

V221D

REPORT NO.: MGA-95-21402

SAFETY COMPLIANCE TESTING FOR FMVSS 214
"SIDE IMPACT PROTECTION - PASSENGER CARS"

FUJI HEAVY INDUSTRIES LTD.
1995 SUBARU LEGACY 4 DOOR STATION WAGON
NHTSA NO: CS5502

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



MGA Ref. No.: G93A-02

Test Date: October 14, 1994
Report Date: November 21, 1994

FINAL REPORT

Prepared For:

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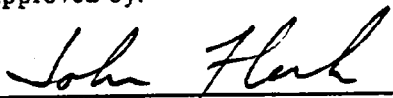
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16. Abstract Compliance tests were conducted on the subject 1995 Subaru Legacy 4 Door Station Wagon in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure for the determination of FMVSS 214 compliance. The test was conducted at the MGA Research Proving Grounds and crash Test Center in Burlington, Wisconsin on October 14, 1994. The impact velocity of the Moving Barrier (MDB) was 32.4 mph (51.7 kph) and the ambient temperature of the struck side (driver's) of the target vehicle at the time of impact was 73°F. The maximum static crush of the impacted vehicle was 294 mm at the occupant H Point level of the struck vehicle. The test or target vehicle's performance is given below: <table border="1"> <thead> <tr> <th></th> <th><u>Driver's SID</u></th> <th><u>Left Rear SID</u></th> </tr> </thead> <tbody> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>53 g's</td> <td>50 g's</td> </tr> <tr> <td>Pelvis Acceleration</td> <td>58 g's</td> <td>53 g's</td> </tr> <tr> <td>Upper Rib Acceleration</td> <td>52.8 g's</td> <td>41.7 g's</td> </tr> <tr> <td>Lower Rib</td> <td>52.5 g's</td> <td>45.3 g's</td> </tr> <tr> <td>Lower Spine</td> <td>53.9 g's</td> <td>55.0 g's</td> </tr> </tbody> </table>							<u>Driver's SID</u>	<u>Left Rear SID</u>	Thoracic Trauma Index (TTI)	53 g's	50 g's	Pelvis Acceleration	58 g's	53 g's	Upper Rib Acceleration	52.8 g's	41.7 g's	Lower Rib	52.5 g's	45.3 g's	Lower Spine	53.9 g's	55.0 g's
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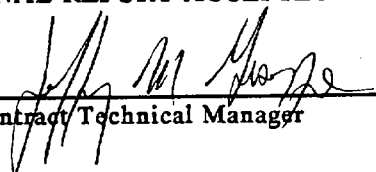
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Approved by:


John Fleck, Project Engineer

Date: 1-10-'95

FINAL REPORT ACCEPTED BY:


Contract Technical Manager

Date: 1/26/95

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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 94 FMVSS 214 "Dynamic" compliance test program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-93-C-02047. The purpose of this test was to evaluate side impact protection in a 1995 Subaru Legacy 4 Door Station Wagon.

This test was conducted using the Office of Vehicle Safety Compliance's FMVSS 214 test procedure (TP-214D-03, dated May 17, 1993).

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes only.

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A stationary 1995 Subaru Legacy 4 Door Station Wagon was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 32.4 mph on October 14, 1994. The orientation angle of the striking vehicle was 90° counterclockwise with respect to the longitudinal axis of the struck vehicle. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are shown in Appendix A.

Two restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to instructions specified in the Laboratory Test Procedure. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report. Appendix B contains the vehicle and dummy response data traces.

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

The summary of the side impact dummy (SID) configuration and performance verification test data are shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.

The driver's Thoracic Trauma Index (TTI) was 53 g's. Maximum pelvic Y acceleration was 58 g's.

The left rear passenger's TTI was 50 g's. Maximum pelvic Y acceleration was 53 g's.

SECTION 3
SUMMARY OF TEST DATA

TABLE 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon
 Vehicle NHTSA No.: CS5502 VIN: 4S3BK6253S6312957
 Vehicle Body Color: Red Month & Year of Manufacture: 6-94
 Engine Data: 4 cylinders; CID; 2.2 Liter; cc
 Placement X Longitudinal; or Lateral
 Transmission: 5 speed; X Manual; Automatic; Overdrive
 Final Drive: Rear Wheel Drive; Frt. Wheel Drive; X Four Wheel Drive
 Odometer Reading 304 miles
 Options: X A/C; X Pwr. Steering.; X Pwr. Brakes; Pwr. Windows
 Power Seats; X Tilt Wheel; Power Door Locks; Self Leveling System

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 32 kpa FRONT (224 kpa)
30 kpa REAR (210 kpa)
 Recommended Tire Size: P185/70R14
 Tires on Test Vehicle: P185/70R14 Manufacturer: Bridgestone

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd Seat 5 Total
 Type of Front Seats: X Bucket; Bench; Split Bench
 Type of Front Seat Back: Fixed; X Adjustable with X Lever
 Vehicle Maximum Capacity Loading = 900 lbs (A) (408 kg)
 No. of Occupants x 150 lbs. = 750 lbs (B) (340 kg)
 Cargo Capacity (A-B) = 150 lbs (68 kg)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>749</u> lbs (340 kg)	Right Rear	=	<u>611</u> lbs (277 kg)
Left Front	=	<u>728</u> lbs (330 kg)	Left Rear	=	<u>671</u> lbs (304 kg)
TOTAL FRONT	=	<u>1477</u> lbs (670 kg)	TOTAL REAR	=	<u>1282</u> lbs (581 kg)
% of Total Vehicle Weight	=	<u>54</u> %;	% of Total Weight	=	<u>46</u> %
TOTAL WEIGHT	=	<u>2759</u> lbs (1251 kg)			

TABLE 2
TEST VEHICLE DATA

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 31, 1994

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 2759 lbs (1251.6 kg)
Cargo Carrying Capacity of Test Vehicle = 150 lbs (68.0 kg)
Weight of 2 Side Impact Dummies (2 x 168 lbs.) = 336 lbs (152.4 kg)
TEST VEHICLE TARGET WEIGHT: = 3245 lbs (1472.0 kg)

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>779</u> lbs (353.4 kg)	Right Rear	= <u>721</u> lbs (327.0 kg)
Left Front	= <u>890</u> lbs (403.7 kg)	Left Rear	= <u>849</u> lbs (385.1 kg)
TOTAL FRONT	= <u>1669</u> lbs (757.1 kg)	TOTAL REAR	= <u>1570</u> lbs (712.1 kg)
% of Total Weight	= <u>52</u> %	% of Total Weight	= <u>48</u> %
TOTAL TEST WEIGHT	= <u>3239</u> lbs (1469.2 kg)		

TEST VEHICLE ATTITUDE (all dimensions in inches):

CURB WEIGHT ATTITUDE: in (mm)

Right Front 27.4 (697) Left Front 27.4 (695) Right Rear 27.2 (691) Left Rear 27.0 (686)

FULLY LOADED WEIGHT ATTITUDE: in (mm)

Right Front 26.2 (667) Left Front 26.3 (668) Right Rear 26.1 (664) Left Rear 25.2 (639)

TEST ATTITUDE: in (mm)

Right Front 26.2 (666) Left Front 26.1 (664) Right Rear 25.7 (654) Left Rear 25.2 (642)

Test Vehicle Wheelbase: 103.5 inches (2629 mm)

C.G. = 50 inches (1270 mm) rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 172.0 in (4370 mm)
Centerline = 184.7 in (4692 mm)
Left Side = 172.0 in (4370 mm)

FIGURE 1
PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

FRONT SEAT CUSHION PLACEMENT:

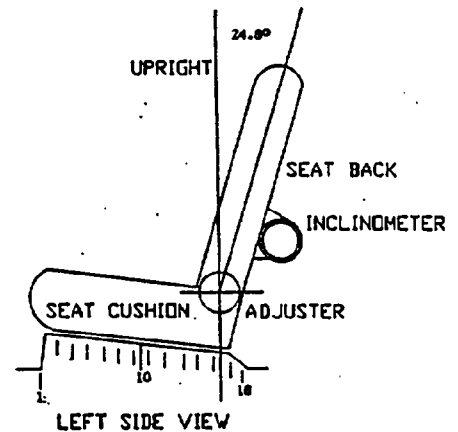
Total Length of Adjustment Travel: 230 mm

Total Number of Adjustment Positions or Detents: 18

Test Position: 10th detent of 18 from front

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 24.8° degrees



SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: Non-Adjustable

Seat Back Adjustment Position: Non-Adjustable

ADJUSTABLE STEERING COLUMN POSITION: Adjusted to mid position

WINDOW POSITIONS:

Left Front closed Left Rear closed

Right Front open Right Rear open

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 16.0 gallons (60 liters)

Test Volume: 14.8 gallons (56.0 liters) 93% of capacity

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

Wheelbase: = 103.5 in (2630 mm)

Impact Point is 14.8 in (375 mm) rearward of front axle centerline

TABLE 3
CRASH TEST SUMMARY FOR TEST VEHICLE

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Overall Length = 184.7 in (4692 mm); Overall Width = 66.6 in (1691 mm)

TEST WEIGHT:

Right Front = 779 lbs (353.4 kg) Right Rear = 721 lbs (327.0 kg)
 Left Front = 890 lbs (403.7 kg) Left Rear = 849 lbs (385.1 kg)
 TOTAL FRONT = 1669 lbs (757.1 kg) TOTAL REAR = 1570 lbs (712.1 kg)
 TOTAL VEHICLE WEIGHT 3239 lbs (1469 kg)
 Wheelbase = 103.5 in (2629 mm)
 Longitudinal C.G. front Center of Front Axle = 50 in (1270 mm)
 Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (245 mm above ground) = 117 mm
 2. LEVEL 2 (462 mm above ground) = 294 mm
 3. LEVEL 3 (575 mm above ground) = 262 mm
 4. LEVEL 4 (855 mm above ground) = 226 mm
 5. LEVEL 5 (1323 mm above ground) = 48 mm
- Maximum Post-Test Intrusion = 294 mm

OCCUPANTS:

	<u>Left Front Passenger</u>	<u>Left Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>3 pt. lap &</u> <u>shoulder belt</u> <u>with airbag</u>	<u>3 pt. lap &</u> <u>shoulder belt</u>

INSTRUMENTATION:

Number of Vehicle Data Channels: = 17
 Number of Cameras: Onboard Vehicle = 3
 Offboard Vehicle = 4
 Deformable Barrier = 2
 TOTAL = 9

TABLE 4
CRASH TEST SUMMARY FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon
Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	= <u>49.3</u> in (1252.2 mm)
Overall Length of MDB (incl. honeycomb impact face)	= <u>162</u> in (4114.8 mm)
Wheelbase of Framework Carriage	= <u>102</u> in (259.1 mm)
Tread of Framework Carriage (Front & Rear)	= <u>74</u> in (1879.6 mm)
C.G. Location Rearward of Front Axle	= <u>43.4</u> in (1102.4 mm)
C.G. Location From Center Line	= <u>-0.3</u> in (-7.62 mm)
C.G. Location Above Ground Level	= <u>19.2</u> in (487.7 mm)

MDB WEIGHT:

Left Front	= <u>1095</u> lbs (496.7 kg)	Left Rear	= <u>413</u> lbs (187.3 kg)
Right Front	= <u>624</u> lbs (283.0 kg)	Right Rear	= <u>858</u> lbs (389.2 kg)
TOTAL FRONT	= <u>1719</u> lbs (779.7 kg)	TOTAL REAR	= <u>1271</u> lbs (576.5 kg)
TOTAL MDB WEIGHT = <u>2990</u> lbs (1356.2 kg)			

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degrees
Impact Speed = Primary: 32.41 mph (52.1 kph) Secondary: 32.45 mph (52.2 kph)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Top of Stack (33 in)	= <u>132</u> mm
2. Row B Mid Stack (27 in)	= <u>109</u> mm
3. Row C Top of Bumper (21 in)	= <u>72</u> mm
4. Row D Center of Bumper (17 in)	= <u>119</u> mm

INSTRUMENTATION:

Number of MDB Data Channels = 7

TABLE 5
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to shoulder</u>	<u>to "C" Post</u>
Arm	<u>to door</u>	<u>to door</u>
Pelvis	<u>to armrest</u>	<u>to door</u>
Left Knee	<u>to door/armrest</u>	<u>to door/armrest</u>
Right Knee	<u>to left knee</u>	<u>to left knee</u>

DOOR OPENING:

	<u>LEFT SIDE</u>	<u>RIGHT SIDE</u>
Front	<u>remained closed</u>	<u>remained closed</u>
Rear	<u>remained closed</u>	<u>remained closed</u>

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 1.5 in (38 mm) rearward Vertical: 0.1 in (3 mm) low

ARM REST LOCATIONS:

Front: 253 mm below window frame

Rear: 253 mm below window frame

SEAT CRUSH:

Driver Seat Back: 97 mm Driver Seat Cushion: 65 mm

Left Rear Seat Back: 28 mm Left Rear Seat Cushion: 85 mm

GLAZING DAMAGE:

Both side windows broken

PILLAR PERFORMANCE:

No separation noted

SILL SEPARATION:

No separation noted

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARYYear/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station WagonVehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

	Front Dummy ID # 269				Rear Dummy ID # 271			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS: Upper Rib Lateral.....Y Upper Rib Lateral....Y(R) Lower Rib Lateral.....Y Lower Rib Lateral.....Y(R)	52.8	31	-12.9	78	41.7	48	-6.0	124
	53.5	31	-13.7	78	41.0	48	-6.4	124
	52.5	33	-11.4	78	45.3	47	-8.4	73
	51.9	33	-11.4	78	44.9	47	-8.7	73
SPINE ACCELERATIONS: Lower Lateral.....Y Lower Lateral.....Y(R)	53.9	37	-18.2	70	55.0	53	-19.9	79
	53.5	37	-18.1	70	55.7	53	-19.5	79
PELVIC ACCELERATIONS: Lateral.....Y Lateral.....Y(R)	57.8	41	-12.7	90	53.4	45	-8.4	96
	56.7	40	-12.9	94	*	*	*	*

REFERENCE:

Positive Direction - Longitudinal (X) = forward

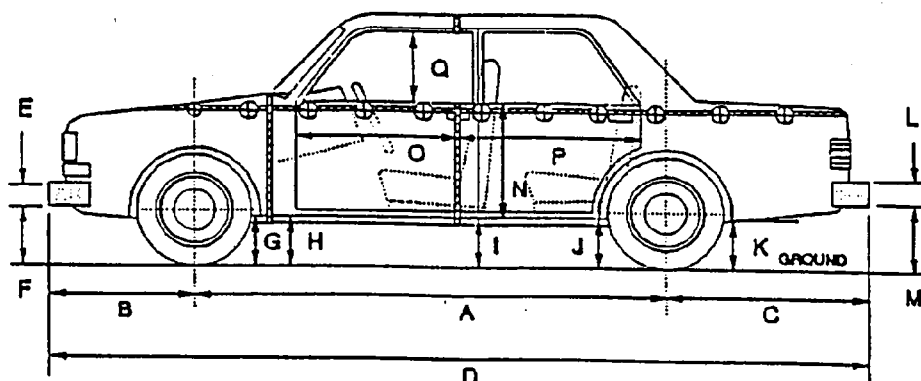
Lateral (Y) = to right

Vertical (Z) = up

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

* Data shift during impact. Data not valid

FIGURE 2
PRE- AND POST-TEST MEASUREMENTS



LEFT SIDE VIEW

D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

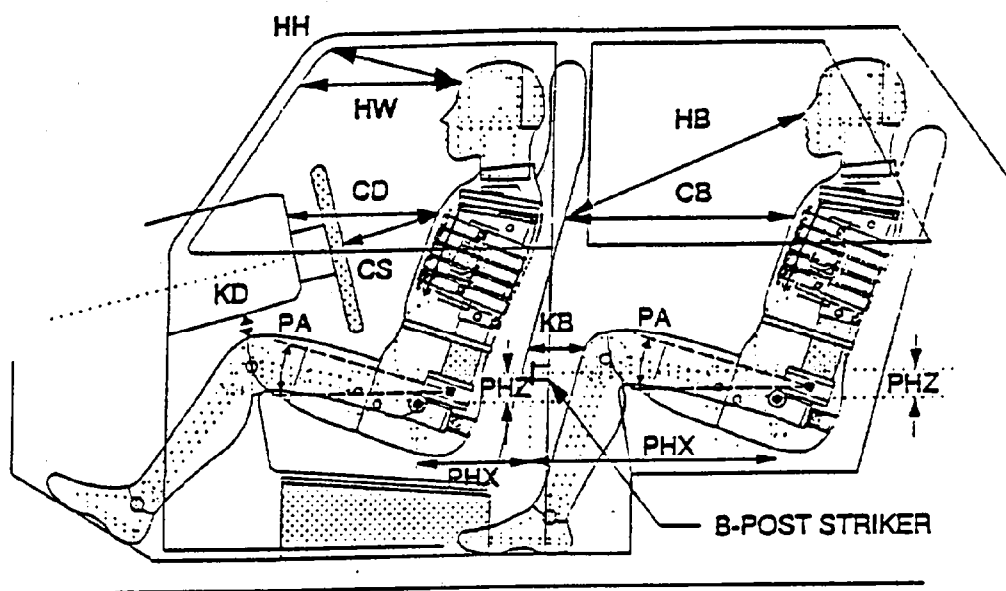
J1 = To Pinch Weld

J2 = To Sill

Units: mm

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	2640	2610	30
B	940	930	10
C	1112	1050	62
D	4692	4590	102
E	170	170	0
F	384	393	-9
G	202	202	0
H	161	184	-23
I	154	160	-6
J1/J2	153/154	154/151	-1/3
K	222	234	-12
L	230	230	0
M	274	272	2
N	640	585	55
O	739	727	12
P	1301	1195	106
Q	435	446	-11
R	4370	4380	-10
S	4370	4343	27
T	1691	1430	261

FIGURE 3
SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

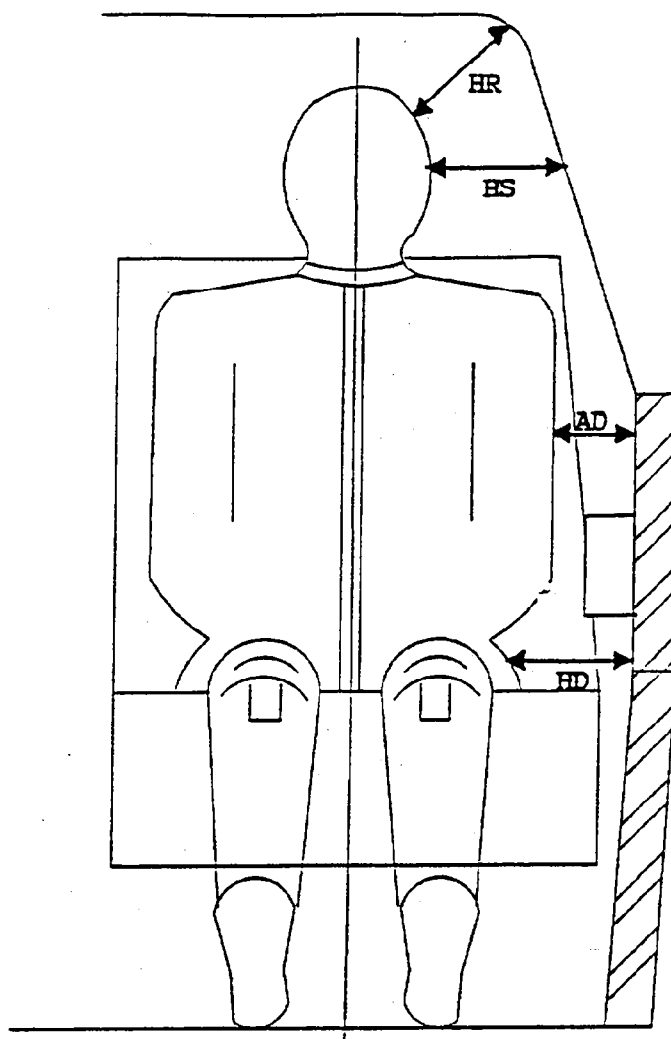
NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in mm

	DRIVER ID #269	LEFT REAR PASSENGER ID #271	
HH	335	---	
HW	540	---	
HB	---	677	
CD	507	CB	540
CS	303	---	
KDL	100	KBL	152
KDR	100	KBR	153
PA°	24.4°	24.6°	
PHX	176	235	
PHZ	114	234	

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

FIGURE 4
SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS



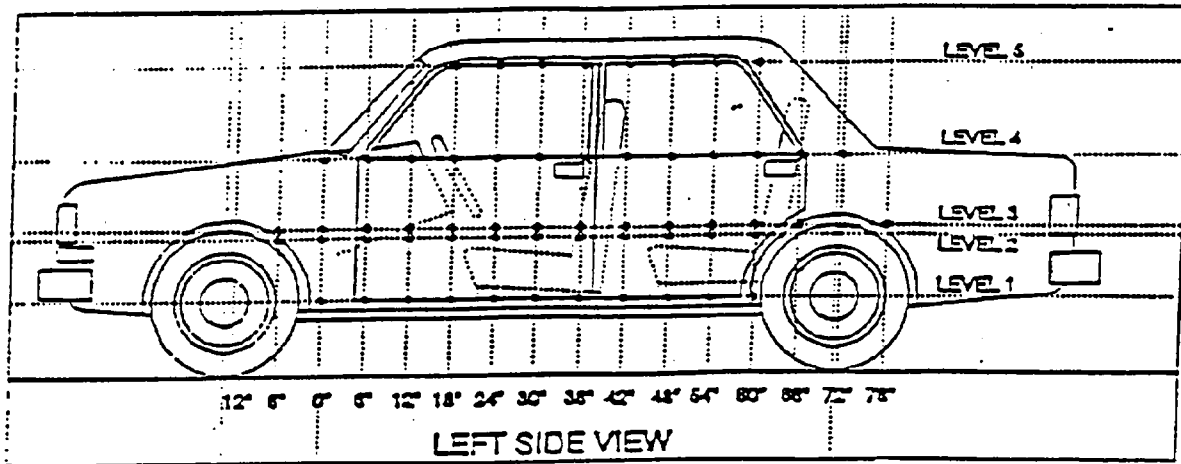
NOTE: All dimensions are in mm

	DRIVER ID #269	LEFT REAR PASSENGER ID #271
HR	120	117
HS	235	240
AD	100	106
HD	180	188

FIGURE 5
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994



As tested height measurements are with respect to ground along the vertical 33" line shown above:

<u>33" Side Profile</u>	
Level 5 @ Window Top	= <u>1323</u> mm
Level 4 @ Window Sill	= <u>855</u> mm
Level 3 @ Mid Door	= <u>575</u> mm
Level 2 @ Occupant H-Point	= <u>462</u> mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>245</u> mm

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH
LEVEL 1 AT AXLE CENTER LINE

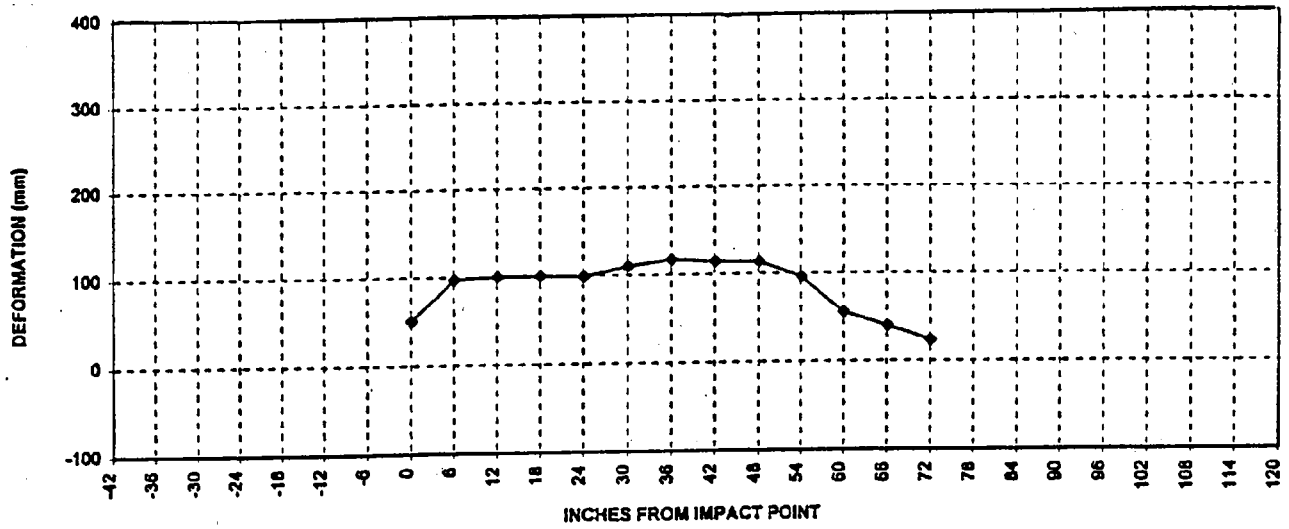
Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	---	---	---
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	844	894	50 (impact point)
6	878	975	97
12	881	981	100
18	880	980	100
24	880	979	99
30	879	989	110
36	876	993	117
42	876	990	114
48	874	987	113
54	874	970	96
60	874	929	55
66	872	911	39
72	862	885	23
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	---	---	---
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 1 AT AXLE CENTER LINE

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

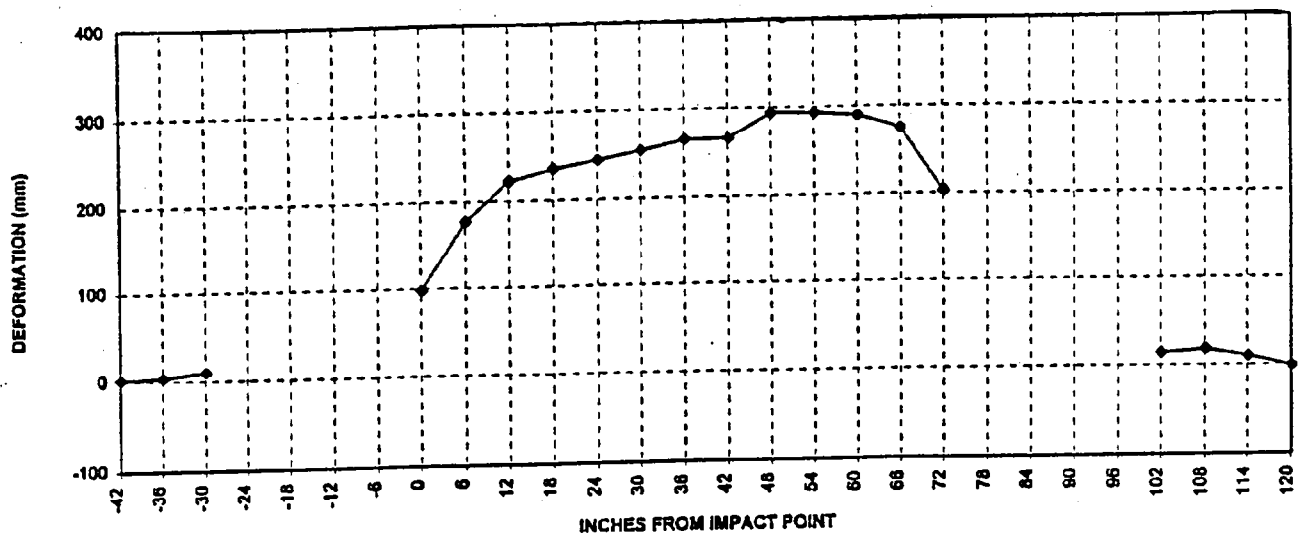
LEVEL 2 AT OCCUPANT H-POINT

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station WagonVehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	910	912	2
-36	878	882	4
-30	860	870	10
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	850	948	98 (impact point)
6	852	1029	177
12	848	1070	222
18	846	1081	235
24	845	1089	244
30	843	1097	254
36	840	1105	265
42	838	1104	266
48	836	1130	294
54	836	1129	293
60	835	1125	290
66	835	1110	275
72	835	1038	203
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	841	855	14
108	848	866	18
114	858	868	10
120	871	870	-1
126	---	---	---
132	---	---	---
138	---	---	---
144	---	---	---

Reference plane is parallel to test vehicle longitudinal centerline
 Given dimensions = reference plane to car body

FIGURE 6 (Cont'd)
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 2 AT OCCUPANT H-POINT

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

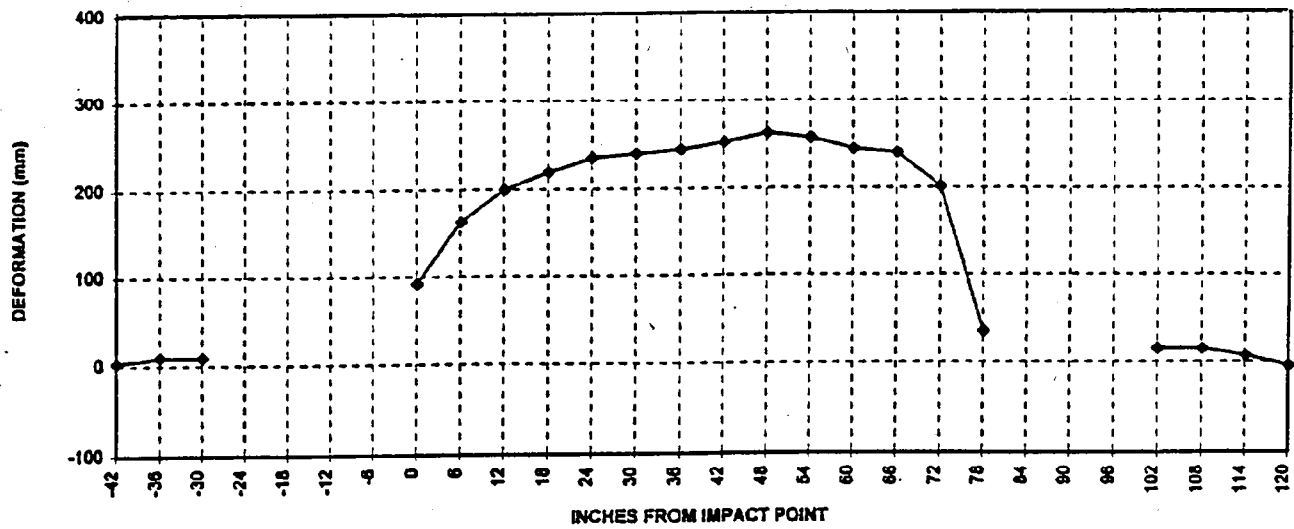
LEVEL 3 AT MID-DOOR

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station WagonVehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	927	930	3
-36	891	900	9
-30	868	877	9
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	848	940	92 (impact point)
6	852	1015	163
12	850	1050	200
18	848	1067	219
24	847	1082	235
30	845	1084	239
36	841	1085	244
42	838	1090	252
48	837	1099	262
54	837	1093	256
60	837	1081	244
66	835	1074	239
72	834	1035	201
78	829	865	36
84	---	---	---
90	---	---	---
96	---	---	---
102	847	862	15
108	857	872	15
114	868	875	7
120	884	880	-4
126	---	---	---
132	---	---	---
138	---	---	---

Reference plane is parallel to test vehicle longitudinal centerline
 Given dimensions = reference plane to car body

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 3 AT MID-DOOR

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH
LEVEL 4 AT WINDOW SILL

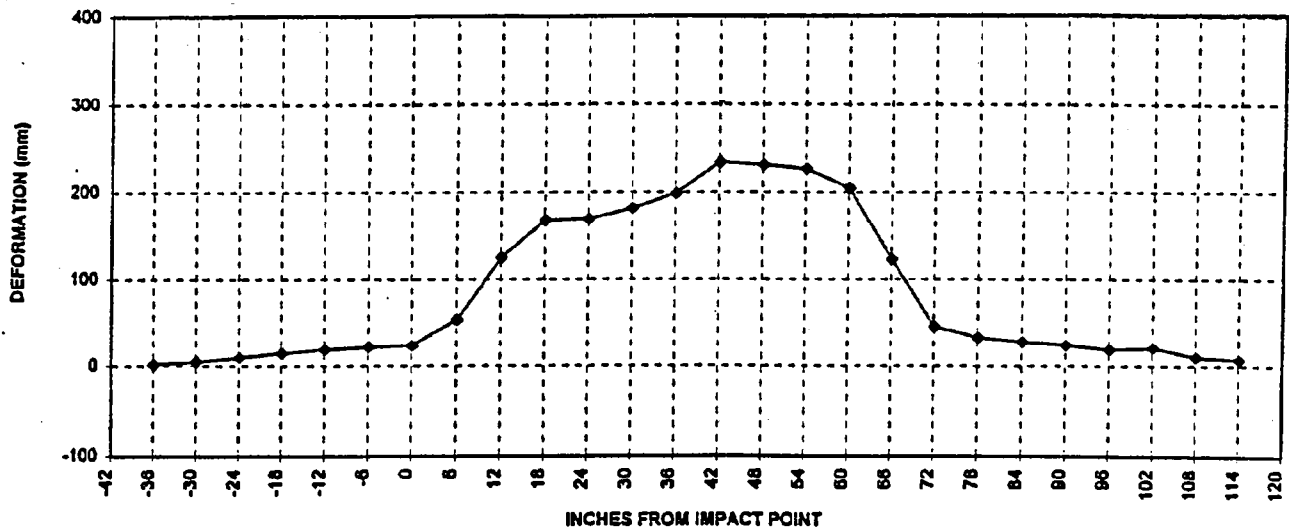
Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	998	1000	2
-30	977	982	5
-24	960	970	10
-18	940	955	15
-12	926	945	19
-6	918	940	22
0	911	935	24 (impact point)
6	908	962	54
12	905	1030	125
18	902	1070	168
24	900	1070	170
30	898	1080	182
36	896	1095	199
42	894	1128	234
48	896	1127	231
54	896	1122	226
60	896	1101	205
66	898	1021	123
72	900	946	46
78	903	936	33
84	909	937	28
90	911	935	24
96	916	935	19
102	921	942	21
108	928	938	10
114	934	941	7
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---
144	---	---	---

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = reference plane to car body

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 4 AT WINDOW SILL

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 5 AT WINDOW TOP

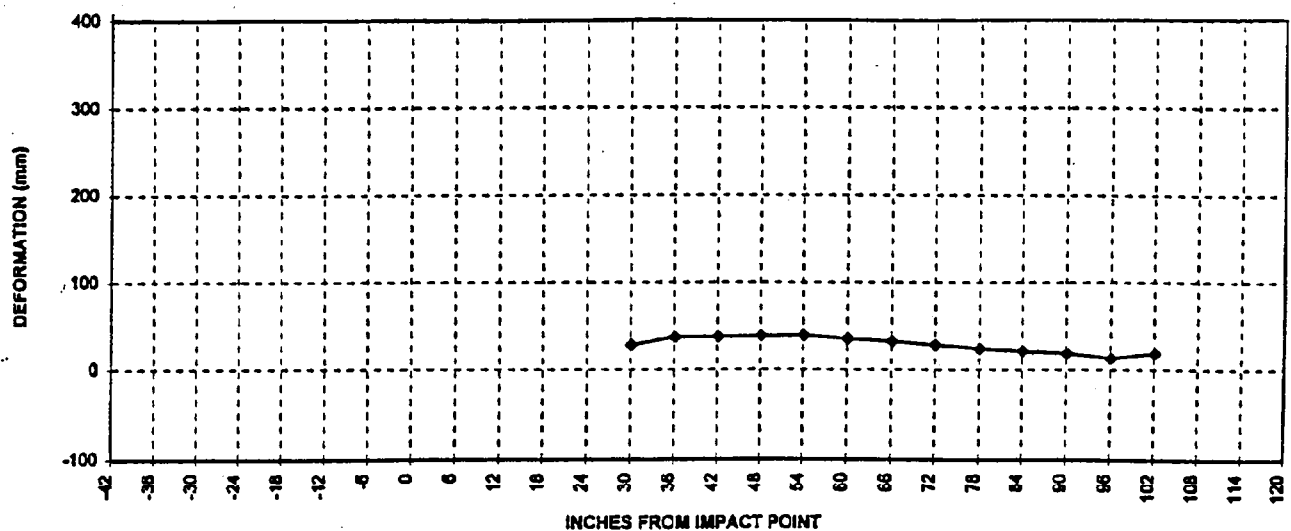
Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station WagonVehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	---	---	---
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	---	---	---
6	---	---	---
12	---	---	---
18	---	---	---
24	---	---	---
30	1146	1175	29
36	1134	1172	38
42	1131	1169	38
48	1131	1170	39
54	1132	1172	40
60	1133	1169	36
66	1136	1169	33
72	1141	1170	29
78	1144	1169	25
84	1147	1169	22
90	1150	1170	20
96	1152	1166	14
102	1156	1176	20
108	---	---	---
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---

(impact point)

Reference plane is parallel to test vehicle longitudinal centerline
 Given dimensions = reference plane to car body

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 5 AT WINDOW TOP

FIGURE 7

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

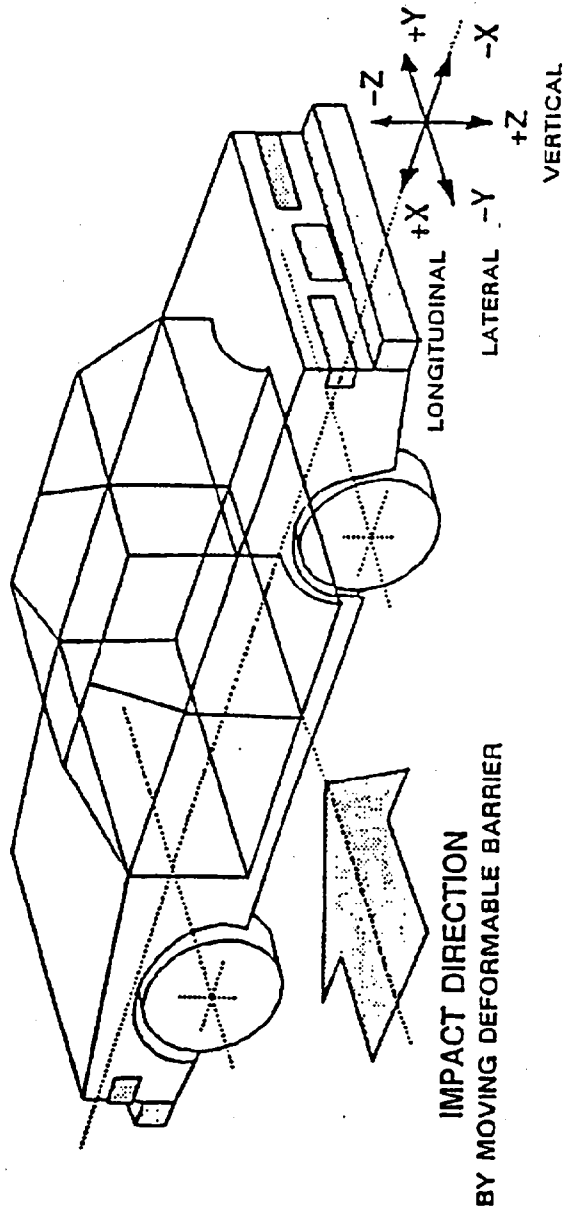
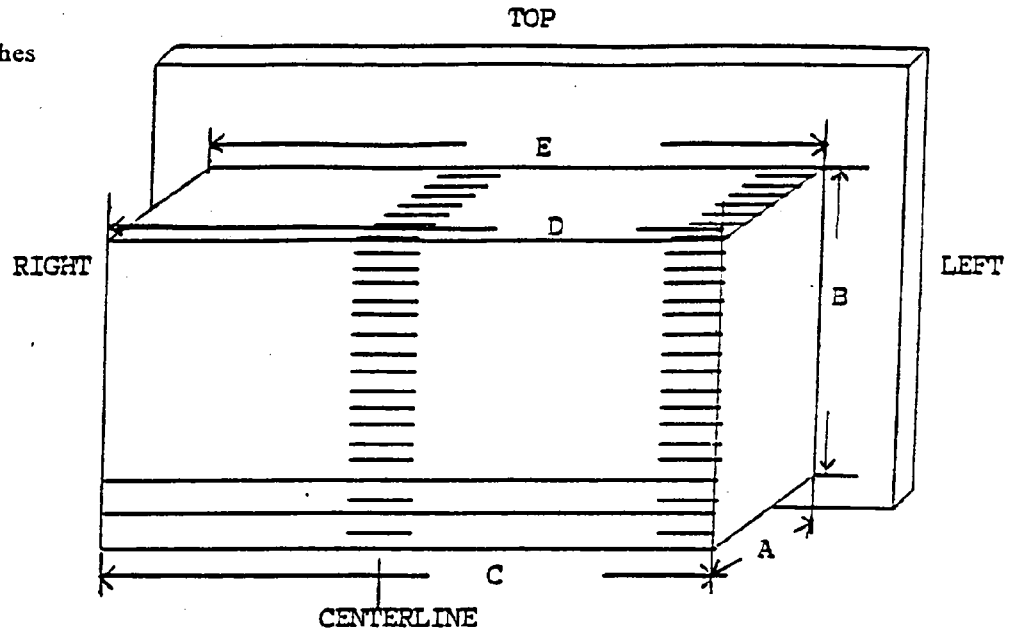


FIGURE 8
MDB FACE DIMENSIONS

Measurements in inches

A = 15.1
B = 22.0
C = 66.1
D = 66.1
E = 66.2



Measurements in inches

	Right	Left
A =	<u>11.0</u>	<u>11.0</u>
B =	<u>13.0</u>	<u>12.9</u>
C =	<u>21.0</u>	<u>21.0</u>
D =	<u>33.0</u>	<u>33.0</u>

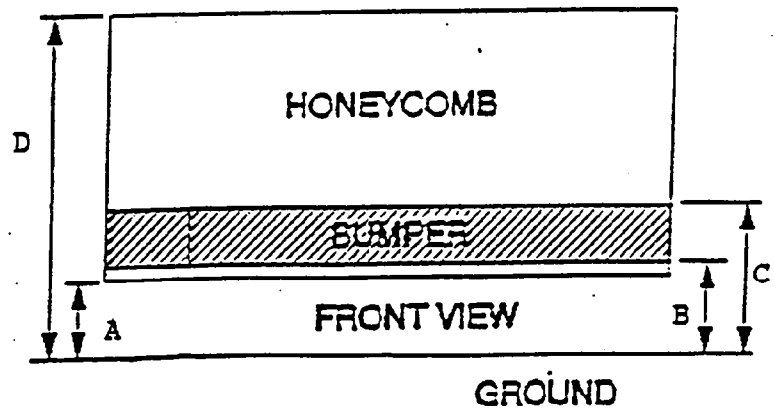


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTORYear/Make/Model/Body Style: 1994/Subaru/Legacy/4 Door Station WagonVehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Location	Top of Stack (33 inches)	Mid-Stack (27 inches)	Top of Bumper (21 inches)	Center of Bumper (17 inches)
Horizontal Distance From Center	Crush (mm)	Crush (mm)	Crush (mm)	Crush (mm)
32"	53	22	36	115
28"	5	-4	72	119
24"	-4	-6	19	107
20"	-3	-6	12	86
16"	-3	-6	10	75
12"	-2	-5	9	68
8"	0	-1	8	64
4"	0	2	9	62
0"	0	3	6	56
4"	1	1	8	53
8"	3	0	7	52
12"	6	0	6	50
16"	6	3	8	50
20"	26	3	12	47
24"	51	12	15	76
28"	98	49	111	76
32"	132	109	36	78

Right

Left

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station WagonVehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums		Lat. (Y) Maximums		Vert. (Z) Maximums		Resultant
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2872	620	280	2.9	-6.9	21.6	-1.8	3.7	-9.6	23.7
2	Rt. Side Sill @ Rear Seat	2005	625	320	5.2	-4.4	25.4	-2.5	3.0	-11.4	26.5
3	Rr. Floorpan Above Axle	1190	40	370	1.8	-9.9	21.6	-2.0	6.7	-6.5	23.5
4	Left Side Sill @ Rr. Seat	1755	710	165	---	---	56.4	-11.4	---	---	---
5	Left Side Sill @ Frt. Seat	2875	708	165	---	---	30.2	-3.2	---	---	---
6	Left A-Post Lower	3268	680	380	---	---	64.9	-13.9	---	---	---
7	Left Mid A-Post	3185	790	820	---	---	734.1	-34.4	---	---	---
8	Left B-Post Lower	2245	675	340	---	---	160.0	-49.1	---	---	---
9	Left B-Post Mid	2245	680	565	---	---	147.8	-25.2	---	---	---
10	Right Rear Occupant Compartment	1903	640	270	---	---	24.0	-2.3	---	---	---
11	Driver Left Seat Track	2459	557	288	---	---	49.6	-20.5	---	---	---

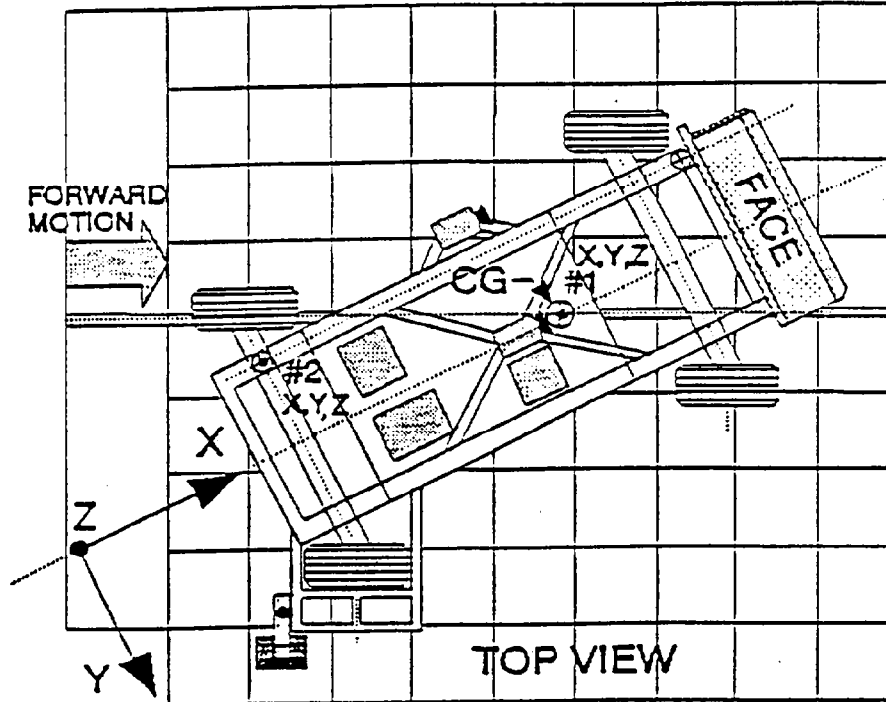
*Reference: X - Rear Bumper (+ Forward)
Y - Vehicle Centerline (+ To right)
Z - Ground Level (+ Up)

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994



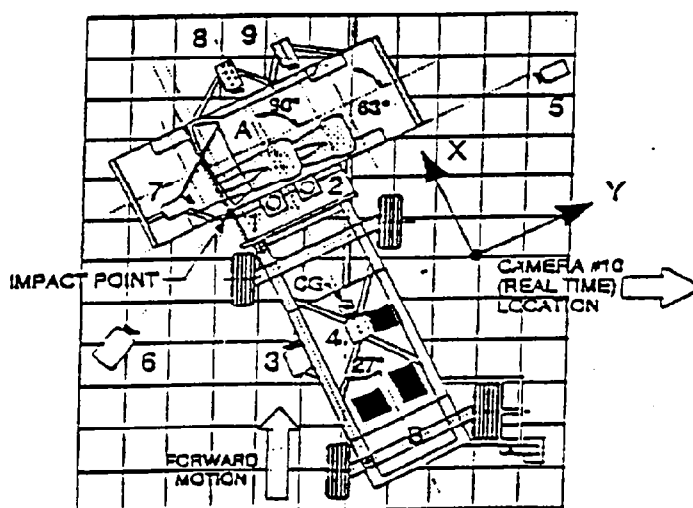
Accel. No.	Location	Coordinates (mm)			Pos. Direct.		Neg. Direct.	
					Max (g)	Time (msec)	Max (g)	Time (msec)
		X	Y	Z				
1	MDB Center of Gravity							
	Longitudinal ... X				0.8	119	-17.0	40
	Lateral Y	-1092	0	483	2.4	57	-4.8	36
	Vertical Z				11.4	20	-20.1	24
	Resultant R				25.1	24	---	---
2	Rear Frame Member							
	Longitudinal ... X	-2591	-625	622	1.7	120	-19.2	40
	Lateral Y				4.7	35	-1.7	56

Reference: X = Front Axle (+Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Up)

FIGURE 10
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994



Camera No.	View	Coordinates (mm)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
	Real Time					13	24
1	Top Pointer	-350	850	5420		13	1099
2	Top Wide	700	0	5130		8	1070
3	Cart Pointer					35	962
4	Cart					13	1005
5	Right Impact	3510	-7810	1010	45°	25	1053
6	Left Impact	-2715	-2550	1480	50°	13	1031
7	Onboard Driver					7.5	893
8	Onboard Hood					13	1010
9	Onboard Passenger					8	935

* Reference: (from point of impact)

+X = Forward
+Y = To Right
+Z = Upward

TABLE 10
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

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

TEST VEHICLE IMPACT TYPE: X Side Impact MDB (32.4 kph)

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:

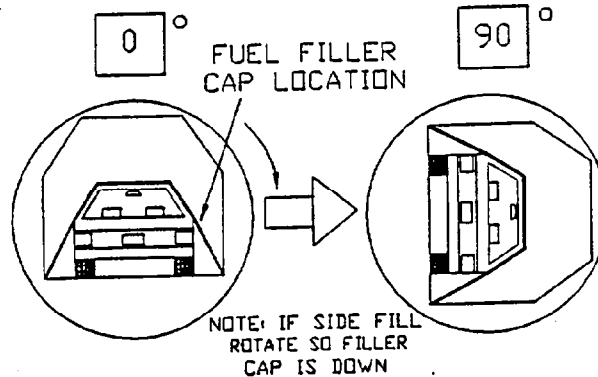
None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

TEST PHASE: 0° - 90°



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.

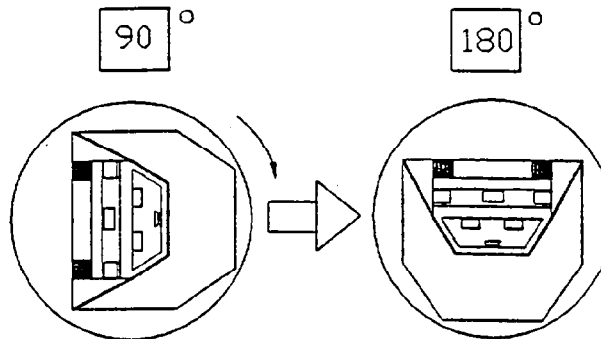
IV. SOLVENT SPILLAGE LOCATIONS(S): None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon

Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

TEST PHASE: 90° - 180°



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
---	---	---	---

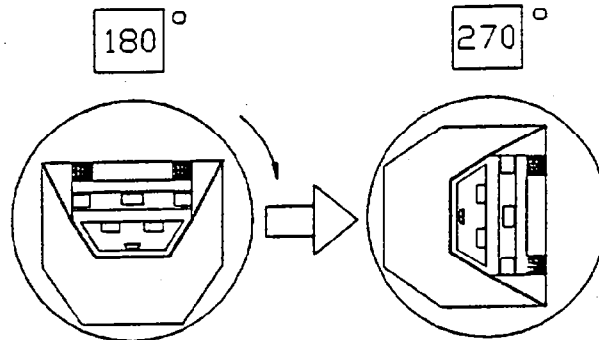
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Sedan
 Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 17 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 17 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
---	---	---	---

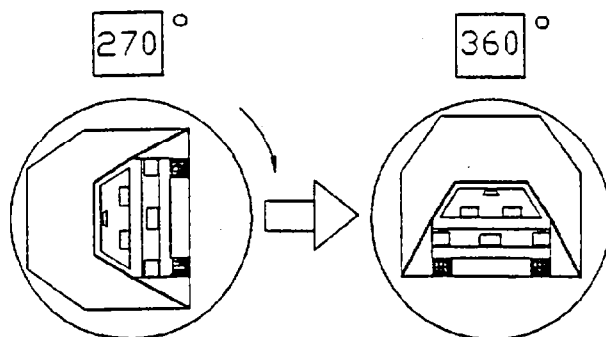
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

Year/Make/Model/Body Style: 1995/Subaru/Legacy/4 Door Station Wagon
Vehicle NHTSA No.: CS5502 TEST DATE: October 14, 1994

TEST PHASE: 270° - 360°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 41 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 41 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:

<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
----------	----------	----------	----------

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

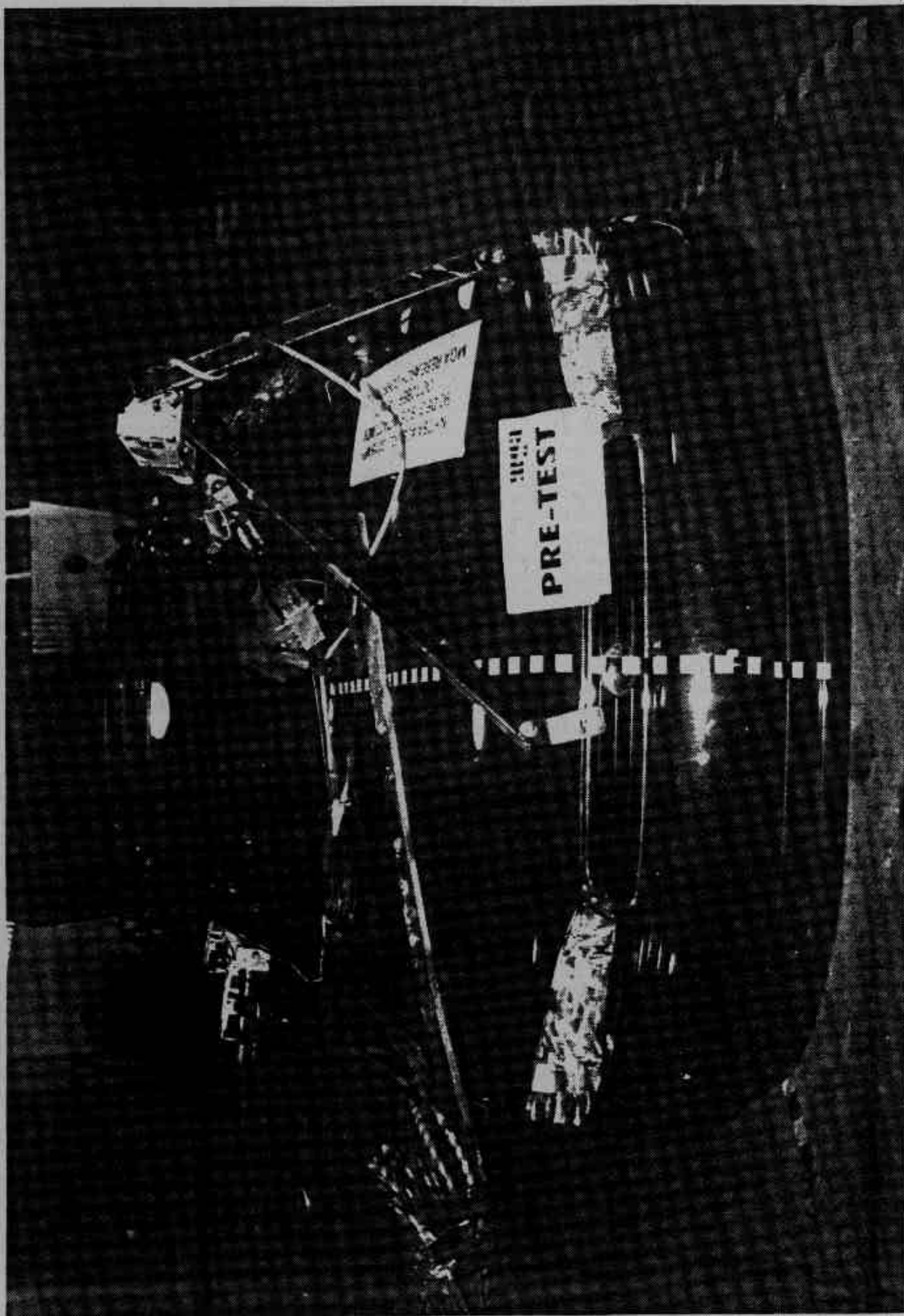
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A-1

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

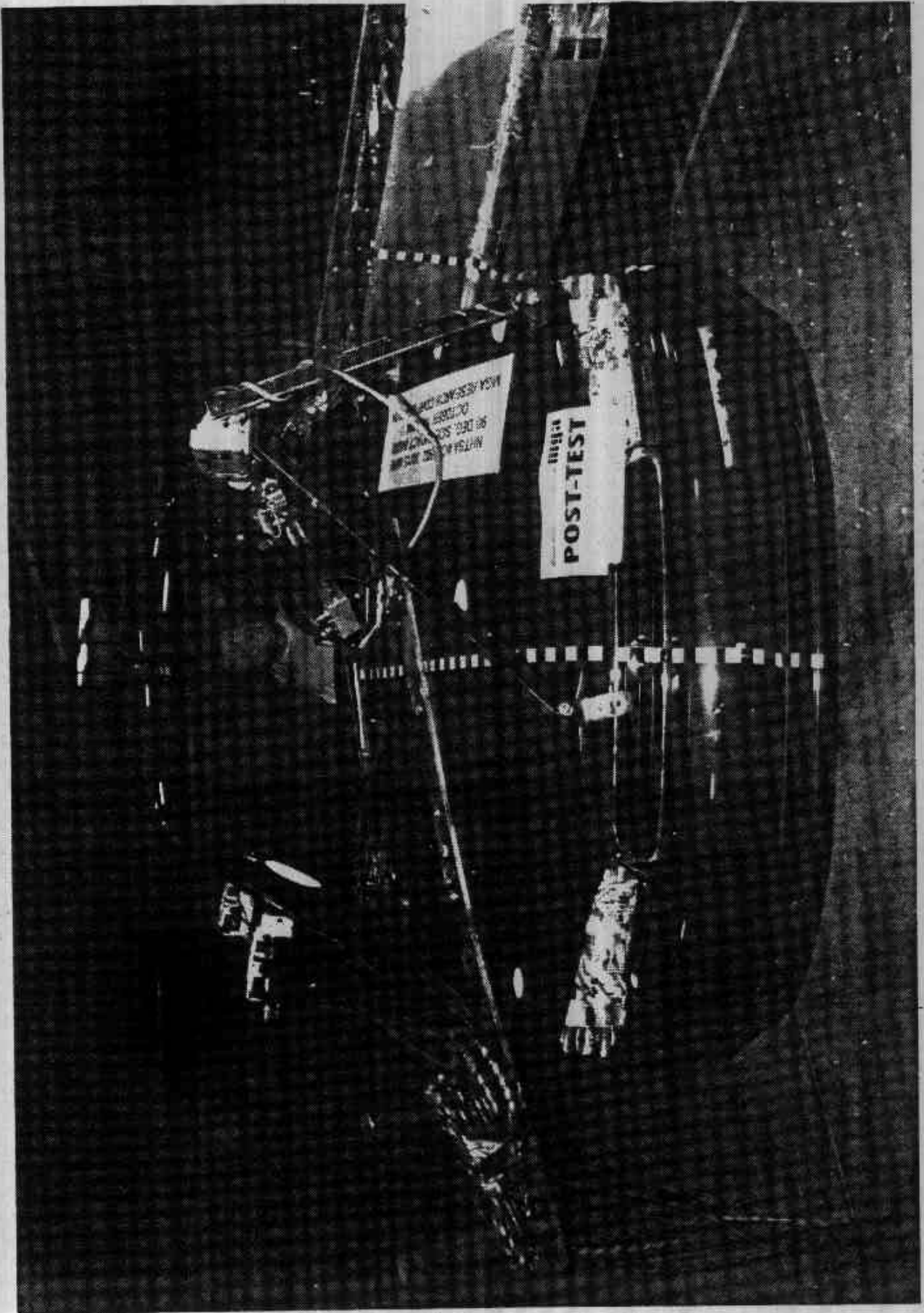


Photo No. A-2 - Post-Test Front View of Test Vehicle

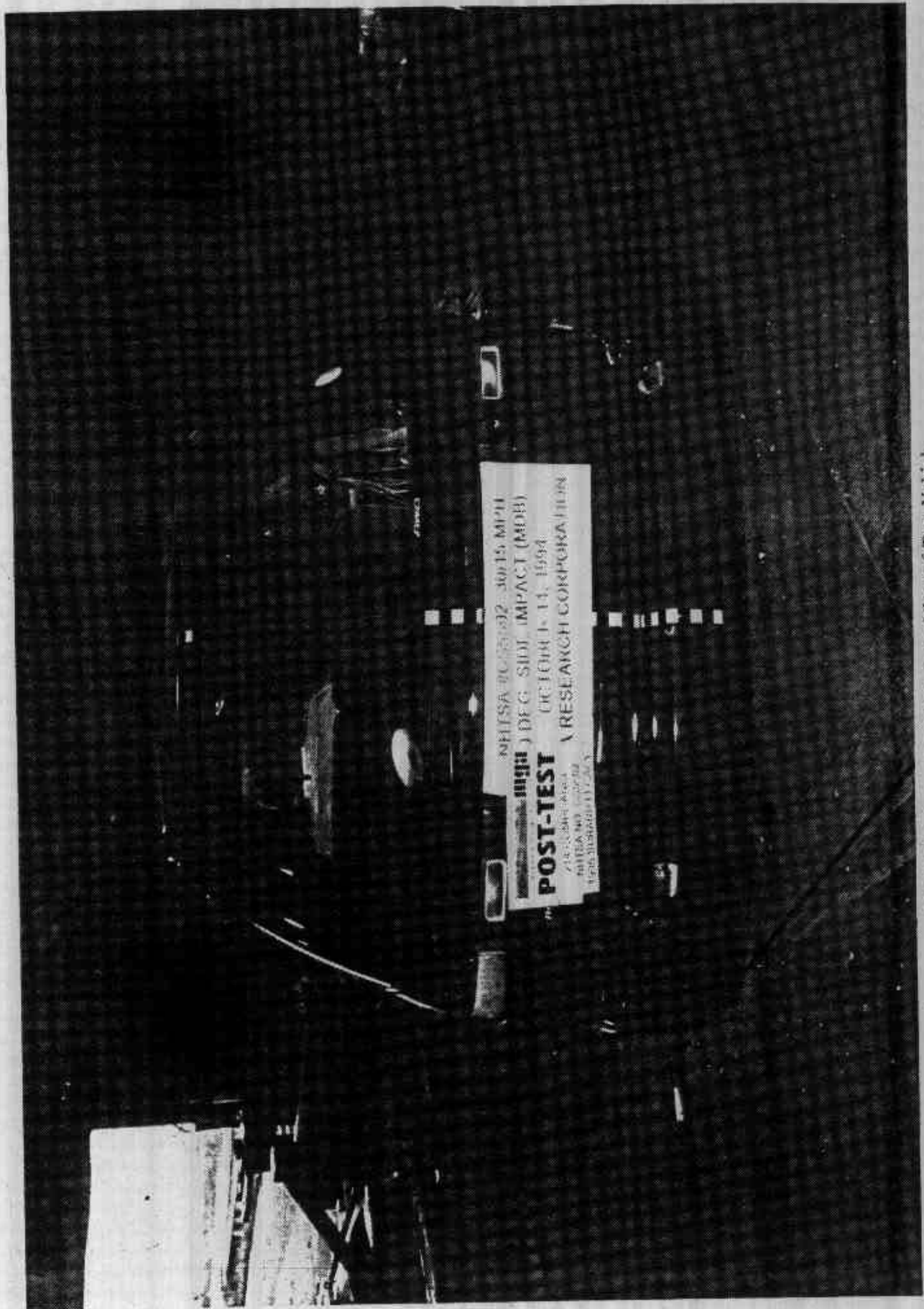


Photo No. A-4 - Post-Test Rear View of Test Vehicle

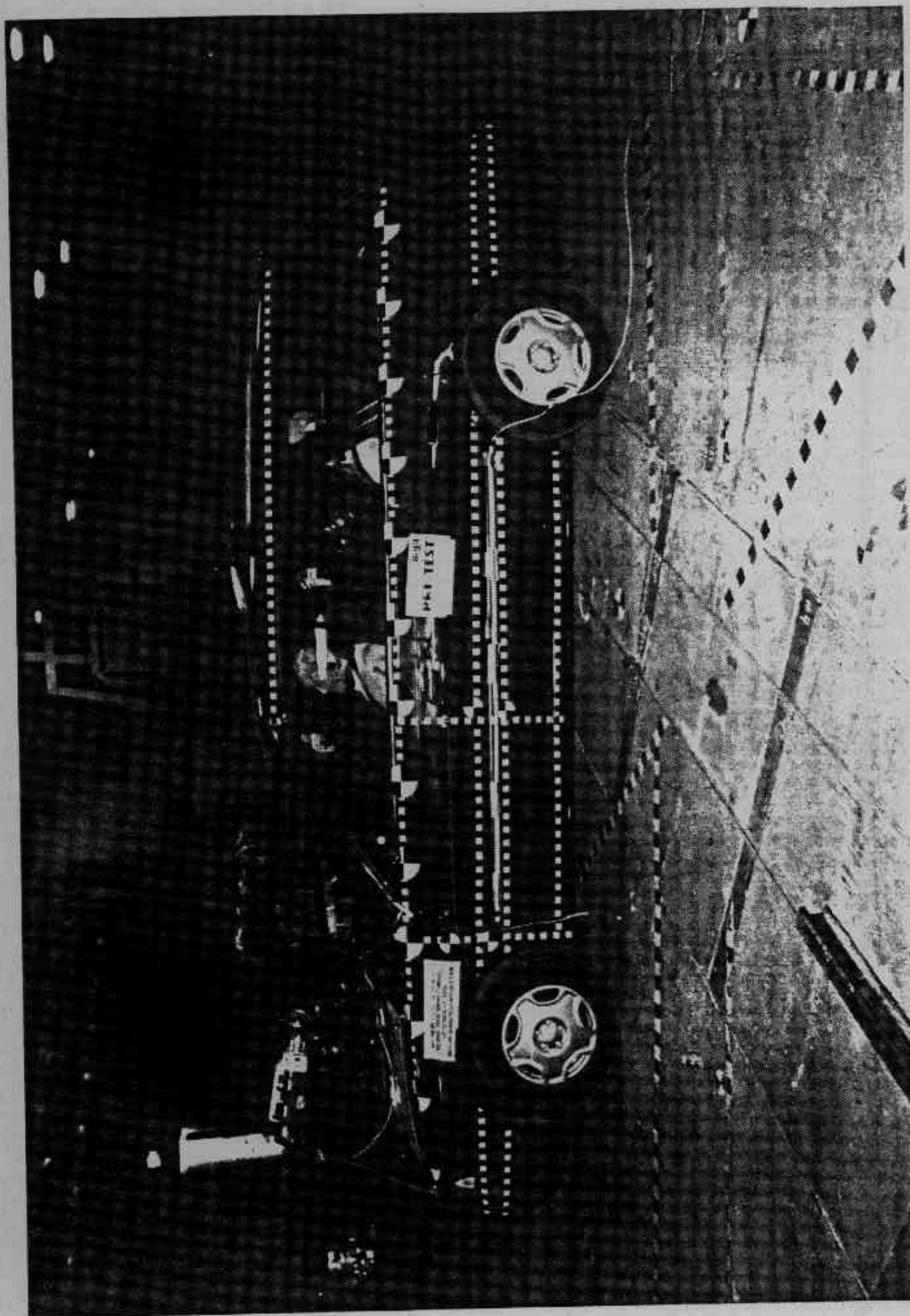


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

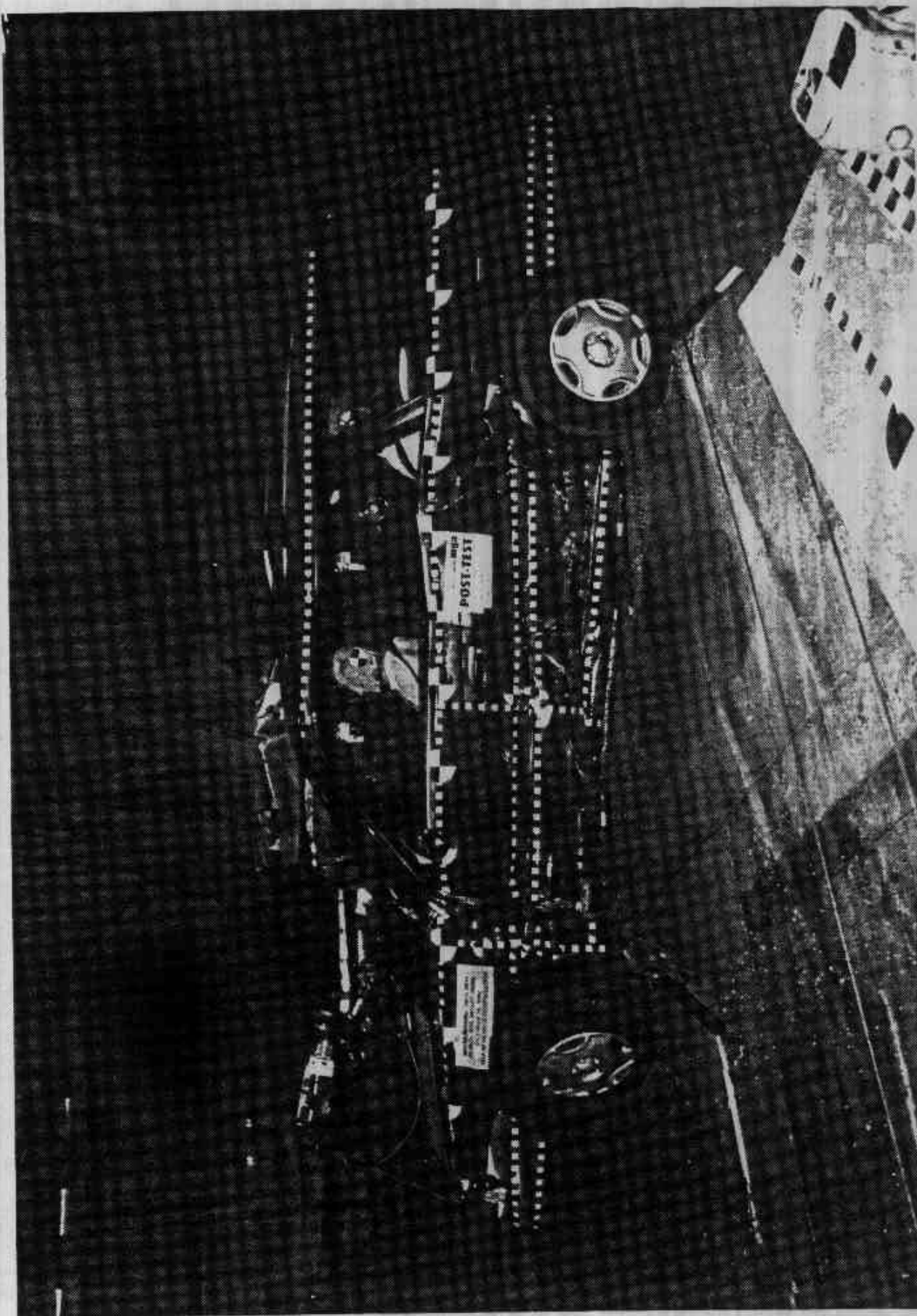


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

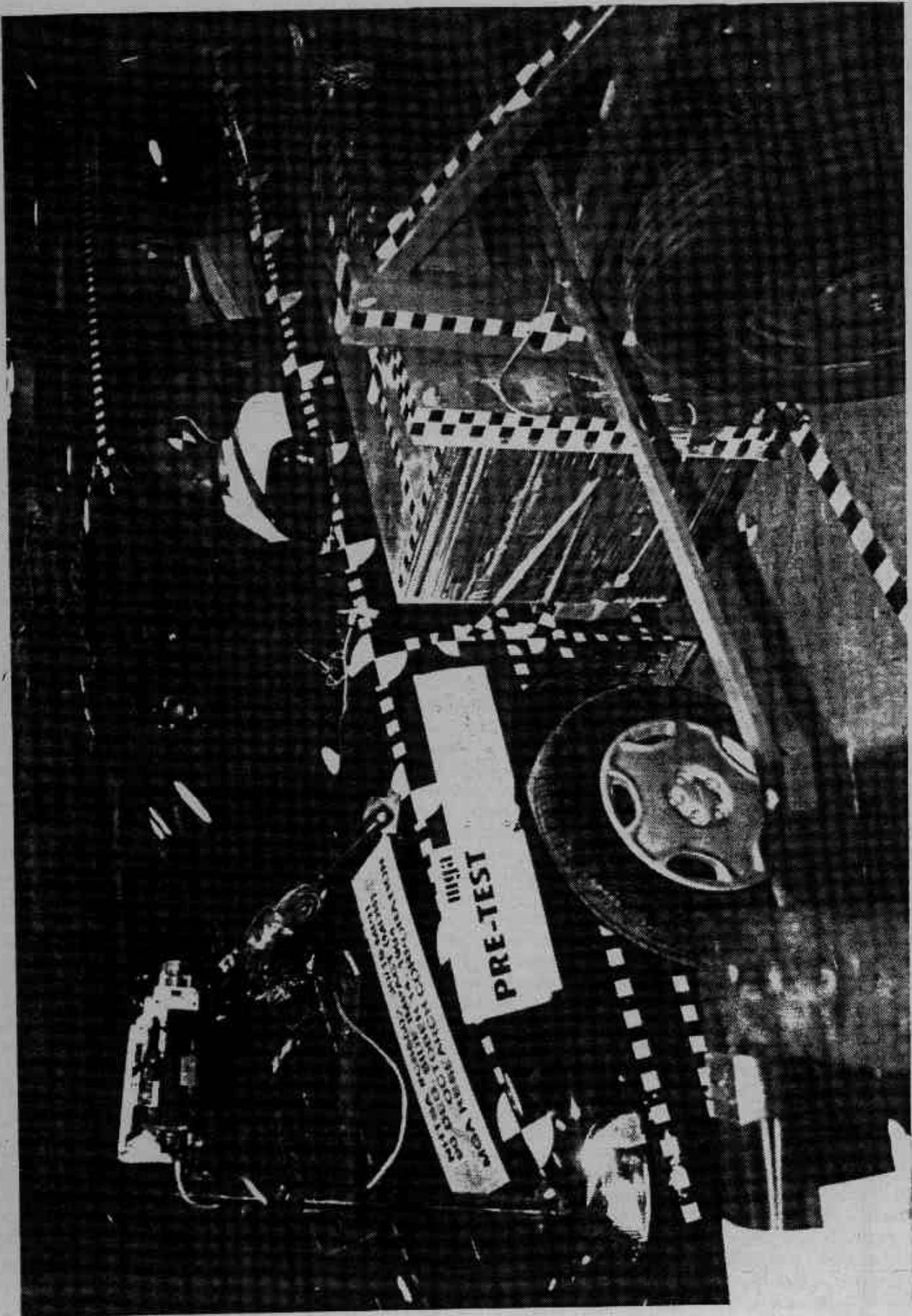


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

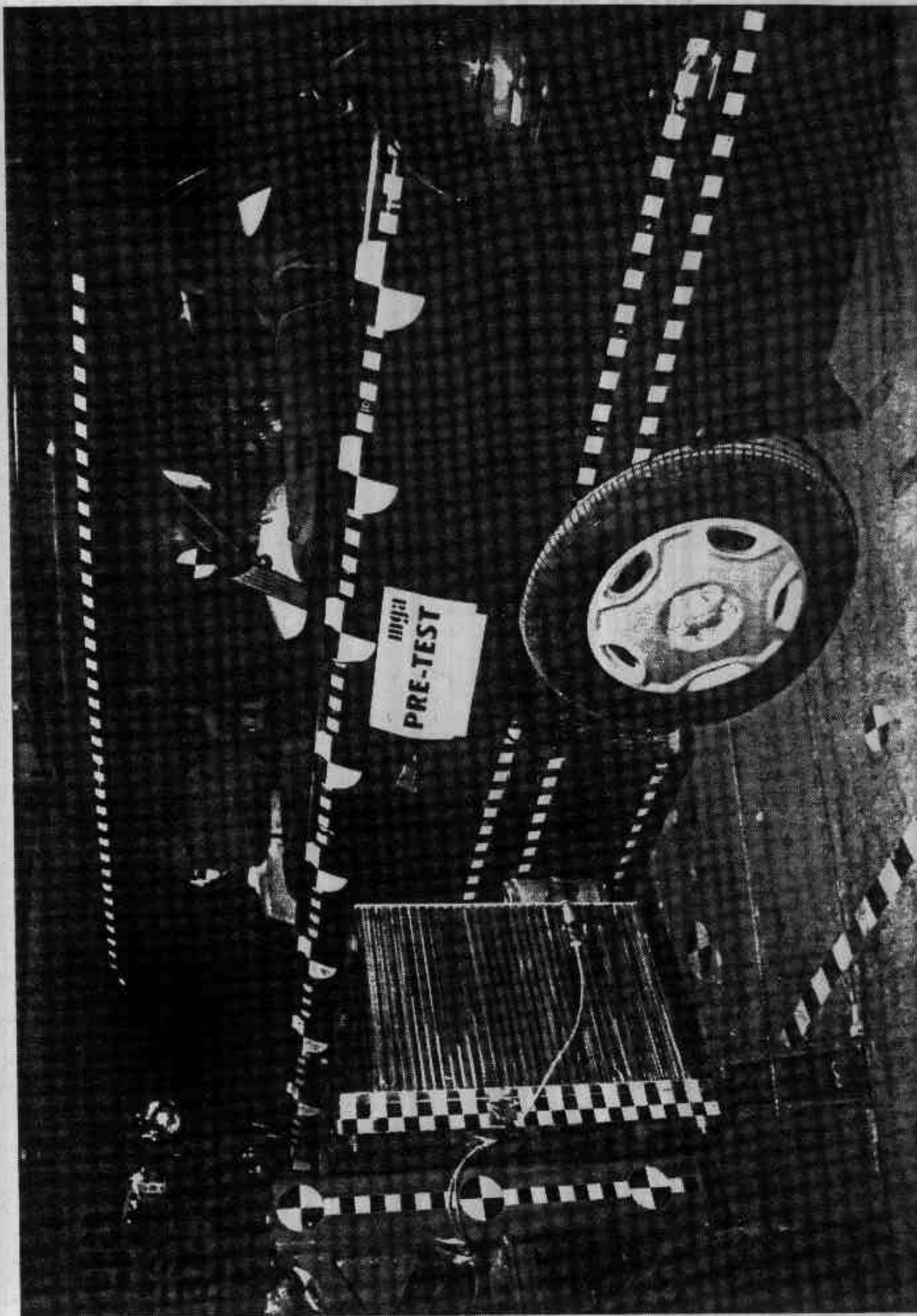


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

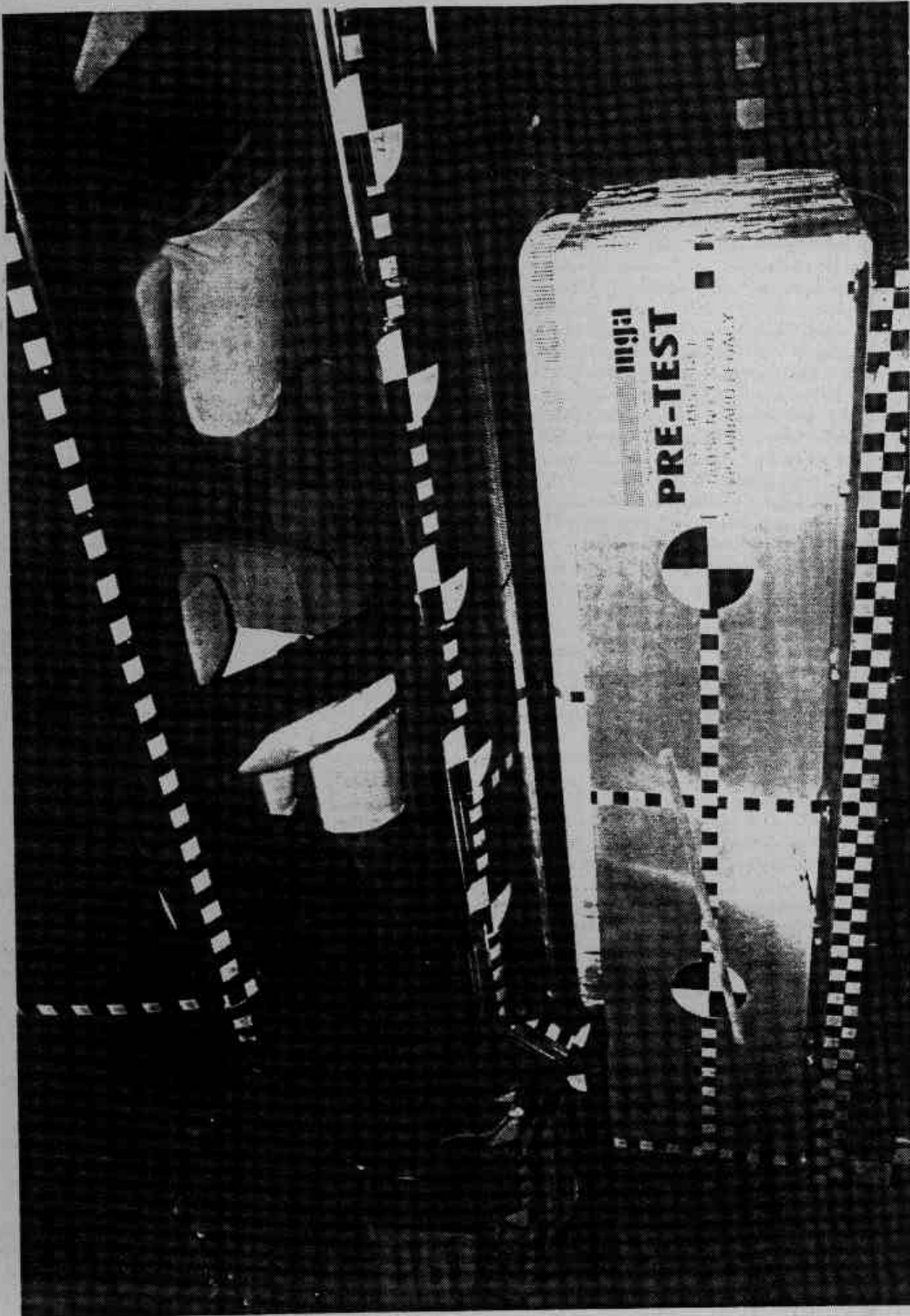


Photo No. A-9 - Pre-Test MDB Position Against Vehicle Overhead View

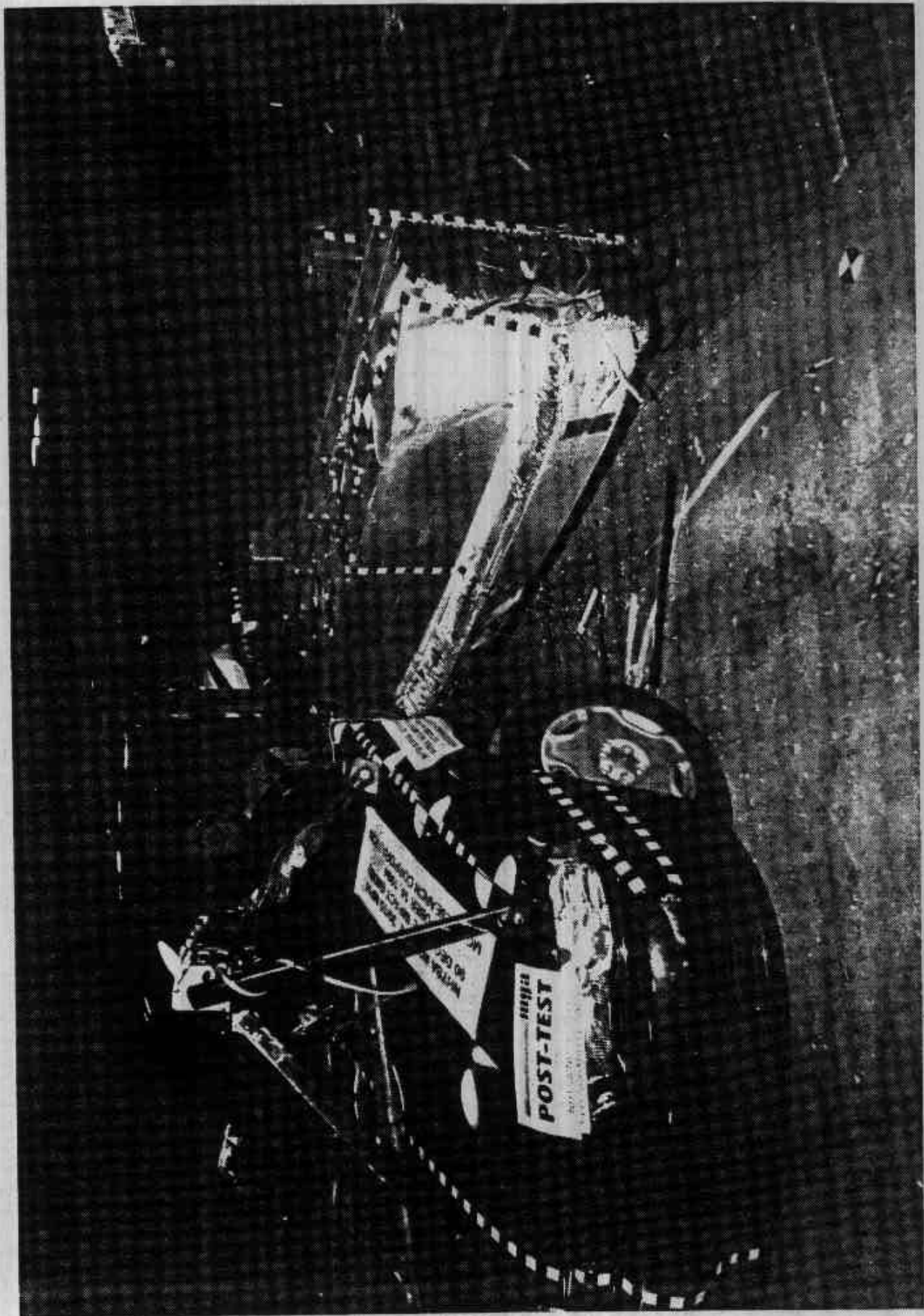
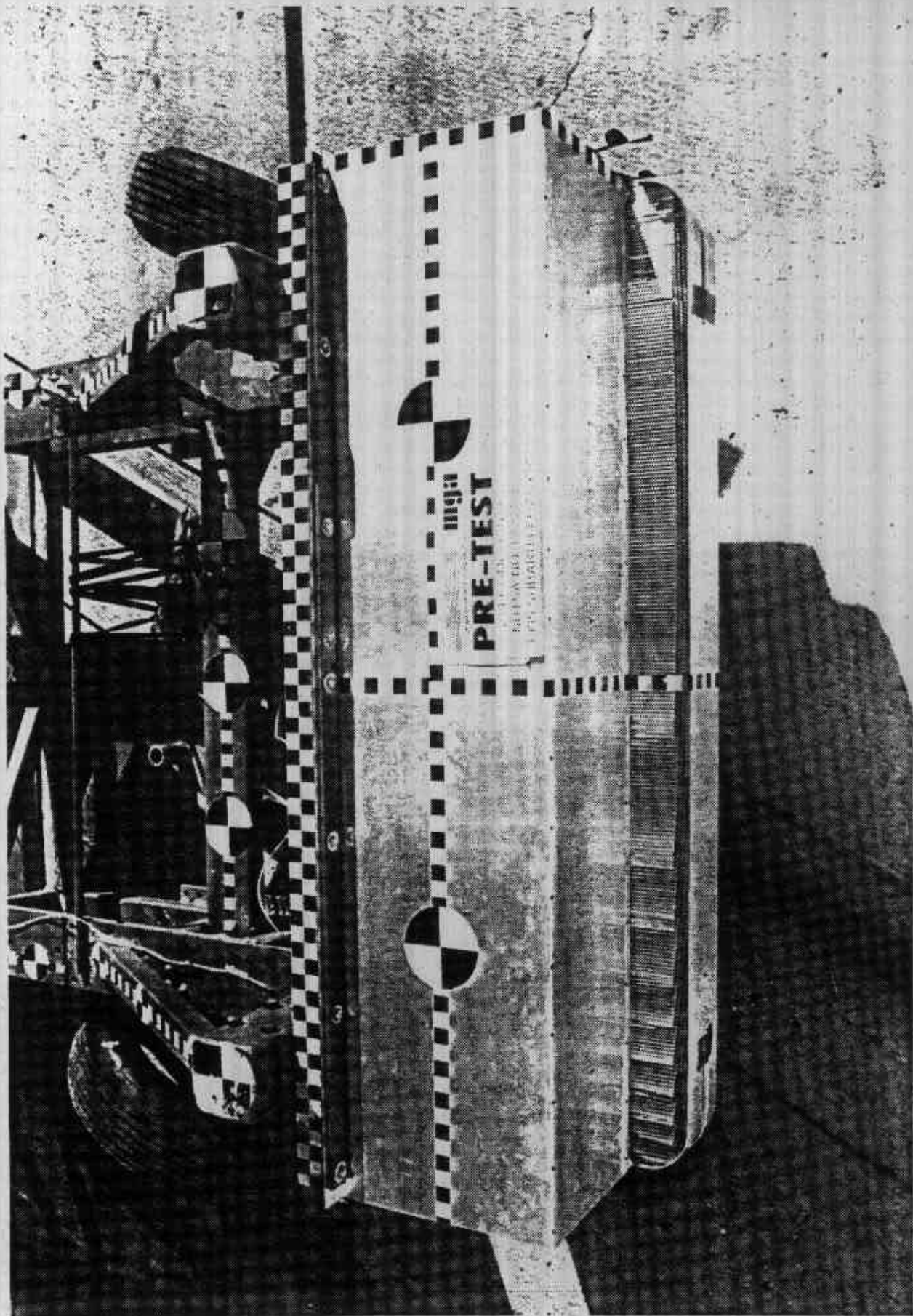


Photo No. A-10 - Post-Test MDB and Vehicle Left Side Front View



Photo No. A-11 - Post-Test MDB and Vehicle Right Side Rear View



A-12

Photo No. A-12 - Pre-Test MDB Top View

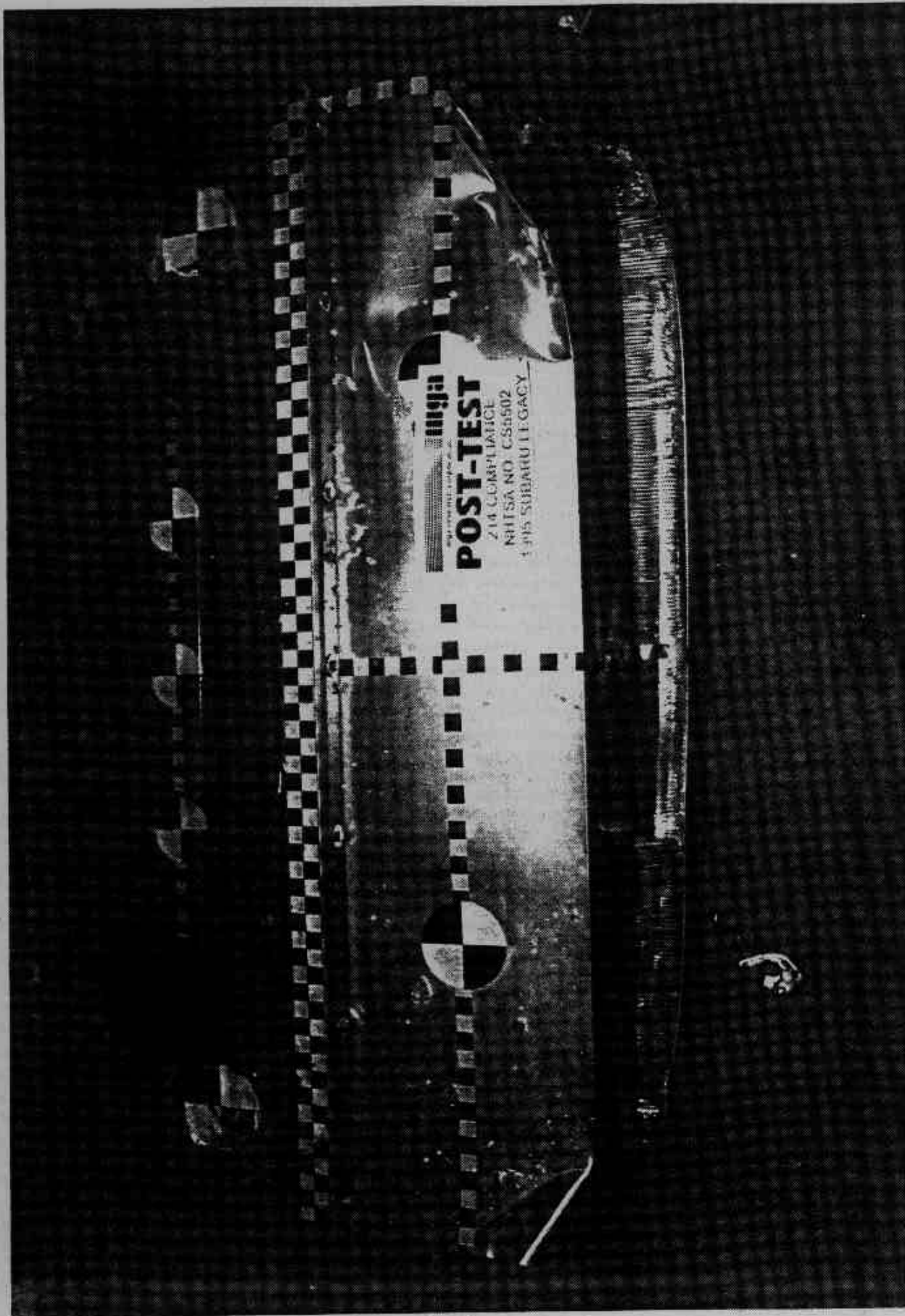


Photo No. A-13 - Post-Test MDB Top View

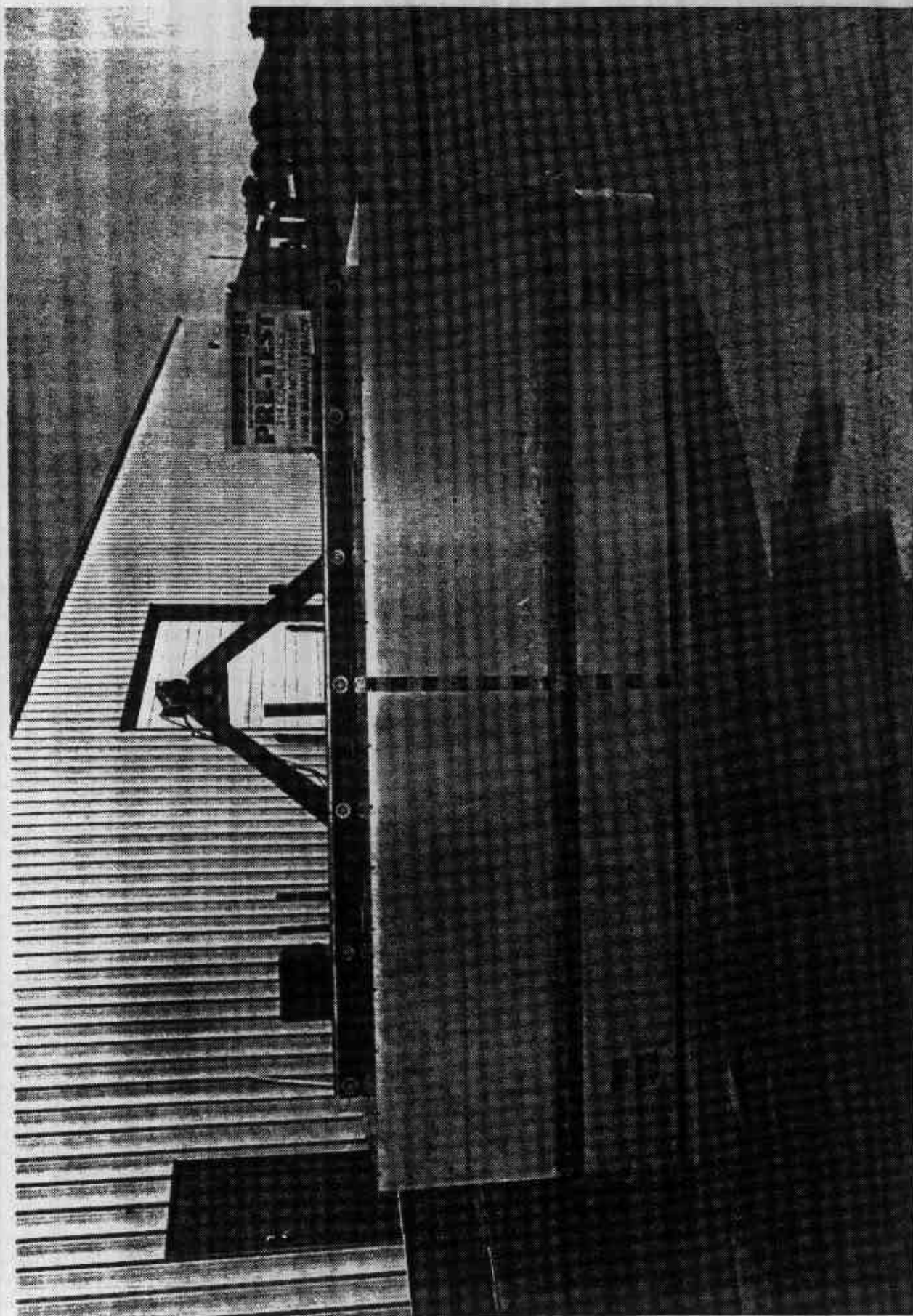


Photo No. A-14 - Pre-Test MDB Front View

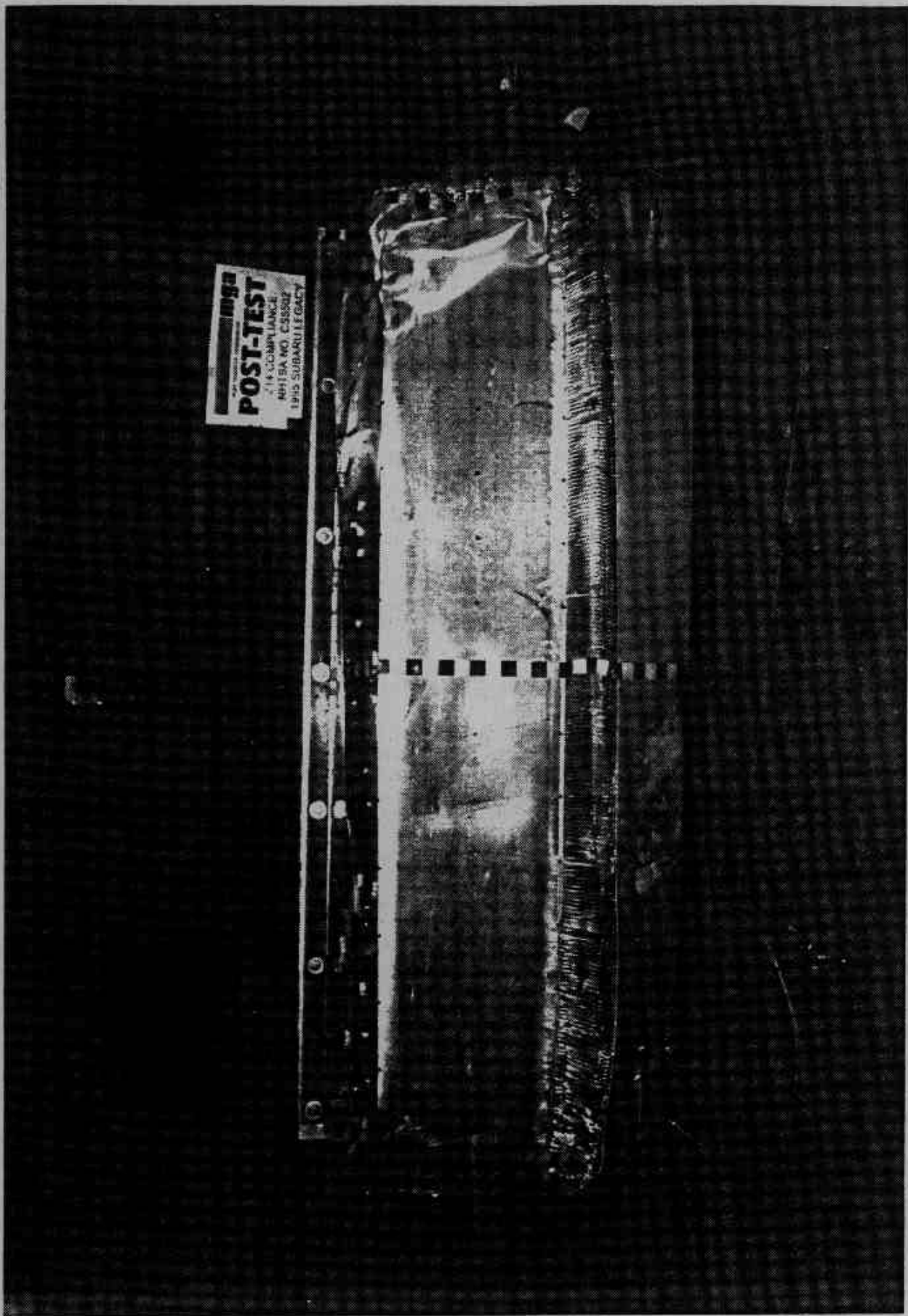


Photo No. A-15 - Post-Test MDB Front View

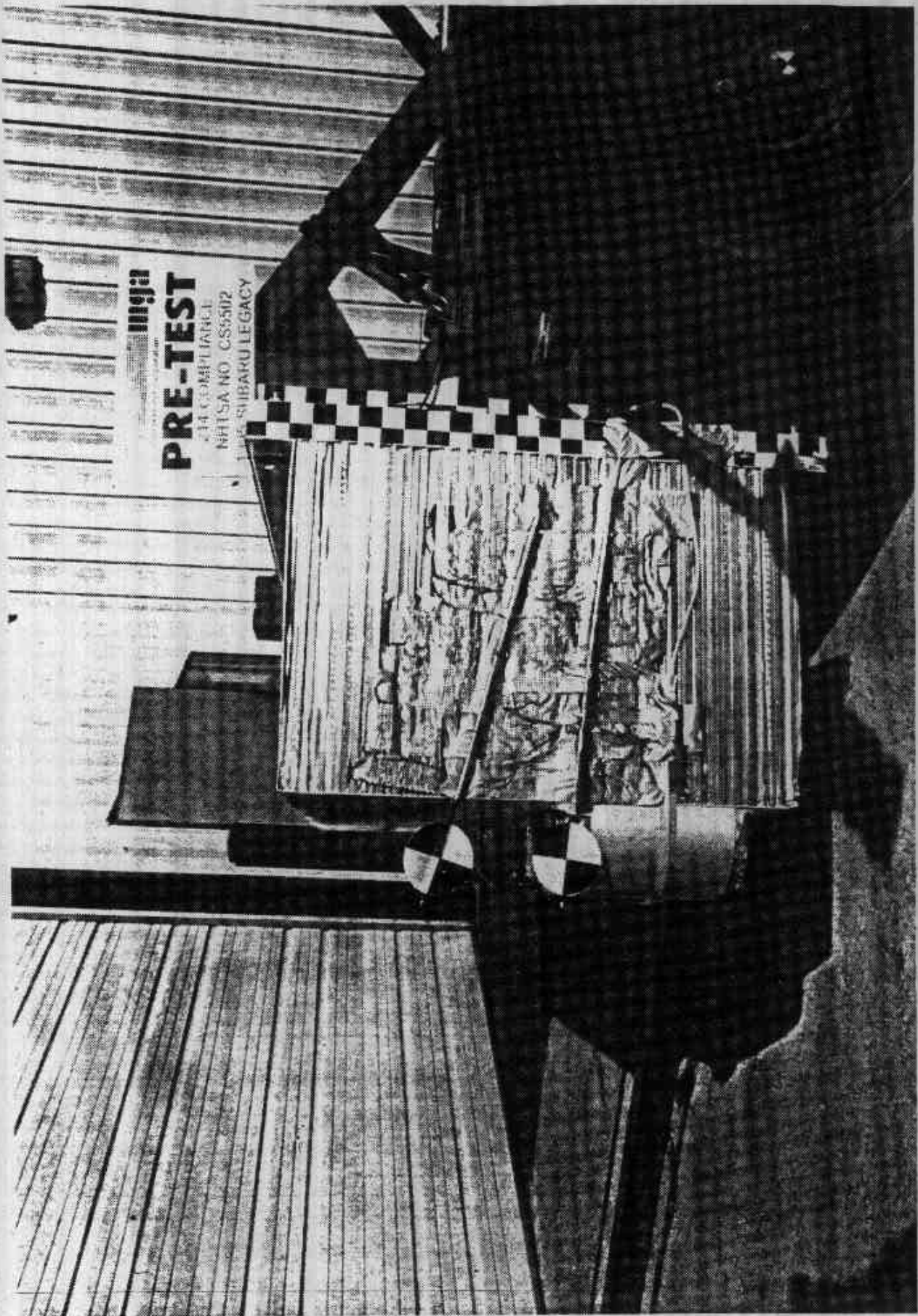


Photo No. A-16 - Pre-Test MDB Left Side View



Photo No. A-17 - Post-Test MDB Left Side View

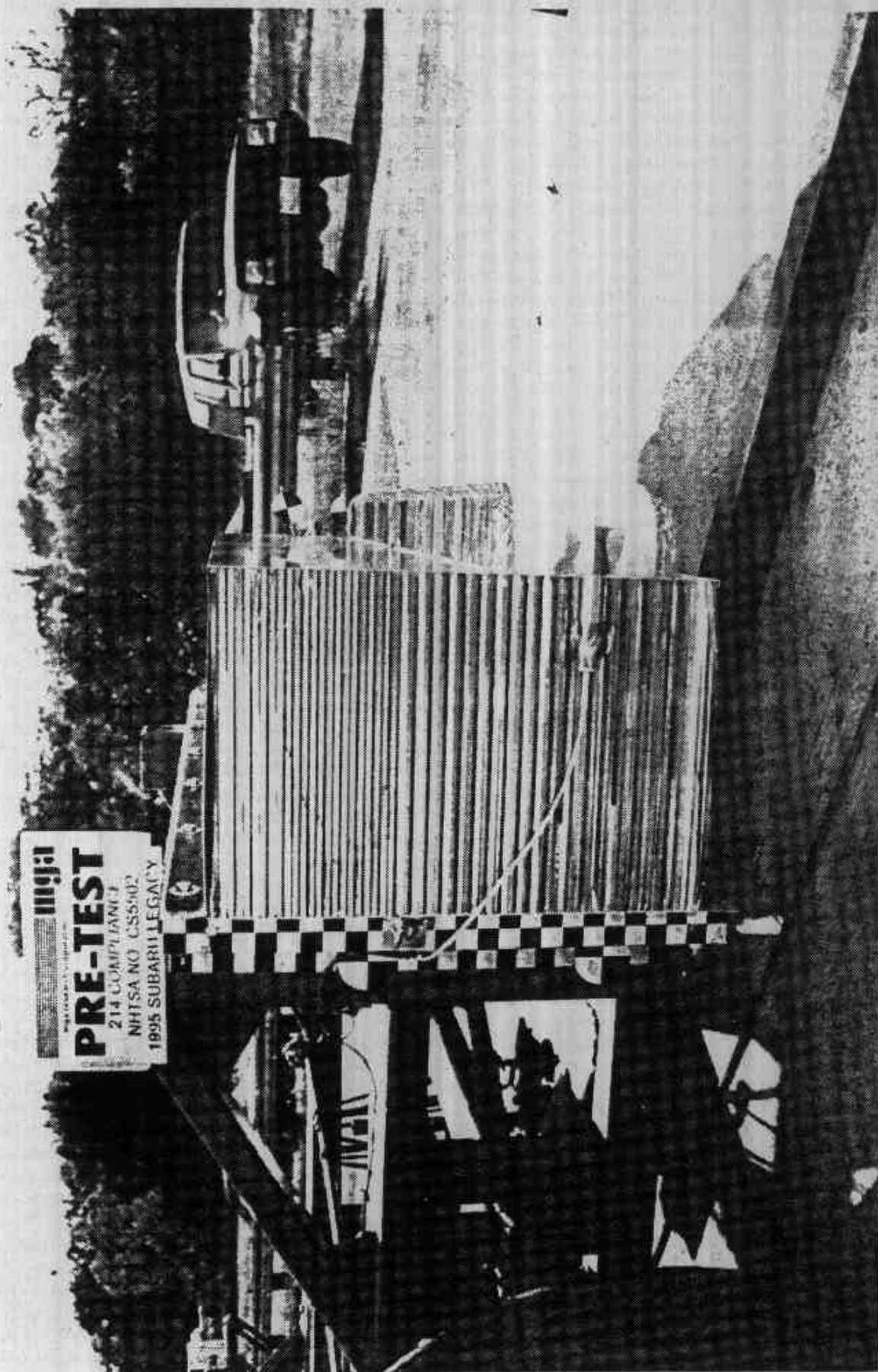


Photo No. A-18 - Pre-Test MDB Right Side View



Photo No. A-19 - Post-Test MDB Right Side View

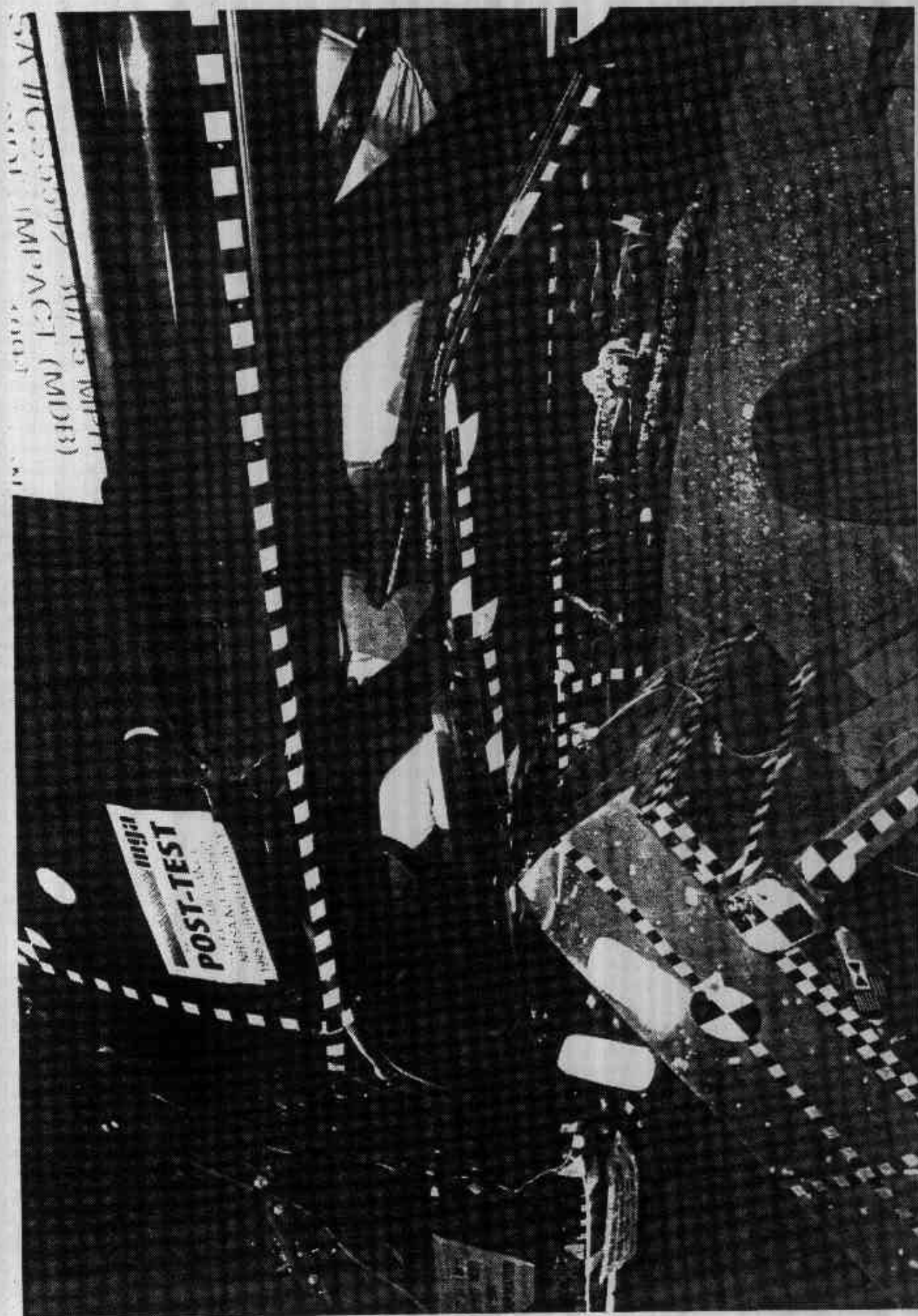


Photo No. A-20 - Post-Test MDB and Vehicle Overhead View

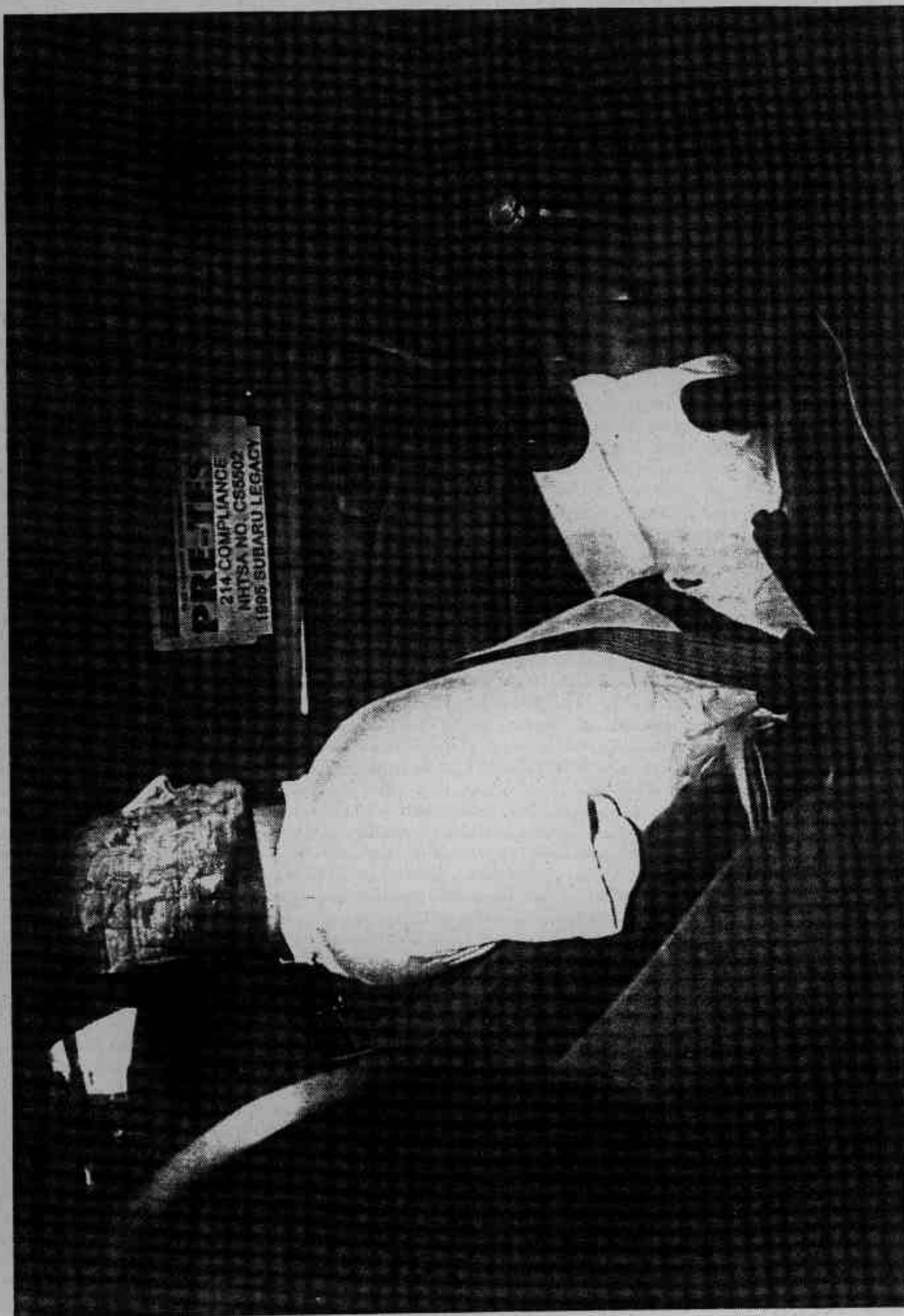


Photo No. A-21 - Pre-Test Driver Dummy Right Side View



Photo No. A-22 - Post-Test Driver Dummy Right Side View

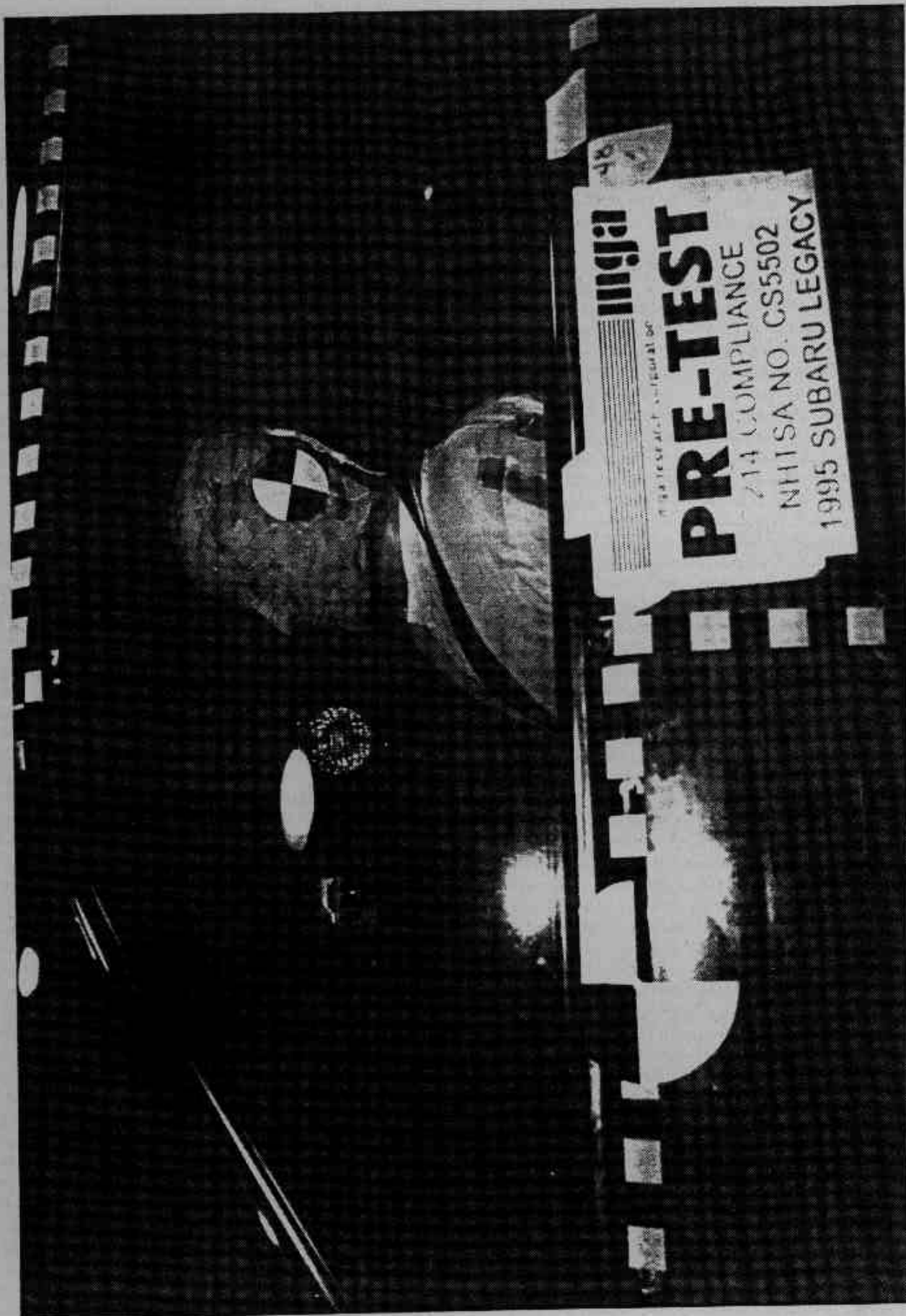


Photo No. A-23 - Pre-Test Driver Dummy Left Side View



Photo No. A-24 - Post-Test Driver Dummy Left Side View

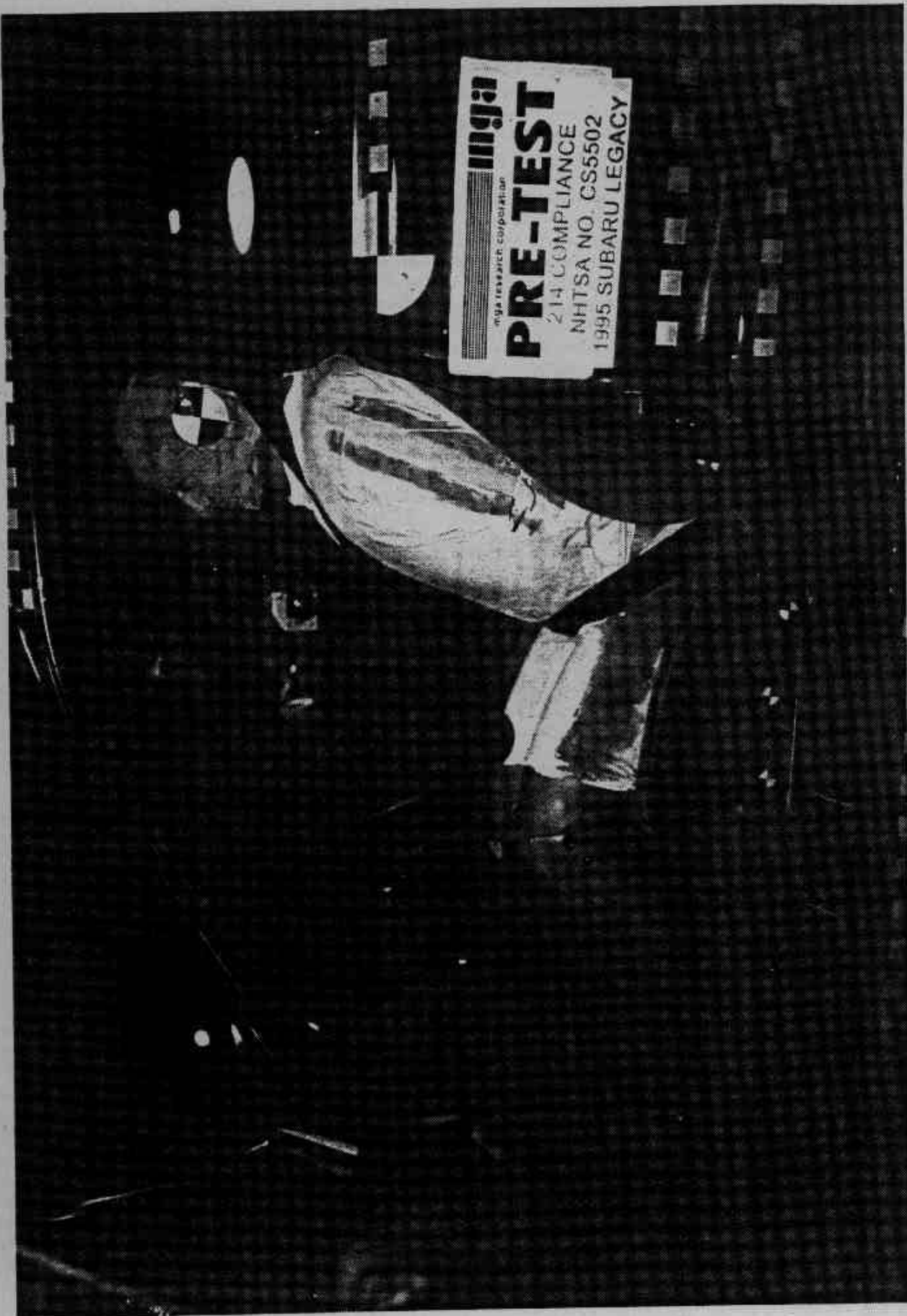


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)



Photo No. A-26 - Post-Test Driver Dummy Impact Point

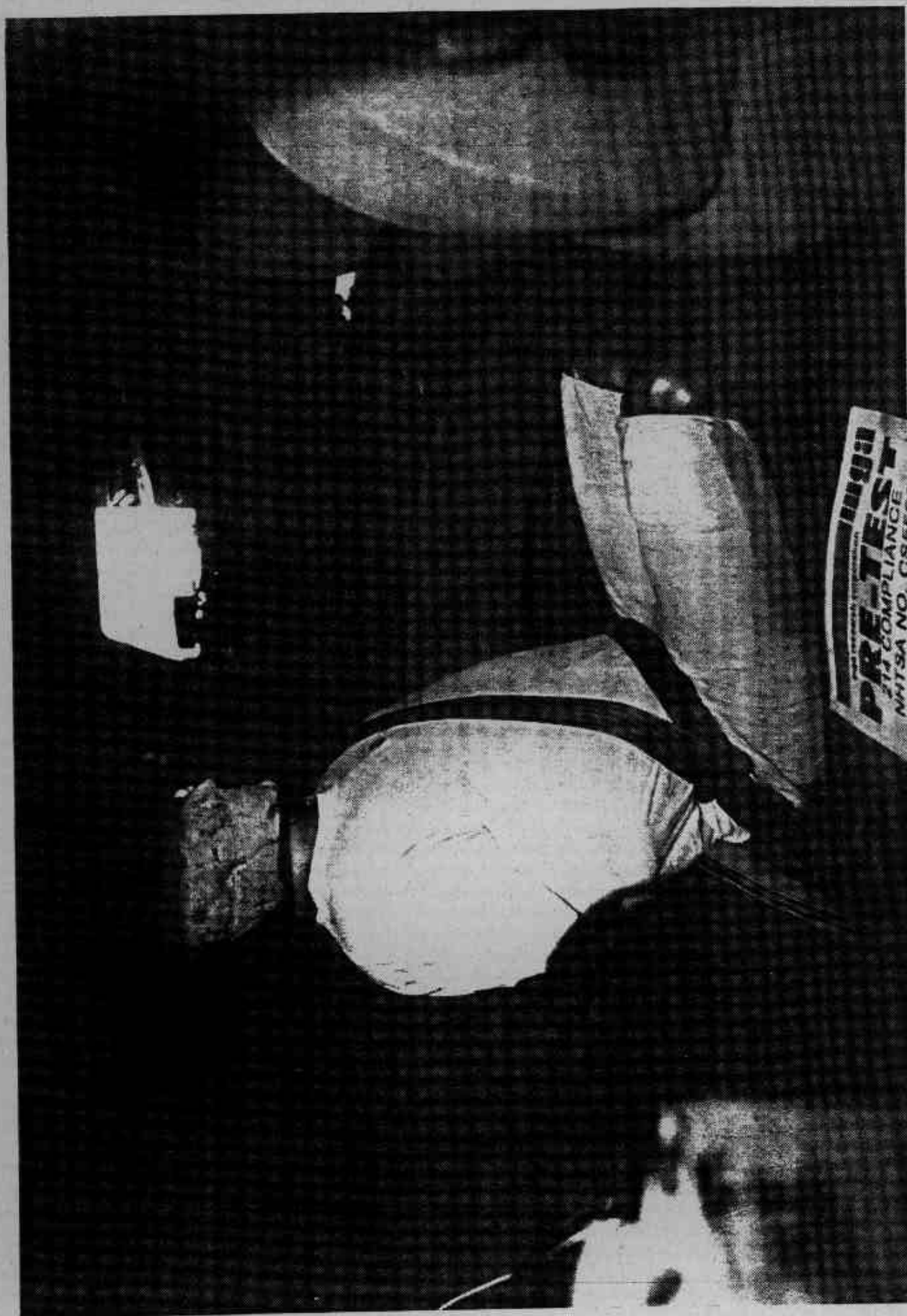


Photo No. A-27 - Pre-Test Passenger Dummy Right Side View



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



Photo No. A-29 - Pre-Test Passenger Dummy Left Side View

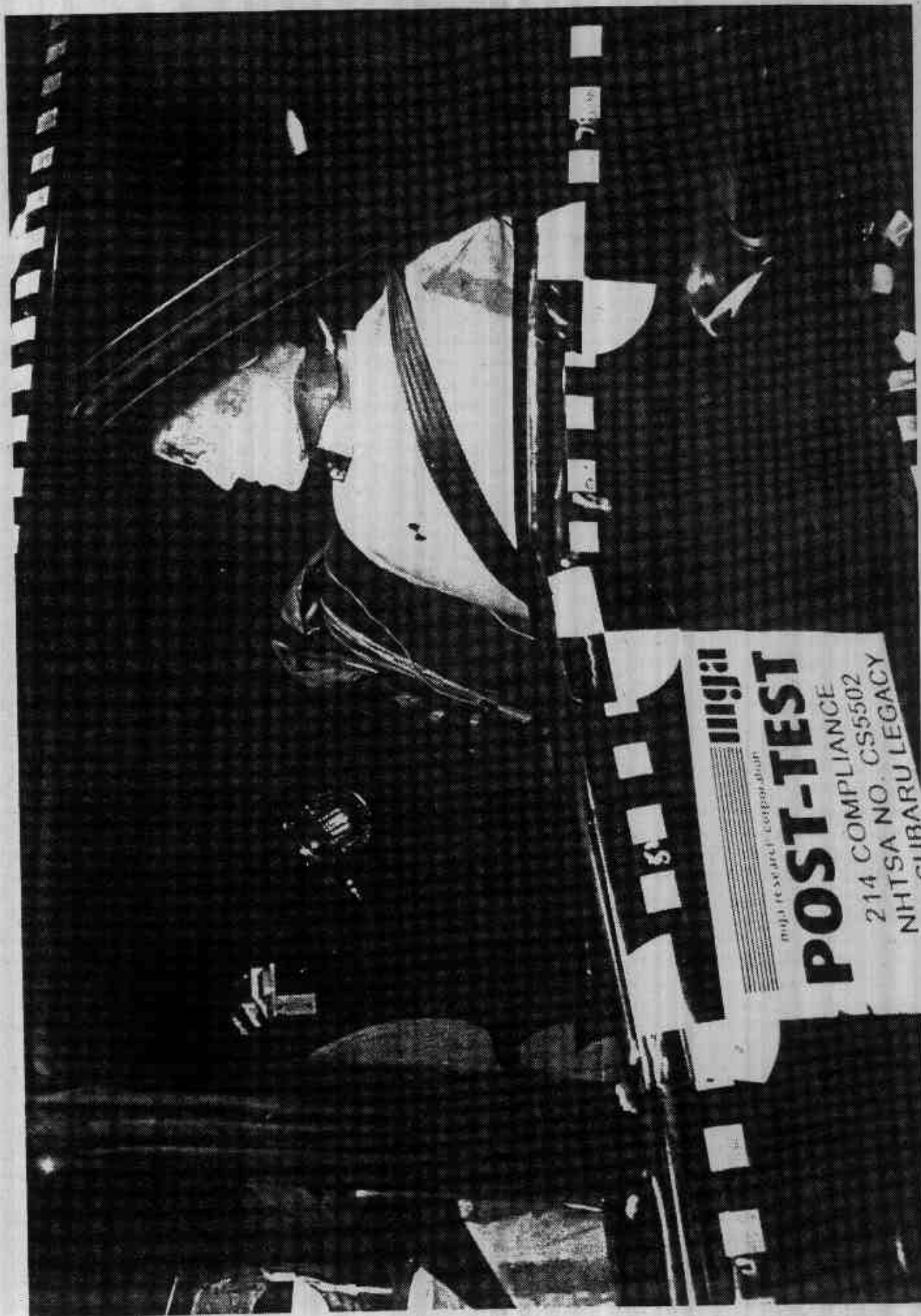


Photo No. A-30 - Post-Test Passenger Dummy Left Side View

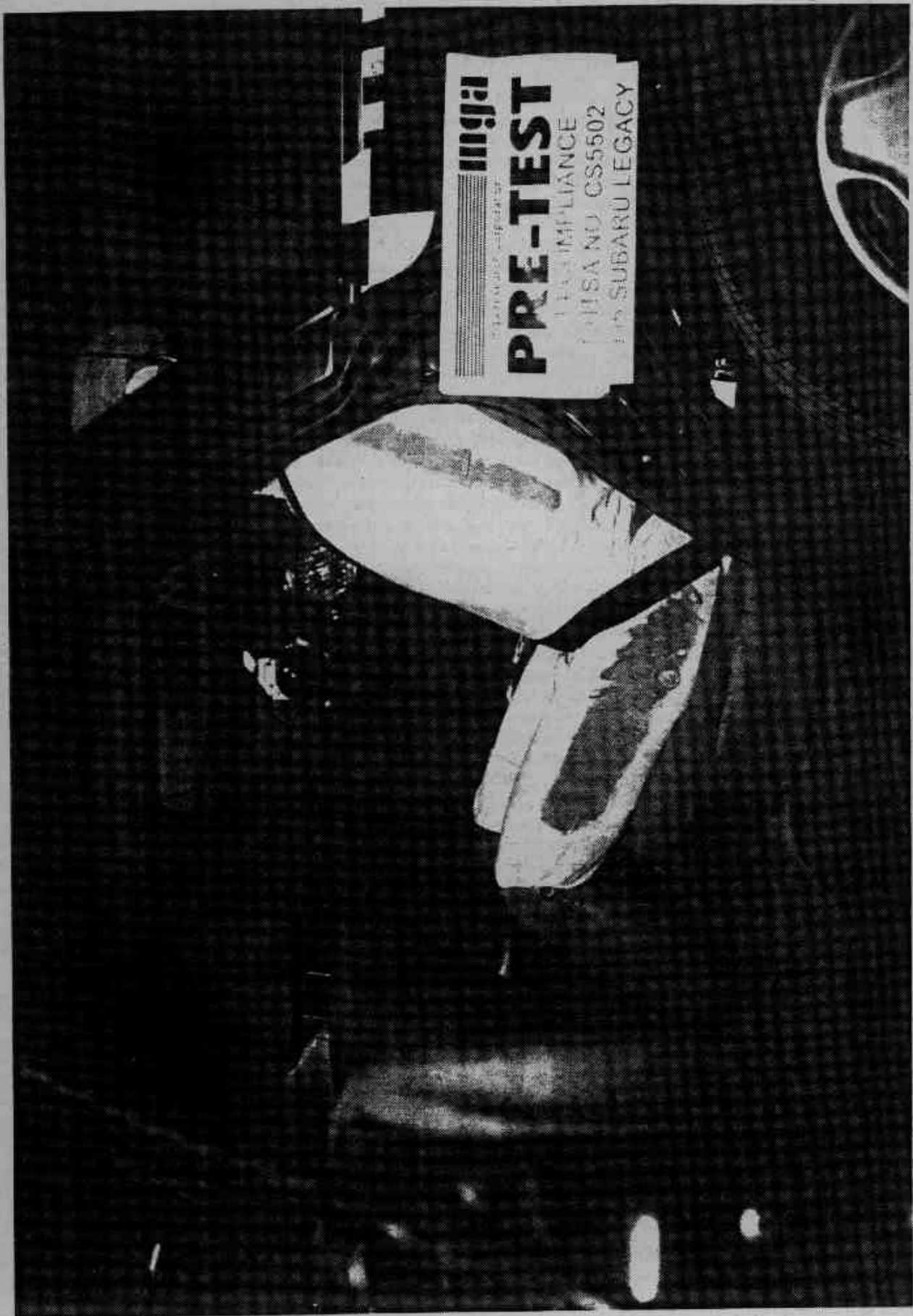


Photo No. A-31 - Pre-Test Passenger Dummy Left Side View (Door Open)

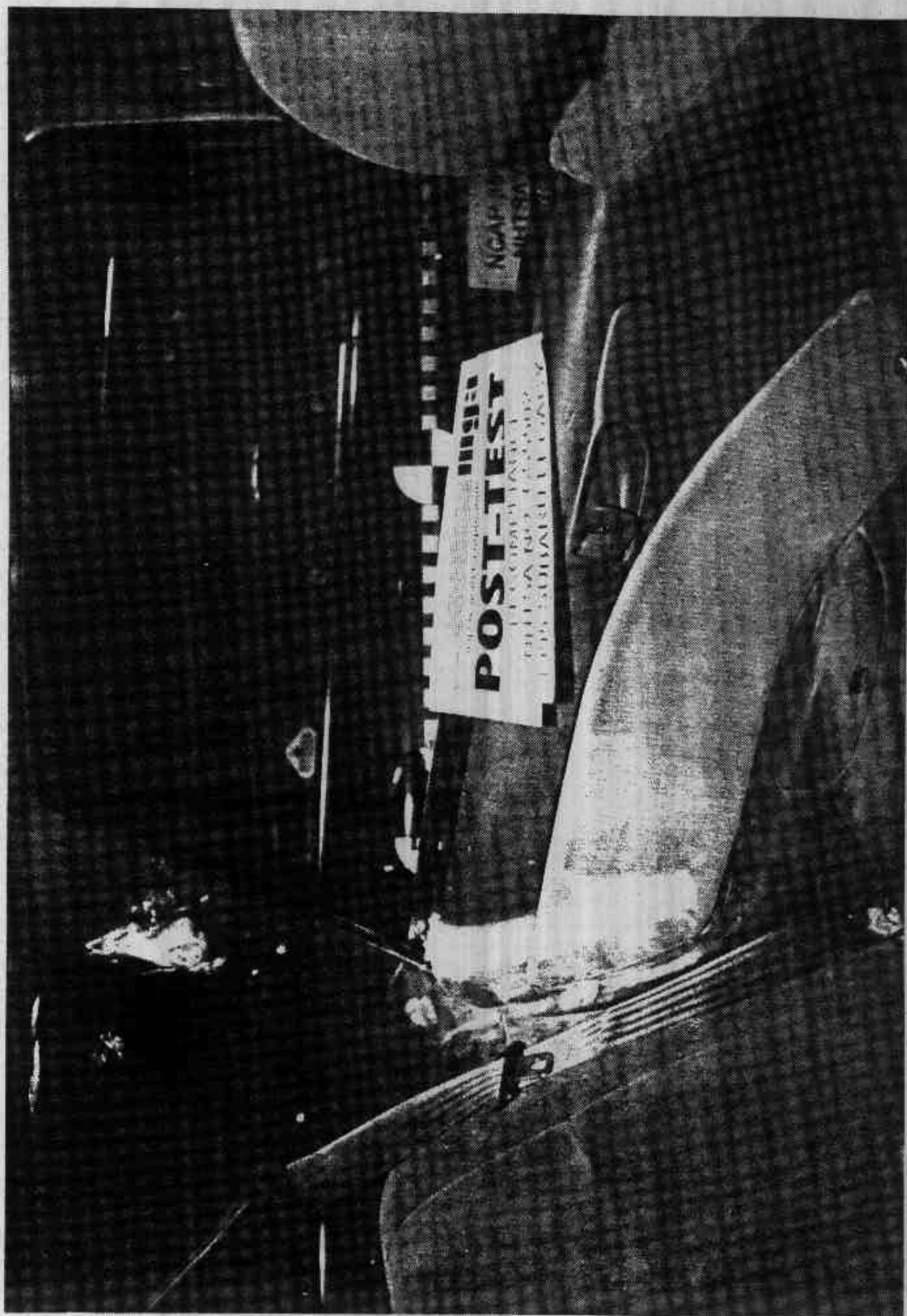


Photo No. A-32 - Post-Test Passenger Dummy Impact Point



Photo No. A-33 - Left Front Impact Point on Vehicle

SUBARU

VEHICLE CAPACITY WEIGHT 3000LB 405KG

NUMBER OF OCCUPANTS TOTAL 5 FRONT 2 REAR 3

RECOMMENDED TIRE INFLATION PRESSURE 32 PSI 2.2 BAR

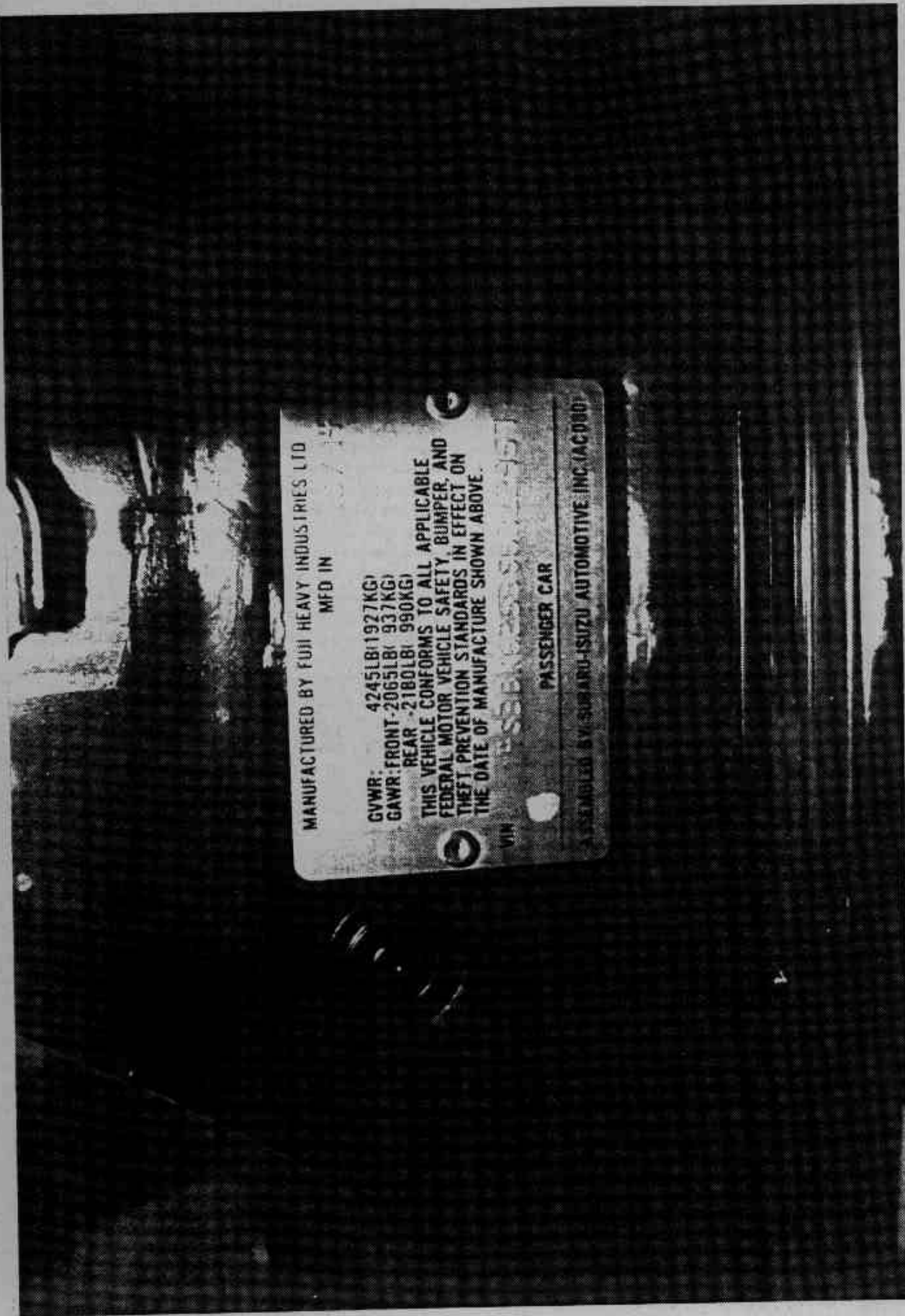
TIRE	FRONT	REAR
P185 70R14 45	32 PSI 2.2 BAR	30 PSI 2.1 BAR

TEMPORARY SPARE TIRE

FWD	P125 70D15	50 PSI 3.4 BAR
4WD	P135 70D16	50 PSI 3.4 BAR

WAGON N1

Photo No. A-34 - Tire Placard



MANUFACTURED BY FUJI HEAVY INDUSTRIES LTD
MFD IN

GVWR: 4245LB(1927KG)
GAWR: FRONT-2065LB(937KG)
REAR -2180LB(990KG)

THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN

PASSENGER CAR

ASSEMBLED BY SUBARU-ISUZU AUTOMOTIVE INC.(AC0001)

Photo No. A-35 - Vehicle Certification Label

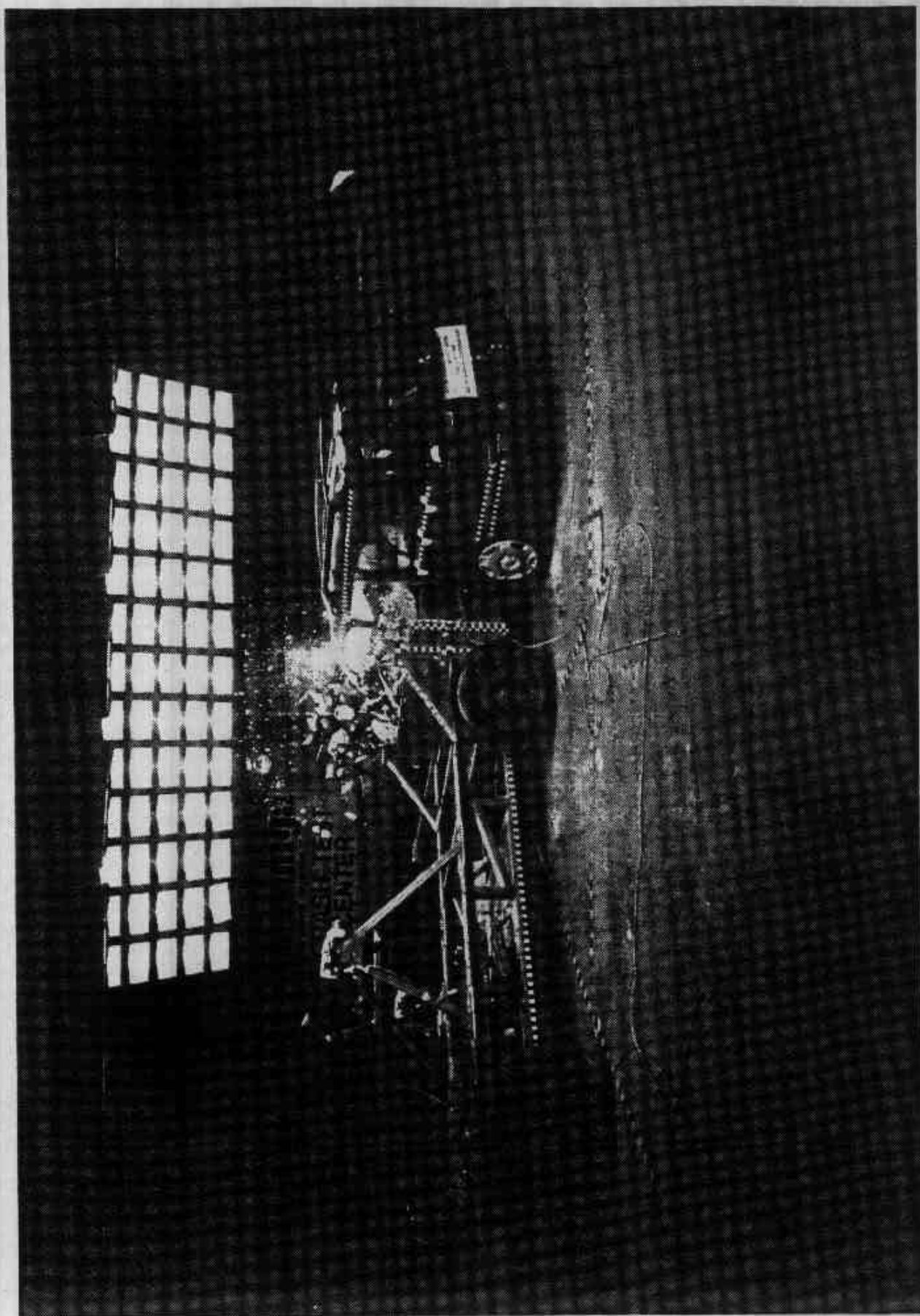


Photo No. A-36 - Impact

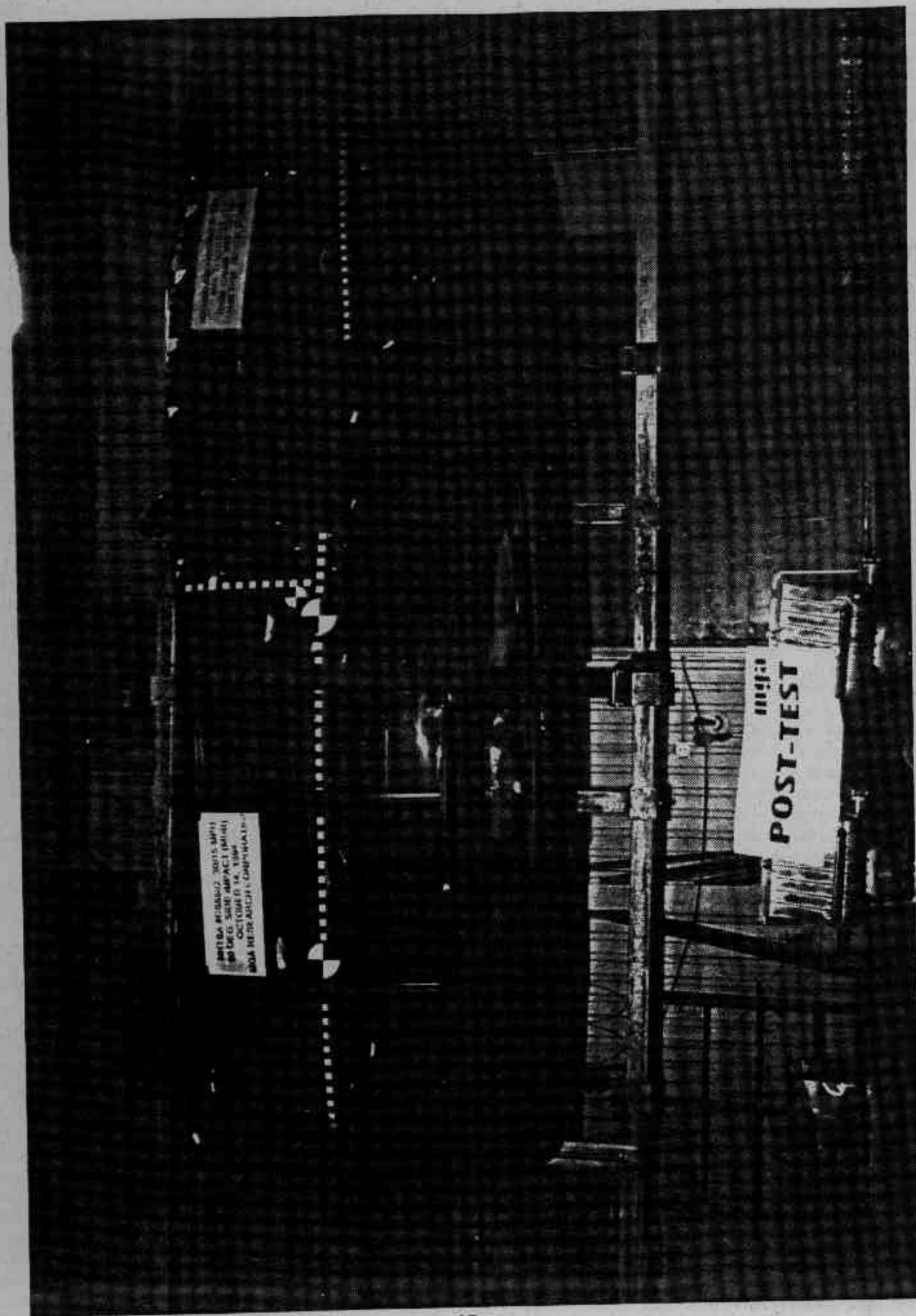
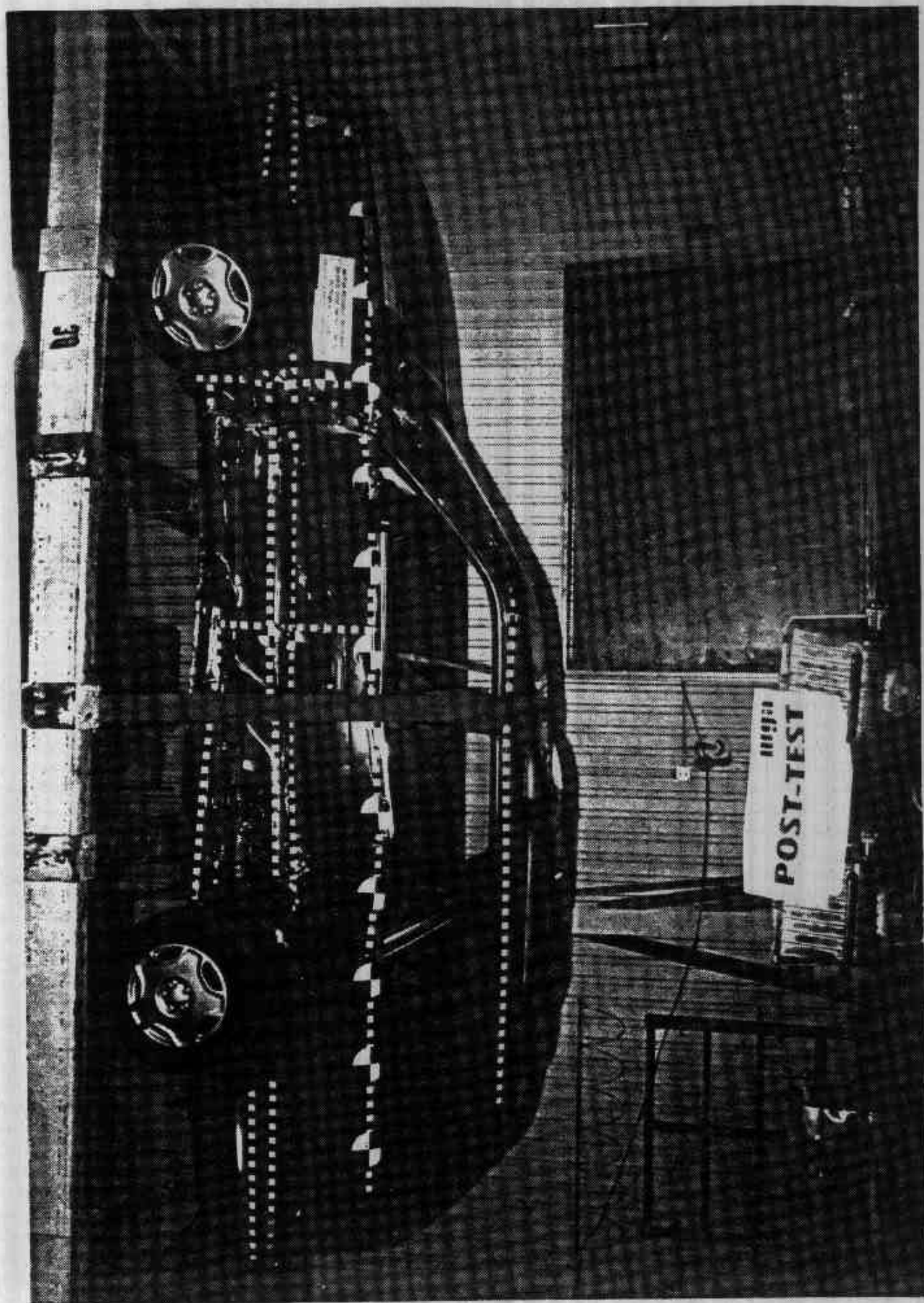


Photo No. A-37 - Rollover 90°



A-38

Photo No. A-38 - Rollover 180°

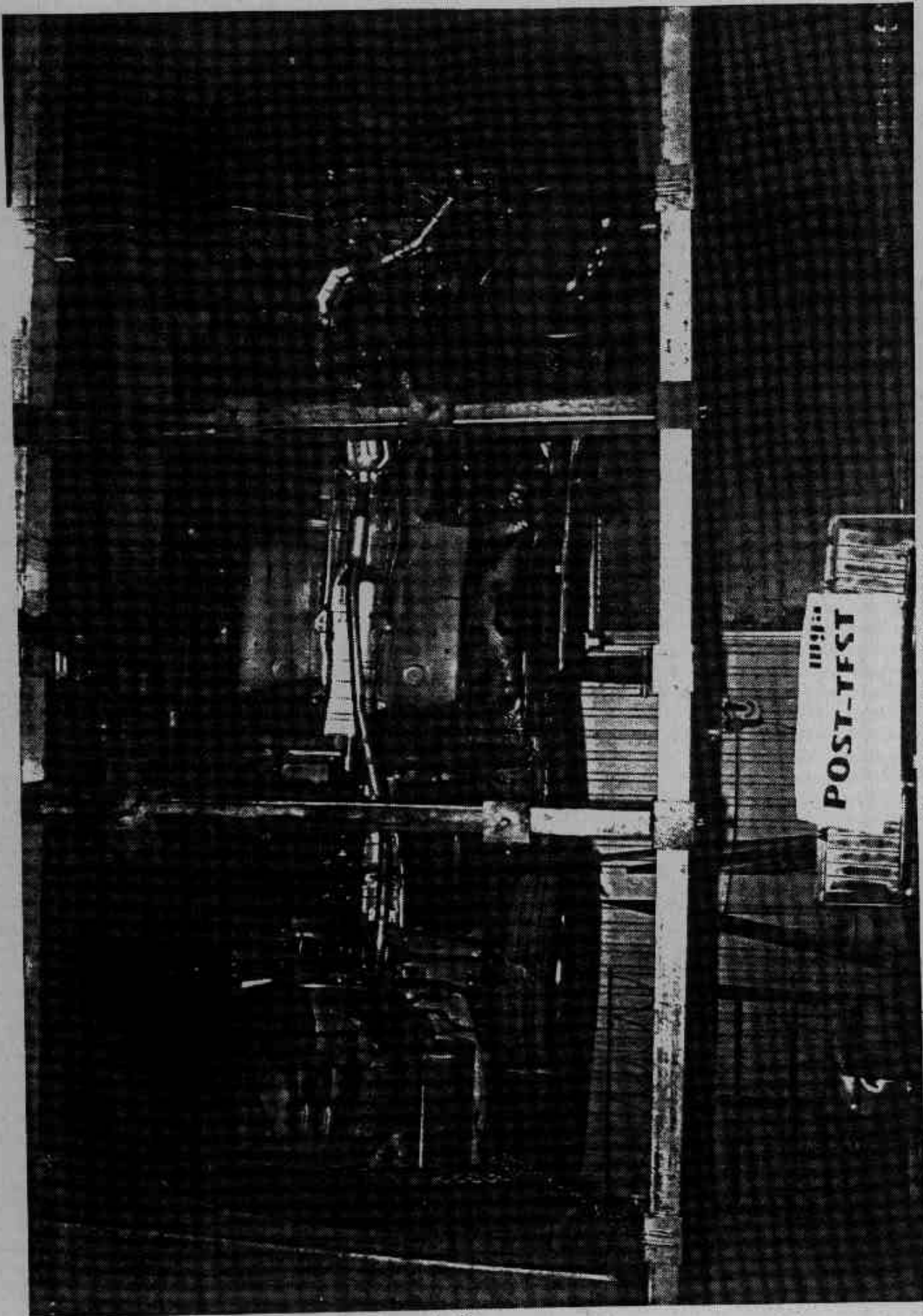
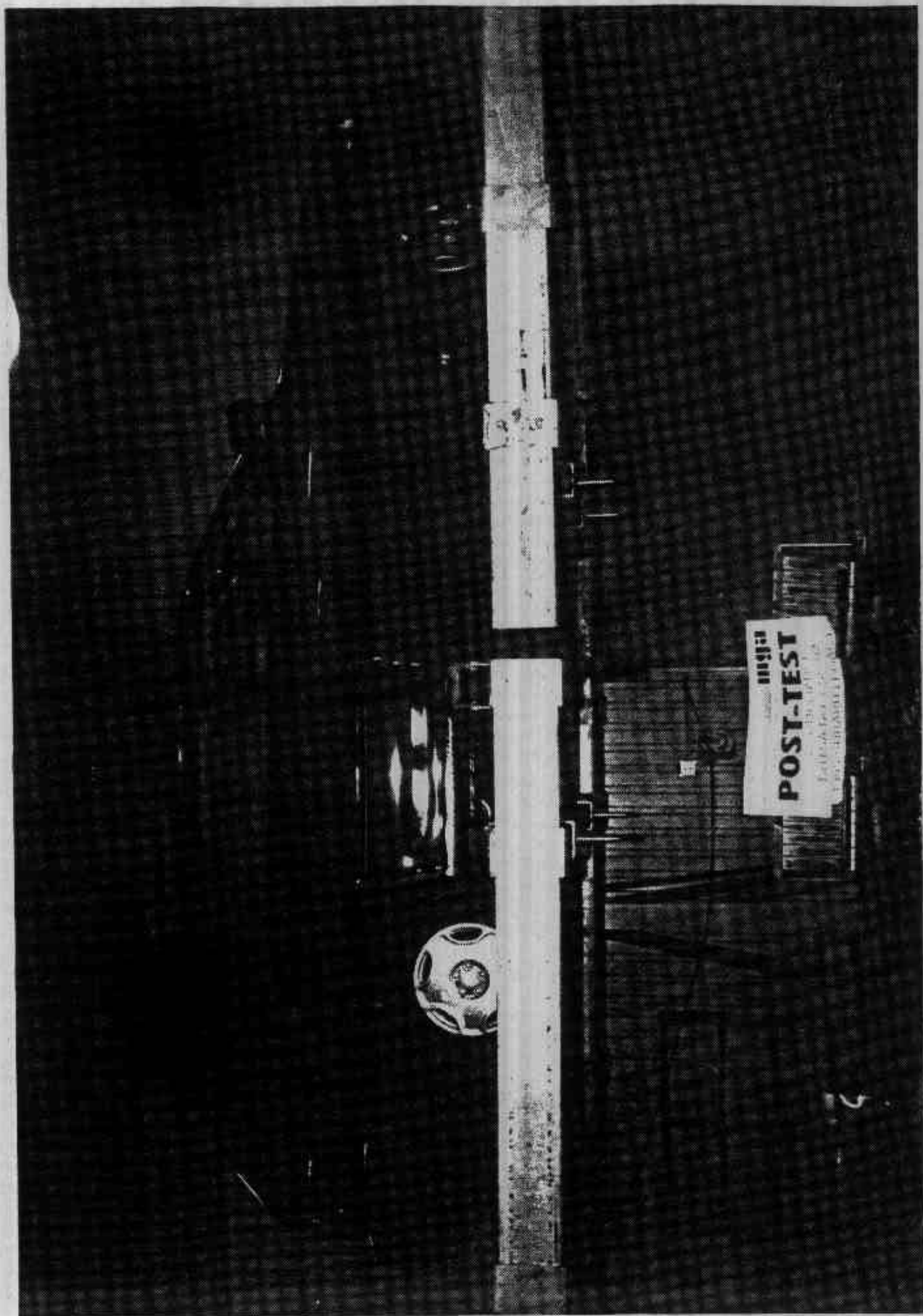


Photo No. A-39 - Rollover 279°



A-40

Photo No. A-40 - Rollover 360°

APPENDIX B - DATA PLOTS

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* No valid data collected

Filter: Class 180 (300 Hz)

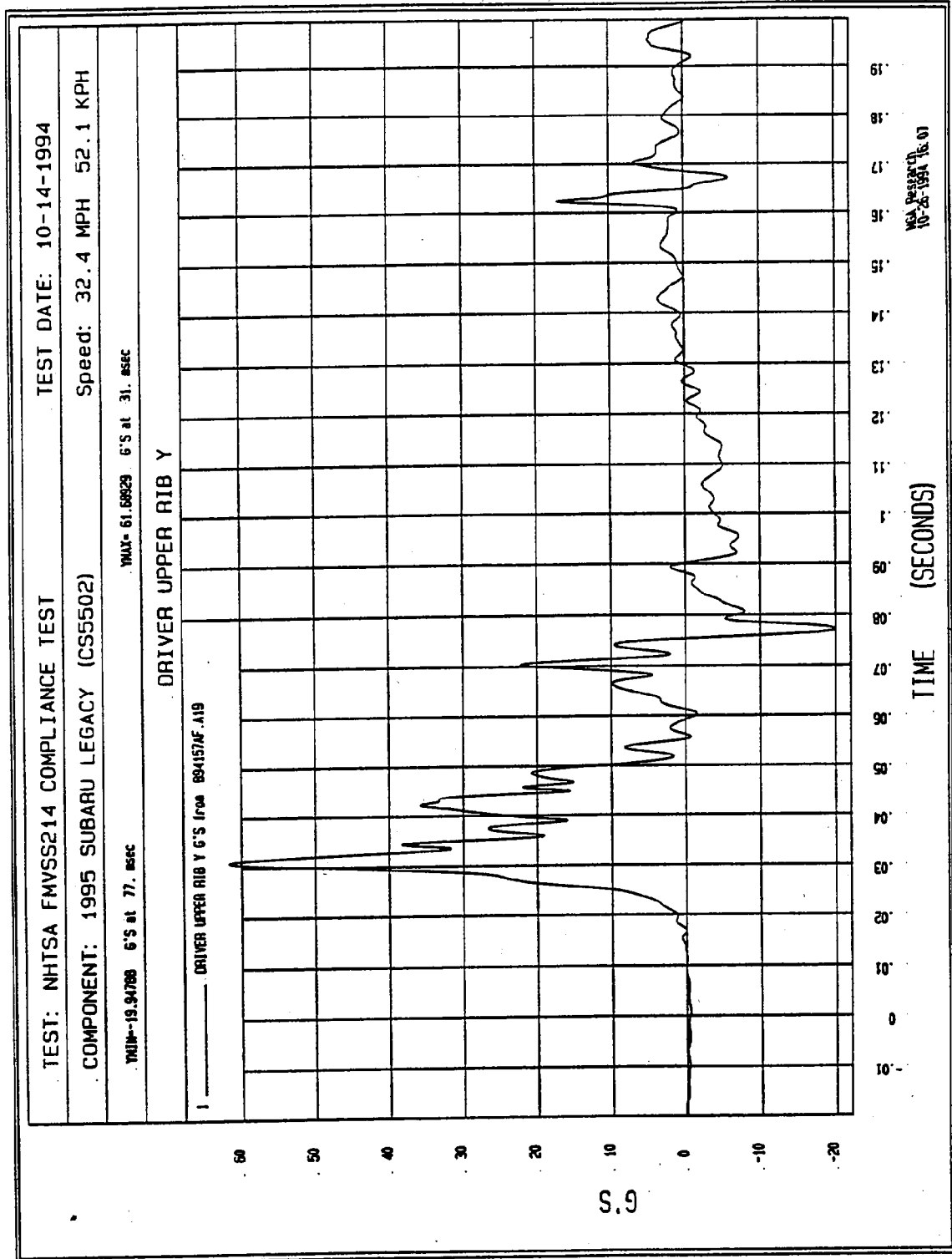


Figure B-1 - Driver Upper Rib Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

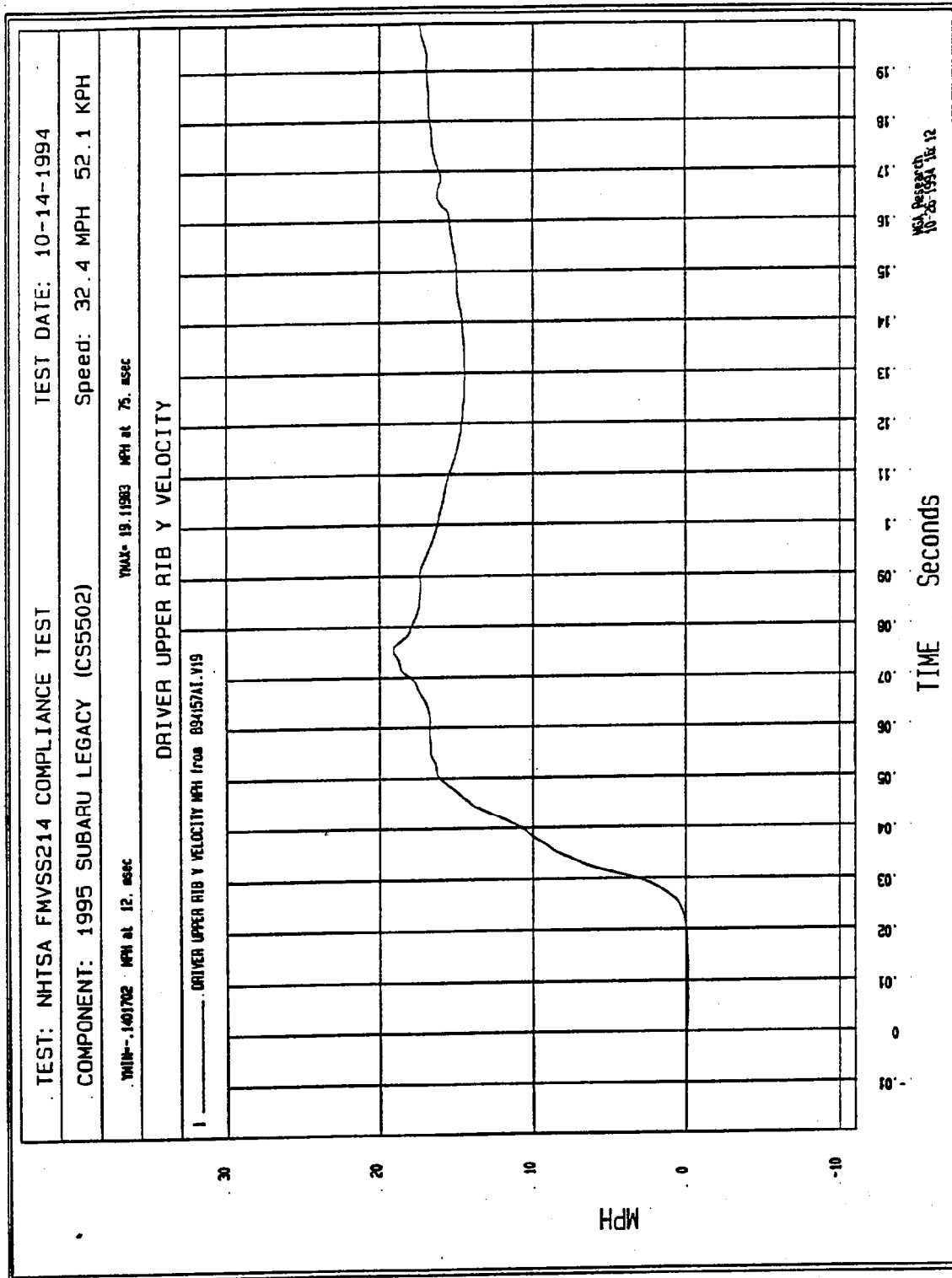


Figure B-2 - Driver Upper Rib Y Velocity vs. Time

Filter: Class 180 (300 Hz)

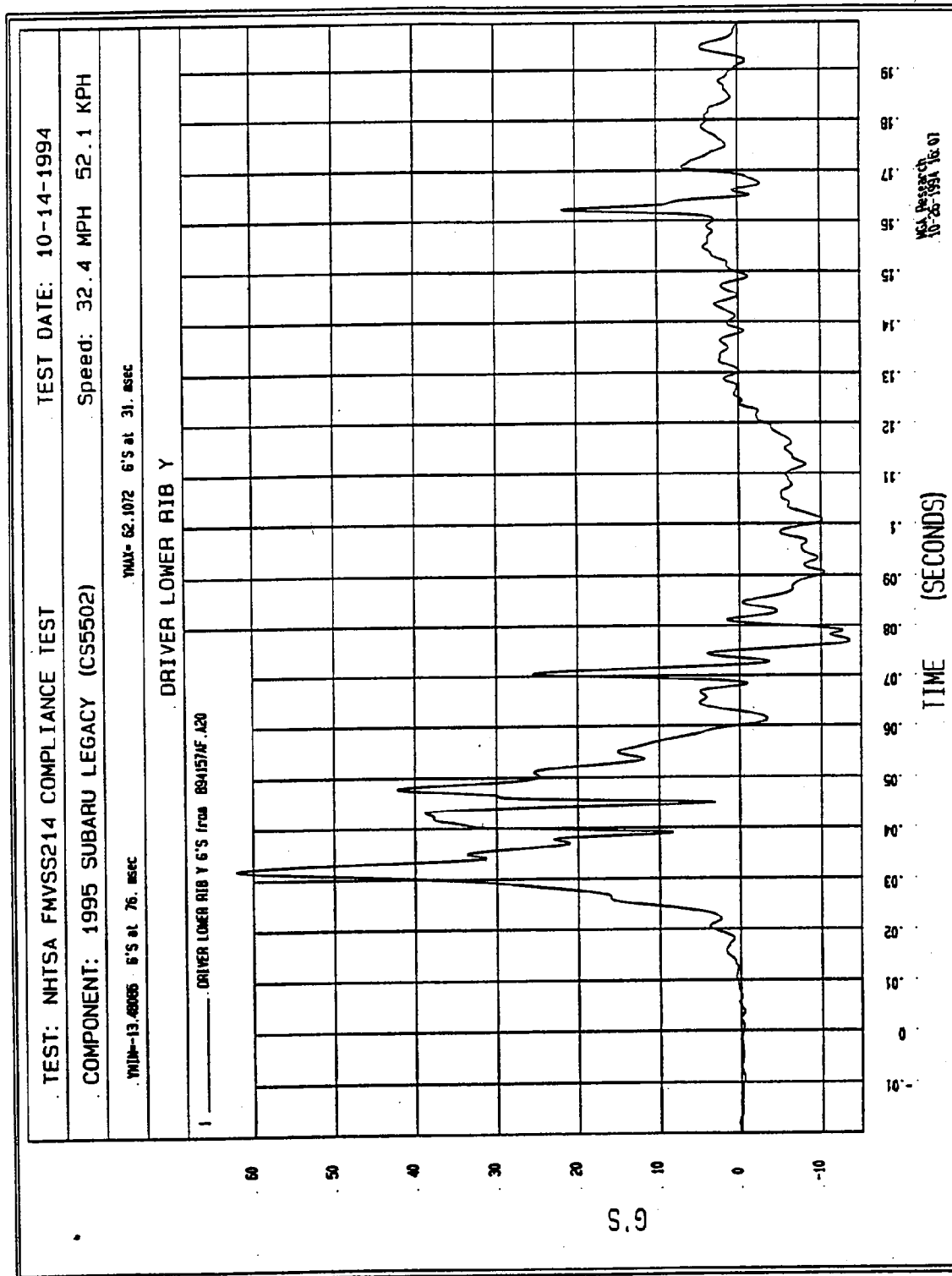


Figure B-3 - Driver Lower Rib Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

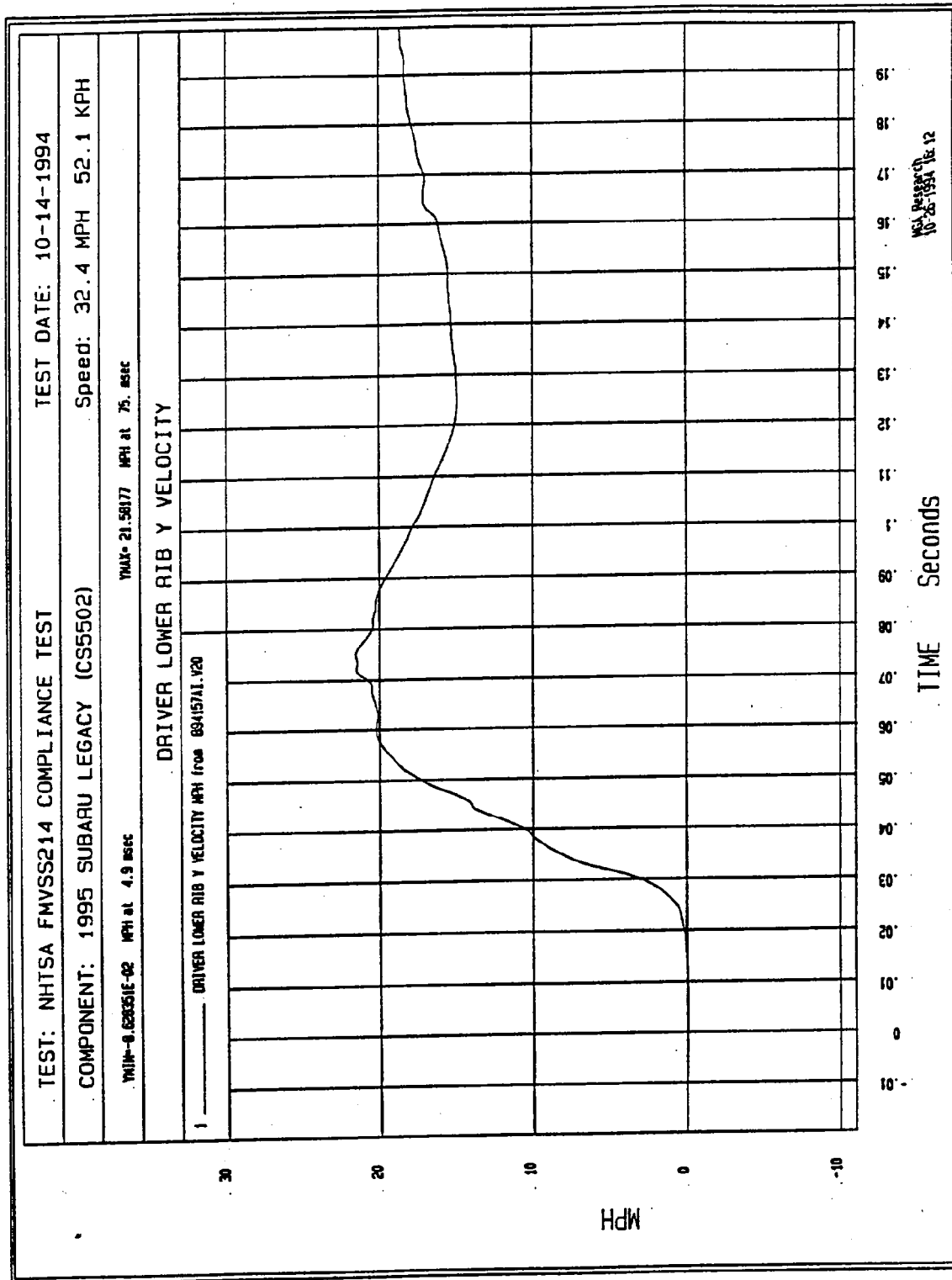


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

Filter: Class 180 (300 Hz)

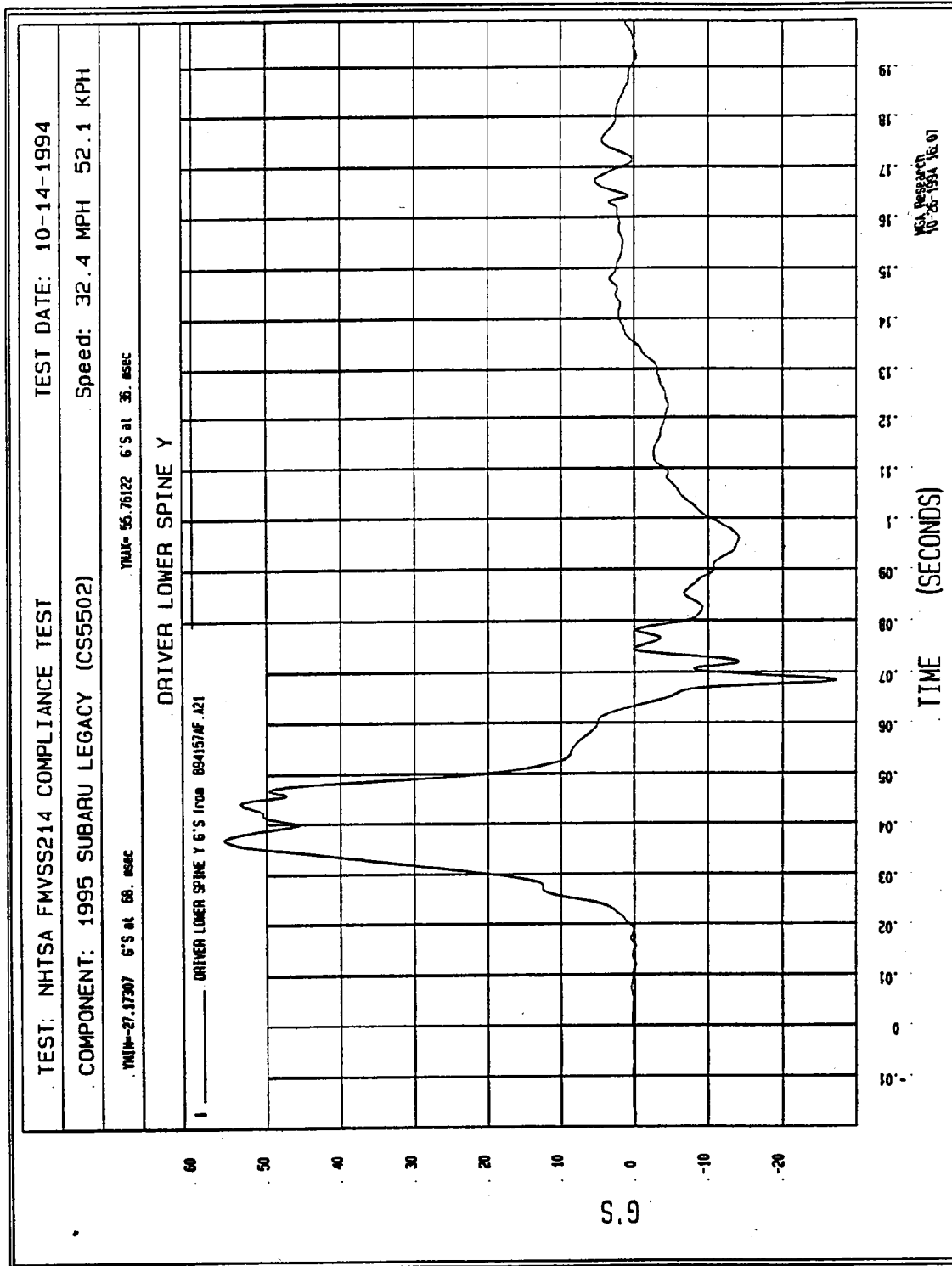


Figure B-5 - Driver Lower Spine Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

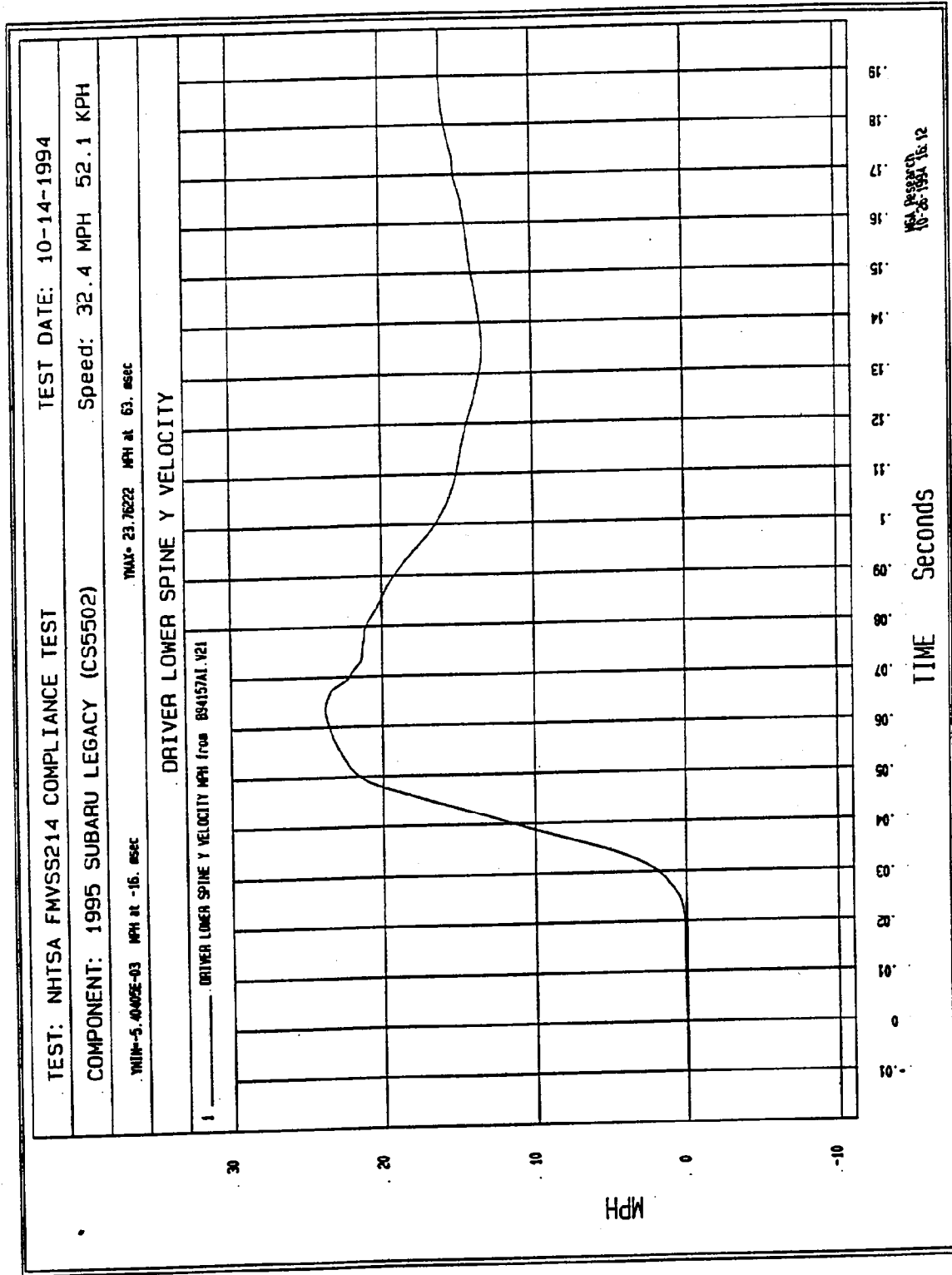


Figure B-6 - Driver Lower Spine Y Velocity vs. Time

Filter: Class 180 (300 Hz)

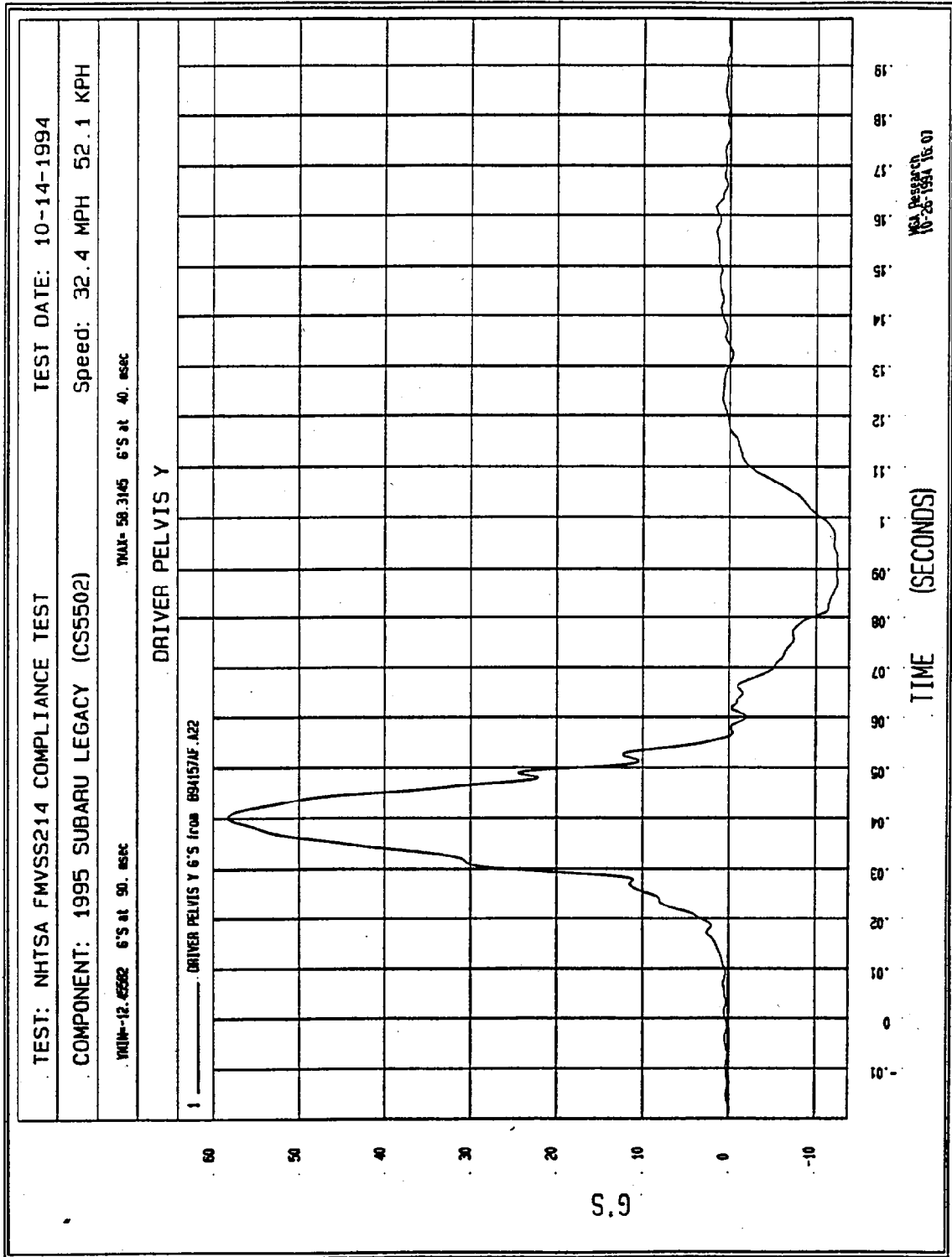


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

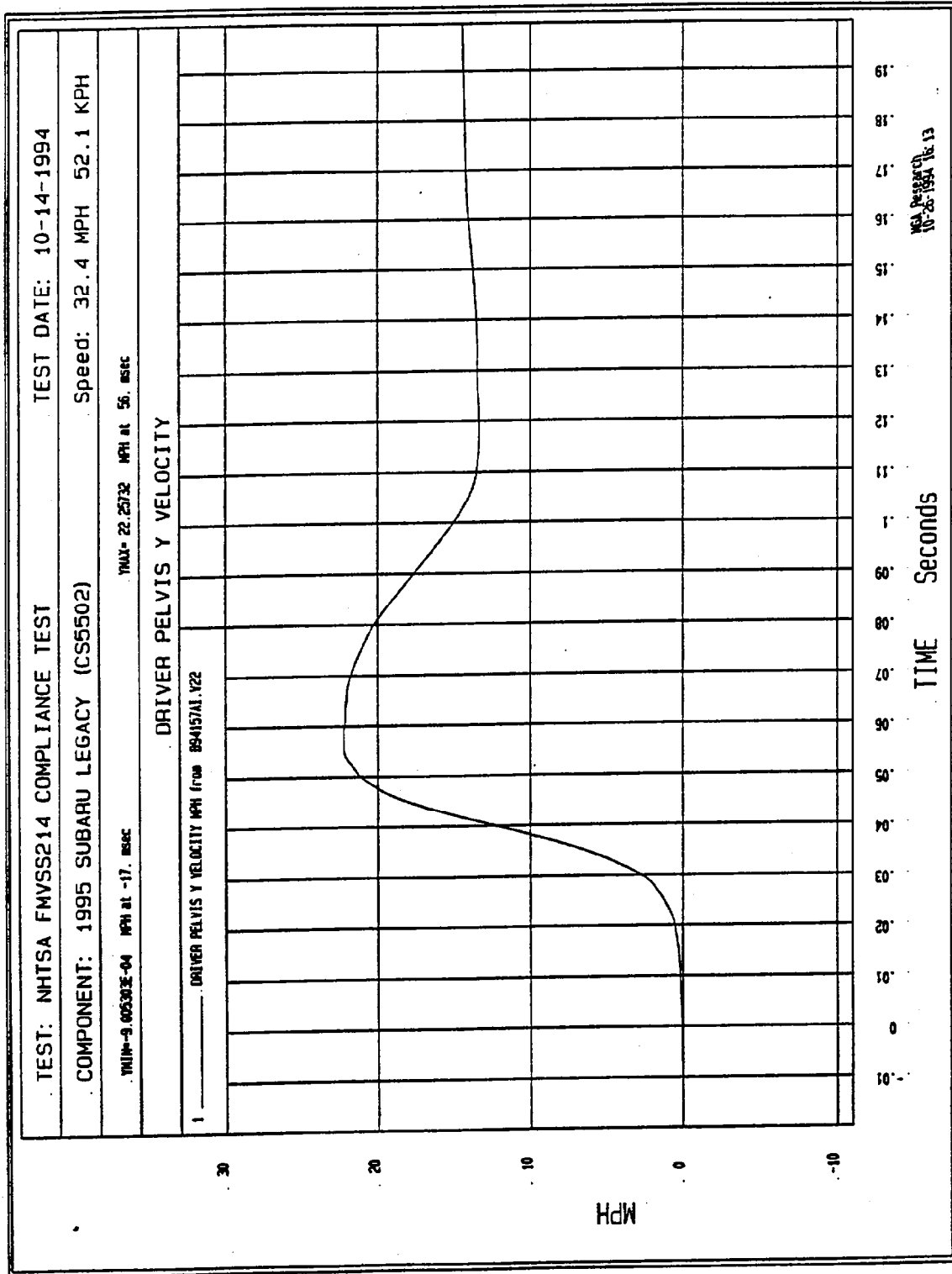


Figure B-8 - Driver Pelvis Y Velocity vs. Time

Filter: Class 180 (300 Hz)

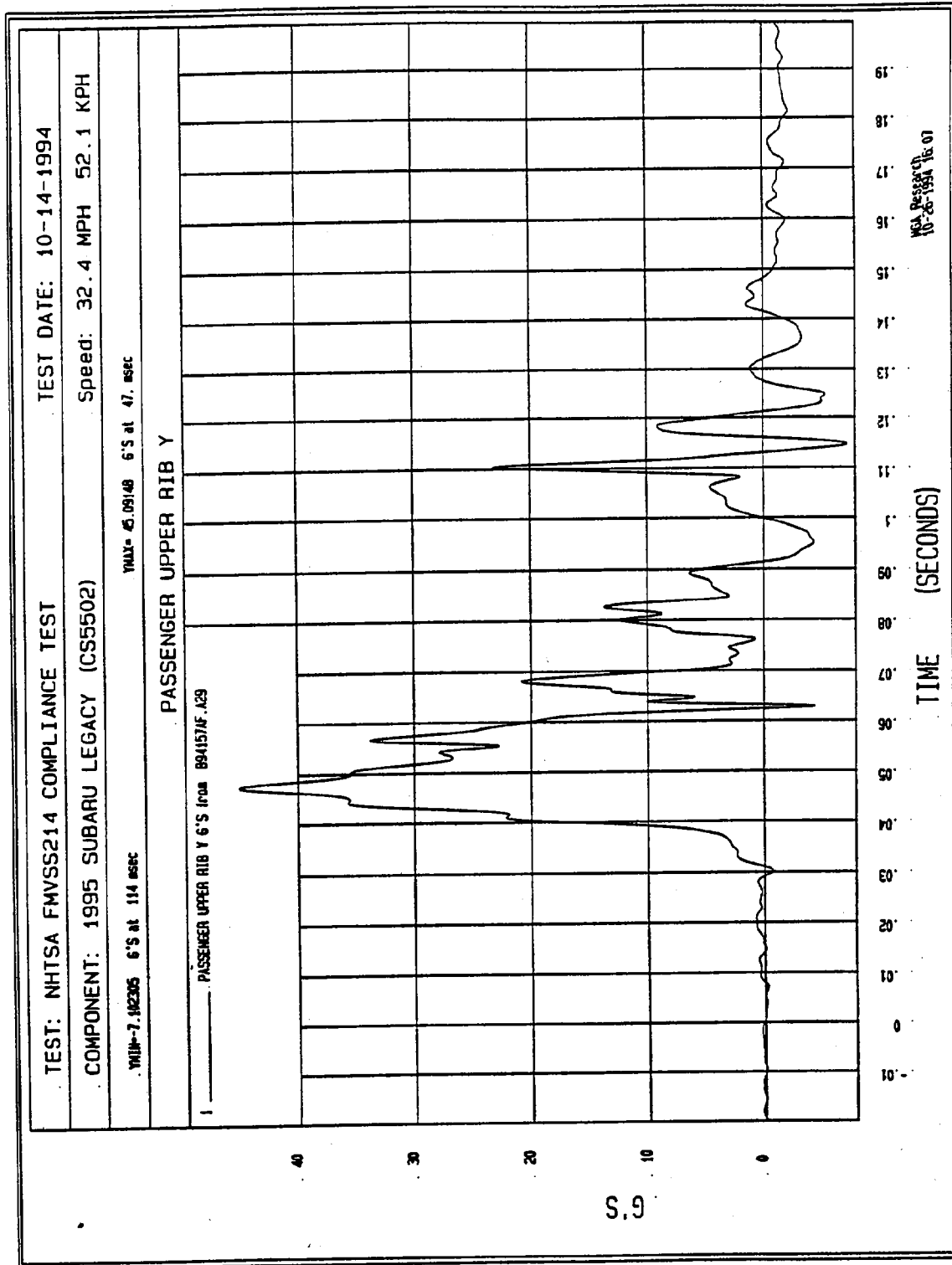


Figure B-9 - Passenger Upper Rib Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

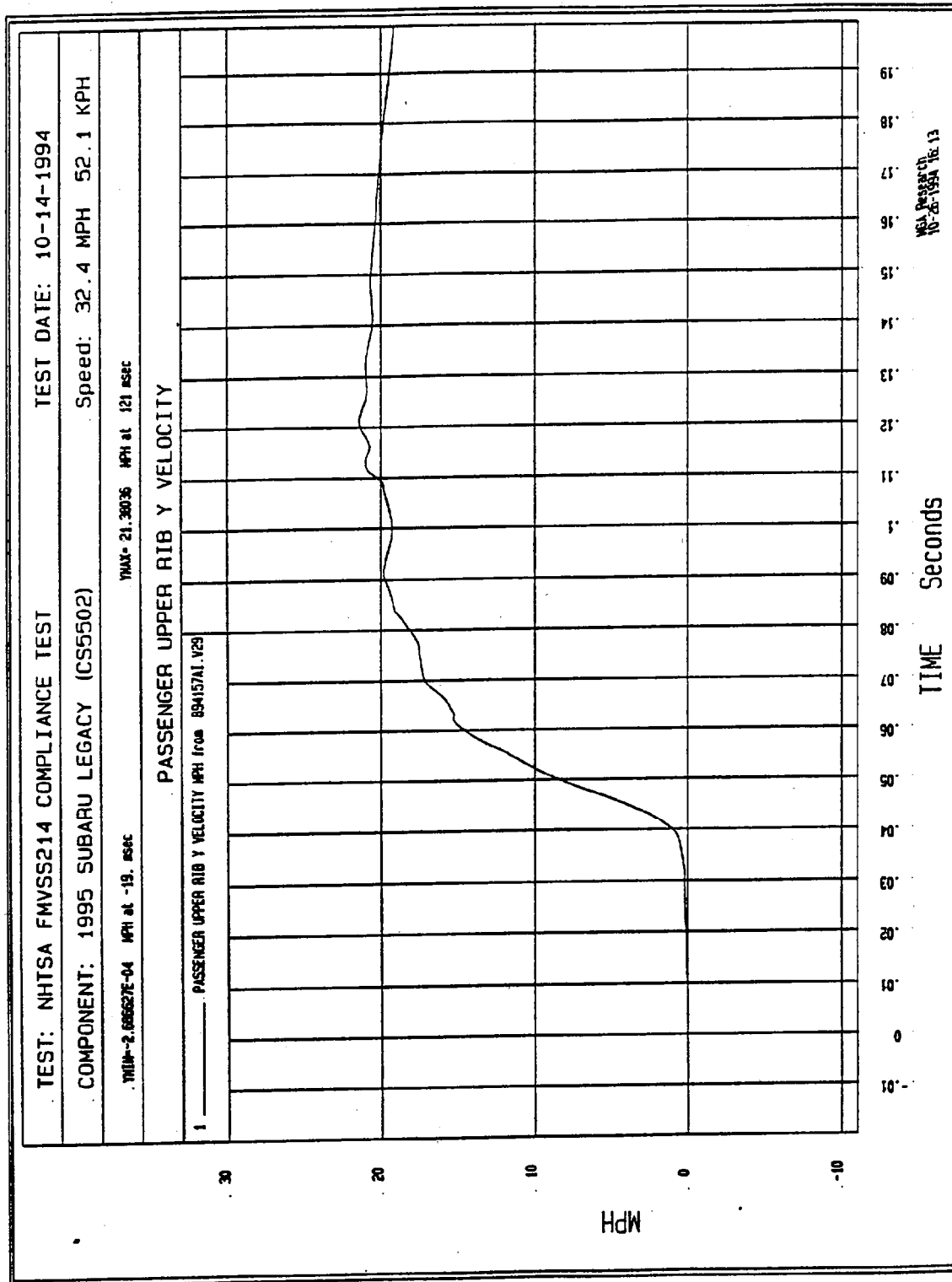


Figure B-10 - Passenger Upper Rib Y Velocity vs. Time

Filter: Class 180 (300 Hz)

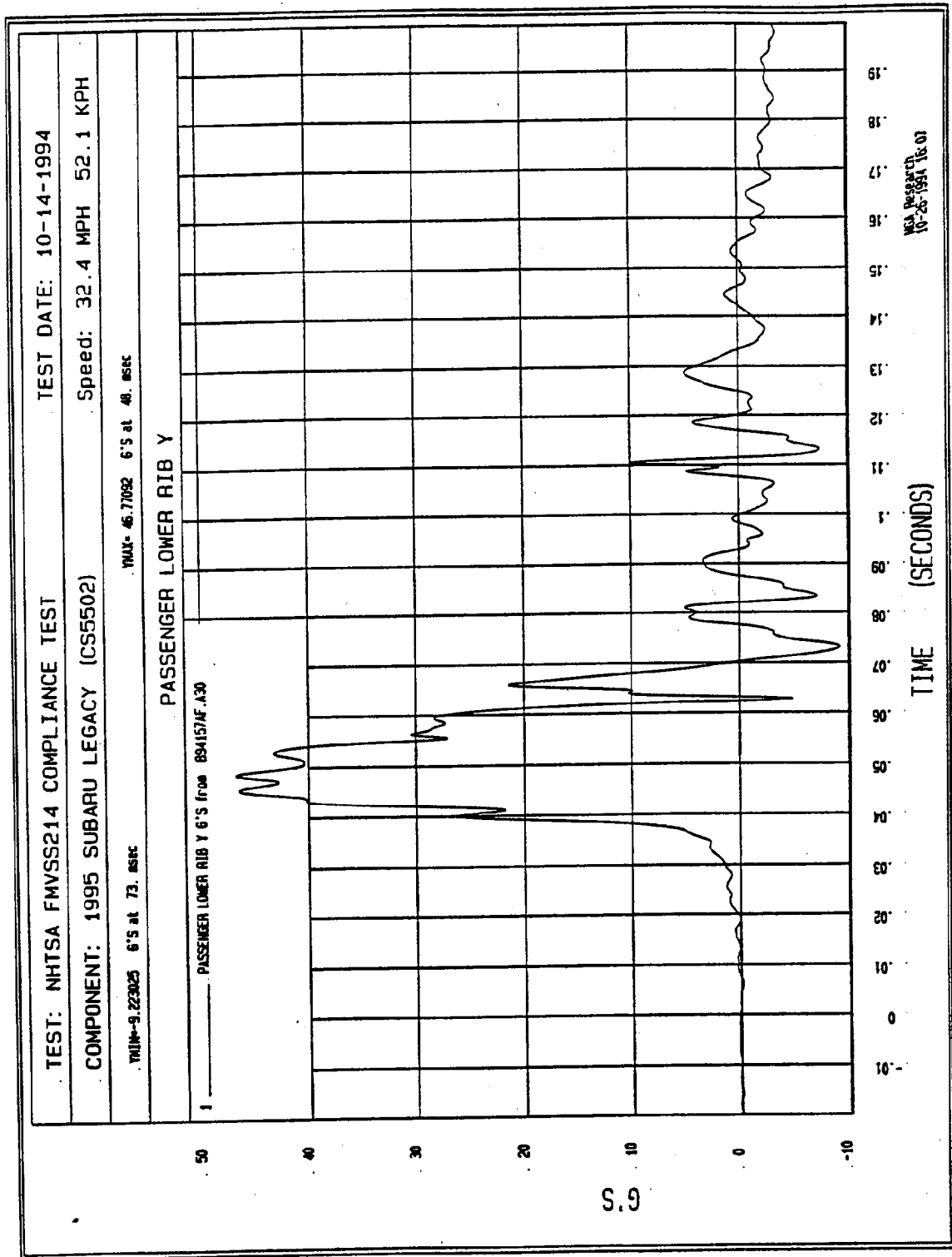


Figure B-11 - Passenger Lower Rib Y Acceleration vs. Time

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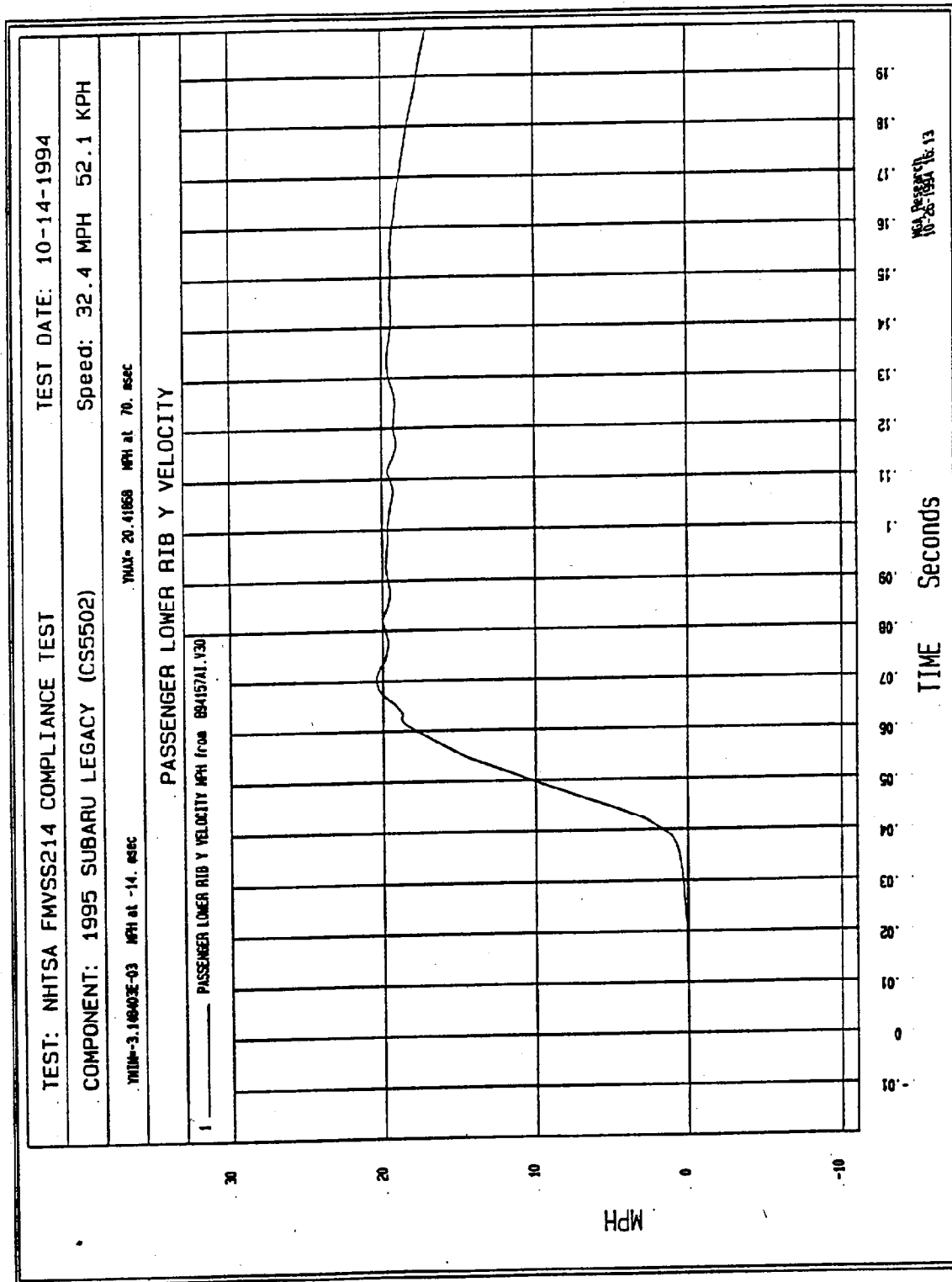


Figure B-12 - Passenger Lower Rib Y Velocity vs. Time

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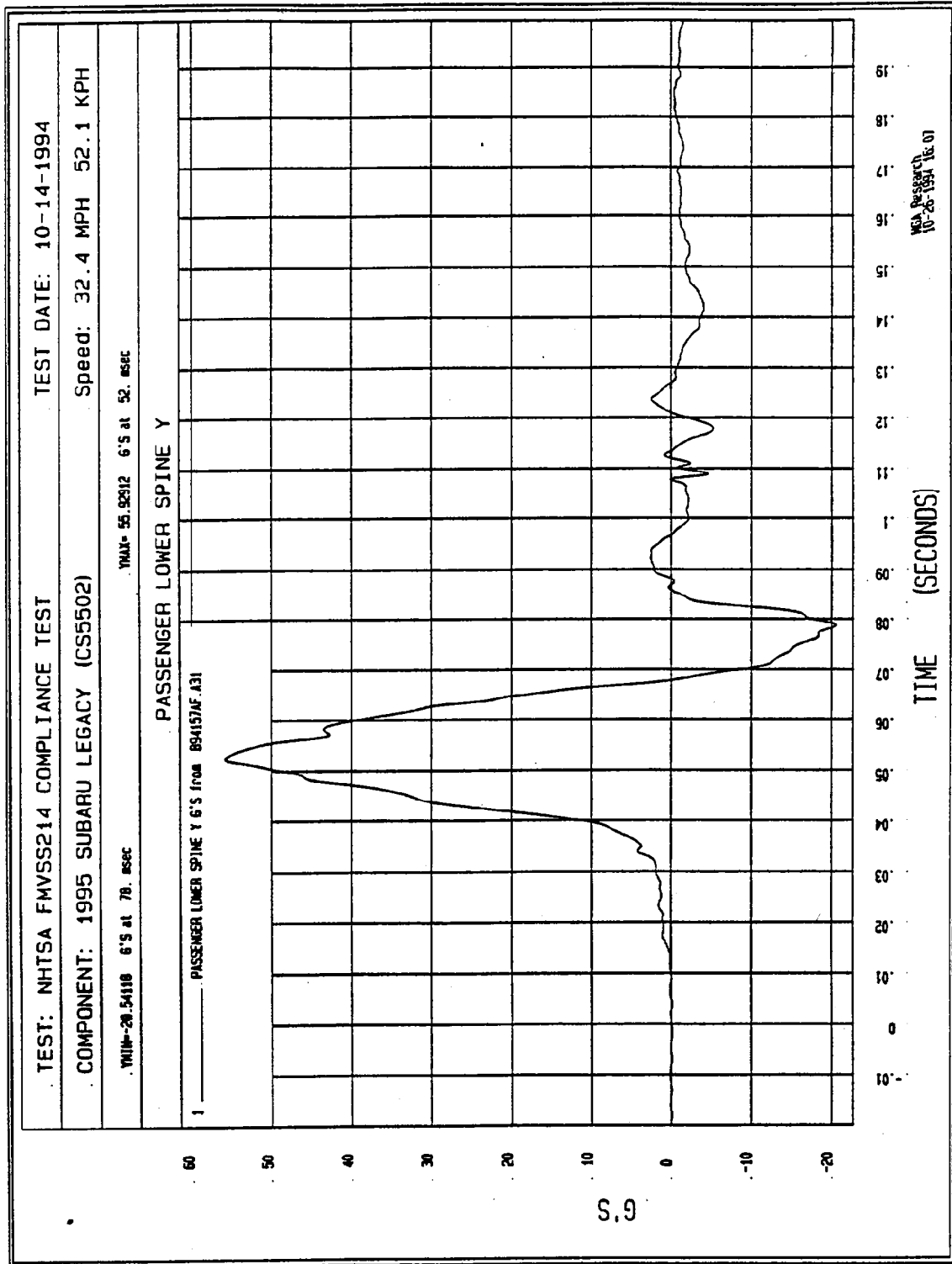


Figure B-13 - Passenger Lower Spine Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

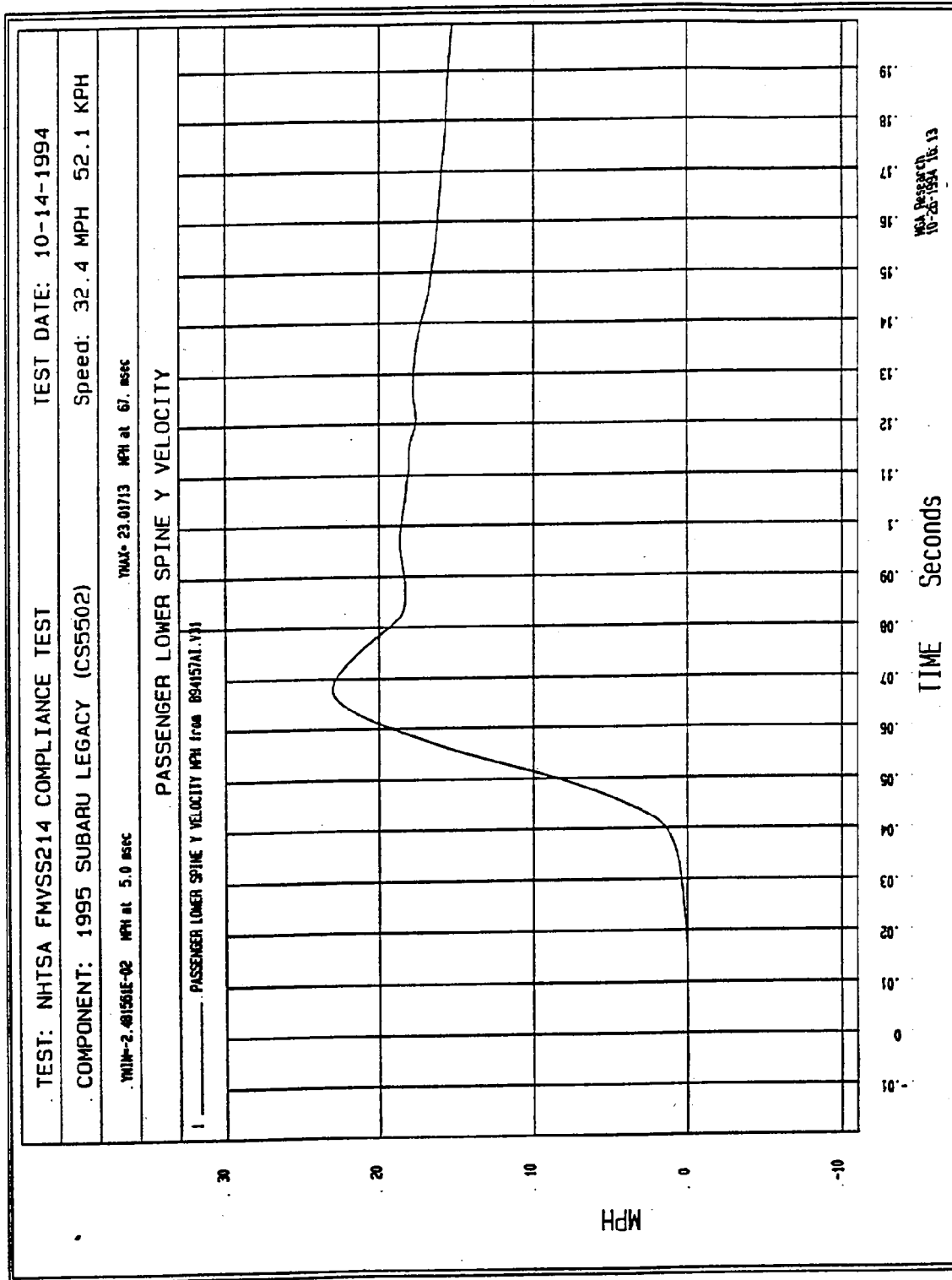


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

Filter: Class 180 (300 Hz)

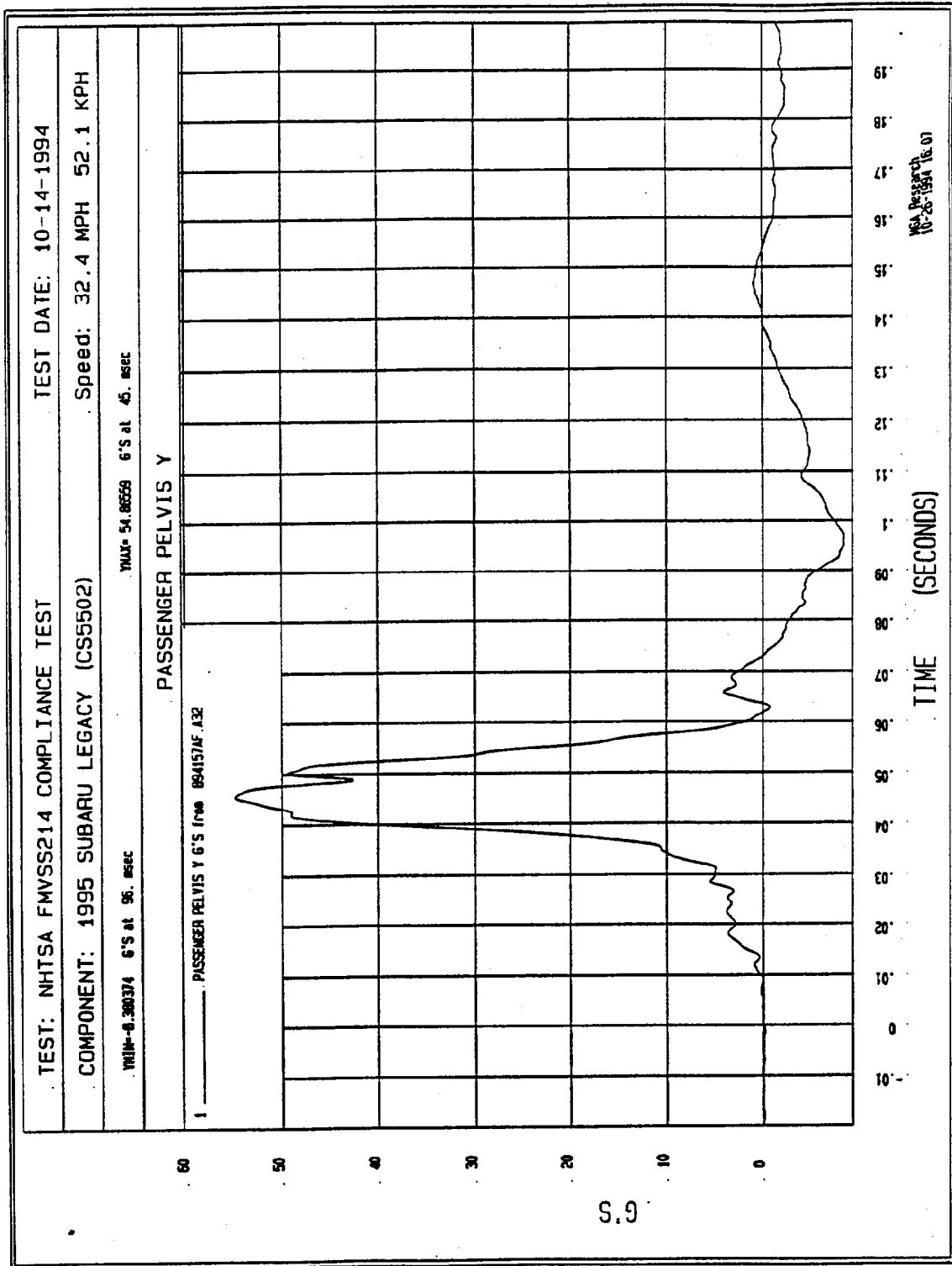


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

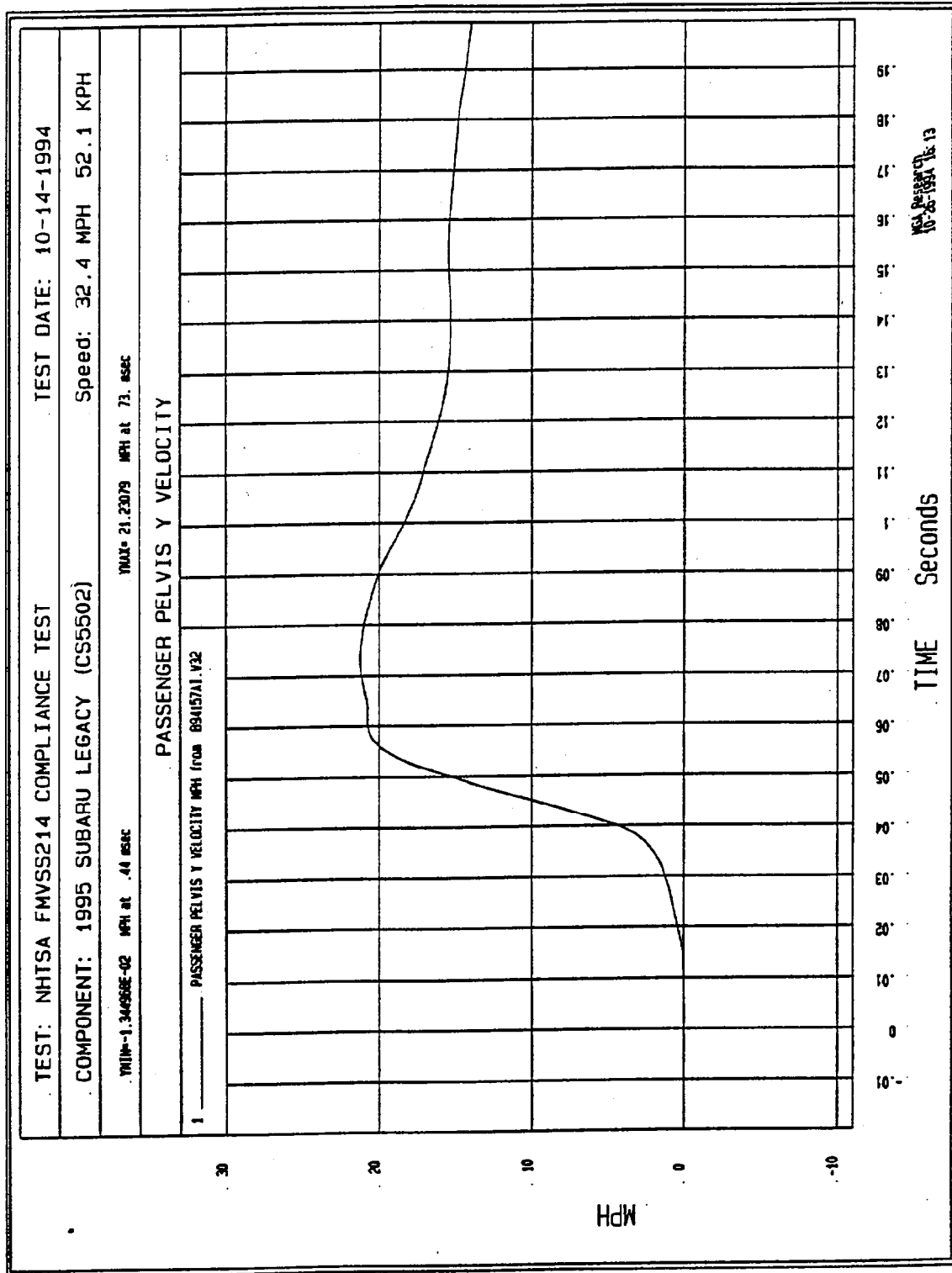


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

Filter: Class 60 (100 Hz)

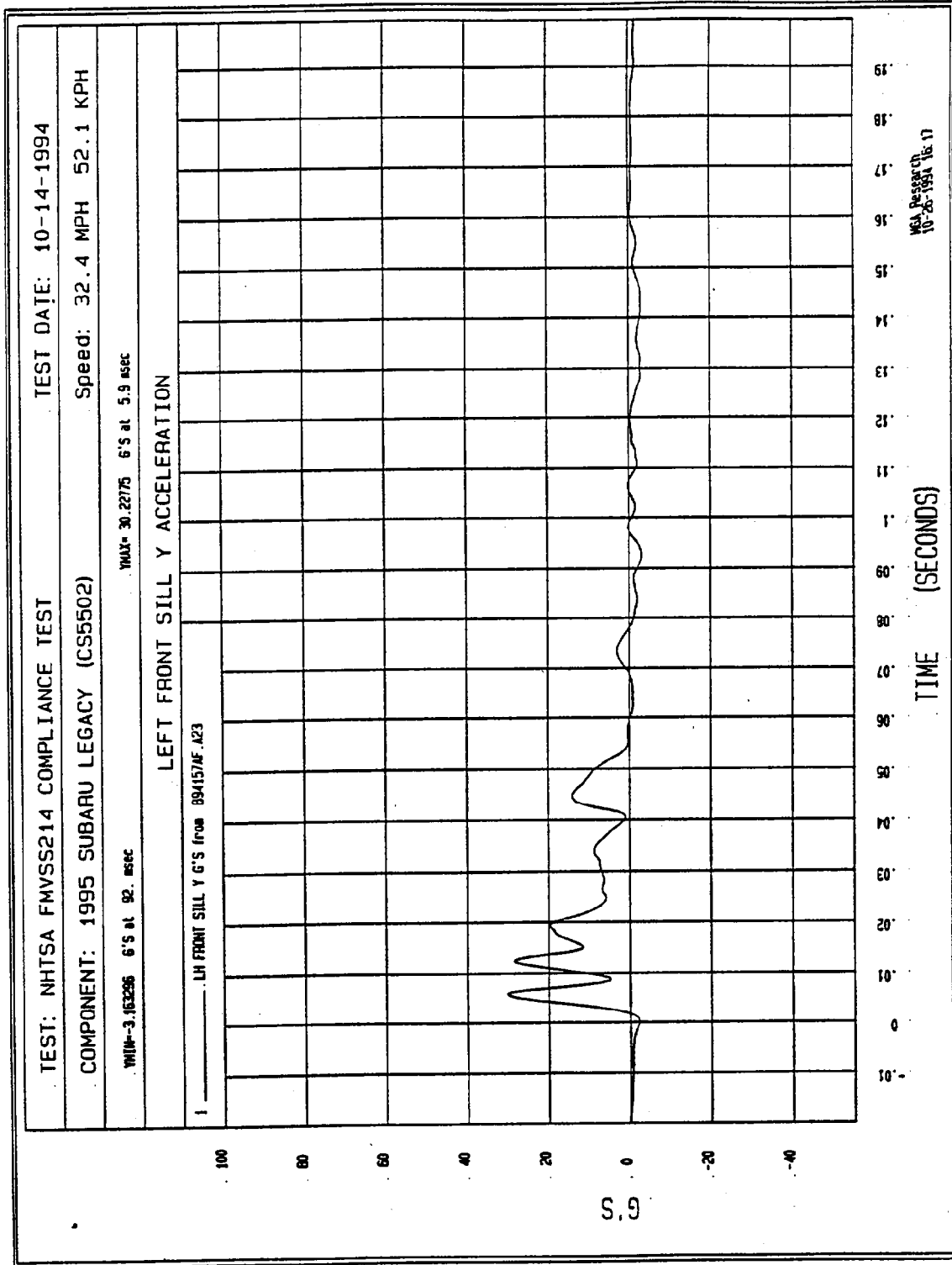


Figure B-17 - Left Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

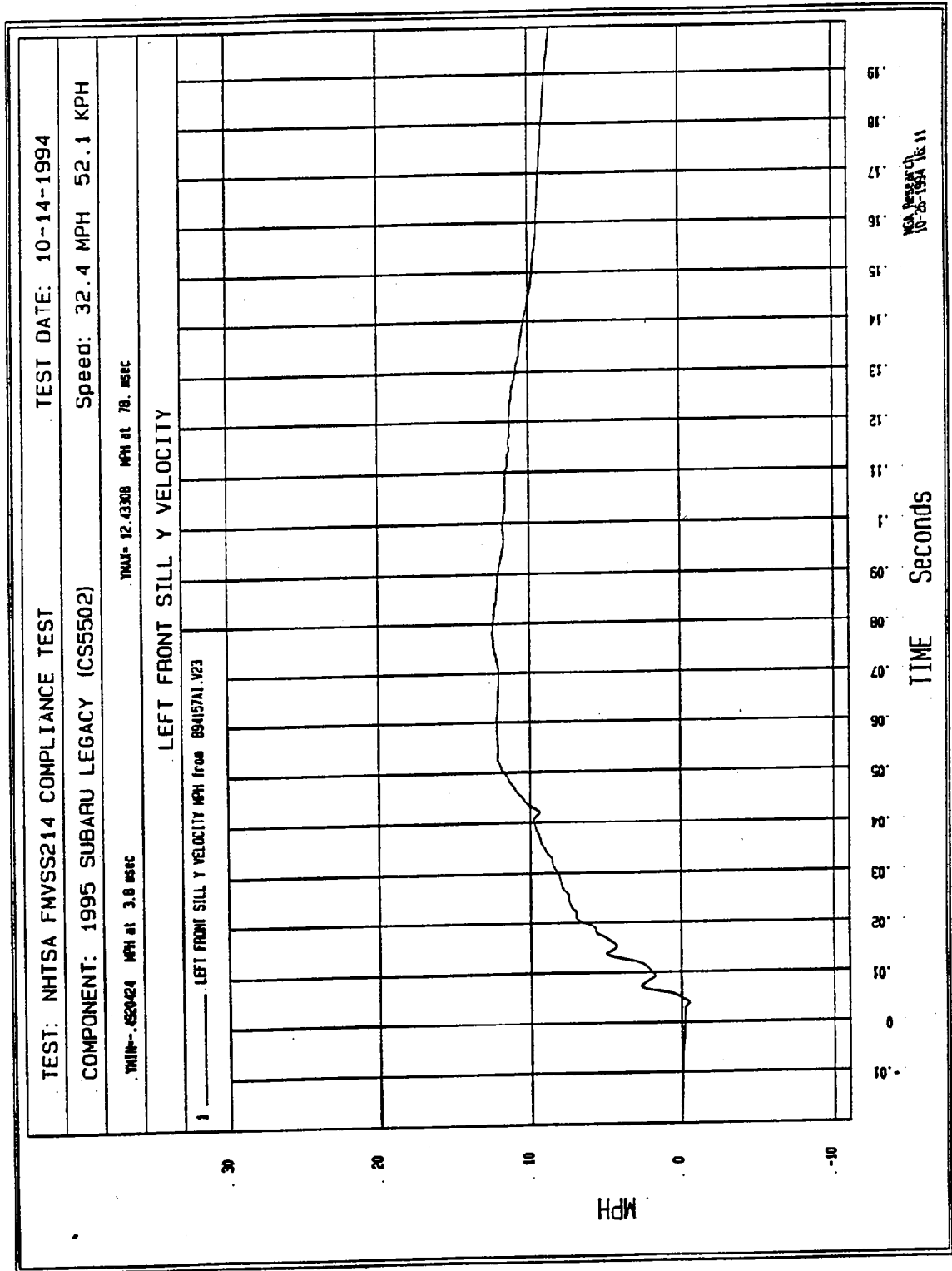


Figure B-18 - Left Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

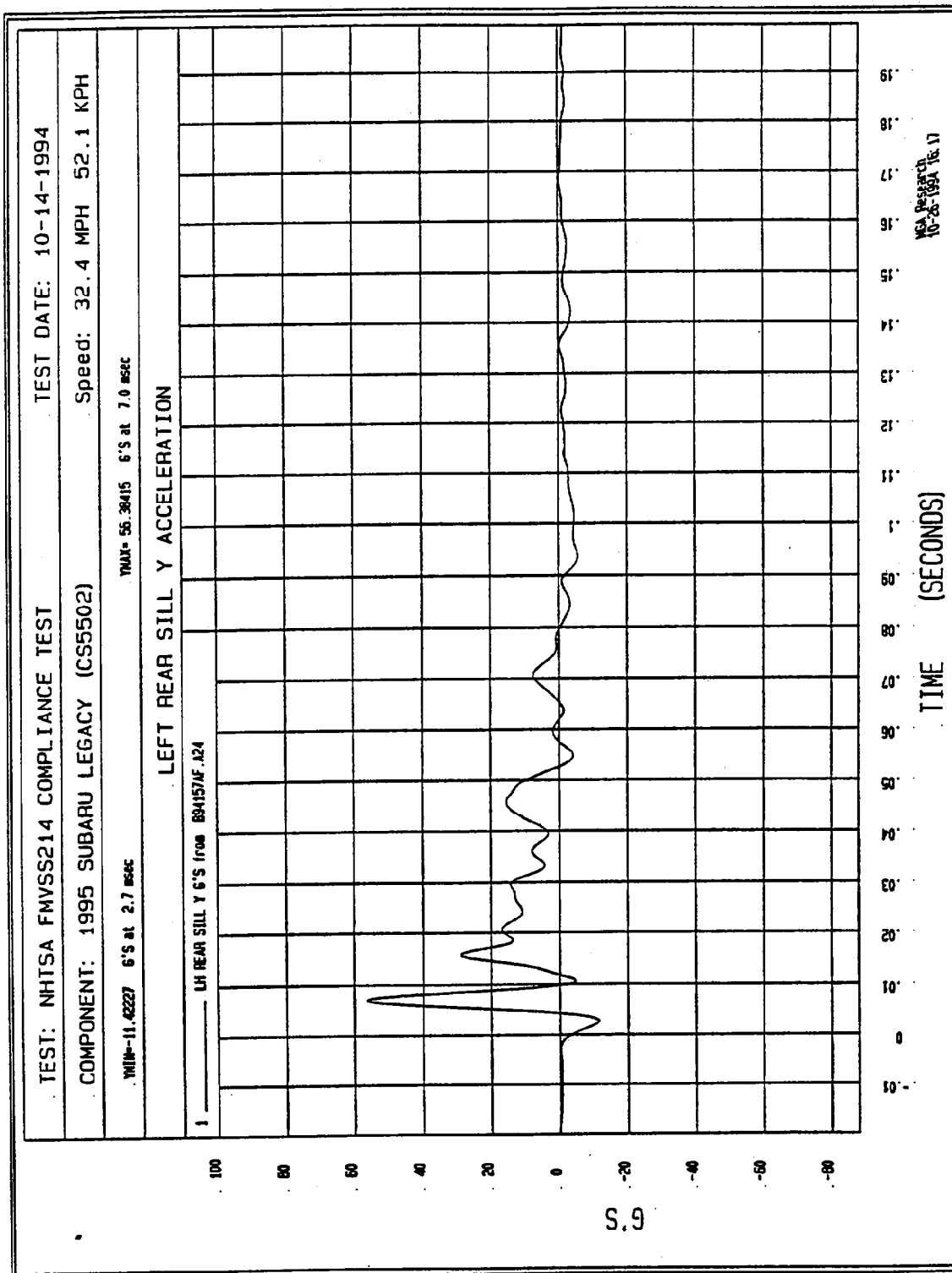
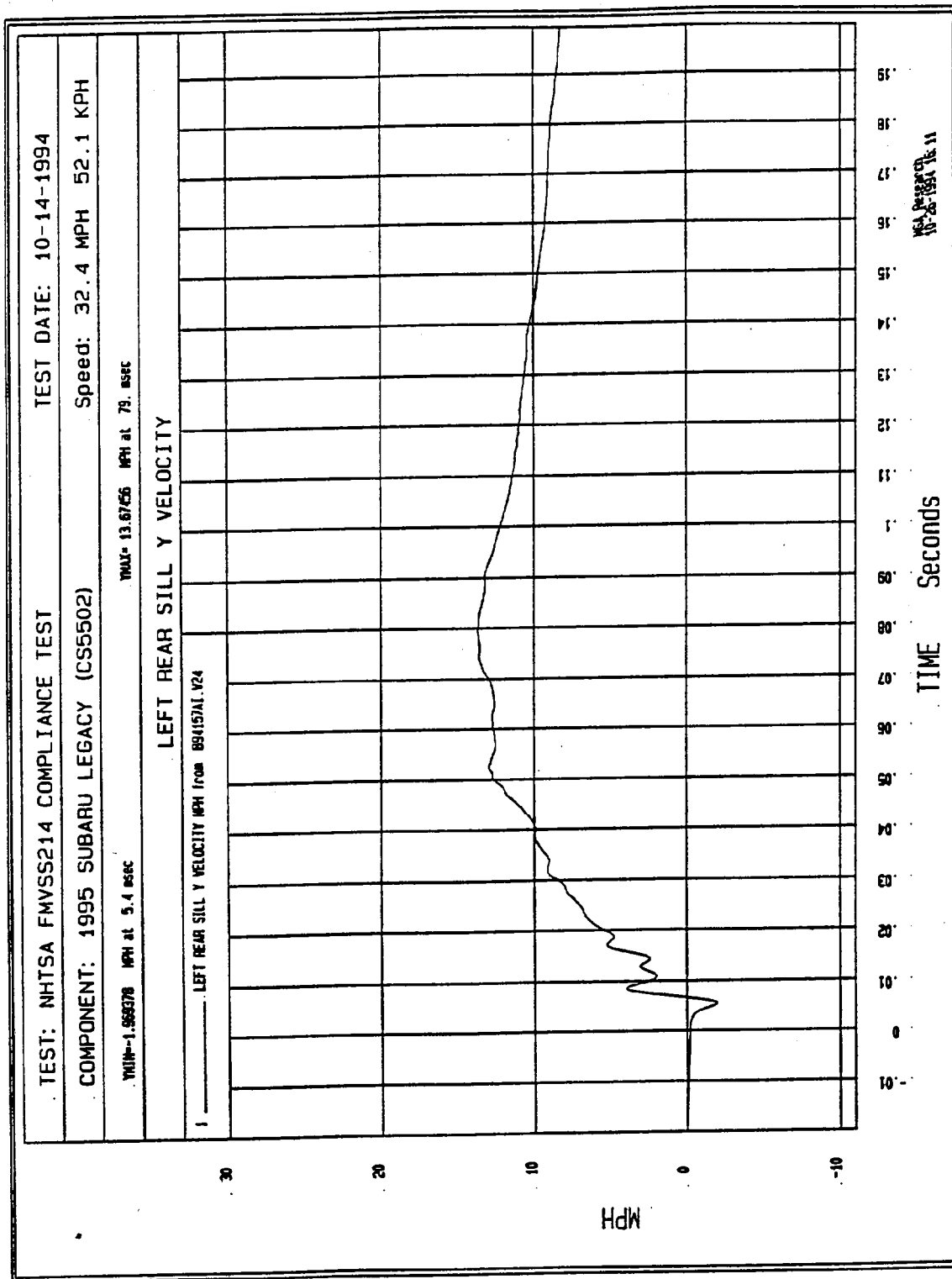


Figure B-19 - Left Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)



Filter: Class 60 (100 Hz)

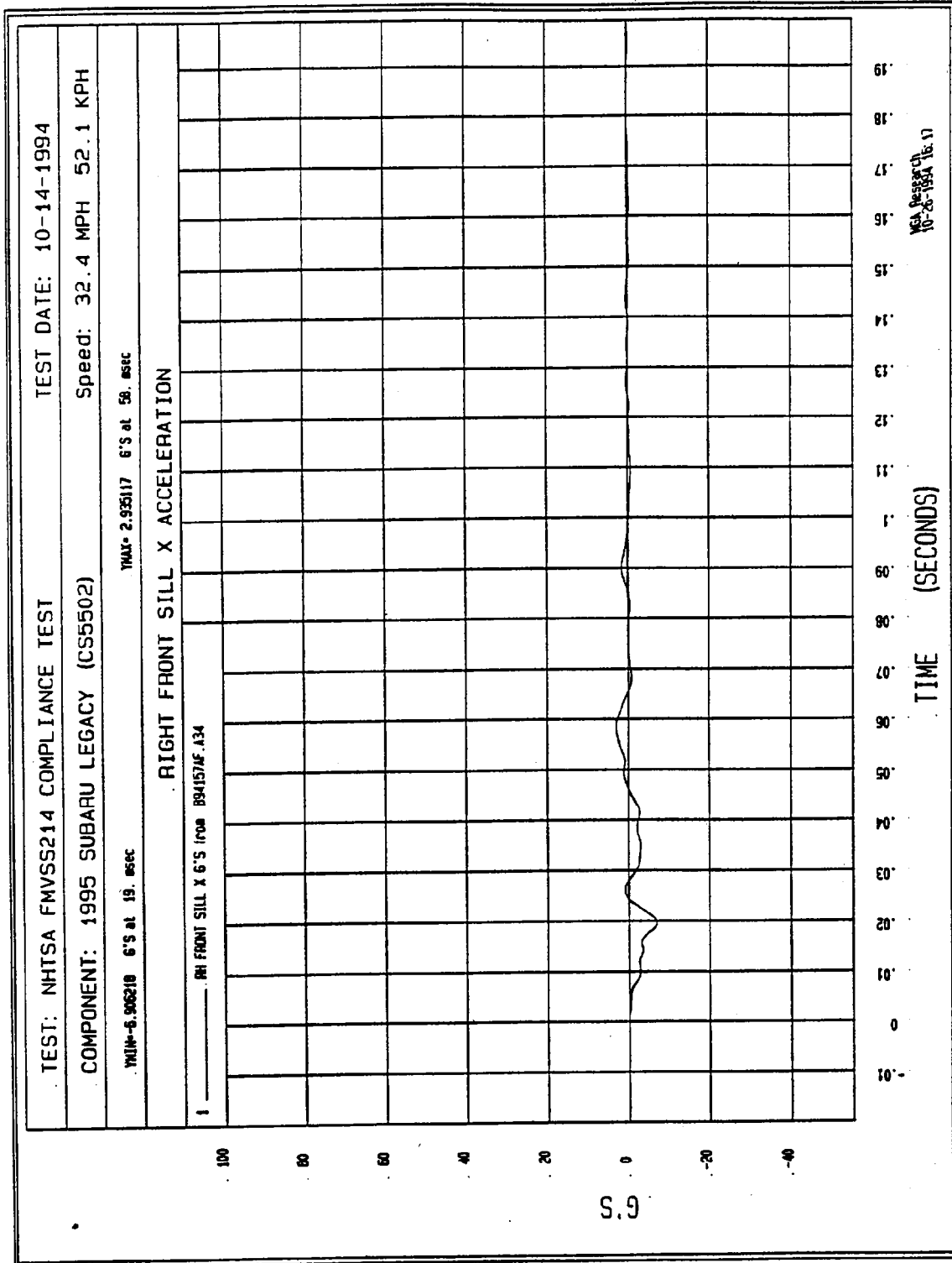


Figure B-21 - Right Front Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

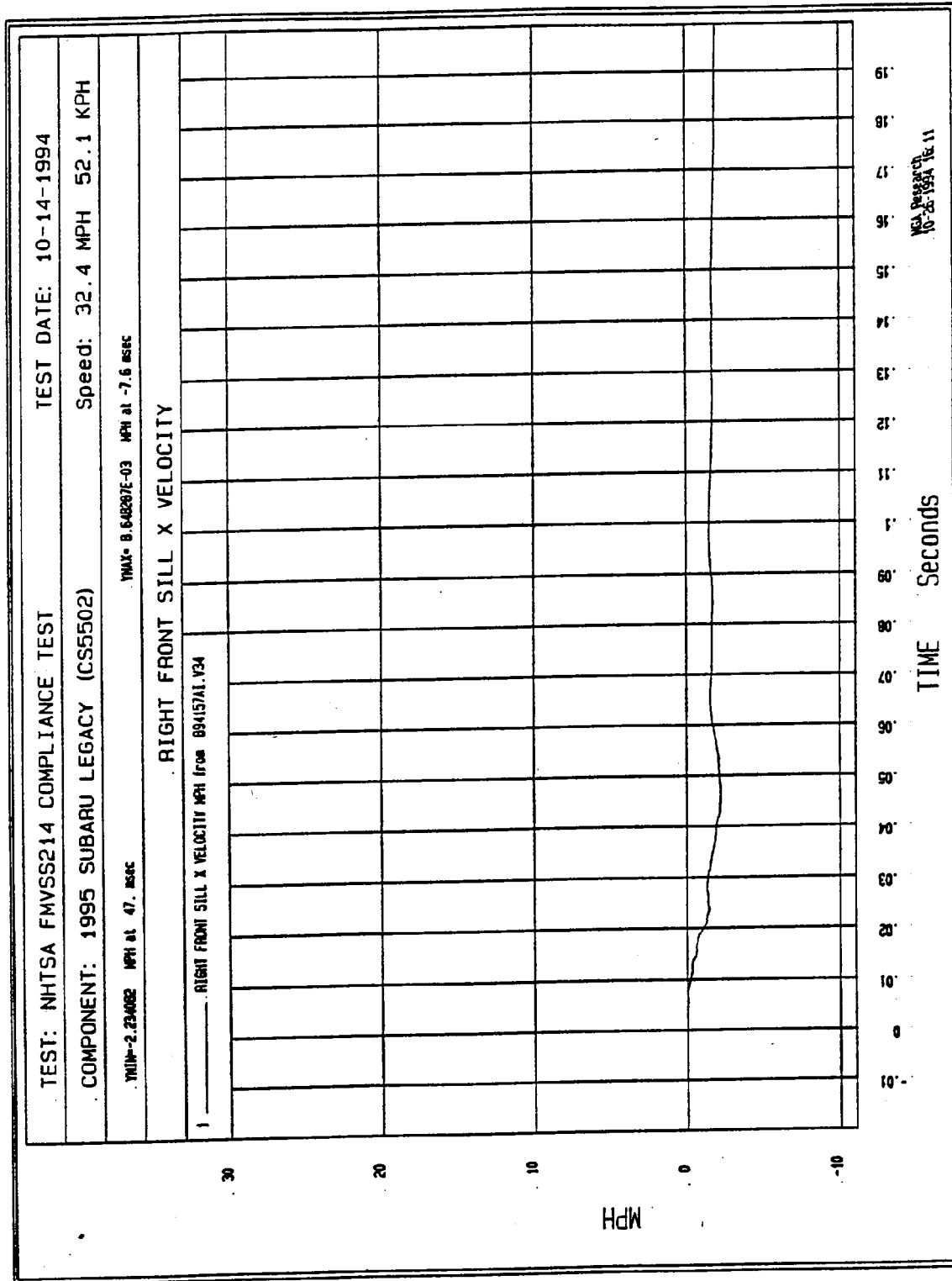


Figure B-22 - Right Front Sill X Velocity vs. Time

TEST: NHTSA FMVSS214 COMPLIANCE TEST TEST DATE: 10-14-1994

COMPONENT: 1995 SUBARU LEGACY (CS5502) Speed: 32.4 MPH 52.1 KPH

YMIN=-1.811256 6'S at 144 msec YMAX= 21.81658 6'S at 7.7 msec

RIGHT FRONT SILL Y ACCELERATION

1 RH FRONT SILL Y 6'S from 894157AF.A35

TIME (SECONDS)

1.9 1.8 1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -16 -17 -18 -19 -20 -21 -22 -23 -24 -25 -26 -27 -28 -29 -30 -31 -32 -33 -34 -35 -36 -37 -38 -39 -40

Figure B-23 - Right Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

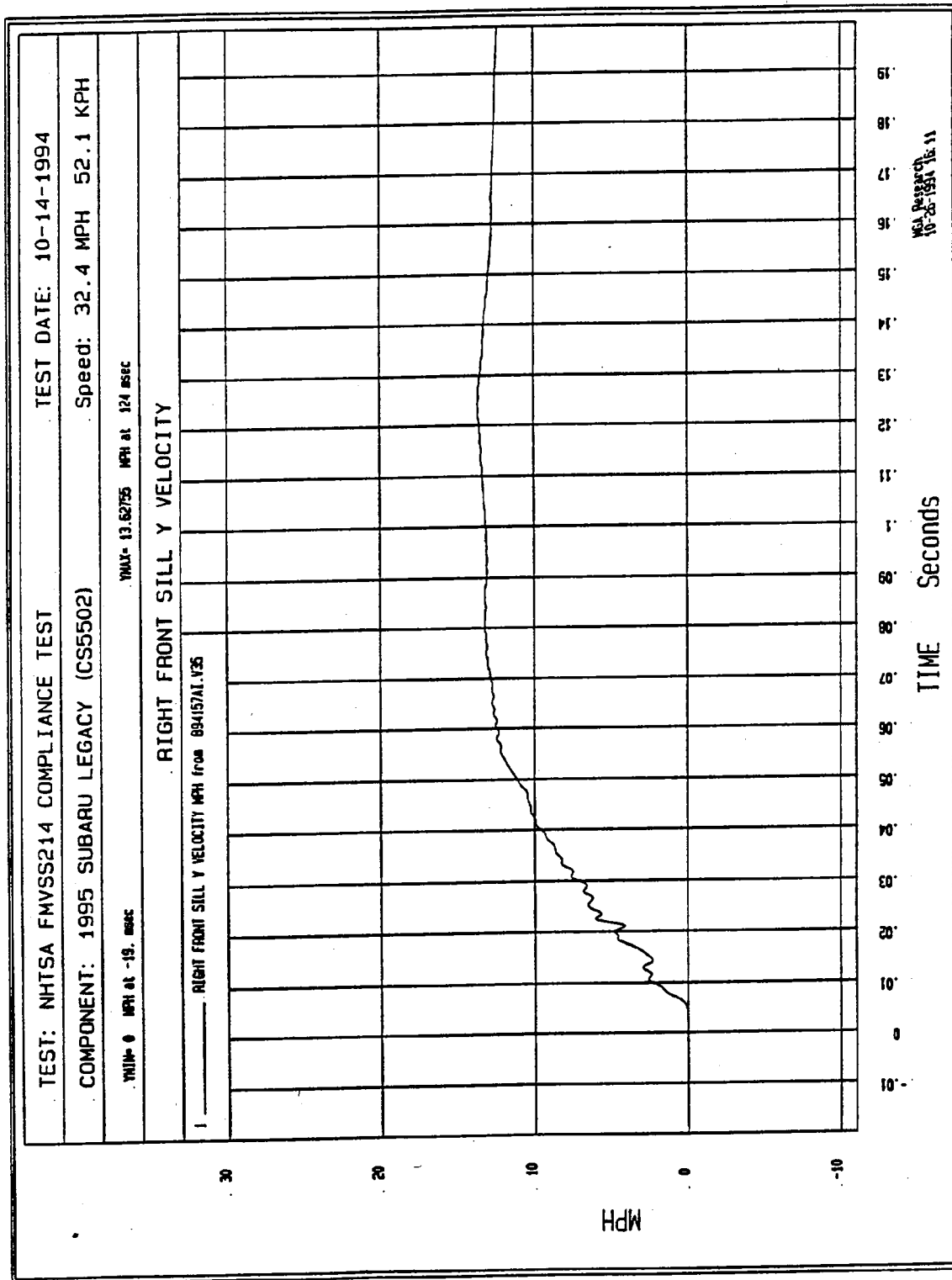


Figure B-24 - Right Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

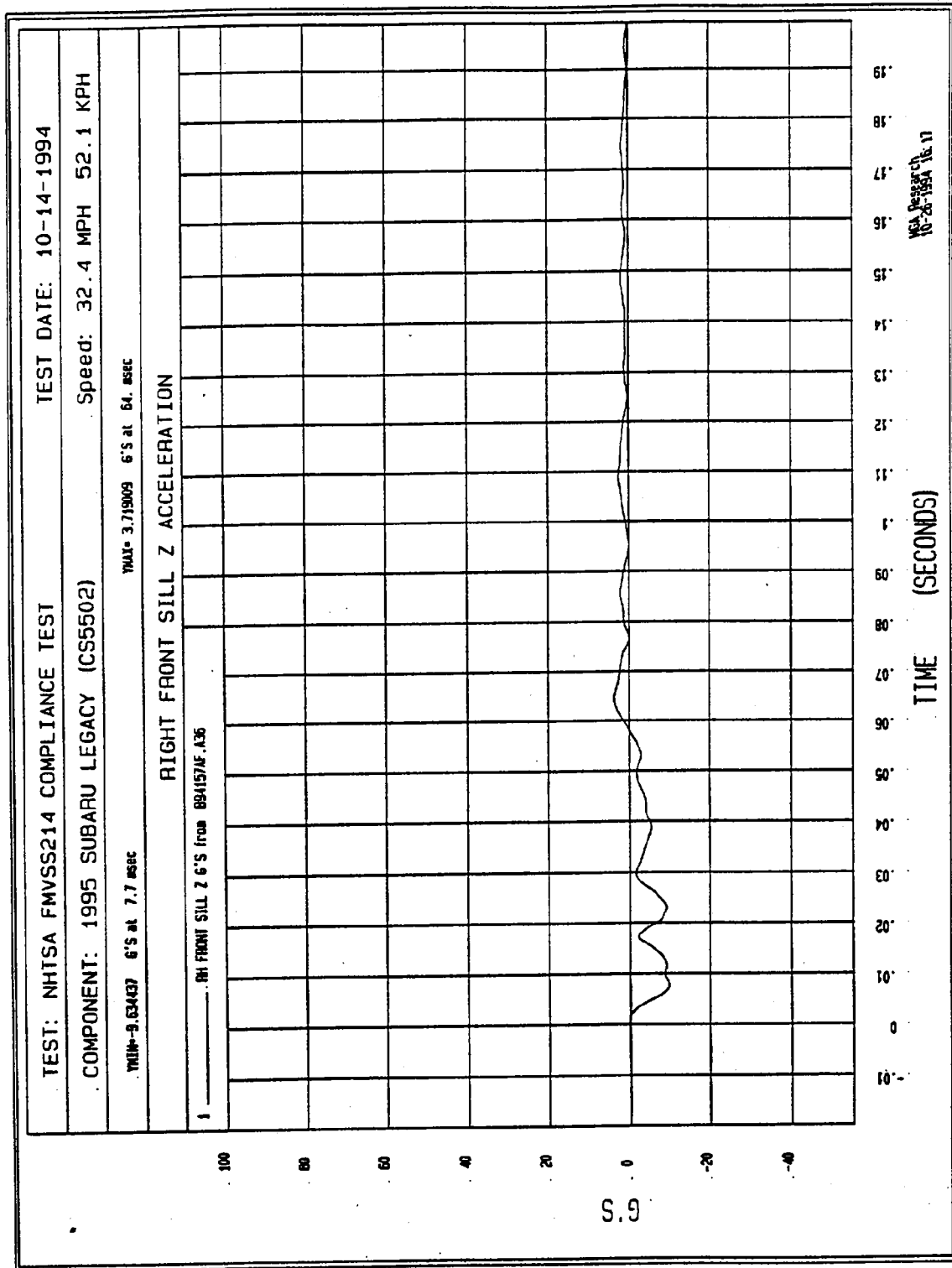


Figure B-25 - Right Front Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

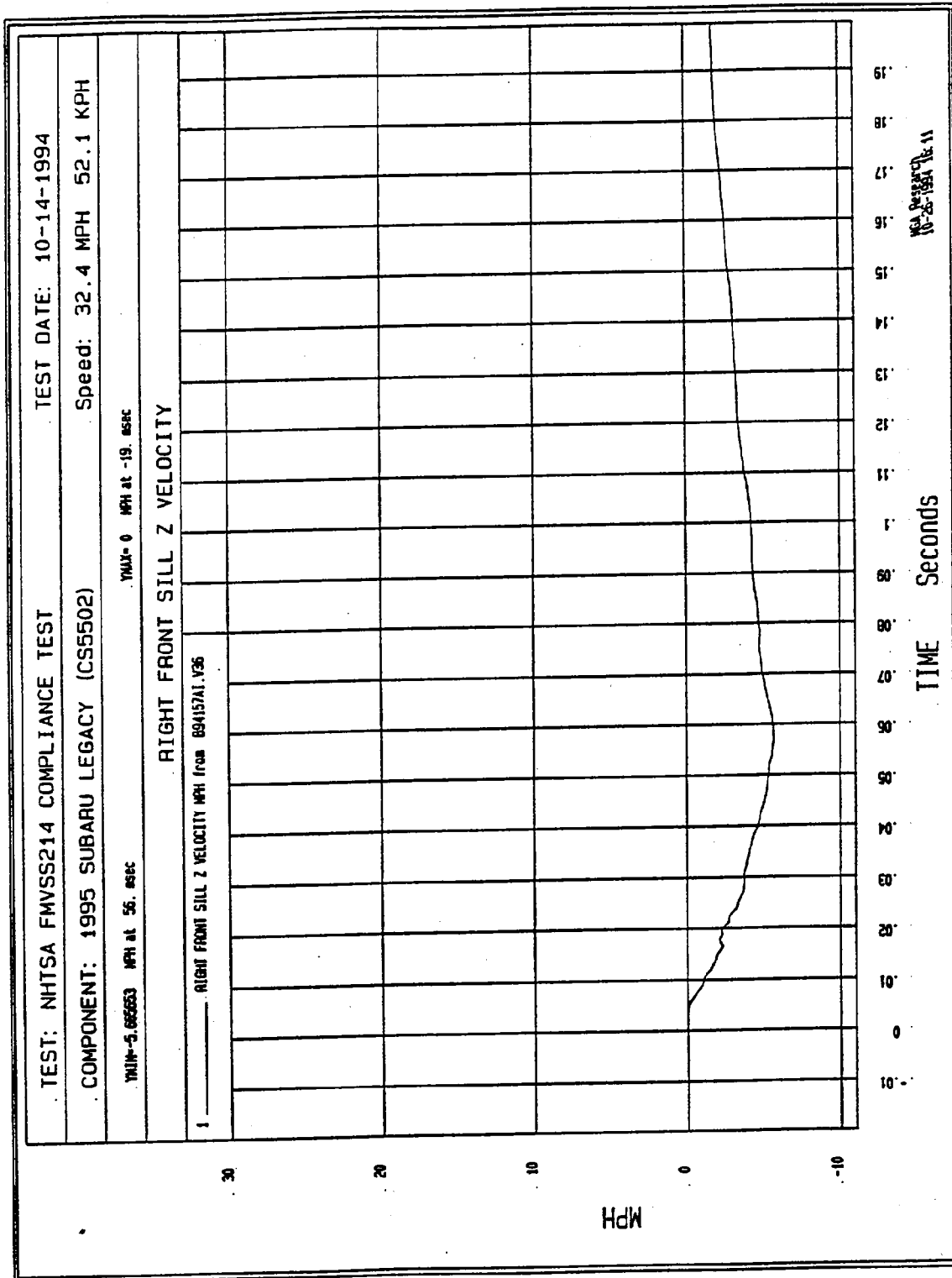


Figure B-26 - Right Front Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

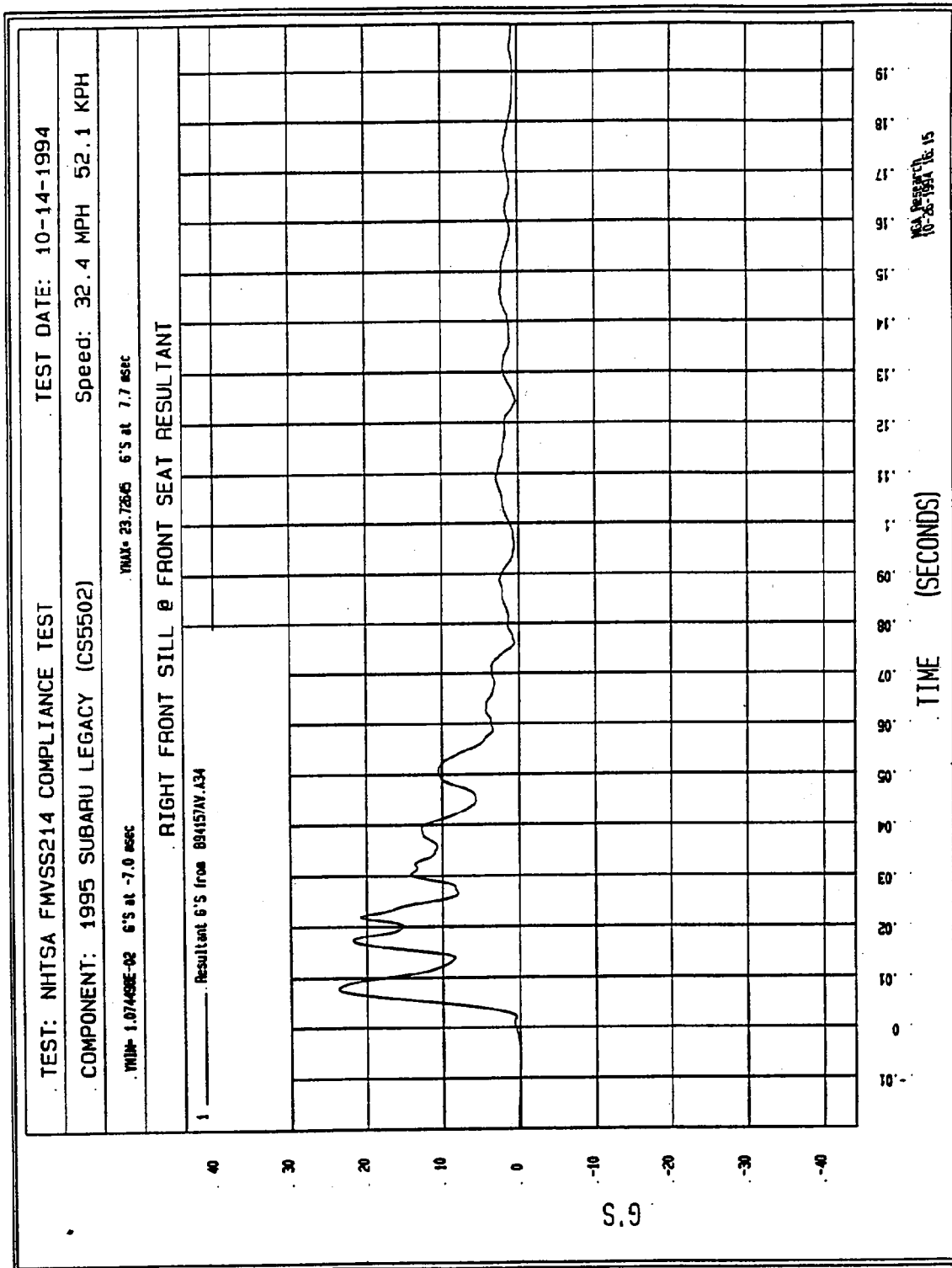


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

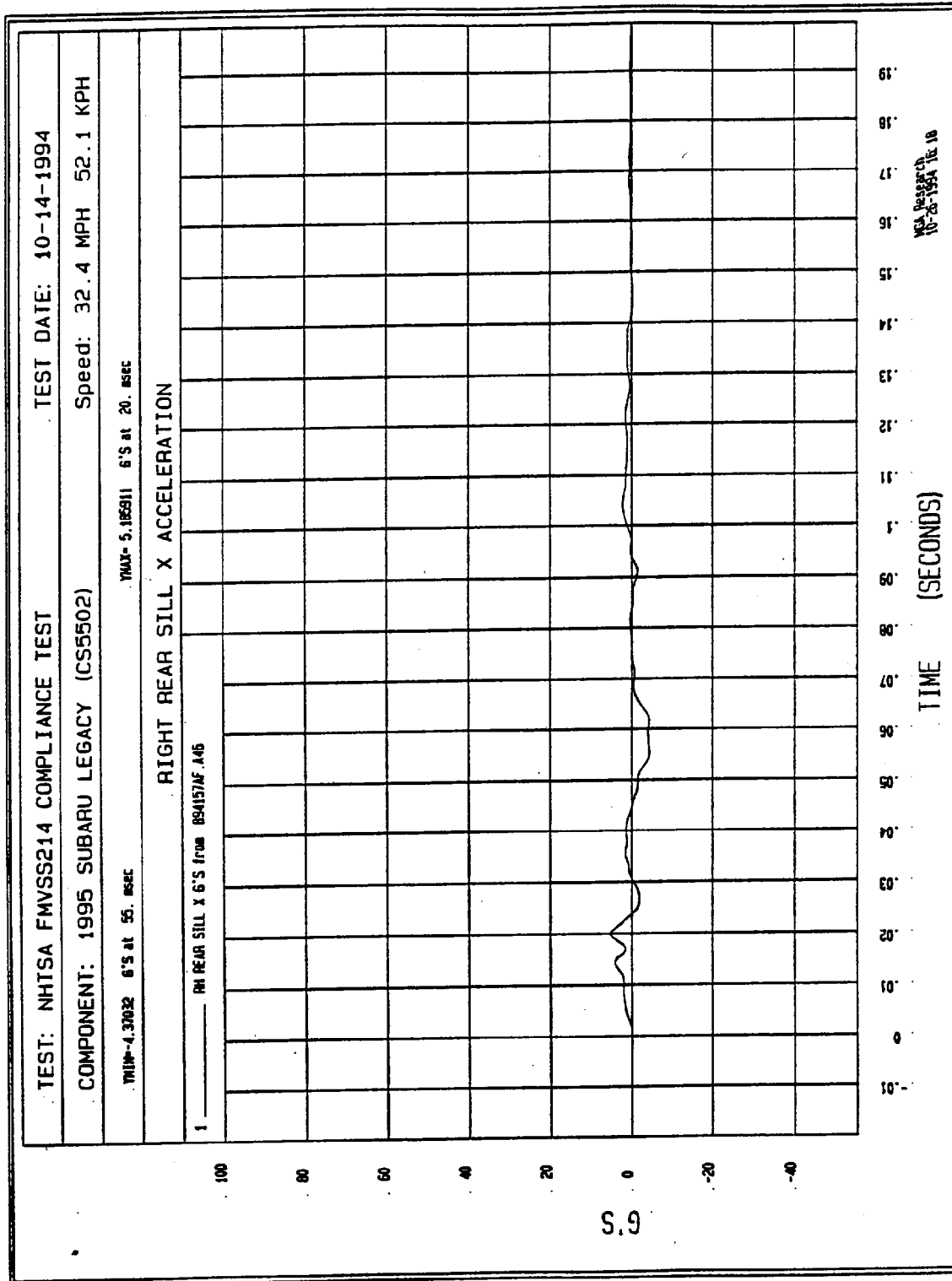


Figure B-28 - Right Rear Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

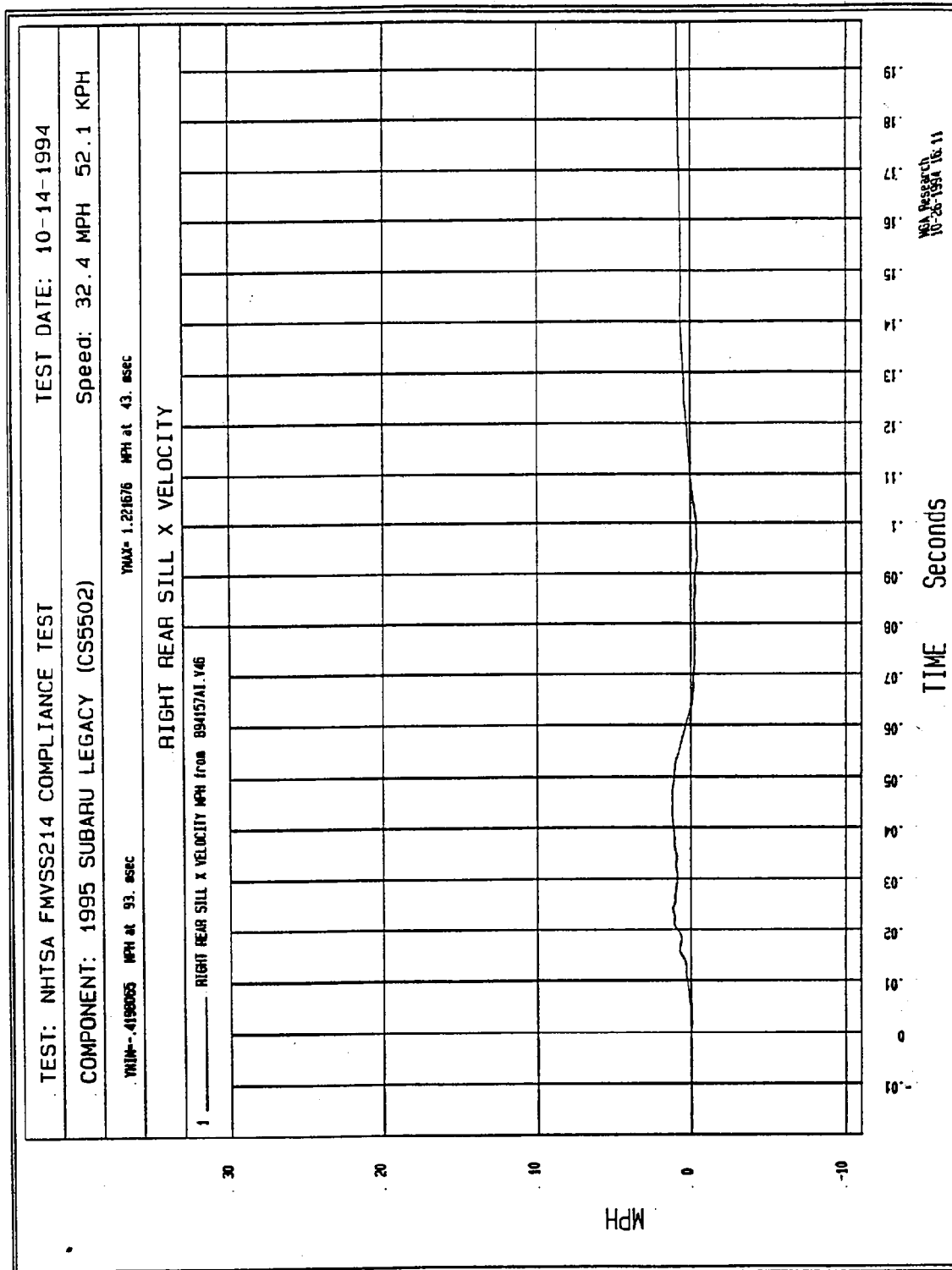


Figure B-29 - Right Rear Sill X Velocity vs. Time

TEST: NHTSA FMVSS214 COMPLIANCE TEST TEST DATE: 10-14-1994

COMPONENT: 1995 SUBARU LEGACY (CS5502) Speed: 32.4 MPH 52.1 KPH

YMIN = -2.459721 G'S at 132 msec YMAX = 25.39745 G'S at 8.7 msec

RIGHT REAR SILL Y ACCELERATION

1 _____ RI REAR SILL Y G'S FROM 894157AF.A47

TIME (SECONDS)

Figure B-30 - Right Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

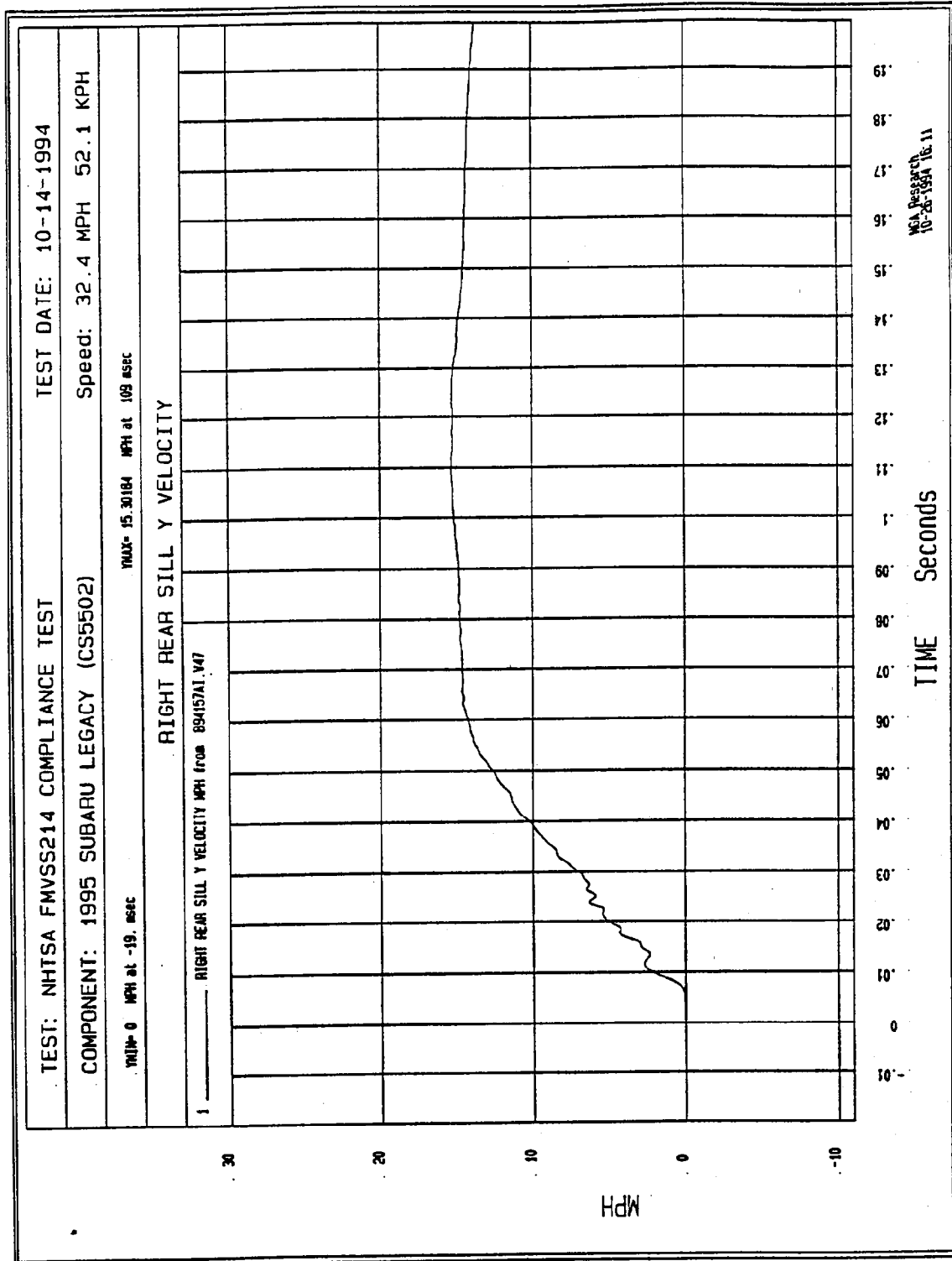


Figure B-31 - Right Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

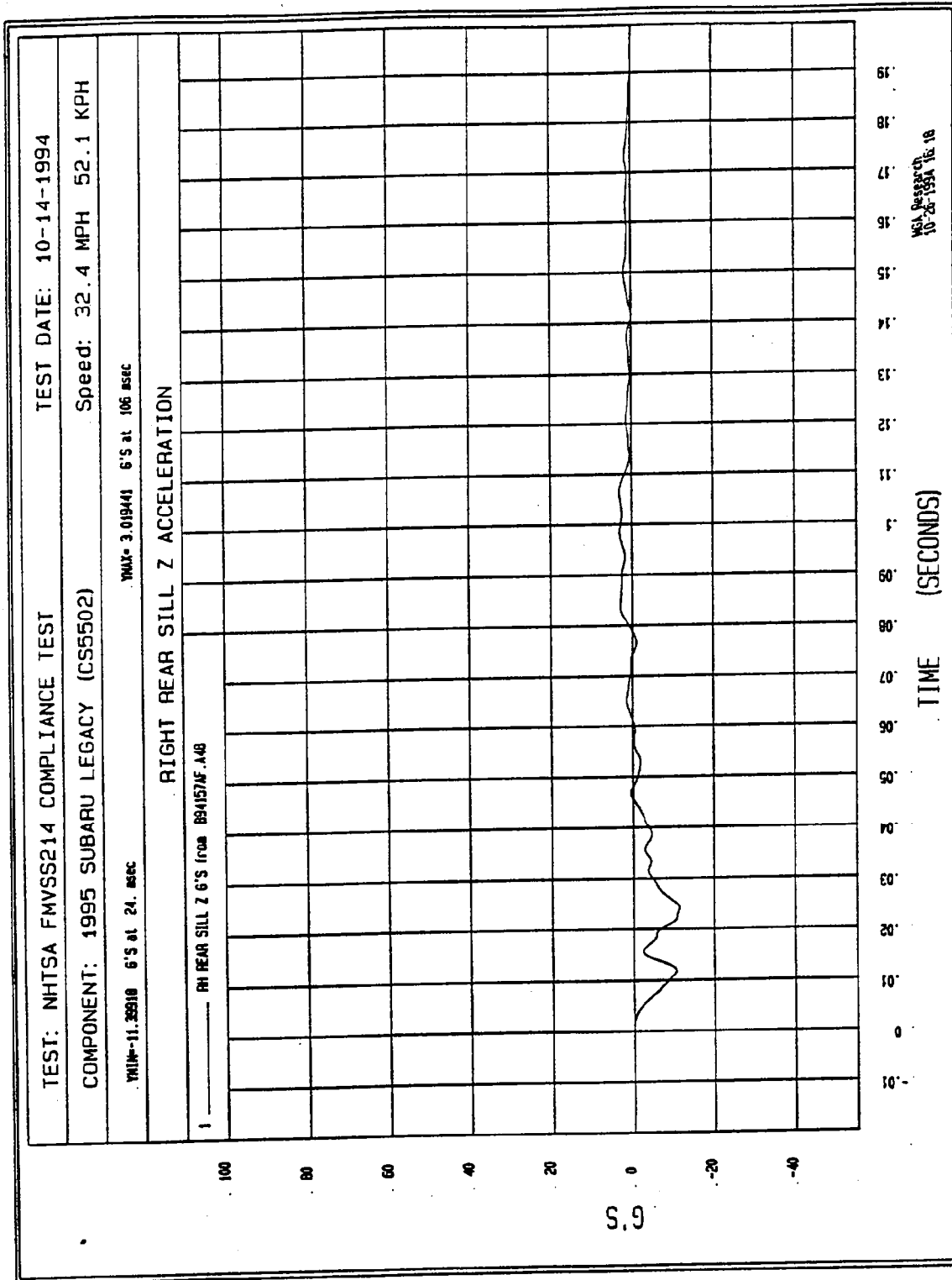


Figure B-32 - Right Rear Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

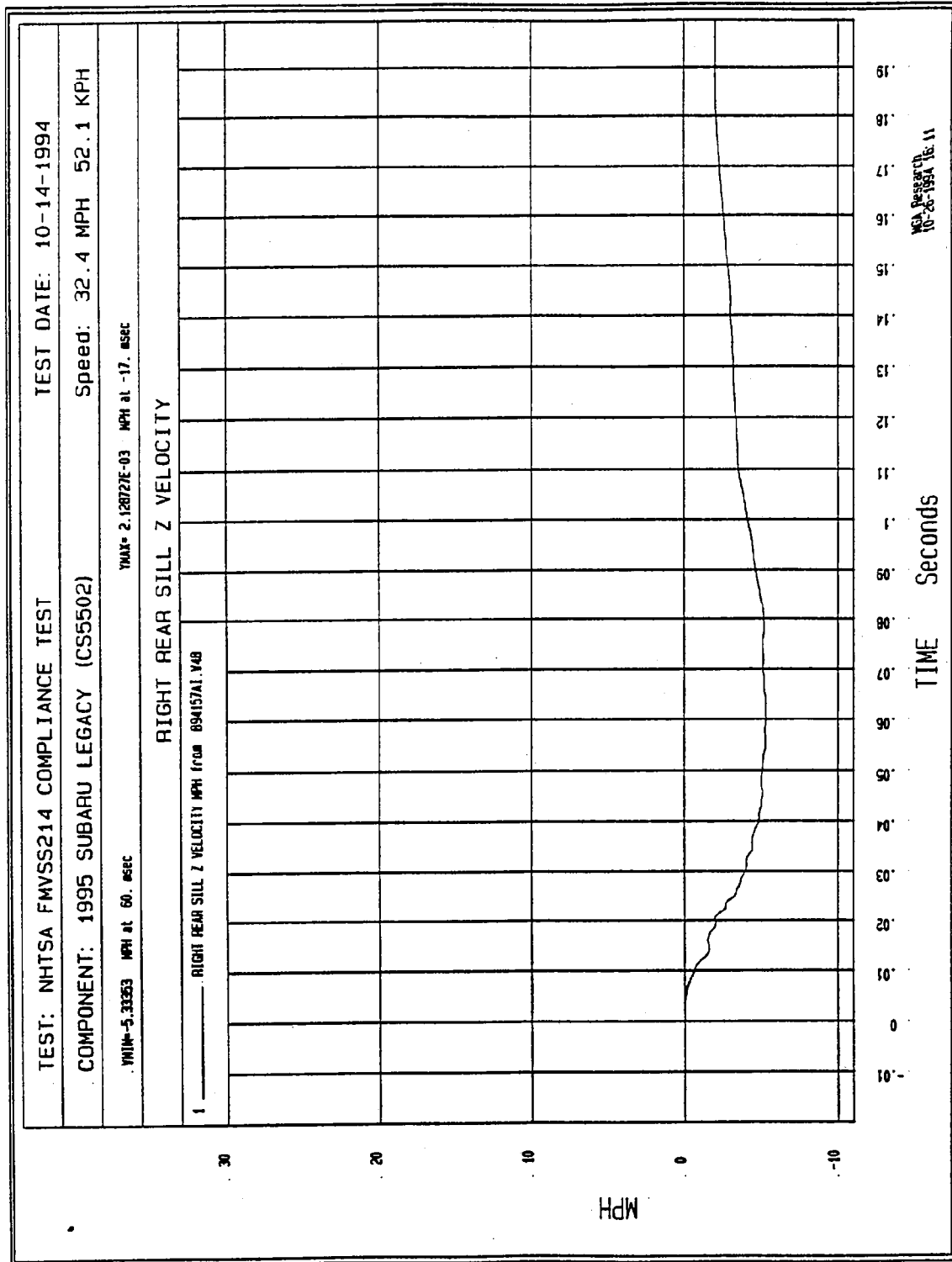


Figure B-33 - Right Rear Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

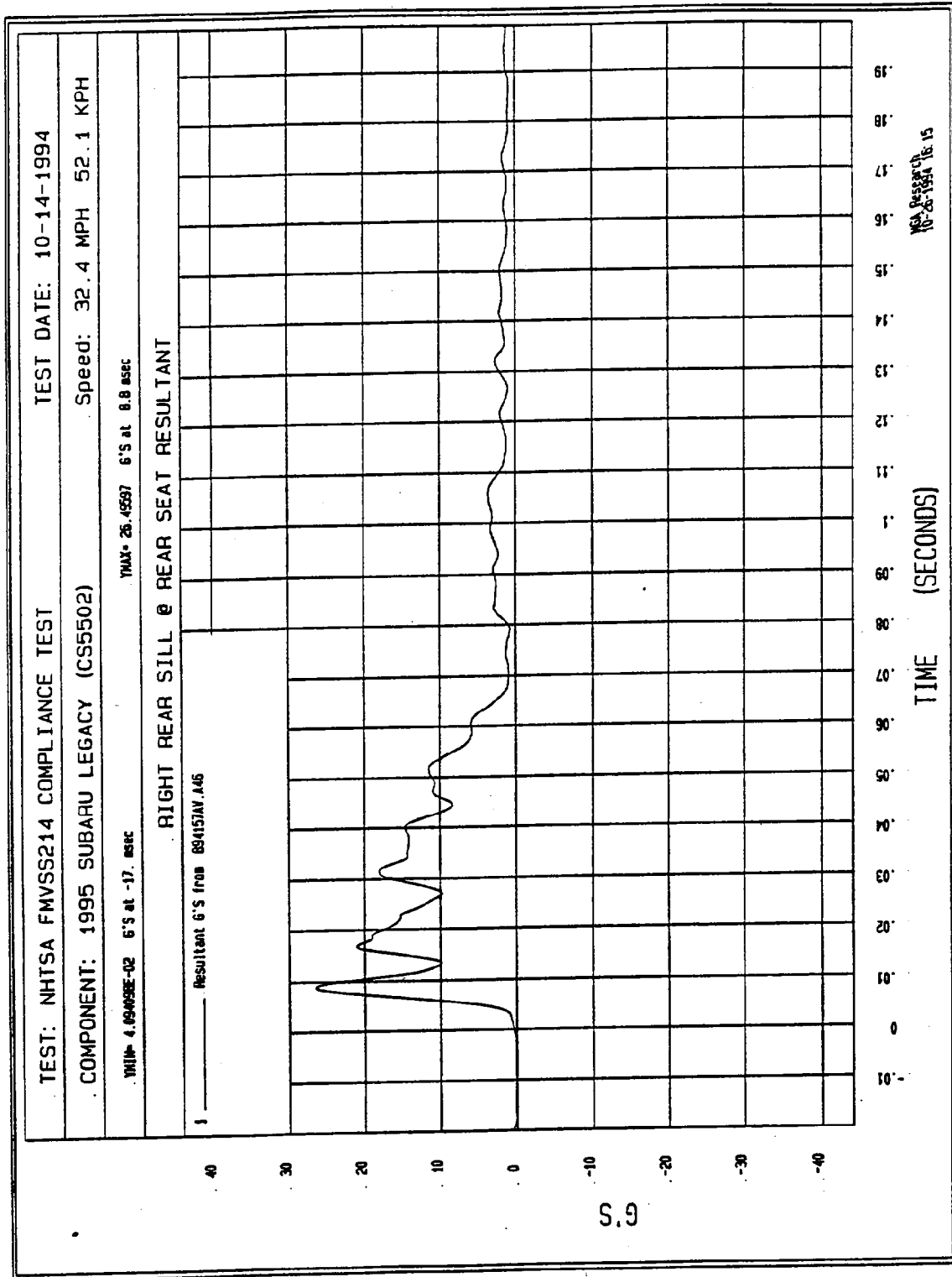


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

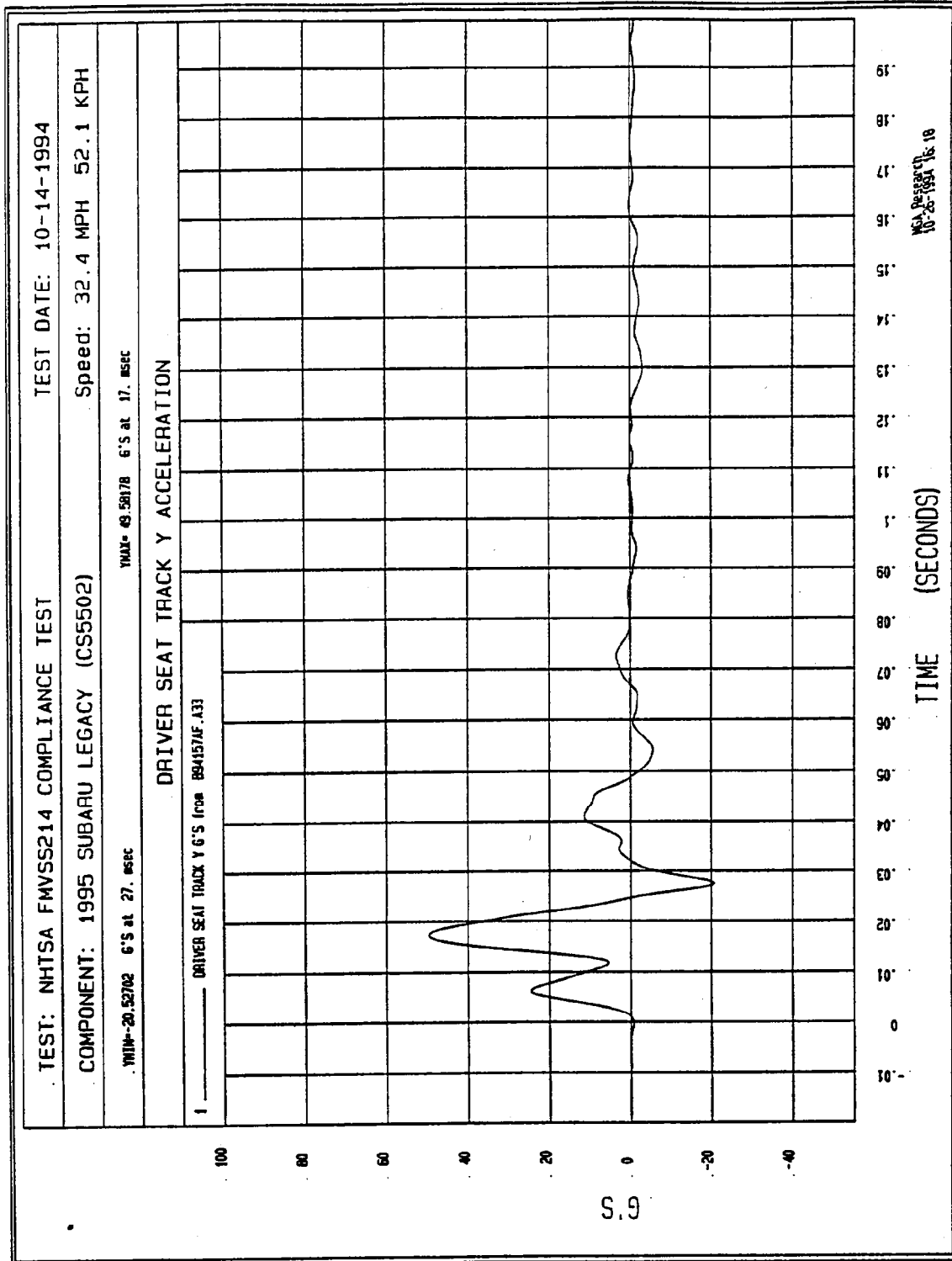


Figure B-35 - Driver Seat Track Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

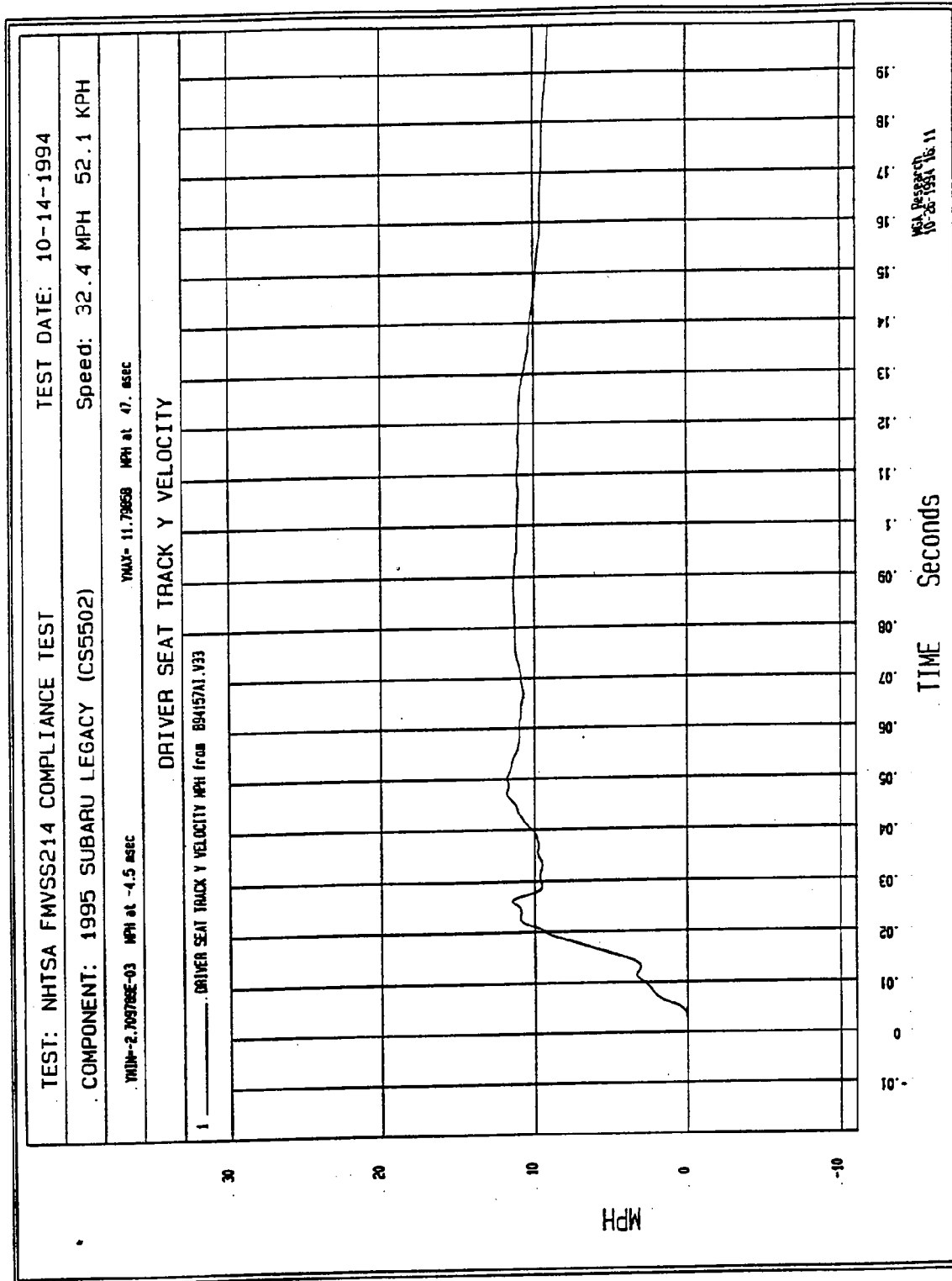


Figure B-36 - Driver Seat Track Y Velocity vs. Time

Filter: Class 60 (100 Hz)

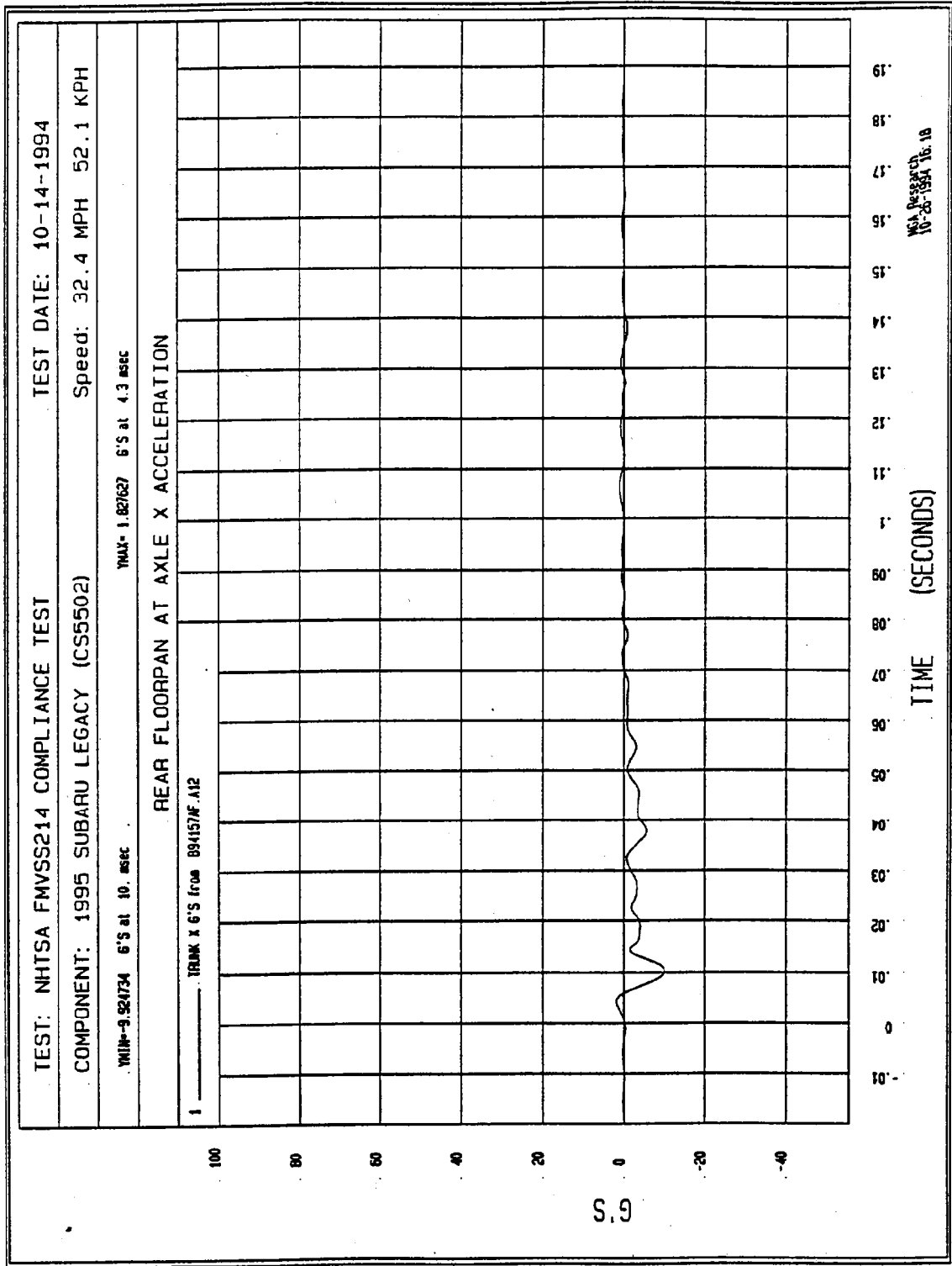


Figure B-37 - Rear Floorpan at Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)

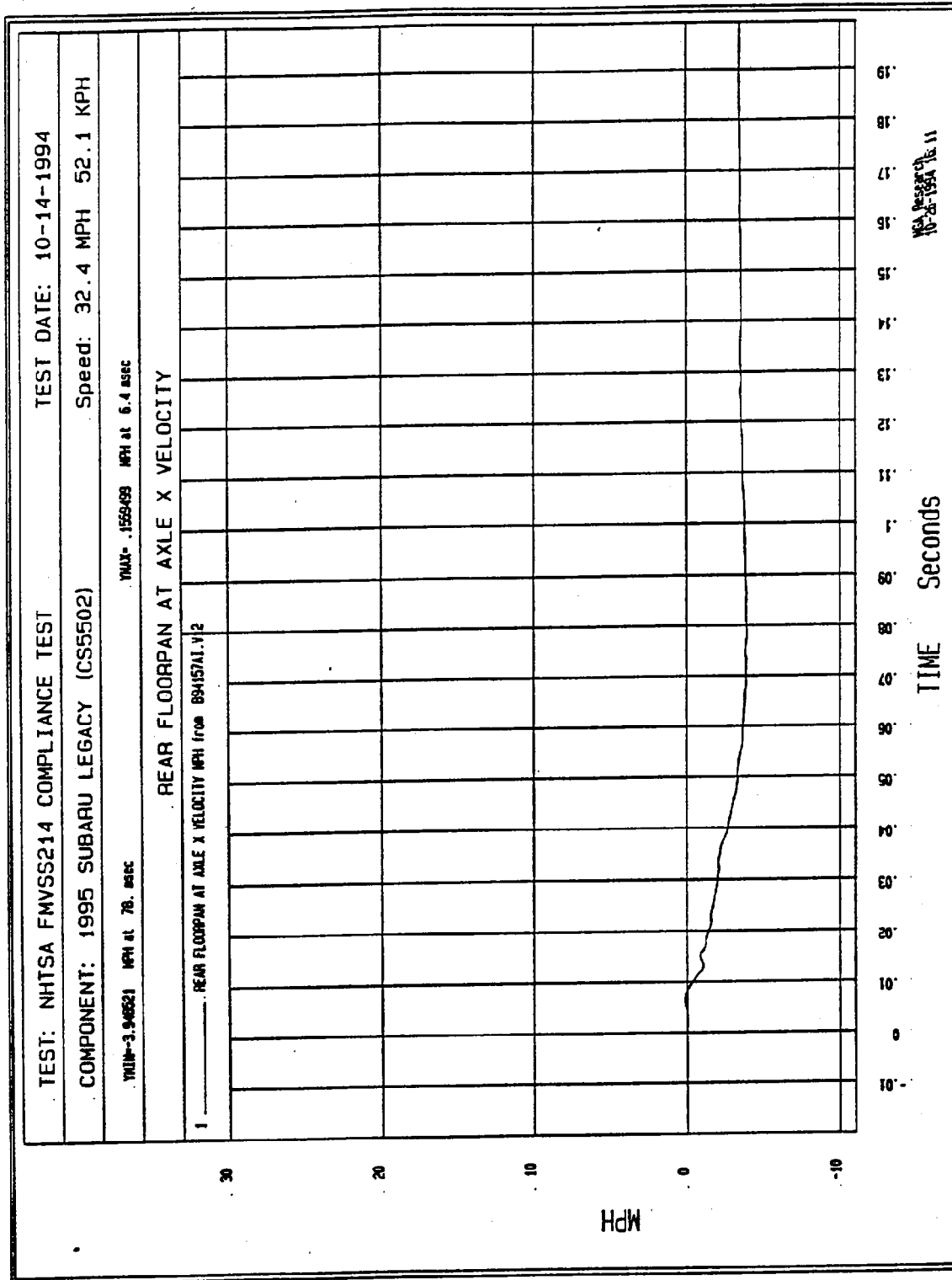


Figure B-38 - Rear Floorpan at Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

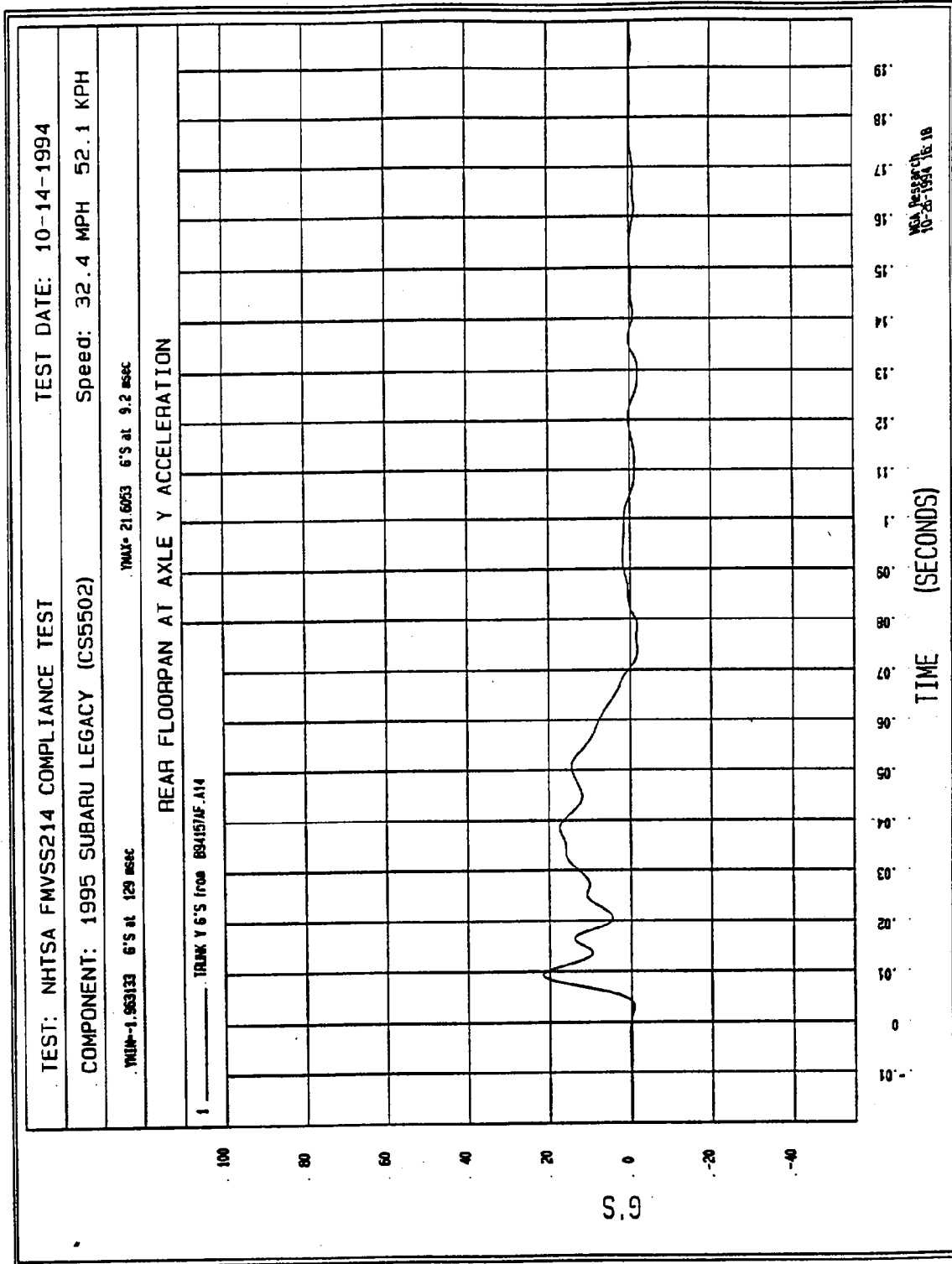


Figure B-39 - Rear Floorpan at Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

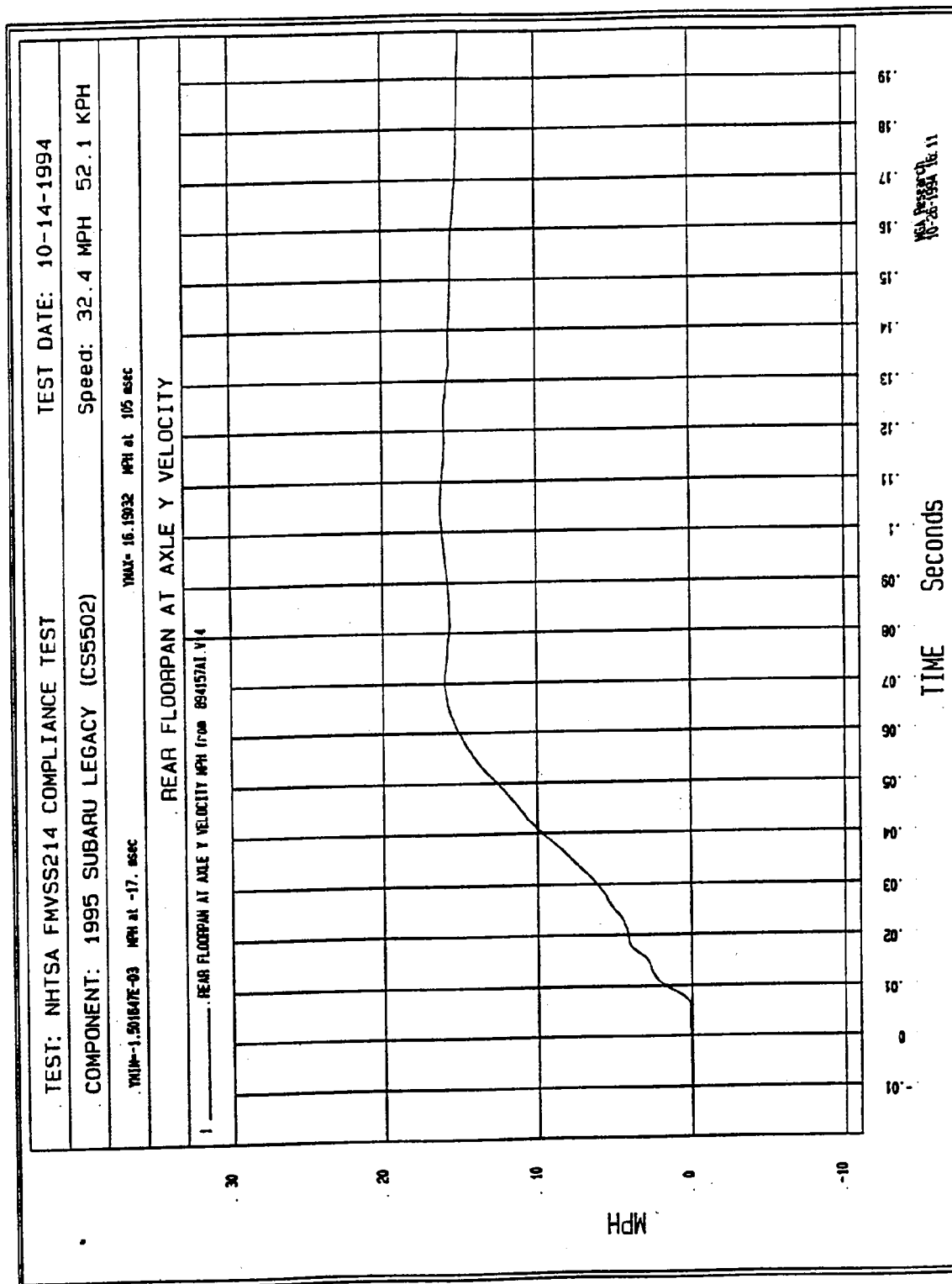


Figure B-40 - Rear Floorpan at Axle Y Velocity vs. Time

Filter: Class 60 (100 Hz)

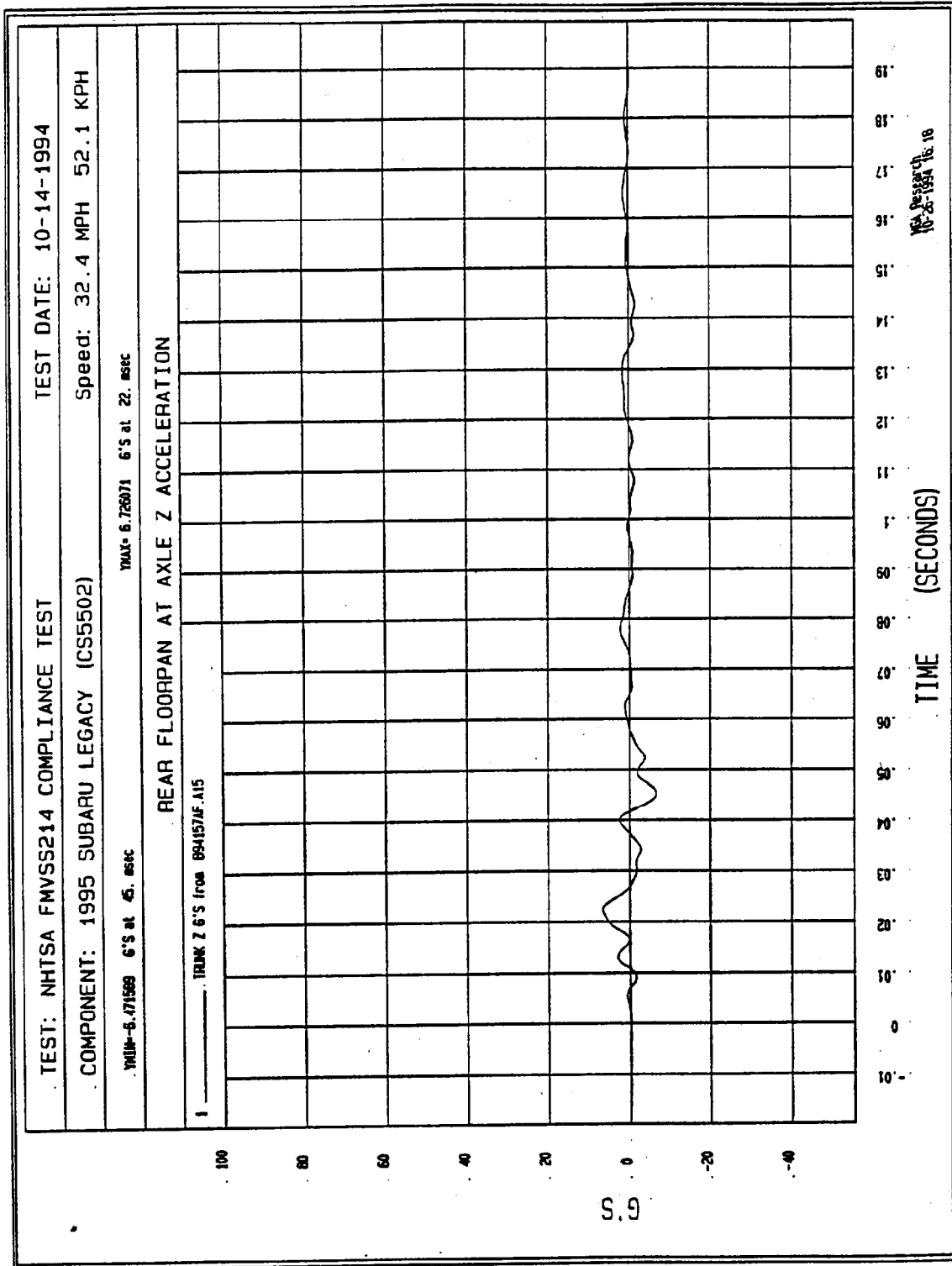


Figure B-41 - Rear Floorpan at Axle Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

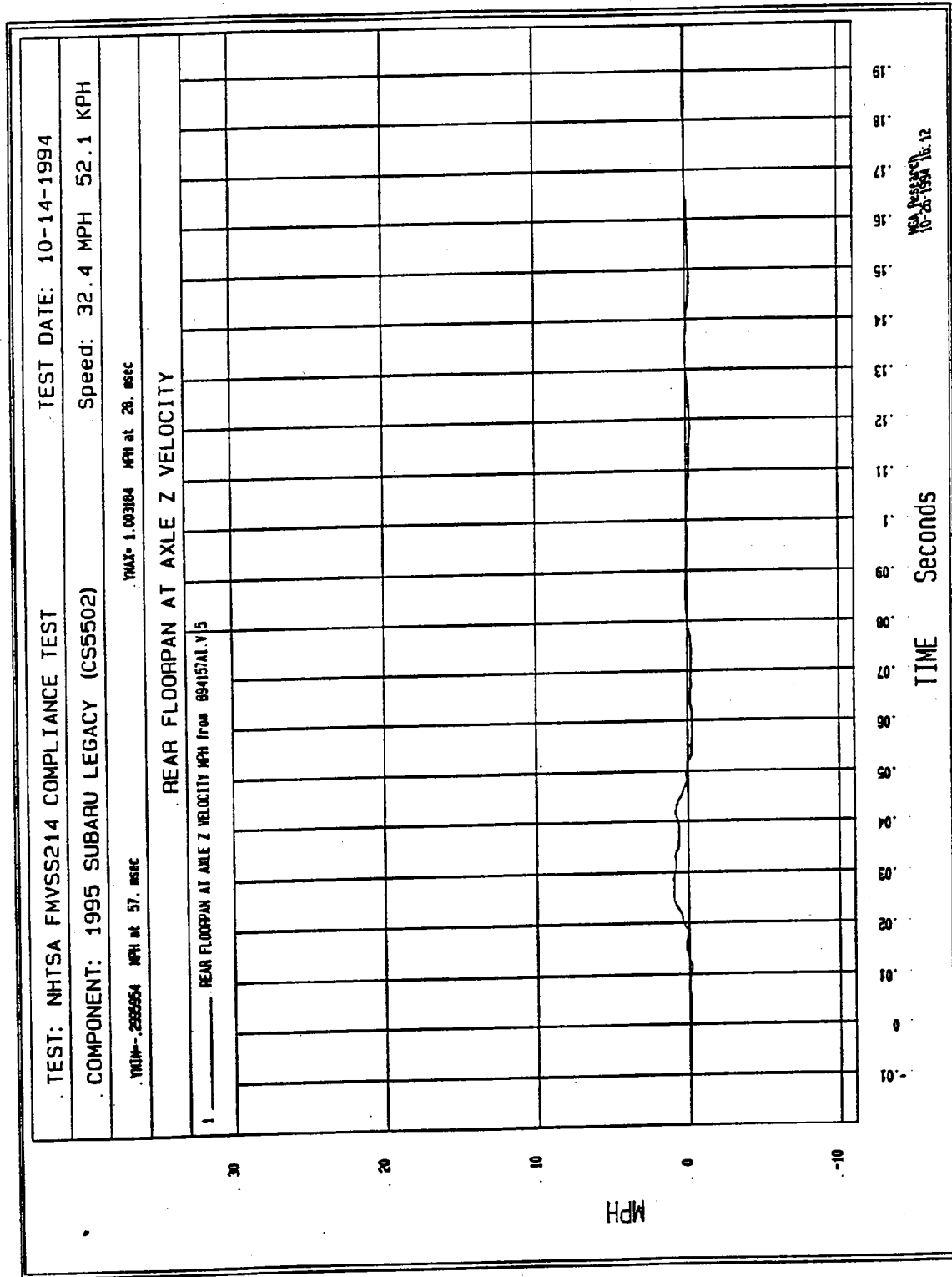


Figure B-42 - Rear Floorpan at Axle Z Velocity vs. Time

Filter: Class 60 (100 Hz)

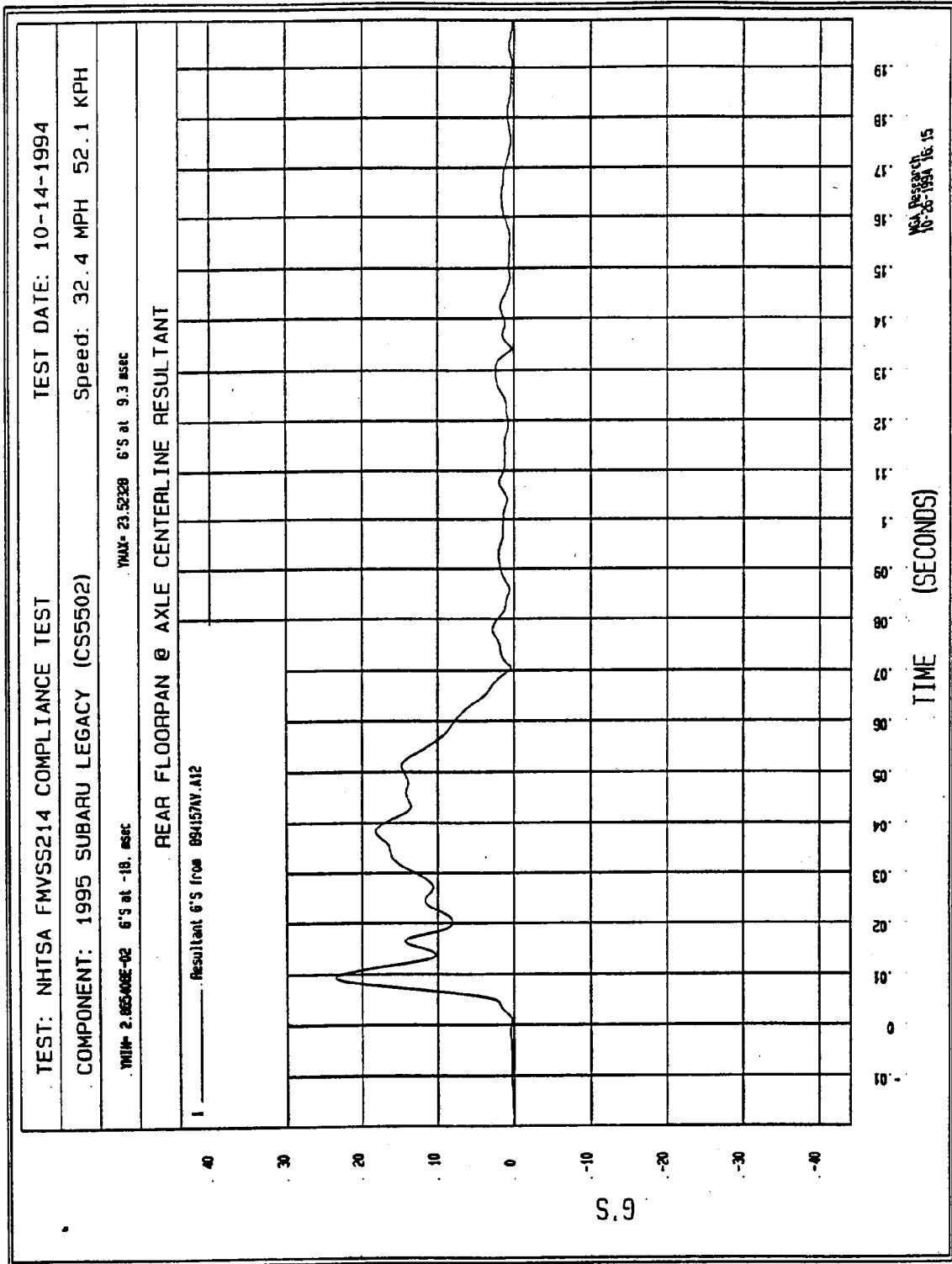


Figure B-43 - Rear Floorpan at Axle Centerline Resultant vs. Time

Filter: Class 60 (100 Hz)

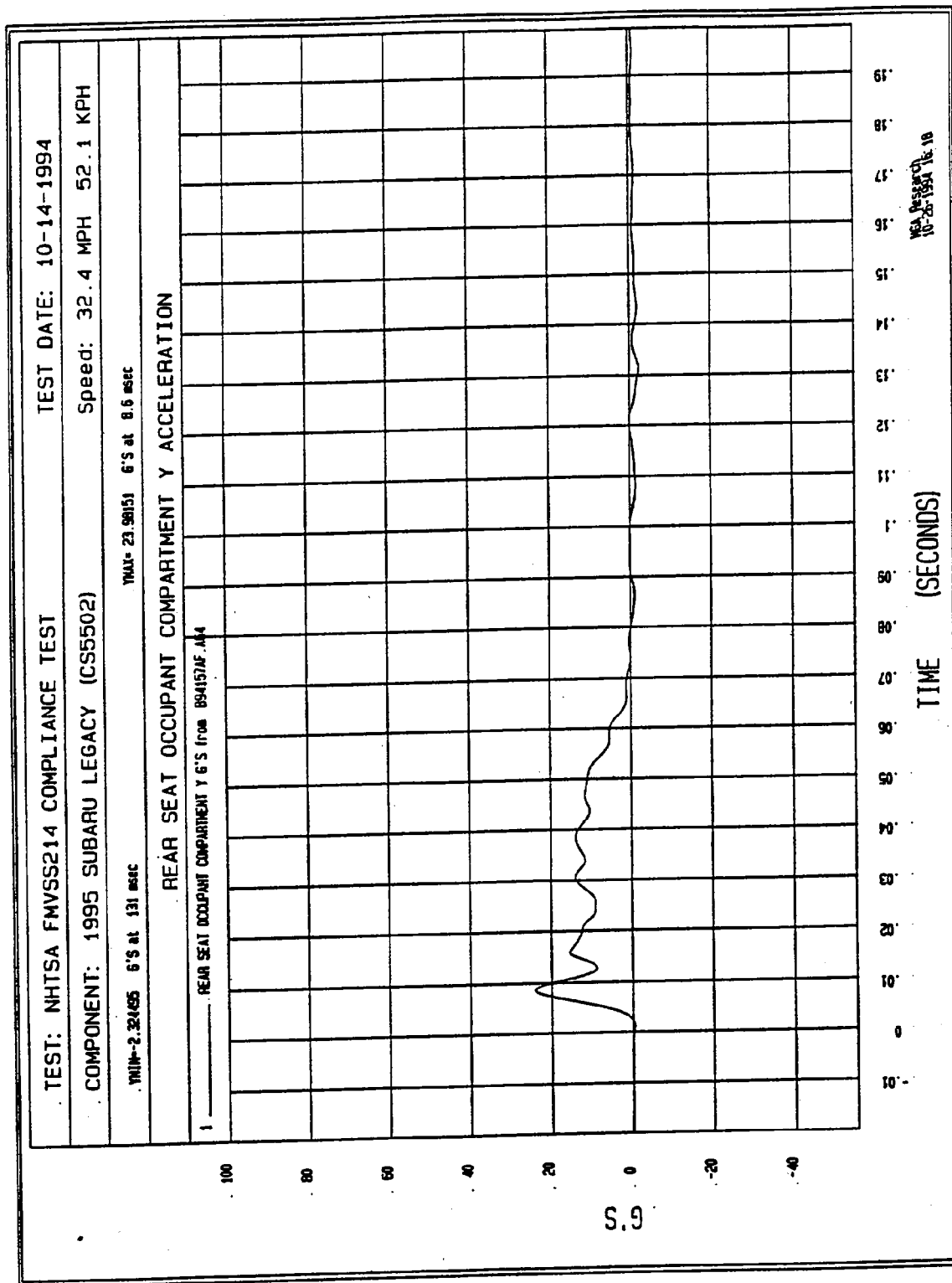


Figure B-44 - Rear Seat Occupant Compartment Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

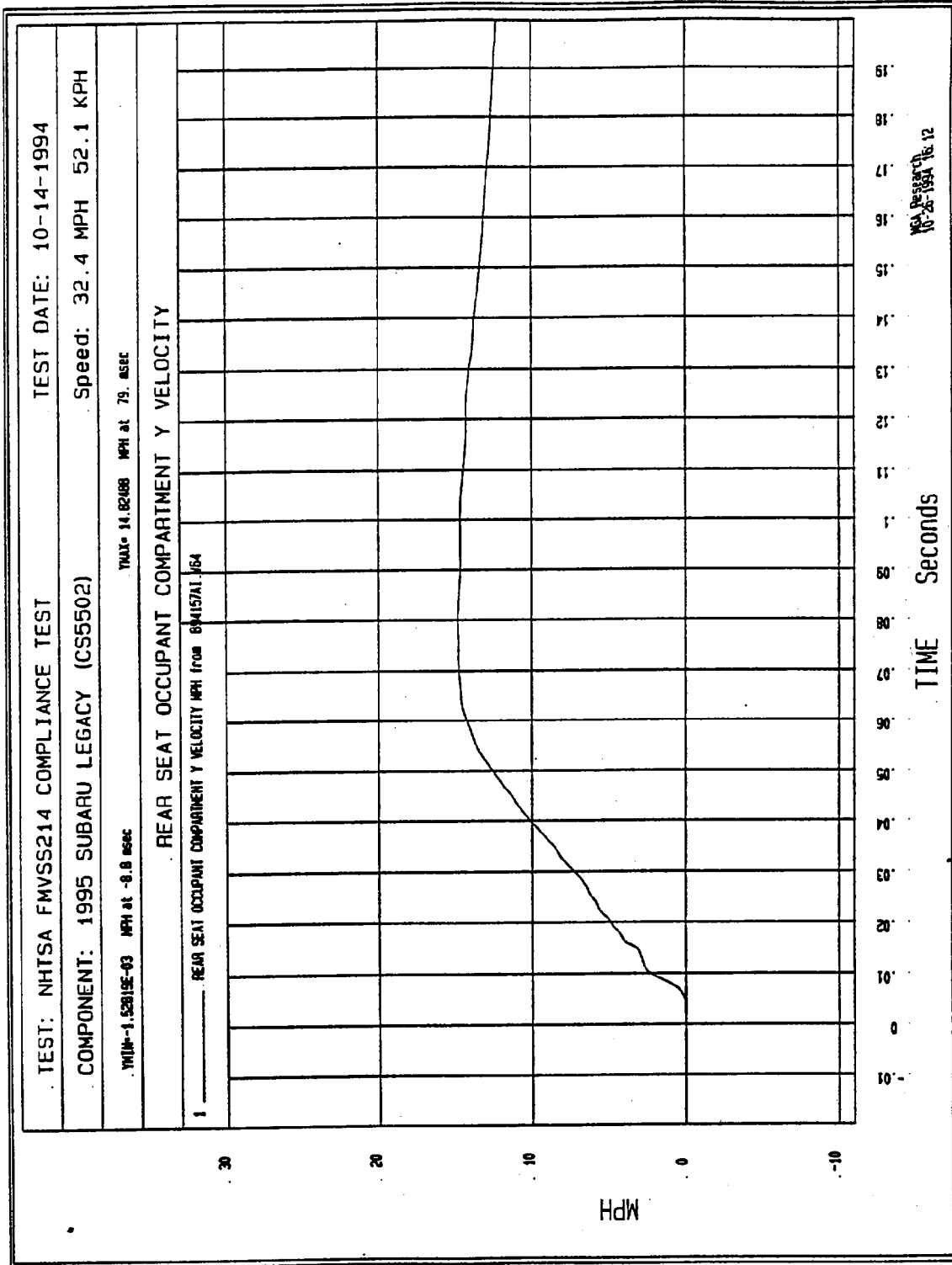


Figure B-45 - Rear Seat Occupant Compartment Y Velocity vs. Time

Filter: Class 60 (100 Hz)

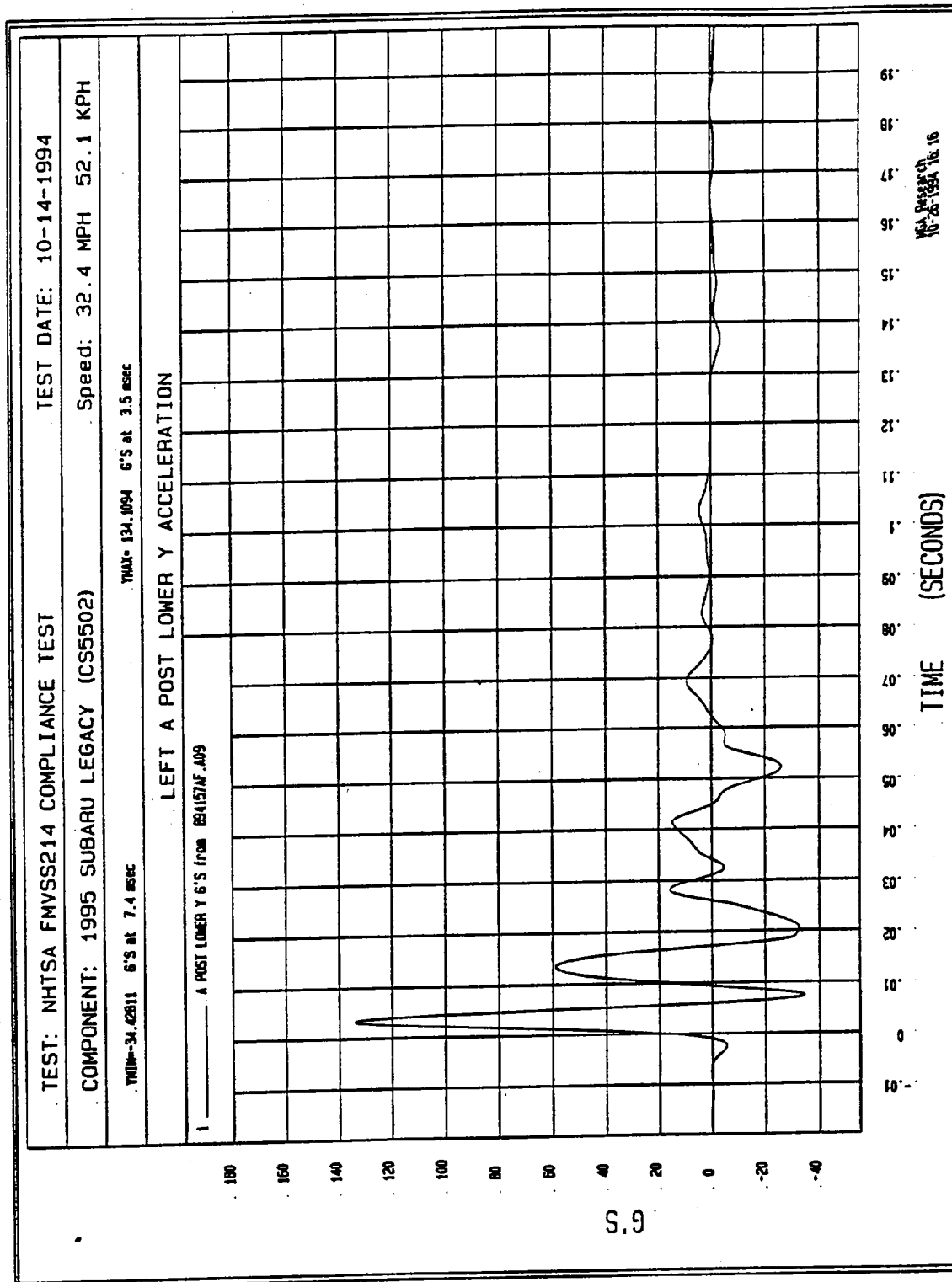


Figure B-46 - Left A Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

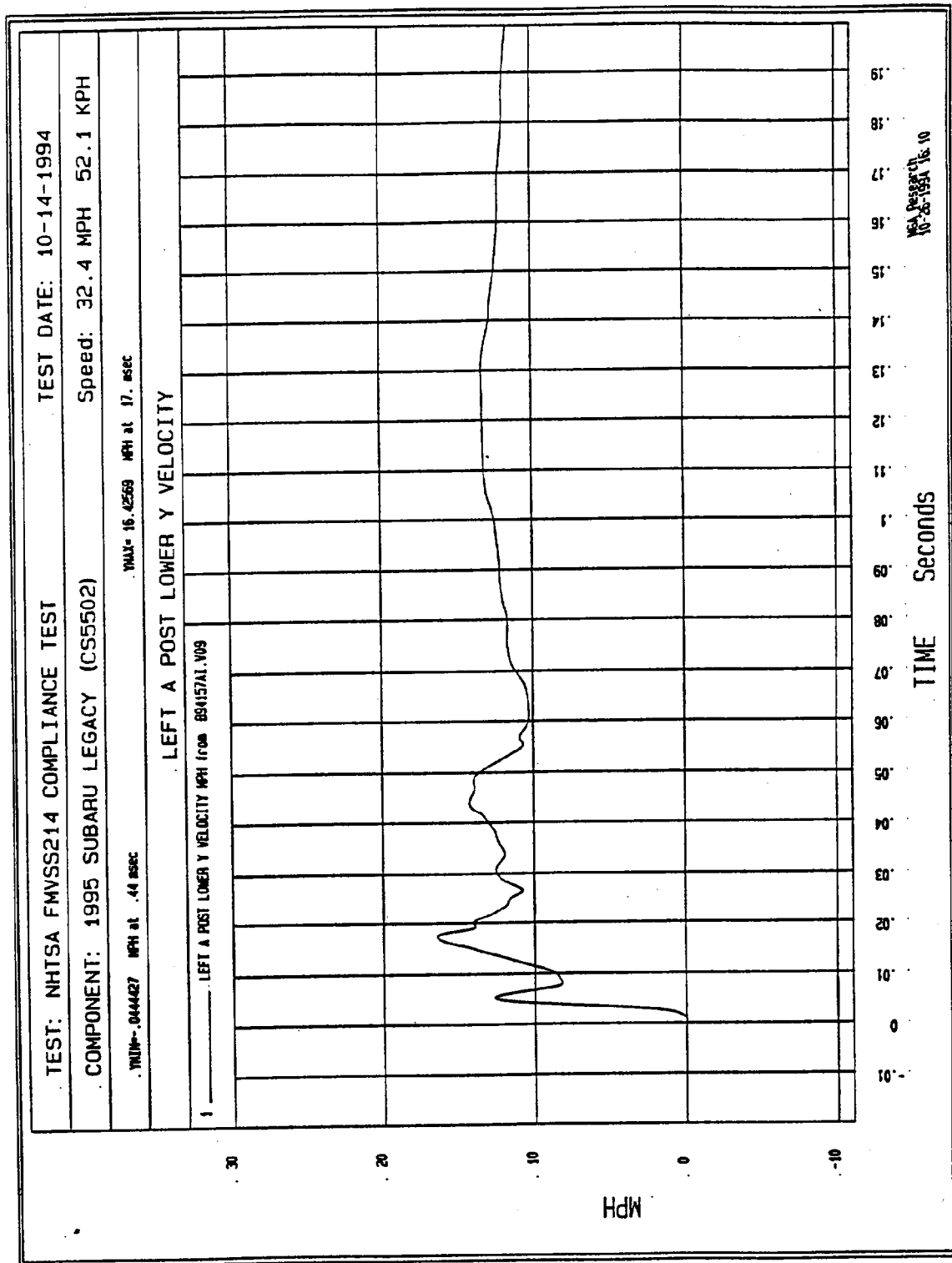


Figure B-47 - Left A Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

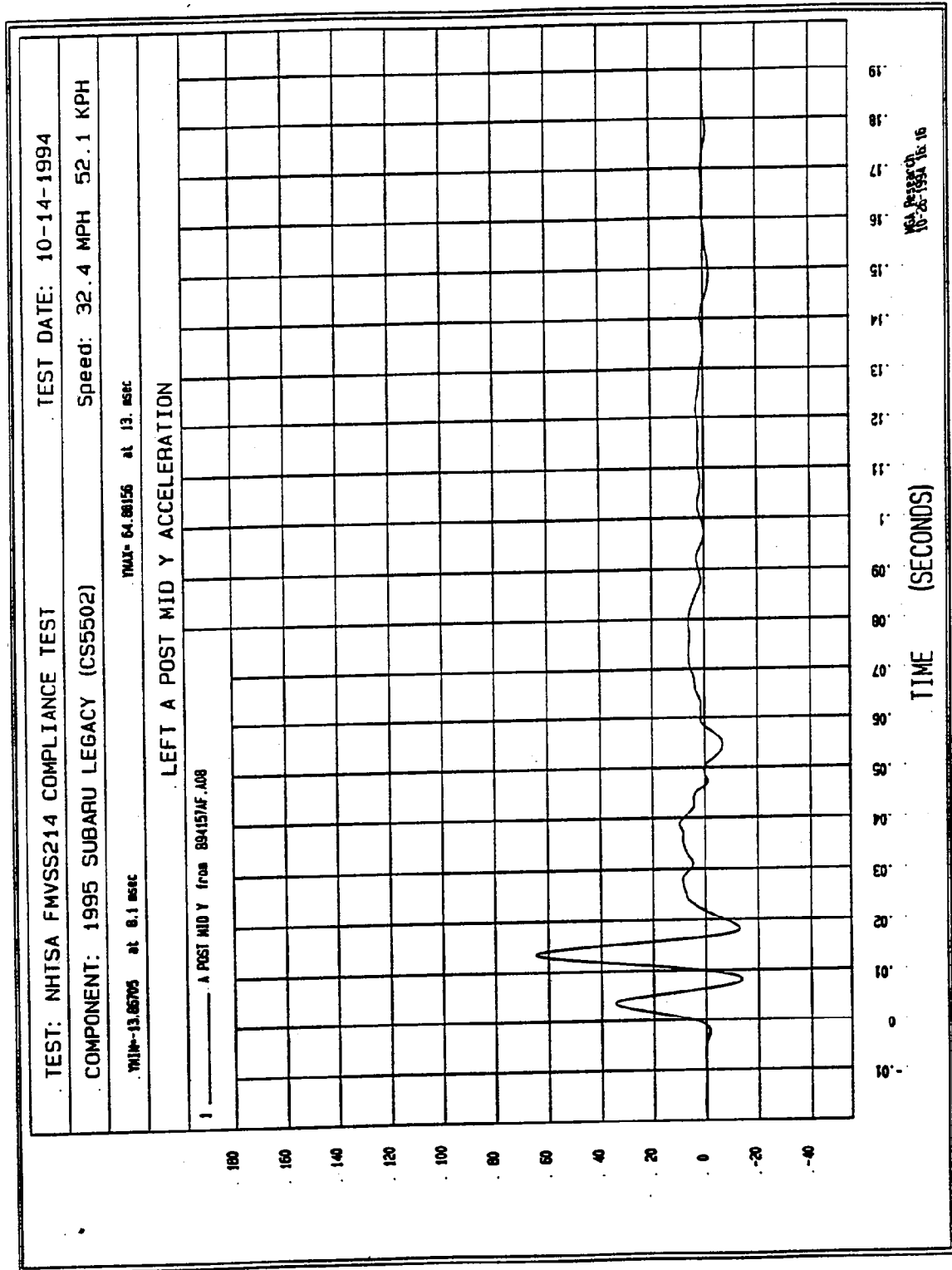


Figure B-48 - Left A Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

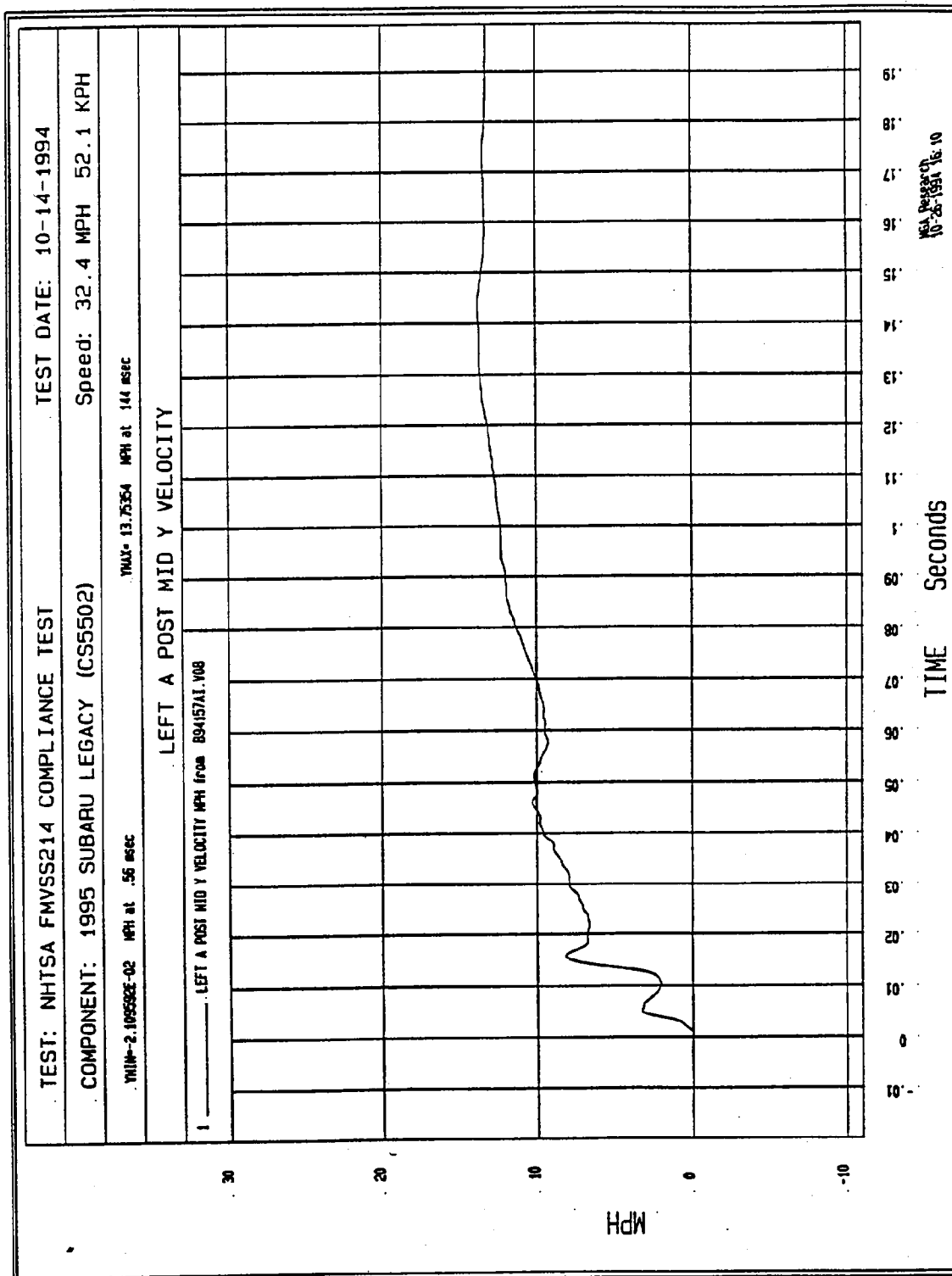


Figure B-49 - Left A Post Mid Y Velocity vs. Time

TEST: NHTSA FMVSS214 COMPLIANCE TEST TEST DATE: 10-14-1994

COMPONENT: 1995 SUBARU LEGACY (CS5502) Speed: 32.4 MPH 52.1 KPH

YIMP-25.1746 6'S at 32.4MPH YMAX-147.8203 6'S at 6.8 msec

LEFT B POST MID Y ACCELERATION

1 B POST MID Y 6'S FROM 894157AF.A10

180
160
140
120
100
80
60
40
20
0
-20
-40

TIME (SECONDS)

0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19

10-28-1994 16:16

Figure B-50 - Left B Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

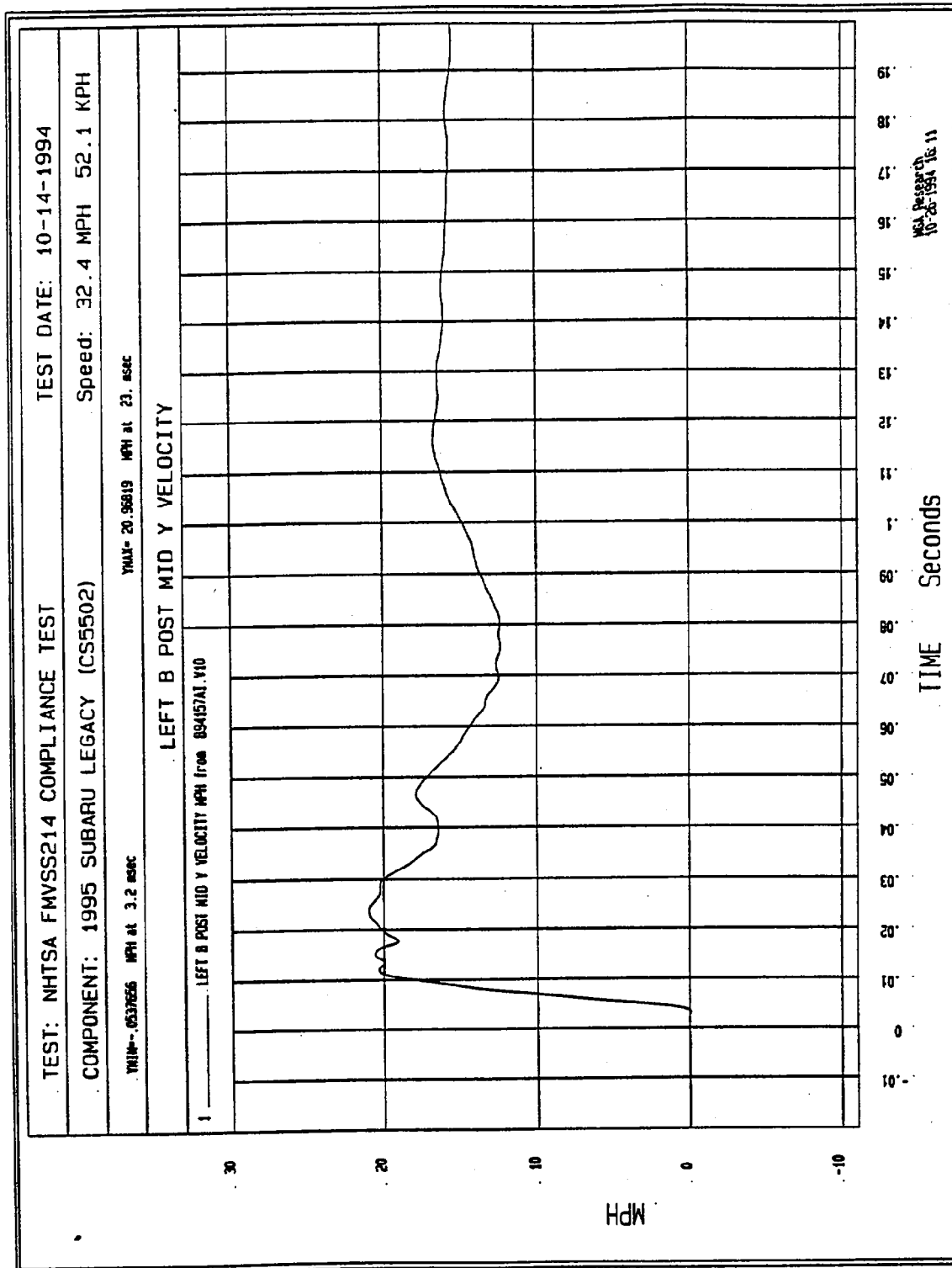


Figure B-51 - Left B Post Mid Y Velocity vs. Time

Filter: Class 60 (100 Hz)

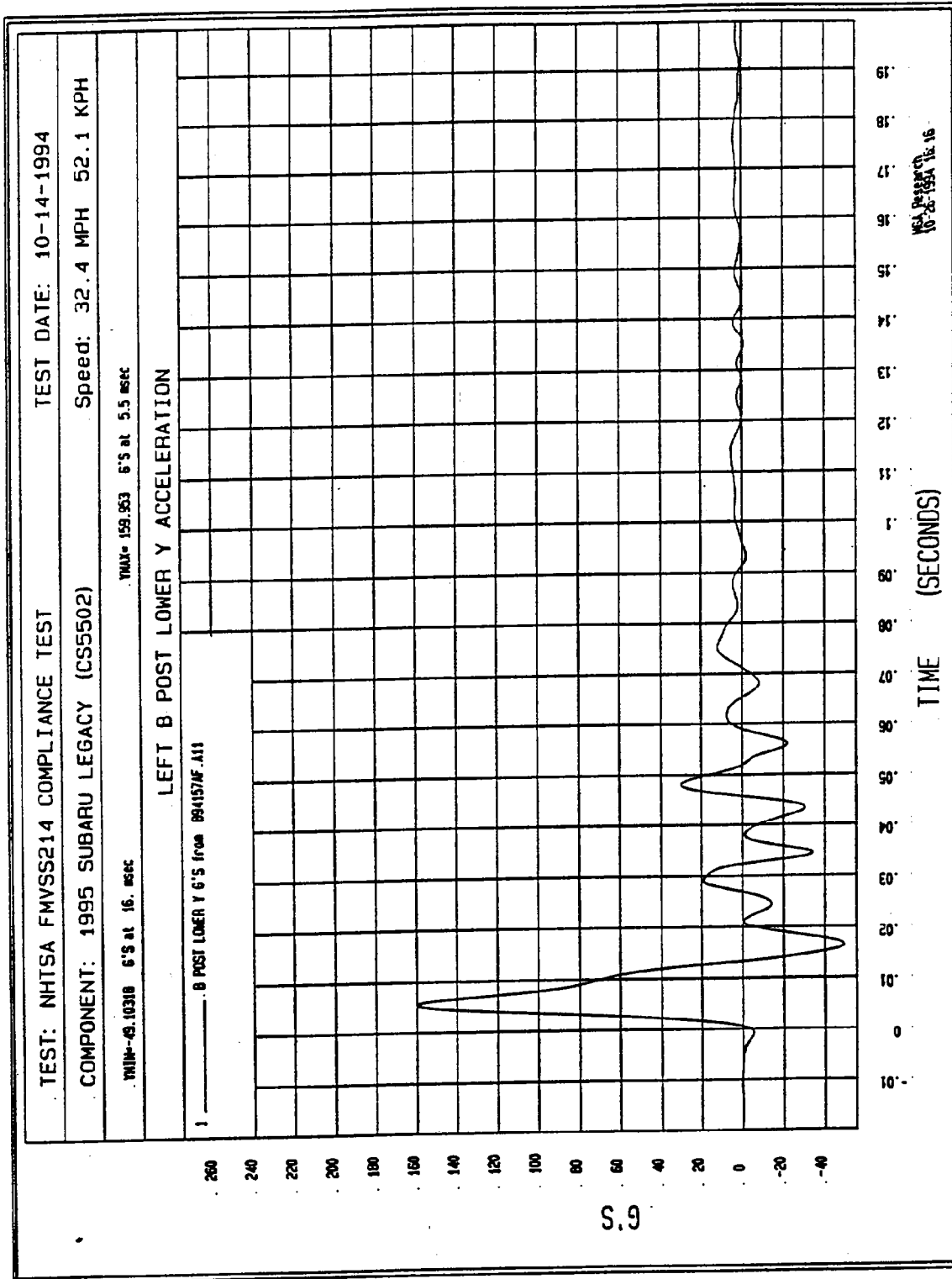


Figure B-52 - Left B Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

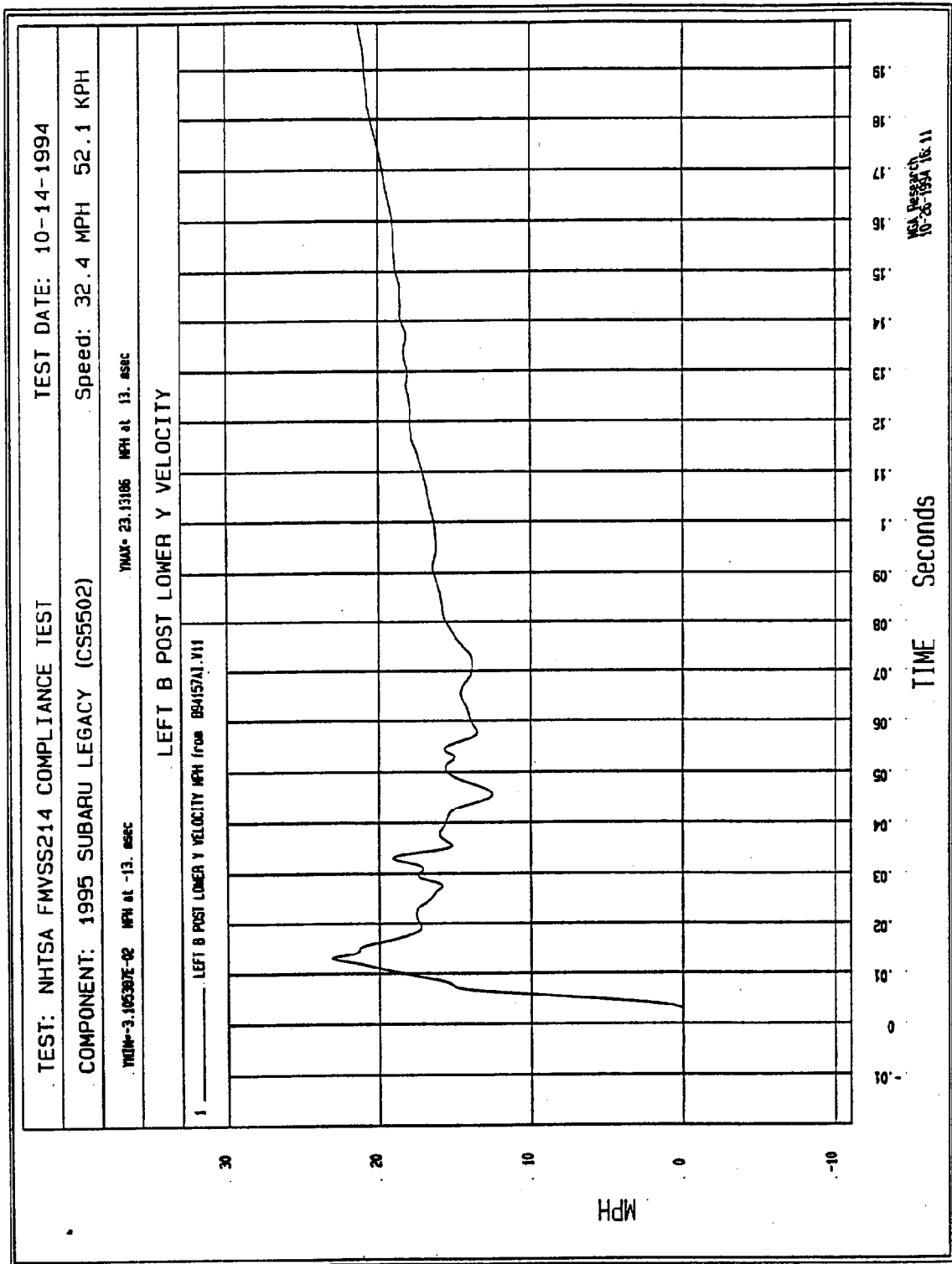


Figure B-53 - Left B Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

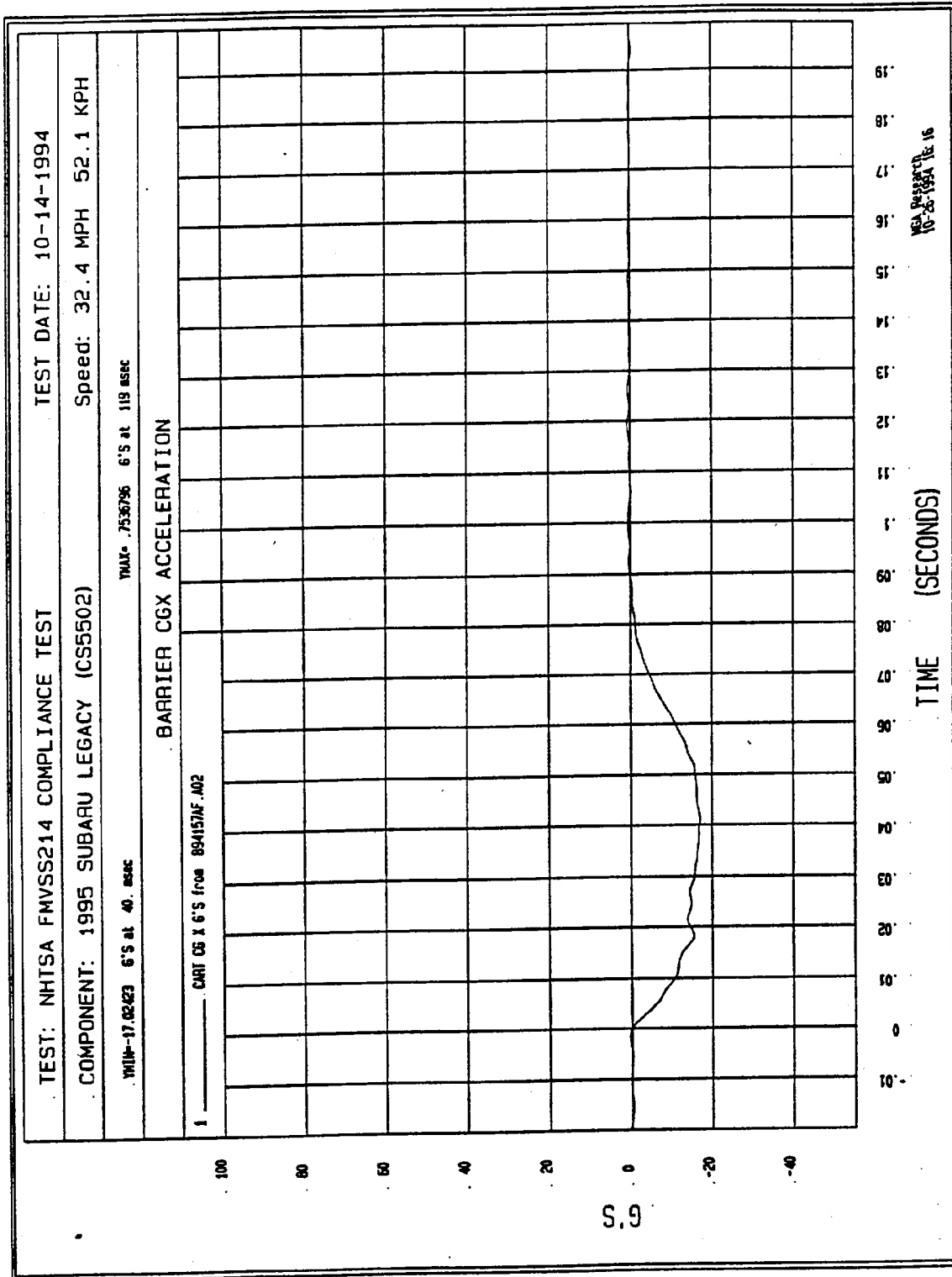


Figure B-54 - Moving Barrier Center of Gravity X Acceleration vs. Time

Filter: Class 180 (300 Hz)

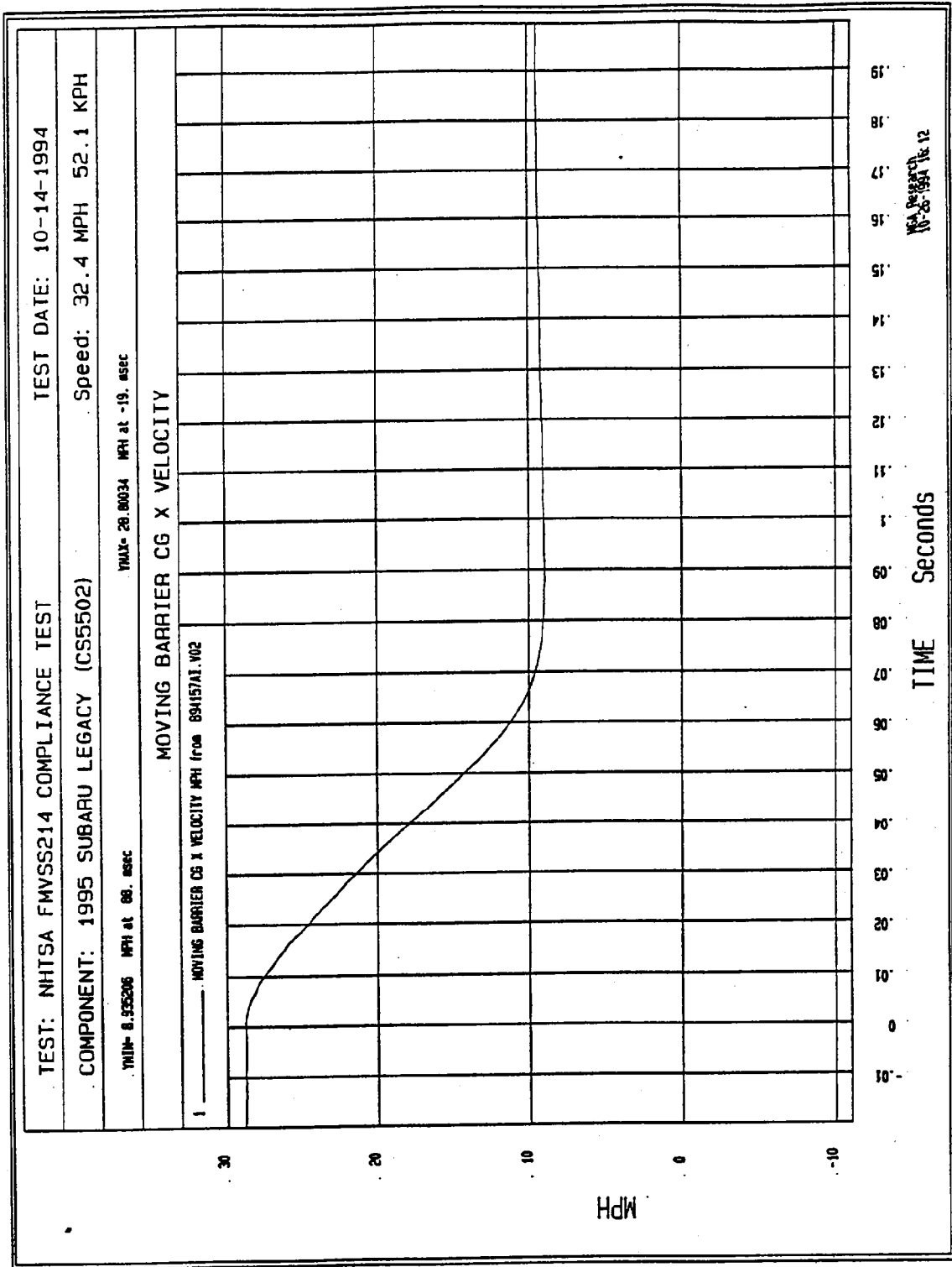


Figure B-55 - Moving Barrier Center of Gravity X Velocity vs. Time

Filter: Class 60 (100 Hz)

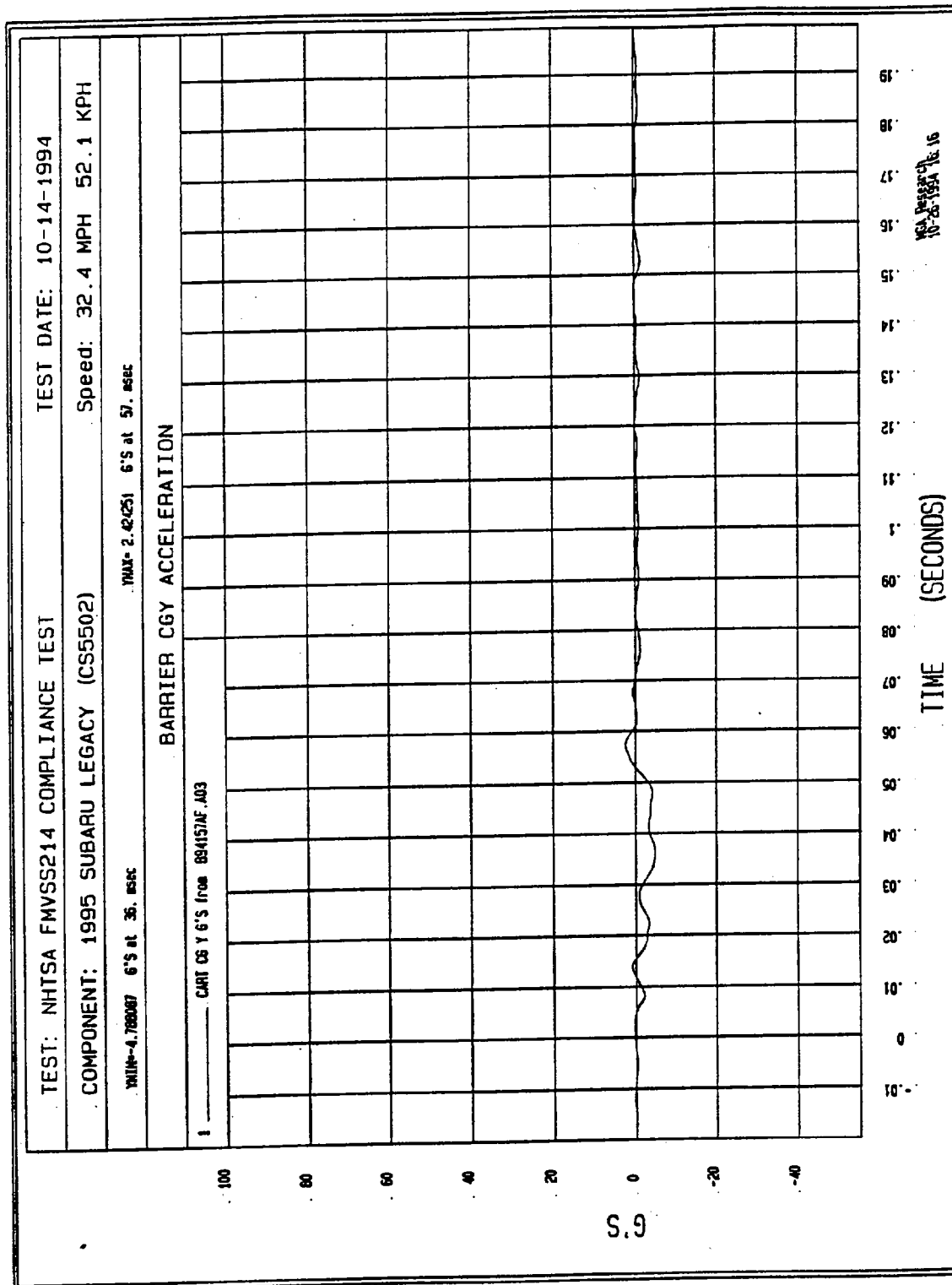


Figure B-56 - Moving Barrier Center of Gravity Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

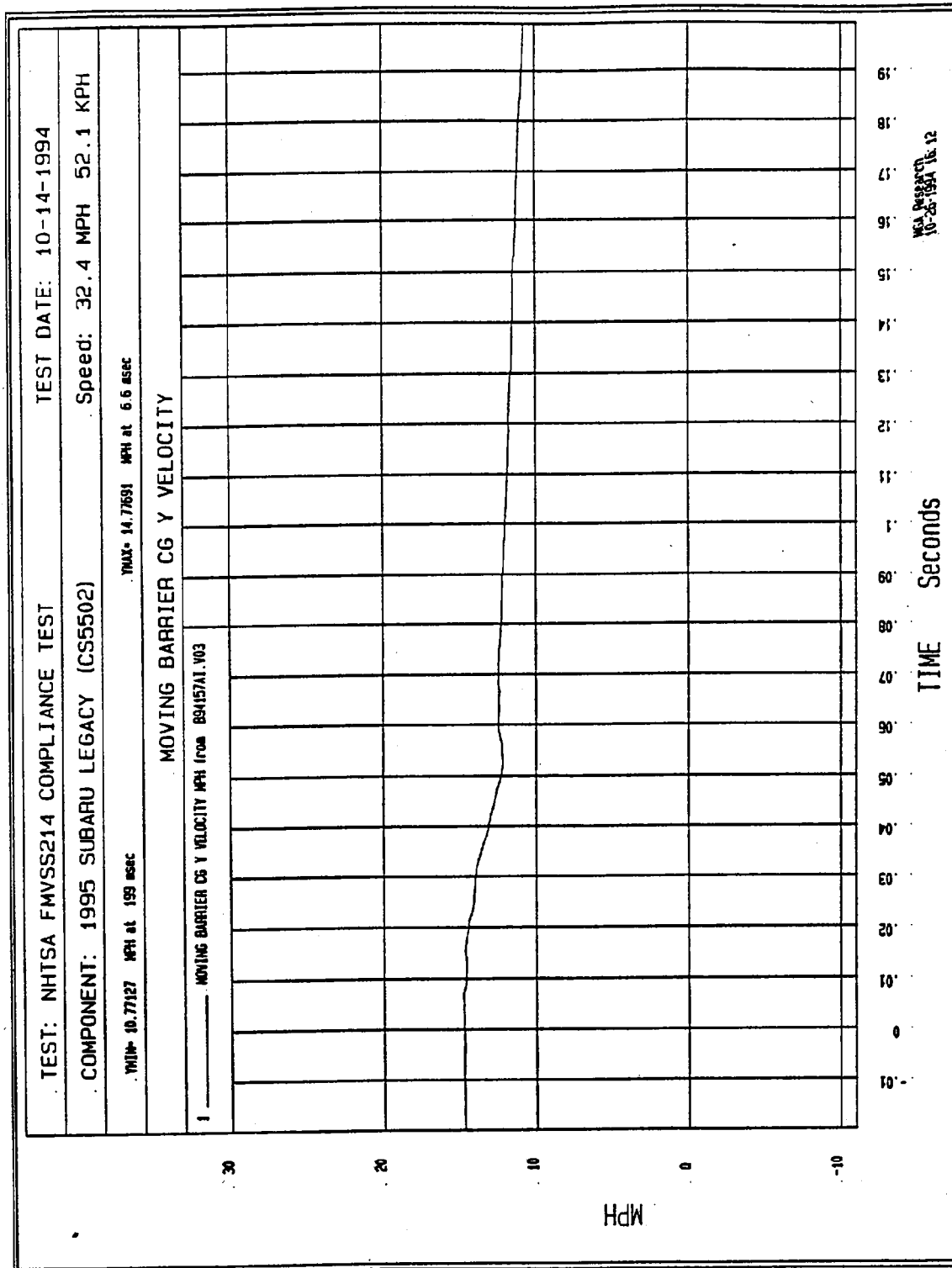


Figure B-57 - Moving Barrier Center of Gravity Y Velocity vs. Time

Filter: Class 60 (100 Hz)

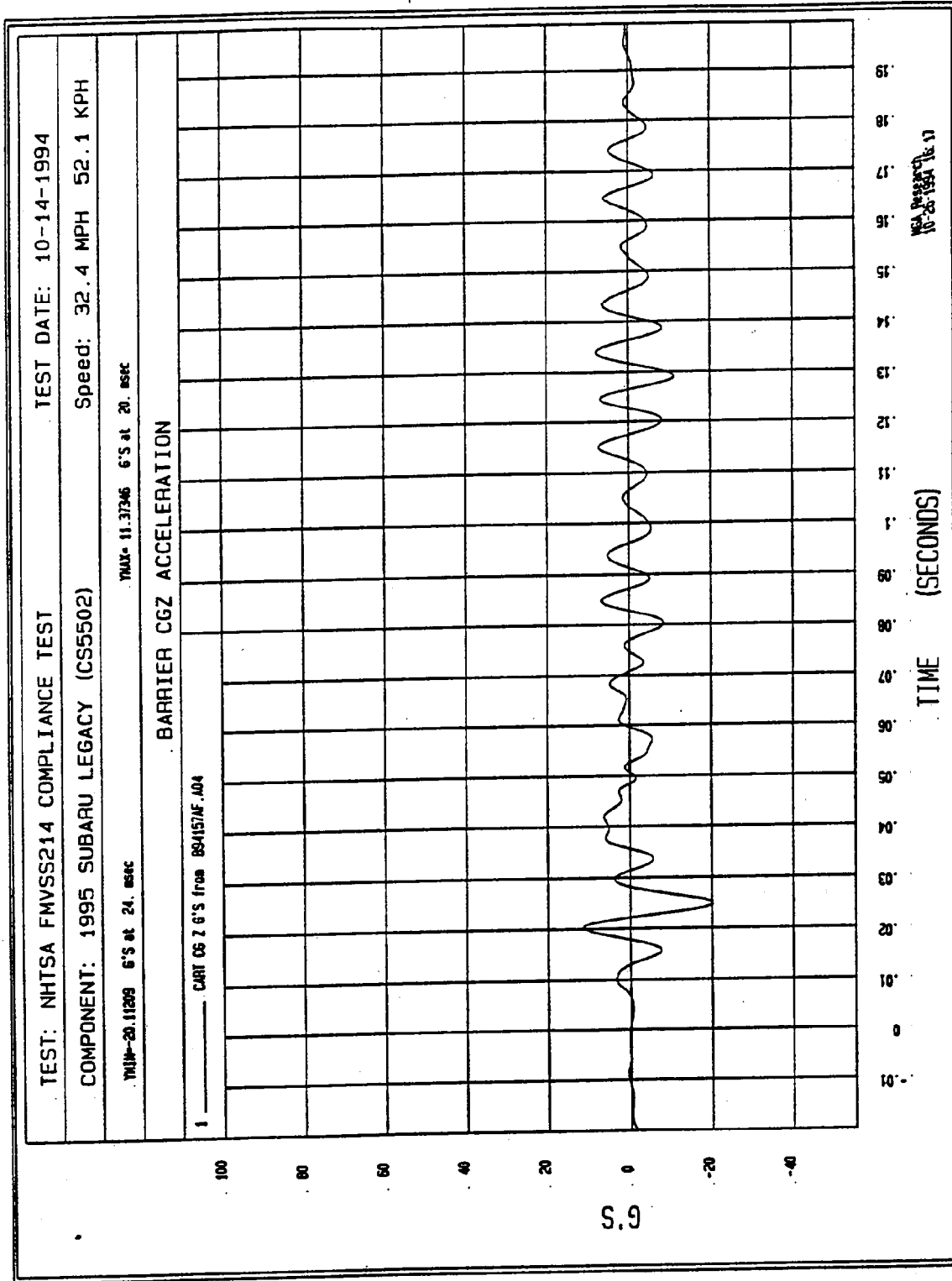


Figure B-58 - Moving Barrier Center of Gravity Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

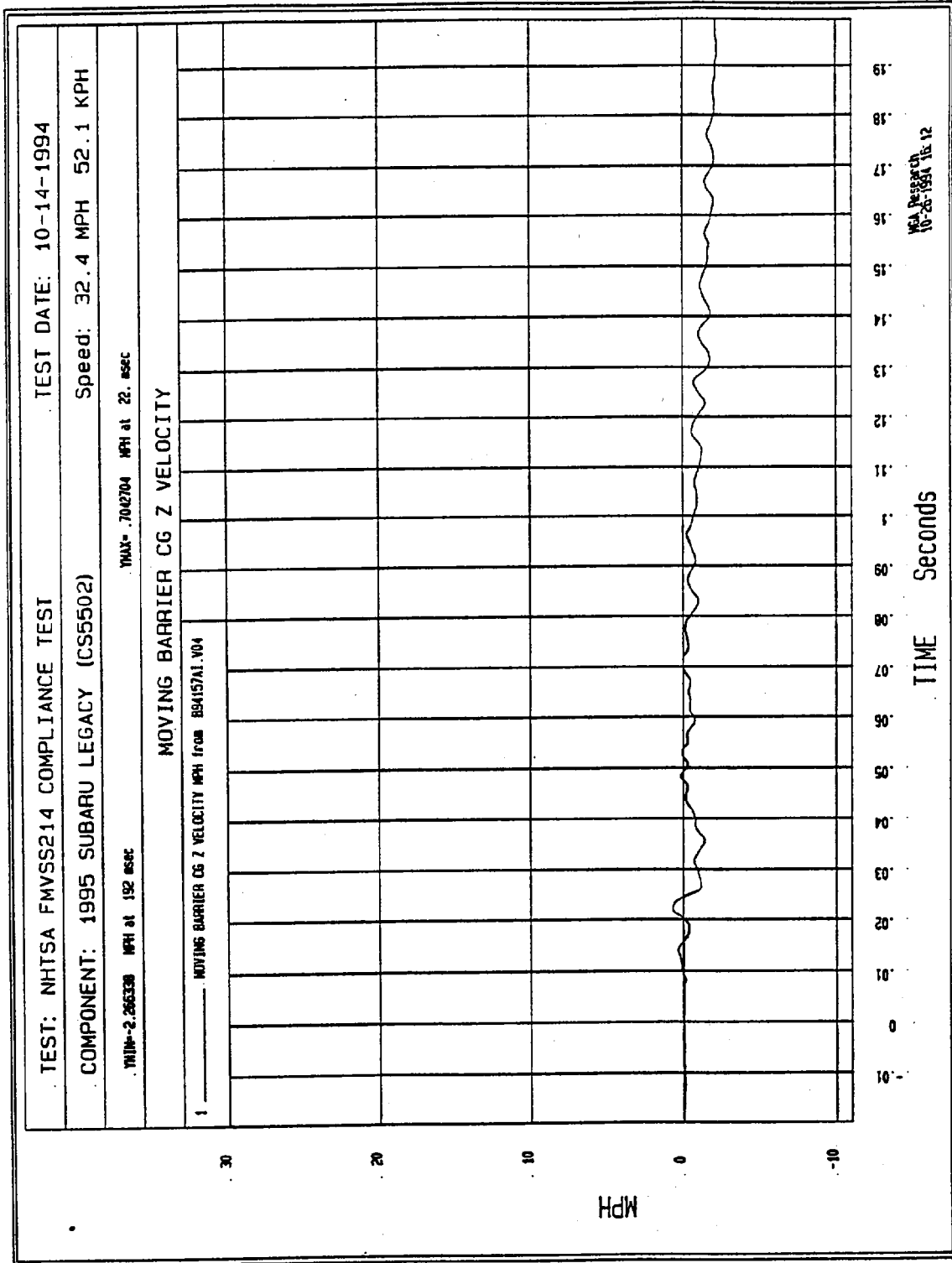


Figure B-59 - Moving Barrier Center of Gravity Z Velocity vs. Time

Filter: Class 60 (100 Hz)

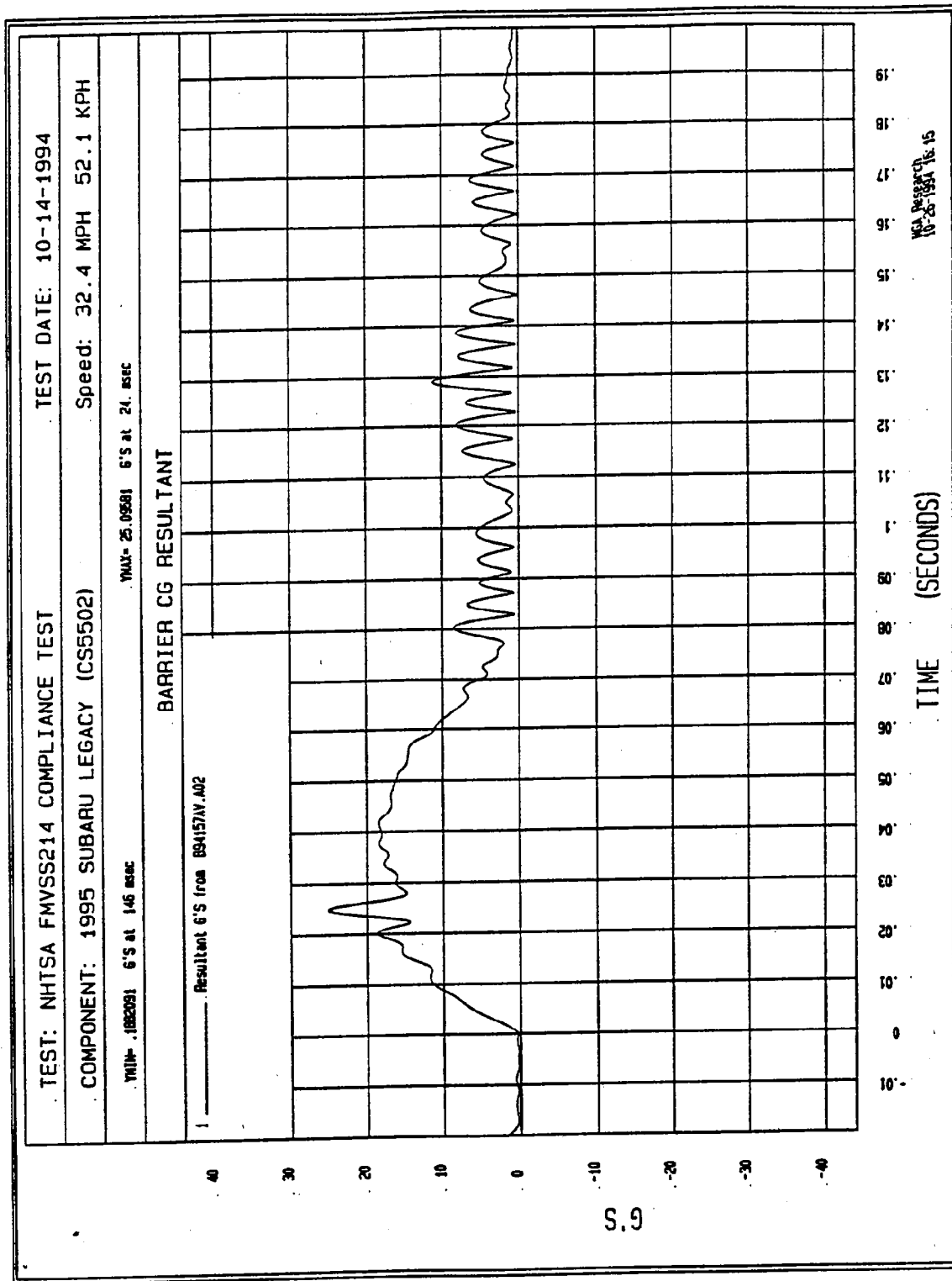
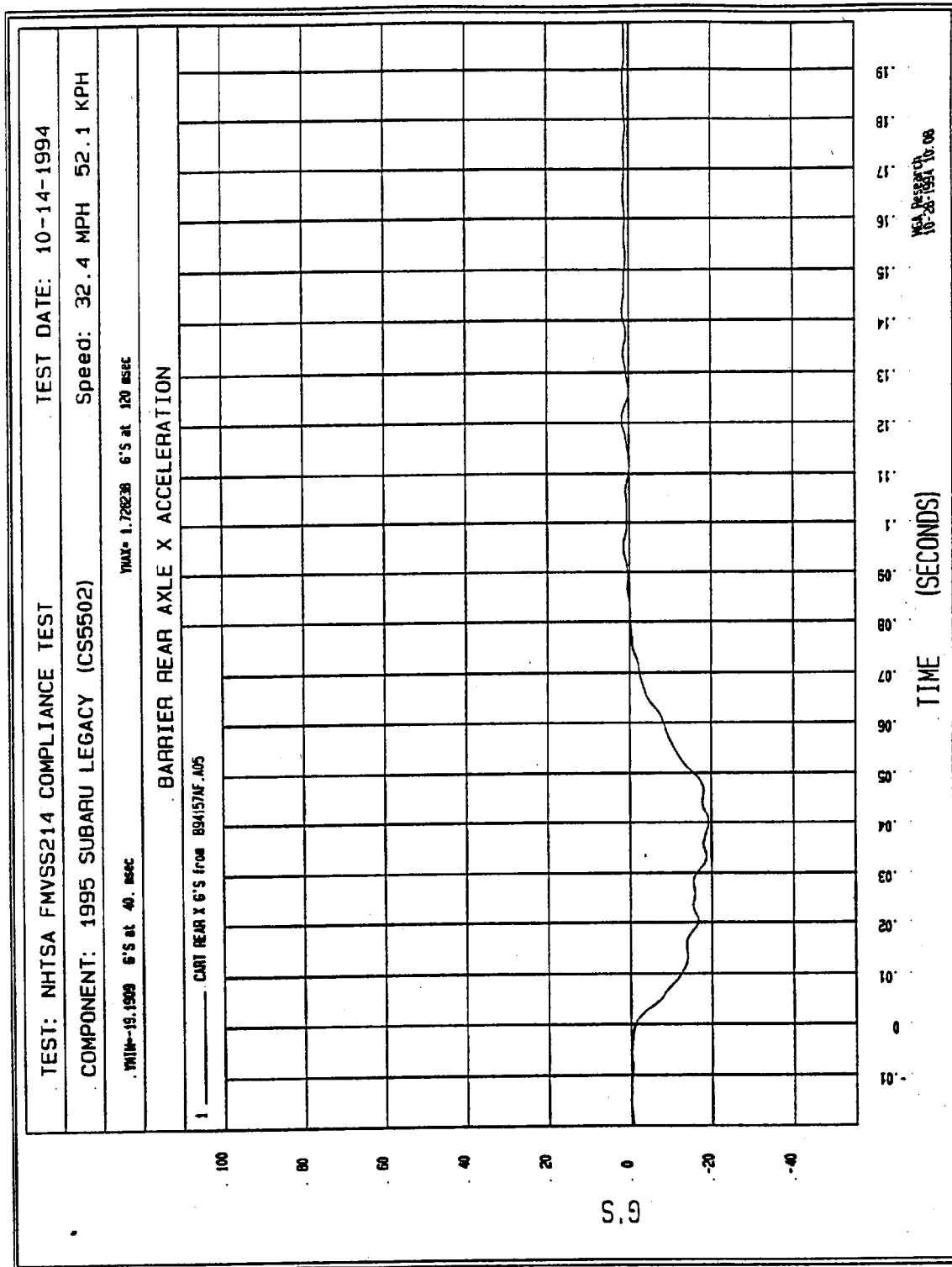


Figure B-60 - Moving Barrier Center of Gravity Resultant vs. Time

Filter: Class 60 (100 Hz)



B-61

Figure B-61 - Moving Barrier Rear Axle X Acceleration vs. Time

Filter: Class 180 (100 Hz)

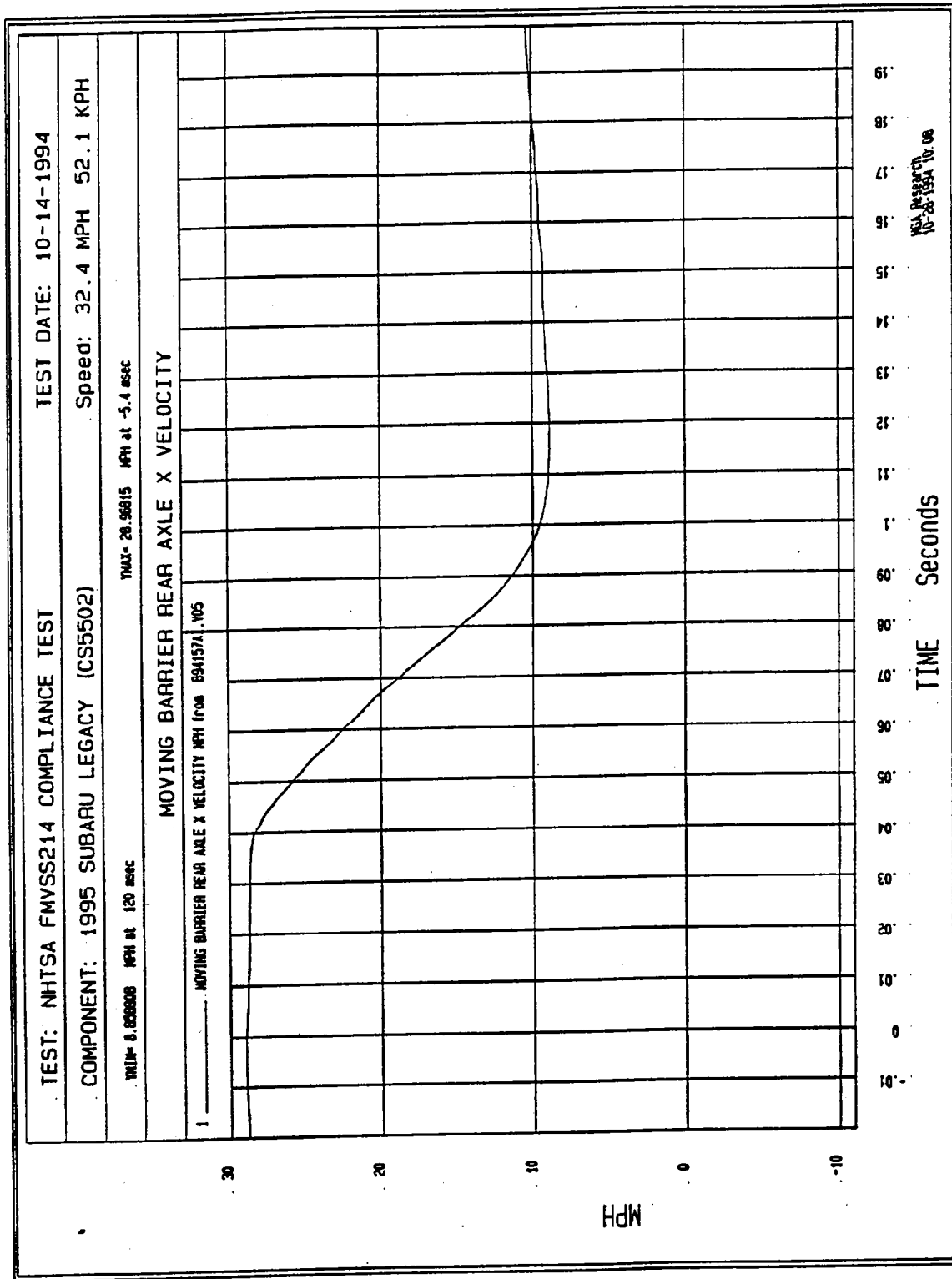


Figure B-62 - Moving Barrier Rear Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

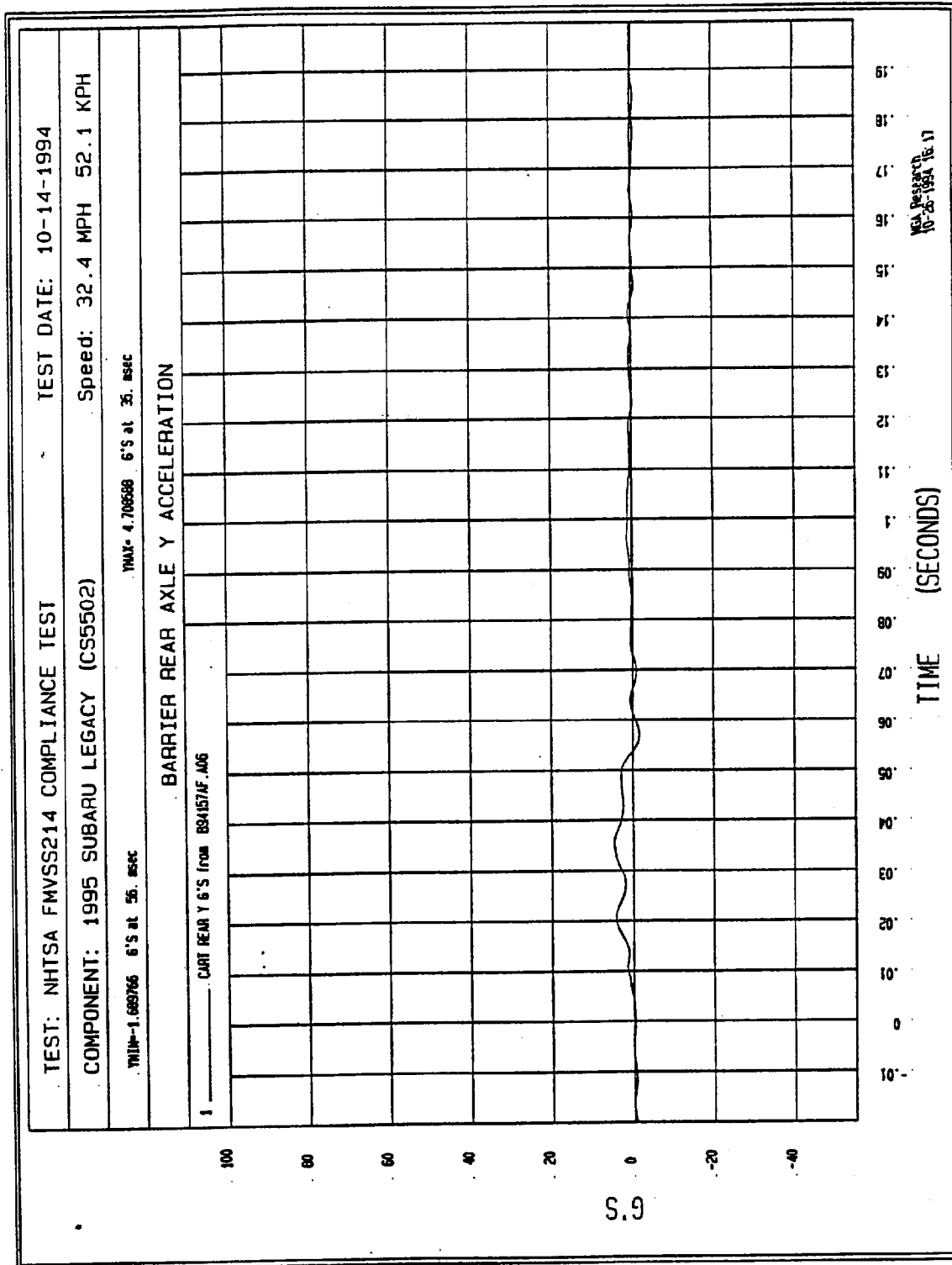


Figure B-63 - Moving Barrier Rear Axle Y Acceleration vs. Time

Filter: Class 180 (100 Hz)

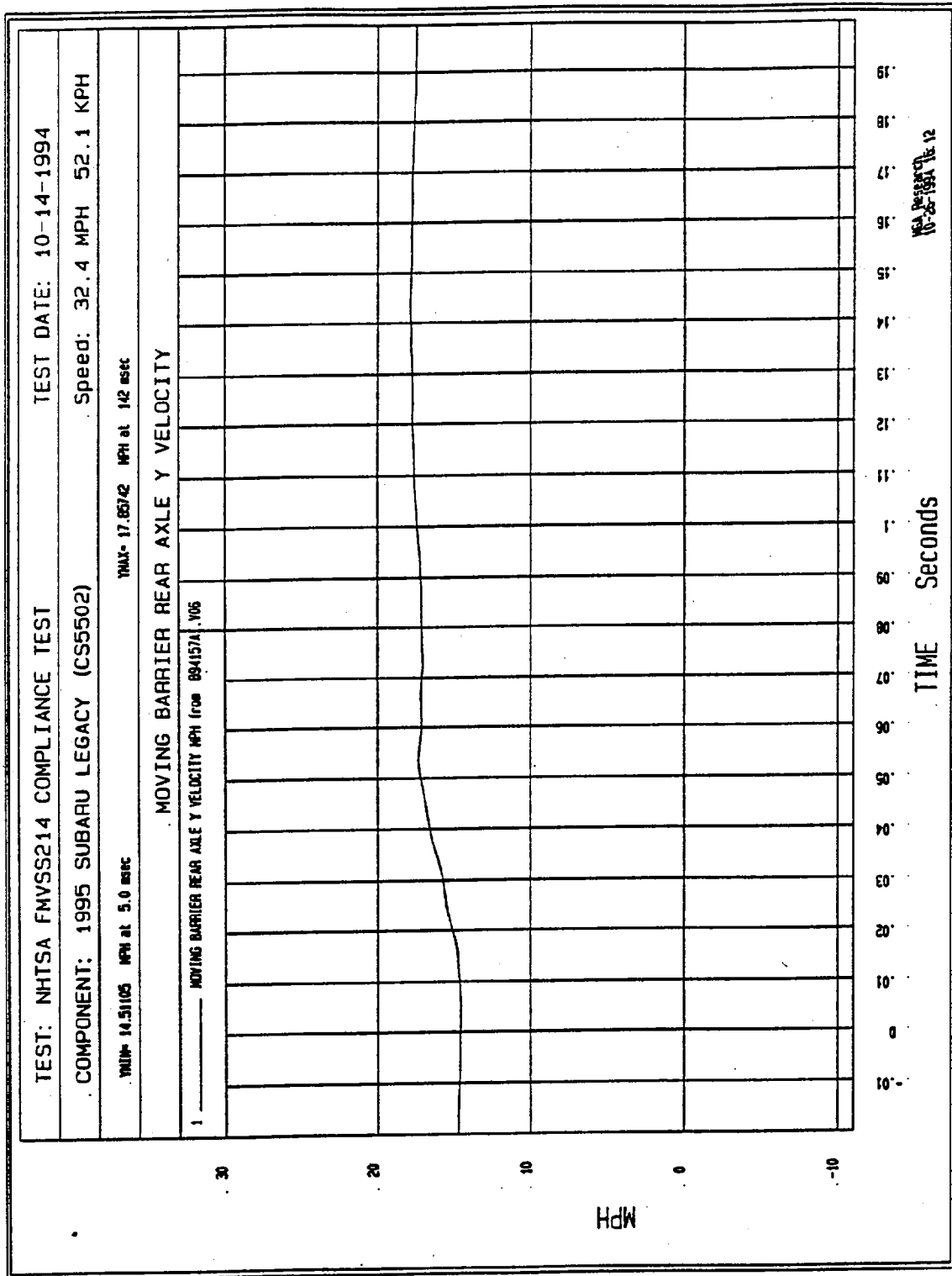


Figure B-64 - Moving Barrier Rear Axle Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

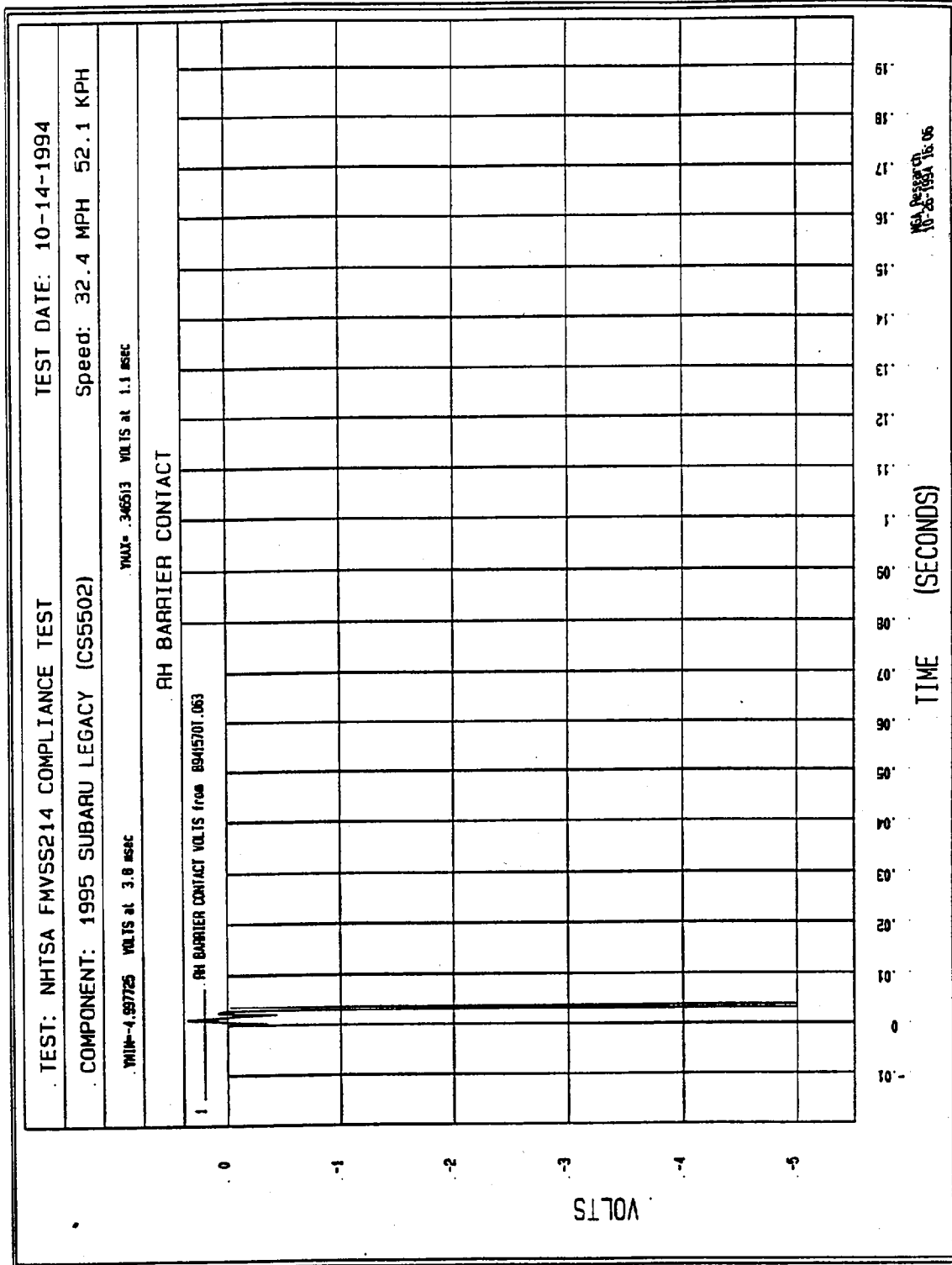


Figure B-65 - Right Hand Barrier Contact

Filter: Class 1000 (1650 Hz)

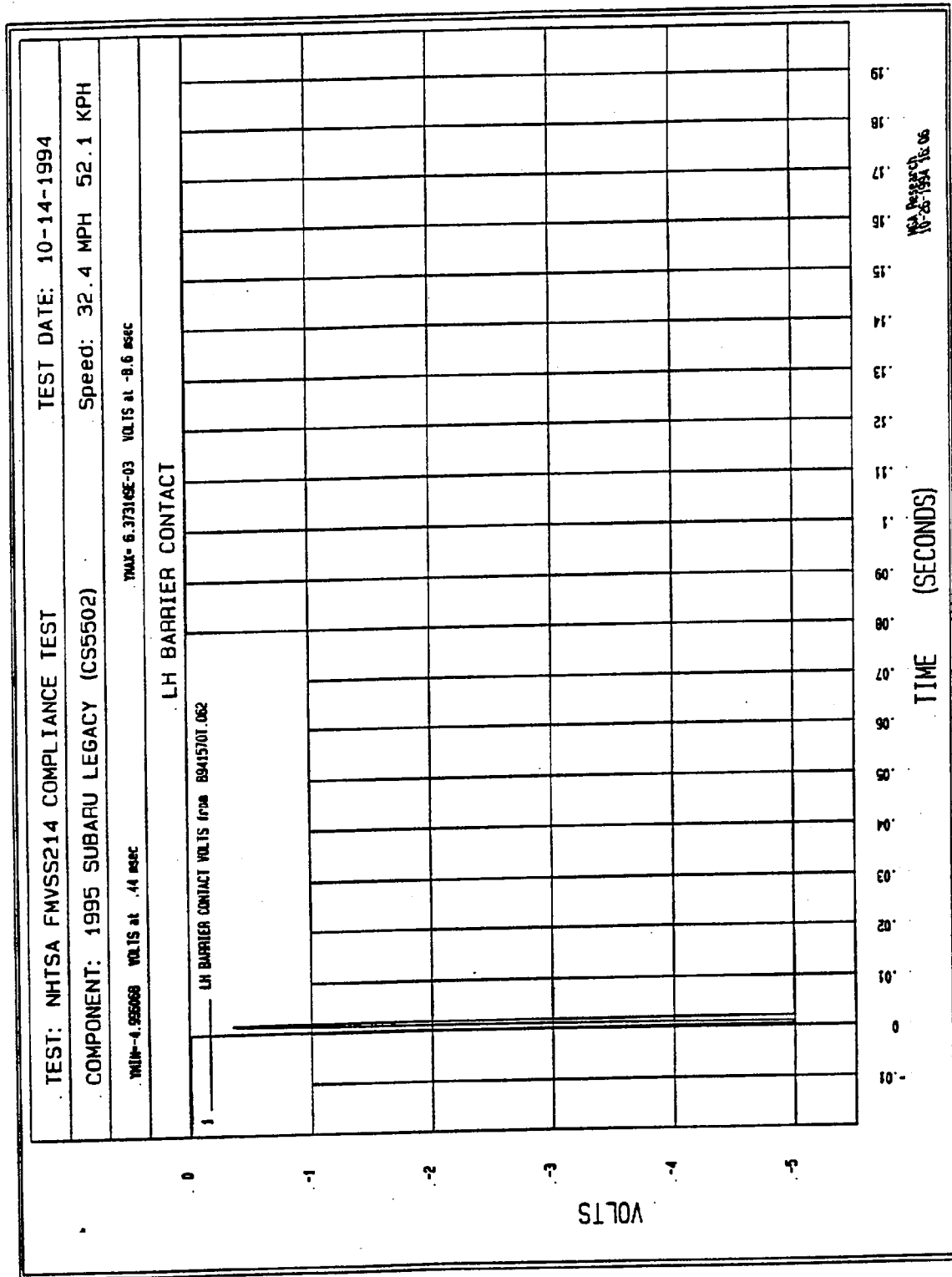


Figure B-66 - Left Hand Barrier Contact

Filter: Class 180 (300 Hz)

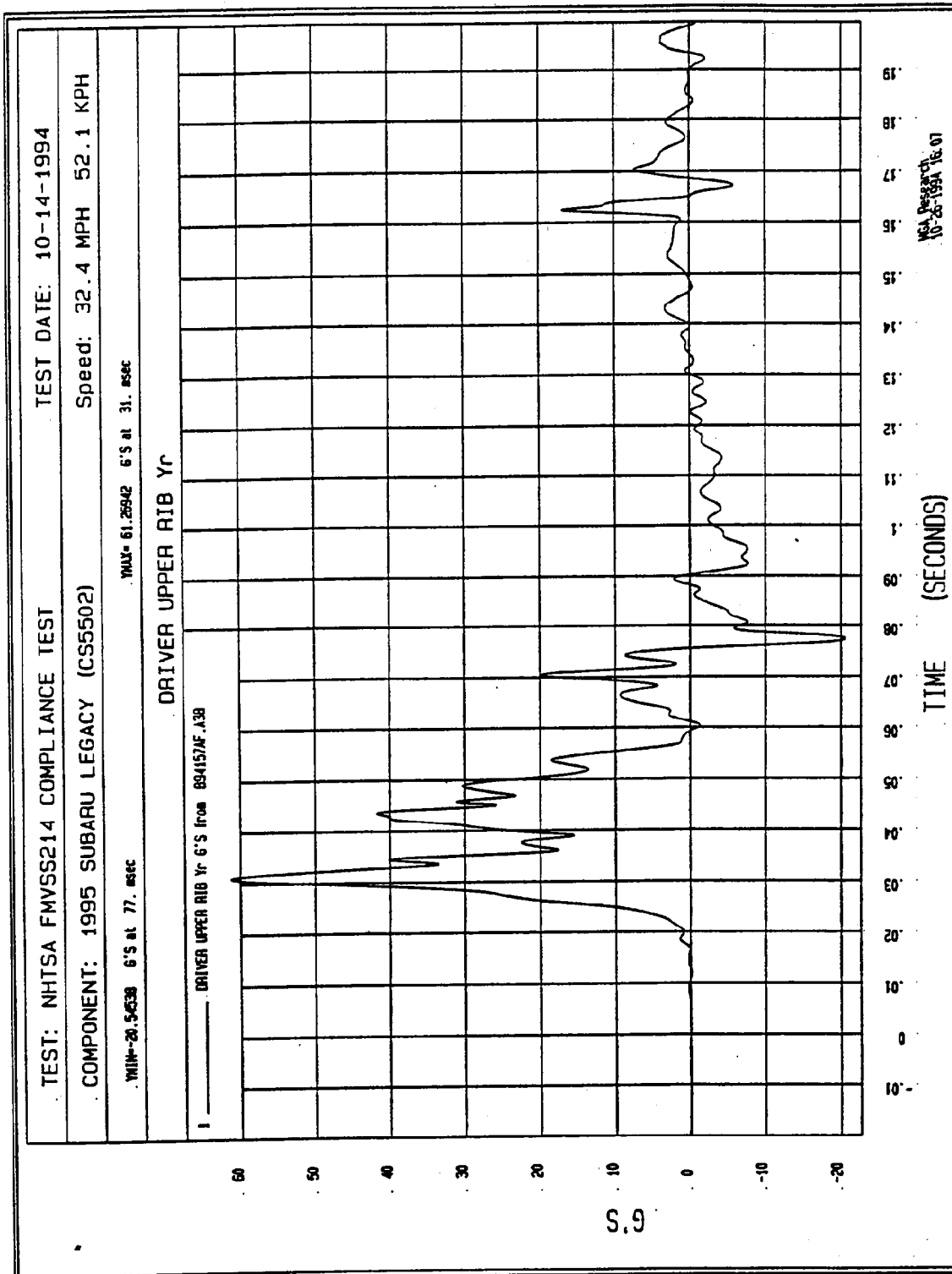


Figure B-67 - Driver Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

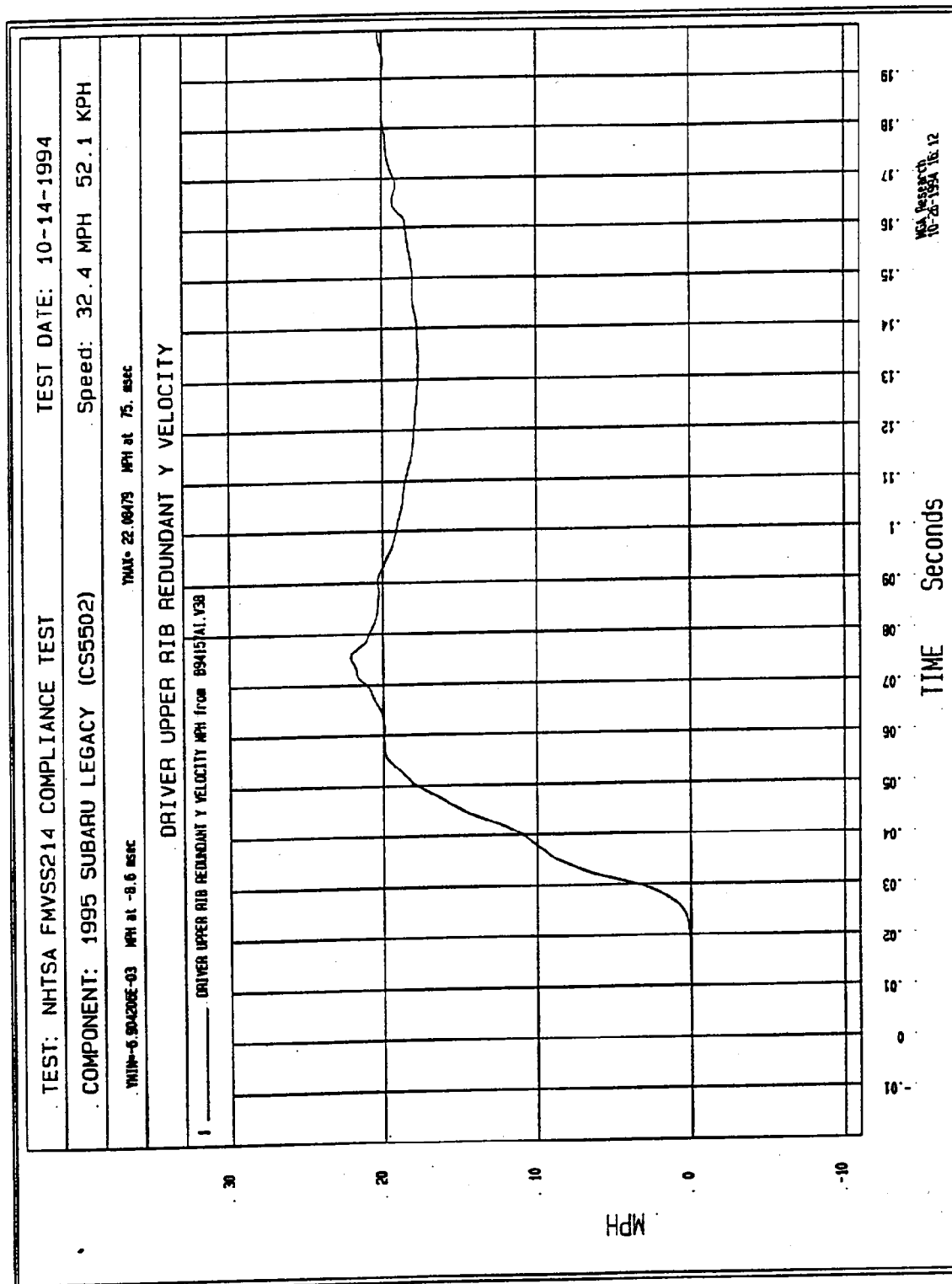


Figure B-68 - Driver Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

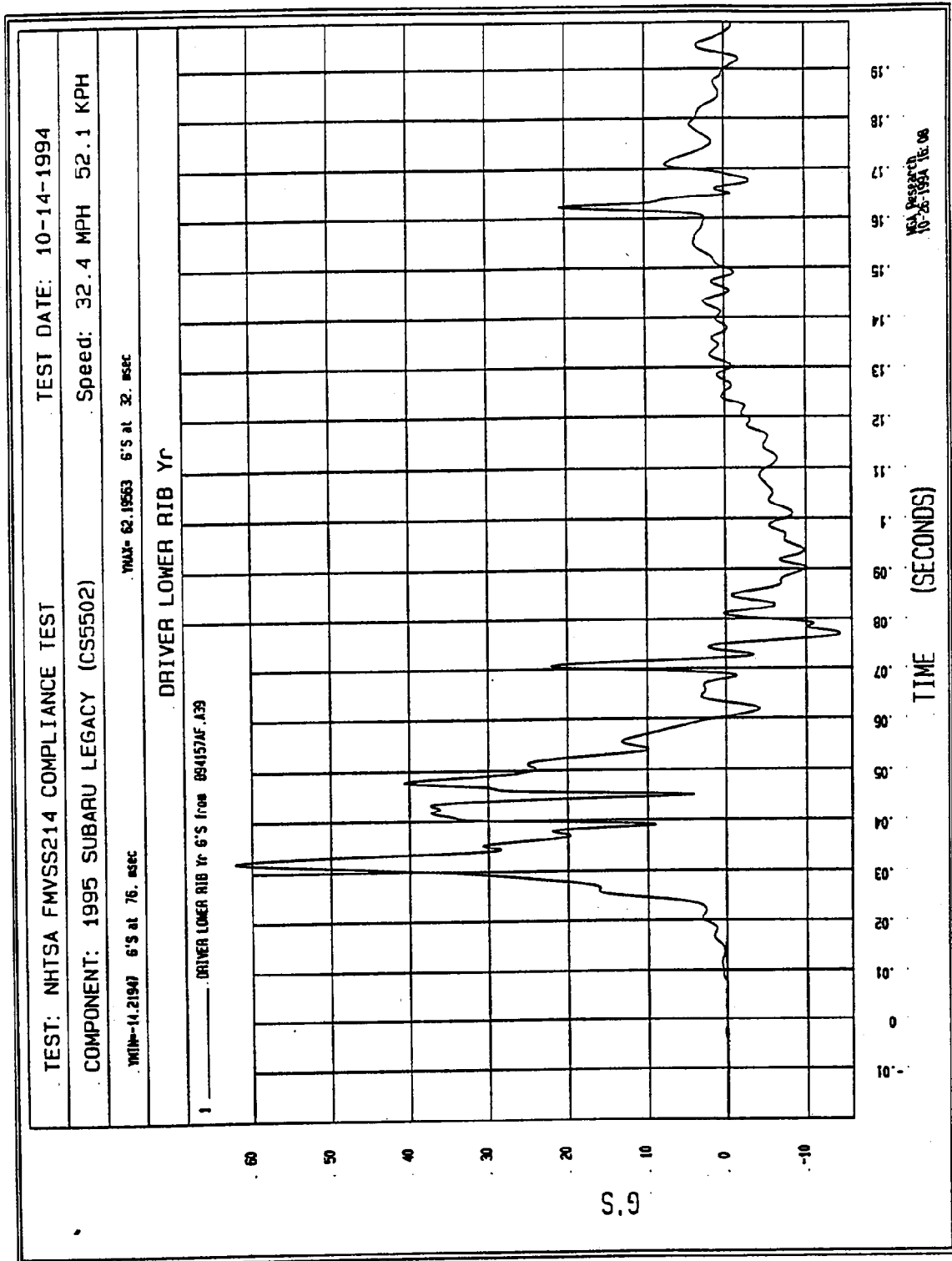


Figure B-69 - Driver Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

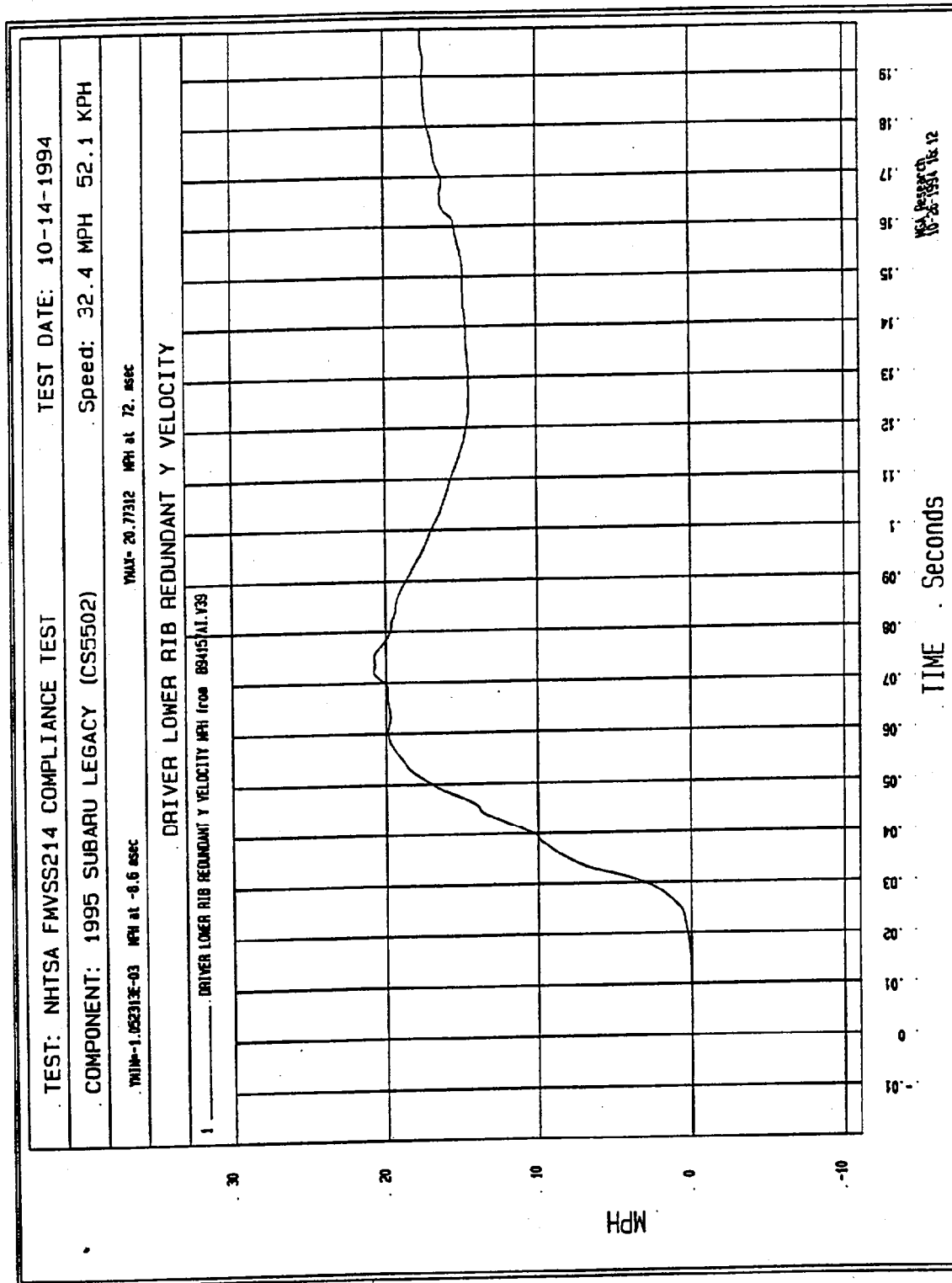


Figure B-70 - Driver Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

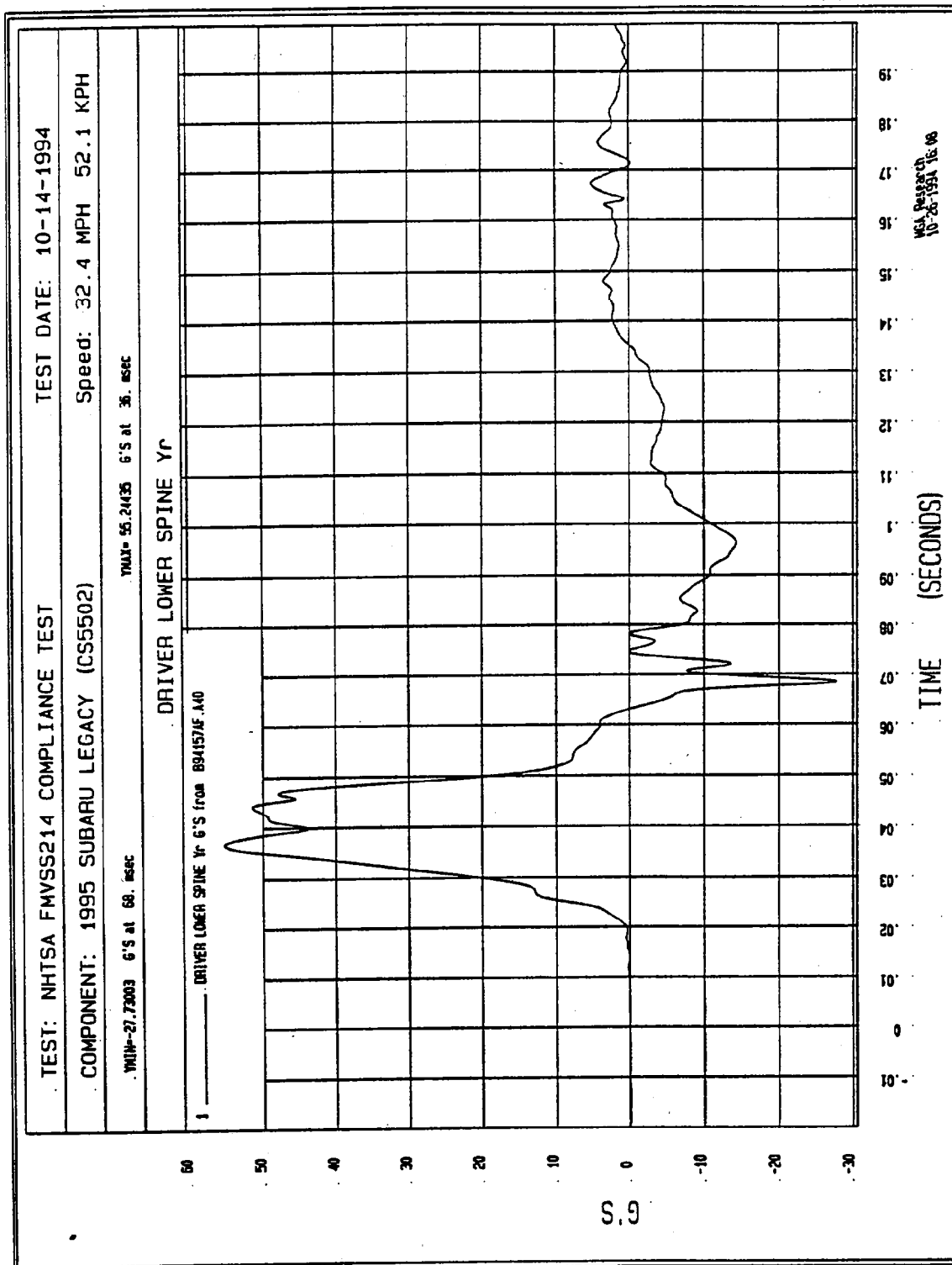


Figure B-71 - Driver Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

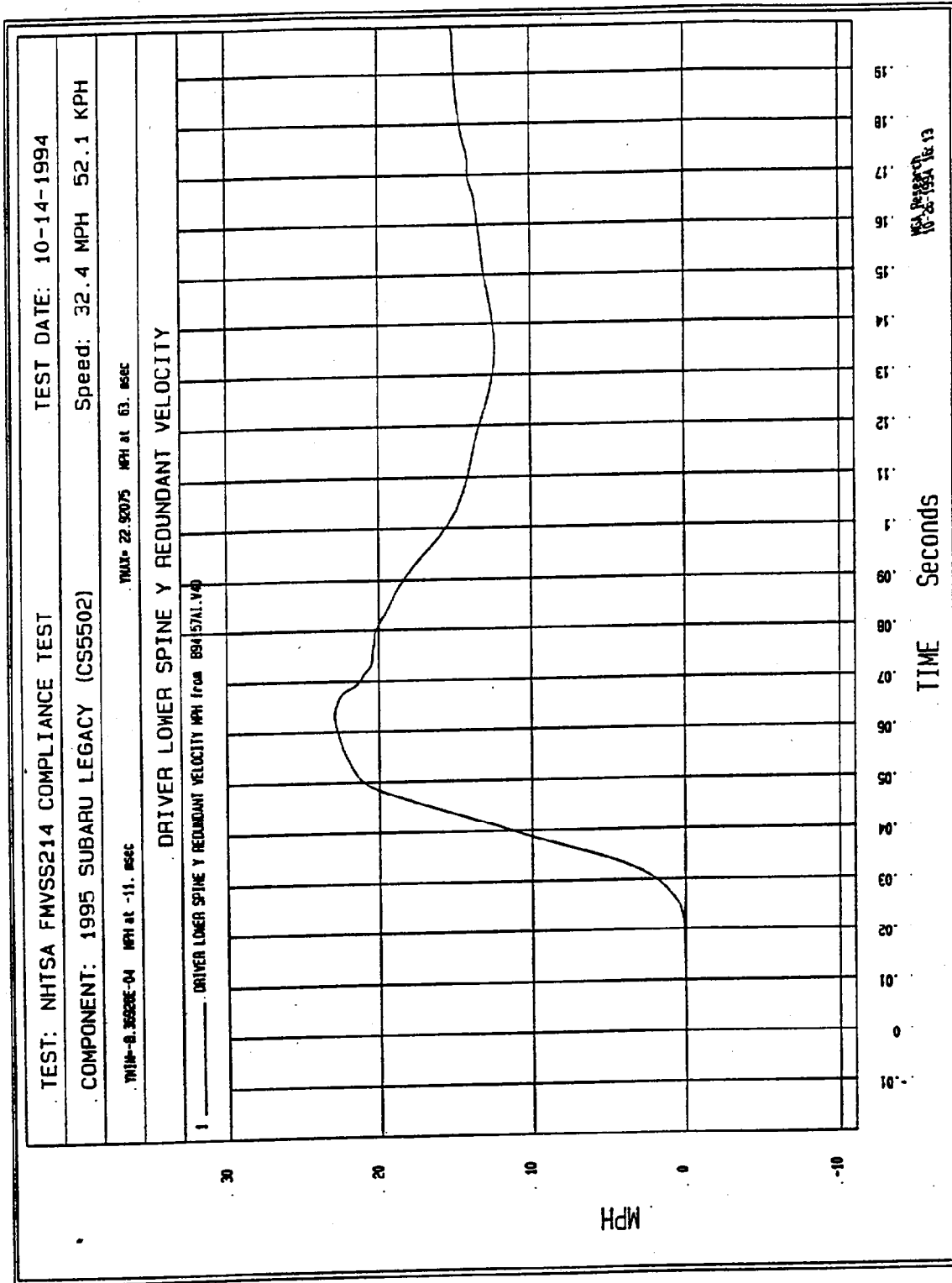


Figure B-72 - Driver Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

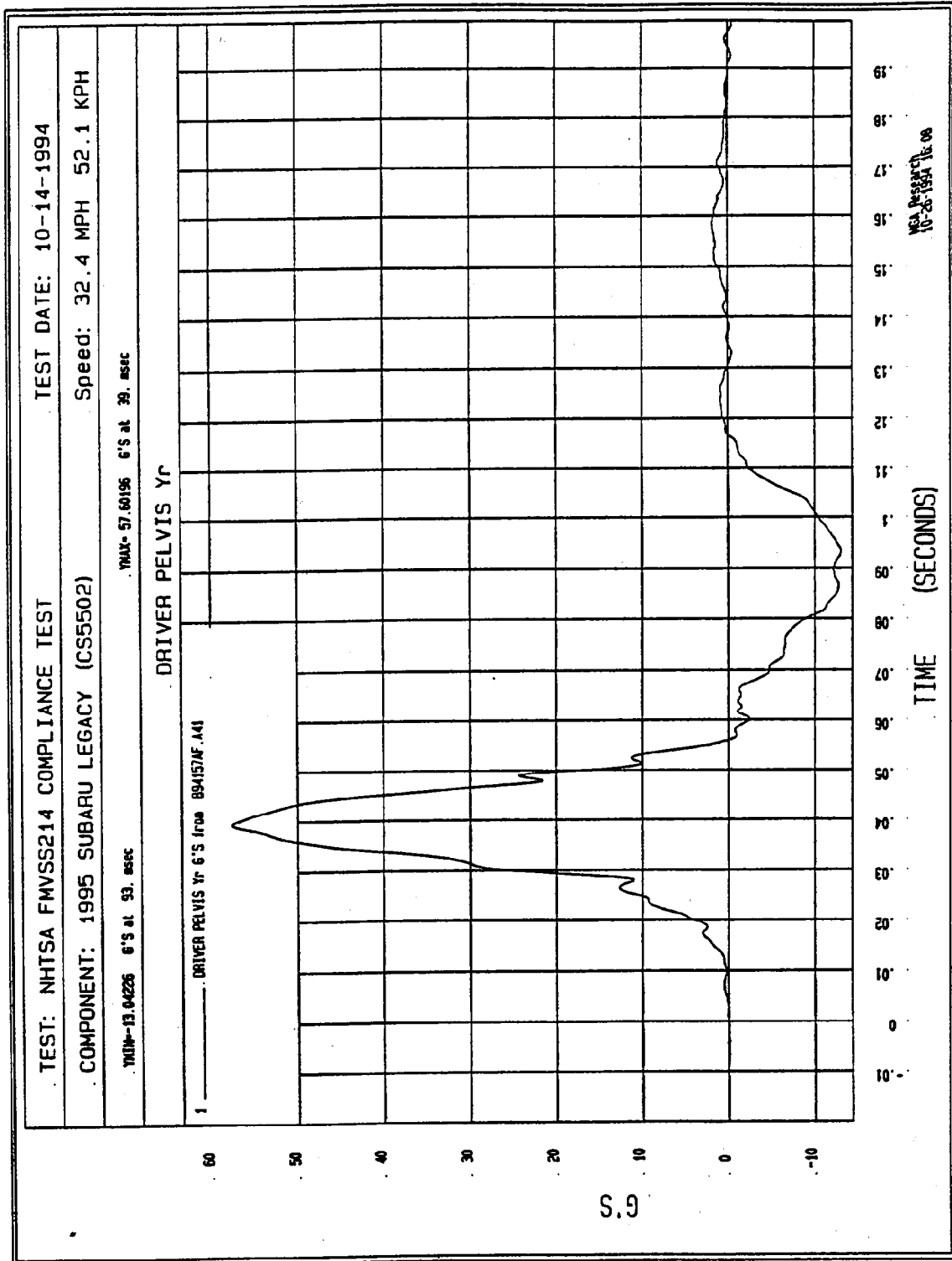


Figure B-73 - Driver Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

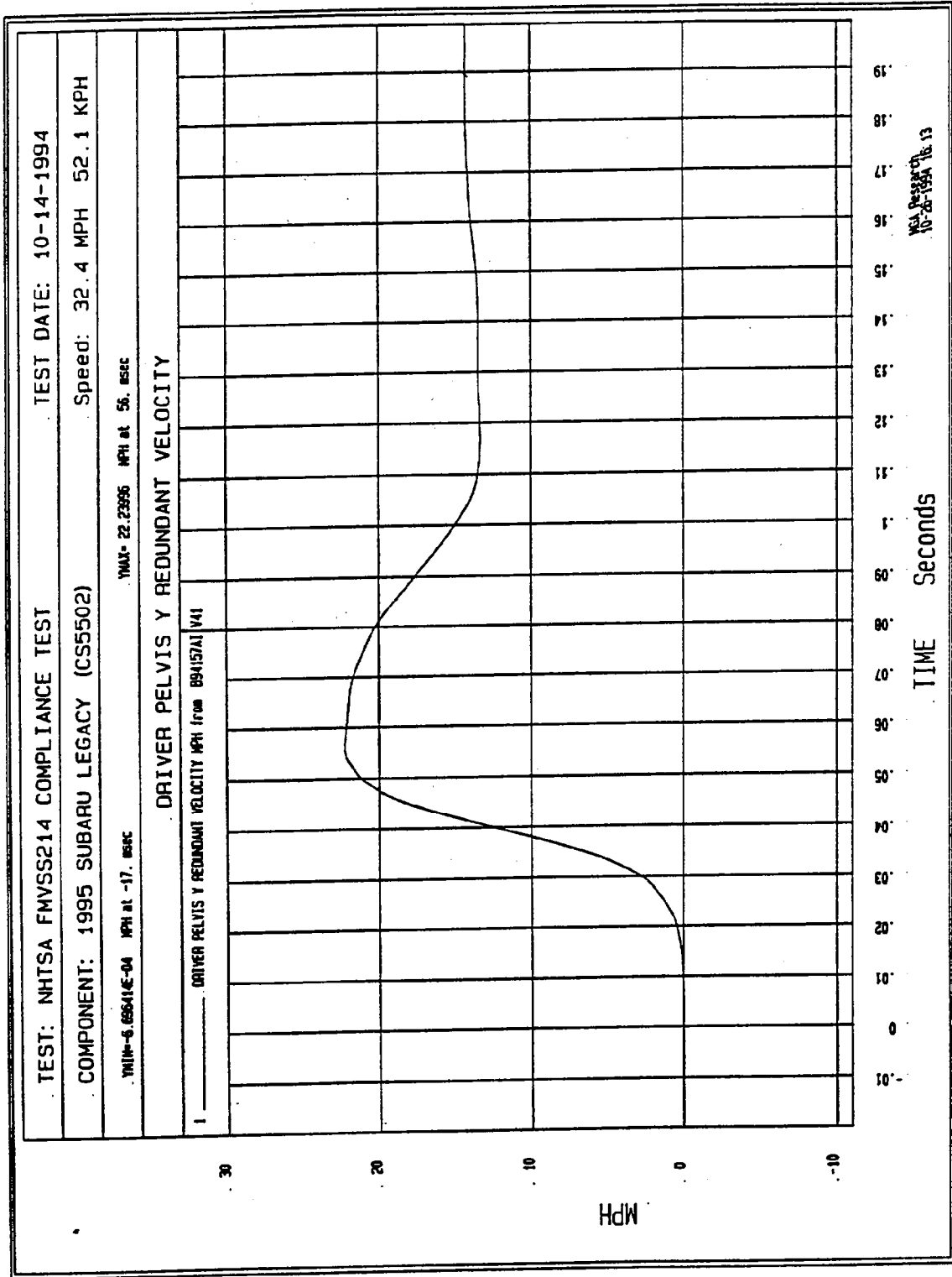


Figure B-74 - Driver Pelvis Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

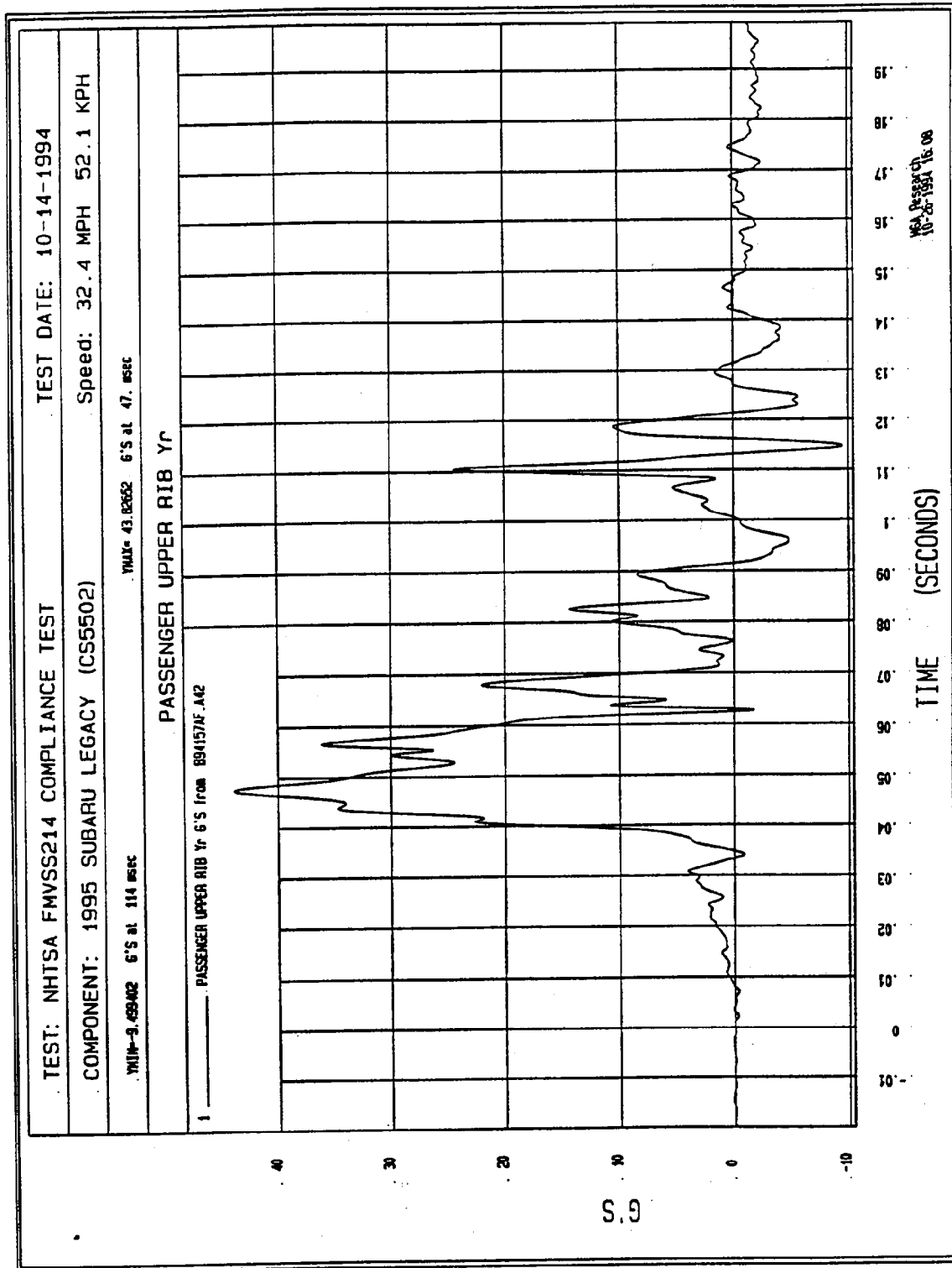


Figure B-75 - Passenger Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

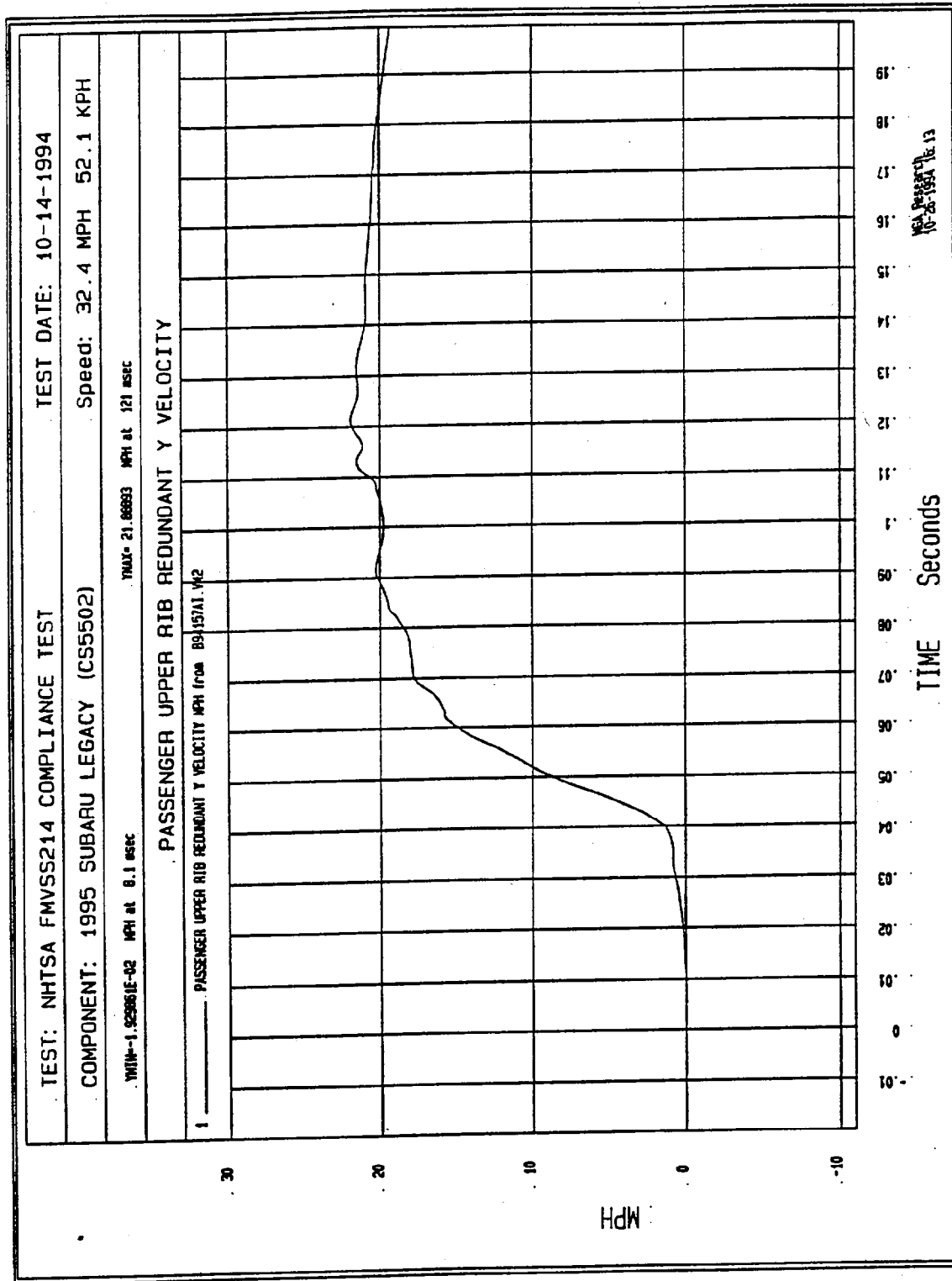


Figure B-76 - Passenger Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

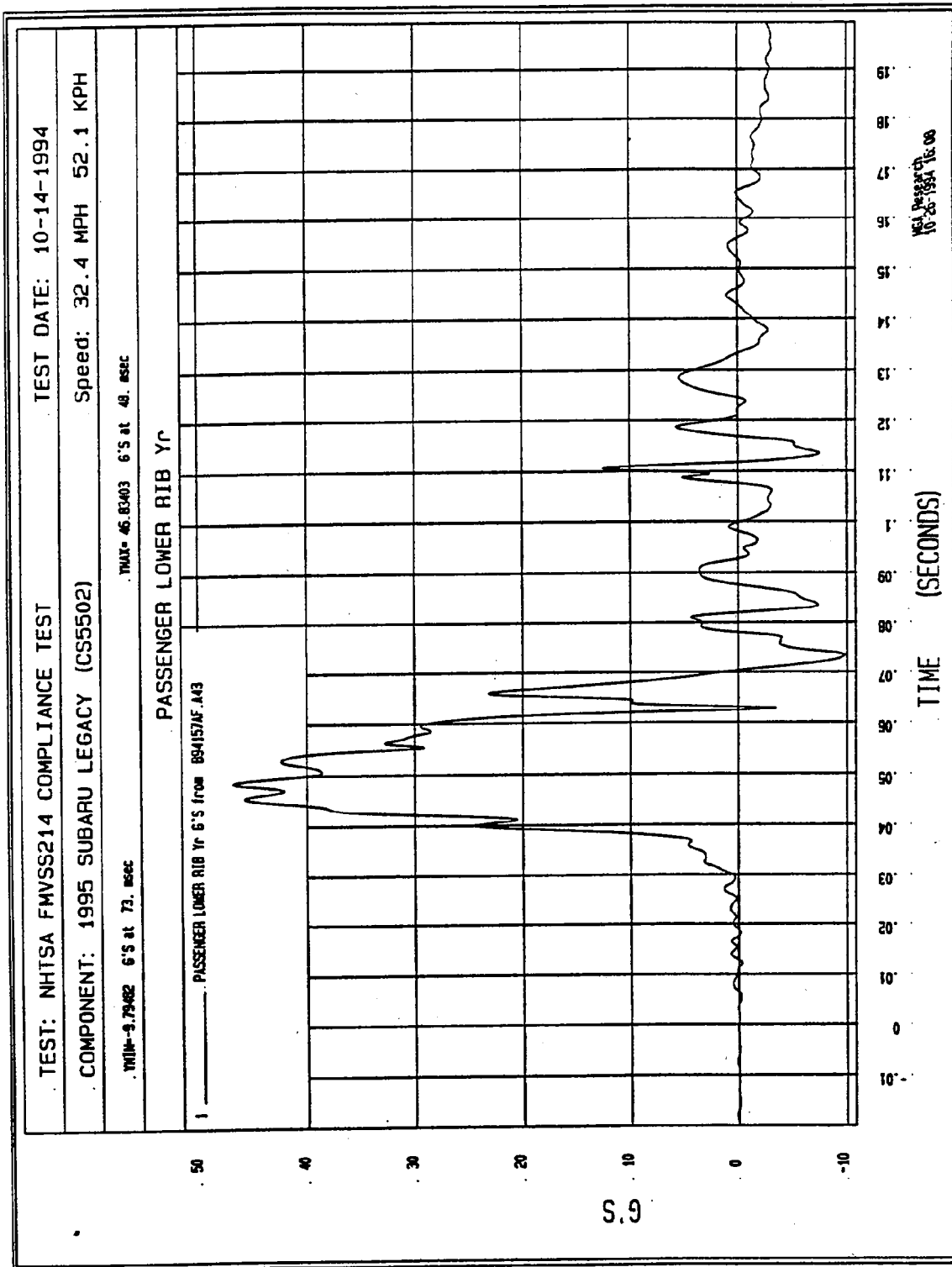


Figure B-77 - Passenger Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

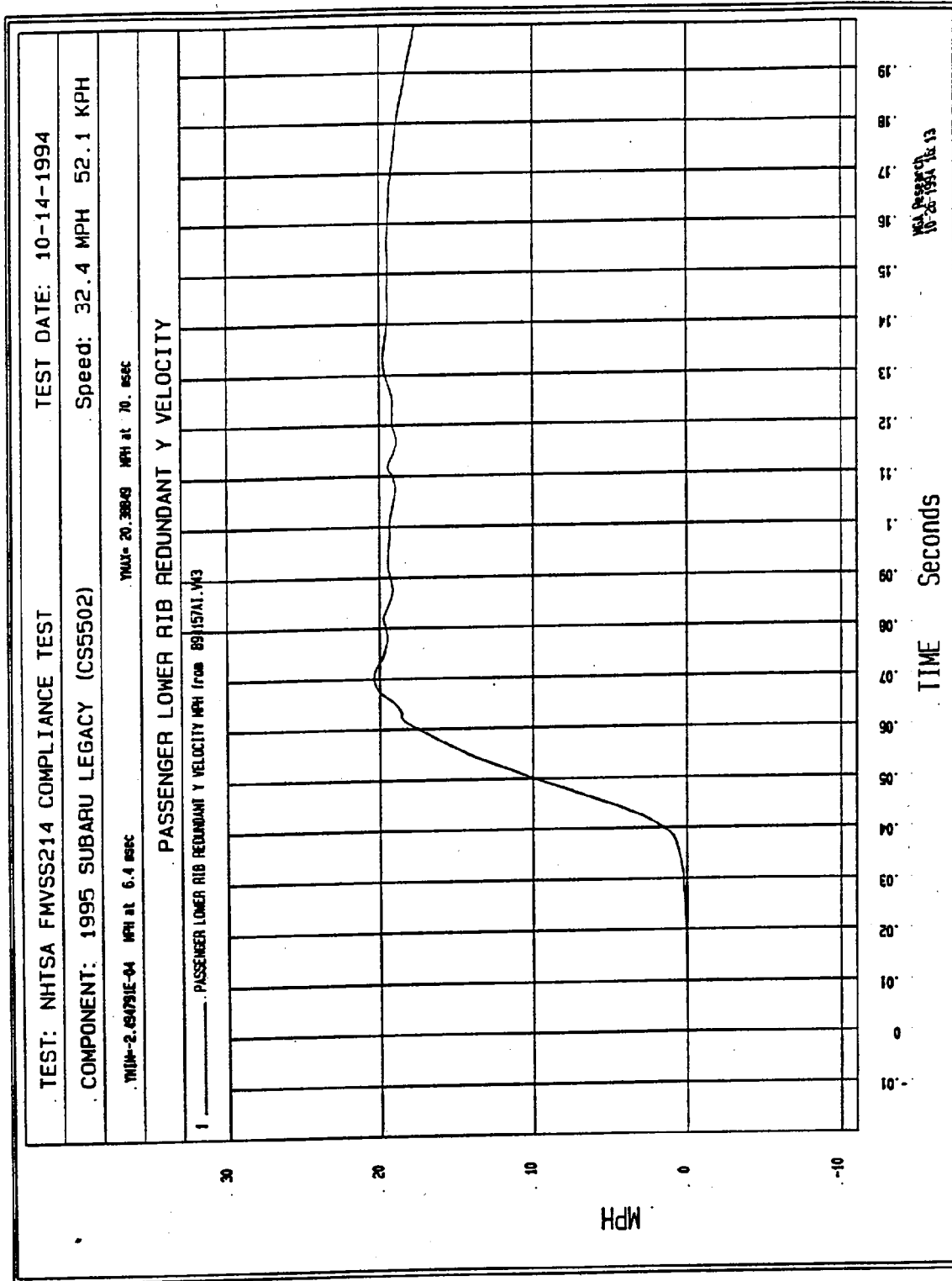


Figure B-78 - Passenger Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

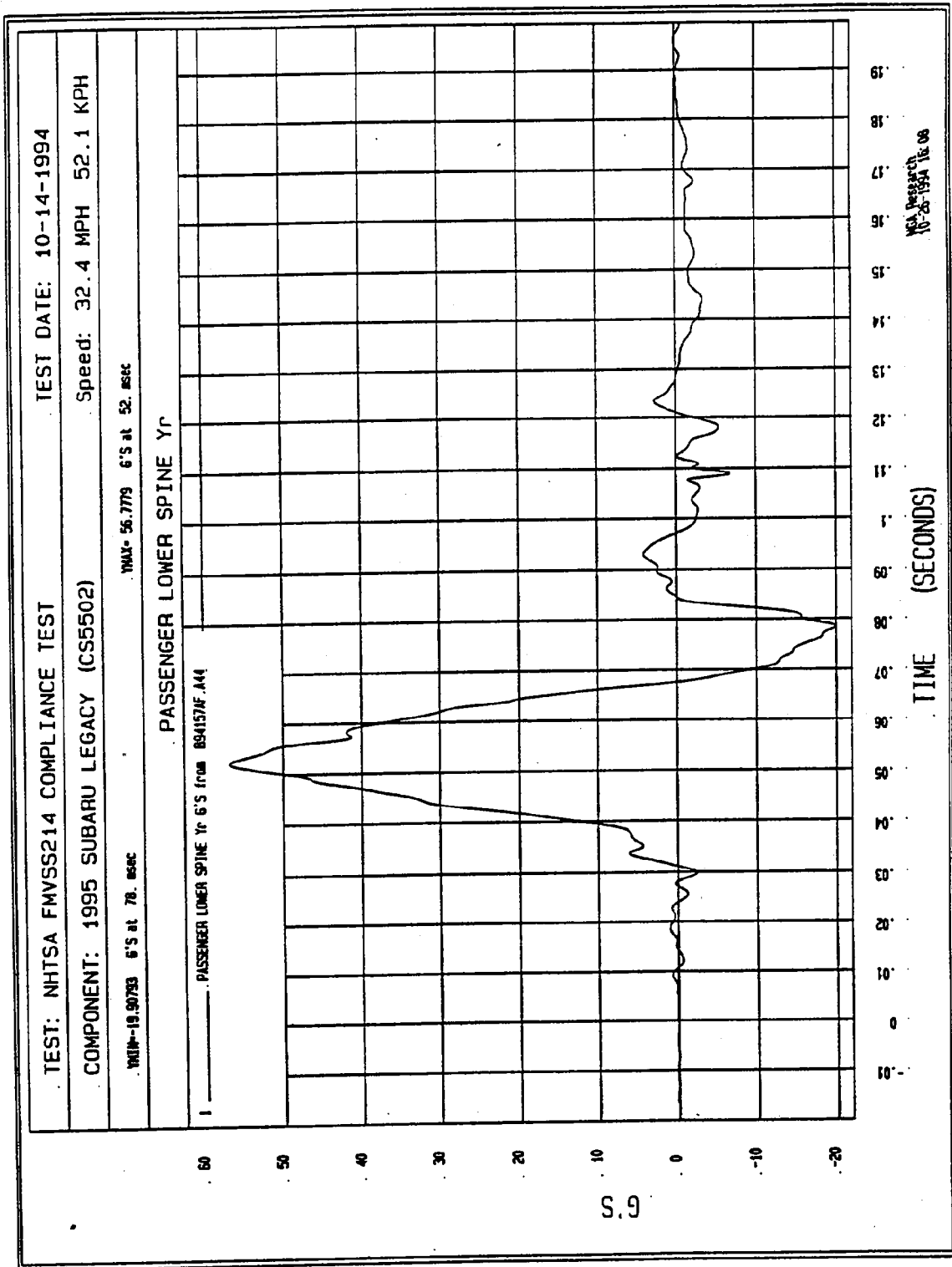


Figure B-79 - Passenger Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

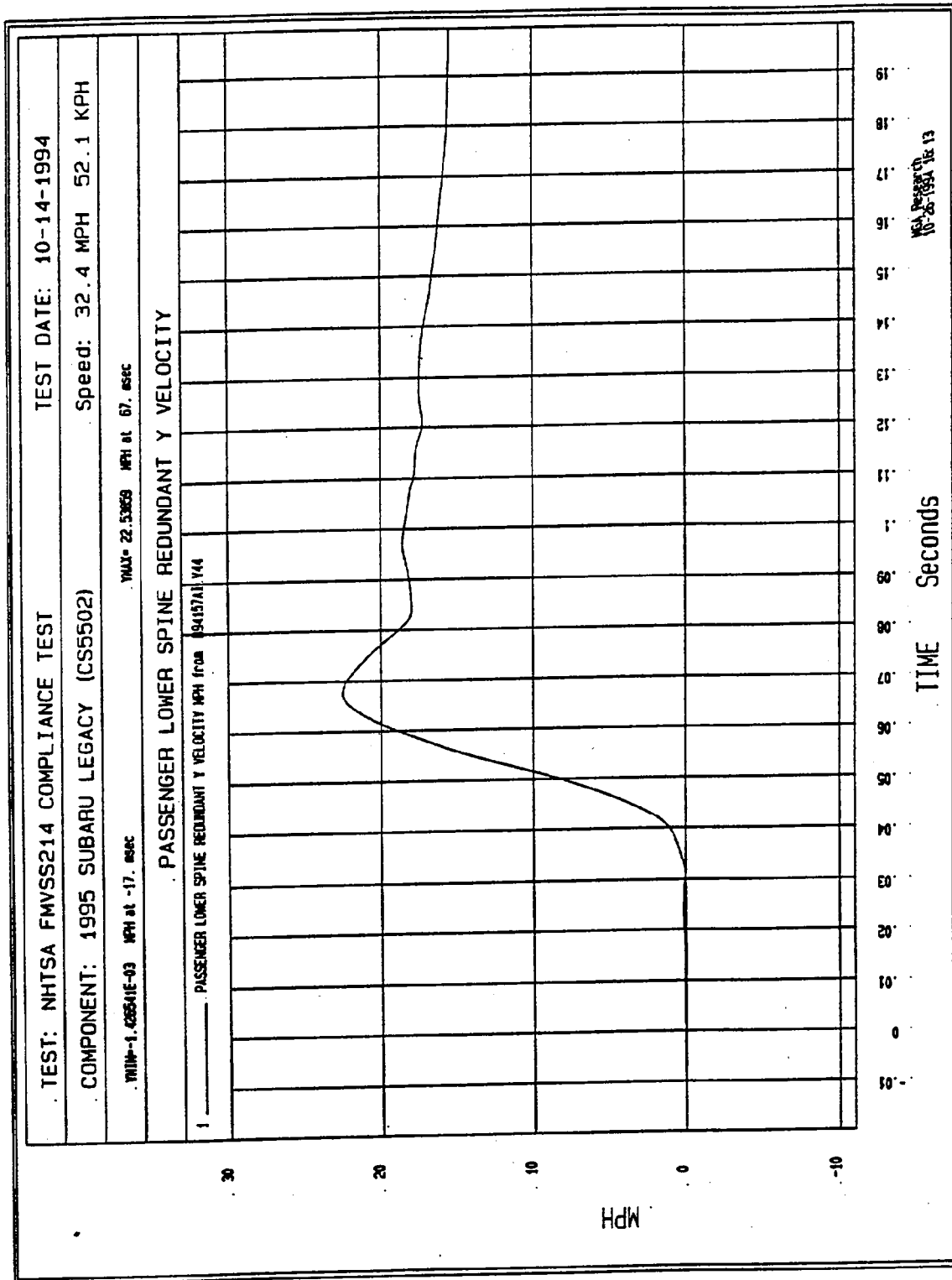


Figure B-80 - Passenger Lower Spine Y Redundant Velocity vs. Time

NO VALID DATA COLLECTED

Figure B-81 - Passenger Pelvis Y Redundant Acceleration vs. Time

NO VALID DATA COLLECTED

Figure B-82 - Passenger Pelvis Y Redundant Velocity vs. Time

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

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* No valid data collected

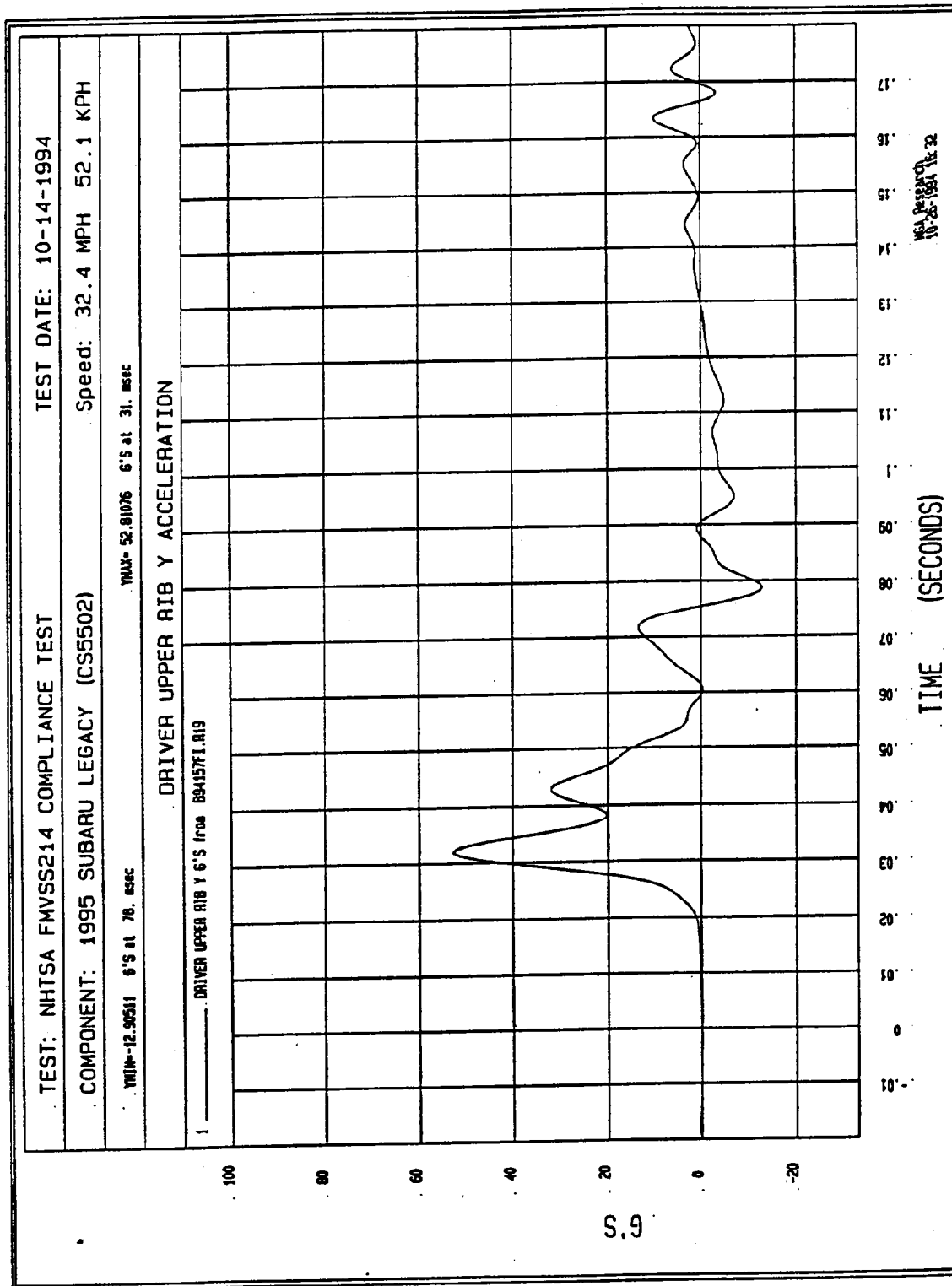


Figure B-83 - Driver Upper Rib Y Acceleration vs. Time

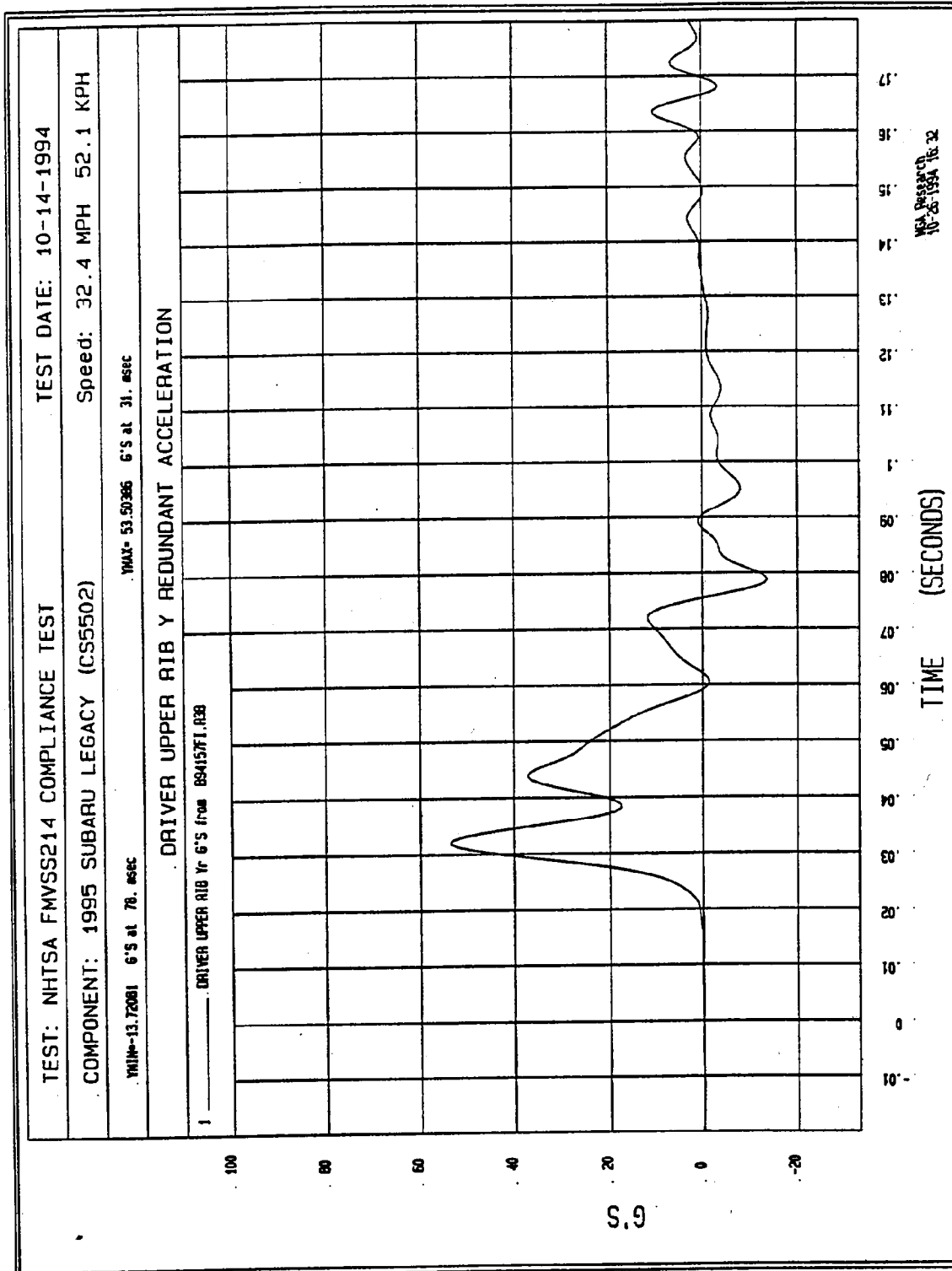


Figure B-84 - Driver Upper Rib Y Redundant Acceleration vs. Time

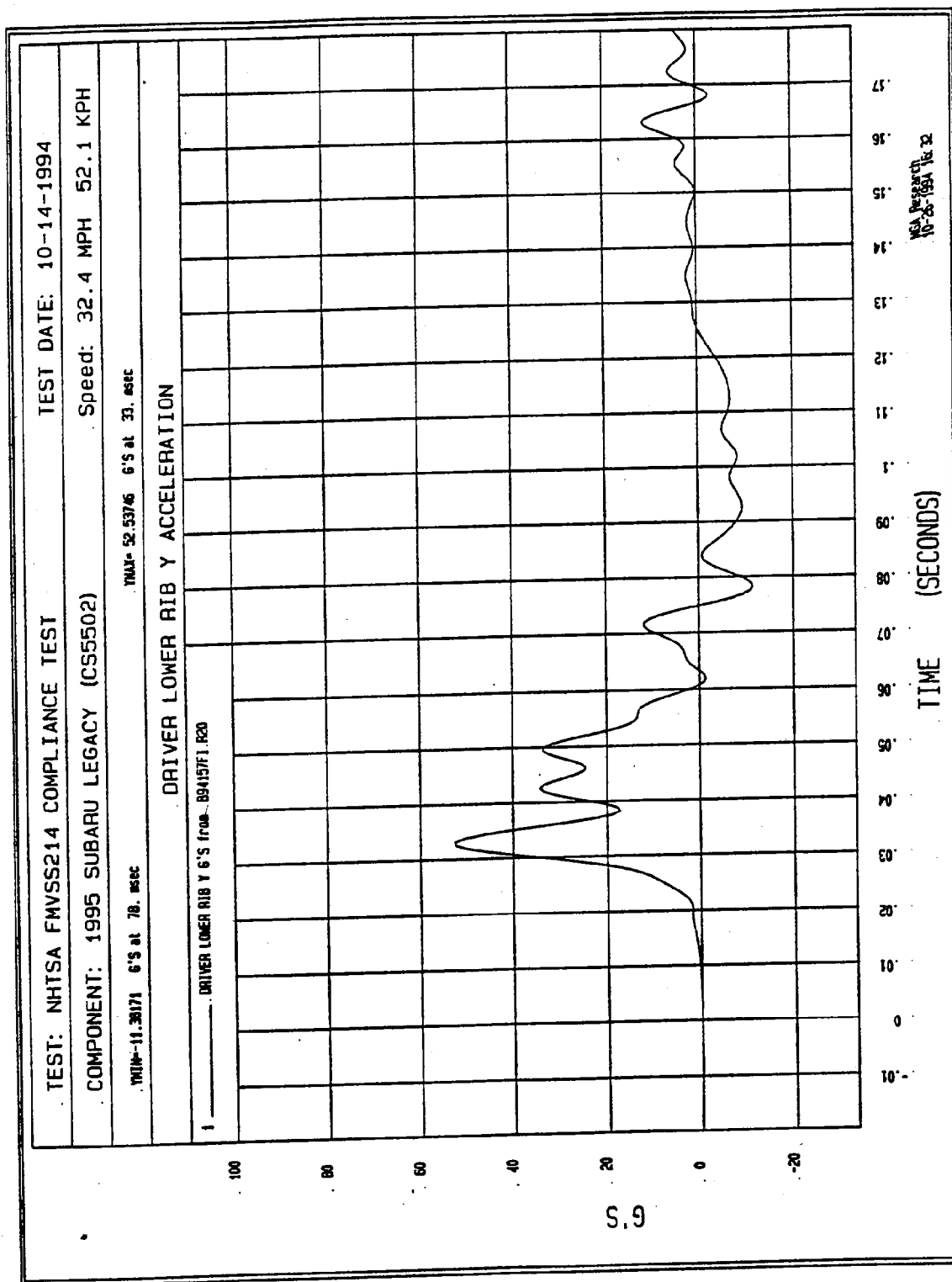


Figure B-85 - Driver Lower Rib Y Acceleration vs. Time

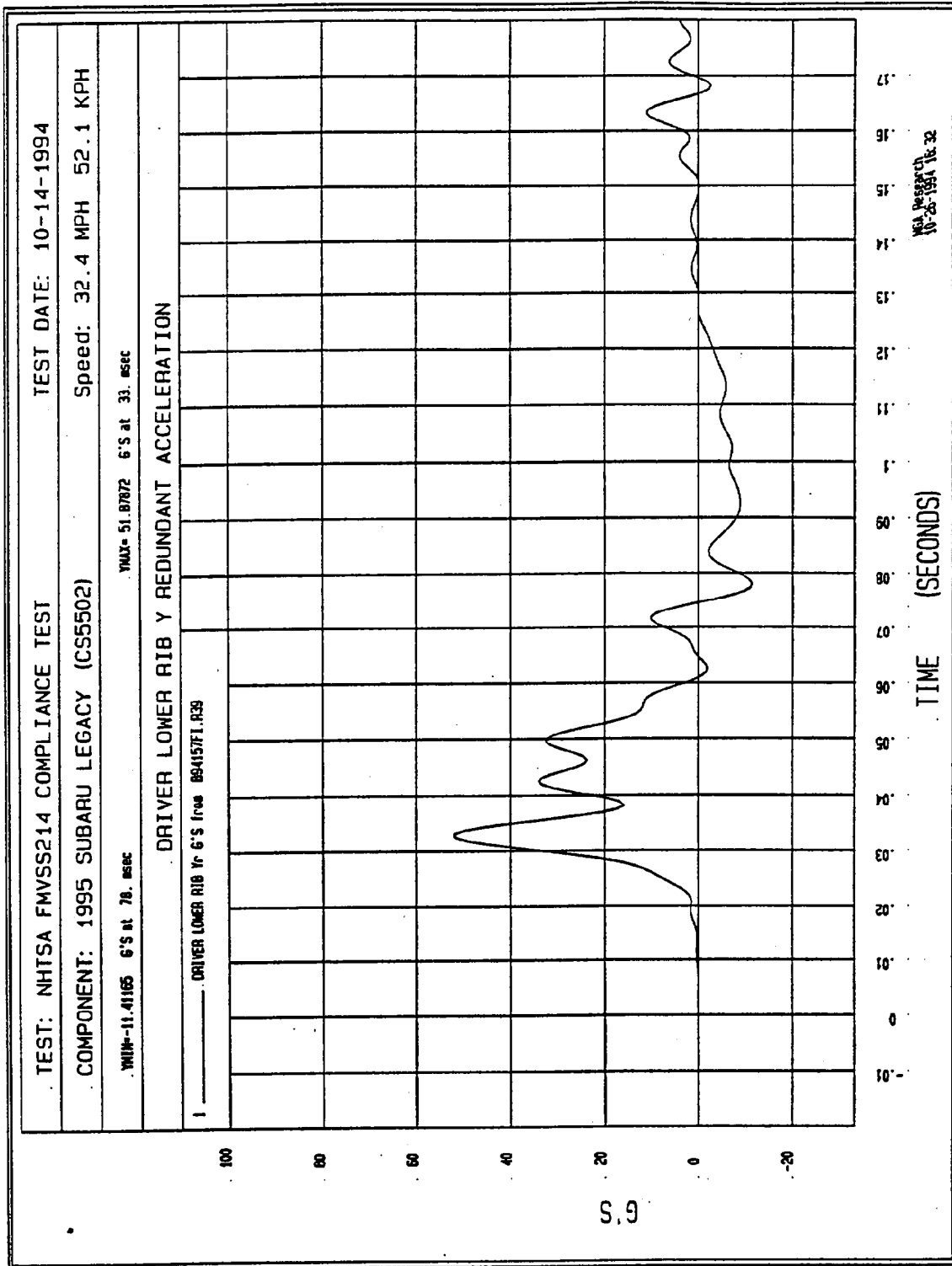


Figure B-86 - Driver Lower Rib Y Redundant Acceleration vs. Time

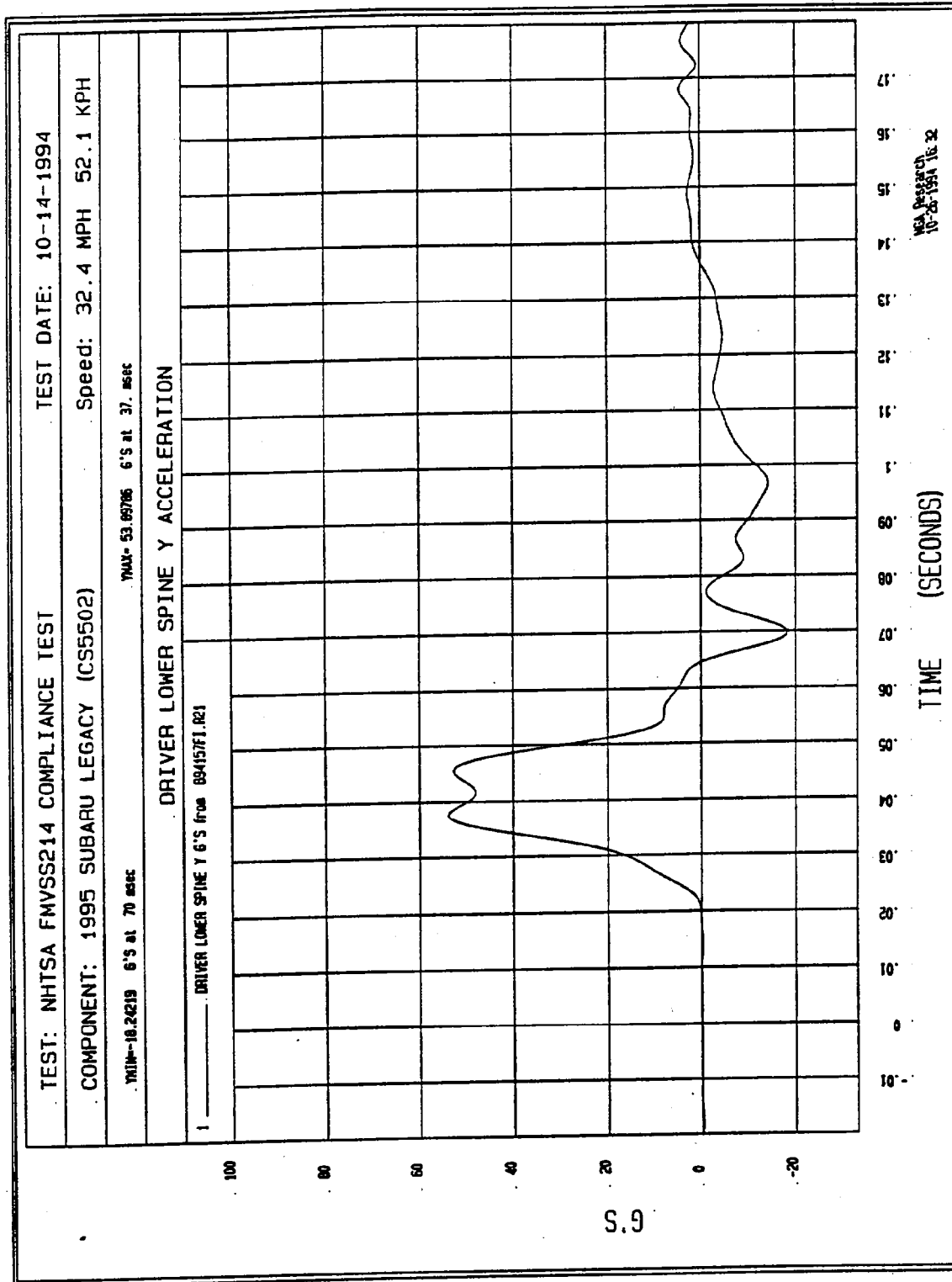


Figure B-87 - Driver Lower Spine Y Acceleration vs. Time

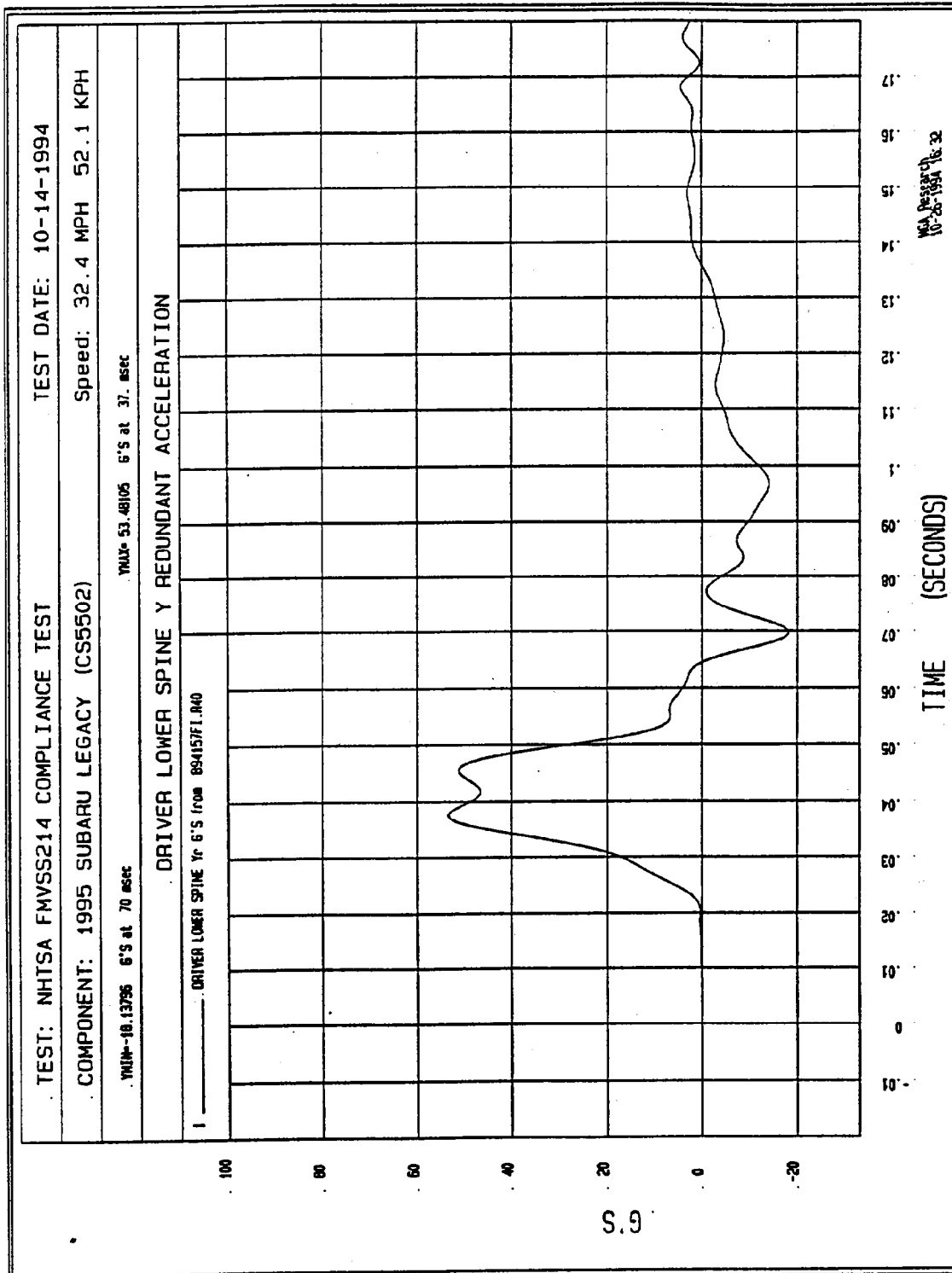


Figure B-88 - Driver Lower Spine Y Redundant Acceleration vs. Time

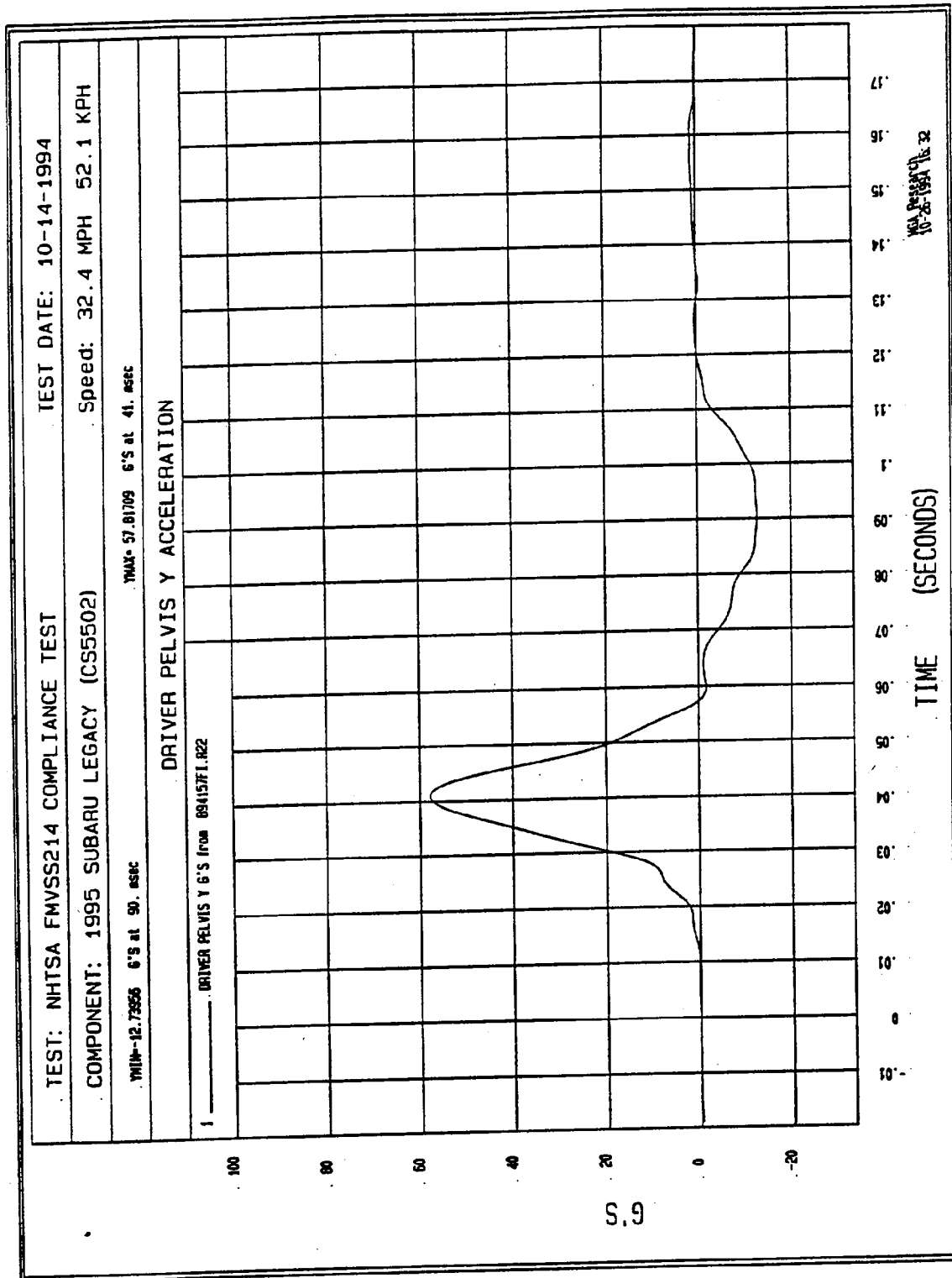


Figure B-89 - Driver Pelvis Y Acceleration vs. Time

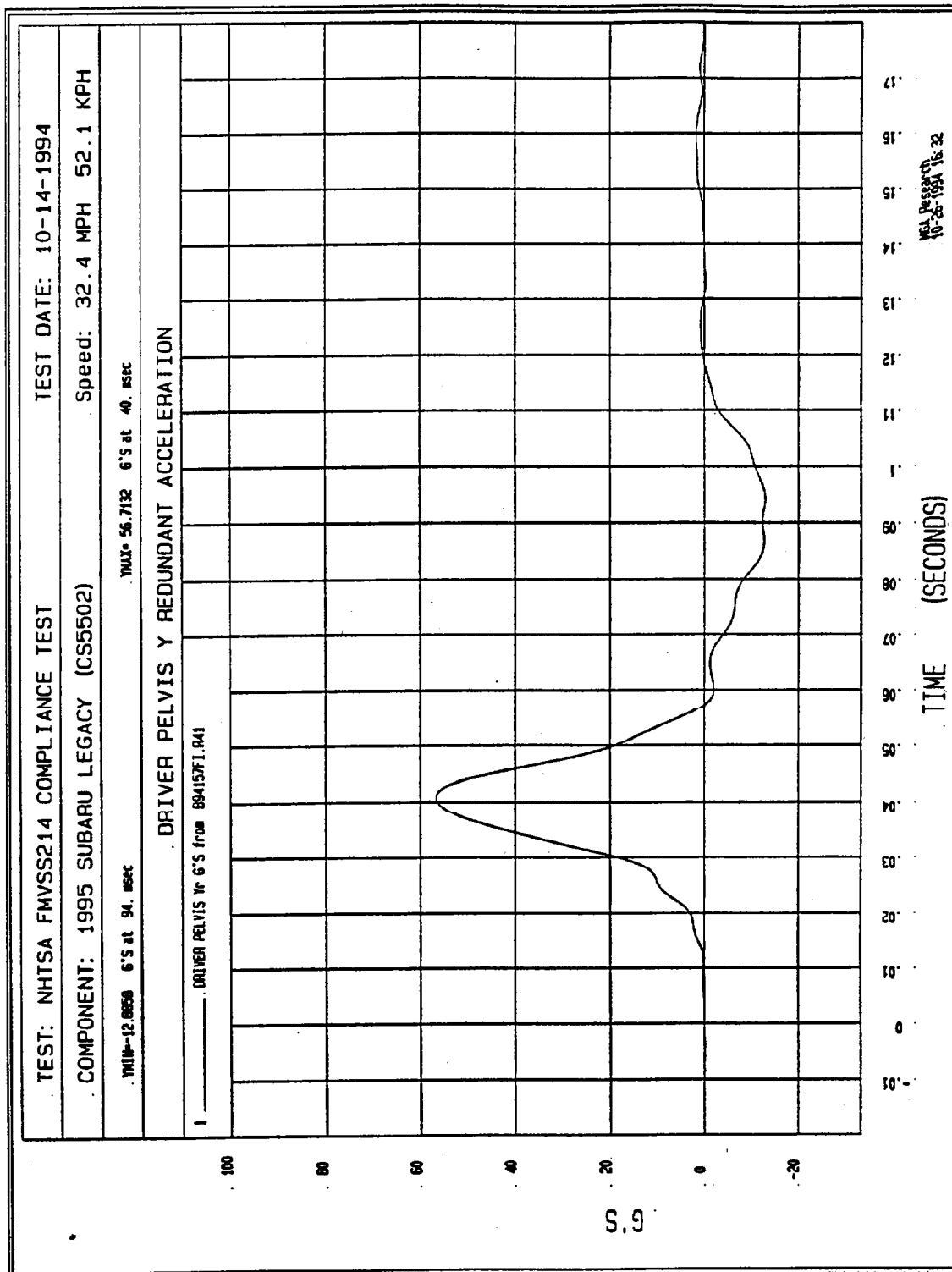


Figure B-90 - Driver Pelvis Y Redundant Acceleration vs. Time

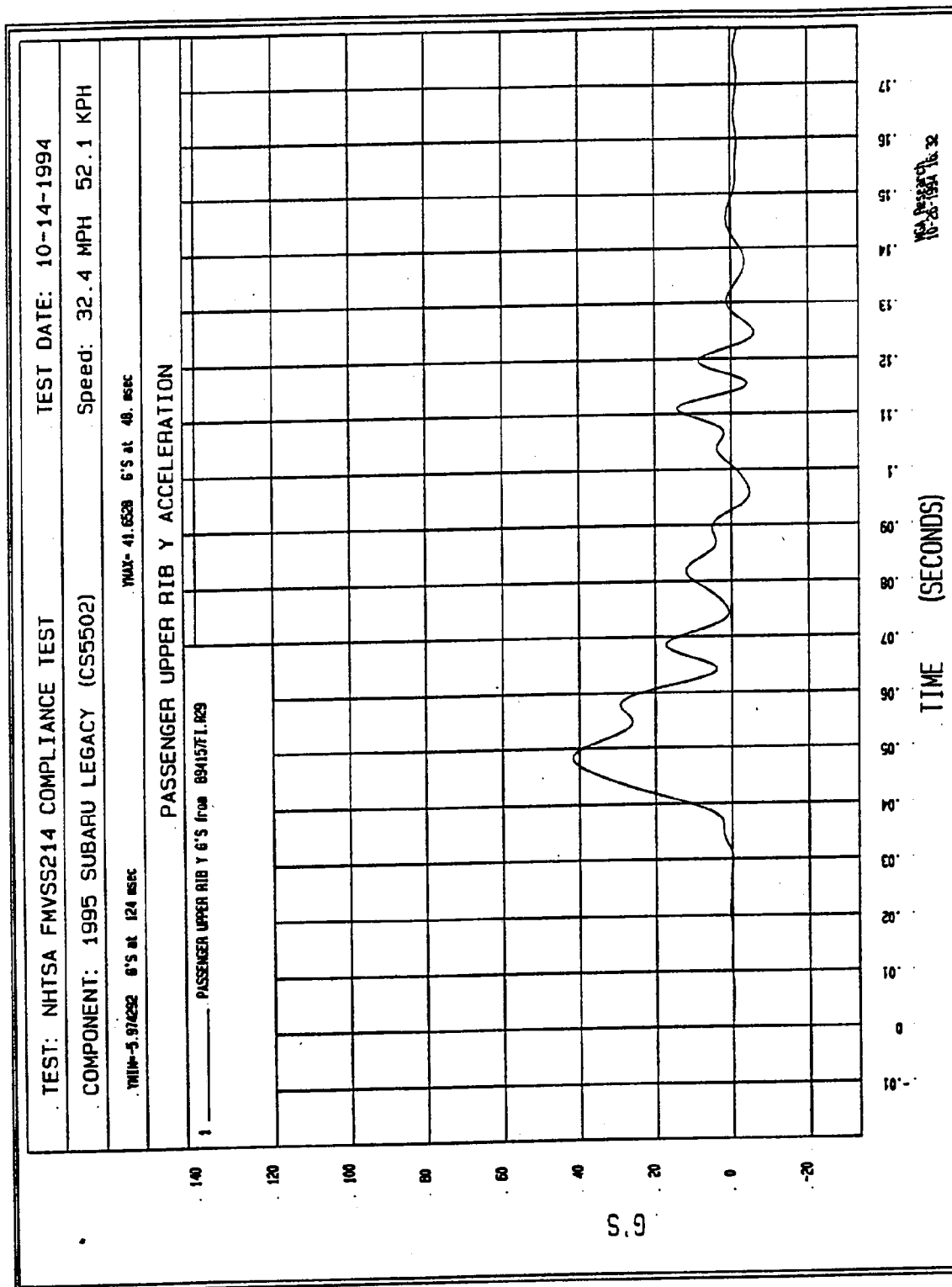


Figure B-91 - Passenger Upper Rib Y Acceleration vs. Time

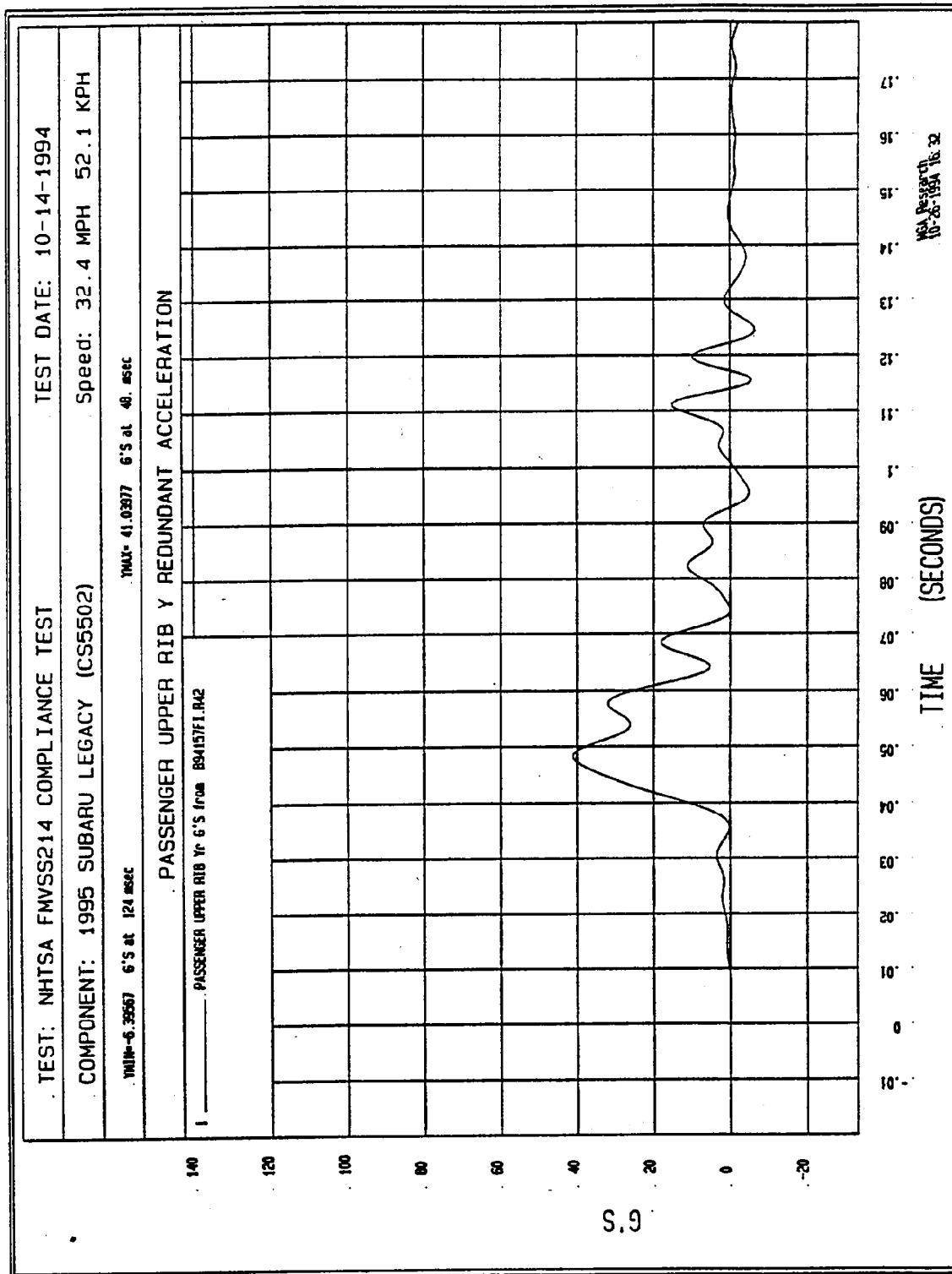


Figure B-92 - Passenger Upper Rib Y Redundant Acceleration vs. Time

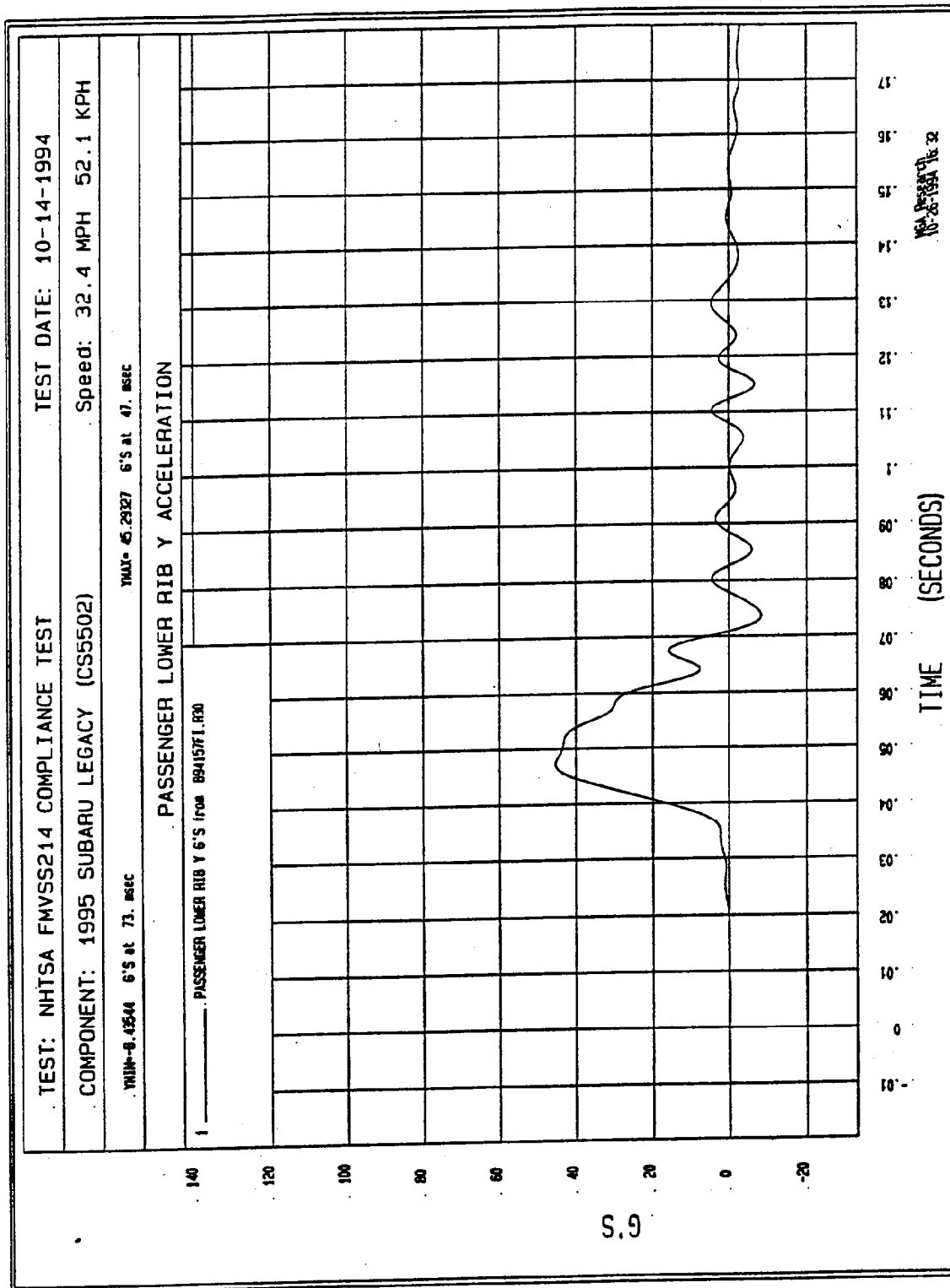


Figure B-93 - Passenger Lower Rib Y Acceleration vs. Time

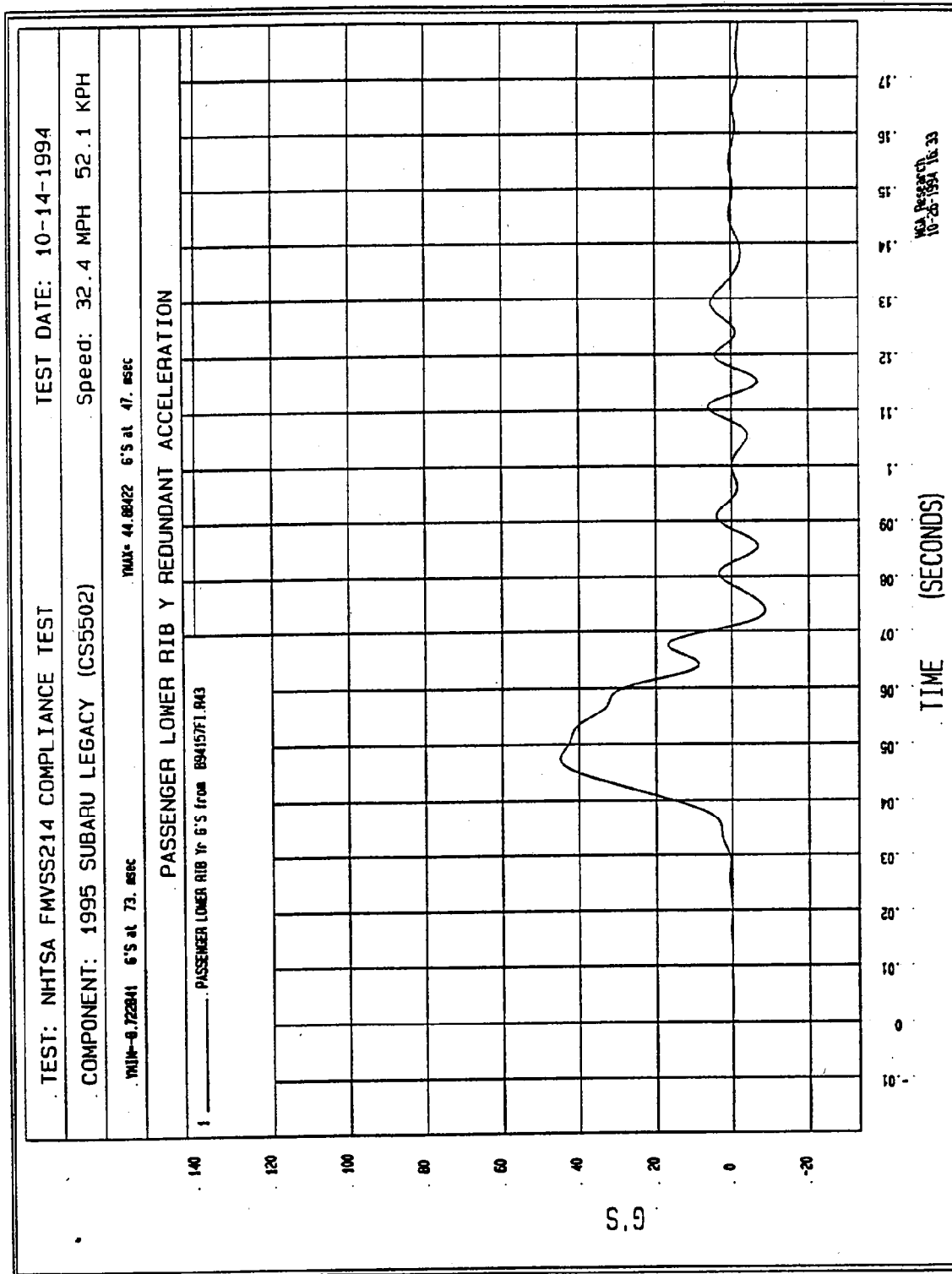


Figure B-94 - Passenger Lower Rib Y Redundant Acceleration vs. Time

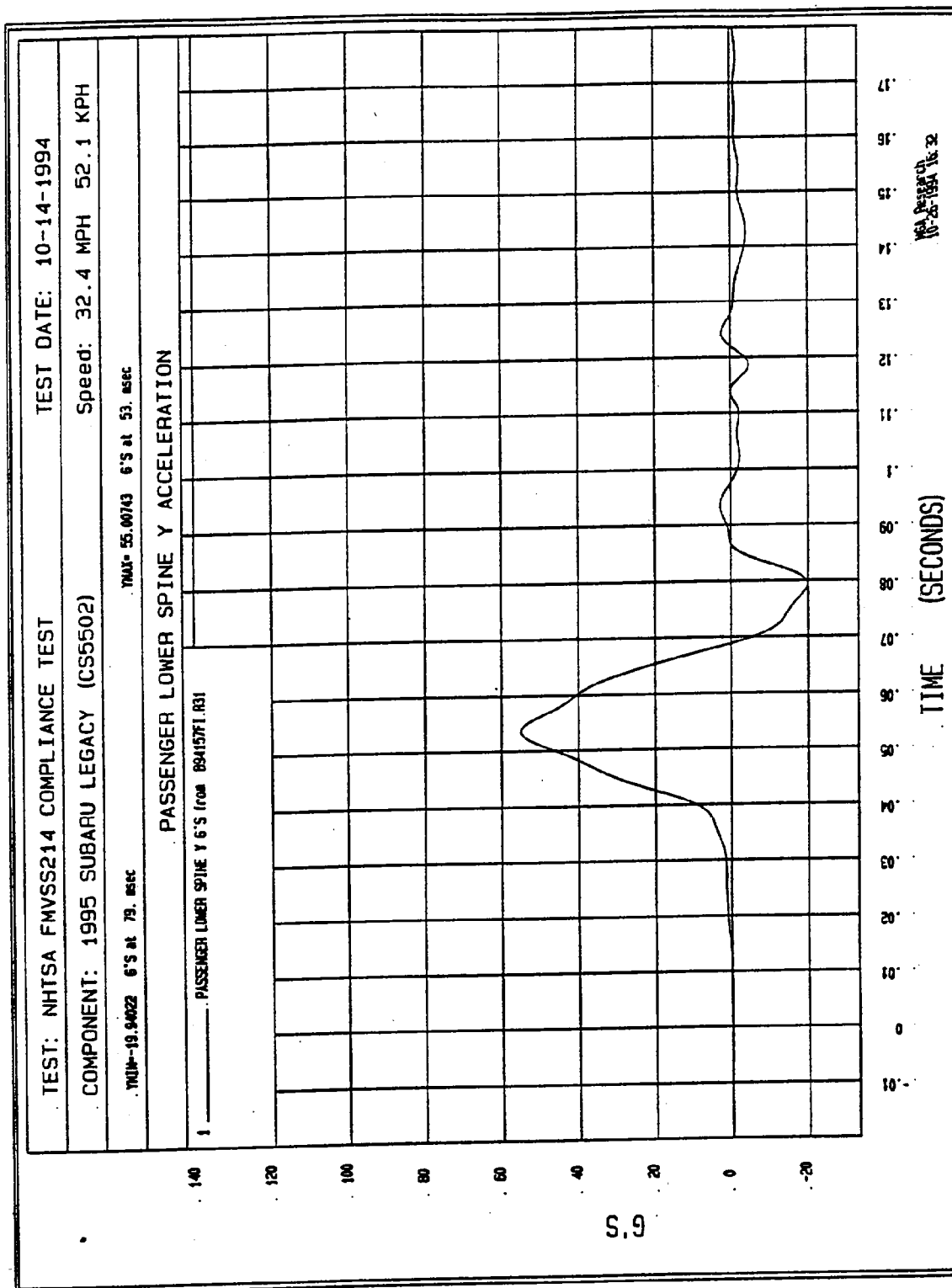


Figure B-95 - Passenger Lower Spine Y Acceleration vs. Time

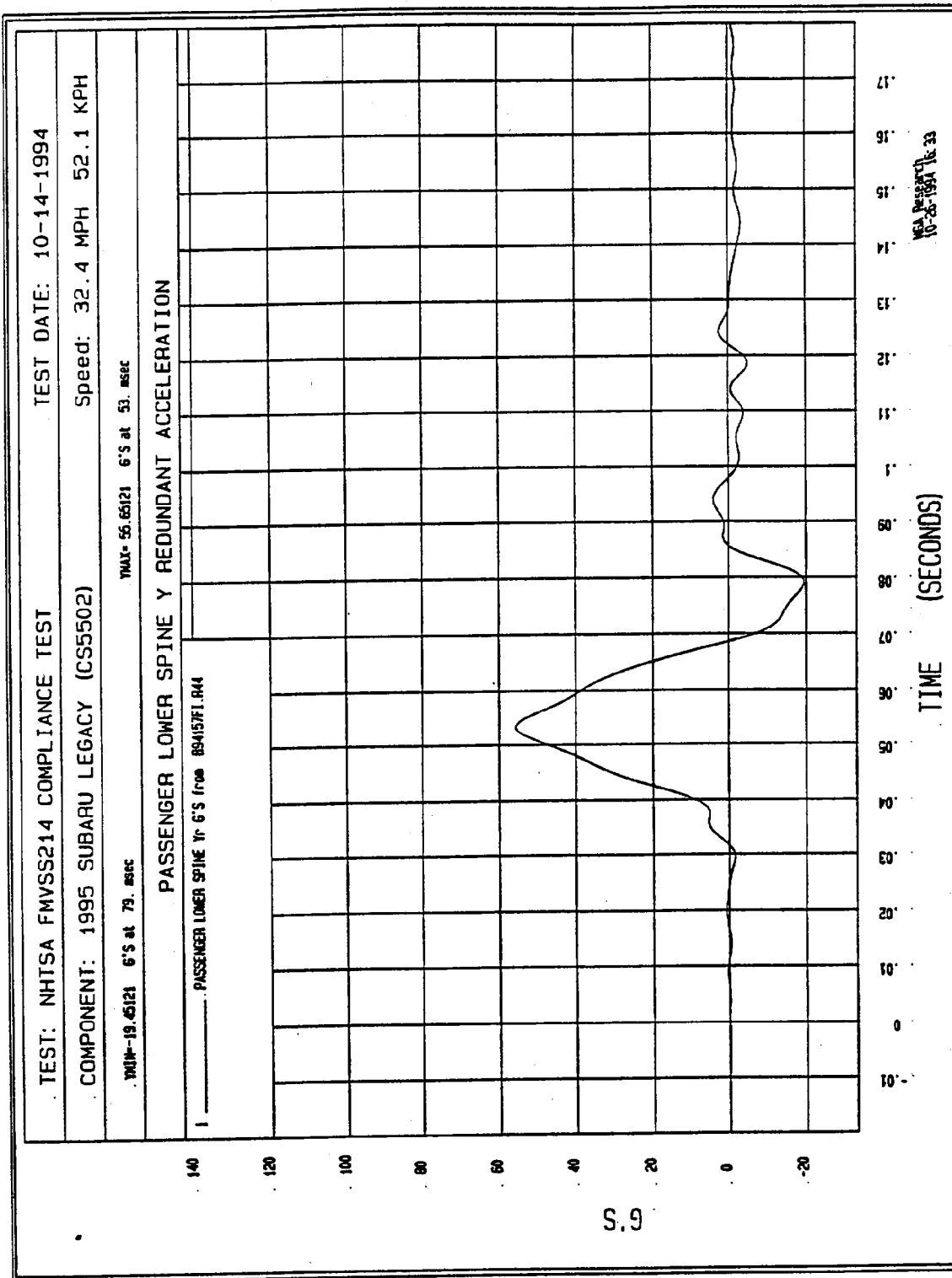


Figure B-96 - Passenger Lower Spine Y Redundant Acceleration vs. Time

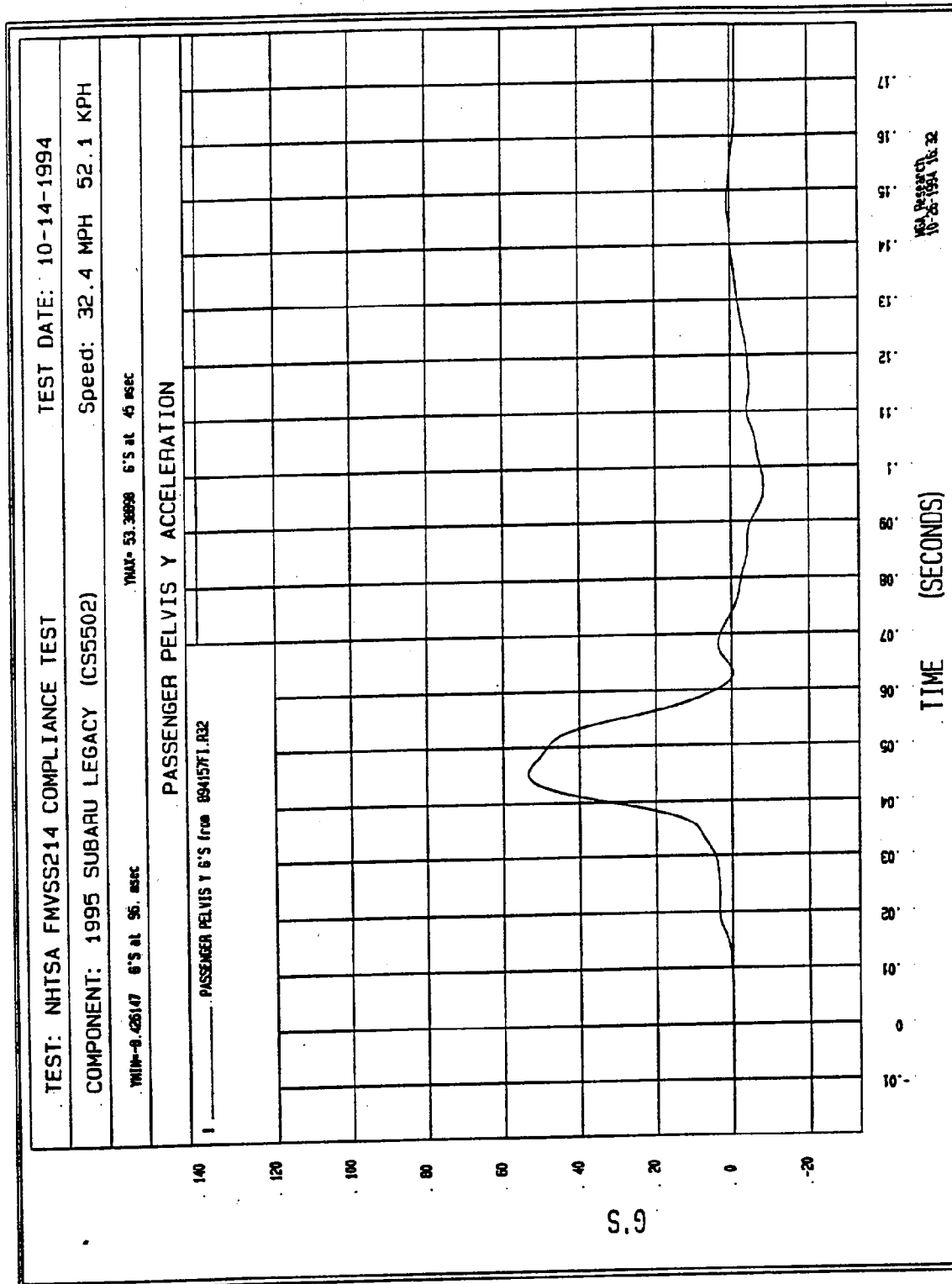


Figure B-97 - Passenger Pelvis Y Acceleration vs. Time

NO VALID DATA COLLECTED

Figure B-98 - Passenger Pelvis Y Redundant Acceleration vs. Time

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-95-DC002

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

FUJI HEAVY INDUSTRIES LTD.
1995 SUBARU LEGACY 4 DOOR SATION WAGON
NHTSA NO. CS5502

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: October 14, 1994

Report Date: November 21, 1994

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NEF-30
400 SEVENTH STREET, S.W., ROOM 6115
Washington, D.C. 20590

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DUMMY S/N: 271	POST-TEST CERTIFICATION DATA	4-1
DUMMY S/N: 269	POST-TEST INSPECTION CHECKLIST	5-1
DUMMY S/N: 271	POST-TEST INSPECTION CHECKLIST	6-1
	VEHICLE AND DUMMY TEMPERATURE	7-1

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

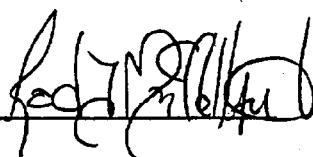
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

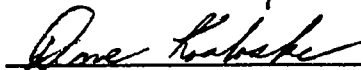
DATE OF VERIFICATION: July 26, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75 - 20.5"	20.3
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	14.9

MEASUREMENTS BY: _____



APPROVED BY: _____



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 20, 1994

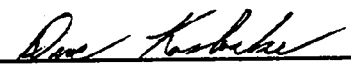
DUMMY NUMBER: 269

TEST NUMBER: D941622

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 fps	13.99
UPPER RIB	37 - 46 g's	39.7
LOWER RIB	37 - 46 g's	39.9
LOWER SPINE	15 - 22 g's	20.8

TEST MEETS SPECIFICATIONS

TECHNICIAN 

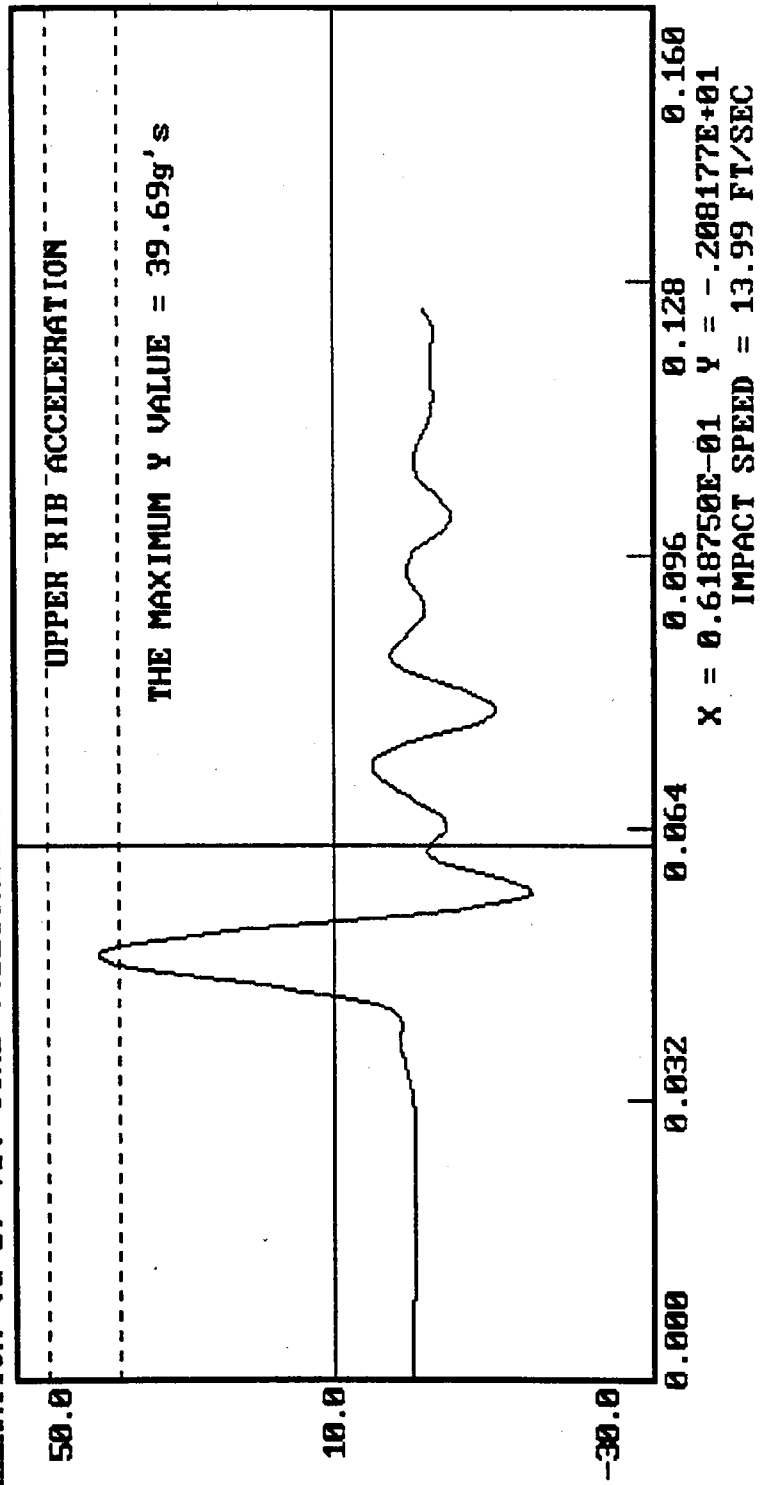
APPROVED BY 

07-20-1994 18:22

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 269

ACCELERATION (G'S) VS. TIME ((SECONDS))

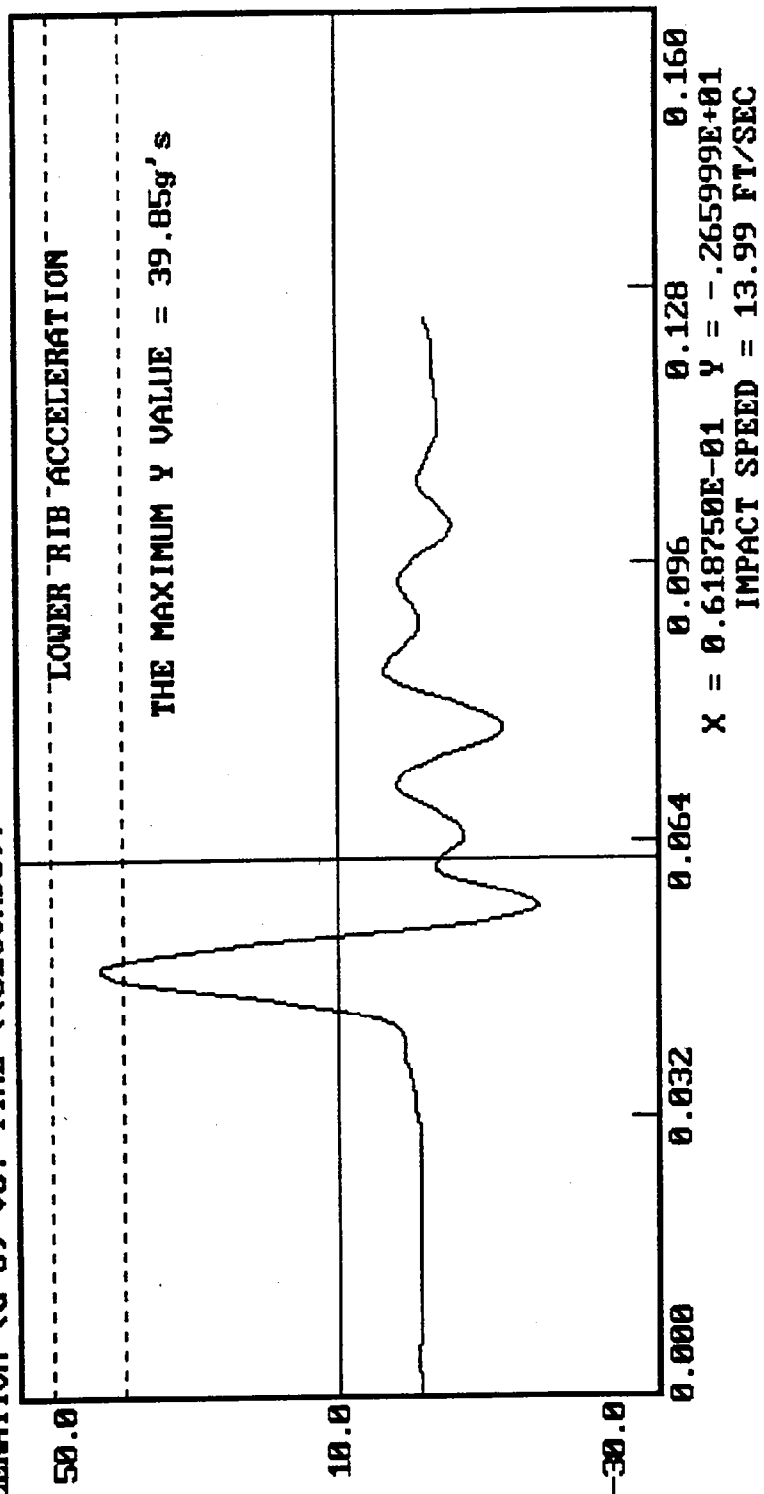


07-20-1994 18:22

DUMMY CALIBRATION - THORAX IMPACT

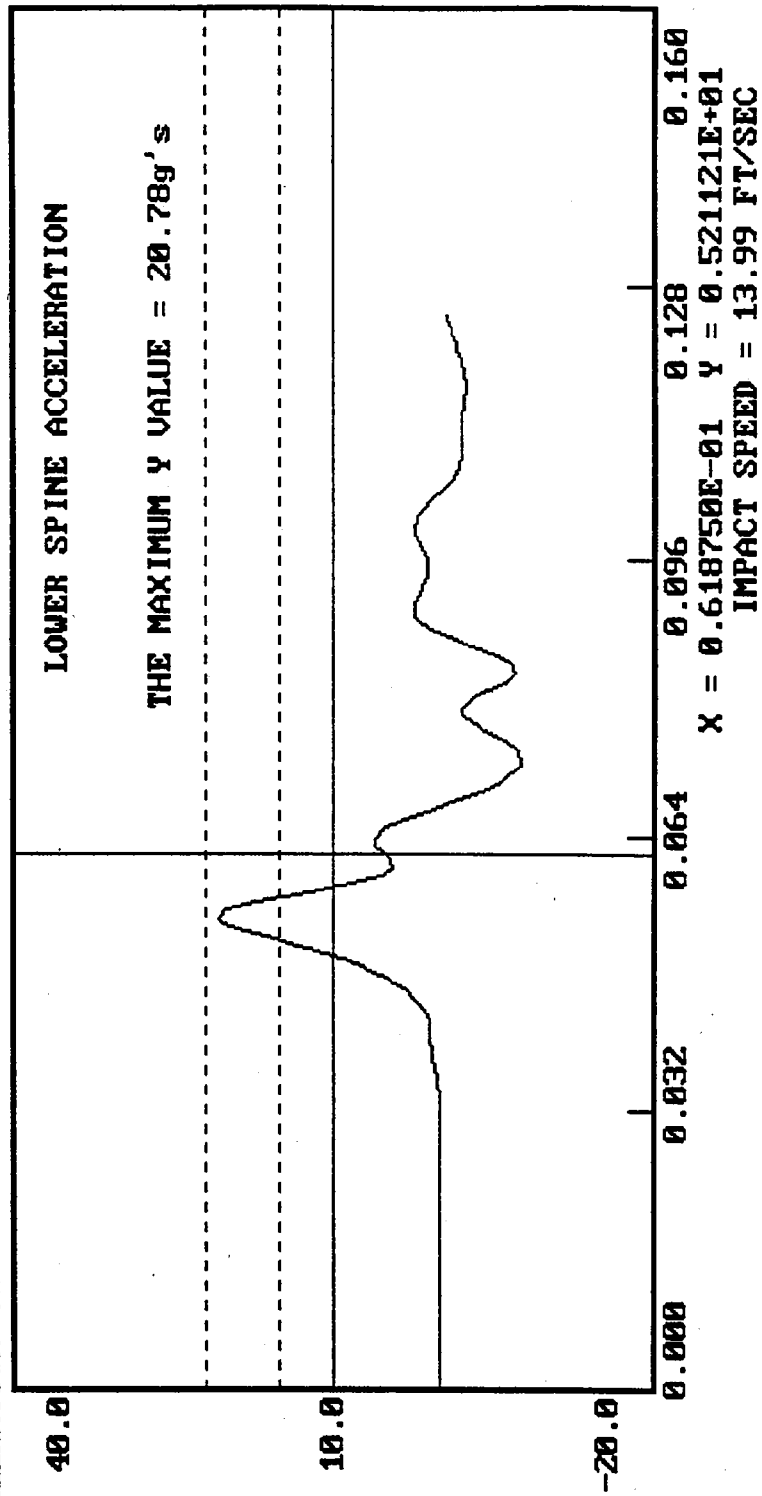
DUMMY # 269

ACCELERATION (G'S) VS. TIME ((SECONDS))



07-20-1994 18:22

DUMY CALIBRATION - THORAX IMPACT
DUMY # 269
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 21, 1994

DUMMY NUMBER: 269

TEST NUMBER: D941623

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	54.8

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

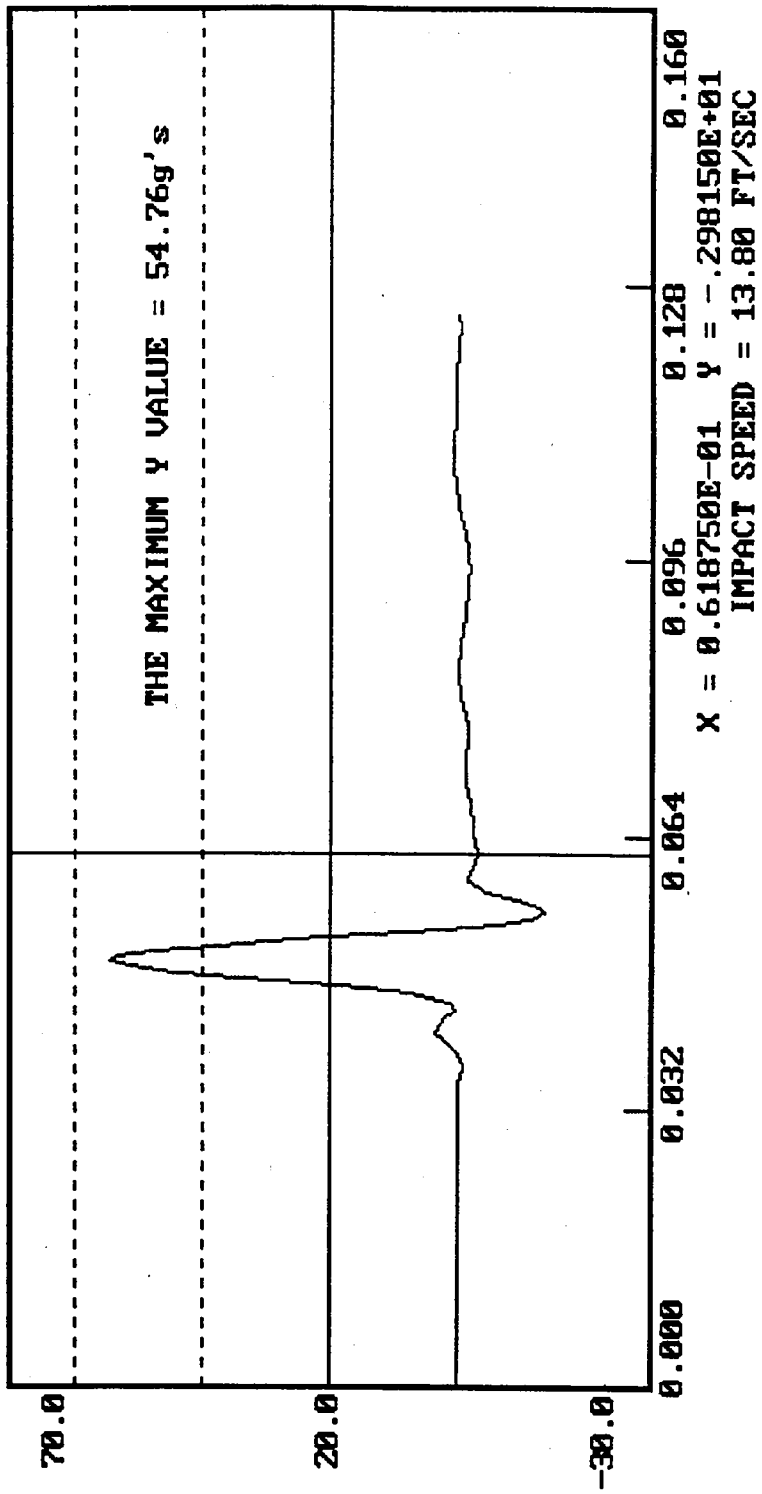


07-21-1994 10:01

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 269

ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION
ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)
SIDE IMPACT DUMMY (SID)

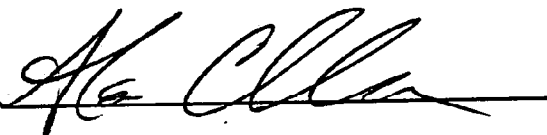
DATE: July 22, 1994

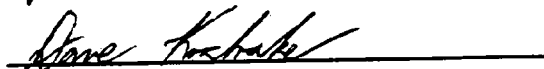
DUMMY NUMBER: 269

TEST NUMBER: D941624

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.9
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.7
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

TECHNICIAN 

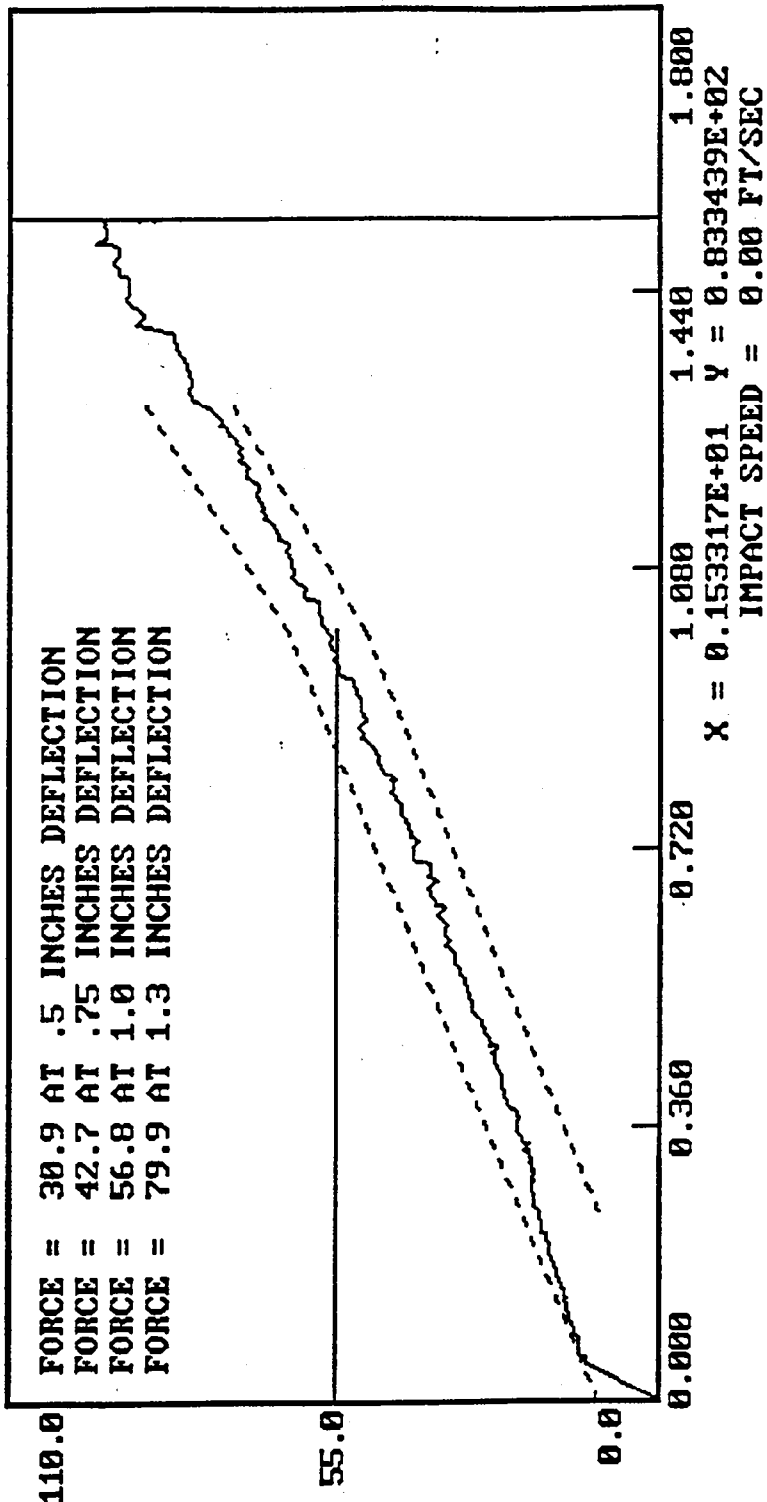
APPROVED BY 

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 269

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)

FORCE = 30.9 AT .5 INCHES DEFLECTION
FORCE = 42.7 AT .75 INCHES DEFLECTION
FORCE = 56.8 AT 1.0 INCHES DEFLECTION
FORCE = 79.9 AT 1.3 INCHES DEFLECTION



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: July 21, 1994

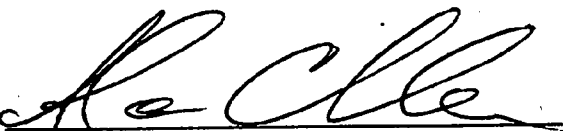
DUMMY NUMBER: 269

TEST NUMBER: D941625

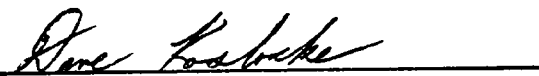
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	32
FORCE @ 30°	34 - 46 lbs	46
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	8°

TEST MEETS SPECIFICATIONS

TECHNICIAN

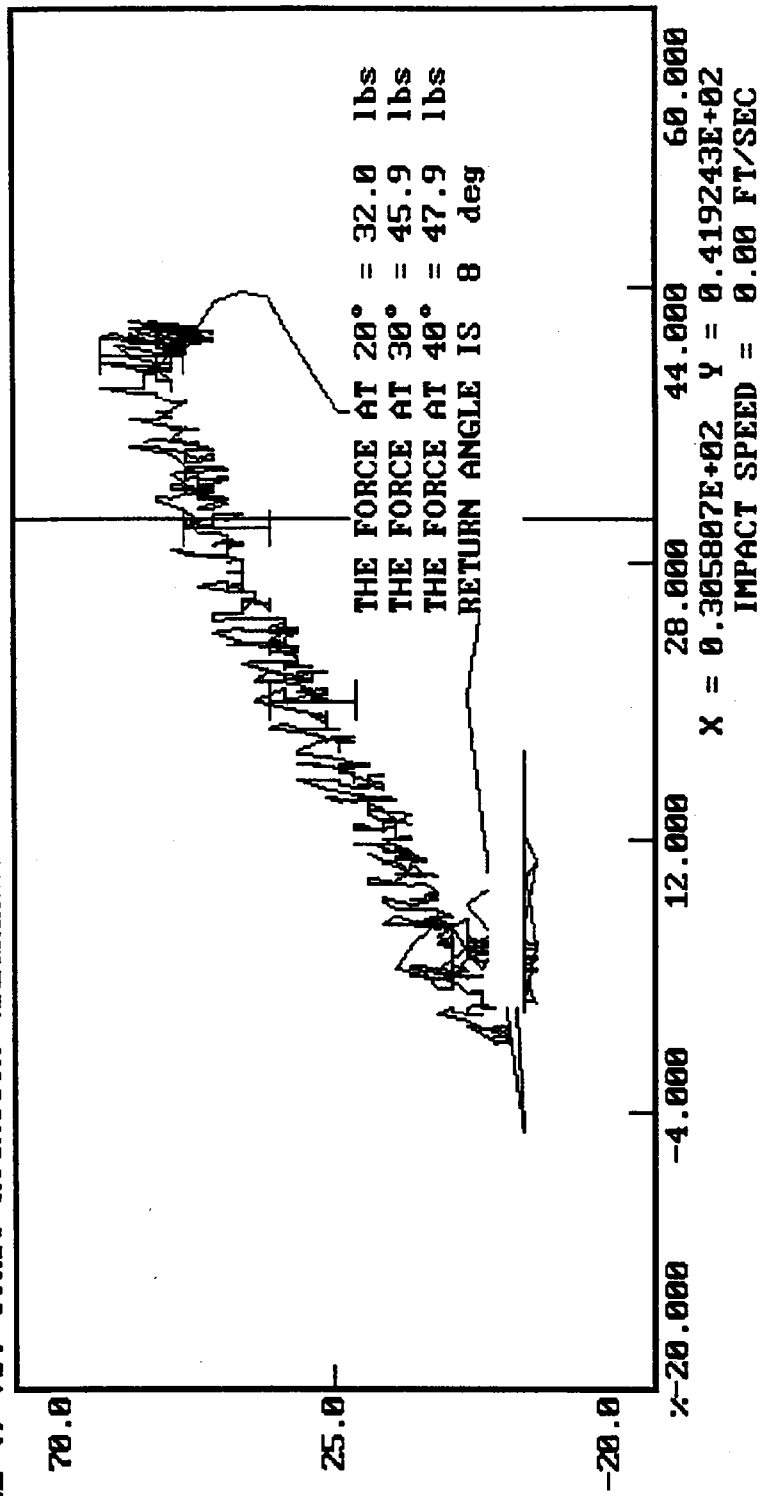


APPROVED BY



07-21-1994 13:23

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 269
FORCE () VS. TORSO ROTATION (DEGREES)



PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 271

Calibration Test Results Summary

Passenger Serial Number: 271

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: July 25, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75 - 20.5"	20.2
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.5
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	14.8

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

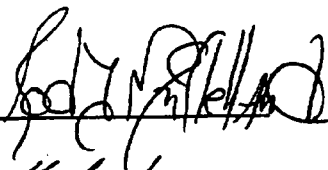
DATE: July 20, 1994

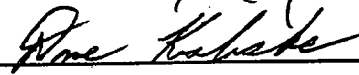
DUMMY NUMBER: 271

TEST NUMBER: D94158

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	69°
RELATIVE HUMIDITY	10 - 70%	56%
PROBE SPEED	13.8 - 14.2 fps	13.83
UPPER RIB	37 - 46 g's	39.4
LOWER RIB	37 - 46 g's	40.7
LOWER SPINE	15 - 22 g's	19.4

TEST MEETS SPECIFICATIONS

TECHNICIAN 

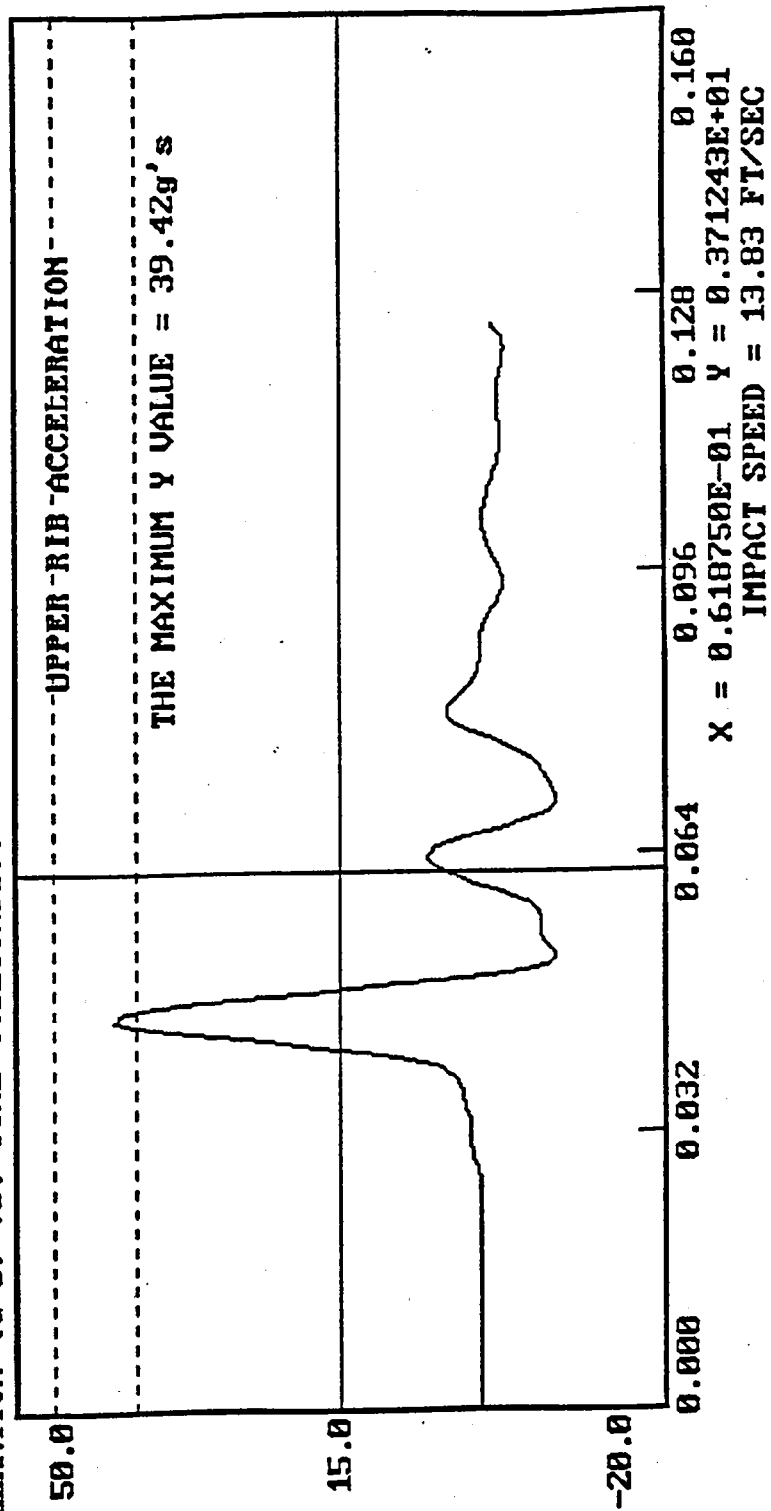
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07-20-1994 12:21

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

ACCELERATION (G'S) VS. TIME ((SECONDS))

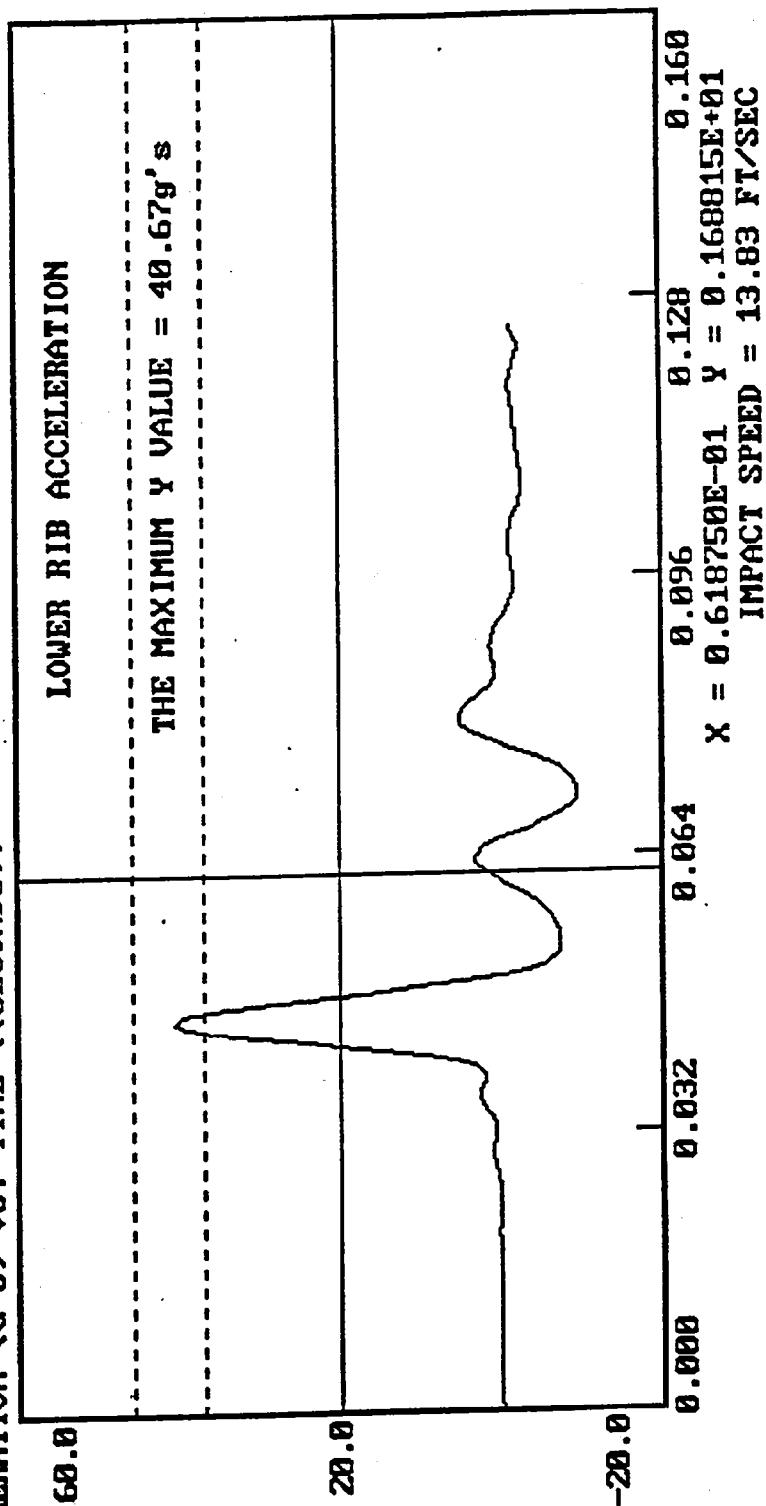


07-20-1994 12:21

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

ACCELERATION (G'S) VS. TIME ((SECONDS))

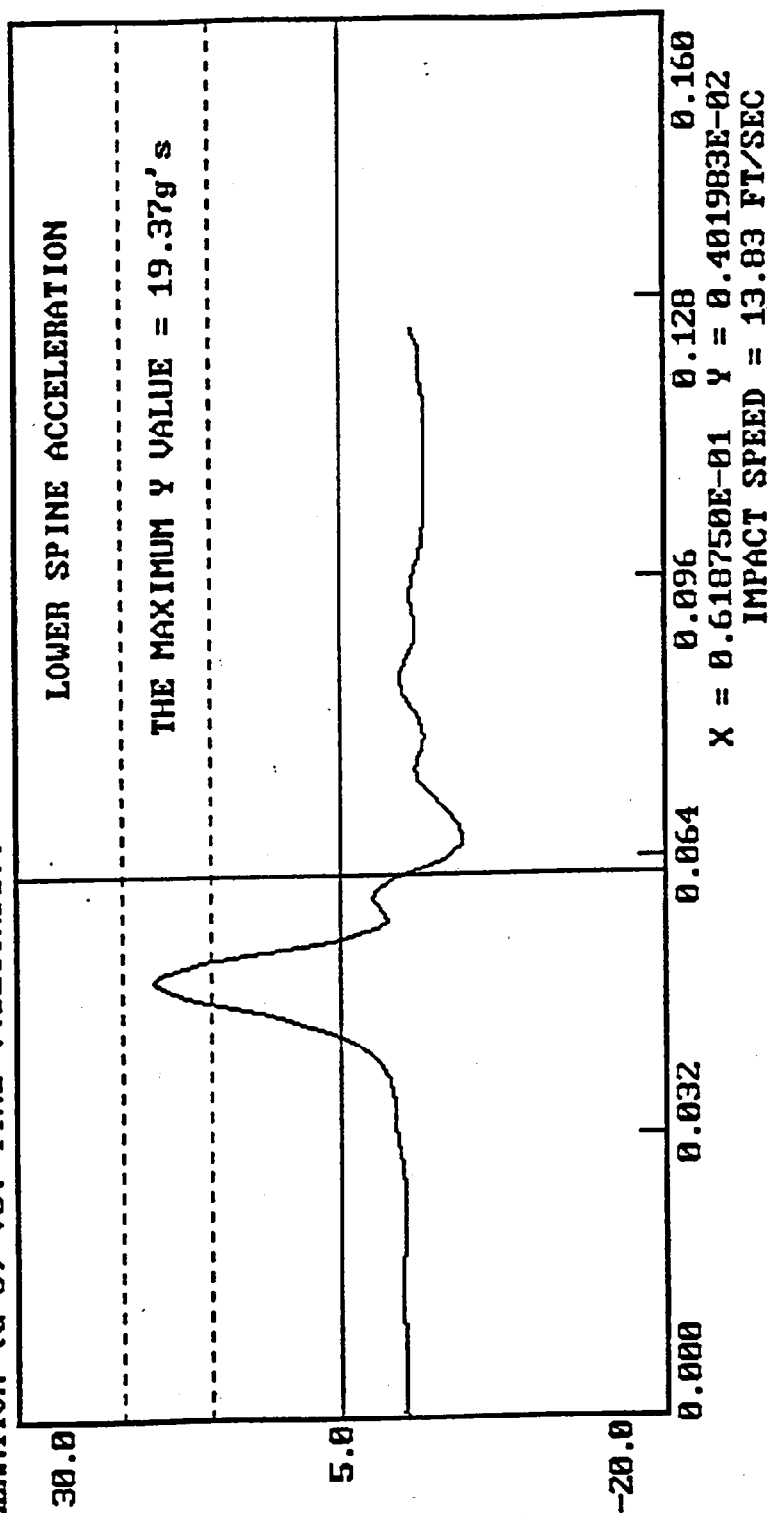


07-20-1994 12:21

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

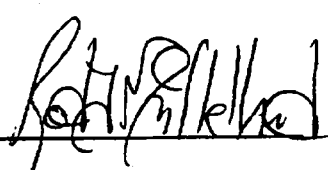
DATE: July 20, 1994

DUMMY NUMBER: 271

TEST NUMBER: D941583

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	55%
PROBE SPEED	13.8 - 14.2 f/s	13.84
PELVIS ACCELERATION	40 - 60 g's	52.6

TEST MEETS SPECIFICATIONS

TECHNICIAN 

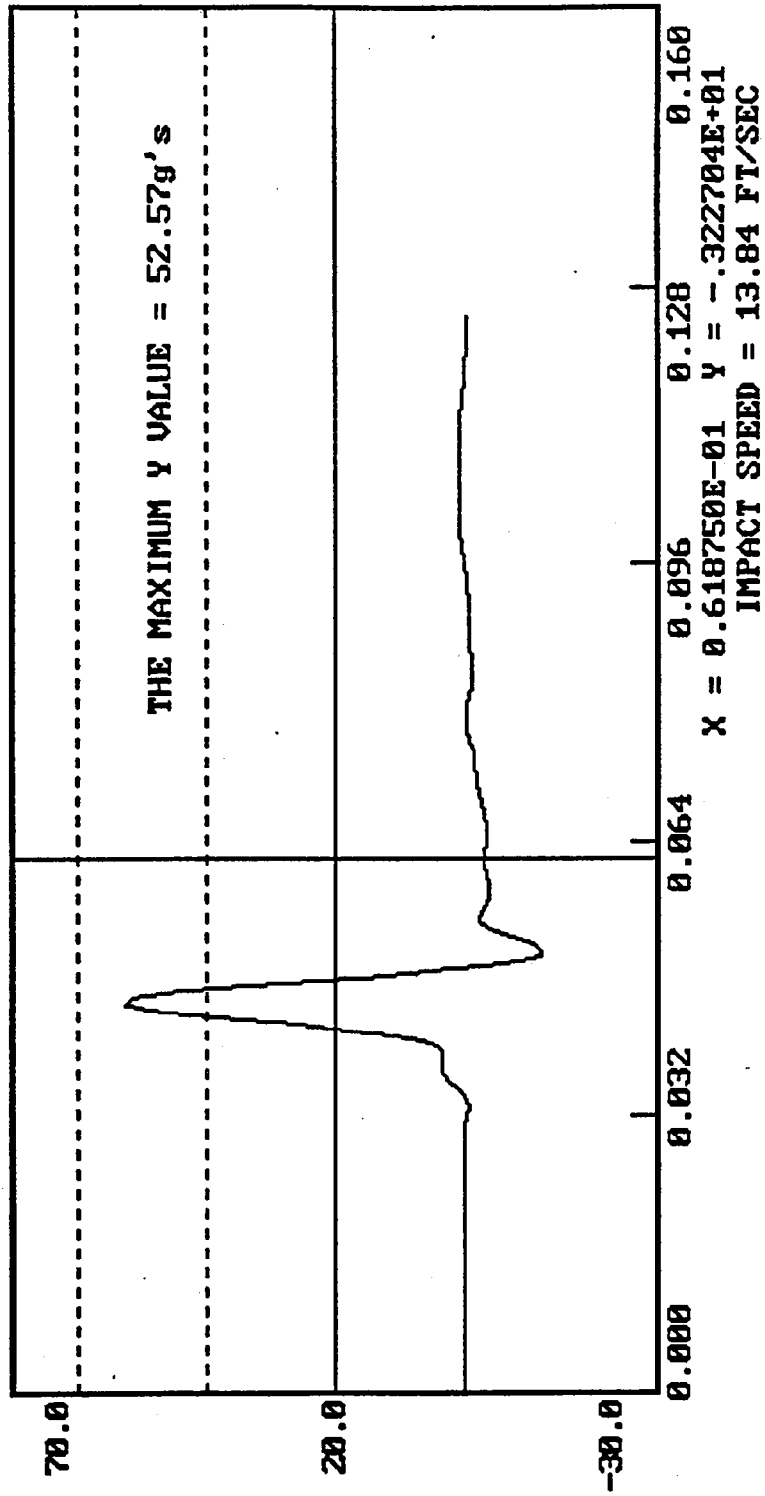
APPROVED BY 

07-20-1994 11:54

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 271

ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1994

DUMMY NUMBER: 271

TEST NUMBER: D941584

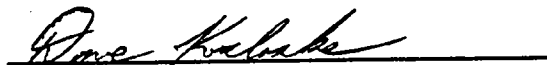
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
FORCE @ 0.5 in	23.3 - 36.5 lbs	28.7
FORCE @ 0.75 in	36.7 - 49.8 lbs	41.1
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	79

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

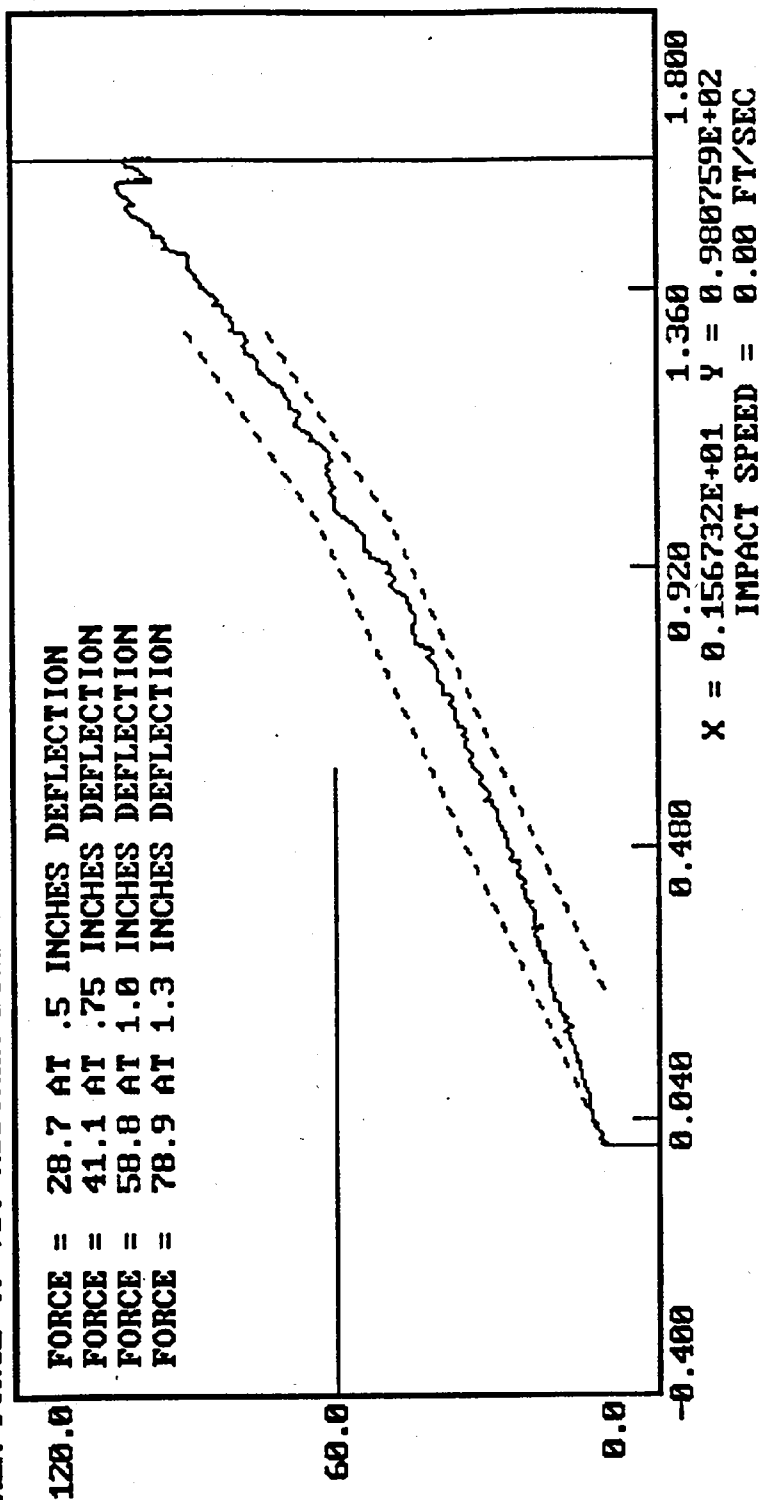


07-22-1994 11:01

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 271

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: July 20, 1994

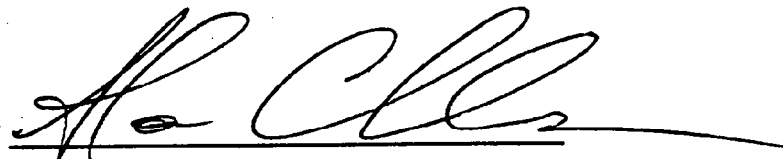
DUMMY NUMBER: 271

TEST NUMBER: D941585

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	23
FORCE @ 30°	34 - 46 lbs	45
FORCE @ 40°	46 - 58 lbs	47
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN

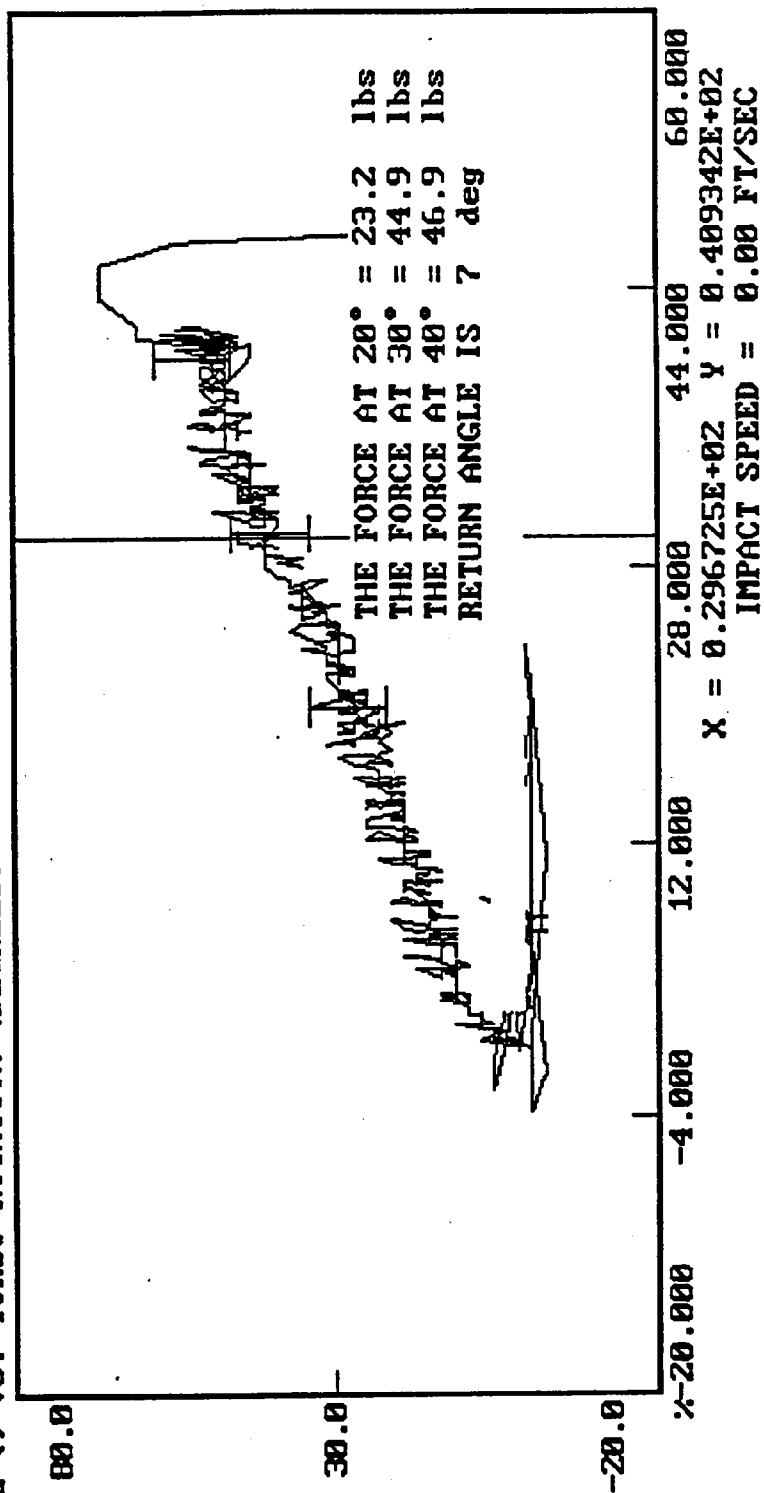


APPROVED BY



07-20-1994 16:05

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 271
FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

DATE OF VERIFICATION: October 28, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.3
RH - Rib Height	19.75 - 20.5"	20.25
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

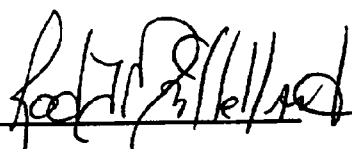
DATE: October 19, 1994

DUMMY NUMBER: 269

TEST NUMBER: D941982

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	71°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 fps	14.03
UPPER RIB	37 - 46 g's	38
LOWER RIB	37 - 46 g's	37
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN 

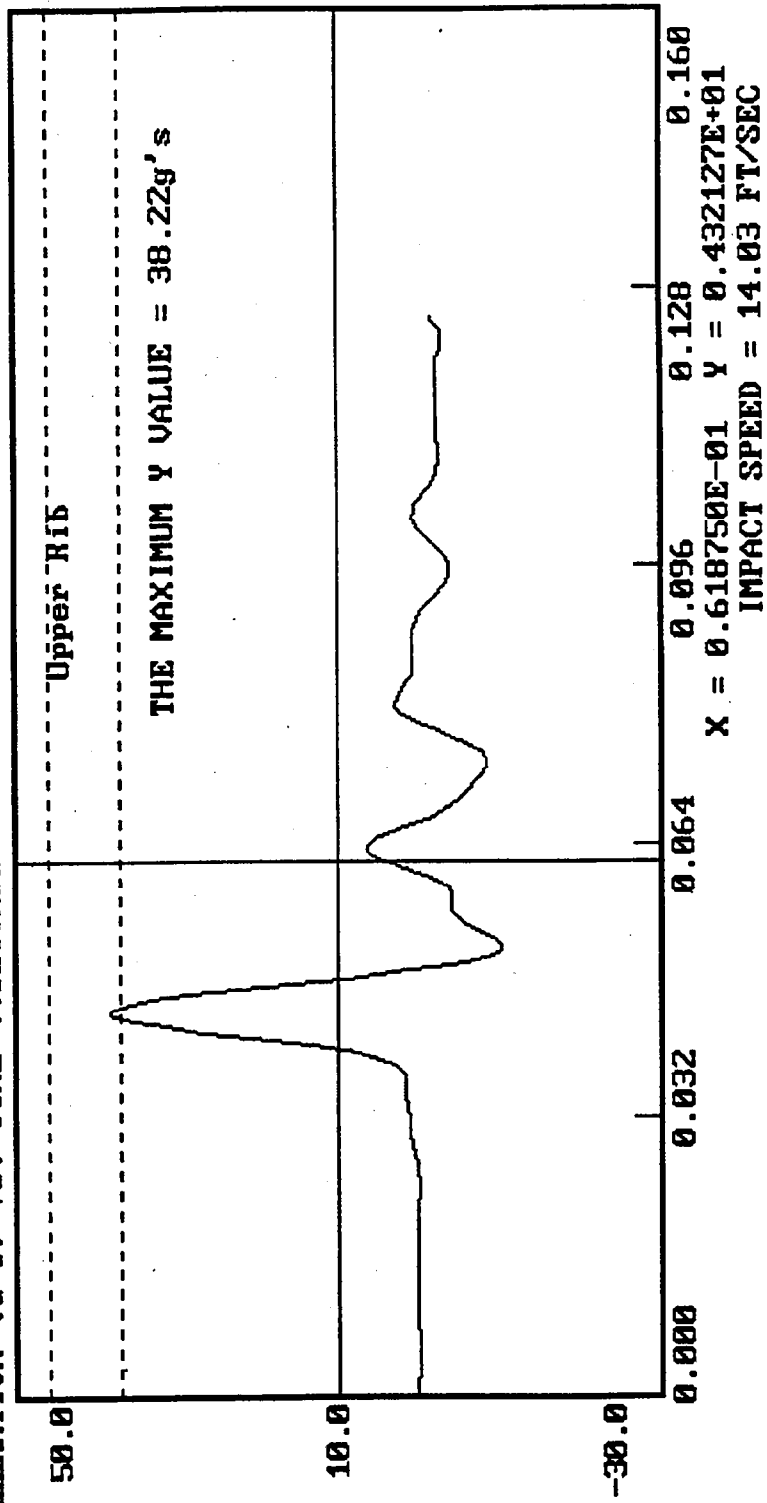
APPROVED BY 

10-19-1994 17:05

DUMMY CALIBRATION - THORAX IMPACT

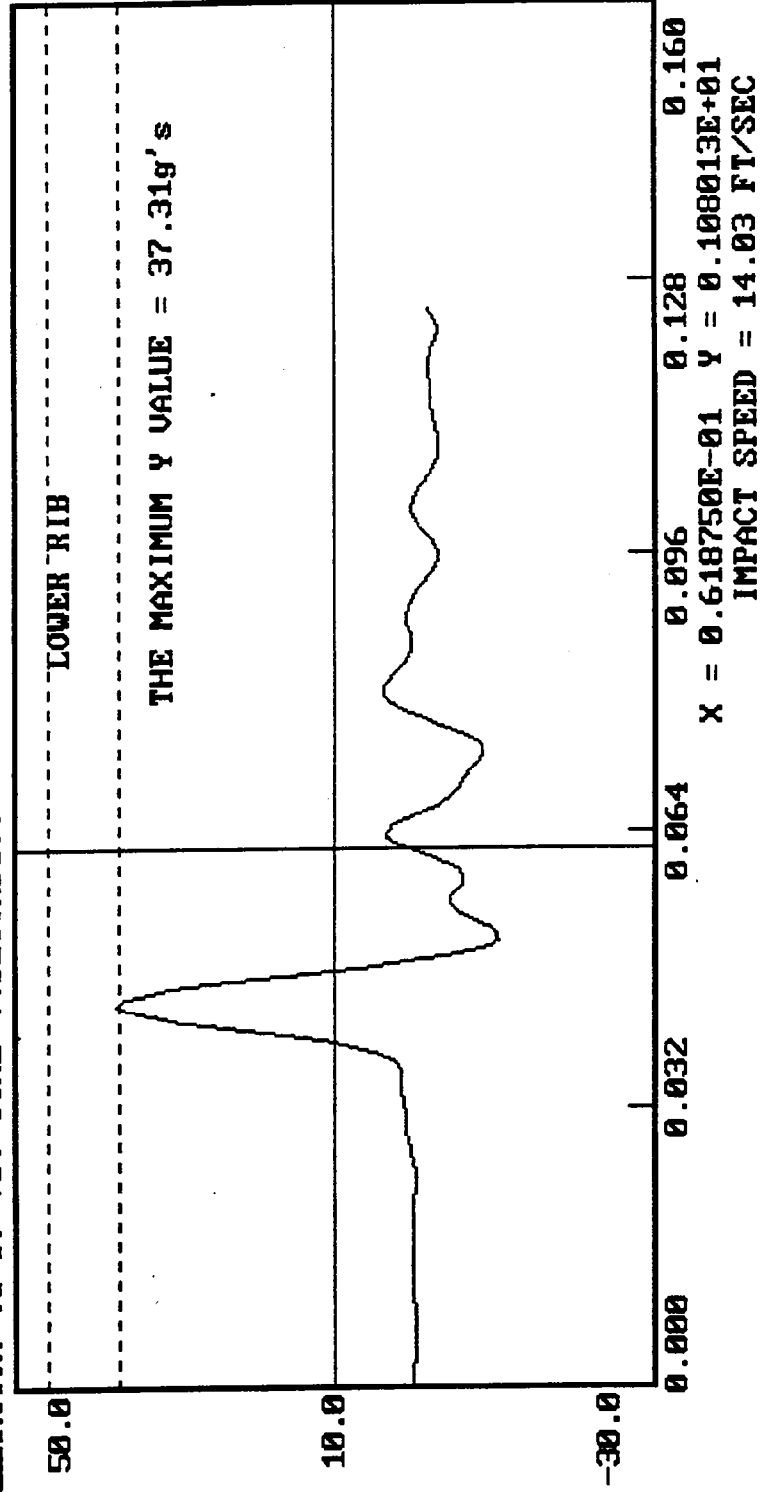
DUMMY # 269

ACCELERATION (G'S) VS. TIME ((SECONDS))



10-19-1994 17:05

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269
ACCELERATION (G'S) VS. TIME ((SECONDS))

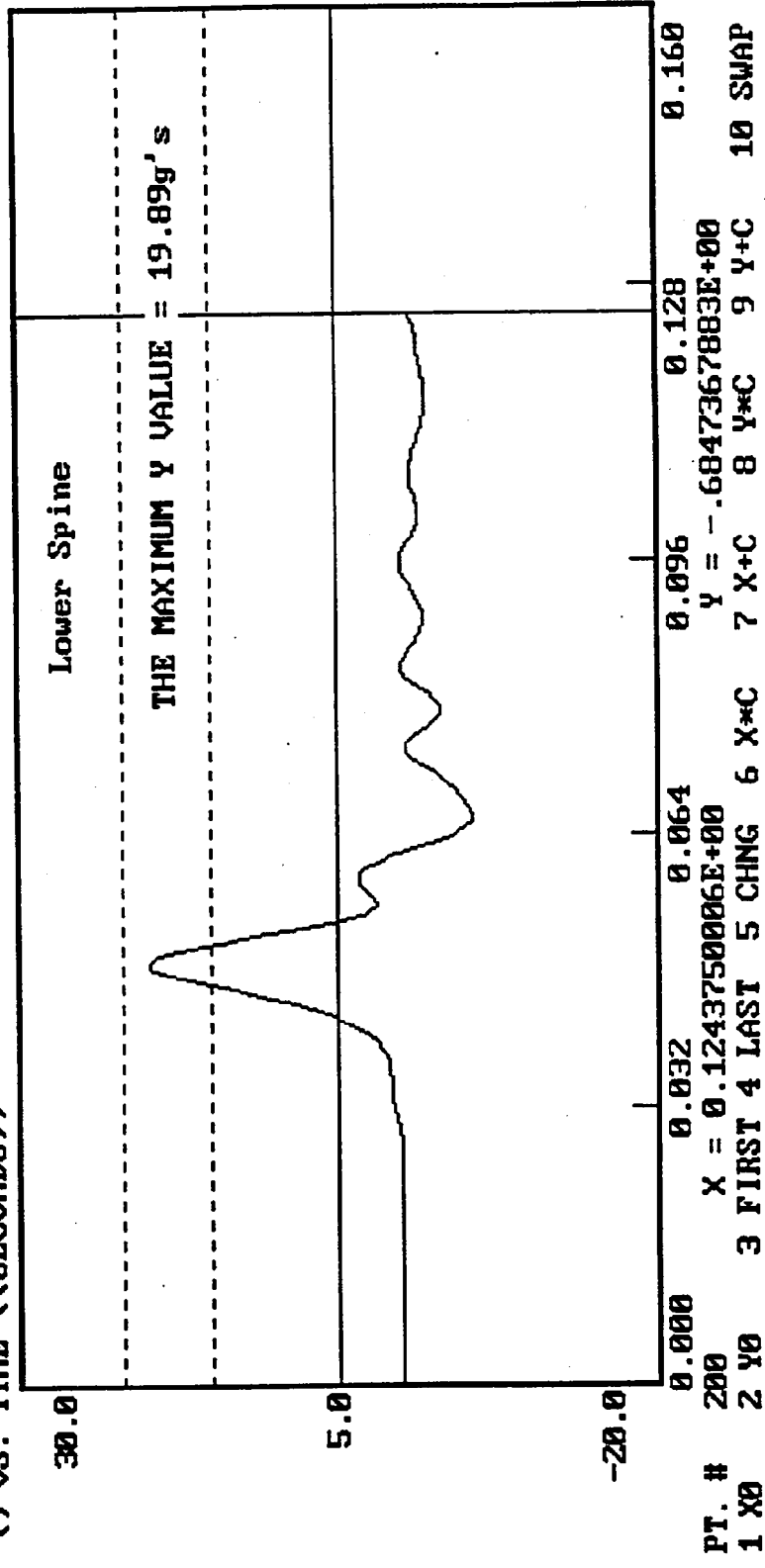


10-19-1994 17:05

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 269

() VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 18, 1994

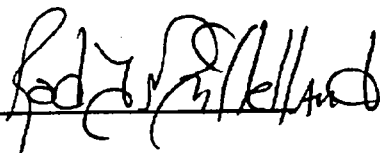
DUMMY NUMBER: 269

TEST NUMBER: D941983

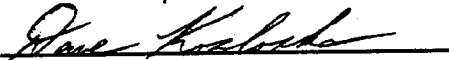
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 f/s	13.96
PELVIS ACCELERATION	40 - 60 g's	44

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

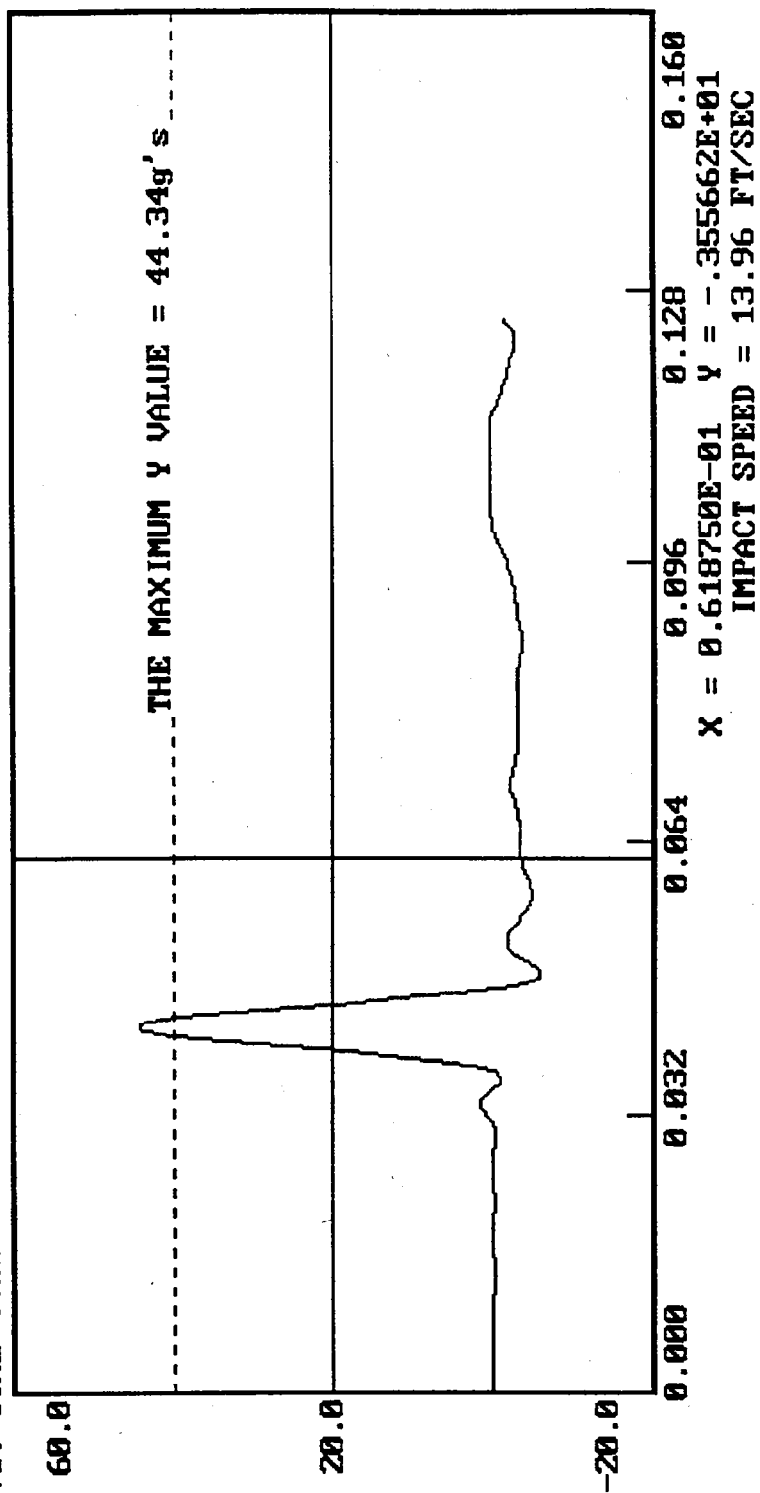


10-18-1994 13:35

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 269

() VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

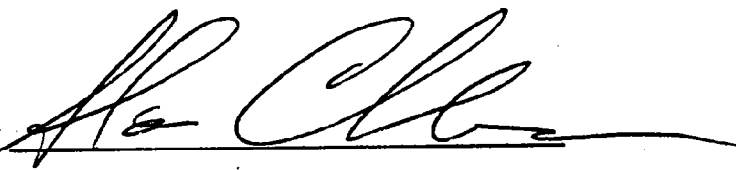
DATE: October 20, 1994

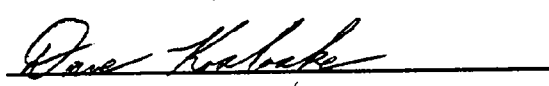
DUMMY NUMBER: 269

TEST NUMBER: D941984

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	58%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.5
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.9
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	79

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

10-20-1994 10:18

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 269

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)

110.0
55.0
0.0

FORCE = 32.5 AT .5 INCHES DEFLECTION
FORCE = 43.9 AT .75 INCHES DEFLECTION
FORCE = 58.9 AT 1.0 INCHES DEFLECTION
FORCE = 78.9 AT 1.3 INCHES DEFLECTION

Abdominal Compression
Deflection

0.400 0.040 0.480 0.920 1.360 1.800

X = 0.141815E+01 Y = 0.721616E+02
IMPACT SPEED = 0.00 FT/SEC

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 20, 1994

DUMMY NUMBER: 269

TEST NUMBER: D941985

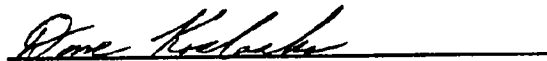
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	58%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	31
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	1°

TEST MEETS SPECIFICATIONS

TECHNICIAN

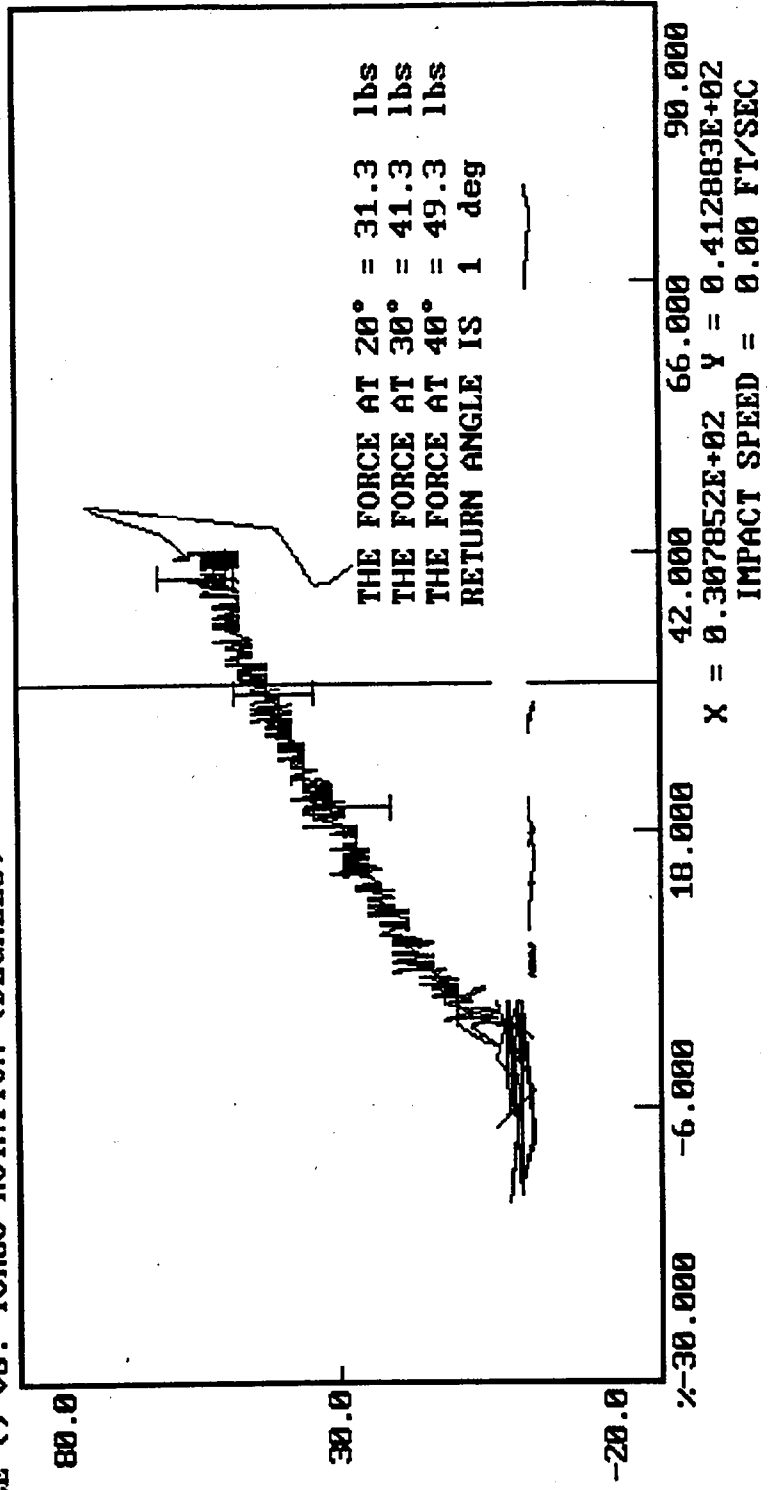


APPROVED BY



10-20-1994 14:46

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 269
FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: October 28, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75 - 20.5"	20.3
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.5
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	14.8

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

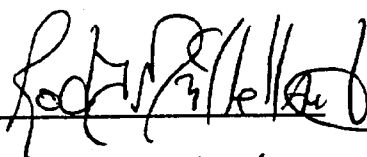
DATE: October 19, 1994

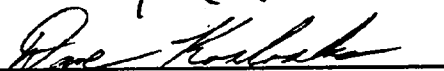
DUMMY NUMBER: 271

TEST NUMBER: D941972

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	71°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 fps	13.93
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN 

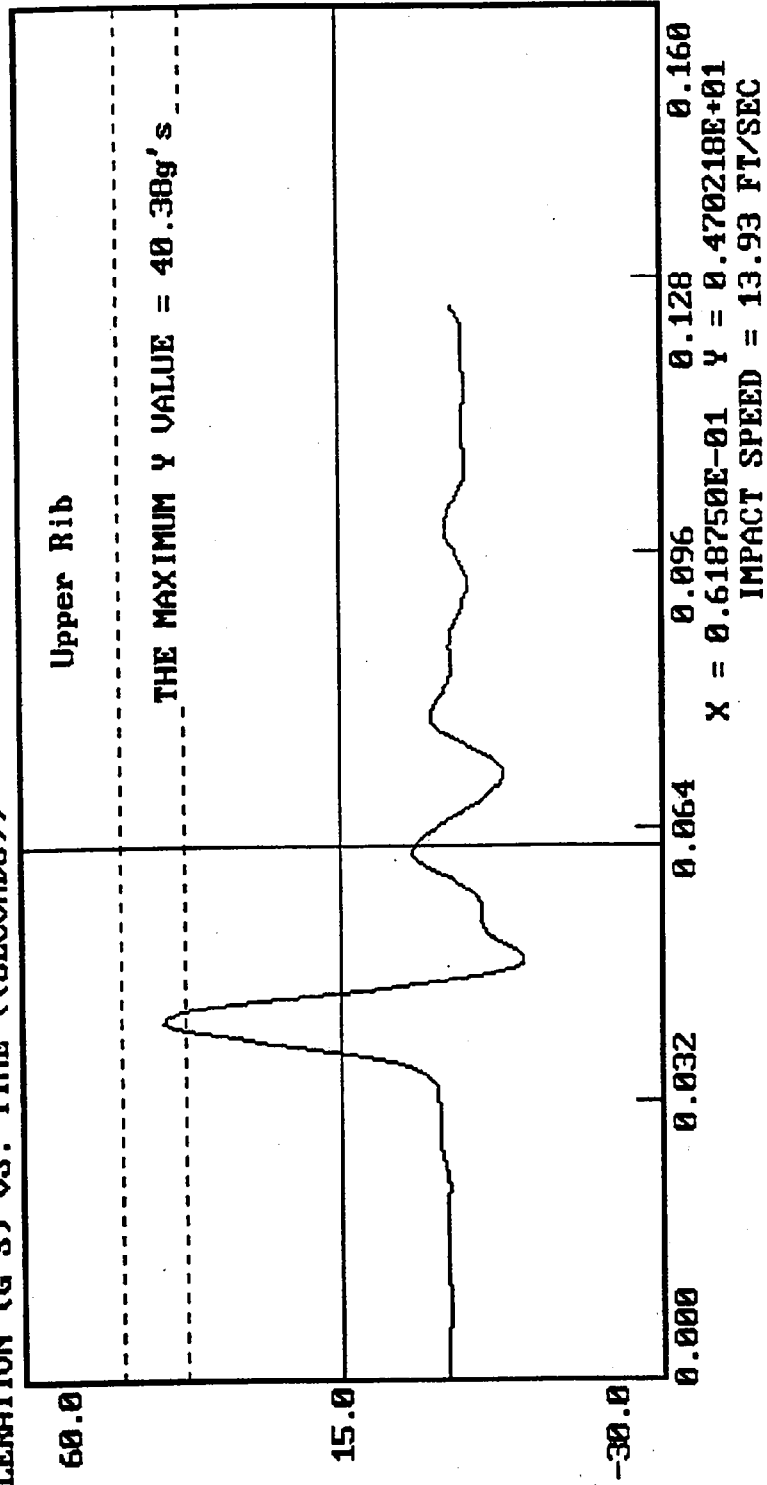
APPROVED BY 

10-19-1994 15:45

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

ACCELERATION (G'S) VS. TIME ((SECONDS))

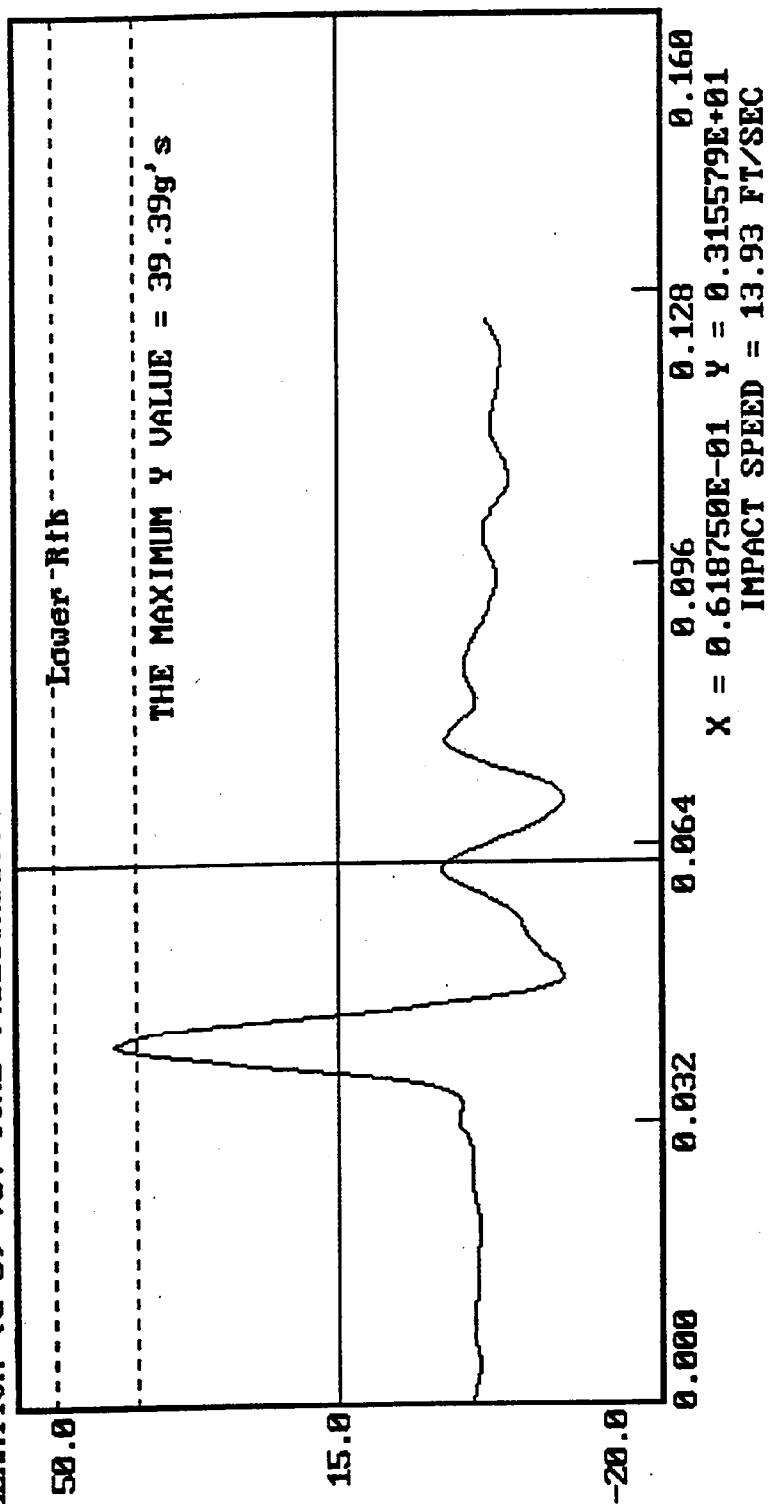


10-19-1994 15:45

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

ACCELERATION (G'S) VS. TIME ((SECONDS))

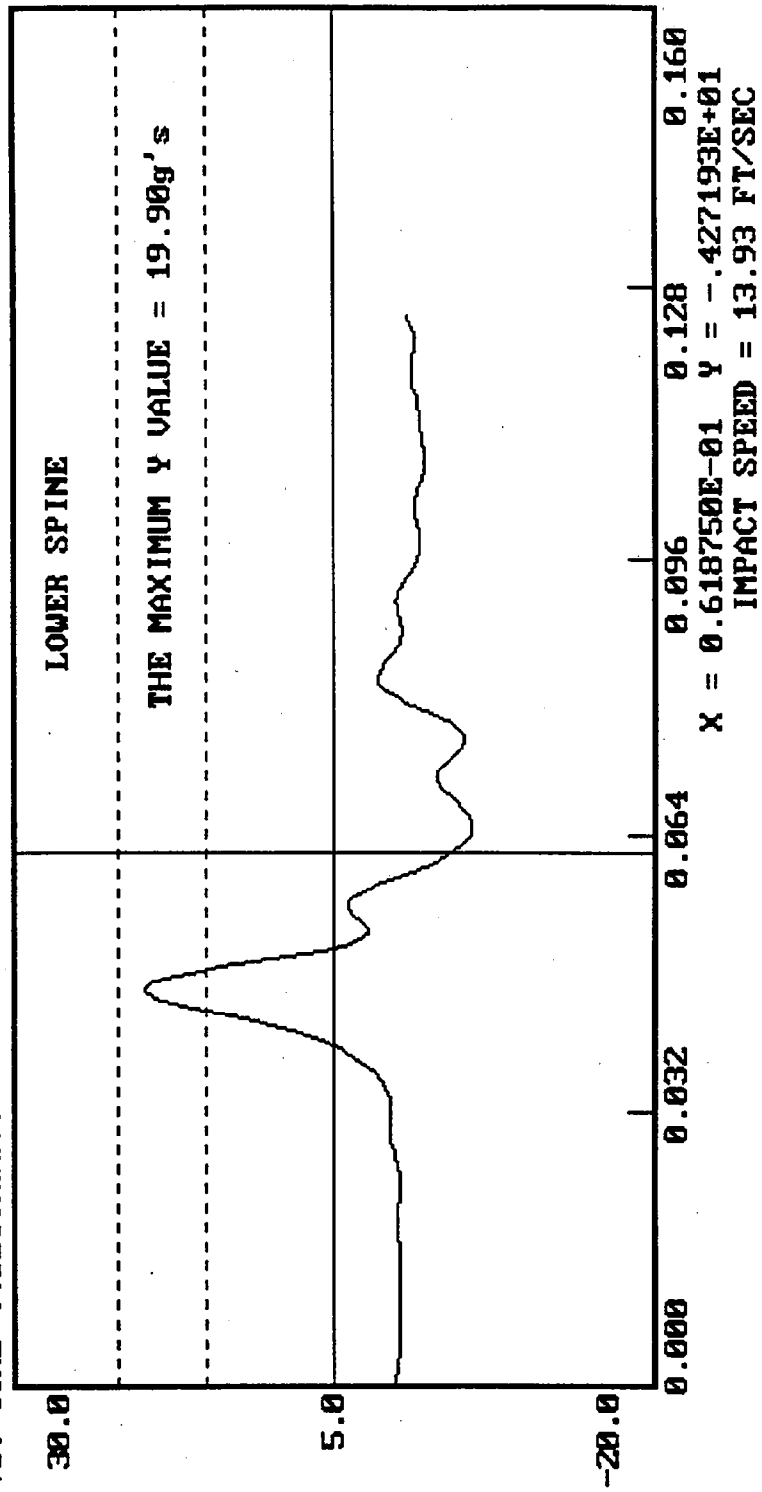


10-19-1994 15:45

DUMY CALIBRATION - THORAX IMPACT

DUMY # 271

() US. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 17, 1994

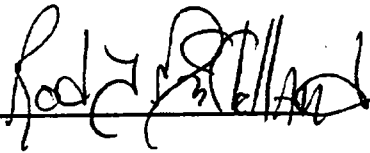
DUMMY NUMBER: 271

TEST NUMBER: D941972

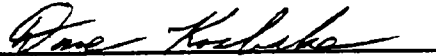
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	78°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 f/s	14.07
PELVIS ACCELERATION	40 - 60 g's	58

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

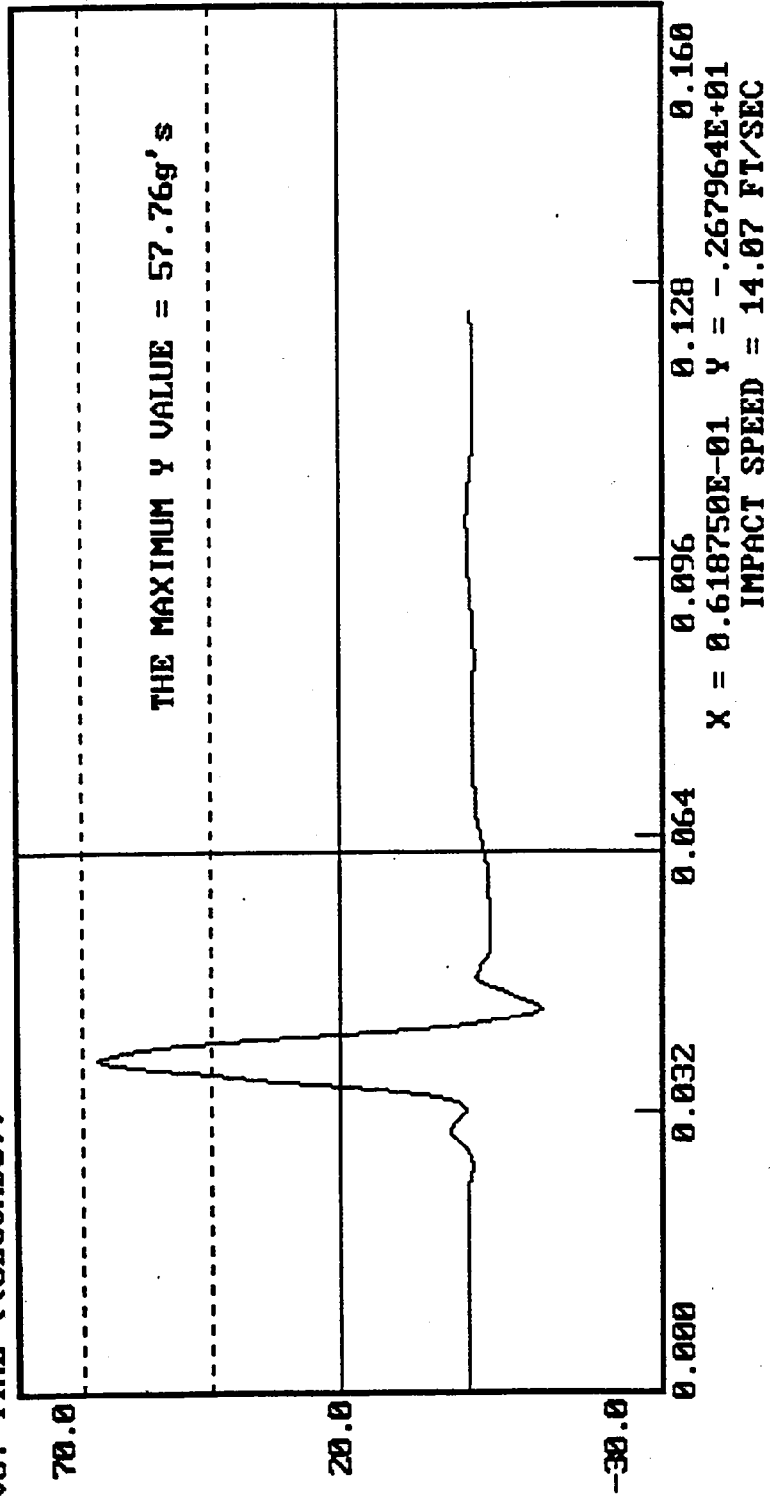


10-17-1994 14:04

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 271

() VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

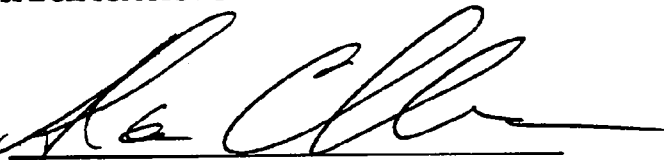
DATE: October 20, 1994

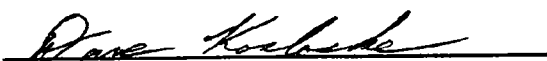
DUMMY NUMBER: 271

TEST NUMBER: D941974

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	68°
RELATIVE HUMIDITY	10 - 70%	58%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.5
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.5
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN 

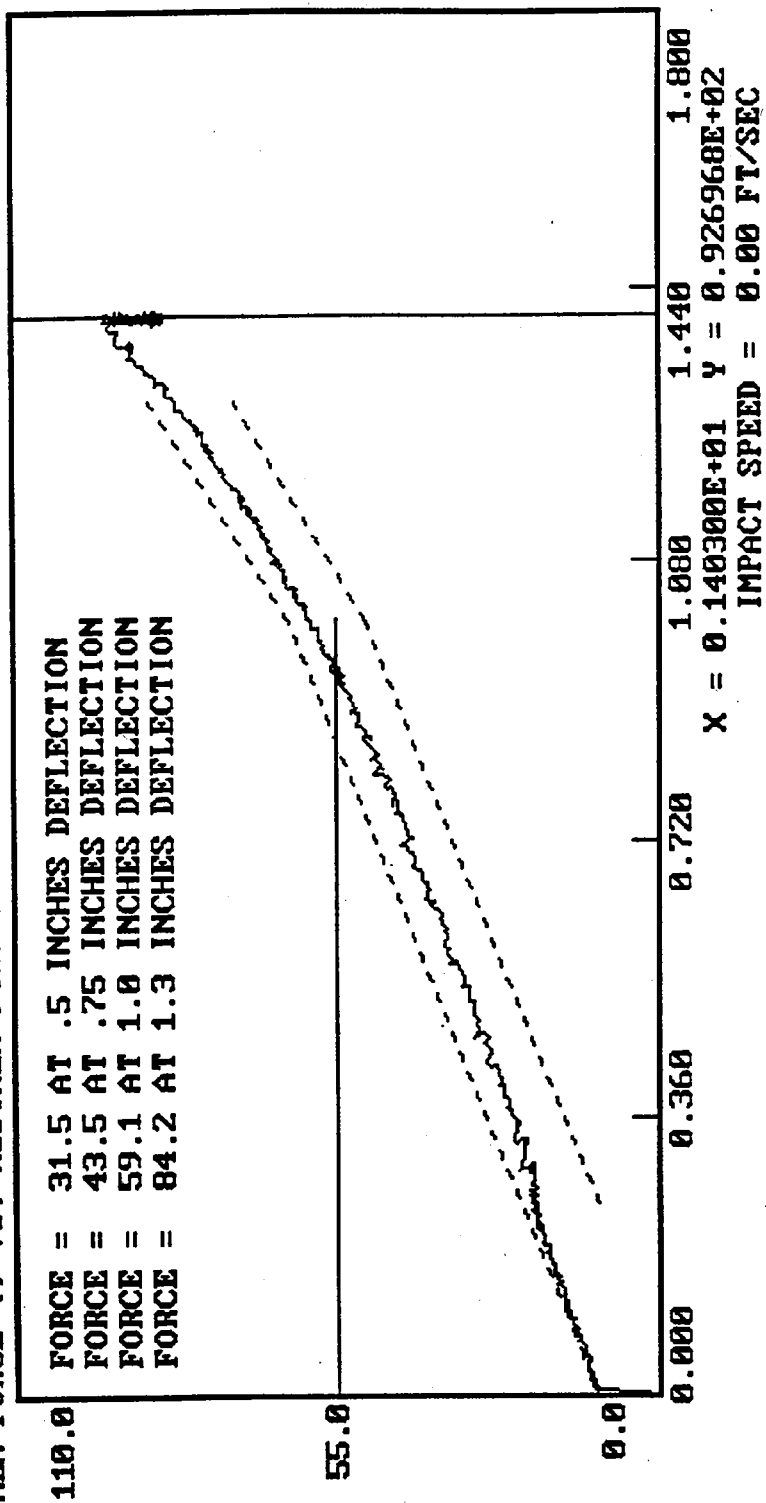
APPROVED BY 

10-20-1994 11:23

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 271

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 21, 1994

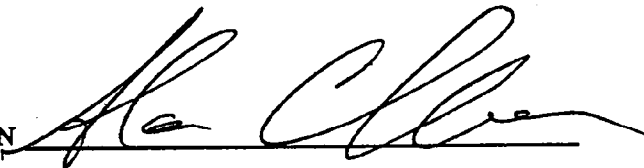
DUMMY NUMBER: 271

TEST NUMBER: D941975

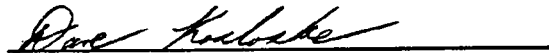
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	48%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	33.7
FORCE @ 30°	34 - 46 lbs	37.8
FORCE @ 40°	46 - 58 lbs	52.0
RETURN ANGLE	12° maximum	1°

TEST MEETS SPECIFICATIONS

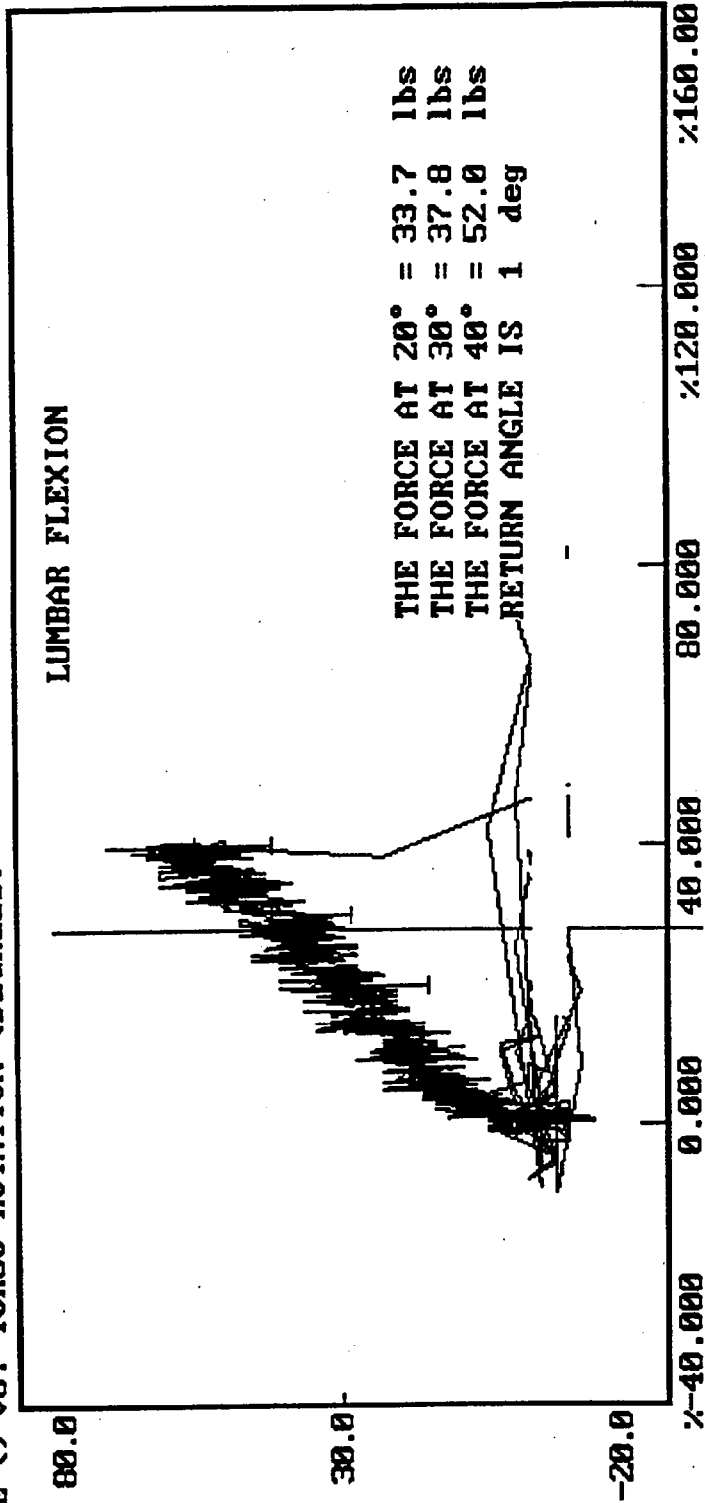
TECHNICIAN



APPROVED BY



DUMMY # Z71
 FORCE () US. TORSO ROTATION (DEGREES)



X = 0.277043E+02 Y = 0.397967E+02
 IMPACT SPEED = 0.00 FT/SEC

POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 269

Inspected By: Dave Kosloske

Date: October 28, 1994

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual, stops, inserts	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

NOTES: (include component/problem/action/reason):

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 271

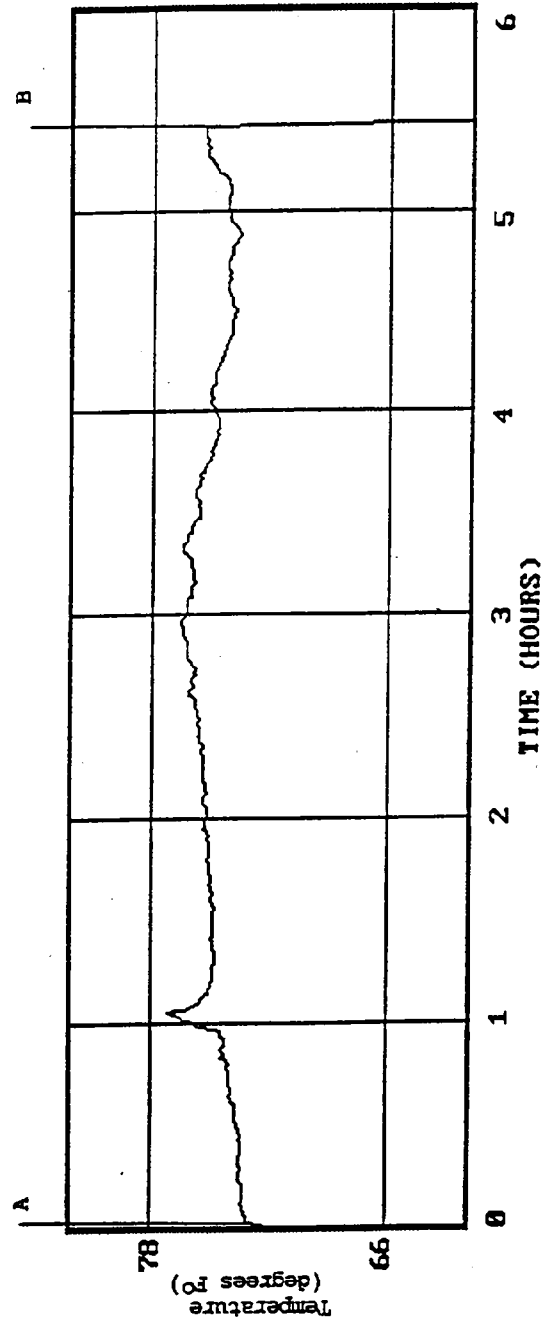
Inspected By: Dave Kosloske

Date: October 28, 1994

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual, stops, inserts	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

NOTES: (include component/problem/action/reason):

VEHICLE AND DUMMY TEMPERATURE



A = Dummies placed in vehicle
B = Test conducted

APPENDIX D
DUMMY AND VEHICLE CALIBRATION DATA

**DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DRIVER DUMMY NO. 269**

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AC913	Endevco	August 12, 1994
Lower Rib	AJ436	Endevco	July 12, 1994
Lower Spine	AHOD1	Endevco	August 01, 1994
Pelvis	AHWK8	Endevco	August 01, 1994
Upper Rib Redundant	AHOM0	Endevco	August 16, 1994
Lower Rib Redundant	AGT81	Endevco	August 16, 1994
Lower Spine Redundant	AH162	Endevco	August 16, 1994
Pelvis Redundant	AGR57	Endevco	August 16, 1994

INSTRUMENTS FOR PASSENGER DUMMY NO. 272

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AGTM8	Endevco	August 01, 1994
Lower Rib	AHY21	Endevco	August 02, 1994
Lower Spine	AJ417	Endevco	October 10, 1994
Pelvis	AGTM2	Endevco	August 16, 1994
Upper Rib Redundant	AJ411	Endevco	July 12, 1994
Lower Rib Redundant	AGTG8	Endevco	August 16, 1994
Lower Spine Redundant	AGP20	Endevco	October 10, 1994
Pelvis Redundant	AC8J4	Endevco	June 10, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	MGA042	Entran	June 02, 1994
MDB CG Y	MGA059	Entran	June 02, 1994
MDB CG Z	MGA060	Entran	April 26, 1994
MDB Rear Axle X	AY90	Endevco	June 02, 1994
MDB Rear Axle Y	MGA025	Entran	July 12, 1994
Lower Left A-Post Y	AN47	Endevco	June 30, 1994
Lower Left B-Post Y	MGA117	Entran	August 31, 1994
Upper Left B-Post Y	MGA154	Entran	June 27, 1994
Mid Left A-Post Y	MGA014	Entran	June 02, 1994
Trunk Centerline X	AAYWB	Endevco	June 12, 1994
Trunk Centerline Y	MGA140	Entran	June 30, 1994
Trunk Centerline Z	AHT35	Endevco	July 12, 1994
Driver Seat Track Y	MGA054	Entran	June 13, 1994
Right Front Sill X	AHYR7	Endevco	July 12, 1994
Right Front Sill Y	A99L	Endevco	June 02, 1994
Right Front Sill Z	AHYK2	Endevco	July 12, 1994
Right Rear Sill X	AY10	Endevco	June 14, 1994
Right Rear Sill Y	MGA088	Entran	June 23, 1994
Right Rear Sill Z	AHTA5	Endevco	July 12, 1994
Right Rear Seat Occupant Compartment Y	MGA090	Entran	June 30, 1994

Note: All Endevco accelerometers are Model No. 7264-2000
All Entran accelerometers are Model No. AGM-72E