

V2224

REPORT NO.: MGA-95-21409

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

TOYOTA MOTOR CORPORATION
1995 TOYOTA TERCEL 2 DOOR
NHTSA NO: CS5103

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



MGA Ref. No.: G93A-02

Test Date: December 13, 1994

Report Date: December 31, 1994

FINAL REPORT

Prepared For:

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16. Abstract Compliance tests were conducted on the subject 1995 Toyota Tercel 2 Door 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 December 13, 1994. The impact velocity of the Moving Barrier (MDB) was 32.7 mph (52.6 kph) and the ambient temperature of the struck side (driver's) of the target vehicle at the time of impact was 71°F. The maximum static crush of the impacted vehicle was 231 mm at the occupant H-Point of the struck vehicle. The test or target vehicle's performance is given below: <table border="1"> <thead> <tr> <th></th> <th><u>Driver's SID</u></th> <th><u>Left Rear SID</u></th> </tr> </thead> <tbody> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>59 g's</td> <td>66 g's</td> </tr> <tr> <td>Pelvis Acceleration</td> <td>64 g's</td> <td>83 g's</td> </tr> <tr> <td>Upper Rib Acceleration</td> <td>52.2 g's</td> <td>45.9 g's</td> </tr> <tr> <td>Lower Rib</td> <td>52.0 g's</td> <td>58.8 g's</td> </tr> <tr> <td>Lower Spine</td> <td>65.0 g's</td> <td>72.5 g's</td> </tr> </tbody> </table>							<u>Driver's SID</u>	<u>Left Rear SID</u>	Thoracic Trauma Index (TTI)	59 g's	66 g's	Pelvis Acceleration	64 g's	83 g's	Upper Rib Acceleration	52.2 g's	45.9 g's	Lower Rib	52.0 g's	58.8 g's	Lower Spine	65.0 g's	72.5 g's
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Approved by:



John Fleck, Project Engineer

Date: 12-28-94

FINAL REPORT ACCEPTED BY:



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 Toyota Tercel 2 Door.

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 Toyota Tercel 2 Door 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 33.1 mph (53.3 kph) on December 13, 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) and left rear (Pos. #4) were placed according to instructions specified in the Laboratory Test Procedure. The side impact event was documented by eight high speed cameras. Camera locations and other pertinent camera information can be found in this report. Appendix B contains the vehicle and dummy response data traces.

The SIDs were instrumented with the following accelerometers.

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

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

The driver's Thoracic Trauma Index (TTI) was 59 g's. Maximum pelvic Y acceleration was 64 g's.

The left rear passenger's TTI was 66 g's. Maximum pelvic Y acceleration was 83 g's.

SECTION 3
SUMMARY OF TEST DATA

TABLE 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door
Vehicle NHTSA No.: CS5103 VIN: JT2EL55D650004319
Vehicle Body Color: Green Month & Year of Manufacture: 9-94
Engine Data: 4 cylinders; CID; 1.5 Liter; cc
Placement Longitudinal; or X Lateral
Transmission: 4 speed; X Manual; Automatic; Overdrive
Final Drive: Rear Wheel Drive; X Frt. Wheel Drive; Four Wheel Drive
Odometer Reading 117 miles
Options: A/C; Pwr. Steering; X Pwr. Brakes; Pwr. Windows
 Power Seats; Tilt Wheel; Power Door Locks; Self Leveling System

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 34 Psi FRONT (234 kpa)
32 Psi REAR (221 kpa)
Recommended Tire Size: P155/SR13
Tires on Test Vehicle: P155SR13 Manufacturer: Michelin

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd Seat 5 Total
Type of Front Seats: X Bucket; Bench; Split Bench
Type of Front Seat Back: Fixed; X Adjustable with X Lever
Vehicle Maximum Capacity Loading = 775 lbs (A) (351.5 kg)
No. of Occupants x 150 lbs. = 750 lbs (B) (340.2 kg)
Cargo Capacity (A-B) = 25 lbs (11.3 kg)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	= <u>572</u> lbs (259.5 kg)	Right Rear	= <u>395</u> lbs (179.2 kg)
Left Front	= <u>603</u> lbs (273.5 kg)	Left Rear	= <u>397</u> lbs (180.0 kg)
TOTAL FRONT	= <u>1175</u> lbs (533.0 kg)	TOTAL REAR	= <u>792</u> lbs (359.2 kg)
% of Total Vehicle Weight	= <u>59.7</u> %;	% of Total Weight	= <u>40.3</u> %
TOTAL WEIGHT	= <u>1967</u> lbs (892.2 kg)		

TABLE 2
TEST VEHICLE DATA

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 1967 lbs (892.2 kg)
Cargo Carrying Capacity of Test Vehicle = 25 lbs (11.2 kg)
Weight of 2 Side Impact Dummies (2 x 178 lbs.) = 356 lbs (161.5 kg)
TEST VEHICLE TARGET WEIGHT: = 2348 lbs (1065.0 kg)

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>610</u> lbs (276.7 kg)	Right Rear	= <u>474</u> lbs (215.0 kg)
Left Front	= <u>686</u> lbs (311.2 kg)	Left Rear	= <u>568</u> lbs (257.6 kg)
TOTAL FRONT	= <u>1296</u> lbs (587.9 kg)	TOTAL REAR	= <u>1042</u> lbs (472.6 kg)
% of Total Weight	= <u>55.4%</u>	% of Total Weight	= <u>44.6%</u>
TOTAL TEST WEIGHT	= <u>2338</u> lbs (1060.5 kg)		

TEST VEHICLE ATTITUDE (all dimensions in inches):

CURB WEIGHT ATTITUDE: in (mm)

Right Front 26.0 (660) Left Front 25.6 (650) Right Rear 25.6 (649) Left Rear 25.0 (635)

FULLY LOADED WEIGHT ATTITUDE: in (mm)

Right Front 26.0 (660) Left Front 24.8 (629) Right Rear 24.6 (625) Left Rear 23.4 (595)

TEST ATTITUDE: in (mm)

Right Front 25.9 (654) Left Front 25.0 (634) Right Rear 24.6 (624) Left Rear 23.5 (596)

Test Vehicle Wheelbase: 93.7 inches (2380 mm)

C.G. = 41.8 inches (1061 mm) rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 151.9 in (3859 mm)
Centerline = 155.3 in (3945 mm)
Left Side = 151.9 in (3859 mm)

FIGURE 1
PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

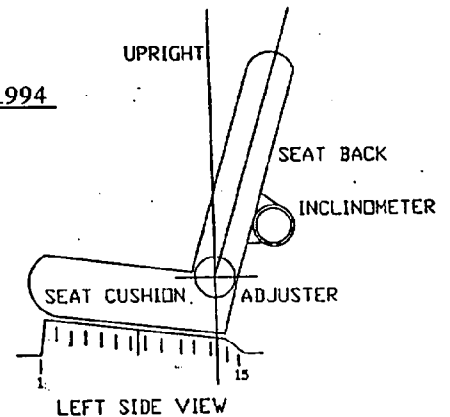
FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 8.2 in (210 mm)

Total Number of Adjustment Positions or Detents: 15

Test Position: Mid (105 mm from front)

(8th detent from front, 1st position being #1)



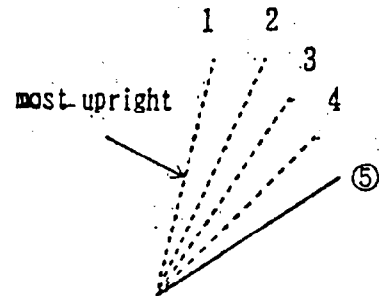
FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 5th notch rearward from most upright

SECOND POSITION SEAT:

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

Seat Back Adjustment Position: N/A



ADJUSTABLE STEERING COLUMN POSITION: Non-adjustable

WINDOW POSITIONS:

Left Front closed Left Rear N/A

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 = 11.9 gallons (45.0 liters)

Test Volume: 11.0 gallons (41.6 liters) 92% of capacity

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

Wheelbase: = 93.7 in (2380 mm)

Impact Point is 9.8 in (250 mm) rearward of front axle centerline

TABLE 3

CRASH TEST SUMMARY FOR TEST VEHICLEYear/Make/Model/Body Style: 1995/Toyota/Tercel/2 DoorVehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994Overall Length = 155.3 in (3945 mm); Overall Width = 64.6 in (1640 mm)TEST WEIGHT:

Right Front = 610 lbs (276.7 kg) Right Rear = 474 lbs (215.0 kg)
 Left Front = 686 lbs (311.2 kg) Left Rear = 568 lbs (257.6 kg)
 TOTAL FRONT = 1296 lbs (587.9 kg) TOTAL REAR = 1042 lbs (472.6 kg)
 % of Total Weight = 55.4 % % of Total Weight = 44.6 %
 TOTAL VEHICLE WEIGHT 2338 lbs (1060.5 kg)
 Wheelbase = 93.7 in (2380 mm)
 Longitudinal C.G. front Center of Front Axle = 41.8 in (1061 mm)
 Impact Angle with Respect to Impactor = 90° degrees

COMPONENTS REMOVED TO MEET TARGET WEIGHT: Wheel caps, jack and tool, spare tire, rear lamps, rear bumper, rear tiedown hooks, interior RH door trim, front head lamps, front bumper, front grill, radiator assembly, left rear occupant camera.

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (245 mm above ground) = 117 mm
 2. LEVEL 2 (426 mm above ground) = 231 mm
 3. LEVEL 3 (561 mm above ground) = 203 mm
 4. LEVEL 4 (830 mm above ground) = 148 mm
 5. LEVEL 5 (1265 mm above ground) = 33 mm
- Maximum Post-Test Intrusion = 231 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 & shoulder belt with airbag</u>	<u>3 pt. lap & shoulder belt</u>

INSTRUMENTATION:

Number of Vehicle Data Channels: = 16
 Number of Cameras: Onboard Vehicle = 4
 Offboard Vehicle = 2
 Deformable Barrier = 2
 TOTAL = 8

TABLE 4
CRASH TEST SUMMARY FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 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: 32.69 mph (52.6 kph) Secondary: * mph (* kph)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1.	Row A Top of Stack (33 in)	= <u>102</u> mm
2.	Row B Mid Stack (27 in)	= <u>68</u> mm
3.	Row C Top of Bumper (21 in)	= <u>84</u> mm
4.	Row D Center of Bumper (17 in)	= <u>128</u> mm

INSTRUMENTATION:

Number of MDB Data Channels = 7

* Not Recorded

TABLE 5
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to door header</u>	<u>to "C" Post</u>
Arm	<u>to door trim panel</u>	<u>to side window & trim panel</u>
Pelvis	<u>to armrest</u>	<u>to armrest</u>
Left Knee	<u>to door trim panel</u>	<u>to "B" Post trim</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: .4 in (10 mm) forward Vertical: .125 in. (3 mm) high

ARM REST LOCATIONS:

Front: 235 mm below window opening
Rear: 270 mm below window opening

SEAT CRUSH:

Driver Seat Back: 25 mm Driver Seat Cushion: 47 mm
Left Rear Seat Back: 5 mm Left Rear Seat Cushion: 27 mm

GLAZING DAMAGE:

Left side windows broken & windshield cracked

PILLAR PERFORMANCE:

No separation noted

SILL SEPARATION:

No separation noted

OTHER NOTABLE IMPACT EFFECTS:

Airbags inflated

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARYYear/Make/Model/Body Style: 1995/Toyota/Tercel/2 DoorVehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

	Front Dummy ID # 272				Rear Dummy ID # 269			
	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	52.2	41	83	45.9	53	19.6	115
	Upper Rib Lateral.....Y(R)	53.7	41	83	46.2	53	21.2	115
	Lower Rib Lateral.....Y	52.0	42	60	58.8	46	20.5	115
	Lower Rib Lateral.....Y(R)	52.4	41	60	56.5	46	21.5	115
SPINE ACCELERATIONS:								
	Lower Lateral.....Y	65.0	36	65	72.5	46	10.2	119
	Lower Lateral.....Y(R)	64.1	36	66	72.9	46	10.1	119
PELVIC ACCELERATIONS:								
	Lateral.....Y	64.4	26	44	83.3	40	4.8	114
	Lateral.....Y(R)	60.0	26	44	85.1	40	4.4	114

REFERENCE:

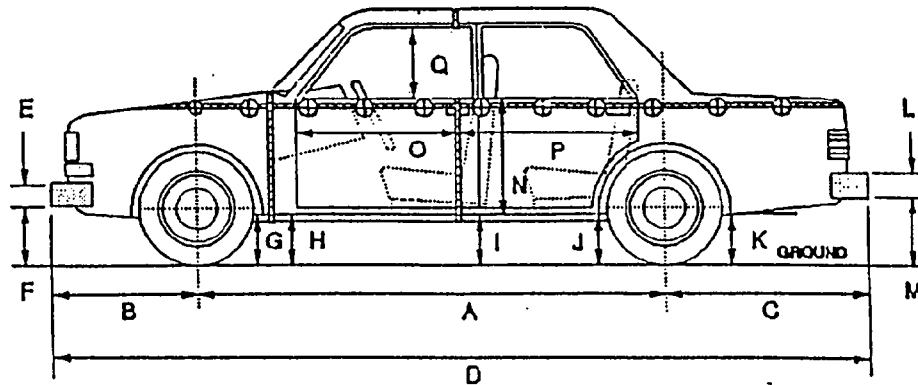
Positive Direction - Longitudinal (X) = forward

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

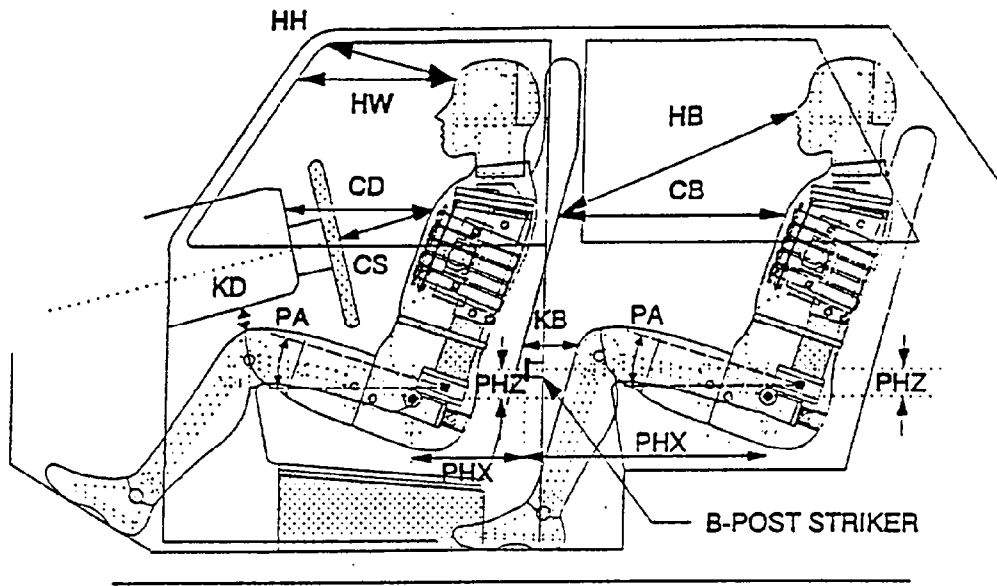
D = Length at Centerline
R = Right Side Length
S = Left Side Length
T = Width at B Post
E & L = Bumper Thickness

J1 = To Pinch Weld
J2 = To Sill

Units: mm

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	2380	2390	10
B	800	710	90
C	765	901	136
D	3945	4001	56
E	Bumper Removed Prior to Testing		
F	254	256	2
G	260	535	275
H	193	217	24
I	166	163	3
J1/J2	187/170	174/158	13/12
K	310	314	4
L	Bumper Removed Prior to Testing		
M	275	281	6
N	655	618	37
O	655	647	8
P	2 Door Vehicle		
Q	420	397	23
R	3859	3859	0
S	3859	3841	18
T	1640	1530	110

FIGURE 3
SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

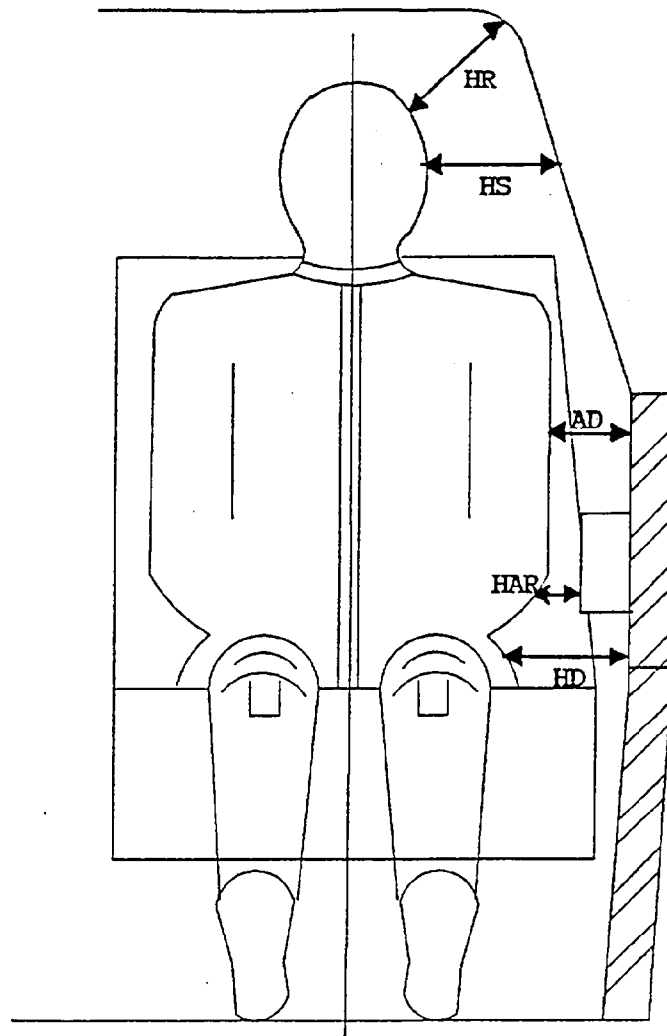
NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in mm

	DRIVER ID #272	LEFT REAR PASSENGER ID #269	
HH	334	---	
HW	497	---	
HB	---	638	
CD	501	CB	500
CS	305	---	
KDL	66	KBL	83
KDR	73	KBR	85
PA°	23.2°	23.1°	
PHX	421	417	
PHZ	175	171	

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



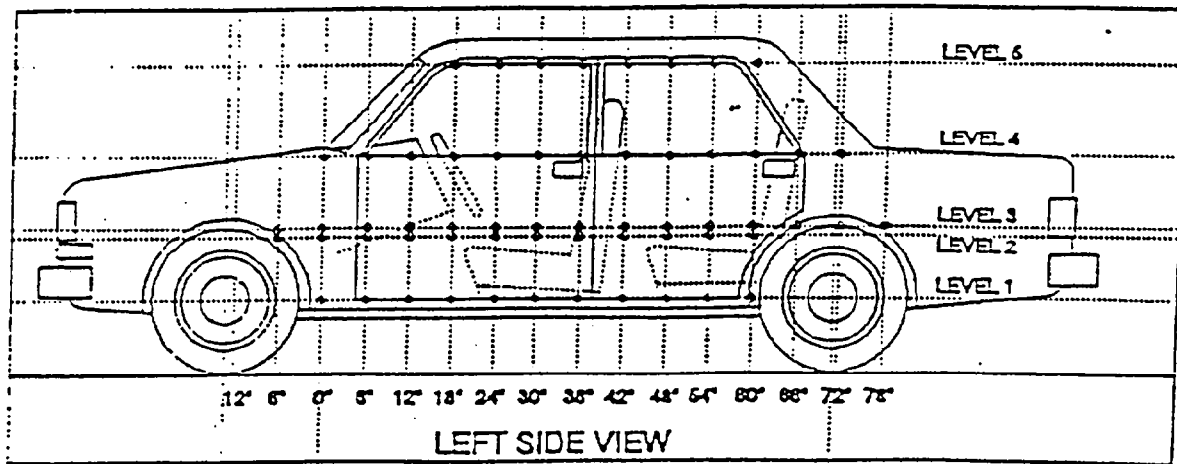
NOTE: All dimensions are in mm

	DRIVER ID #272	LEFT REAR PASSENGER ID #269
HR	94	89
HS	207	216
AD	74	90
HD	112	117

FIGURE 5
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994



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

33" Side Profile

Level 5 @ Window Top	= <u>49.8</u> in (1265 mm)
Level 4 @ Window Sill	= <u>32.7</u> in (830 mm)
Level 3 @ Mid Door	= <u>22.1</u> in (561 mm)
Level 2 @ Occupant H-Point	= <u>16.7</u> in (426 mm)
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>9.6</u> in (245 mm)

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

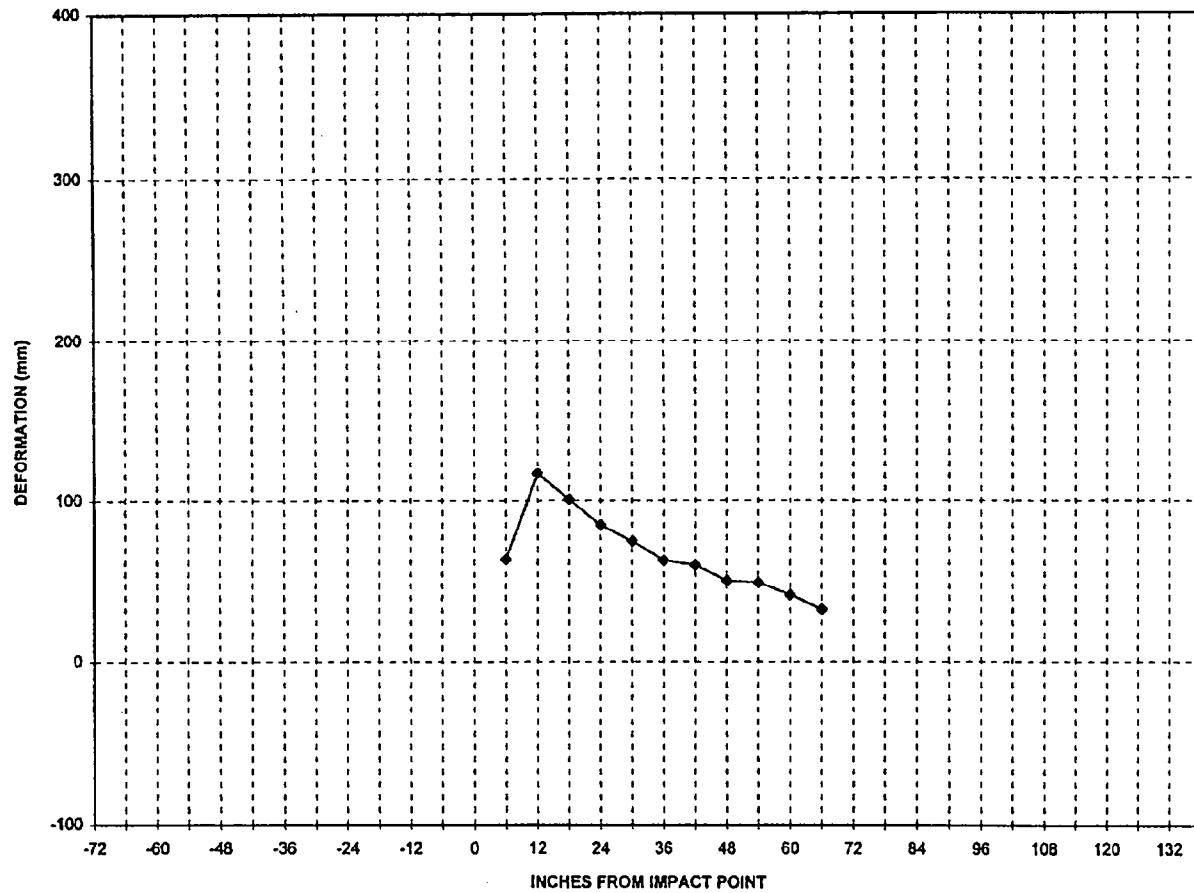
LEVEL 1 AT AXLE CENTER LINE

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 DoorVehicle NHTSA No.: CS5103 TEST DATE: December 13, 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	861	925	64 (impact point)
12	864	981	117
18	857	958	101
24	858	943	85
30	853	928	75
36	859	922	63
42	858	918	60
48	865	915	50
54	864	913	49
60	867	908	41
66	865	897	32
72	---	---	---
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	---	---	---
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 1 AT AXLE CENTER LINE

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH
LEVEL 2 AT OCCUPANT H-POINT

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

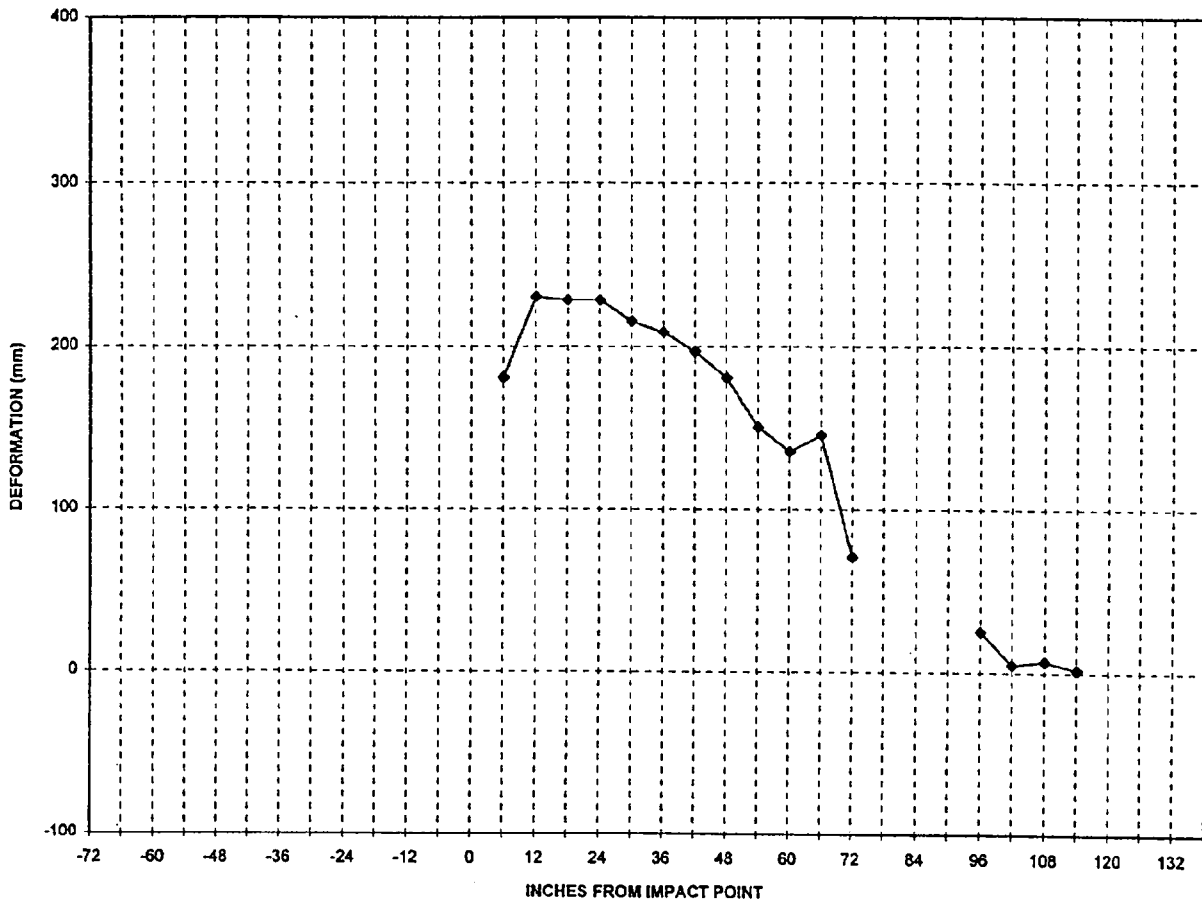
Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

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	811	992	181
12	807	1038	231
18	806	1035	229
24	805	1034	229
30	808	1024	216
36	806	1015	209
42	805	1002	197
48	806	987	181
54	807	958	151
60	811	947	136
66	814	960	146
72	814	885	71
78	---	---	---
84	---	---	---
90	---	---	---
96	825	850	25
102	845	850	5
108	858	865	7
114	870	878	2
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---
144	---	---	---

(impact point)

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

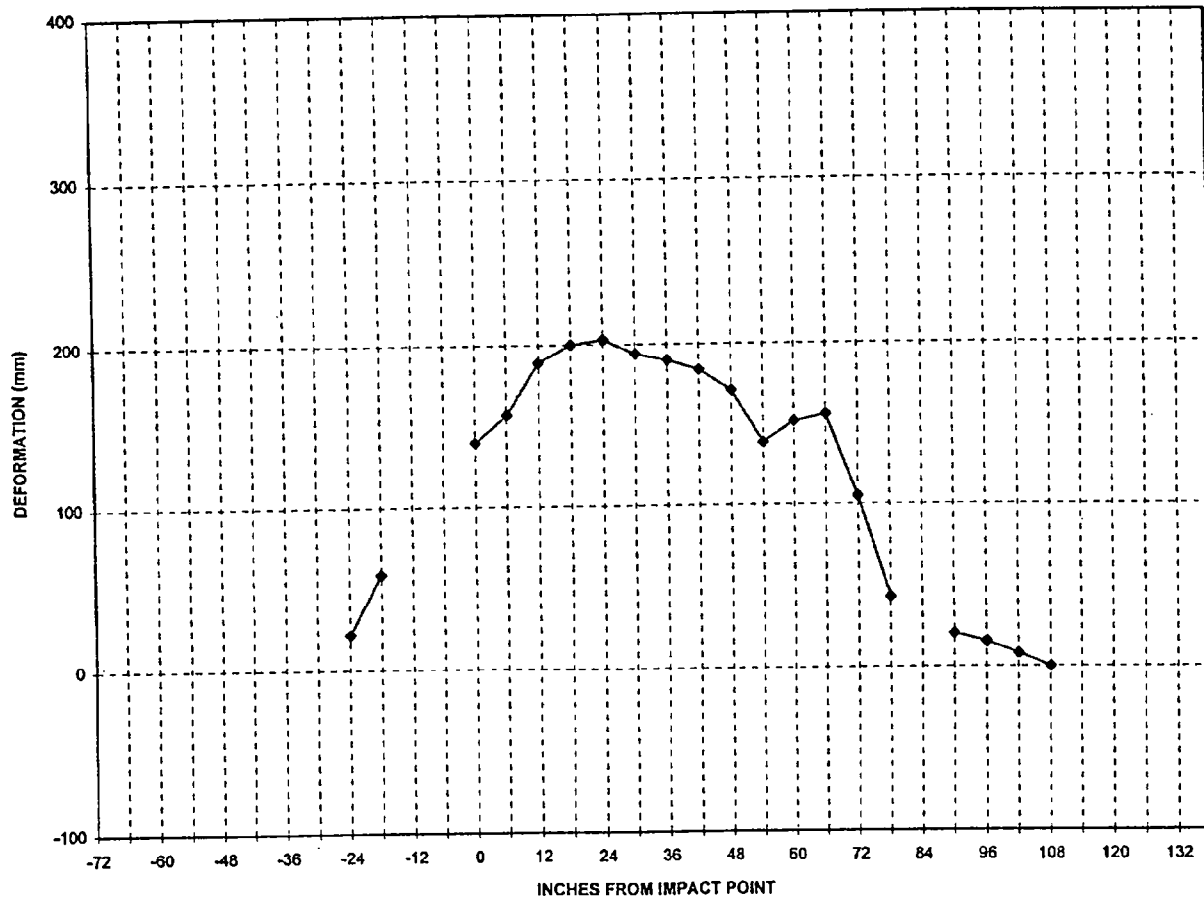
Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	---	---	---
-24	883	905	22
-18	830	889	59
-12	---	---	---
-6	---	---	---
0	813	953	140 (impact point)
6	817	974	157
12	811	1000	189
18	803	1003	200
24	804	1007	203
30	801	995	194
36	803	993	190
42	803	987	184
48	804	975	171
54	806	945	139
60	810	962	152
66	815	971	156
72	818	923	105
78	807	850	43
84	---	---	---
90	809	829	20
96	849	864	15
102	865	873	8
108	884	884	0
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 3 AT MID-DOOR

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

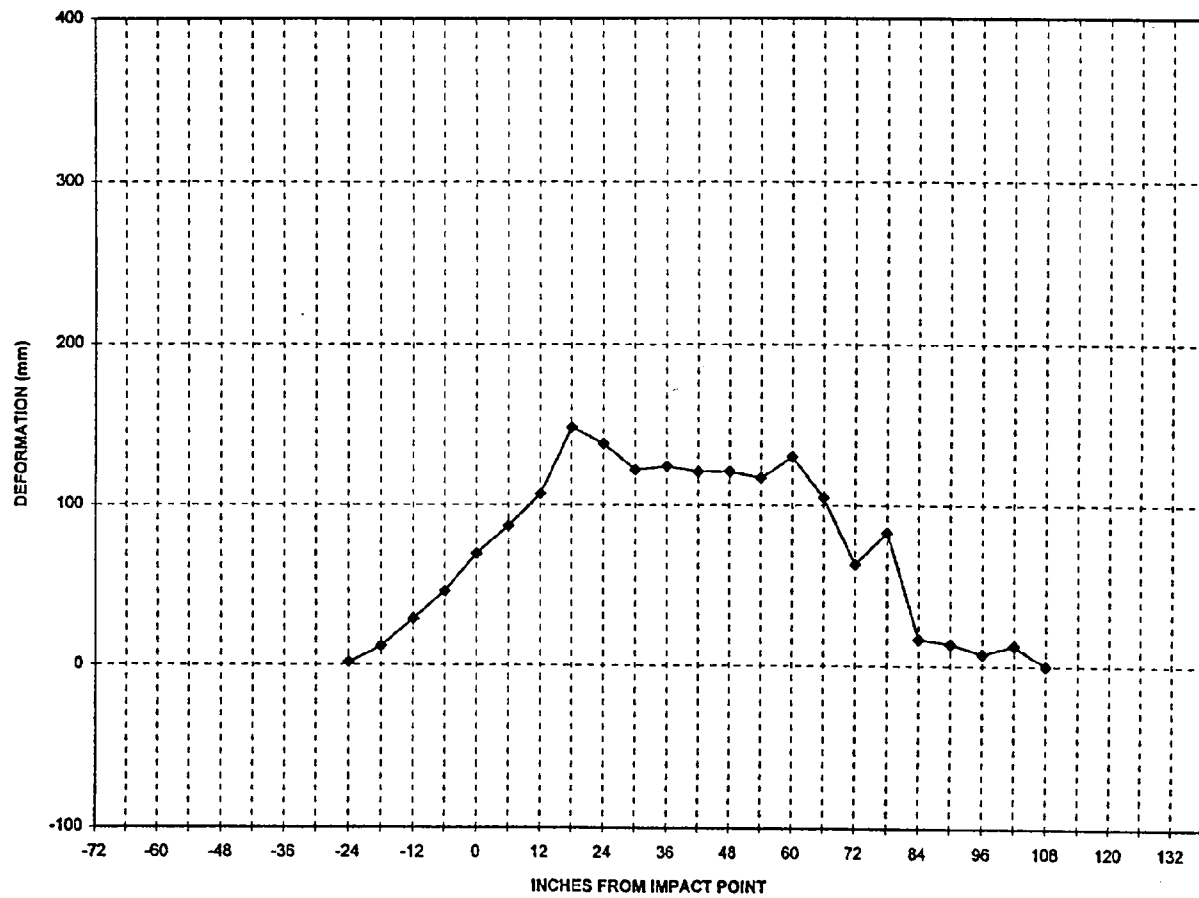
LEVEL 4 AT WINDOW SILL

Year/Make/Model/Body Style: 1995/Toyota/Tercel//2 DoorVehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	---	---	---
-24	910	912	2
-18	893	905	12
-12	880	909	29
-6	865	911	46
0	856	925	69 (impact point)
6	848	935	87
12	844	951	107
18	839	987	148
24	838	976	138
30	844	966	122
36	843	967	124
42	847	968	121
48	846	967	121
54	853	970	117
60	857	987	130
66	860	965	105
72	868	931	63
78	824	907	83
84	883	900	17
90	892	906	14
96	905	913	8
102	910	923	13
108	929	929	0
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---
144	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 4 AT WINDOW SILL

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 5 AT WINDOW TOP

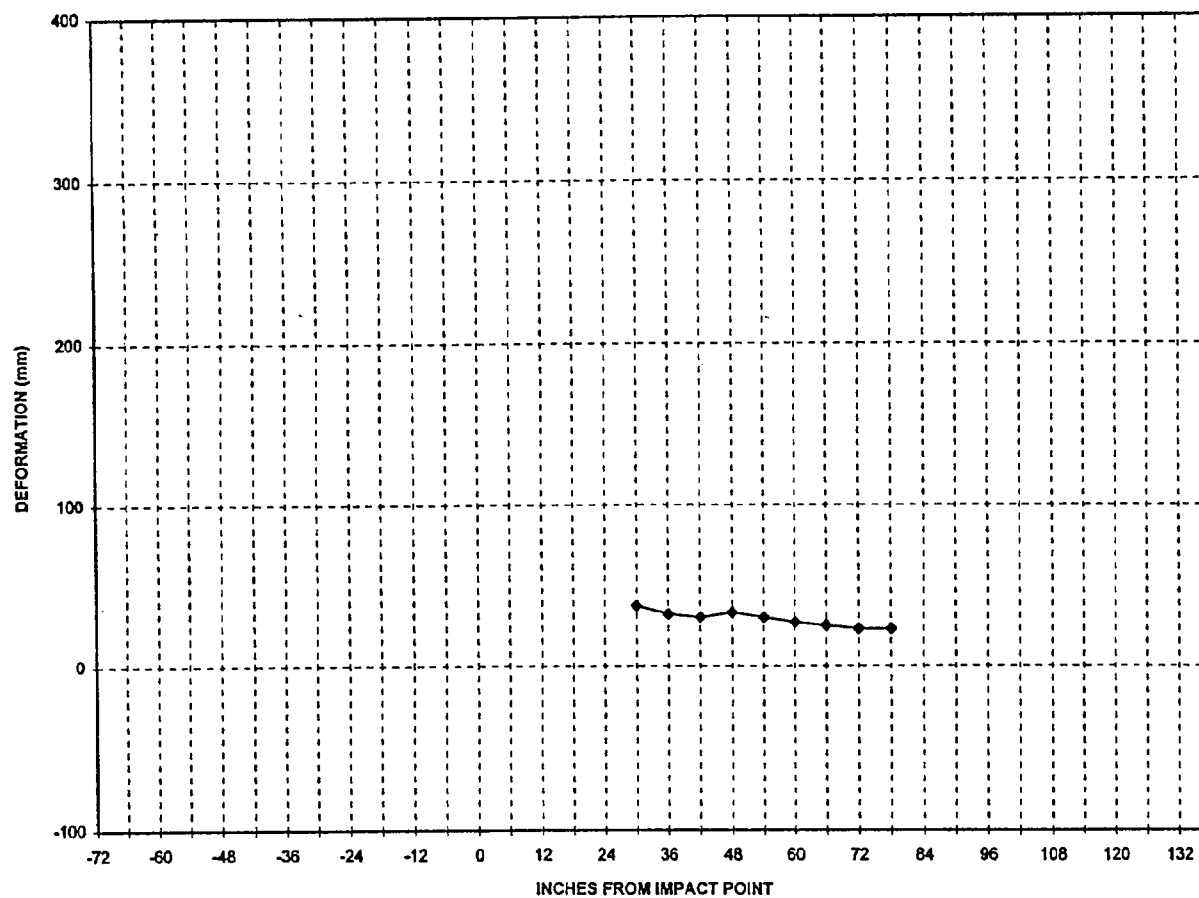
Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 DoorVehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

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	1138	1175	37
36	1123	1155	32
42	1128	1158	30
48	1132	1165	33
54	1137	1167	30
60	1141	1168	27
66	1143	1168	25
72	1143	1166	23
78	1152	1175	23
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: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

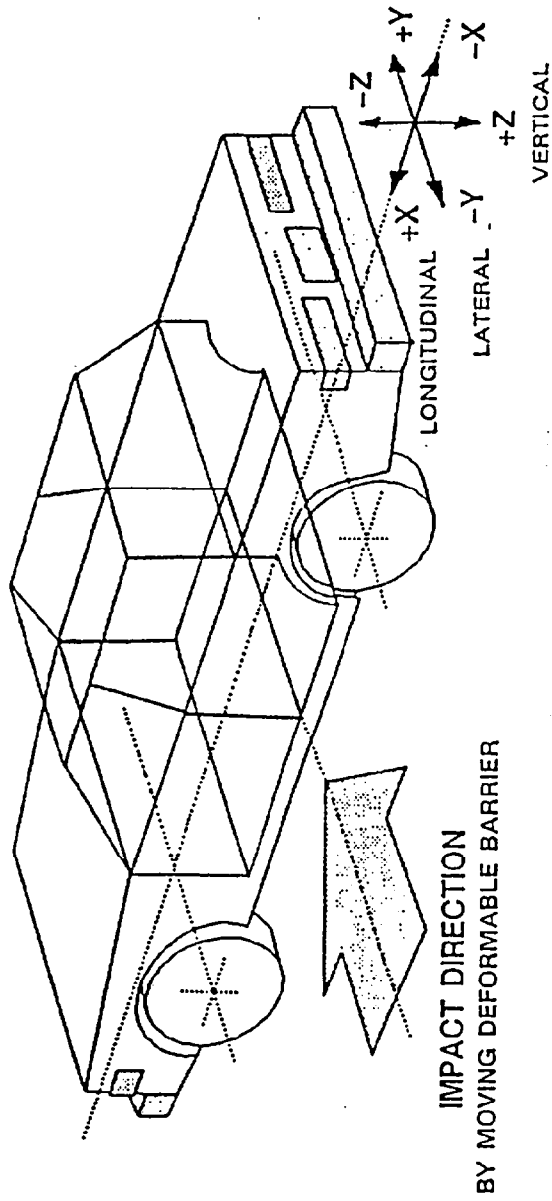
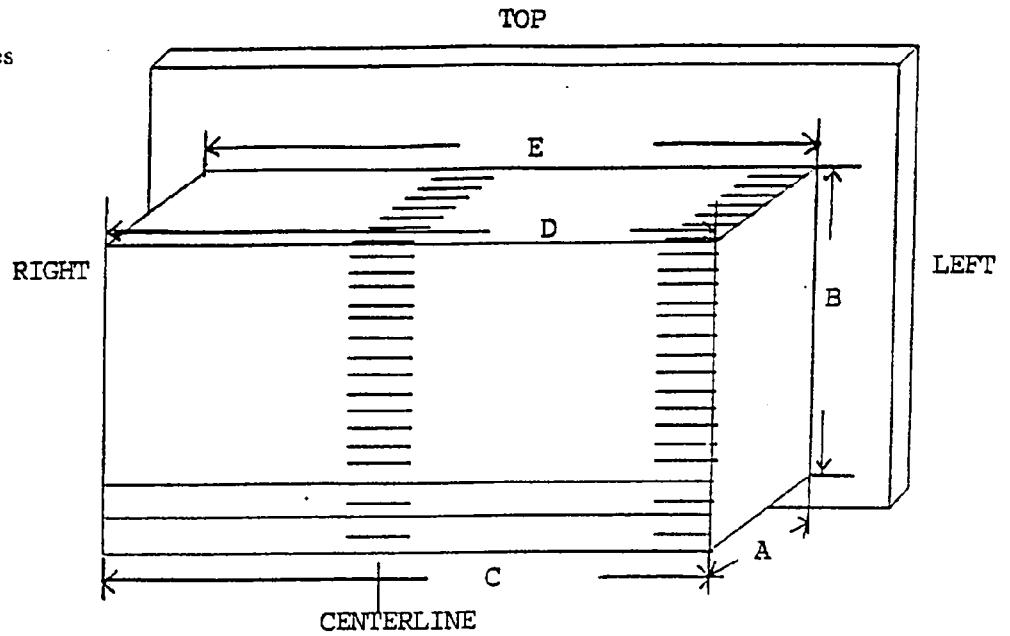


FIGURE 8
MDB FACE DIMENSIONS

Measurements in inches

A = 15.0
B = 21.9
C = 66.0
D = 66.1
E = 66.2



Measurements in inches

	Right	Left
A =	<u>10.9</u>	<u>11.0</u>
B =	<u>13.0</u>	<u>13.1</u>
C =	<u>21.0</u>	<u>21.1</u>
D =	<u>33.0</u>	<u>33.0</u>

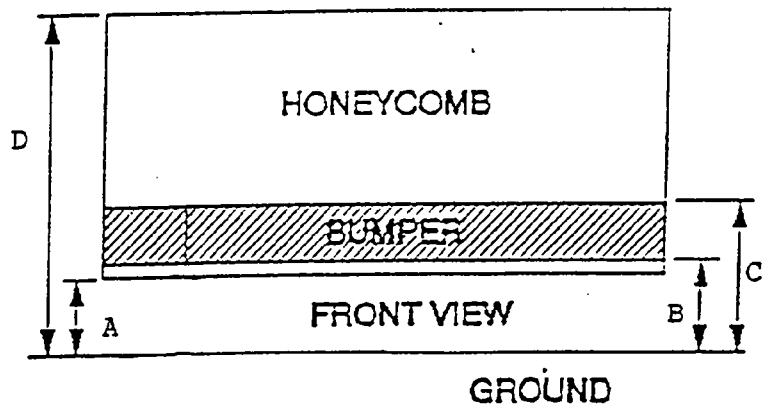


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 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"	1.2 (30)	1.0 (25)	3.1 (79)	4.5 (114)
28"	.2 (6)	.2 (5)	3.3 (83)	4.7 (119)
24"	.1 (3)	.2 (6)	3.3 (84)	5.0 (127)
20"	.1 (3)	.5 (13)	3.3 (84)	5.0 (128)
16"	.1 (3)	.3 (8)	2.6 (67)	4.4 (113)
12"	.1 (3)	.1 (3)	1.8 (48)	3.5 (89)
8"	.2 (5)	.1 (2)	1.3 (32)	2.6 (67)
4"	.2 (5)	.1 (2)	.9 (22)	1.9 (49)
0"	.2 (5)	.1 (2)	.8 (19)	1.2 (40)
4"	.4 (9)	.1 (2)	.8 (21)	1.4 (36)
8"	.4 (9)	.1 (3)	.9 (22)	1.5 (38)
12"	.4 (10)	.1 (3)	.9 (24)	1.5 (39)
16"	.5 (13)	.1 (3)	1.0 (25)	1.6 (41)
20"	.9 (24)	.2 (5)	1.1 (27)	1.6 (41)
24"	1.7 (43)	.9 (22)	1.2 (30)	2.0 (51)
28"	2.3 (59)	2.7 (68)	1.5 (37)	2.4 (62)
32"	4.0 (102)	2.6 (67)	1.6 (41)	2.4 (62)

Right

Left

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 DoorVehicle NHTSA No.: CS5103 TEST DATE: December 13, 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 ¹	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2336	660	330	6.6	7.4	36.9	4.5	9.2	5.6	37.0
2	Rt. Side Sill @ Rear Seat	1753	635	279	4.9	5.1	50.1	3.4	7.5	11.6	50.3
3	Rr. Floorpan Above Axle	914	0	584	16.8	23.4	48.8	4.6	27.9	38.8	56.3
4	Left Side Sill @ Rr. Seat	1626	-660	229	---	---	34.0	4.2	---	---	---
5	Left Side Sill @ Frt. Seat	2413	-686	152	---	---	31.0	4.2	---	---	---
6	Left A-Post Lower	2870	-660	356	---	---	101.7	57.4	---	---	---
7	Left Mid A-Post	2870	-737	736	---	---	63.4	6.2	---	---	---
8	Left B-Post Lower	1752	-635	254	---	---	38.6	5.3	---	---	---
9	Right Rear Occupant Compartment	1574	356	229	---	---	51.0	4.1	---	---	---
10	Driver Left Seat Track	2127	-552	235	---	---	33.9	3.2	---	---	---

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

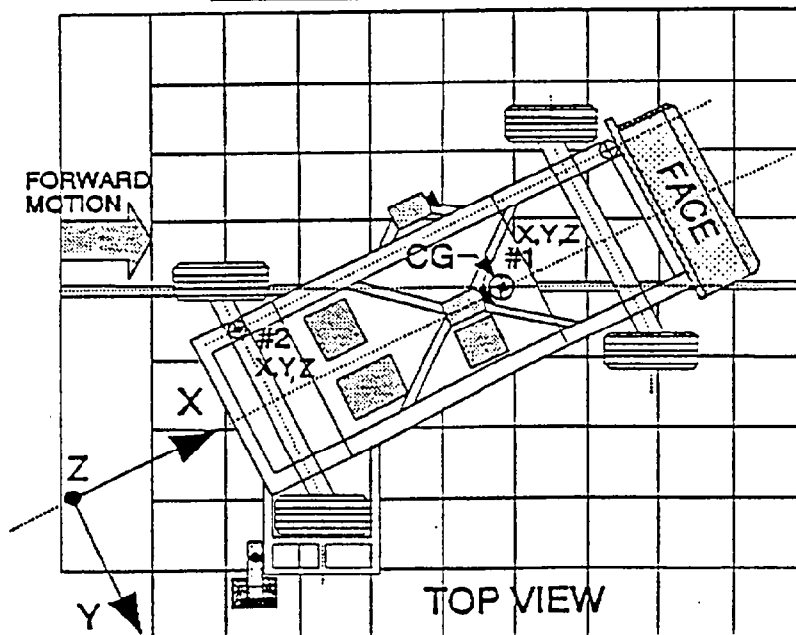
¹ All X Dimensions Taken With Rear Bumper on Vehicle

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

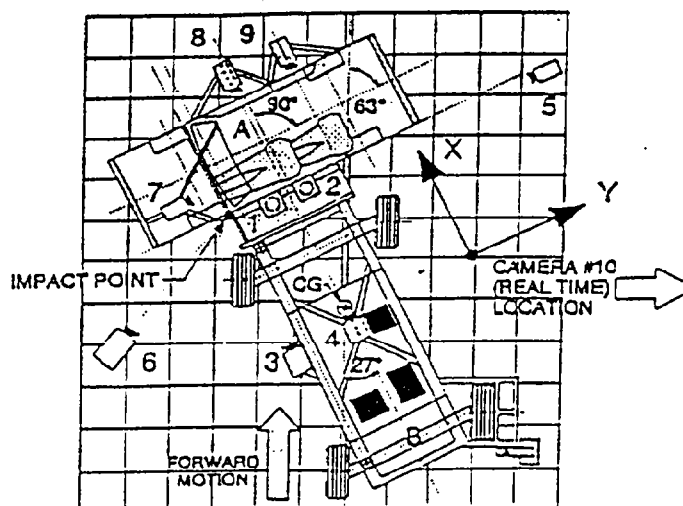


Accel. No.	Location	Coordinates (mm)			Pos. Direct.		Neg. Direct.	
		X	Y	Z	Max (g)	Time (msec)	Max (g)	Time (msec)
1	MDB Center of Gravity							
	Longitudinal ... X				0.9	92	17.9	35
	Lateral Y	-1092	0	483	1.2	59	8.9	33
	Vertical Z				15.5	36	6.2	27
	Resultant R				25.1	35	---	---
2	Rear Frame Member							
	Longitudinal ... X	-2591	-625	622	1.6	97	22.7	31
	Lateral Y				5.3	20	3.6	70

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

FIGURE 10
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door
Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 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	NR
2	Top Wide	700	0	5130		8	1053
3	Cart Pointer					35	1020
4	Cart					13	1015
5	Right Impact	5000	-7440	1430		25	781
6	Left Overall	-1940	2400	1575		13	1093
7	Onboard Driver					7.5	1010
8	Onboard Hood					13	971

* Reference: (from point of impact)

+X = Forward

+Y = To Right

+Z = Upward

NR = Not Recorded

TABLE 10
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 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 (32.7 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:

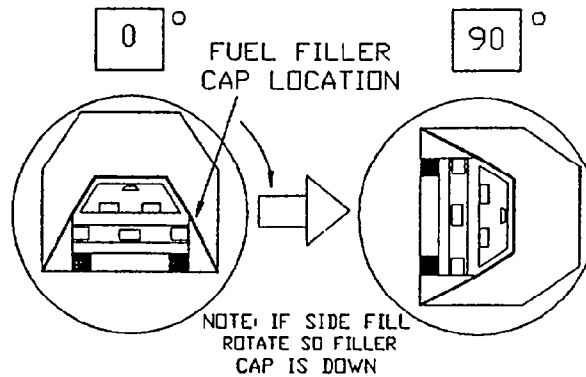
None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

TEST PHASE: 0° - 90°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 45 seconds
 Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

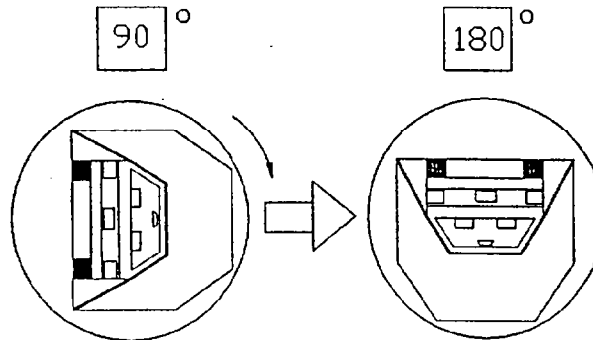
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

TEST PHASE: 90° - 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 45 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

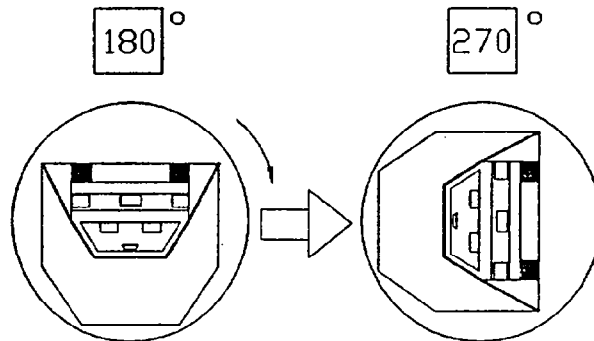
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 45 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

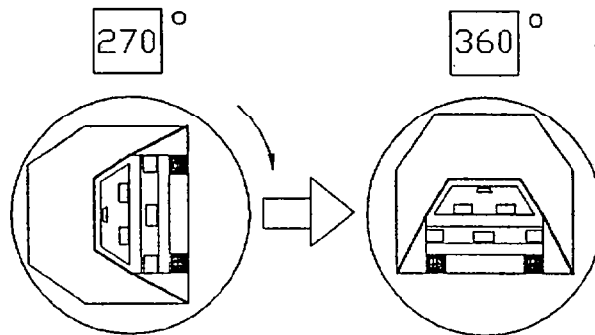
IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Toyota/Tercel/2 Door

Vehicle NHTSA No.: CS5103 TEST DATE: December 13, 1994

TEST PHASE: 270° - 360°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 45 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

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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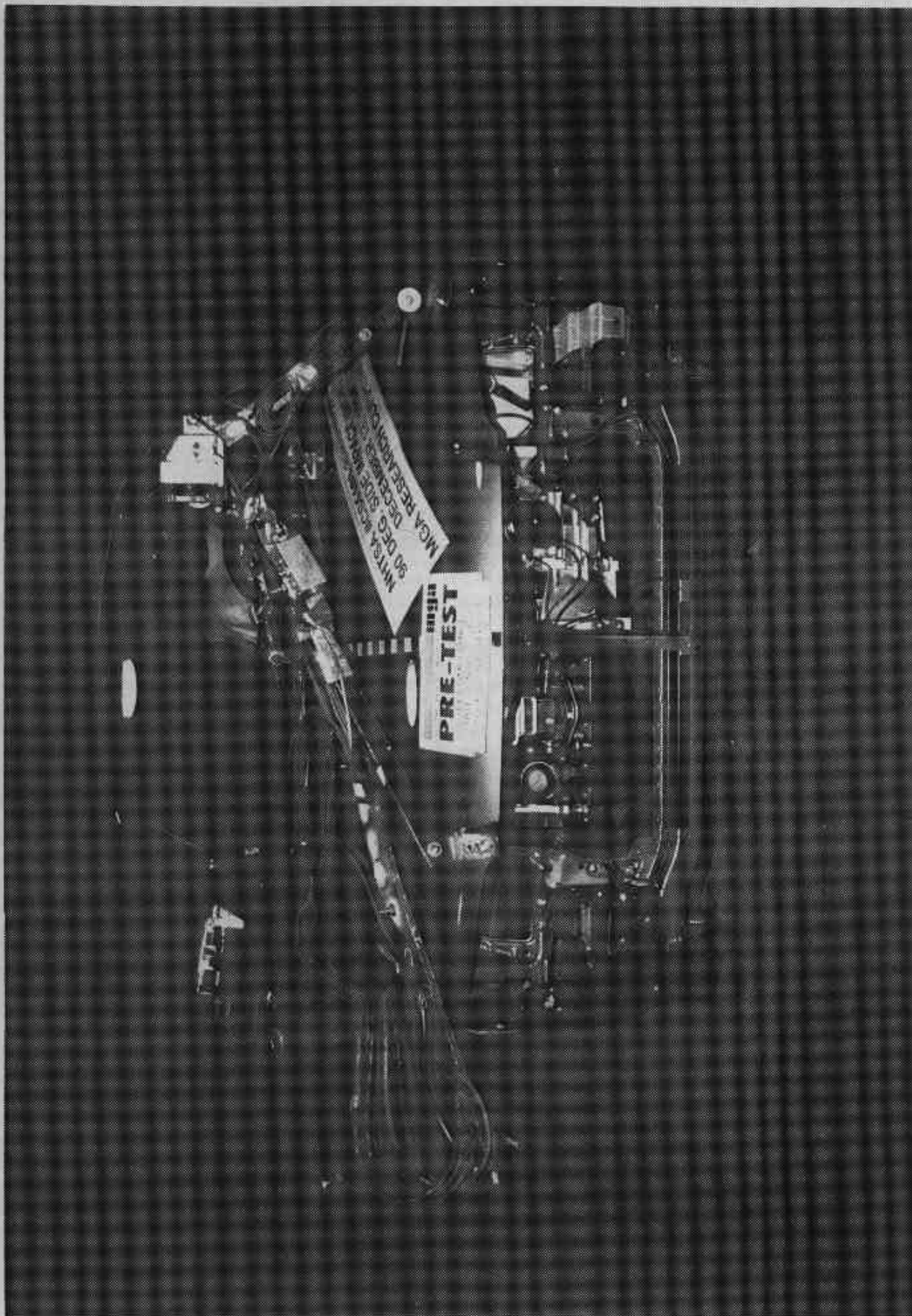


Photo No. A-1 - Pre-Test Front View of Test Vehicle

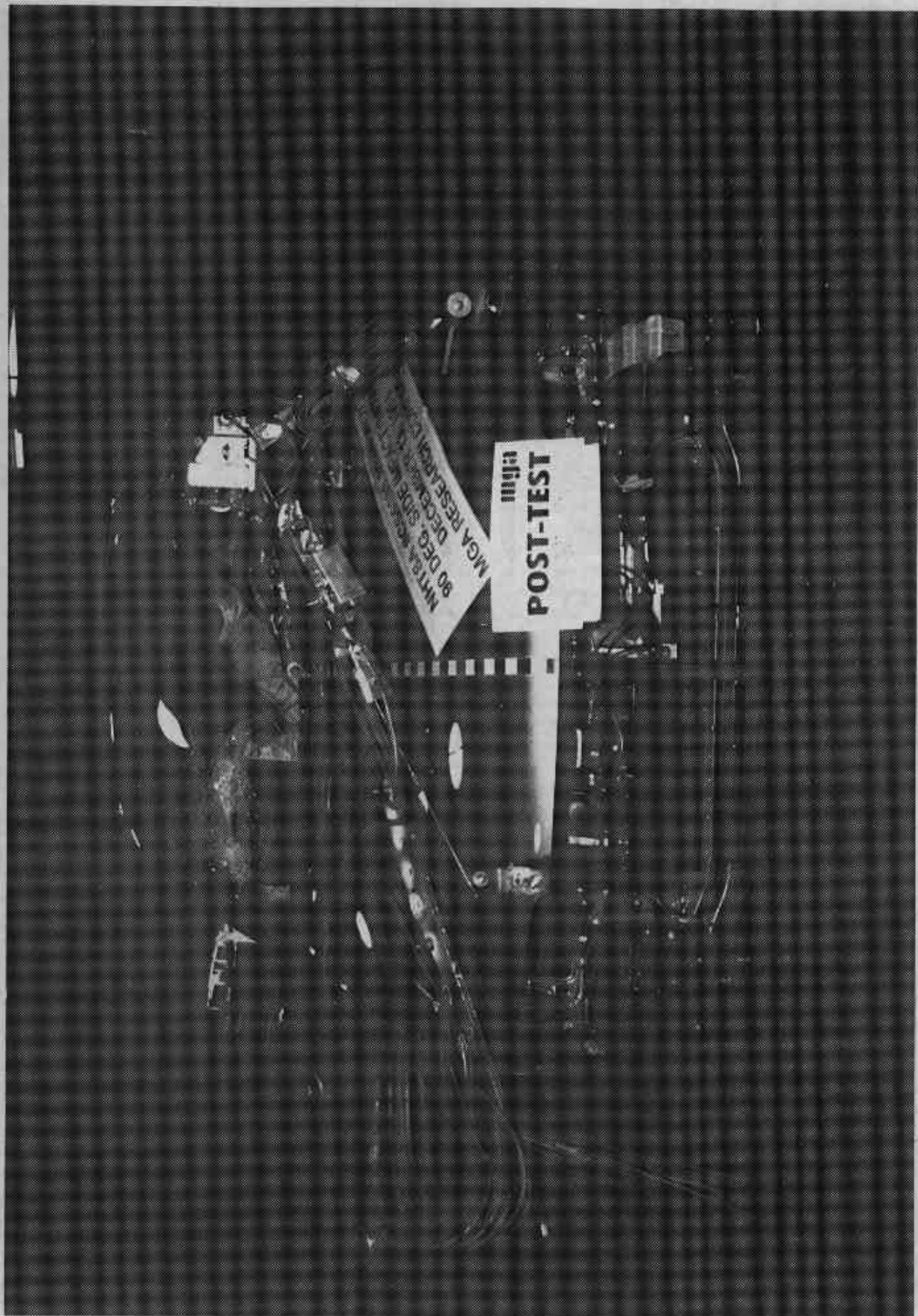


Photo No. A-2 - Post-Test Front View of Test Vehicle



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



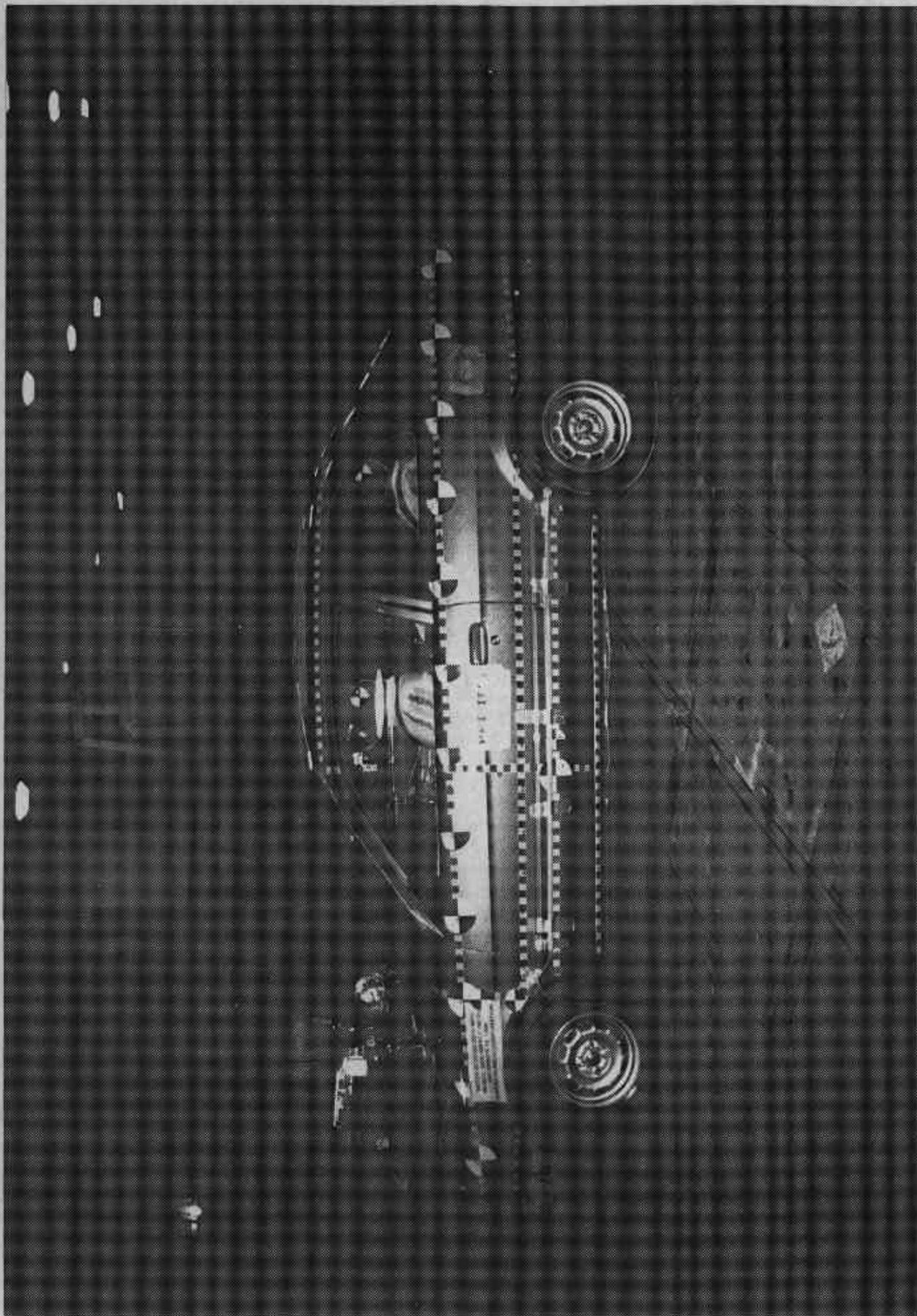


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

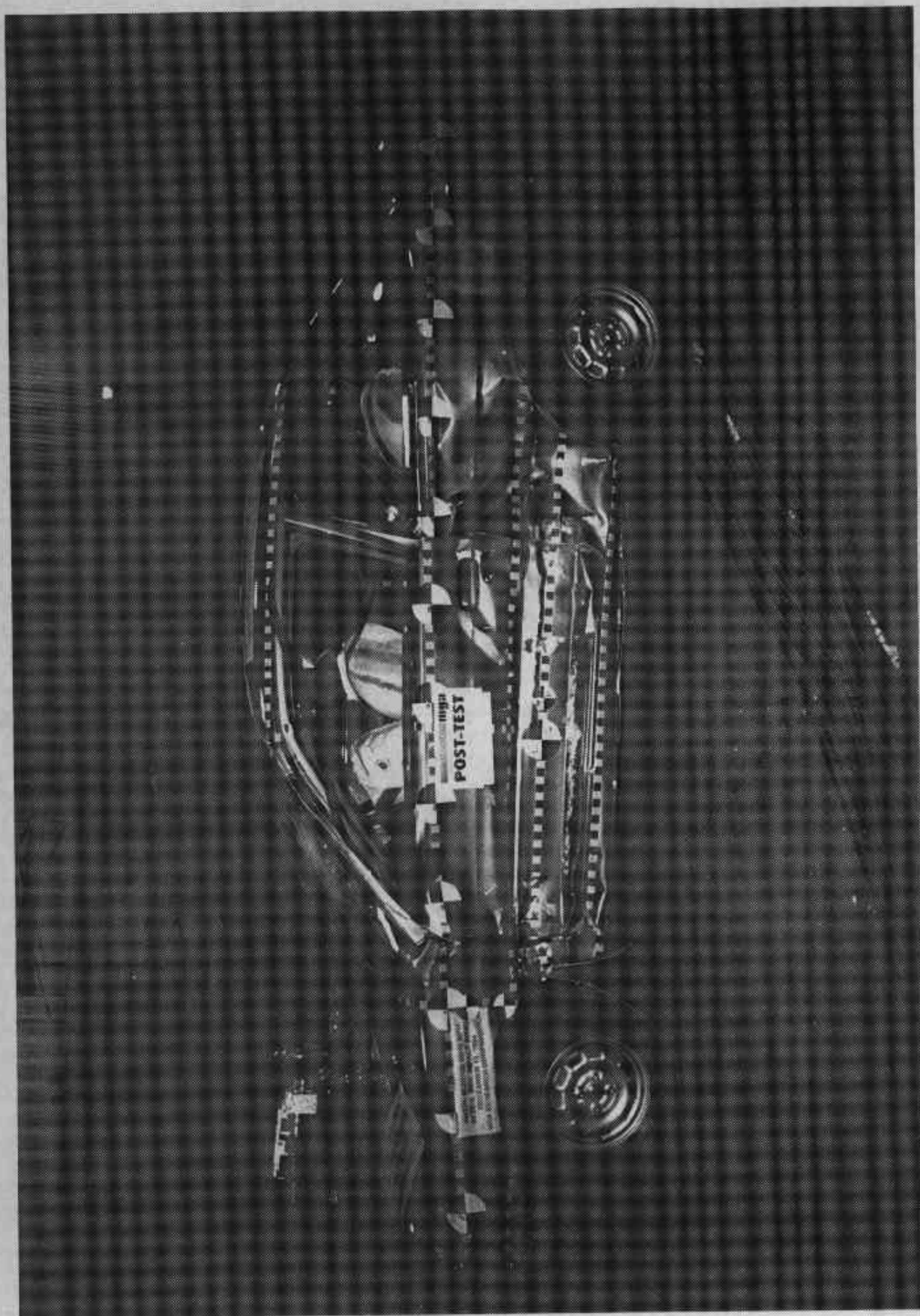


Photo No. A-6 - Post-Test Left Side View of Test Vehicle



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

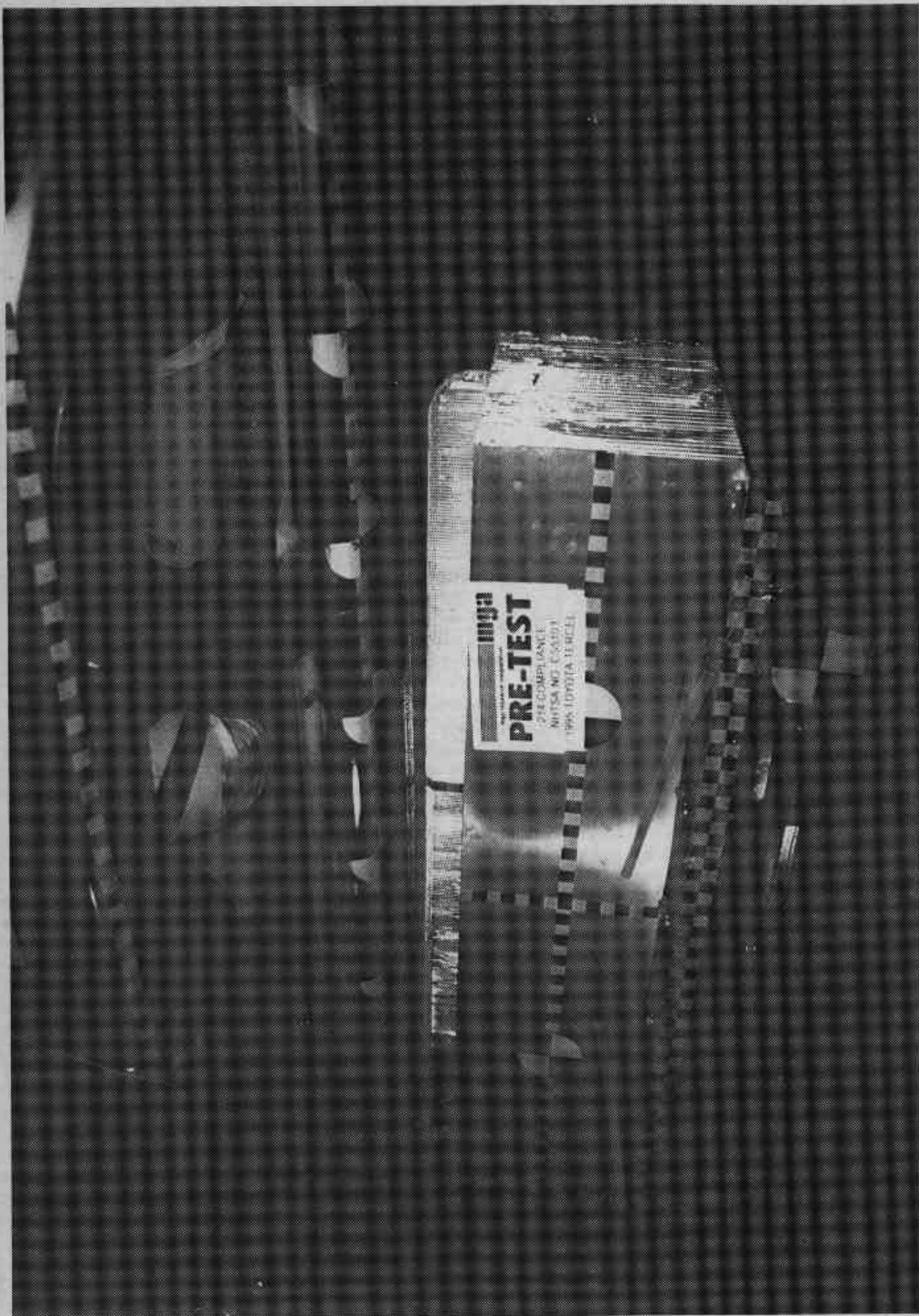
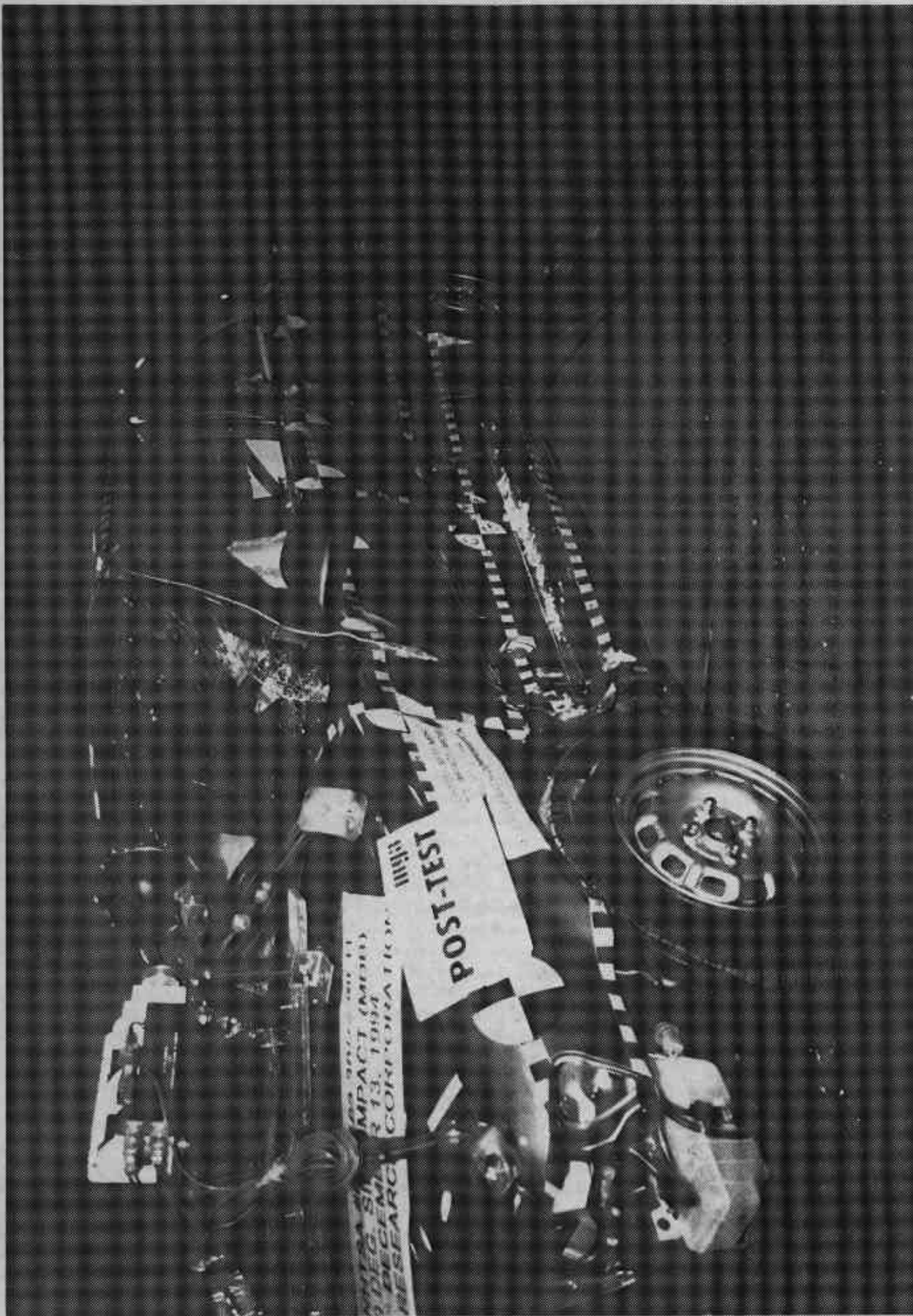


Photo No. A-9 - Pre-Test MDB Position Against Vehicle Overhead View



A-10

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

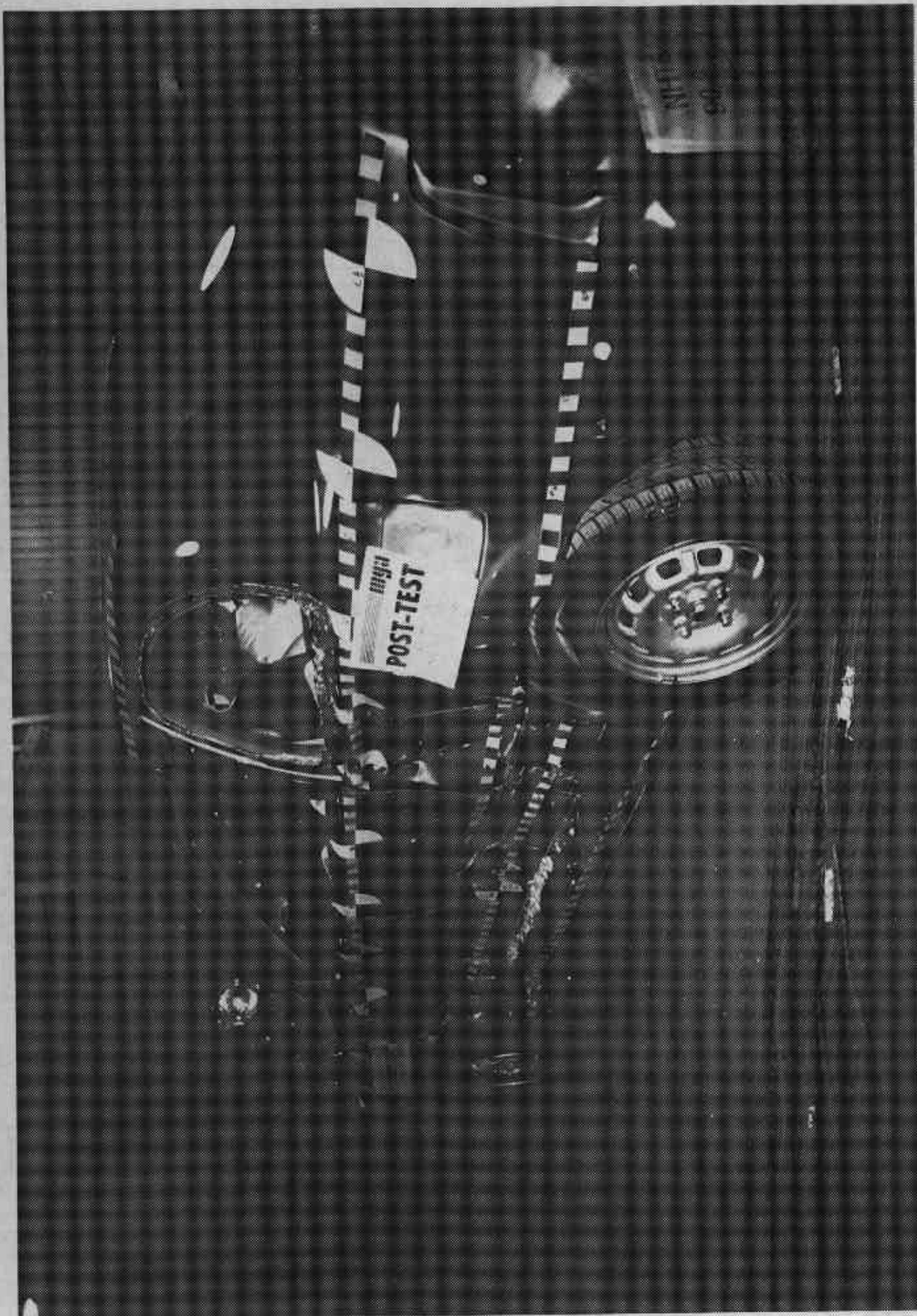
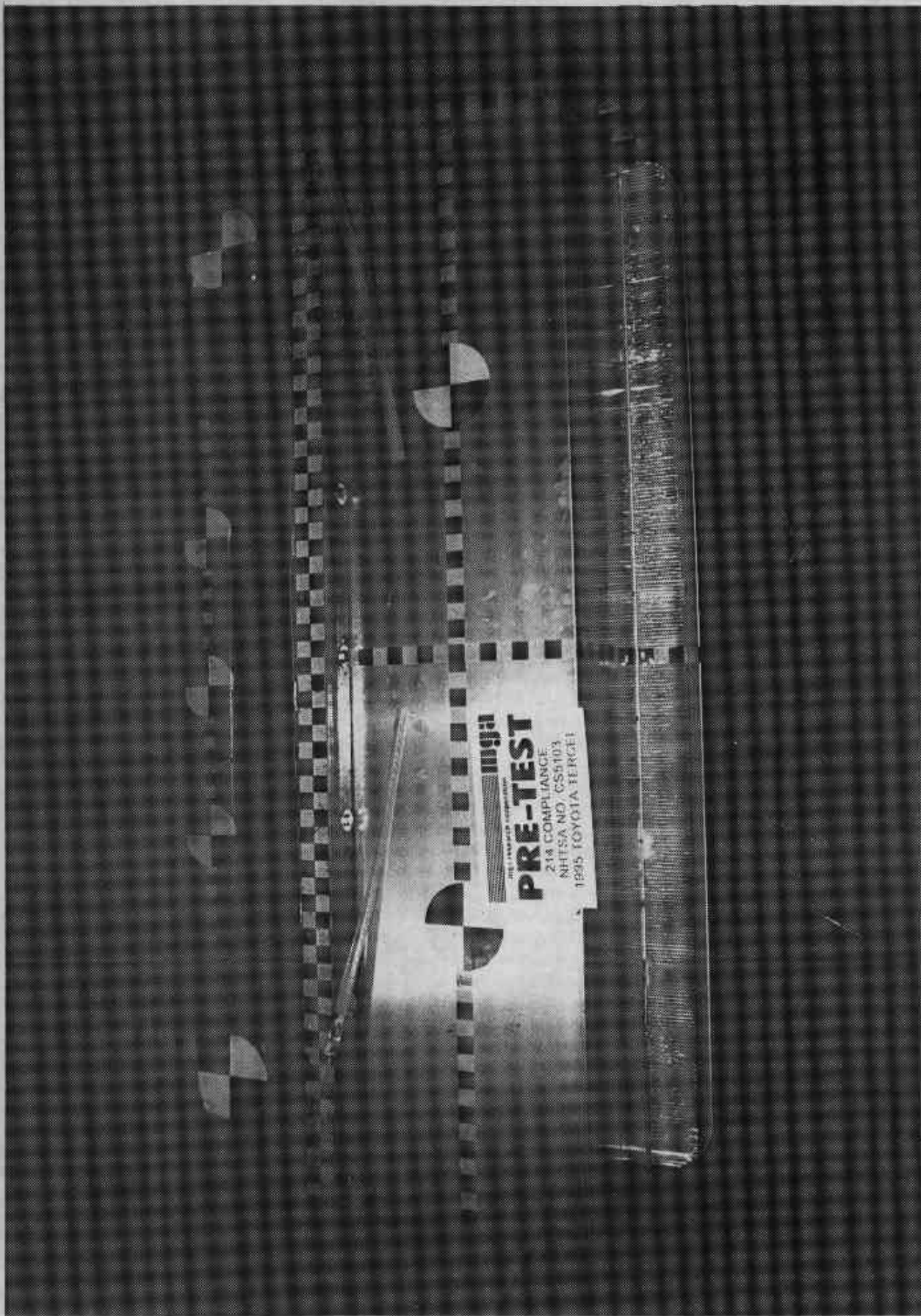
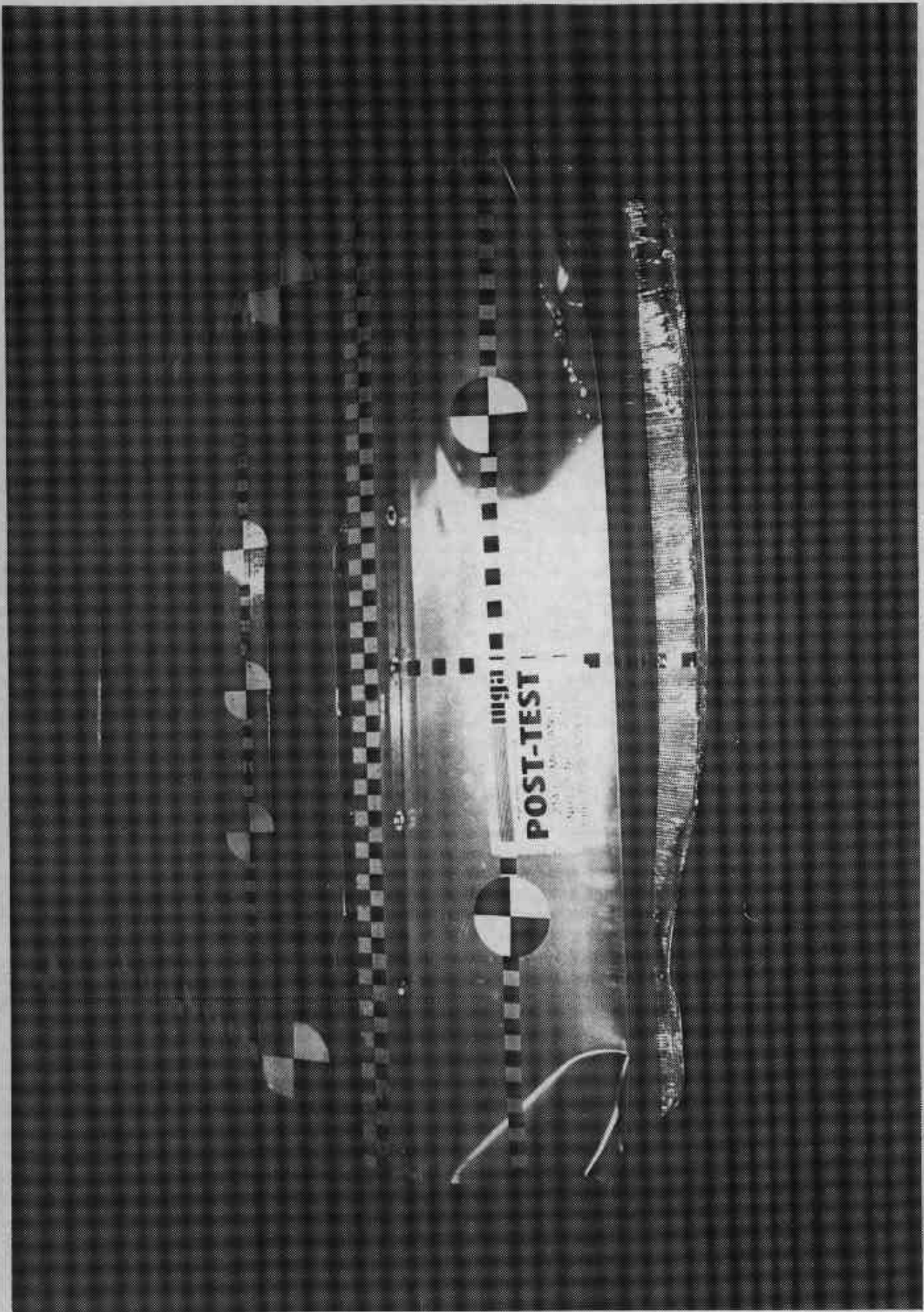


Photo No. A-11 - Post-Test Vehicle Right Side Rear View



A-12

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



A-13

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

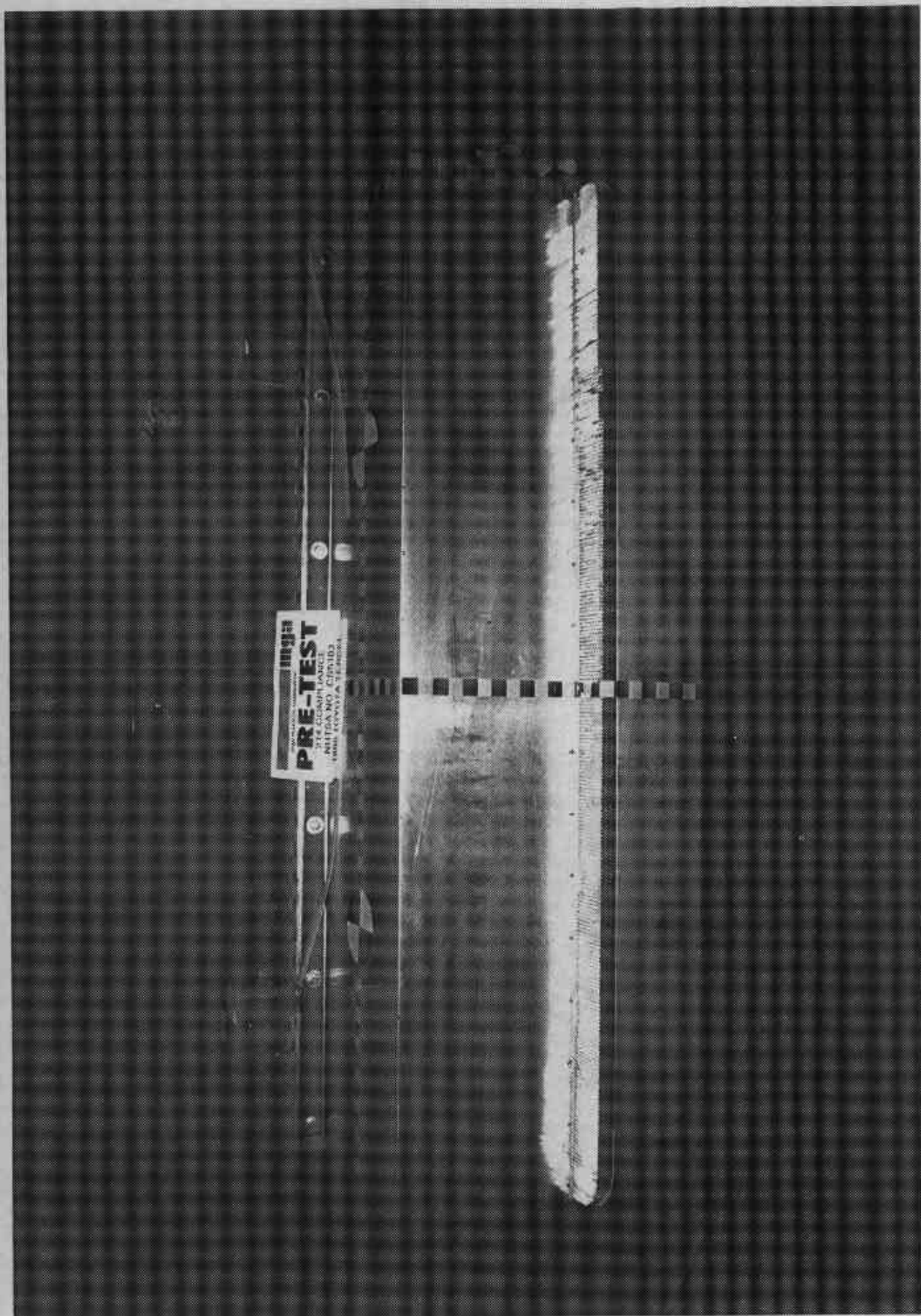


Photo No. A-14 - Pre-Test MDB Front View

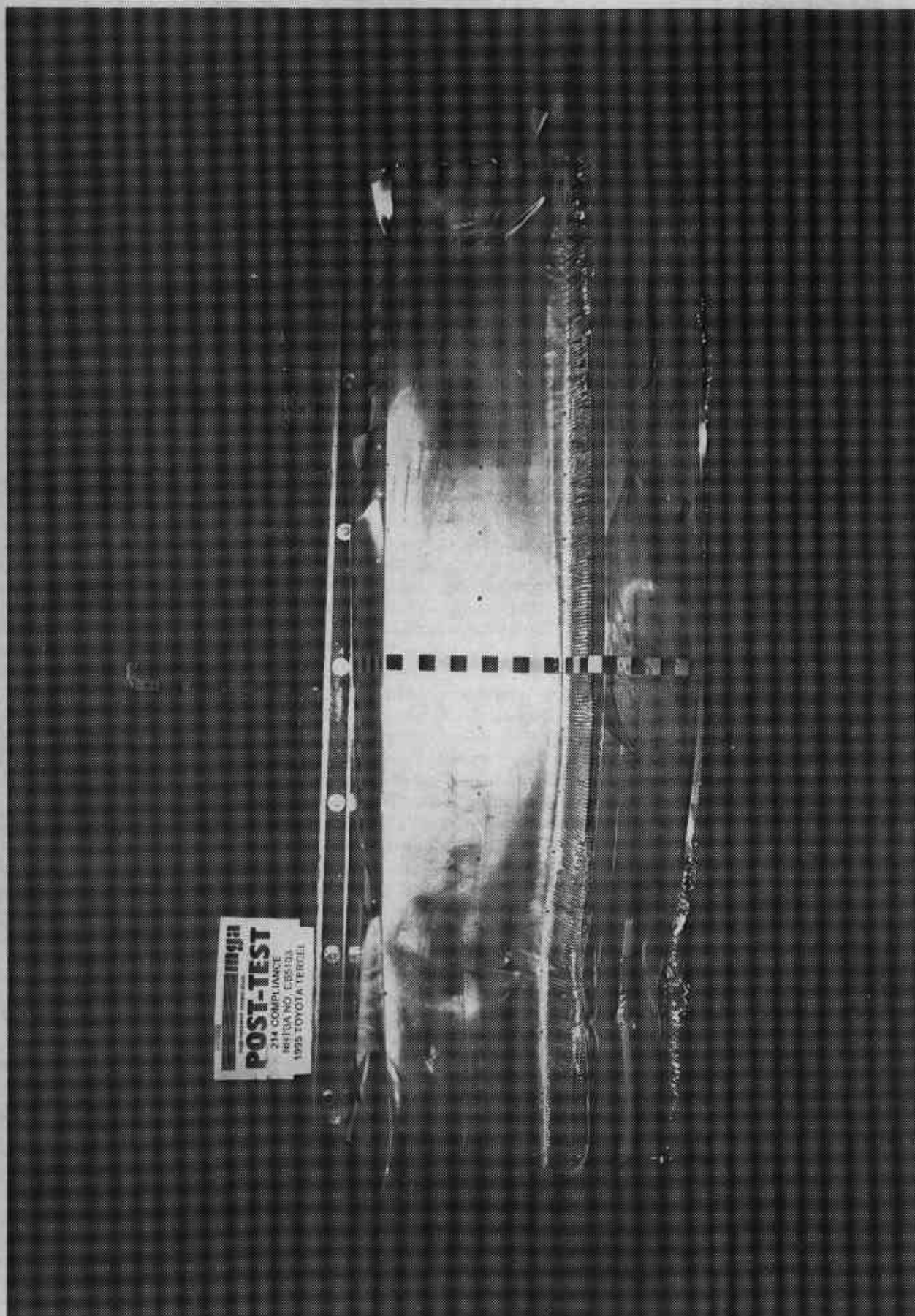


Photo No. A-15 - Post-Test MDB Front View



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

mg
130 Recycle Corporation
POST-TEST
214 COMPLIANCE
NHTSA NO. CS5103
1991 TOYOTA TERCEL

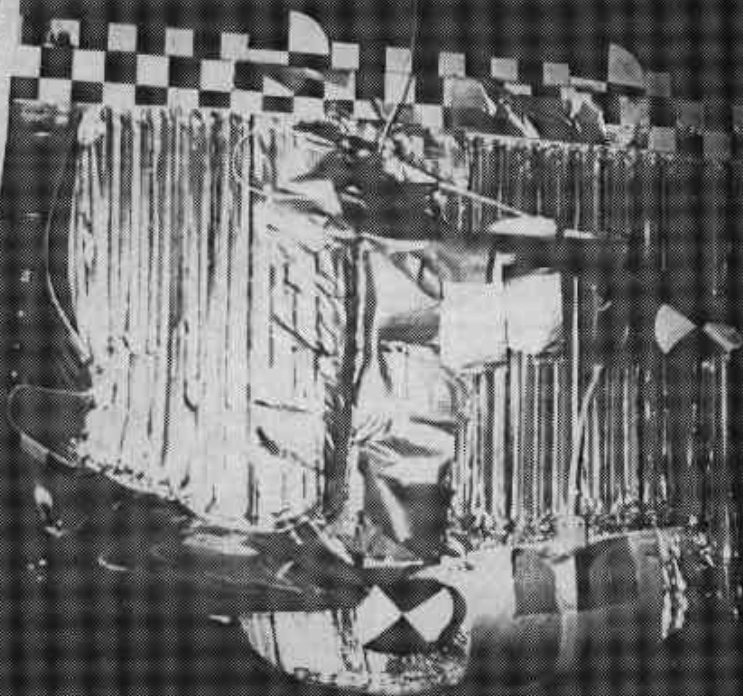


Photo No. A-17 - Post-Test MDB Left Side View

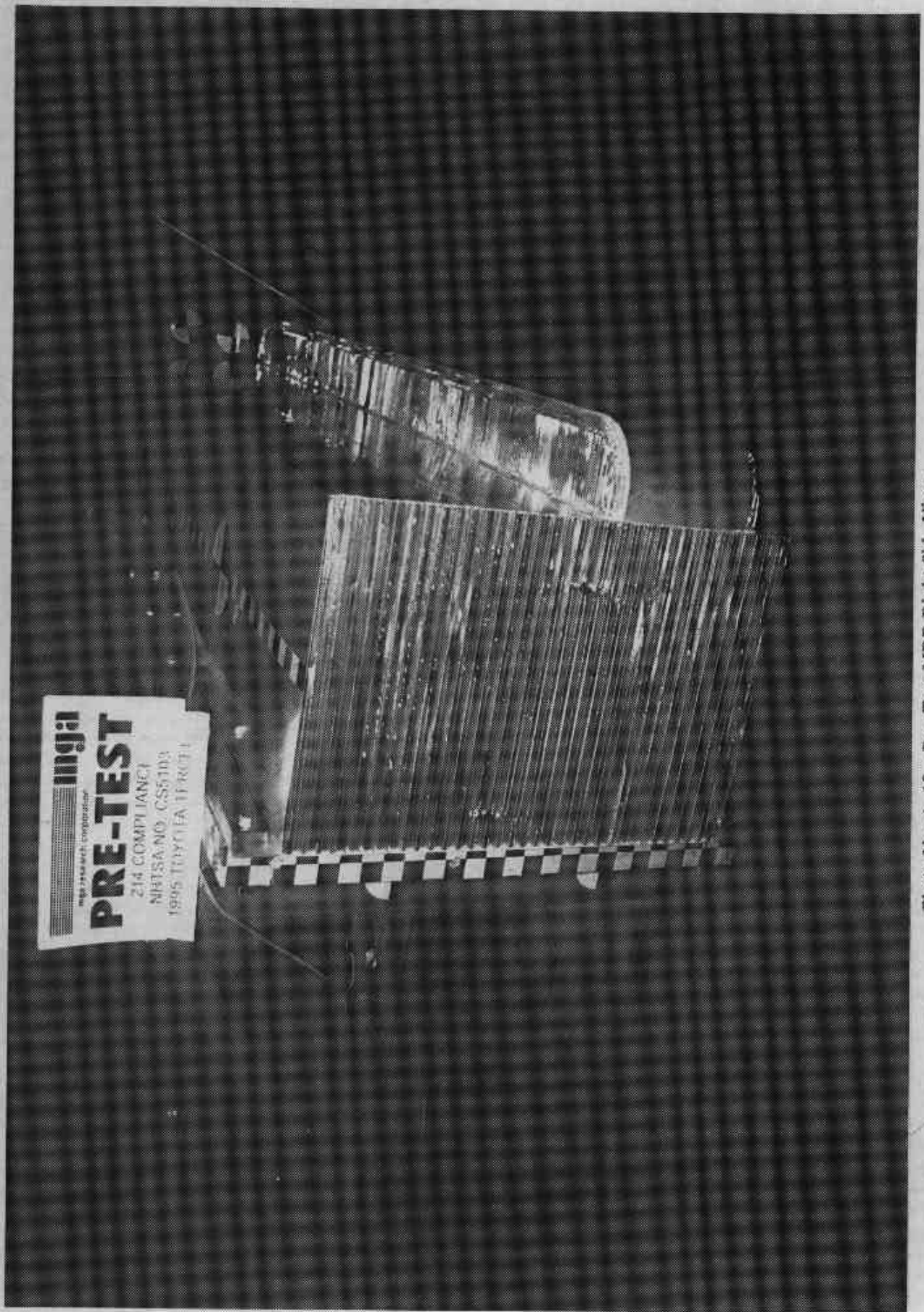


Photo No. A-18 - Pre-Test MDB Right Side View

POST-TEST
214 COMPLIANCE
NIHTSA NO. CS5103
1995 TOYOTA TERCEL

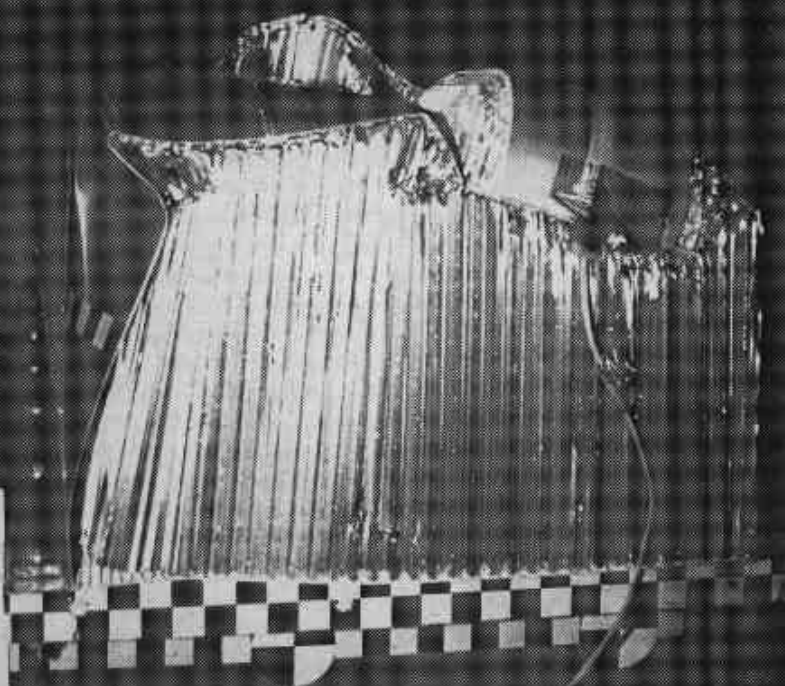


Photo No. A-19 - Post-Test MDB Right Side View



Photo No. A-2B - Post-Test Vehicle Overhead View

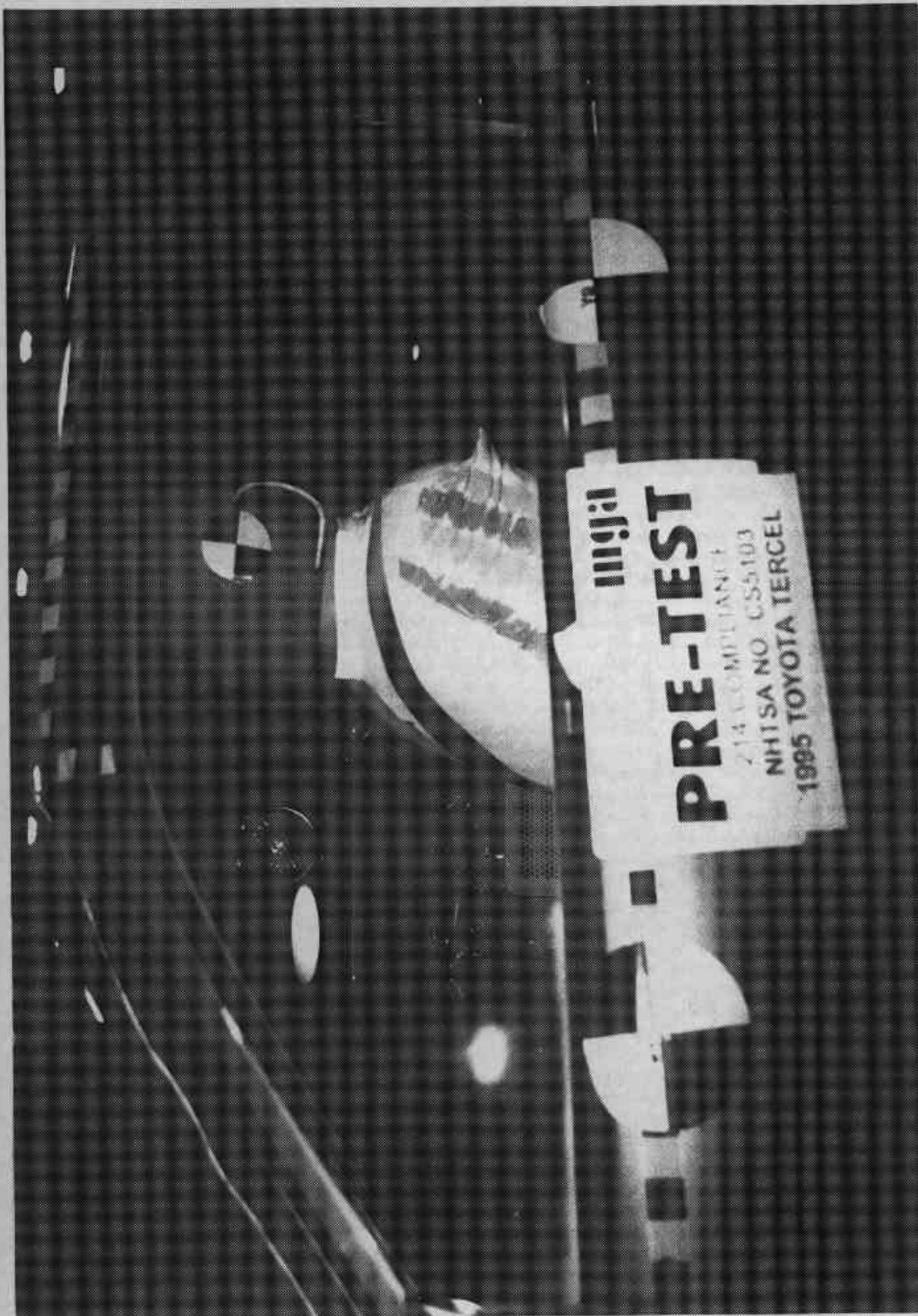


Photo No. A-21 - Pre-Test Driver Dummy Right Side View

A-21

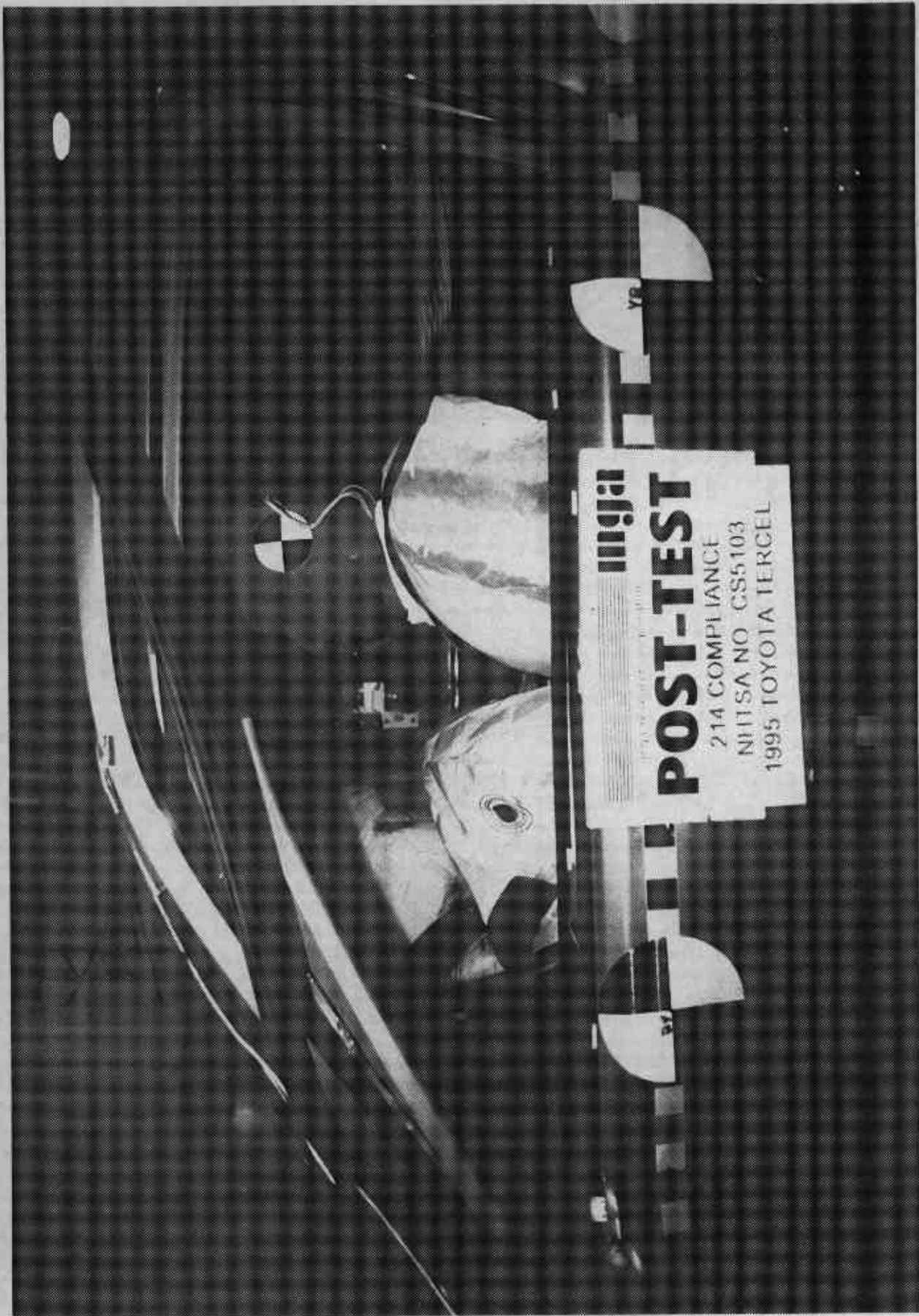


Photo No. A-22 - Post-Test Driver Dummy Right Side View



A-23

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



A-24

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

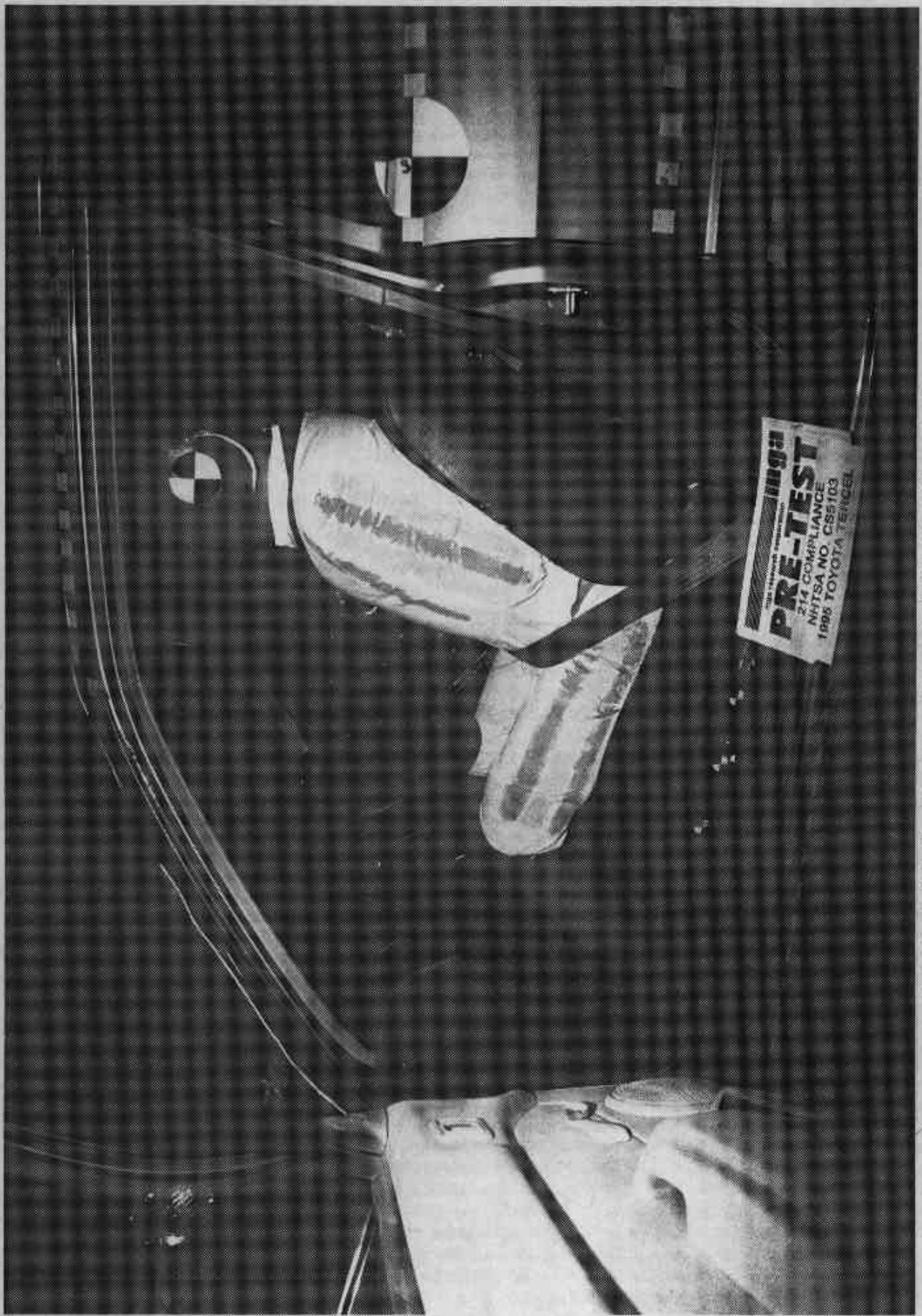


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)

A-25

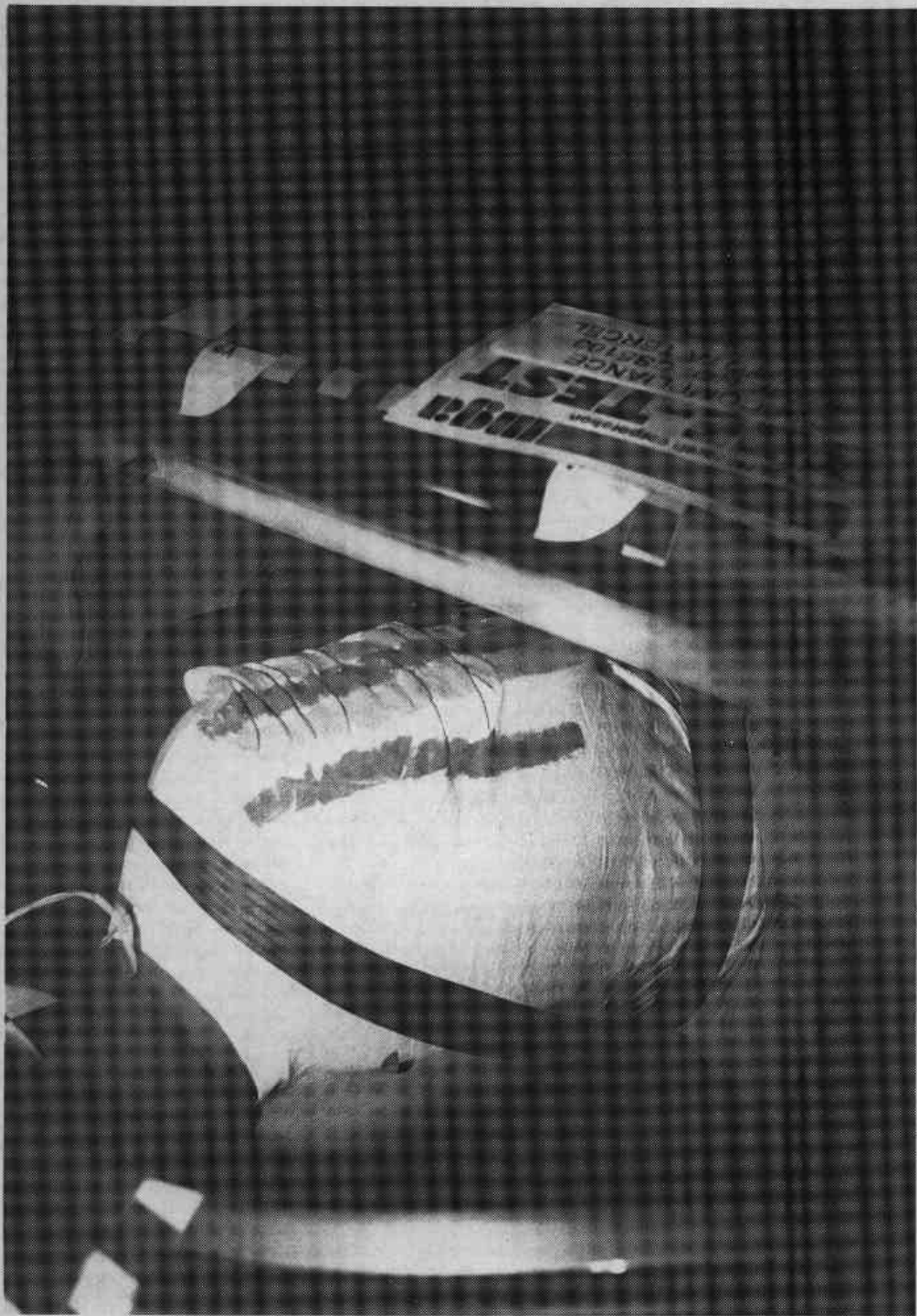


Photo No. A-26 - Pre-Test Driver Dummy Shoulder and Door Top View

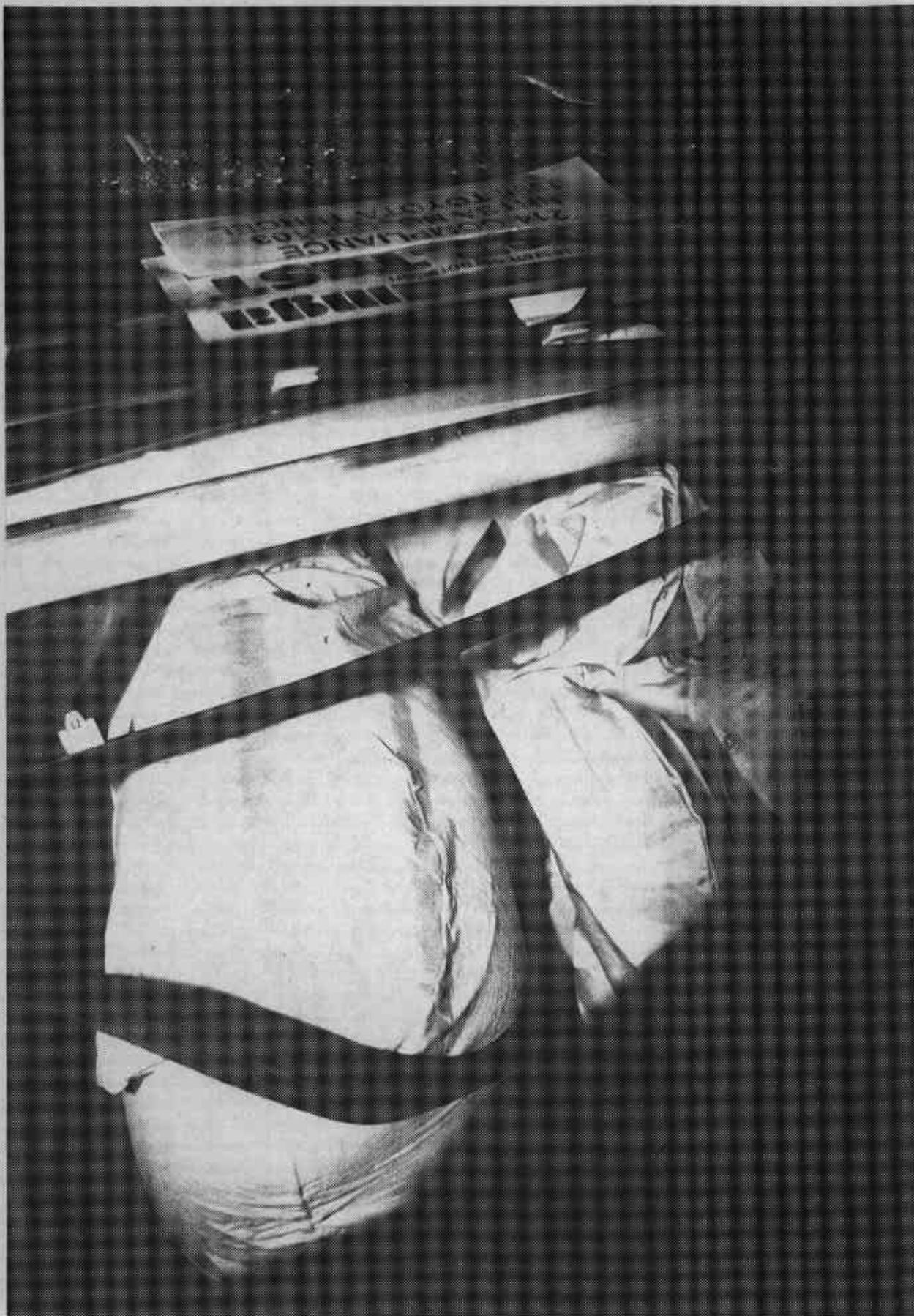


Photo No. A-27 - Post-Test Driver Dummy Shoulder and Door Top View

A-27

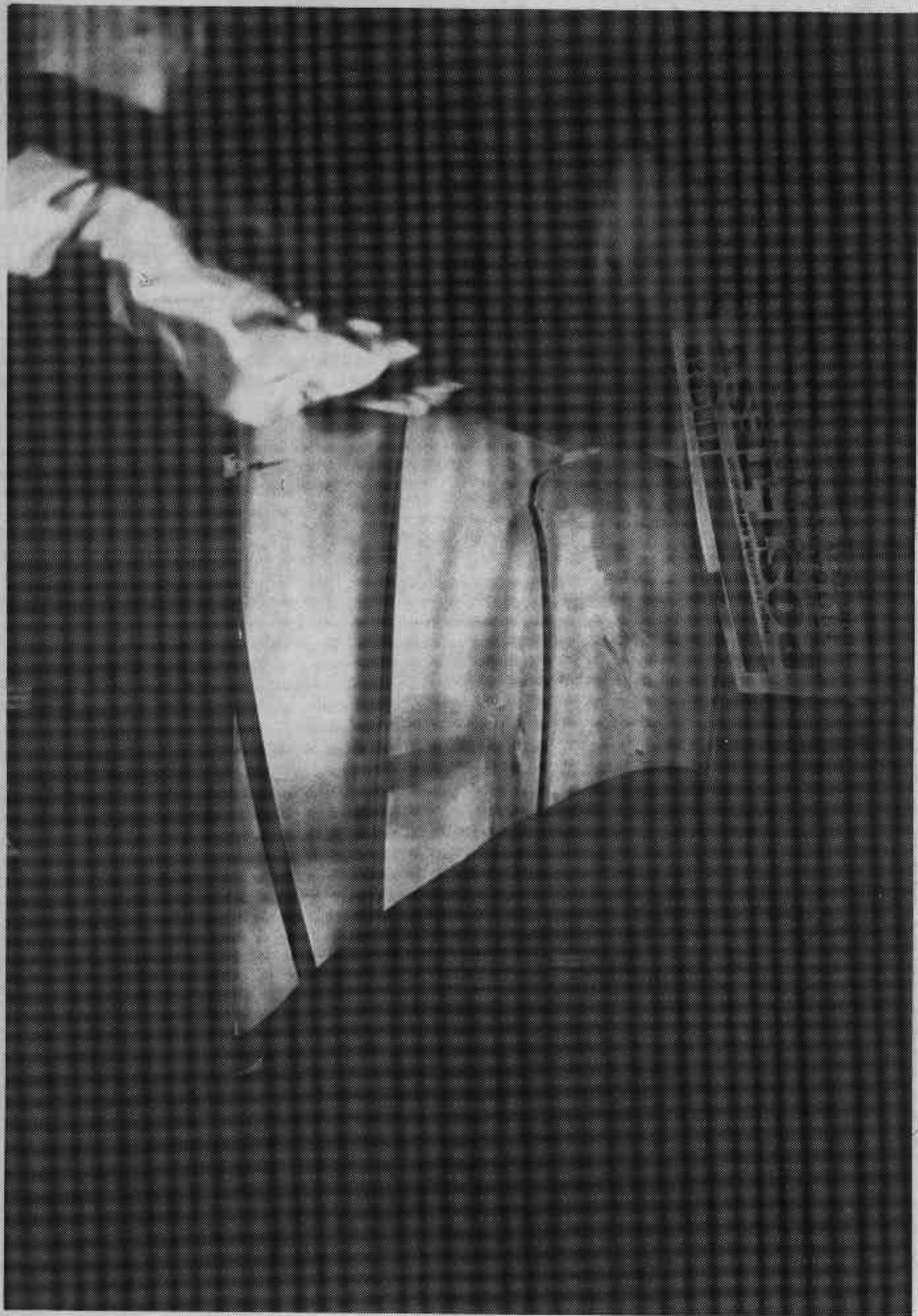


Photo No. A-28 - Post-Test Driver Dummy Contact

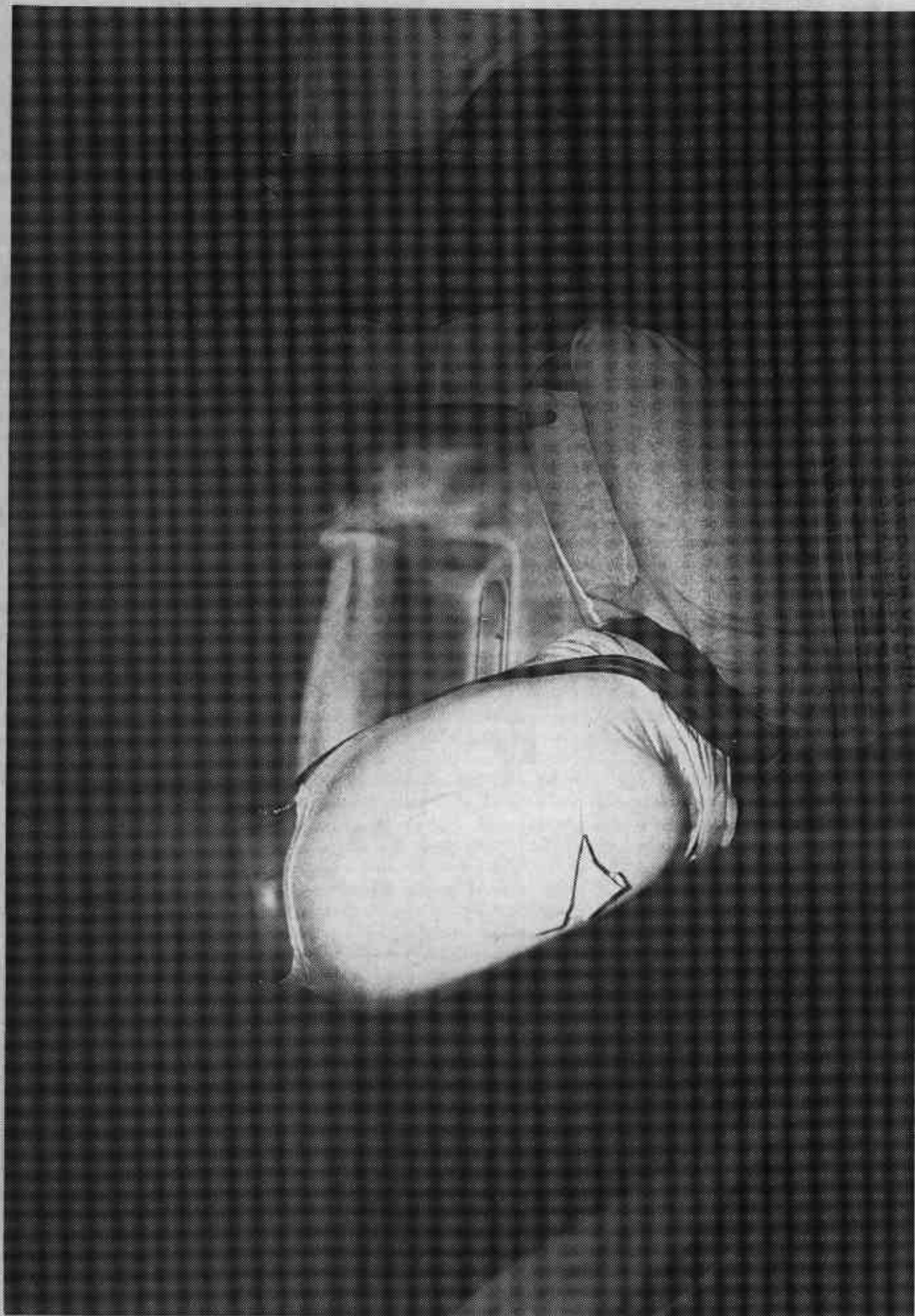


Photo No. A-29 - Pre-Test Passenger Dummy Right Side View

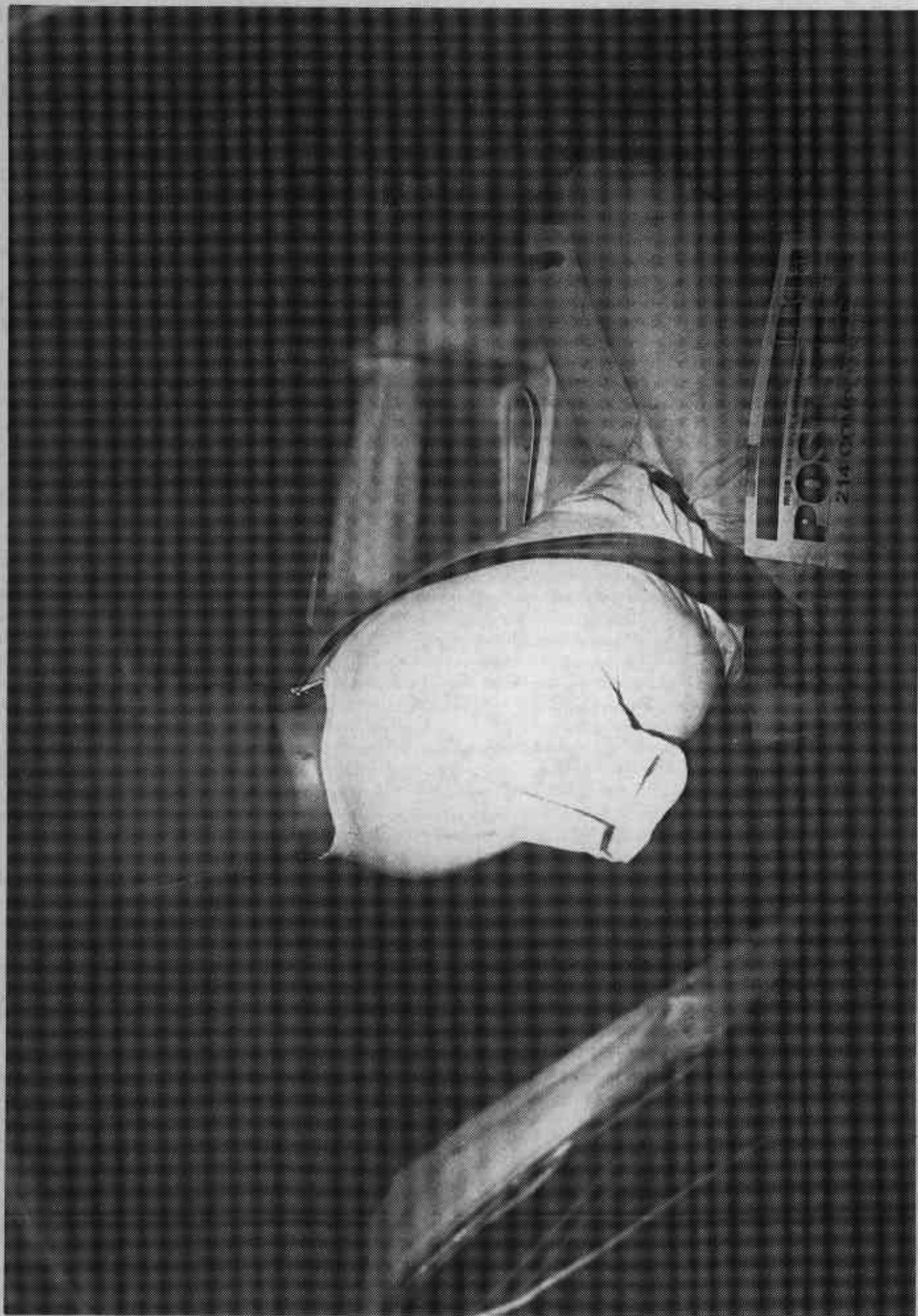


Photo No. A-38 - Post-Test Passenger Dummy Right Side View

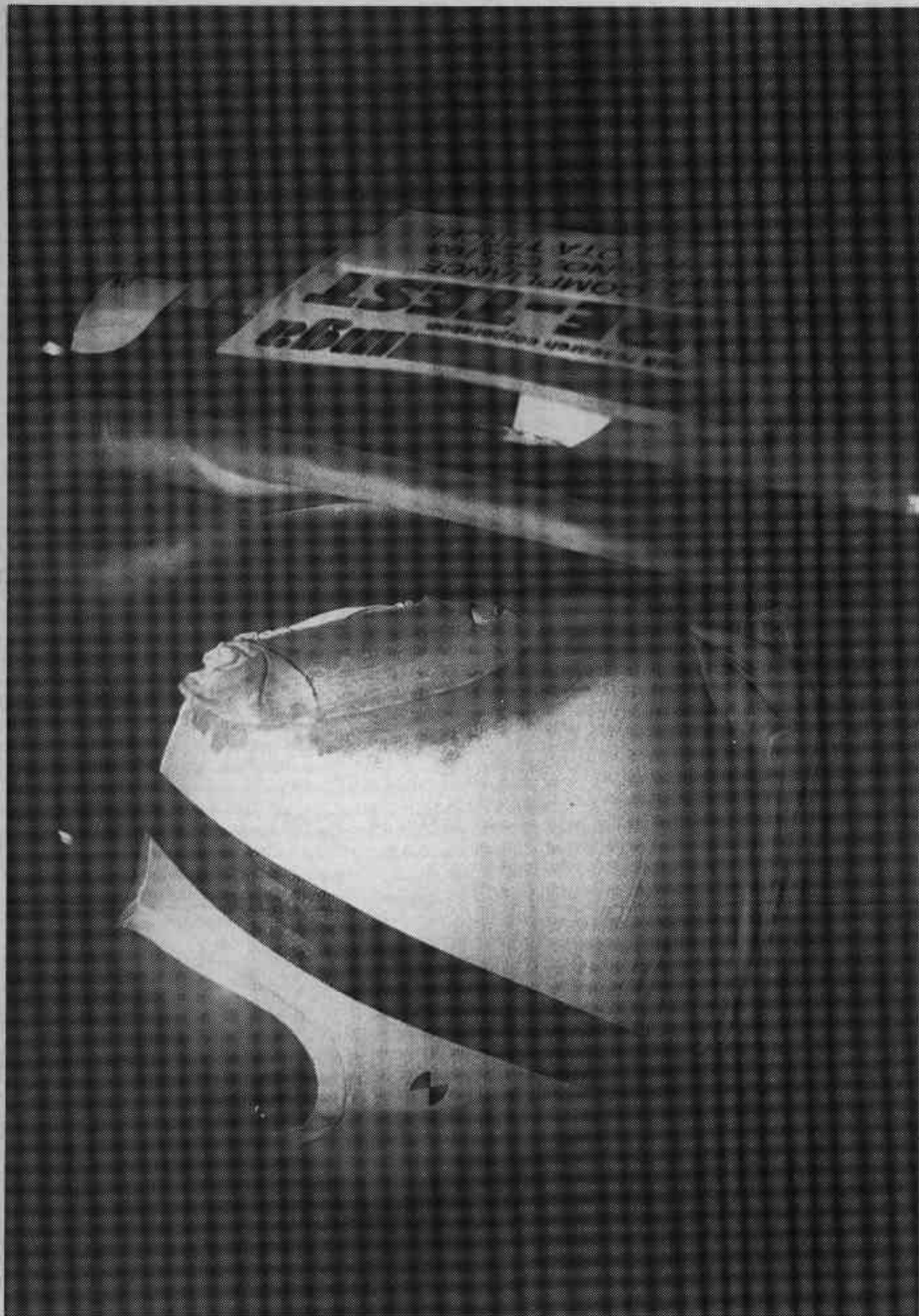
A-30



Photo No. A-31 - Pre-Test Passenger Dummy Left Side View

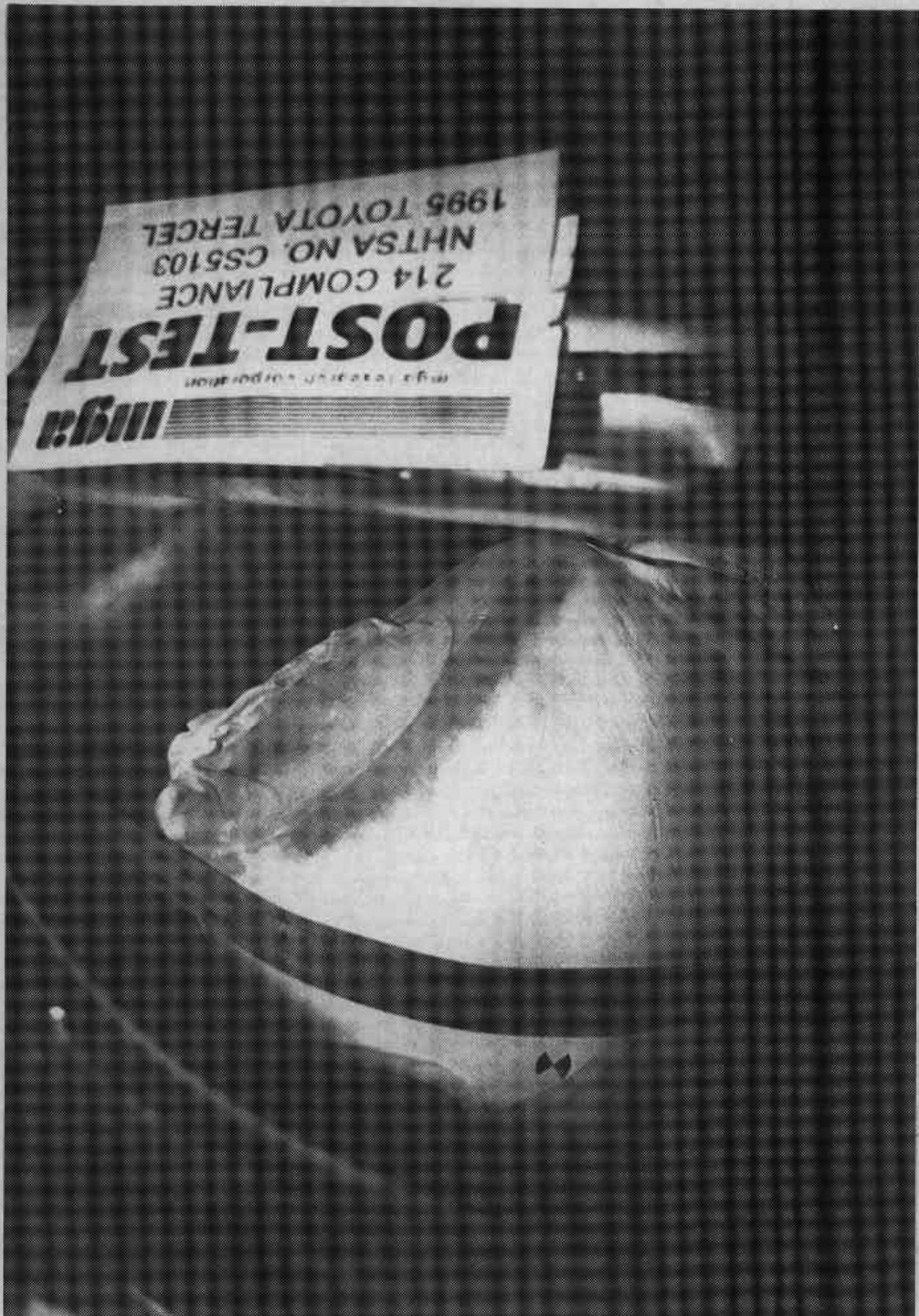


Photo No. A-32 - Post-Test Passenger Dummy Left Side View



A-33

Photo No. A-33 - Pre-Test Passenger Dummy Shoulder and Door Top View



A-34

Photo No. A-34 - Post-Test Passenger Dummy Shoulder and Door Top View



Photo No. A-35 - Post-Test Passenger Dummy Contact

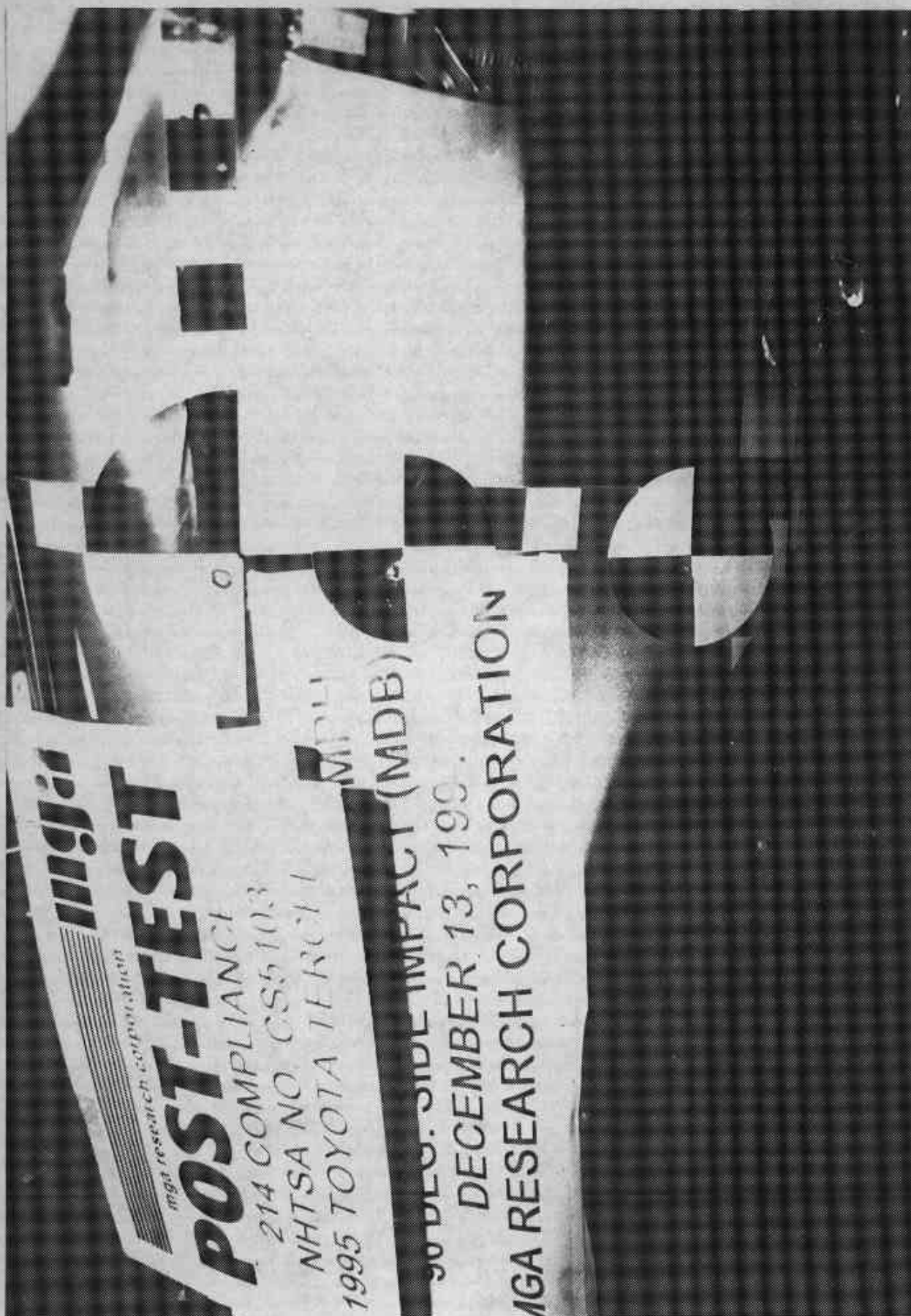


Photo No. A-36 - Left Front Impact Point on Vehicle

* MFD BY TOYOTA MOTOR CORPORATION 09/84
 GWR 2850LB GMA 1550LB RX 1550LB
 THIS VEHICLE CONFORMS TO ALL APPLICABLE
 FEDERAL MOTOR VEHICLE SAFETY STANDARDS AND
 THEFT PREVENTION STANDARDS IN EFFECT ON
 THE DATE OF MANUFACTURE SHOWN ABOVE
 VIN: JTEG2237 2E65004314 PASS CAR

07/11/2004
 APRI-GIA-GLA1 MADE IN JAPAN

800-355-5555

Photo No. A-37 - Vehicle Certification Label

VEHICLE	CAPACITY	WEIGHT (lbs)	775
DESIGNATED SEATING	CAPACITY TOTAL	5 (FRONT SEAT)	
RECOMMENDED	TIRE SIZE	155SR13	
RECOMMENDED COLD TIRE INFLATION PRESSURES (psi)			
VEHICLE - LONG			
VEHICLE - SHORT			
VEHICLE - CAPACITY WEIGHT	FRONT	30	REAR 32
SPARE			
TIRE			
RECOMMENDED TIRE SIZE (WITH MAXIMUM LOAD)	155SR13		
RECOMMENDED TIRE INFLATION PRESSURE (psi)	30		
RECOMMENDED TIRE INFLATION PRESSURE (psi)	32		

Photo No. A-38 - Tire Placard



Photo No. A-39 - Impact

A-39



Photo No. A-48 - Rollover 98°

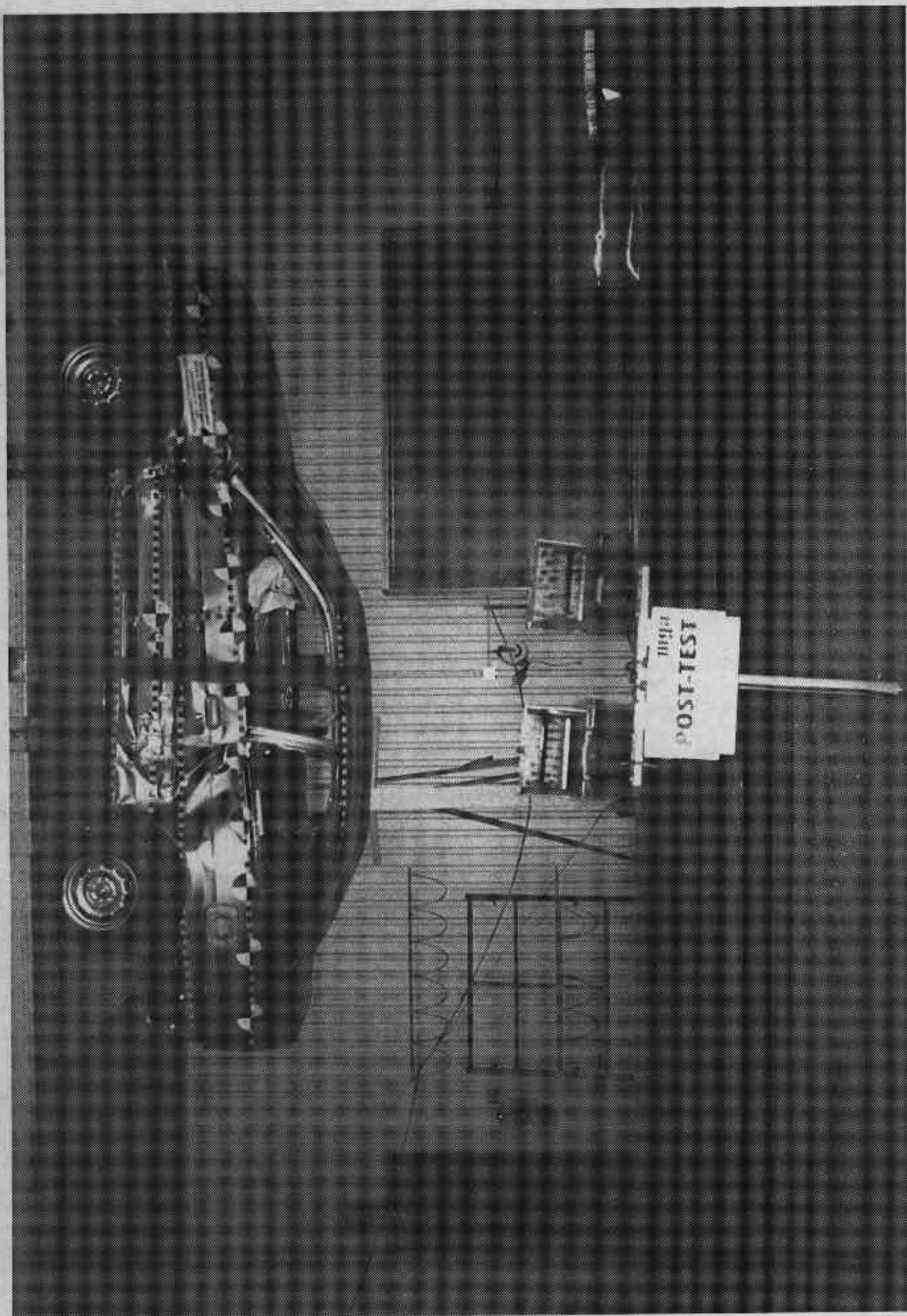


Photo No. A-41 - Rollover 180°



Photo No. A-42 - Rollover 27g°

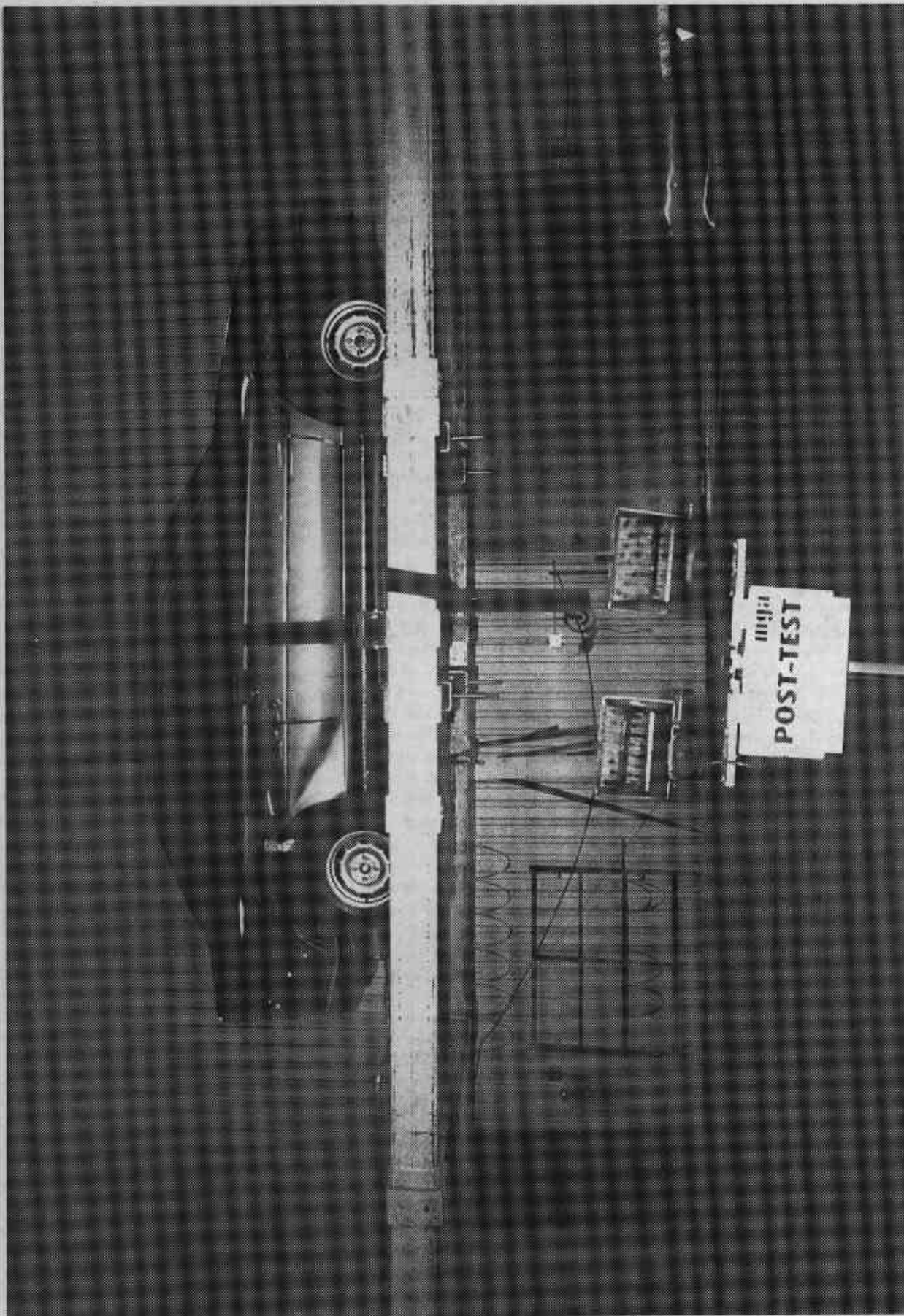


Photo No. A-43 - Rollover 360°

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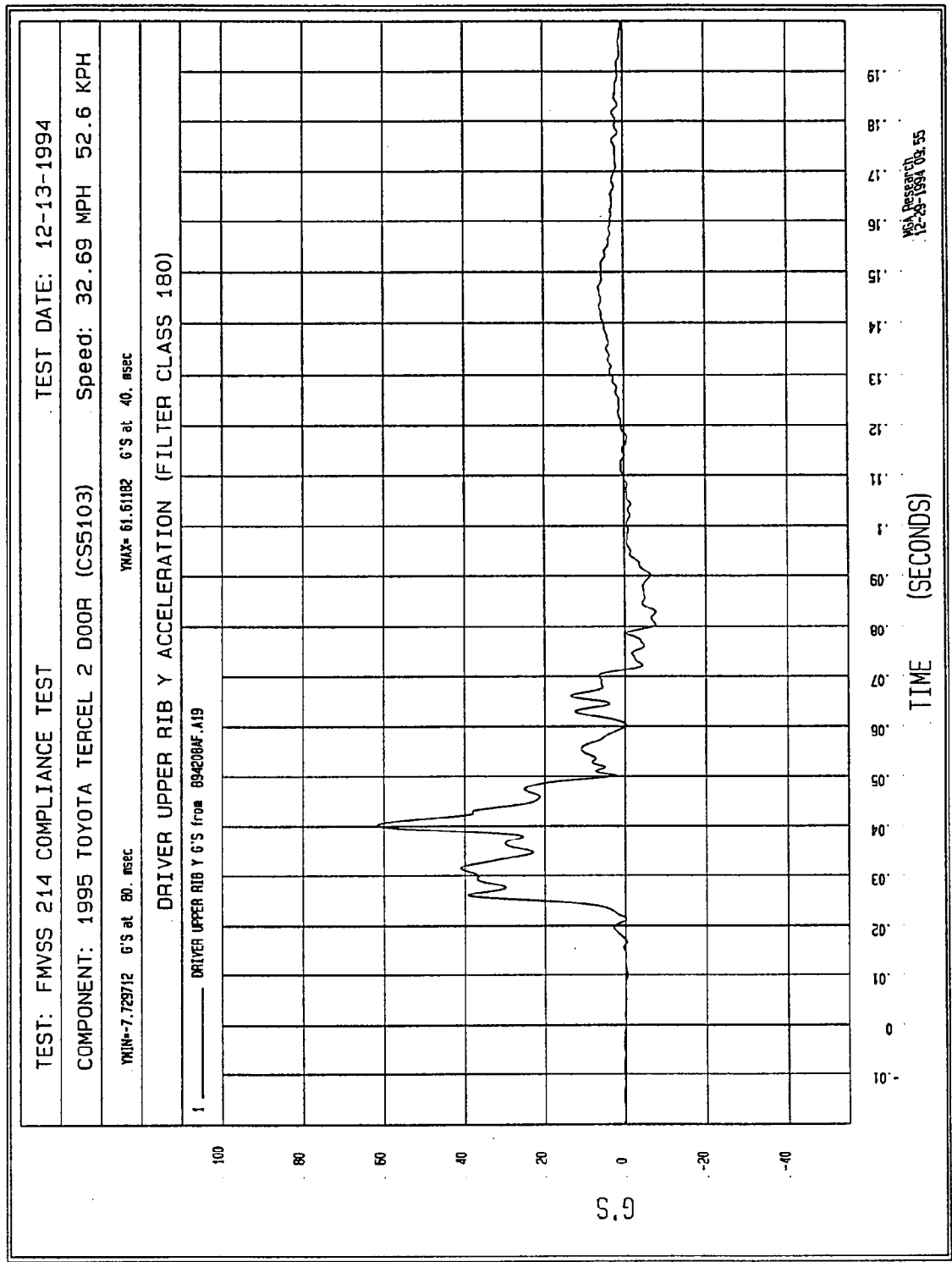


Figure B-1 - Driver Upper Rib Y Acceleration vs. Time

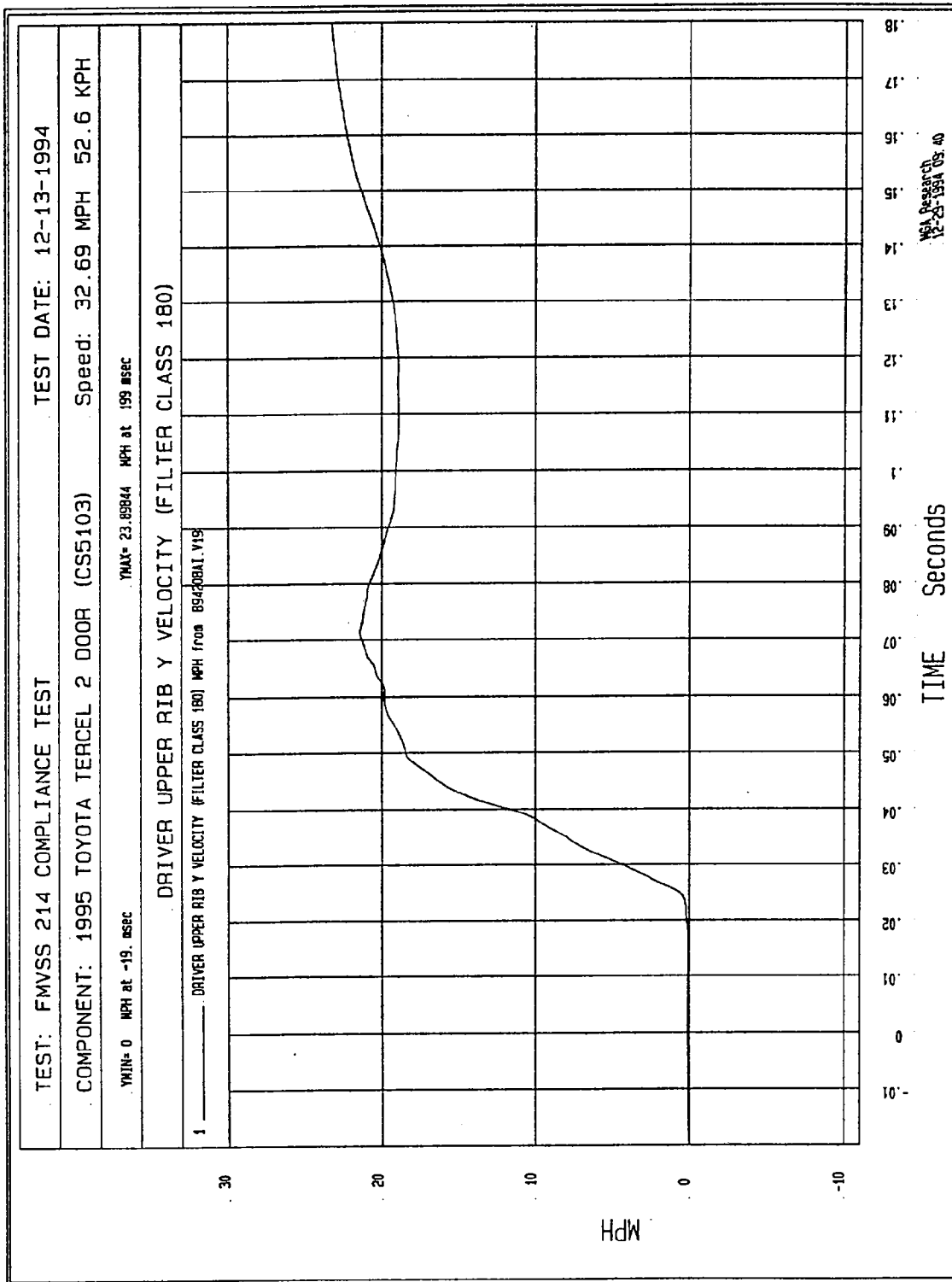
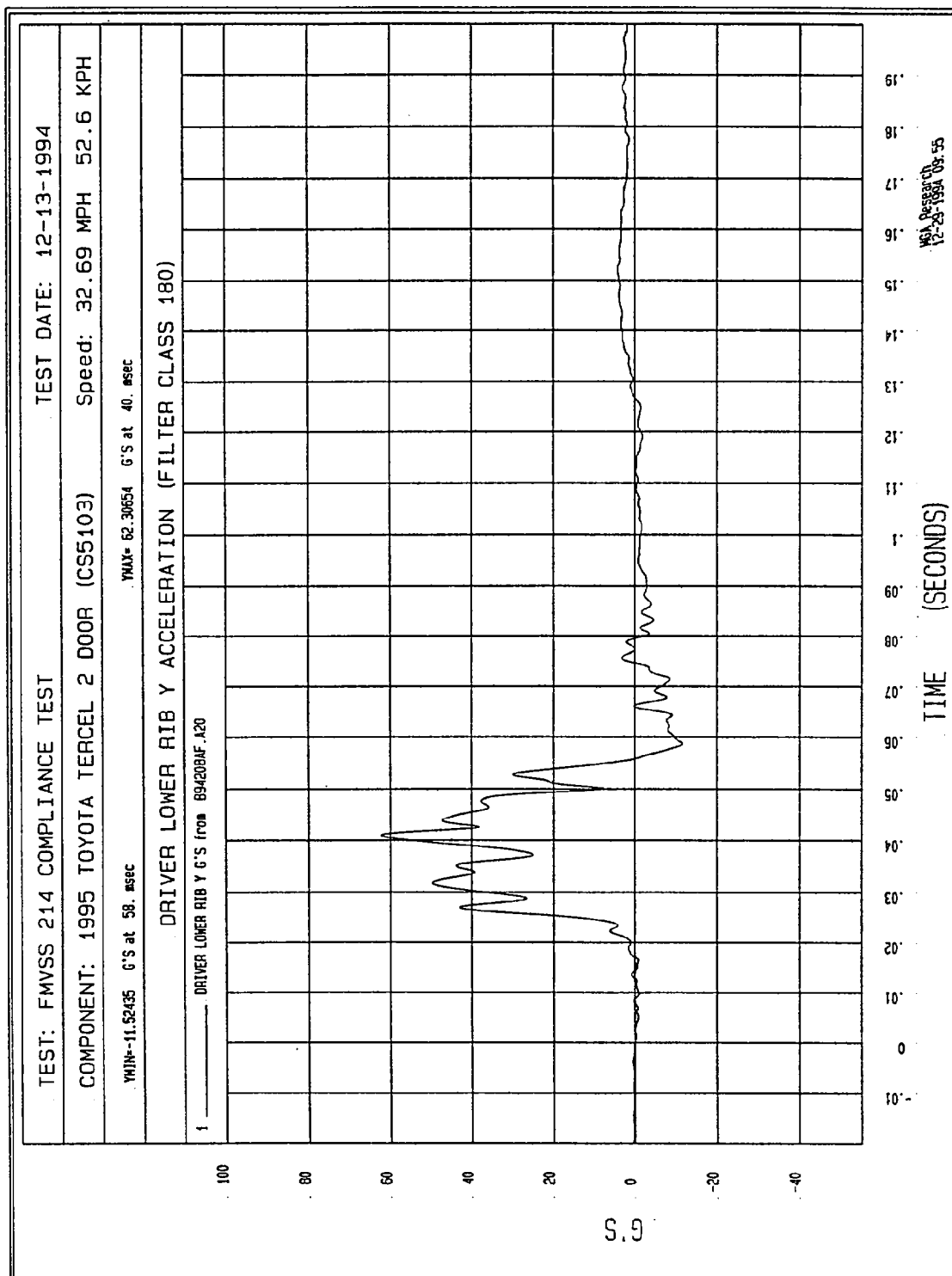


Figure B-2 - Driver Upper Rib Y Velocity vs. Time



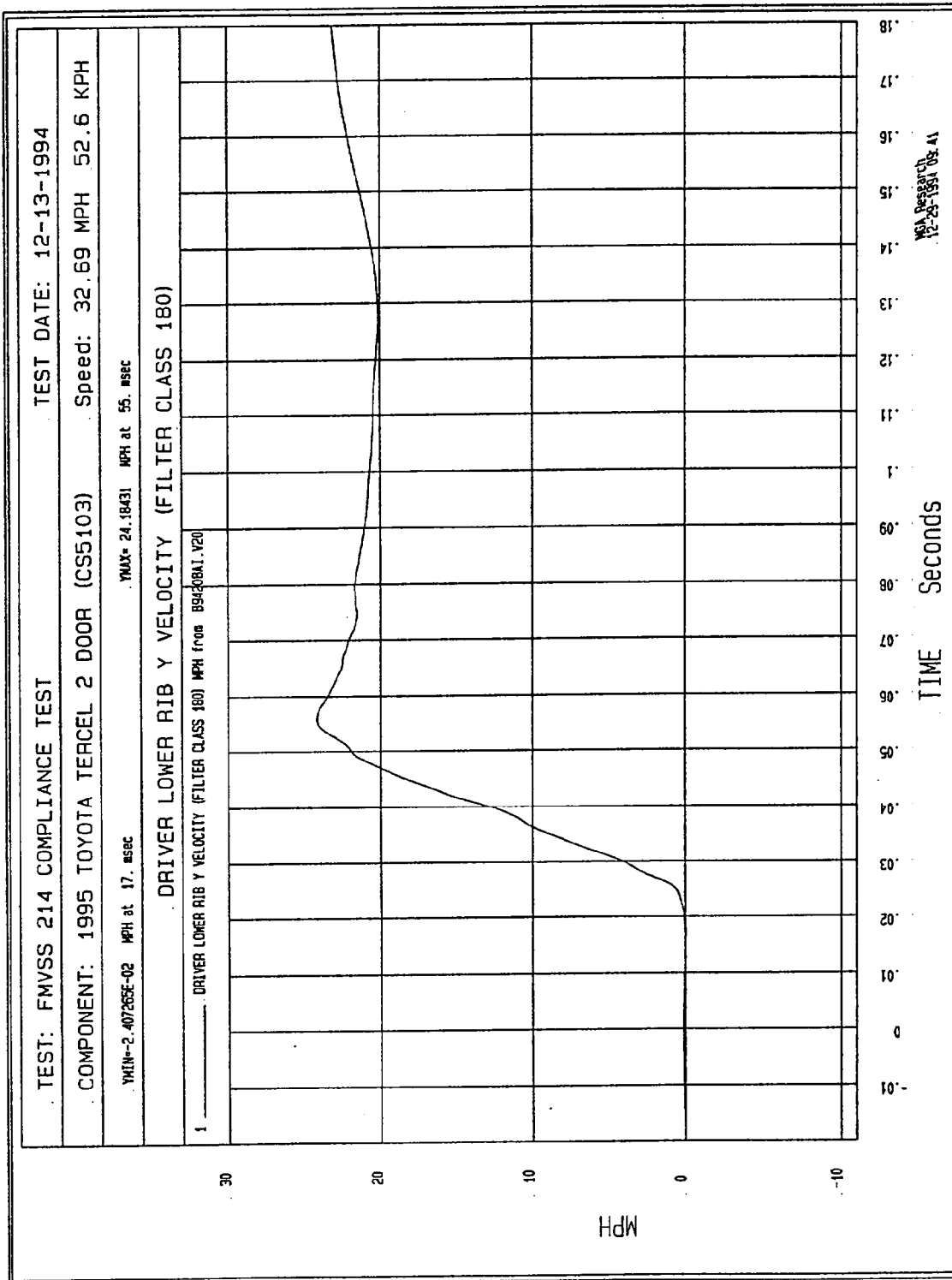


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

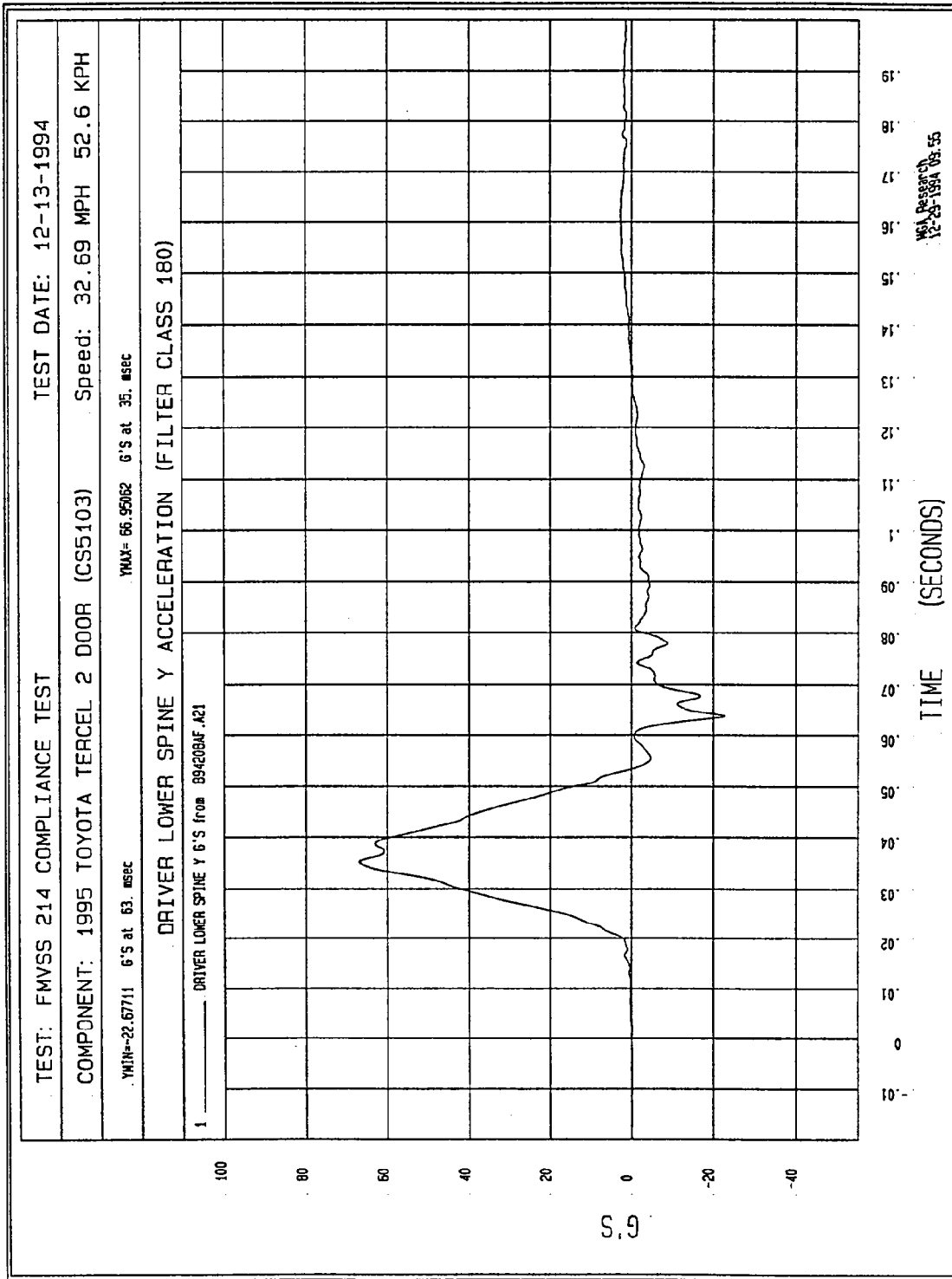


Figure B-5 - Driver Lower Spine Y Acceleration vs. Time

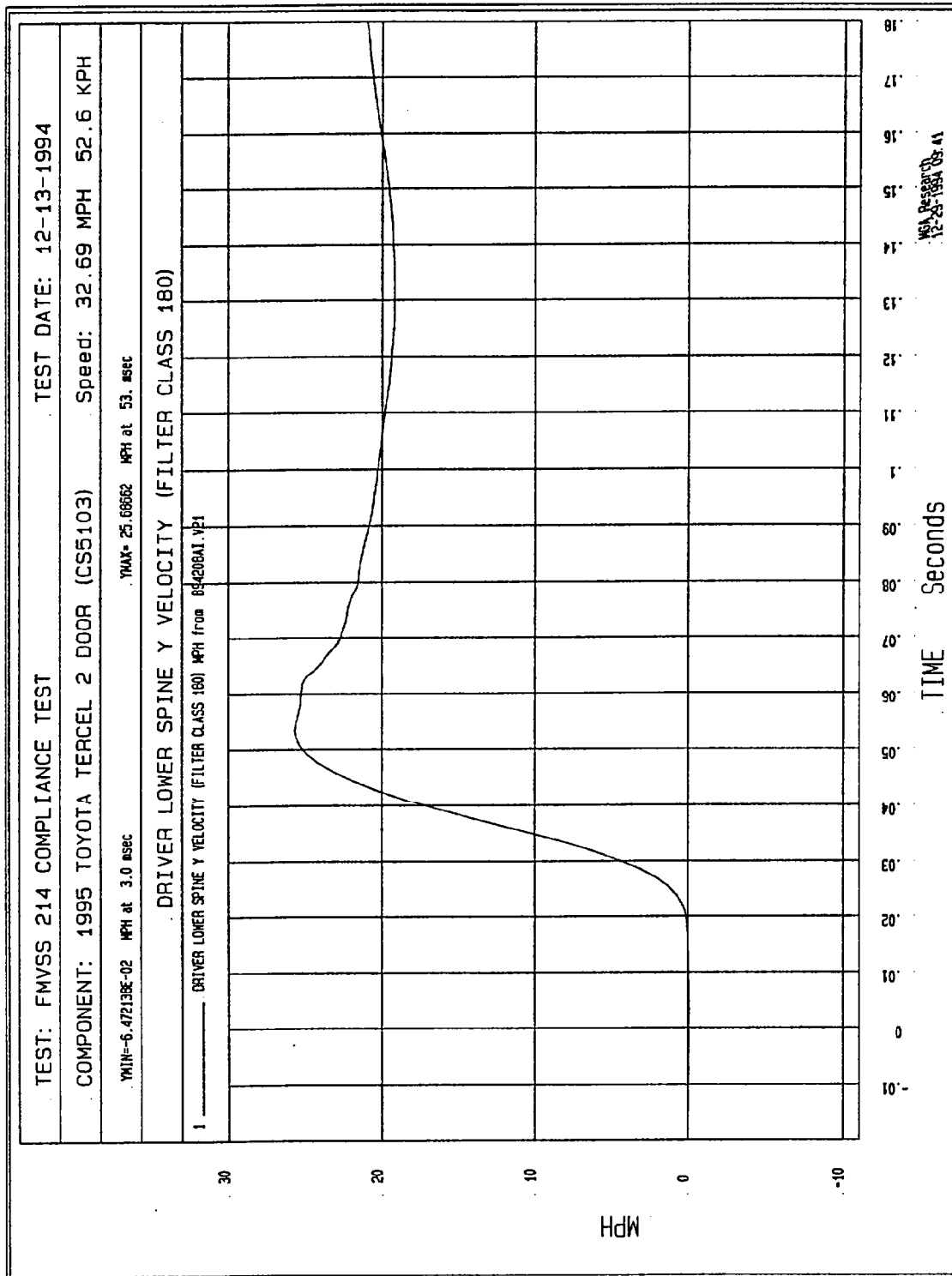


Figure B-6 - Driver Lower Spine Y Velocity vs. Time

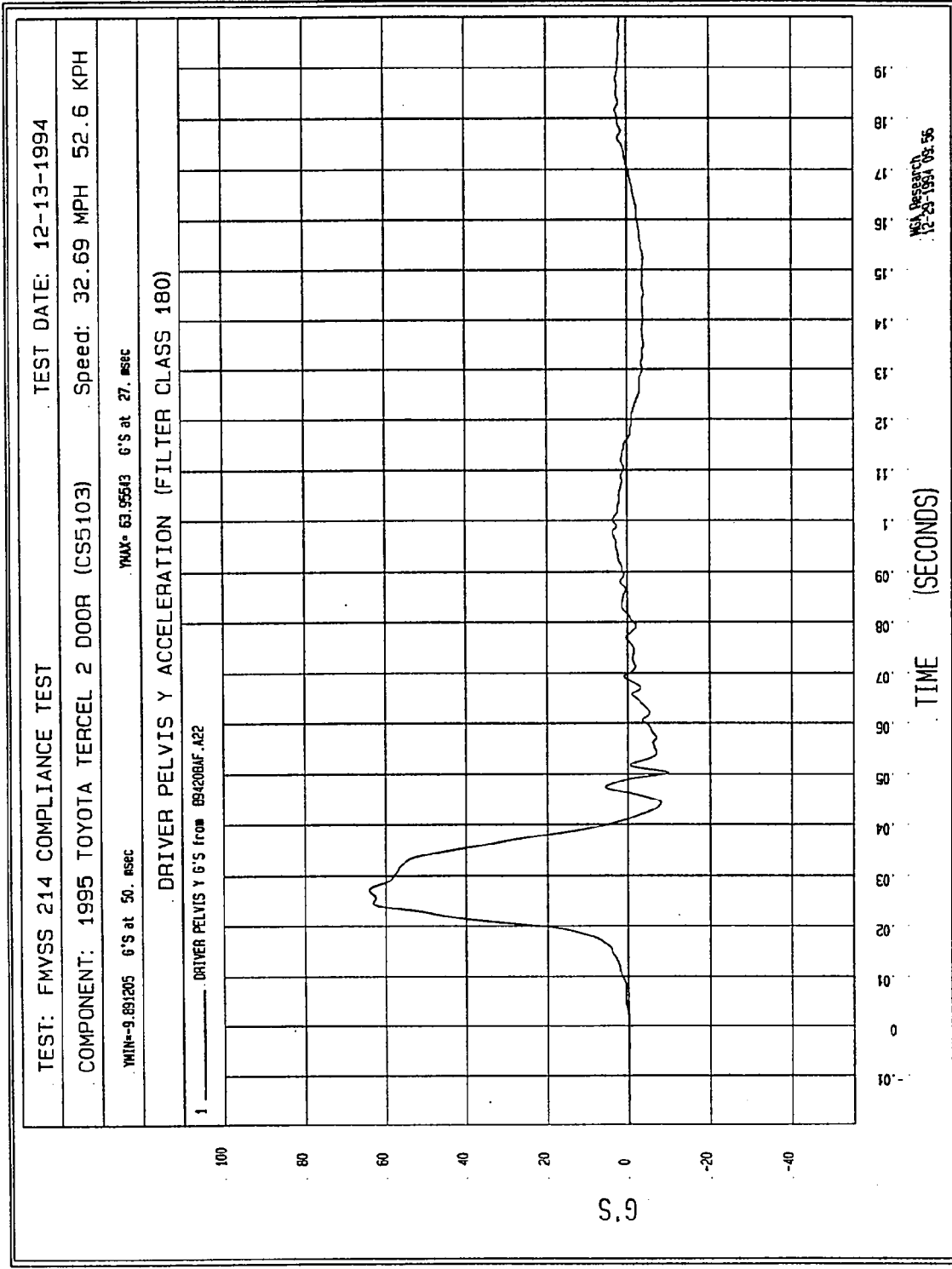


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

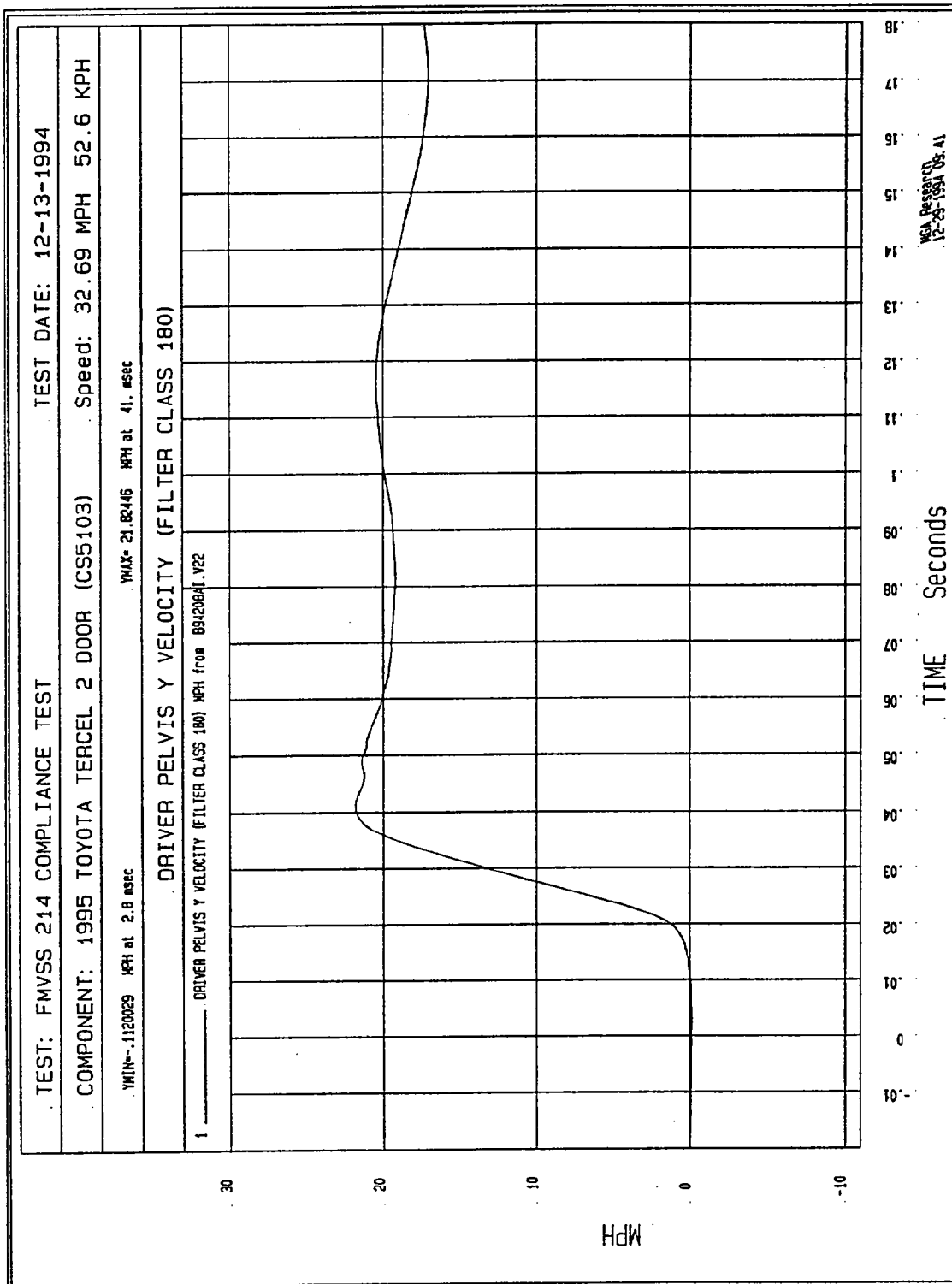


Figure B-8 - Driver Pelvis Y Velocity vs. Time

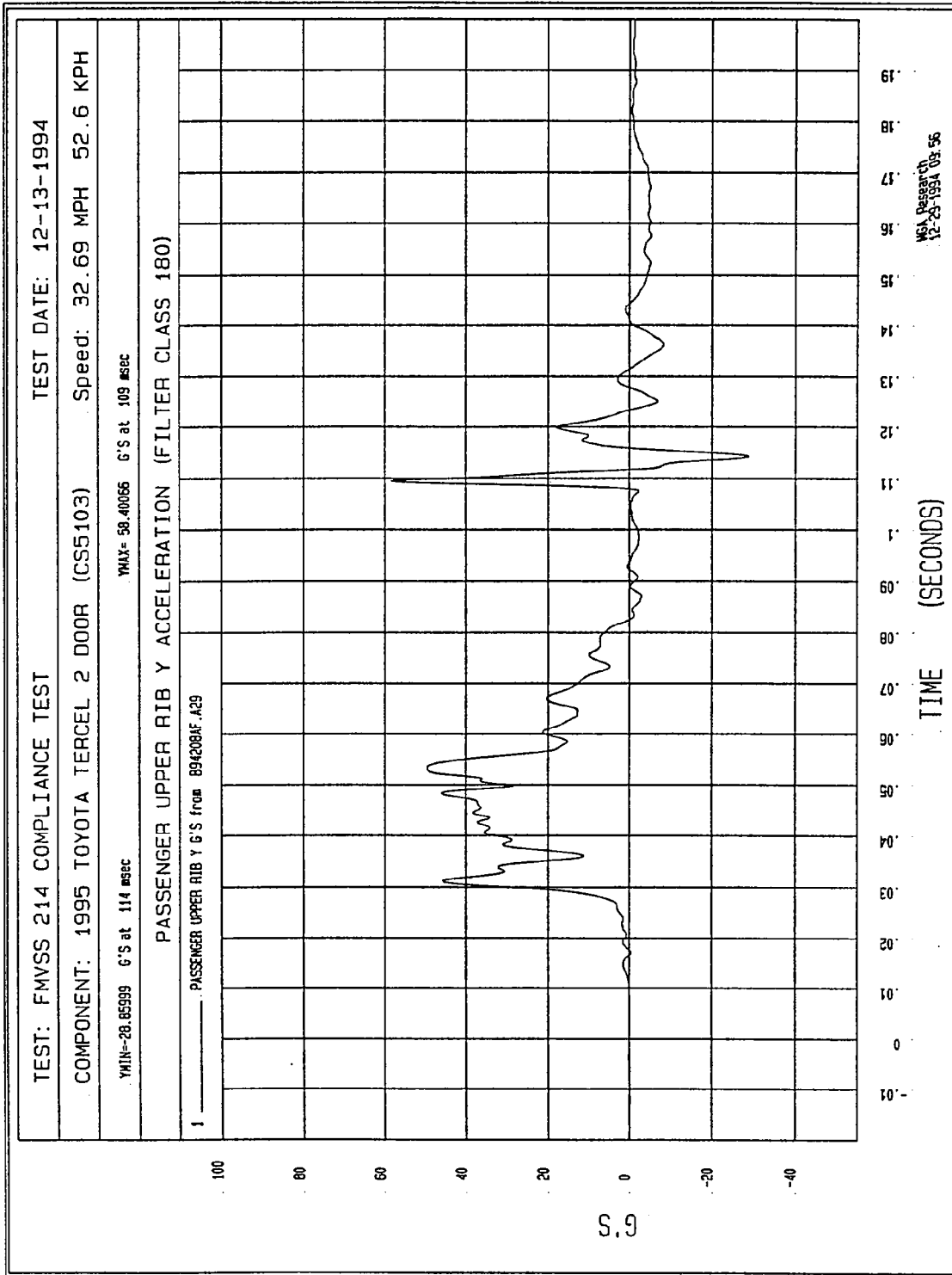


Figure B-9 - Passenger Upper Rib Y Acceleration vs. Time

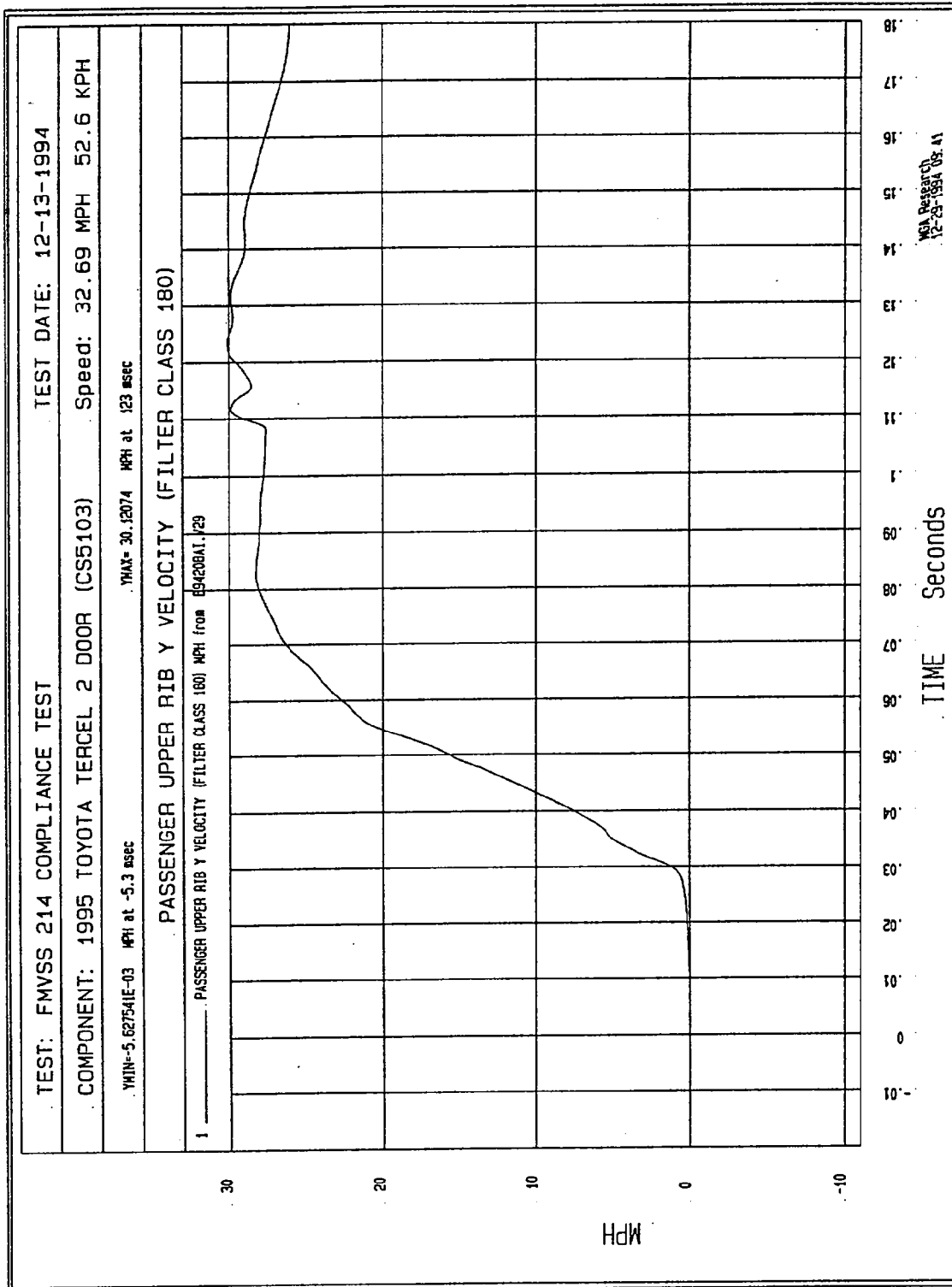


Figure B-10 - Passenger Upper Rib Y Velocity vs. Time

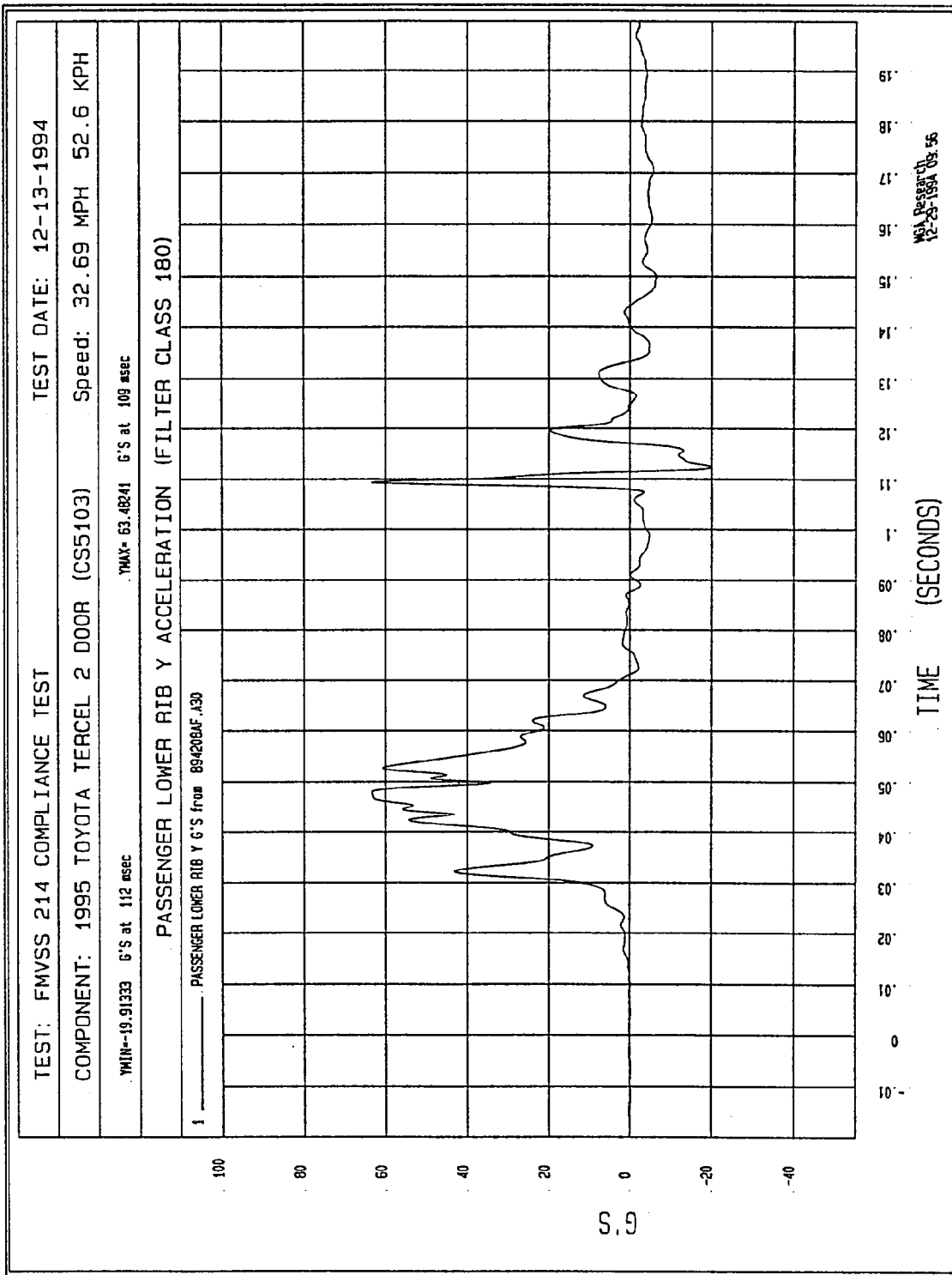
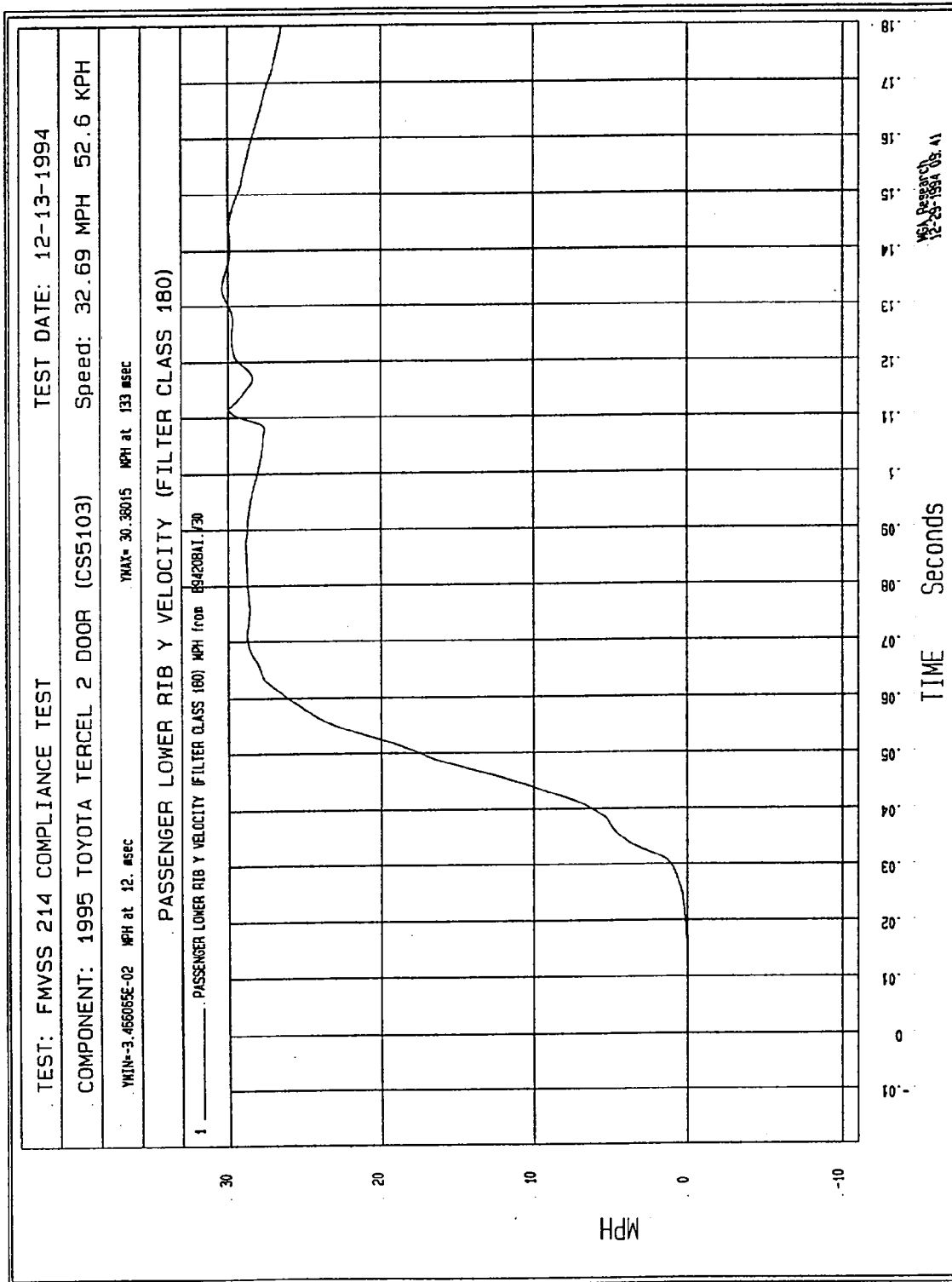


Figure B-11 - Passenger Lower Rib Y Acceleration vs. Time



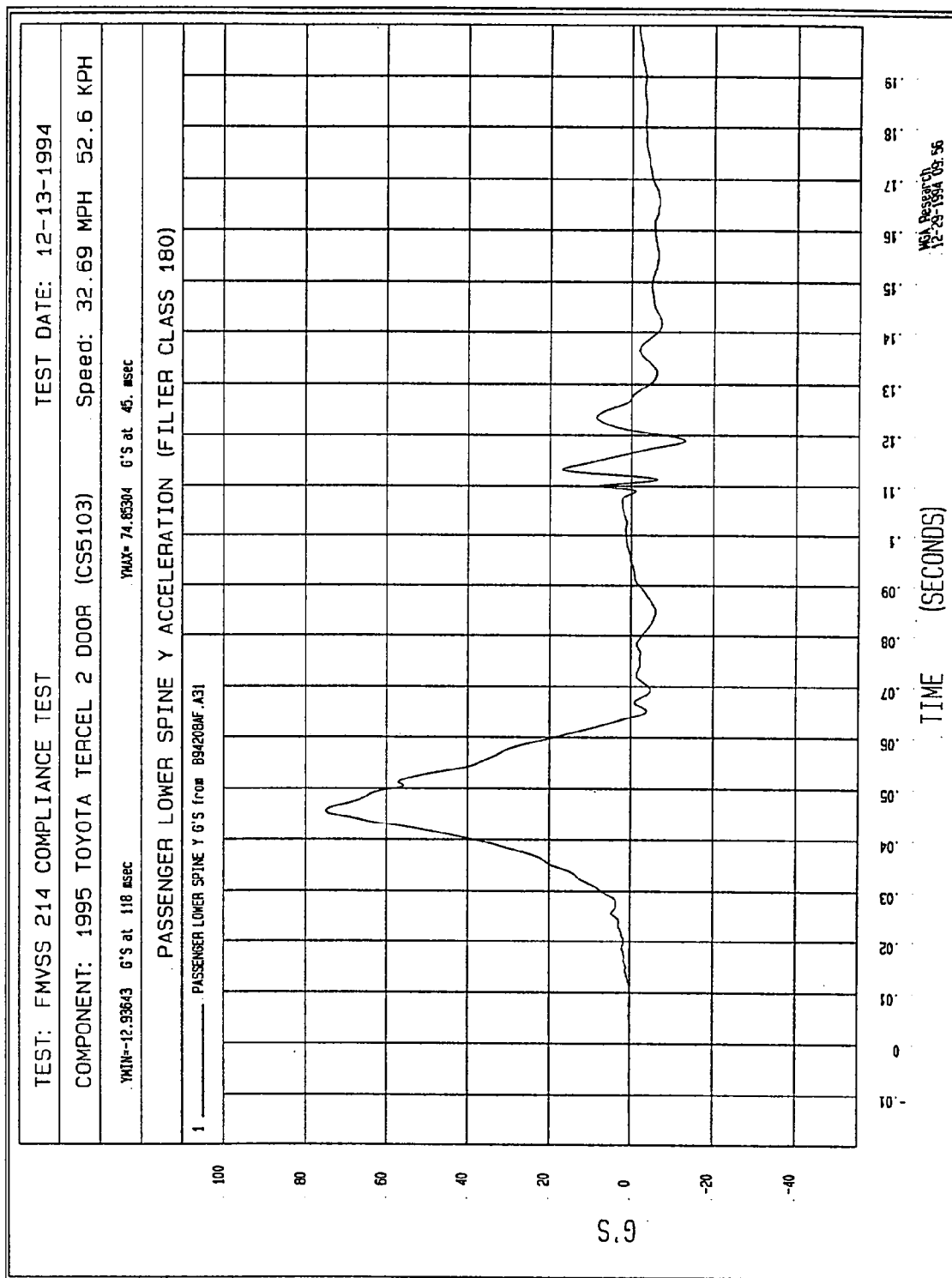


Figure B-13 - Passenger Lower Spine Y Acceleration vs. Time

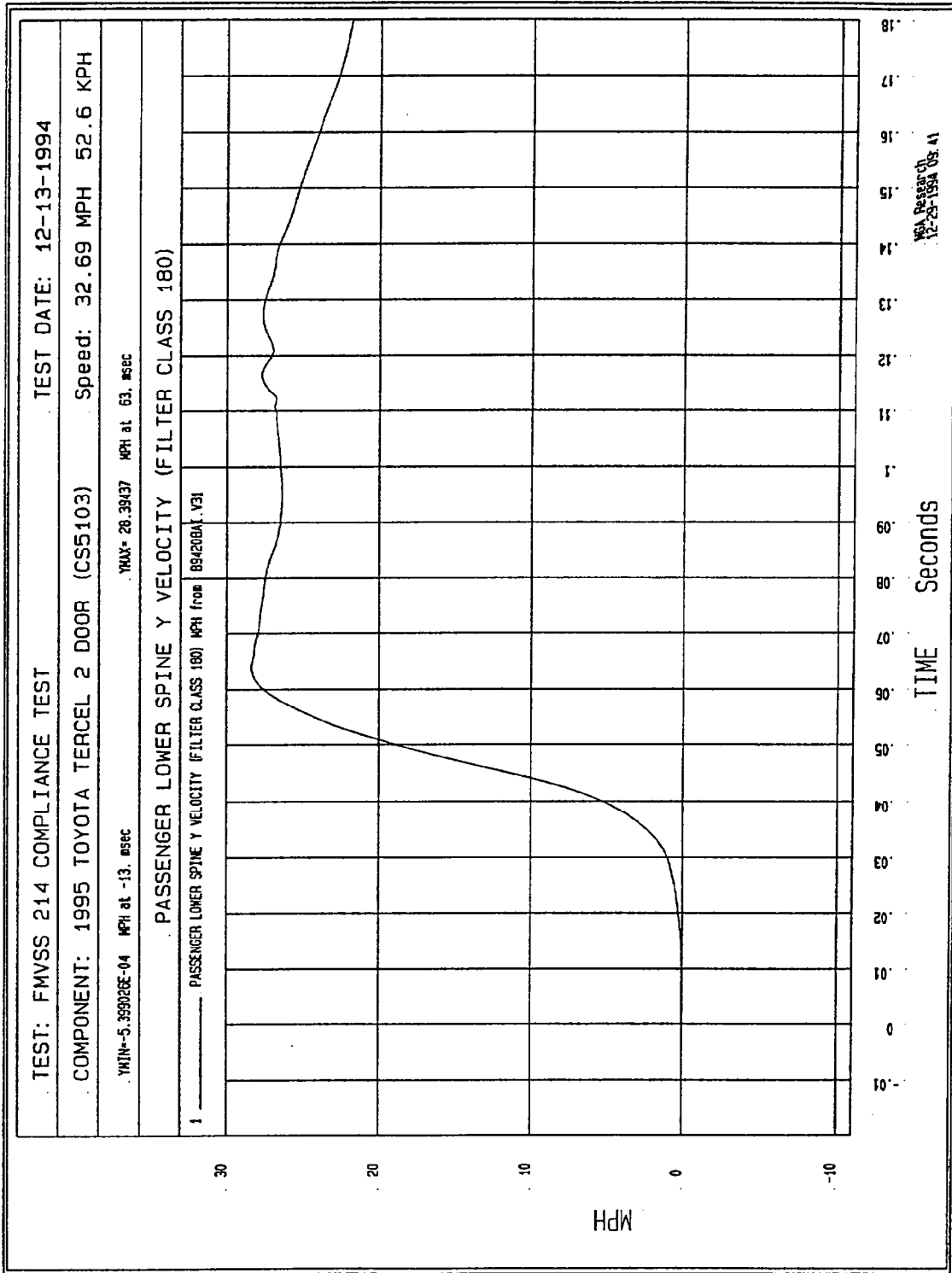


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

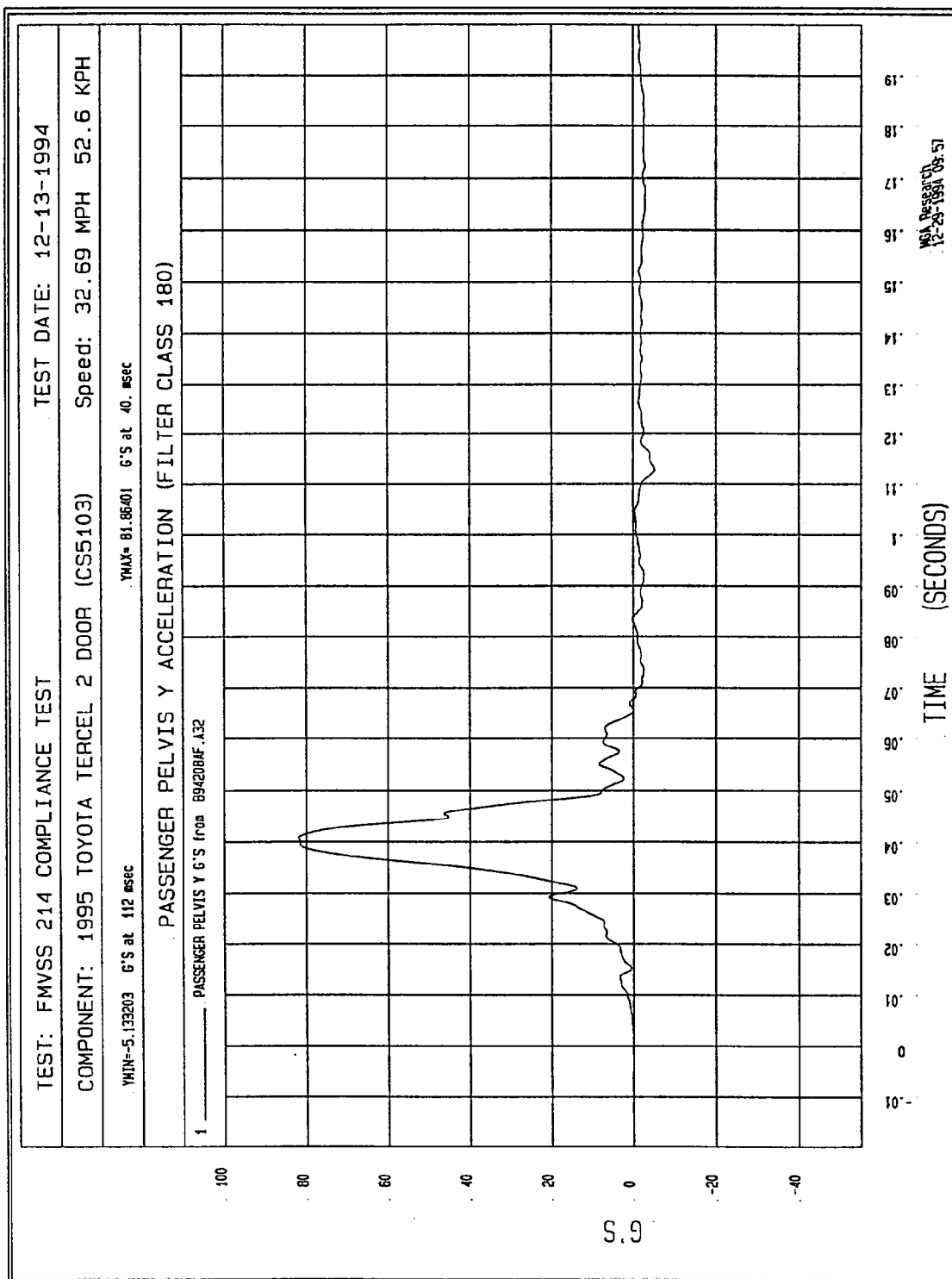


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

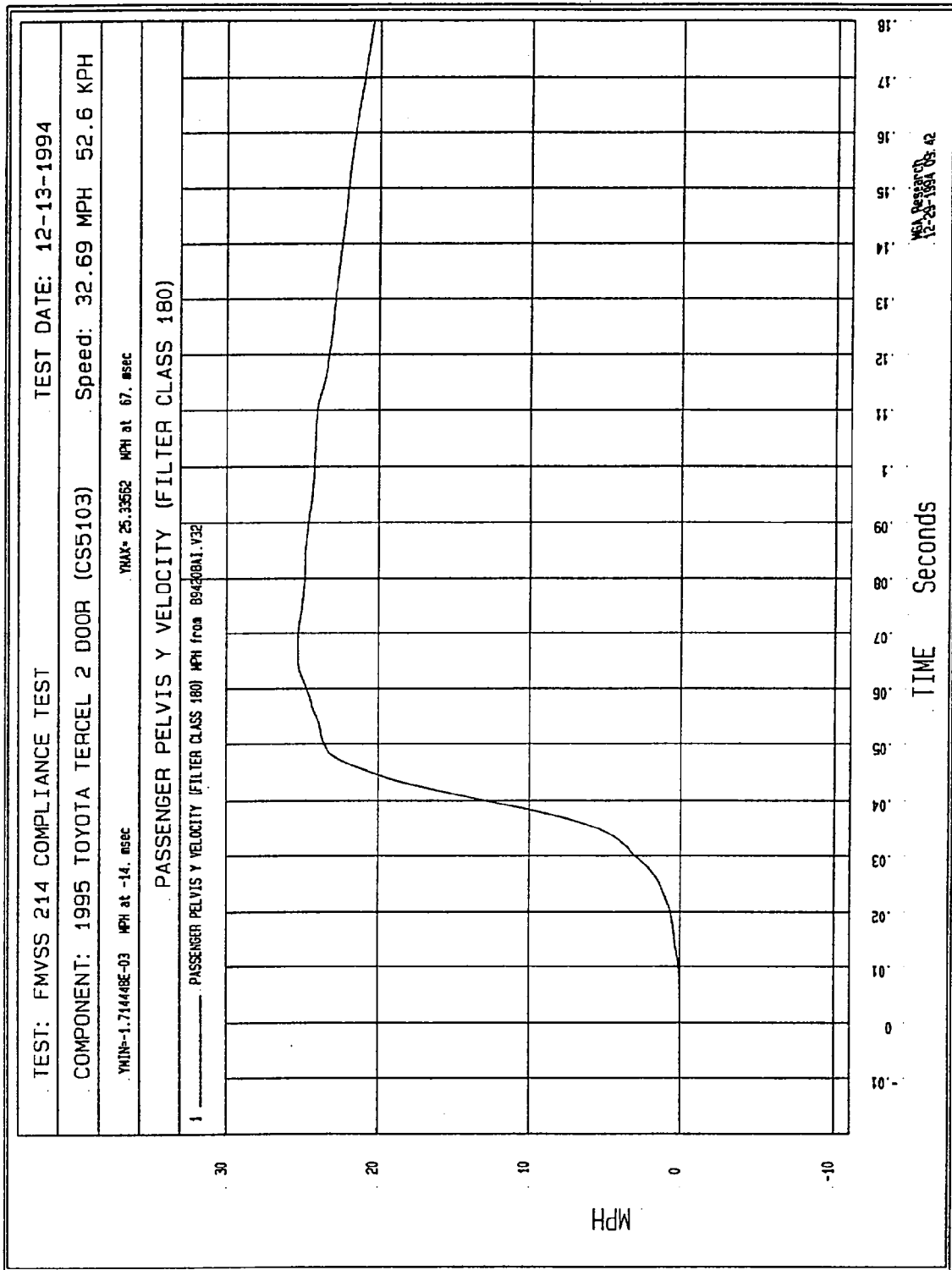


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

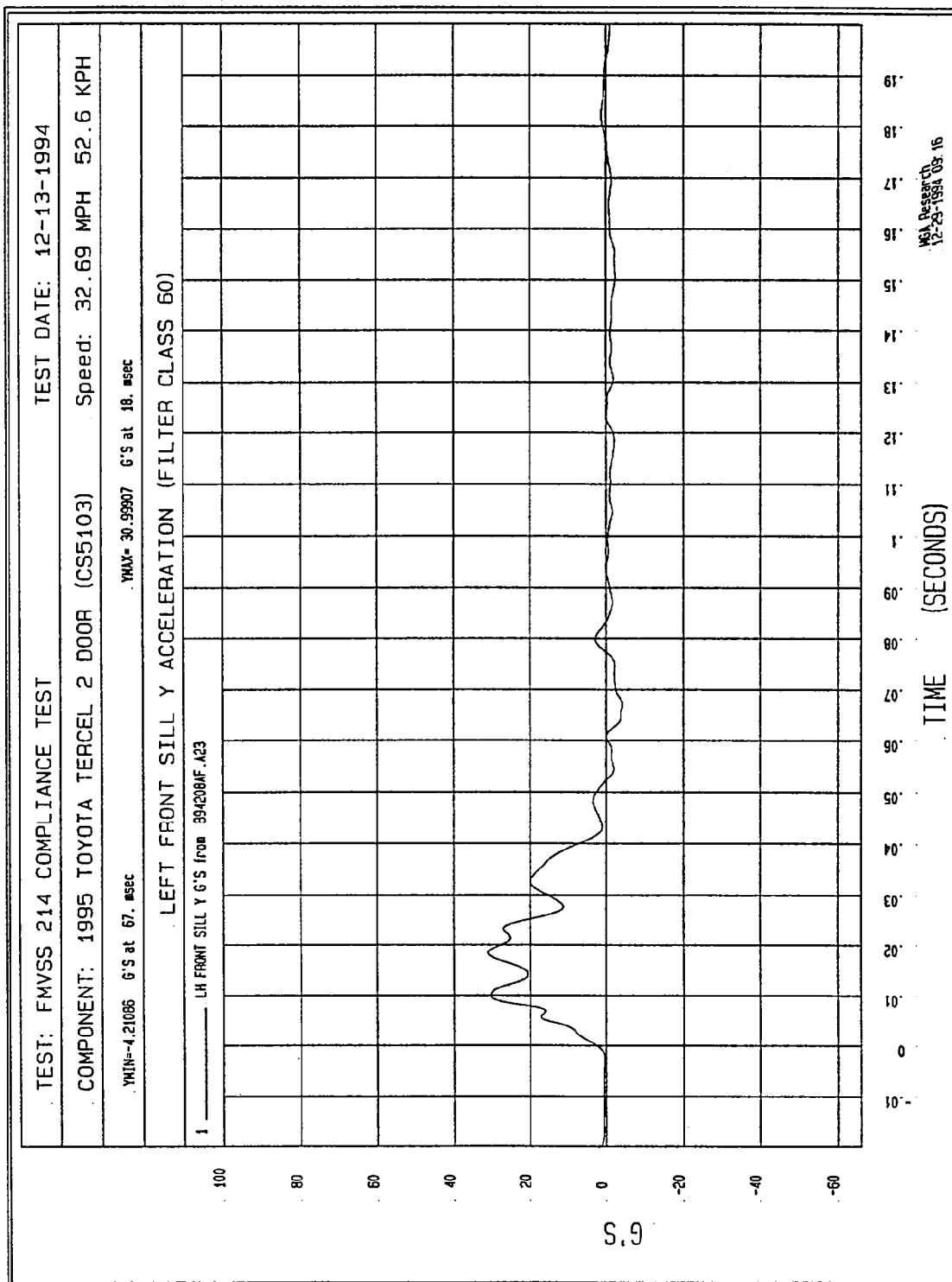
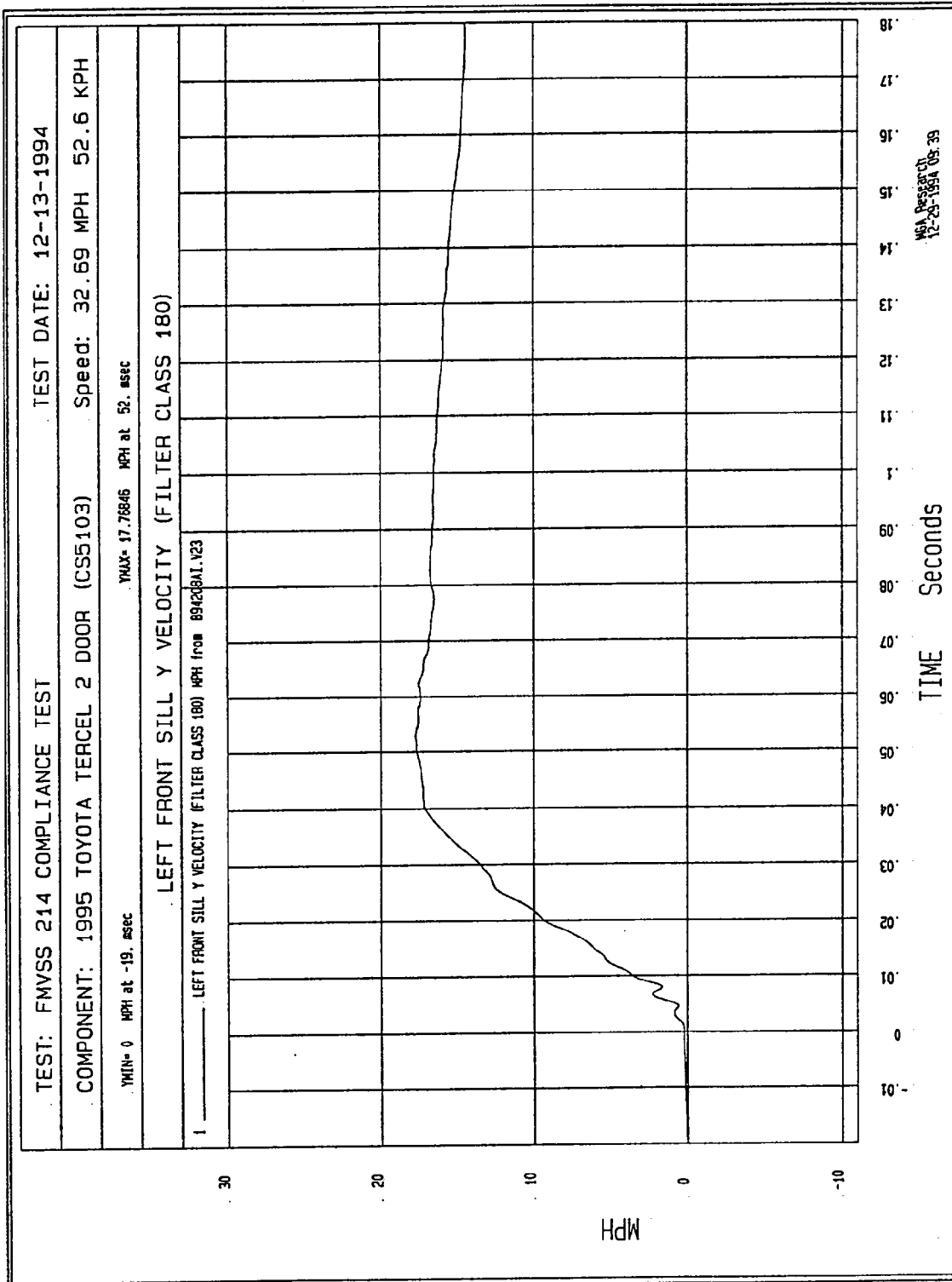


Figure B-17 - Left Front Sill Y Acceleration vs. Time



B-18

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

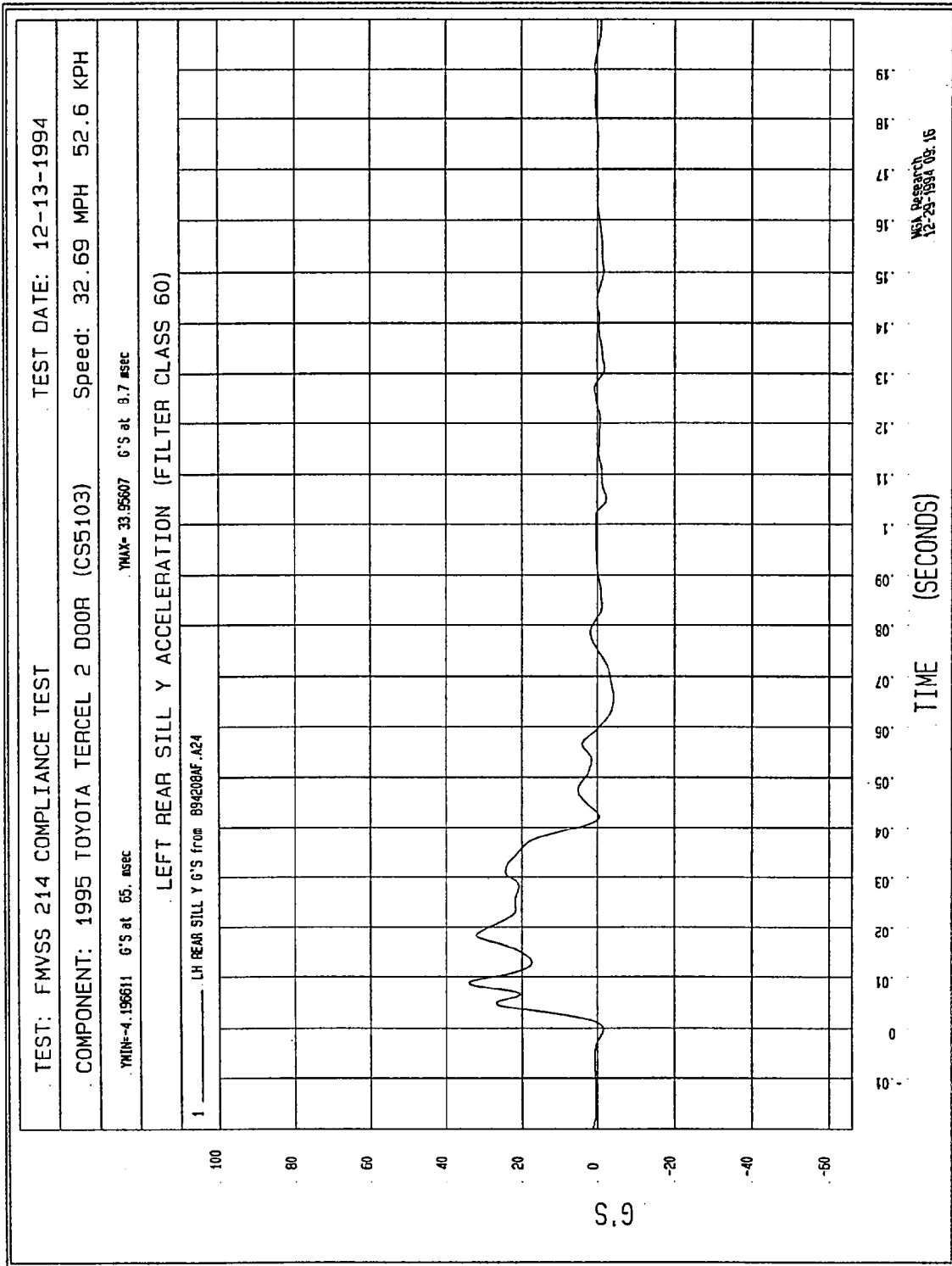
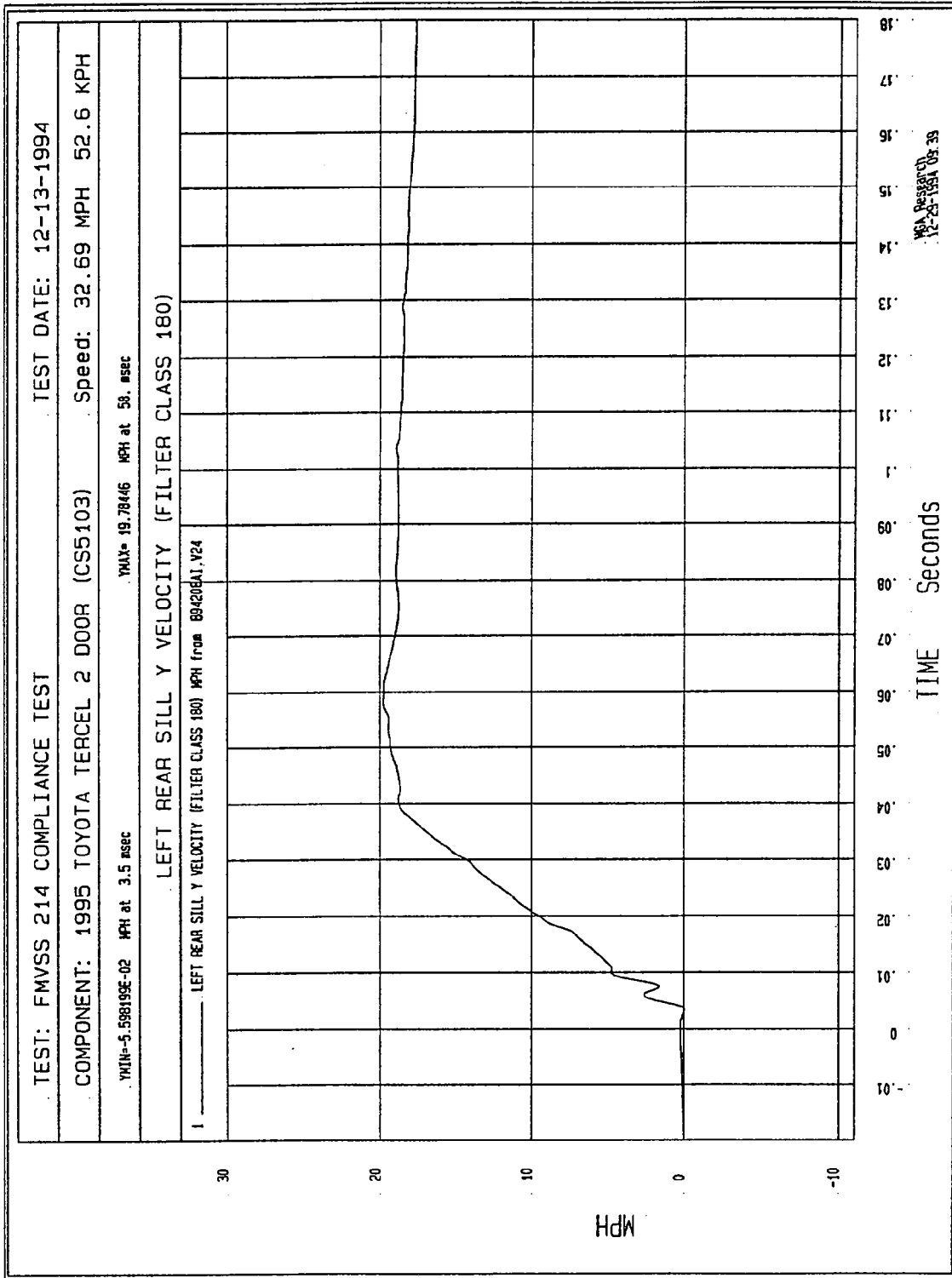


Figure B-19 - Left Rear Sill Y Acceleration vs. Time



B-20

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

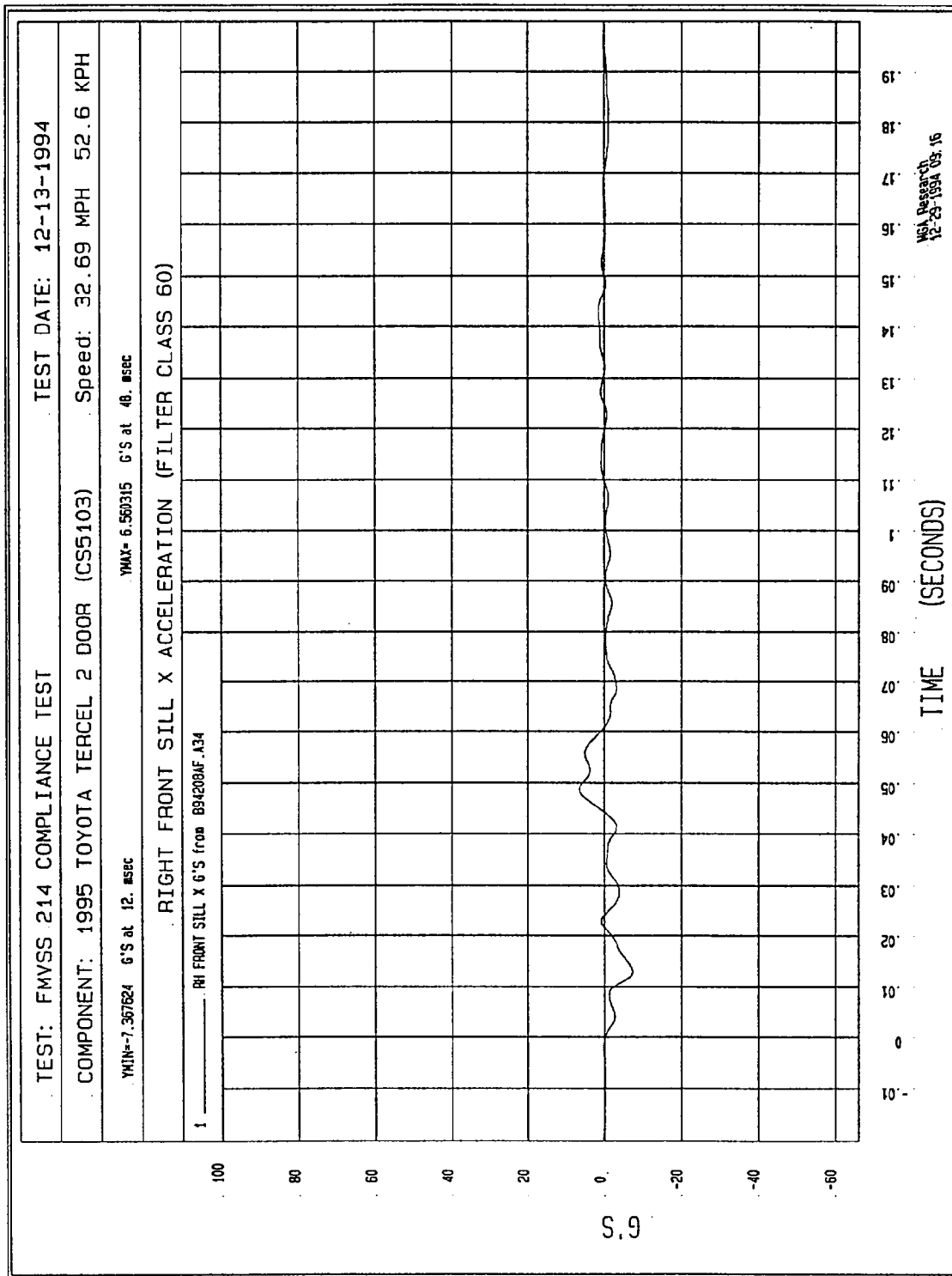


Figure B-21 - Right Front Sill X Acceleration vs. Time

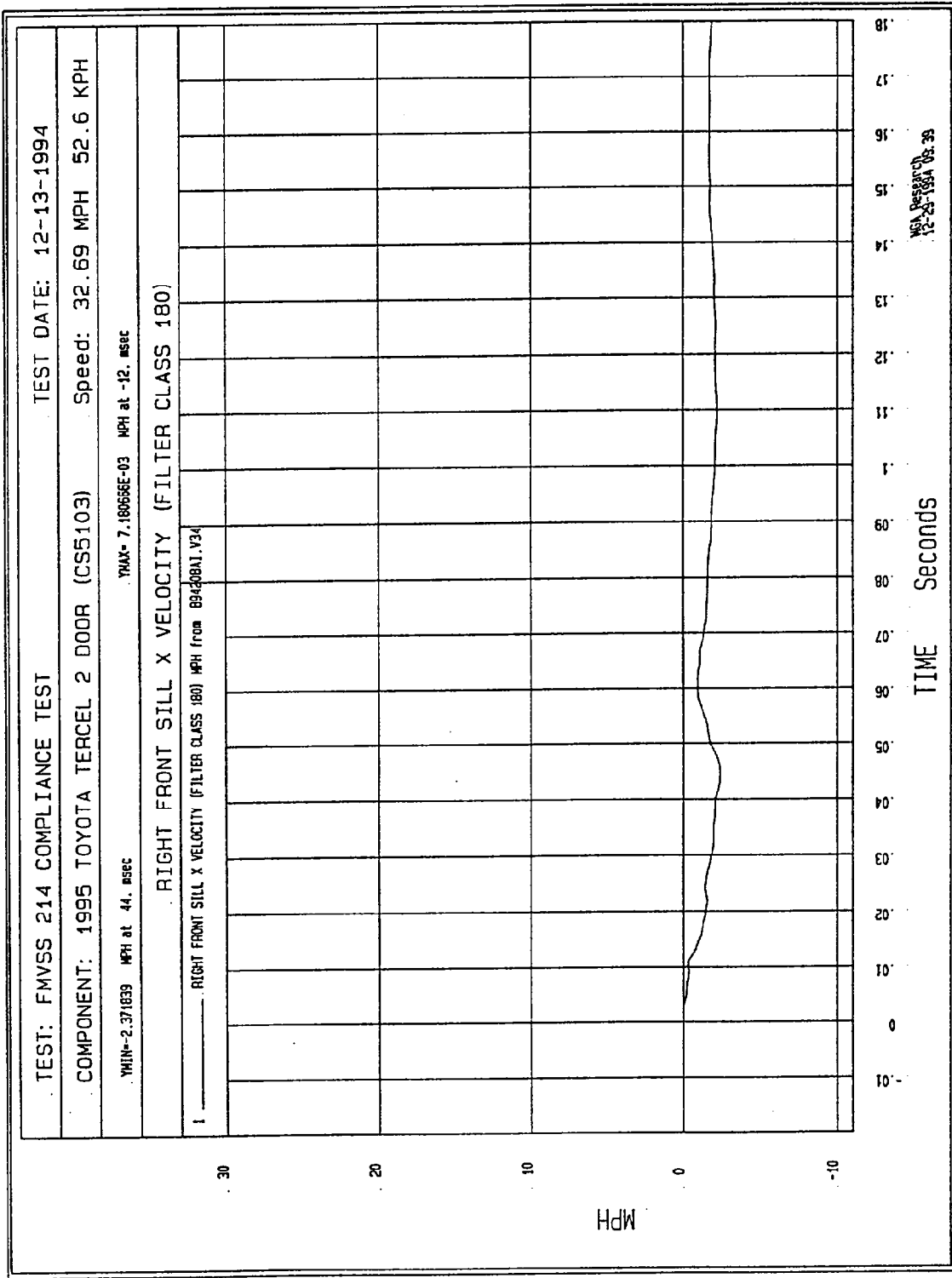


Figure B-22 - Right Front Sill X Velocity vs. Time

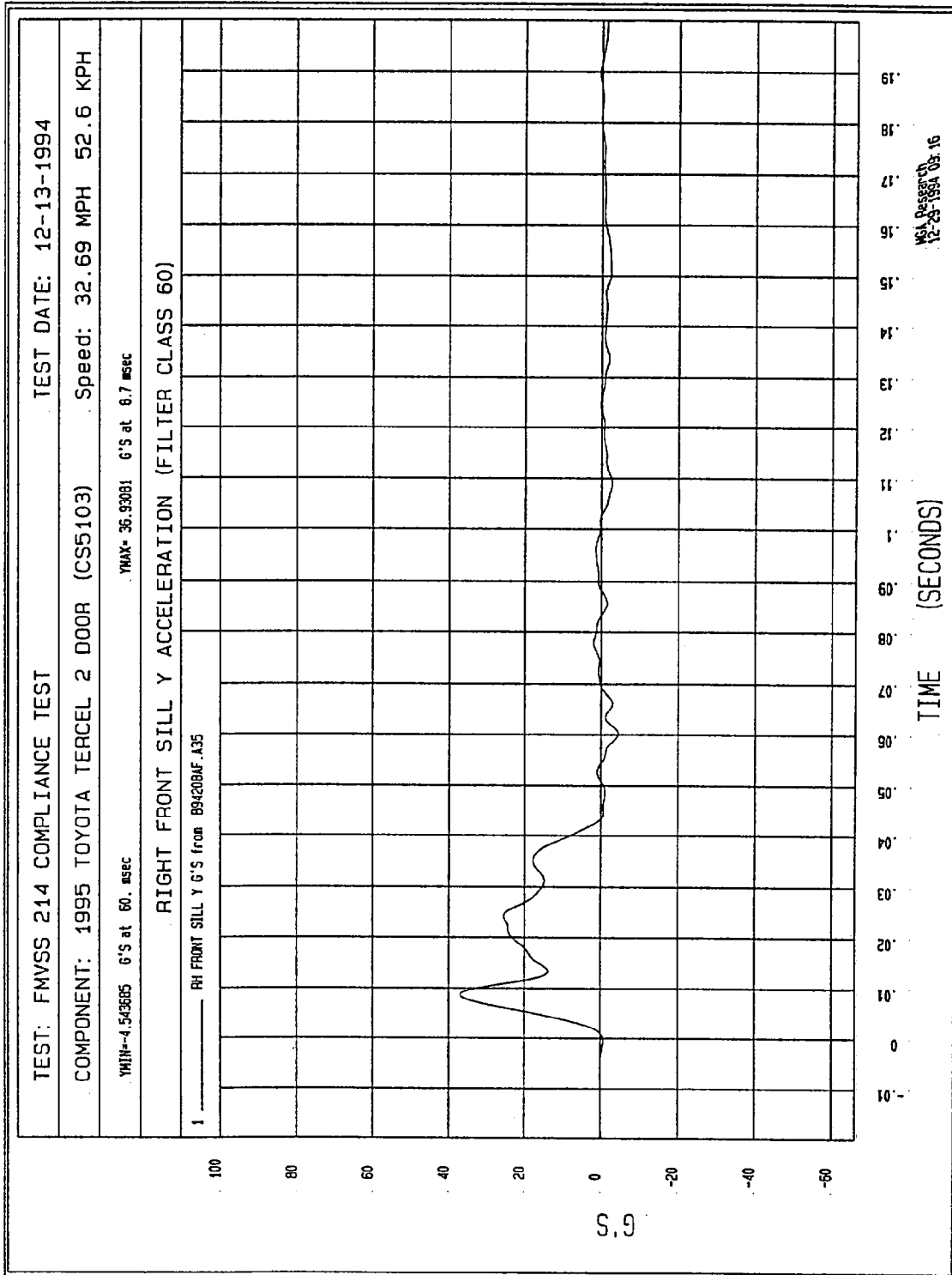


Figure B-23 - Right Front Sill Y Acceleration vs. Time

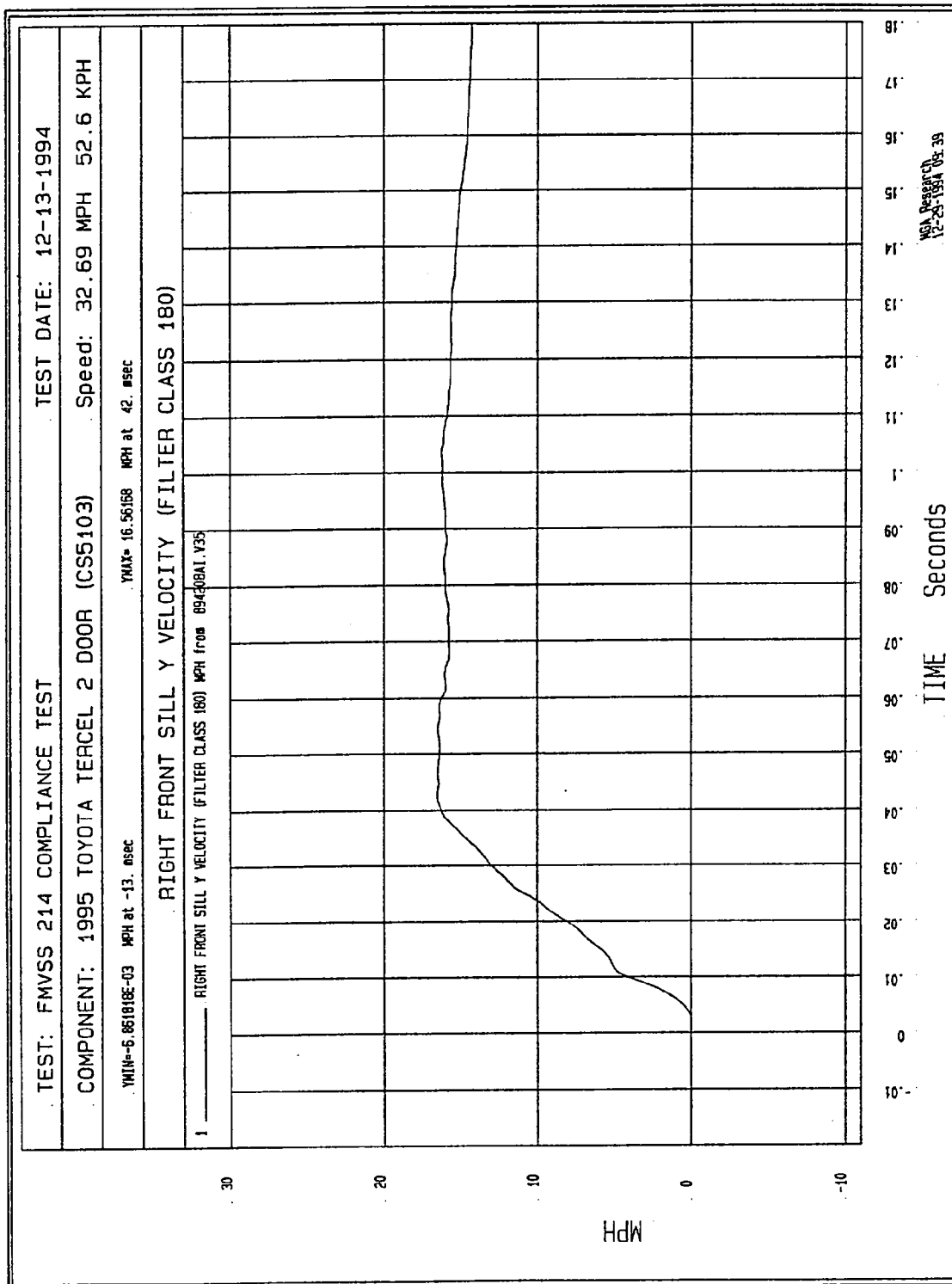


Figure B-24 - Right Front Sill Y Velocity vs. Time

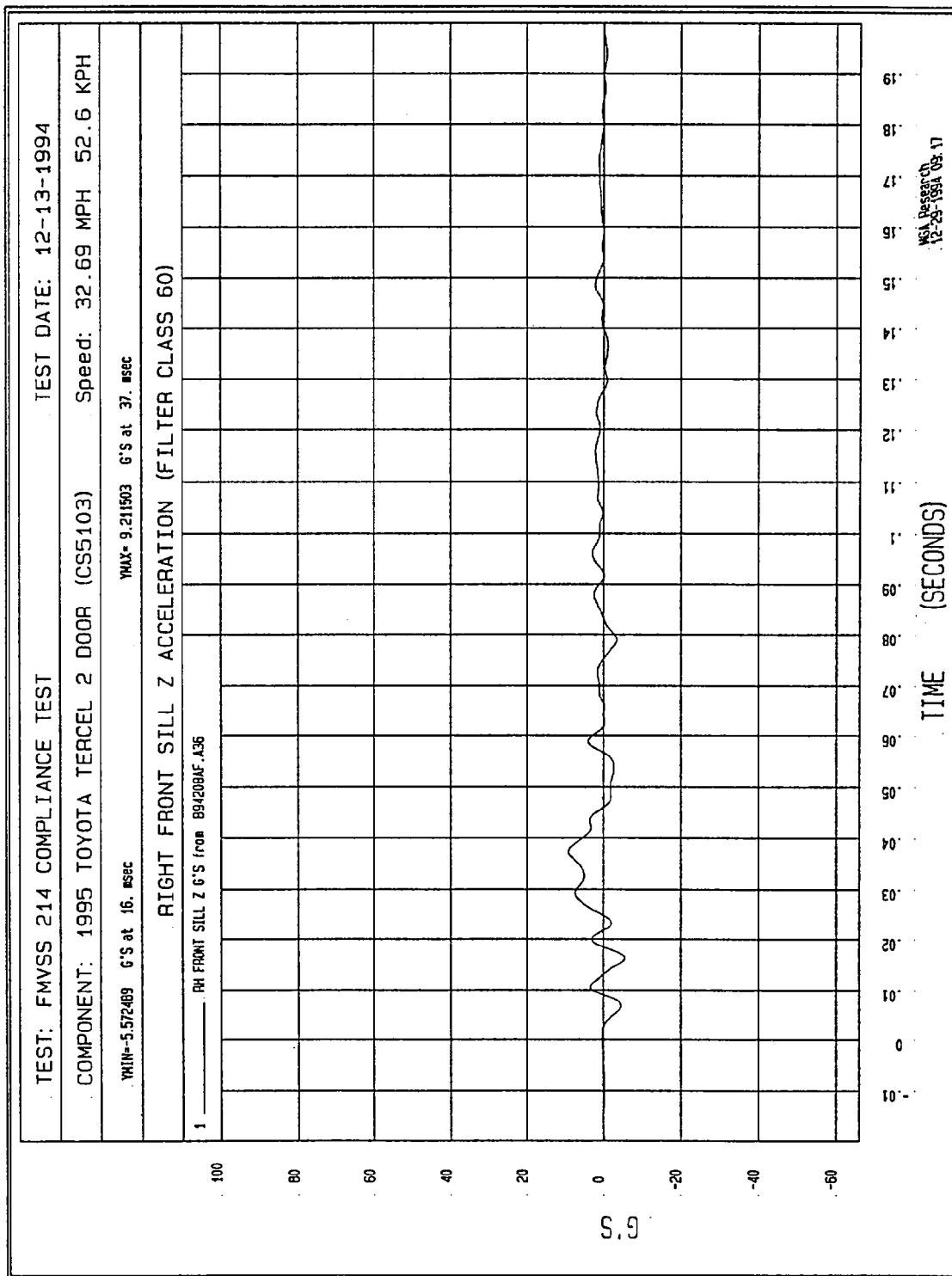


Figure B-25 - Right Front Sill Z Acceleration vs. Time

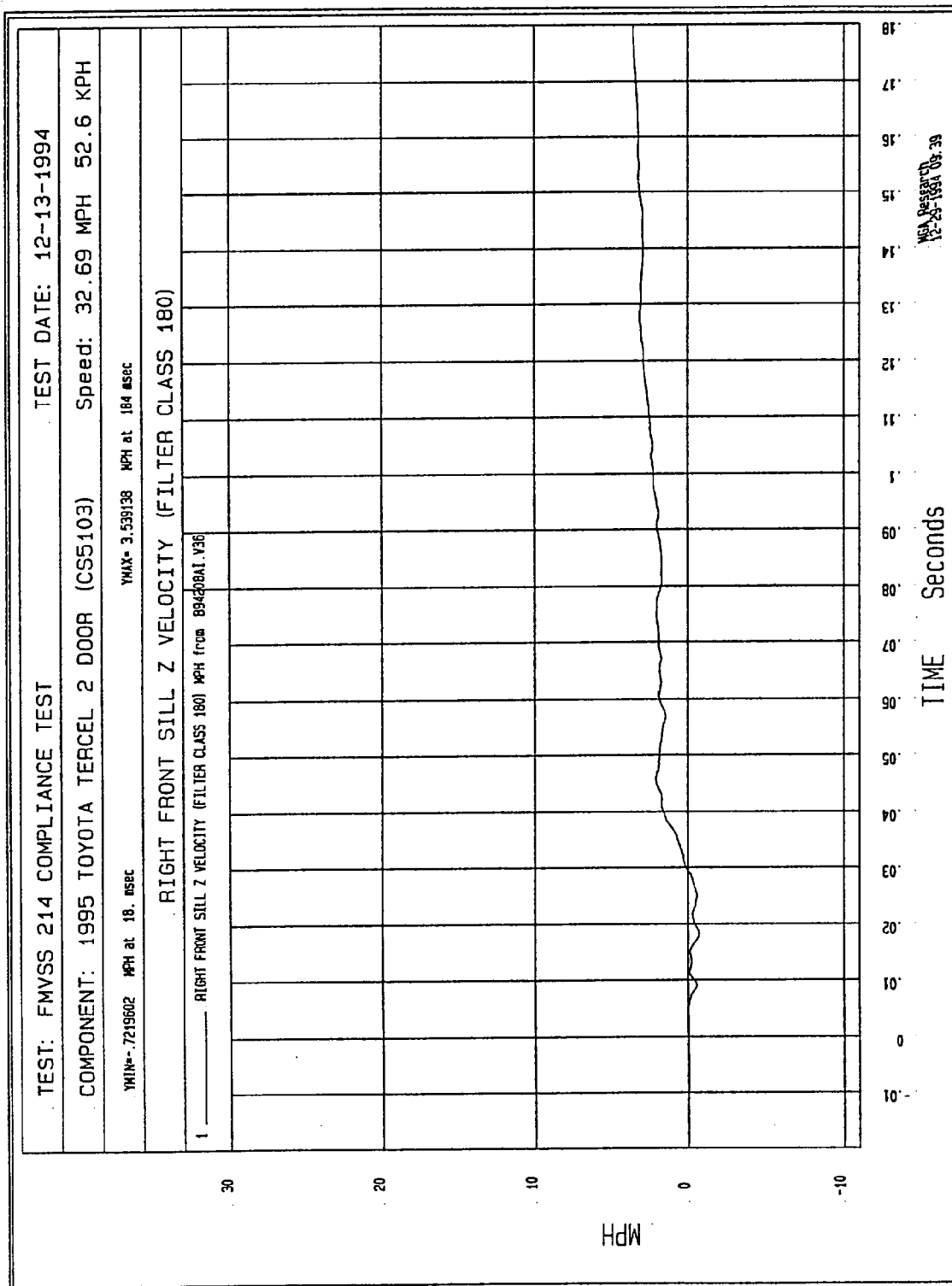


Figure B-26 - Right Front Sill Z Velocity vs. Time

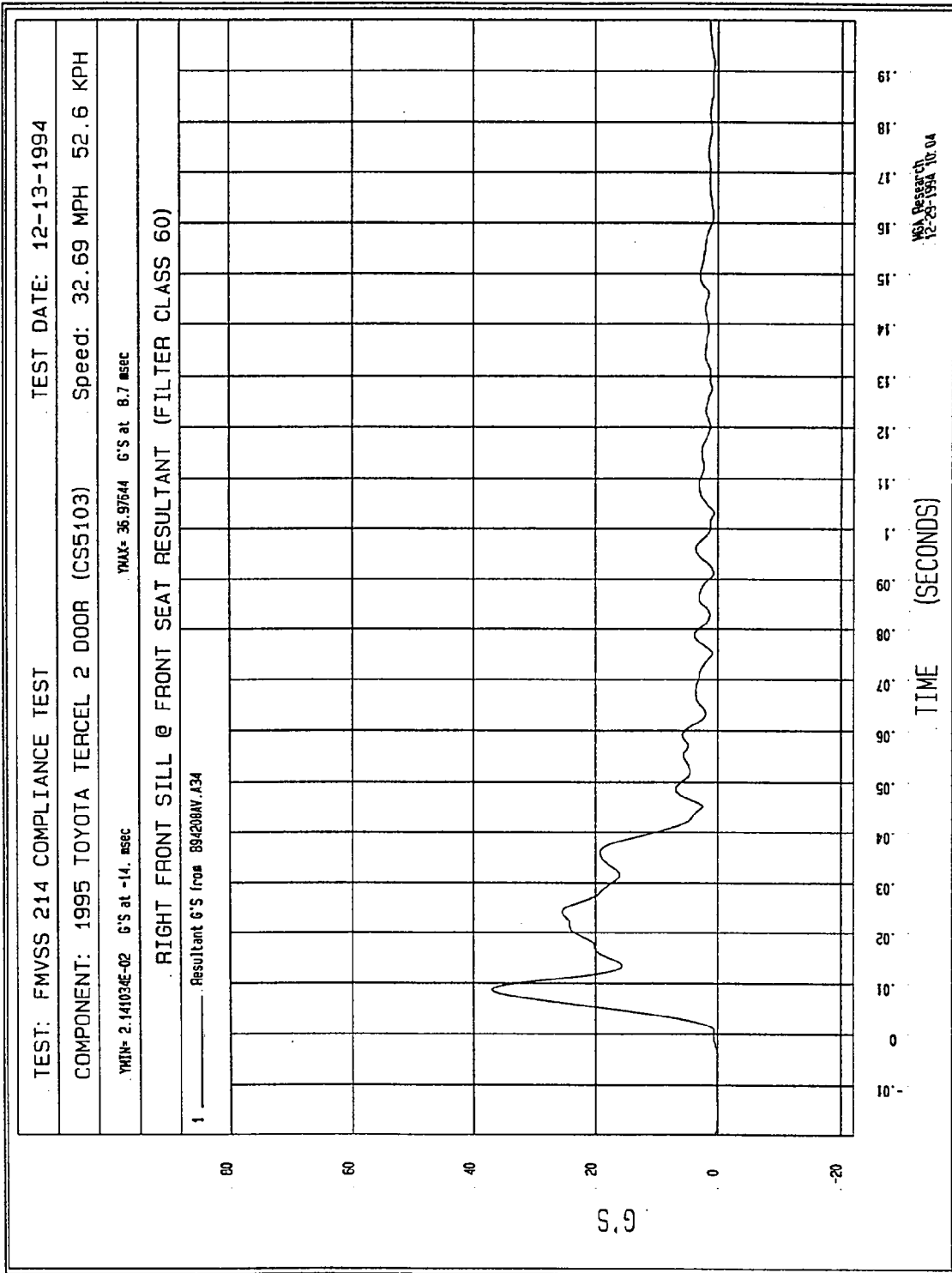


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

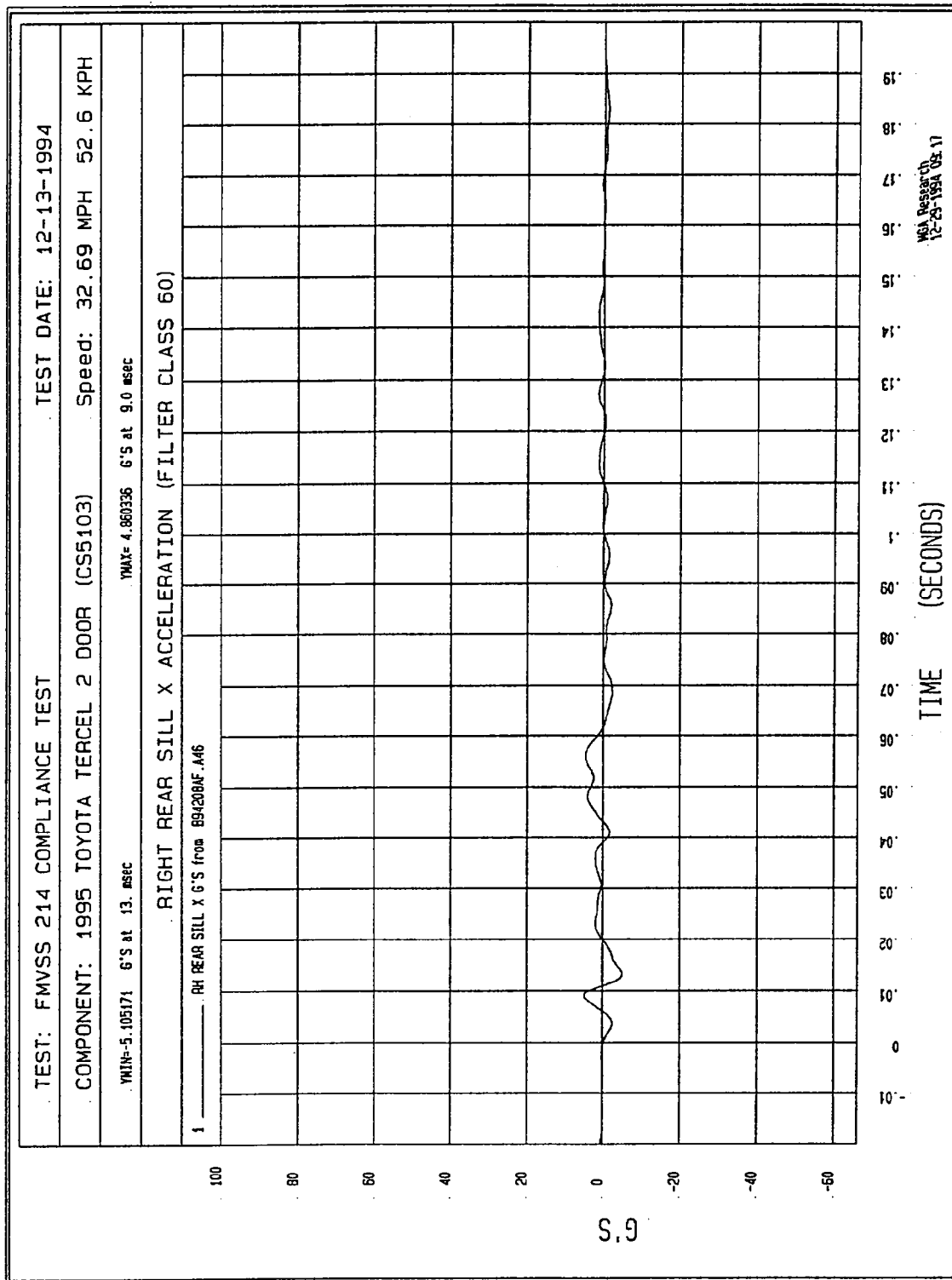


Figure B-28 - Right Rear Sill X Acceleration vs. Time

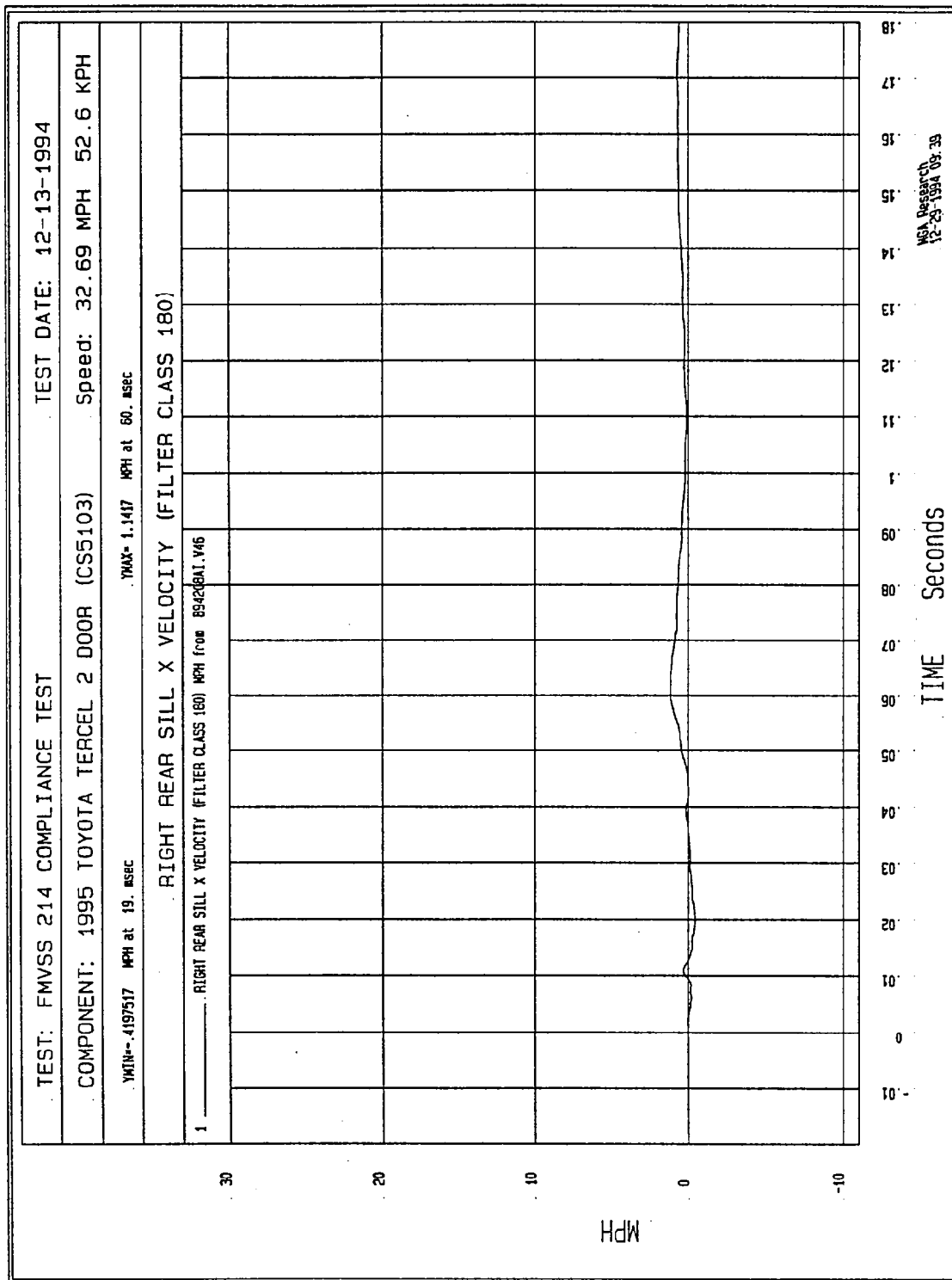
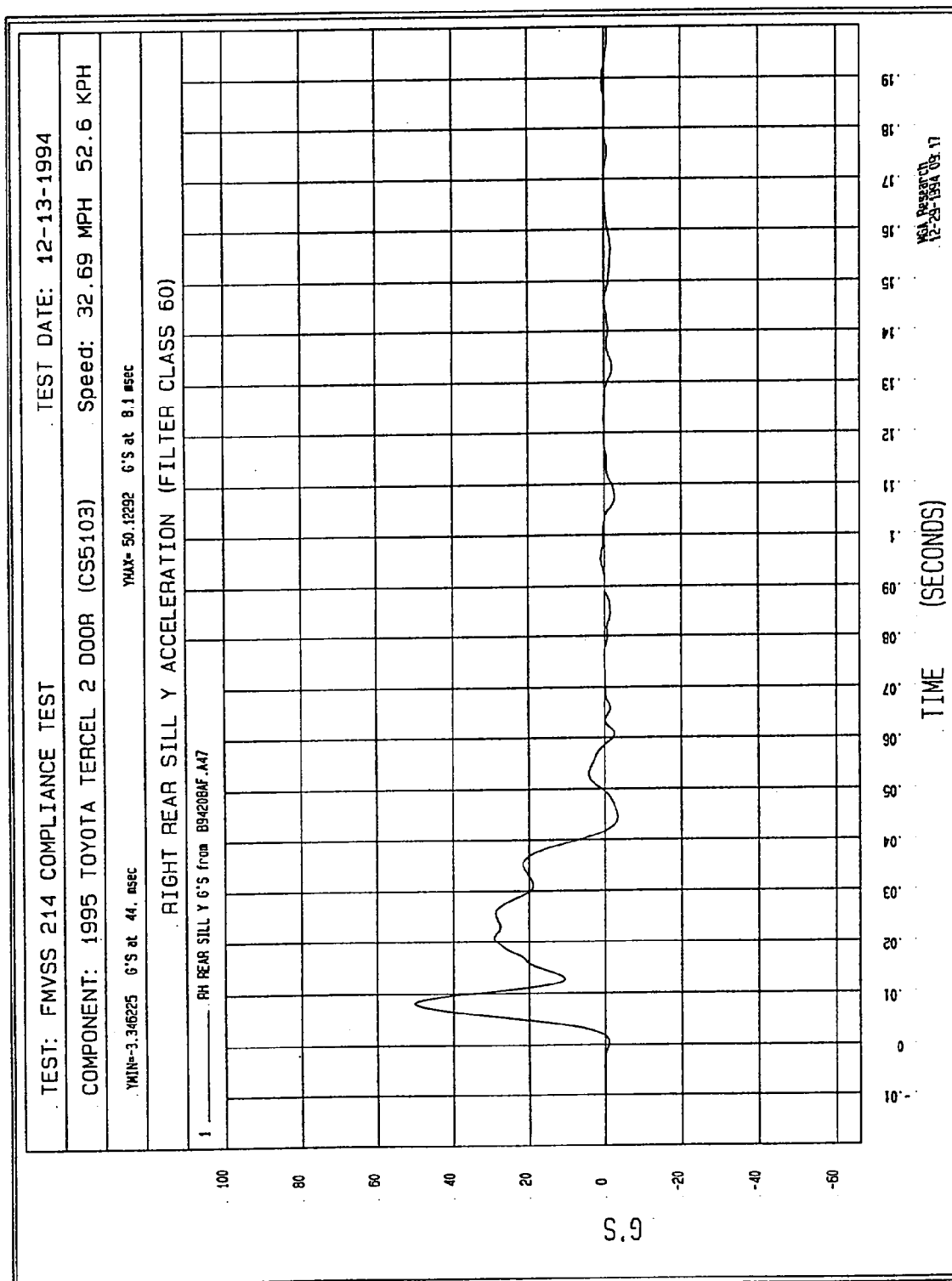
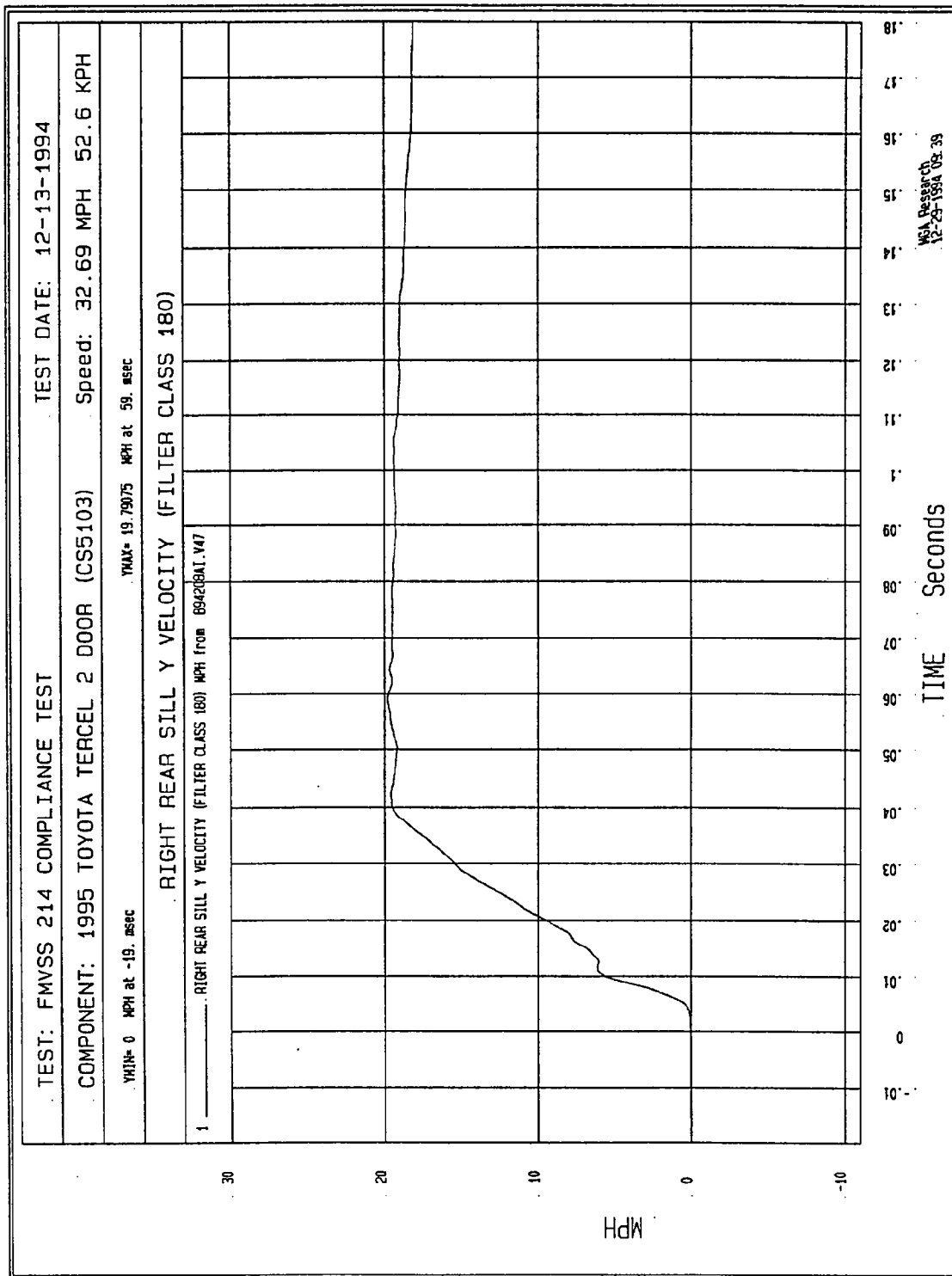


Figure B-29 - Right Rear Sill X Velocity vs. Time





B-31

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

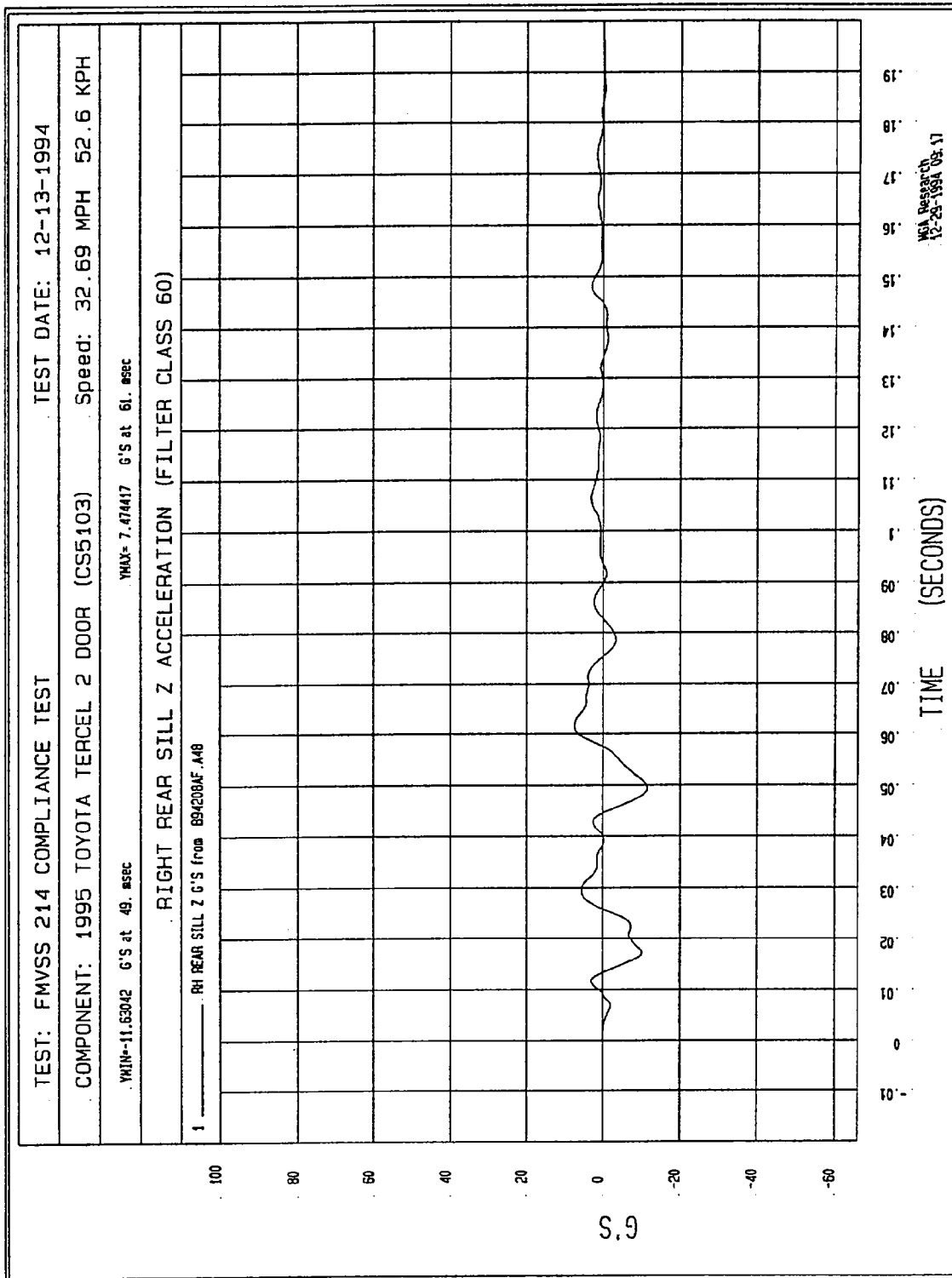
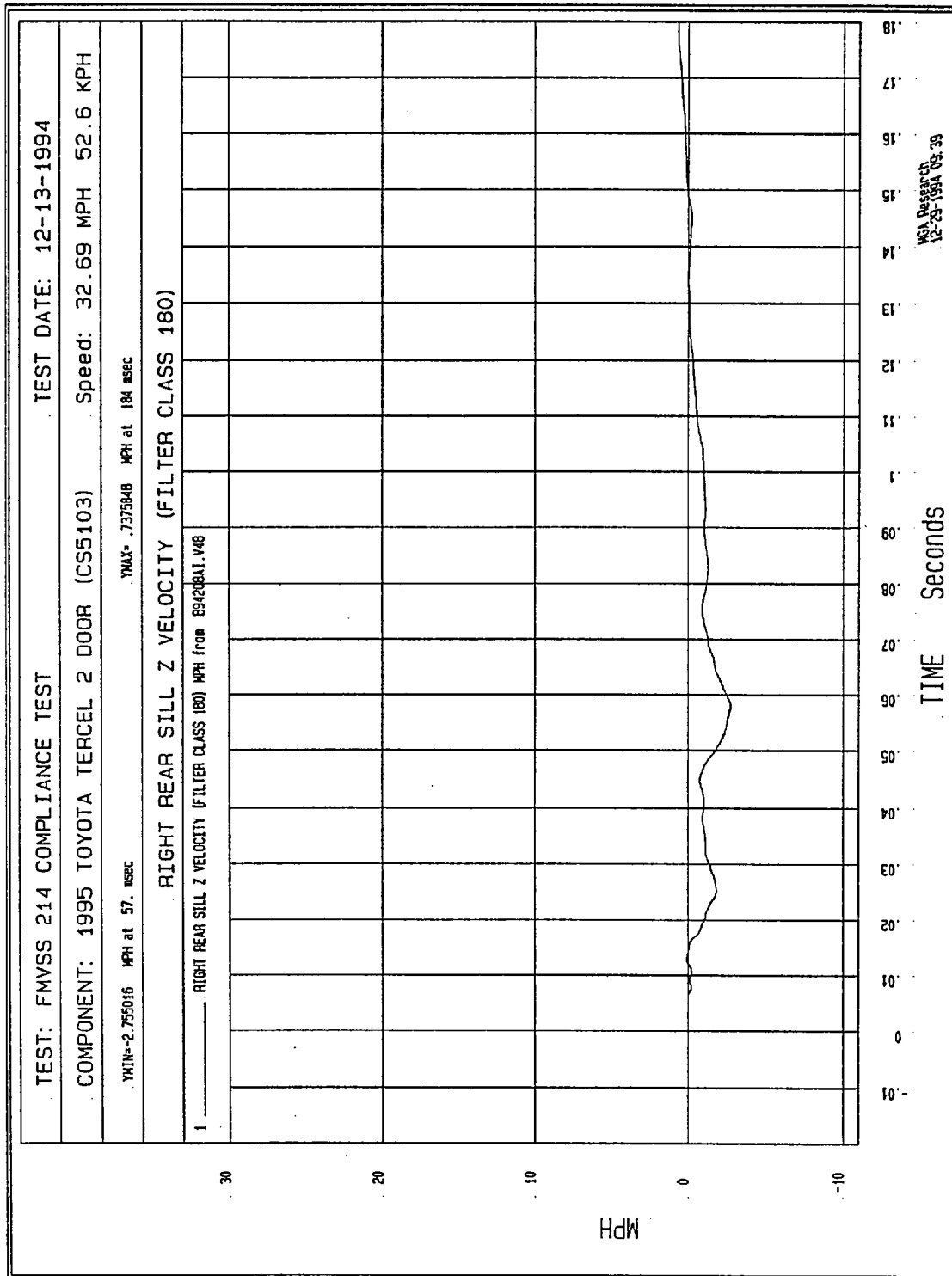


Figure B-32 - Right Rear Sill Z Acceleration vs. Time



B-33

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

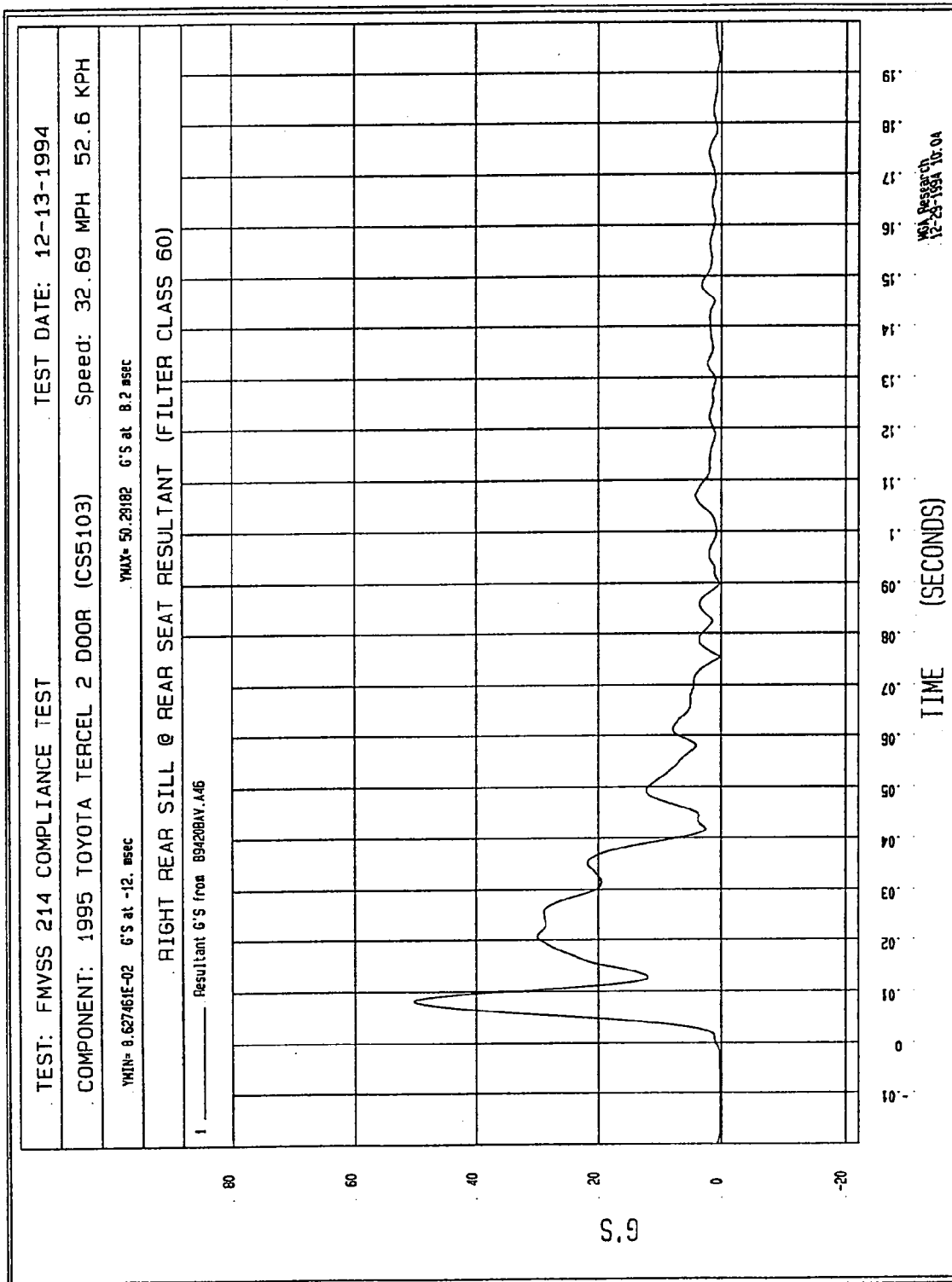


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

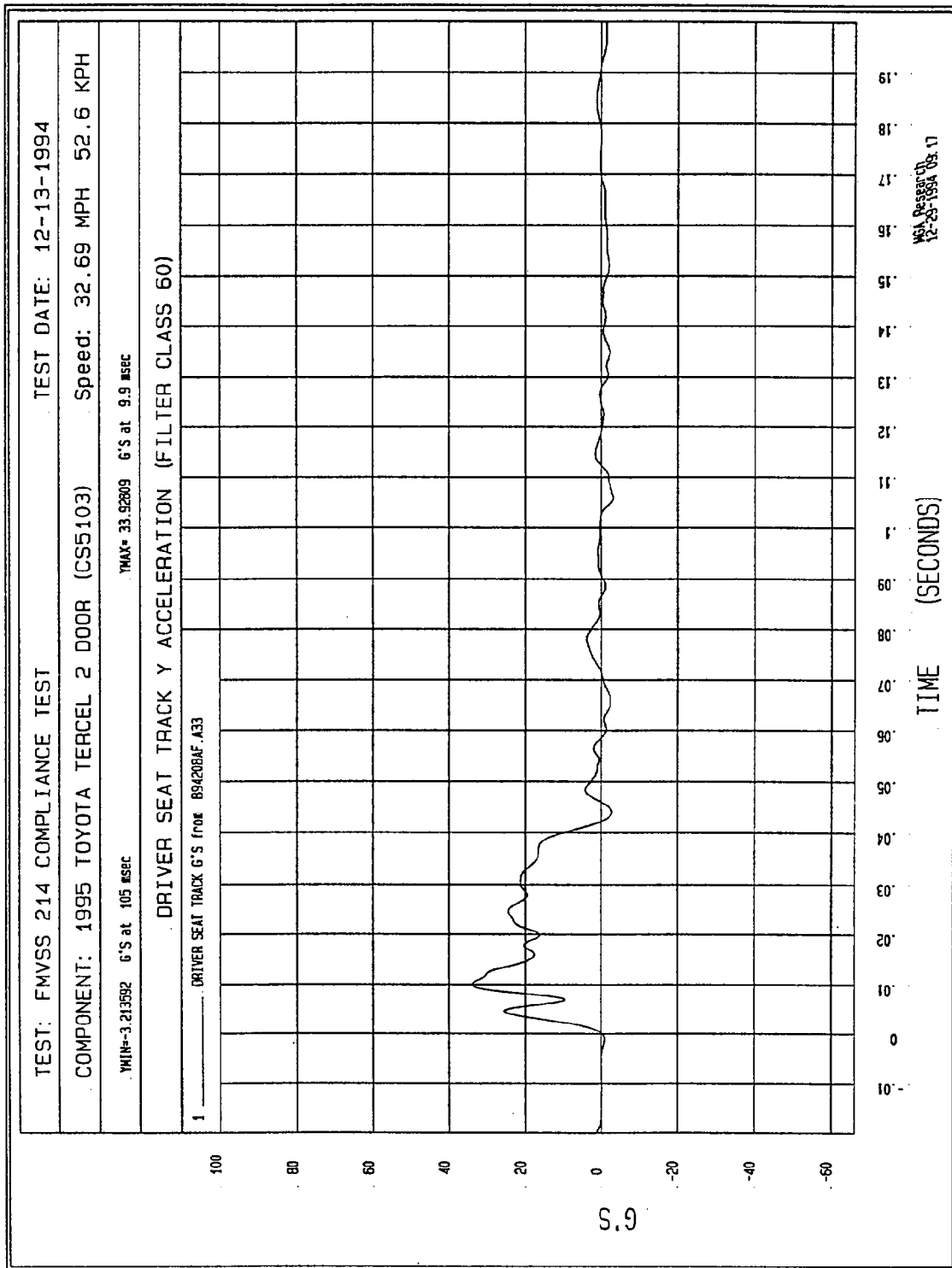
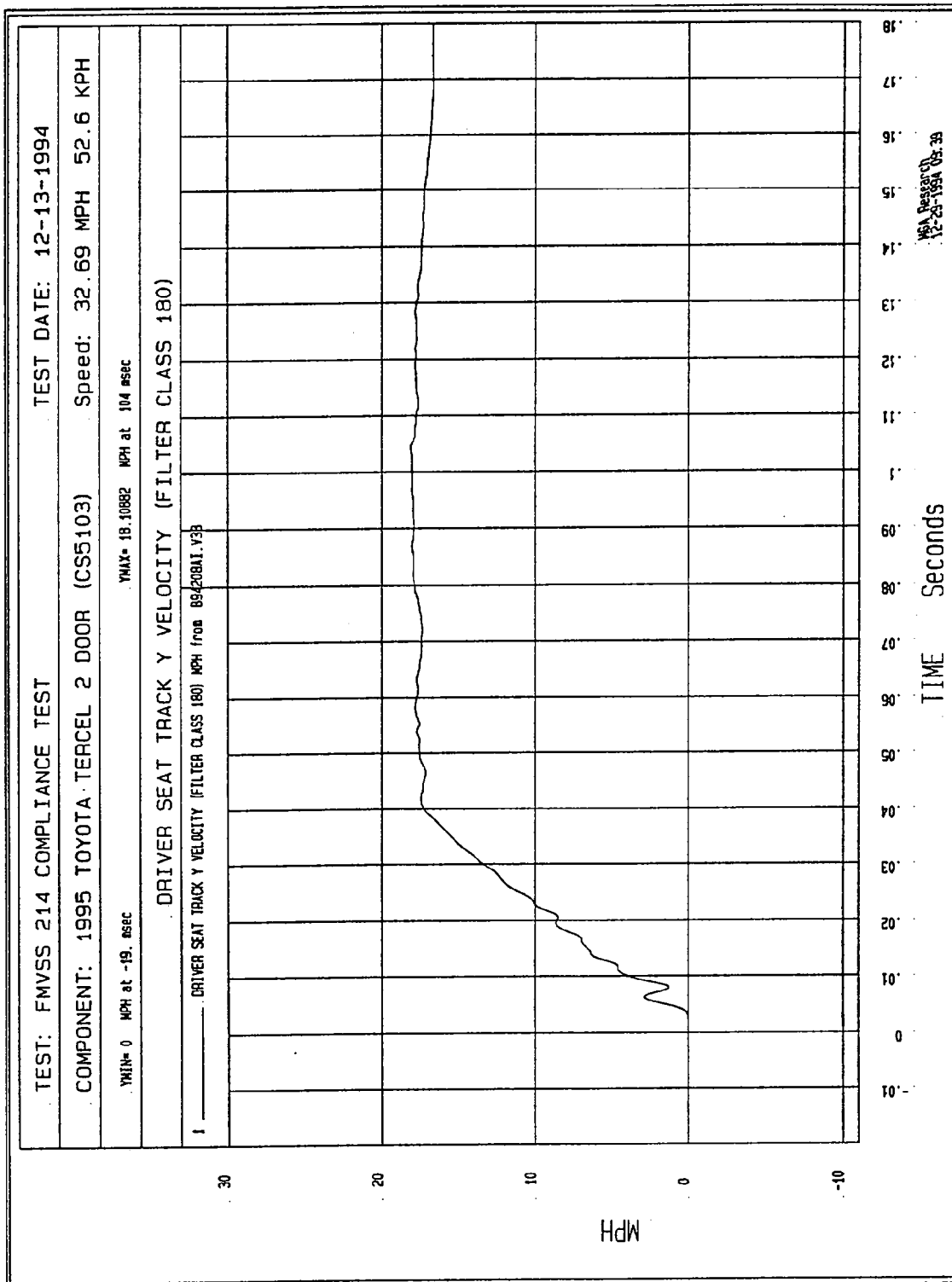


Figure B-35 - Driver Seat Track Y Acceleration vs. Time



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

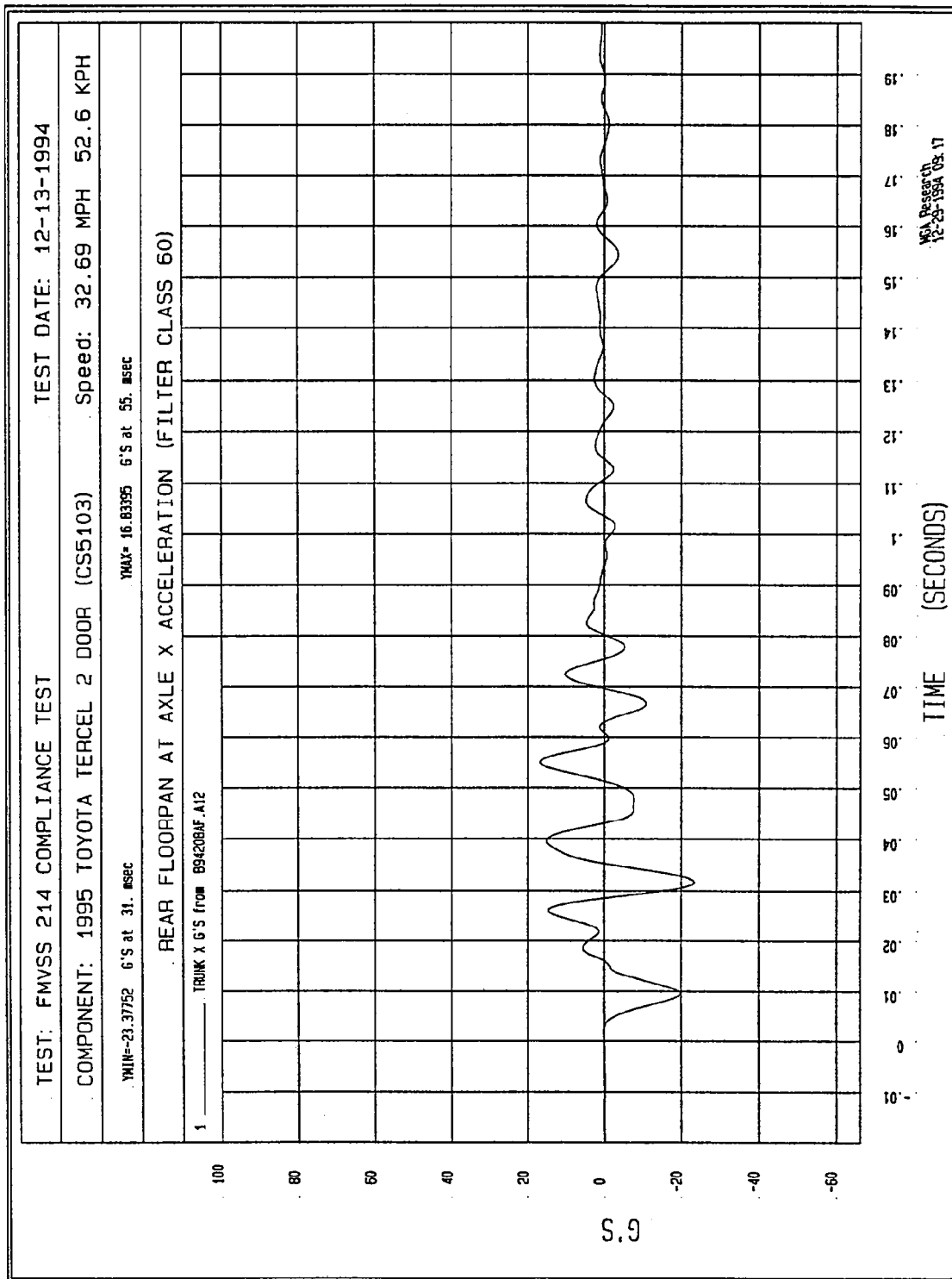


Figure B-37 - Rear Floorpan at Axle X Acceleration vs. Time

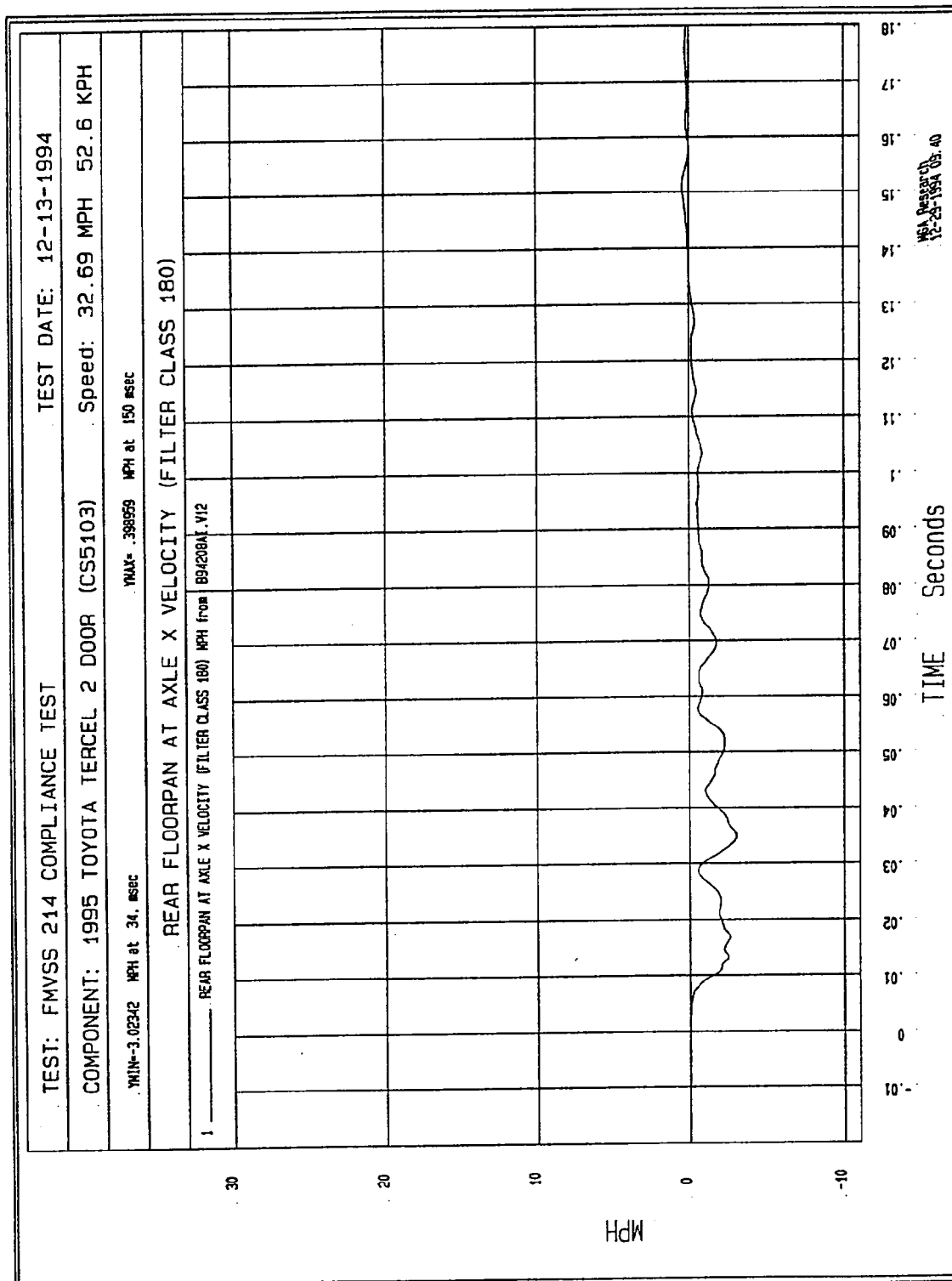


Figure B-38 - Rear Floorpan at Axle X Velocity vs. Time

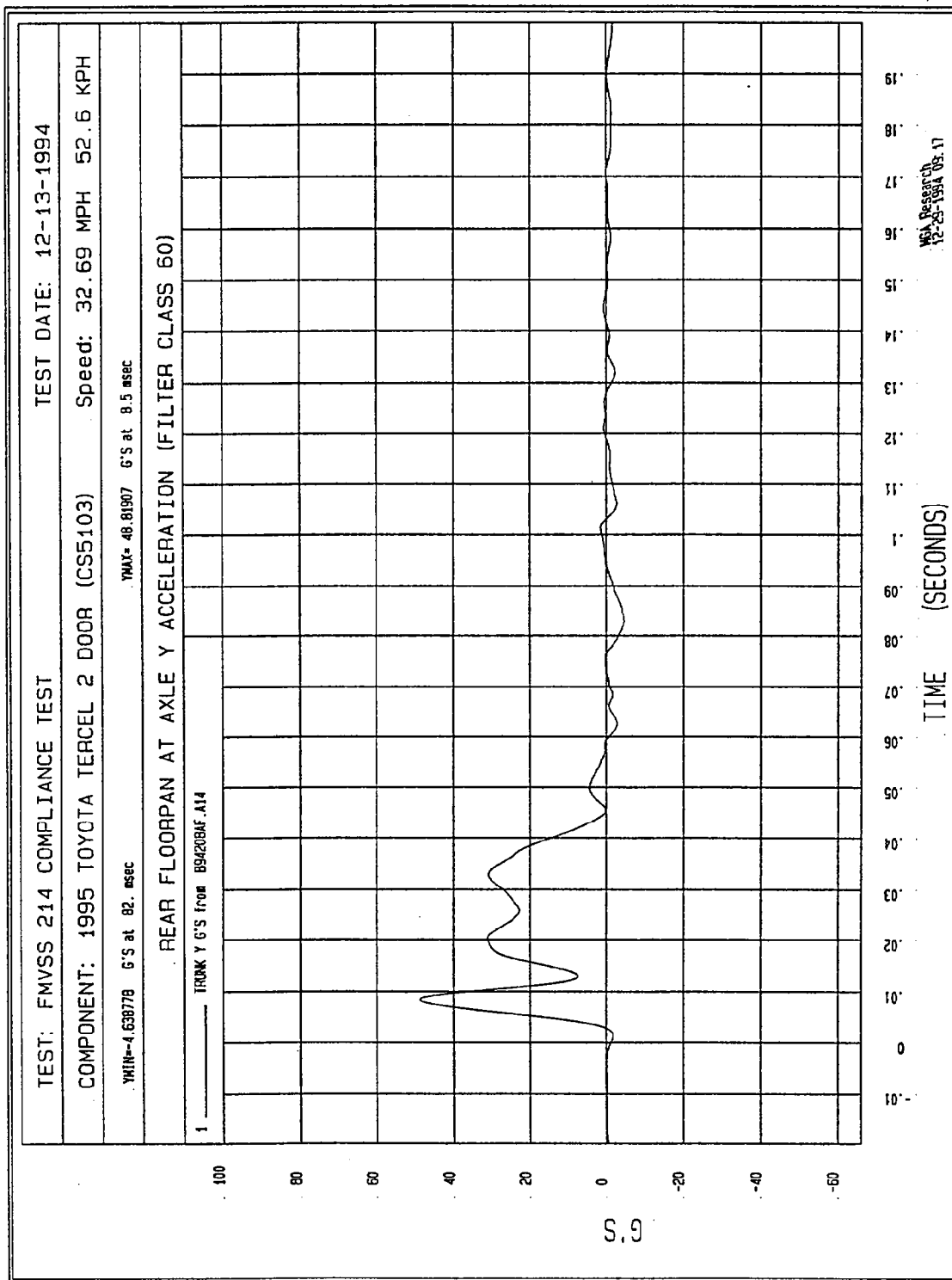
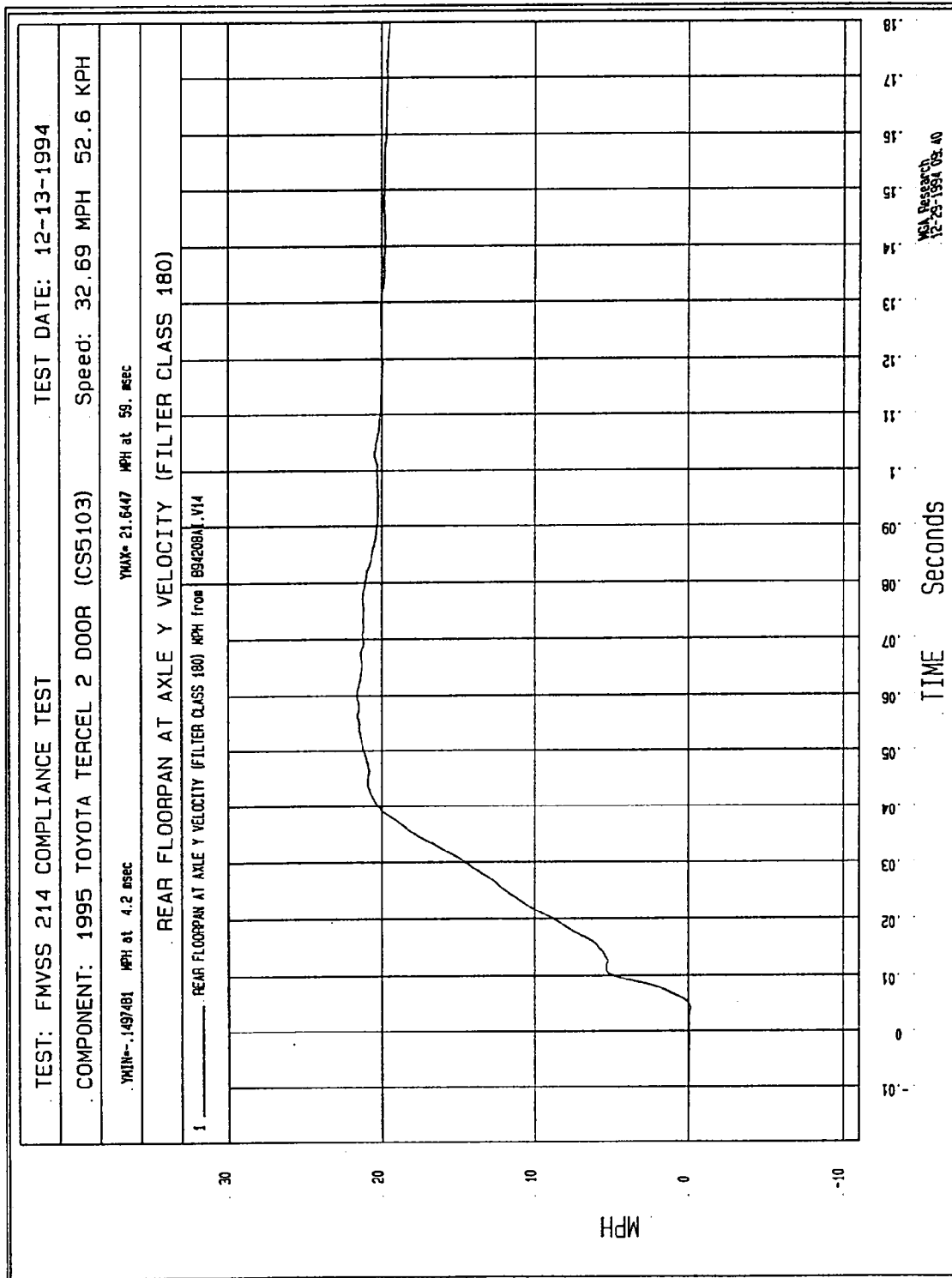
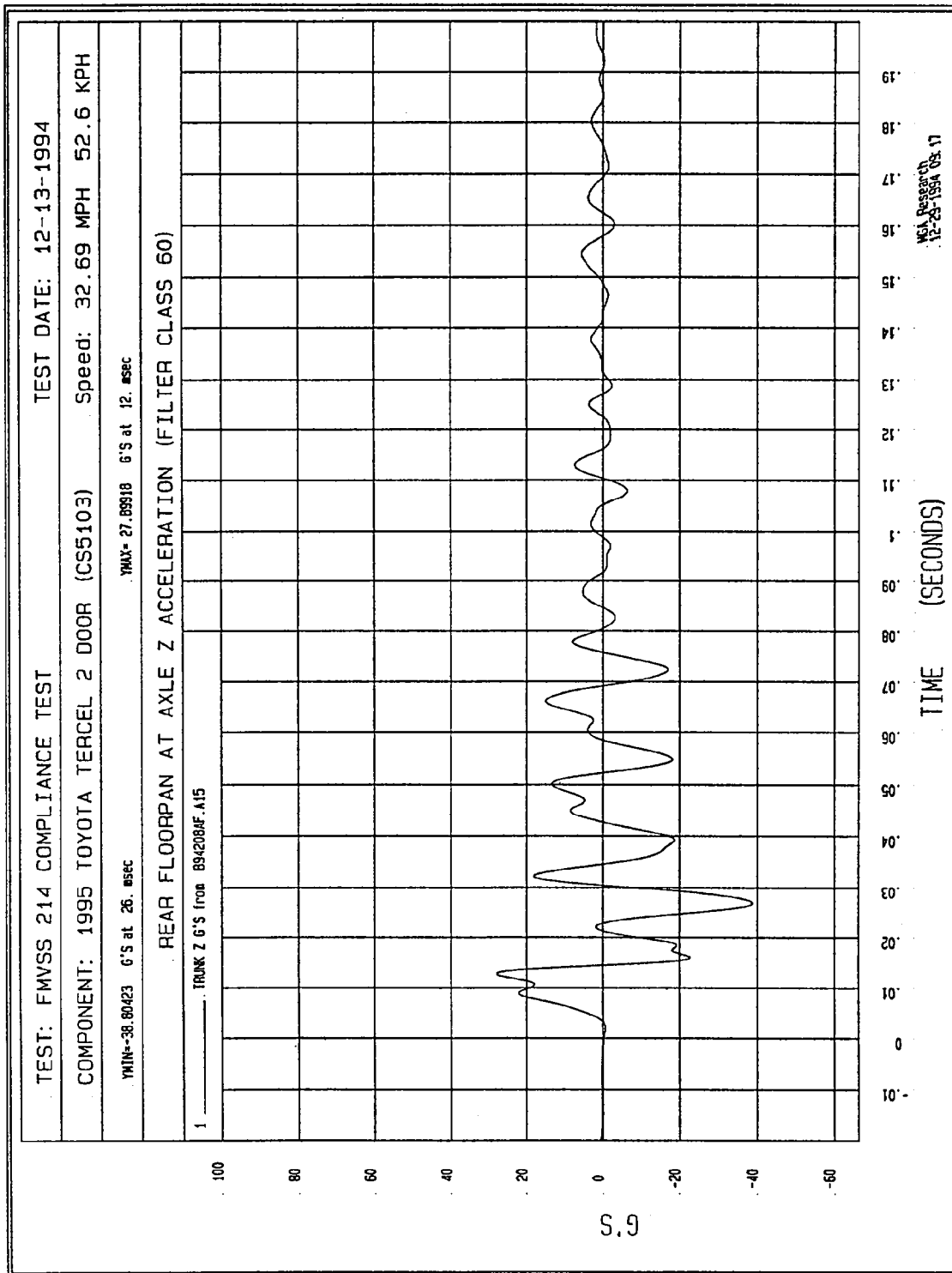


Figure B-39 - Rear Floorpan at Axle Y Acceleration vs. Time



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



B-41

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

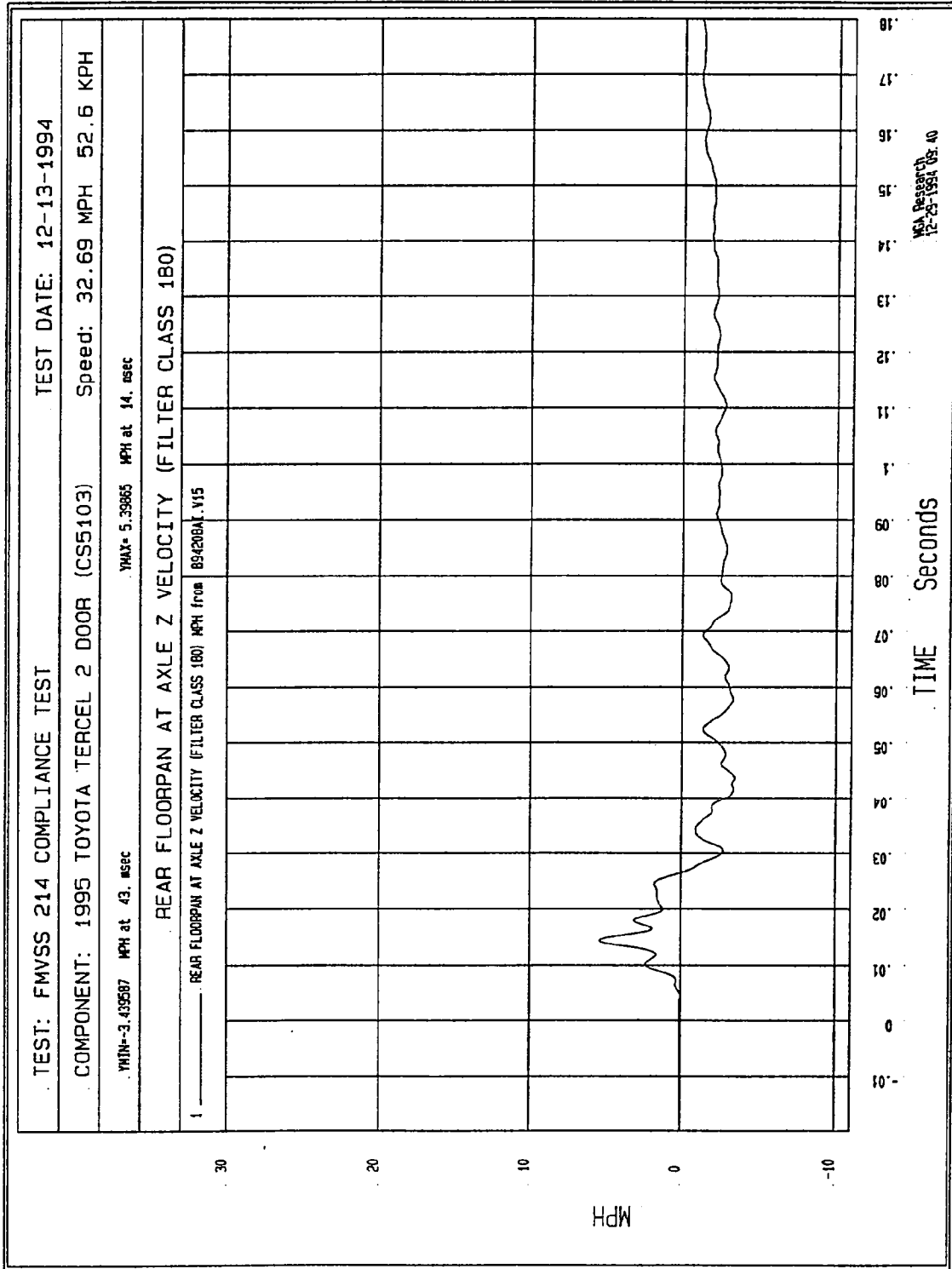


Figure B-42 - Rear Floorpan at Axle Z Velocity vs. Time

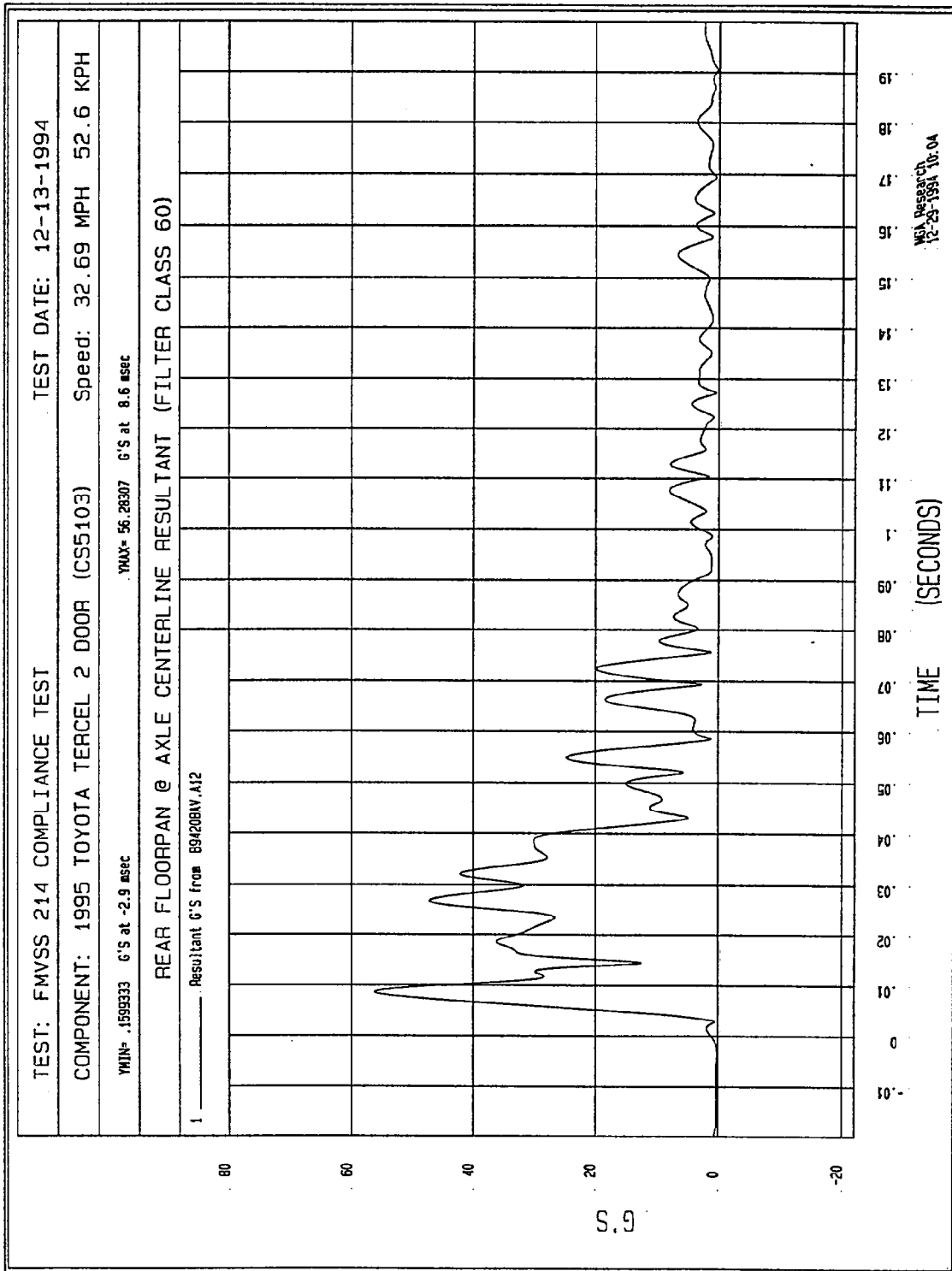


Figure B-43 - Rear Floorpan at Axle Centerline Resultant vs. Time

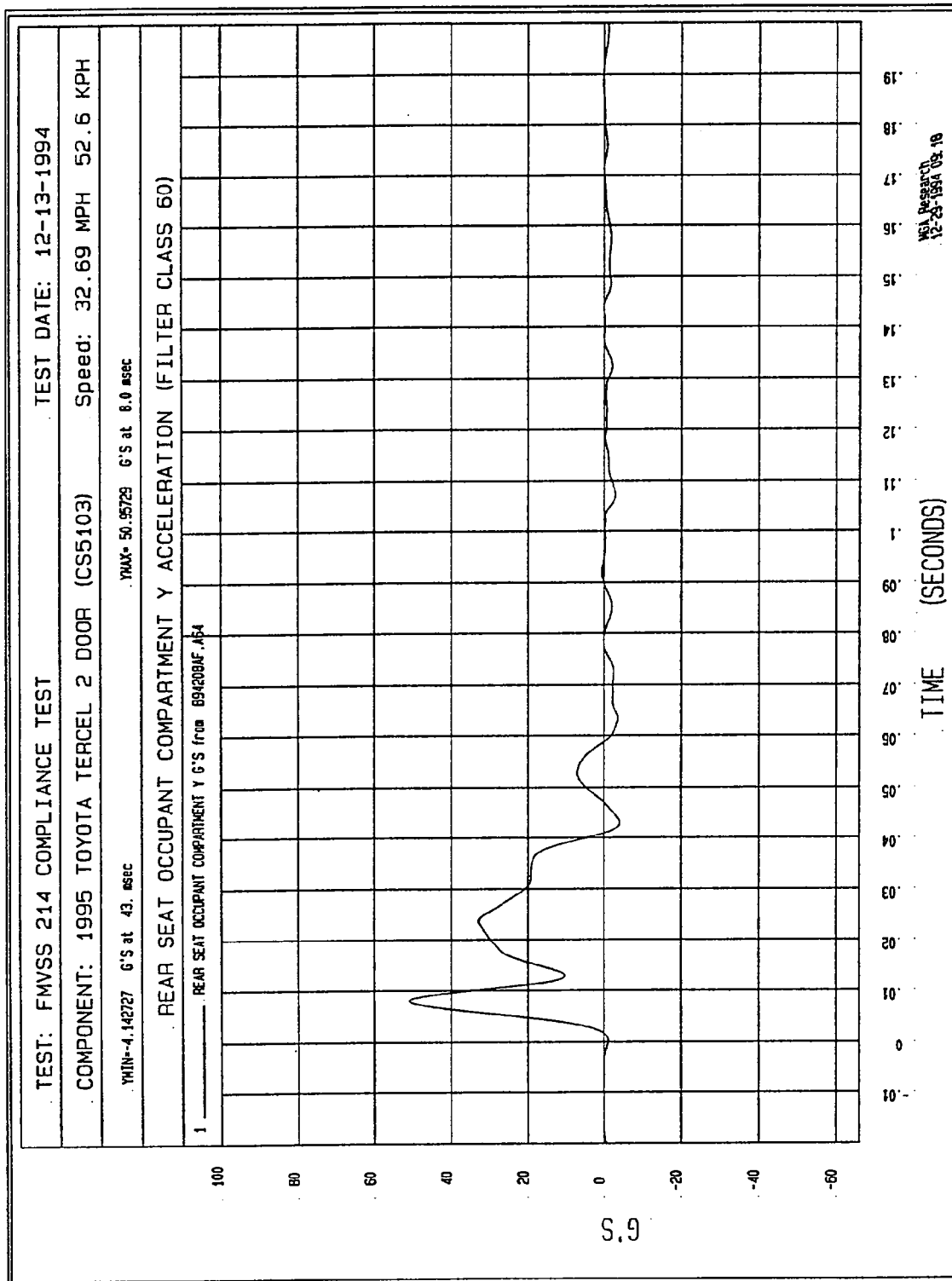
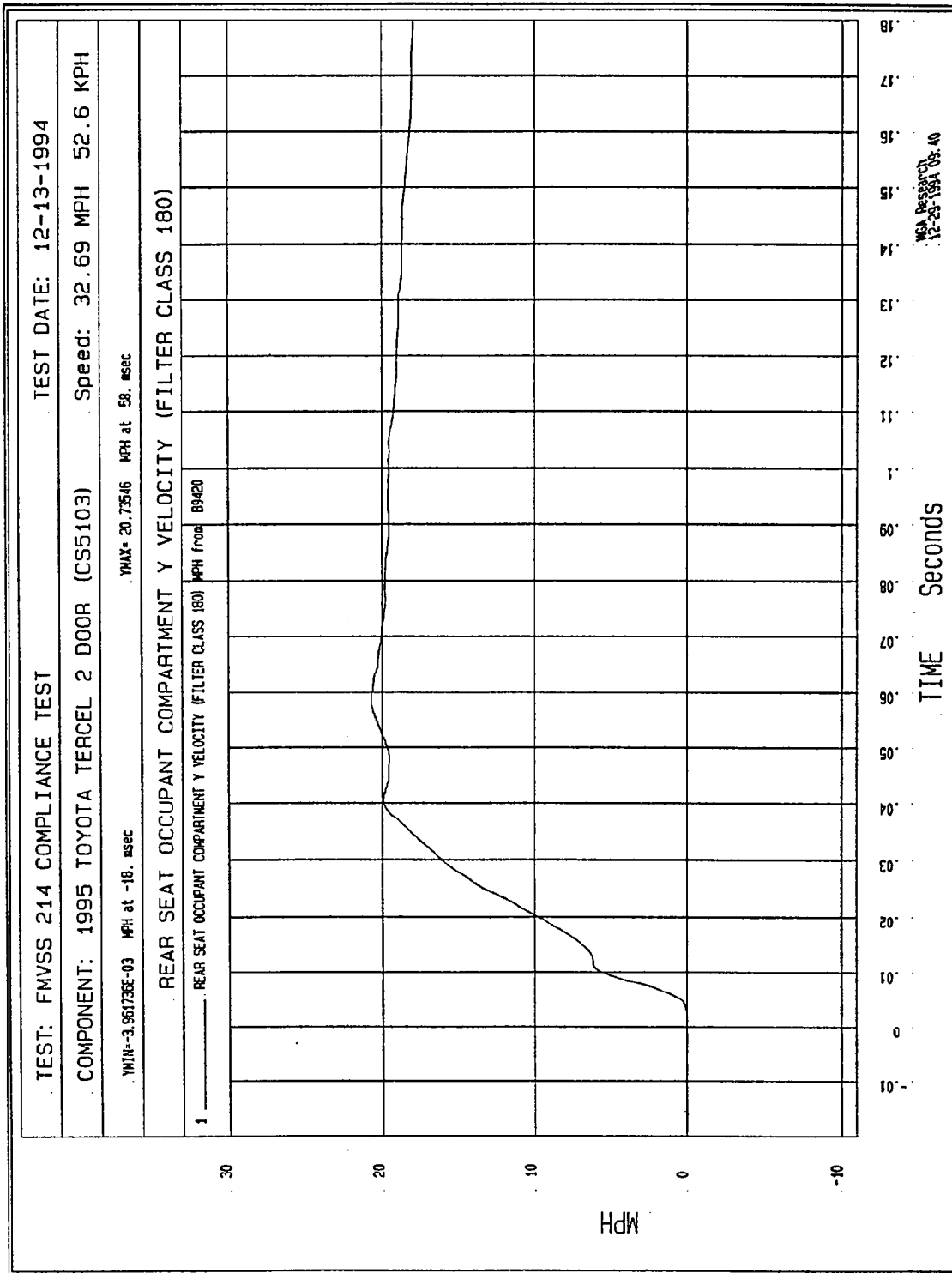


Figure B-44 - Rear Seat Occupant Compartment Y Acceleration vs. Time



MSA Research
12-23-1994 09:40

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

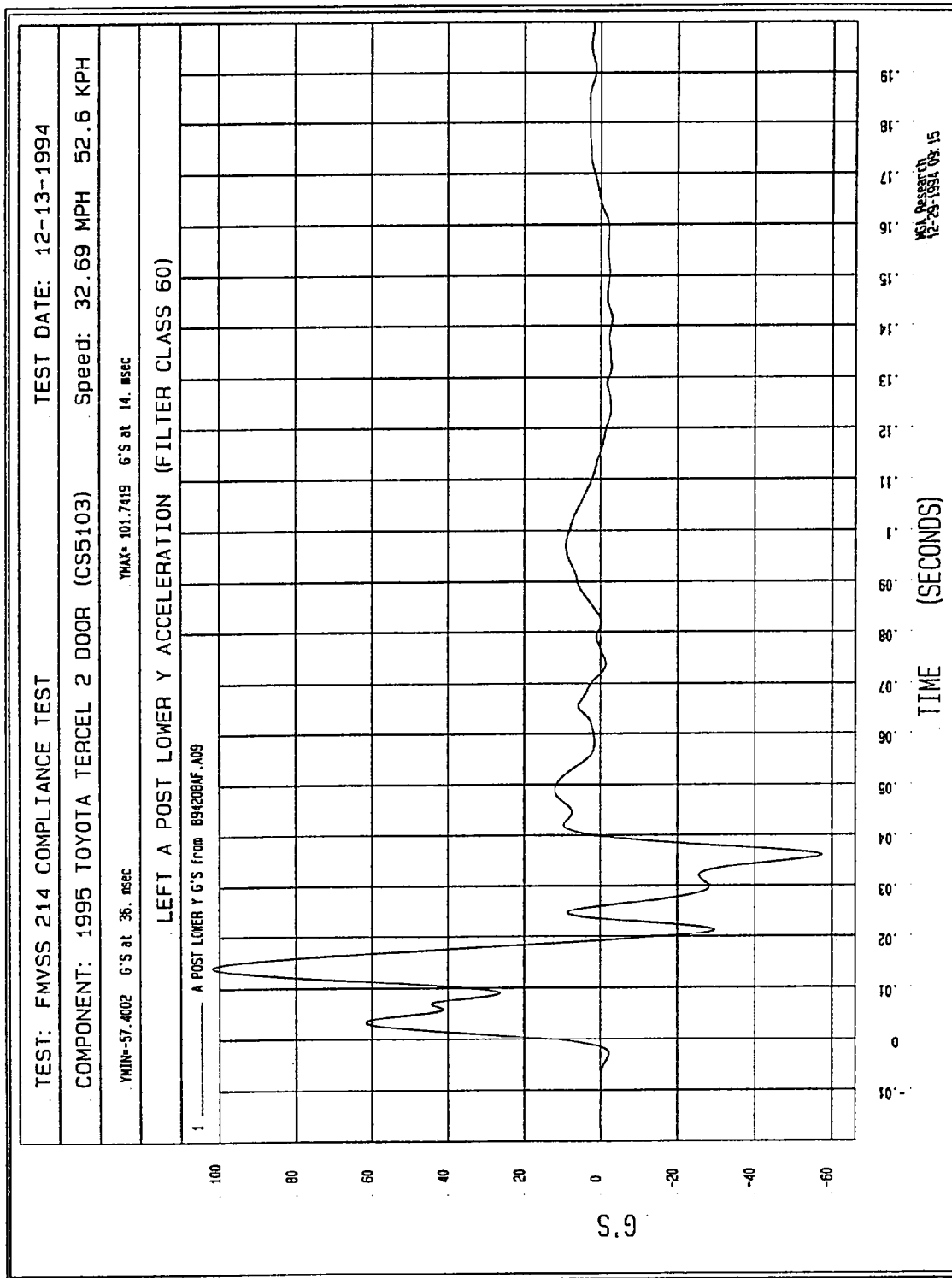
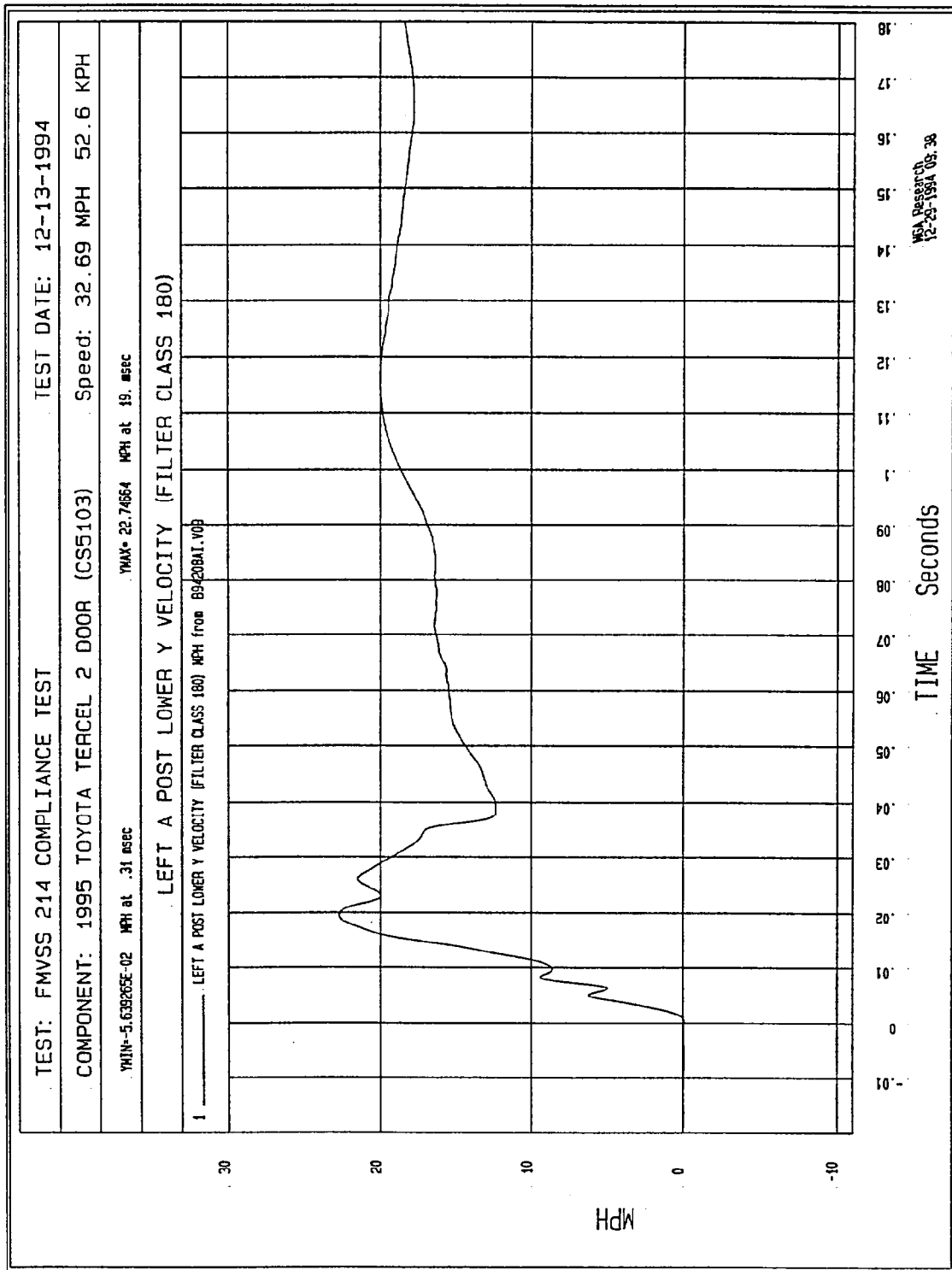
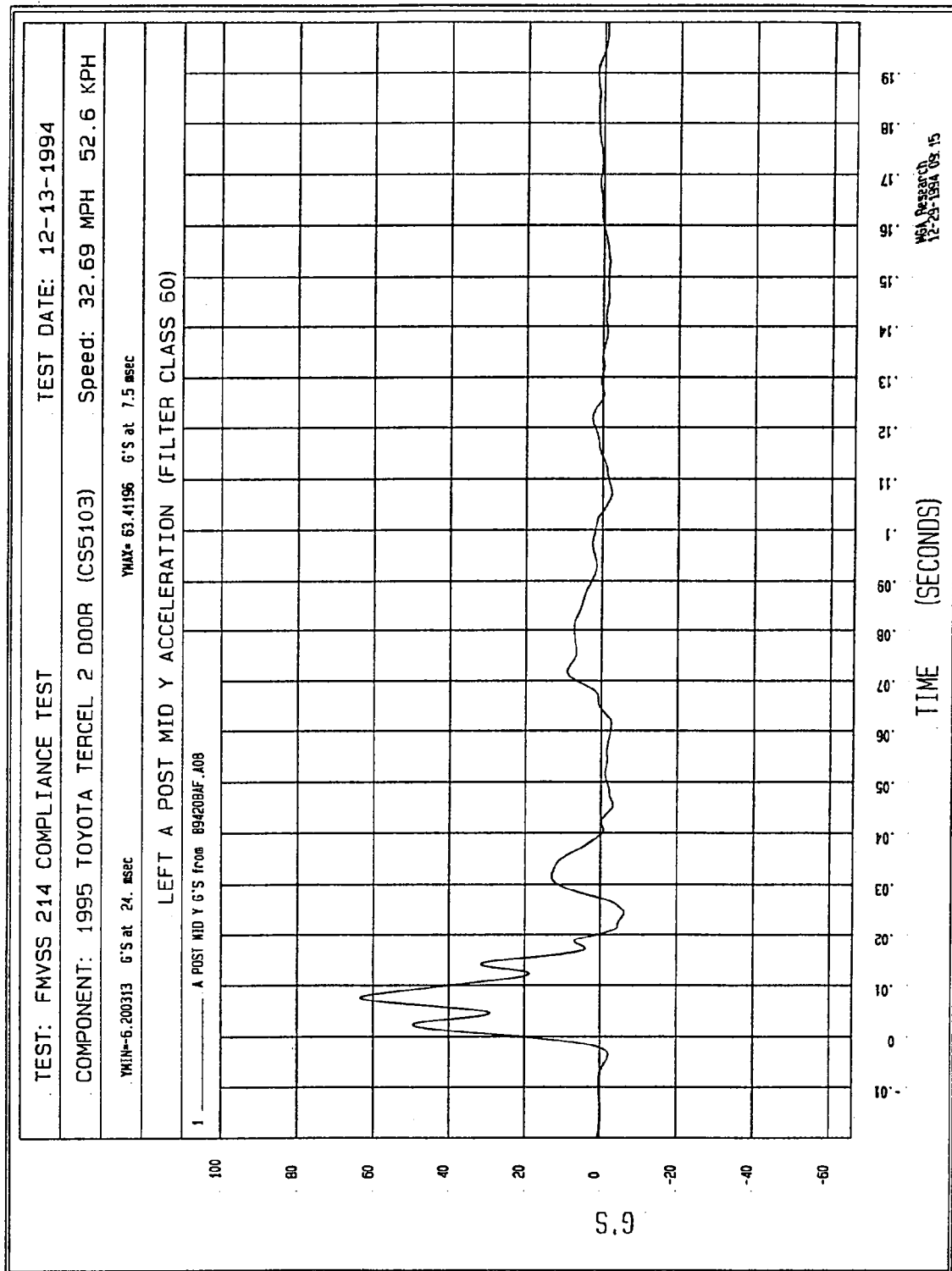


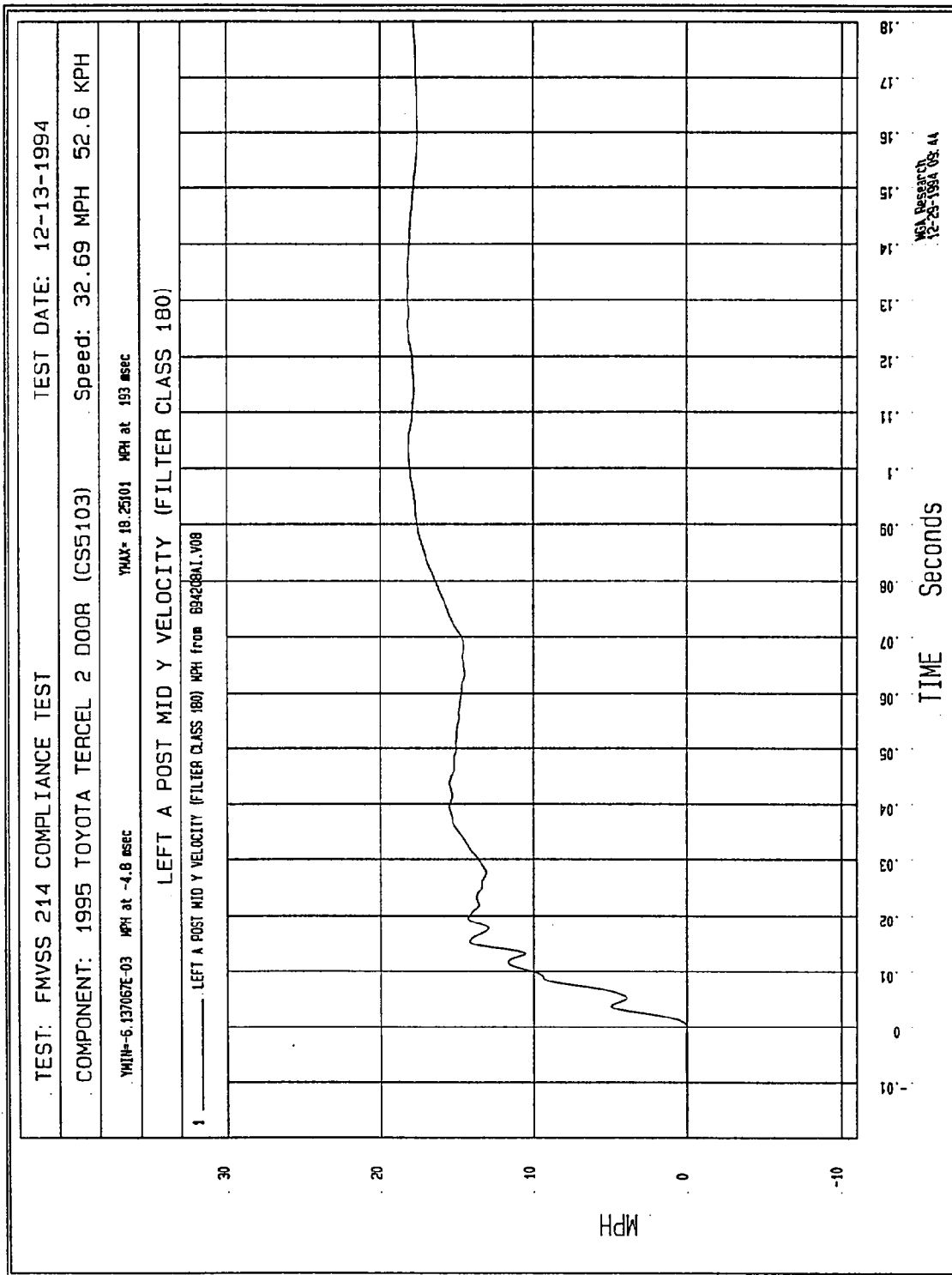
Figure B-46 - Left A Post Lower Y Acceleration vs. Time



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





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

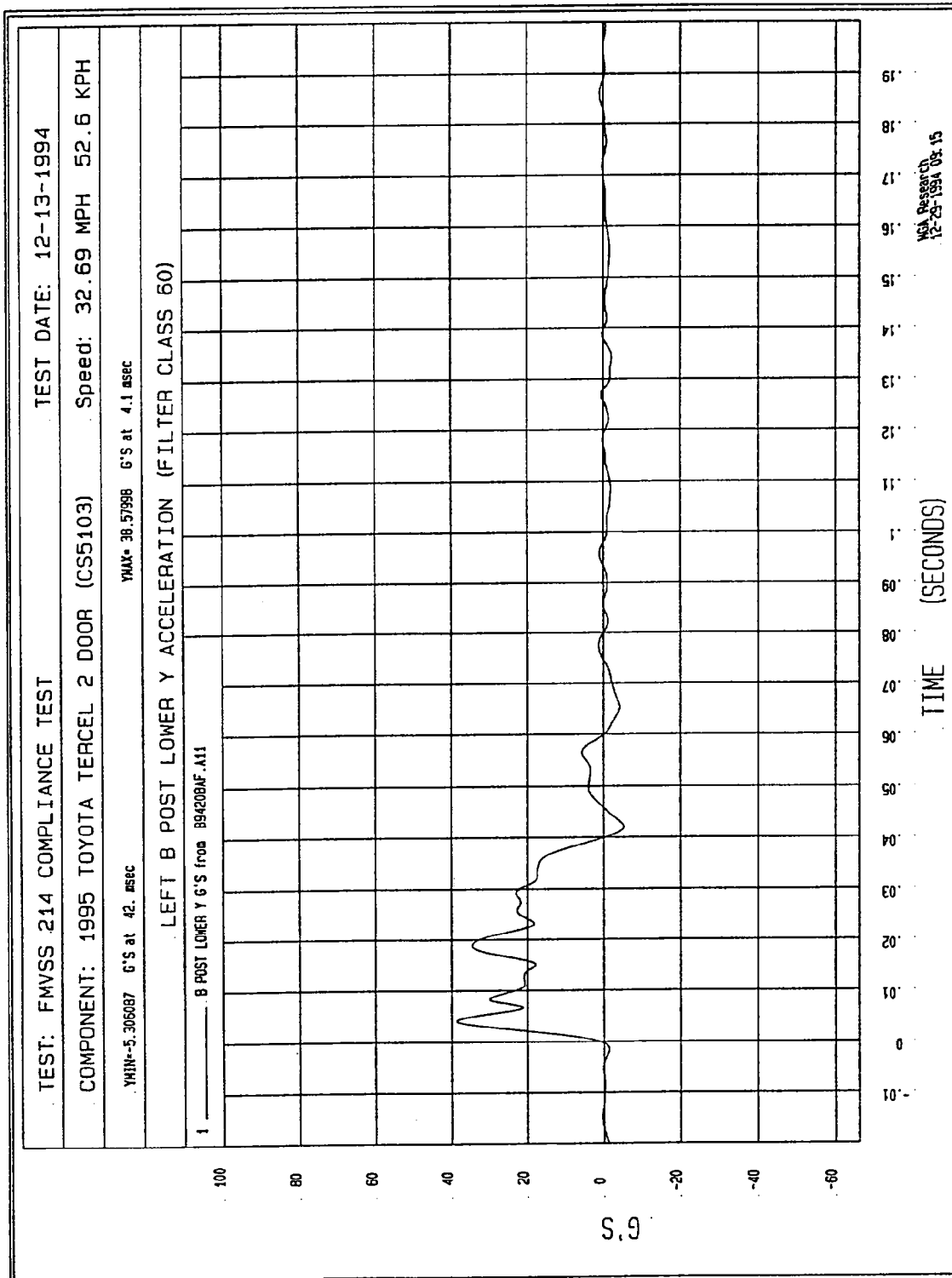
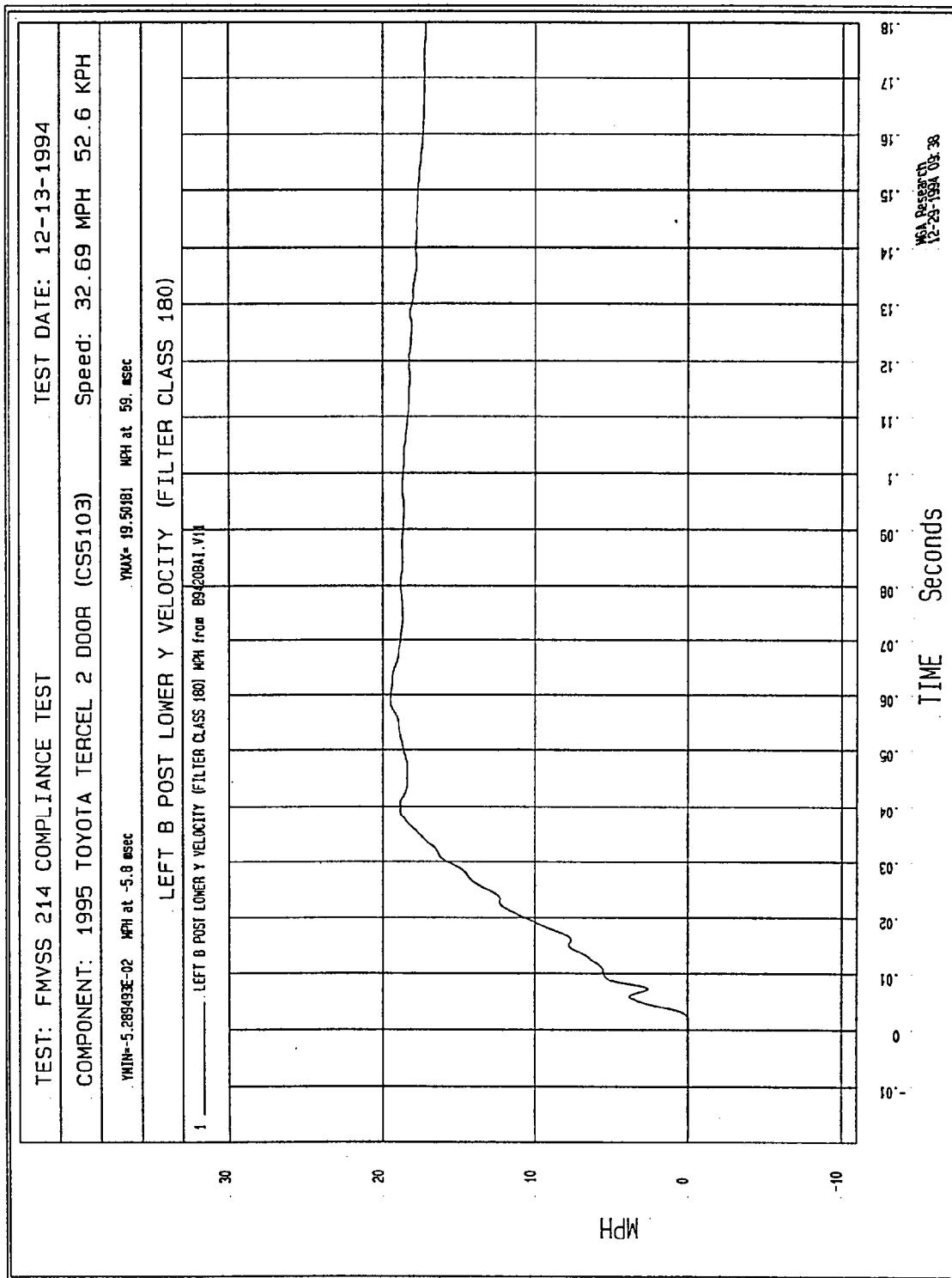


Figure B-50 - Left B Post Lower Y Acceleration vs. Time



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

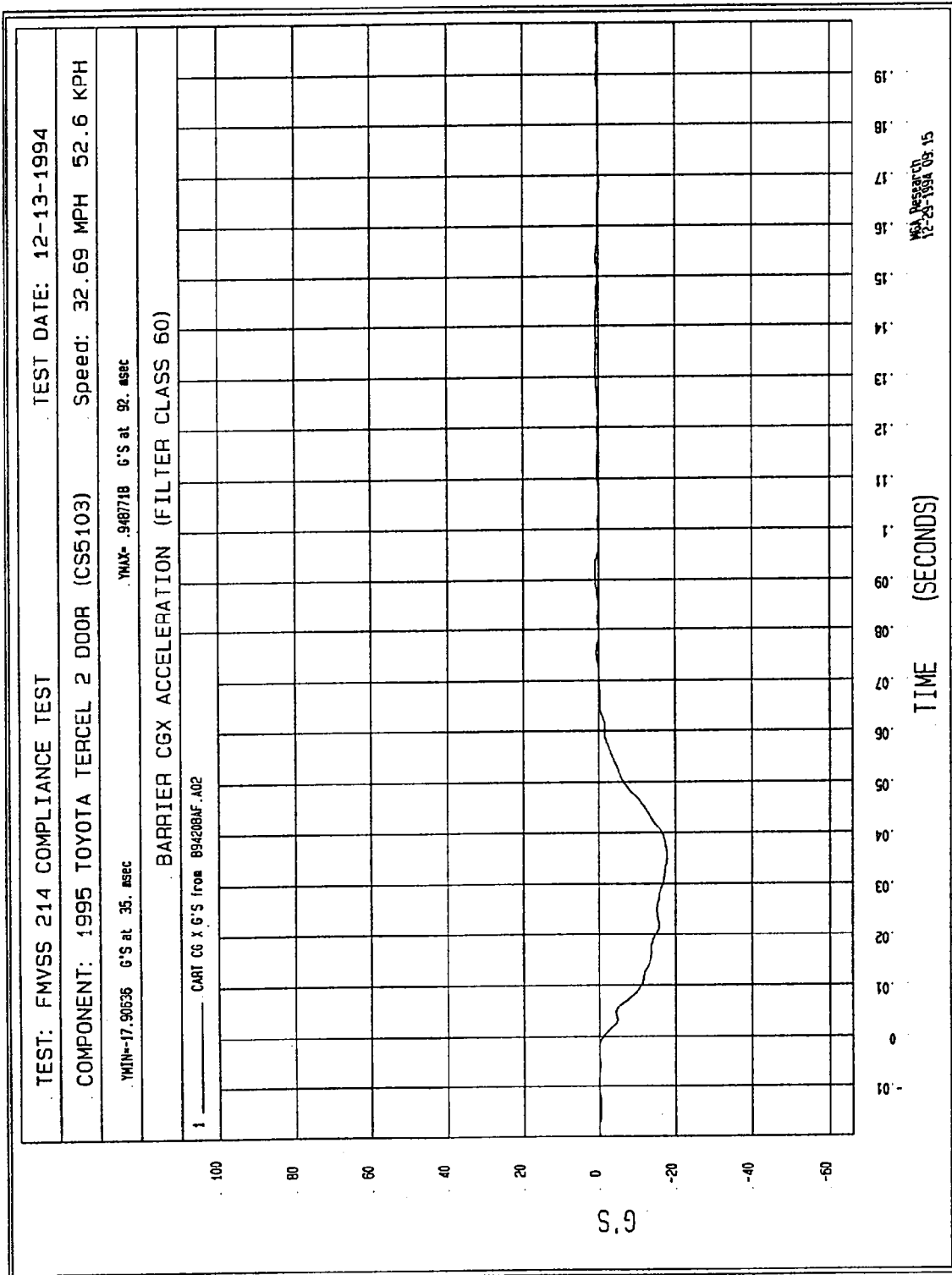
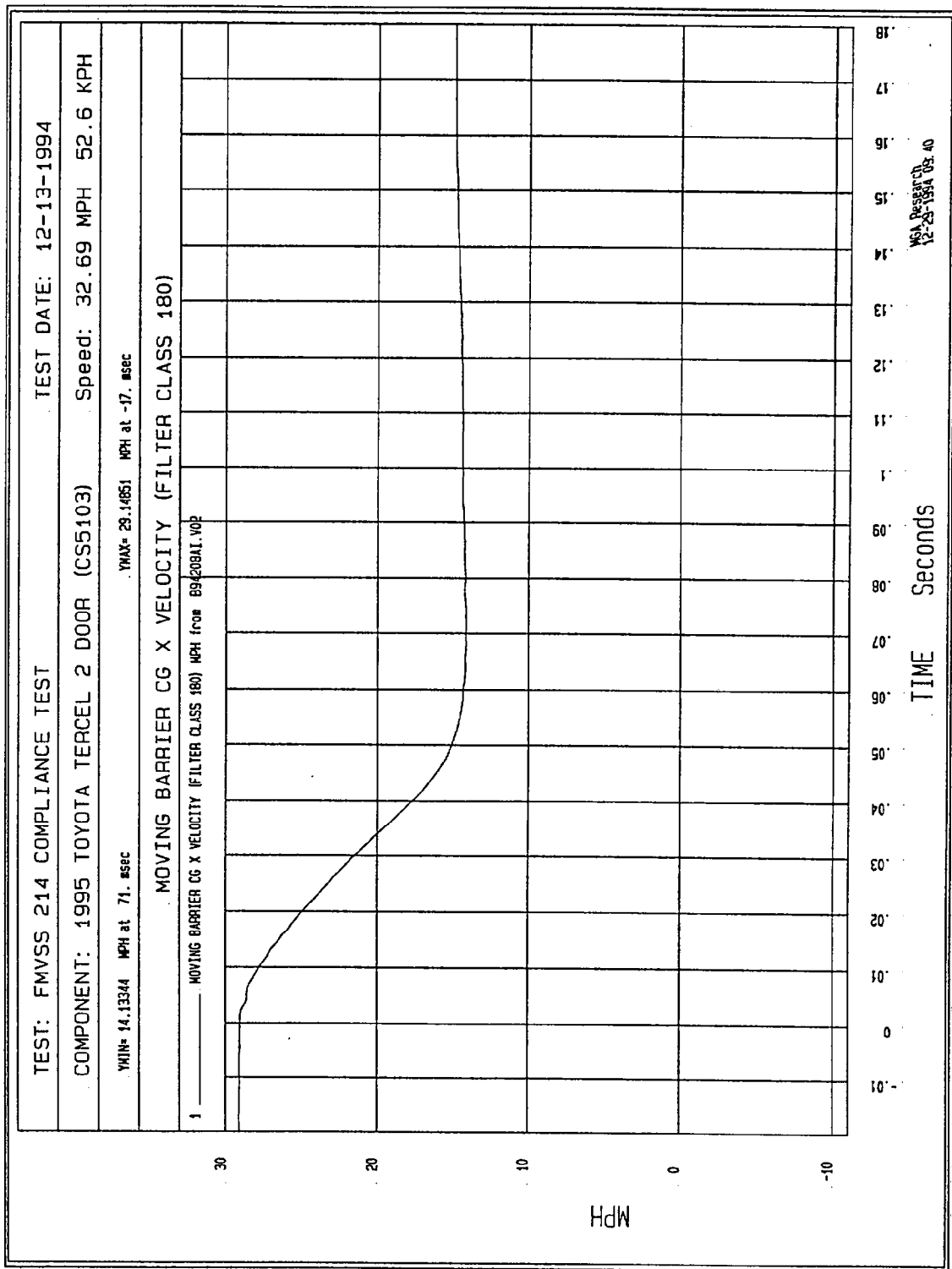


Figure B-52 - Moving Barrier Center of Gravity X Acceleration vs. Time



B-53

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

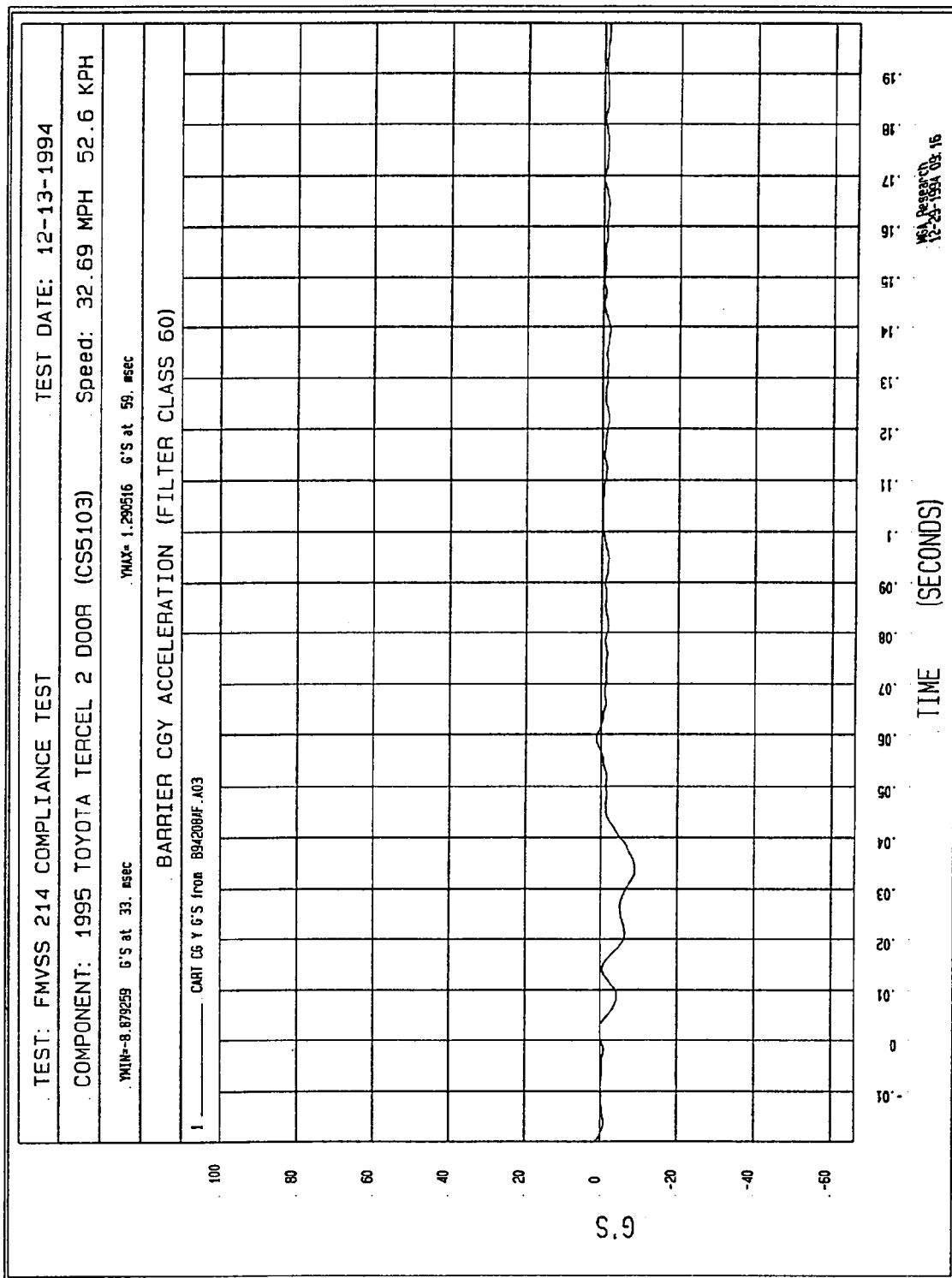


Figure B-54 - Moving Barrier Center of Gravity Y Acceleration vs. Time

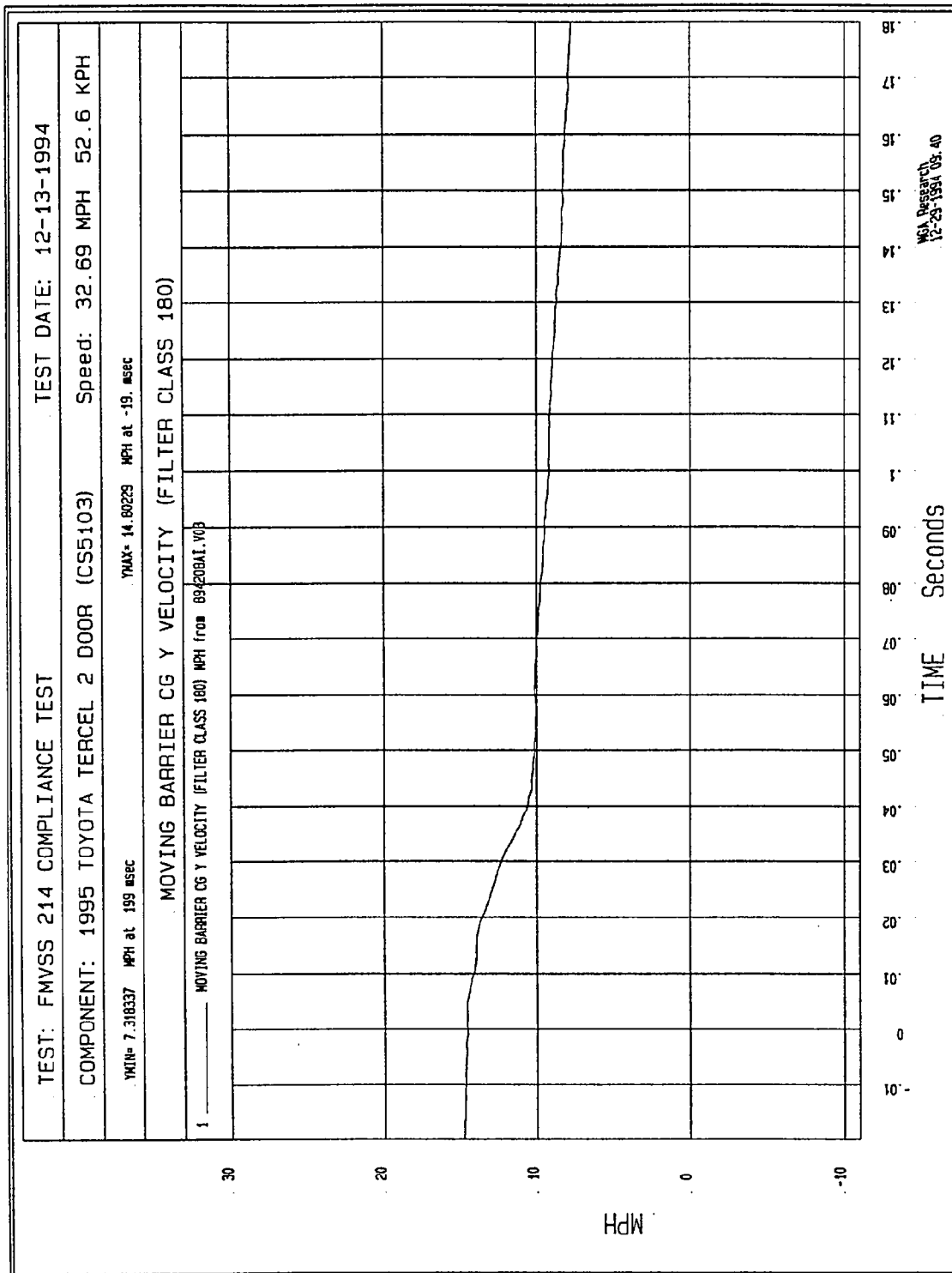


Figure B-55 - Moving Barrier Center of Gravity Y Velocity vs. Time

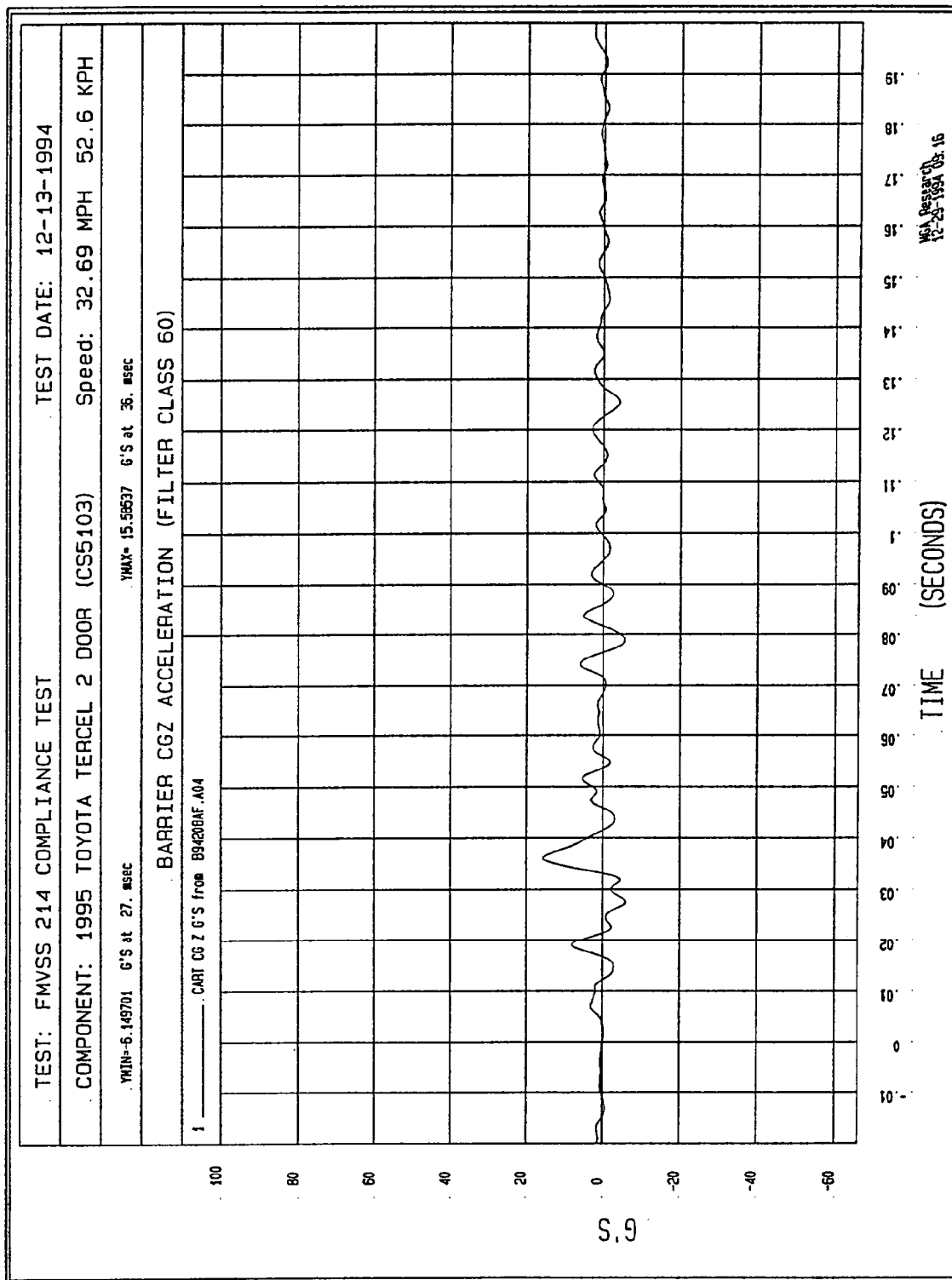


Figure B-56 - Moving Barrier Center of Gravity Z Acceleration vs. Time

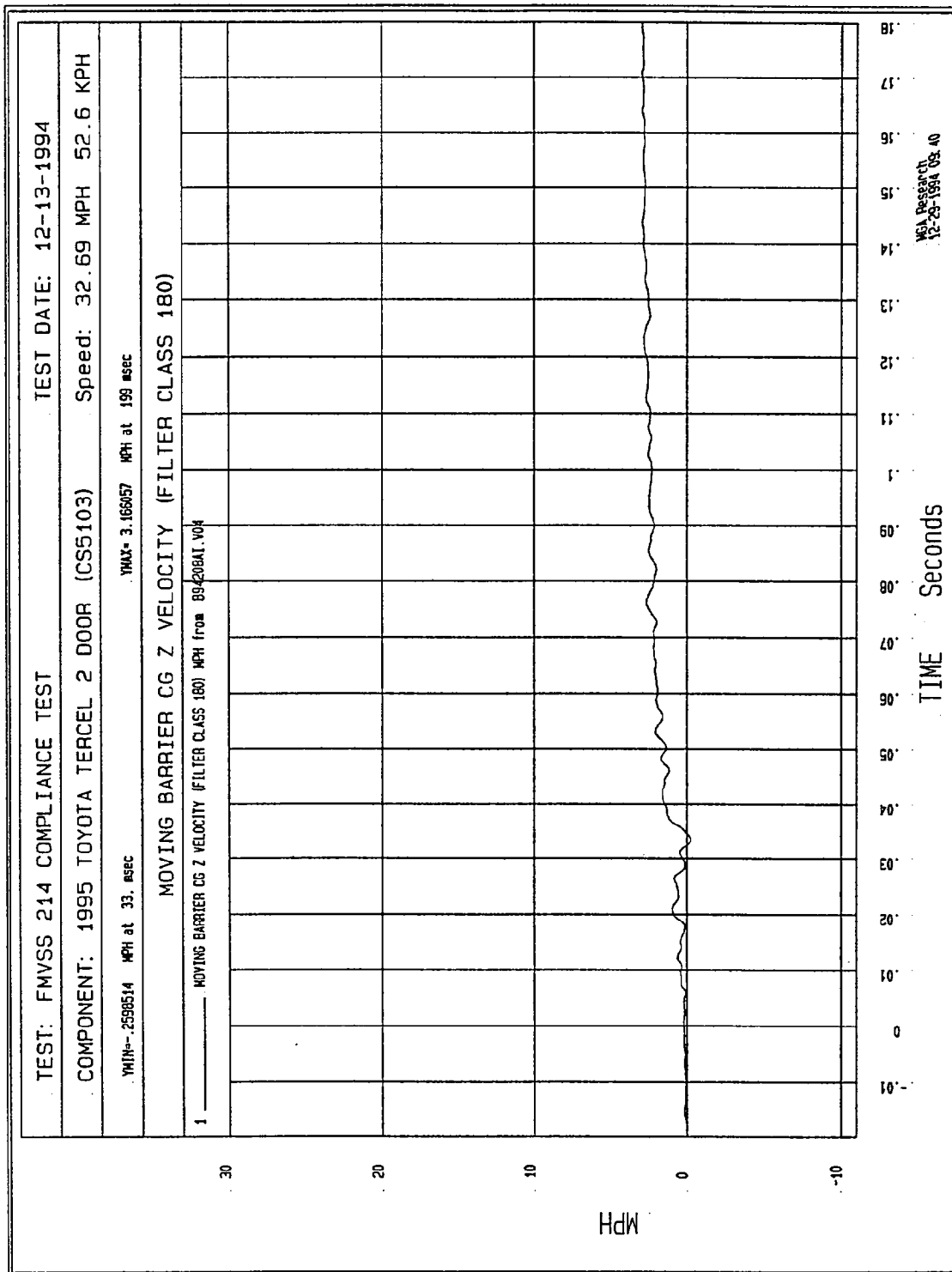
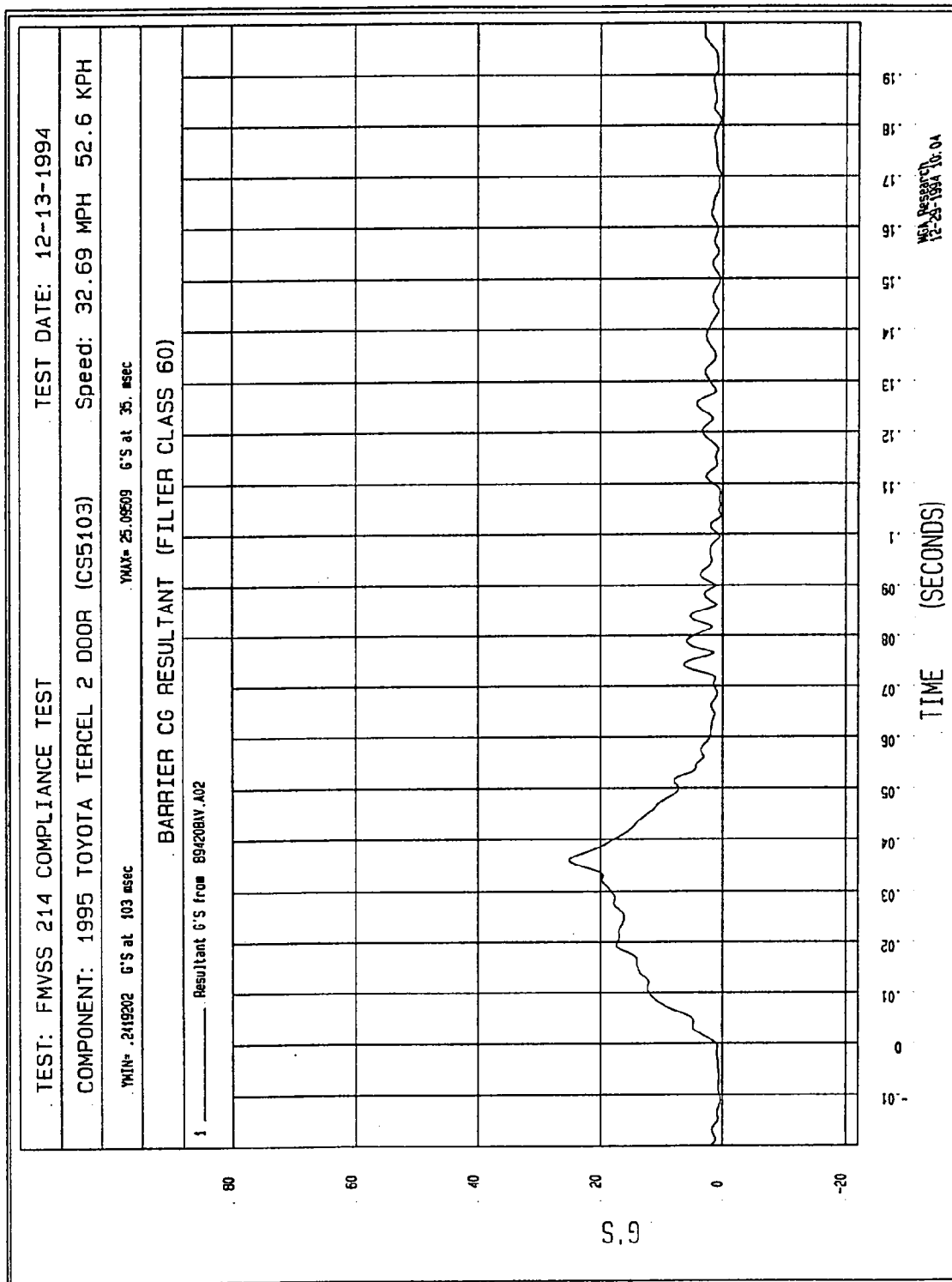


Figure B-57 - Moving Barrier Center of Gravity Z Velocity vs. Time



B-58

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

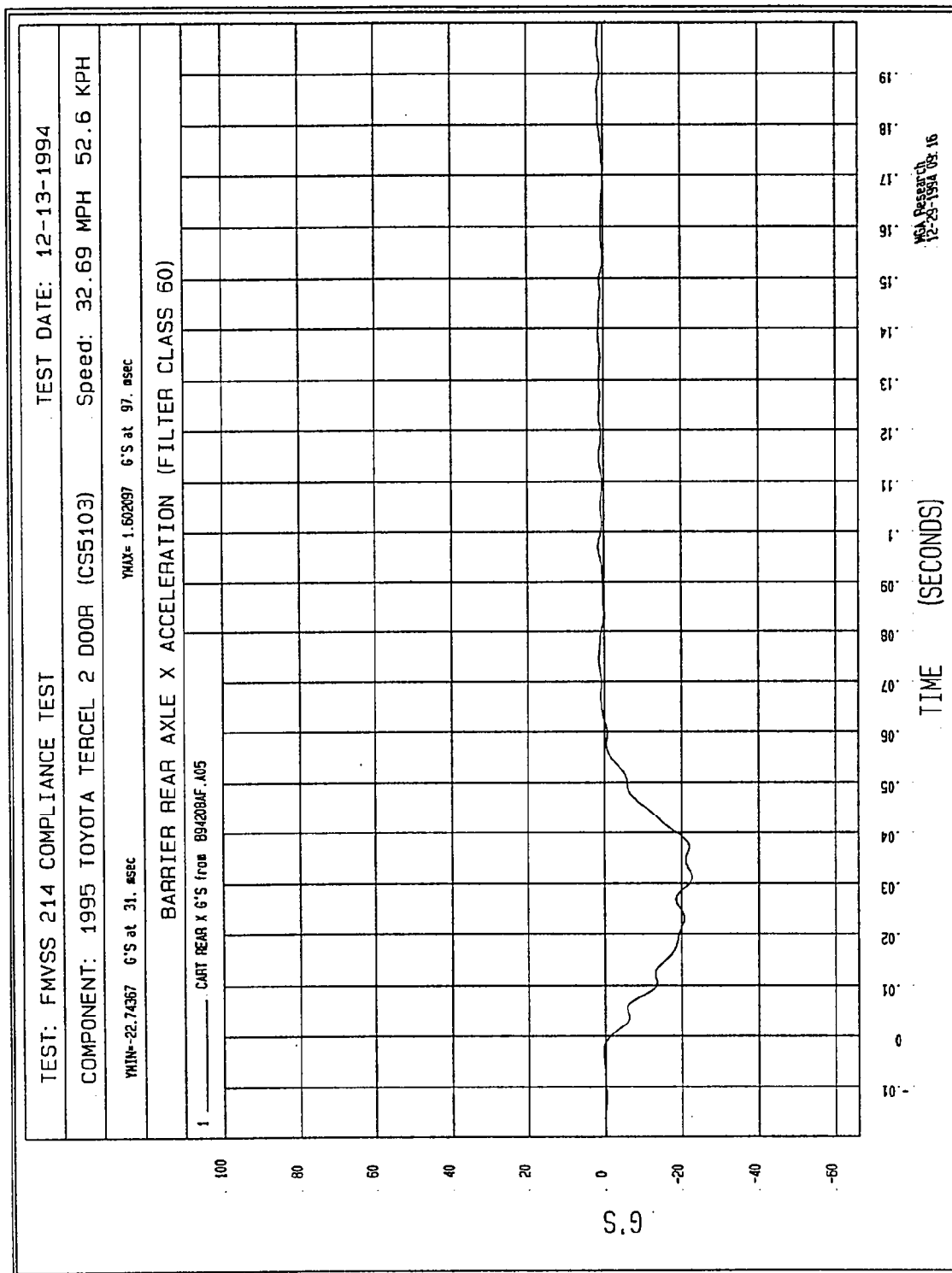


Figure B-59 - Moving Barrier Rear Axle X Acceleration vs. Time

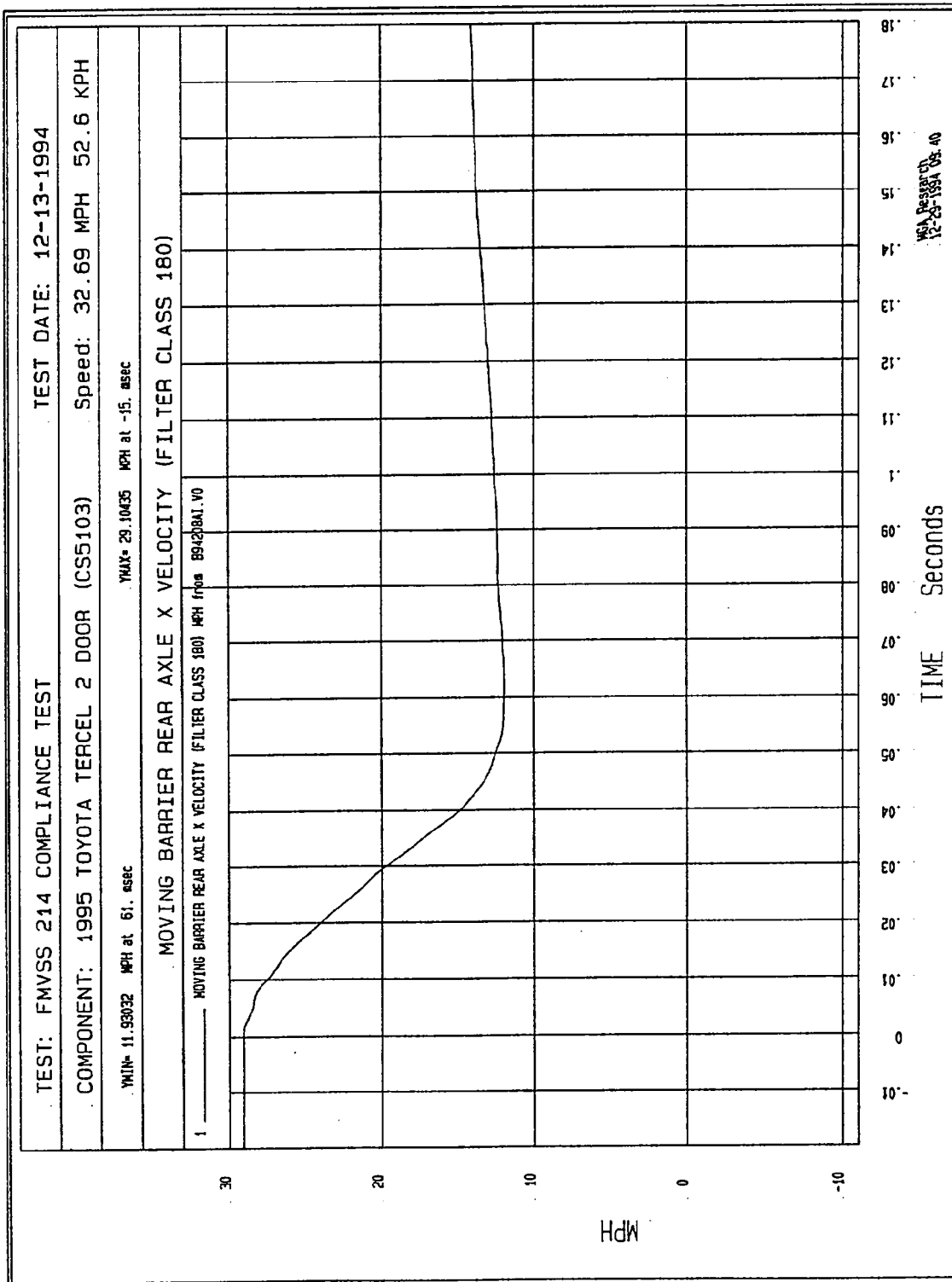
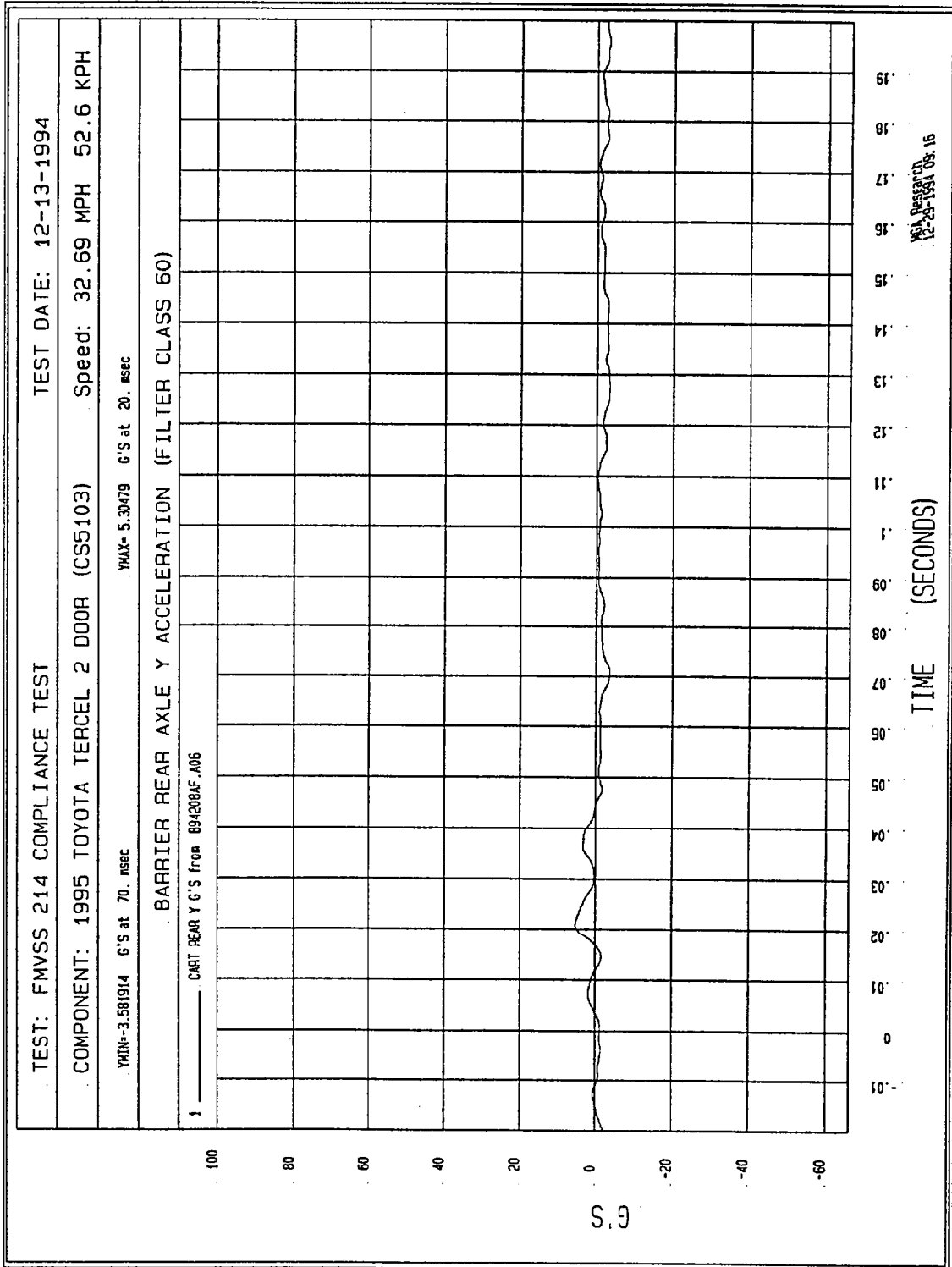


Figure B-60 - Moving Barrier Rear Axle X Velocity vs. Time



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

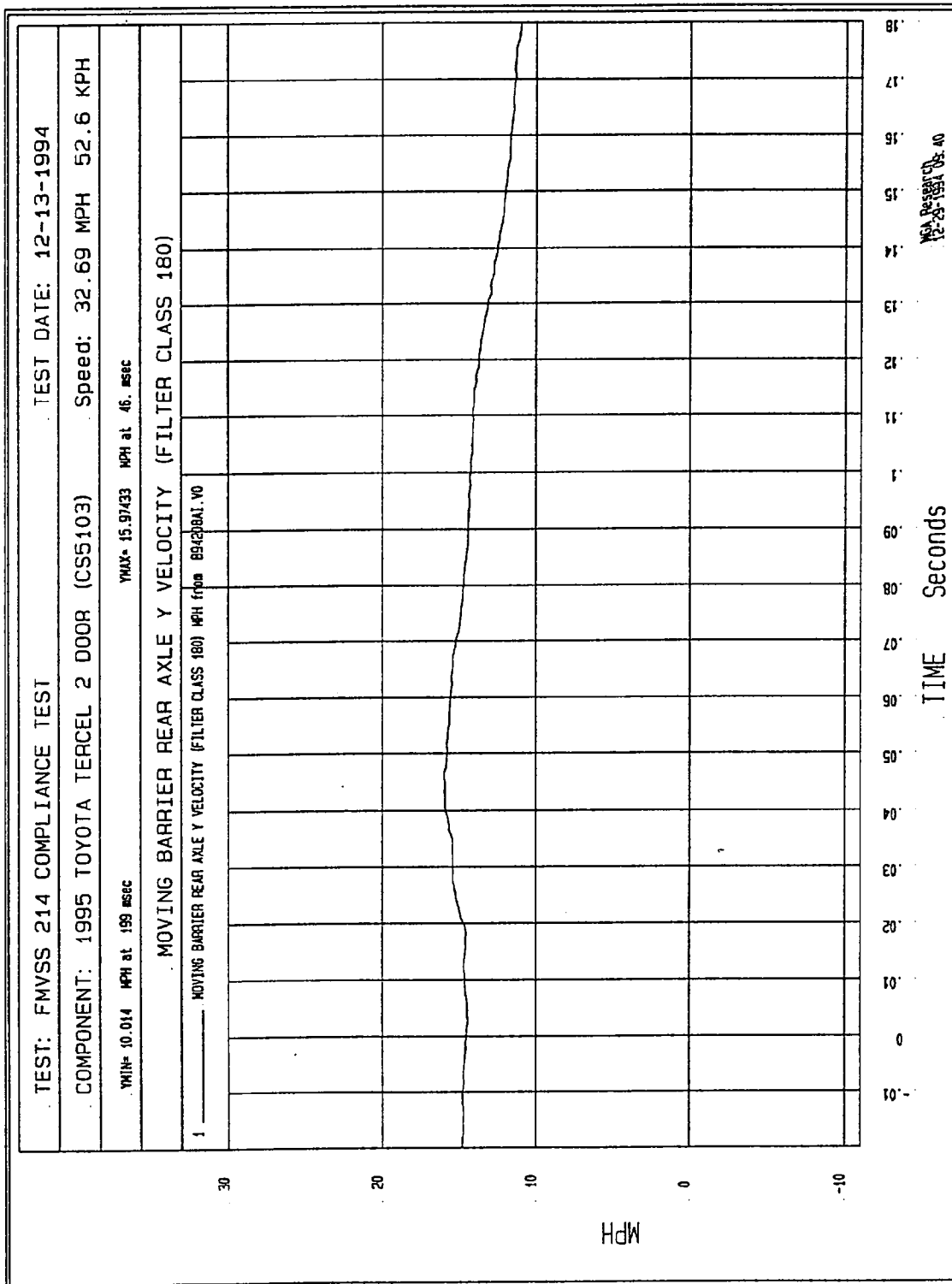
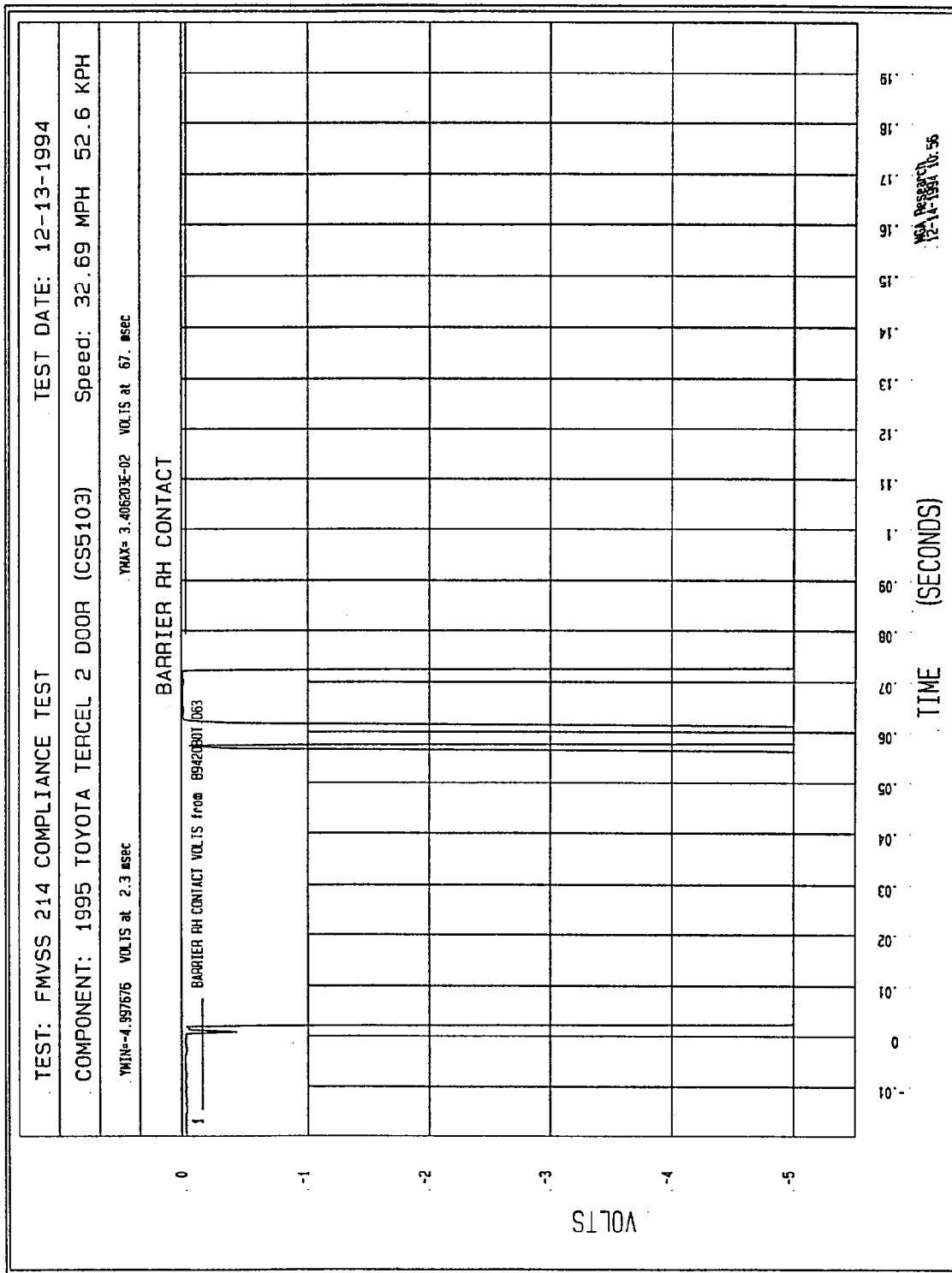


Figure B-62 - Moving Barrier Rear Axle Y Velocity vs. Time



B-63

Figure B-63 - Right Hand Barrier Contact

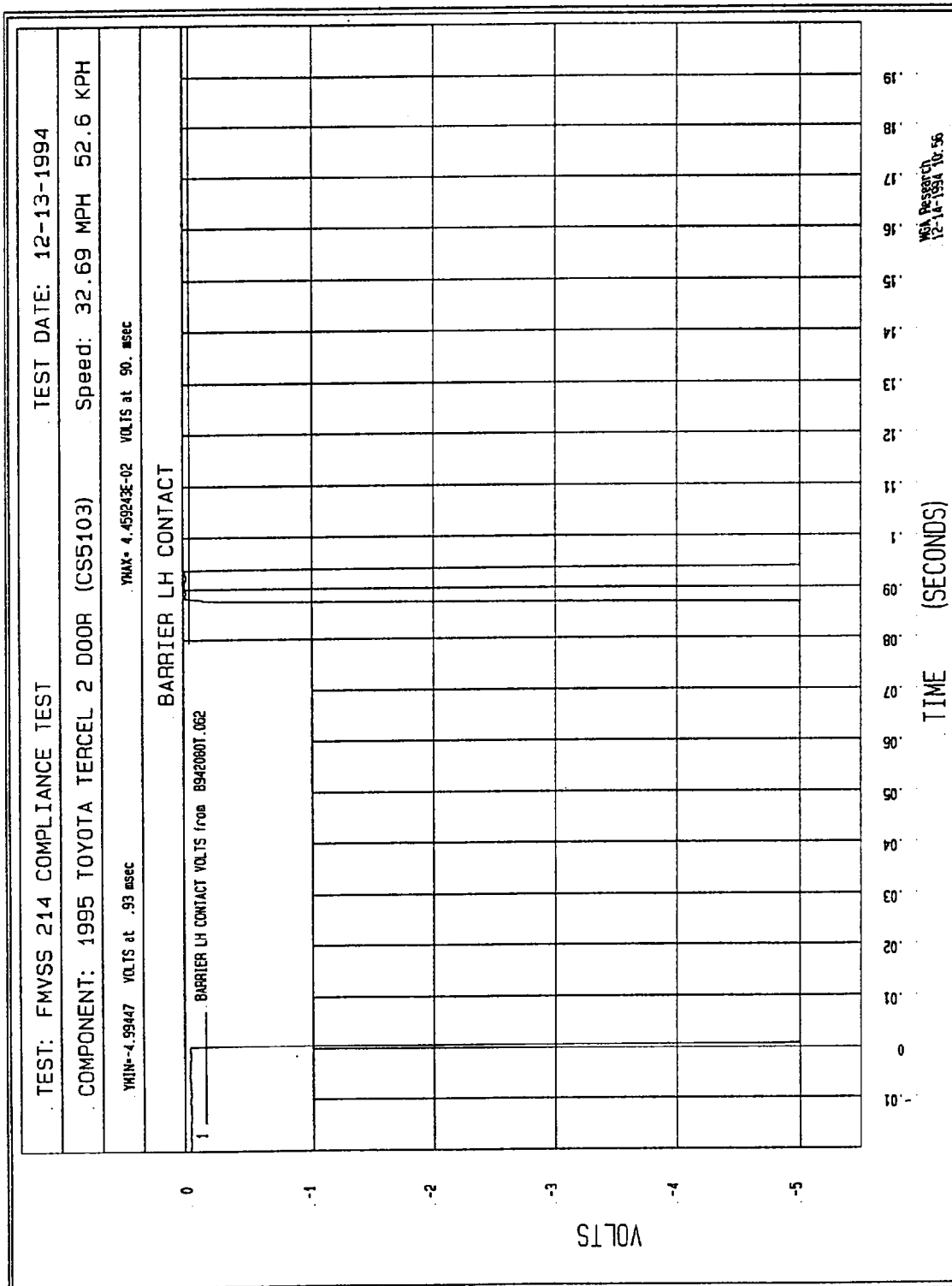
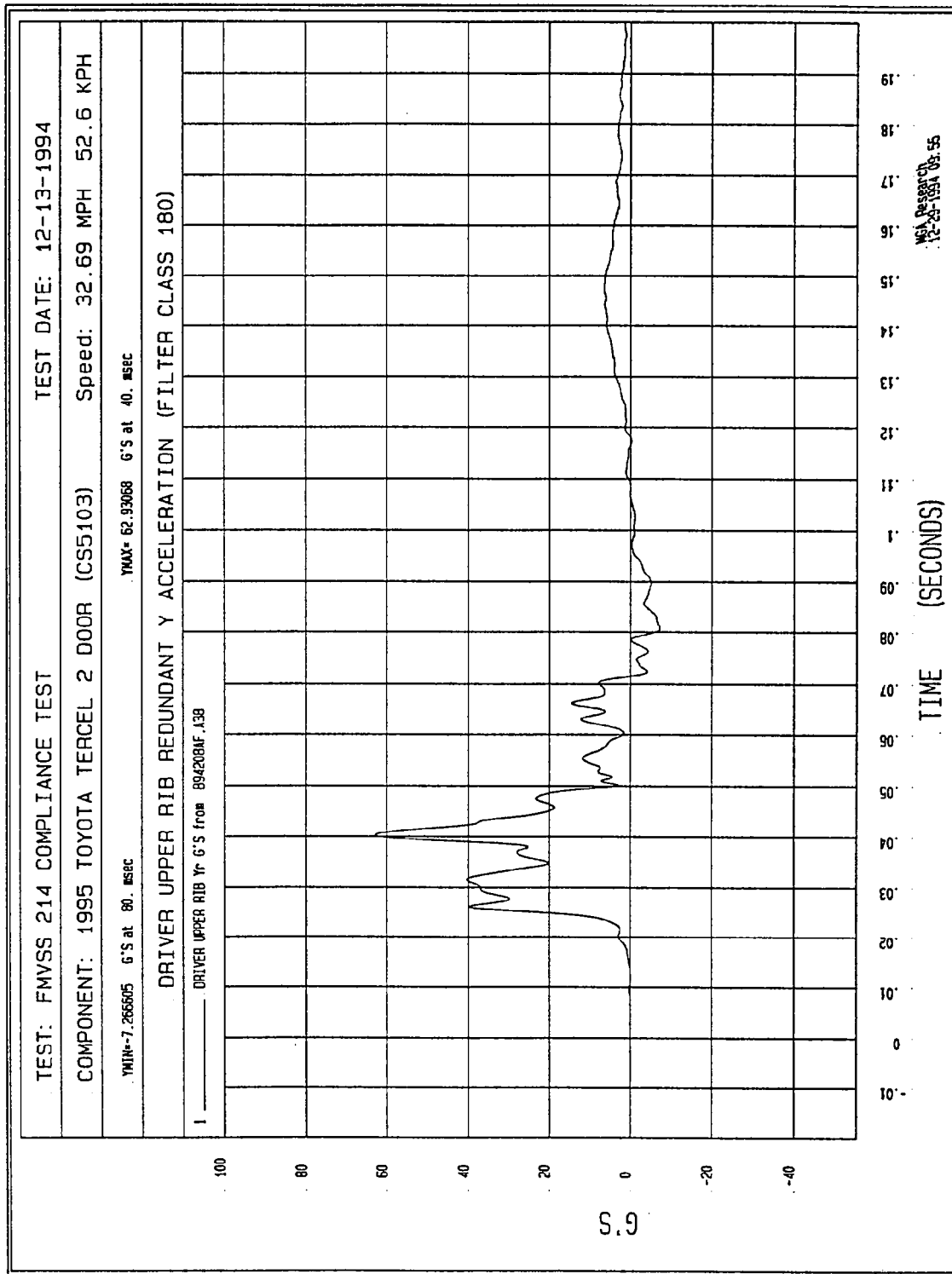
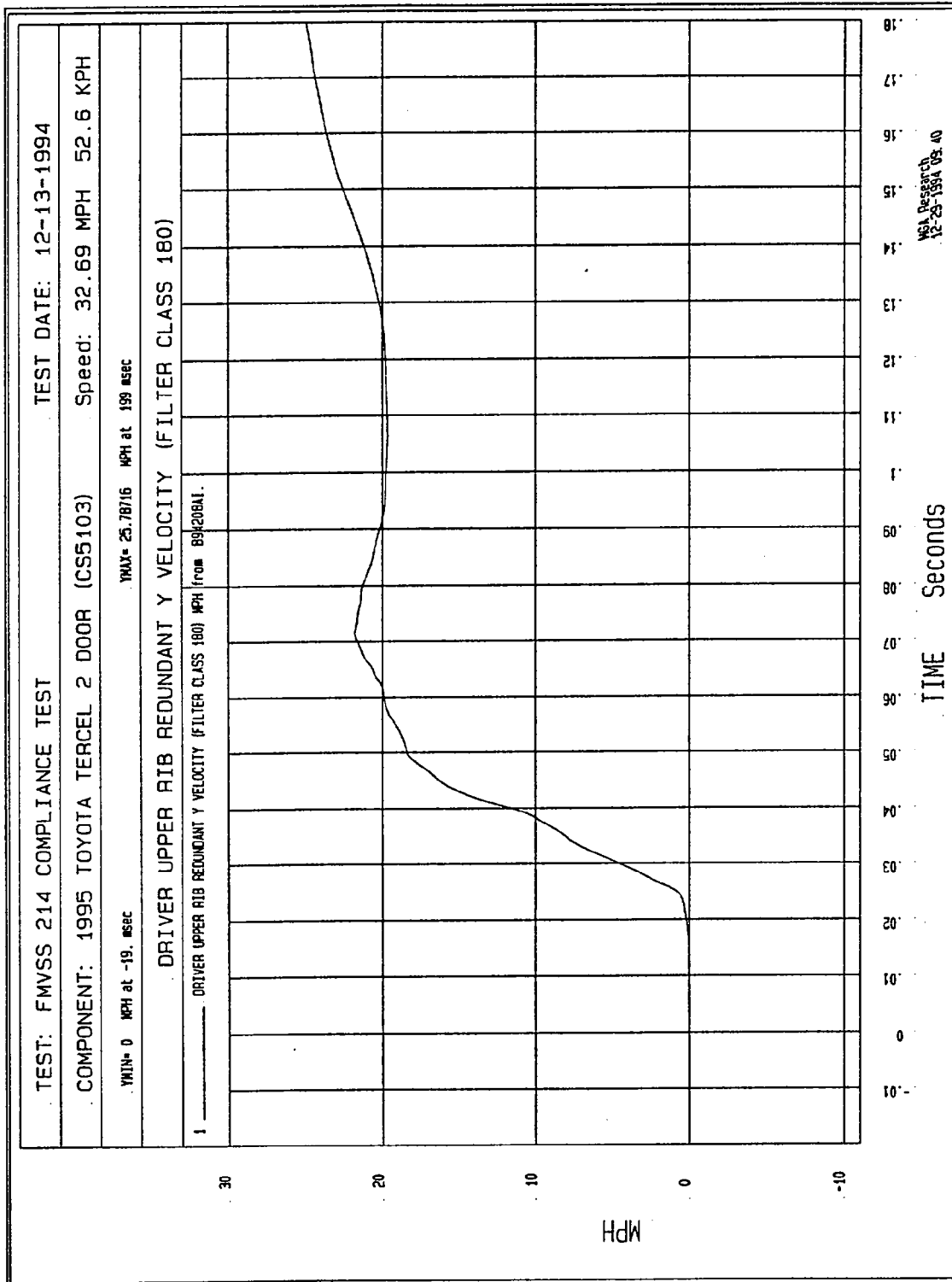


Figure B-64 - Left Hand Barrier Contact



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



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

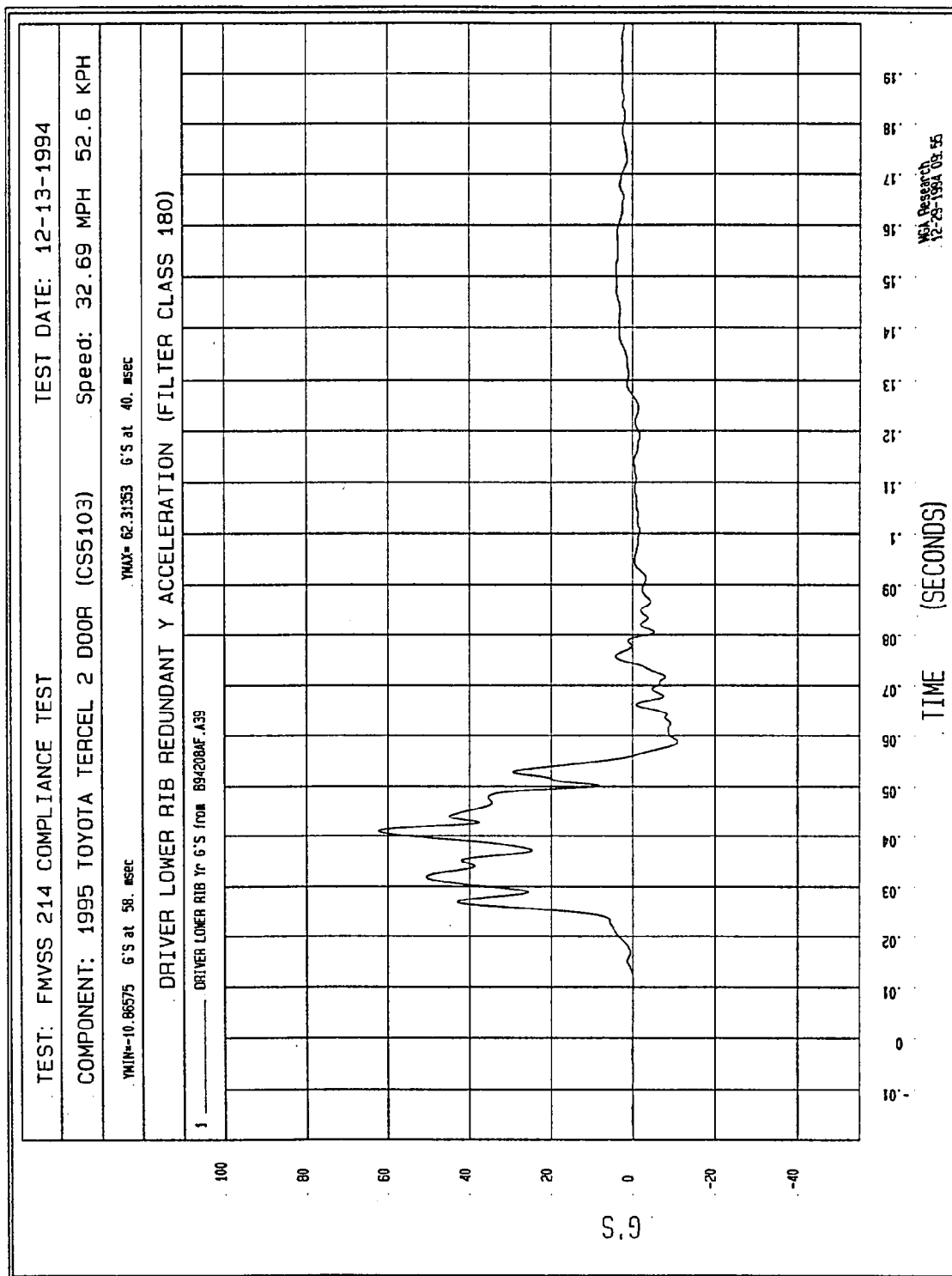
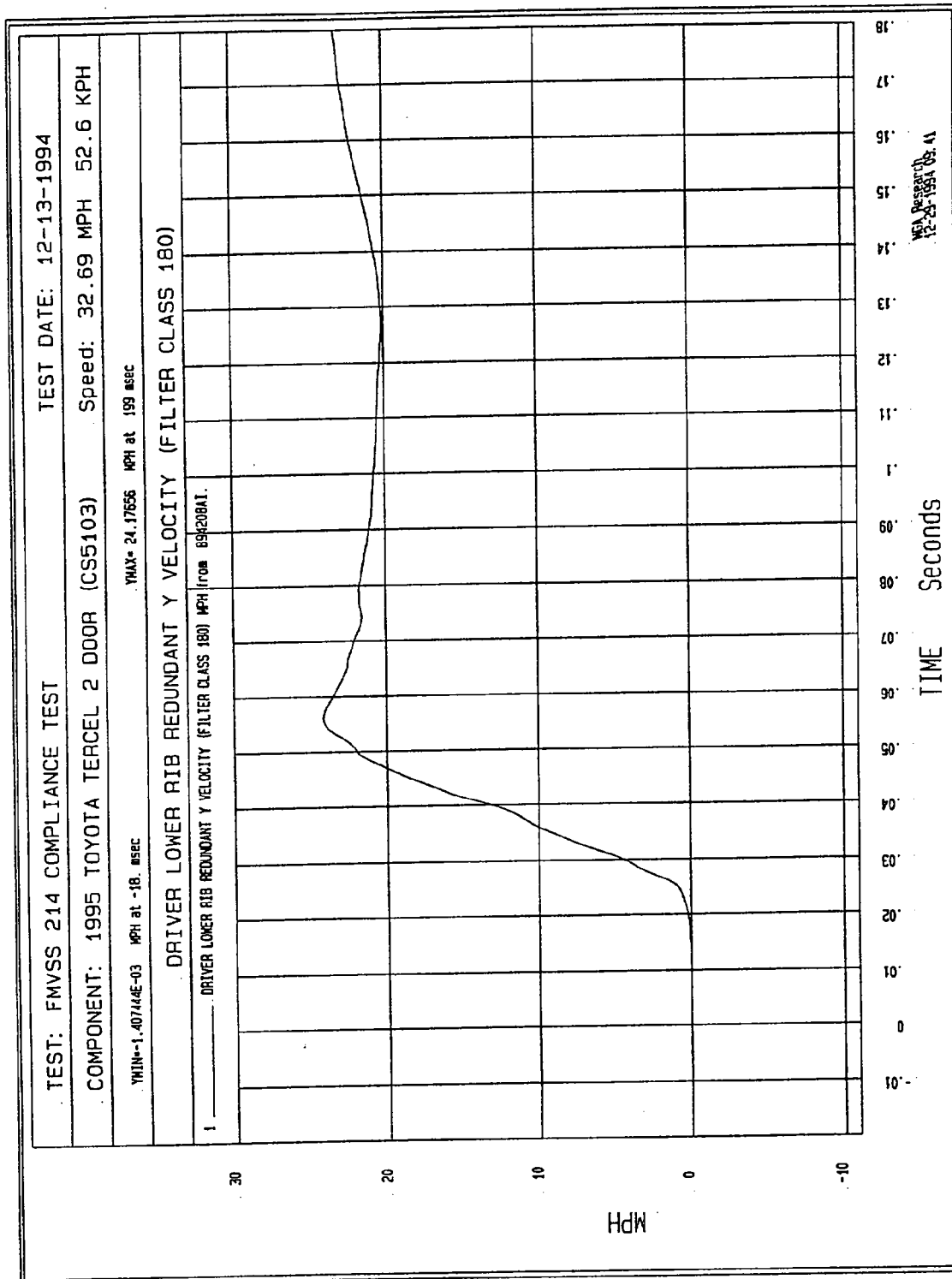
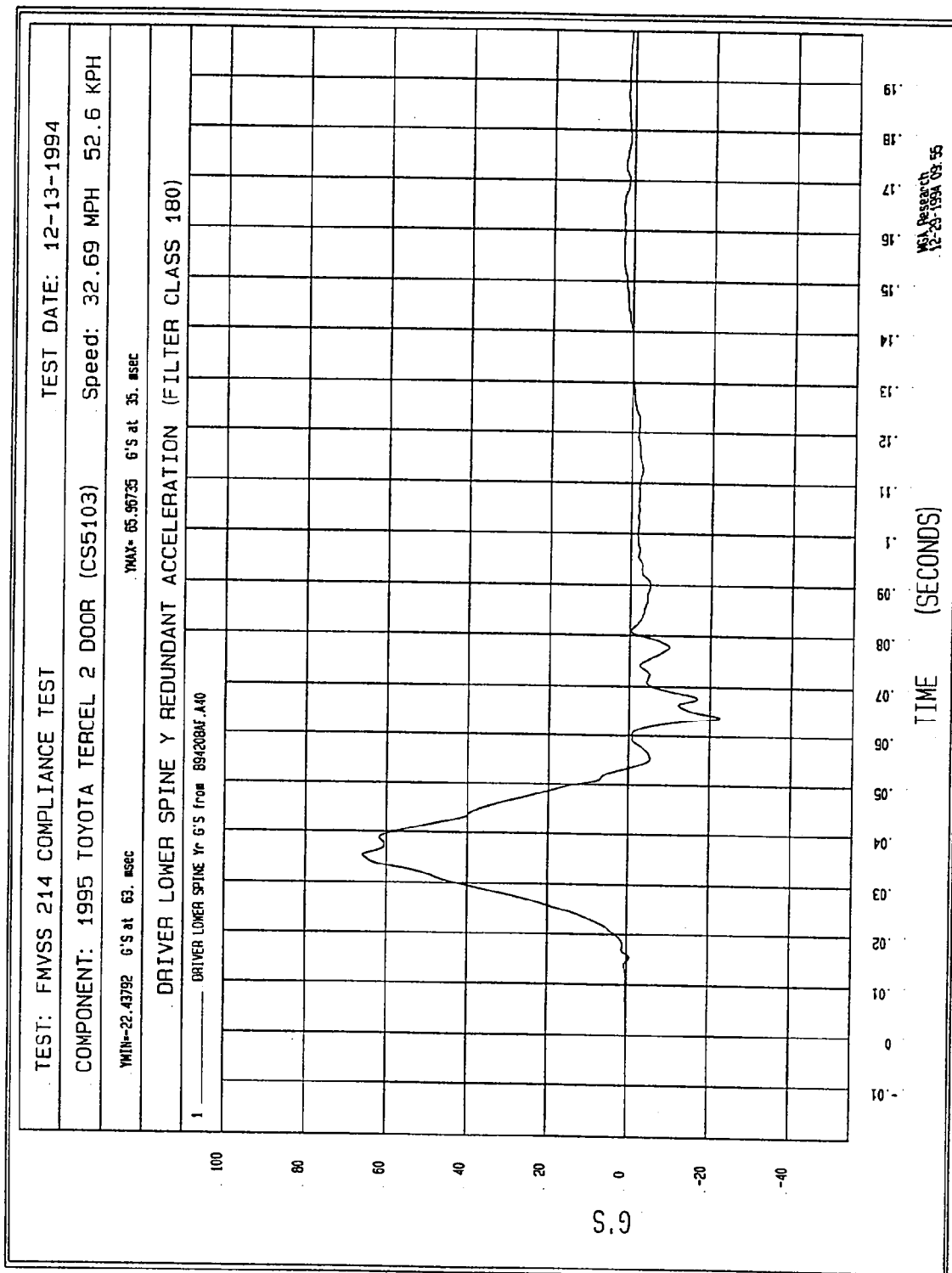


Figure B-67 - Driver Lower Rib Y Redundant Acceleration vs. Time



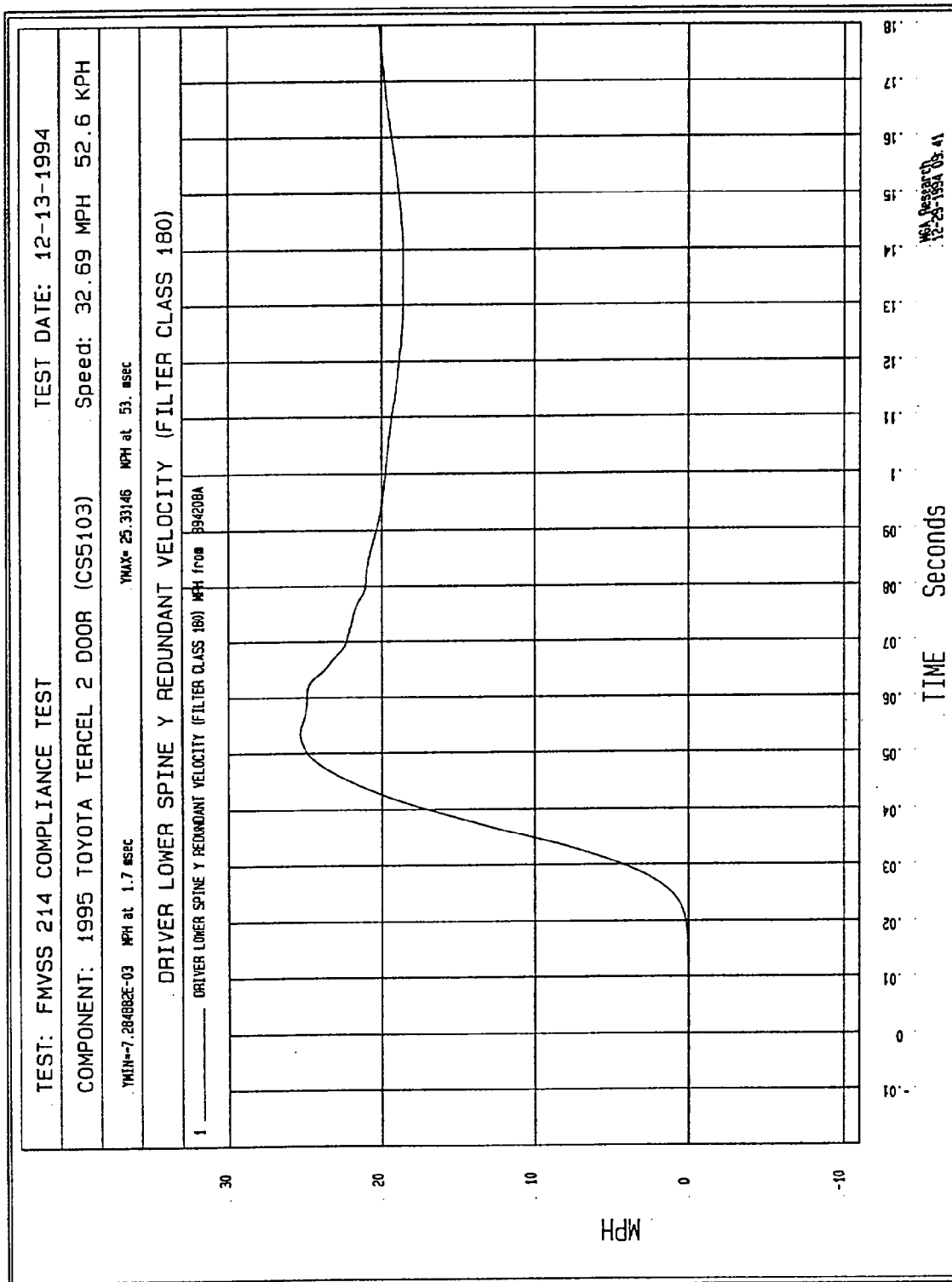
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Figure B-68 - Driver Lower Rib Y Redundant Velocity vs. Time



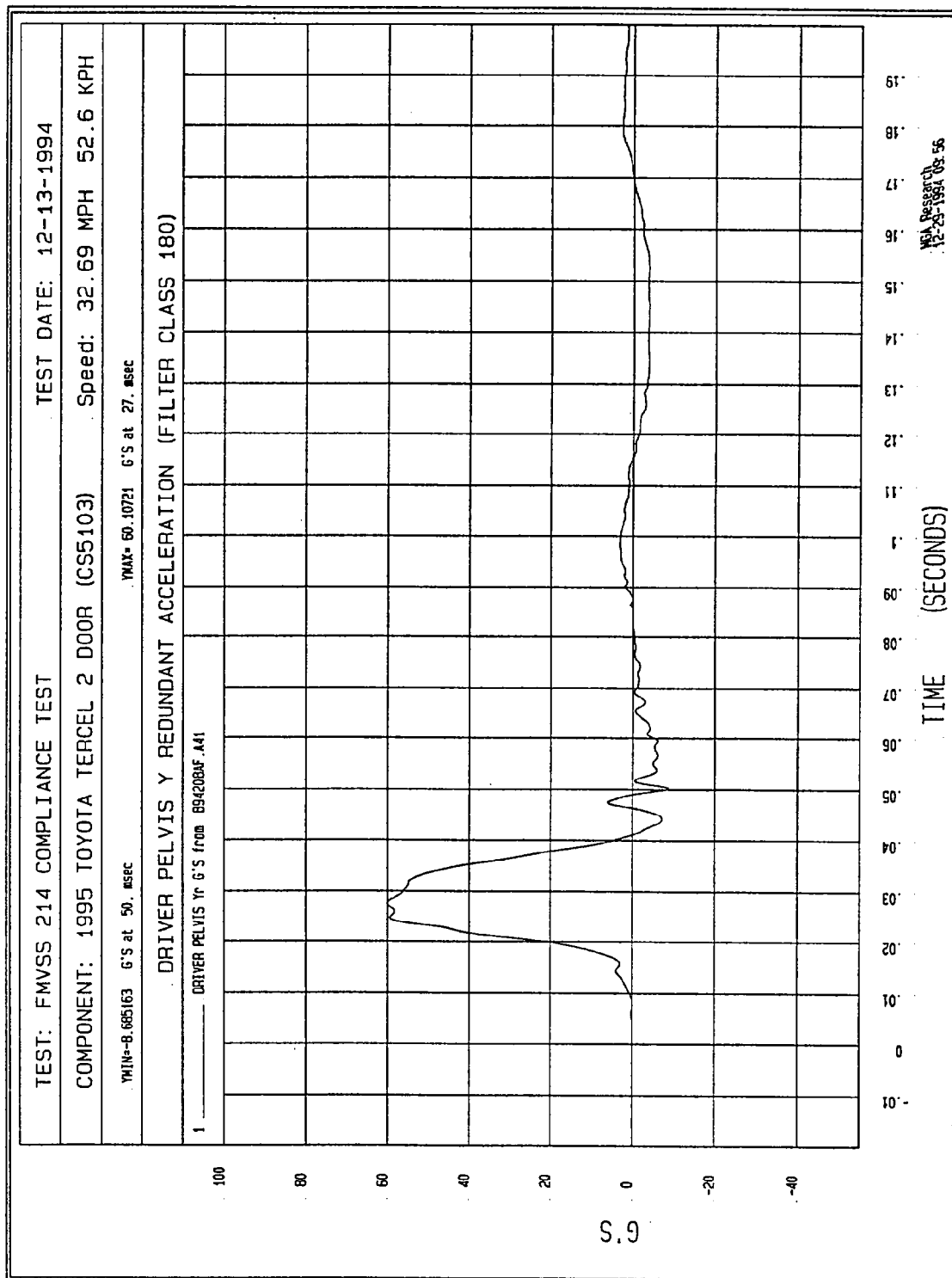
B-69

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



B-70

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



B-71

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

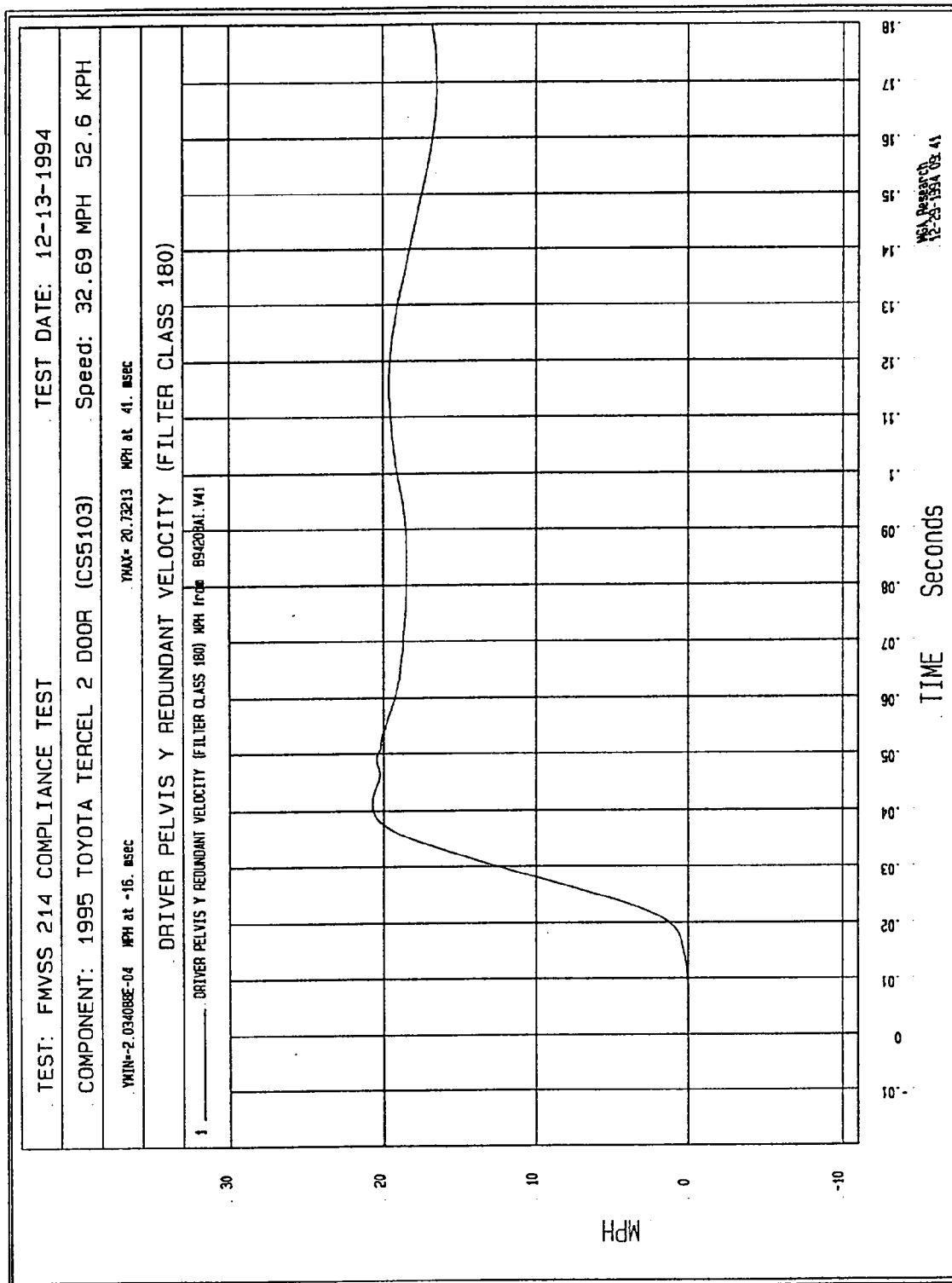
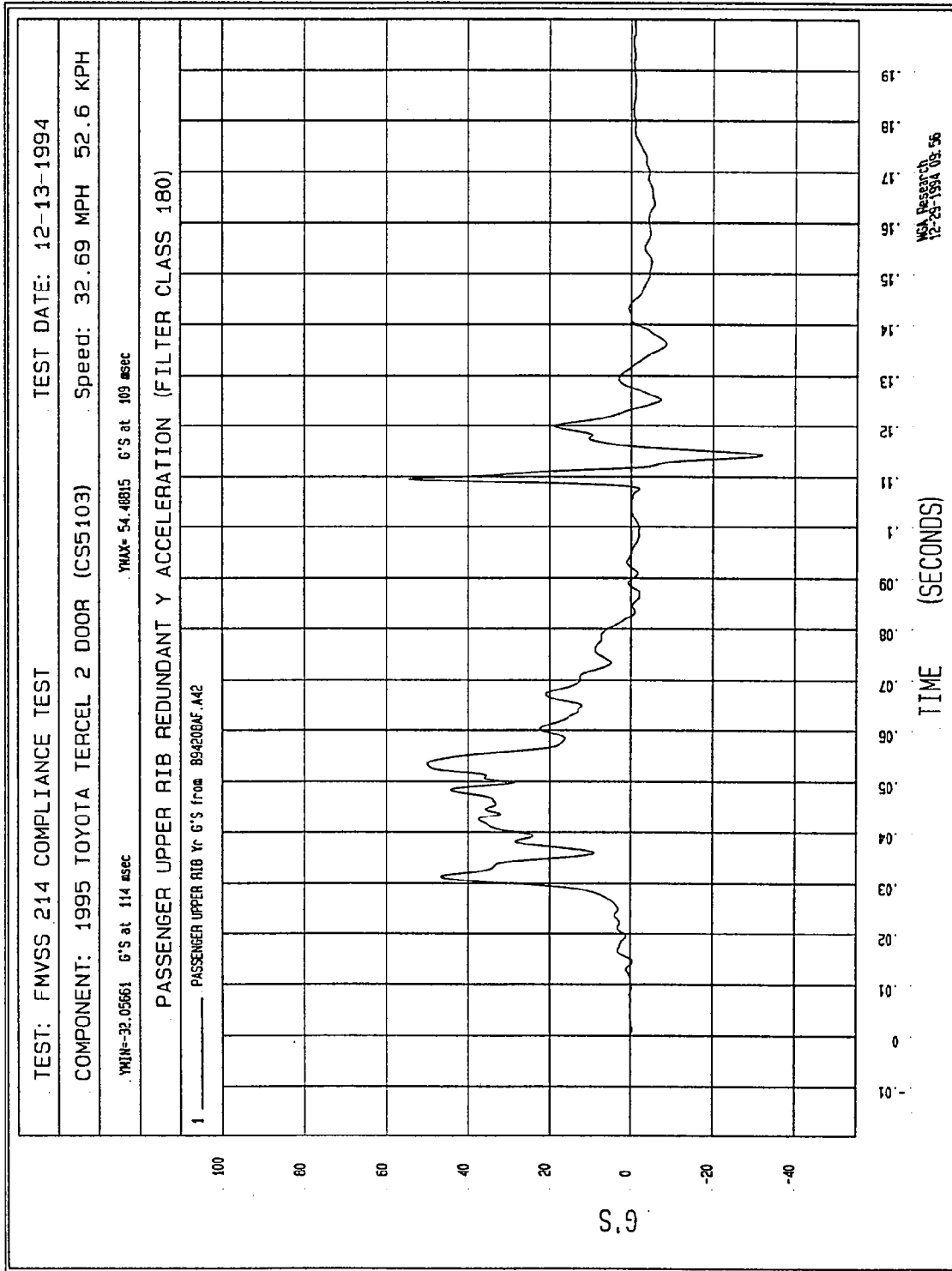


Figure B-72 - Driver Pelvis Y Redundant Velocity vs. Time



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

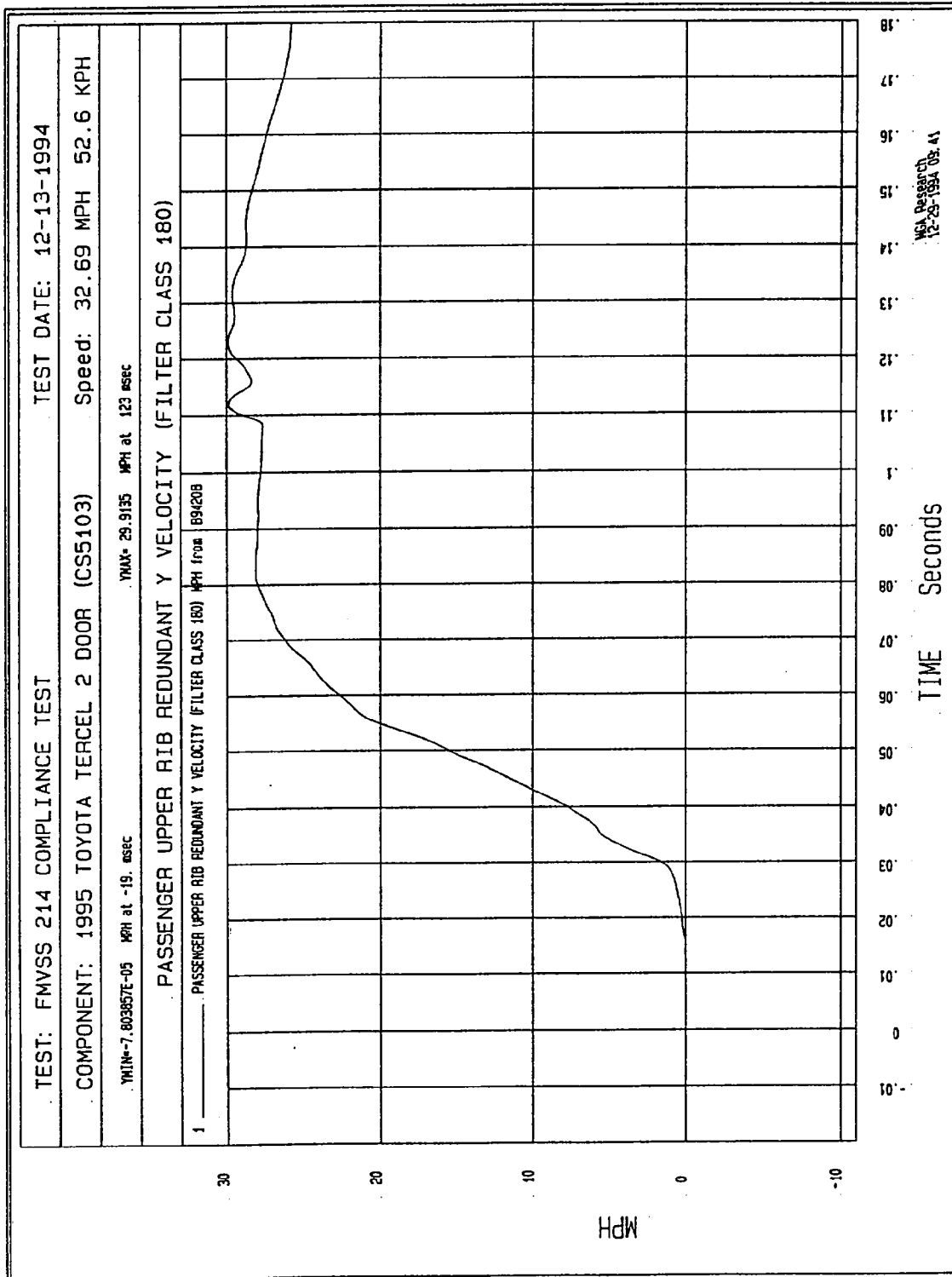
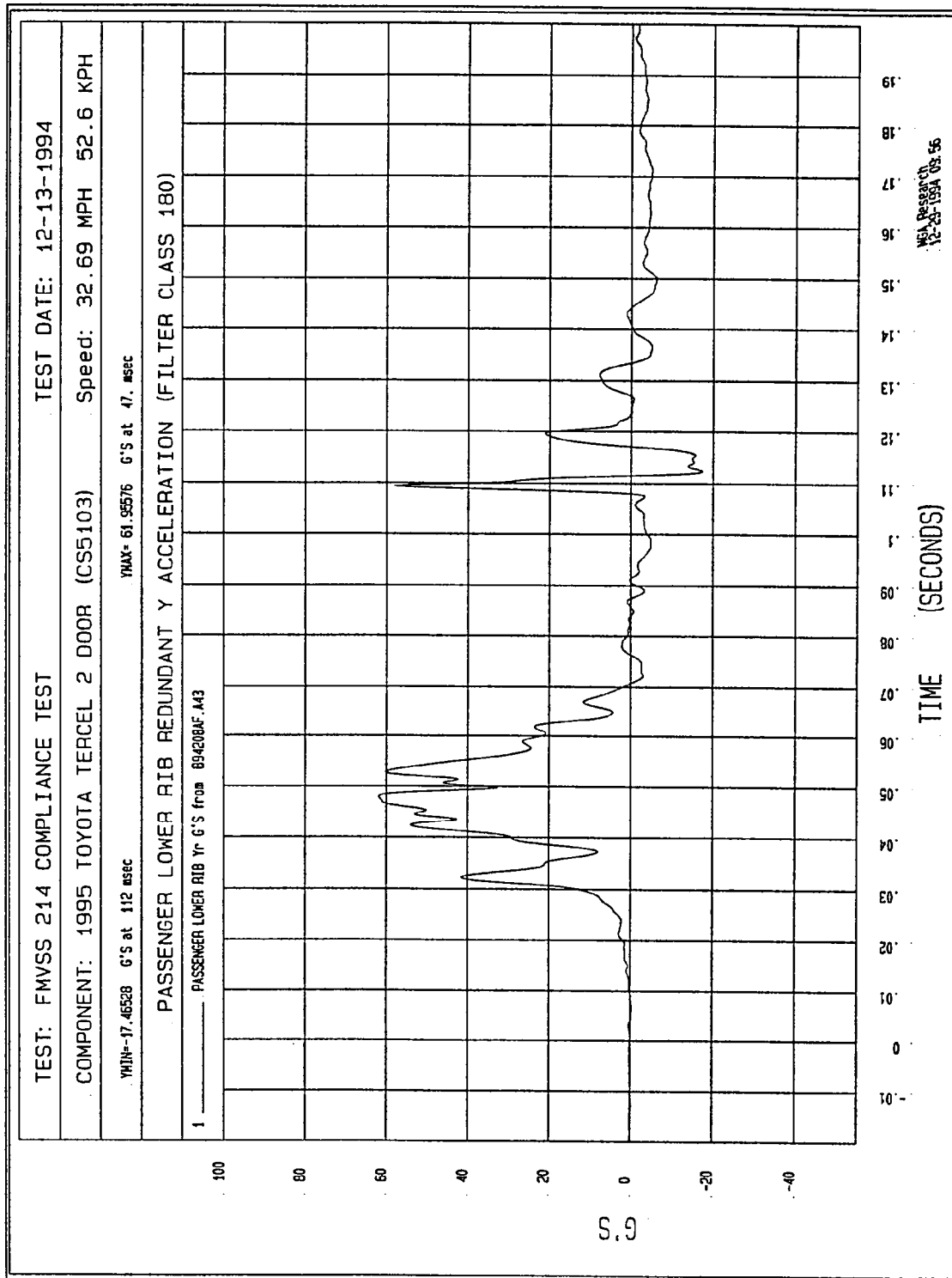
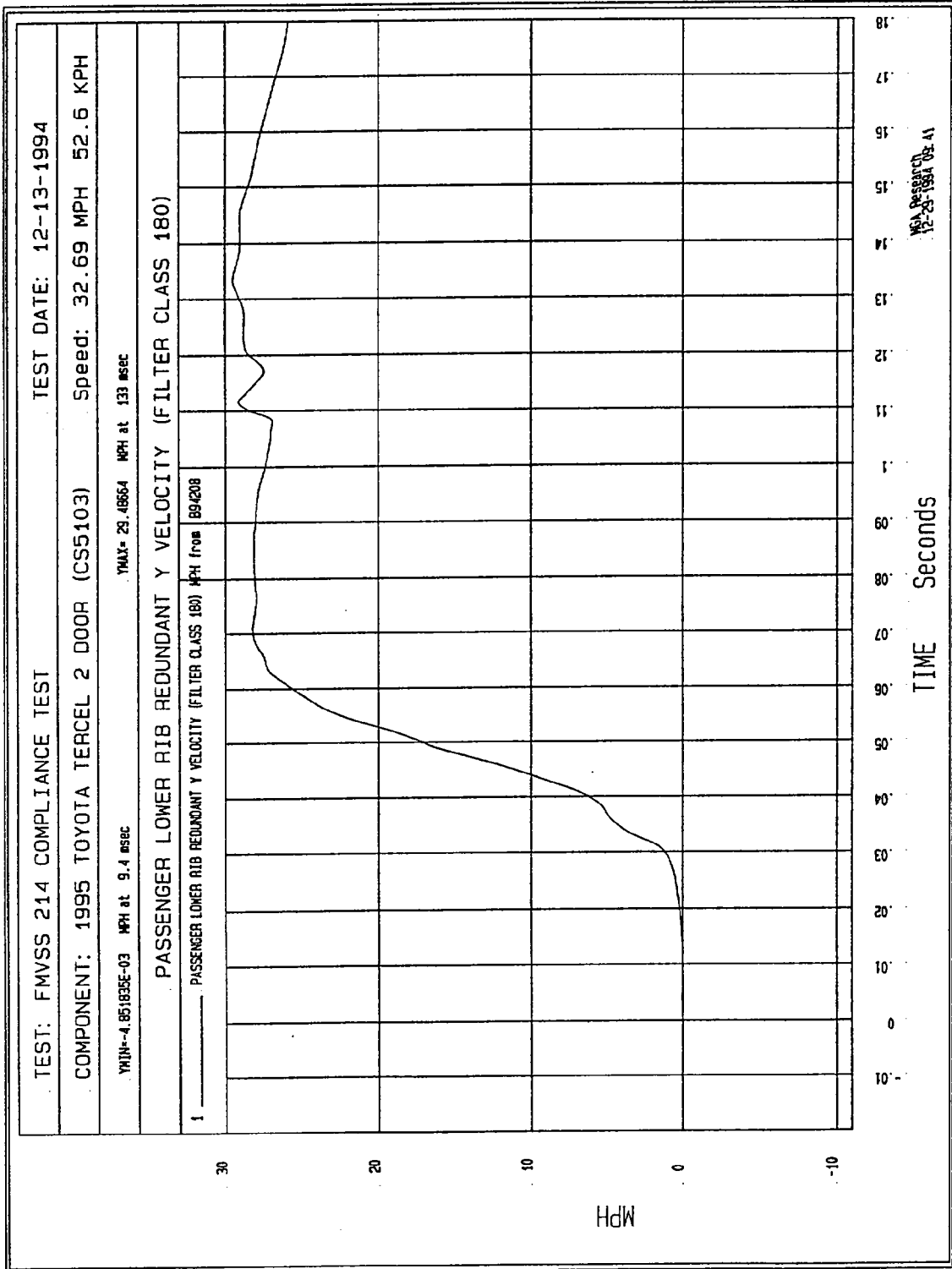


Figure B-74 - Passenger Upper Rib Y Redundant Velocity vs. Time



B-75

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



B-76

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

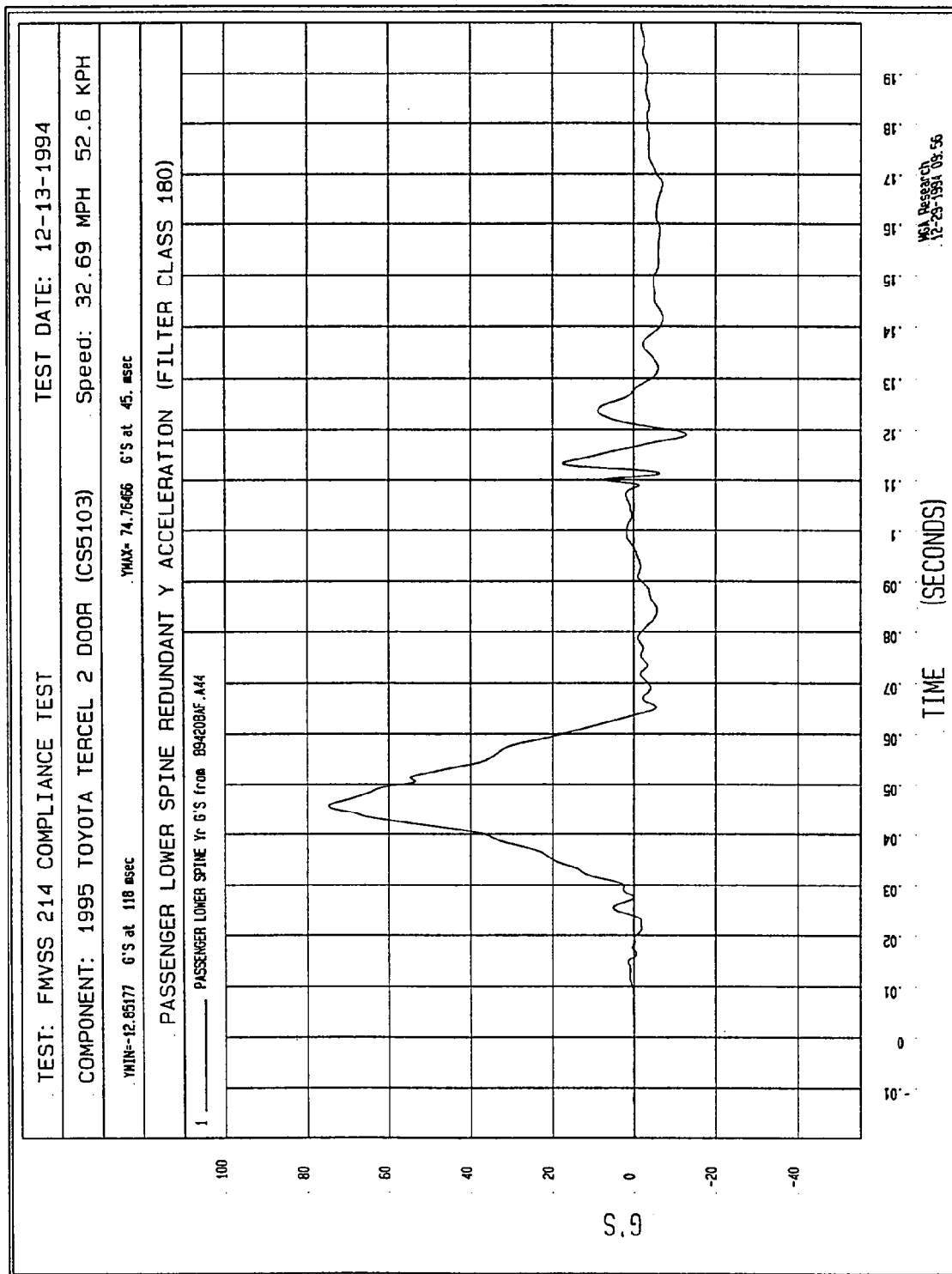
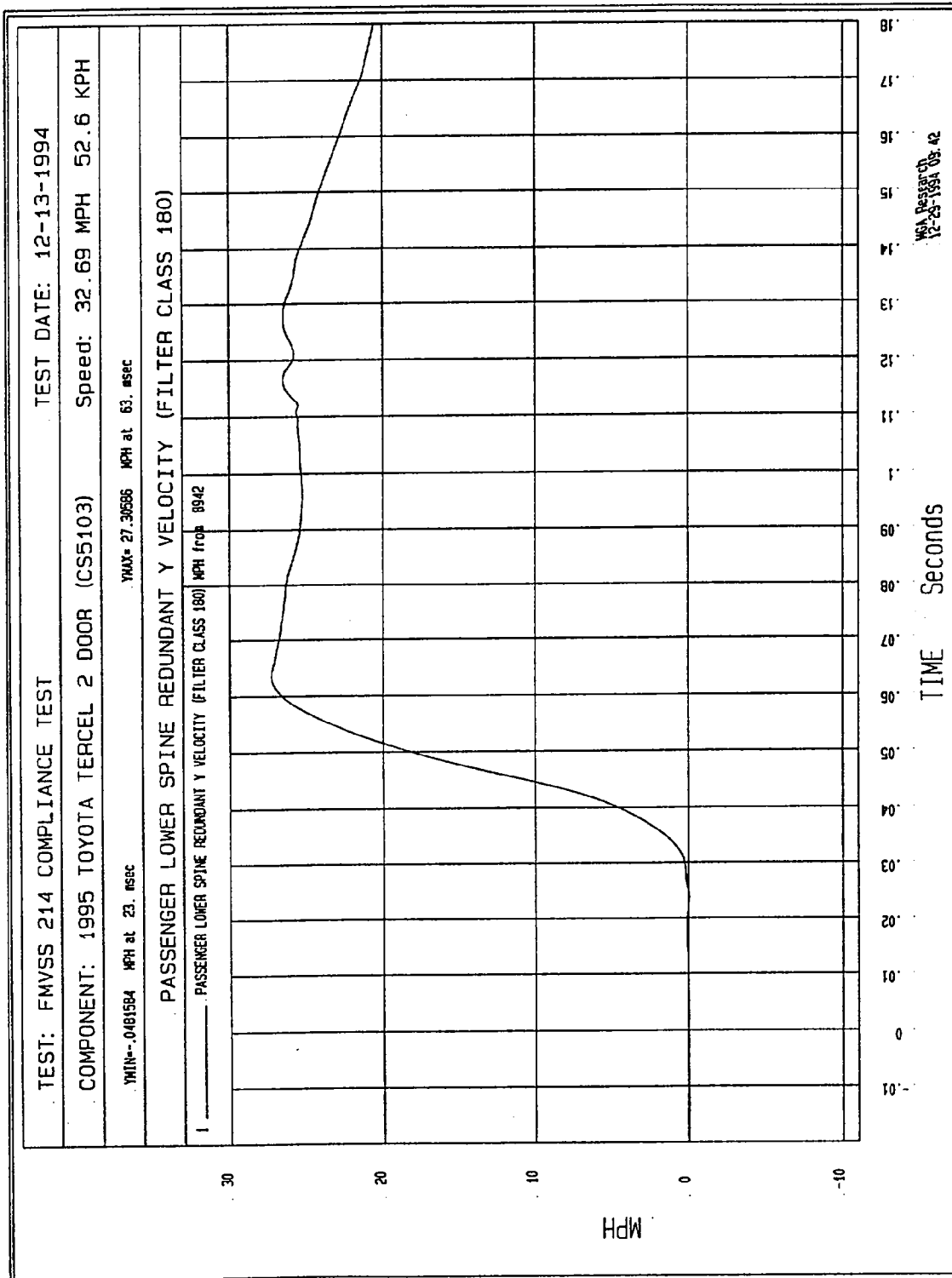
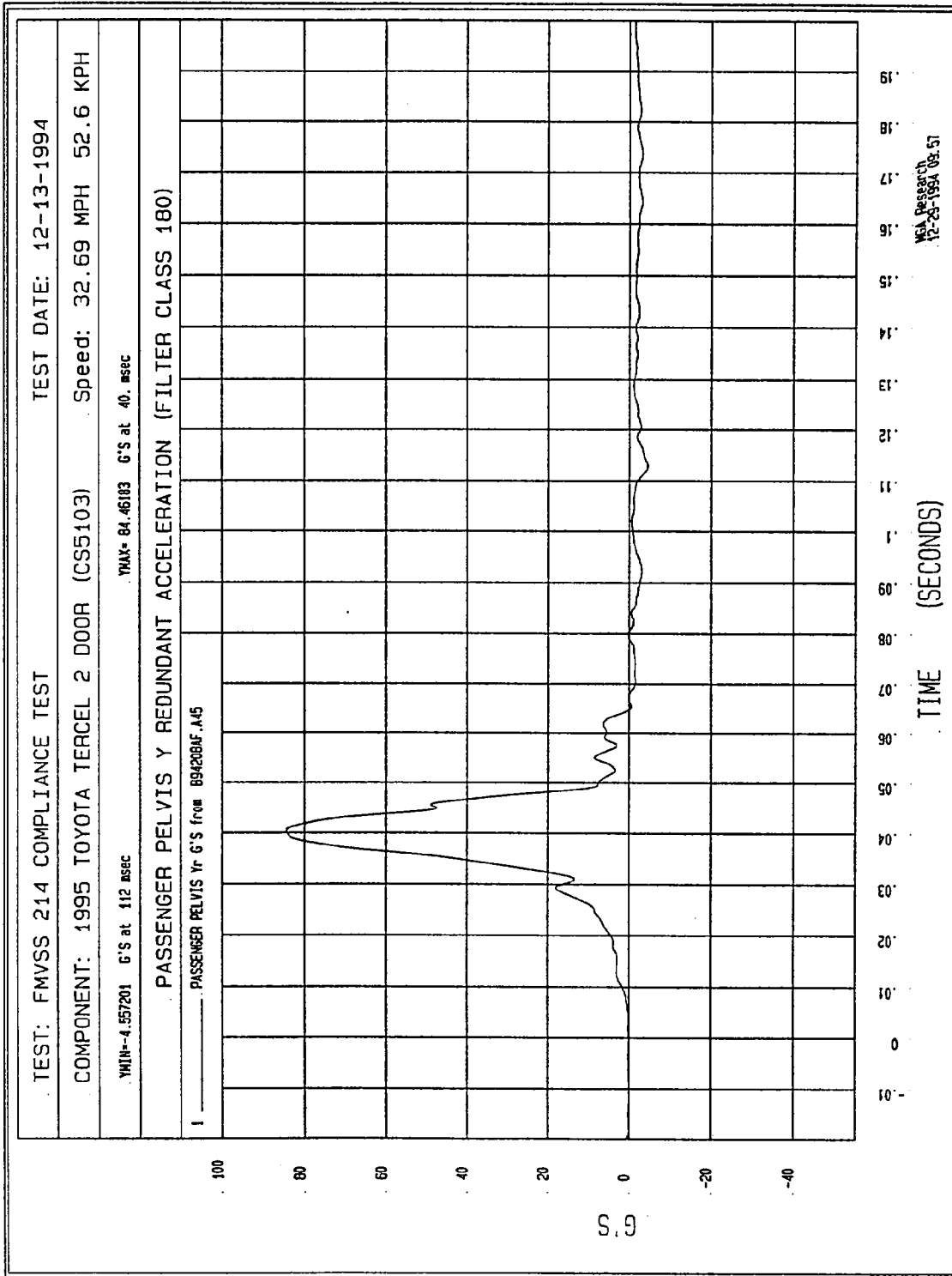


Figure B-77 - Passenger Lower Spine Y Redundant Acceleration vs. Time



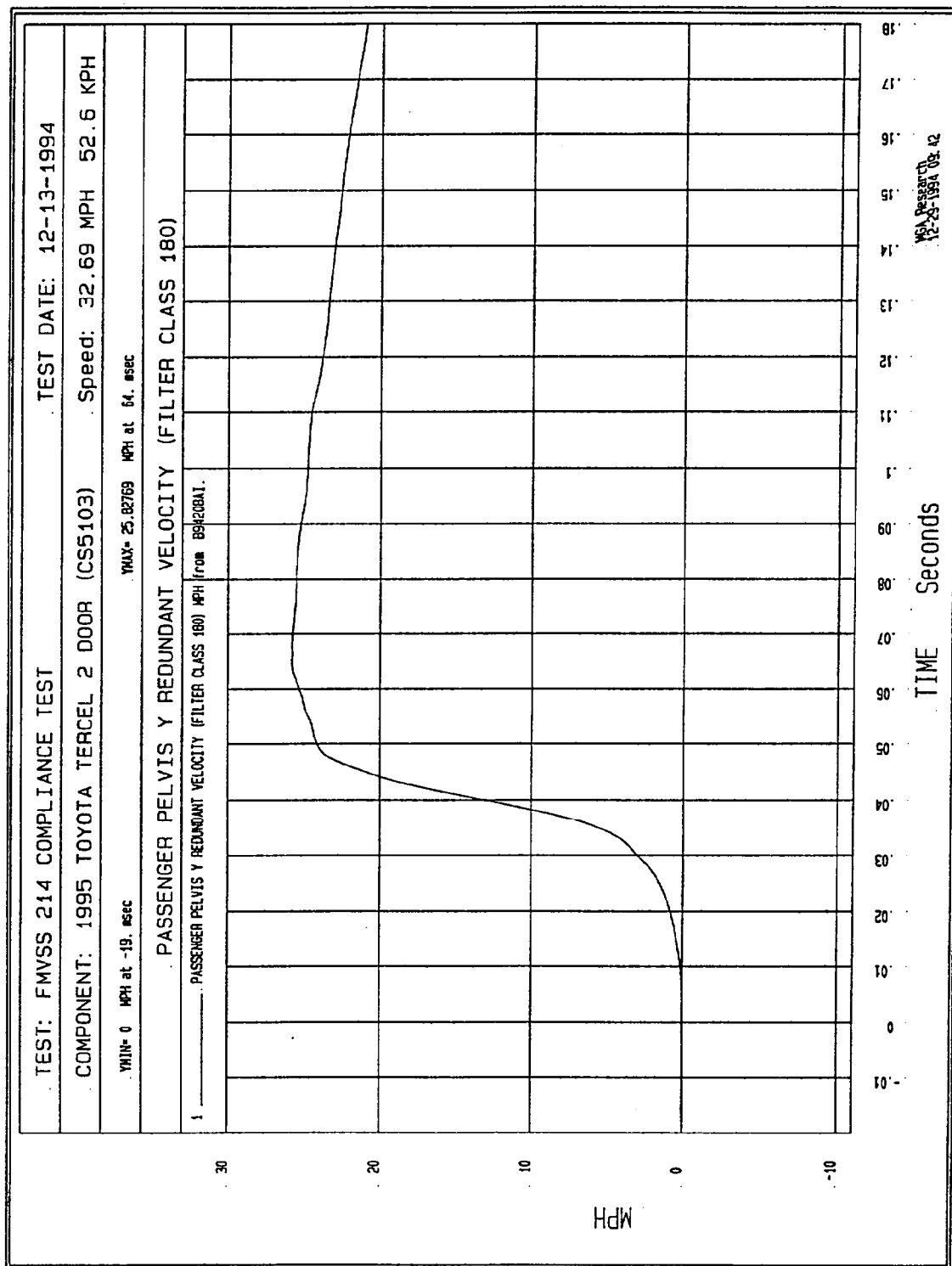
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Figure B-78 - Passenger Lower Spine Y Redundant Velocity vs. Time



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



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

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

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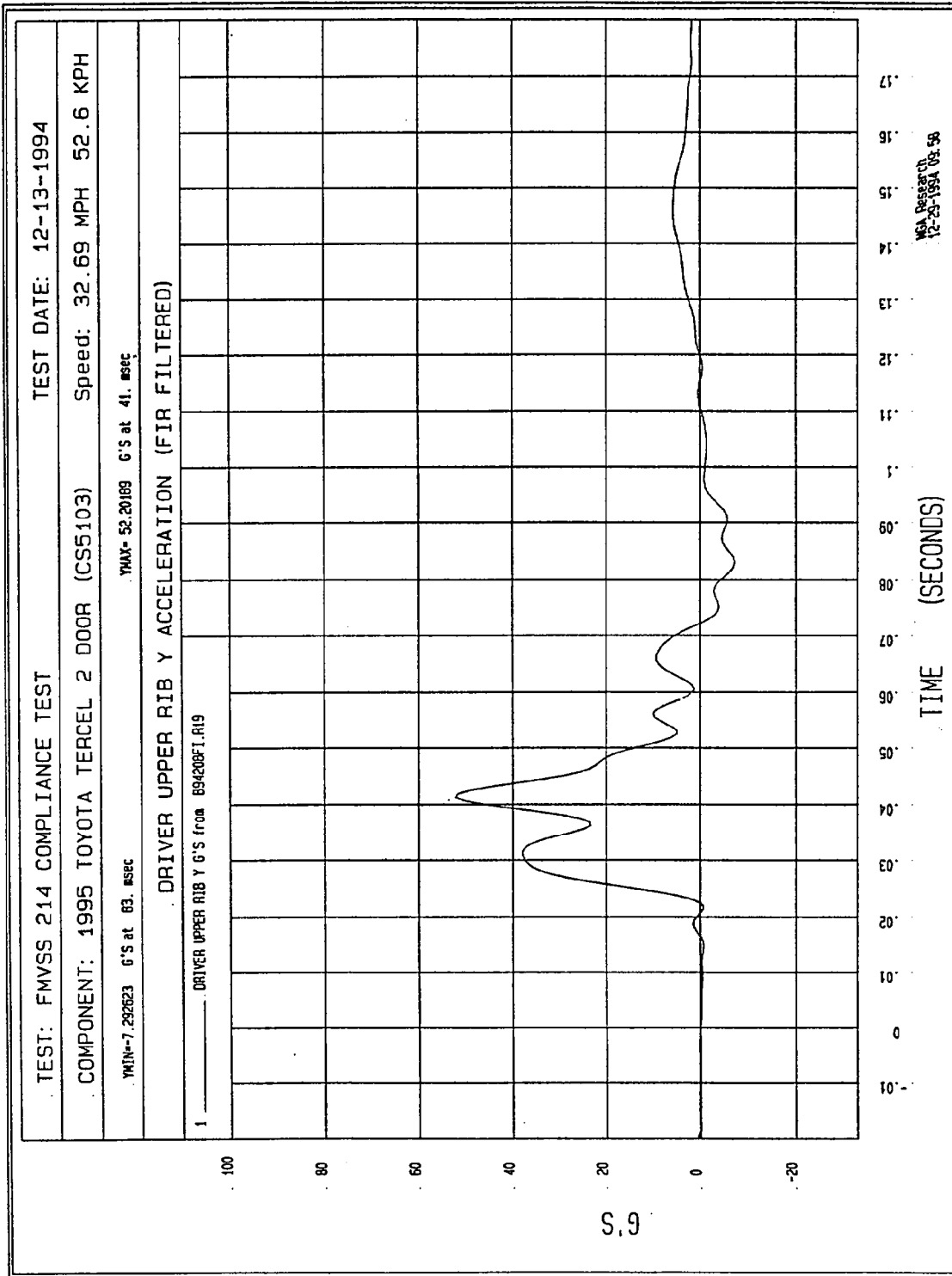


Figure B-81 - Driver Upper Rib Y Acceleration vs. Time

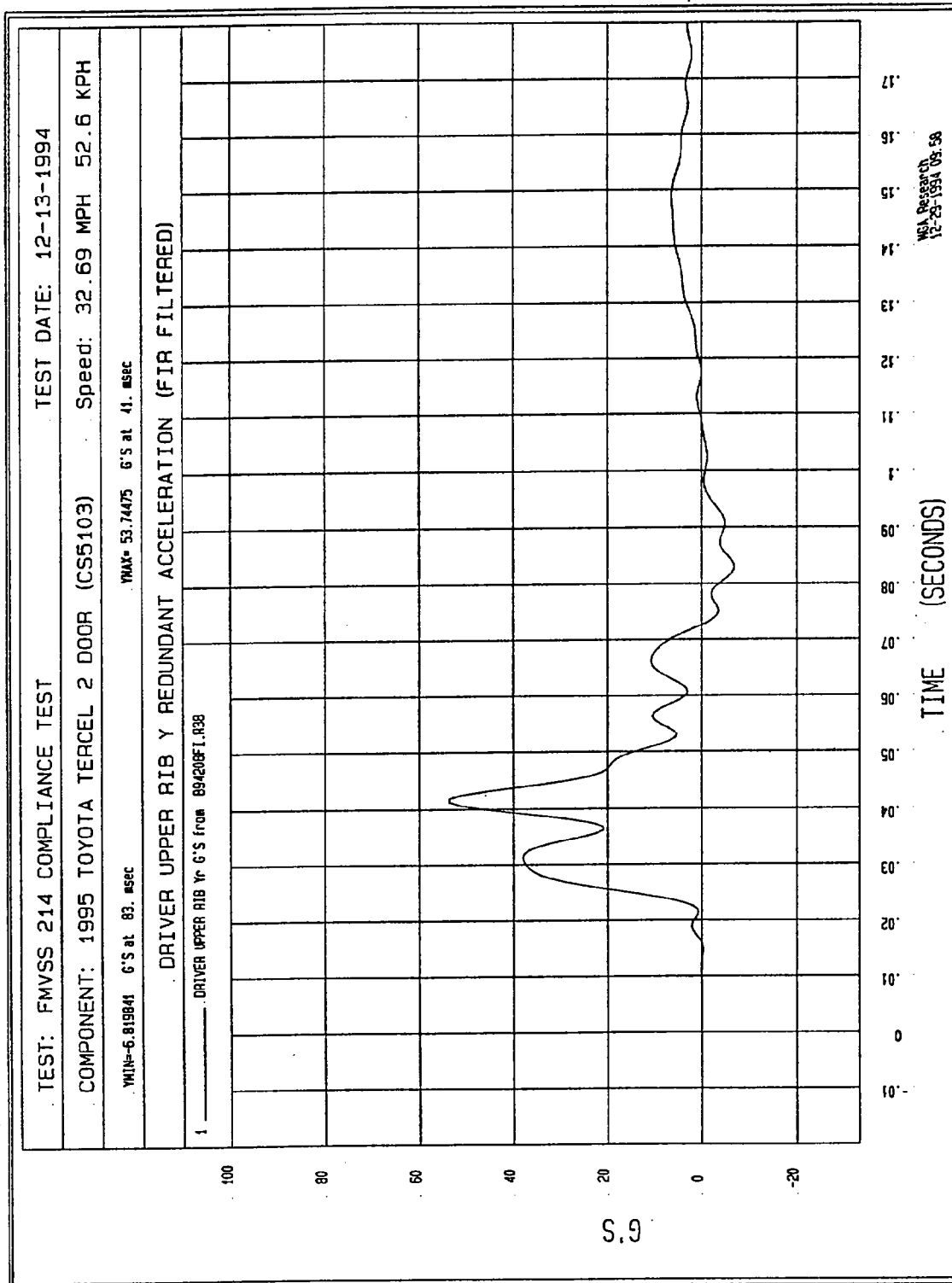


Figure B-82 - Driver Upper Rib Y Redundant Acceleration vs. Time

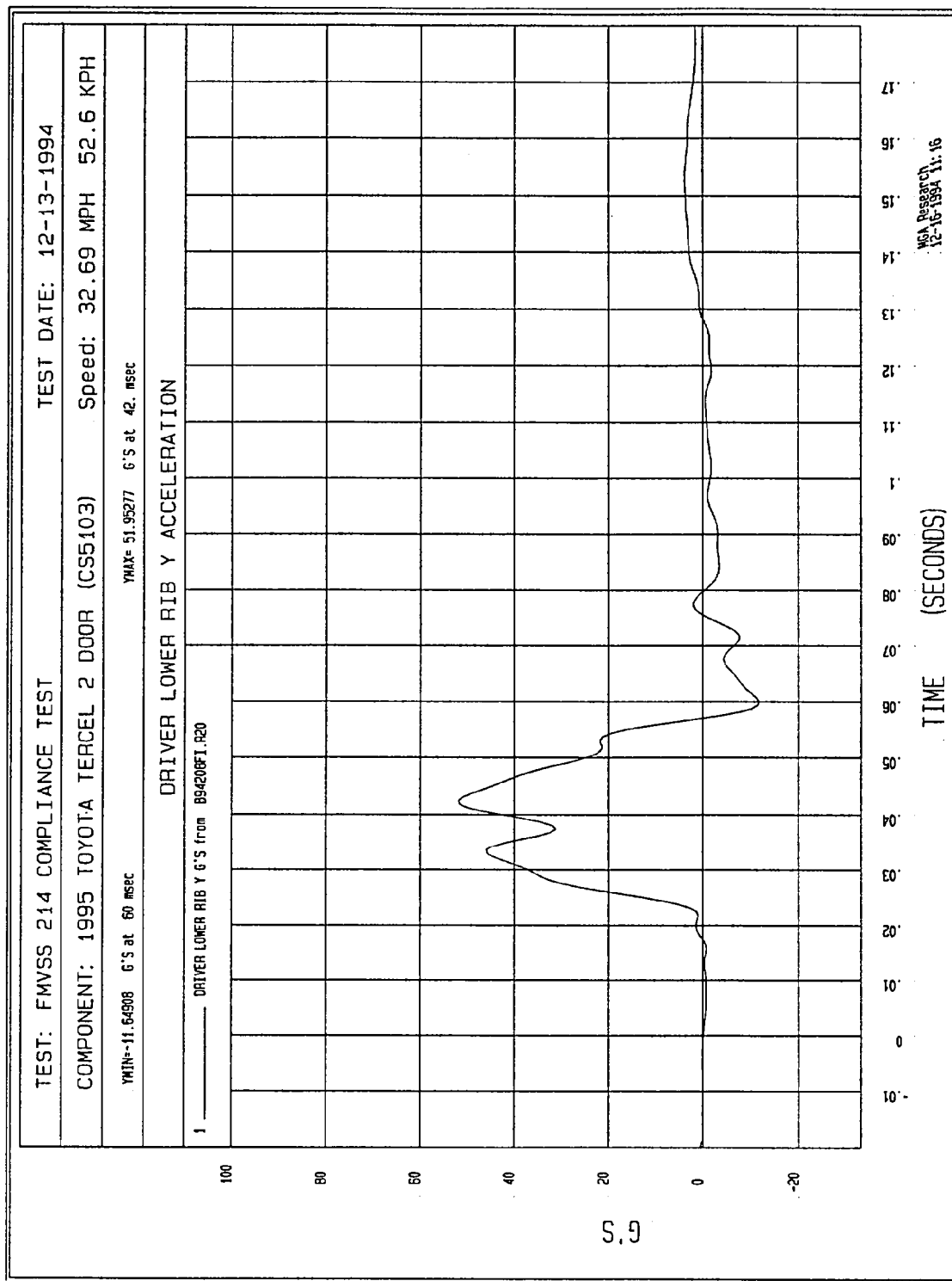


Figure B-83 - Driver Lower Rib Y Acceleration vs. Time

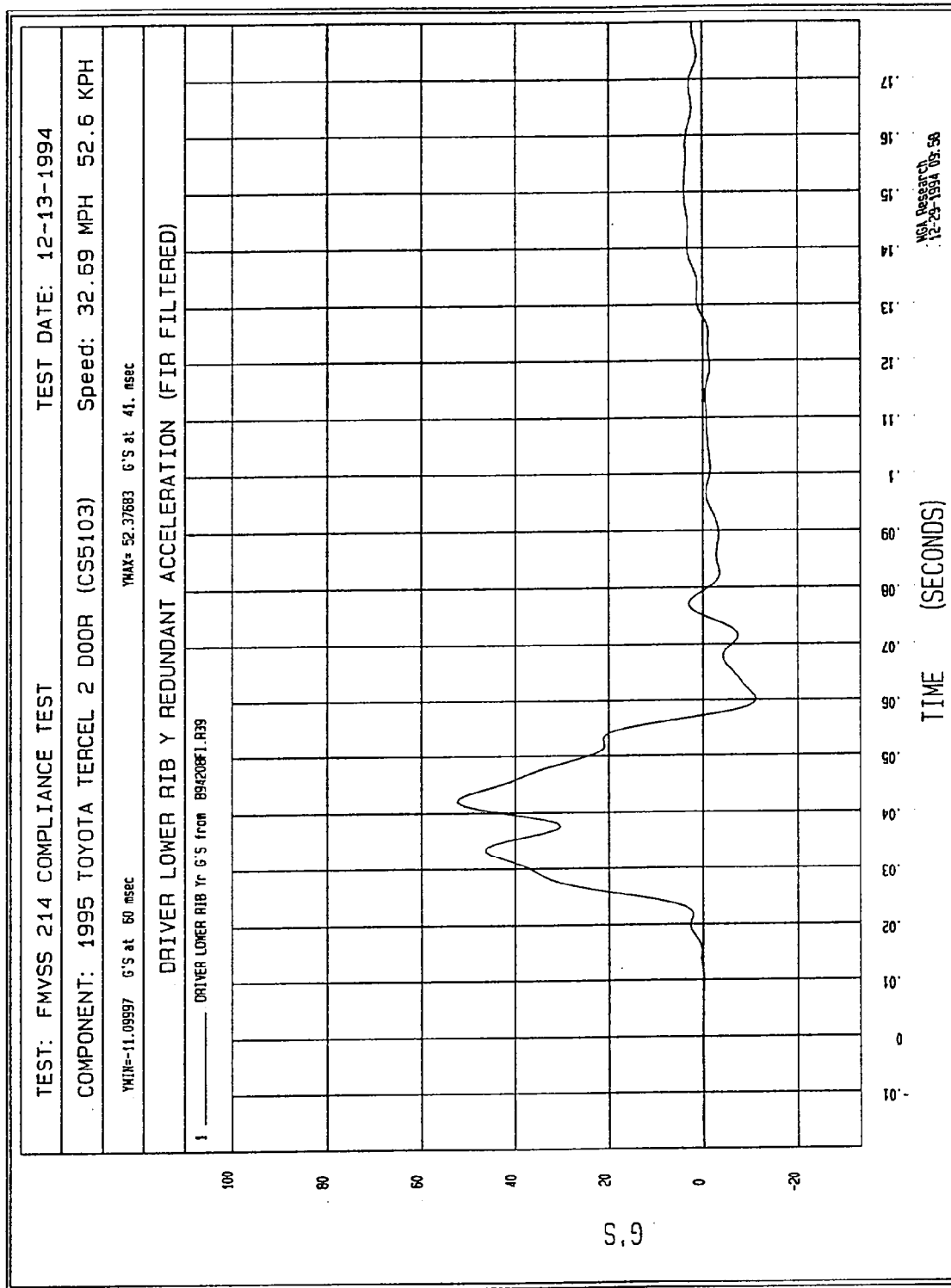


Figure B-84 - Driver Lower Rib Y Redundant Acceleration vs. Time

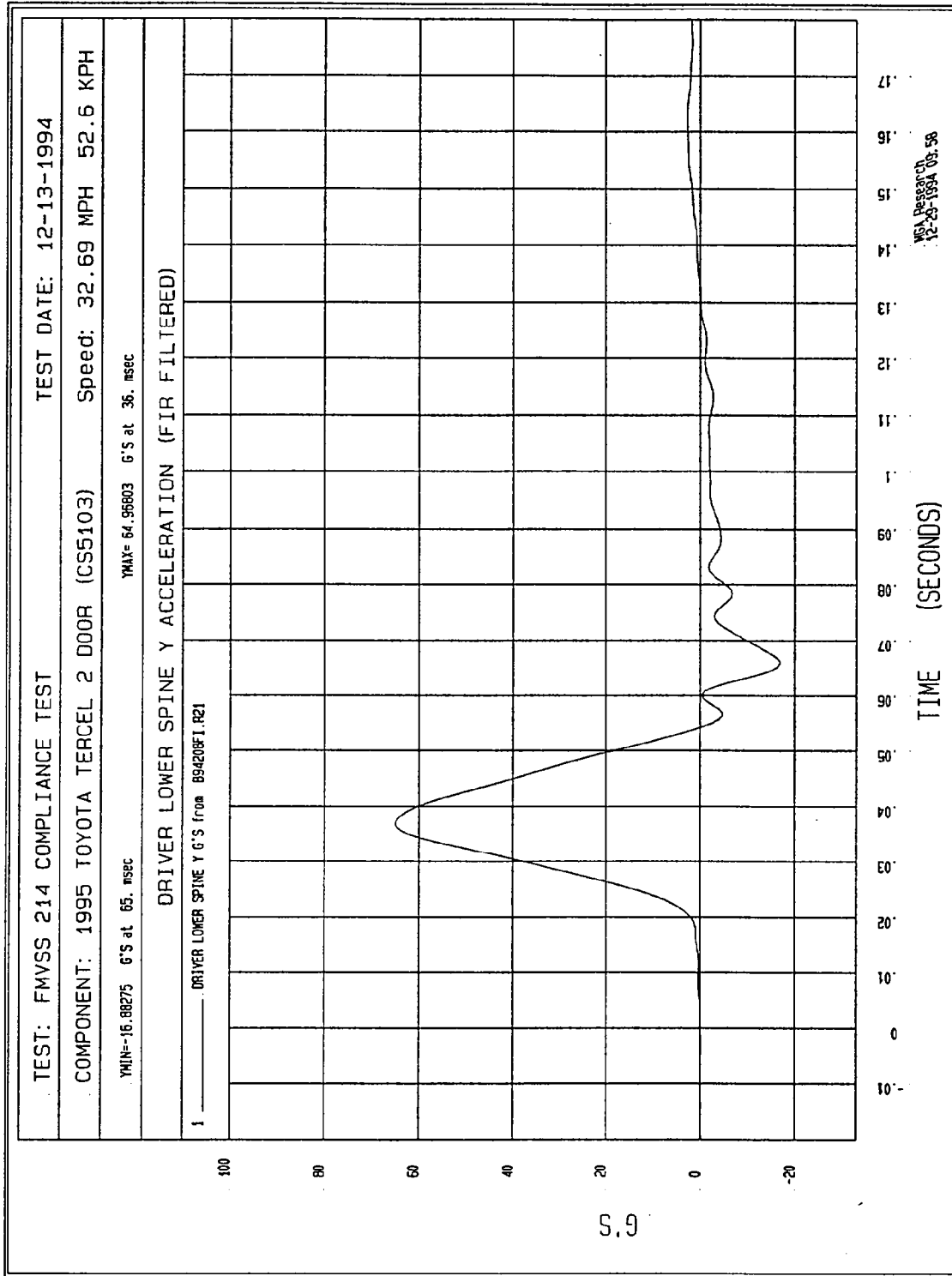


Figure B-85 - Driver Lower Spine Y Acceleration vs. Time

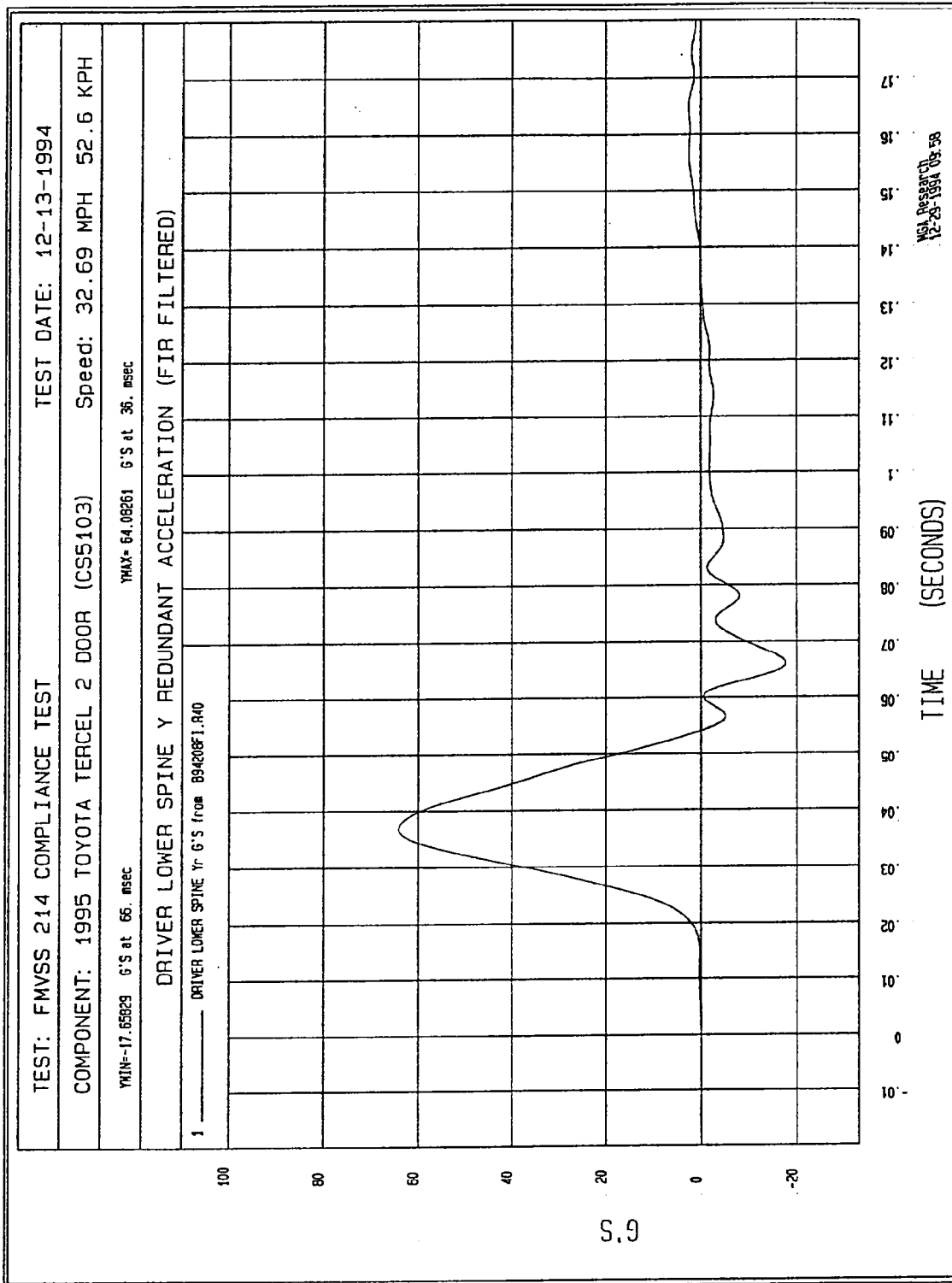


Figure B-86 - Driver Lower Spine Y Redundant Acceleration vs. Time

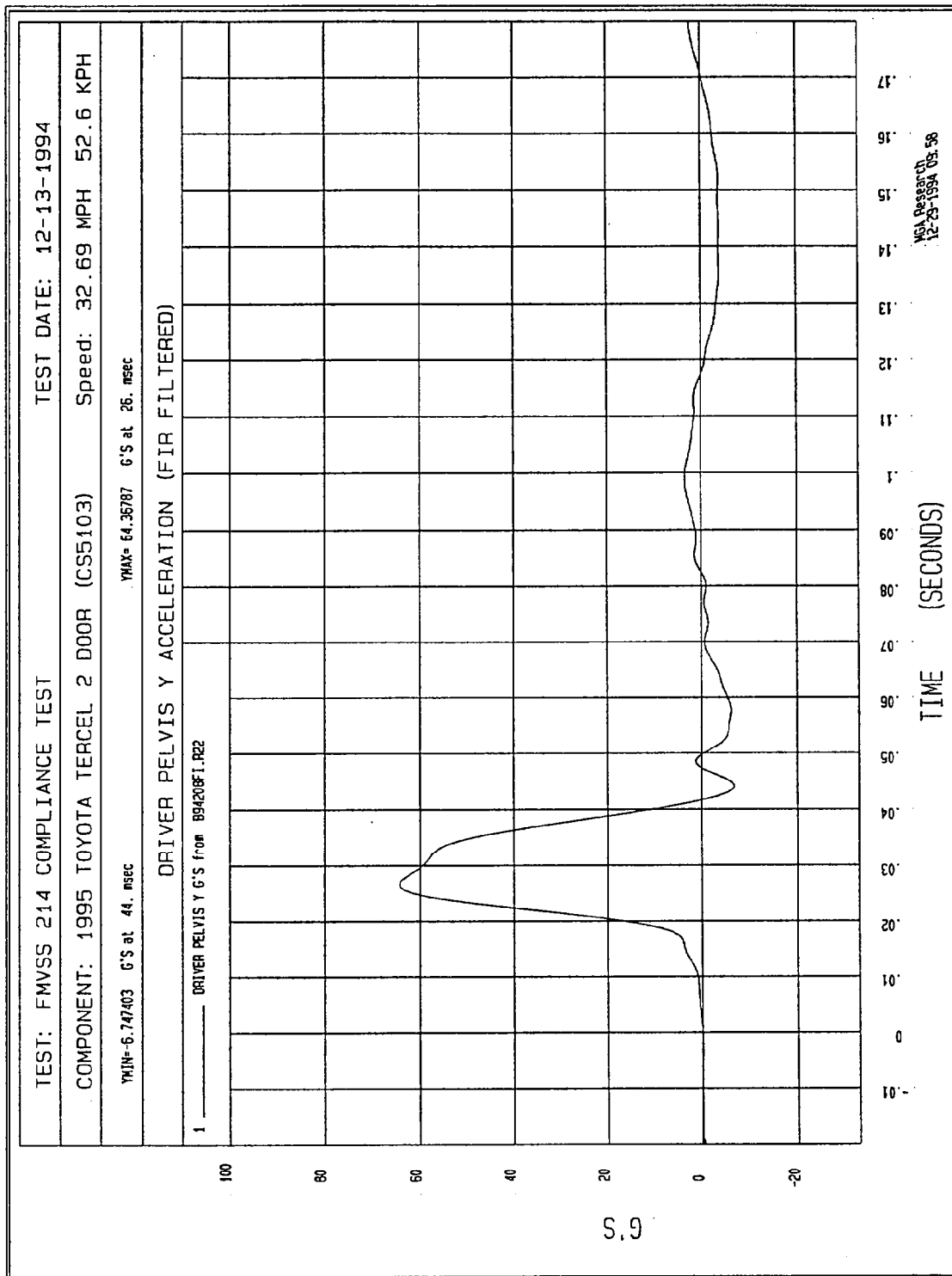


Figure B-87 - Driver Pelvis Y Acceleration vs. Time

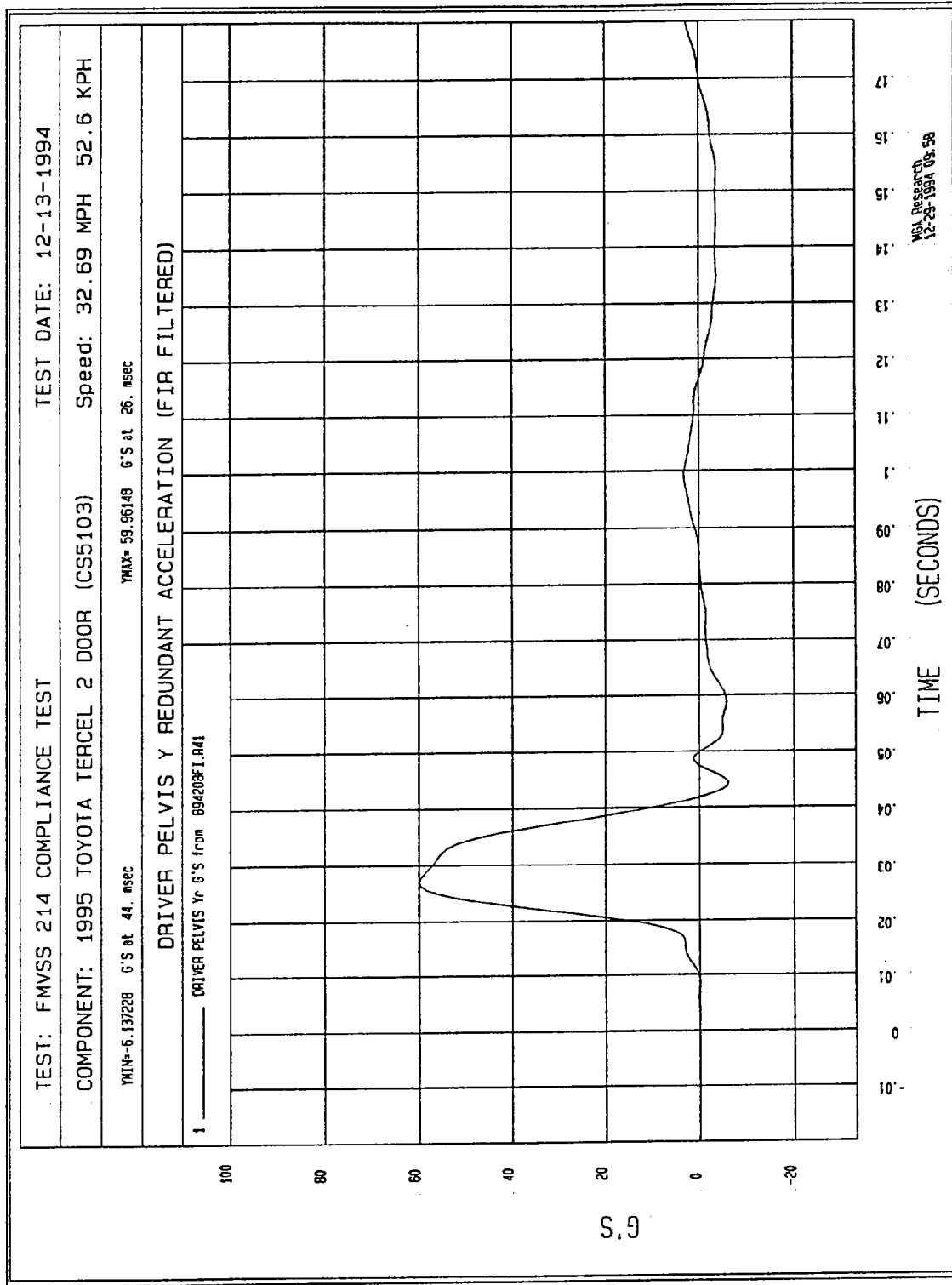


Figure B-88 - Driver Pelvis Y Redundant Acceleration vs. Time

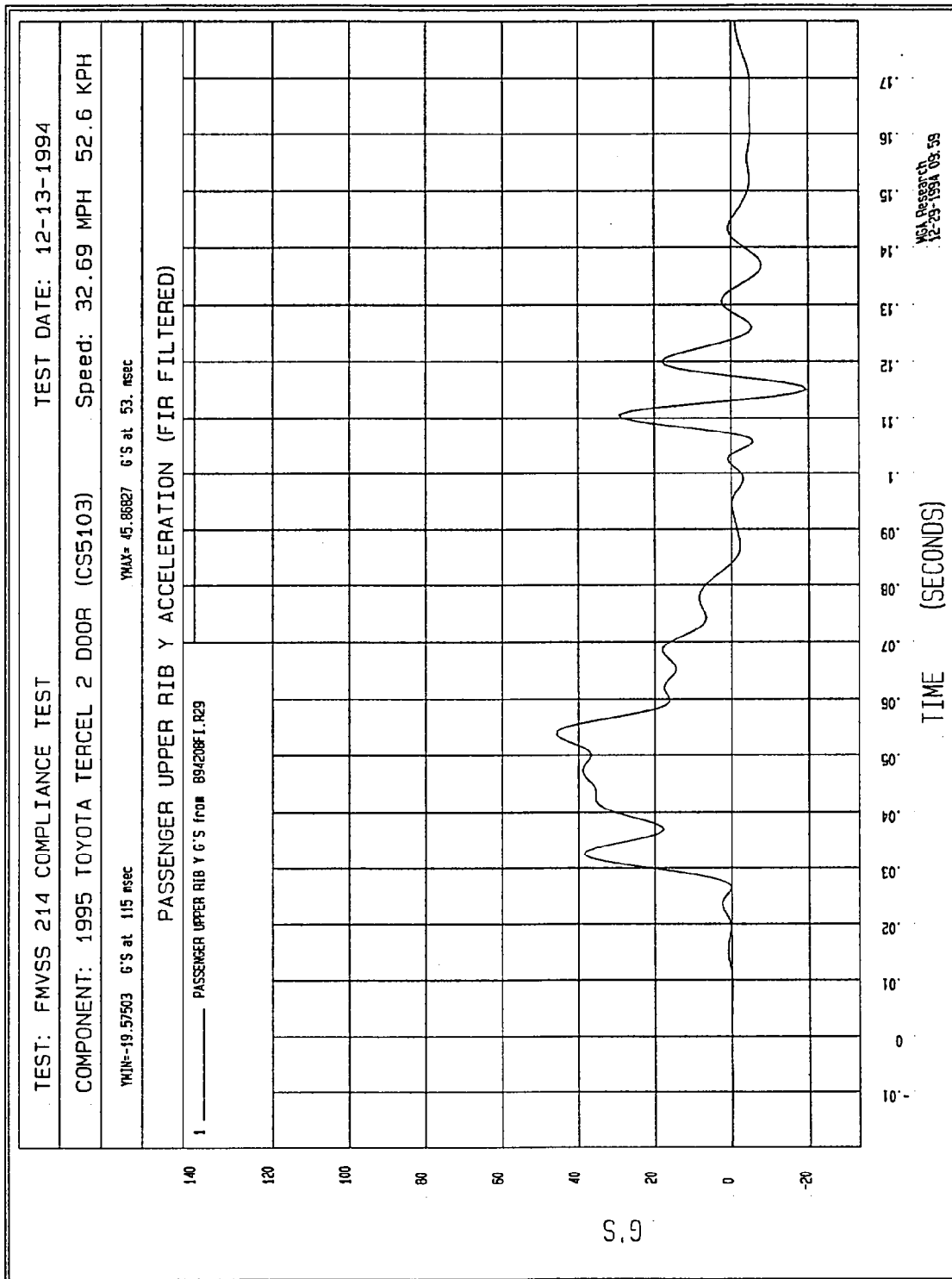


Figure B-89 - Passenger Upper Rib Y Acceleration vs. Time

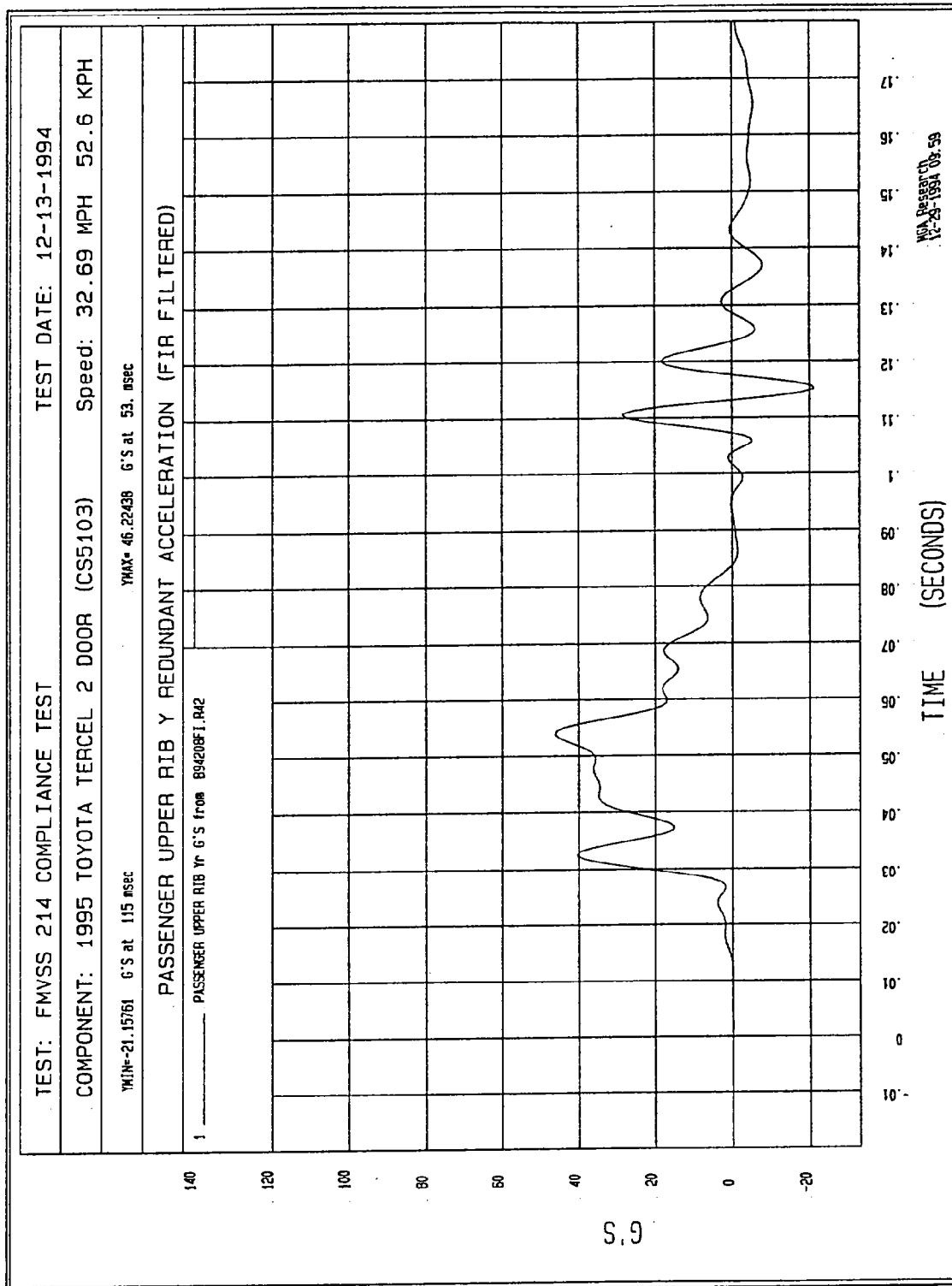


Figure B-90 - Passenger Upper Rib Y Redundant Acceleration vs. Time

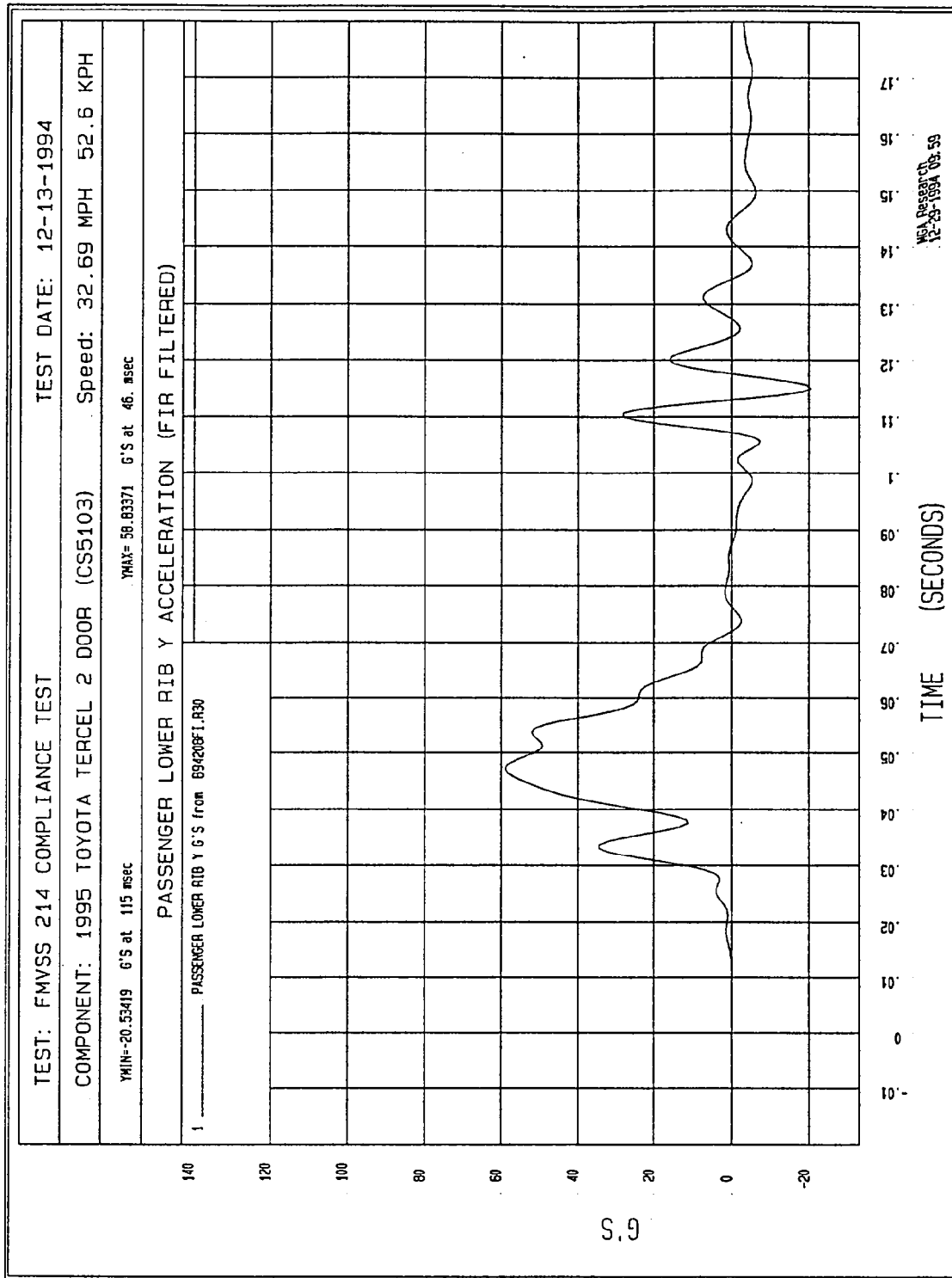


Figure B-91 - Passenger Lower Rib Y Acceleration vs. Time

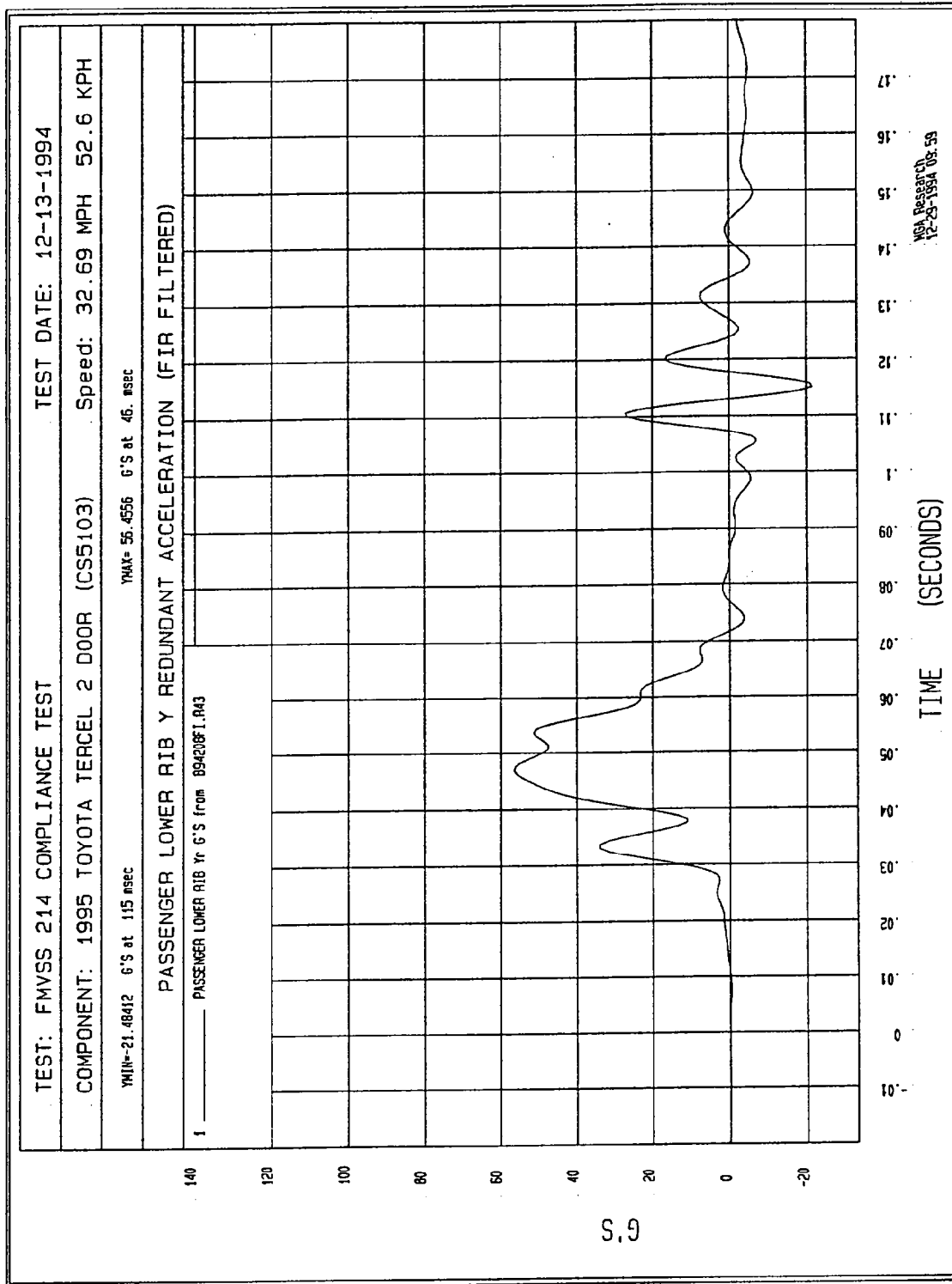


Figure B-92 - Passenger Lower Rib Y Redundant Acceleration vs. Time

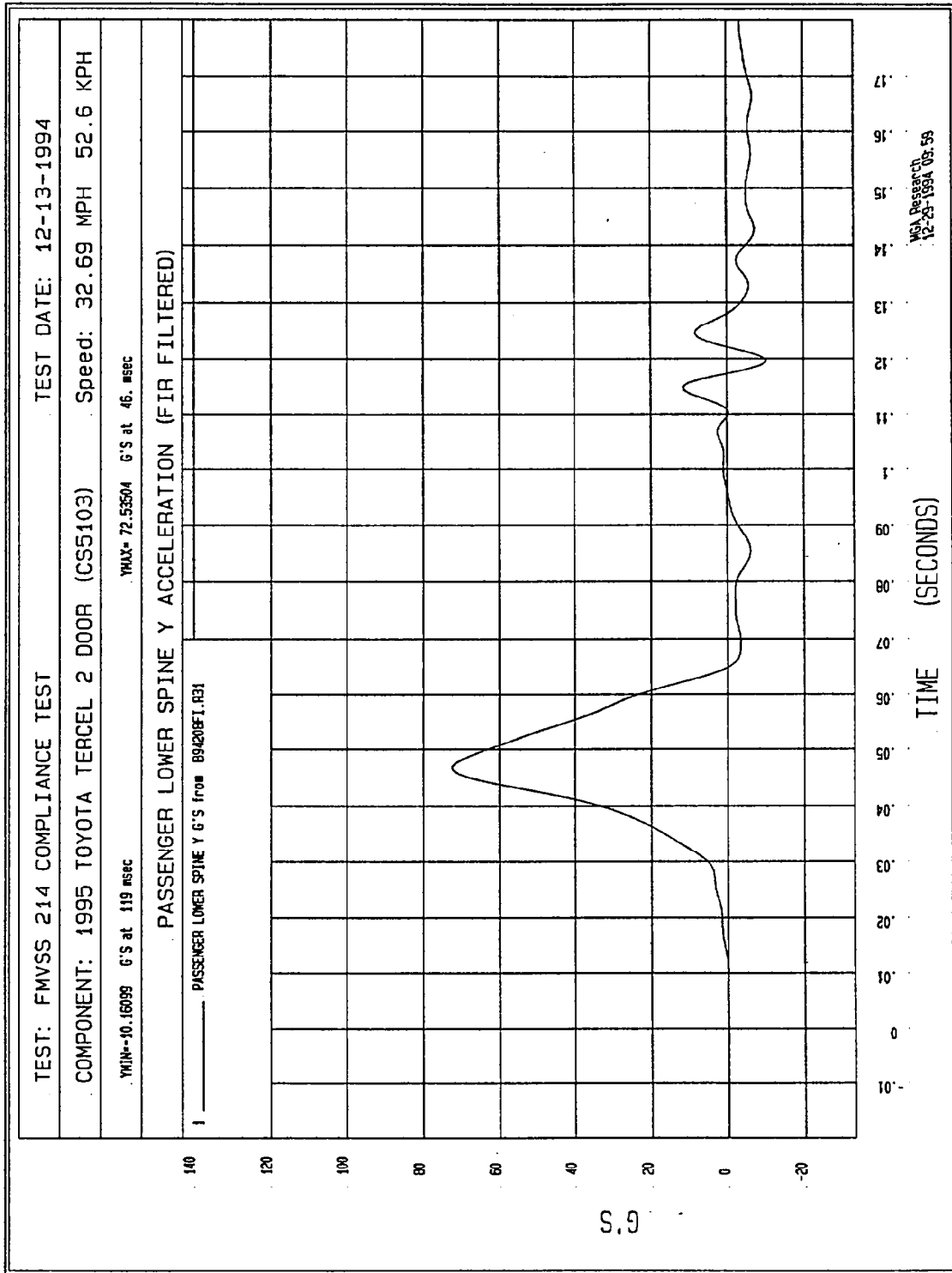


Figure B-93 - Passenger Lower Spine Y Acceleration vs. Time

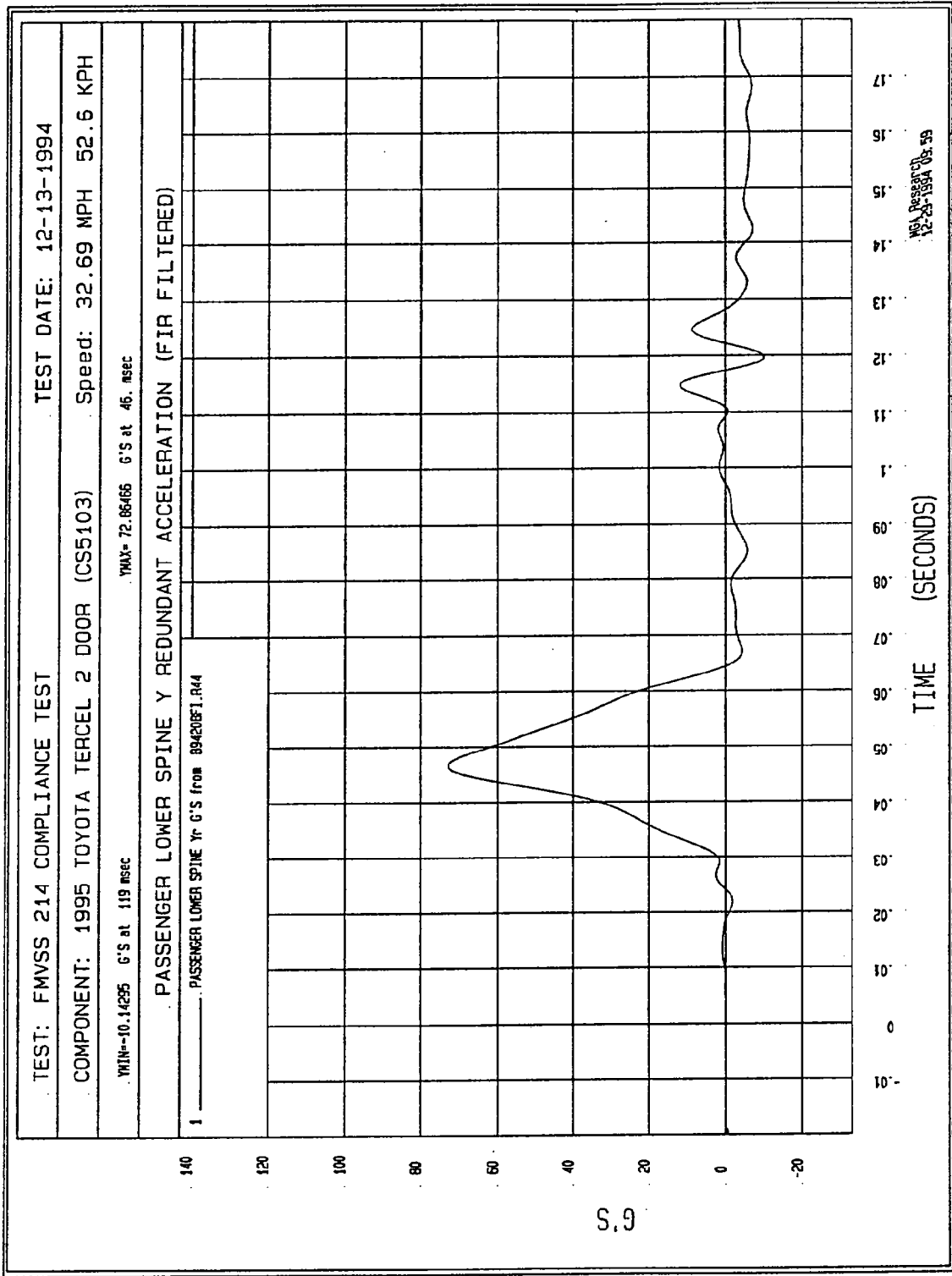


Figure B-94 - Passenger Lower Spine Y Redundant Acceleration vs. Time

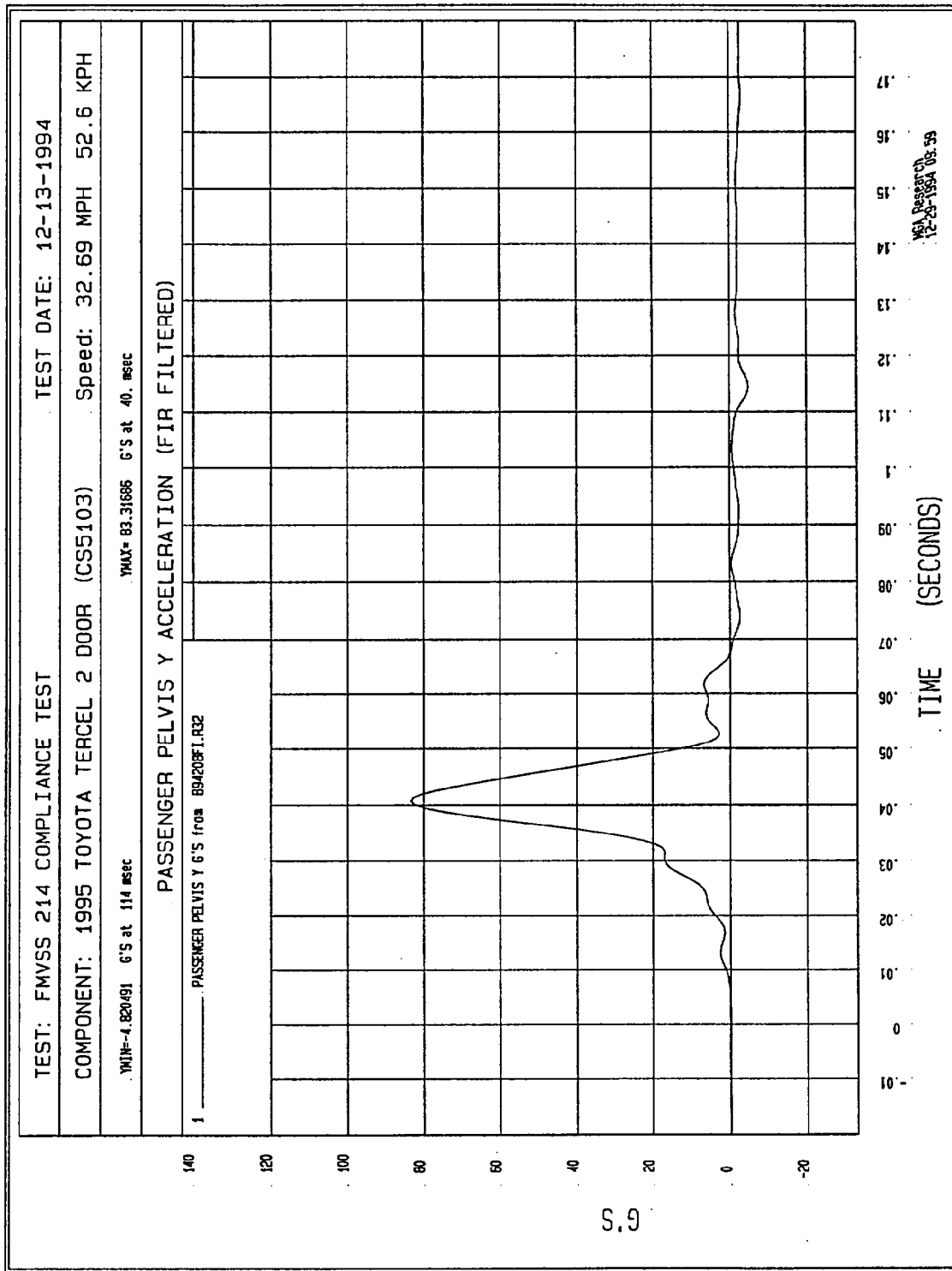


Figure B-95 - Passenger Pelvis Y Acceleration vs. Time

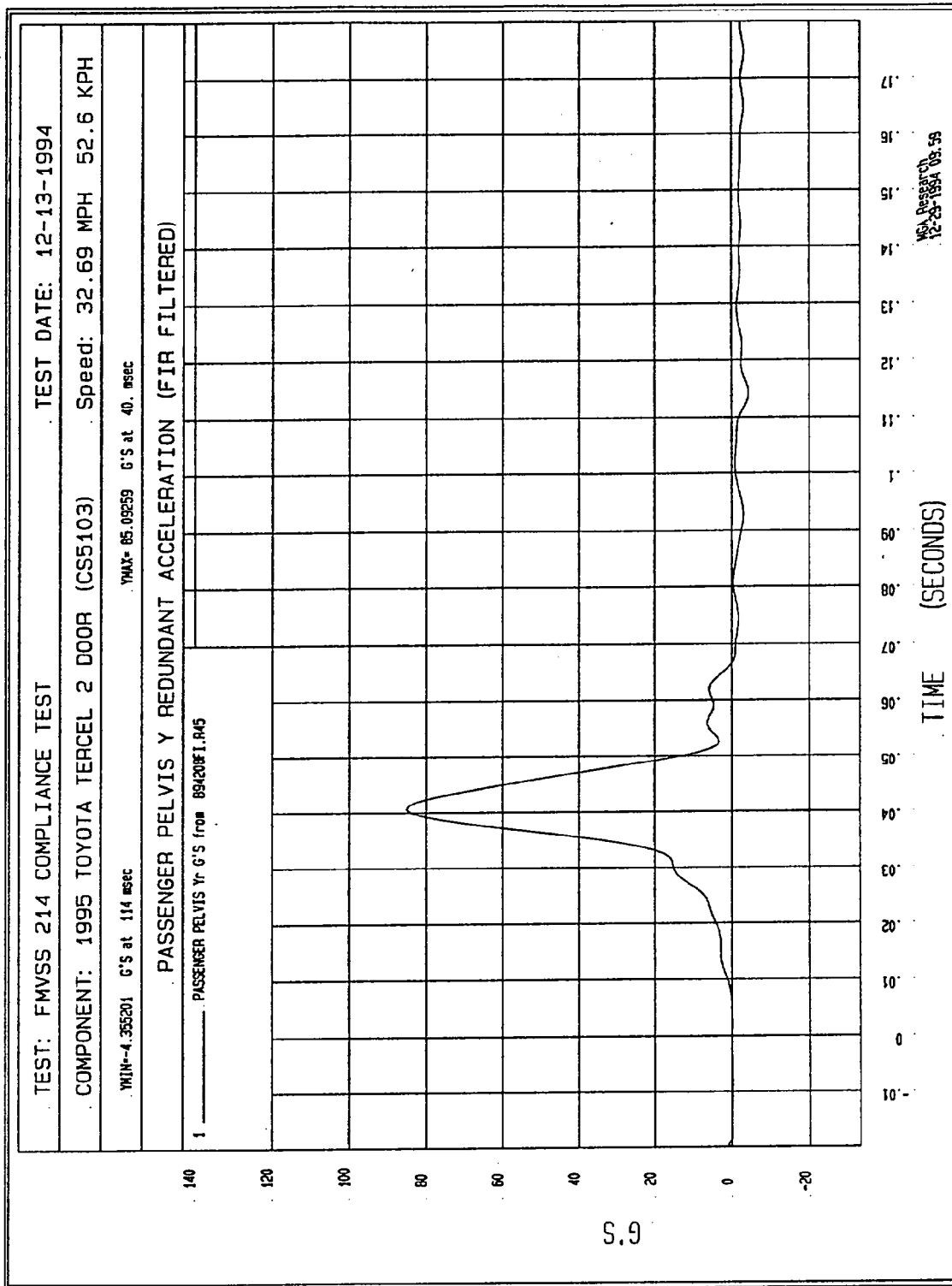


Figure B-96 - Passenger Pelvis Y Redundant Acceleration vs. Time

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-95-DC009

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

TOYOTA MOTOR CORPORATION
1995 TOYOTA TERCEL 2 DOOR
NHTSA NO. CS5103

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: December 13, 1994

Report Date: December 31, 1994

FINAL REPORT

Prepared For:

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

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PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Pre-Test Calibration

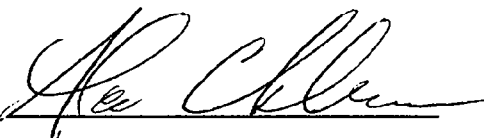
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

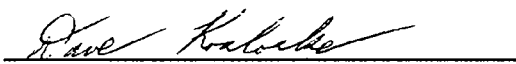
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

DATE OF VERIFICATION: December 5, 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: December 5, 1994

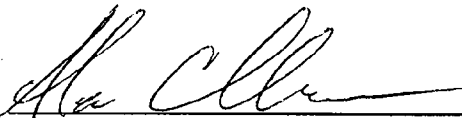
DUMMY NUMBER: 272

TEST NUMBER: D94332

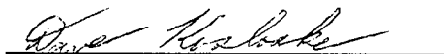
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

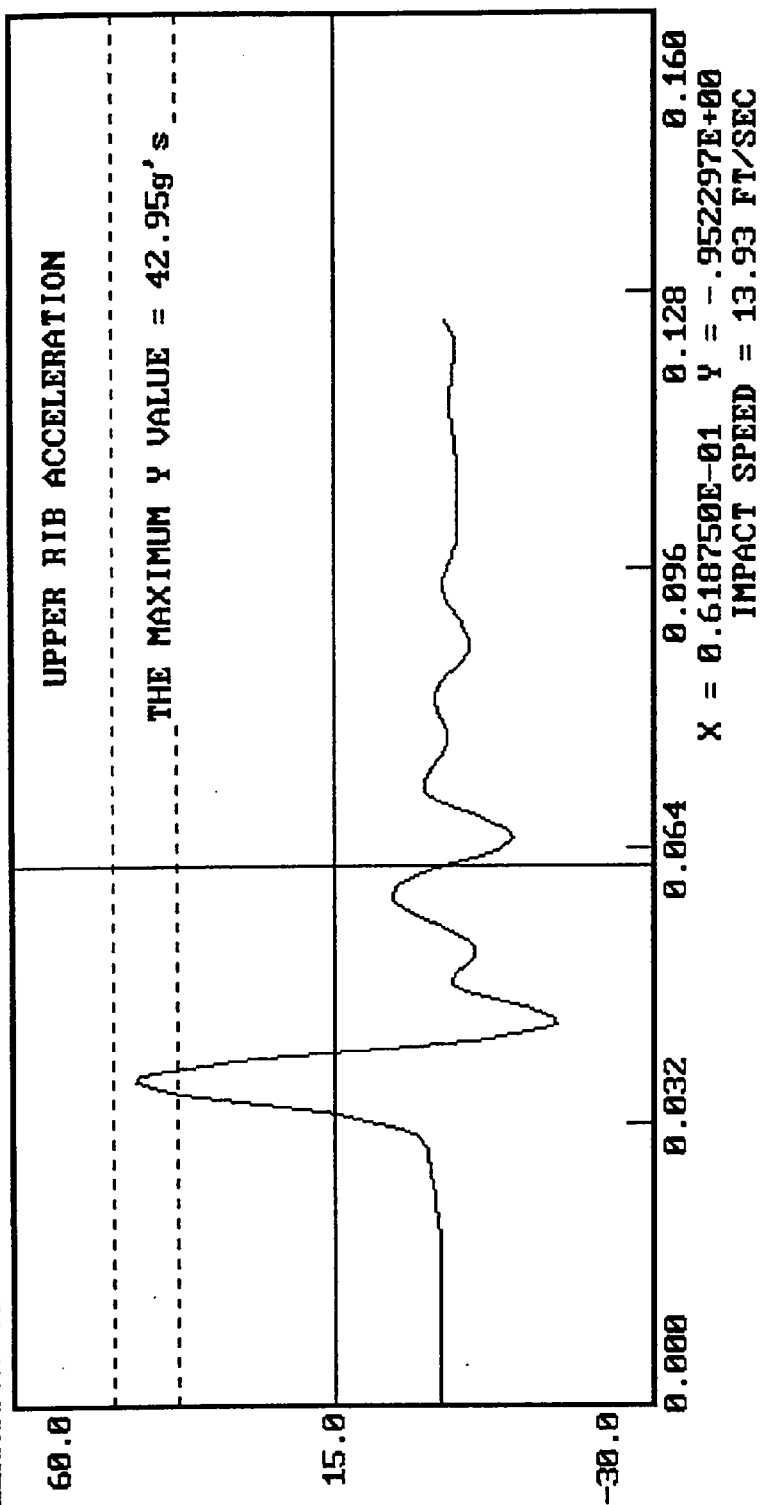


12-05-1994 12:13

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 272

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

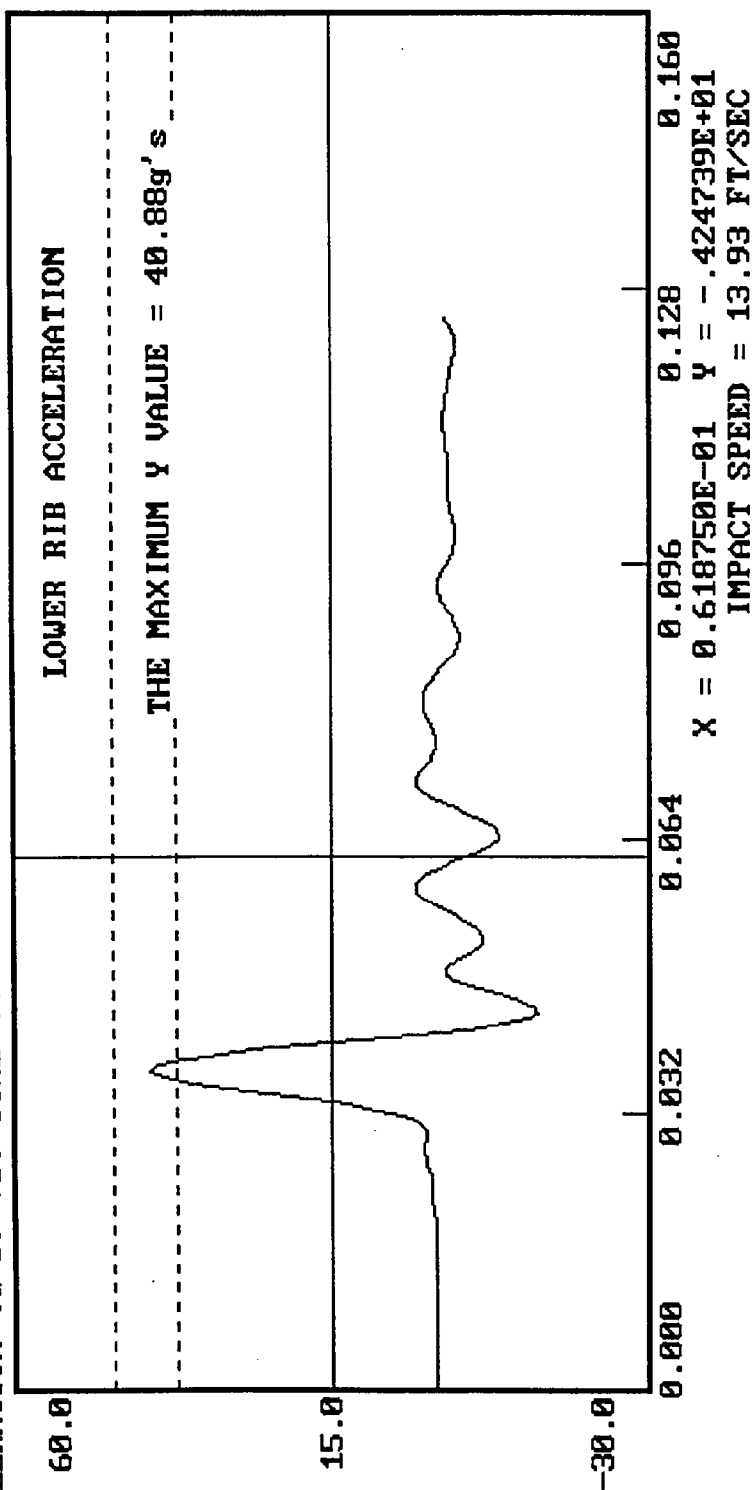


12-05-1994 12:13

DUMMY CALIBRATION - THORAX IMPACT

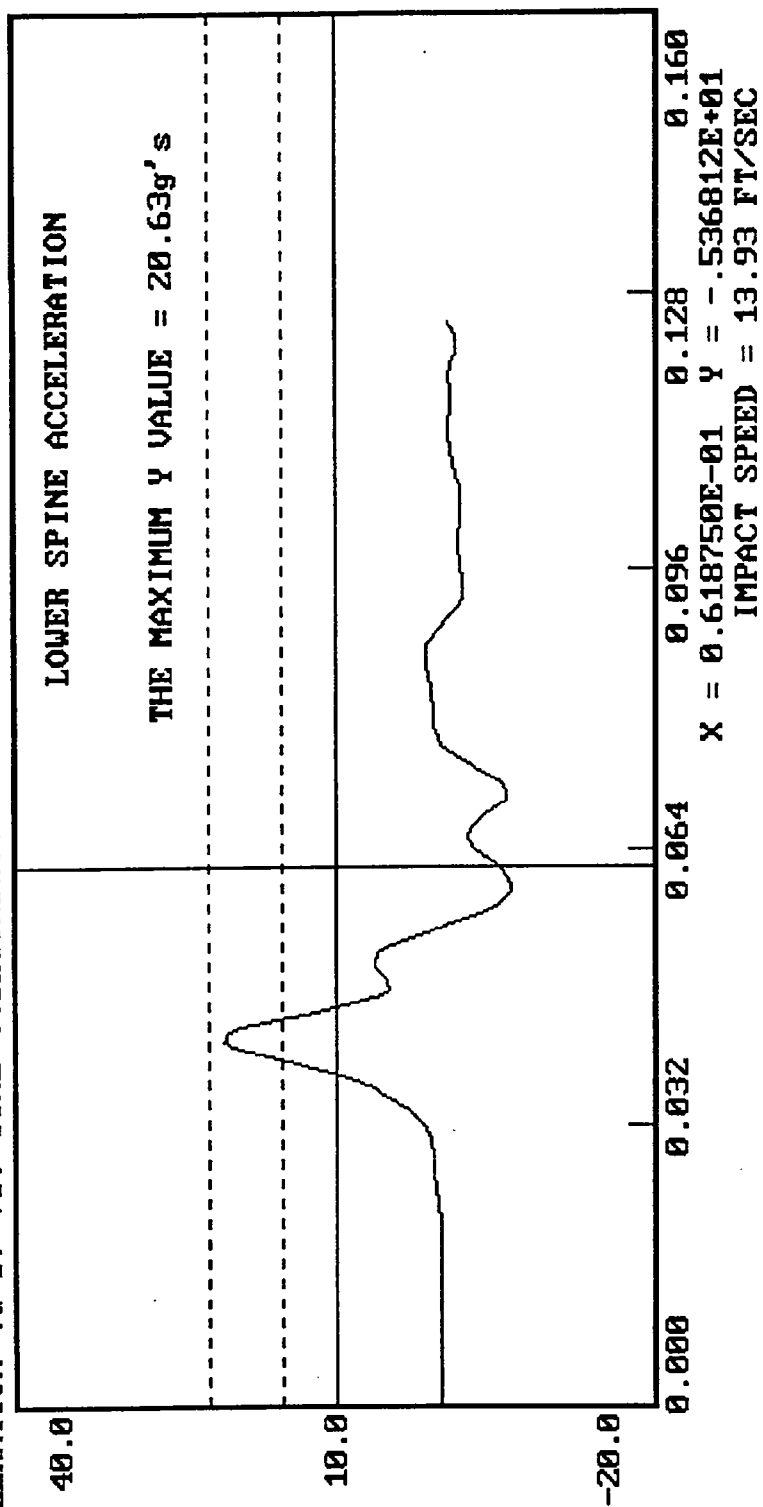
DUMMY # 272

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



12-05-1994 12:13

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 5, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94333

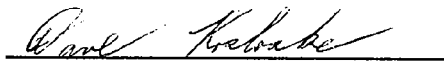
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	33%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	58

TEST MEETS SPECIFICATIONS

TECHNICIAN

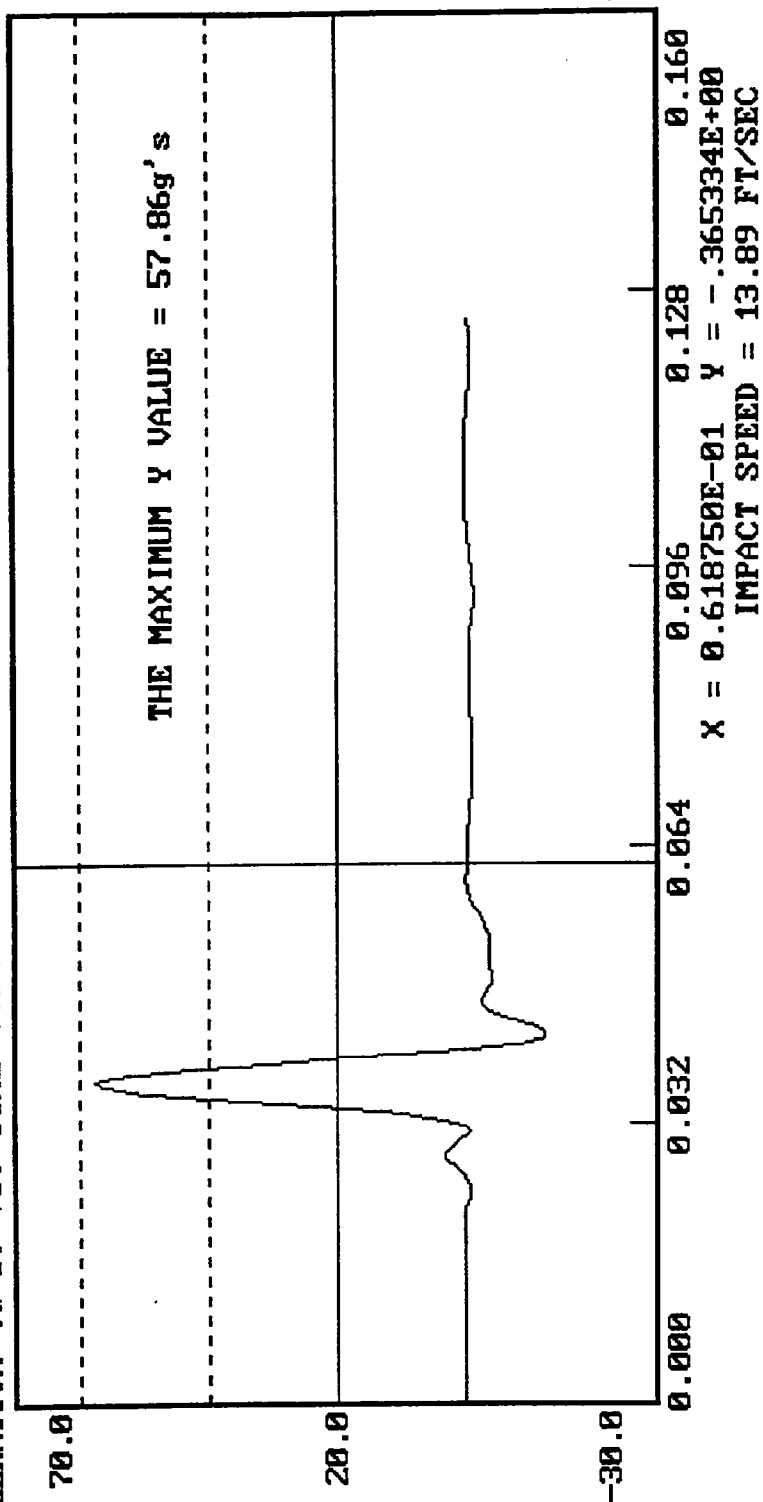


APPROVED BY



12-05-1994 13:38

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: December 4, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94334

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	38%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.0
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	82

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Weidman

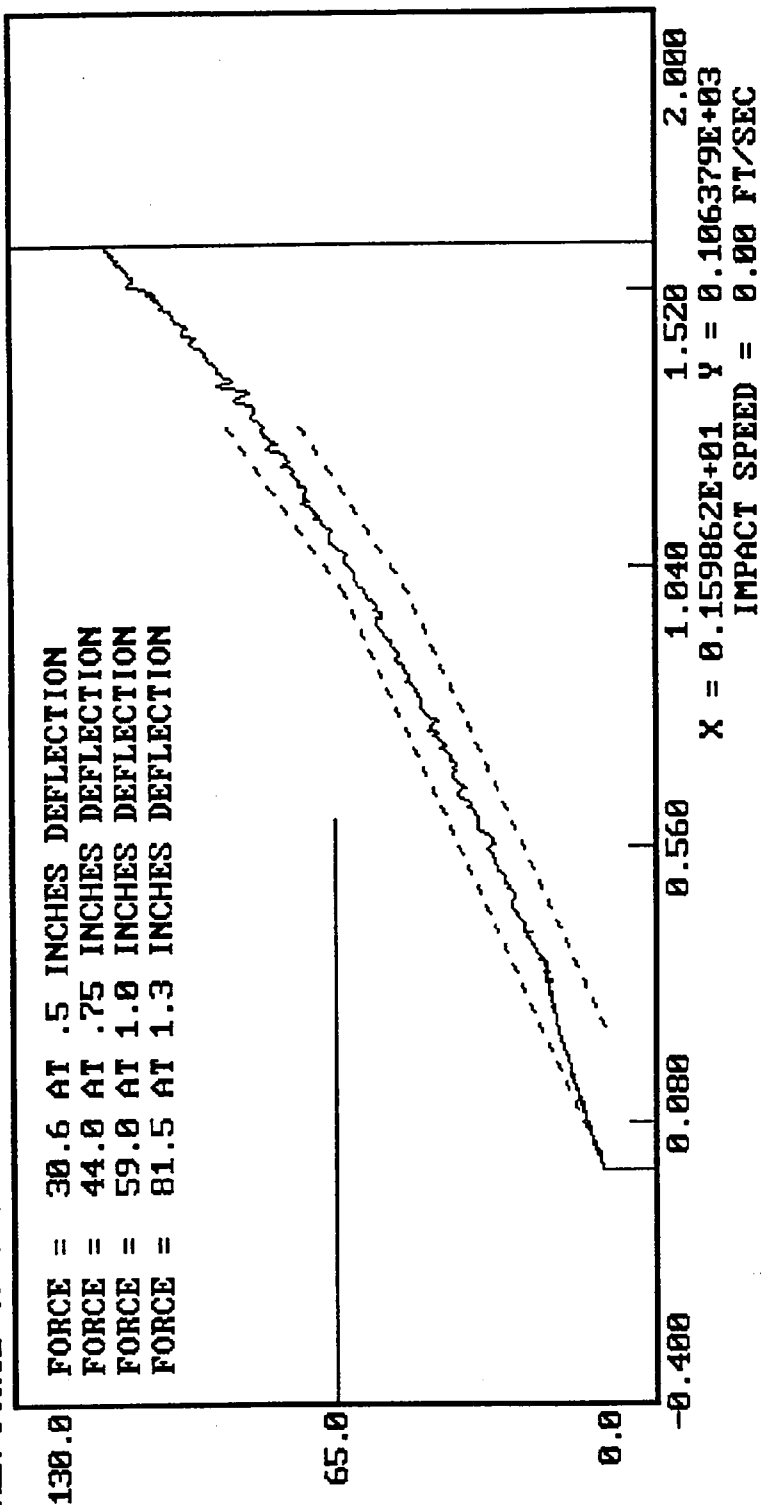
APPROVED BY Rene Kosloski

12-04-1994 15:27

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 272

ABDOMEN FORCE () US. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 4, 1994

DUMMY NUMBER: 272

TEST NUMBER: D94335

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	38%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	28
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	55
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN

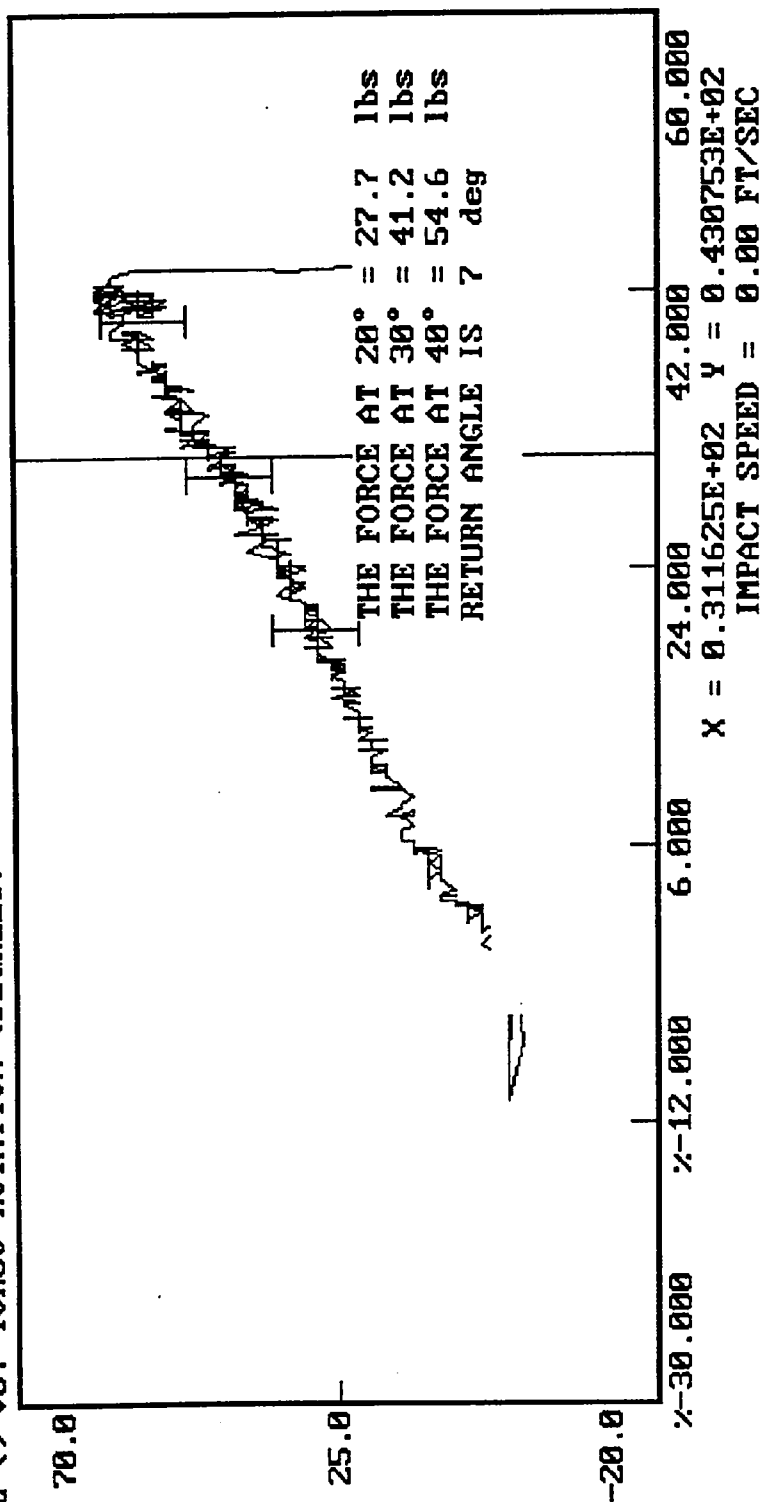
He Chen

APPROVED BY

Don Kishida

12-04-1994 15:04

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





PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 269

Calibration Test Results Summary

Passenger Serial Number: 269

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

DATE OF VERIFICATION: November 30, 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"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: 

APPROVED BY:  Dave Kabiske

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 30, 1994

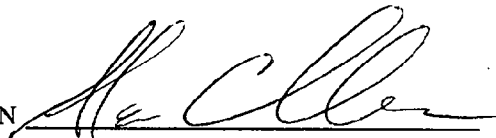
DUMMY NUMBER: 269

TEST NUMBER: D94272

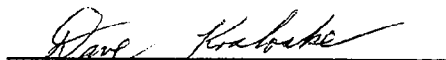
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	42
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

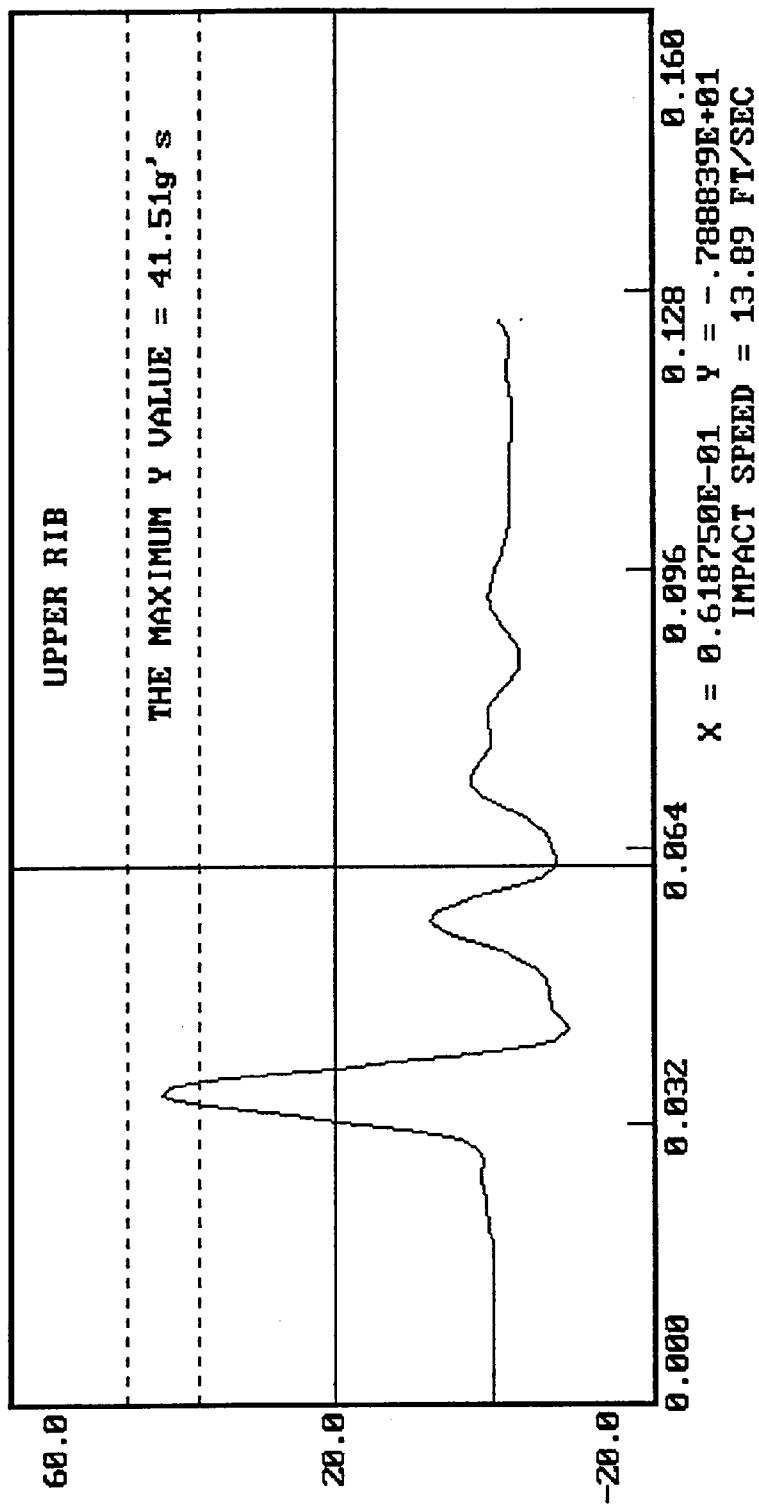
TECHNICIAN



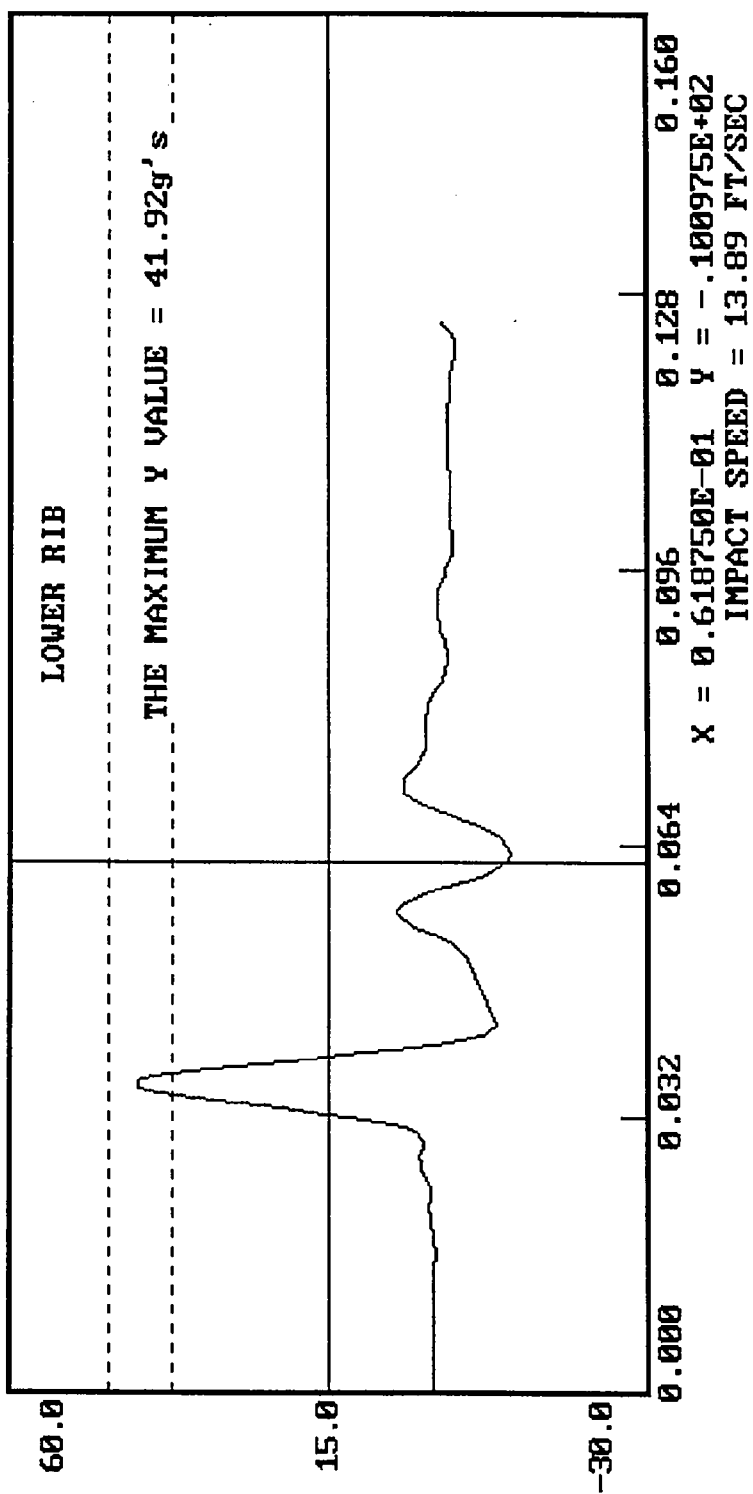
APPROVED BY



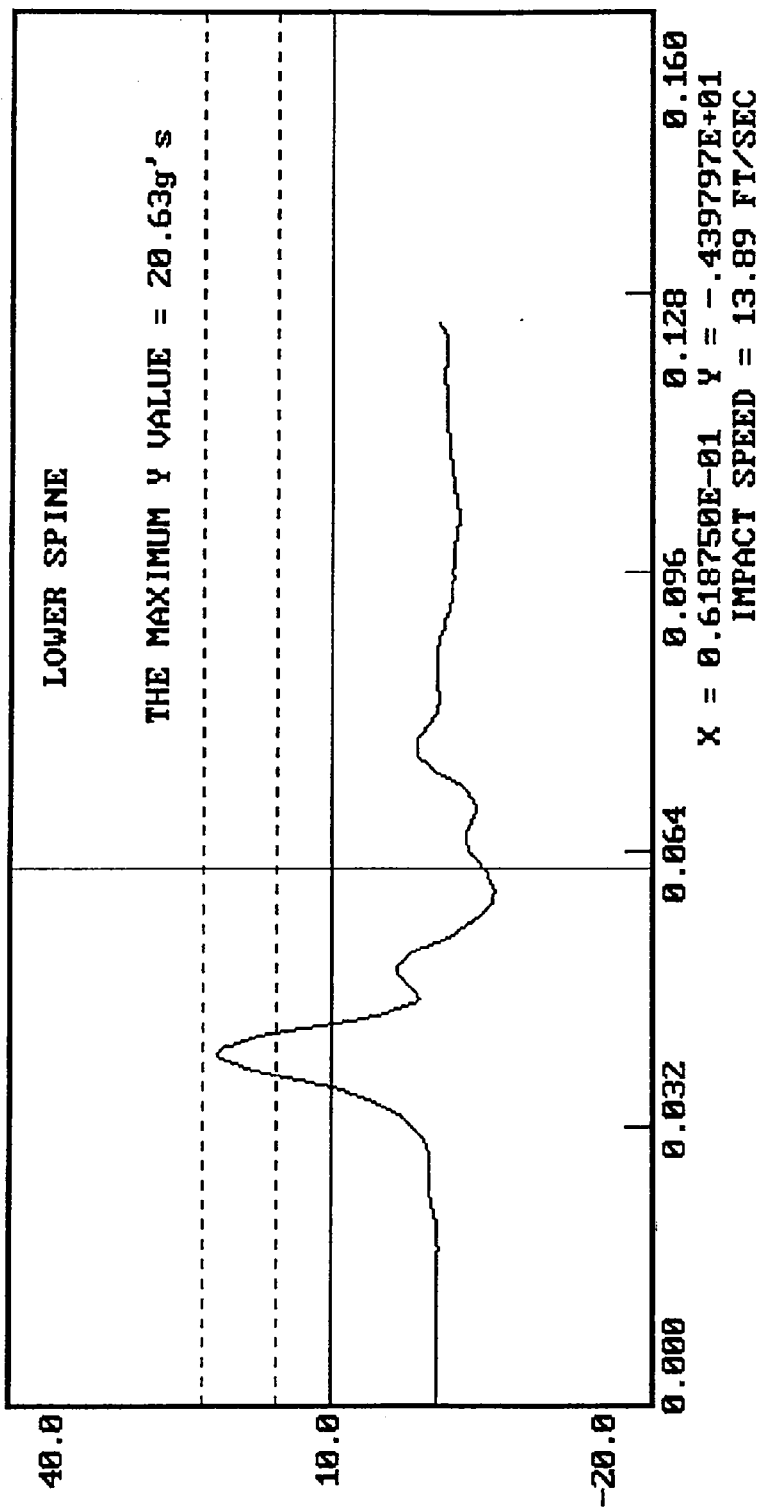
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 11-30-1994 12:22
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 11-30-1994 12:22
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 11-30-1994 12:22
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

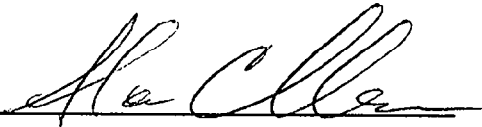
DATE: November 30, 1994

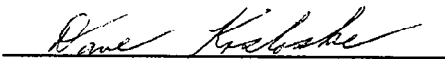
DUMMY NUMBER: 269

TEST NUMBER: D94273

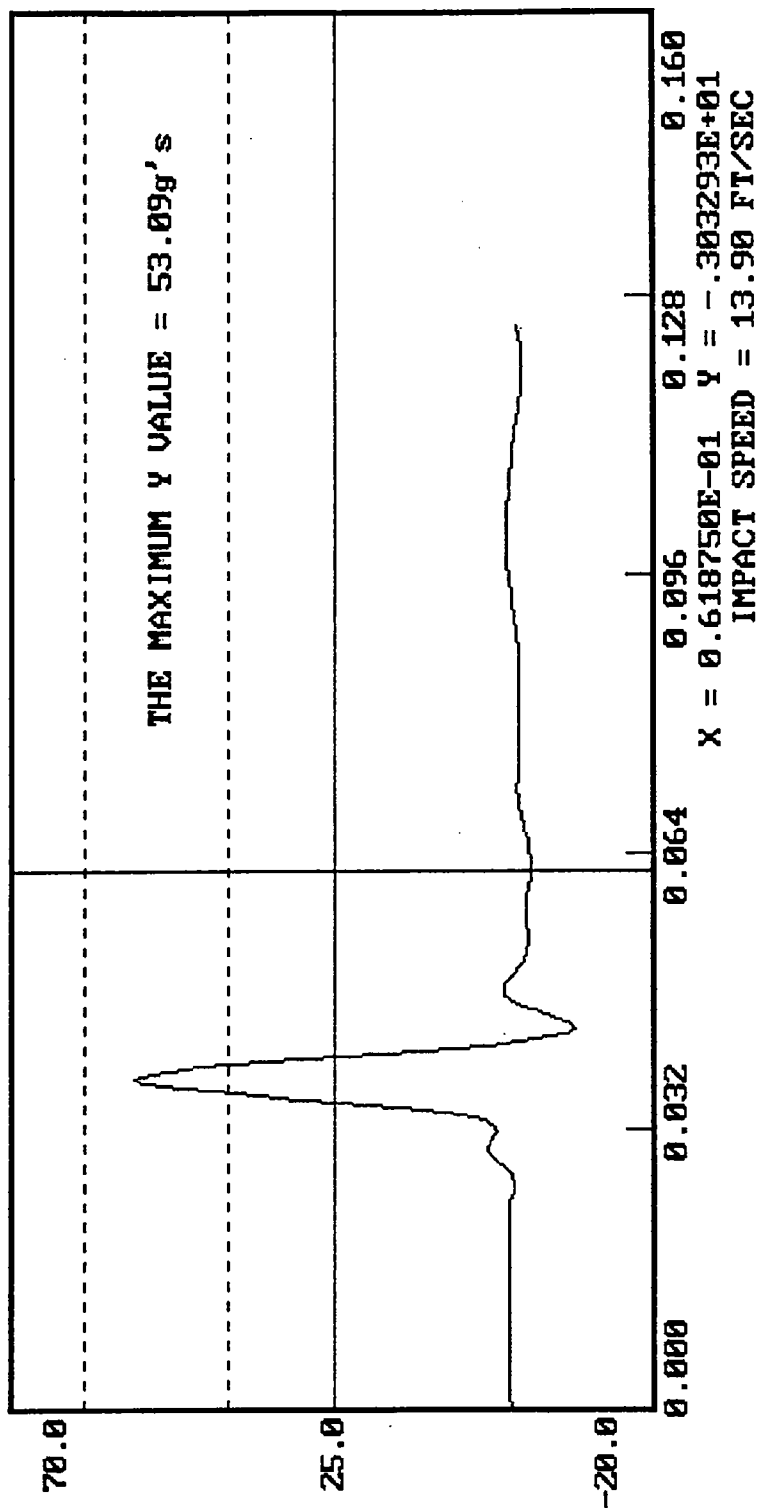
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	53

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 269
11-30-1994 15:42
ACCELERATION (G'S) VS. TIME ((SECONDS))



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

DATE: November 30, 1994

DUMMY NUMBER: 269

TEST NUMBER: D94274

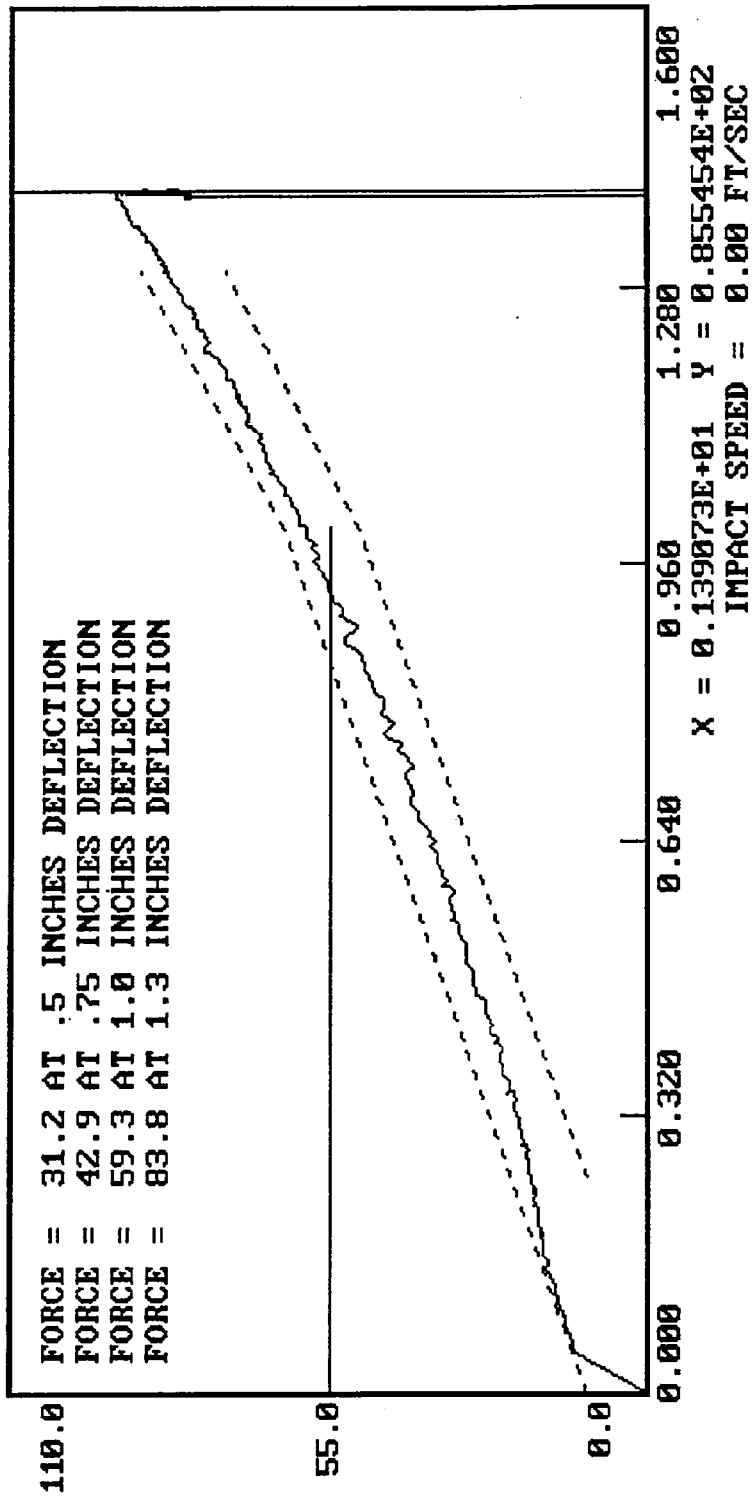
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.2
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.9
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

APPROVED BY Dave Keshake

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 269
 11-30-1994 04:51
 ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: November 30, 1994

DUMMY NUMBER: 269

TEST NUMBER: D94275

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	30
FORCE @ 30°	34 - 46 lbs	40
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	8°

TEST MEETS SPECIFICATIONS

TECHNICIAN

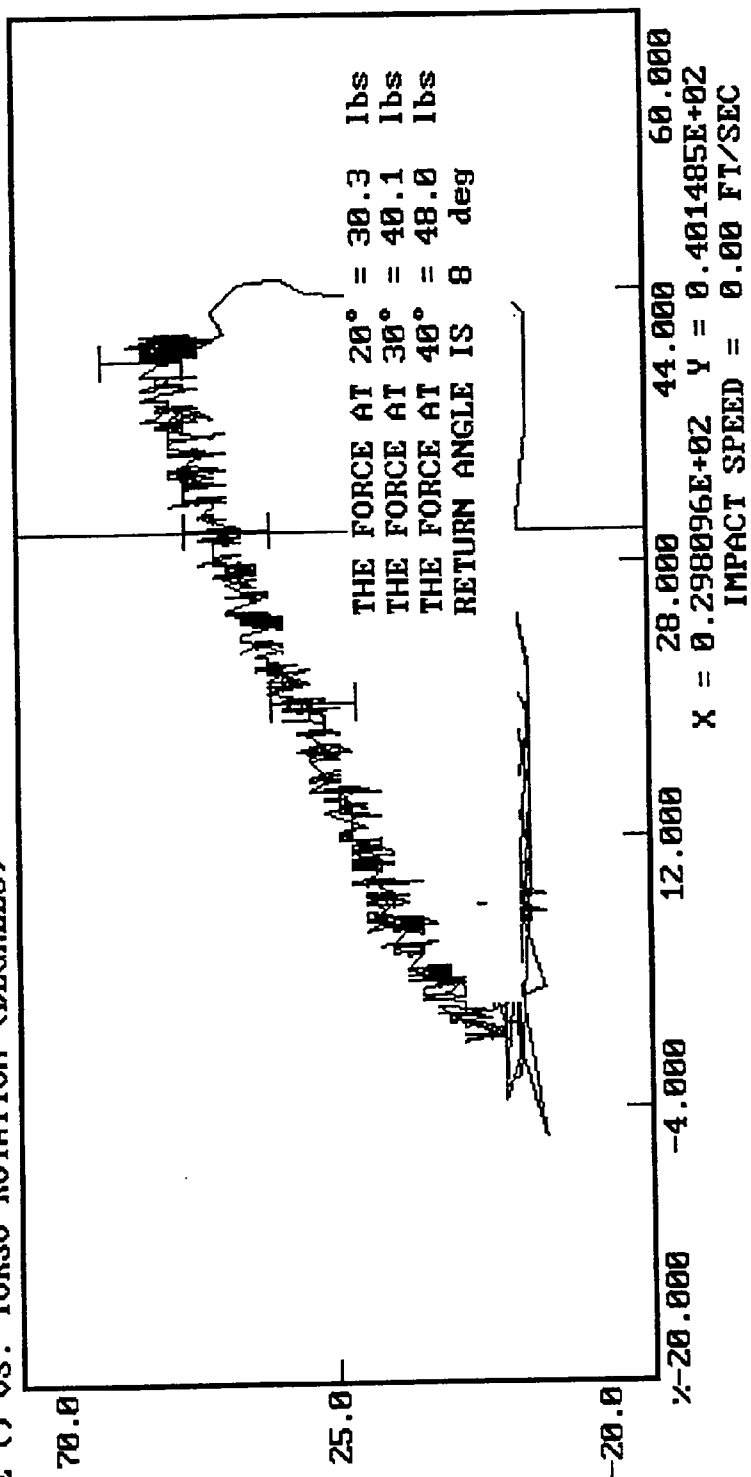
Jim Wil

APPROVED BY

Dave Kucharski

11-30-1994 16:07

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 269
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.

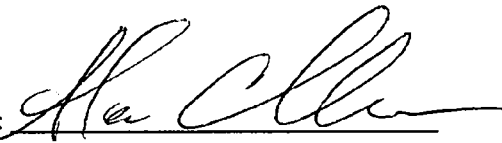
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

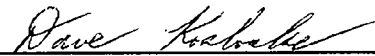
DATE OF VERIFICATION: December 16, 1994

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"	20.5
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: December 13, 1994

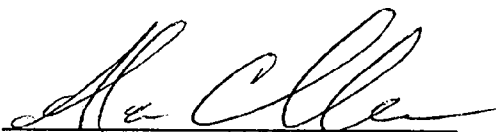
DUMMY NUMBER: 272

TEST NUMBER: D94432

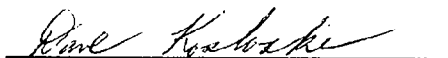
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	40
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

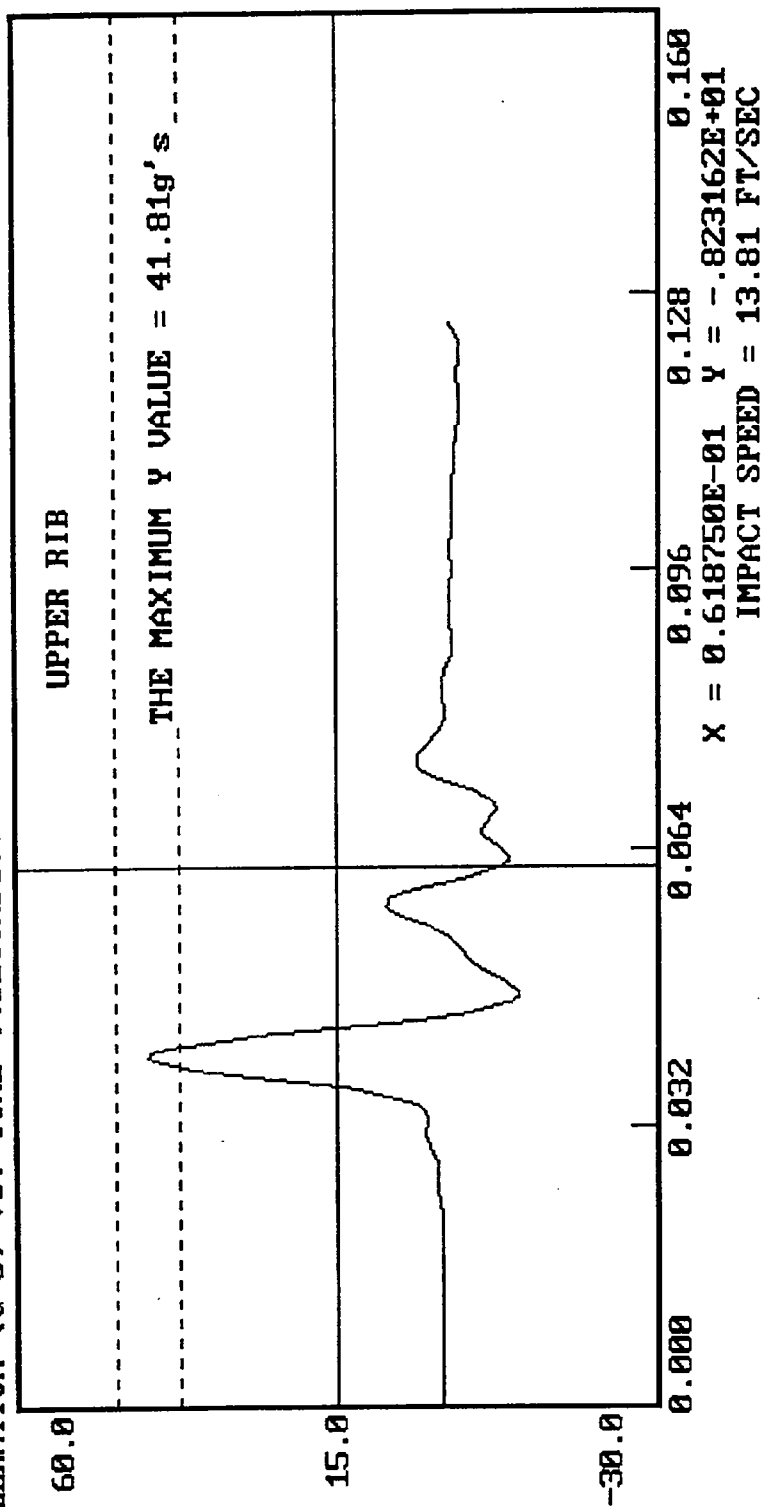


12-13-1994 16:42

DUMMY CALIBRATION - THORAX IMPACT

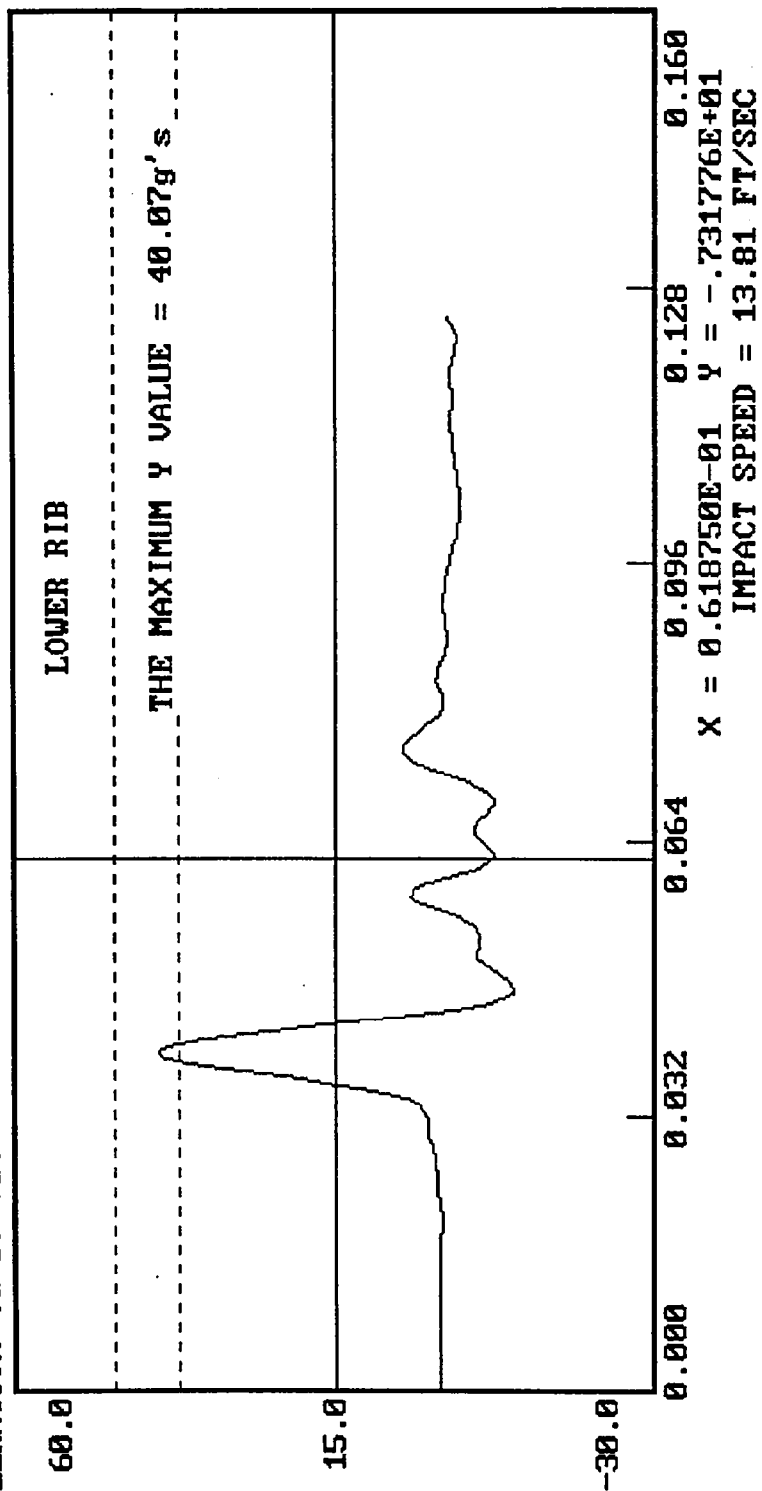
DUMMY # 272

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



12-13-1994 16:42

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

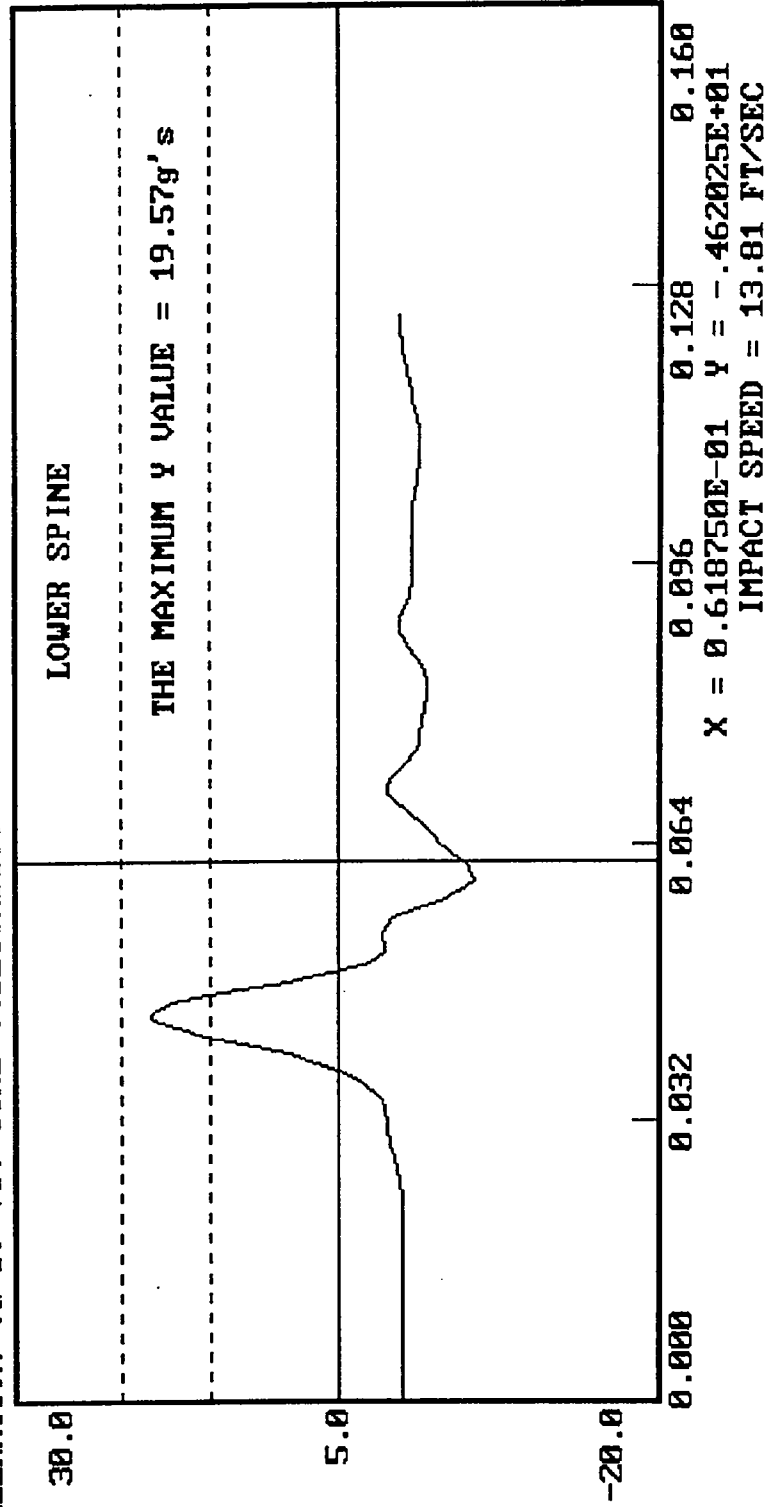


12-13-1994 16:42

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 272

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 14, 1994

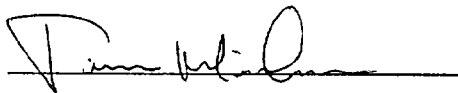
DUMMY NUMBER: 272

TEST NUMBER: D94433

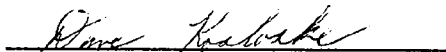
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

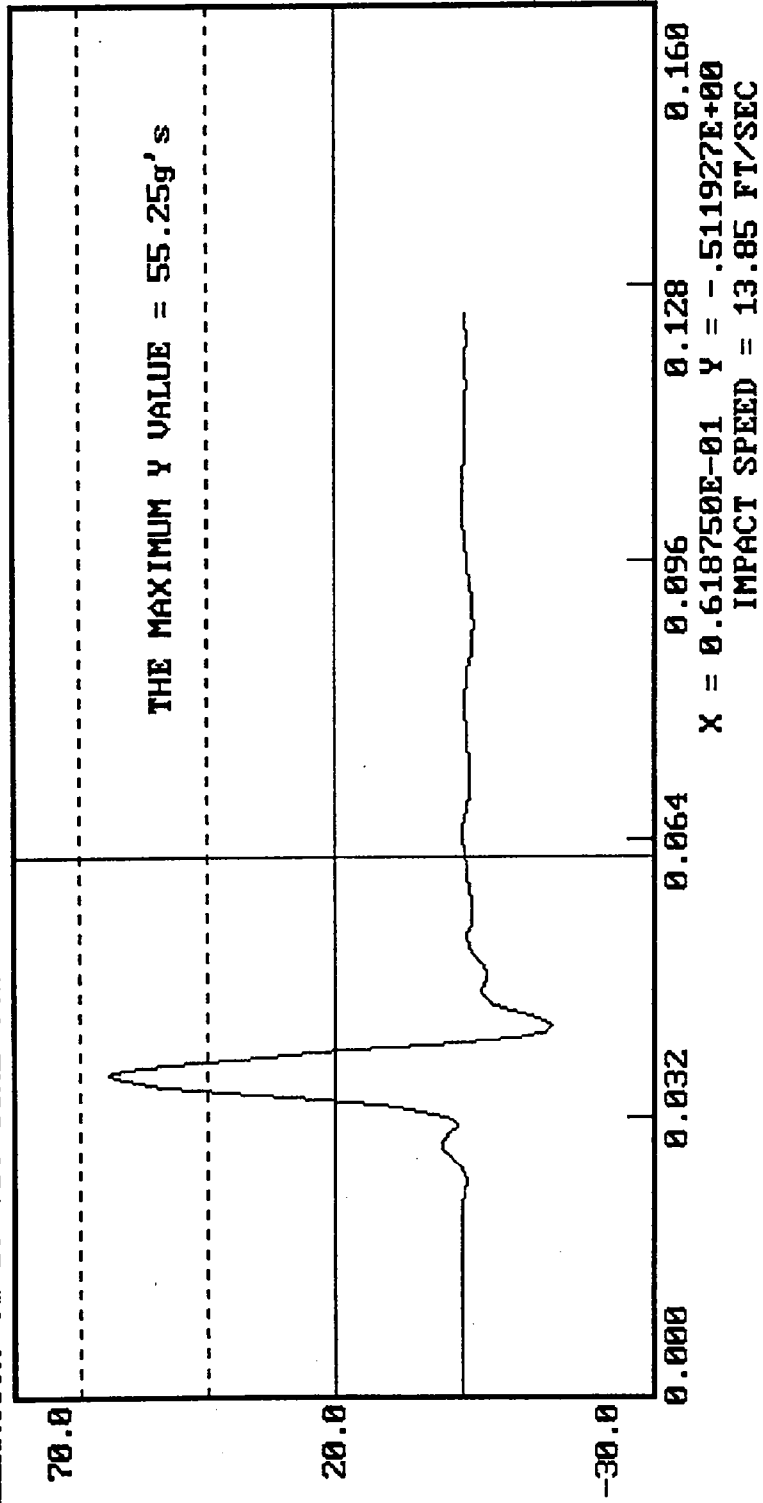


12-14-1994 15:01

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: December 15, 1994

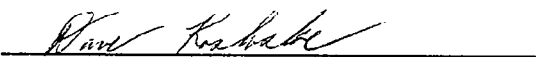
DUMMY NUMBER: 272

TEST NUMBER: D94434

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.5
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.0
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

TECHNICIAN 

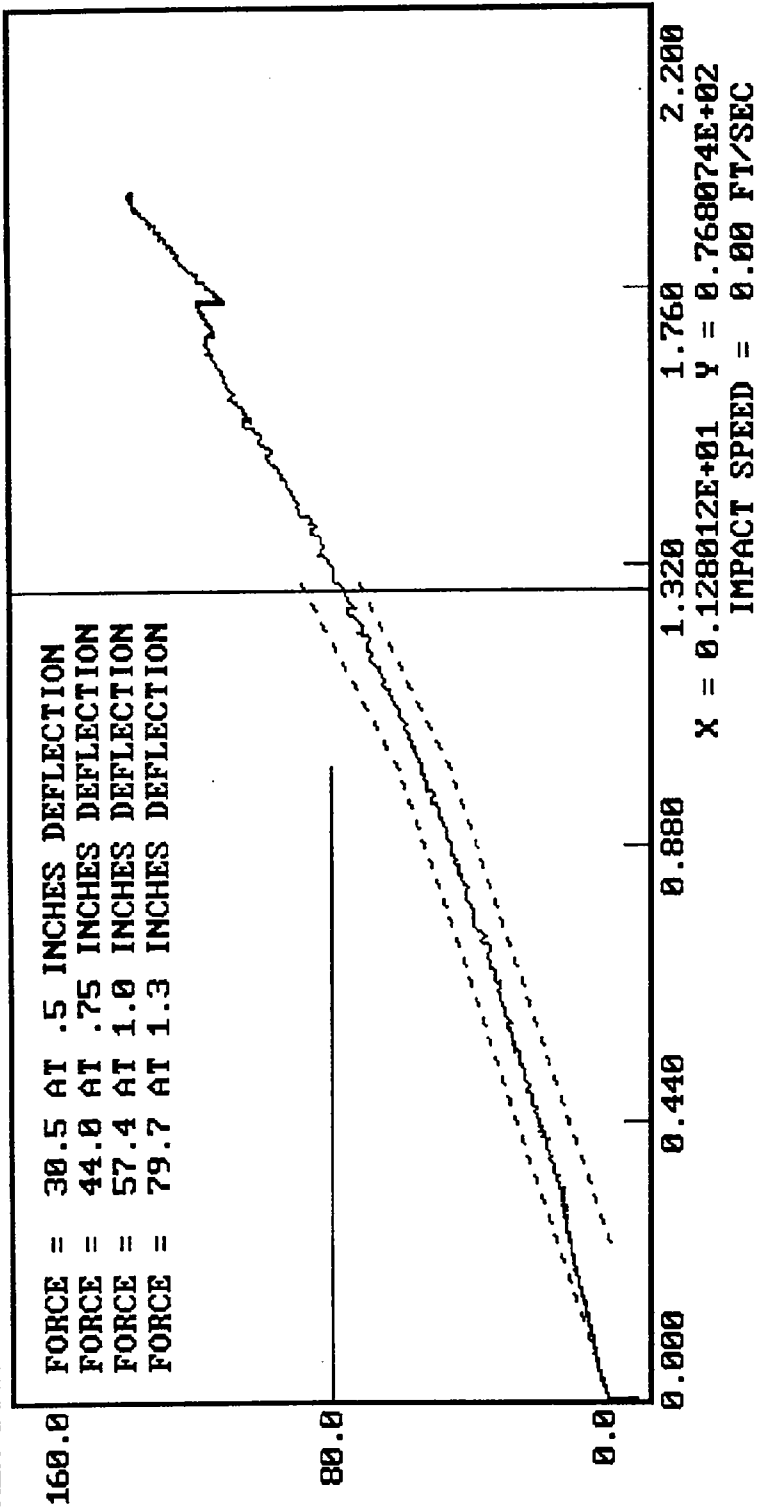
APPROVED BY 

12-15-1994 15:04

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 272

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

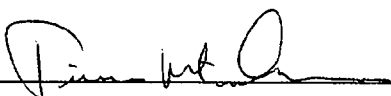
DATE: December 15, 1994

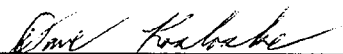
DUMMY NUMBER: 272

TEST NUMBER: D94435

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	37
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	6°

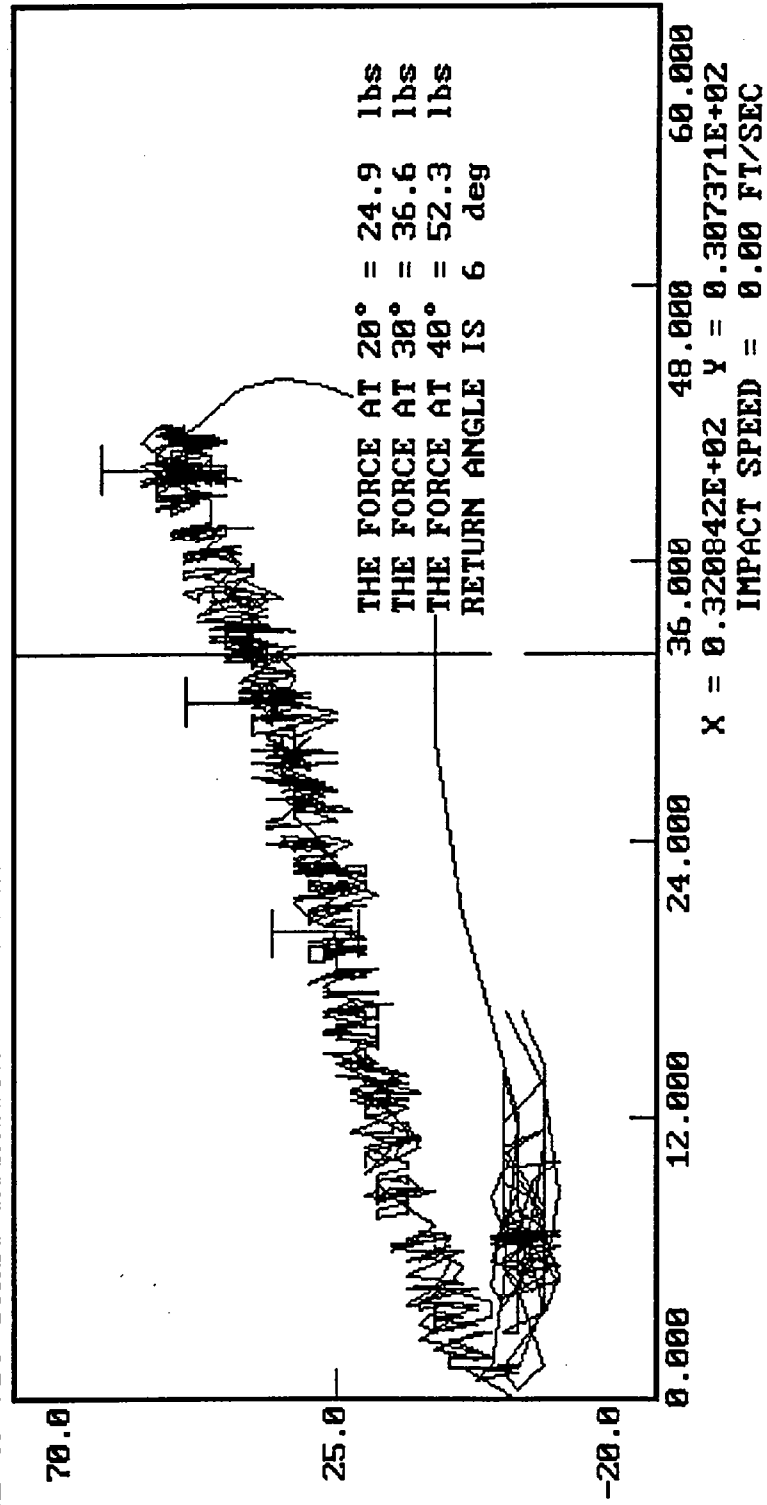
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

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

12-15-1994 14:05



POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

Post-Test Calibration

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

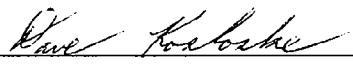
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

DATE OF VERIFICATION: December 16, 1994

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.3
RH - Rib Height	19.75" - 20.50"	20.20
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)

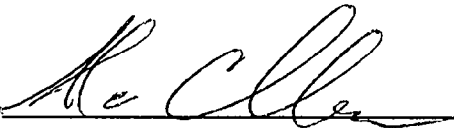
DATE: December 13, 1994

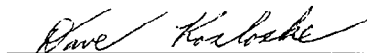
DUMMY NUMBER: 269

TEST NUMBER: D94402

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	41
LOWER RIB	37 - 46 g's	38
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

TECHNICIAN: 

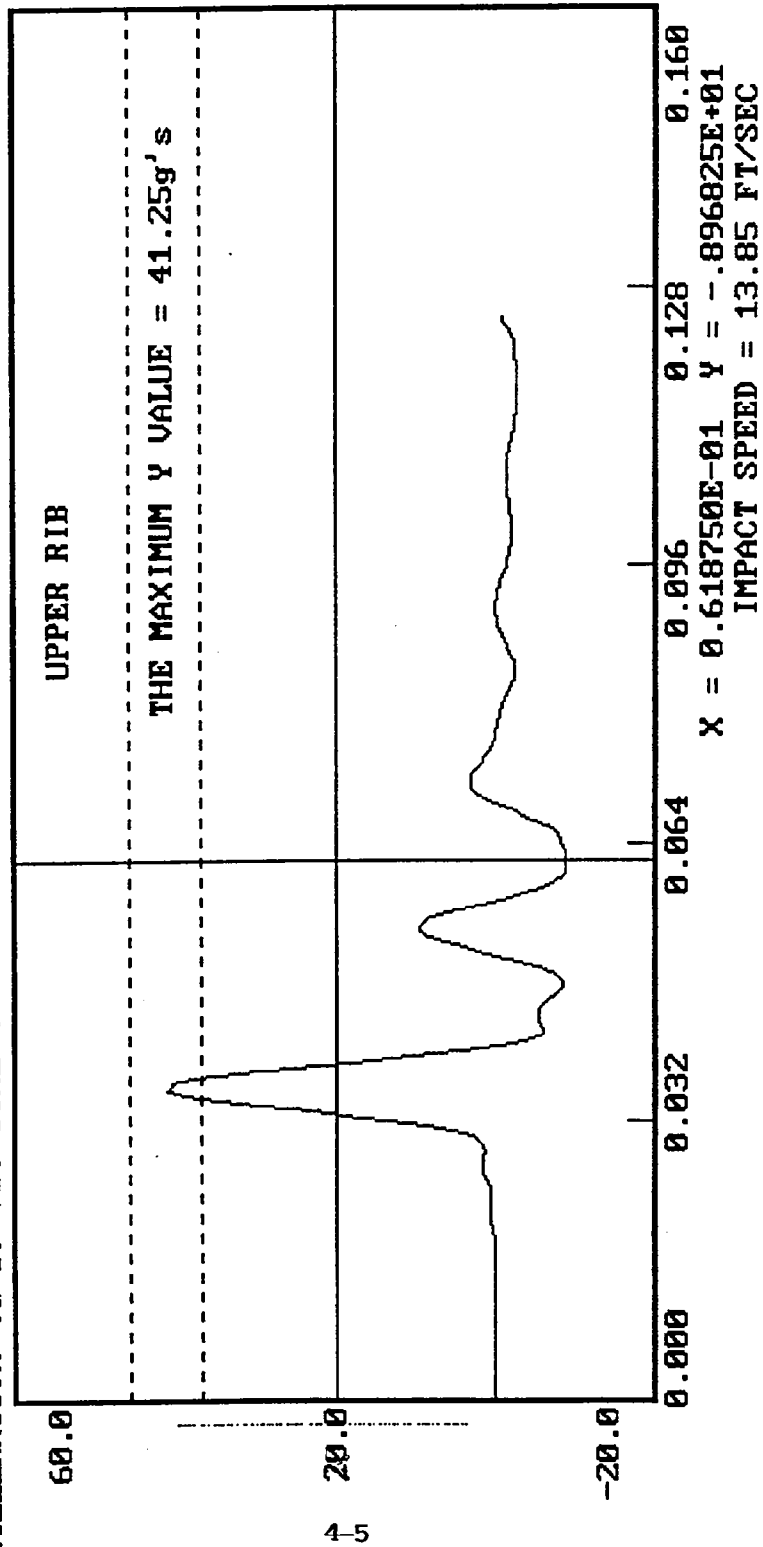
APPROVED BY 

12-13-1994 15:51

DUMMY CALIBRATION - THORAX IMPACT

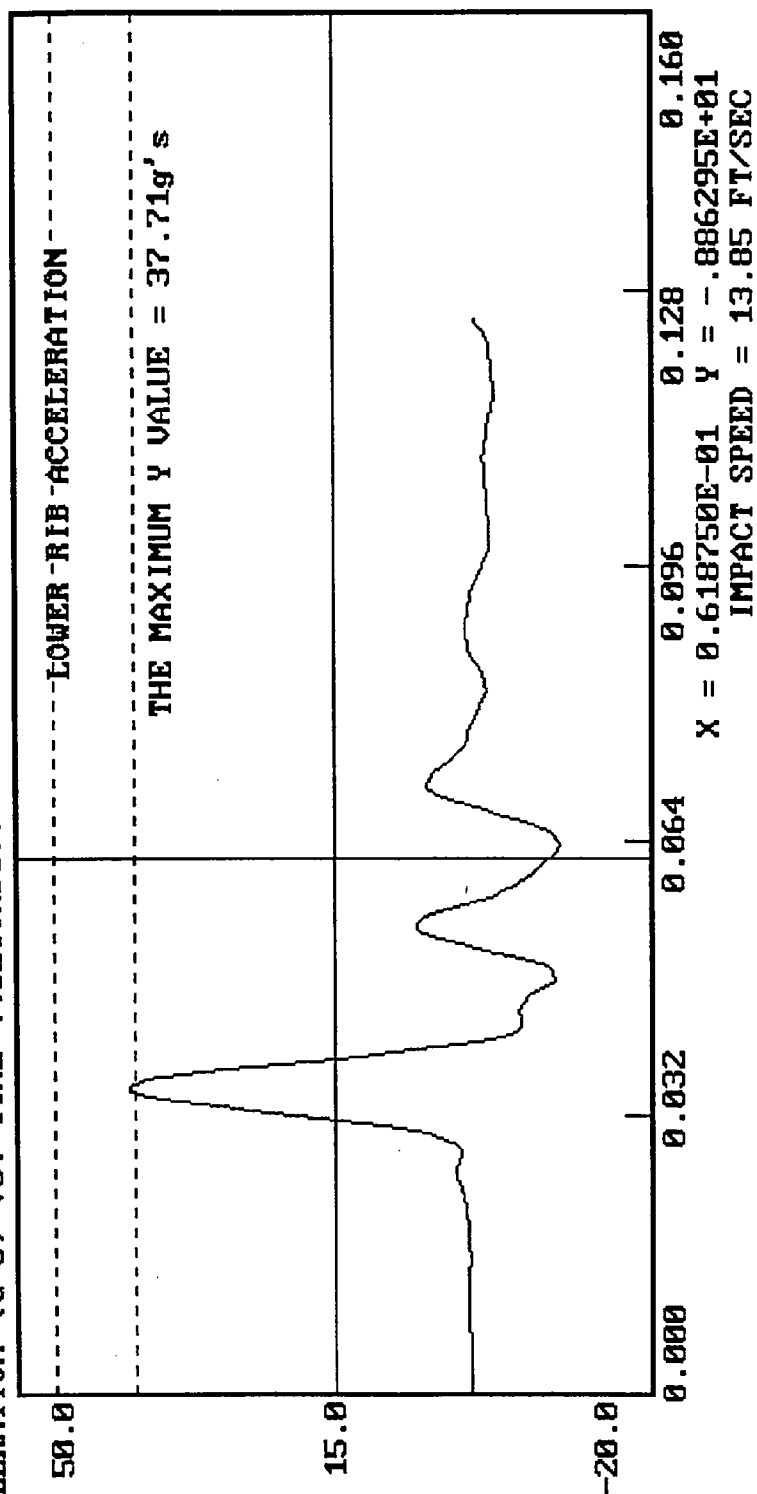
DUMMY # 269

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



12-13-1994 15:51

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

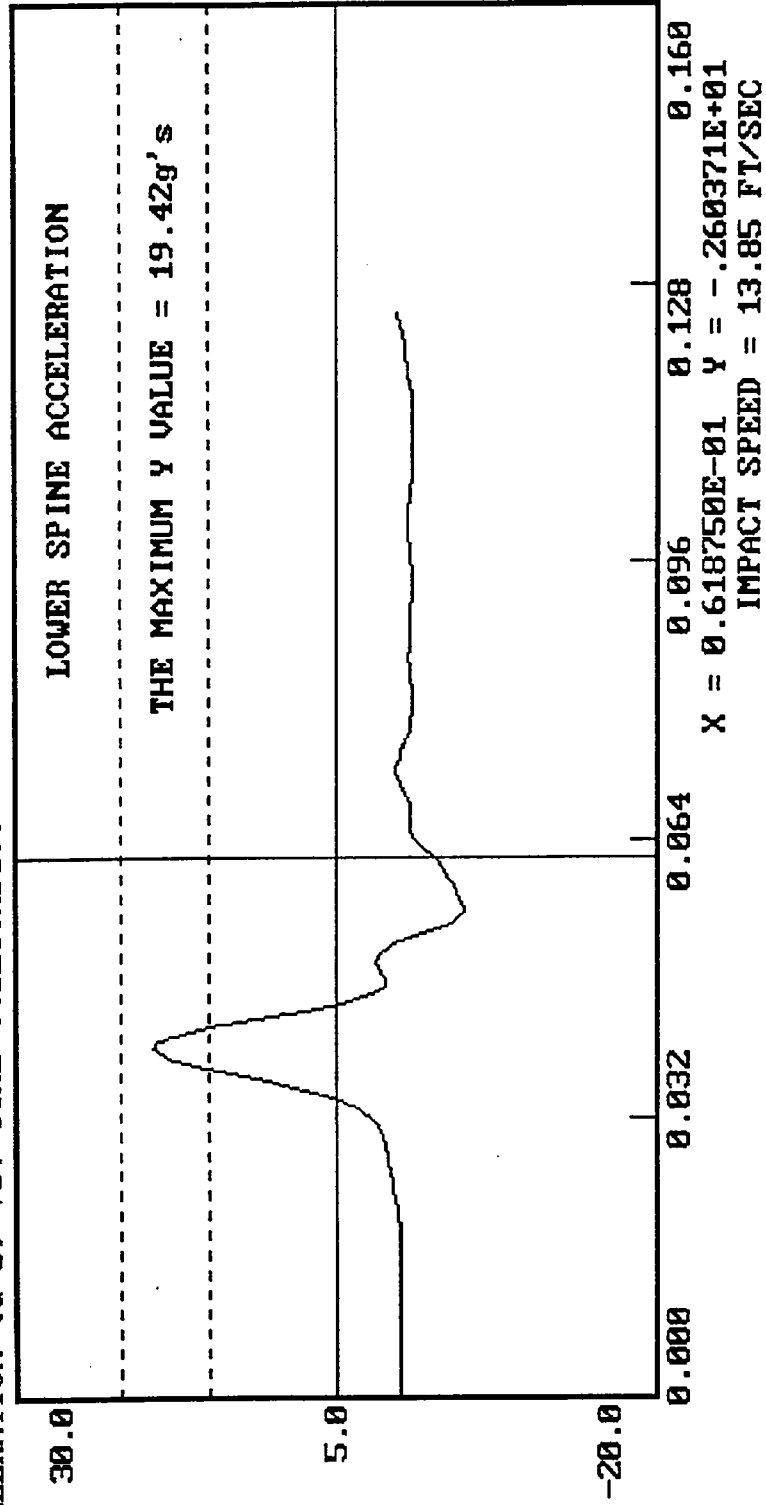


12-13-1994 15:51

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 269

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 14, 1994

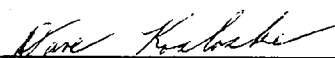
DUMMY NUMBER: 269

TEST NUMBER: D94403

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	58

TEST MEETS SPECIFICATIONS

TECHNICIAN 

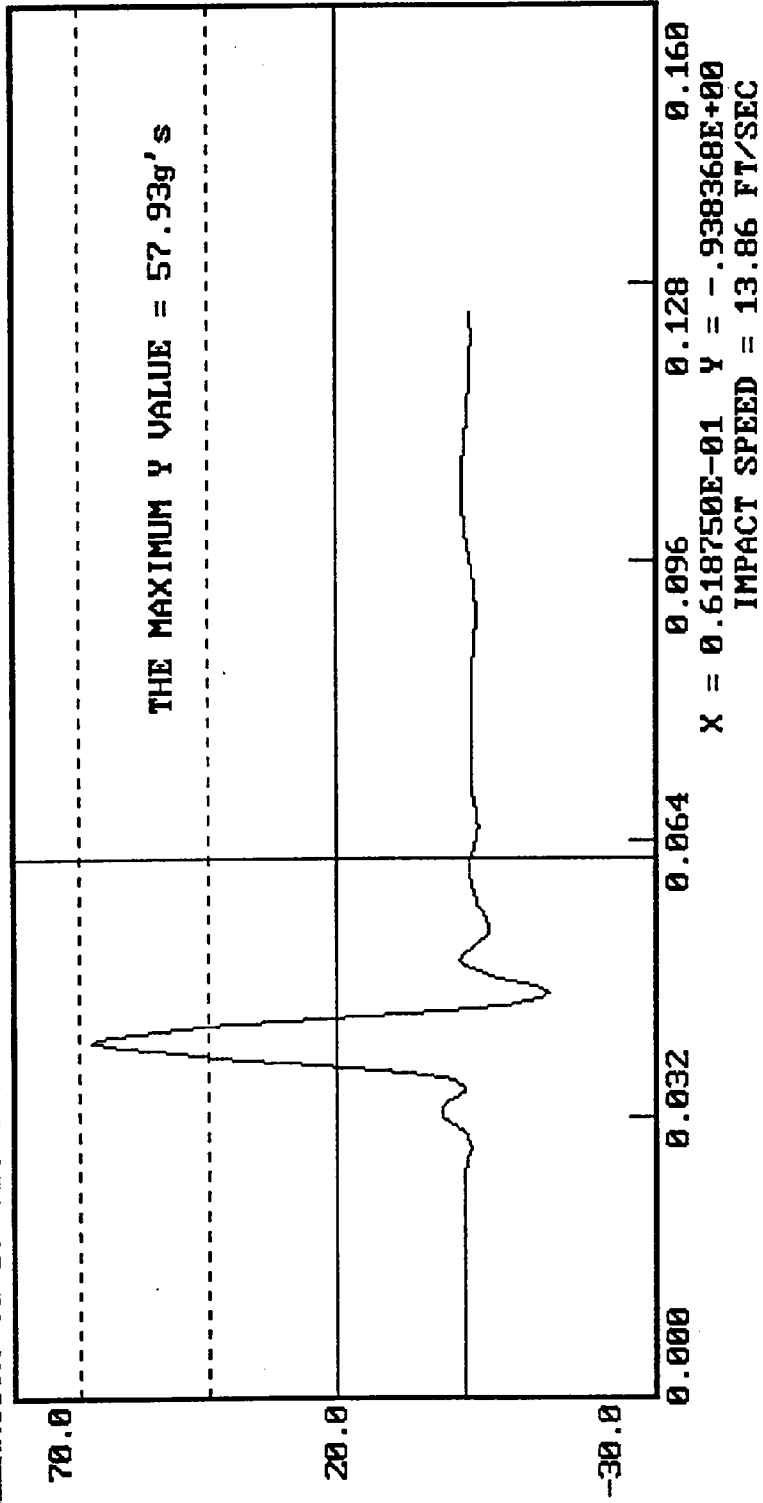
APPROVED BY 

12-14-1994 14:51

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 269

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



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

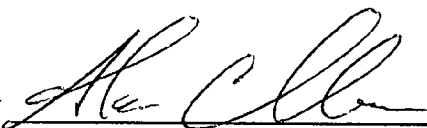
DATE: December 15, 1994

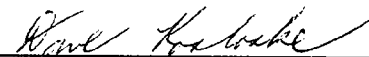
DUMMY NUMBER: 269

TEST NUMBER: D94404

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.0
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.9
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

TECHNICIAN 

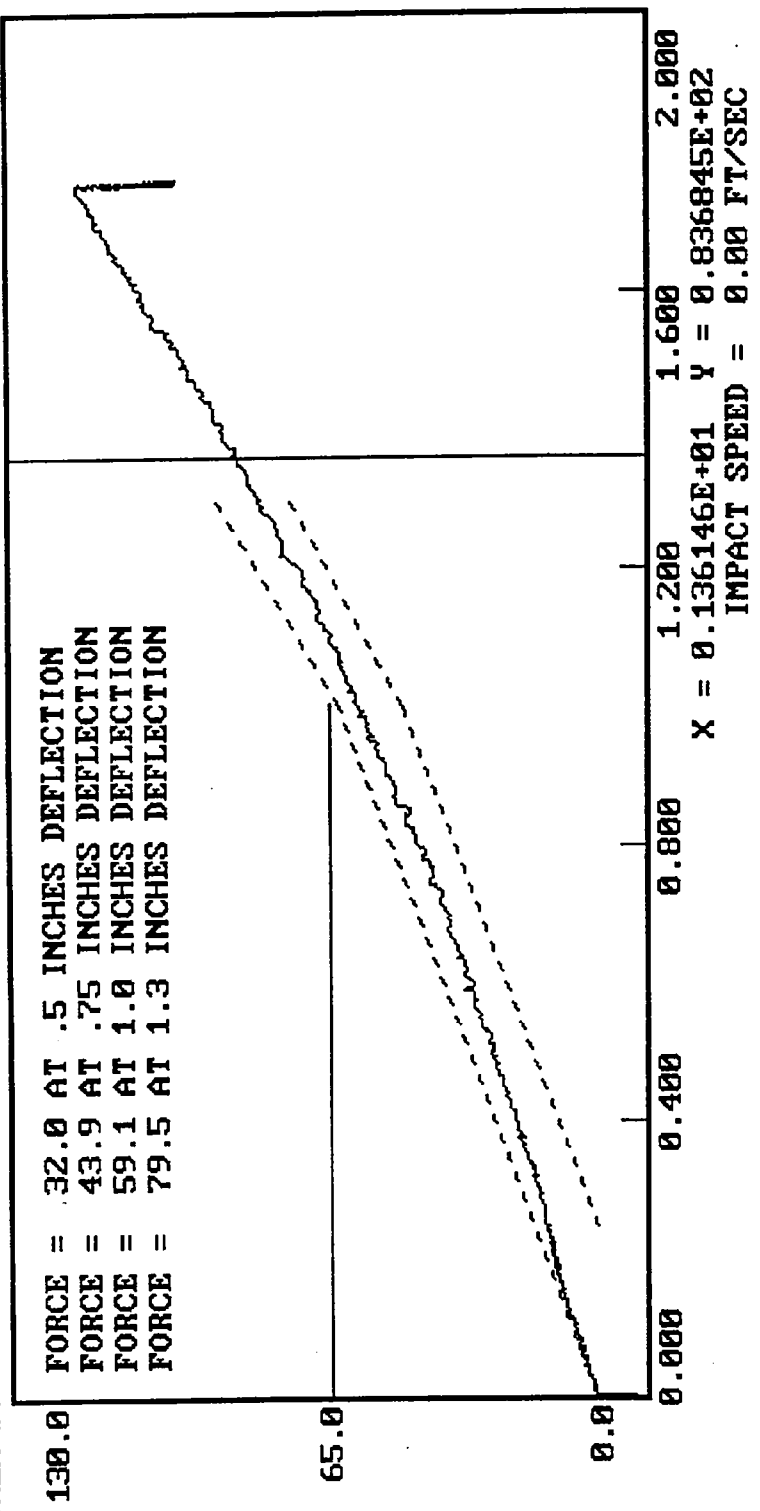
APPROVED BY 

12-15-1994 15:11

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 269

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 15, 1994

DUMMY NUMBER: 269

TEST NUMBER: D94405

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	24
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	47
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

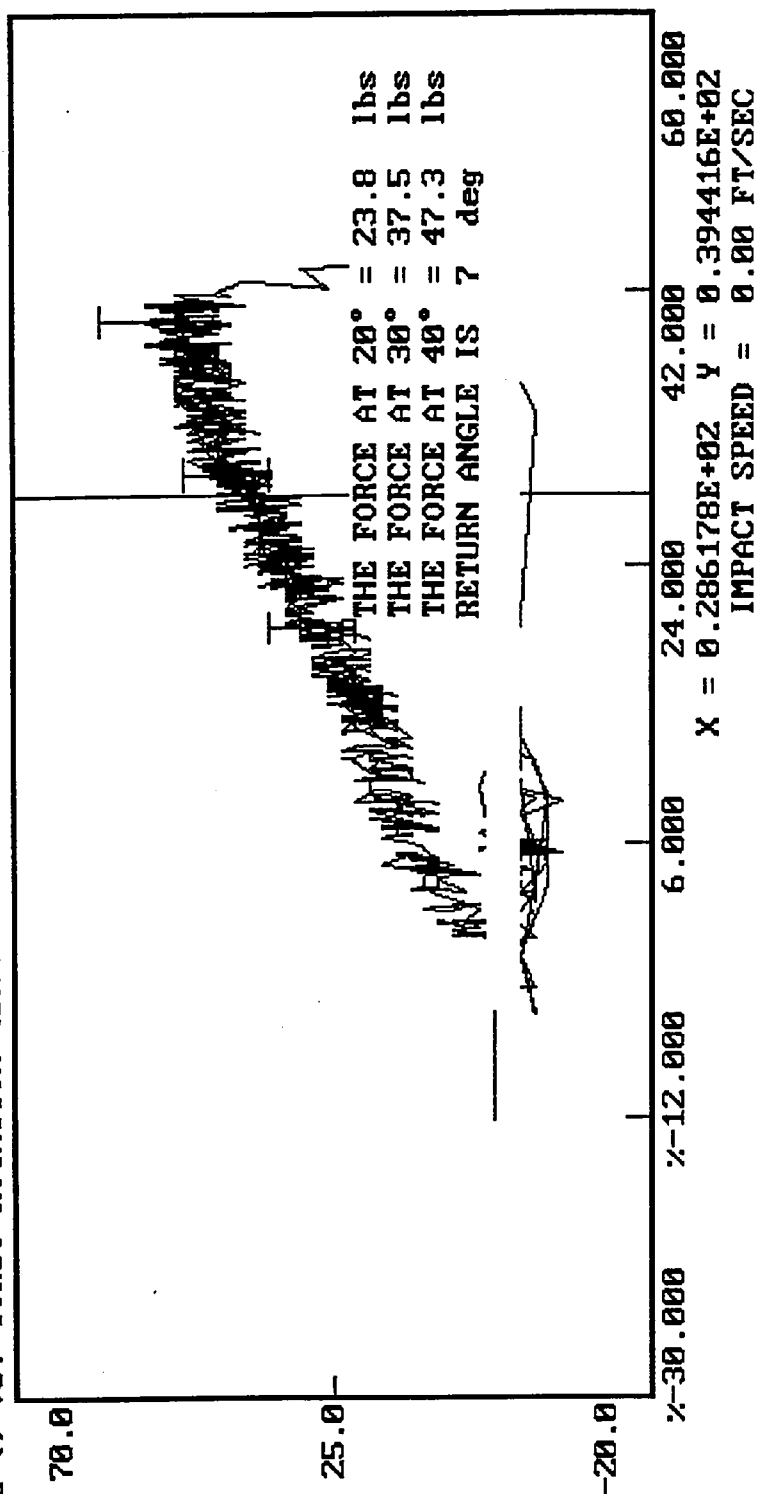


12-15-1994 13:49

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 269

FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 272

Inspected By: Rod McClelland

Date: December 16, 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: 269

Inspected By: Al Chalmers

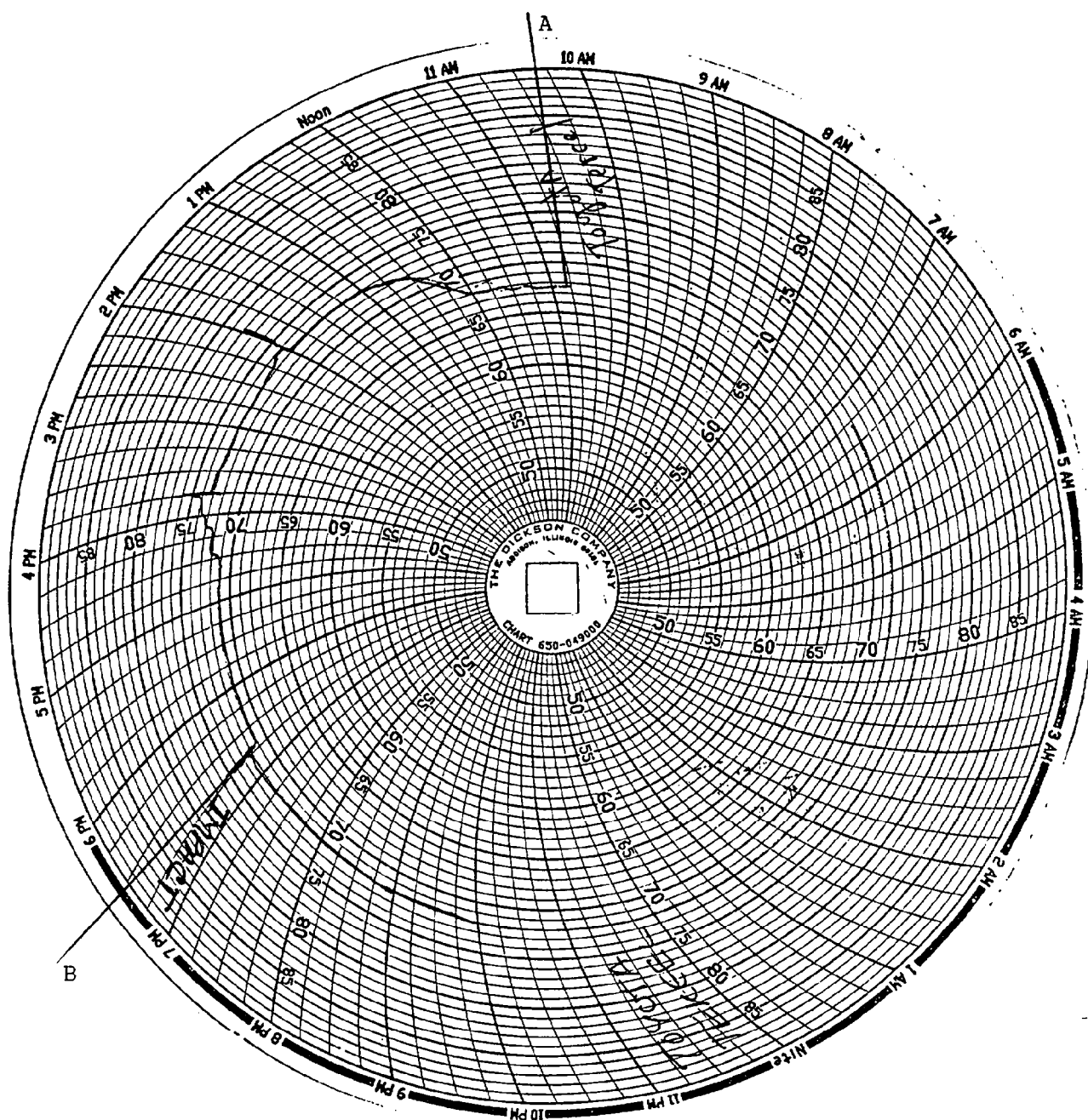
Date: December 16, 1994

<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

Temperature (degrees F)



Time (hours)

- A = Dummies placed in vehicle
- B = Test conducted

APPENDIX D
DUMMY AND VEHICLE CALIBRATION DATA

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

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AHW95	Endevco	July 07, 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	AT614	Endevco	November 07, 1994
Lower Spine Redundant	AJ420	Endevco	September 02, 1994
Pelvis Redundant	AHWN3	Endevco	September 02, 1994

INSTRUMENTS FOR PASSENGER DUMMY NO. 269

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AC913	Endevco	September 12, 1994
Lower Rib	AJ436	Endevco	July 12, 1994
Lower Spine	AH001	Endevco	September 01, 1994
Pelvis	AHWK8	Endevco	September 01, 1994
Upper Rib Redundant	AH0M0	Endevco	September 16, 1994
Lower Rib Redundant	AG781	Endevco	September 16, 1994
Lower Spine Redundant	AGIG2	Endevco	September 16, 1994
Pelvis Redundant	AJ606	Endevco	November 07, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	MGA060	Entran	August 04, 1994
MDB CG Y	MGA058	Entran	November 18, 1994
MDB CG Z	MGA065	Entran	November 18, 1994
MDB Rear Axle X	MGA076	Entran	November 18, 1994
MDB Rear Axle Y	AH0P9	Endevco	October 02, 1994
Lower Left A-Post Y	MGA155	Entran	June 30, 1994
Lower Left B-Post Y	MGA073	Entran	May 24, 1994
Mid Left A-Post Y	A13	Endevco	October 30, 1994
Trunk Centerline X	AKAE8	Endevco	October 14, 1994
Trunk Centerline Y	AJ5L6	Endevco	October 17, 1994
Trunk Centerline Z	AJ9D5	Endevco	October 17, 1994
Driver Seat Track Y	MGA035	Entran	November 07, 1994
Right Front Sill X	A18	Endevco	November 07, 1994
Right Front Sill Y	AJ4R1	Endevco	October 14, 1994
Right Front Sill Z	AHYV5	Endevco	October 19, 1994
Right Rear Sill X	AHT35	Endevco	July 12, 1994
Right Rear Sill Y	AJ4G8	Endevco	October 14, 1994
Right Rear Sill Z	AJ638	Endevco	October 14, 1994
Left Front Sill Y	MGA159	Entran	June 23, 1994
Left Rear Sill Y	X06	Endevco	November 10, 1994
Right Rear Seat Occupant Compartment Y	AJ9E1	Endevco	October 14, 1994

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