

V2215

REPORT NO.: MGA-95-21404

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

GENERAL MOTORS CORPORATION
1995 CHEVROLET MONTE CARLO 2 DOOR COUPE
NHTSA NO: CS0110

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



MGA Ref. No.: G93A-02

Test Date: November 17, 1994

Report Date: November 30, 1994

FINAL REPORT

Prepared For:

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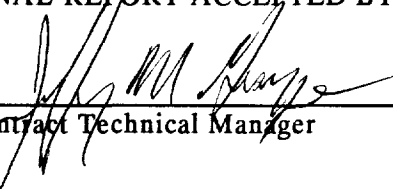
Approved by:



John Fleck, Project Engineer

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Contract Technical Manager

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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 Chevrolet Monte Carlo 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 Chevrolet Monte Carlo 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 November 17, 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. The SID in the driver (Pos. #1) was placed according to instructions specified in the Laboratory Test Procedure. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report. Appendix B contains the vehicle and dummy response data traces

The SIDs were instrumented with the following accelerometers.

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

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

SECTION 3
SUMMARY OF TEST DATA

TABLE 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe
Vehicle NHTSA No.: CS0110 VIN: 2G1WW12M0S9154501
Vehicle Body Color: Blue Month & Year of Manufacture: 9-94
Engine Data: 6 cylinders; CID; 3.1 Liter; cc
Placement Longitudinal; or X Lateral
Transmission: 4 speed; Manual; X Automatic; Overdrive
Final Drive: Rear Wheel Drive; X Frt. Wheel Drive; Four Wheel Drive
Odometer Reading 213 miles
Options: X A/C; X Pwr. Steering; X Pwr. Brakes; X Pwr. Windows
 Power Seats; Tilt Wheel; X Power Door Locks; Self Leveling System

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 30 Psi FRONT (210 kpa)
30 Psi REAR (210 kpa)
Recommended Tire Size: P205/70R15
Tires on Test Vehicle. P205/70R15 Manufacturer: BF Goodrich

Vehicle Capacity Data:

Number of Occupants: 3 Front; 3 Rear; 3rd Seat 6 Total
Type of Front Seats: Bucket; Bench; X Split Bench
Type of Front Seat Back: Fixed; X Adjustable with X Lever
Vehicle Maximum Capacity Loading = 1058 lbs (A) (480 kg)
No. of Occupants x 150 lbs. = 900 lbs (B) (408 kg)
Cargo Capacity (A-B) = 158 lbs (72 kg)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>1037</u> lbs (470.4 kg)	Right Rear	=	<u>599</u> lbs (271.7 kg)
Left Front	=	<u>1086</u> lbs (492.6 kg)	Left Rear	=	<u>595</u> lbs (269.9 kg)
TOTAL FRONT	=	<u>2123</u> lbs (963.0 kg)	TOTAL REAR	=	<u>1194</u> lbs (541.6 kg)
% of Total Vehicle Weight	=	<u>64.0</u> %	% of Total Weight	=	<u>36.0</u> %
TOTAL WEIGHT	=	<u>3317</u> lbs (1504.6 kg)			

TABLE 2
TEST VEHICLE DATA

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT

Total Test Vehicle Delivered Weight with Maximum Fluids = 3317 lbs (1504.6 kg)

Cargo Carrying Capacity of Test Vehicle = 158 lbs (71.7 kg)

Weight of 2 Side Impact Dummies (2 x 178 lbs.) = 356 lbs (161.5 kg)

TEST VEHICLE TARGET WEIGHT. = 3831 lbs (1737.8 kg)

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 1088 lbs (493.5 kg) Right Rear = 731 lbs (331.6 kg)

Left Front = 1202 lbs (545.2 kg) Left Rear = 792 lbs (359.3 kg)

TOTAL FRONT = 2290 lbs (1038.7 kg) TOTAL REAR = 1523 lbs (690.9 kg)

% of Total Weight = 60 % % of Total Weight = 40 %

TOTAL TEST WEIGHT = 3813 lbs (1729.6 kg)

TEST VEHICLE ATTITUDE (all dimensions in inches):

CURB WEIGHT ATTITUDE: in (mm)

Right Front 28.4 (721) Left Front 27.7 (703) Right Rear 28.8 (732) Left Rear 29.0 (737)

FULLY LOADED WEIGHT ATTITUDE: in (mm)

Right Front 27.8 (707) Left Front 27.4 (697) Right Rear 28.0 (710) Left Rear 27.4 (697)

TEST ATTITUDE: in (mm)

Right Front 27.6 (700) Left Front 27.7 (703) Right Rear 28.0 (711) Left Rear 27.4 (697)

Test Vehicle Wheelbase 107.1 inches (2721 mm)

C.G = 42.6 inches (1082 mm) rearward of front wheel centerline

TOTAL VEHICLE LENGTH

Right Side = 186.4 in (4735 mm)

Centerline = 201.9 in (5128 mm)

Left Side = 186.4 in (4735 mm)

FIGURE 1
PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 8.7 in (220 mm)

Total Number of Adjustment Positions or Detents: 23

Test Position: Mid (12th detent from forward position,
1st detent being #1)

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 26° degrees

SECOND POSITION SEAT:

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

Seat Back Adjustment Position: Non-Adjustable

ADJUSTABLE STEERING COLUMN POSITION: Adjusted to mid position
(3rd position up from down)

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 = 17.1 gallons (64.7 liters)

Test Volume: 15.8 gallons (59.8 liters) 92.3% of capacity

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

Wheelbase: = 107.1 in (2721 mm)

Impact Point is 16.6 in (421 mm) rearward of front axle centerline

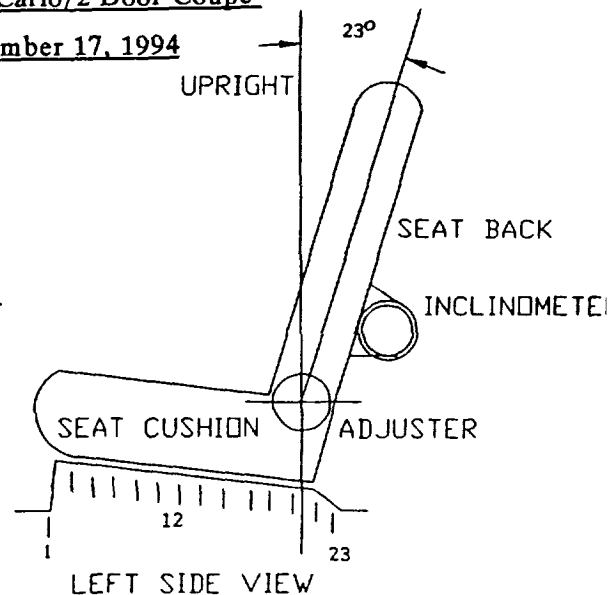


TABLE 3
CRASH TEST SUMMARY FOR TEST VEHICLE

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

Overall Length = 201.9 in (5128 mm); Overall Width = 71.2 in (1809 mm)

TEST WEIGHT

Right Front	=	<u>1088</u> lbs (493.5 kg)	Right Rear	=	<u>731</u> lbs (331.6 kg)
Left Front	=	<u>1202</u> lbs (545.2 kg)	Left Rear	=	<u>792</u> lbs (359.3 kg)
TOTAL FRONT	=	<u>2290</u> lbs (1038.7 kg)	TOTAL REAR	=	<u>1523</u> lbs (690.9 kg)
% of Total	=	<u>60</u> %	% of Total	=	<u>40</u> %
TOTAL VEHICLE WEIGHT <u>3813</u> lbs (1729.6 kg)					
Wheelbase = <u>107.1</u> in (2721 mm)					
Longitudinal C.G. front Center of Front Axle				=	<u>42.6</u> in (1082 mm)
Impact Angle with Respect to Impactor				=	<u>90°</u> degrees

MAXIMUM EXTERIOR STATIC CRUSH

1	LEVEL 1 (	<u>309</u> mm above ground)	=	<u>284</u> mm
2	LEVEL 2 (	<u>493</u> mm above ground)	=	<u>360</u> mm
3	LEVEL 3 (	<u>602</u> mm above ground)	=	<u>312</u> mm
4.	LEVEL 4 (	<u>897</u> mm above ground)	=	<u>233</u> mm
5	LEVEL 5 (	<u>1311</u> mm above ground)	=	<u>64</u> mm
Maximum Post-Test Intrusion = <u>360</u> mm				

OCCUPANTS

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

INSTRUMENTATION:

Number of Vehicle Data Channels	=	<u>17</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: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

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

MDB WEIGHT:

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

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degrees

Impact Speed = Primary: 32.9 mph (52.5 kph) Secondary: 33.0 mph (52.6 kph)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1.	Row A Top of Stack (33 in)	= <u>112</u> mm
2.	Row B Mid Stack (27 in)	= <u>102</u> mm
3.	Row C Top of Bumper (21 in)	= <u>99</u> mm
4.	Row D Center of Bumper (17 in)	= <u>112</u> mm

INSTRUMENTATION

Number of MDB Data Channels = 7

TABLE 5
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No. CS0110 TEST DATE November 17, 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 "C" Post</u>
Pelvis	<u>to door trim panel</u>	<u>to door panel</u>
Left Knee	<u>to door trim panel</u>	<u>to "B" Post</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 in (0 mm) forward/rearward Vertical. .25 in (6.4 mm) low

ARM REST LOCATIONS:

Front 9 in below window opening

Rear 9 in below window opening

SEAT CRUSH:

Driver Seat Back: 145 mm Driver Seat Cushion: 22 mm

Left Rear Seat Back: 200 mm Left Rear Seat Cushion: 250 mm

GLAZING DAMAGE:

Driver's Side Door Window broke and windshield cracked

PILLAR PERFORMANCE:

No separation noted

SILL SEPARATION:

No separation noted

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARYYear/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

	Front Dummy ID # 272			Rear Dummy ID # 270		
	Pos. Direct.		Neg. Direct	Pos. Direct.		Neg. Direct
	Max (g)	Time (msec)		Max (g)	Time (msec)	
RIB ACCELERATIONS:						
Upper Rib Lateral.....Y	63.5	38	-13.5	74.8	49	-6.5
Upper Rib Lateral....Y(R)	63.9	38	-13.2	73.5	49	-6.3
Lower Rib Lateral.....Y	64.3	40	-10.4	70.9	48	-21.1
Lower Rib Lateral.....Y(R)	64.9	40	-9.8	67.9	48	-20.0
SPINE ACCELERATIONS:						
Lower Lateral.....Y	80.2	43	-15.8	68.1	49	-19.8
Lower LateralY(R)	79.5	42	-15.8	67.4	49	-21.3
PELVIC ACCELERATIONS:						
Lateral.....Y	77.2	38	-8.5	70.7	41	-9.4
Lateral.....Y(R)	71.5	38	-8.0	72.4	41	-9.6

REFERENCE:

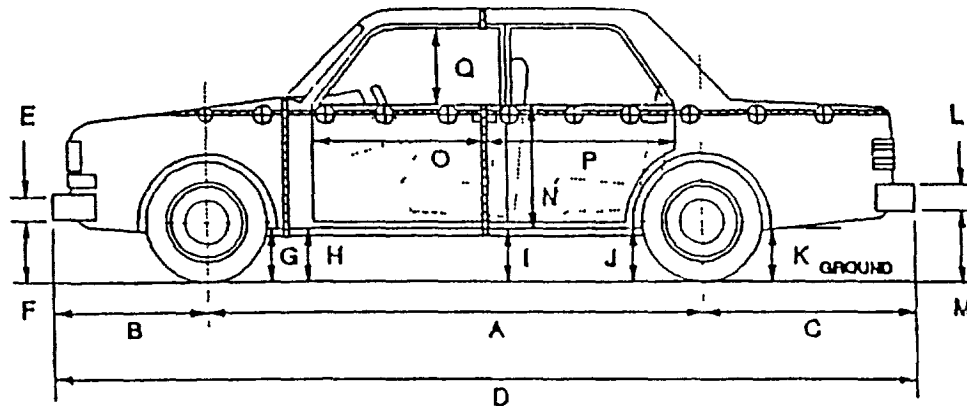
Positive Direction - Longitudinal (X) = forward

Lateral (Y) = to right

Vertical (Z) = up

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

FIGURE 2
PRE- AND POST-TEST MEASUREMENTS



LEFT SIDE VIEW

D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

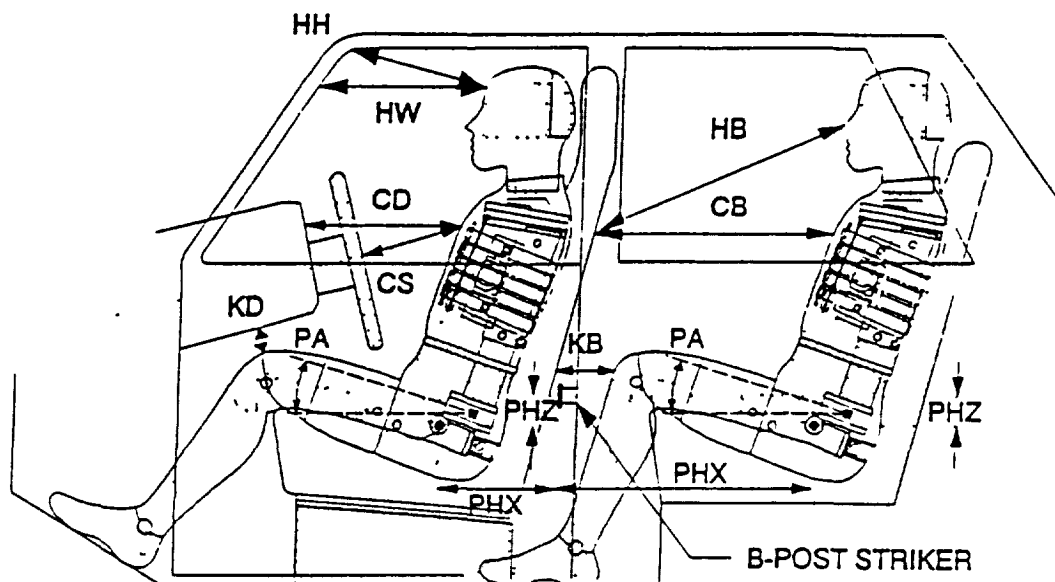
J1 = To Pinch Weld

J2 = To Sill

Units: mm

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	2727	2710	17
B	1189	1189	0
C	1212	1111	101
D	5128	5010	118
E	217	217	0
F	358	374	16
G	231	228	3
H	215	212	3
I	210	188	22
J1/J2	209/212	214/197	5/15
K	258	264	6
L	370	370	0
M	319	341	22
N	632	500	132
O	827	760	67
P	589	584	5
Q	398	391	7
R	4735	4695	40
S	4735	4766	31
T	1809	1048	761

FIGURE 3
SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

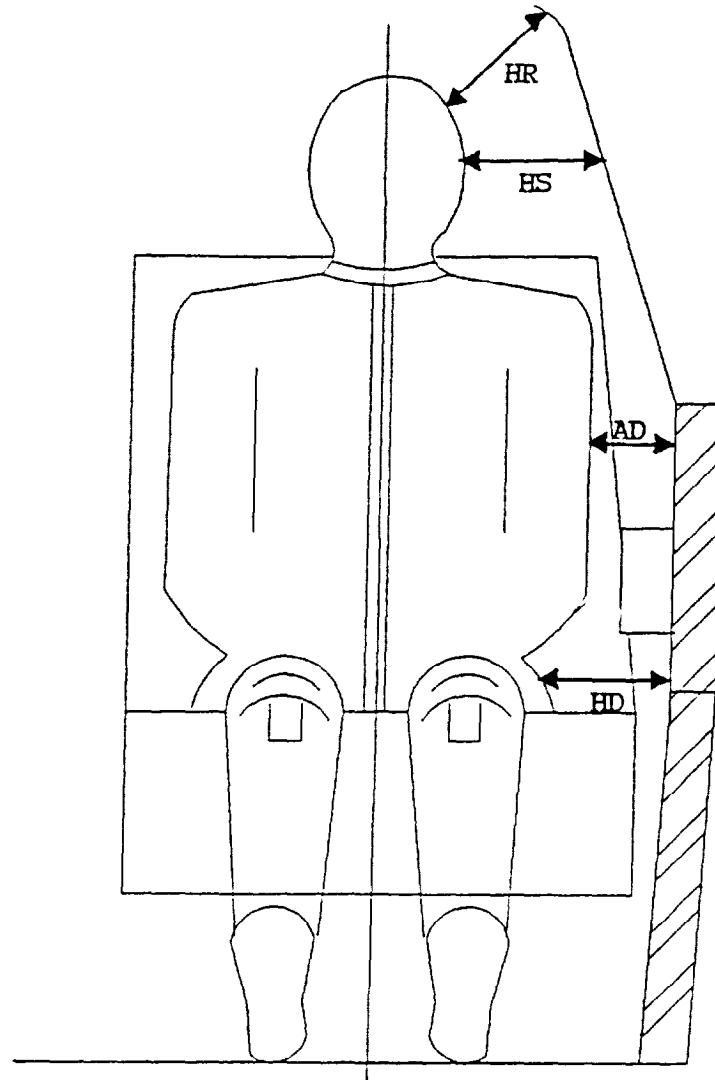
NOTE: 2-DOOR VEHICLE SHOWN
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in mm

	DRIVER ID #272	LEFT REAR PASSENGER ID #270	
HH	361	---	
HW	550	---	
HB	---	680	
CD	502	CB	562
CS	294	---	
KDL	74	KBL	130
KDR	90	KBR	132
PA°	23.2°	24.6°	
PHX	504	379	
PHZ	136	153	

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

FIGURE 4
SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS



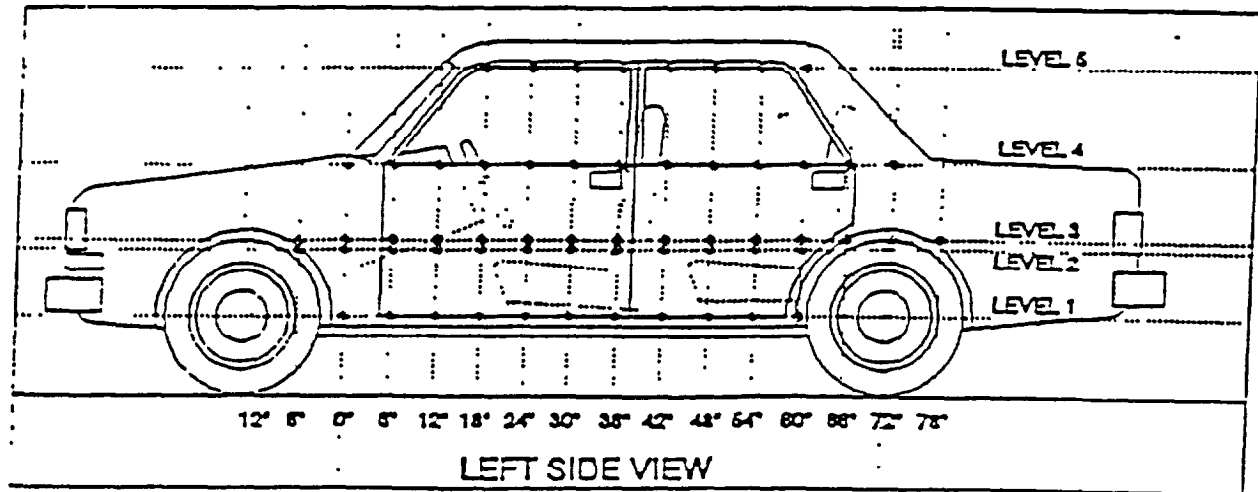
NOTE: All dimensions are in mm

	DRIVER ID #272	LEFT REAR PASSENGER ID #270
HR	120	167
HS	312	264
AD	158	158
HD	181	94

FIGURE 5
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 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>51.6</u> in (1311 mm)
Level 4 @ Window Sill	= <u>35.3</u> in (897 mm)
Level 3 @ Mid Door	= <u>23.7</u> in (602 mm)
Level 2 @ Occupant H-Point	= <u>19.4</u> in (493 mm)
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>12.2</u> in (309 mm)

TABLE 7

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

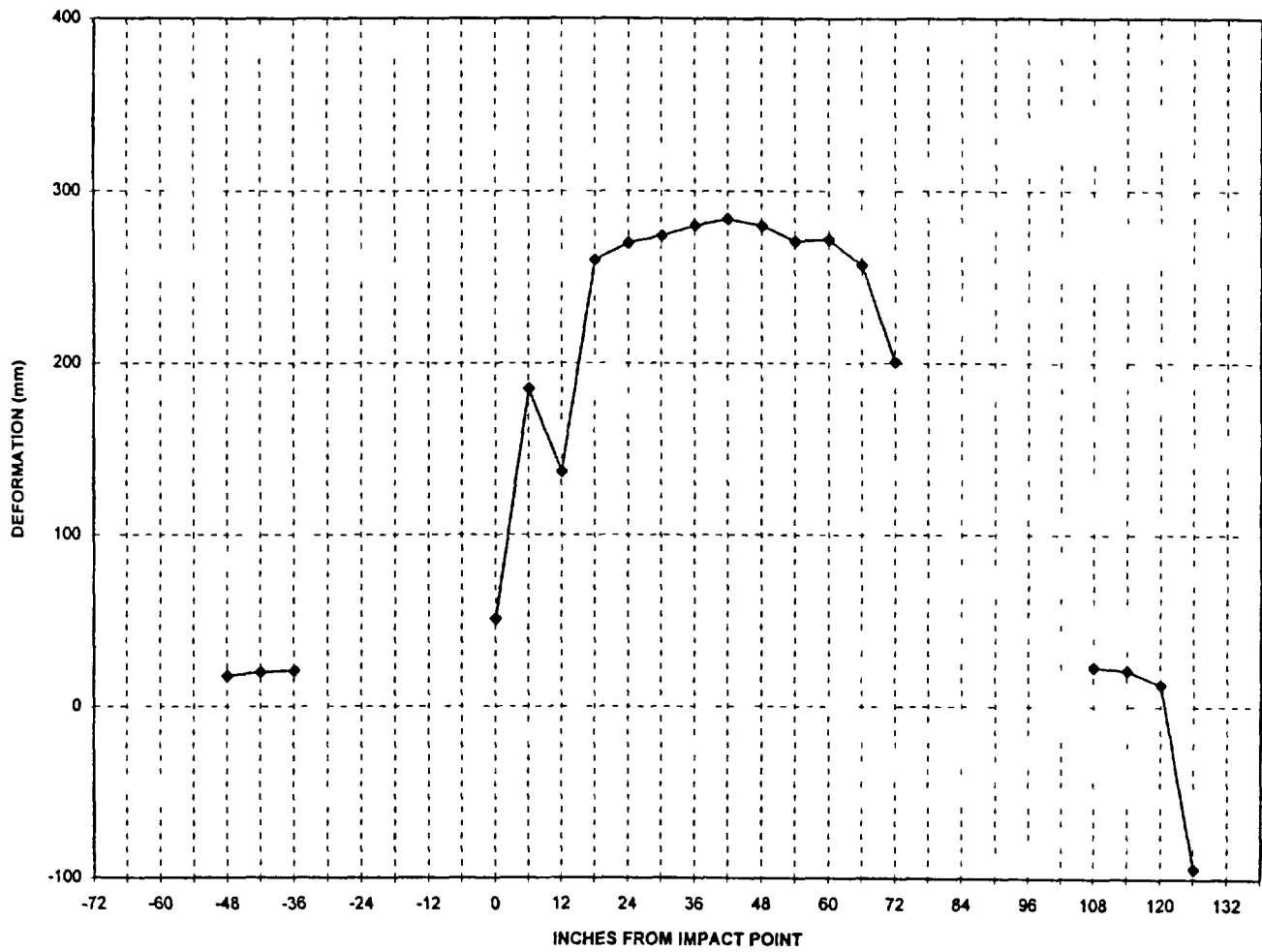
Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.. CS0110 TEST DATE: November 17, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	887	905	18
-42	842	862	20
-36	819	840	21
-30	---	---	---
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	780	831	51 (impact point)
6	781	966	185
12	781	918	137
18	781	1041	260
24	782	1052	270
30	781	1055	274
36	783	1063	280
42	786	1070	284
48	786	1066	280
54	786	1057	271
60	786	1058	272
66	790	1047	257
72	791	992	201
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	831	854	23
114	847	868	21
120	872	885	13
126	910	816	-94
132	---	---	---
138	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 1 AT AXLE CENTER LINE

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 2 AT OCCUPANT H-POINT

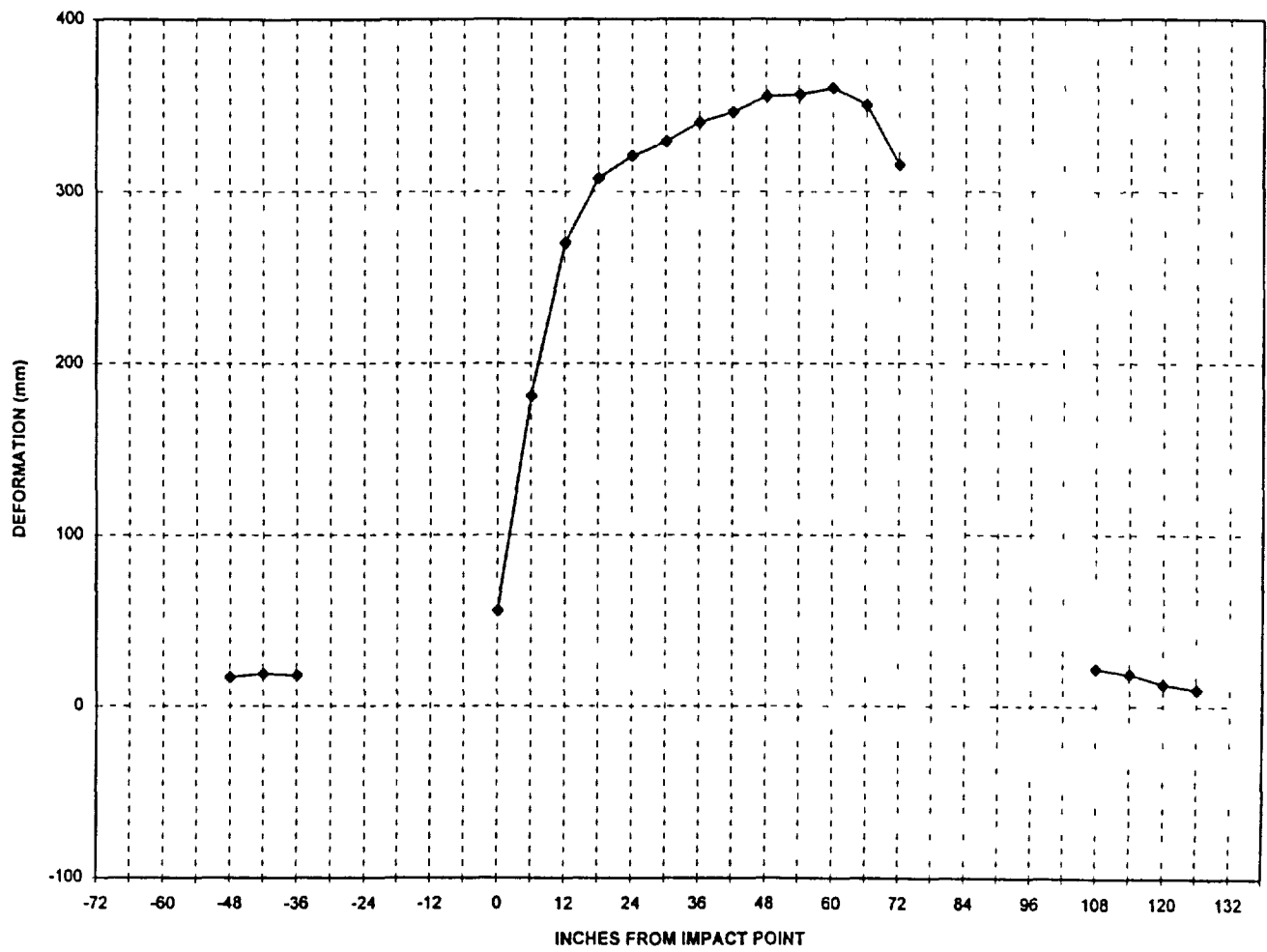
Year/Make/Model/Body Style 1995/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No. CS0110 TEST DATE: November 17, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	858	875	17
-42	825	844	19
-36	805	823	18
-30	---	---	---
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	756	812	56 (impact point)
6	756	937	181
12	755	1025	270
18	753	1061	308
24	753	1074	321
30	752	1081	329
36	751	1092	340
42	752	1098	346
48	752	1107	355
54	754	1110	356
60	757	1117	360
66	759	1109	350
72	763	1079	316
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	806	828	22
114	818	837	19
120	836	849	13
126	869	879	10
132	---	---	---
138	---	---	---
144	---	---	---

Reference plane is parallel to test vehicle longitudinal centerline

Given dimensions = reference plane to car body

FIGURE 6 (Cont'd)
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 2 AT OCCUPANT H-POINT

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

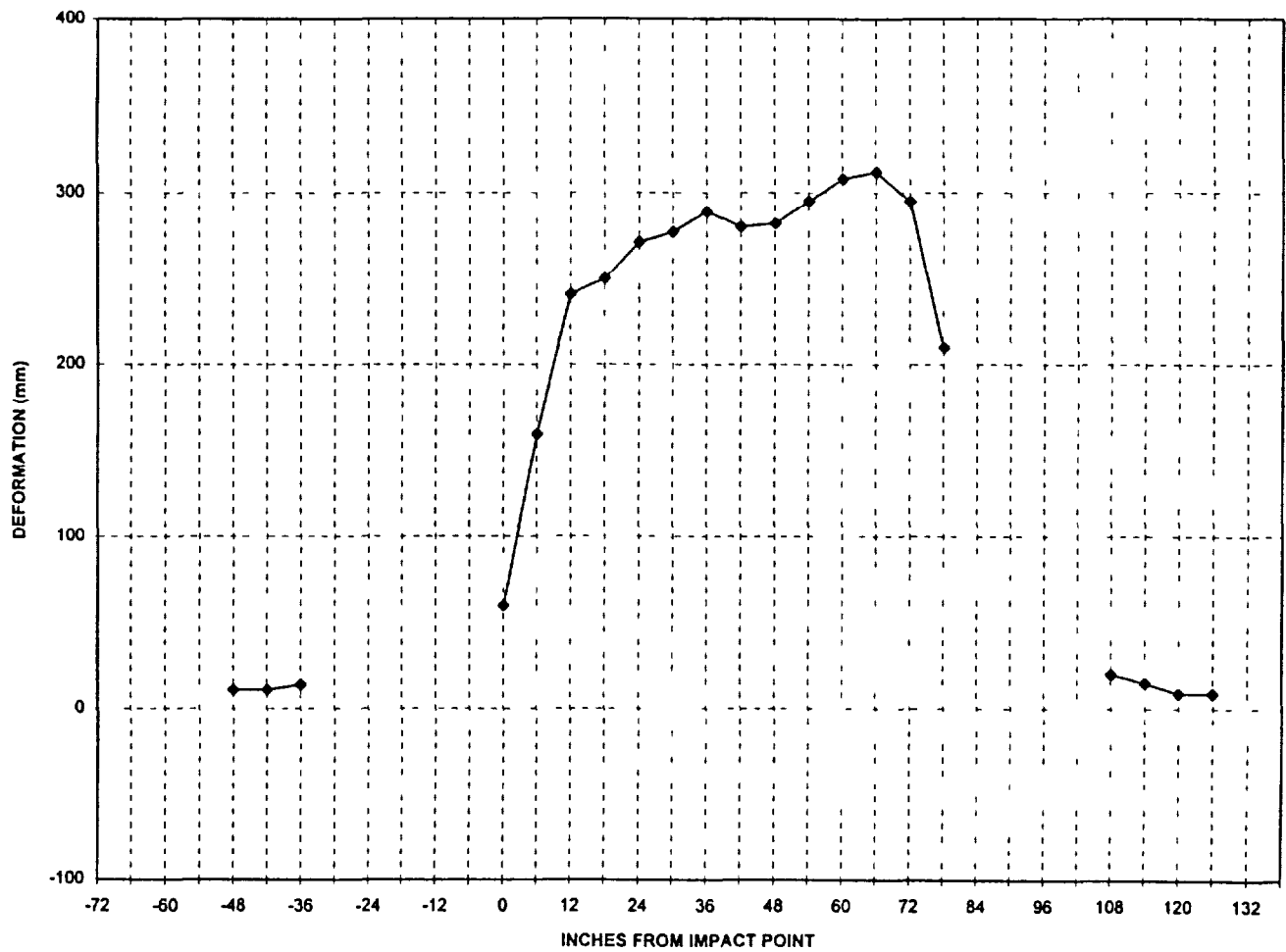
LEVEL 3 AT MID-DOOR

Year/Make/Model/Body Style 1995/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	886	897	11
-42	842	853	11
-36	817	831	14
-30	---	---	---
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	745	805	60 (impact point)
6	746	906	160
12	747	988	241
18	747	997	250
24	745	1018	271
30	743	1020	277
36	742	1031	289
42	741	1021	280
48	742	1024	282
54	744	1039	295
60	747	1055	308
66	752	1064	312
72	756	1051	295
78	759	969	210
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	802	822	20
114	821	836	15
120	848	857	9
126	886	895	9
132	---	---	---
138	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 3 AT MID-DOOR

TABLE 7

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

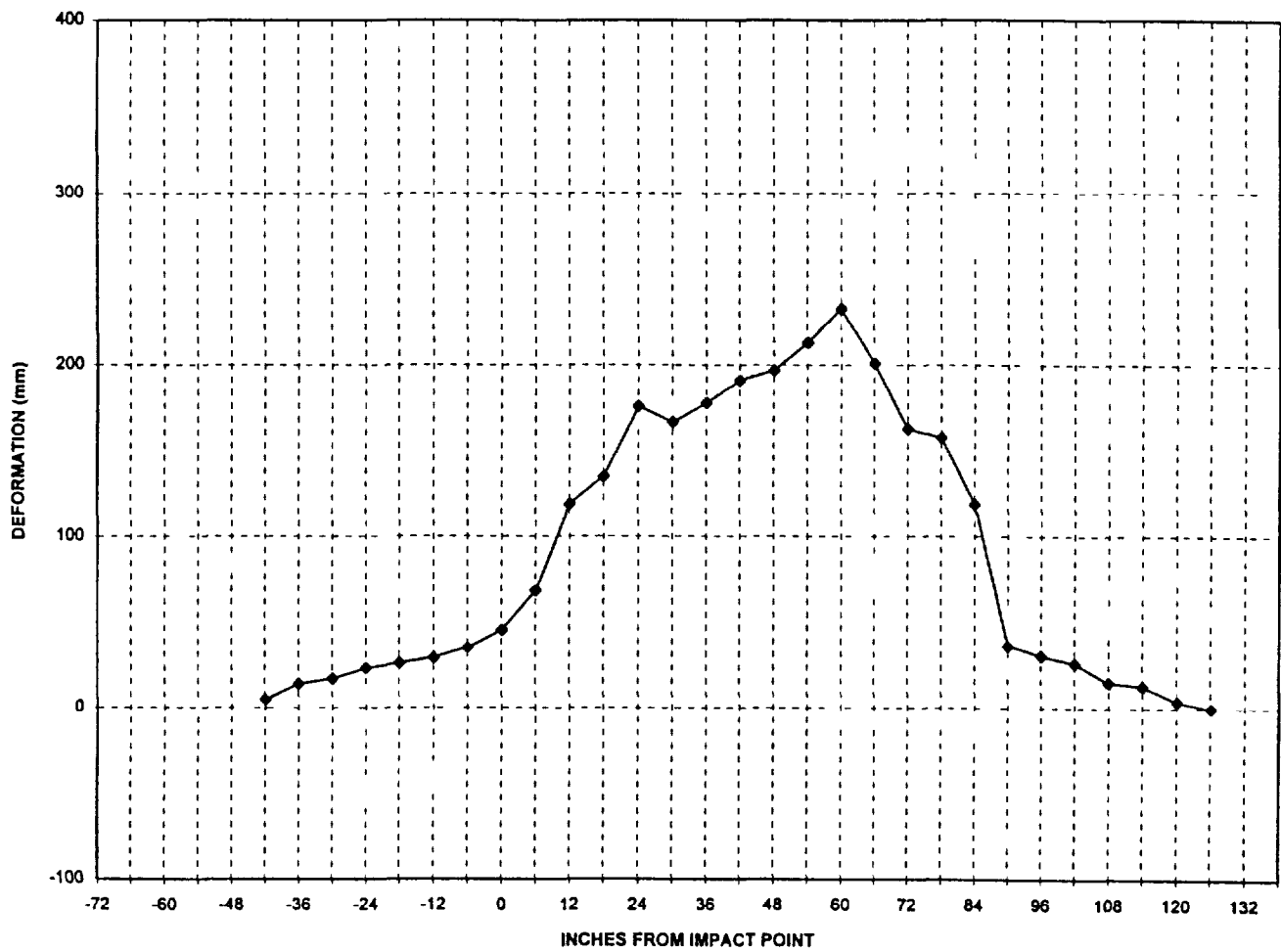
Year/Make/Model/Body Style 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No. CS0110 TEST DATE: November 17, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	905	910	5
-36	878	892	14
-30	862	879	17
-24	844	867	23
-18	835	861	26
-12	828	857	29
-6	822	857	35
0	818	863	45 (impact point)
6	816	894	68
12	816	835	119
18	812	947	135
24	809	985	176
30	812	979	167
36	812	990	178
42	811	1002	191
48	813	1010	197
54	814	1027	213
60	818	1051	233
66	823	1024	201
72	825	988	163
78	827	985	158
84	833	952	119
90	842	878	36
96	847	877	30
102	857	883	26
108	873	888	15
114	892	905	13
120	919	923	4
126	852	952	0
132	---	---	---
138	---	---	---
144	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 4 AT WINDOW SILL

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 5 AT WINDOW TOP

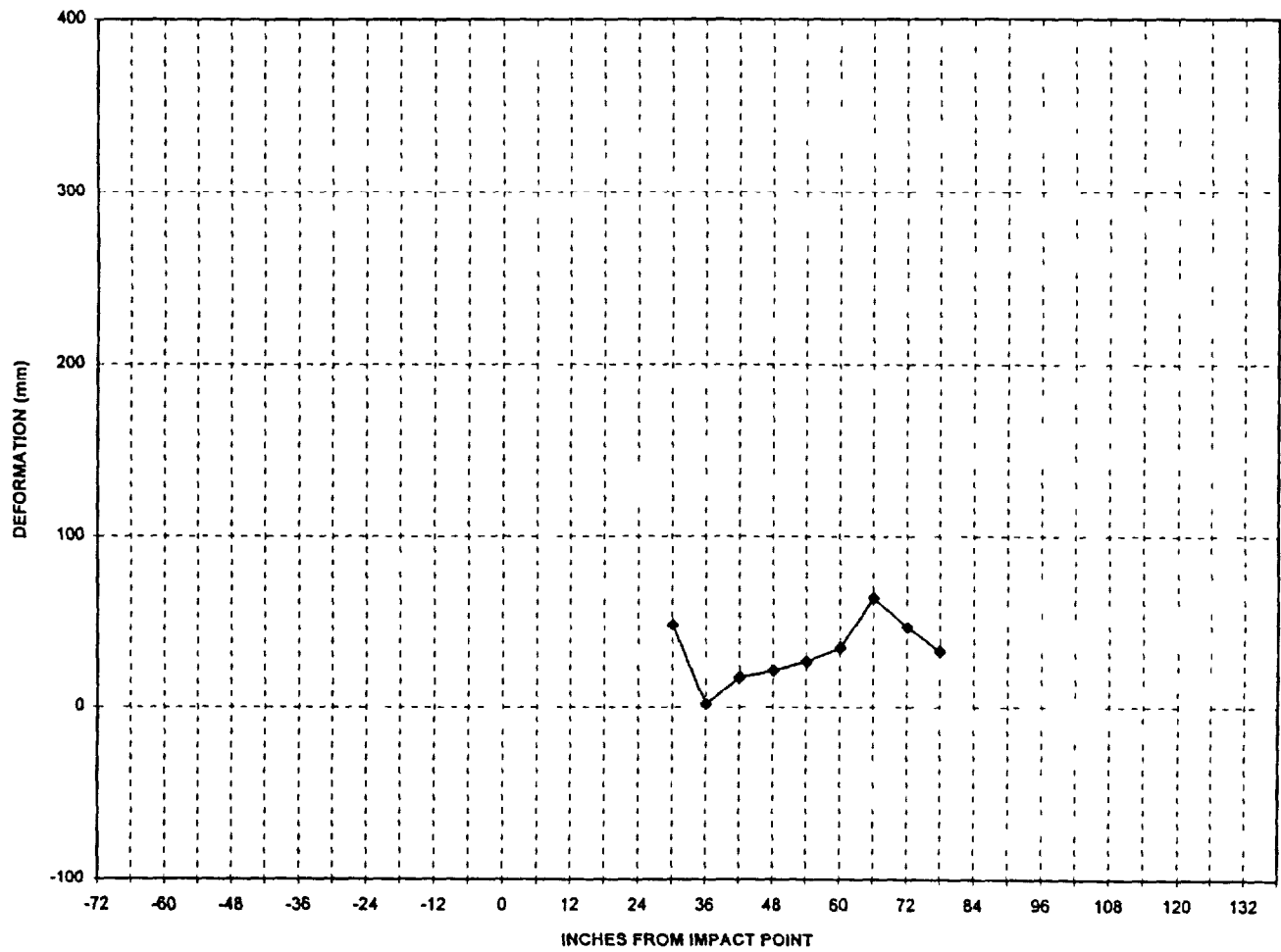
Year/Make/Model/Body Style 1995/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	---	---	---
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	---	---	---
6	---	---	---
12	---	---	---
18	---	---	---
24	---	---	---
30	<u>1066</u>	<u>1114</u>	<u>48</u>
36	<u>1061</u>	<u>1063</u>	<u>2</u>
42	<u>1058</u>	<u>1076</u>	<u>18</u>
48	<u>1061</u>	<u>1083</u>	<u>22</u>
54	<u>1063</u>	<u>1090</u>	<u>27</u>
60	<u>1067</u>	<u>1102</u>	<u>35</u>
66	<u>1069</u>	<u>1133</u>	<u>64</u>
72	<u>1082</u>	<u>1129</u>	<u>47</u>
78	<u>1092</u>	<u>1125</u>	<u>33</u>
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

4-17

FIGURE 7

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

TEST DATE: November 17, 1994

Vehicle NHSTA No.: CS0110

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

TEST DATE: November 17, 1994

Vehicle NHSTA No.: CS0110

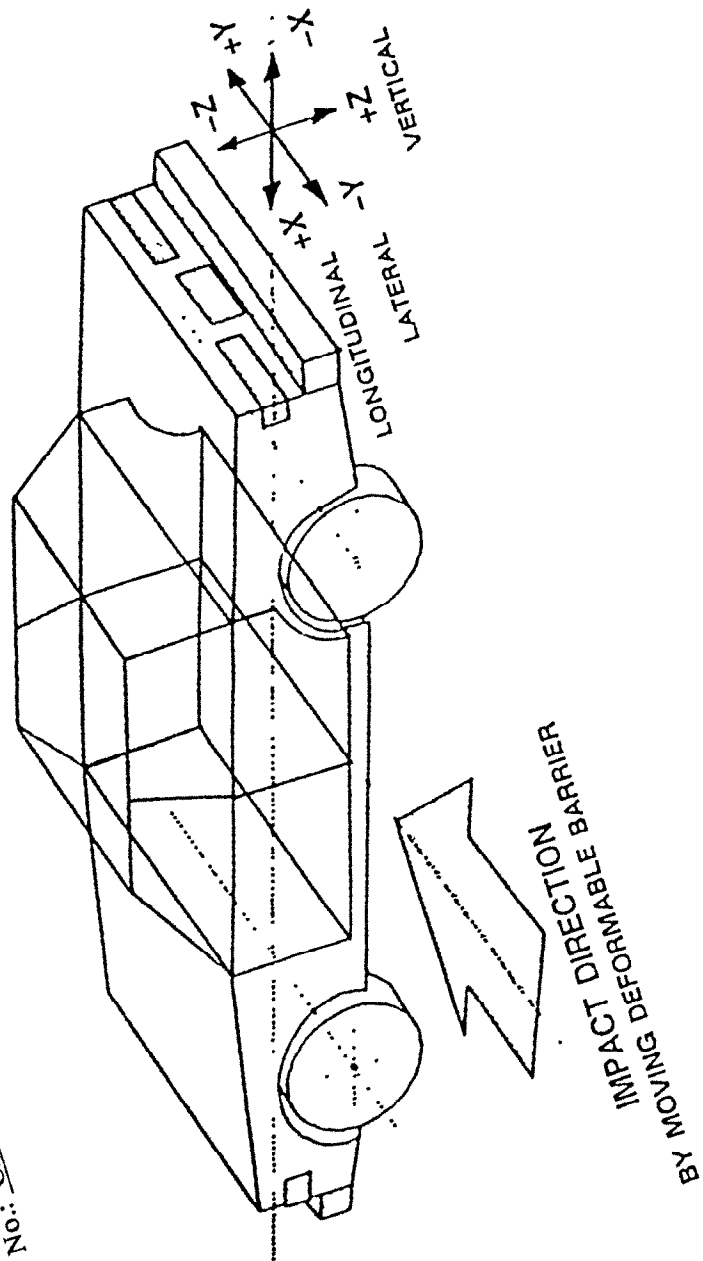
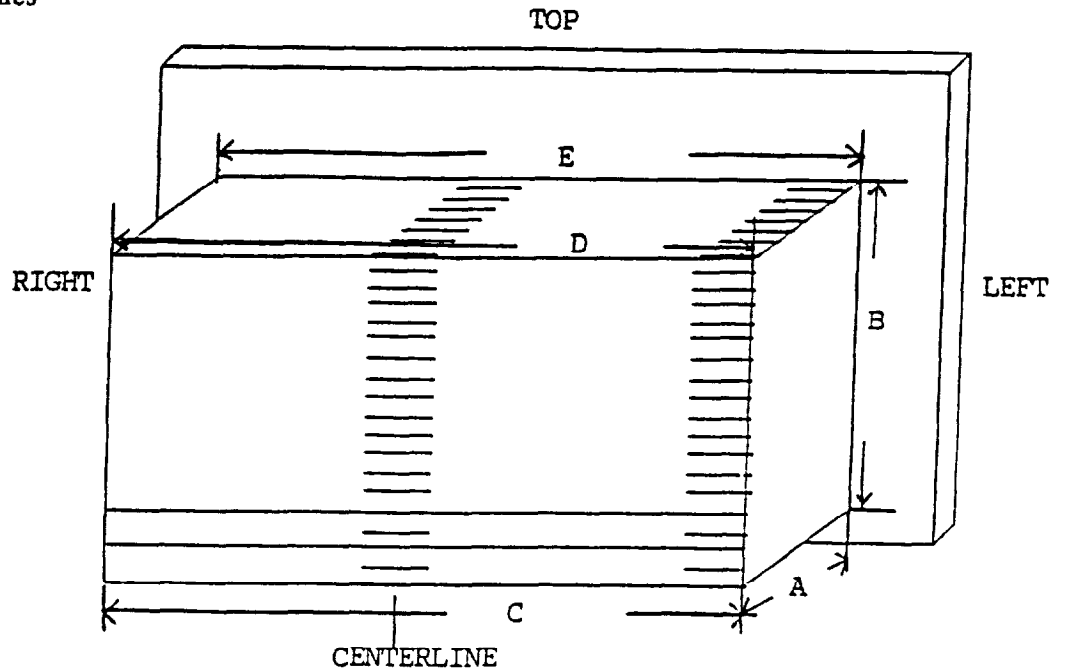


FIGURE 8
MDB FACE DIMENSIONS

Measurements in inches

A = 15.1
 B = 22.0
 C = 66.3
 D = 66.2
 E = 66.3



Measurements in inches

	Right	Left
A =	<u>10.9</u>	<u>11.0</u>
B =	<u>13.0</u>	<u>13.0</u>
C =	<u>21.0</u>	<u>21.0</u>
D =	<u>32.9</u>	<u>33.0</u>

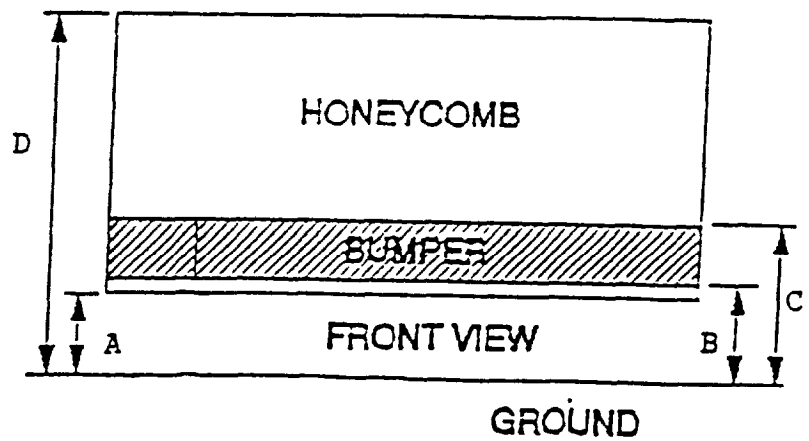


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTORYear/Make/Model/Body Style 1994/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No · CS0110 TEST DATE November 17, 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 (mm)	Crush inches (mm)	Crush inches (mm)	Crush inches (mm)
32"	3.3 (84)	10 (4)	13 (5)	66 (2.6)
28"	1 1 (28)	-5 (-.2)	0 (0)	56 (2.2)
24"	3 (8)	-5 (-.2)	-3 (-.1)	41 (1.6)
20"	-1 (-.3)	-3 (-.1)	-5 (-.2)	33 (1.3)
16"	-3 (-.1)	0 (0)	-3 (-.1)	28 (1.1)
12"	-3 (-.1)	-3 (-.1)	-3 (-.1)	28 (1.1)
8"	-3 (-.1)	-3 (-.1)	-3 (-.1)	28 (1.1)
4"	0 (0)	-3 (-.1)	-3 (-.1)	25 (1.0)
0"	0 (0)	-3 (-.1)	0 (0)	28 (1.1)
4"	0 (0)	-5 (-.2)	0 (0)	33 (1.3)
8"	0 (0)	-5 (-.2)	3 (1)	33 (1.3)
12"	0 (0)	-5 (-.2)	8 (3)	36 (1.4)
16"	5 (2)	-3 (-.1)	8 (3)	38 (1.5)
20"	20 (8)	-3 (-.1)	15 (6)	41 (1.6)
24"	46 (1.8)	3 (1)	20 (8)	53 (2.1)
28"	64 (2.5)	25 (1.0)	33 (1.3)	53 (2.1)
32"	4.4 (112)	4 0 (102)	99 (3.9)	112 (4.4)

Right

Left

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2920	630	320	6	5	18	2	5	10	18.6
2	Rt. Side Sill @ Rear Seat	2012	520	435	5	9	18	3	8	3	20.2
3	Rr. Floorpan Above Axle	1133	0	550	2	8	19	4	6	7	19.9
4	Left Side Sill @ Rr. Seat	2025	-722	240	---	---	25	9	---	---	---
5	Left Side Sill @ Frt. Seat	2863	-722	220	---	---	22	3	---	---	---
6	Left A-Post Lower**	3351	-745	500	---	---	82	4	---	---	---
7	Left Mid A-Post	3406	-745	708	---	---	150	87	---	---	---
8	Left B-Post Lower	2108	-755	465	---	---	189	244	---	---	---
9	Left B-Post Mid	2074	-745	795	---	---	150	2	---	---	---
10	Right Rear Occupant Compartment	2046	332	370	---	---	20	32	---	---	---
11	Driver Left Seat Track	2800	-700	260	---	---	62	*1	---	---	---

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

** Data shift during impact

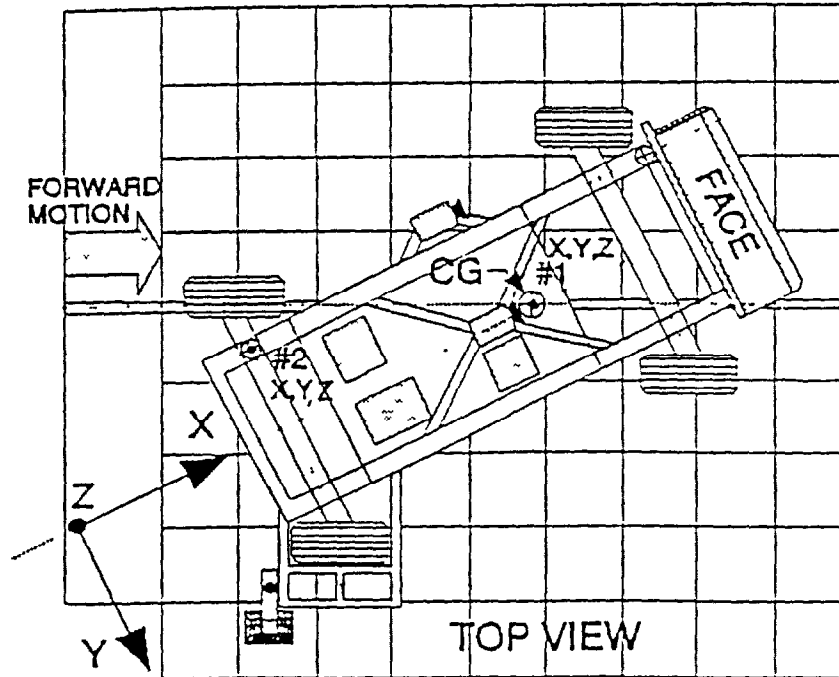
*1 Data loss at 20 msec.

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994



Accel. No.	Location	Coordinates (mm)			Pos Direct.		Neg. Direct.	
					Max (g)	Time (msec)	Max (g)	Time (msec)
		X	Y	Z				
1	MDB Center of Gravity							
	Longitudinal ... X				1.2	96	17.4	40
	Lateral Y	-1092	0	483	9.5	47	0.3	-18
	Vertical Z				10.7	62	11.8	24
	Resultant R				21.0	36	---	---
2	Rear Frame Member							
	Longitudinal ... X	-2591	-625	622	.9	185	22.6	43
	Lateral Y				*	*	*	*

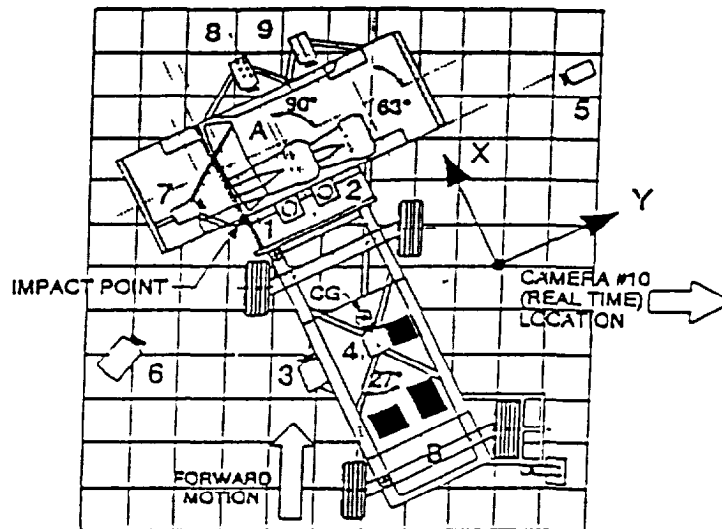
Reference: X = Front Axle (+Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Up)

* No valid data collected

FIGURE 10
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994



Camera No.	View	Coordinates (mm)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
	Real Time					13	24
1	Top Impact	-350	850	5420		13	985
2	Top Wide	700	0	5130		8	1000
3	Cart Pointer					35	952
4	Cart					13	926
5	Right Impact	3500	-7810	1010		25	976
6	Left Impact	-2715	2550	1480		13	1026
7	Onboard Driver					.5	909
8	Onboard Hood					13	1000
9	Onboard Passenger					8	1000

* 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/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 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 kph)

FUEL SPILLAGE MEASUREMENT

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

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

SOLVENT SPILLAGE DETAILS

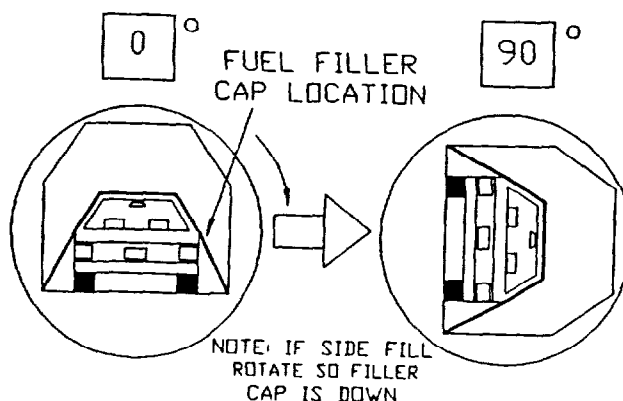
None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

TEST PHASE: 0° - 90°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 51 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 51 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.

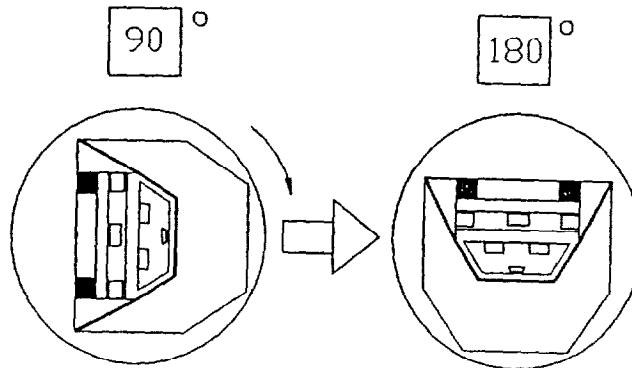
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

TEST PHASE: 90° - 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 35 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 35 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.

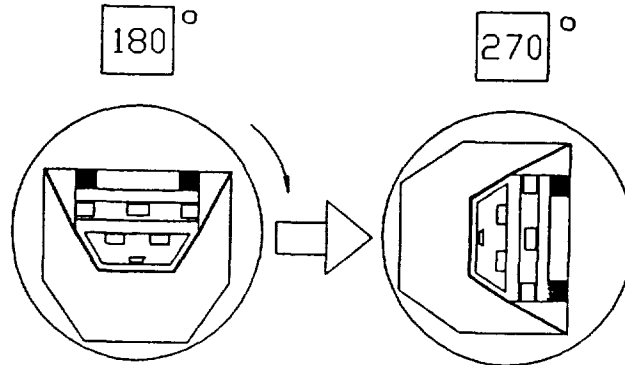
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Chevrolet/Monte Carlo/2 Door Coupe

Vehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 40 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 40 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
----------	---------	---------	---------

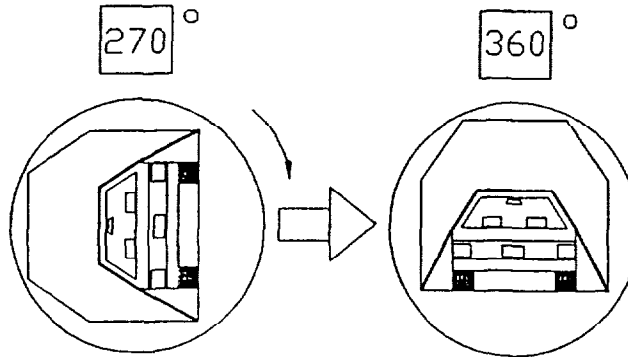
III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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/Chevrolet/Monte Carlo/2 Door CoupeVehicle NHTSA No.: CS0110 TEST DATE: November 17, 1994TEST PHASE: 270° - 360°I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 37 seconds
 (Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 37 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

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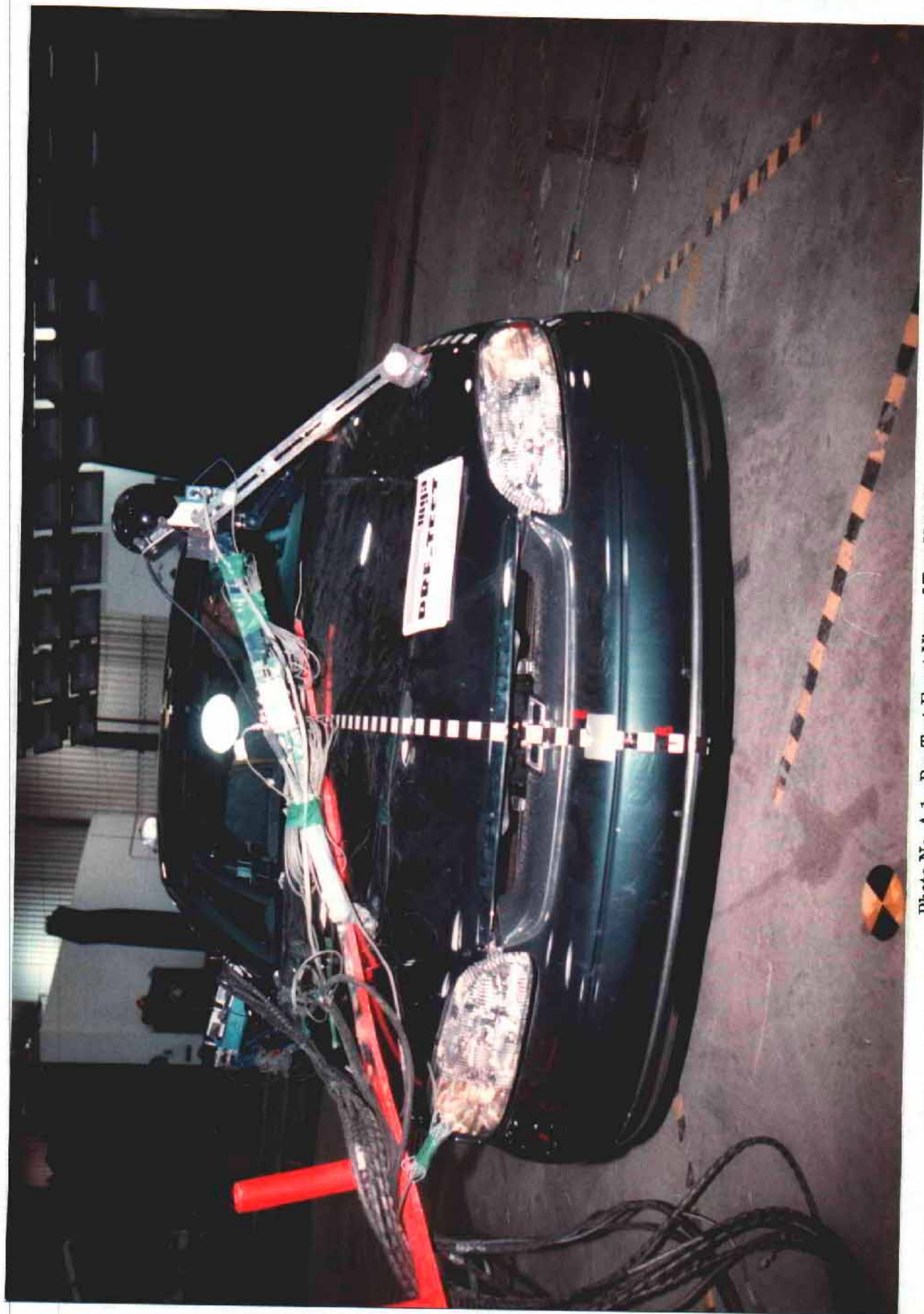


Photo No. A-1 - Pre-Test Front View of Test Vehicle



Photo No. A-2 - Pre-Test Rear View of Test Vehicle



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

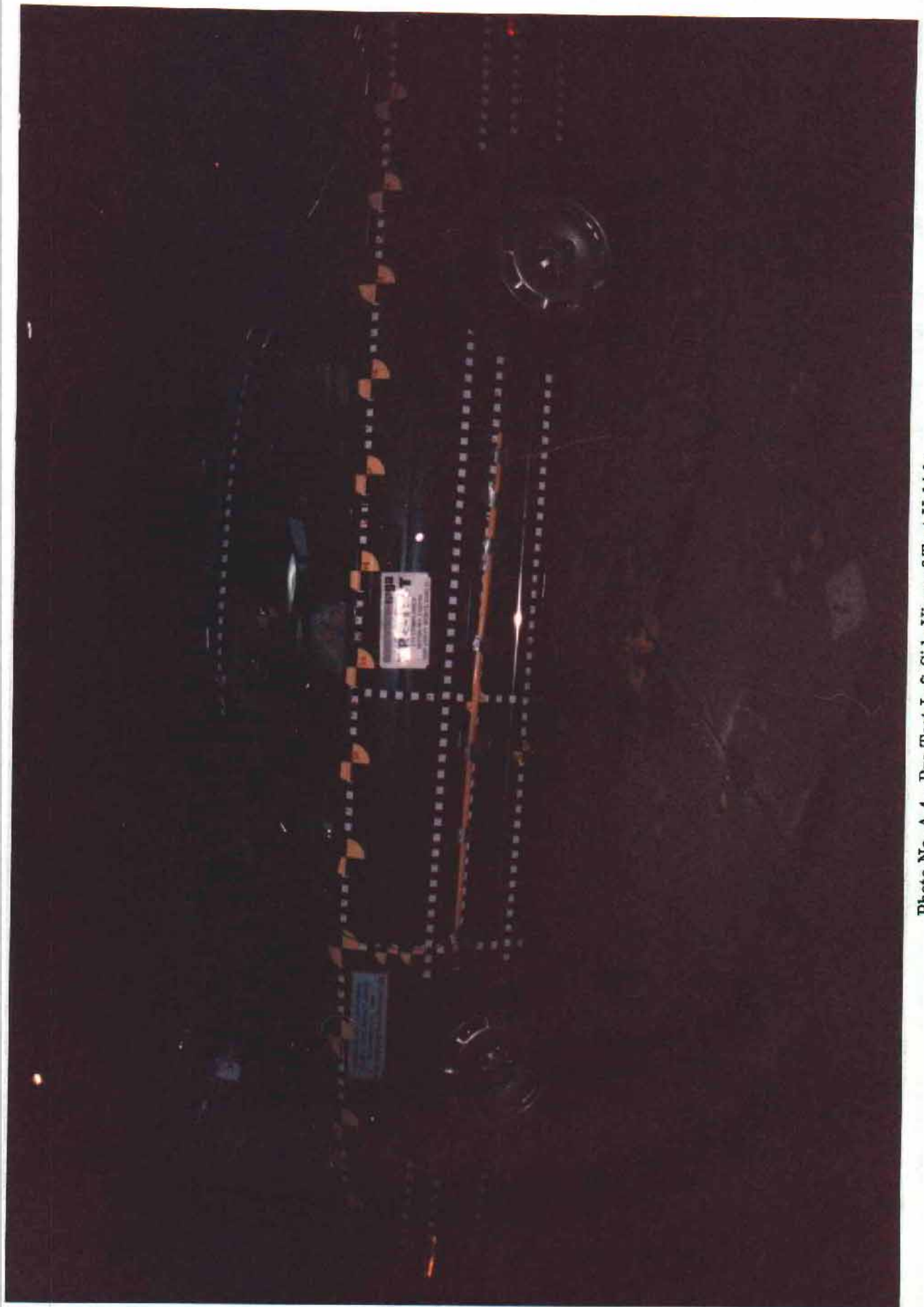


Photo No. A-4 - Pre-Test Left Side View of Test Vehicle

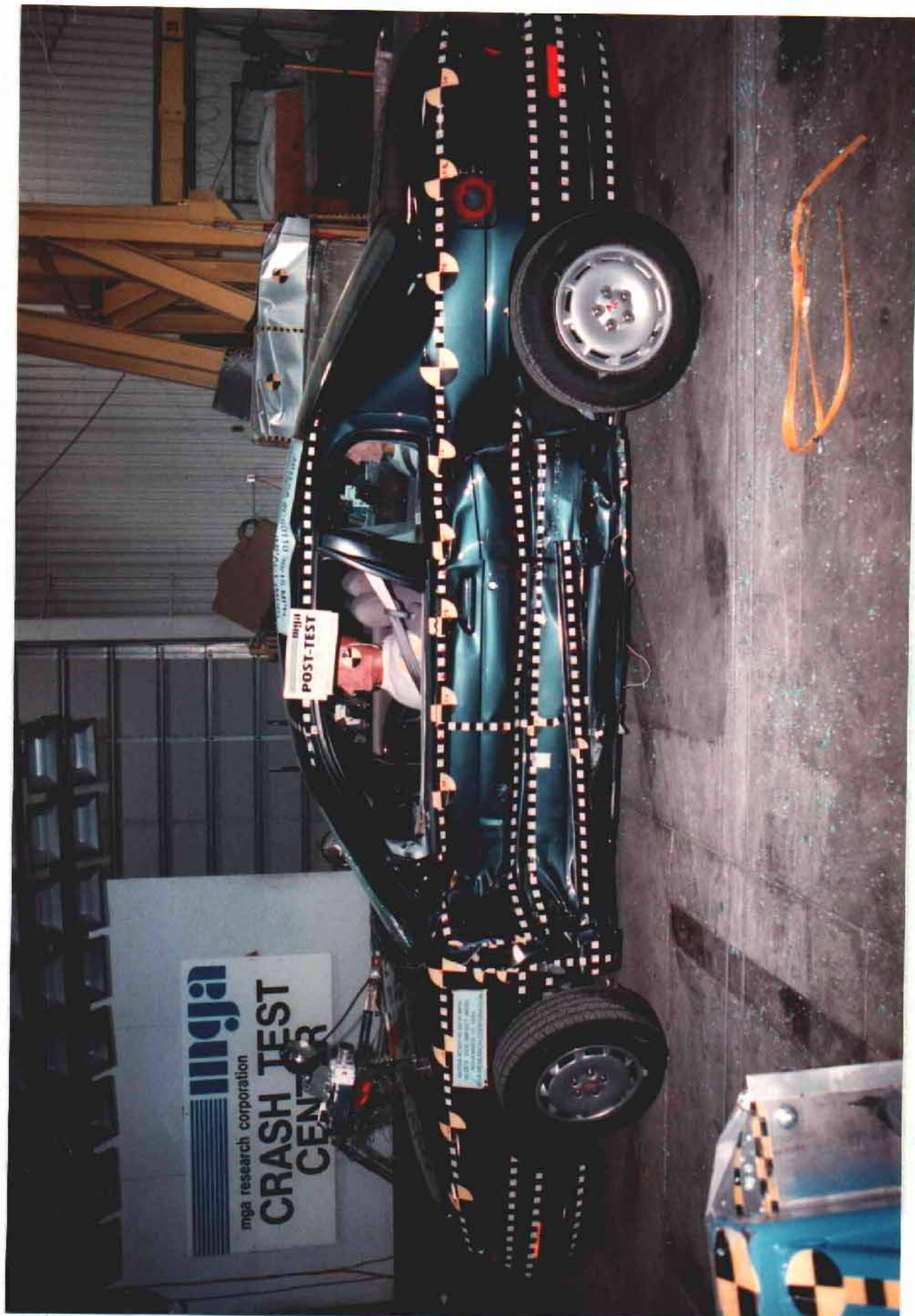


Photo No. A-5 - Post-Test Left Side View of Test Vehicle

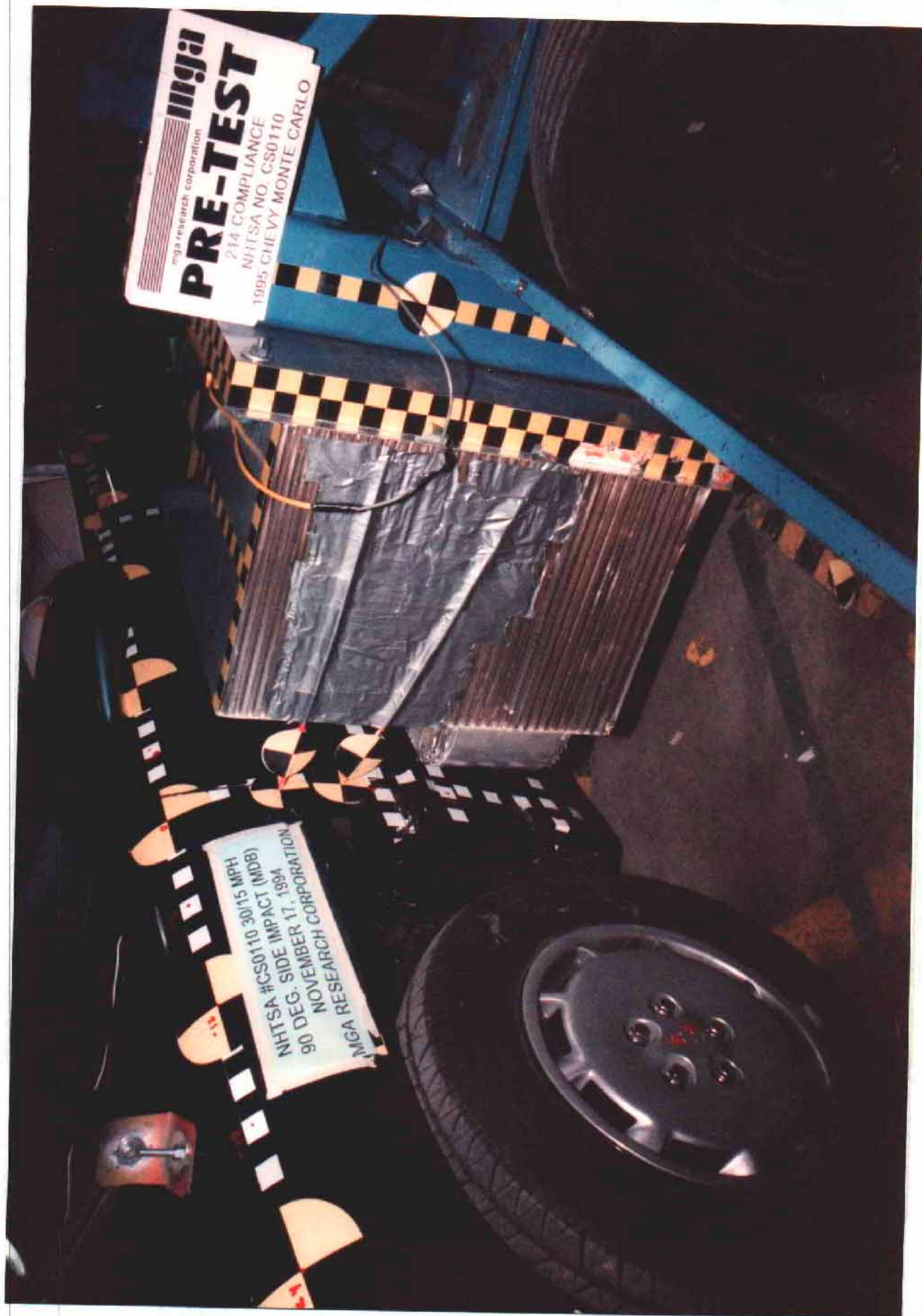


Photo No. A-6 - Pre-Test MDB Positioned Against Vehicle (left side)

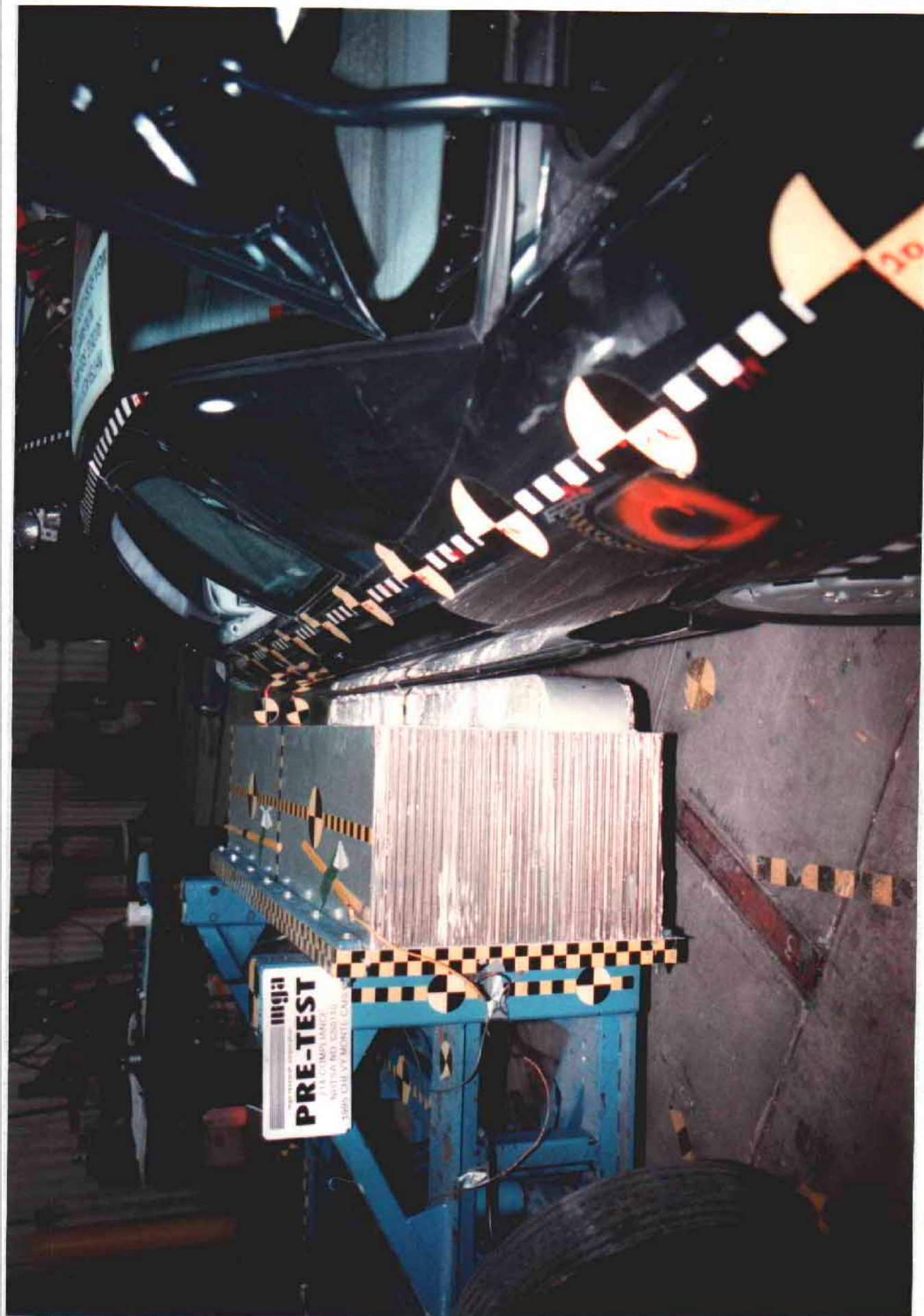


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (right side)

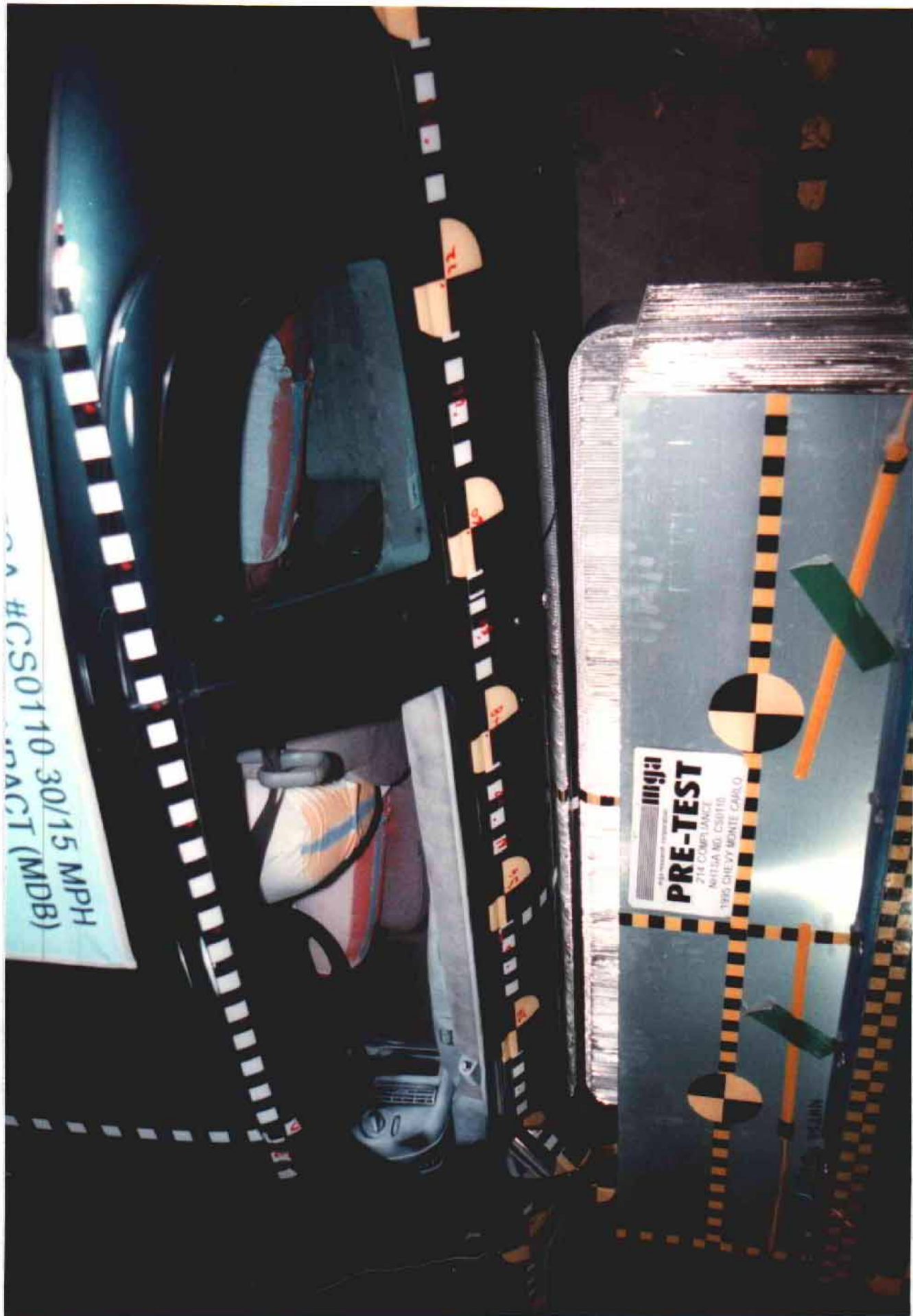


Photo No. A-8 - Pre-Test MDB Position Against Vehicle Overhead View

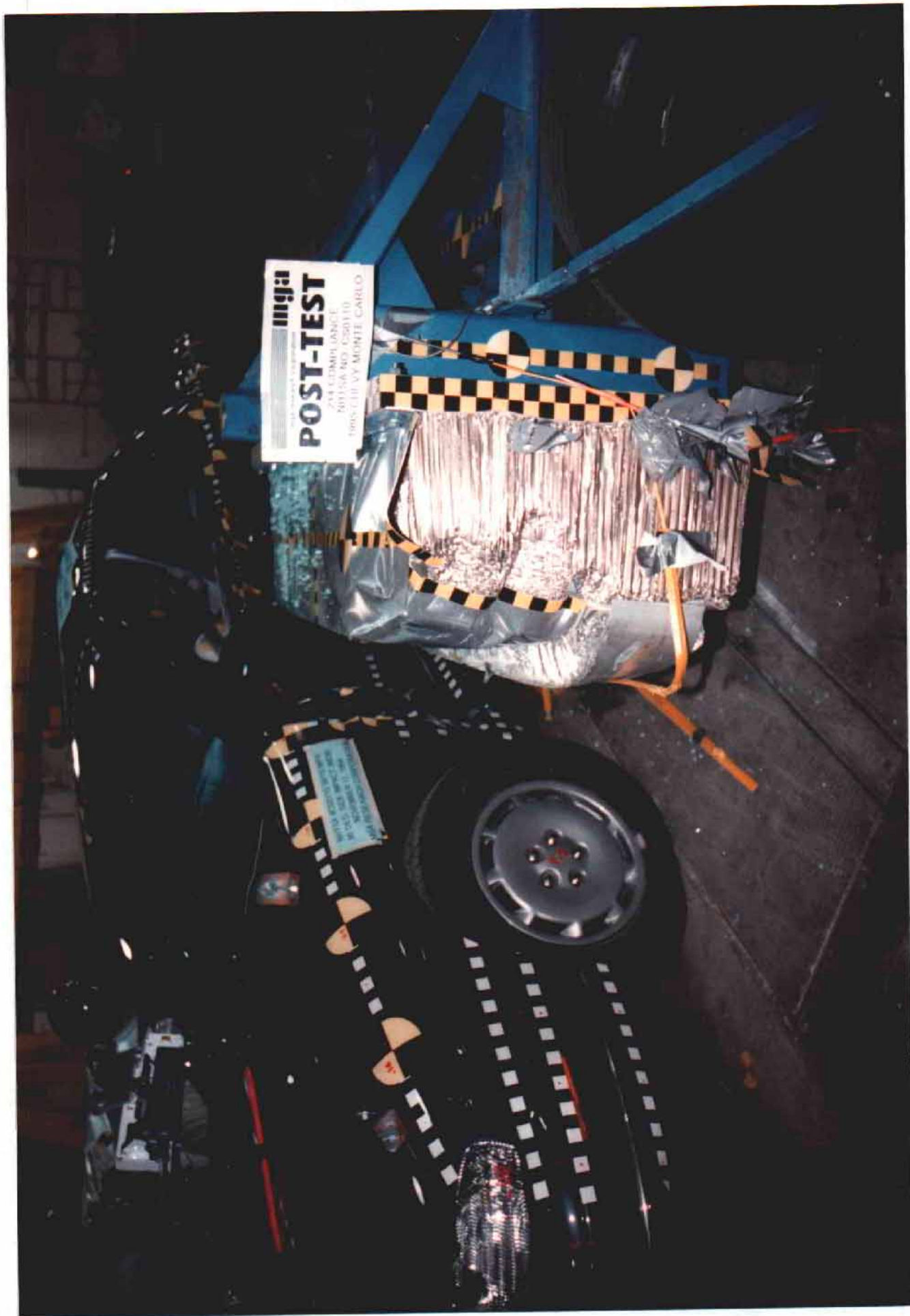


Photo No. A-9 - Post-Test MDB and Vehicle Left Side Front View



Photo No. A-10 - Post-Test MDB and Vehicle Right Side Rear View

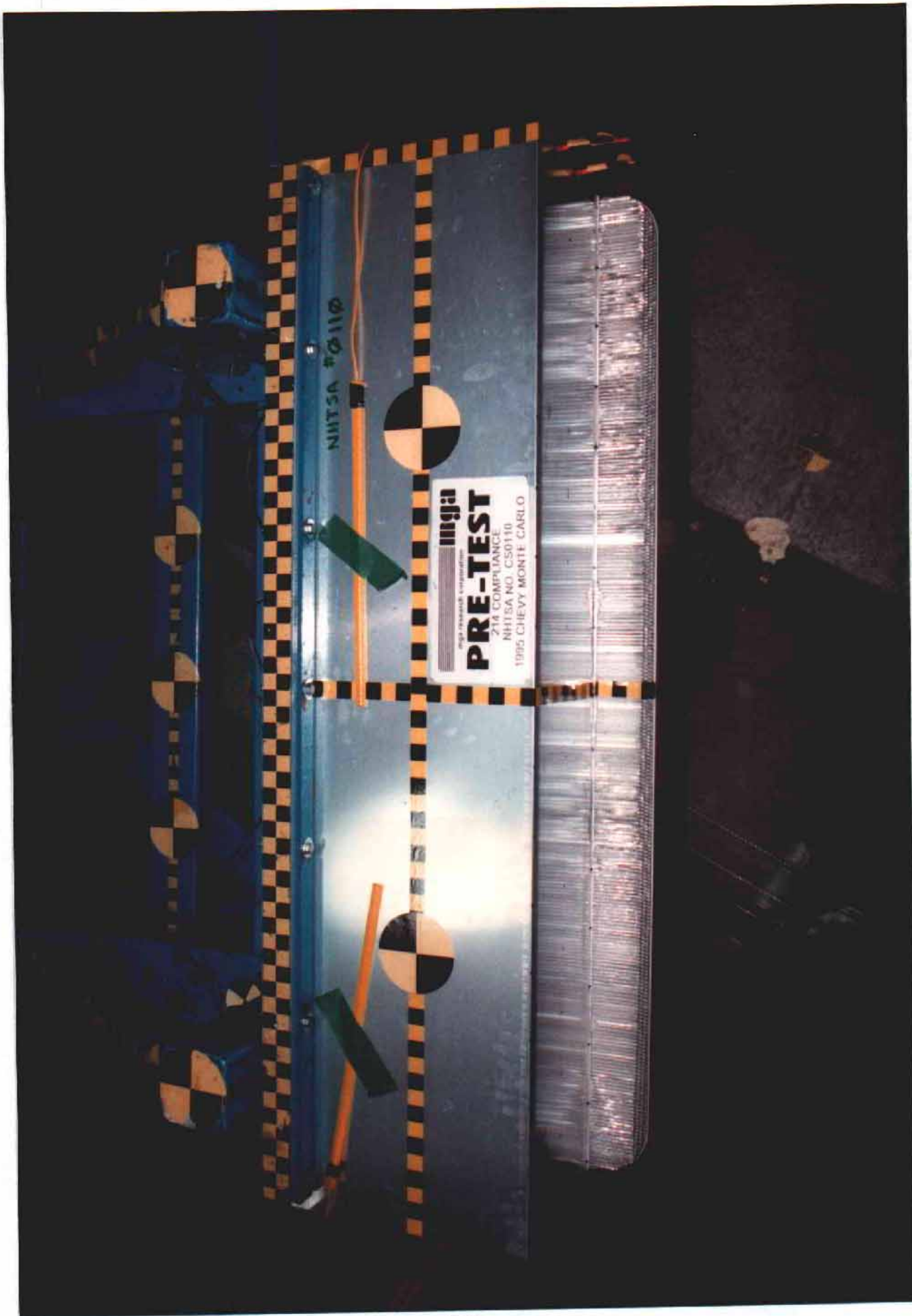


Photo No. A-11 - Pre-Test MDB Top View

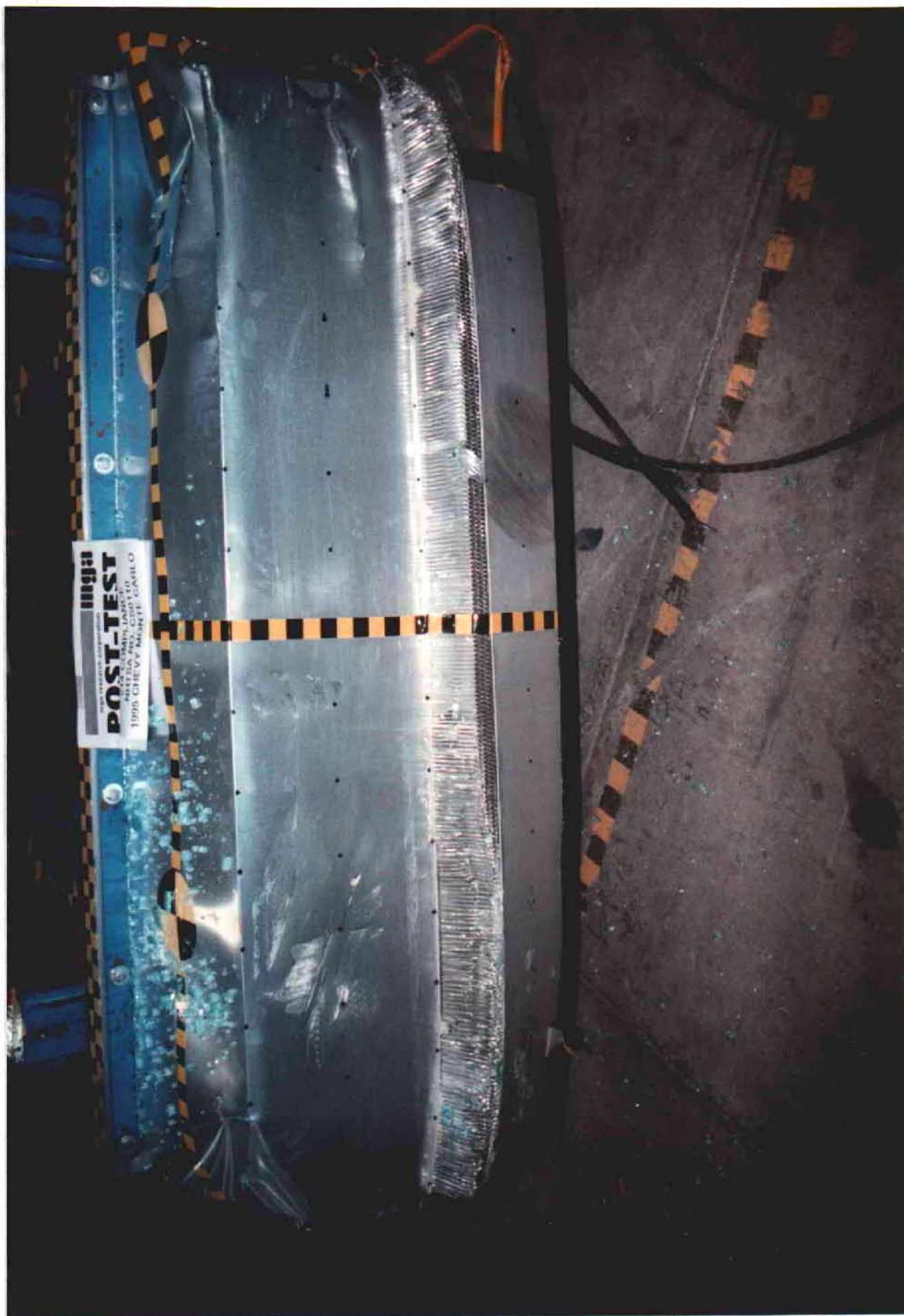
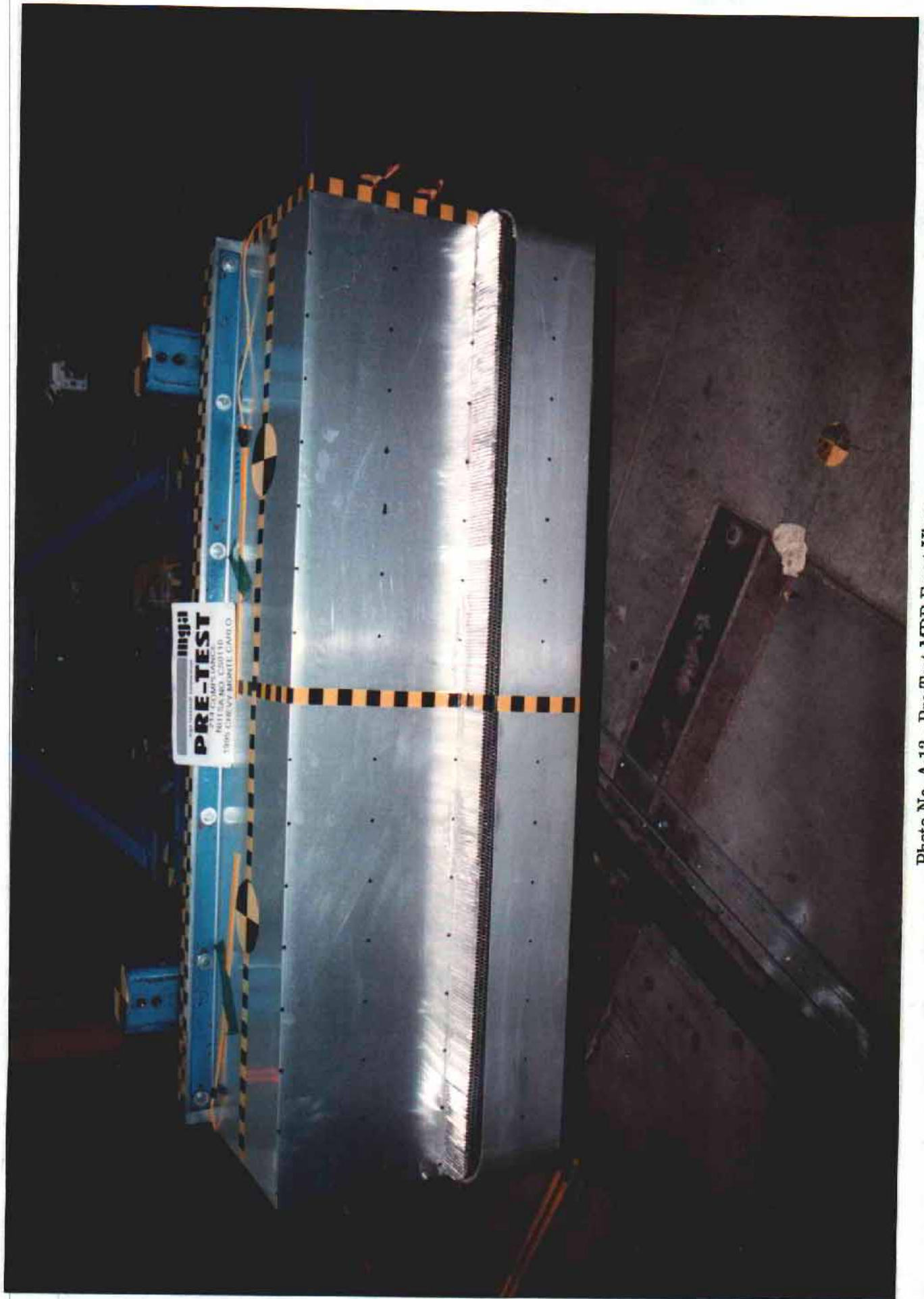


Photo No. A-12 - Post-Test MDB Top View



A-13

Photo No. A-13 - Pre-Test MDB Front View

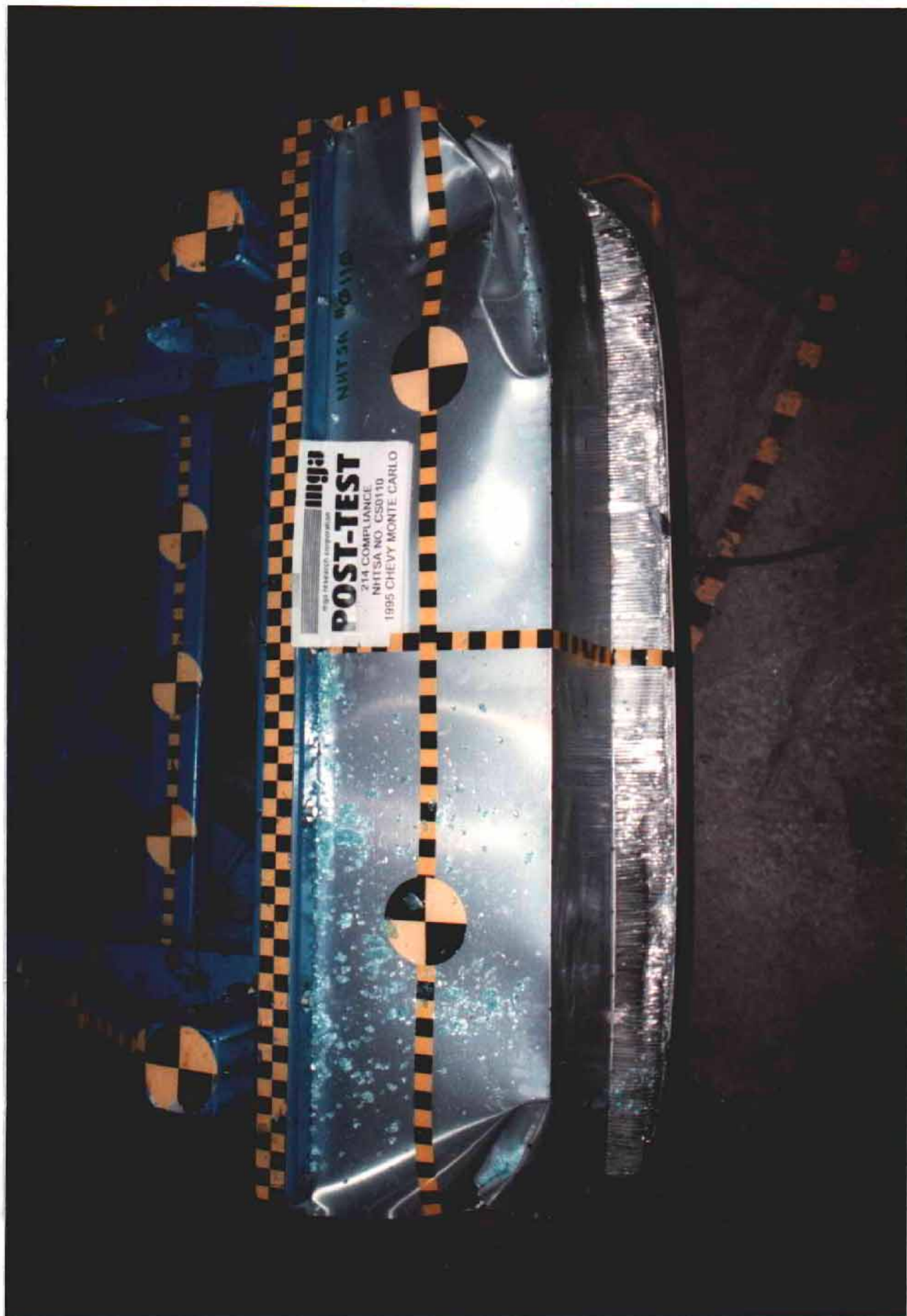


Photo No. A-14 - Post-Test MDB Front View

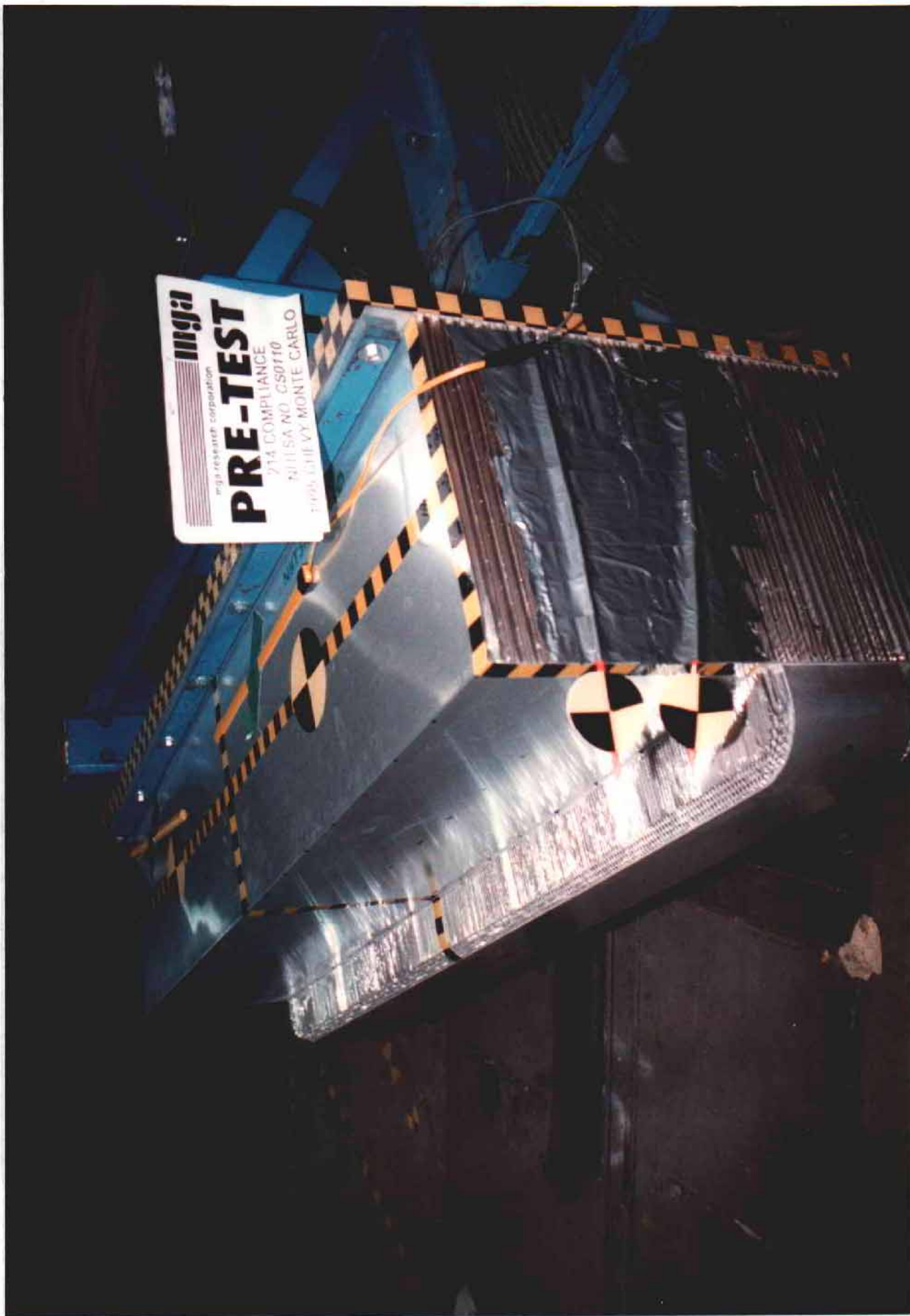


Photo No. A-15 - Pre-Test MDB Left Side View

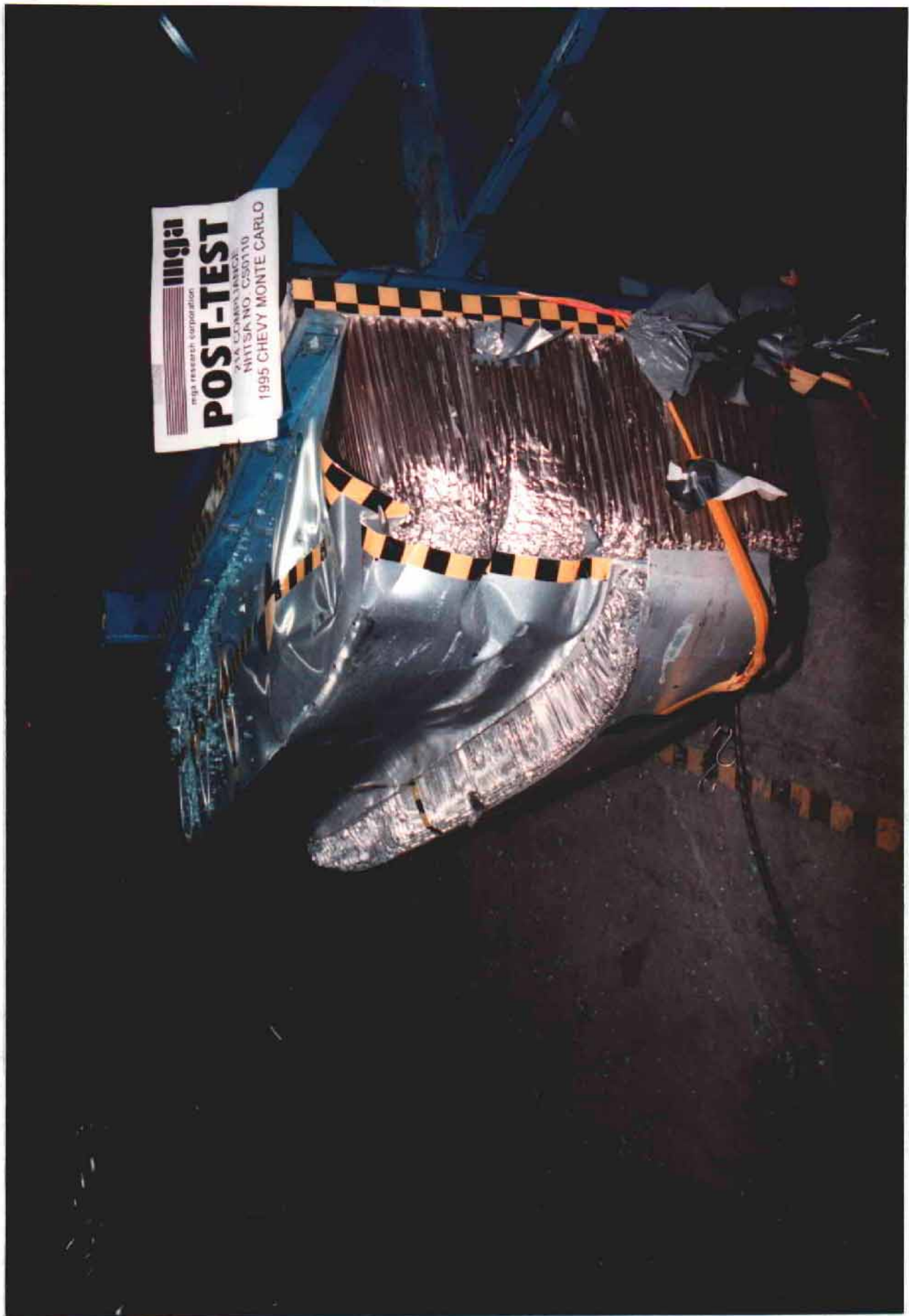
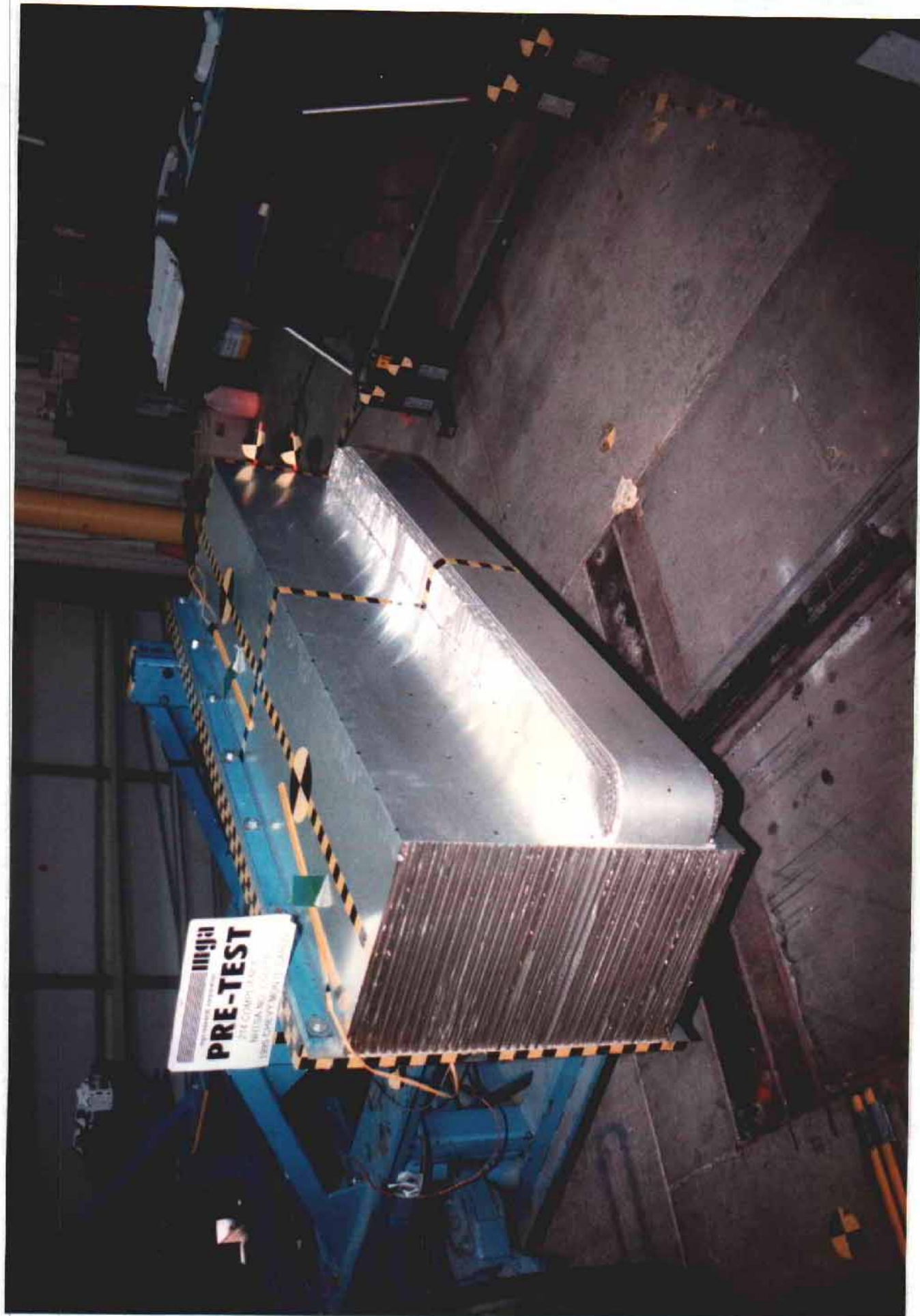


Photo No. A-16 - Post-Test MDB Left Side View



PRE-TEST
202-640-1140
NORTH AN
1995-1996

Photo No. A-17 - Pre-Test MDB Right Side View



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

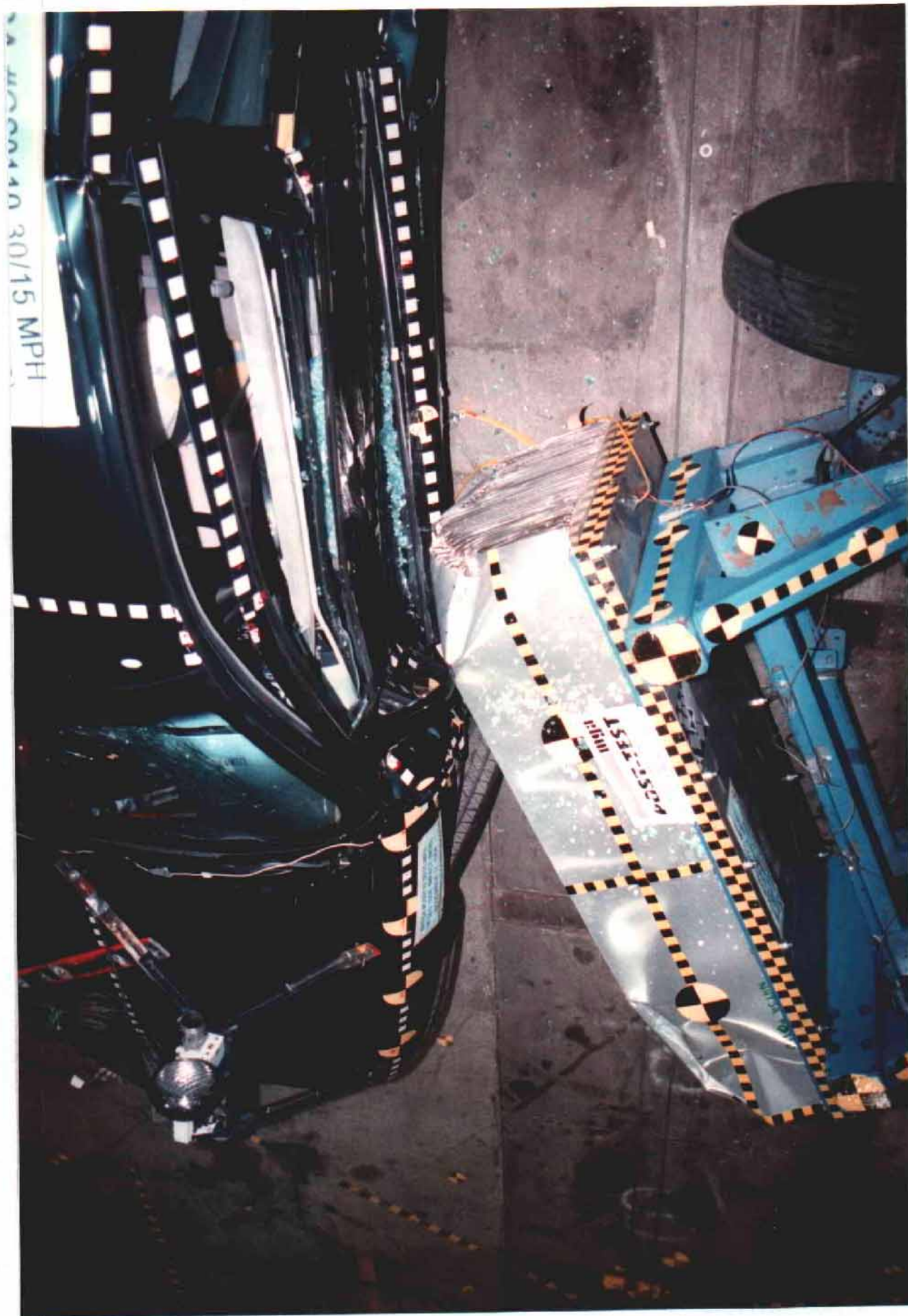


Photo No. A-19 - Post-Test MDB and Vehicle Overhead View

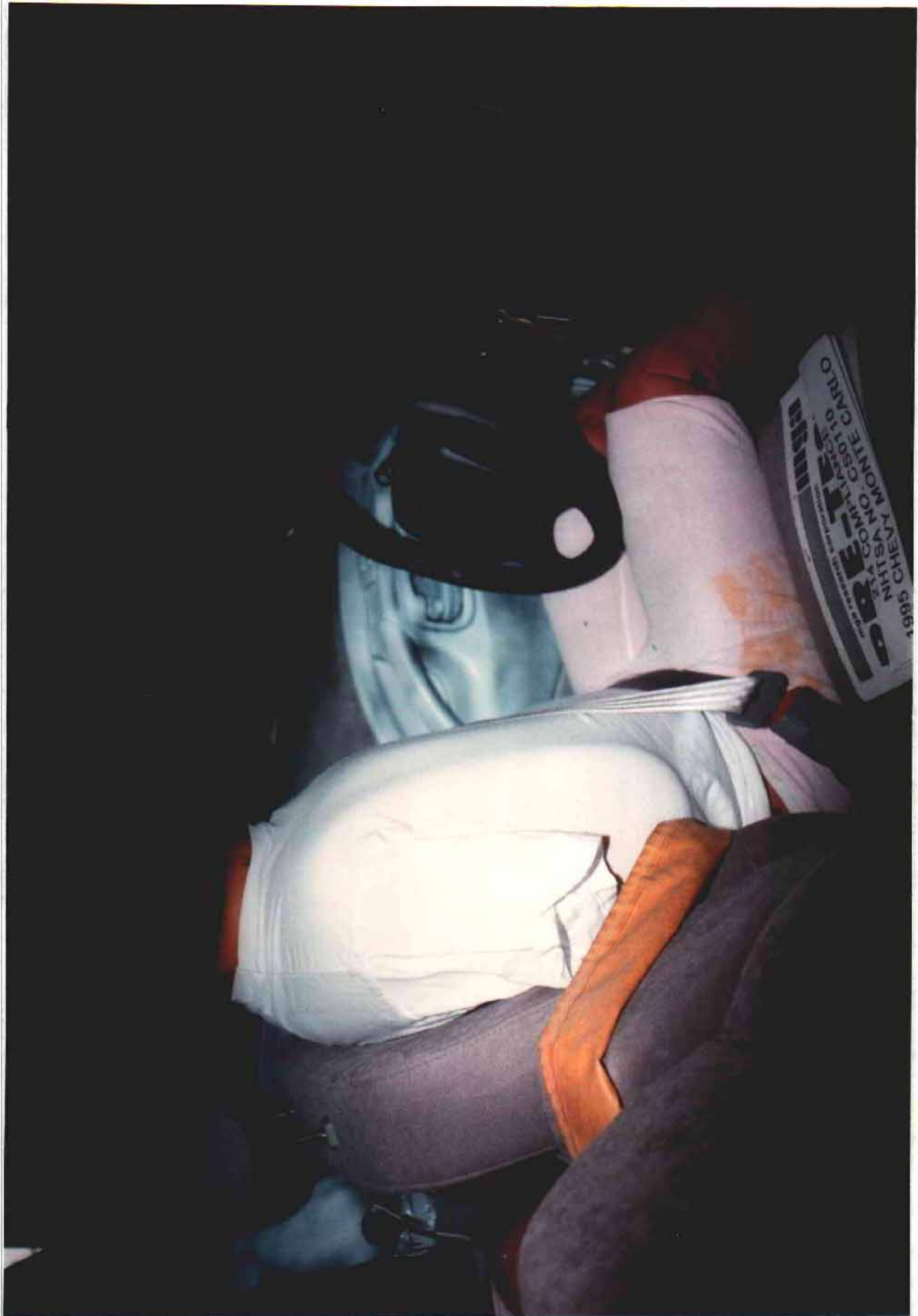


Photo No. A-20 - Pre-Test Driver Dummy Right Side View



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

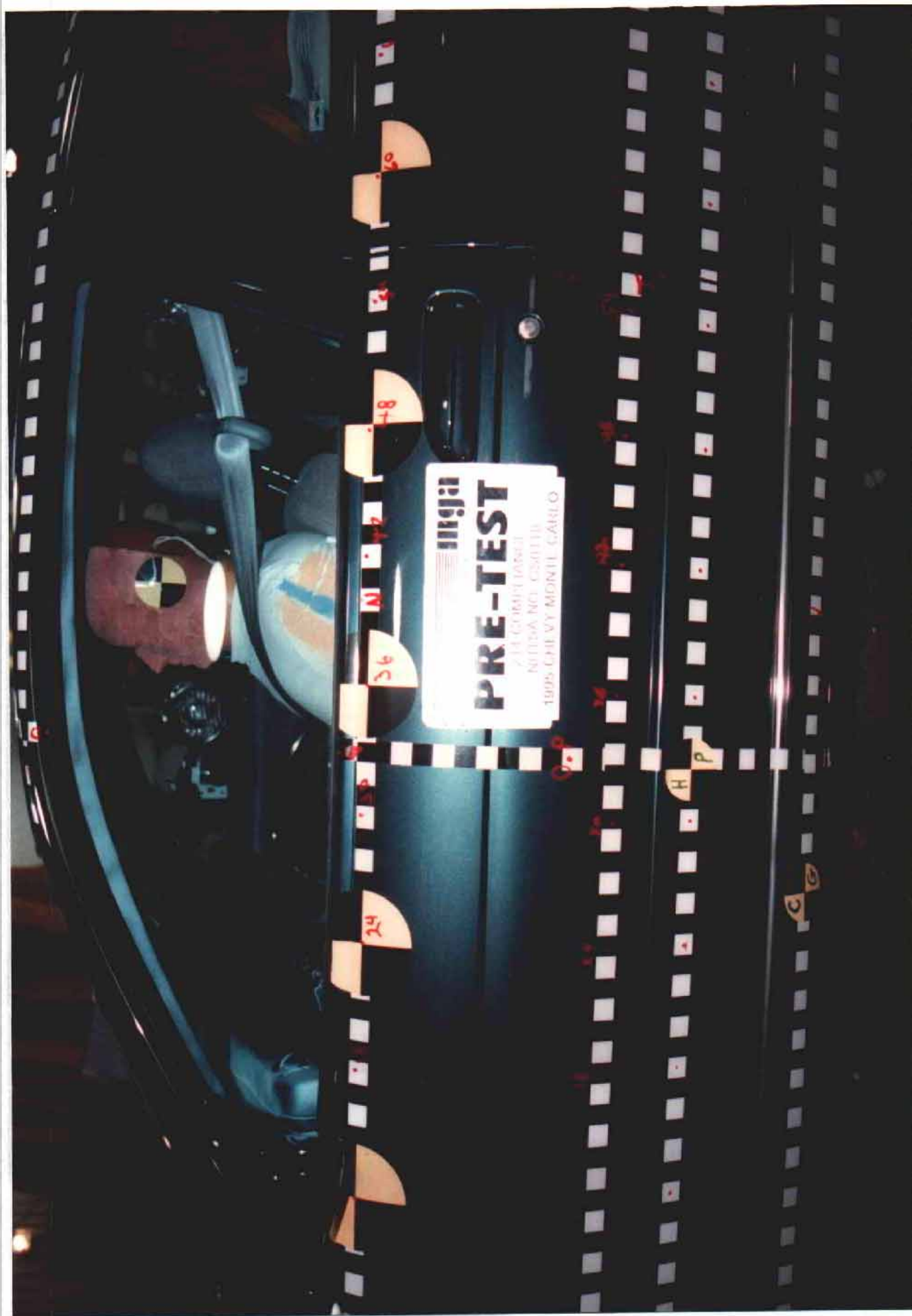


Photo No. A-22 - Pre-Test Driver Dummy Left Side View

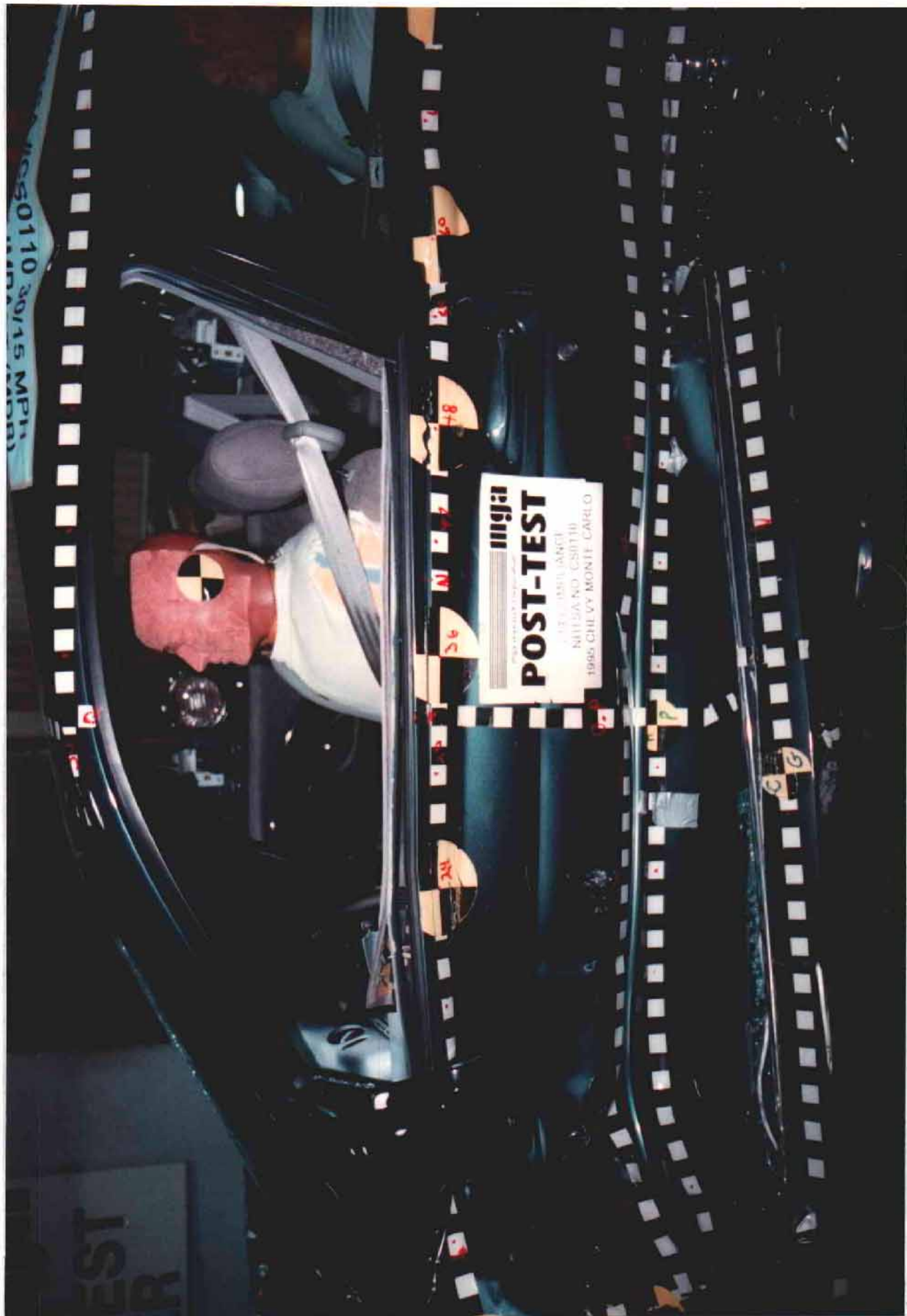


Photo No. A-23 - Post-Test Driver Dummy Left Side View



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



Photo No. A-25 - Post-Test Driver Dummy Shoulder and Door Top View



Photo No. A-26 - Pre-Test Passenger Dummy Right Side View



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



Photo No. A-28 - Pre-Test Passenger Dummy Left Side View

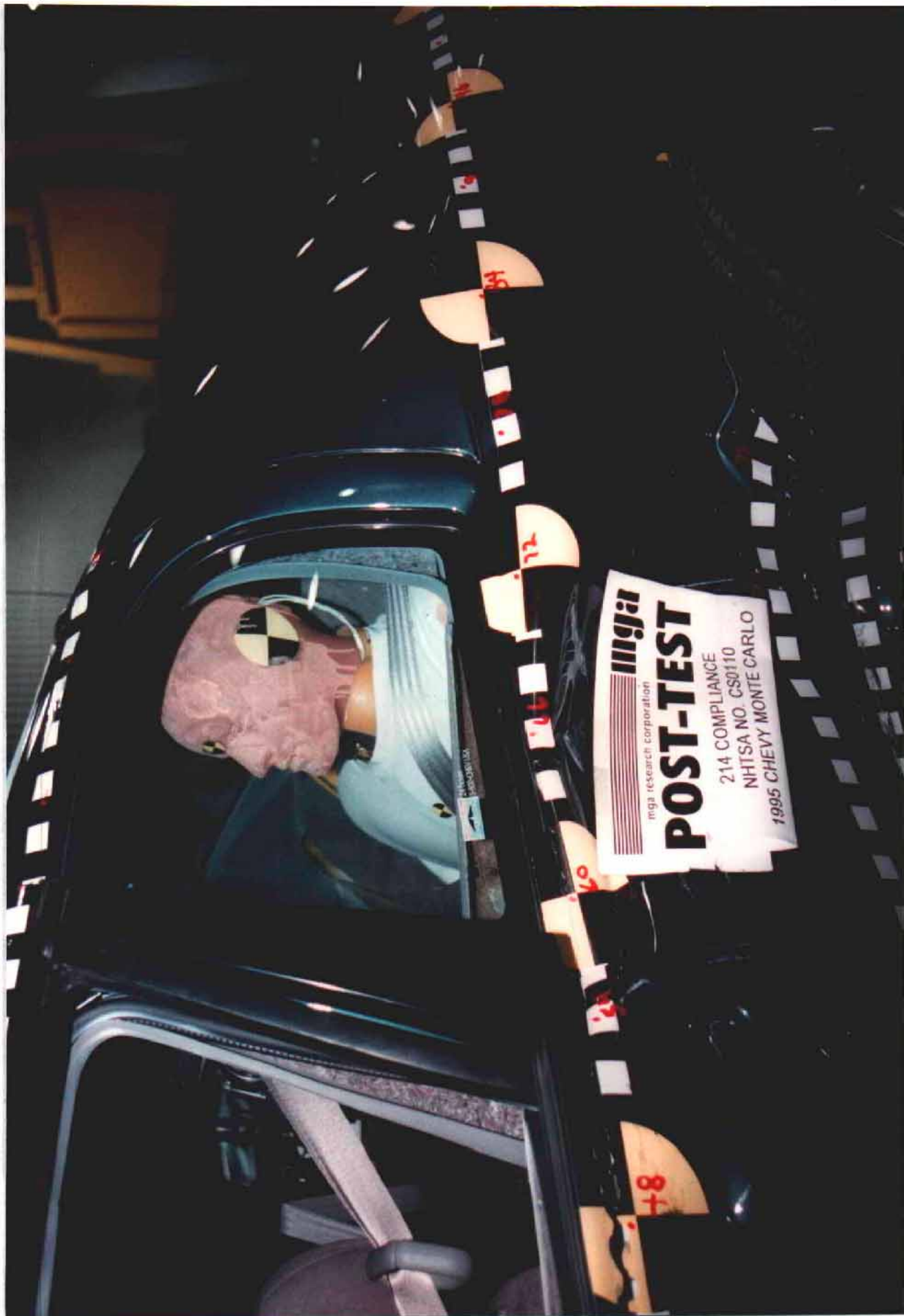


Photo No. A-29 - Post-Test Passenger Dummy Left Side View



Photo No. A-30 - Pre-Test Passenger Dummy Shoulder and Door Top View

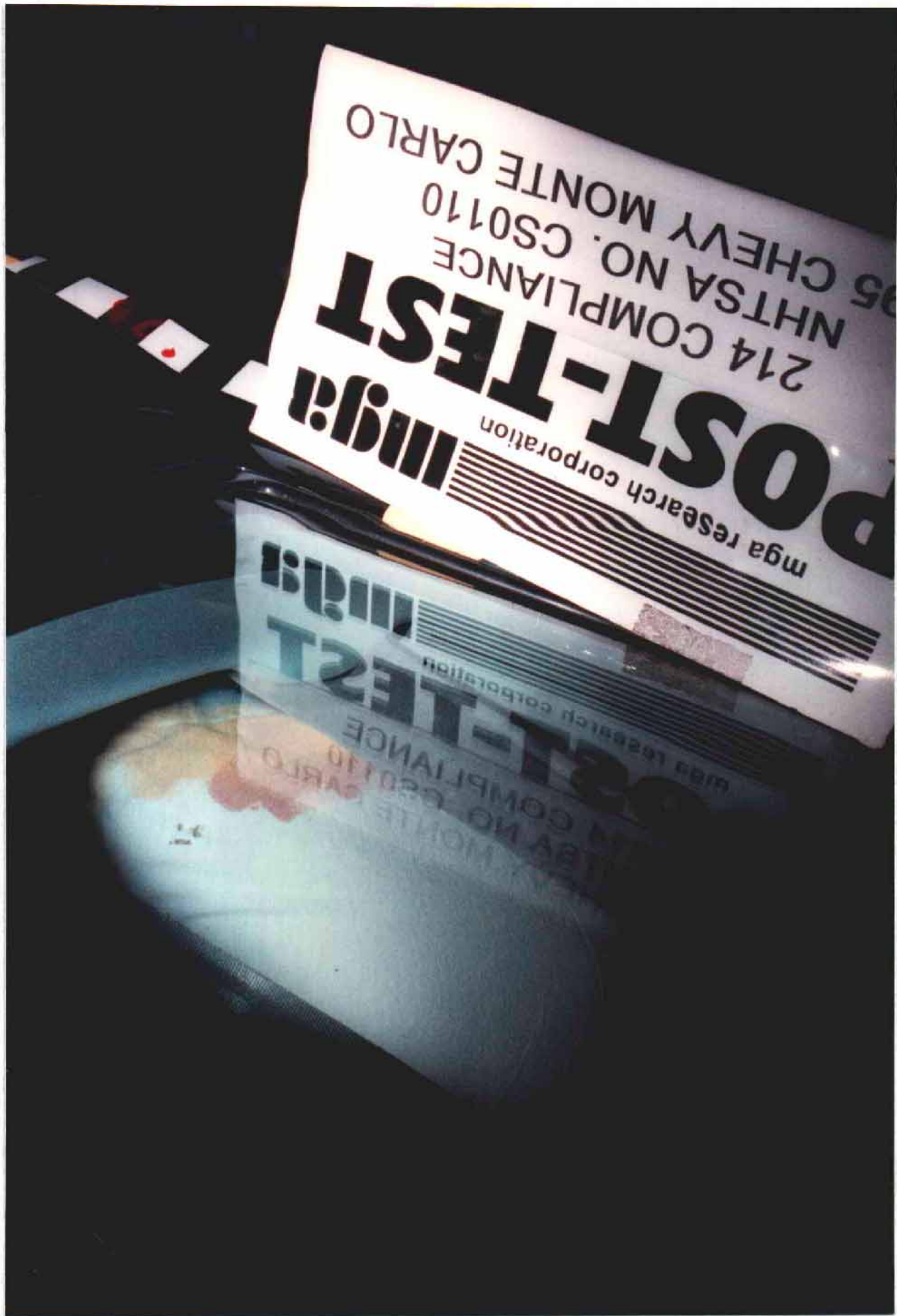


Photo No. A-31 - Post-Test Passenger Dummy Shoulder and Door Top View

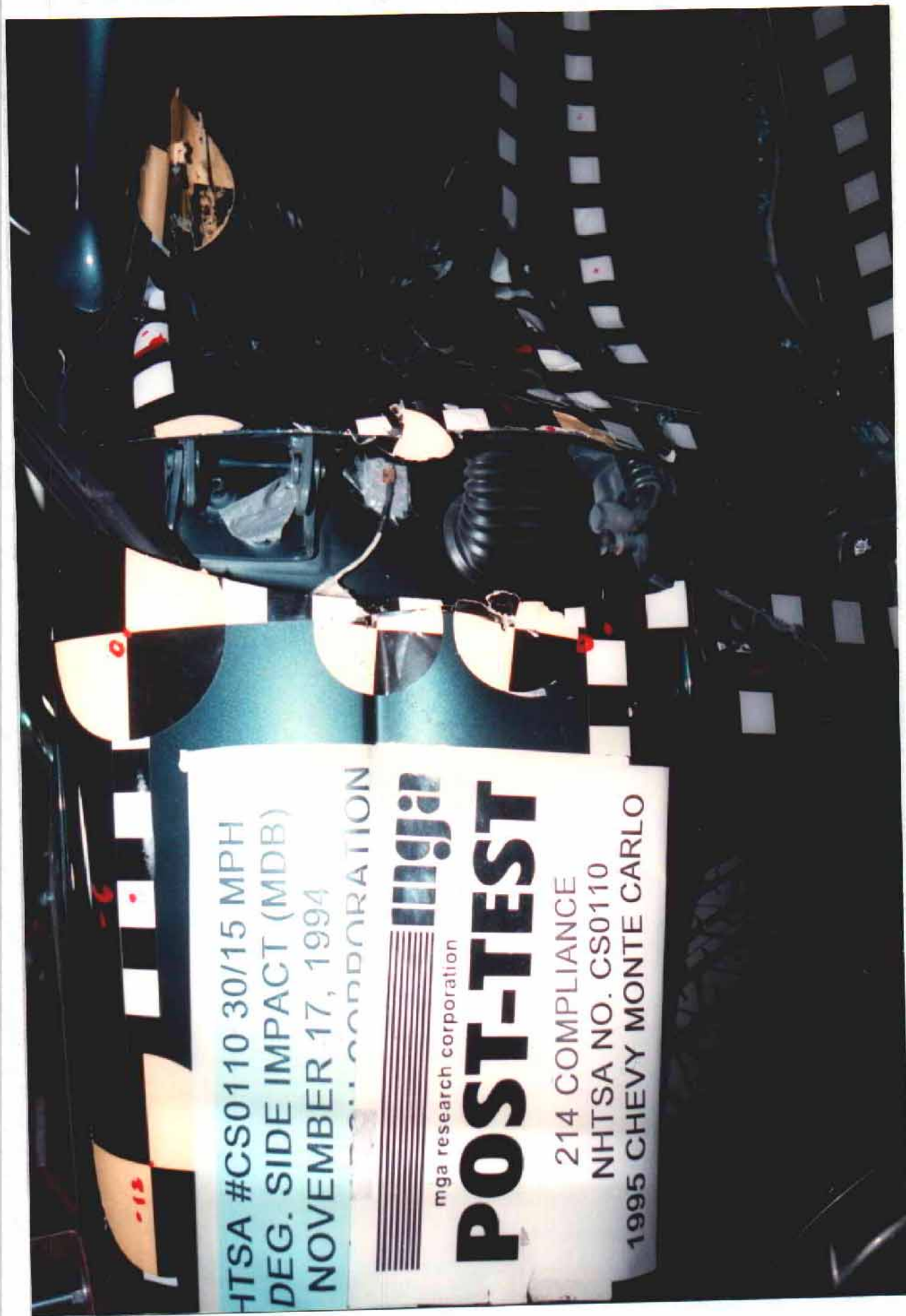
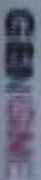


Photo No. A-32 - Left Front Impact Point on Vehicle

			
MFD BY GENERAL MOTORS OF CANADA			
LTD.			
DATE	GVWR	GAWR FRT	GAWR RR
09/94	4403LB	2438LB	1965LB
	1997KG	1106KG	891KG
THIS VEHICLE CONFORMS TO ALL APPLI- CABLE U.S. FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.			
2G1WM12M0S9154501	PASS CAR		
10135543-A			



10135543-B

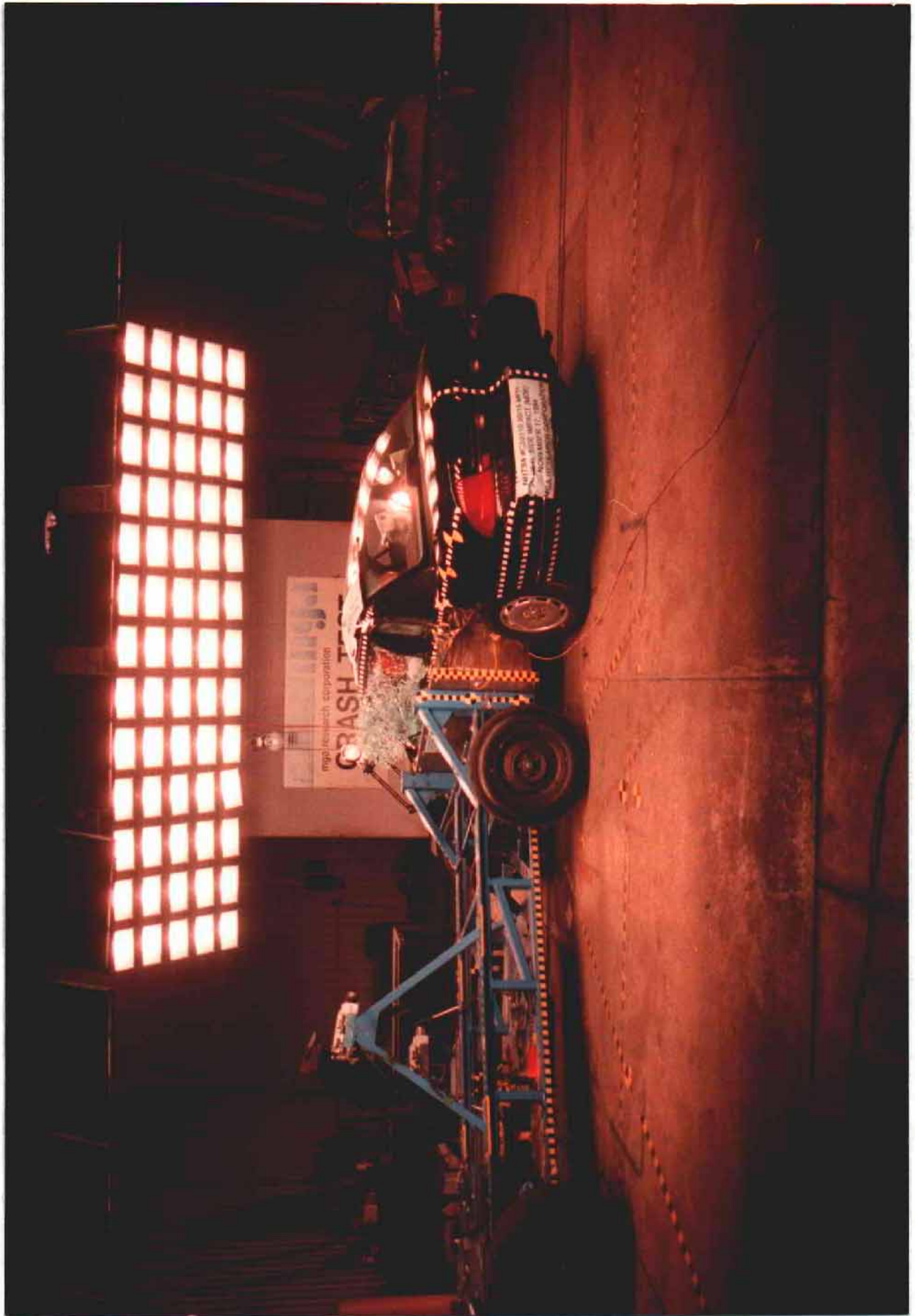


Photo No. A-35 - Impact

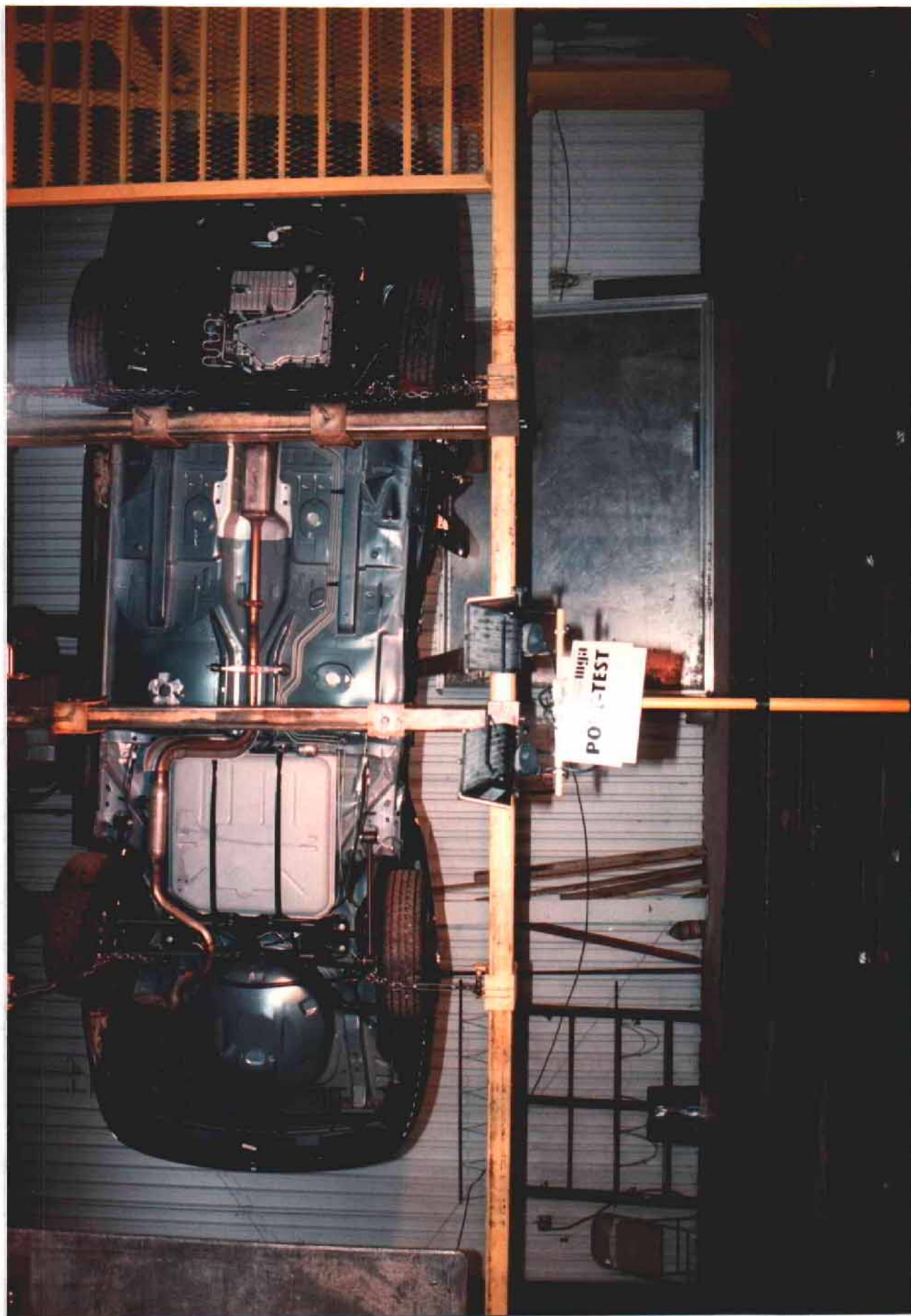


Photo No. A-36 - Rollover 90°

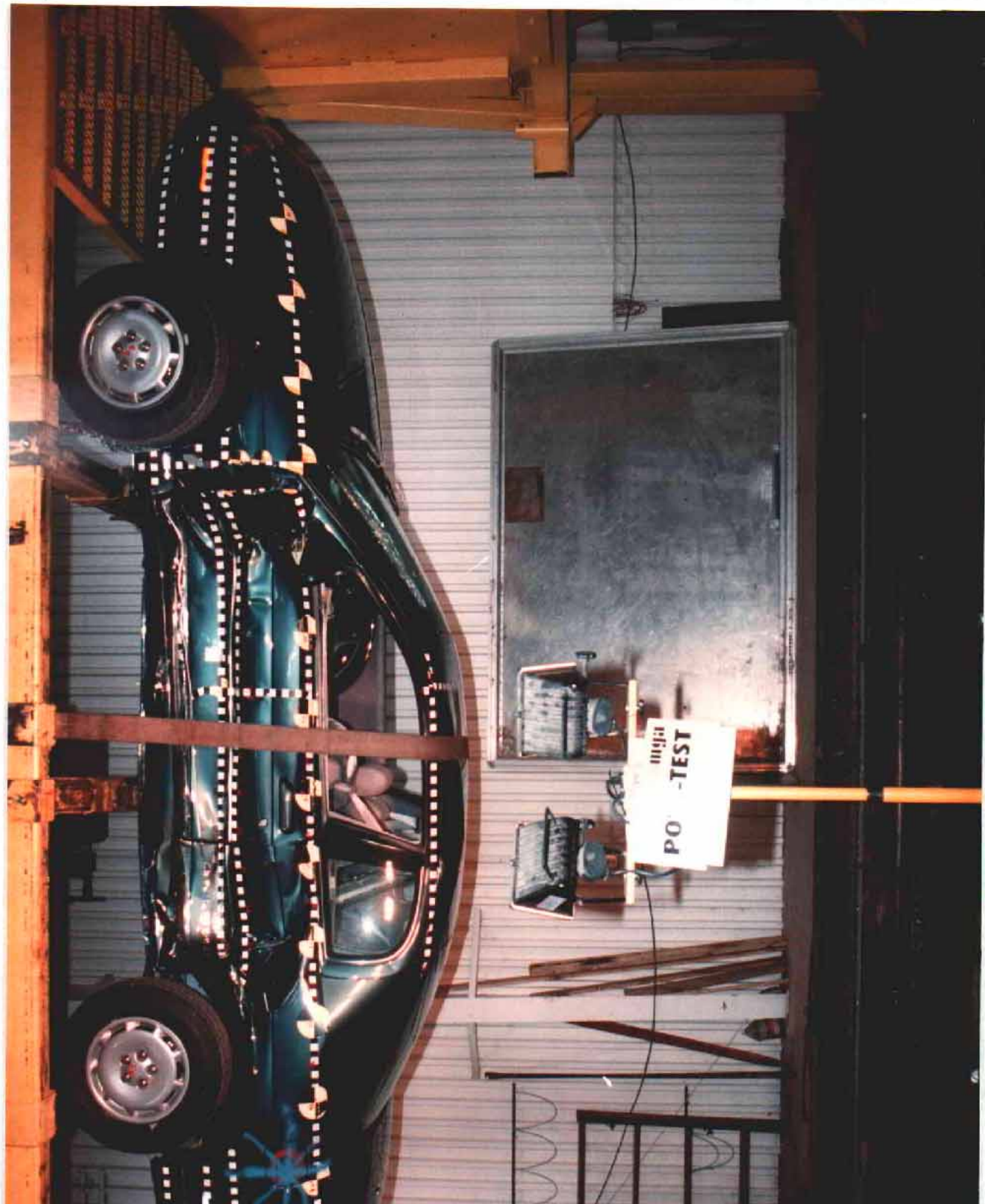


Photo No. A-37 - Rollover 180°



Photo No. A-38 - Rollover 270°

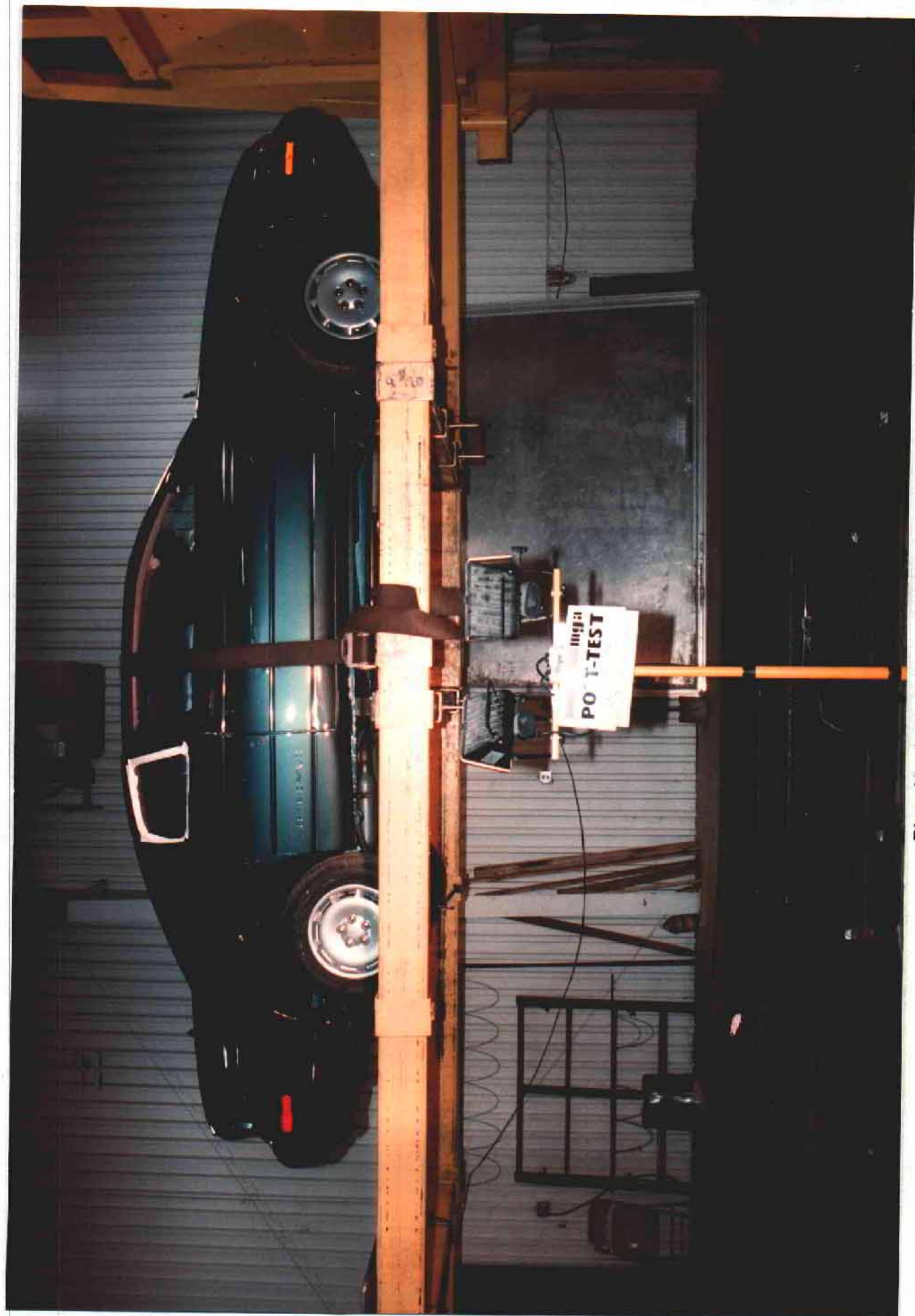


Photo No. A-89 - Rollover 360°

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* No valid data collected

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Filter: Class 1000 (1650 Hz)

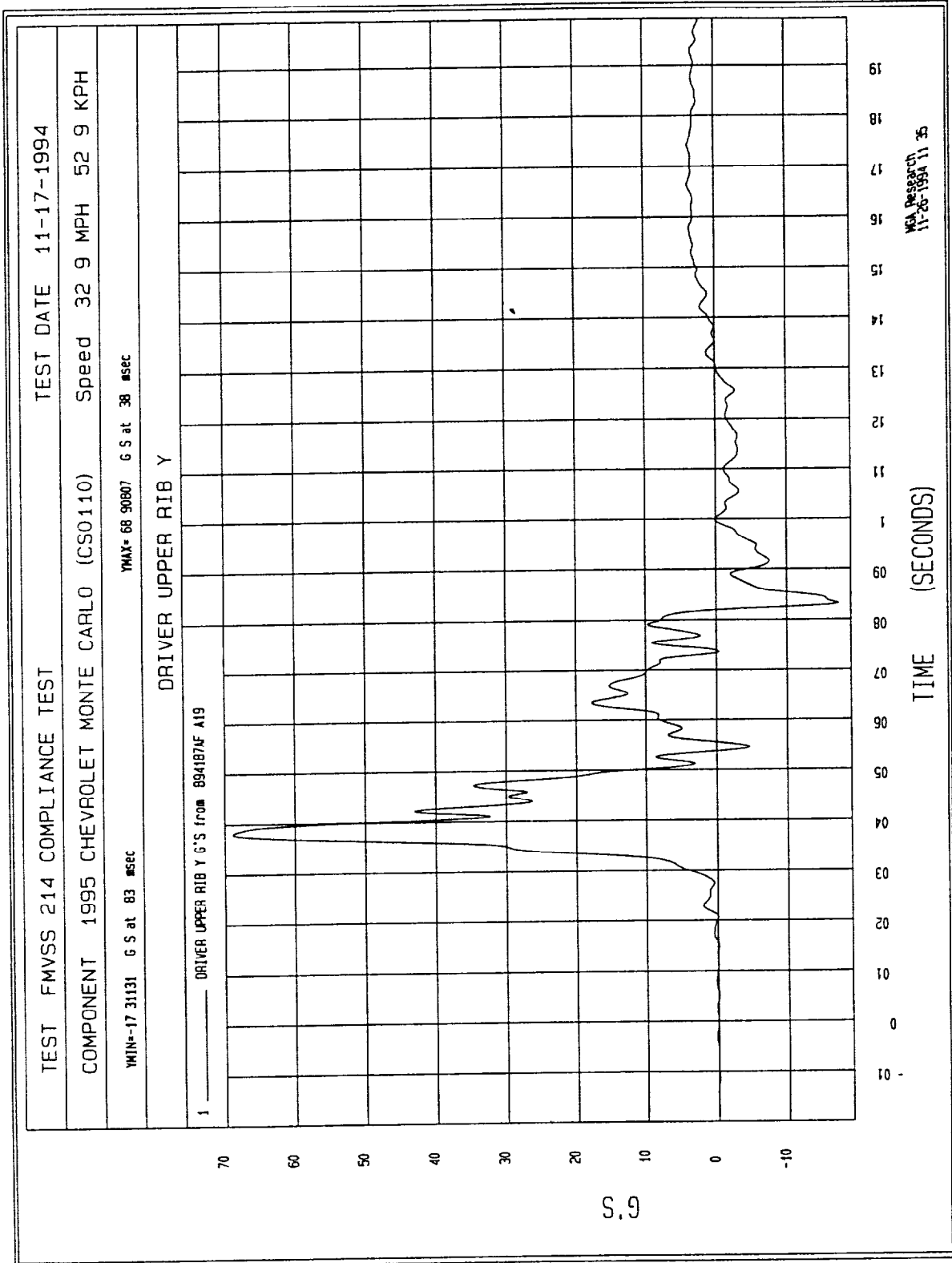


Figure B-1 - Driver Upper Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

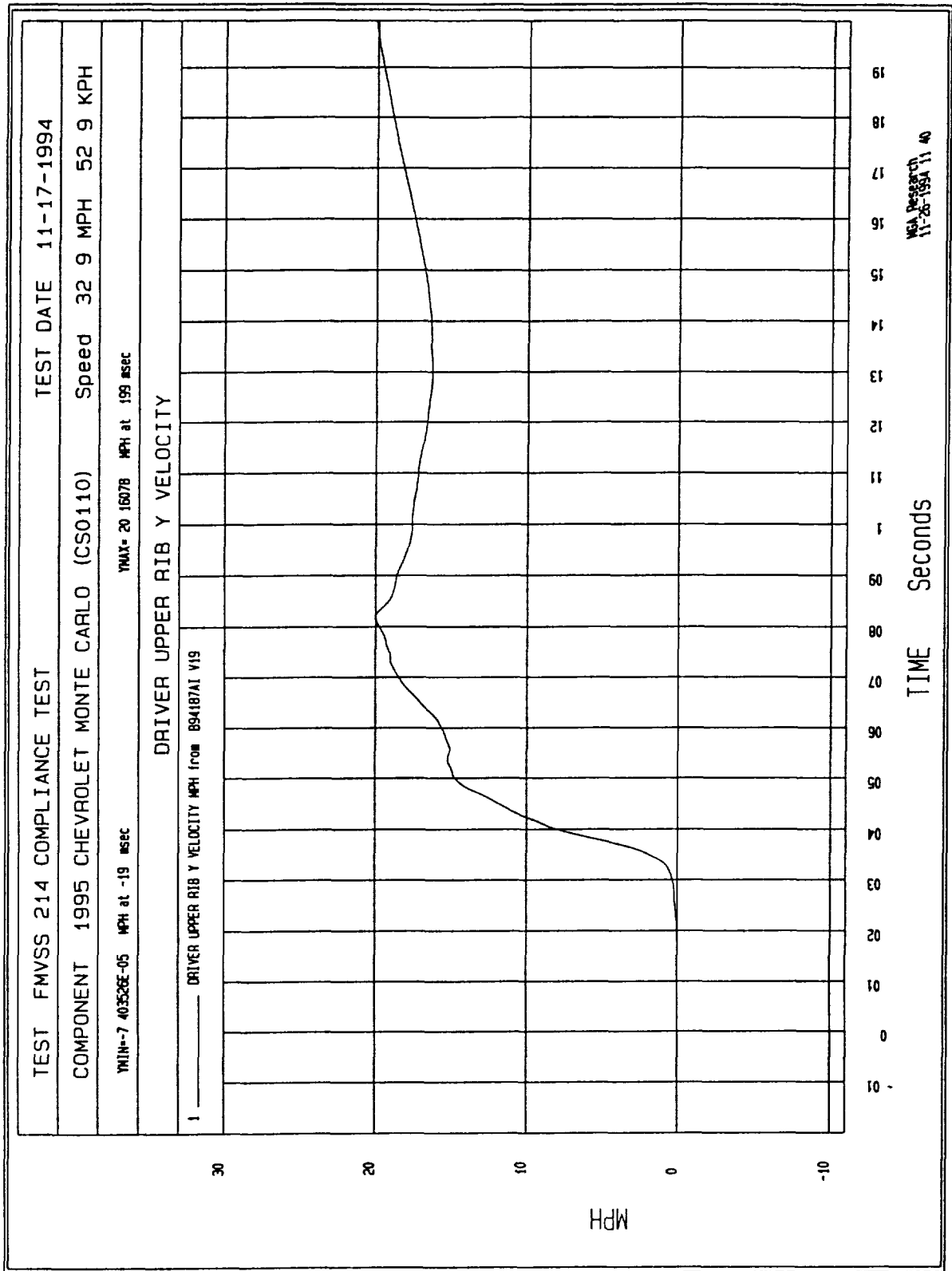


Figure B-2 - Driver Upper Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

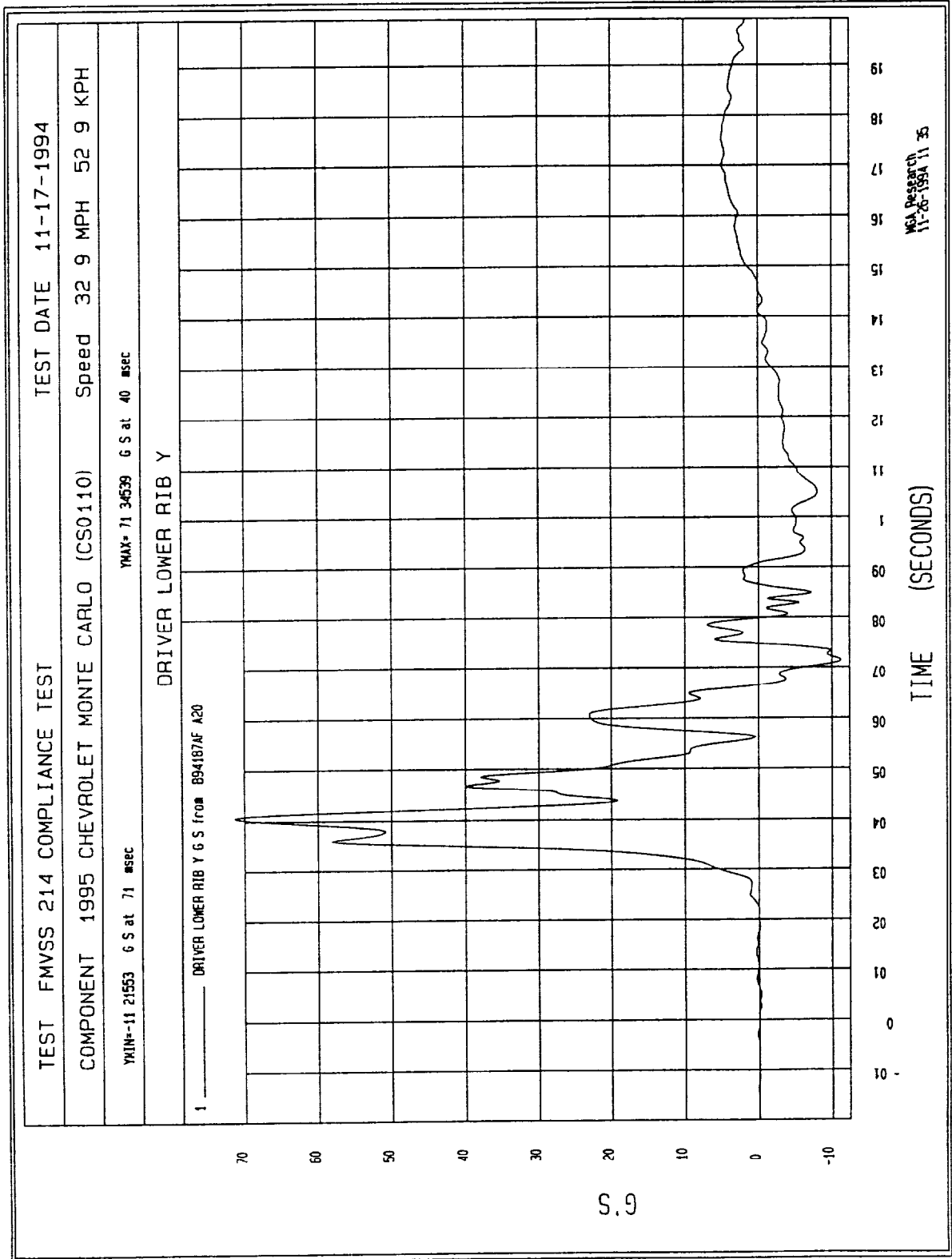


Figure B-3 - Driver Lower Rib Y Acceleration vs. Time

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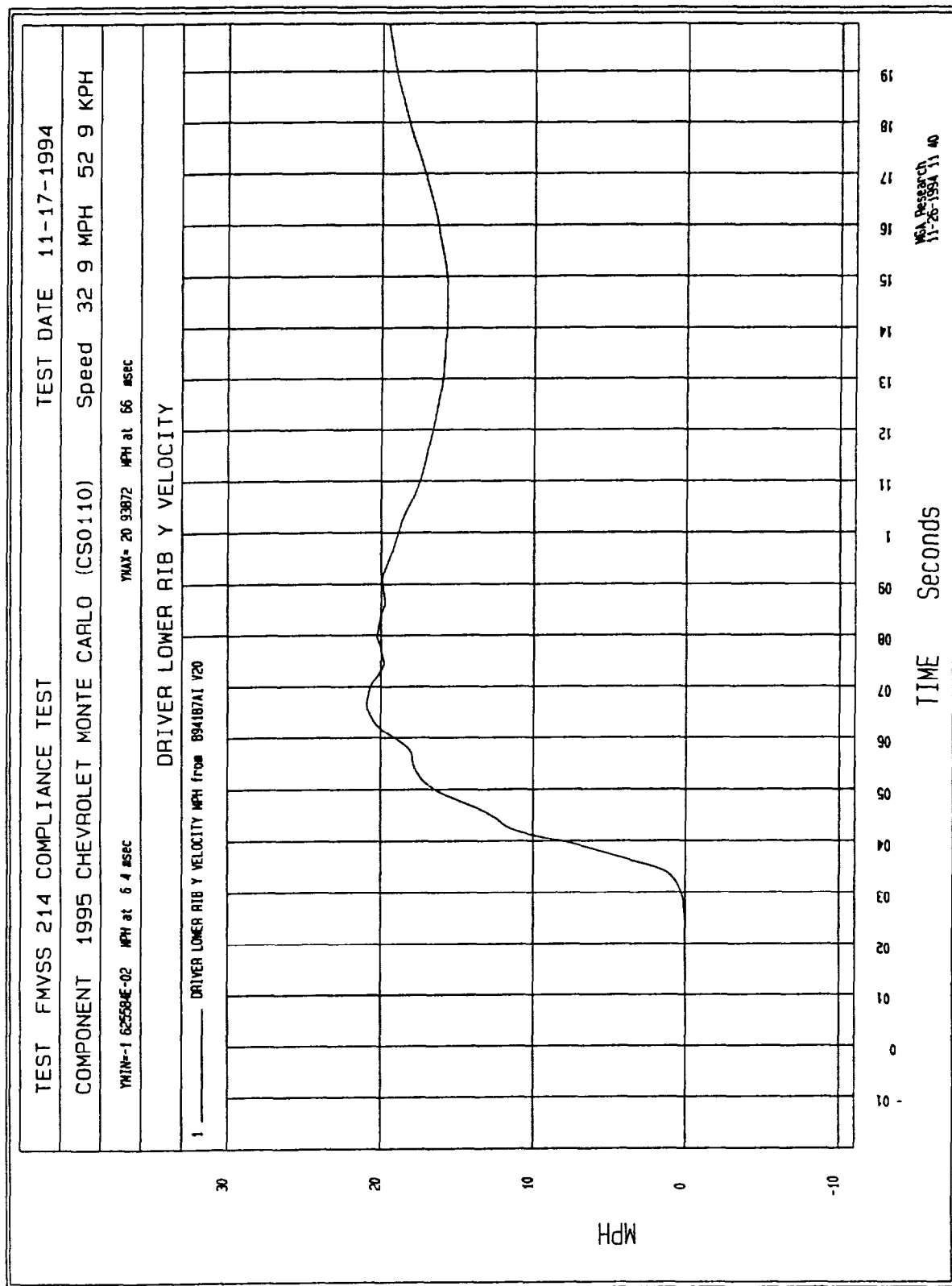


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

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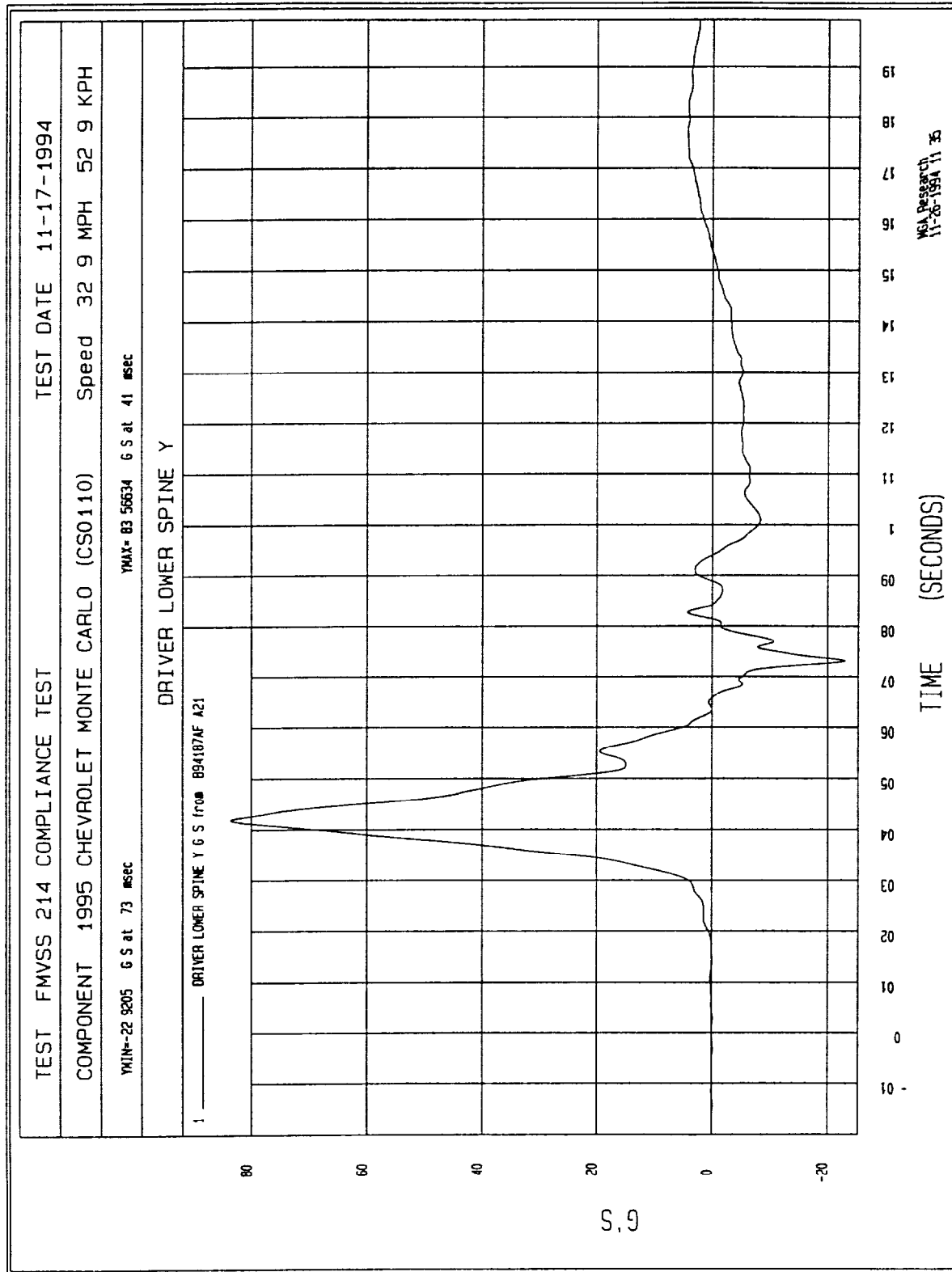


Figure B-5 - Driver Lower Spine Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

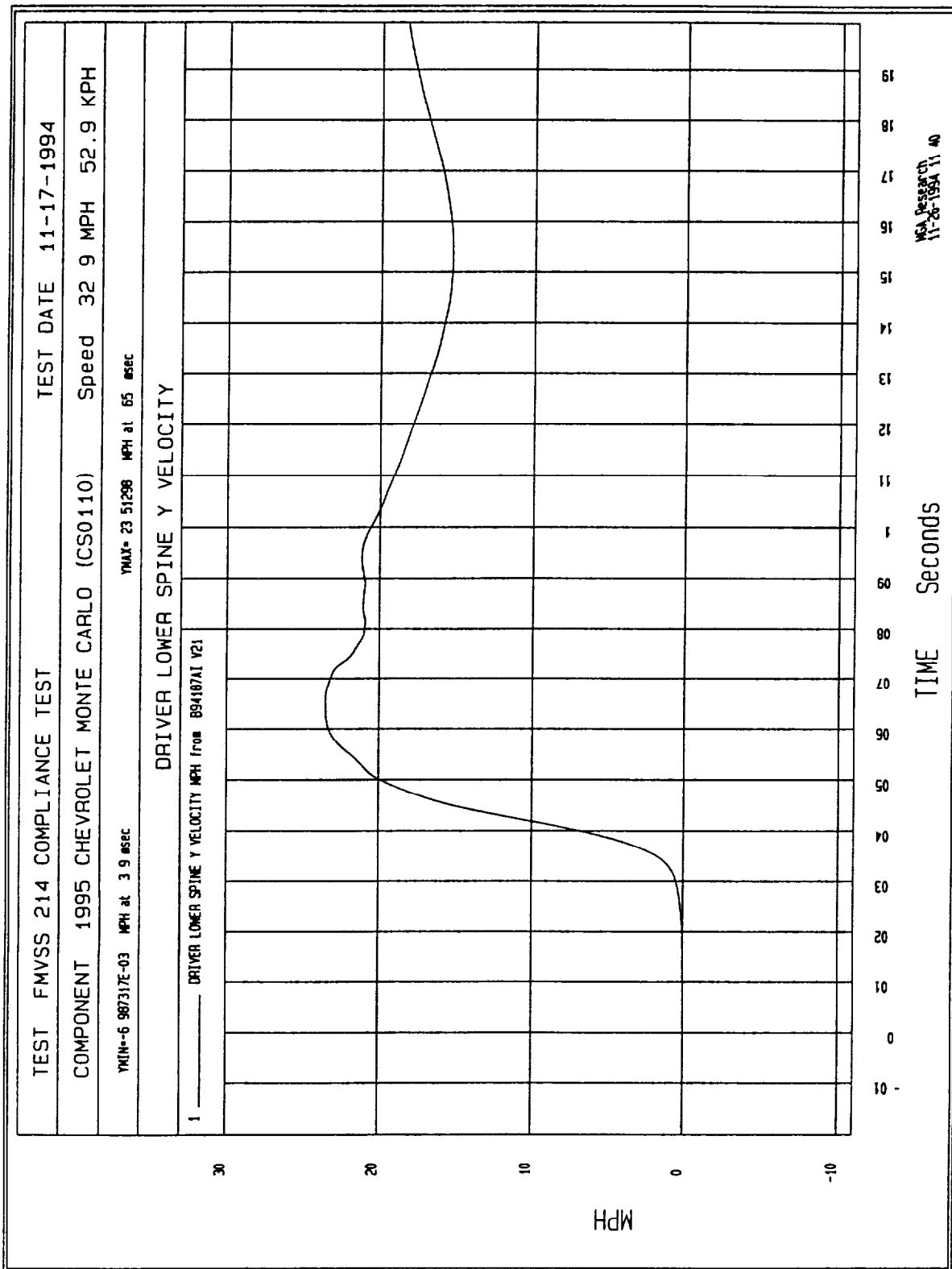


Figure B-6 - Driver Lower Spine Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

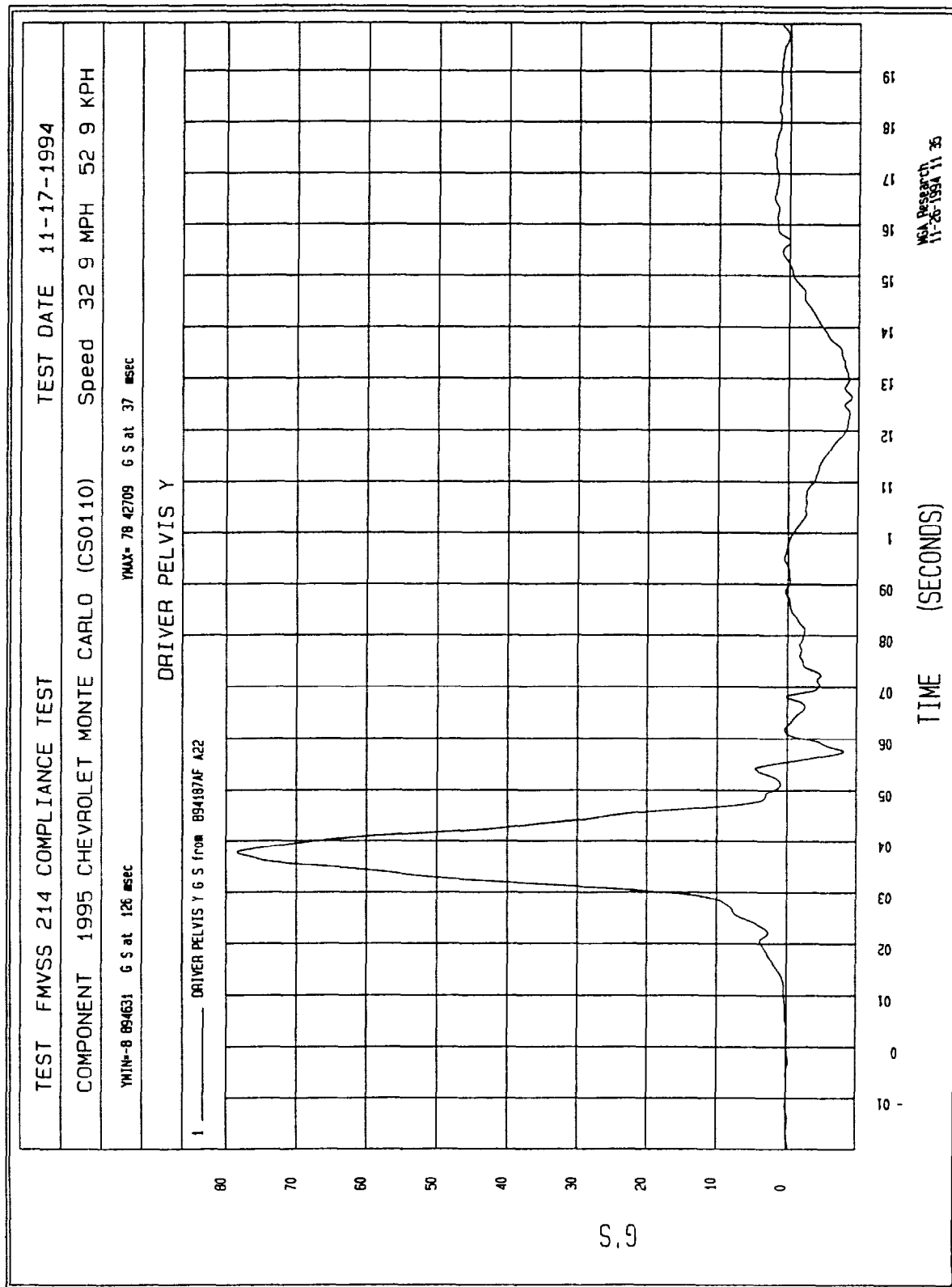


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

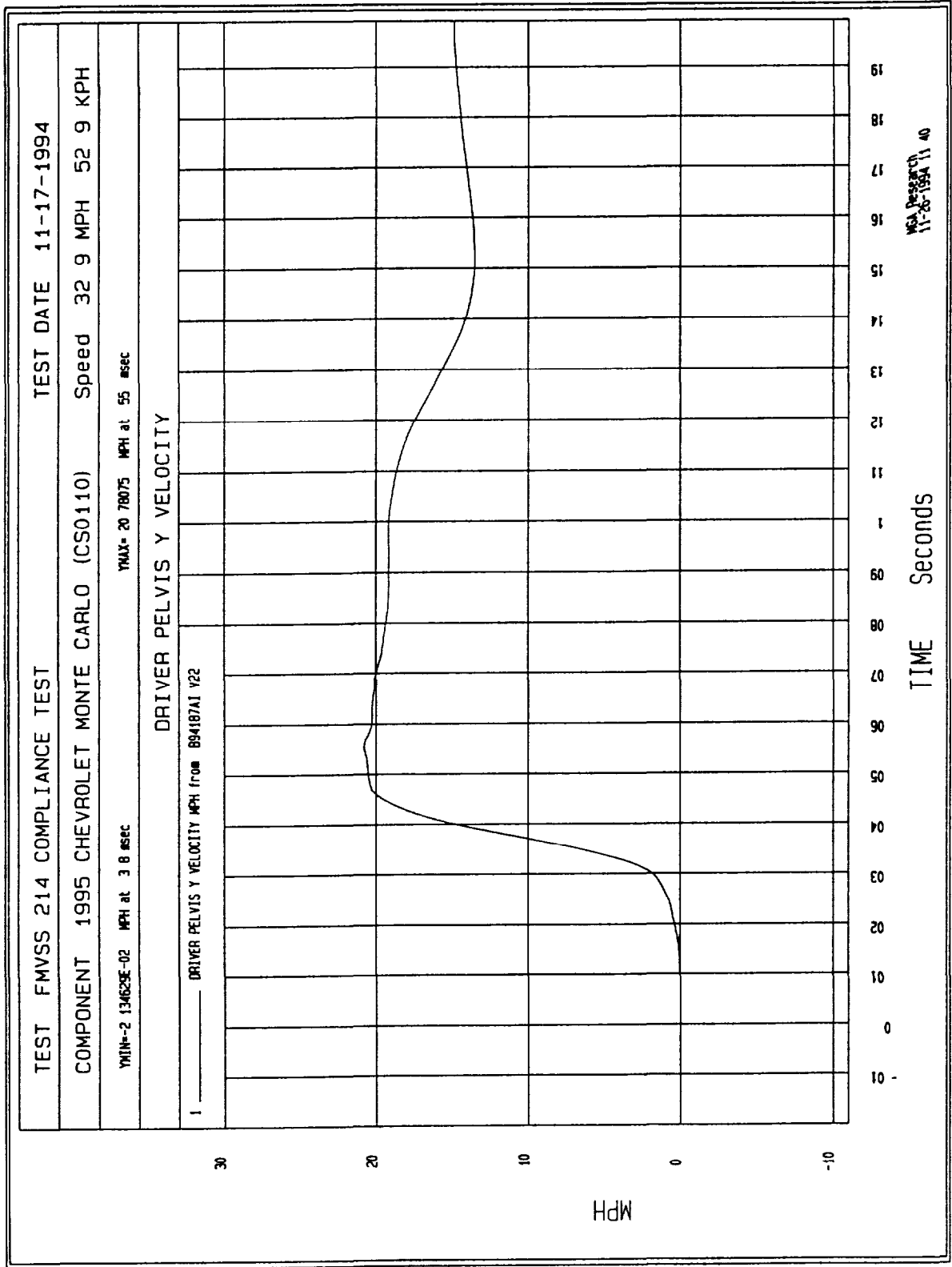


Figure B-8 - Driver Pelvis Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

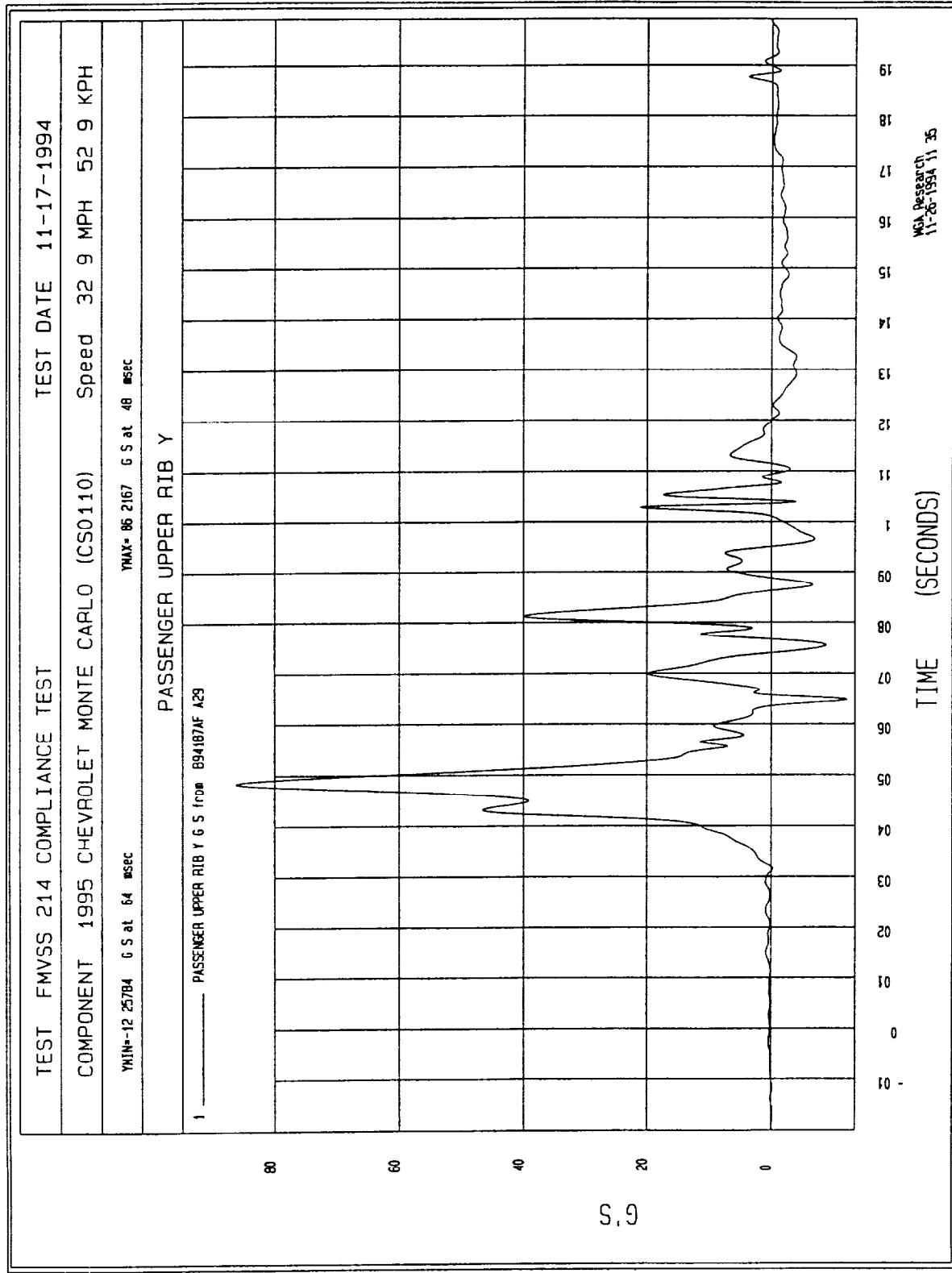


Figure B-9 - Passenger Upper Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

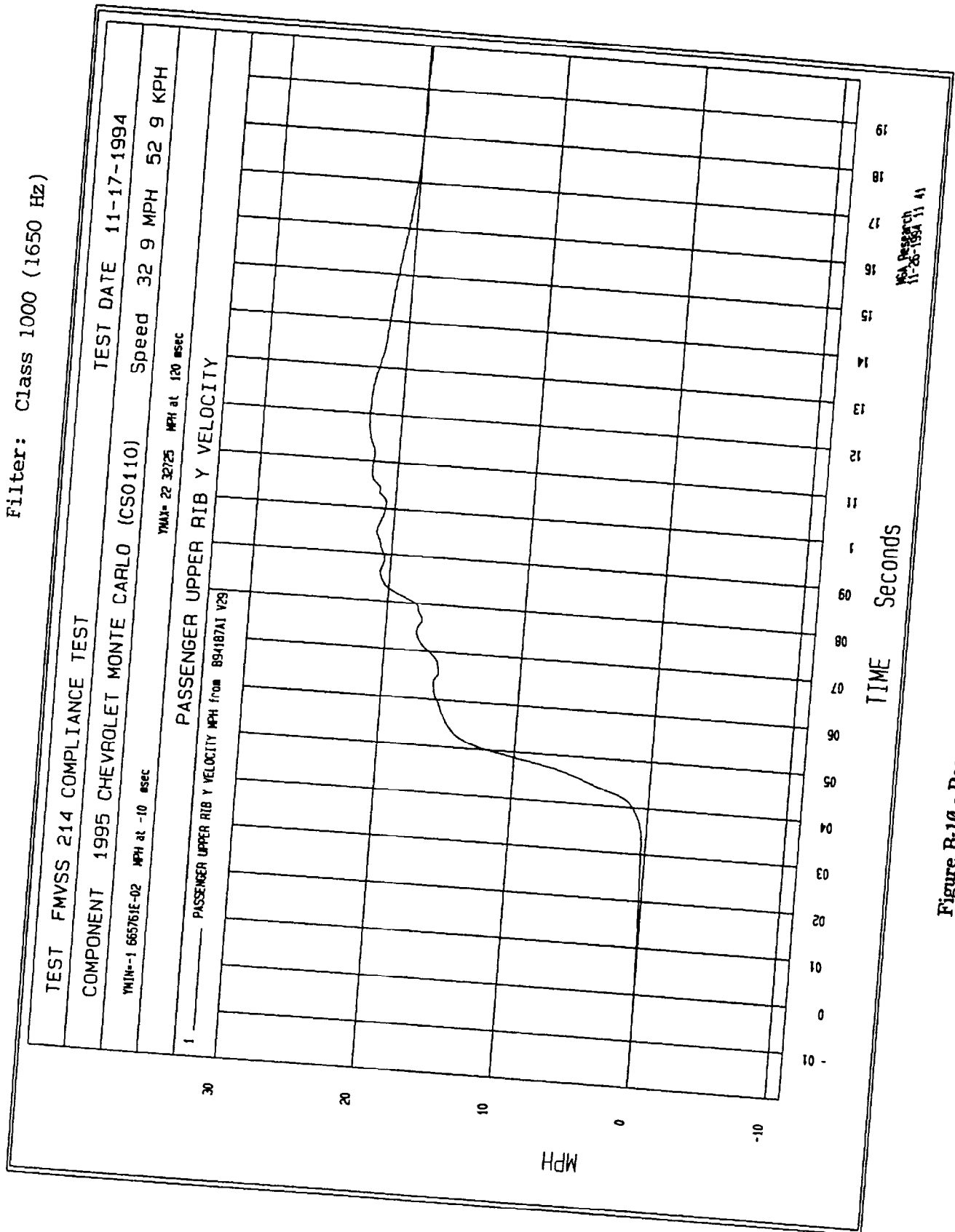


Figure B-10 - Passenger Upper Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

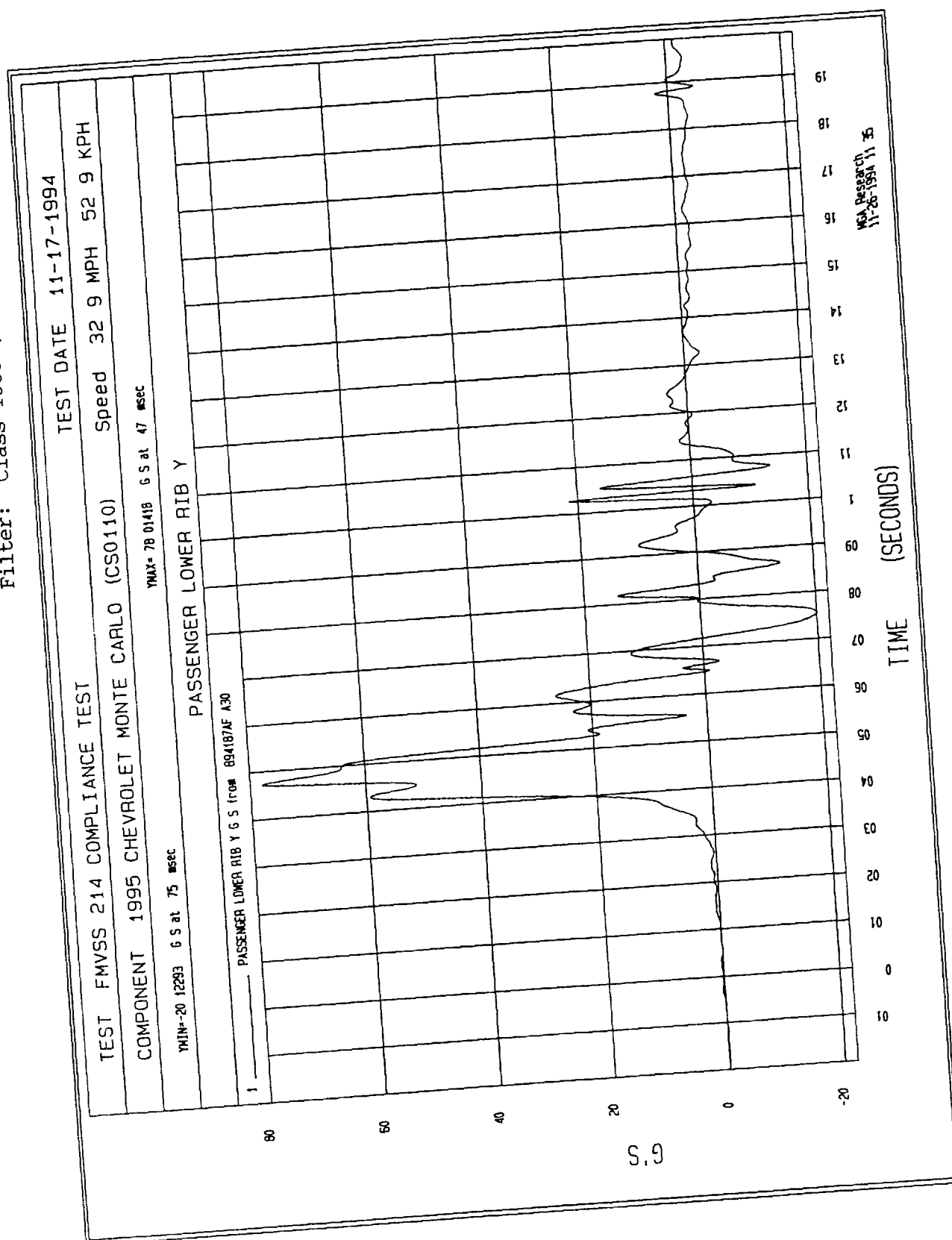


Figure B-11 - Passenger Lower Rib Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

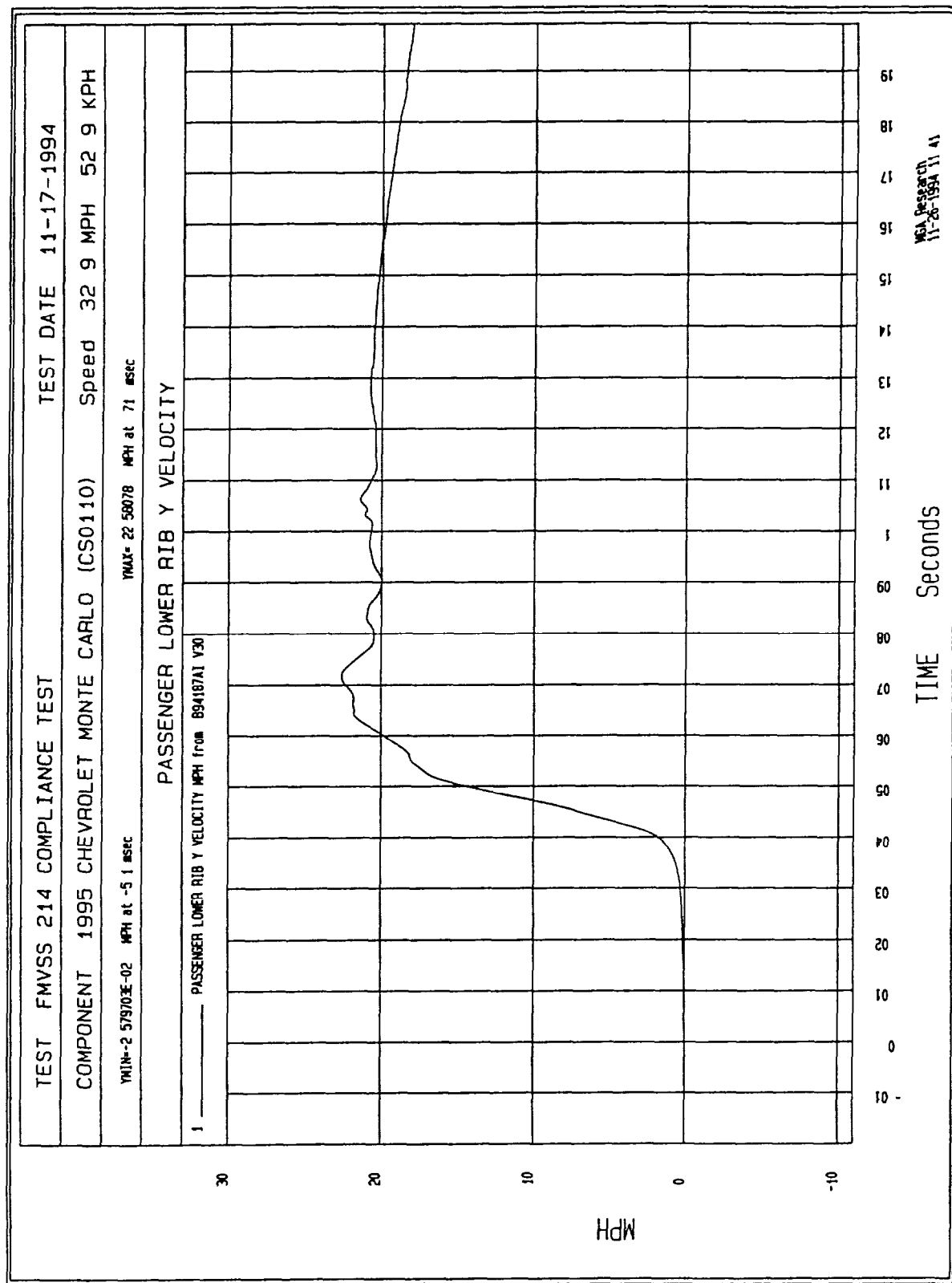


Figure B-12 - Passenger Lower Rib Y Velocity vs. Time

Filter: Class 1000 (1650 Hz)

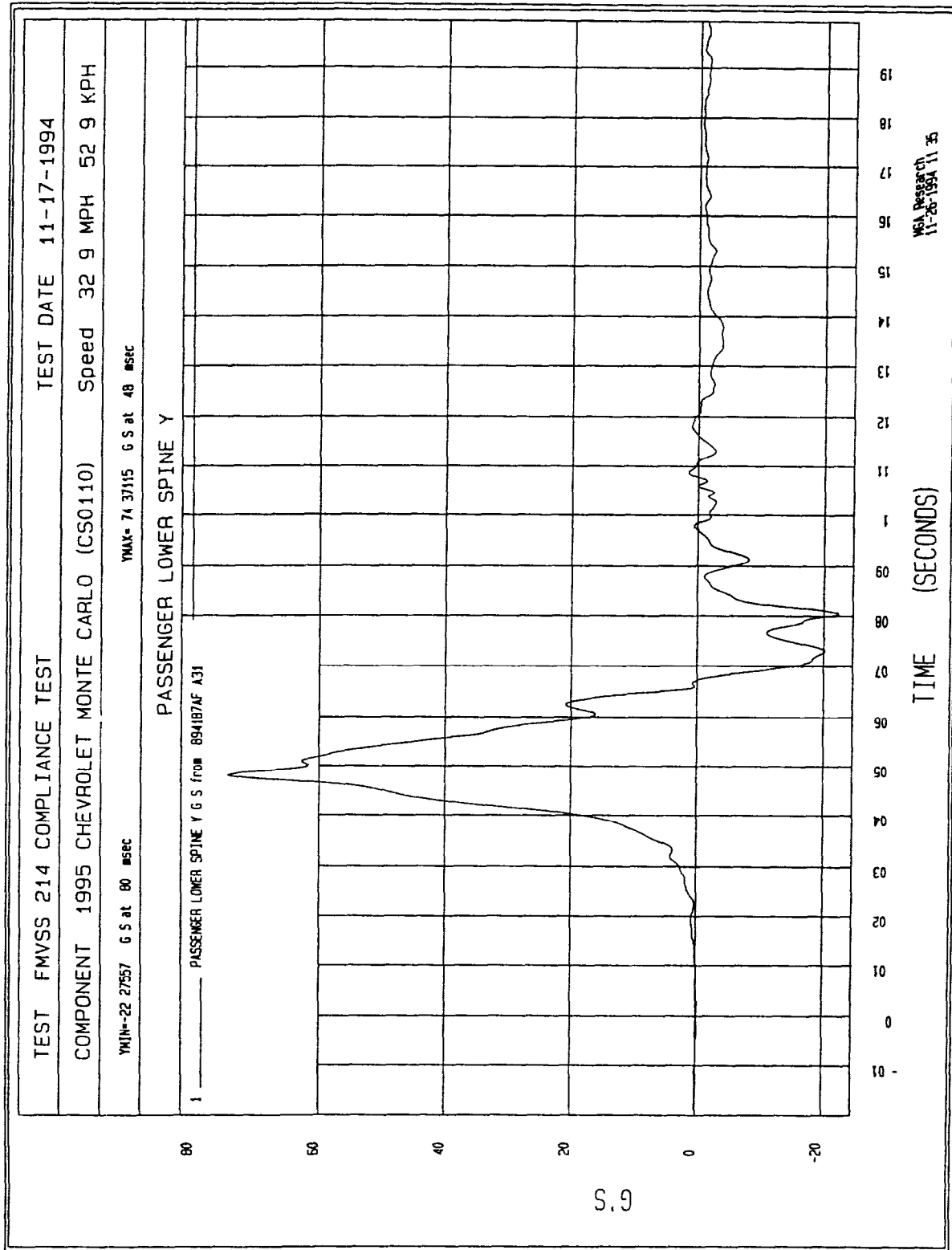


Figure B-13 - Passenger Lower Spine Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

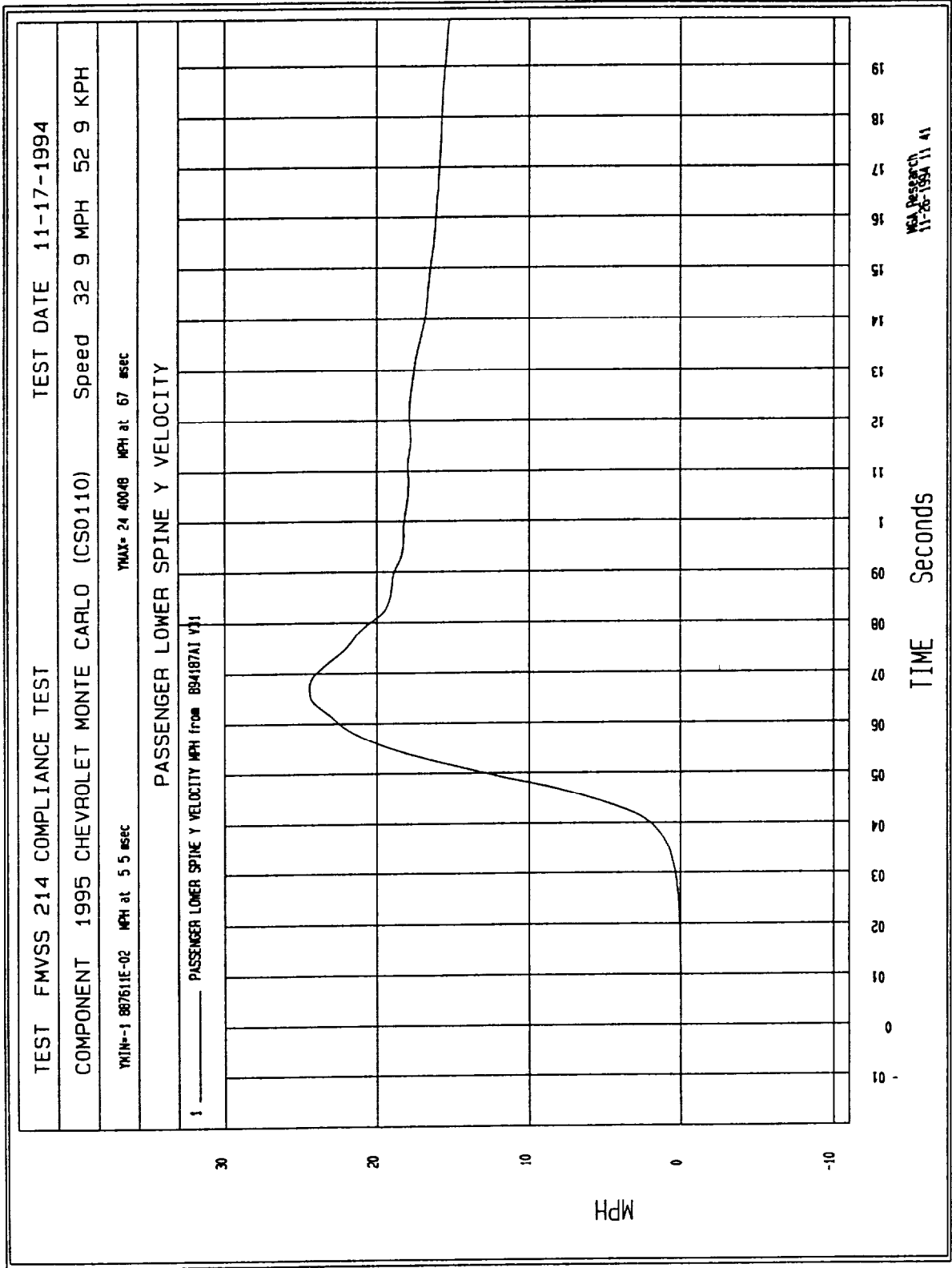


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

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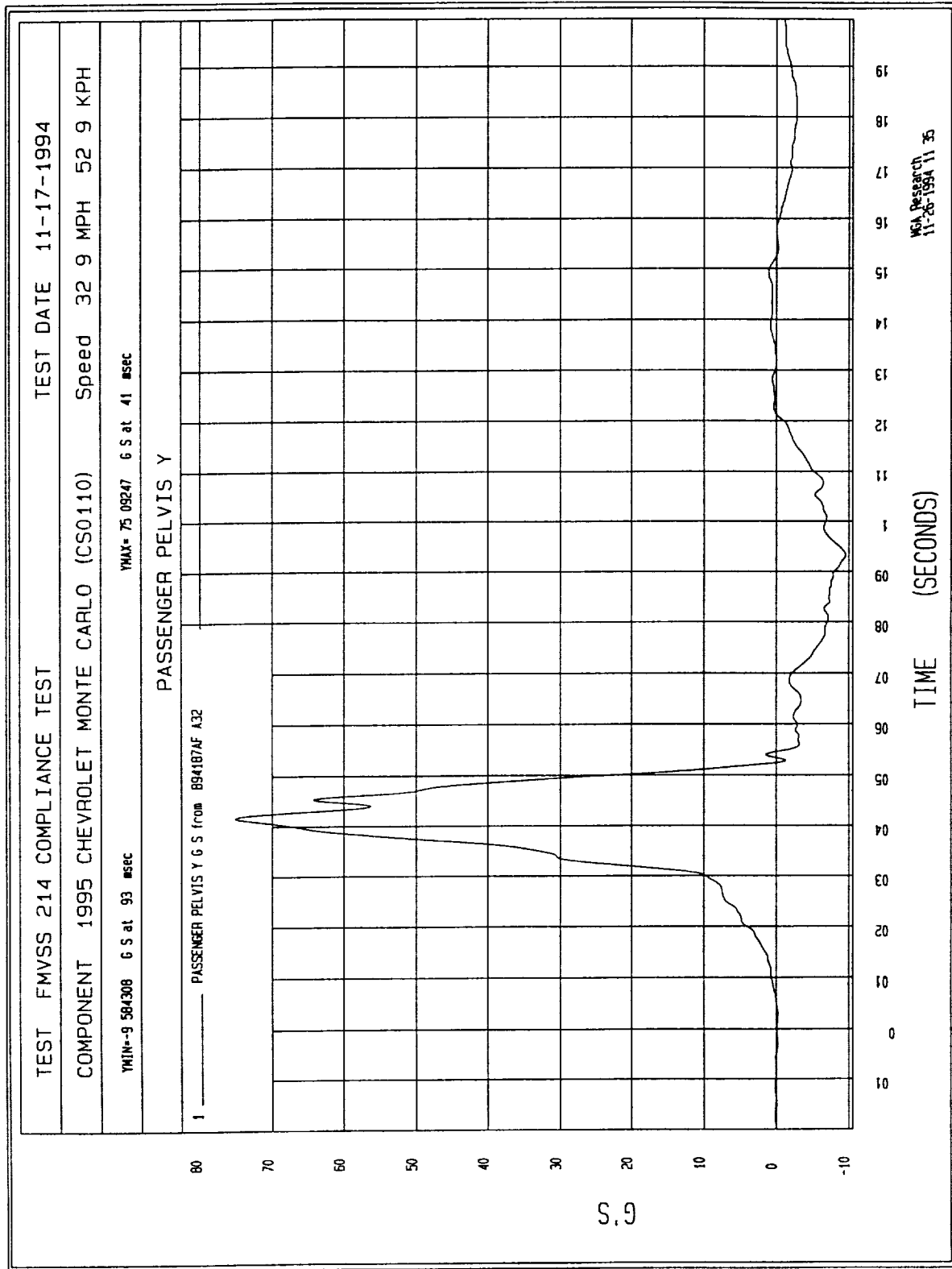


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

Filter: Class 1000 (1650 Hz)

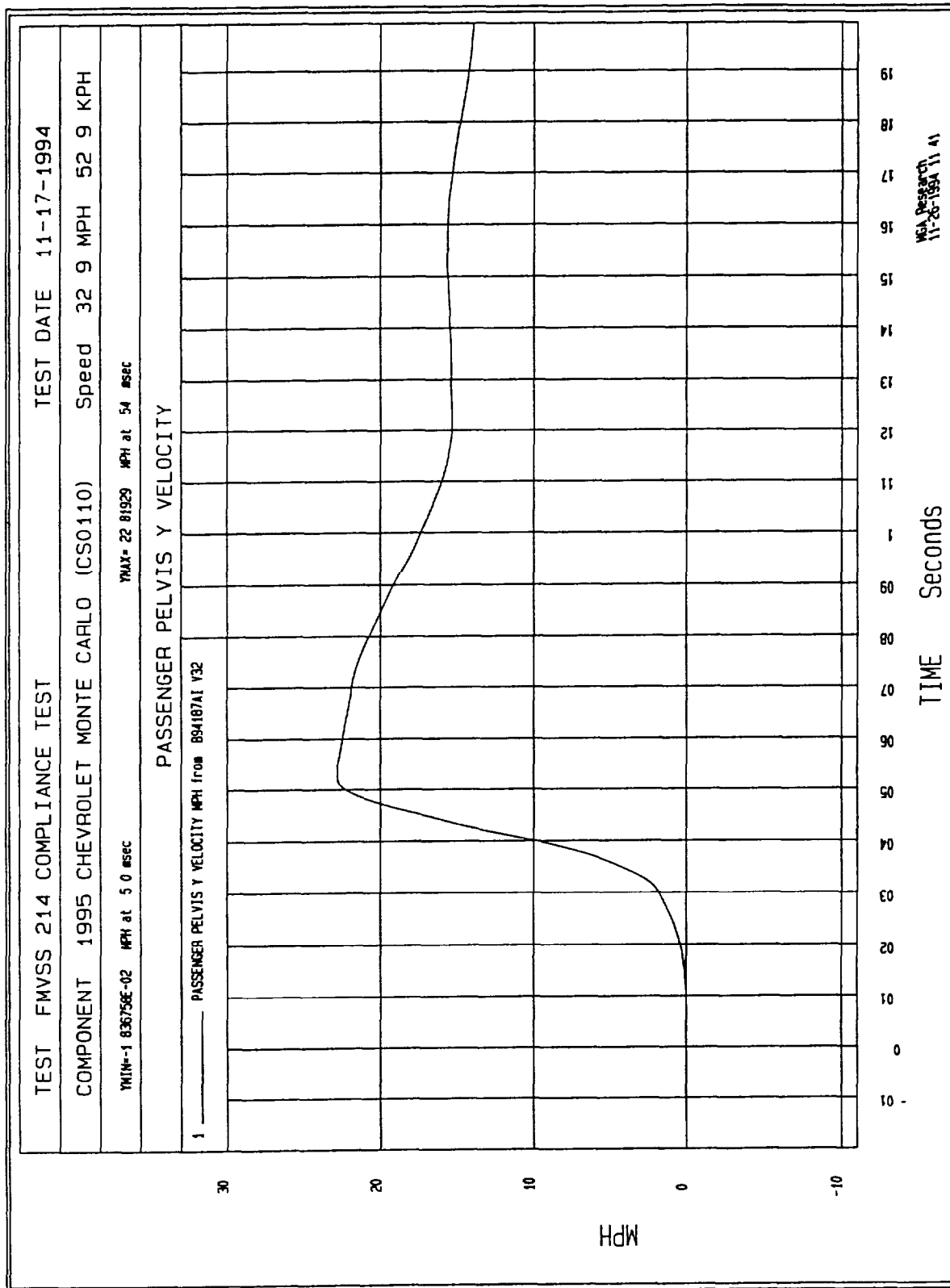


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

Filter: Class 60 (100 Hz)

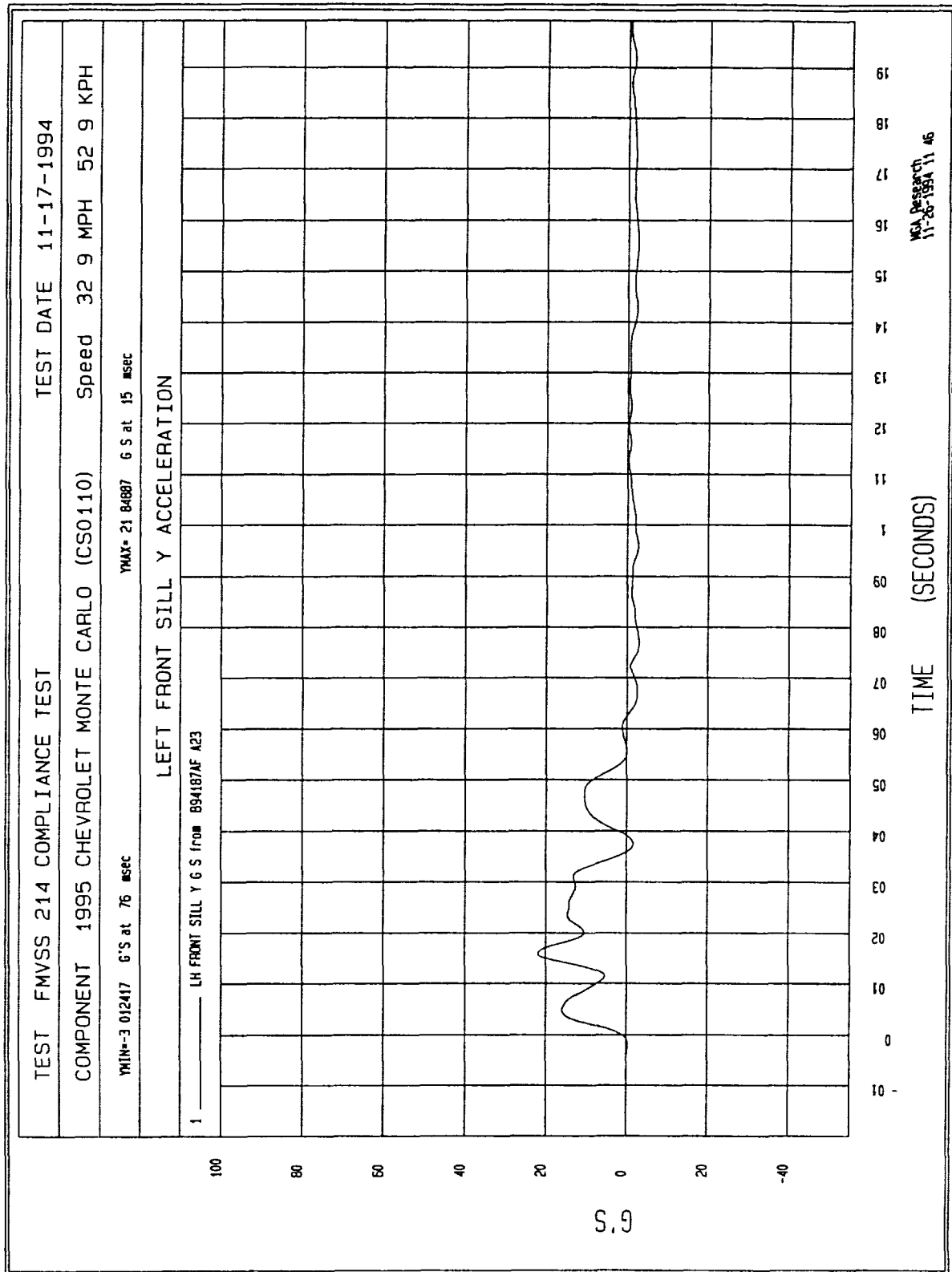


Figure B-17 - Left Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

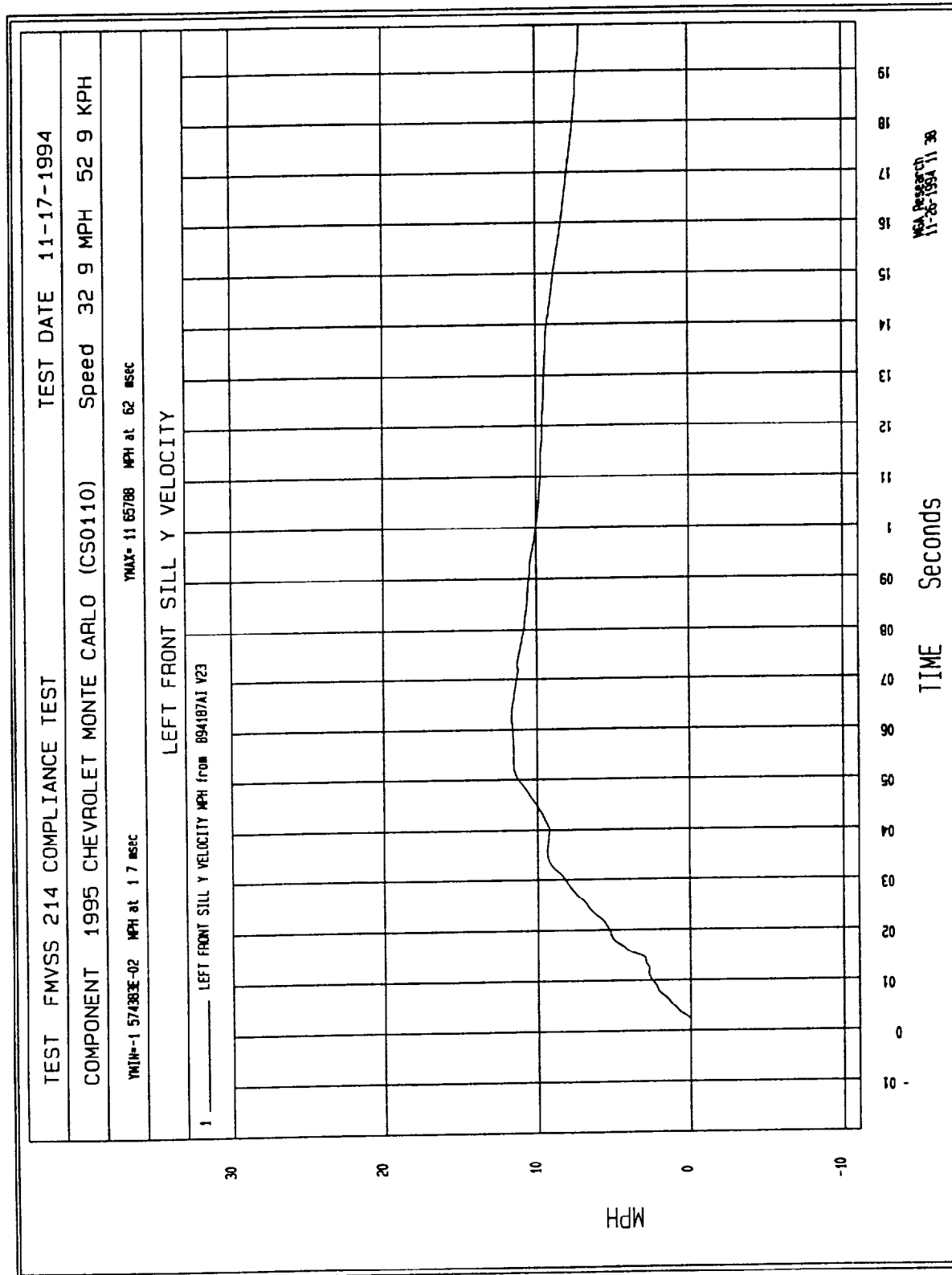


Figure B-18 - Left Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

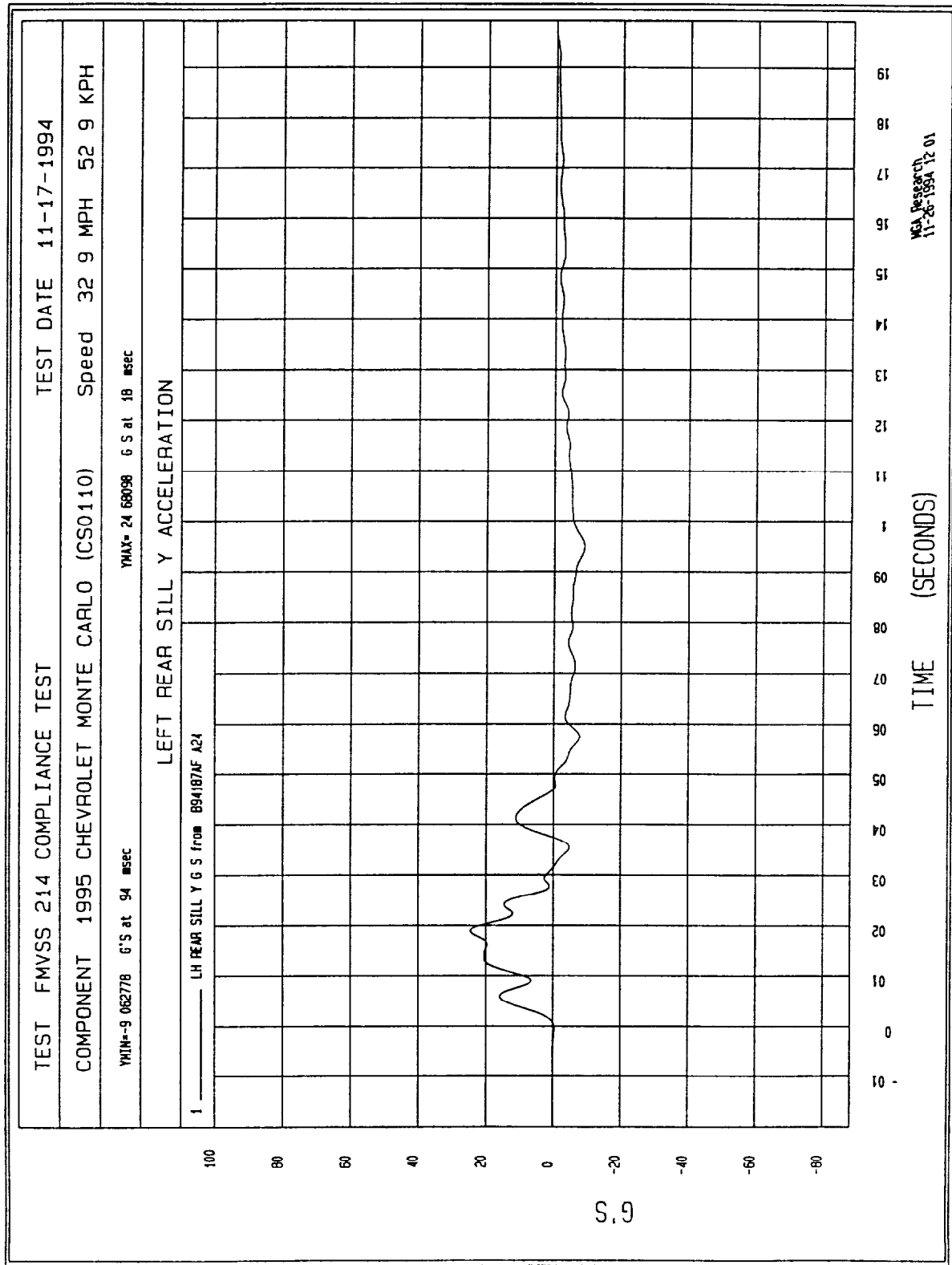


Figure B-19 - Left Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

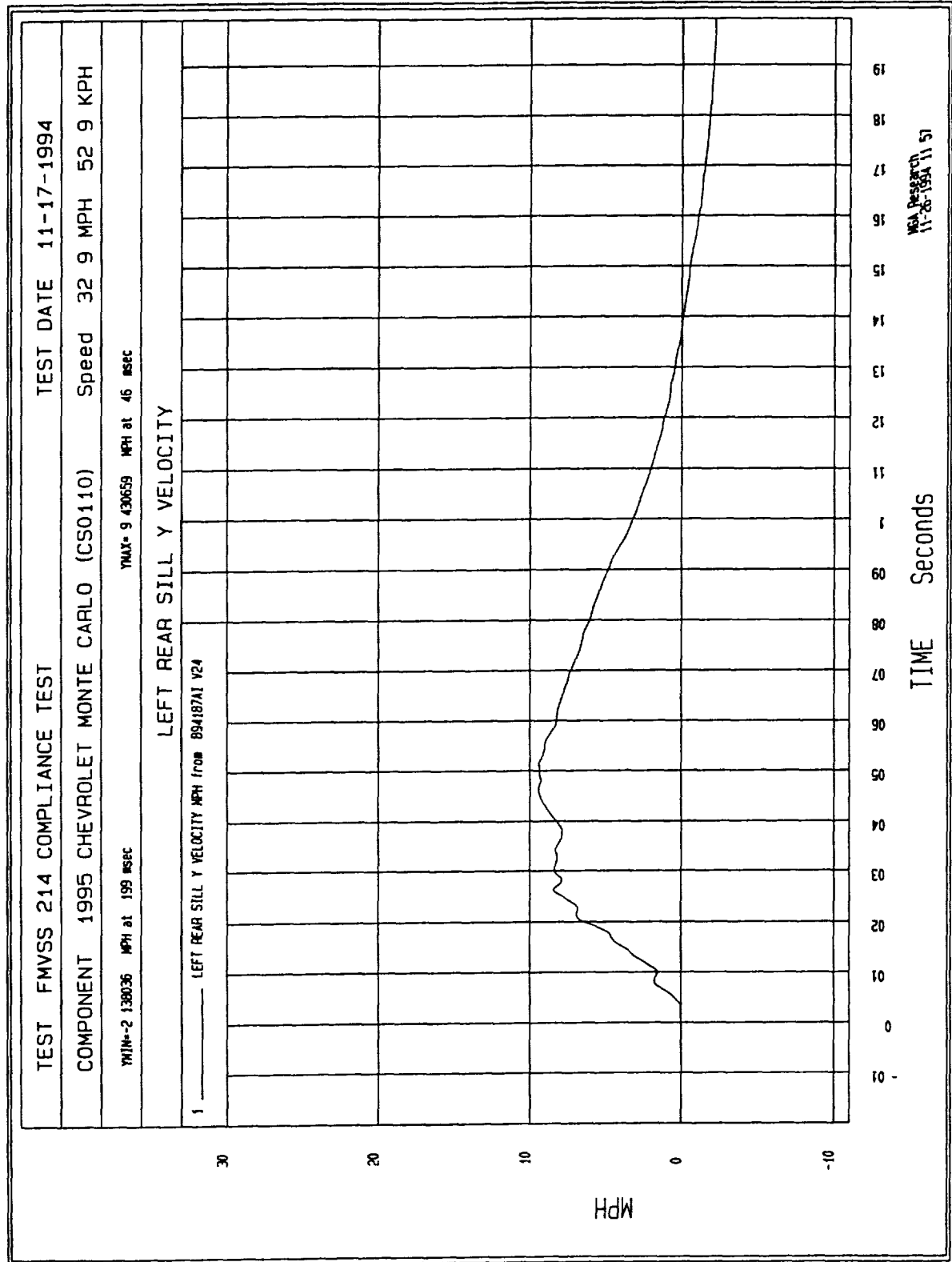


Figure B-20 - Left Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

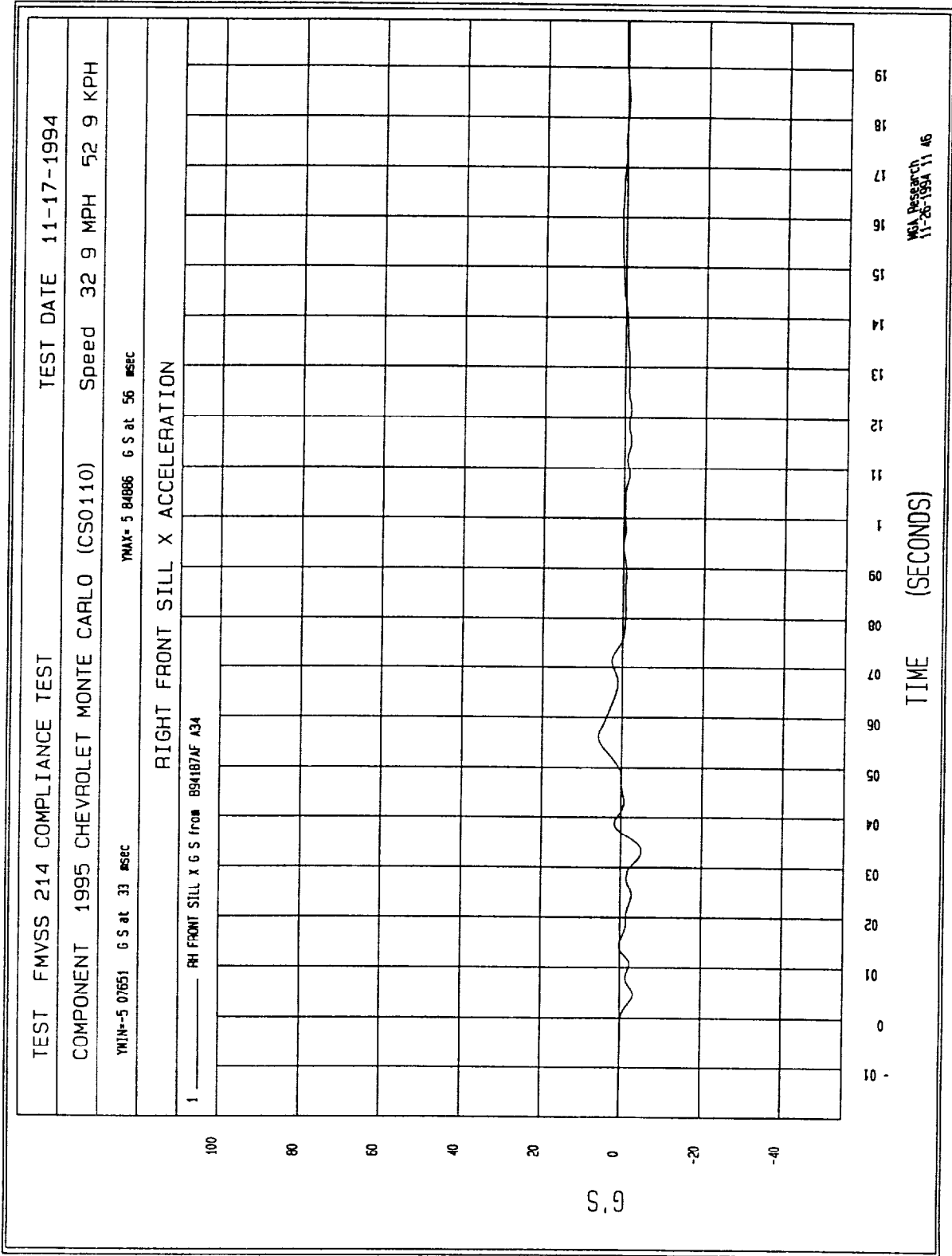


Figure B-21 - Right Front Sill X Acceleration vs. Time

TEST FMVSS 214 COMPLIANCE TEST TEST DATE 11-17-1994

COMPONENT 1995 CHEVROLET MONTE CARLO (CS0110) Speed 32 9 MPH 52 9 KPH

YMIN=-1 673473 MPH at 36 msec YMAX= 2 558472E-02 MPH at -9 5 msec

RIGHT FRONT SILL X VELOCITY

1 RIGHT FRONT SILL X VELOCITY MPH from B94187A1 V34

MPH

TIME Seconds

11-26-1994 11:39

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

Filter: Class 60 (100 Hz)

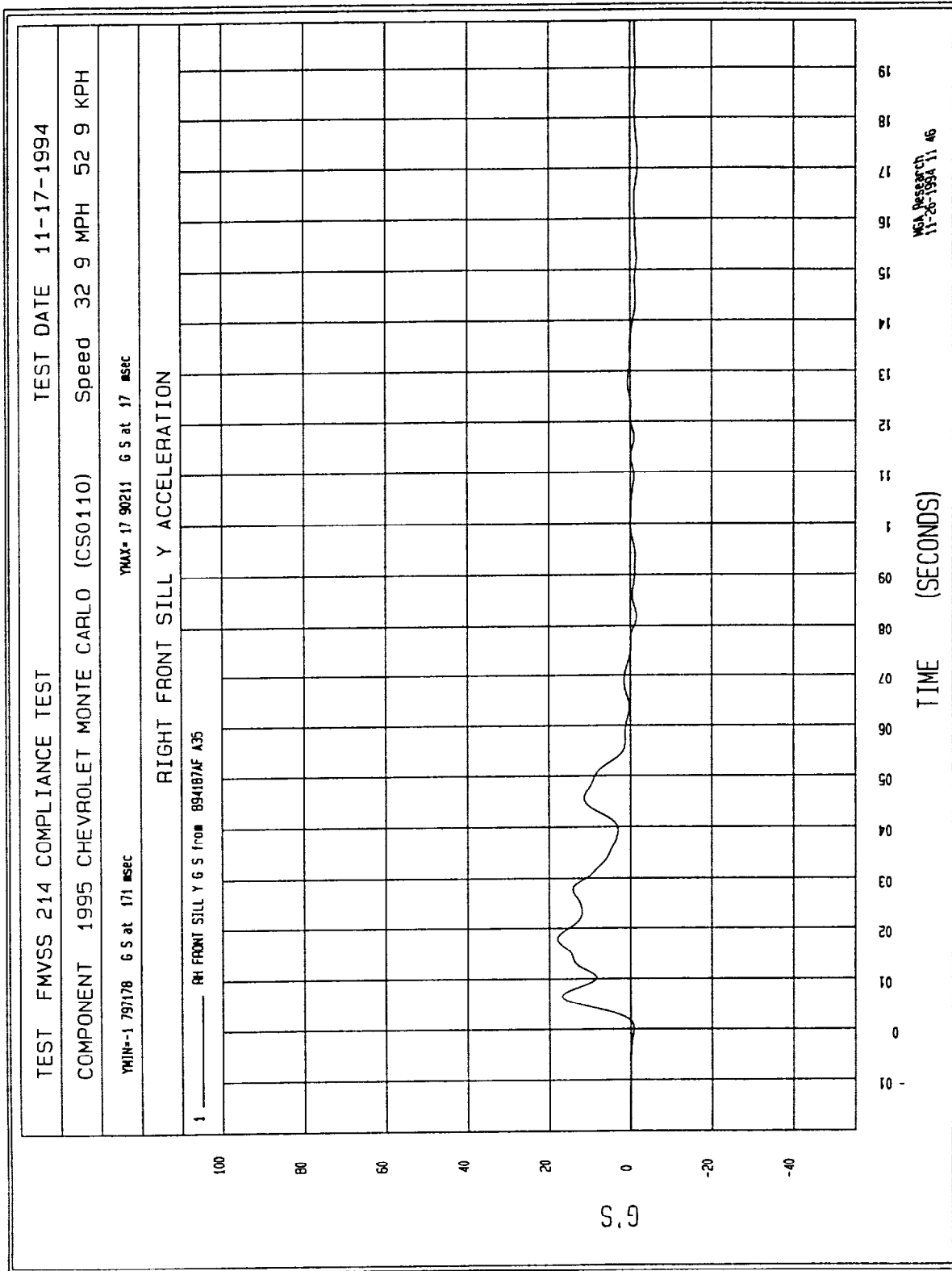


Figure B-23 - Right Front Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

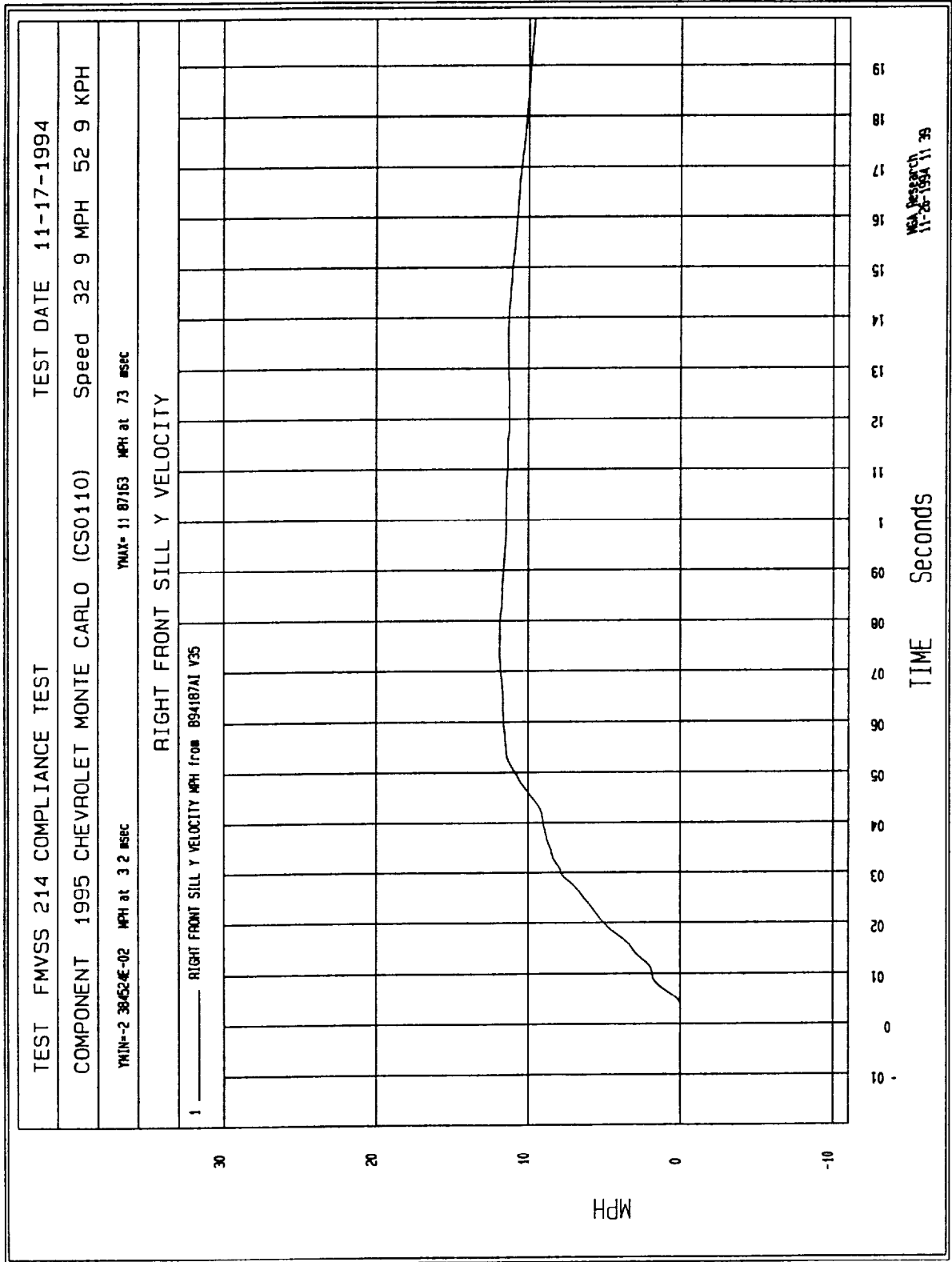


Figure B-24 - Right Front Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

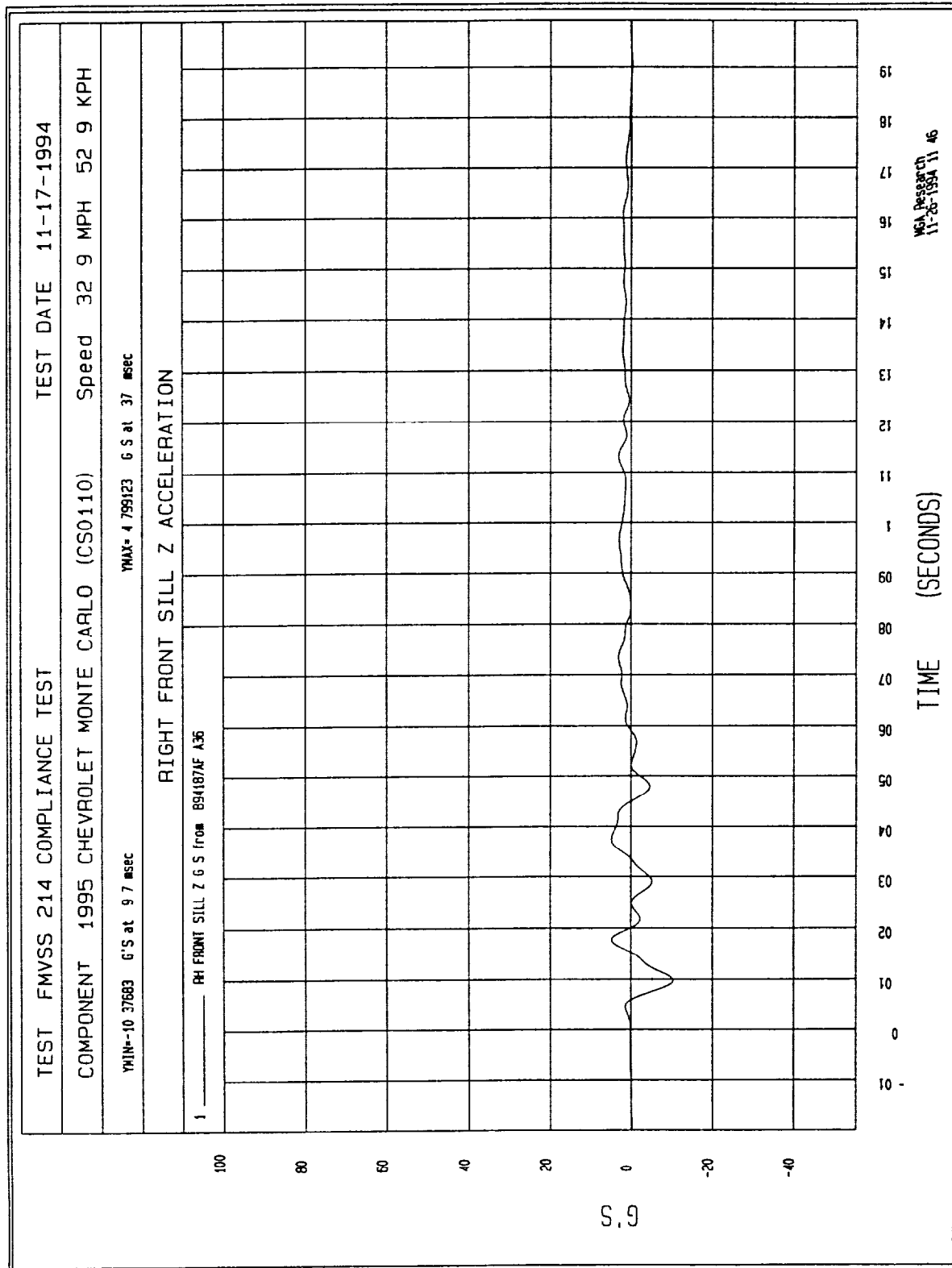


Figure B-25 - Right Front Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

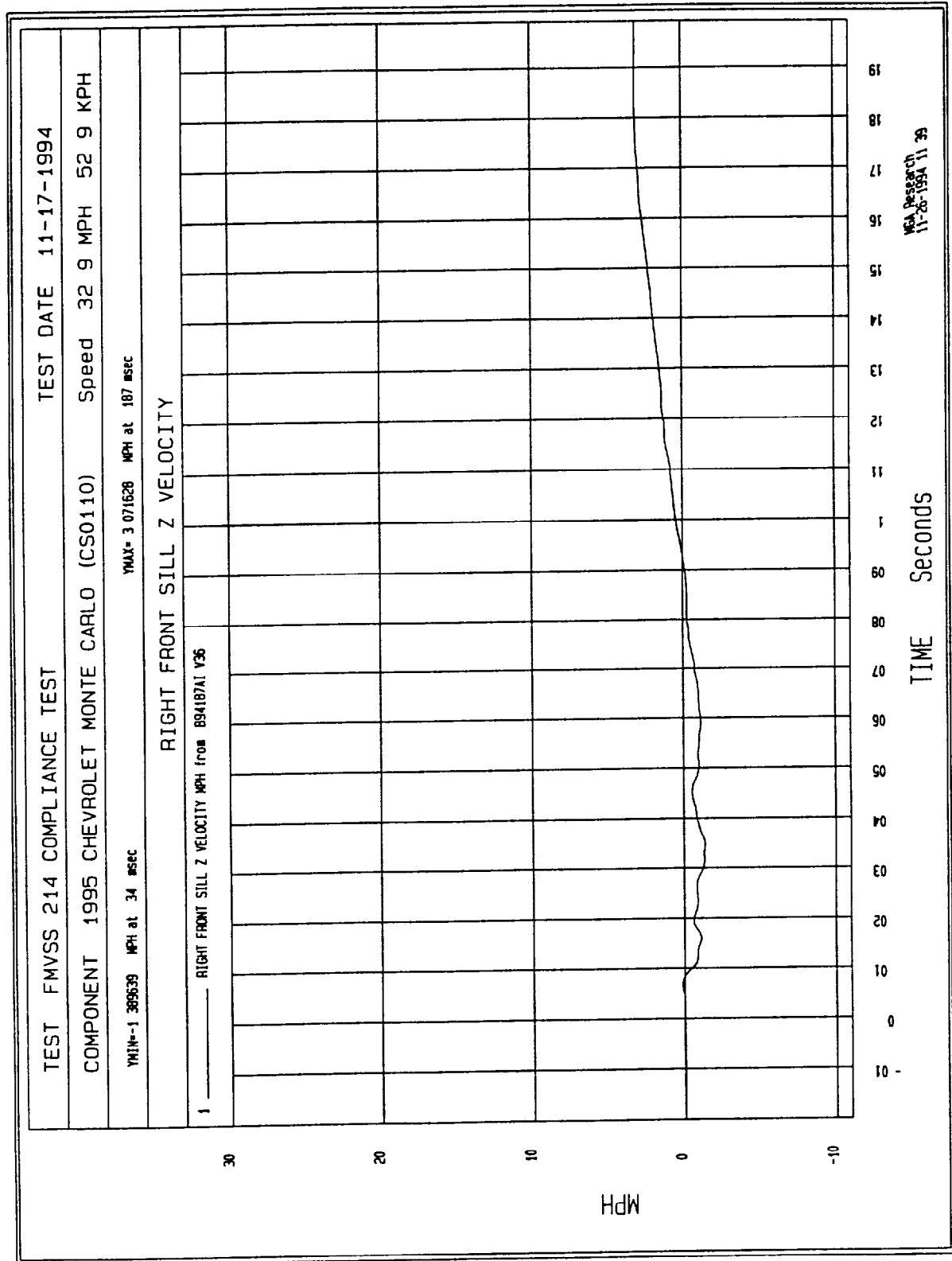


Figure B-26 - Right Front Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

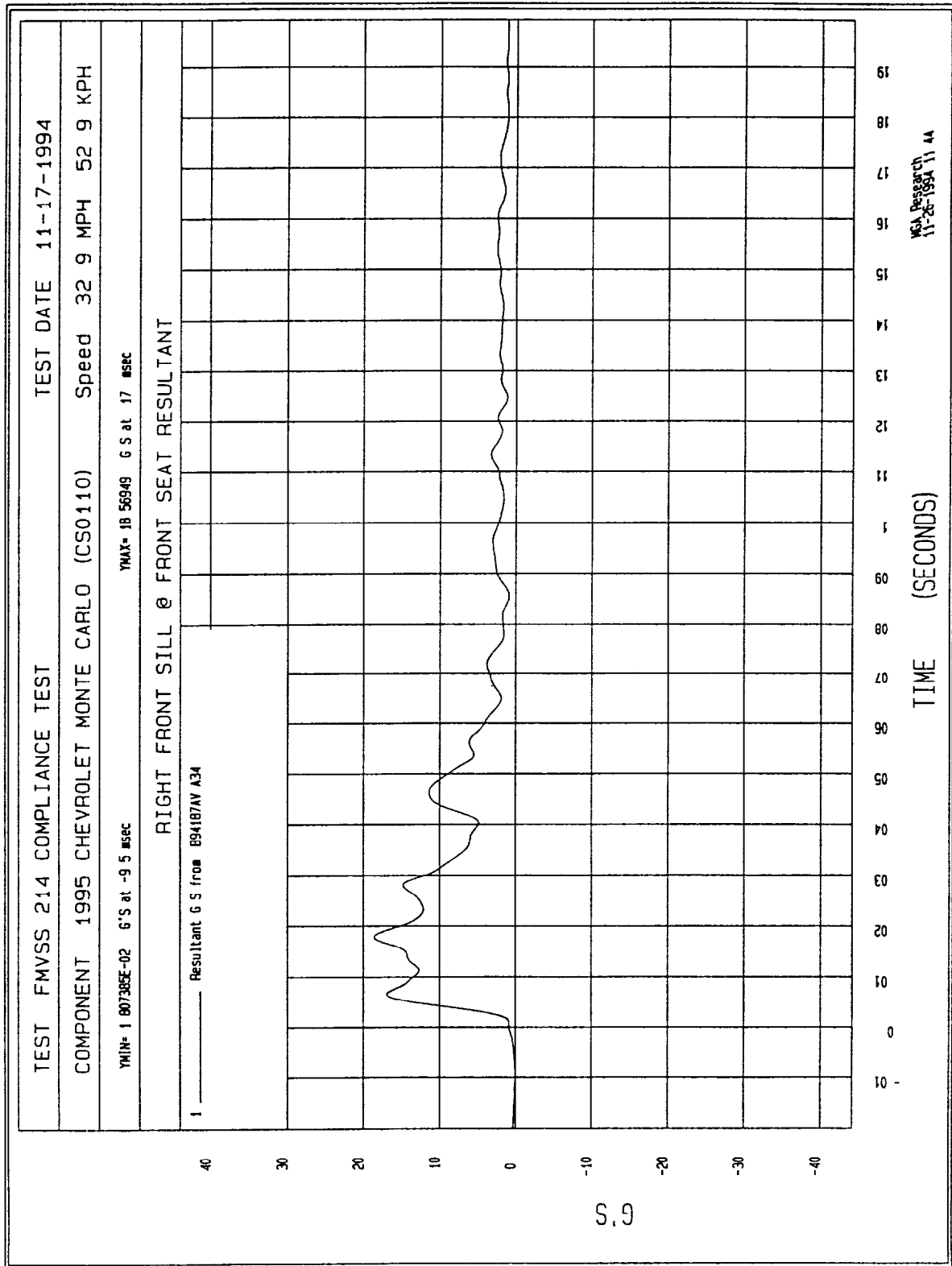


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

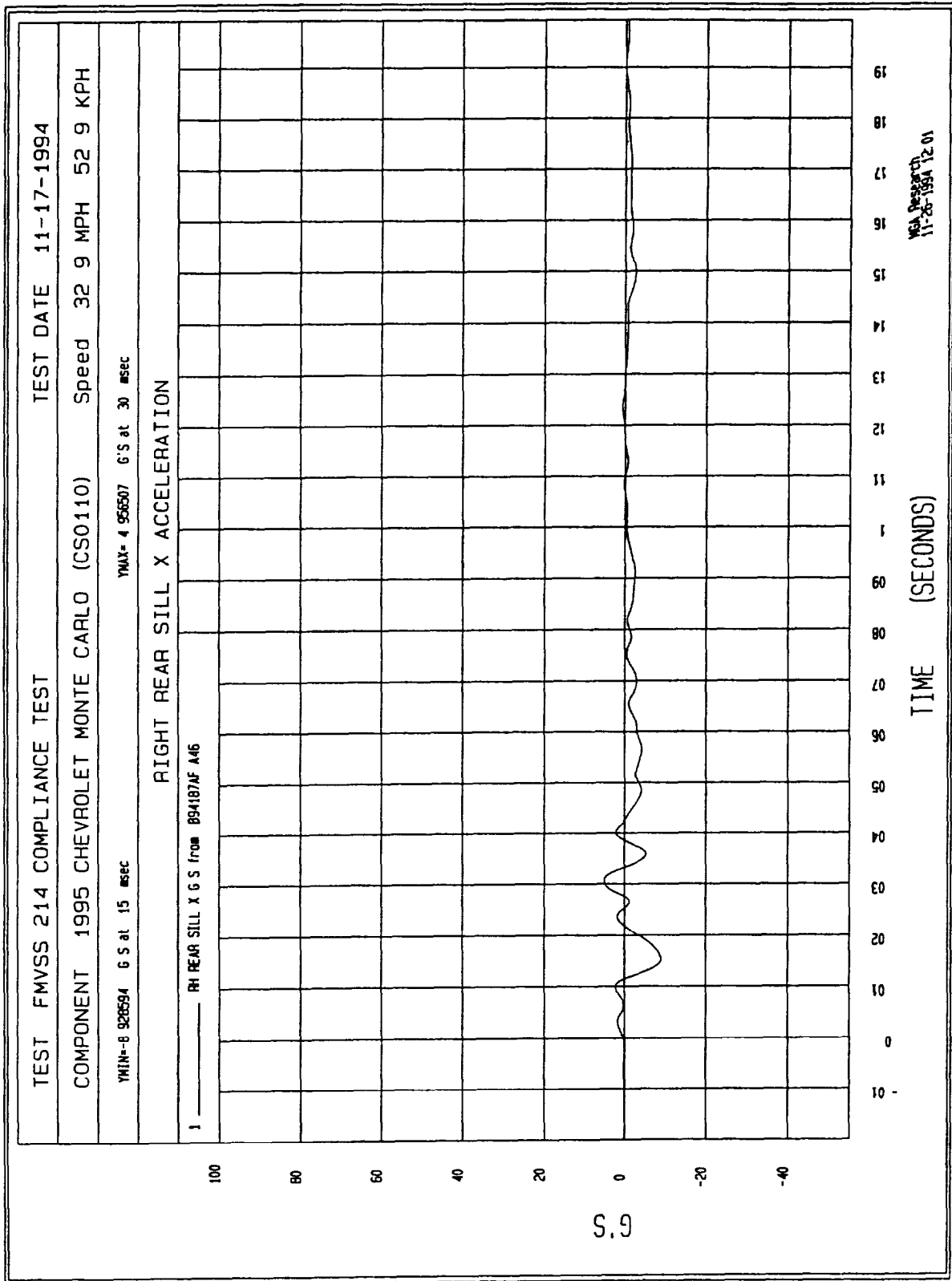


Figure B-28 - Right Rear Sill X Acceleration vs. Time

Filter: Class 180 (300 Hz)

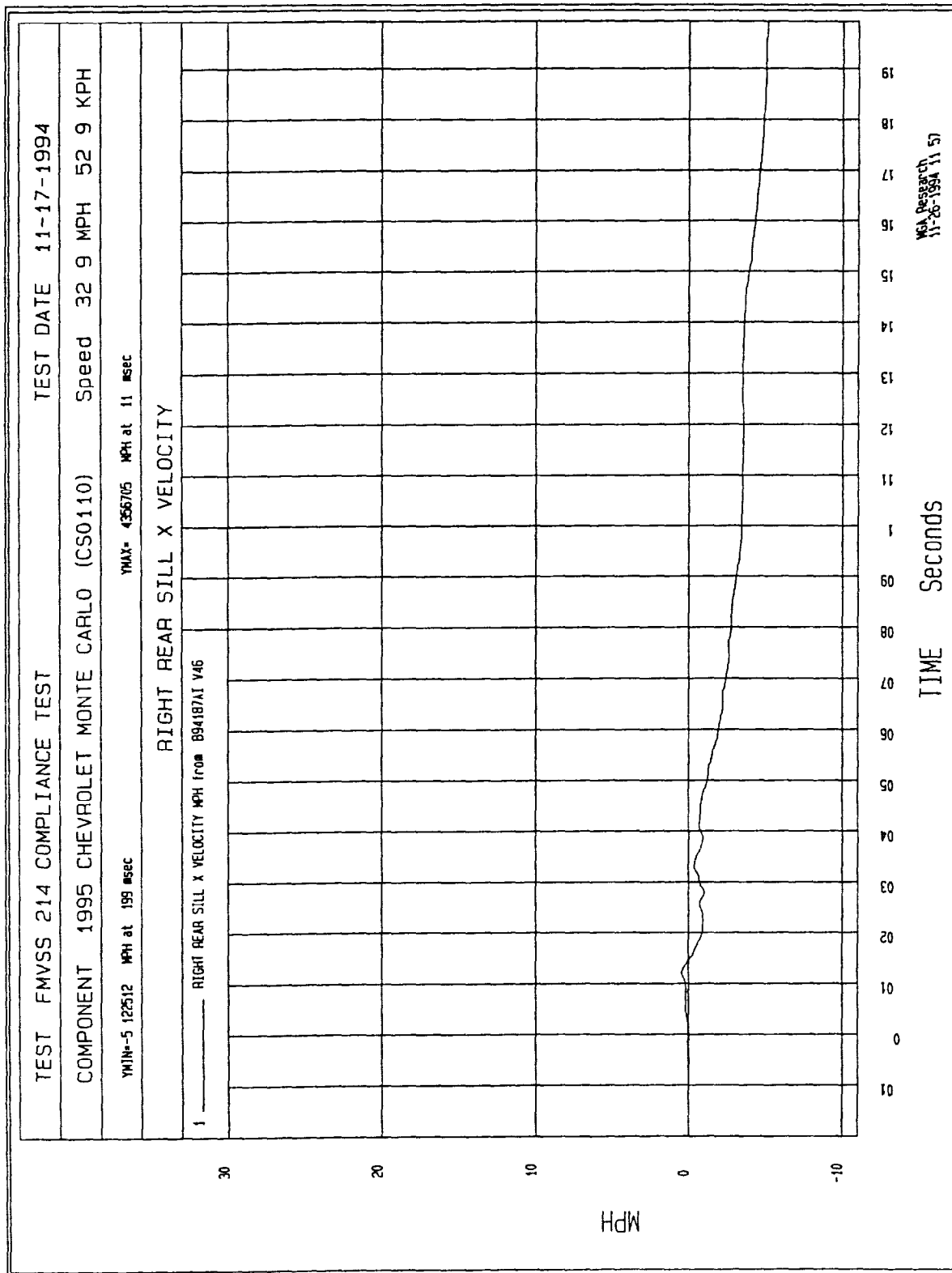


Figure B-29 - Right Rear Sill X Velocity vs. Time

Filter: Class 60 (100 Hz)

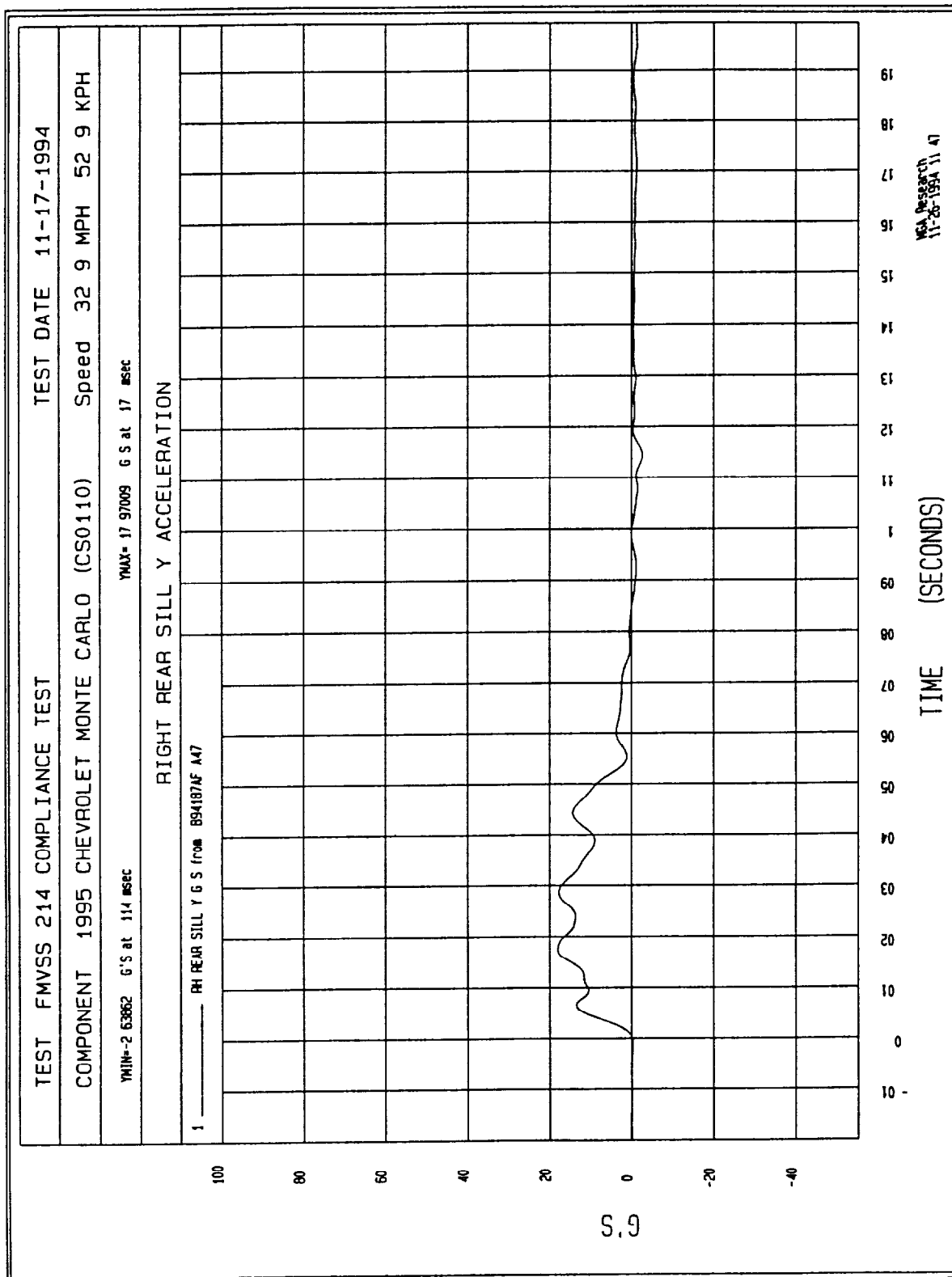


Figure B-30 - Right Rear Sill Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

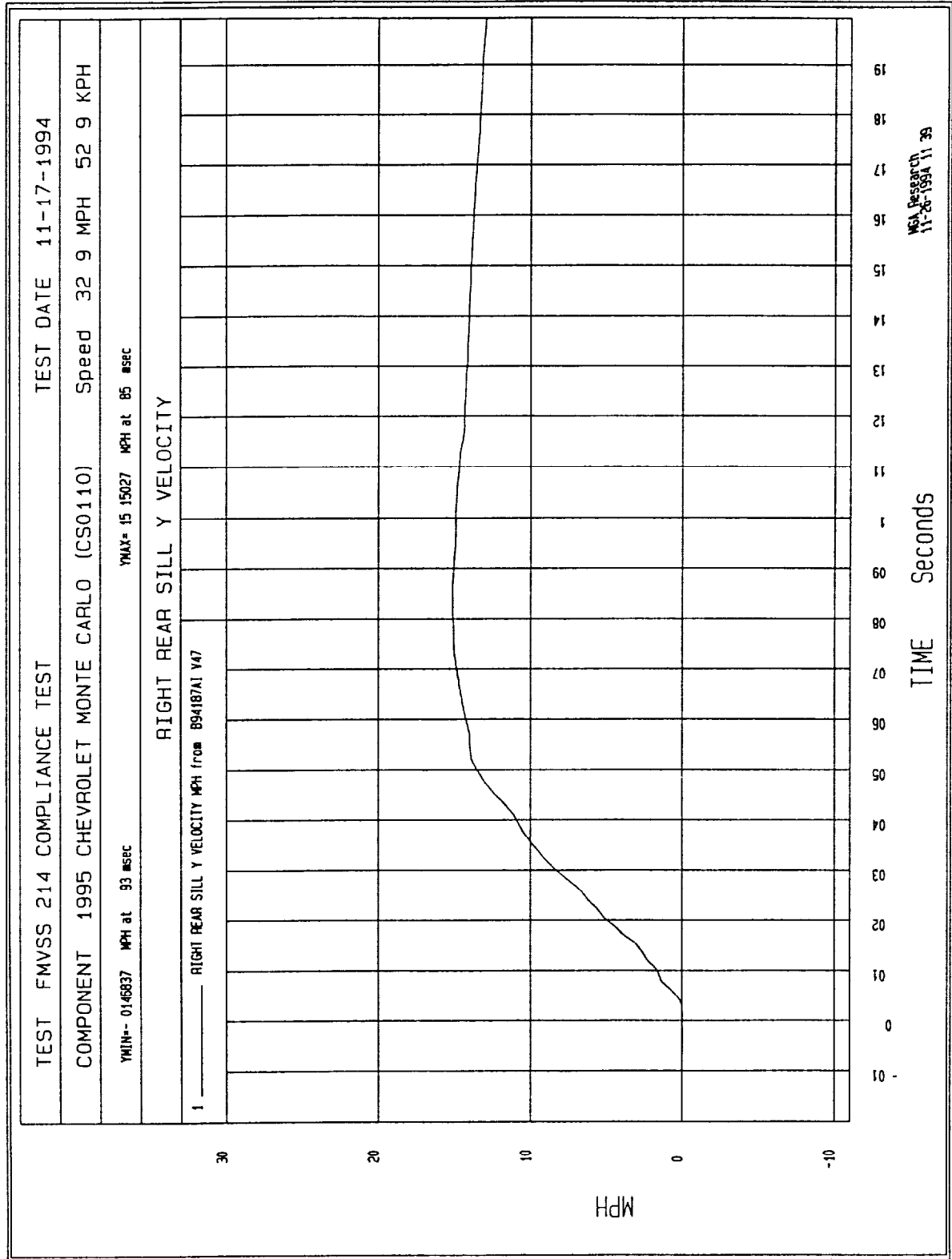


Figure B-31 - Right Rear Sill Y Velocity vs. Time

Filter: Class 60 (100 Hz)

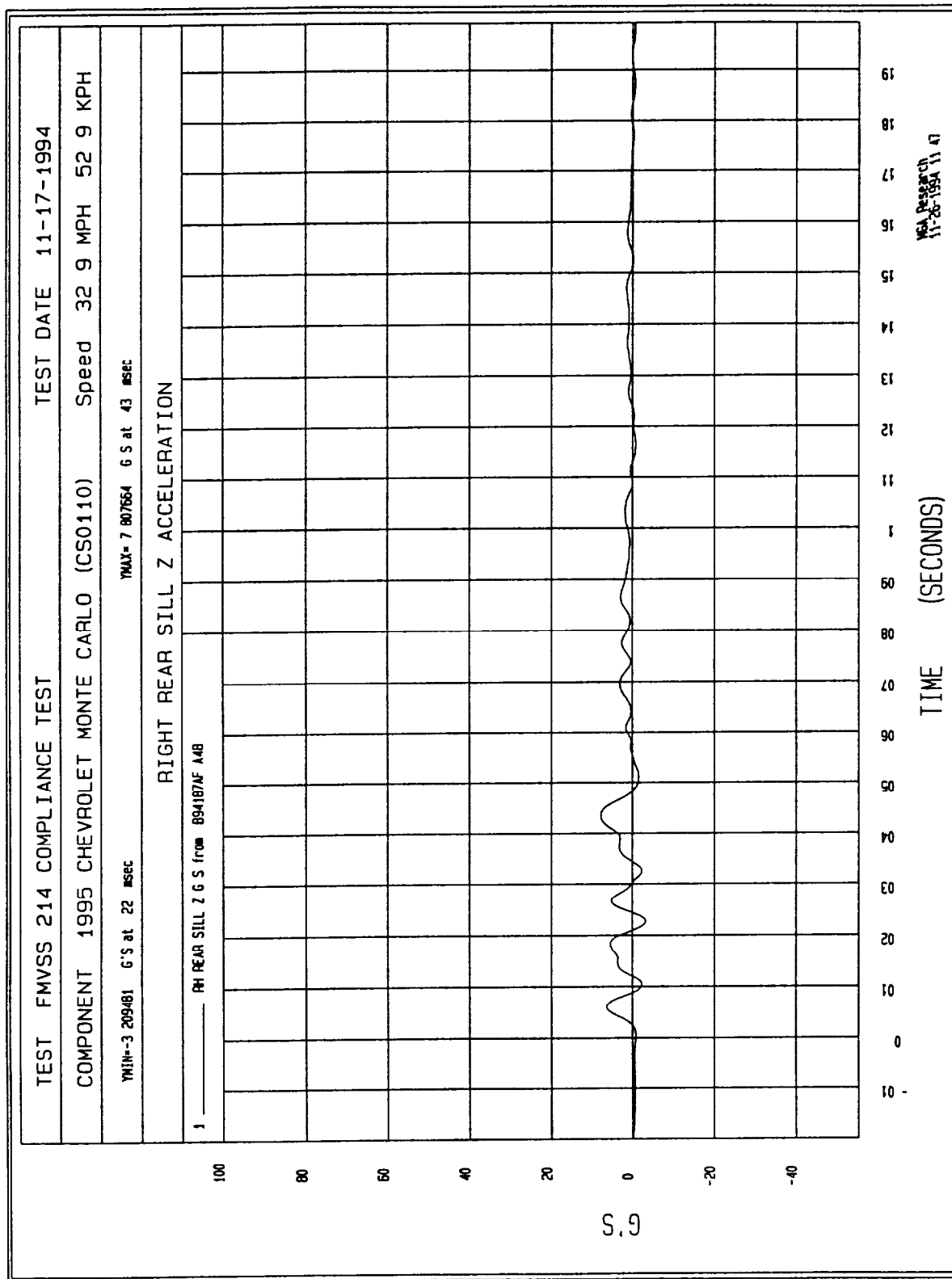


Figure B-32 - Right Rear Sill Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

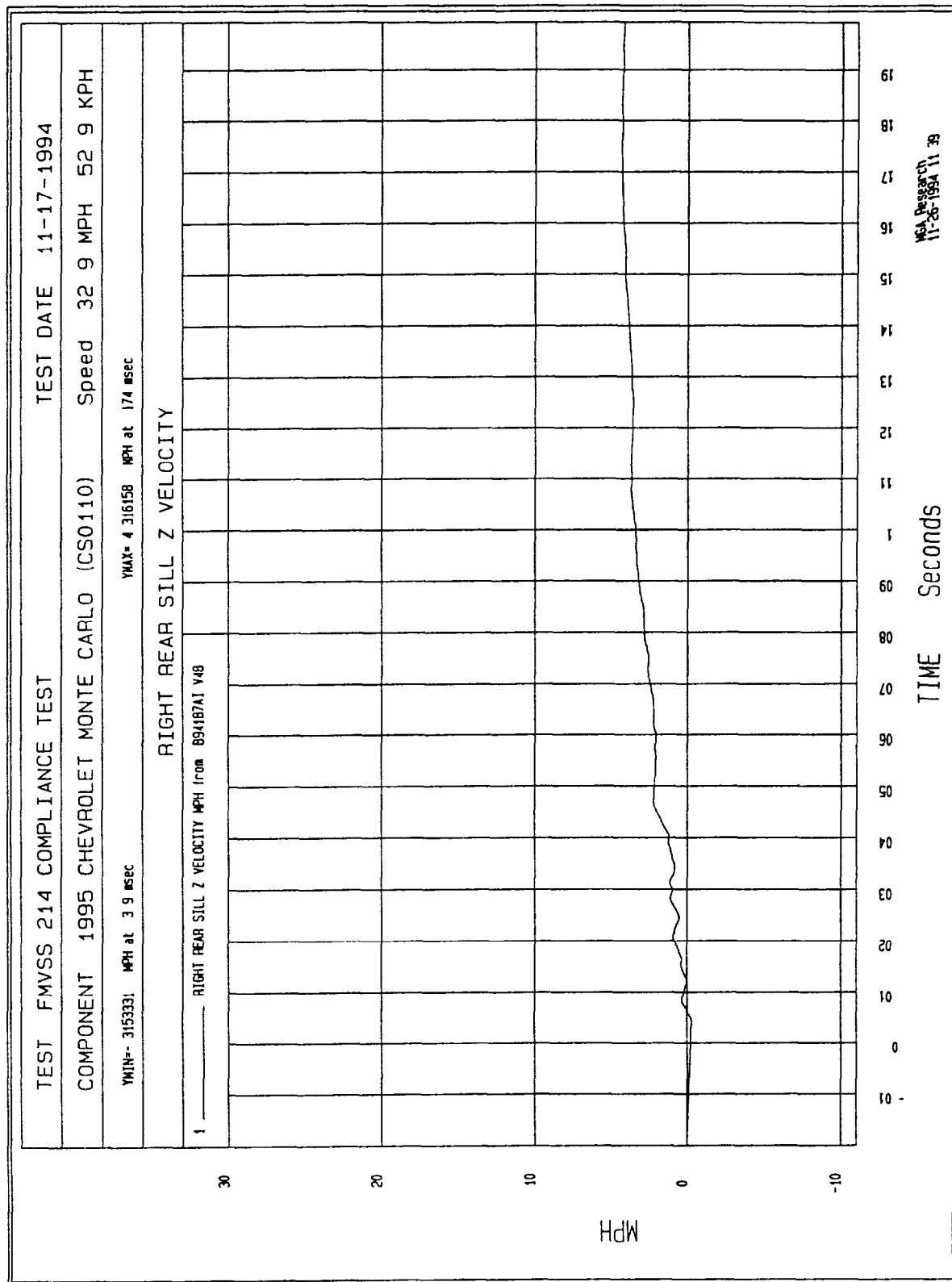


Figure B-33 - Right Rear Sill Z Velocity vs. Time

Filter: Class 60 (100 Hz)

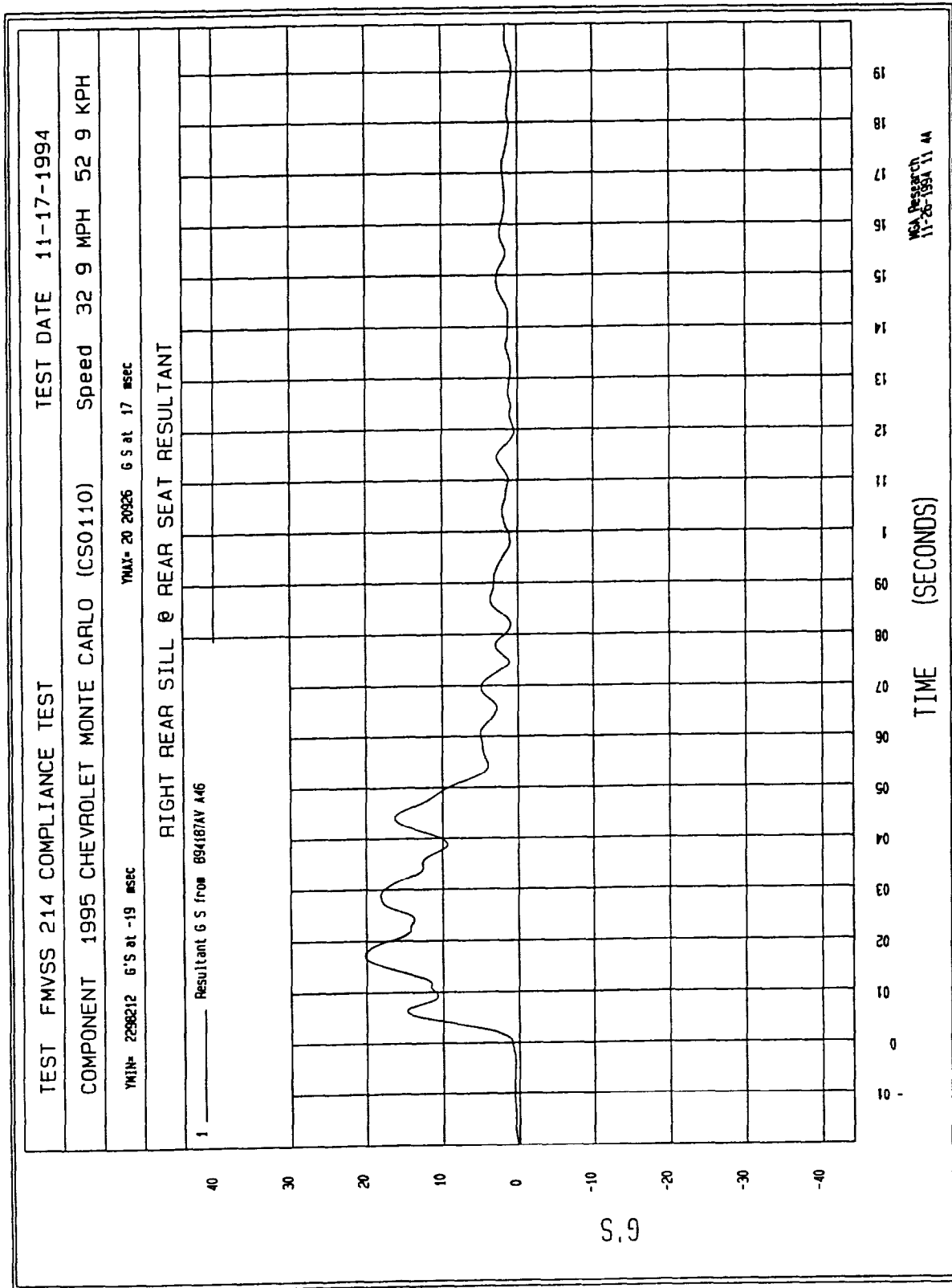


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

Filter: Class 60 (100 Hz)

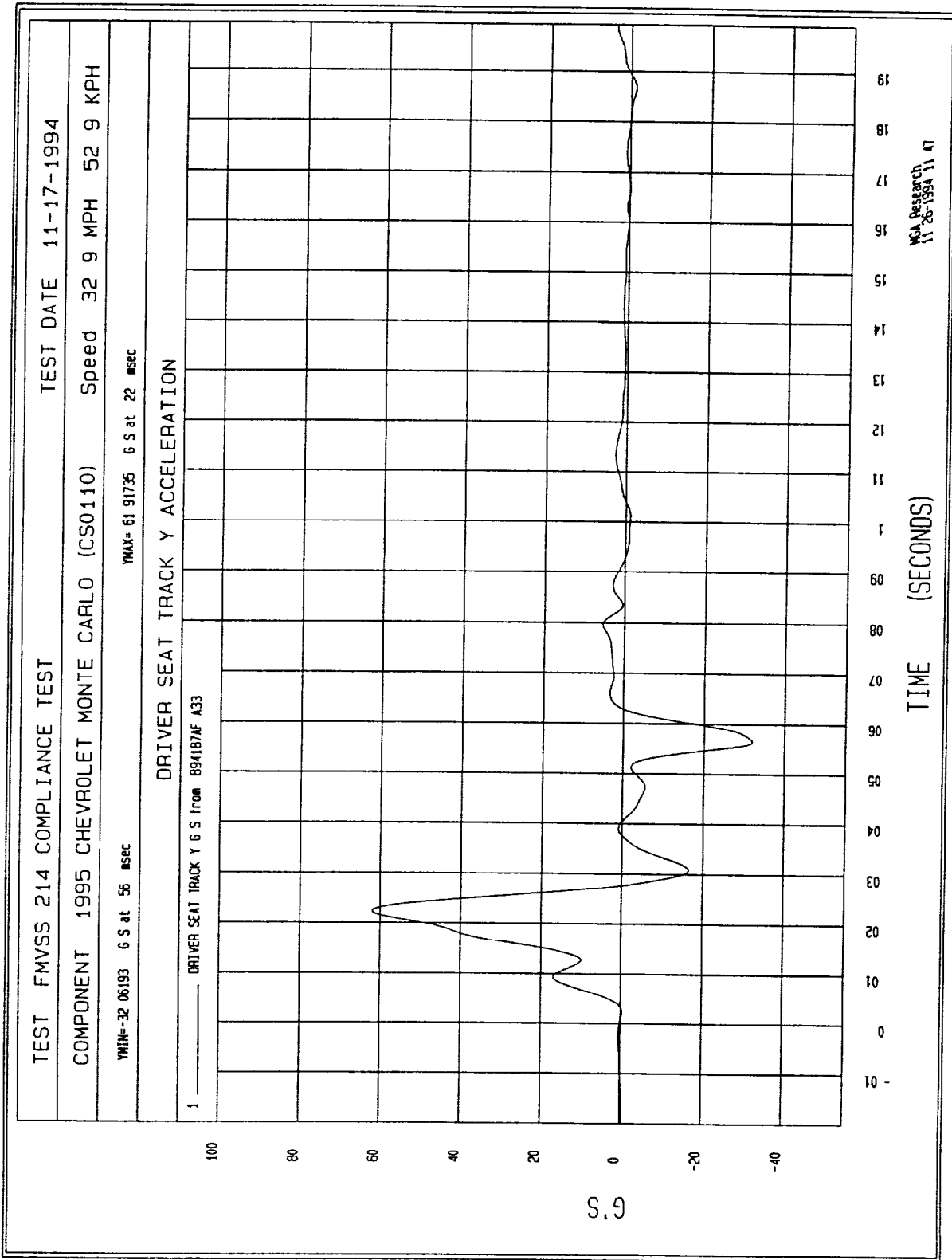


Figure B-35 - Driver Seat Track Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

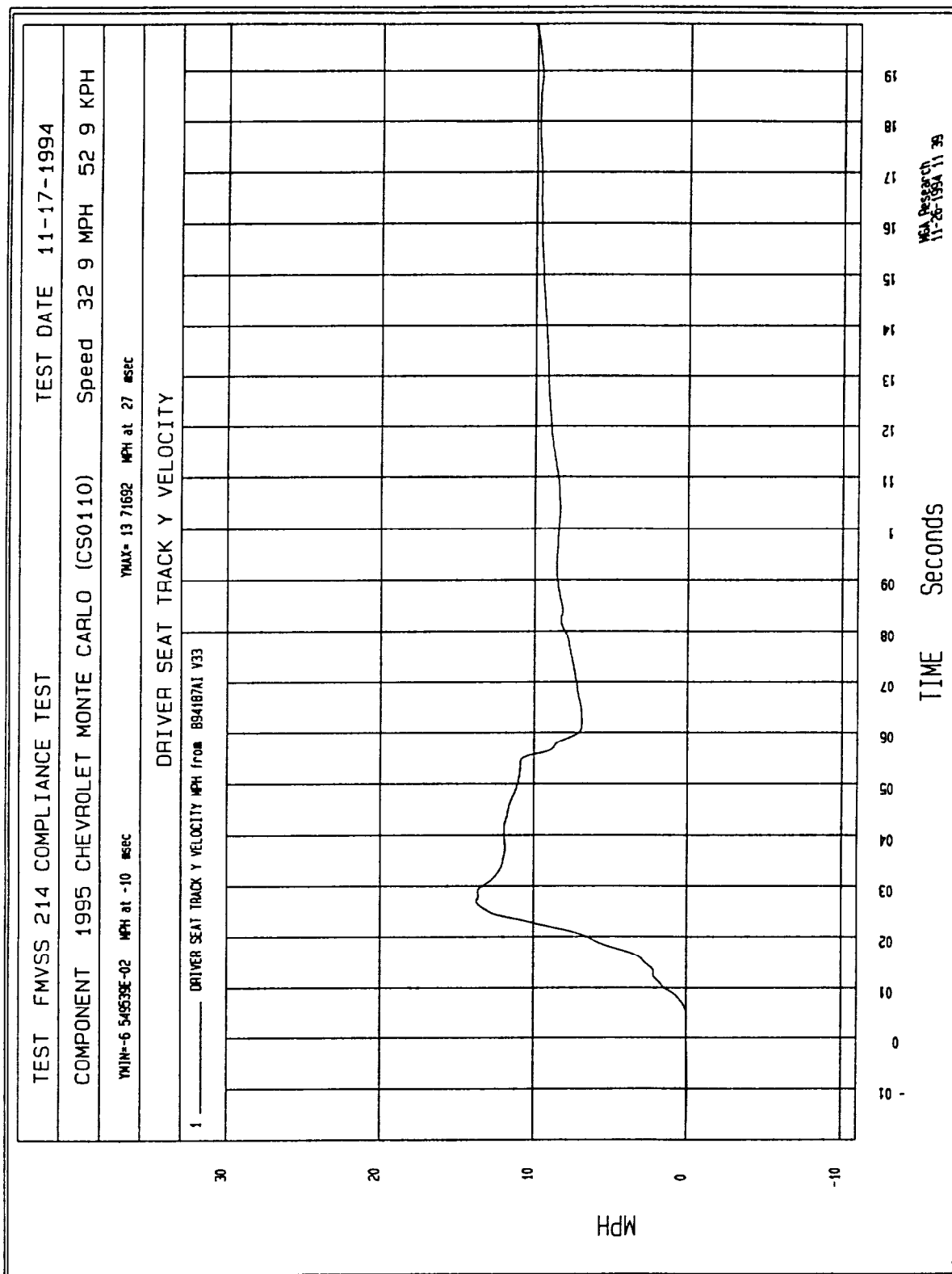


Figure B-36 - Driver Seat Track Y Velocity vs. Time

Filter: Class 60 (100 Hz)

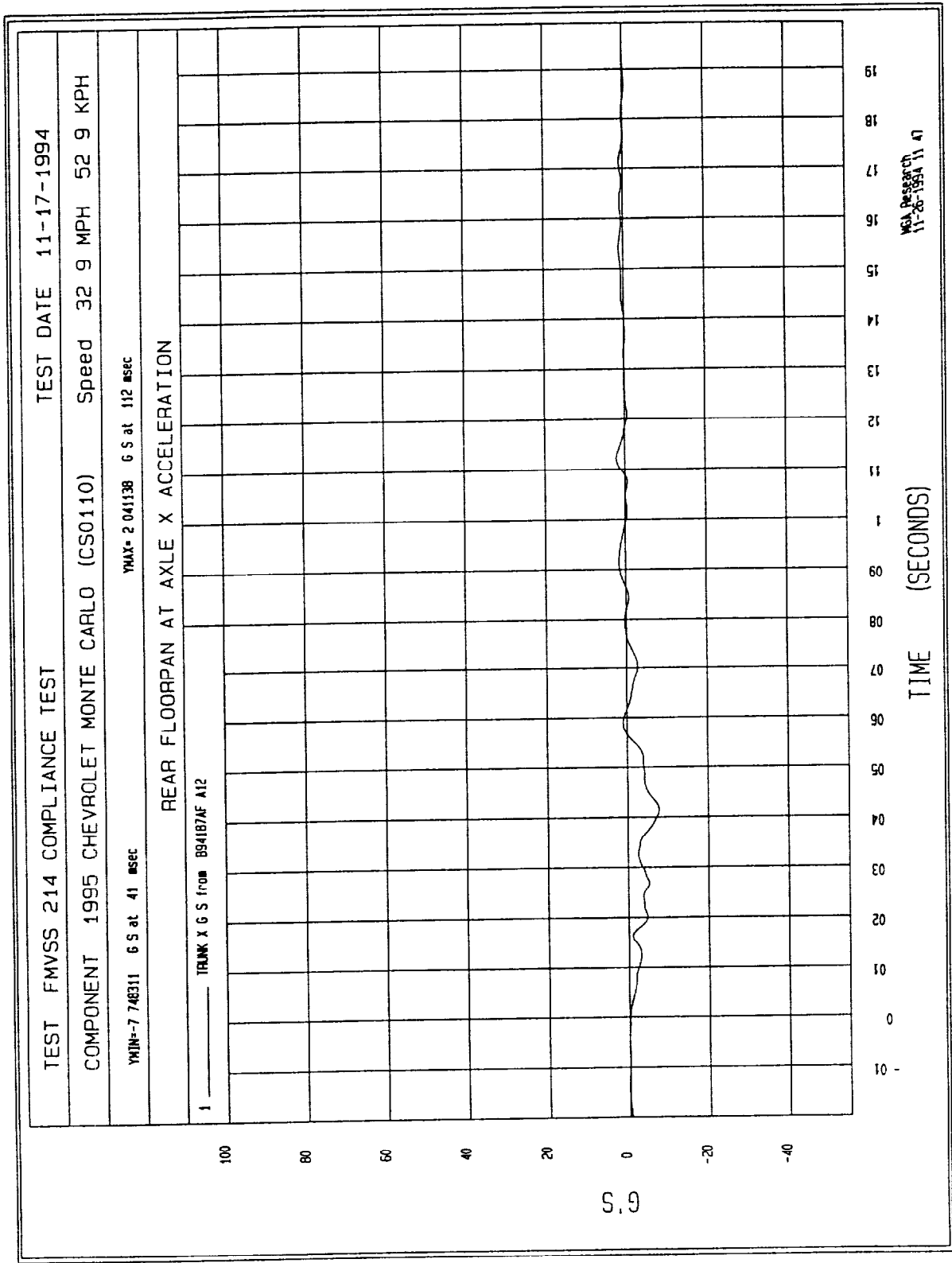


Figure B-37 - Rear Floorpan at Axle X Acceleration vs. Time

TEST FMVSS 214 COMPLIANCE TEST TEST DATE 11-17-1994

COMPONENT 1995 CHEVROLET MONTE CARLO (CS0110) Speed 32.9 MPH 52.9 KPH

YMIN = -4.821595 MPH at 86 msec YMAX = 0 MPH at -19 msec

REAR FLOORPAN AT AXLE X VELOCITY

1 REAR FLOORPAN AT AXLE X VELOCITY MPH from 894187A1 V12

Time (Seconds)	Velocity (MPH)
-0.1	-4.8
0.0	0.0
0.1	0.0
0.2	0.0
0.3	0.0
0.4	0.0
0.5	0.0
0.6	0.0
0.7	0.0
0.8	0.0
0.9	0.0
1.0	0.0
1.1	0.0
1.2	0.0
1.3	0.0
1.4	0.0
1.5	0.0
1.6	0.0
1.7	0.0
1.8	0.0
1.9	0.0

MPH

TIME Seconds

SEA Research
11-26-1994 11:29

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

Filter: Class 60 (100 Hz)

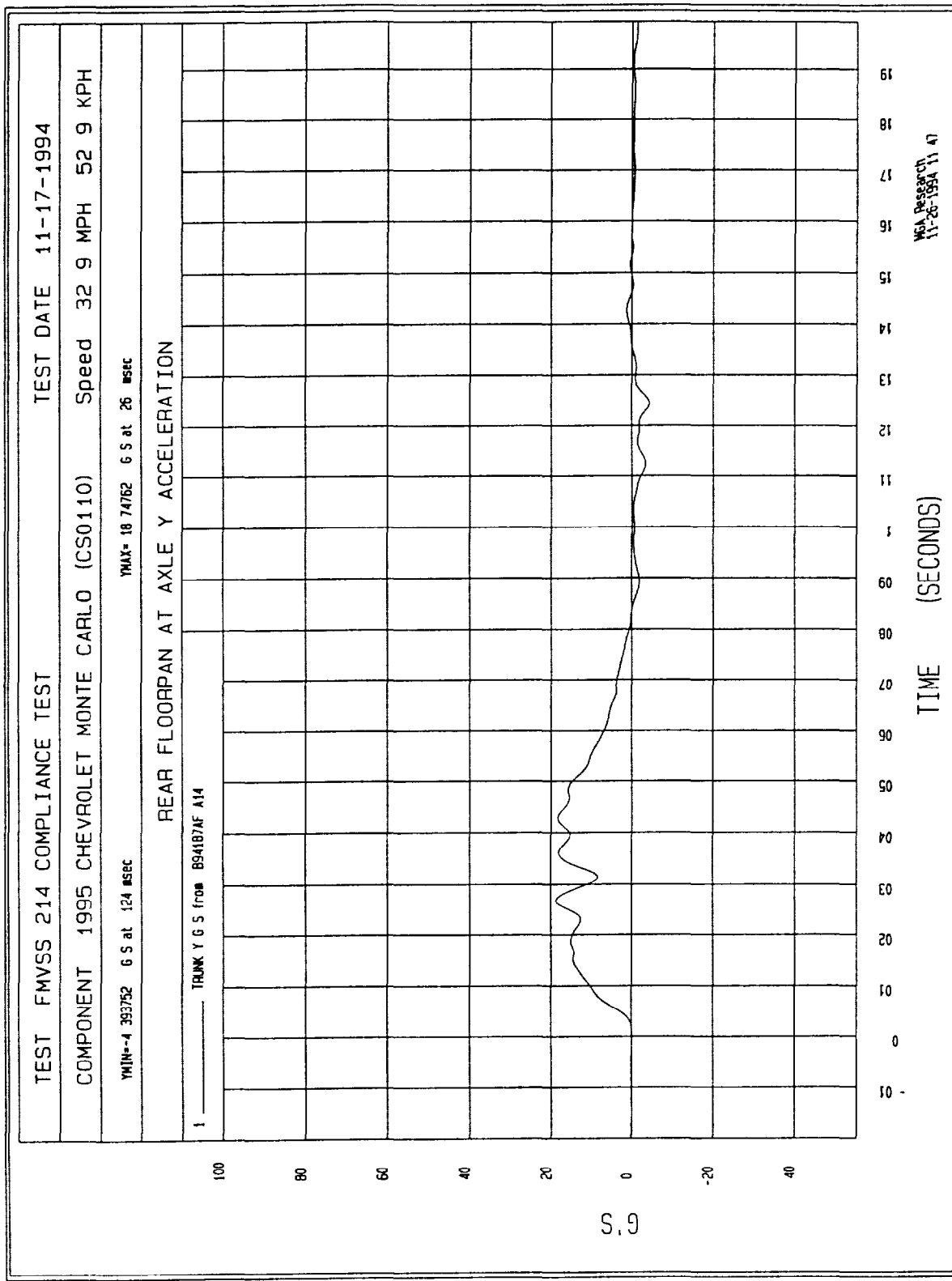


Figure B-39 - Rear Floorpan at Axle Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

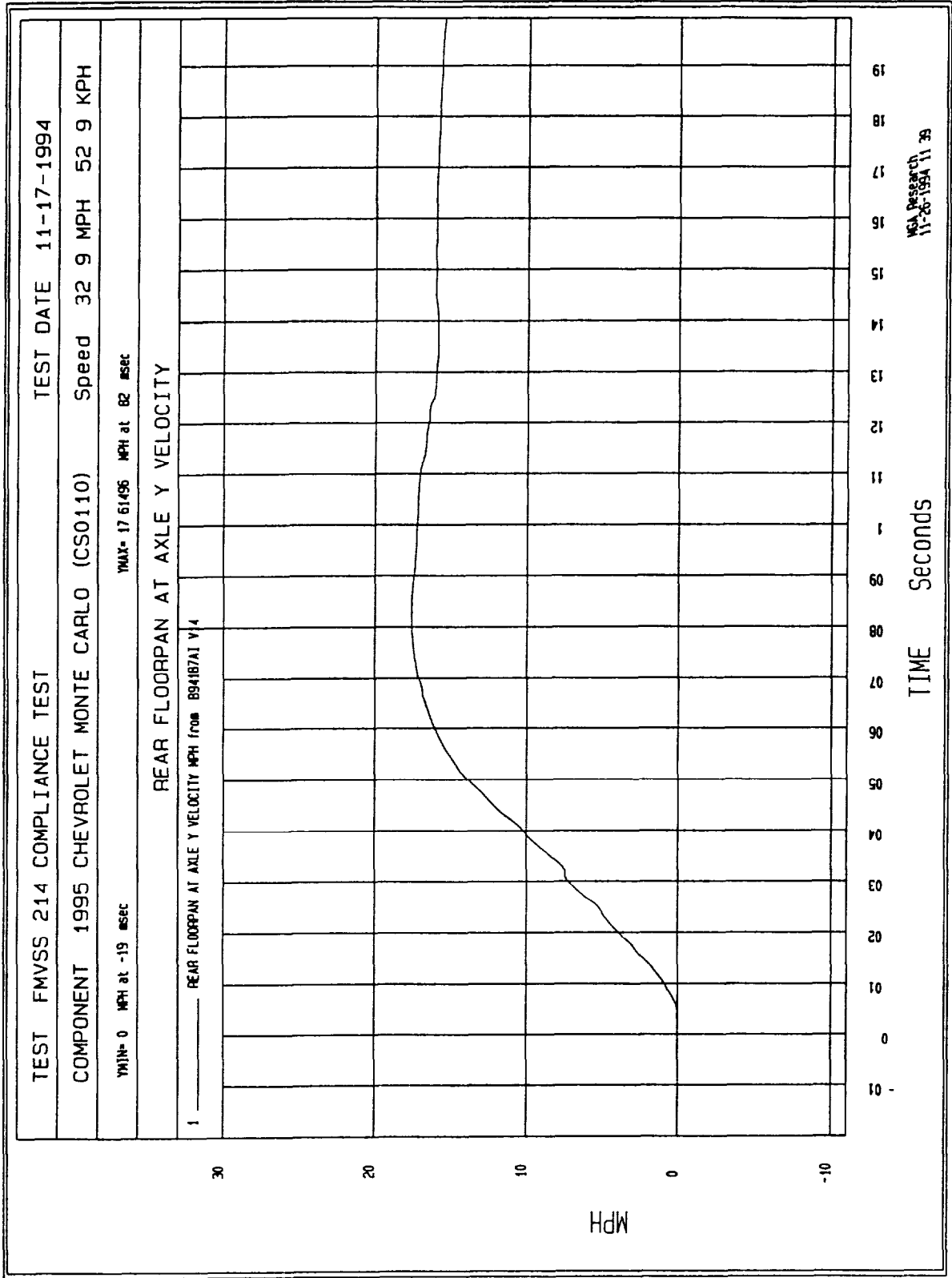


Figure B-40 - Rear Floorpan at Axle Y Velocity vs. Time

Filter: Class 60 (100 Hz)

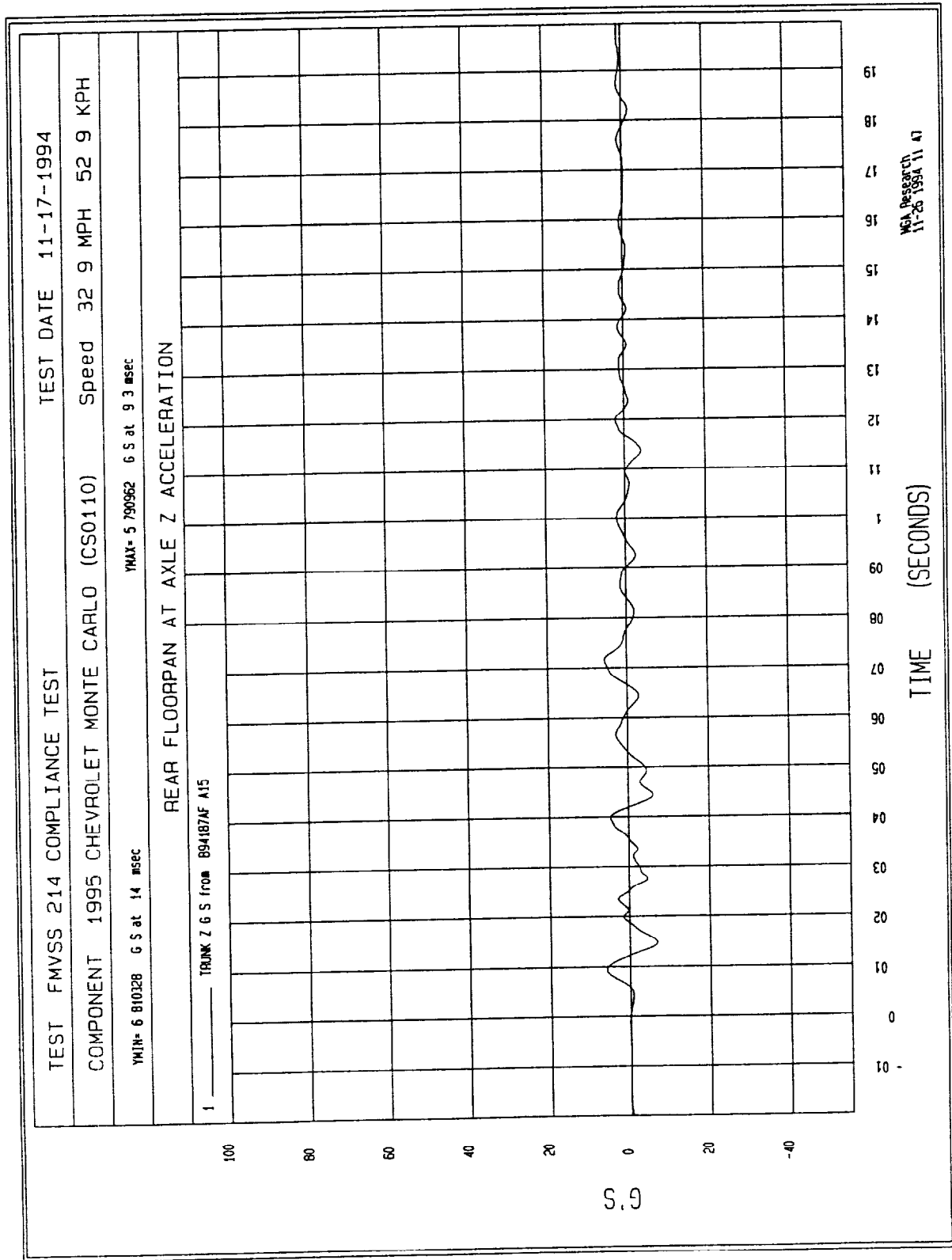


Figure B-41 - Rear Floorpan at Axle Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

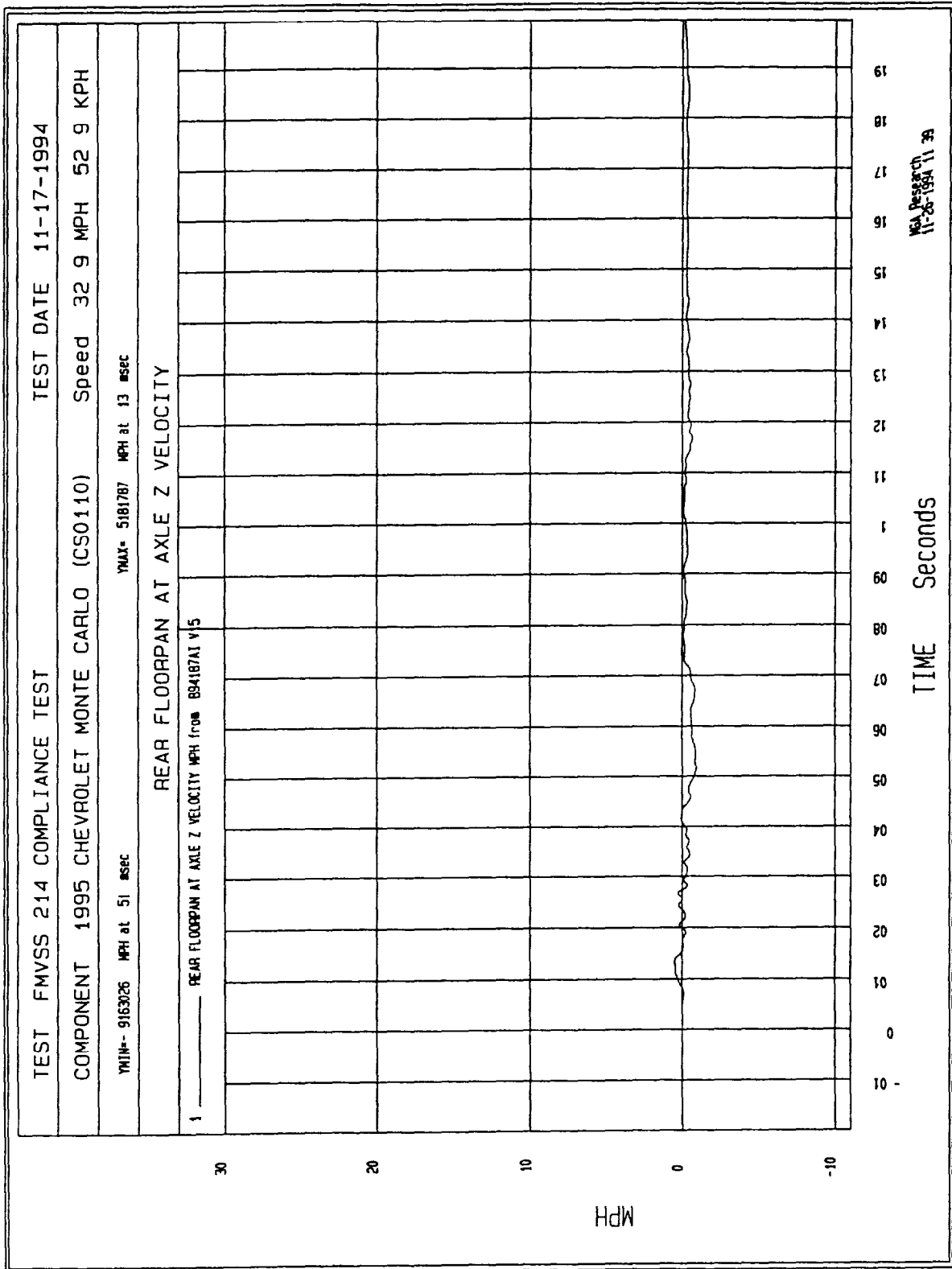


Figure B-42 - Rear Floorpan at Axle Z Velocity vs. Time

Filter: Class 60 (100 Hz)

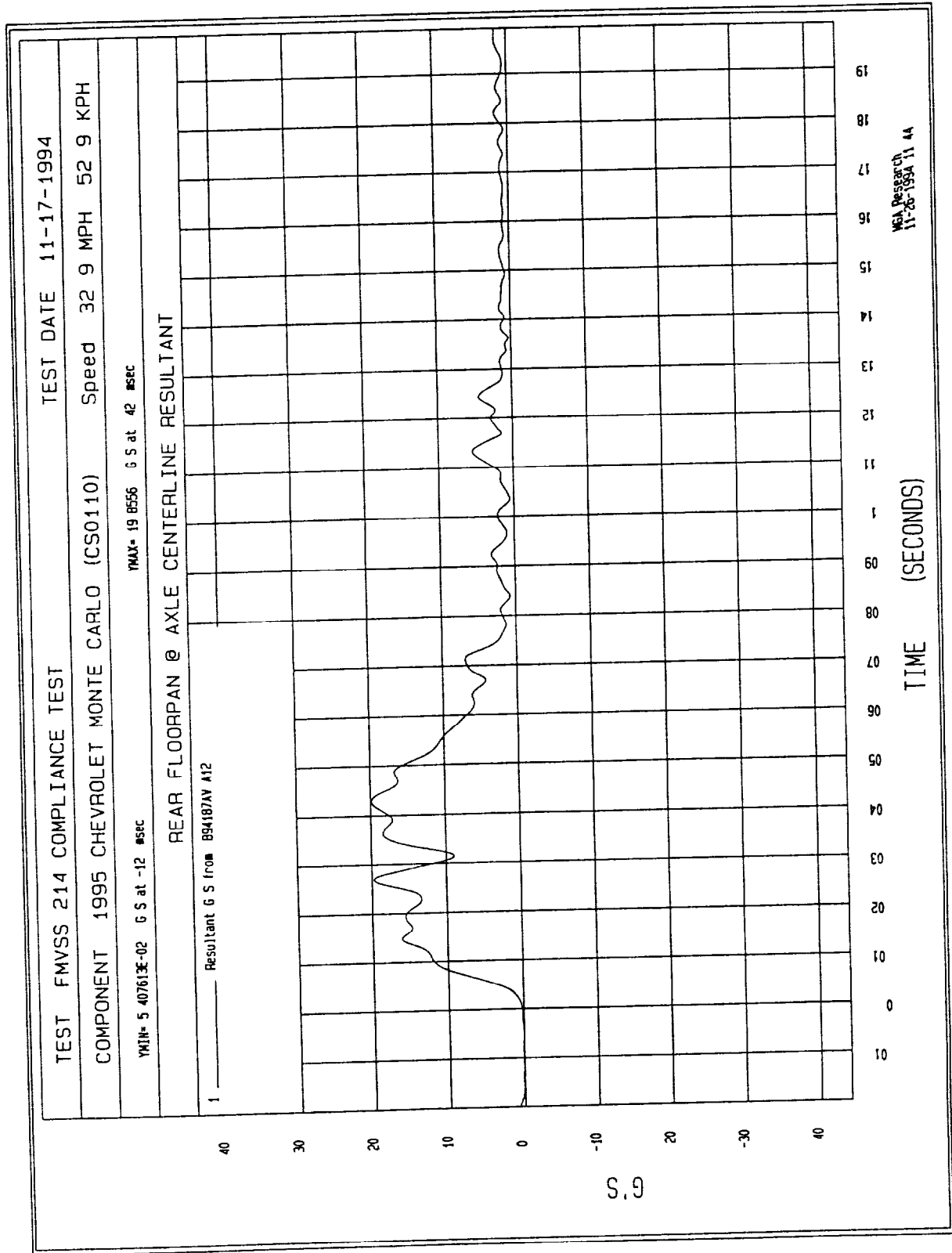


Figure B-43 - Rear Floorpan at Axle Centerline Resultant vs. Time

Filter: Class 60 (100 Hz)

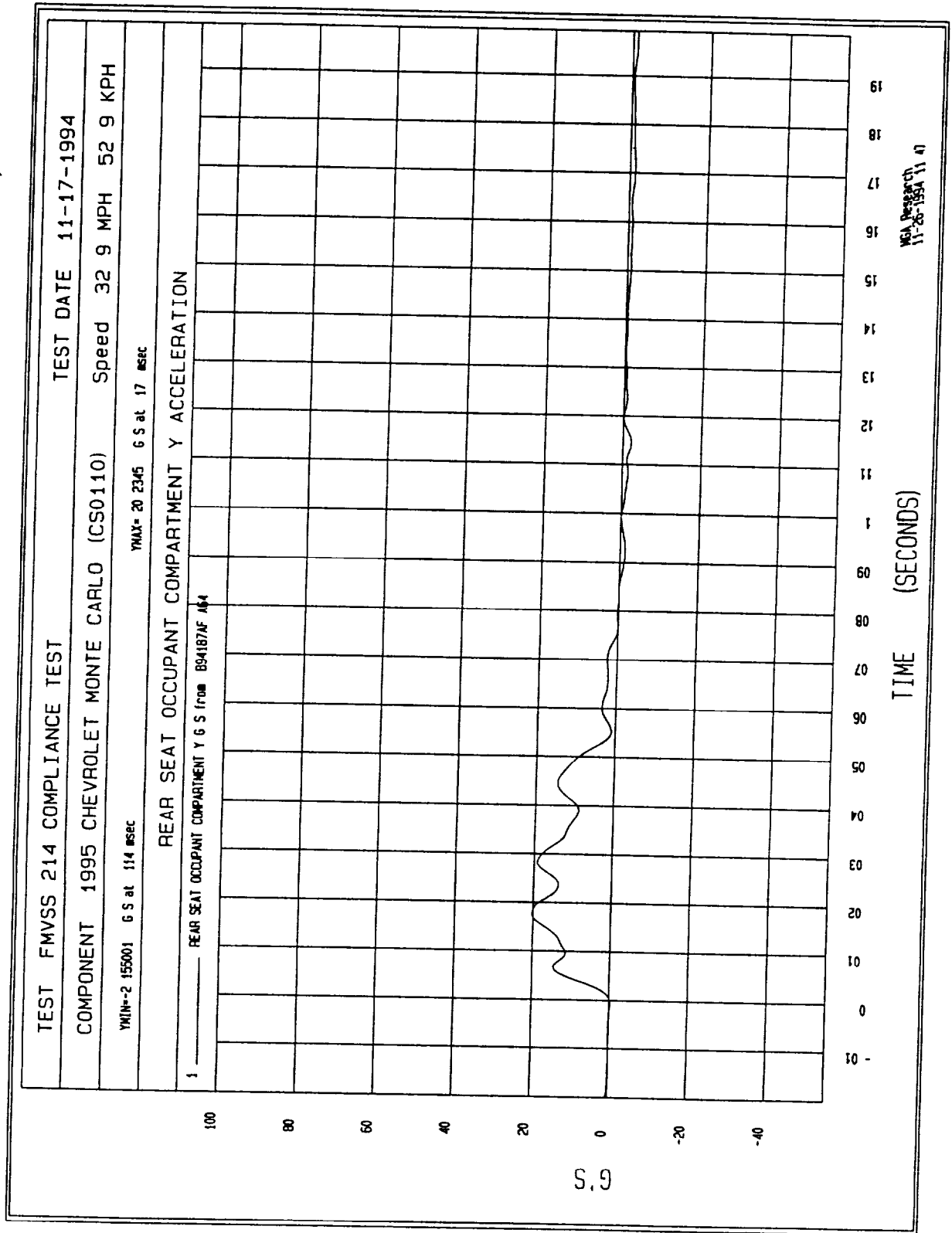


Figure B-44 - Rear Seat Occupant Compartment Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

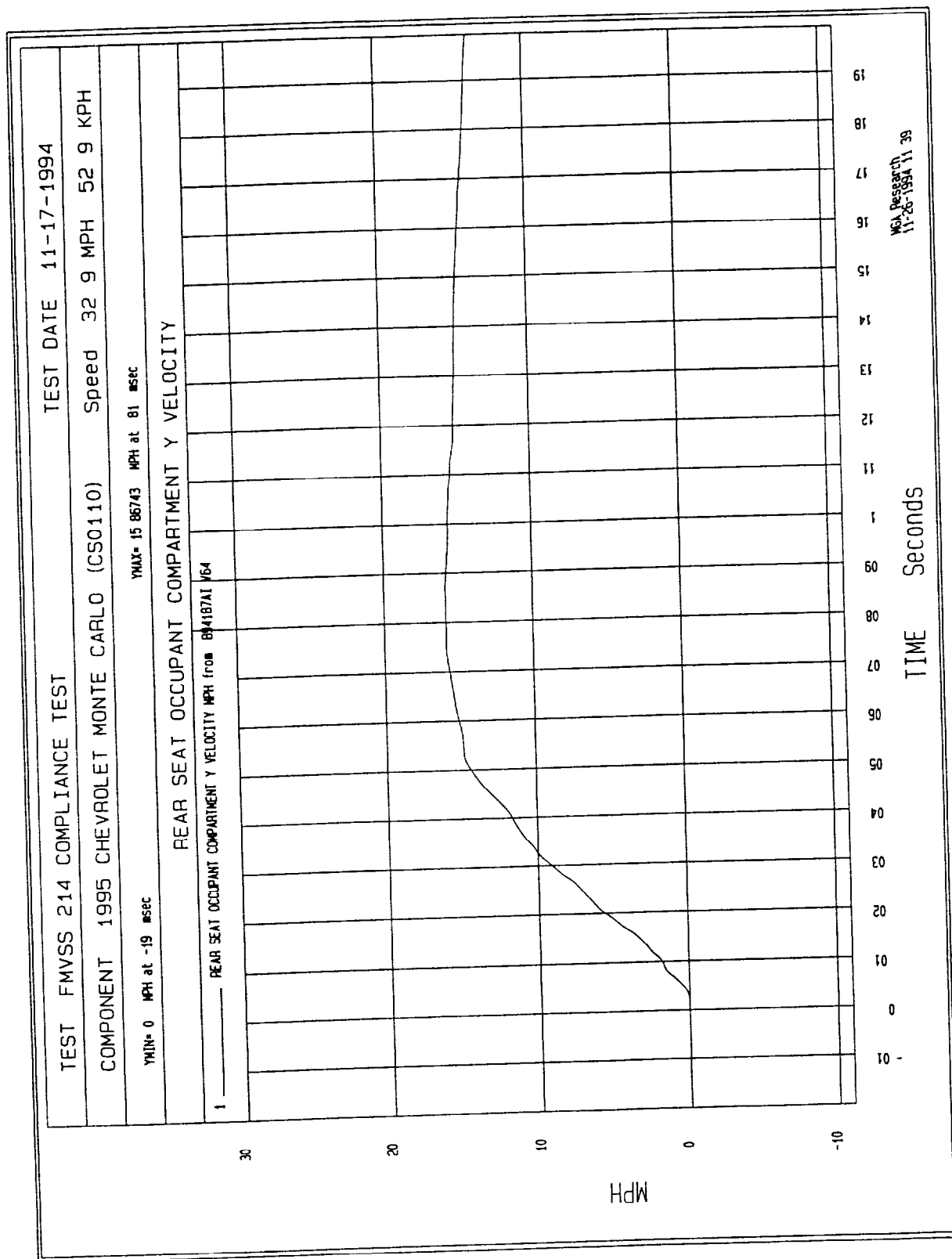


Figure B-45 - Rear Seat Occupant Compartment Y Velocity vs. Time

Filter: Class 60 (100 Hz)

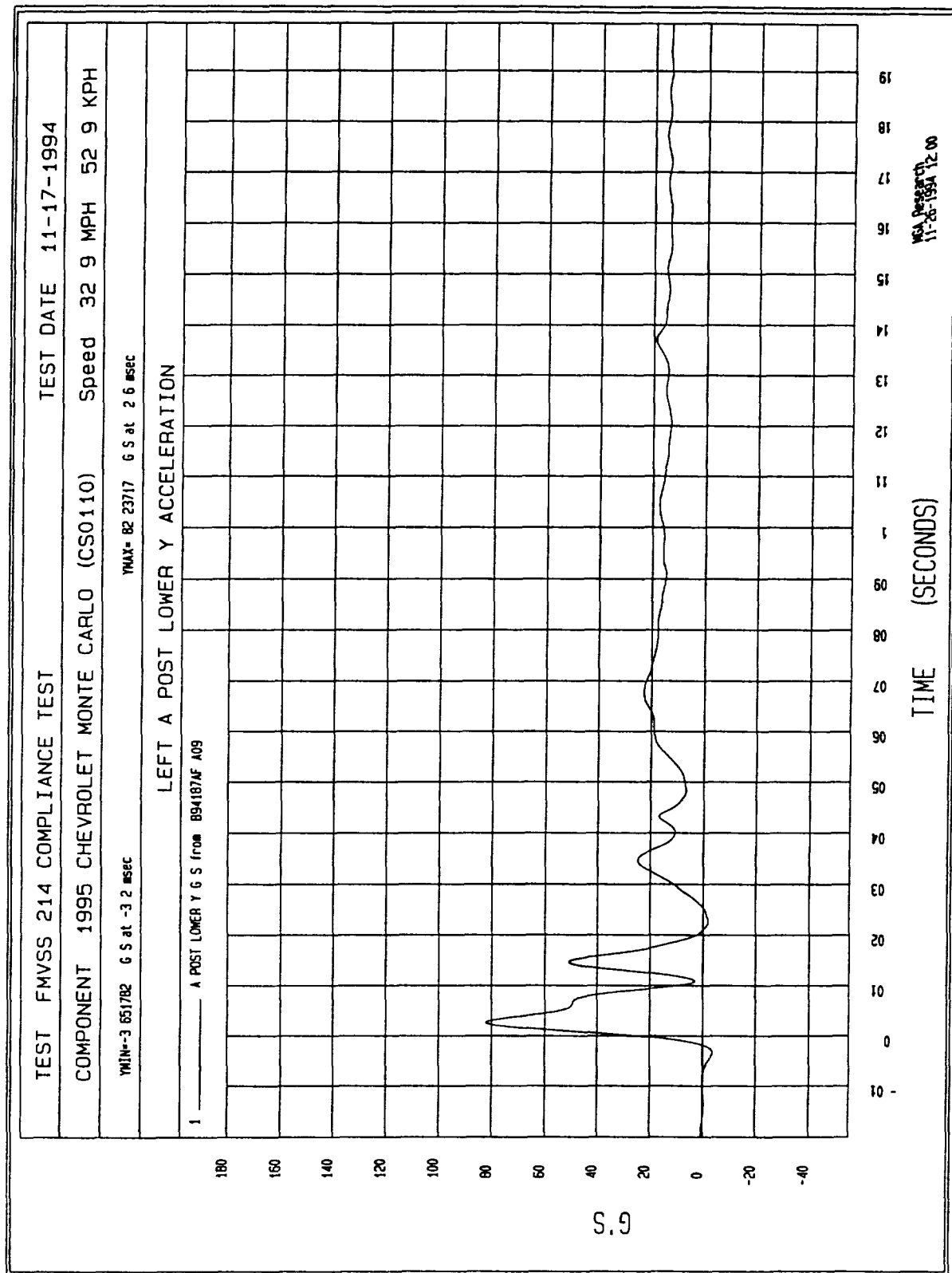


Figure B-46 - Left A Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

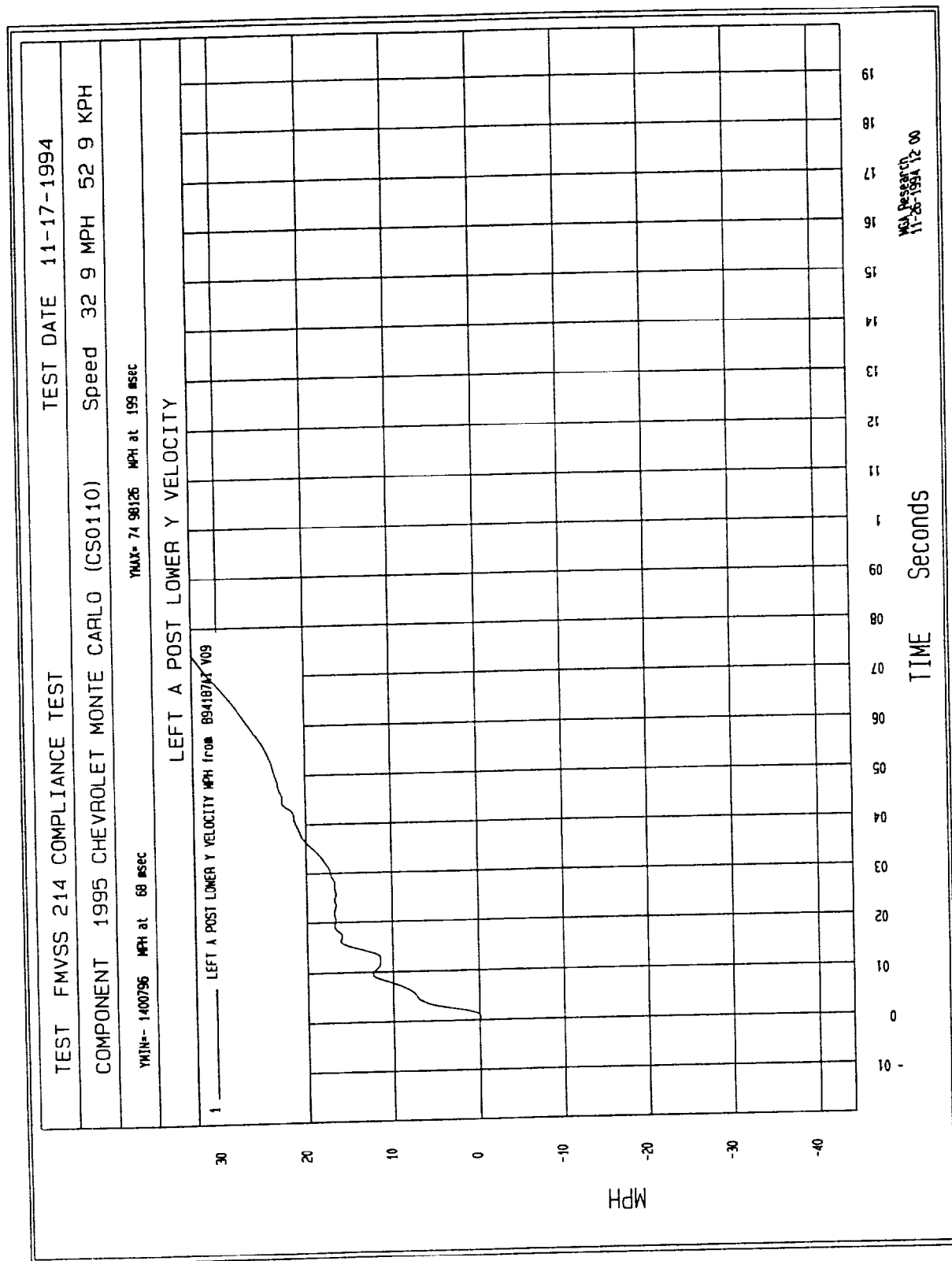


Figure B-47 - Left A Post Lower Y Velocity vs. Time

TEST FMVSS 214 COMPLIANCE TEST TEST DATE 11-17-1994

COMPONENT 1995 CHEVROLET MONTE CARLO (CS0110) Speed 32 9 MPH 52 9 KPH

YMIN=-1 432919 G'S at 54 msec YMAX= 36 85109 G'S at 2 8 msec

LEFT A POST MID Y ACCELERATION

1 A POST MID Y G'S from 894187AF A08

TIME (SECONDS)

19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -0.01

G.S

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

Filter: Class 180 (300 Hz)

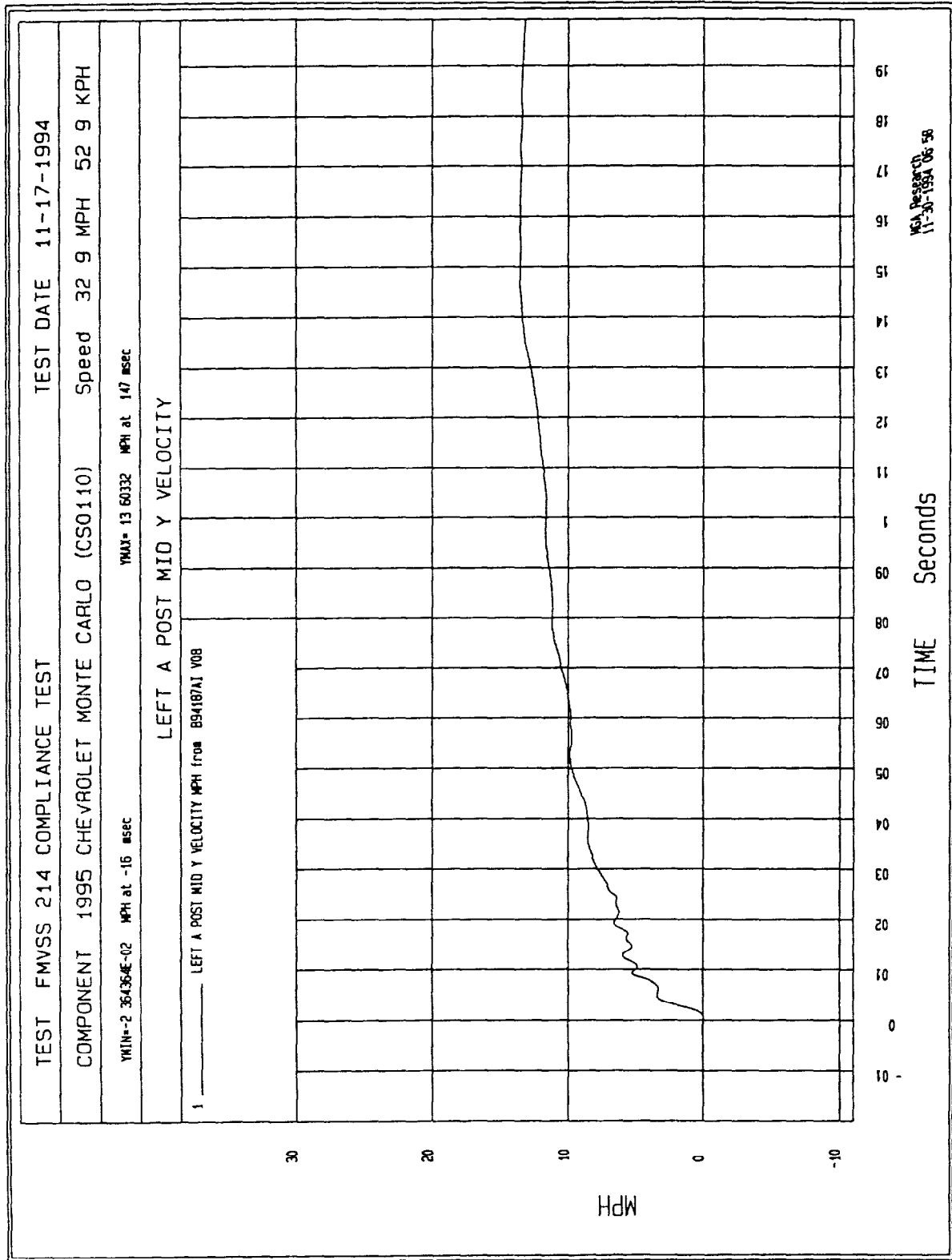


Figure B-49 - Left A Post Mid Y Velocity vs. Time

Filter: Class 60 (100 Hz)

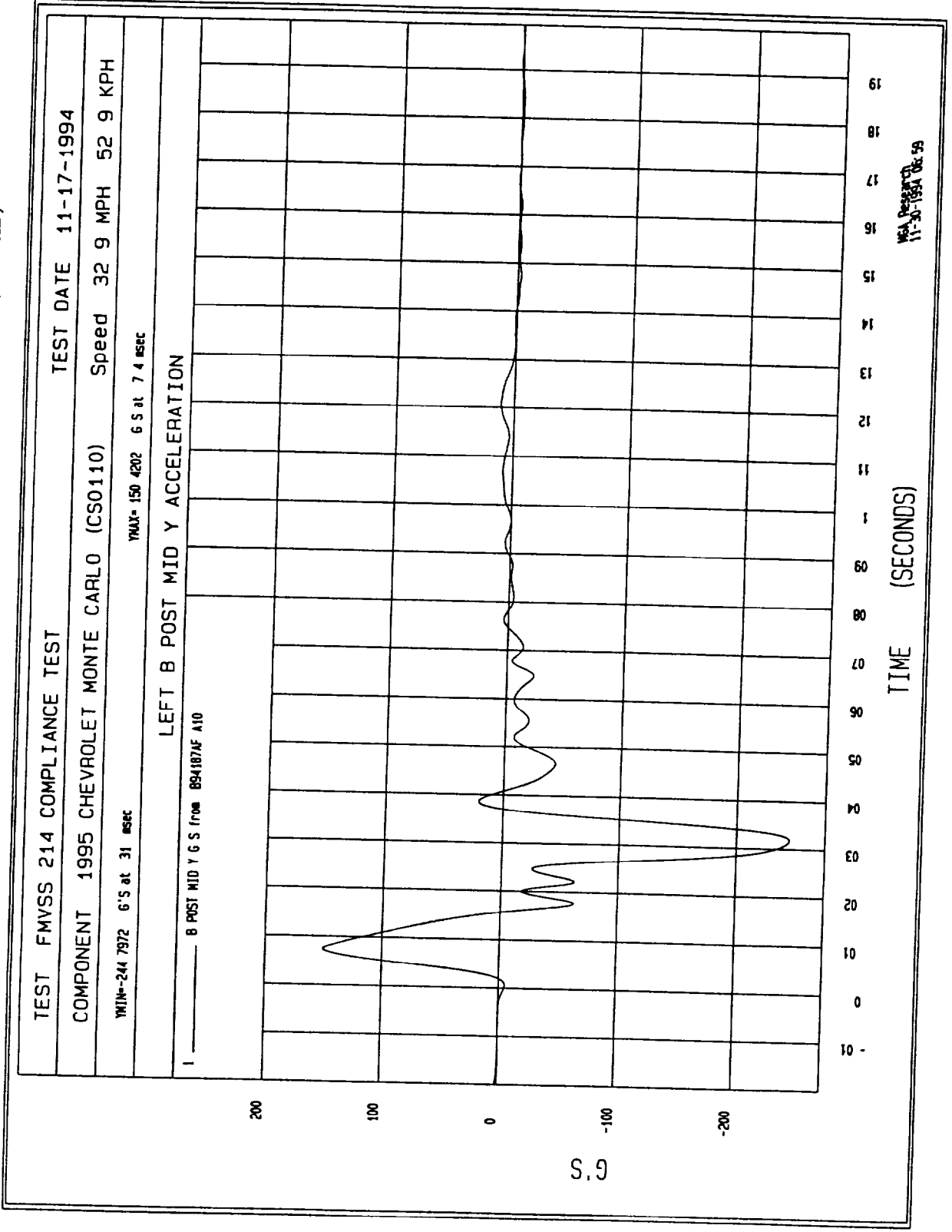


Figure B-50 - Left B Post Mid Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

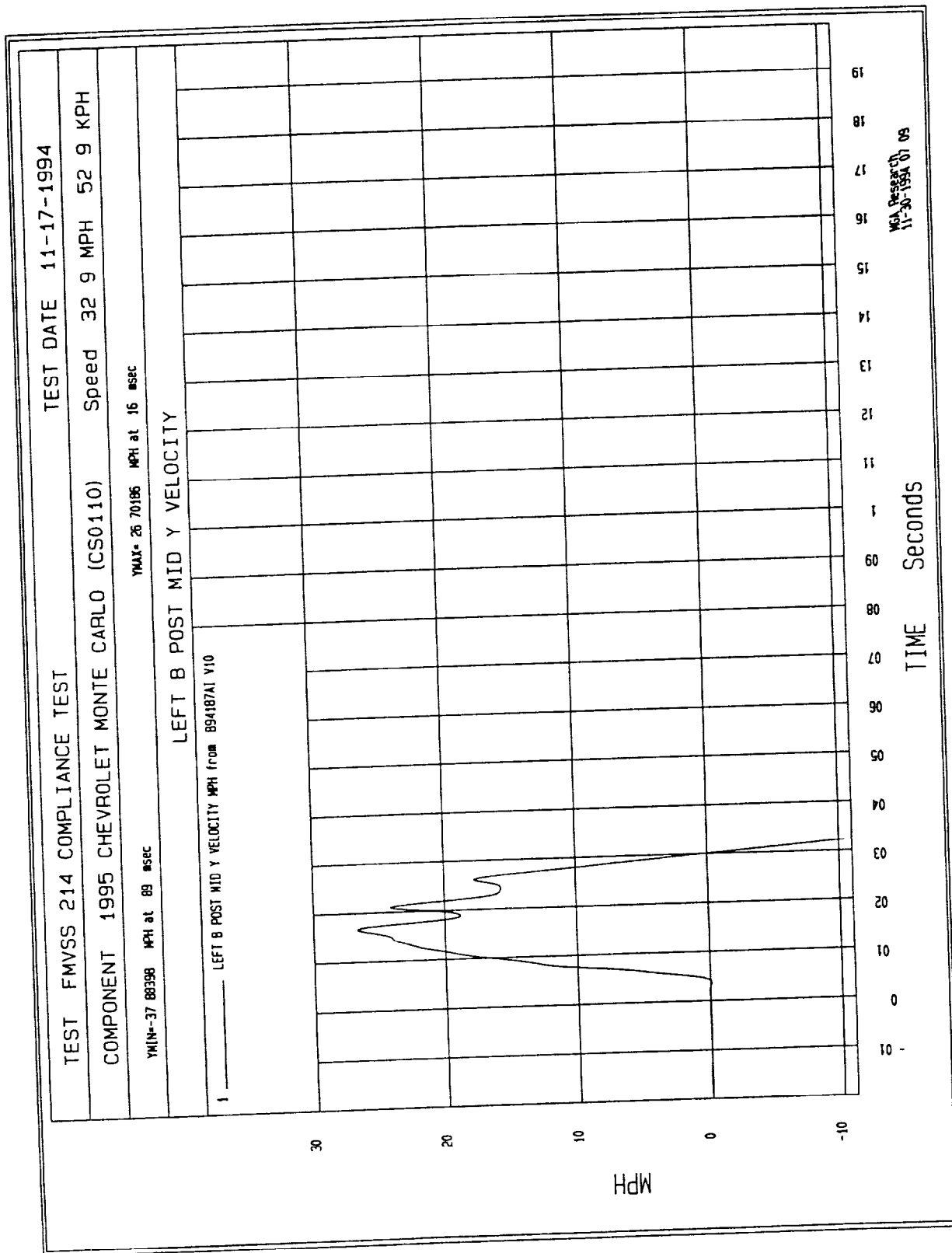


Figure B-51 - Left B Post Mid Y Velocity vs. Time

Filter: Class 60 (100 HZ)

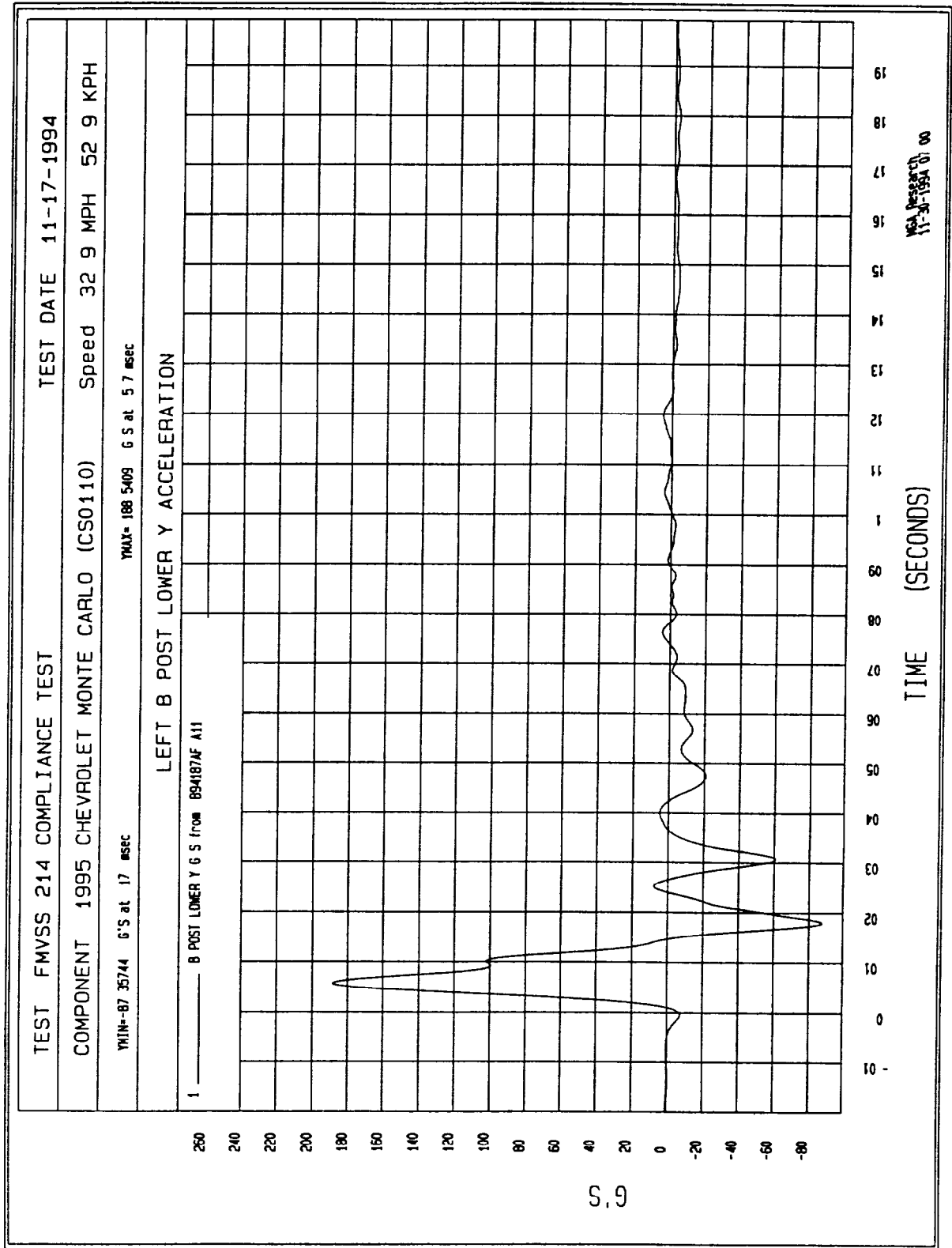


Figure B-52 - Left B Post Lower Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

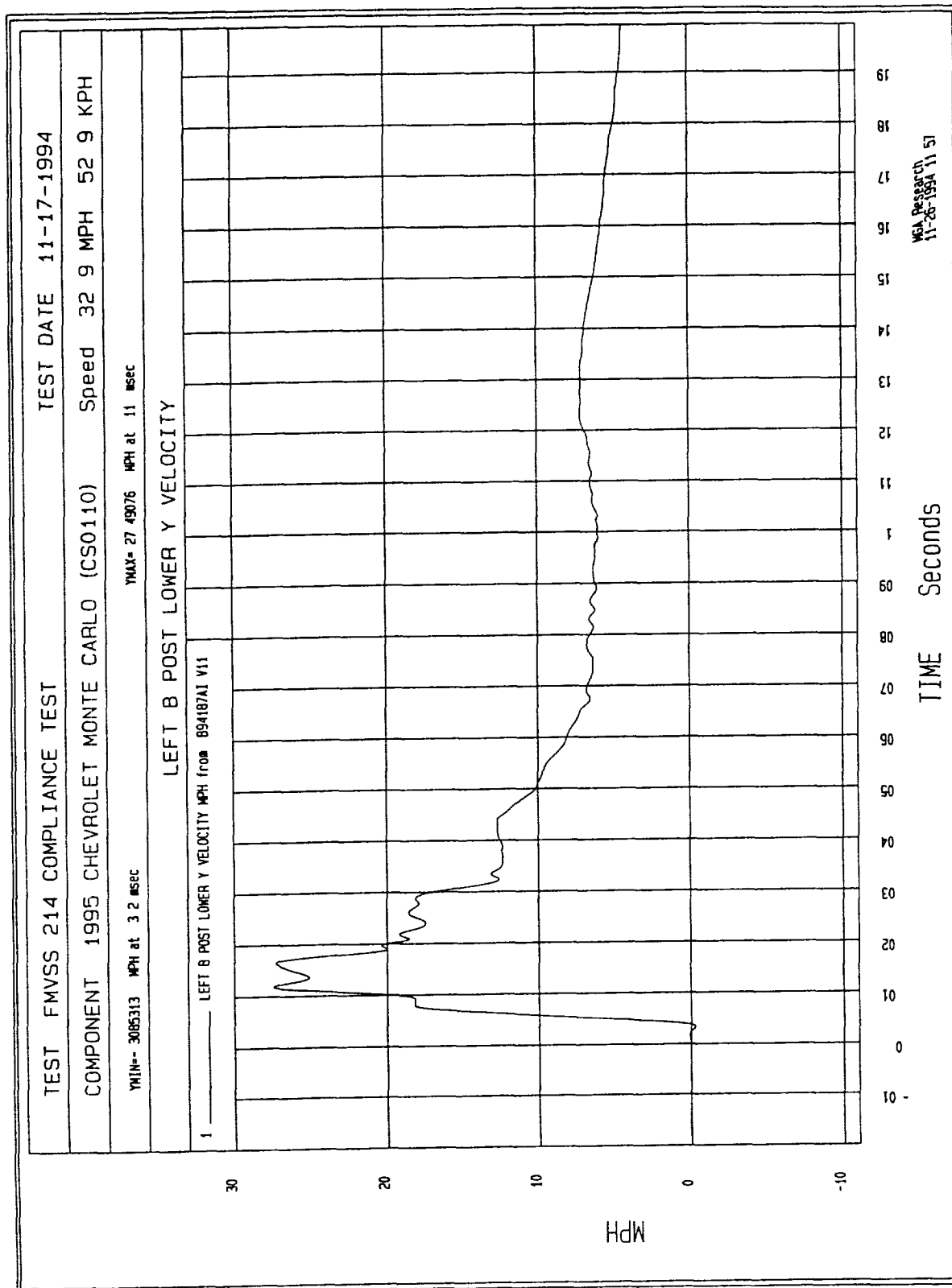


Figure B-53 - Left B Post Lower Y Velocity vs. Time

Filter: Class 60 (100 Hz)

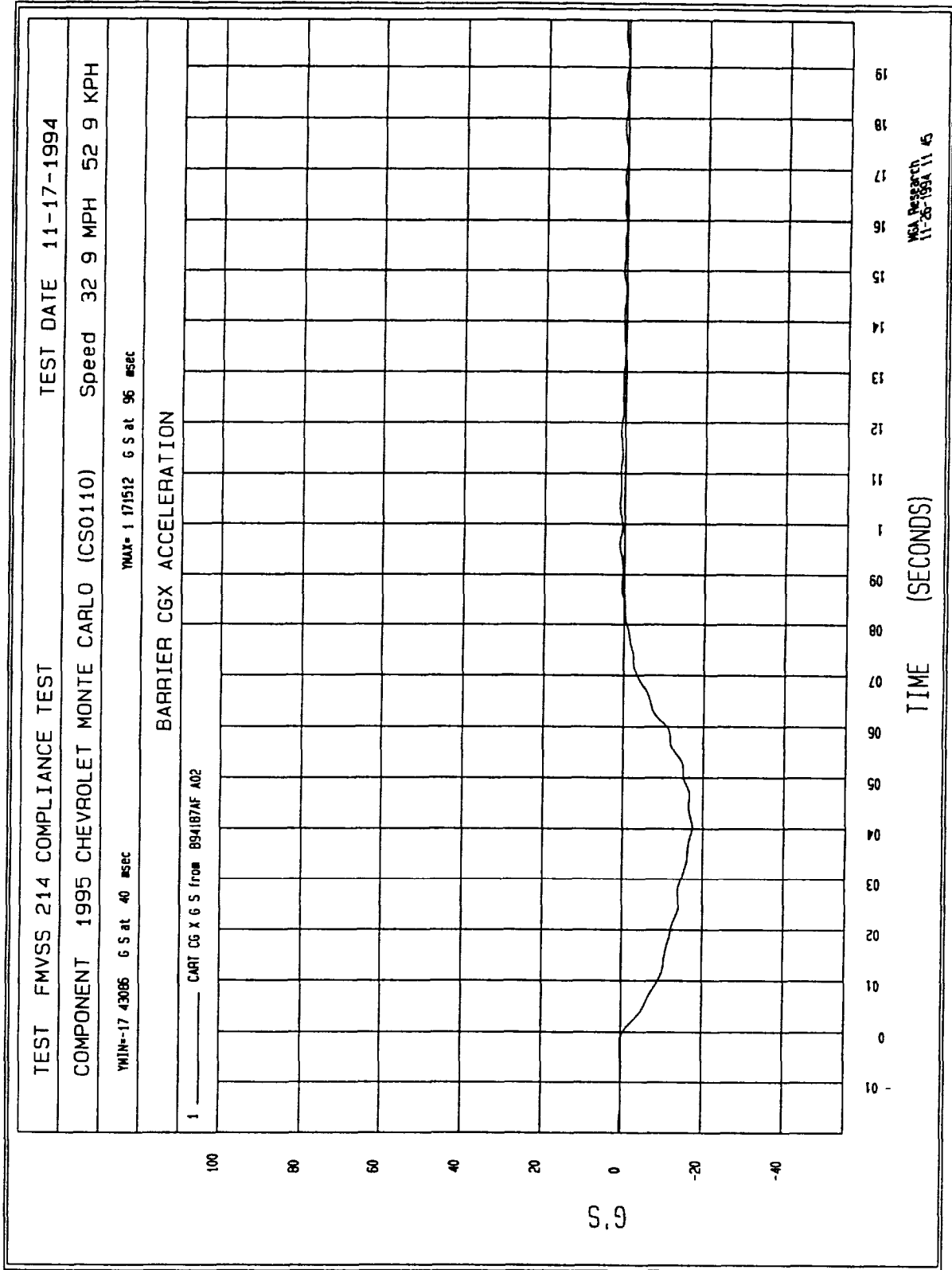


Figure B-54 - Moving Barrier Center of Gravity X Acceleration vs. Time

Filter: Class 180 (300 Hz)

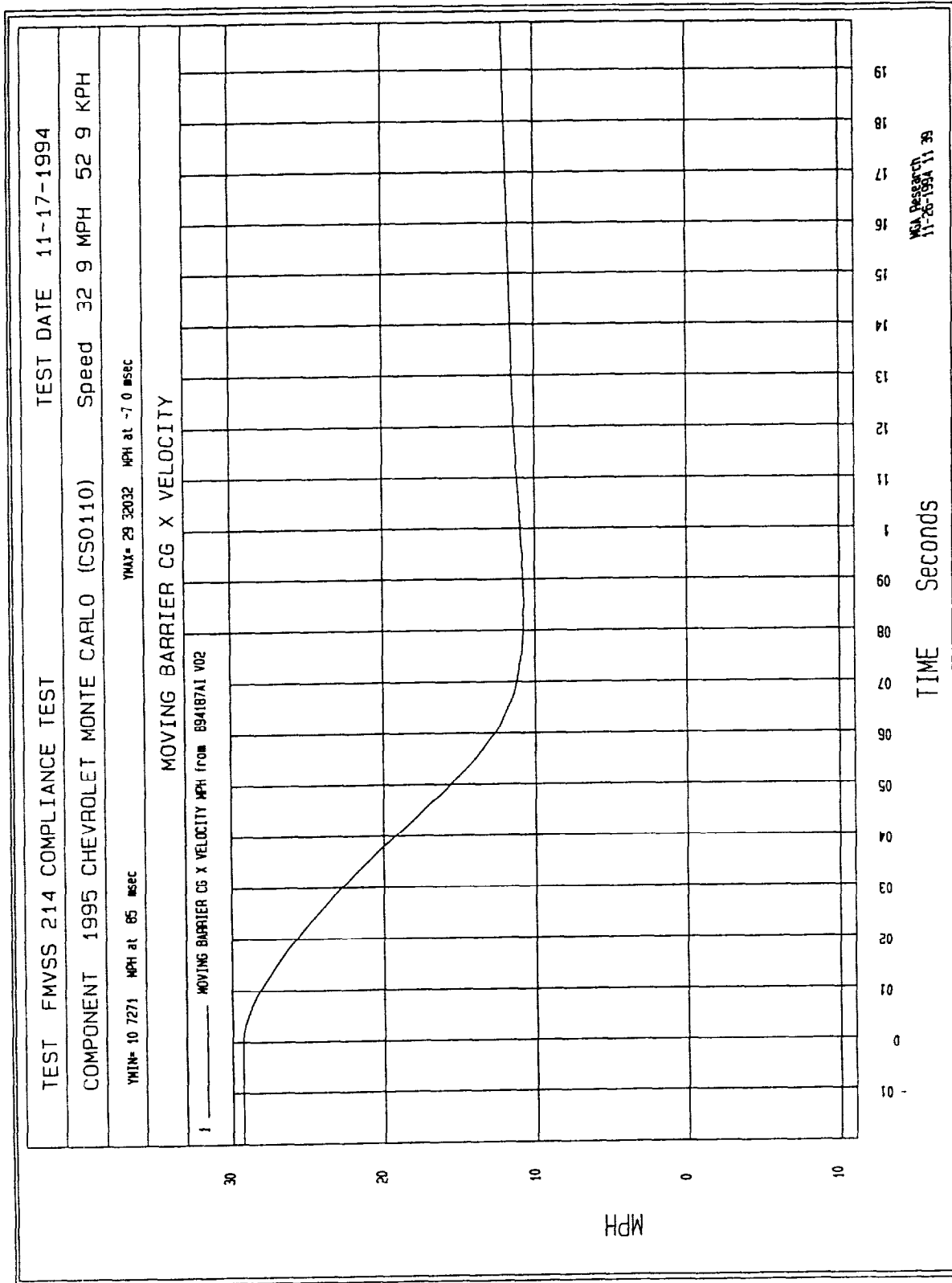


Figure B-55 - Moving Barrier Center of Gravity X Velocity vs. Time

Filter: Class 60 (100 Hz)

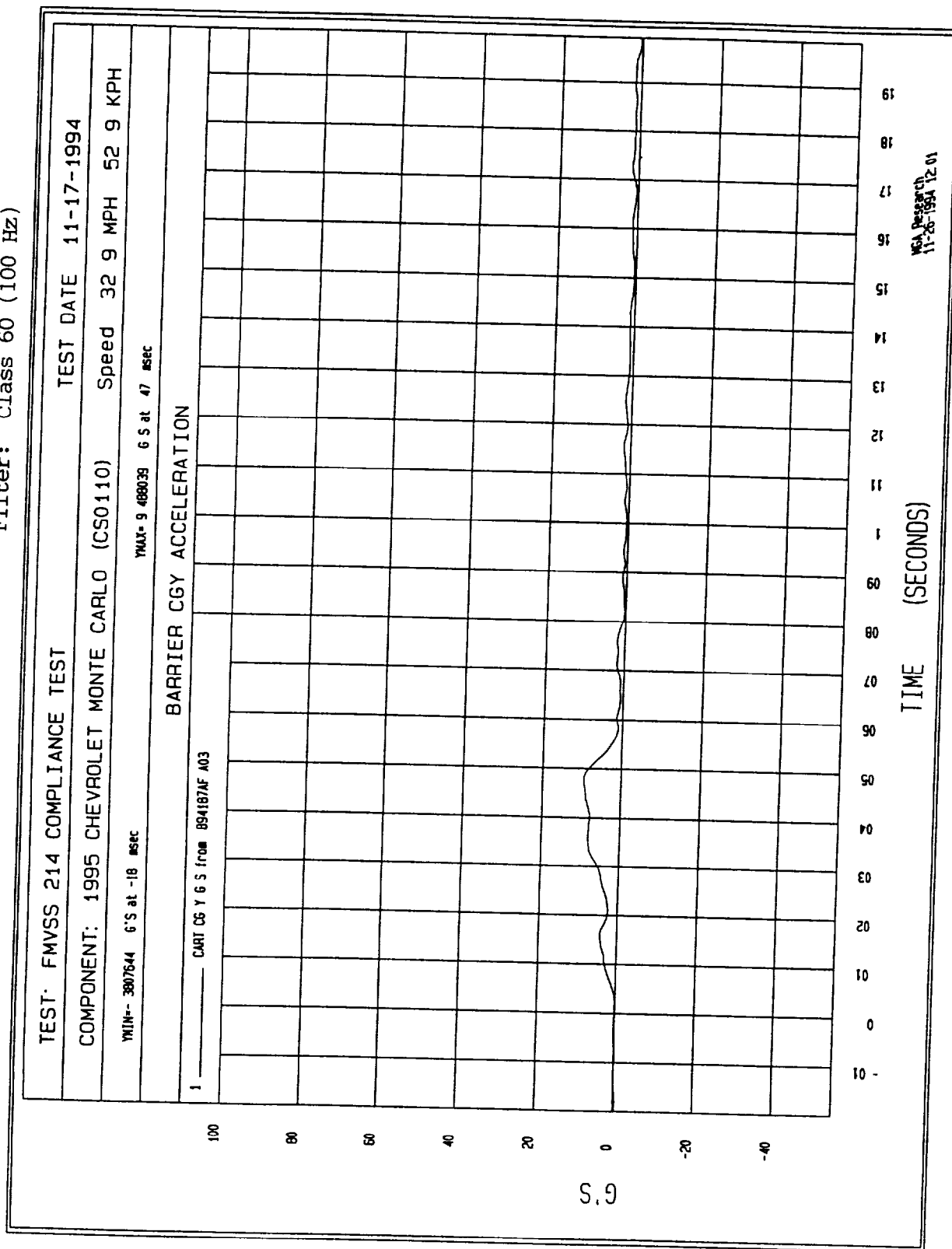


Figure B-56 - Moving Barrier Center of Gravity Y Acceleration vs. Time

Filter: Class 180 (300 Hz)

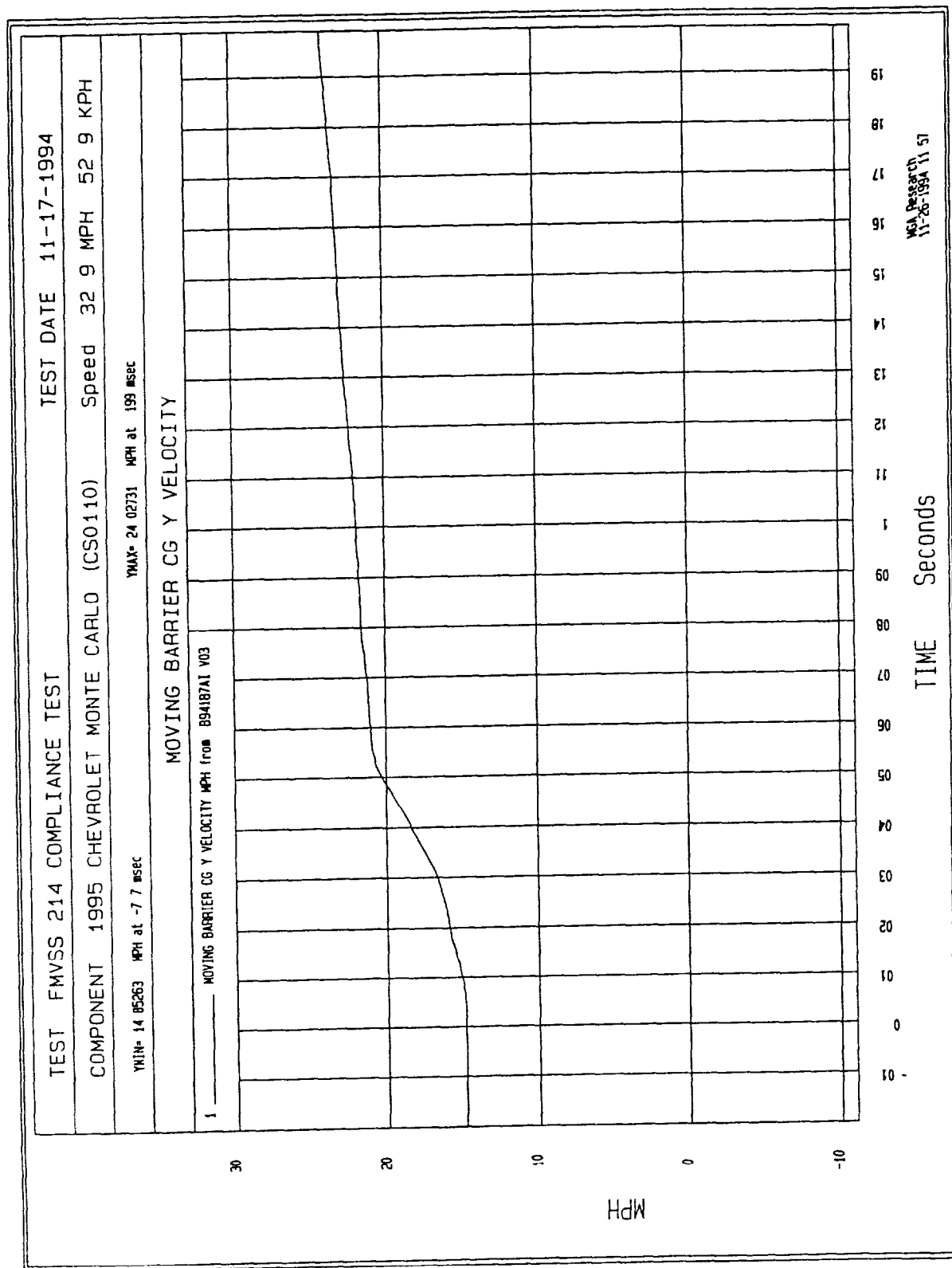


Figure B-57 - Moving Barrier Center of Gravity Y Velocity vs. Time

Filter: Class 60 (100 Hz)

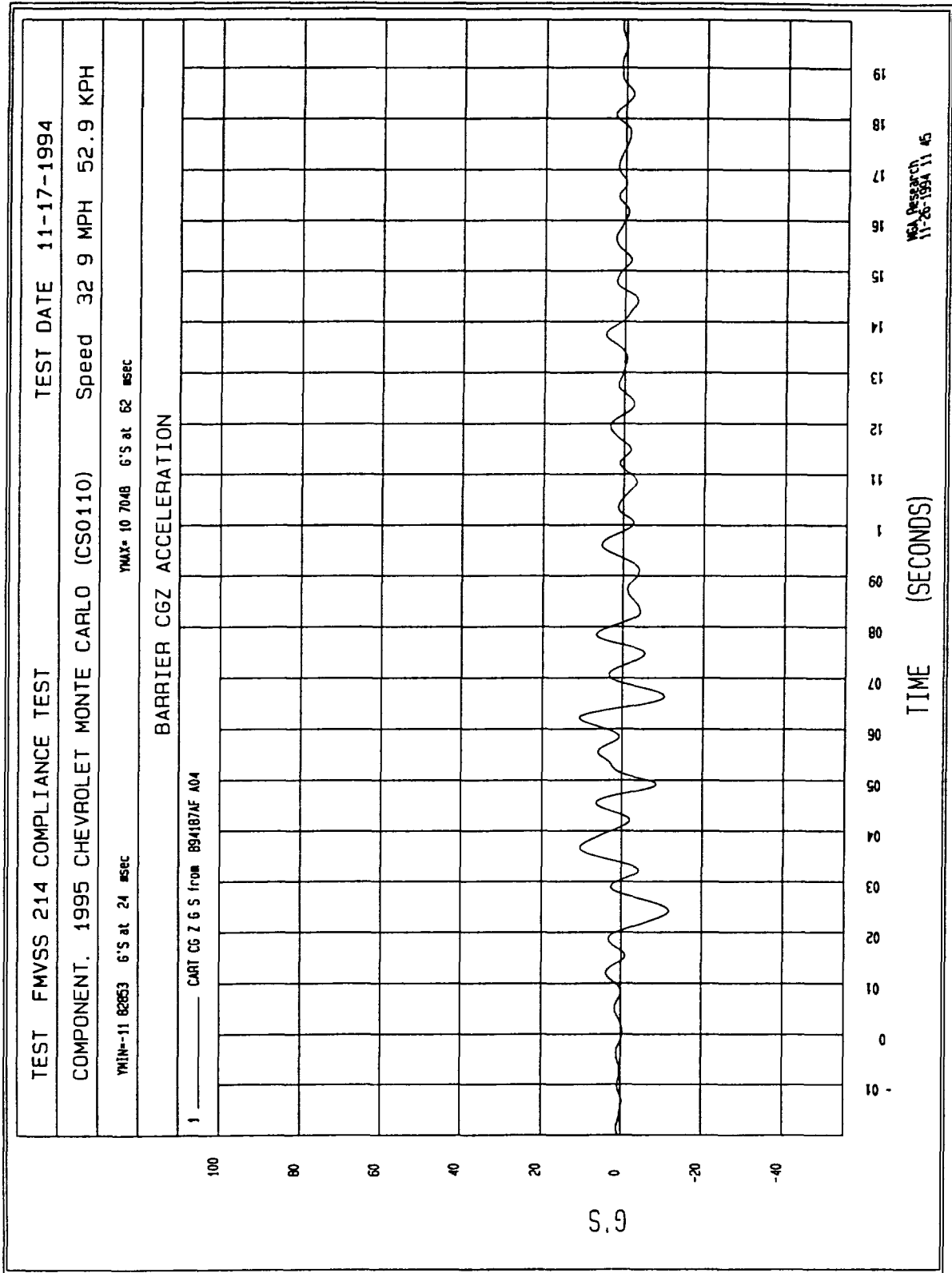


Figure B-58 - Moving Barrier Center of Gravity Z Acceleration vs. Time

Filter: Class 180 (300 Hz)

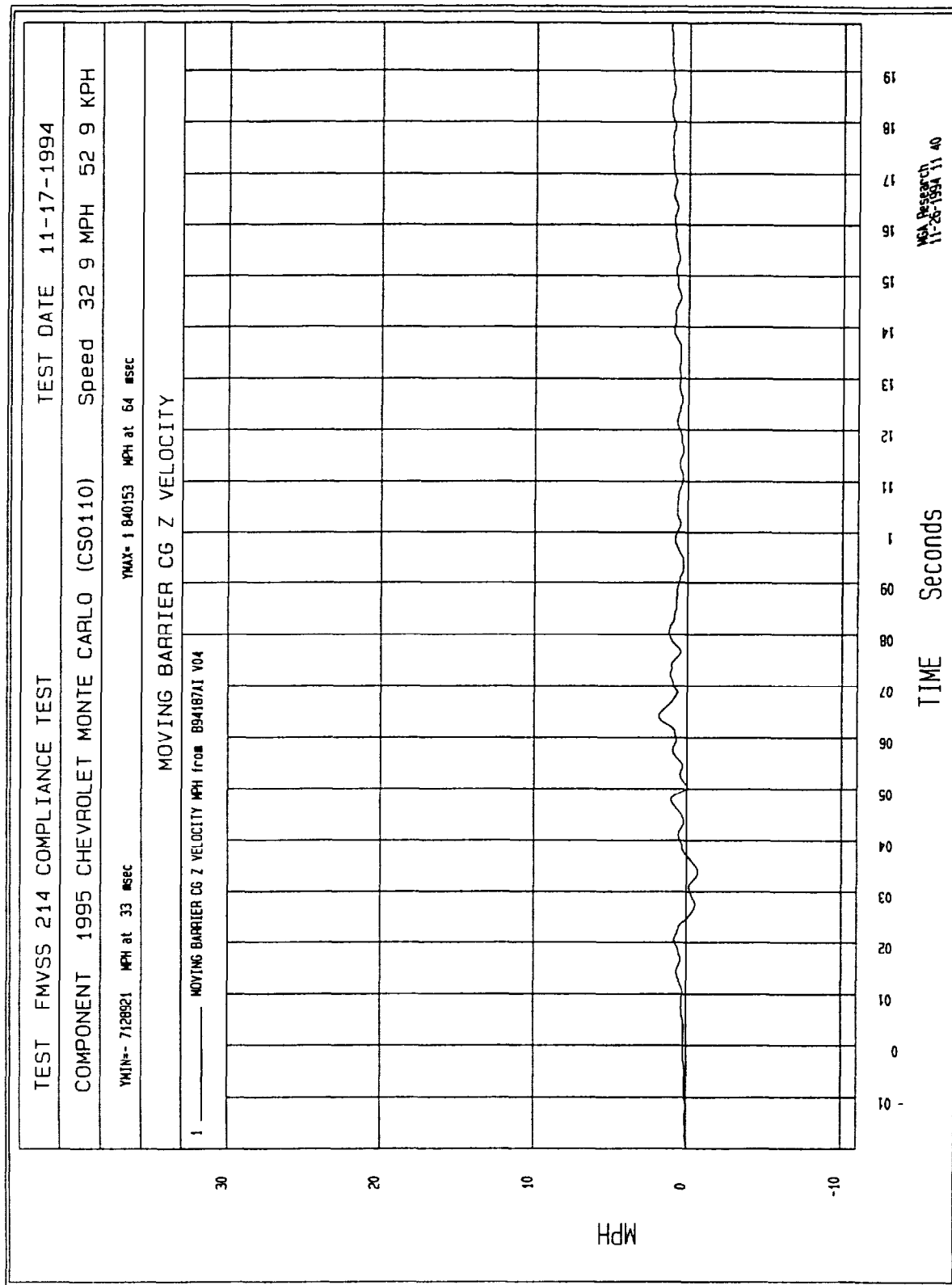


Figure B-59 - Moving Barrier Center of Gravity Z Velocity vs. Time

Filter: Class 60 (100 Hz)

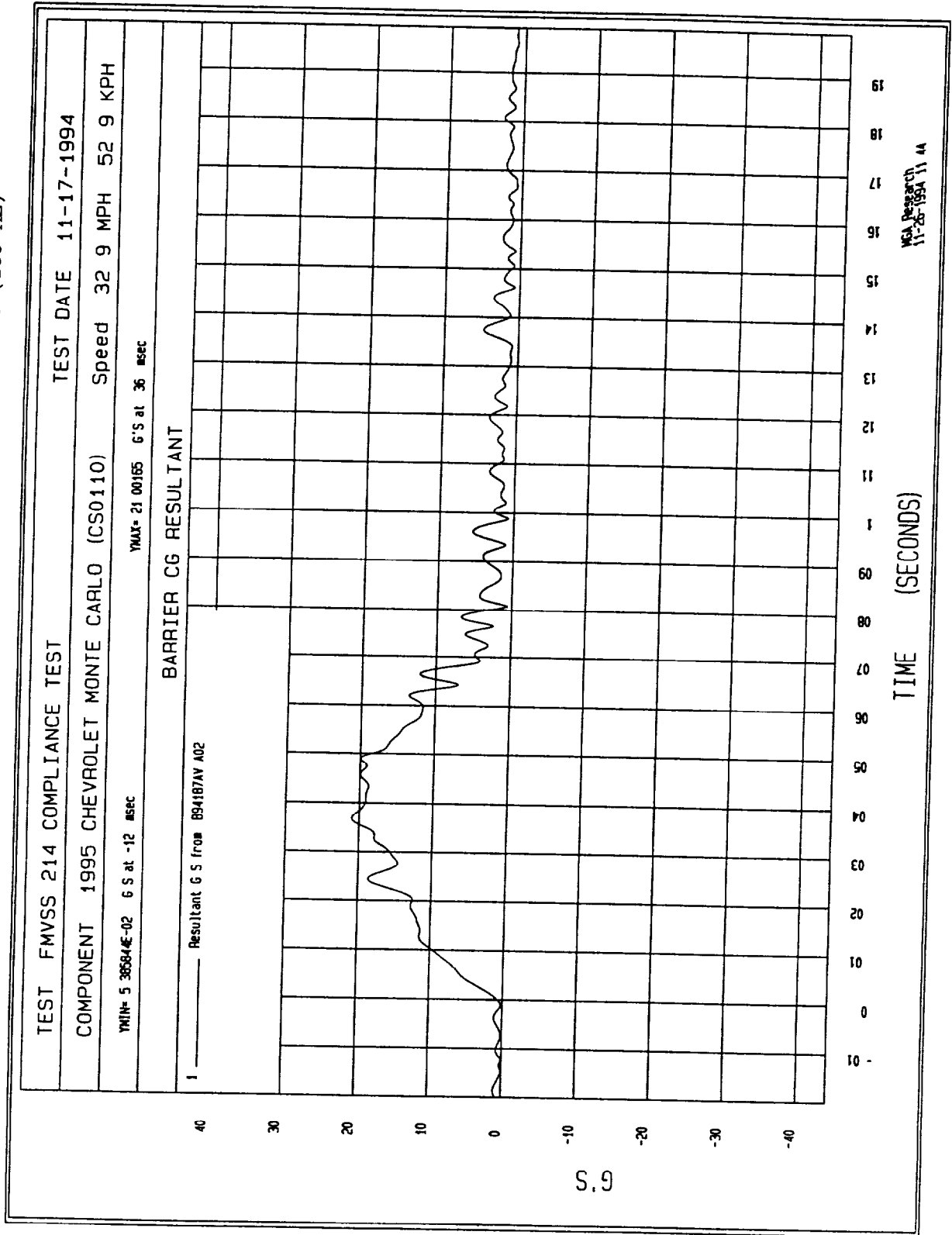


Figure B-60 - Moving Barrier Center of Gravity Resultant vs. Time

Filter: Class 60 (100 Hz)

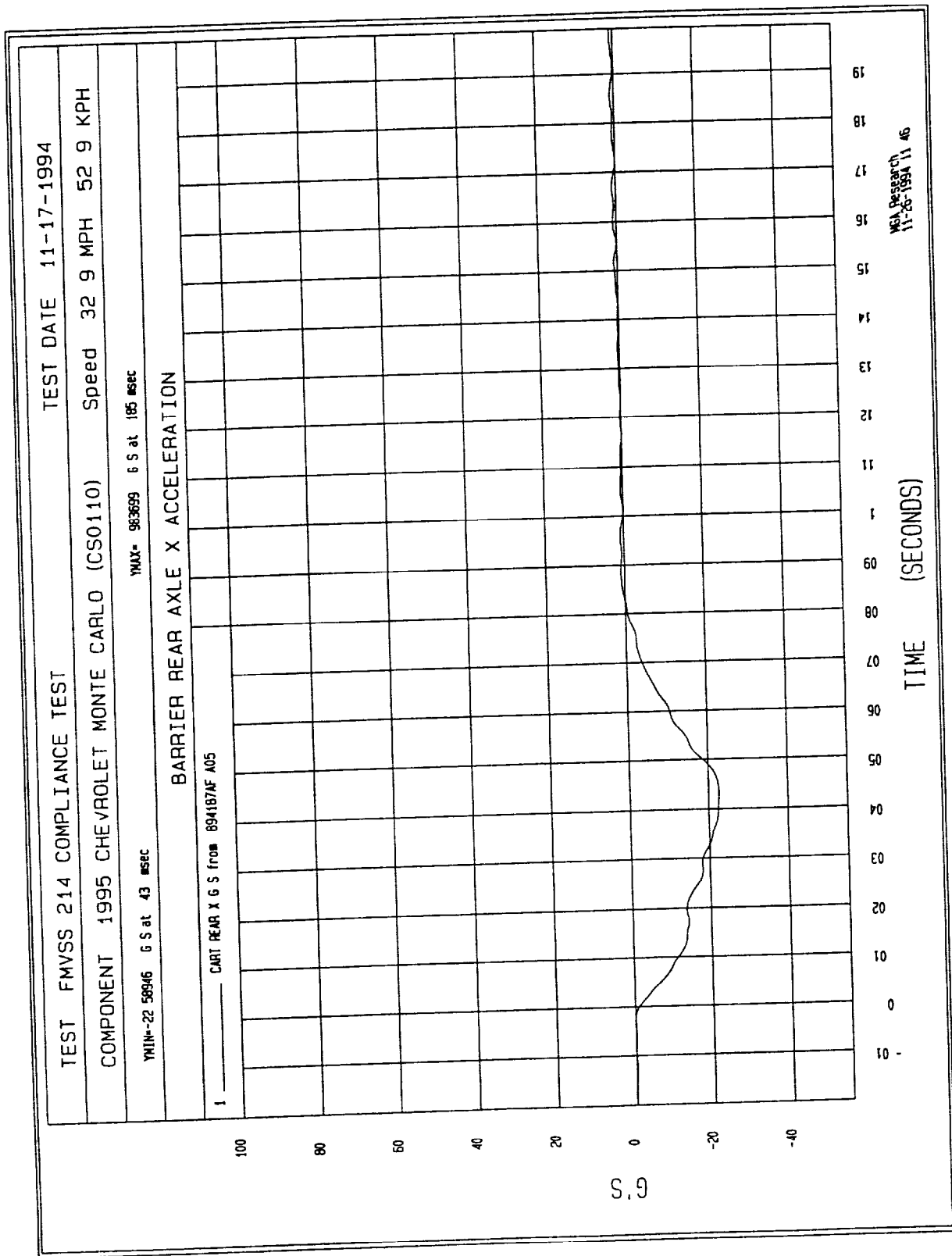


Figure B-61 - Moving Barrier Rear Axle X Acceleration vs. Time

Filter: Cias 180 (300 Hz)

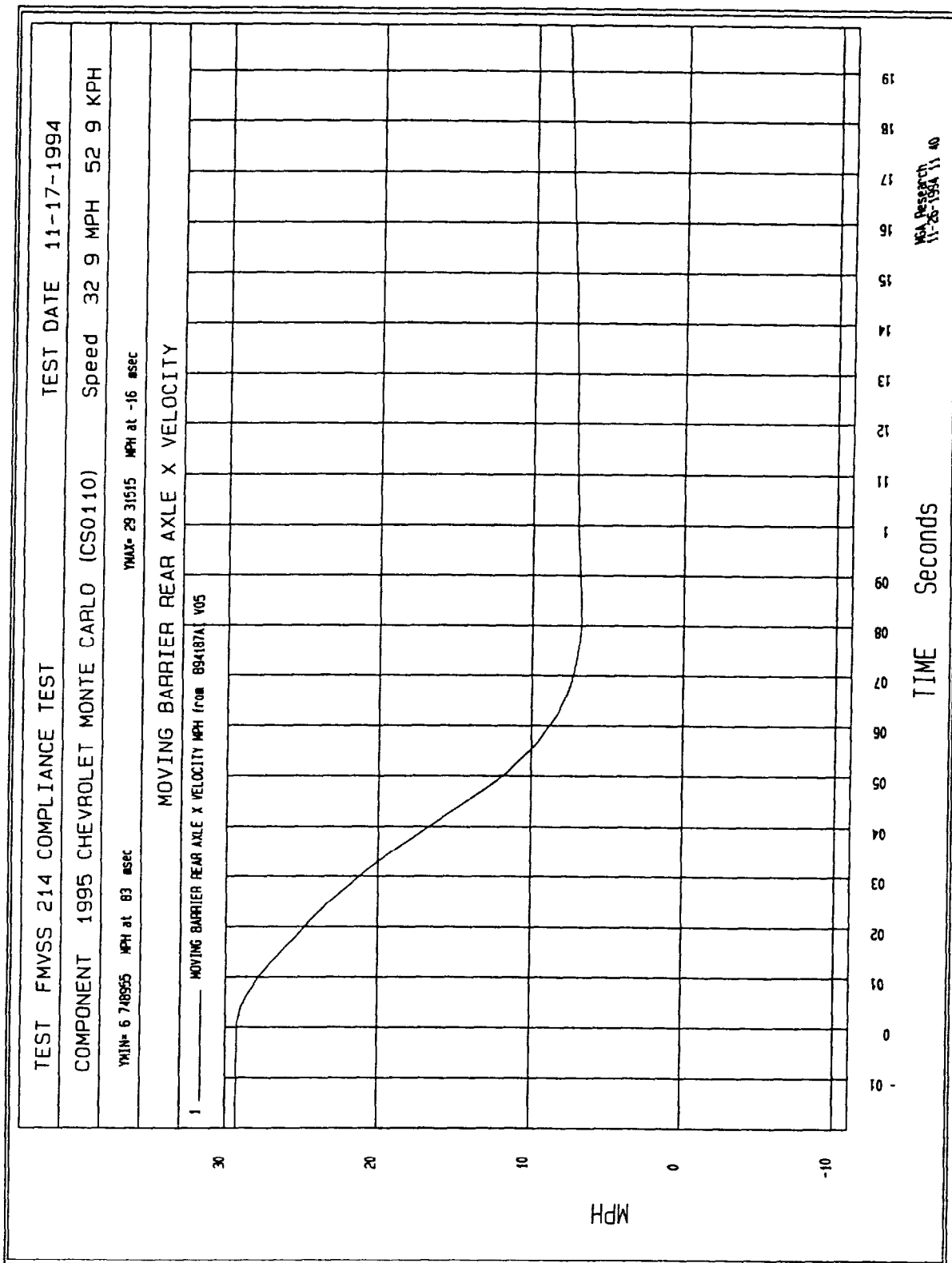


Figure B-62 - Moving Barrier Rear Axle X Velocity vs. Time

NO VALID DATA COLLECTED

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

NO VALID DATA COLLECTED

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

Filter: Class 1000 (1650 Hz)

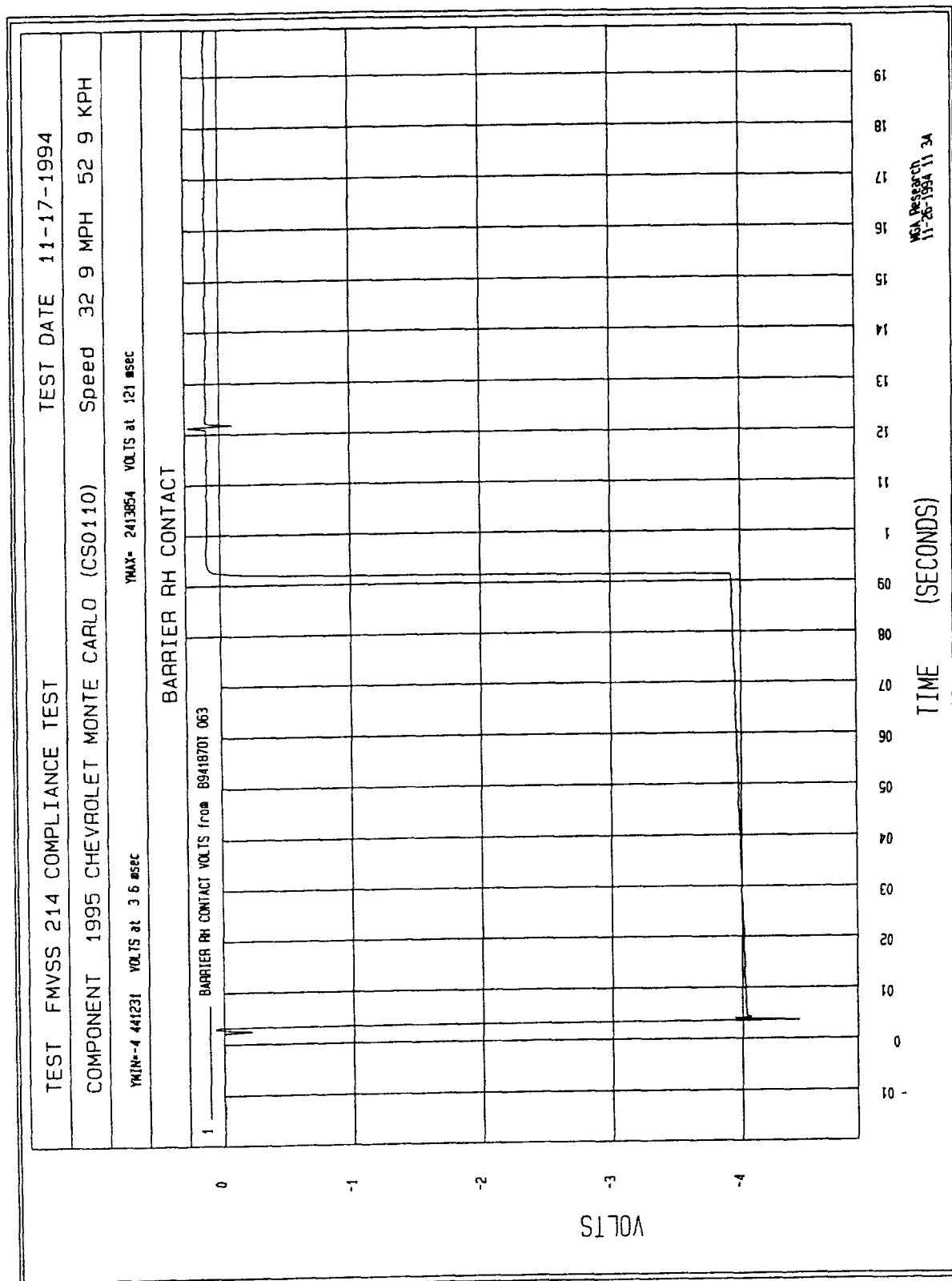


Figure B-65 - Right Hand Barrier Contact

Filter: Class 1000 (1650 Hz)

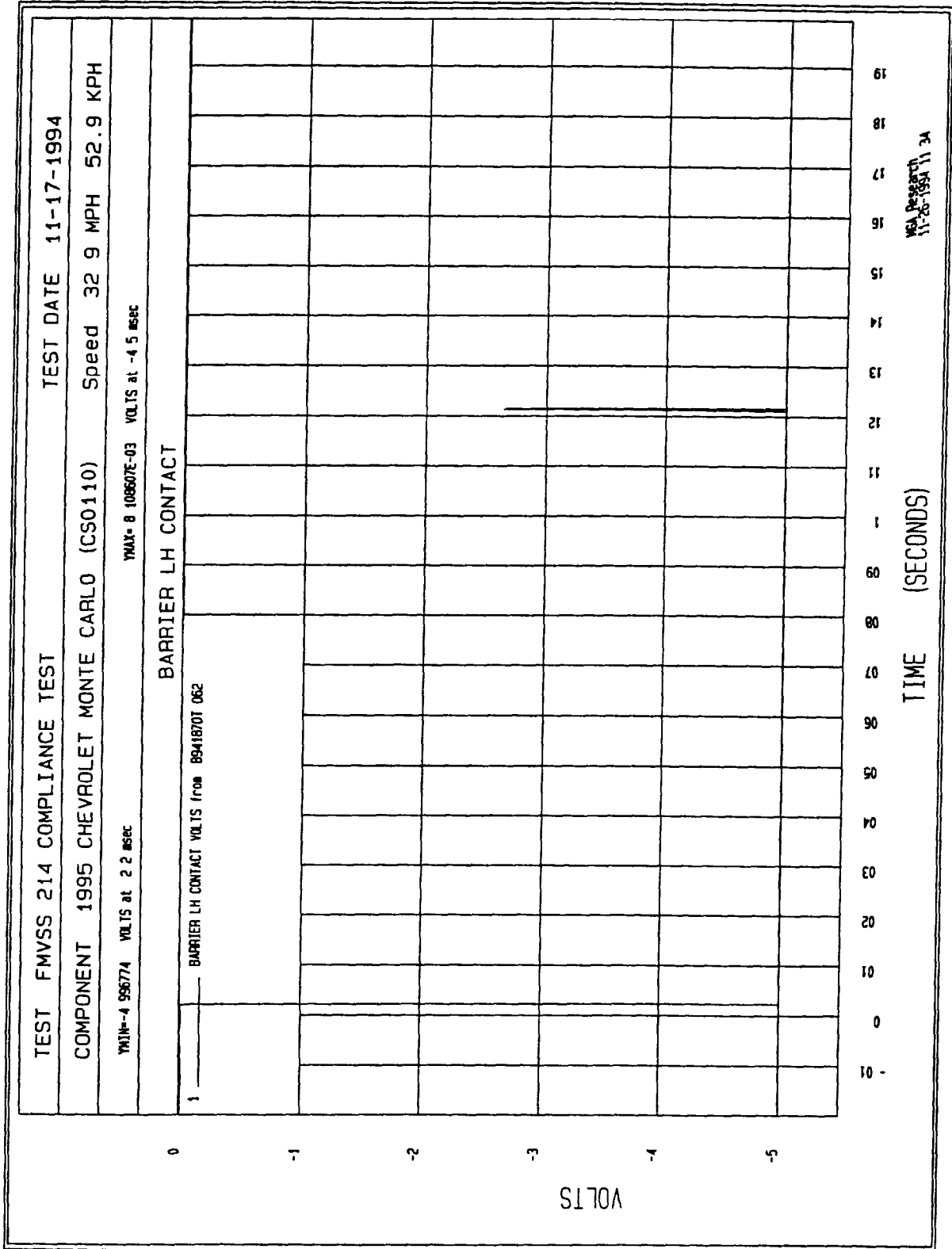


Figure B-66 - Left Hand Barrier Contact

Filter: Class 180 (300 Hz)

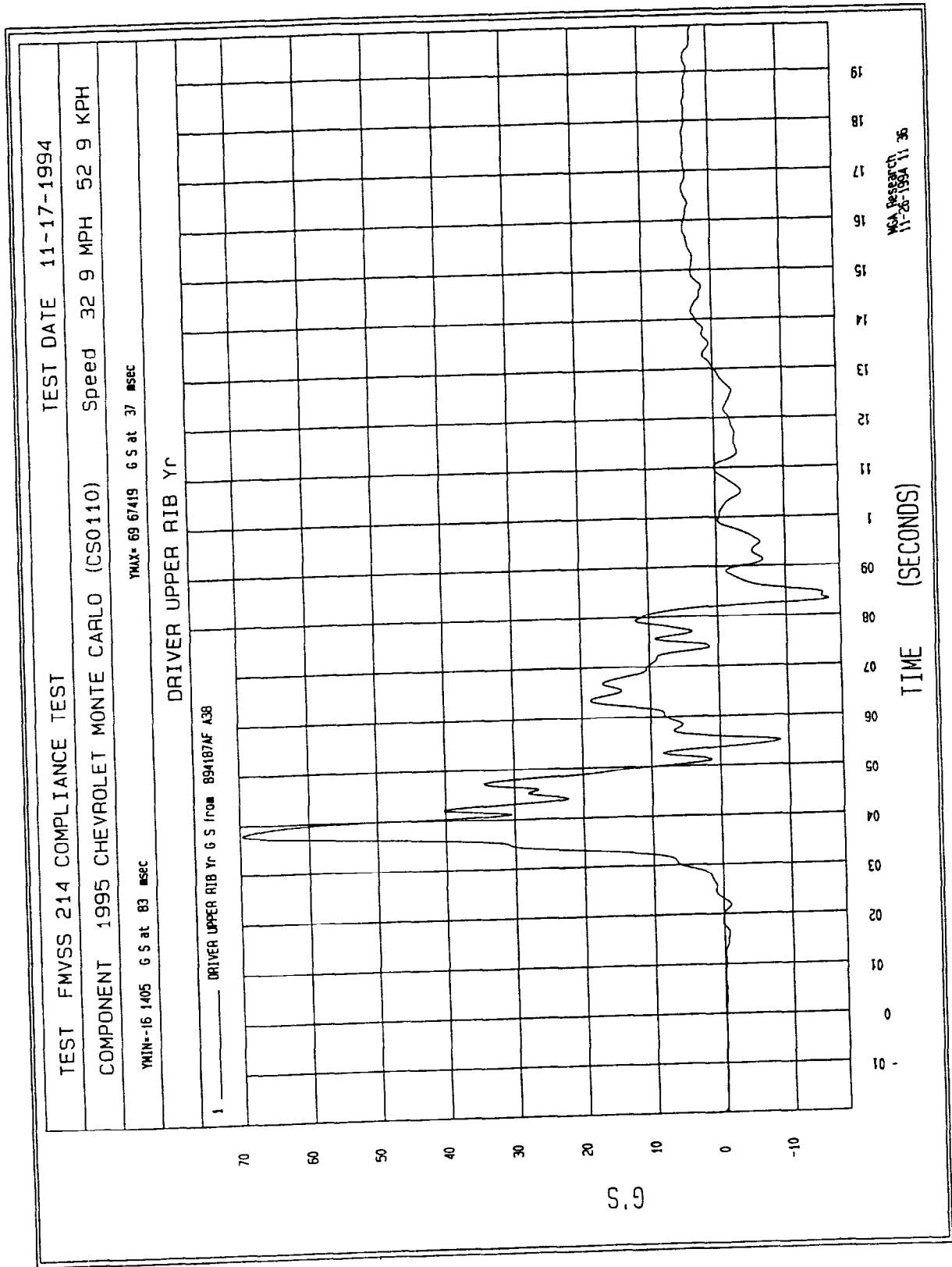


Figure B-67 - Driver Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

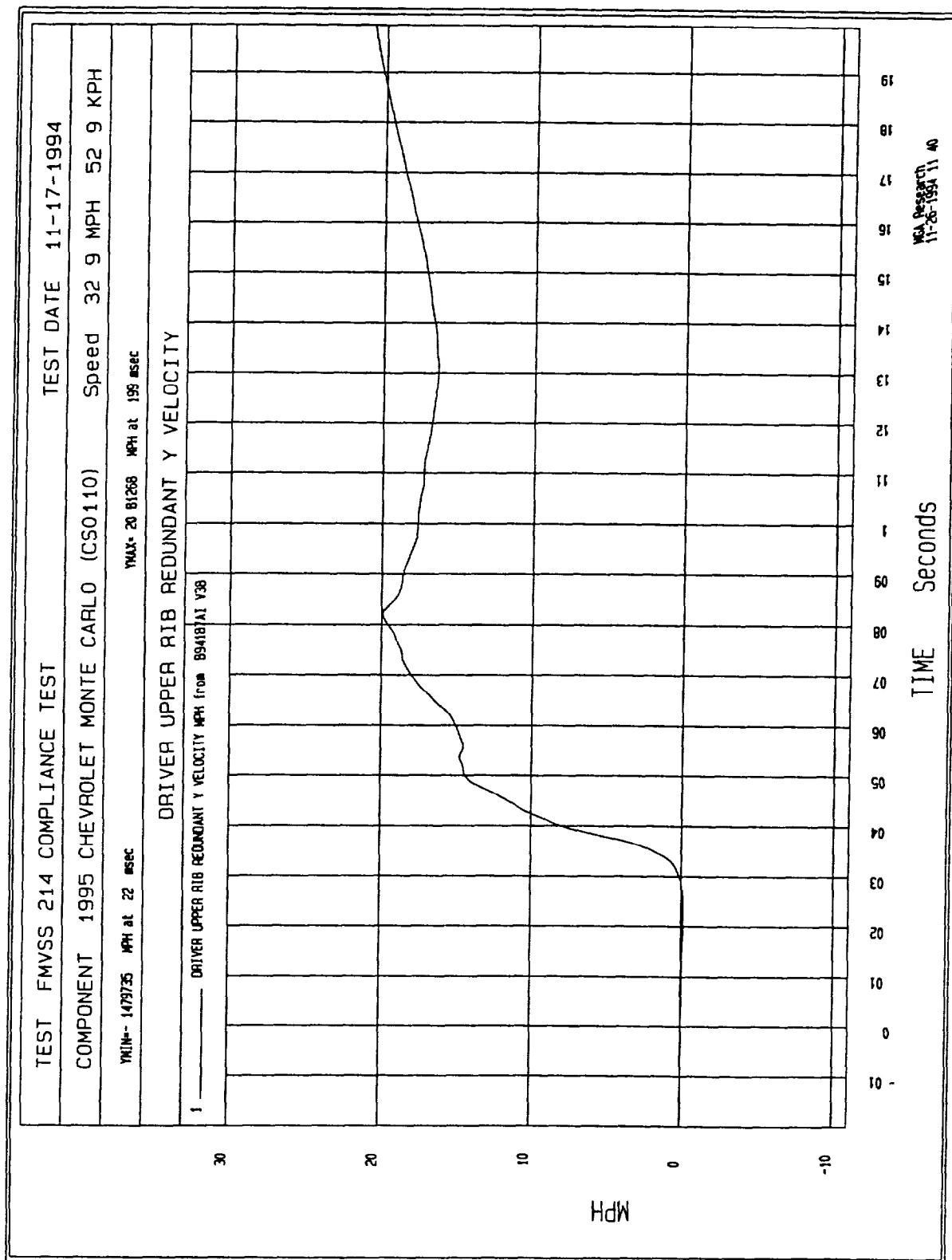


Figure B-68 - Driver Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

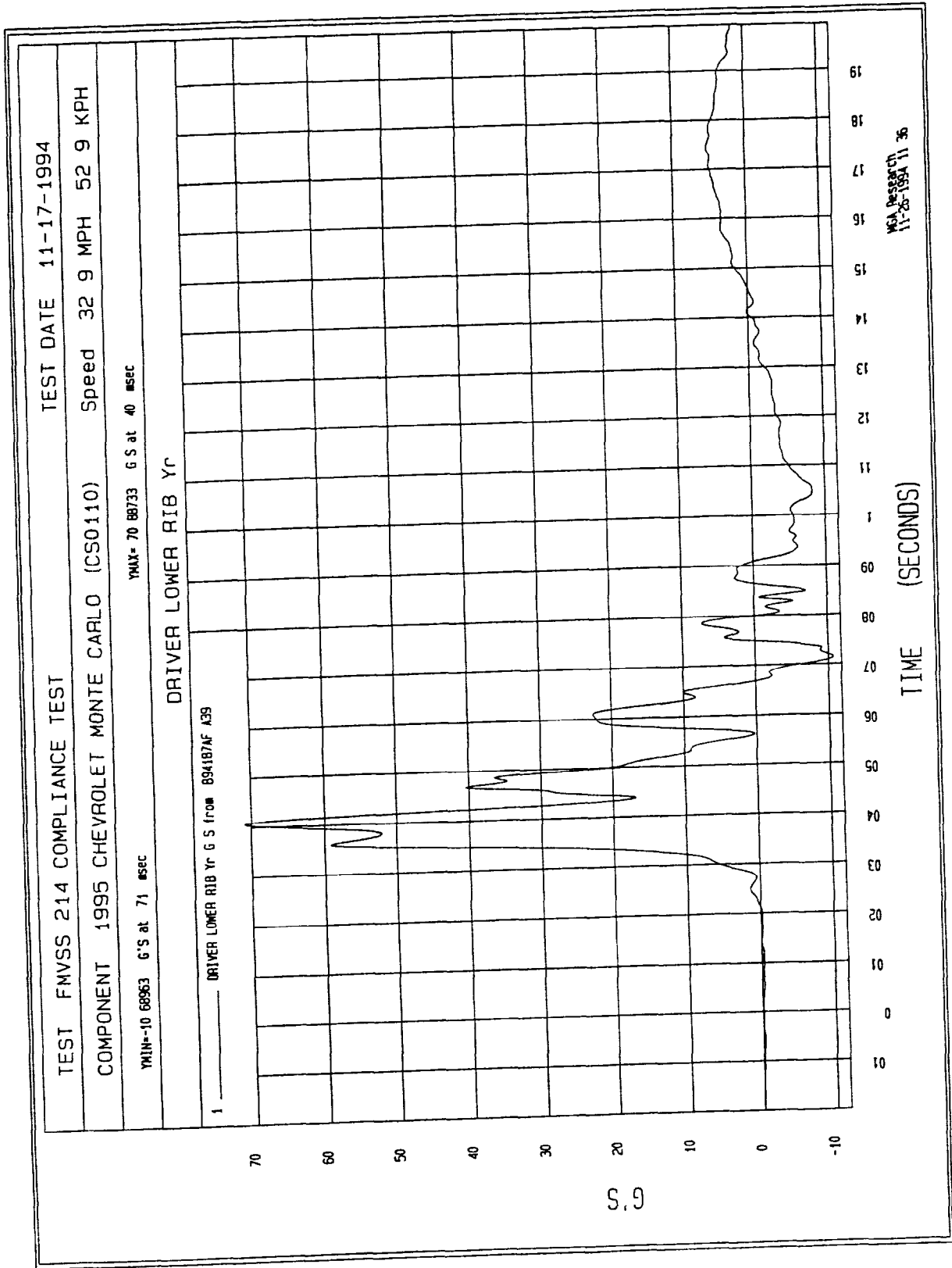


Figure B-69 - Driver Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

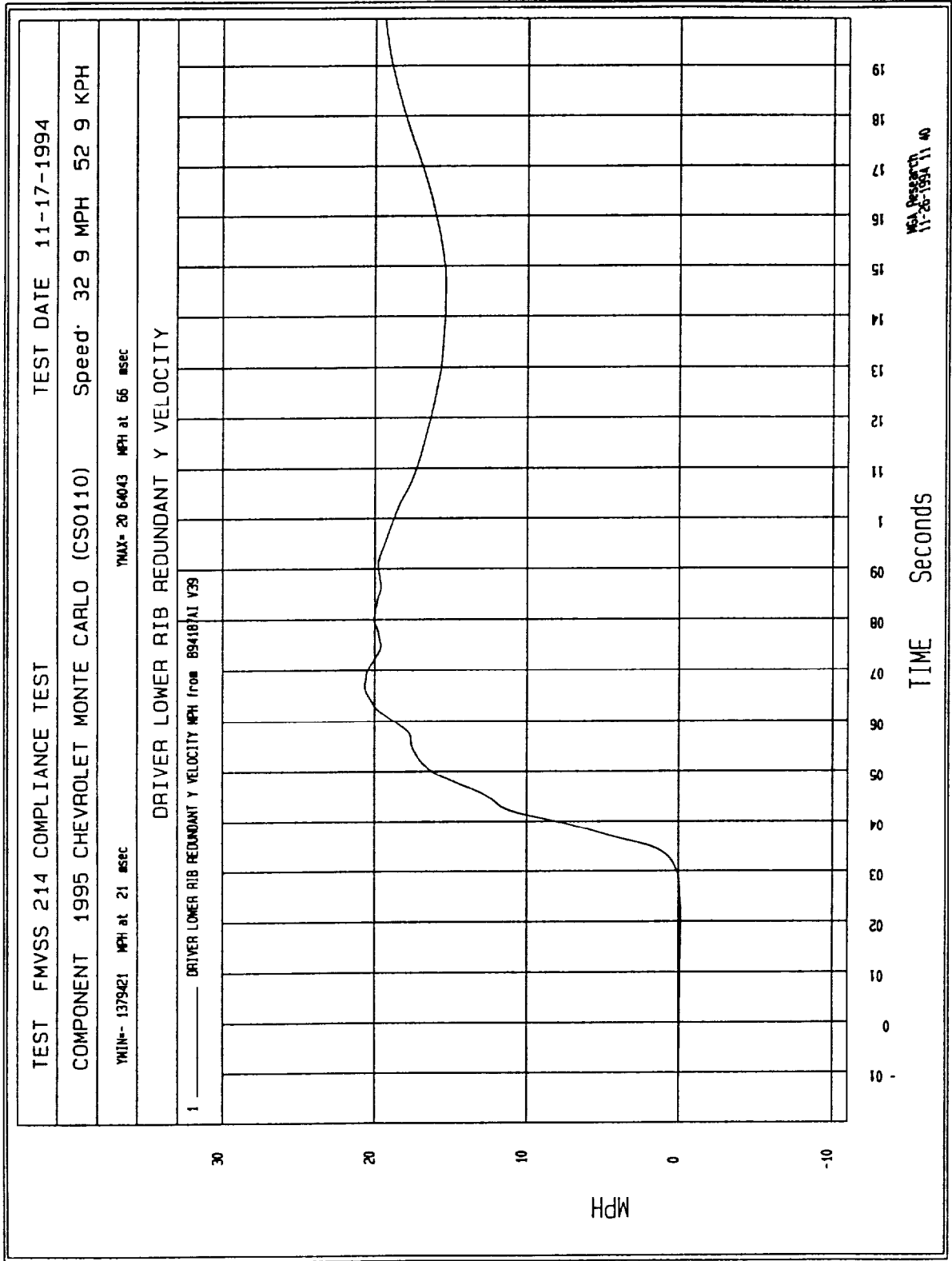


Figure B-70 - Driver Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

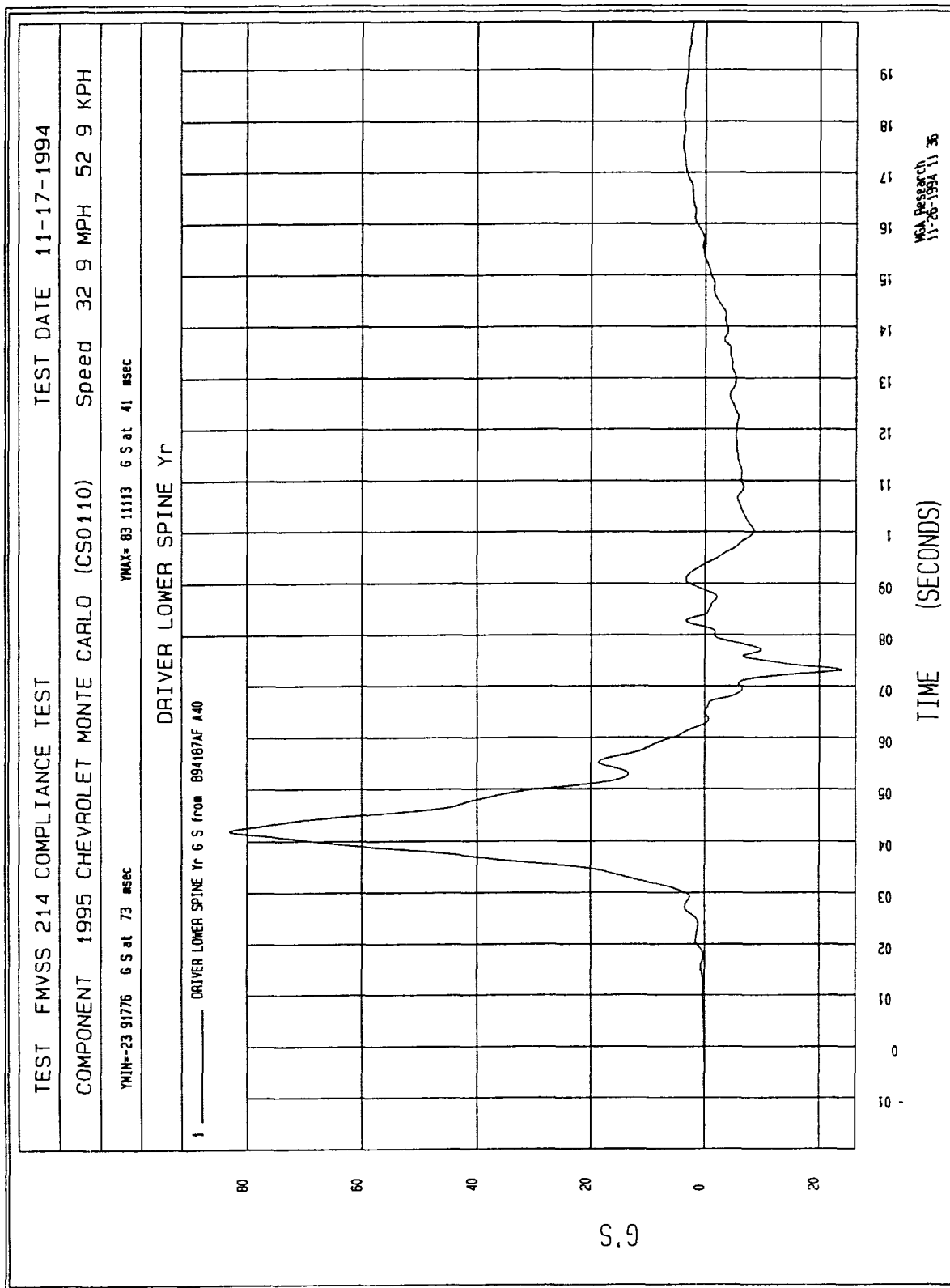


Figure B-71 - Driver Lower Spine Y Redundant Acceleration vs Time

Filter: Class 180 (300 Hz)

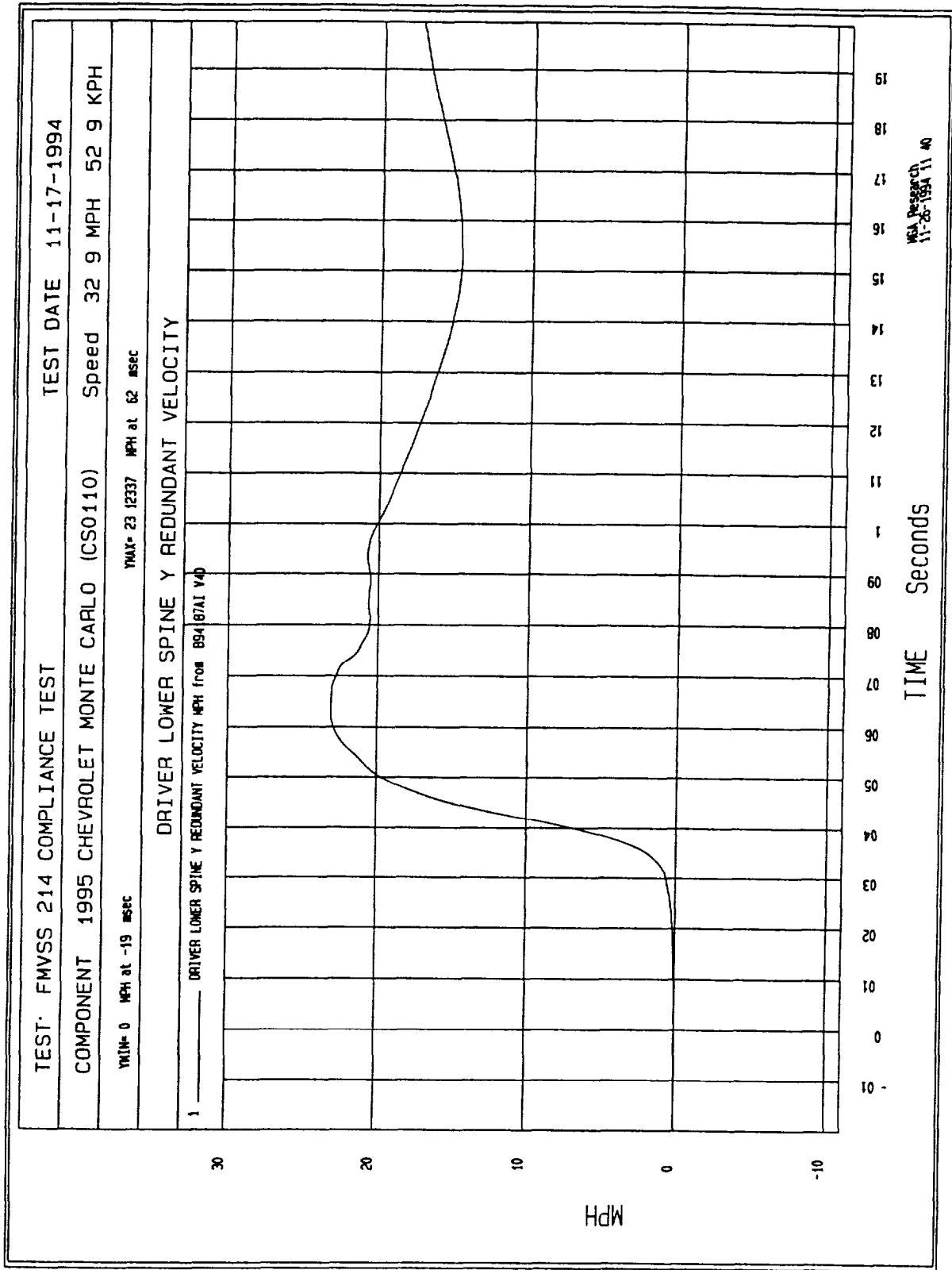


Figure B-72 - Driver Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

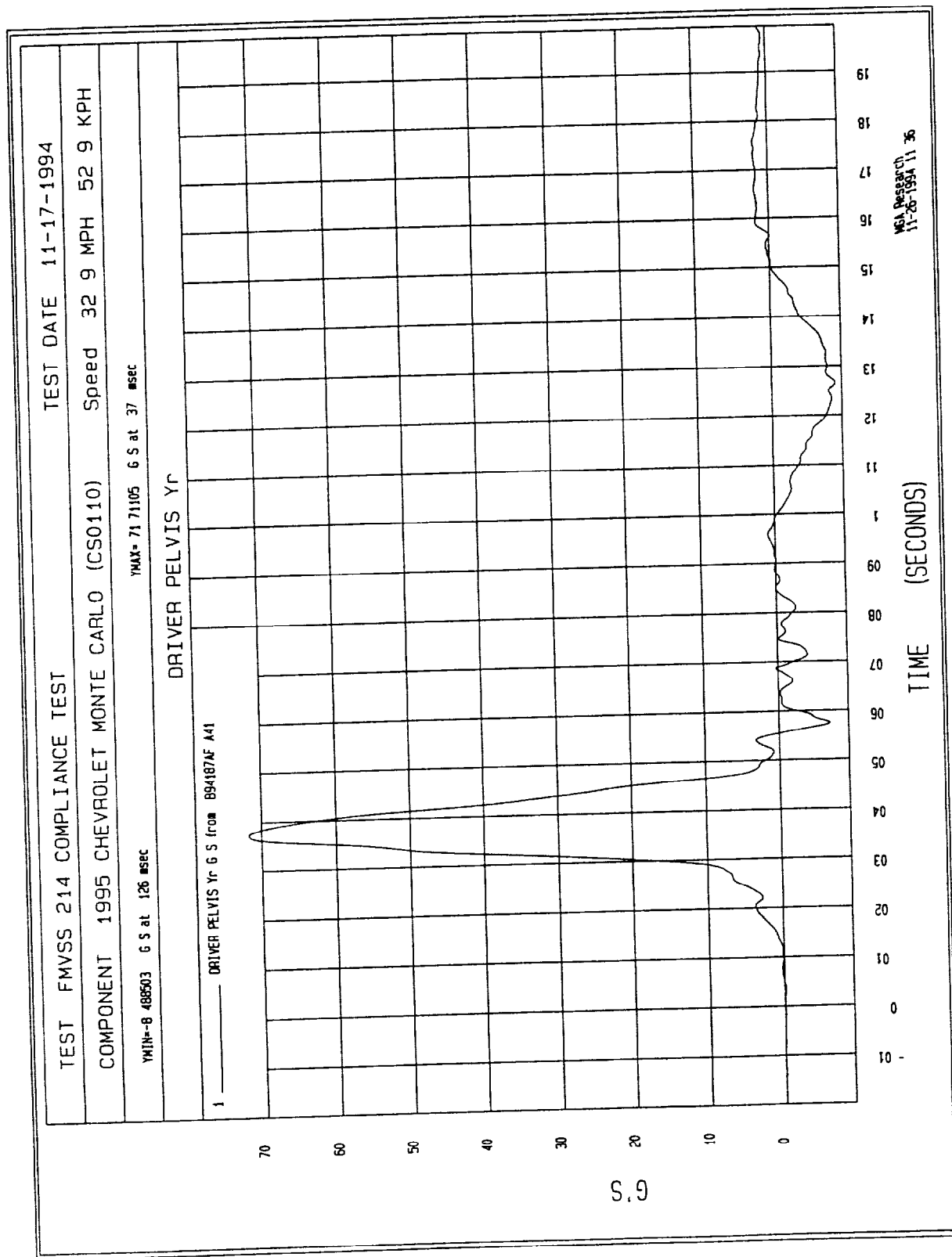


Figure B-73 - Driver Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

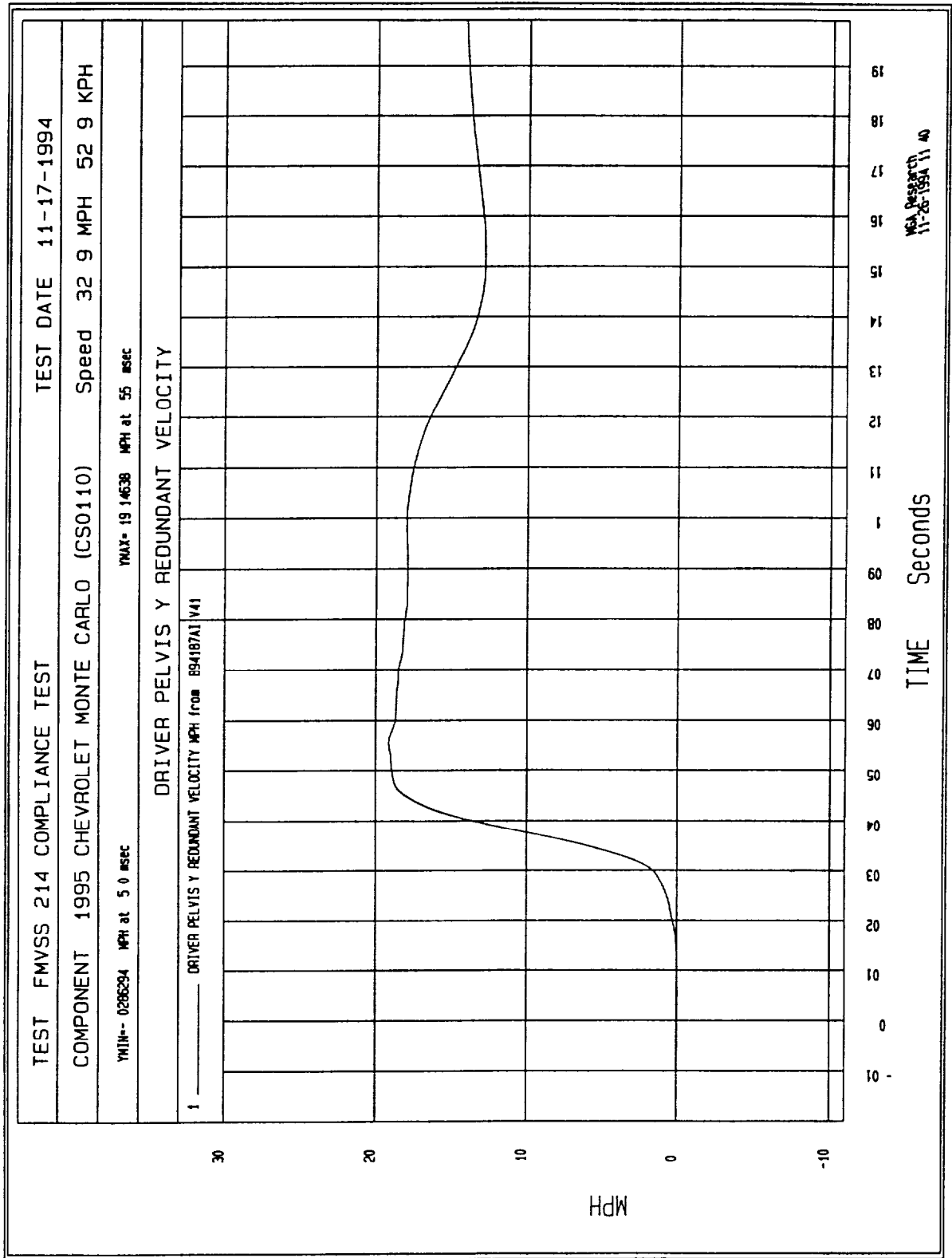


Figure B-74 - Driver Pelvis Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

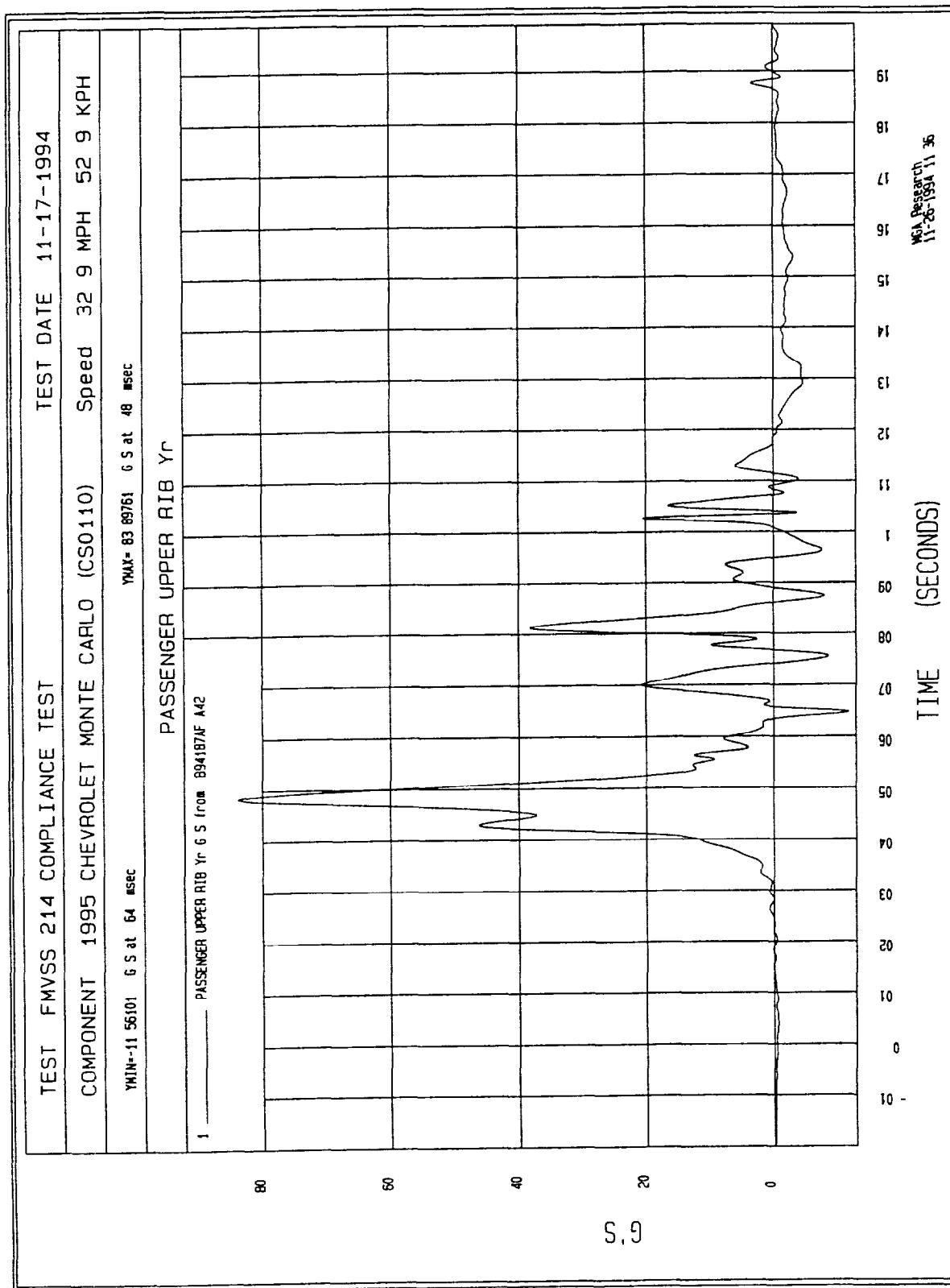


Figure B-75 - Passenger Upper Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

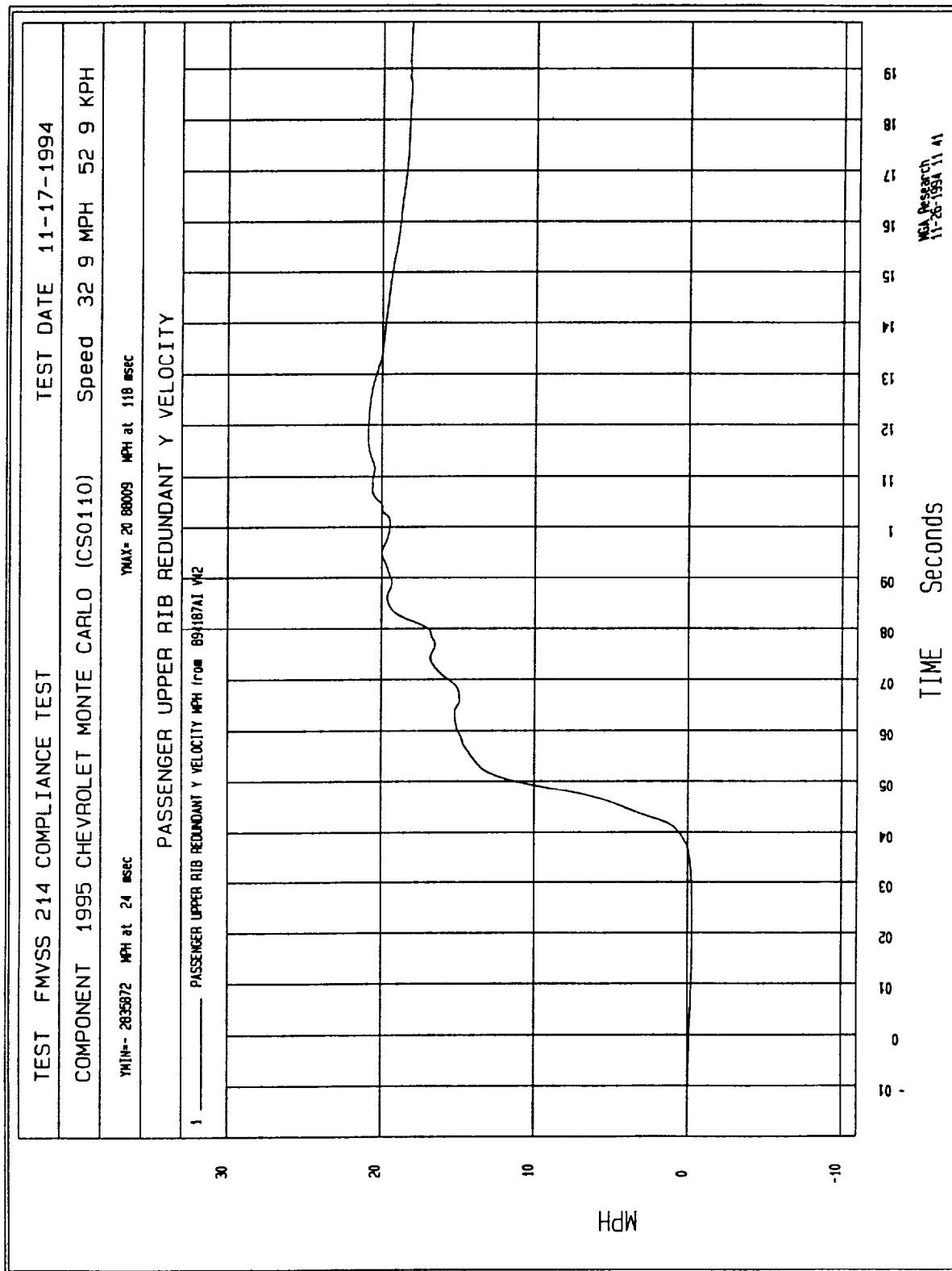


Figure B-76 - Passenger Upper Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

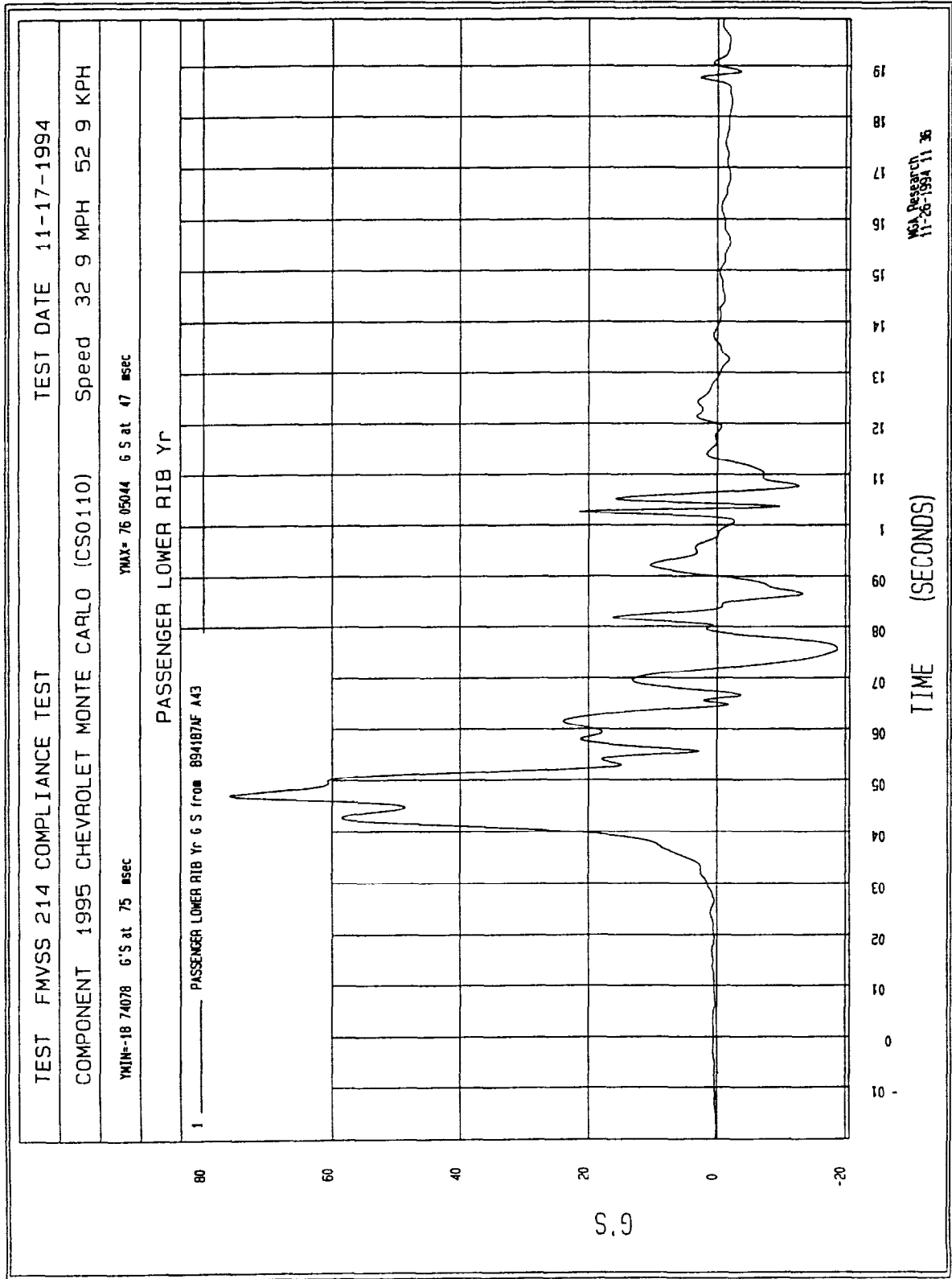


Figure B-77 - Passenger Lower Rib Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

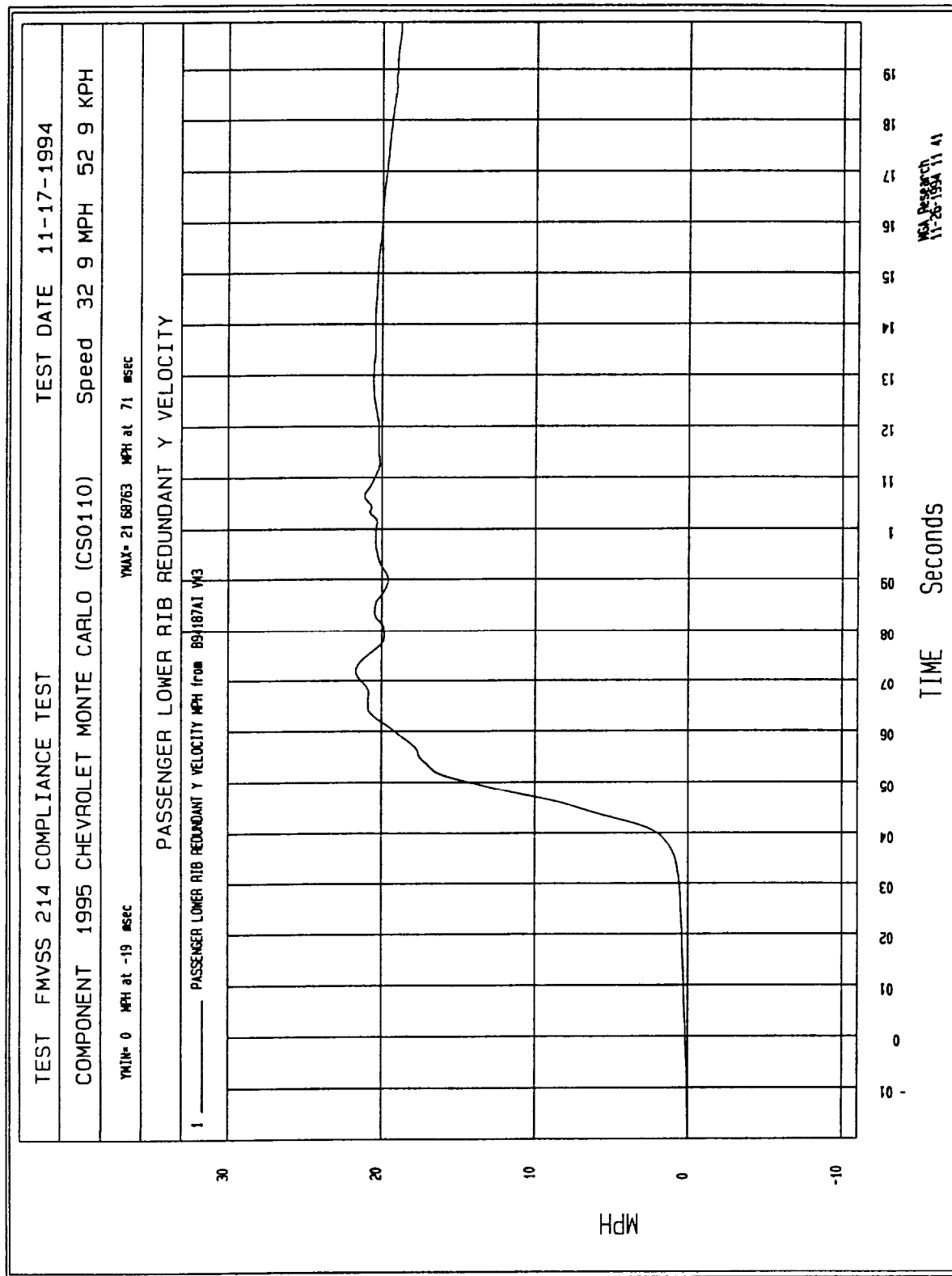


Figure B-78 - Passenger Lower Rib Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

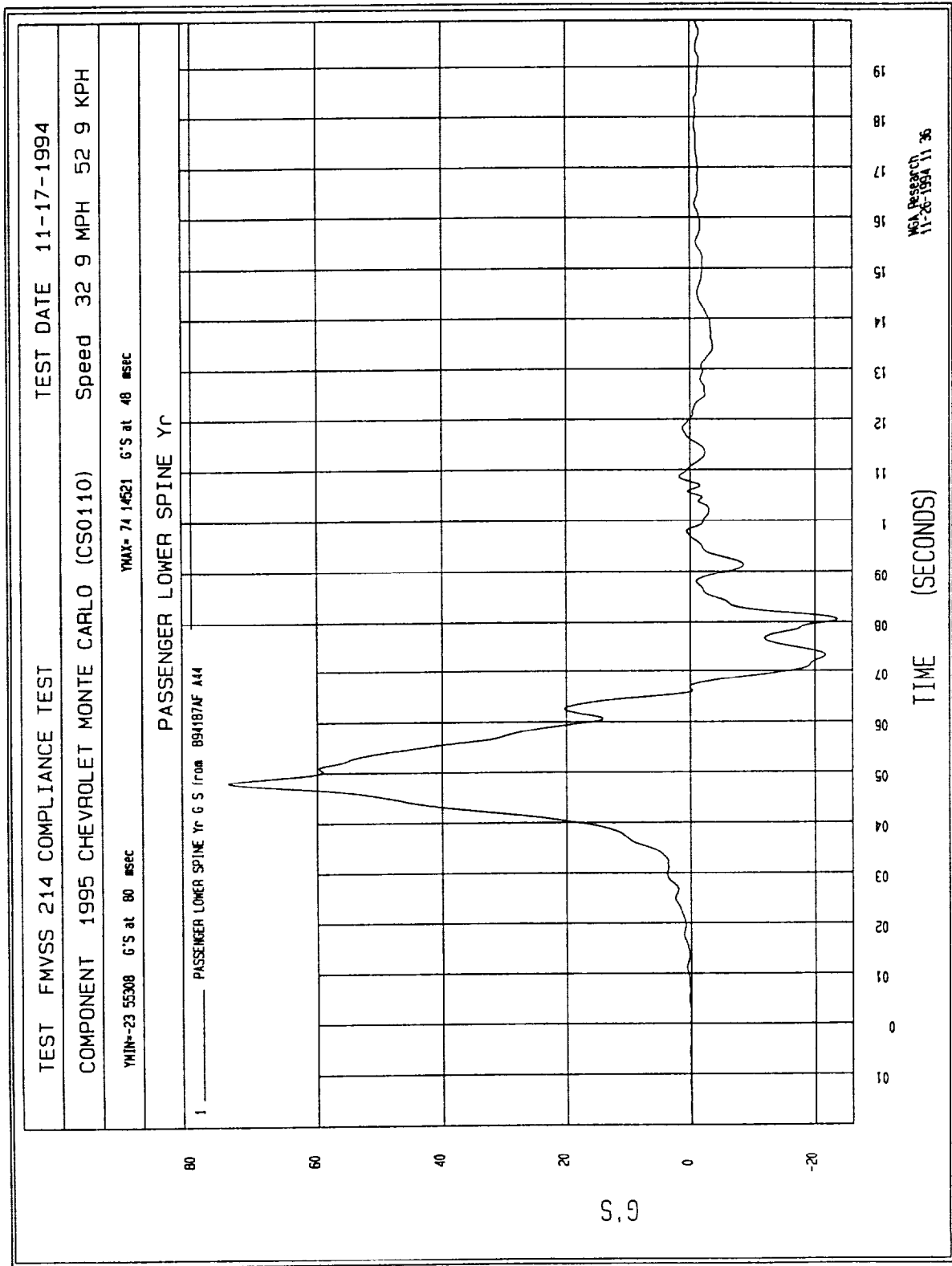


Figure B-79 - Passenger Lower Spine Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

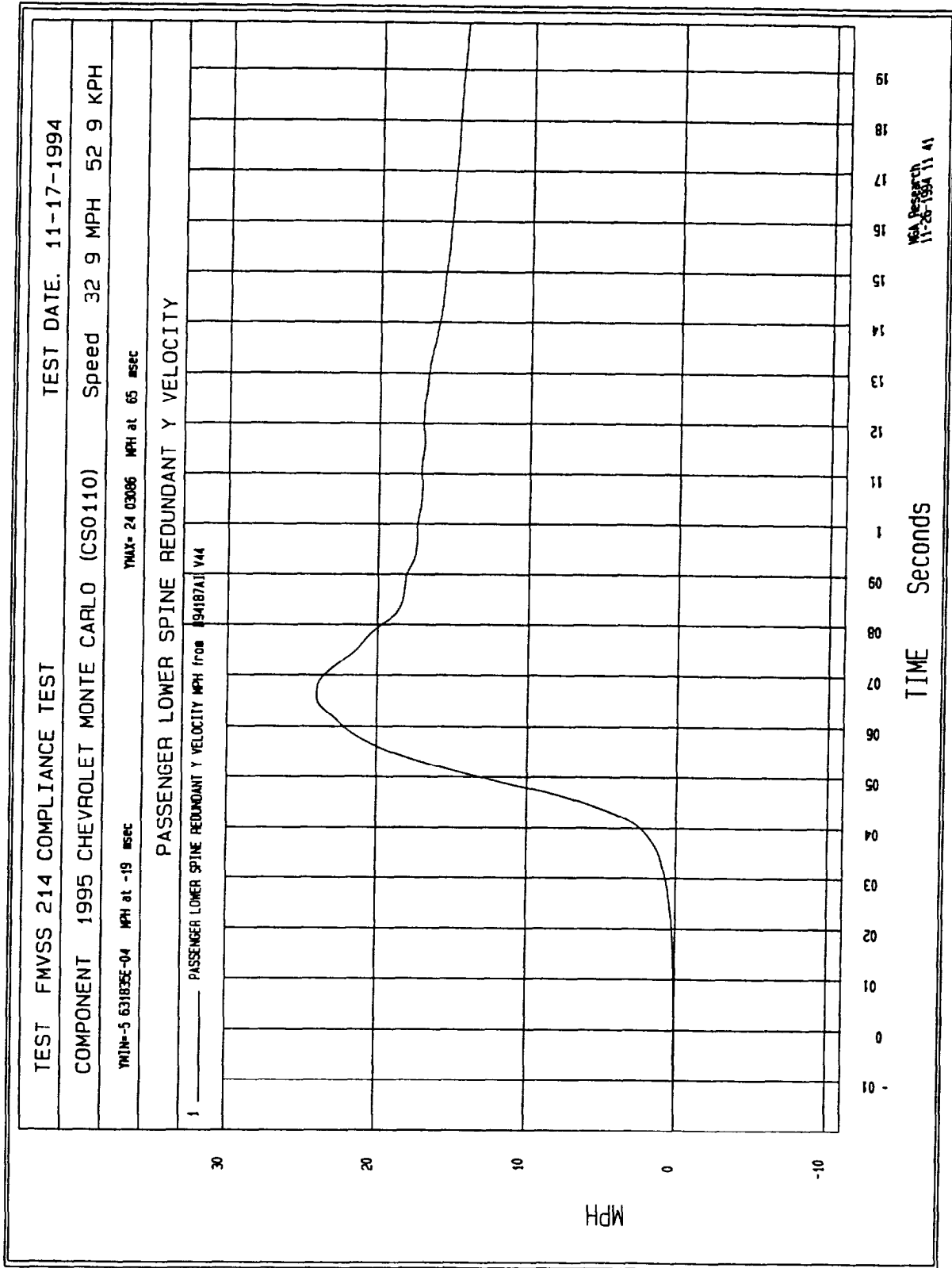


Figure B-80 - Passenger Lower Spine Y Redundant Velocity vs. Time

Filter: Class 180 (300 Hz)

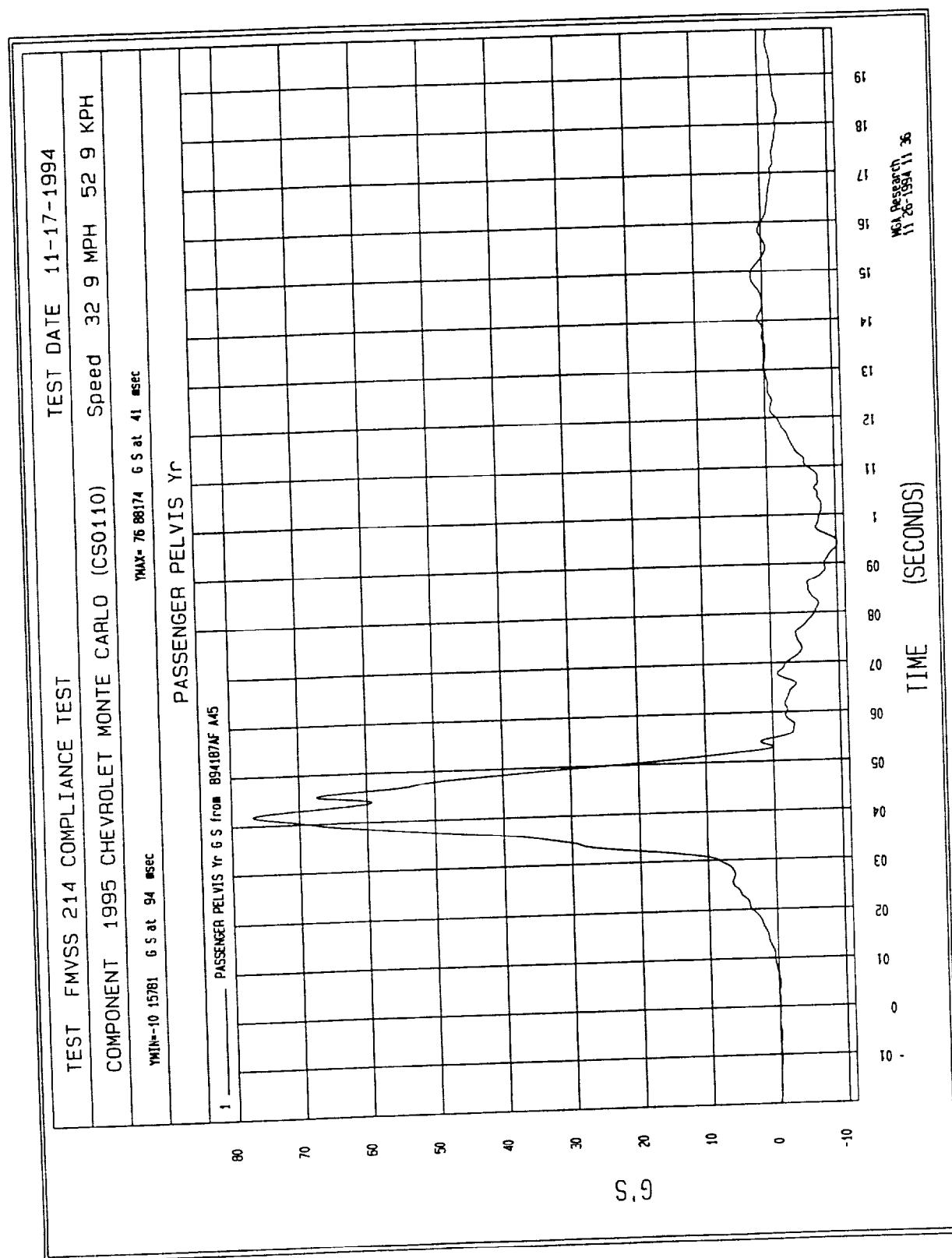


Figure B-81 - Passenger Pelvis Y Redundant Acceleration vs. Time

Filter: Class 180 (300 Hz)

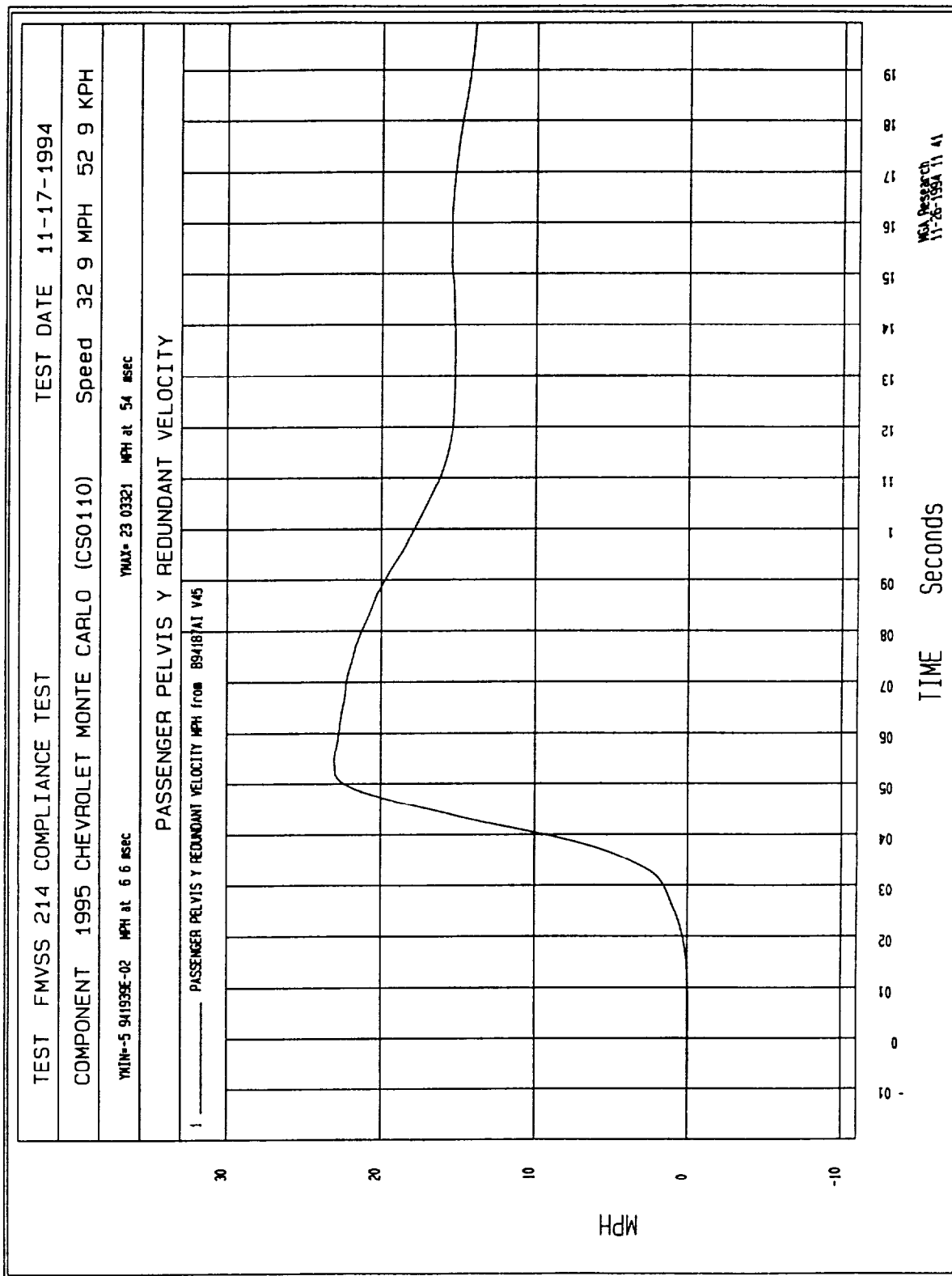


Figure B-82 - Passenger Pelvis Y Redundant Velocity vs. Time

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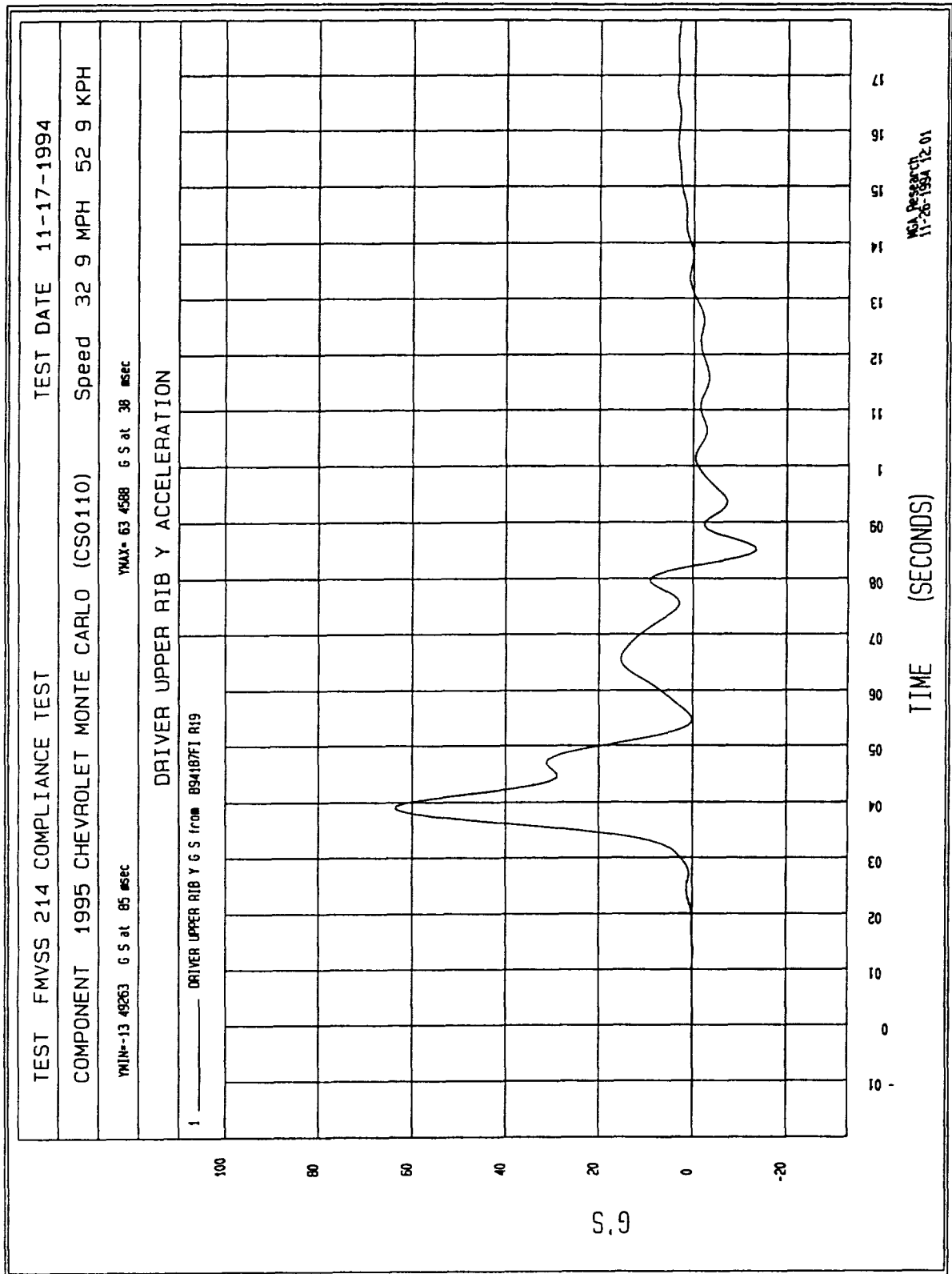


Figure B-83 - Driver Upper Rib Y Acceleration vs. Time

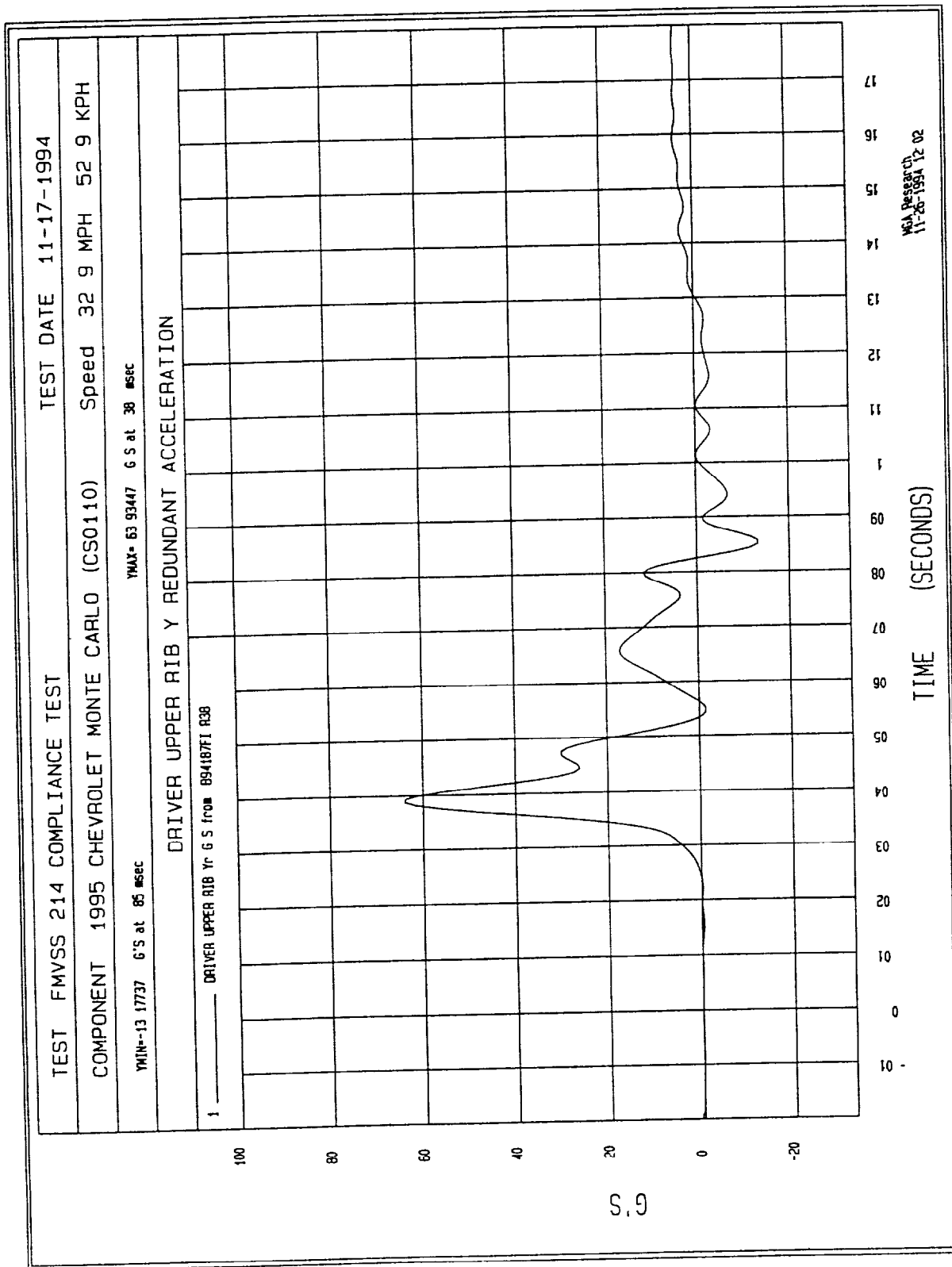


Figure B-84 - Driver Upper Rib Y Redundant Acceleration vs. Time

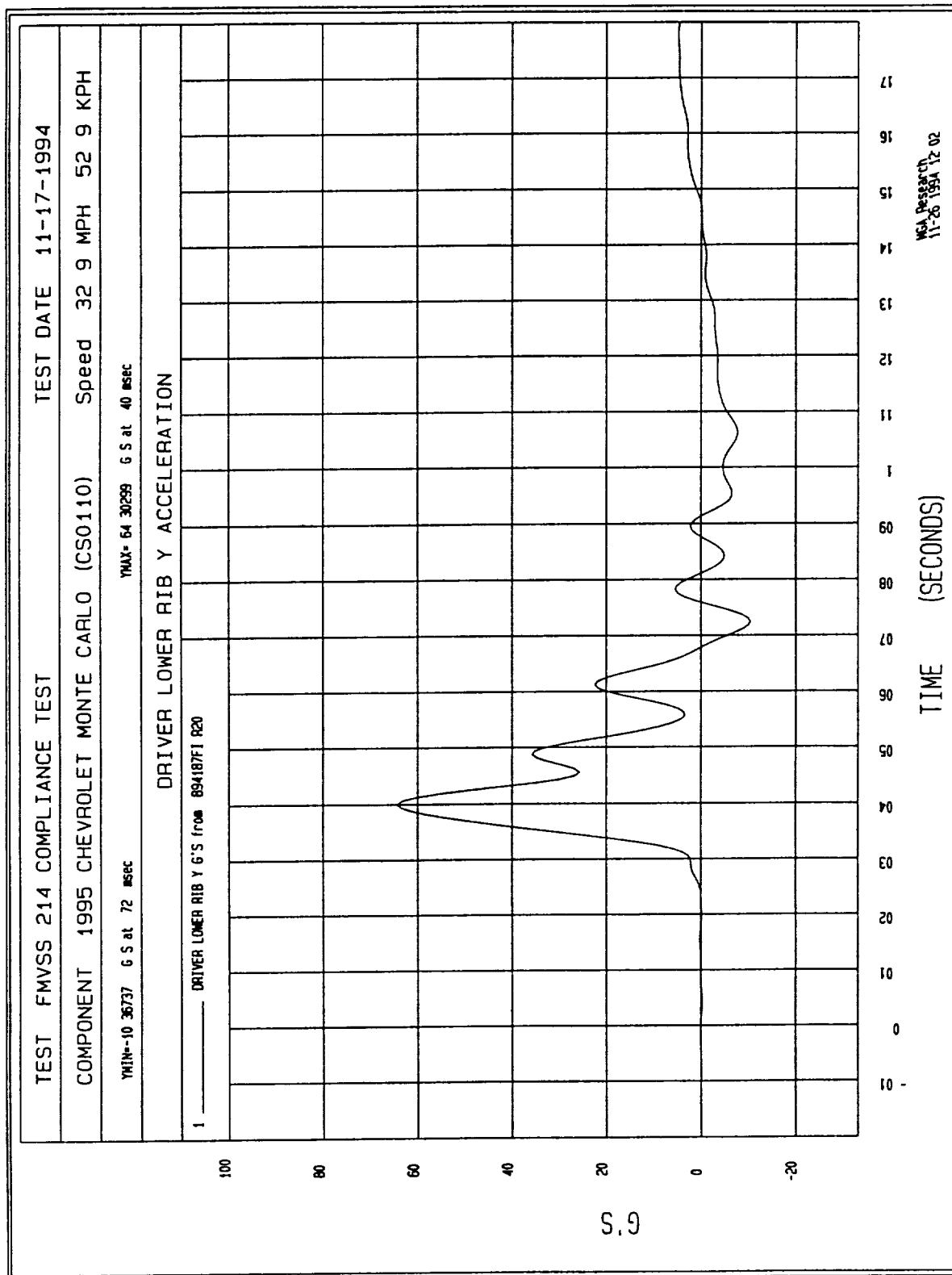


Figure B-85 - Driver Lower Rib Y Acceleration vs. Time

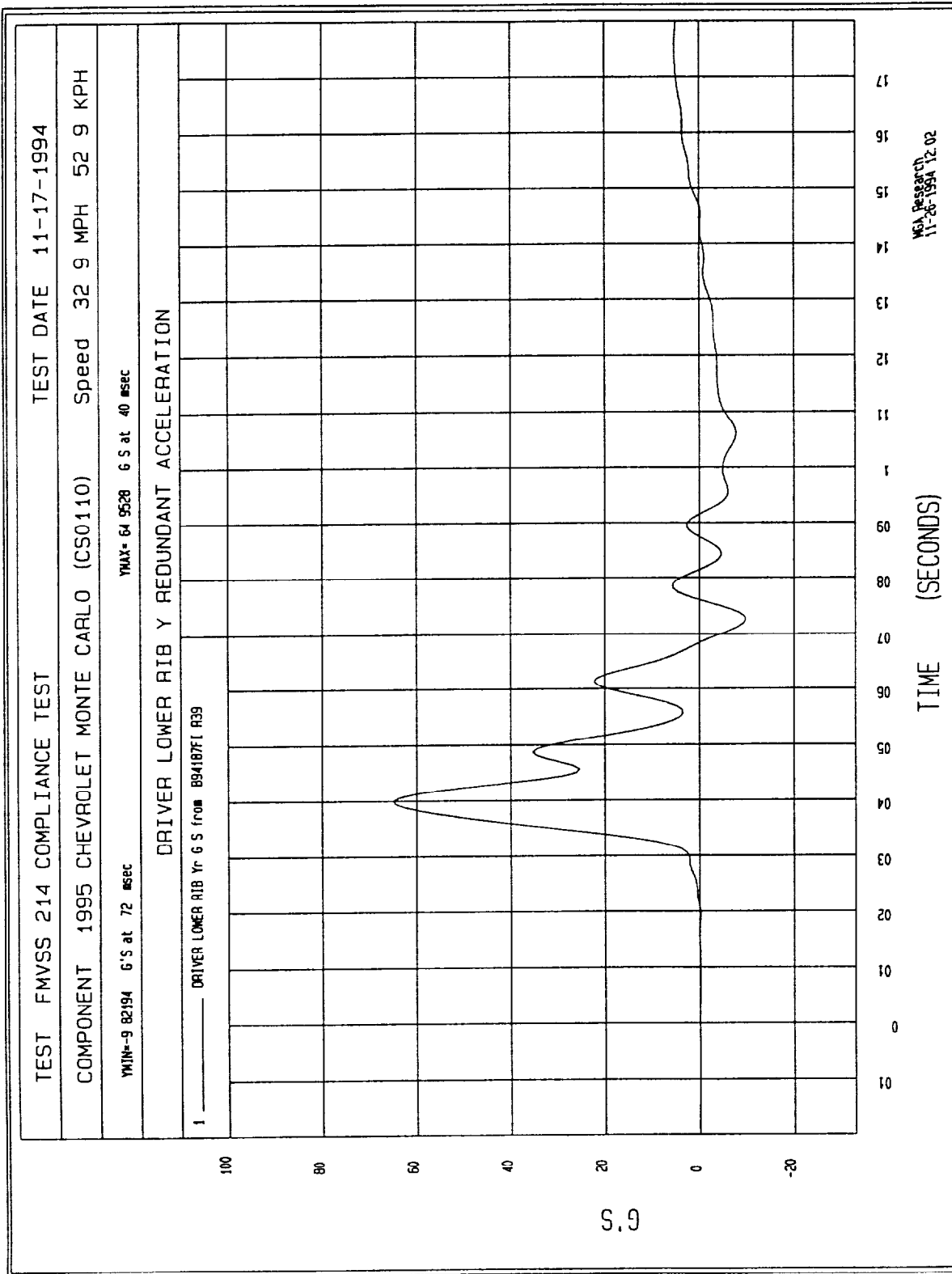
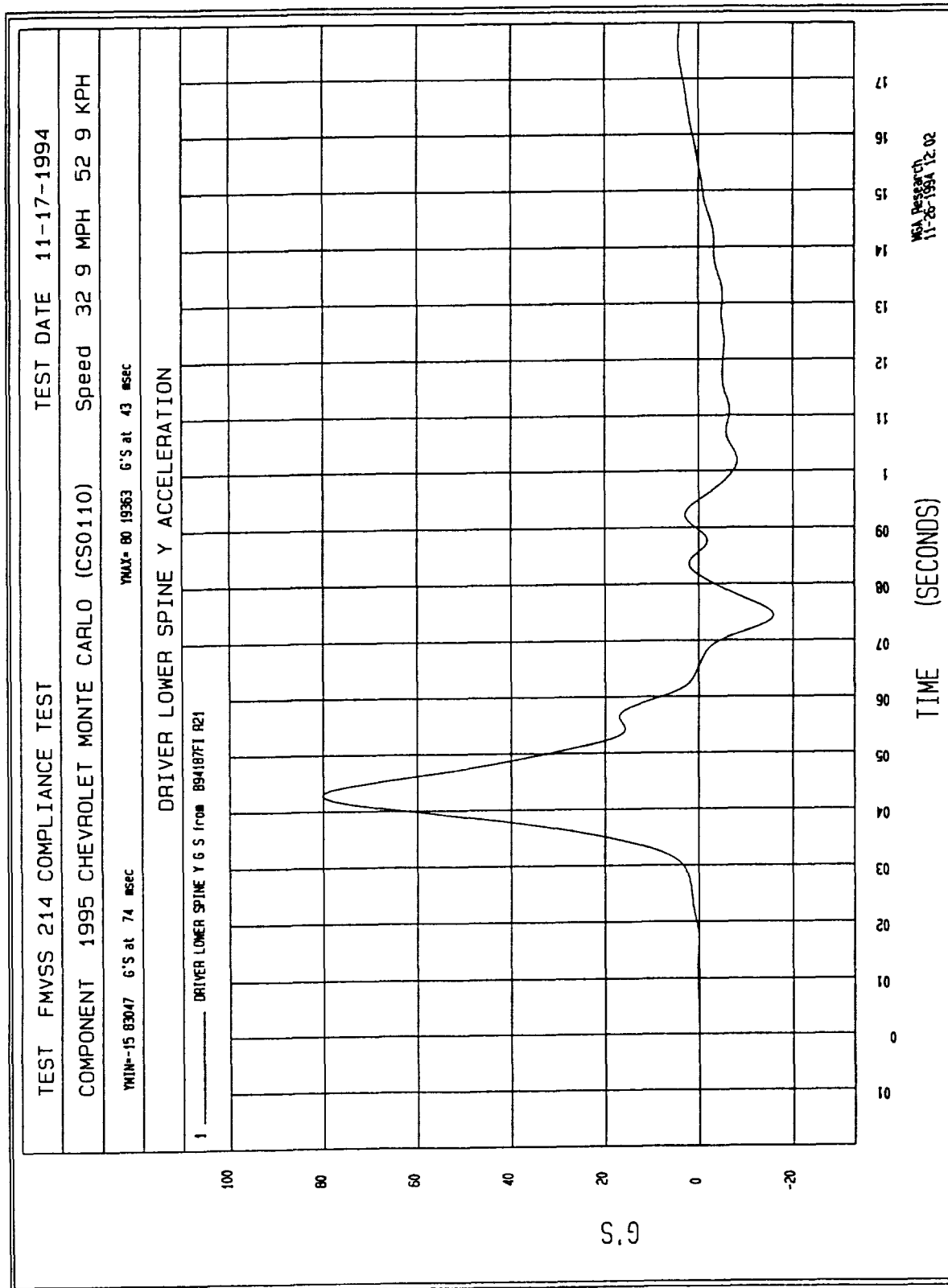


Figure B-86 - Driver Lower Rib Y Redundant Acceleration vs. Time



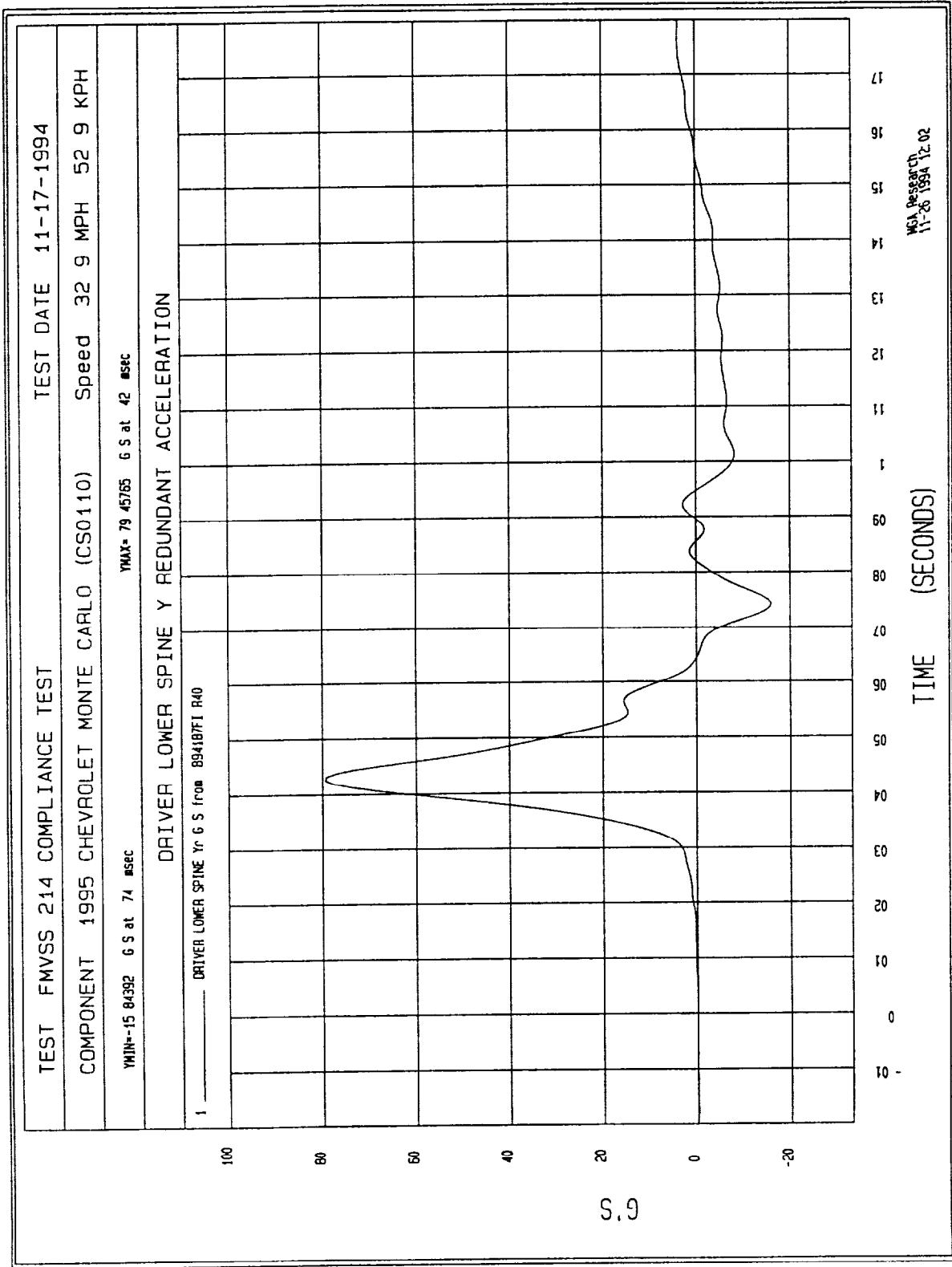


Figure B-88 - Driver Lower Spine Y Redundant Acceleration vs. Time

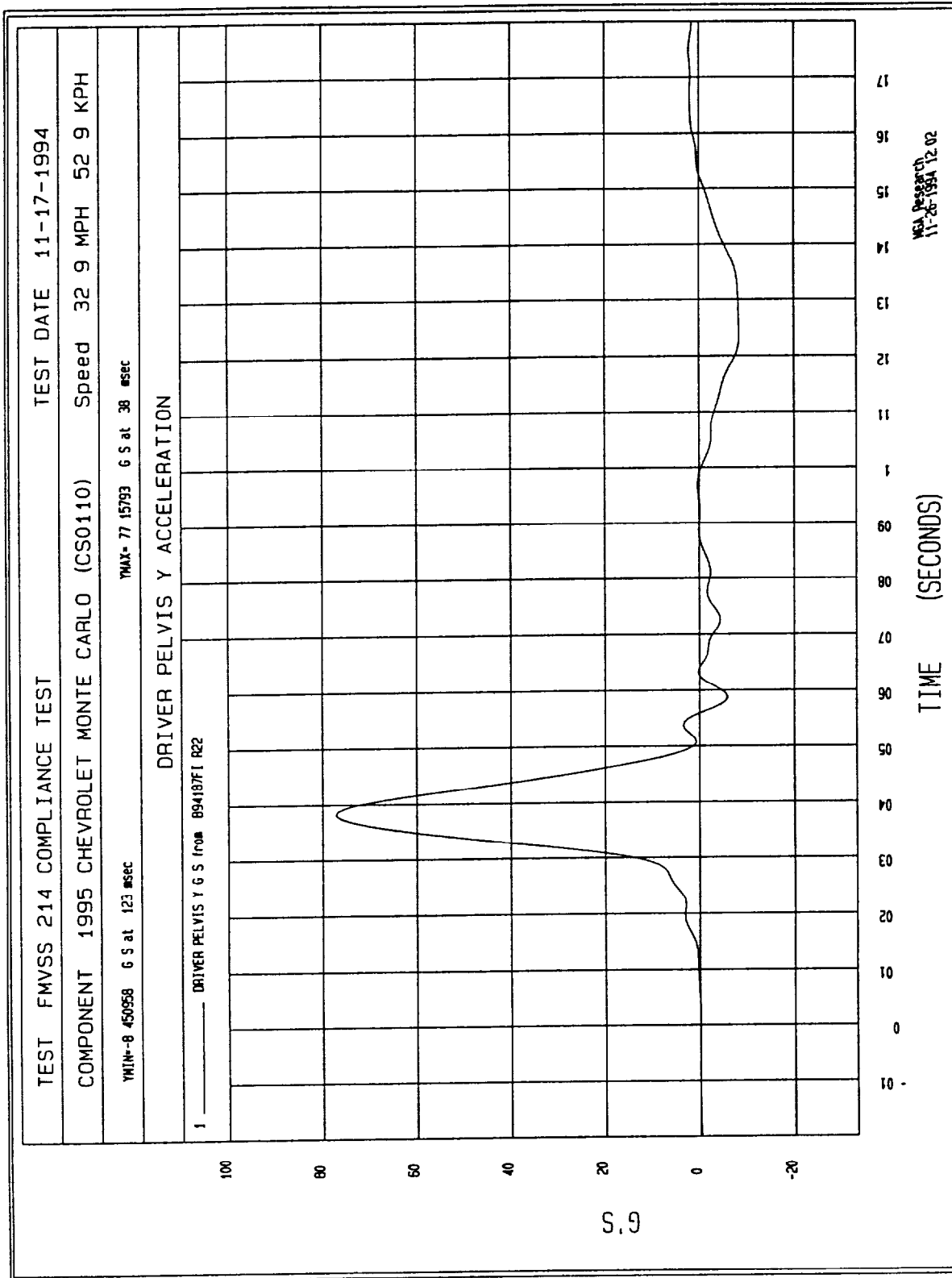


Figure B-89 - Driver Pelvis Y Acceleration vs. Time

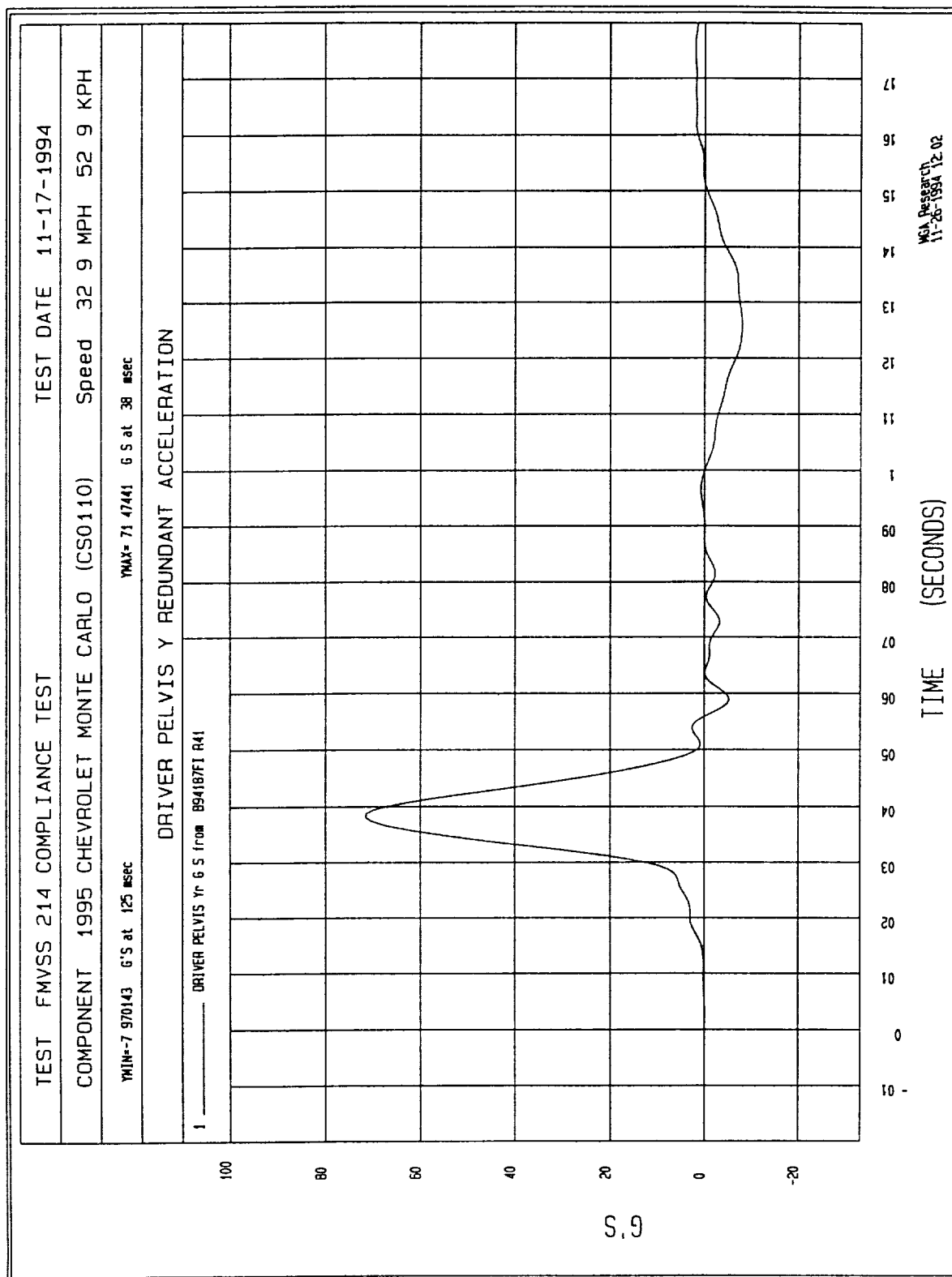


Figure B-90 - Driver Pelvis Y Redundant Acceleration vs. Time

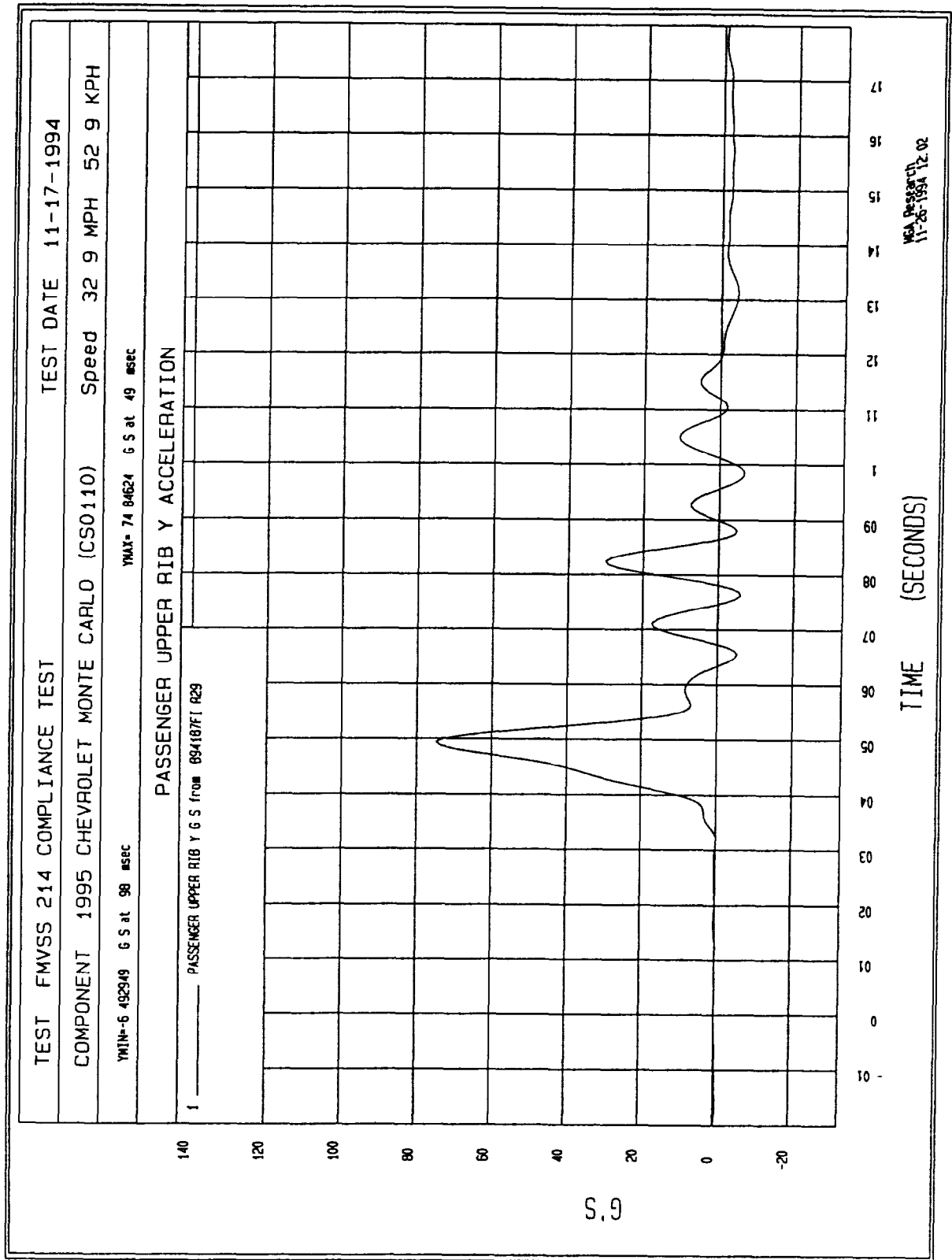


Figure B-91 - Passenger Upper Rib Y Acceleration vs. Time

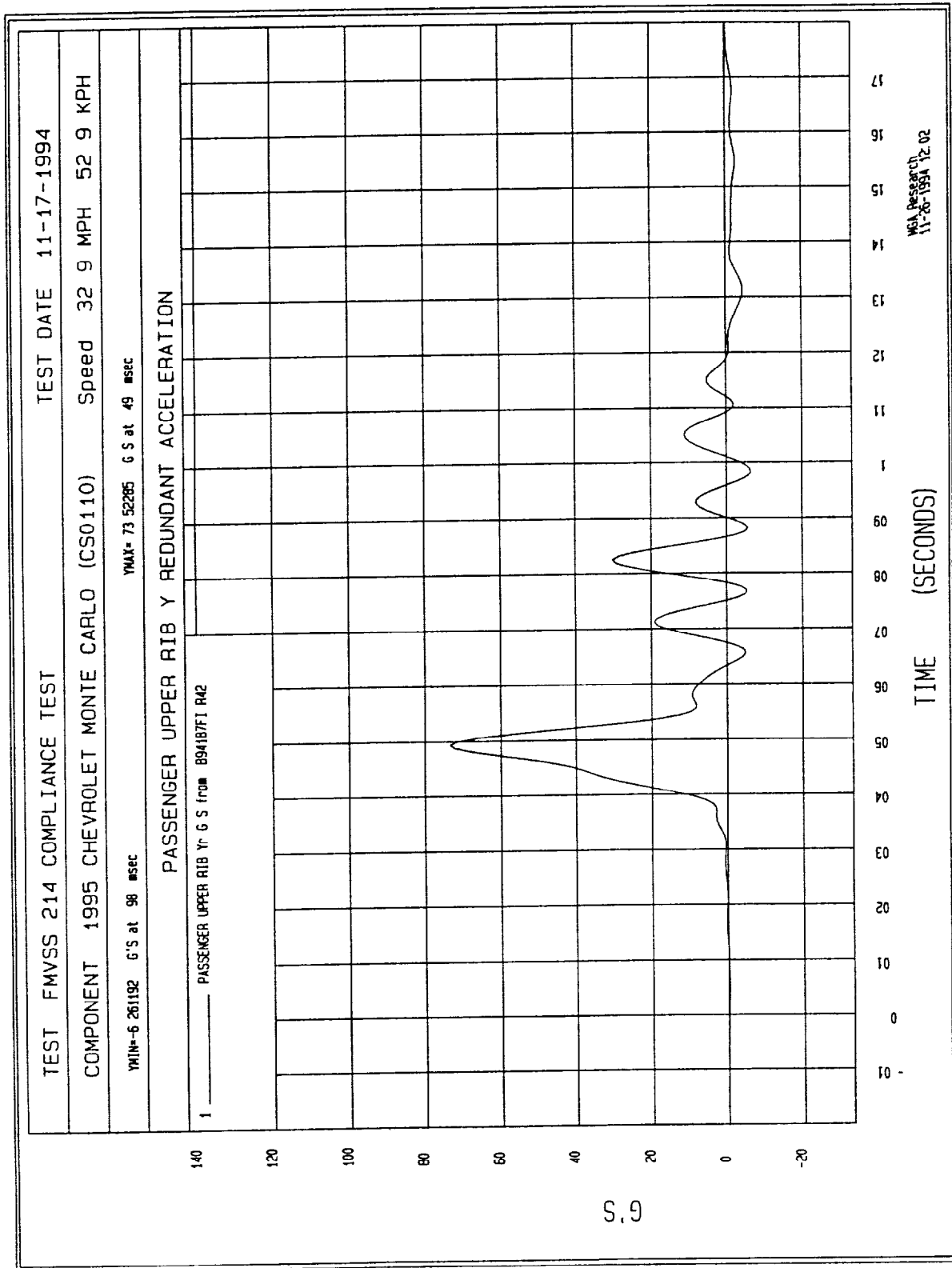


Figure B-92 - Passenger Upper Rib Y Redundant Acceleration vs. Time

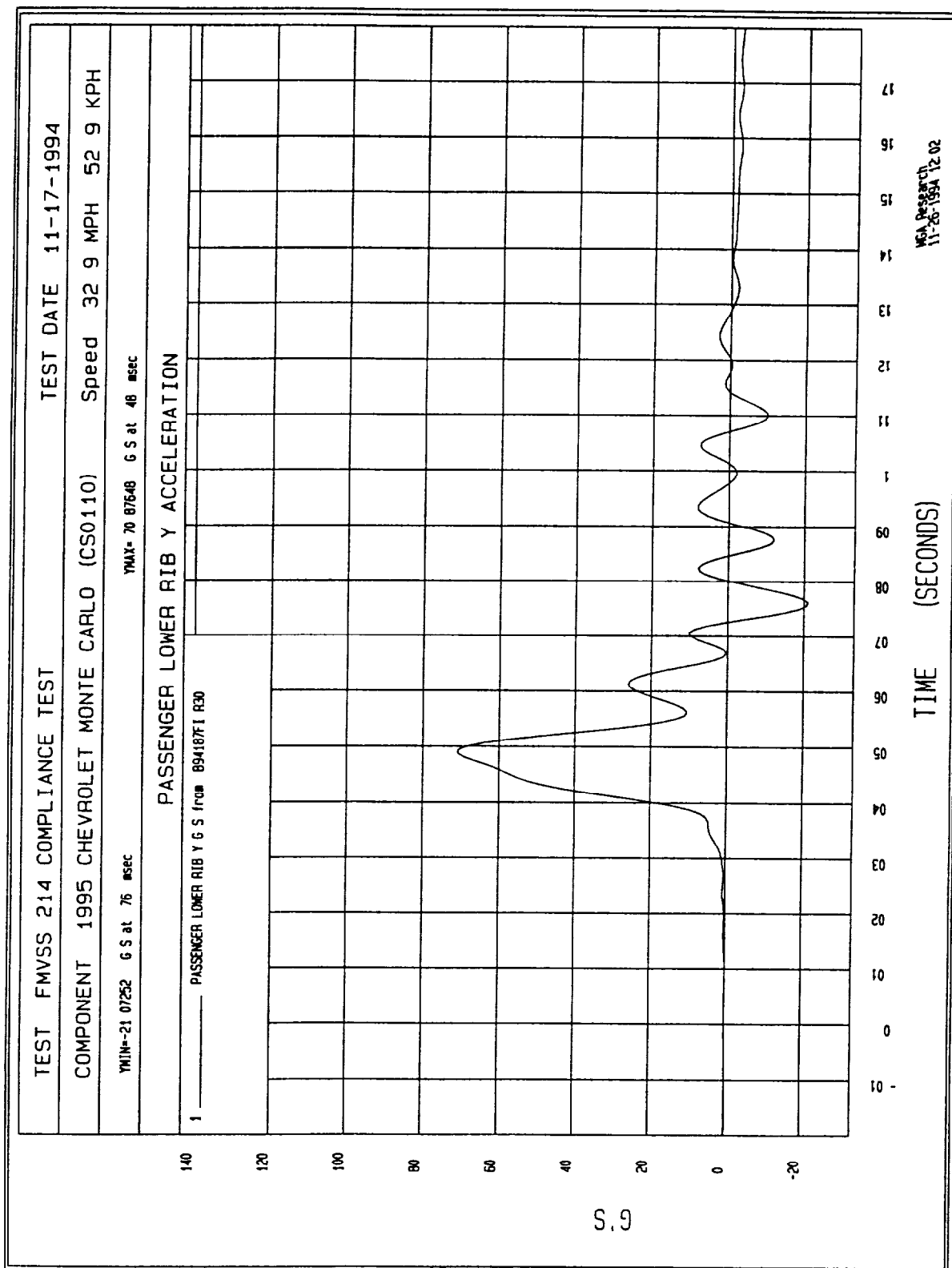


Figure B-93 - Passenger Lower Rib Y Acceleration vs. Time

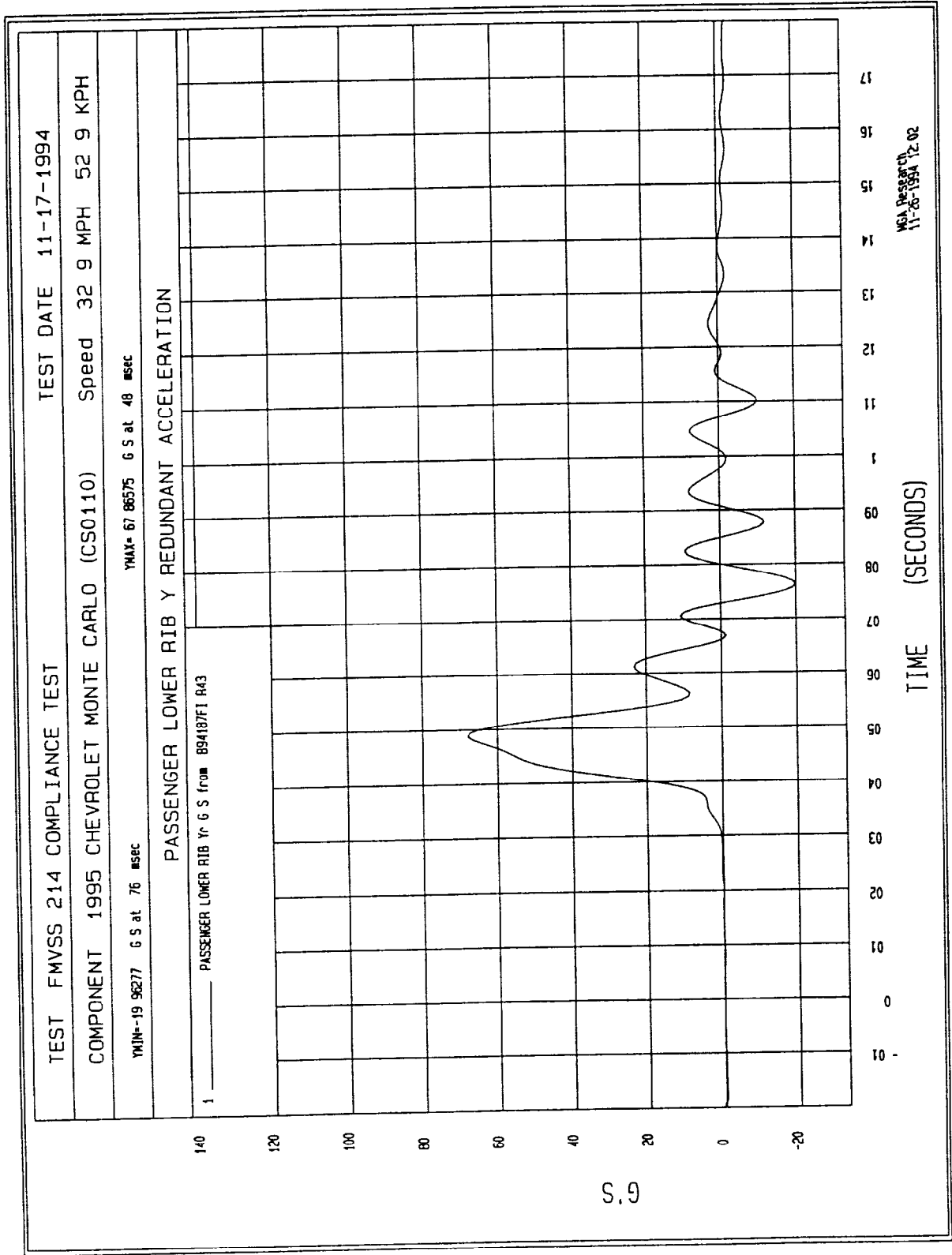


Figure B-94 - Passenger Lower Rib Y Redundant Acceleration vs. Time

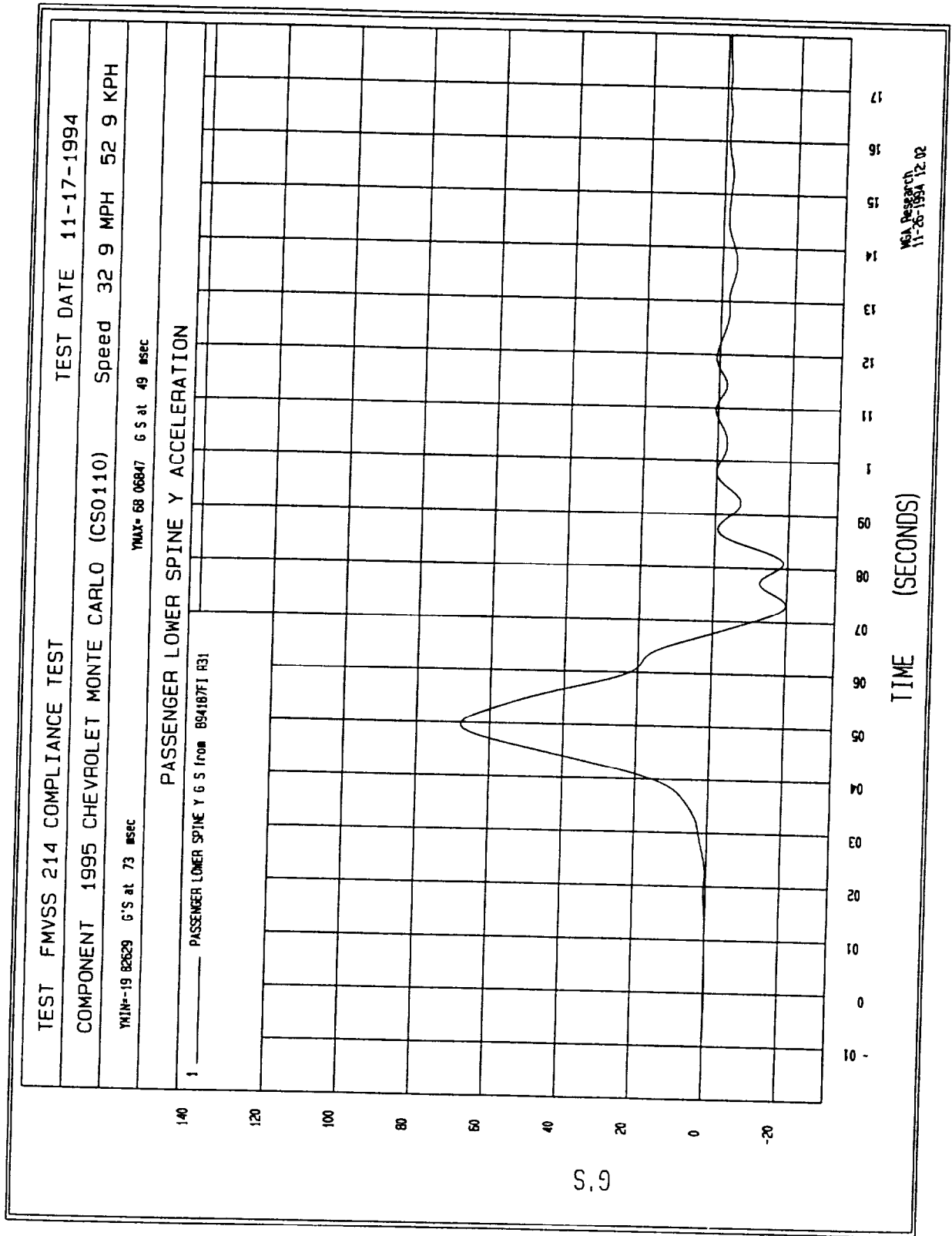


Figure B-95 - Passenger Lower Spine Y Acceleration vs. Time

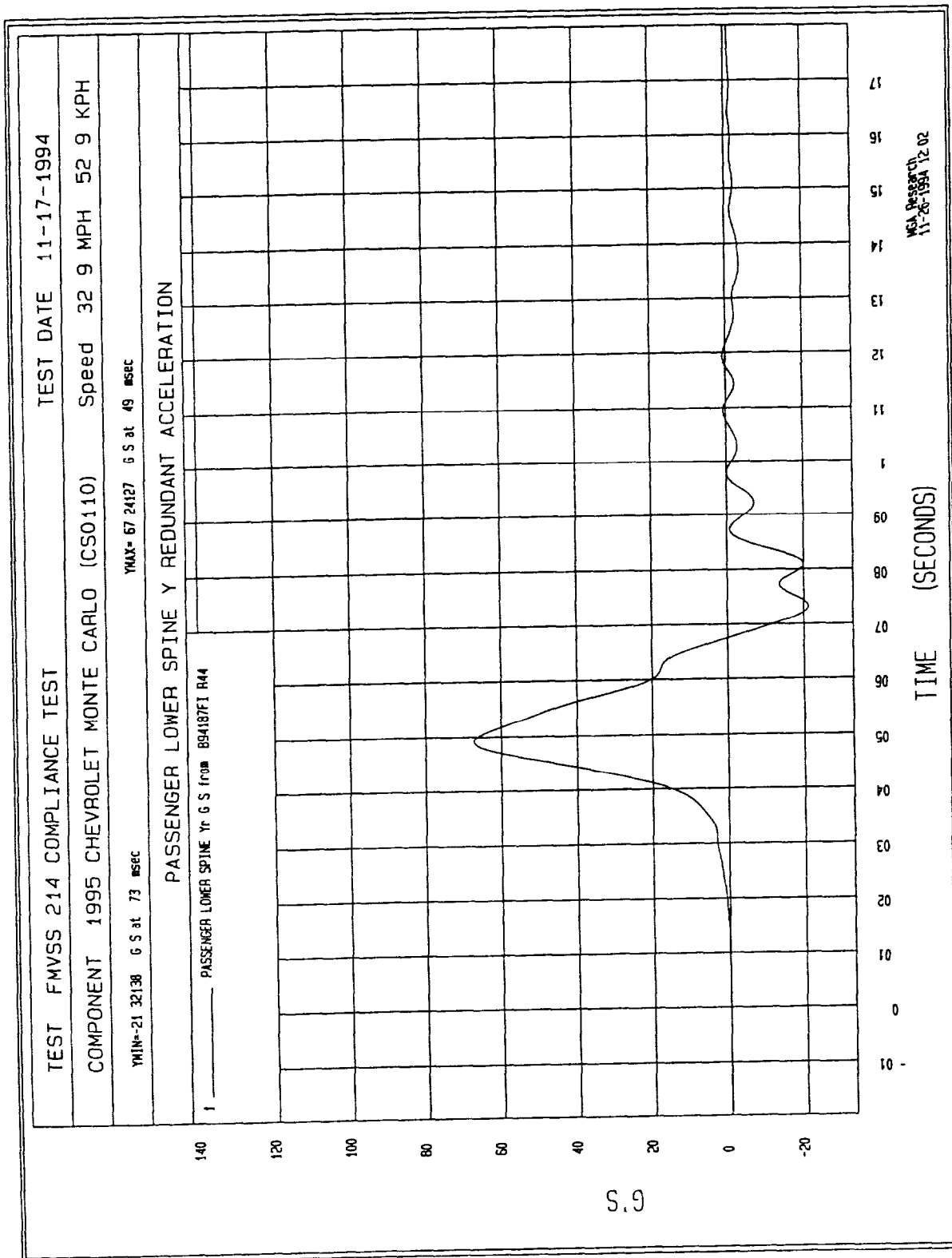


Figure B-96 - Passenger Lower Spine Y Redundant Acceleration vs. Time

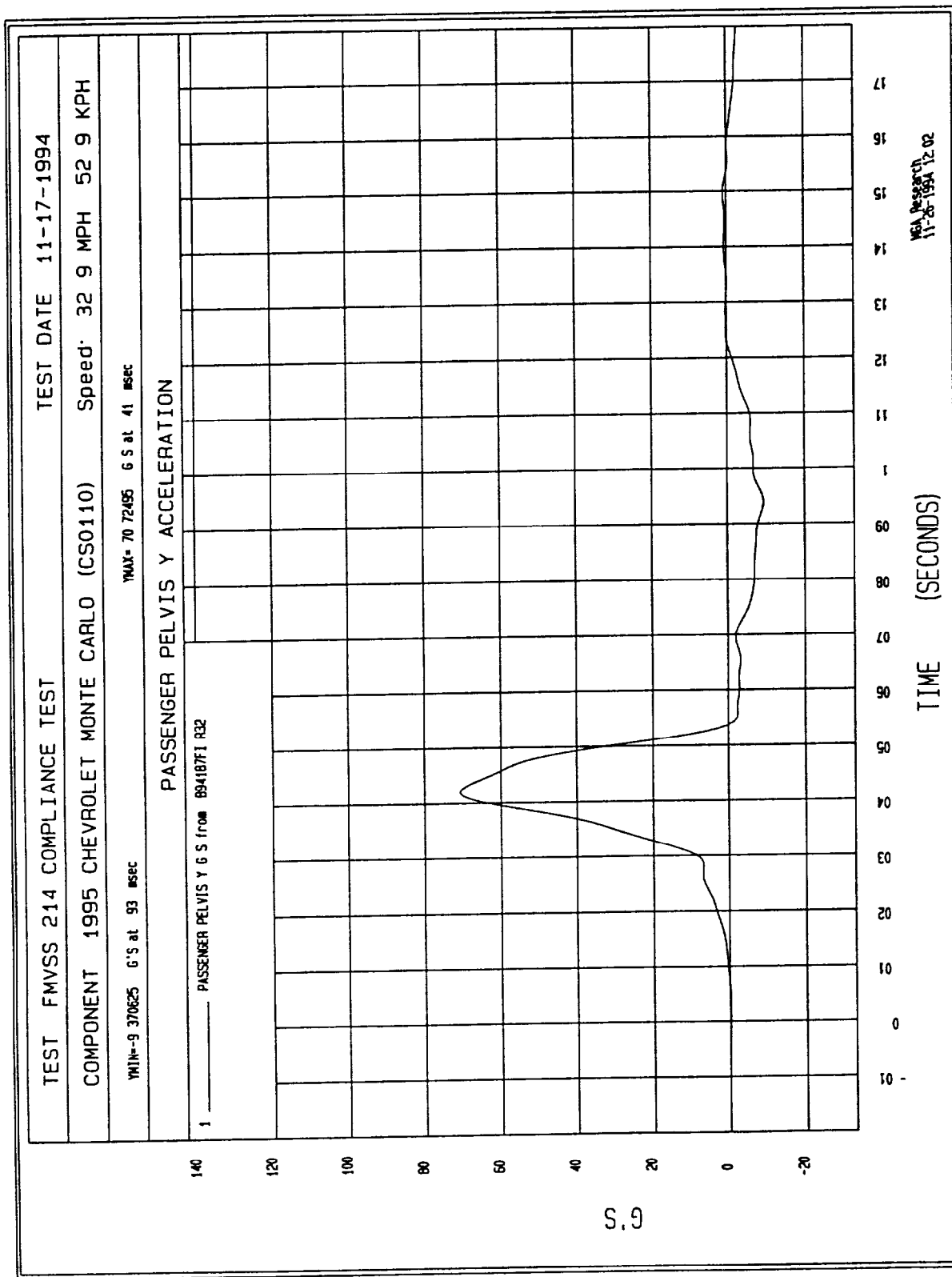


Figure B-97 - Passenger Pelvis Y Acceleration vs. Time

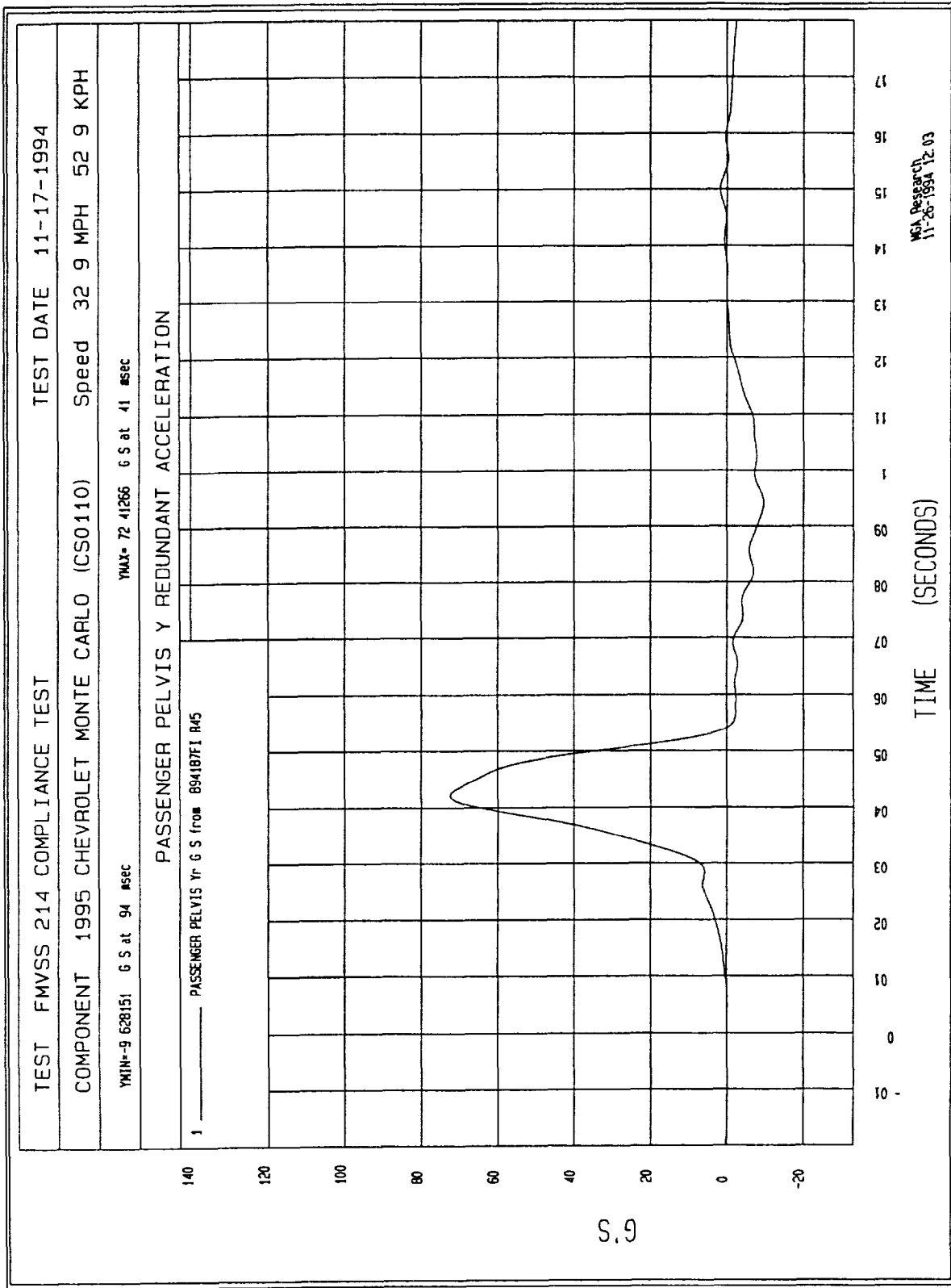


Figure B-98 - Passenger Pelvis Y Redundant Acceleration vs Time

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-95-DC004

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

GENERAL MOTORS CORPORATION
1995 CHEVROLET MONTE CARLO 2 DOOR COUPE
NHTSA NO. CS0110

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: November 17, 1994

Report Date: November 30, 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

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 272

Calibration Test Results Summary

Dummy 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: July 25, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75 - 20.50"	20.30
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"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	14.8

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

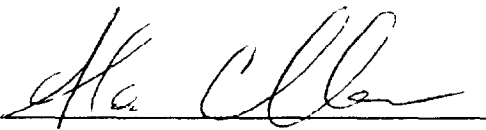
DATE: July 20, 1994

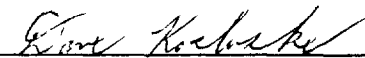
DUMMY NUMBER: 272

TEST NUMBER: D941592

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	19

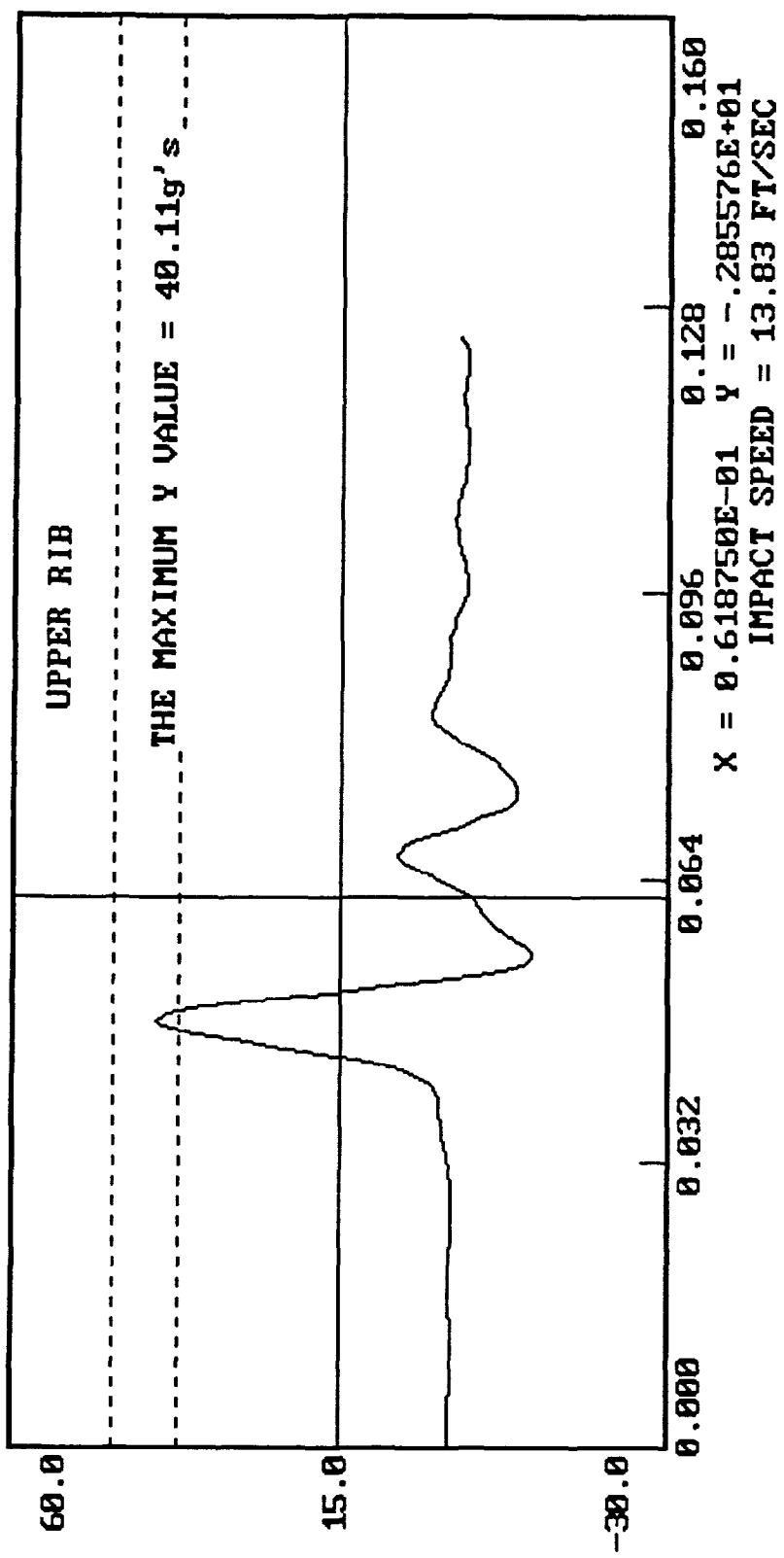
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 272
 07-20-1994 12:59

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

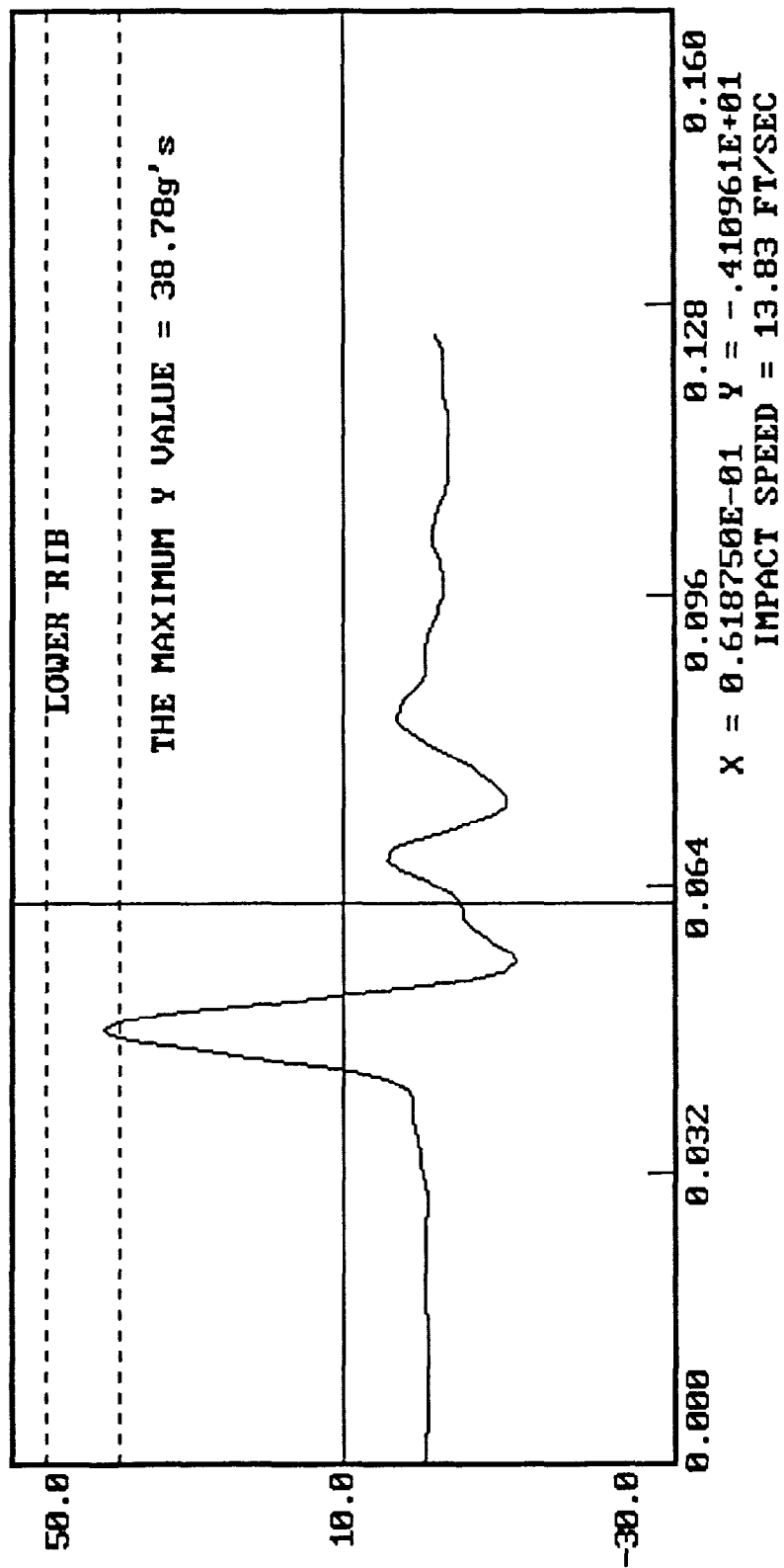


07-20-1994 12:59

DUMMY CALIBRATION - THORAX IMPACT

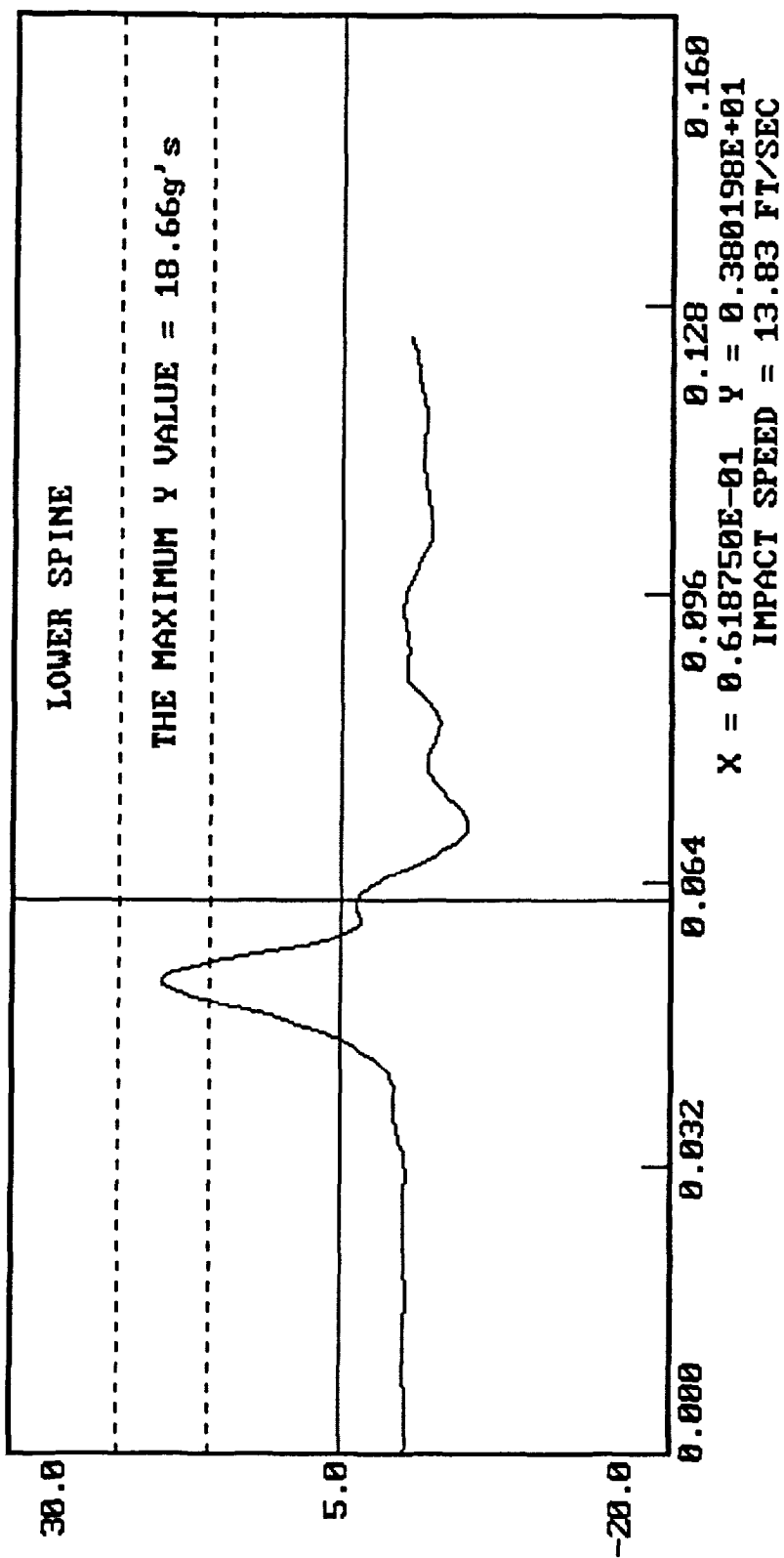
DUMMY # 272

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



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 272
 07-20-1994 12:59

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 20, 1994

DUMMY NUMBER: 272

TEST NUMBER: D941593

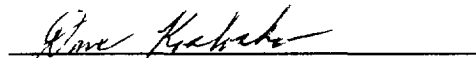
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

TECHNICIAN



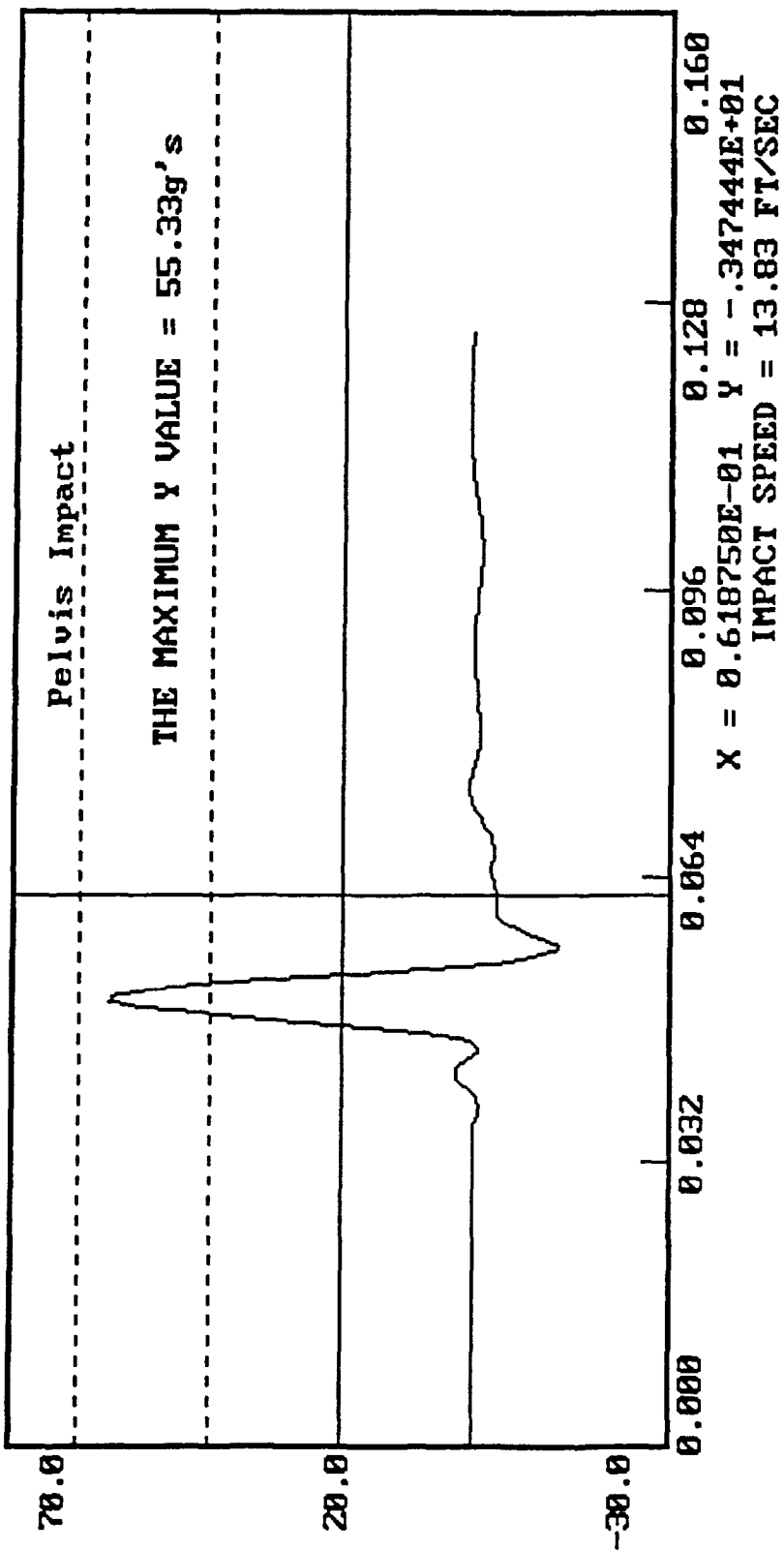
APPROVED BY



DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 272

07-20-1994 11:36

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1994

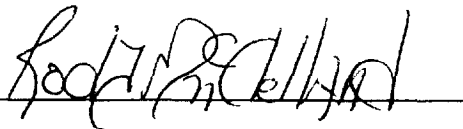
DUMMY NUMBER: 272

TEST NUMBER D941594

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	68%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.2
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.6
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

TECHNICIAN

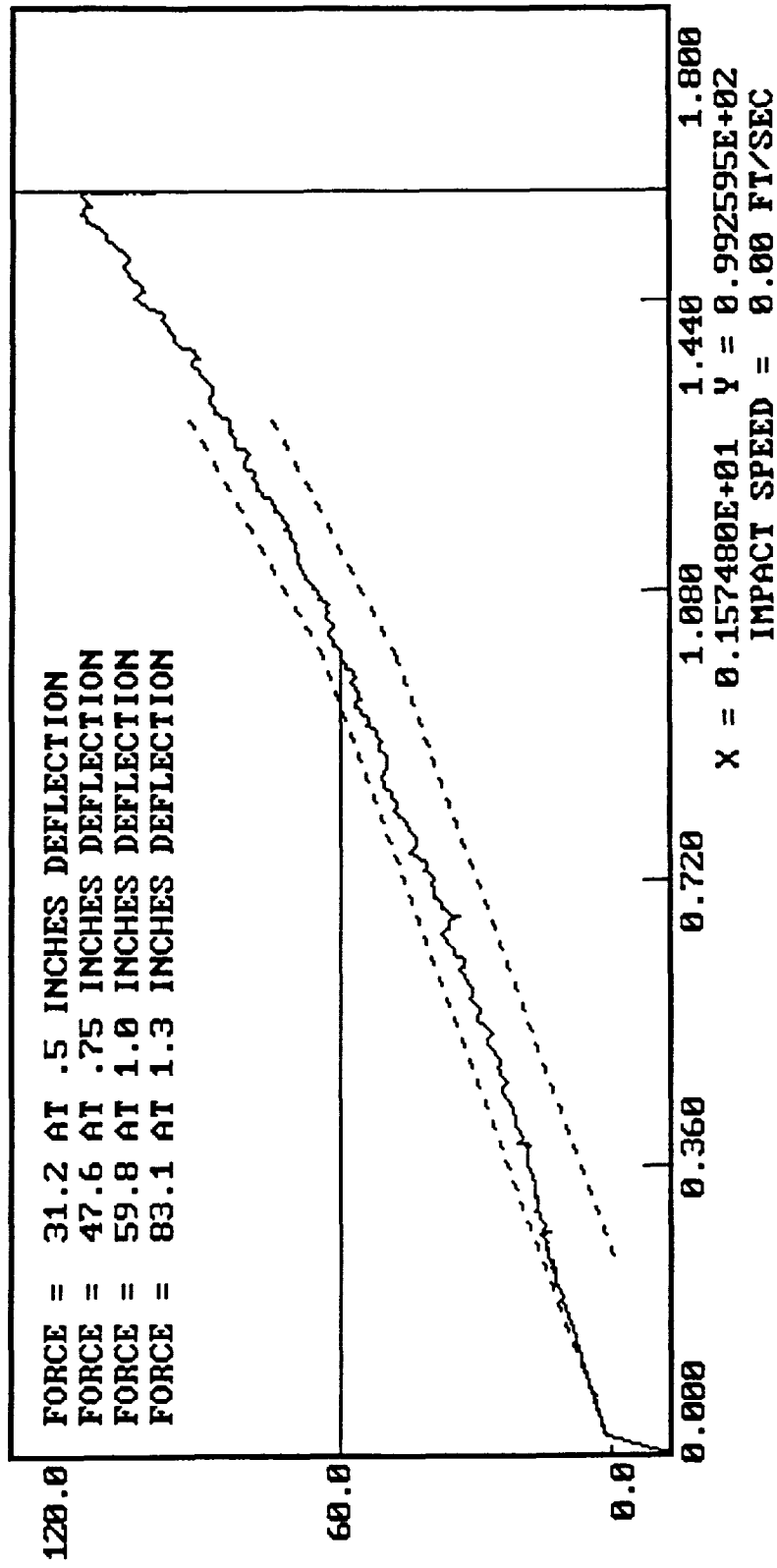


APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 272
 07-22-1994 11:07

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE July 20, 1994

DUMMY NUMBER: 272

TEST NUMBER: D941595

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	30
FORCE @ 30°	34 - 46 lbs	46
FORCE @ 40°	46 - 58 lbs	54
RETURN ANGLE	12° maximum	6°

TEST MEETS SPECIFICATIONS

TECHNICIAN Rod J. DeWitt

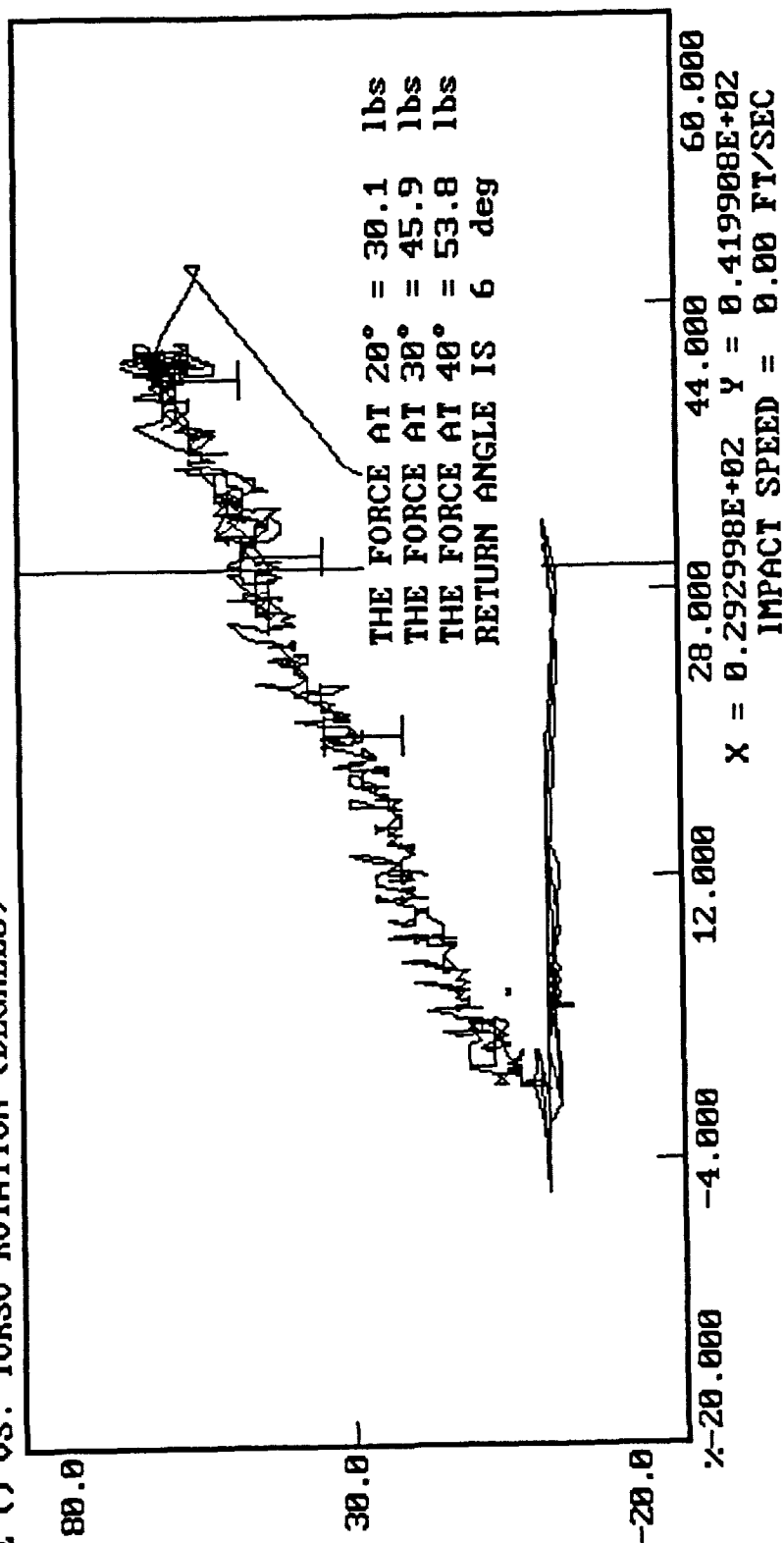
APPROVED BY Steve Katschke

07-20-1994 17:02

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 272

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: July 26, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.1
RH - Rib Height	19.75 - 20.50"	20.30
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"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	14.8

MEASUREMENTS BY: _____

Redmond

APPROVED BY _____

Wm. Kibake

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 21, 1994

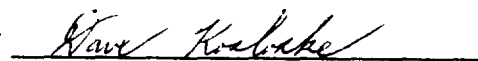
DUMMY NUMBER. 270

TEST NUMBER: D941632

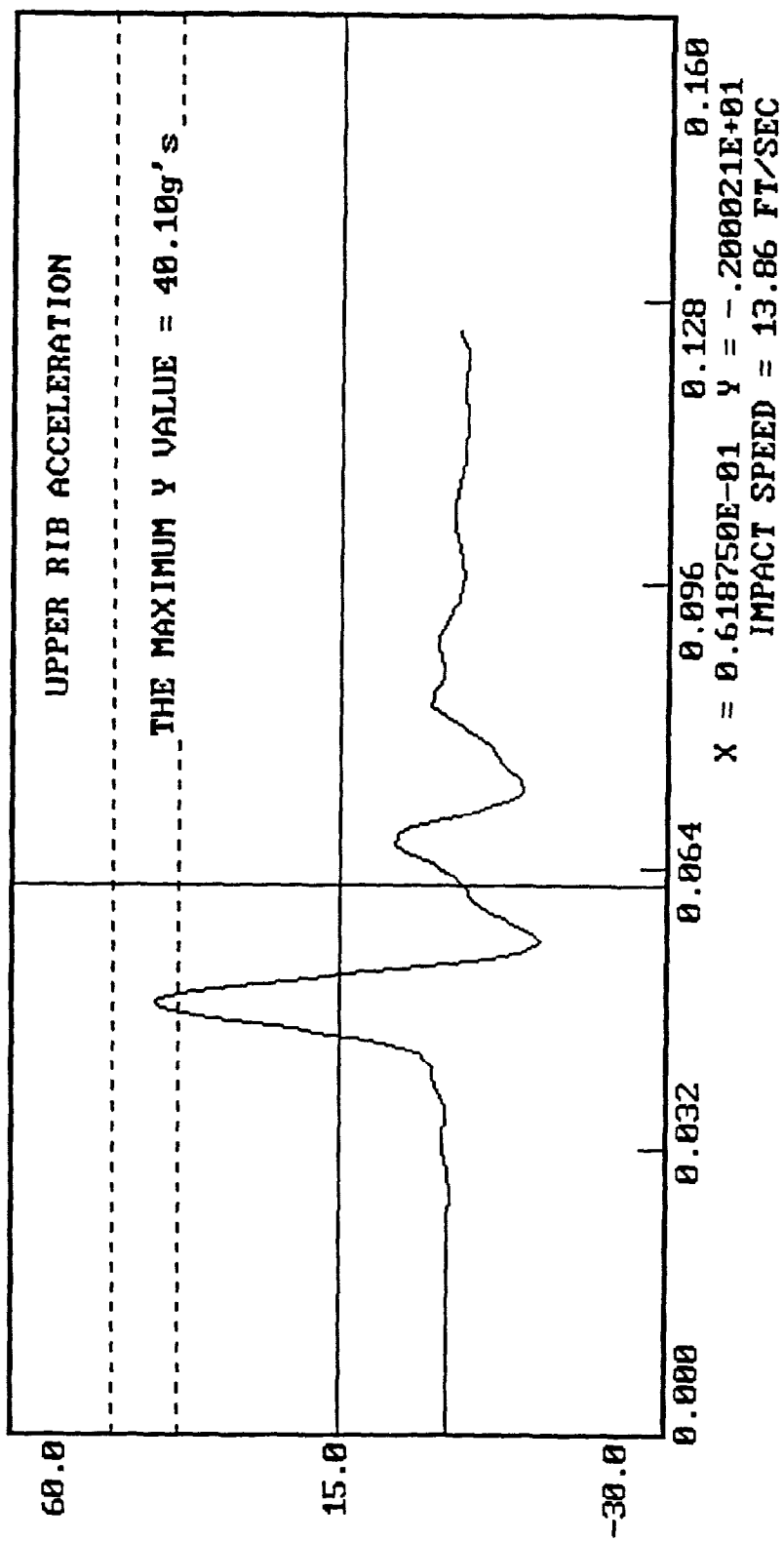
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

TECHNICIAN 

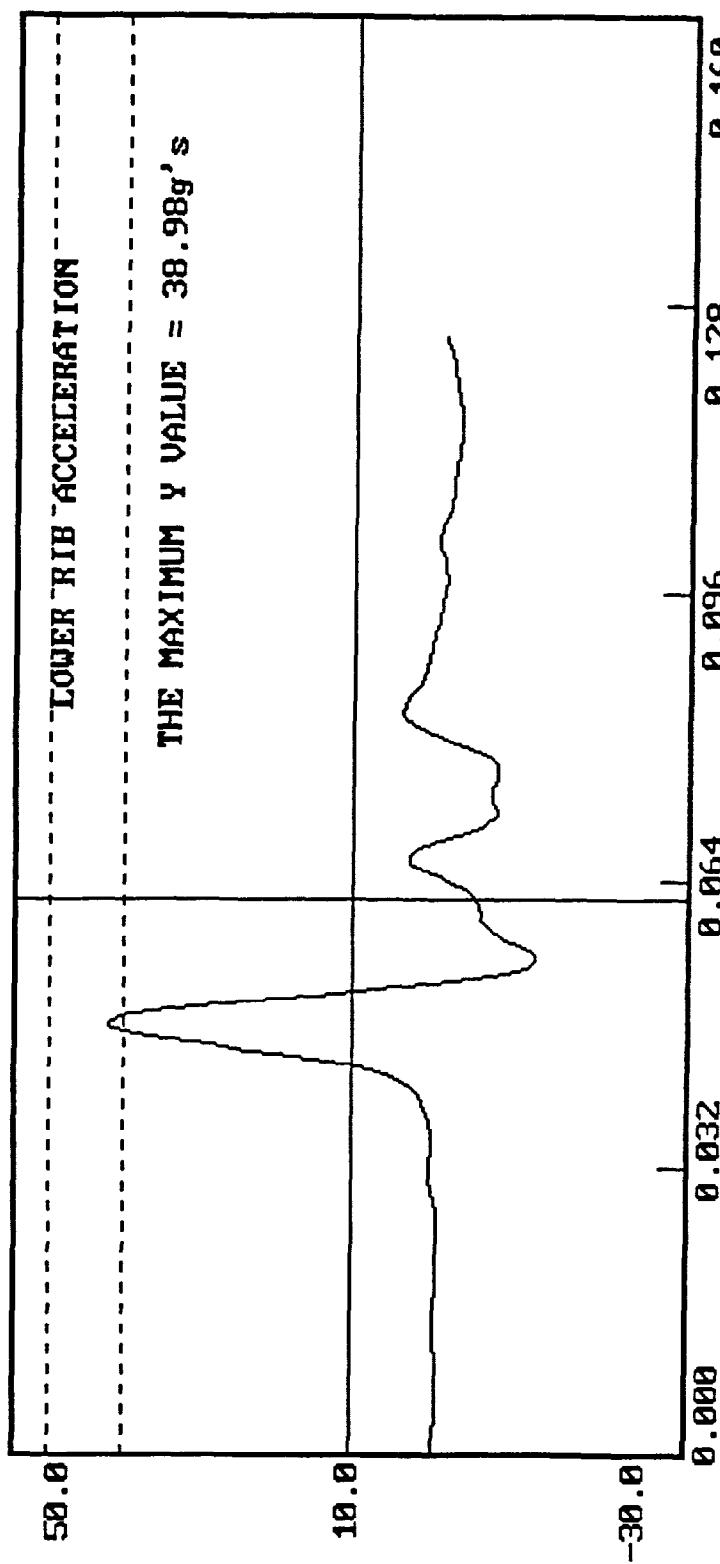
APPROVED BY 

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 07-21-1994 09:07
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 07-21-1994 09:07

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

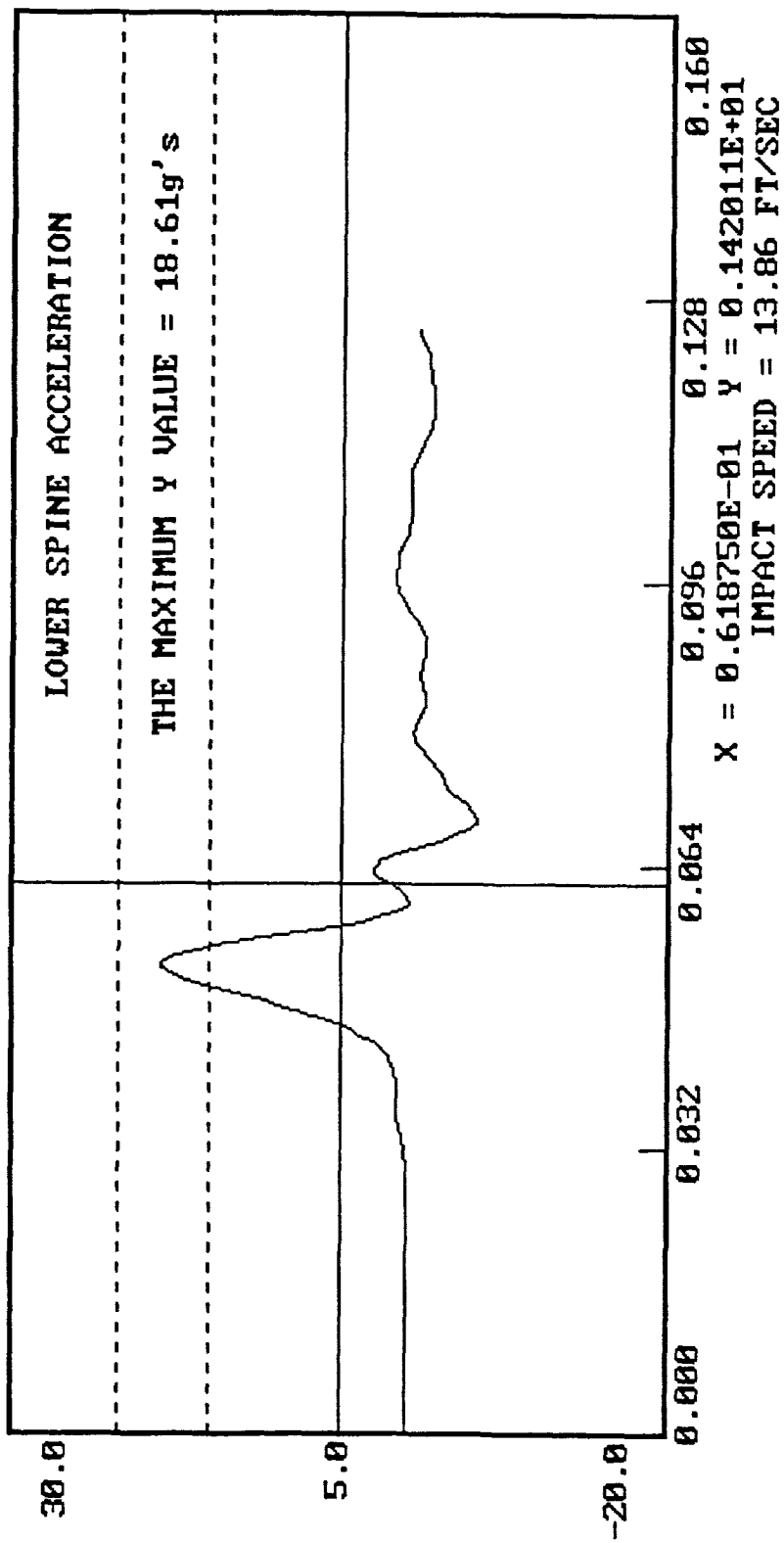


X = 0.618750E-01 Y = -.489325E+01
 IMPACT SPEED = 13.86 FT/SEC

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270

07-21-1994 09:07

() US. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 21, 1994

DUMMY NUMBER: 270

TEST NUMBER: D941633

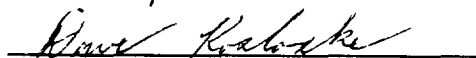
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	50%
PROBE SPEED	13.8 - 14.2 f/s	13.8
PELVIS ACCELERATION	40 - 60 g's	59

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

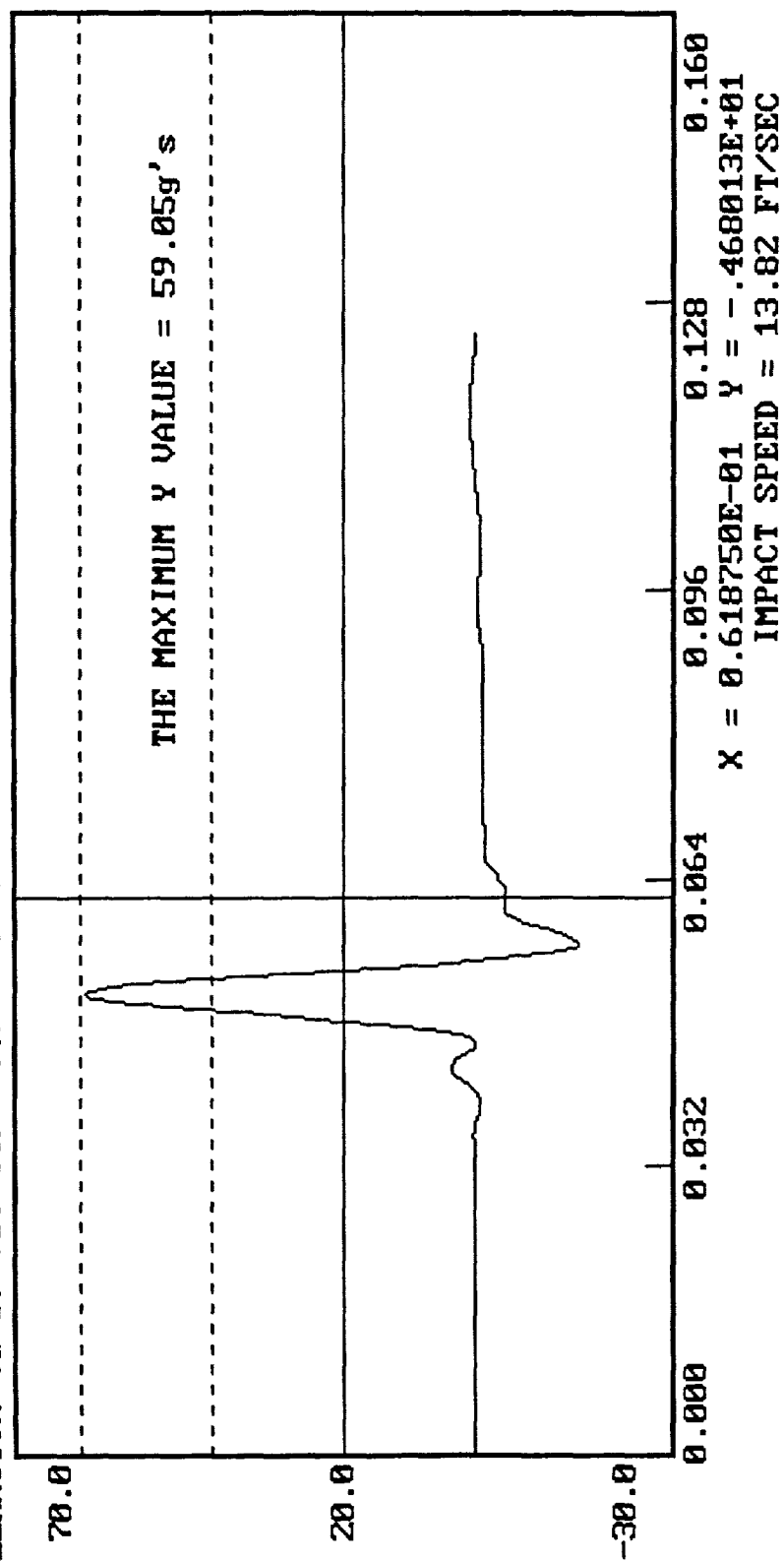


07-21-1994 09:49

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: July 22, 1994

DUMMY NUMBER: 270

TEST NUMBER: D941634

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.9
FORCE @ 1.0 in	50 - 63 lbs	63
FORCE @ 1.3 in	73 - 88 lbs	87

TEST MEETS SPECIFICATIONS

TECHNICIAN *Al. Chen*

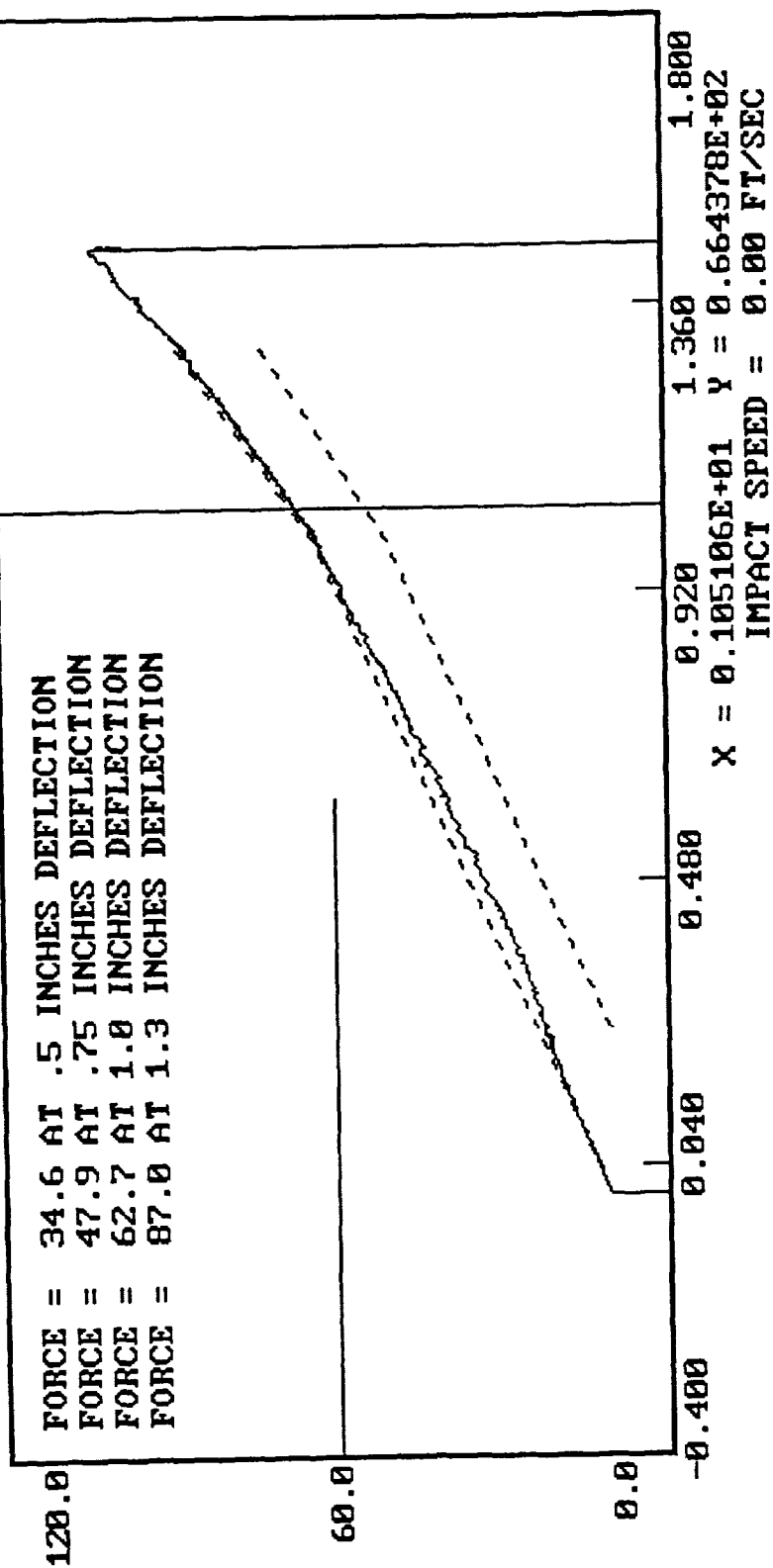
APPROVED BY *Dave Krolske*

07-22-1994 10:54

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 270

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: July 21, 1994

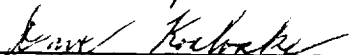
DUMMY NUMBER: 270

TEST NUMBER: D941635

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	48%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	28
FORCE @ 30°	34 - 46 lbs	40
FORCE @ 40°	46 - 58 lbs	54
RETURN ANGLE	12° maximum	7°

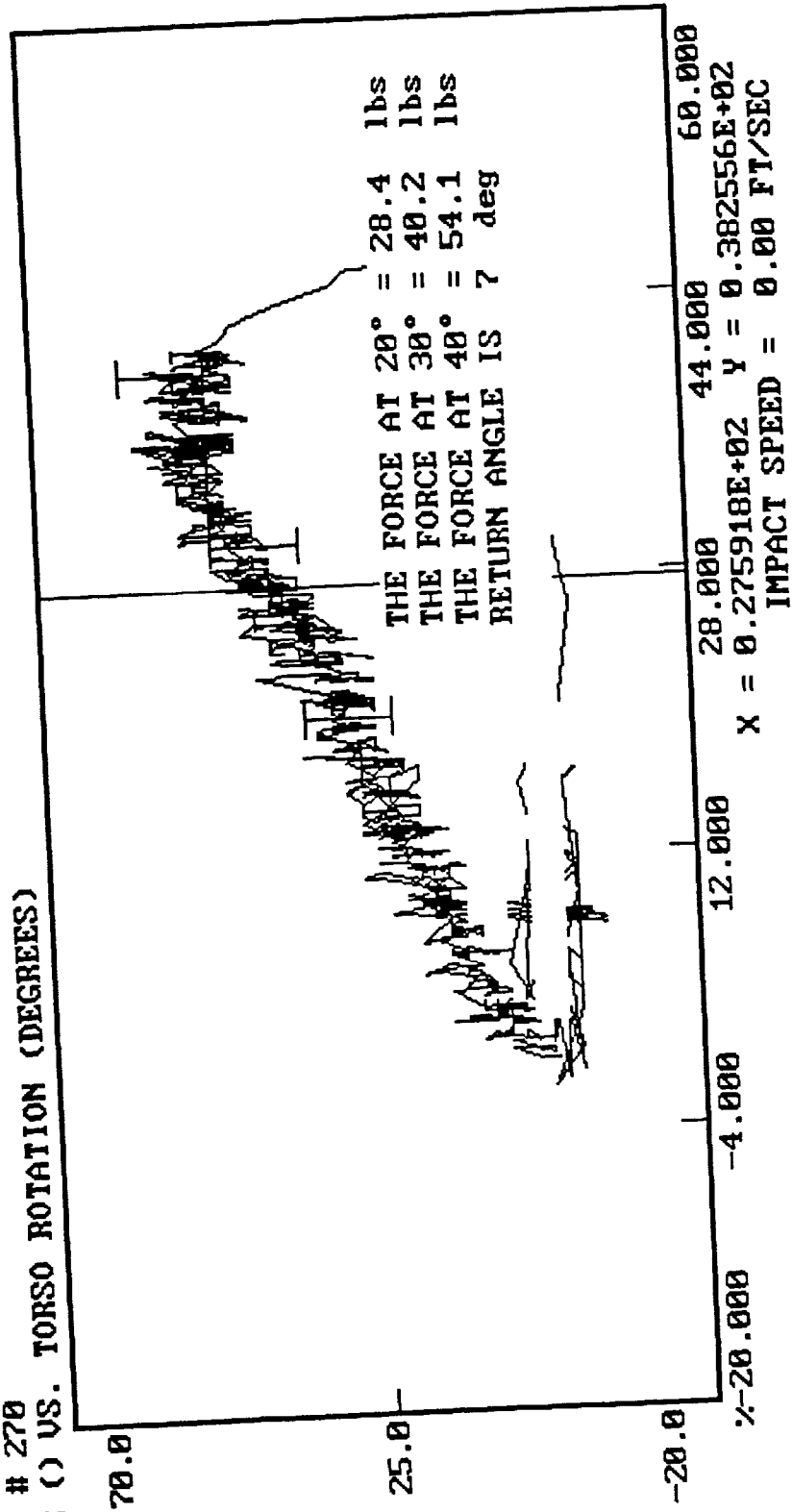
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

07-21-1994 14:18

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



POST-TEST CERTIFICATION DATA

Driver 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

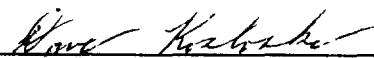
DATE OF VERIFICATION: November 21, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.3
RH - Rib Height	19.75 - 20.50"	20.25
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 18, 1994

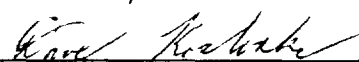
DUMMY NUMBER: 272

TEST NUMBER: D942162

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	46
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	21

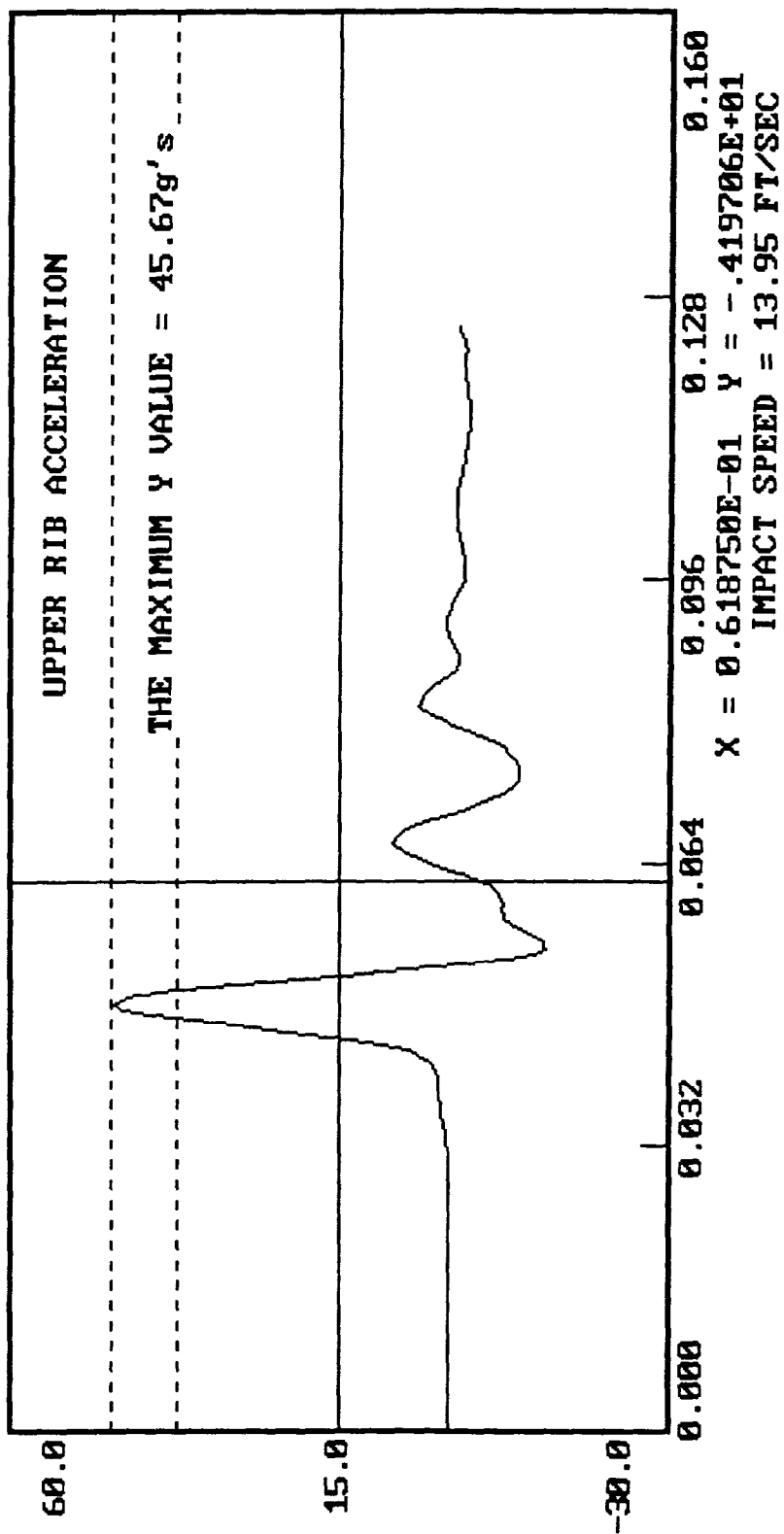
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

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

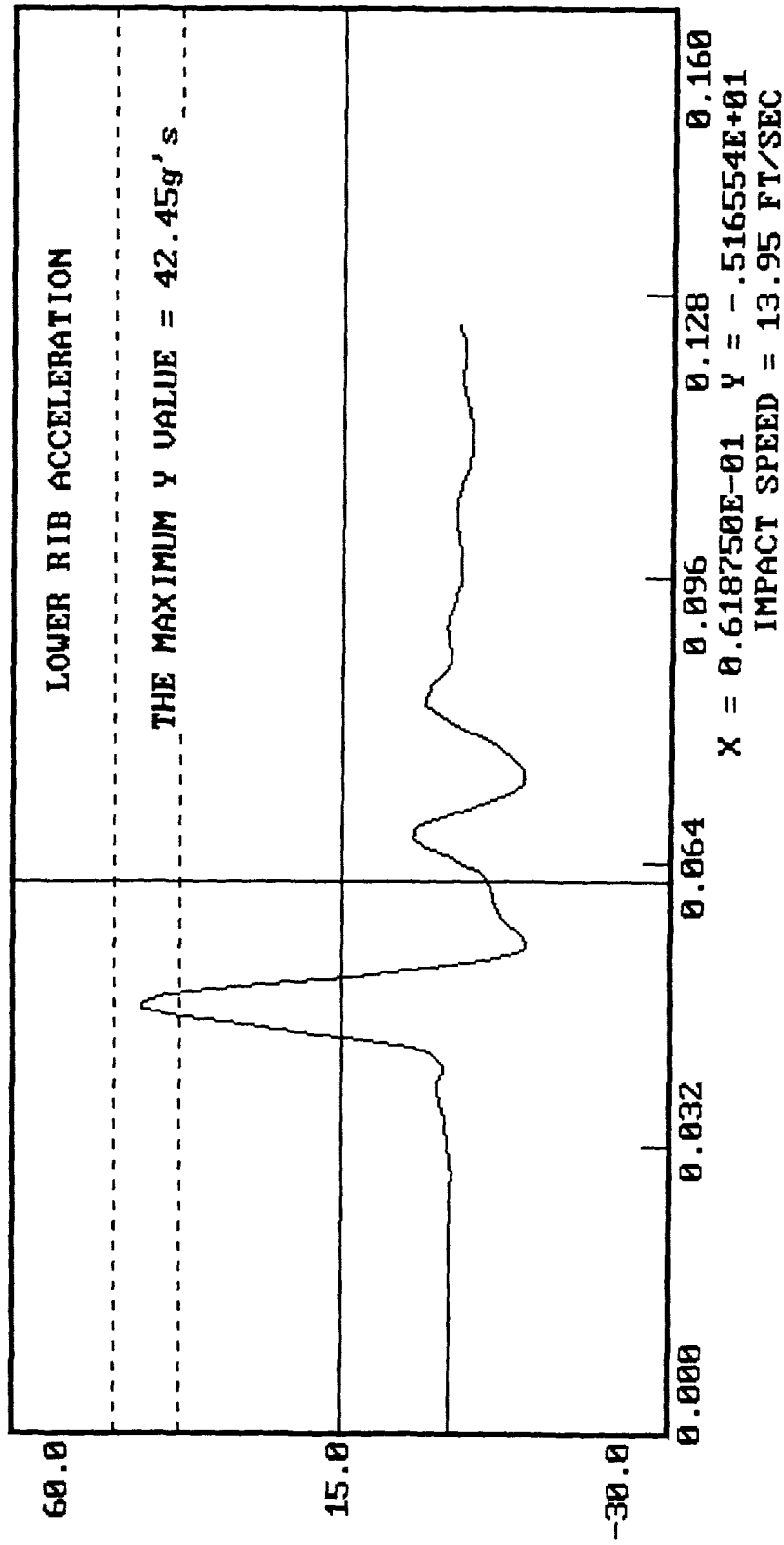
11-18-1994 10:35



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 272

11-18-1994 10:35

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

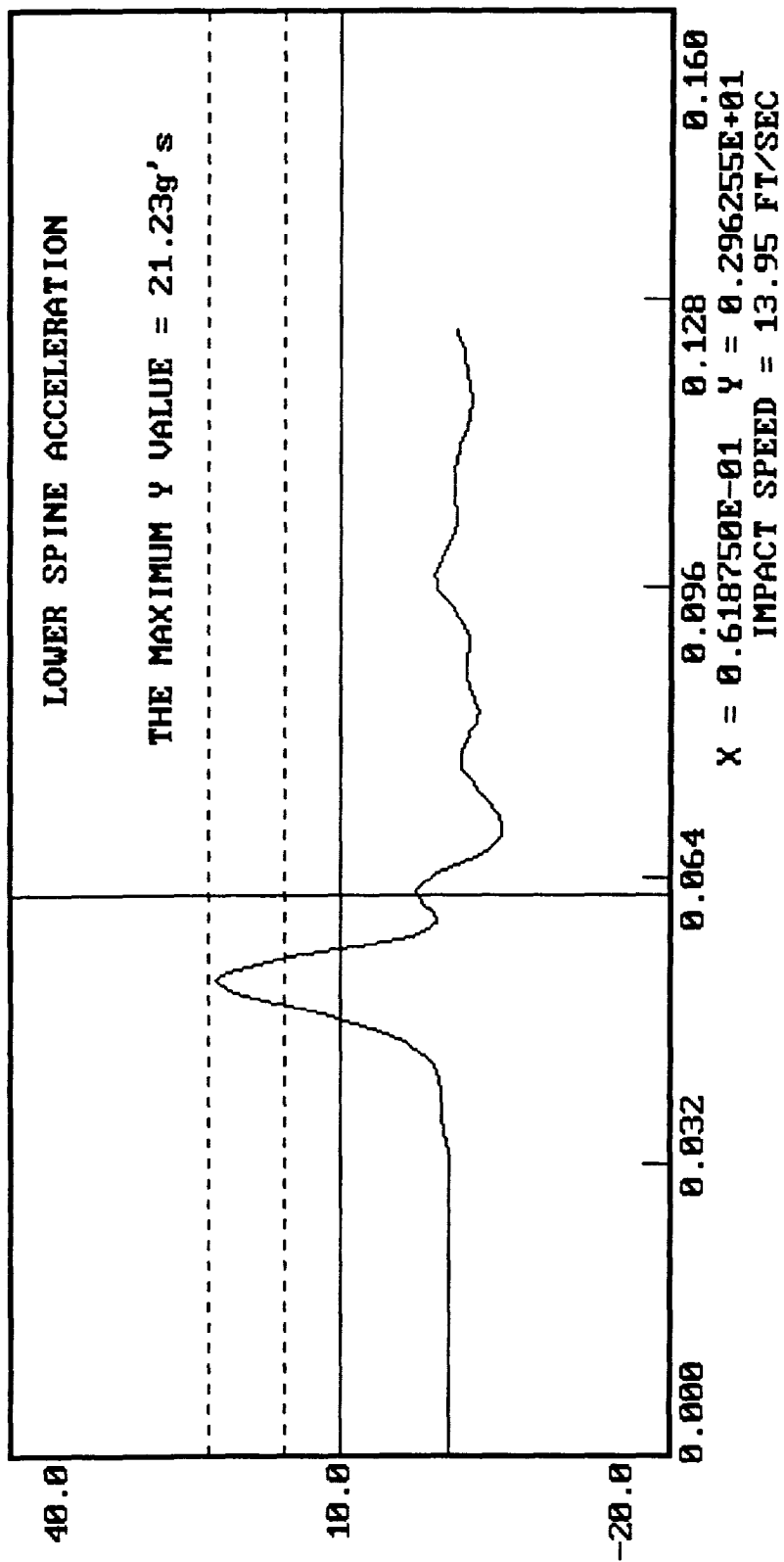


DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 272

11-18-1994 10:35

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 18, 1994

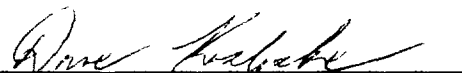
DUMMY NUMBER: 272

TEST NUMBER D942163

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
PROBE SPEED	13.8 - 14.2 f/s	14 0
PELVIS ACCELERATION	40 - 60 g's	52

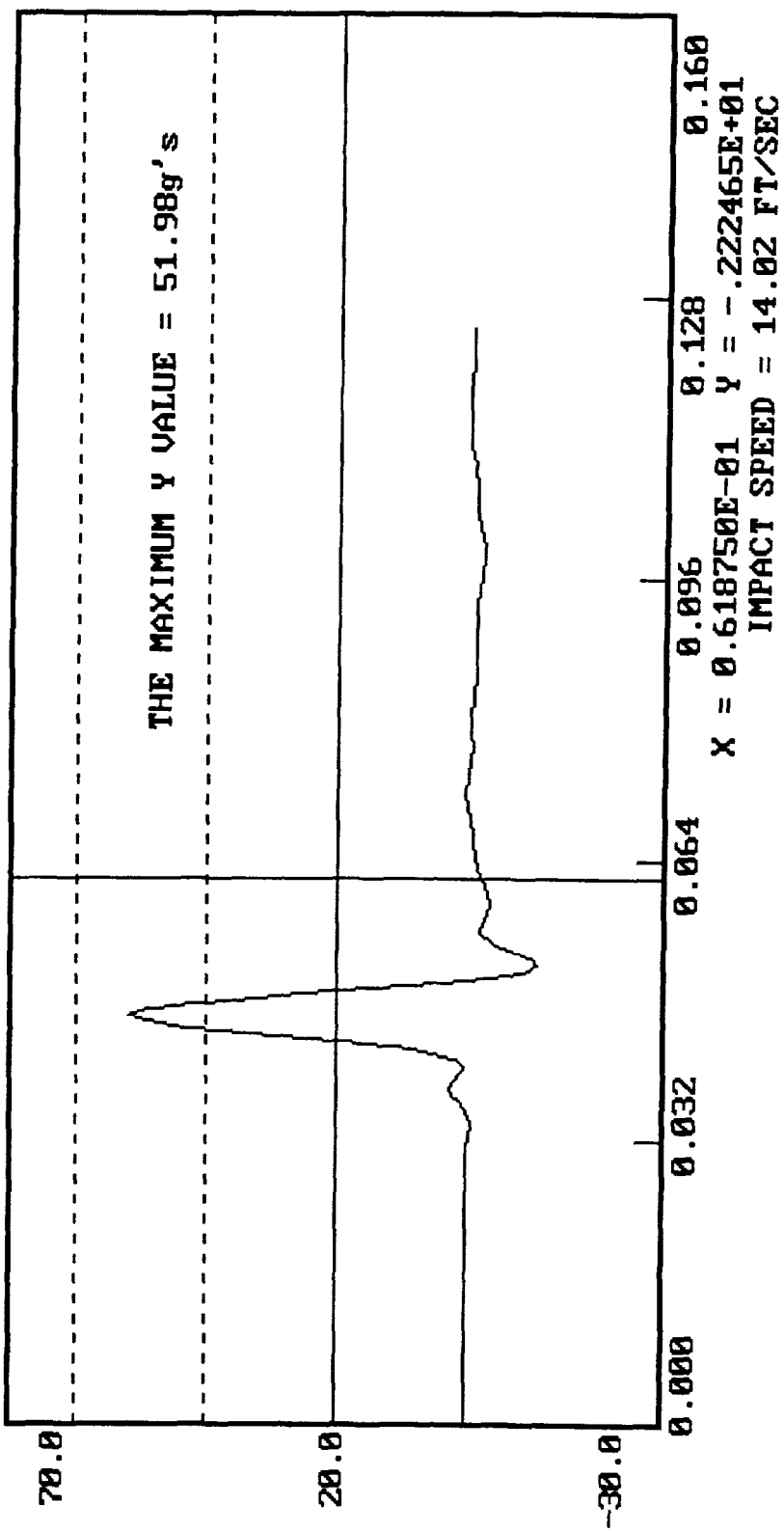
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 272
11-18-1994 14:52

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: November 21, 1994

DUMMY NUMBER: 272

TEST NUMBER: D942164

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.0
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.6
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	78

TEST MEETS SPECIFICATIONS

TECHNICIAN

Rodney R. (C) / AD

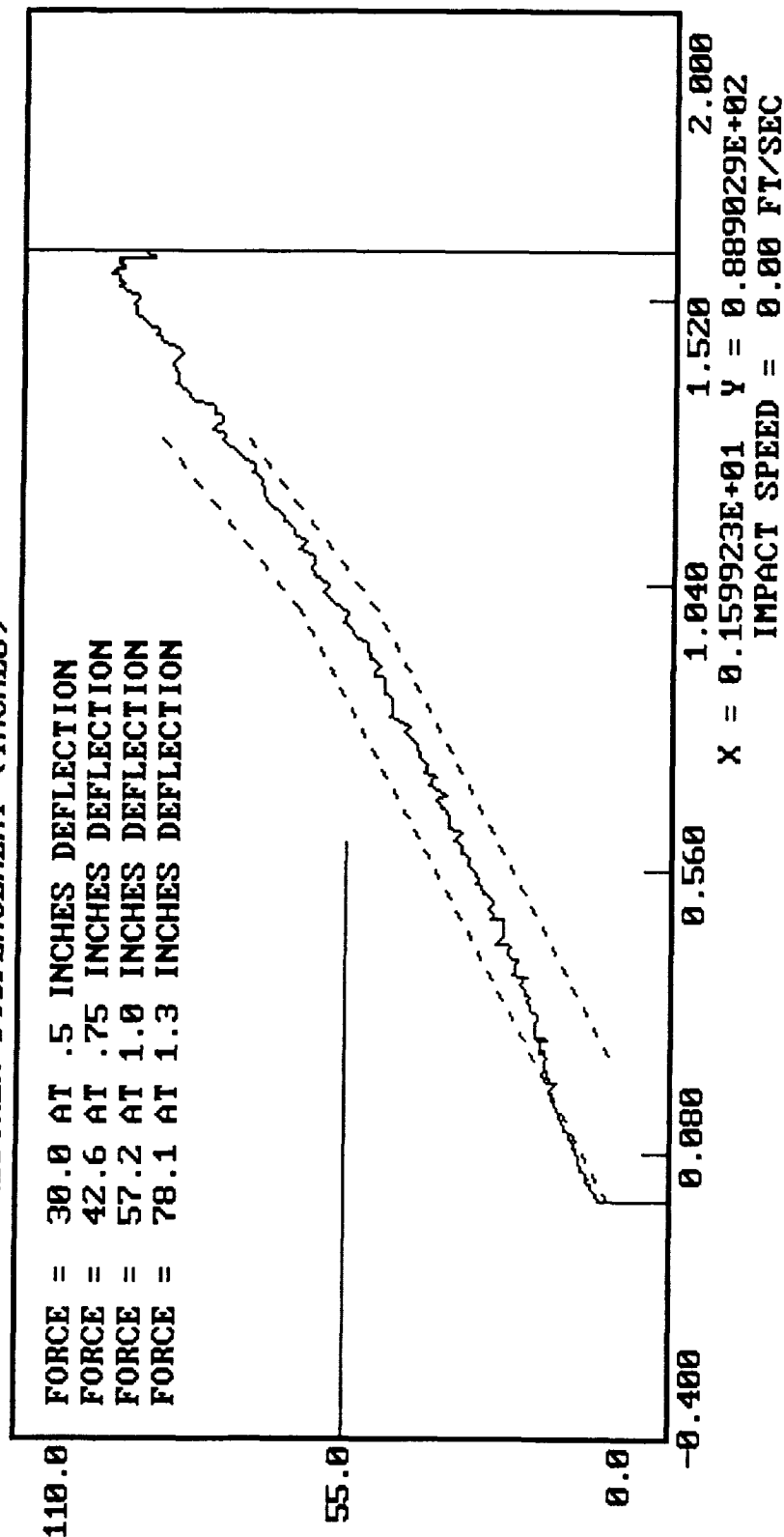
APPROVED BY

Steve K. K. K.

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 272

11-21-1994 10:20

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: November 21, 1994

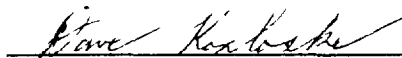
DUMMY NUMBER: 272

TEST NUMBER: D942165

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	45
FORCE @ 40°	46 - 58 lbs	57
RETURN ANGLE	12° maximum	4°

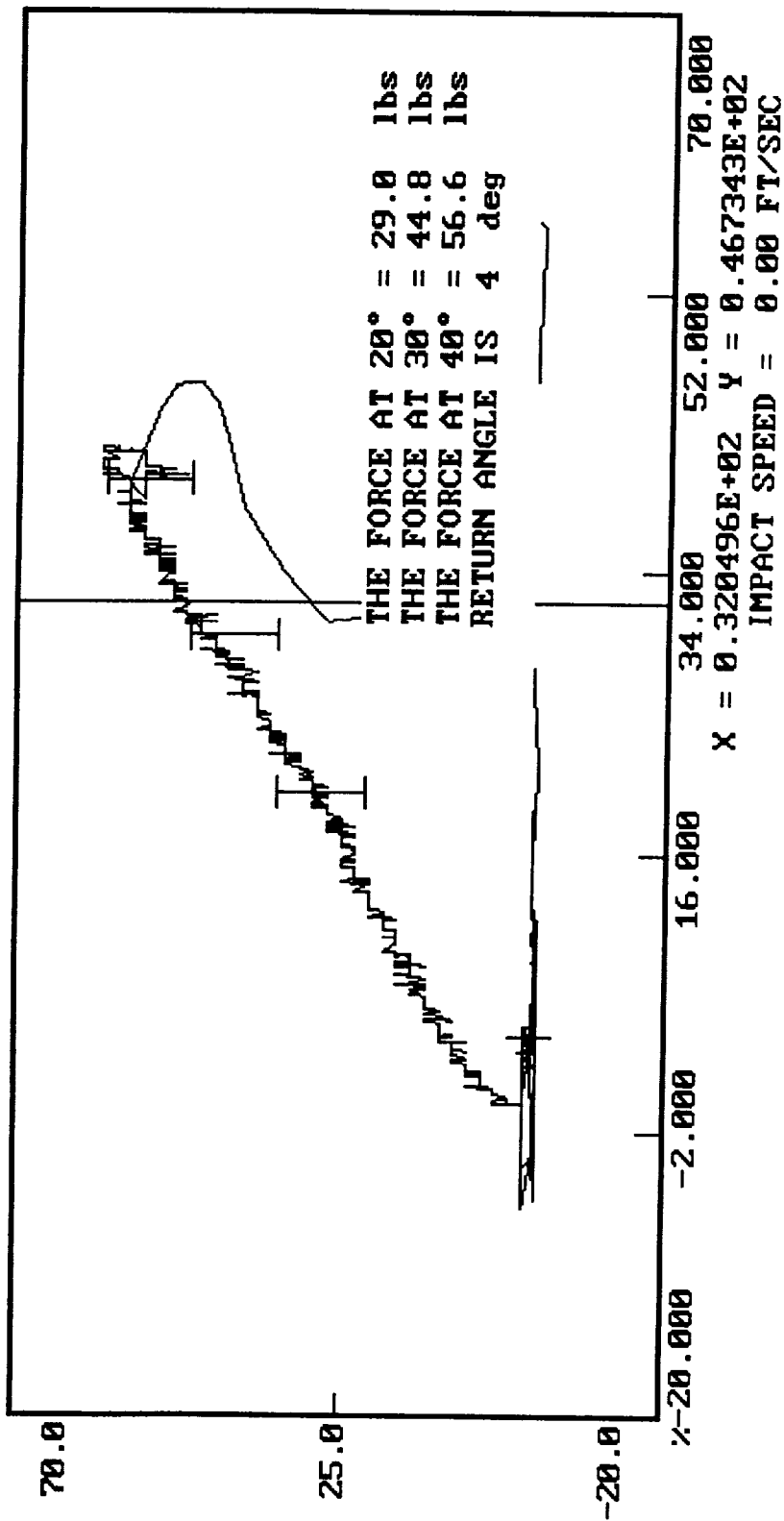
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

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

11-21-1994 11:04



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 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.

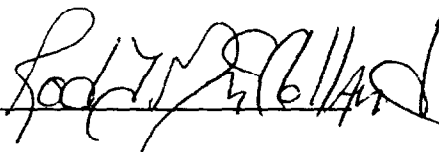
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

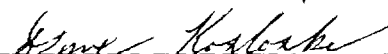
DATE OF VERIFICATION: November 21, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.0
RH - Rib Height	19.75 - 20.50"	20.25
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.5
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: _____



APPROVED BY: _____



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 18, 1994

DUMMY NUMBER: 270

TEST NUMBER: D942152

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	40
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN

Alan C. Allen

APPROVED BY

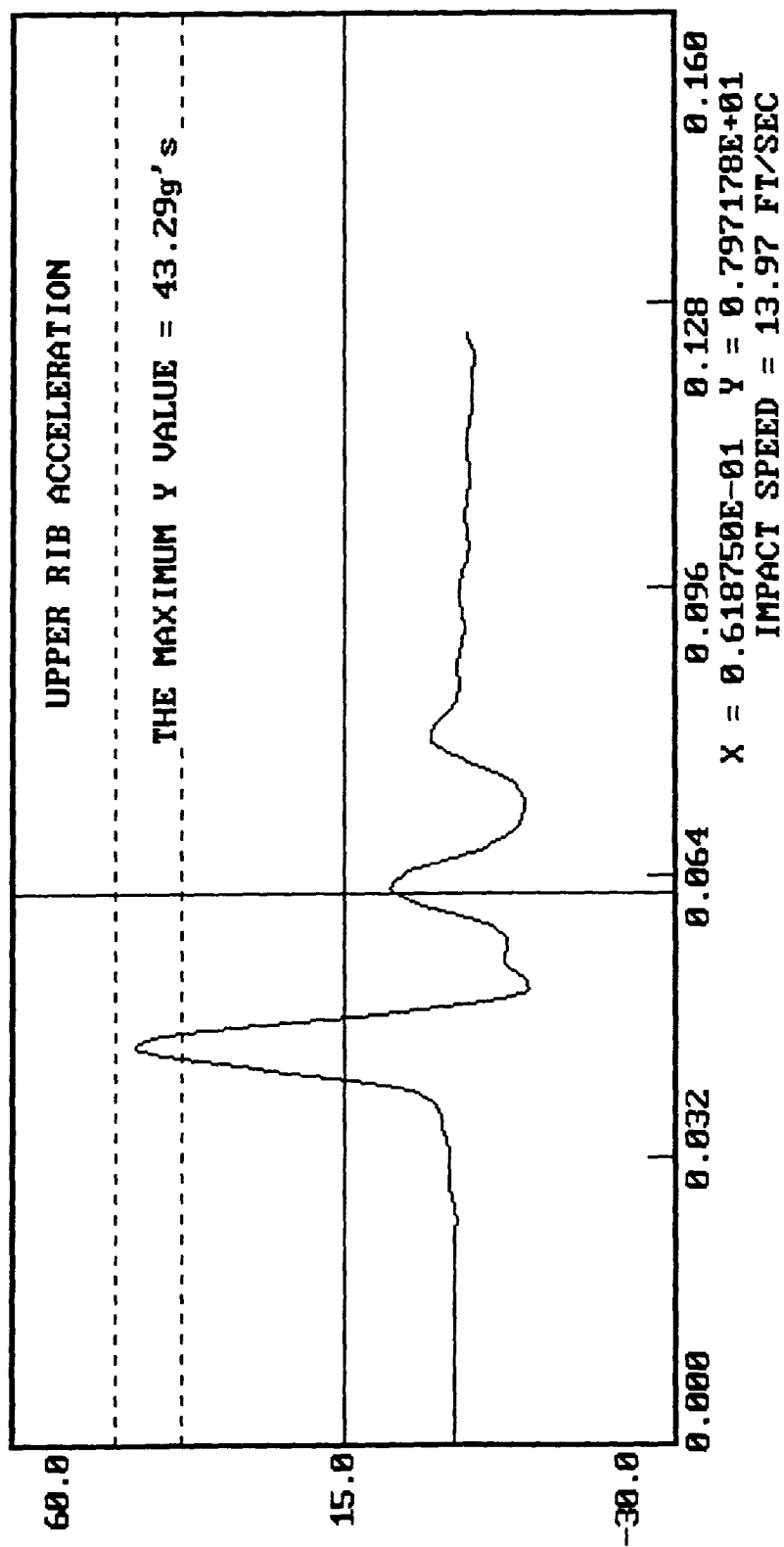
Gene Katoski

11-18-1994 10:03

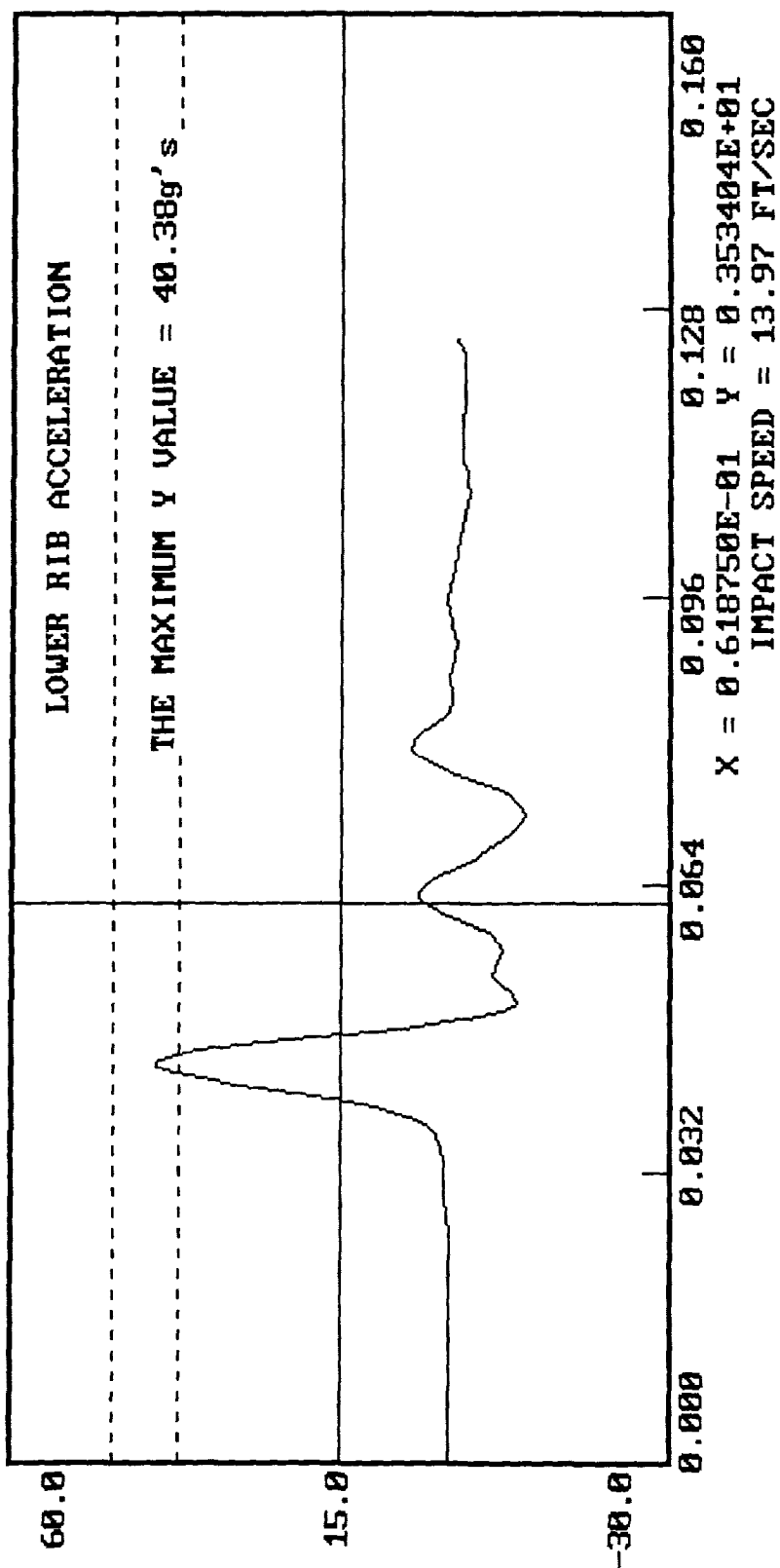
DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 270

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



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 11-18-1994 10:03
 ACCELERATION (G'S) VS. TIME ((SECONDS))

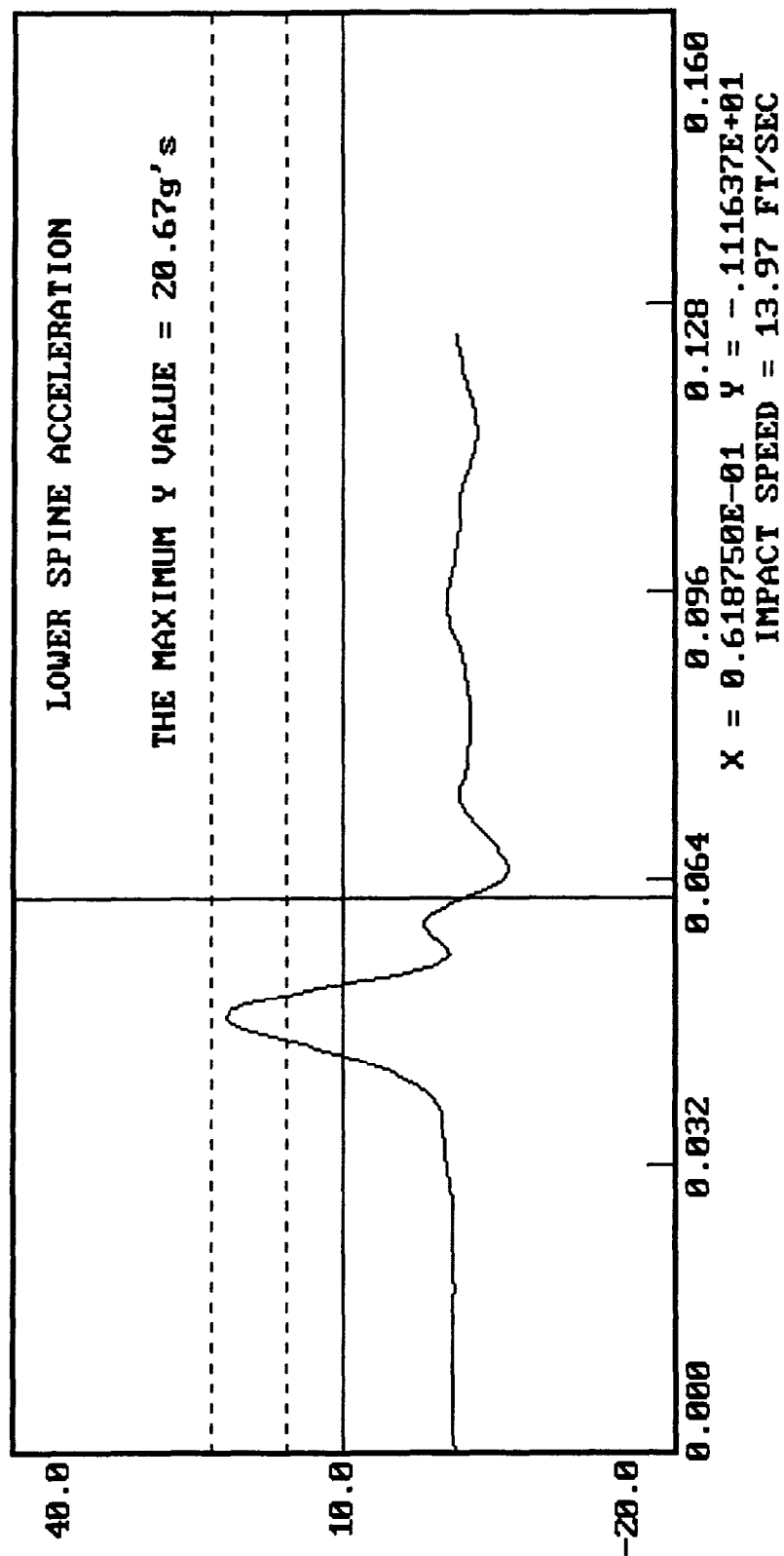


DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 270

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

11-18-1994 10:03



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

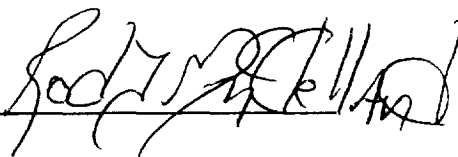
DATE: November 18, 1994

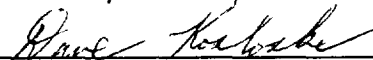
DUMMY NUMBER. 270

TEST NUMBER D942153

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
PROBE SPEED	13.8 - 14.2 f/s	14
PELVIS ACCELERATION	40 - 60 g's	47

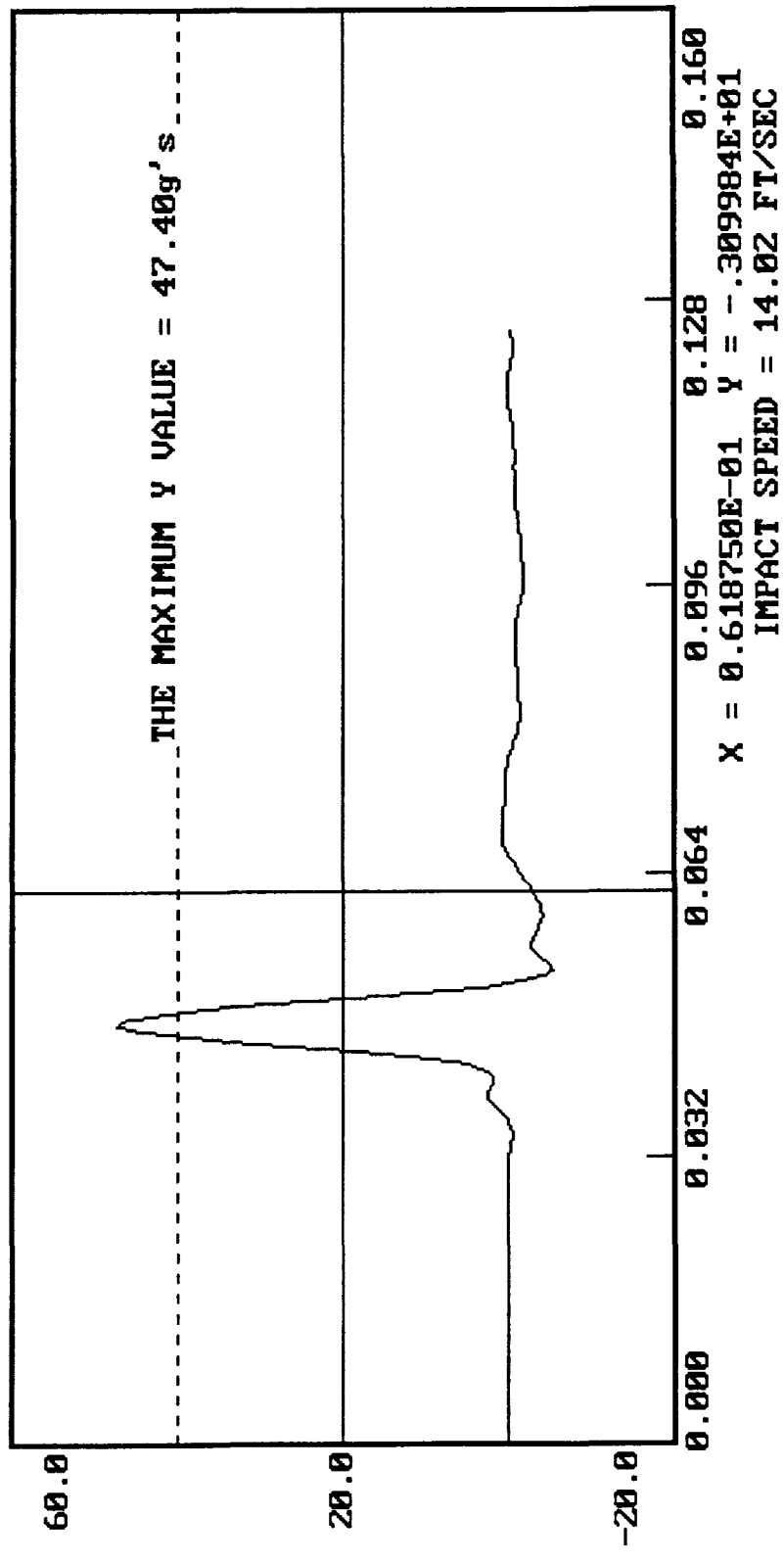
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 270
 11-18-1994 15:50

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

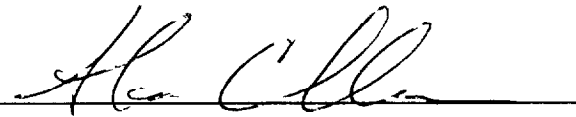
DATE: November 21, 1994

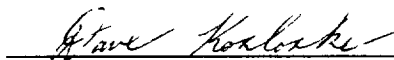
DUMMY NUMBER: 270

TEST NUMBER: D942154

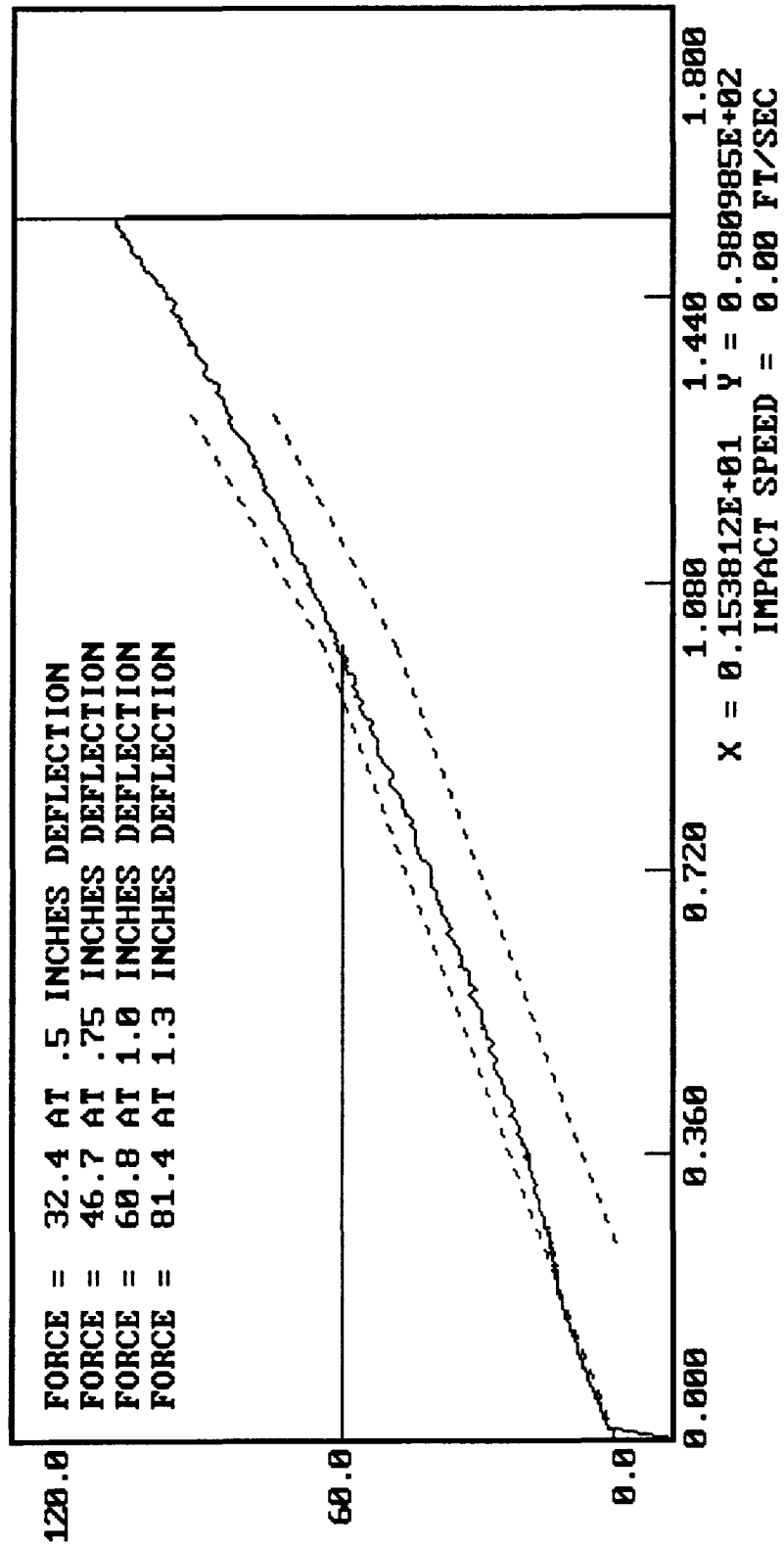
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.4
FORCE @ 0.75 in	36.7 - 49.8 lbs	46.7
FORCE @ 1.0 in	50 - 63 lbs	61
FORCE @ 1.3 in	73 - 88 lbs	81

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 11-21-1994 10:10
 ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: November 21, 1994

DUMMY NUMBER 270

TEST NUMBER D942155

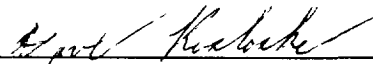
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	46
RETURN ANGLE	12° maximum	3°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

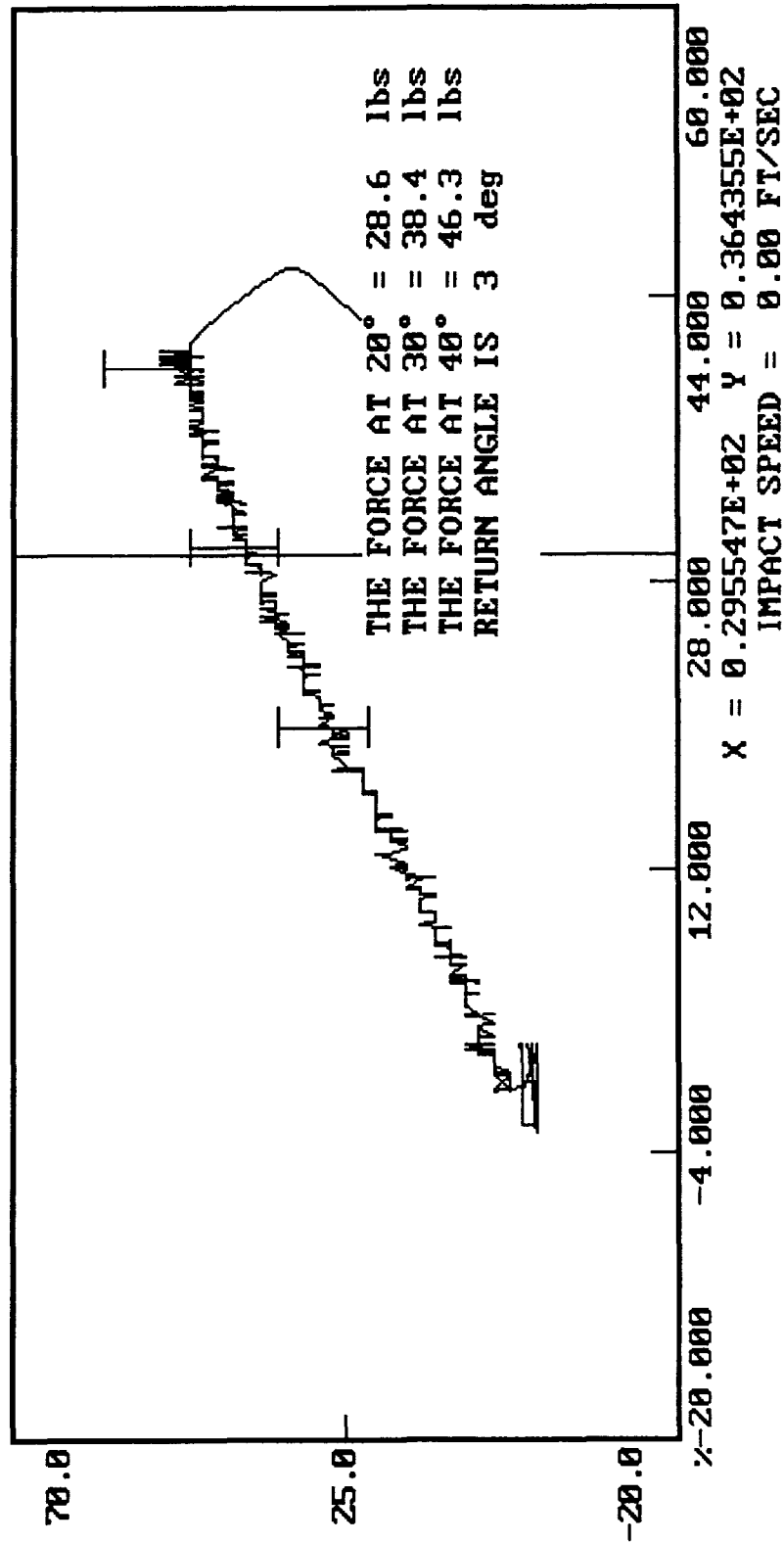


DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 278

FORCE () VS. TORSO ROTATION (DEGREES)

11-21-1994 10:56



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 272

Inspected By: Rod McClelland

Date: November 21, 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: 270

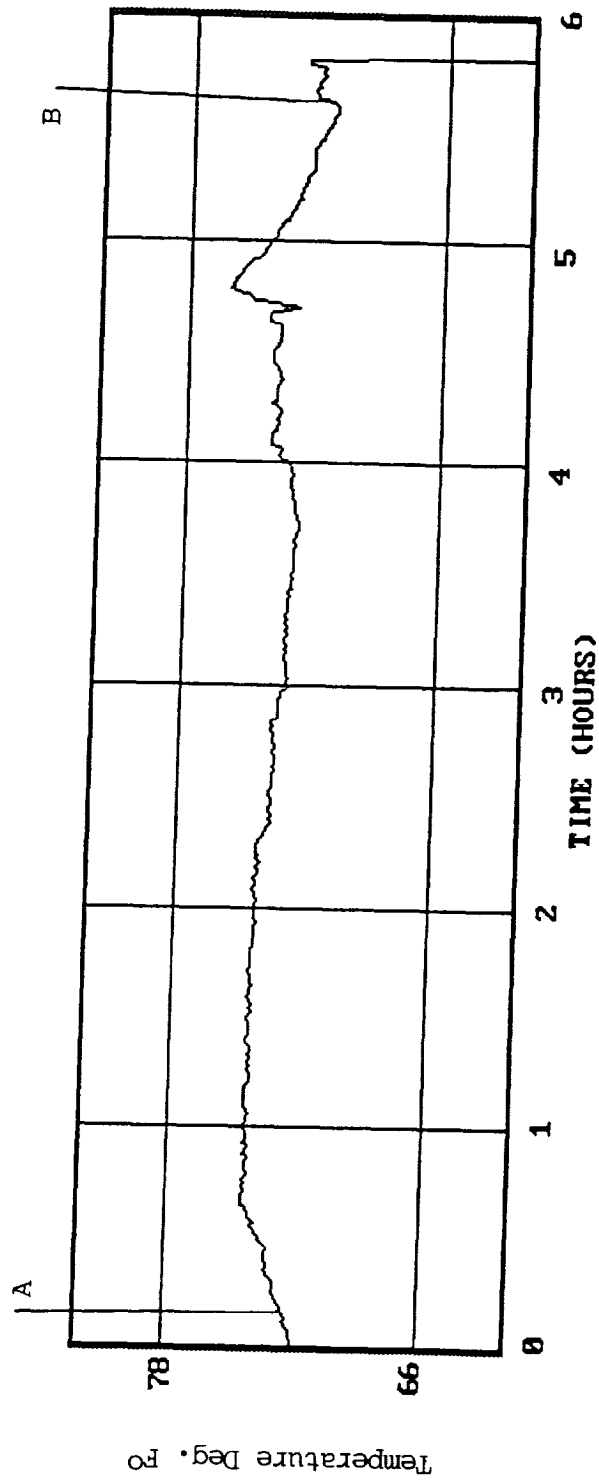
Inspected By: Al Chalmers

Date: November 21, 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 = Impact

APPENDIX D
DUMMY AND VEHICLE CALIBRATION DATA

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DRIVER DUMMY NO. 272

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AGRT3	Endevco	September 02, 1994
Lower Rib	AHY99	Endevco	September 02, 1994
Lower Spine	AJ7C2	Endevco	September 02, 1994
Pelvis	AGP07	Endevco	September 16, 1994
Upper Rib Redundant	AHR15	Endevco	September 02, 1994
Lower Rib Redundant	AJ614	Endevco	November 07, 1994
Lower Spine Redundant	AJ420	Endevco	September 02, 1994
Pelvis Redundant	AHWN3	Endevco	September 02, 1994

INSTRUMENTS FOR PASSENGER DUMMY NO. 270

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AHTF1	Endevco	September 01, 1994
Lower Rib	AGTP7	Endevco	June 10, 1994
Lower Spine	AGTE9	Endevco	June 27, 1994
Pelvis	AJ808	Endevco	October 12, 1994
Upper Rib Redundant	AGTB5	Endevco	September 16, 1994
Lower Rib Redundant	AJ7E9	Endevco	August 26, 1994
Lower Spine Redundant	AC9B7	Endevco	August 01, 1994
Pelvis Redundant	AJ9N4	Endevco	October 12, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	AJ5T6	Endevco	October 17, 1994
MDB CG Y	A KAE8	Endevco	October 14, 1994
MDB CG Z	AJ9T5	Endevco	October 17, 1994
MDB Rear Axle X	AJ66Ø	Endevco	October 14, 1994
MDB Rear Axle Y	AJ9J6	Endevco	October 12, 1994
Lower Left A-Post Y	AØ3	Endevco	November Ø7, 1994
Lower Left B-Post Y	X12	Endevco	November Ø4, 1994
Mid Left A-Post Y	MGA157	Entran	May 16, 1994
Mid Left B-Post Y	MGA155	Entran	June 3Ø, 1994
Trunk Centerline X	AHY5	Endevco	October 14, 1994
Trunk Centerline Y	AJ4R1	Endevco	October 14, 1994
Trunk Centerline Z	XØ9	Endevco	November Ø4, 1994
Driver Seat Track Y	X13	Endevco	November Ø7, 1994
Right Front Sill X	MGA159	Entran	June Ø2, 1994
Right Front Sill Y	MGAØ98	Entran	August 12, 1994
Right Front Sill Z	MGAØ88	Entran	June 23, 1994
Right Rear Sill X	XØ6	Endevco	November 1Ø, 1994
Right Rear Sill Y	A13	Entran	October 3Ø, 1994
Right Rear Sill Z	AØ2	Endevco	October 3Ø, 1994
Right Rear Seat Occupant Compartment Y	MGAØ84	Entran	August Ø4, 1994

Note: All Endevco accelerometers are Model No. 7264-2ØØØ
All Entran accelerometers are Model No. AGM-72E