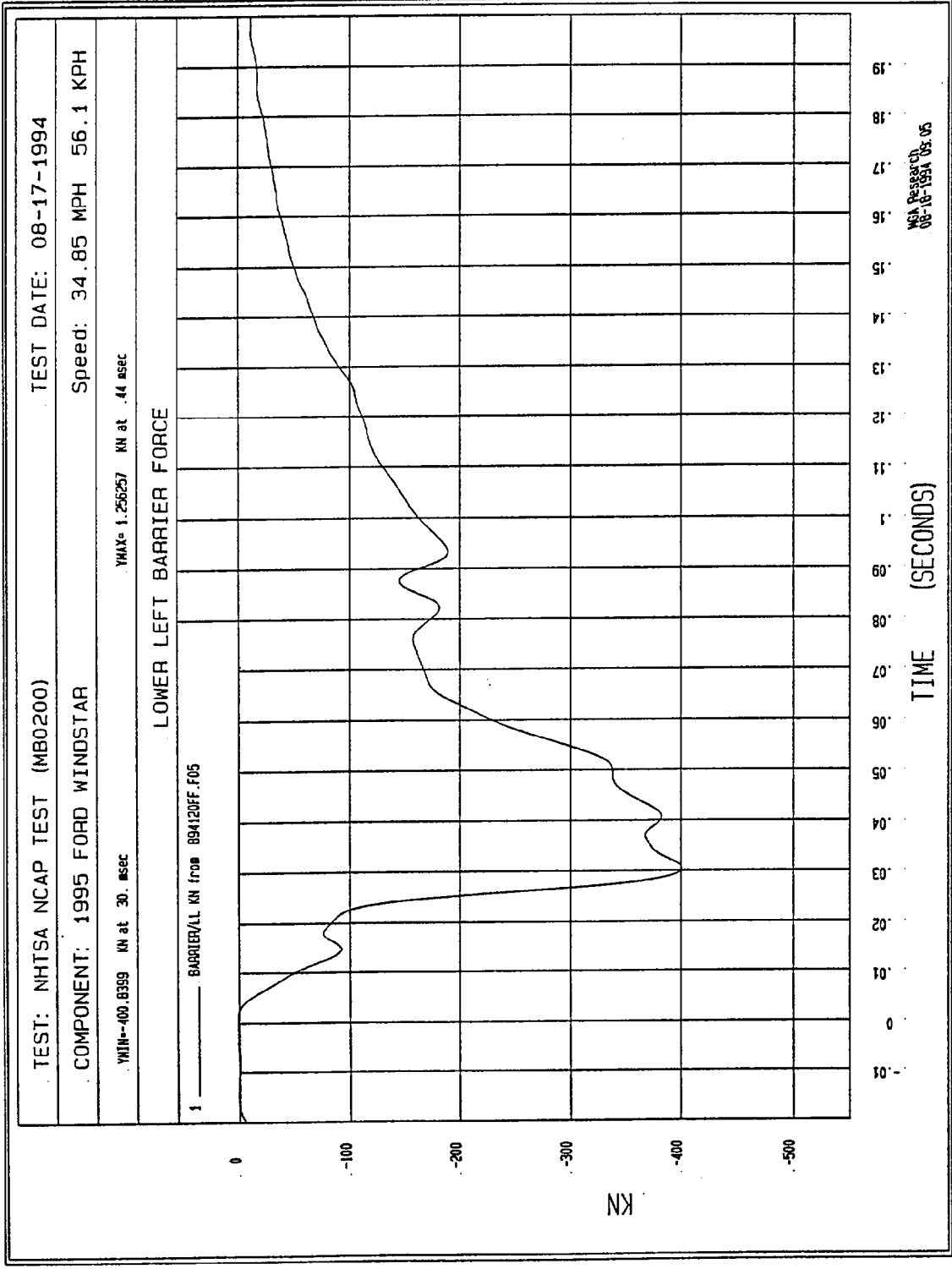


Figure B-28 - Lower Left Barrier Force vs. Time

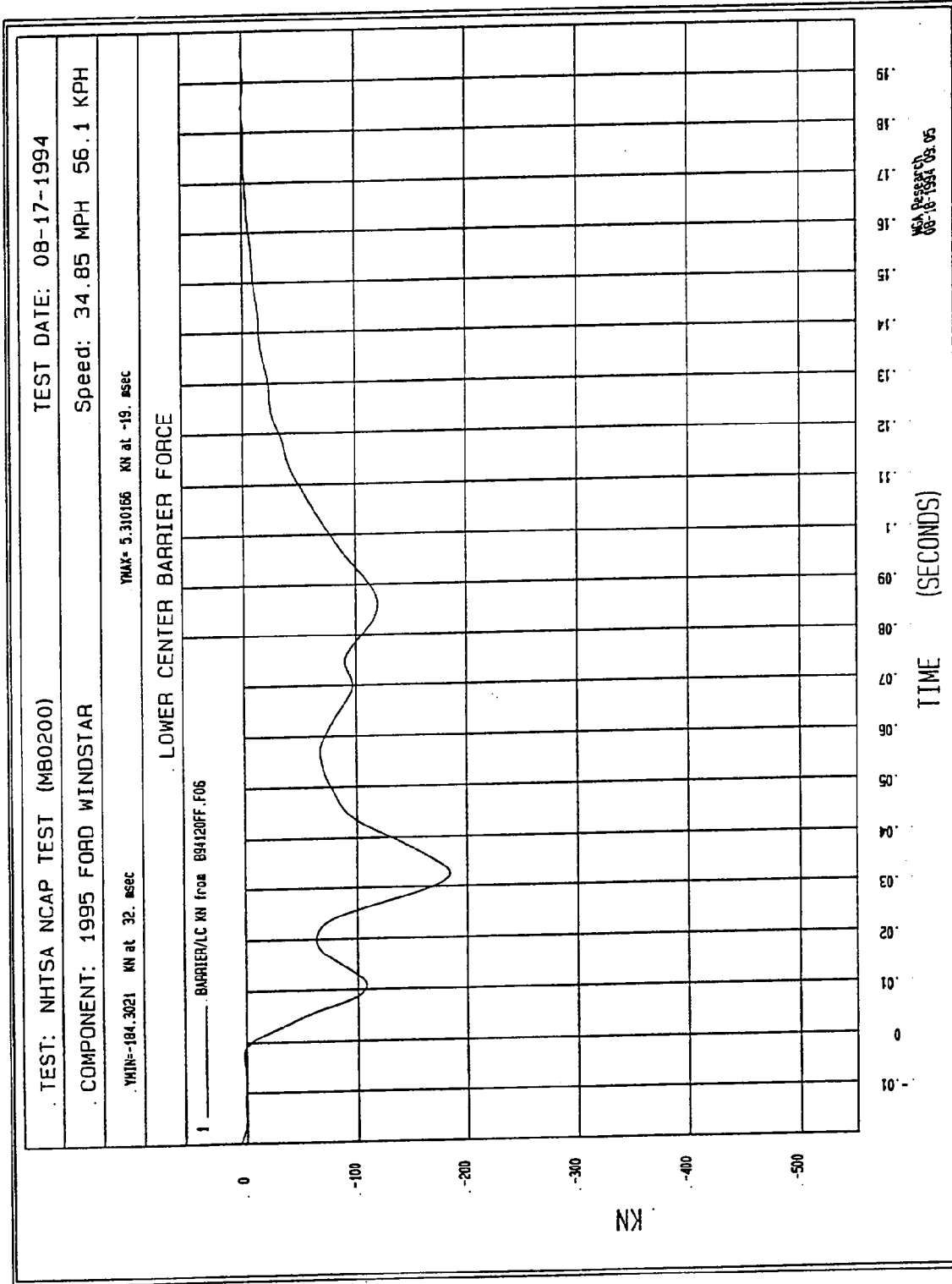


Figure B-29 - Lower Center Barrier Force vs. Time

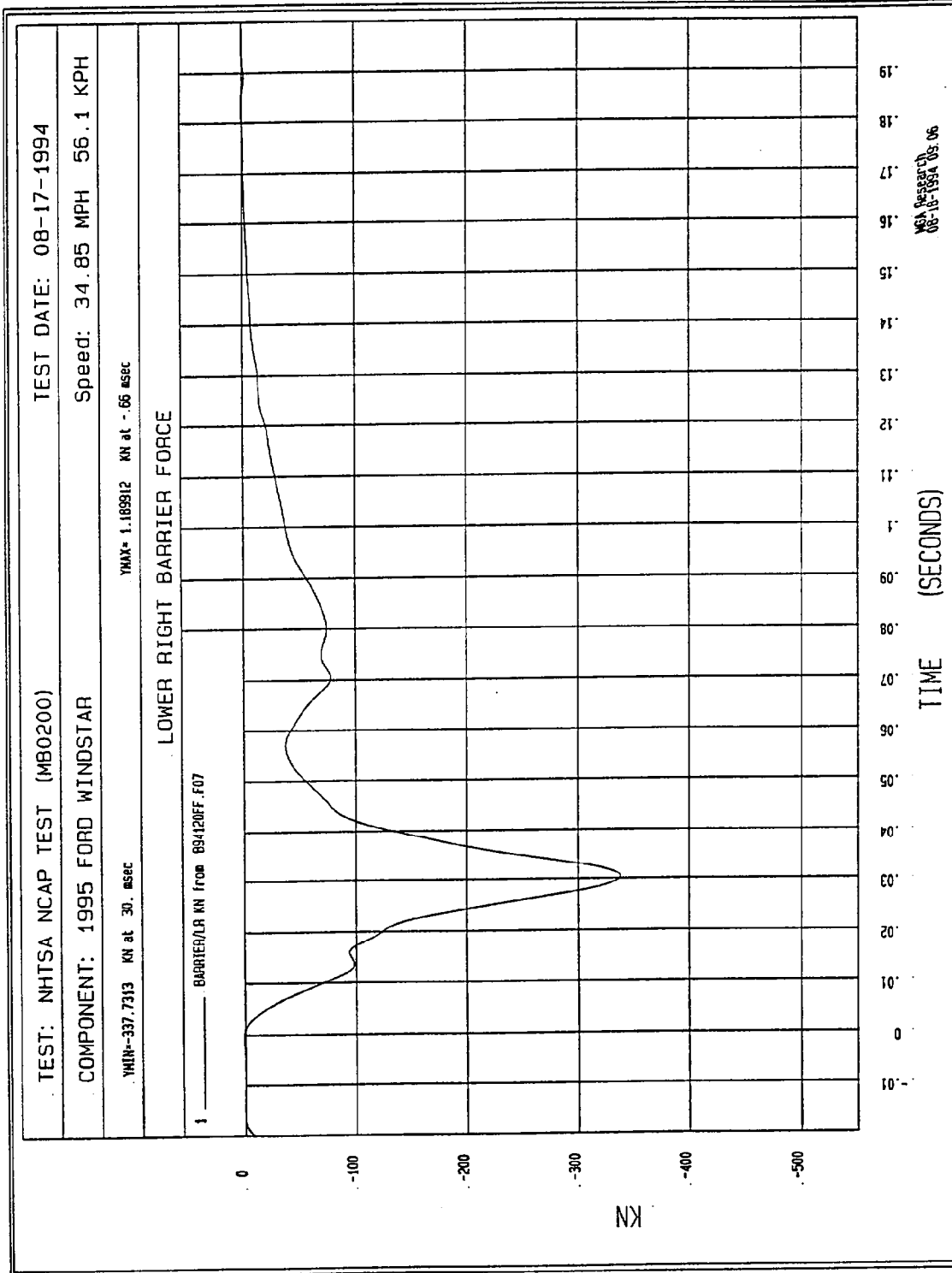


Figure B-30 - Lower Right Barrier Force vs. Time

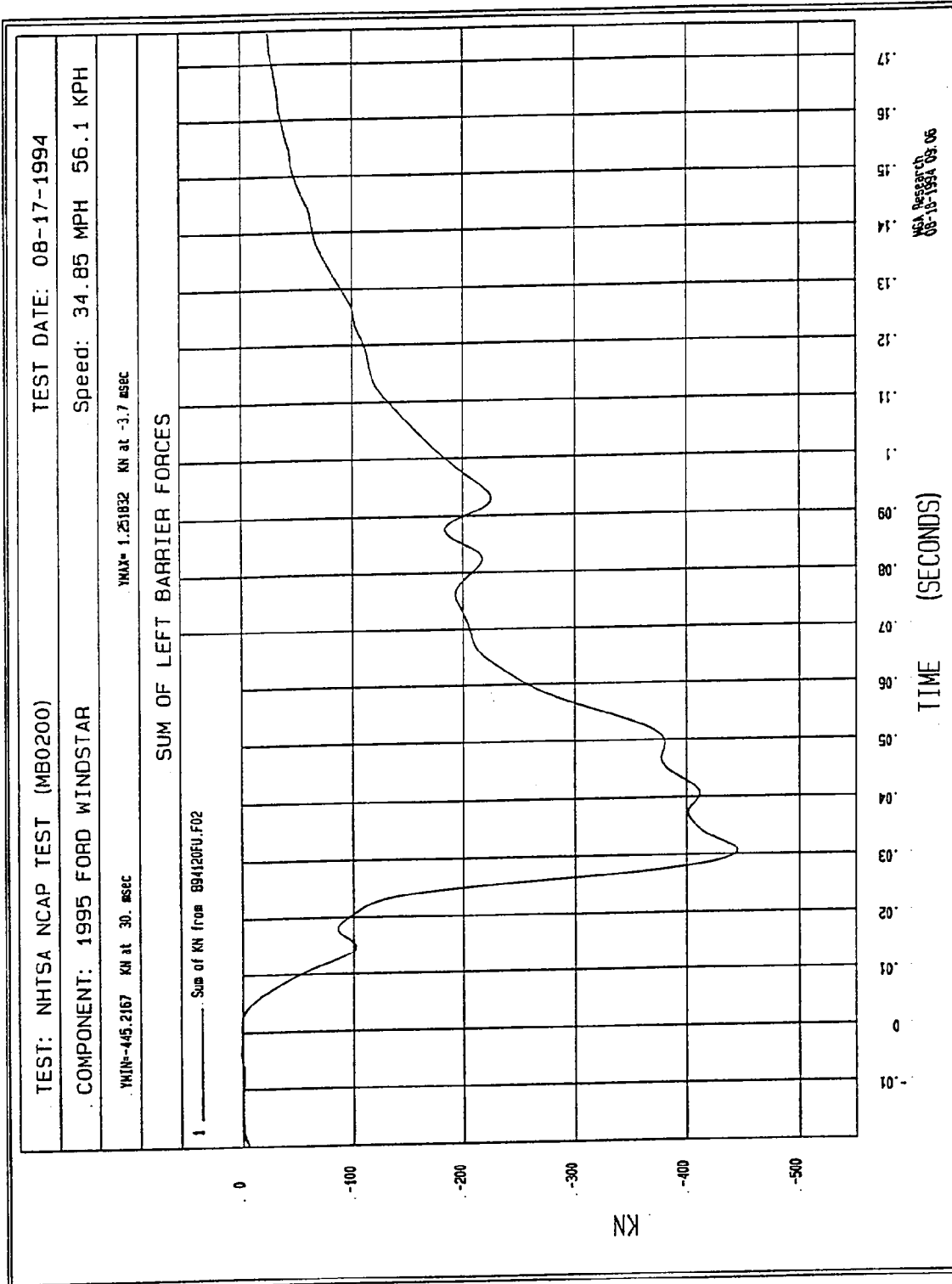


Figure B-31 - Sum of Left Barrier Forces vs. Time

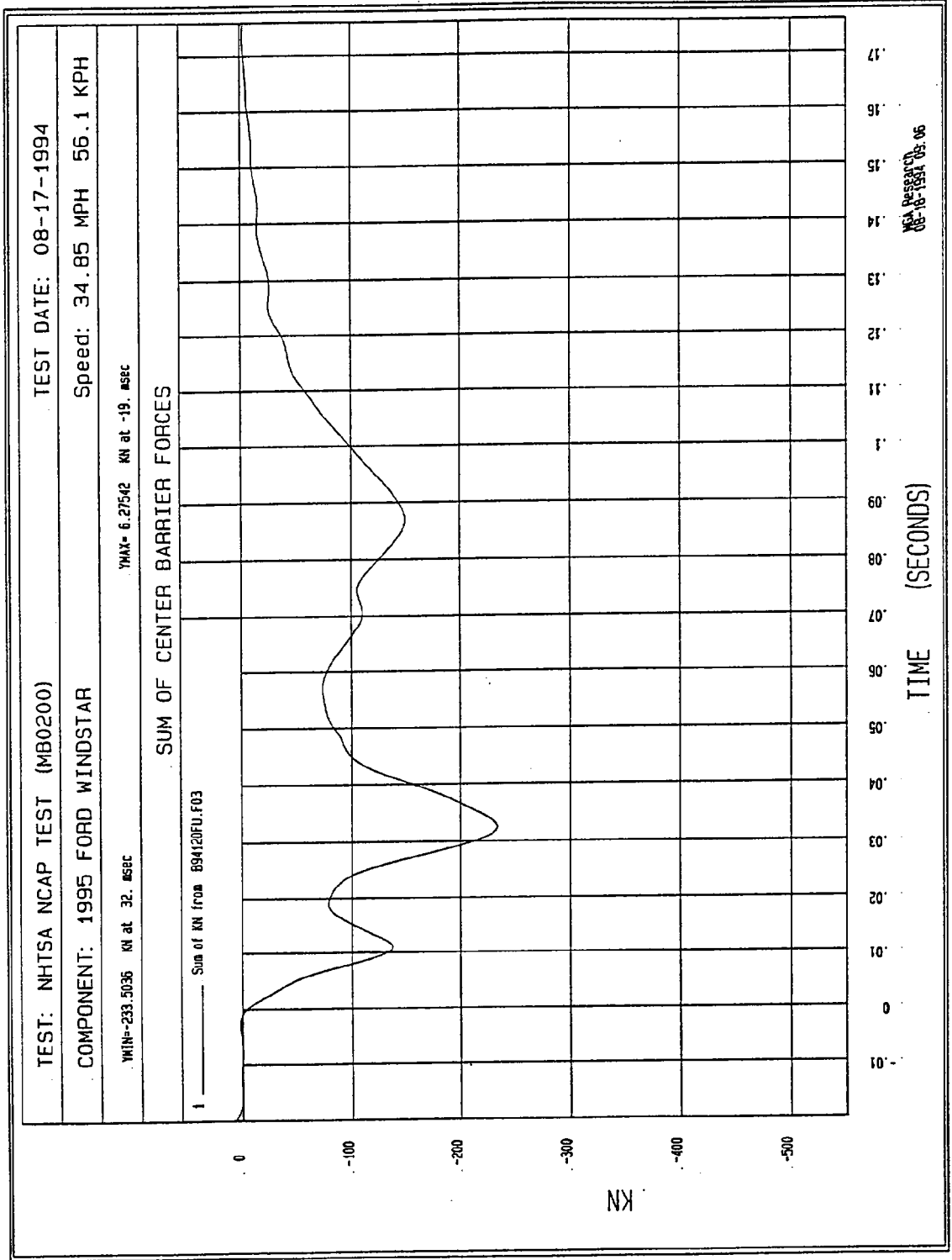


Figure B-32 - Sum of Center Barrier Forces vs. Time

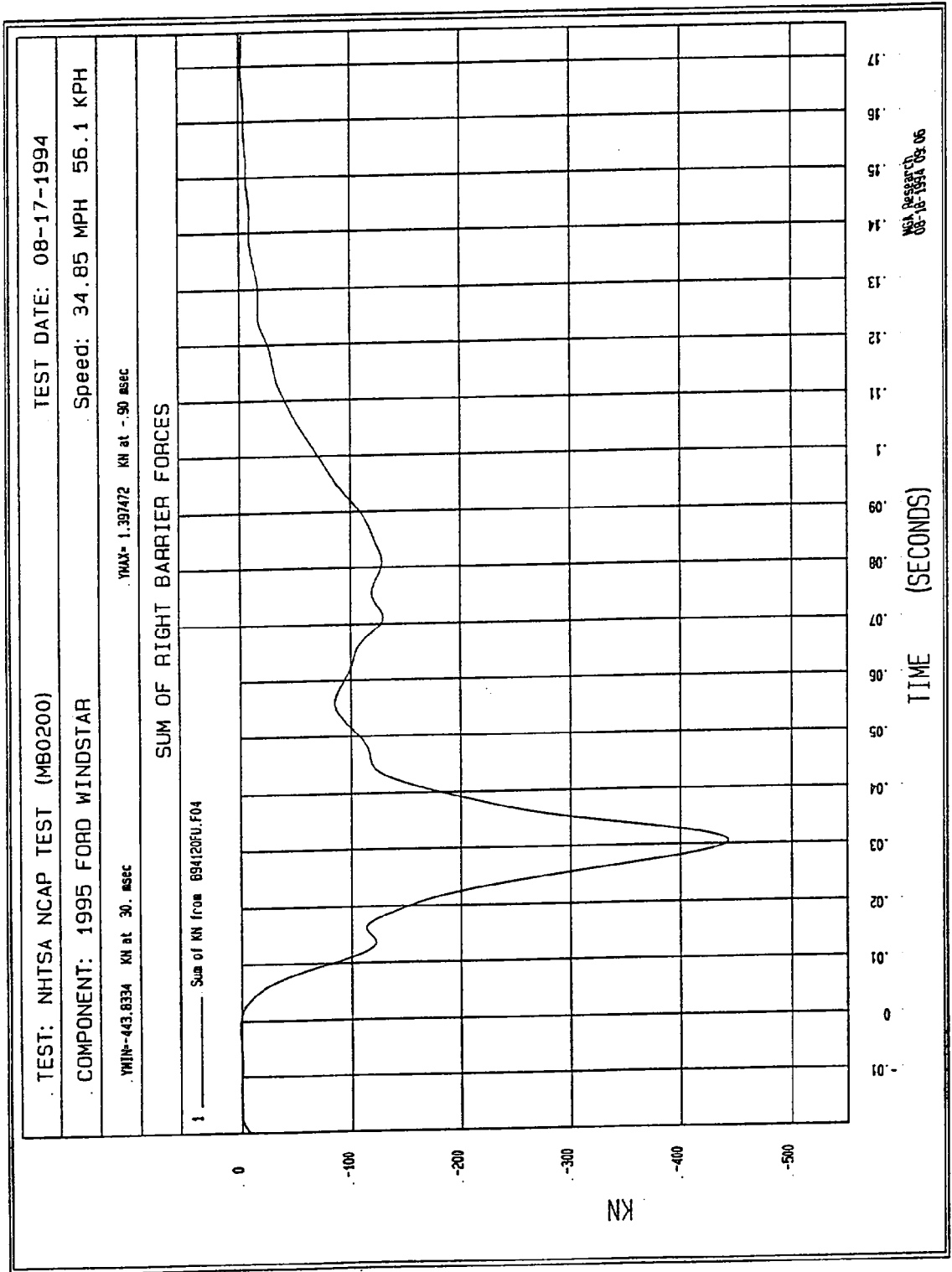


Figure B-33 - Sum of Right Barrier Forces vs. Time

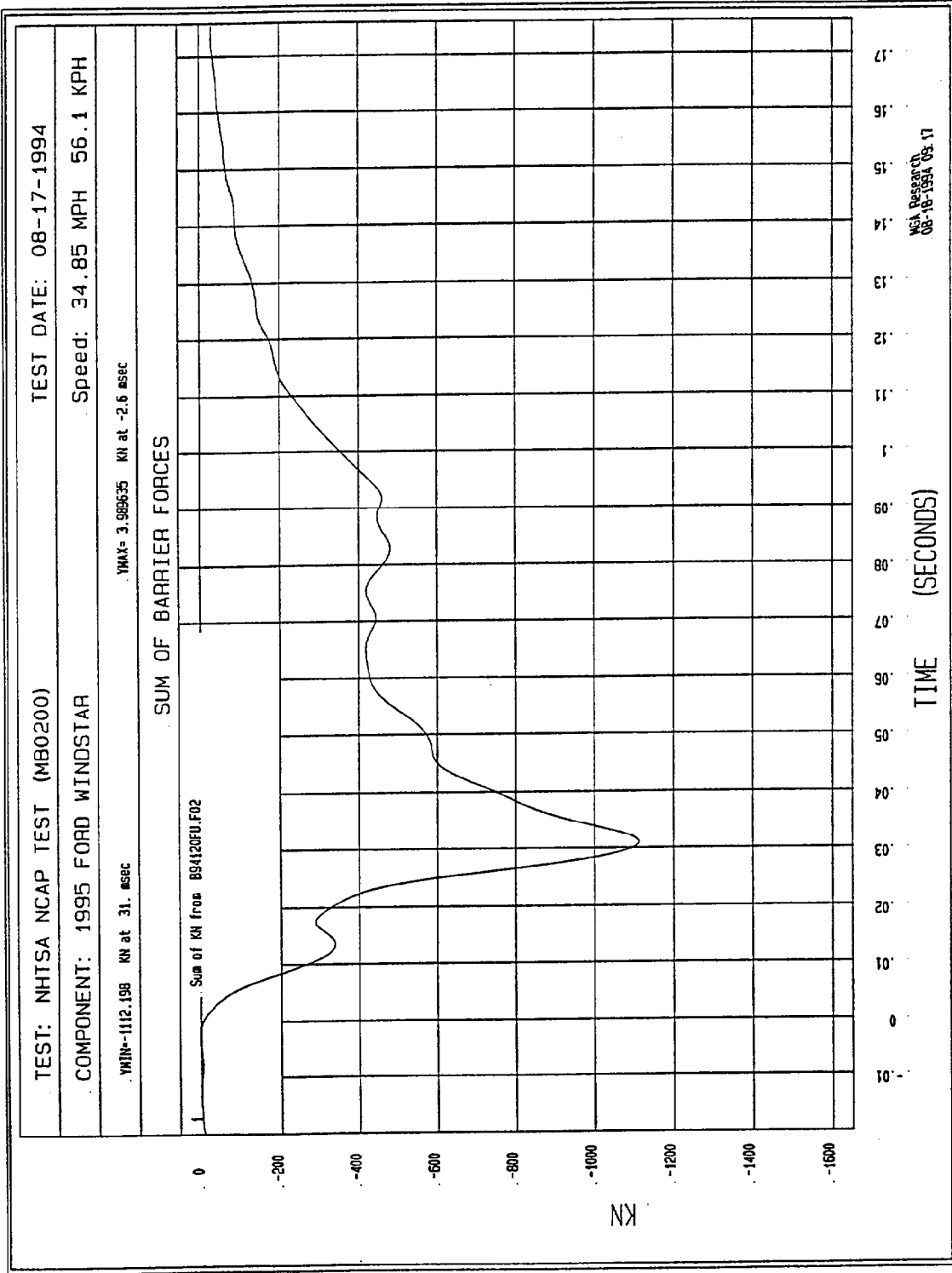


Figure B-34 - Sum of Barrier Forces vs. Time

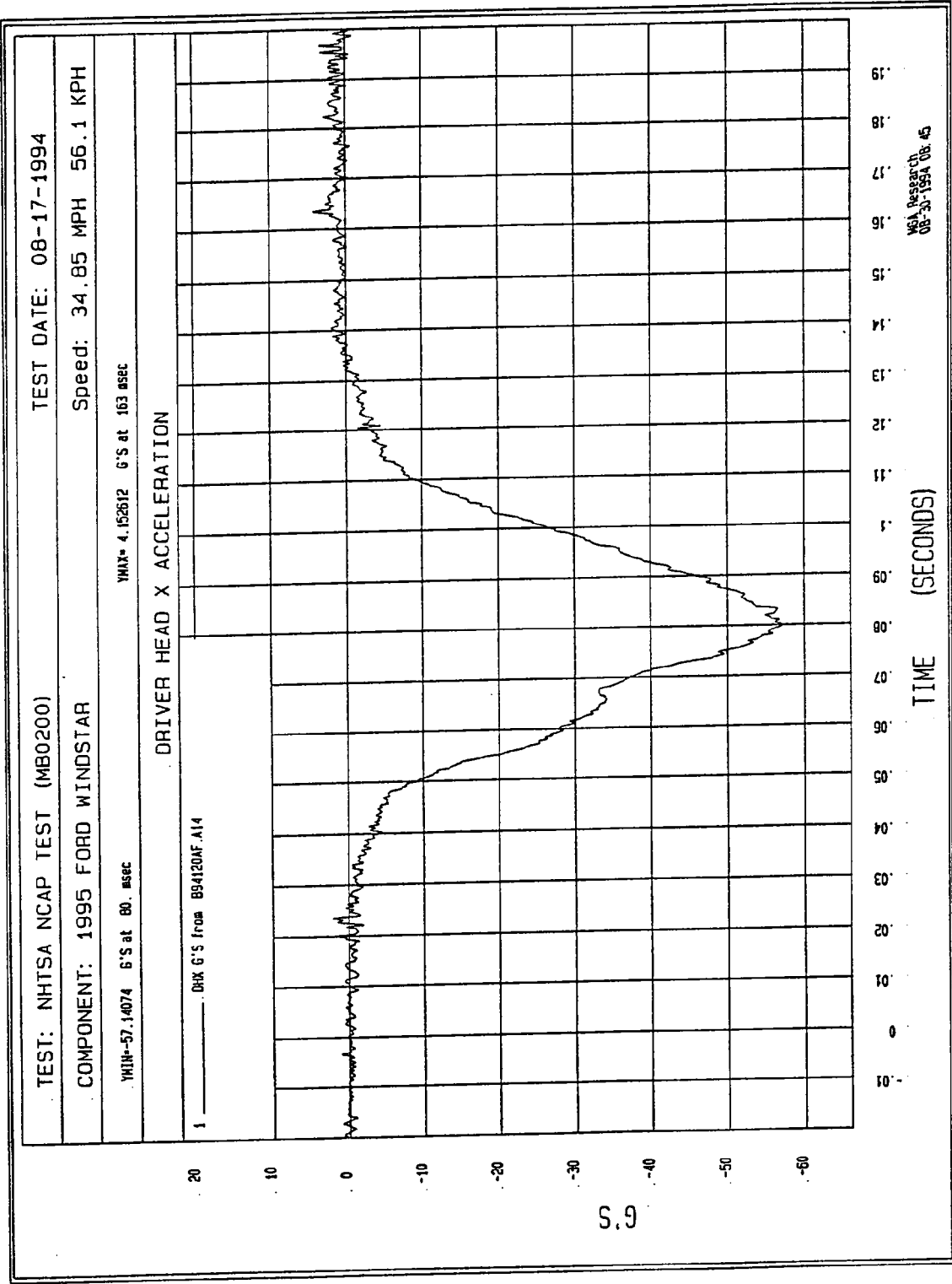


Figure B-35 - Driver Head X Acceleration vs. Time

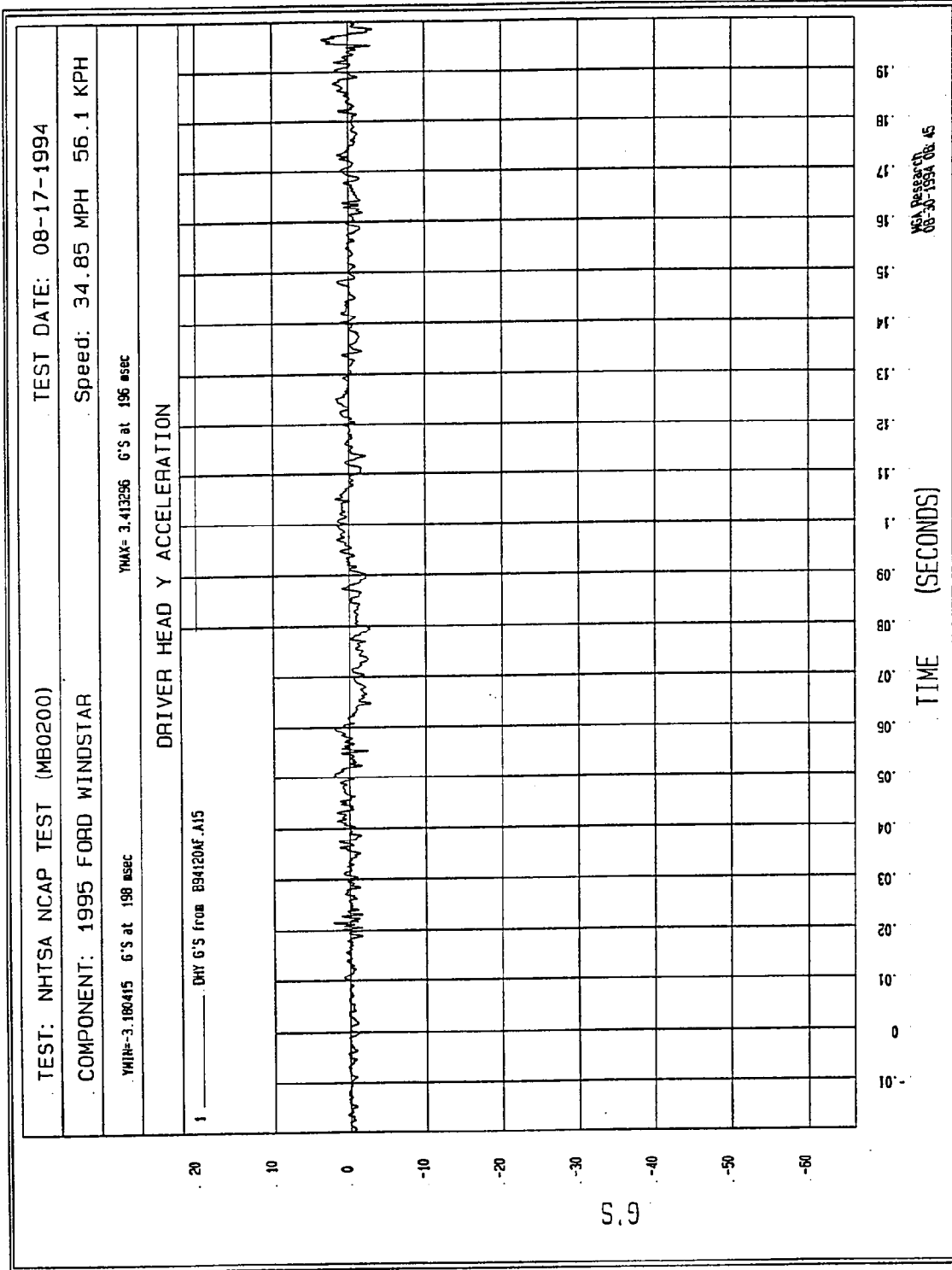


Figure B-36 - Driver Head Y Acceleration vs. Time

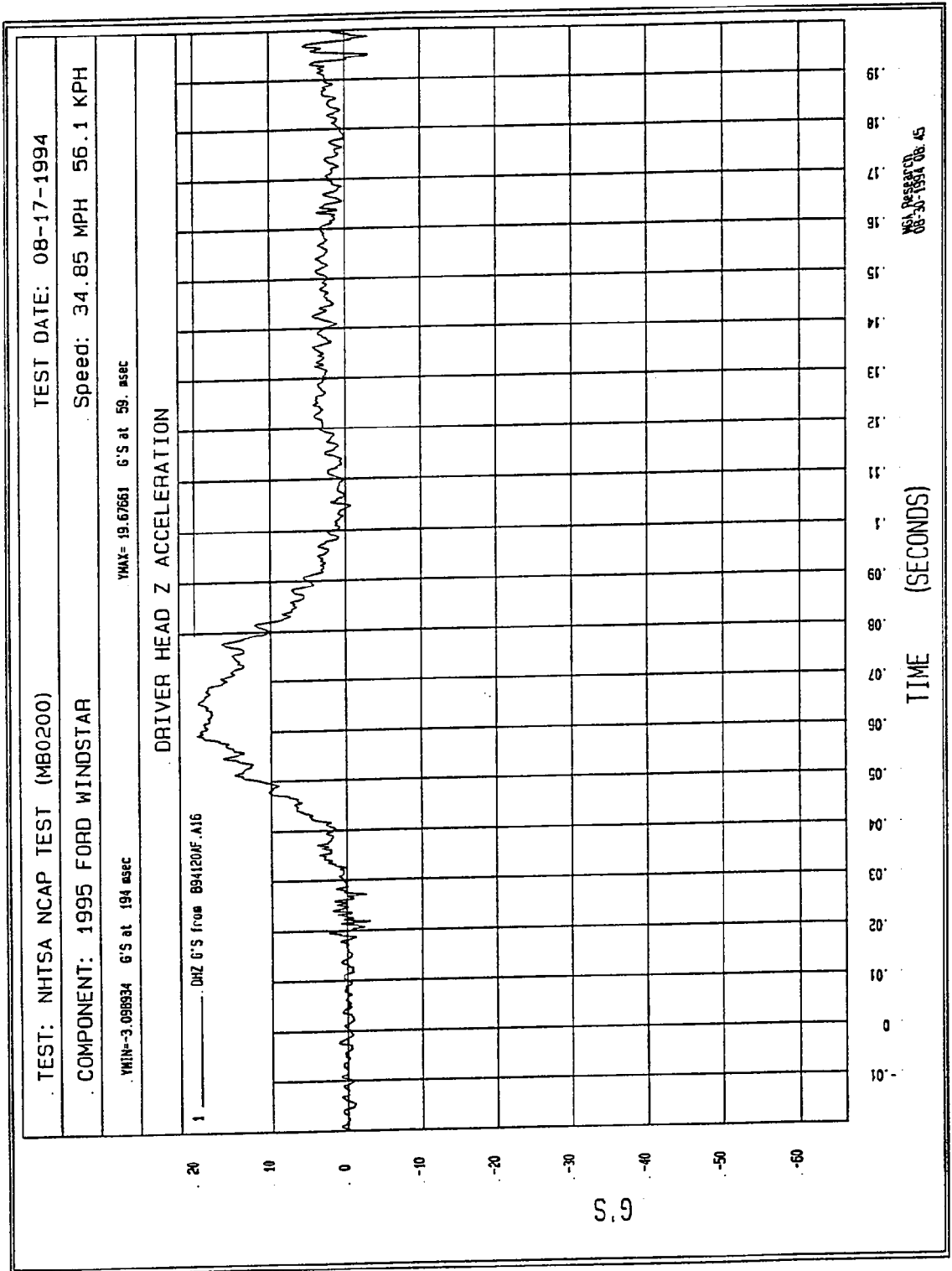


Figure B-37 - Driver Head Z Acceleration vs. Time

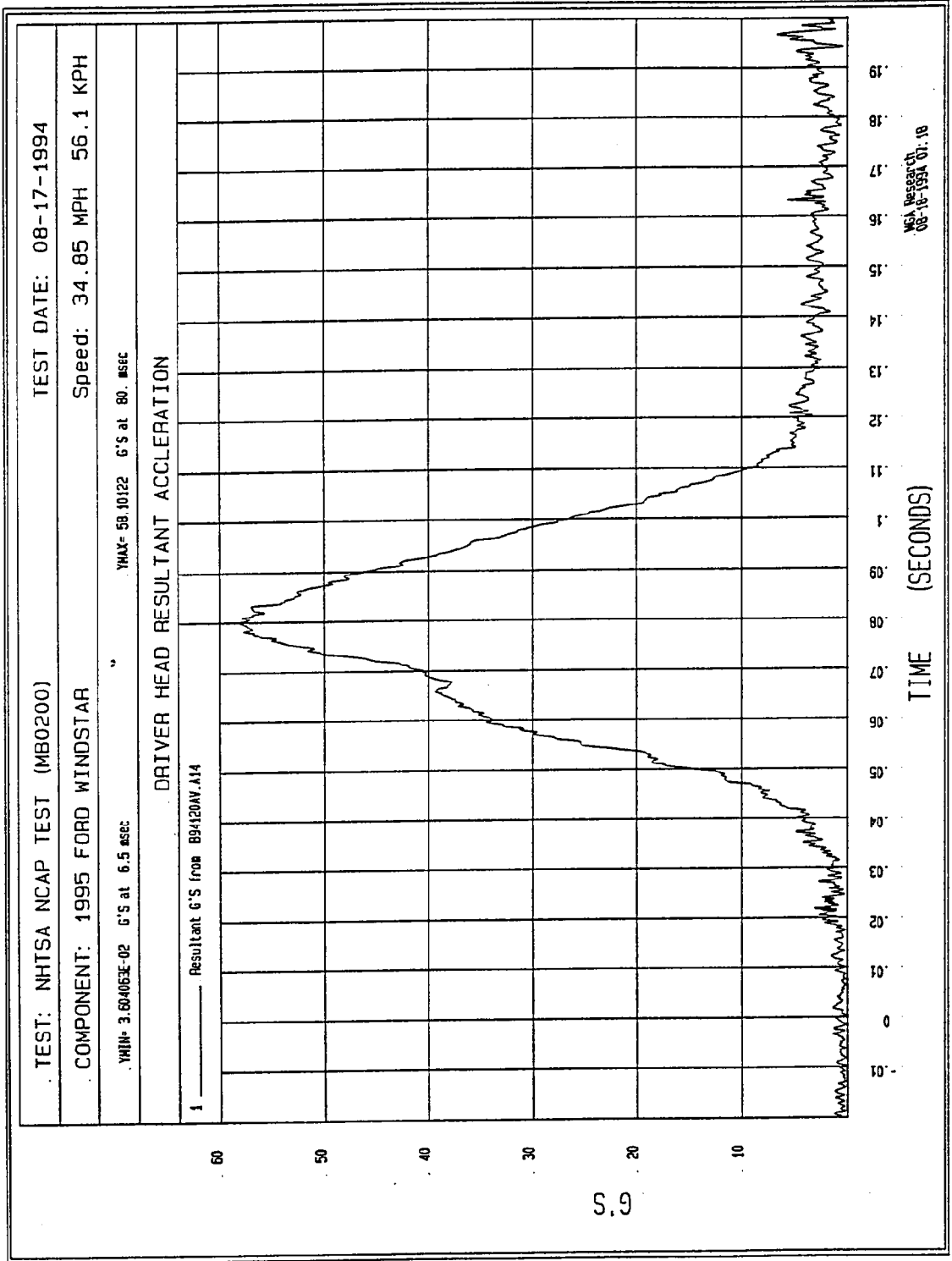


Figure B-38 - Driver Head Resultant Acceleration vs. Time

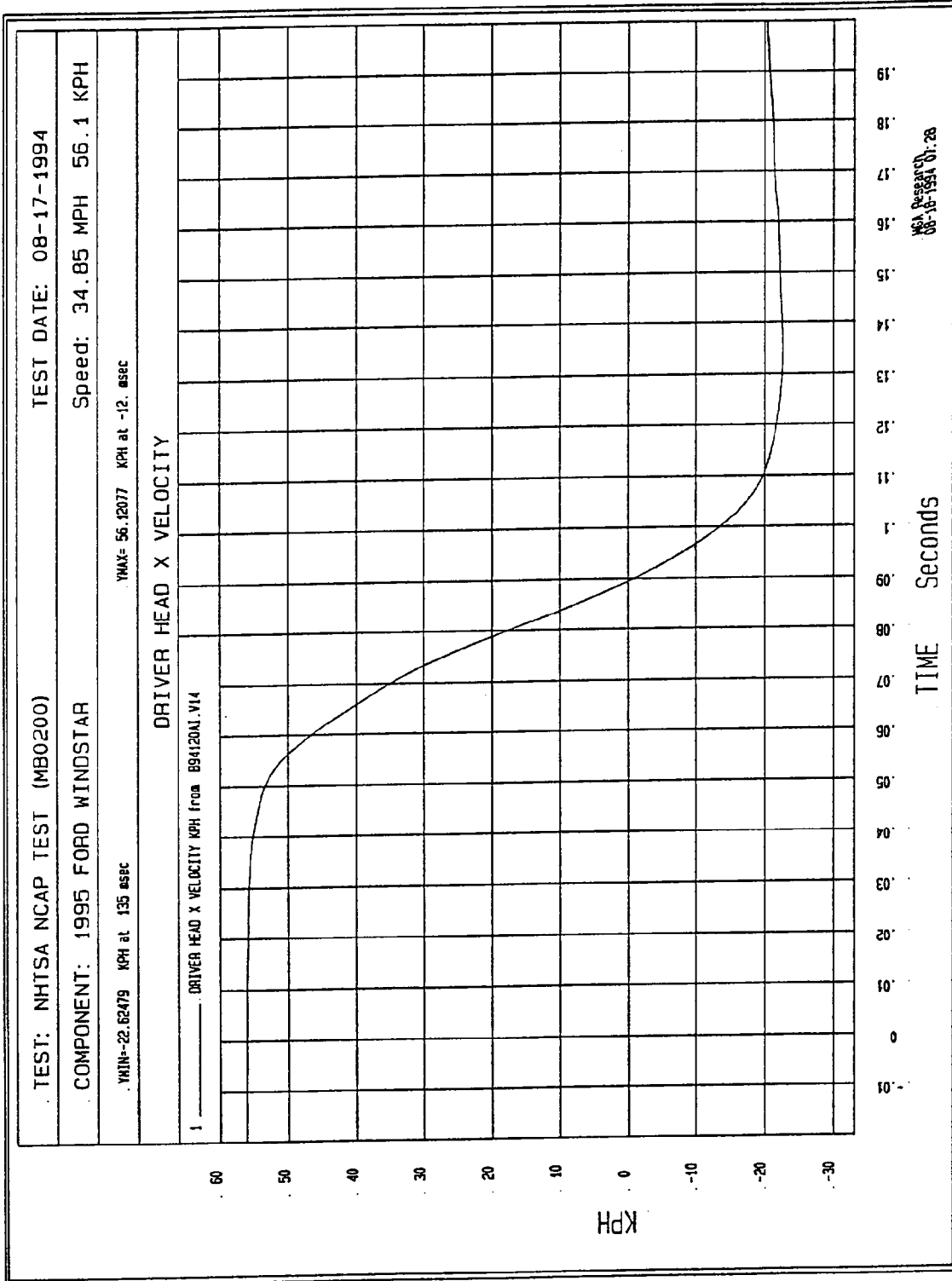


Figure B-39 - Driver Head X Velocity vs. Time

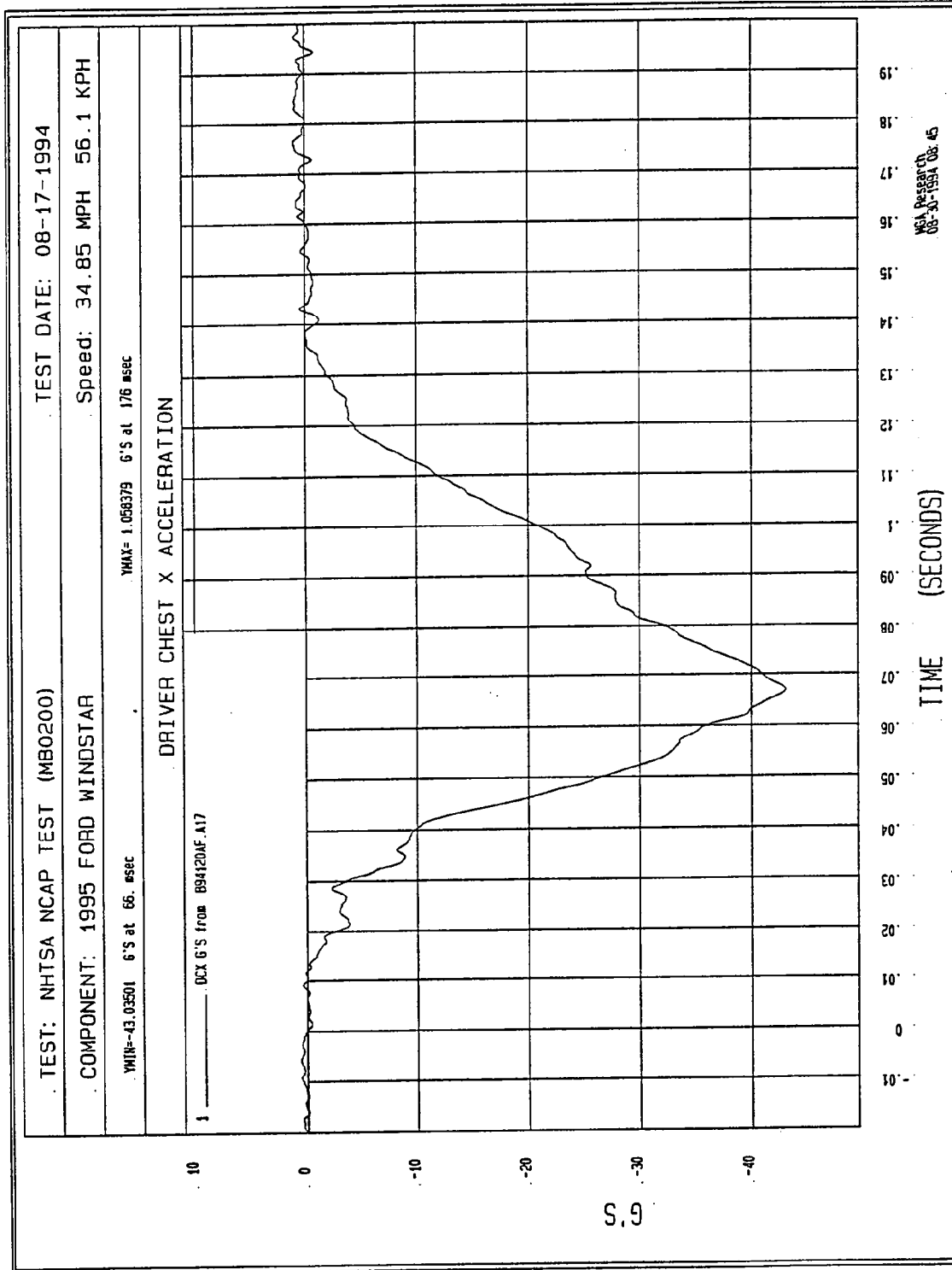


Figure B-40 - Driver Chest X Acceleration vs. Time

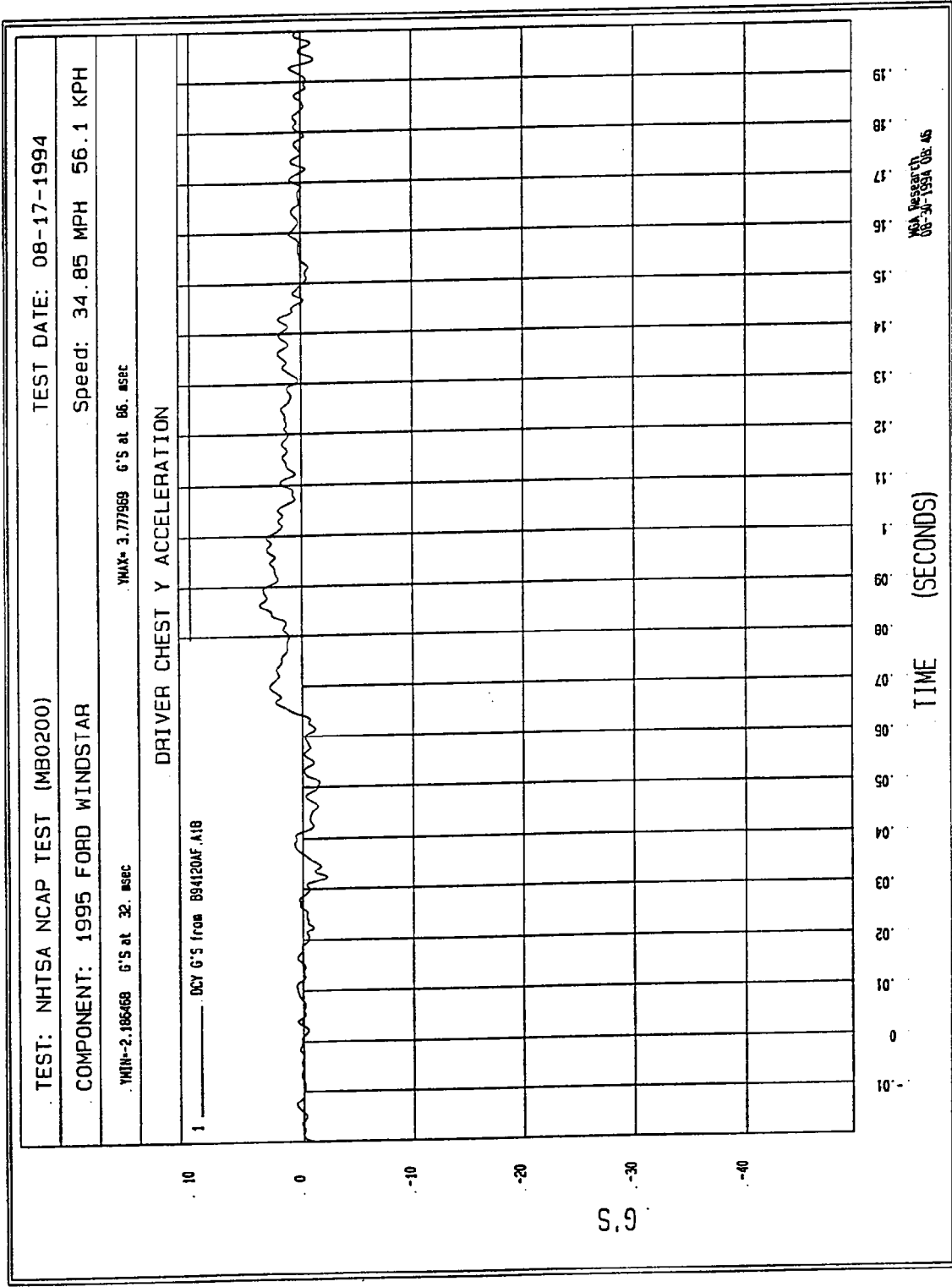


Figure B-41 - Driver Chest Y Acceleration vs. Time

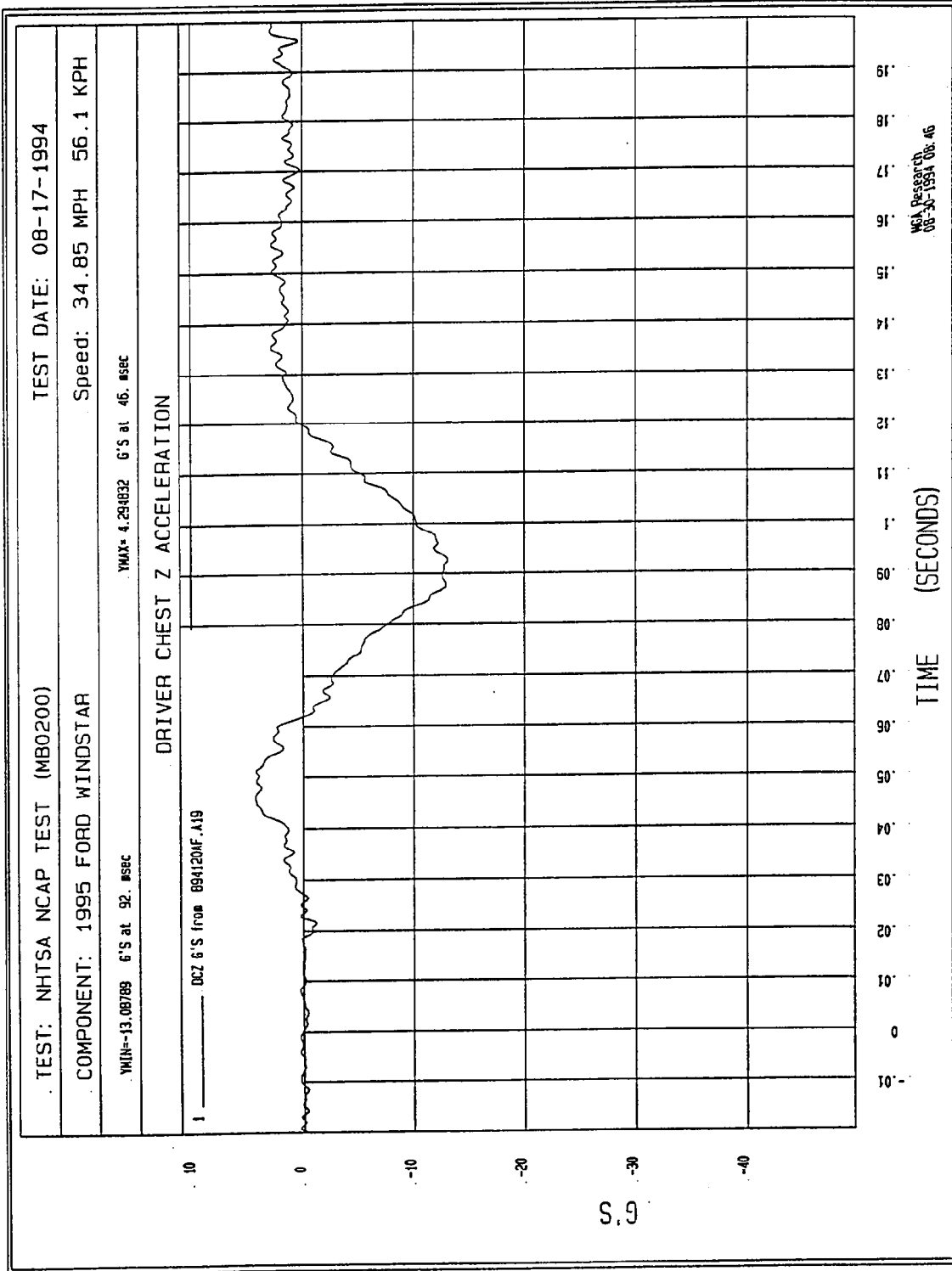


Figure B-42 - Driver Chest Z Acceleration vs. Time

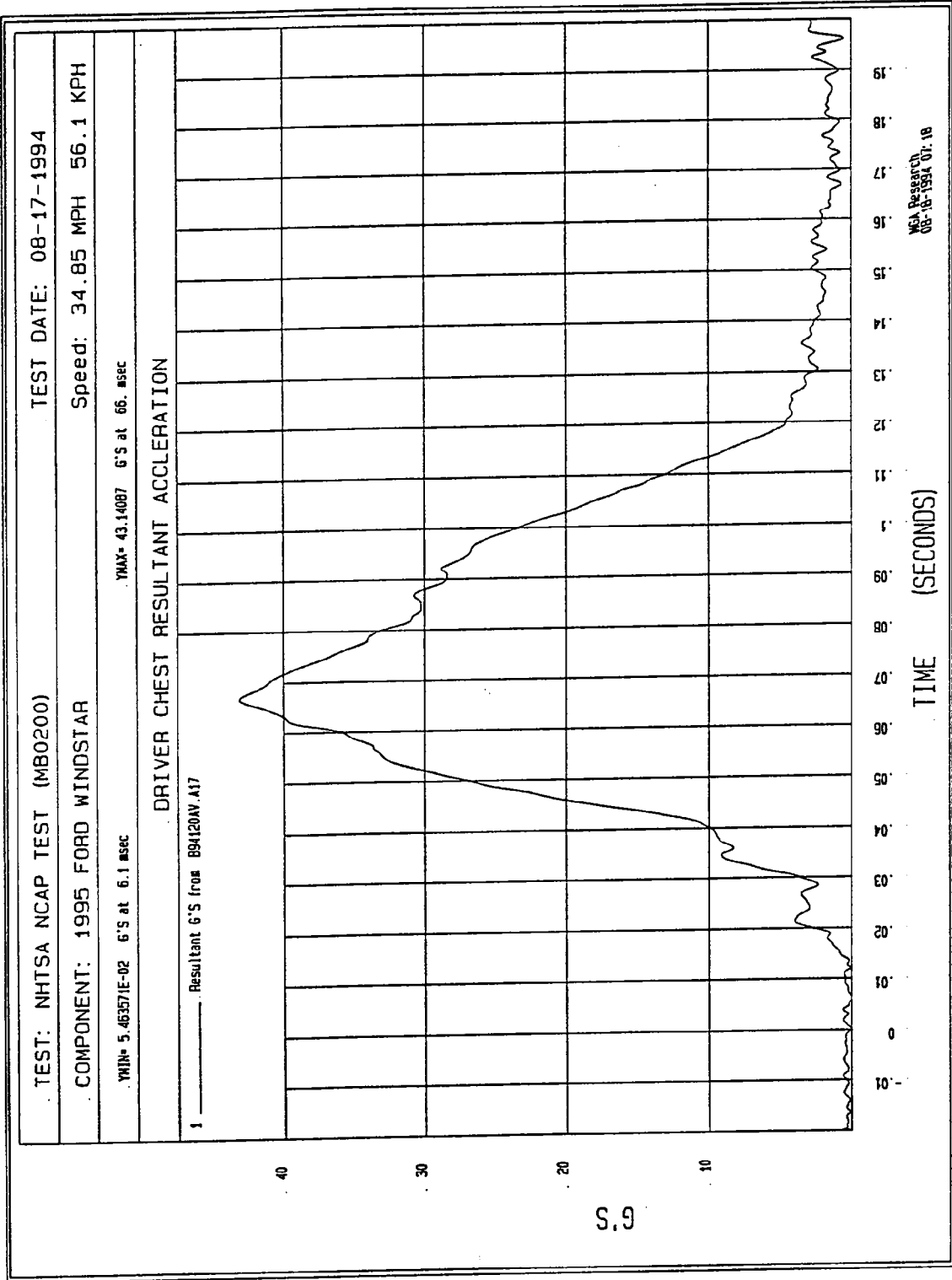


Figure B-43 - Driver Chest Resultant vs. Time

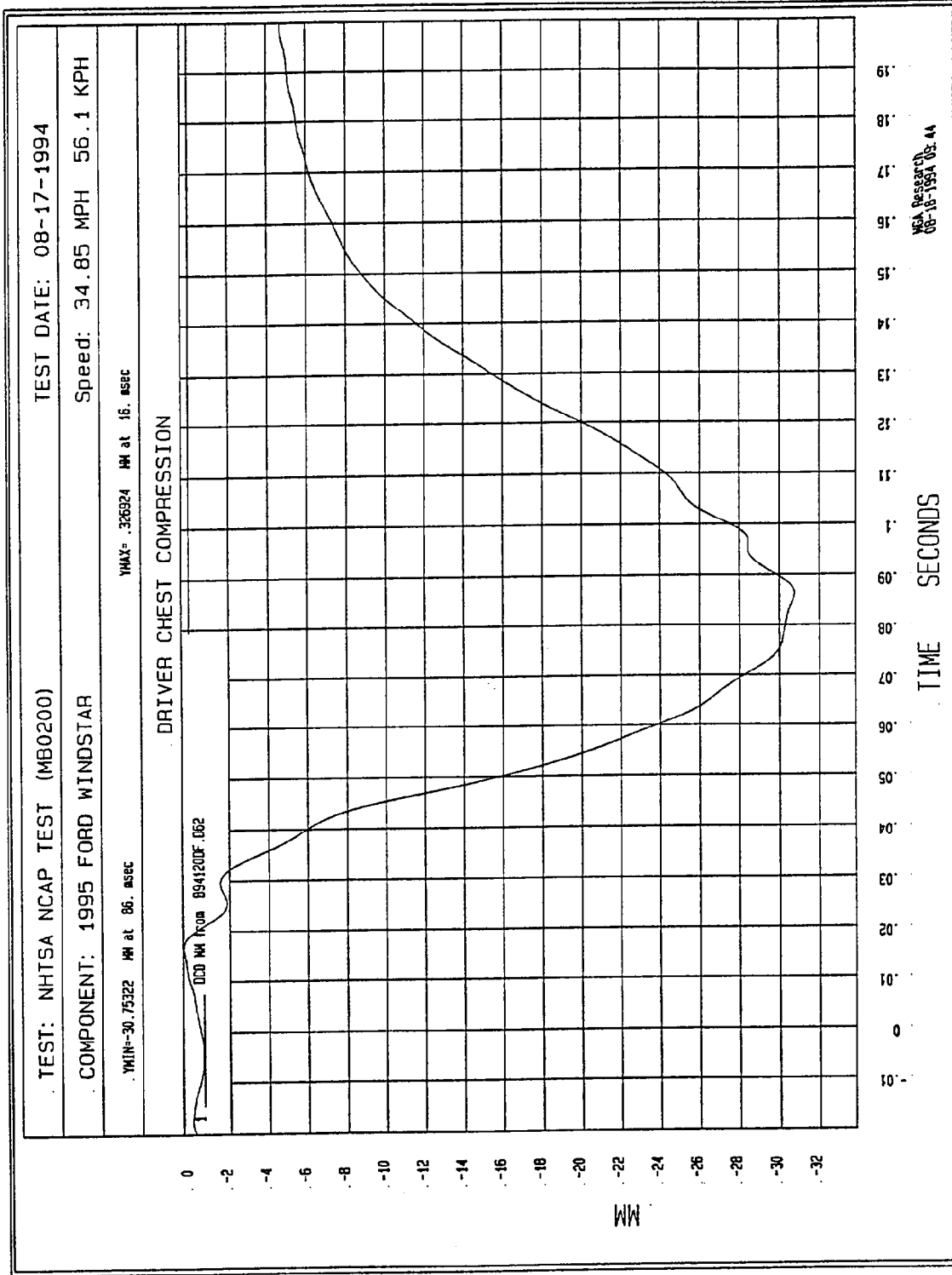


Figure B-44 - Driver Chest Compression vs. Time

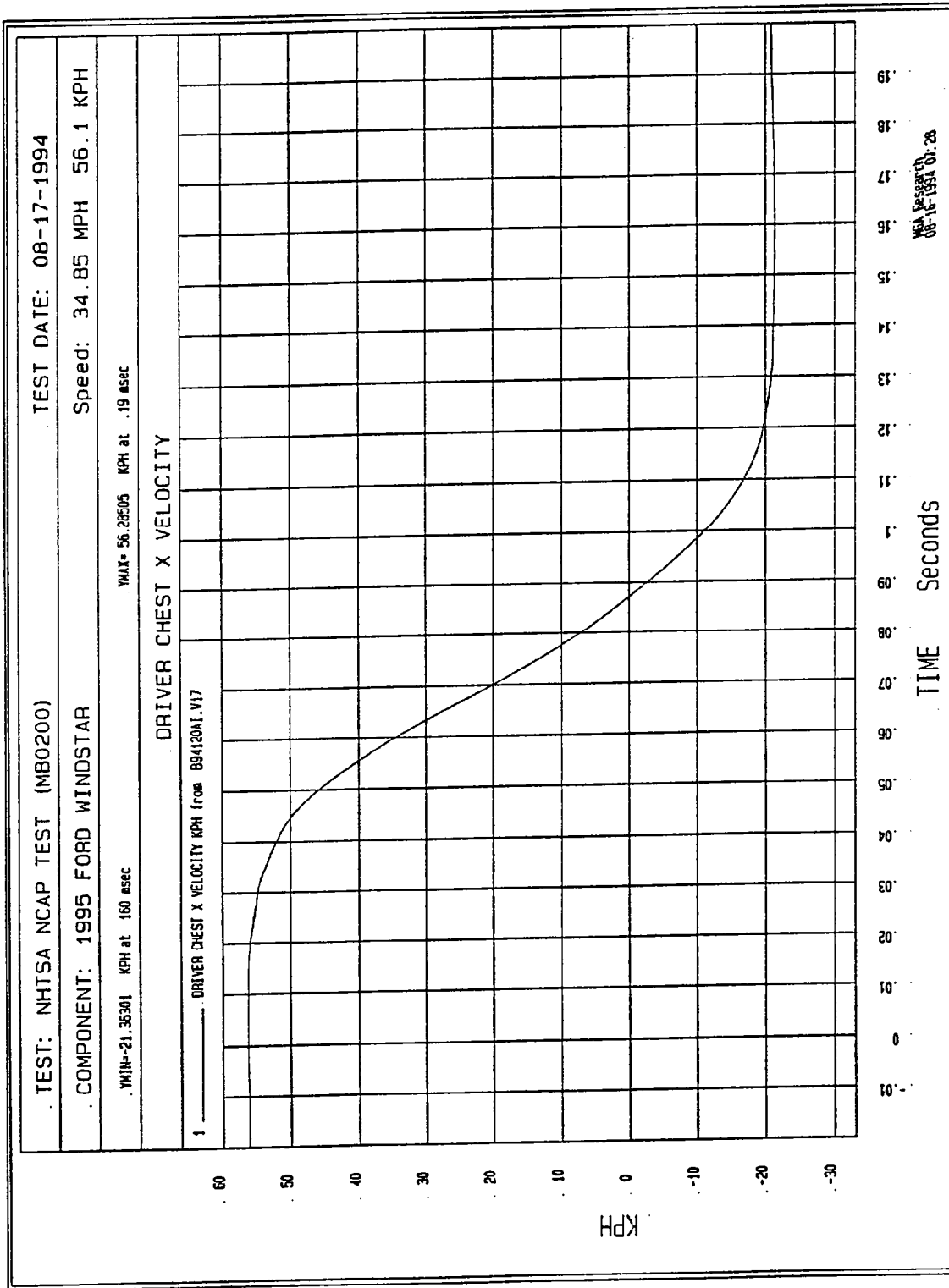


Figure B-45 - Driver Chest X Velocity vs. Time

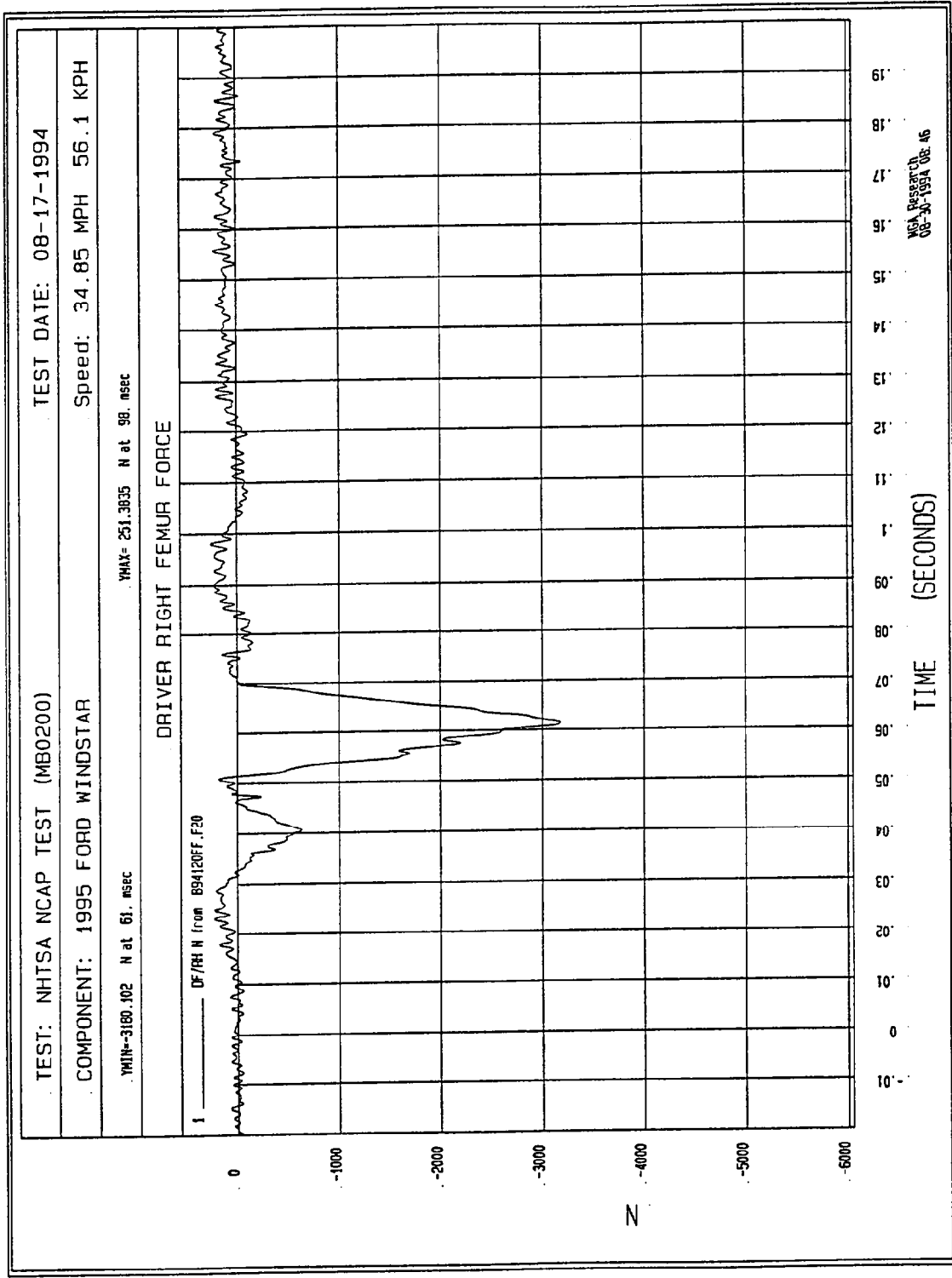


Figure B-46 - Driver Right Femur Force vs. Time

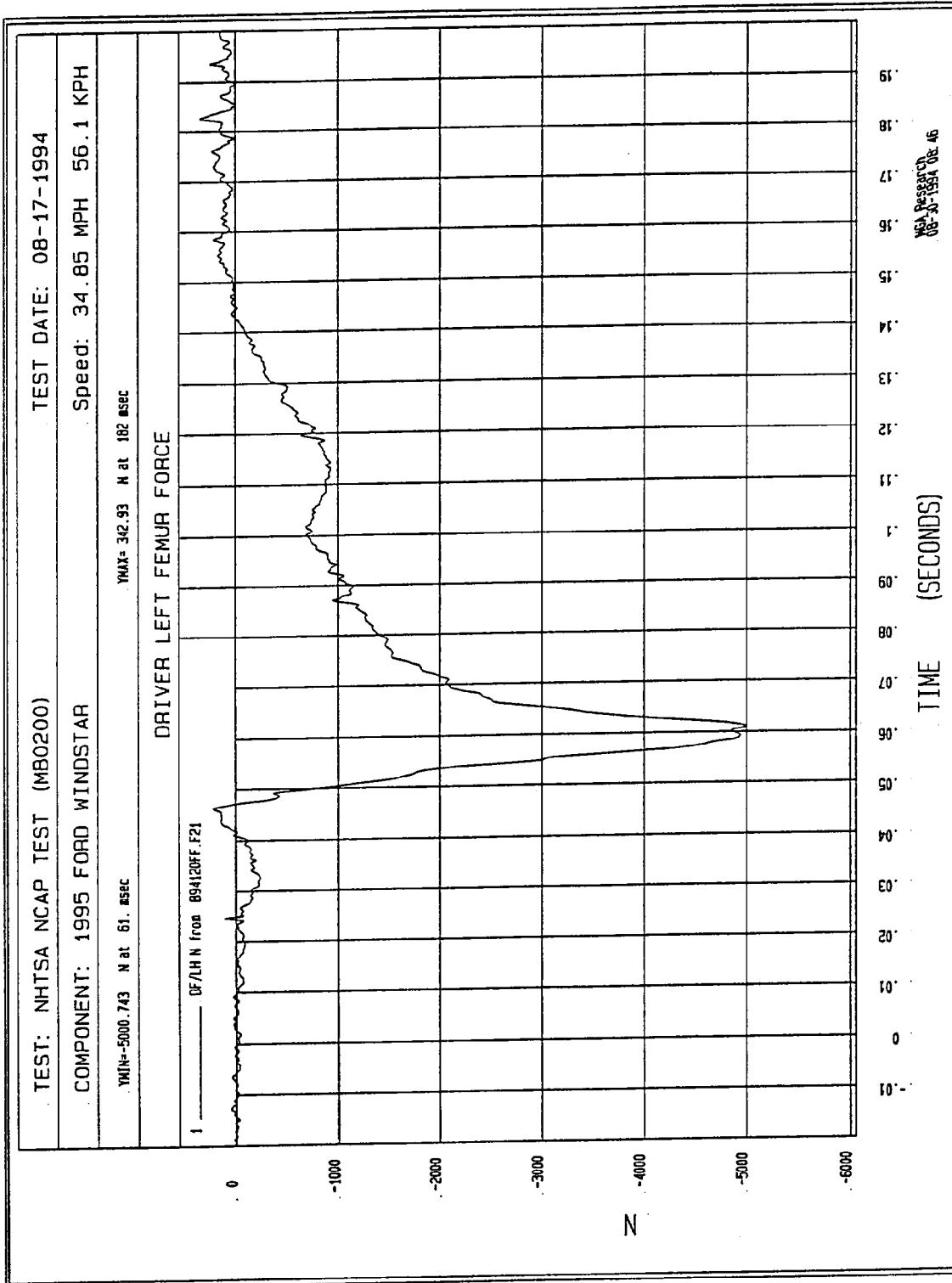


Figure B-47 - Driver Left Femur Force vs. Time

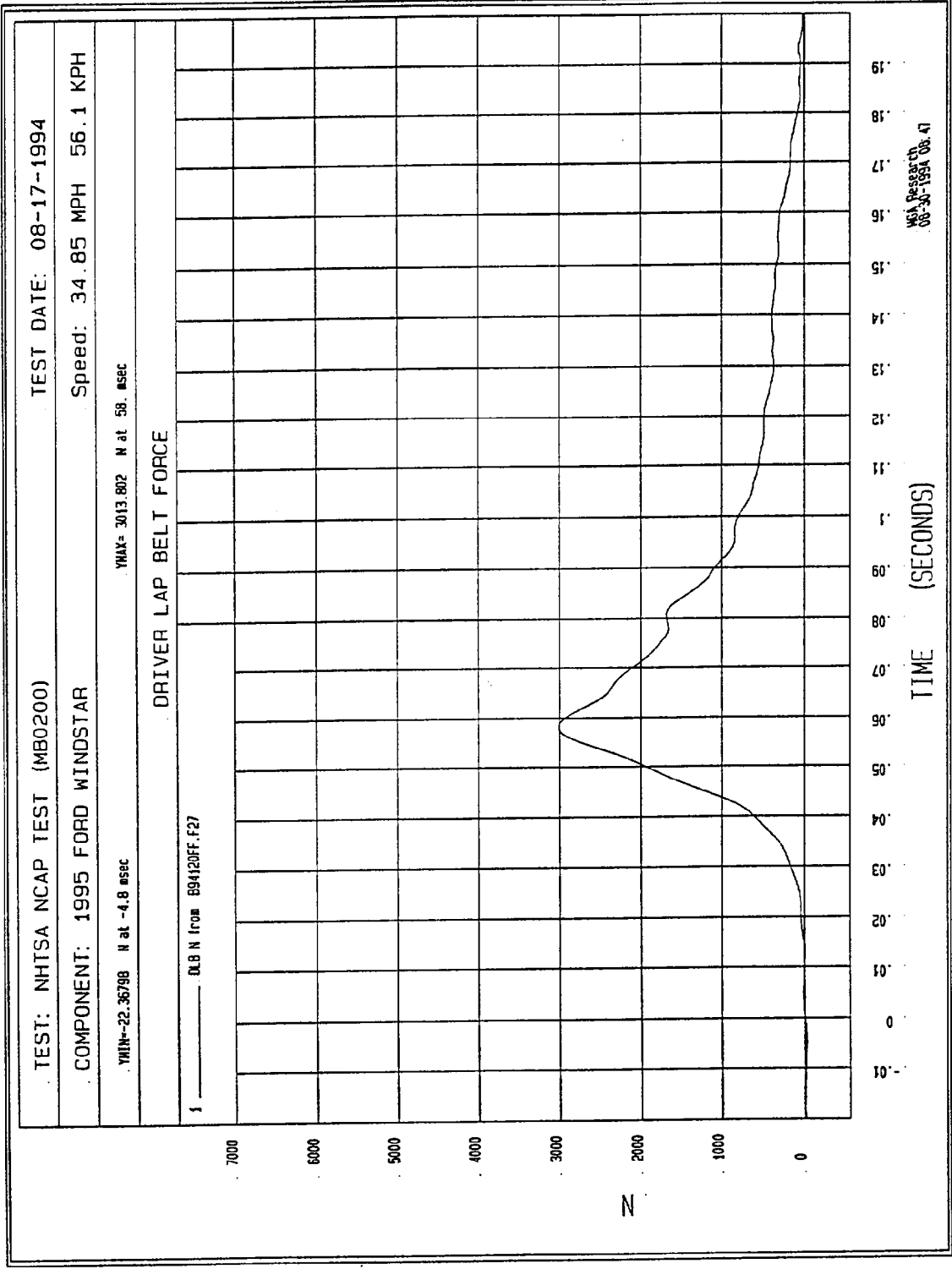


Figure B-48 - Driver Lap Belt Force vs. Time

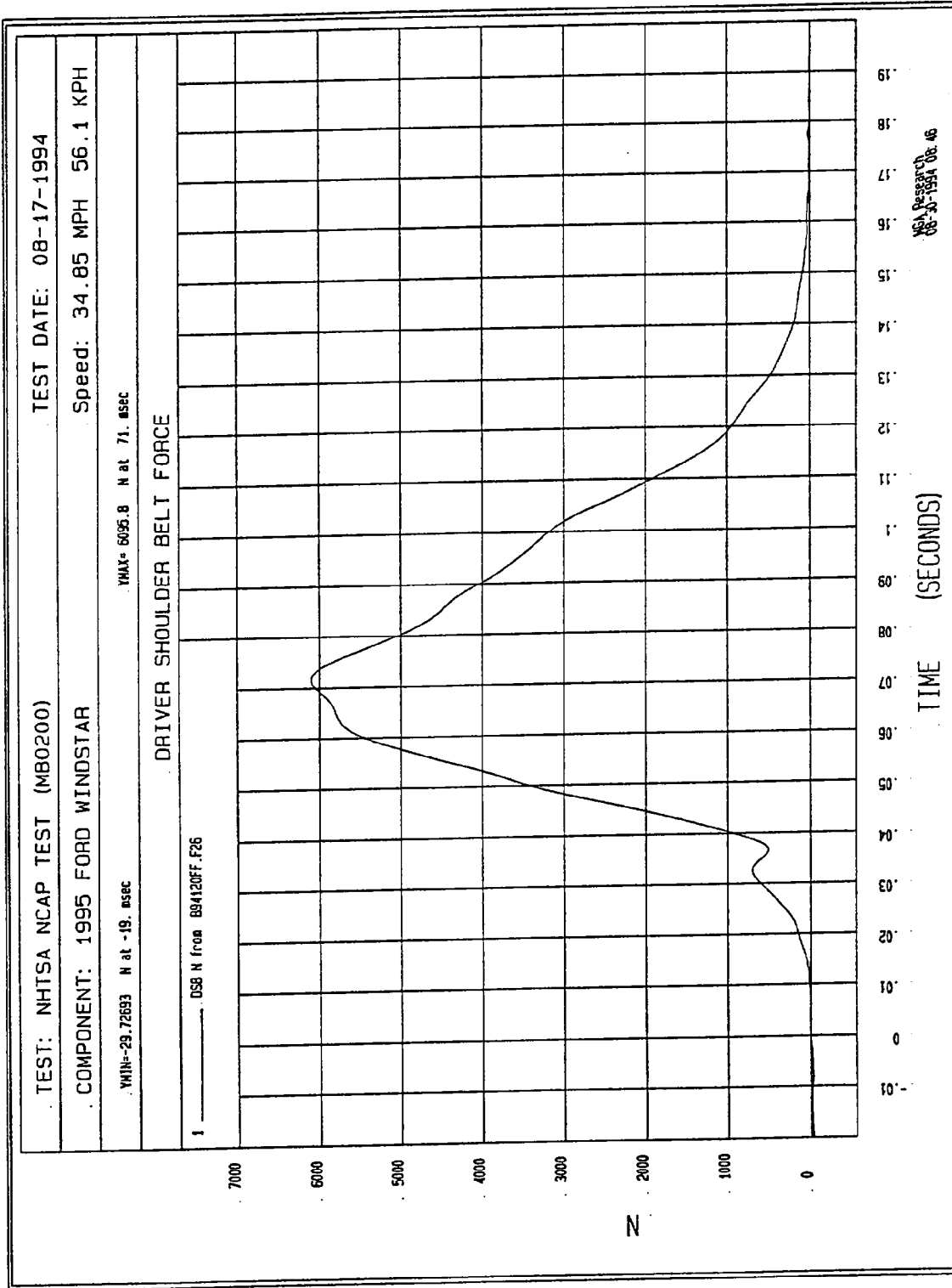


Figure B-49 - Driver Shoulder Belt Force vs. Time

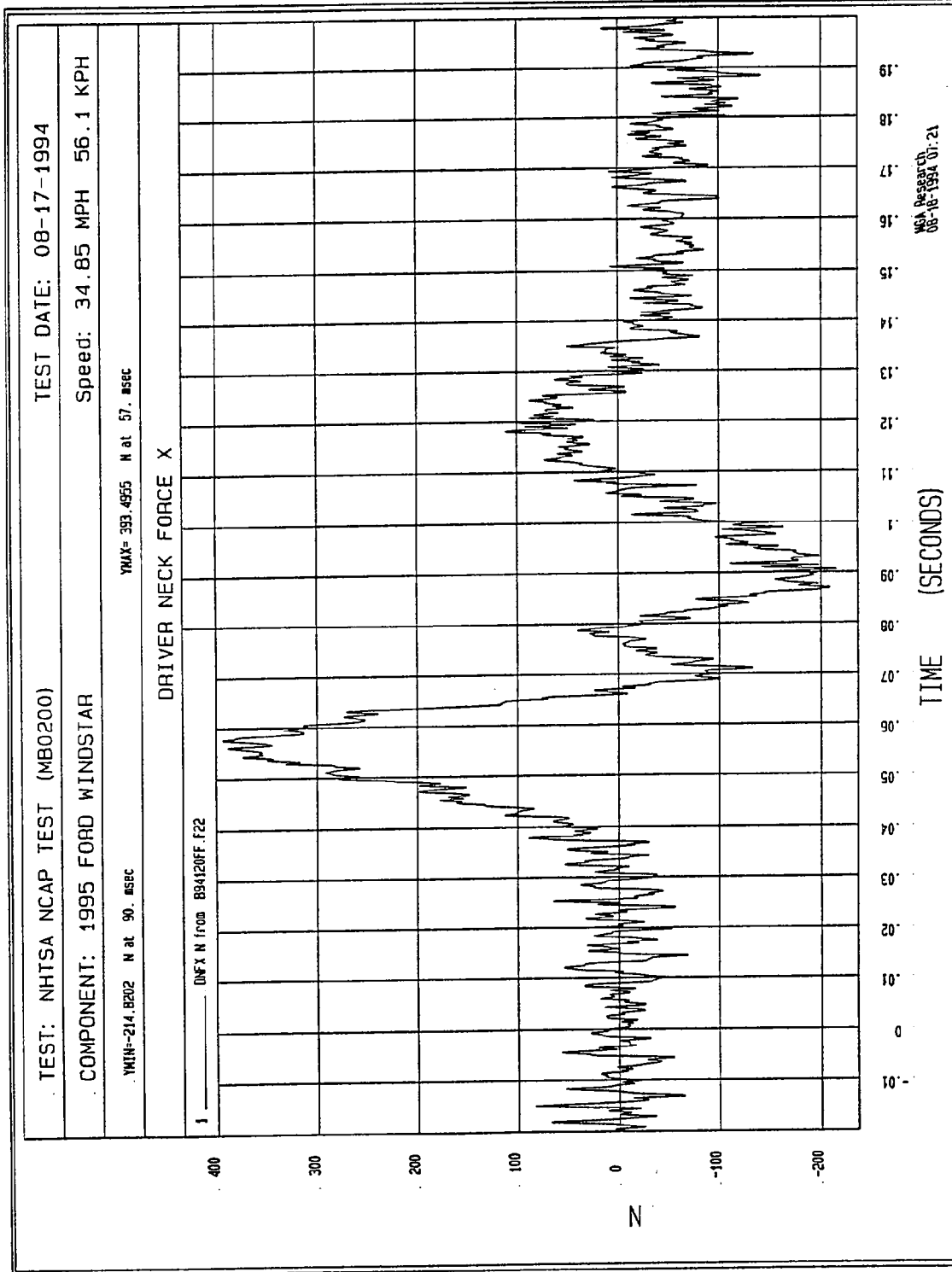


Figure B-50 - Driver Neck Force X vs. Time

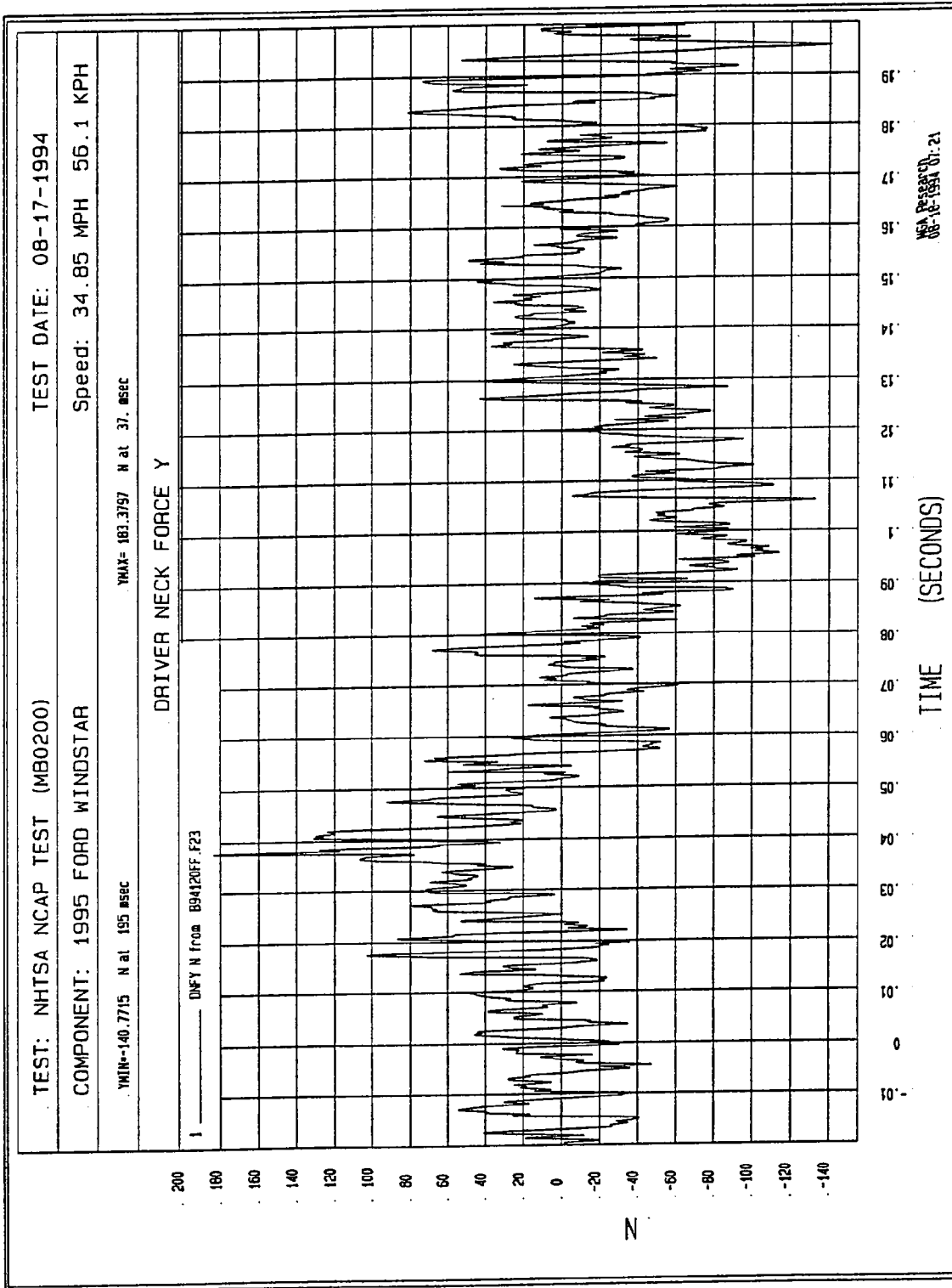


Figure B-51 - Driver Neck Force Y vs. Time

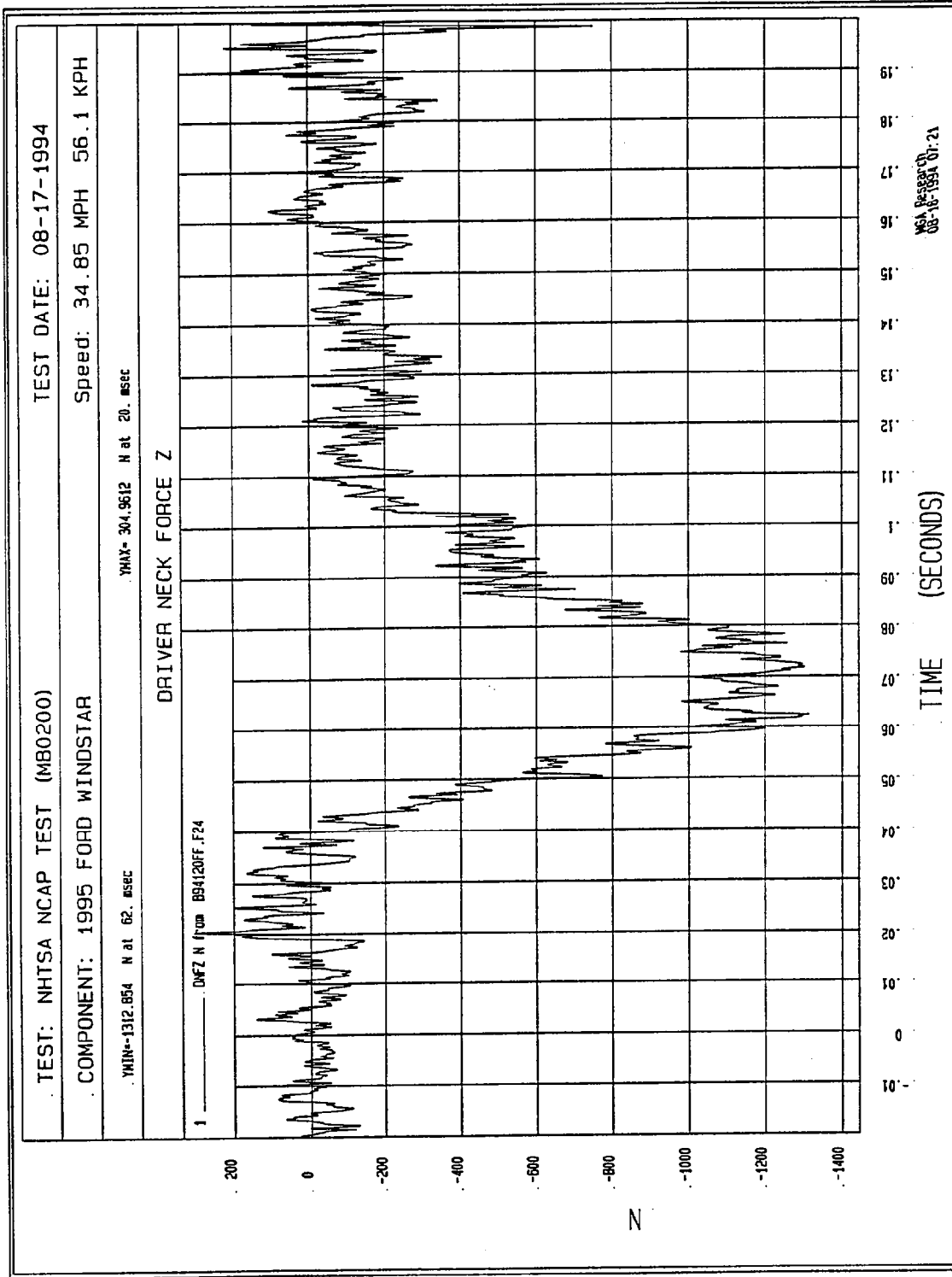


Figure B-52 - Driver Neck Force Z vs. Time

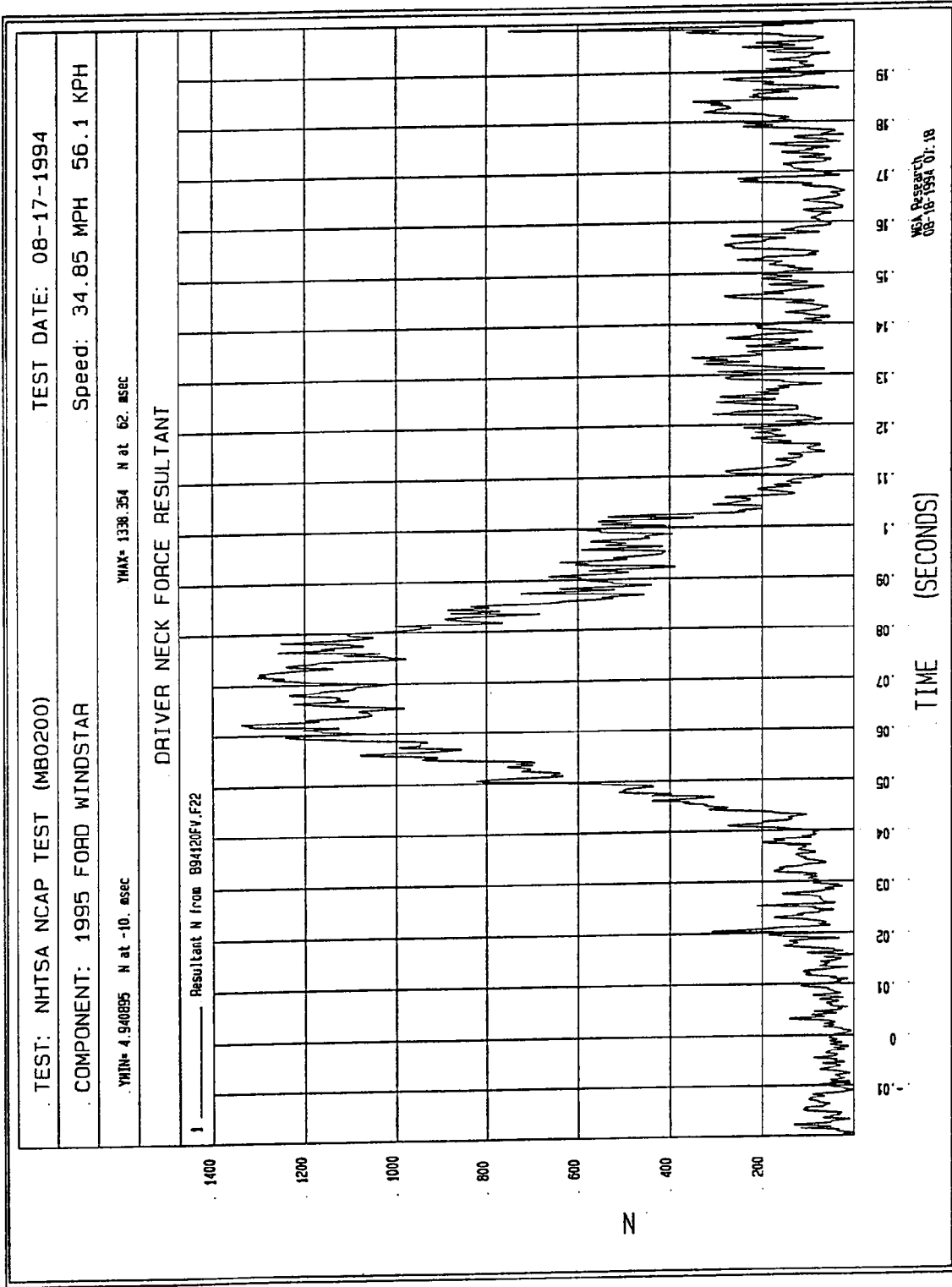


Figure B-53 - Driver Neck Force Resultant vs. Time

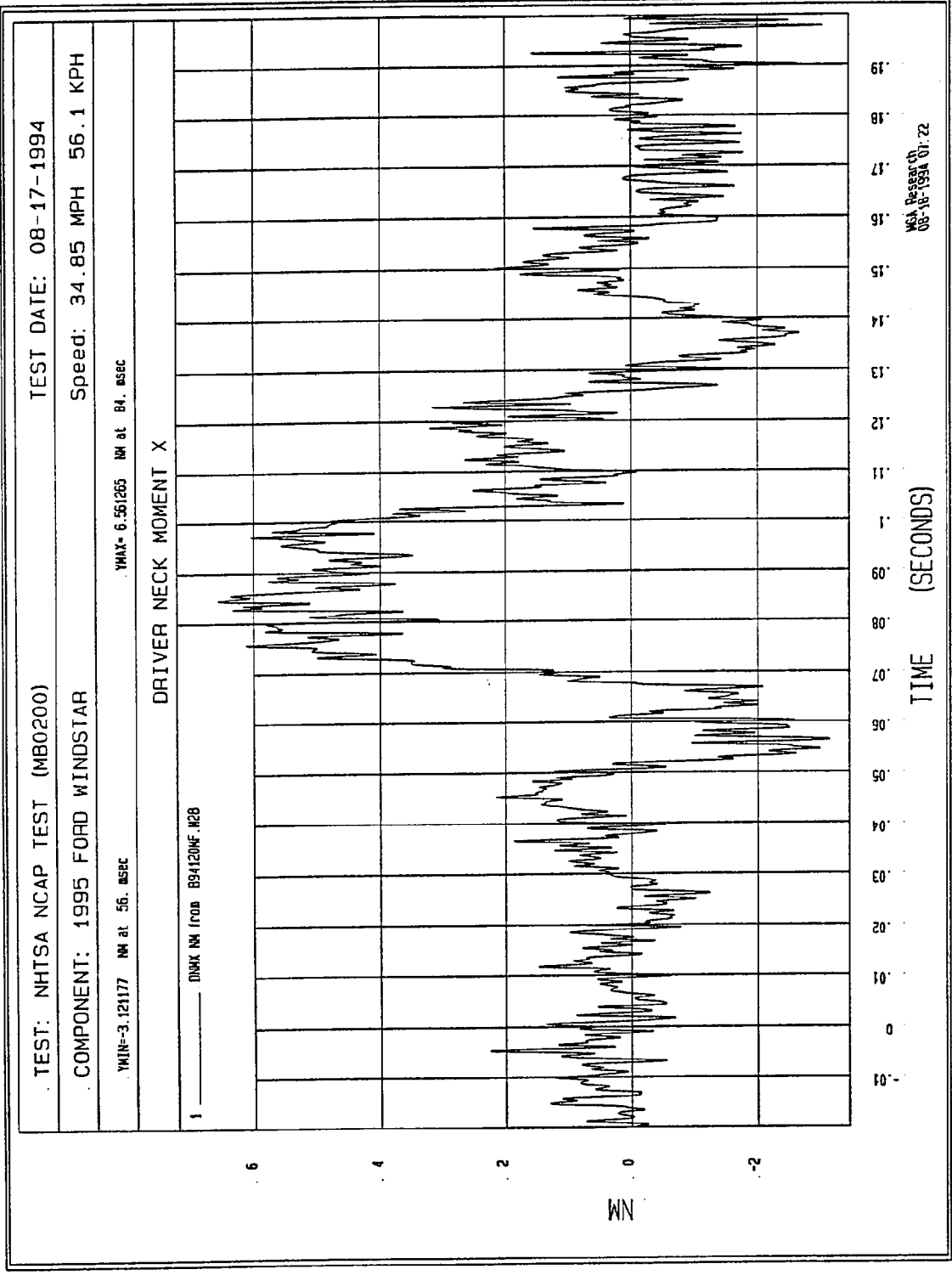
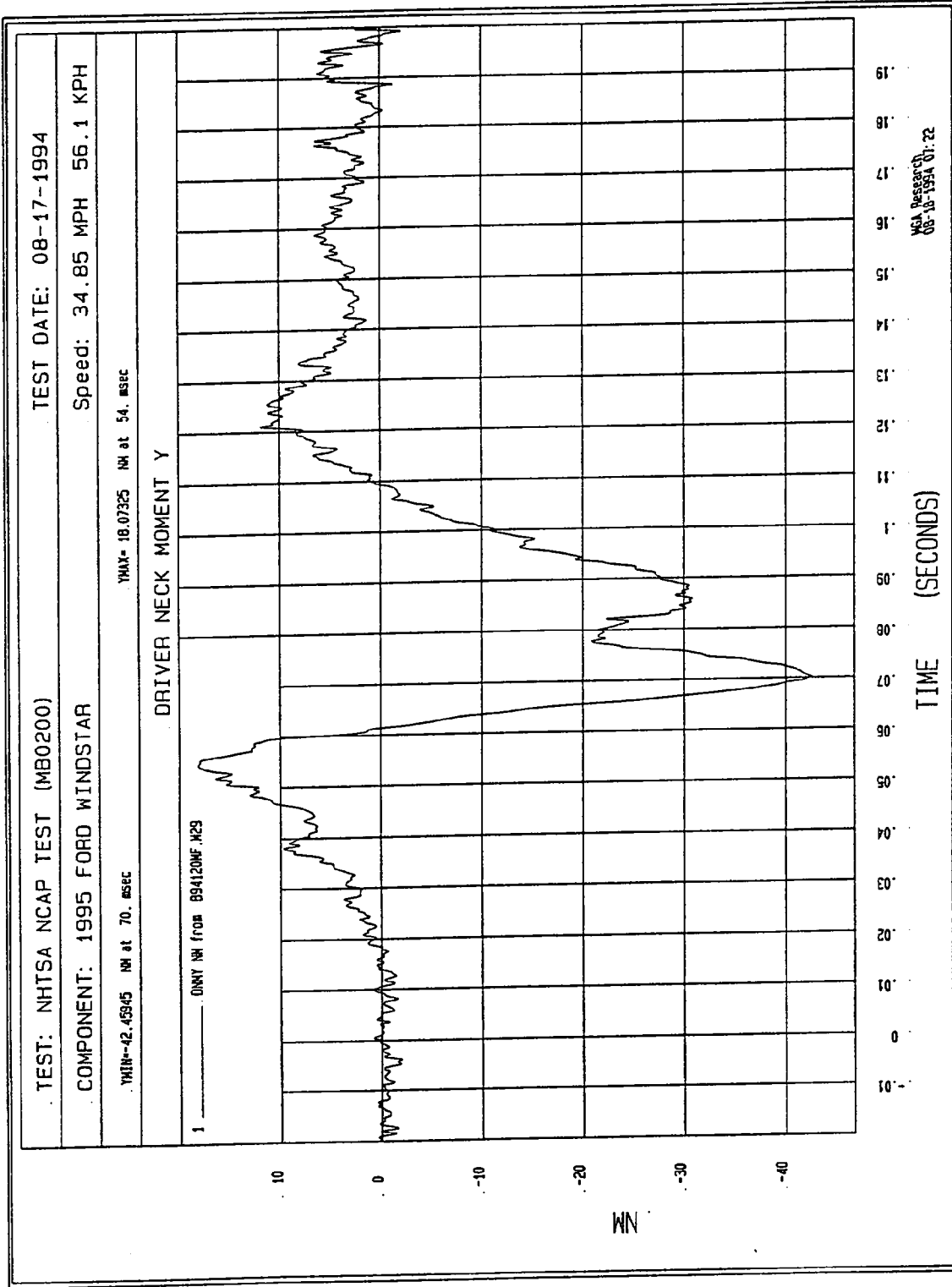


Figure B-54 - Driver Neck Moment X vs. Time



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Figure B-55 - Driver Neck Moment Y vs. Time

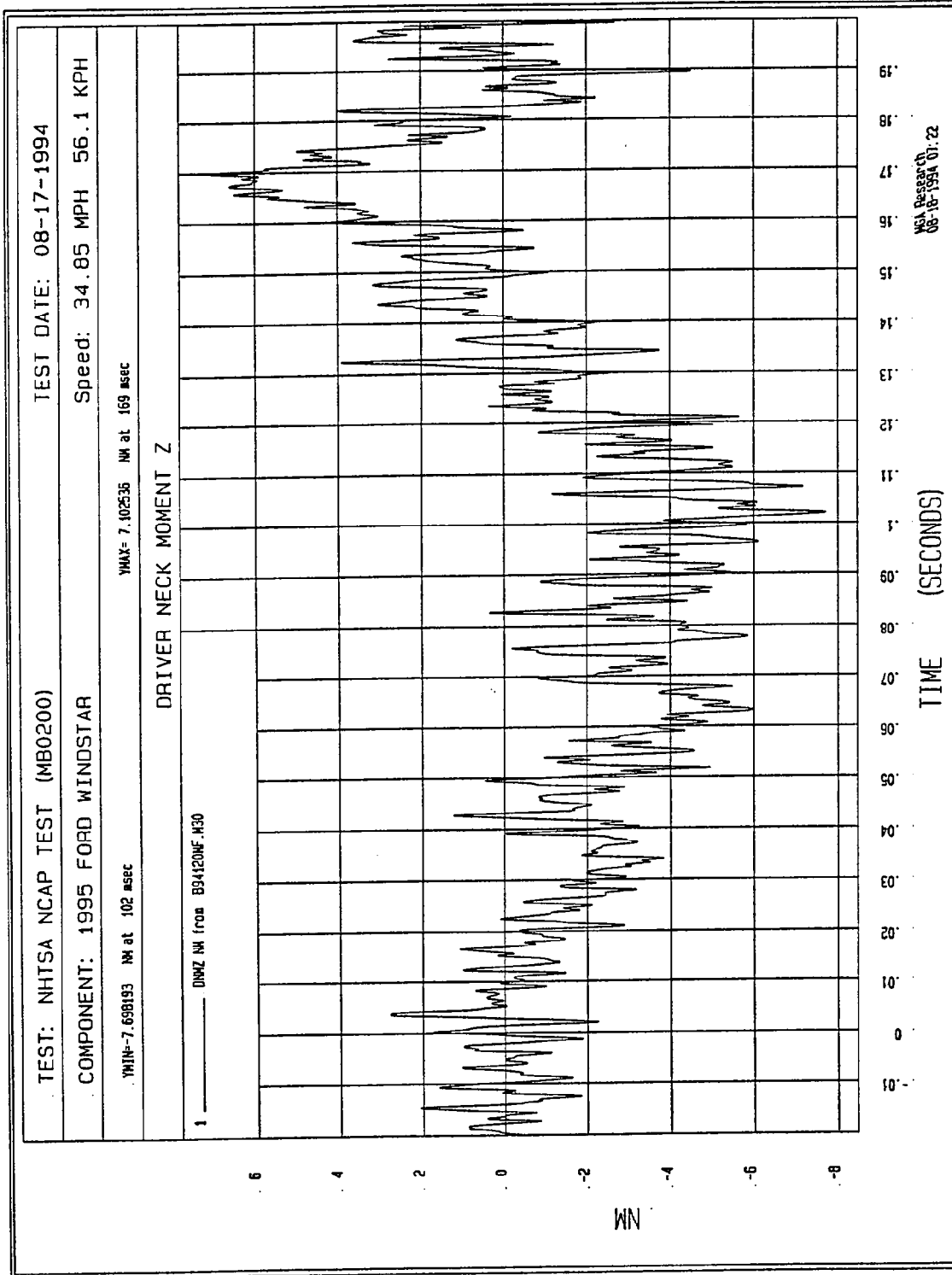


Figure B-56 - Driver Neck Moment Z vs. Time

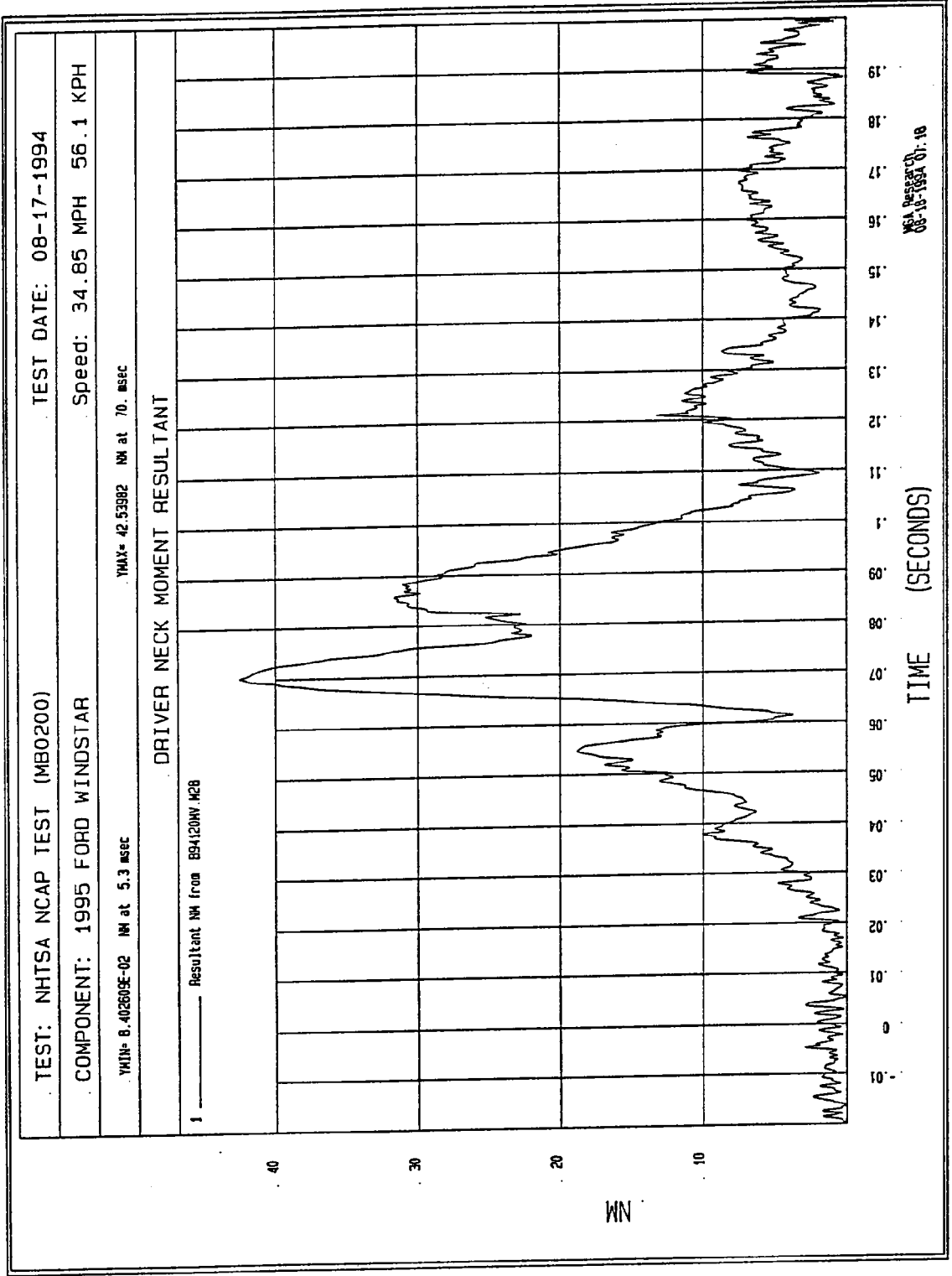
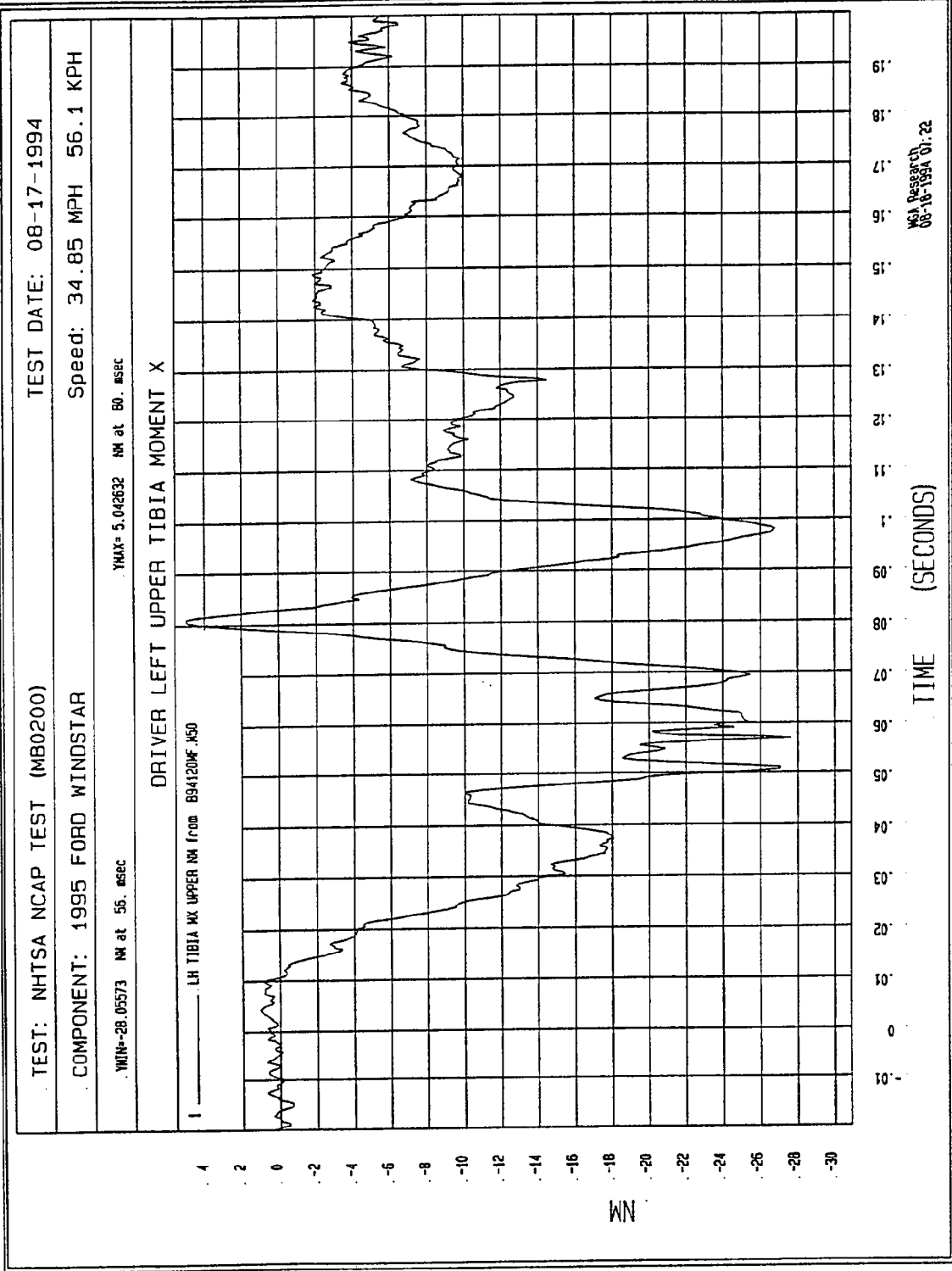


Figure B-57 - Driver Neck Moment Resultant vs. Time



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Figure B-58 - Driver Left Upper Tibia Moment X vs. Time

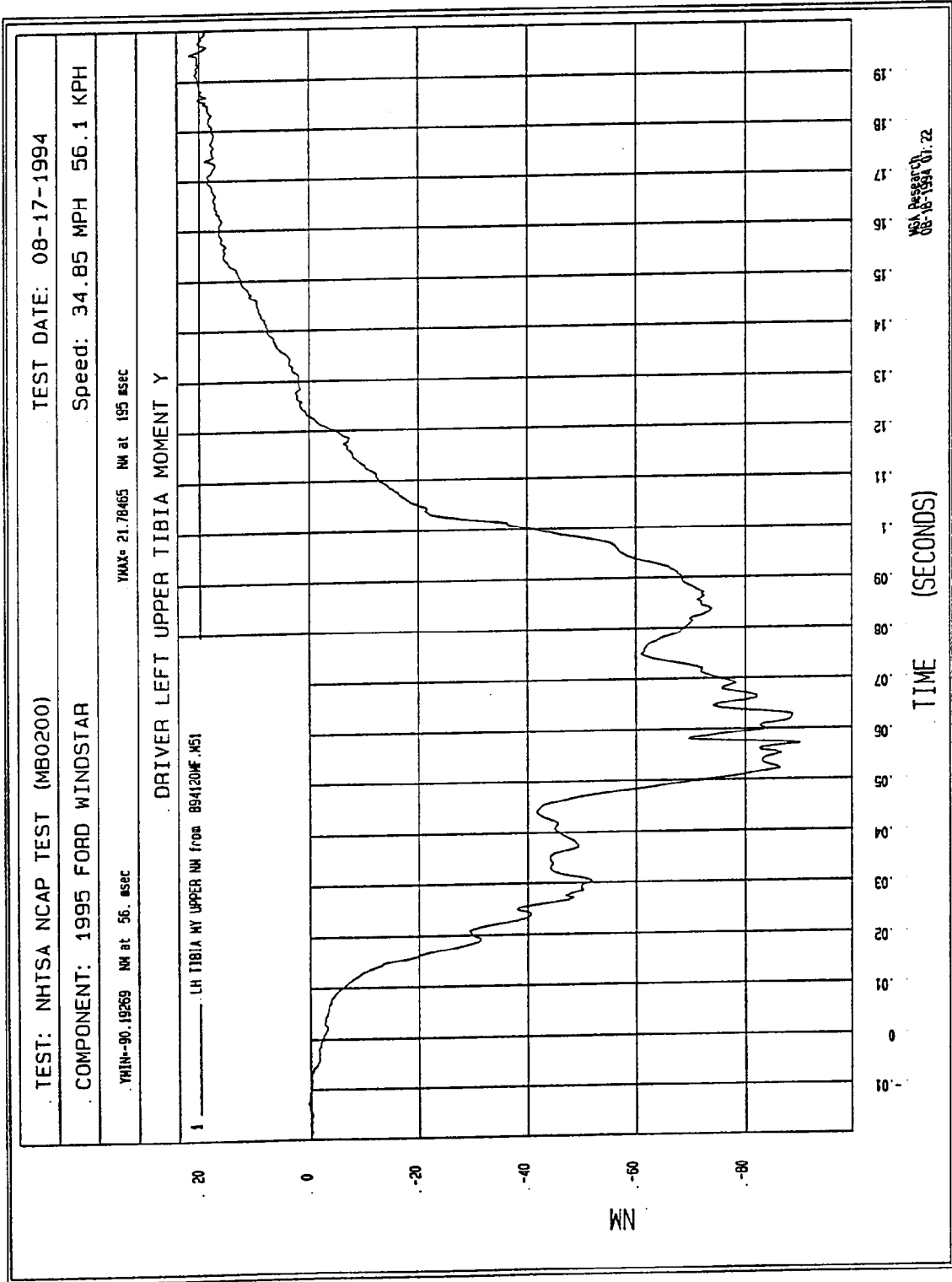


Figure B-59 - Driver Left Upper Tibia Moment Y vs. Time

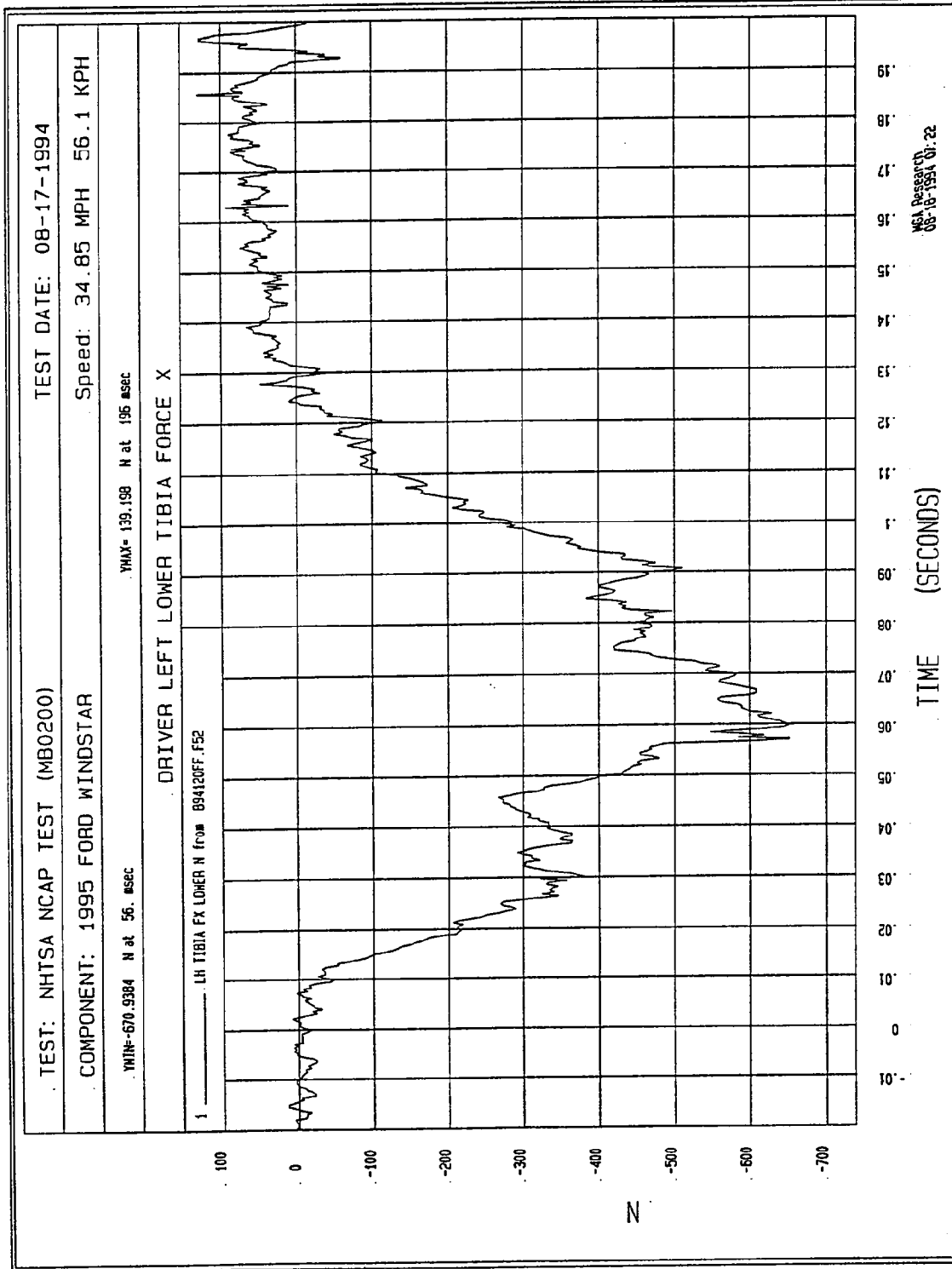


Figure B-60 - Driver Left Lower Tibia Force X vs. Time

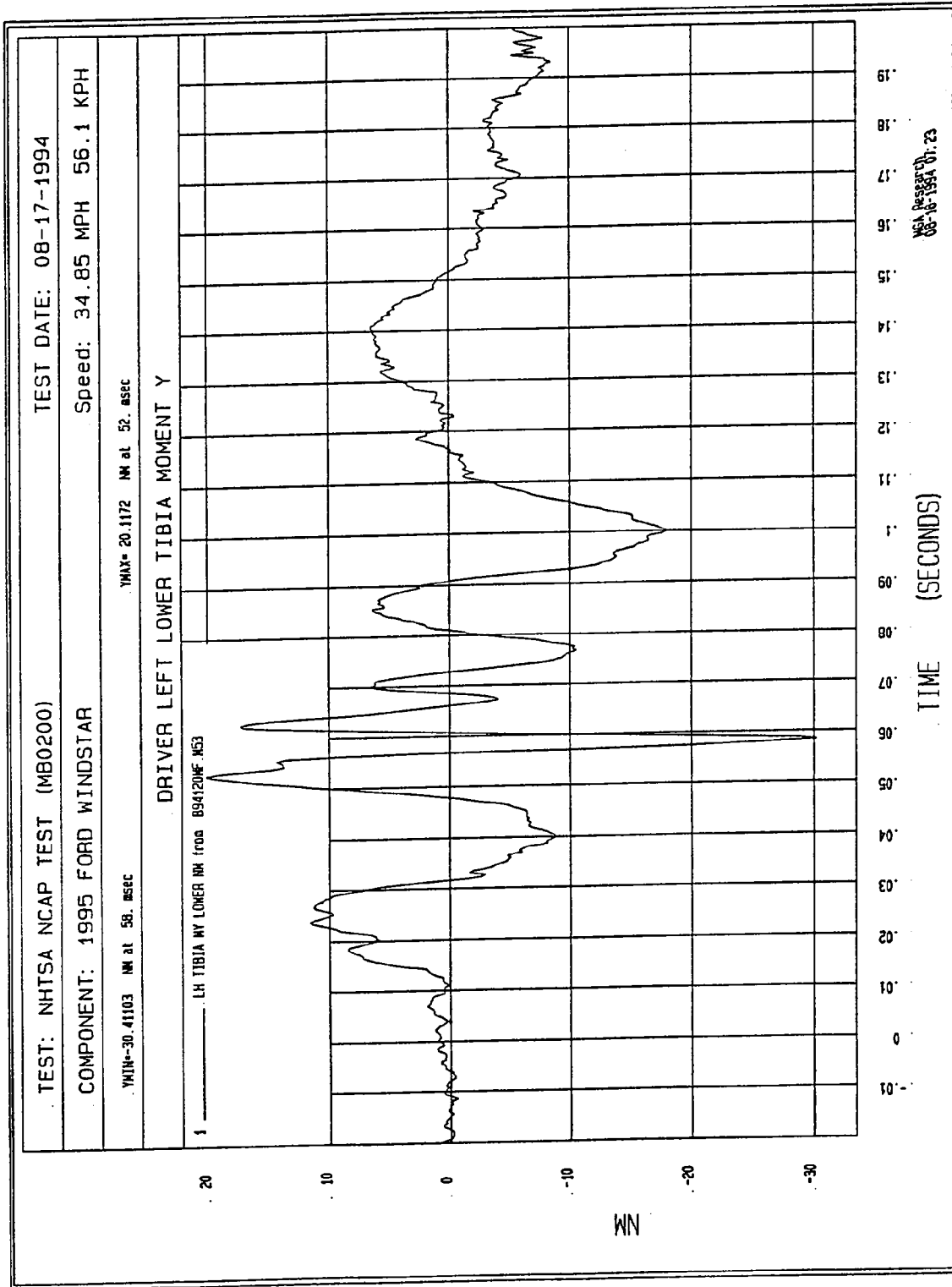


Figure B-61 - Driver Left Lower Tibia Moment Y vs. Time

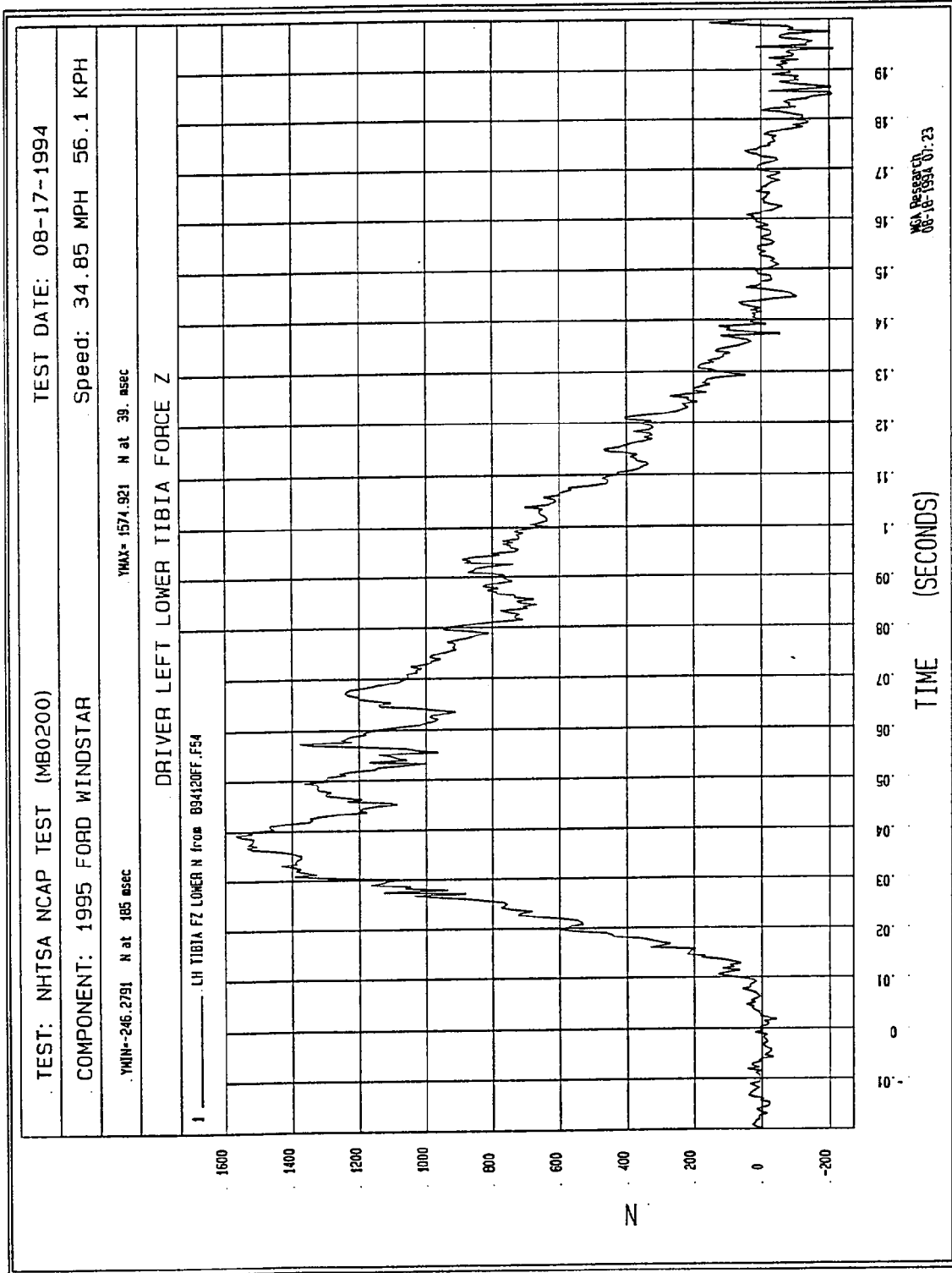


Figure B-62 - Driver Left Lower Tibia Force Z vs. Time

TEST DATE: 08-17-1994

TEST: NHTSA NCAP TEST (MB0200)

Speed: 34.85 MPH 56.1 KPH

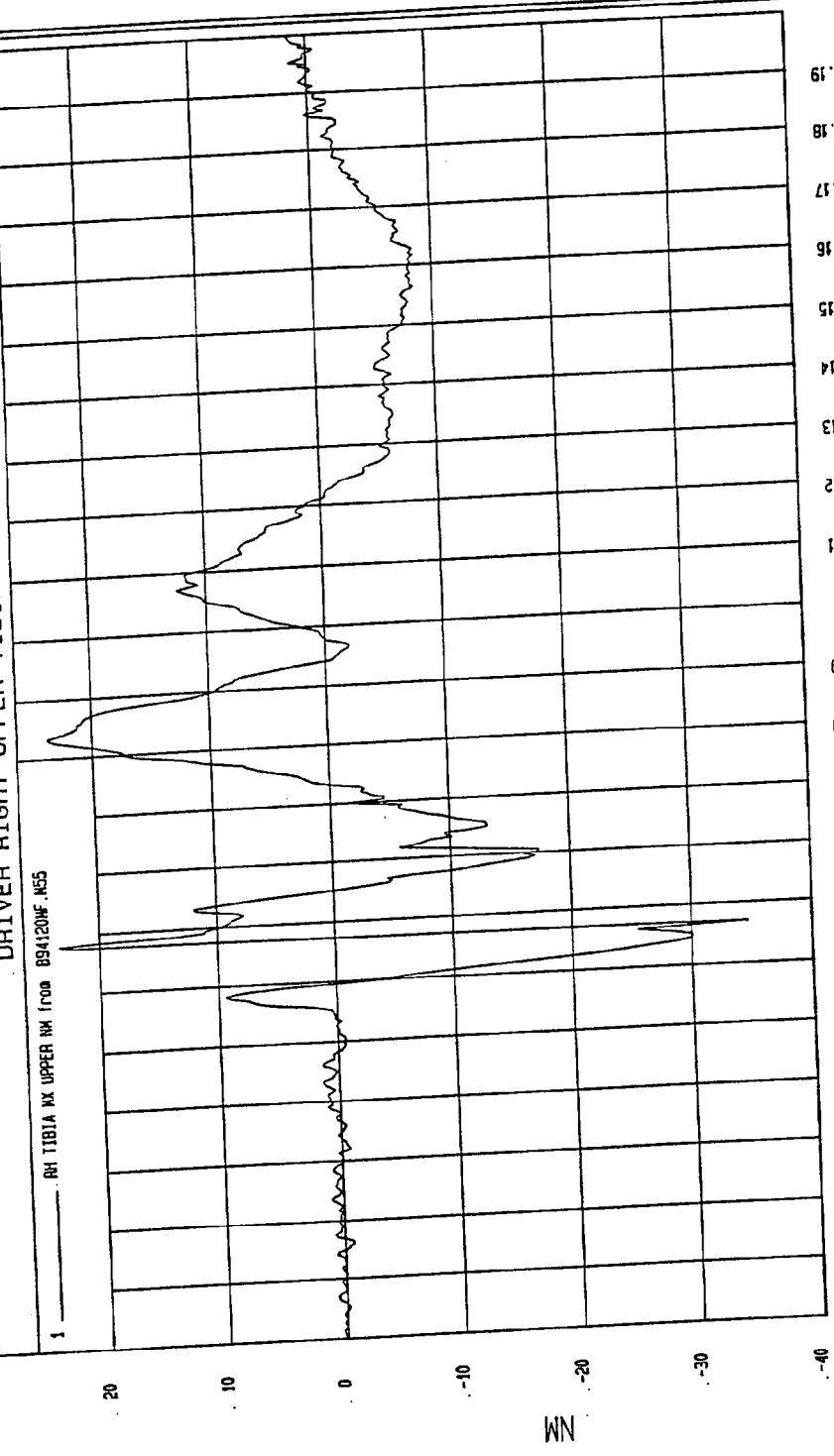
COMPONENT: 1995 FORD WINDSTAR

YMAX= 23.93536 NM at 47.85SEC

YMIN= -36.43694 NM at 46.85SEC

DRIVER RIGHT UPPER TIBIA MOMENT X

1 RH TIBIA MX UPPER NH FROM 894120WF.N55



NGA Research
08-18-1994 07:23

TIME (SECONDS)

NM

milli Moment X vs. Time

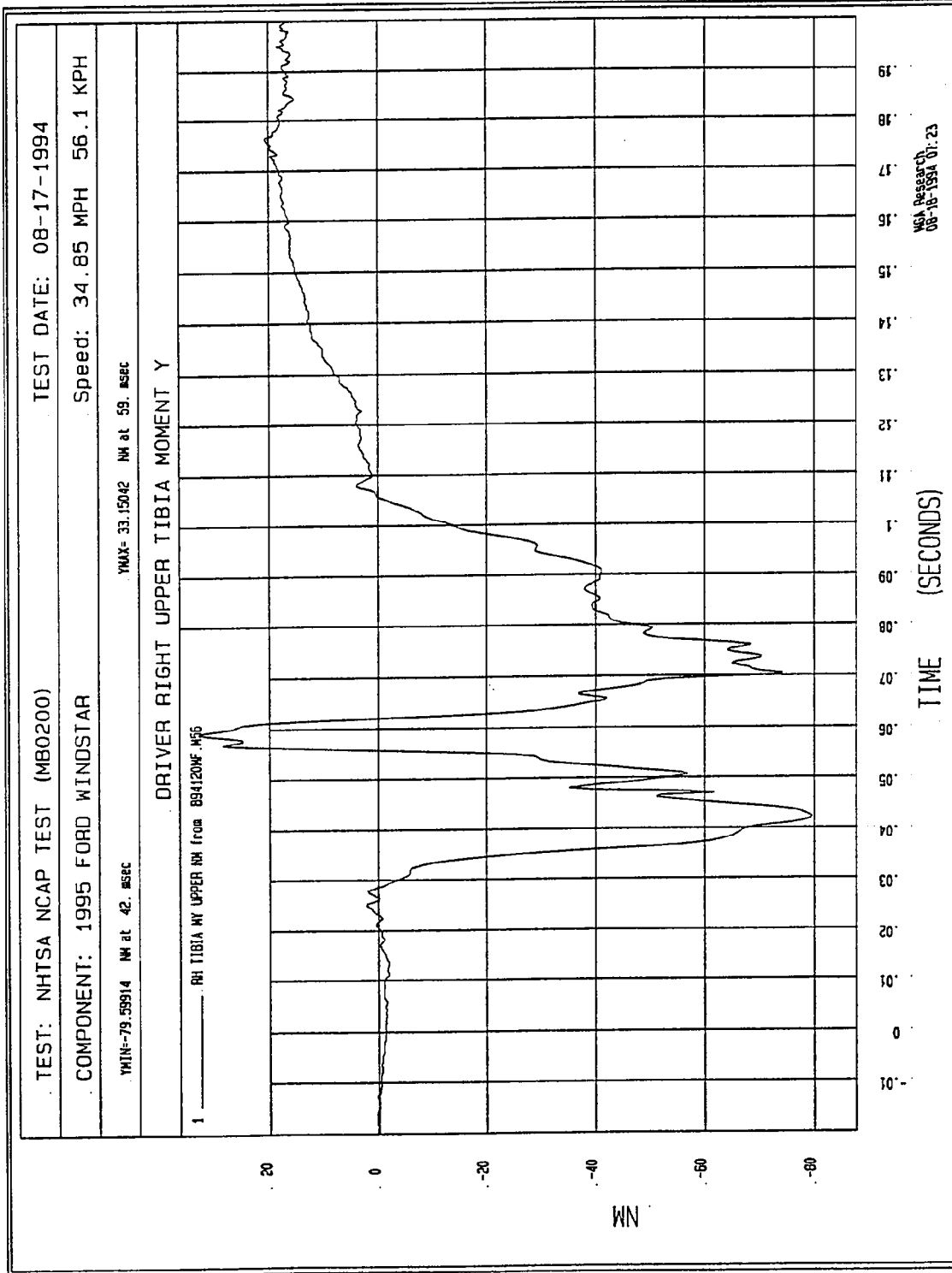


Figure B-64 - Driver Right Upper Tibia Moment Y vs. Time

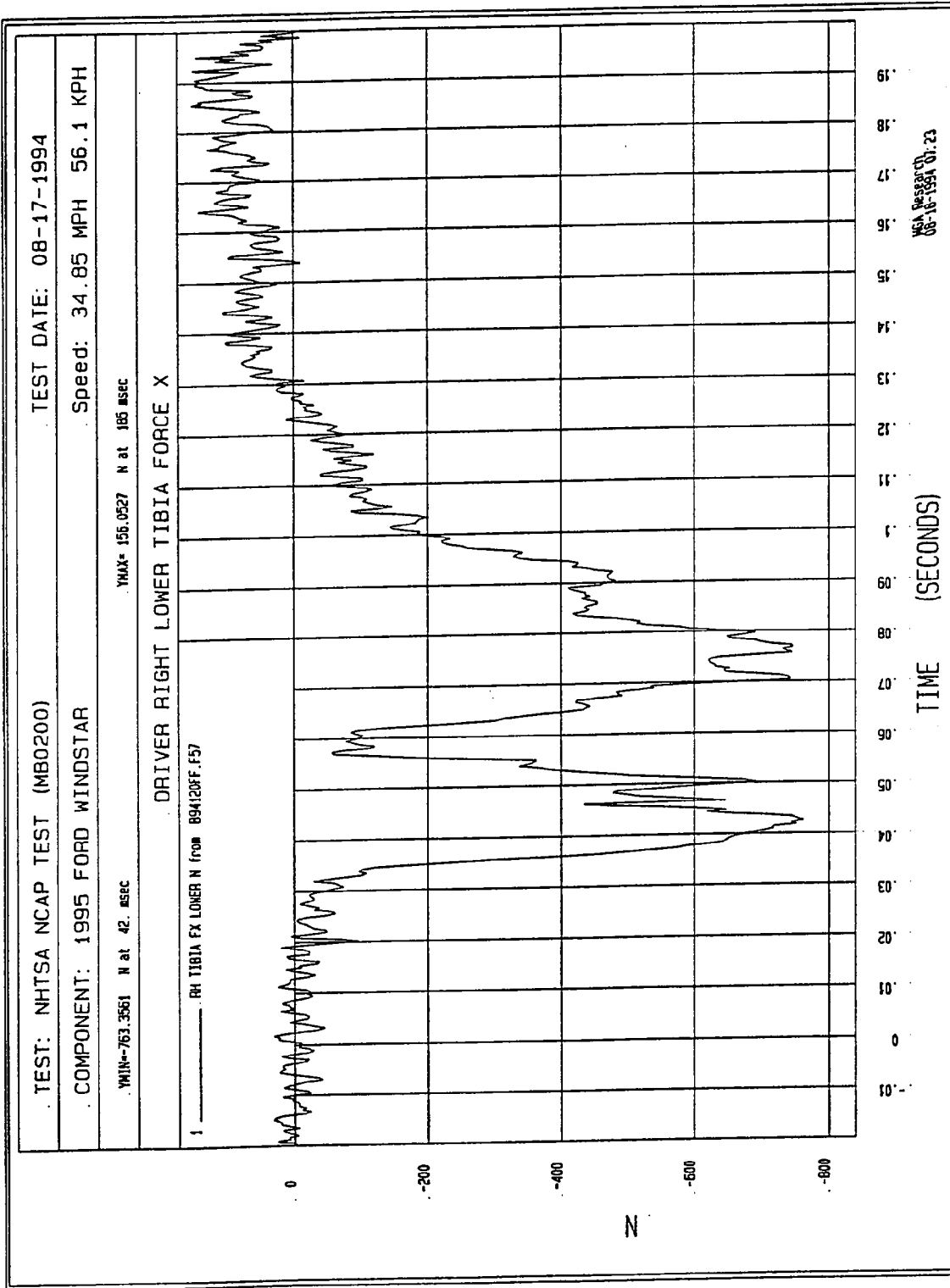


Figure B-65 - Driver Right Lower Tibia Force X vs. Time

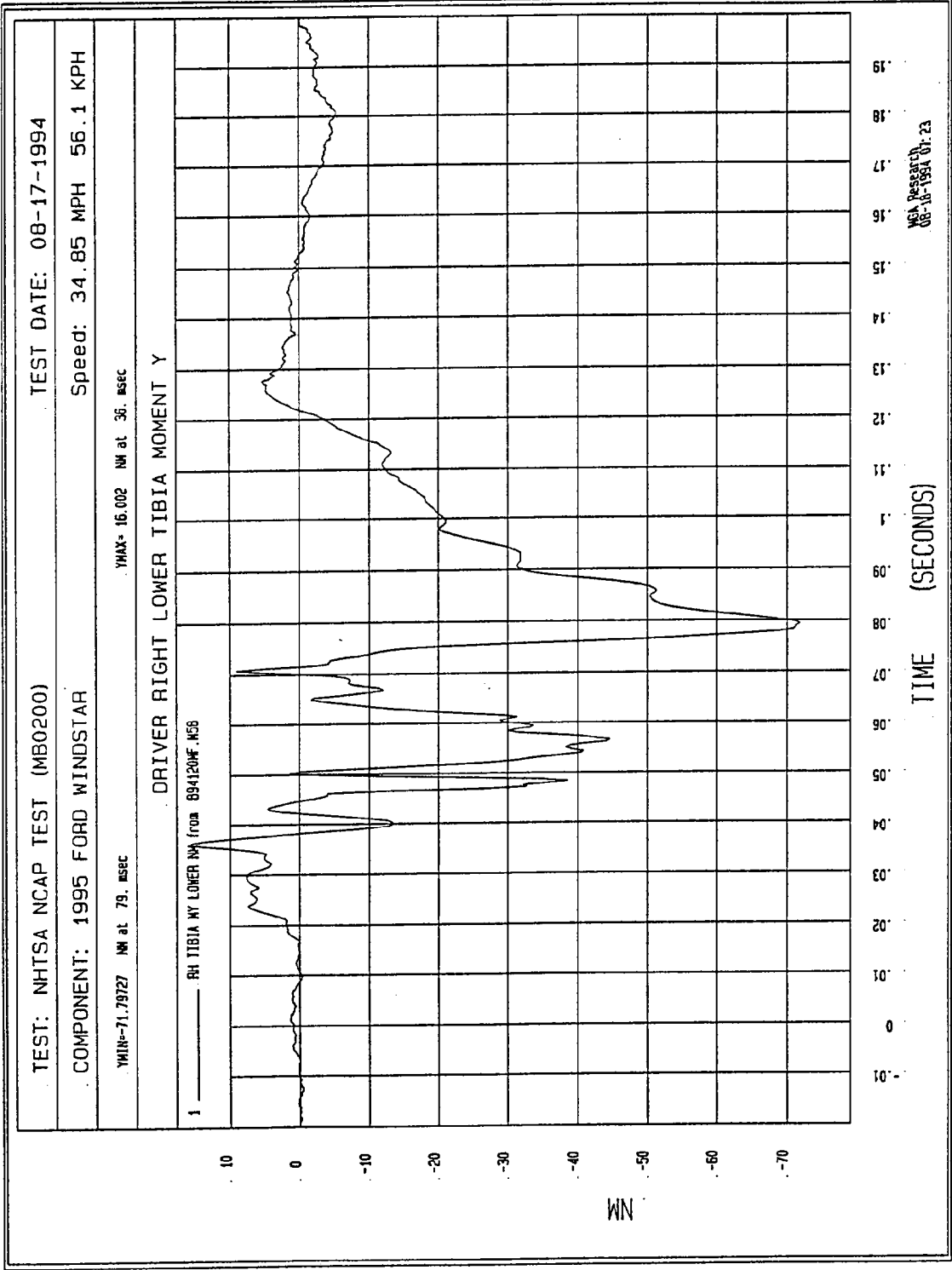


Figure B-66 - Driver Right Lower Tibia Moment Y vs. Time

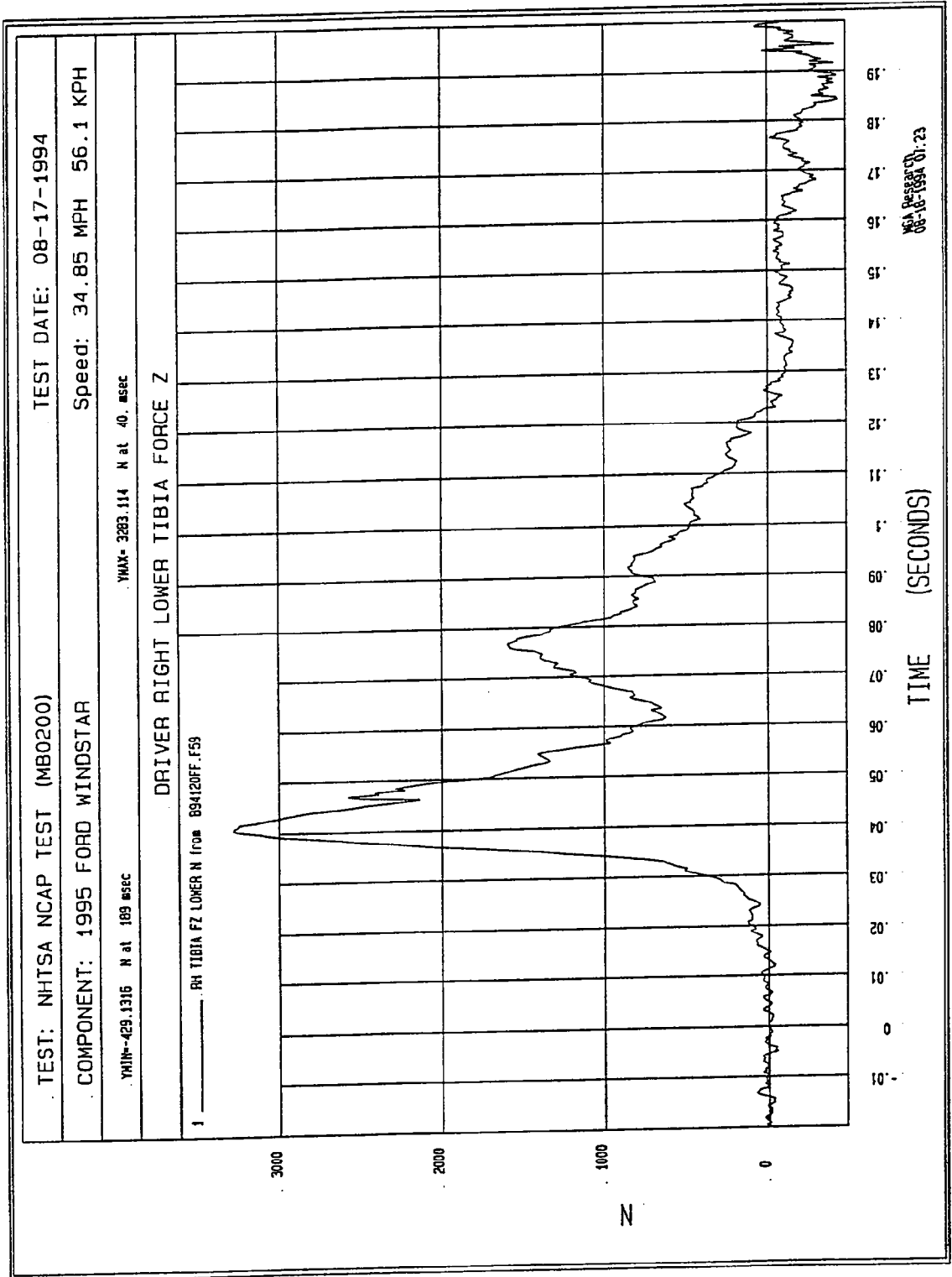


Figure B-67 - Driver Right Lower Tibia Force Z vs. Time

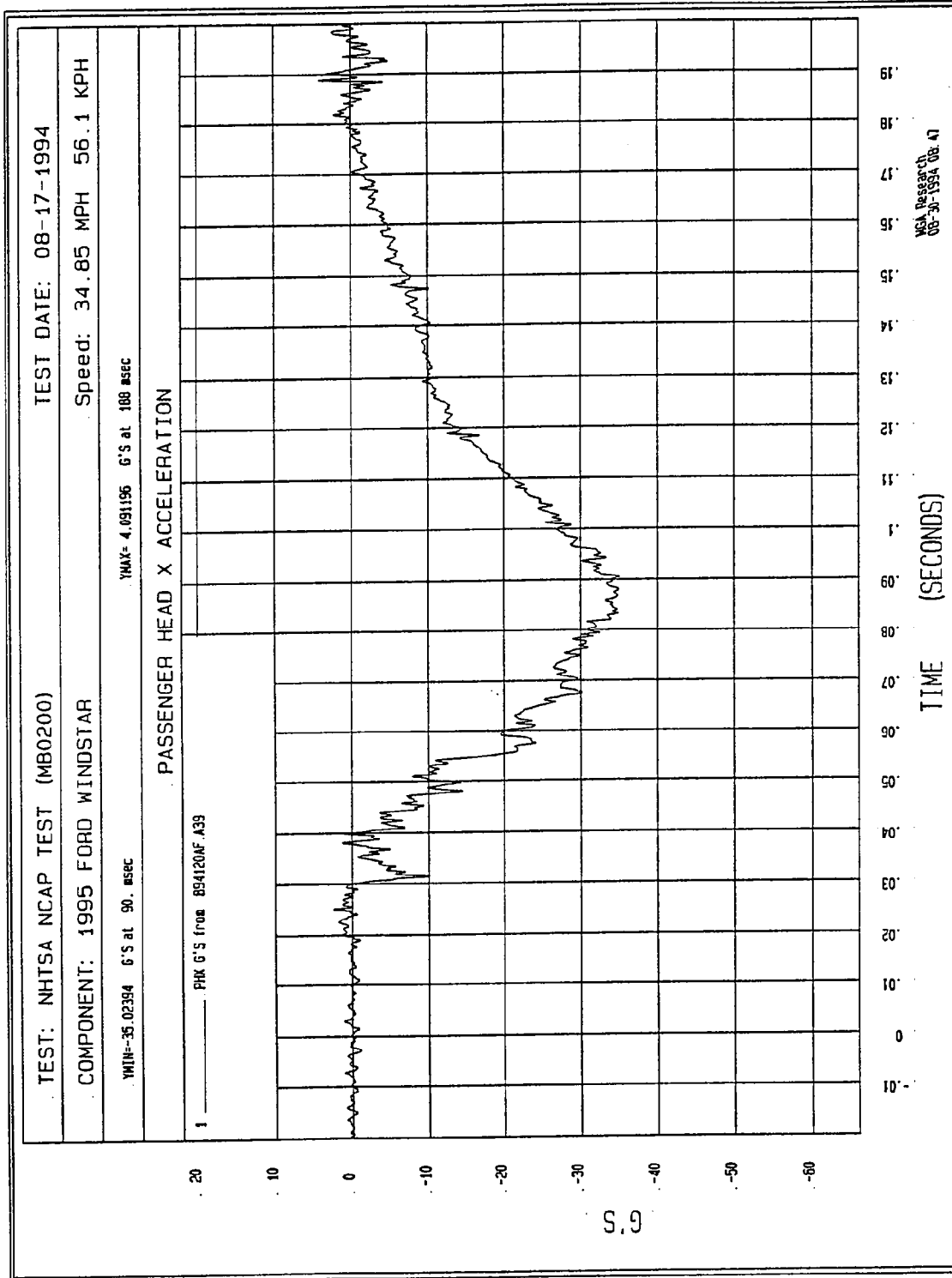


Figure B-68 - Passenger Head X Acceleration vs. Time

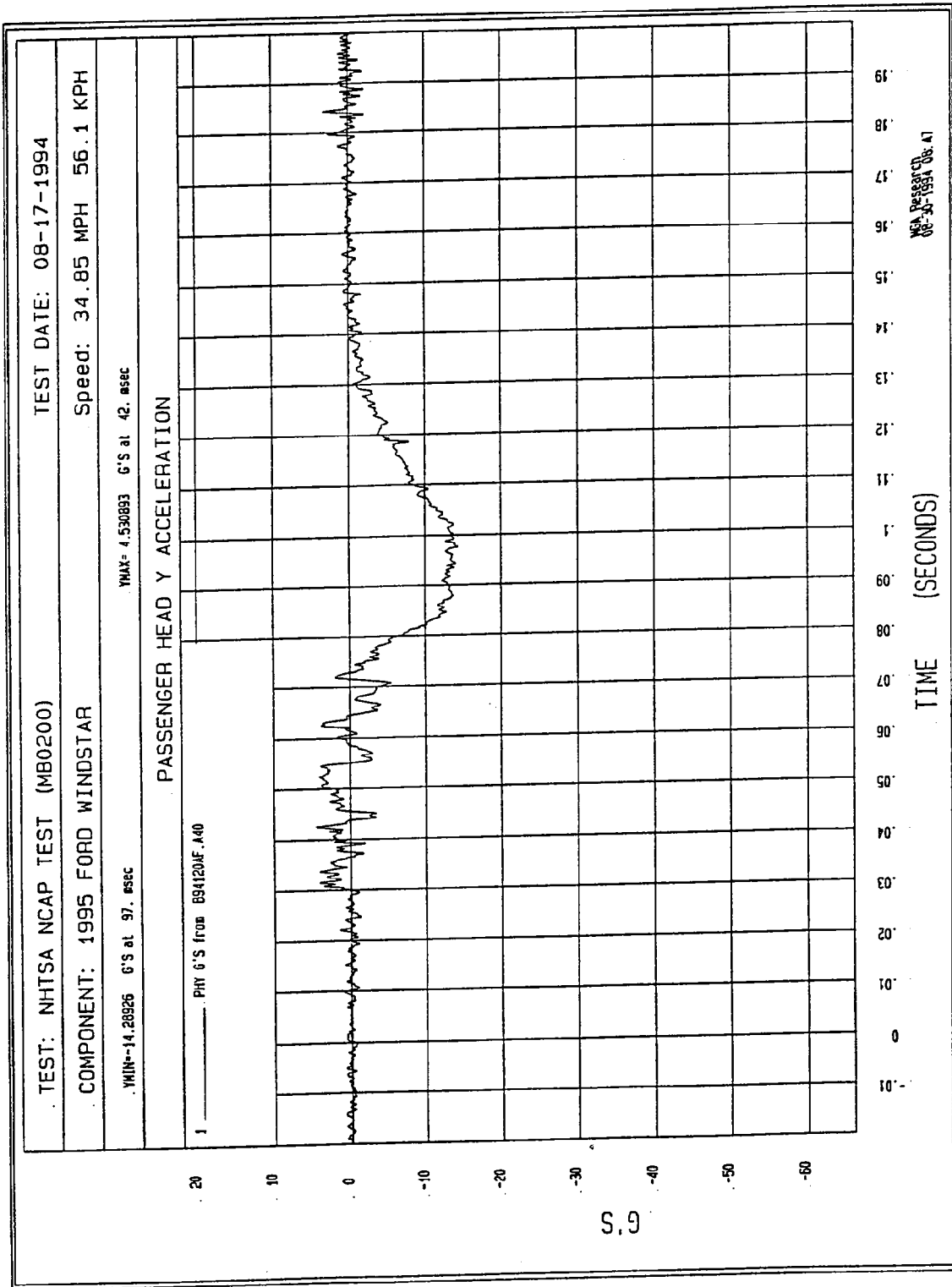


Figure B-69 - Passenger Head Y Acceleration vs. Time

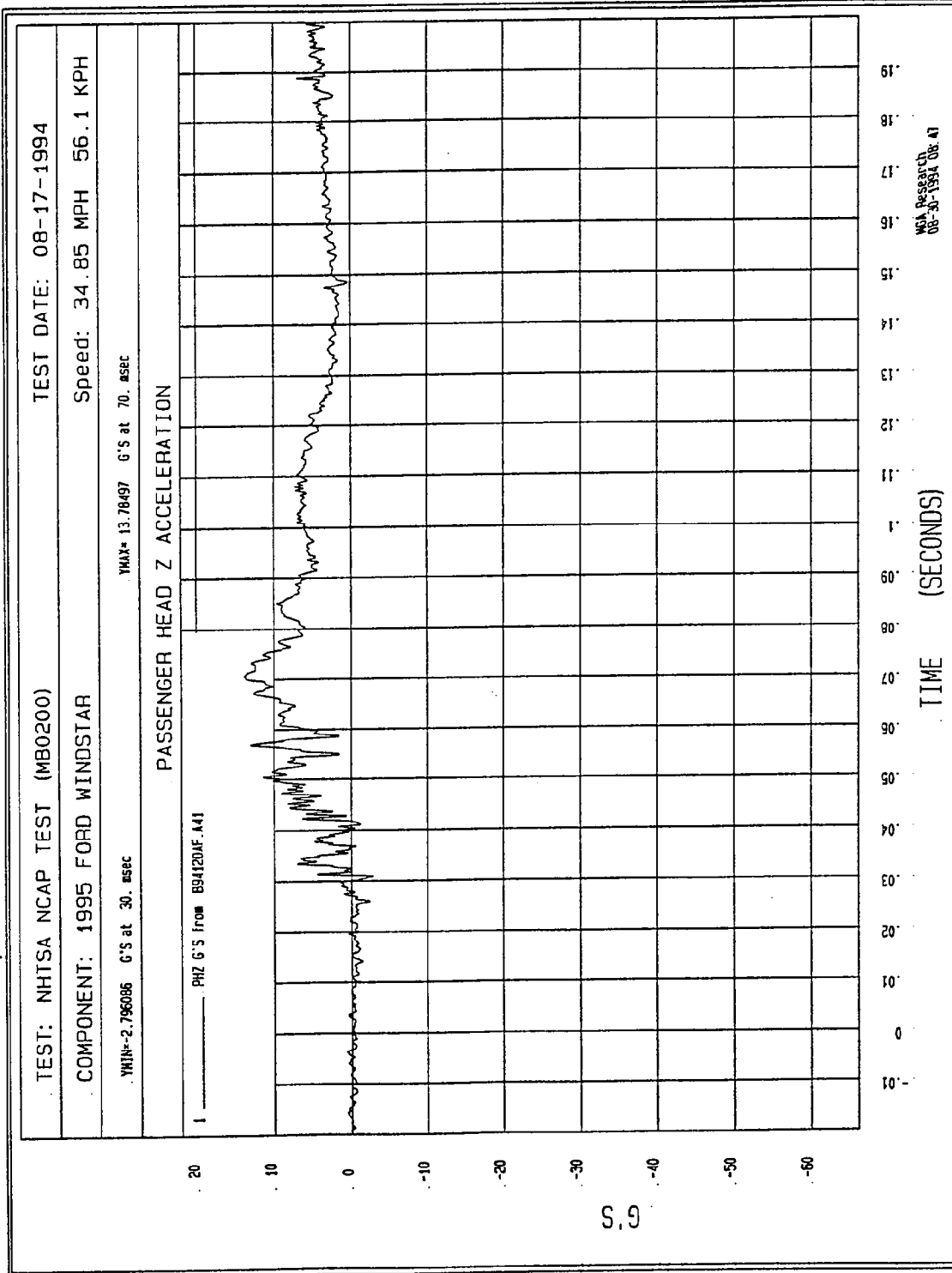


Figure B-70 - Passenger Head Z Acceleration vs. Time

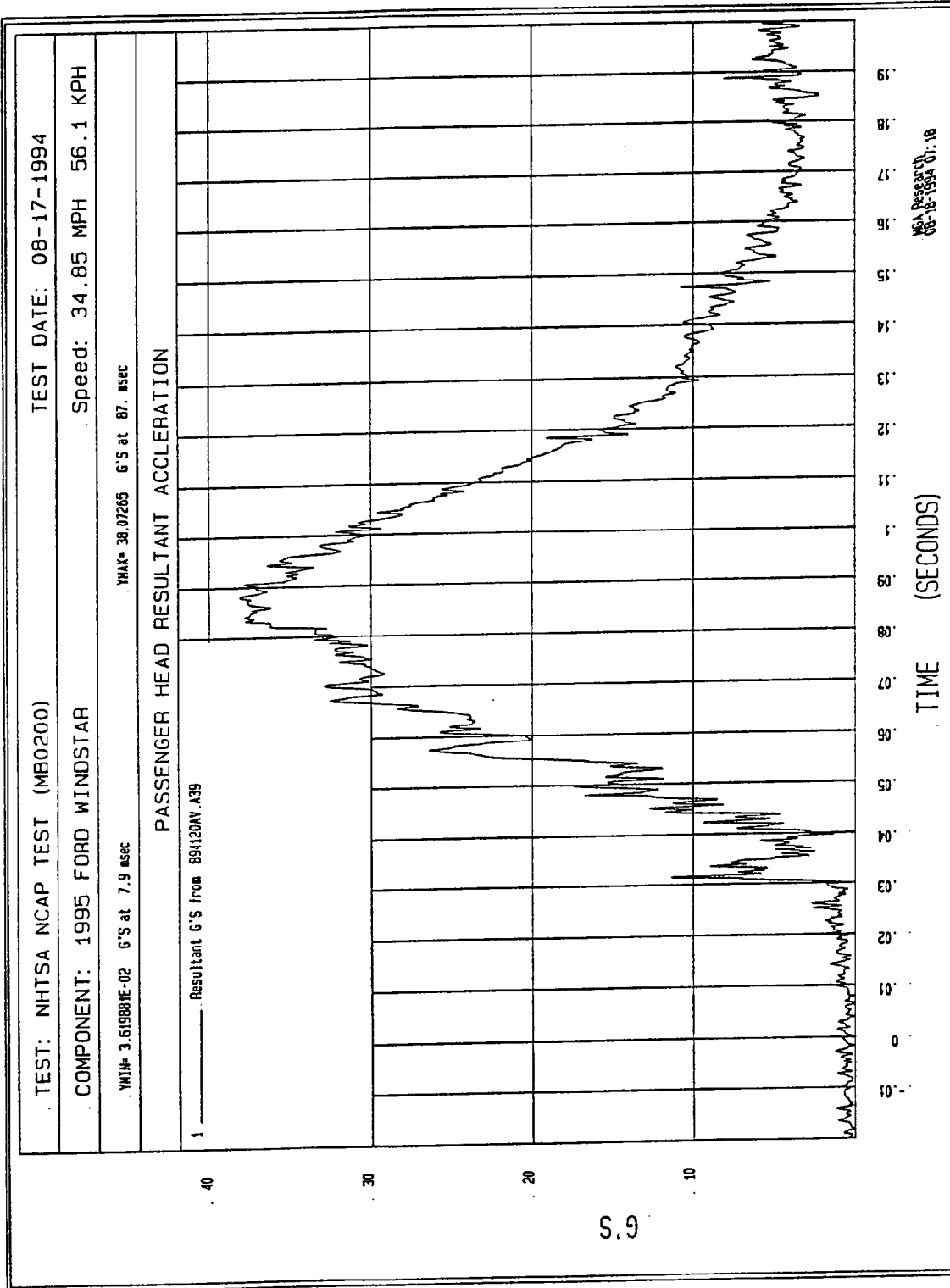


Figure B-71 - Passenger Head Resultant vs. Time

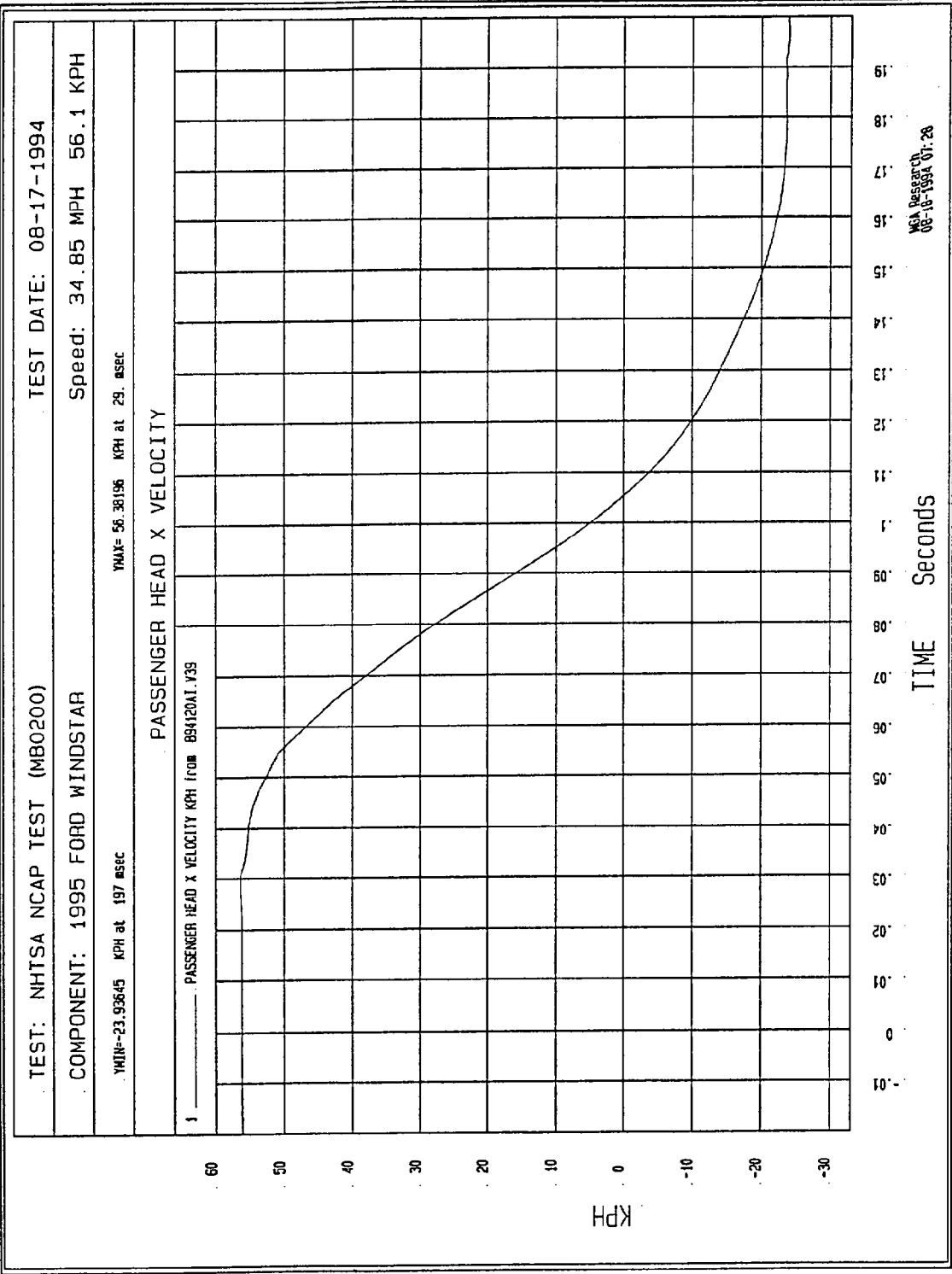


Figure B-72 - Passenger Head X Velocity vs. Time

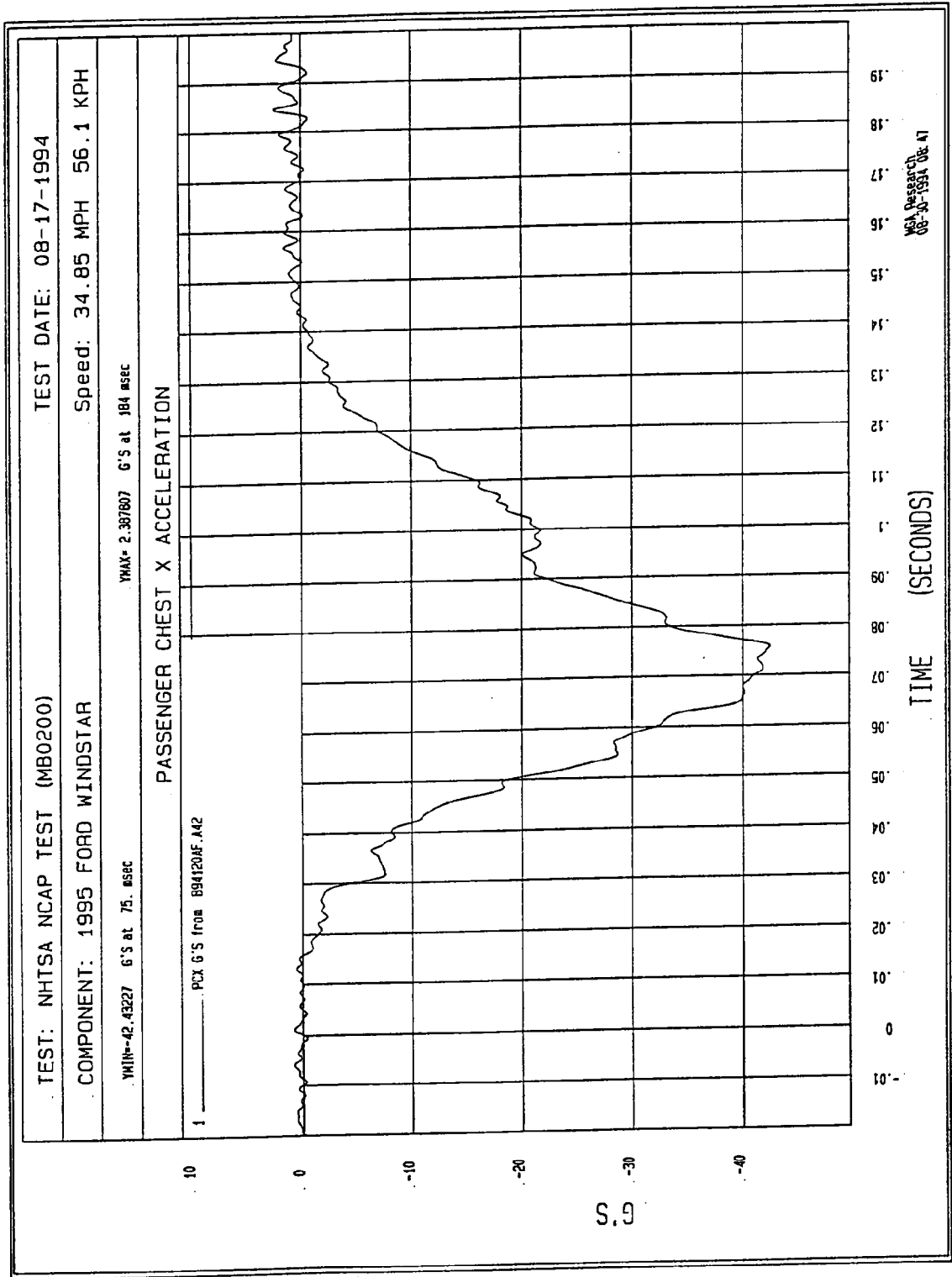


Figure B-73 - Passenger Chest X Acceleration vs. Time

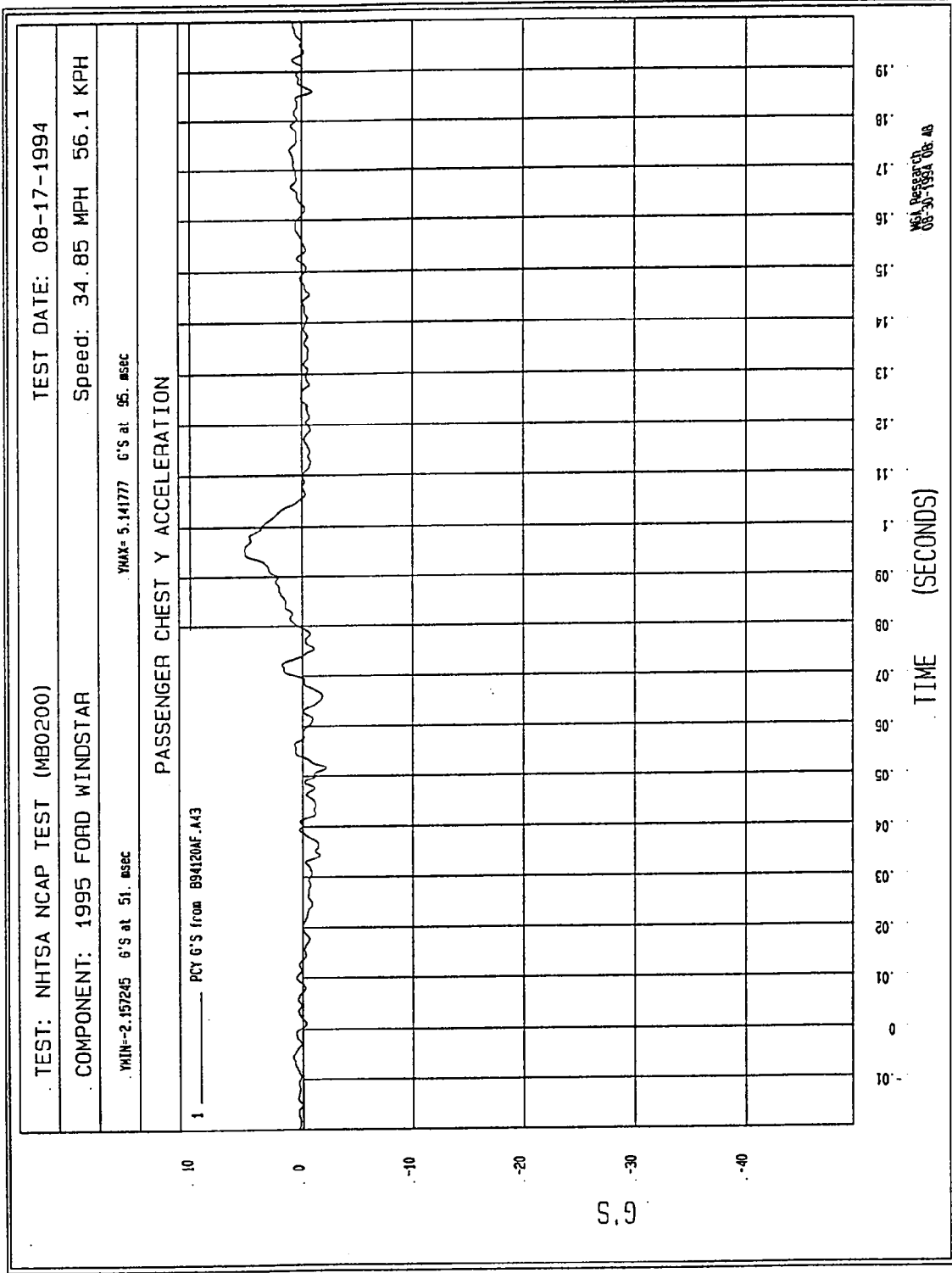


Figure B-74 - Passenger Chest Y Acceleration vs. Time

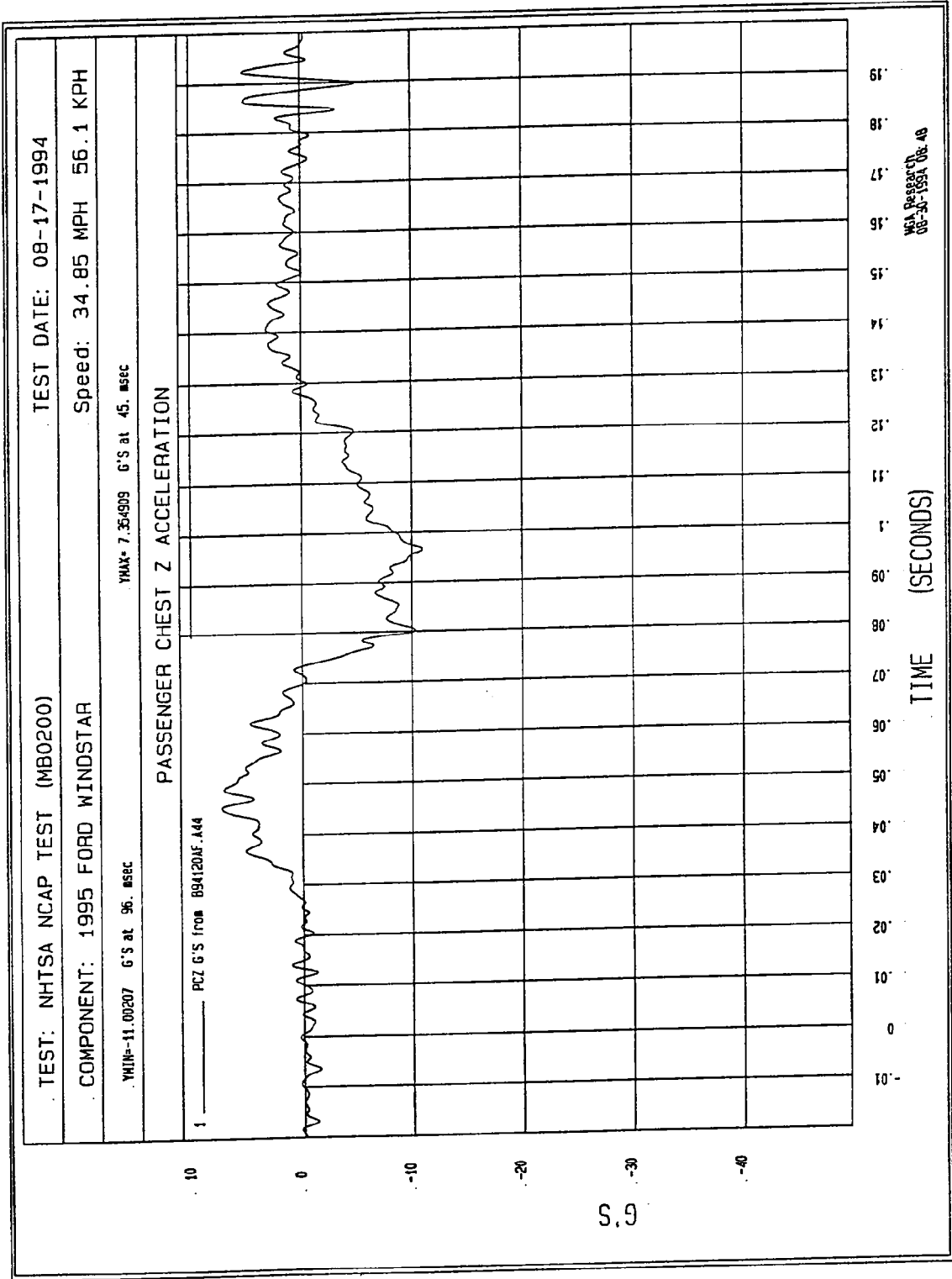


Figure B-75 - Passenger Chest Z Acceleration vs. Time

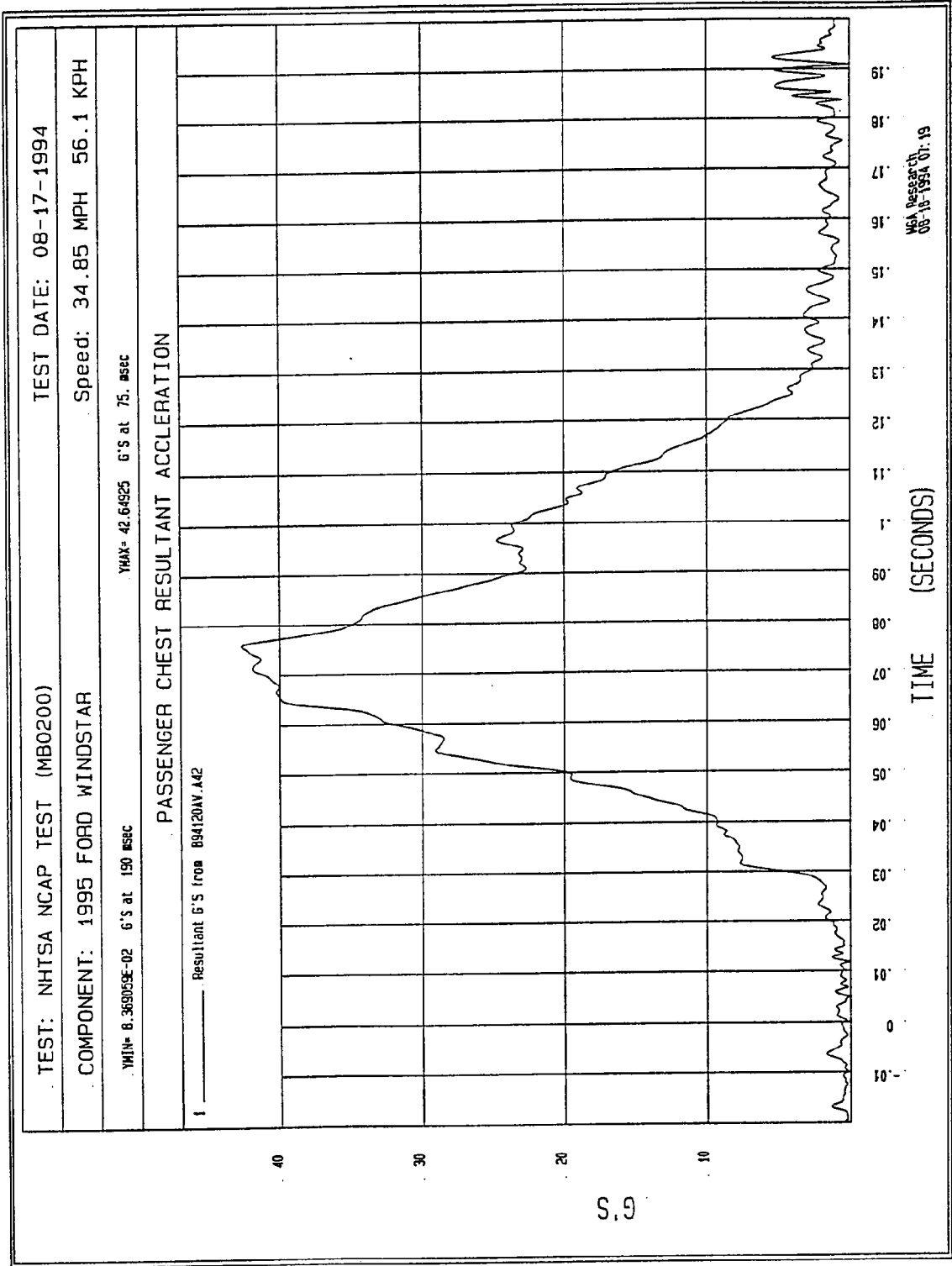


Figure B-76 - Passenger Chest Resultant vs. Time

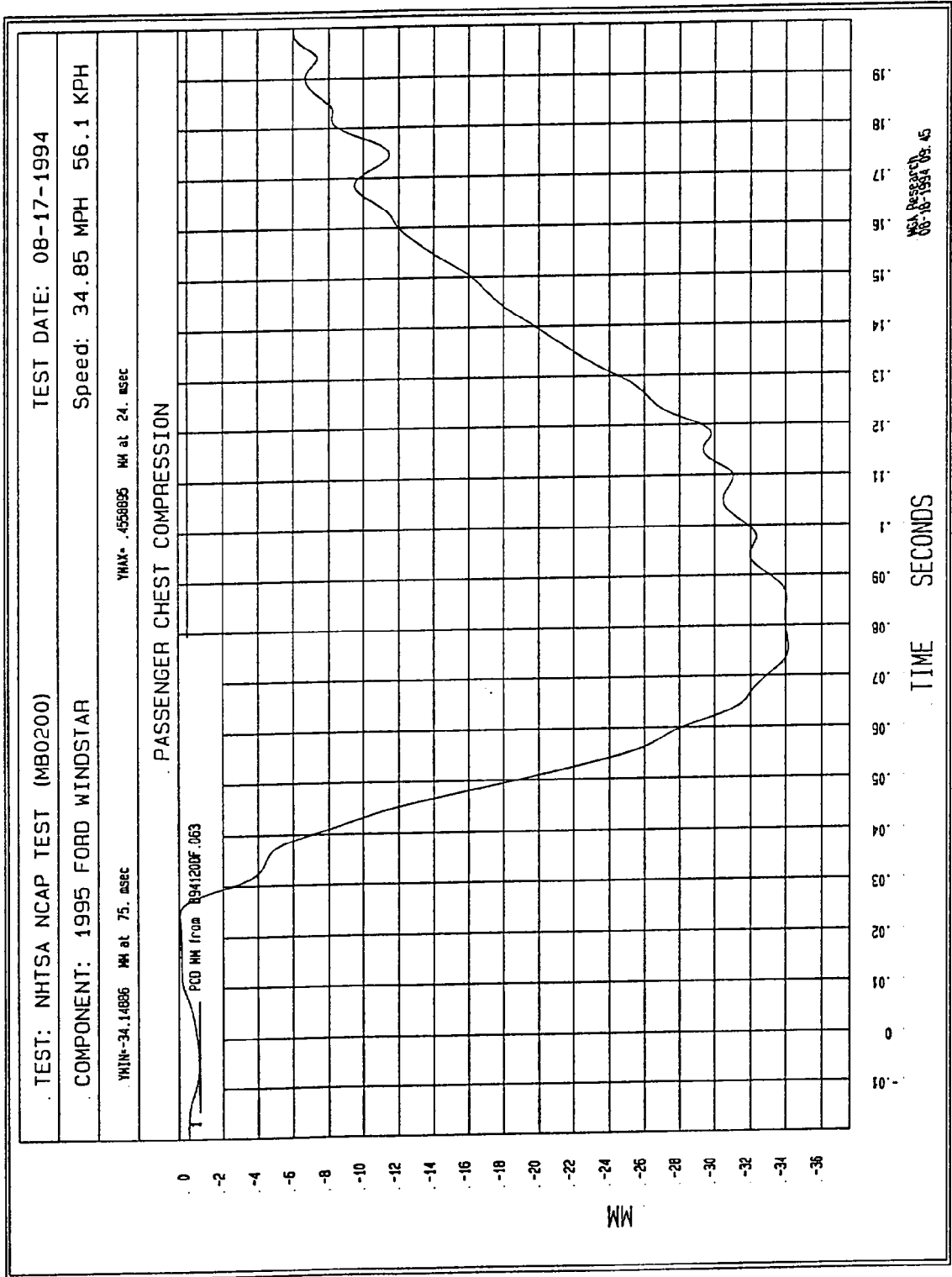


Figure B-77 - Passenger Chest Compression vs. Time

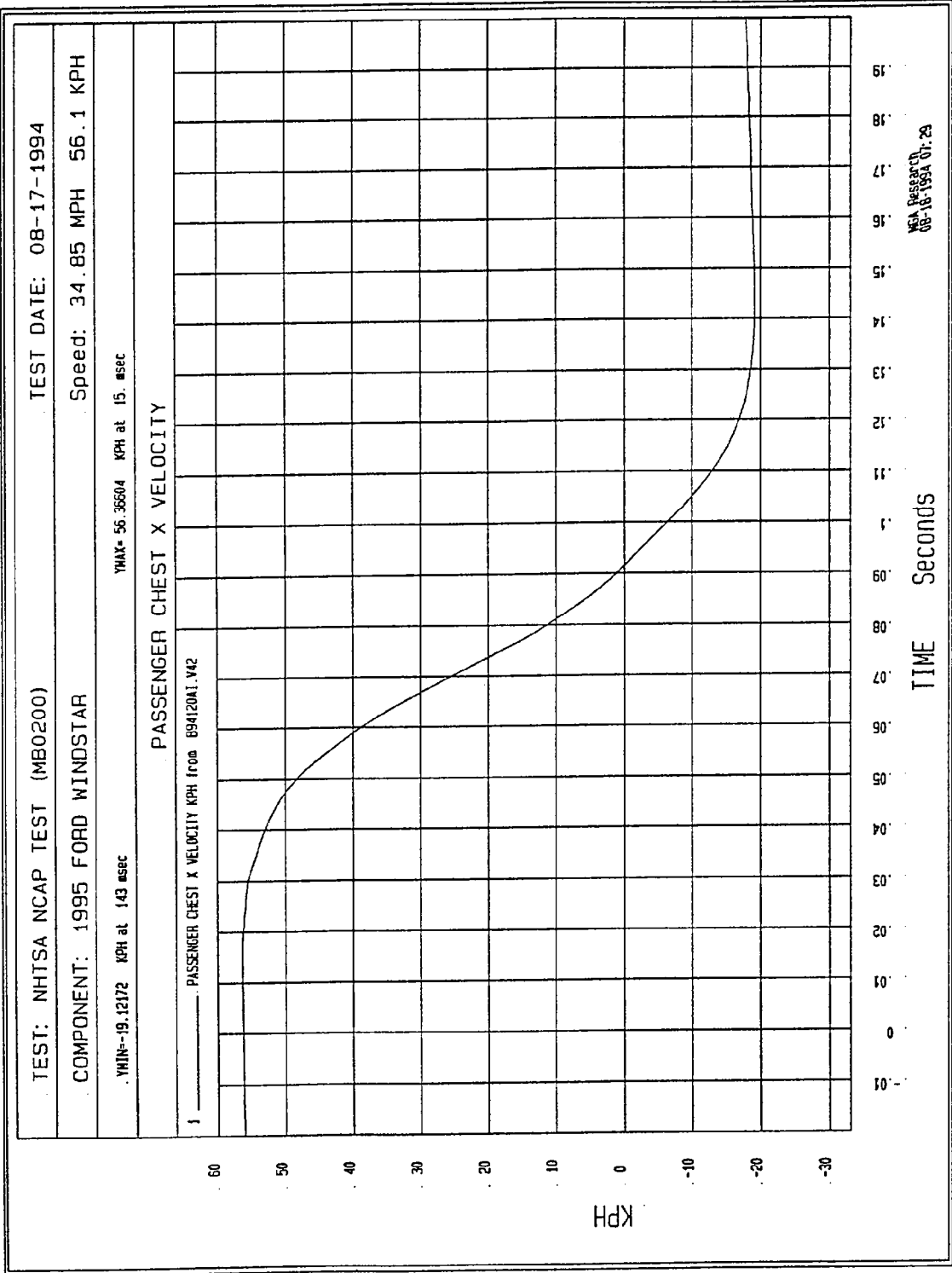


Figure B-78 - Passenger Chest X Velocity vs. Time

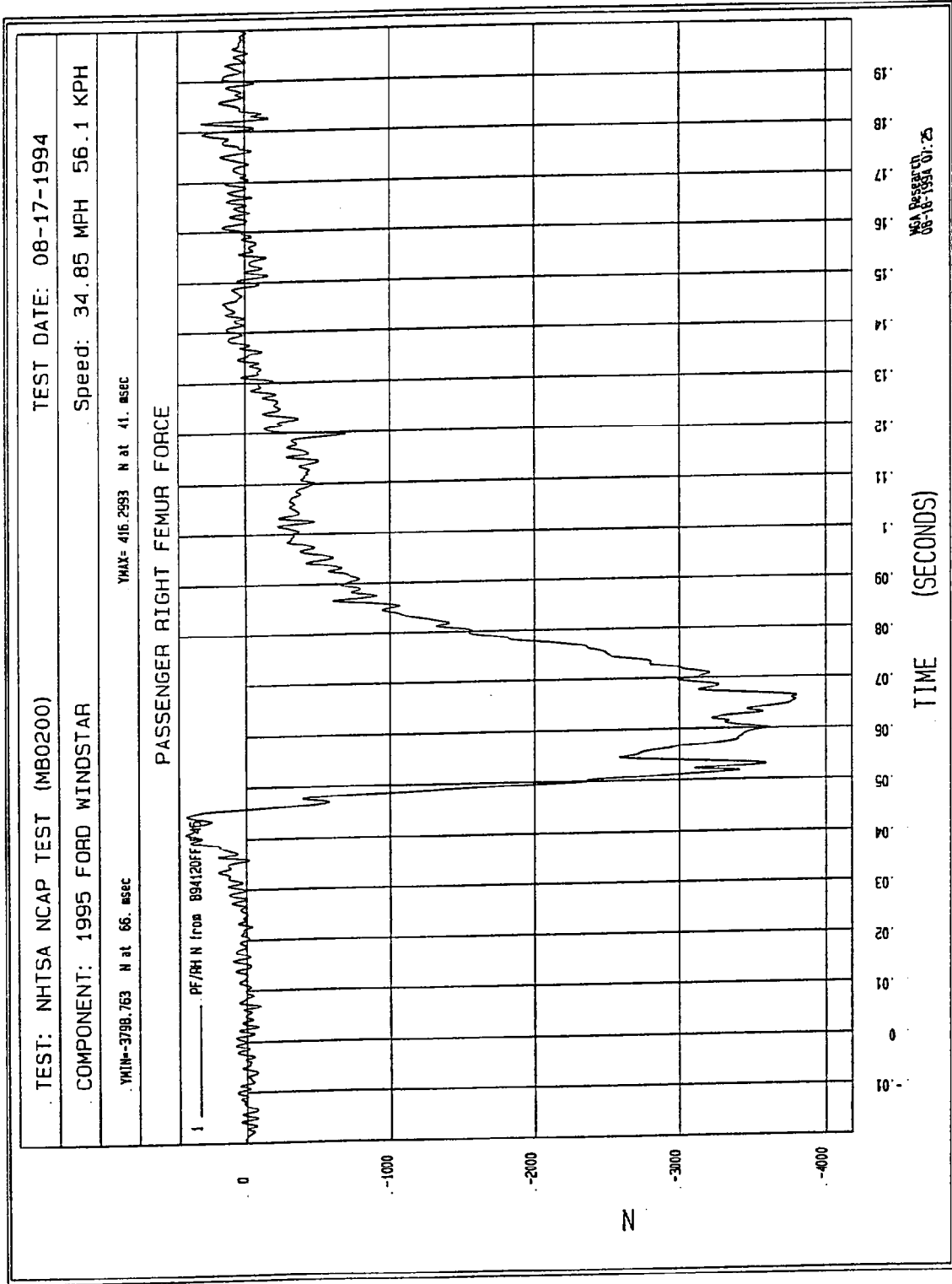


Figure B-79 - Passenger Right Femur Force vs. Time

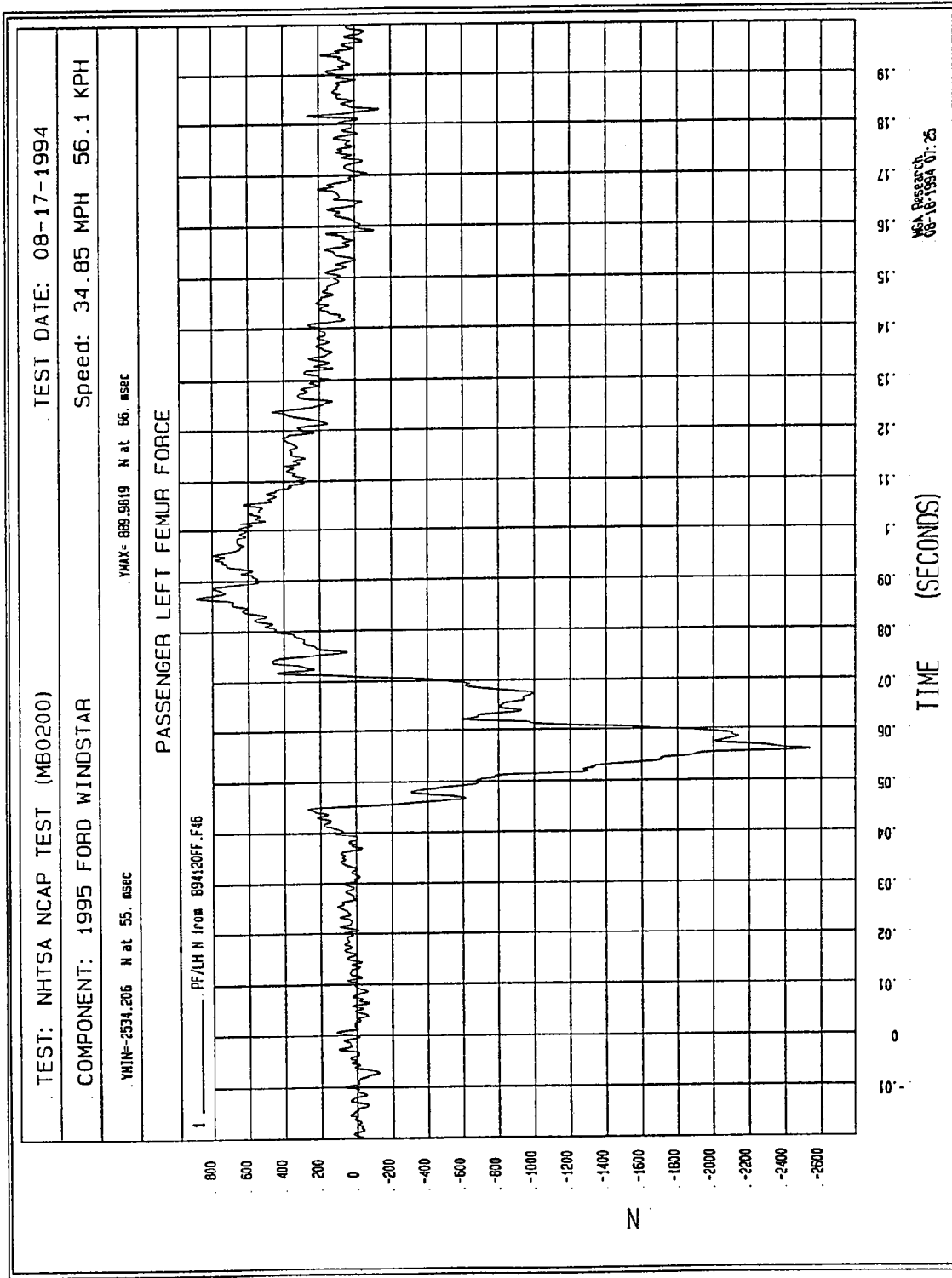


Figure B-80 - Passenger Left Femur Force vs. Time

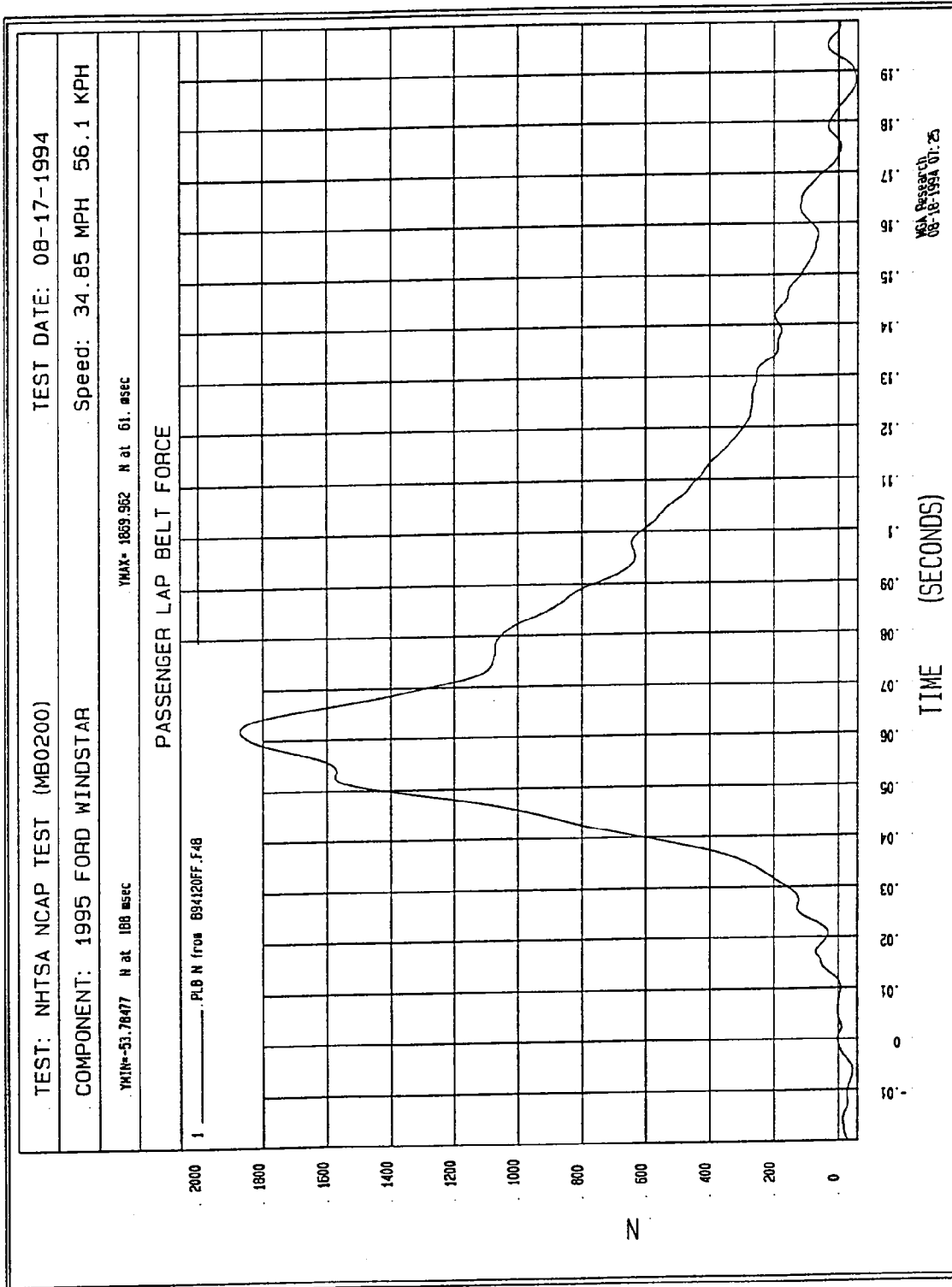


Figure B-81 - Passenger Lap Belt Force vs. Time

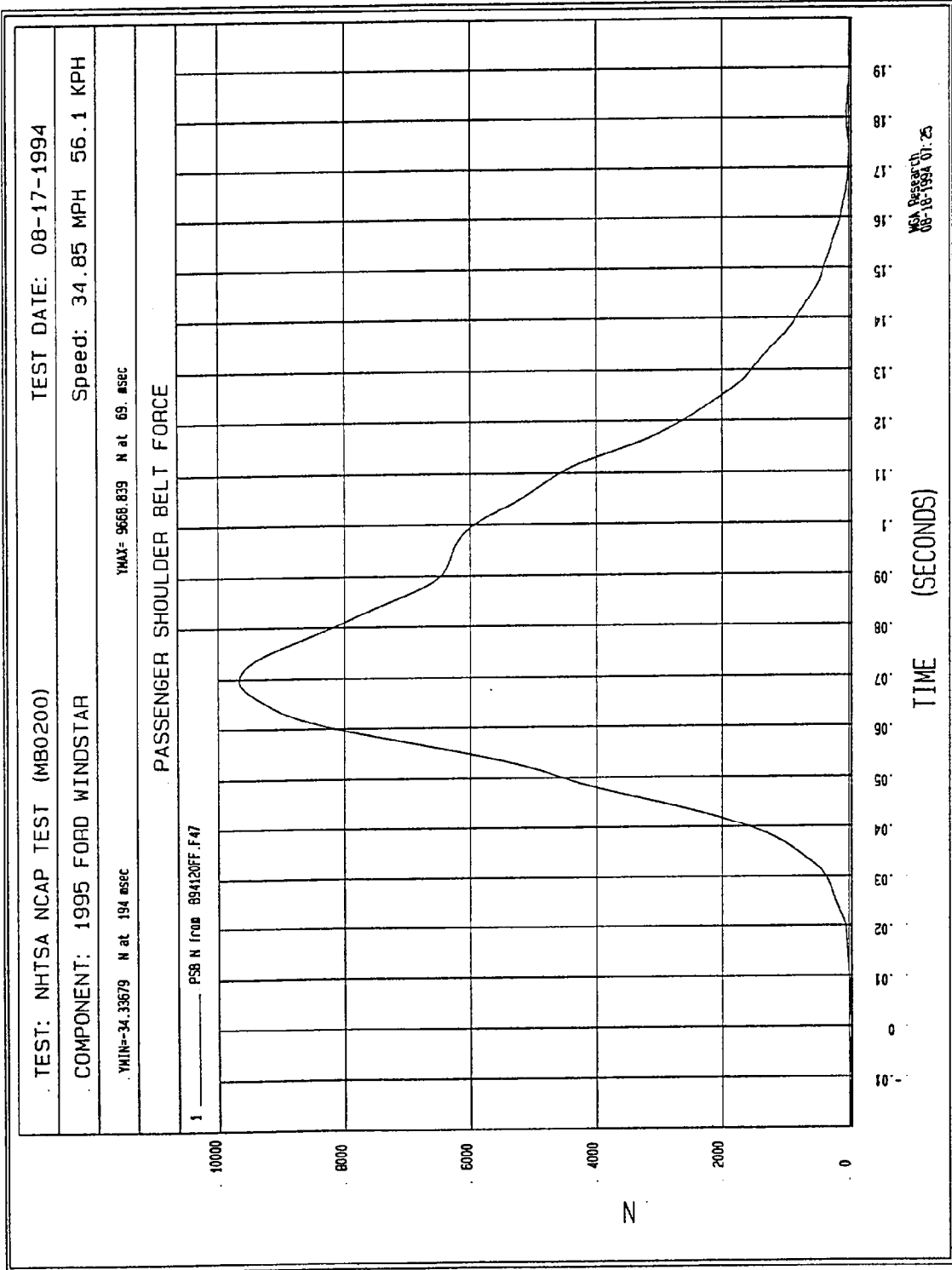


Figure B-82 - Passenger Shoulder Belt Force vs. Time

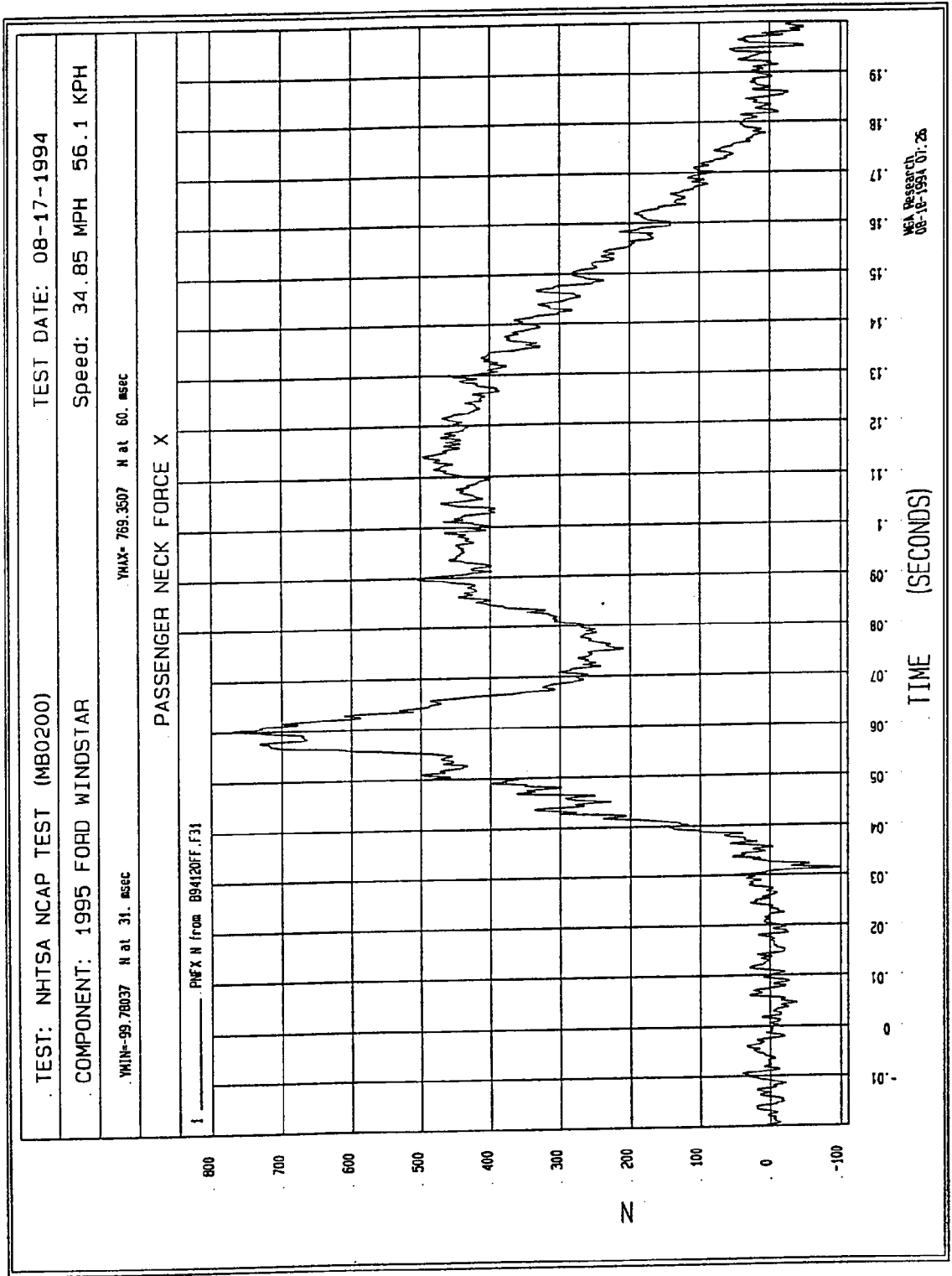


Figure B-83 - Passenger Neck Force X vs. Time

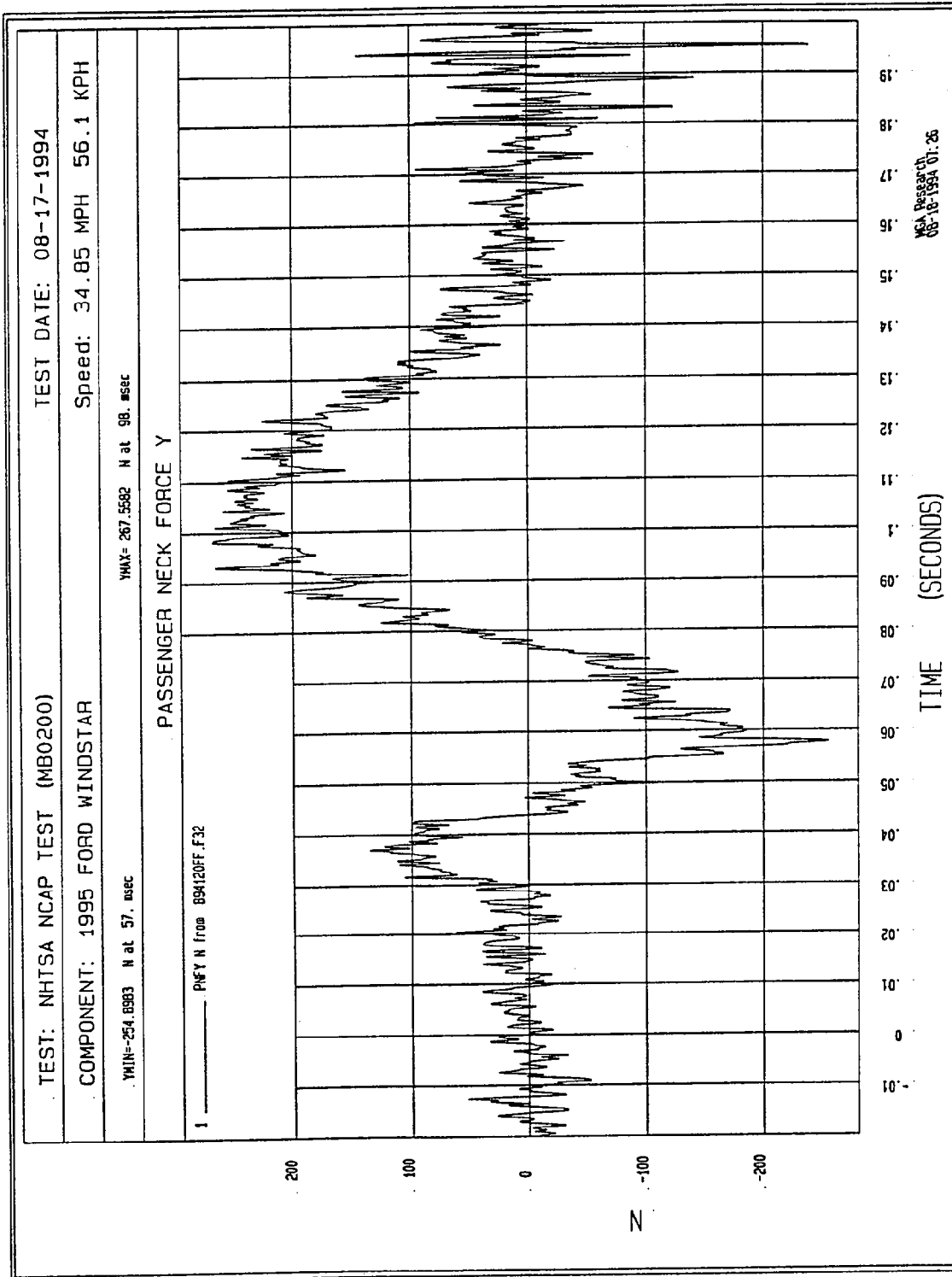


Figure B-84 - Passenger Neck Force Y vs. Time

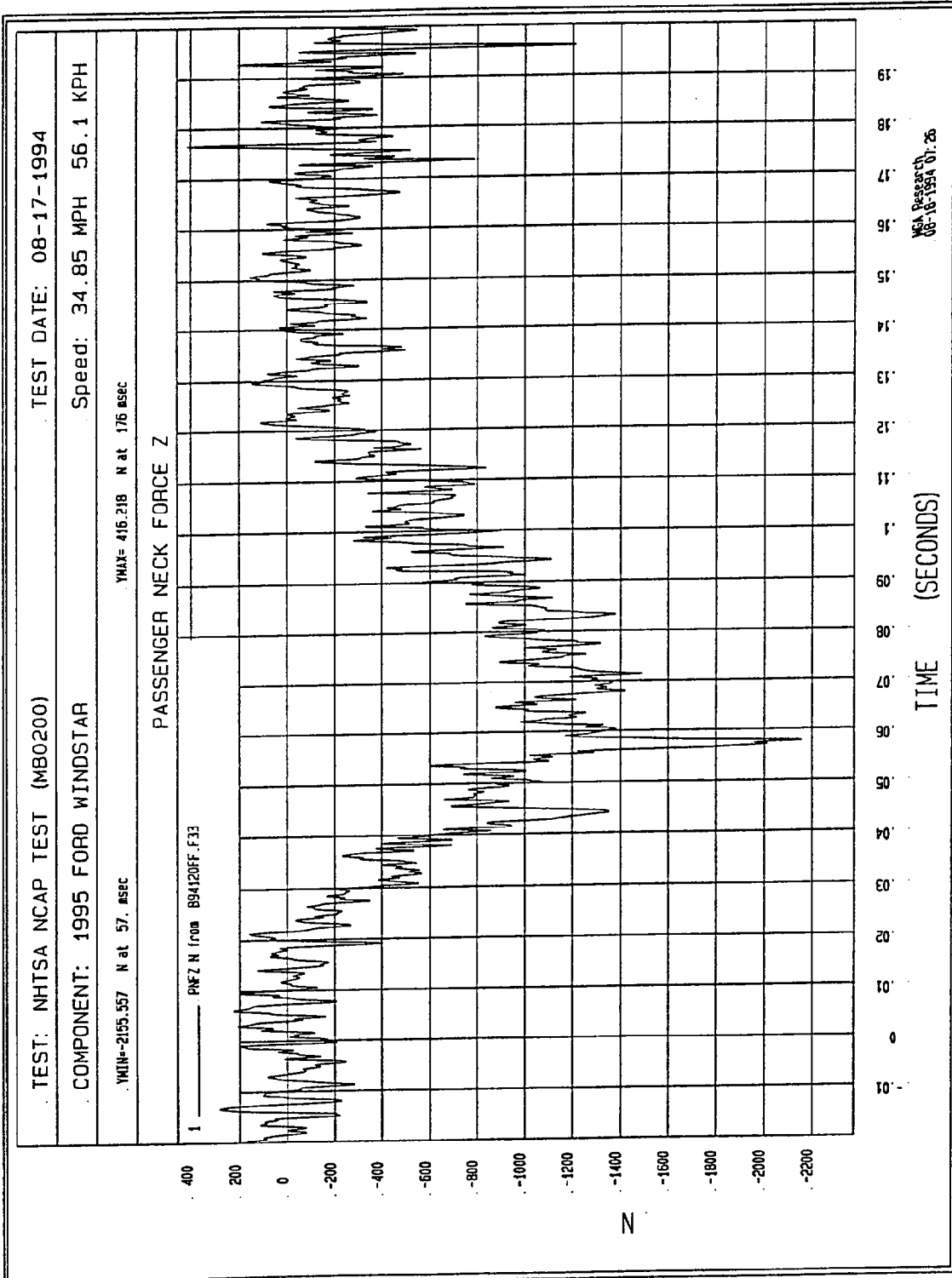


Figure B-85 - Passenger Neck Force Z vs. Time

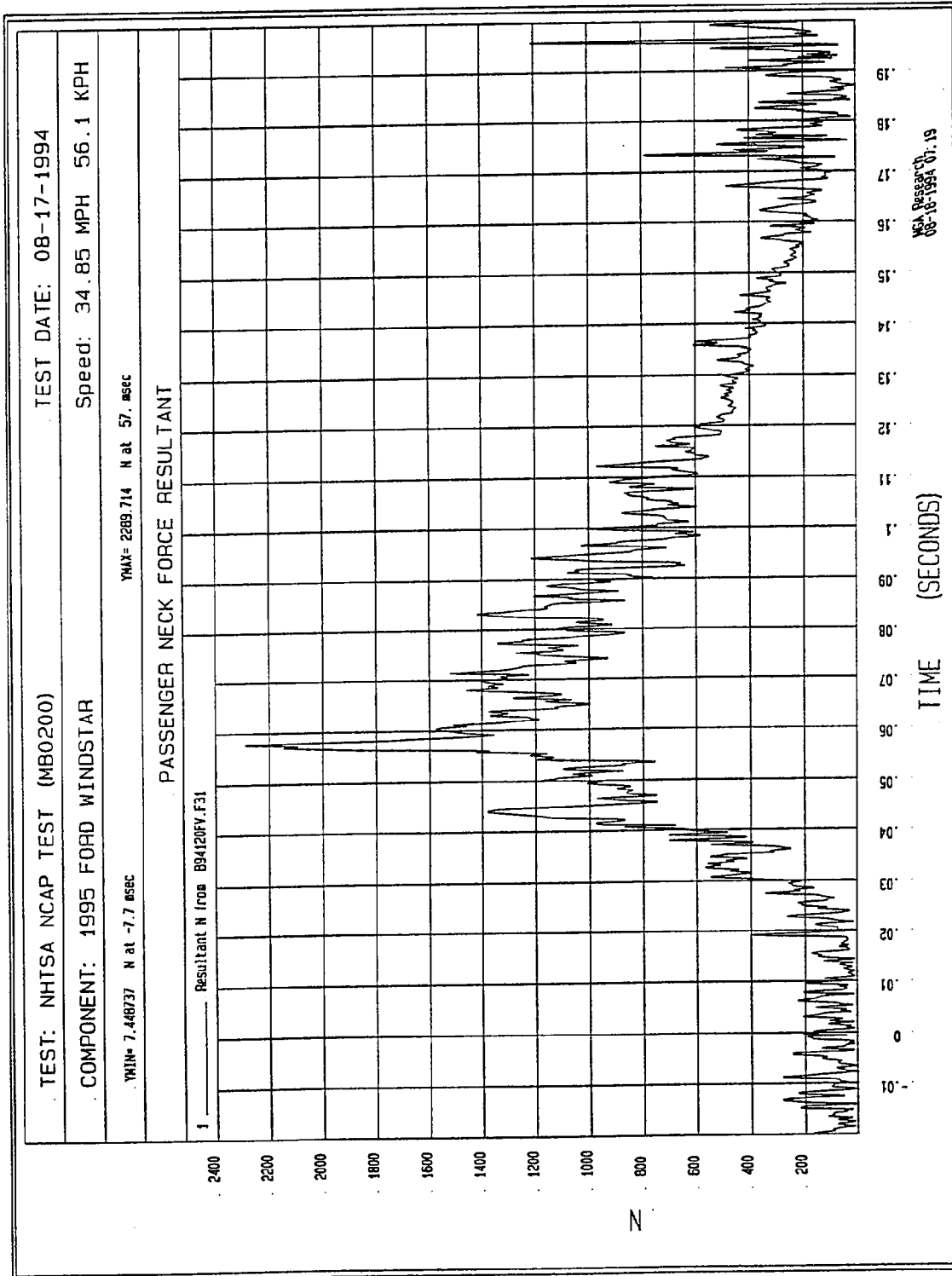


Figure B-86 - Passenger Neck Force Resultant vs. Time

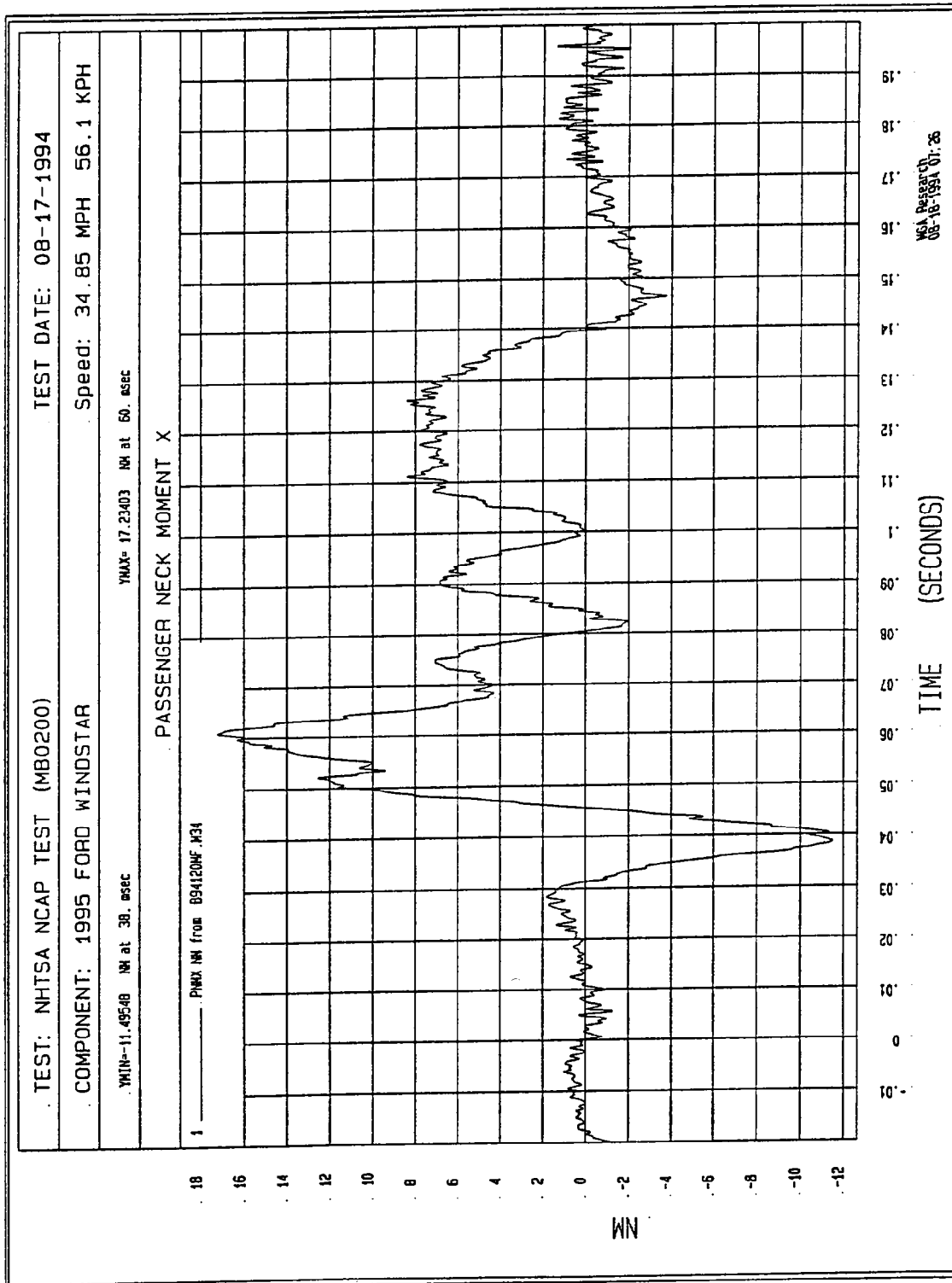


Figure B-87 - Passenger Neck Moment X vs. Time

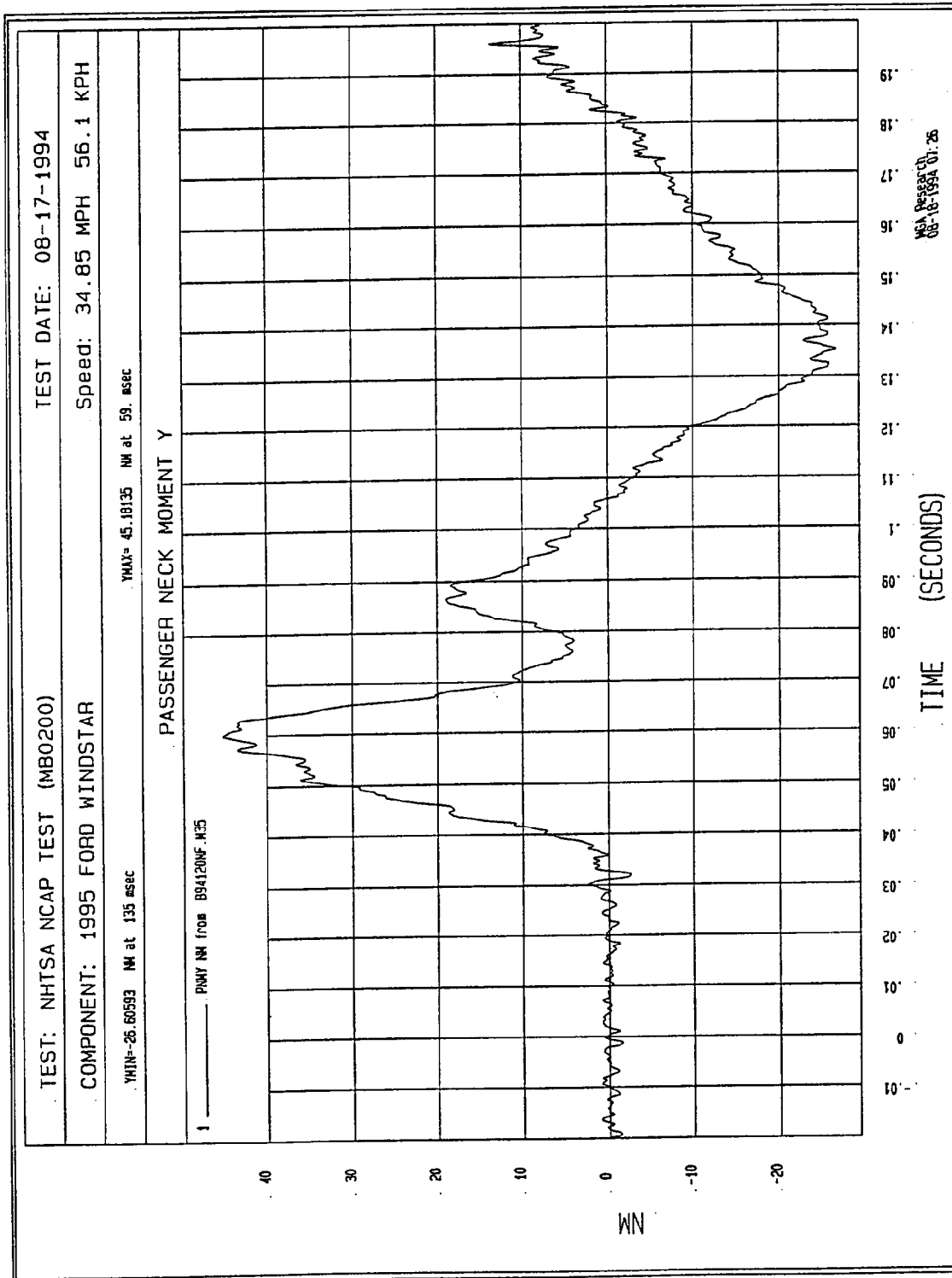


Figure B-88 - Passenger Neck Moment Y vs. Time

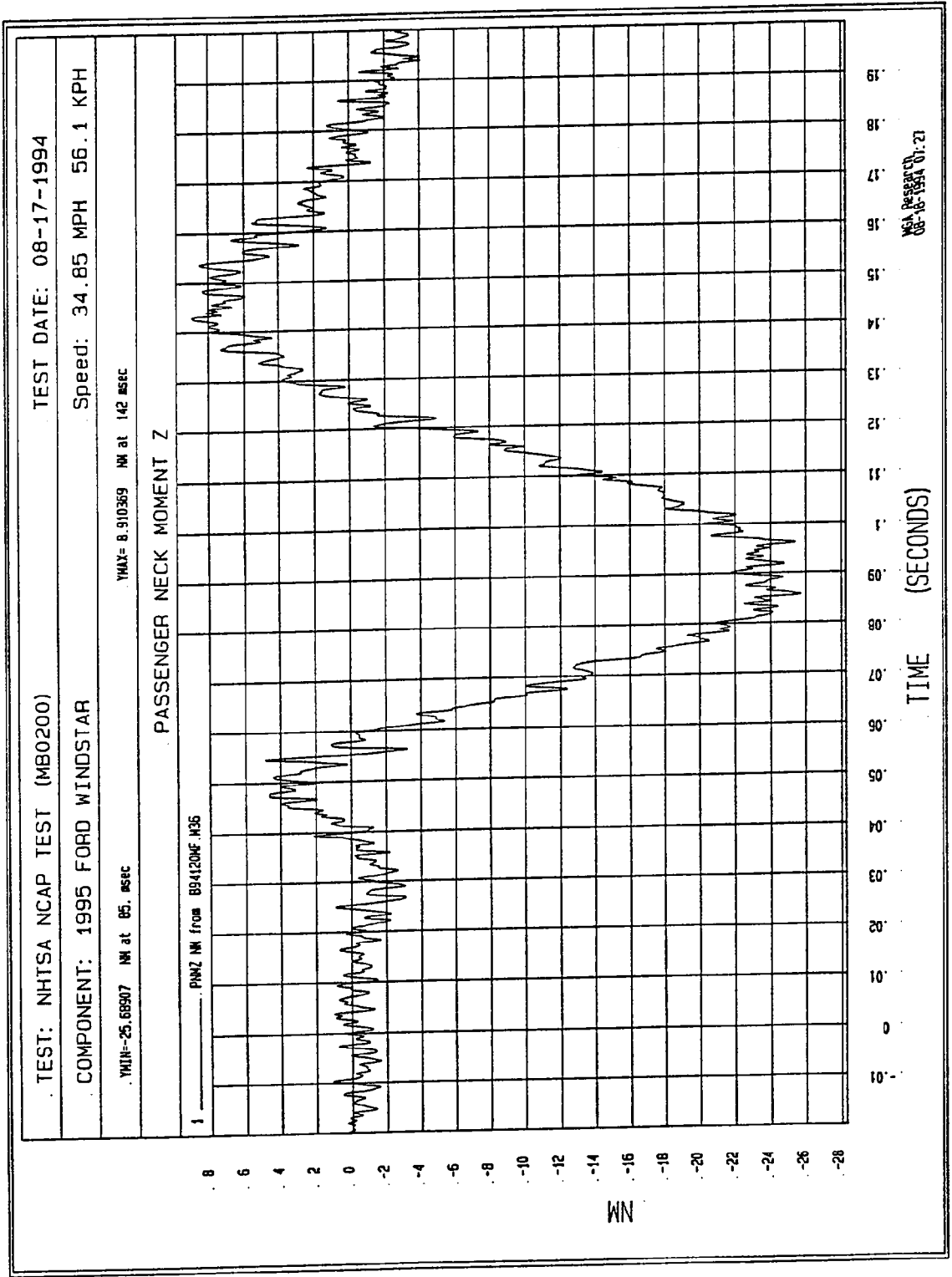


Figure B-89 - Passenger Neck Moment Z vs. Time

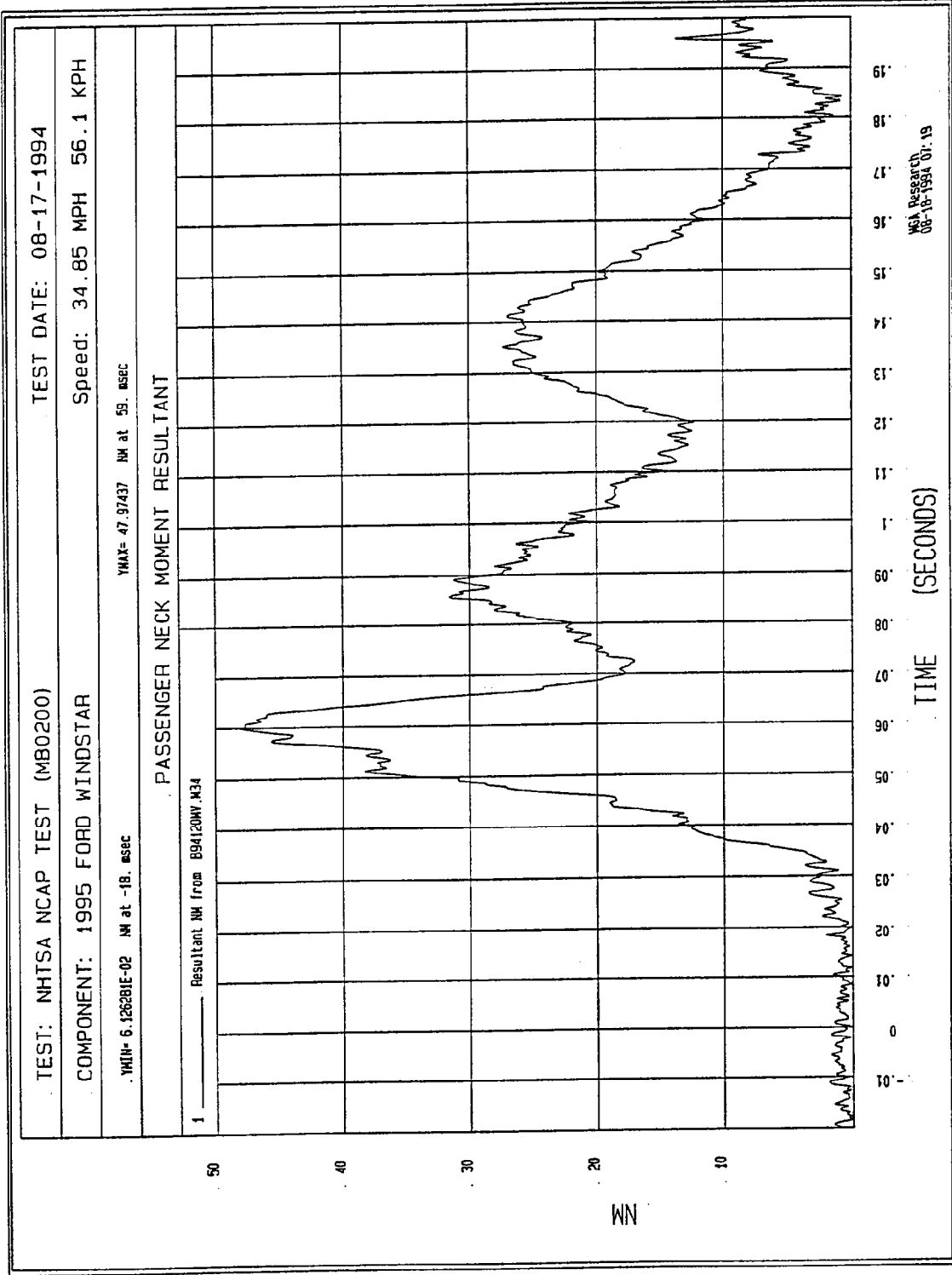


Figure B-90 - Passenger Neck Moment Resultant vs. Time

APPENDIX C
Dummy Configuration & Performance Verification Data

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 066 DUMMY CALIBRATION BY: Rod McClelland and Al Chalmers

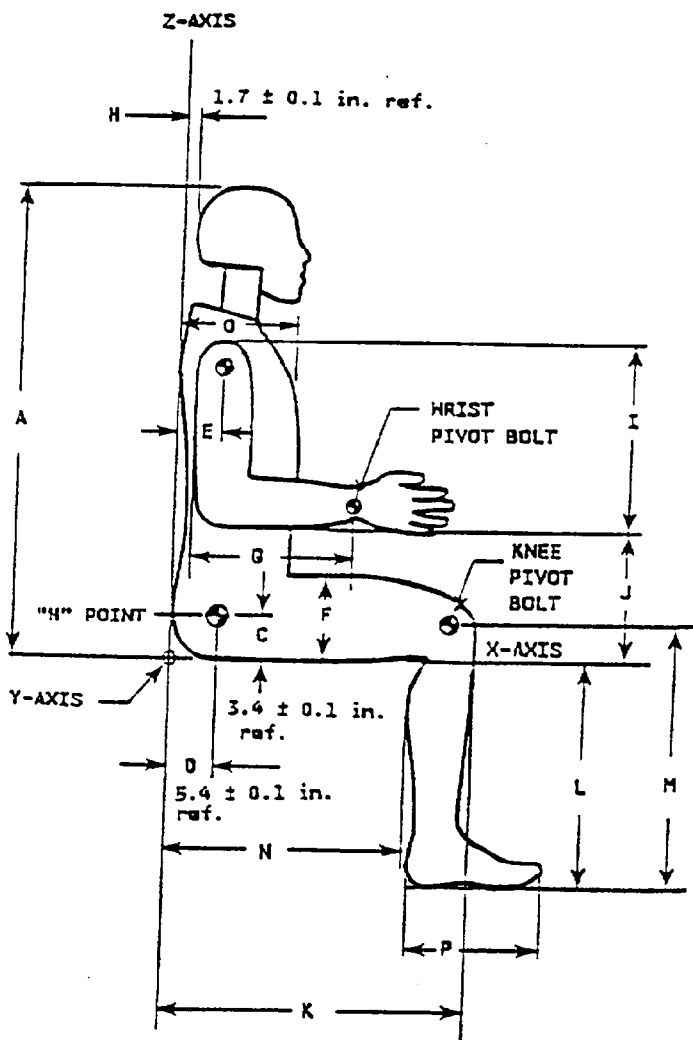
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: 03-24-94

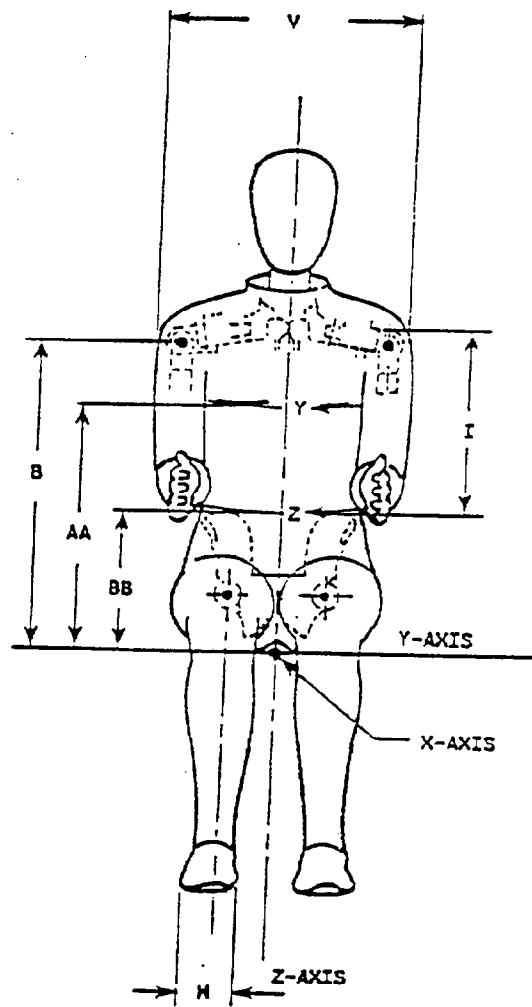
DESCRIPTION	SPECIFICATION (inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.9
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	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.: 066 DUMMY CALIBRATION BY: Rod McClelland and Al Chalmers

VERIFICATION DATE: 03-24-94

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

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	269
Peak Lateral Acceleration	15 G. MAX	2
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	24.33
	20 MS	17.60 - 22.60 G	20.35
	30 MS	12.50 - 18.50 G	14.55
Max. Pendulum G Above 30 MS		29.0 G MAX	14.5
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	39
D Plane Rotation	MAX	64 - 78 DEG.	78
	TIME	57 - 64 MS	59
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	117
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	72
	TIME	47 - 58 MS	53
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	106

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	20.01
Pendulum Deceleration	10 MS	17.20 - 21.20 G	20.68
	20 MS	14.00 - 19.00 G	17.69
	30 MS	11.00 - 16.00 G	11.05
Max. Pendulum G Above 30 MS		22 G Max	11
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	46
D Plane Rotation	MAX	81 - 106 DEG.	101
	TIME	72 - 82 MS	77
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	160
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-51.3
	TIME	65 - 79 MS	72
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	148

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	22.3
Peak Deflection	2.50 to 2.86 IN.	2.64
Peak Resistive Force	1160 to 1325 LBS.	1266
Internal Hysteresis	69 to 85%	70

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.	1060

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1087

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 065 DUMMY CALIBRATION BY: Rod McClelland and Al Chalmers

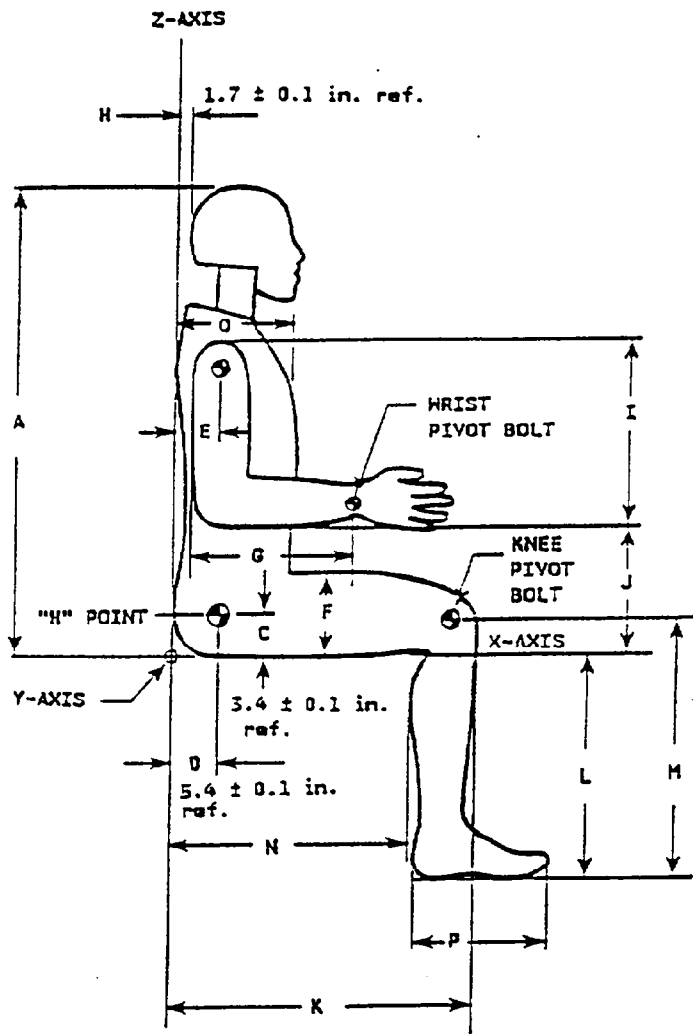
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: 03-15-94

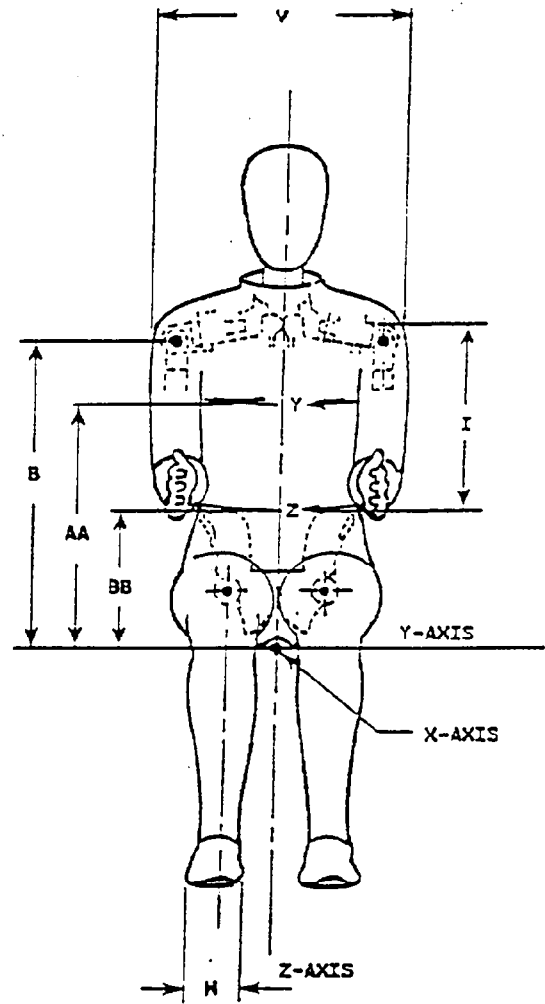
DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.8
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	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.: 065 DUMMY CALIBRATION BY: Rod McClelland and Al Chalmers

VERIFICATION DATE: 03-15-94

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

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	265
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	23.0
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.19
	20 MS	17.60 - 22.60 G	19.59
	30 MS	12.50 - 18.50 G	13.33
Max. Pendulum G Above 30 MS		29.0 G MAX	14.4
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	39
D Plane Rotation	MAX	64 - 78 DEG.	74
	TIME	57 - 64 MS	58
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	117
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	68
	TIME	47 - 58 MS	53
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	103

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	20.06
Pendulum Deceleration	10 MS	17.20 - 21.20 G	19.05
	20 MS	14.00 - 19.00 G	16.01
	30 MS	11.00 - 16.00 G	12.10
Max. Pendulum G Above 30 MS		22 G Max	12
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	45
D Plane Rotation	MAX	81 - 106 DEG.	98
	TIME	72 - 82 MS	76
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	160
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-45.5
	TIME	65 - 79 MS	70
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	143

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.	2.66
Peak Resistive Force	1160 to 1325 LBS.	1244
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.	1097

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1099

APPENDIX D

Dummy, Vehicle and Laboratory Calibration Data

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 066

	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	66G	Bourns	7/08/94
Lap Belt Load Cell	657	Lebow	8/09/94
Torso Belt Load Cell	625	Lebow	8/09/94

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 066

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	439	Denton	05/09/94
Upper Right Tibia Moment Y	439	Denton	05/09/94
Lower Right Tibia Moment Y	427	Denton	05/09/94
Lower Right Tibia Force X	427	Denton	05/09/94
Lower Right Tibia Force Z	427	Denton	05/09/94
Upper Left Tibia Moment X	437	Denton	05/09/94
Upper Left Tibia Moment Y	437	Denton	05/09/94
Lower Left Tibia Moment Y	425	Denton	05/09/94
Lower Left Tibia Force X	425	Denton	05/09/94
Lower Left Tibia Force Z	425	Denton	05/09/94

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 65

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACDE7	Endevco	7/28/94
Head Y	ACC7Ø	Endevco	7/28/94
Head Z	ACCW9	Endevco	7/28/94
Chest X	ACC78	Endevco	7/12/94
Chest Y	ACC86	Endevco	7/12/94
Chest Z	ACC93	Endevco	7/12/94
Right Femur Load Cell	259	Denton	8/Ø1/94
Left Femur Load Cell	26Ø	Denton	8/Ø1/94
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	65G	Bourns	8/Ø3/94
Lap Belt Load Cell	662	Lebow	8/Ø9/94
Torso Belt Load Cell	69Ø	Lebow	8/Ø9/94

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	MGA121	Entran	5/16/94
Right Rear Seat Crossmember X	AY90	Endevco	8/04/94
Top of Engine X	MGA119	Entran	8/01/94
Bottom of Engine X	AHDR9	Endevco	8/12/94
Left Brake Caliper X	MGA110	Entran	8/12/94
Right Brake Caliper X	DK75	Endevco	8/12/94
Instrument Panel X	MGA120	Entran	6/30/94
Redundant Left Rear Seat Crossmember X	ADBA6	Endevco	7/12/94
Redundant Right Rear Seat Crossmember X	AJ7R8	Endevco	8/01/94

LABORATORY INSTRUMENTS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	AGH90	Endevco	5/10/94
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

Using Safety Restraints Properly

Safety Belts

The use of safety belts helps to restrain you and your passengers in case of a collision. In most states and in Canada, the law requires their use. We strongly recommend that you use them every time you travel in your vehicle.

Safety belts provide best restraint when:

- the seatback is upright
- the occupant is sitting upright (not slouched)
- the lap belt is snug and low on the hips
- the shoulder belt is snug against the chest
- the knees are straight forward

For your safety, your vehicle has different types of safety belts:

- **Lap and Shoulder Belts** – For people who sit next to the side windows.
- **Lap Belts** – For people who sit in the middle of the third row seat.

See the following sections for directions on how to properly use these safety belts. Also see *Safety Restraints for Children* in this chapter for special instructions about using safety belts for children.

WARNING

Make sure that you and your passengers, including pregnant women, wear safety belts. Be sure that the lap belt portion of your safety belt fits snugly and as low as possible around the hips. If safety belts are not used properly, the risk of you or your passengers being injured in a collision greatly increases.

Do not allow any people to ride in the cargo area of your vehicle. People who are not riding in seats with their safety belts fastened are much more likely to be injured in a collision.

WARNING

Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around your neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

WARNING

Always drive and ride with your seatback upright and the lap belt portion of your safety belt snug and low across the hips. This will reduce the risk of serious injury to the abdomen or neck that could be caused by sliding under the safety belts in a collision.

Children should always ride with the seatback in the fully upright position. When the seatback is not fully upright, there is a greater risk that the child will slide under the safety belt and be seriously injured in a collision.

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Never use a single belt for more than one person or across more than one seating position. This greatly increases the risk that one or both of the people will be injured in a collision. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair.

WARNING

Lock the doors of your vehicle before driving to lessen the risk of the door coming open in a collision.

Safety Belt Maintenance

Check the safety belt systems periodically to make sure that they work properly and are not damaged.

WARNING

All safety belt assemblies, including retractors, buckles, front seat belt buckle support assemblies (slide bar) (if so equipped), child safety seat tether bracket assemblies (if so equipped) and attaching hardware, should be inspected after any collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

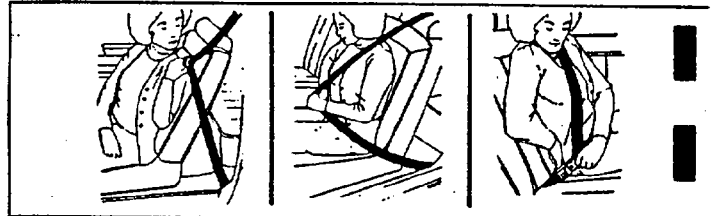
Combination Lap and Shoulder Belts

While in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, turn hard, or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap and shoulder belt locks and helps reduce your forward movement.

After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

To fasten the belt, pull the lap/shoulder belt from the retractor so that the shoulder portion of the belt crosses your shoulder

and chest. Be sure the belt is not twisted. If it is, remove the twist. Insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Make sure the tongue is securely fastened to the buckle.



Fastening the front seat lap and shoulder belt

WARNING

Make sure that the lap belt is as low around your hips as possible. Do not wear the lap belt around your waist. If you do not use the lap belts properly, the risk of being injured in a collision greatly increases.

WARNING

All front and rear seat outboard occupants (including pregnant women) should wear lap and shoulder belts, for optimum protection in a collision.

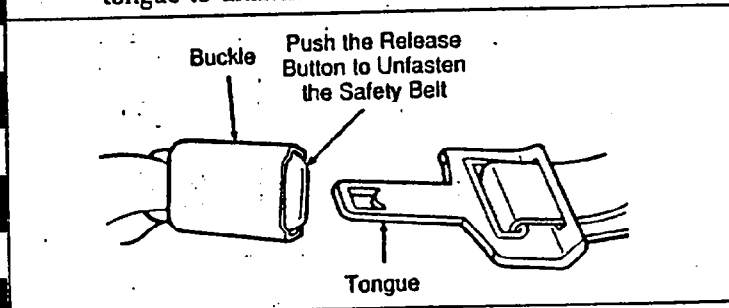
WARNING

Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

Adjust the lap part of the belt by pulling up on the shoulder belt until the lap belt fits snugly and as low as possible around your hips.

To unfasten the belt:

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.



Unfastening the lap and shoulder belts

2. While the belt retracts, guide the tongue to its original position. If you do not guide the tongue, it may strike you or part of the vehicle.

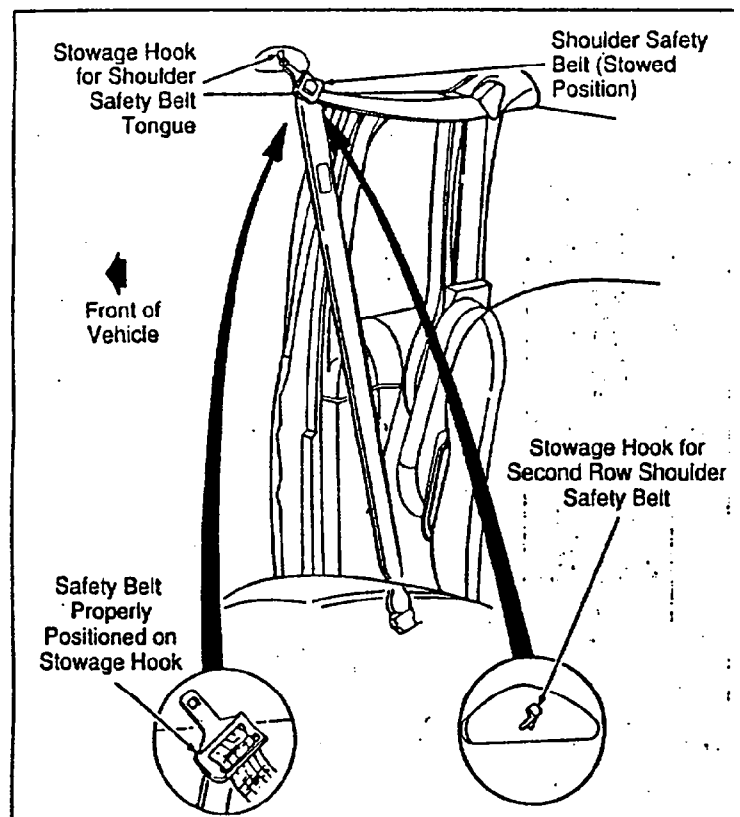
Combination Lap and Shoulder Belt – Second Row Bench Seat

There is a unique safety restraint system for the outside seating position of the second row bench seat. It is very important that you read and understand this section before anyone rides in the outside seating position (near the sliding door) of the two-passenger bench seat.

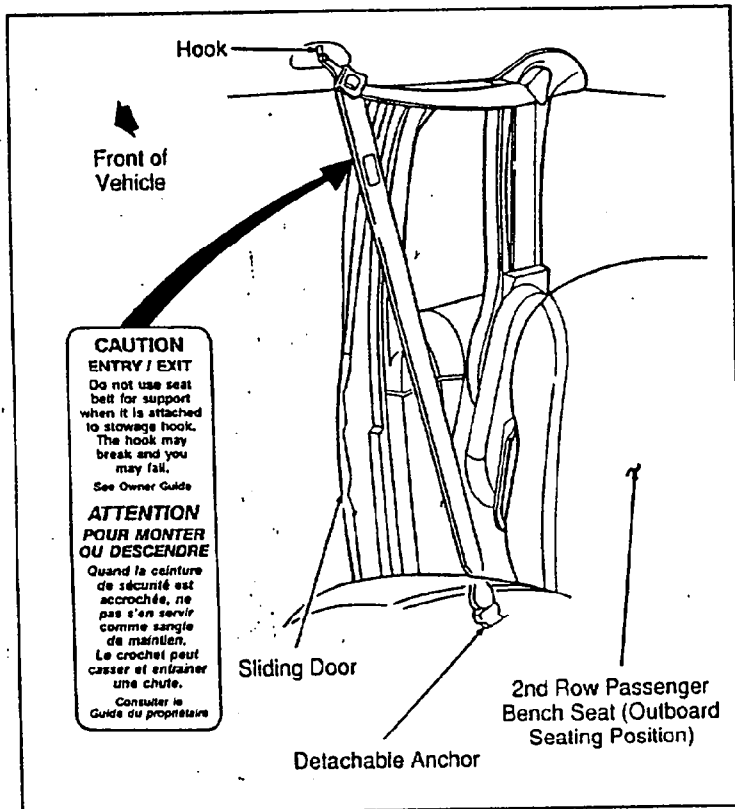
In addition to safety belt anchorages in the floor and roof structures, the second row bench seat has a detachable safety belt anchor mounted to the outboard side of the seat. The safety belt should always remain attached to this anchor except when removing this seat.

The second row passenger side outboard seating position uses a hook above the sliding door to stow the shoulder safety belt when entering or exiting the vehicle or when it is not being used.

NOTE: When the belt is stowed using the hook, DO NOT use the hanging belt as an assist when entering the vehicle.



Proper stowage of second row shoulder safety belt



Location of the stowage hook caution label on safety belt

When removing the second row bench seat:

1. Disengage the safety belt from the seat by pushing the red release button on the detachable anchor (see Figure 1). When this shoulder belt assembly is free of the seat, allow the retractor to wind up the slack in the belt.
2. Using the clip attached to the end of the shoulder belt, clip the end of the belt to the stationary portion of the shoulder belt (see Figure 2). The end of the shoulder belt must be clipped in order to keep it from striking anything during vehicle operation.

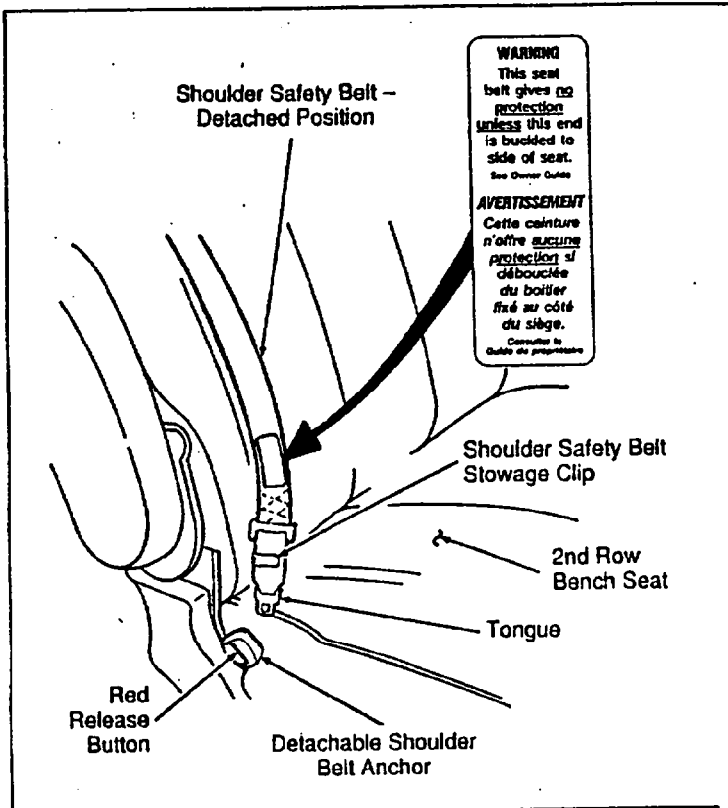


Figure 1: Second row bench seat detachable anchor

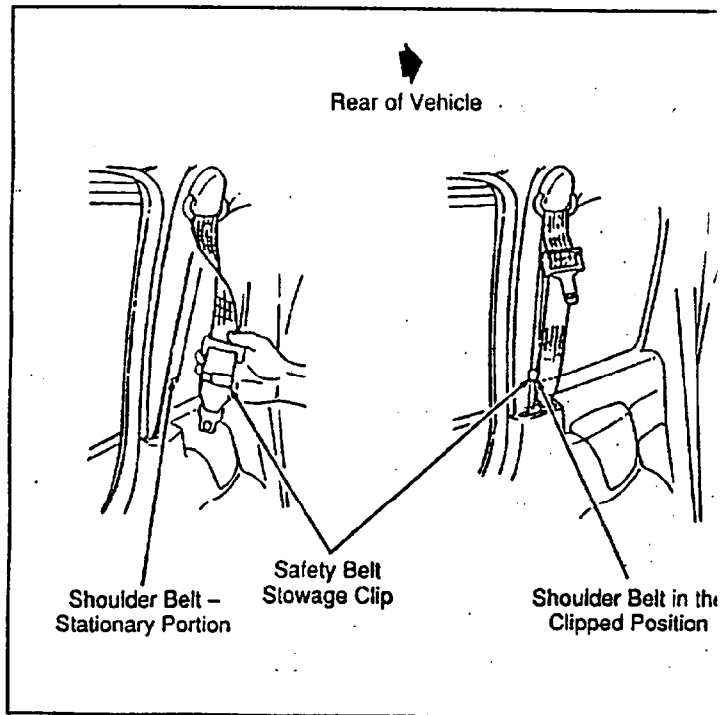


Figure 2: Securing the detachable shoulder belt

Refer to the "Seats" section in the *Features* chapter of this Owner Guide for information on removing seats.

After re-installing the second row bench seat, make sure that the safety belt is not twisted before you insert it into the detachable anchor. A twisted safety belt may cause the retract to work improperly. Then insert the detachable anchor tongue into the detachable anchor until you hear a "snap" and feel the latch engage.

WARNING

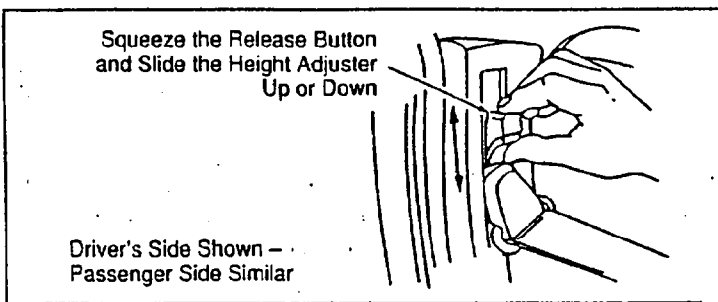
When reinstalling a rear seat in your vehicle it must be placed in its original position. Improper installation of the seat will prevent correct use of the safety belts and could increase the risk and/or severity of injury in an accident. Refer to the warning label on the seat belt.

Shoulder Belt Adjustment (Driver and Right Front Passenger)

You can adjust the shoulder belt height to one of five (5) positions. To adjust, pinch the release button and slide it up or down until the belt rests on your shoulder near your neck. Release the button and make sure the adjuster is firmly seated in one of the five (5) positions.

WARNING

If the shoulder belt is off your shoulder or on your upper arm, there is a greater risk of severe injury in a collision.

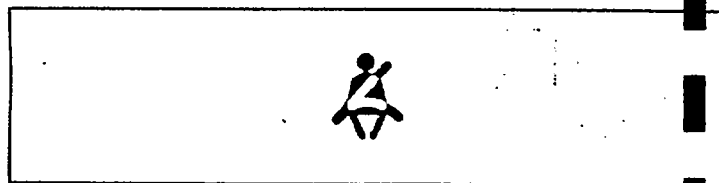


The shoulder belt height adjuster

Safety Belt Warning Light and Chime

This warning light and chime remind you to fasten your safety belt. The following conditions will take place:

- If the driver does not fasten the safety belt before ignition is turned to ON, the chime will sound for four (4) to eight (8) seconds and the light will illuminate for one (1) to two (2) minutes, or until the safety belt is fastened.
- If the driver fastens the safety belt before the ignition is turned to ON, the chime will not sound and the light will not illuminate.
- If the safety belt is buckled while the light is on and the chime is sounding, both the light and the chime turn off.



The safety belt warning light

Lap Belts

The lap belt in the center of the rear seat does not adjust automatically. You must adjust it to fit snugly and as low as possible around your hips. Do not wear it around your waist.

Before you fasten your lap belt, you may need to lengthen it.

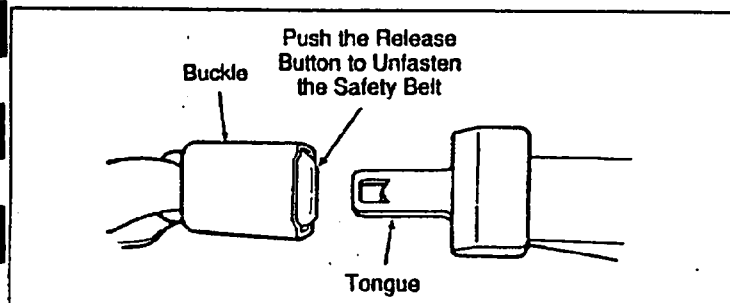
To lengthen the belt, tip the belt tongue at a right angle to belt. Pull the belt tongue over your lap until it reaches the buckle.

To fasten the belt, pull the belt across your hips and insert the tongue into the correct buckle on your seat until you hear a snap and feel it lock. Make sure the buckle is securely fastened.

Adjust the belt so that it fits snugly around your hips:

- If you need to lengthen the belt, unfasten it and repeat the procedure above.
- If you need to shorten the belt, pull on the loose end of the webbing.

To unfasten the belt, push the red release button on the end of the buckle. This allows the tongue to unlatch from the buckle.



Unfastening the lap belt in the center rear seating position

Safety Belt Extension Assembly

For some people, the safety belt may be too short even when it is fully extended. You can add about eight inches (20 cm) to the belt length with a safety belt extension assembly (Part number 611C22). Safety belt extensions are available at no cost from your dealer.



Use only extensions manufactured by the same supplier as the safety belt. Manufacturer identification is located at the end of the webbing on a label. Also, use the safety belt extension only if the safety belt is too short for you when fully extended. Do not use extension to change the fit of the shoulder belt across the torso. Failure to follow these instructions will affect the performance of the safety belts and increase the risk of personal injury.

How to Untwist or Unjam a Safety Belt Retractor

If you should jam a safety belt retractor by allowing the belt to retract when it is twisted, you can free the webbing with this procedure:

1. Pull on the belt with both hands to tighten it on the retractor spool.
2. Feed the belt back into the retractor until it is completely retracted. Repeat previous step if necessary.
3. Pull the belt out of its holder as far as it will go and untwist the belt or remove the object that is jamming the belt. Let the belt retract.
4. Then, pull the belt out and let it retract several times to make sure that the belt works properly.

Procedure to Correct a Twisted Safety Belt at the "D" Ring (if so equipped) Front and/or Rear Outboard Seating Positions

NOTE: The restraint system shown in the following figures may be different than your vehicle. However, use these figures and this procedure to correct a twisted safety belt at any outboard seating position that has a "D" ring.

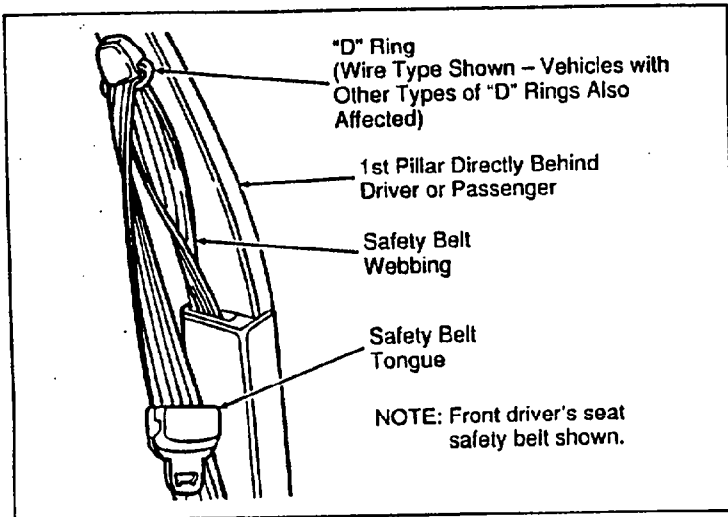


Figure 1

1. Grasp the belt webbing at the "D" ring. See Figure 2.

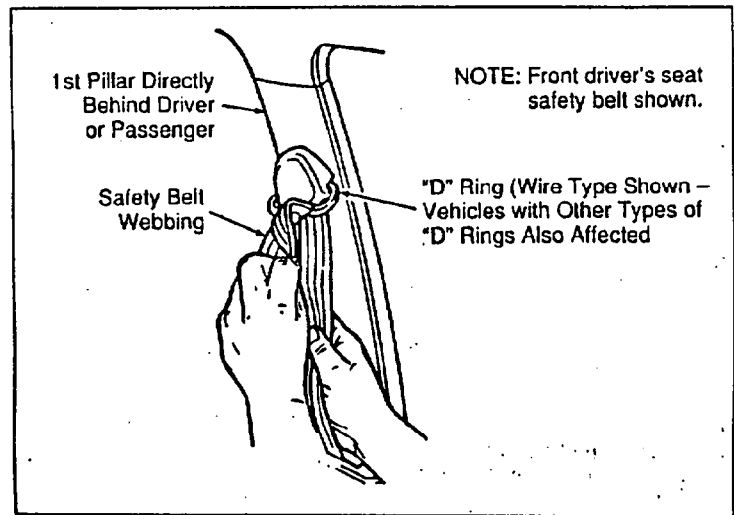


Figure 2

2. Rotate and fold the belt webbing over itself as required to remove the twist.
3. Feed the folded portion of the belt through the "D" ring.
4. When completed, safety belt should look like Figure 3.

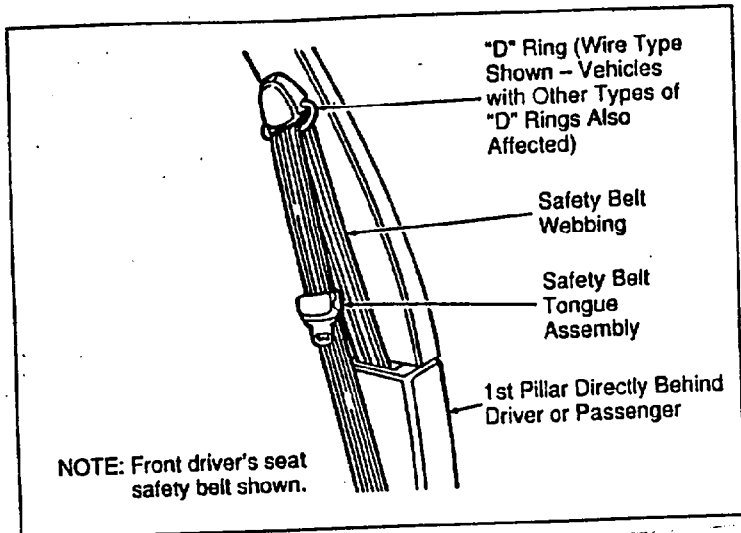


Figure 3

Procedure to Correct a Rotated Tongue on the Safety Belt (Front and/or Rear Outboard Seating Positions)

NOTE: The restraint system shown in the following figures may be different than your vehicle. However, use these figures and this procedure to correct a rotated tongue on the safety belt at any outboard seating position that has a "D" ring. See Figure 4.

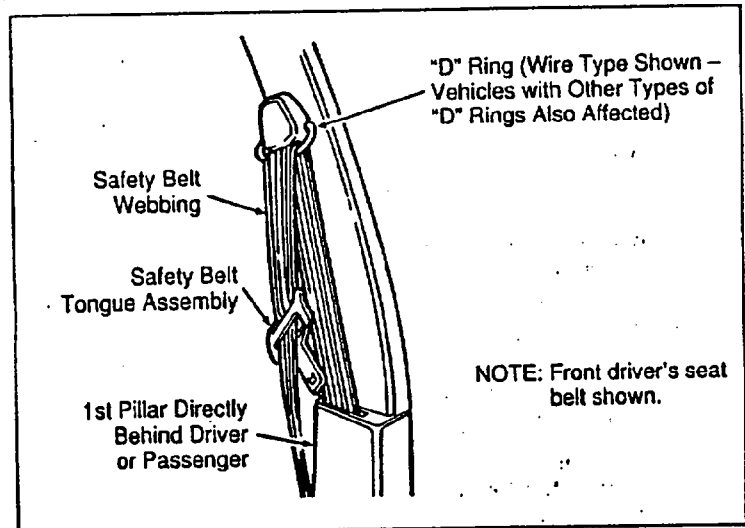


Figure 4

1. Grasp the belt tongue and pull down on the belt webbing closest to you to form a loop through the upper (narrow and longer) slot in the tongue. See Figure 5.

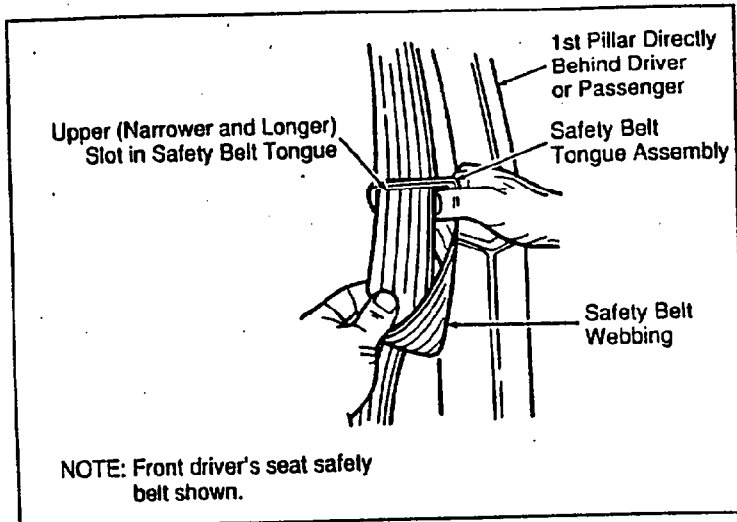


Figure 5

2. Working within the upper slot, rotate and fold the belt webbing over itself as required to remove the twist. See Figure 5.
3. Pull the excess belt webbing back through the upper slot in the tongue.
4. Repeat the above steps to complete the removal of the twist at the lower (wider and shorter) slot in the tongue. See Figure 6.

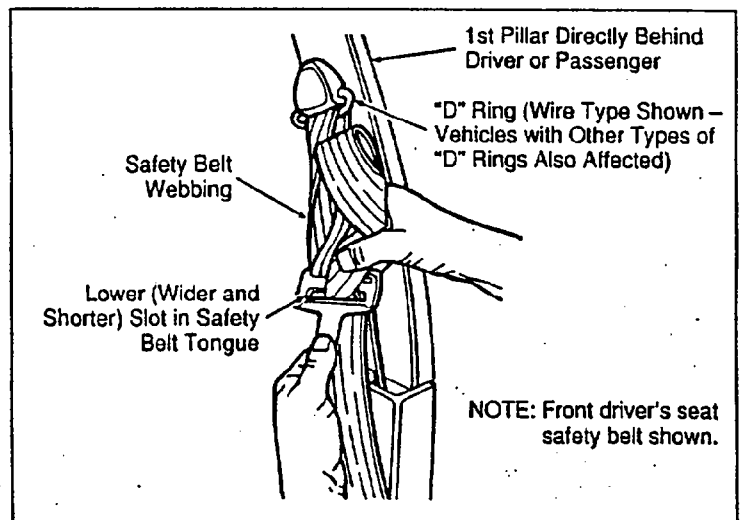


Figure 6

5. When completed, the safety belt should look like Figure 3.

Air Bag Supplemental Restraint System (SRS)

Your vehicle is equipped with a driver side airbag supplemental restraint system, located in the steering wheel and identified by the letters "SRS" in the center of the wheel.

The letters "SRS" above the glove box indicate your vehicle is also equipped with a right front passenger air bag.

The driver side and right front passenger air bags are Supplemental Restraint Systems (SRS), provided at these seating positions in addition to the lap/shoulder belt. They are designed to supplement the protection provided to properly belted occupants in moderate to severe frontal collisions. The supplemental airbag system does not provide restraint to the lower body.

The Importance of Wearing Safety Belts

WARNING

ALWAYS WEAR THE SAFETY BELT!

WARNING

All occupants of the vehicle, including the driver, should always wear their safety belts, whether or not an airbag Supplemental Restraint System is also provided at their seating position. Failure to do so may increase the risk of severe injury or death in the event of a collision.

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- help keep you in the proper position (away from the air bag) when it inflates
- reduce the risk of harm in rollover, side or rear impact collisions, because an air bag is not designed to inflate in such situations
- reduce the risk of harm in frontal collisions that are not severe enough to activate the supplemental air bag
- reduce the risk of being thrown from your vehicle

The Importance of Being Properly Seated

In a collision, the air bag must inflate extremely fast to help provide additional protection for you. In order to do this, the air bag must inflate with considerable force. If you are not seated in a normal riding position with your back against the seatback, the air bag may not protect you properly and could possibly hurt you as it inflates.

Important Information for Passenger Air Bag

Your vehicle has a right front passenger air bag. It is important for front seat passengers' safety that they remain properly seated whenever the vehicle is moving. This means that small children should be secured in appropriate child safety seats and all other occupants should sit upright, with their backs against the seatback, and restrained by lap and shoulder belts. No passenger should sit toward the front edge of the seat, or stand or lean near the air bag cover (which is near the glove box).

WARNING

If a passenger is not properly seated and restrained, an inflating air bag could cause serious injury.

WARNING

Rear-facing infant seats should never be placed in the front seat.

In rear-facing infant seats, the infant's head is closer to the air bag. The force of the rapidly inflating air bag could push the top of the rear-facing seat against the vehicle seatback, center

E-11 armrests (if equipped) or center console (if equipped). **REAR-FACING INFANT SEATS MUST ALWAYS BE SECURED IN THE REAR SEAT**, and other child safety seats and infant seats should be secured in the rear seat whenever possible.

WARNING

Do not place objects or mount equipment on or near the air bag module covers (identified by the letters "SRS") on the steering wheel and instrument panel, or in front seat areas that may come in contact with a deploying air bag, because any such objects could cause harm if the vehicle is in a collision severe enough to cause the airbag to inflate. Failure to follow this instruction may increase the risk of personal injury in the event of a collision.

For further information about the proper mounting of equipment in the front seat of this vehicle, please refer to Ford's brochure entitled *Some Important Information About Air Bag Supplemental Restraint System* which can be obtained by calling Helm Inc. at 1-800-782-4356. Ask for brochure FPS-8602.

For additional important safety information on the proper use of seat belts, child seats, and infant seats, please read the other sections of this part of the Owner Guide, especially sections entitled *Safety Belts for Children* and *Safety Seats for Children*.

How the Air Bag Supplemental Restraint System Operates

The supplemental air bag system has two main parts. One part is the air bag system with the driver air bag and passenger air bag. The second part is the electrical system, consisting of impact sensors and a system diagnostic module. The sensors sense the crash and send an electrical pulse to activate the air bags. The diagnostic module monitors its own circuits, the air bag electrical system, the air bag readiness light, the air bag power, and the air bag igniters.

The driver air bag is in the center of the steering wheel. The front passenger seat air bag is located in the center of the instrument panel ledge above the glove compartment.

The air bag system uses a readiness light and a tone to indicate the condition of the system. The readiness light is in the instrument cluster. When you turn the ignition key to ON, the light will illuminate for approximately six (6) seconds and then turn off. This indicates that the system is operating normally.

NOTE: Maintenance of the air bag system is not required.

A problem with the system is indicated by one or more of the following:

- the readiness light will either flash or stay lit, or
- it will not light immediately after the ignition is turned on, or
- a group of five beeps will be heard.

If any of these things happens, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately.

Tone generator

The air bag readiness light indicates the air bag system condition. However, a series of five sets of five beeps will be heard only if the readiness light doesn't work and there is a problem with the air bag system. This also means that the Air Bag Supplemental Restraint System (SRS) is in need of service. The tone pattern will repeat (five sets of five beeps) periodically until the problem and light are repaired. Unless serviced, the Air Bag Supplemental Restraint System may not function properly in the event of a collision.

WARNING

Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System; tampering could cause activation of the system and increase the risk of personal injury. DO NOT REPLACE OR OTHERWISE TAMPER WITH THE AIR BAG FUSES. For servicing of the Air Bag Supplemental Restraint System, see your dealer.

The air bag system is designed to stay out of sight until it is activated. The air bag system is designed to deploy in frontal and front-angled collisions more severe than hitting a parked vehicle of similar size and weight head-on at about 28 mph (45 km/h). Because the system senses the crash severity rather than vehicle speed, some frontal collisions at speeds above 28 mph (45 km/h) will not inflate the air bag.

The following four steps show how the air bag system works:

1. Sensors in the vehicle will detect the degree of severity of a frontal impact. When two sensors (one primary and one safing) close at the same time, electric current flows to the inflator and the system ignites the gas generant.
2. The propellant then rapidly burns in the metal container. The rapid burning produces nitrogen gas and small amounts of dust. The nitrogen gas and dust are cooled and filtered during inflation of the air bag.
3. The inflating supplemental air bag splits open the trim cover. The supplemental air bag then rapidly unfolds and inflates in front of the driver.

NOTE: STEPS 1-3 TAKE PLACE IN A FRACTION OF A SECOND.

4. After inflation, the gas empties through holes in the air bag. The air bag deflates at once.

The surface of the air bags and the vehicle interior may be dusted with a powdery residue. The powder is corn starch or talcum powder, which is used to lubricate the air bag as it inflates, and sodium compounds such as sodium carbonates (e.g., baking soda), and possibly a very small amount of sodium hydroxide that may be irritating to the skin and eyes, but is not toxic.

Right after air bag inflation, you may notice smoke (from the powder and dust) and smell the burnt propellant. This is normal.



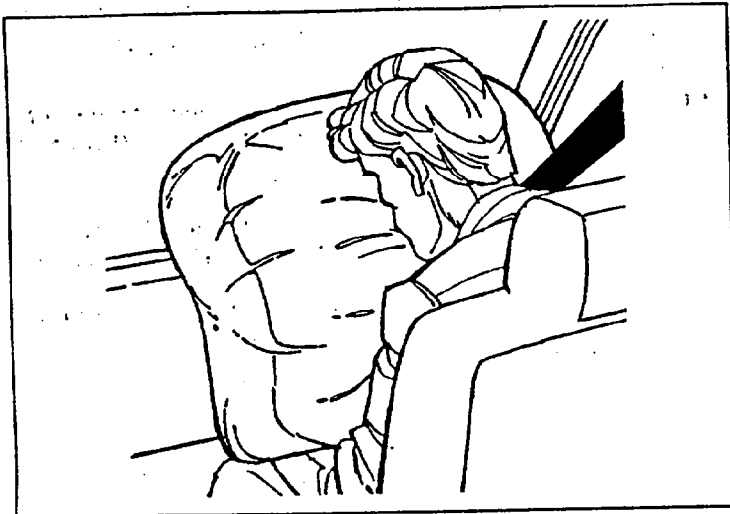
Several air bag system components get hot after inflation. Do not try to touch them after inflation.

Air bags may not inflate in certain frontal collisions, even though the vehicle may be badly damaged. The fact that your air bag did not inflate in such a collision does not mean that something is wrong with the air bag system. Rather, it means the crash forces were not severe enough to need an air bag to prevent serious injury.



E-13

Inflated driver-side air bag



Inflated passenger-side air bag

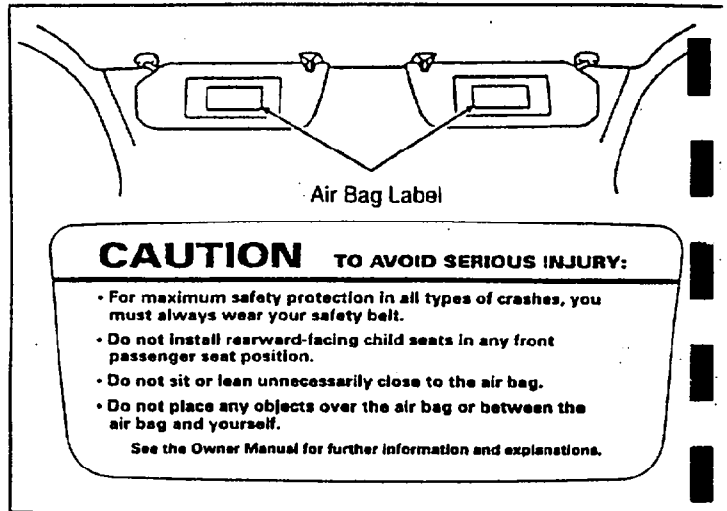
WARNING The air bag will inflate only once. The system is designed to function on a one-time-only basis. If the air bag is inflated, **THE AIR BAG WILL NOT FUNCTION AGAIN AND MUST BE REPLACED IMMEDIATELY.** If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

Disposal of supplemental air bag equipped vehicles

For disposal of air bags or air bag equipped vehicles, see your local Ford or Lincoln-Mercury dealer, or refer to the procedures in the 1995 Ford Service Manual. Information on how to order a service manual is available at an authorized Ford or Lincoln-Mercury dealer. You can also order a service manual using the order form in the *Accessories* chapter of your Owner Guide.

Service and information labels

Service and information labels are attached to the sun visor (USA vehicles), on the headliner above the driver's sun visor (Canadian vehicles), and near the radiator support in the engine compartment.



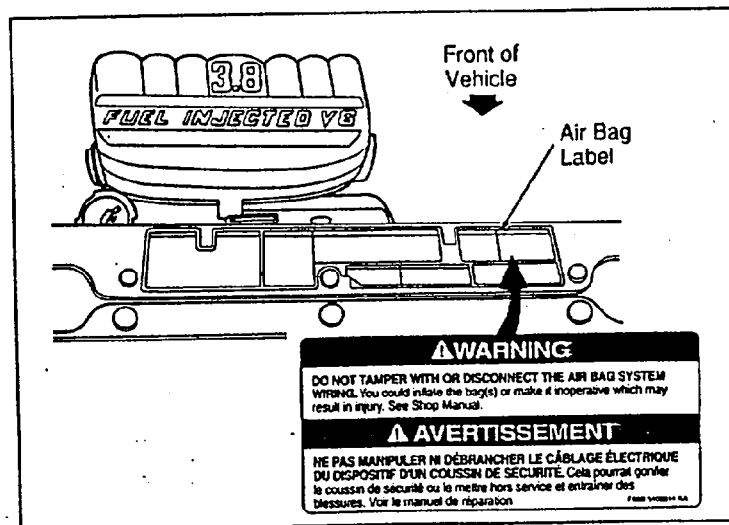
Air Bag Label

CAUTION TO AVOID SERIOUS INJURY:

- For maximum safety protection in all types of crashes, you must always wear your safety belt.
- Do not install rearward-facing child seats in any front passenger seat position.
- Do not sit or lean unnecessarily close to the air bag.
- Do not place any objects over the air bag or between the air bag and yourself.

See the Owner Manual for further information and explanations.

Location of air bag labels on sun visors



Front of Vehicle

Air Bag Label

WARNING

DO NOT TAMPER WITH OR DISCONNECT THE AIR BAG SYSTEM WIRING. You could inflate the bag(s) or make it inoperative which may result in injury. See Shop Manual.

AVERTISSEMENT

NE PAS MANIPULER NI DÉBRANCHER LE CÂBLAGE ÉLECTRIQUE DU DISPOSITIF D'UN COUSSIN DE SÉCURITÉ. Cela pourrait gonfler le coussin de sécurité ou le mettre hors service et entraîner des blessures. Voir le manuel de réparation.

Location of air bag label on radiator support