

V2117

REPORT NO.: MGA-94-21413

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

NISSAN MOTOR CORPORATION
1995 NISSAN 240SX 2 DOOR COUPE
NHTSA NO: CS5200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



MGA Ref. No.: G93A-02

Test Date: June 29, 1994

Report Date: September 23, 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, SW ROOM 6115

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. MGA-94-21413		2. Government Accession No		3. Recipient's Catalog No.																			
4. Title and Subtitle Final Report for FMVSS 214 Compliance Testing of a 1995 Nissan 240SX 2 Door Coupe NHTSA NO. CS5200				5. Report Date September 23, 1994																			
				6. Performing Organization Code MGA																			
7. Author(s) John Fleck				8. Performing Organization Report No. MGA-DOT-214-13																			
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105				10. Work Unit No.																			
				11. Contract or Grant No. DTNH22-93-C-02047																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (Mail Code: NEF-30) 400 Seventh St., S.W., Room 6115 Washington, D C. 20590				13. Type of Report and Period Covered Final Report July 1994																			
				14. Sponsoring Agency Code NEF-30																			
15. Supplementary Notes																							
16. Abstract Compliance tests were conducted on the subject 1995 Nissan 240SX 2 Door Coupe 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 June 29, 1994. The impact velocity of the Moving Barrier (MDB) was 32.9 mph and the ambient temperature of the struck side (driver's) of the target vehicle at the time of impact was 76°F. The maximum static crush of the impacted vehicle was 14.7 inches at level 3, the mid-door level. The test or target vehicle's performance is given below:																							
<table border="0"> <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>71 g's</td> <td>74 g's</td> </tr> <tr> <td>Pelvis Acceleration</td> <td>75 g's</td> <td>65 g's</td> </tr> <tr> <td>Upper Rib Acceleration</td> <td>62.4 g's</td> <td>87.0 g's</td> </tr> <tr> <td>Lower Rib</td> <td>64.6 g's</td> <td>90.3 g's</td> </tr> <tr> <td>Lower Spine</td> <td>77.2 g's</td> <td>57.6 g's</td> </tr> </tbody> </table>							<u>Driver's SID</u>	<u>Left Rear SID</u>	Thoracic Trauma Index (TTI)	71 g's	74 g's	Pelvis Acceleration	75 g's	65 g's	Upper Rib Acceleration	62.4 g's	87.0 g's	Lower Rib	64.6 g's	90.3 g's	Lower Spine	77.2 g's	57.6 g's
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17. Key Words Side Impact Dummy (SID) Compliance Test FMVSS 214 Side Impact Protection				18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division, Room 5108 (NAD-52), 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 Attn: Robert Hornickle																			
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 248																			
				22. Price																			

This Test Report was prepared for the U.S. Department of Transportation. National Highway Traffic Safety Administration, under Contract No. DTNH22-93-C-02047.

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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 Nissan 240SX 2 Door Coupe.

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 Nissan 240SX 2 Door Coupe 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 32.9 mph on June 29, 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 position. The SID in the driver (Pos. #1) was placed according to instructions specified in the Laboratory Test Procedure. The left rear SID (Pos. #4) could not be placed according to instructions specified in the laboratory test procedure and was used for informational purposes only. The side impact event was documented by eight 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.

The driver's Thoracic Trauma Index (TTI) was 71 g's. Maximum pelvic Y acceleration was 75 g's.

The left rear passenger's TTI was 74 g's. Maximum pelvic Y acceleration was 65 g's.

TEST NOTES

The left rear SID (Pos. #4) could not be positioned according to the FMVSS 214 laboratory test procedure (pelvic angle between 23° and 25°), the SID was used for informational purposes only

At approximately 135 msec following impact, the driver upper rib "Y" acceleration is invalid due to a data shift. This occurred very late in the data and did not affect the maximum value recorded for this acceleration.

SECTION 3
SUMMARY OF TEST DATA

TABLE 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION.

Year/Make/Model/Body Style: 1995/Nissan/240SX//2 Door Coupe
 Vehicle NHTSA No.: CS5200 VIN: JN1AS44D55W008388
 Vehicle Body Color: Green Month & Year of Manufacture: 4-94
 Engine Data: 4 cylinders; CID; 2.4 Liter; cc
 Placement X Longitudinal; or Lateral
 Transmission. 5 speed; X Manual; Automatic; Overdrive
 Final Drive. X Rear Wheel Drive; Frt. Wheel Drive; Four Wheel Drive
 Odometer Reading 237 miles
 Options: X A/C; X Pwr. Steering, X Pwr. Brakes; X Pwr. Windows
 Power Seats, X Tilt Wheel, Power Door Locks; Self Leveling System

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 28 psi FRONT
28 psi REAR
 Recommended Tire Size. P195/60R15 87H
 Tires on Test Vehicle: P195/60R15 87H Manufacturer: Yokohama

Vehicle Capacity Data:

Number of Occupants: 2 Front, 2 Rear; 3rd Seat 4 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 = 687 lbs (A)
 No. of Occupants x 150 lbs. = 600 lbs (B)
 Cargo Capacity (A-B) = 87 lbs

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS

Right Front	=	<u>741</u> lbs	Right Rear	=	<u>565</u> lbs
Left Front	=	<u>728</u> lbs	Left Rear	=	<u>585</u> lbs
TOTAL FRONT	=	<u>1469</u> lbs	TOTAL REAR	=	<u>1150</u> lbs
% of Total Vehicle Weight	=	<u>56.0</u> %	% of Total Weight	=	<u>44.0</u> %
TOTAL WEIGHT	=	<u>2619</u> lbs			

TABLE 2
TEST VEHICLE DATA

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 2619 lbs
Maximum Cargo Carrying Capacity of Test Vehicle = 87 lbs
Weight of 2 Side Impact Dummies (2 x 178 lbs.) = 356 lbs
TEST VEHICLE TARGET WEIGHT: = 3062 lbs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>778</u> lbs	Right Rear	= <u>671</u> lbs
Left Front	= <u>832</u> lbs	Left Rear	= <u>768</u> lbs
TOTAL FRONT	= <u>1610</u> lbs	TOTAL REAR	= <u>1439</u> lbs
% of Total Weight	= <u>53.0</u> %	% of Total Weight	= <u>47.0</u> %
TOTAL TEST WEIGHT	= <u>3049</u> lbs		

TEST VEHICLE ATTITUDE (all dimensions in inches):

CURB WEIGHT ATTITUDE: (in)

Right Front 27.8 Left Front 27.8 Right Rear 26.7 Left Rear 26.5

FULLY LOADED WEIGHT ATTITUDE: (in)

Right Front 27.0 Left Front 26.4 Right Rear 26.0 Left Rear 25.4

TEST ATTITUDE: (in)

Right Front 26.6 Left Front 26.4 Right Rear 25.8 Left Rear 25.4

Test Vehicle Wheelbase: 99.4 inches

C.G. = 46.9 inches rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 169.3 in
Centerline = 177.2 in
Left Side = 169.3 in

FIGURE 1
PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 8 6 in

Total Number of Adjustment Positions or Detents: 20 detents

Test Position: 11th detent from front

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 25° degrees (13th notch)

SECOND POSITION SEAT

Total Length of Fore/Aft Adjustment Travel: Non Adjustable

Seat Back Adjustment Position: Non Adjustable @ 26°

ADJUSTABLE STEERING COLUMN POSITION:

Adjusted to mid position (20°)

WINDOW POSITIONS:

Left Front closed Left Rear closed

Right Front open Right Rear removed

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 = 17.2 gallons

Test Volume: 16.0 gallons (93% of capacity)

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

Wheelbase: = 99 4 in

Impact Point is 12 7 in rearward of front axle centerline

TABLE 3
CRASH TEST SUMMARY FOR TEST VEHICLE

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

Overall Length = 177.2 in; Overall Width = 68.1 in

TEST WEIGHT:

Right Front	=	<u>778</u> lbs	Right Rear	=	<u>671</u> lbs
Left Front	=	<u>832</u> lbs	Left Rear	=	<u>768</u> lbs
TOTAL FRONT	=	<u>1610</u> lbs	TOTAL REAR	=	<u>1439</u> lbs
TOTAL VEHICLE WEIGHT <u>3049</u> lbs					
Wheelbase = <u>99.4</u> in					
Longitudinal C.G. front Center of Front Axle				=	<u>46.9</u> in
Impact Angle with Respect to Impactor				=	<u>90°</u> degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (9.8 in above ground) = 8.5 in
 2. LEVEL 2 (16.0 in above ground) = 12.9 in
 3. LEVEL 3 (21.9 in above ground) = 14.7 in
 4. LEVEL 4 (33.0 in above ground) = 10.0 in
 5. LEVEL 5 (47.3 in above ground) = 2.8 in
- Maximum Post-Test Intrusion = 14.7 in

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:	=	<u>16</u>
Number of Cameras: Onboard Vehicle	=	<u>2</u>
Offboard Vehicle	=	<u>4</u>
Deformable Barrier	=	<u>2</u>
TOTAL	=	<u>8</u>

TABLE 4
CRASH TEST SUMMARY FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe
 Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

POSITION OF IMPACT (MDB) ON MONORAIL

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>49 3</u>	in
Overall Length of MDB (incl. honeycomb impact face)	=	<u>162</u>	in
Wheelbase of Framework Carriage	=	<u>102</u>	in
Tread of Framework Carriage (Front & Rear)	=	<u>74</u>	in
C.G. Location Rearward of Front Axle	=	<u>43 4</u>	in
C G Location From Center Line	=	<u>-0.3</u>	in
C.G. Location Above Ground Level	=	<u>19 2</u>	in

MDB WEIGHT:

Left Front	=	<u>1095</u>	lbs	Left Rear	=	<u>413</u>	lbs
Right Front	=	<u>624</u>	lbs	Right Rear	=	<u>858</u>	lbs
TOTAL FRONT	=	<u>1719</u>	lbs	TOTAL REAR	=	<u>1271</u>	lbs
TOTAL MDB WEIGHT = <u>2990</u> lbs							

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degrees
 Impact Speed = Primary: 32.9 mph Secondary: 33 3 mph

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1.	Row A Top of Stack (33 in)	=	<u>3.7</u>	in
2.	Row B Mid Stack (27 in)	=	<u>0 8</u>	in
3.	Row C Top of Bumper (21 in)	=	<u>1.5</u>	in
4.	Row D Center of Bumper (17 in)	=	<u>1 9</u>	in

INSTRUMENTATION:

Number of MDB Data Channels = 7

TABLE 5
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to side window</u>	<u>to "C" Post</u>
Arm	<u>to door trim panel</u>	<u>to door trim panel</u>
Pelvis	<u>to door trim panel</u>	<u>to door trim panel</u>
Left Knee	<u>to door trim panel</u>	<u>to door trim panel</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>N/A</u>	<u>N/A</u>

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 0.8 in forward Vertical: 0.7 in high

ARM REST LOCATIONS:

Front: 10.4 inches below window opening

Rear: 9.6 inches below window opening

SEAT CRUSH:

Driver Seat Back: 4.8 inches Driver Seat Cushion: 5.2 inches

Left Rear Seat Back: 1.0 inches Left Rear Seat Cushion: 4.4 inches

GLAZING DAMAGE:

Both struck side windows broken and windshield cracked

PILLAR PERFORMANCE:

No "A", "B" or "C" pillar separation evident

SILL SEPARATION:

Sill separated for a total length of 21" starting 15.25 inches in front of rear

wheel opening

OTHER NOTABLE IMPACT EFFECTS:

Both driver and front passenger airbags deployed

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARYYear/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

	Front Dummy ID # 269				Rear Dummy ID # 270			
	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)	62.4	30	-20.4	76	87.0	46	-8.1	86
	64.9	31	-26.8	76	88.2	46	-9.0	86
	64.6	32	-21.9	76	90.3	46	-16.4	72
	69.1	32	-21.9	76	90.1	46	-14.5	72
SPINE ACCELERATIONS: Lower Lateral.....Y Lower Lateral.....Y(R)	77.2	33	-29.8	68	57.6	48	-11.9	79
	76.5	33	-30.2	68	57.7	48	-12.4	79
PELVIC ACCELERATIONS: Lateral.....Y Lateral.....Y(R)	74.6	28	-28.5	63	64.7	38	-9.8	63
	74.7	28	-28.9	63	64.7	38	-8.3	61

REFERENCE:

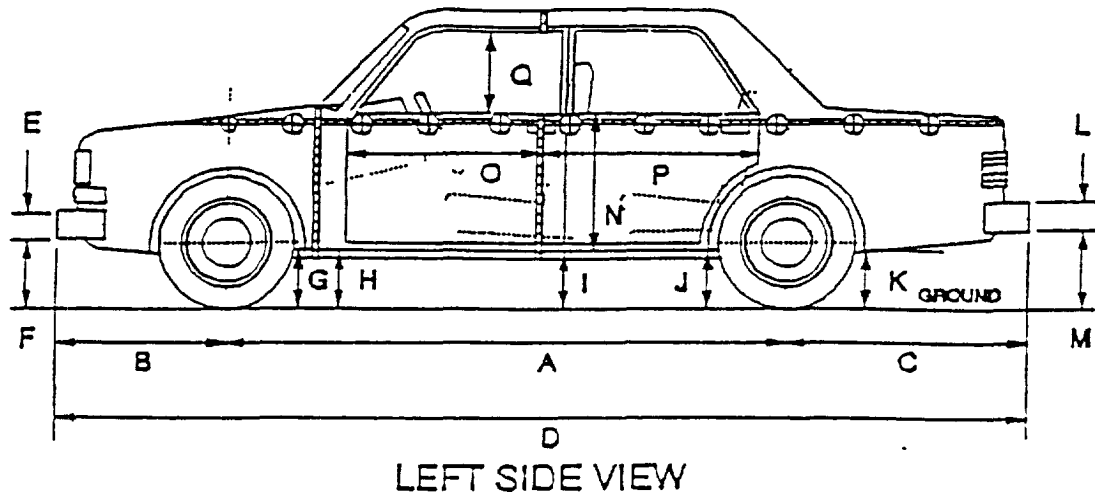
Positive Direction - Longitudinal (X) = forward

Lateral (Y) = to right

Vertical (Z) = up

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

FIGURE 2
PRE- AND POST-TEST MEASUREMENTS



D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

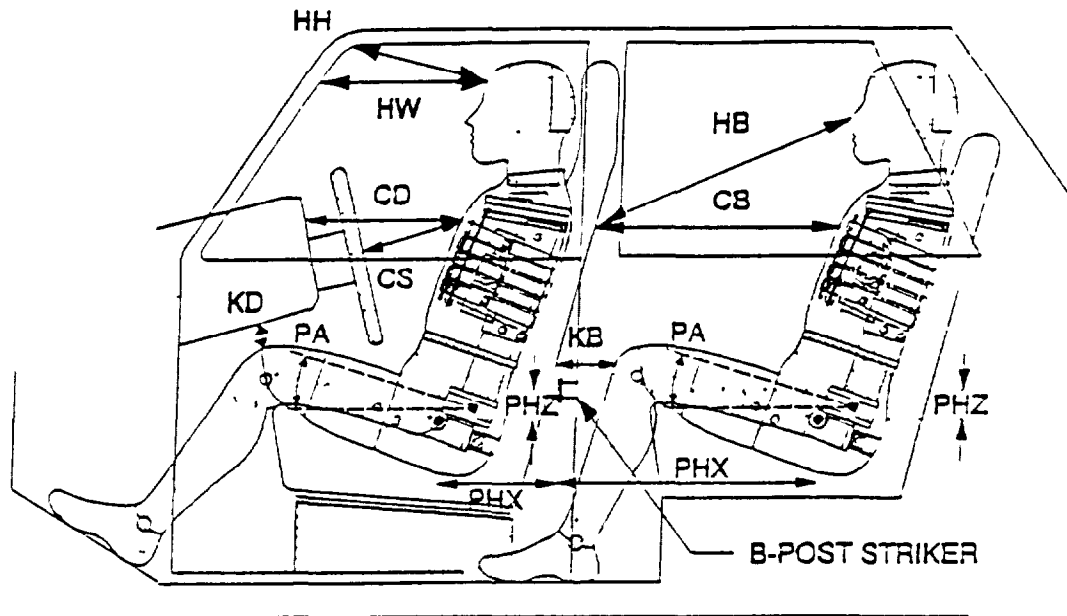
J1 = To Pinch Weld

J2 = To Sill

Units: in

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	99.4	97.7	1.7
B	37.6	35.9	1.7
C	40.2	38.9	1.3
D	177.2	172.5	4.6
E	6.1	6.5	0.4
F	14.5	16.4	1.9
G	8.7	7.9	0.8
H	6.8	9.3	2.5
I	6.4	7.5	1.1
J1/J2	6.9/6.4	8.3/7.6	1.4/1.2
K	8.1	8.4	0.3
L	15.3	16.4	1.1
M	11.3	11.5	0.2
N	22.6	20.0	2.6
O	24.4	23.9	0.5
P	24.9	24.3	0.6
Q	13.1	14.9	1.8
R	169.3	172.4	3.1
S	169.3	170.3	1.0
T	68.3	56.8	11.5

FIGURE 3
SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



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

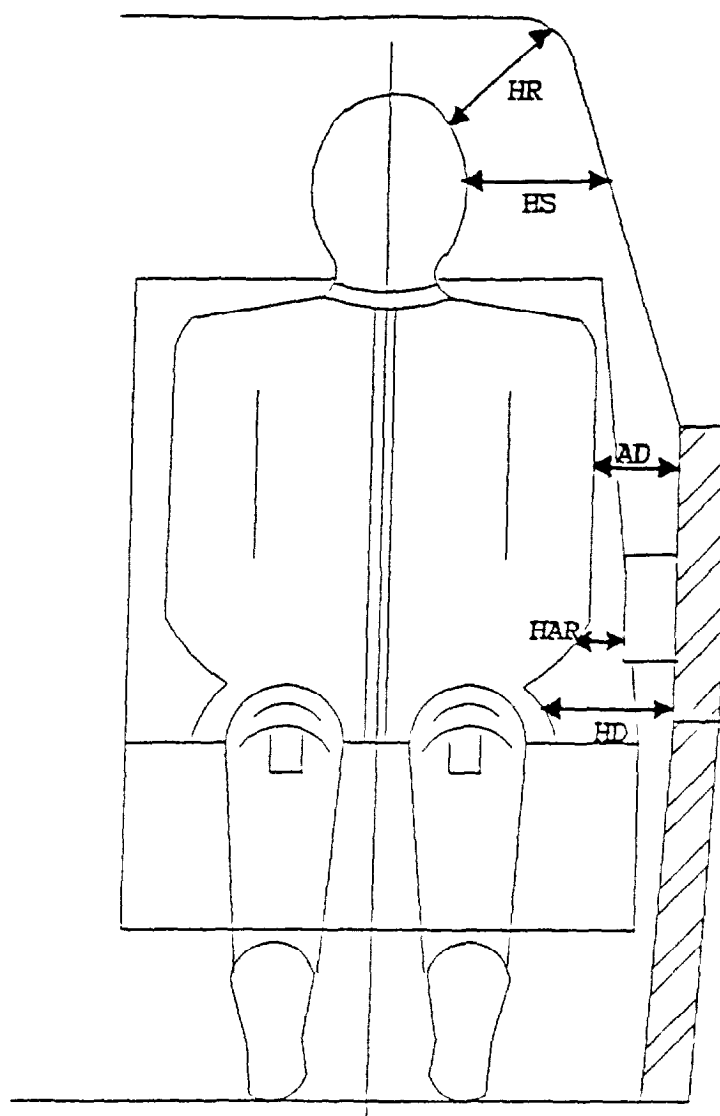
LEFT SIDE VIEW

NOTE: All dimensions are in inches

	DRIVER ID #269	LEFT REAR PASSENGER ID #270	
HH	16.5	---	
HW	24.5	---	
HB	---	7.5	
CD	22.0	CB	11.3
CS	14.8	---	
KDL	7.5	KBL	---
KDR	7.5	KBR	---
PA°	24.0°	---	
PHX	13.8	12.8	
PHZ	7.5	8.0	

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

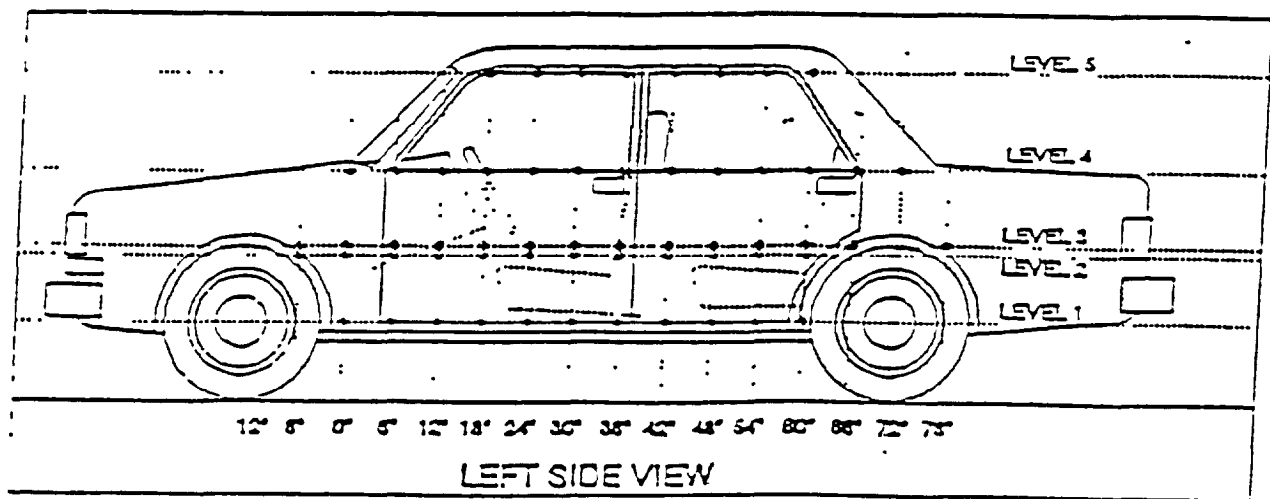


NOTE: All dimensions are in inches

	DRIVER ID #269	LEFT REAR PASSENGER ID #270
HR	4.3	5.6
HS	9.0	11.1
AD	3.0	2.8
HD	4.3	4.5

FIGURE 5
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe
Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 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>47.3</u> in
Level 4 @ Window Sill	= <u>33.0</u> in
Level 3 @ Mid Door	= <u>21.9</u> in
Level 2 @ Occupant H-Point	= <u>16.0</u> in
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>9.8</u> in

TABLE 7

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

Year/Make/Model/Body Style. 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	39.3	39.2	-0.1
-36	35.9	35.6	-0.3
-30	34.0	33.7	-0.3
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	---	---	---
6	33.1	38.4	5.3 (impact point)
12	33.1	40.5	7.4
18	33.1	40.7	7.6
24	33.0	40.6	7.6
30	33.1	40.7	7.6
36	33.1	40.7	7.6
42	32.9	41.0	8.1
48	32.9	41.4	8.5
54	32.9	40.9	8.0
60	32.9	40.2	7.3
66	32.9	39.6	6.7
72	32.9	38.7	5.8
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

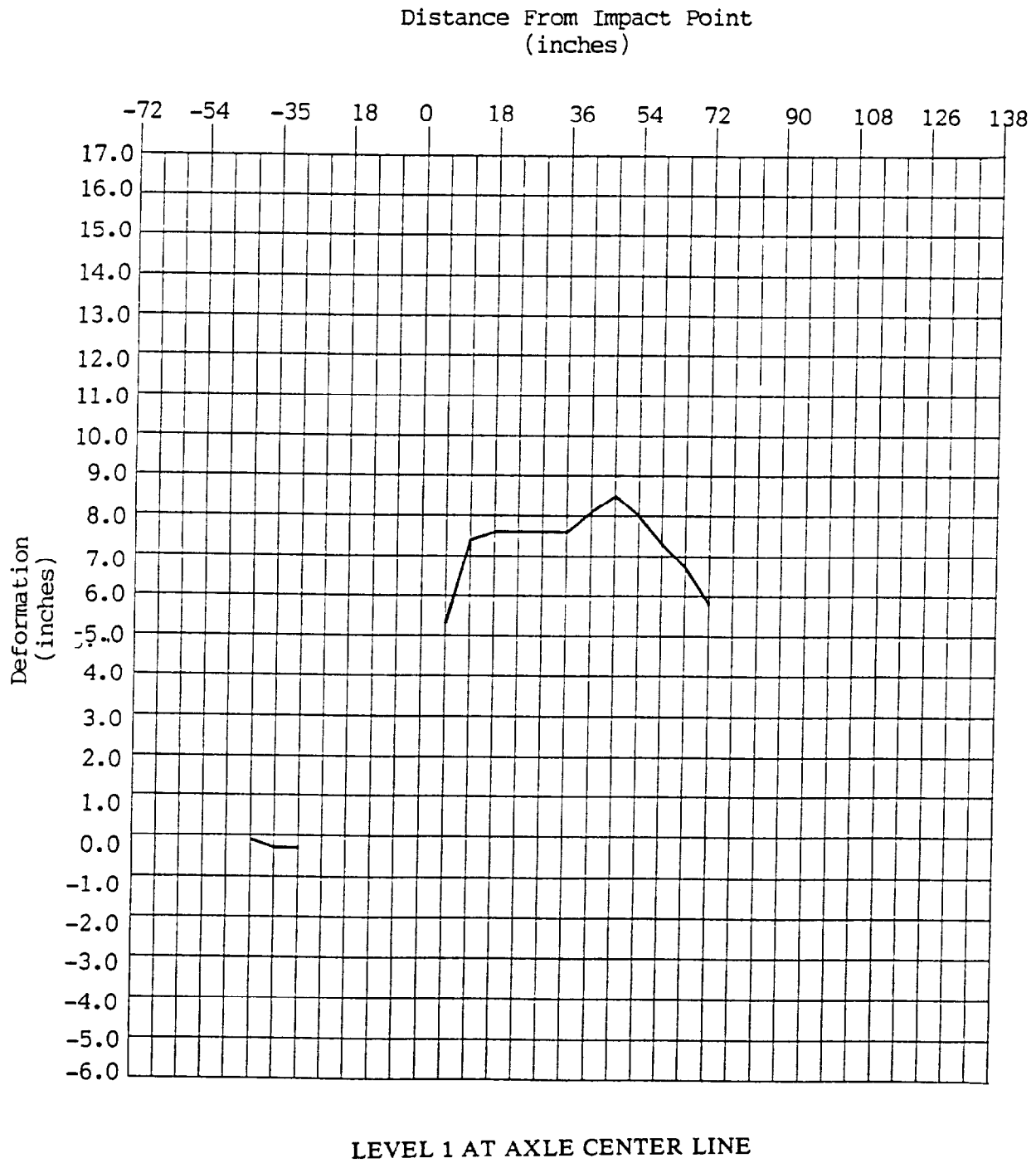


TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

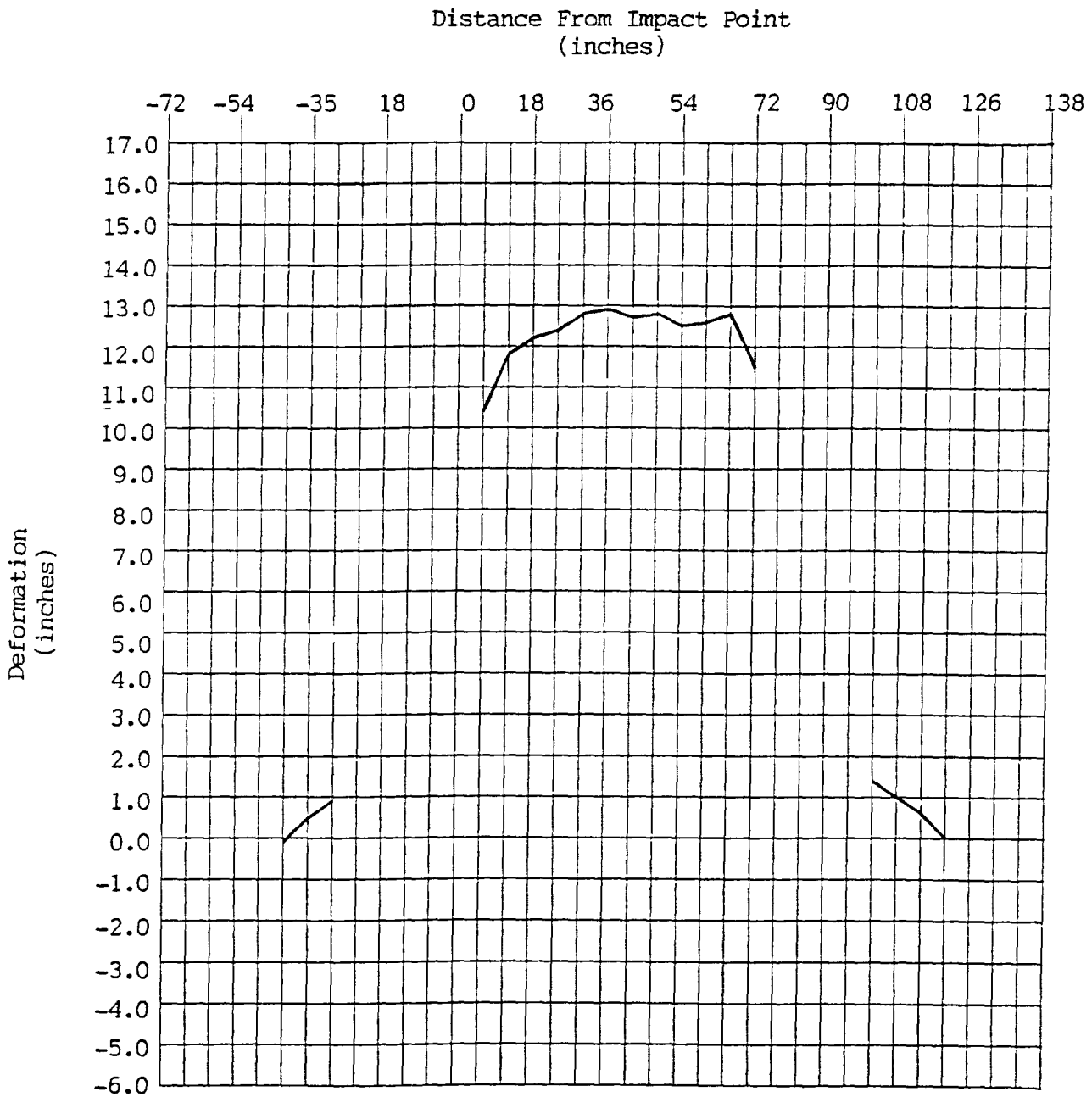
LEVEL 2 AT OCCUPANT H-POINT

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No. CS5200 TEST DATE: June 29, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	36.5	36.4	-0.1
-36	34.3	34.8	0.5
-30	33.0	33.9	0.9
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	---	---	---
6	31.7	42.1	10.4 (impact point)
12	31.7	43.5	11.8
18	31.7	43.9	12.2
24	31.7	44.1	12.4
30	31.7	44.5	12.8
36	31.7	44.6	12.9
42	31.7	44.4	12.7
48	31.7	44.5	12.8
54	31.7	44.2	12.5
60	31.7	44.3	12.6
66	31.7	44.5	12.8
72	31.7	43.2	11.5
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	32.8	34.2	1.4
108	33.6	34.6	1.0
114	34.6	35.2	0.6
120	35.7	35.7	0
126	---	---	---
132	---	---	---
138	---	---	---

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/Nissan/240SX/2 Door CoupeVehicle NHTSA No.. CS5200 TEST DATE: June 29, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	33.3	34.3	1.0
-24	32.1	34.3	2.2
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	31.3	41.8	10.5 (impact point)
6	31.3	43.2	11.9
12	31.3	43.2	11.9
18	31.3	43.1	11.8
24	31.3	43.9	12.6
30	31.2	44.2	12.9
36	31.3	43.9	12.6
42	31.3	44.0	12.7
48	31.2	44.2	13.0
54	31.2	44.1	12.9
60	31.2	44.4	13.1
66	31.2	45.9	14.7
72	31.2	44.4	13.2
78	---	---	---
84	---	---	---
90	---	---	---
96	31.8	33.3	1.5
102	32.5	33.7	1.2
108	33.2	34.2	1.0
114	34.0	34.7	0.7
120	35.1	35.6	0.5
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

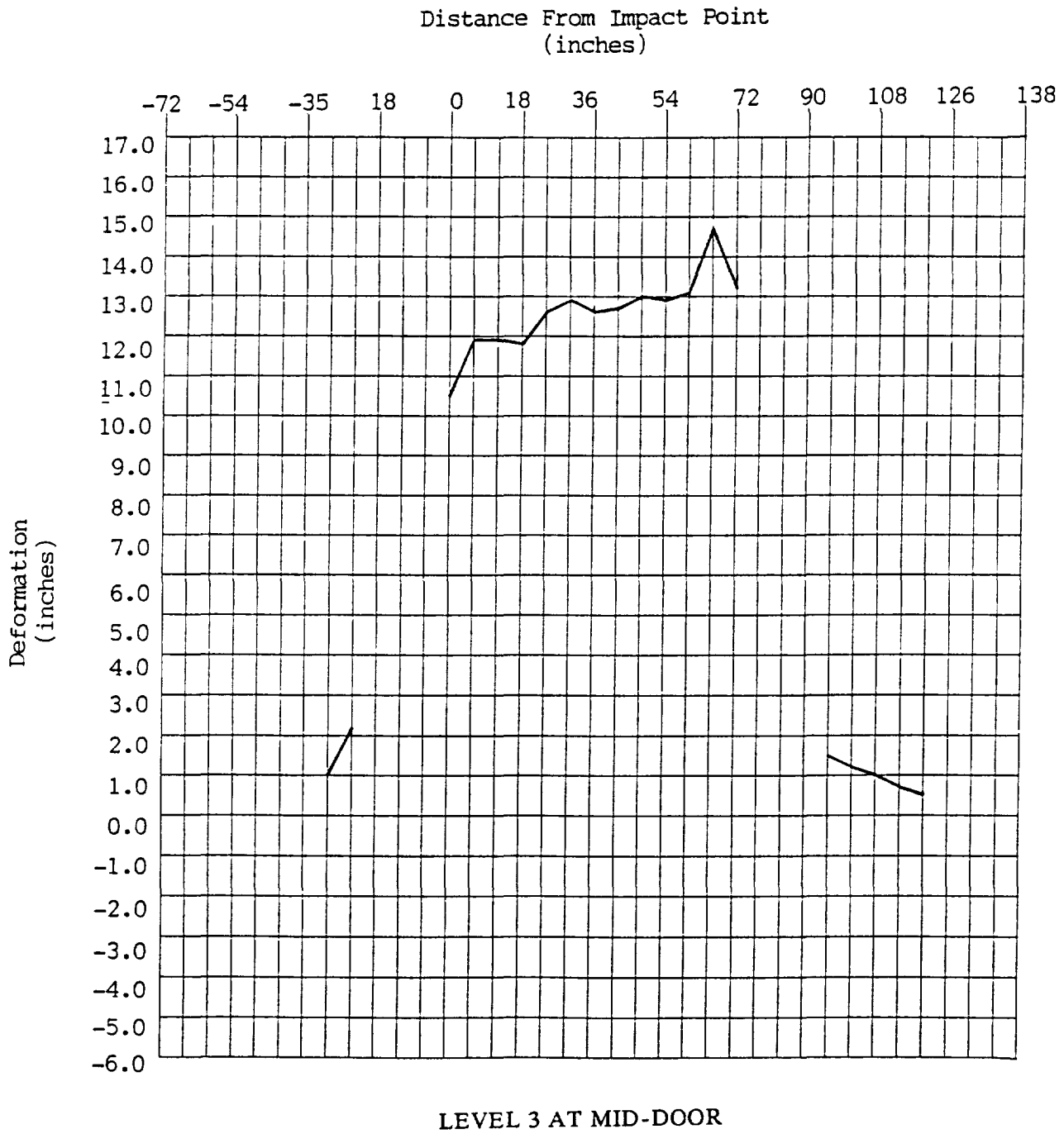


TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

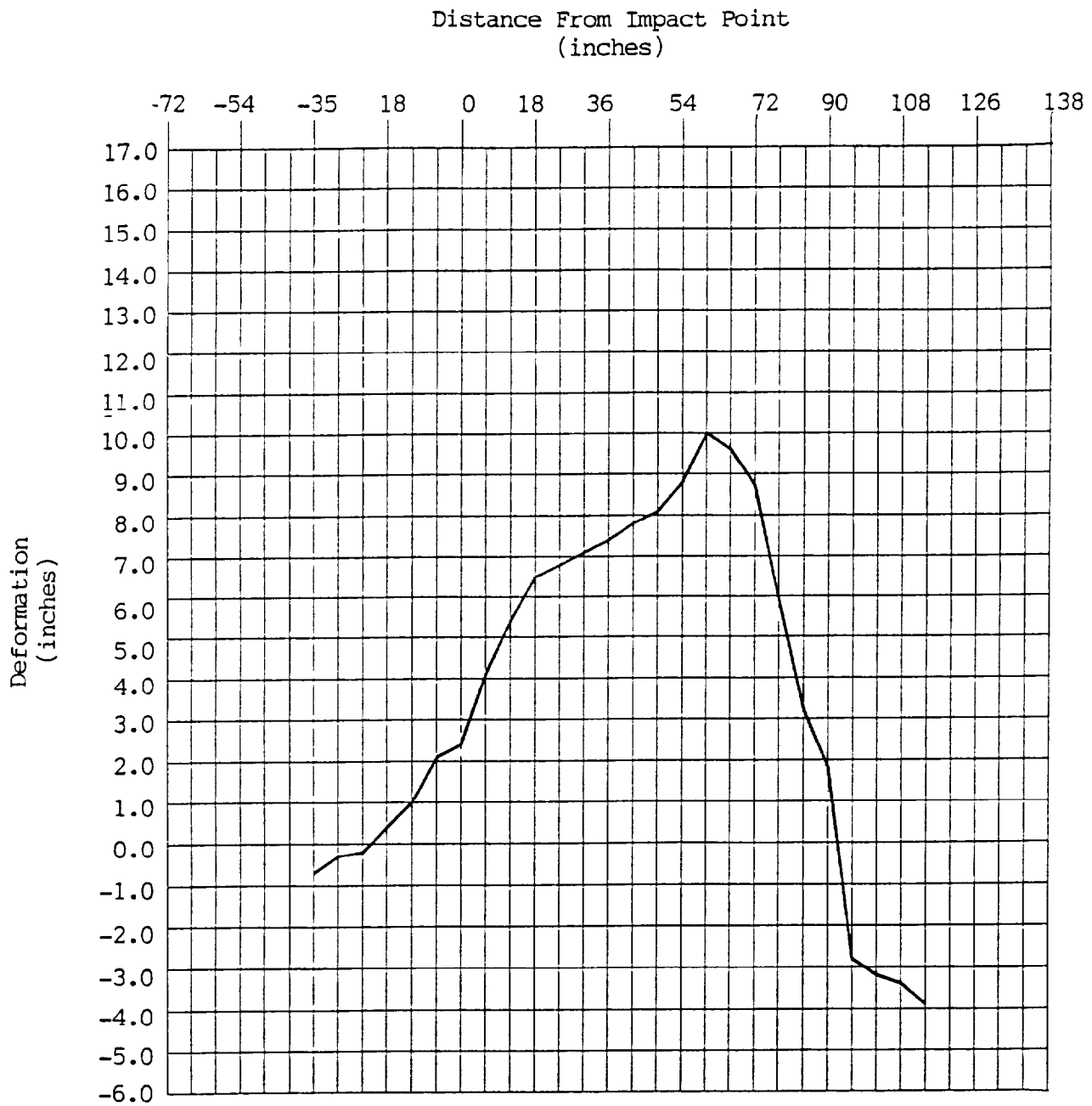
LEVEL 4 AT WINDOW SILL

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No.. CS5200 TEST DATE: June 29, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	37.1	36.4	-0.7
-30	36.0	35.7	-0.3
-24	35.4	35.2	-0.2
-18	35.0	35.4	0.4
-12	34.6	35.6	1.0
-6	33.9	36.0	2.1
0	34.1	36.5	2.4 (impact point)
6	33.9	37.8	4.1
12	33.9	39.3	5.4
18	33.9	40.4	6.5
24	33.9	40.7	6.8
30	33.8	40.9	7.1
36	33.9	41.3	7.4
42	33.9	41.7	7.8
48	33.9	42.0	8.1
54	34.0	42.8	8.8
60	34.2	44.2	10.0
66	34.3	43.9	9.6
72	34.3	43.0	8.7
78	34.4	40.3	5.9
84	34.6	37.8	3.2
90	35.0	36.8	1.8
96	35.2	32.4	-2.8
102	35.8	32.6	-3.2
108	36.2	32.8	-3.4
114	37.0	33.1	-3.9
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 4 AT WINDOW SILL

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

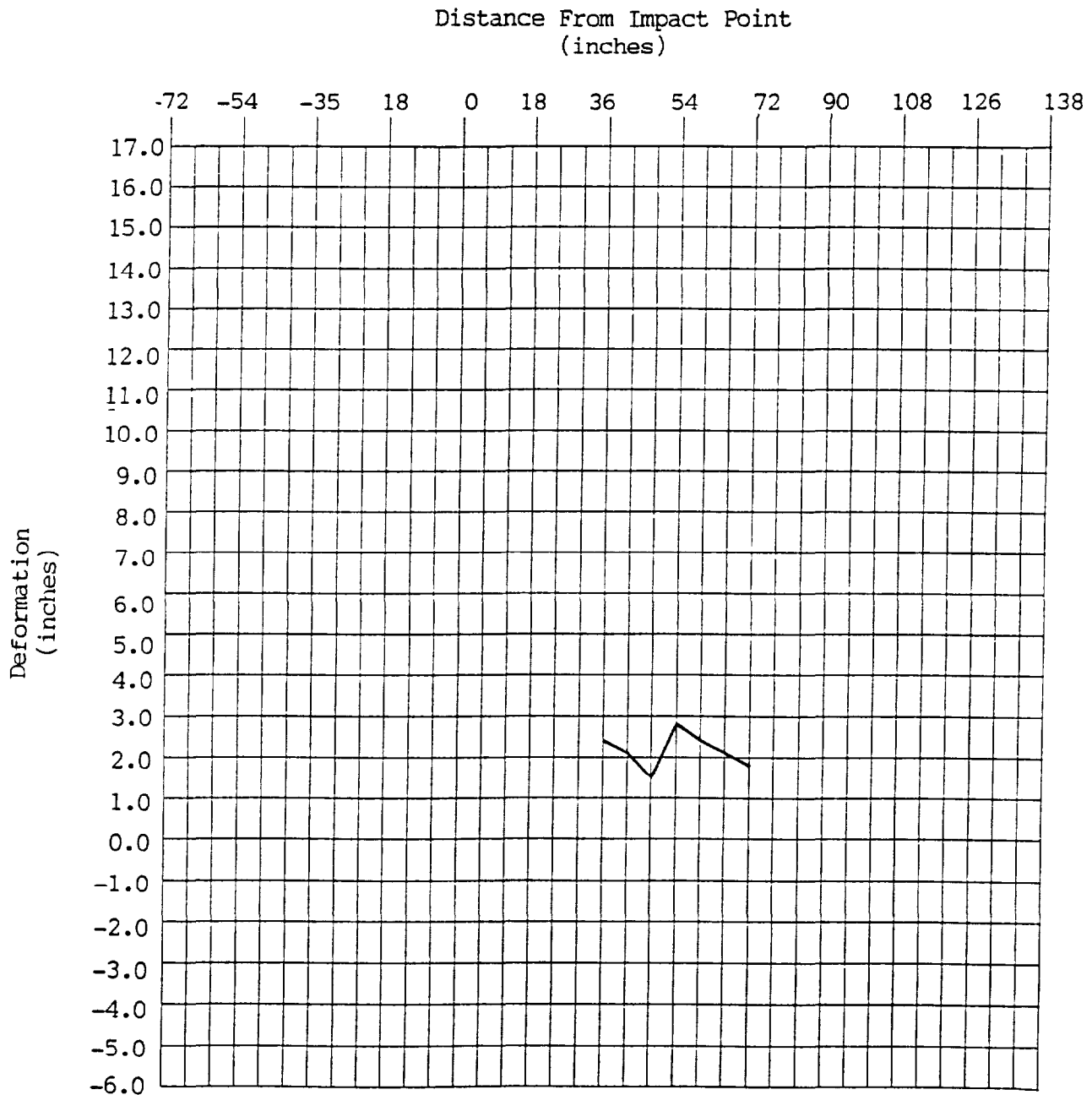
LEVEL 5 AT WINDOW TOP

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No CS5200 TEST DATE: June 29, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)	
-72	---	---	---	
-66	---	---	---	
-60	---	---	---	
-54	---	---	---	
-48	---	---	---	
-42	---	---	---	
-36	---	---	---	
-30	---	---	---	
-24	---	---	---	
-18	---	---	---	
-12	---	---	---	
-6	---	---	---	
0	---	---	---	(impactpoint)
6	---	---	---	
12	---	---	---	
18	---	---	---	
24	---	---	---	
30	---	---	---	
36	43.5	45.9	2.4	
42	43.5	45.6	2.1	
48	43.4	44.9	1.5	
54	43.2	46.0	2.8	
60	43.3	45.7	2.4	
66	43.5	45.6	2.1	
72	43.8	45.6	1.8	
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 5 AT WINDOW TOP

FIGURE 7
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SENSITIVITY

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SENSITIVITY

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SENSITIVITY

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TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SENSITIVITY

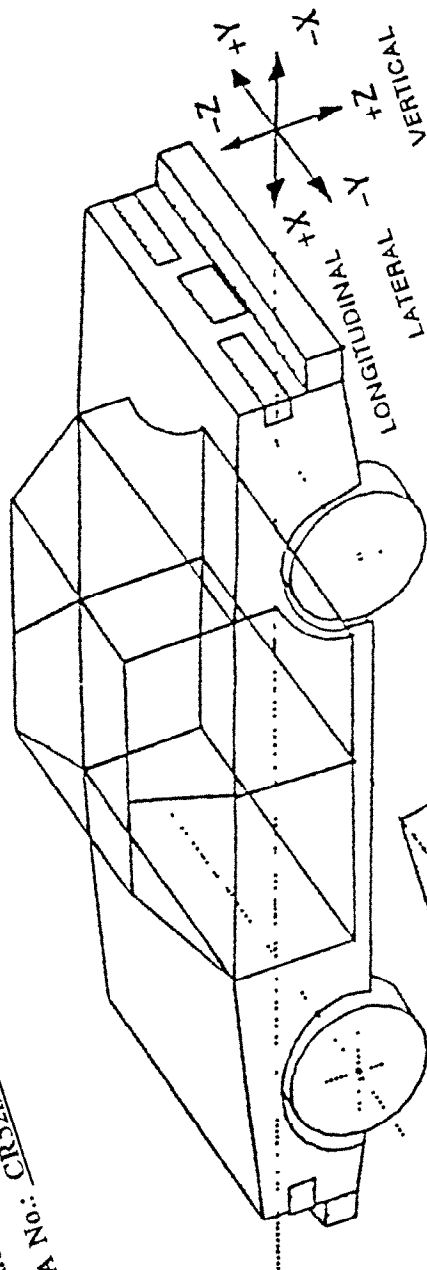
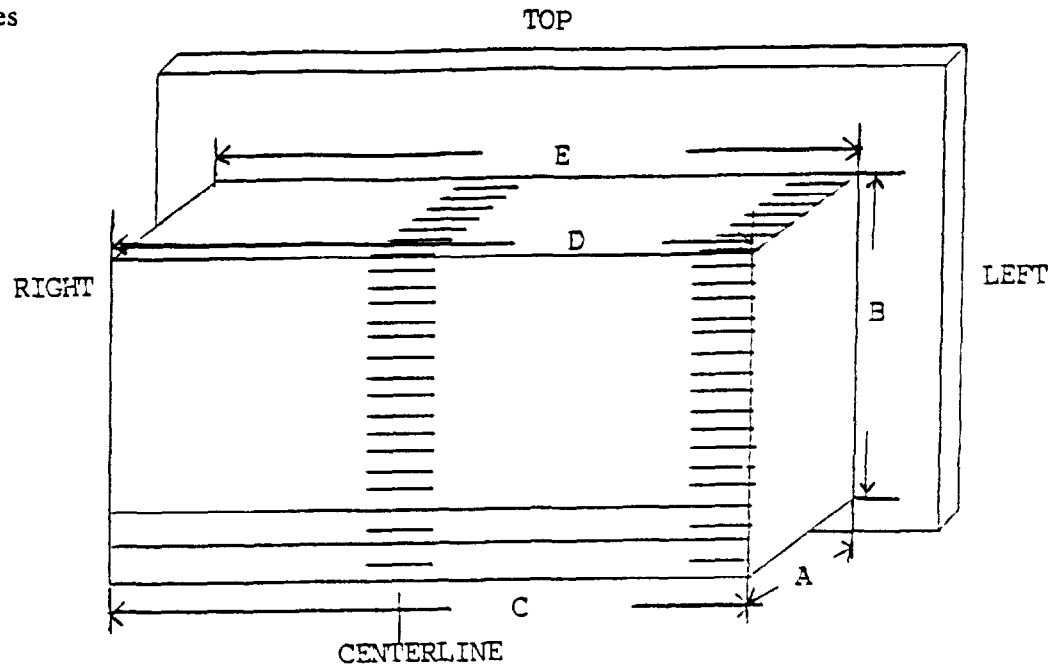


FIGURE 8
MDB FACE DIMENSIONS

Measurements in inches

A = 15.1
 B = 22.1
 C = 66.1
 D = 66.1
 E = 66.2



Measurements in inches

	Right	Left
A =	<u>10.9</u>	<u>10.9</u>
B =	<u>13.0</u>	<u>13.0</u>
C =	<u>21.1</u>	<u>21.0</u>
D =	<u>33.0</u>	<u>32.9</u>

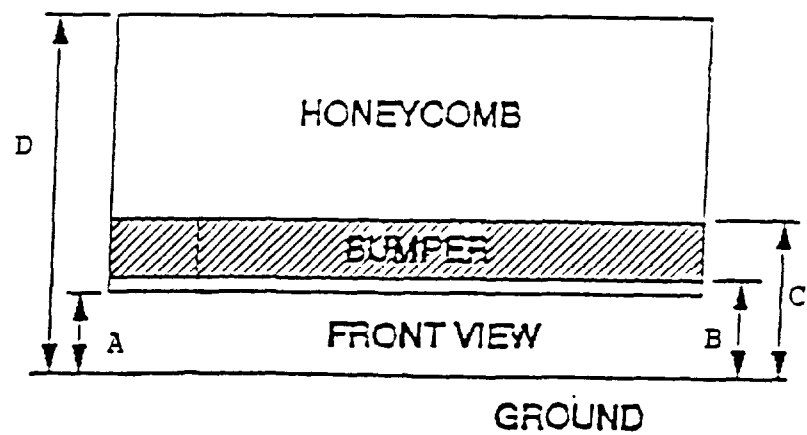


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTORYear/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No: CS5200 TEST DATE: June 29, 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 (inches)	Crush (inches)	Crush (inches)	Crush (inches)
32"	0.3	0.1	0.2	1.2
28"	-0.3	-0.3	0.1	1.0
24"	-0.3	-0.2	0.1	1.0
20"	-0.1	-0.2	0.1	0.9
16"	-0.1	-0.1	0.1	0.9
12"	0	0	0.2	0.7
8"	0.1	0	0.2	0.7
4"	0.2	0.1	0.2	0.5
0"	0.1	0.1	0.3	0.5
4"	0.2	0.2	0.3	0.7
8"	0.3	0.2	0.3	0.8
12"	0.3	0.2	0.4	0.9
16"	0.6	0.2	0.4	0.9
20"	1.4	0.3	0.5	1.1
24"	2.6	0.5	0.8	1.4
28"	3.1	0.1	1.1	1.6
32"	3.7	0.8	1.5	1.9

Right Side

Left Side

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

Accel. No.	Description	Coordinates (in)			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	98.9	26.4	11.5	5.4	-8.1	21.6	-2.7	5.4	-6.4	23.1
2	Rt. Side Sill @ Rear Seat	74.6	26.9	10.6	5.7	-6.7	23.2	-3.0	8.3	-7.6	23.8
3	Rr. Floorpan Above Axle	33.6	0	24.5	1.7	-9.5	22.5	-2.4	5.5	-3.6	23.9
4	Left Side Sill @ Rr. Seat	68.1	-23.0	7.9	---	---	40.8	-16.8	---	---	---
5	Left Side Sill @ Frt. Seat	95.6	-23.0	8.0	---	---	80.4	-73.8	---	---	---
6	Left Lower "A" Post	116.8	-28.3	13.3	---	---	142.5	-28.3	---	---	---
7	Left Lower "B" Post	70.6	-29.0	19.0	---	---	221.8	-65.3	---	---	---
8	Left Mid "B" Post	70.6	-29.0	23.0	---	---	186.4	-54.2	---	---	---
9	Right Rear Occupant Compartment	69.1	-14.0	11.9	---	---	21.8	-2.6	---	---	---
10	Driver Left Seat Track	100.0	12.0	12.1	---	---	70.4	-40.1	---	---	---

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

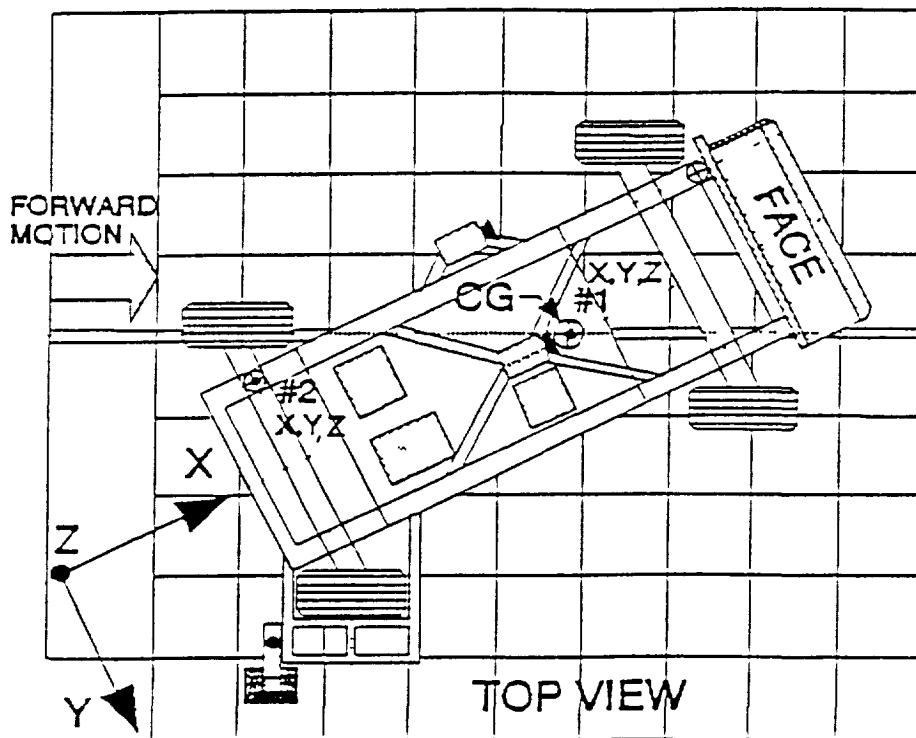
Z - Ground Level (+ Up)

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1995/Nissan/240SX//2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994



Accel. No.	Location	Coordinates (in)			Pos. Direct.		Neg. Direct.	
					Max (g)	Time (msec)	Max (g)	Time (msec)
		X	Y	Z				
1	MDB Center of Gravity							
	Longitudinal ... X				1.5	126	-15.9	26
	Lateral Y	-43.0	0	19.0	0.6	102	-6.8	33
	Vertical Z				13.8	28	-12.3	42
	Resultant R				20.6	37	---	---
2	Rear Frame Member							
	Longitudinal ... X	-102.0	-24.6	24.5	19.5	32	-4.9	112
	Lateral Y				*	*	*	*

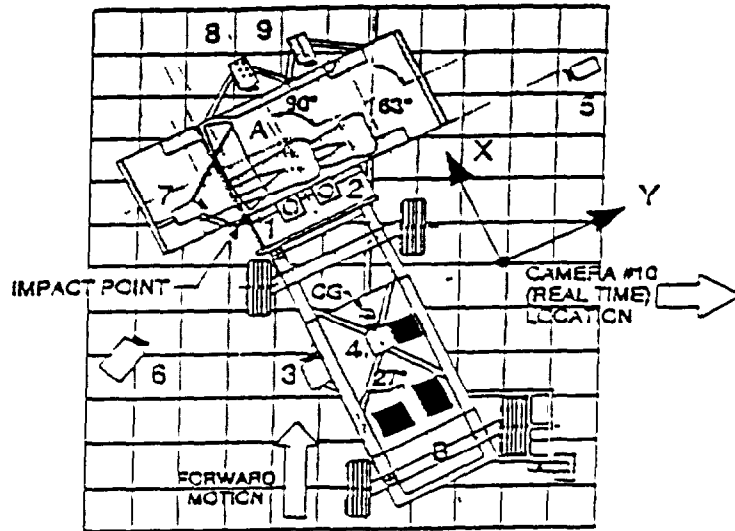
Reference: X = Front Axle (+Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Up)

* No valid data collected

FIGURE 10
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994



Camera No.	View	Coordinates (in)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
	Real Time					10	24
1	Top Pointer	0	15.0	193.7		13	no timing
2	Top Wide	15.7	0	211.0		8	1149
3	Cart Pointer					35	985
4	Cart					13	1015
5	Right Impact	20	-335.8	30.6	45°	35	952
6	Left Impact	-95.3	112.2	51.9	45°	13	1111
7	Onboard Hood					13	1000
8	Onboard Driver					7.5	769

* 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/Nissan/240SX/2 Door Sedan

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 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 (32.9 mph)

FUEL SPILLAGE MEASUREMENT:

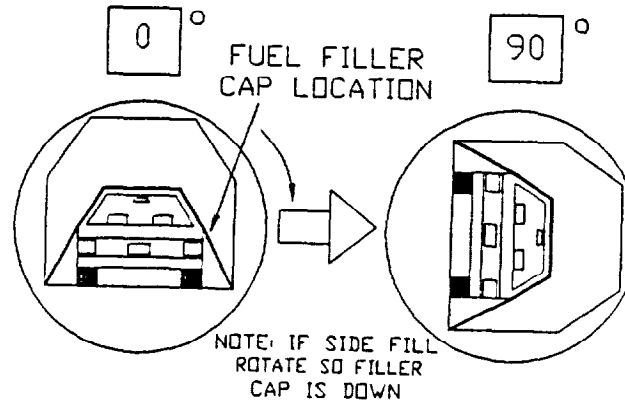
1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

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

SOLVENT SPILLAGE DETAILS:

None

TABLE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETYear/Make/Model/Body Style: 1995/Nissan/240SX/2 Door CoupeVehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994TEST PHASE: 0° - 90°I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 58 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 58 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.

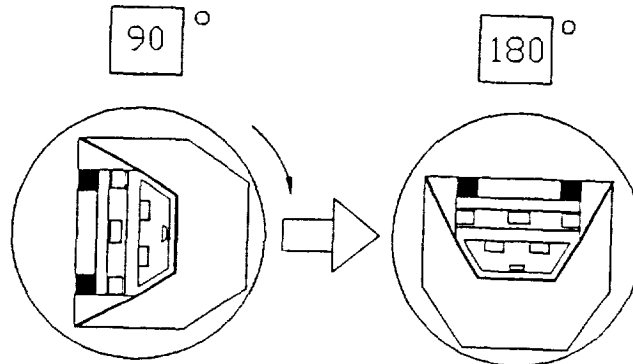
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

TEST PHASE: 90° - 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 44 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 44 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
---	---	---	---

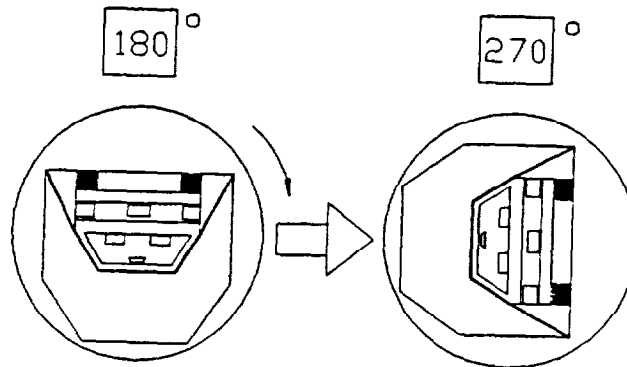
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Coupe
 Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 26 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

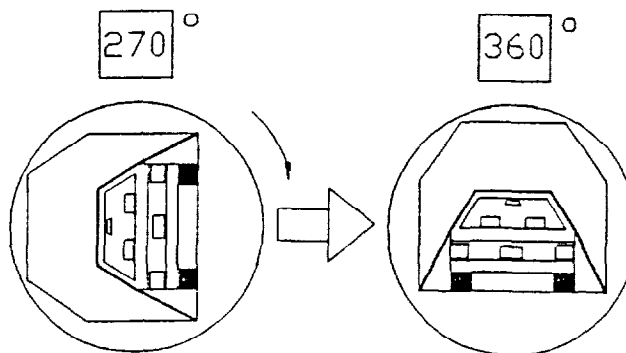
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Nissan/240SX/2 Door Sedan

Vehicle NHTSA No.: CS5200 TEST DATE: June 29, 1994

TEST PHASE: 270° - 360°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 43 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 43 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 OF PHOTOGRAPHS

	<u>Page No.</u>
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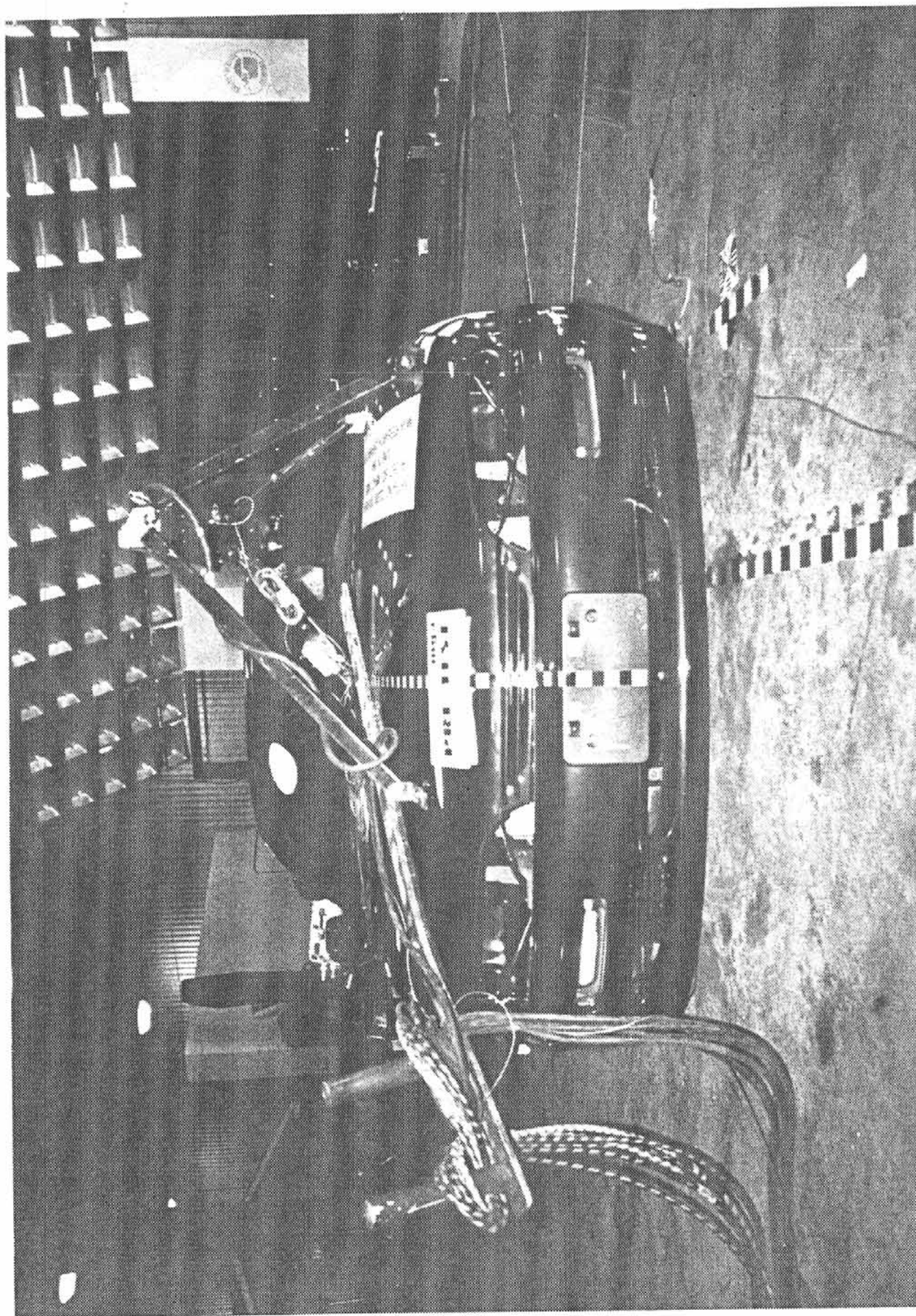
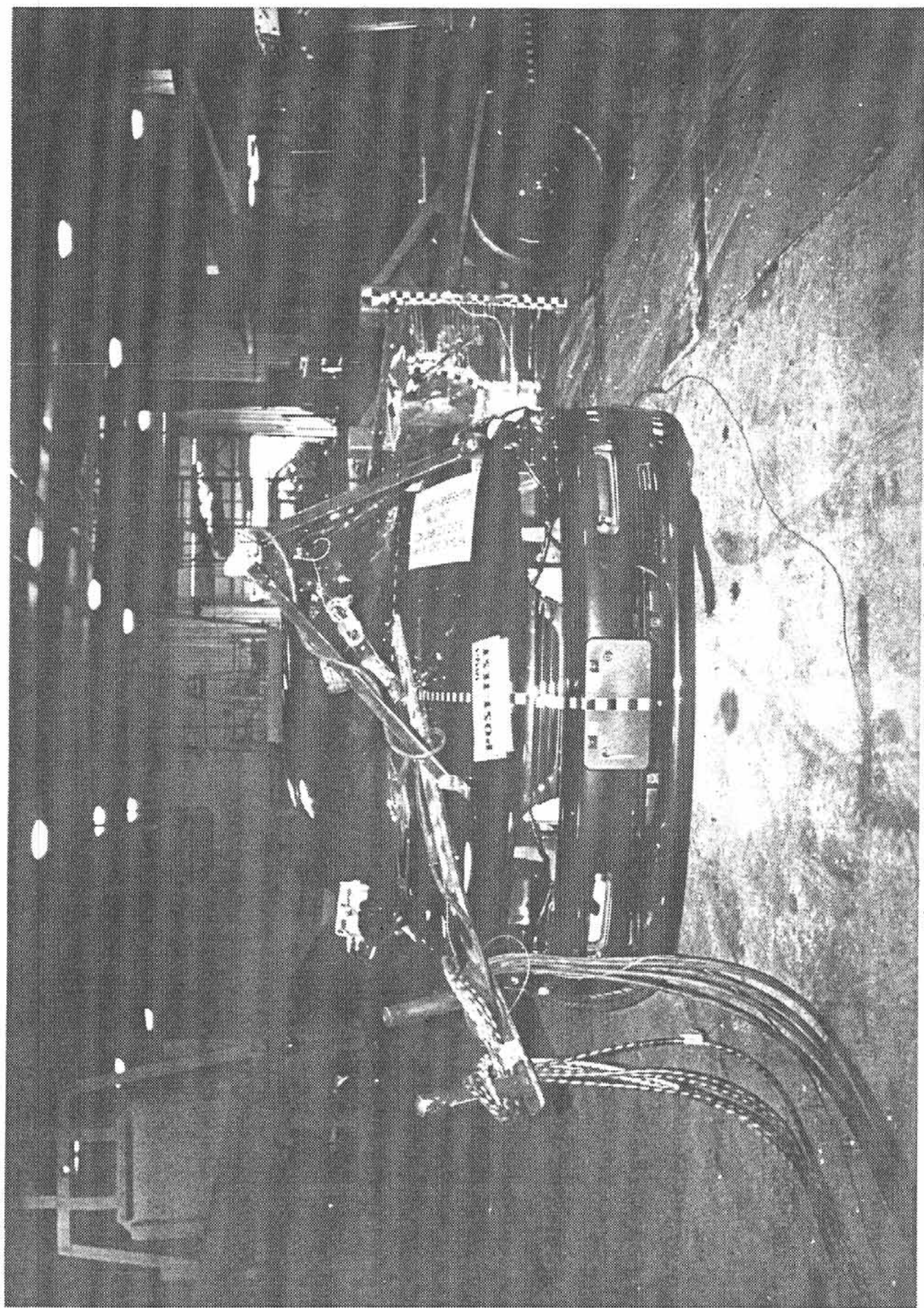


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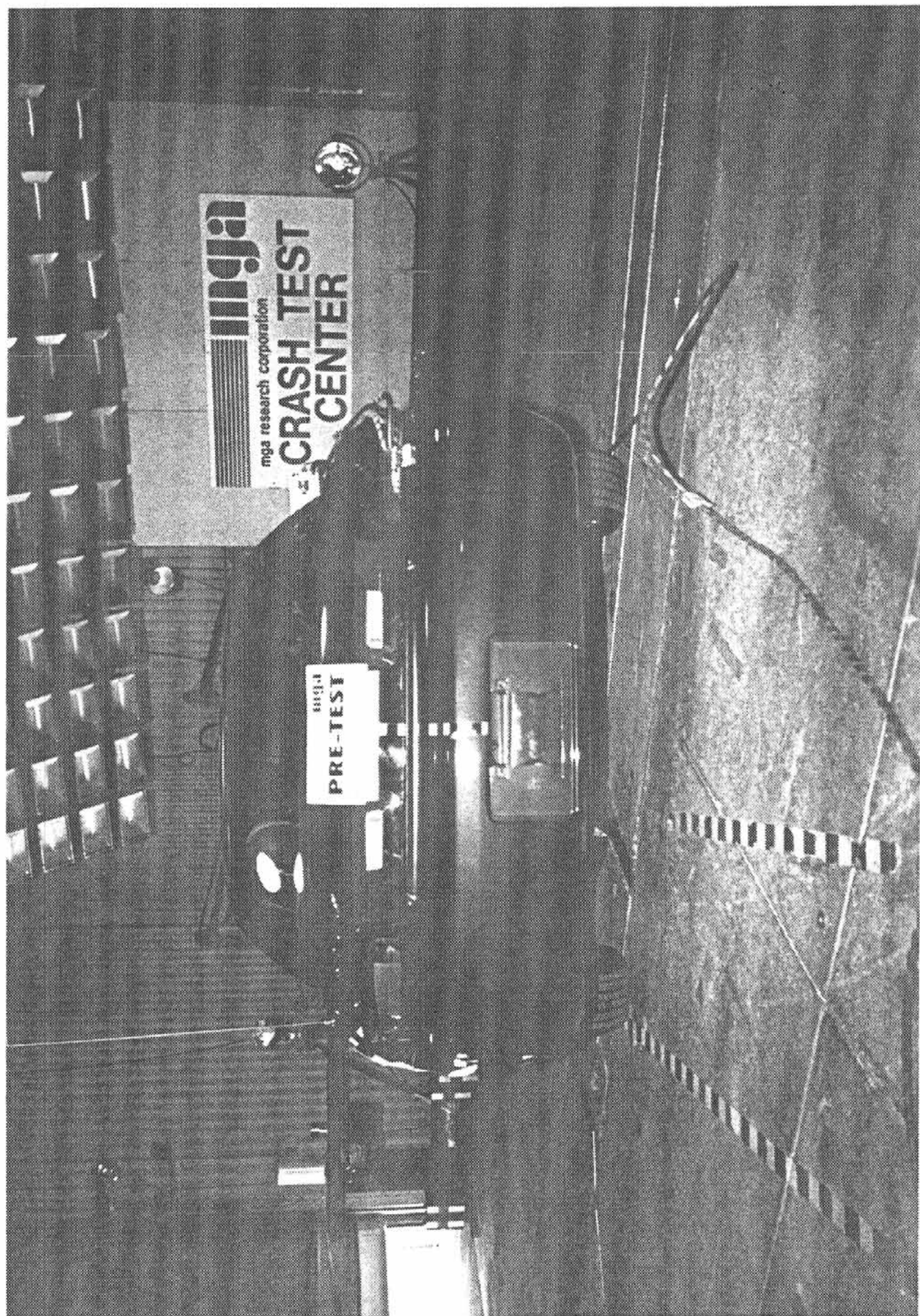


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

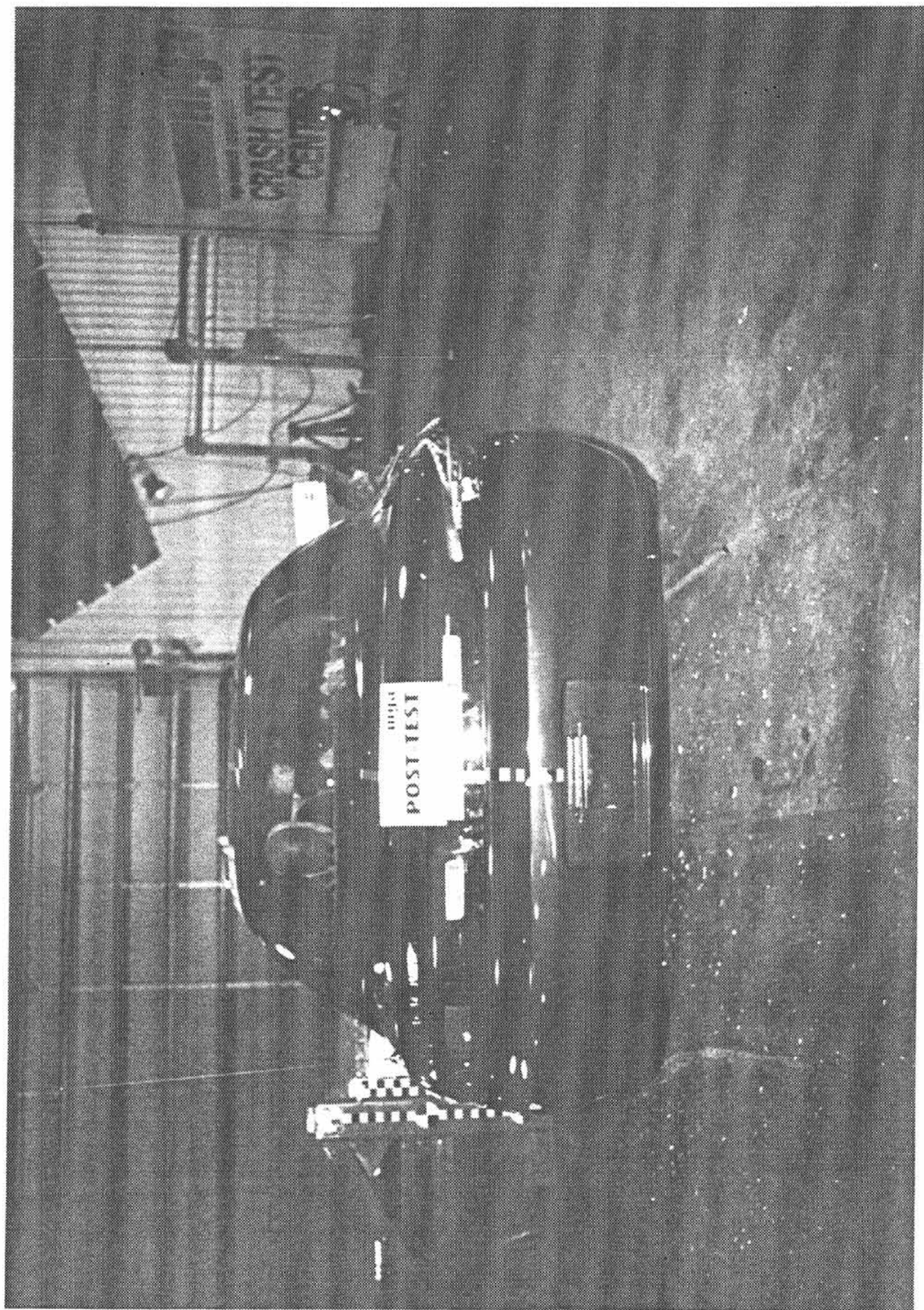


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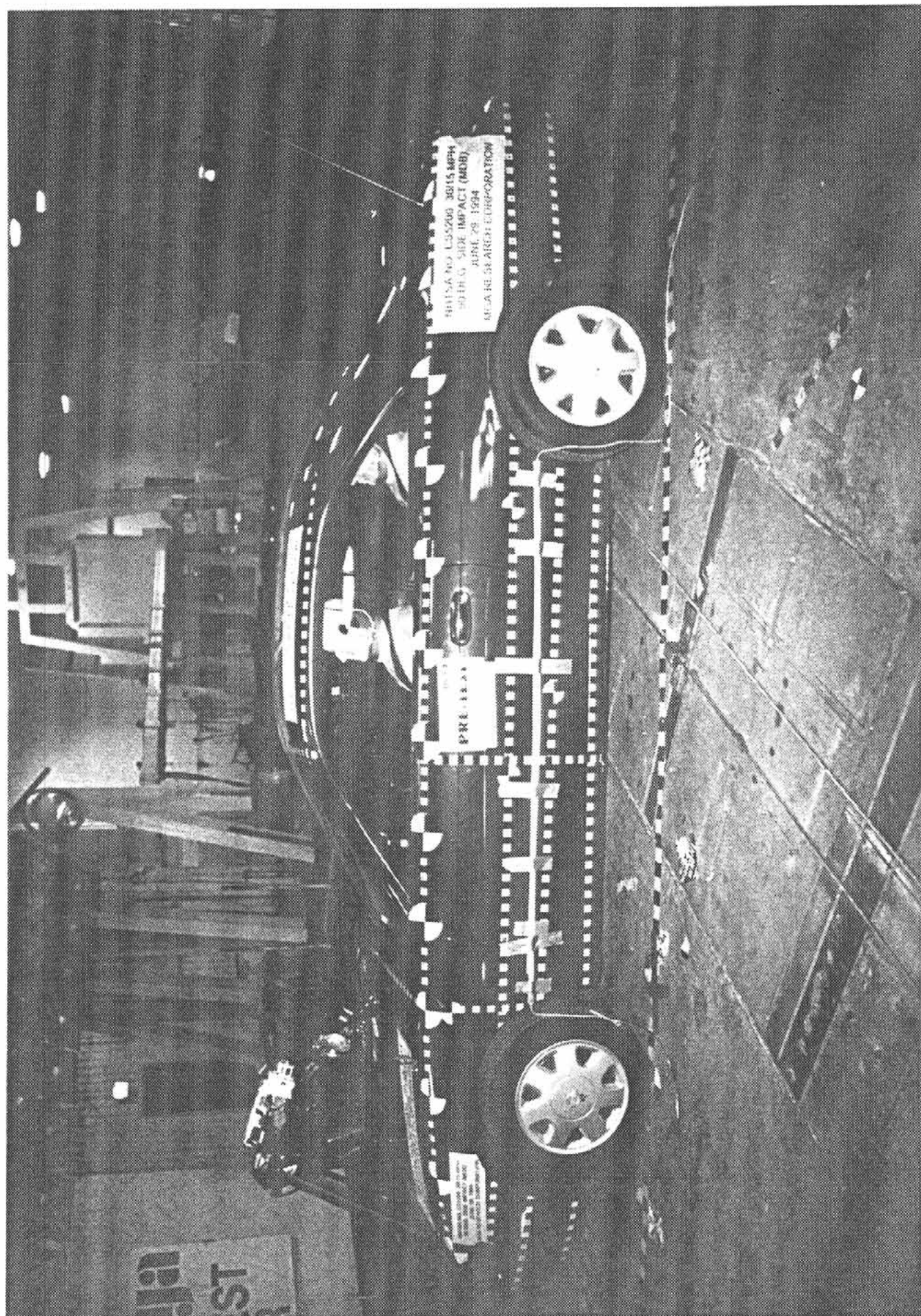


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

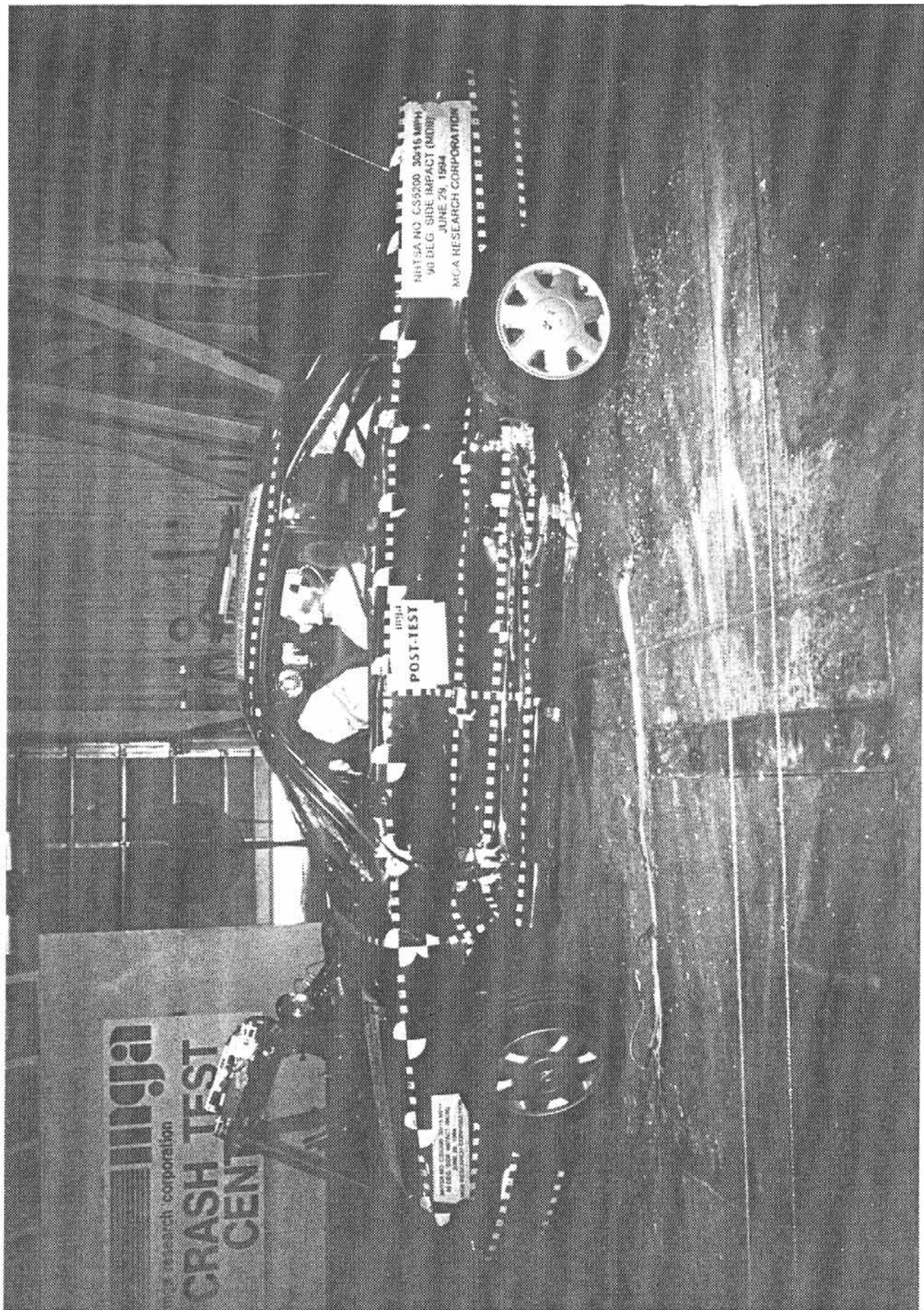


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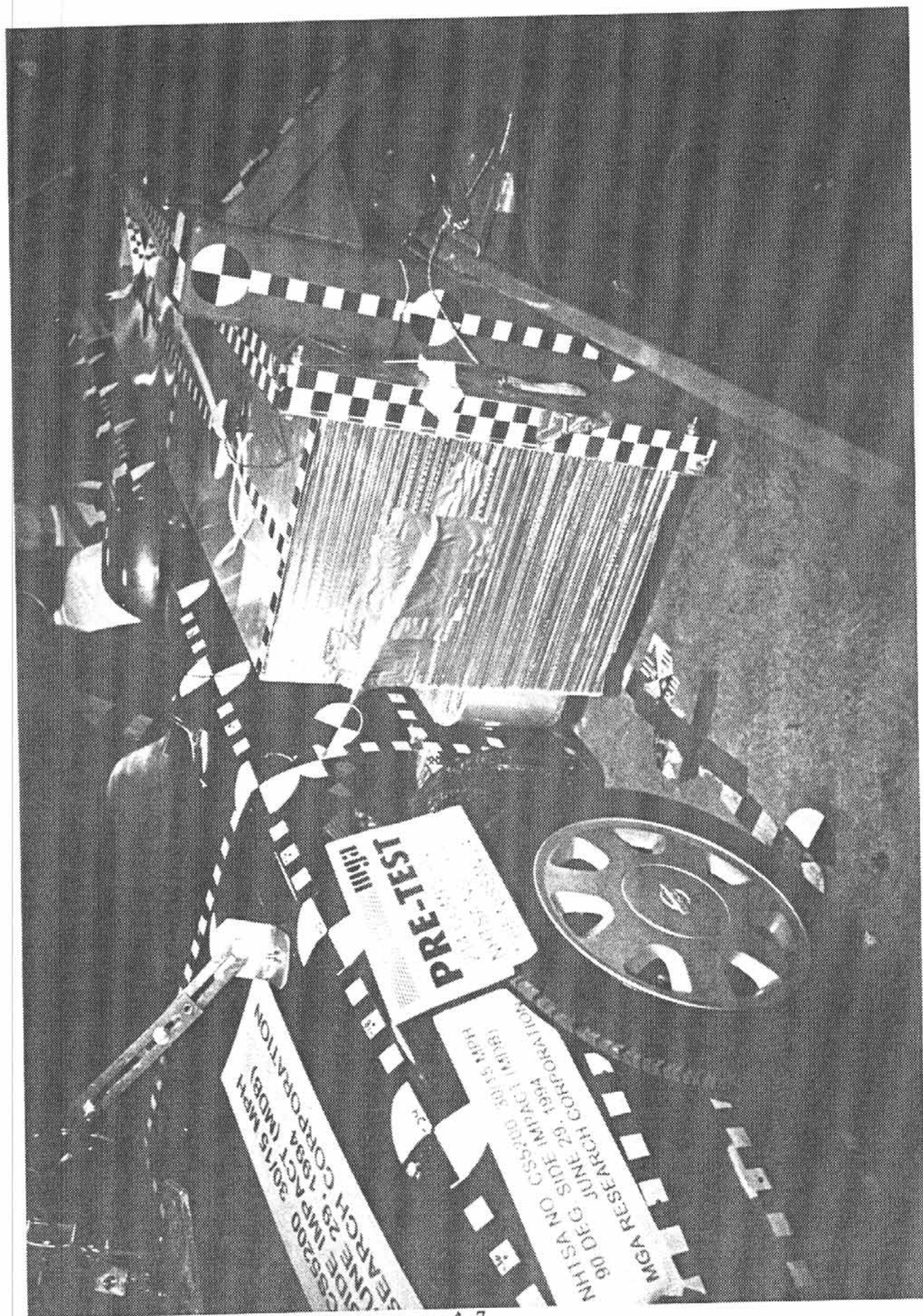


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

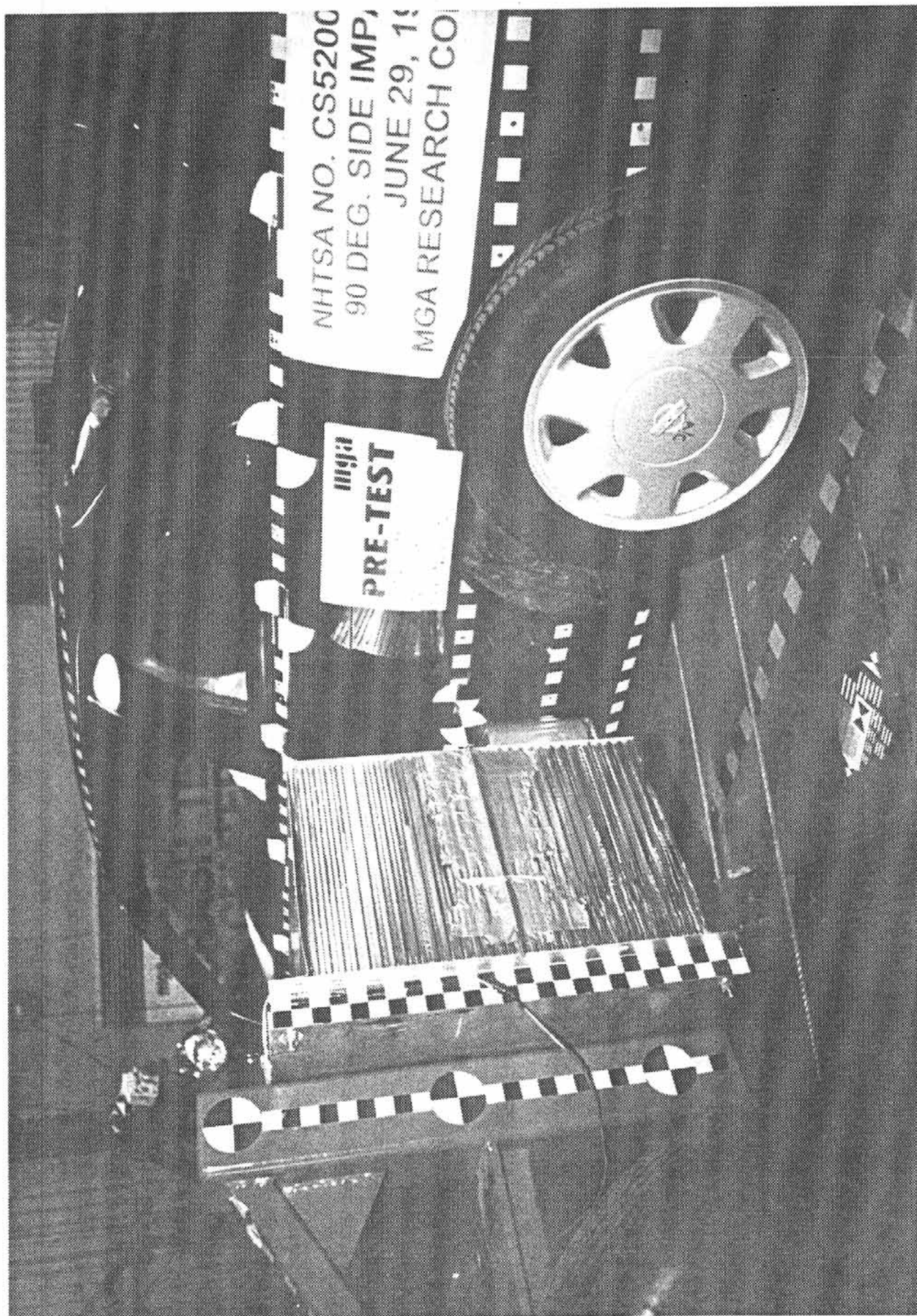


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

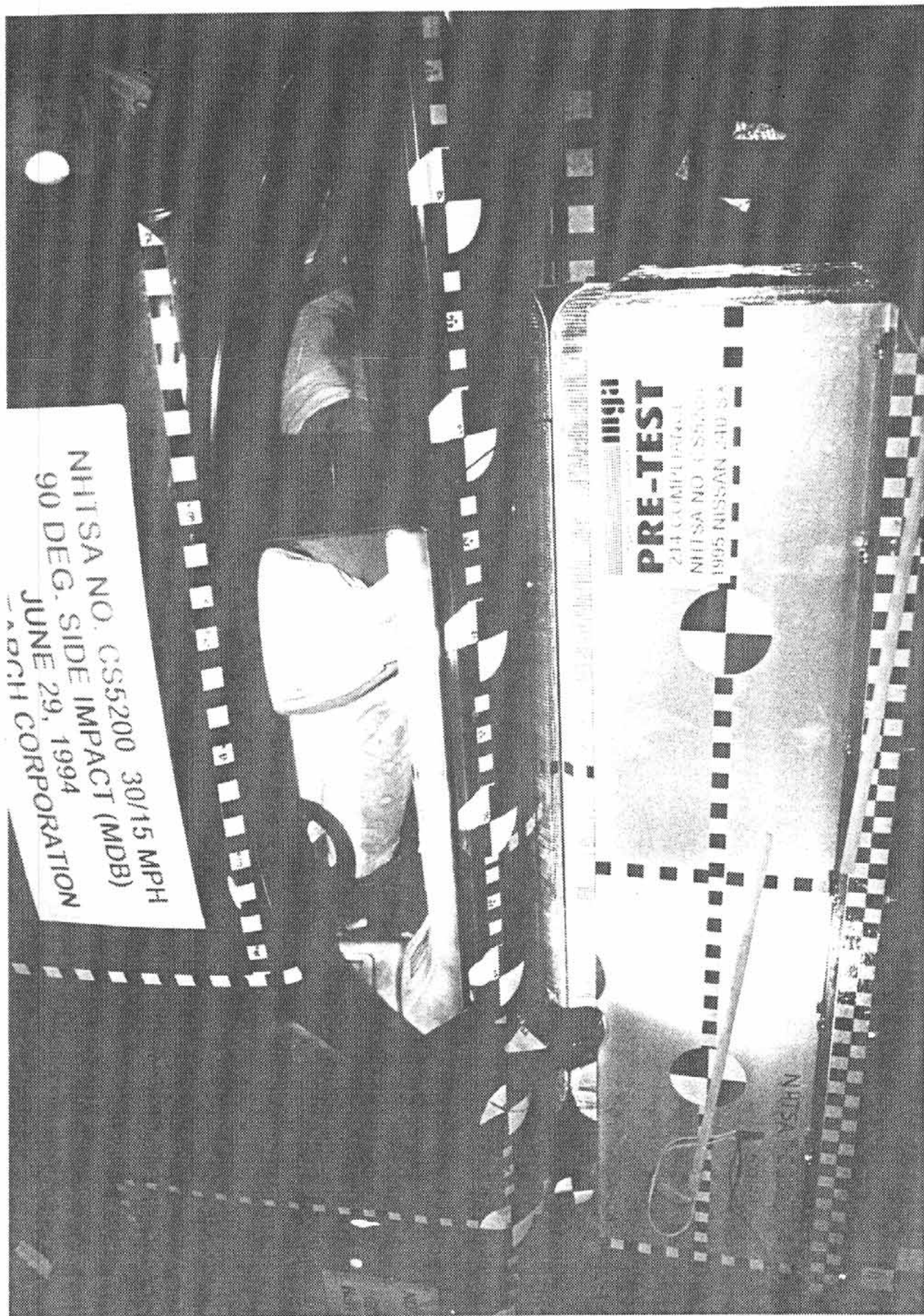


Photo No. A-9 - Pre-Test MDB Position Against Vehicle Overhead View

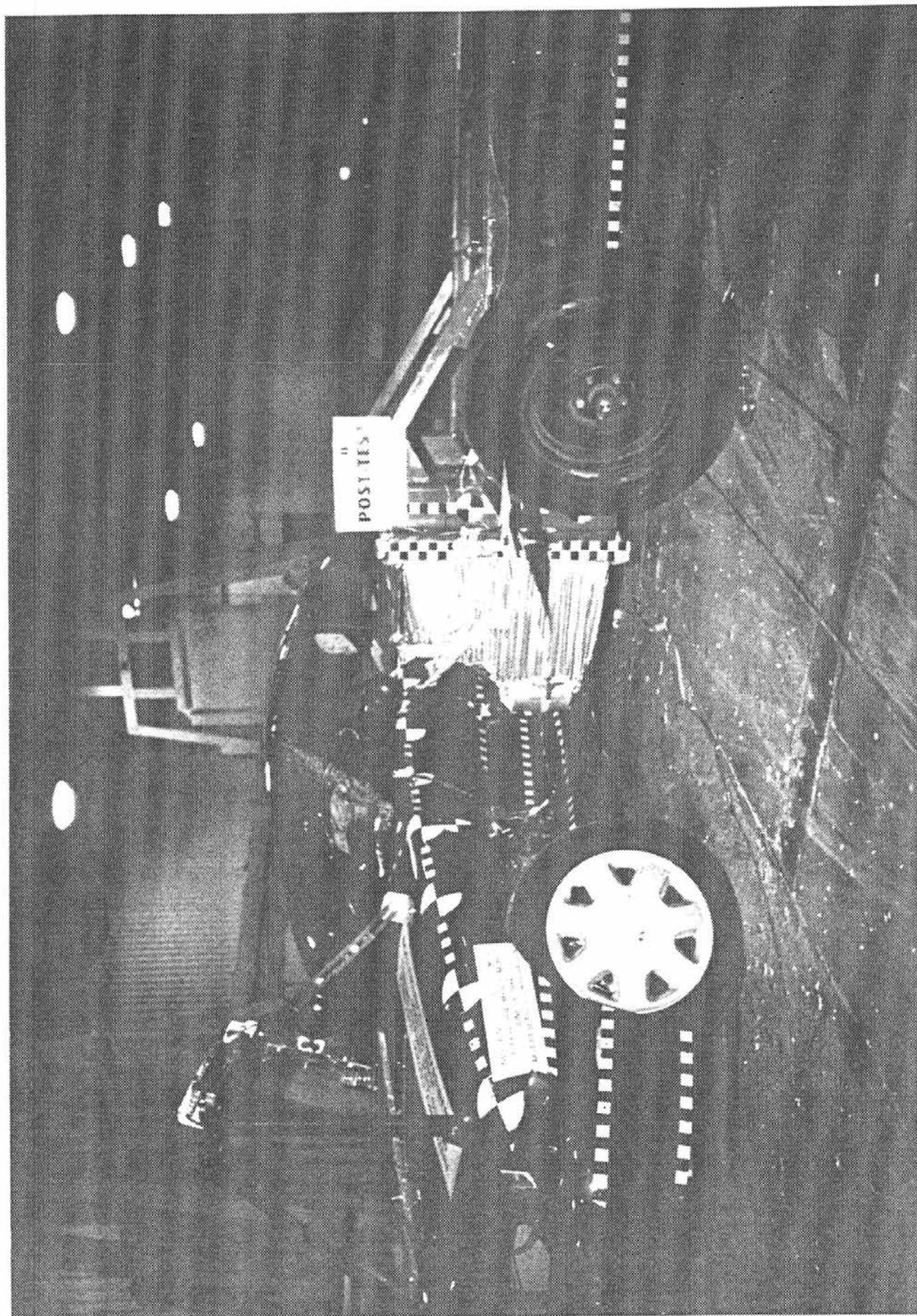


Photo No. A-10 - Post-Test MDB and Vehicle Left Side Front View

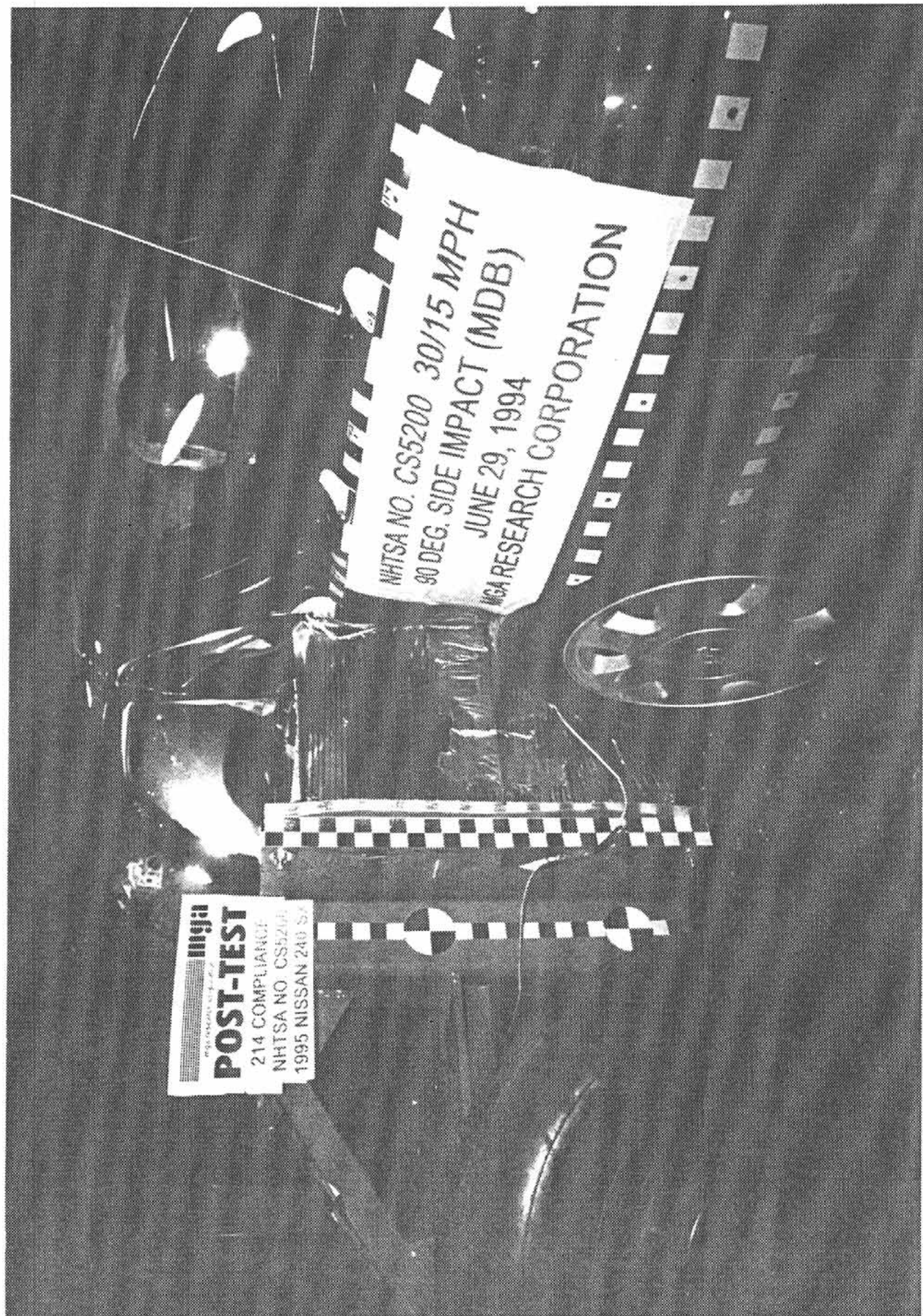


Photo No. A-11 - Post-Test MDB and Vehicle Right Side Rear View

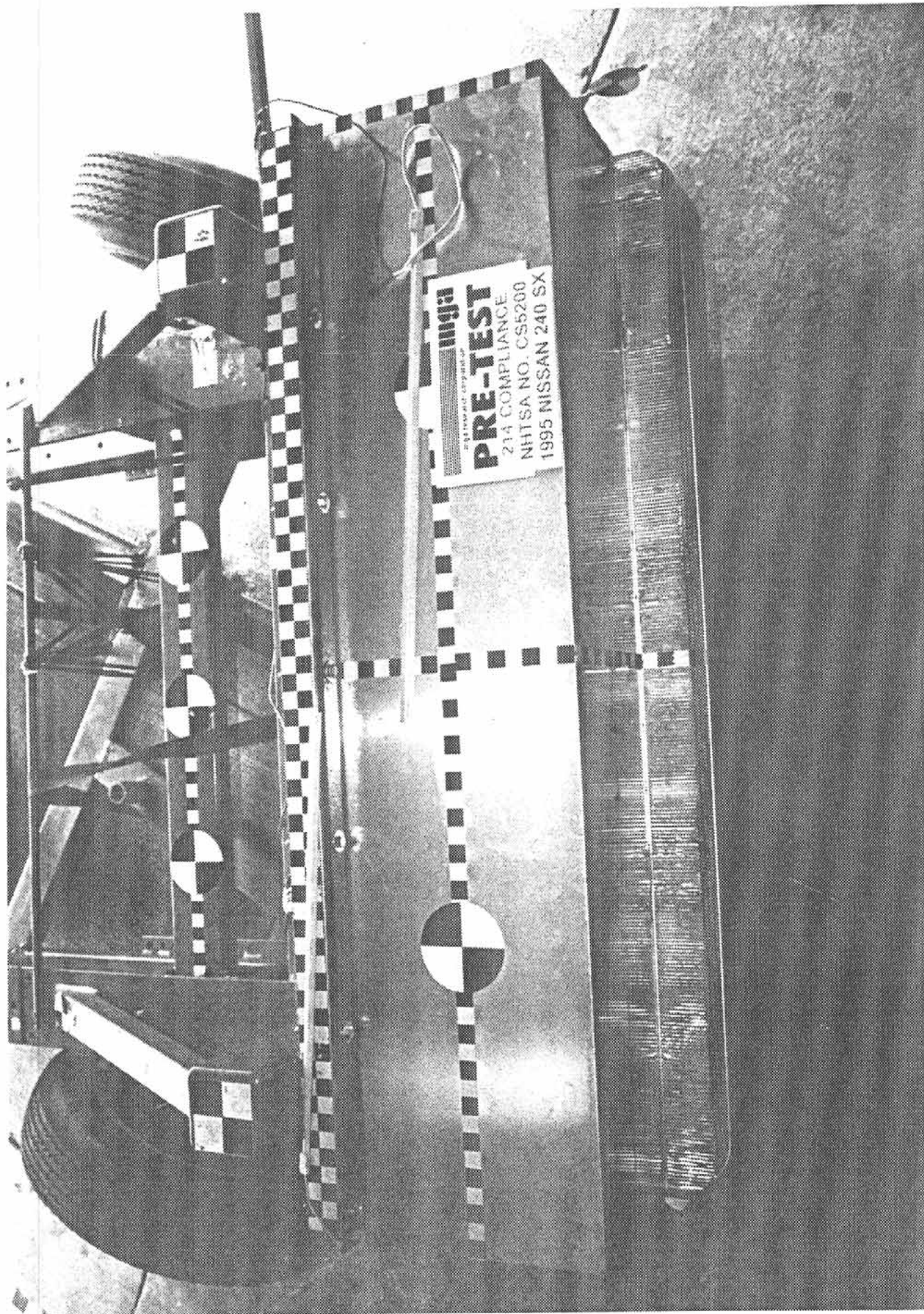


Photo No. A-12 - Pre-Test MDB Top View

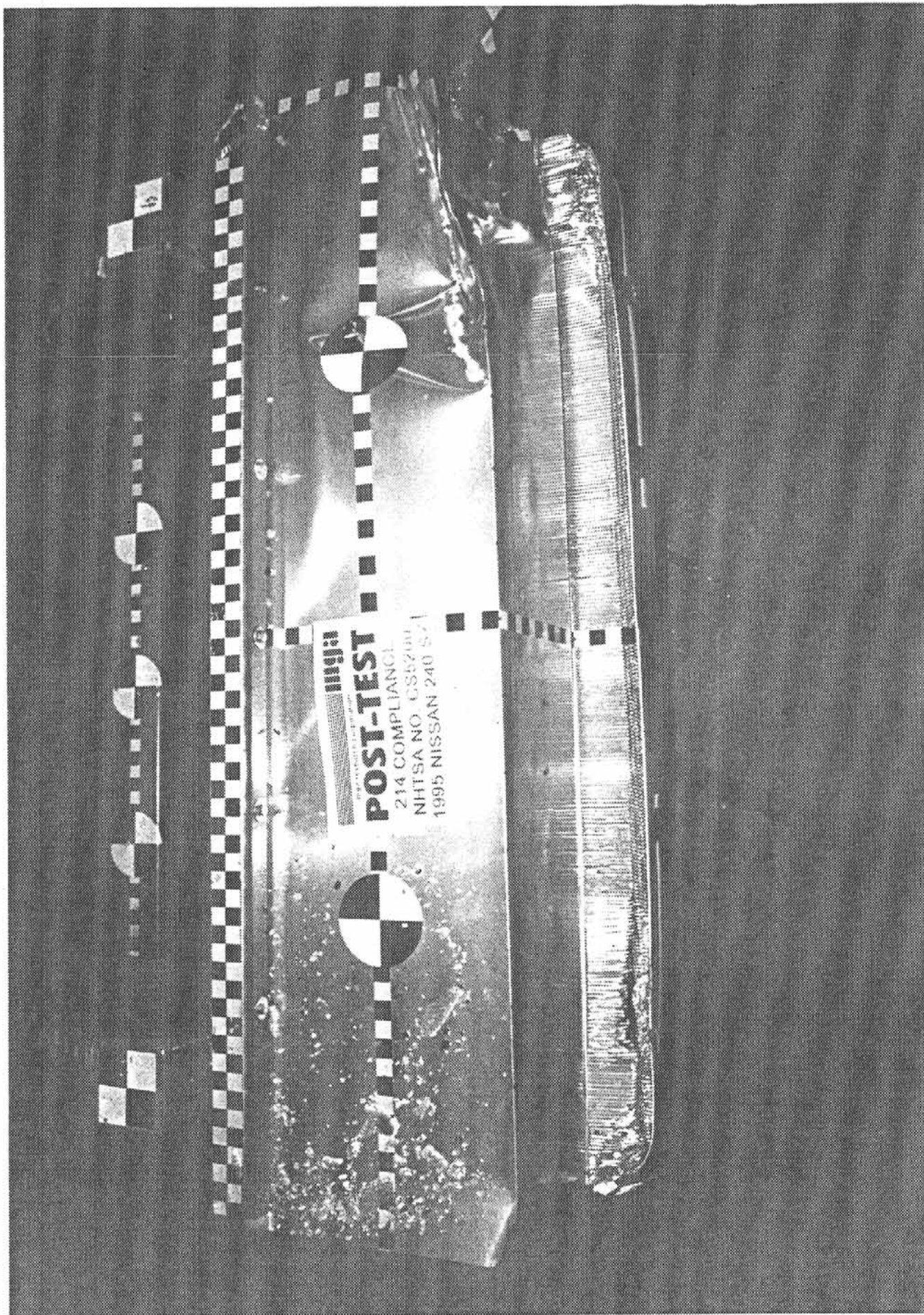


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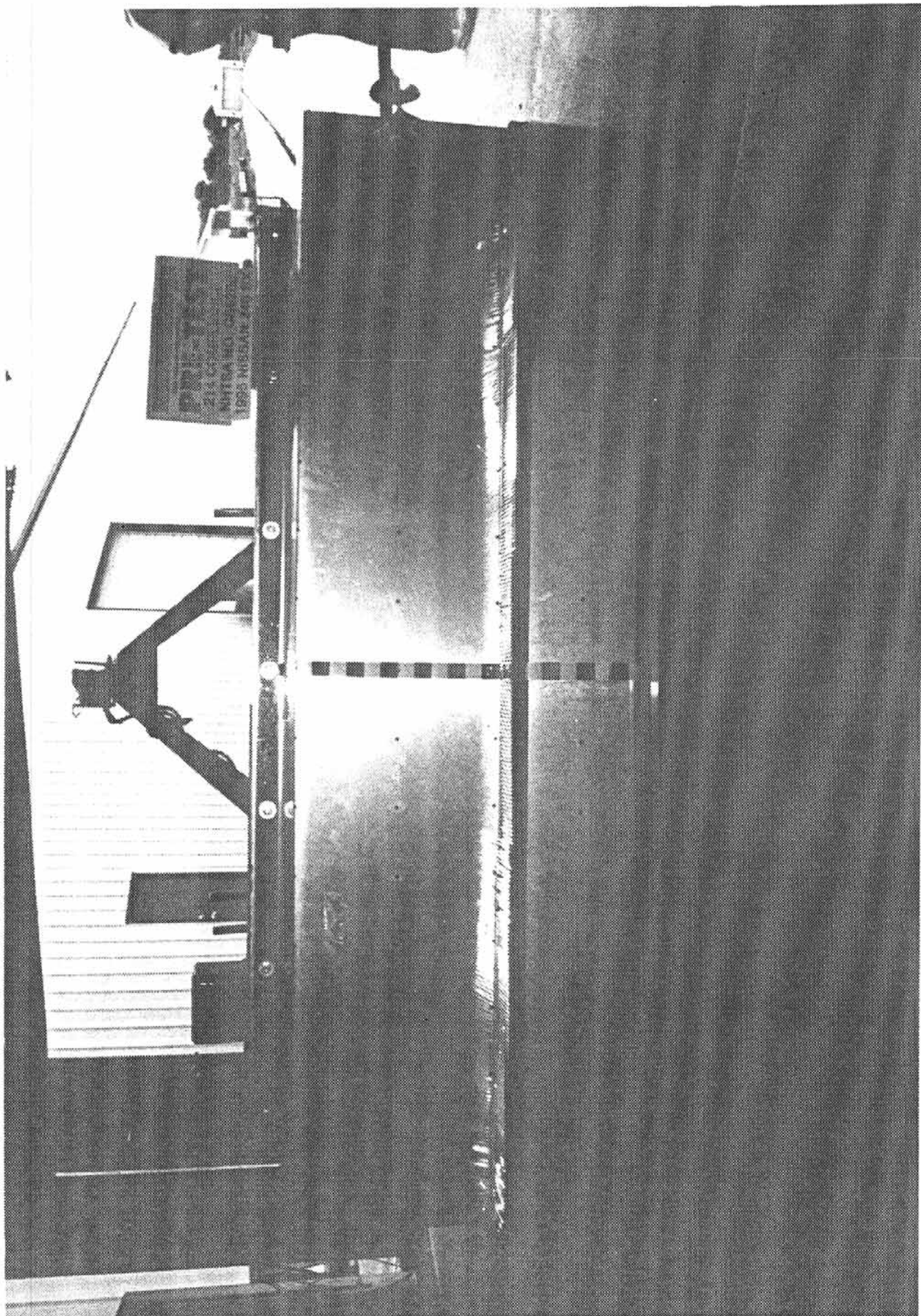


Photo No. A-14 - Pre-Test MDB Front View

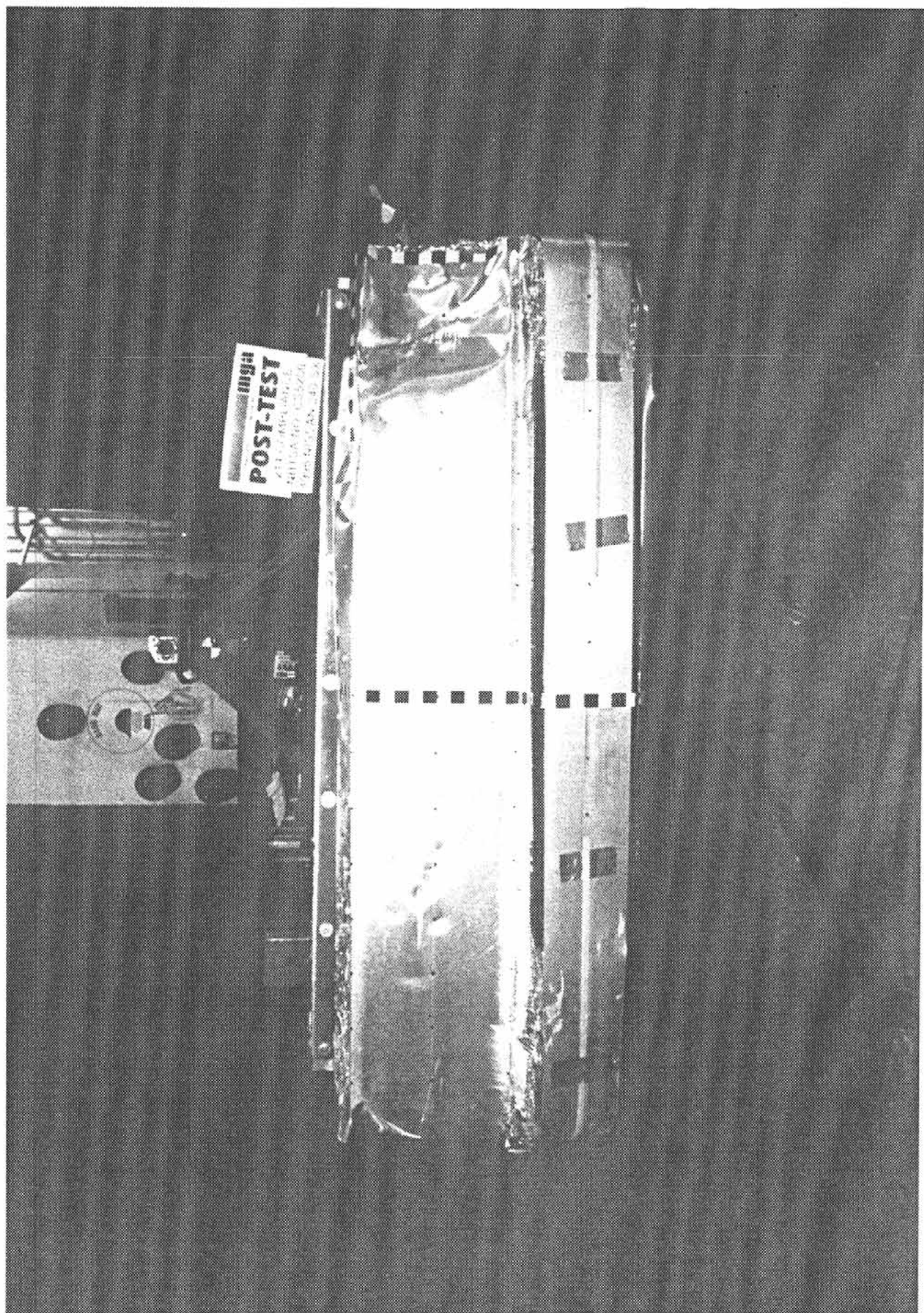


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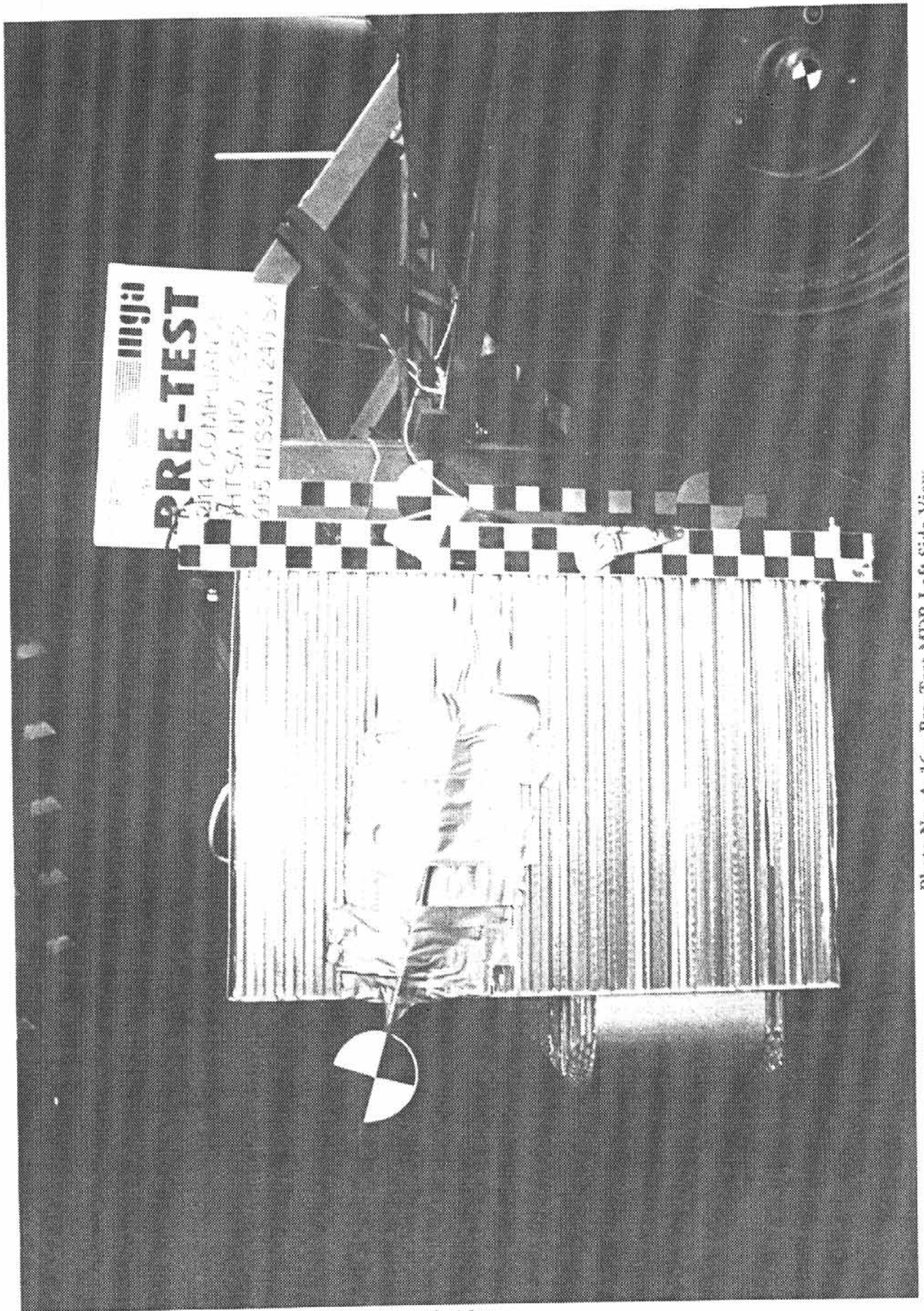


Photo No. A-16 - Pre-Test MDB Left Side View

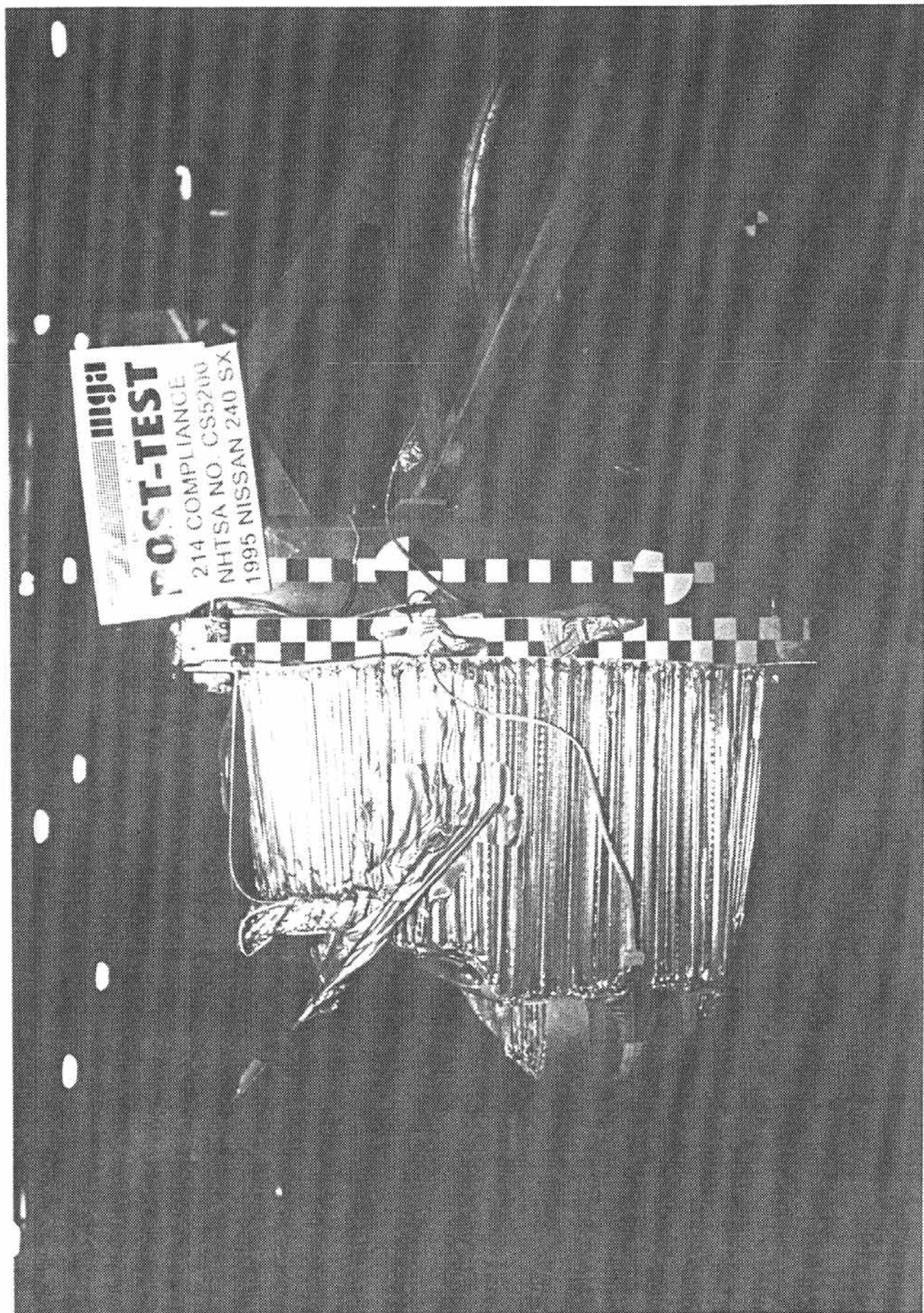


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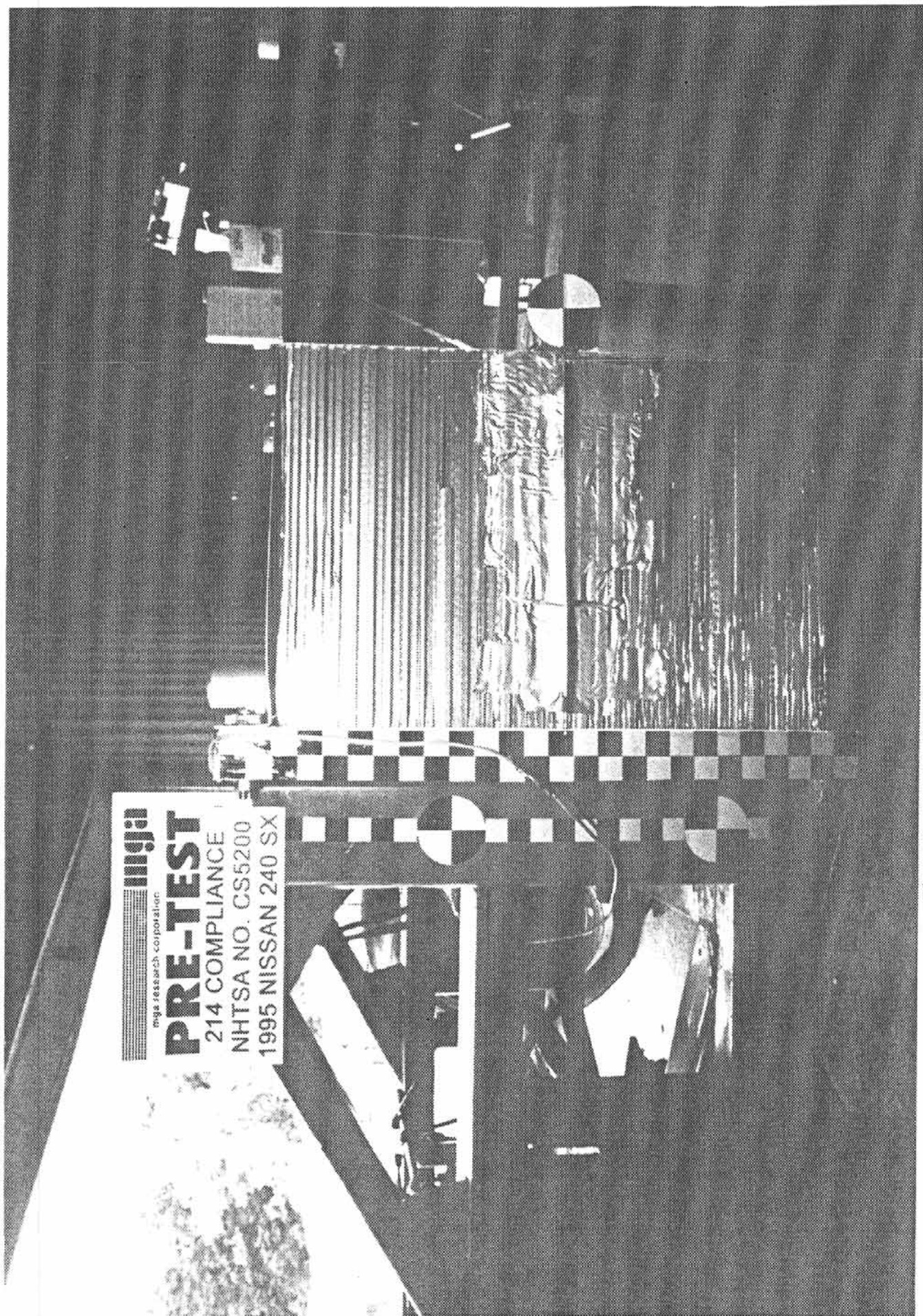


Photo No. A-18 - Pre-Test MDB Right Side View

INTEGRAL
POST-TEST
214 COMPLIANCE
NHTSA NO. CS5200
1995 NISSAN 240 SX

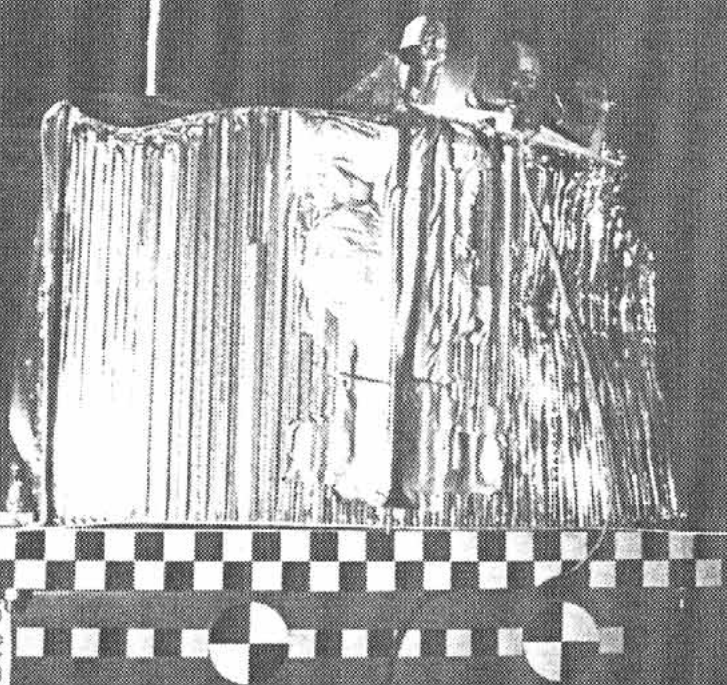


Photo No. A-19 - Post-Test MDB Right Side View

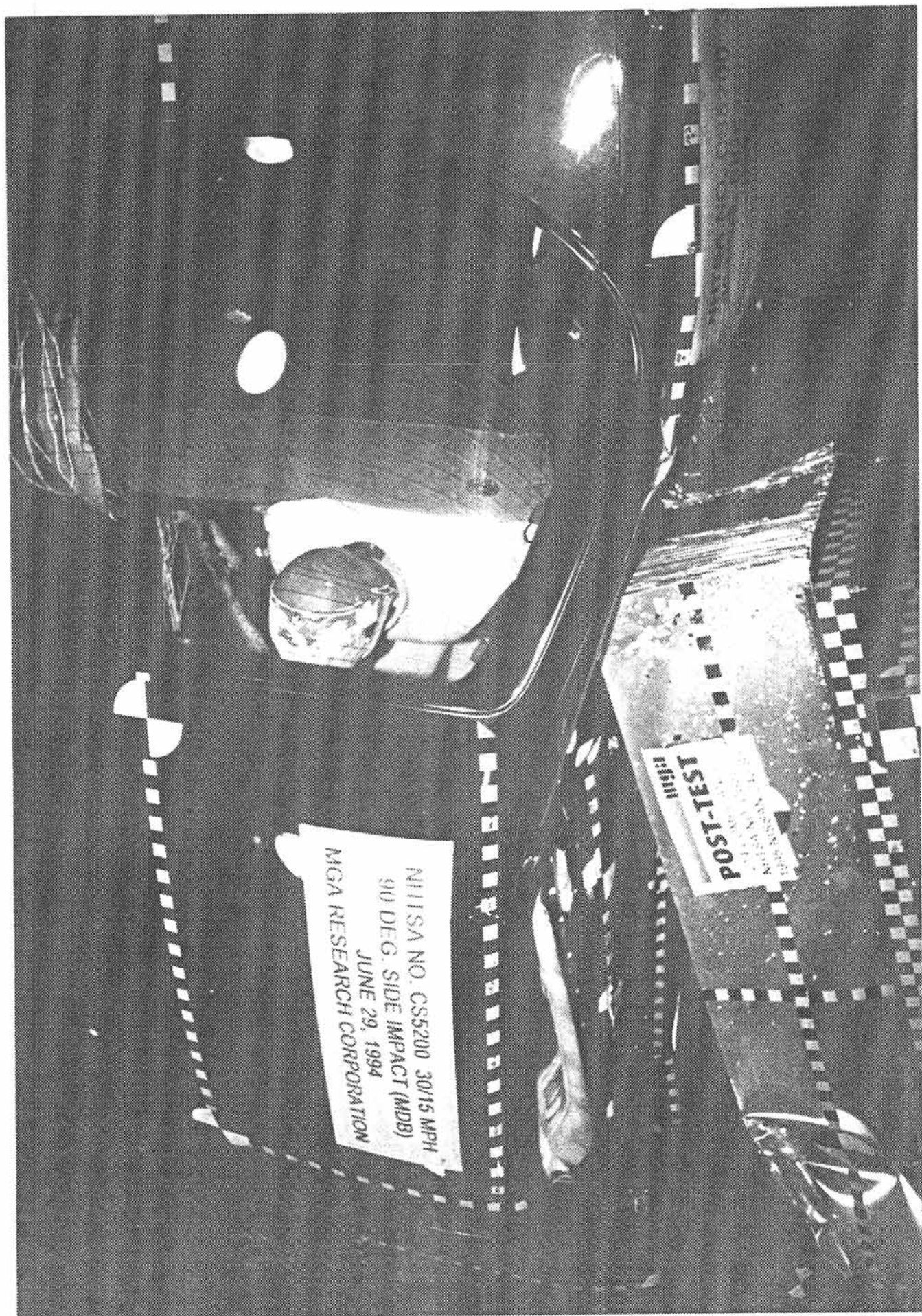


Photo No. A-20 - Post-Test MDB and Vehicle Overhead View

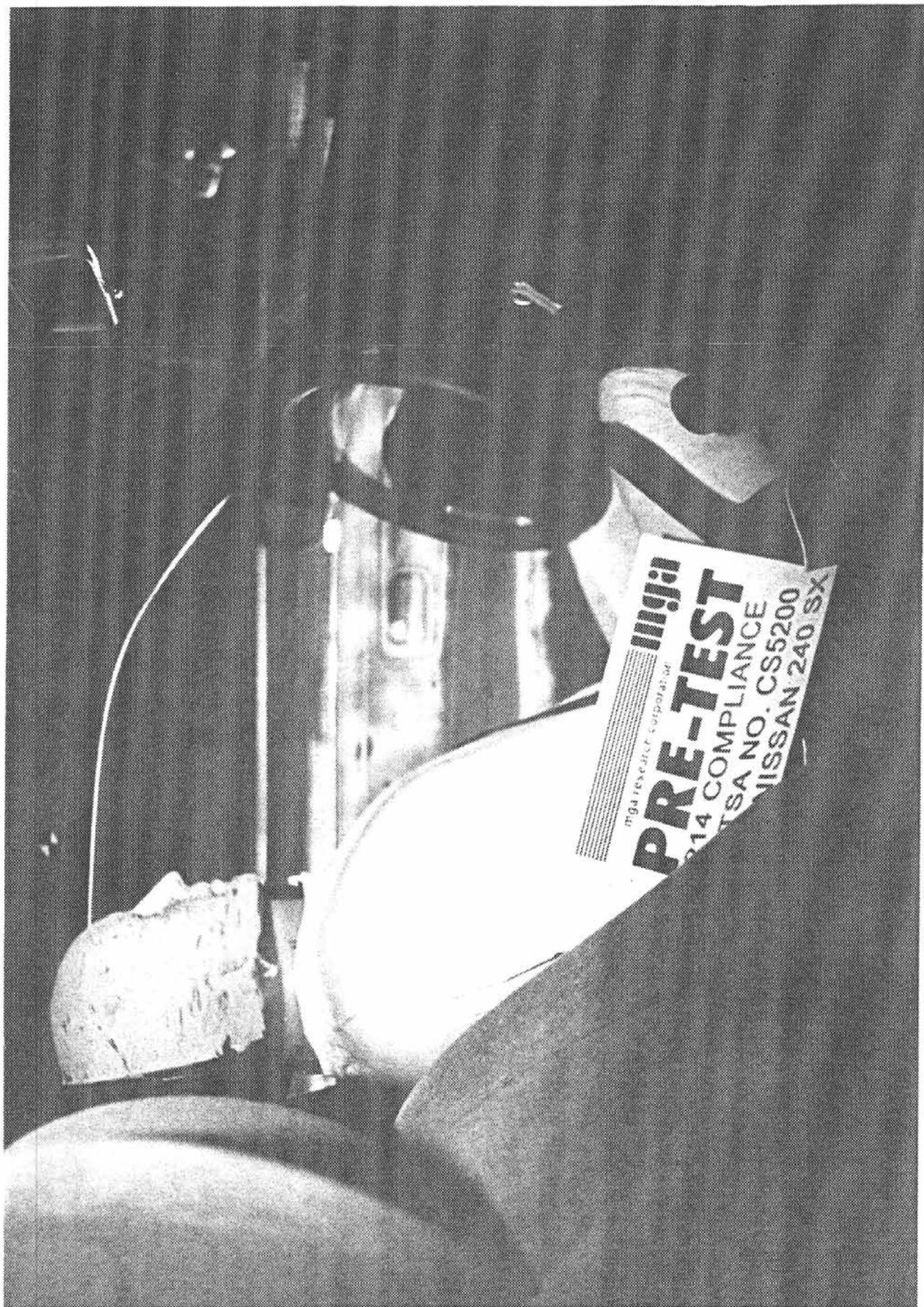


Photo No. A-21 - Pre-Test Driver Dummy Right Side View

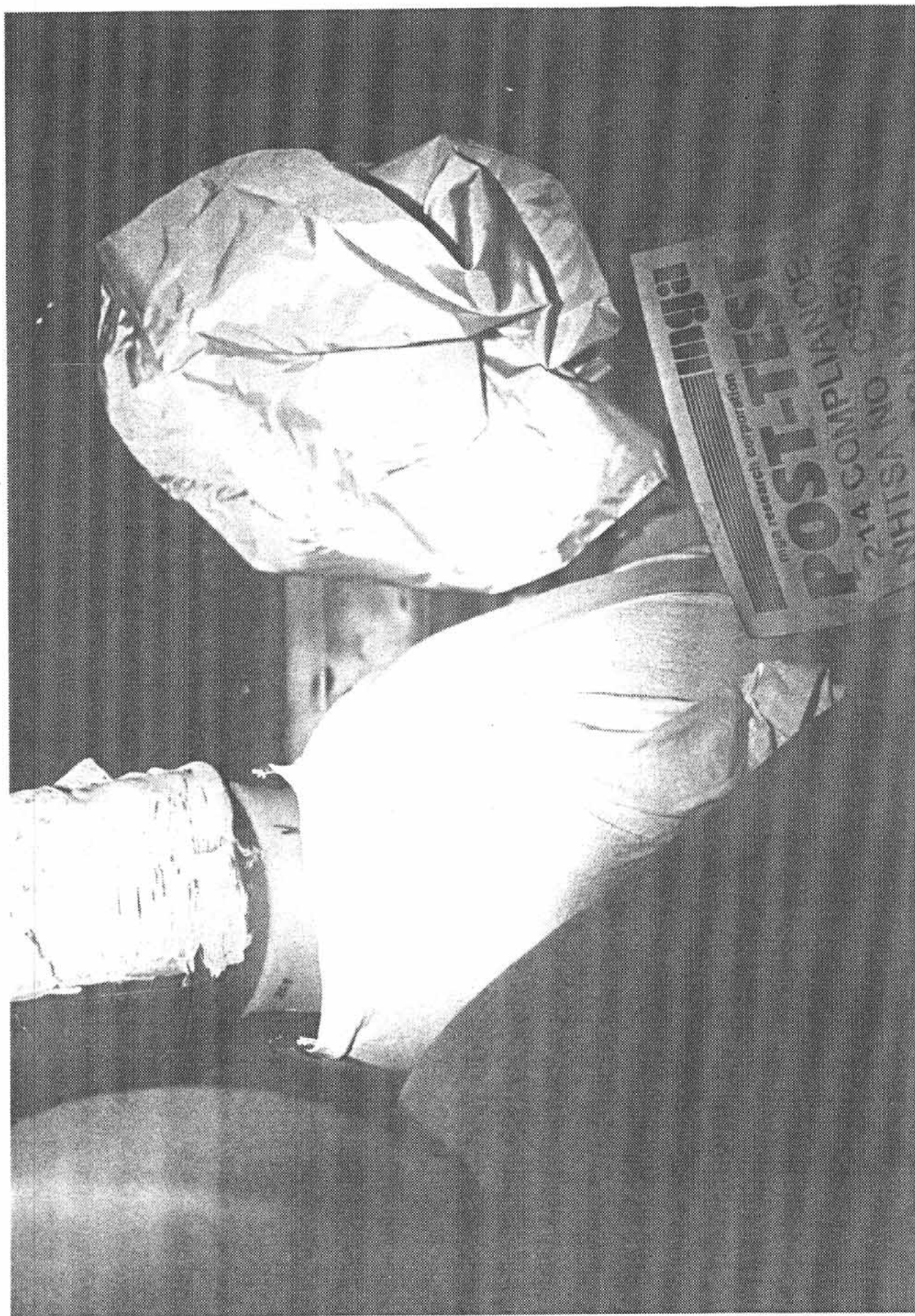
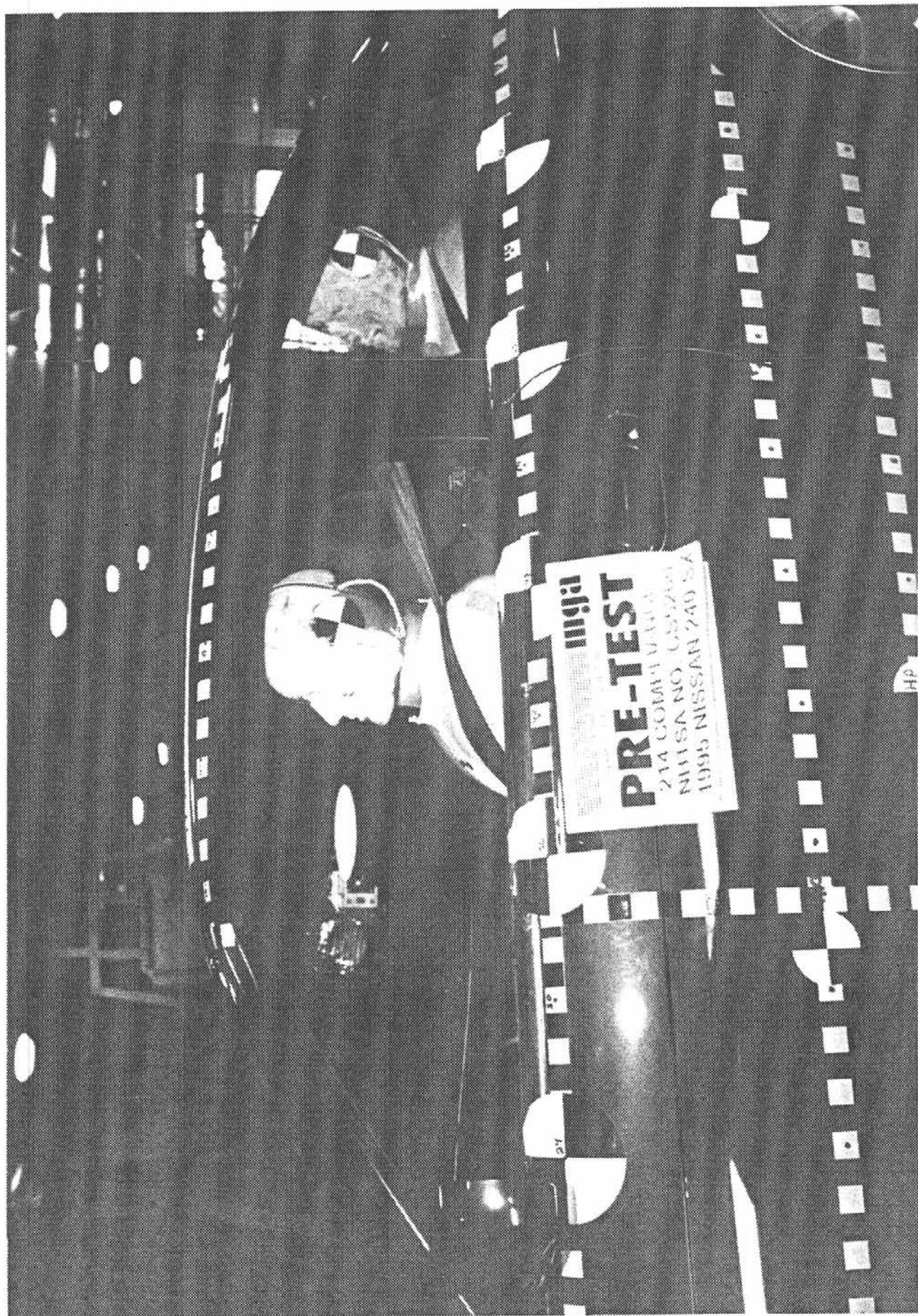


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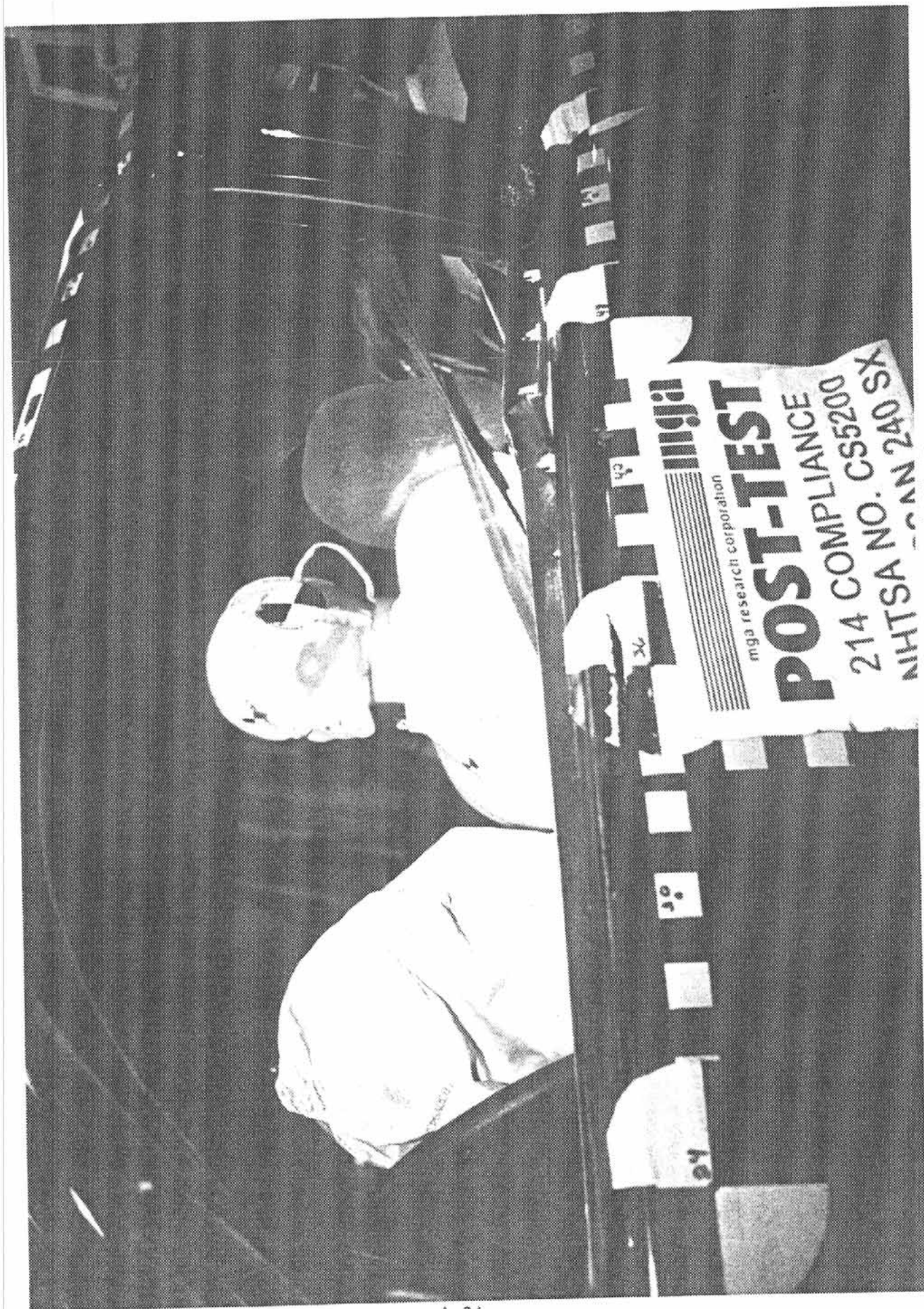


Photo No. A-24 - Post-Test Driver Dummy Left Side View



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

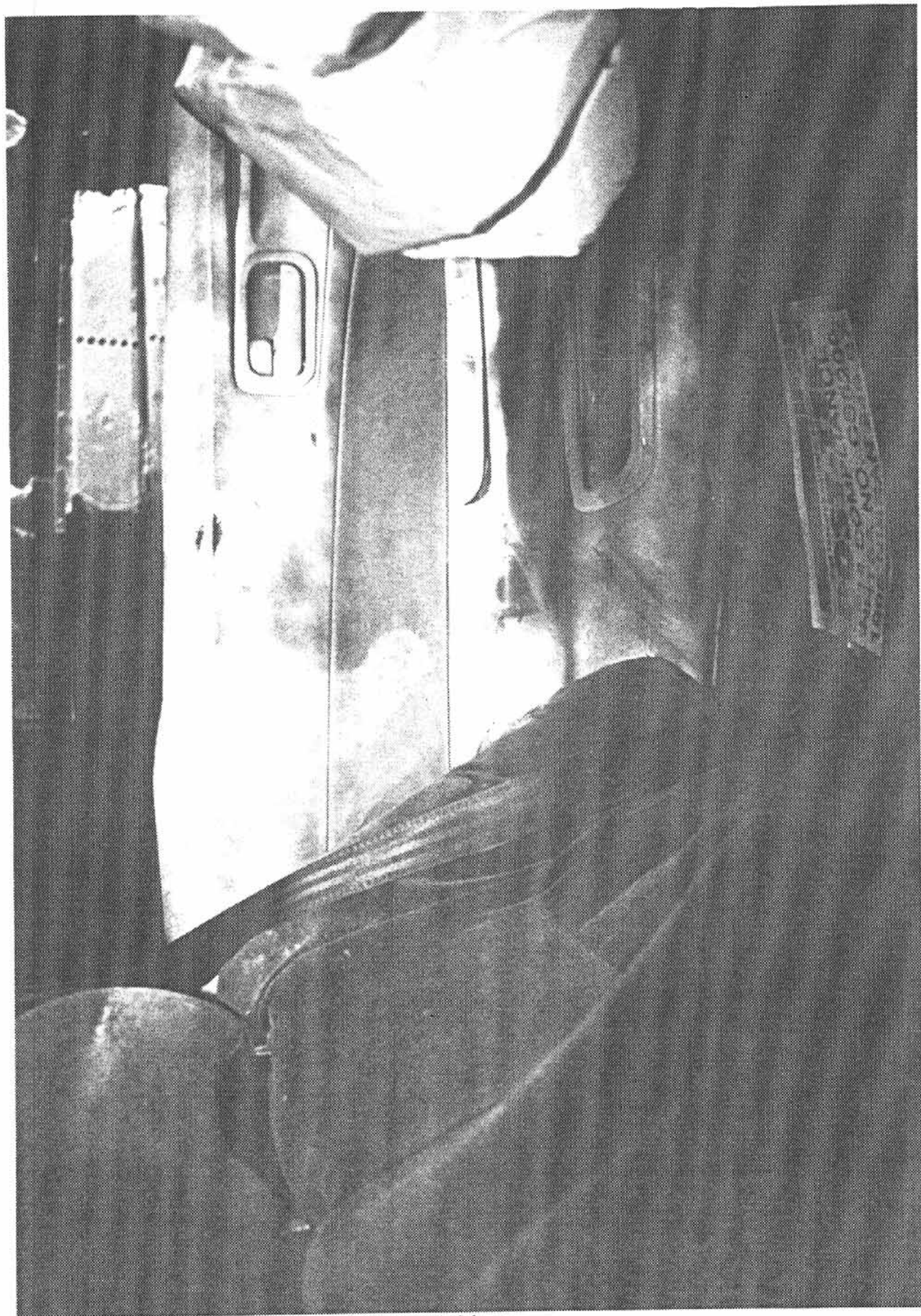


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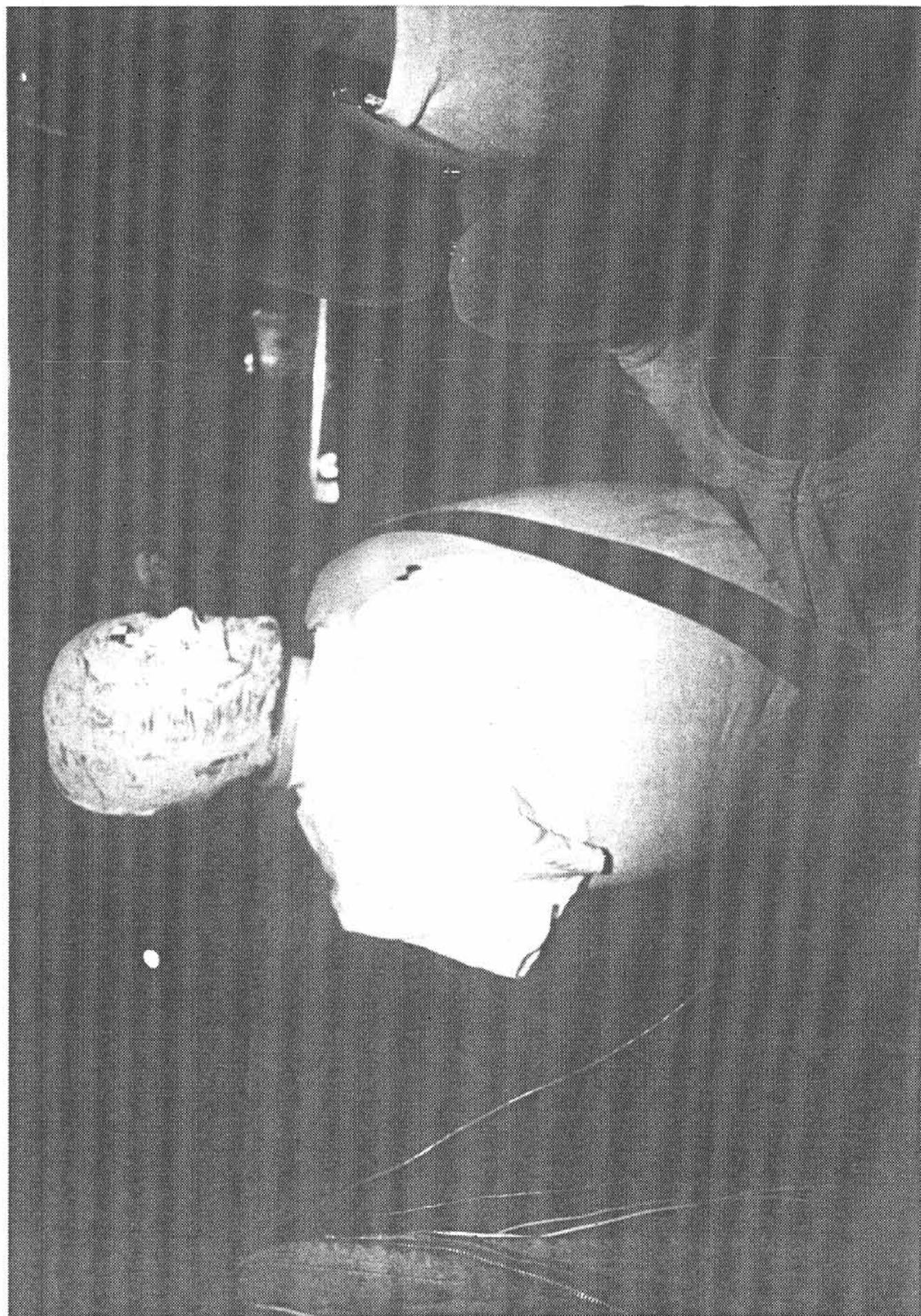


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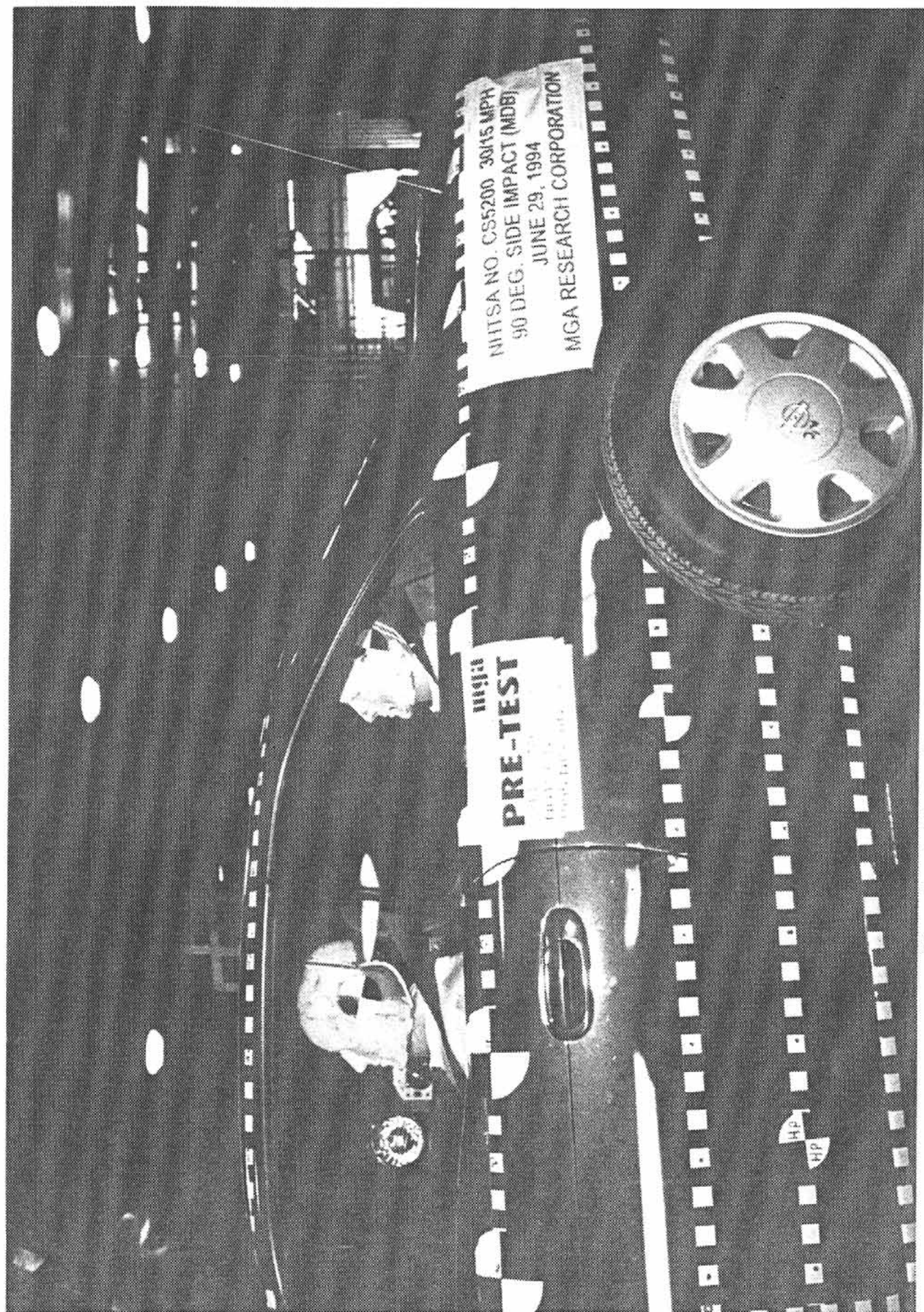


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Photo No. A-30 - Post-Test Passenger Dummy Left Side View

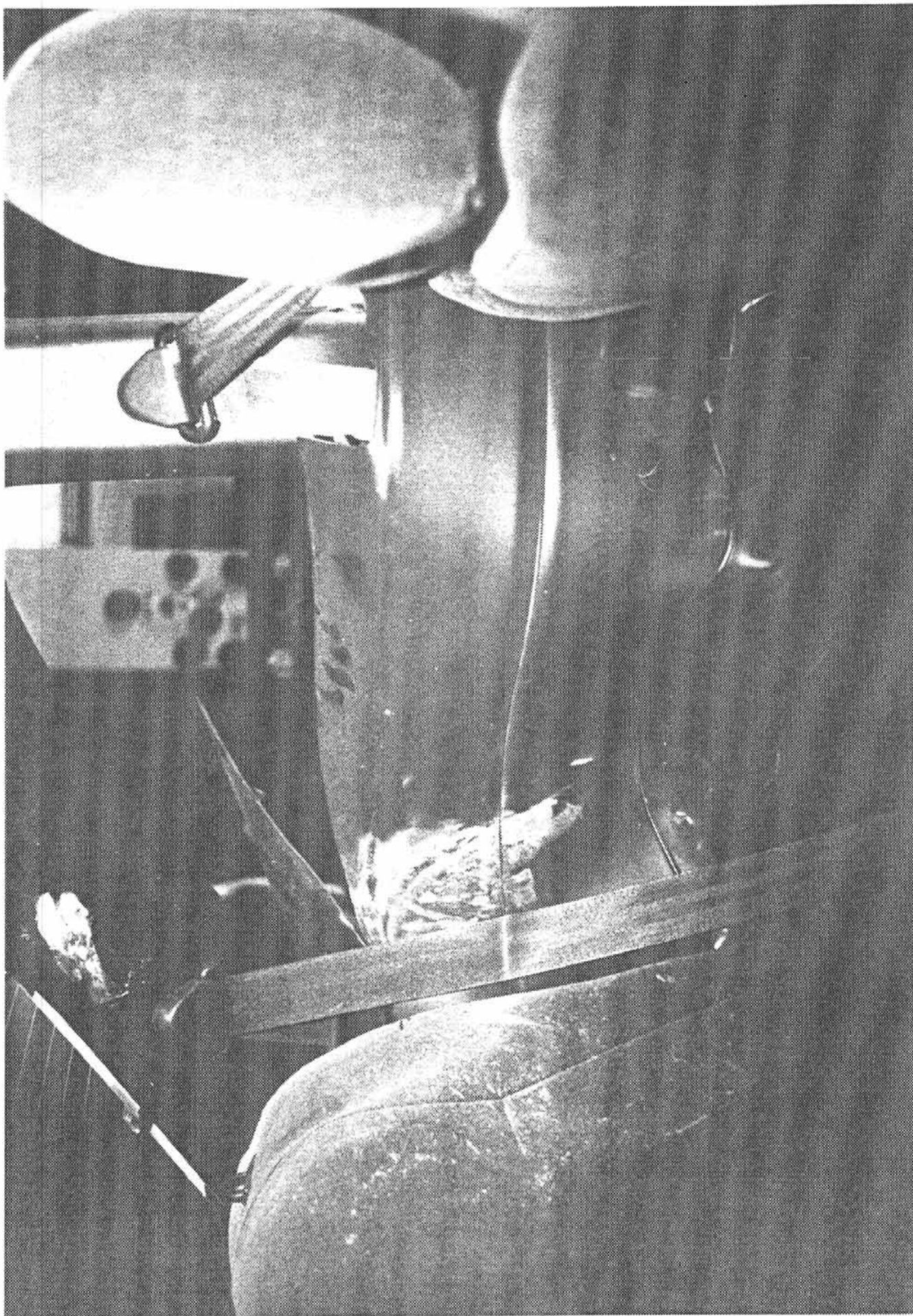


Photo No. A-31 - Post-Test Passenger Dummy Impact Point

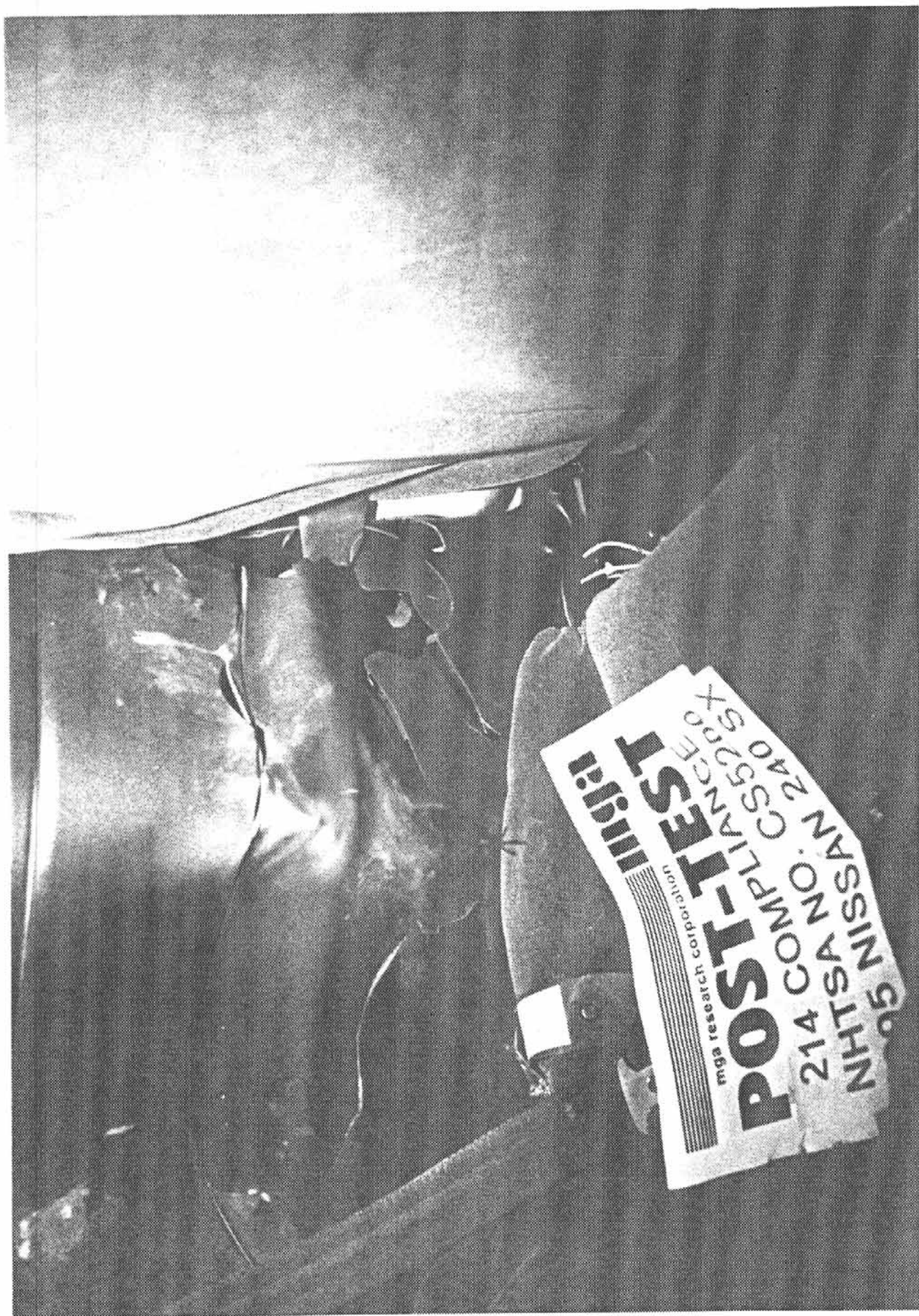


Photo No. A-32 - Post-Test Passenger Dummy Impact Point



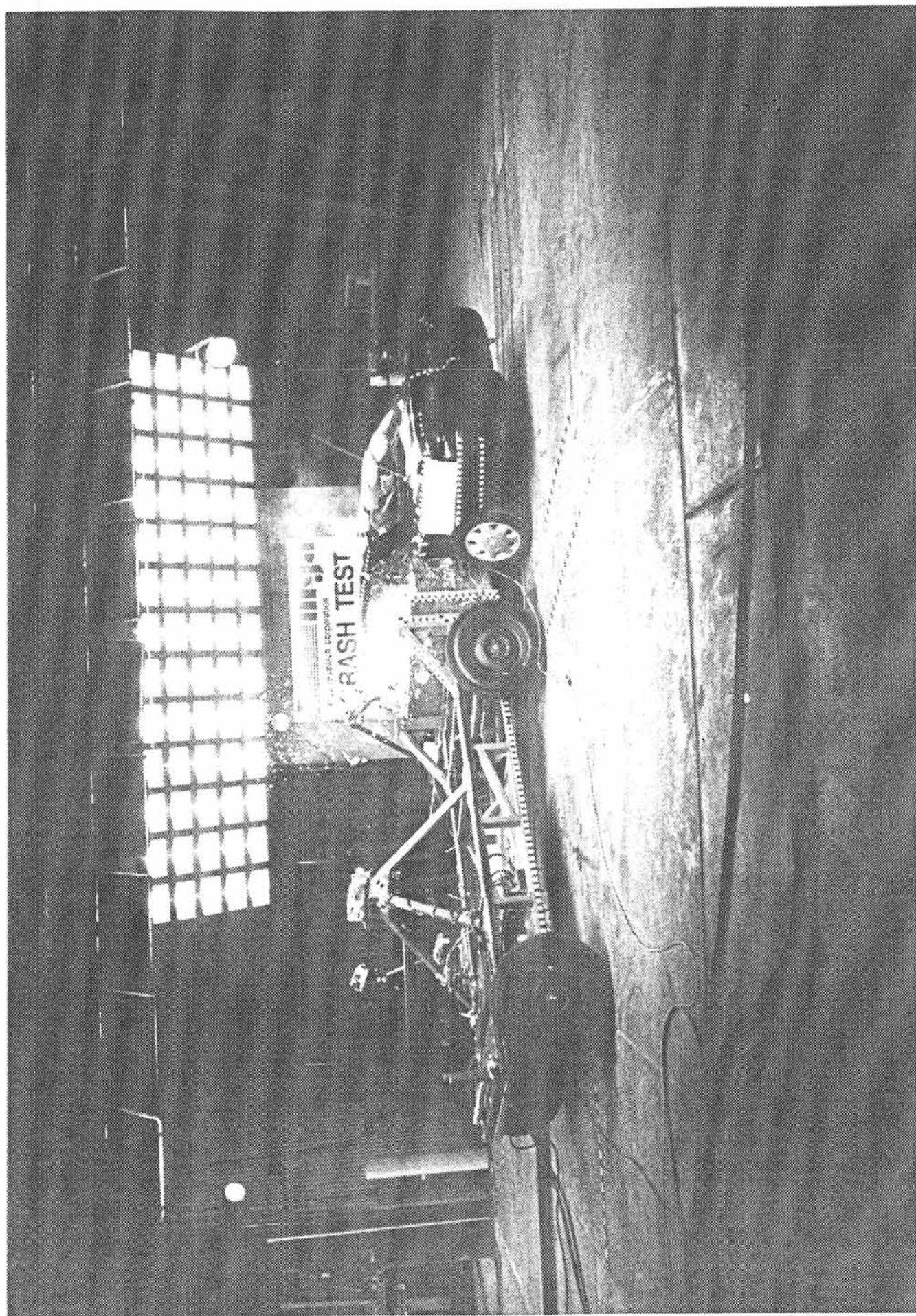


Photo No. A-35 - Impact

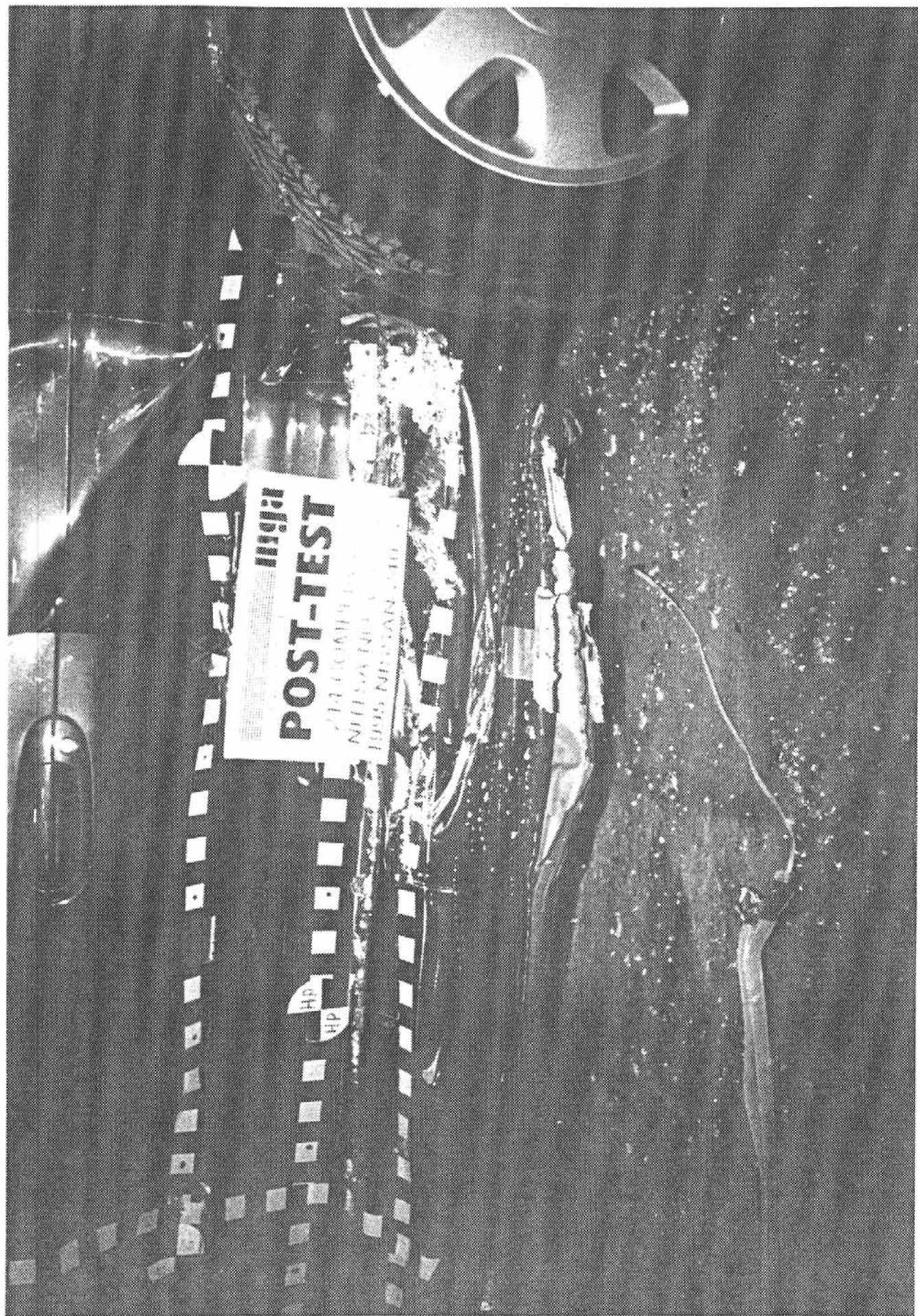
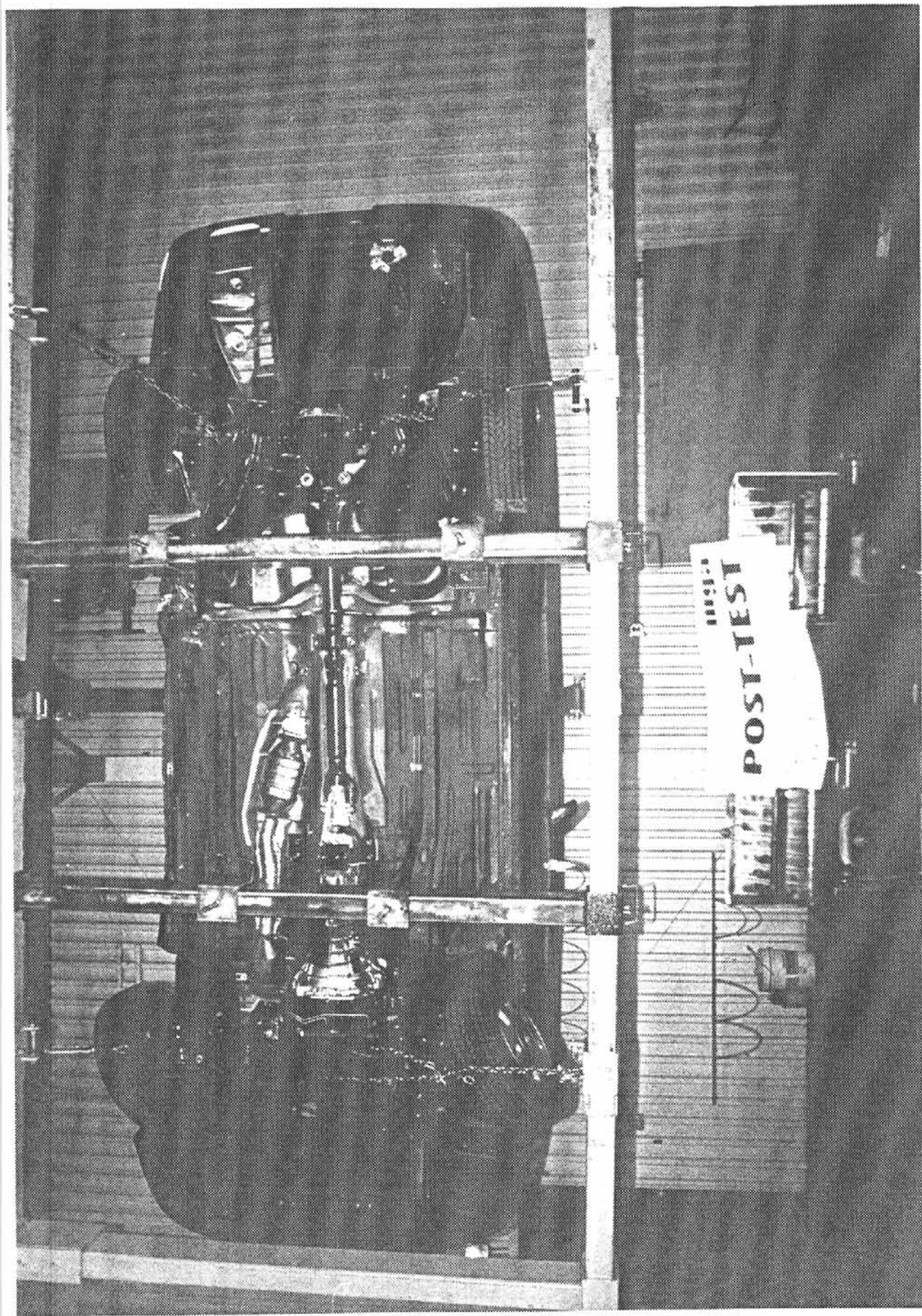


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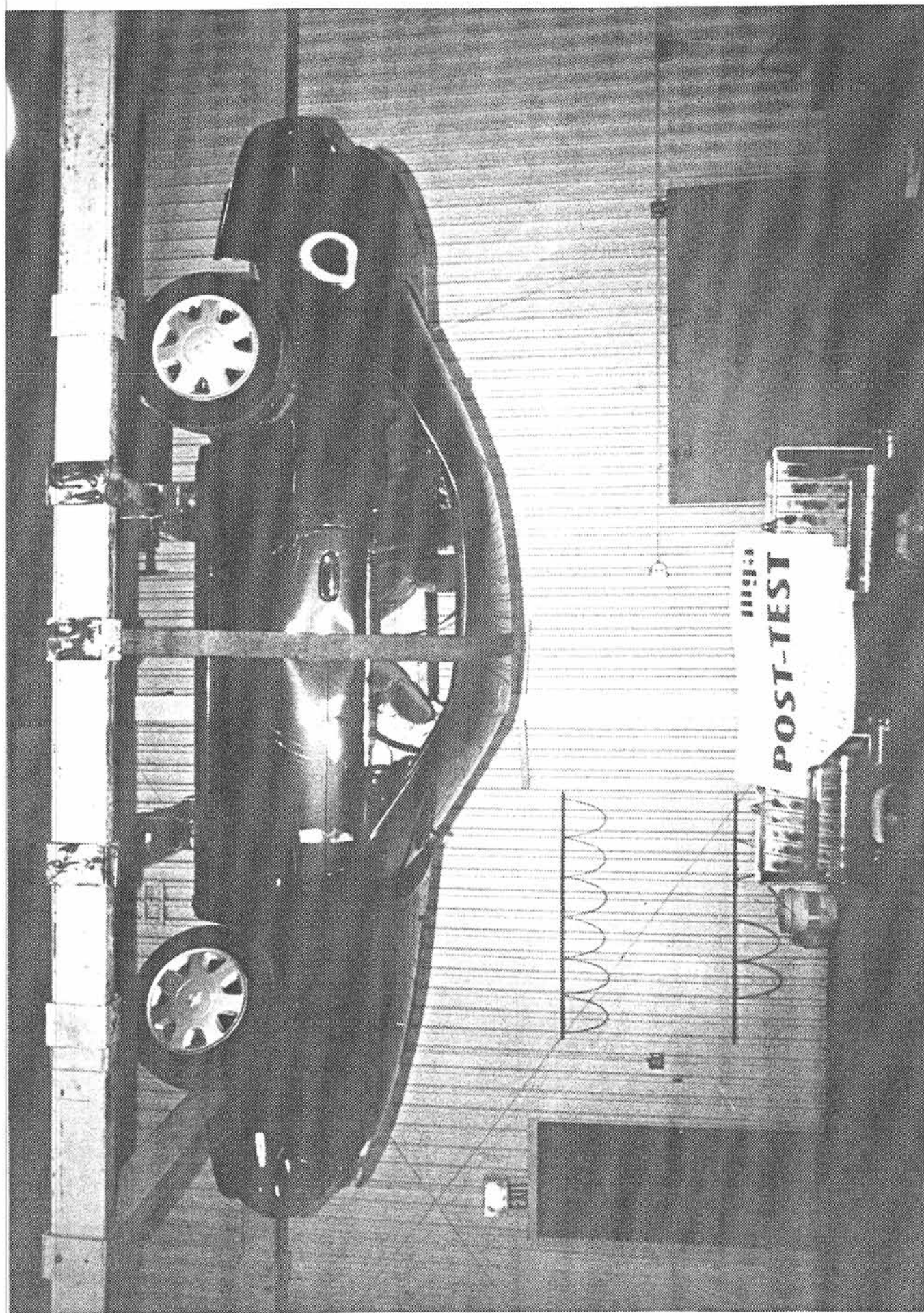


Photo No. A-38 - Rollover 180°

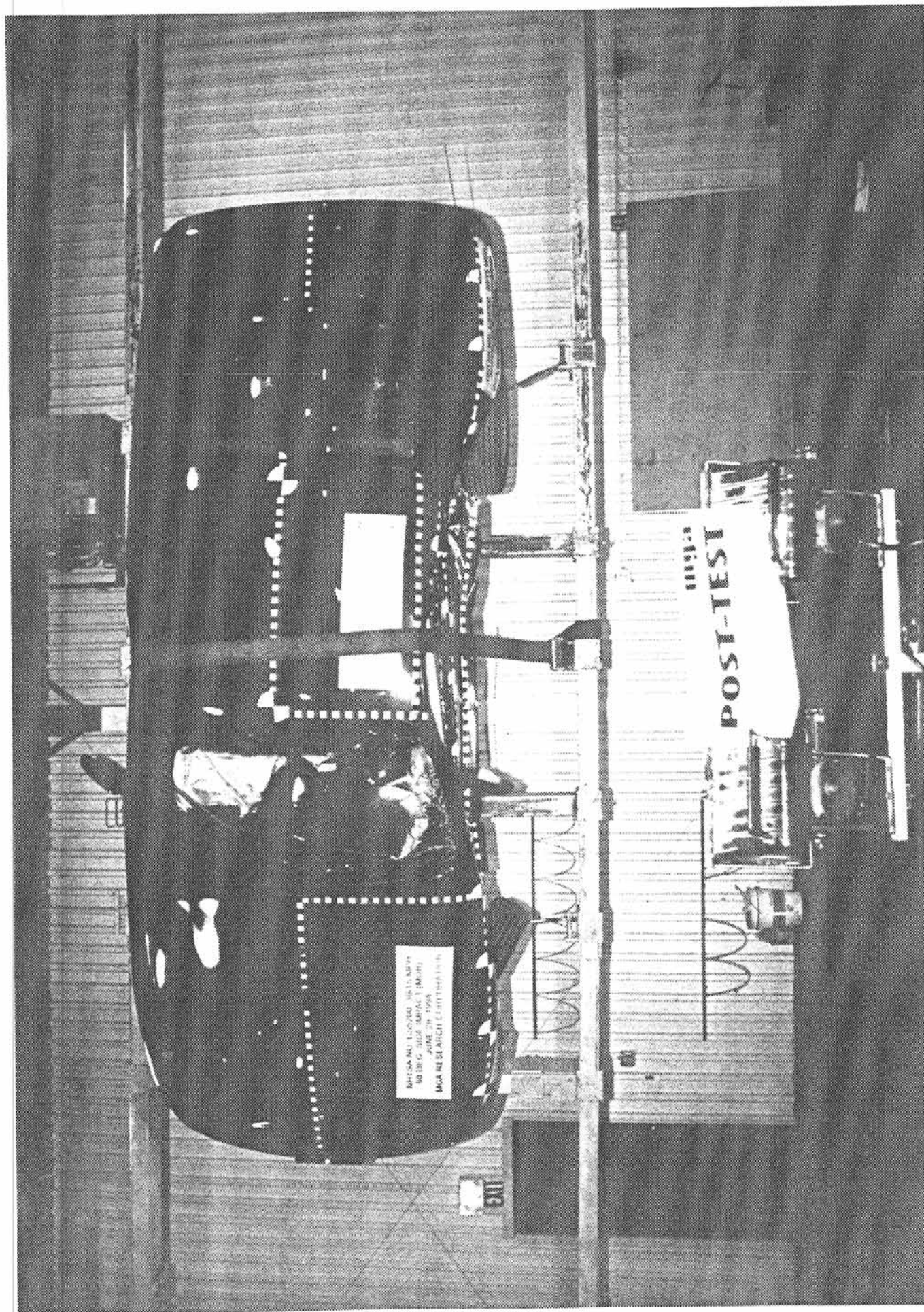


Photo No. A-39 - Rollover 270°

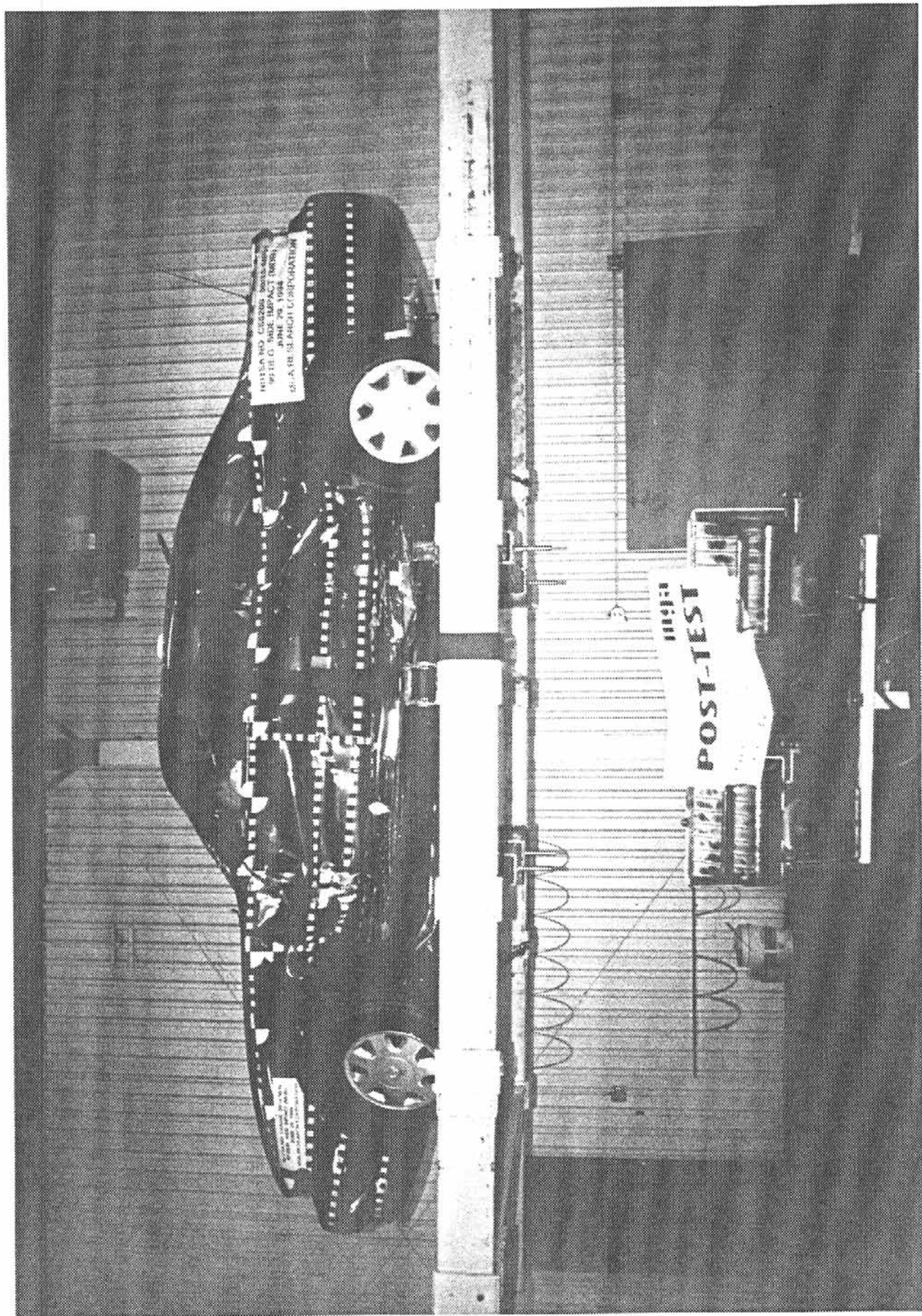


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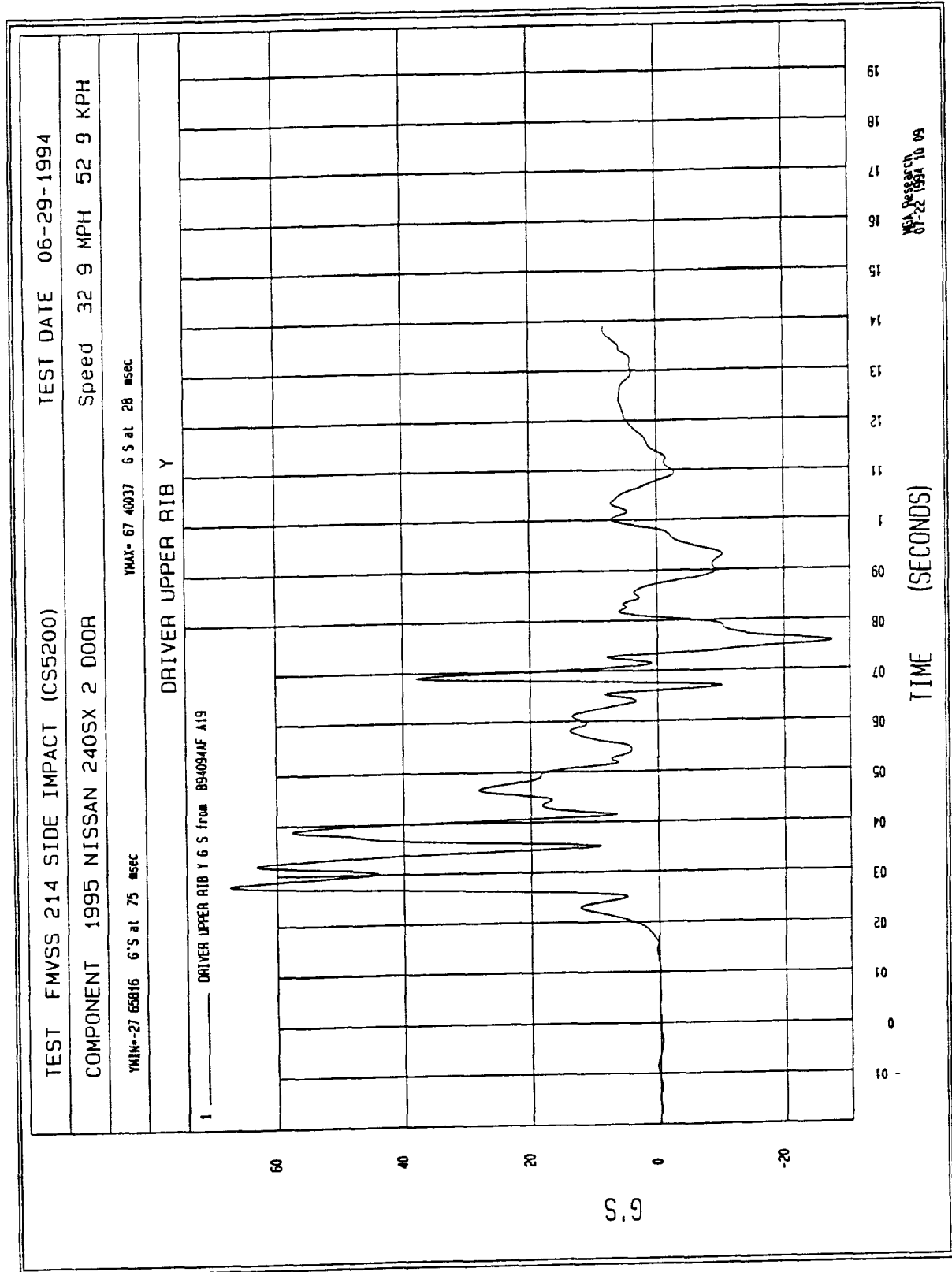


Figure B-1 - Driver Upper Rib Y Acceleration vs Time

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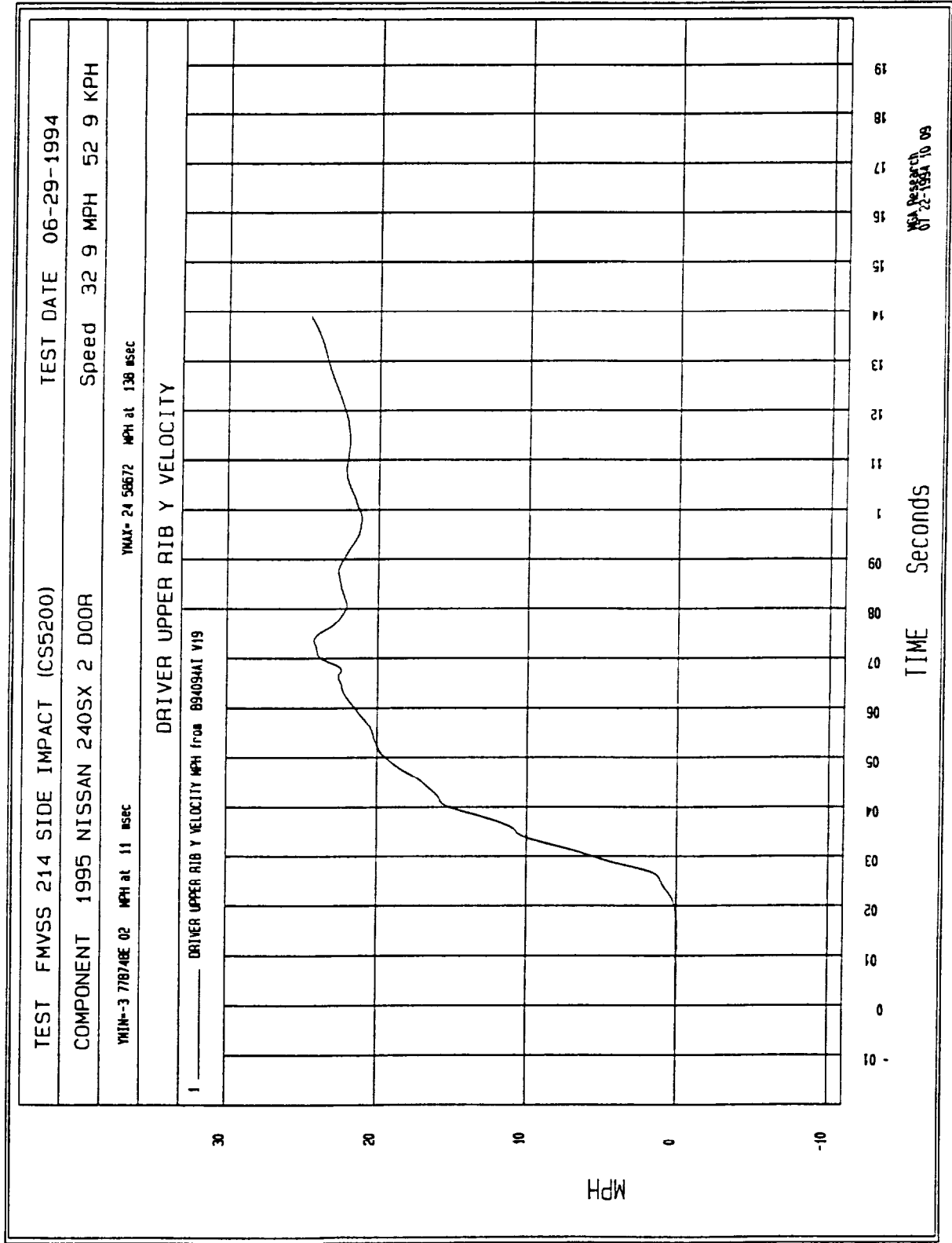


Figure B-2 - Driver Upper Rib Y Velocity vs. Time

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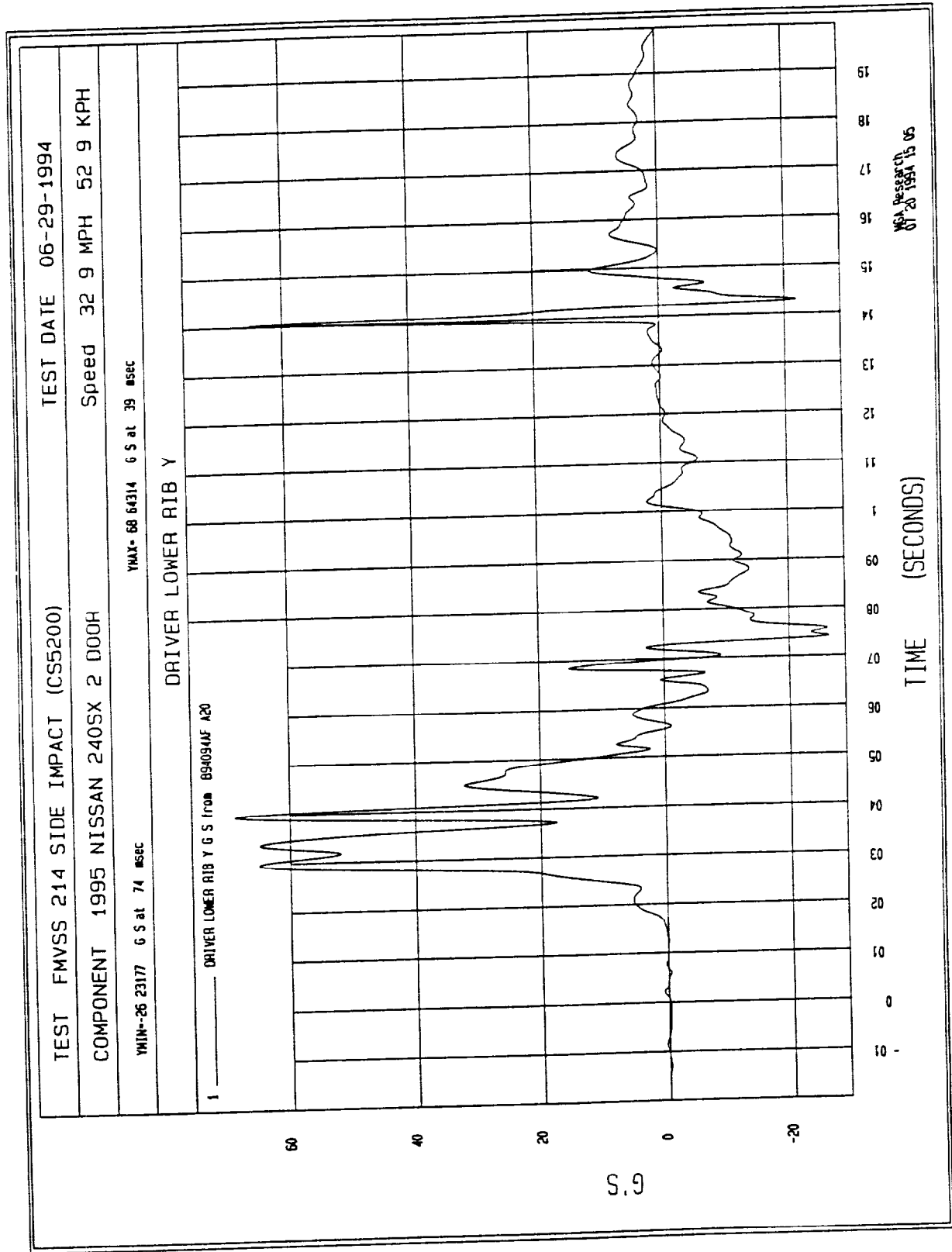


Figure B-3 - Driver Lower Rib Y Acceleration vs. Time

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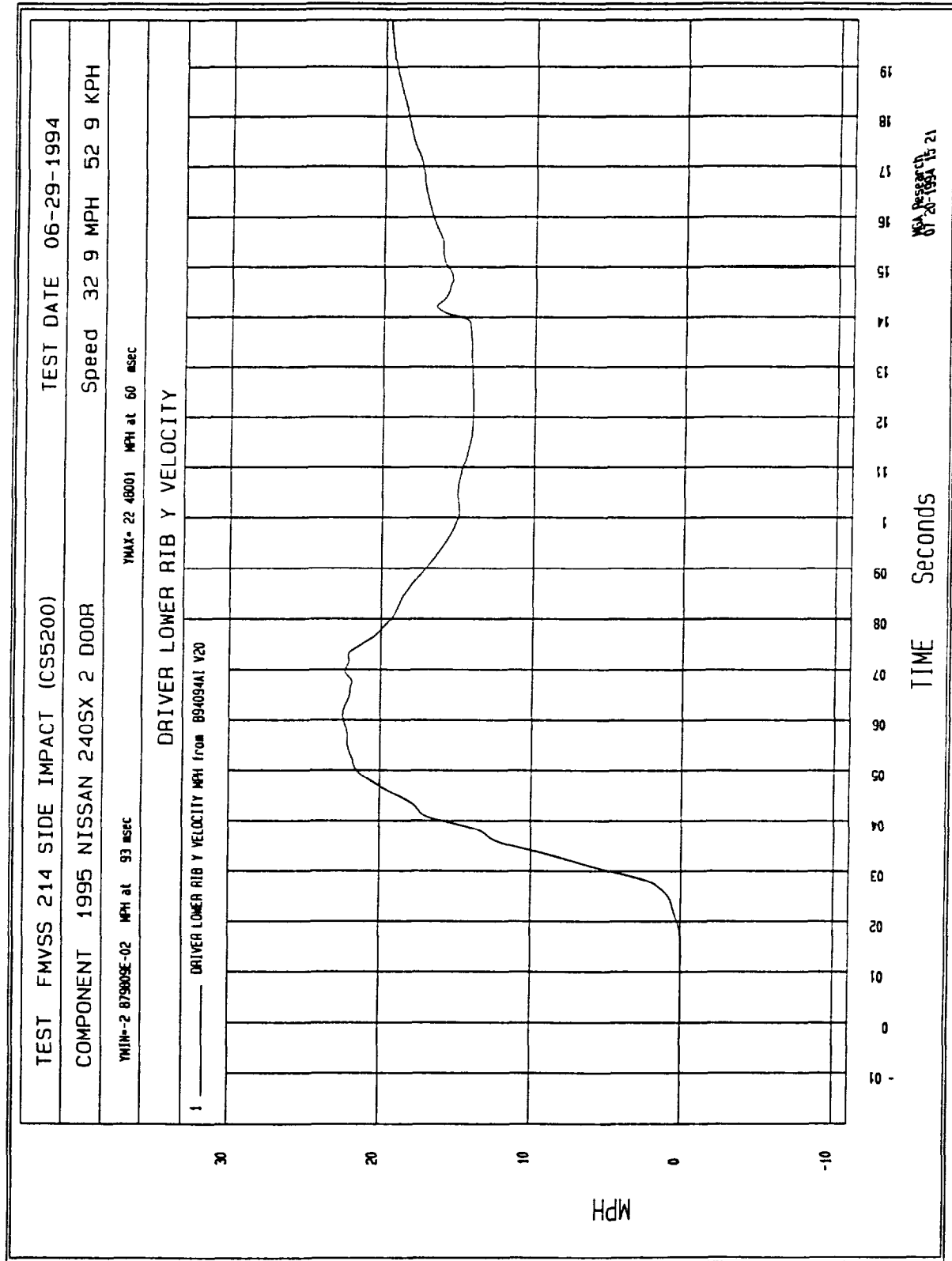


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

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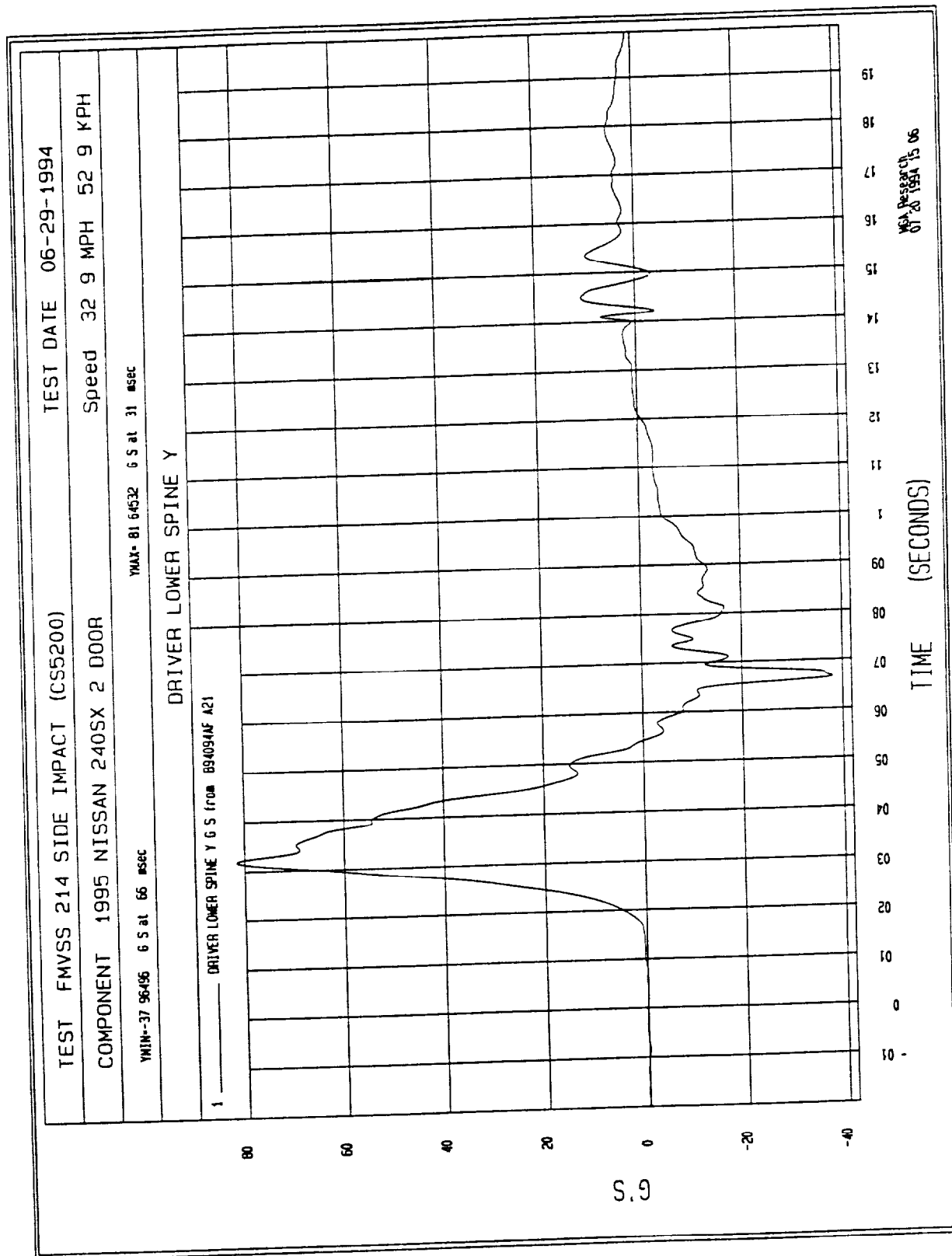


Figure B-5 - Driver Lower Spine Y Acceleration vs Time

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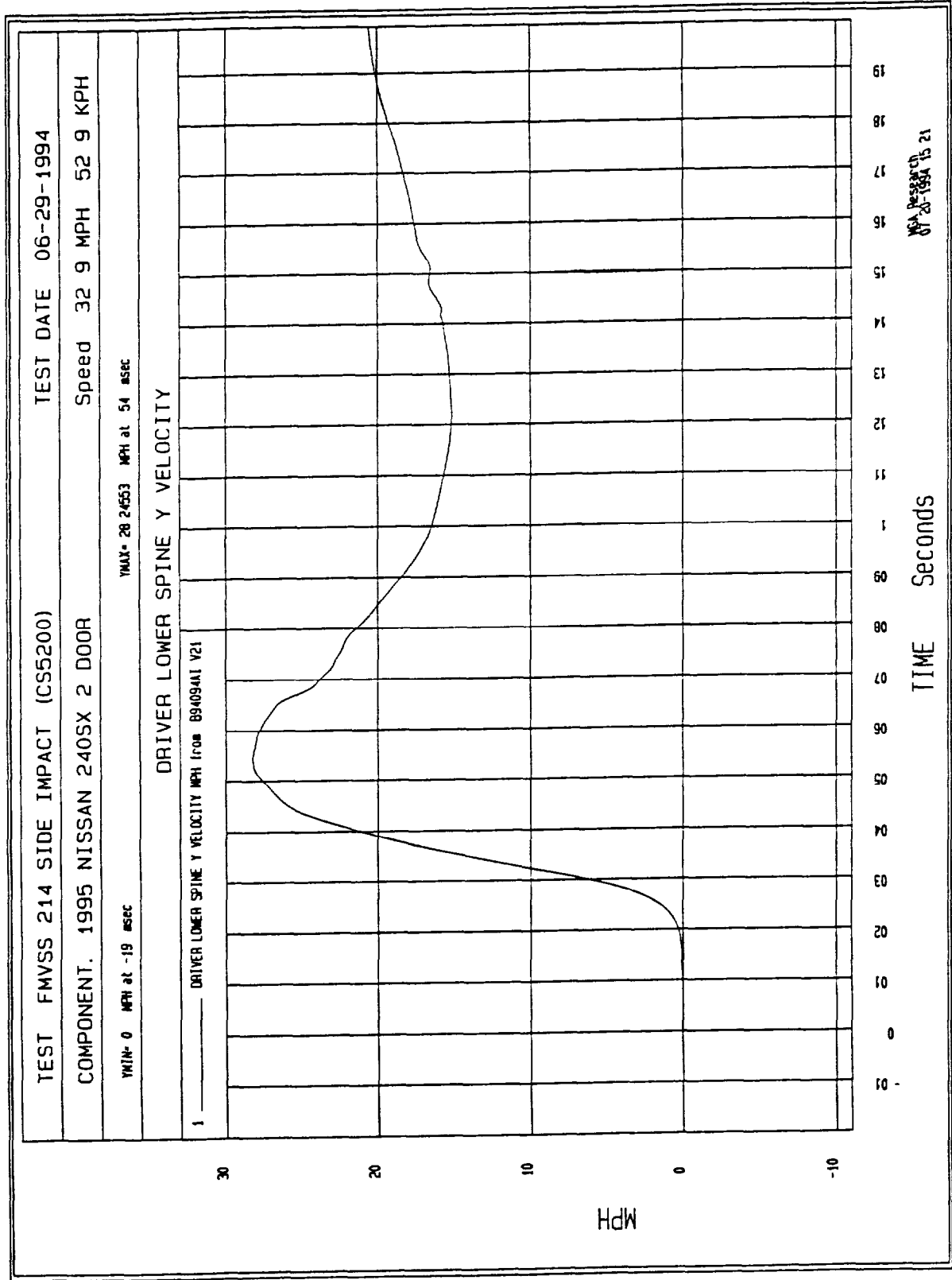


Figure B-6 - Driver Lower Spine Y Velocity vs. Time

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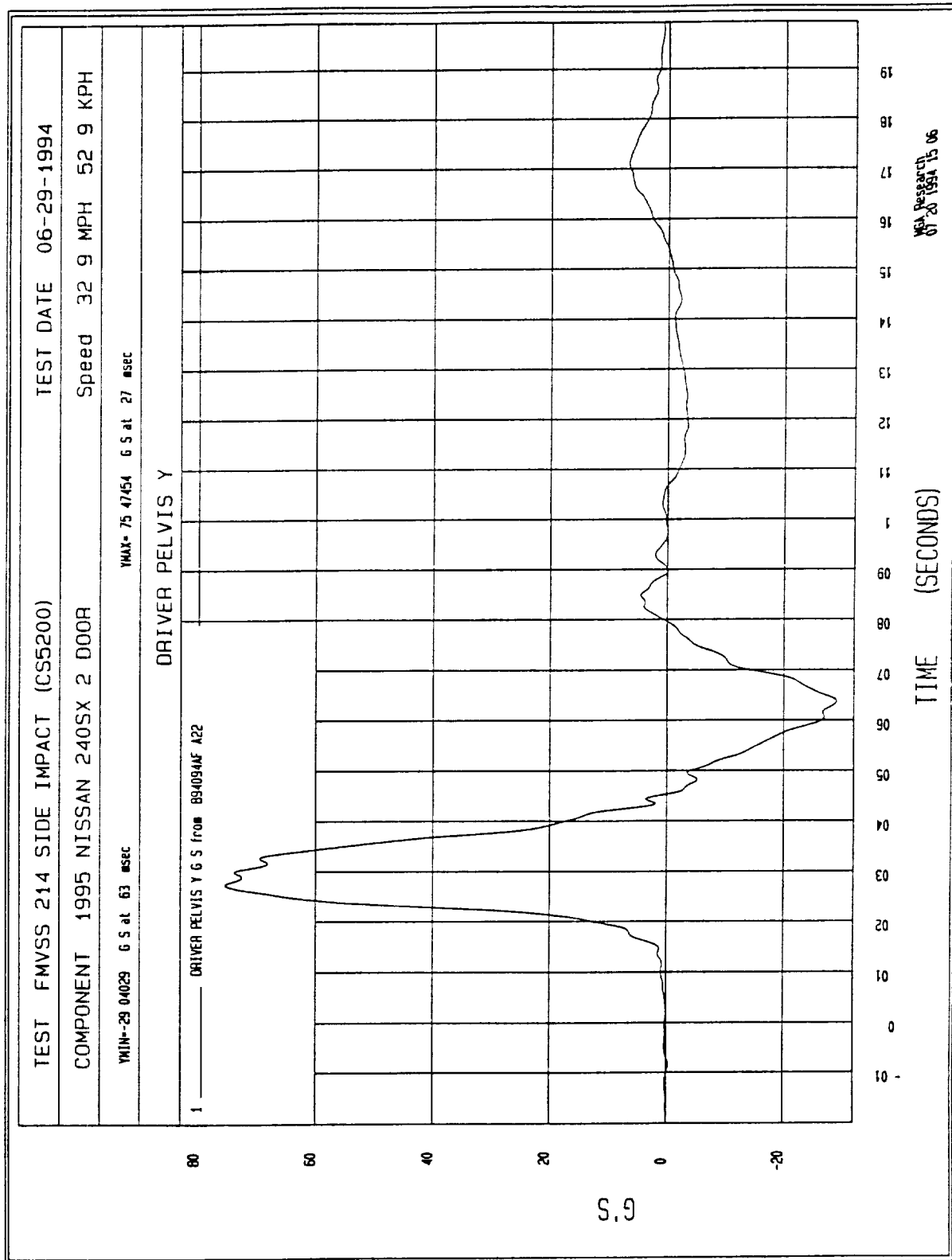


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

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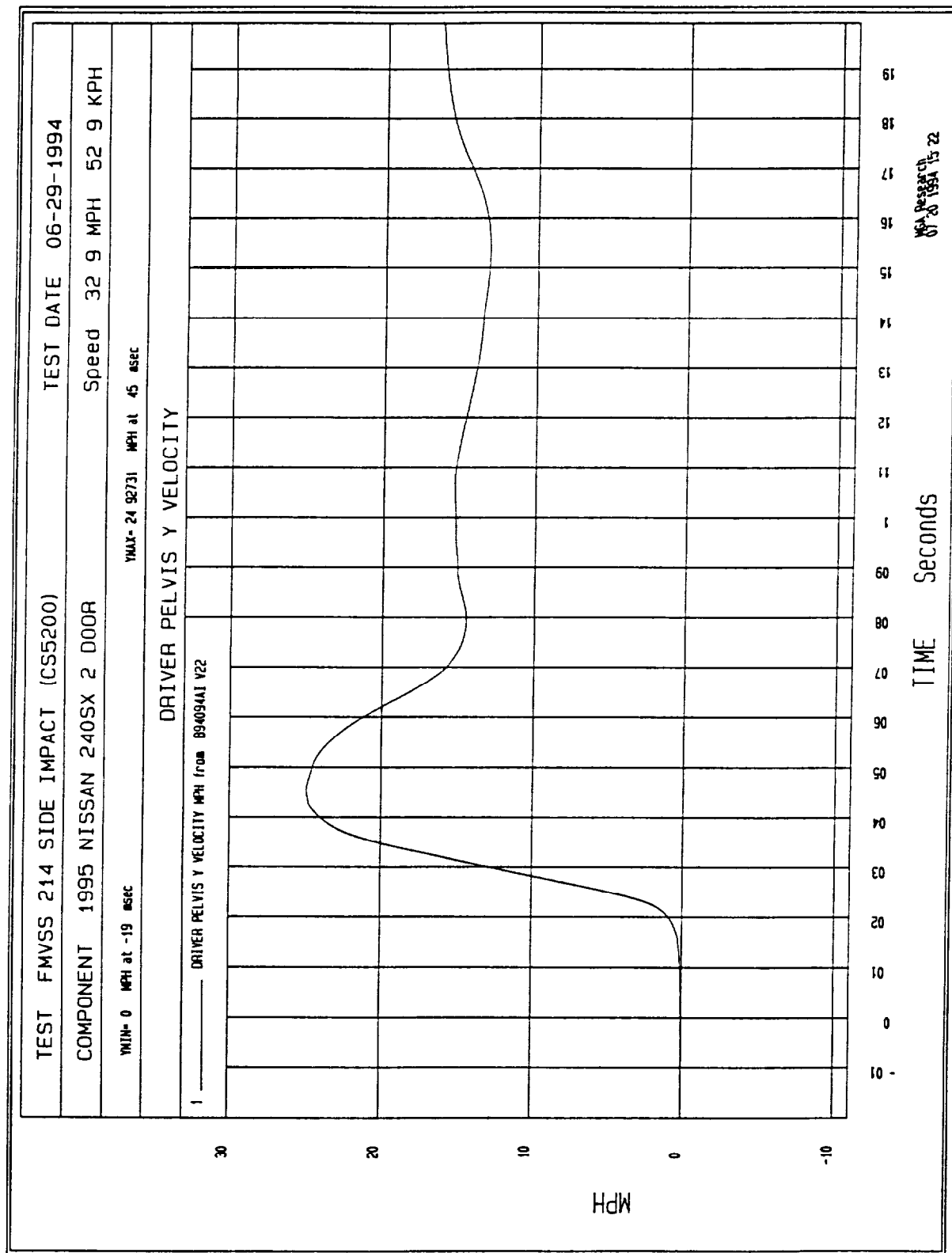


Figure B-8 - Driver Pelvis Y Velocity vs. Time

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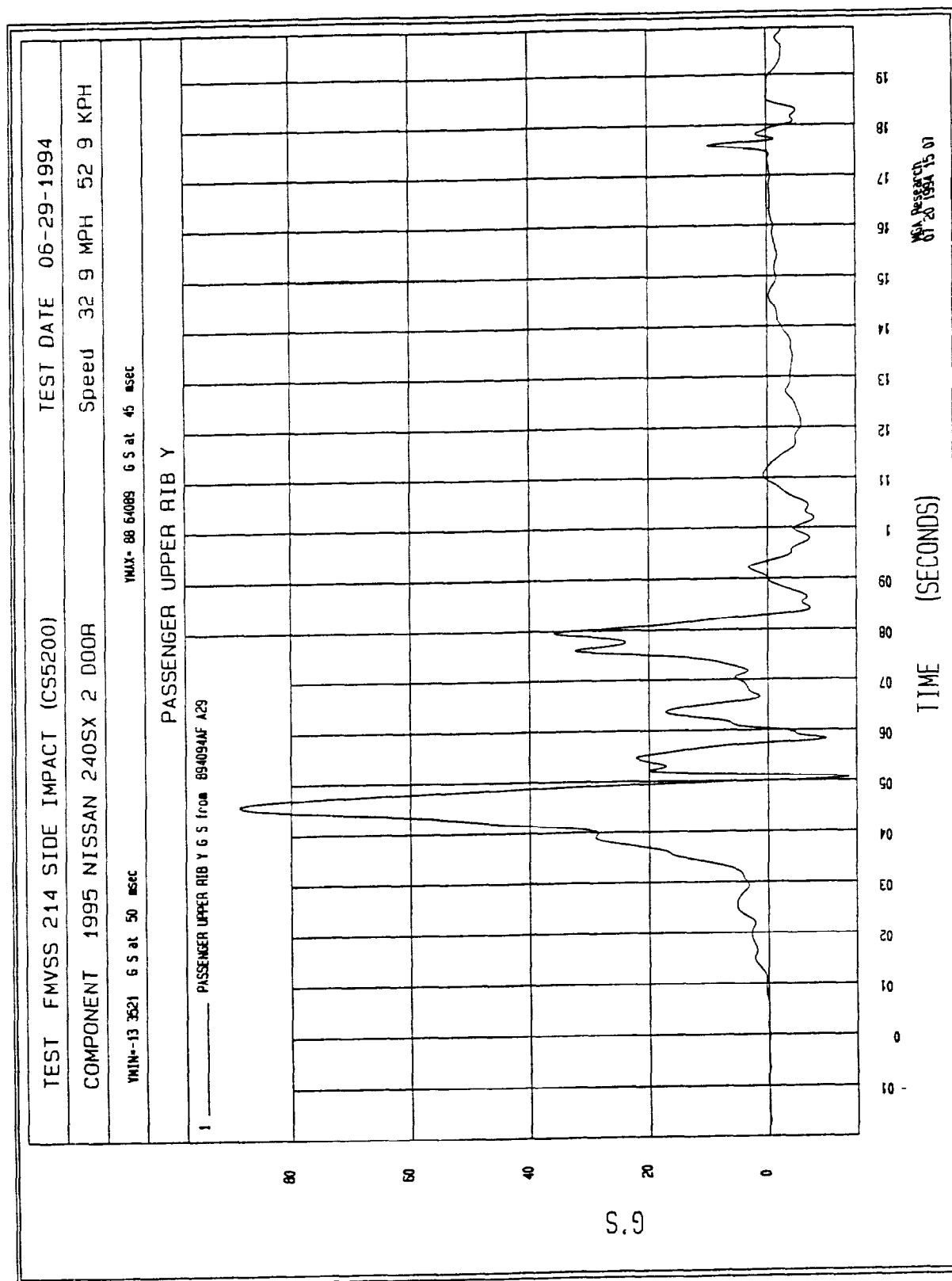


Figure B-9 - Passenger Upper Rib Y Acceleration vs Time

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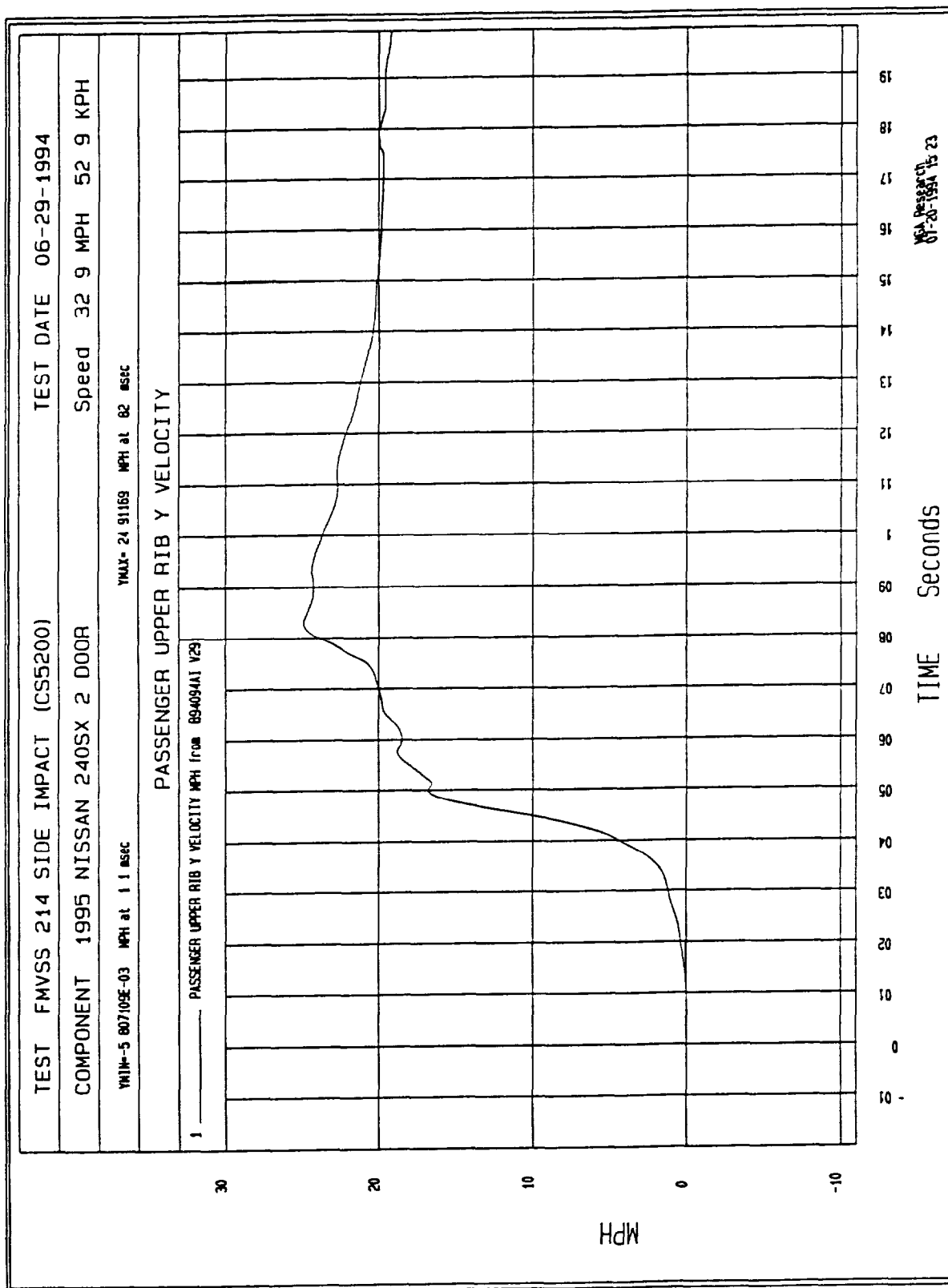


Figure B-10 - Passenger Upper Rib Y Velocity vs. Time

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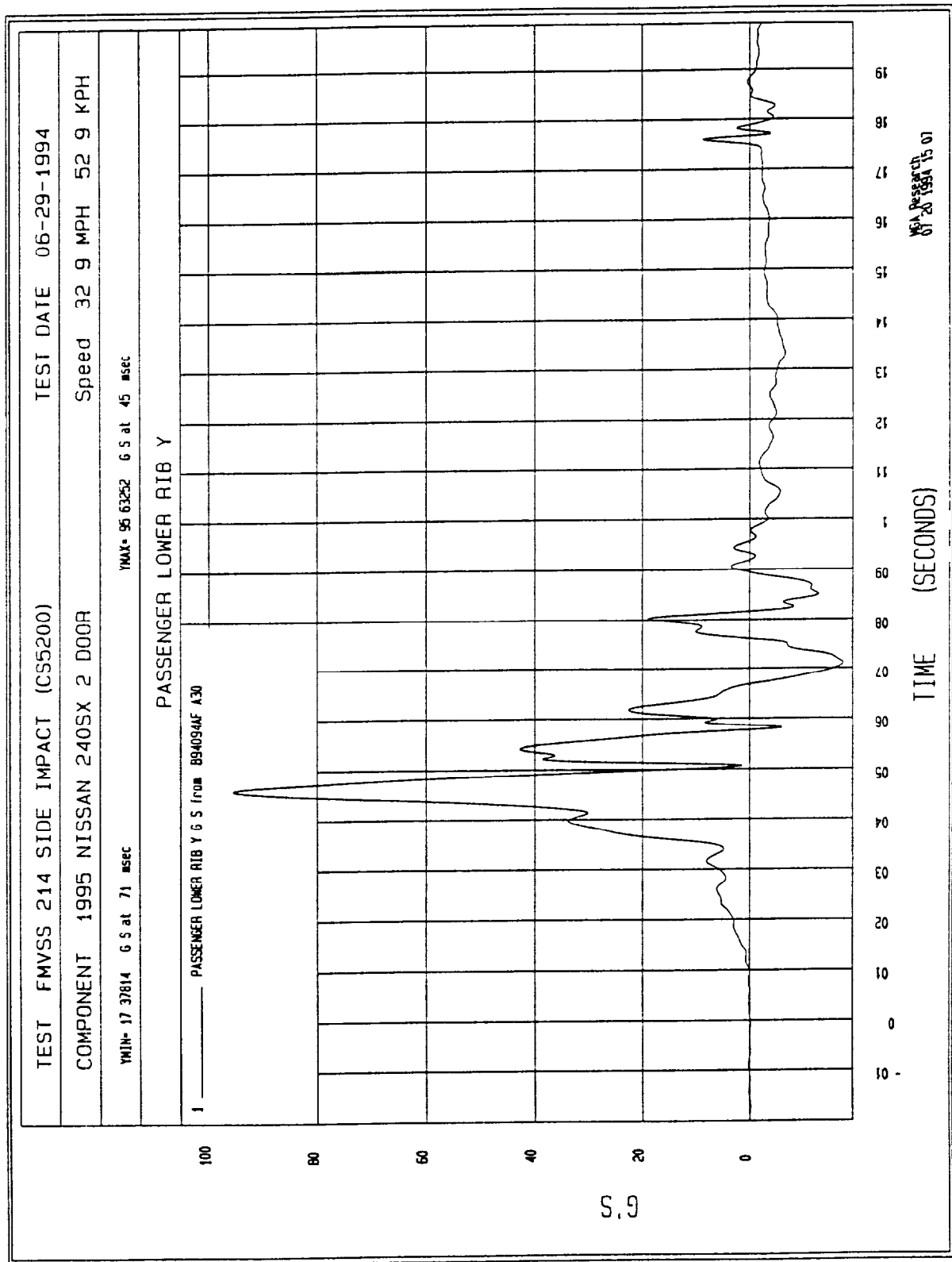


Figure B-11 - Passenger Lower Rib Y Acceleration vs Time

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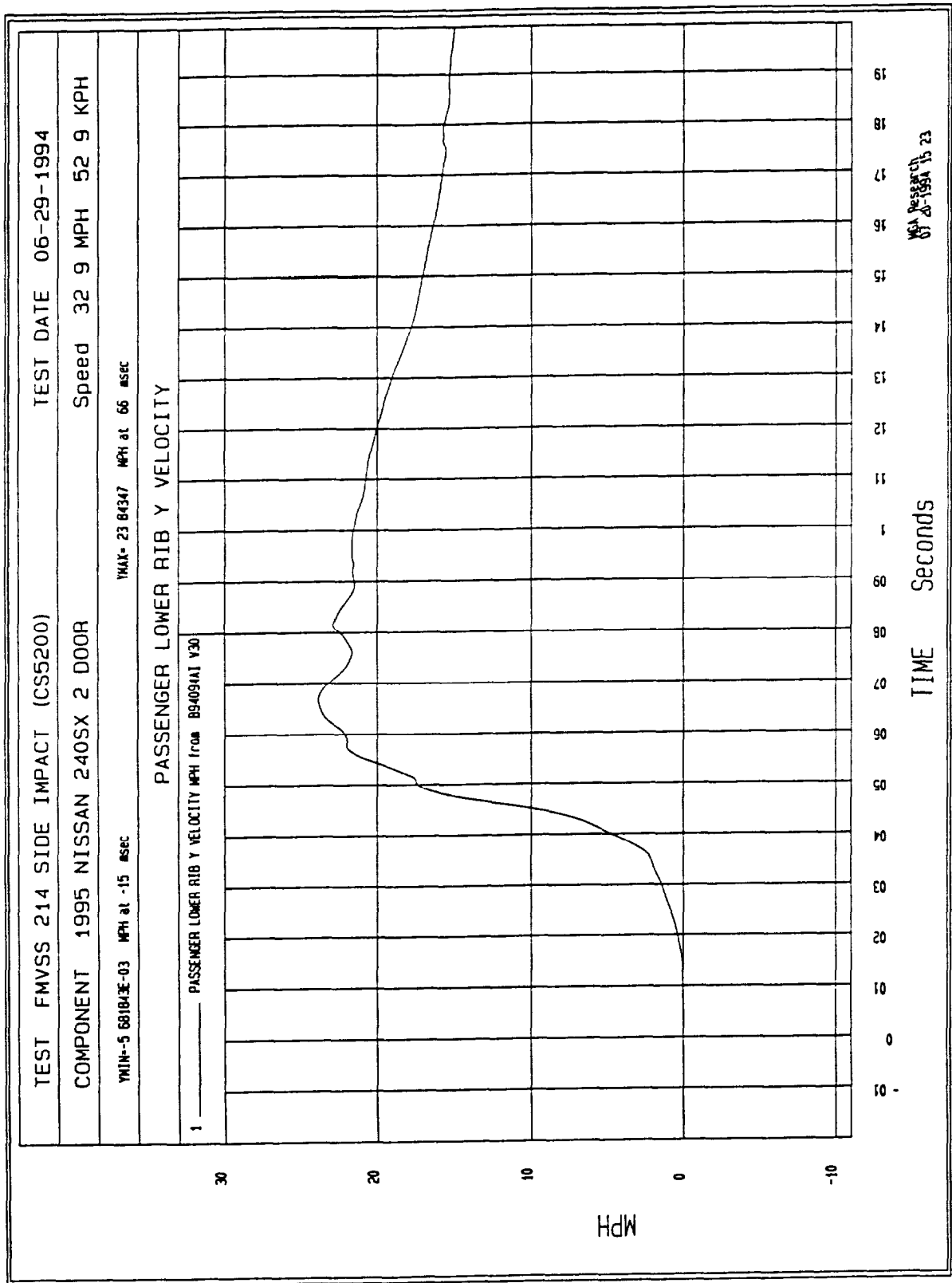


Figure B-12 - Passenger Lower Rib Y Velocity vs. Time

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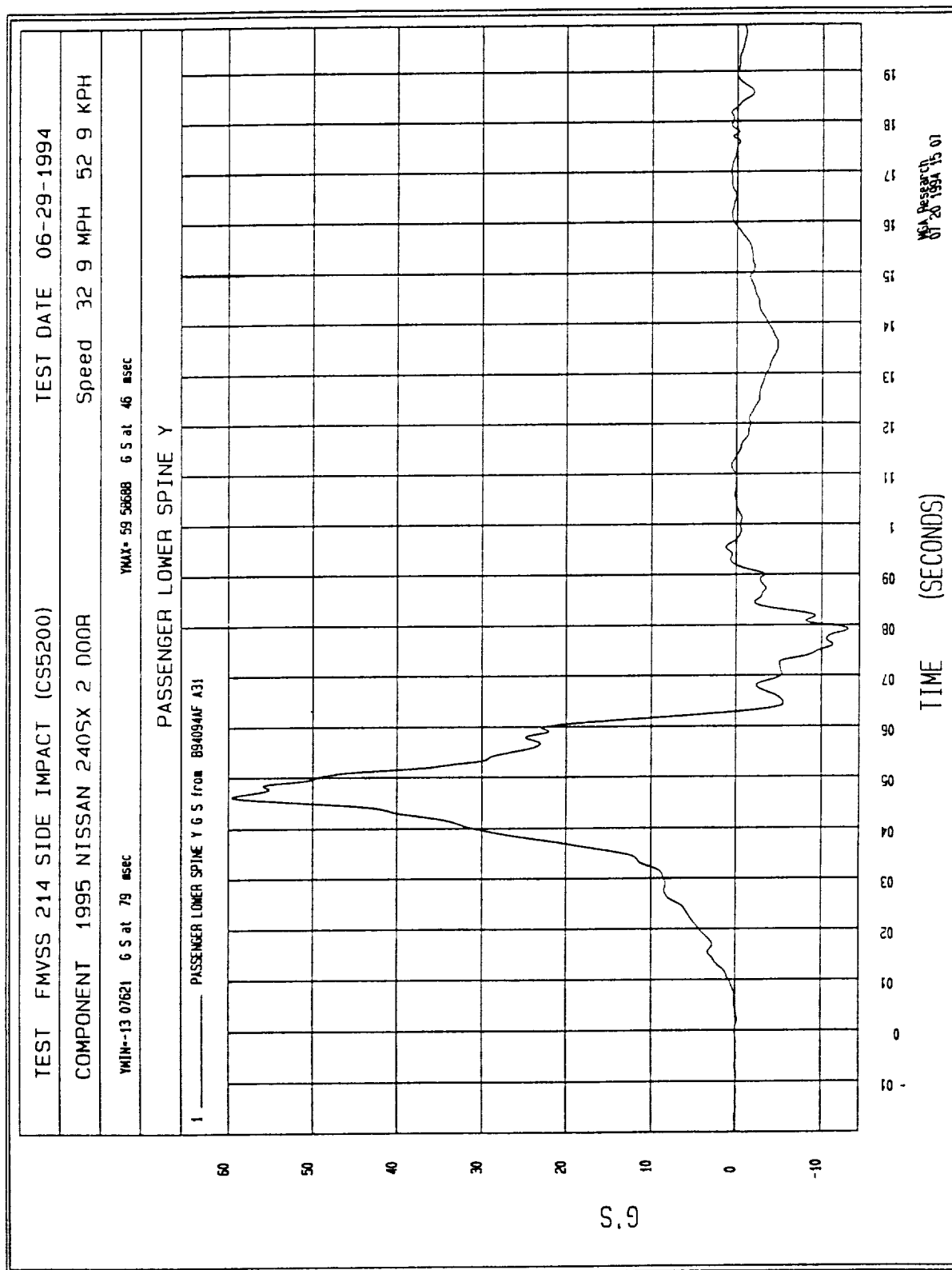


Figure B-13 - Passenger Lower Spine Y Acceleration vs Time

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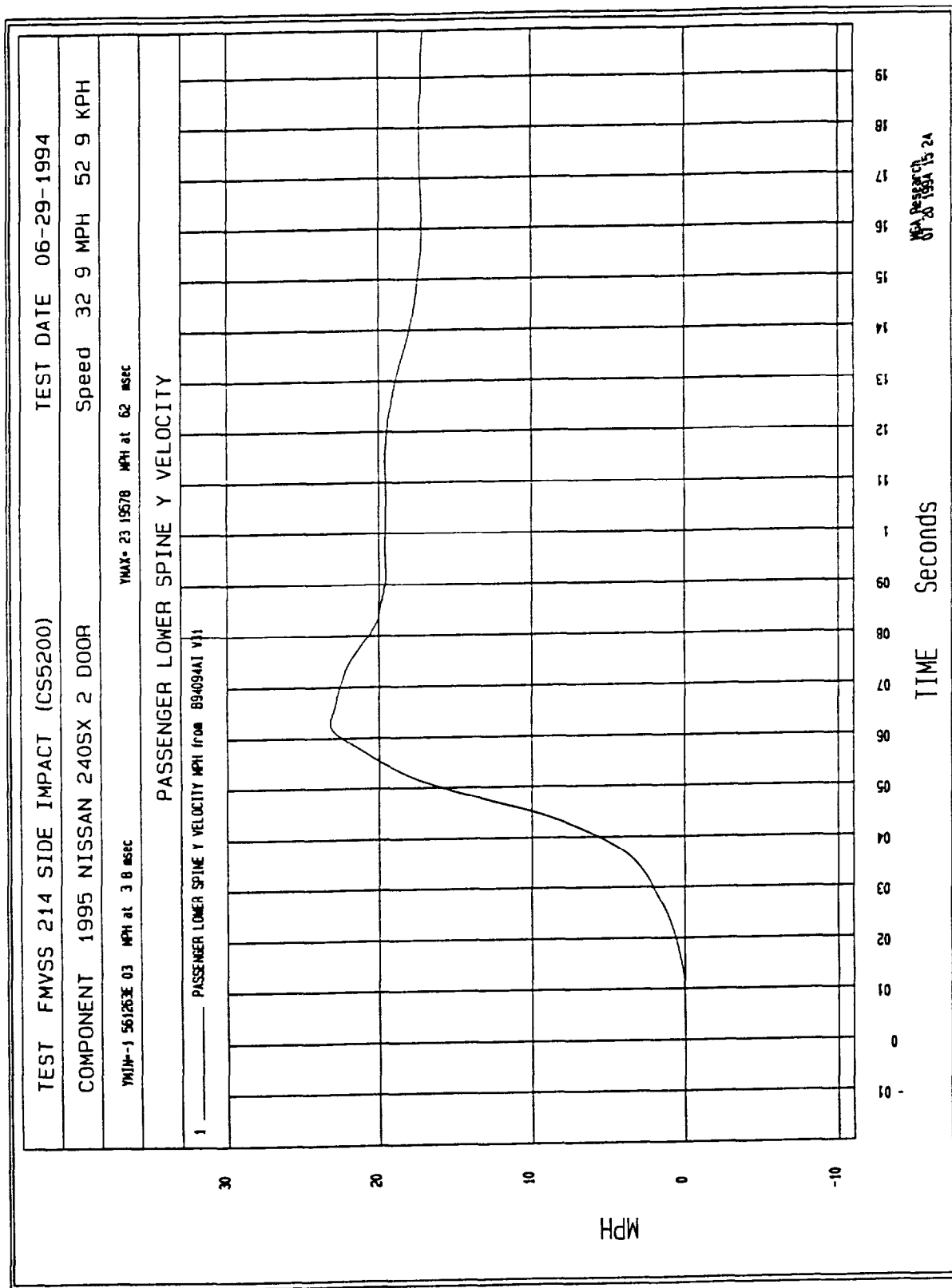


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

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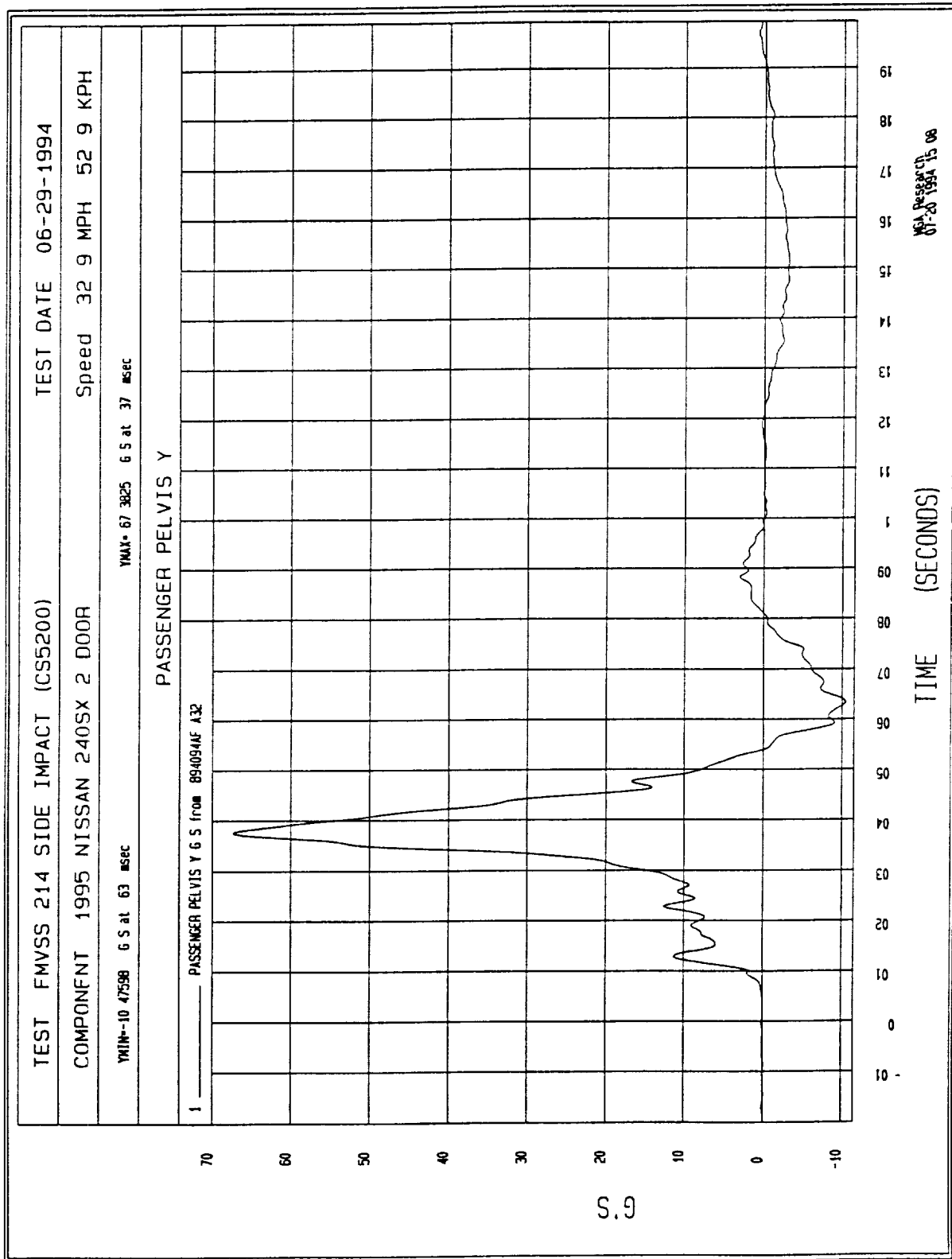


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

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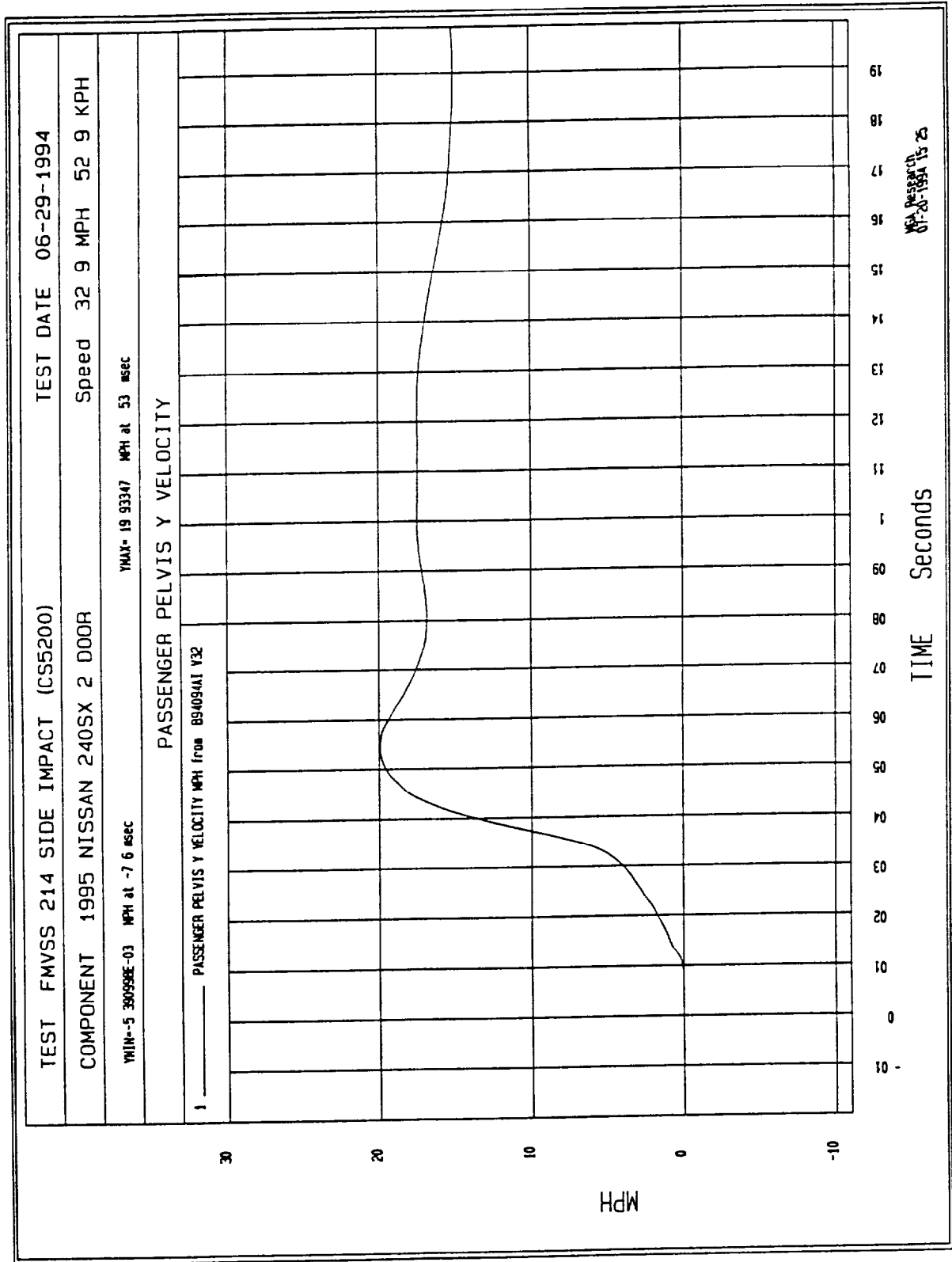


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

Filter: Class 60 (100 Hz)

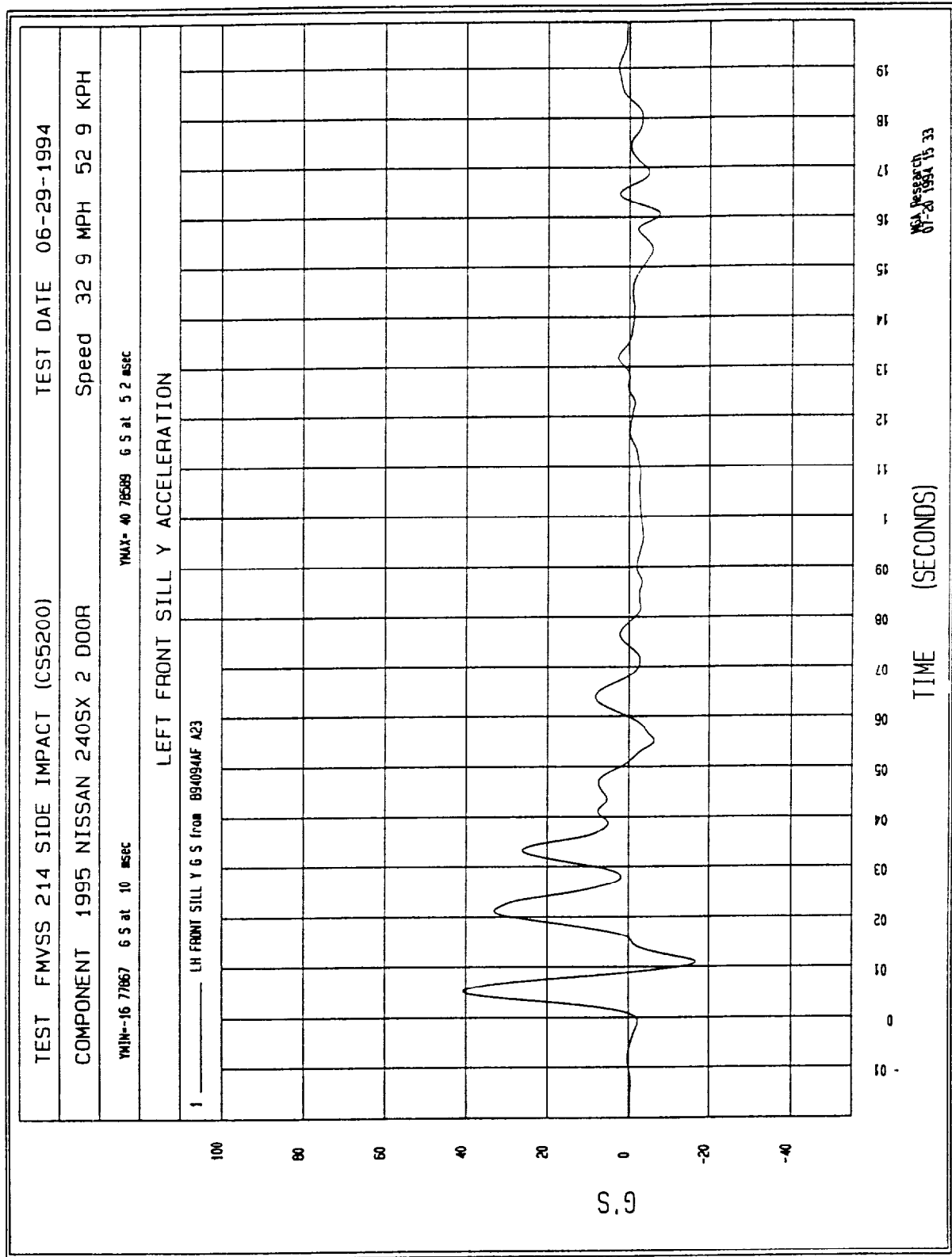


Figure B-17 - Left Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

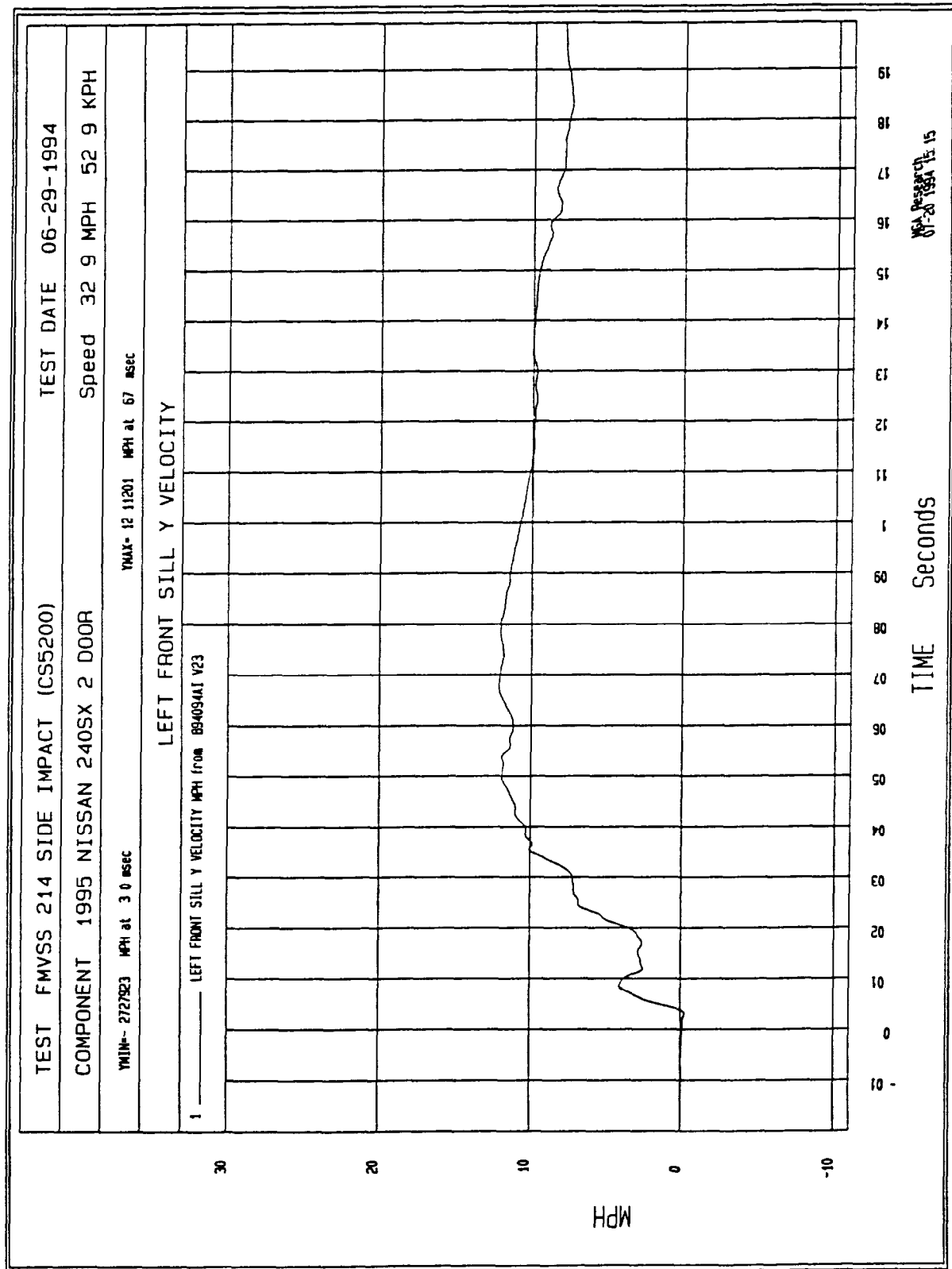


Figure B-18 - Left Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

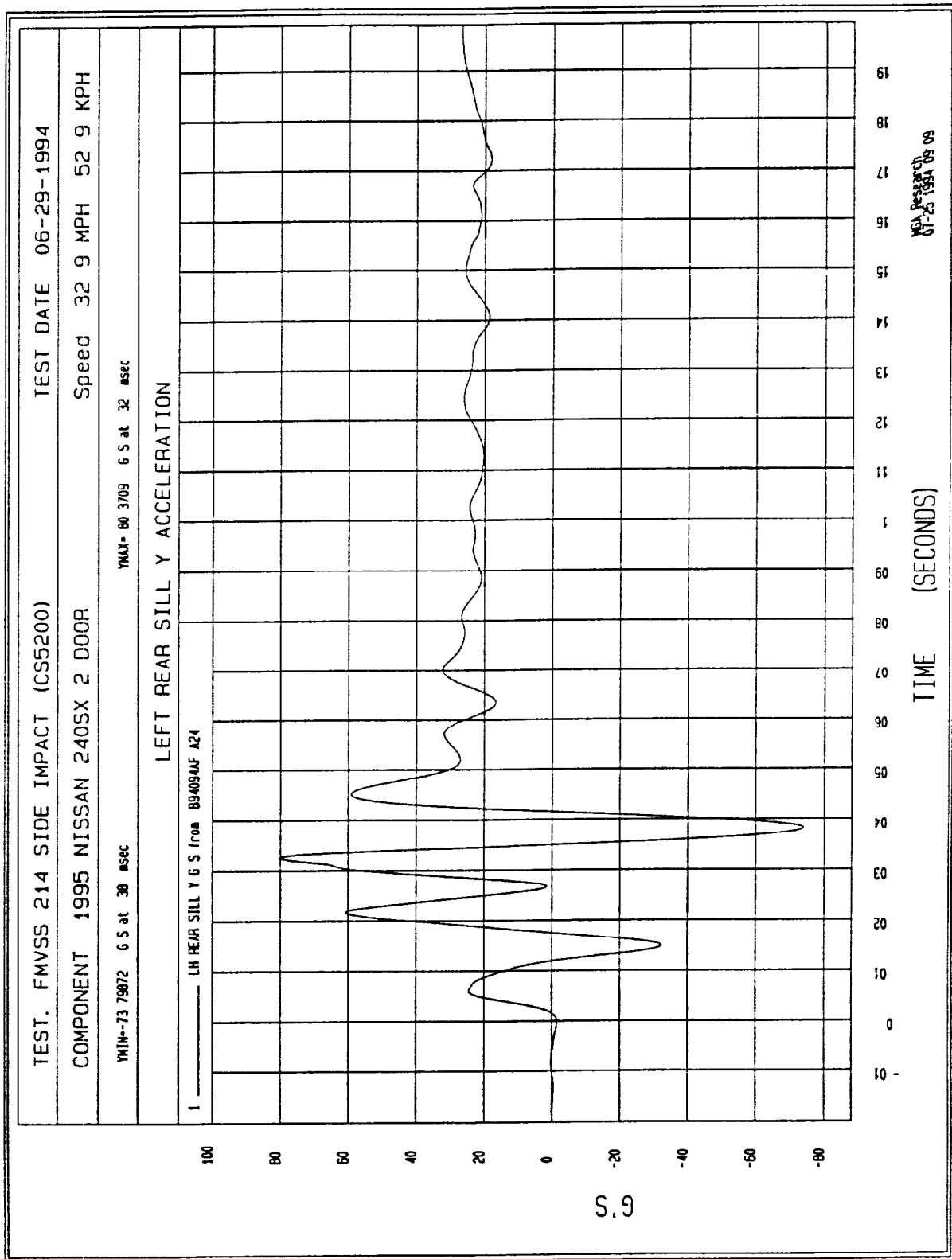


Figure B-19 - Left Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

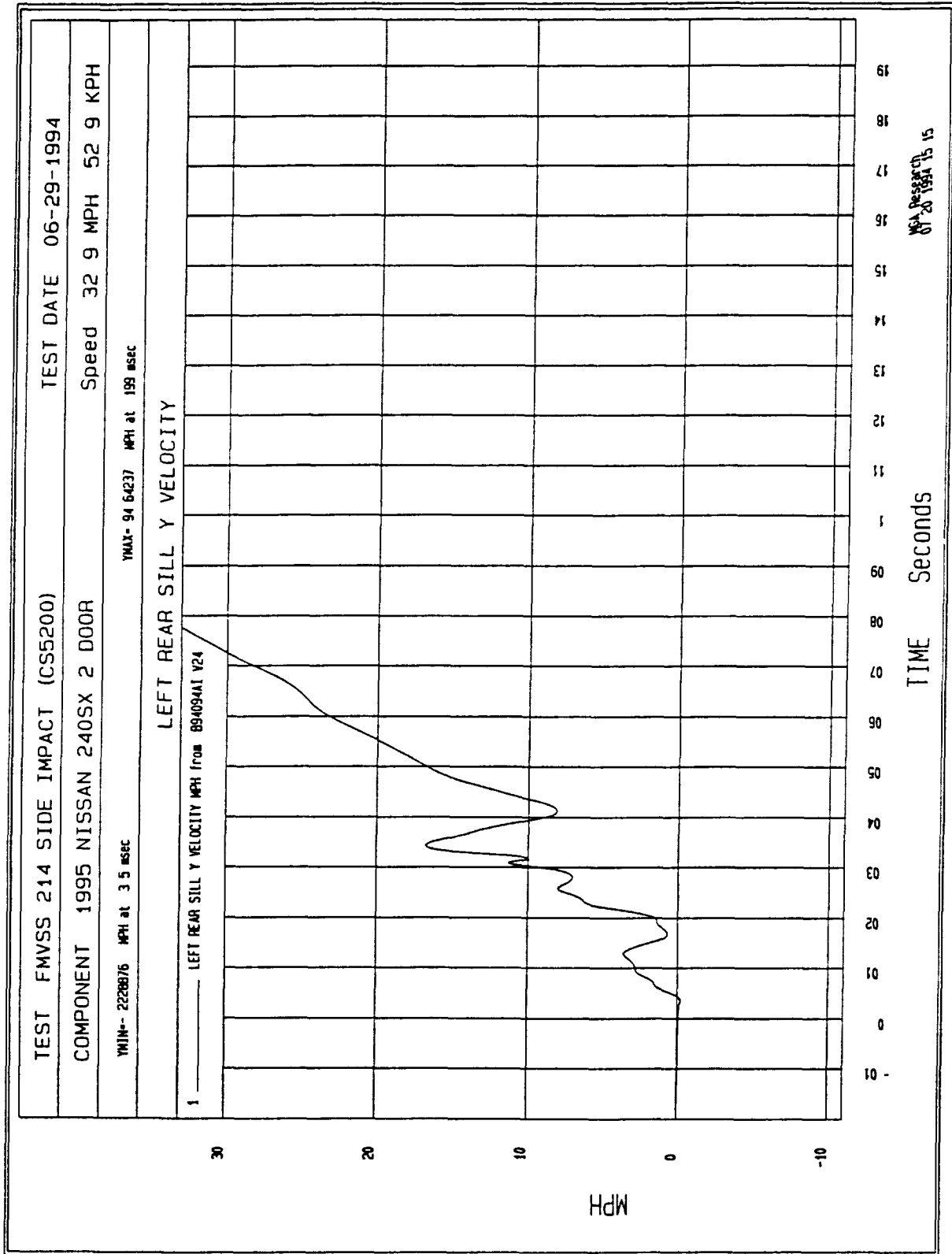


Figure B-20 - Left Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

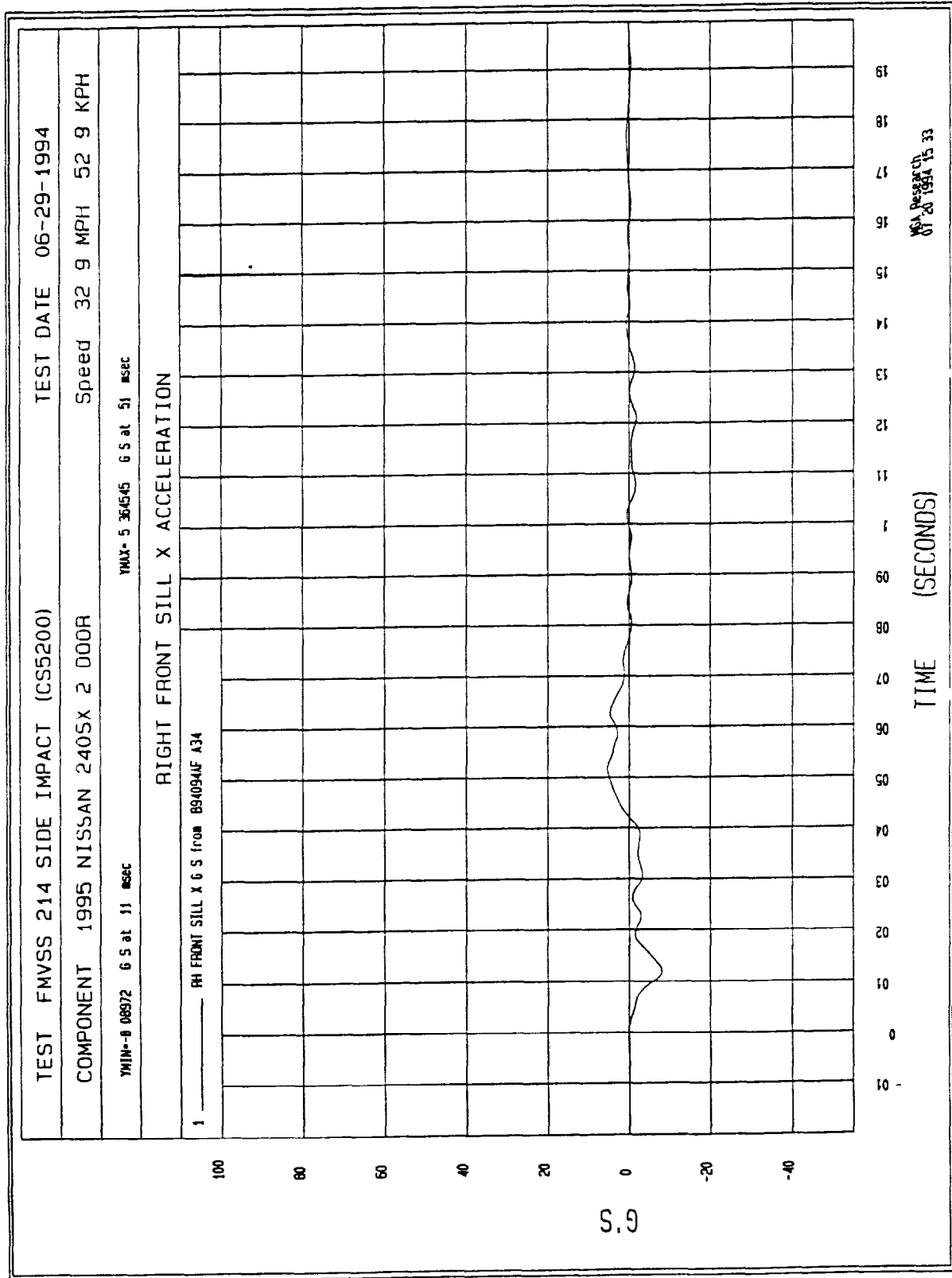


Figure B-21 - Right Front Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

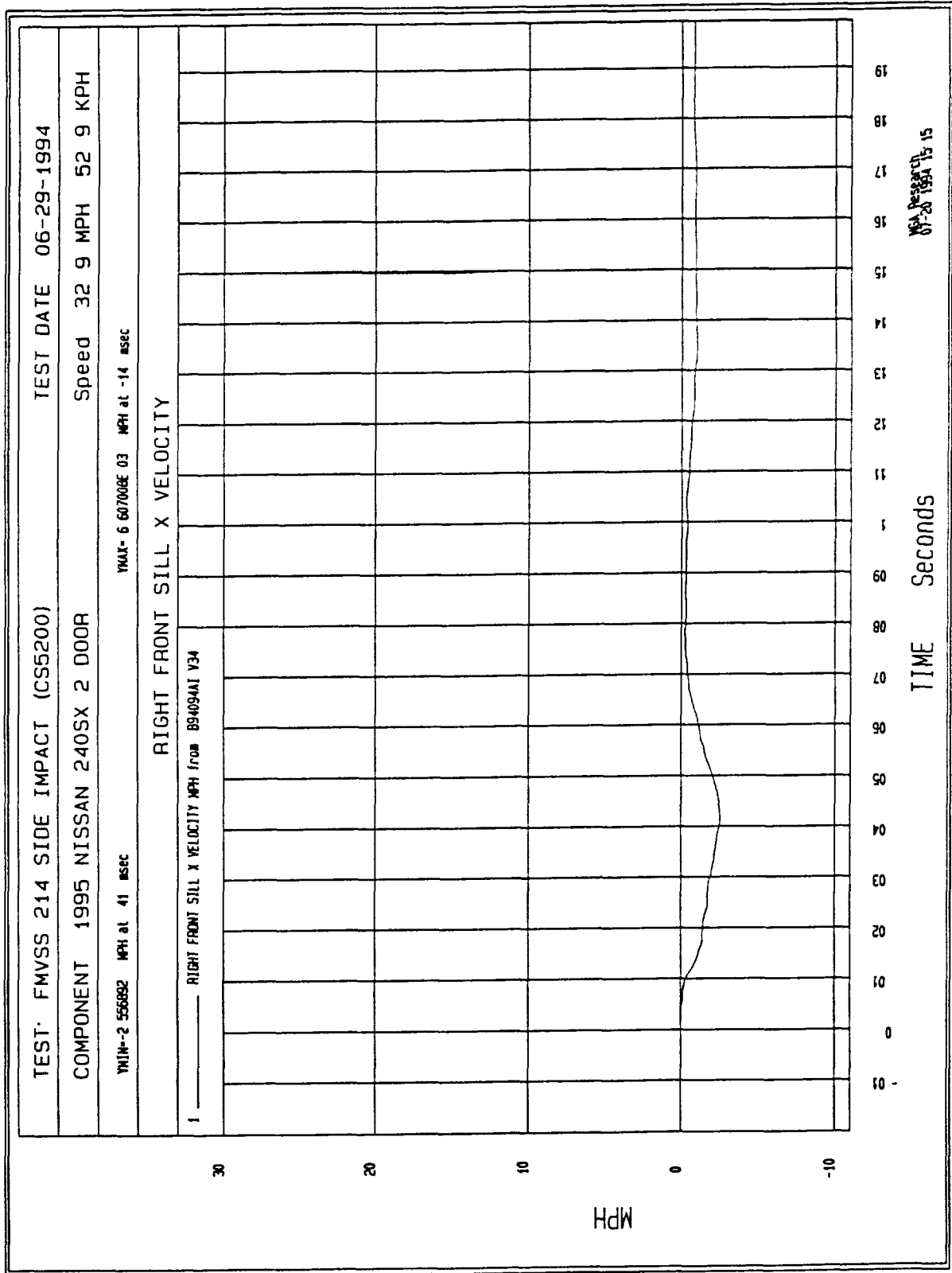


Figure B-22 - Right Front Sill X Velocity vs. Time

Filter: Class 60 (100 Hz)

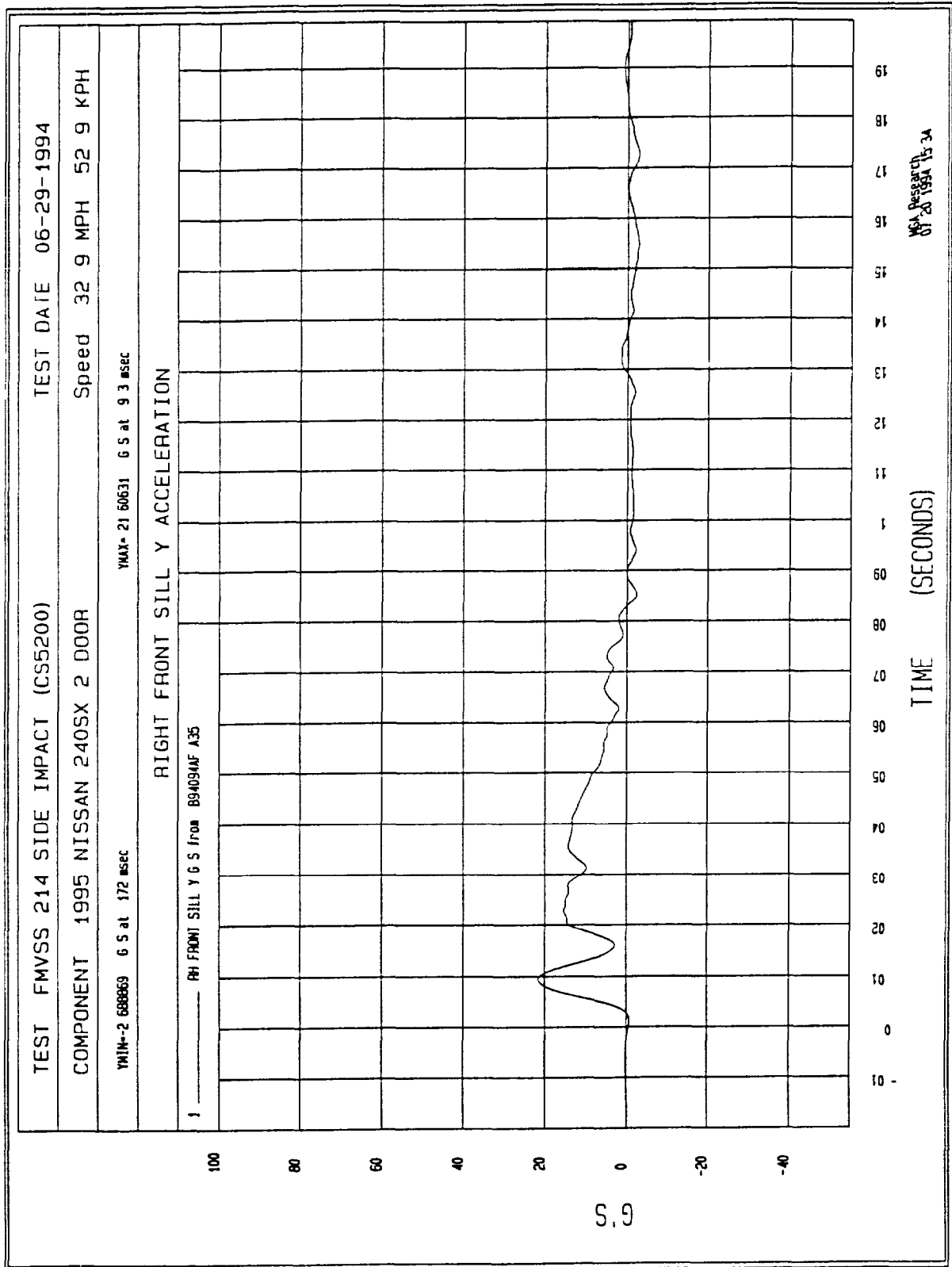


Figure B-23 - Right Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

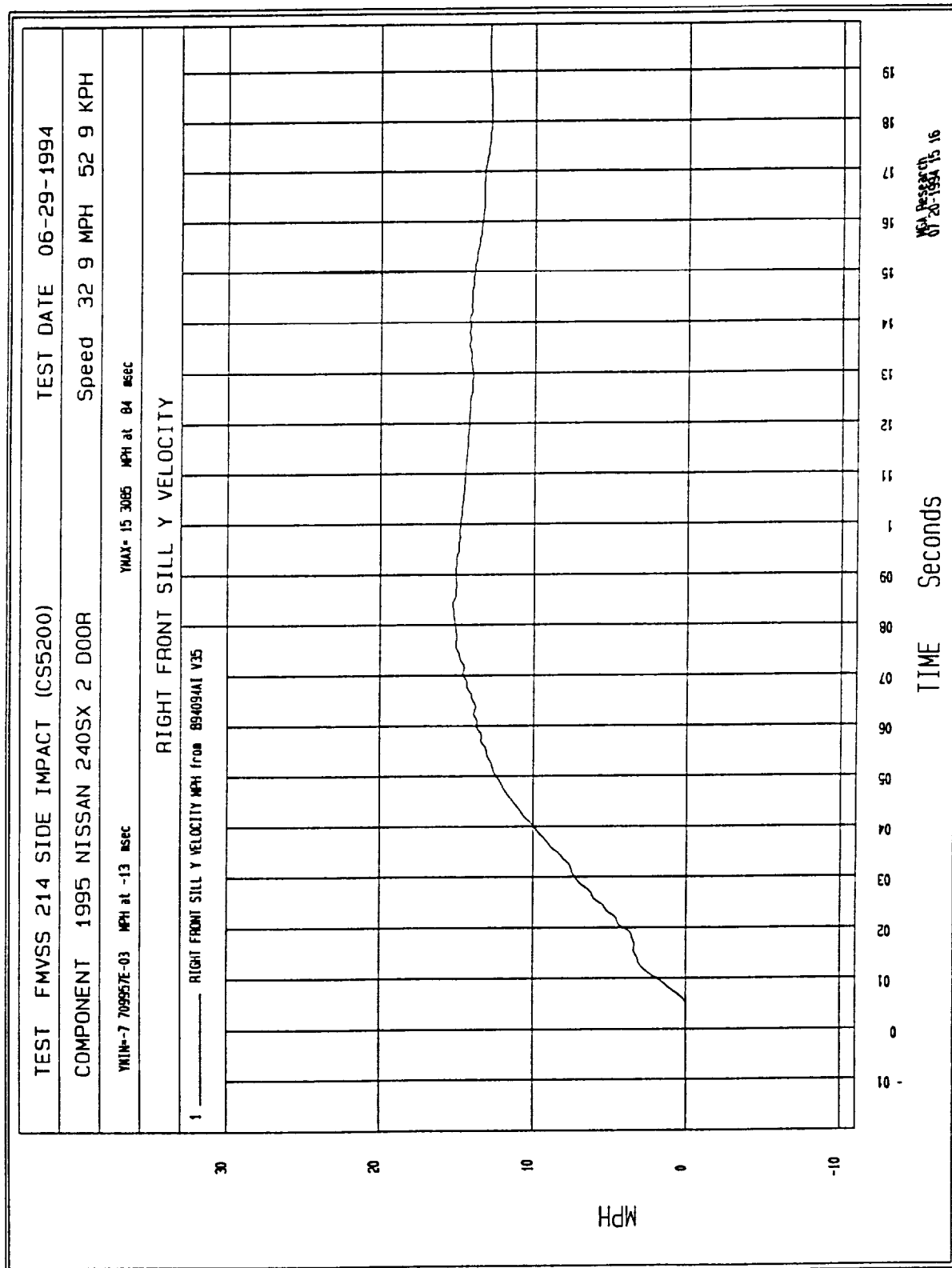


Figure B-24 - Right Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

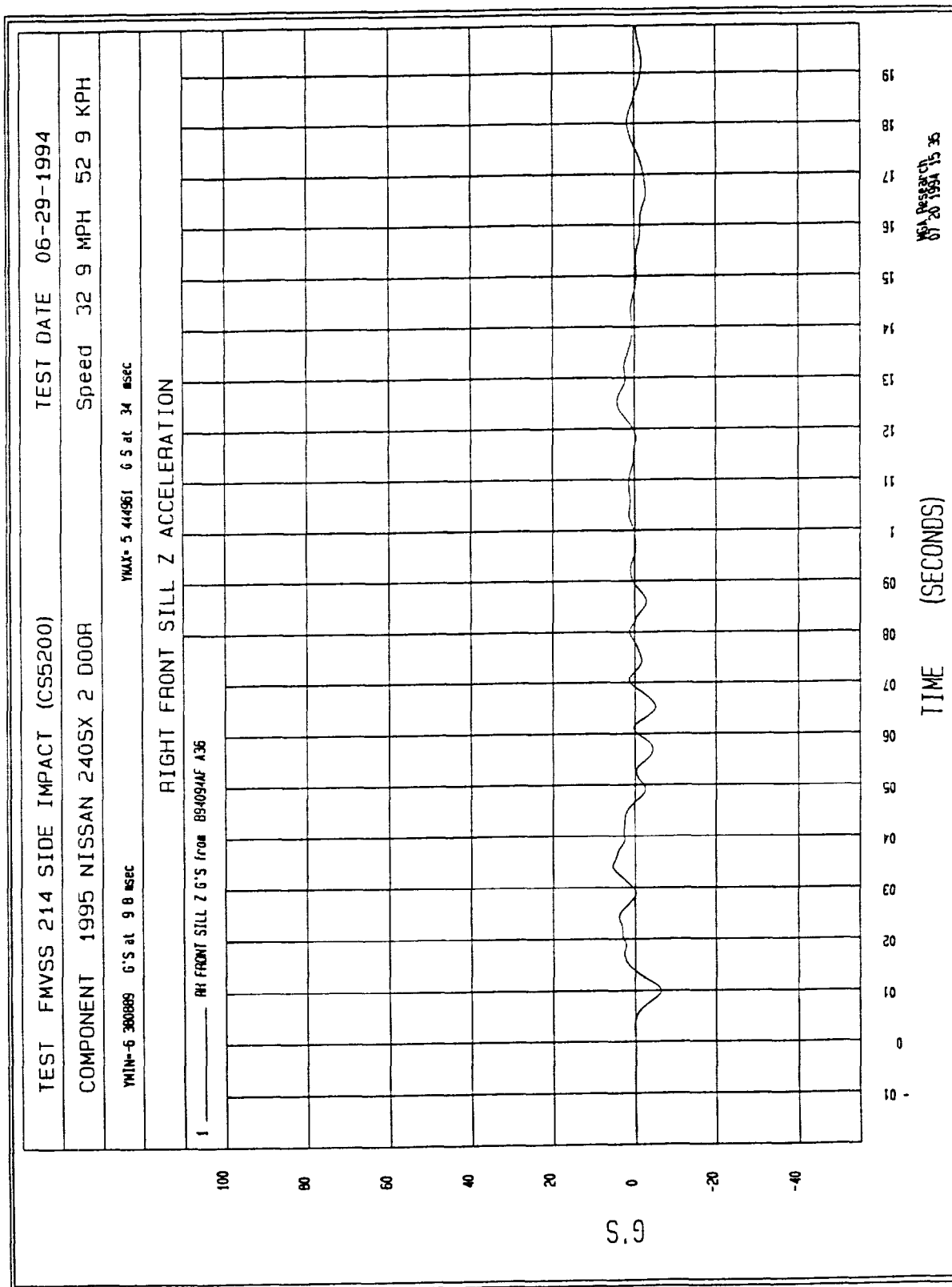


Figure B-25 - Right Front Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

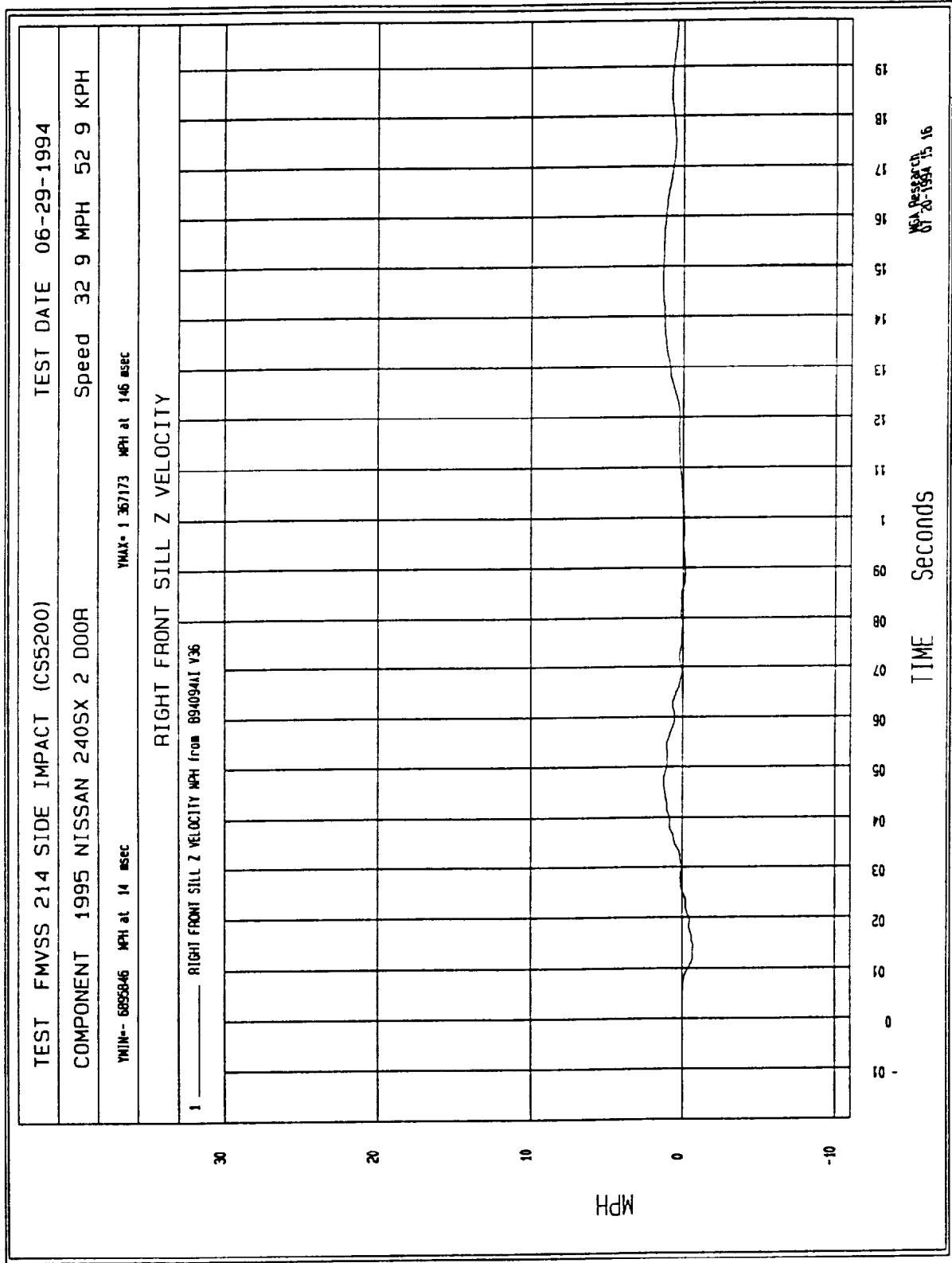


Figure B-26 - Right Front Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

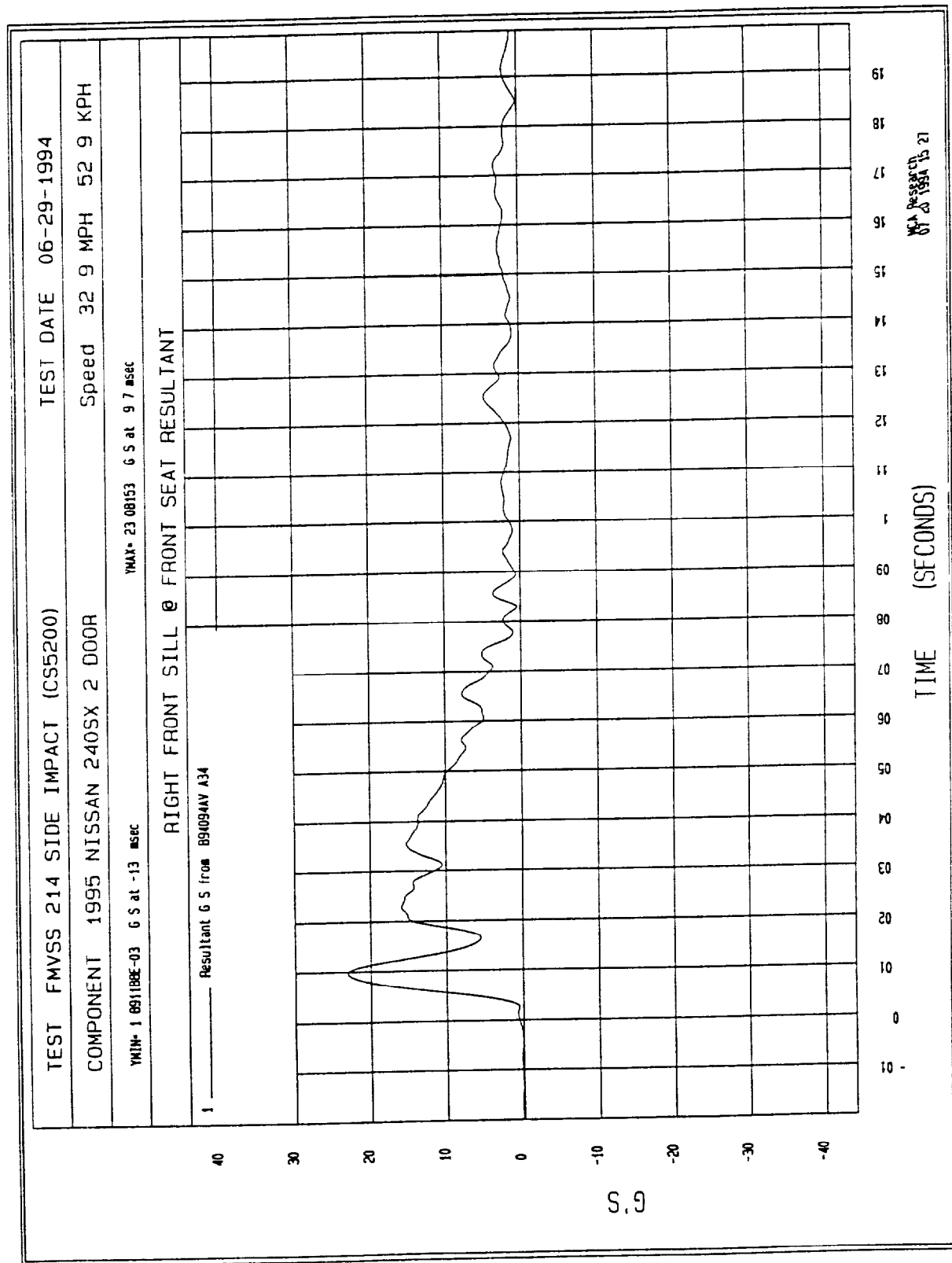


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

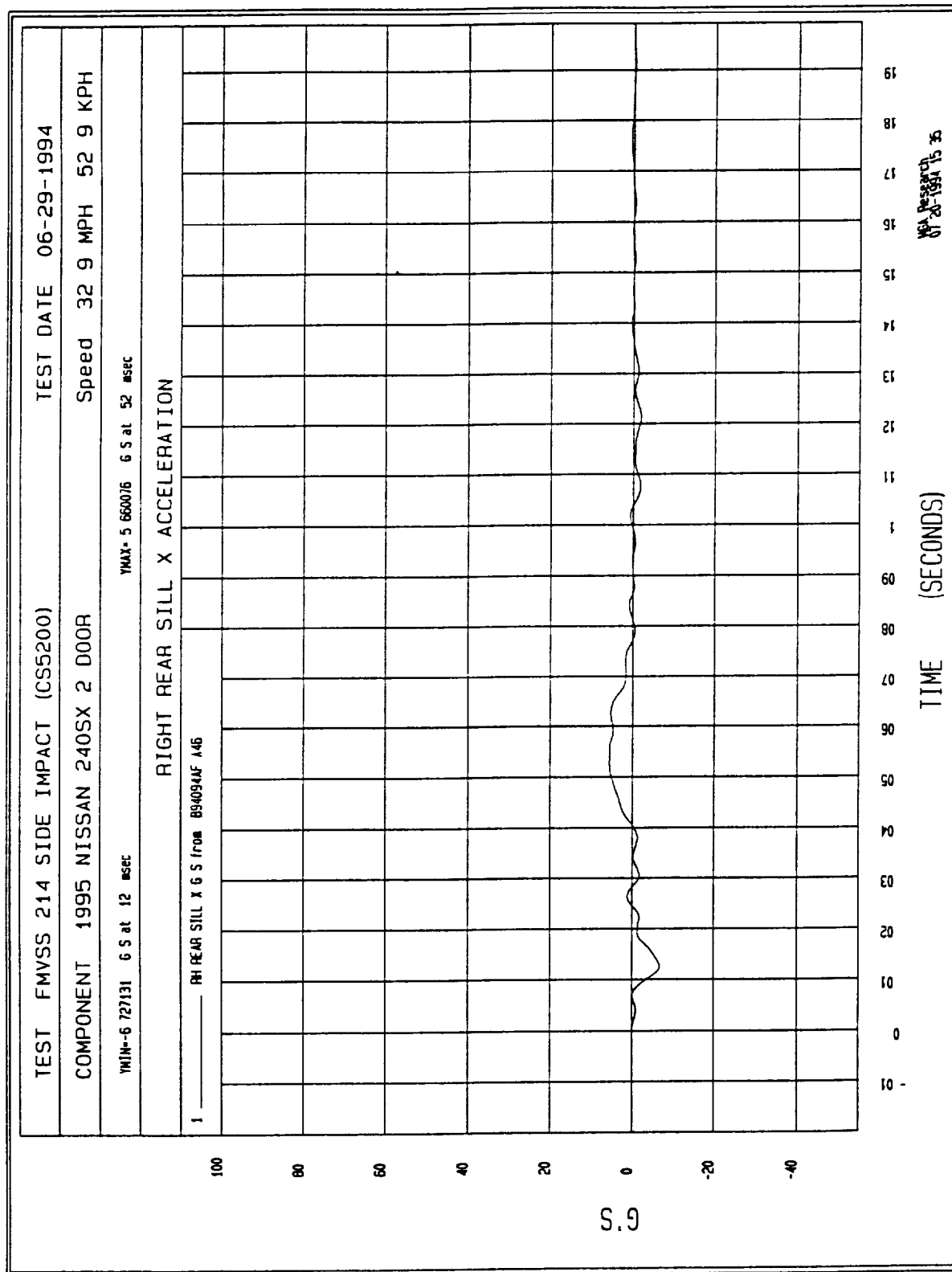


Figure B-28 - Right Rear Sill X Acceleration vs. Time

TEST	FMVSS 214 SIDE IMPACT (CS5200)	TEST DATE	06-29-1994
COMPONENT	1995 NISSAN 240SX 2 DOOR	Speed	32 9 MPH 52 9 KPH
YMIN=1 423507	MPH at 40 msec	YMAX=1 537828	MPH at 85 msec

1 _____ RIGHT REAR SILL X VELOCITY MPH from B94094A1 V46

TIME Seconds

MPA Research
01 20 1994 15 16

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

Filter: Class 60 (100 Hz)

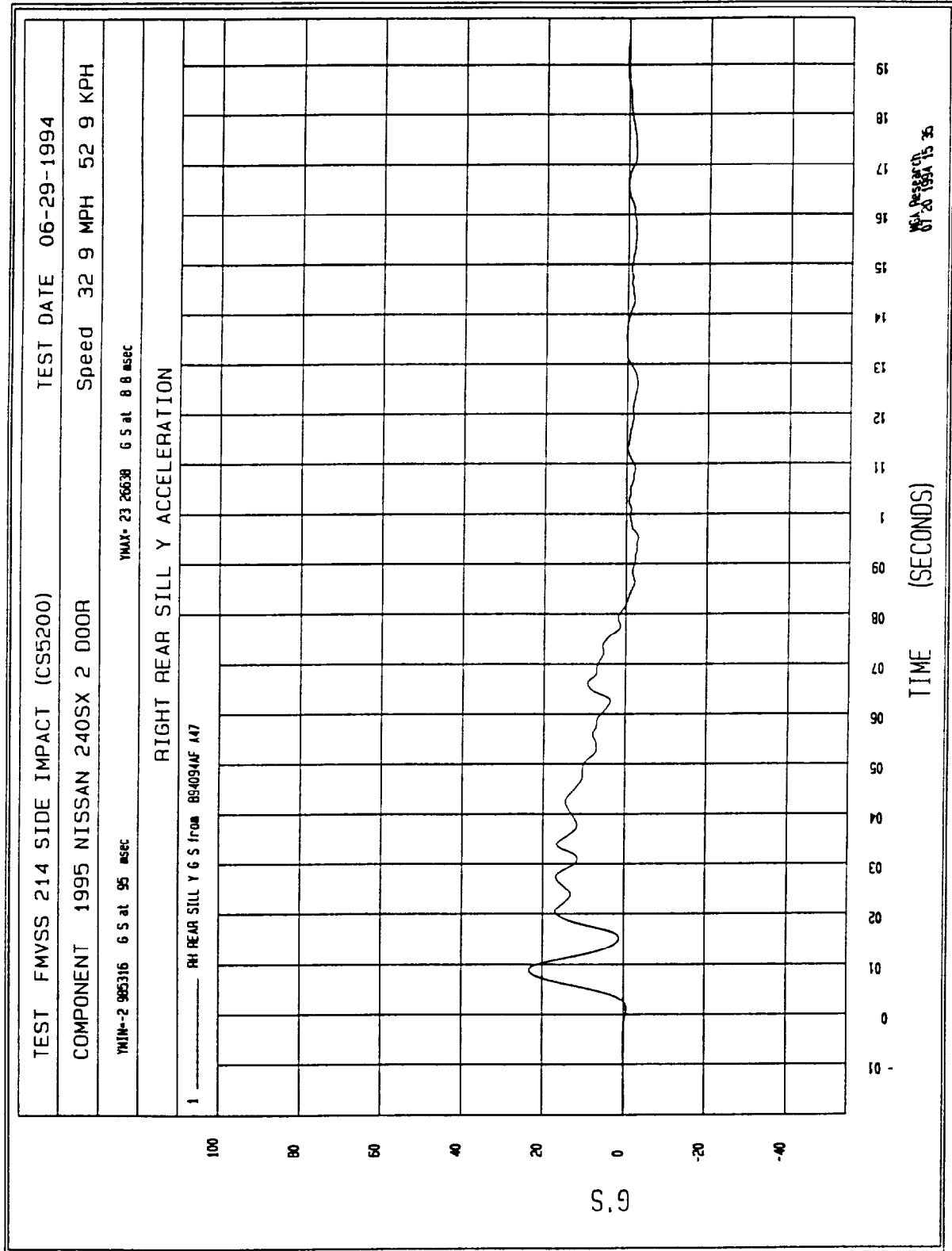


Figure B-30 - Right Rear Sill Y Acceleration vs. Time

TEST: FMVSS 214 SIDE IMPACT (CS5200)	TEST DATE 06-29-1994
COMPONENT 1995 NISSAN 240SX 2 DOOR	Speed 32.9 MPH 52.9 KPH
YMIN--5.721894E 03 MPH at -9.8 msec	YMAX= 16.96148 MPH at 80 msec
RIGHT REAR SILL Y VELOCITY	
1 _____ RIGHT REAR SILL Y VELOCITY MPH from 884094A1 V47	

Time (Seconds)	Velocity (MPH)
0.0	0.5
0.5	1.5
0.8	-5.7
1.5	1.5
2.5	-1.5
3.0	-0.5
4.0	0.5
5.0	-0.5
6.0	0.5
7.0	-0.5
8.0	0.5
9.0	-0.5
10.0	0.5
11.0	-0.5
12.0	0.5
13.0	-0.5
14.0	0.5
15.0	-0.5
16.0	0.5
17.0	-0.5
18.0	0.5
19.0	-0.5

MCA Research
07-20-1994 15:17

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

Filter: Class 60 (100 Hz)

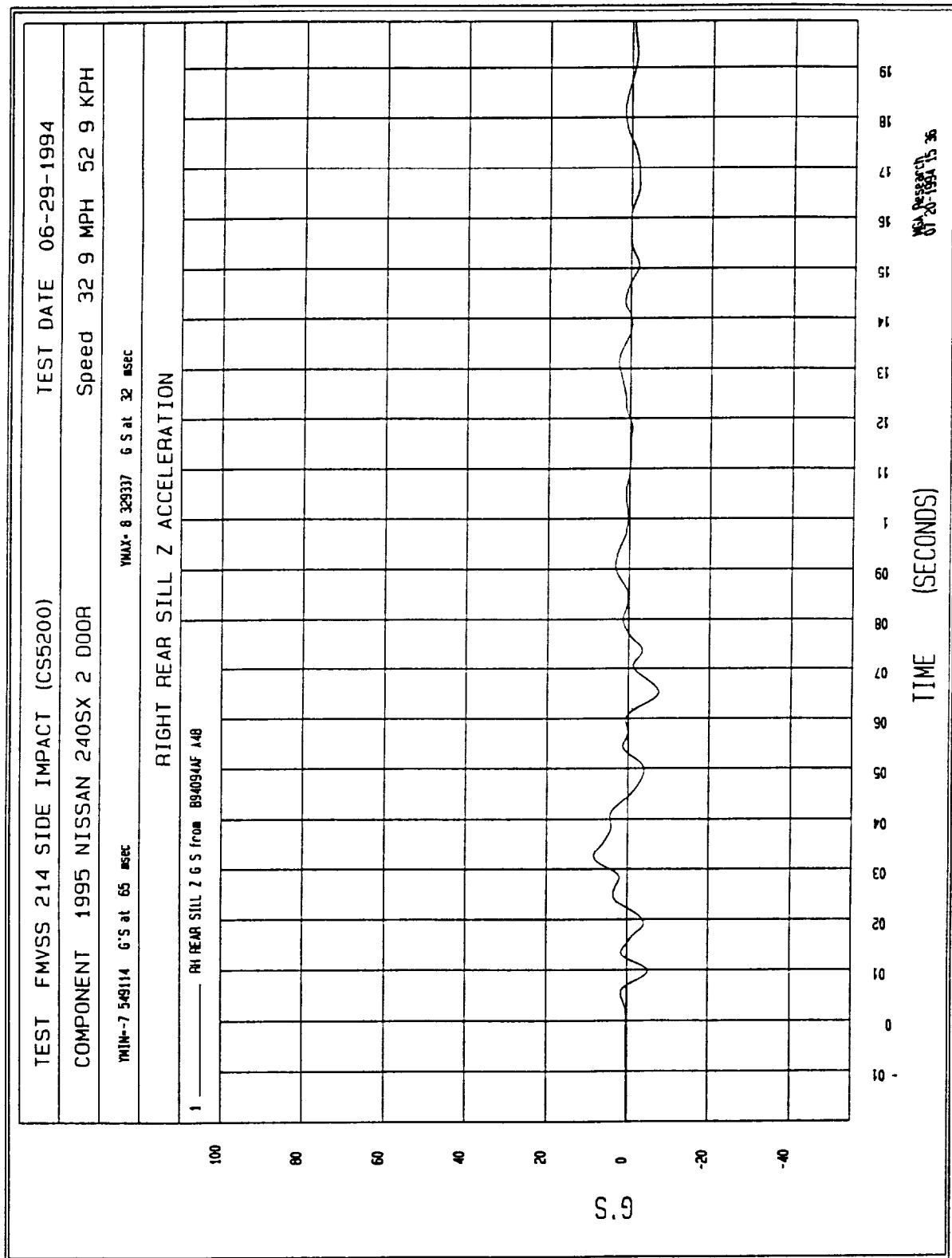


Figure B-32 - Right Rear Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

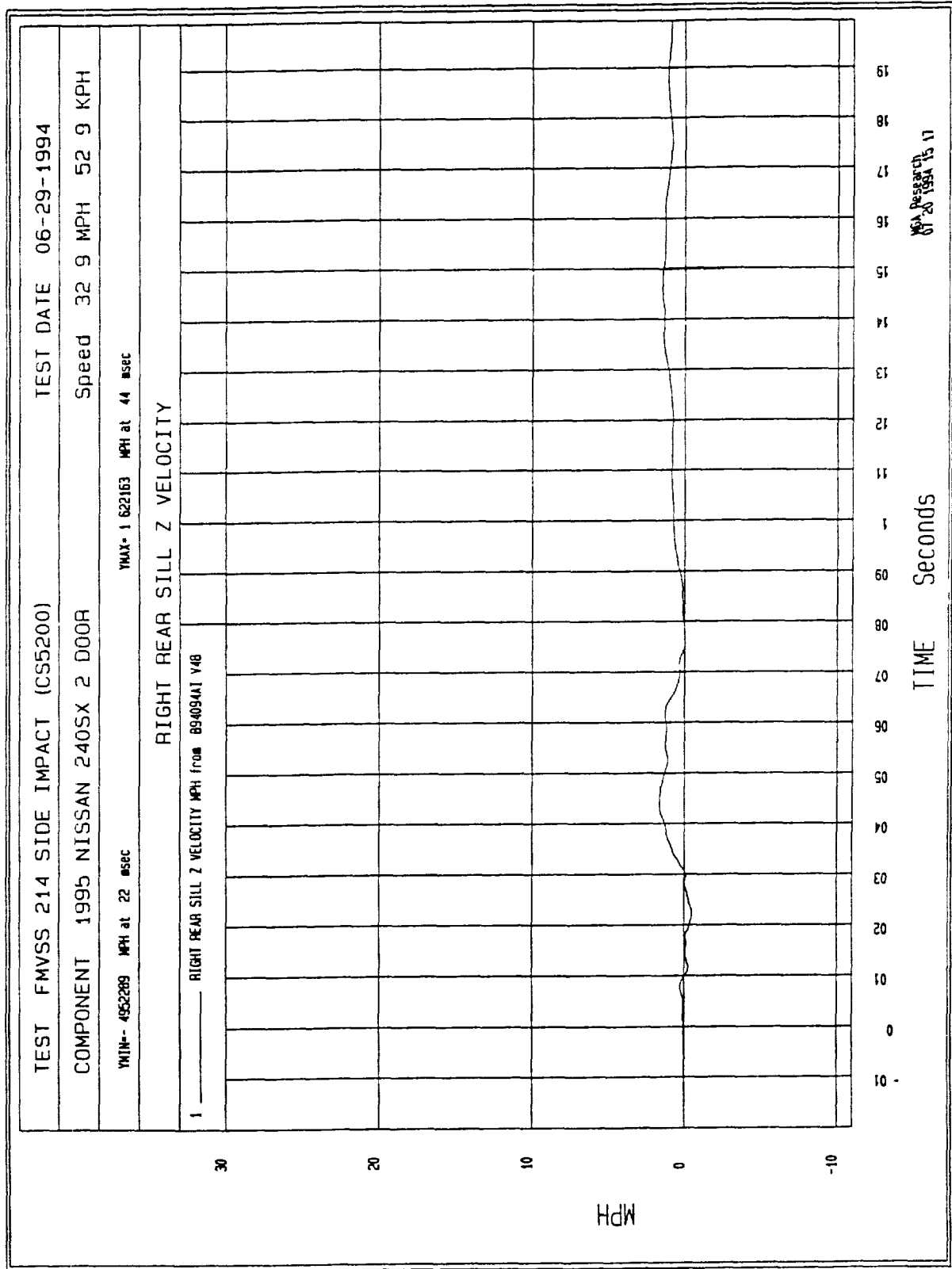


Figure B-33 - Right Rear Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

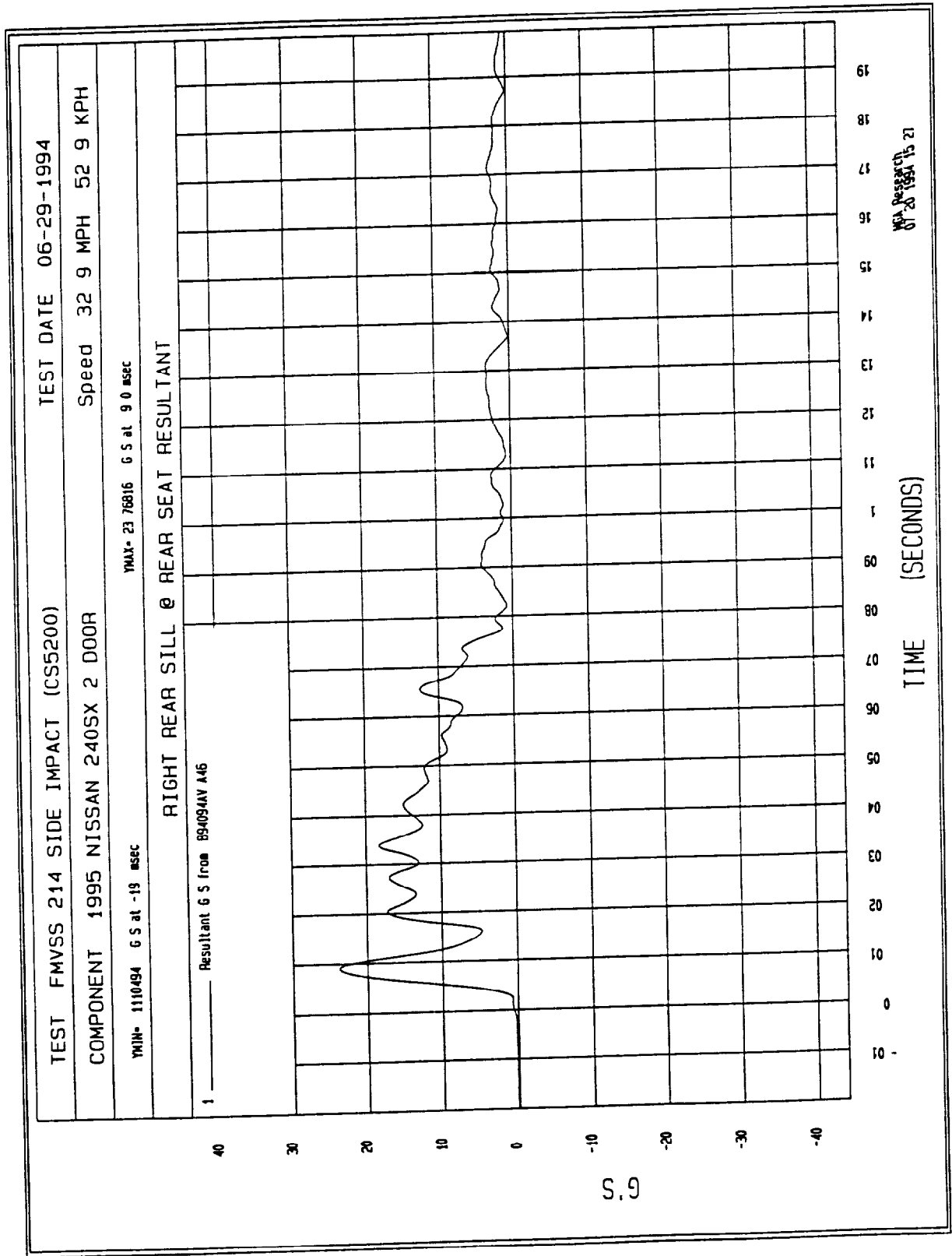


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

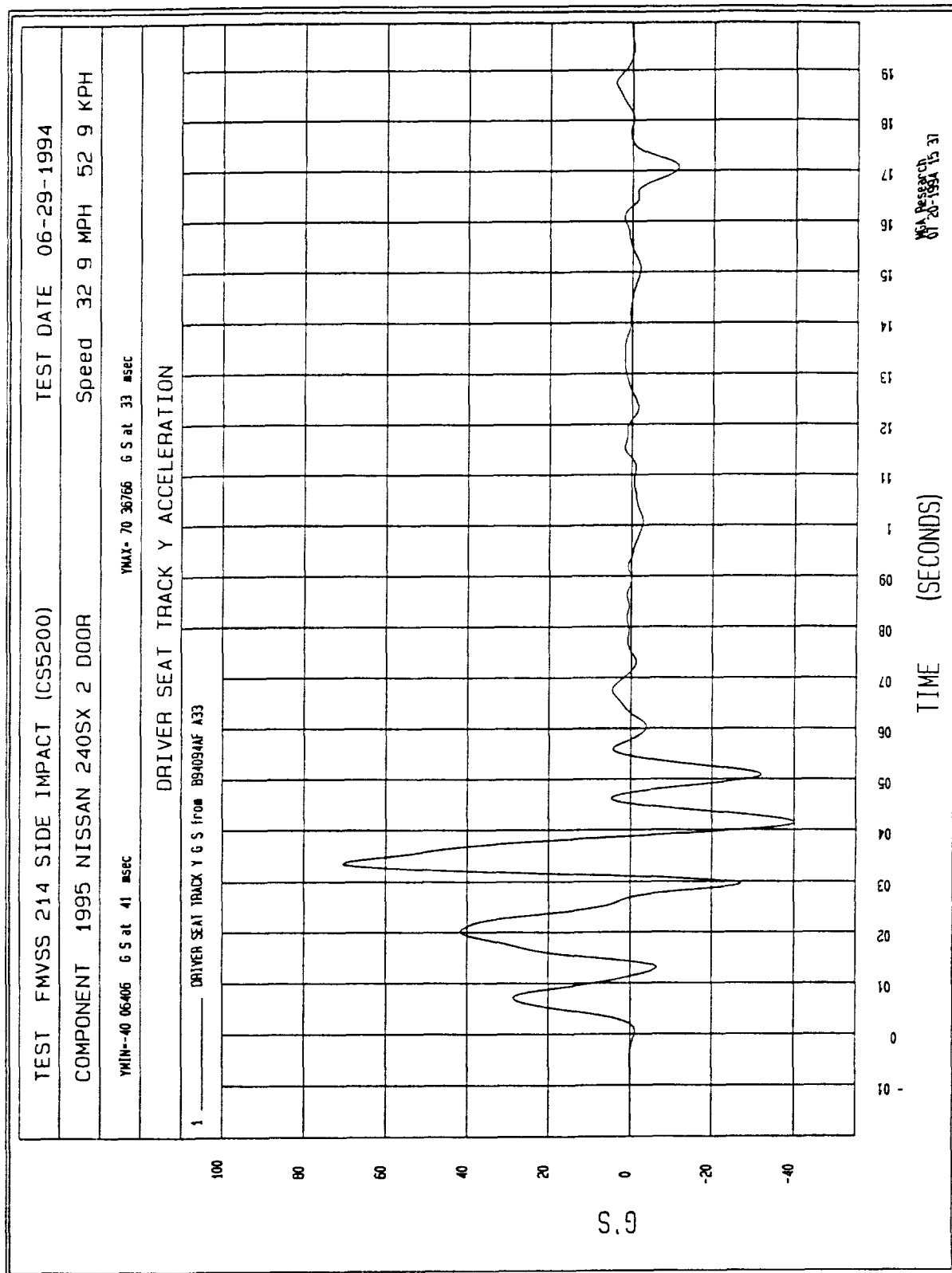


Figure B-35 - Driver Seat Track Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

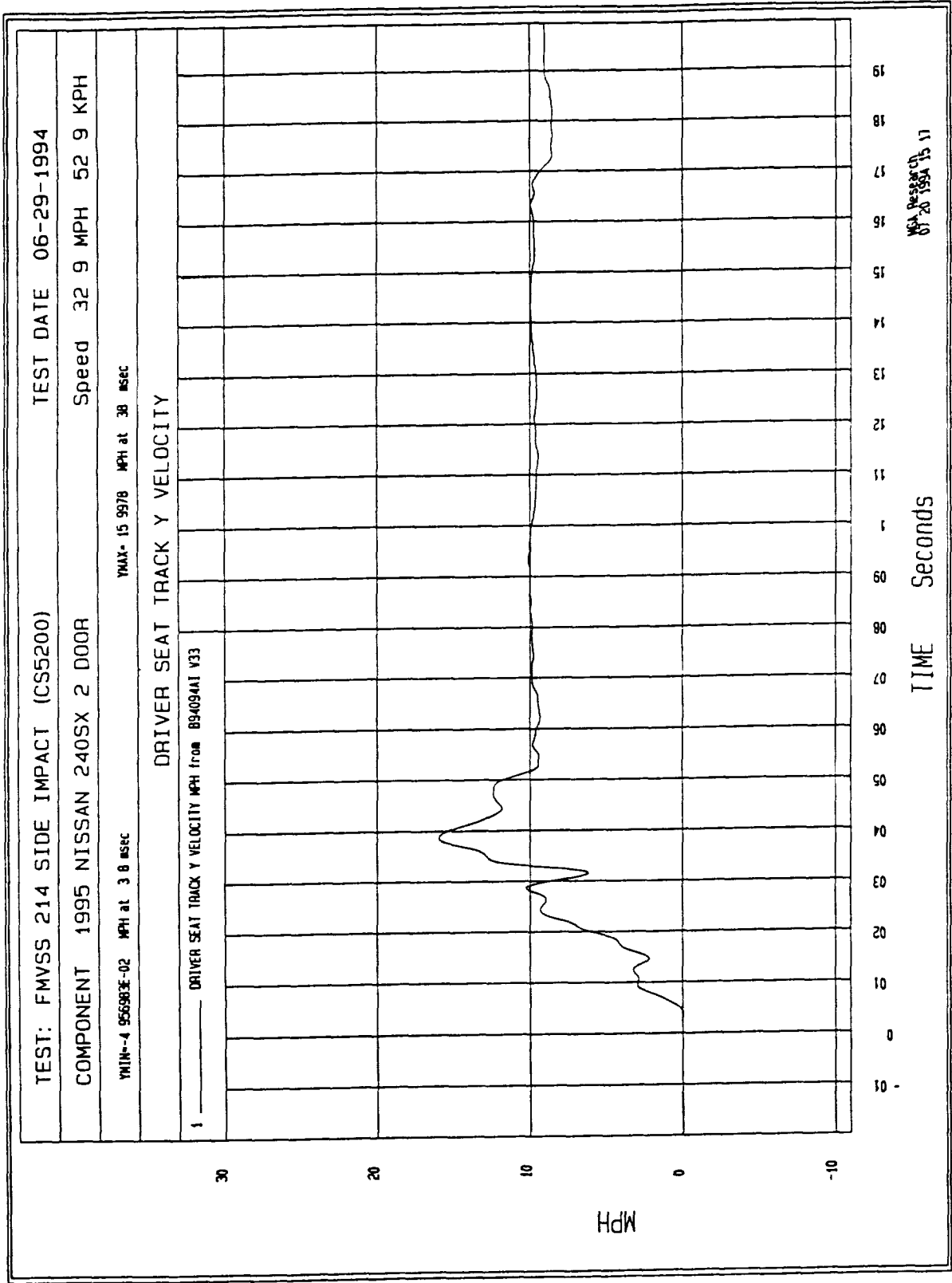


Figure B-36 - Driver Seat Track Y Velocity vs. Time

Filter: Class 60 (100 Hz)

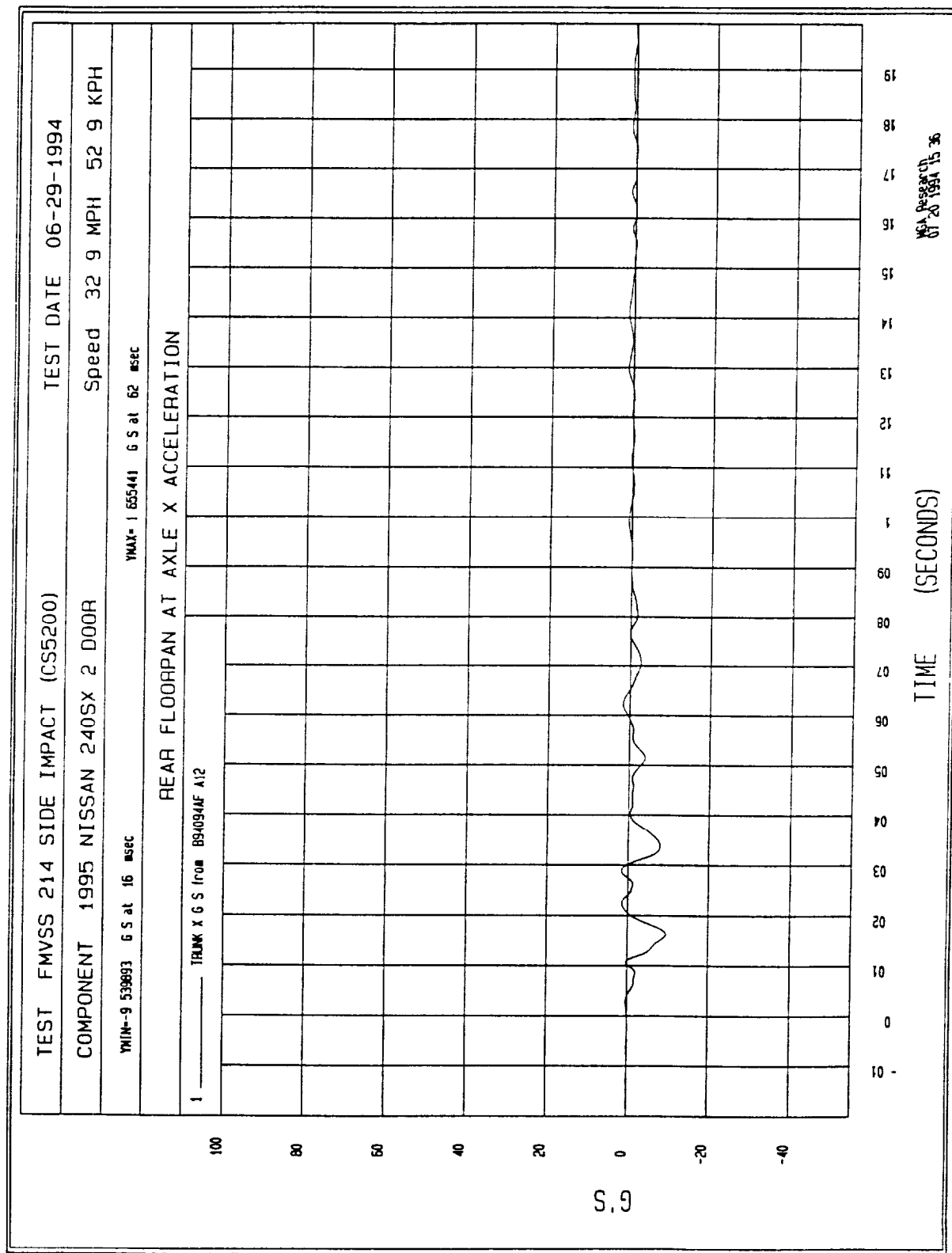


Figure B-37 - Rear Floorpan at Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)

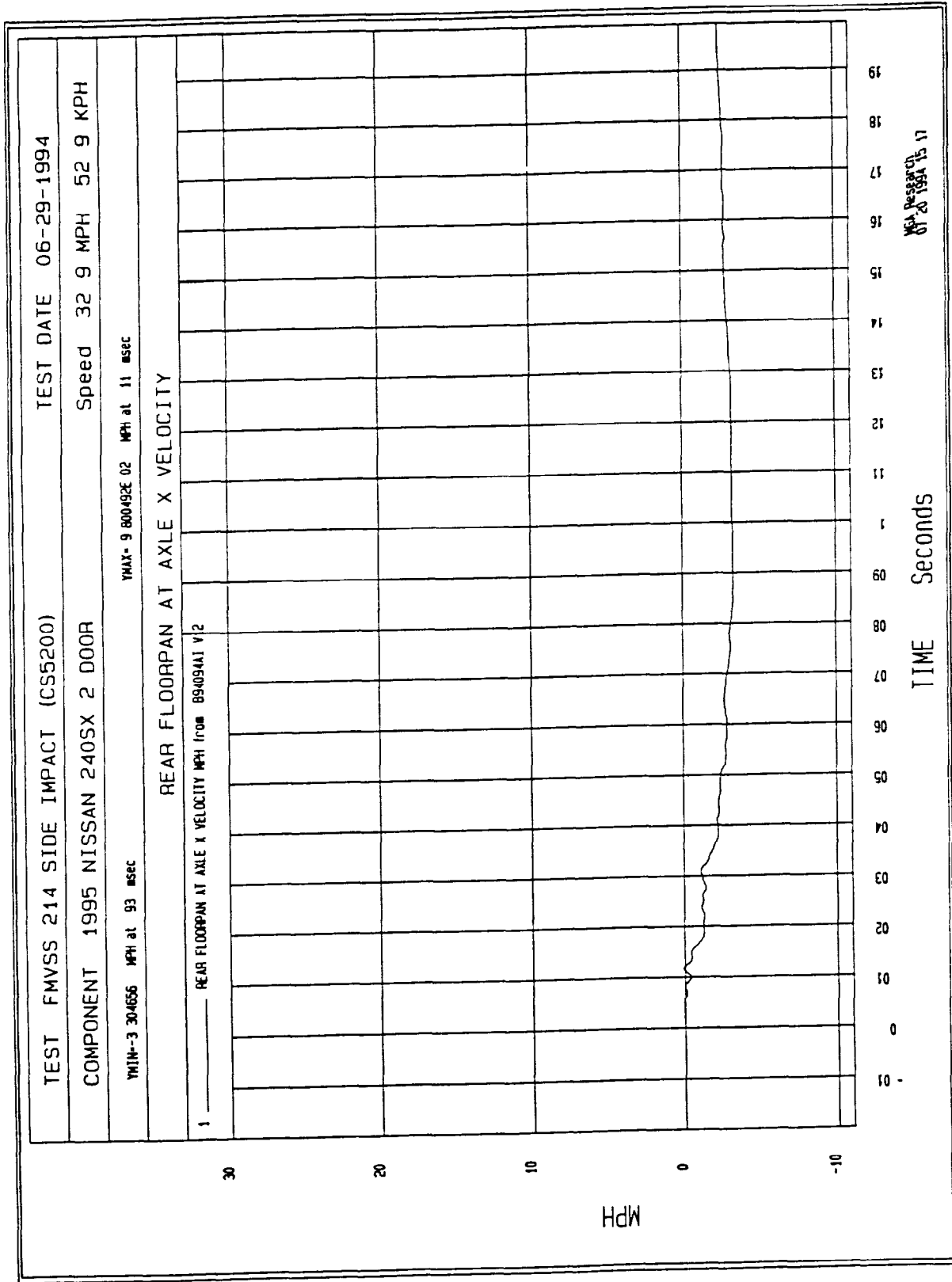


Figure B-38 - Rear Floorpan at Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

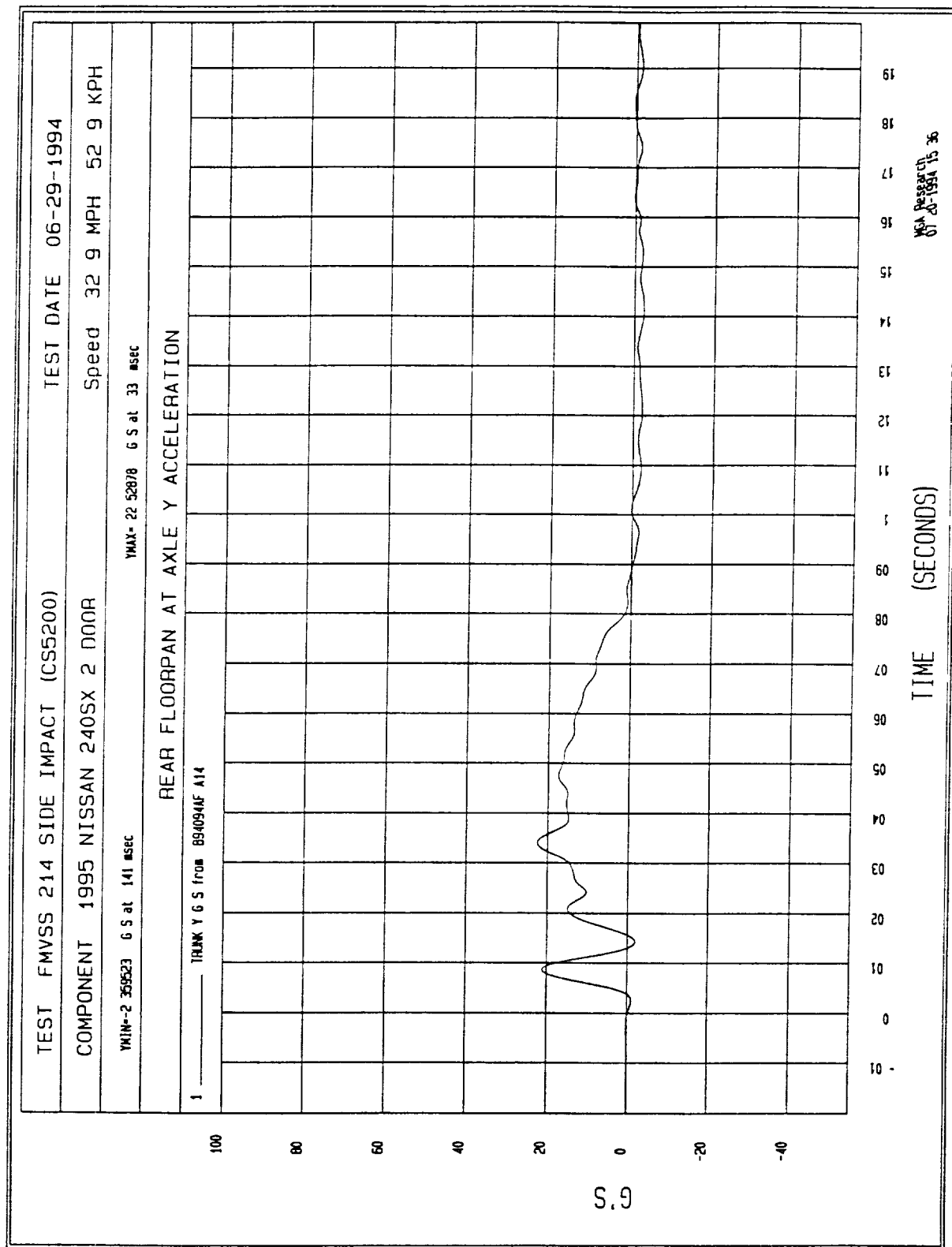


Figure B-39 - Rear Floorpan at Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

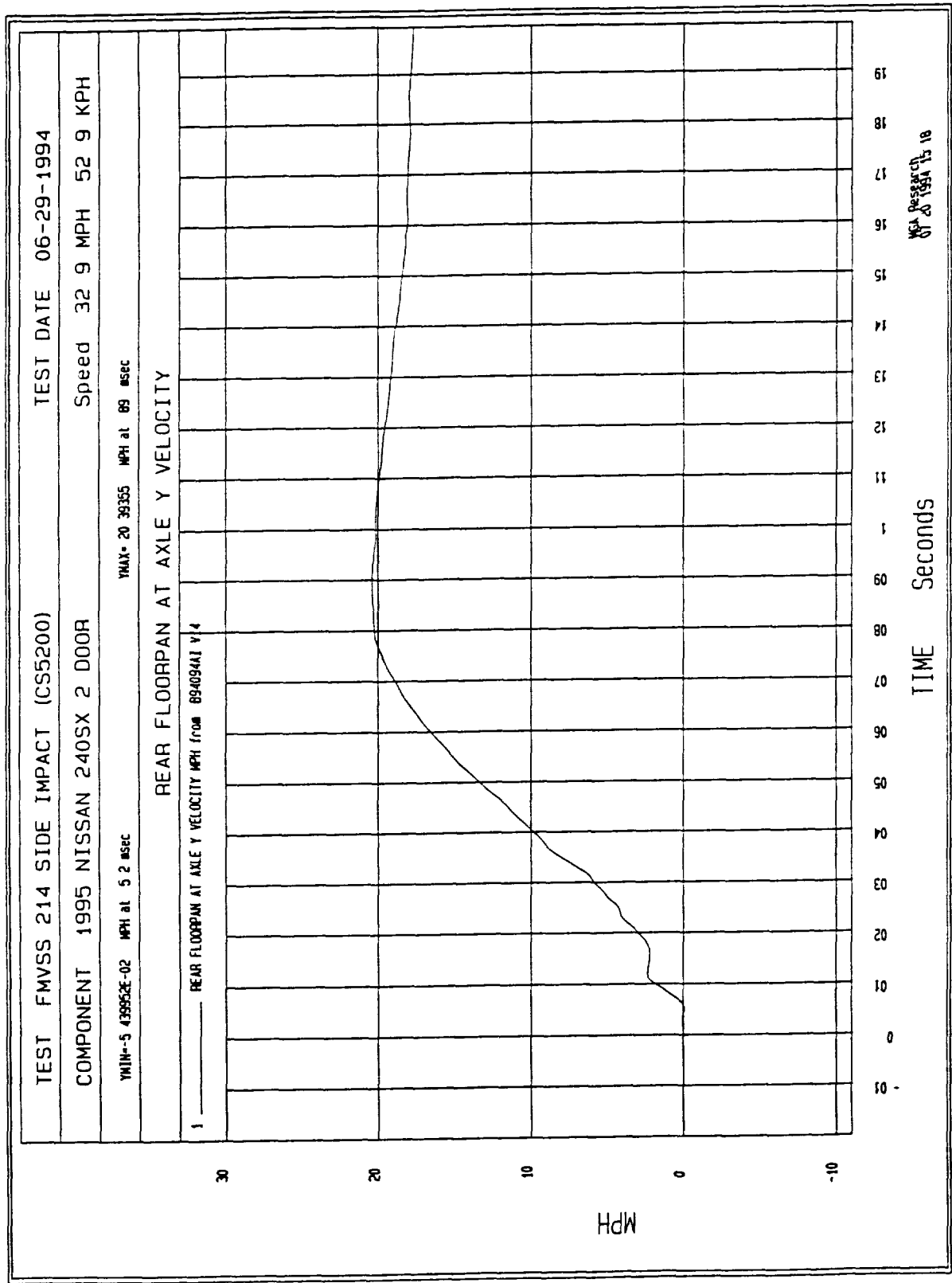


Figure B-40 - Rear Floorpan at Axle Y Velocity vs. Time

Filter: Class 60 (100 Hz)

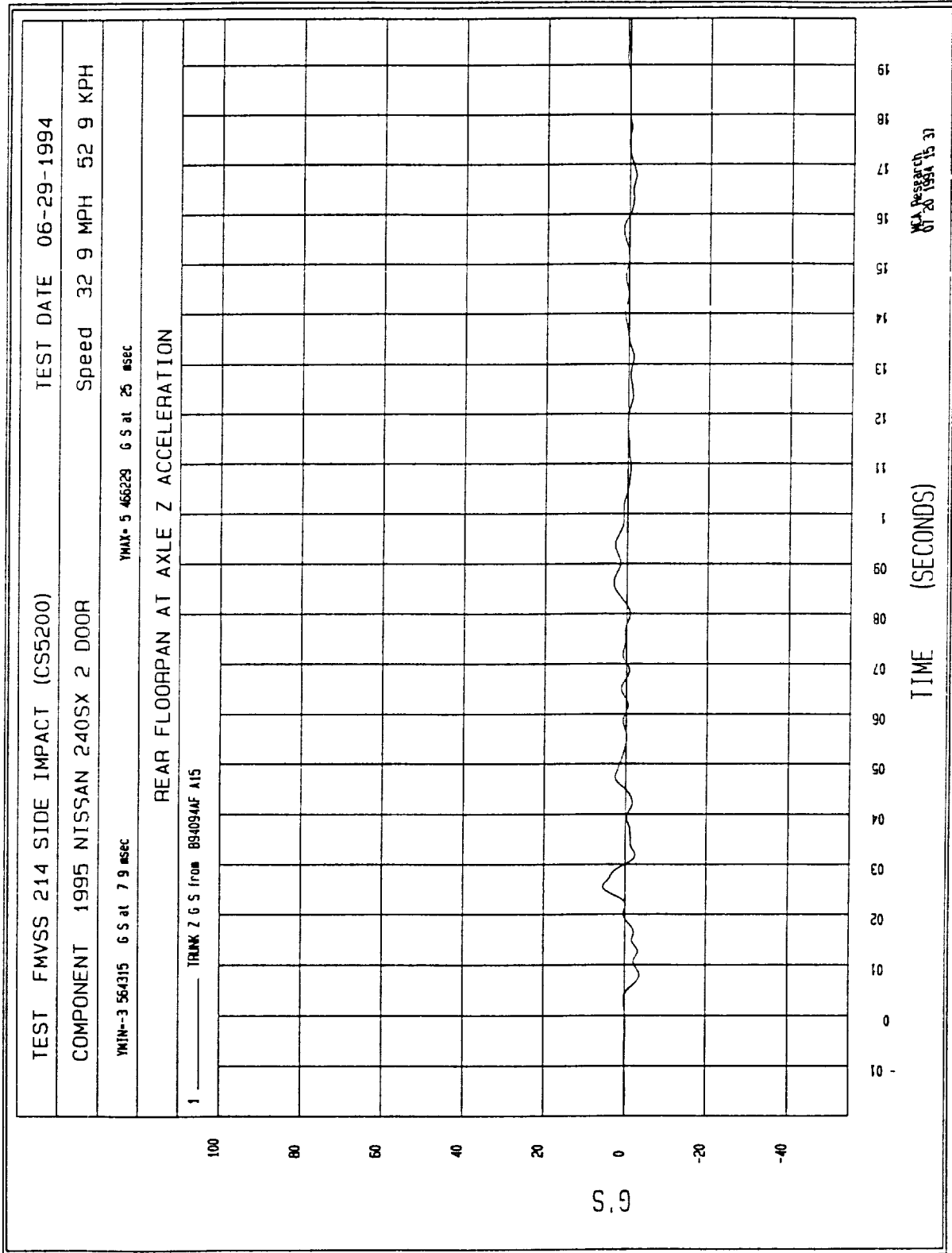


Figure B-41 - Rear Floorpan at Axle Z Acceleration vs Time

Filter: Class 180 (300 Hz)

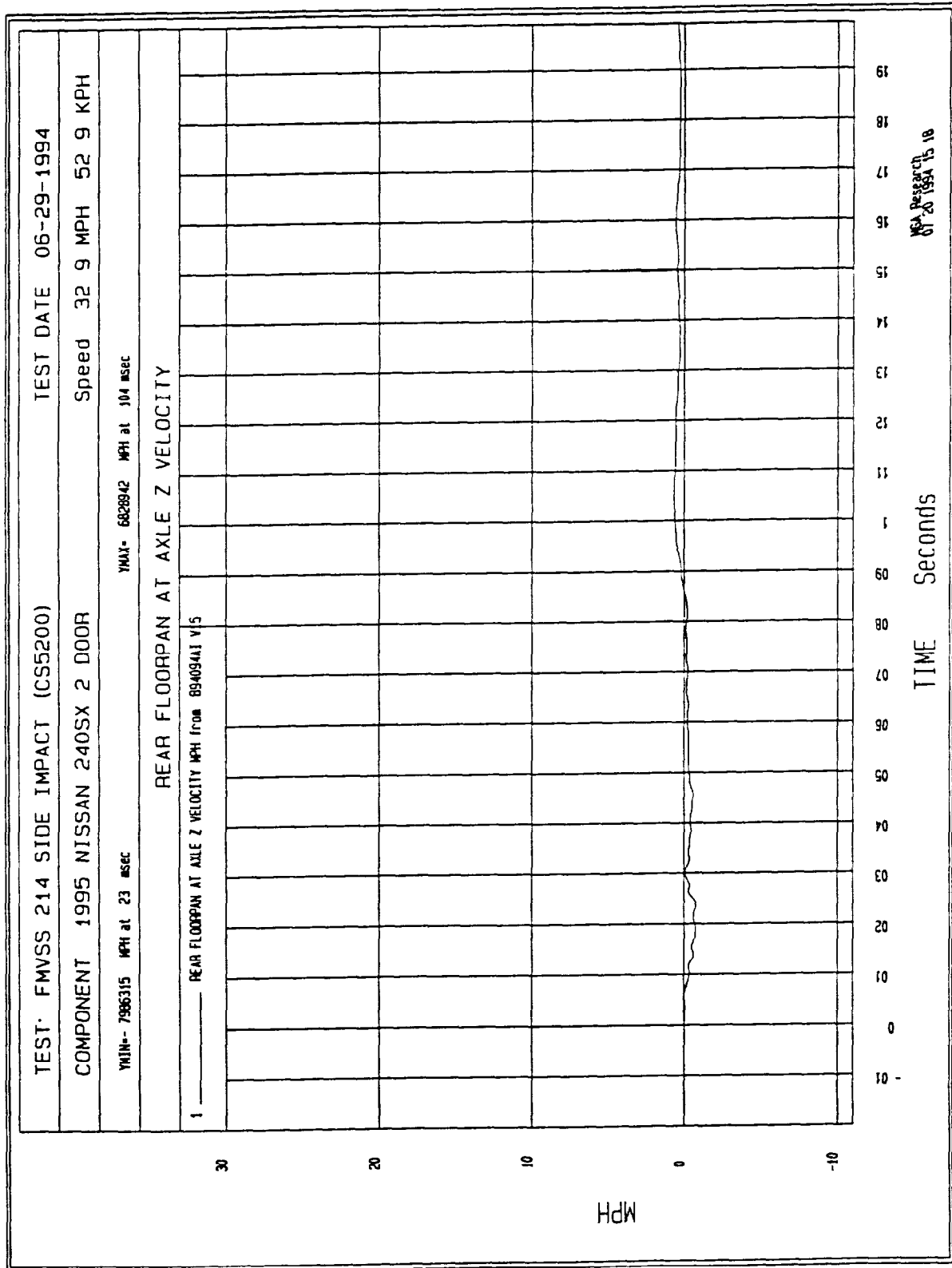


Figure B-42 - Rear Floorpan at Axle Z Velocity vs. Time

Filter: Class 60 (100 Hz)

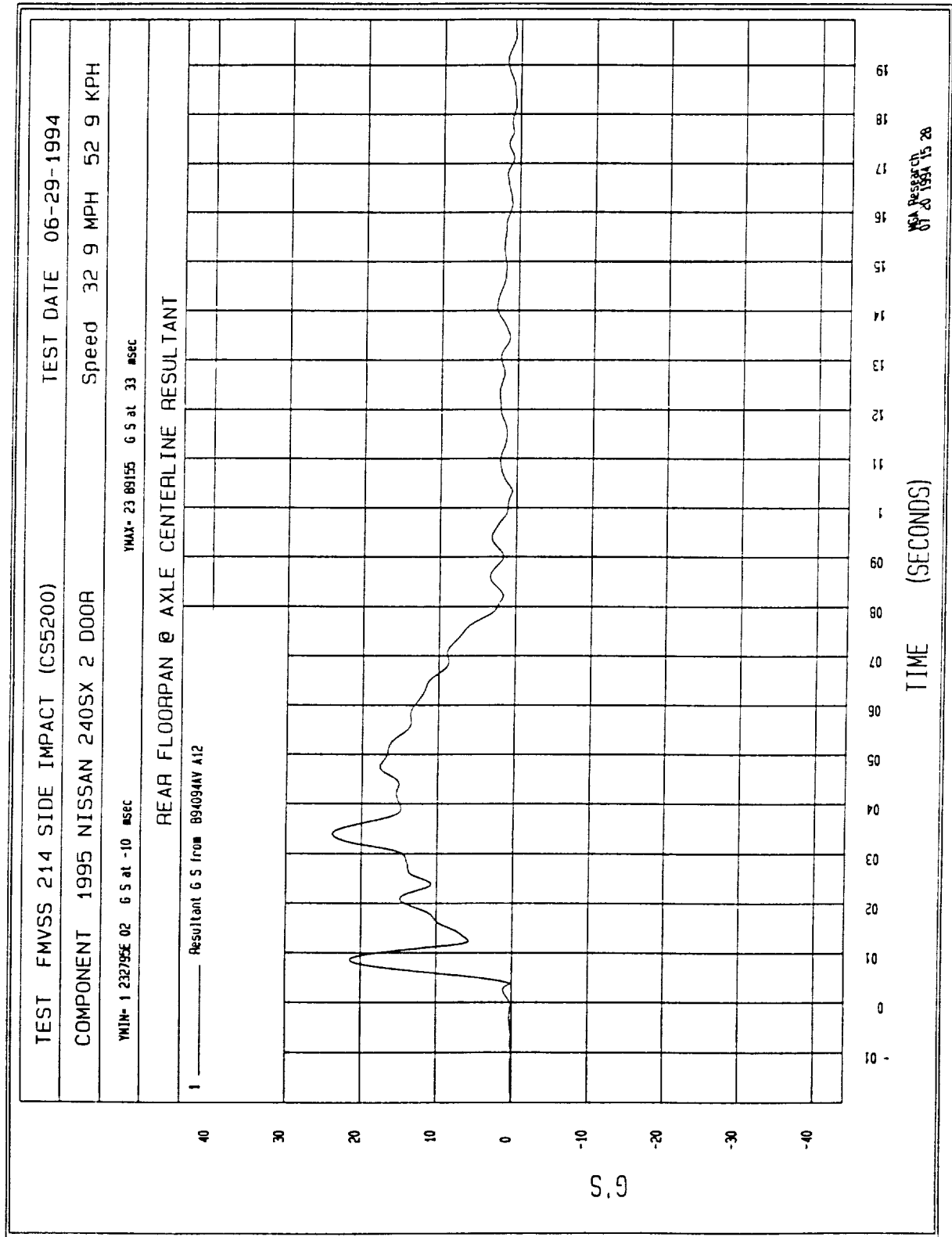


Figure B-43 - Rear Floorpan at Axle Centerline Resultant vs. Time

Filter: Class 60 (100 Hz)

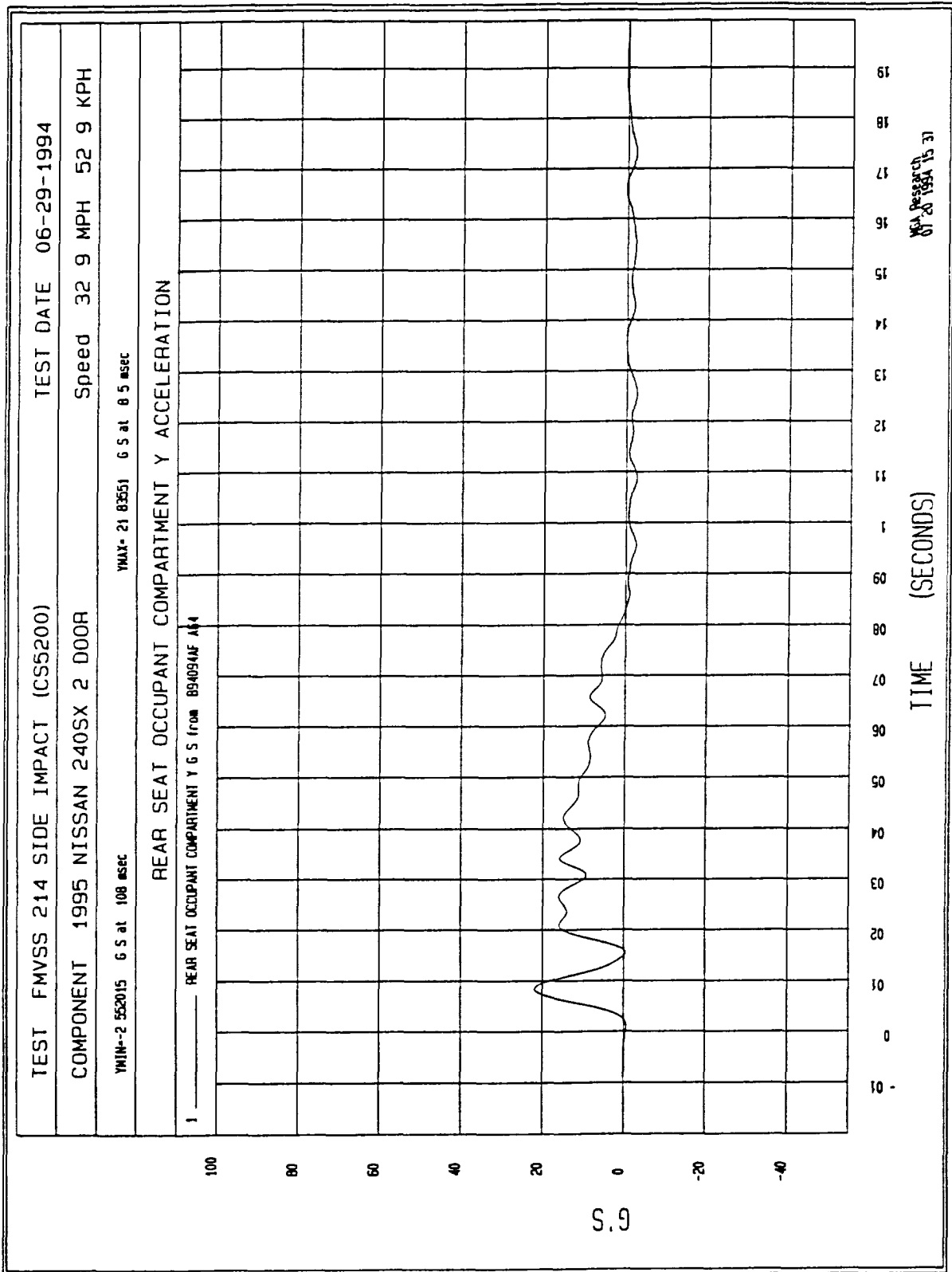


Figure B-44 - Rear Seat Occupant Compartment Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

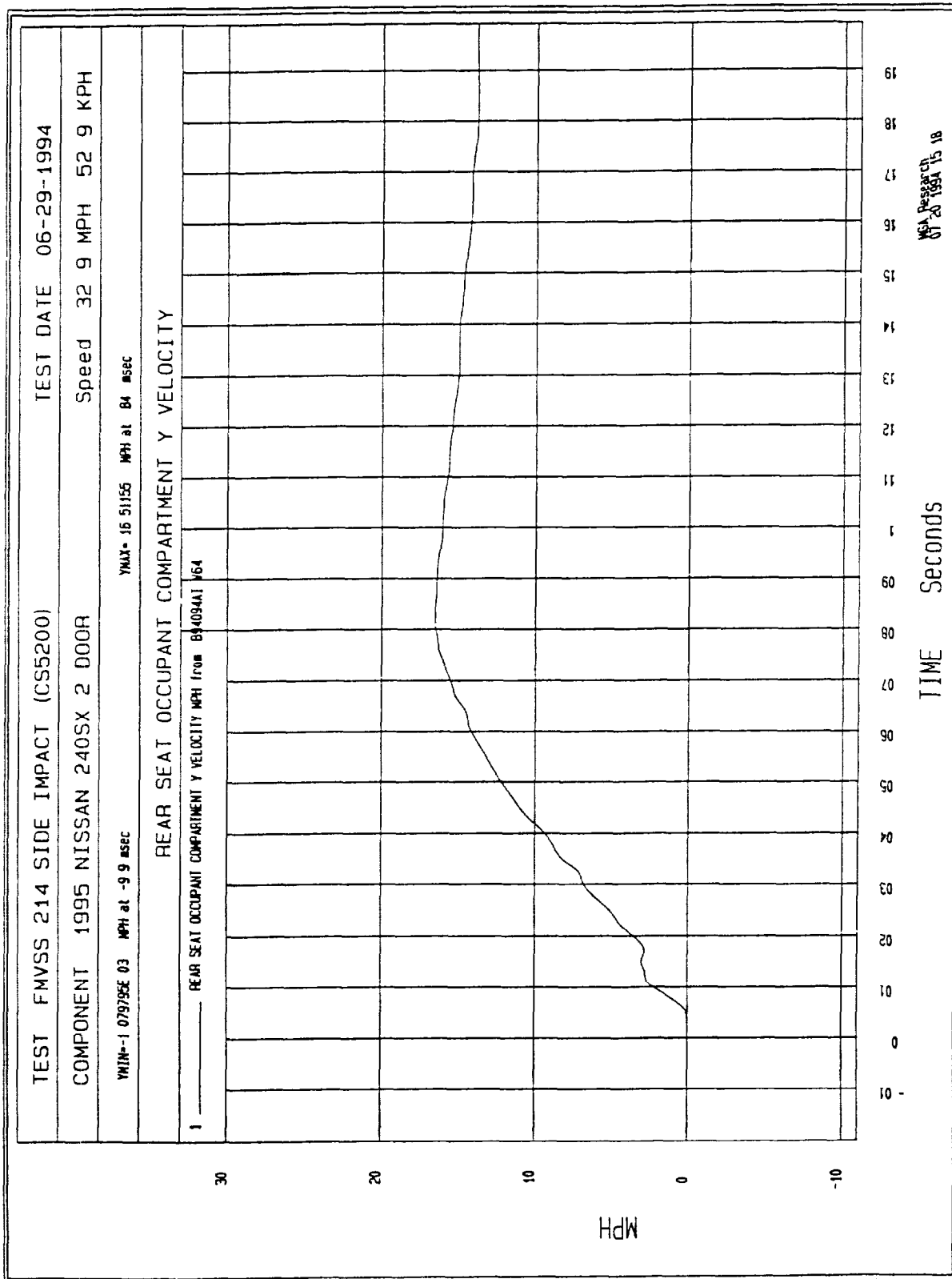


Figure B-45 - Rear Seat Occupant Compartment Y Velocity vs Time

Filter: Class 60 (100 Hz)

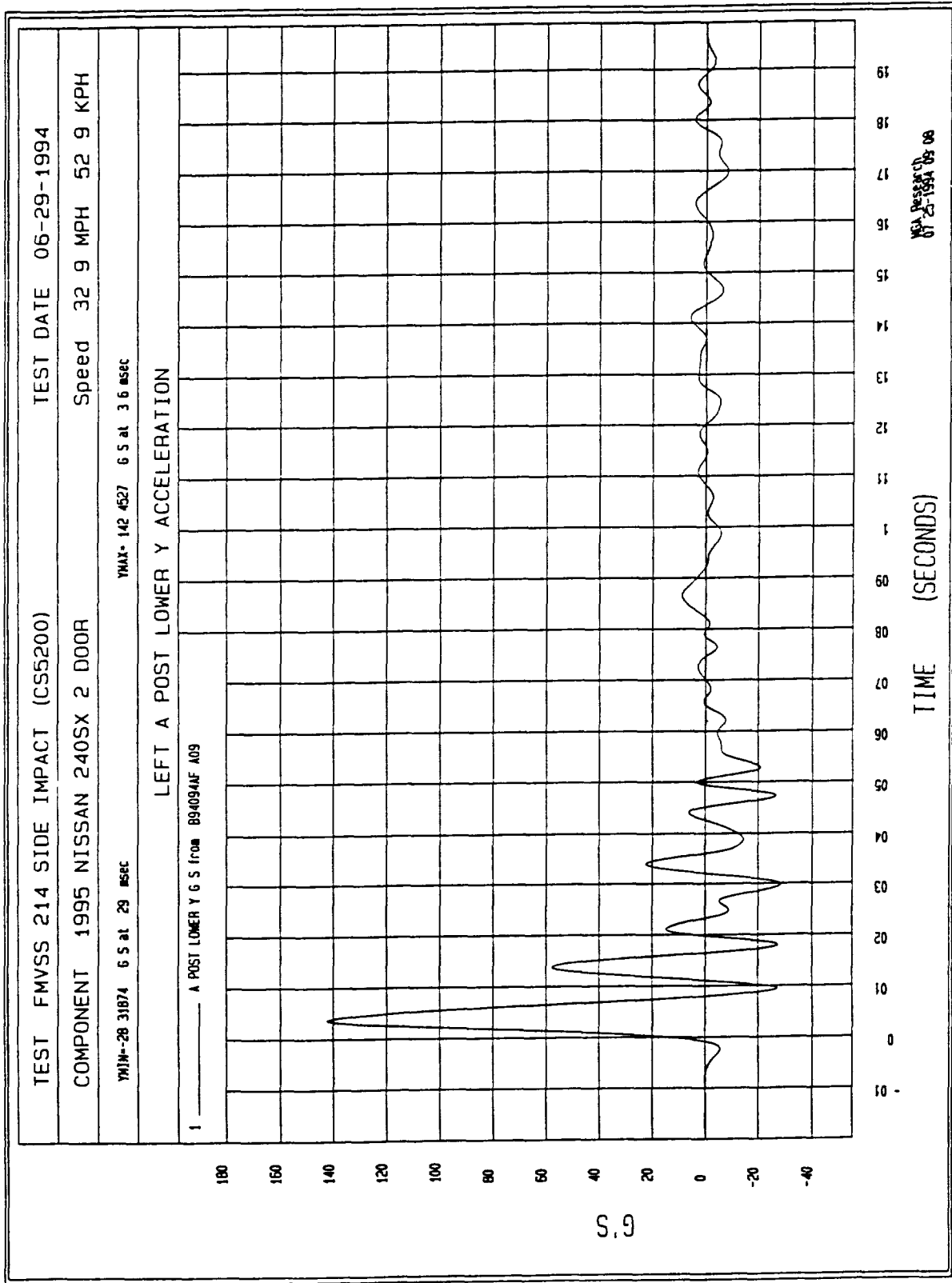


Figure B-46 - Left A Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

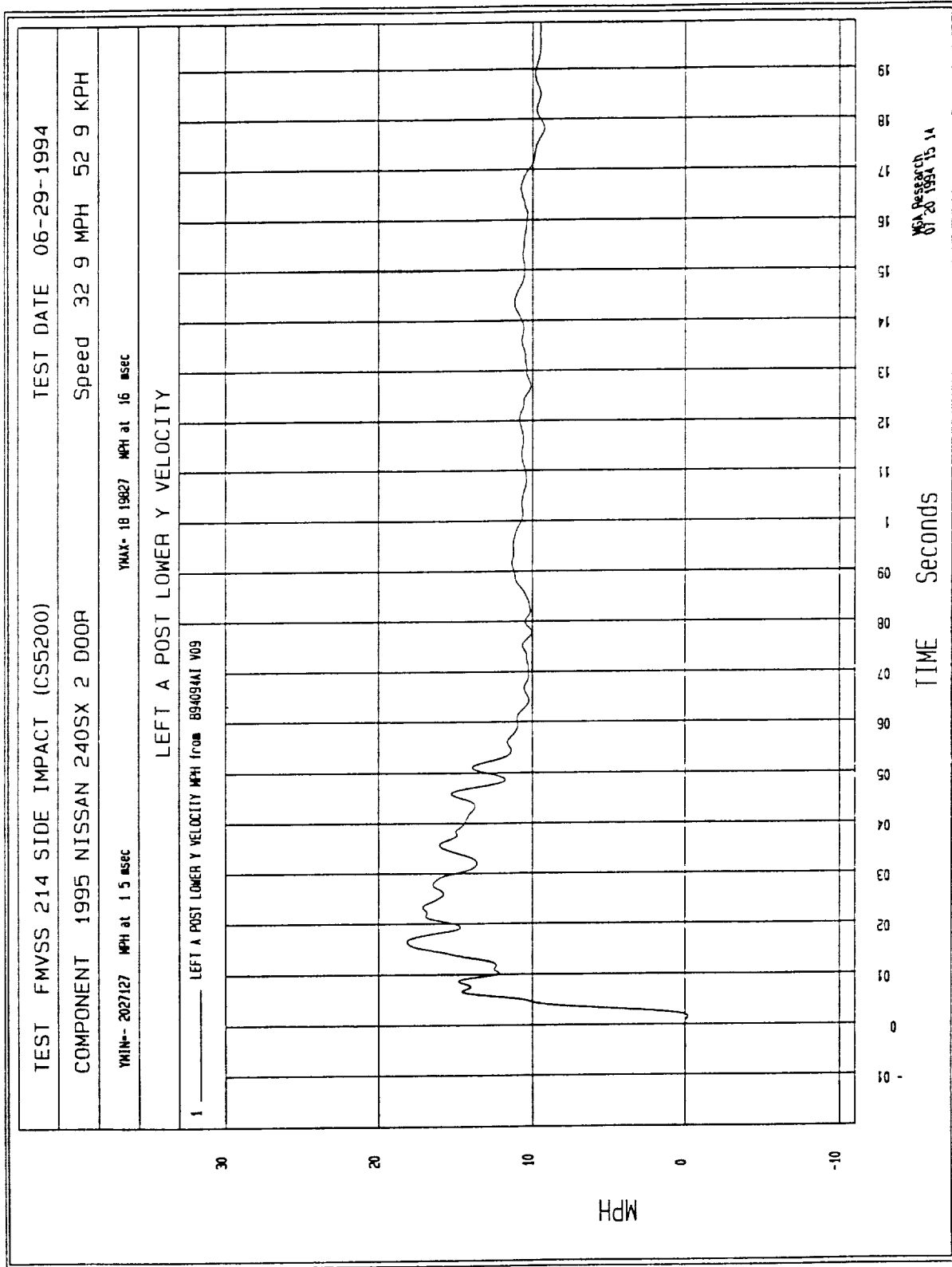


Figure B-47 - Left A Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

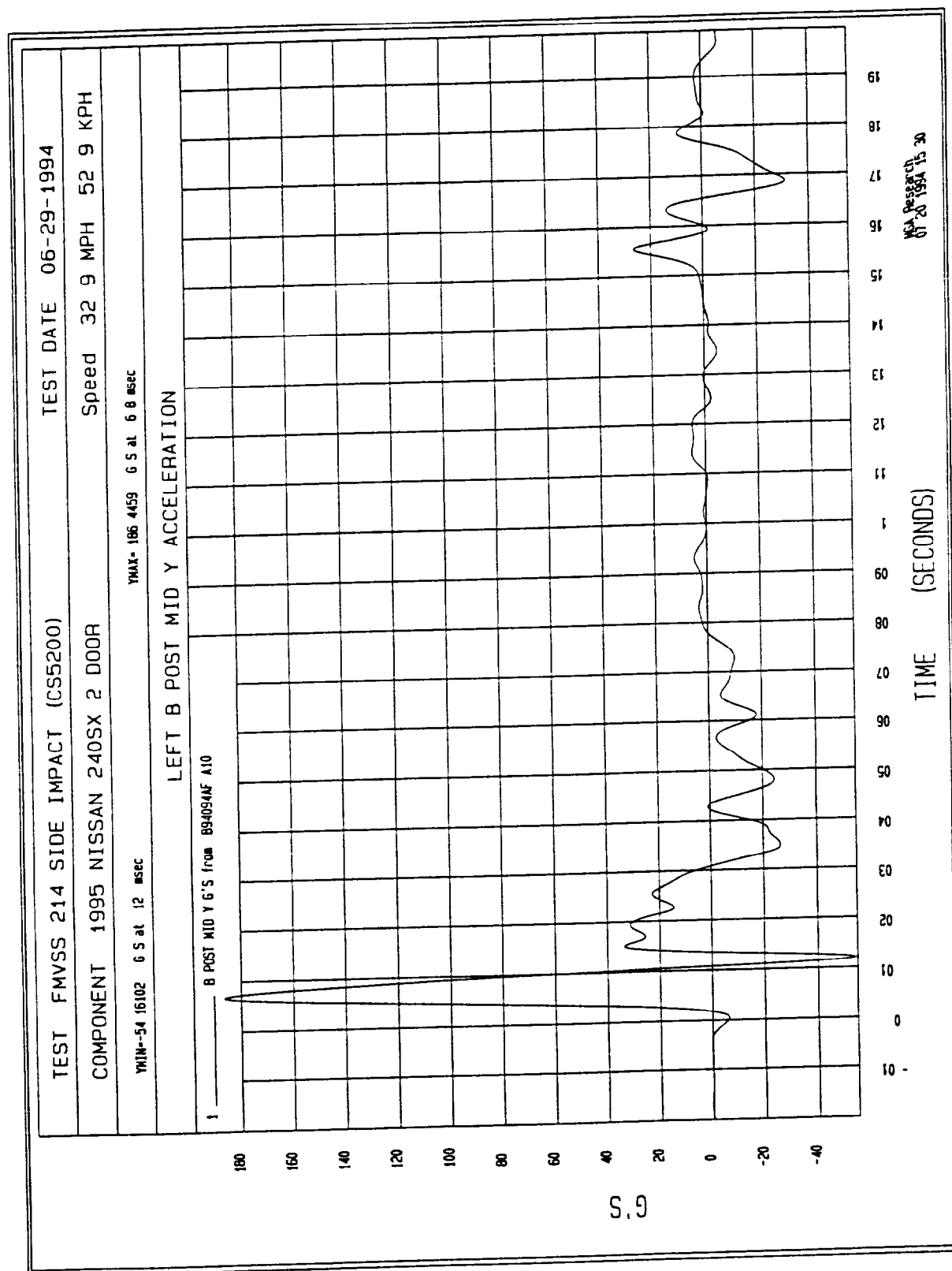


Figure B-48 - Left B Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

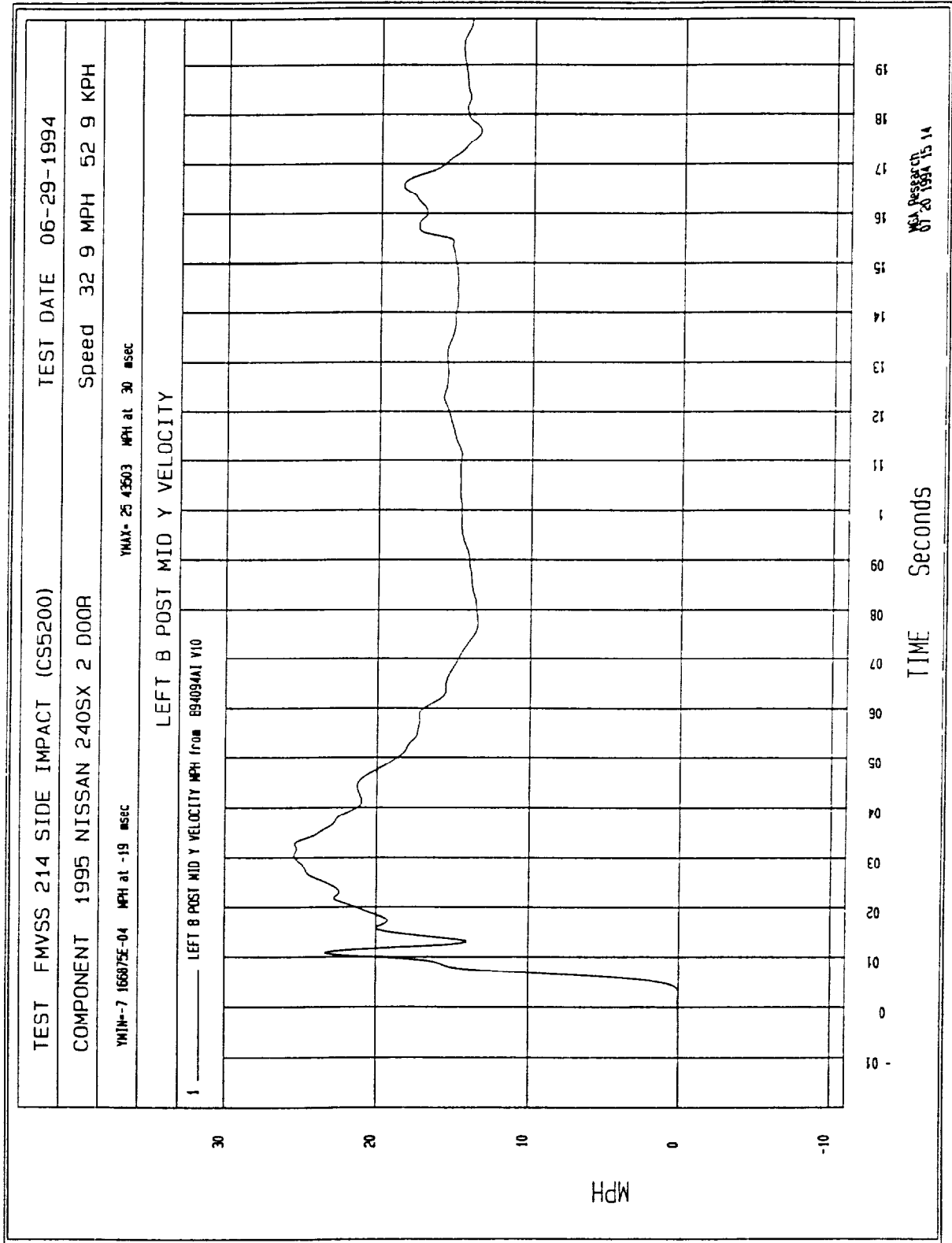


Figure B-49 - Left B Post Mid Y Velocity vs. Time

Filter: Class 60 (100 Hz)

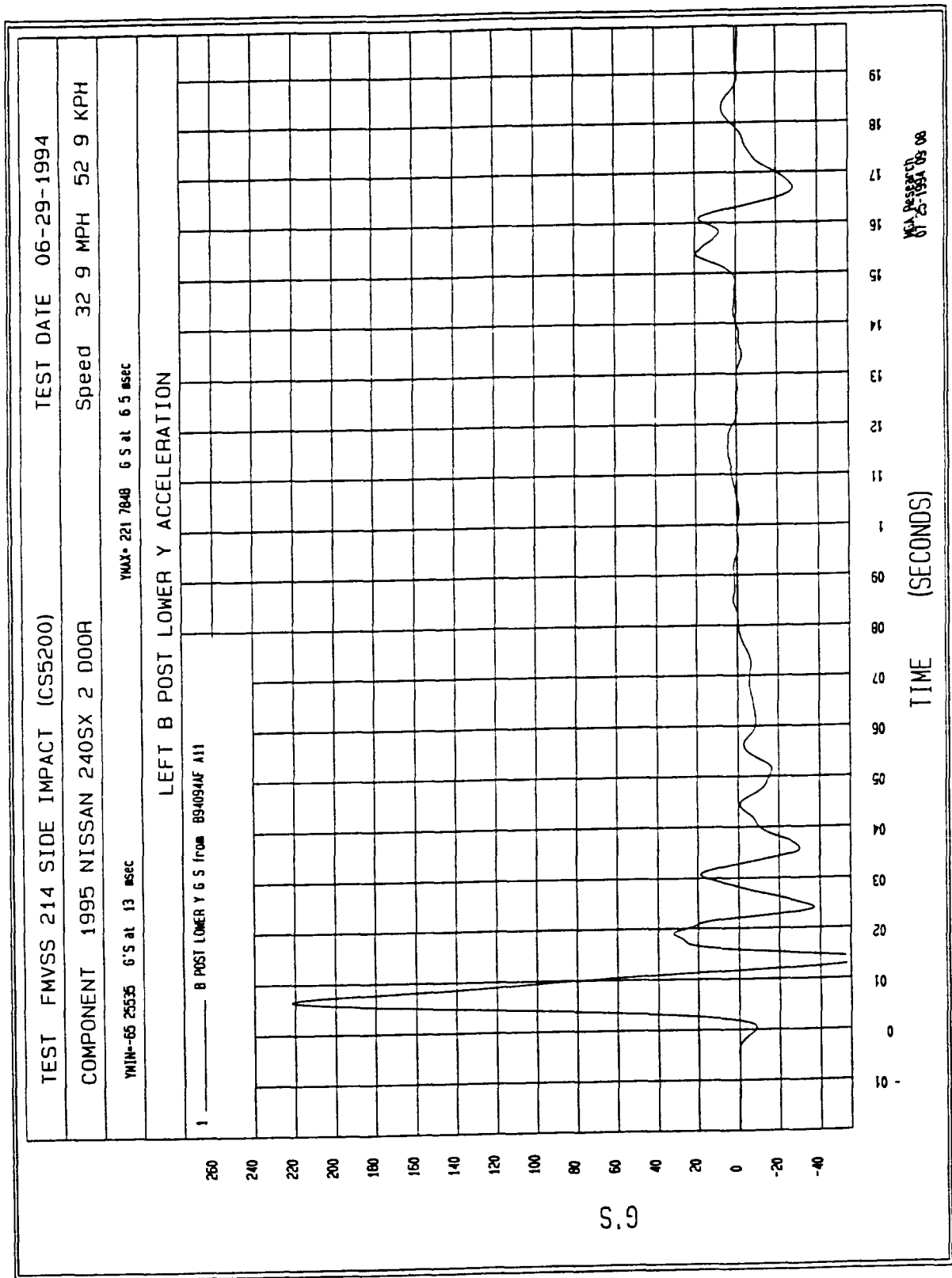


Figure B-50 - Left B Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

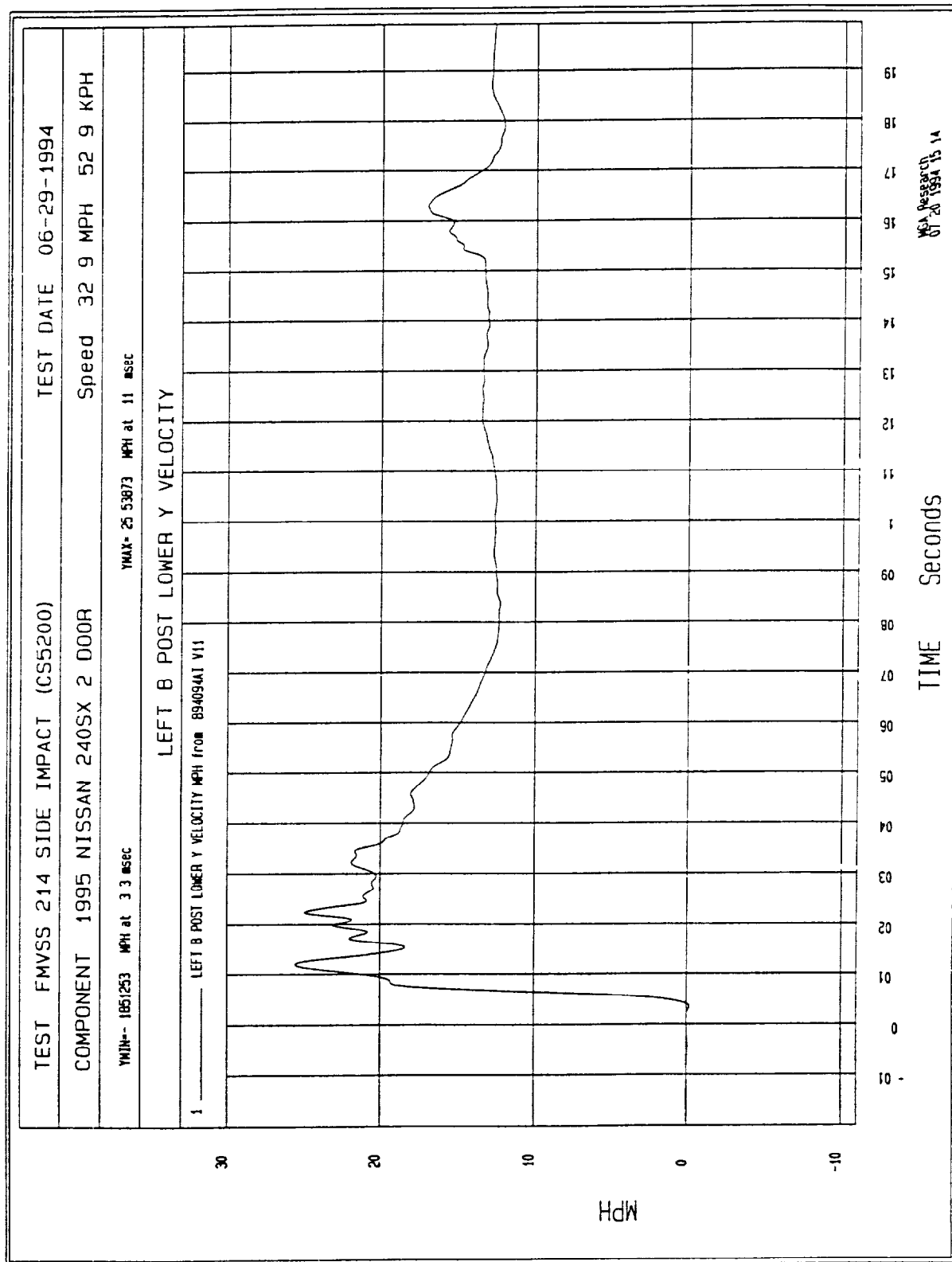


Figure B-51 - Left B Post Lower Y Velocity vs Time

Filter: Class 60 (100 Hz)

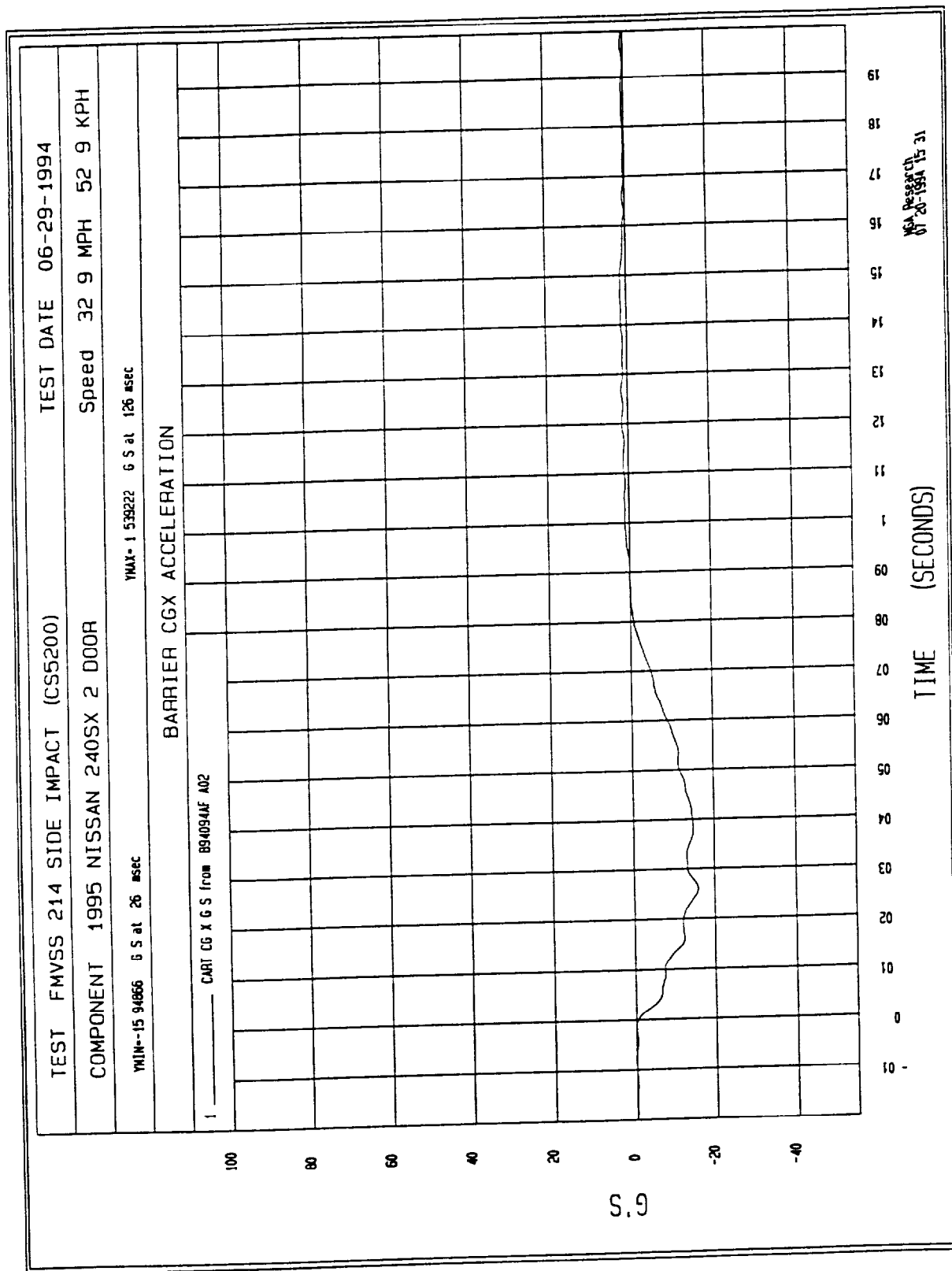


Figure B-52 - Moving Barrier Center of Gravity X Acceleration vs. Time

Filter. Class 180 (300 Hz)

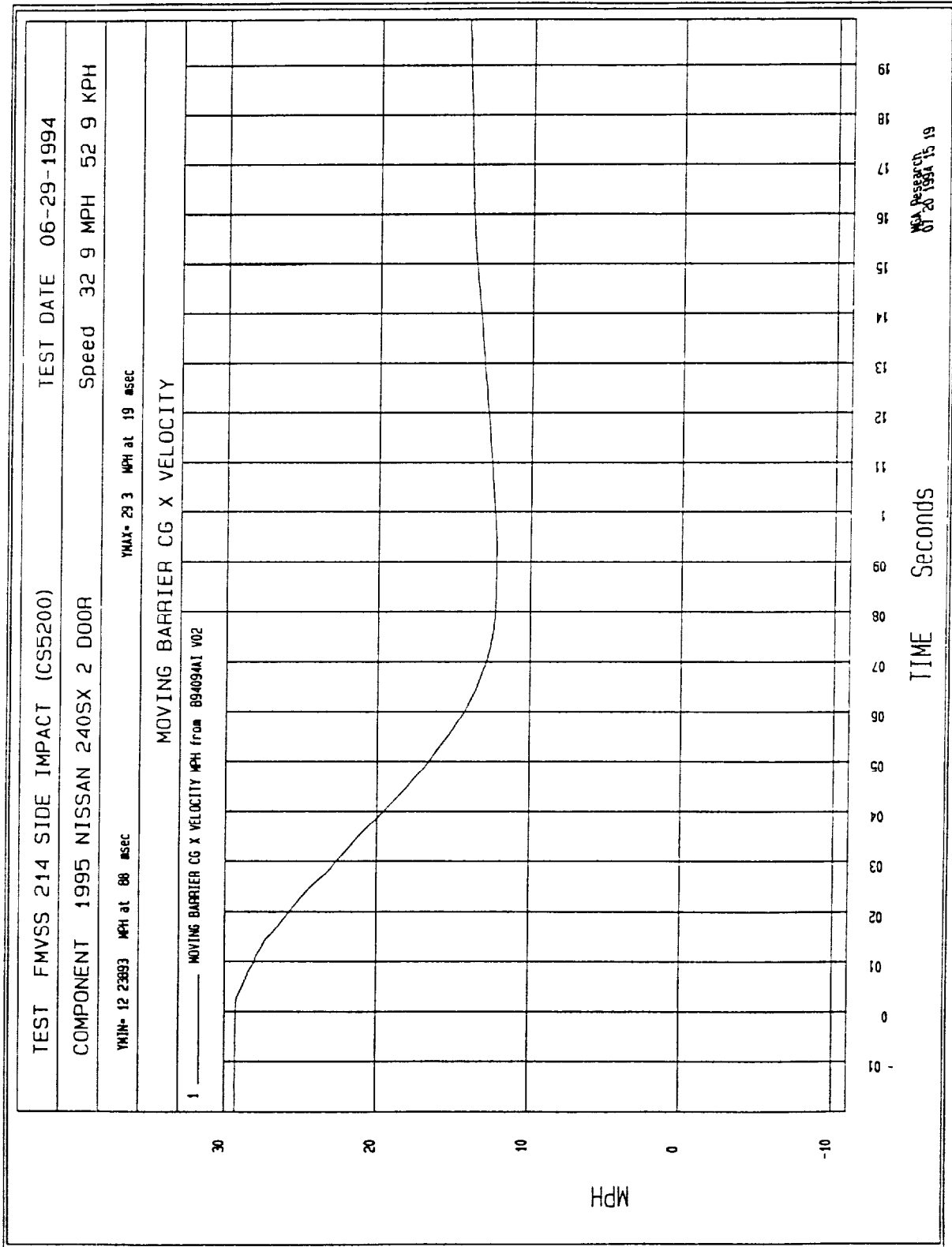


Figure B-53 - Moving Barrier Center of Gravity X Velocity vs. Time

Filter: Class 60 (100 Hz)

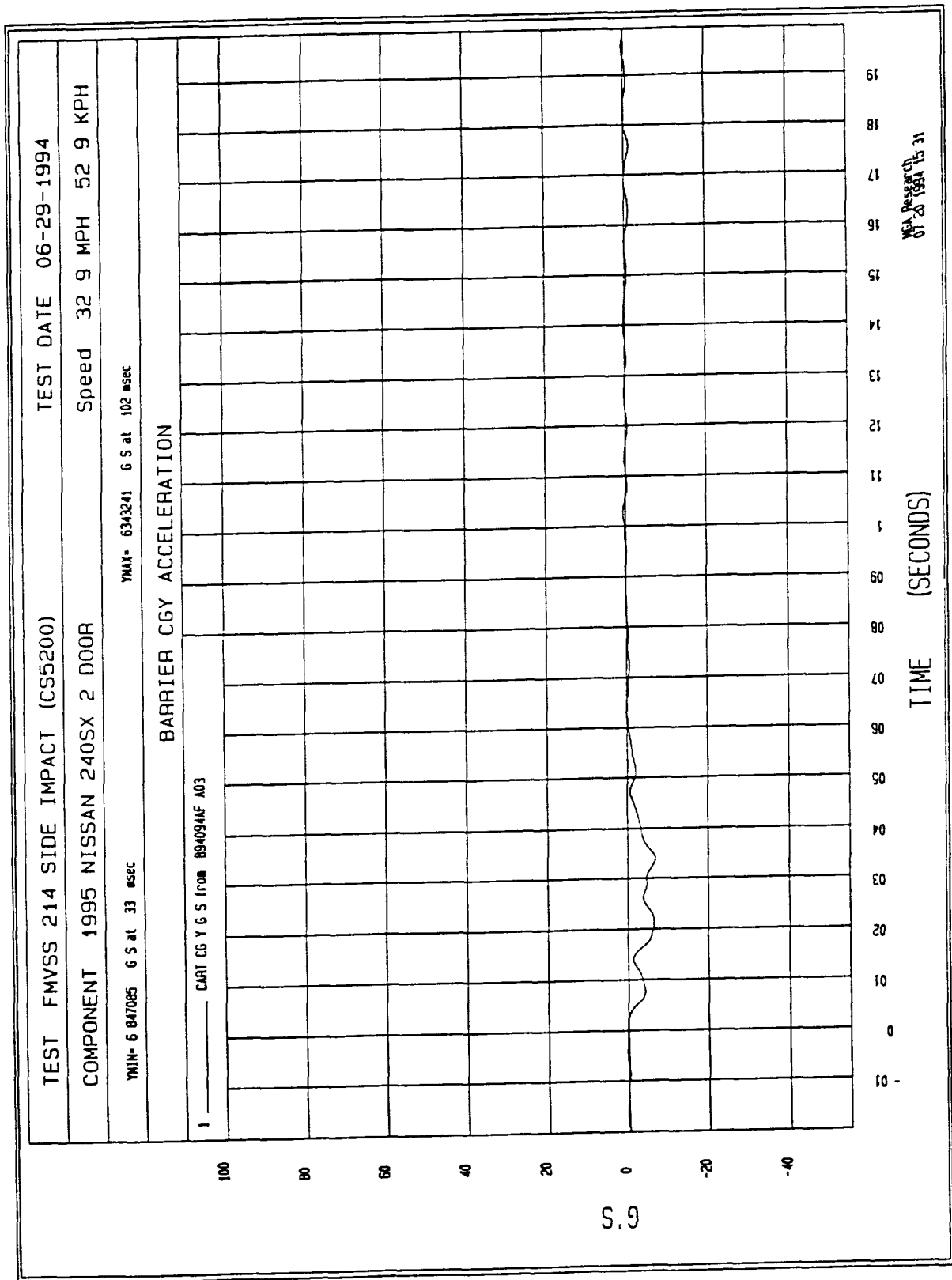


Figure B-54 - Moving Barrier Center of Gravity Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

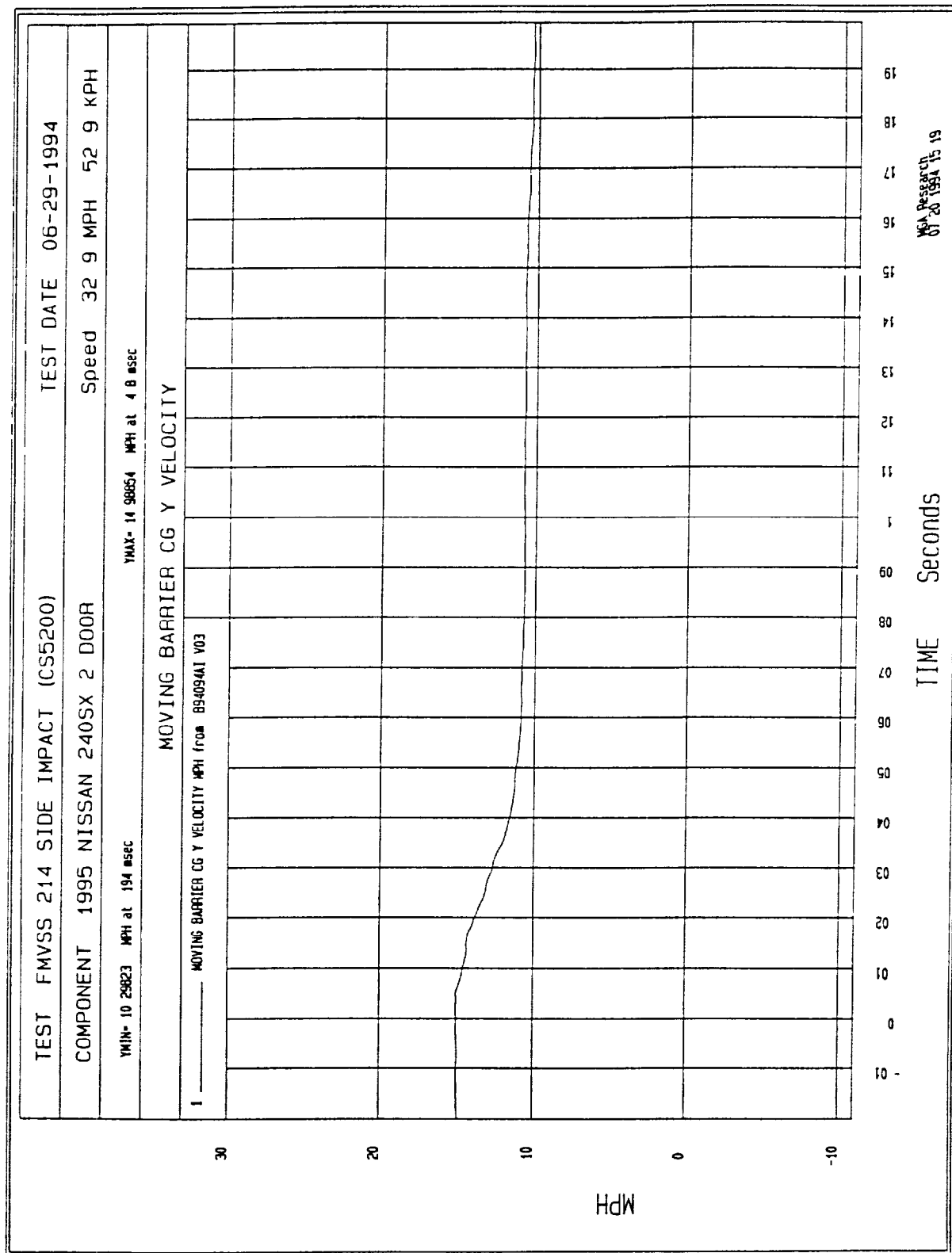


Figure B-55 - Moving Barrier Center of Gravity Y Velocity vs Time

Filter: Class 60 (100 Hz)

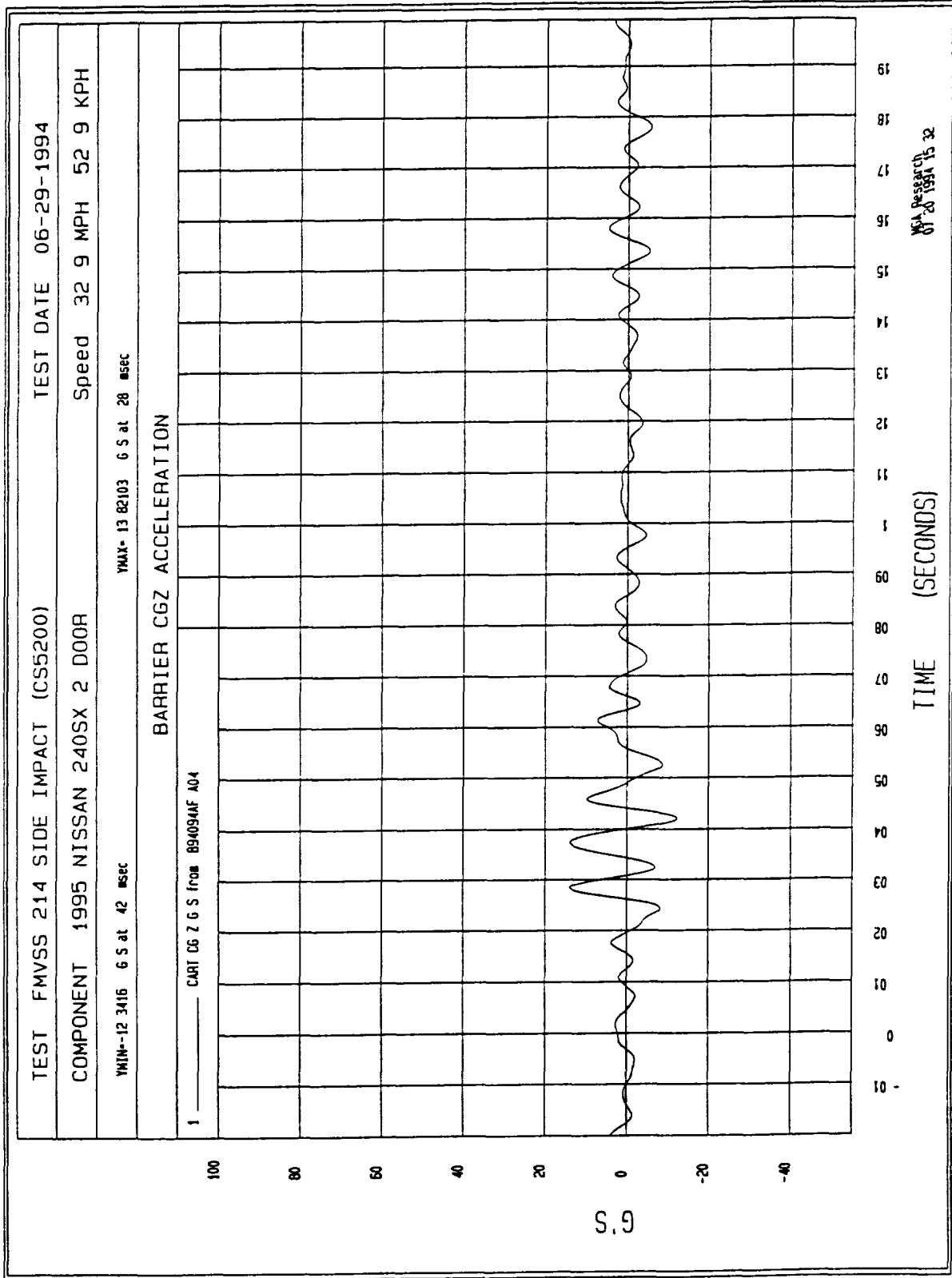


Figure B-56 - Moving Barrier Center of Gravity Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

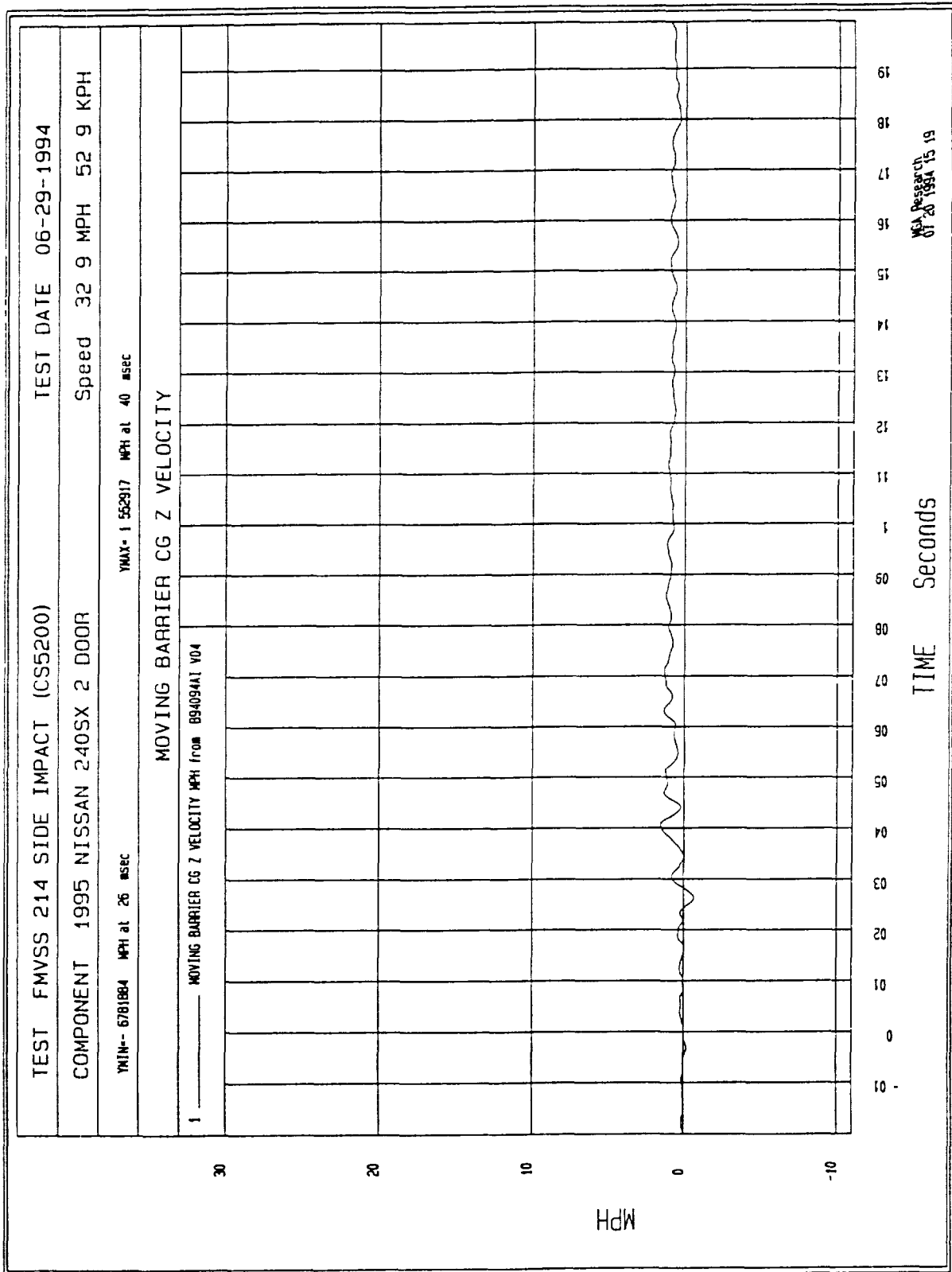


Figure B-57 - Moving Barrier Center of Gravity Z Velocity vs. Time

Filter: Class 60 (100 Hz)

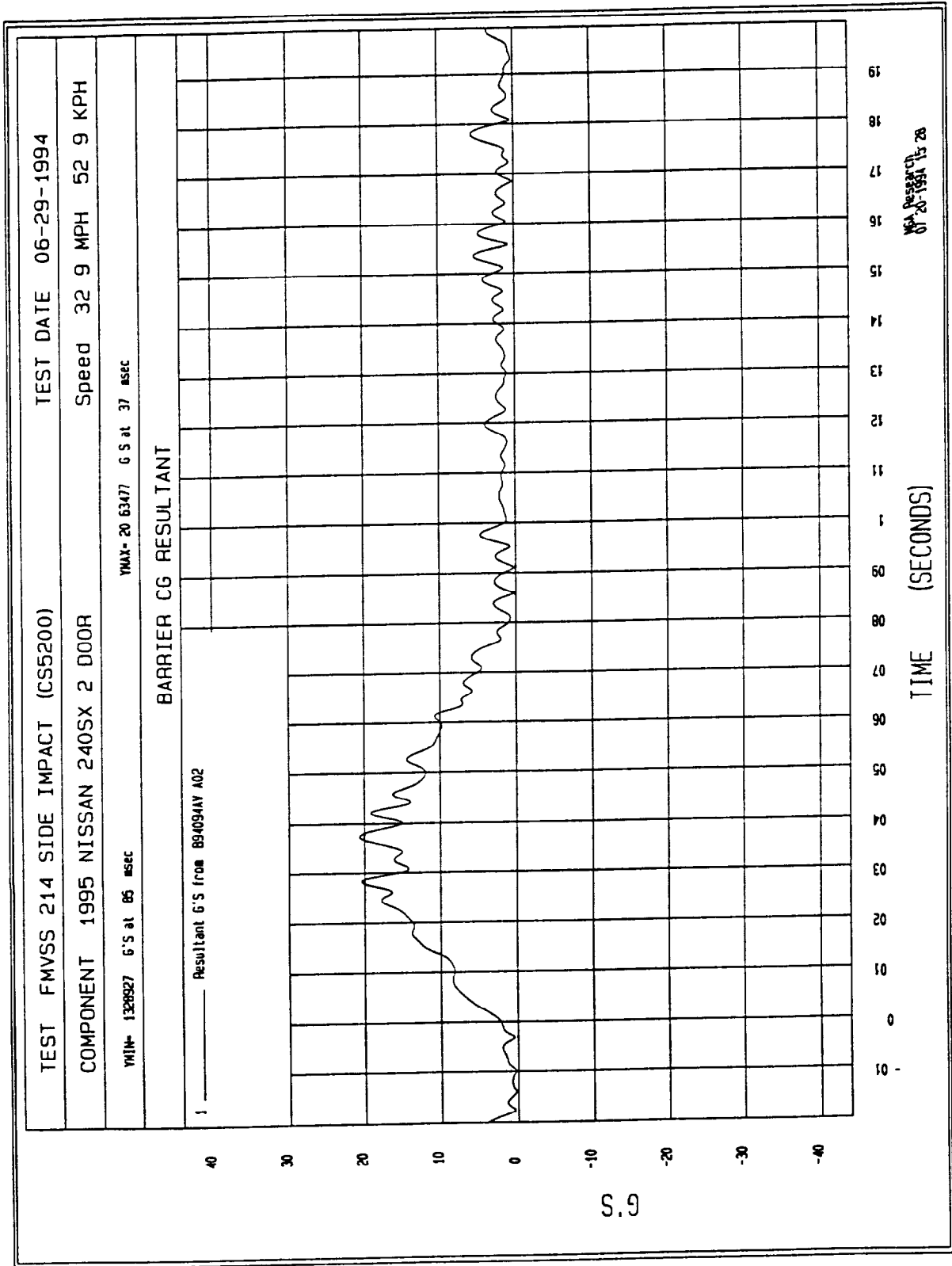


Figure B-58 - Moving Barrier Center of Gravity Resultant vs. Time

Filter: Class 60 (100 Hz)

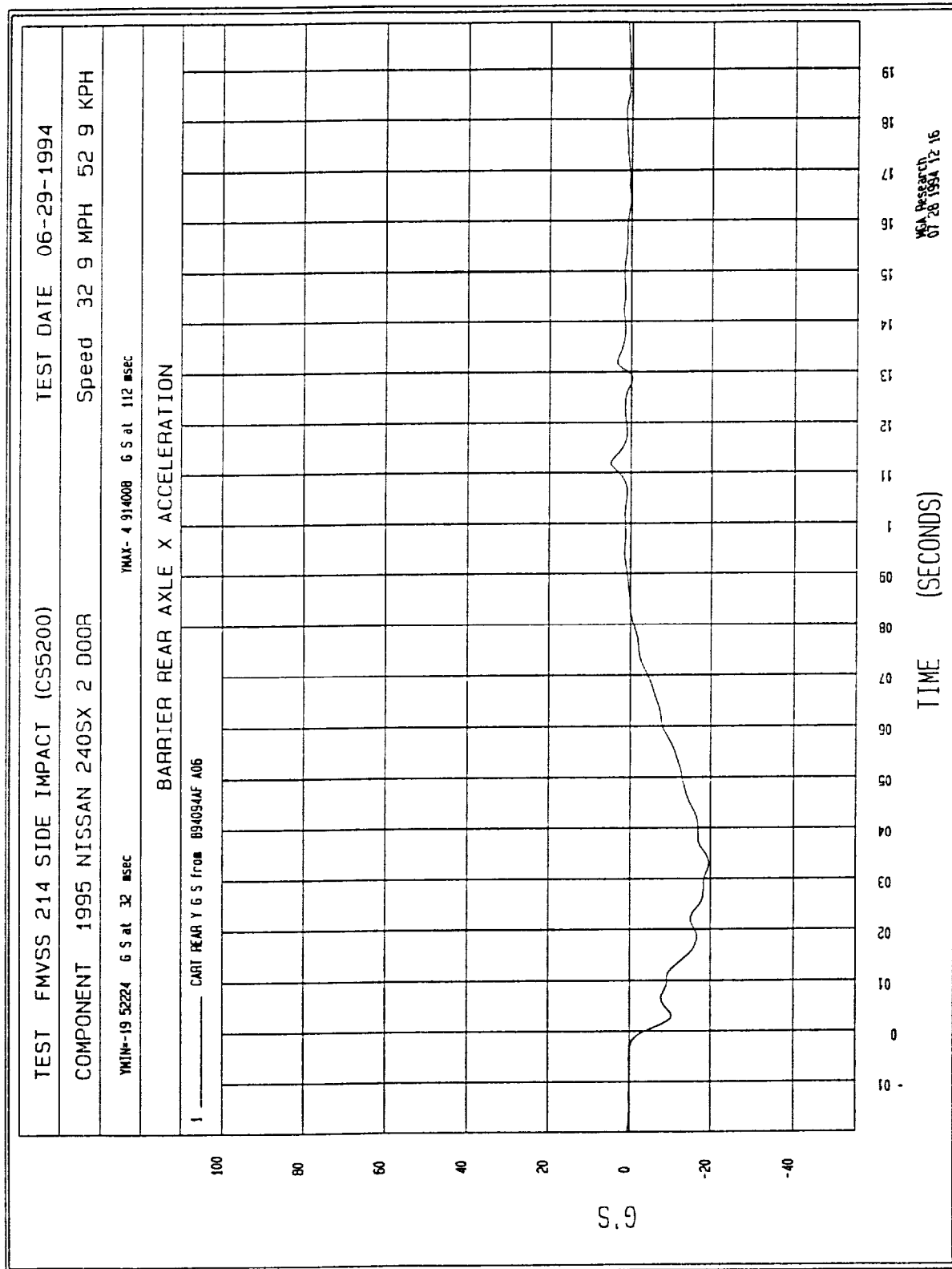


Figure B-59 - Moving Barrier Rear Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)

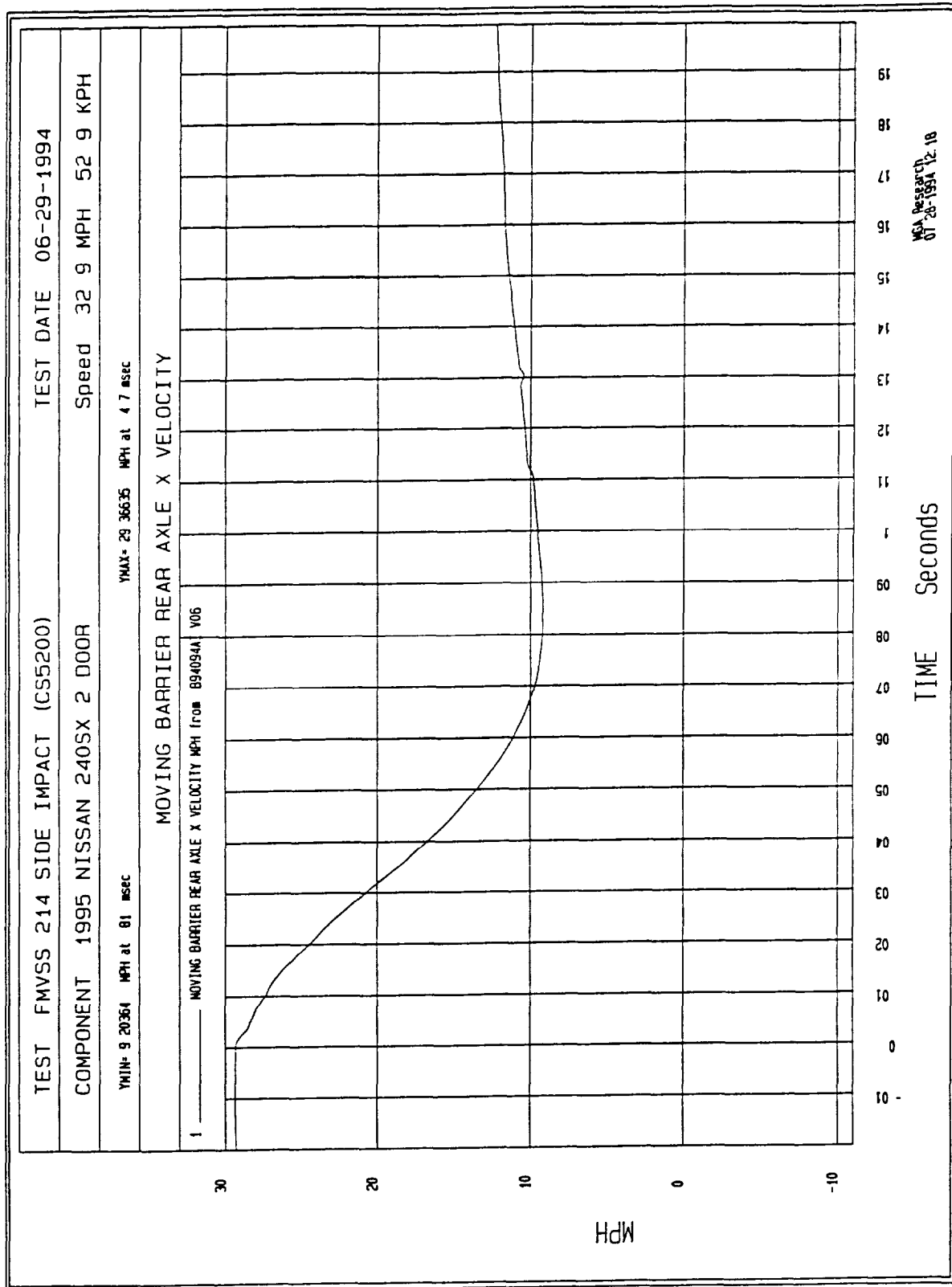


Figure B-60 - Moving Barrier Rear Axle X Velocity vs. Time

NO VALID DATA COLLECTED

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

NO VALID DATA COLLECTED

Figure B-62 - Moving Barrier Rear Axle Y Velocity vs Time

Filter: Class 1000 (1650 Hz)

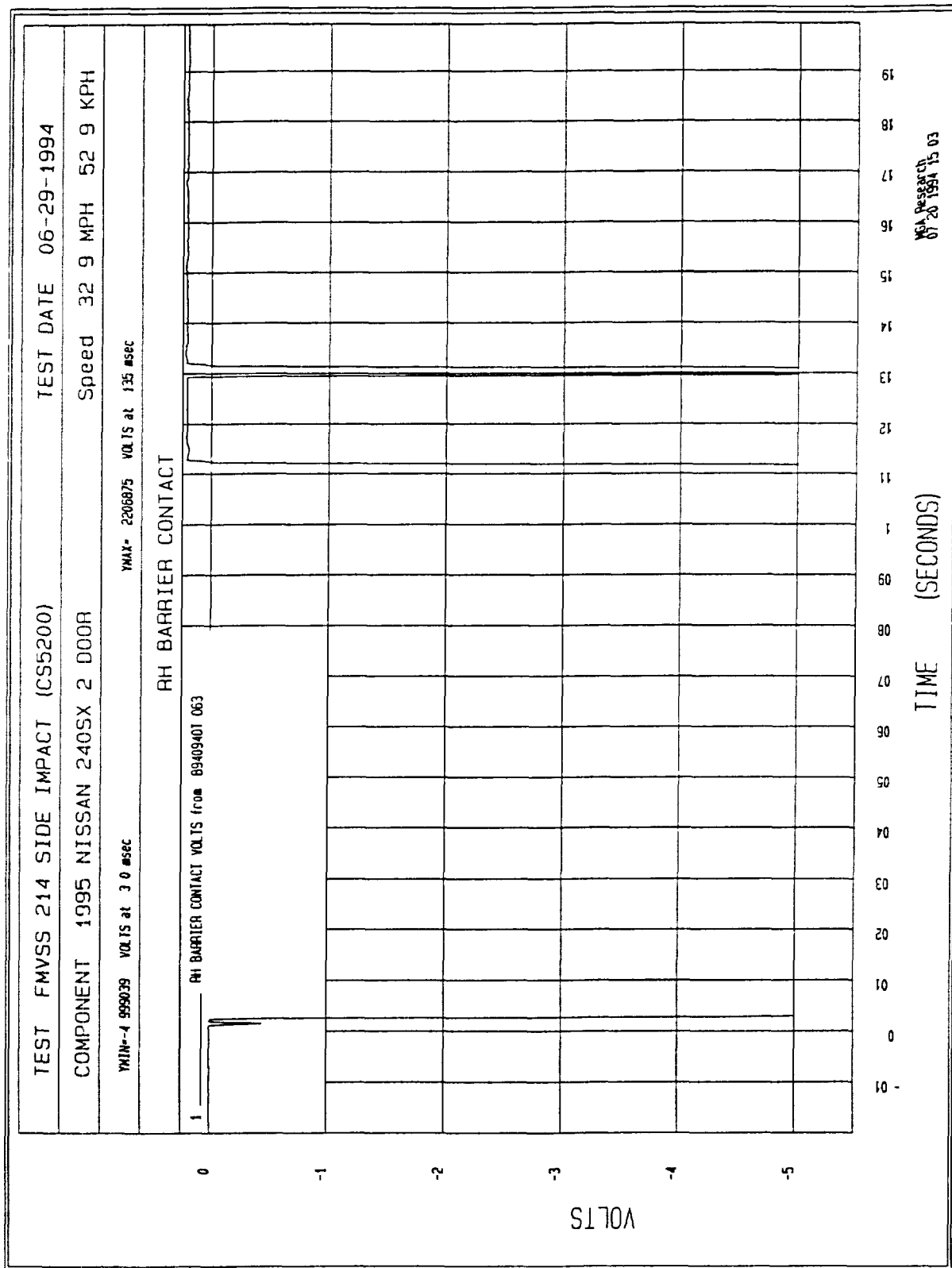


Figure B-63 - Right Hand Barrier Contact

Filter: Class 1000 (1650 Hz)

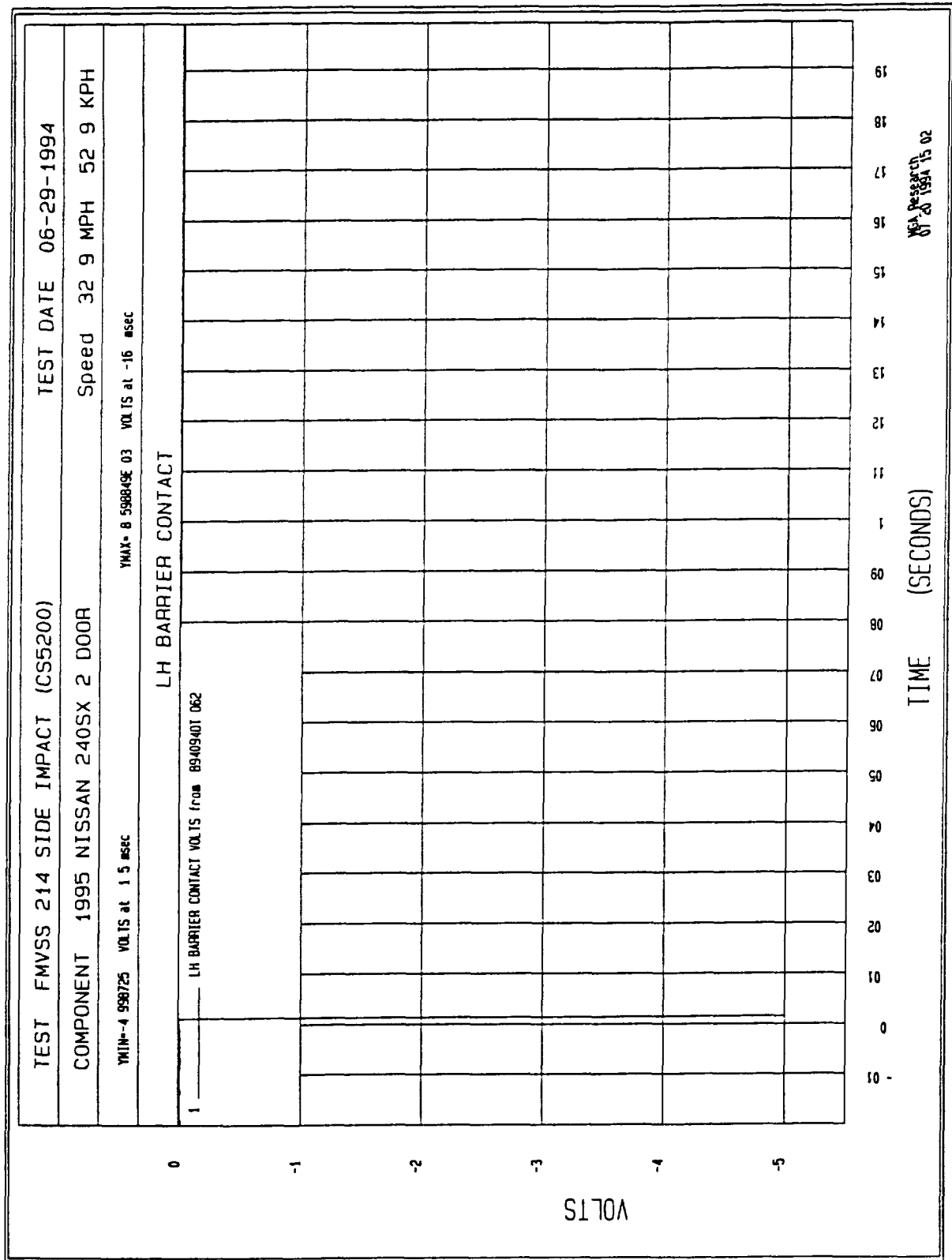


Figure B-64 - Left Hand Barrier Contact

Filter: Class 180 (300 Hz)

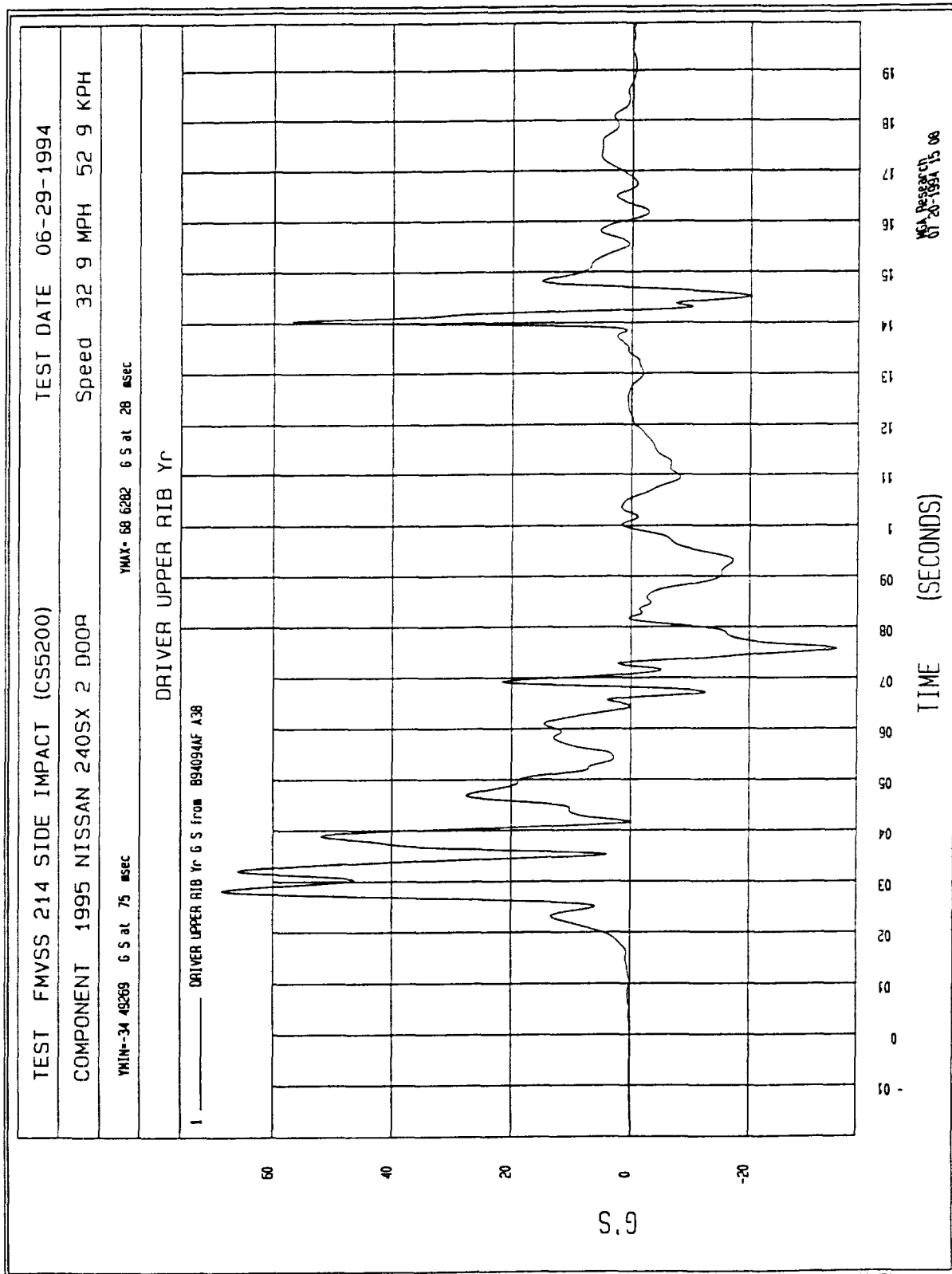


Figure B-65 - Driver Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

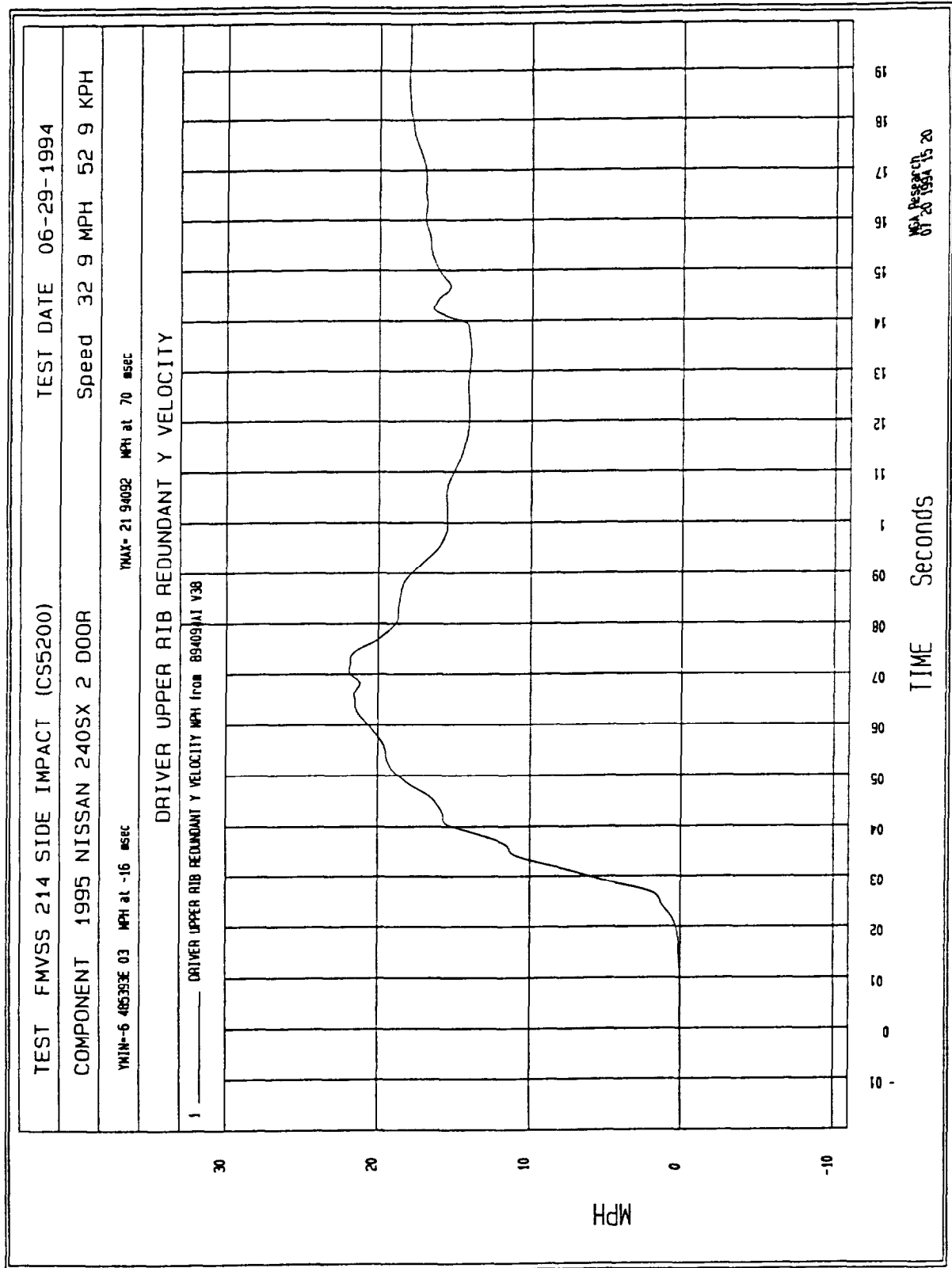


Figure B-66 - Driver Upper Rib Y Redundant Velocity vs. Time

TEST FMVSS 214 SIDE IMPACT (CS5200)	TEST DATE 06-29-1994
COMPONENT 1995 NISSAN 240SX 2 DOOR	Speed 32.9 MPH 52.9 KPH
YMIN=-26.64718 G S at 75 msec	YMAX= 82.10079 G S at 39 msec

DRIVER LOWER RIB Yr

1 DRIVER LOWER RIB Yr G S from B94094AF A39

G.S.

TIME (SECONDS)

WCA Research
01-20-1994 15 08

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

Filter: Class 180 (300 Hz)

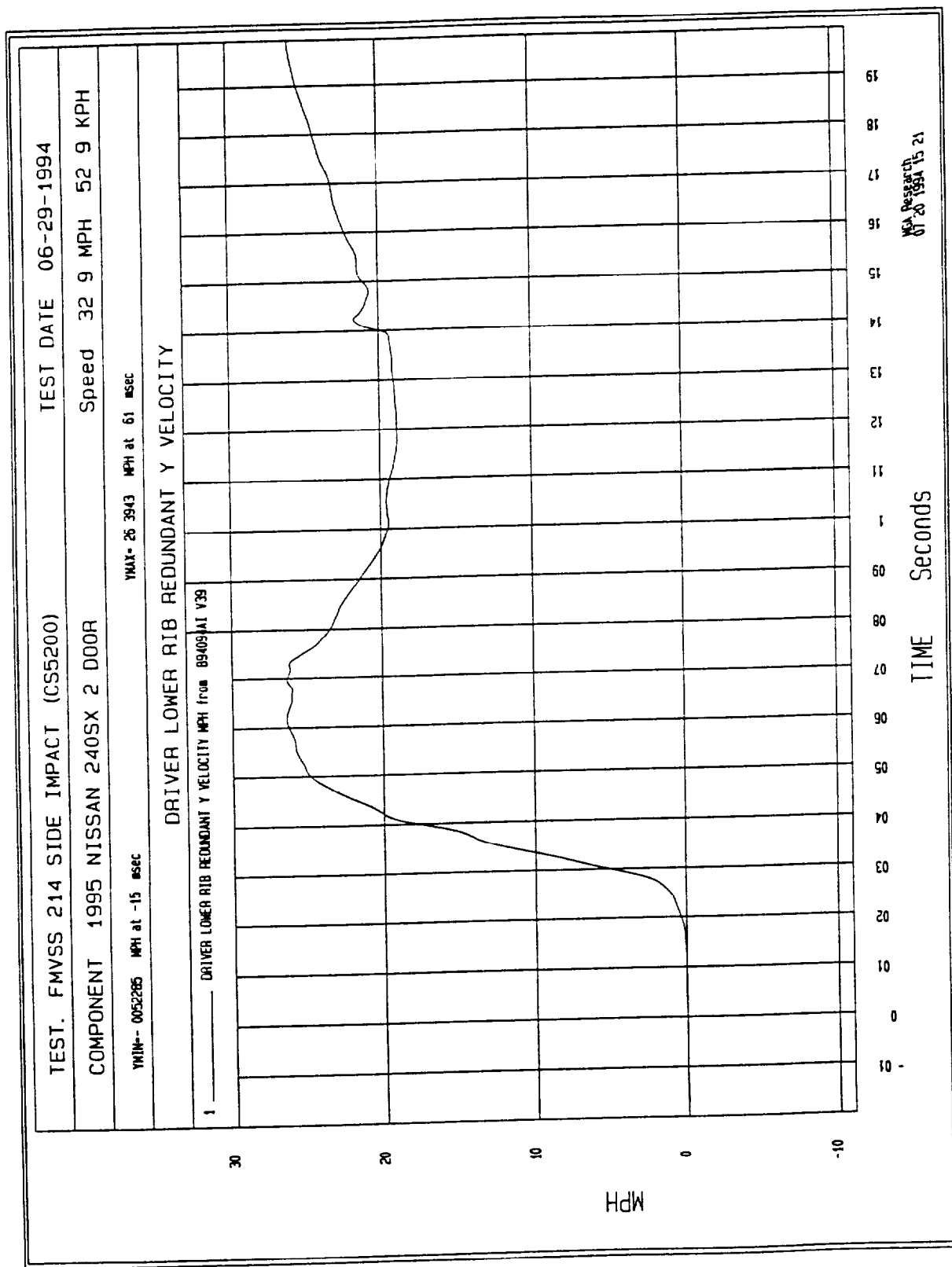


Figure B-68 - Driver Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

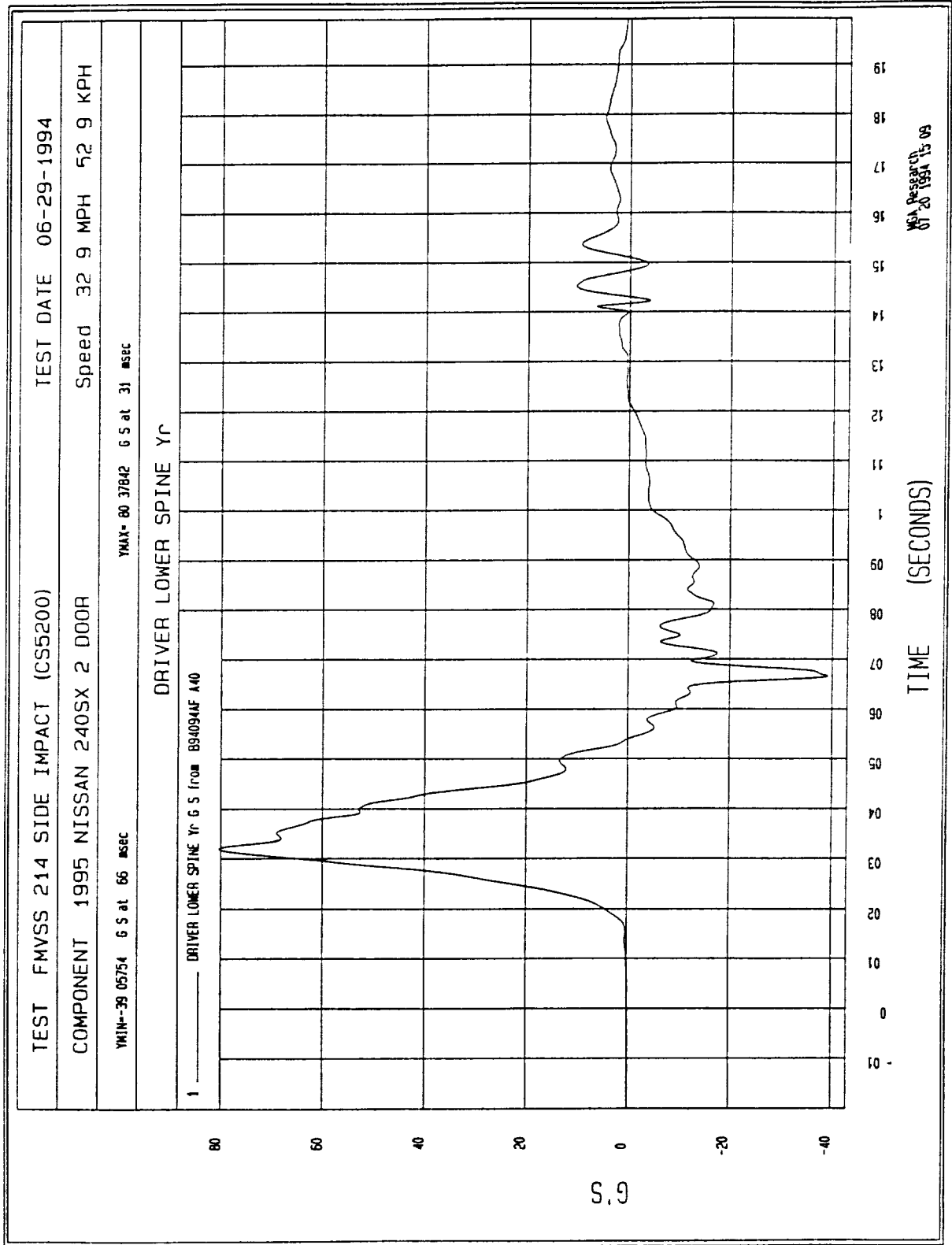


Figure B-69 - Driver Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

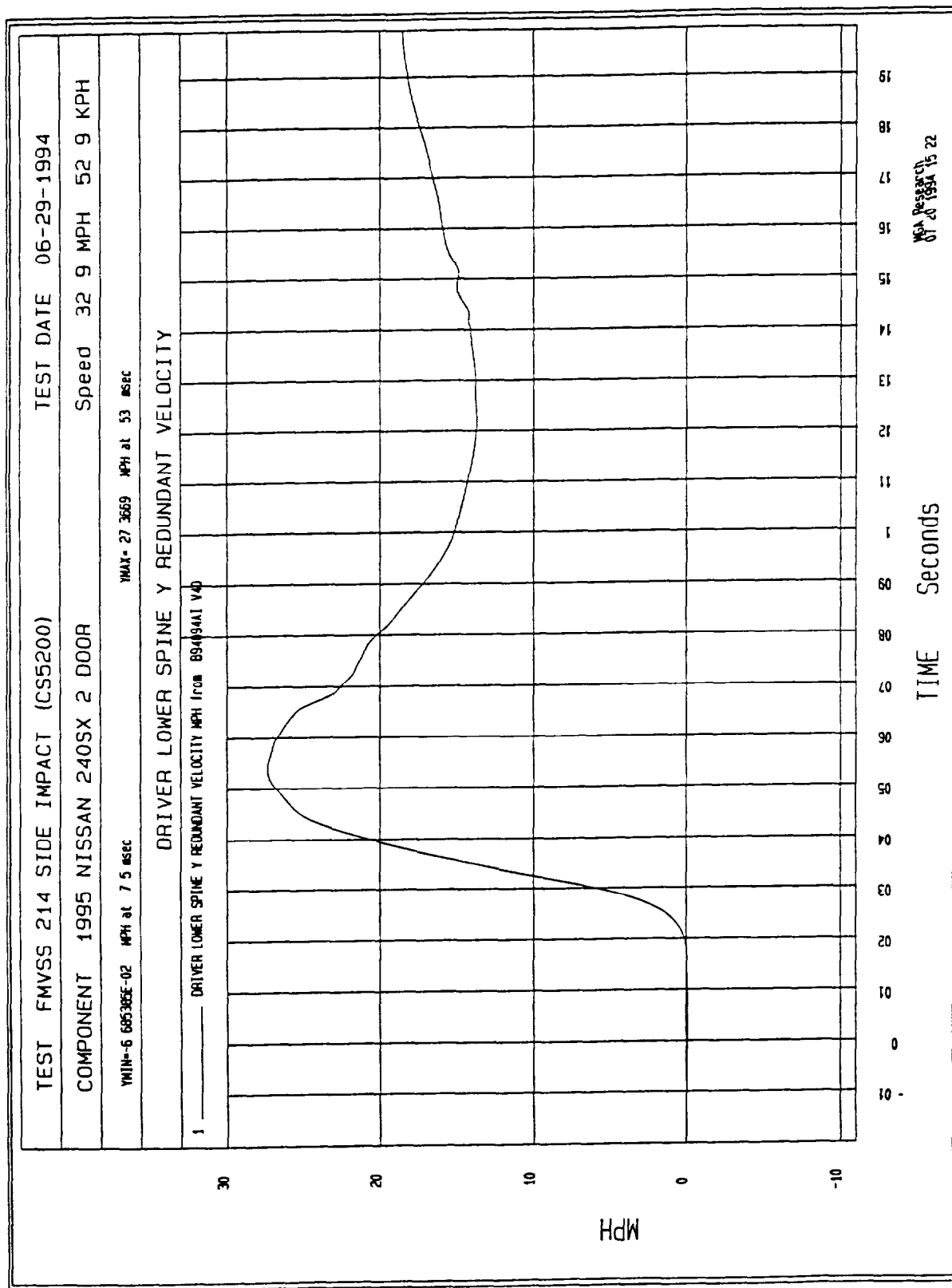


Figure B-70 - Driver Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

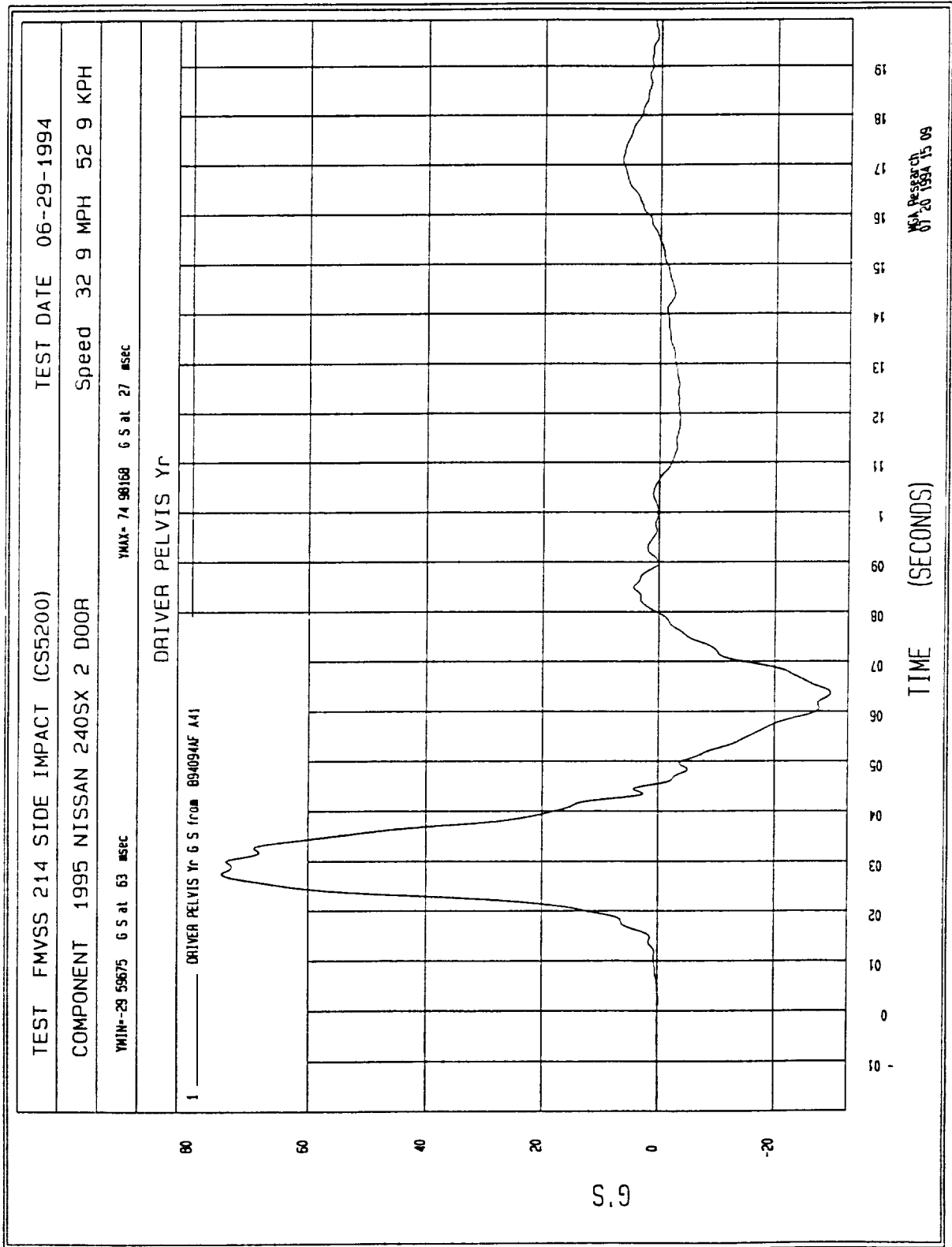


Figure B-71 - Driver Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

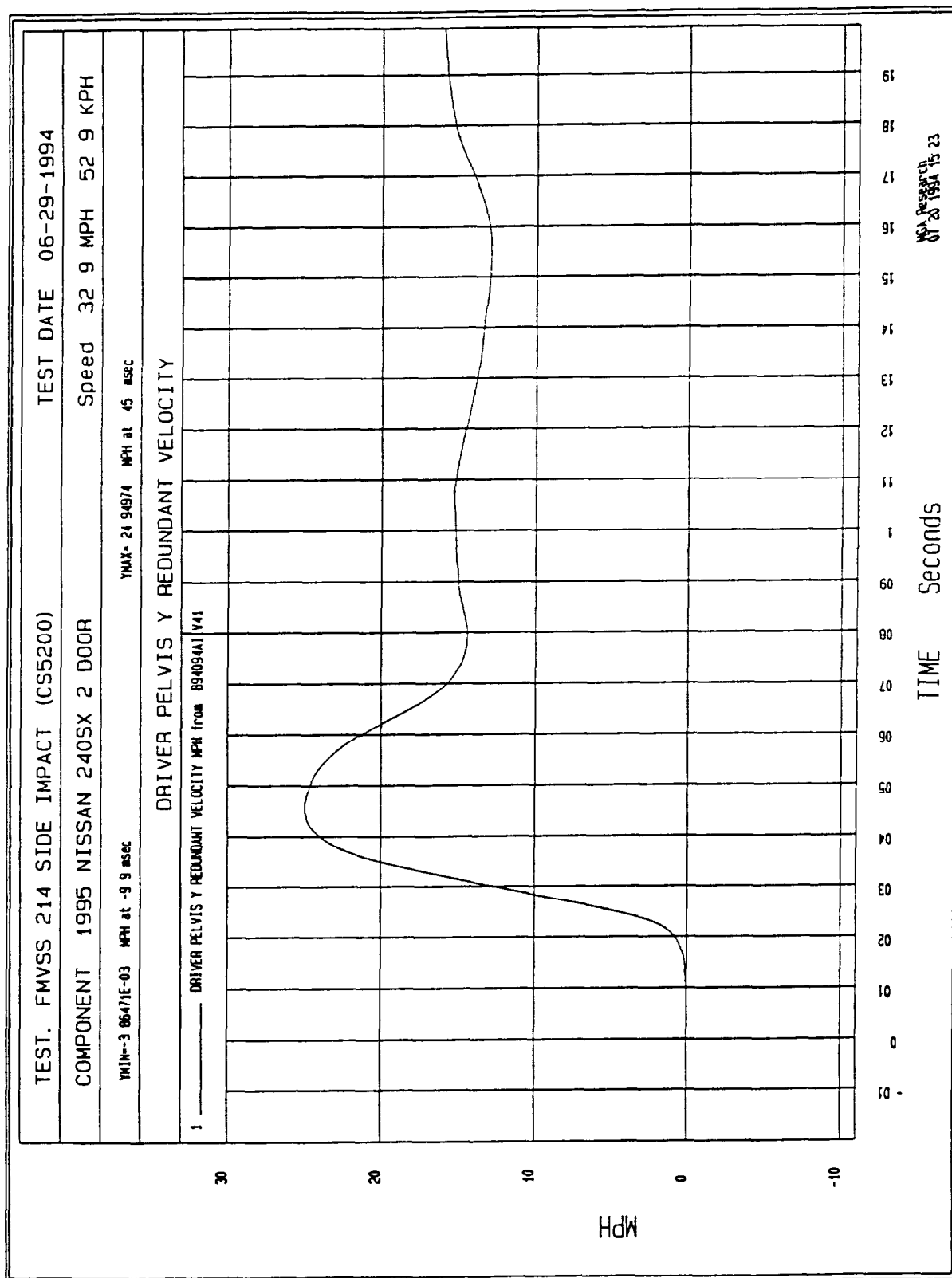


Figure B-72 - Driver Pelvis Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

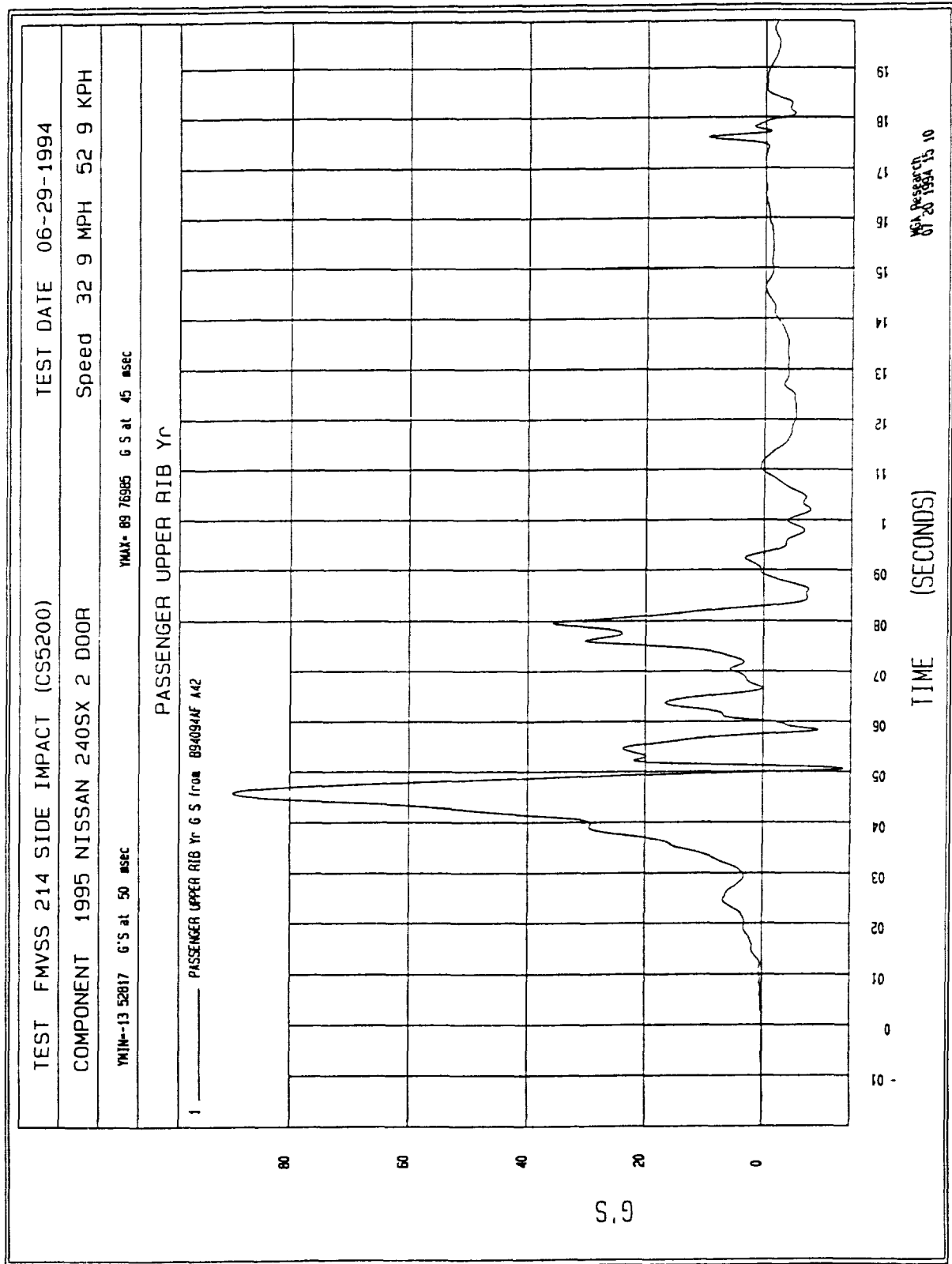


Figure B-73 - Passenger Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

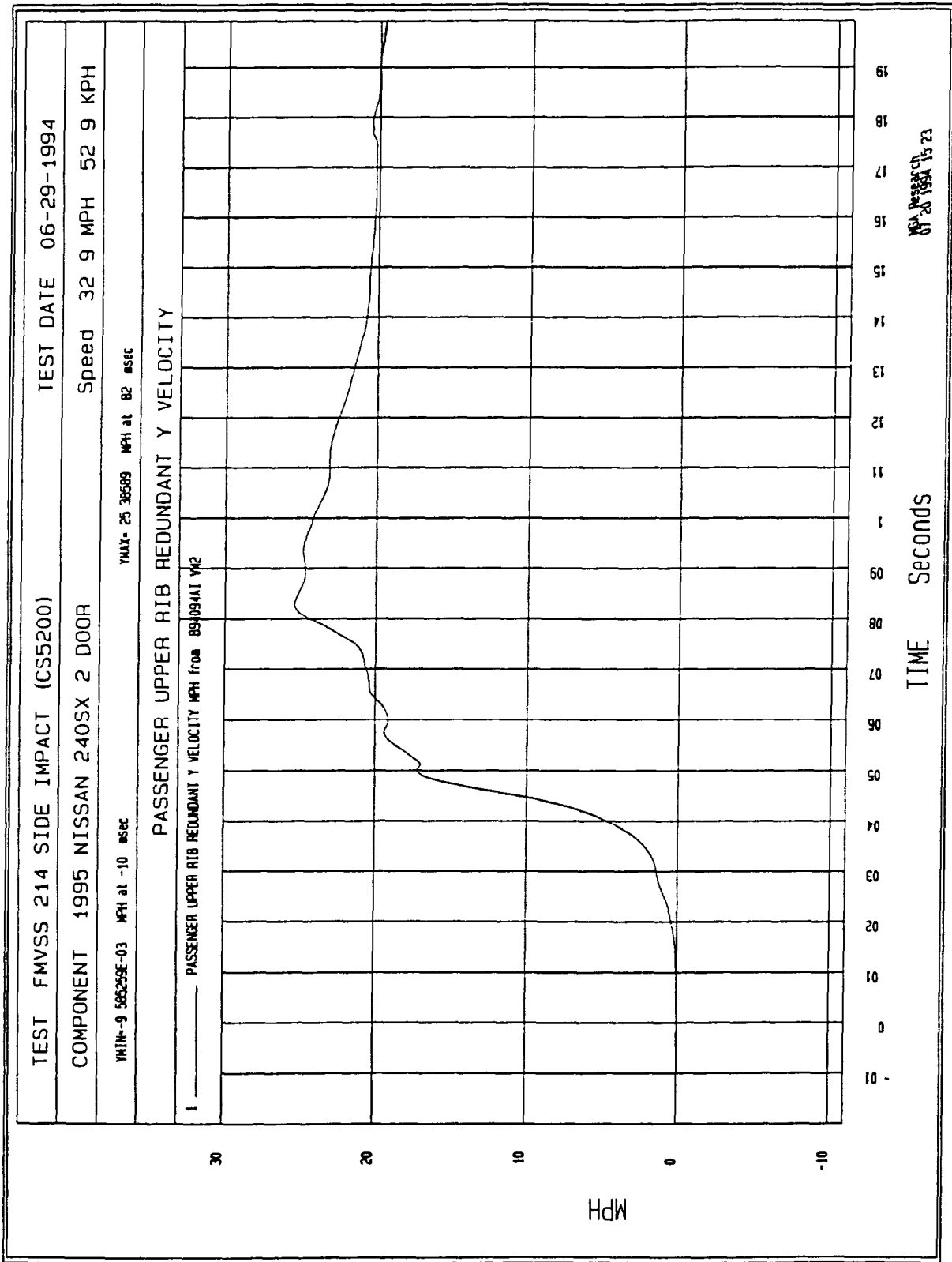


Figure B-74 - Passenger Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

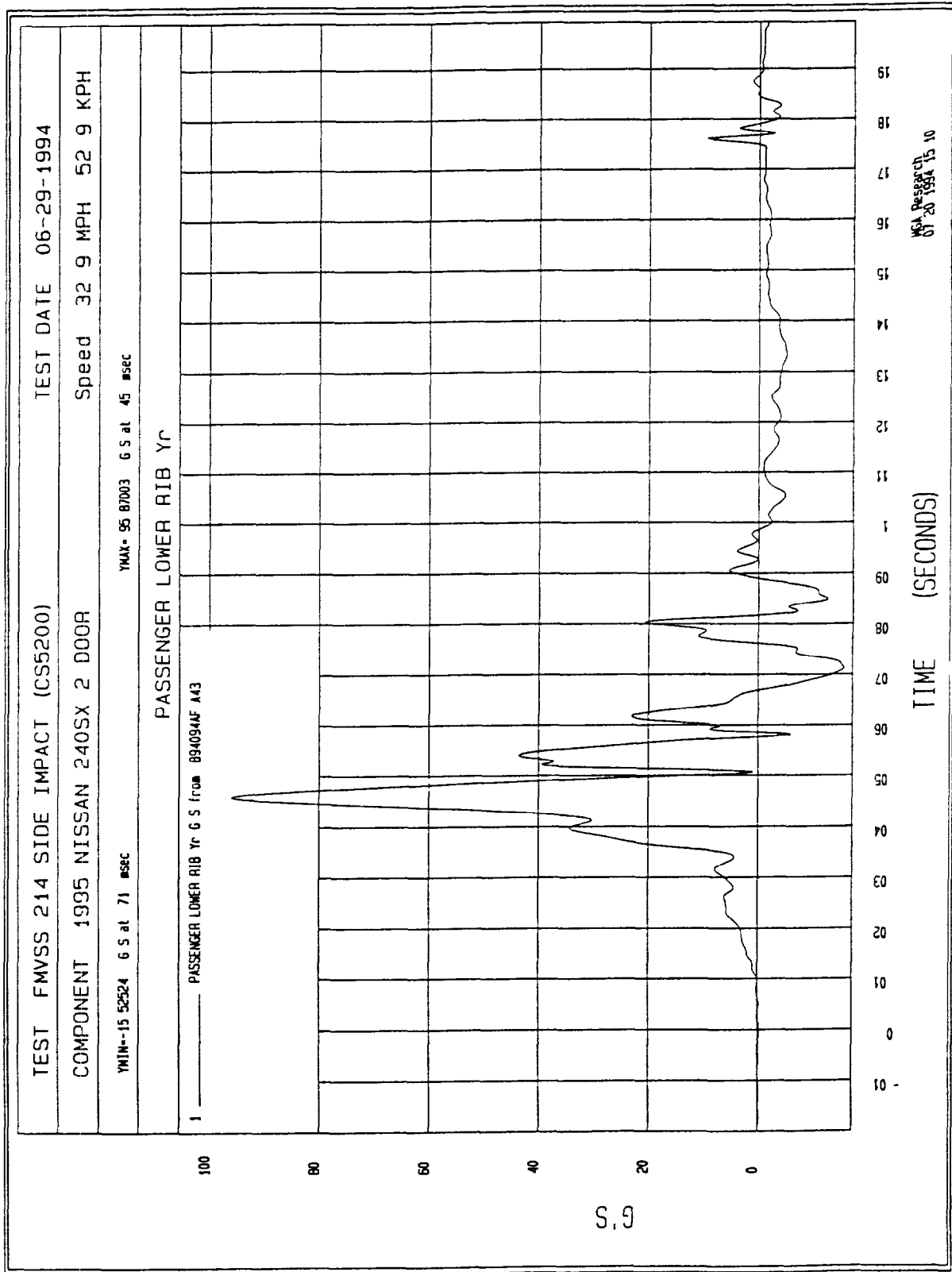


Figure B-75 - Passenger Lower Rib Y Redundant Acceleration vs Time

Filter: Class 180 (300 Hz)

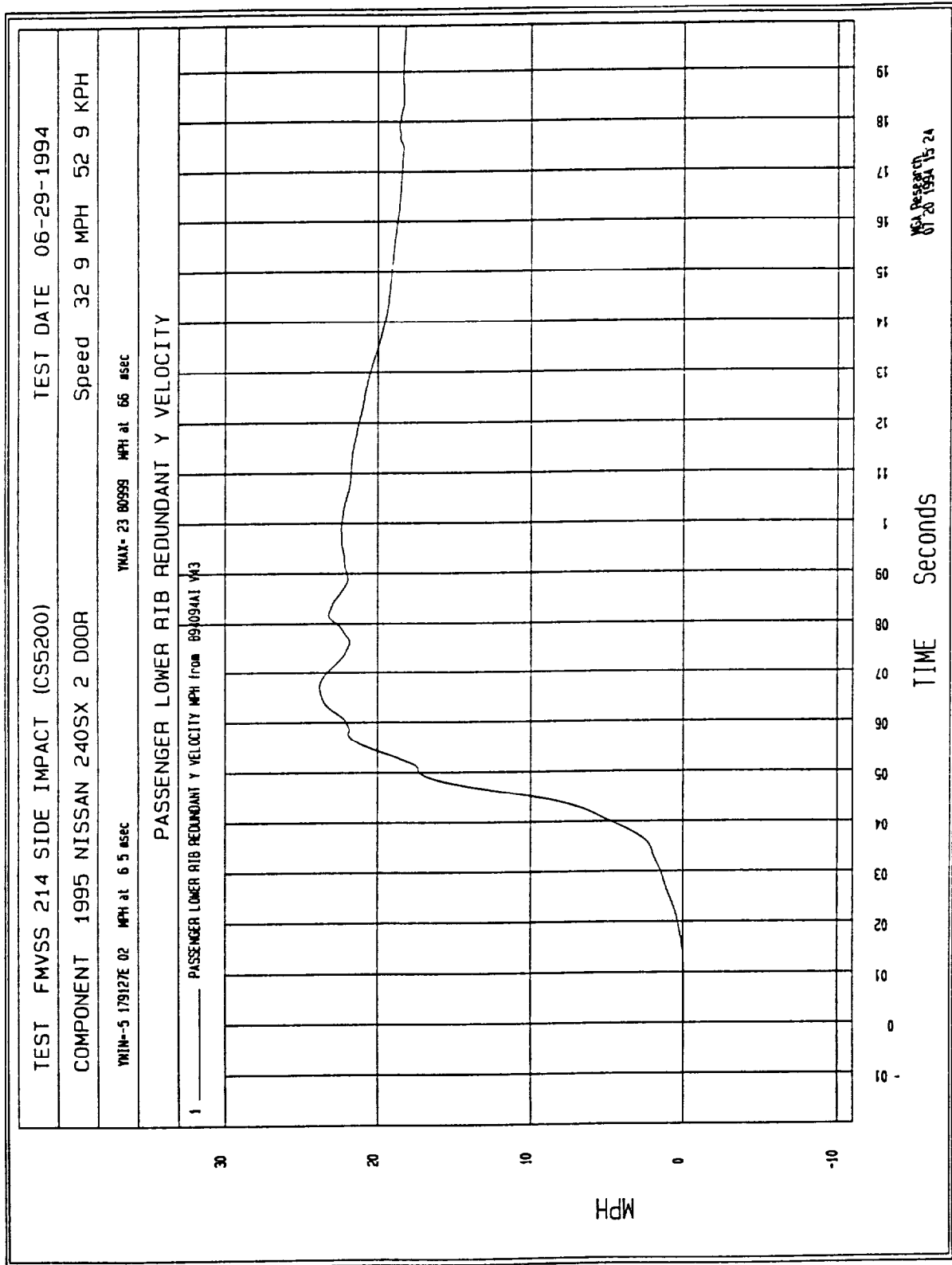


Figure B-76 - Passenger Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

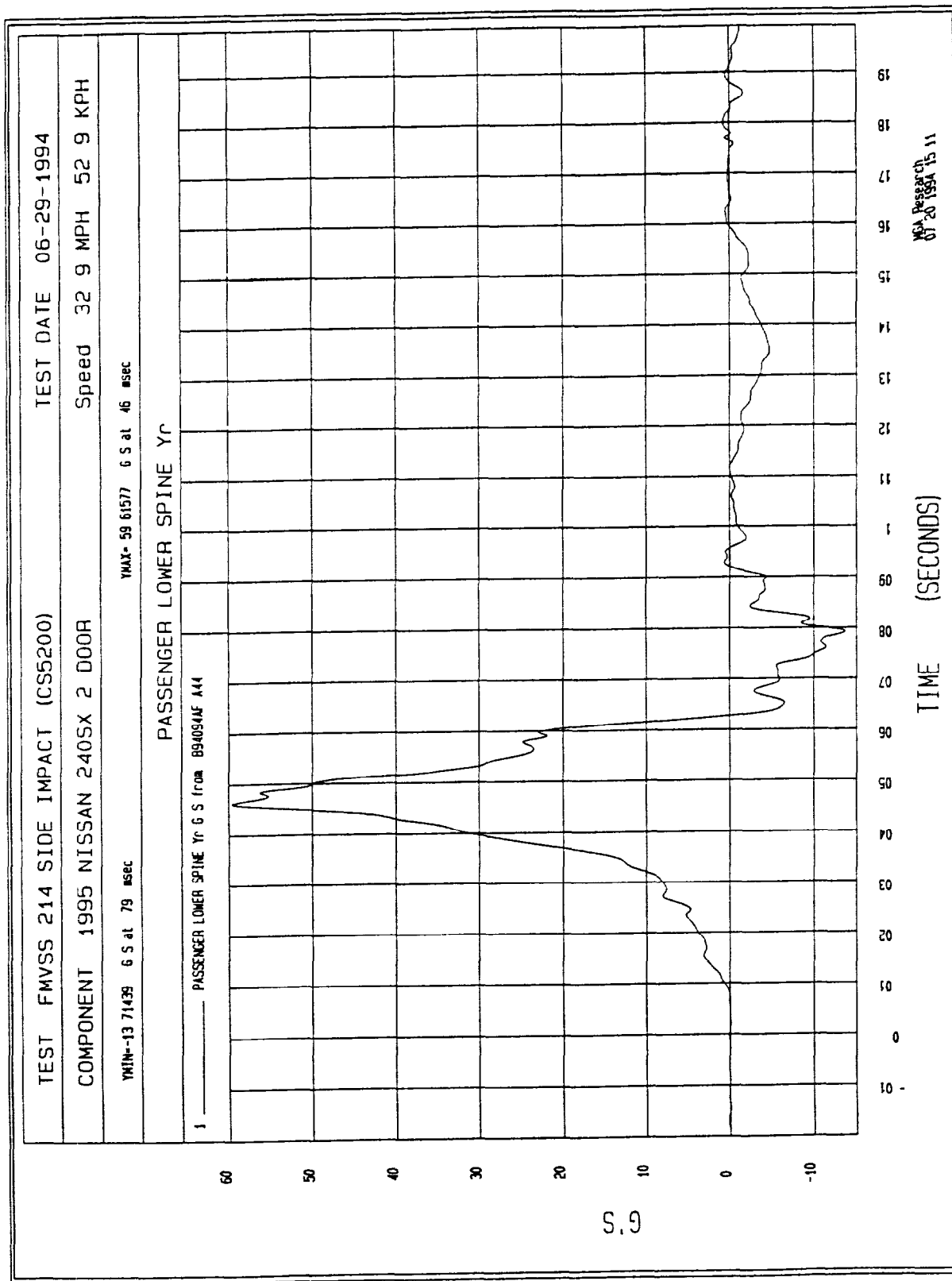


Figure B-77 - Passenger Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

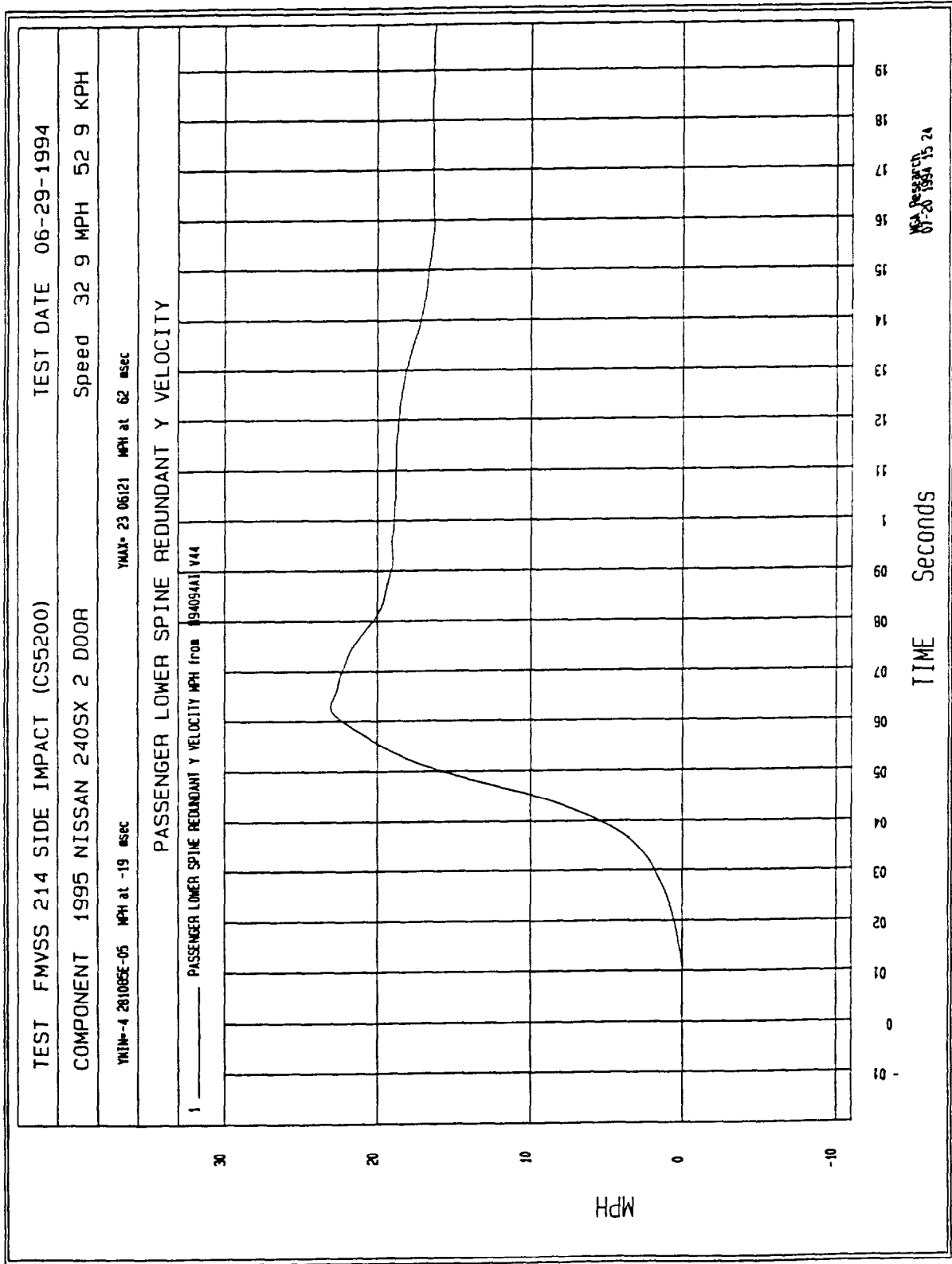


Figure B-78 - Passenger Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

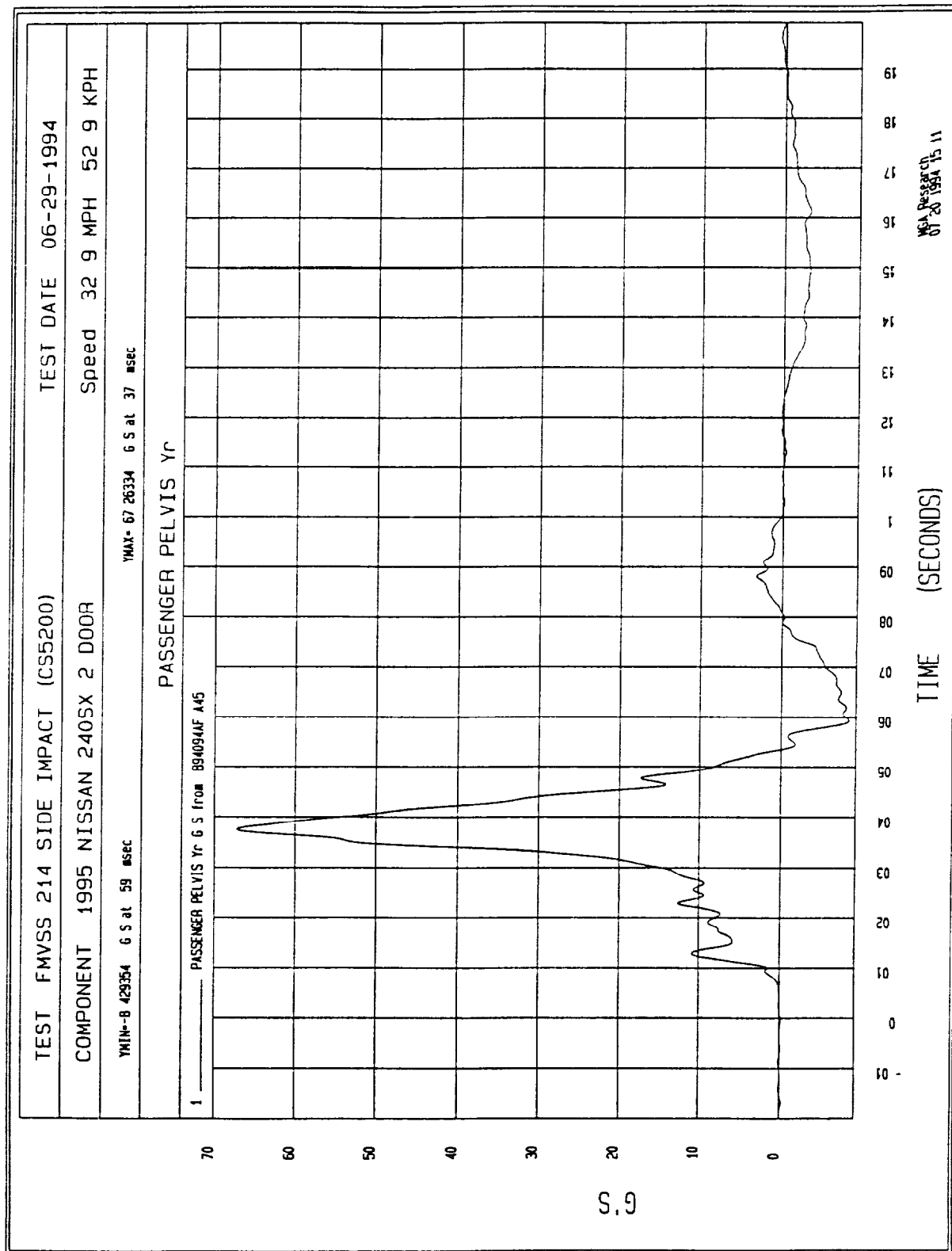


Figure B-79 - Passenger Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

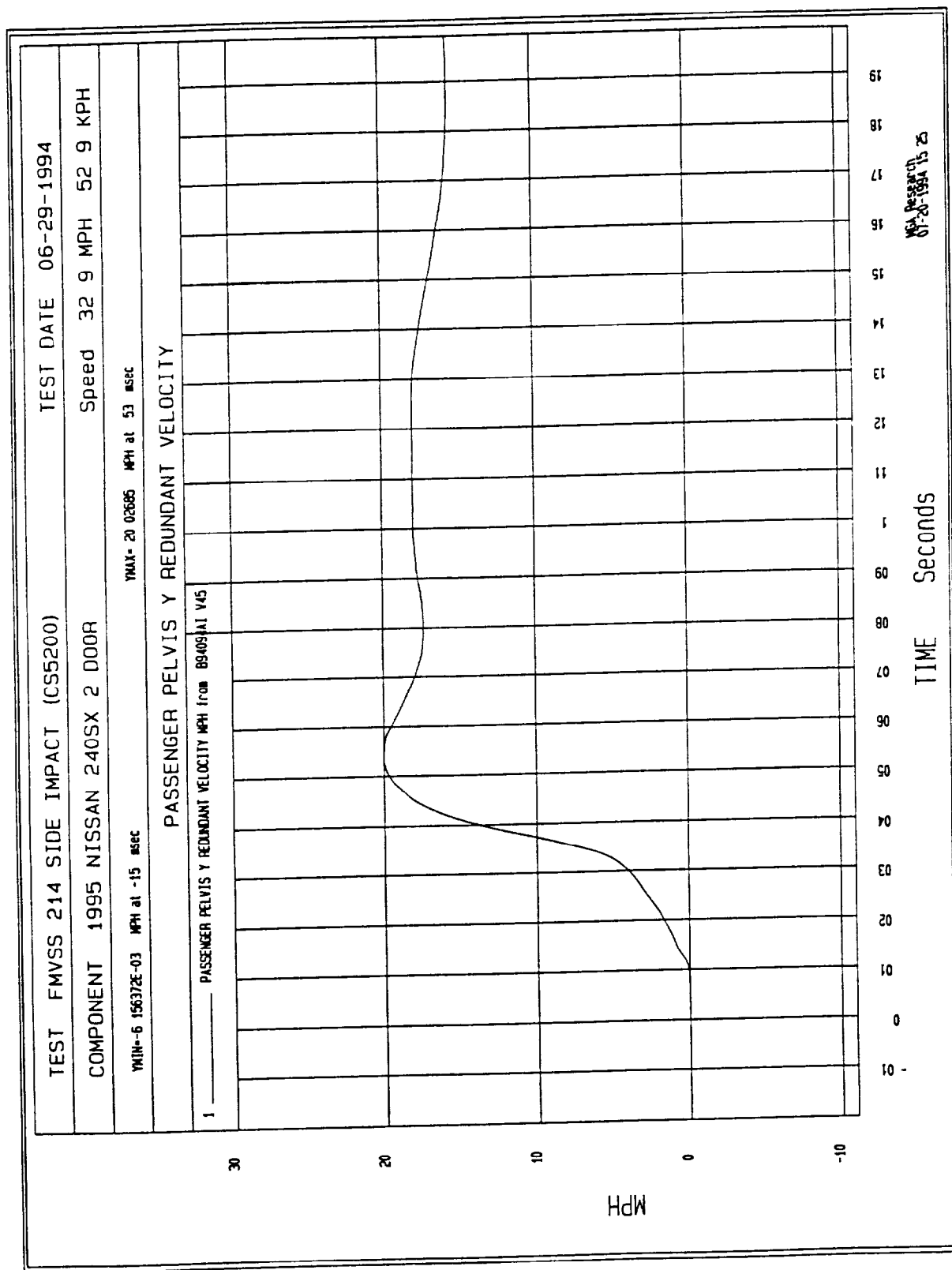


Figure B-80 - Passenger Pelvis Y Redundant Velocity vs. Time

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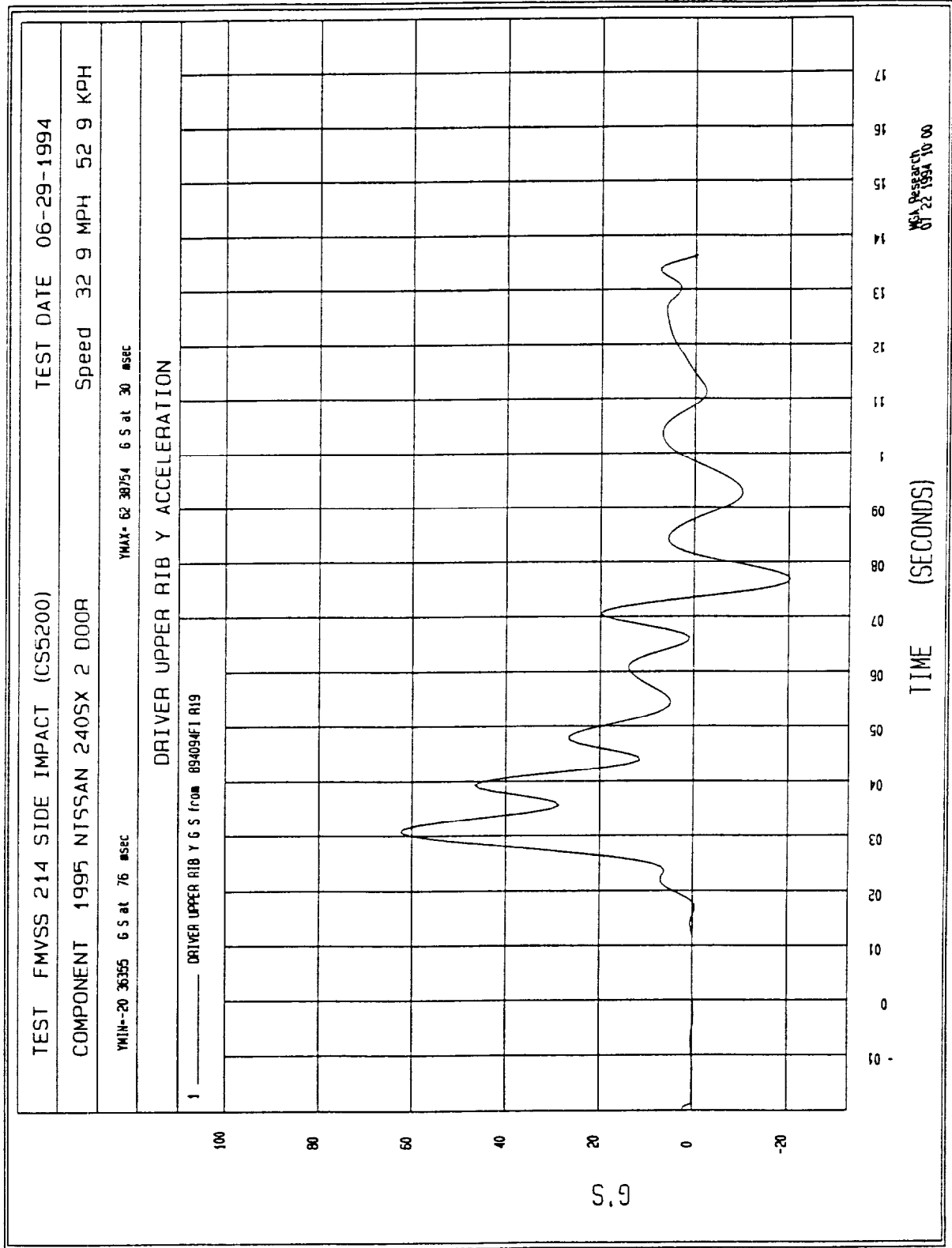


Figure B-81 - Driver Upper Rib Y Acceleration vs. Time

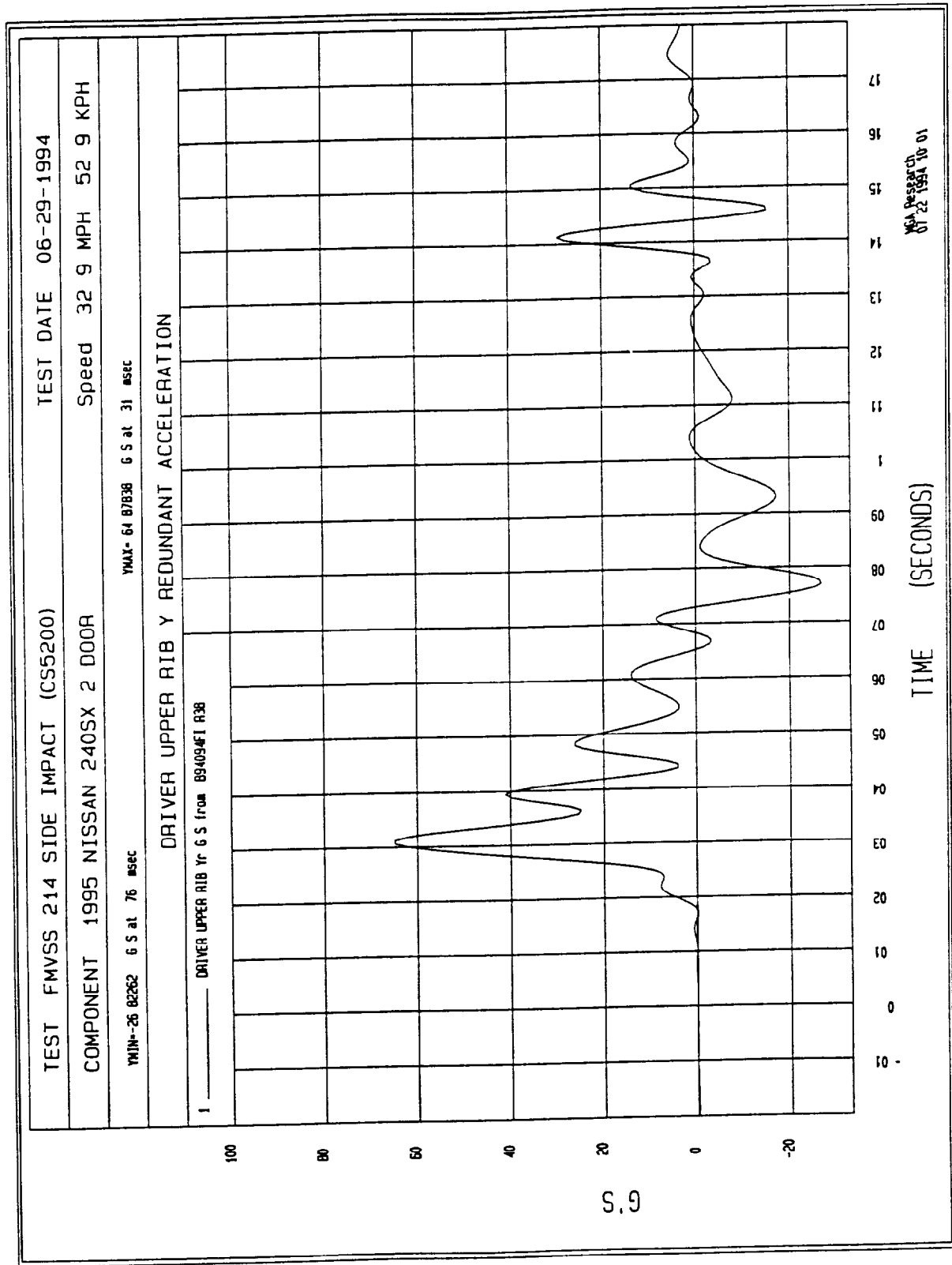


Figure B-82 - Driver Upper Rib Y Redundant Acceleration vs. Time

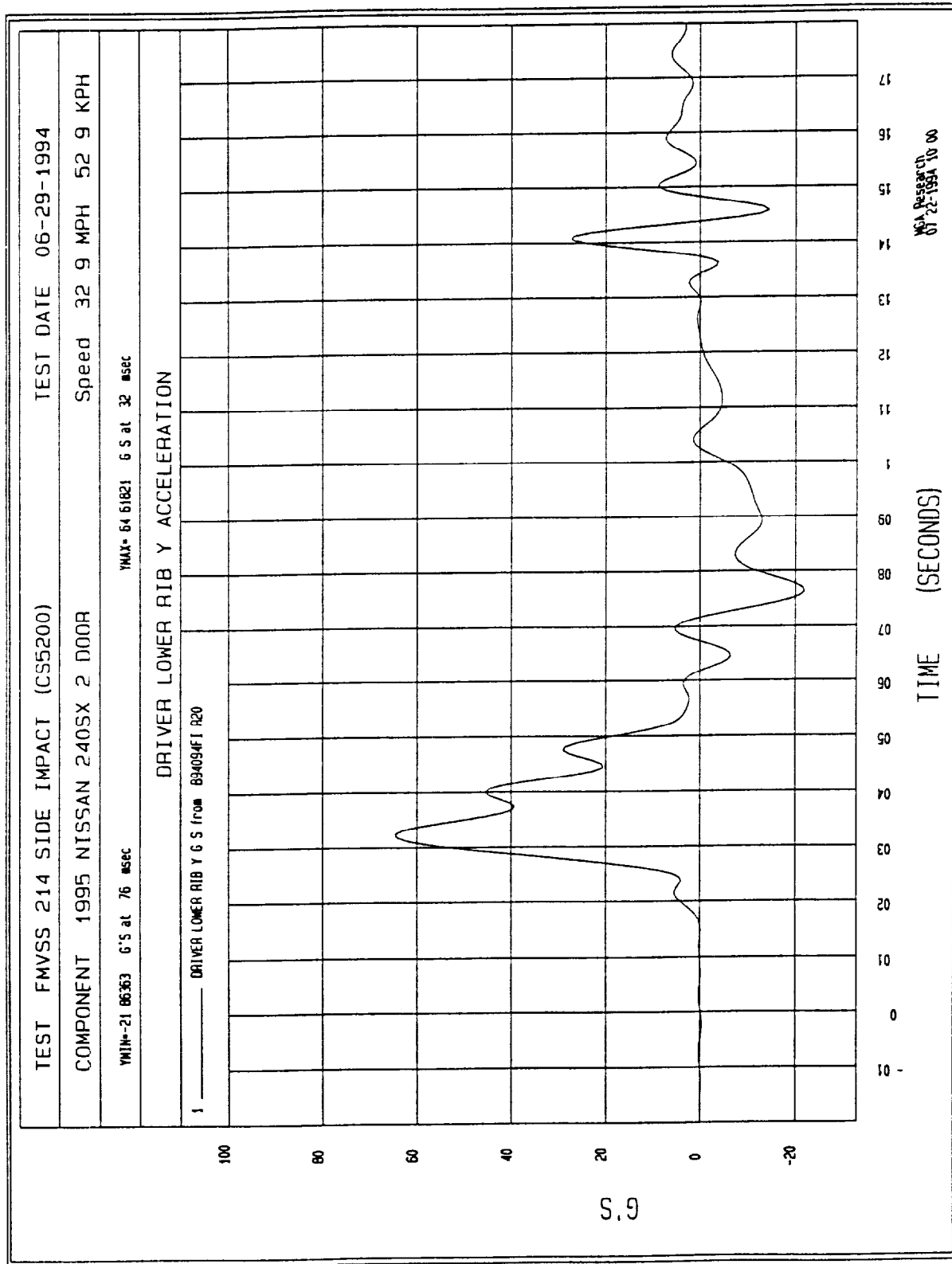


Figure B-83 - Driver Lower Rib Y Acceleration vs. Time

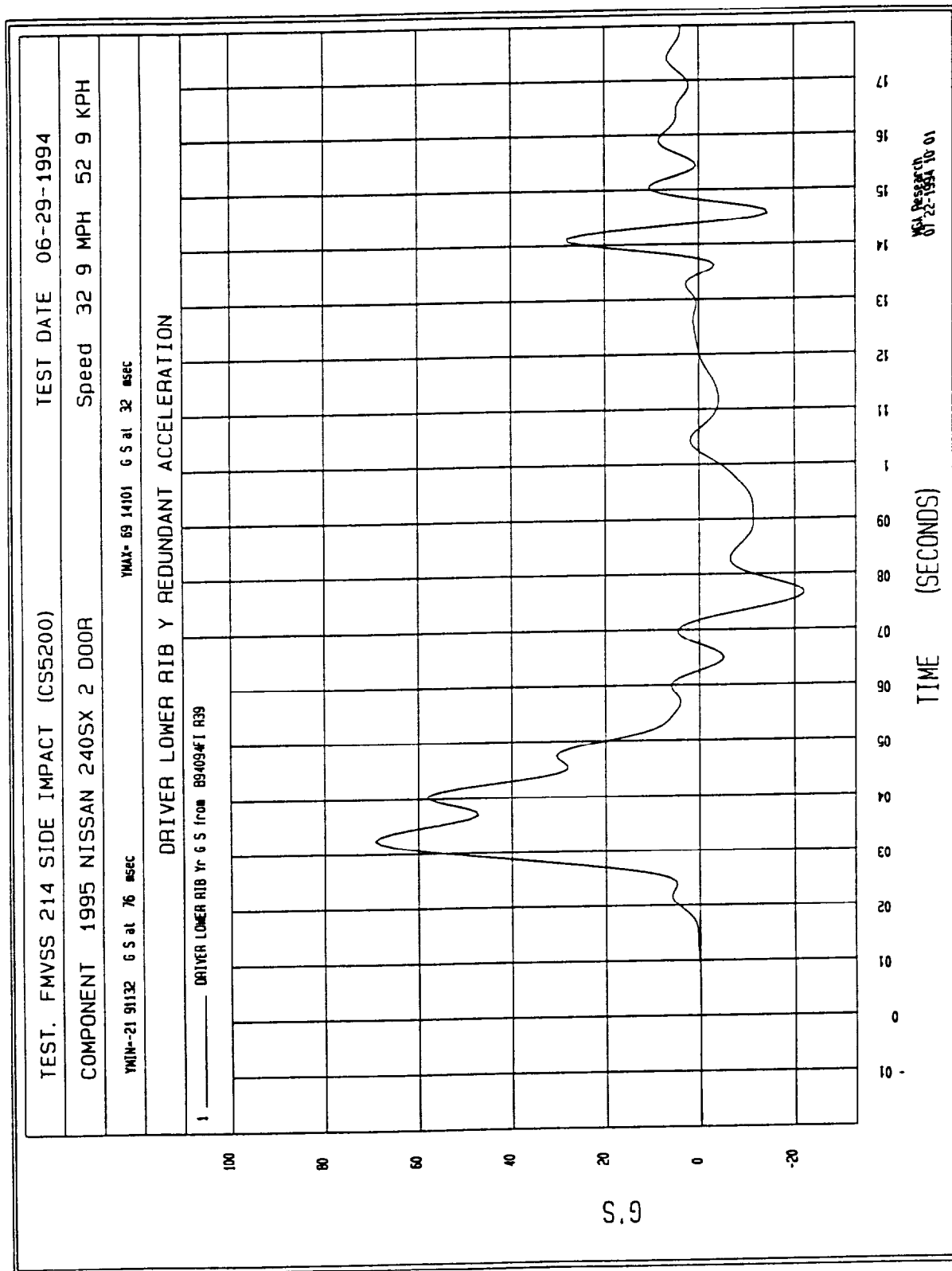


Figure B-84 - Driver Lower Rib Y Redundant Acceleration vs. Time

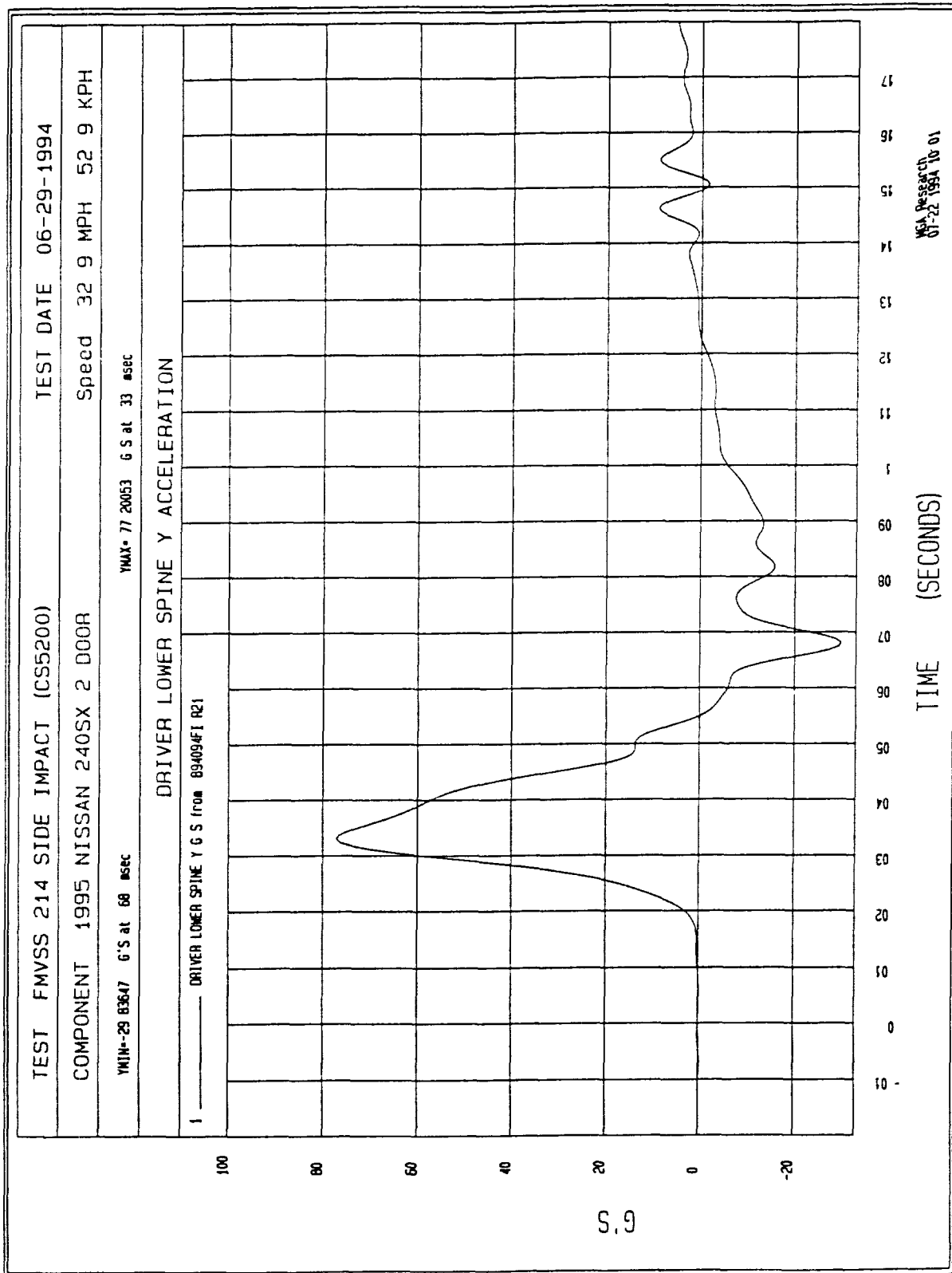


Figure B-85 - Driver Lower Spine Y Acceleration vs. Time

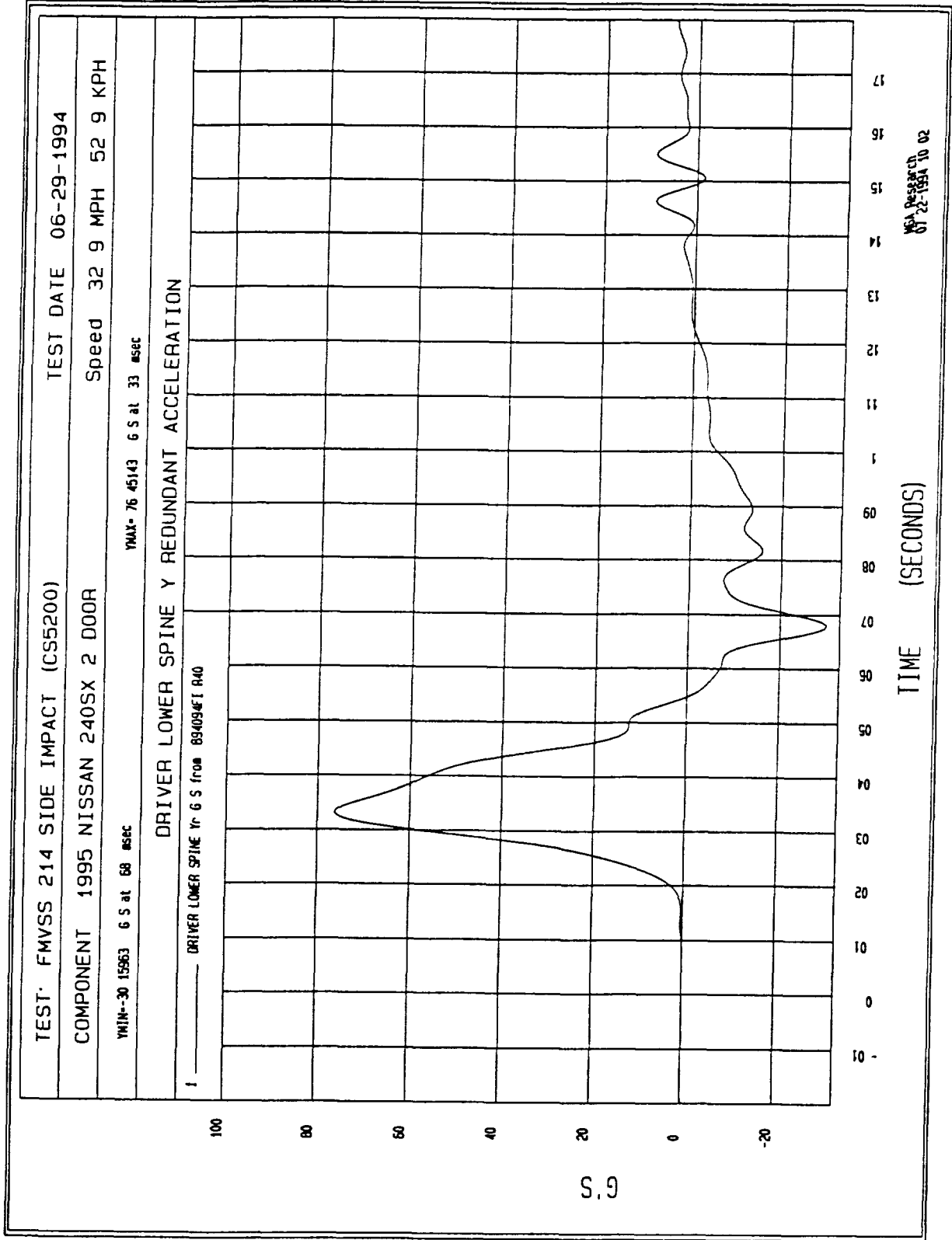


Figure B-86 - Driver Lower Spine Y Redundant Acceleration vs. Time

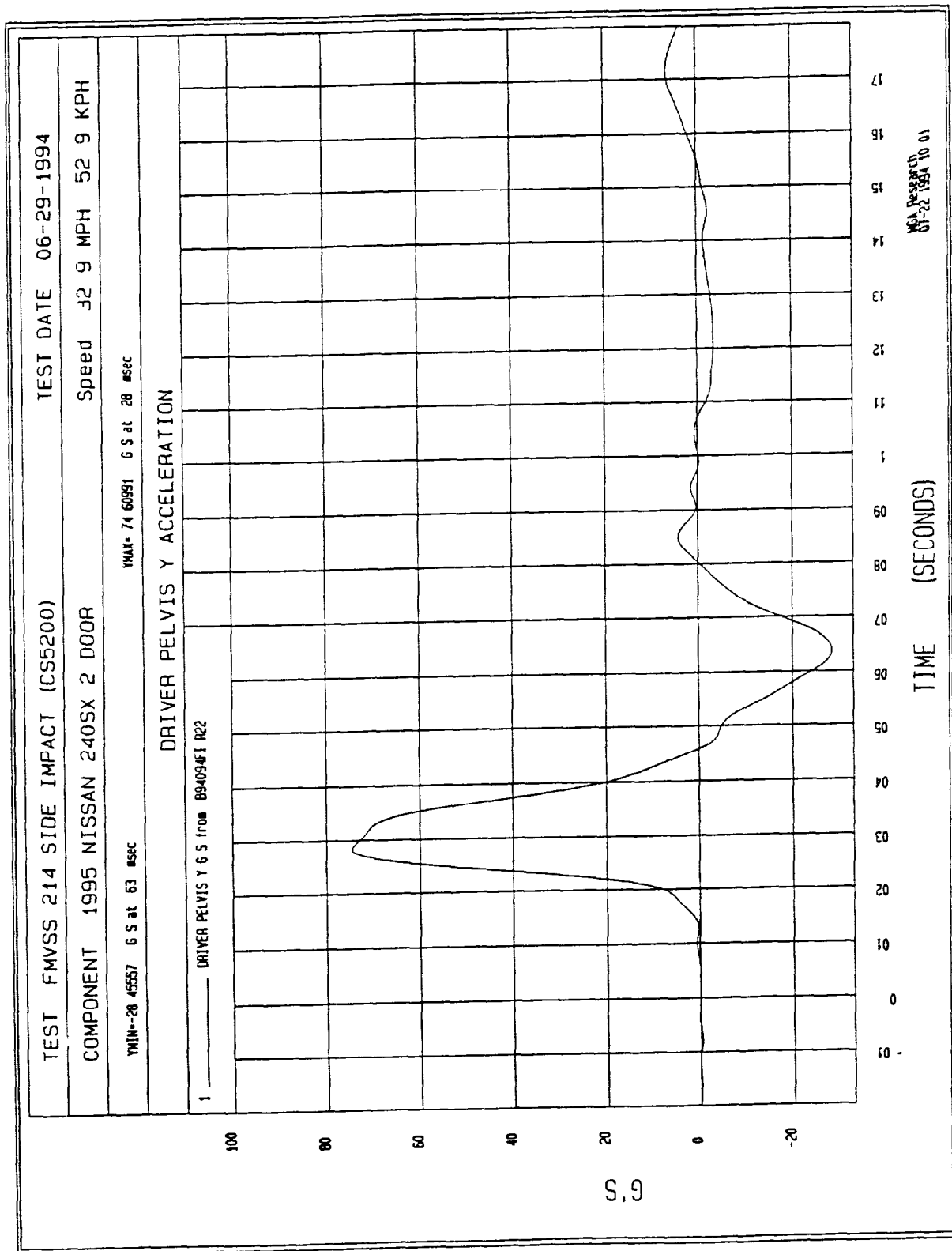


Figure B-87 - Driver Pelvis Y Acceleration vs. Time

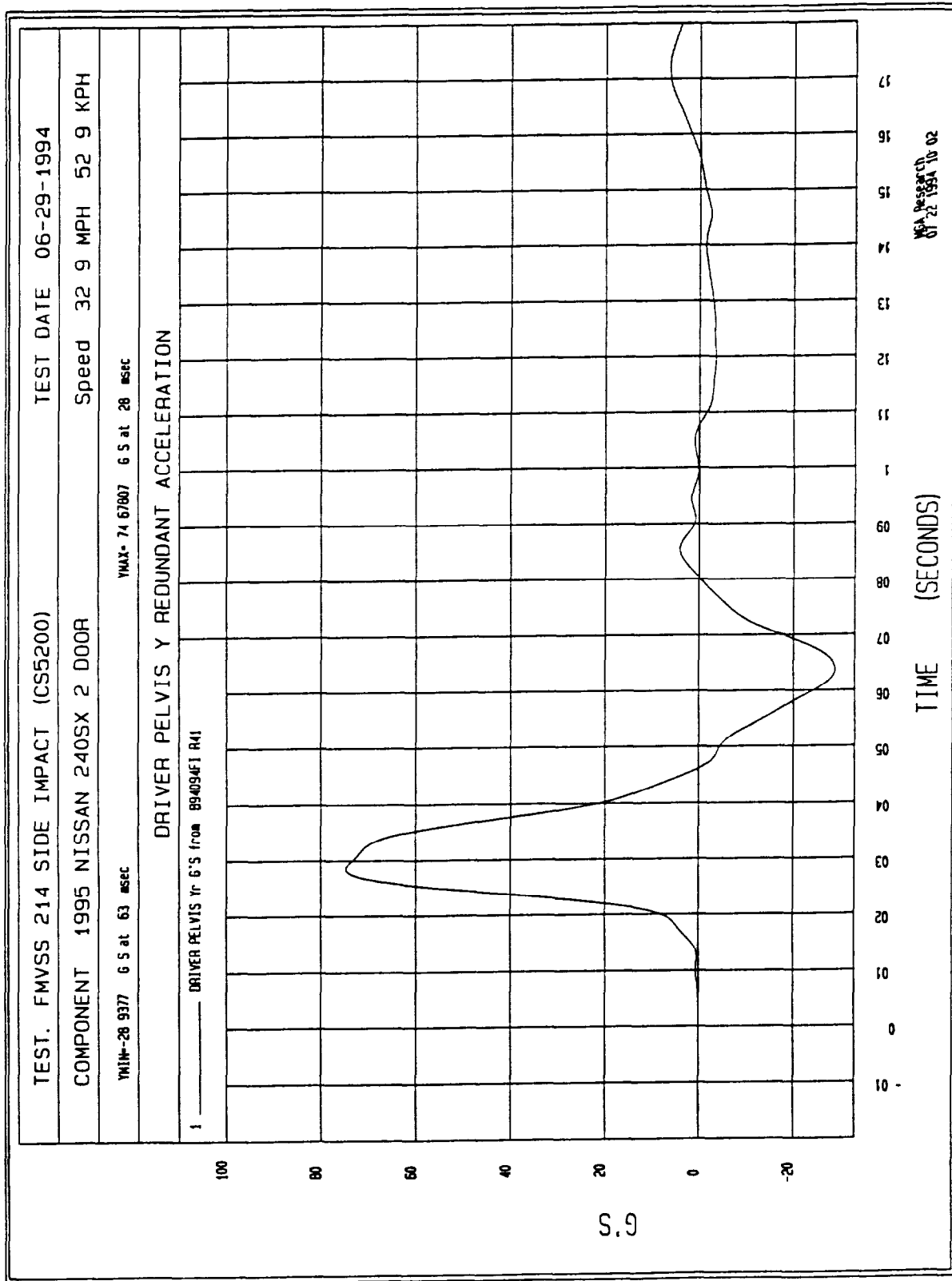
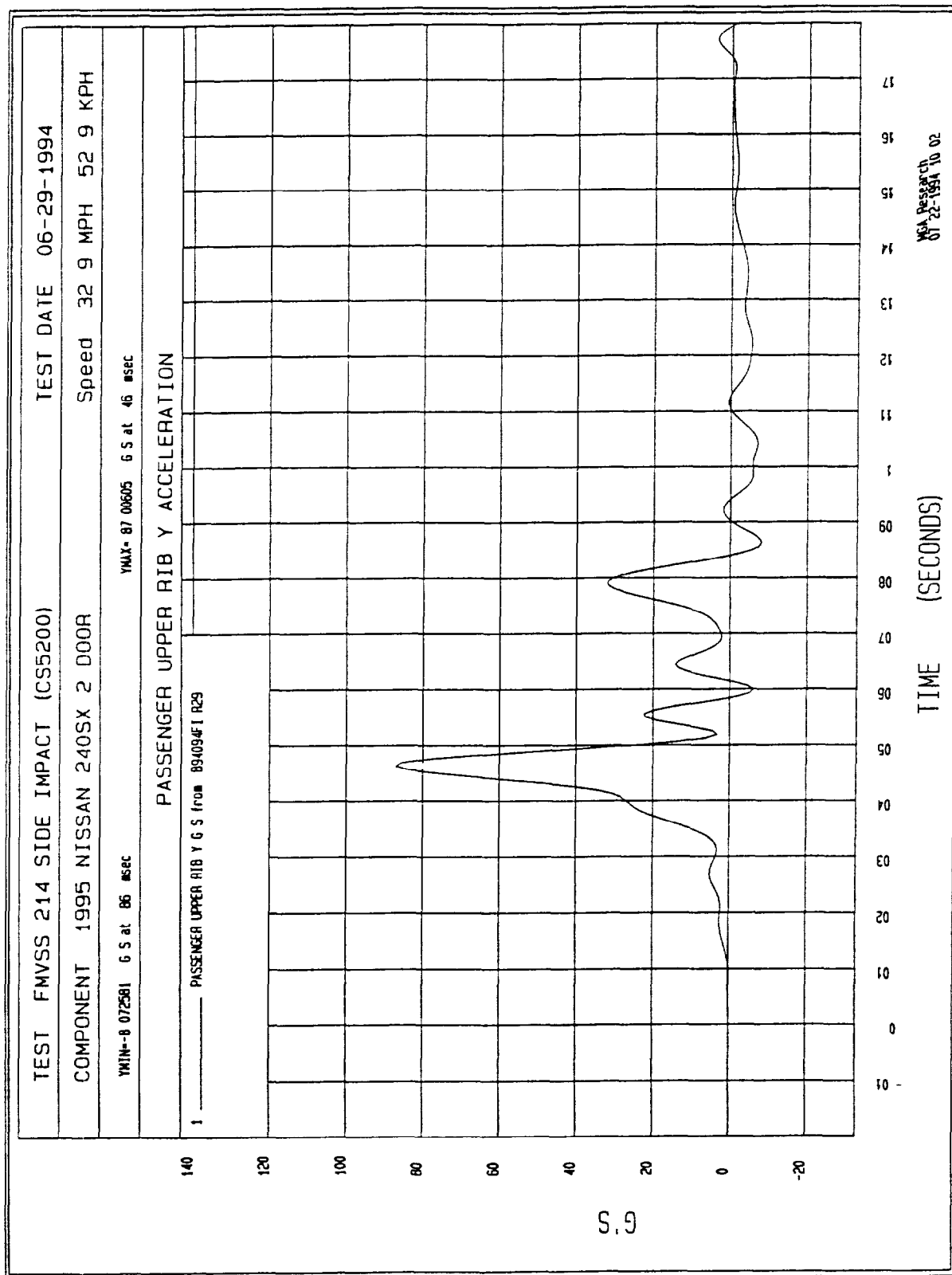


Figure B-88 - Driver Pelvis Y Redundant Acceleration vs. Time



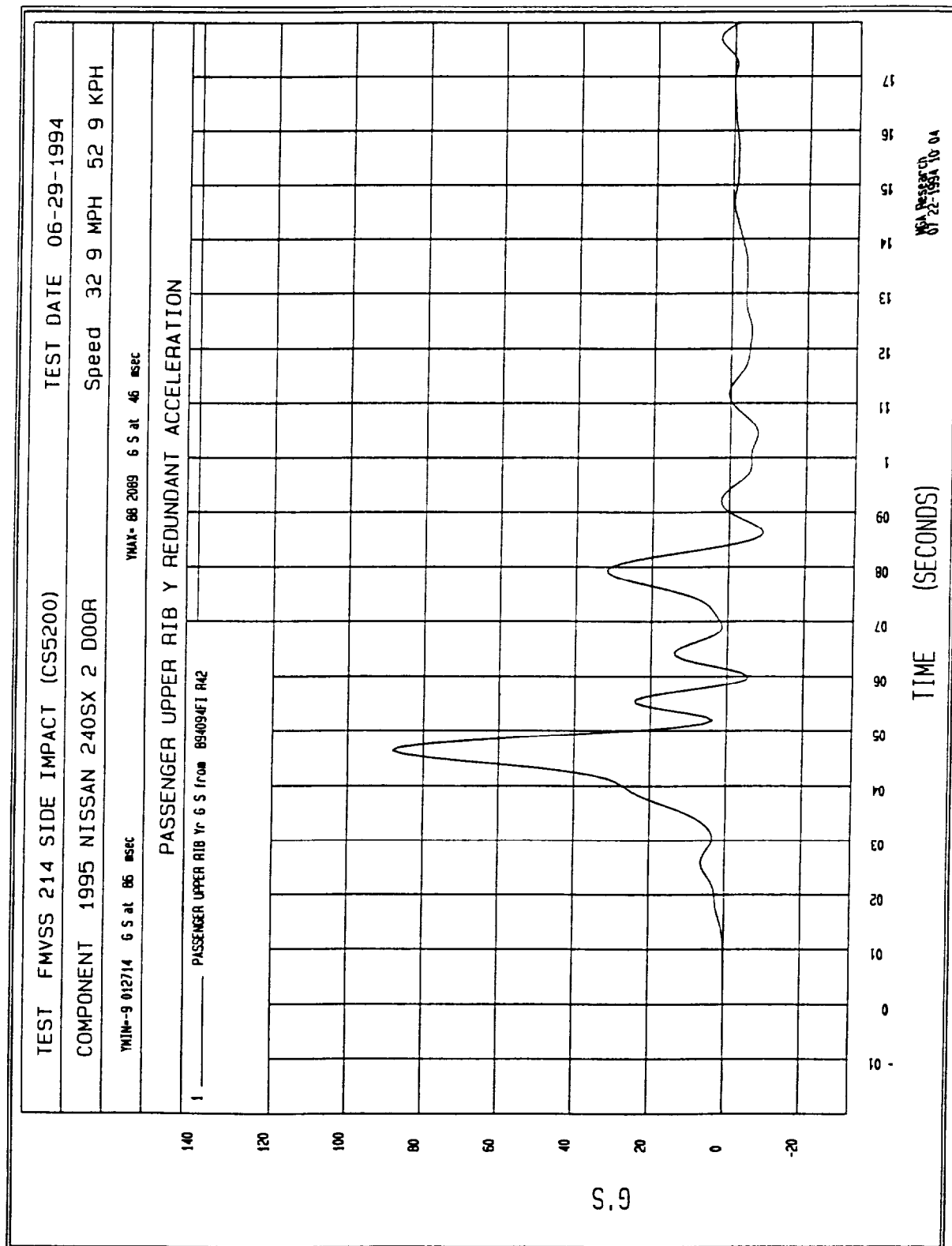


Figure B-90 - Passenger Upper Rib Y Redundant Acceleration vs. Time

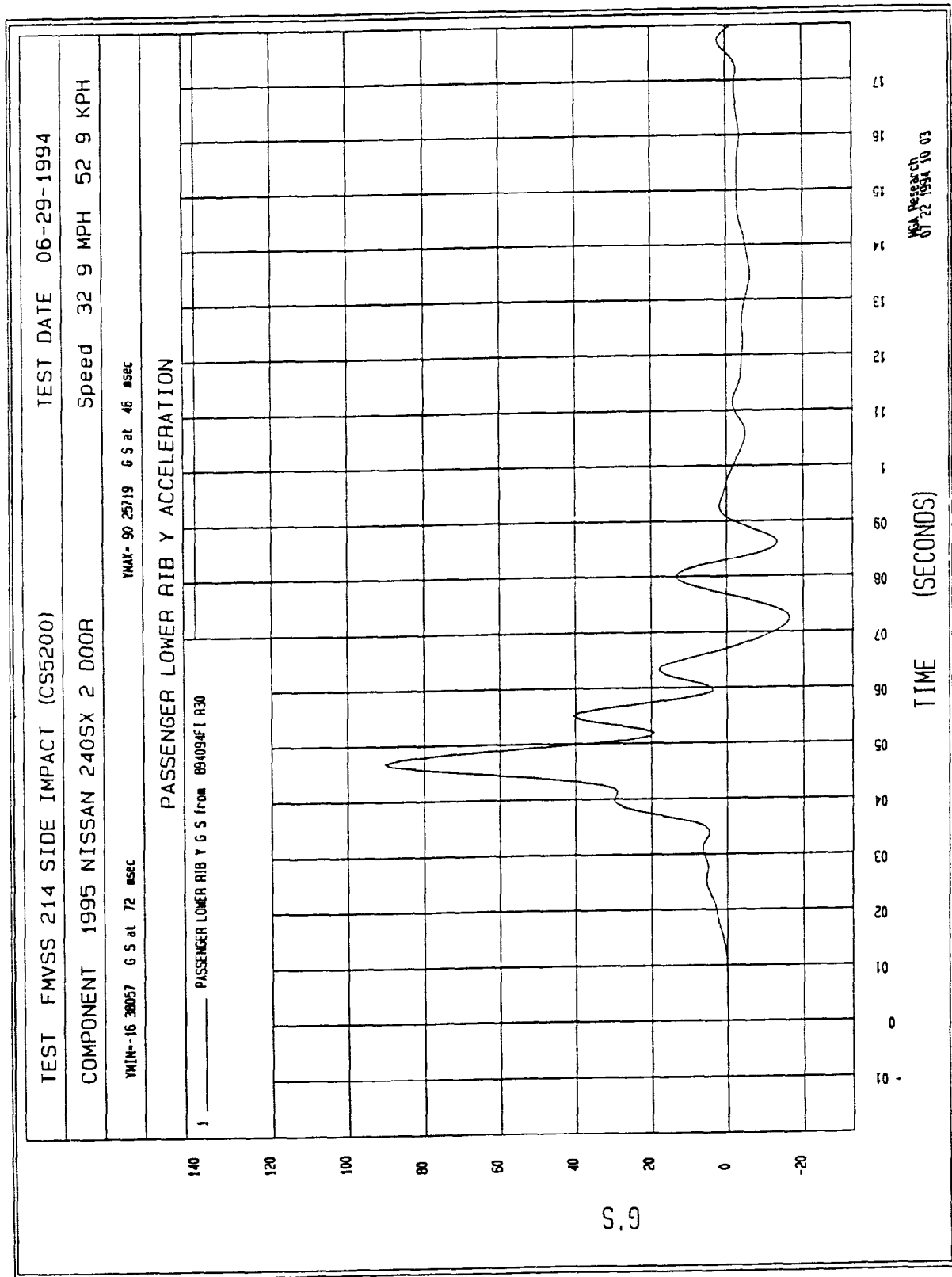


Figure B-91 - Passenger Lower Rib Y Acceleration vs. Time

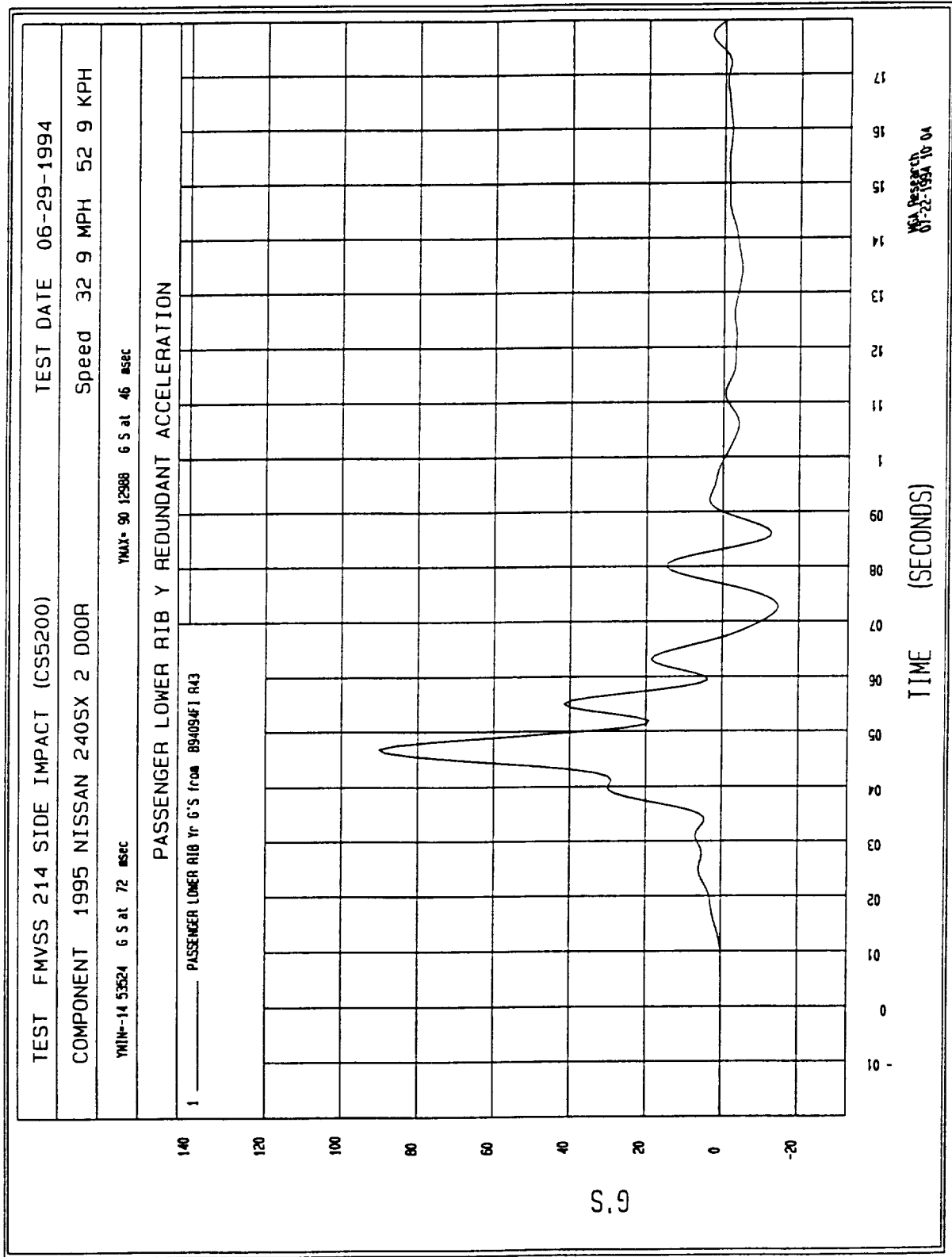


Figure B-92 - Passenger Lower Rib Y Redundant Acceleration vs. Time

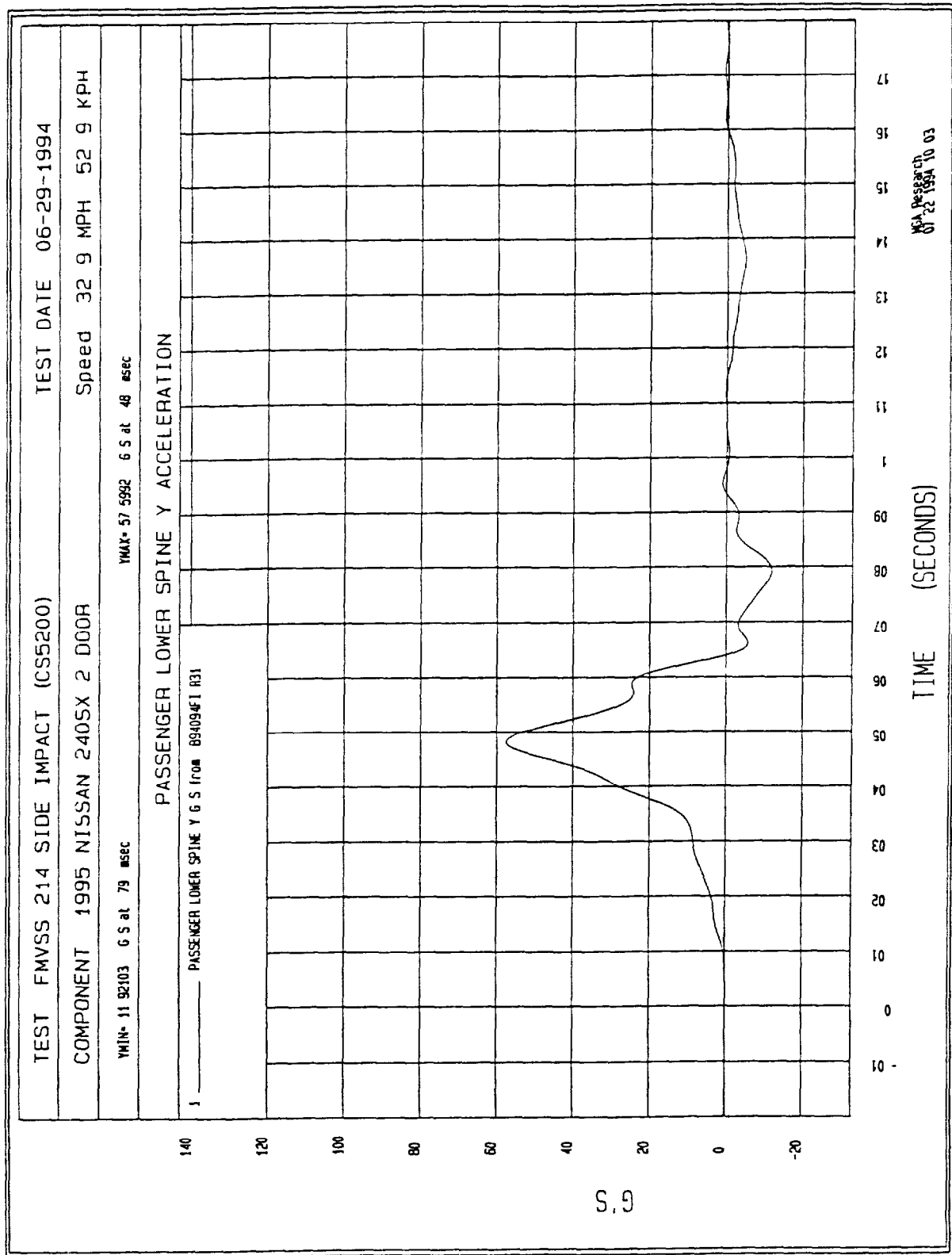


Figure B-93 - Passenger Lower Spine Y Acceleration vs. Time

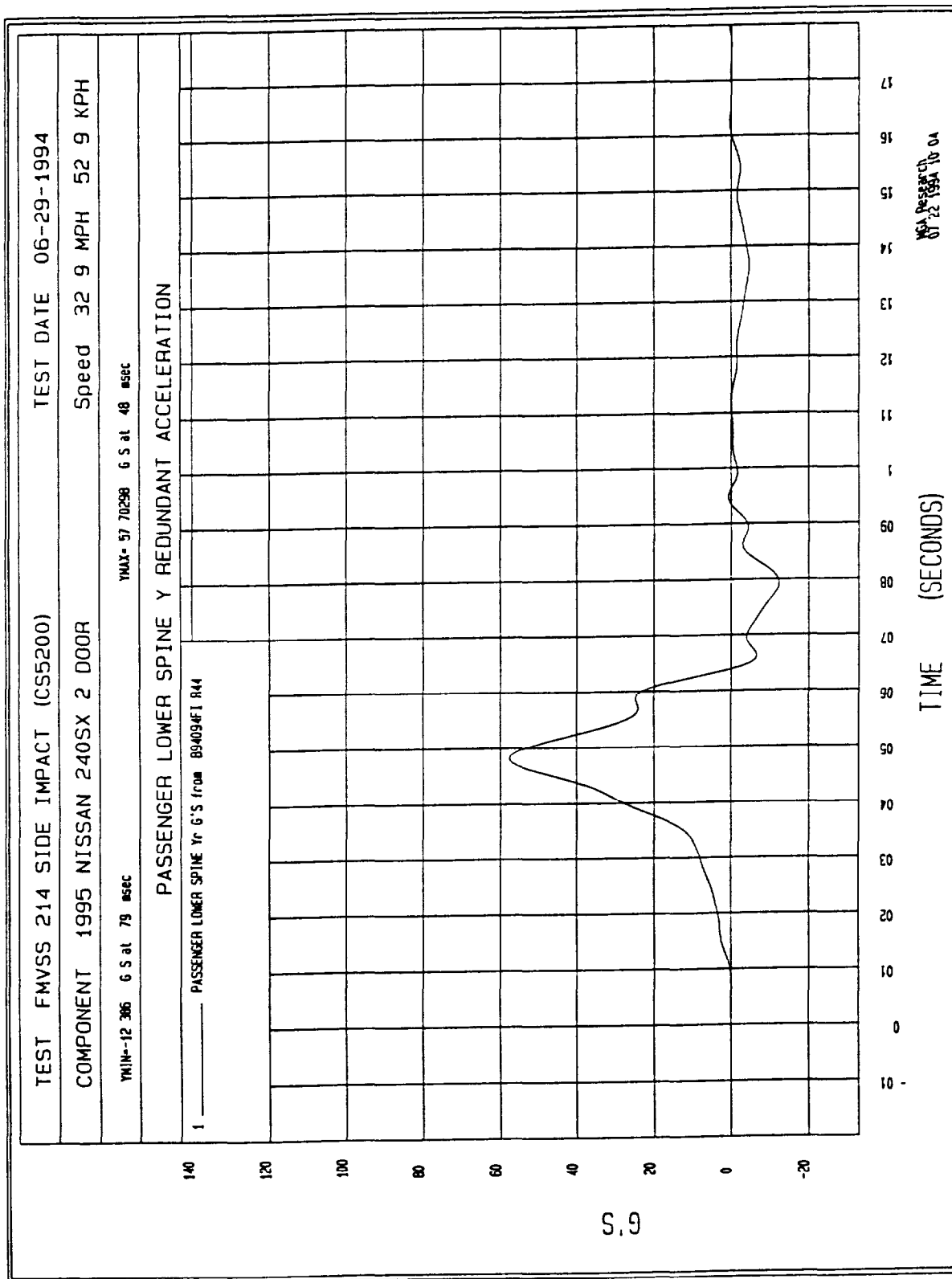


Figure B-94 - Passenger Lower Spine Y Redundant Acceleration vs. Time

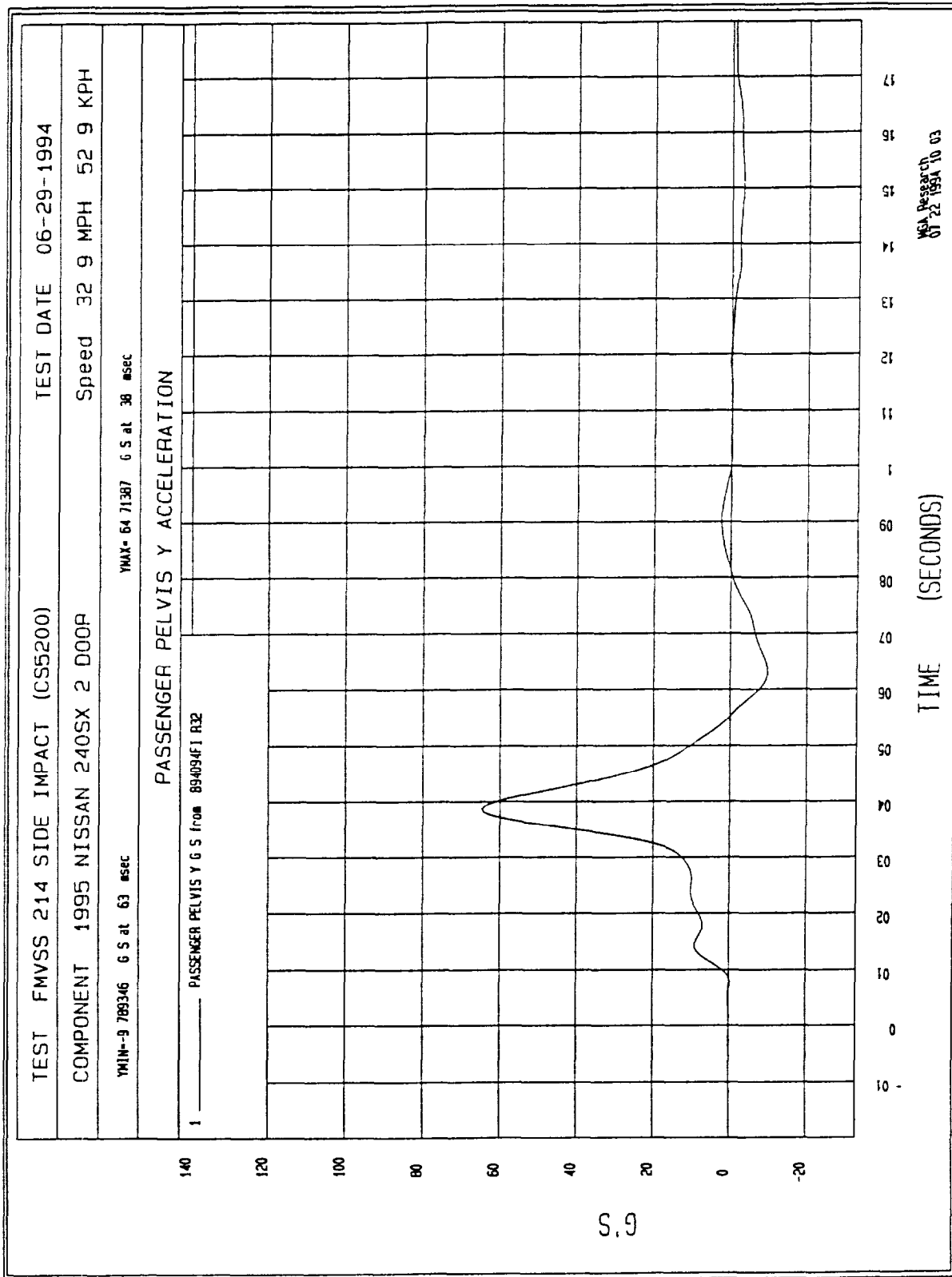


Figure B-95 - Passenger Pelvis Y Acceleration vs. Time

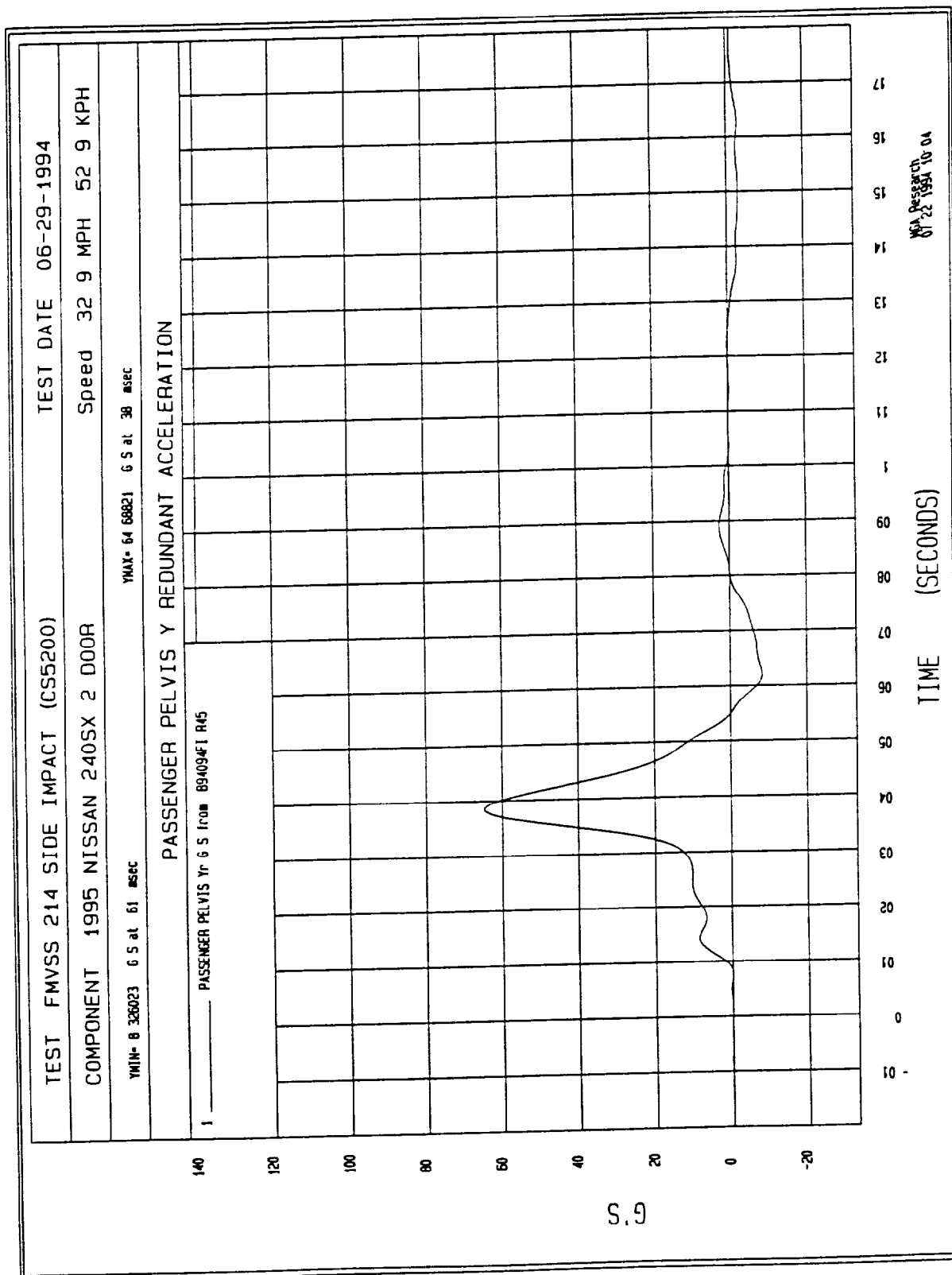


Figure B-96 - Passenger Pelvis Y Redundant Acceleration vs. Time

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-94-DC013

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

NISSAN MOTOR CORPORATION
1995 NISSAN 240SX 2 DOOR COUPE
NHTSA NO. CS5200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: June 29, 1994

Report Date: September 23, 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: 269	POST-TEST CERTIFICATION DATA	3-1
DUMMY S/N: 270	POST-TEST CERTIFICATION DATA	4-1
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DUMMY S/N: 270	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

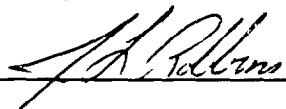
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.. 269

DATE OF VERIFICATION: June 27, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35 0" - 35.8"	35.4
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 2
KV - Knee Pivot From Back Line	20.1" - 20 7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19 6
HW - Hip Width	14.0" - 15.4"	14.4

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 27, 1994

DUMMY NUMBER 269

TEST NUMBER. D94302

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	41
LOWER RIB	37 - 46 g's	37
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

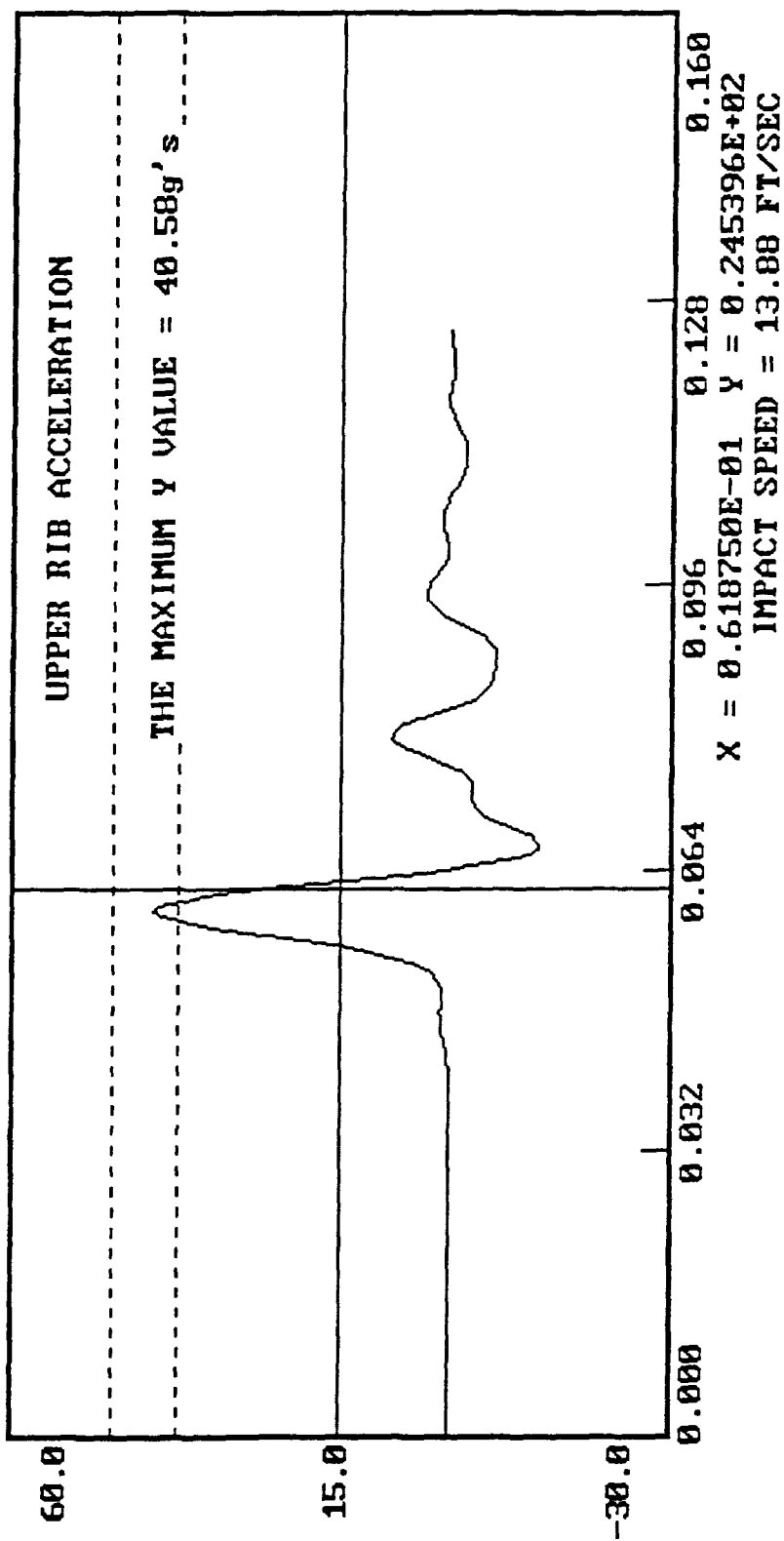
TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269

06-27-1994 13:29

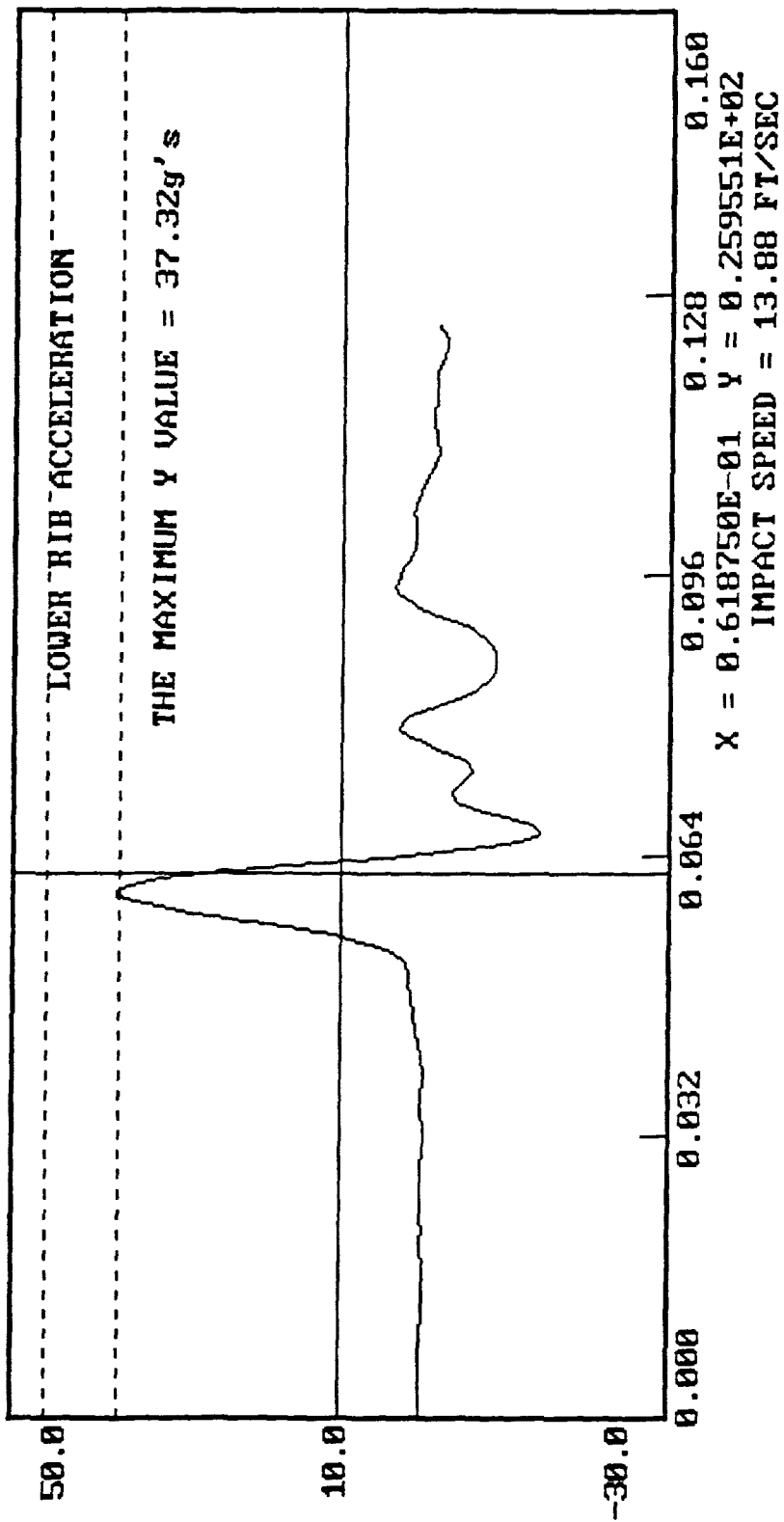
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269

06-27-1994 13:29

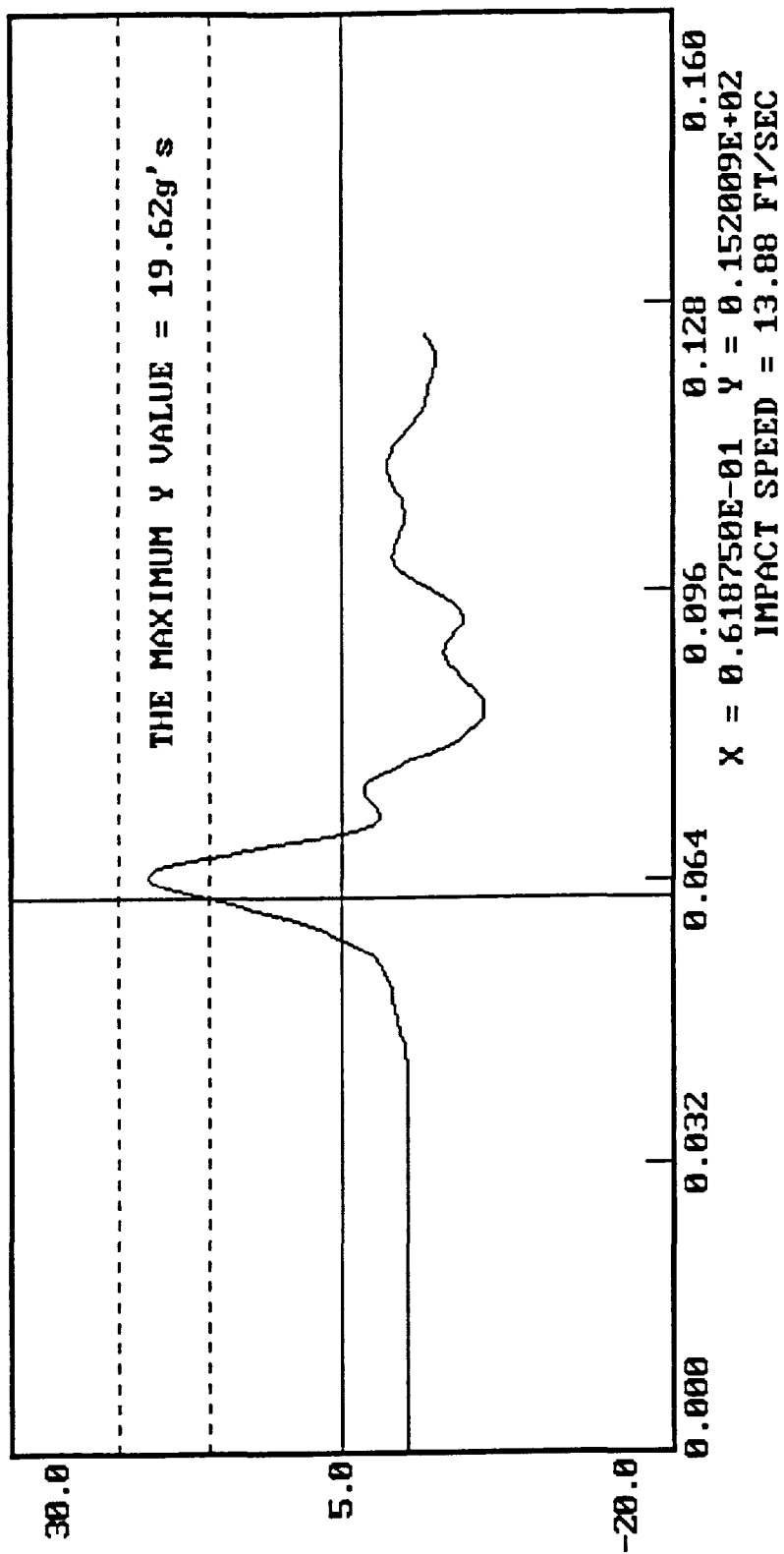
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269

06-27-1994 13:29

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 27, 1994

DUMMY NUMBER: 269

TEST NUMBER: D94303

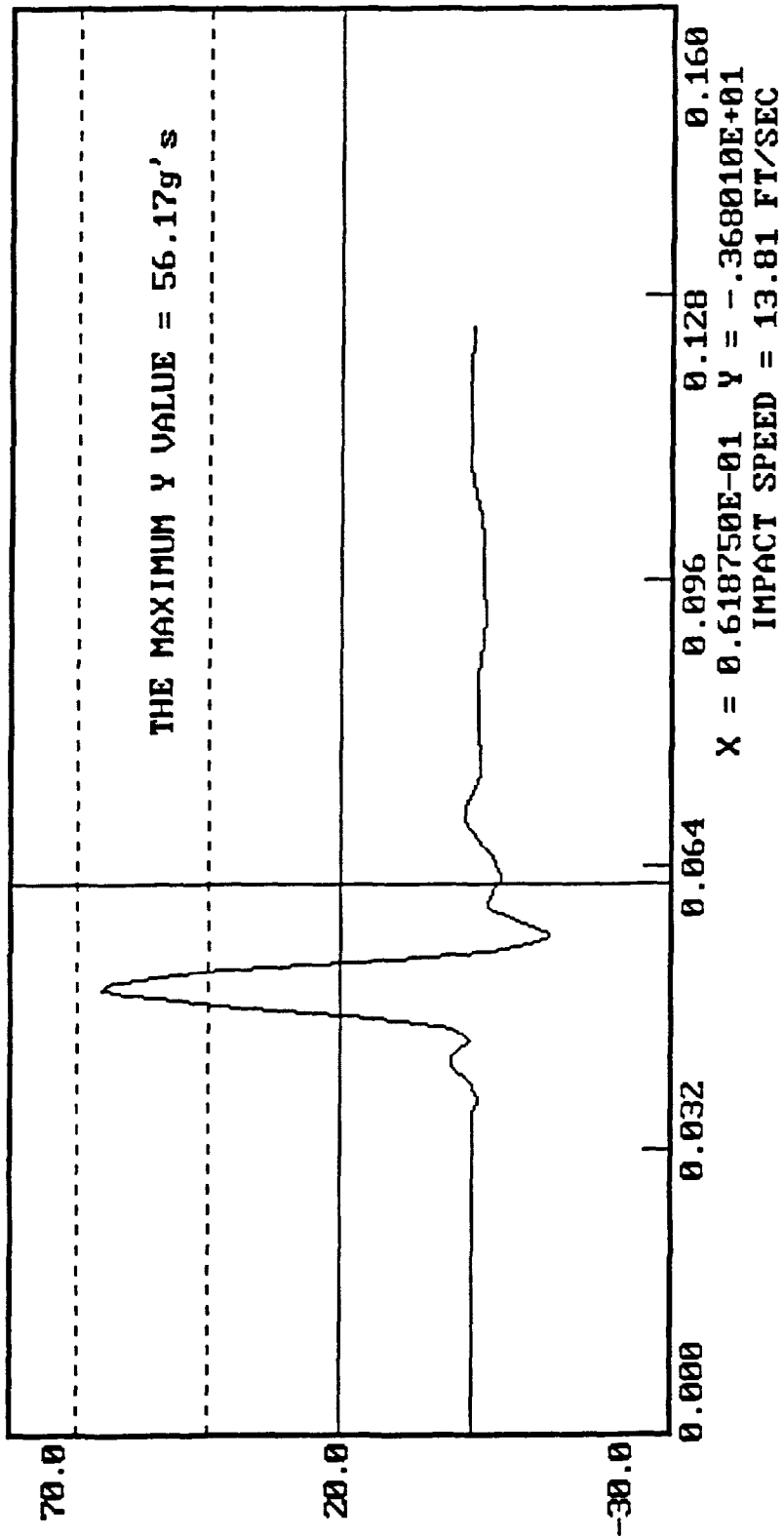
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	56

TEST MEETS SPECIFICATIONS

TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 269
 06-27-1994 16:03
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

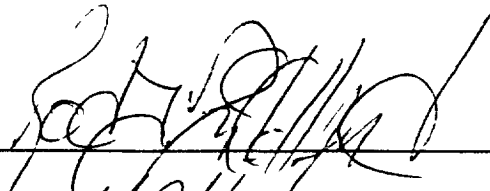
DATE June 27, 1994

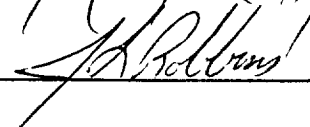
DUMMY NUMBER. 269

TEST NUMBER D94304

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	58%
FORCE @ 0.5 in	23.3 - 36.5 lbs	29.8
FORCE @ 0.75 in	36.7 - 49.8 lbs	45.5
FORCE @ 1.0 in	50 - 63 lbs	61
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN 

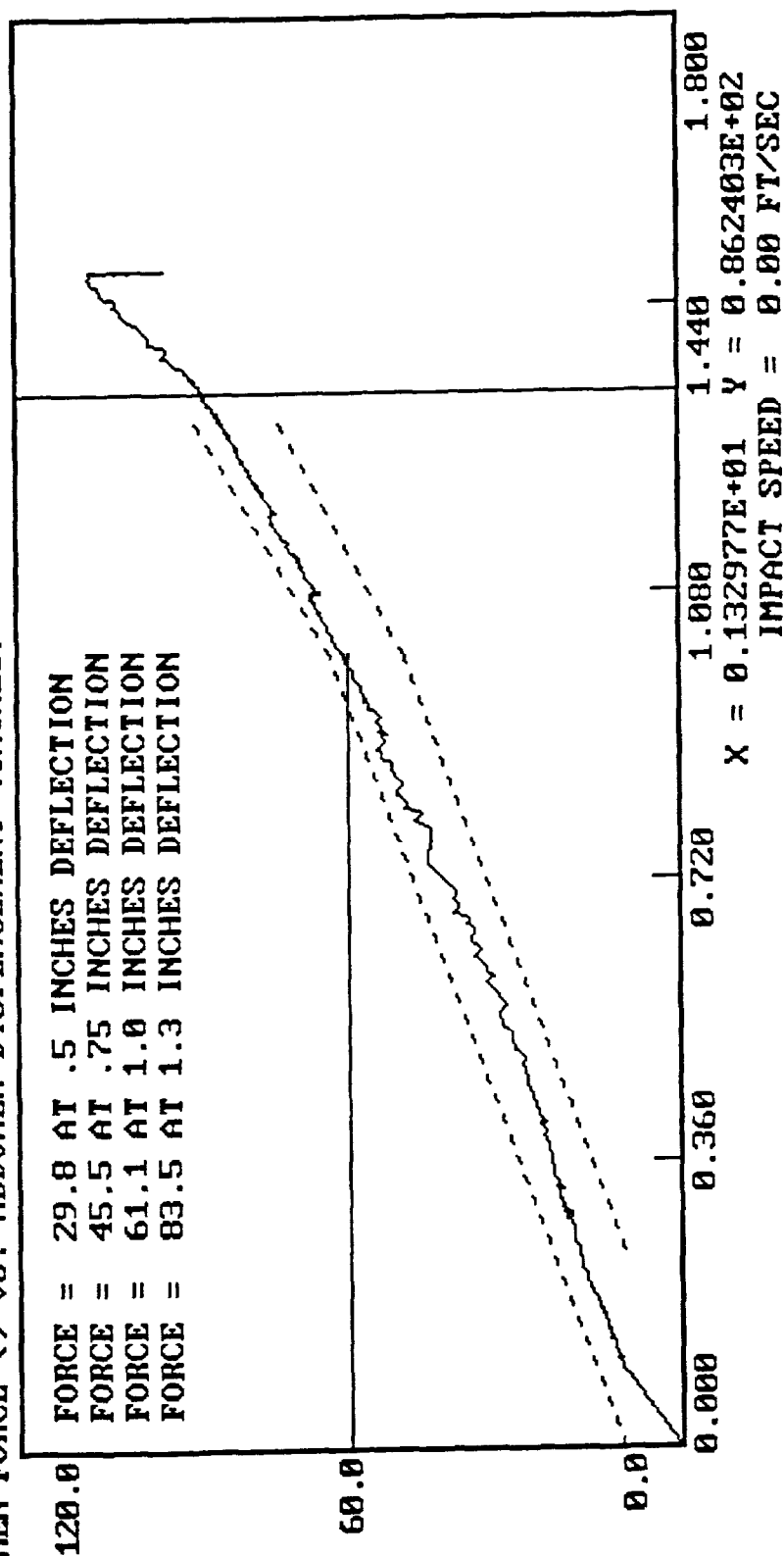
APPROVED BY 

06-27-1994 10:16

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 269

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE June 28, 1994

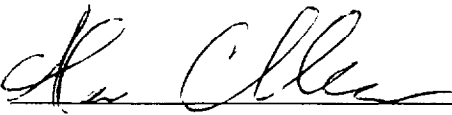
DUMMY NUMBER 269

TEST NUMBER. D94305

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	40
FORCE @ 40°	46 - 58 lbs	50
RETURN ANGLE	12° maximum	5°

TEST MEETS SPECIFICATIONS

TECHNICIAN

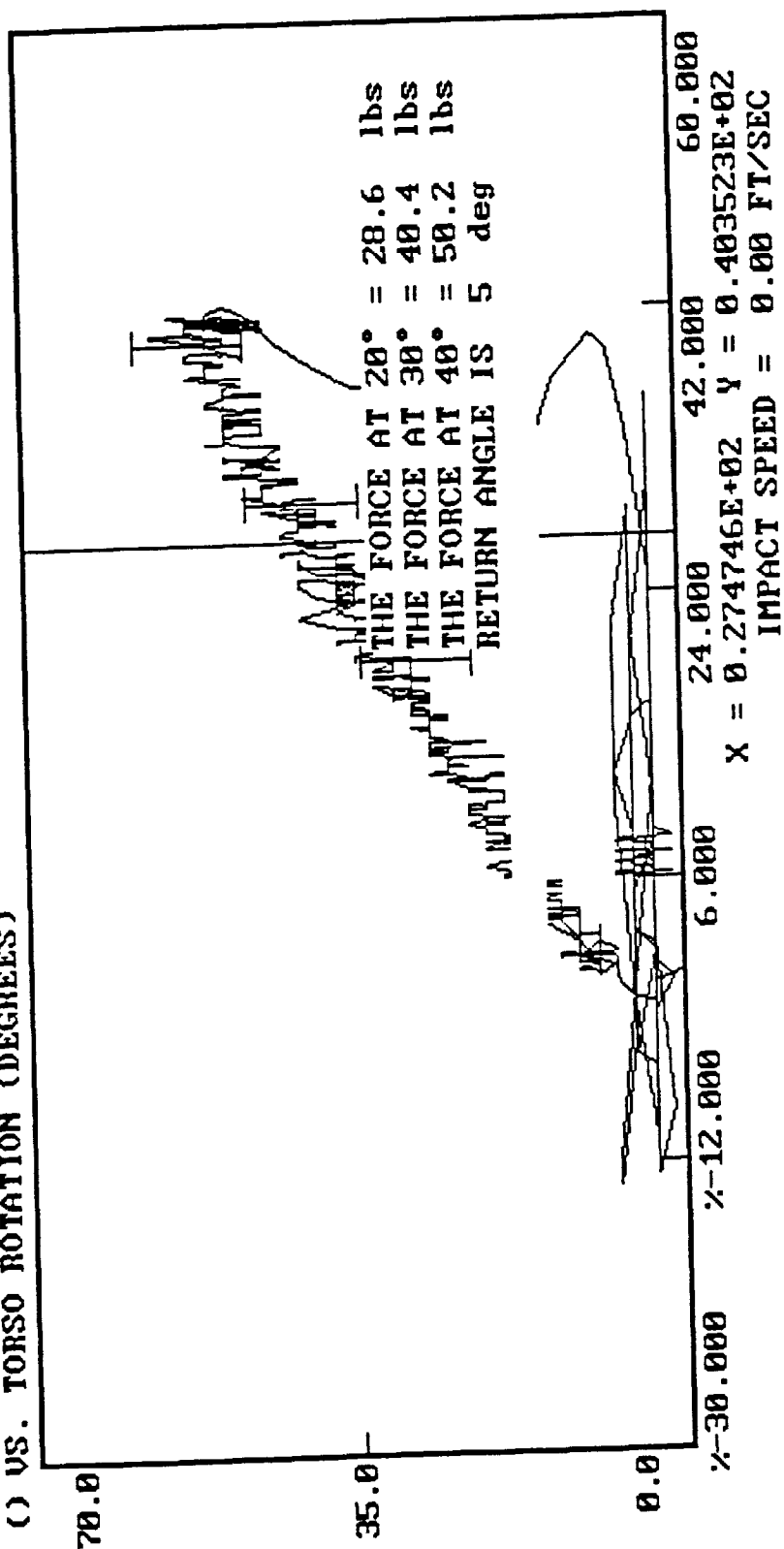


APPROVED BY



06-28-1994 08:57

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



PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 270

Calibration Test Results Summary

Passenger Serial Number 270

Pre-Test Calibration

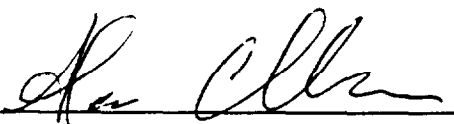
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test.	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

DATE OF VERIFICATION: June 22, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
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"	20.5
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. June 22, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94252

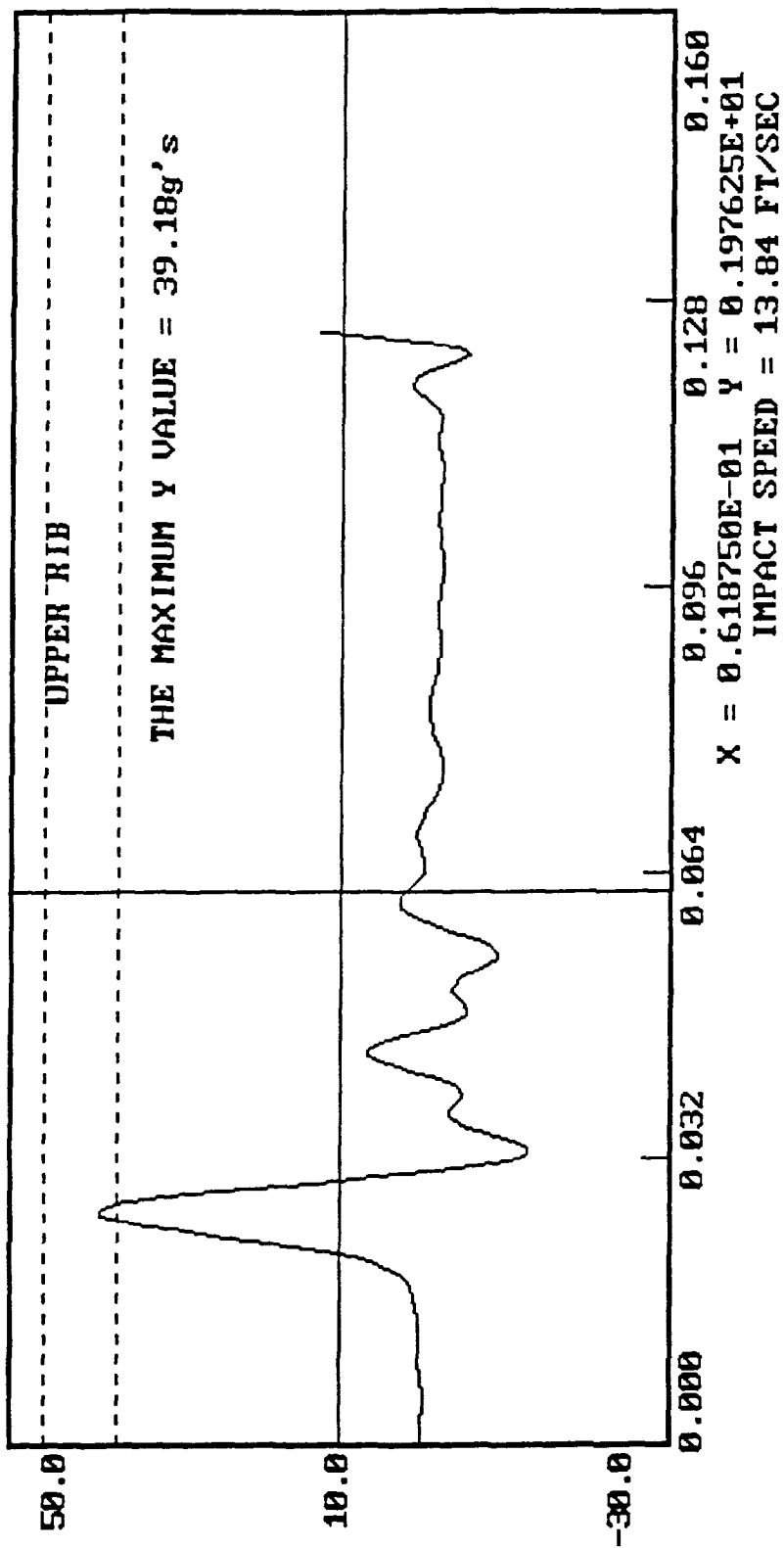
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	69°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	39
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

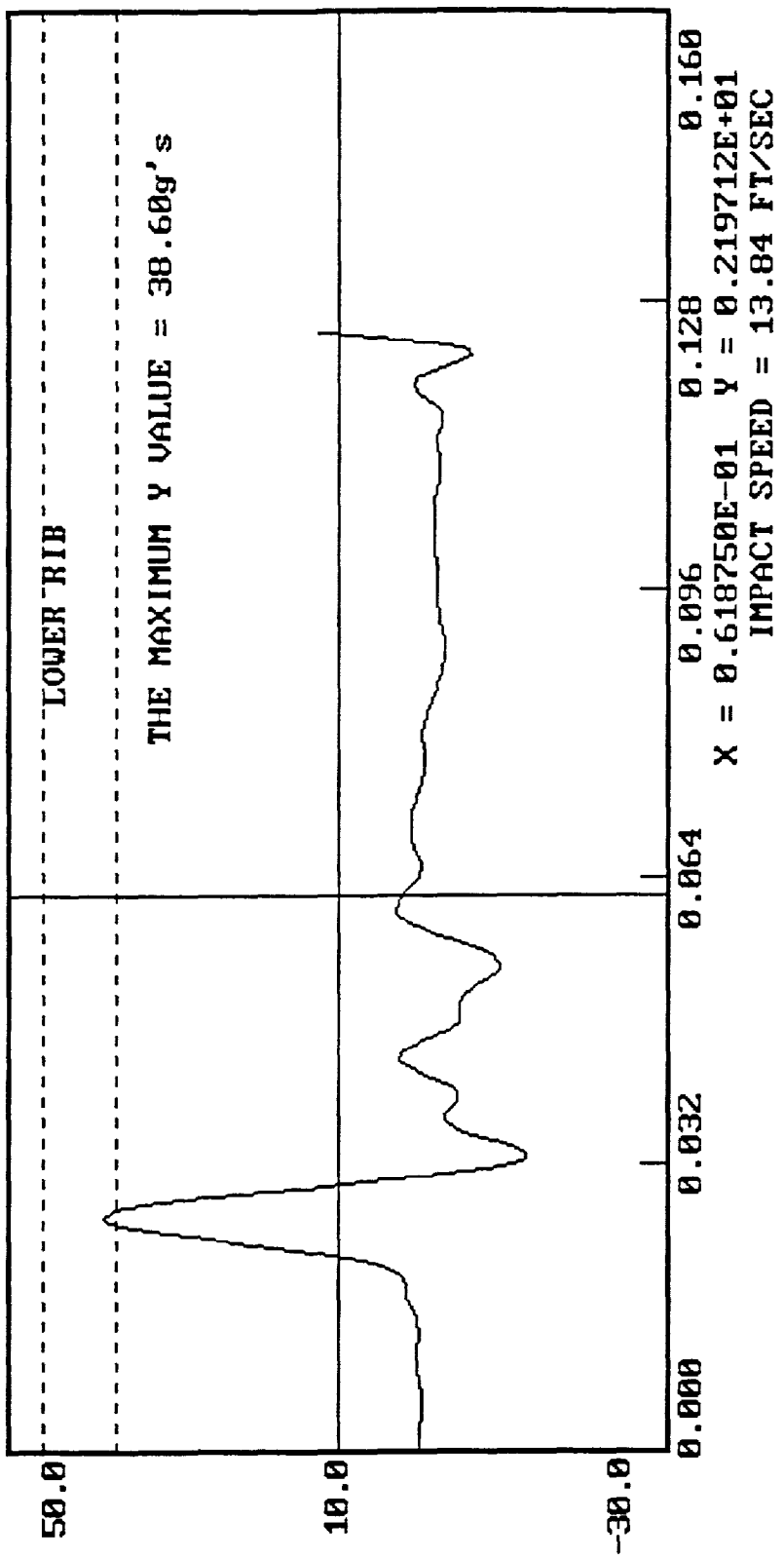
TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 06-23-1994 09:34
 ACCELERATION (G'S) VS. TIME ((SECONDS))



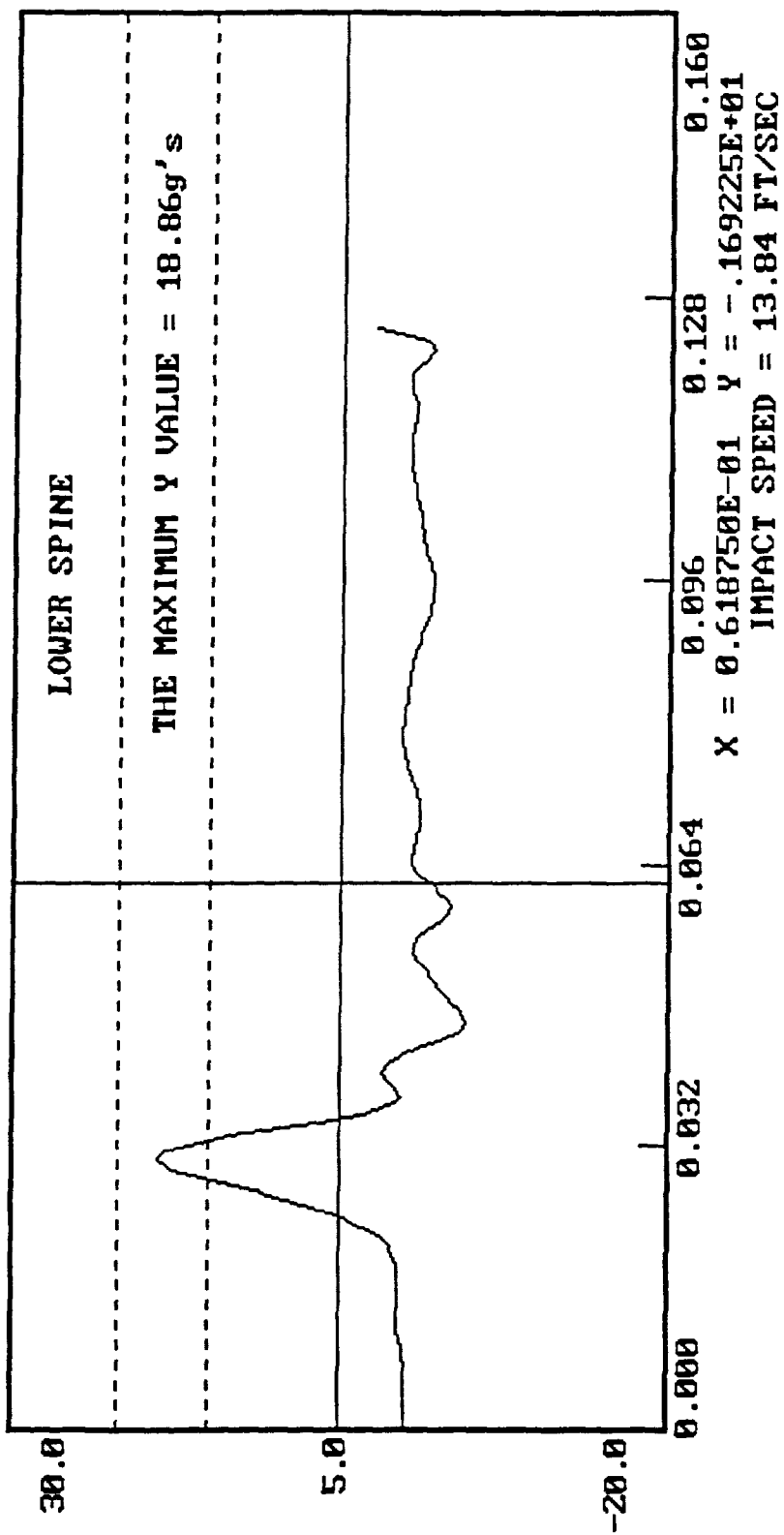
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 06-23-1994 09:34
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270

06-23-1994 09:34

() VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 22, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94253

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	42%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	59

TEST MEETS SPECIFICATIONS

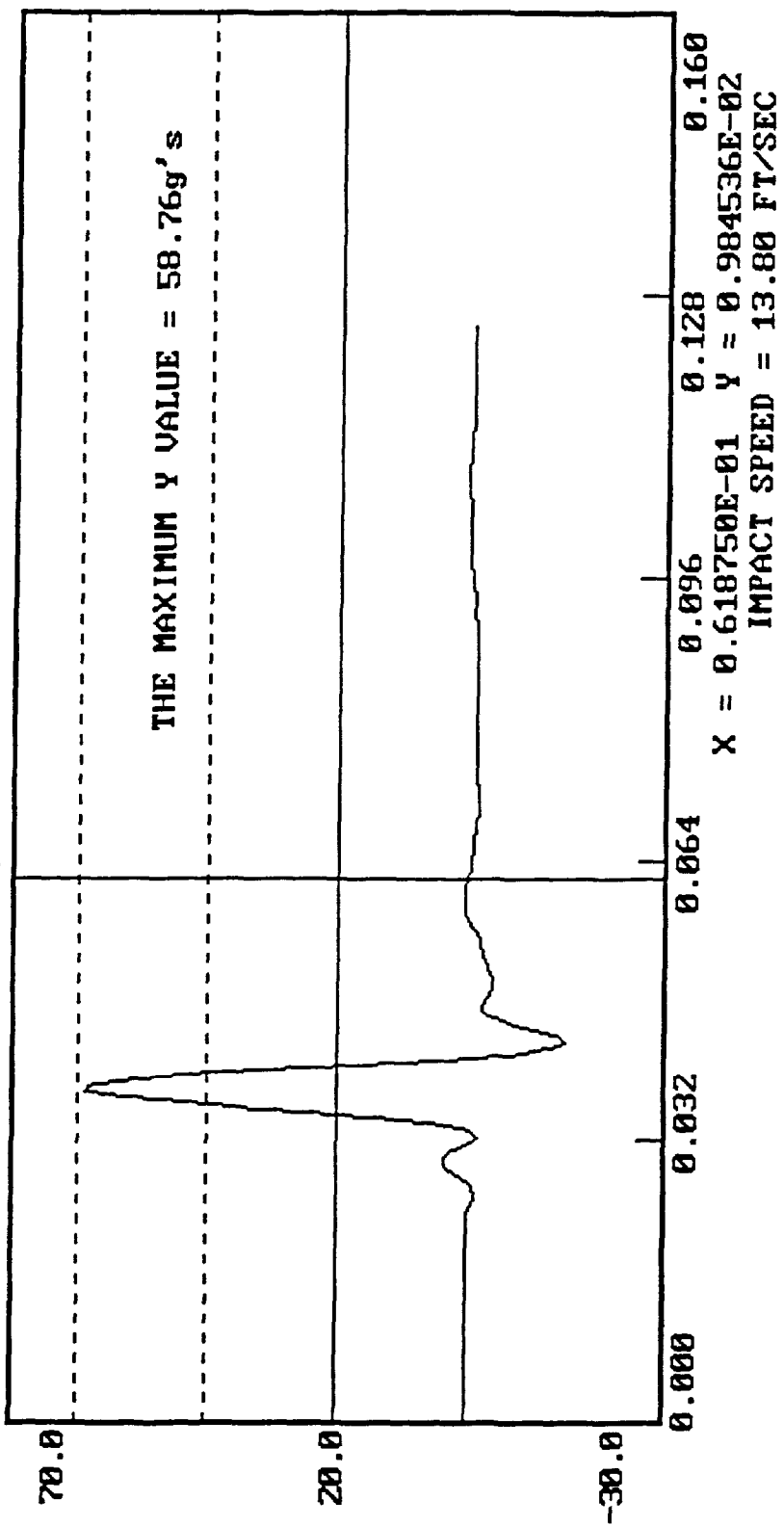
TECHNICIAN

APPROVED BY

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 270

06-22-1994 15:04

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



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

DATE. June 24, 1994

DUMMY NUMBER: 270

TEST NUMBER. D94254

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	57%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.0
FORCE @ 0.75 in	36.7 - 49.8 lbs	45.5
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	81

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

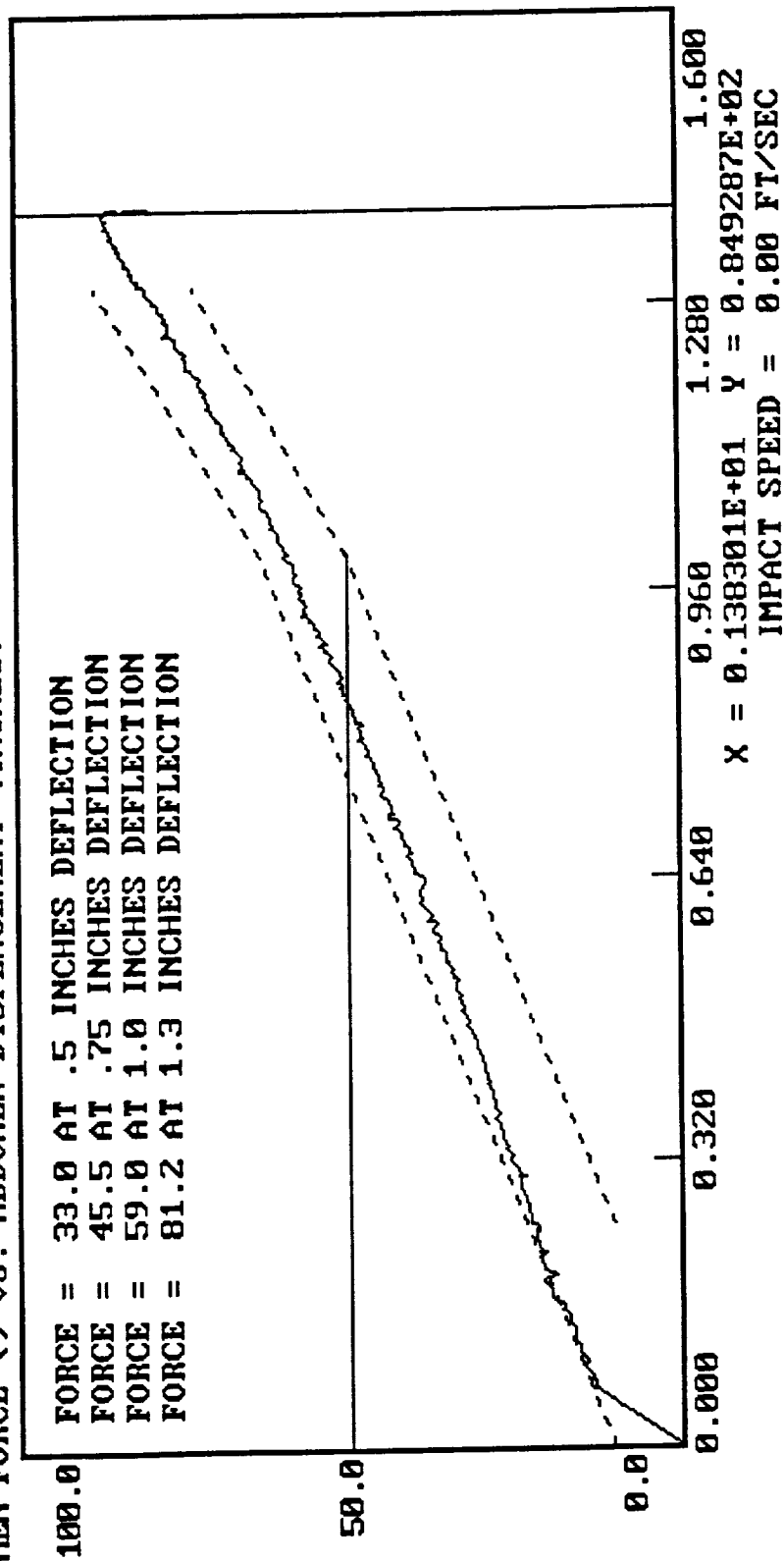


06-24-1994 15:52

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 270

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE. June 27, 1994

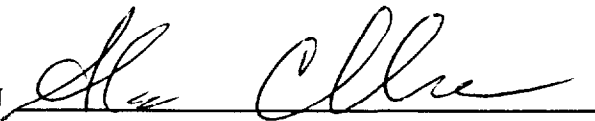
DUMMY NUMBER. 270

TEST NUMBER. D94255

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	30
FORCE @ 30°	34 - 46 lbs	37
FORCE @ 40°	46 - 58 lbs	53
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN

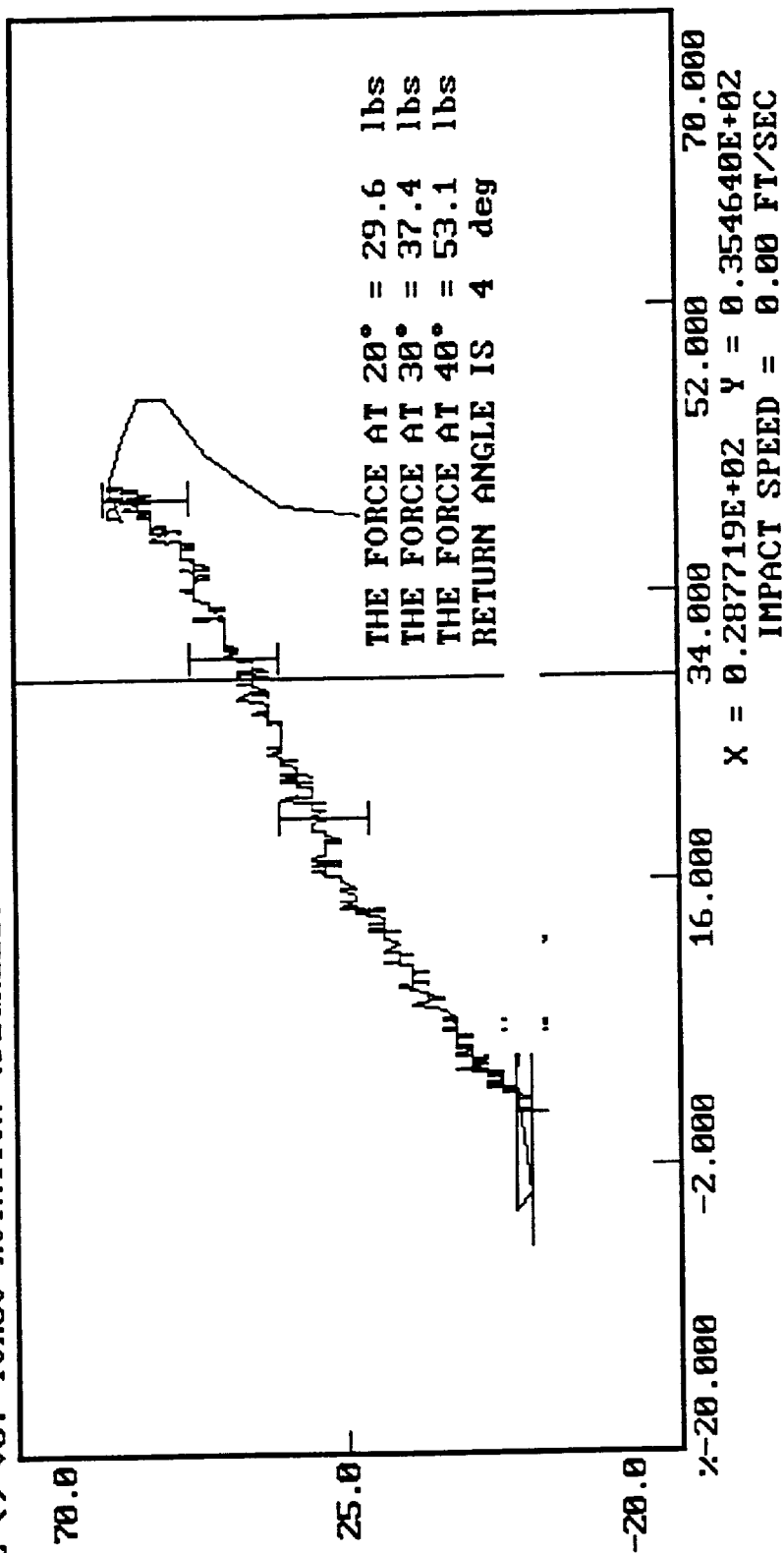


APPROVED BY



06-27-1994 09:38

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 270
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: June 30, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
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"	9.2
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	14.4

MEASUREMENTS BY: _____

APPROVED BY: _____

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 30, 1994

DUMMY NUMBER: 269

TEST NUMBER: D94382

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	45%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	38
LOWER SPINE	15 - 22 g's	19

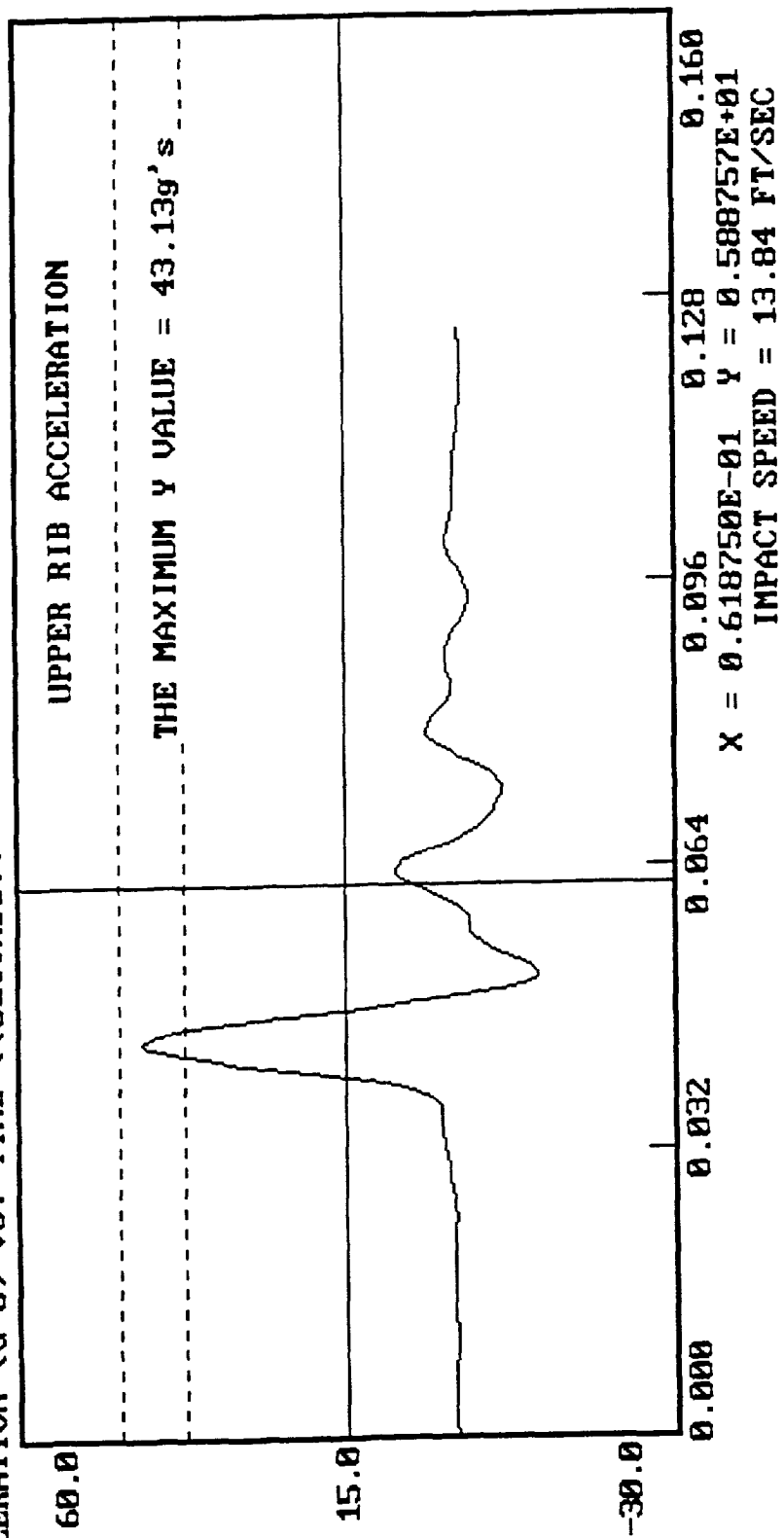
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

06-30-1994 15:54

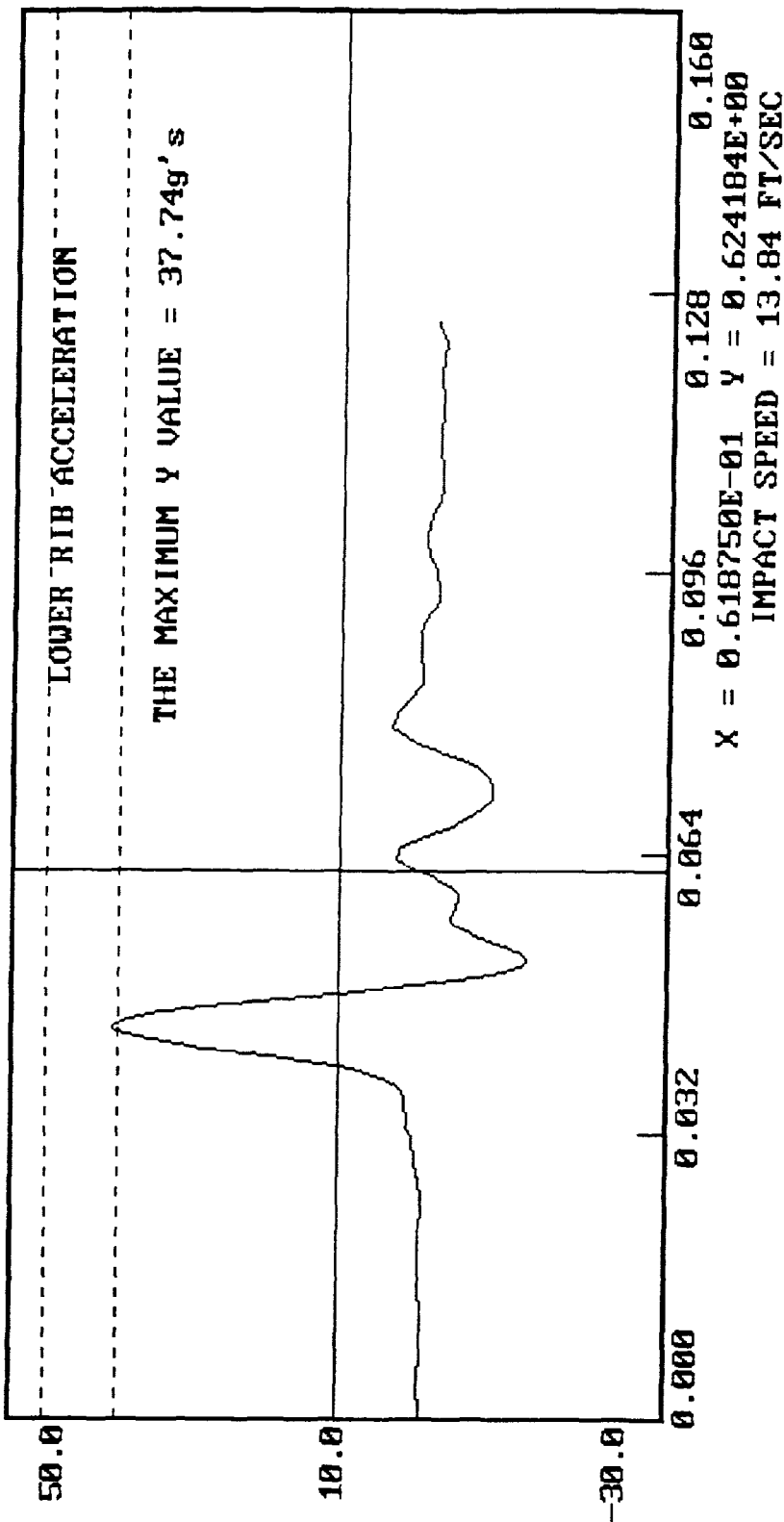
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269
ACCELERATION (G'S) VS. TIME ((SECONDS))



06-30-1994 15:54

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269

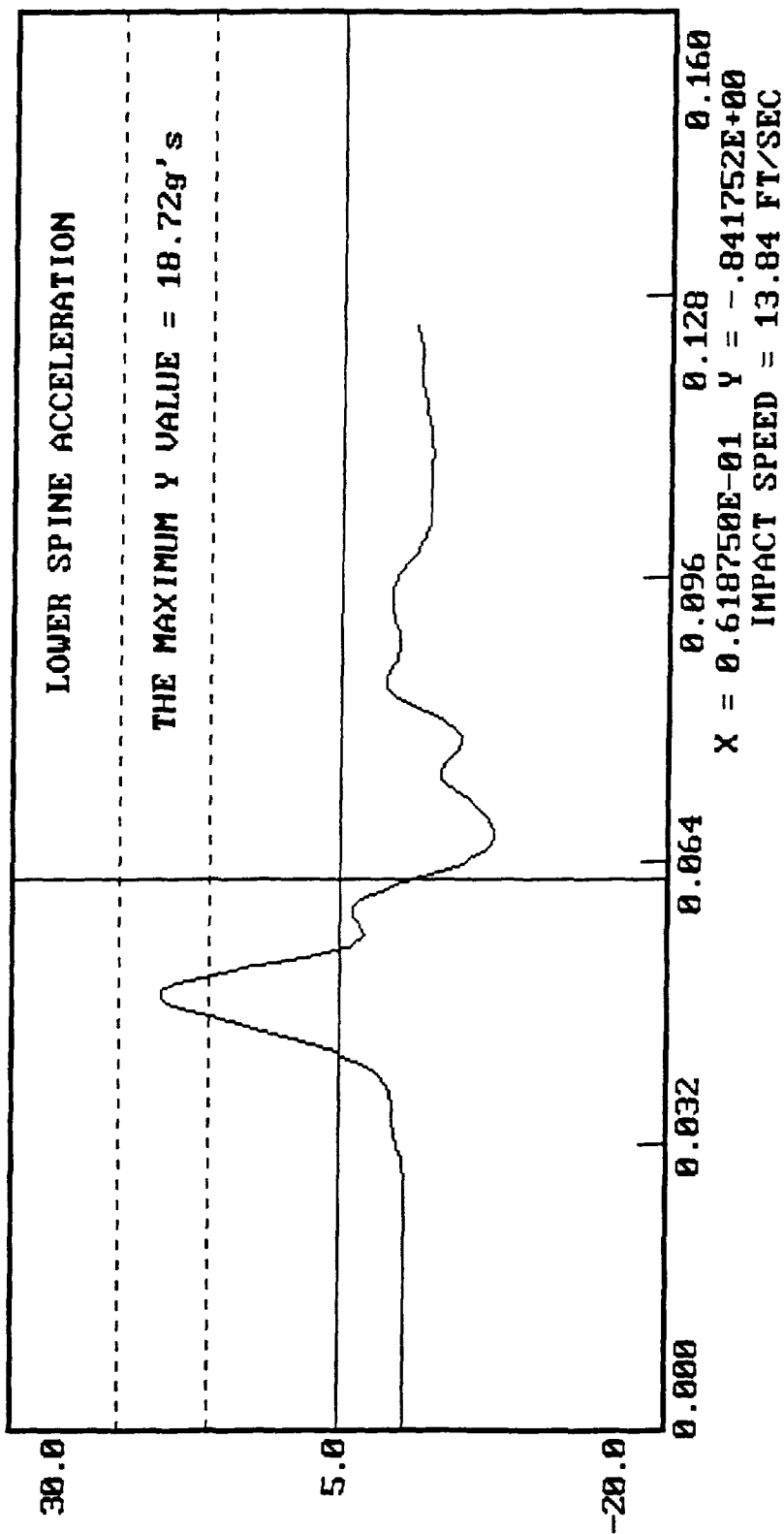
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269

06-30-1994 15:54

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 5, 1994

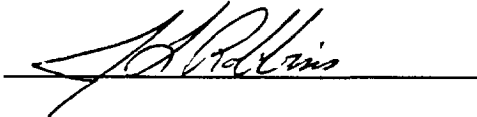
DUMMY NUMBER. 269

TEST NUMBER. D94383

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	71°
RELATIVE HUMIDITY	10 - 70%	42%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	55

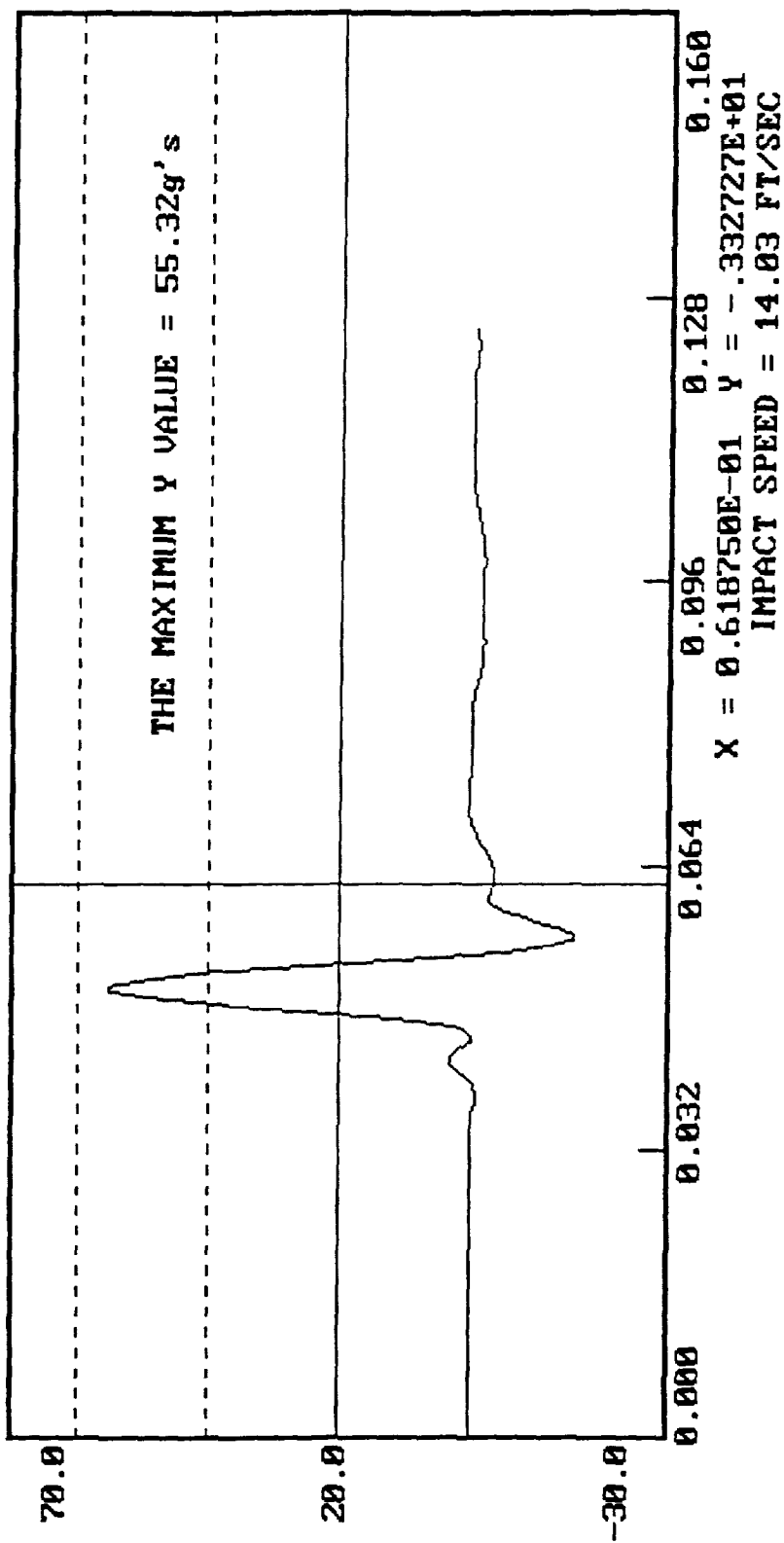
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 269
 07-05-1994 12:55

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: July 1, 1994

DUMMY NUMBER: 269

TEST NUMBER: D94384

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	72°
RELATIVE HUMIDITY	10 - 70%	52%
FORCE @ 0.5 in	23.3 - 36.5 lbs	29.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.4
FORCE @ 1.0 in	50 - 63 lbs	56
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

TECHNICIAN

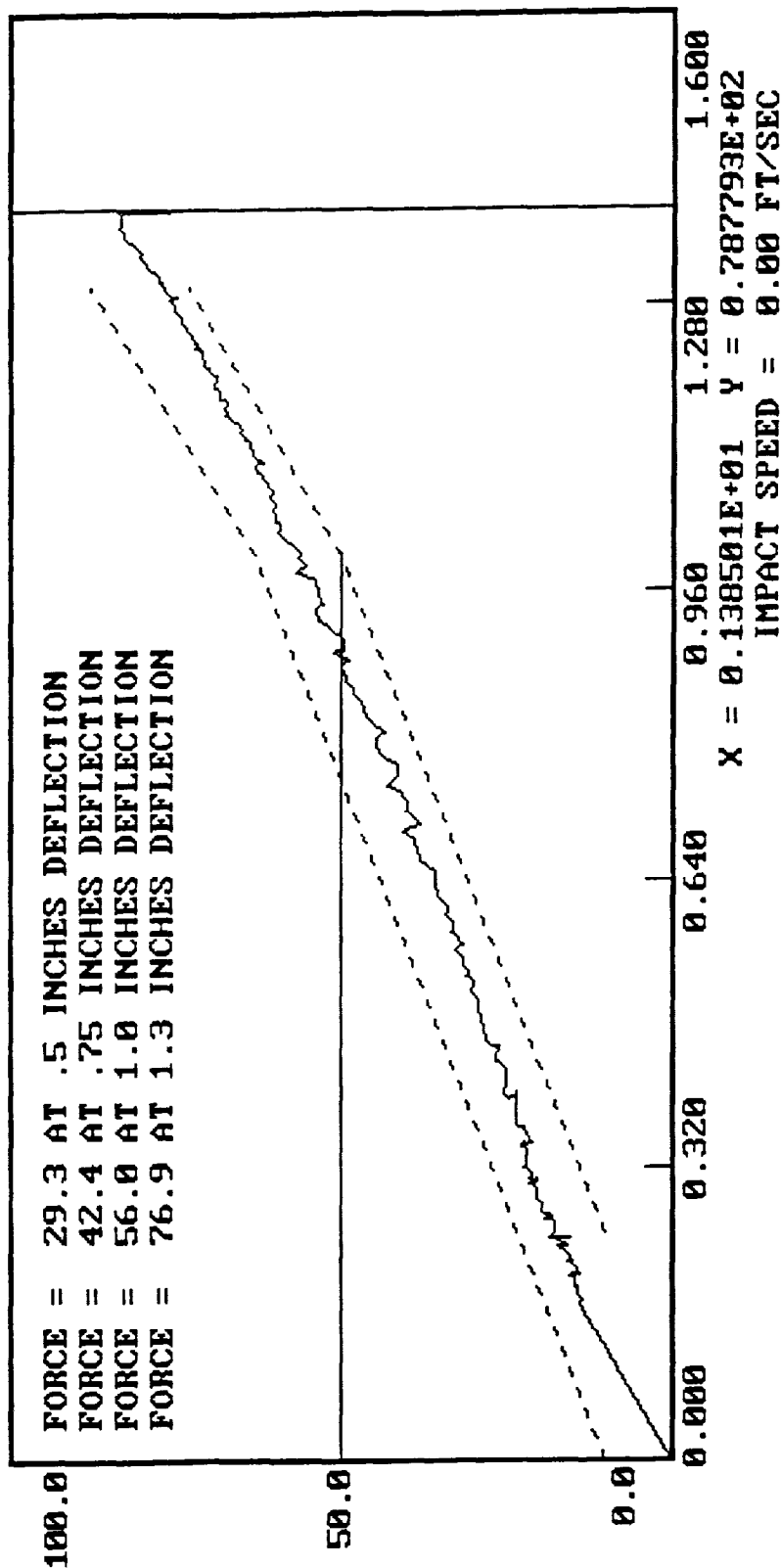
APPROVED BY

07-01-1994 10:09

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 269

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: July 5, 1994

DUMMY NUMBER. 269

TEST NUMBER: D94385

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	71°
RELATIVE HUMIDITY	10 - 70%	42%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	32
FORCE @ 30°	34 - 46 lbs	42
FORCE @ 40°	46 - 58 lbs	58
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN

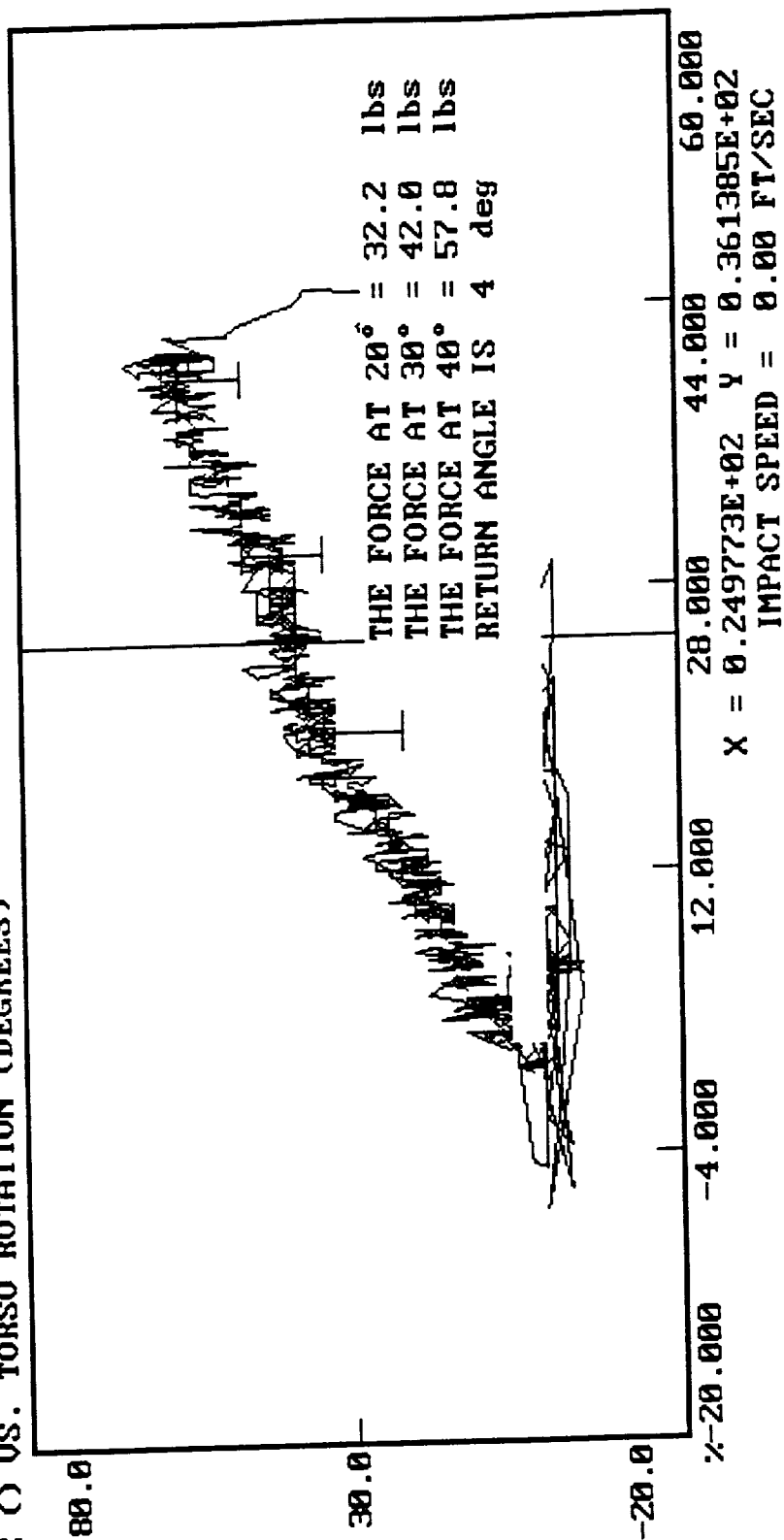


APPROVED BY



07-05-1994 17:15

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



POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number 270

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 failed post-test impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression requirements.
Lumbar Flexion Test	The lumbar passed all flexion test requirements

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

DATE OF VERIFICATION: June 30, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
RH - Rib Height	19.75 - 20.5"	20.4
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"	20.2
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)

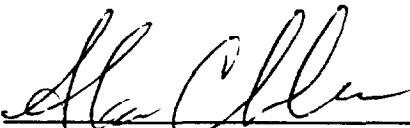
DATE: June 30, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94392

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

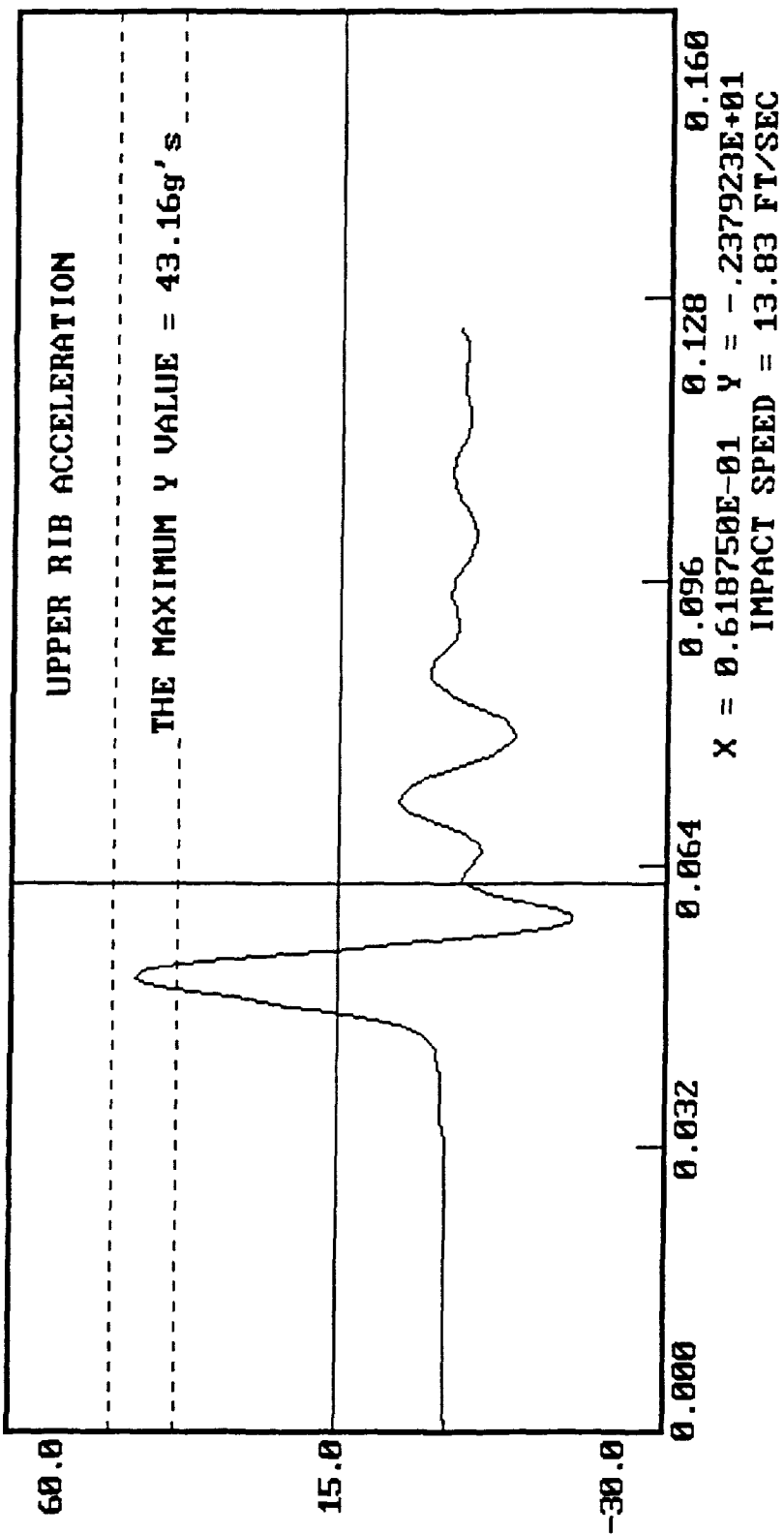
TECHNICIAN 

APPROVED BY 

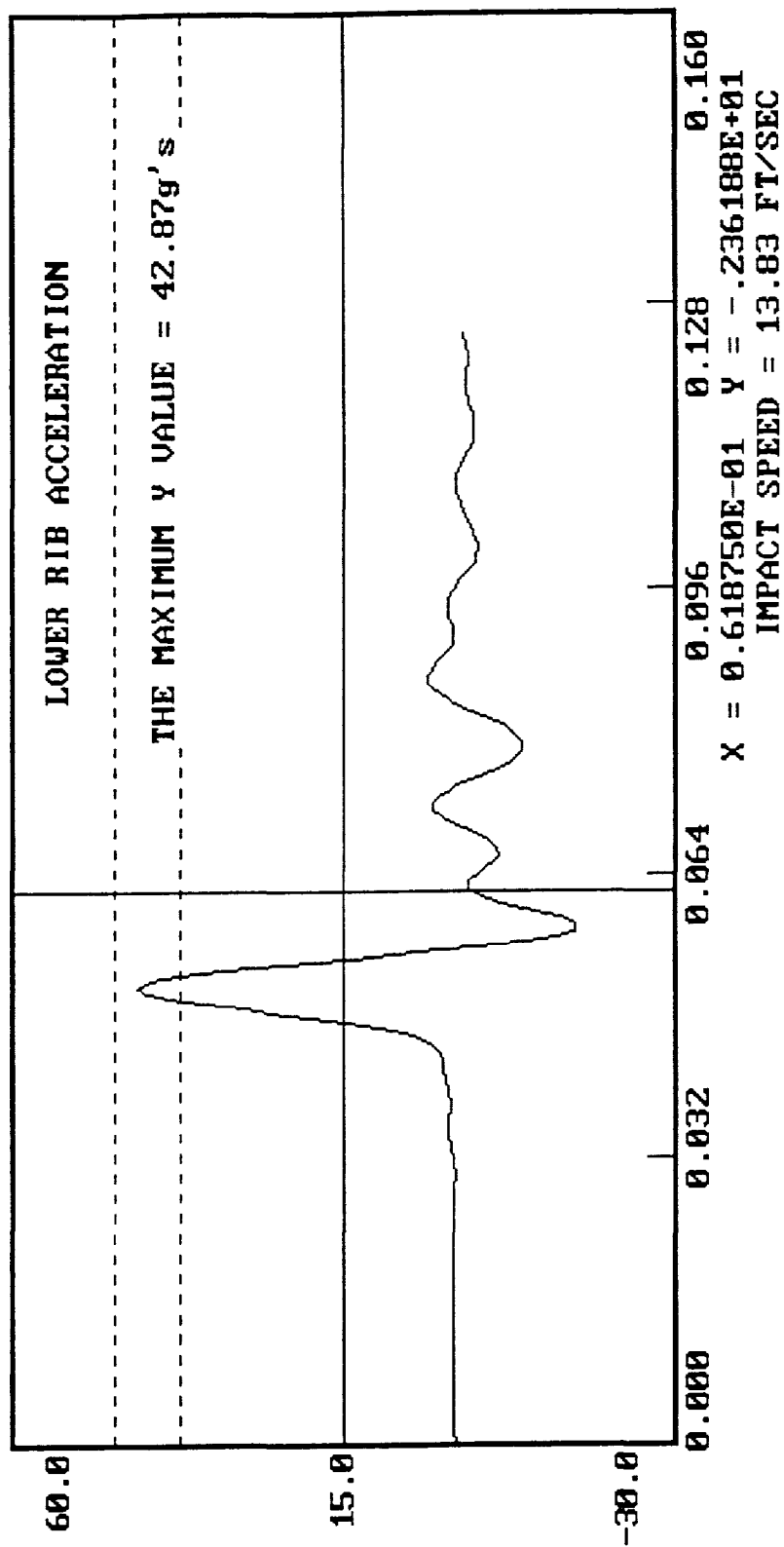
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270

06-30-1994 15:14

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



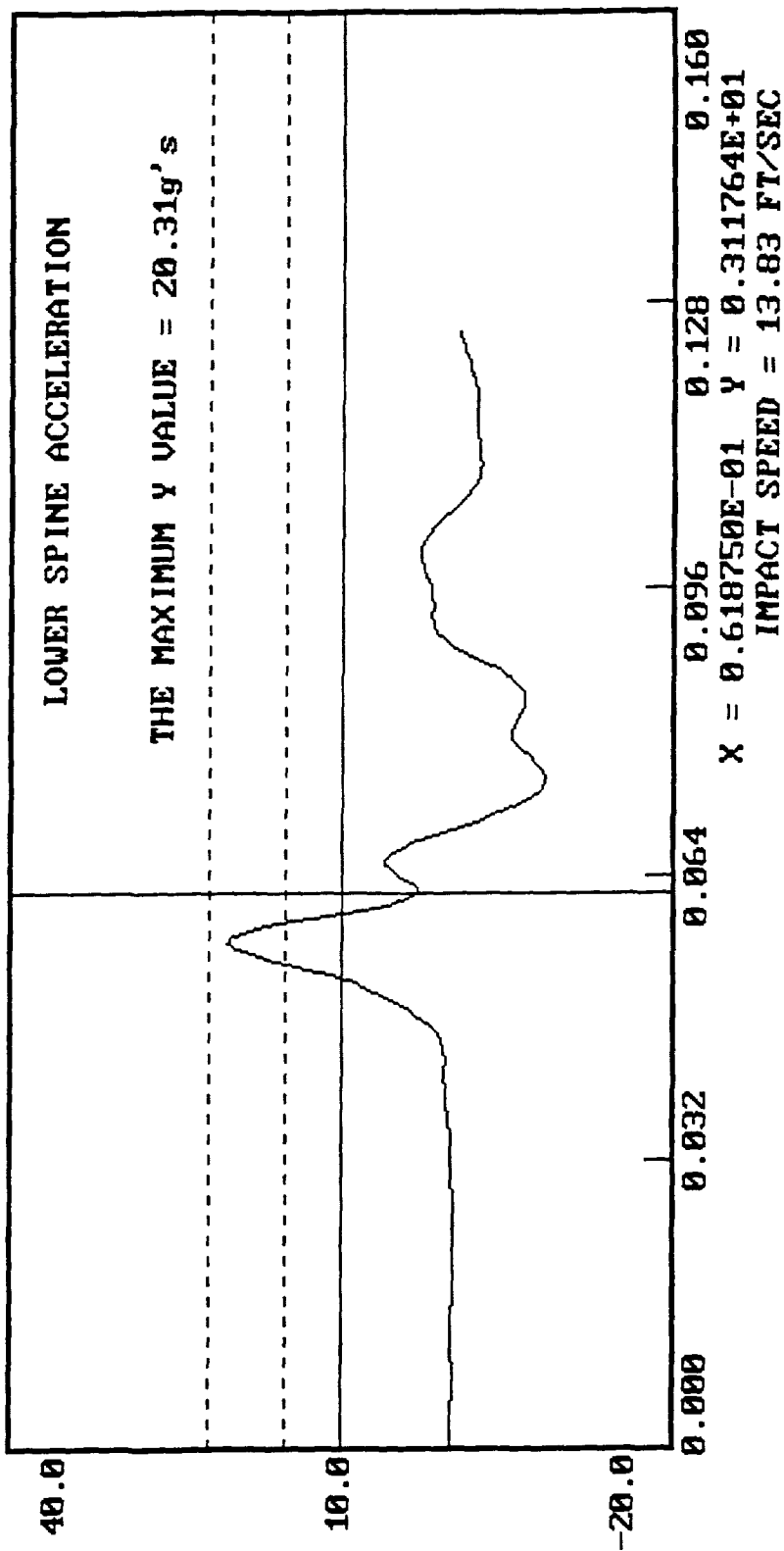
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 06-30-1994 15:14
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270

06-30-1994 15:14

() VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

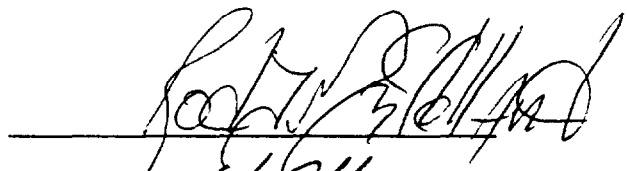
DATE. July 5, 1994

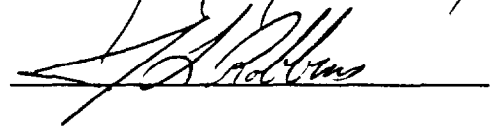
DUMMY NUMBER. 270

TEST NUMBER: D94393

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	71°
RELATIVE HUMIDITY	10 - 70%	42%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	66*

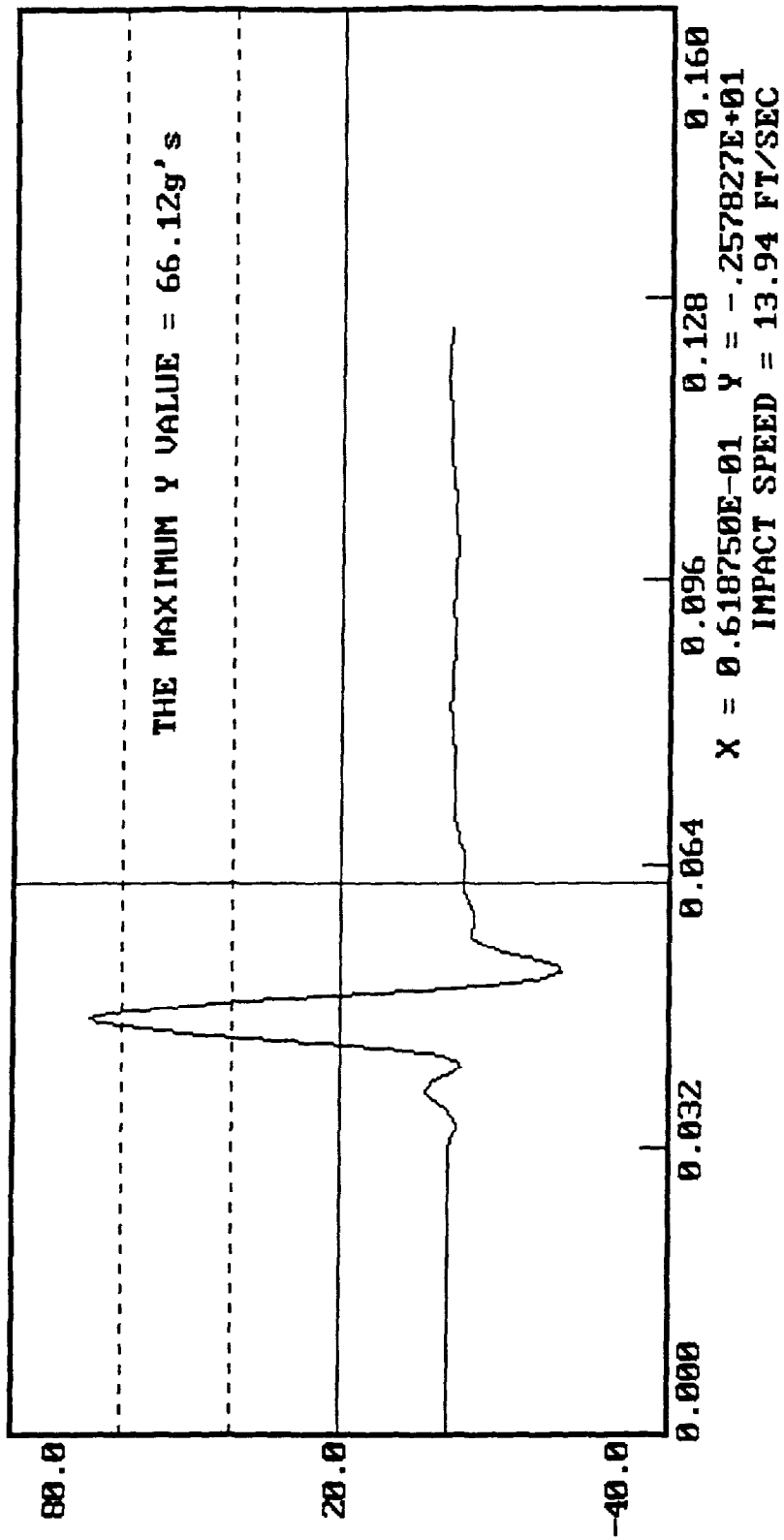
*TEST DOES NOT MEET SPECIFIED REQUIREMENTS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 270
 () VS. TIME ((SECONDS))

07-05-1994 13:51



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

DATE: July 1, 1994

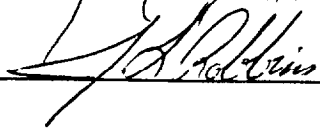
DUMMY NUMBER 270

TEST NUMBER: D94394

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	72°
RELATIVE HUMIDITY	10 - 70%	52%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.7
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

TECHNICIAN 

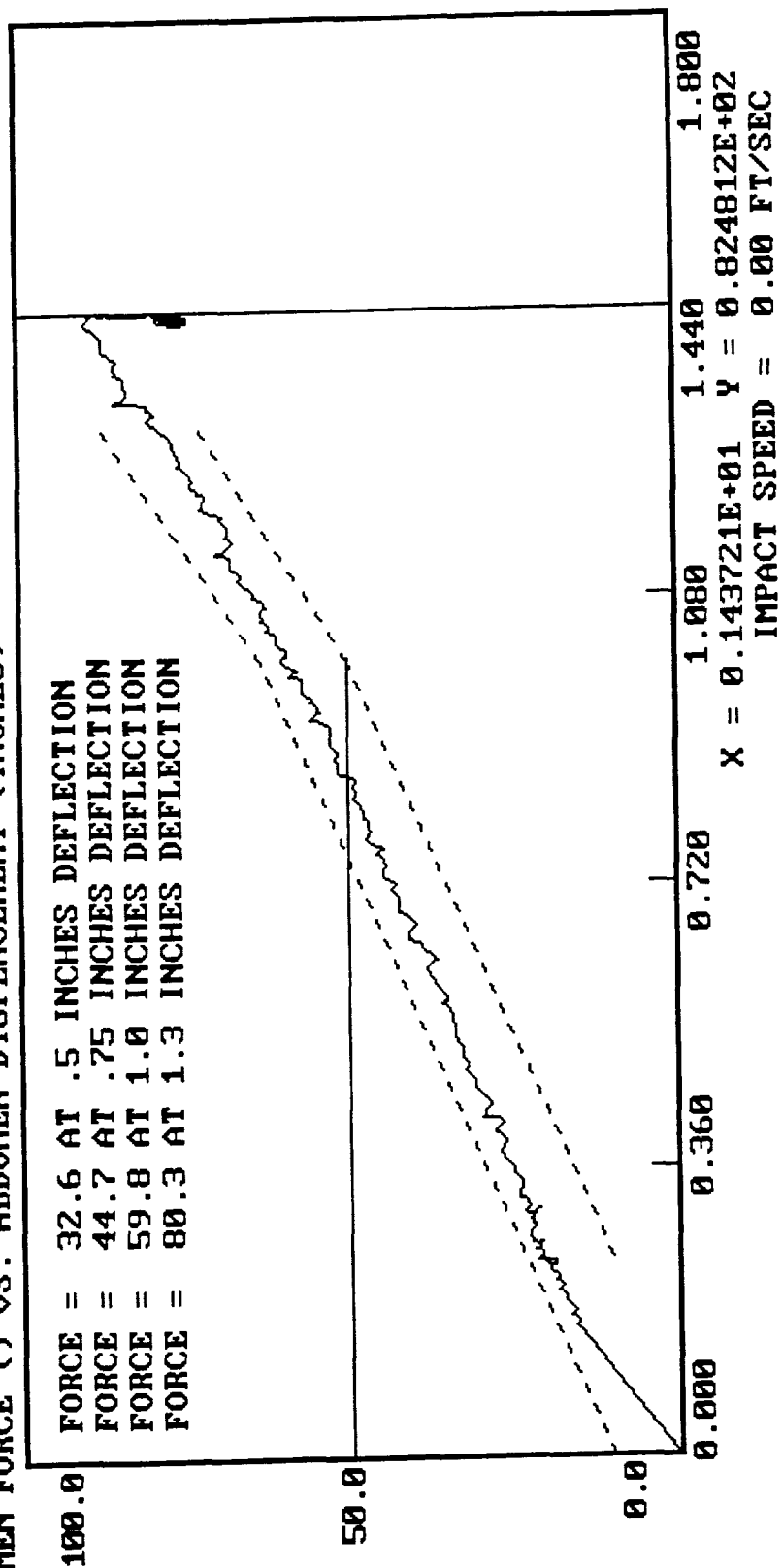
APPROVED BY 

07-01-1994 10:01

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 270

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: July 5, 1994

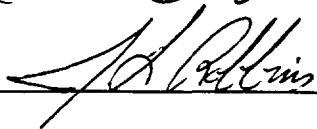
DUMMY NUMBER: 270

TEST NUMBER: D94395

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	71°
RELATIVE HUMIDITY	10 - 70%	42%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	31
FORCE @ 30°	34 - 46 lbs	39
FORCE @ 40°	46 - 58 lbs	55
RETURN ANGLE	12° maximum	5°

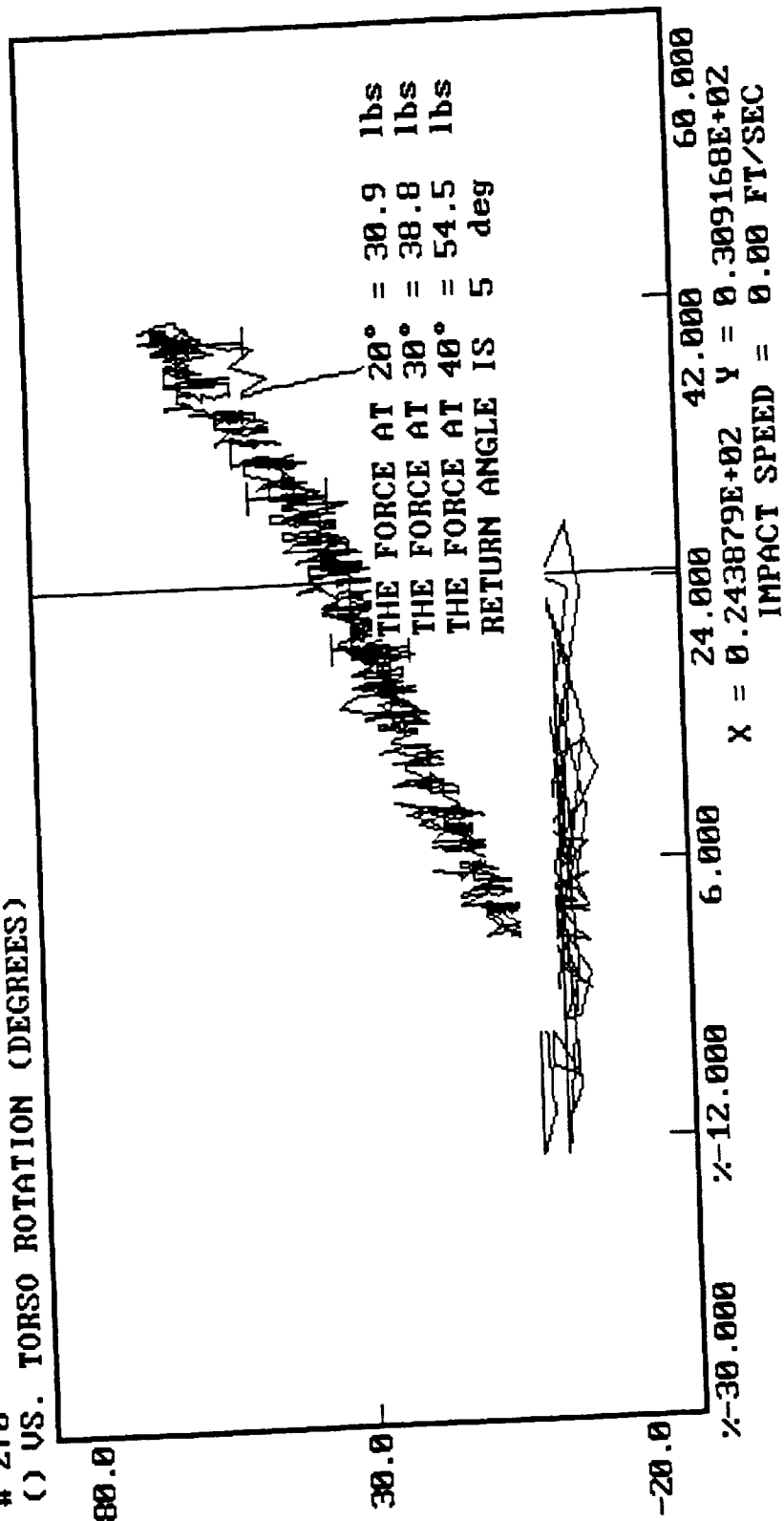
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

07-05-1994 18:00

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 270
 FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 269

Inspected By: Jeff Robbins

Date: July 5, 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	DAMAGED*
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):

- * Broken rivets on rear rib wrap assembly. The rib wrap assembly was replaced after post-test calibration. This dummy passed post-test thorax impact requirements.

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Jeff Robbins

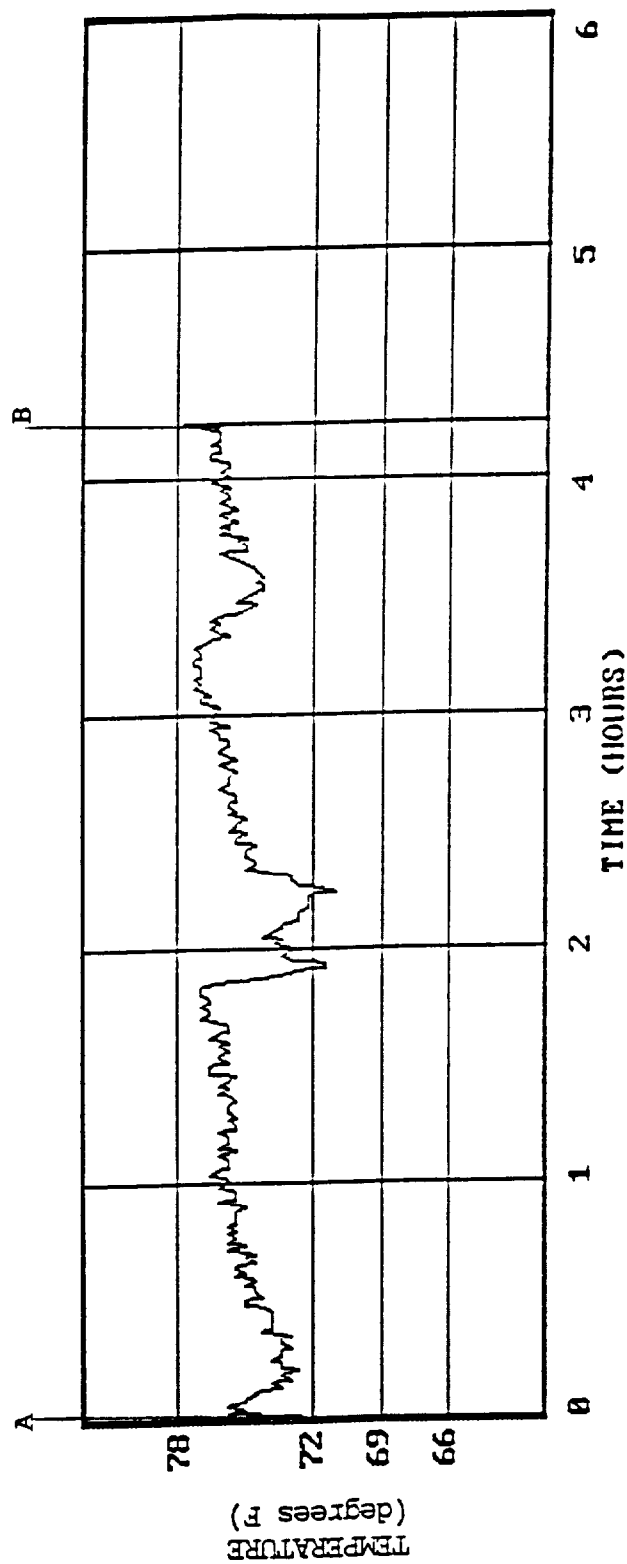
Date: July 5, 1994

<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	DAMAGED*
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):

- * The pelvis was damaged during compliance testing. Material was torn in the location of the pelvic instrumentation box. The pelvic assembly would not post-test calibrate so it was replaced prior to pre-test pelvic impacts. The damaged pelvis was returned to VRTC.

VEHICLE AND DUMMY TEMPERATURE



A = Dummy 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	AGNA4	Endevco	June 21, 1994
Lower Rib	AH0N9	Endevco	June 20, 1994
Lower Spine	AHY91	Endevco	June 20, 1994
Pelvis	AHY68	Endevco	June 21, 1994
Upper Rib Redundant	AHW95	Endevco	June 21, 1994
Lower Rib Redundant	AH1E2	Endevco	June 20, 1994
Lower Spine Redundant	AHYA1	Endevco	June 21, 1994
Pelvis Redundant	AHT55	Endevco	June 21, 1994

INSTRUMENTS FOR PASSENGER DUMMY NO. 270

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AGTE9	Endevco	June 27, 1994
Lower Rib	AHTN3	Endevco	June 27, 1994
Lower Spine	AE9C8	Endevco	June 27, 1994
Pelvis	AGRW3	Endevco	June 27, 1994
Upper Rib Redundant	AHOC3	Endevco	June 27, 1994
Lower Rib Redundant	AHTT4	Endevco	June 27, 1994
Lower Spine Redundant	AGMT2	Endevco	June 27, 1994
Pelvis Redundant	AHT12	Endevco	June 27, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	MGA135	Entran	June 13, 1994
MDB CG Y	MGA120	Entran	June 13, 1994
MDB CG Z	AZ02	Endevco	June 13, 1994
MDB Rear Axle X	MGA165	Entran	June 13, 1994
MDB Rear Axle Y	MGA054	Entran	June 13, 1994
Lower Left A-Post	MGA045	Entran	June 2, 1994
Lower Left B-Post	MGA004	Entran	June 2, 1994
Upper Left B-Post	A84	Endevco	June 2, 1994
Trunk Centerline X	MGA091	Entran	June 2, 1994
Trunk Centerline Y	A99L	Endevco	June 2, 1994
Trunk Centerline Z	MGA154	Entran	June 2, 1994
Driver Seat Track	MGA131	Entran	June 14, 1994
Right Front Sill X	MGA137	Entran	May 24, 1994
Right Front Sill Y	MGA158	Entran	June 14, 1994
Right Front Sill Z	MGA143	Entran	June 14, 1994
Right Rear Sill X	AC815	Endevco	June 13, 1994
Right Rear Sill Y	MGA124	Entran	June 13, 1994
Right Rear Sill Z	MGA007	Entran	June 14, 1994
Right Rear Seat Occupant Compartment	MGA035	Entran	May 24, 1994
Left Front Sill Y	MGA003	Entran	June 9, 1994
Left Rear Sill Y	MGA145	Entran	May 24, 1994

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