

V2096

V2096

REPORT NO. MGA-94-DC009

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

MITSUBISHI MOTORS
1994 MITSUBISHI GALANT 4 DOOR SEDAN
NHTSA NO. CR5602

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: June 16, 1994

Report Date: September 28, 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

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. MGA-94-21409	2. Government Accession No.	3. Recipient's Catalog No.																			
4. Title and Subtitle Final Report for FMVSS 214 Compliance Testing of a 1994 Mitsubishi Galant 4 Door Sedan NHTSA NO. CR5602		5. Report Date September 28, 1994																			
		6. Performing Organization Code MGA																			
7. Author(s) John Fleck		8. Performing Organization Report No. MGA-DOT-214-09																			
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 1994 Mitsubishi Galant 4 Door Sedan 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 16, 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 15.2 inches at 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>62 g's</td><td>85 g's</td></tr> <tr> <td>Pelvis Acceleration</td><td>73 g's</td><td>118 g's</td></tr> <tr> <td>Upper Rib Acceleration</td><td>55 g's</td><td>97 g's</td></tr> <tr> <td>Lower Rib</td><td>45 g's</td><td>86 g's</td></tr> <tr> <td>Lower Spine</td><td>69 g's</td><td>73 g's</td></tr> </tbody> </table>					<u>Driver's SID</u>	<u>Left Rear SID</u>	Thoracic Trauma Index (TTI)	62 g's	85 g's	Pelvis Acceleration	73 g's	118 g's	Upper Rib Acceleration	55 g's	97 g's	Lower Rib	45 g's	86 g's	Lower Spine	69 g's	73 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 1994 Mitsubishi Galant 4 Door Sedan.

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 1994 Mitsubishi Galant 4 Door Sedan 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 16, 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.

The driver's Thoracic Trauma Index (TTI) was 62 g's. Maximum pelvic Y acceleration was 73 g's.

The left rear passenger's TTI was 85 g's. Maximum pelvic Y acceleration was 118 g's.

SECTION 3
SUMMARY OF TEST DATA

TABLE 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan
 Vehicle NHTSA No.: CR5602 VIN: 4A3AJ46G5RE116840
 Vehicle Body Color: Red
 Engine Data: 4 cylinders; CID; 2.4 Liter; cc
 Placement Longitudinal; or X Lateral
 Transmission: 5 speed; X Manual; Automatic; X Overdrive
 Final Drive: Rear Wheel Drive; X Frt. Wheel Drive; Four Wheel Drive
 Odometer Reading 93 miles
 Options: X A/C; X Pwr. Steering.; X Pwr. Brakes; Pwr. Windows
 X Power Seats; X Tilt Wheel; X Power Door Locks; Self Leveling System

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 32 psi FRONT
 29 psi REAR
 Recommended Tire Size: P185/70R14 or P195/70R14
 Tires on Test Vehicle: P185/70R14 Manufacturer: Bridgestone

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; N/A 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 = 827 lbs (A)
 No. of Occupants x 150 lbs. = 750 lbs (B)
 Cargo Capacity (A-B) = 77 lbs

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	= <u>857</u> lbs	Right Rear	= <u>537</u> lbs
Left Front	= <u>882</u> lbs	Left Rear	= <u>545</u> lbs
TOTAL FRONT	= <u>1739</u> lbs	TOTAL REAR	= <u>1082</u> lbs
% of Total Vehicle Weight =	<u>61.6</u> %;	% of Total Weight =	<u>38.4</u> %
TOTAL WEIGHT	= <u>2821</u> lbs		

TABLE 2
TEST VEHICLE DATA

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 2821 lbs

Maximum Cargo Carrying Capacity of Test Vehicle = 77 lbs

Weight of 2 Side Impact Dummies (2 x 178 lbs.) = 356 lbs

TEST VEHICLE TARGET WEIGHT: = 3254 lbs

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 907 lbs Right Rear = 632 lbs

Left Front = 978 lbs Left Rear = 722 lbs

TOTAL FRONT = 1885 lbs TOTAL REAR = 1354 lbs

% of Total Weight = 58.2 % % of Total Weight = 41.8 %

TOTAL TEST WEIGHT = 3239 lbs

TEST VEHICLE ATTITUDE (all dimensions in inches):

CURB WEIGHT ATTITUDE: (in)

Right Front 27.3 Left Front 26.9 Right Rear 27.0 Left Rear 26.8

FULLY LOADED WEIGHT ATTITUDE: (in)

Right Front 27.1 Left Front 26.1 Right Rear 26.0 Left Rear 25.1

TEST ATTITUDE: (in)

Right Front 27.0 Left Front 26.6 Right Rear 26.4 Left Rear 25.5

Test Vehicle Wheelbase: 103.9 inches

C.G. = 43.4 inches rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 173.5 in

Centerline = 187.9 in

Left Side = 173.5 in

FIGURE 1
PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan
Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

FRONT SEAT CUSHION PLACEMENT:

Total Number of Adjustment Positions or Detents: 23
Test Position: 12th From Front

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 26.0° degrees (13th notch)

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 down Right Rear down

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 = 16.9 gallons

Test Volume: 15.7 gallons (92.9% of capacity)

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

Wheelbase: = 103.9 in

Impact Point is 14.9 in rearward of front axle centerline

TABLE 3
CRASH TEST SUMMARY FOR TEST VEHICLE

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

Overall Length = 187.9 in; Overall Width = 67.8 in

TEST WEIGHT:

Right Front	=	<u>907</u> lbs	Right Rear	=	<u>632</u> lbs
Left Front	=	<u>978</u> lbs	Left Rear	=	<u>722</u> lbs
TOTAL FRONT	=	<u>1885</u> lbs	TOTAL REAR	=	<u>1354</u> lbs
TOTAL VEHICLE WEIGHT <u>3239</u> lbs					
Wheelbase = <u>103.9</u> in					
Longitudinal C.G. front Center of Front Axle = <u>43.4</u> in					
Impact Angle with Respect to Impactor = <u>90°</u> degrees					

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (9.8 in above ground) = 10.1 in
2. LEVEL 2 (17.3 in above ground) = 15.1 in
3. LEVEL 3 (22.0 in above ground) = 15.2 in
4. LEVEL 4 (34.0 in above ground) = 10.5 in
5. LEVEL 5 (50.6 in above ground) = 2.4 in

Maximum Post-Test Intrusion = 15.2 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 & shoulder belt with airbag</u>	<u>3 pt. lap & shoulder belt</u>

INSTRUMENTATION:

Number of Vehicle Data Channels:	=	<u>16</u>
Number of Cameras: Onboard Vehicle	=	<u>3</u>
Offboard Vehicle	=	<u>4</u>
Deformable Barrier	=	<u>2</u>
TOTAL	=	<u>9</u>

TABLE 4
CRASH TEST SUMMARY FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 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: 32.85 mph Secondary: 32.95 mph

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1.	Row A Top of Stack (33 in)	=	<u>5.6</u>	in
2.	Row B Mid Stack (27 in)	=	<u>0.8</u>	in
3.	Row C Top of Bumper (21 in)	=	<u>0.3</u>	in
4.	Row D Center of Bumper (17 in)	=	<u>3.8</u>	in

INSTRUMENTATION:

Number of MDB Data Channels = 7

TABLE 5
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to d-ring</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>remained closed</u>	<u>remained closed</u>

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 1.5 in rearward Vertical: 1.0 in high

ARM REST LOCATIONS:

Front: 10.4 inches below window opening

Rear: 9.9 inches below window opening

SEAT CRUSH:

Driver Seat Back: 3.1 inches Driver Seat Cushion: 4.0 inches

Left Rear Seat Back: 6.5 inches Left Rear Seat Cushion: 6.2 inches

GLAZING DAMAGE:

Driver and left rear door glazing broken and windshield cracked

PILLAR PERFORMANCE:

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

SILL SEPARATION:

No sill separation noted

OTHER NOTABLE IMPACT EFFECTS:

Fuel filler door opened during impact

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARY

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

	Front Dummy ID # 270				Rear Dummy ID # 272			
	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)	55.3	26	-13.1	77	96.8	45	-11.3	96
	58.4	26	-12.2	77	95.5	45	-10.9	96
	44.9	26	-11.5	76	85.5	44	-25.5	73
	47.9	26	-11.0	77	86.2	44	-25.5	74
SPINE ACCELERATIONS: Lower Lateral.....Y Lower Lateral.....Y(R)	69.2	29	-21.6	68	73.3	46	-20.6	71
	71.0	29	-21.6	68	75.8	46	-19.6	71
PELVIC ACCELERATIONS: Lateral.....Y Lateral.....Y(R)	73.3	33	-18.9	76	117.6	35	-17.6	80
	73.1	33	-18.4	76	122.2	35	-17.8	83

REFERENCE:

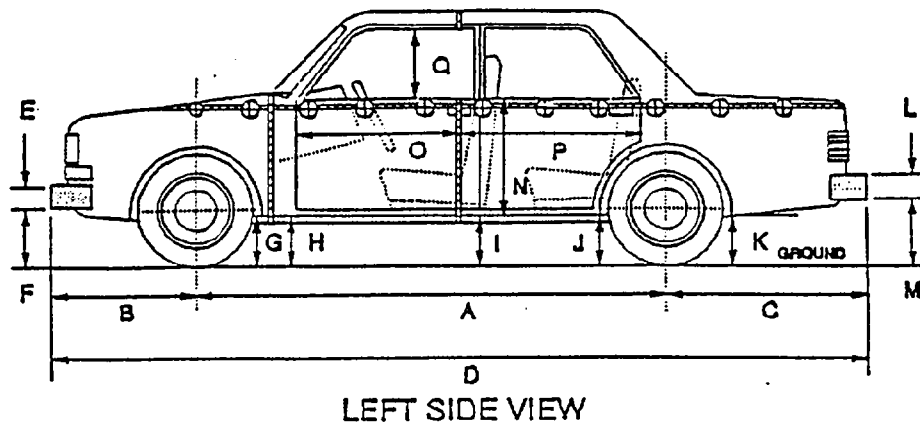
Positive Direction - Longitudinal (X) = forward

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

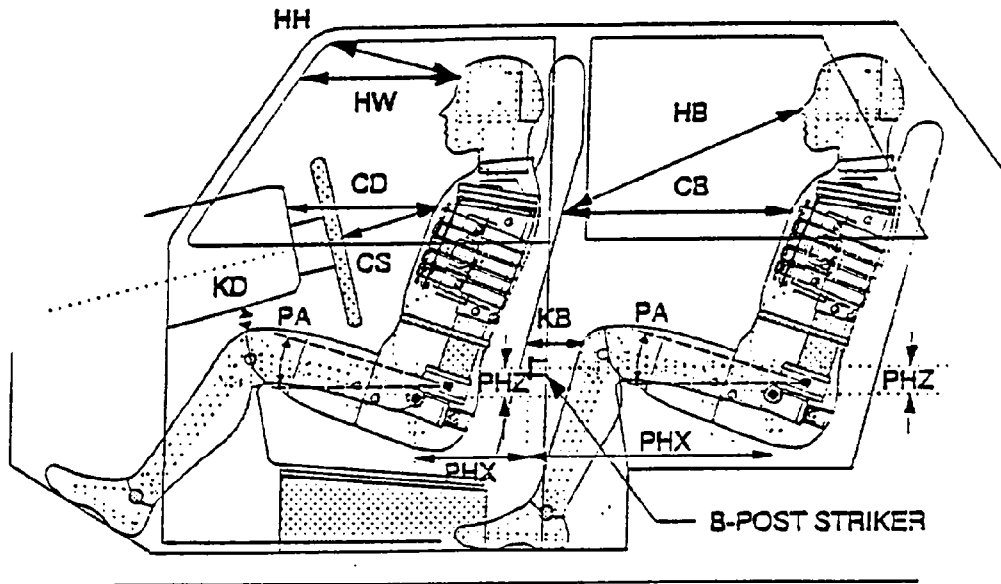
J2 = To Sill

Units: in

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	183.9	181.8	2.1
B	40.1	39.9	0.2
C	44.0	43.8	0.2
D	188.0	185.5	2.5
E	6.1	6.4	0.3
F	8.4	14.6	6.2
G	6.8	6.9	0.1
H	6.3	7.1	0.8
I	7.0	6.3	0.7
J1/J2	7.1/6.3	6.5/5.4	0.6/0.9
K	8.6	8.8	0.2
L	10.4	11.4	1.0
M	12.9	13.0	0.1
N	24.4	21.9	2.5
O	28.1	27.3	0.8
P	51.5	45.5	6.0
Q	18.1	17.9	0.2
R	173.5	172.9	0.6
S	173.5	170.0	3.5
T	67.8	55.4	12.4

FIGURE 3

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

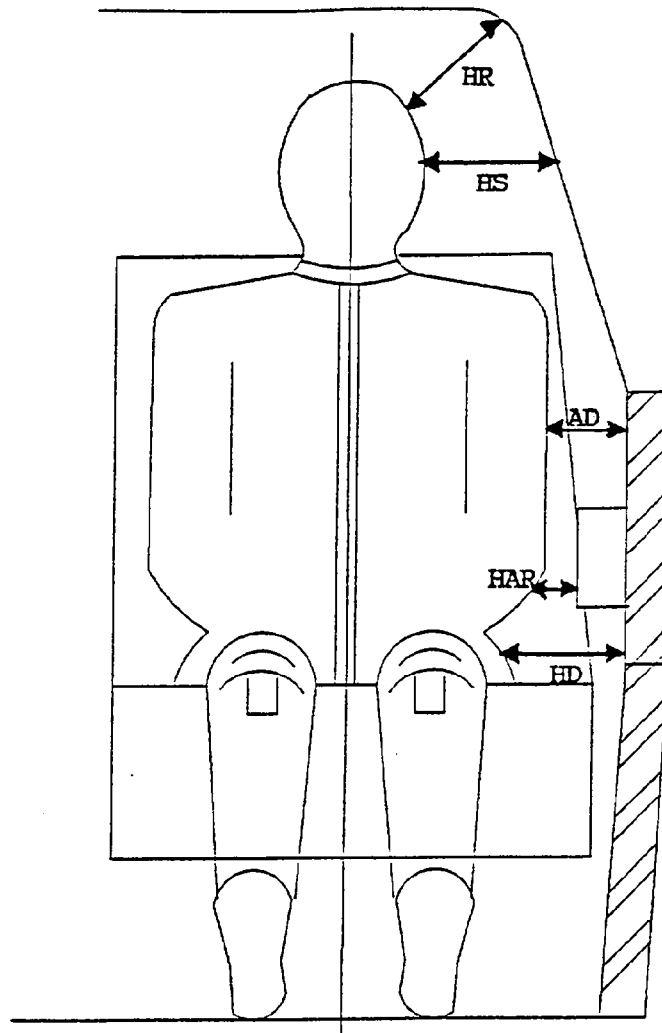
NOTE: 2-DOOR VEHICLE SHOWN.
REAR DUMMY PHX & PHZ
MEASUREMENTS FOR A 4-DOOR
VEHICLE WOULD USE THE C-POST
STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in inches

	DRIVER ID #270	LEFT REAR PASSENGER ID #272	
HH	15.4	---	
HW	25.4	---	
HB	---	26.3	
CD	22.1	CB	19.5
CS	14.0	---	
KDL	7.9	KBL	5.5
KDR	8.0	KBR	5.3
PA°	23.5°	24.6°	
PHX	6.3	9.9	
PHZ	5.1	12.8	

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



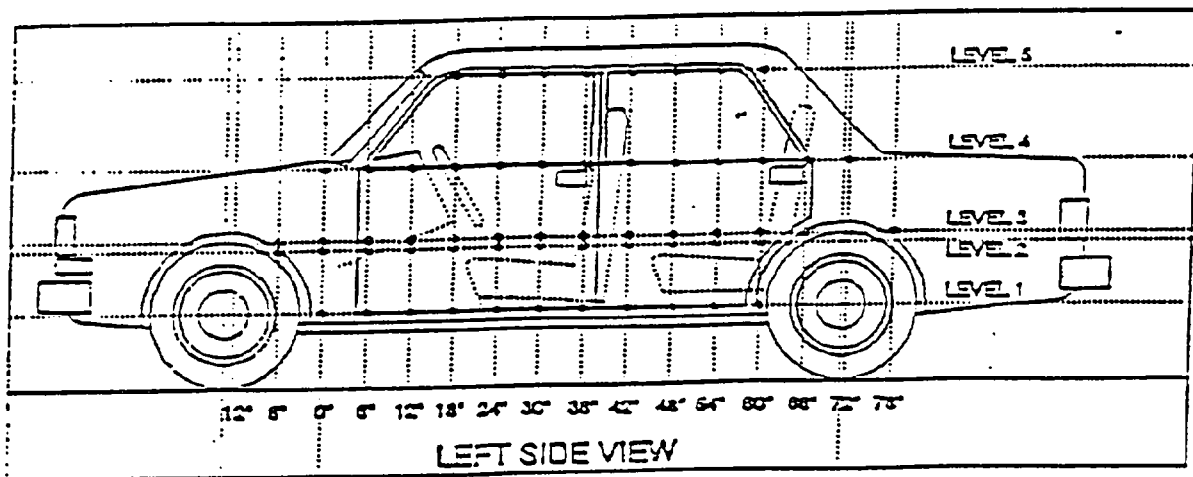
NOTE: All dimensions are in inches

	DRIVER ID #270	LEFT REAR PASSENGER ID #272
HR	5.8	5.1
HS	10.3	6.5
AD	4.8	5.4
HD	6.9	7.1

FIGURE 5
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 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>50.6</u> in
Level 4 @ Window Sill	= <u>34.0</u> in
Level 3 @ Mid Door	= <u>22.0</u> in
Level 2 @ Occupant H-Point	= <u>17.3</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

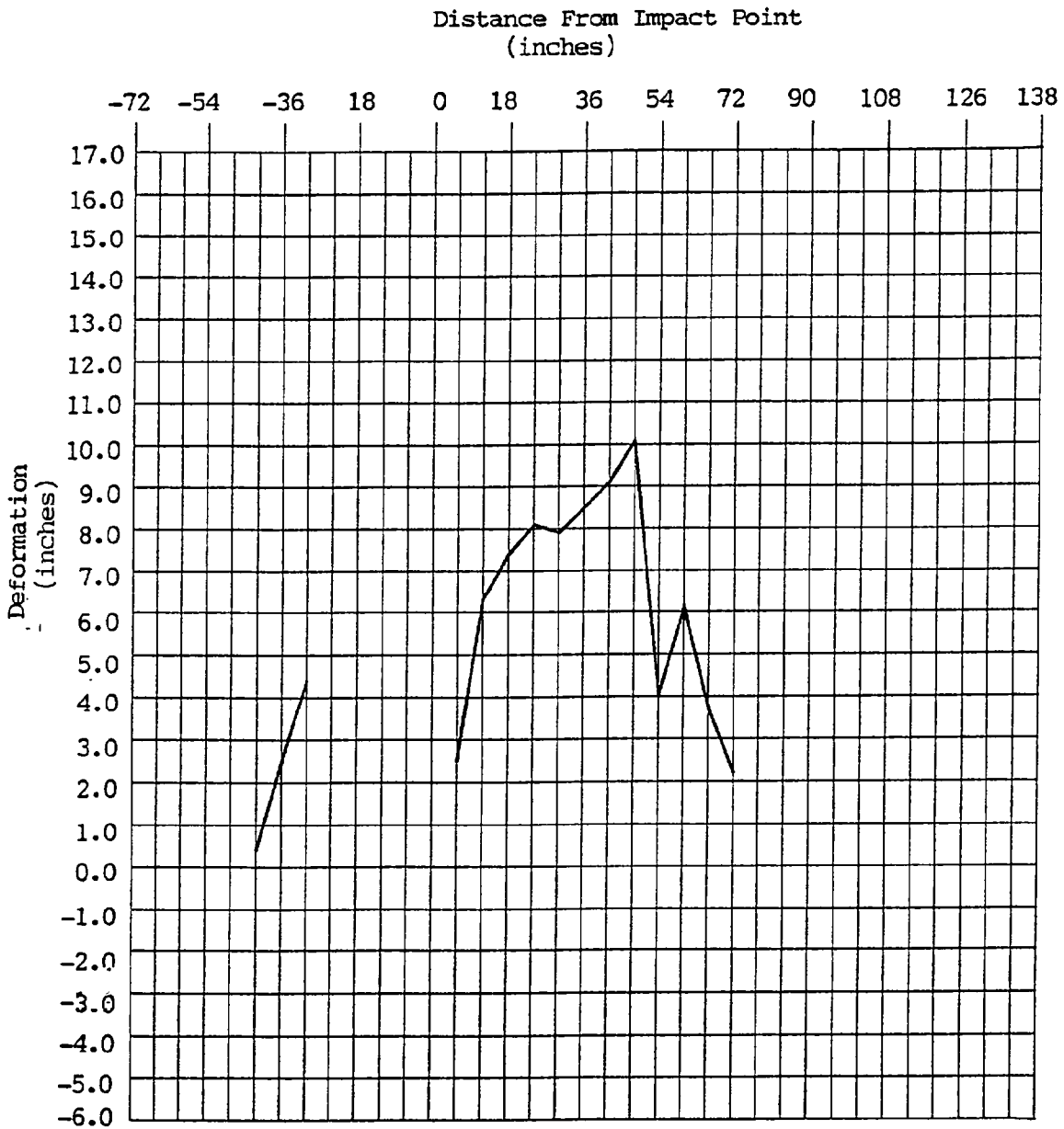
Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	41.7	42.1	0.4
-36	39.0	41.5	2.5
-30	34.1	38.5	4.4
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	---	---	---
6	38.1	40.6	2.5
12	38.3	44.6	6.3
18	38.5	45.9	7.4
24	38.6	46.7	8.1
30	38.6	46.5	7.9
36	38.6	47.1	8.5
42	38.5	47.6	9.1
48	38.5	48.6	10.1
54	38.5	42.5	4.0
60	38.2	44.3	6.1
66	38.0	41.7	3.7
72	37.8	40.0	2.2
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
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 1 AT AXLE CENTER LINE

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

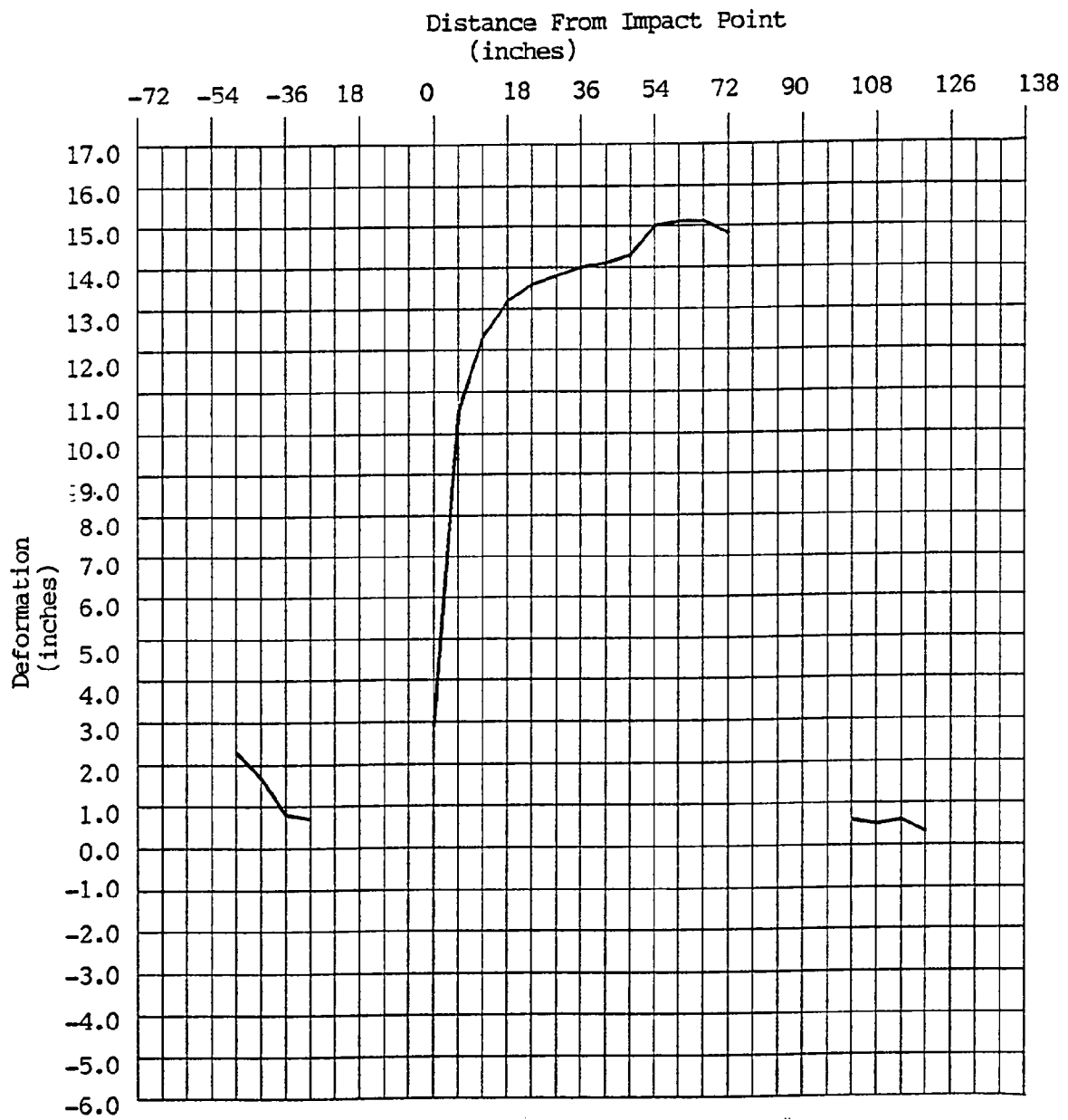
LEVEL 2 AT OCCUPANT H-POINT

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	39.7	42.0	2.3
-42	38.2	39.9	1.7
-36	37.8	38.6	0.8
-30	37.4	38.1	0.7
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	37.0	39.9	2.9 (impact point)
6	37.0	47.5	10.5
12	37.0	49.3	12.3
18	37.0	50.2	13.2
24	37.1	50.7	13.6
30	37.1	50.9	13.8
36	37.1	51.1	14.0
42	37.0	51.1	14.1
48	36.8	51.1	14.3
54	36.8	51.8	15.0
60	36.9	52.0	15.1
66	36.9	52.0	15.1
72	37.0	51.8	14.8
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	37.4	38.0	0.6
108	37.8	38.3	0.5
114	38.3	38.9	0.6
120	39.1	39.4	0.3
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

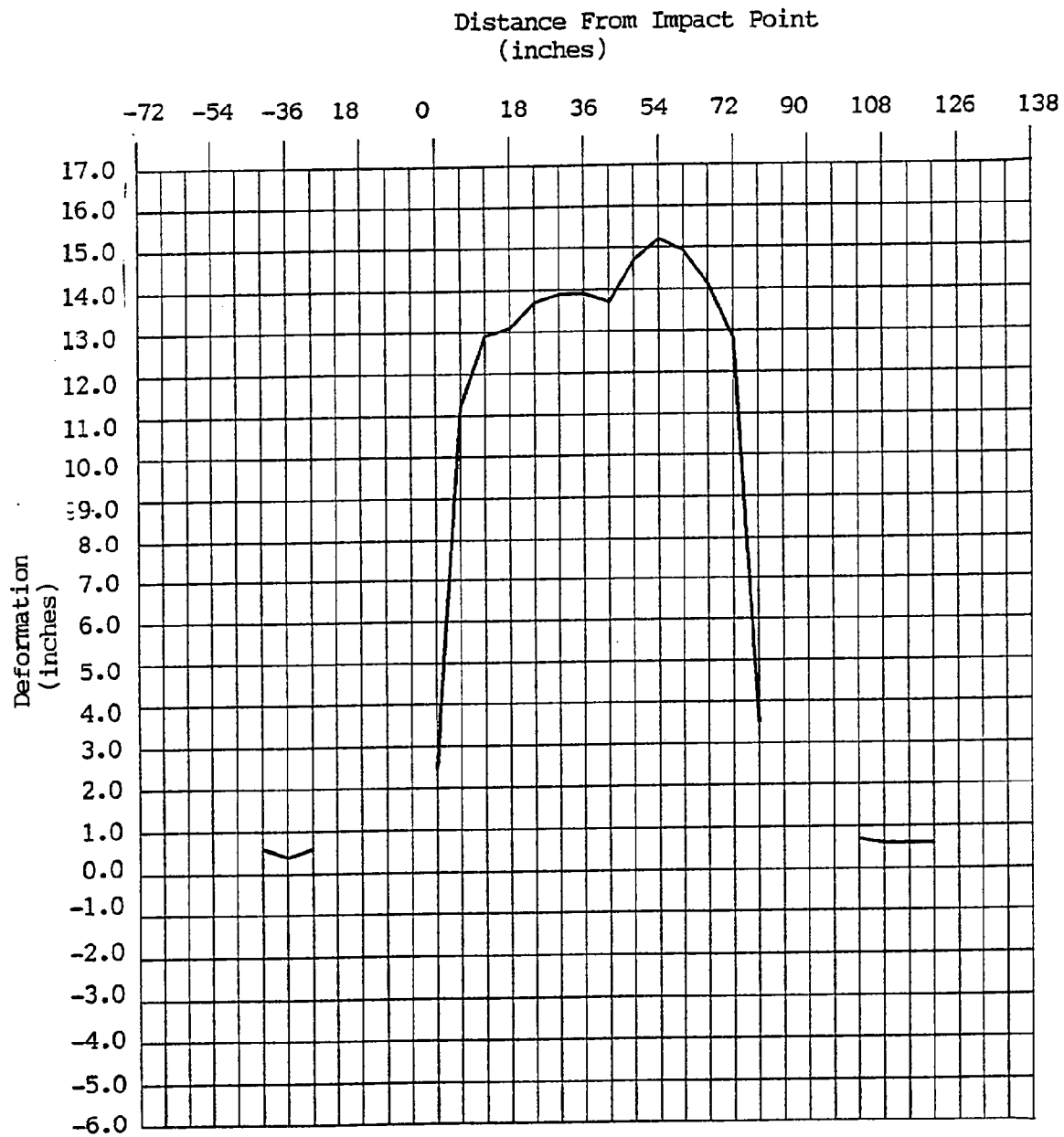
LEVEL 3 AT MID-DOOR

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	42.7	43.3	0.6
-36	39.5	39.9	0.4
-30	37.8	38.4	0.6
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	36.7	39.2	2.5 (impact point)
6	36.9	48.1	11.2
12	36.9	49.8	12.9
18	36.9	50.0	13.1
24	36.9	50.6	13.7
30	37.0	50.9	13.9
36	32.0	50.9	13.9
42	37.0	50.7	13.7
48	36.8	51.5	14.7
54	36.8	52.0	15.2
60	36.9	51.8	14.9
66	36.9	51.0	14.1
72	36.8	49.6	12.8
78	36.7	40.2	3.5
84	---	---	---
90	---	---	---
96	---	---	---
102	37.2	37.9	0.7
108	38.0	38.6	0.6
114	38.8	39.4	0.6
120	40.0	40.6	0.6
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

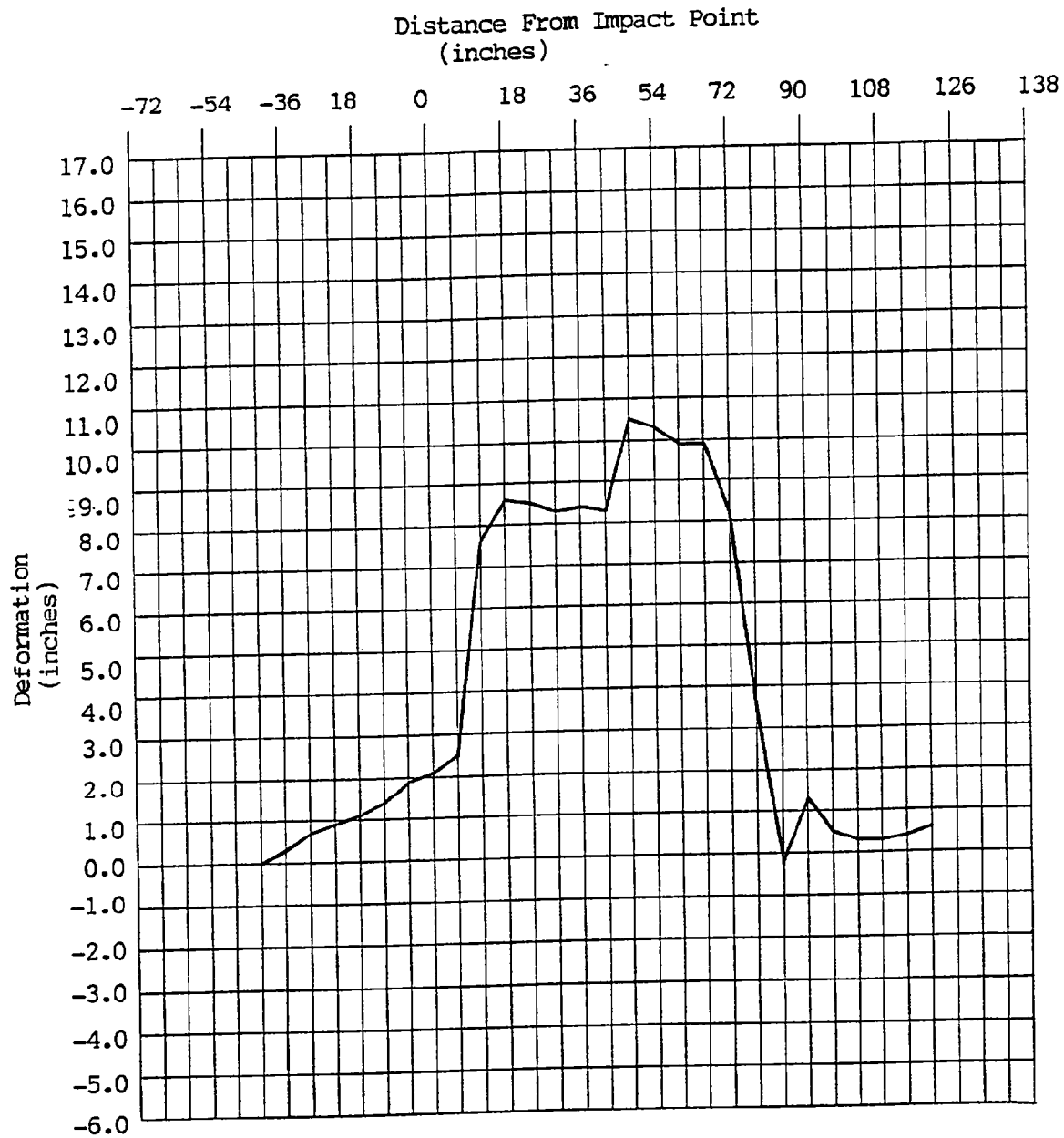
Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

Longitudinal Distance (in)	PRE-TEST (in)	POST-TEST (in)	STATIC CRUSH (in)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	45.2	45.2	0
-36	43.6	43.9	0.3
-30	42.4	43.1	0.7
-24	41.7	42.6	0.9
-18	41.1	42.2	1.1
-12	40.6	42.0	1.4
-6	40.0	41.9	1.9
0	39.8	41.9	2.1 (impact point)
6	39.6	42.1	2.5
12	39.5	47.1	7.6
18	39.5	48.1	8.6
24	39.5	48.0	8.5
30	39.5	47.8	8.3
36	39.3	47.7	8.4
42	39.4	47.7	8.3
48	39.3	49.8	10.5
54	39.3	49.6	10.3
60	39.4	49.3	9.9
66	39.5	49.4	9.9
72	39.6	47.8	8.2
78	39.6	43.1	3.5
84	39.8	39.6	-0.2
90	39.8	41.1	1.3
96	40.2	40.7	0.5
102	40.6	40.9	0.3
108	41.1	41.4	0.3
114	41.8	42.2	0.4
120	42.5	43.1	0.6
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

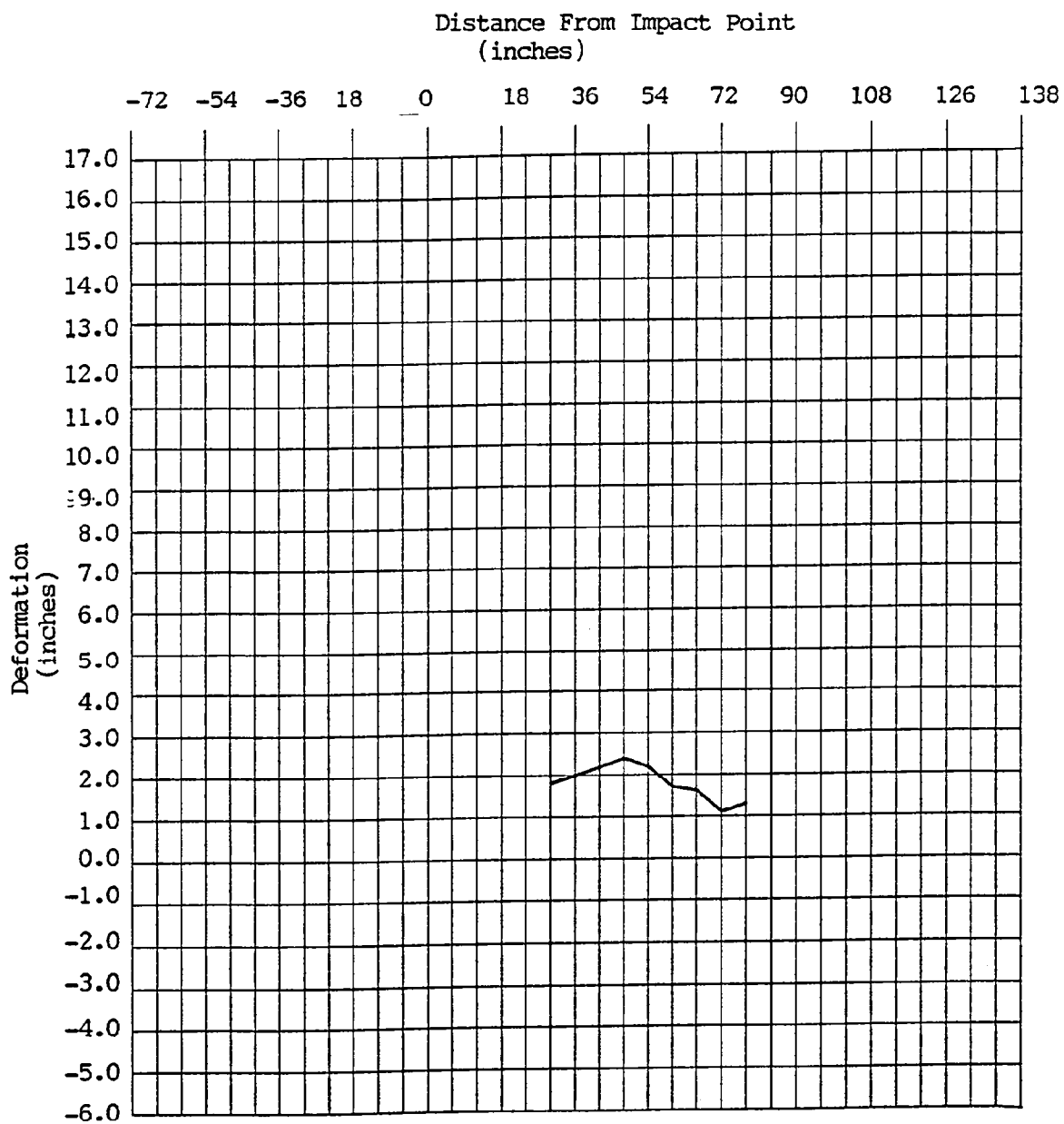
Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

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	---	---	---
6	---	---	---
12	---	---	---
18	---	---	---
24	---	---	---
30	49.5	51.3	1.8
36	49.1	51.1	2.0
42	49.0	51.2	2.2
48	48.9	51.3	2.4
54	48.9	51.1	2.2
60	49.0	50.7	1.7
66	49.0	50.6	1.6
72	49.3	50.4	1.1
78	49.9	51.2	1.3
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
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: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

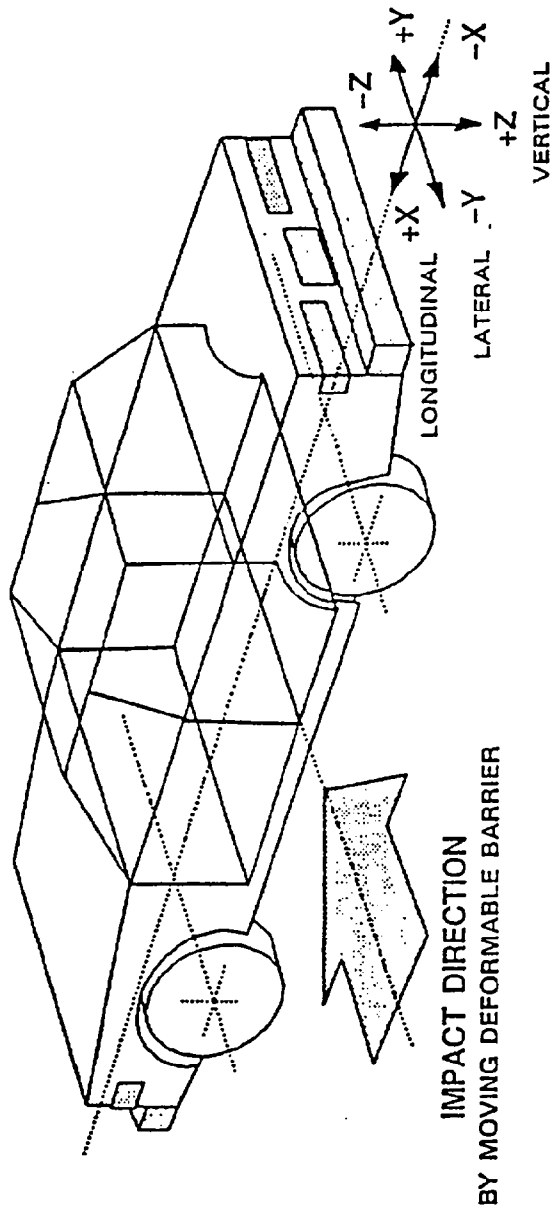
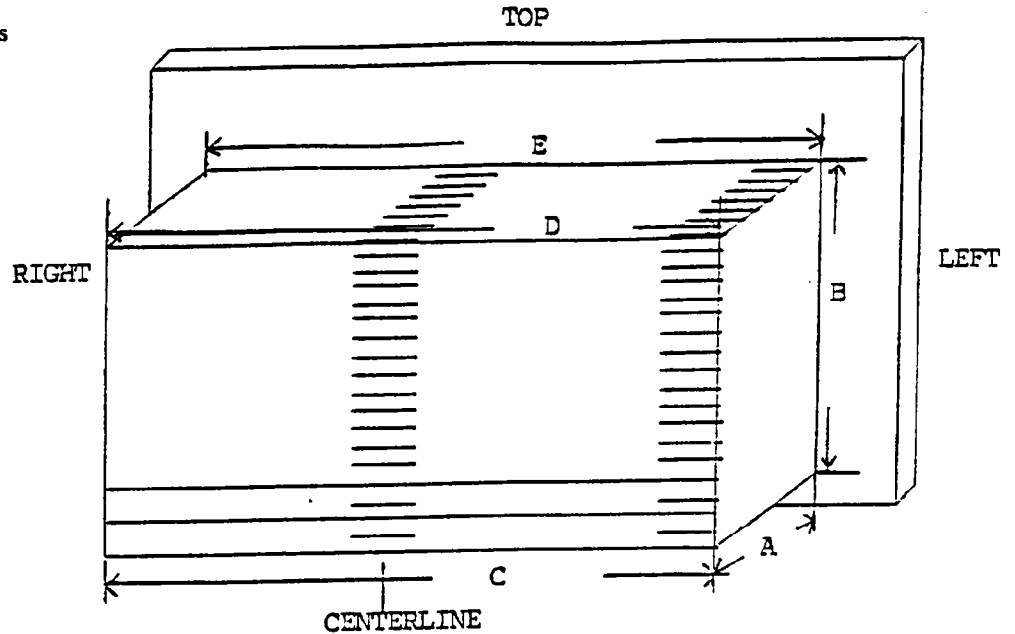


FIGURE 8
MDB FACE DIMENSIONS

Measurements in inches

A = 15.1
B = 22.1
C = 66.4
D = 66.4
E = 66.3



Measurements in inches

Right	Left
A = <u>10.9</u>	<u>10.9</u>
B = <u>12.9</u>	<u>13.0</u>
C = <u>20.9</u>	<u>21.0</u>
D = <u>32.9</u>	<u>32.9</u>

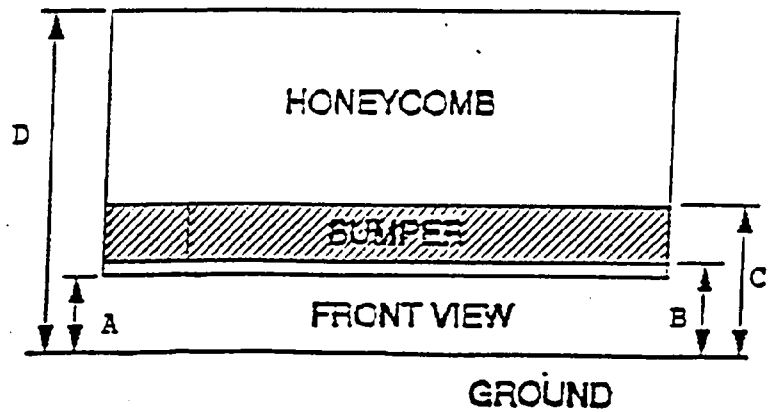


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTORYear/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 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"	1.6	0.3	0.3	-0.2
28"	-0.1	-0.1	0	-0.1
24"	-0.1	-0.1	-0.2	-0.1
20"	-0.1	-0.2	0	-0.1
16"	-0.1	-0.2	0	-0.1
12"	-0.1	-0.1	0	-0.1
8"	-0.1	-0.1	0	0
4"	-0.1	0	0.1	0.1
0"	-0.1	0	0.1	0.1
4"	1.1	-0.1	0.2	0.3
8"	1.1	0	0.3	0.5
12"	1.1	0	0.3	0.6
16"	1.2	0	0.4	0.8
20"	1.2	0	0.5	1.2
24"	1.6	0.4	0.7	1.2
28"	3.2	0.8	0.3	2.4
32"	5.6	0.7	0.1	3.8

Right Side

Left Side

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 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	111.6	26.6	9.8	1.8	-6.7	14.2	-1.8	3.6	-2.6	16.4
2	Rt. Side Sill @ Rear Seat	77.3	27.0	10.0	2.7	-6.1	15.5	-2.1	5.9	-4.7	22.2
3	Rr. Floorpan Above Axle	42.5	0	18.0	2.4	-5.3	17.0	-2.0	10.2	-8.3	17.0
4	Left Side Sill @ Rr. Seat	73.3	27.5	7.6	---	---	27.8	-7.1	---	---	---
5	Left Side Sill @ Frt. Seat	106.5	27.5	7.6	---	---	31.2	-8.4	---	---	---
6	Driver Left Seat Track	93.5	23.3	9.9	---	---	64.2	-26.6	---	---	---
7	Right Rear Occupant Compartment	74.1	13.4	11.3	---	---	17.1	-2.2	---	---	---
8	Left Lower "A" Post	123.8	29.0	17.5	---	---	78.0	-32.4	---	---	---
9	Left Mid "B" Post	86.5	28.0	22.8	---	---	254.2	-48.5	---	---	---
10	Left Lower "B" Post	86.5	28.3	13.3	---	---	179.3	-62.8	---	---	---

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

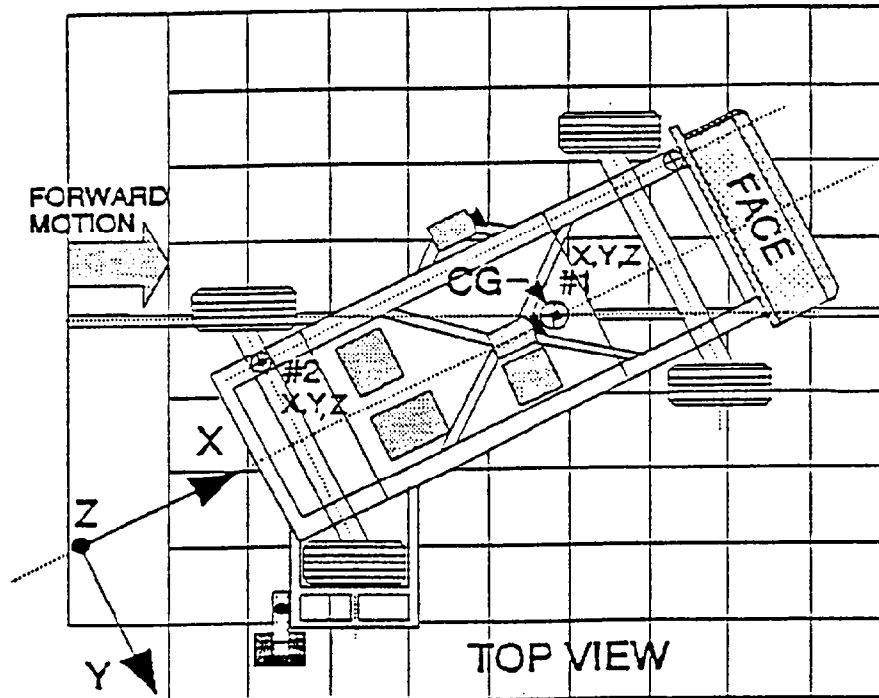
Z - Ground Level (+ Up)

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994



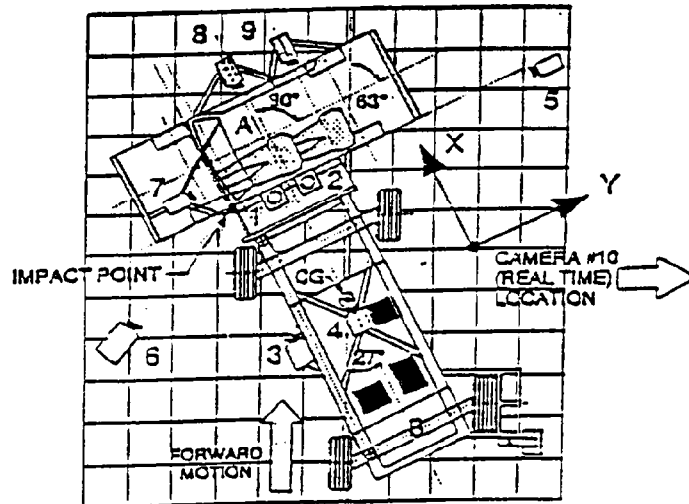
Accel. No.	Location	Coordinates (in)			Pos. Direct.		Neg. Direct.	
					Max (g)	Time (msec)	Max (g)	Time (msec)
		X	Y	Z				
1	MDB Center of Gravity							
	Longitudinal ... X				1.8	130	-14.4	30
	Lateral Y	-43.0	0	19.0	1.5	60	-7.2	33
	Vertical Z				14.3	78	-11.9	50
	Resultant R				16.1	33	---	---
2	Rear Frame Member							
	Longitudinal ... X	-102.0	-24.6	24.5	4.5	73	-9.2	23
	Lateral Y				1.4	151	-10.2	33

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: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994



Camera No.	View	Coordinates (in)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
	Real Time					10	24
1	Top Pointer	0	14.9	193.7		13	1111
2	Top Wide	15.7	0	211.0		8	1143
3	Cart Pointer					35	1005
4	Cart					13	1015
5	Right Impact	20	-335.8	30.6	45°	35	1000
6	Left Impact	95.3	112.2	52.0		7.5	1000
7	Onboard Hood					13	1000
8	Onboard Driver					7.5	1000
9	Onboard Passenger					8	800

* 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: 1994/Mitsubishi/Galant/4 Door Sedan
Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 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 (32.85 mph)

FUEL SPILLAGE MEASUREMENT:

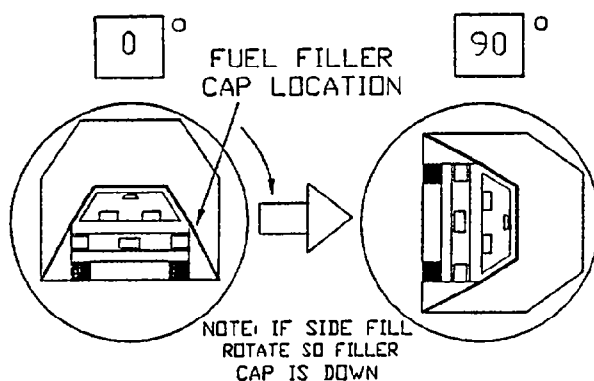
1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

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: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994TEST PHASE: 0° - 90°I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 53 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 53 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.

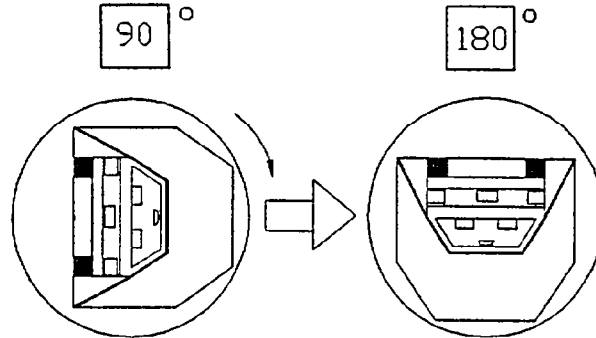
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan

Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

TEST PHASE: 90° - 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 38 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 38 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
---	---	---	---

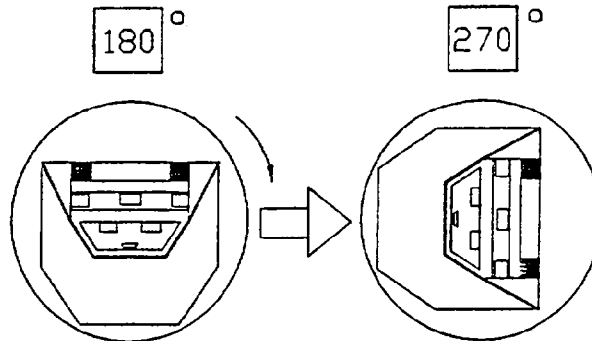
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door Sedan
 Vehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 27 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

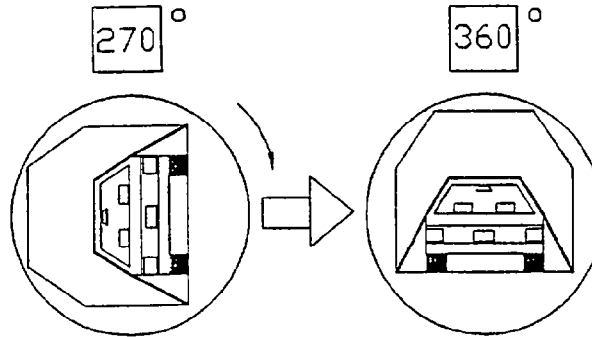
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

TABLE 11

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)Year/Make/Model/Body Style: 1994/Mitsubishi/Galant/4 Door SedanVehicle NHTSA No.: CR5602 TEST DATE: June 16, 1994TEST PHASE: 270° - 360°I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 27 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATIONS(S): None

APPENDIX A - PHOTOGRAPHS

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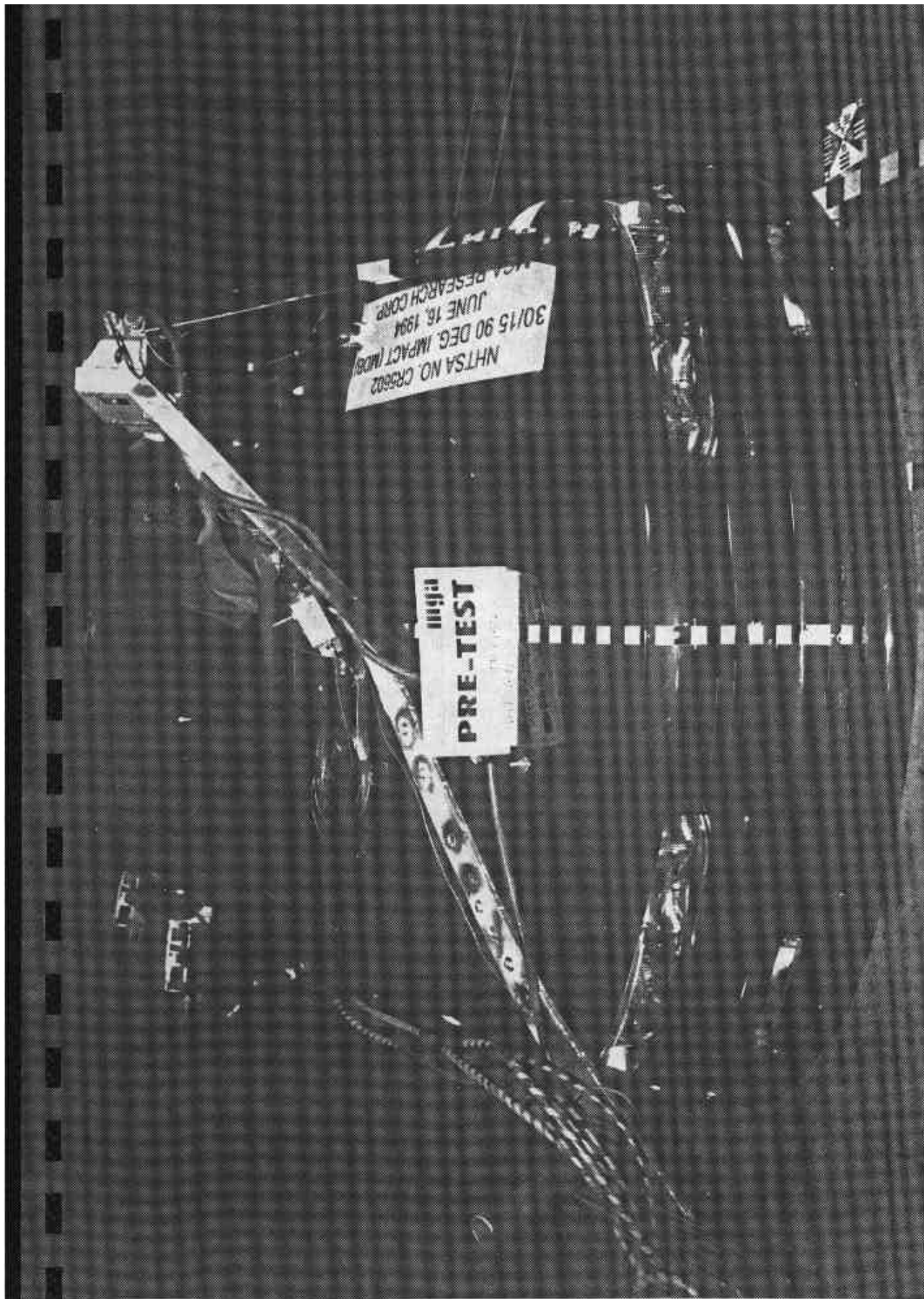


Photo No. A-1 - Pre-Test Front View of Test Vehicle

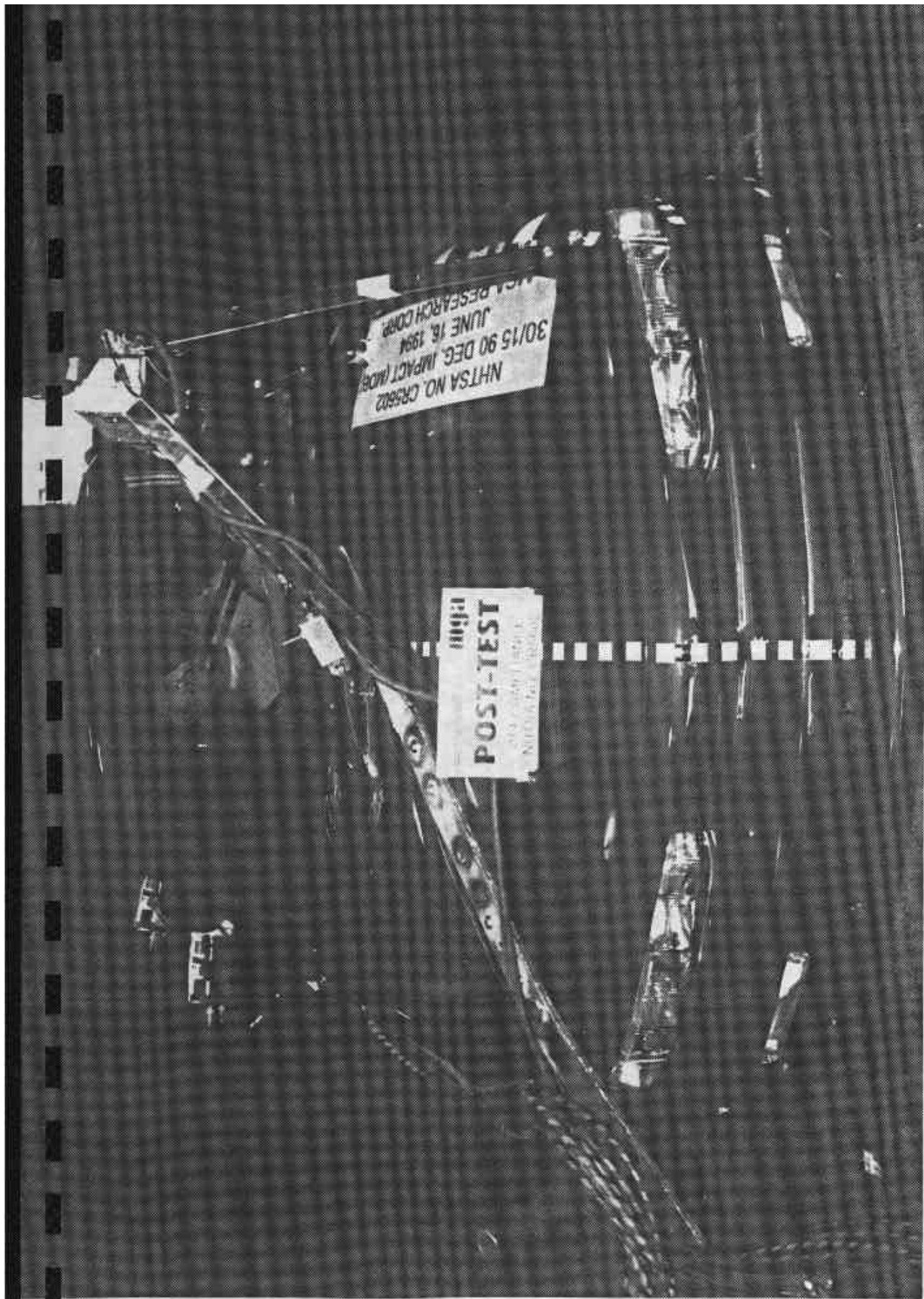


Photo No. A-2 - Post-Test Front View of Test Vehicle

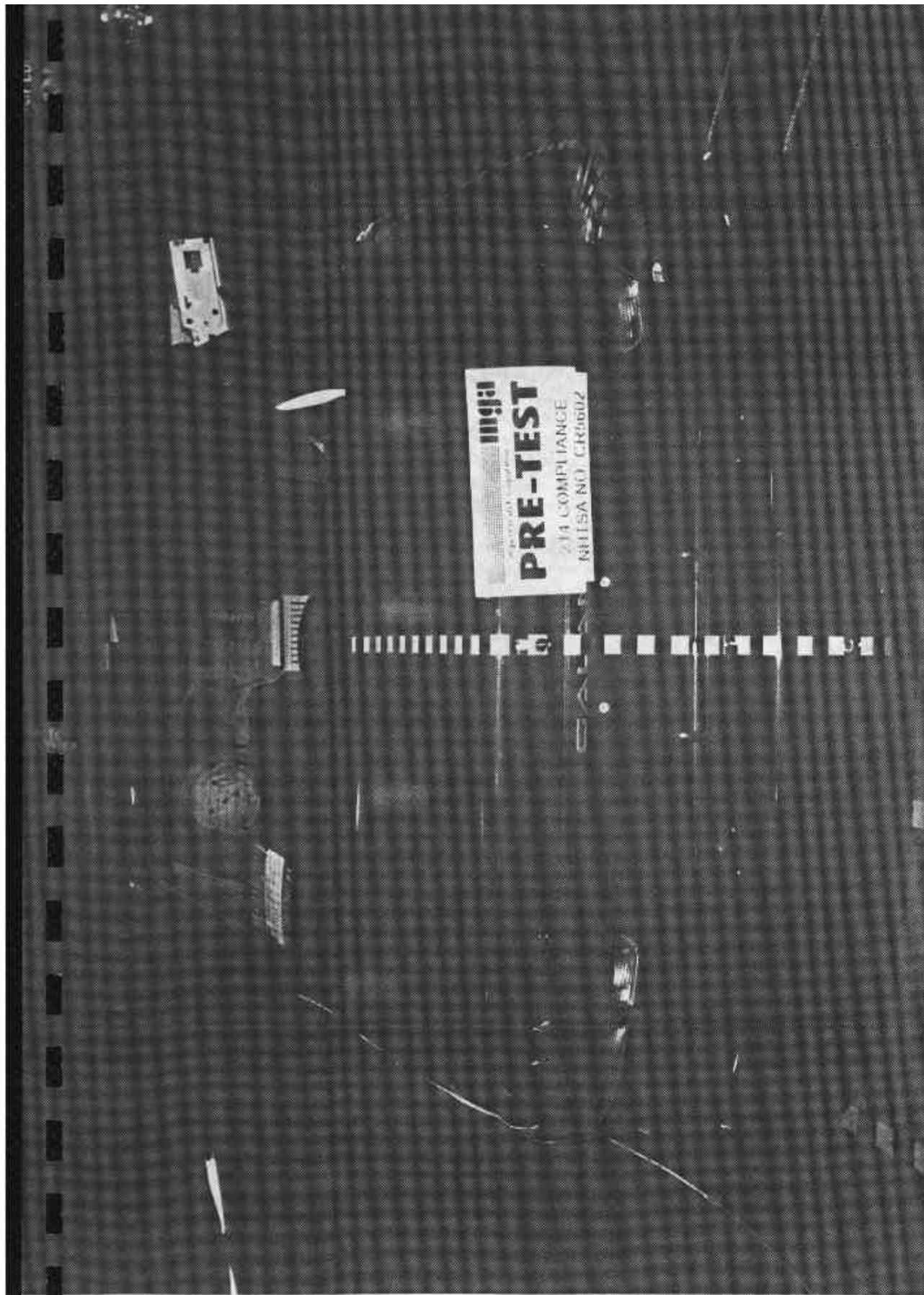


Photo No. A-3 - Pre-Test Rear View of Test Vehicle



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

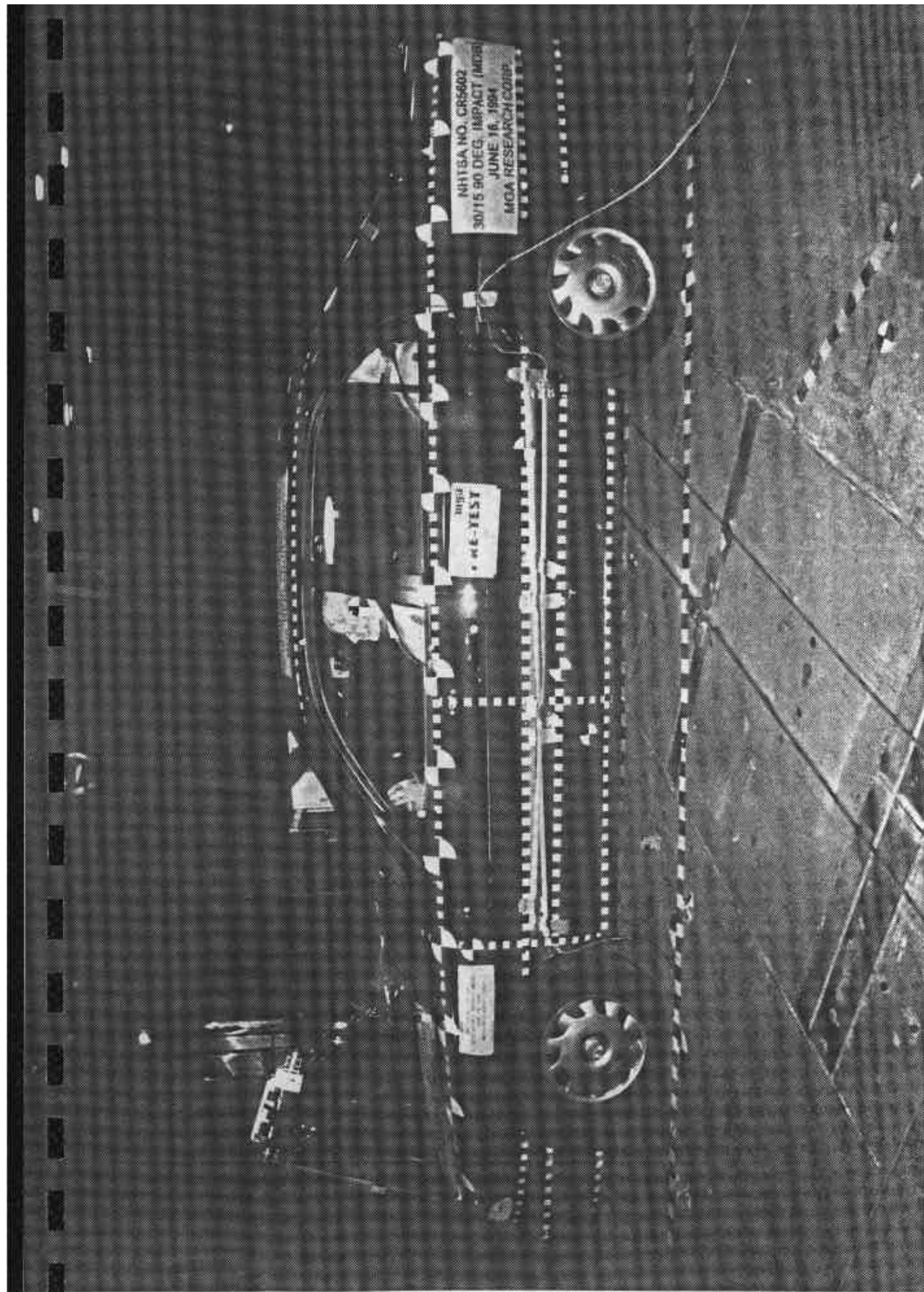


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

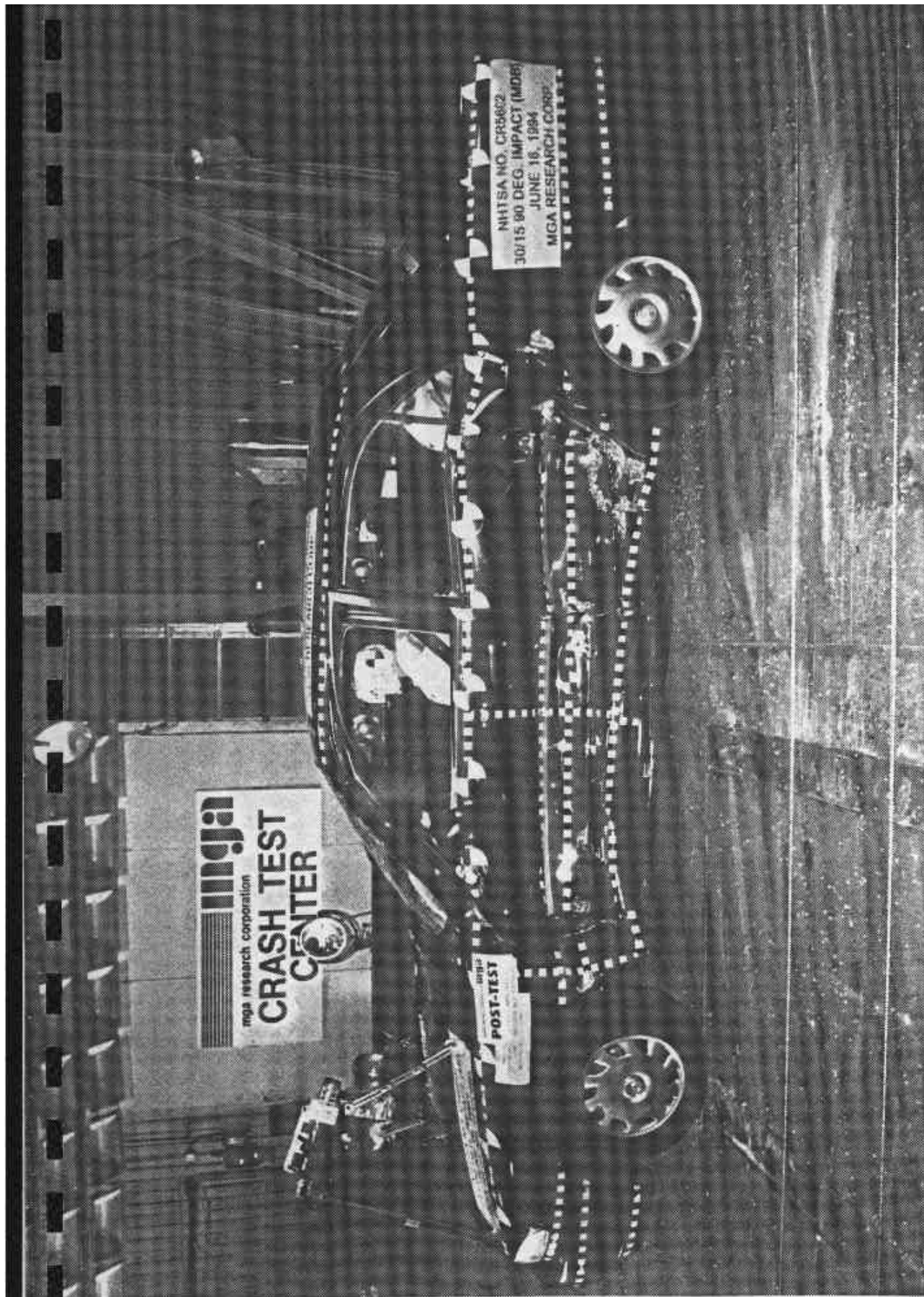


Photo No. A-6 - Post-Test Left Side View of Test Vehicle



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



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

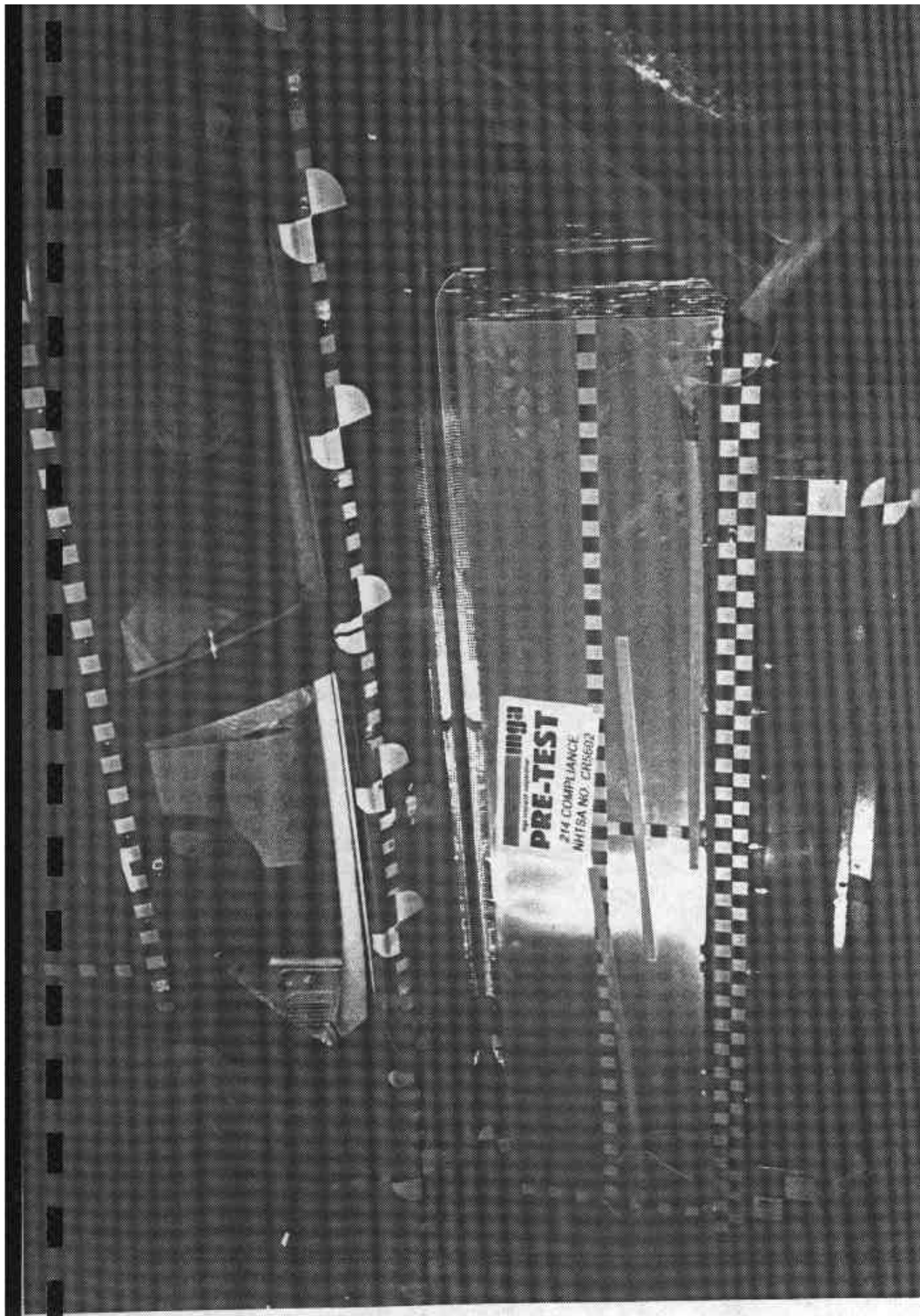


Photo No. A-9 - Pre-Test MDB Position Against Vehicle Overhead View

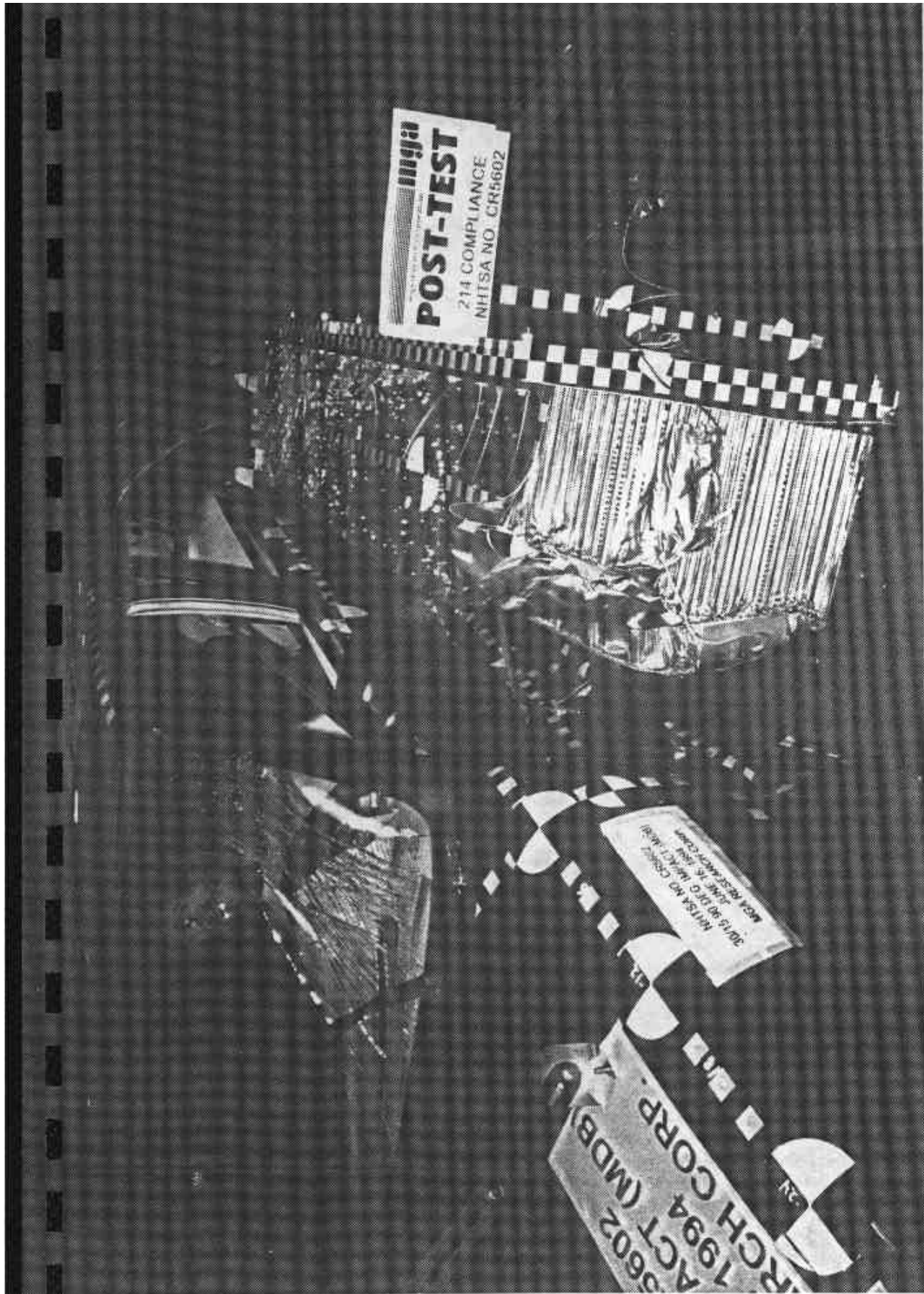


Photo No. A-10 - Post-Test MDB and Vehicle Left Side Front View

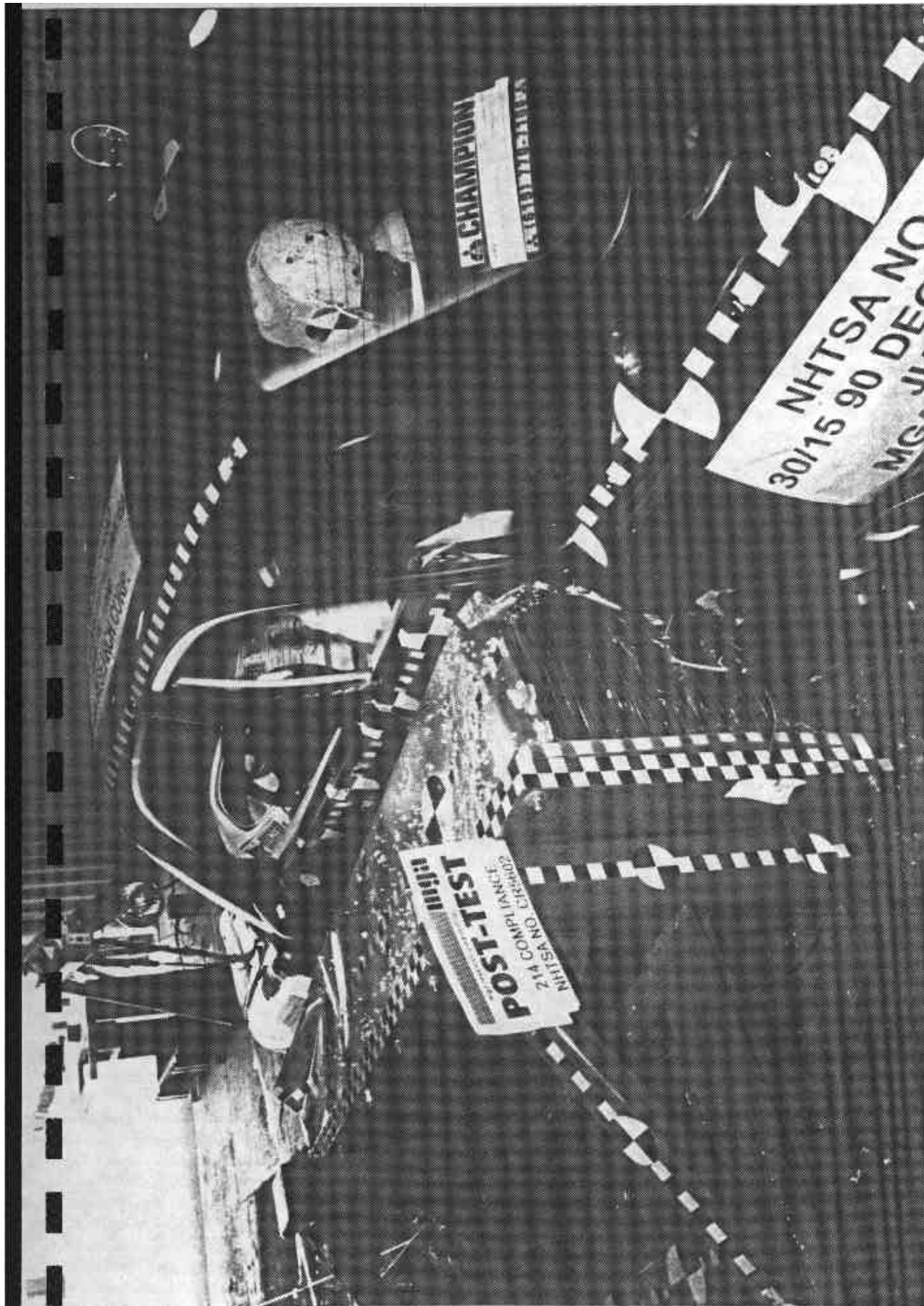


Photo No. A-11 - Post-Test MDB and Vehicle Right Side Rear View



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

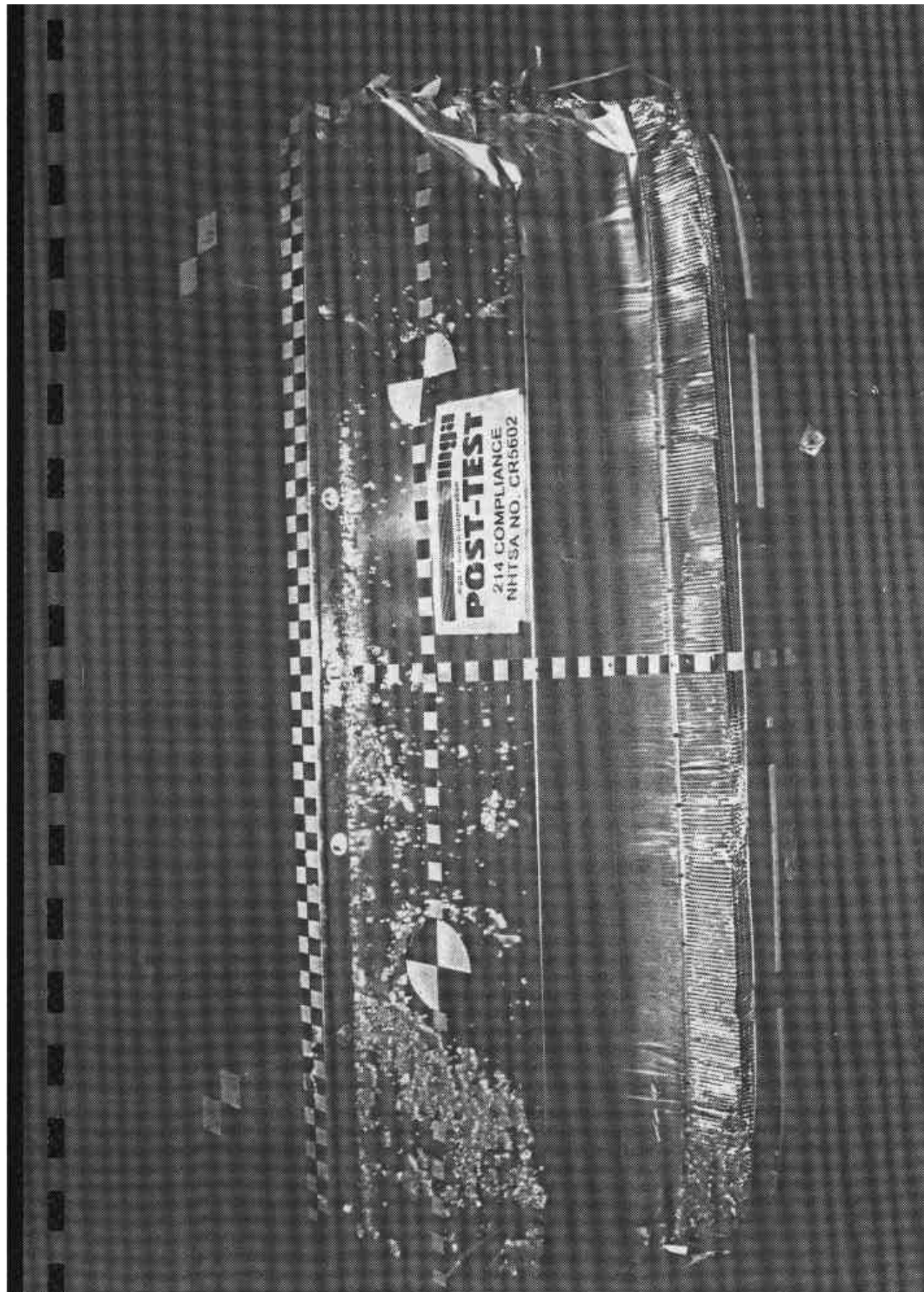


Photo No. A-13 - Post-Test MDB Top View

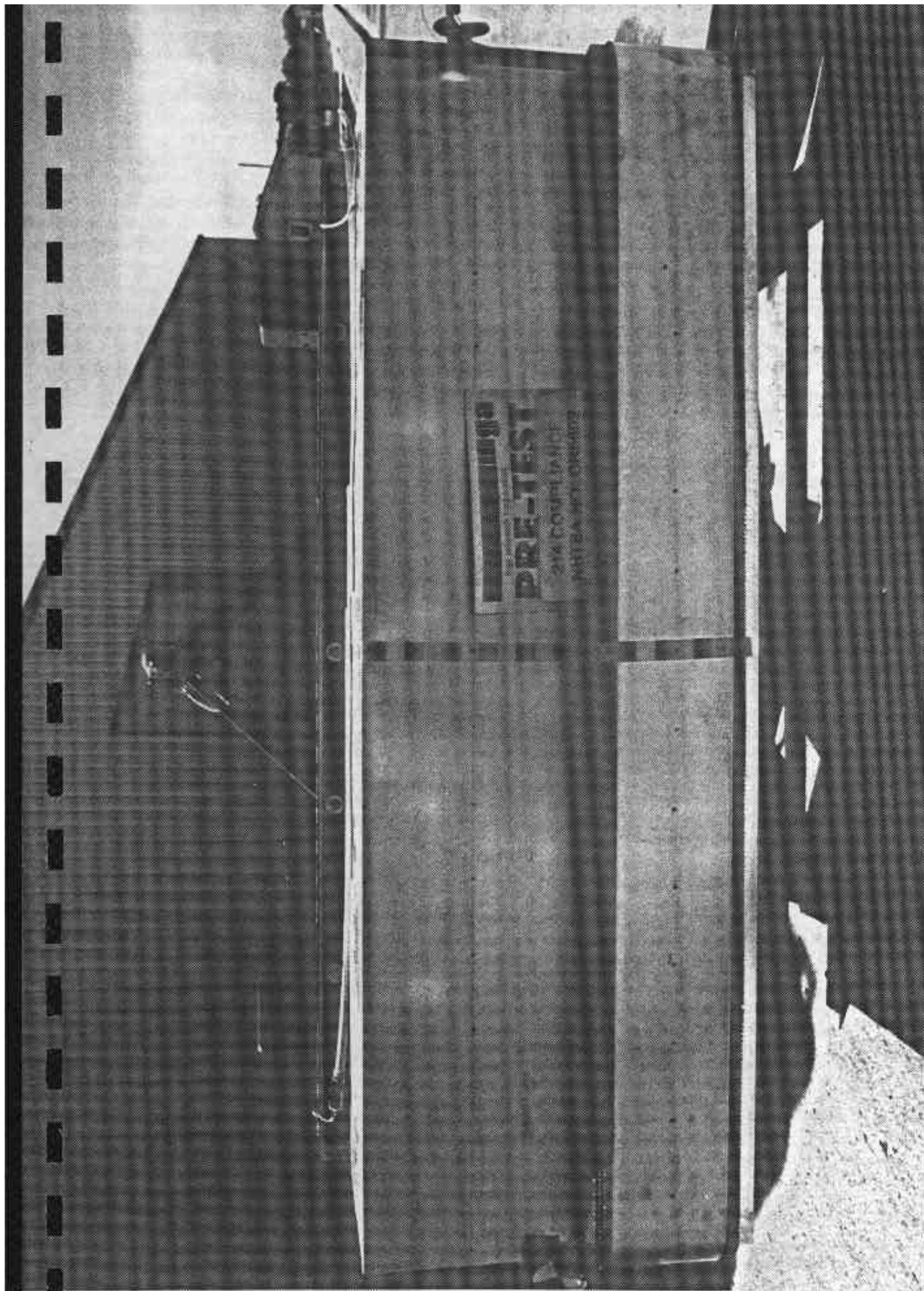


Photo No. A-14 - Pre-Test MDB Front View

POST-TEST
214 COMPLIANCE
NHTSA NO. CR5602

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

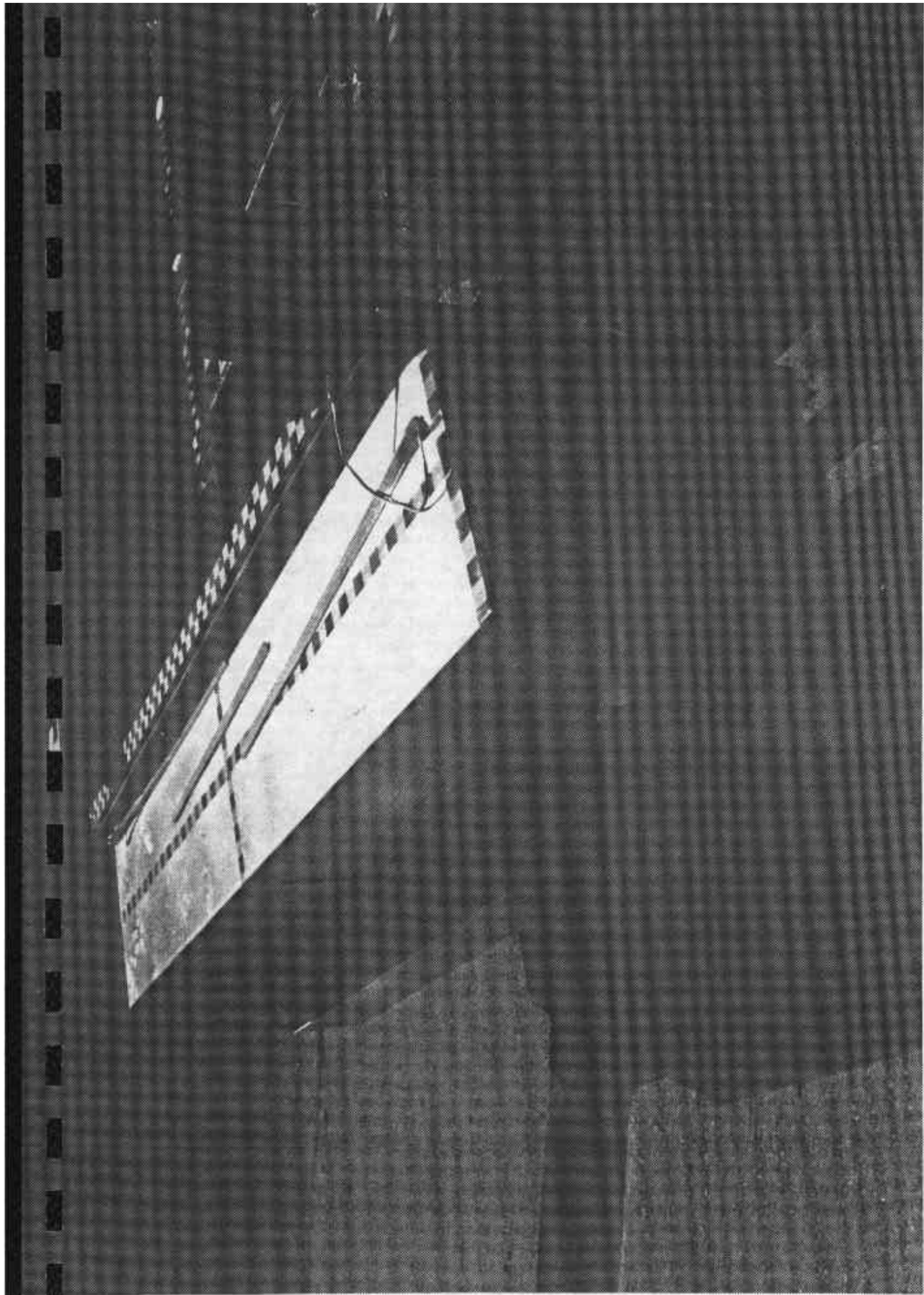


Photo No. A-16 - Pre-Test MDB Left Side View

inga
POST-TEST
214 COMPLIANCE
NHTSA NO. CR5602



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



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

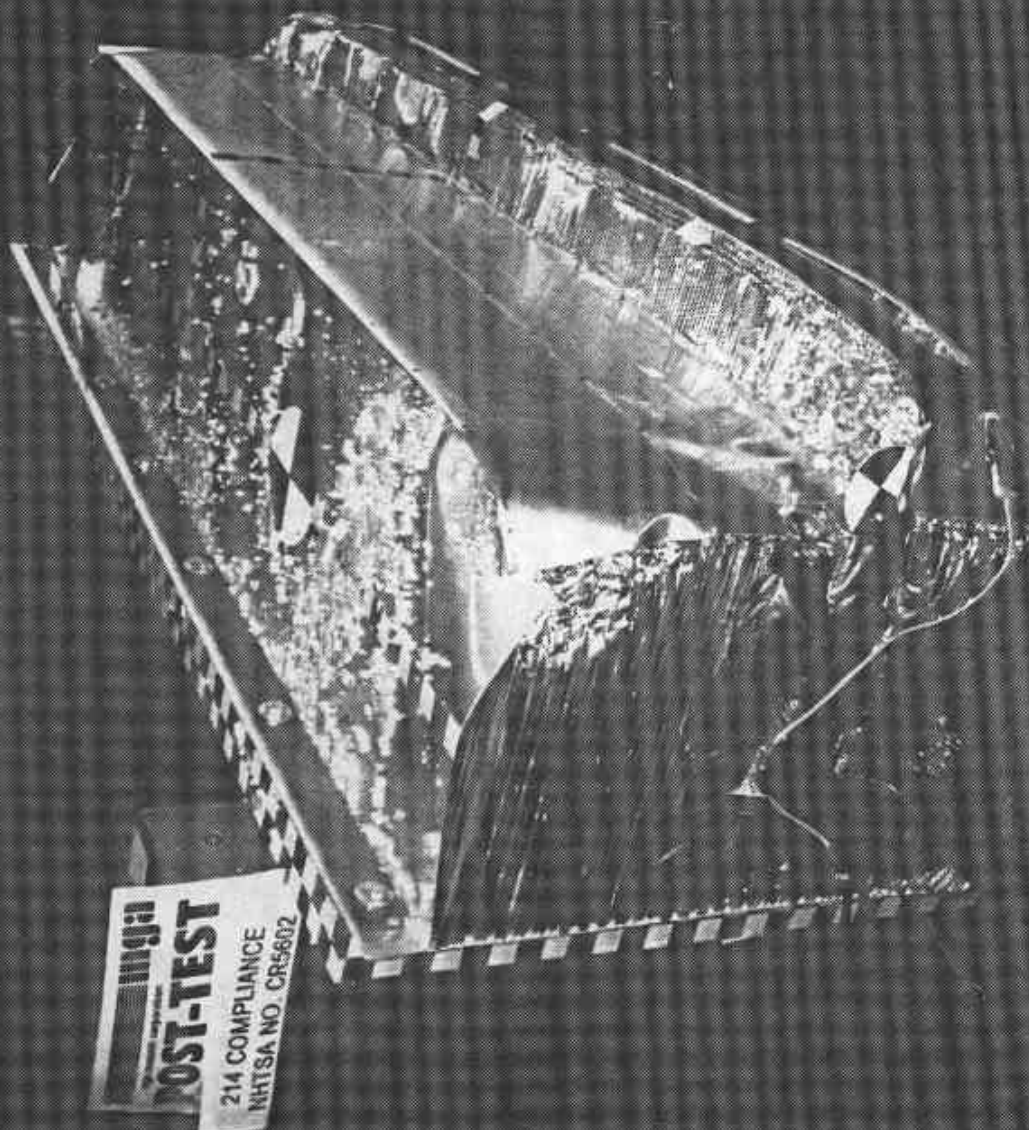


Photo No. A-19 - Post-Test MDB Right Side View

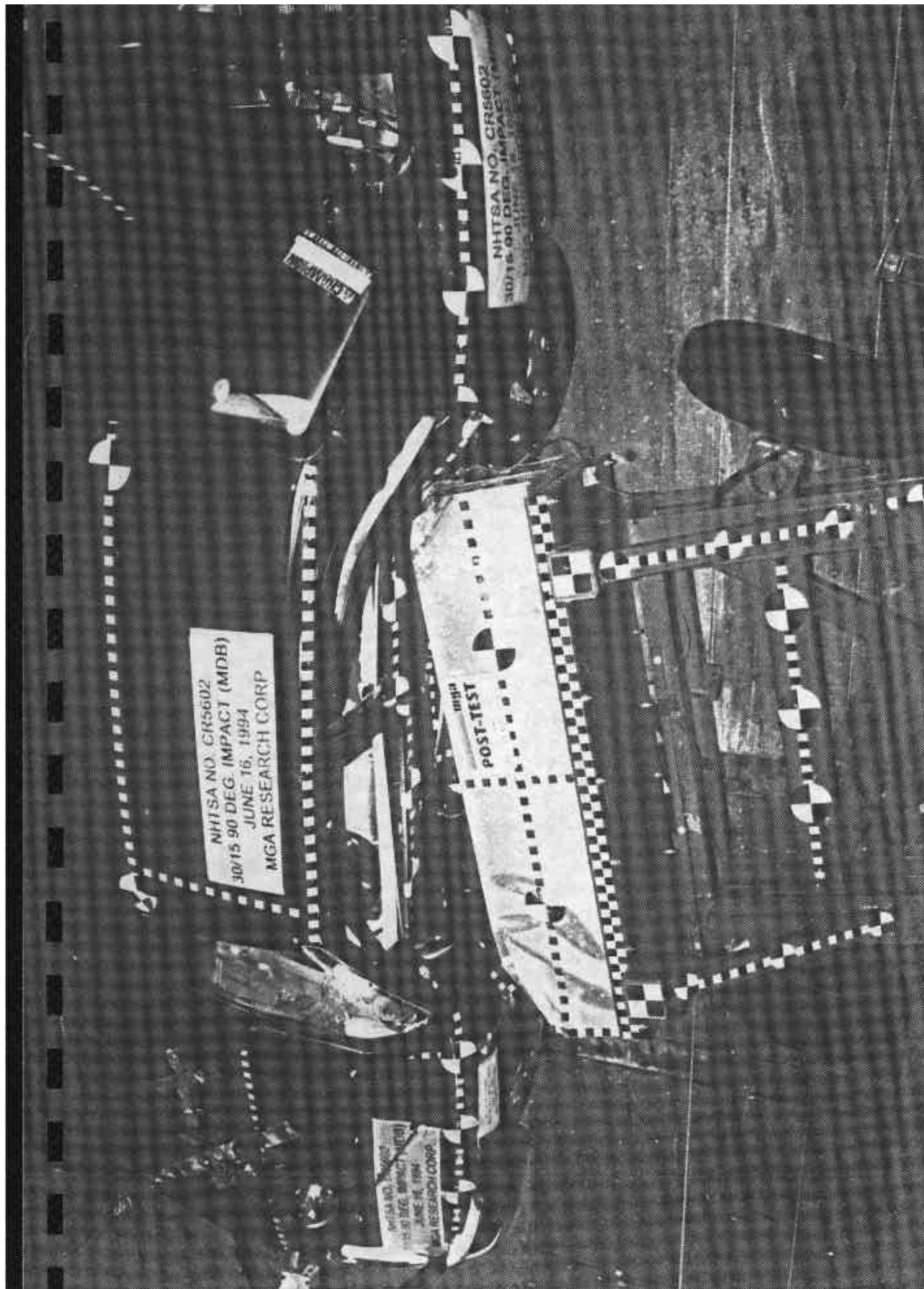


Photo No. A-20 - Post-Test MDB and Vehicle Overhead View

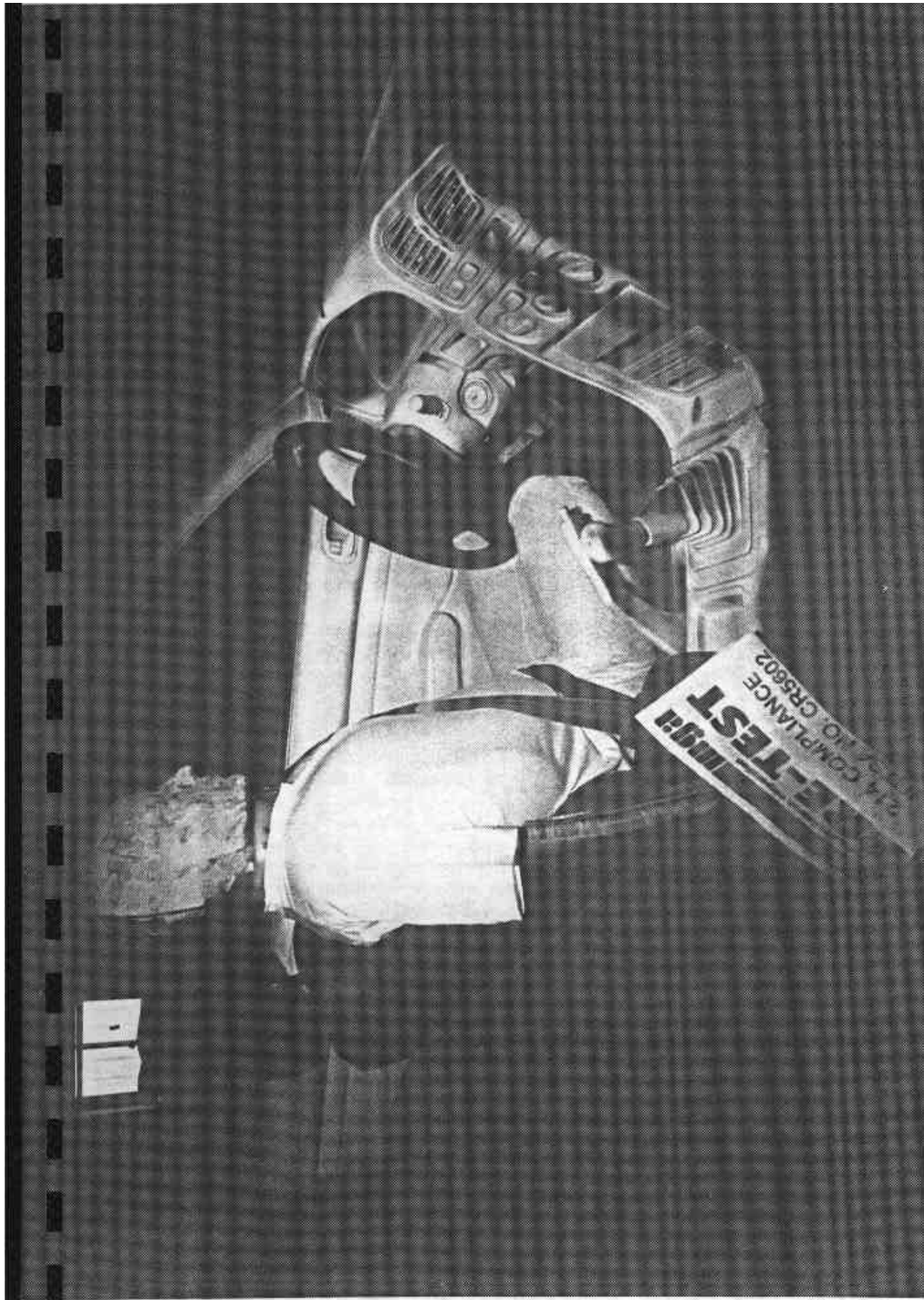


Photo No. A-21 - Pre-Test Driver Dummy Right Side View

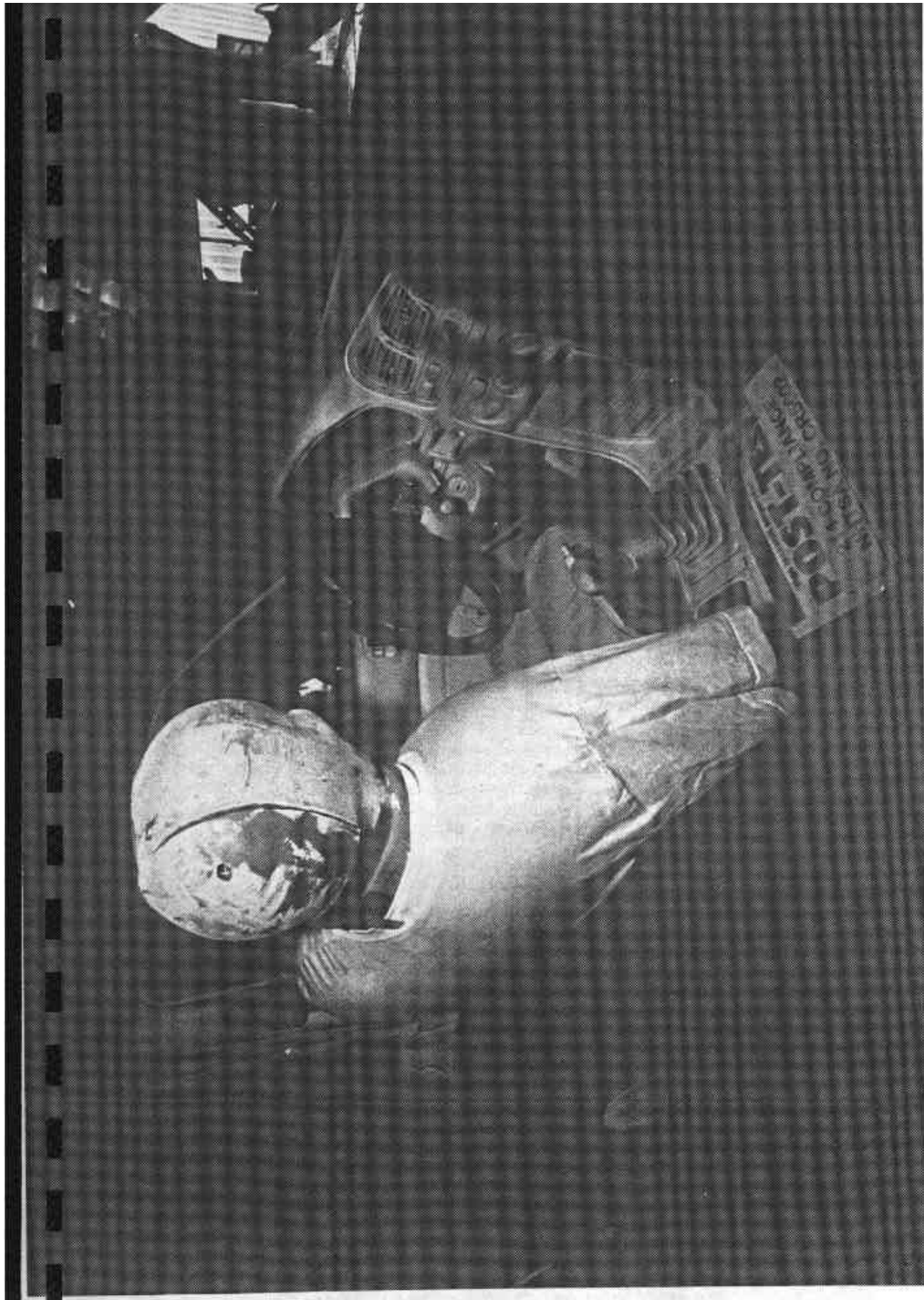


Photo No. A-22 - Post-Test Driver Dummy Right Side View

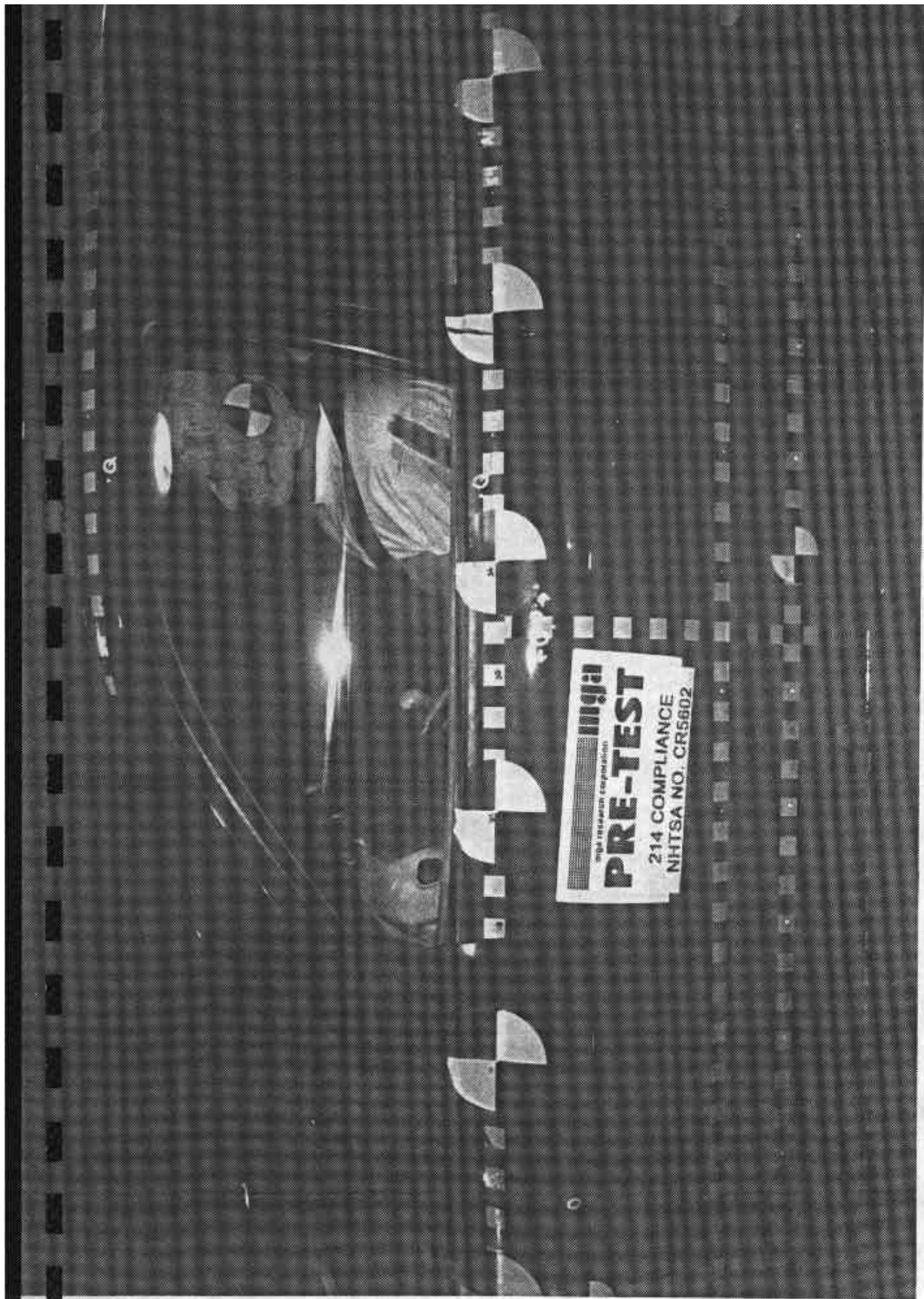


Photo No. A-23 - Pre-Test Driver Dummy Left Side View

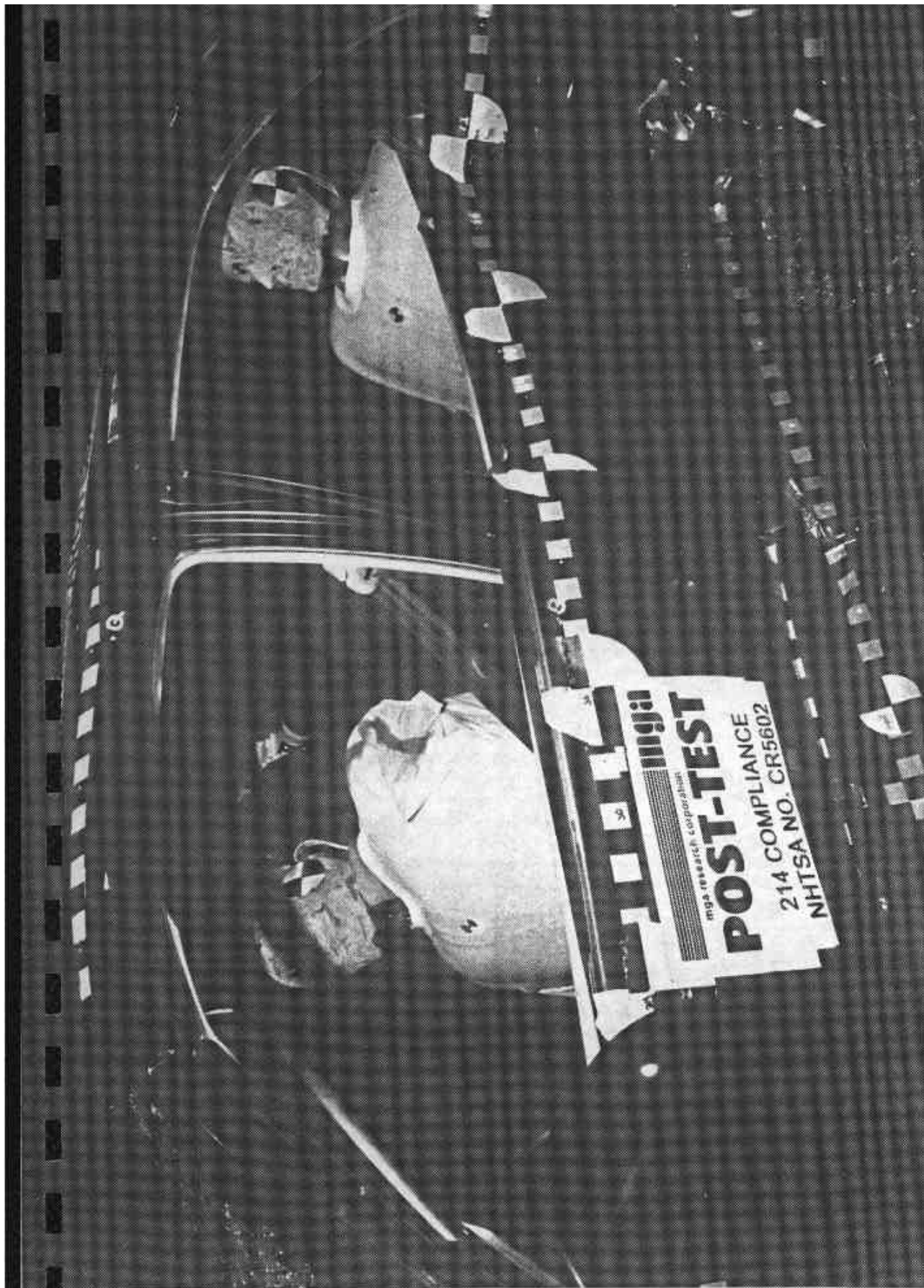


Photo No. A-24 - Post-Test Driver Dummy Left Side View

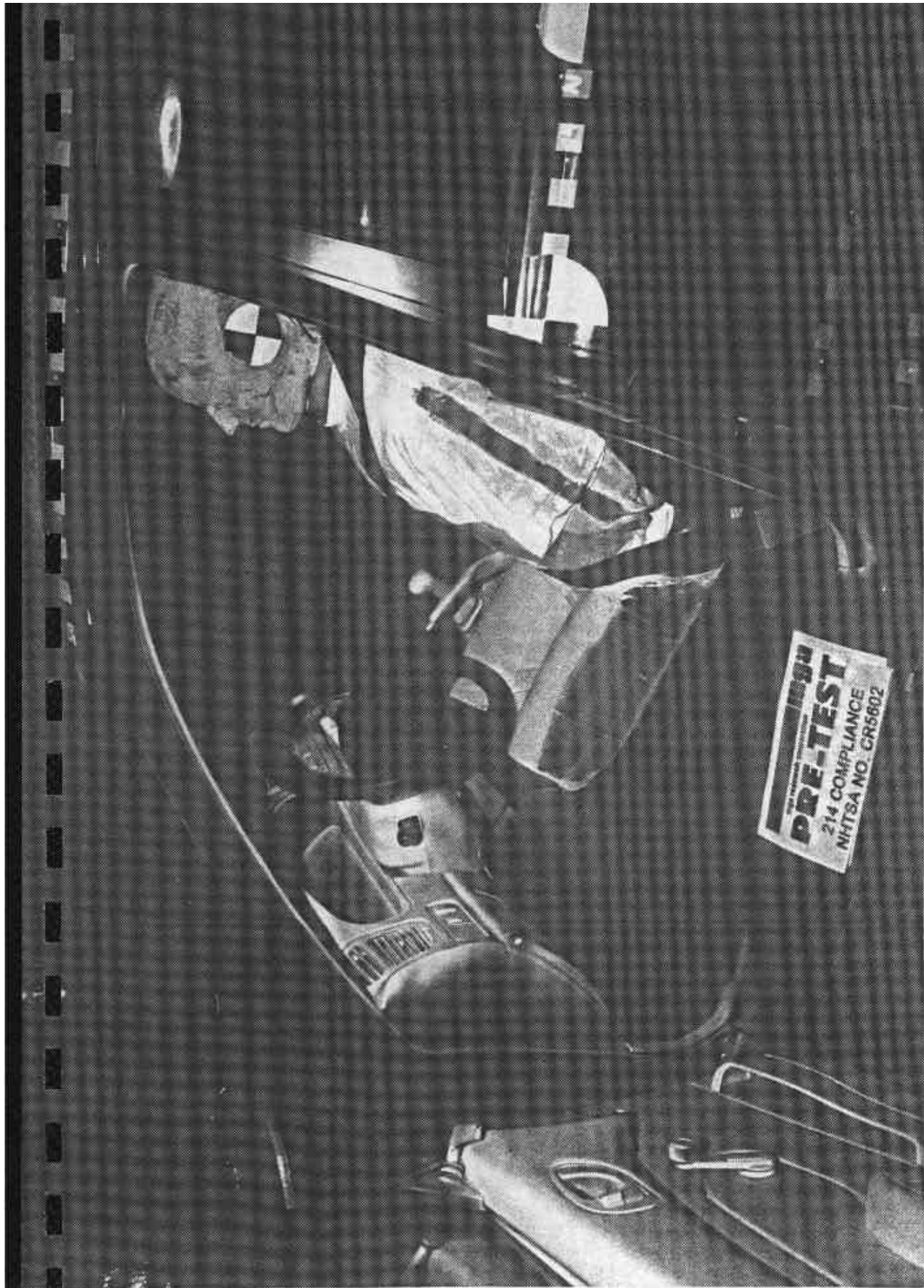


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)



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

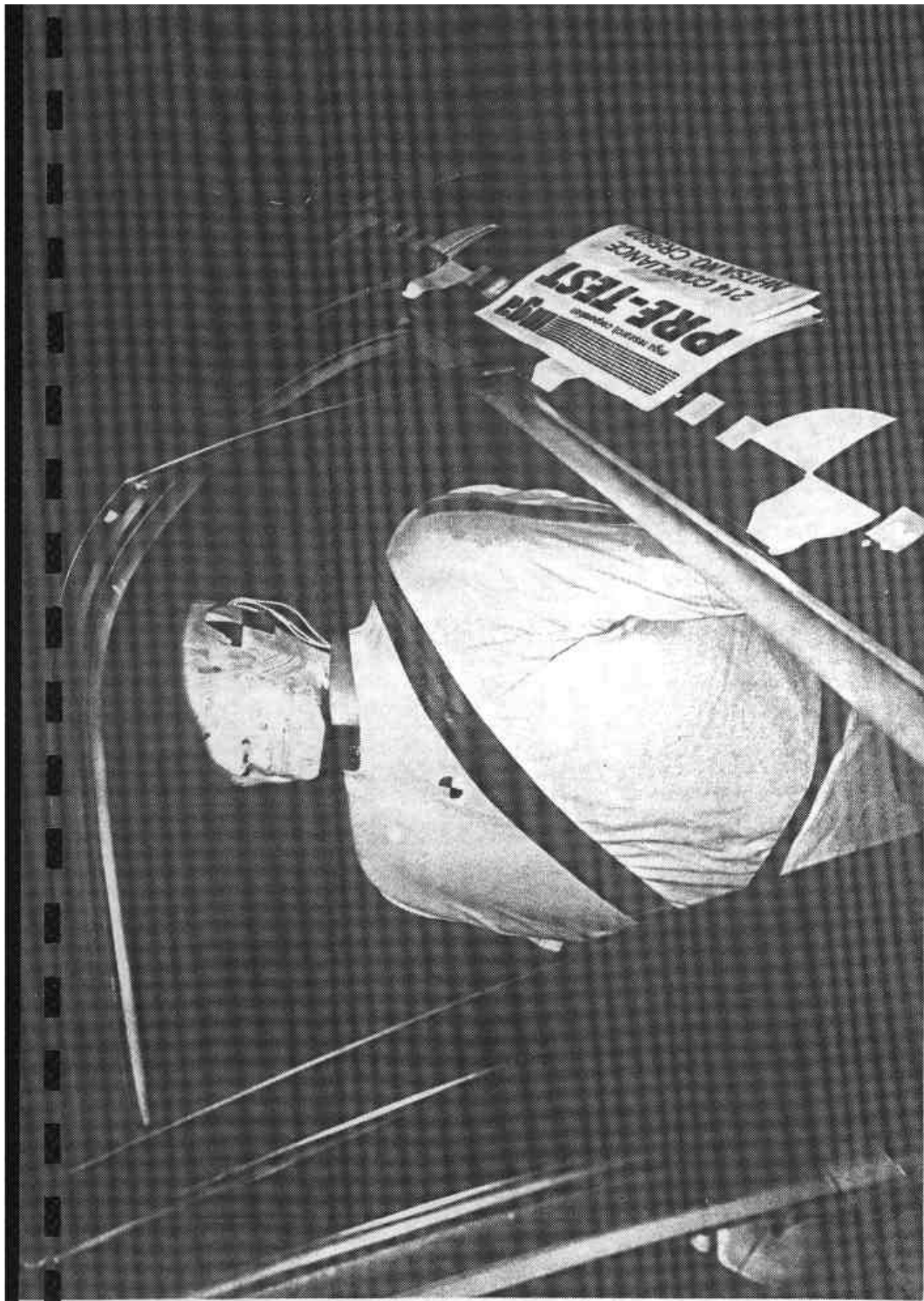


Photo No. A-29 - Pre-Test Passenger Dummy Left Side View

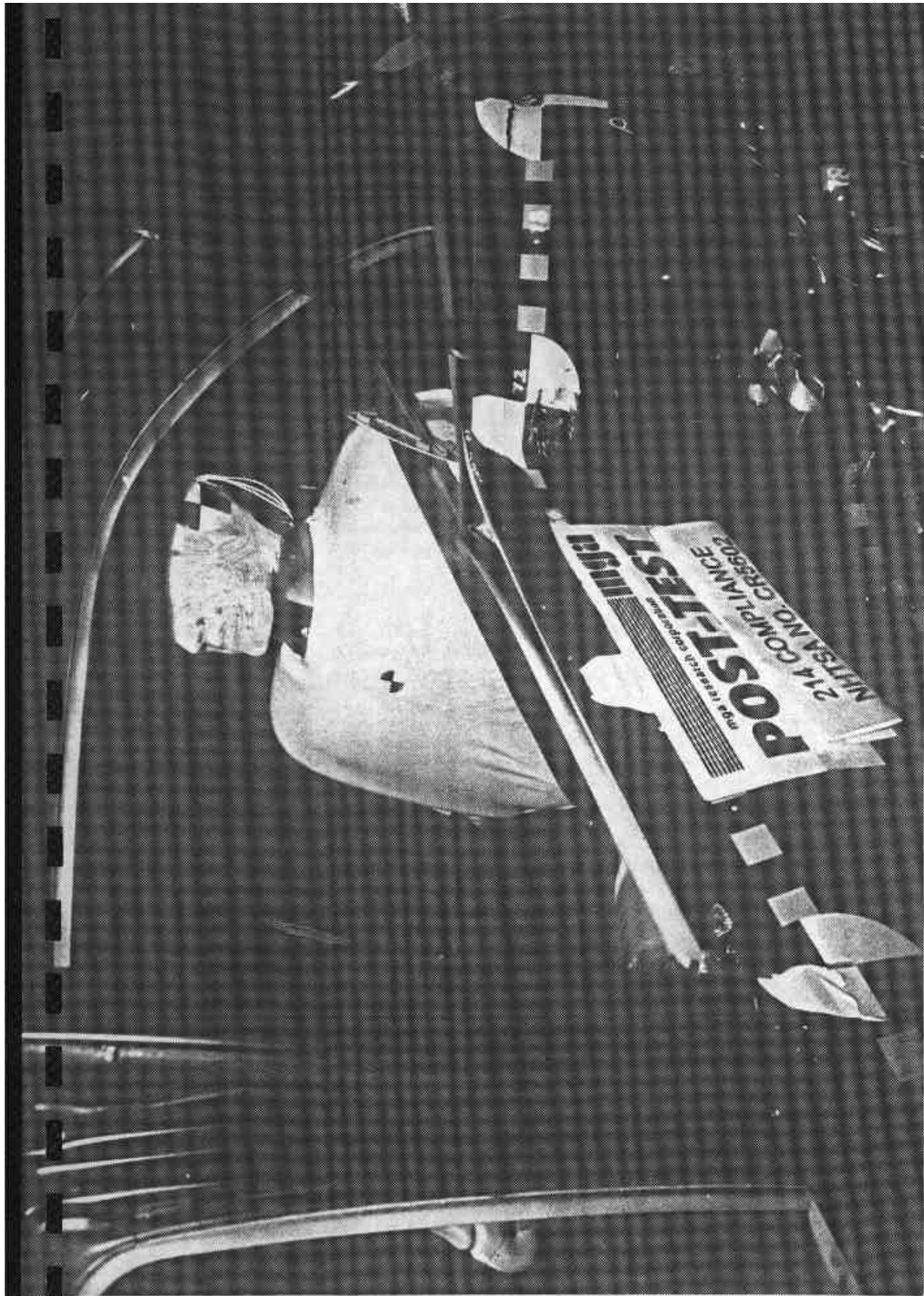


Photo No. A-30 - Post-Test Passenger Dummy Left Side View



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

A-31



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

TIRE INFLATION PRESSURE (COLD)	
STANDARD INFLATION PRESSURE FOR ALL LOAD	
1ST SEAT	2 PASS.
2ND SEAT	3 PASS.
TOTAL	5 PASS.
LUGGAGE	35kg (77 LBS)
TOTAL WEIGHT	375kg (827 LBS)
TIRE SIZE	P185/70R14 87H
FRONT	P185/60R15 87H
REAR	200kPa
(32psi)	(29psi)
TIRE SIZE	Y125/70D15
TEMPORARY USE ONLY	420kPa
	(60psi)
PART NO.	MR103233

Photo No. A-33 - Tire Placard

MADE IN U.S.A. DATE MAR. 1974

MANUFACTURED BY DIAMOND-STAR MOTORS CORP.

GWR 3725 LBS GAWR 2140 LBS GAWR 1785 LBS
1780 KG FR. 970 KG RR. 810 KG

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

4A3AJ46G5RE116B4D



MSX 028801

VEHICLE TYPE: PASSENGER CAR NUMBER 223

Photo No. A-34 - Vehicle Certification Label

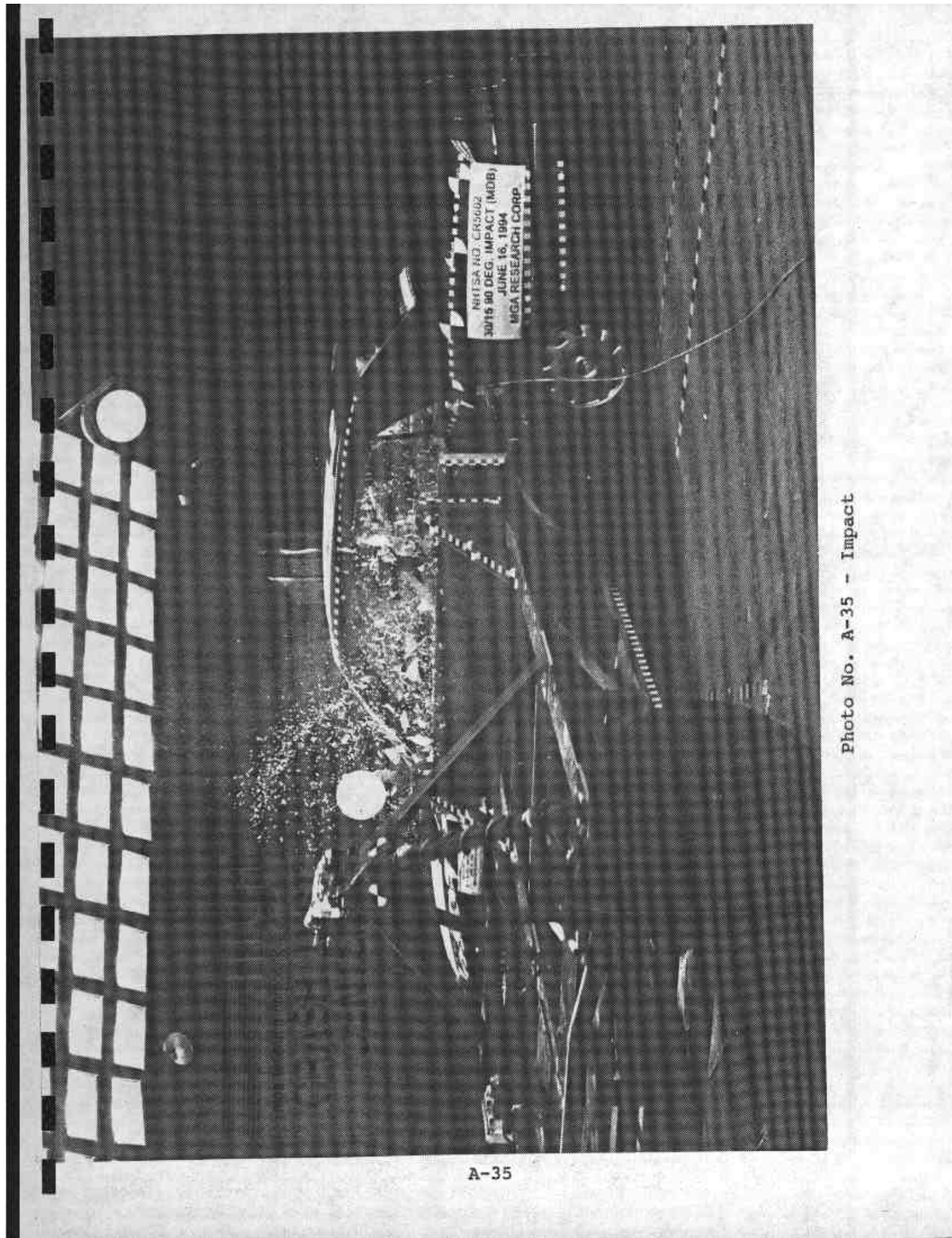


Photo No. A-35 - Impact

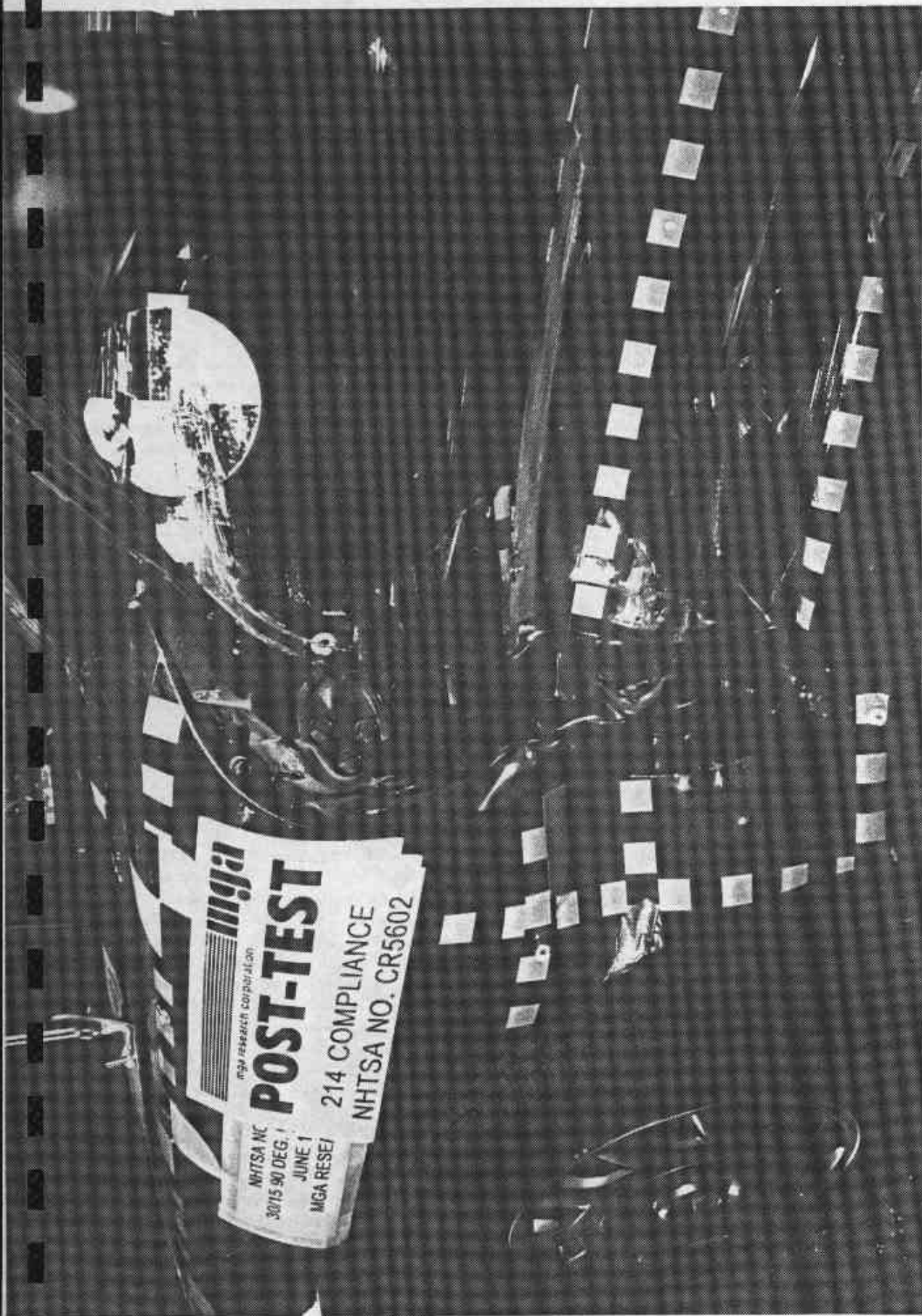


Photo No. A-36 - Left Front Impact Location on Vehicle

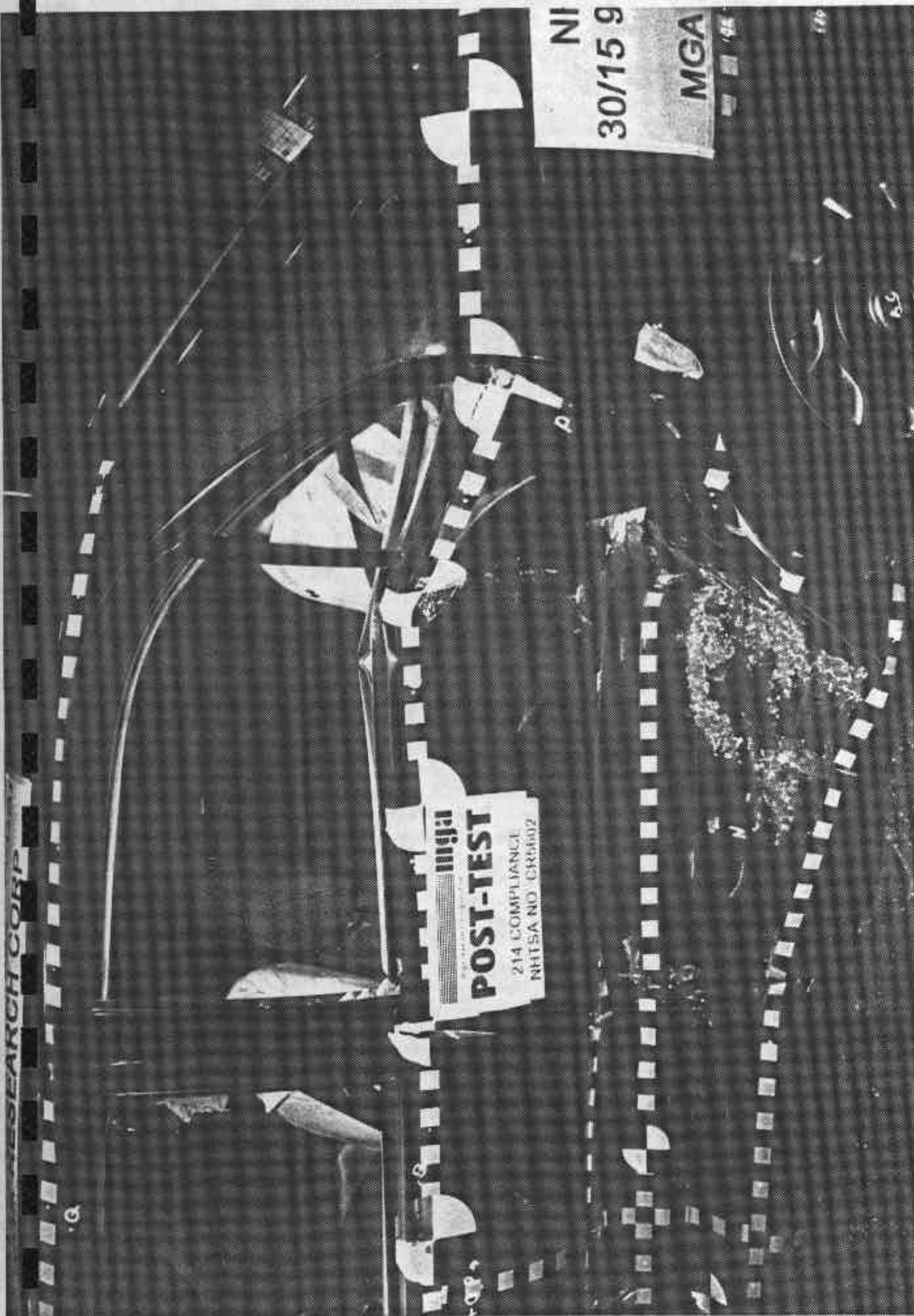


Photo No. A-37 - Left Rear Impact Location on Vehicle



Photo No. A-38 - Rollover 94°

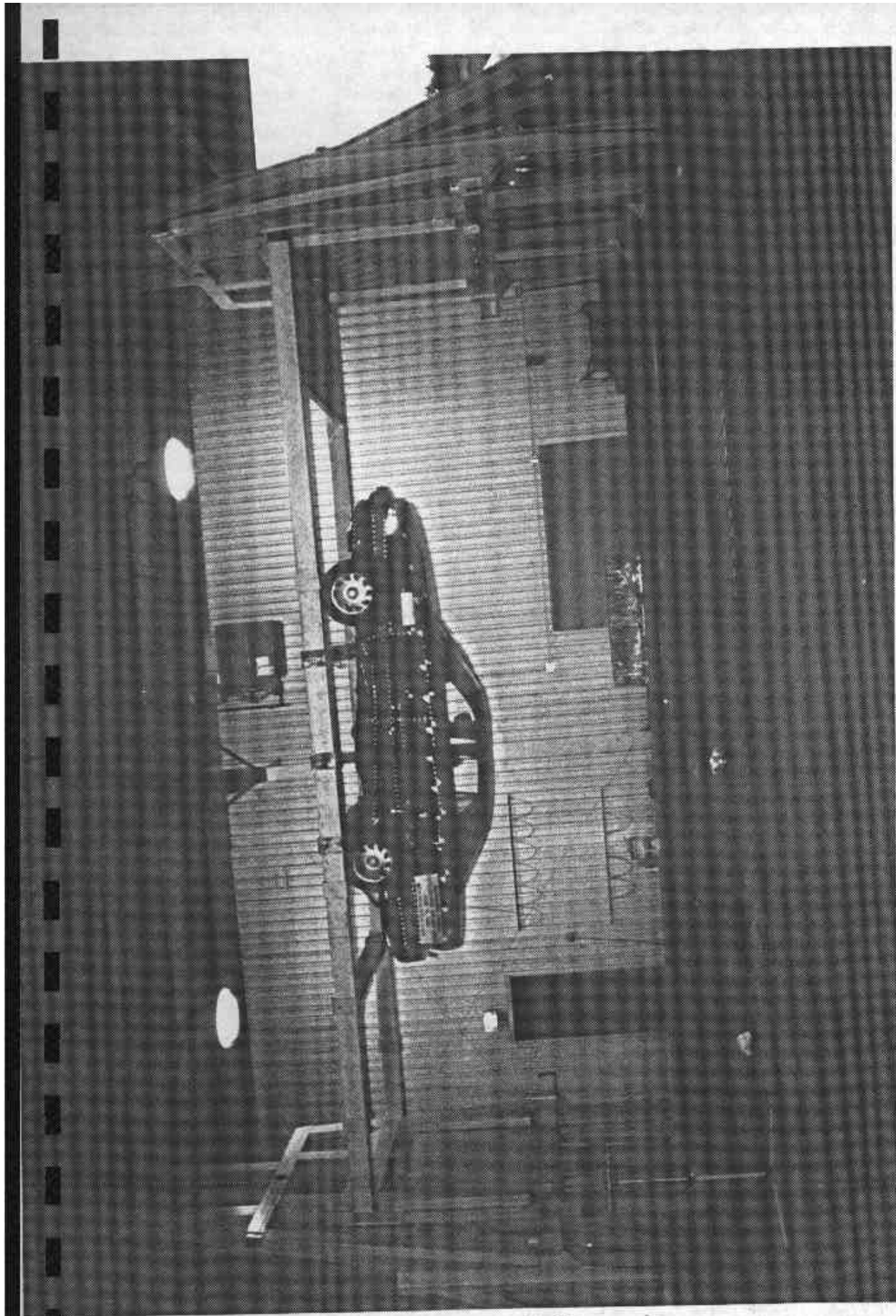
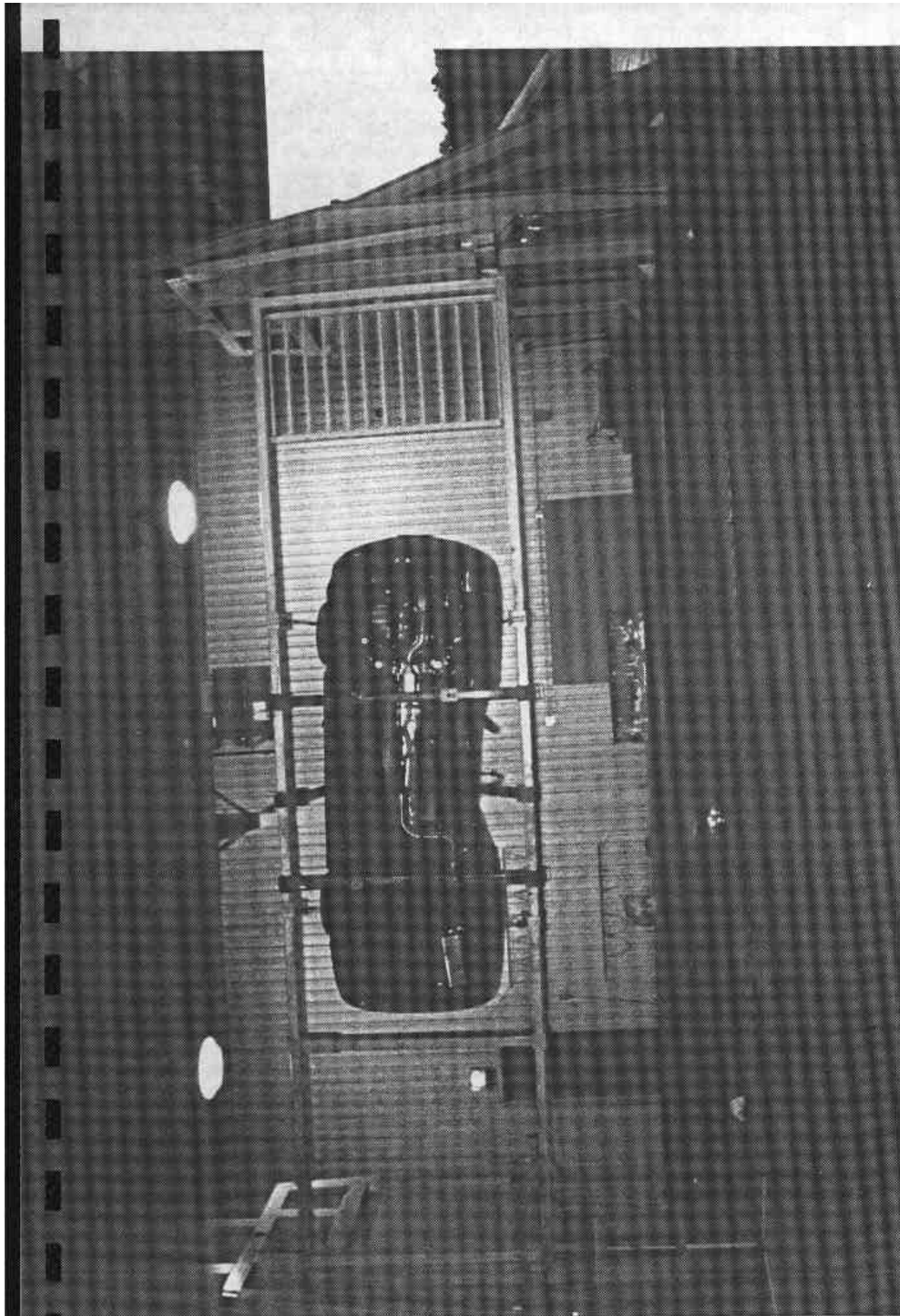


Photo No. A-39 - Rollover 180°

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Photo No. A-40 - Rollover 270°



Photo No. A-41 - Rollover 369°

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APPENDIX B - DATA PLOTS

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Filter: Class 180 (300 Hz)

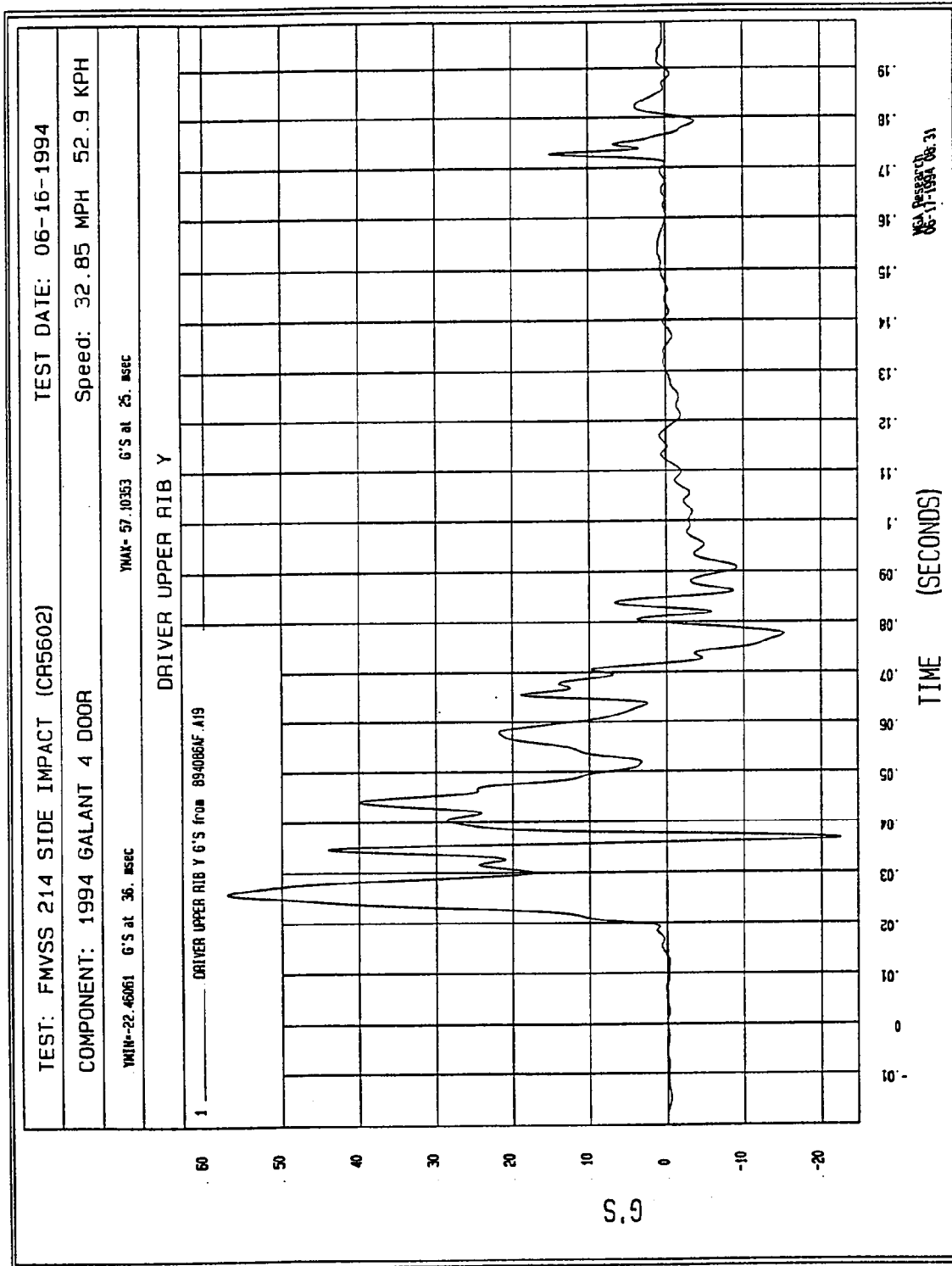


Figure B-1 - Driver Upper Rib Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

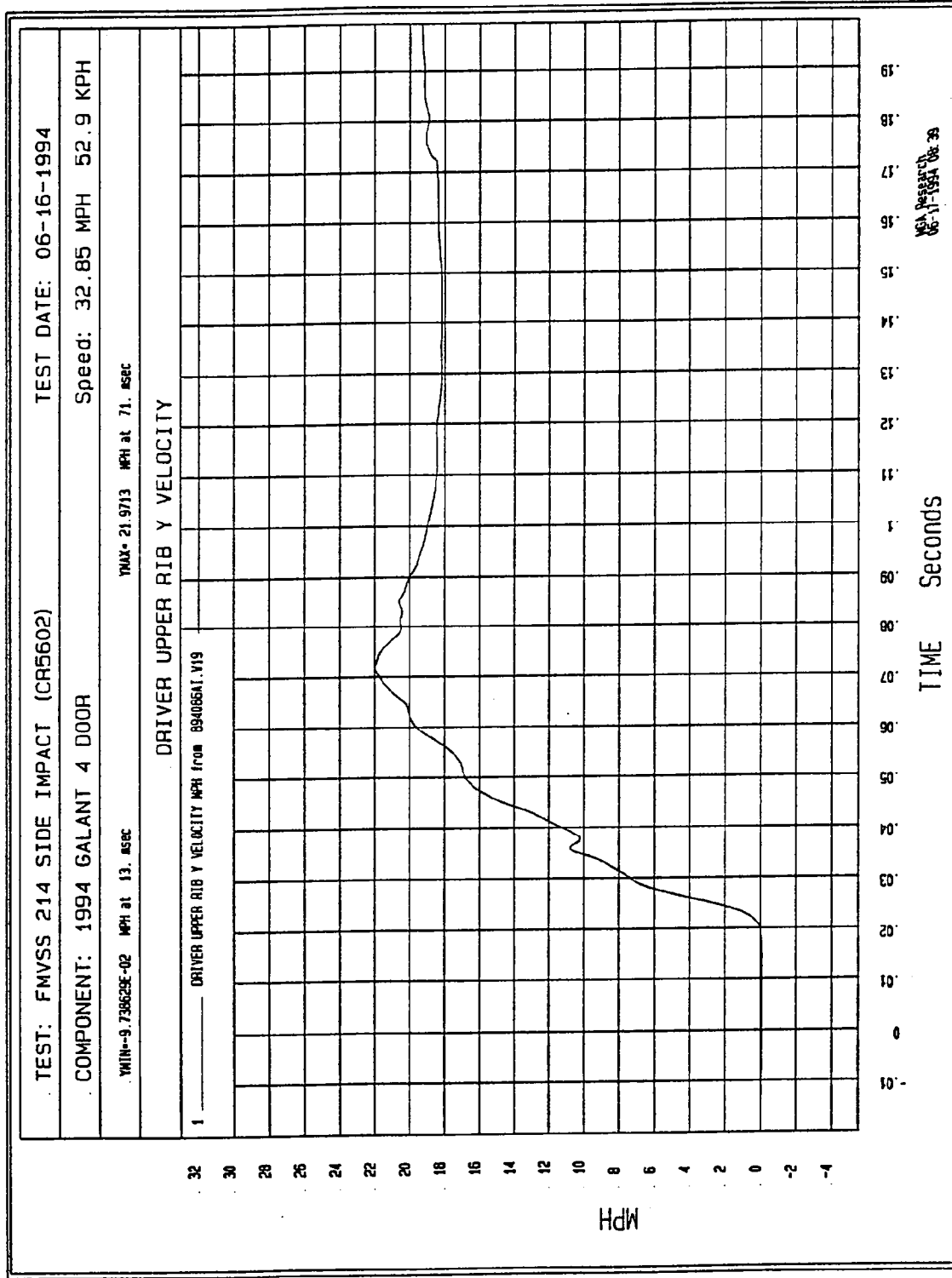


Figure 1-2 - Driver Upper Rib Y Velocity vs. Time

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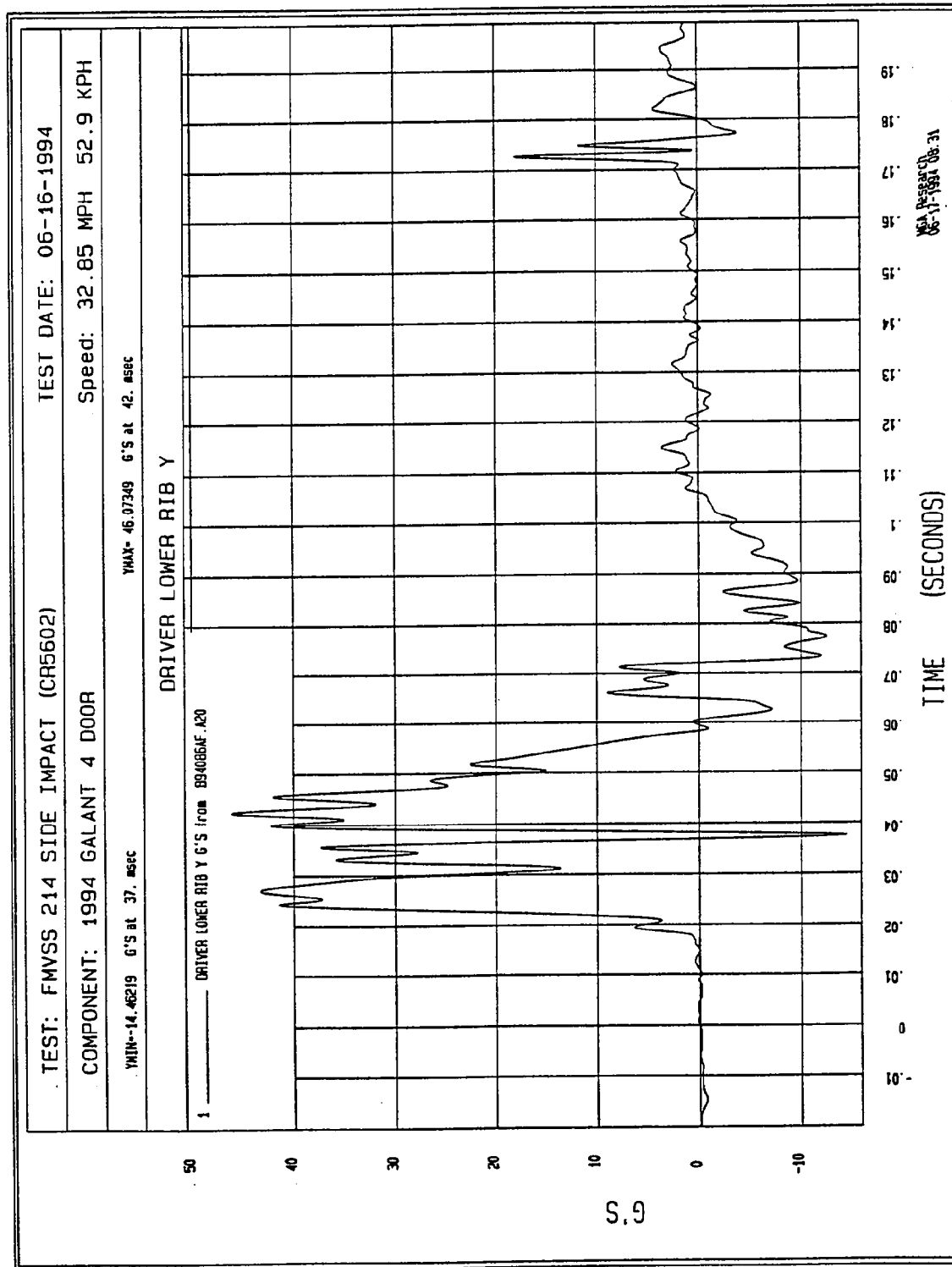


Figure B-3 - Driver Lower Rib Y Acceleration vs. Time

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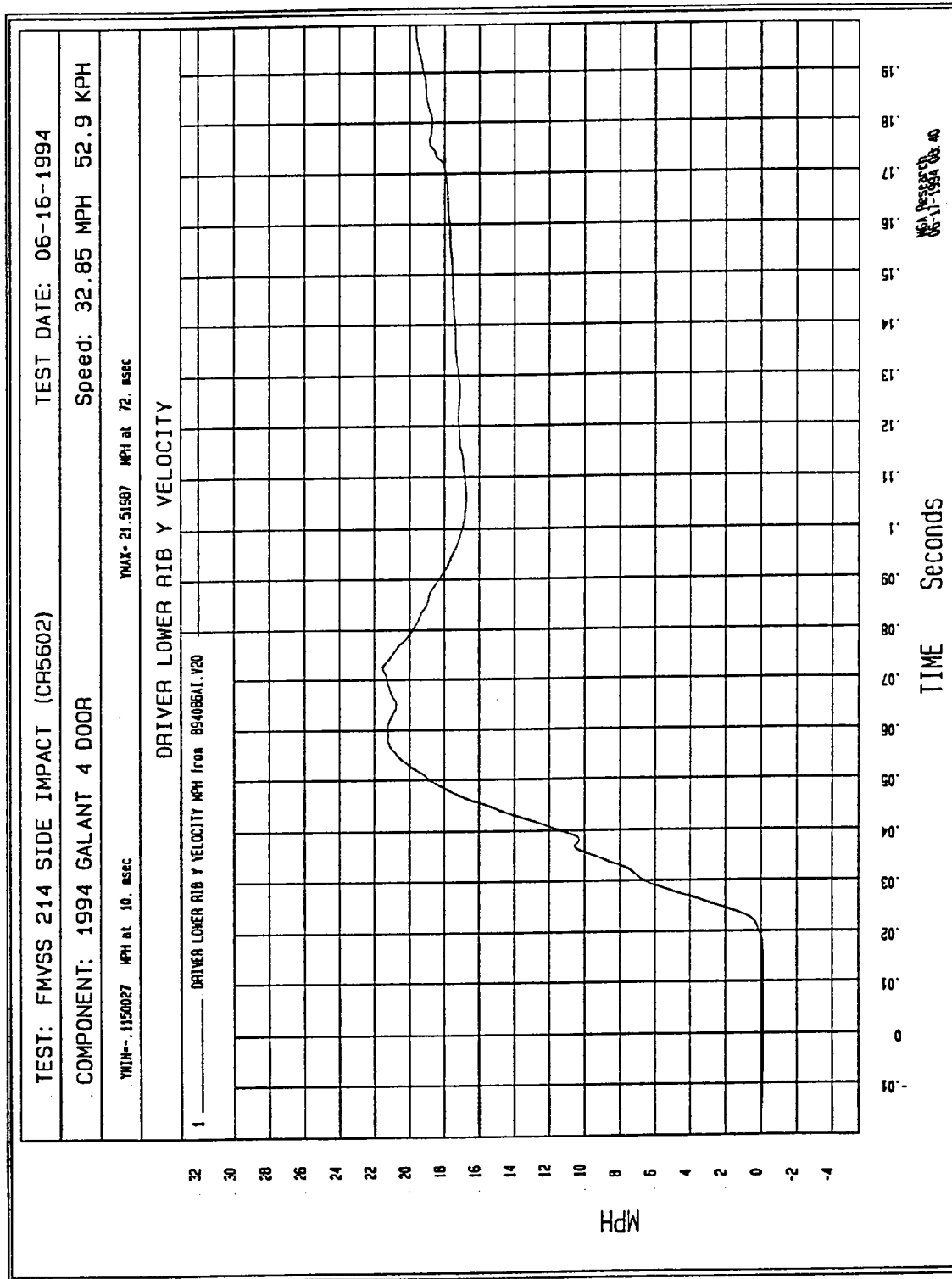


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

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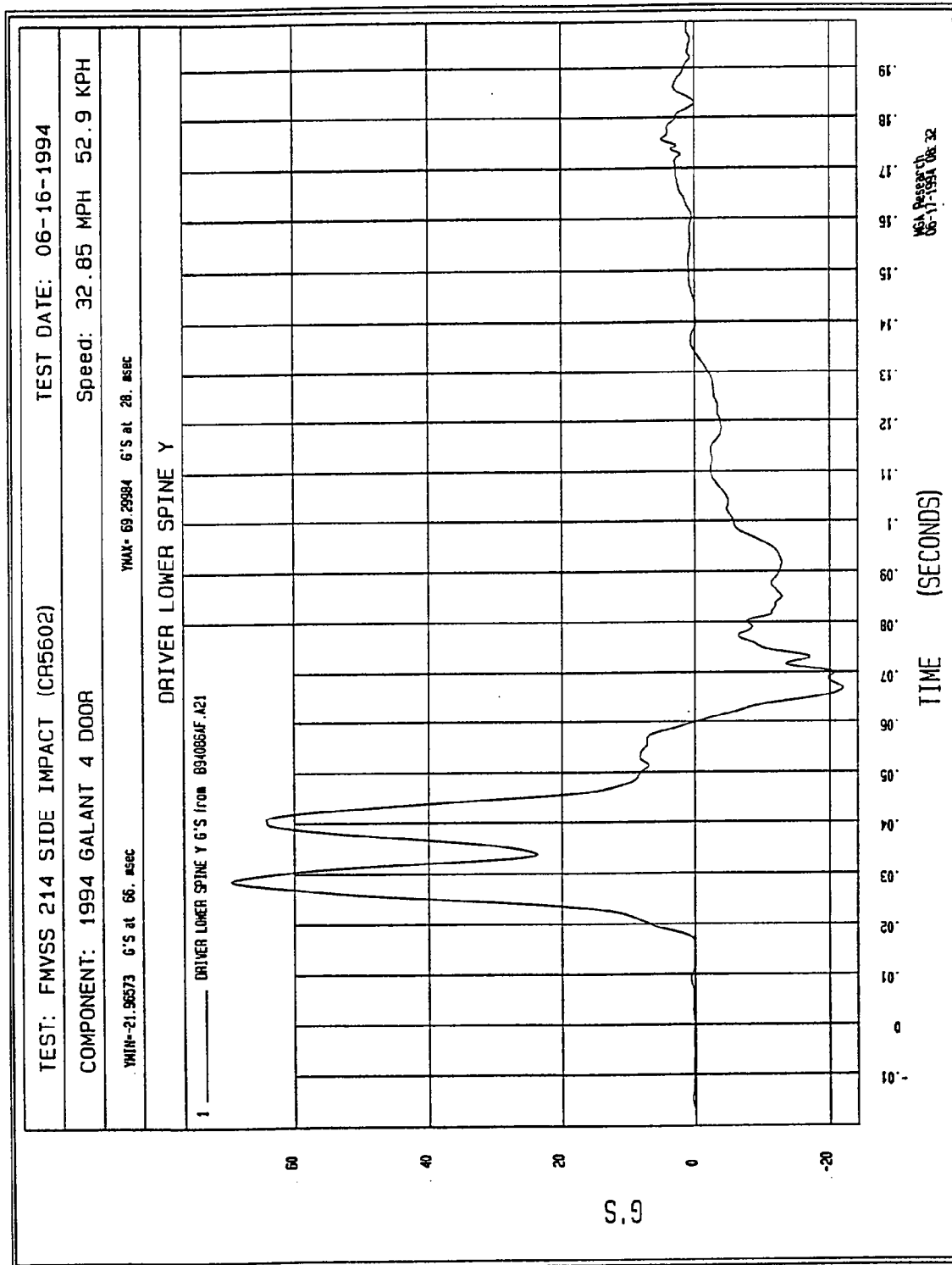
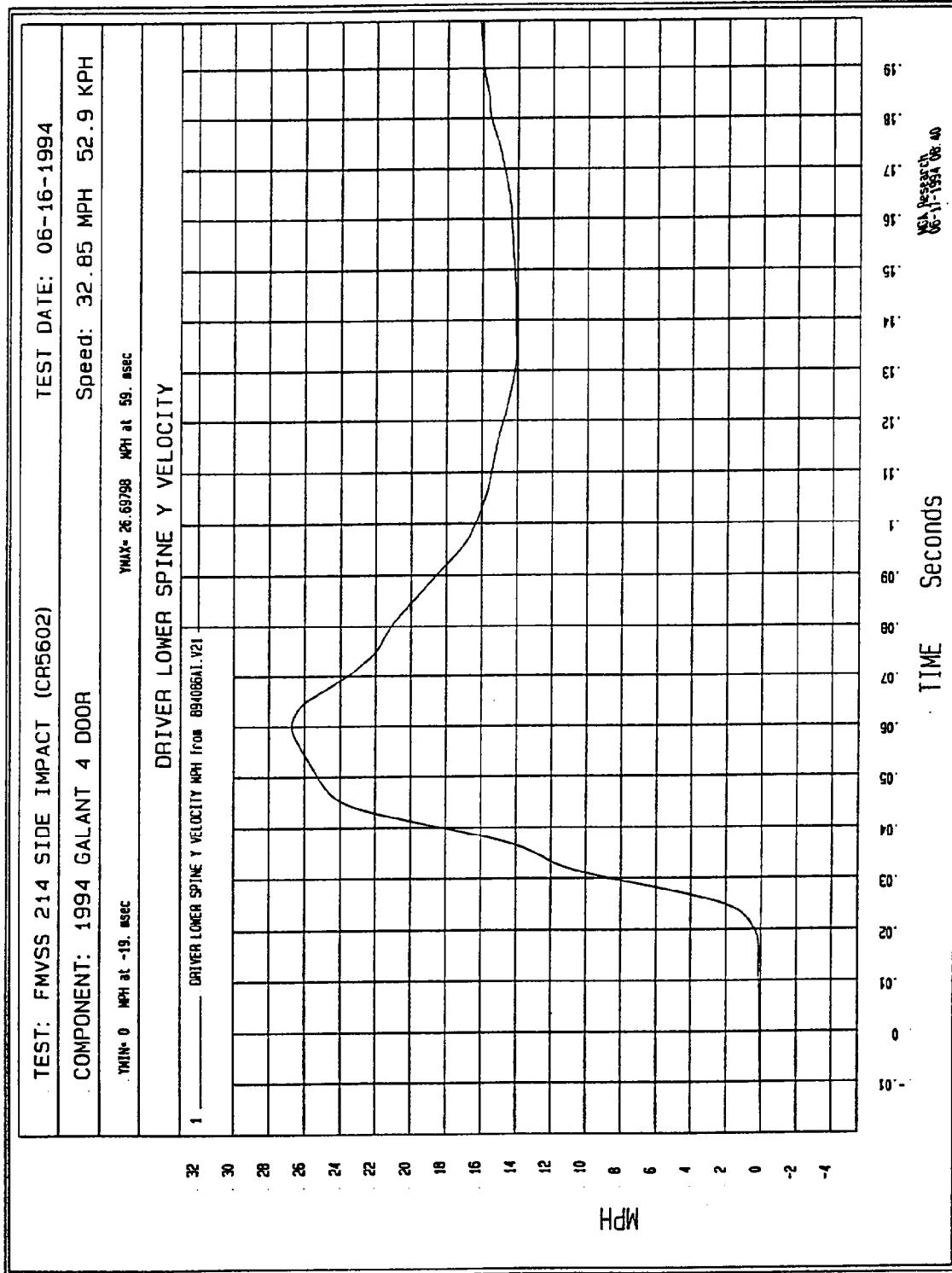


Figure B-5 - Driver Lower Spine Y Acceleration vs. Time

Filter: Class 180 (300 Hz)



Filter: Class 180 (300 Hz)

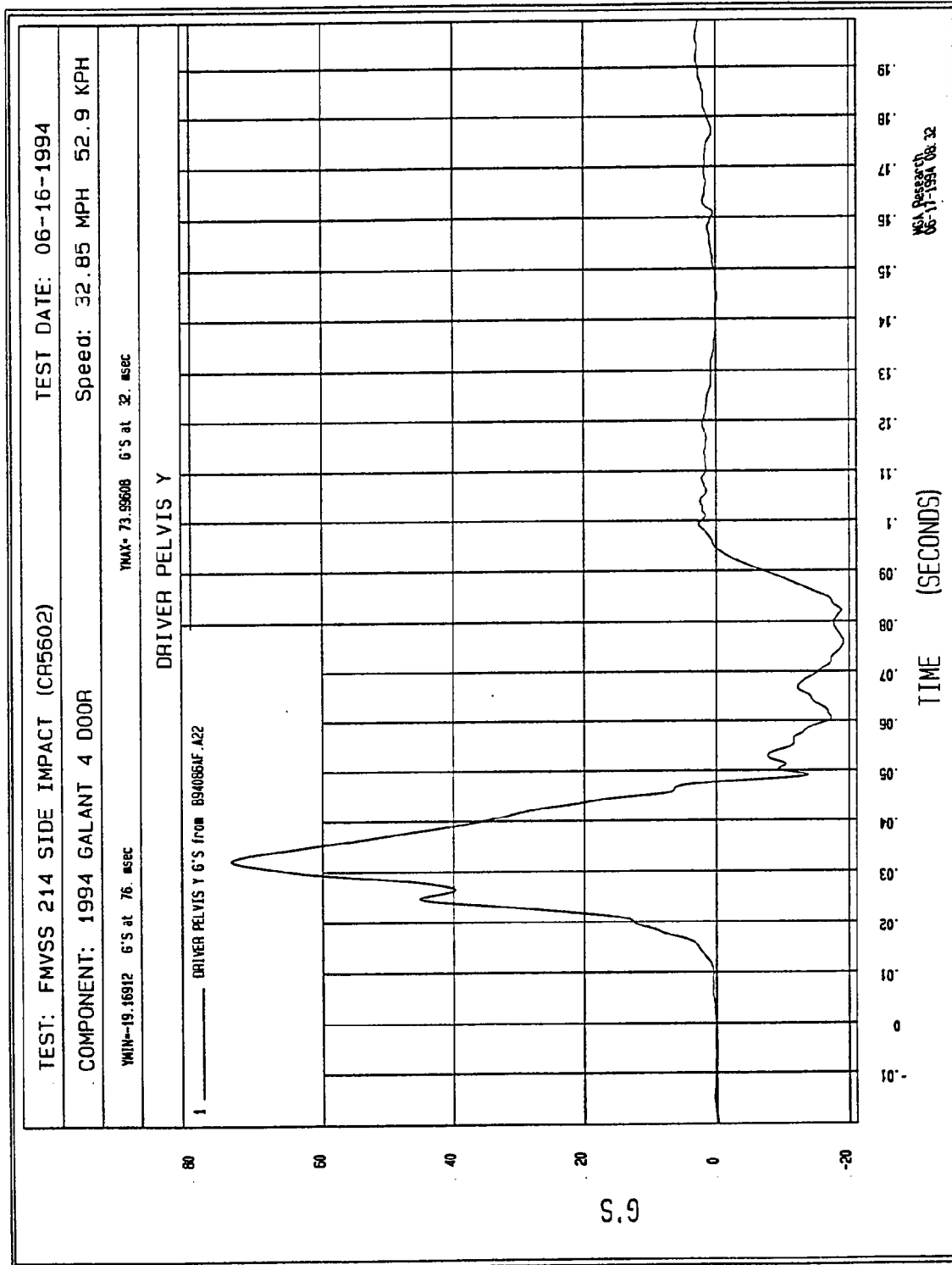


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

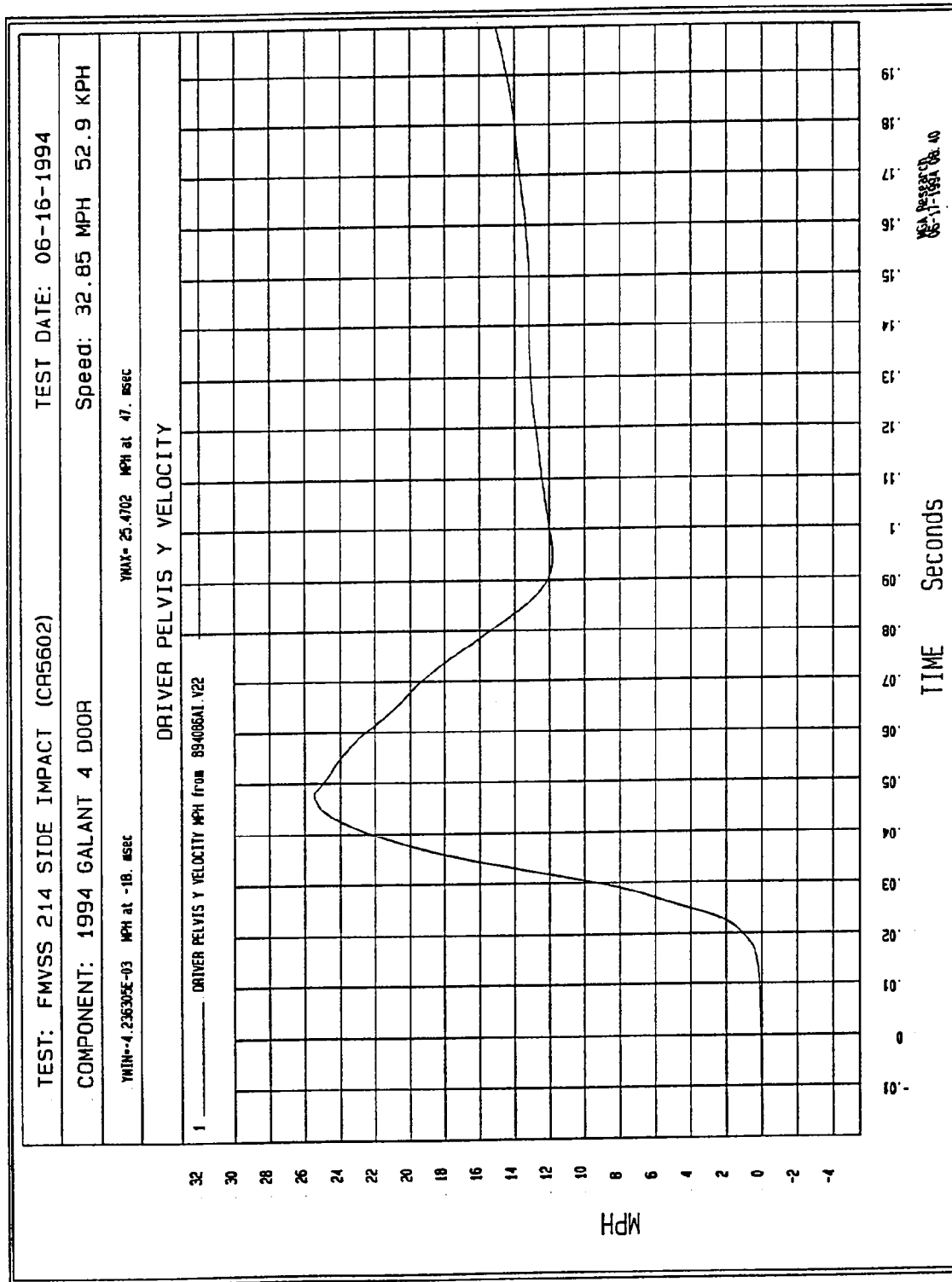


Figure B-8 - Driver Pelvis Y Velocity vs. Time

Filter: Class 180 (300 Hz)

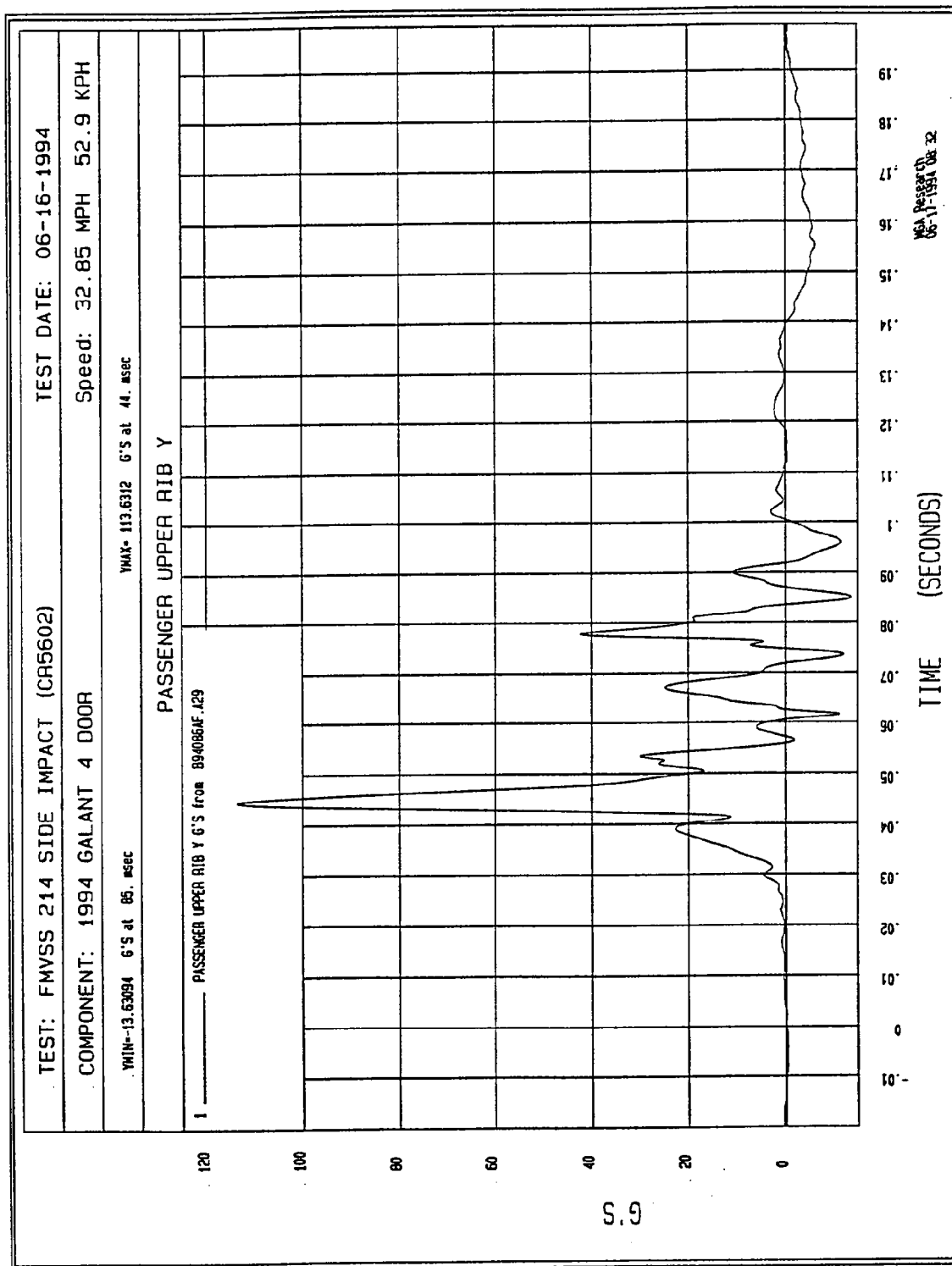


Figure B-9 - Passenger Upper Rib Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

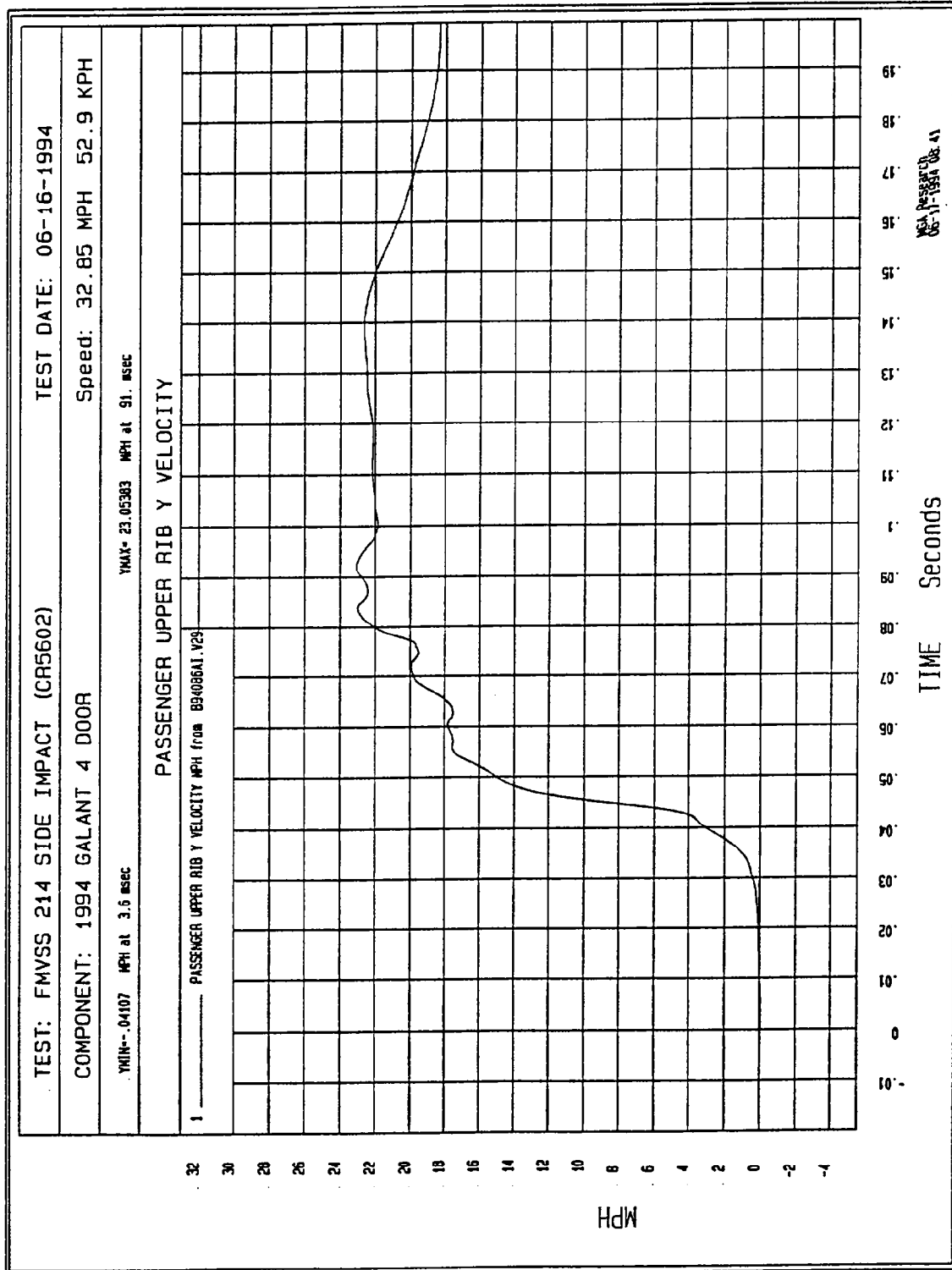


Figure B-10 - Passenger Upper Rib Y Velocity vs. Time

Filter: Class 180 (300 Hz)

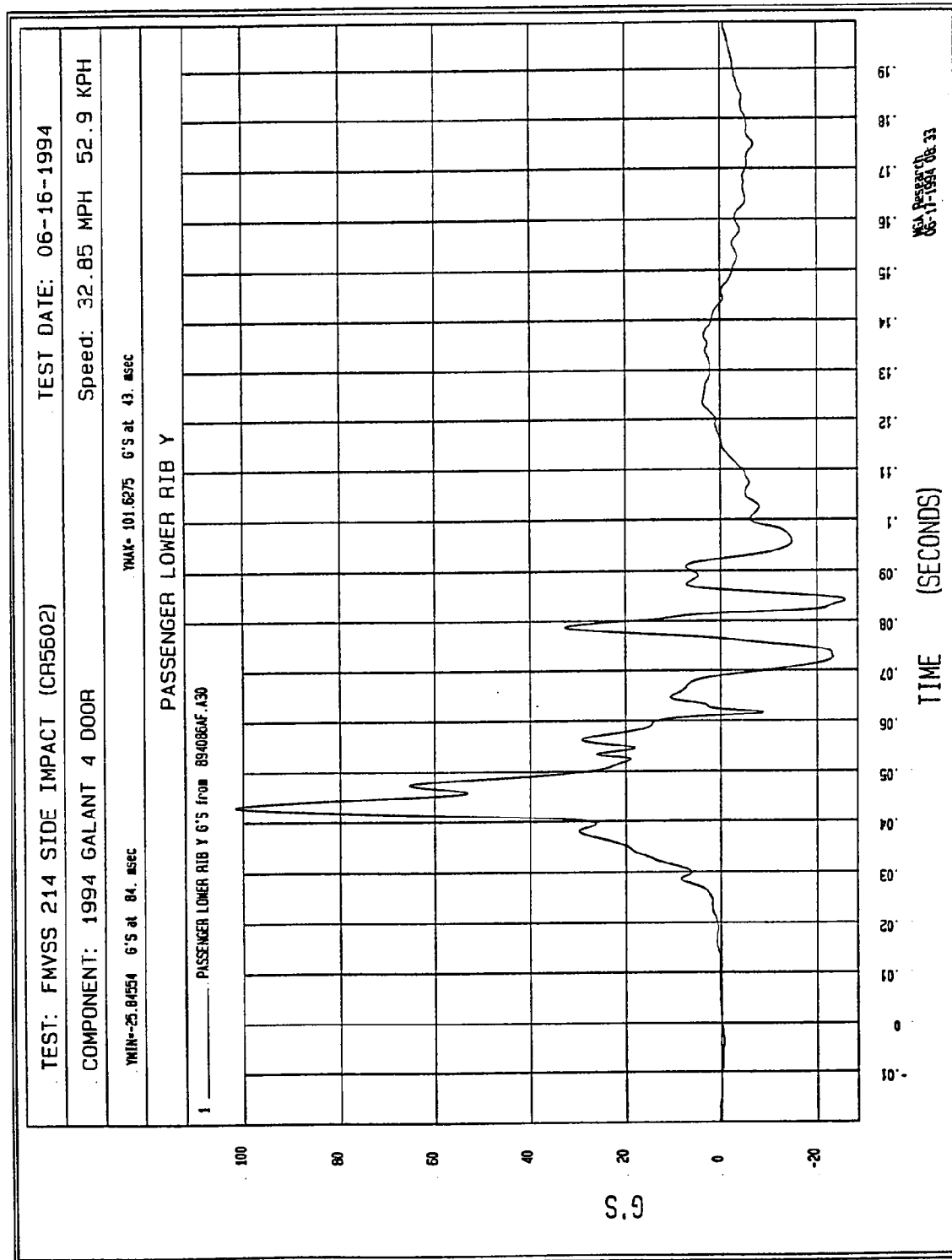


Figure B-11 - Passenger Lower Rib Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

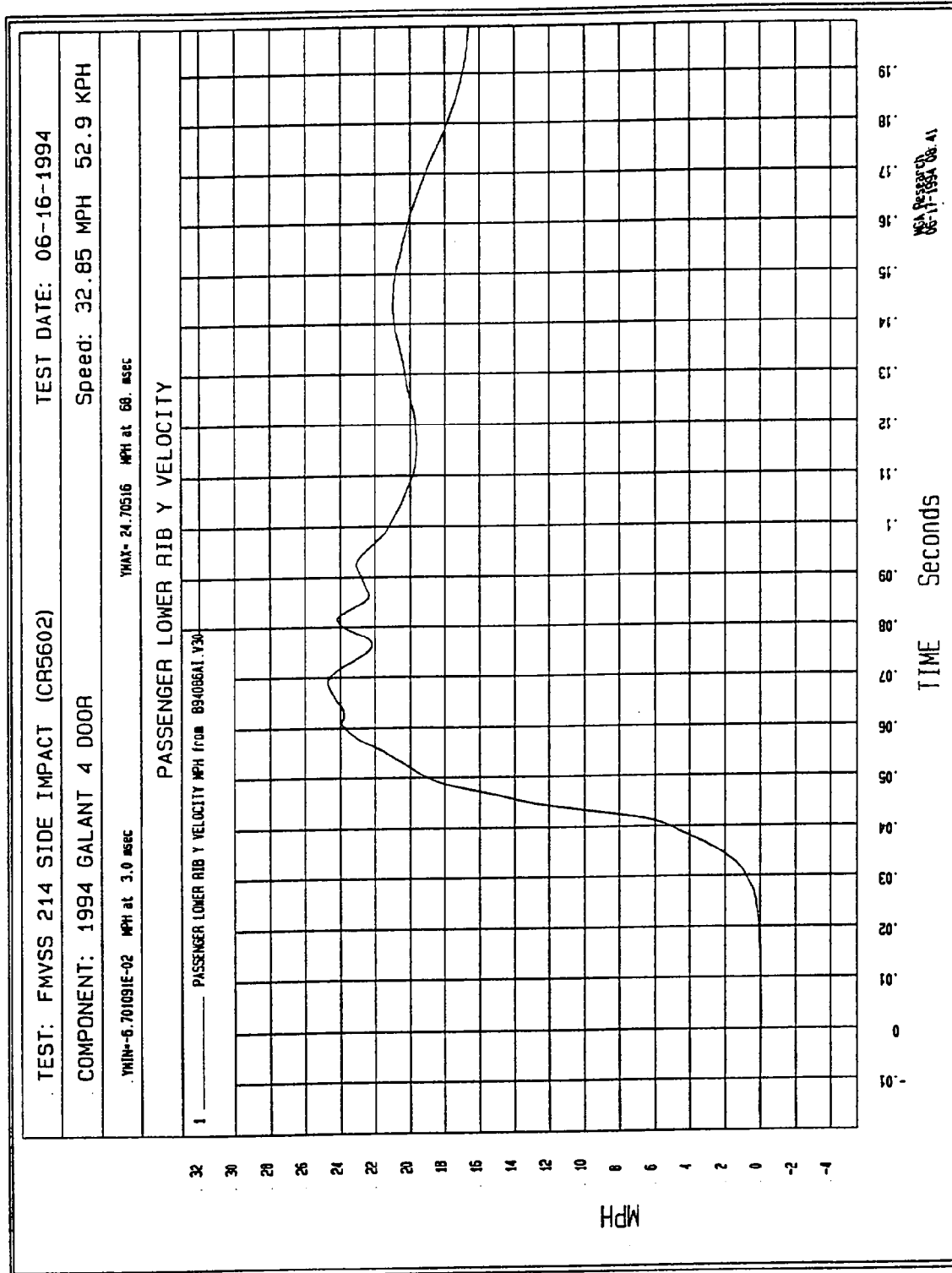


Figure B-12 - Passenger Lower Rib Y Velocity vs. Time

Filter: Class 180 (300 Hz)

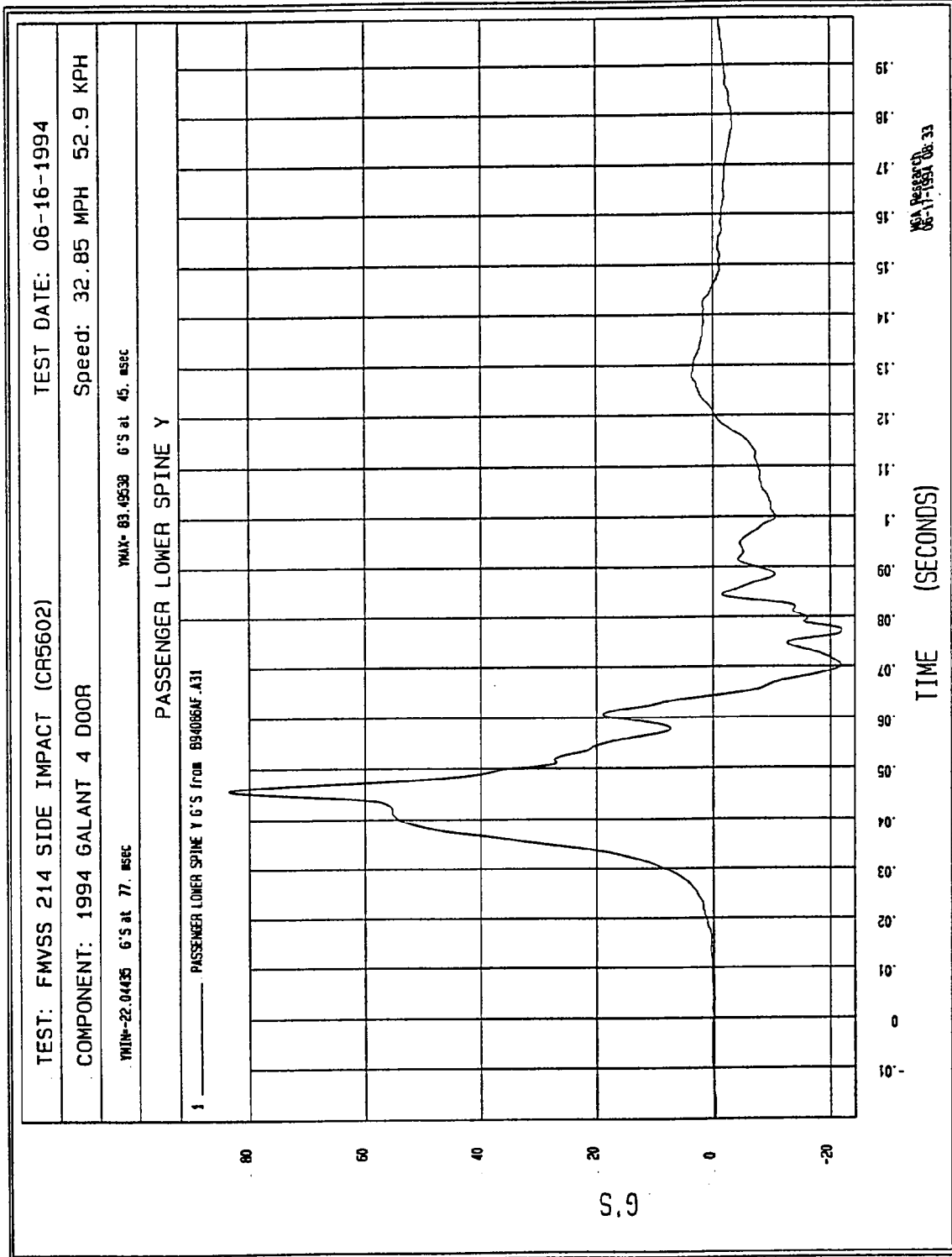


Figure B-13 - Passenger Lower Spine Y Acceleration vs. Time

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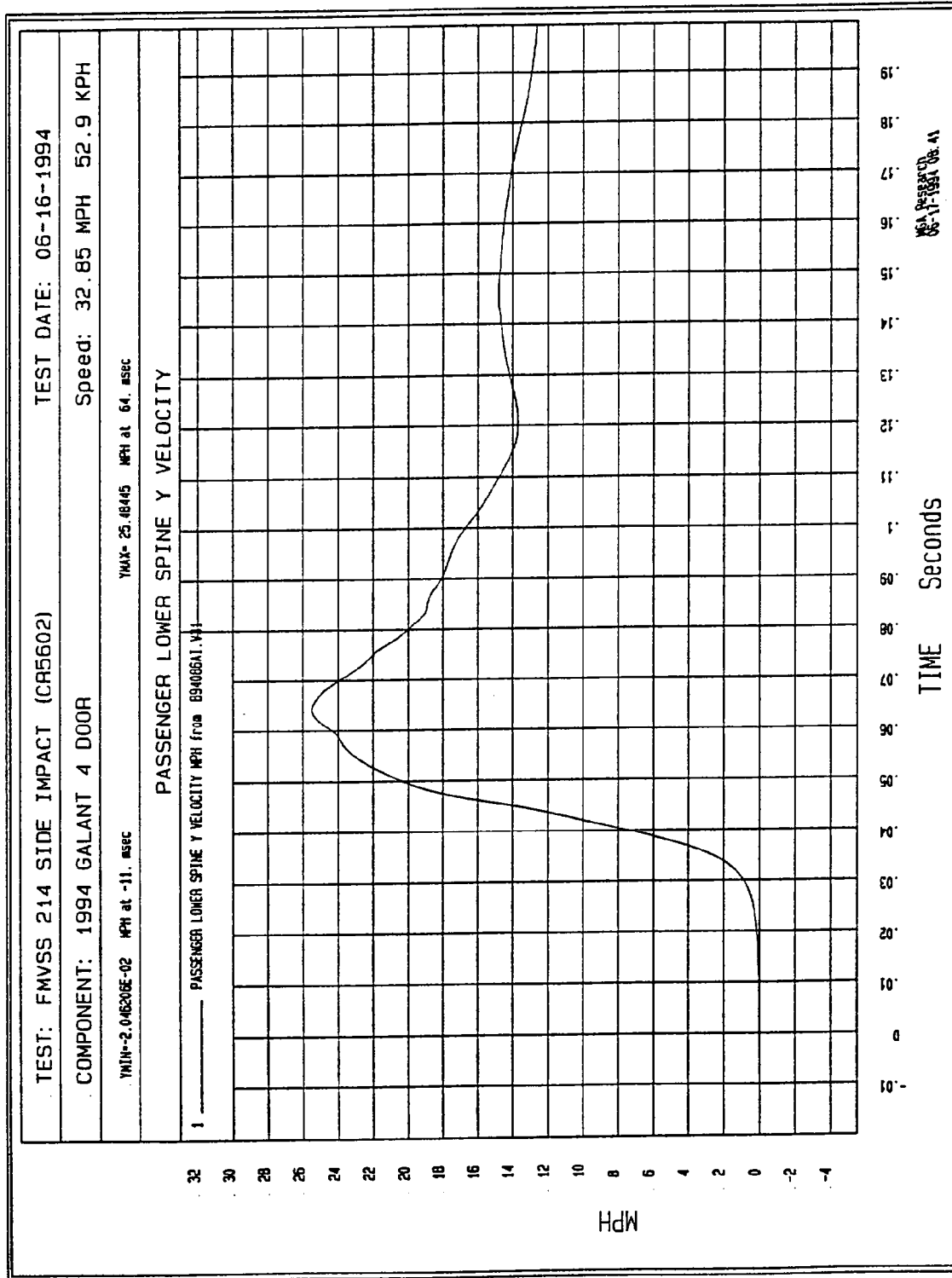


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

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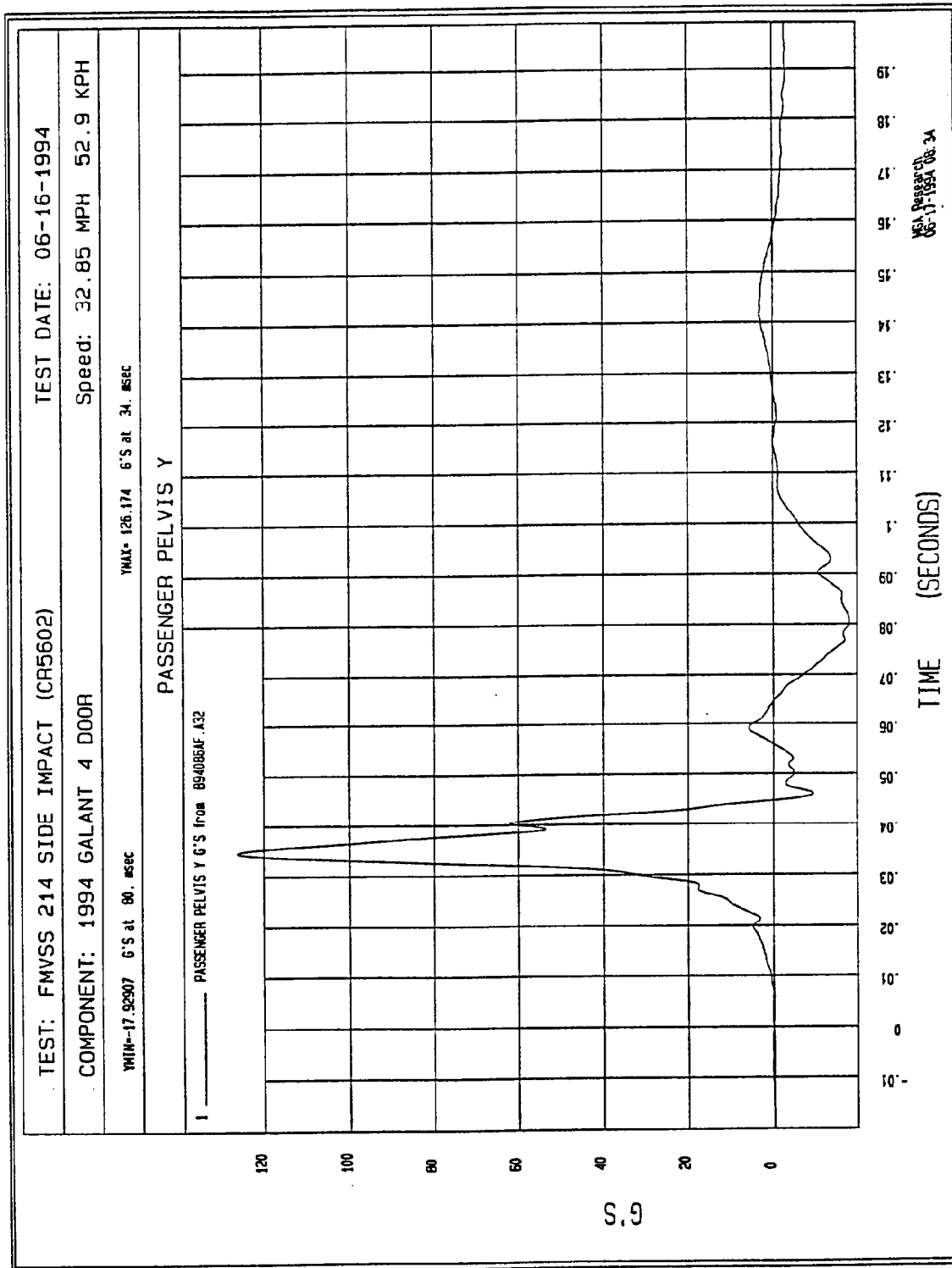


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

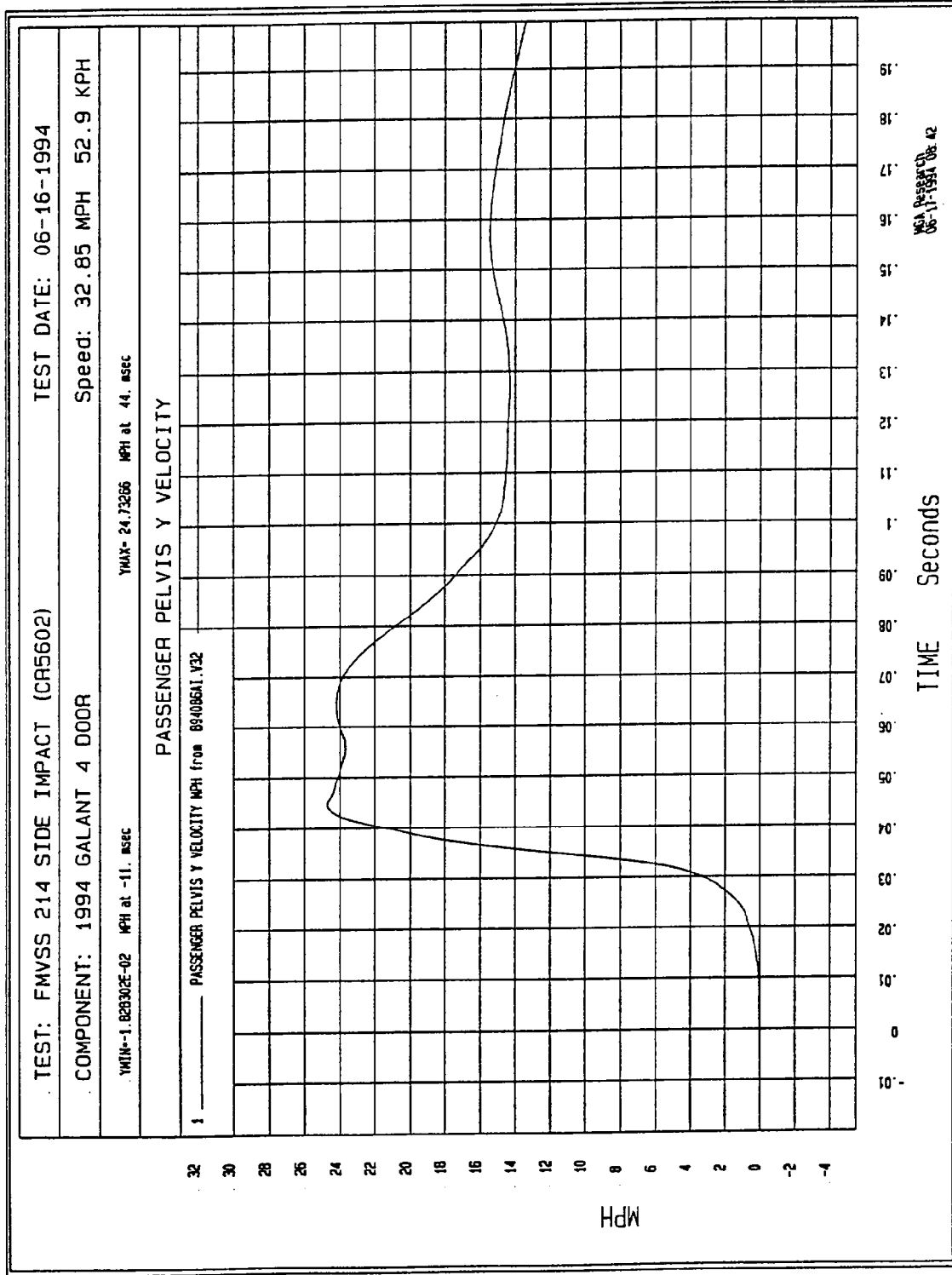


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

Filter: Class 60 (100 Hz)

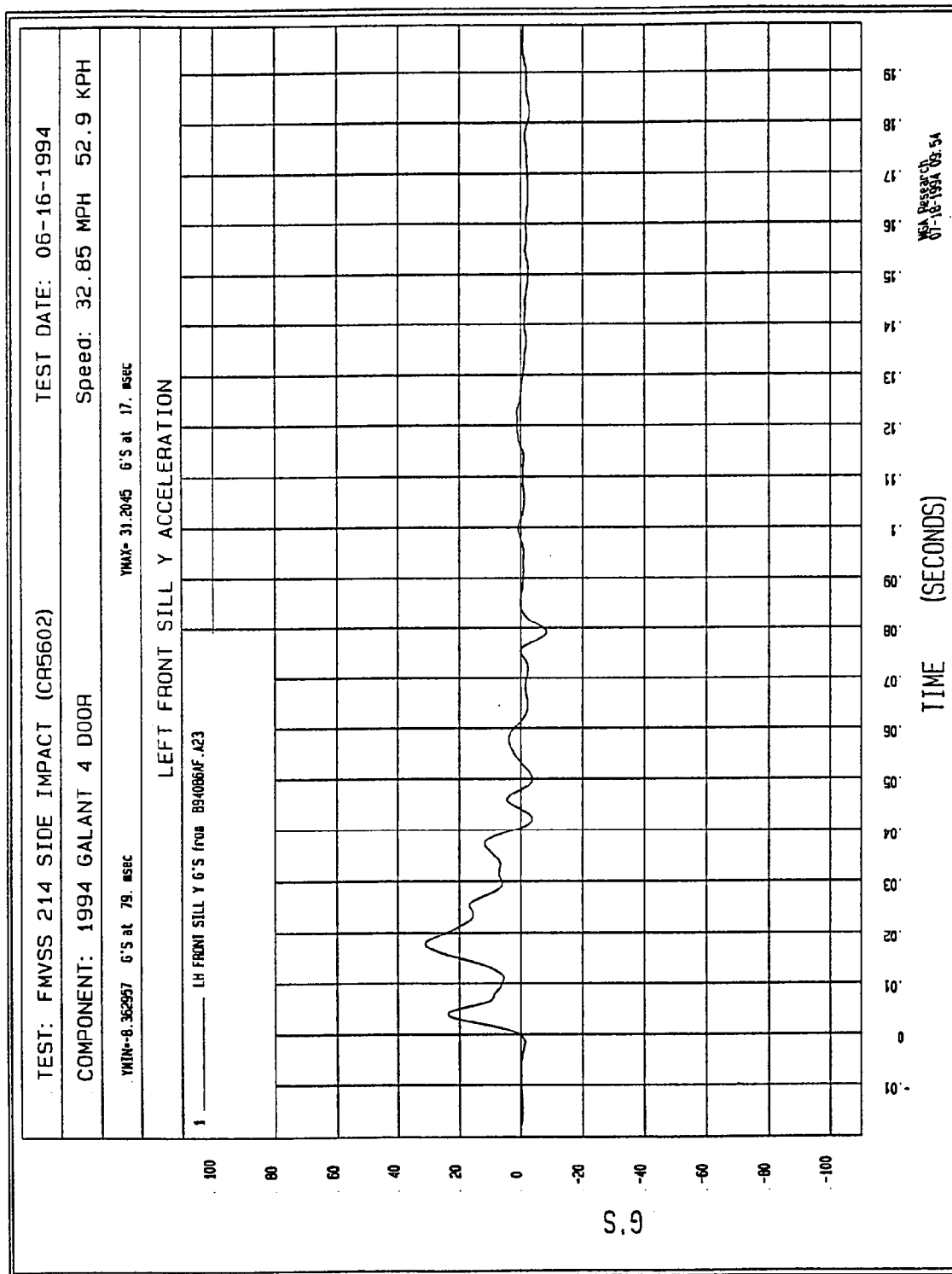


Figure B-17 - Left Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

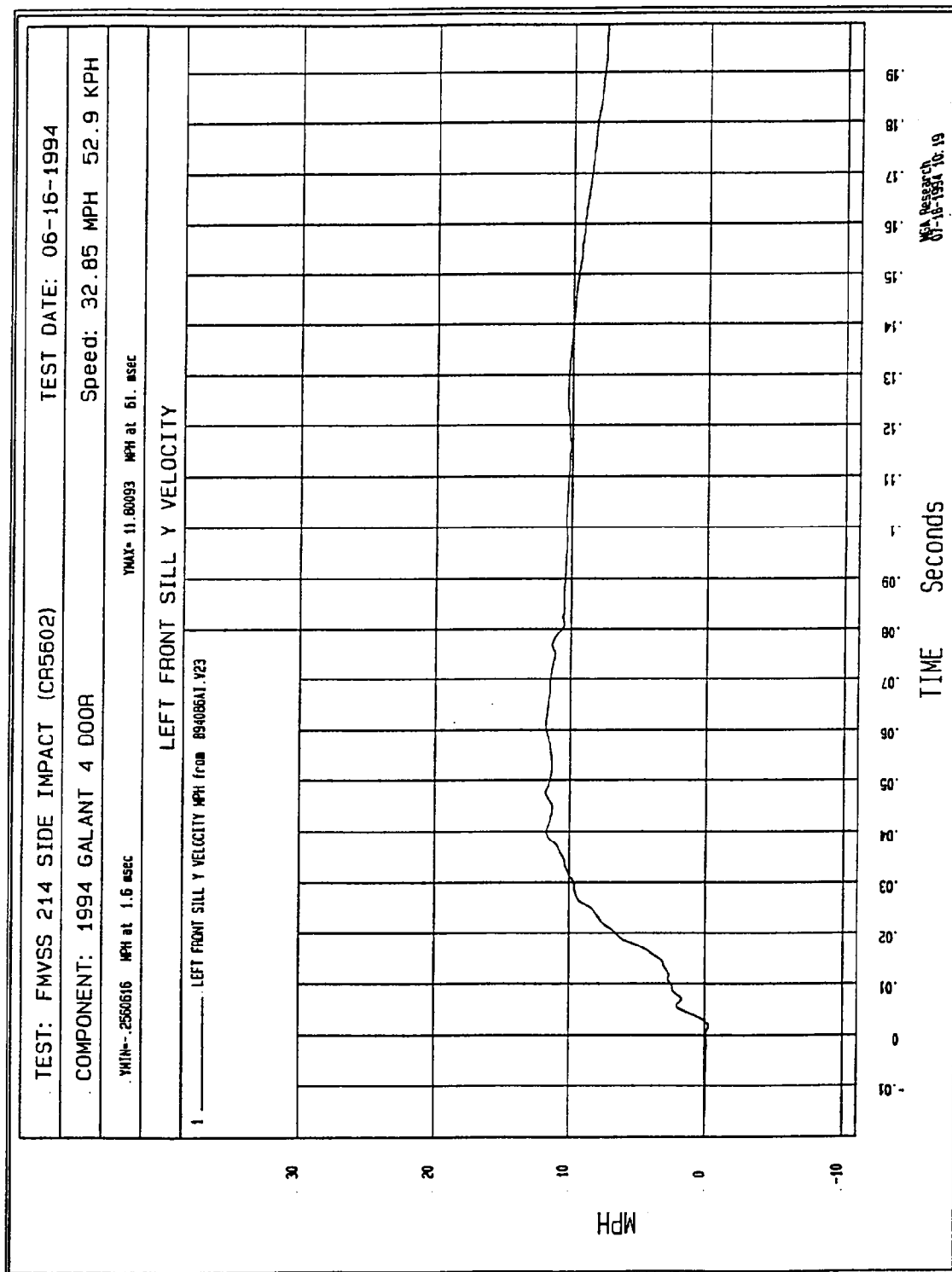


Figure B-18 - Left Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

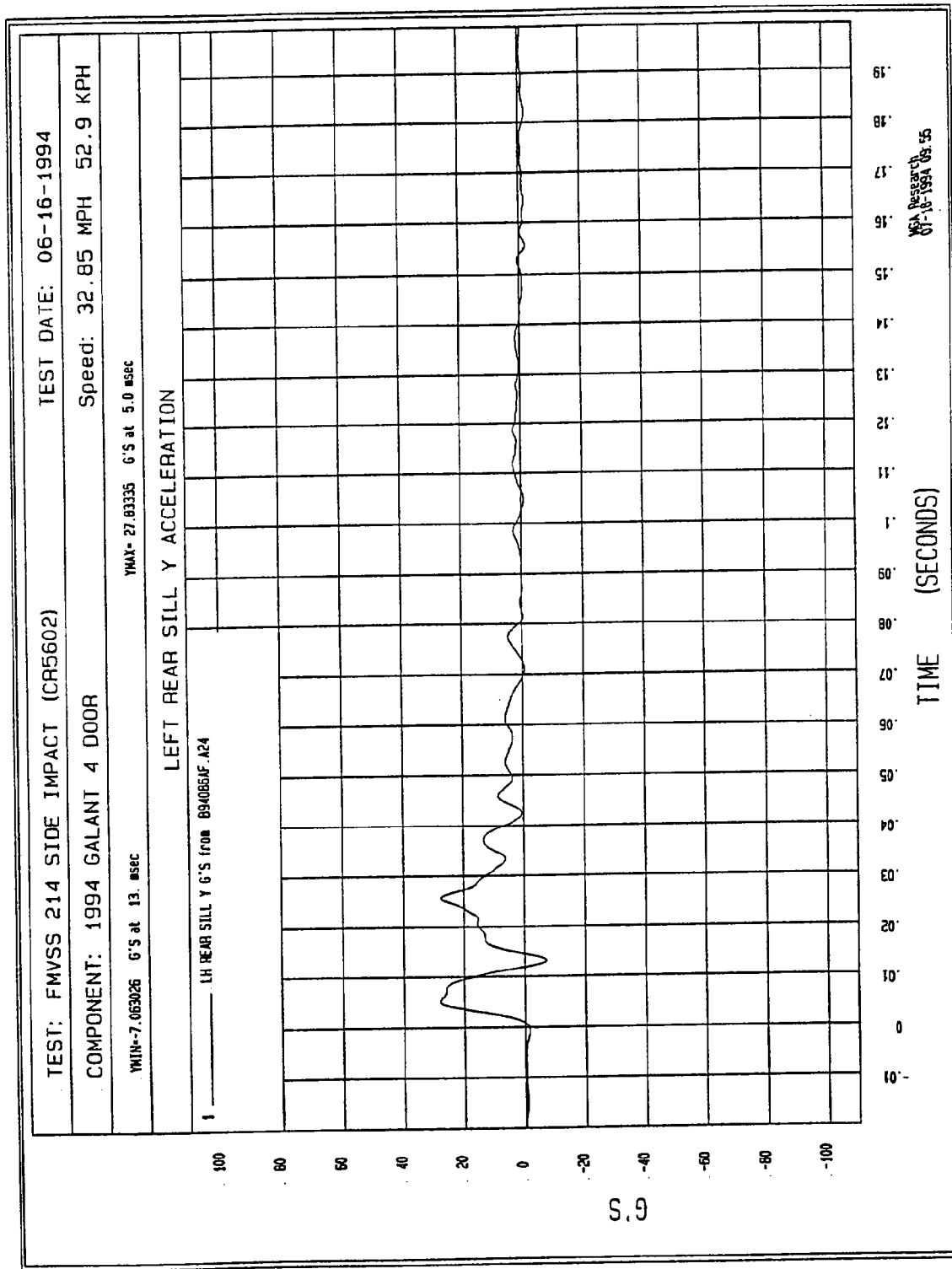


Figure B-19 - Left Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

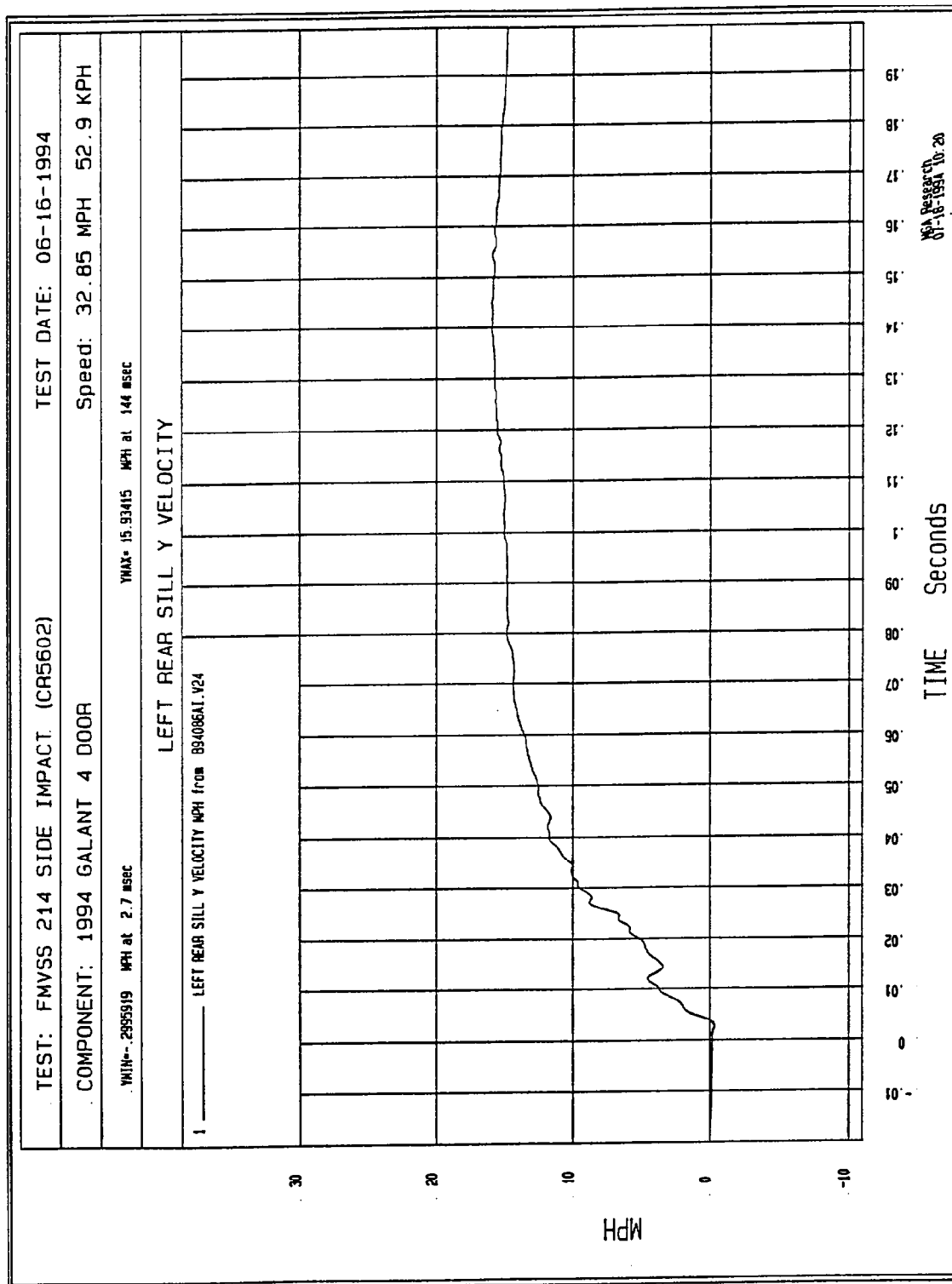


Figure B-20 - Left Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

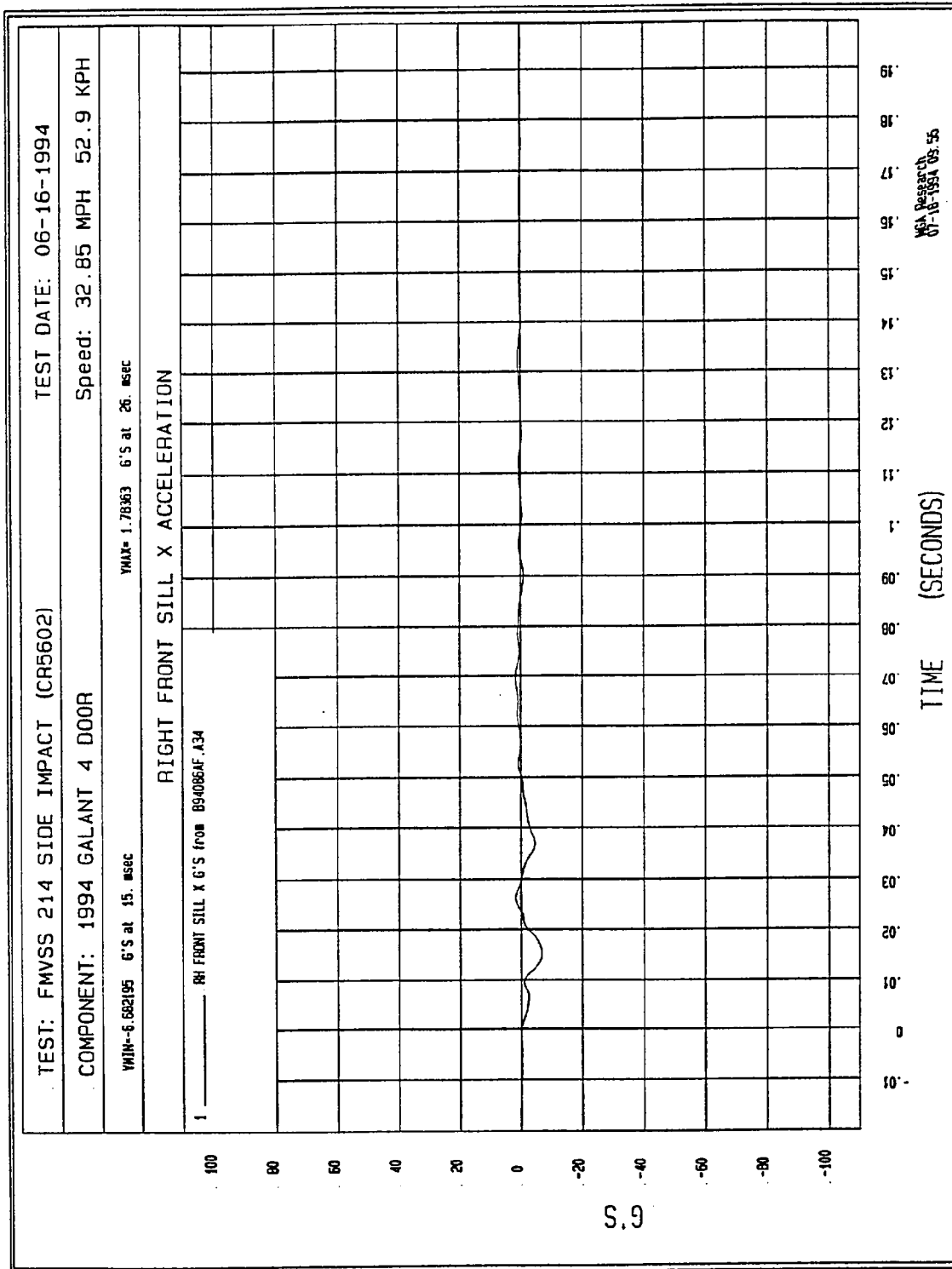


Figure B-21 - Right Front Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

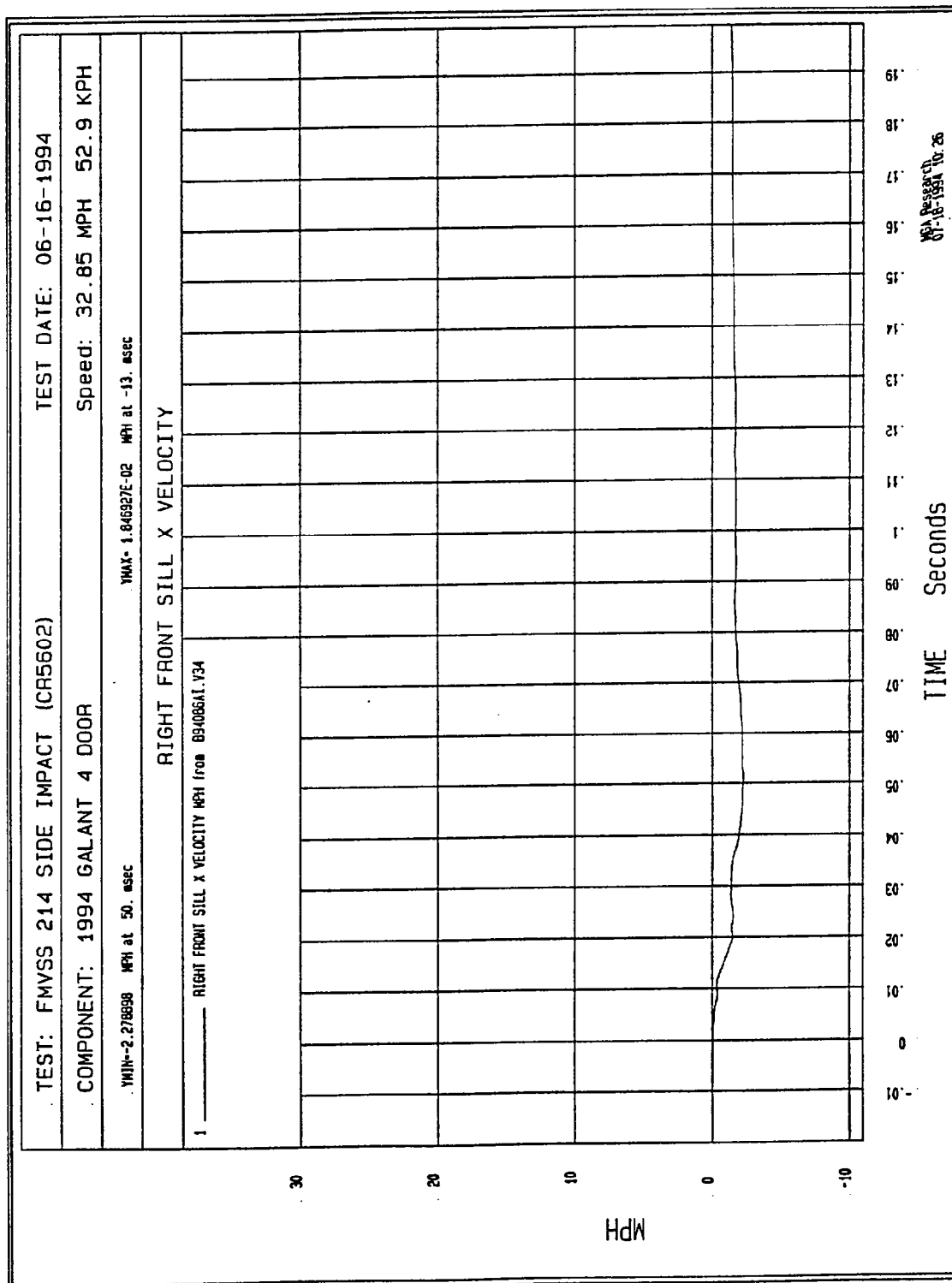


Figure B-22 - Right Front Sill X Velocity vs. Time

Filter: Class 60 (100 Hz)

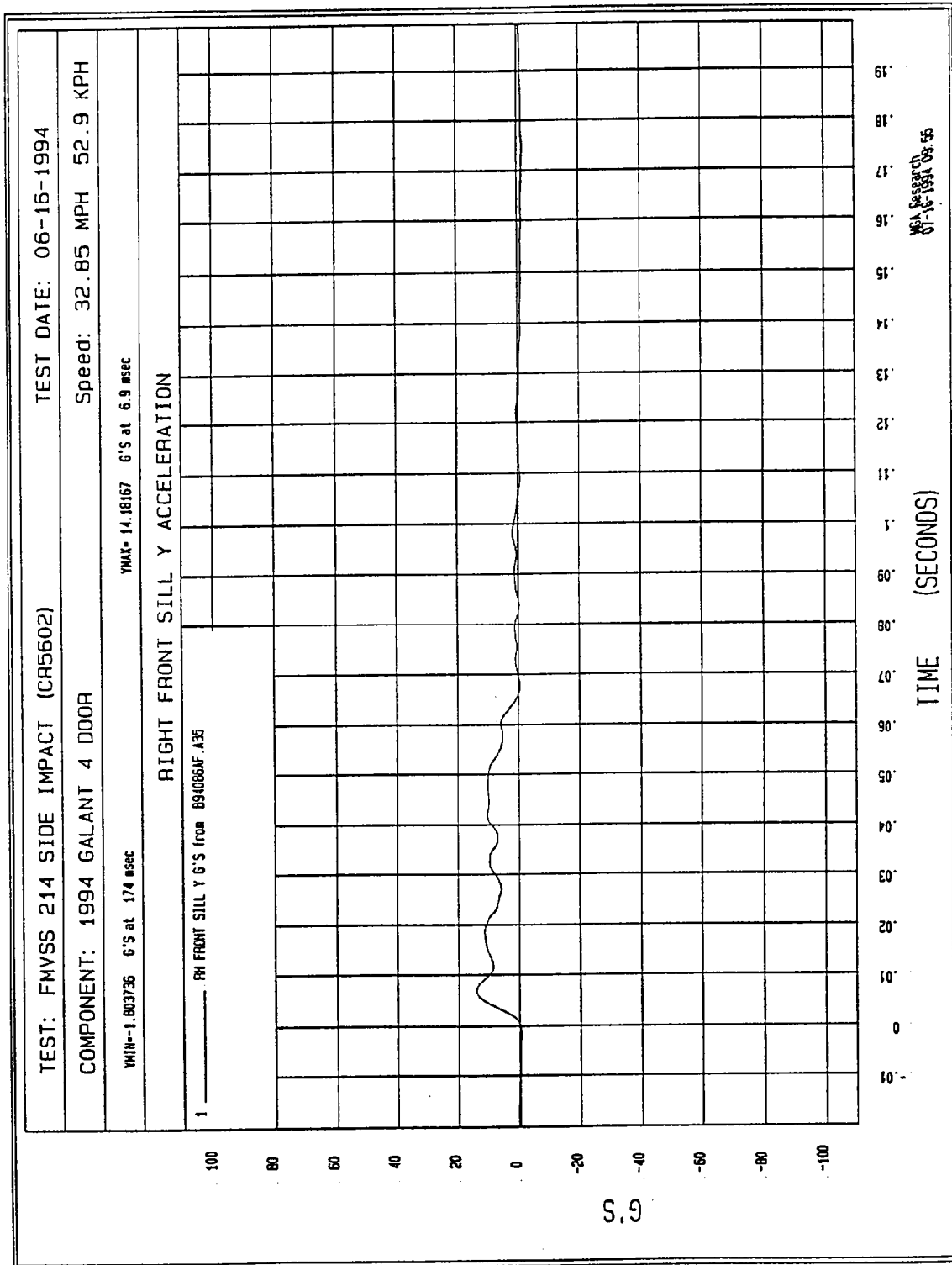


Figure B-23 - Right Front Sill Y Acceleration vs. Time

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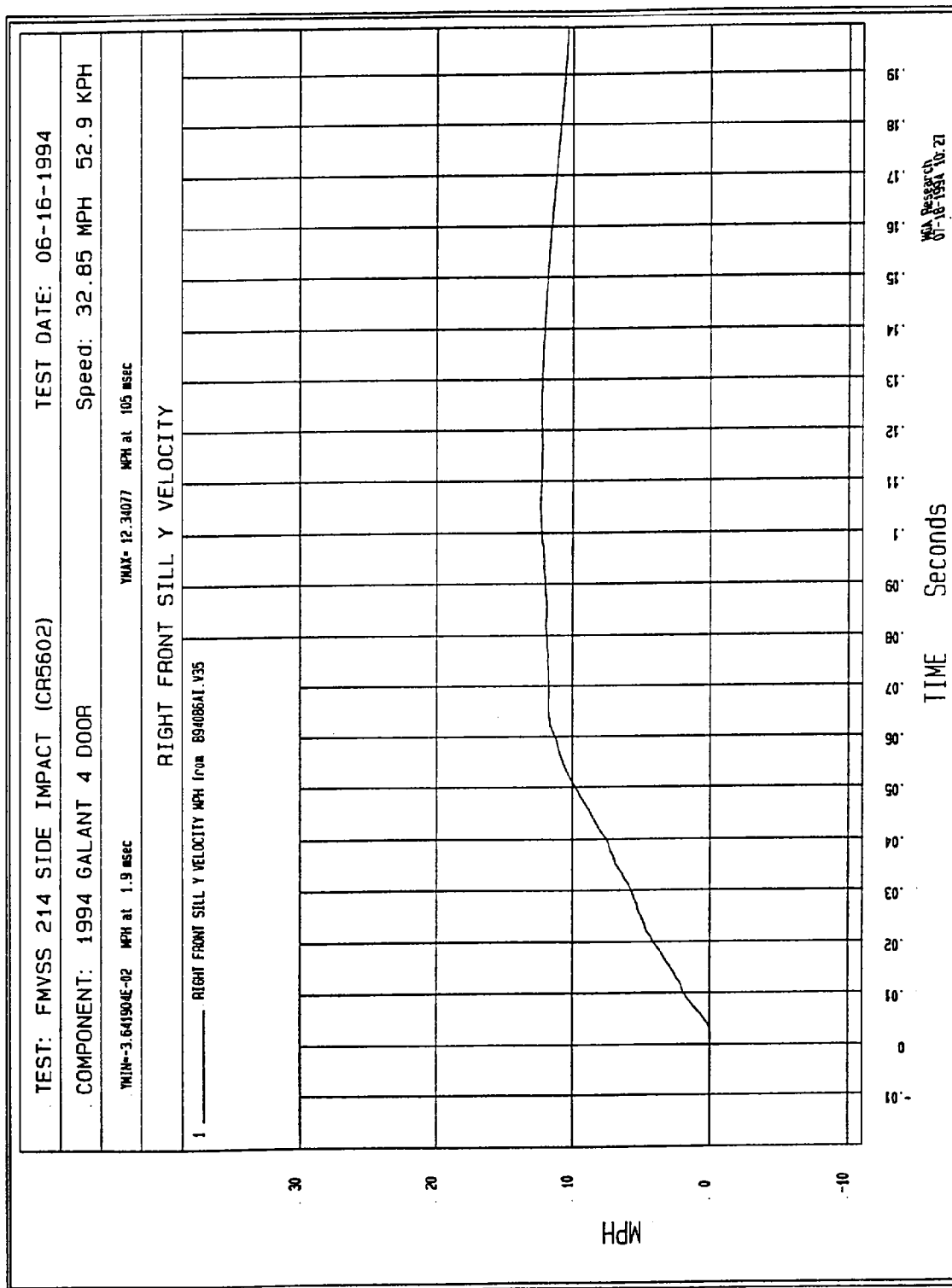


Figure B-24 - Right Front Sill y Velocity vs. Time

Filter: Class 60 (100 Hz)

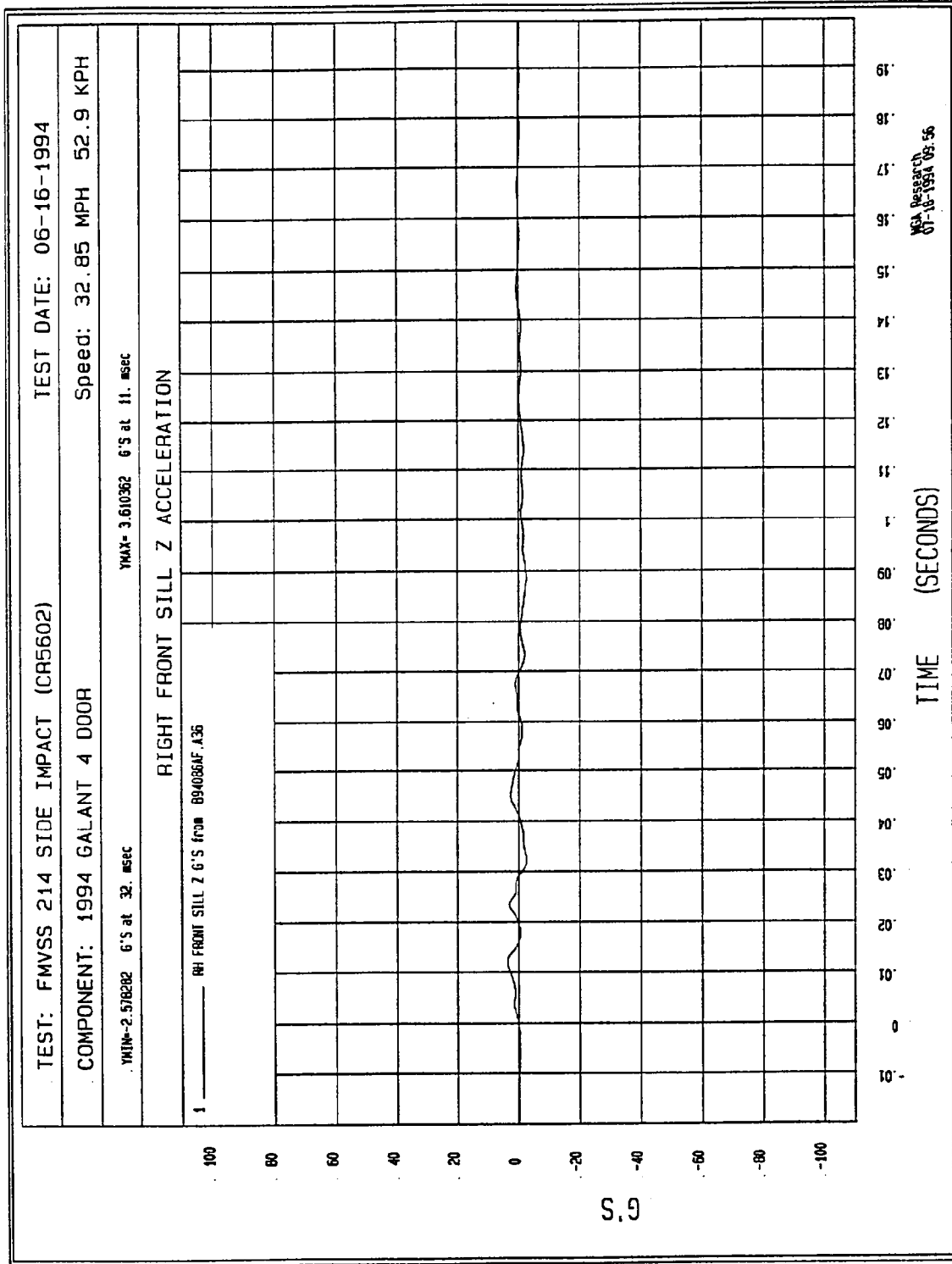


Figure B-25 - Right Front Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

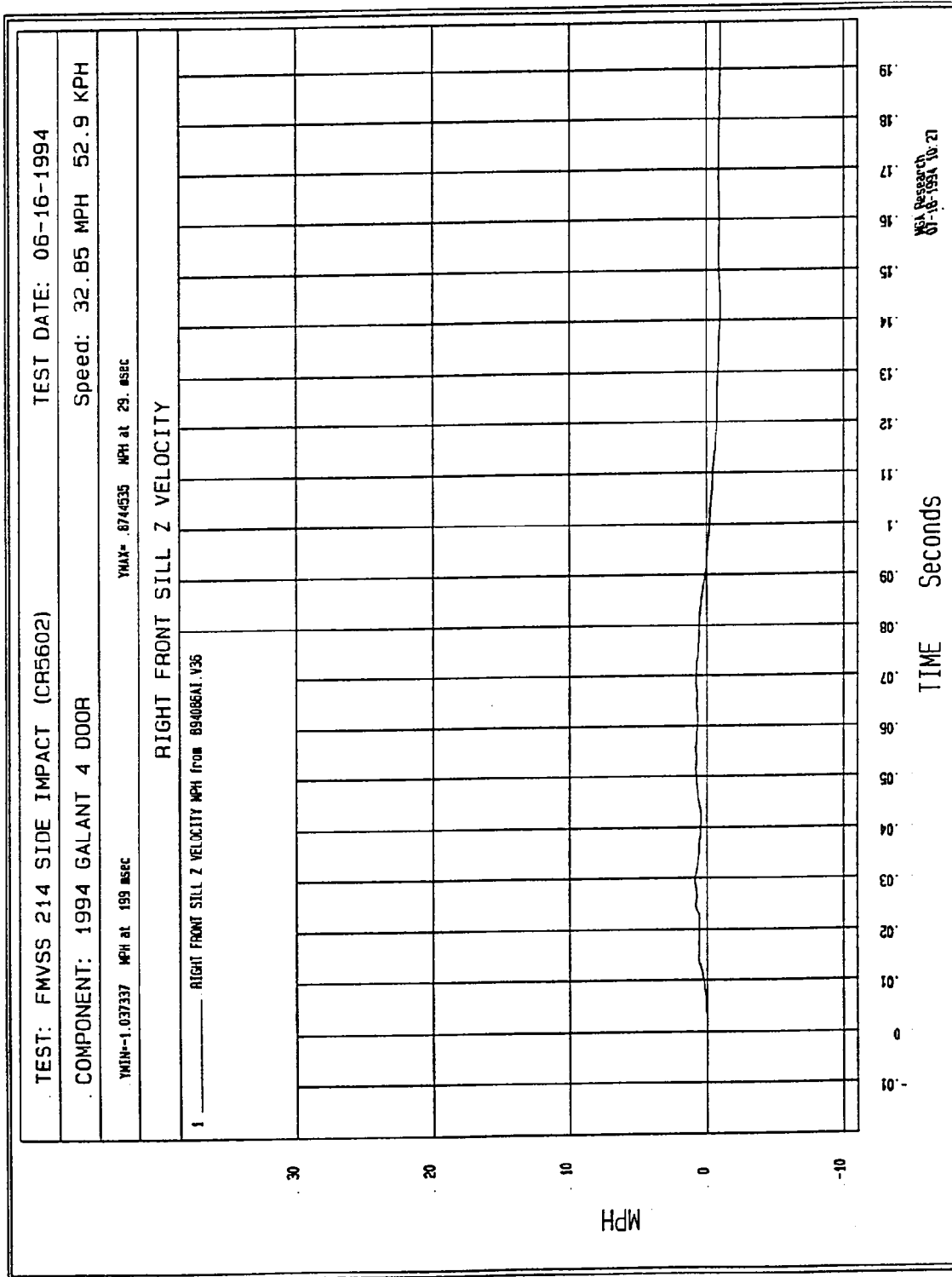


Figure B-26 - Right Front Sill Z Velocity vs. Time

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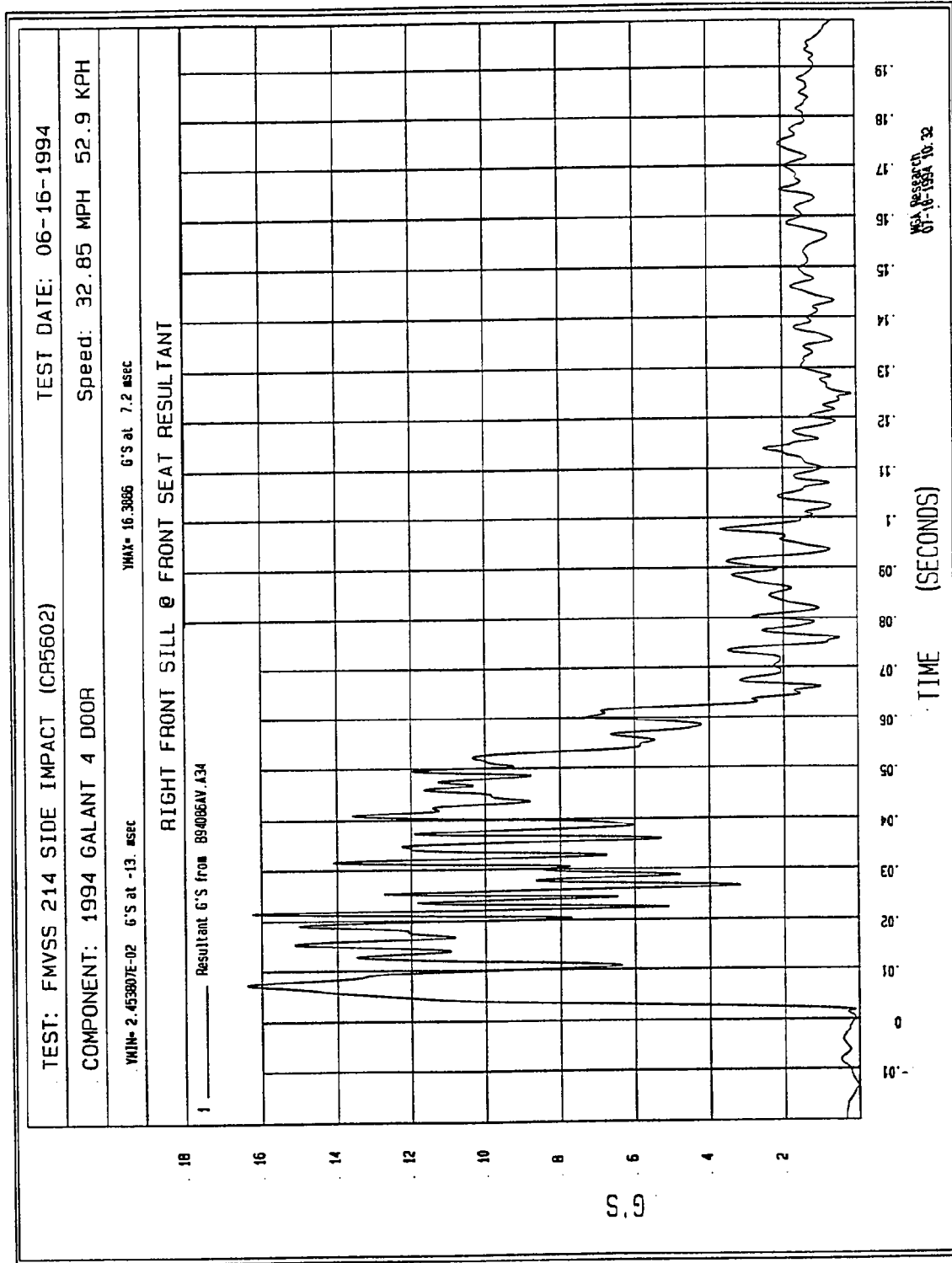


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

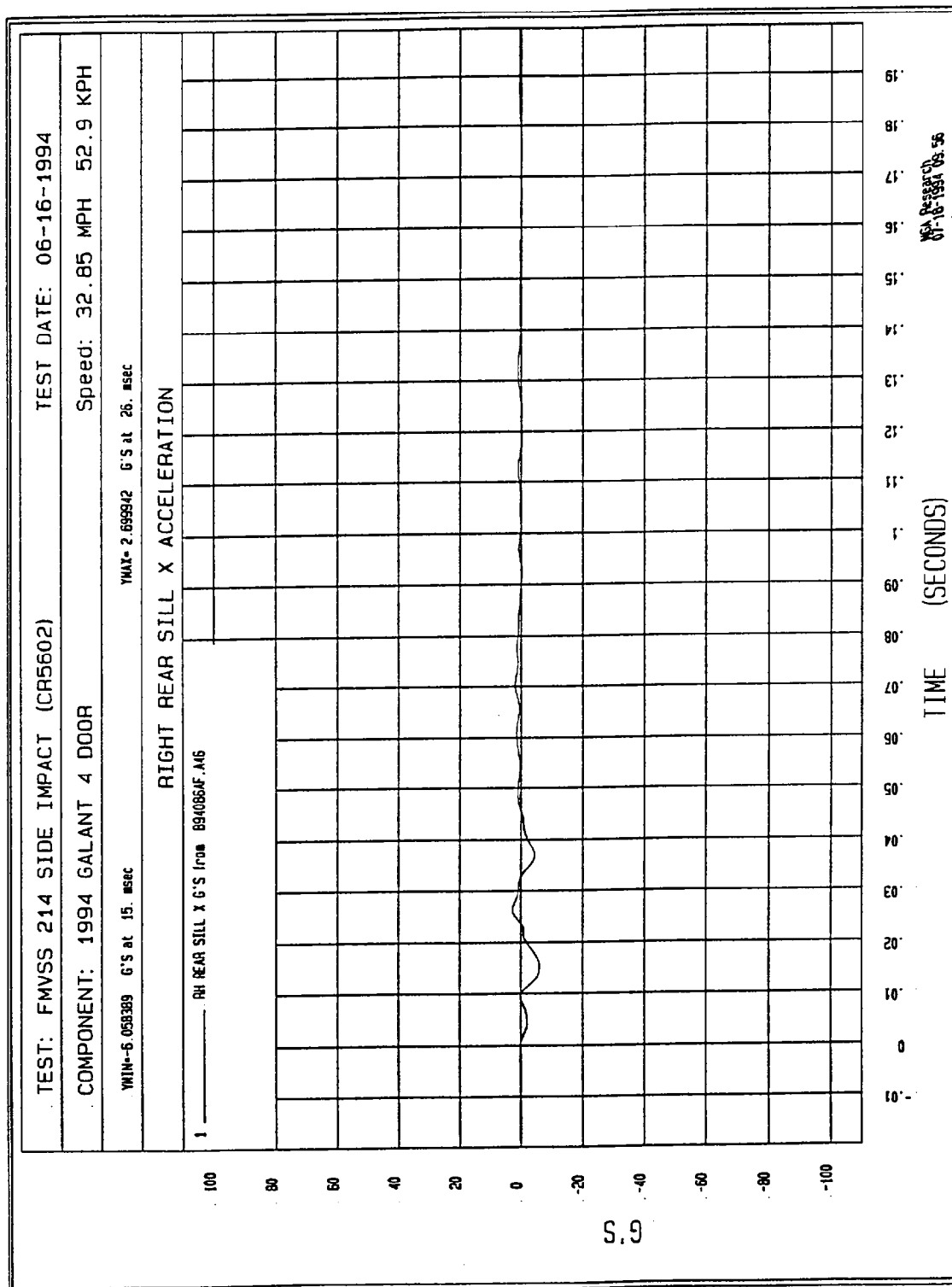


Figure B-28 - Right Rear Sill X Acceleration vs. Time

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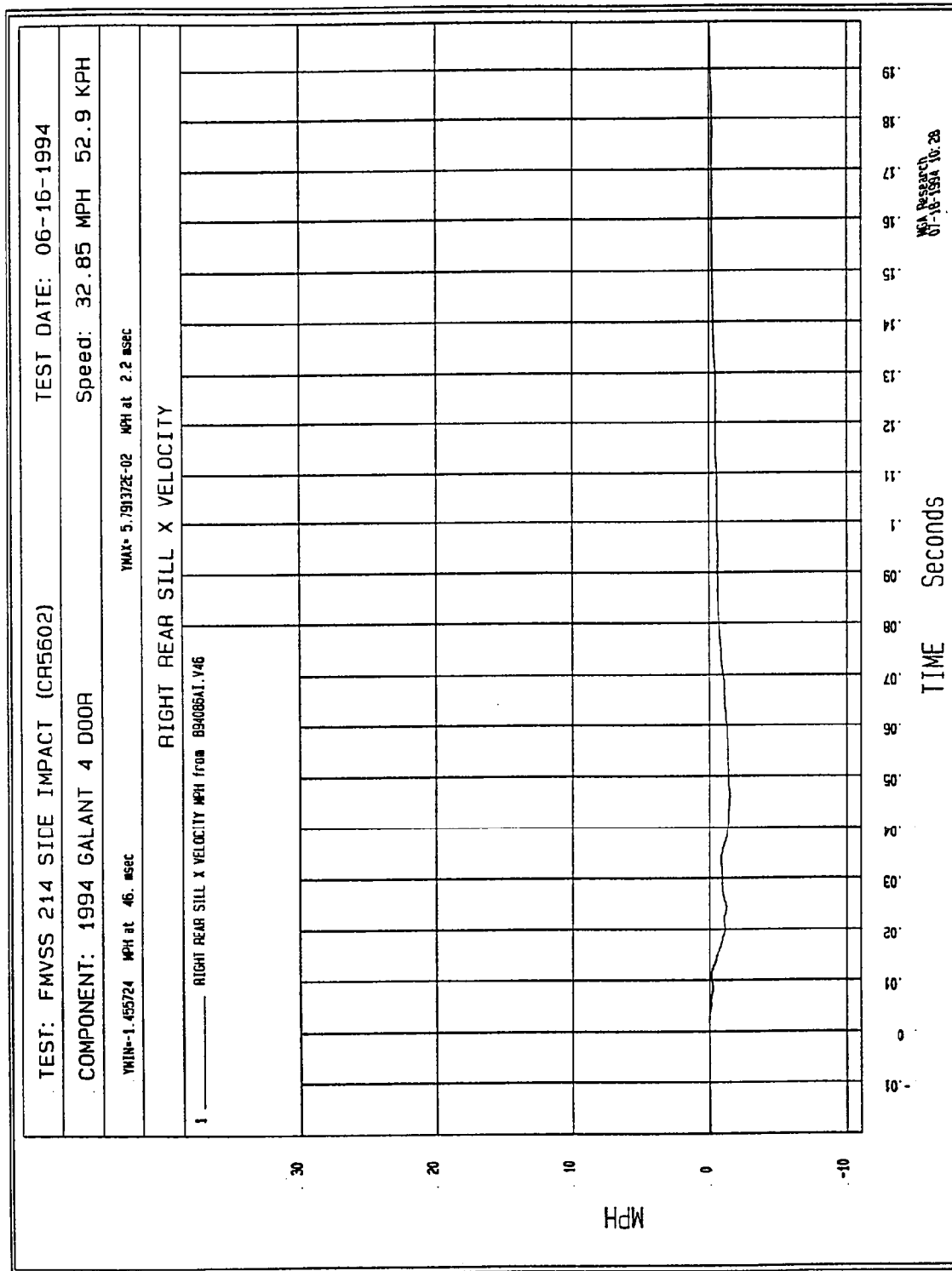


Figure B-29 - Right Rear Sill X Velocity vs. Time

Filter: Class 60 (100 Hz)

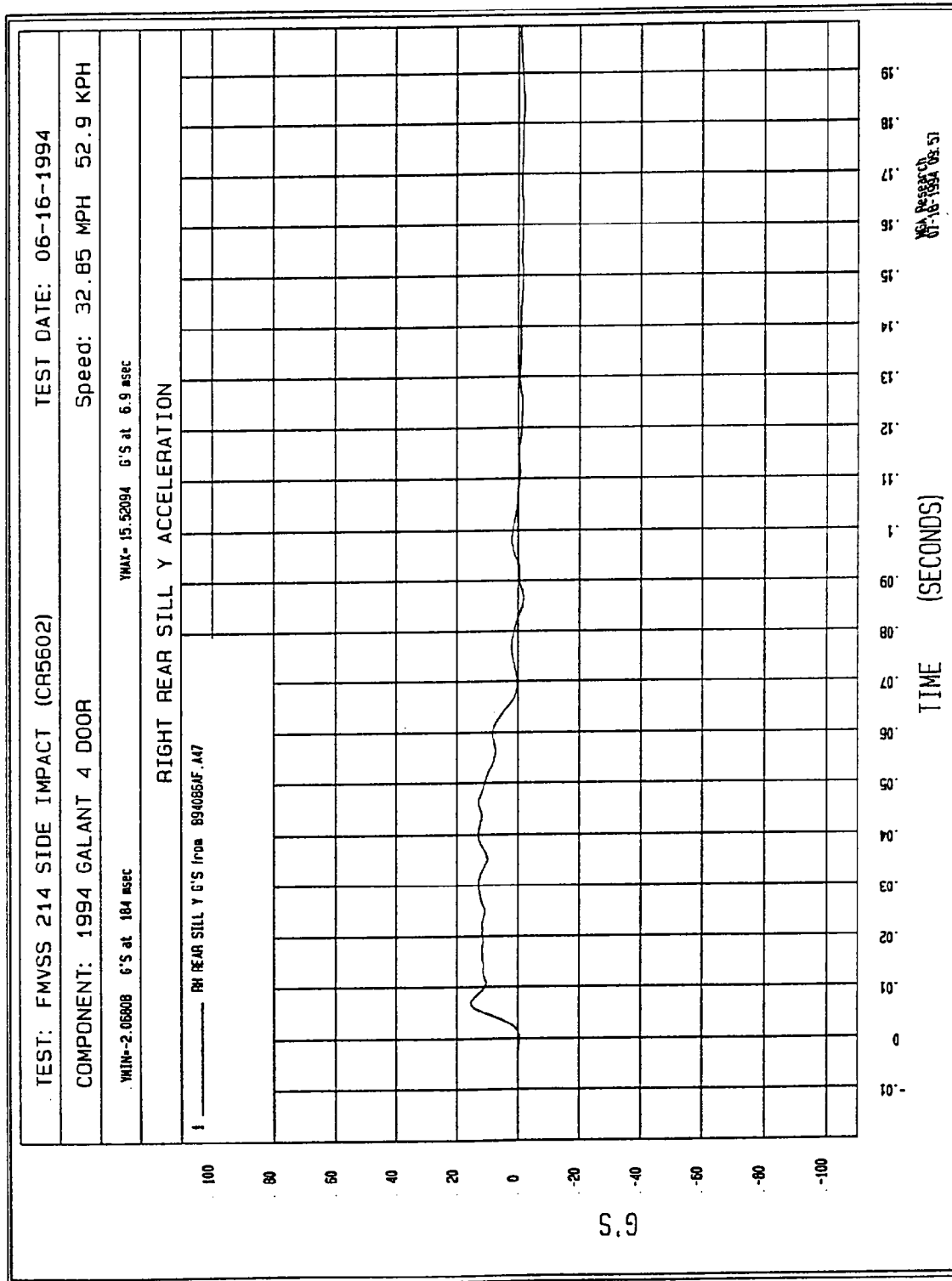


Figure B-30 - Right Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

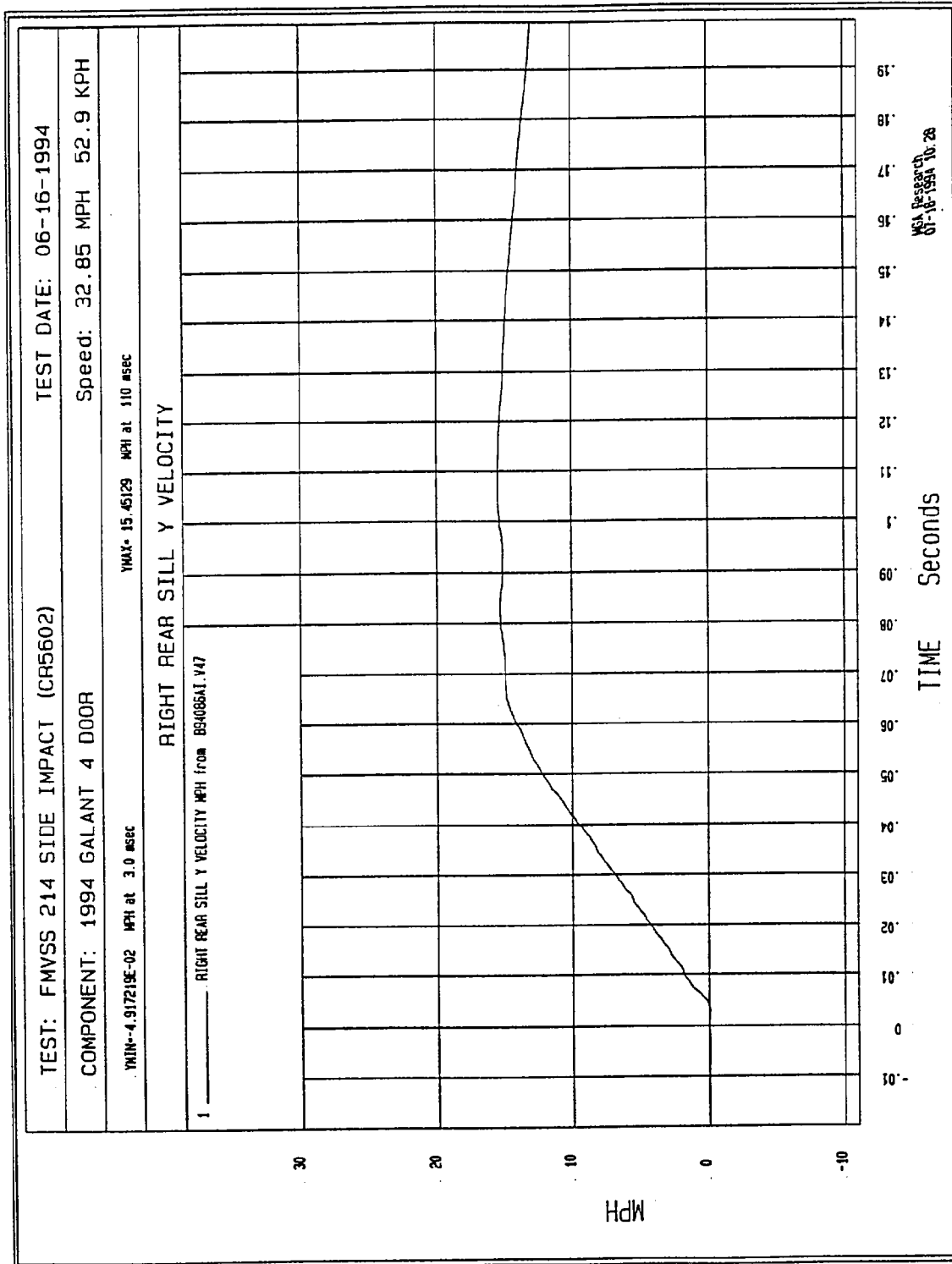


Figure B-31 - Right Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

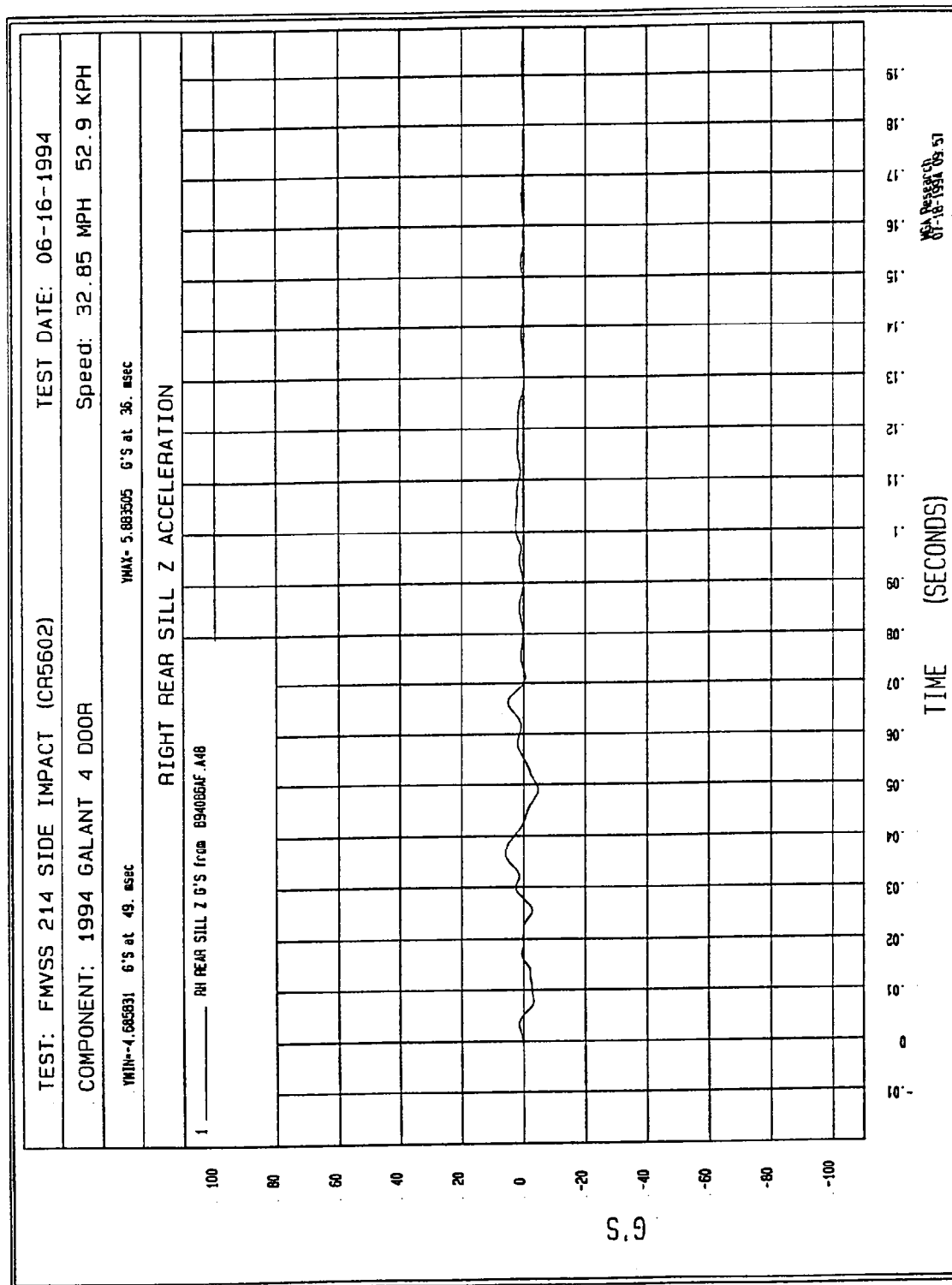


Figure B-32 - Right Rea. Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

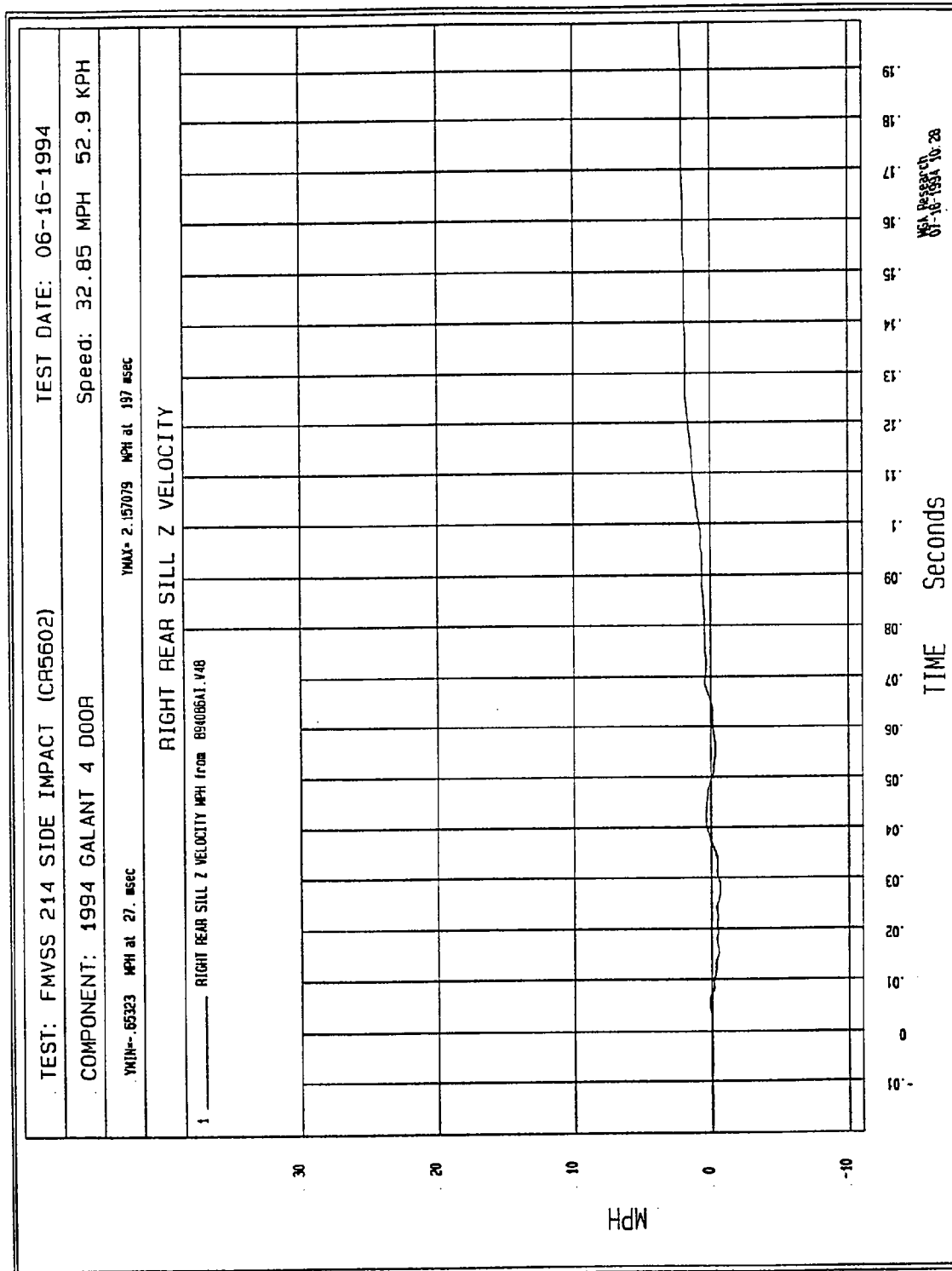


Figure B-33 - Right Rear Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

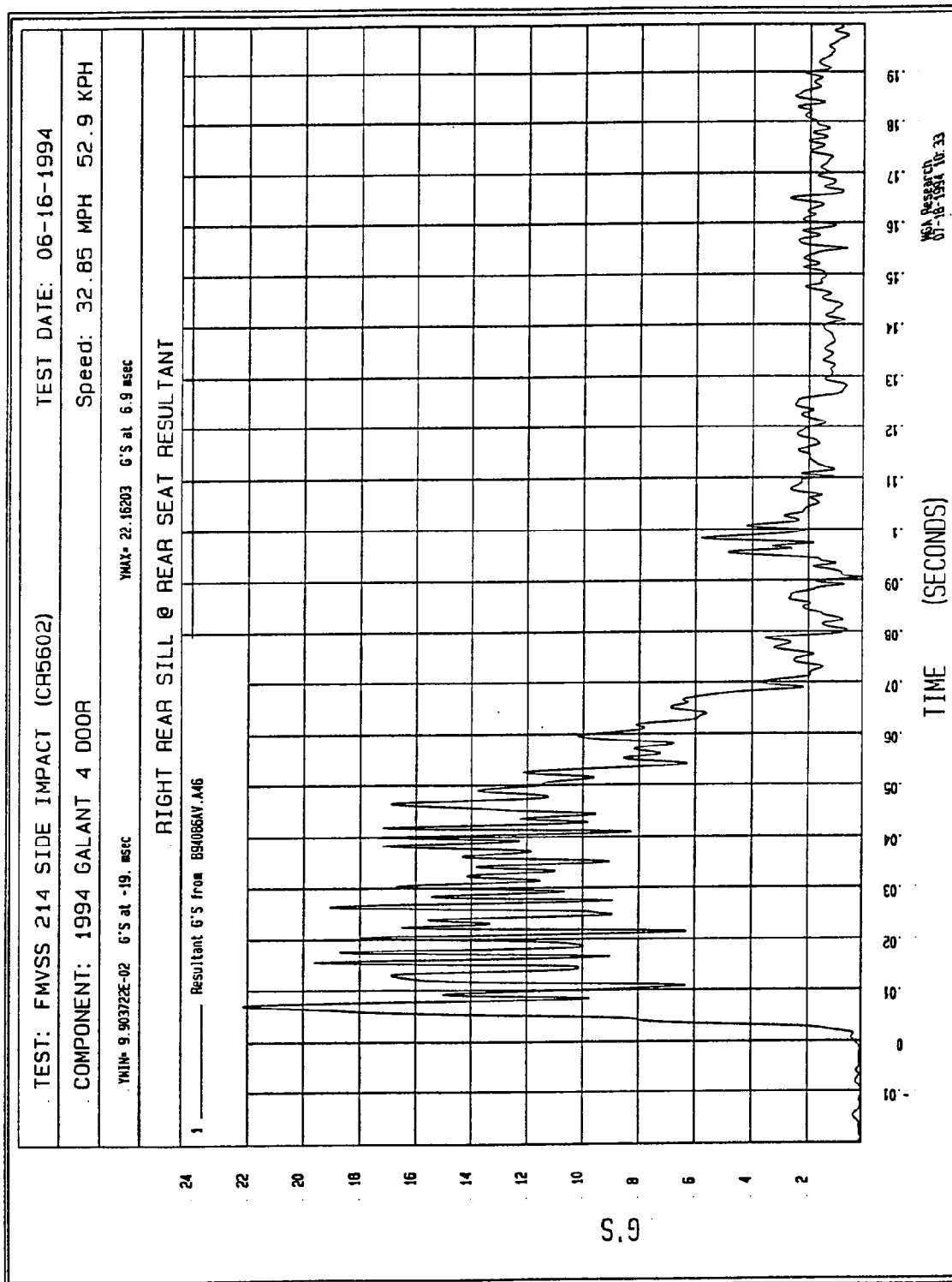


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

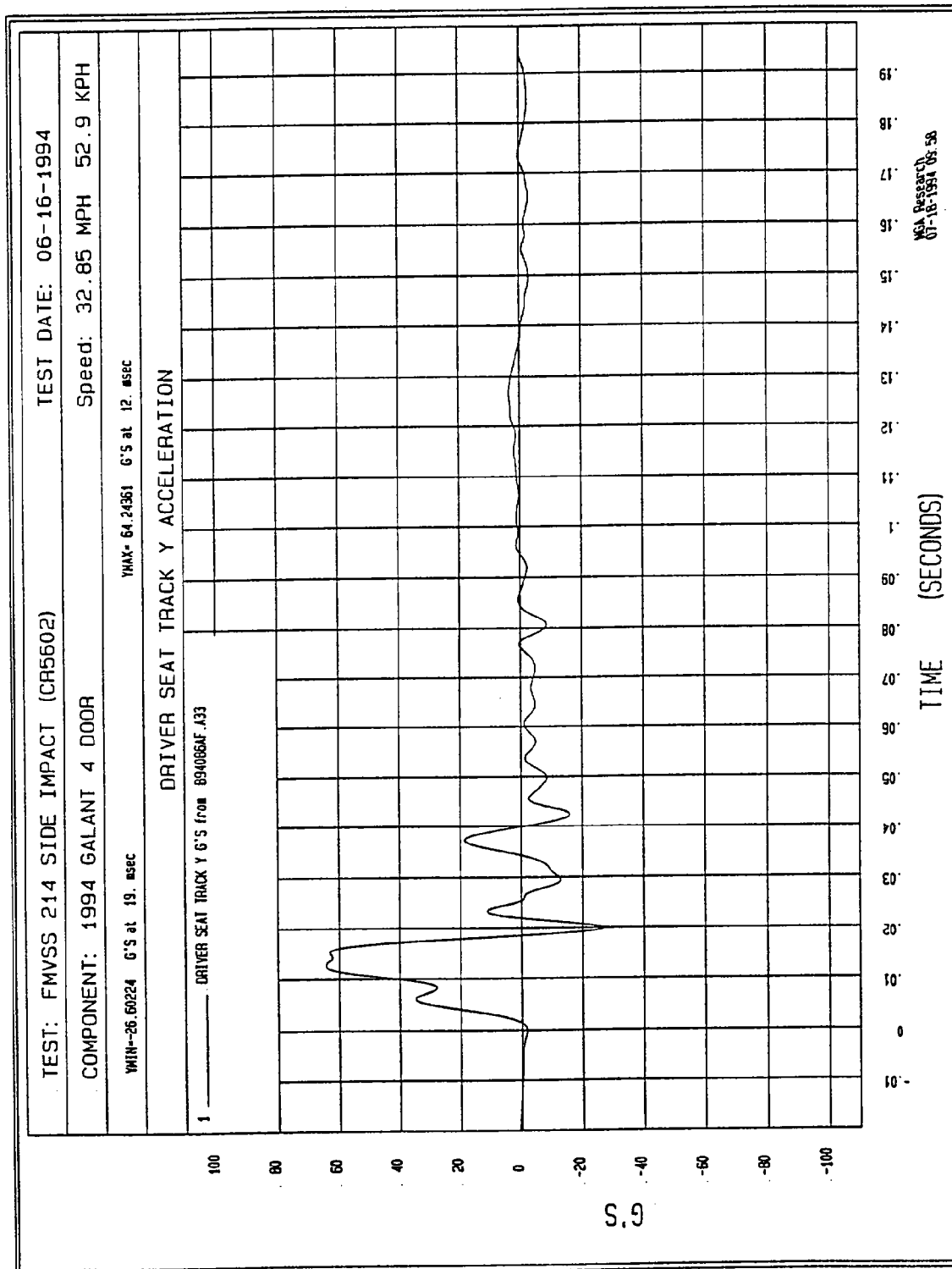


Figure B-35 - Driver Seat Track Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

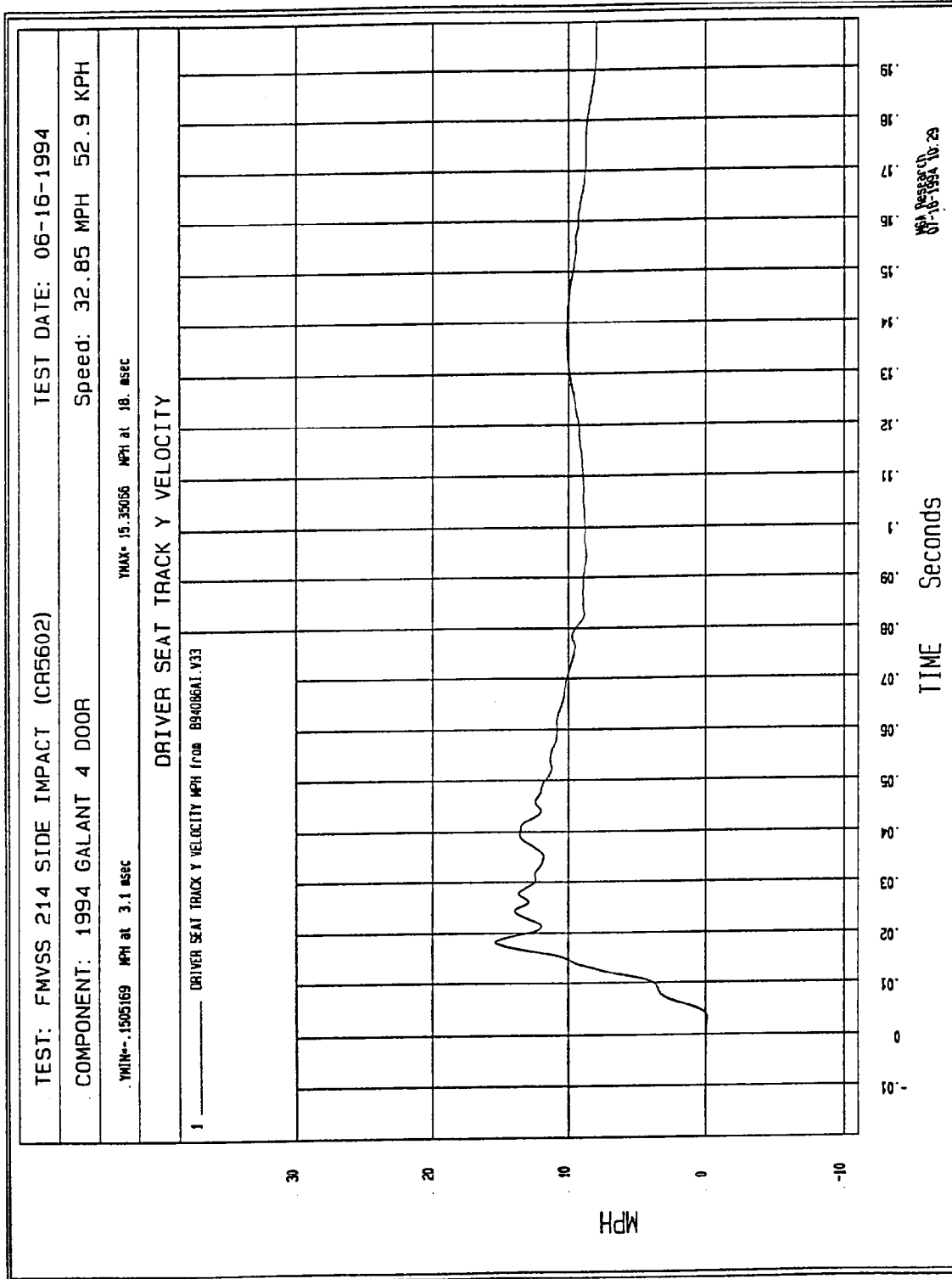


Figure B-36 - Driver Seat Track Y Velocity vs. Time

Filter: Class 60 (100 Hz)

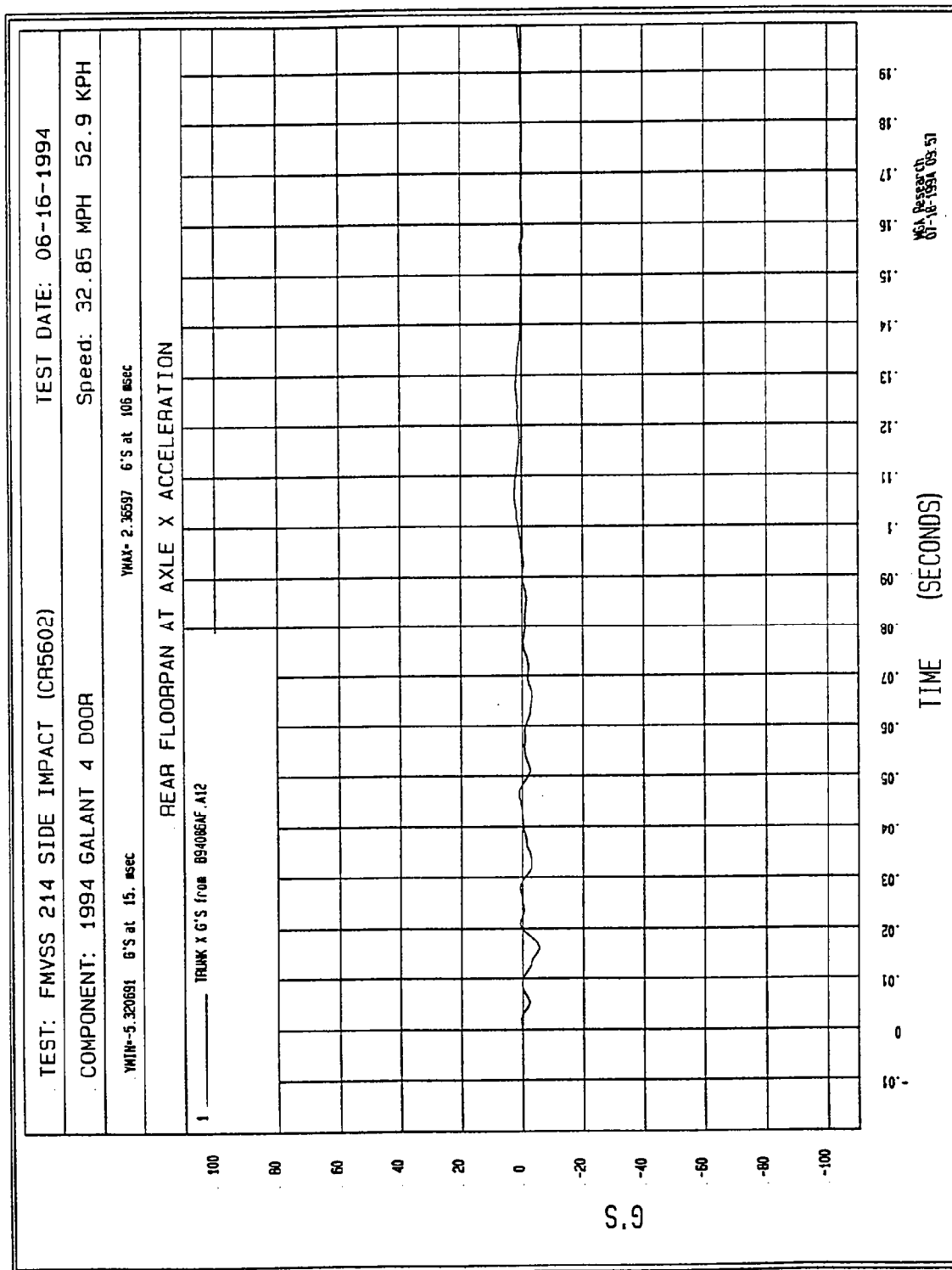


Figure B-37 - Rear Floorpan at Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)

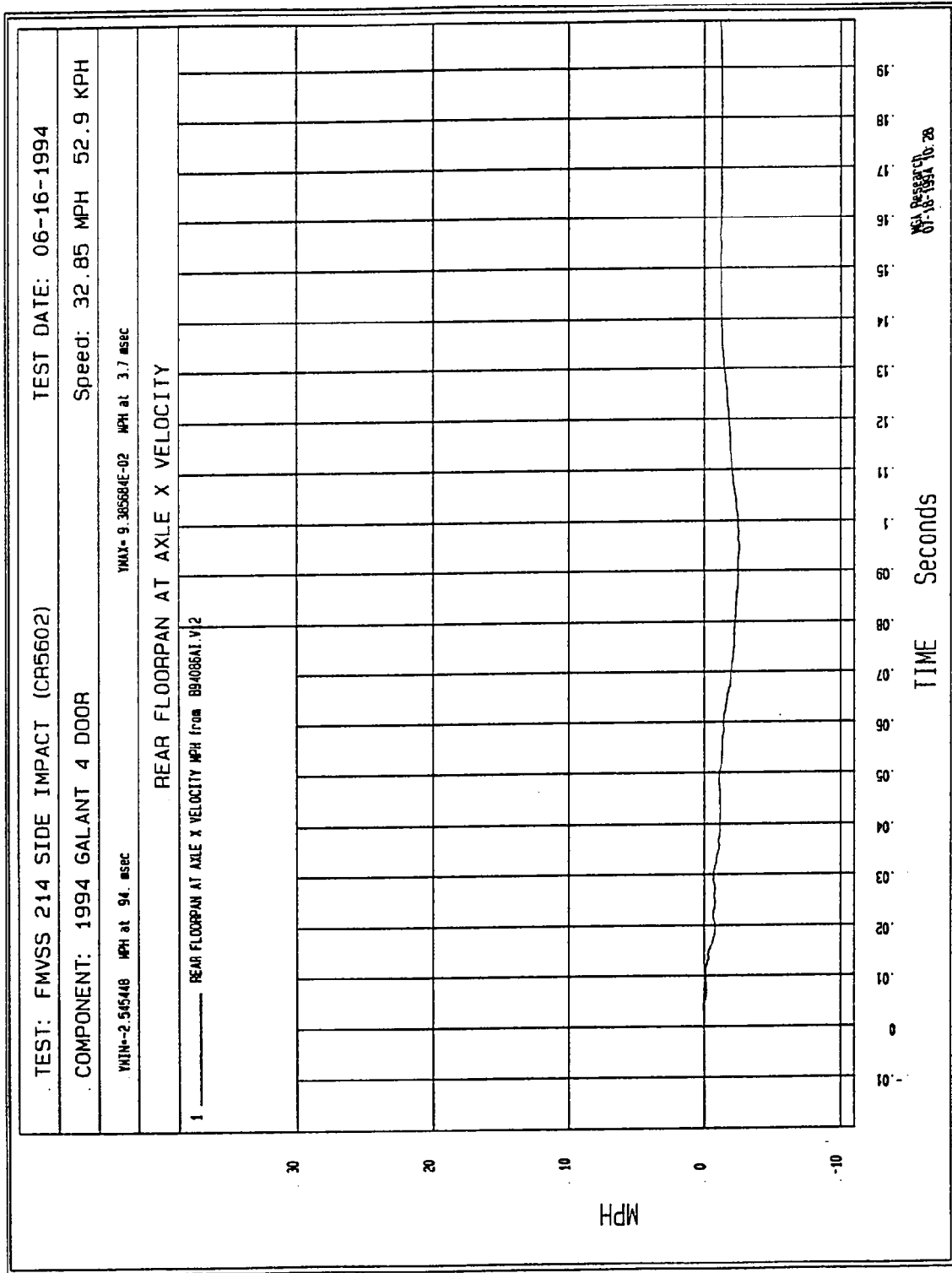


Figure B-38 - Rear Floorpan at Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

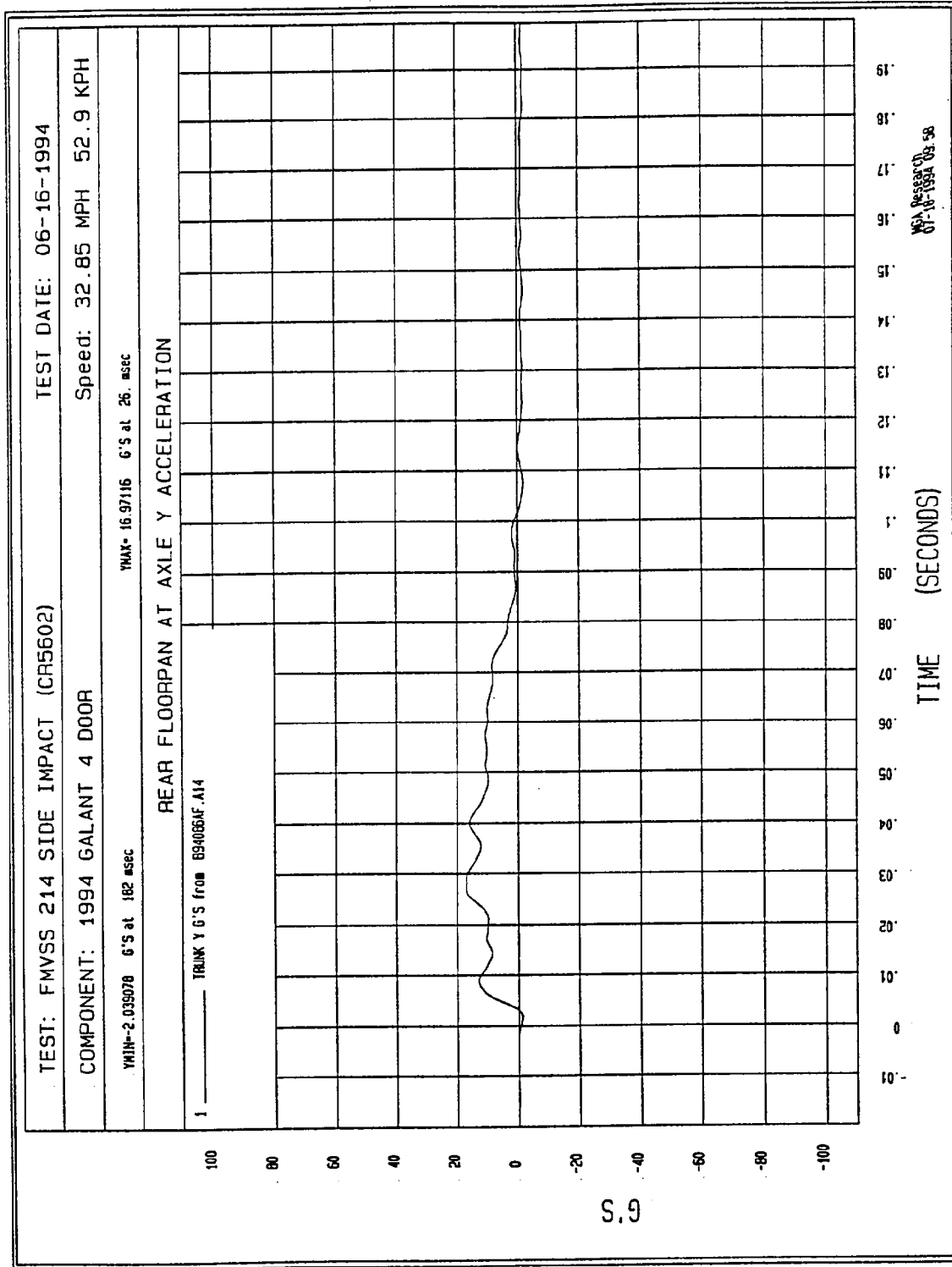


Figure B-39 - Rear Floorpan at Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

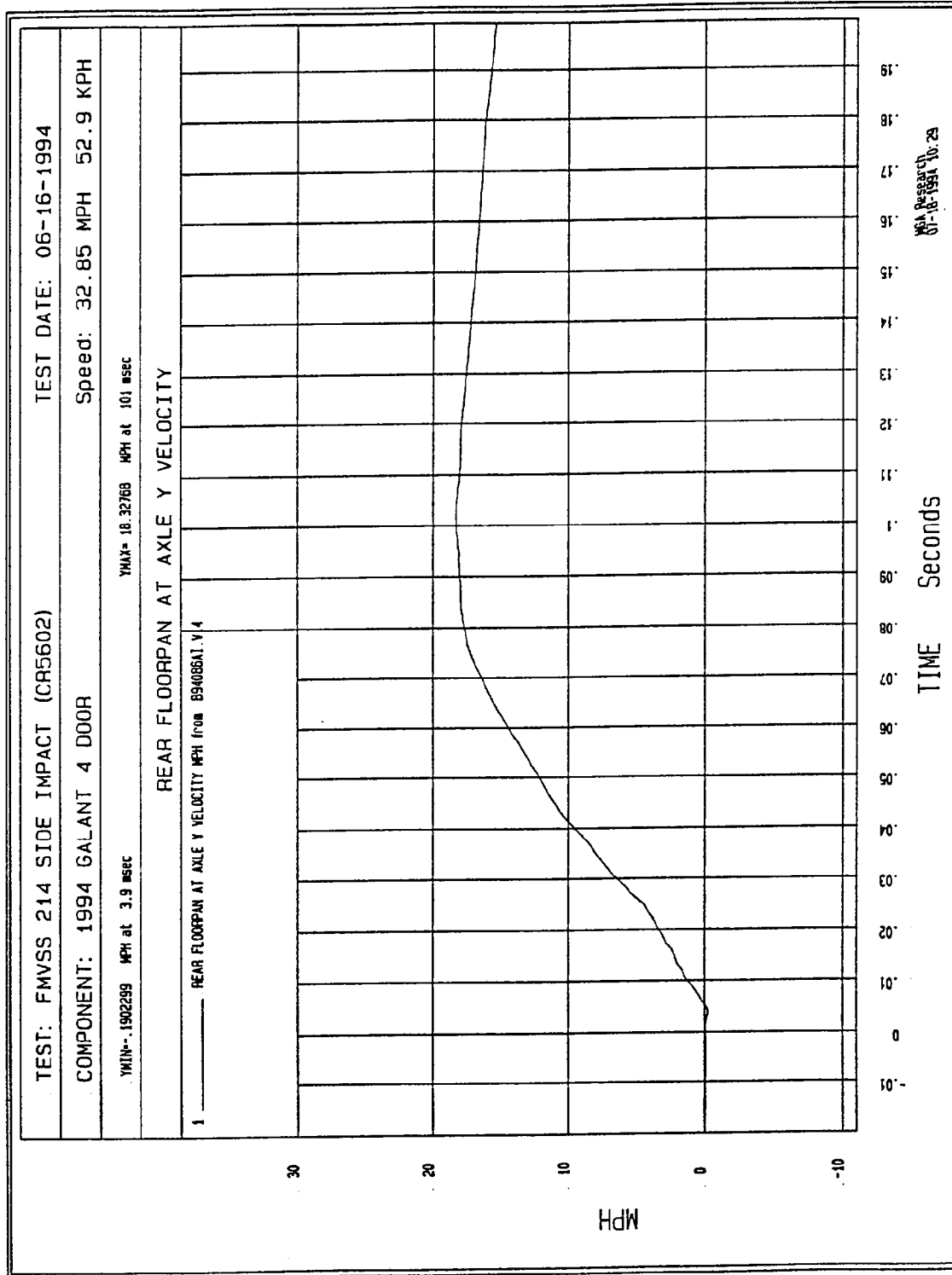


Figure B-40 - Rear Floorpan at Axle Y Velocity vs. Time

Filter: Class 60 (100 Hz)

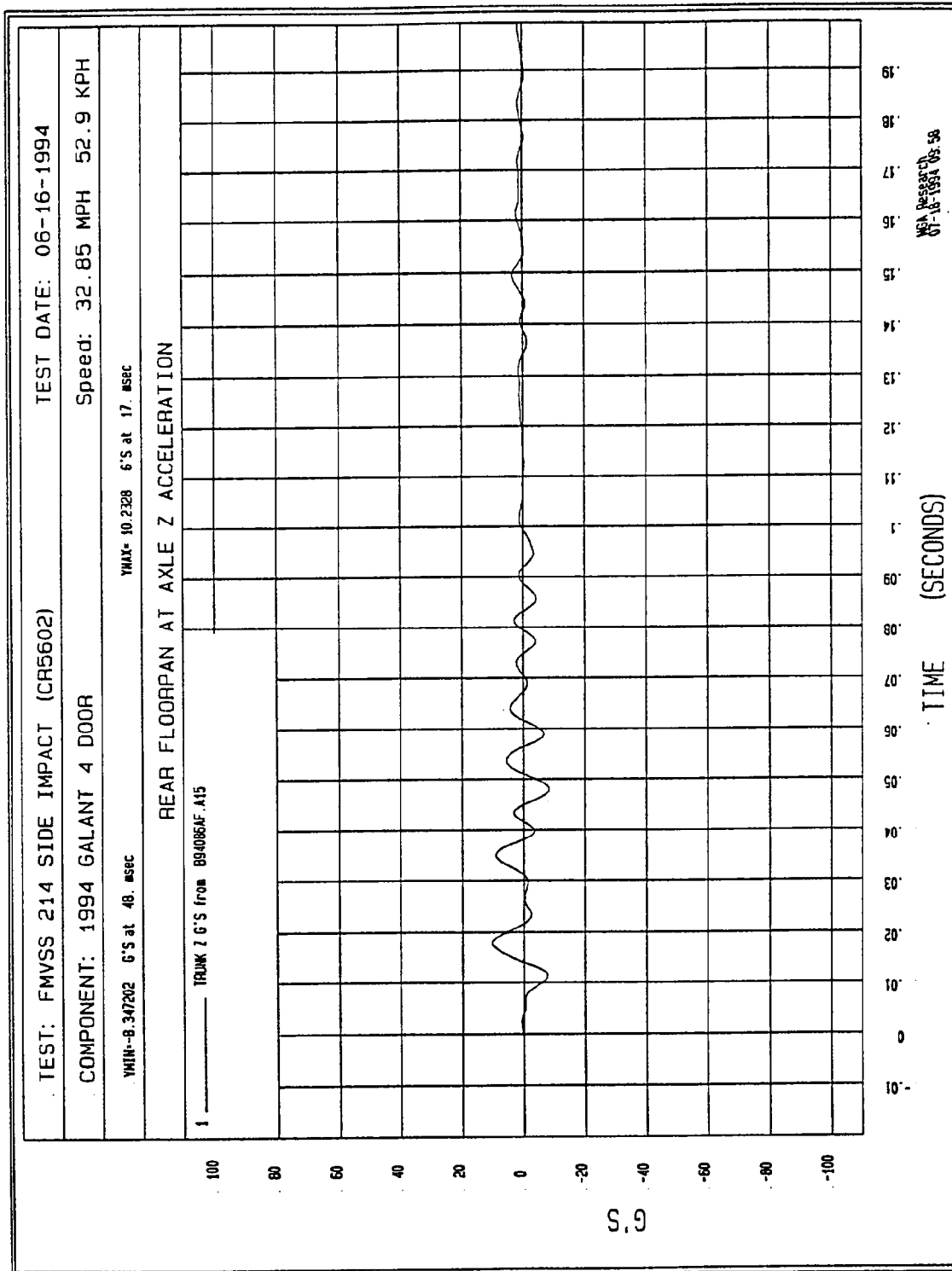


Figure B-41 - Rear Floorpan at Axle Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

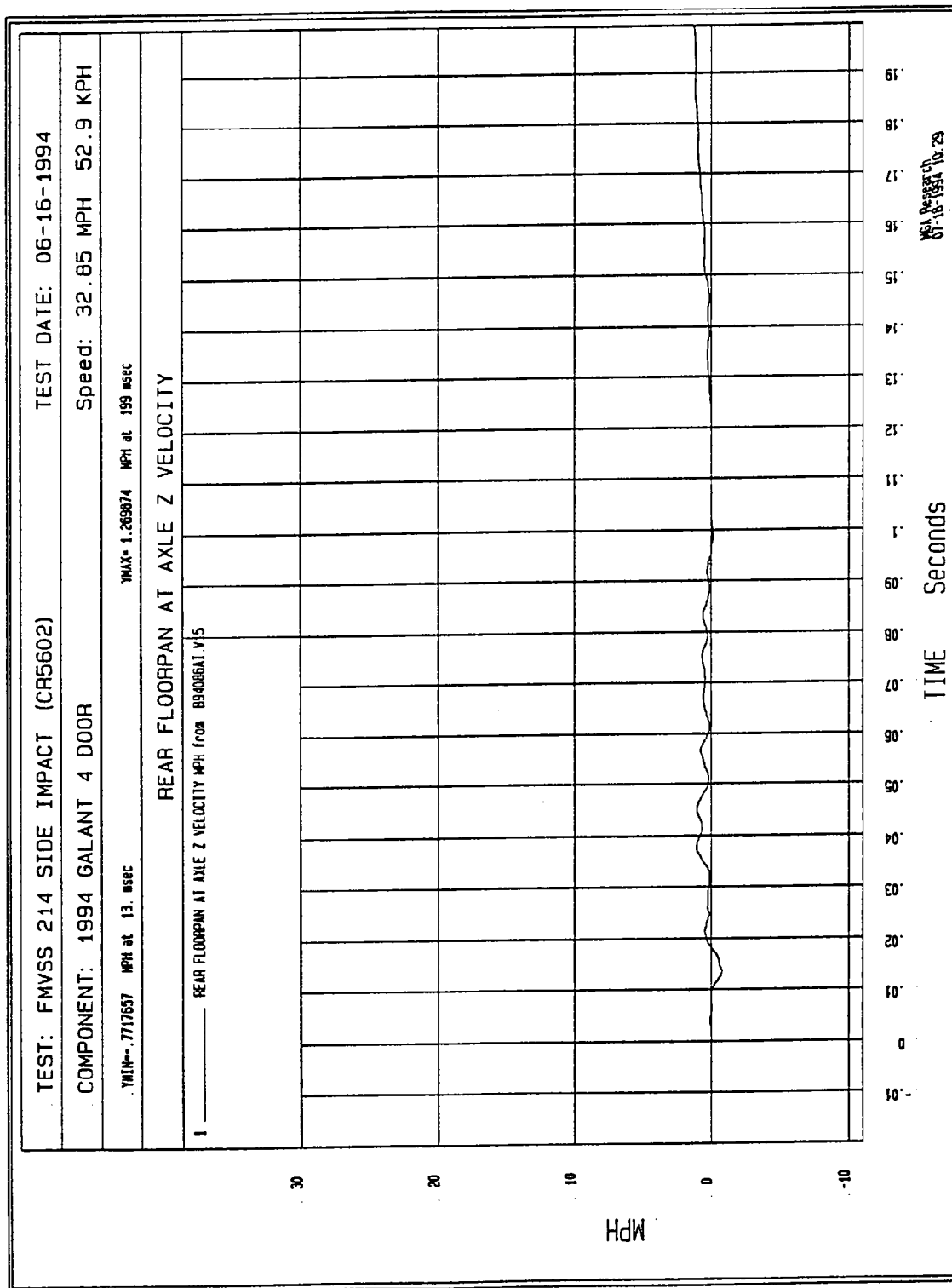


Figure B-42 - Rear Floorpan at Axle Z Velocity vs. Time

TEST: FMVSS 214 SIDE IMPACT (CR5602) TEST DATE: 06-16-1994

COMPONENT: 1994 GALANT 4 DOOR Speed: 32.85 MPH 52.9 KPH

YMIN= 2.417151E-02 G'S at -3.3 msec YMAX= 16.98074 G'S at 26. msec

REAR FLOORPAN @ AXLE CENTERLINE RESULTANT

1 Resultant G'S from B94085AV.A12

MECA Research
06-17-1994 08:46

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

Filter: Class 60 (100 Hz)

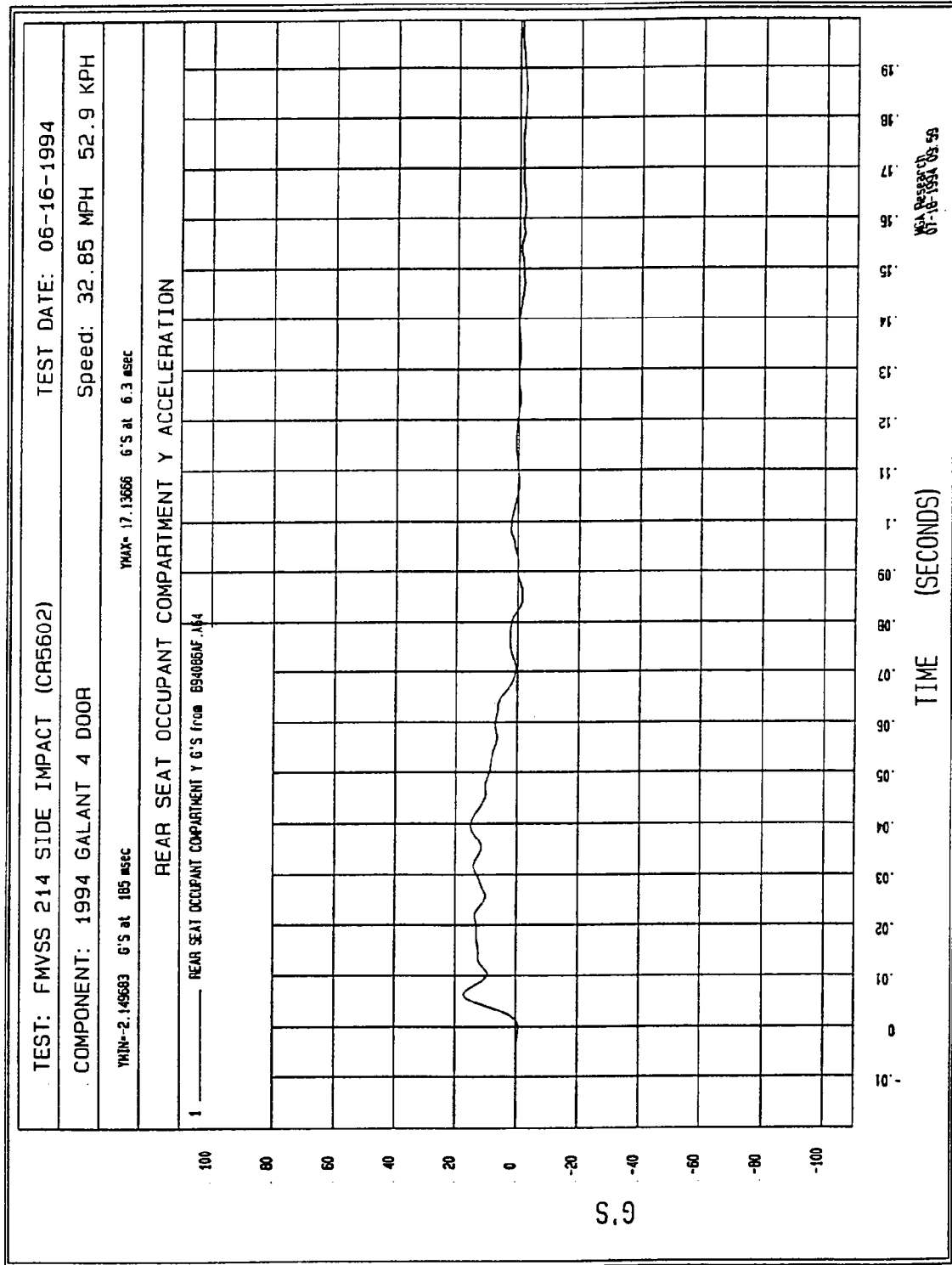


Figure B-44 - Rear Seat Occupant Compartment Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

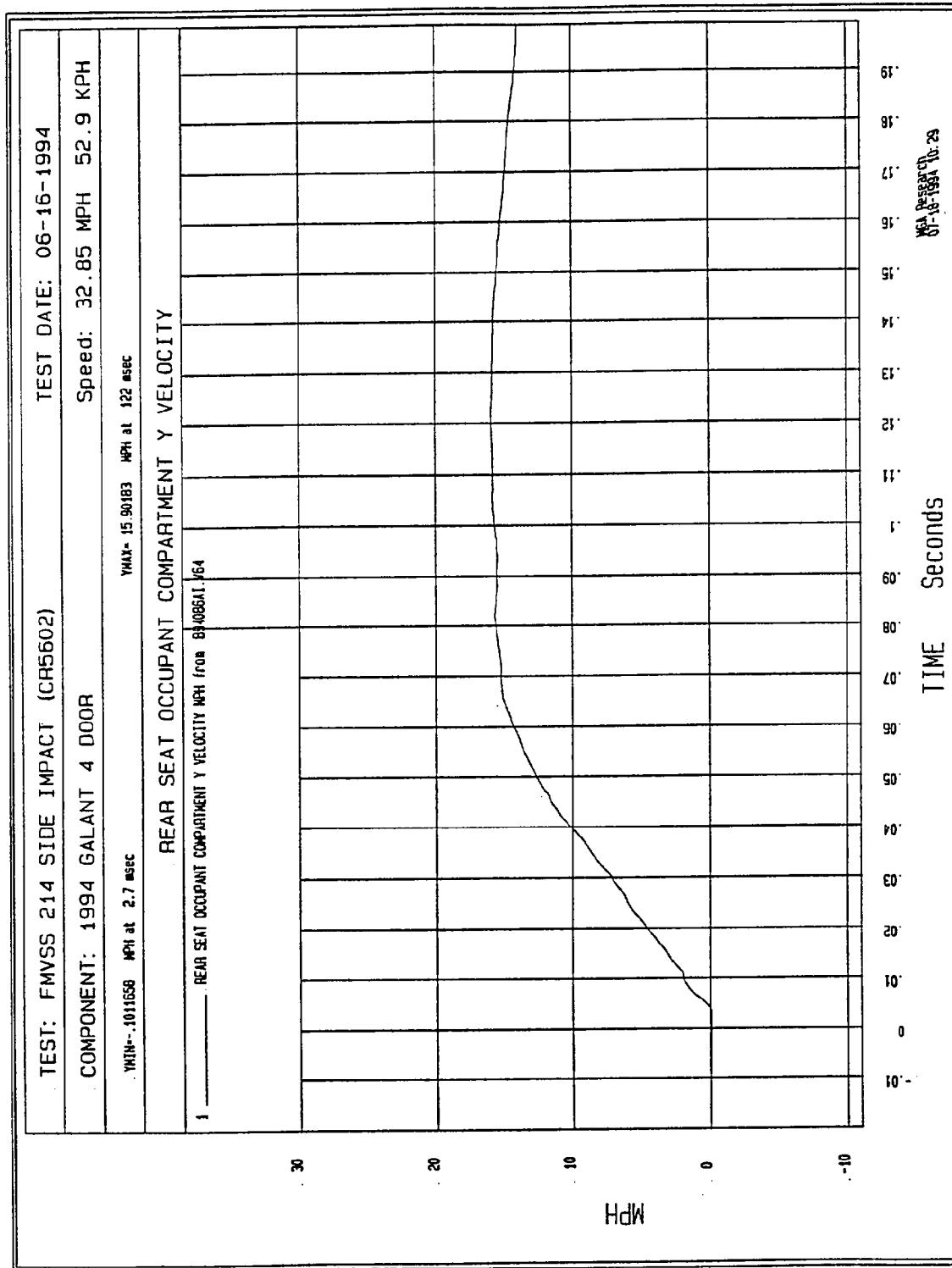


Figure B-45 - Rear Seat Occupant Compartment Y Velocity vs. Time

Filter: Class 60 (100 Hz)

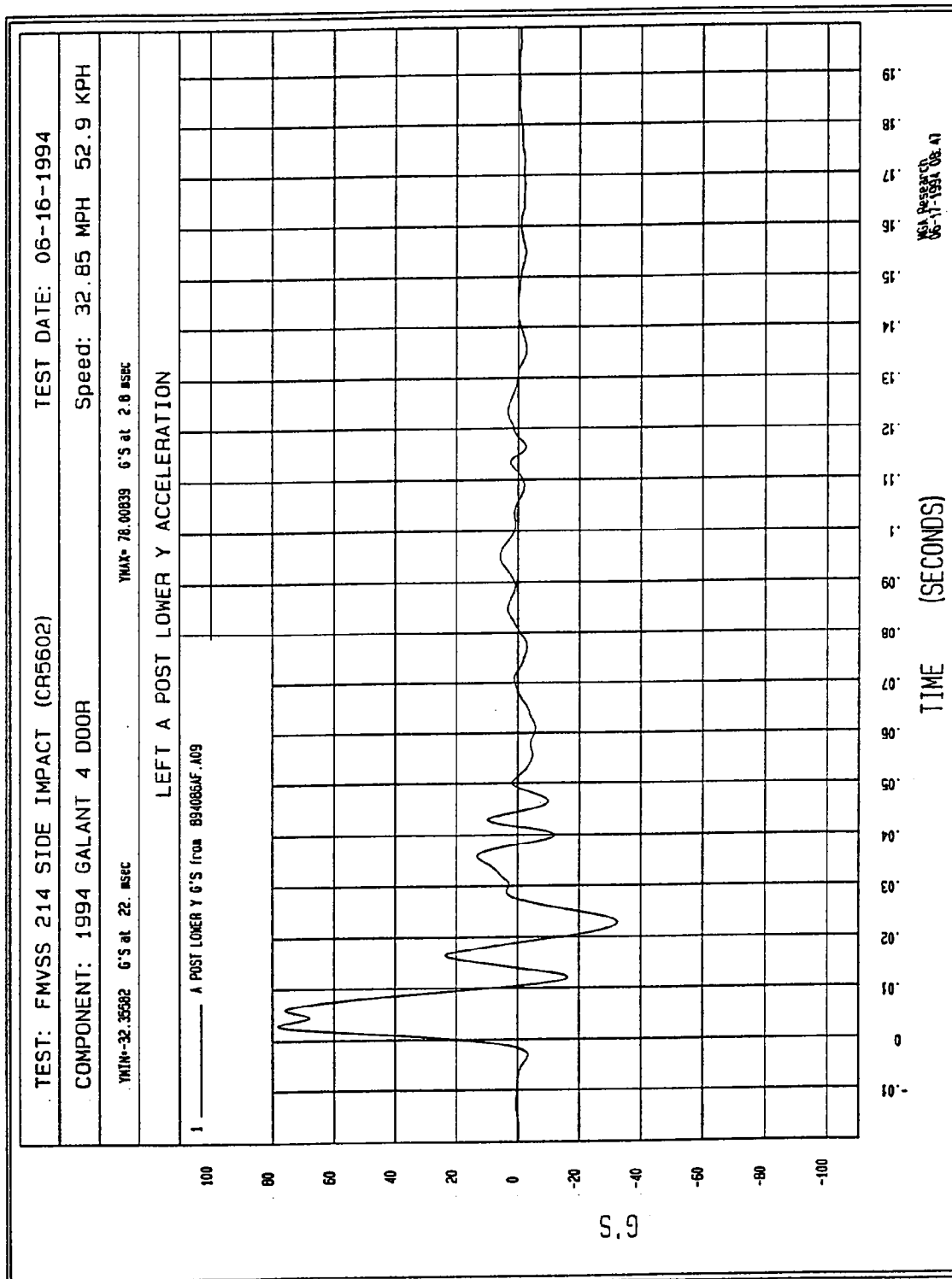


Figure B-46 - Left A Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

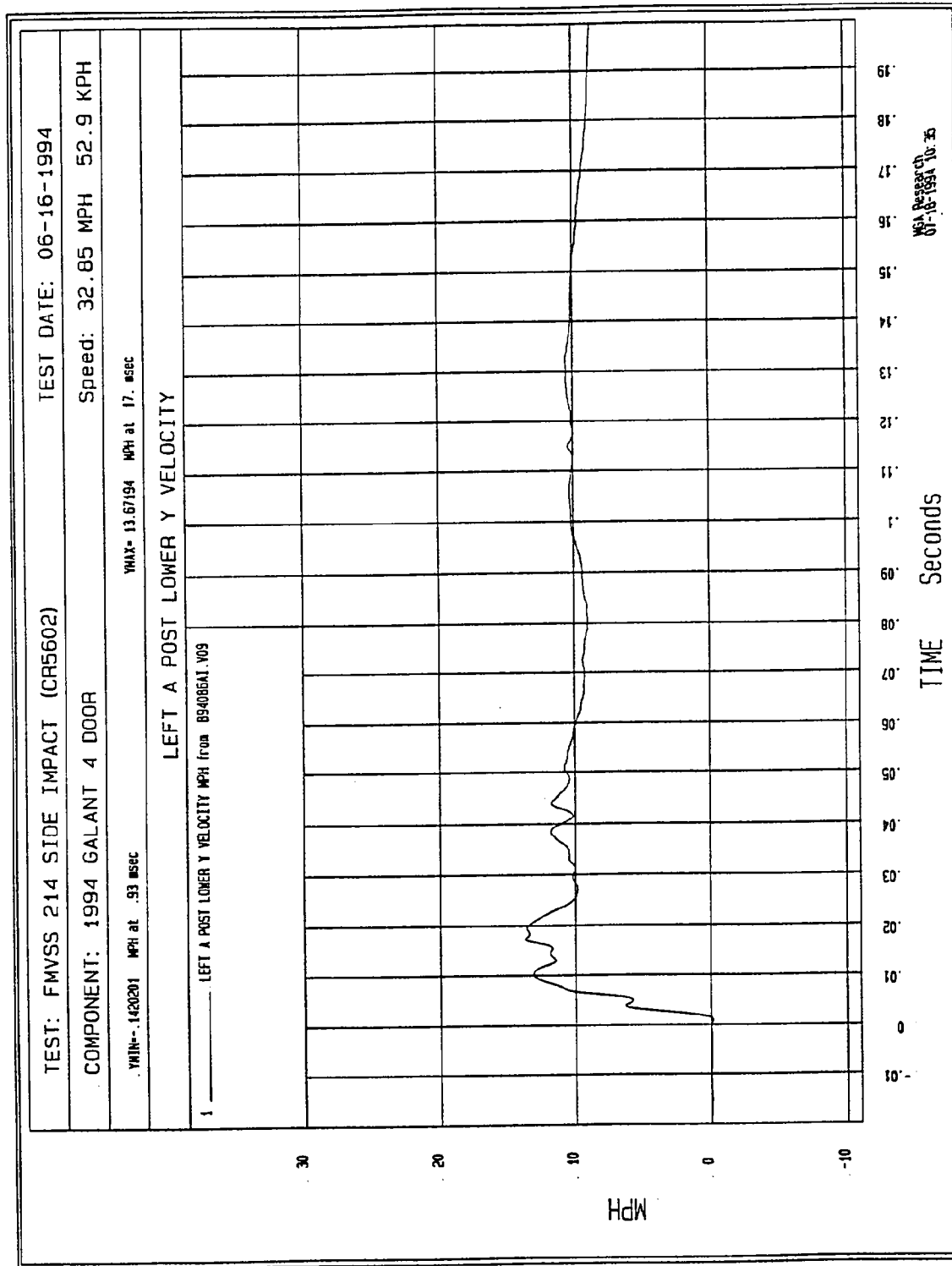


Figure B-47 - Left A Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

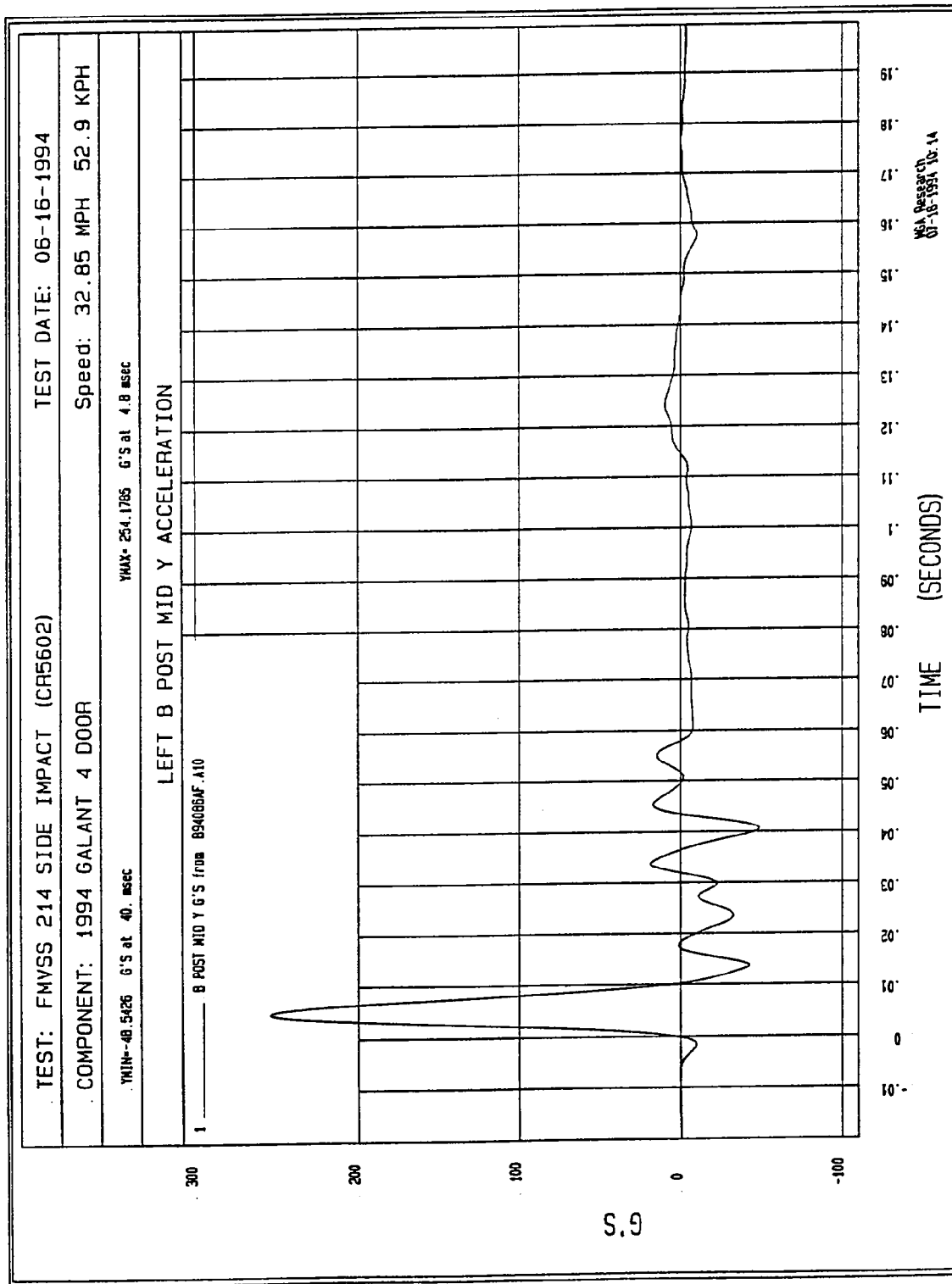


Figure B-48 - Left B Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

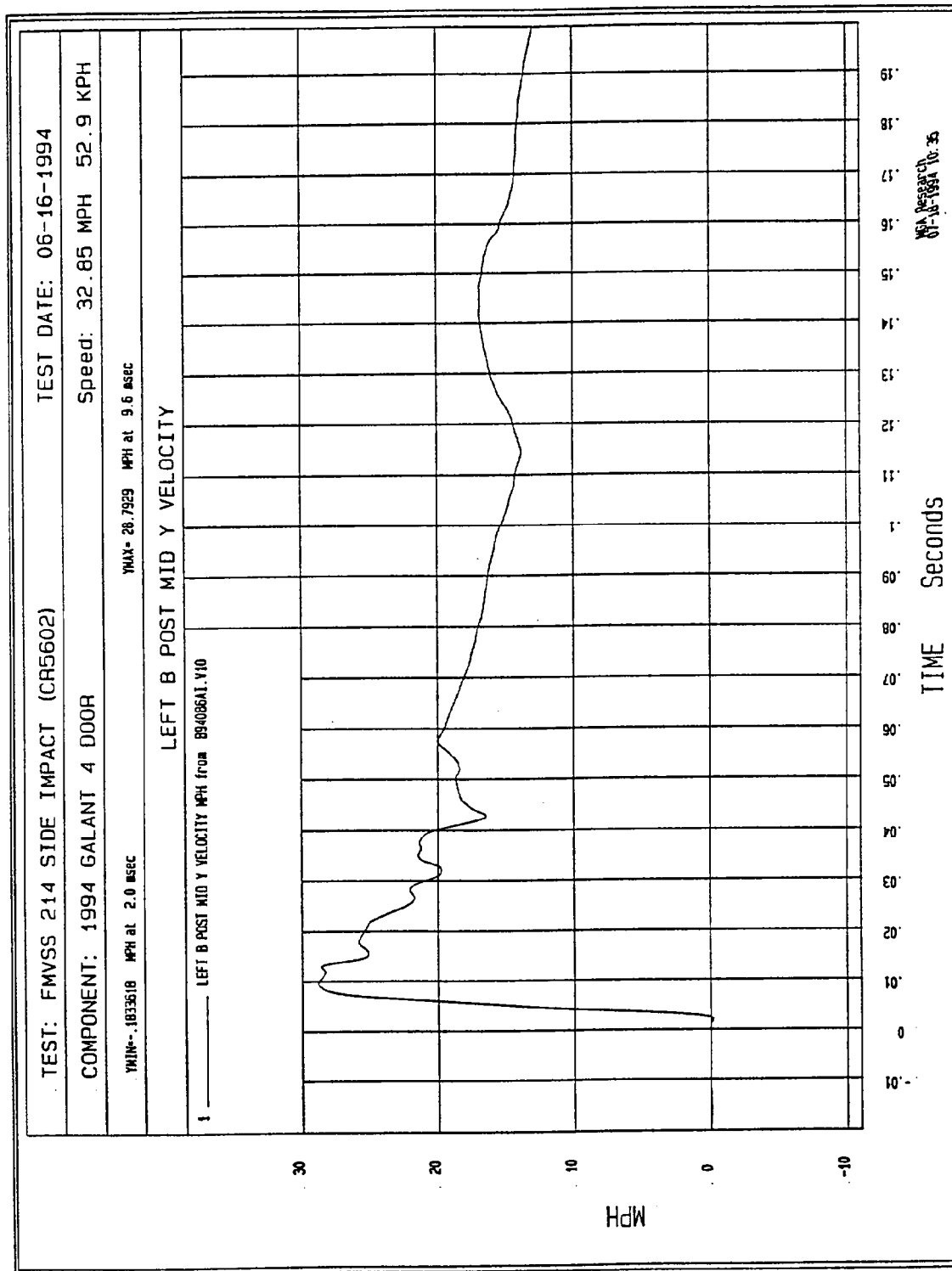


Figure B-49 - Left B Post Mid Y Velocity vs. Time

Filter: Class 60 (100 Hz)

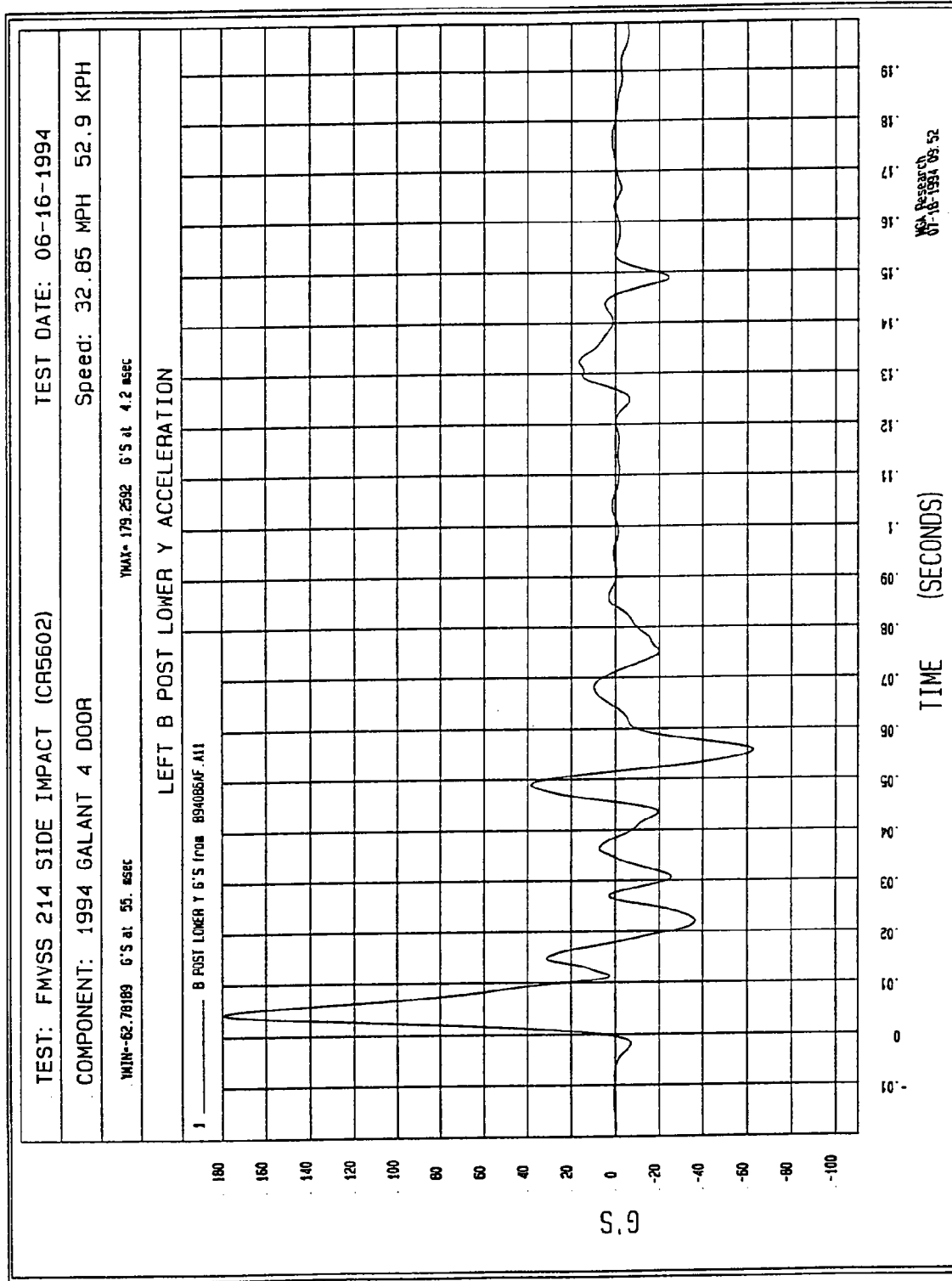


Figure B-50 - Left B Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

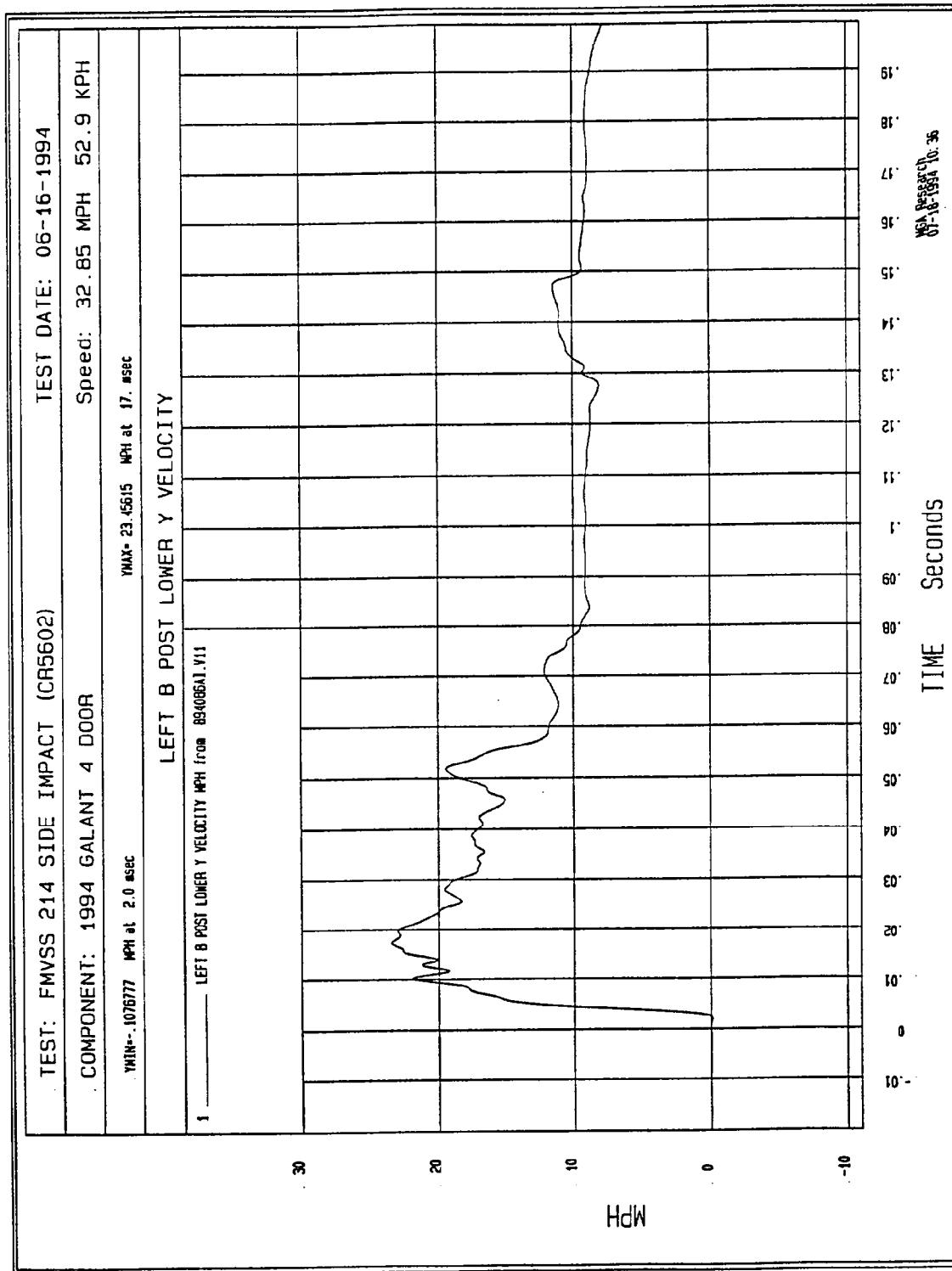


Figure B-11 - Left B Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

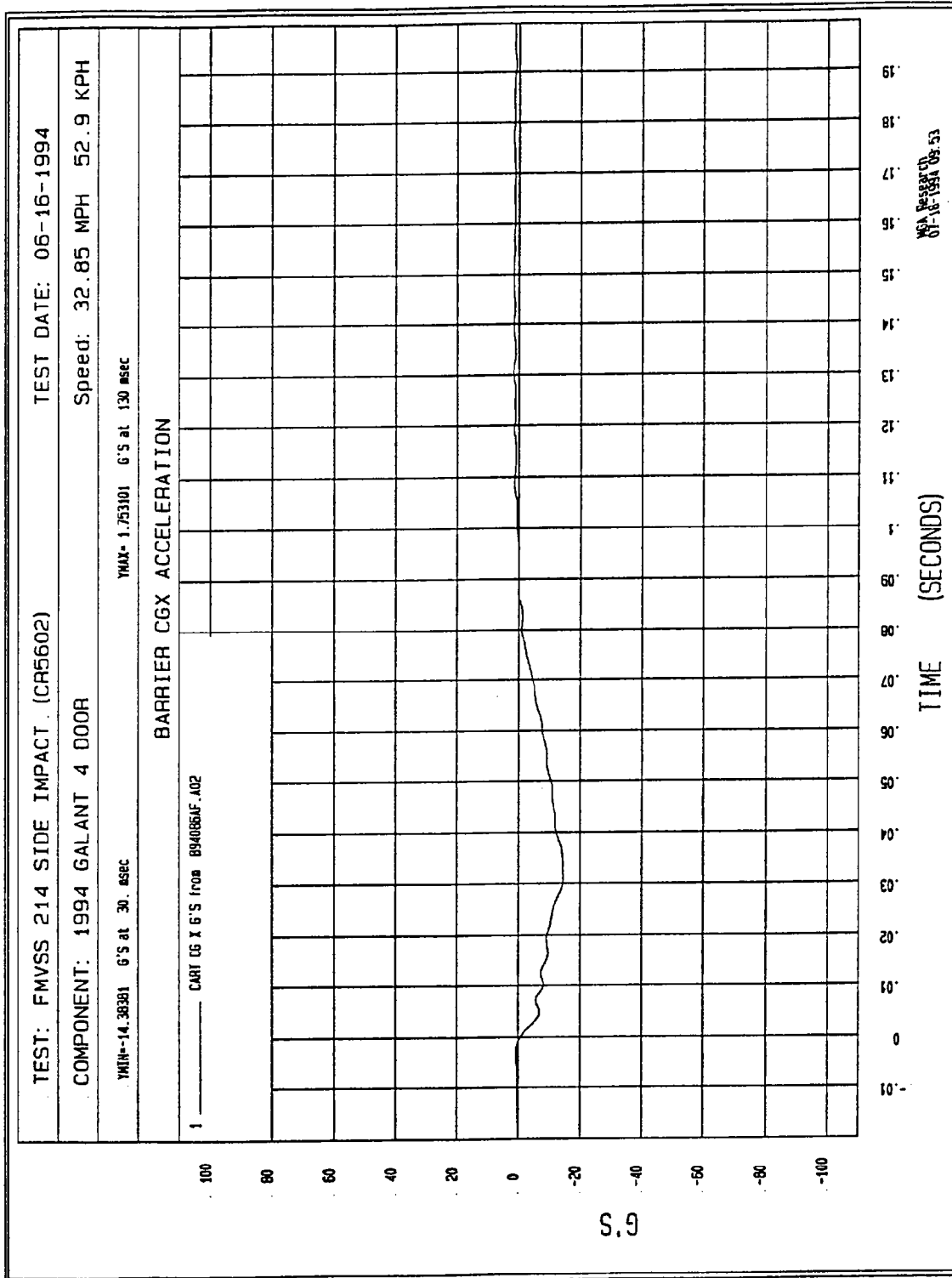


Figure B-52 - Moving Barrier Center of Gravity X Acceleration vs. Time

Filter: Class 180 (300 Hz)

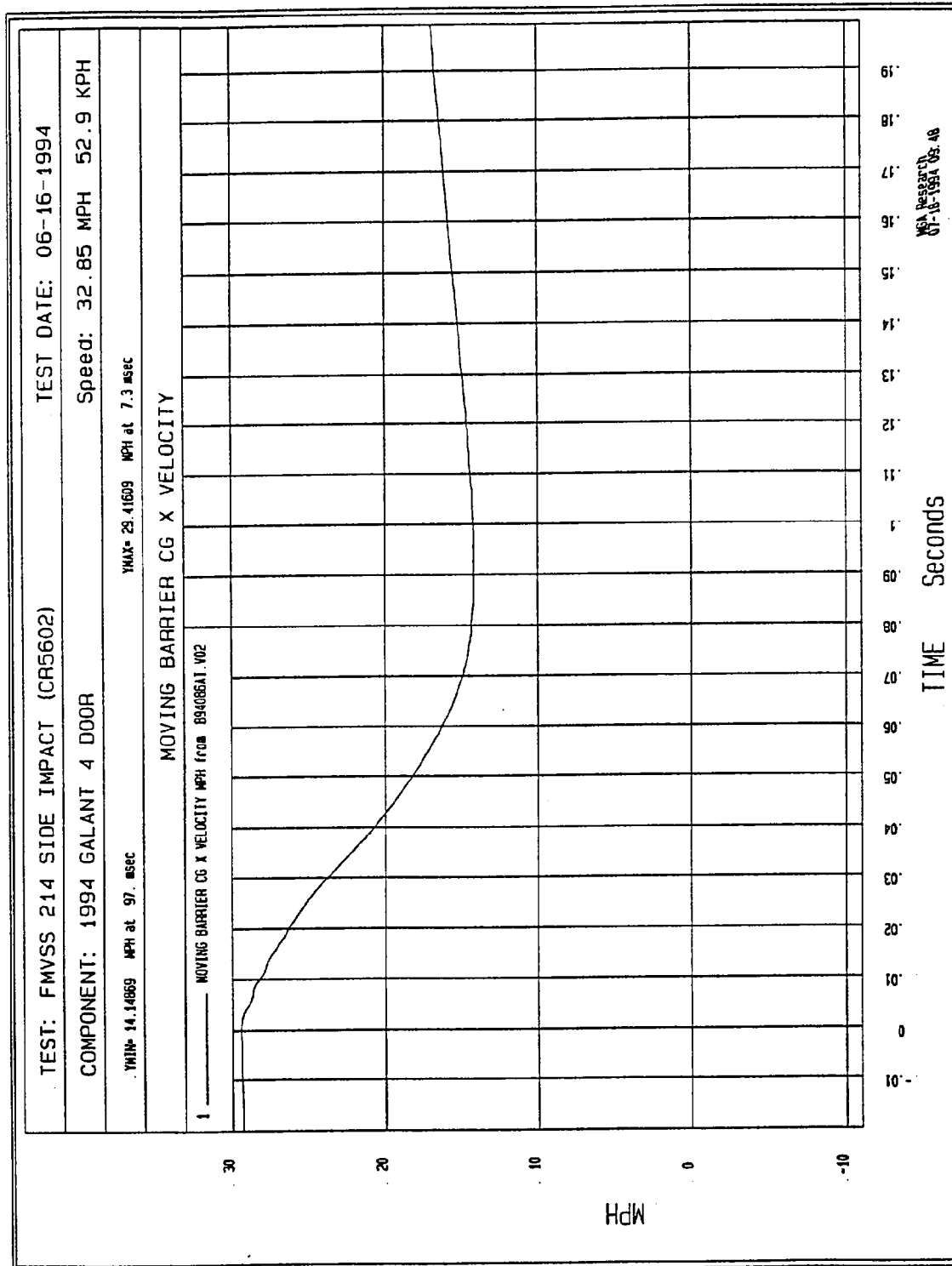


Figure B-53 - Moving Barrier Center of Gravity X Velocity vs. Time

Filter: Class 60 (100 Hz)

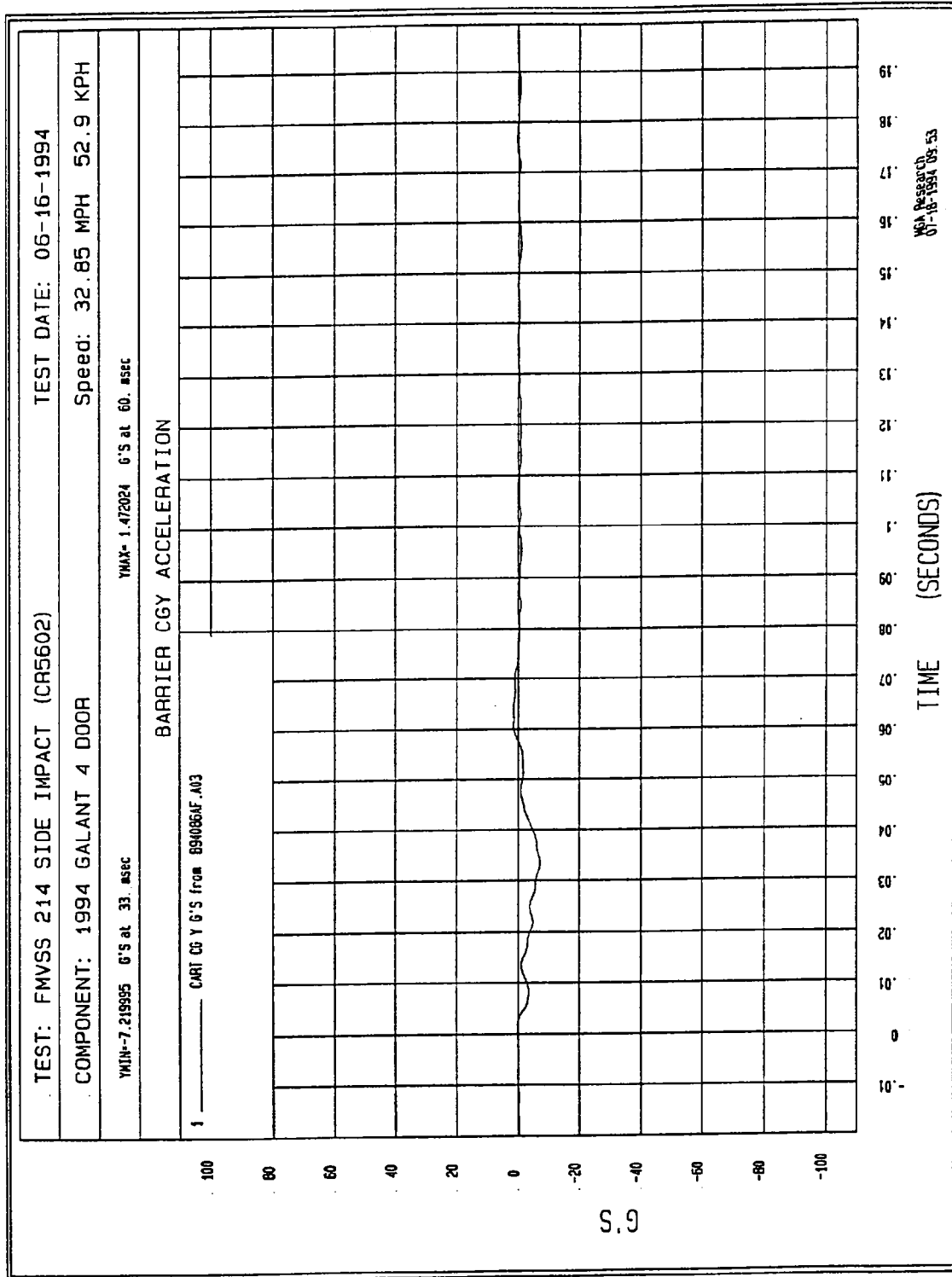


Figure B-54 - Moving Barrier Center of Gravity Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

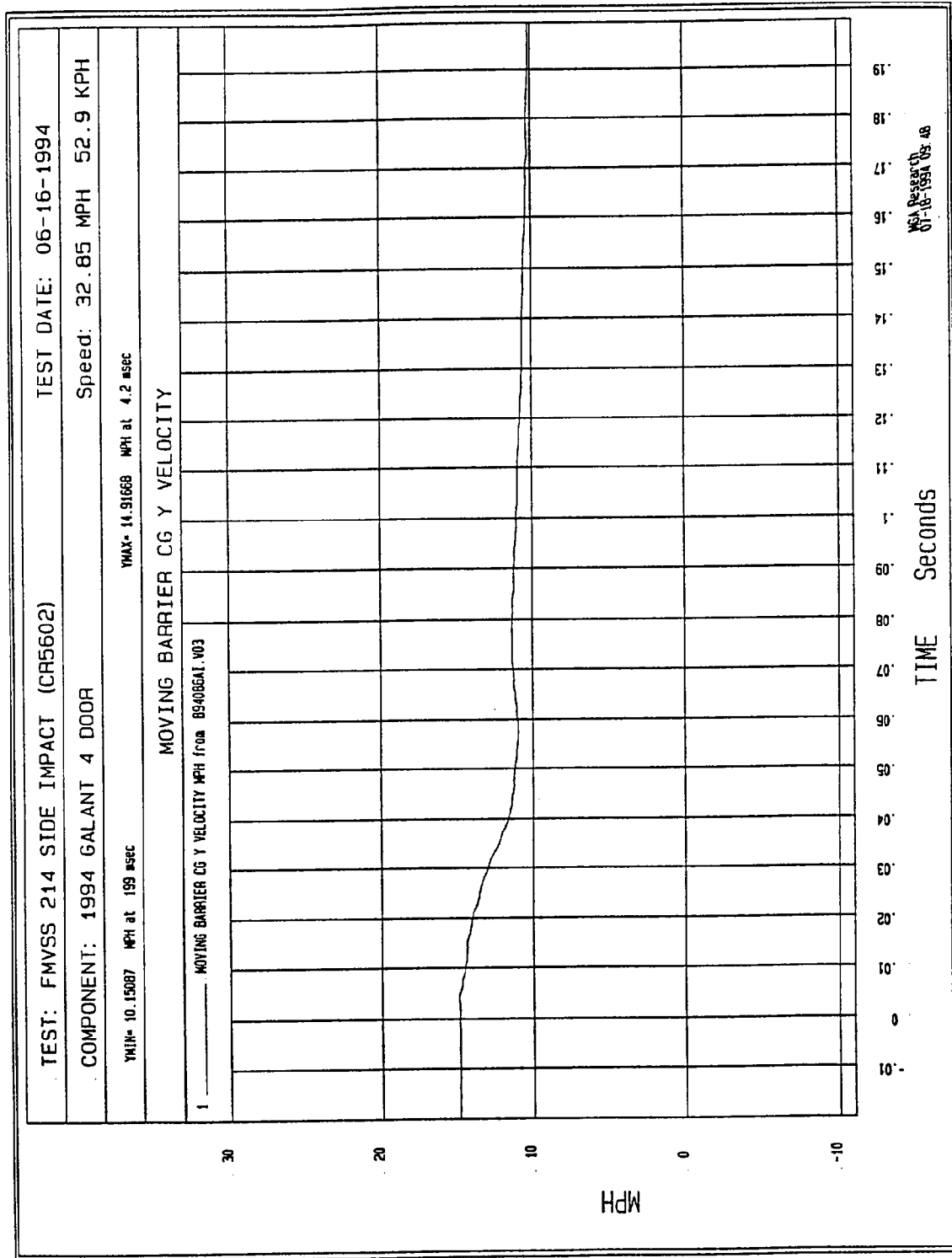


Figure B-55 - Moving Barrier Center of Gravity Y Velocity vs. Time

Filter: Class 60 (100 Hz)

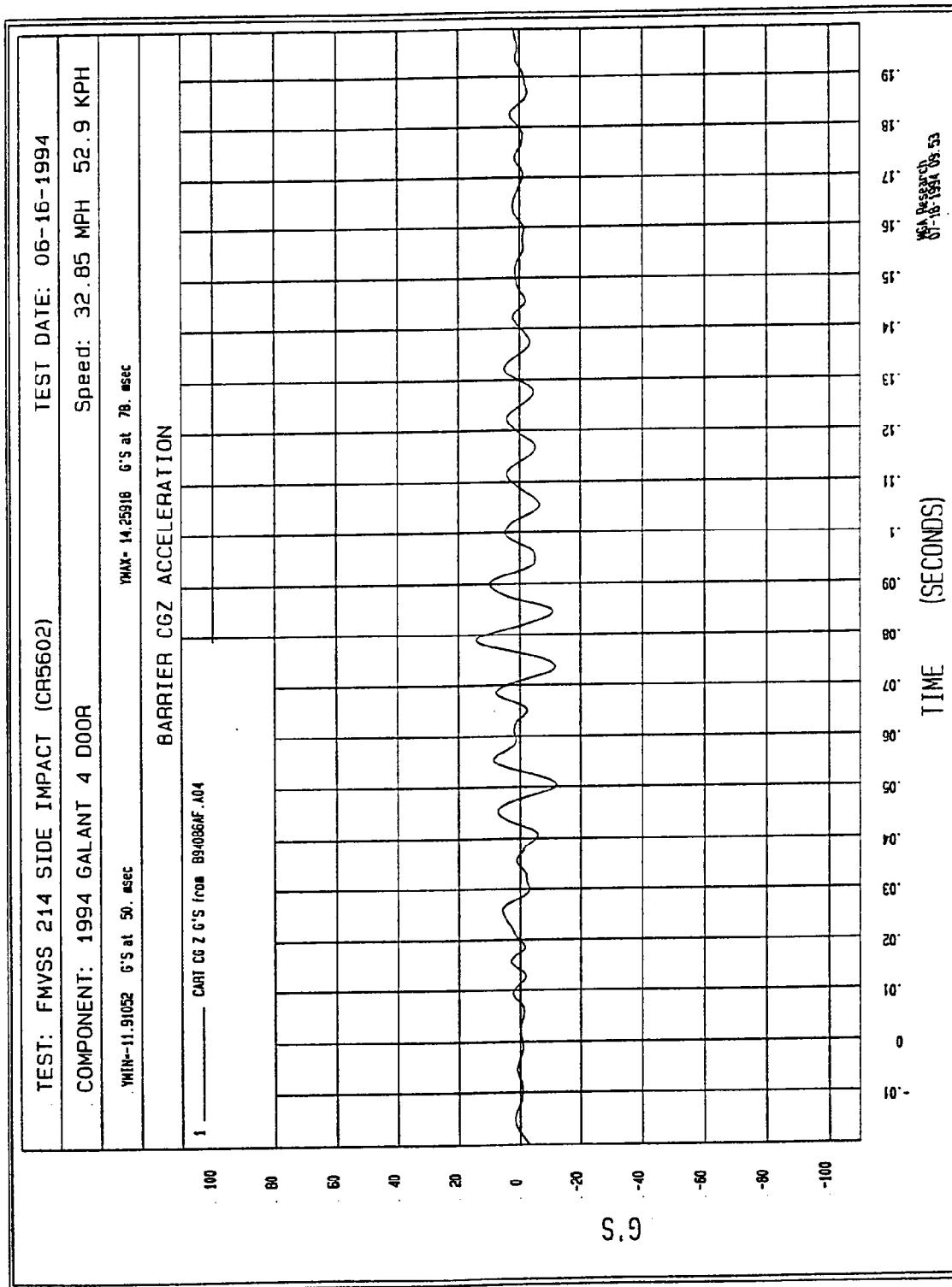


Figure B-56 - Moving Barrier Center of Gravity Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

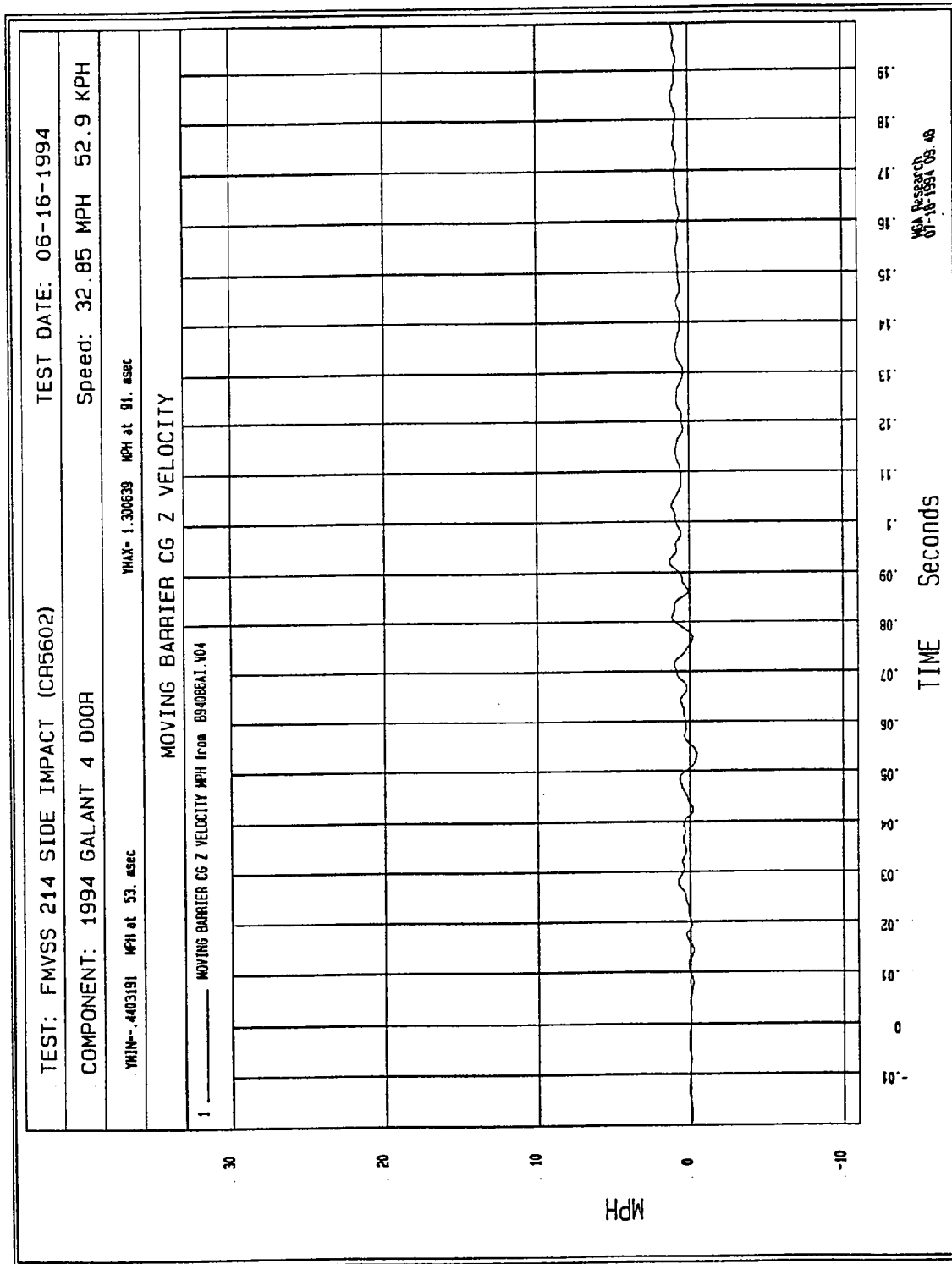


Figure B-57 - Moving Barrier Center of Gravity Z Velocity vs. Time

Filter: Class 60 (100 Hz)

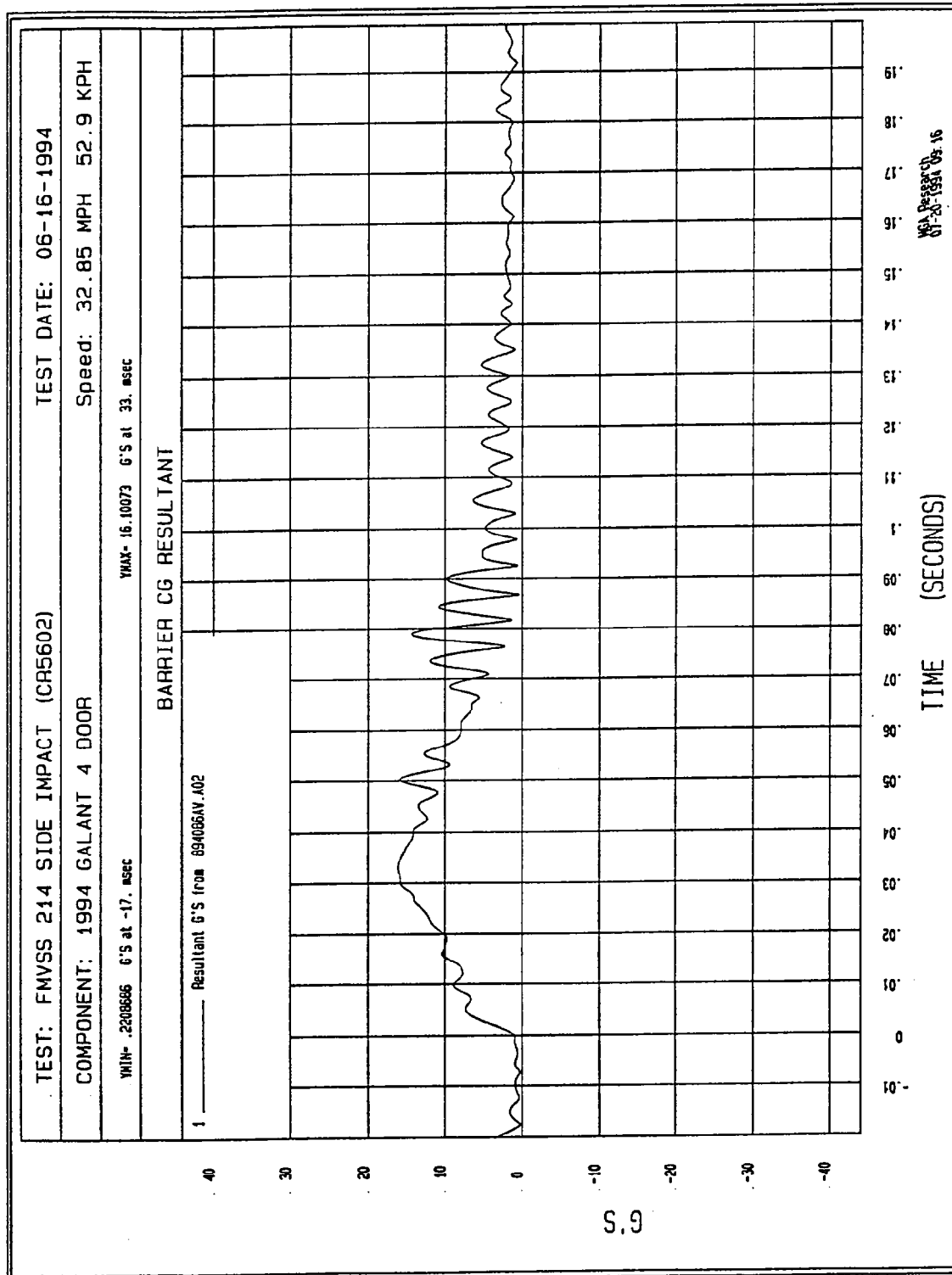


Figure B-58 - Moving Barrier Center of Gravity Resultant vs. Time

Filter: Class 60 (100 Hz)

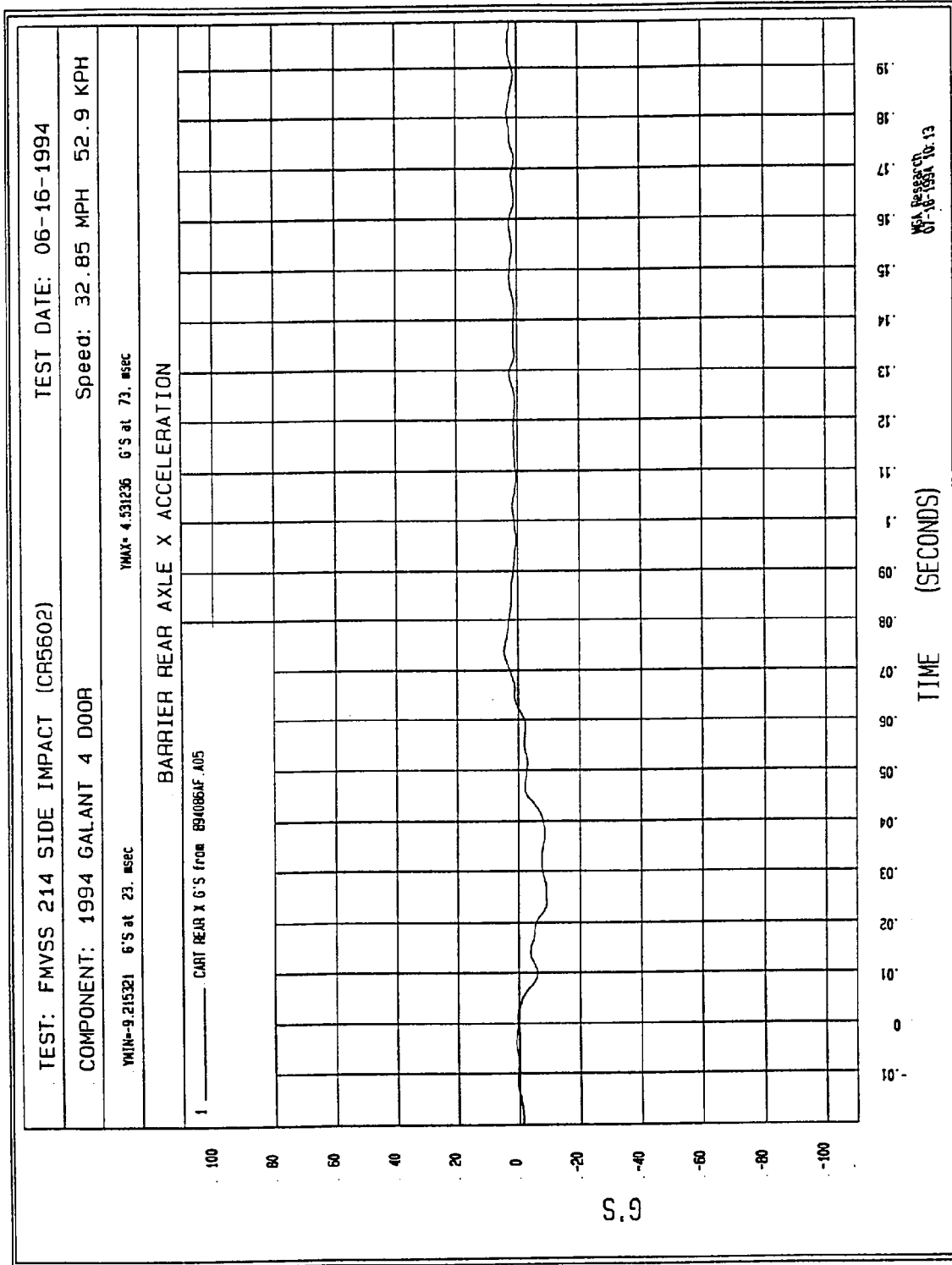


Figure B-59 - Moving Barrier Rear Axle X Acceleration vs. Time

Filter: Class 180 (300 Hz)

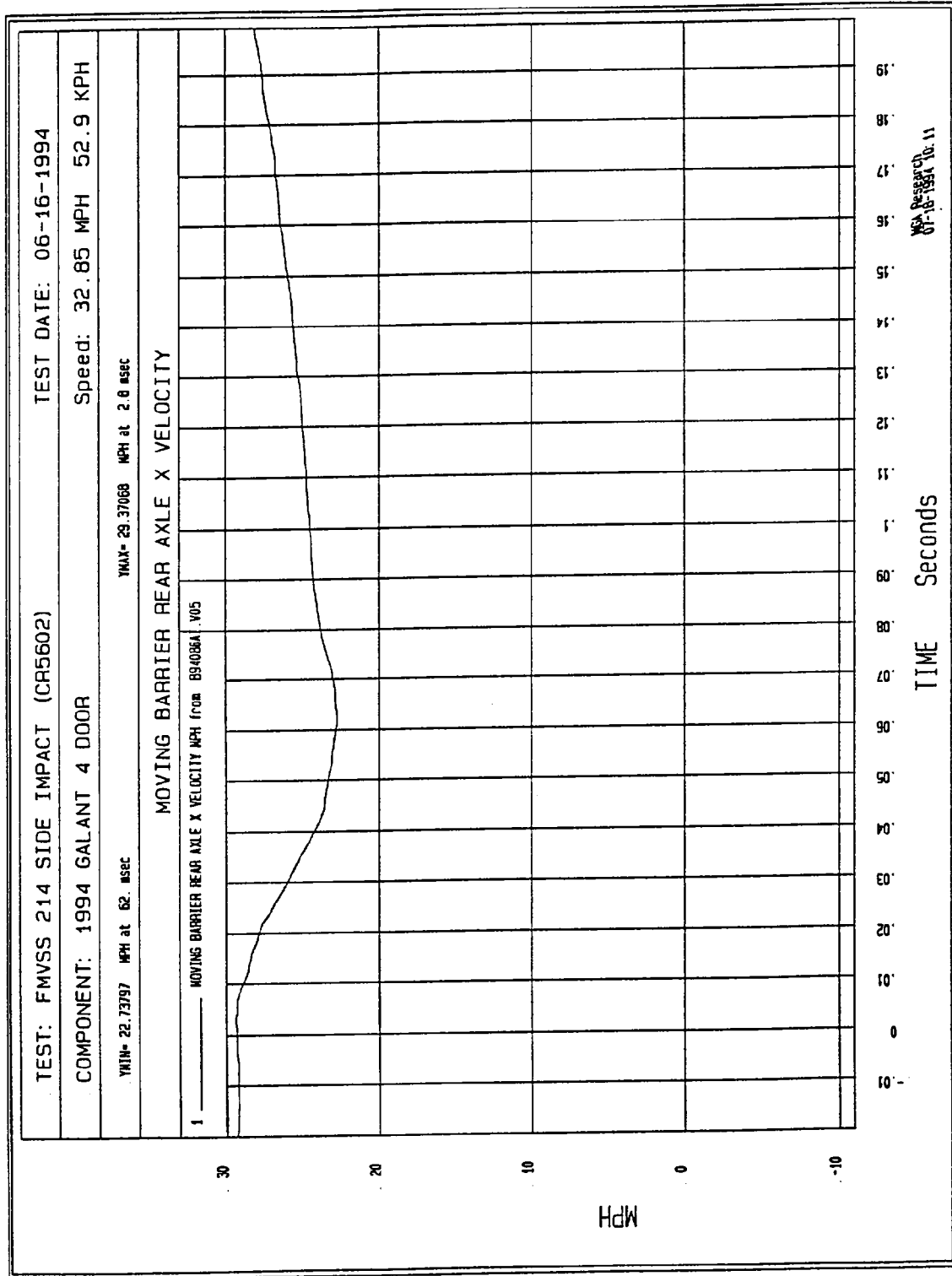


Figure B-60 - Moving Barrier Rear Axle X Velocity vs. Time

Filter: Class 60 (100 Hz)

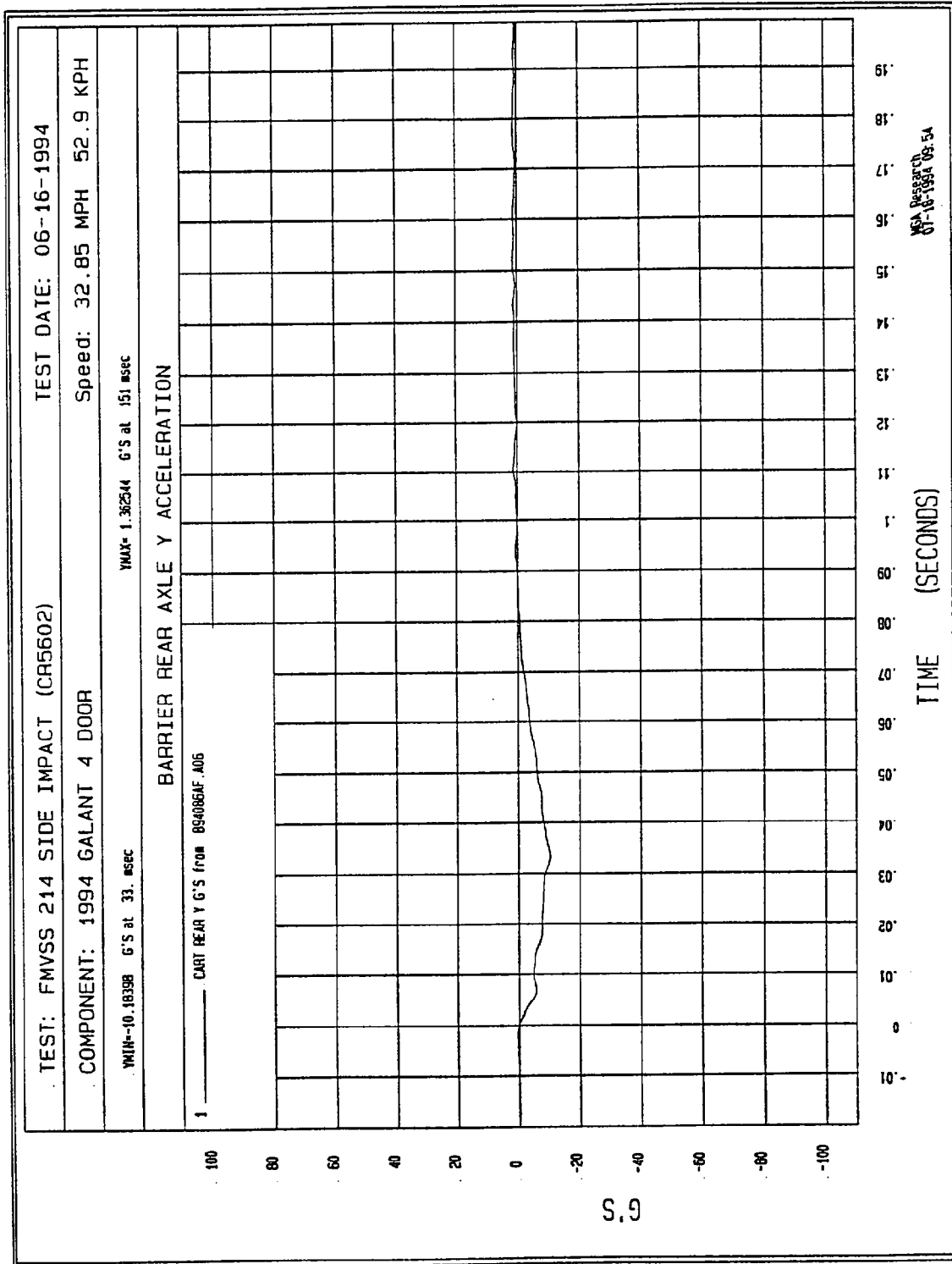


Figure B-61 - Moving Barrier Rear Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

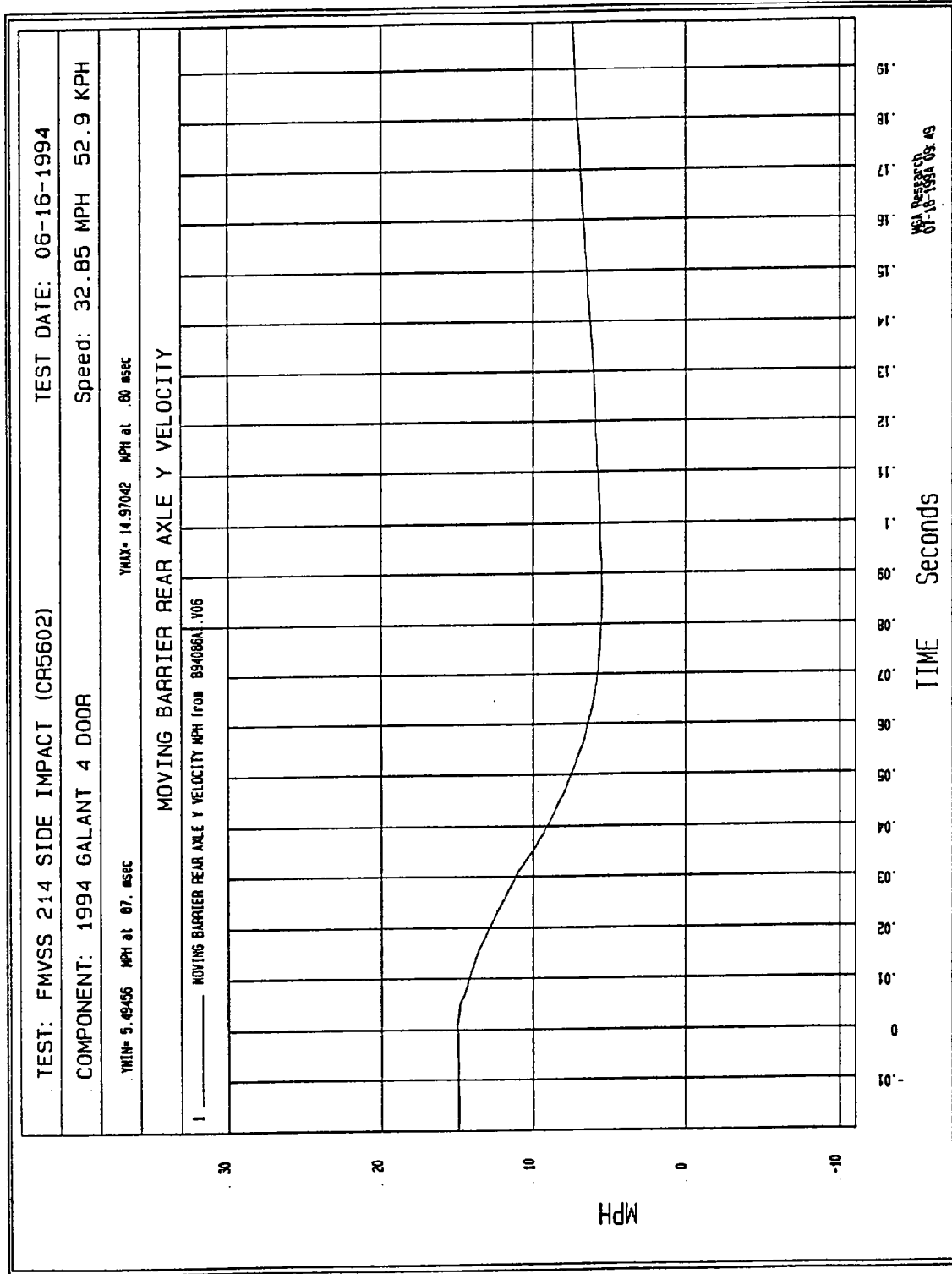
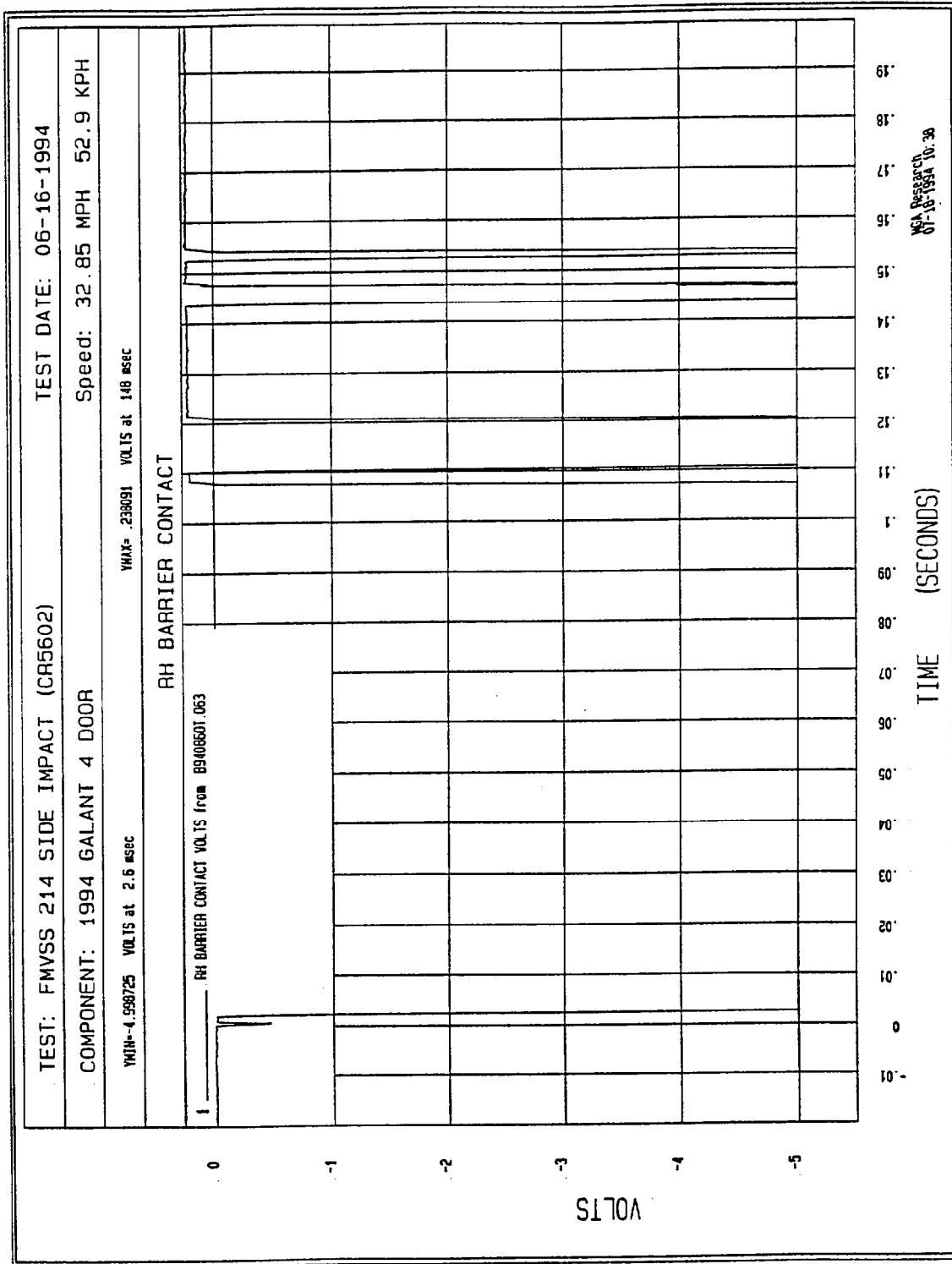


Figure B-62 - Moving Barrier Rear Axle Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)



B-63

Figure B-63 - Right Hand Barrier Contact

Filter: Class 1000 (1650 Hz)

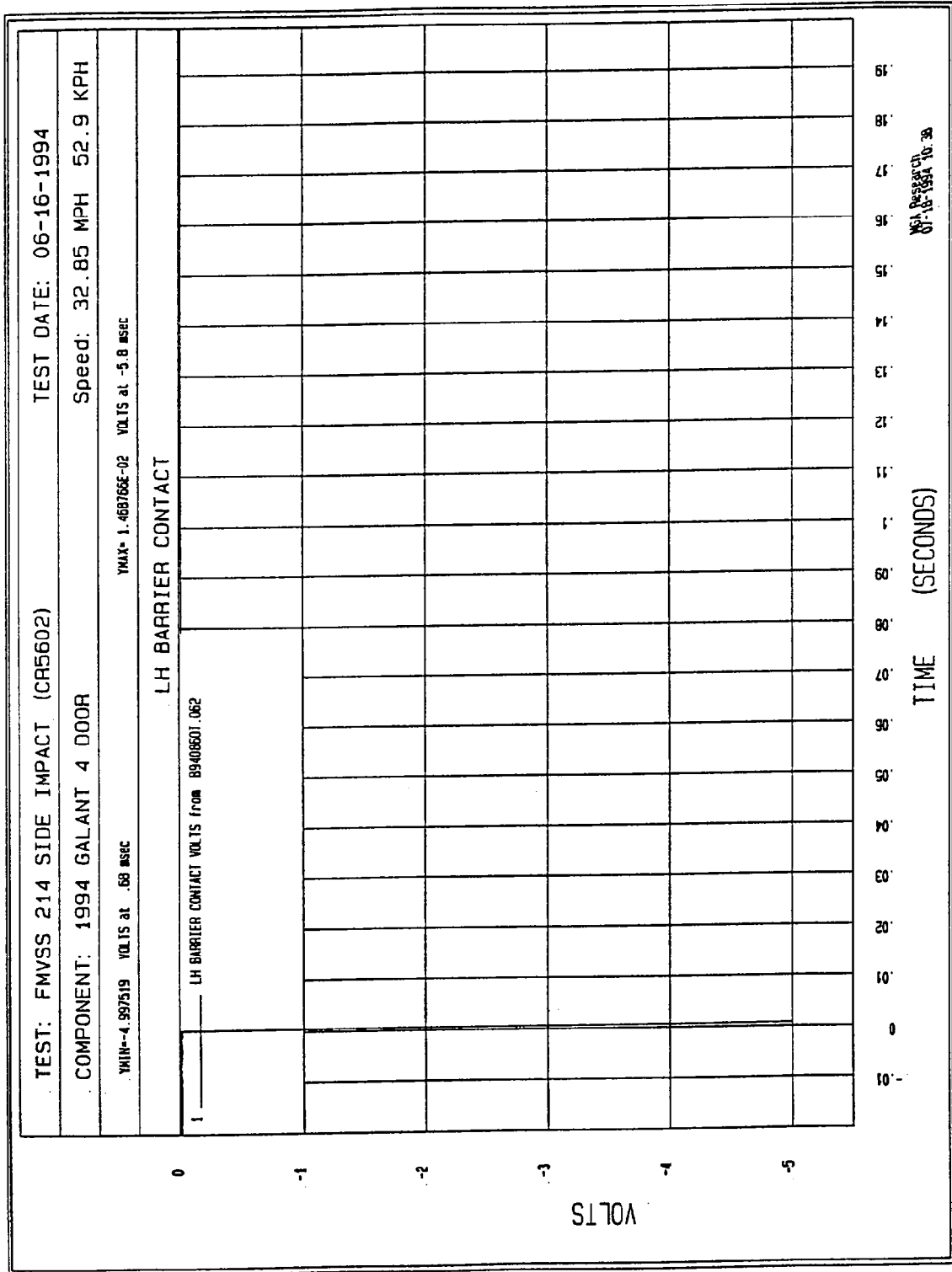


Figure B-64 -- Left Hand Barrier Contact

Filter: Class 180 (300 Hz)

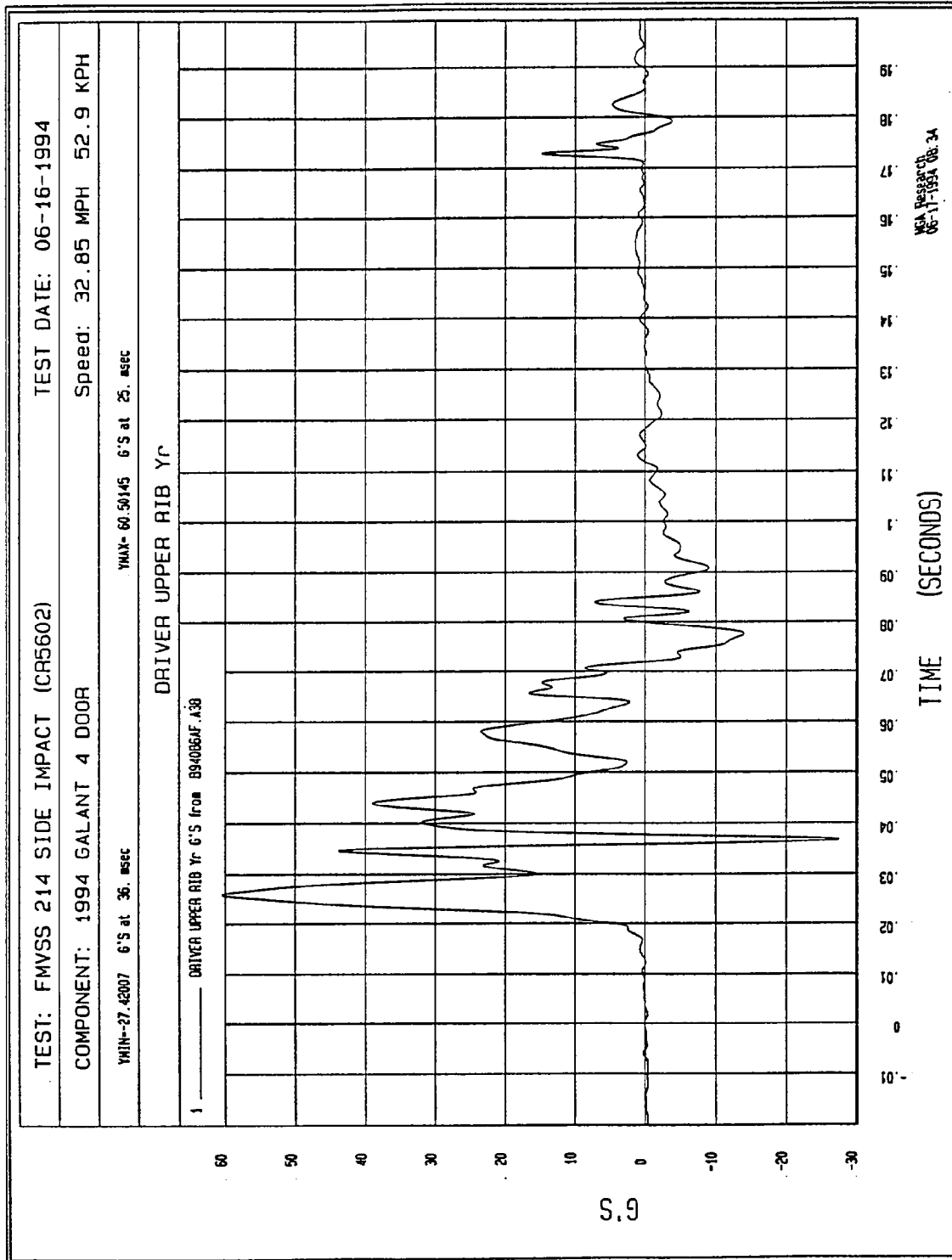
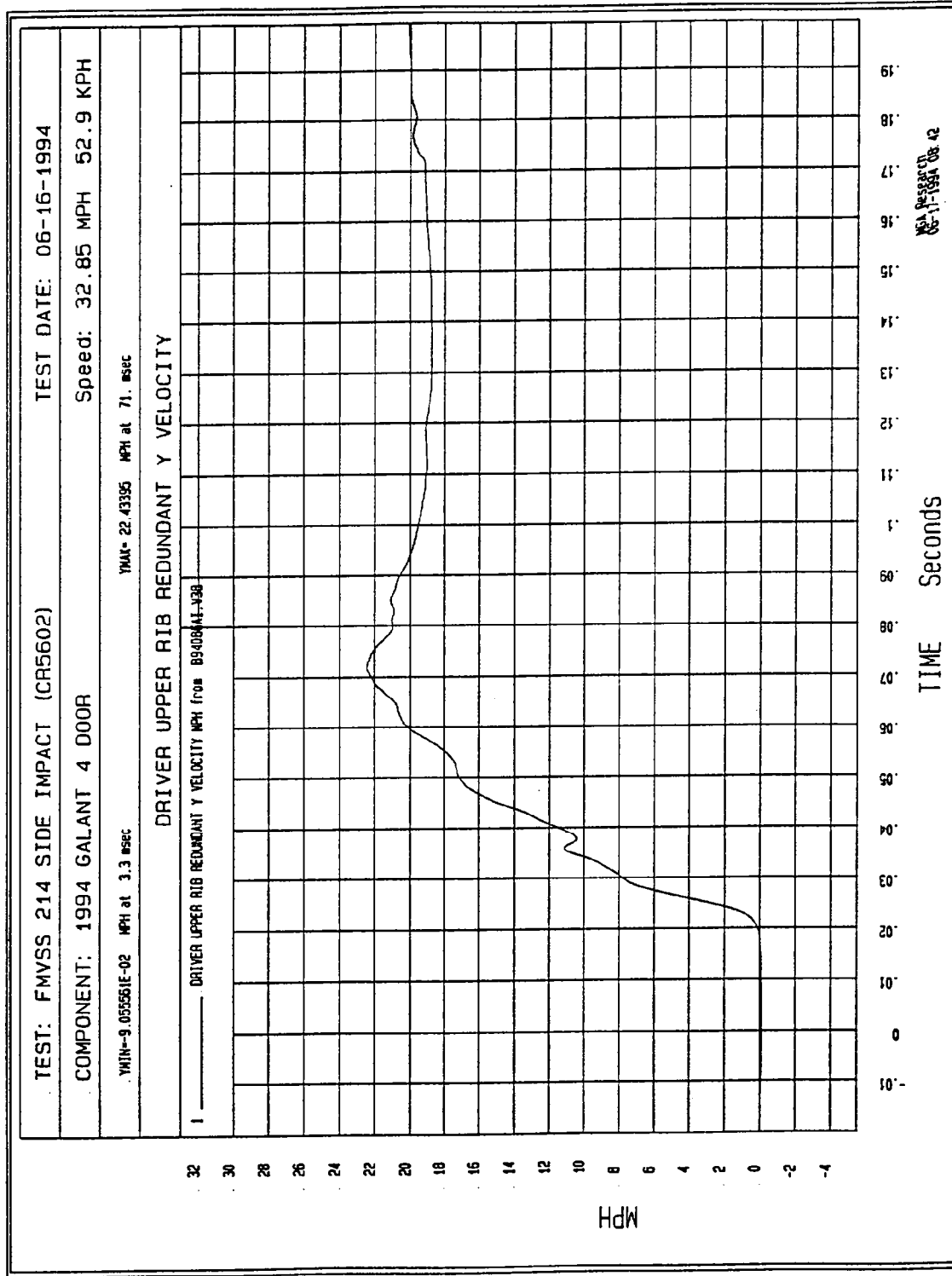


Figure B-65 - Driver Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)



Filter: Class 180 (300 Hz)

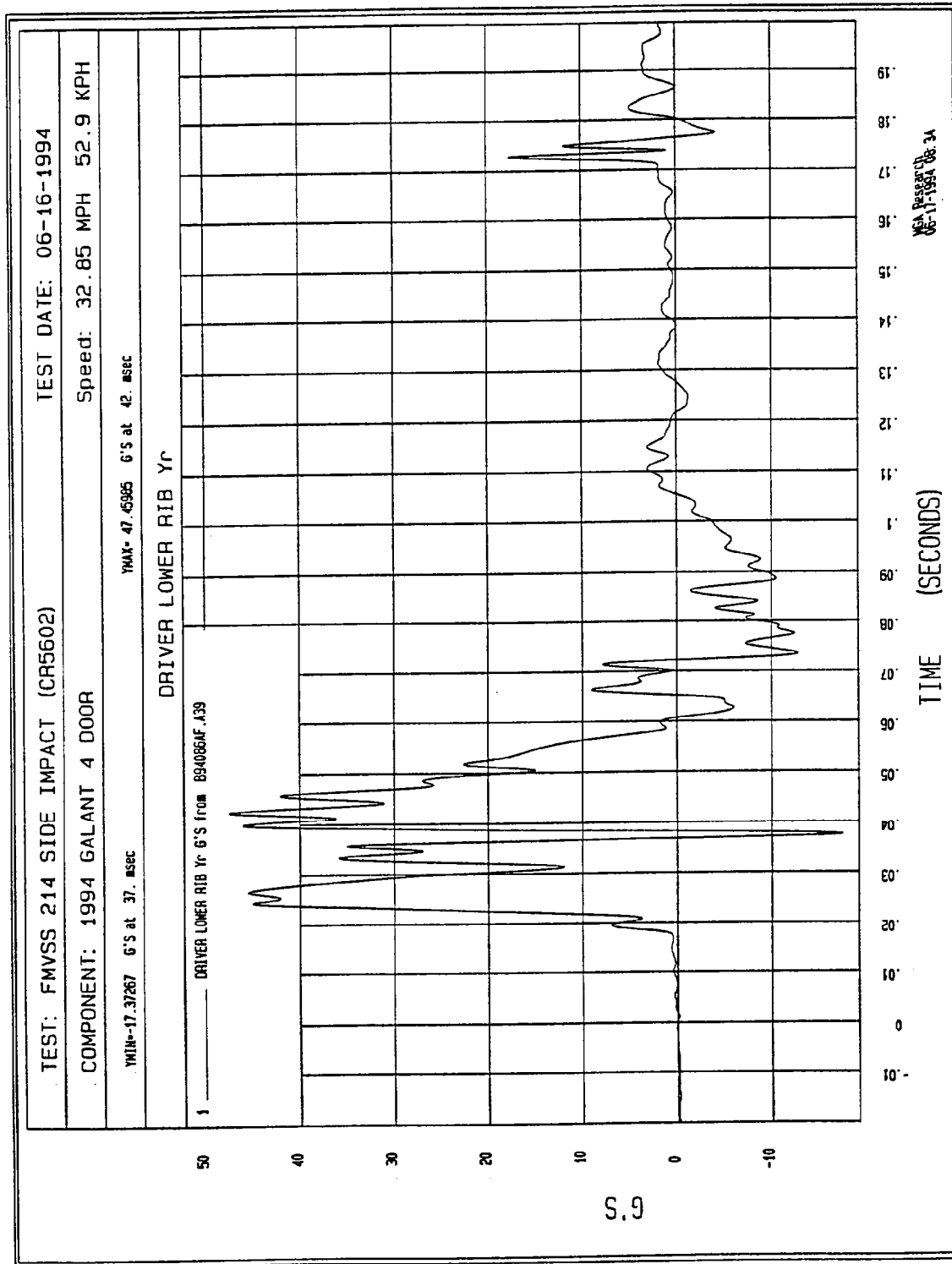
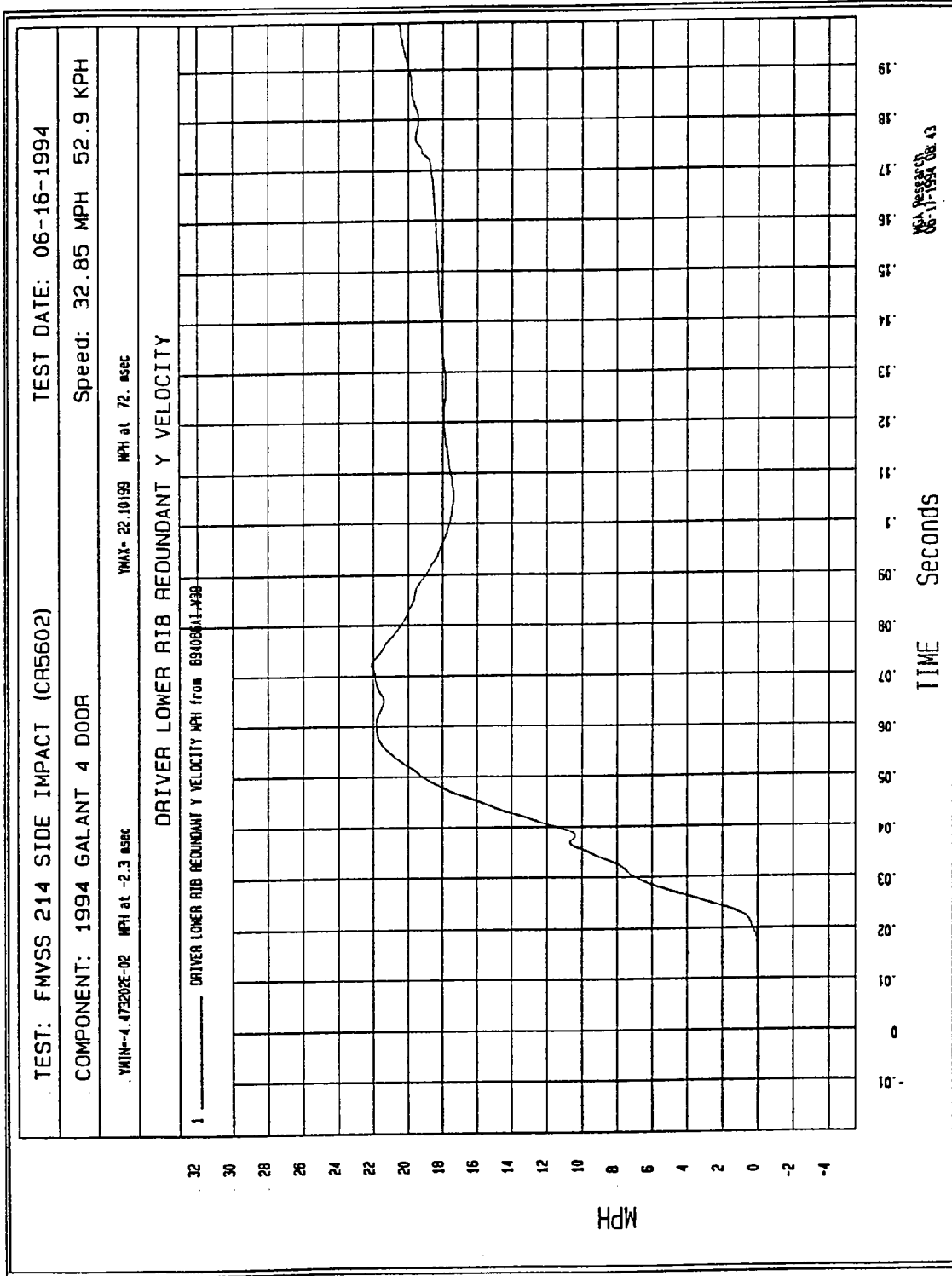


Figure B-67 - Driver Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)



B-68

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

Filter: Class 180 (300 Hz)

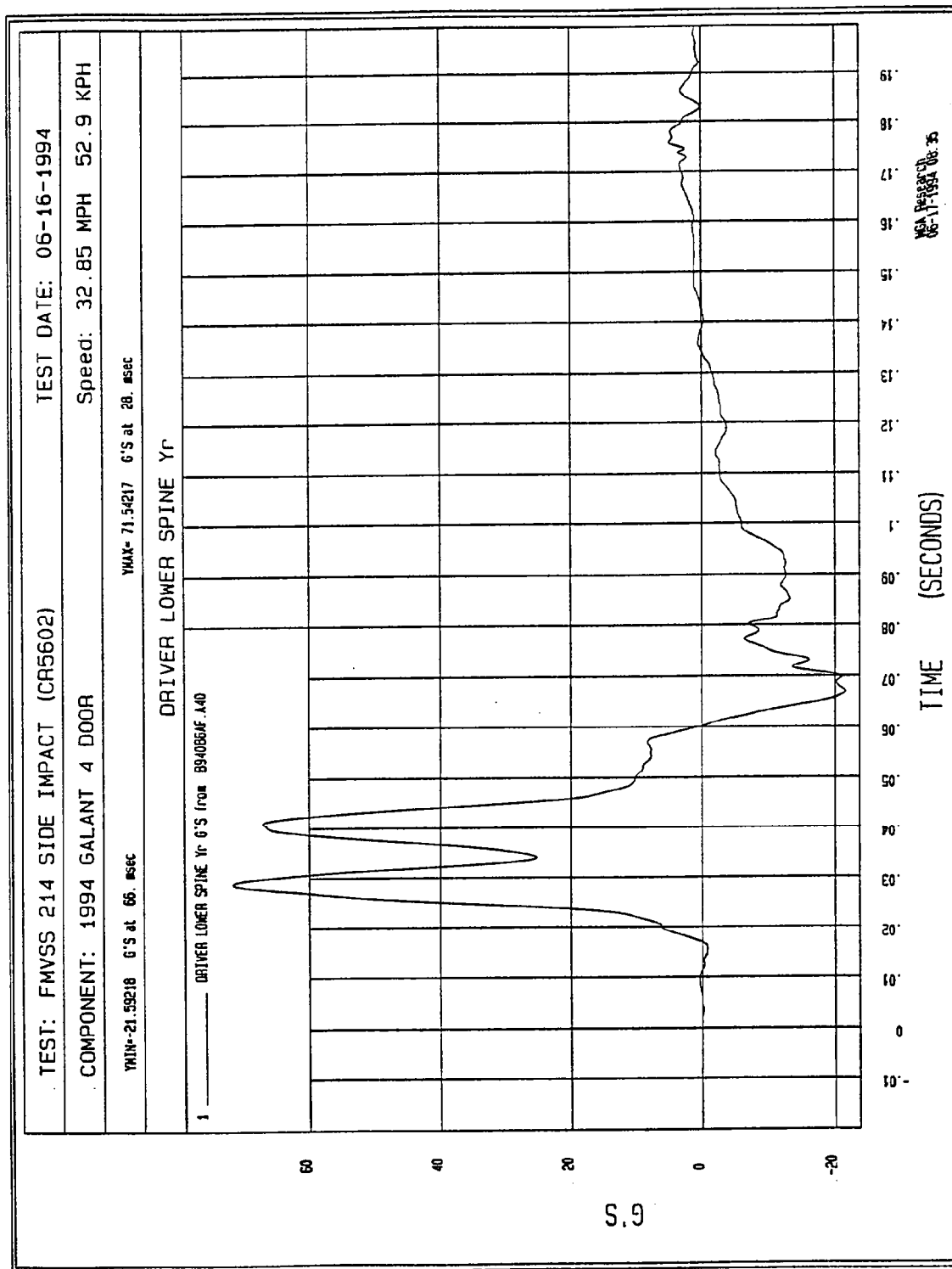


Figure B-69 - Driver Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

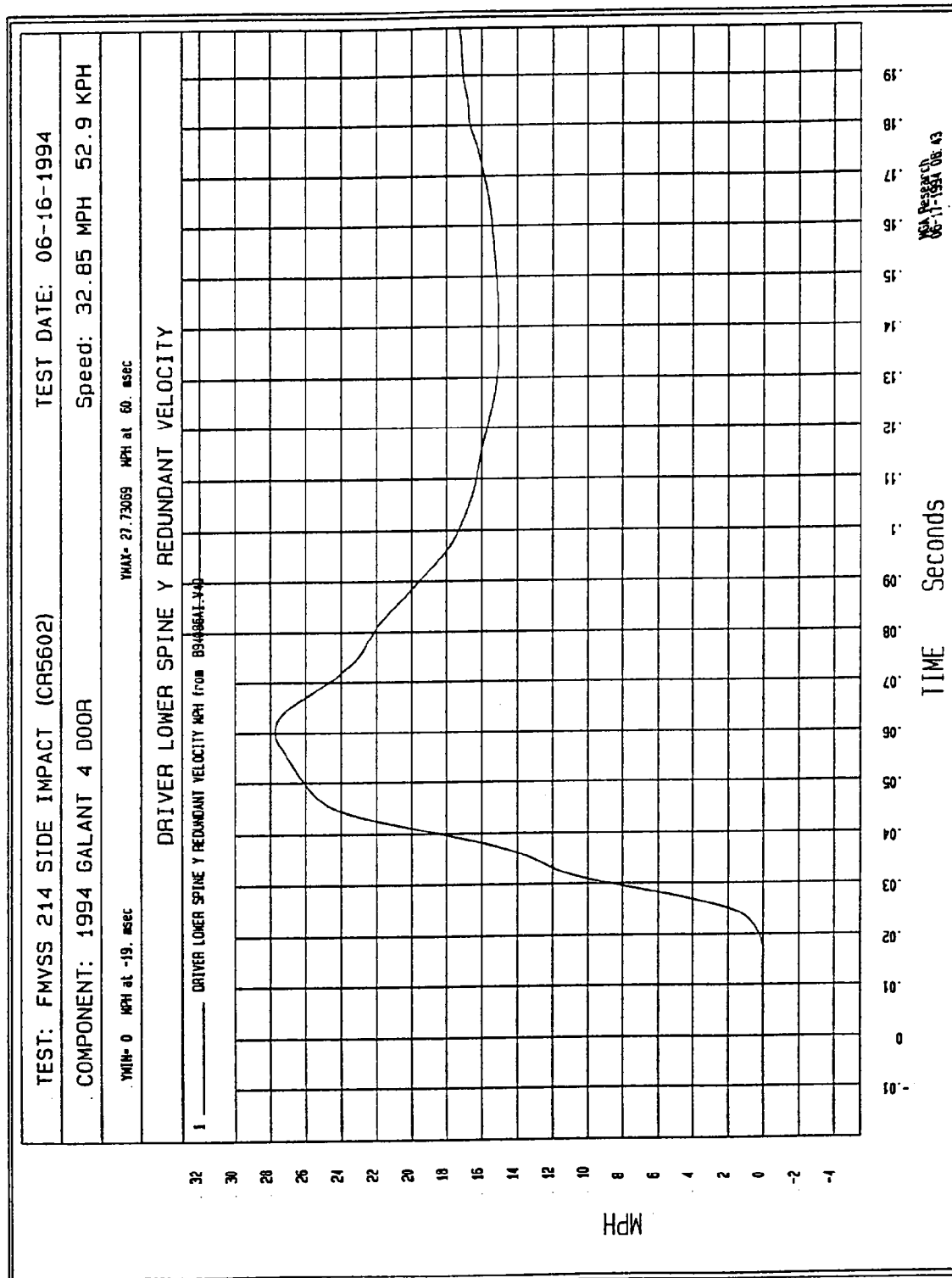


Figure B-70 - Driver Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

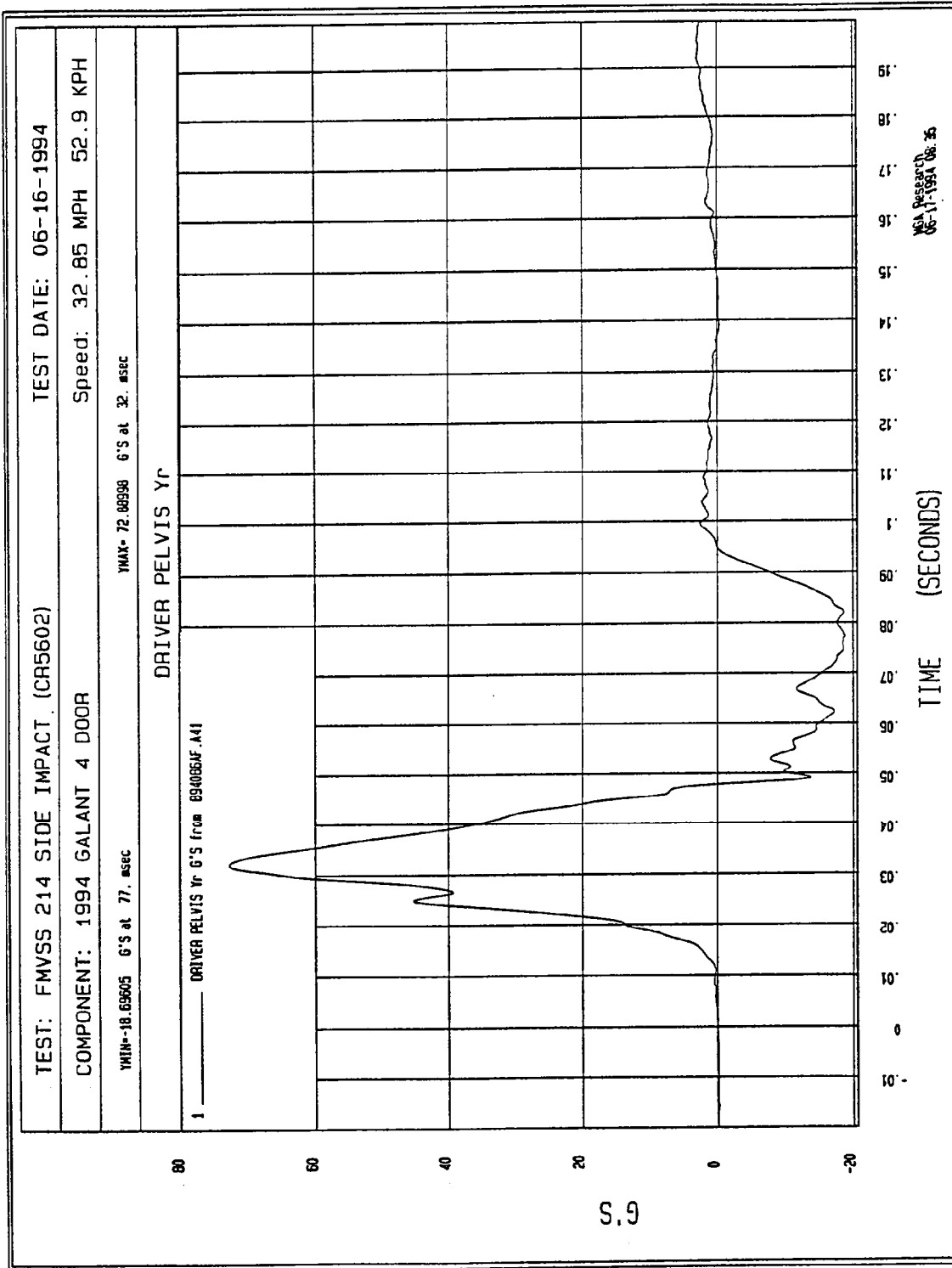


Figure B-71 - Driver Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

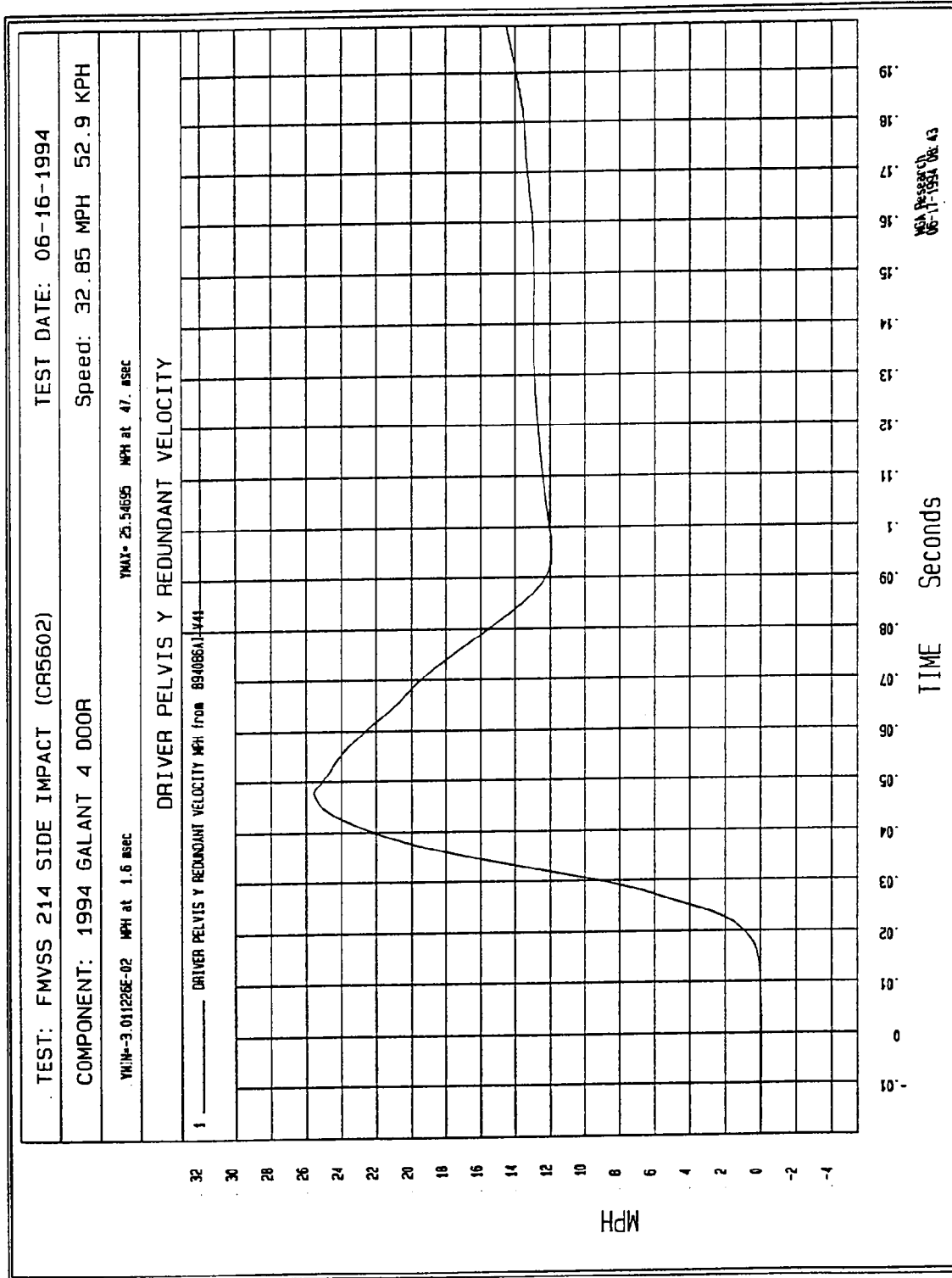


Figure B-72 - Driver Pelvis Y Redundant Velocity vs. Time

TEST: FMVSS 214 SIDE IMPACT (CR5502)	TEST DATE: 06-16-1994
COMPONENT: 1994 GALANT 4 DOOR	Speed: 32.85 MPH 52.9 KPH
YMIN=-15.00343 6'S at 85. msec	YMAX= 113.0702 6'S at 44. msec
PASSENGER UPPER RIB Yr	
1 _____ PASSENGER UPPER RIB Yr 6'S from B94085AF.142	

120
100
80
60
40
20
0

0 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50

G'S

TIME (SECONDS)

MsA Research
06-17-1994 08:36

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

Filter: Class 180 (300 Hz)

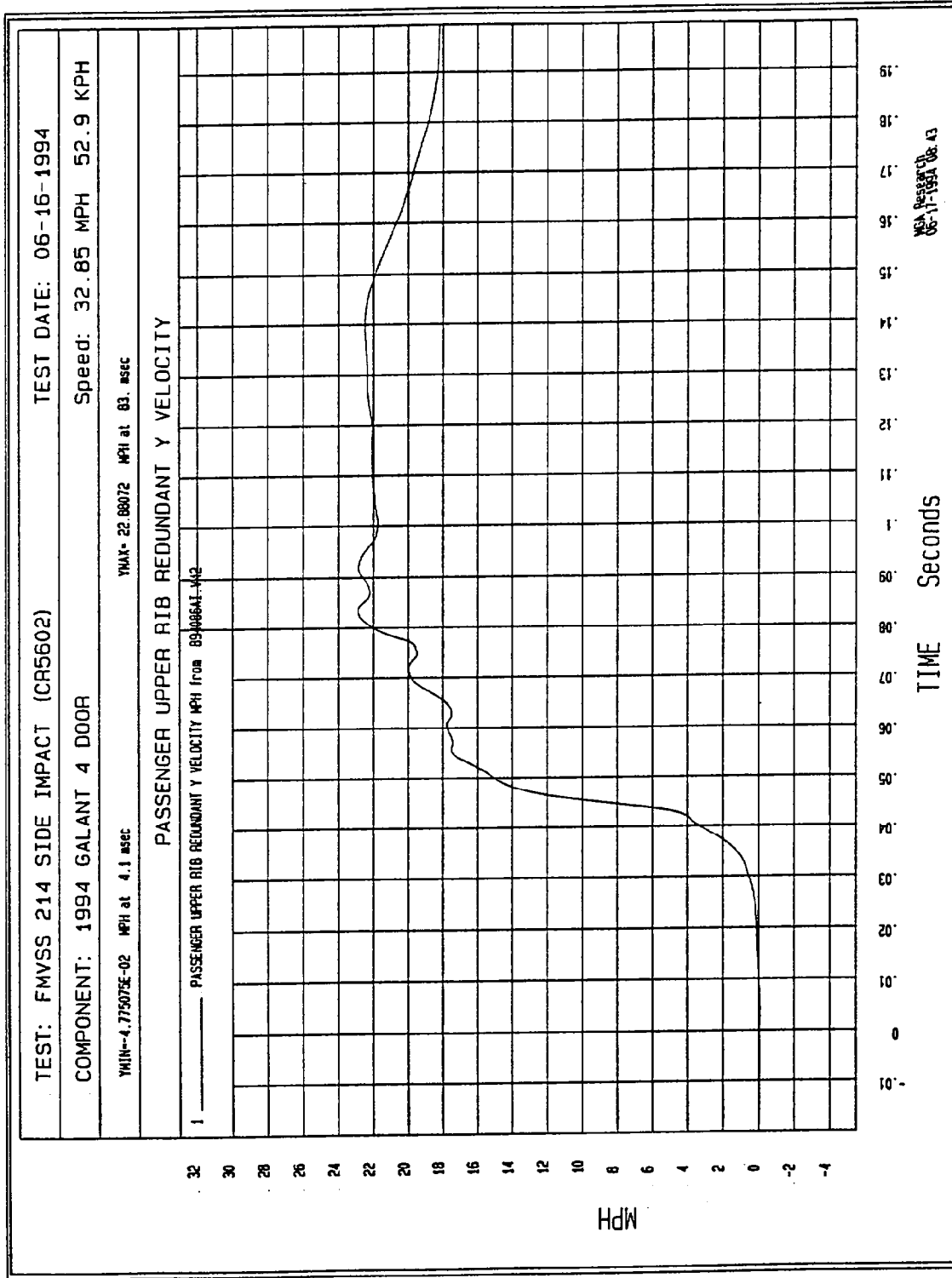


Figure B-74 - Passenger Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

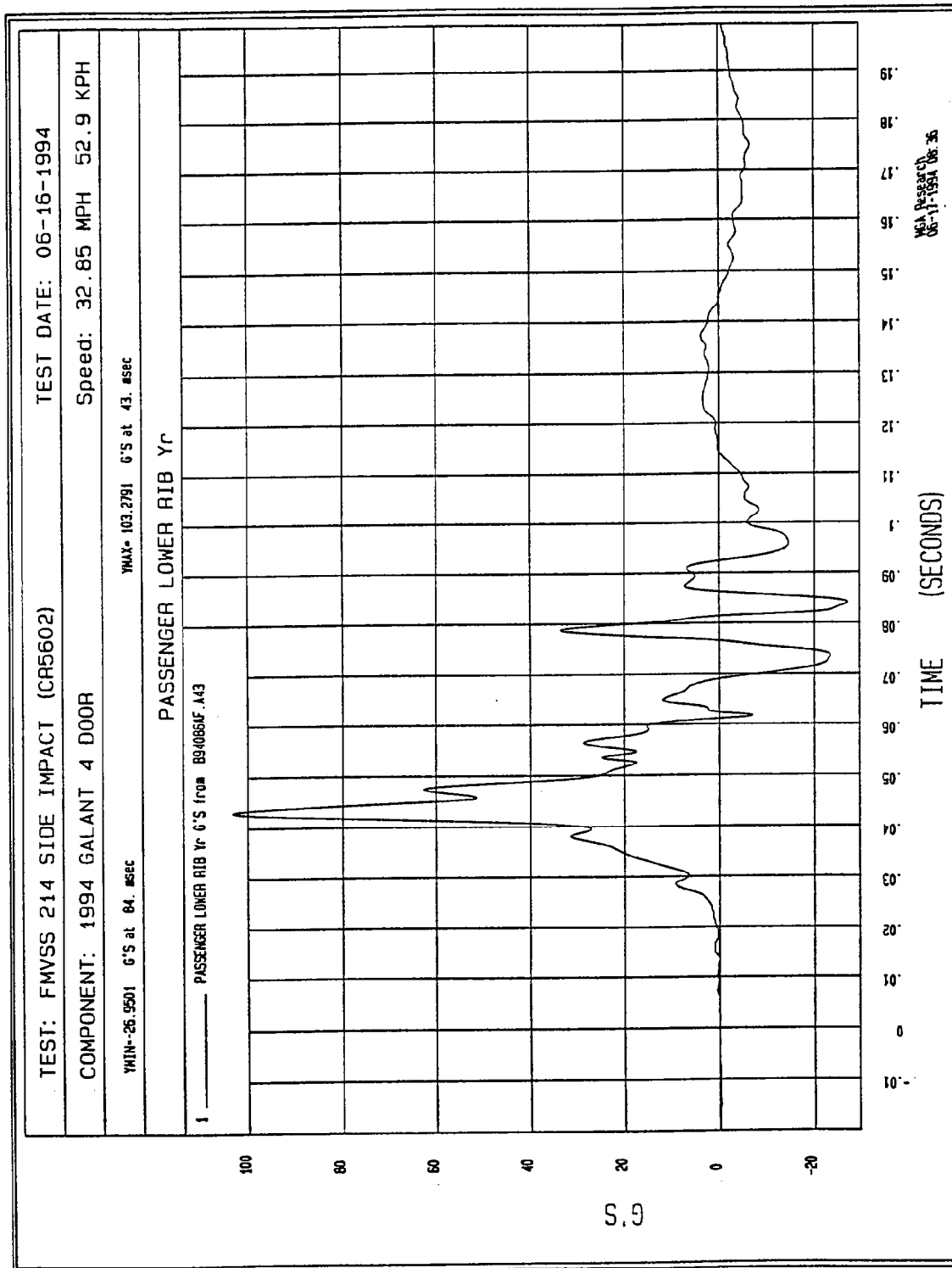


Figure B-75 - Passenger Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

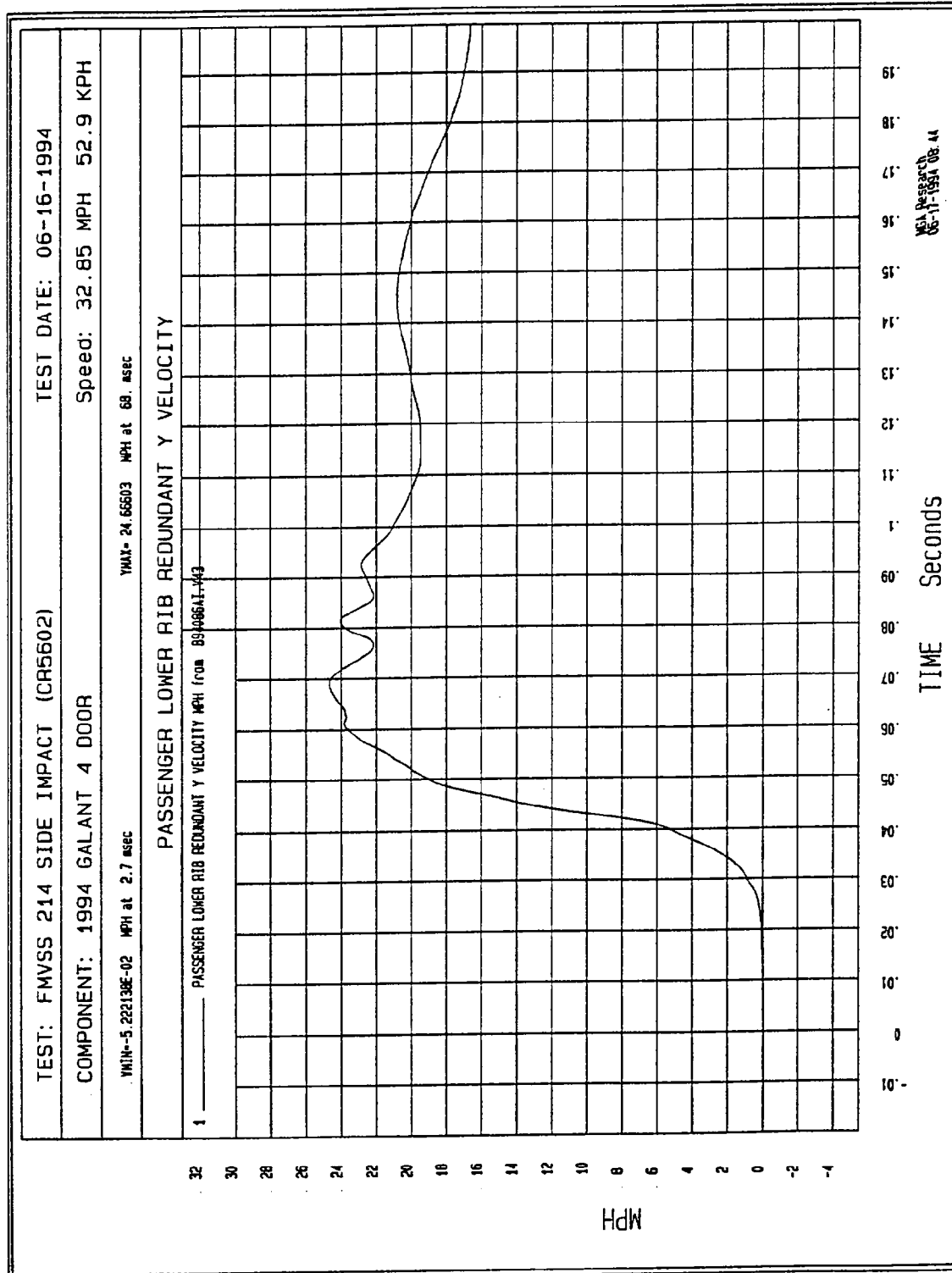


Figure B-76 - Passenger Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

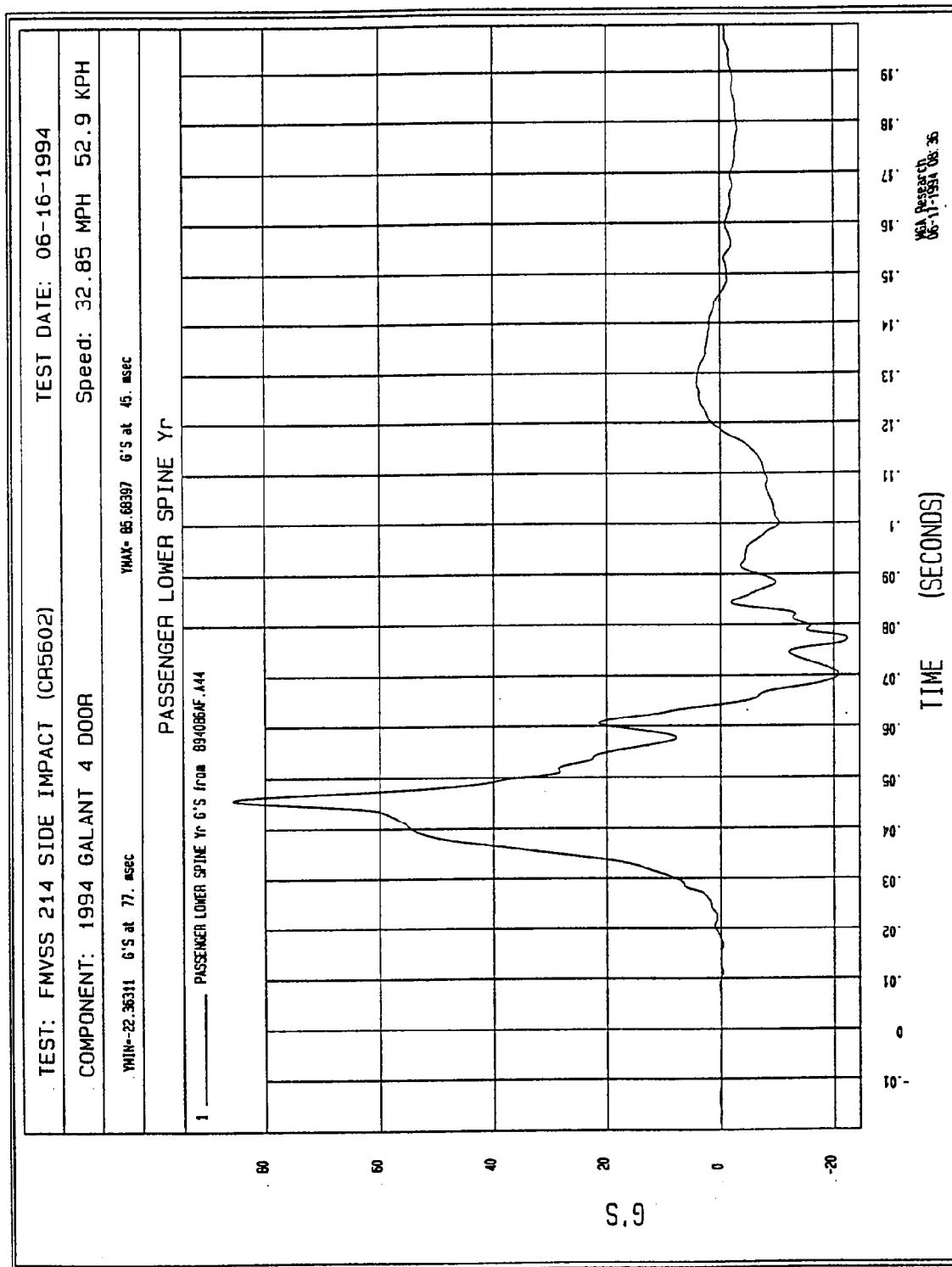


Figure B-77 - Passenger Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

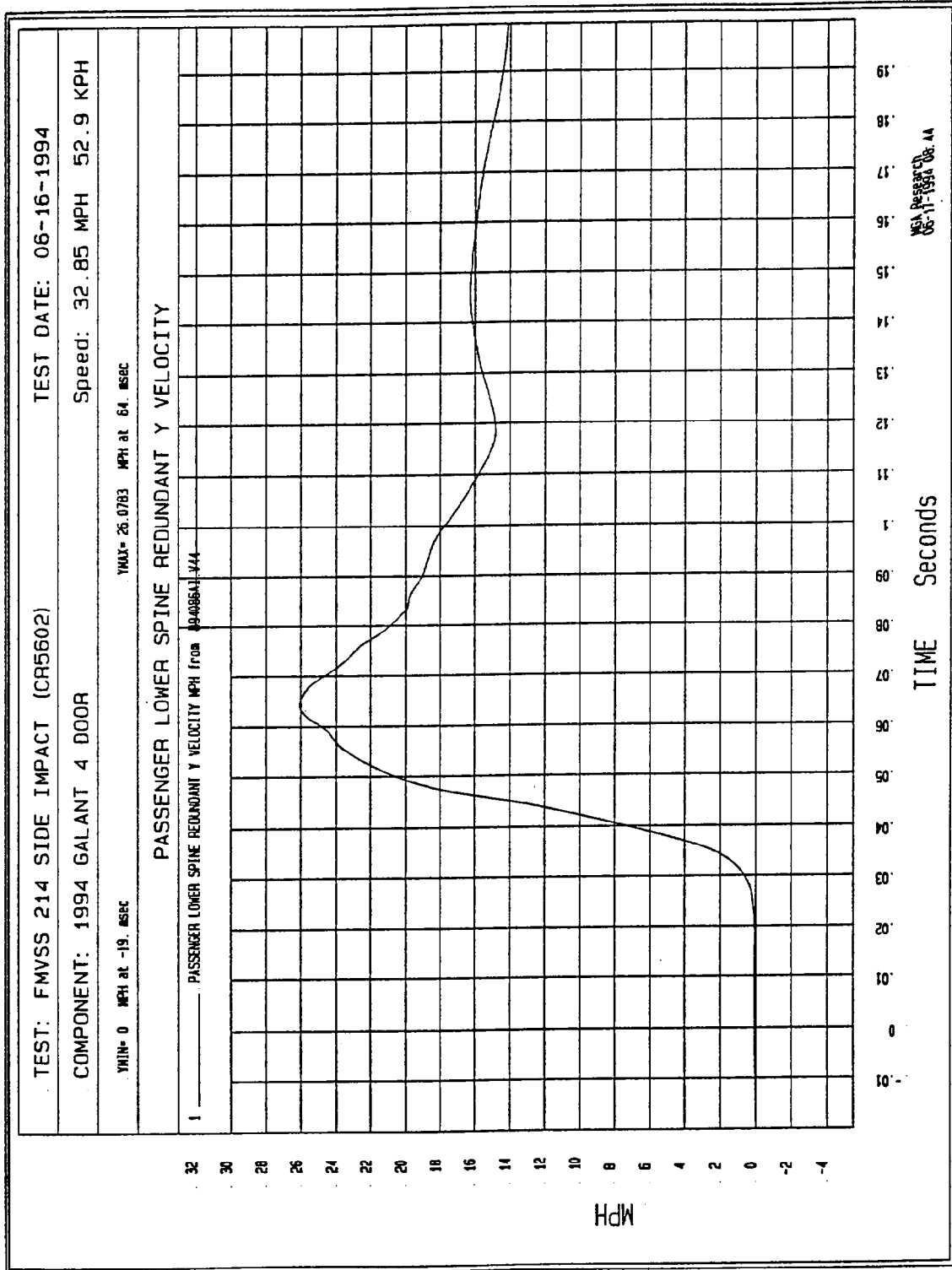


Figure B-78 - Passenger Lower Spine Y Redundant Velocity vs. Time

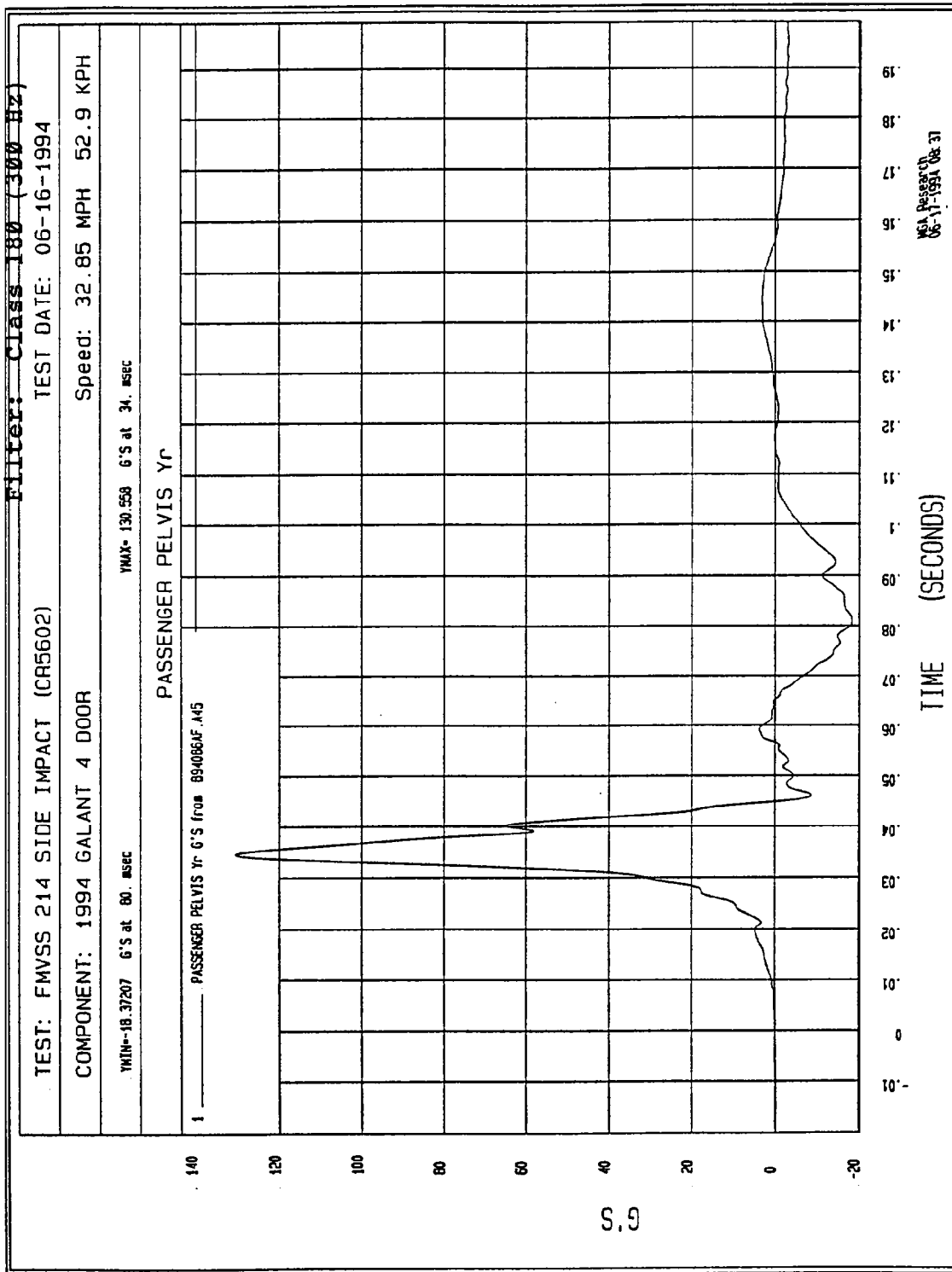
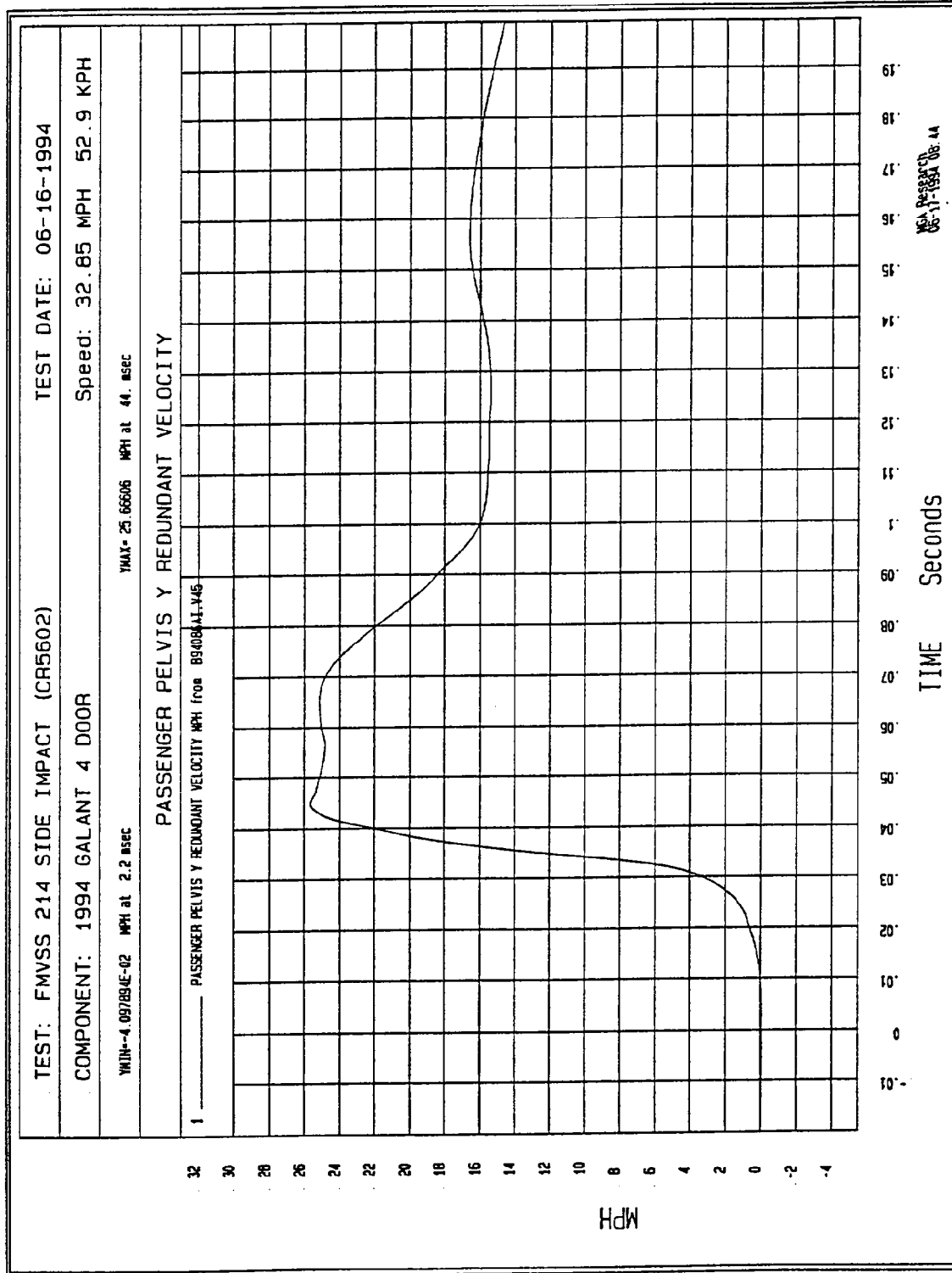


Figure B-79 - Passenger Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)



B-80

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

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

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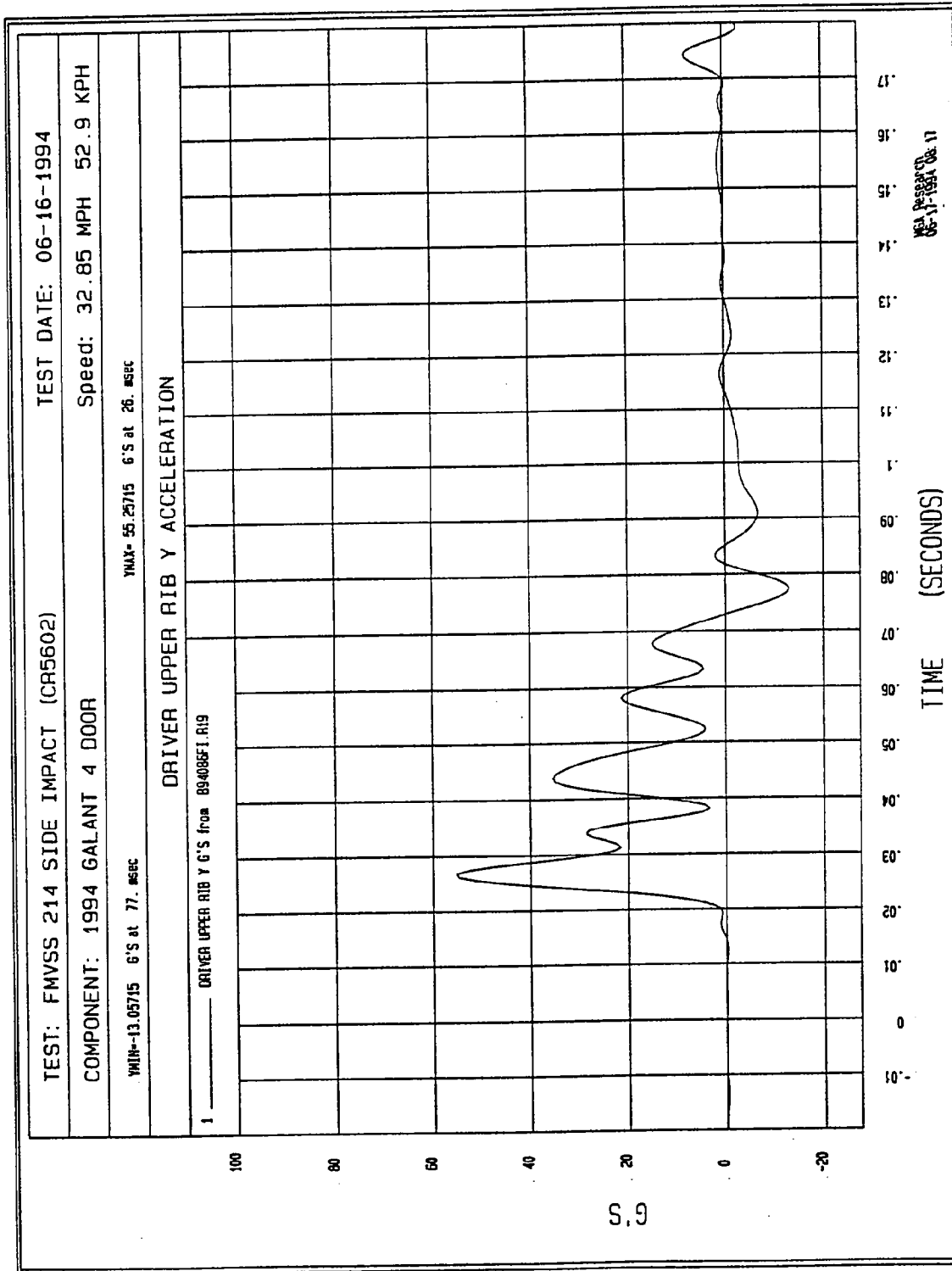


Figure B-81 - Driver Upper Rib Y Acceleration vs. T.me

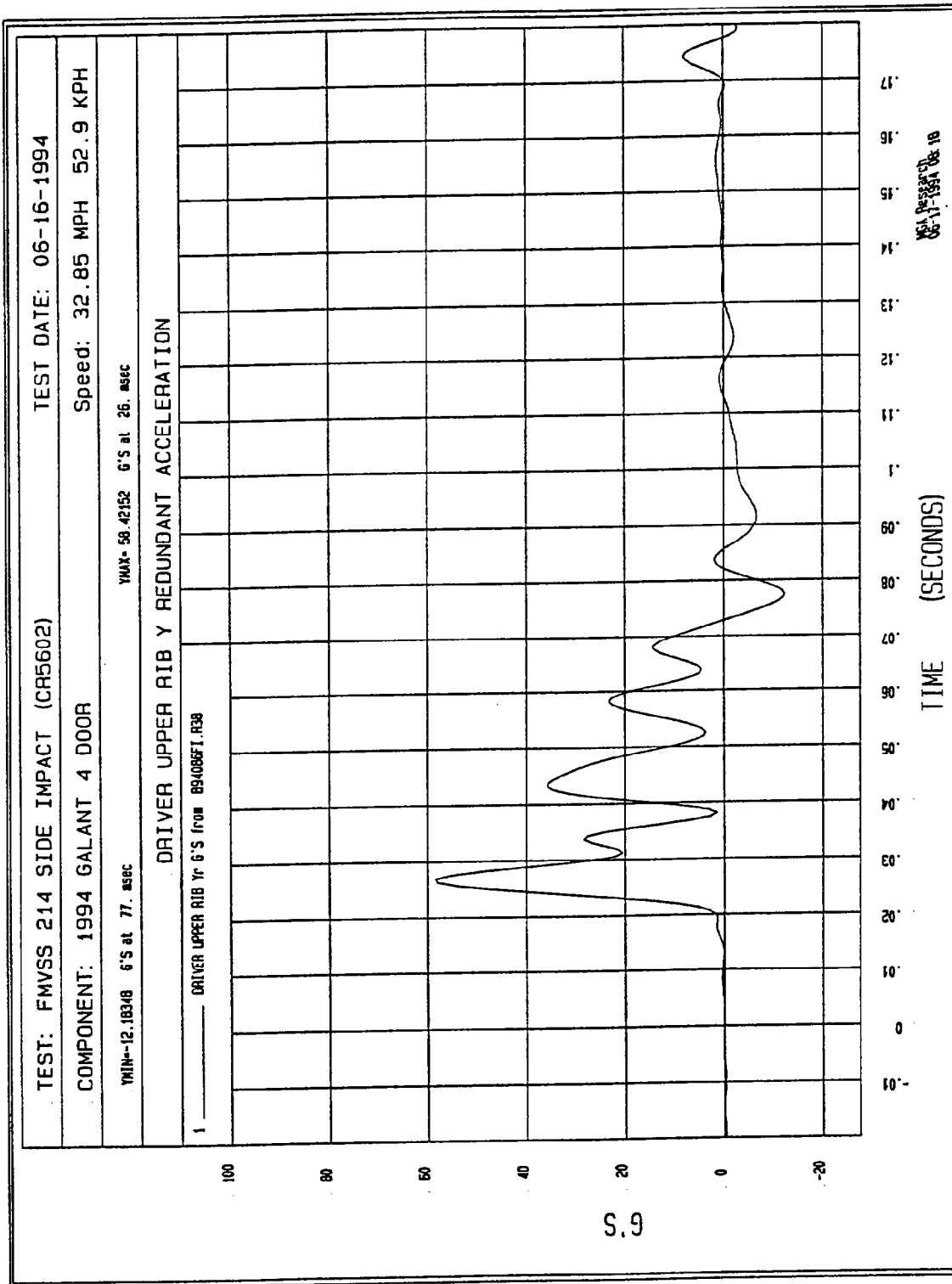


Figure B-82 - Driver Upper Rib Y Redundant Acceleration vs. Time

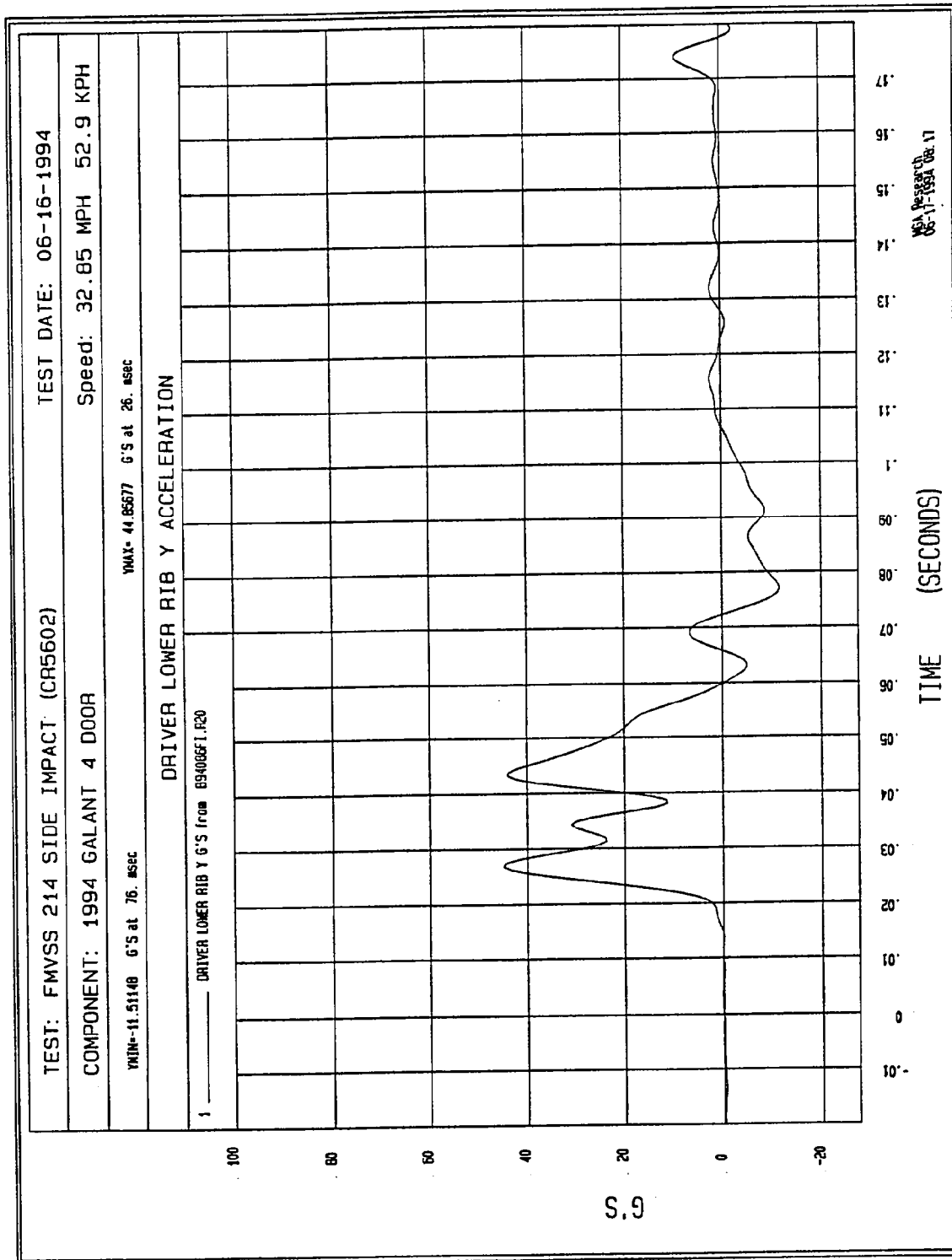


Figure B-83 - Driver Lower Rib Y Acceleration vs. Time

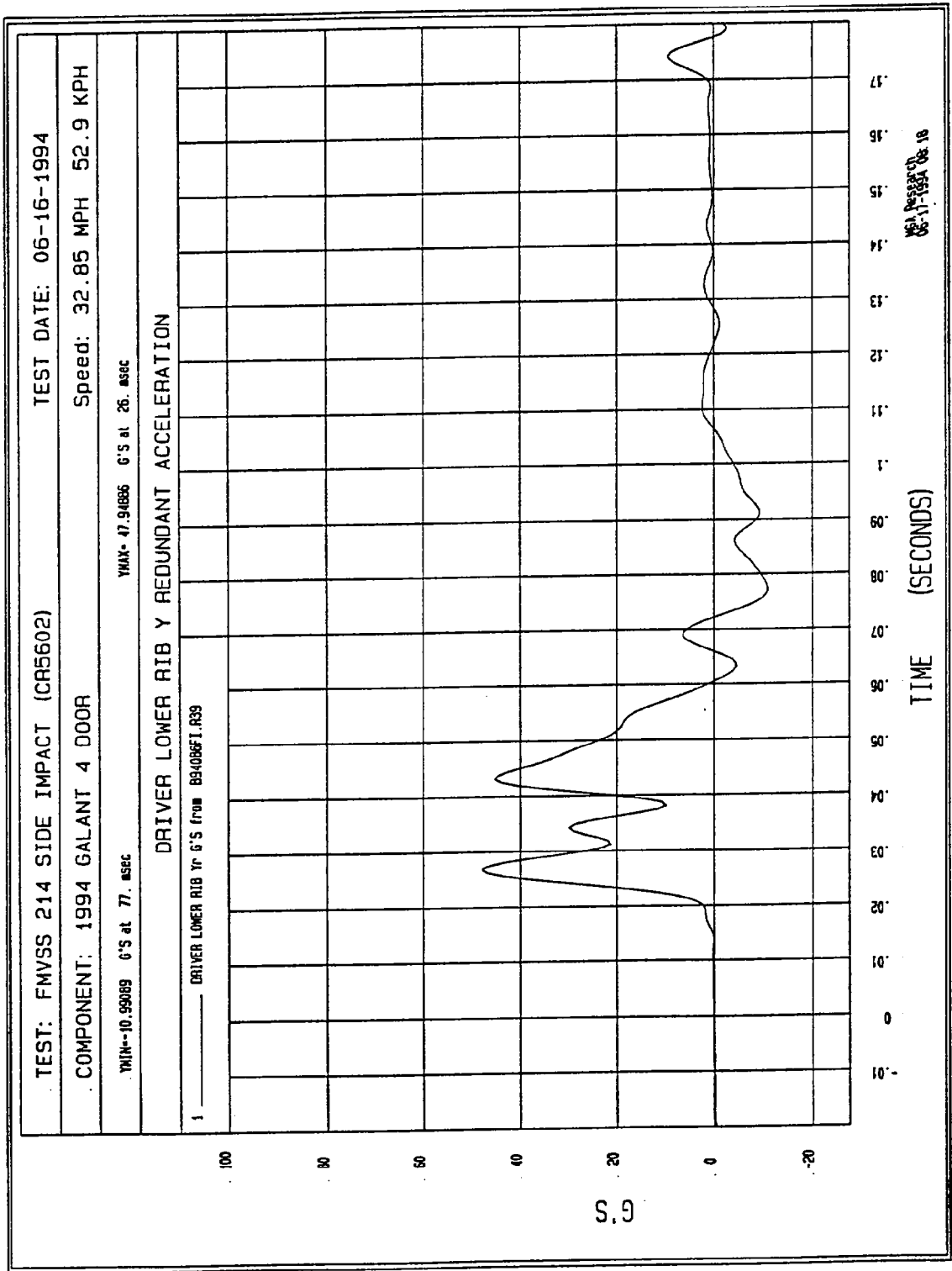


Figure B-84 - Driver Lower Rib Y Redundant Acceleration vs. Time

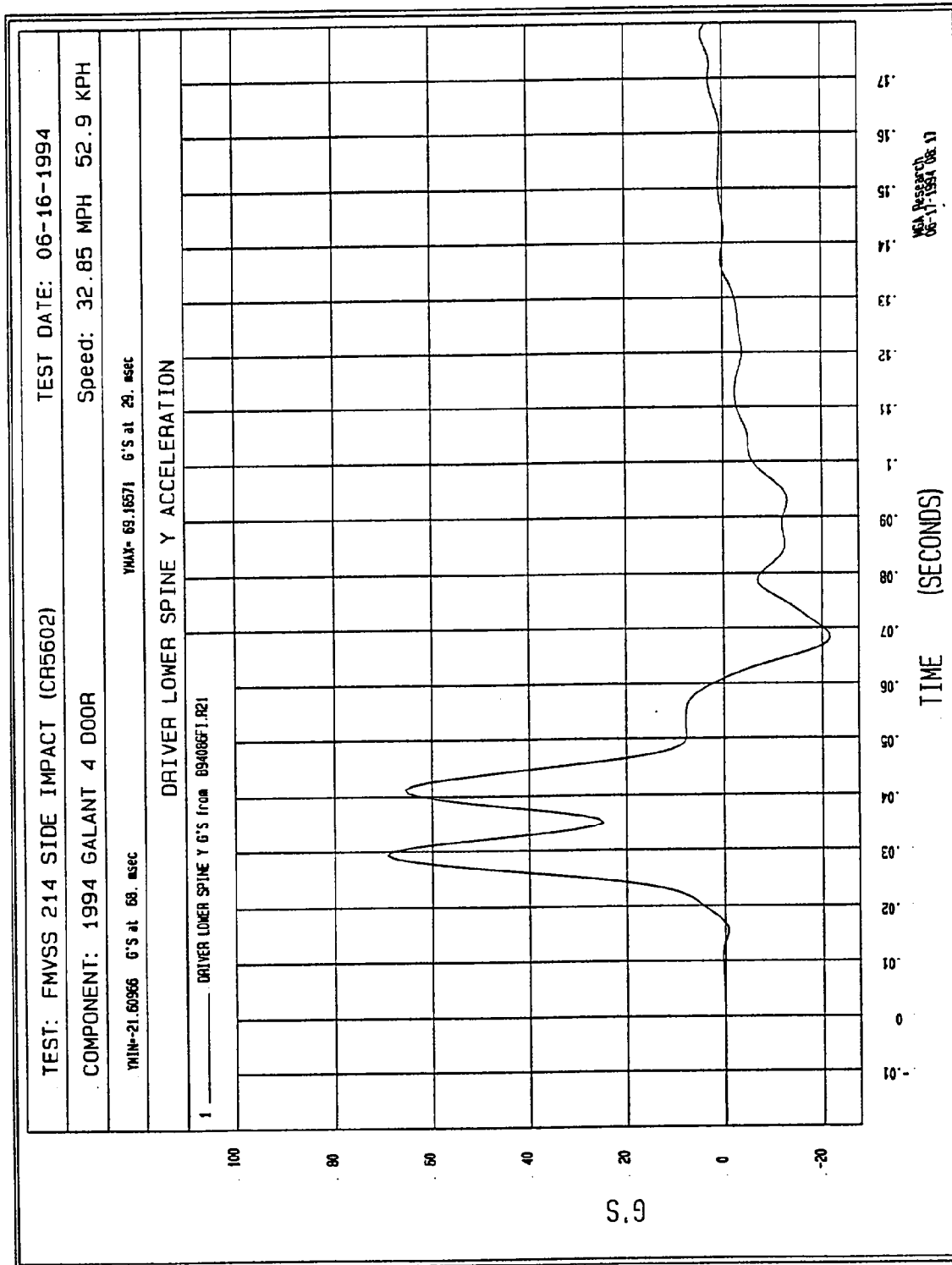


Figure B-85 - Driver Lower Spine Y Acceleration vs. TimeB-85

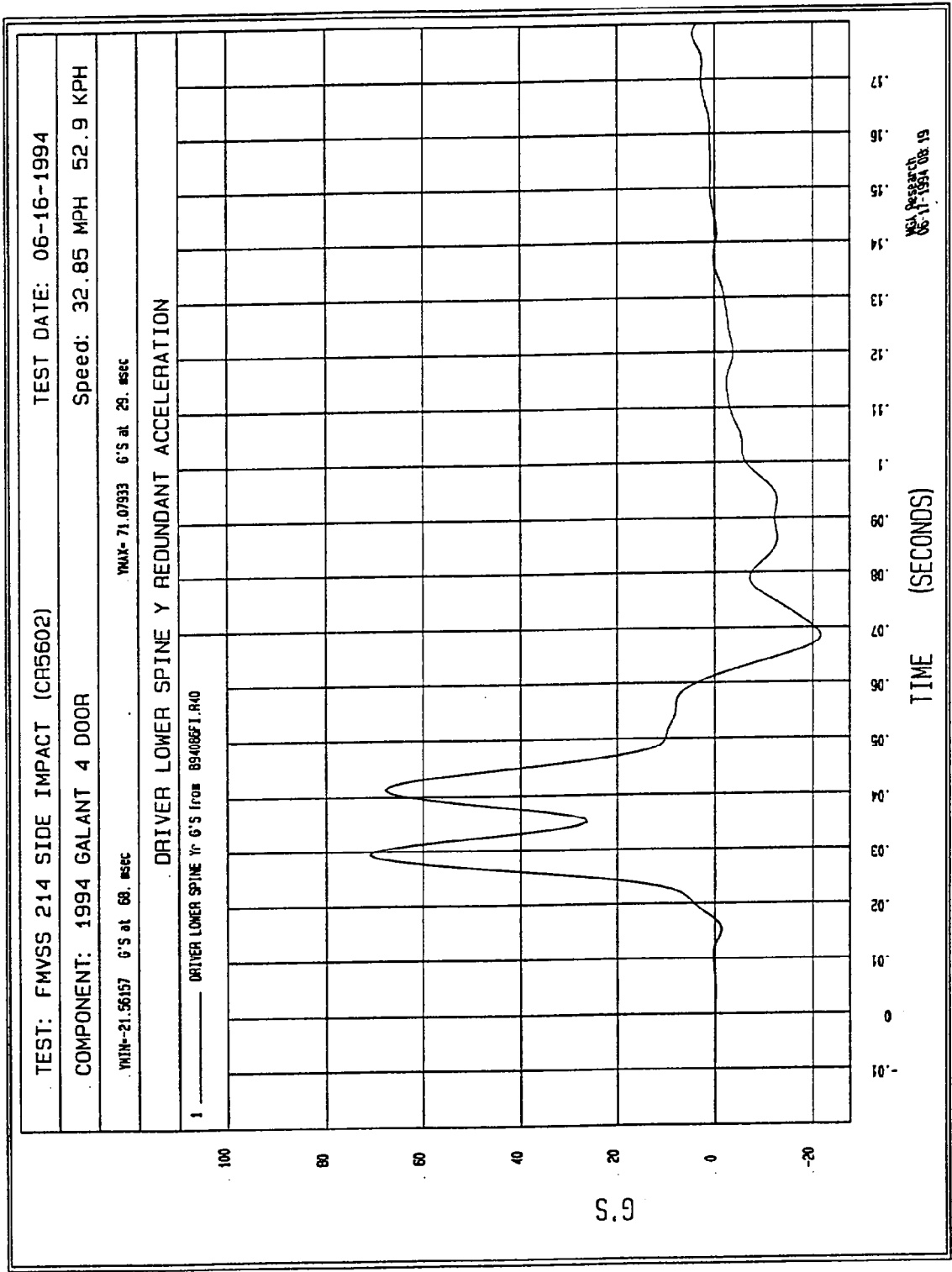


Figure B-86 - Driver Lower Spine Y Redundant Acceleration vs. Time

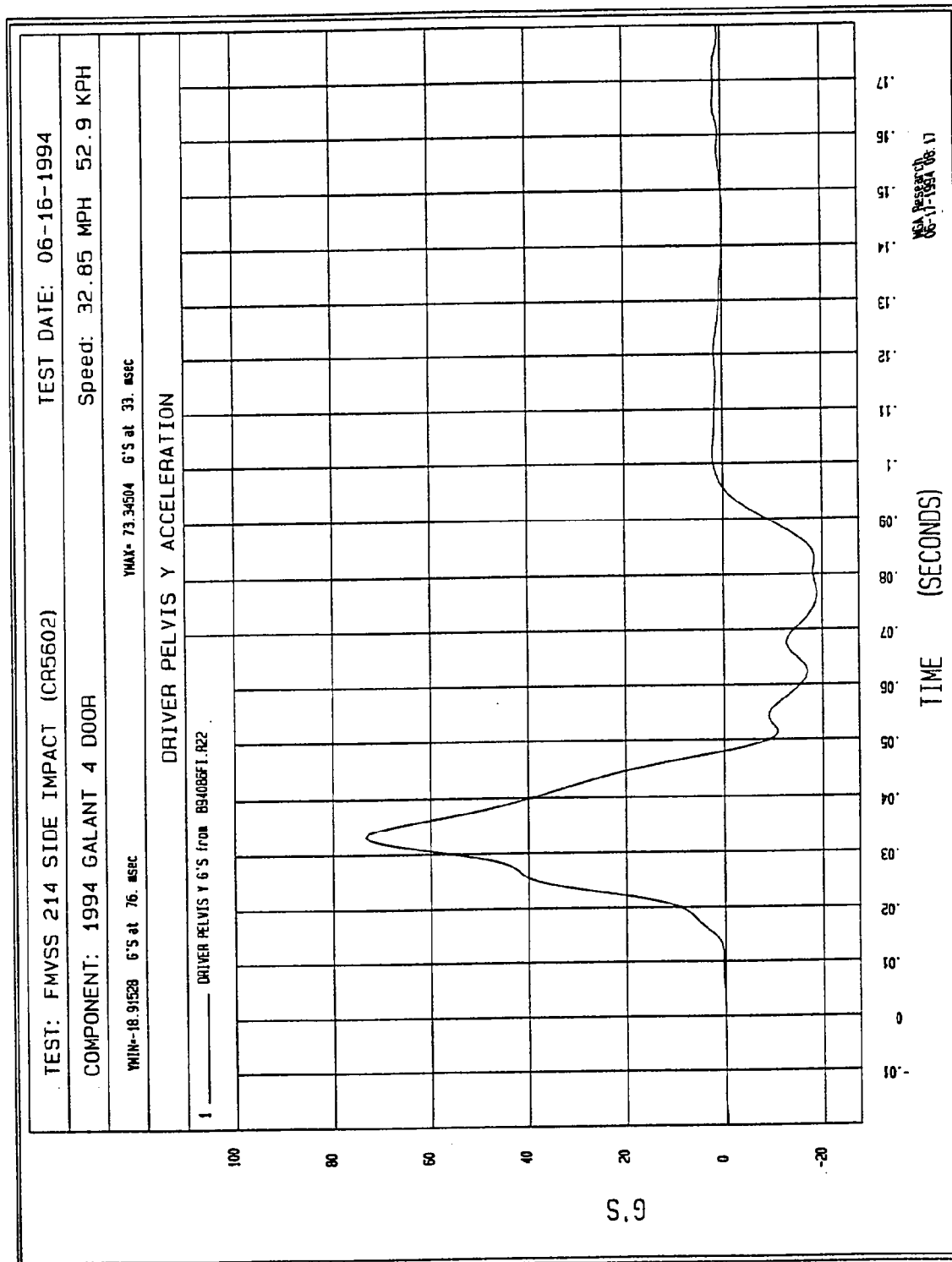


Figure B-87 - Driver Pelvis Y Acceleration vs. Time

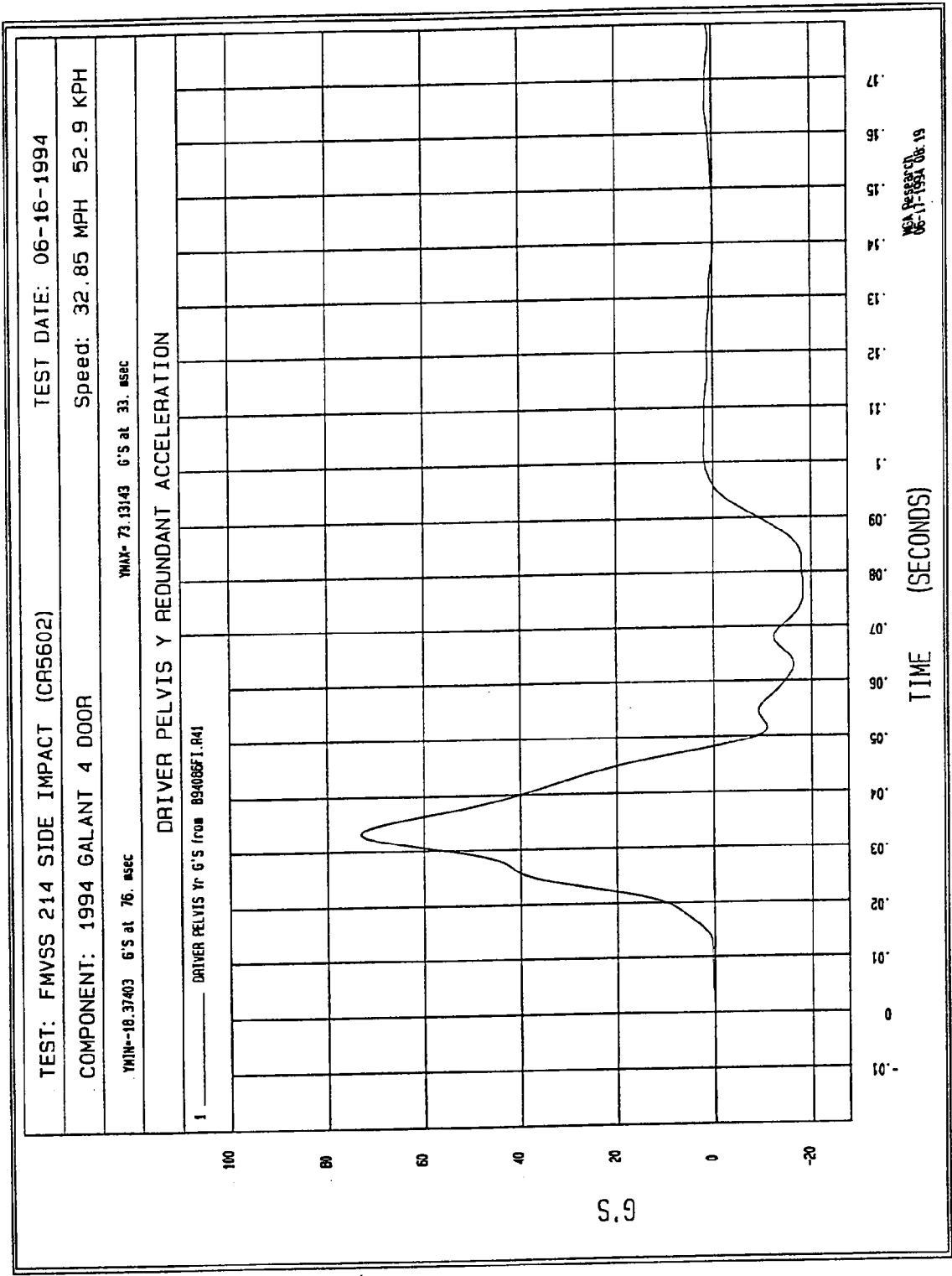


Figure B-88 - Driver Pelvis Y Redundant Acceleration vs. Time

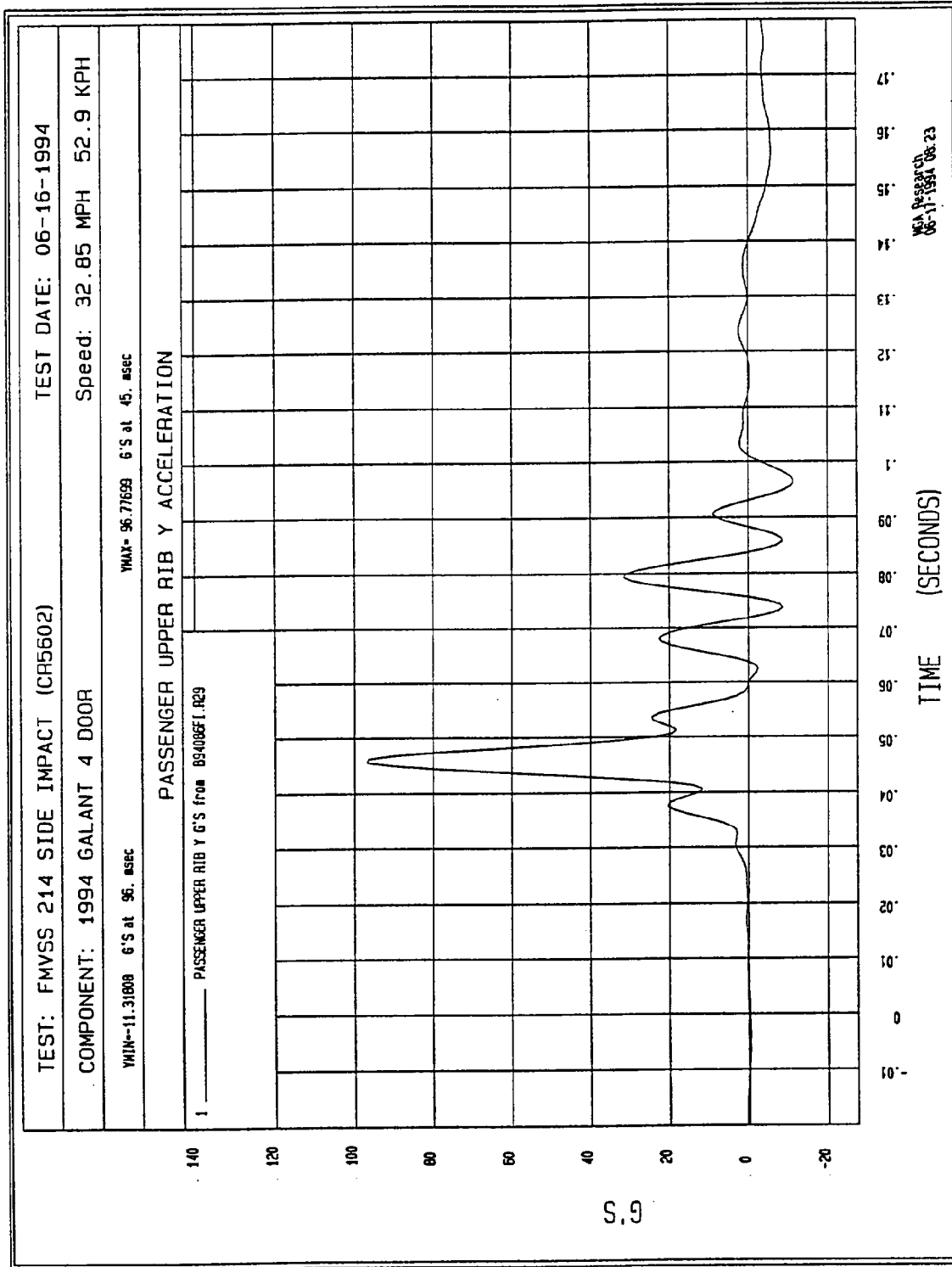


Figure B-89 - Passenger Upper Rib Y Acceleration vs. Time

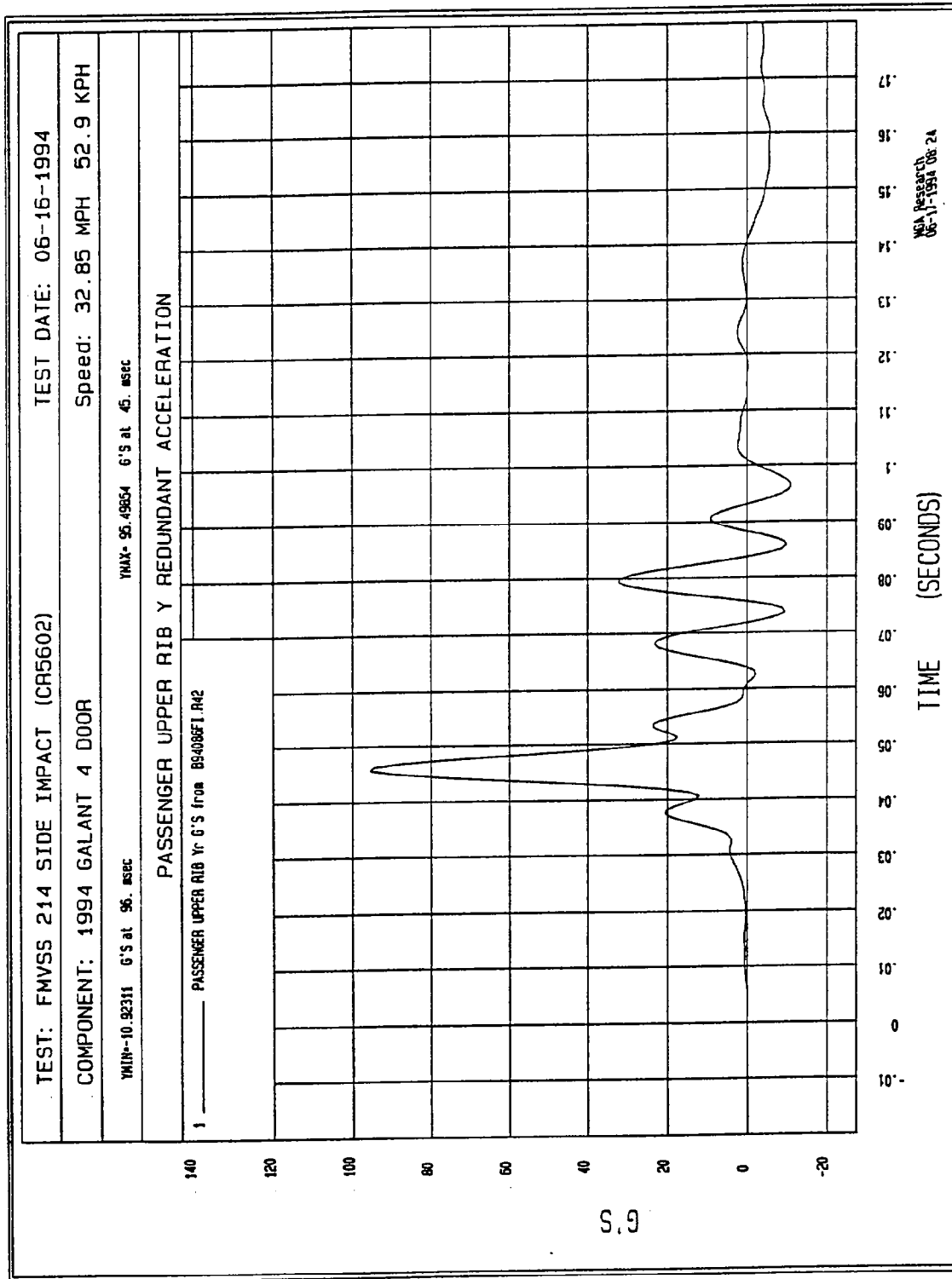


Figure B-90 - Passenger Upper Rib Y Redundant Acceleration vs. Time

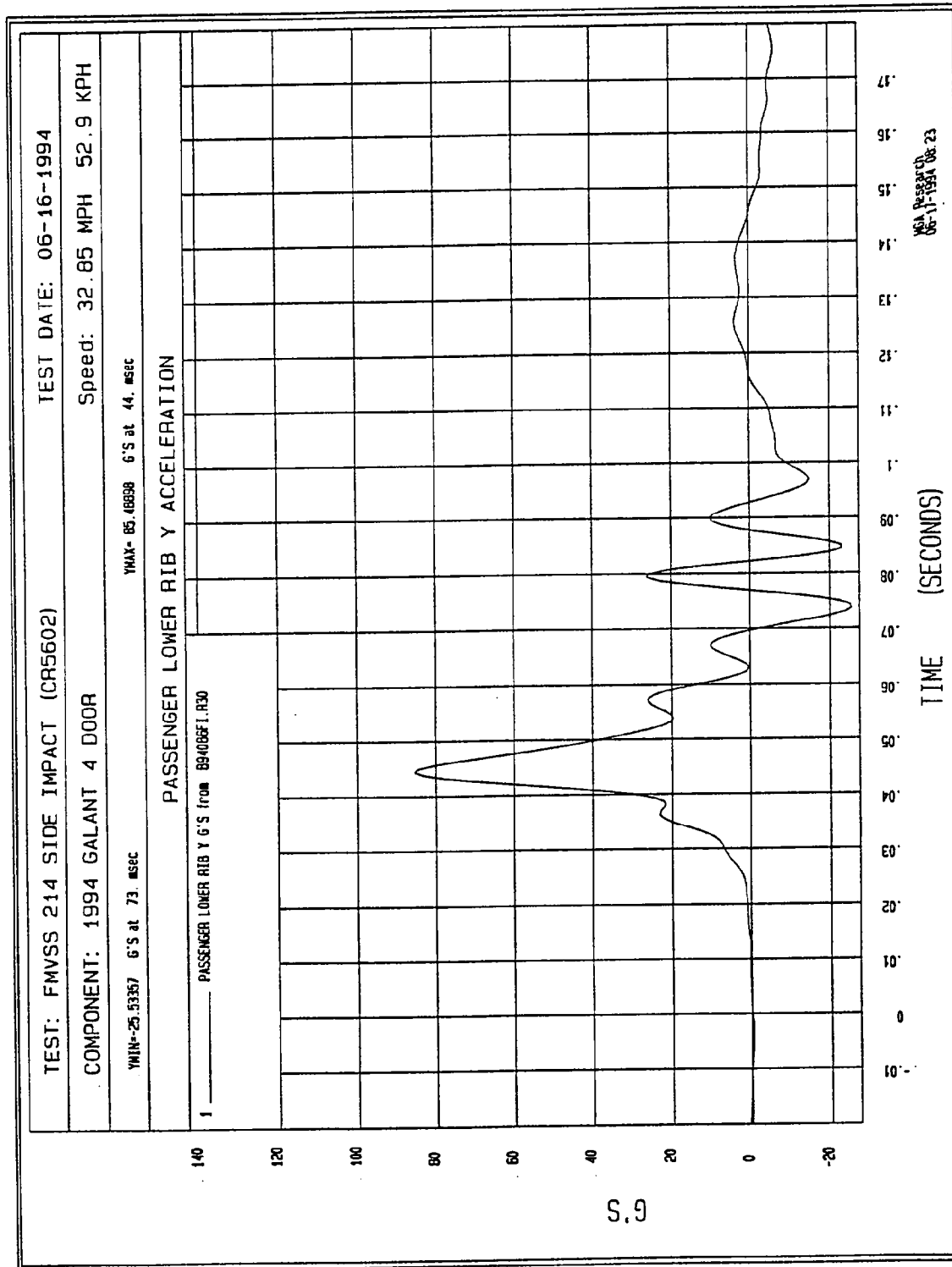


Figure B-91 - Passenger Lower Rib Y Acceleration vs. Time

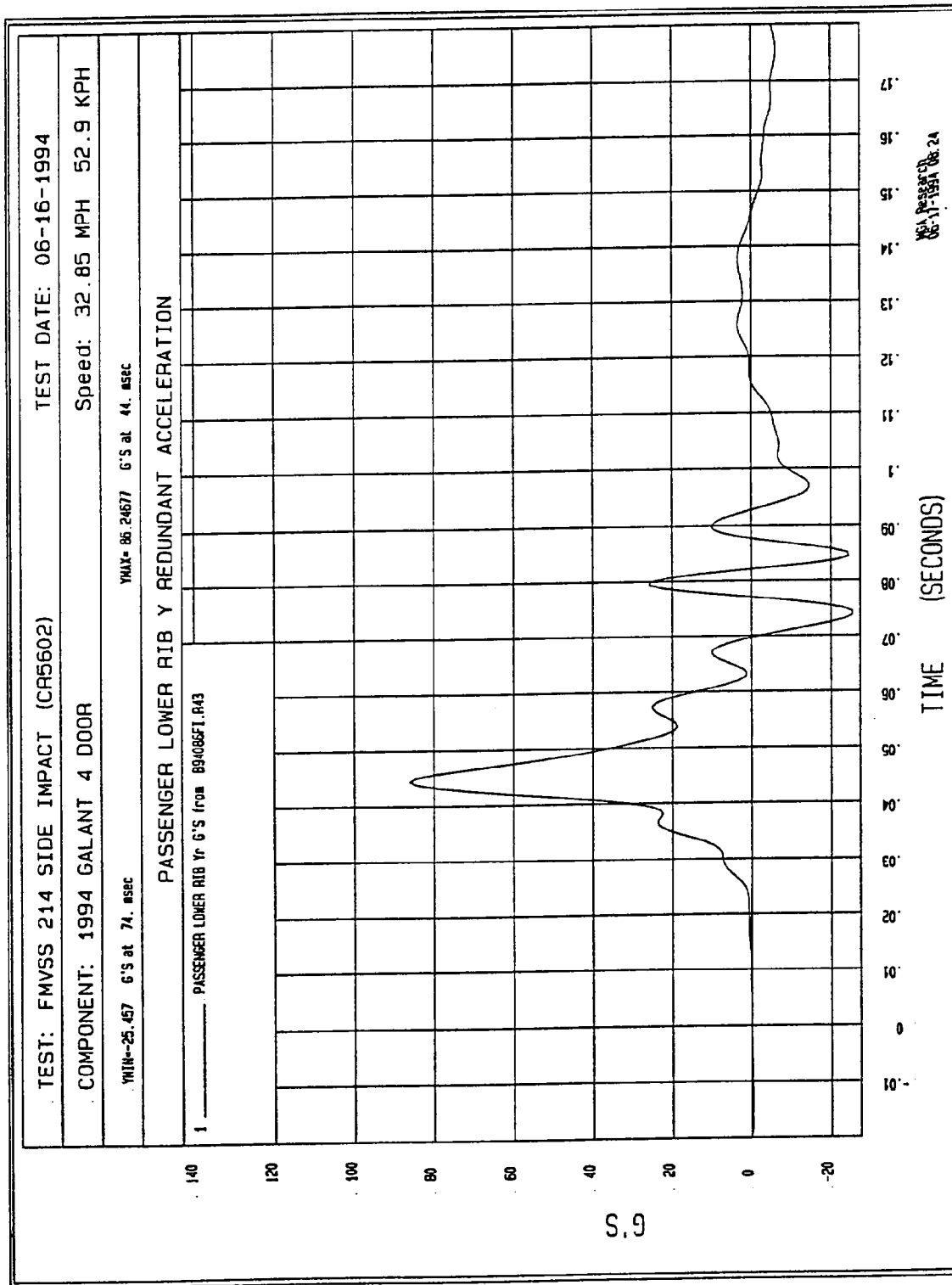


Figure B-92 - Passenger Lower Rib Y Redundant Acceleration vs. Time

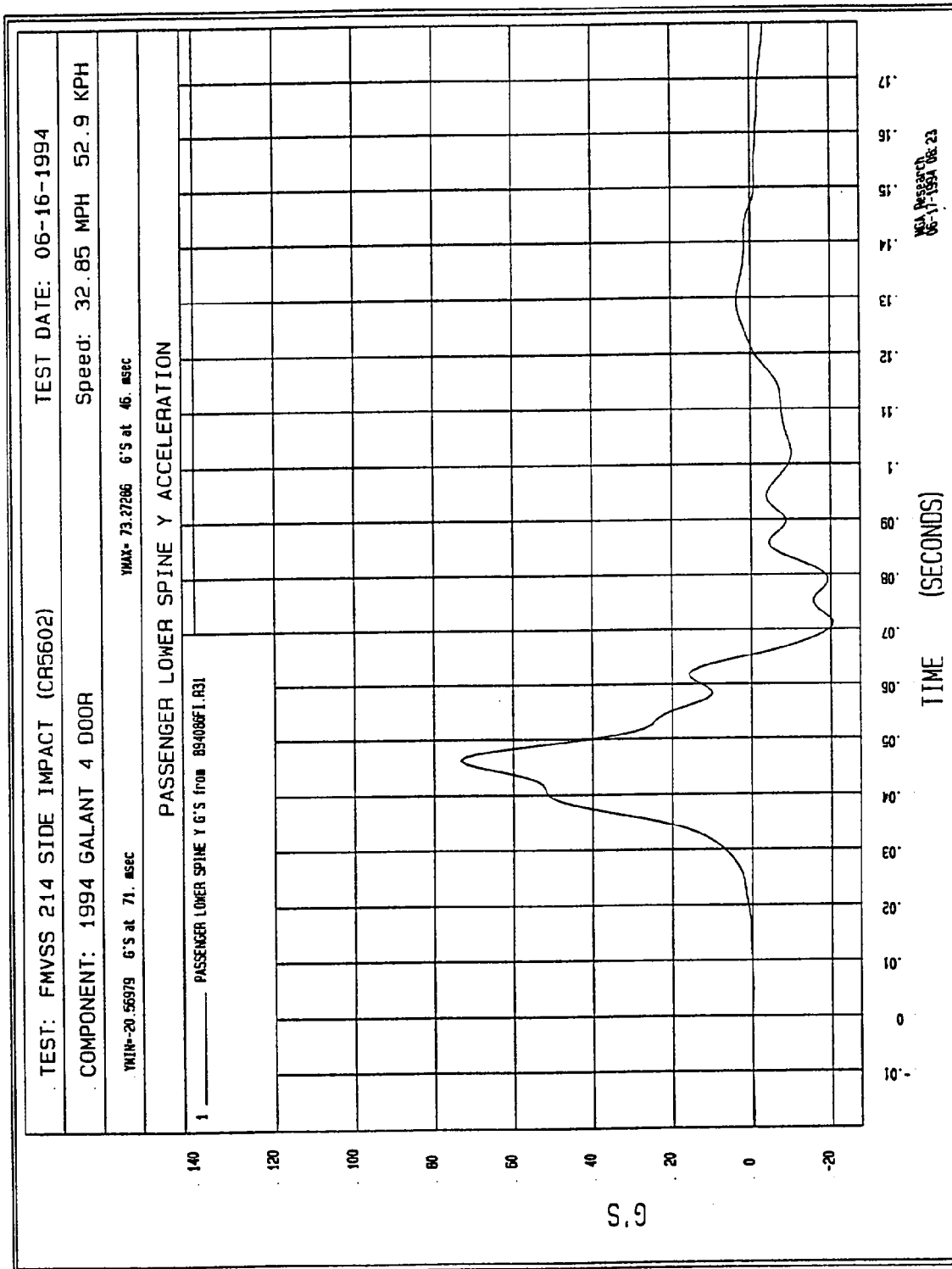


Figure B-93 - Passenger Lower Spine Y Acceleration vs. Time

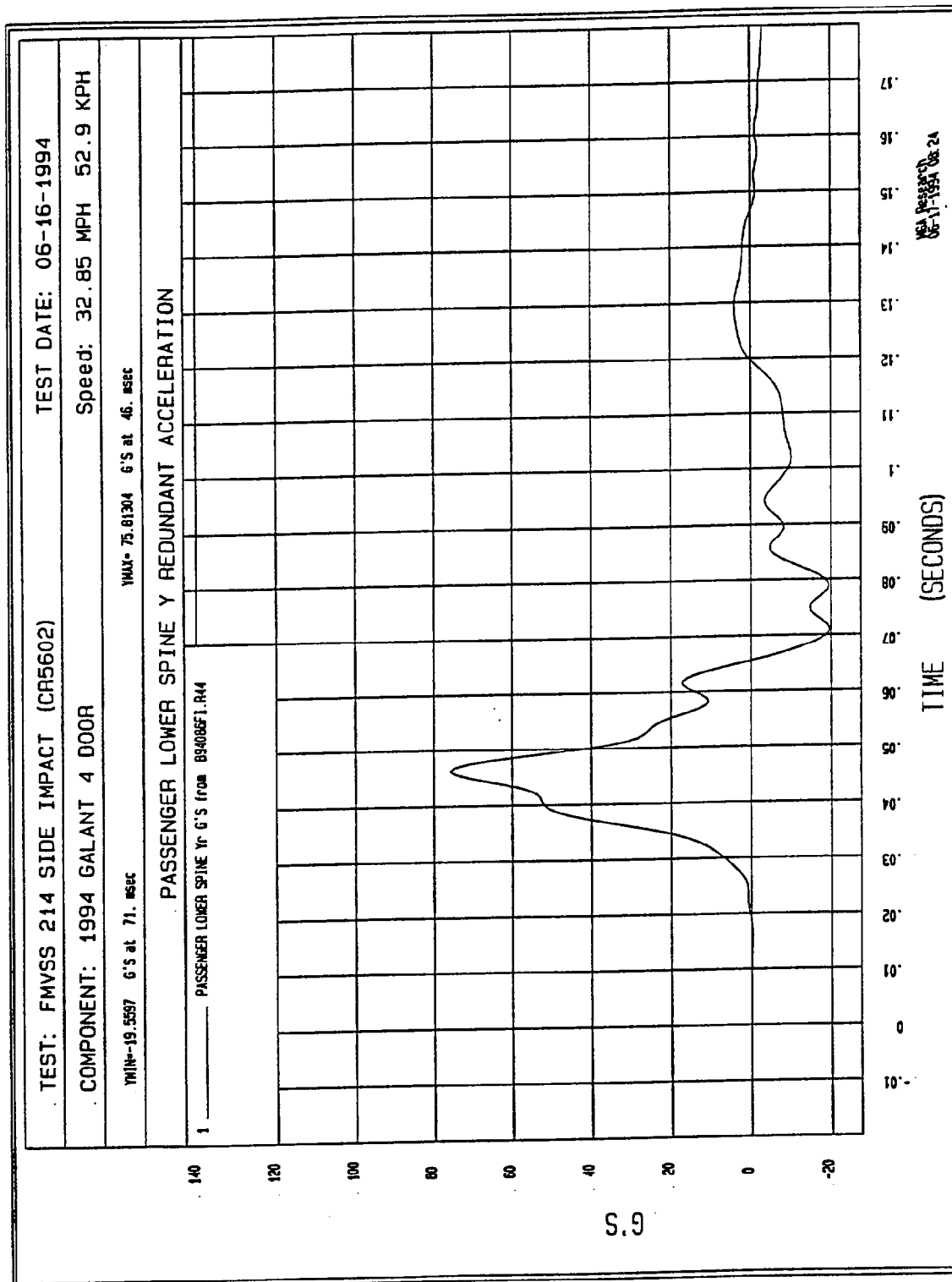


Figure B-94 - Passenger Lower Spine Y Redundant Acceleration vs. Time

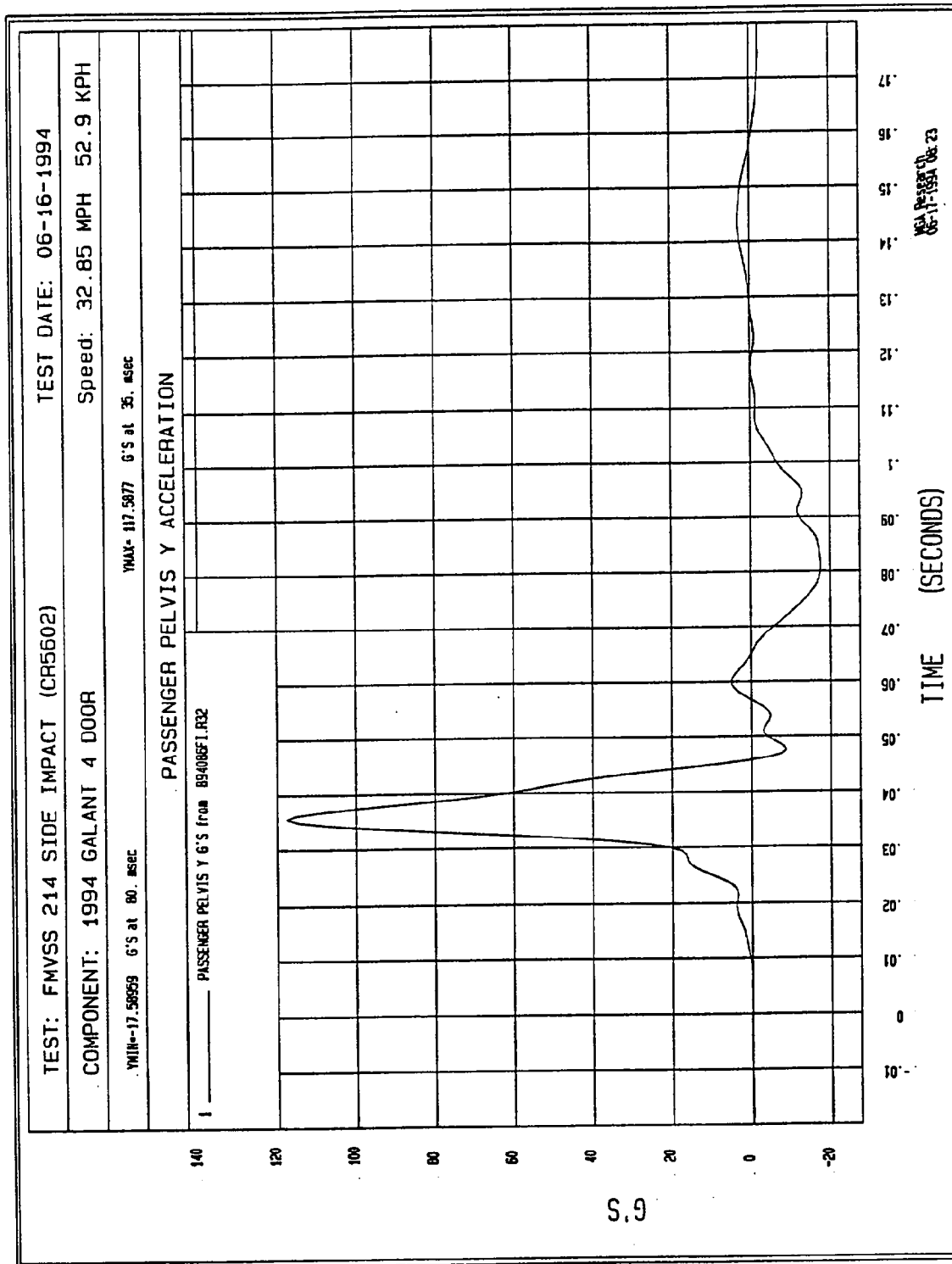


Figure B-95 - Passenger Pelvis Y Acceleration vs. Time

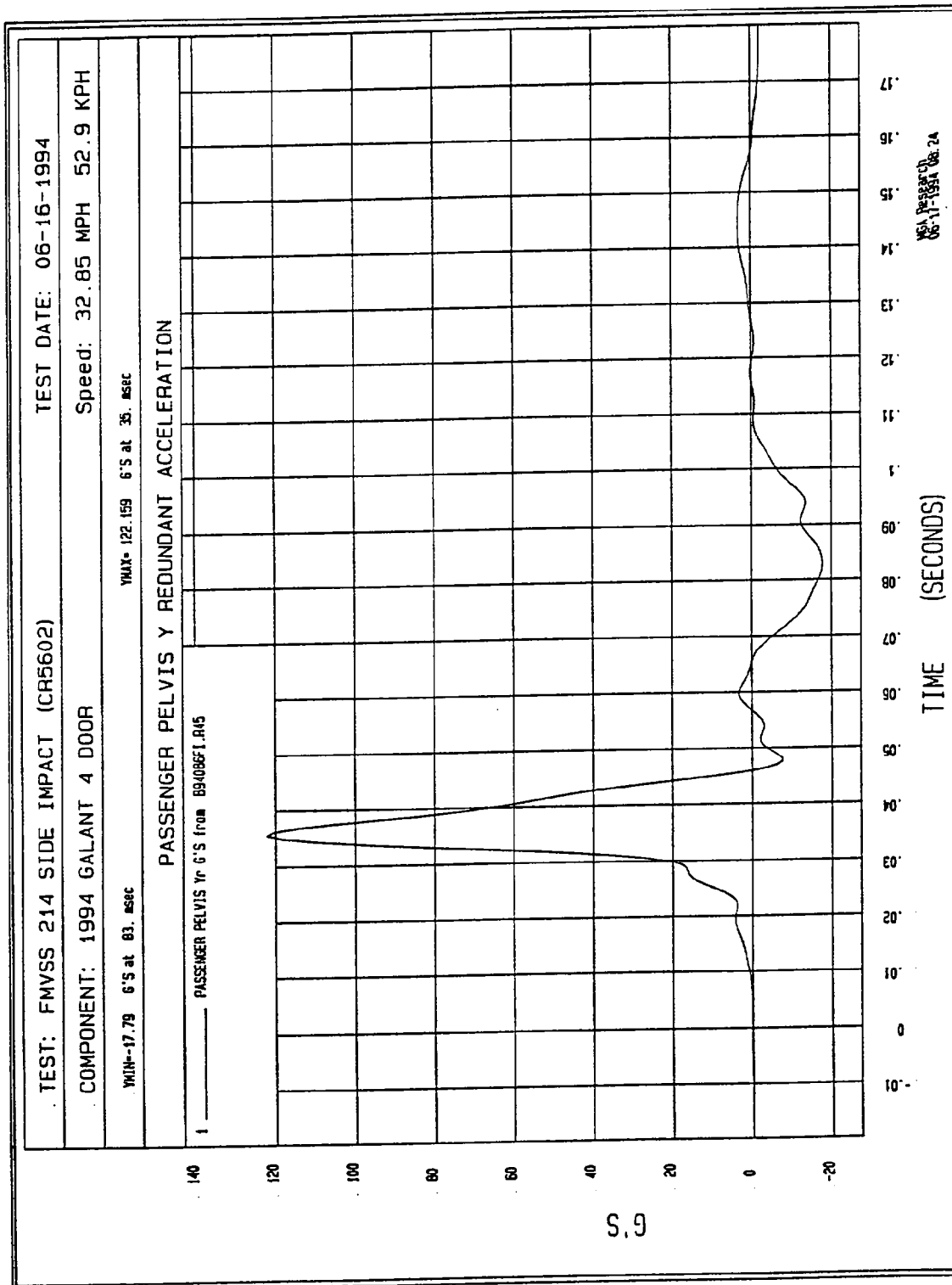


Figure B-96 - Passenger Pelvis Y Redundant Acceleration vs. Time

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO.: MGA-94-21409

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

MITSUBISHI MOTORS
1994 MITSUBISHI GALANT 4 DOOR SEDAN
NHTSA NO: CR5602

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



MGA Ref. No.: G93A-02

Test Date: June 16, 1994

Report Date: September 28, 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

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DUMMY S/N: 272	PRE-TEST CERTIFICATION DATA	2-1
DUMMY S/N: 270	POST-TEST CERTIFICATION DATA	3-1
DUMMY S/N: 272	POST-TEST CERTIFICATION DATA	4-1
DUMMY S/N: 270	POST-TEST INSPECTION CHECKLIST	5-1
DUMMY S/N: 272	POST-TEST INSPECTION CHECKLIST	6-1
	VEHICLE AND DUMMY TEMPERATURE	7-1

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 270

Calibration Test Results Summary

Dummy 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 10, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.6
RH - Rib Height	19.75 - 20.5"	20.5
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"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	14.6

MEASUREMENTS BY:

Alan Allen

APPROVED BY:

J. Robbins

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 10, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94052

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	18

TEST MEETS SPECIFICATIONS

TECHNICIAN *Ha Cla*

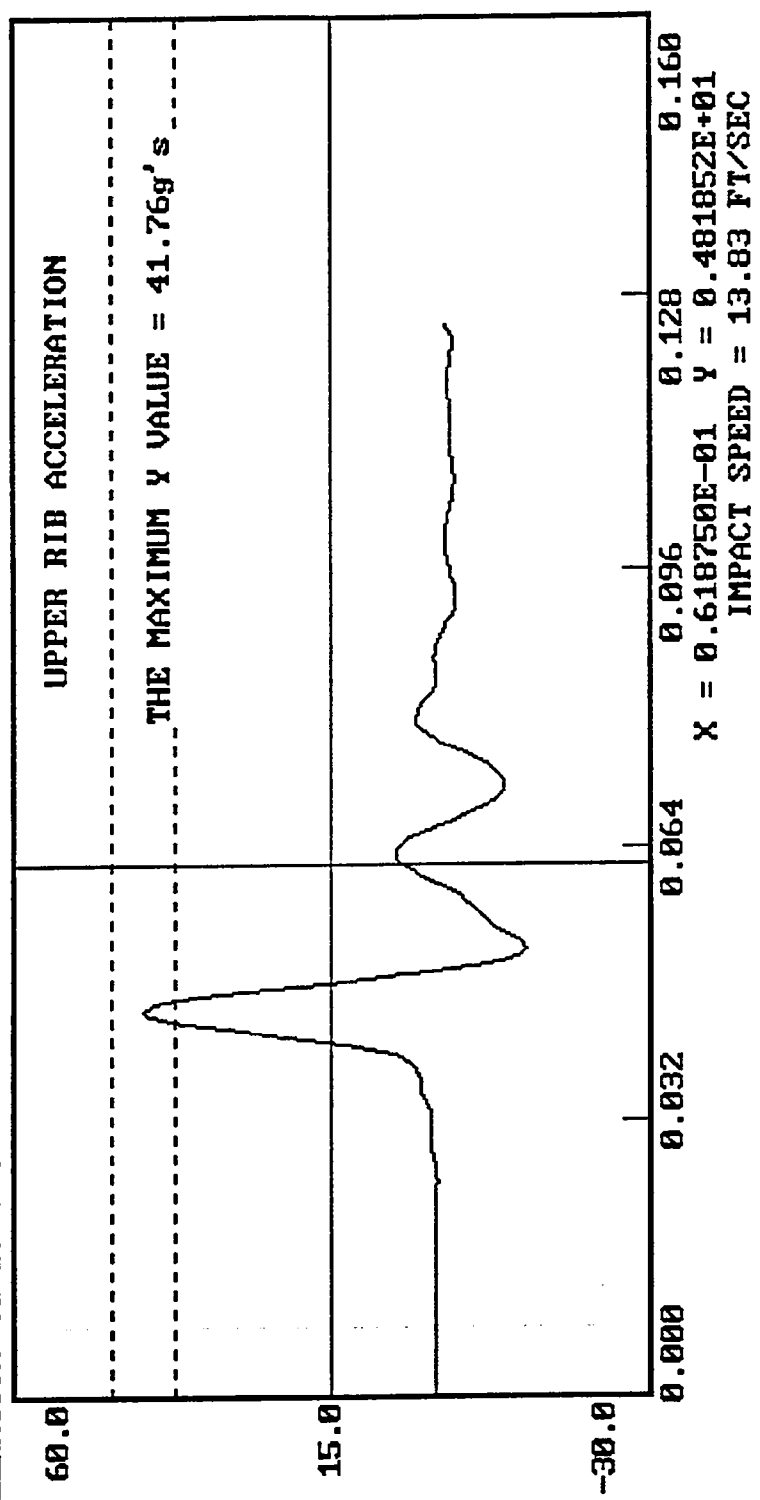
APPROVED BY *J. Collins*

06-10-1994 08:56

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 270

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

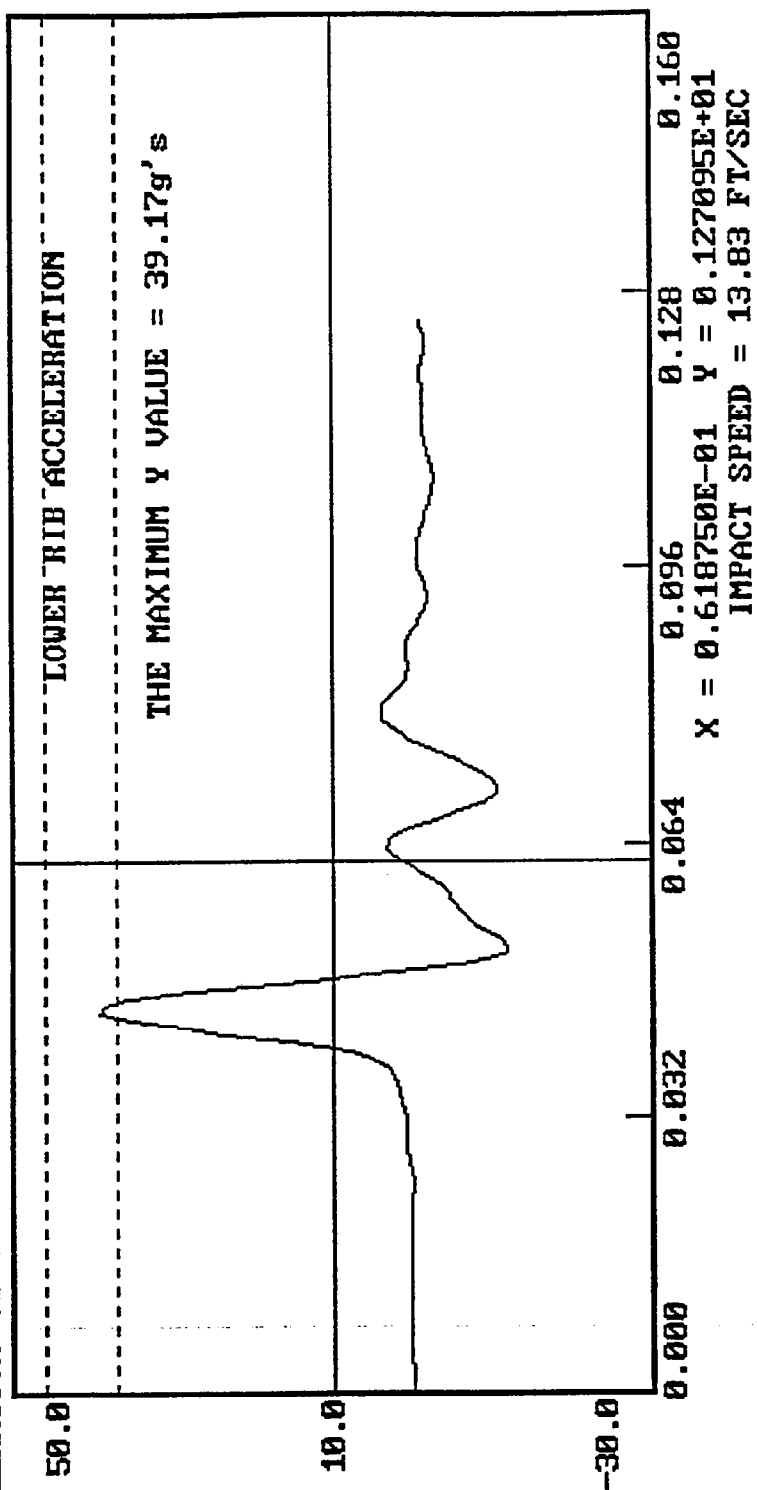


06-10-1994 08:56

DUMMY CALIBRATION - THORAX IMPACT

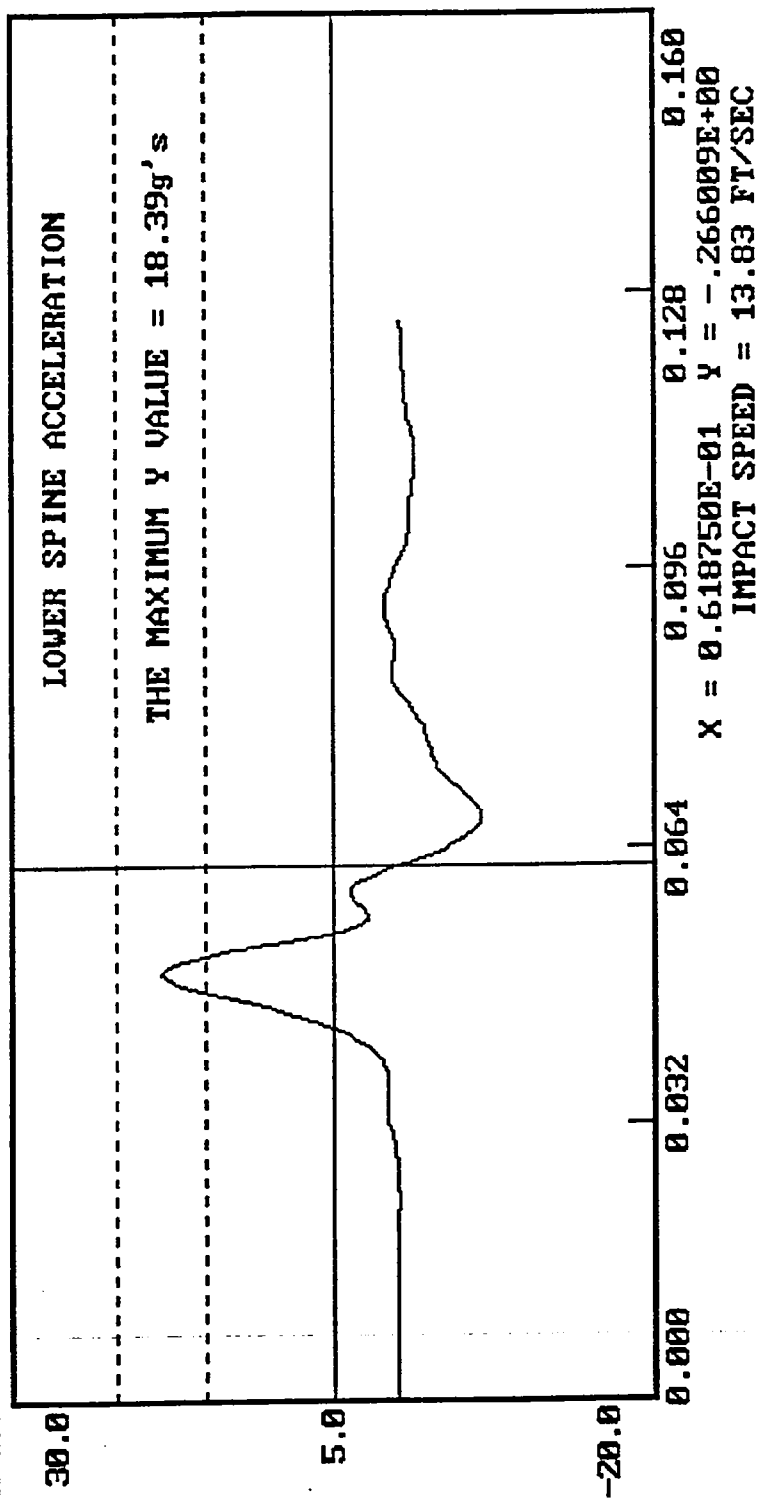
DUMMY # 270

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



06-10-1994 08:56

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

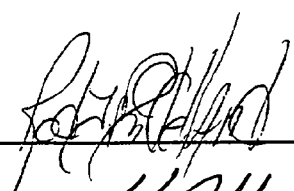
DATE: June 10, 1994

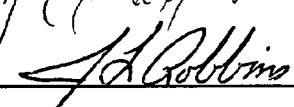
DUMMY NUMBER: 270

TEST NUMBER: D94053

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	51

TEST MEETS SPECIFICATIONS

TECHNICIAN 

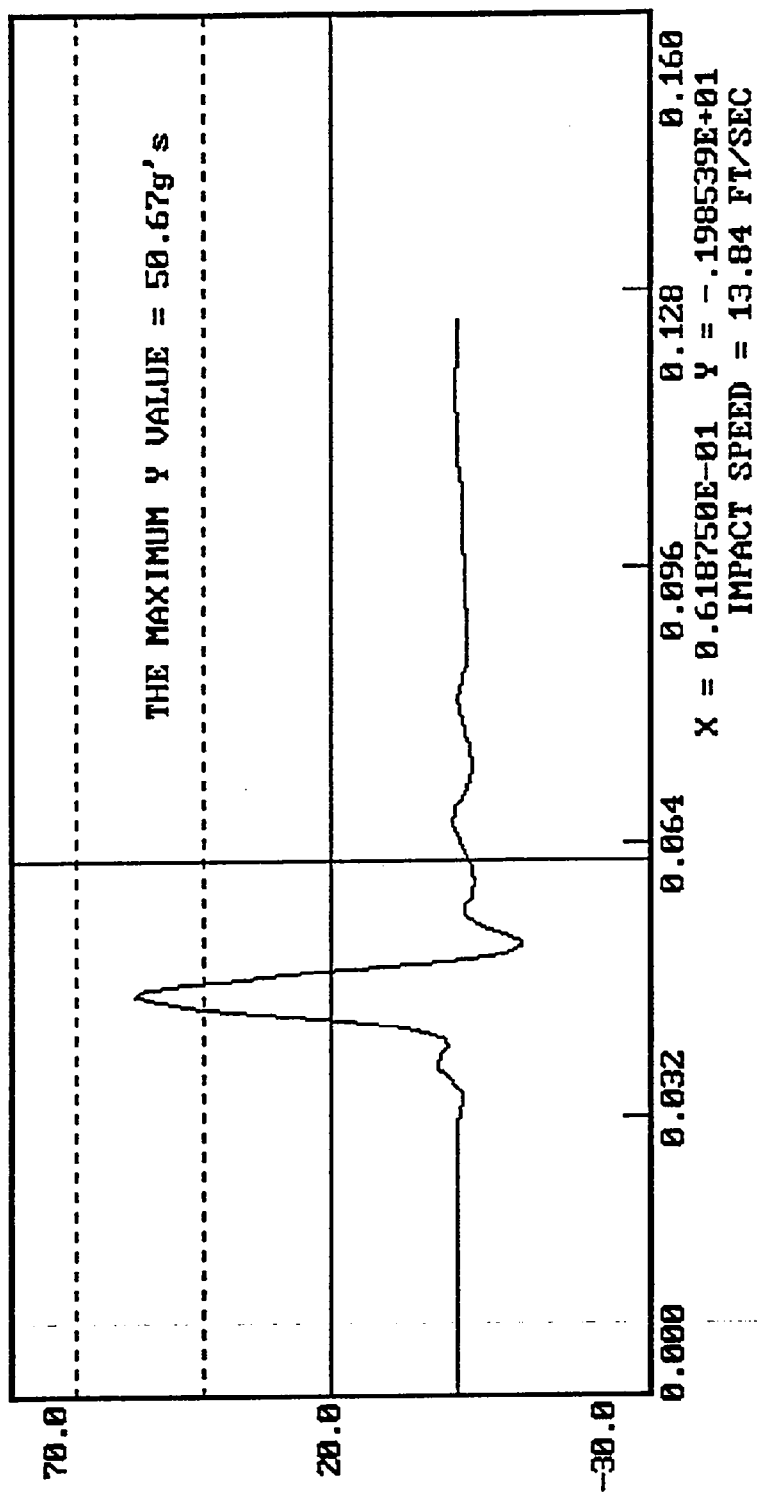
APPROVED BY 

06-10-1994 09:48

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 270

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



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

DATE: June 10, 1994

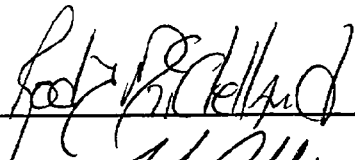
DUMMY NUMBER: 270

TEST NUMBER: D94054

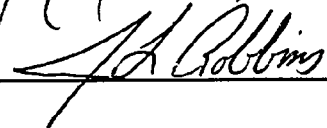
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.0
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.9
FORCE @ 1.0 in	50 - 63 lbs	58
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

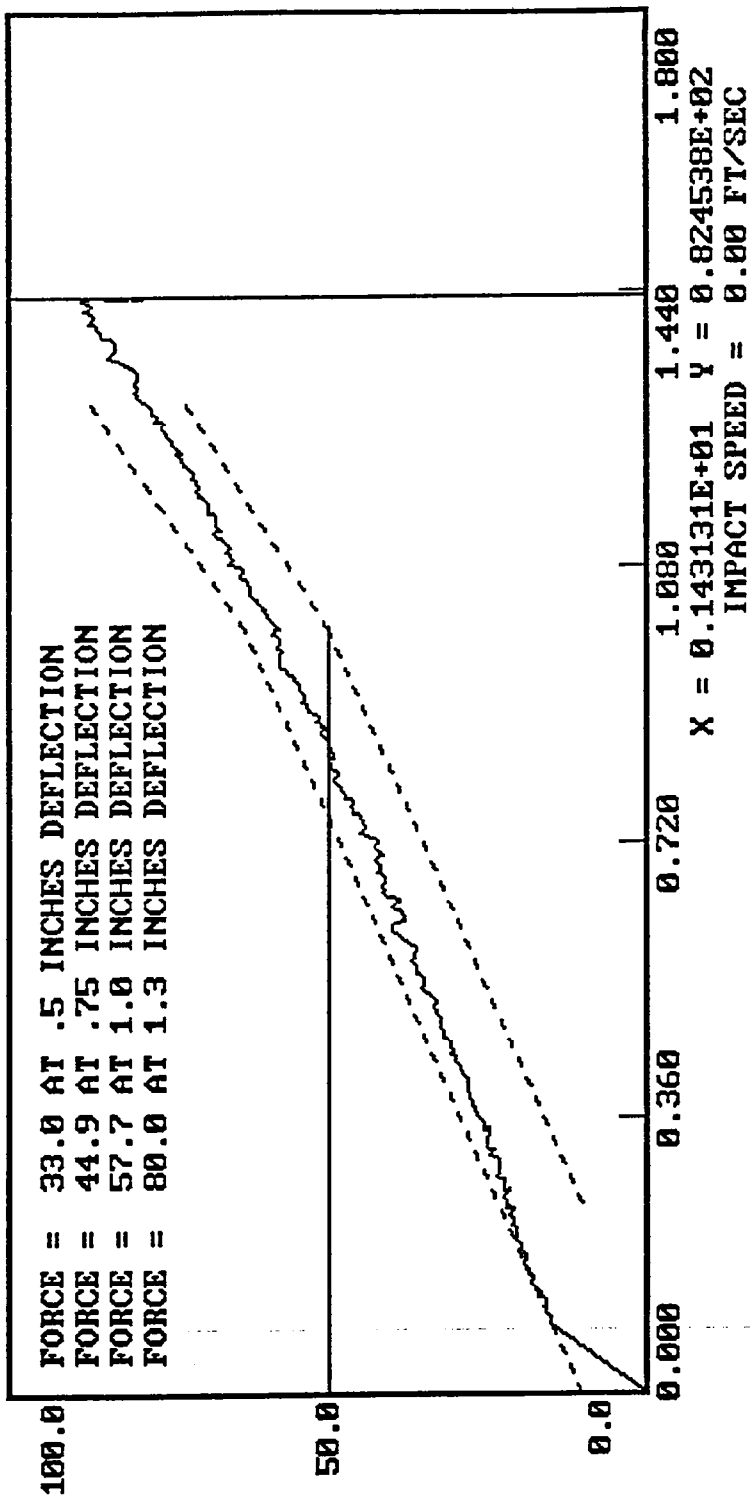
TECHNICIAN



APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 06-10-1994 10:51
 ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: June 10, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94055

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	22
FORCE @ 30°	34 - 46 lbs	42
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	6°

TEST MEETS SPECIFICATIONS

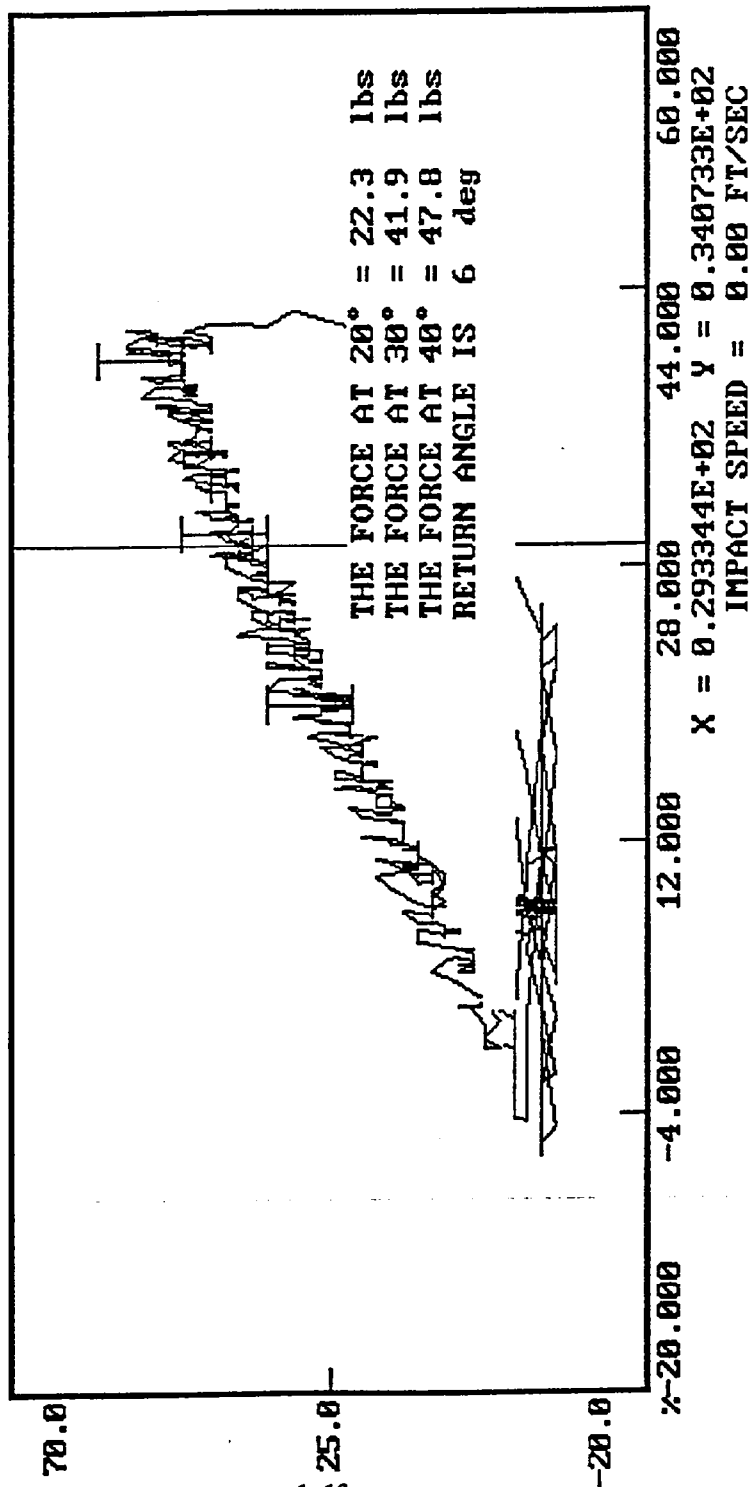
TECHNICIAN

A. Clarke

APPROVED BY

J. Robbins

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 270 I
 06-10-1994 11:11
 FORCE () VS. TORSO ROTATION (DEGREES)



PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 272

Calibration Test Results Summary

Passenger Serial Number: 272

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.: 272

DATE OF VERIFICATION: June 10, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.6
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"	9.2
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.3
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	15.1

MEASUREMENTS BY: *Ala Ala*

APPROVED BY: *J. Rollins*

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 10, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94062

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	20

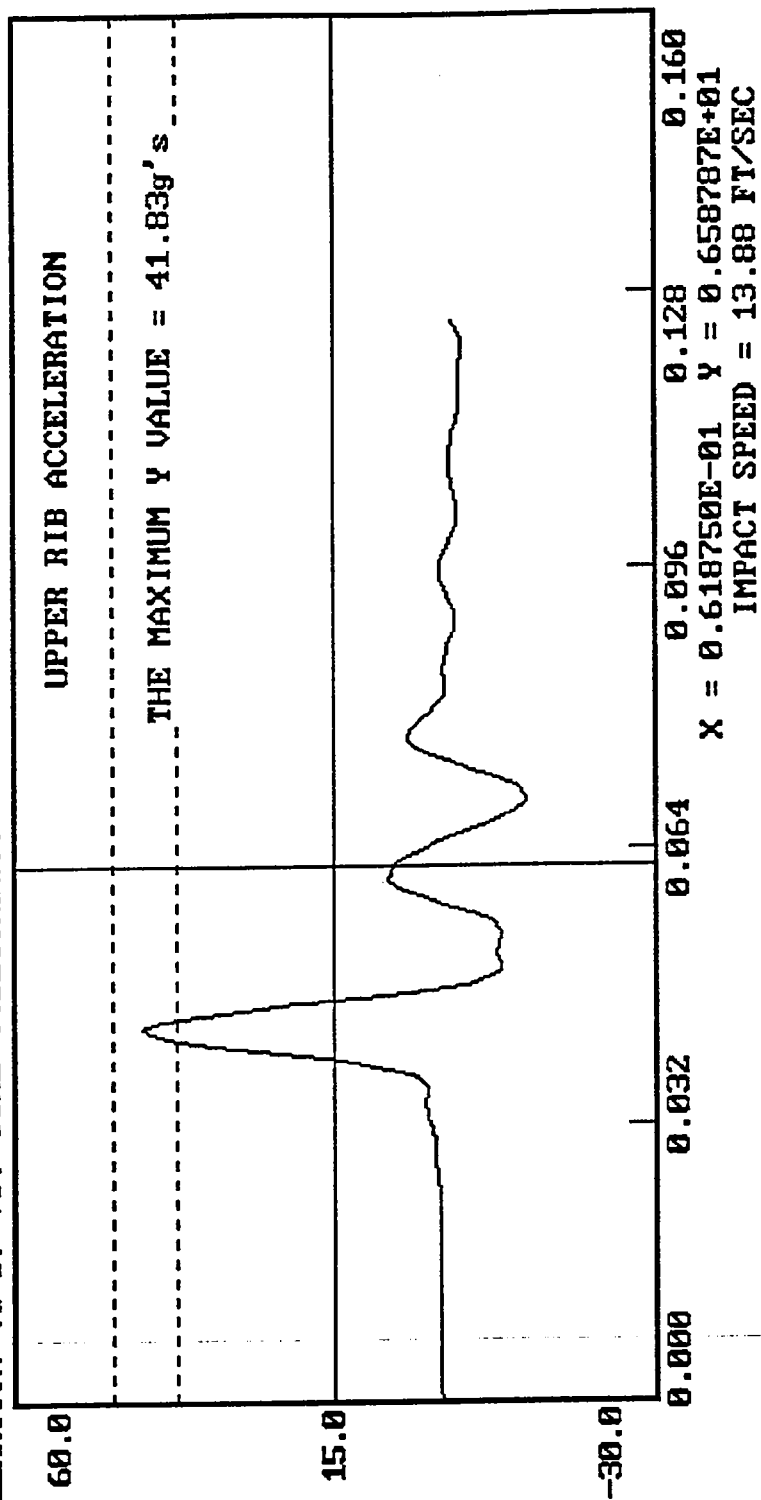
TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY  _____

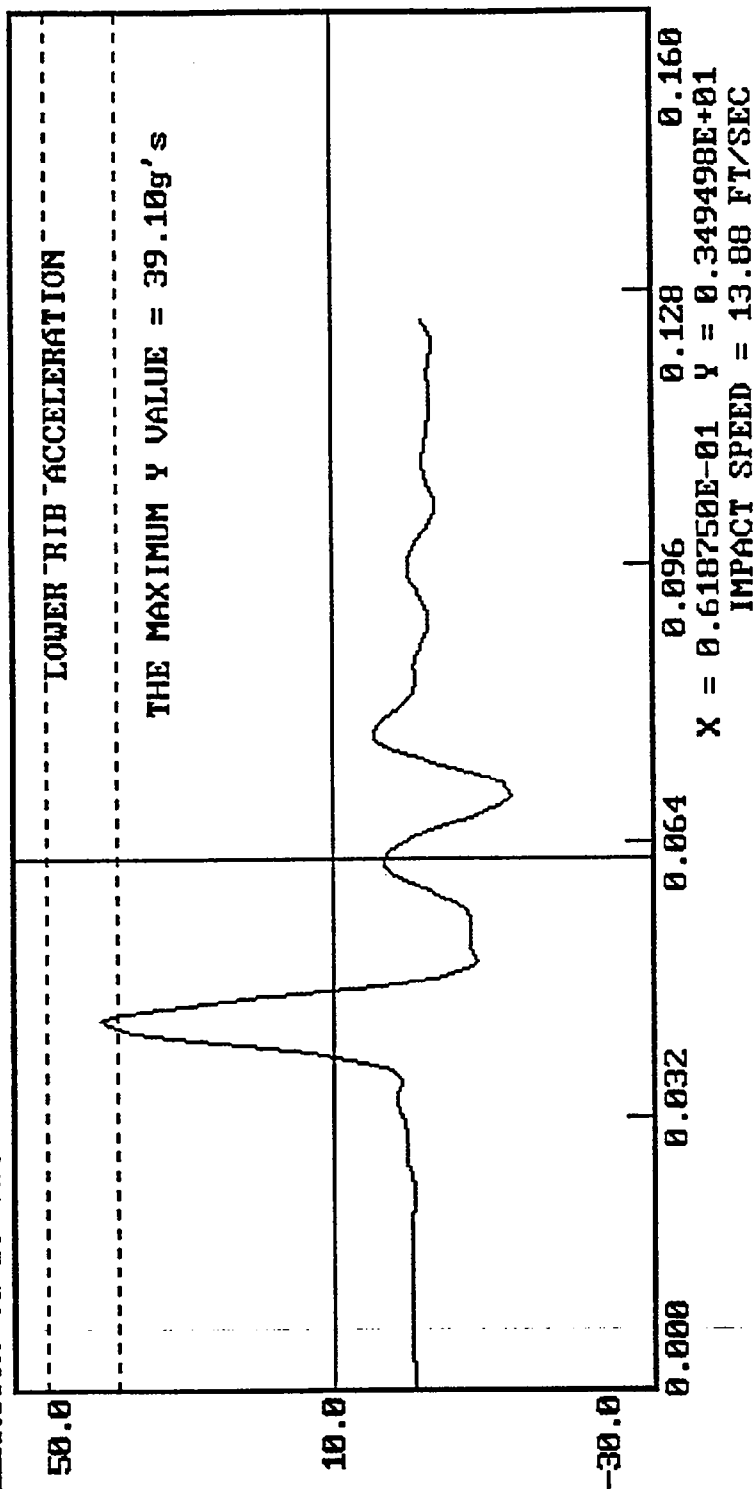
06-10-1994 09:16

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



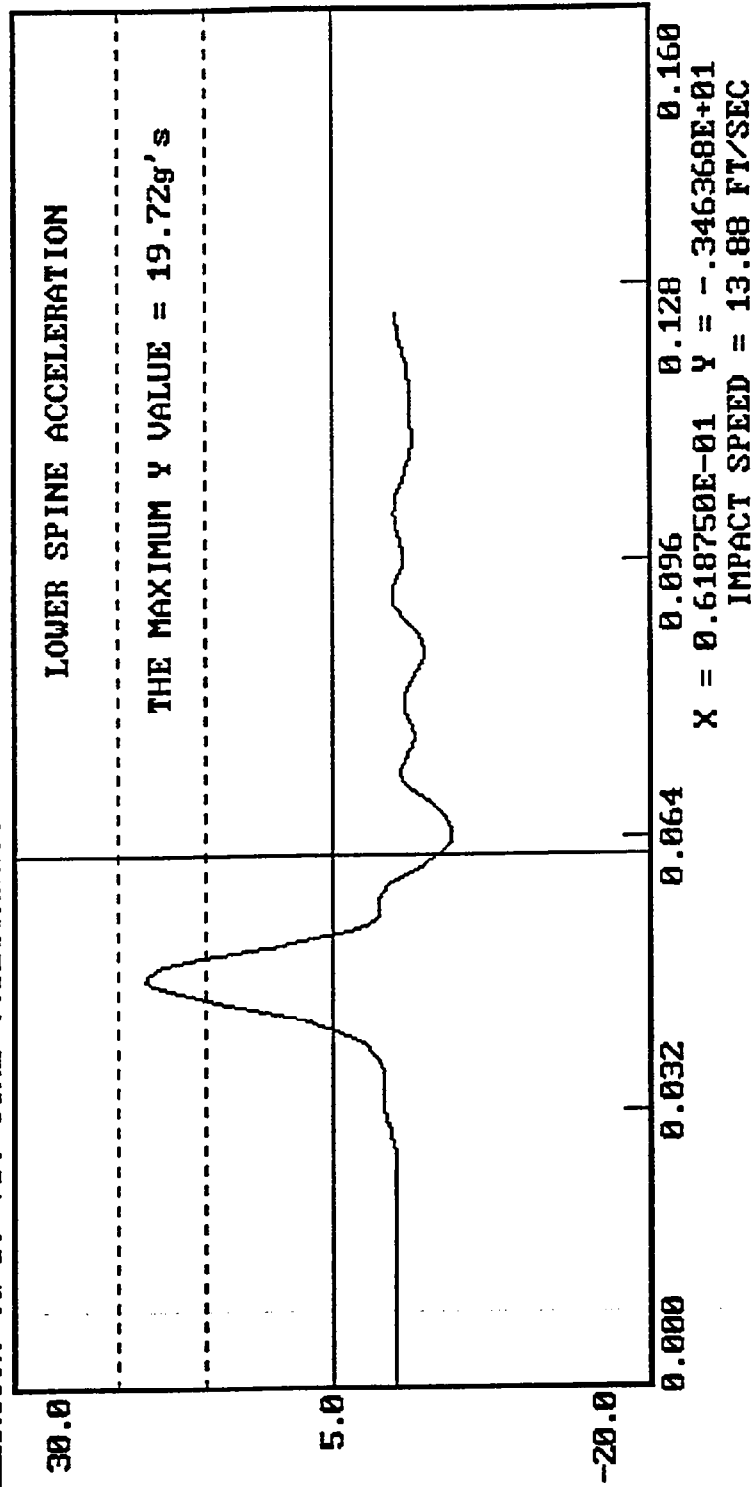
06-10-1994 09:16

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



06-10-1994 09:16

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

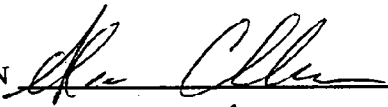
DATE: June 10, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94063

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	49

TEST MEETS SPECIFICATIONS

TECHNICIAN 

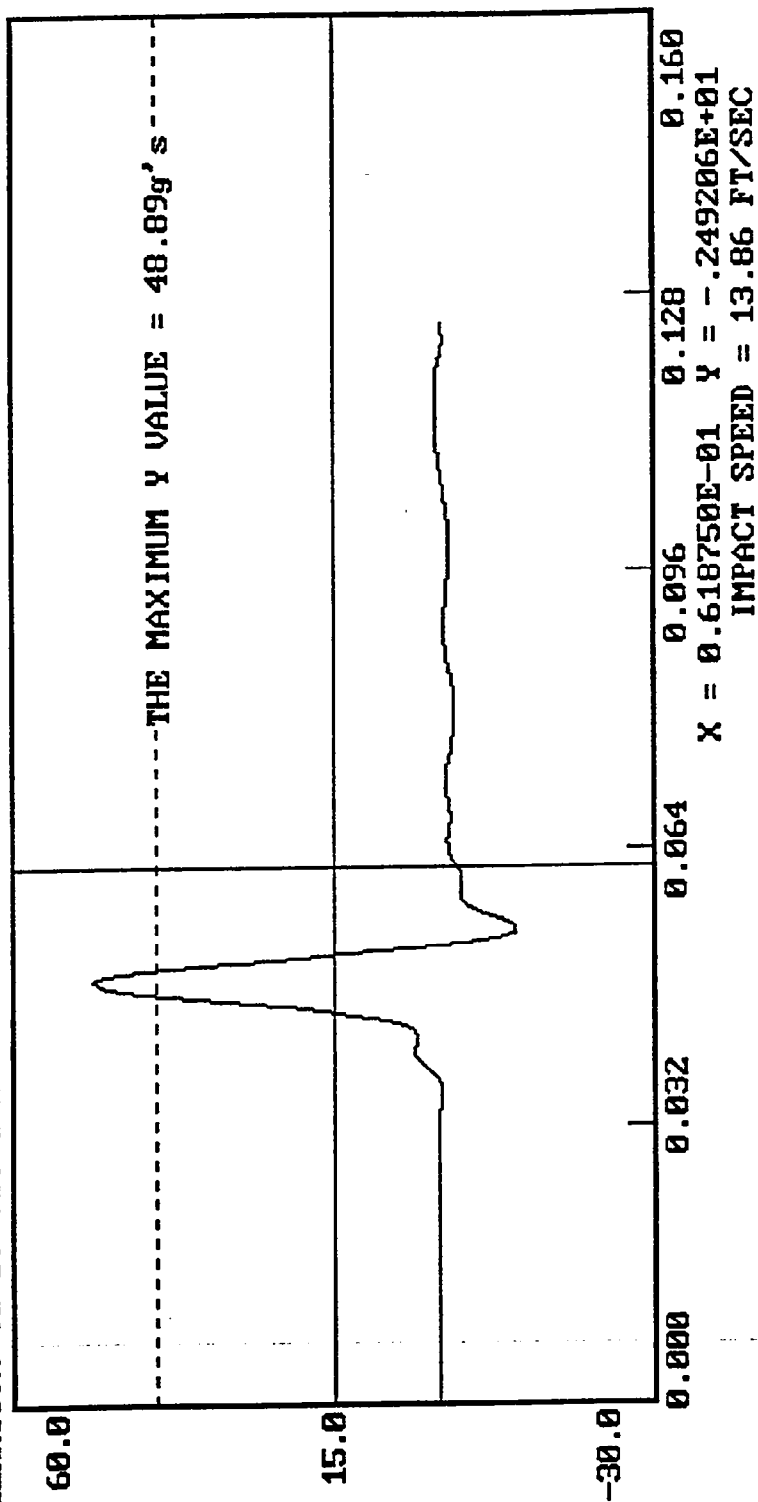
APPROVED BY 

06-10-1994 09:36

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 272

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



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

DATE: June 10, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94064

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.8
FORCE @ 0.75 in	36.7 - 49.8 lbs	46.6
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

TECHNICIAN

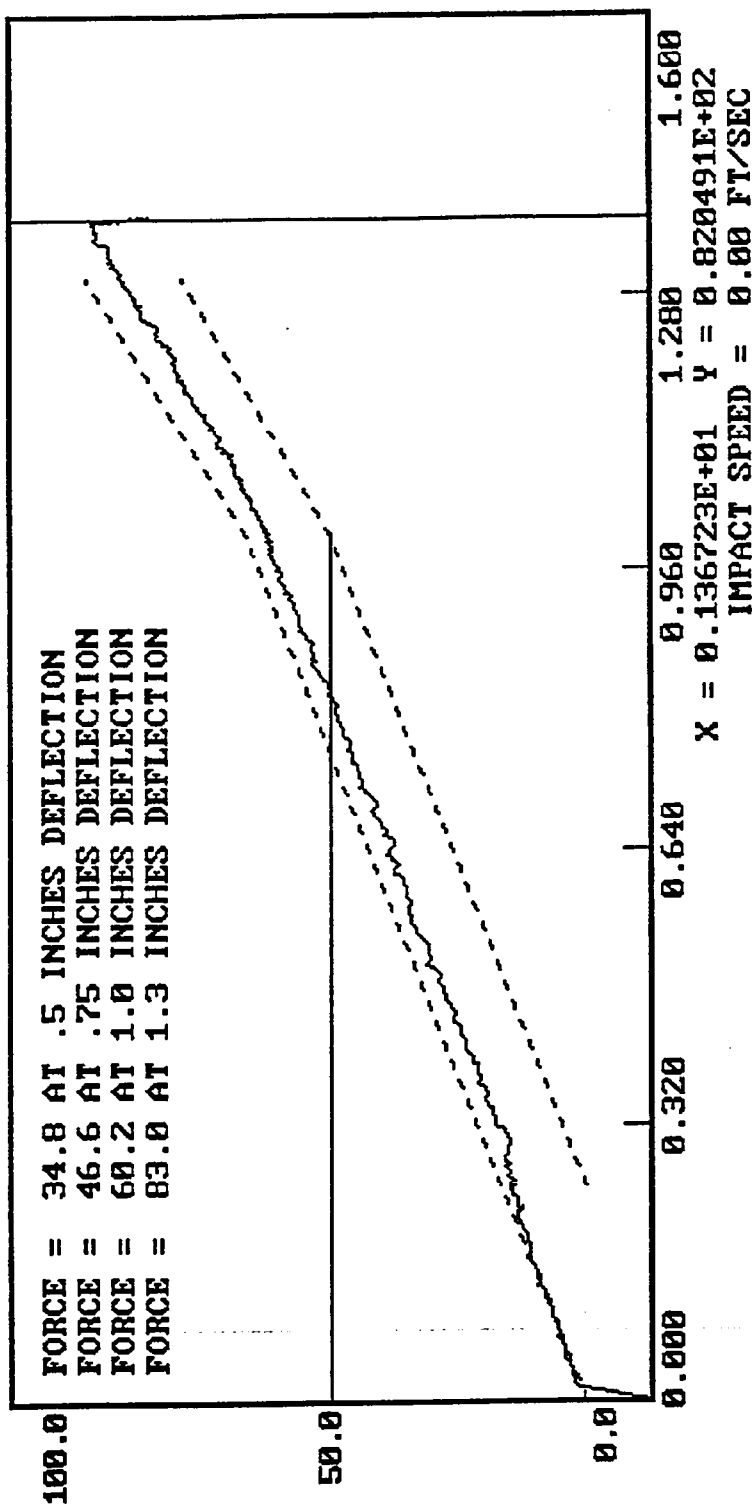
APPROVED BY

06-10-1994 10:45

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 272

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: June 10, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94065

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	42
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN

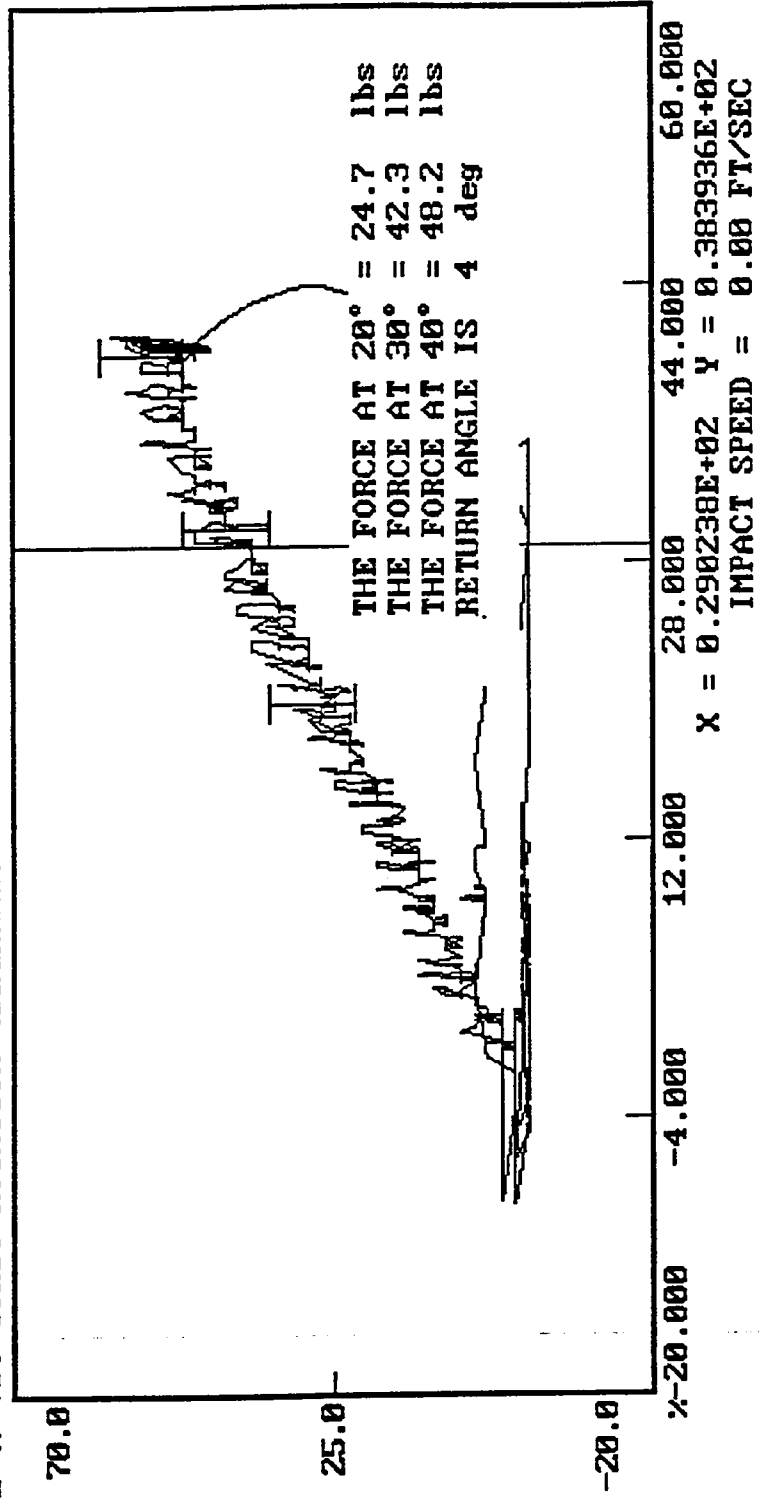
Ala. Chlun

APPROVED BY

J. H. Robbins

06-10-1994 11:33

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 272
FORCE () US. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Post-Test Calibration

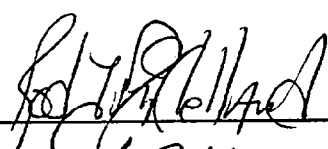
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

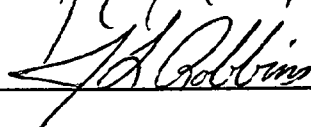
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

DATE OF VERIFICATION: June 17, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.5
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"	9.4
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"	14.6

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 17, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94172

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	54%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

TECHNICIAN

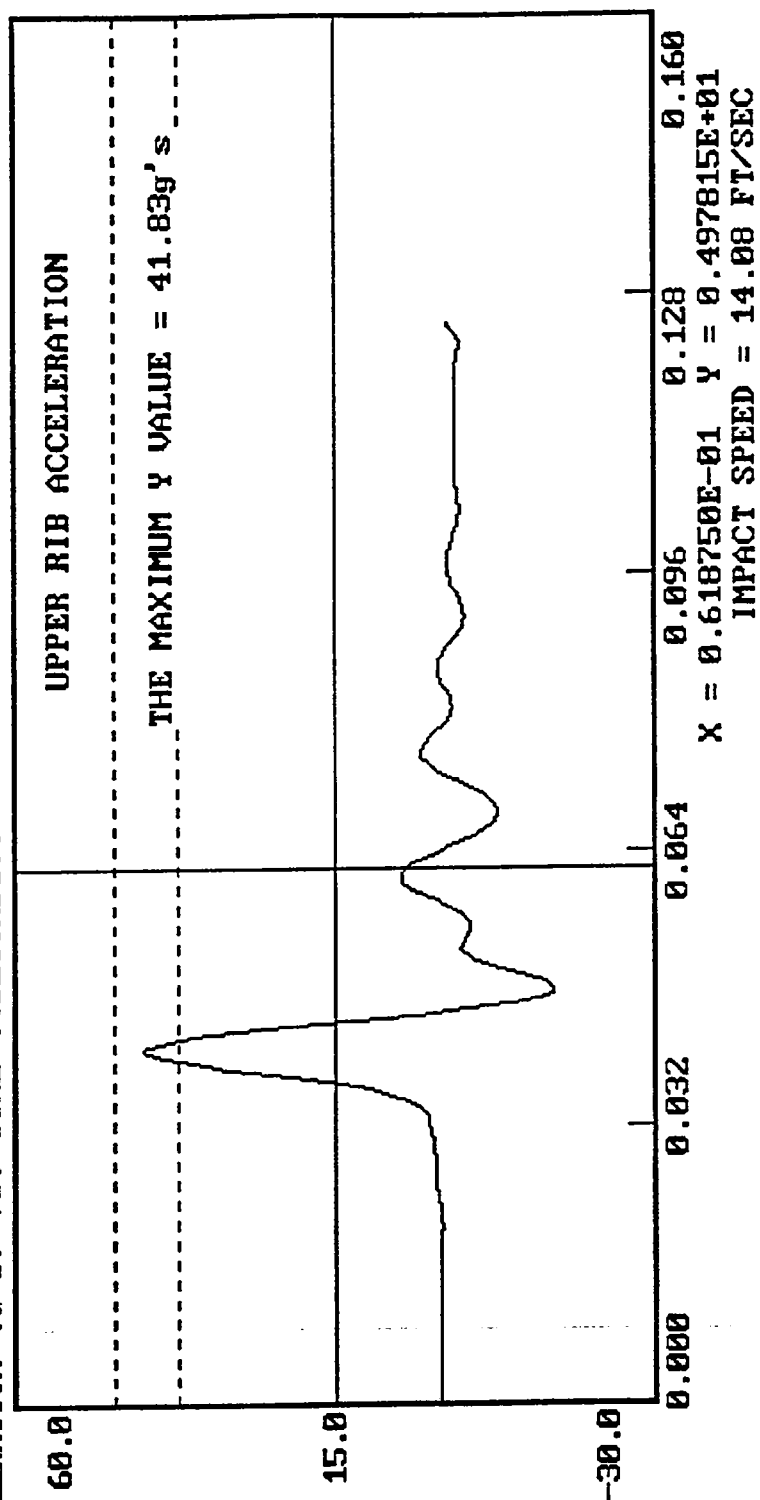
Alan C. [Signature]

APPROVED BY

[Signature]

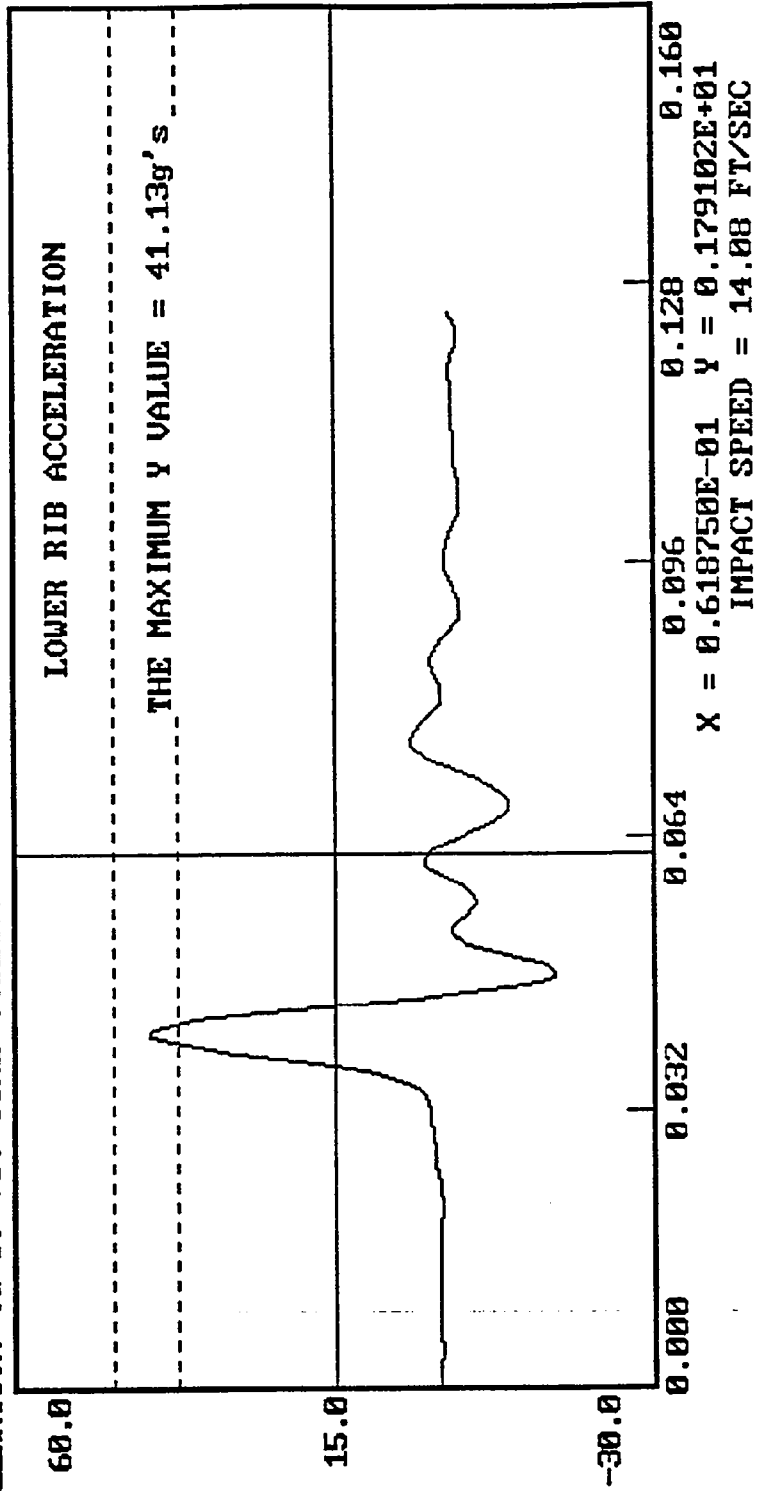
06-17-1994 12:07

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



06-17-1994 12:07

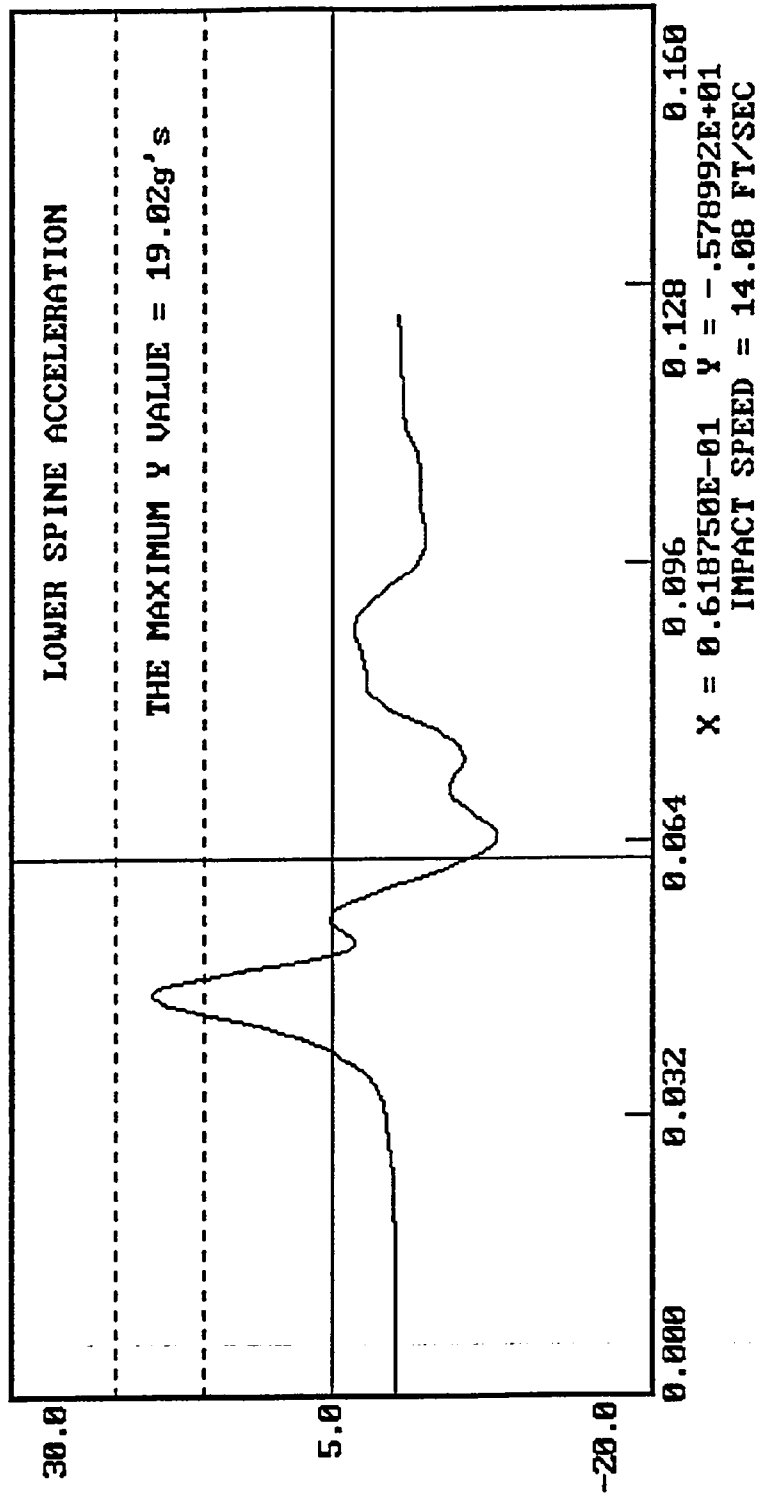
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270

06-17-1994 12:07

() VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 20, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94173

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	62%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	58

TEST MEETS SPECIFICATIONS

TECHNICIAN

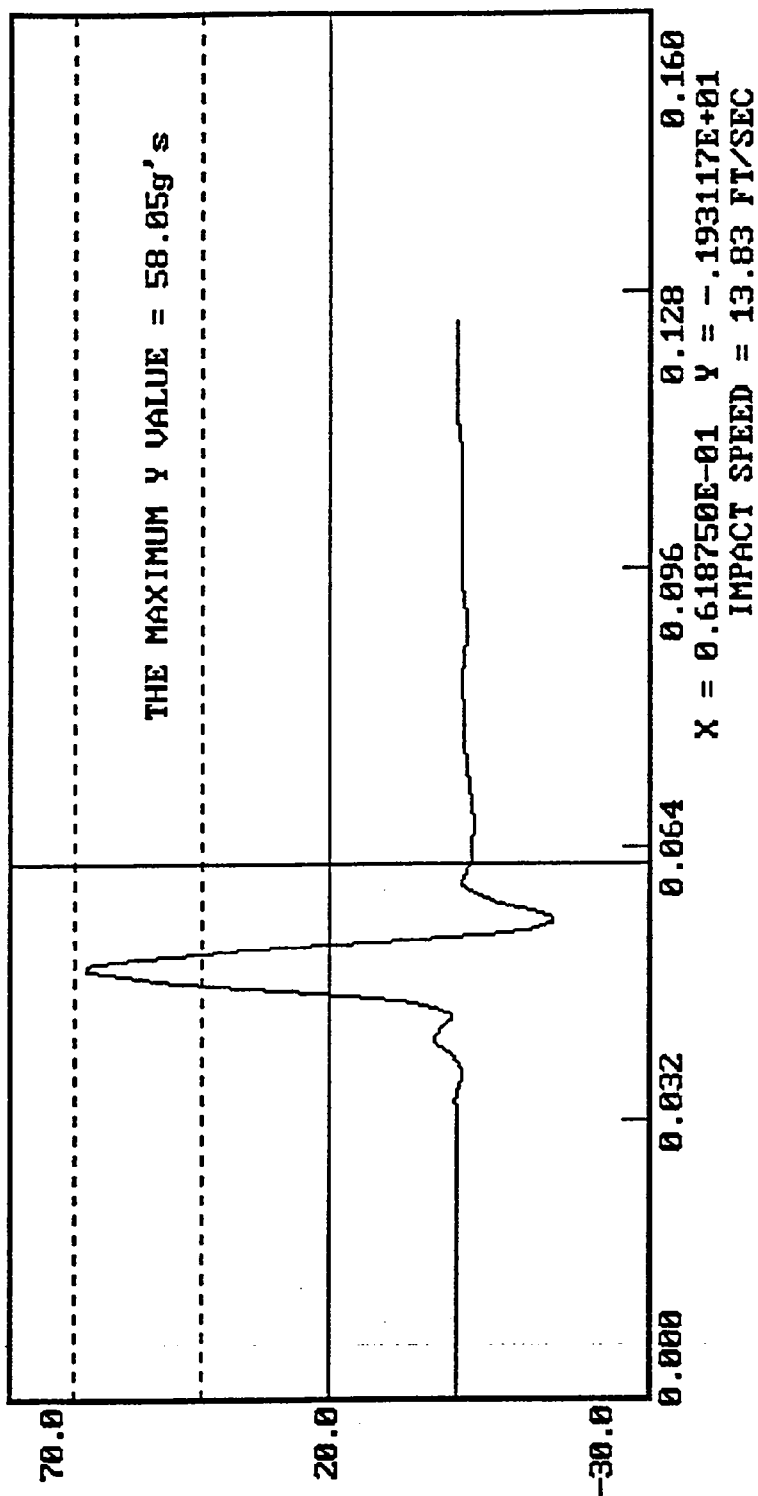
A. Allen

APPROVED BY

J. Rollins

06-20-1994 14:49

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: June 20, 1994

DUMMY NUMBER: 270

TEST NUMBER: D94174

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	46.2
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

TECHNICIAN

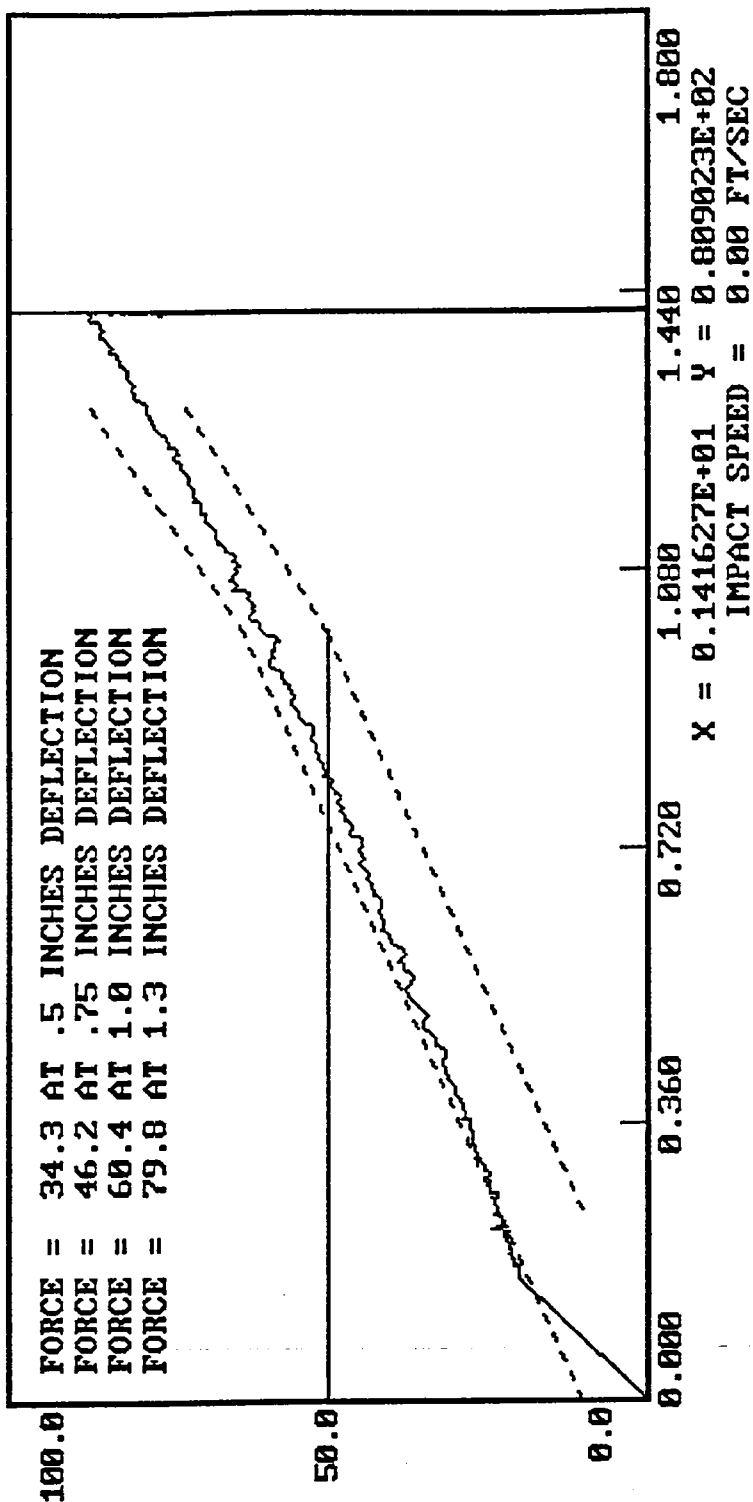


APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 06-20-1994 15:19

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

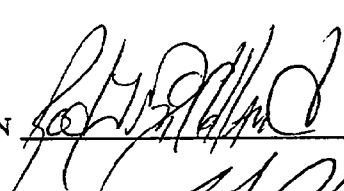
DATE: June 20, 1994

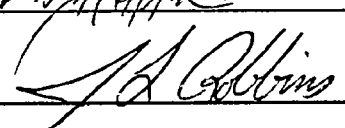
DUMMY NUMBER: 270

TEST NUMBER: D94175

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	28
FORCE @ 30°	34 - 46 lbs	44
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	3°

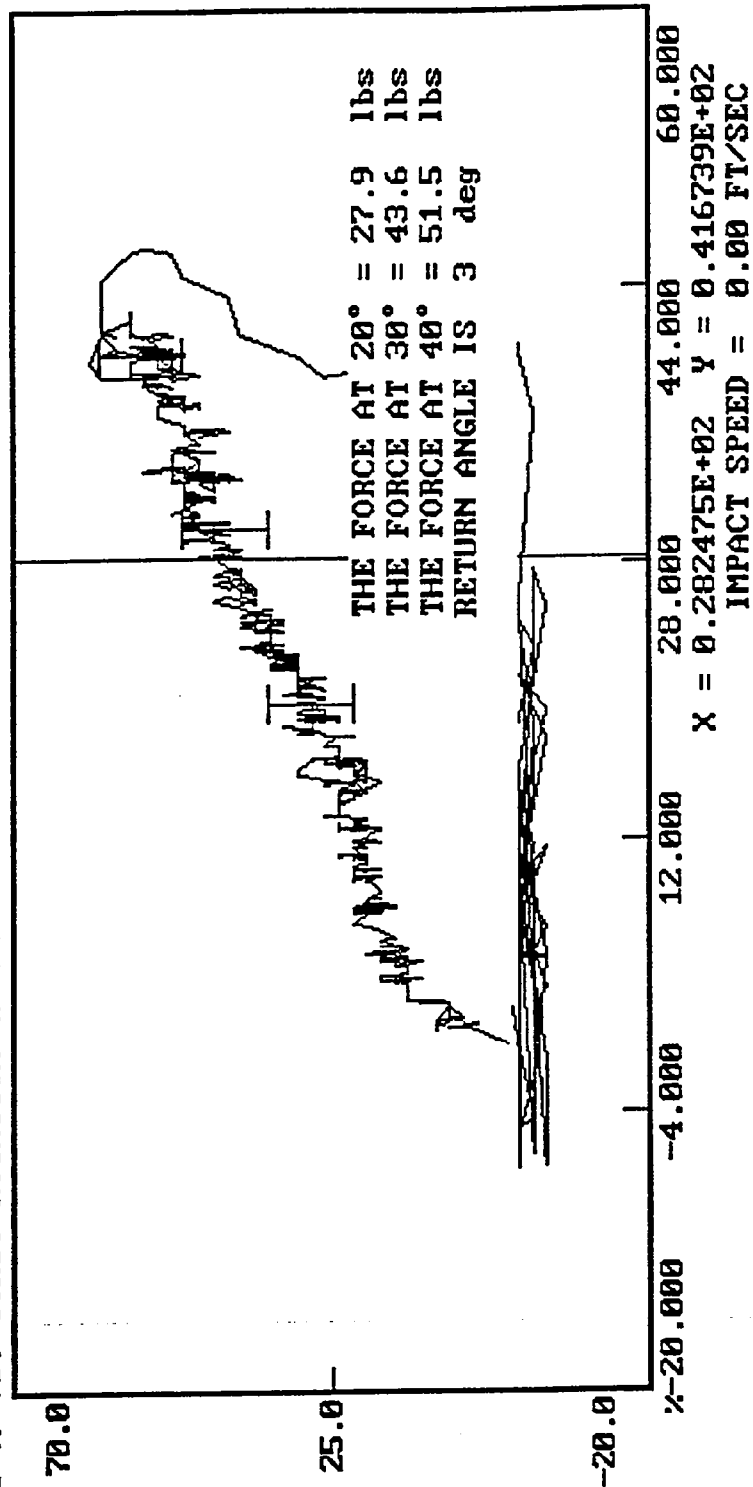
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

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

06-20-1994 16:14



POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

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.: 272

DATE OF VERIFICATION: June 17, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.5
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"	15.0

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

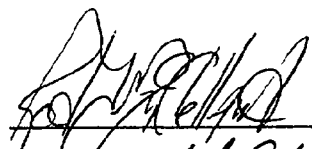
DATE: June 17, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94182

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	44
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN 

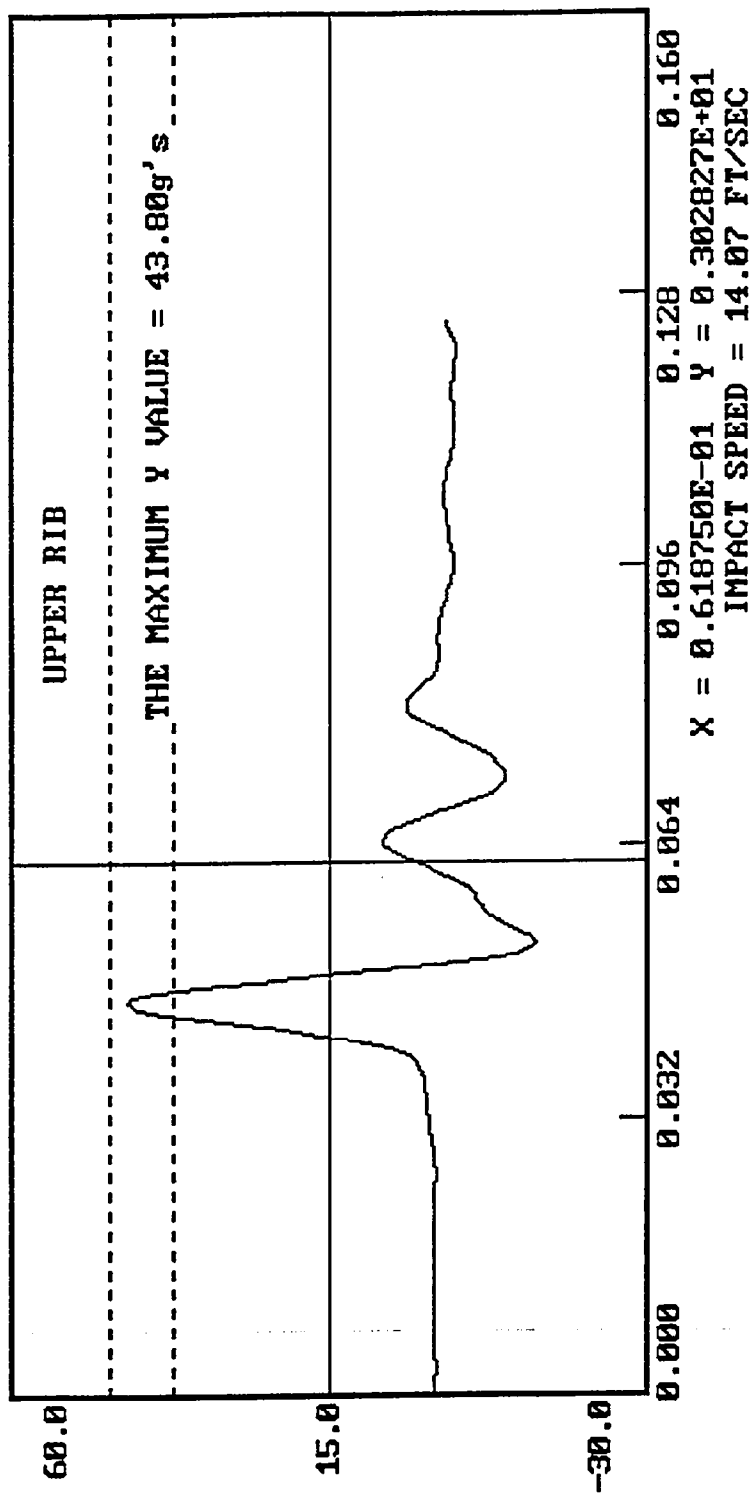
APPROVED BY 

06-17-1994 13:29

DUMMY CALIBRATION - THORAX IMPACT

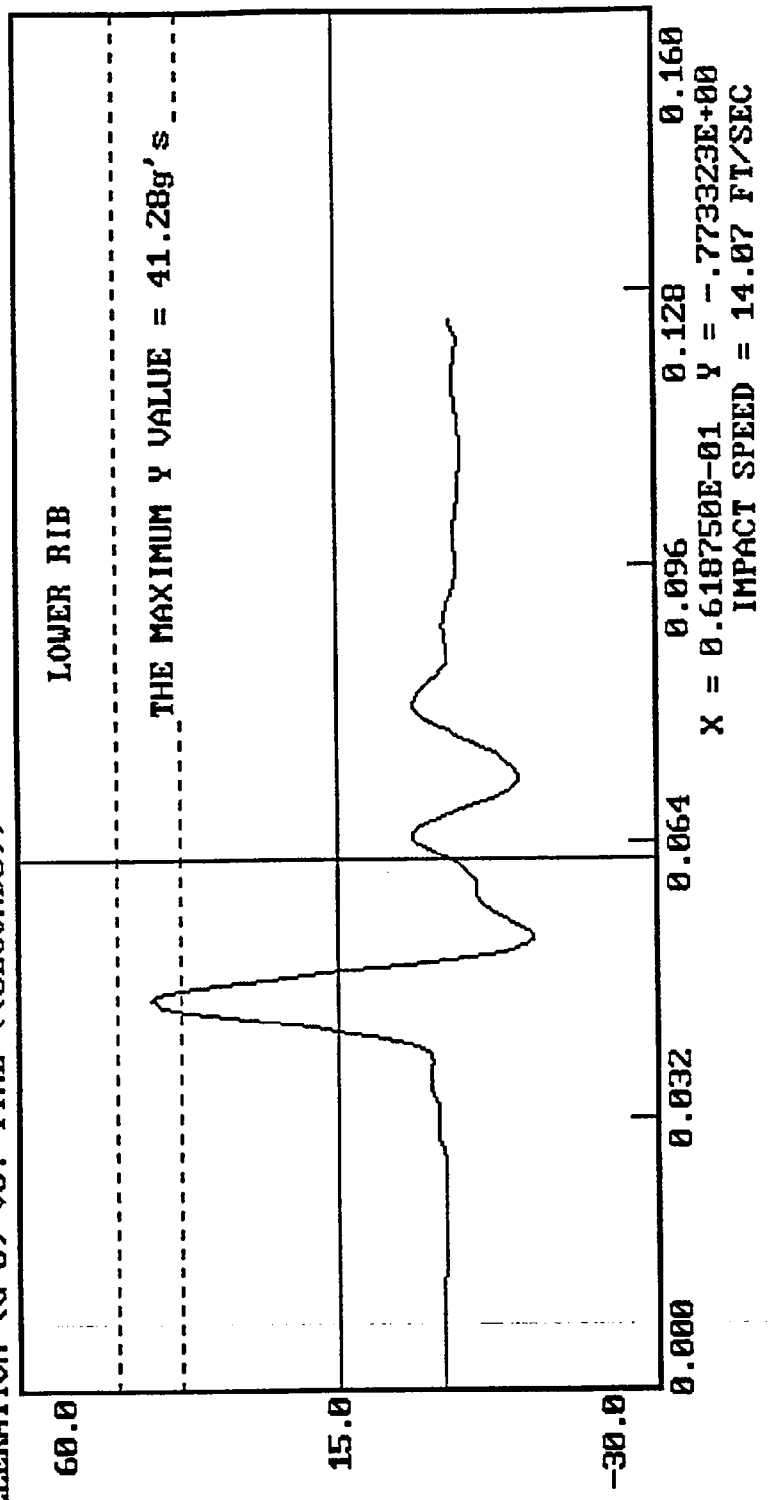
DUMMY # 272

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



06-17-1994 13:29

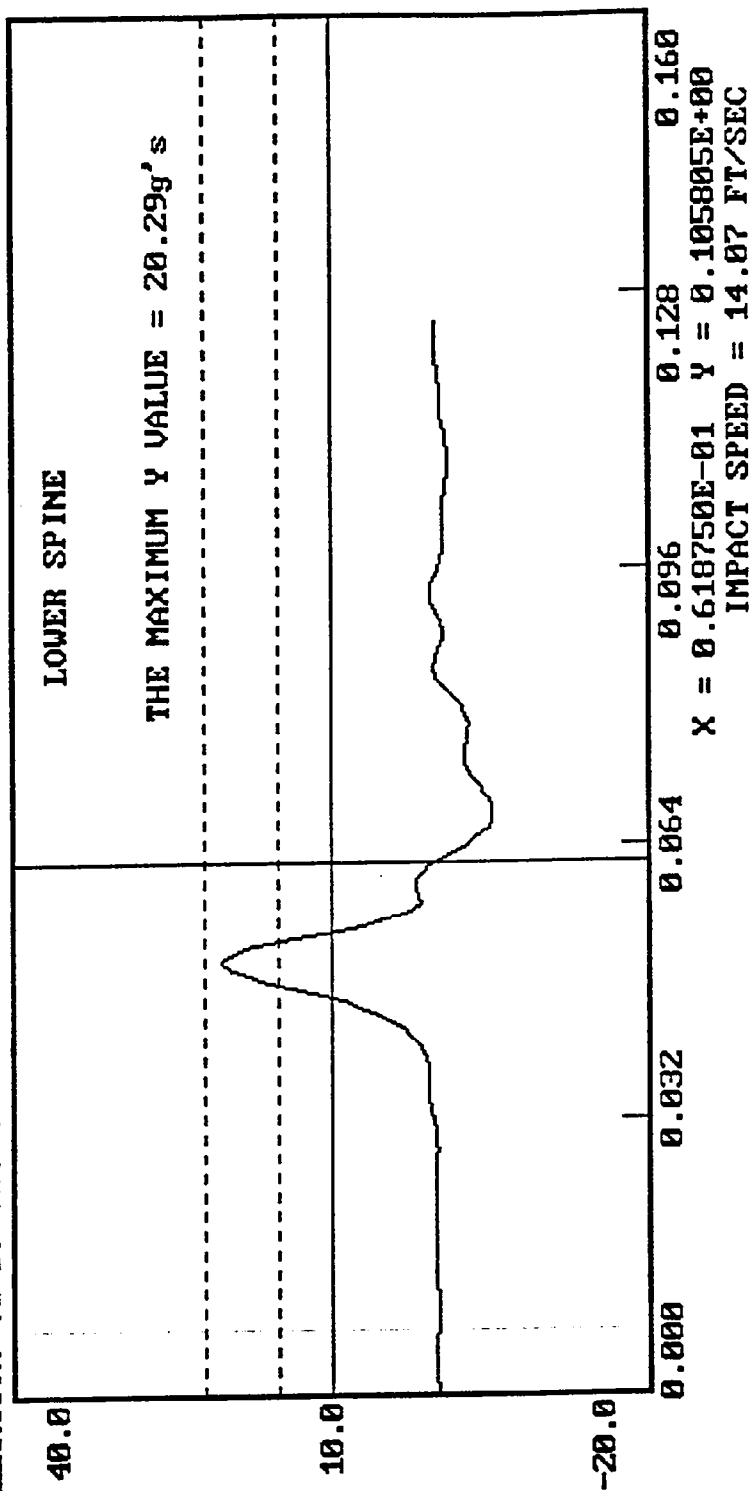
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



06-17-1994 13:29

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 20, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94183

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	62%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

TECHNICIAN

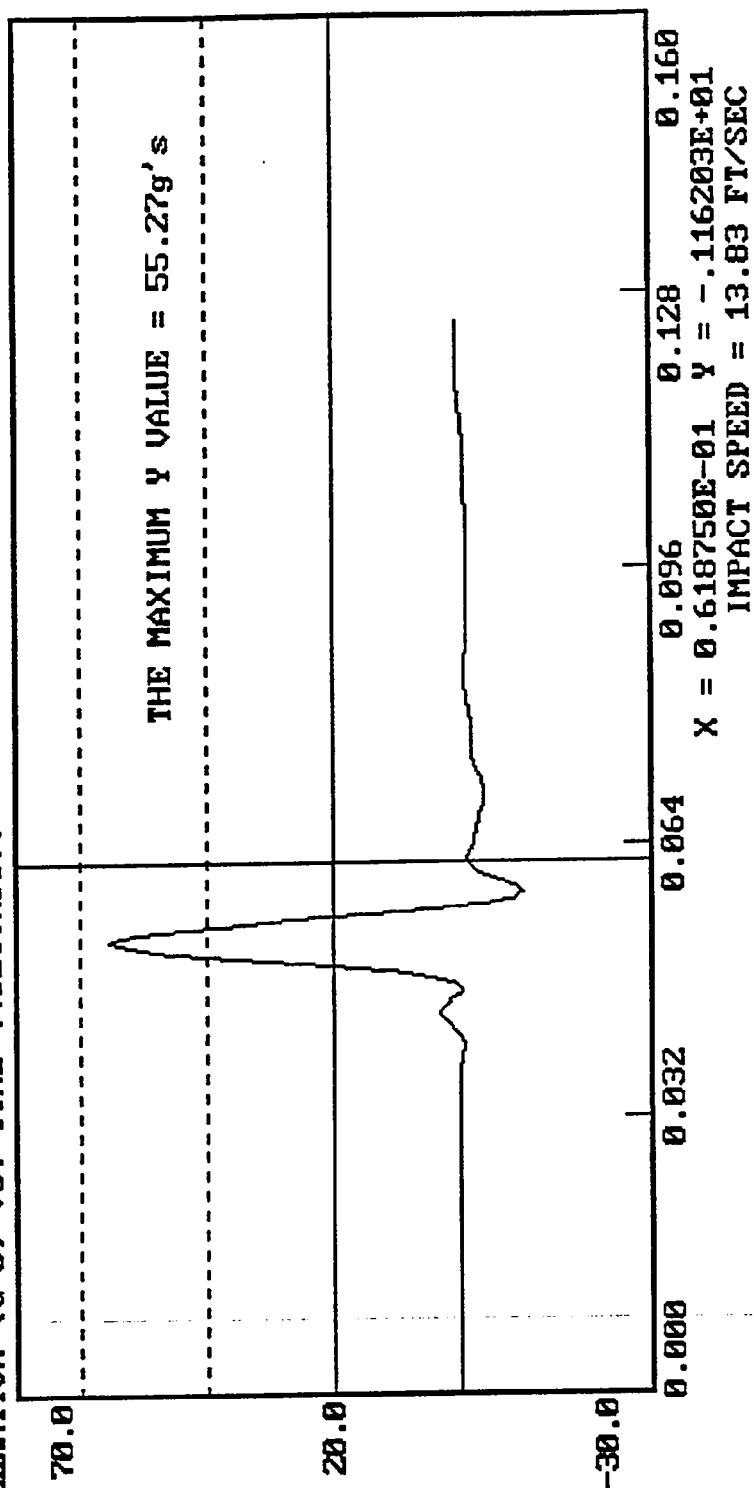
Ala Chlan

APPROVED BY

J. Robbins

06-20-1994 14:42

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))



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

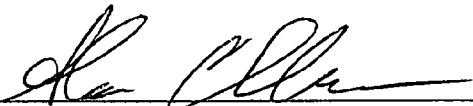
DATE: June 20, 1994

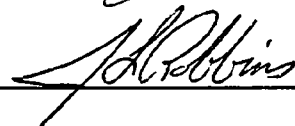
DUMMY NUMBER: 272

TEST NUMBER: D94184

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	68%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.4
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.3
FORCE @ 1.0 in	50 - 63 lbs	62
FORCE @ 1.3 in	73 - 88 lbs	84

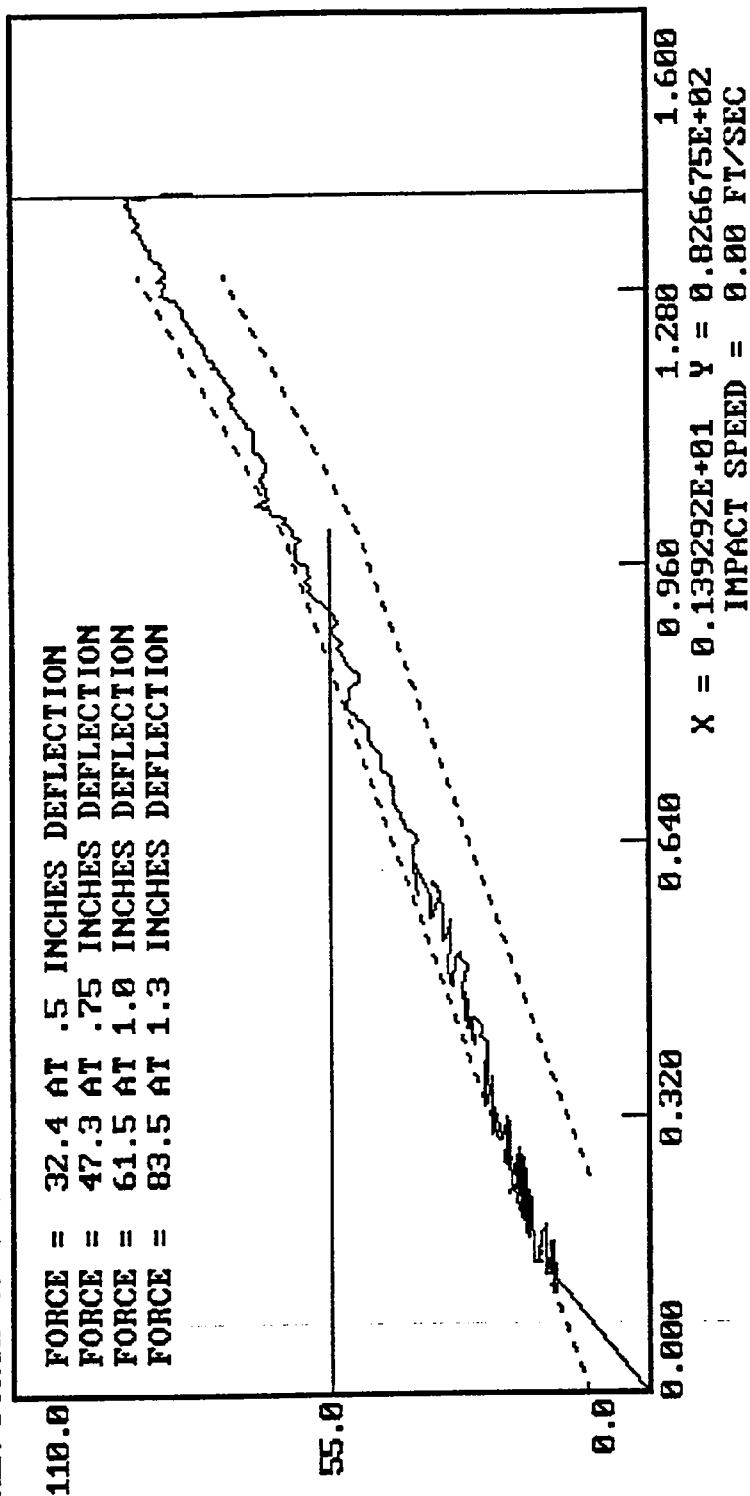
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

06-20-1994 15:15

DUMMY CALIBRATION - ABDOMEN COMPRESSION
DUMMY # 272
ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

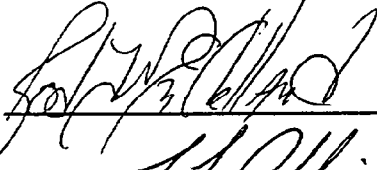
DATE: June 20, 1994

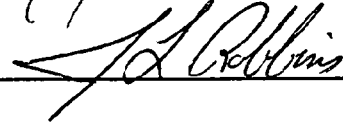
DUMMY NUMBER: 272

TEST NUMBER: D94185

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	72°
RELATIVE HUMIDITY	10 - 70%	55%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	37
FORCE @ 40°	46 - 58 lbs	47
RETURN ANGLE	12° maximum	7°

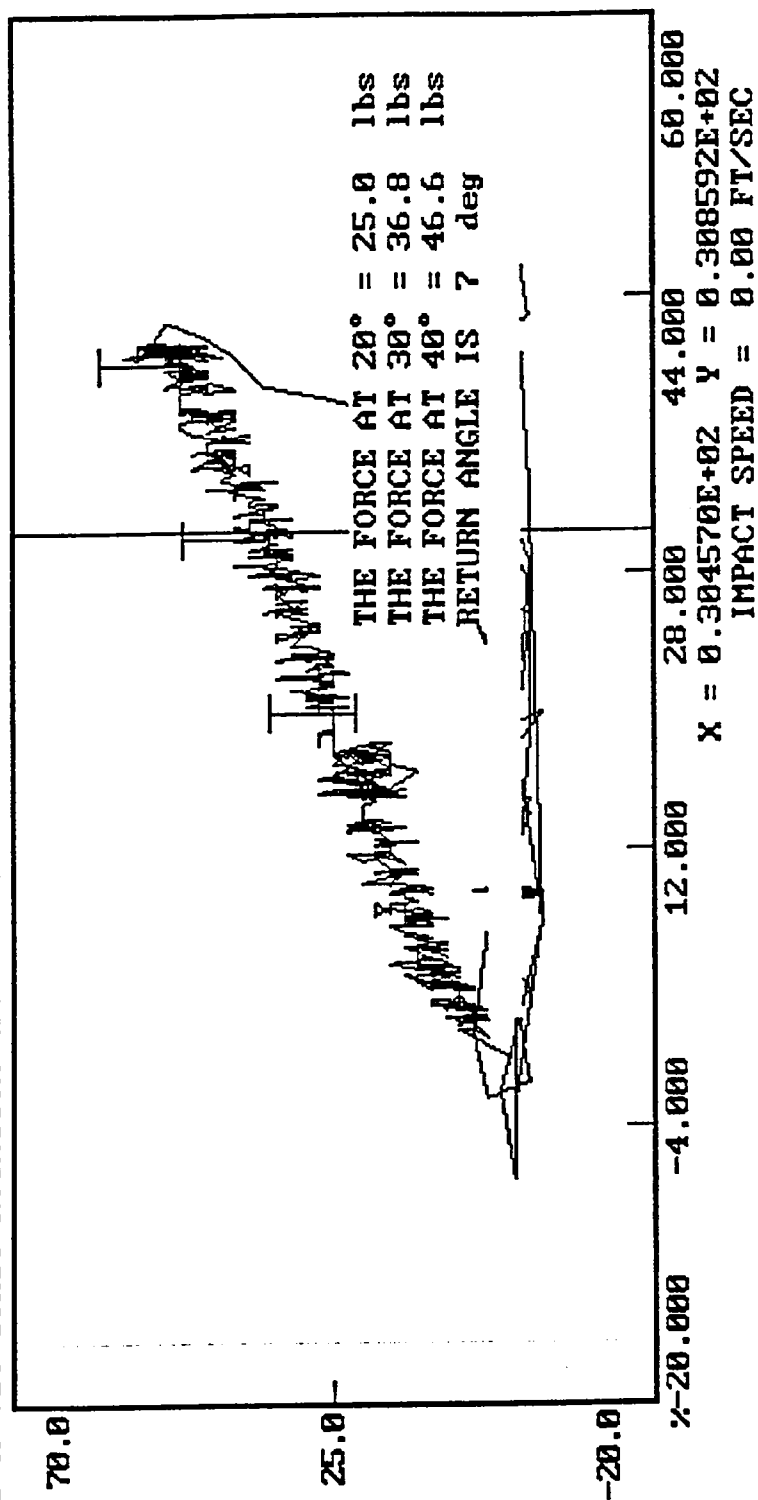
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

06-20-1994 15:44

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 272
FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Jeff Robbins

Date: June 17, 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: 272

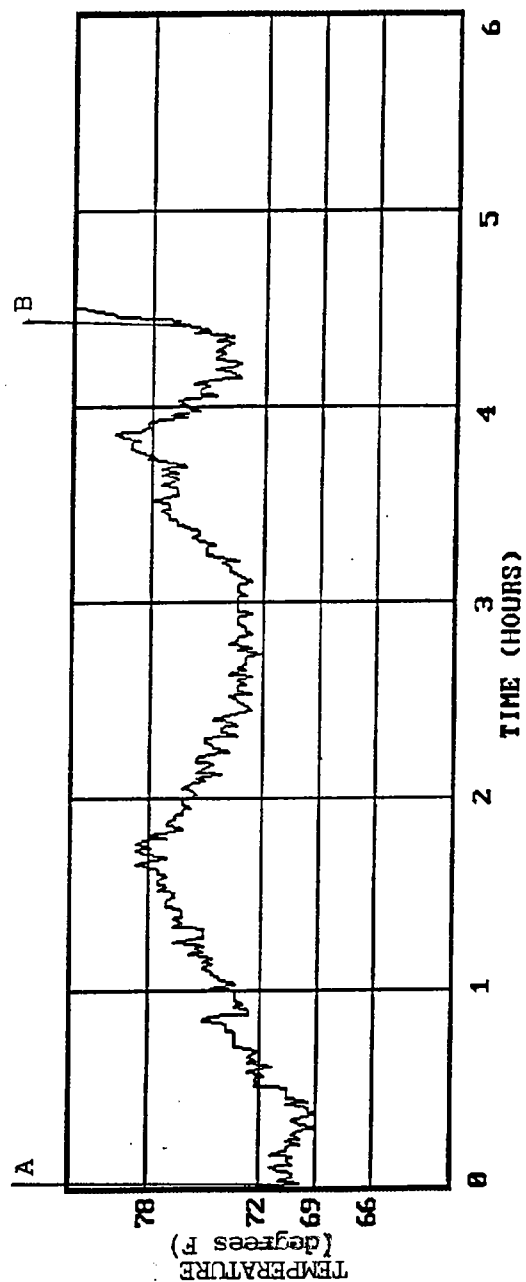
Inspected By: Jeff Robbins

Date: June 17, 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 installed in vehicle
B = Test conducted

APPENDIX D
DUMMY AND VEHICLE CALIBRATION DATA

**DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DRIVER DUMMY NO. 270**

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AGTW3	Endevco	June 10, 1994
Lower Rib	AHTW4	Endevco	June 10, 1994
Lower Spine	AGRD5	Endevco	June 10, 1994
Pelvis	AHTN3	Endevco	June 10, 1994
Upper Rib Redundant	AHOC3	Endevco	June 14, 1994
Lower Rib Redundant	AHWL7	Endevco	June 10, 1994
Lower Spine Redundant	AC6J4	Endevco	June 10, 1994
Pelvis Redundant	AC9B7	Endevco	June 10, 1994

INSTRUMENTS FOR PASSENGER DUMMY NO. 272

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AGTM2	Endevco	June 10, 1994
Lower Rib	ACCA3	Endevco	June 10, 1994
Lower Spine	AGT57	Endevco	June 10, 1994
Pelvis	AHTL9	Endevco	June 10, 1994
Upper Rib Redundant	AGTB5	Endevco	June 10, 1994
Lower Rib Redundant	AHTP3	Endevco	June 10, 1994
Lower Spine Redundant	AGTG8	Endevco	June 10, 1994
Pelvis Redundant	AC9B7	Endevco	June 10, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	MGA135	Entran	June 13, 1994
MDB CG Y	MGA126	Entran	June 13, 1994
MDB CG Z	AZ02	Endevco	June 13, 1994
MDB Rear Axle X	MGA054	Entran	June 13, 1994
MDB Rear Axle Y	MGA165	Entran	June 13, 1994
Lower Left A-Post	MGA079	Entran	June 14, 1994
Lower Left B-Post	MGA144	Entran	June 14, 1994
Upper Left B-Post	MGA016	Entran	June 14, 1994
Trunk Centerline X	AC815	Entran	June 13, 1994
Trunk Centerline Y	MGA007	Entran	June 14, 1994
Trunk Centerline Z	MGA124	Entran	June 13, 1994
Driver Seat Track	MGA130	Entran	June 14, 1994
Right Front Sill X	MGA146	Entran	June 13, 1994
Right Front Sill Y	MGA106	Entran	June 13, 1994
Right Front Sill Z	MGA114	Entran	June 13, 1994
Right Rear Sill X	MGA143	Entran	June 14, 1994
Right Rear Sill Y	MGA158	Entran	June 14, 1994
Right Rear Sill Z	MGA137	Entran	May 24, 1994
Right Rear Seat Occupant Compartment	MGA131	Entran	June 14, 1994

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