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REPORT NO.: MGA-95-21416

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

SUBARU MOTORS
1995 SUBARU IMPREZA 4 DOOR SEDAN
NHTSA NO: CS5503

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



MGA Ref. No.: G93A-02

Test Date: January 25, 1995

Report Date: February 17, 1995

FINAL REPORT

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SECTION 1
PURPOSE AND TEST PROCEDURE

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

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

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A stationary 1995 Subaru Impreza 4 Door Sedan was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 33.1 mph (53.2 kph) on January 25, 1995. 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 position (Pos. #1) and left rear position (Pos. #4) were 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.

The driver's Thoracic Trauma Index (TTI) was 60 g's. Maximum pelvic Y acceleration was 81 g's.

The left rear passenger's TTI was 75 g's. Maximum pelvic Y acceleration was 82 g's.

SECTION 3
SUMMARY OF TEST DATA

TABLE 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
 Vehicle NHTSA No.: CS5503 VIN: JF1GC2355SB511130
 Vehicle Body Color: Red Month & Year of Manufacture: 8/94
 Engine Data: 4 cylinders; CID; Liter; 1800 cc
 Placement Longitudinal; or X Lateral
 Transmission: 5 speed; X Manual; Automatic; Overdrive
 Final Drive: Rear Wheel Drive; X Frt. Wheel Drive; Four Wheel Drive
 Odometer Reading 51 miles
 Options: X A/C; X Pwr. Steering.; X Pwr. Brakes; Pwr. Windows
 Power Seats; Tilt Wheel; Power Door Locks; Power Side Mirrors;

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 32 Psi FRONT (220 kpa)
29 Psi REAR (200 kpa)
 Recommended Tire Size: 16580R13
 Tires on Test Vehicle: 16580R13 Manufacturer: Yokohama

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 = 800 lbs (A) (362.9 kg)
 No. of Occupants x 150 lbs. = 750 lbs (B) (340.2 kg)
 Cargo Capacity (A-B) = 50 lbs (22.7 kg)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front = 742 lbs (336.6 kg) Right Rear = 479 lbs (217.3 kg)
 Left Front = 764 lbs (346.6 kg) Left Rear = 490 lbs (222.3 kg)
 TOTAL FRONT = 1506 lbs (683.2 kg) TOTAL REAR = 969 lbs (439.6 kg)
 % of Total Vehicle Weight = 60.8%; % of Total Weight = 39.2 %
 TOTAL WEIGHT = 2475 lbs (1122.8 kg)

TABLE 2
TEST VEHICLE DATA

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 2475 lbs (1122.7 kg)
Cargo Carrying Capacity of Test Vehicle = 50 lbs (22.7 kg)
Weight of 2 Side Impact Dummies (2 x 178 lbs.) = 356 lbs (161.5 kg)
TEST VEHICLE TARGET WEIGHT: = 2881 lbs (1306.9 kg)

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>772</u> lbs (350.2 kg)	Right Rear	= <u>588</u> lbs (266.7 kg)
Left Front	= <u>857</u> lbs (388.7 kg)	Left Rear	= <u>648</u> lbs (293.9 kg)
TOTAL FRONT	= <u>1629</u> lbs (738.9 kg)	TOTAL REAR	= <u>1236</u> lbs (560.6 kg)
% of Total Weight	= <u>56.9%</u>	% of Total Weight	= <u>43.1%</u>
TOTAL TEST WEIGHT	= <u>2865</u> lbs (1299.5 kg)		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE: in (mm)

Right Front 26.7 (678) Left Front 26.4 (670) Right Rear 25.8 (655) Left Rear 25.7 (653)

FULLY LOADED WEIGHT ATTITUDE: in (mm)

Right Front 26.6 (676) Left Front 25.5 (648) Right Rear 25.1 (638) Left Rear 24.3 (616)

TEST ATTITUDE: in (mm)

Right Front 26.3 (667) Left Front 25.8 (656) Right Rear 24.8 (631) Left Rear 24.3 (616)

Test Vehicle Wheelbase: 99.2 inches (2520 mm)

C.G. = 42.8 inches (1086 mm) rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 164.0 in (4165 mm)
Centerline = 171.9 in (4365 mm)
Left Side = 164.0 in (4165 mm)

FIGURE 1
PRE-TEST CONDITIONS

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 8.5 in (215 mm)

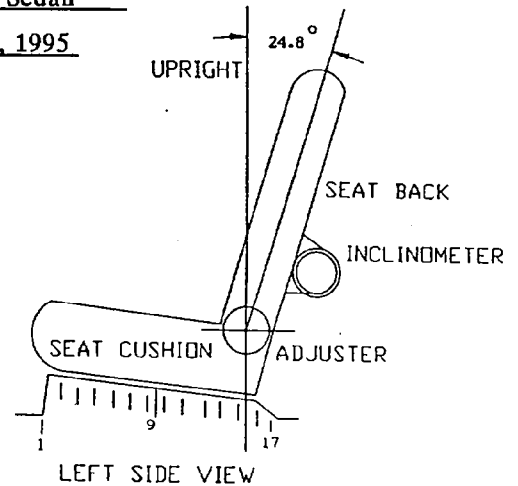
Total Number of Adjustment Positions or Detents: 17

Test Position: Mid Position

(9th detent from front, 1st position being #1)

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 24.8° degrees from full forward position



SECOND POSITION SEAT:

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

Seat Back Adjustment Position: N/A

ADJUSTABLE STEERING COLUMN POSITION: Mid Position

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 = 13.2 gallons (50.0 liters)

Test Volume: 12.3 gallons (46.4 liters) 92.8% of capacity

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

Wheelbase: = 99.2 in (2520 mm)

Impact Point is 12.6 in (320 mm) rearward of front axle centerline

TABLE 3
CRASH TEST SUMMARY FOR TEST VEHICLE

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

Overall Length = 171.9 in (4365 mm); Overall Width = 70.2 in (1784 mm)

TEST WEIGHT:

Right Front	=	<u>772</u> lbs (350 kg)	Right Rear	=	<u>588</u> lbs (267 kg)
Left Front	=	<u>857</u> lbs (389 kg)	Left Rear	=	<u>648</u> lbs (294 kg)
TOTAL FRONT	=	<u>1629</u> lbs (739 kg)	TOTAL REAR	=	<u>1236</u> lbs (561 kg)
% of Total Weight	=	<u>56.9</u> %	% of Total Weight	=	<u>43.1</u> %
TOTAL VEHICLE WEIGHT <u>2865</u> lbs (1300 kg)					
Wheelbase = <u>99.2</u> in (2520 mm)					
Longitudinal C.G. front Center of Front Axle			= <u>42.8</u> in (1086 mm)		
Impact Angle with Respect to Impactor			= <u>90°</u> degrees		

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (1290 mm 50.8 in above ground) = 171 mm (6.7 in)
 2. LEVEL 2 (854 mm 33.6 in above ground) = 334 mm (13.1 in)
 3. LEVEL 3 (568 mm 22.4 in above ground) = 299 mm (11.8 in)
 4. LEVEL 4 (478 mm 18.8 in above ground) = 230 mm (9.1 in)
 5. LEVEL 5 (240 mm 9.4 in above ground) = 115 mm (4.5 in)
- Maximum Post-Test Intrusion = 334 mm (13.1 in)

OCCUPANTS:

	<u>Left Front Passenger</u>	<u>Left Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>type 2 lap &</u> <u>shoulder belt</u> <u>with airbag</u>	<u>type 2 lap &</u> <u>shoulder belt</u>

INSTRUMENTATION:

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

TABLE 4
CRASH TEST SUMMARY FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

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 (2590.8 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: 33.08 mph (53.2 kph) Secondary: 33.0 mph (53.1 kph)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1.	Row A Top of Stack (33 in)	= <u>113</u> mm
2.	Row B Mid Stack (27 in)	= <u>86</u> mm
3.	Row C Top of Bumper (21 in)	= <u>78</u> mm
4.	Row D Center of Bumper (17 in)	= <u>73</u> mm

INSTRUMENTATION:

Number of MDB Data Channels = 7

TABLE 5
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
 Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to shoulder belt and shoulder</u>	<u>to C Post</u>
Arm	<u>to rear of door and B Post</u>	<u>to rear of door</u>
Pelvis	<u>to armrest</u>	<u>to armrest</u>
Left Knee	<u>to armrest and window crank</u>	<u>to armrest and window crank</u>
Right Knee	<u>to left knee</u>	<u>to left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 6 mm (.24 in) forward Vertical: 8 mm (.31 in) high

ARM REST LOCATIONS:

Front: 248 mm (9.8 in) below window opening
 Rear: 250 mm (9.8 in) below window opening

SEAT CRUSH:

Driver Seat Back: 57 mm (2.2 in) Driver Seat Cushion: 51 mm (2.0 in)
Left Rear Seat Back: 76 mm (3.0 in) Left Rear Seat Cushion: 138 mm (5.4 in)

GLAZING DAMAGE:

Left side door windows broken and windshield cracked

PILLAR PERFORMANCE:

No separation evident

SILL SEPARATION:

No sill separation evident

OTHER NOTABLE IMPACT EFFECTS:

Driver and passenger airbags deployed

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

TABLE 6

SIDE IMPACT DUMMY (SID) TEST DATA SUMMARYYear/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door SedanVehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

	Front Dummy ID # 270				Rear Dummy ID # 271			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS:								
Upper Rib Lateral.....Y	61.7	29	-17.9	76	69.5	43	-5.4	163
Upper Rib Lateral....Y(R)	62.5	29	-19.1	76	69.3	43	-5.0	163
Lower Rib Lateral.....Y	46.1	40	-11.2	91	79.8	41	-13.3	70
Lower Rib Lateral.....Y(R)	44.8	40	-10.8	92	79.4	41	-13.9	70
SPINE ACCELERATIONS:								
Lower Lateral.....Y	58.9	34	-21.0	68	70.1	46	-16.9	73
Lower Lateral.....Y(R)	57.9	33	-23.1	68	69.9	46	-17.2	73
PELVIC ACCELERATIONS:								
Lateral.....Y	80.9	34	-9.7	83	81.7	38	-7.7	92
Lateral.....Y(R)	82.1	34	-9.7	82	82.3	38	-8.1	93

REFERENCE:

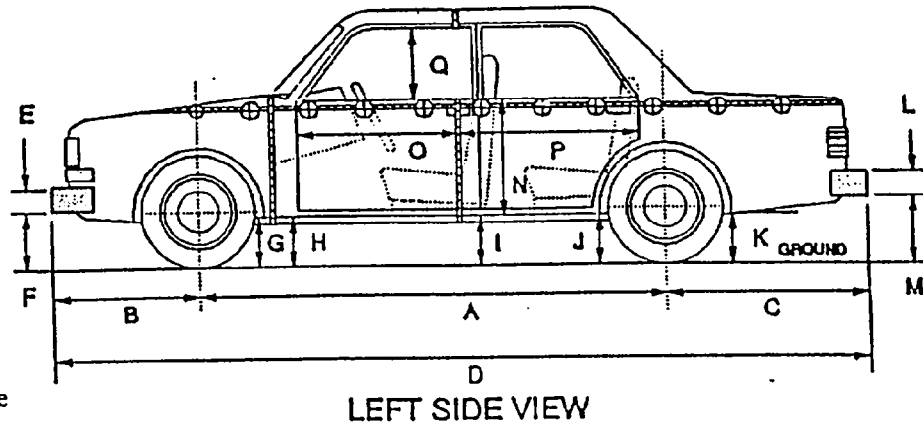
Positive Direction - Longitudinal (X) = forward

Lateral (Y) = to right

Vertical (Z) = up

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

FIGURE 2
PRE- AND POST-TEST MEASUREMENTS



D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

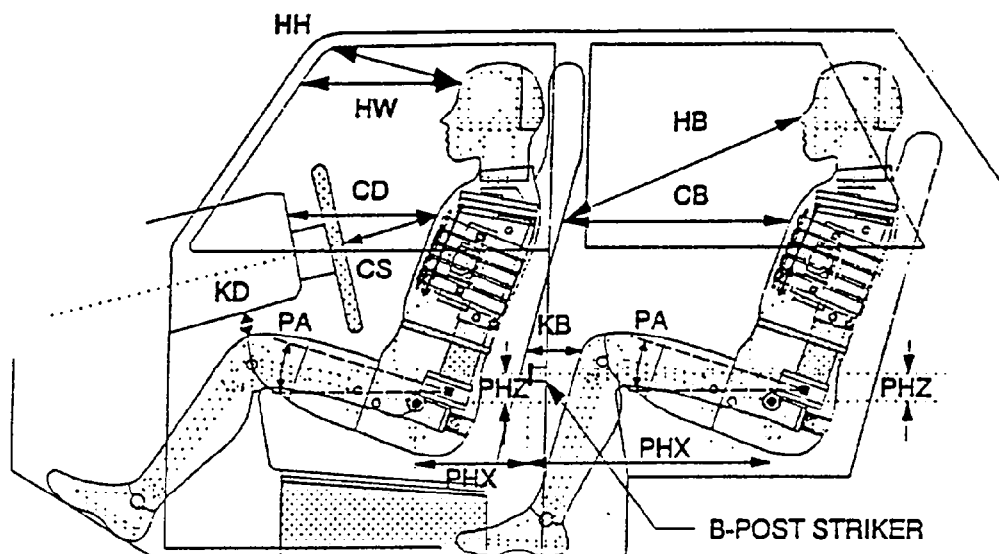
J1 = To Pinch Weld

J2 = To Sill

Units: mm

LOCATION	PRE-TEST	POST-TEST	Δ CHANGE
A	2520	2491	29
B	870	865	5
C	975	915	60
D	4365	4271	94
E	180	180	0
F	396	413	17
G	228	241	13
H	182	242	60
I	176	216	40
J1	171	199	28
J2	176	200	24
K	267	296	29
L	300	300	0
M	293	332	39
N	645	556	89
O	673	681	8
P	1313	1216	97
Q	425	436	11
R	4165	4176	11
S	4165	4107	58
T	1784	1384	400

FIGURE 3
SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS



LEFT SIDE VIEW

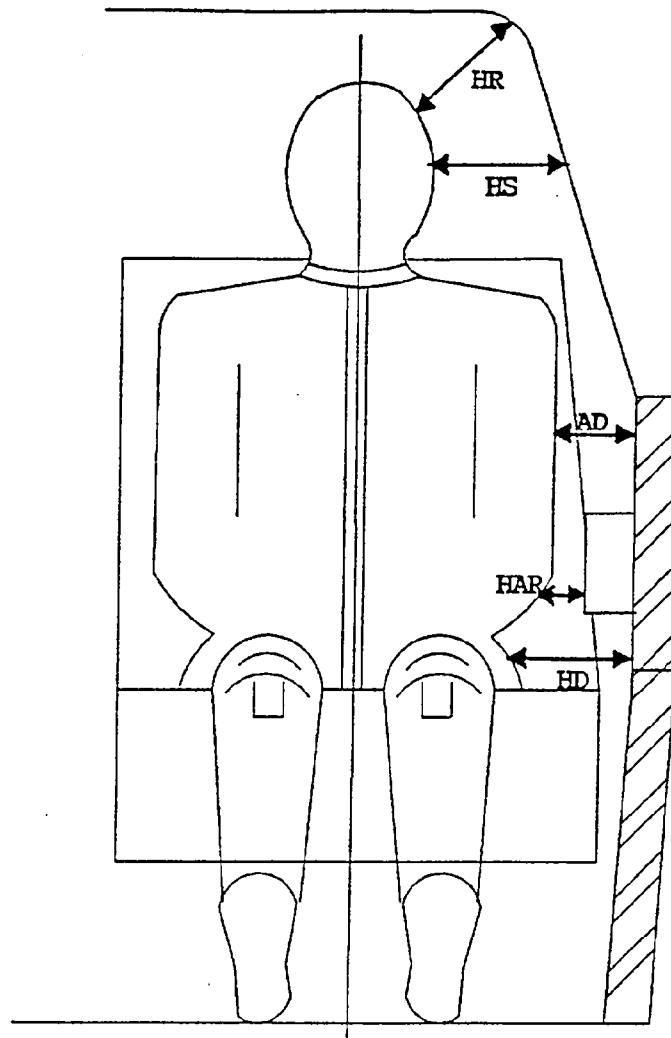
NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in mm

	DRIVER ID #270	LEFT REAR PASSENGER ID #271	
HH	368	N/A	
HW	562	N/A	
HS	N/A	145	
CD	524	CB	145
CS	328	N/A	
KDL	132	KBL	89
KDR	128	KBR	80
PA°	23.6°	24.2°	
PHX	150	287	
PHZ	108	259	

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

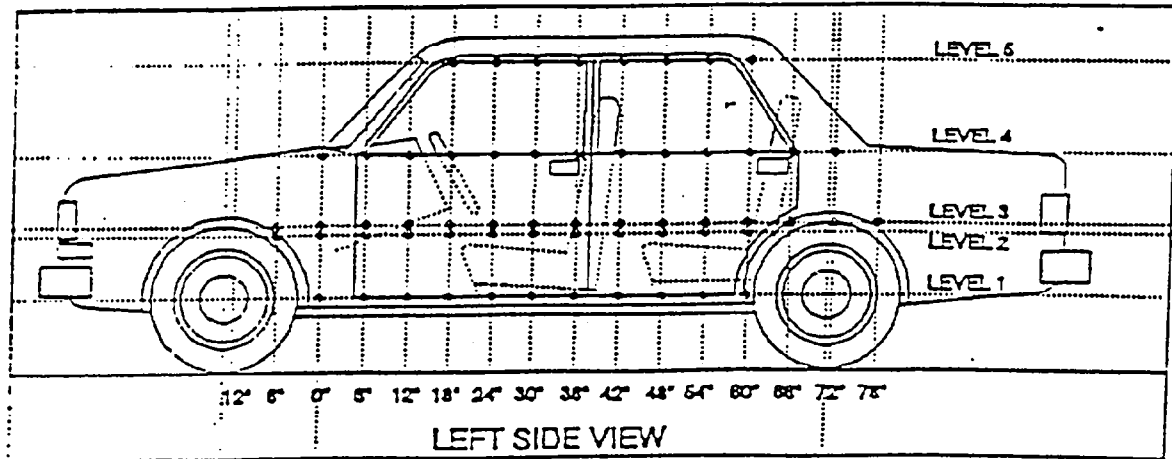


NOTE: All dimensions are in mm

	DRIVER ID #270	LEFT REAR PASSENGER ID #271
HR	134	85
HS	234	136
AD	88	90
HD	181	157

FIGURE 5
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995



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

33" Side Profile

Level 5 @ Window Top	= <u>1290</u> mm (50.8 in)
Level 4 @ Window Sill	= <u>854</u> mm (33.6 in)
Level 3 @ Mid Door	= <u>568</u> mm (22.4 in)
Level 2 @ Occupant H-Point	= <u>478</u> mm (18.8 in)
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>240</u> mm (9.4 in)

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH

LEVEL 1 AT AXLE CENTER LINE

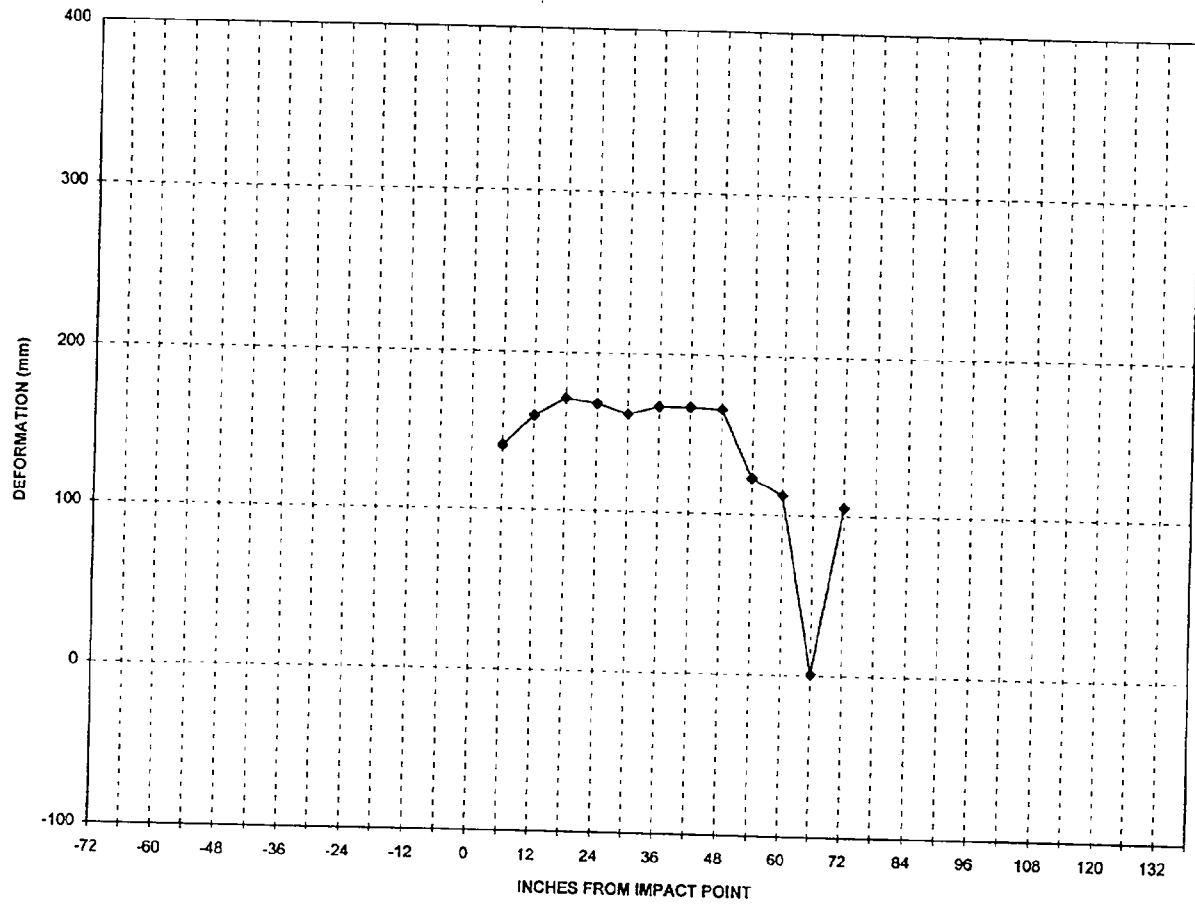
Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door SedanVehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

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	1031	890	141
12	1051	891	160
18	1060	889	171
24	1054	886	168
30	1046	884	162
36	1047	880	167
42	1047	880	167
48	1046	880	166
54	1003	880	123
60	992	880	112
66	881	880	1
72	984	879	105
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	---	---	---
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---

(impact point)

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 1 AT AXLE CENTER LINE

TABLE 7

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

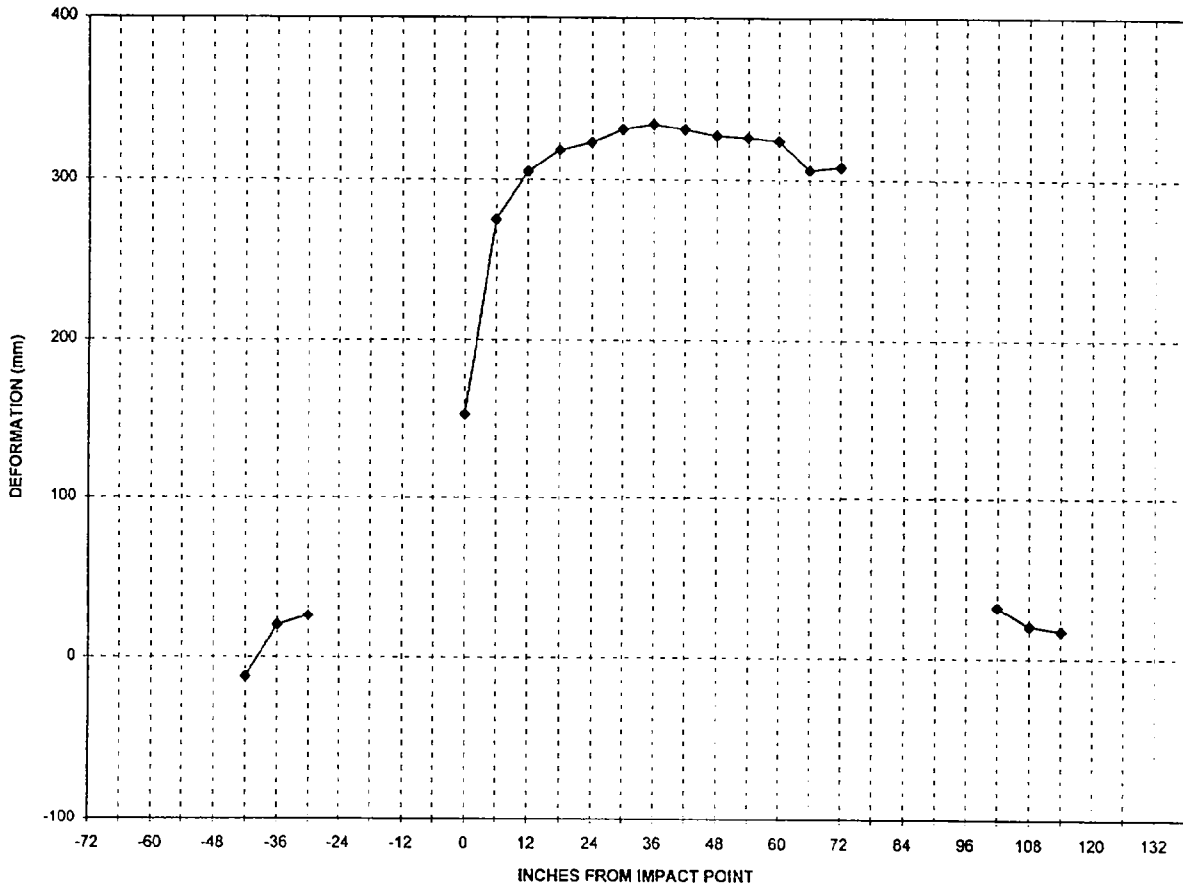
Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	951	939	-12
-36	910	890	20
-30	885	859	26
-24	---	---	---
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	990	837	153 (impact point)
6	1115	840	275
12	1145	840	305
18	1157	839	318
24	1162	839	323
30	1166	835	331
36	1167	833	334
42	1163	832	331
48	1162	835	327
54	1160	834	326
60	1155	831	324
66	1139	833	306
72	1139	831	308
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	873	841	32
108	890	870	20
114	916	899	17
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---
144	---	---	---

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

FIGURE 6 (Cont'd)
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 2 AT OCCUPANT H-POINT

TABLE 7

TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH
LEVEL 3 AT MID-DOOR

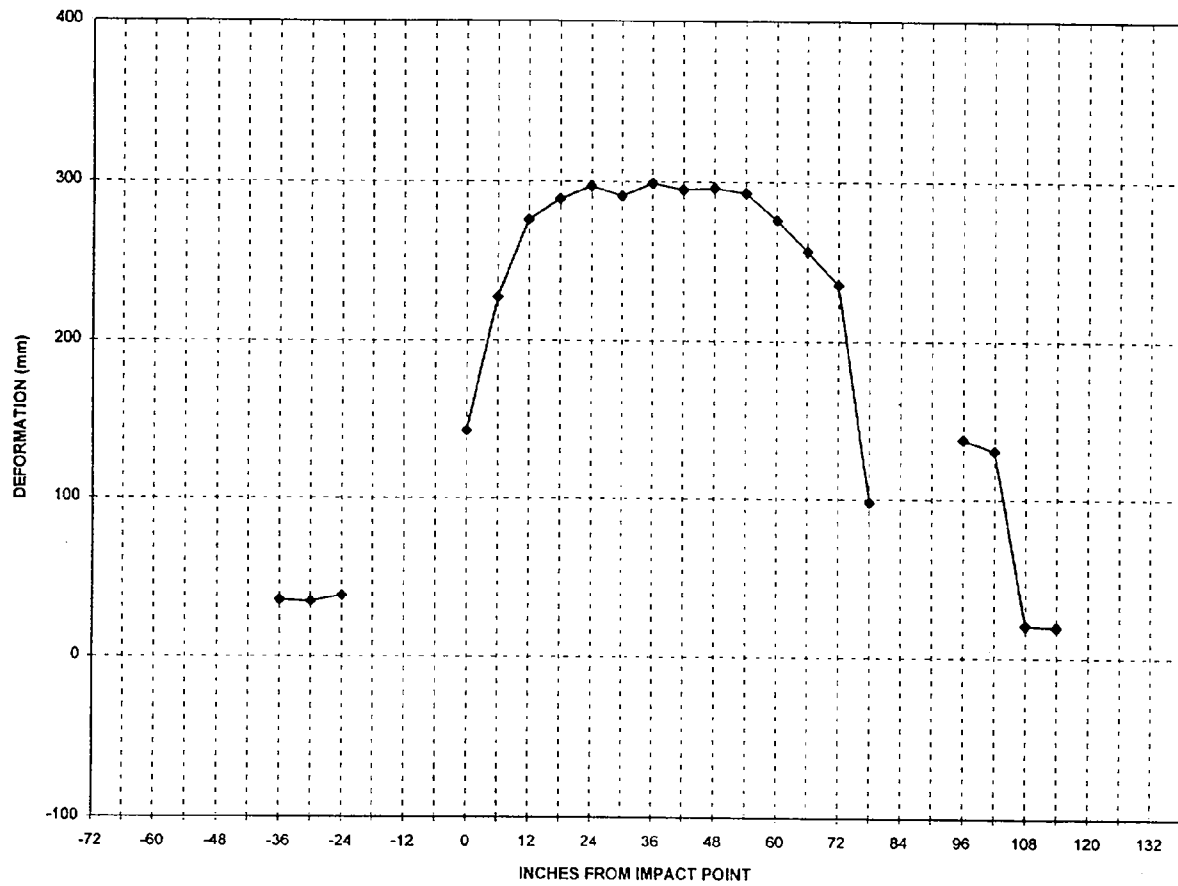
Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	940	905	35
-30	904	870	34
-24	877	839	38
-18	---	---	---
-12	---	---	---
-6	---	---	---
0	975	832	143 (impact point)
6	1063	836	227
12	1111	835	276
18	1126	837	289
24	1132	835	297
30	1125	834	291
36	1130	831	299
42	1126	831	295
48	1128	832	296
54	1125	832	293
60	1107	831	276
66	1086	830	256
72	1064	829	235
78	925	827	98
84	---	---	---
90	---	---	---
96	970	832	138
102	990	859	131
108	909	889	20
114	850	831	19
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

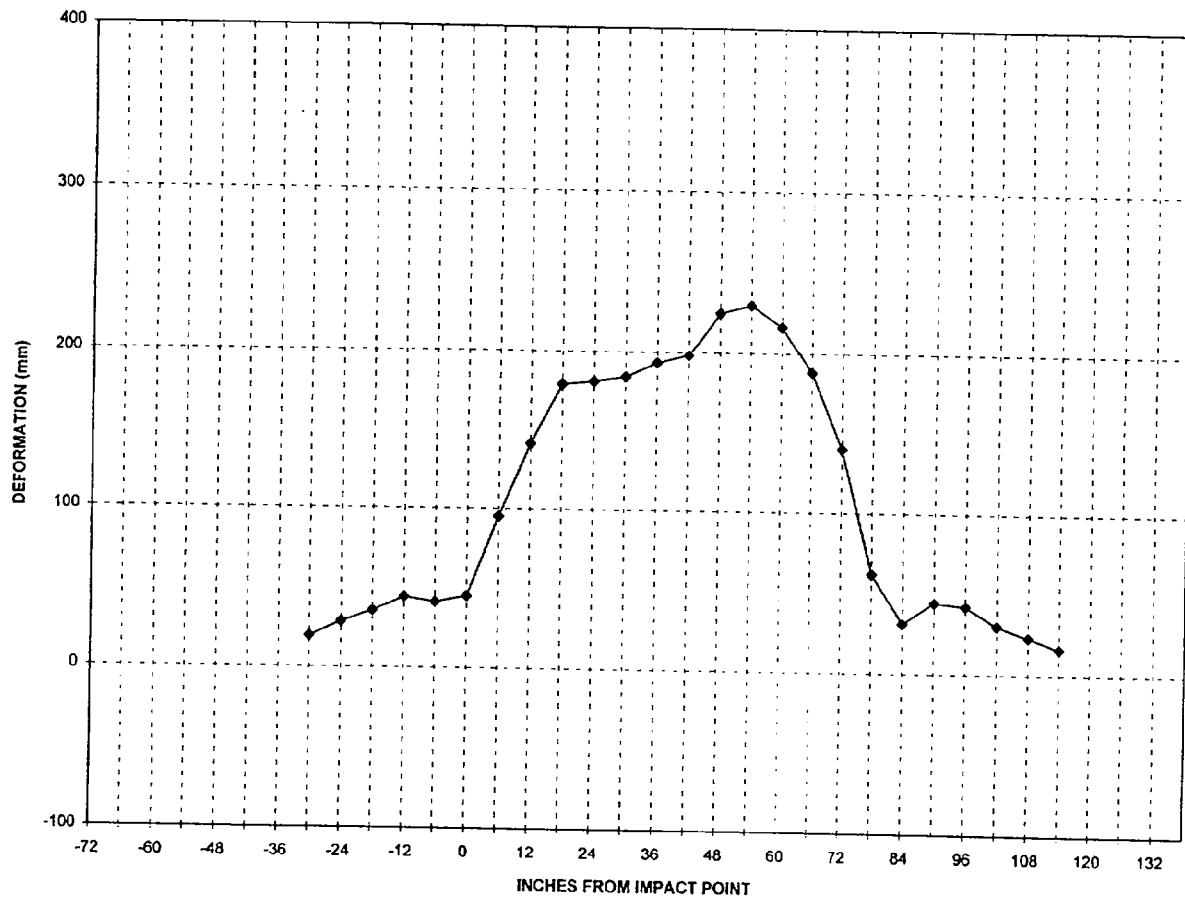
Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

Longitudinal Distance (in)	PRE-TEST (mm)	POST-TEST (mm)	STATIC CRUSH (mm)
-72	---	---	---
-66	---	---	---
-60	---	---	---
-54	---	---	---
-48	---	---	---
-42	---	---	---
-36	---	---	---
-30	1006	987	19
-24	1000	972	28
-18	987	952	35
-12	981	937	44
-6	973	932	41
0	971	926	45 (impact point)
6	1006	911	95
12	1054	912	142
18	1091	912	179
24	1094	913	181
30	1096	912	184
36	1101	908	193
42	1106	908	198
48	1133	908	225
54	1140	910	230
60	1130	913	217
66	1104	916	188
72	1052	911	141
78	981	919	62
84	954	923	31
90	975	931	44
96	982	940	42
102	985	955	30
108	1000	977	23
114	1031	1015	16
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---
144	---	---	---

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 4 AT WINDOW SILL

TABLE 7
TEST VEHICLE EXTERIOR PROFILES FROM REFERENCE PLANE AND STATIC CRUSH
LEVEL 5 AT WINDOW TOP

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

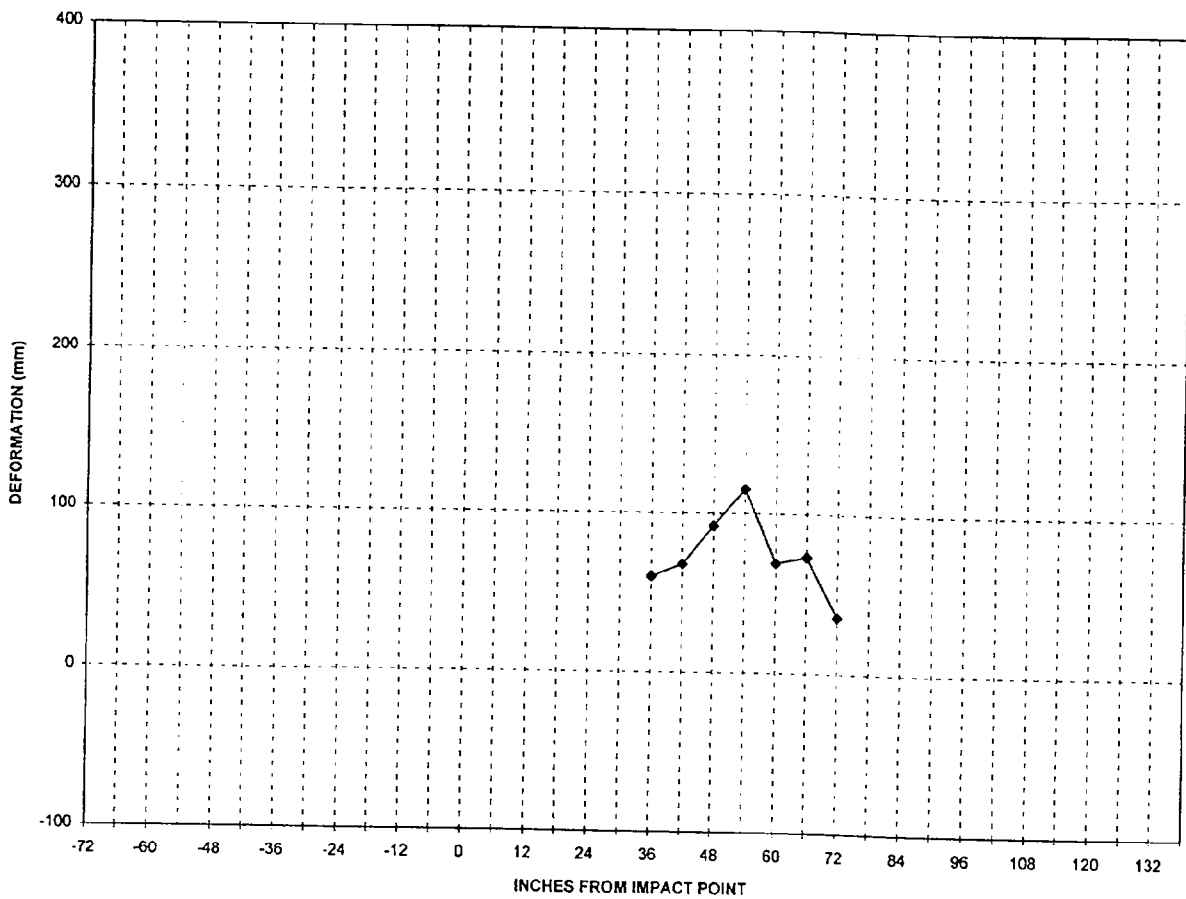
Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

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	---	---	---
36	1213	1153	60
42	1221	1153	68
48	1246	1154	92
54	1275	1160	115
60	1231	1162	69
66	1242	1169	73
72	1220	1185	35
78	---	---	---
84	---	---	---
90	---	---	---
96	---	---	---
102	---	---	---
108	---	---	---
114	---	---	---
120	---	---	---
126	---	---	---
132	---	---	---
138	---	---	---

(impact point)

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

FIGURE 6
VEHICLE EXTERIOR STATIC CRUSH



LEVEL 5 AT WINDOW TOP

FIGURE 7
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

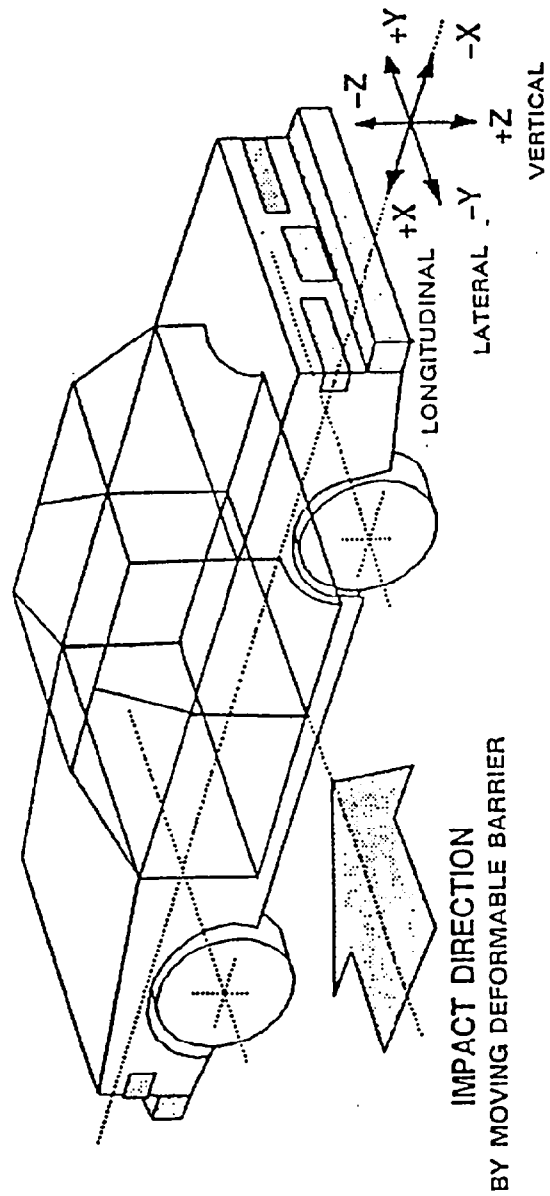
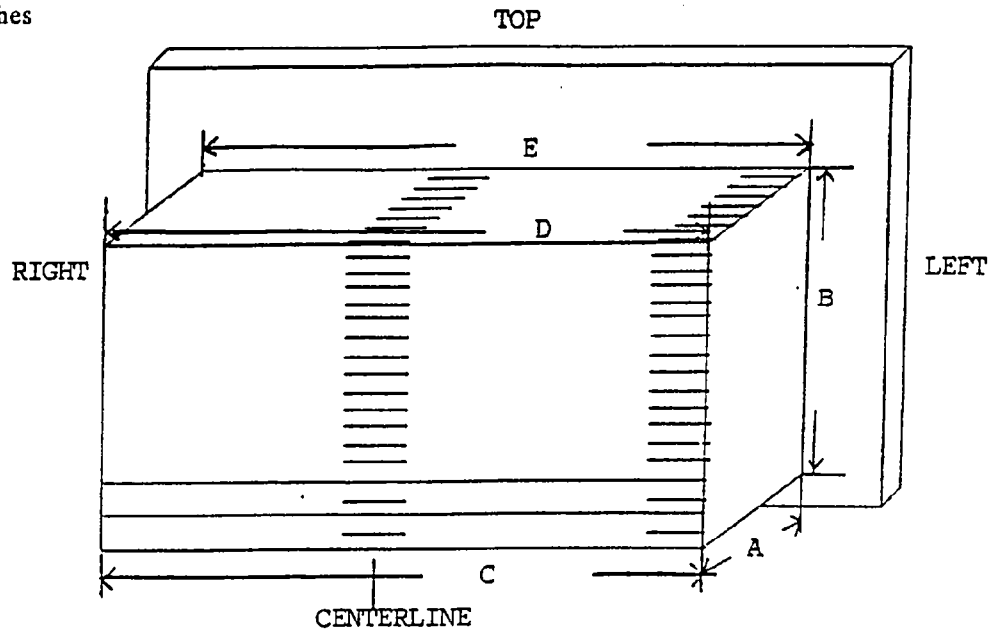


FIGURE 8
MDB FACE DIMENSIONS

Measurements in inches

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



Measurements in inches

	Right	Left
A =	<u>11.1</u>	<u>10.9</u>
B =	<u>13.1</u>	<u>12.9</u>
C =	<u>21.1</u>	<u>20.9</u>
D =	<u>33.9</u>	<u>32.9</u>

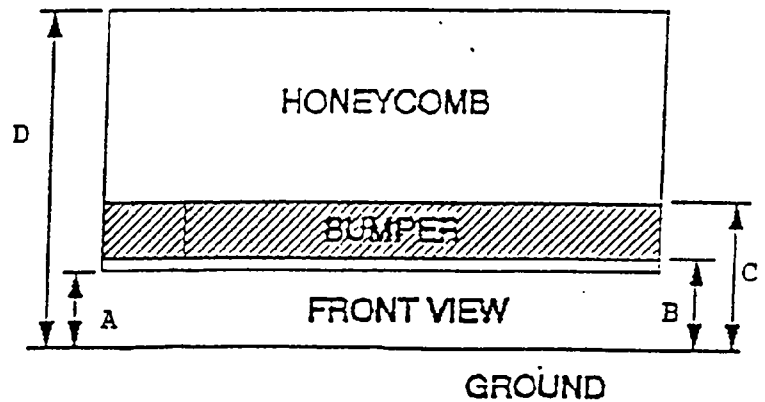


TABLE 8

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

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"	1.5 (38)	0.4 (10)	1.0 (25)	1.9 (48)
28"	0 (0)	-0.6 (-14)	0.6 (14)	1.7 (43)
24"	-0.3 (-8)	-0.1 (-3)	0.4 (10)	1.3 (32)
20"	-0.3 (-6)	-0.1 (-3)	0.3 (8)	1.0 (25)
16"	-0.3 (-6)	-0.1 (-3)	0.3 (8)	1.1 (27)
12"	-0.3 (-6)	-0.1 (-3)	0.3 (8)	1.2 (30)
8"	-0.3 (-6)	-0.1 (-2)	0.3 (8)	1.0 (25)
4"	-0.6 (-14)	0 (0)	0.3 (8)	1.1 (27)
0"	-0.6 (-14)	-0.1 (-2)	0.3 (6)	1.3 (33)
4"	-0.1 (-3)	-0.1 (-2)	0.3 (8)	1.0 (25)
8"	-0.1 (-2)	-0.1 (-2)	0.4 (10)	1.0 (25)
12"	-0.1 (-2)	-0.1 (-2)	0.5 (13)	1.1 (27)
16"	0.3 (6)	0 (0)	0.6 (14)	1.9 (48)
20"	0.4 (9.5)	0 (0)	0.7 (17)	1.9 (49)
24"	1.5 (38)	0.3 (6)	0.9 (24)	2.4 (62)
28"	3.3 (84)	2.6 (66.7)	1.4 (37)	2.0 (51)
32"	4.4 (113)	3.6 (92)	2.1 (52)	2.9 (73)

TABLE 9

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door SedanVehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

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	2538	645	255	3.5	-7.9	22.0	-2.0	4.1	-6.5	22.3
2	Rt. Side Sill @ Rear Seat	1870	645	380	5.1	-5.8	24.4	-2.3	4.3	-6.9	24.8
3	Rr. Floorpan Above Axle	890	23	480	2.8	-13.2	25.2	-3.9	6.6	-7.1	26.1
4	Left Side Sill @ Rr. Seat	1601	750	185	---	---	83.1	-12.6	---	---	---
5	Left Side Sill @ Frt. Seat	2343	750	185	---	---	28.2	-10.6	---	---	---
6	Left Lower A-Post	2972	685	450	---	---	143.3	-104.0	---	---	---
7	Left Mid A-Post	2005	740	800	---	---	103.4	-39.1	---	---	---
8	Left B-Post Lower**	---	---	---	---	---	---	---	---	---	---
9	Left B-Post Mid**	---	---	---	---	---	---	---	---	---	---
10	Right Rear Occupant Compartment	1768	312	341	---	---	22.8	-2.4	---	---	---
11	Driver Left Seat Track	2051	545	272	---	---	72.7	-19.9	---	---	---

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

Z - Ground Level (+ Up)

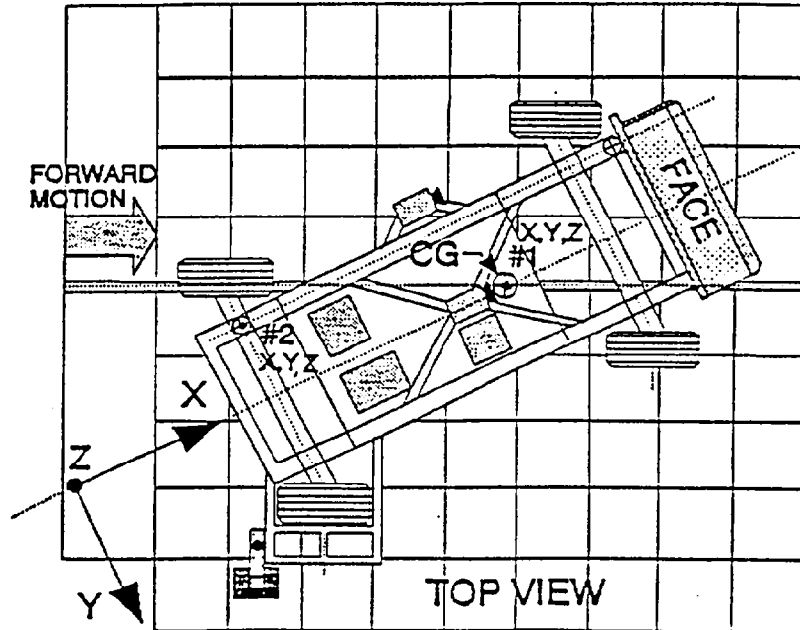
** Accelerometers 9 and 10 were not mounted because they would have disturbed the structure of the vehicle in these locations.

FIGURE 9

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

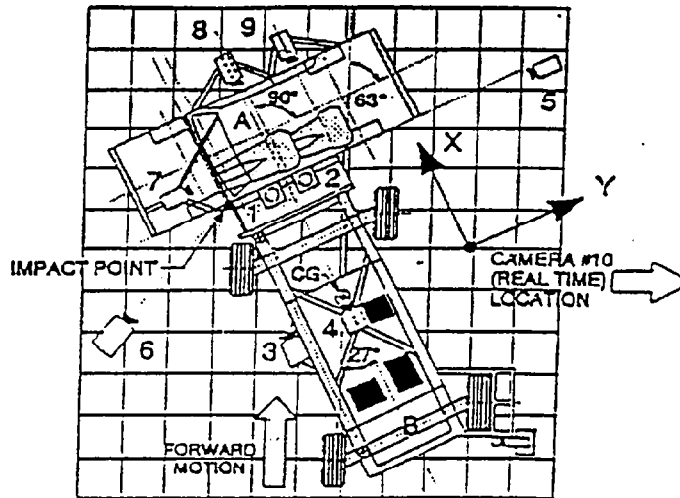


Accel. No.	Location	Coordinates (mm)			Pos. Direct.		Neg. Direct.	
					Max	Time	Max	Time
		X	Y	Z	(g)	(msec)	(g)	(msec)
1	MDB Center of Gravity							
	Longitudinal ... X				2.0	125	-14.9	39
	Lateral Y	-1092	0	483	2.0	62	-8.8	21
	Vertical Z				8.1	50	-15.4	46
	Resultant R				19.5	46	0	0
2	Rear Frame Member							
	Longitudinal ... X	-2591	-625	622	2.5	131	-17.0	31
	Lateral Y				6.1	22	-1.3	-19

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

FIGURE 10
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
 Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995



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	962
2	Top Wide	700	0	5130		8	939
3	Cart Pointer					35	913
4	Cart					13	1010
5	Right Impact	3790	7500	1050	90°	25	1130
6	Left Impact	2260	2520	1550	90°	13	976
7	Onboard Driver					7.5	1000
8	Onboard Hood					13	1005
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/Subaru/Impreza/4 Door Sedan

Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

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 33.08 mph (53.2 kph)

FUEL SPILLAGE MEASUREMENT:

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

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

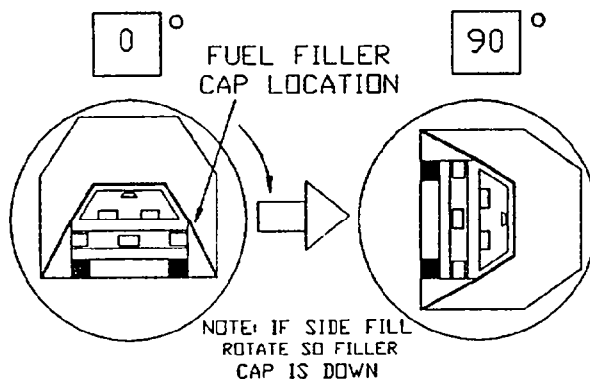
SOLVENT SPILLAGE DETAILS:

None

TABLE 11
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

TEST PHASE: 0° - 90°



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

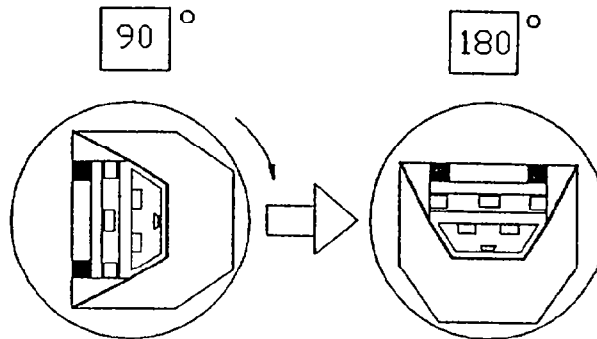
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
 Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

TEST PHASE: 90° - 180°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
 TOTAL 7 minutes 27 seconds
 Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

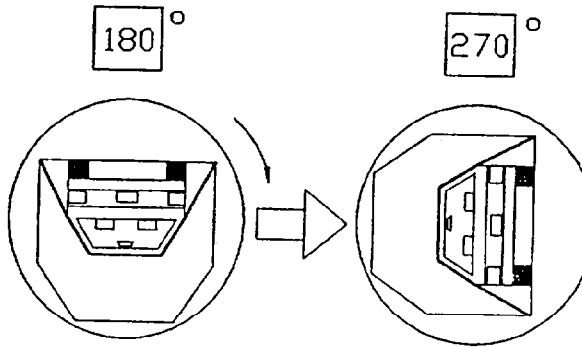
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

TEST PHASE: 180° - 270°



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 18 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 18 seconds
Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

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

(2) Maximum Allowable Solvent Spillage

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

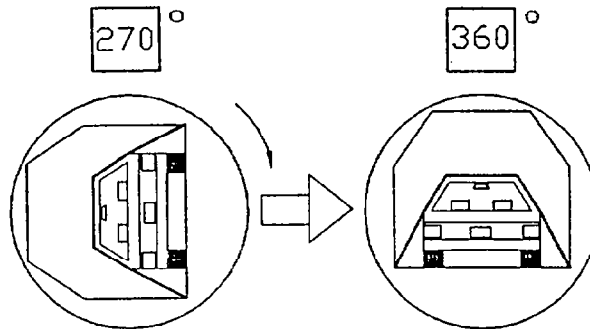
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

Year/Make/Model/Body Style: 1995/Subaru/Impreza/4 Door Sedan
 Vehicle NHTSA No.: CS5503 TEST DATE: January 25, 1995

TEST PHASE: 270° - 360°



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

APPENDIX A - PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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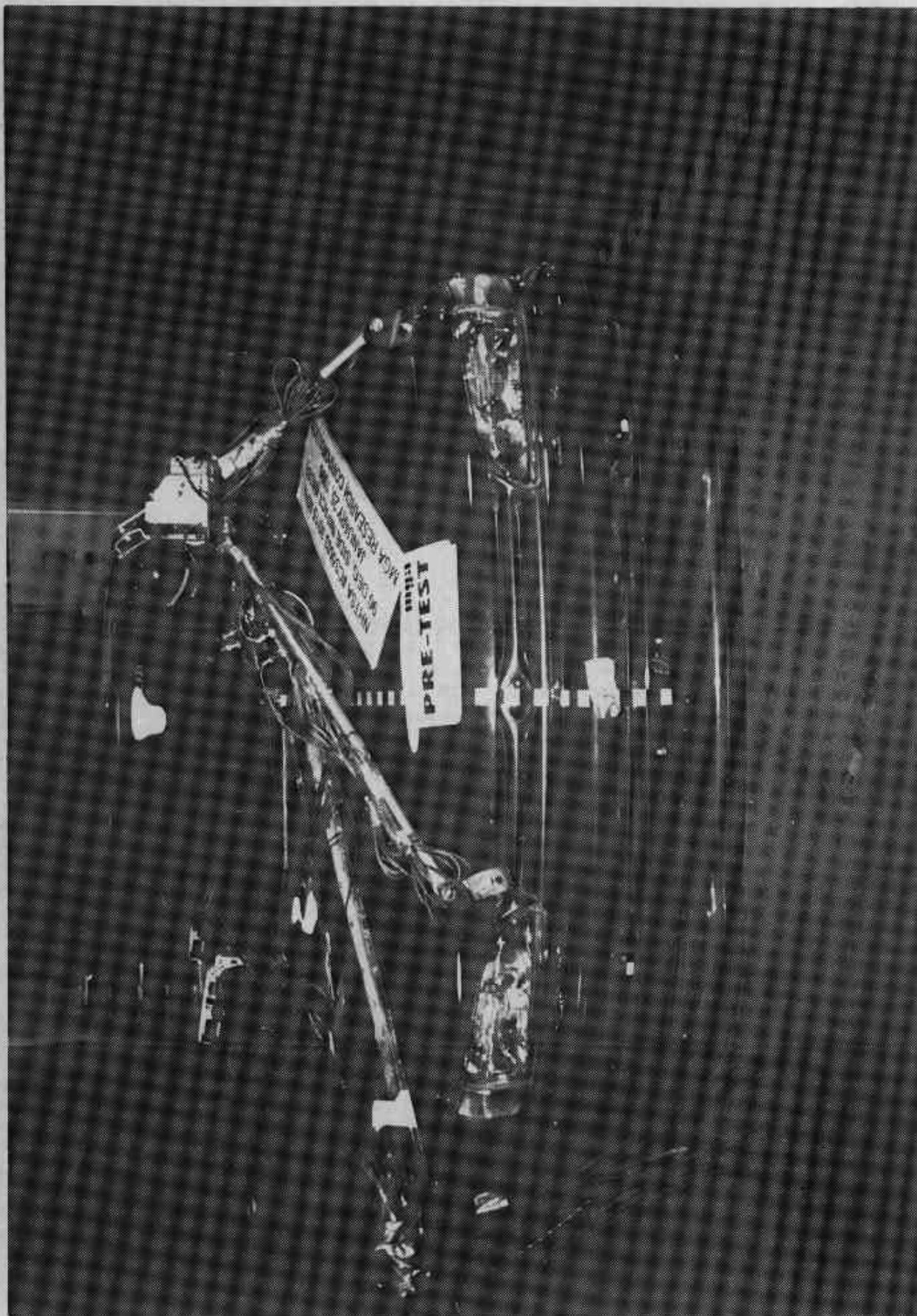




Photo No. A-3 - Pre-Test Rear View of Test Vehicle

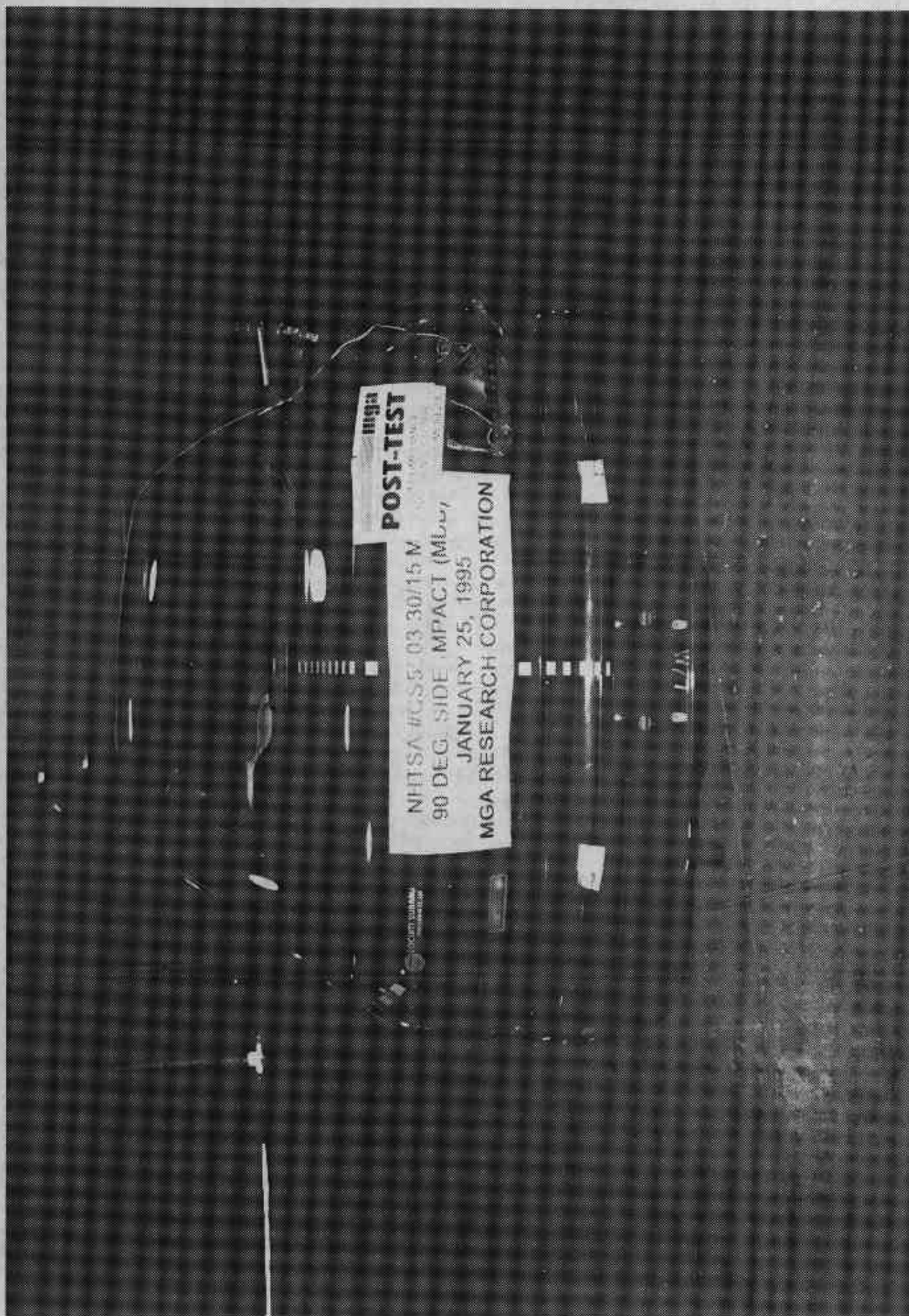


Photo No. A-4 - Post-Test Rear View of Test Vehicle

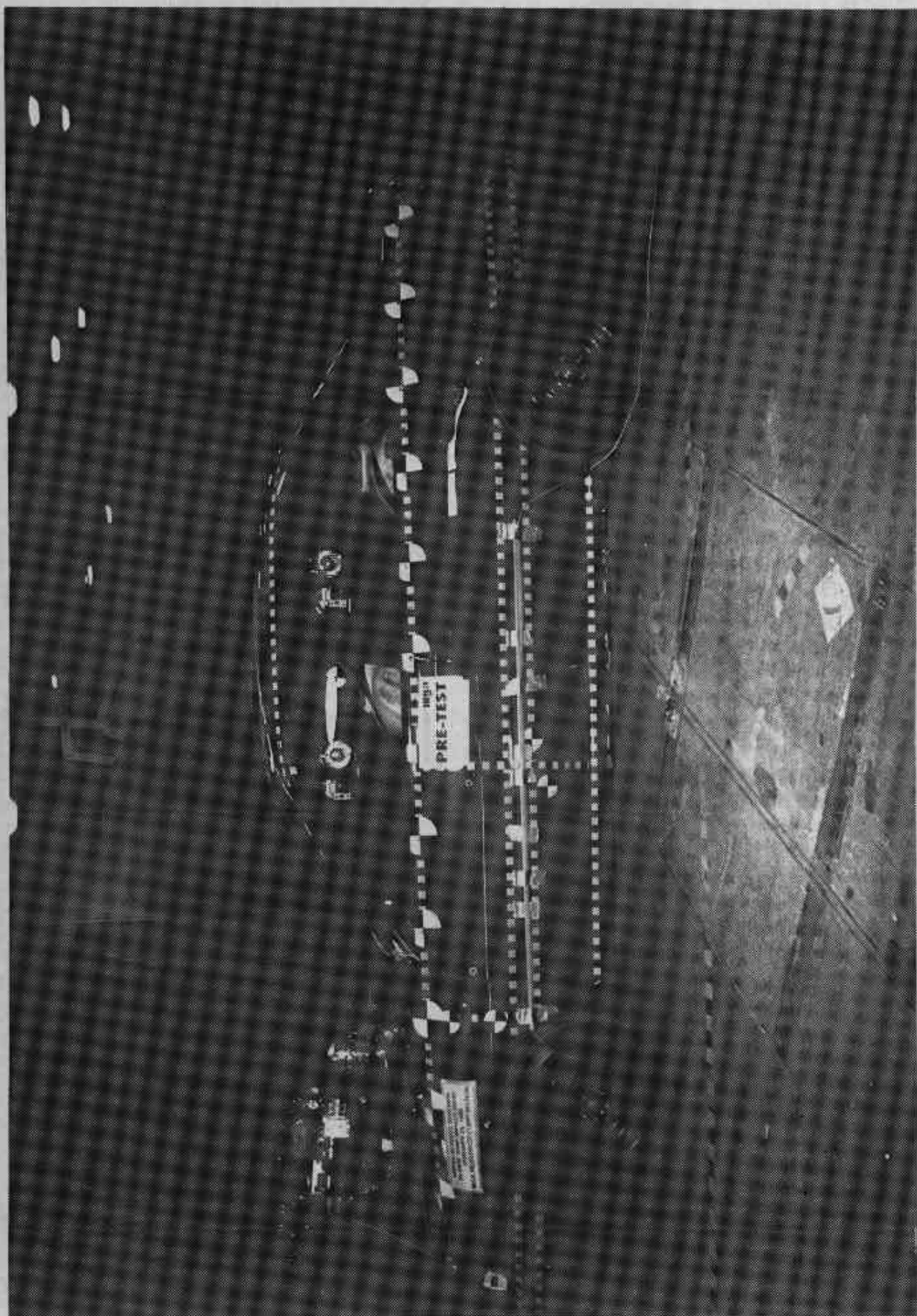


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

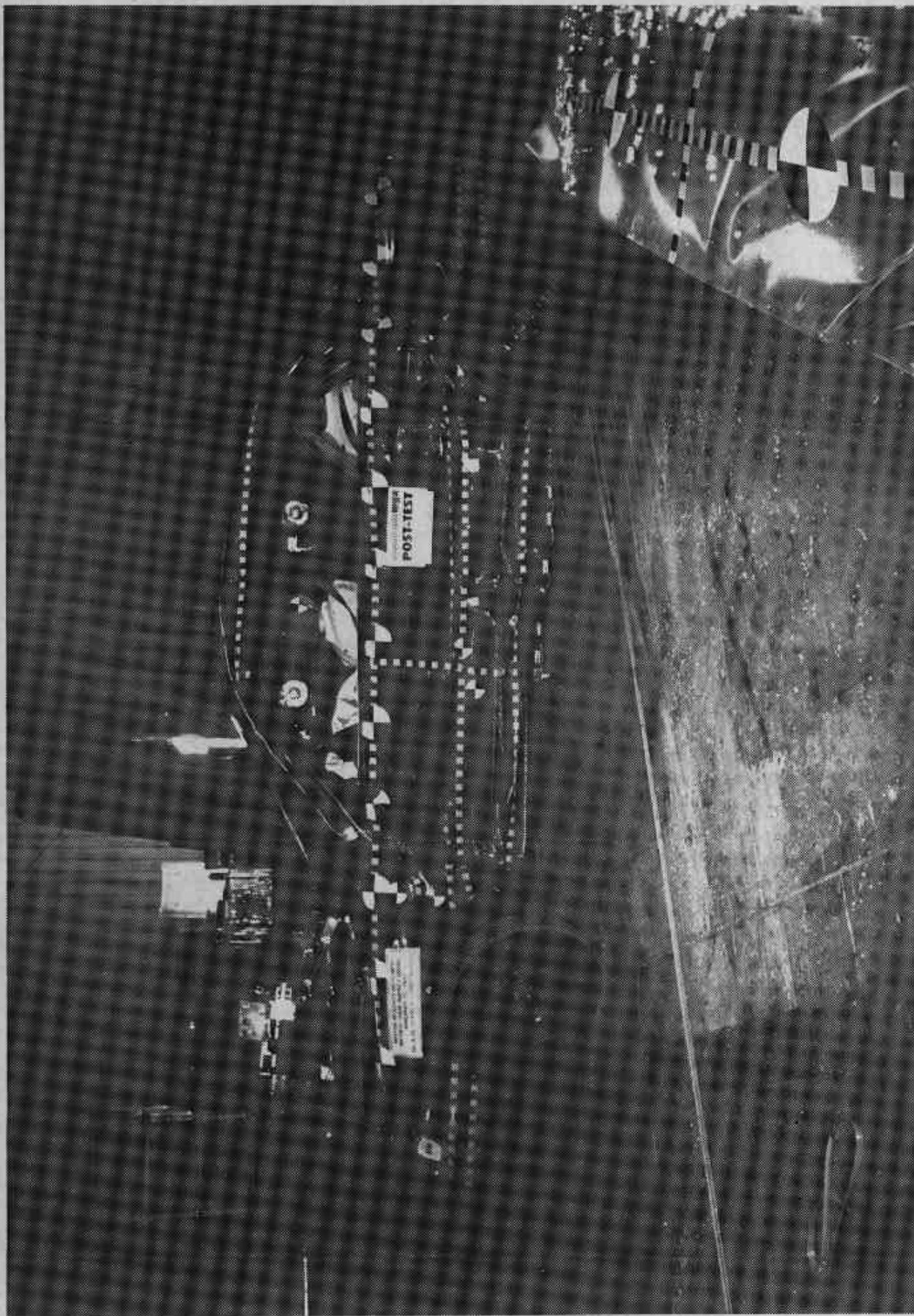


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

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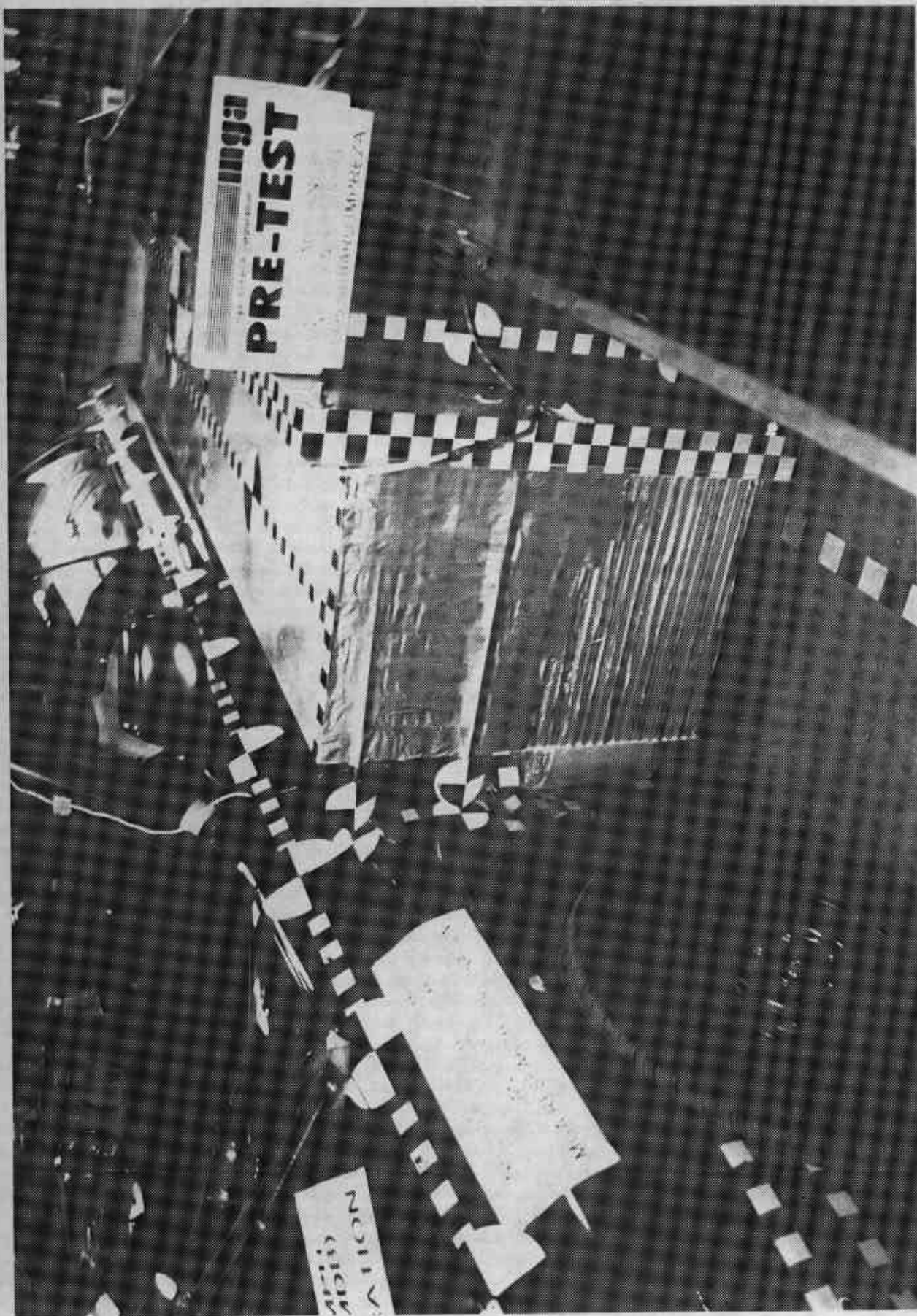


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

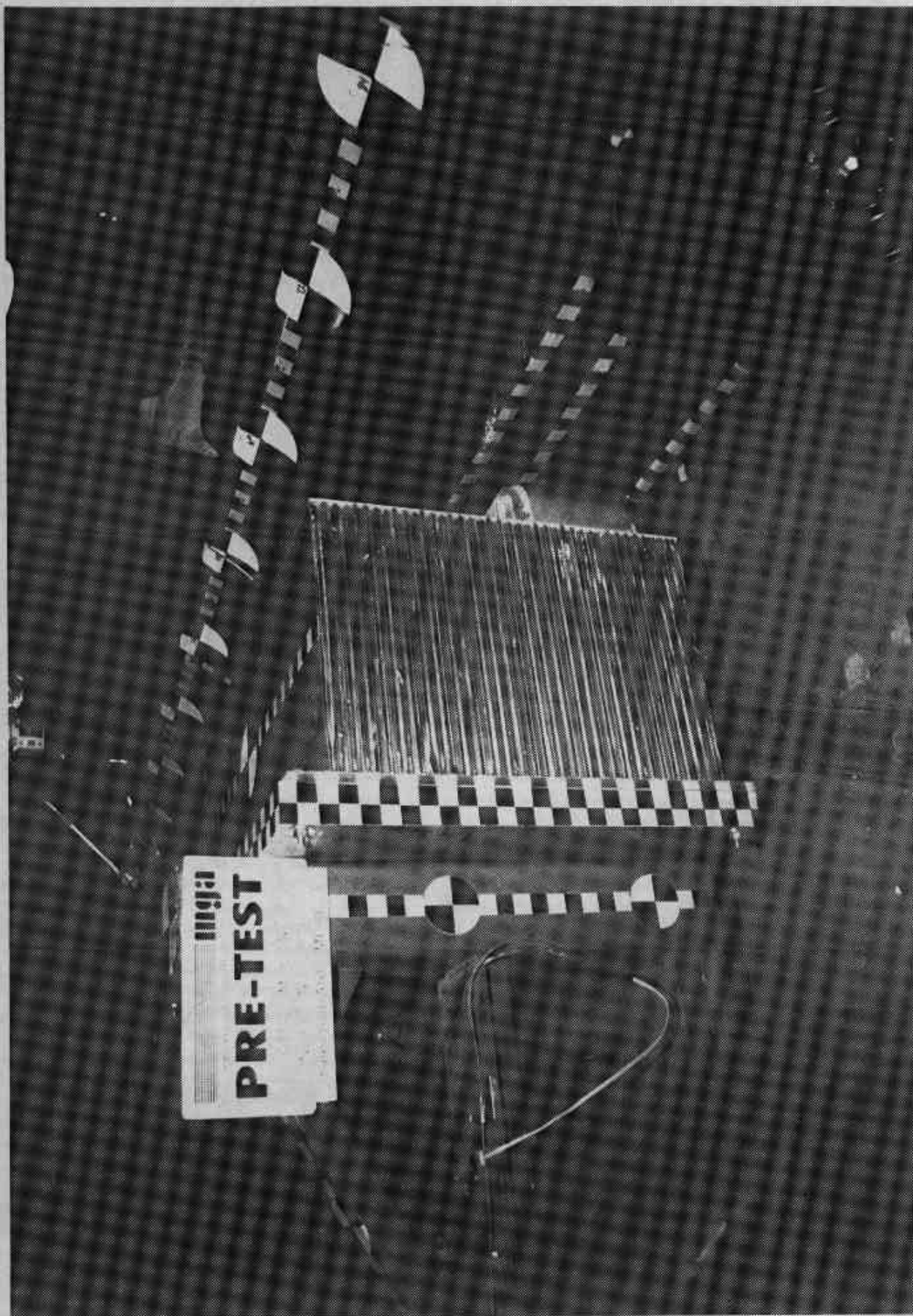


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

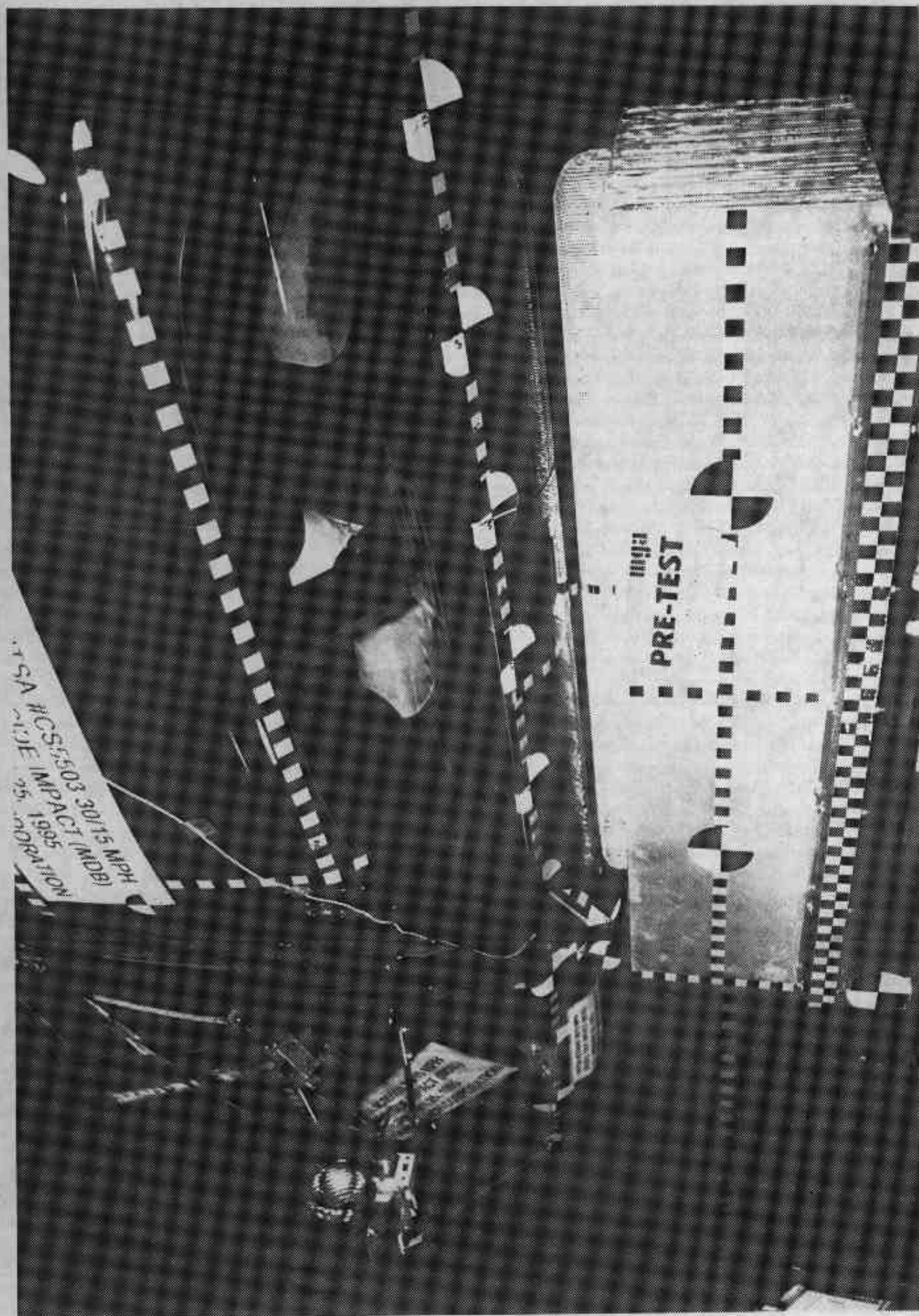


Photo No. A-9 - Pre-Test MDB Position Against Vehicle Overhead View



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Photo No. A-10 - Post-Test MDB Position Against Vehicle (left side)

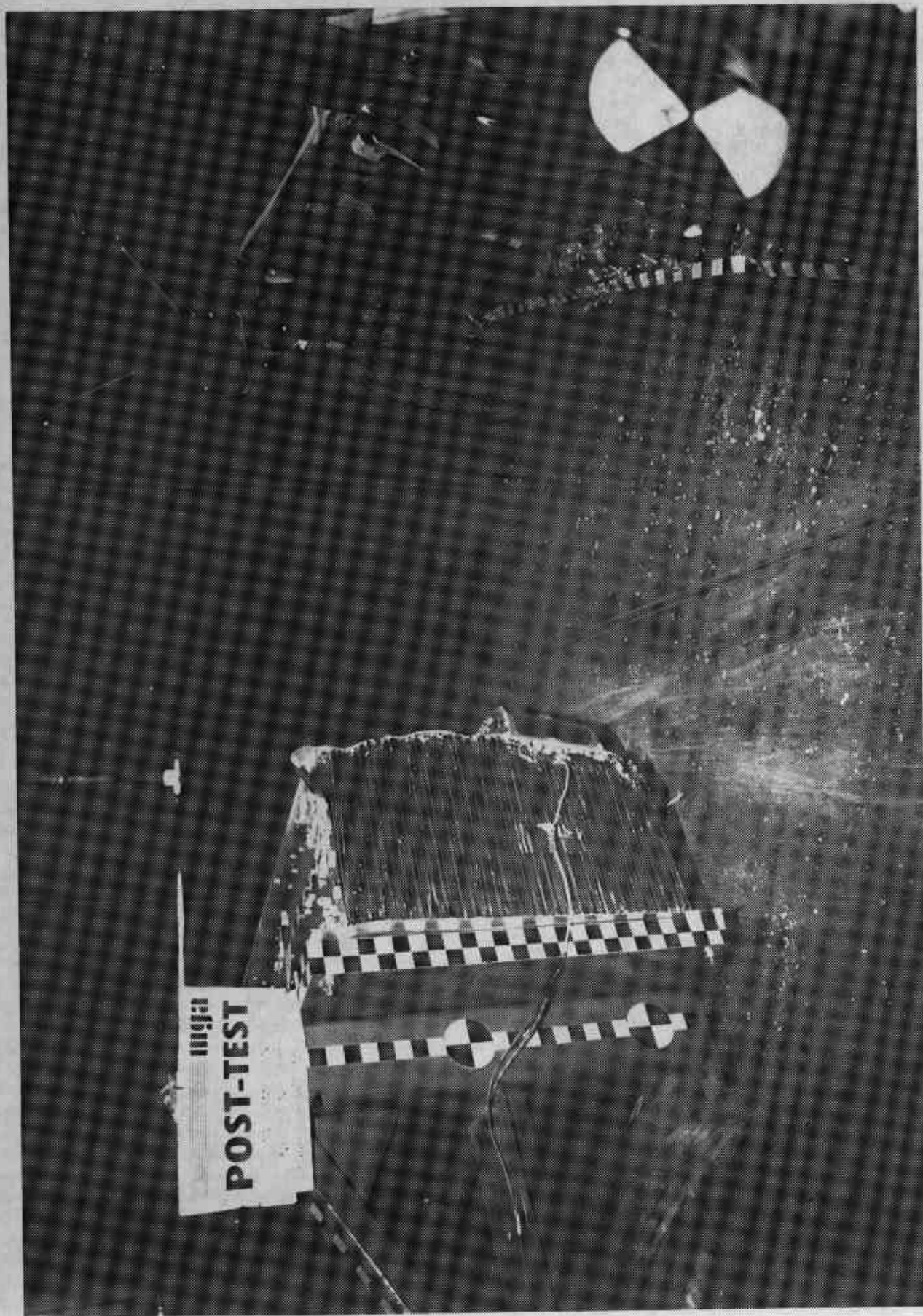
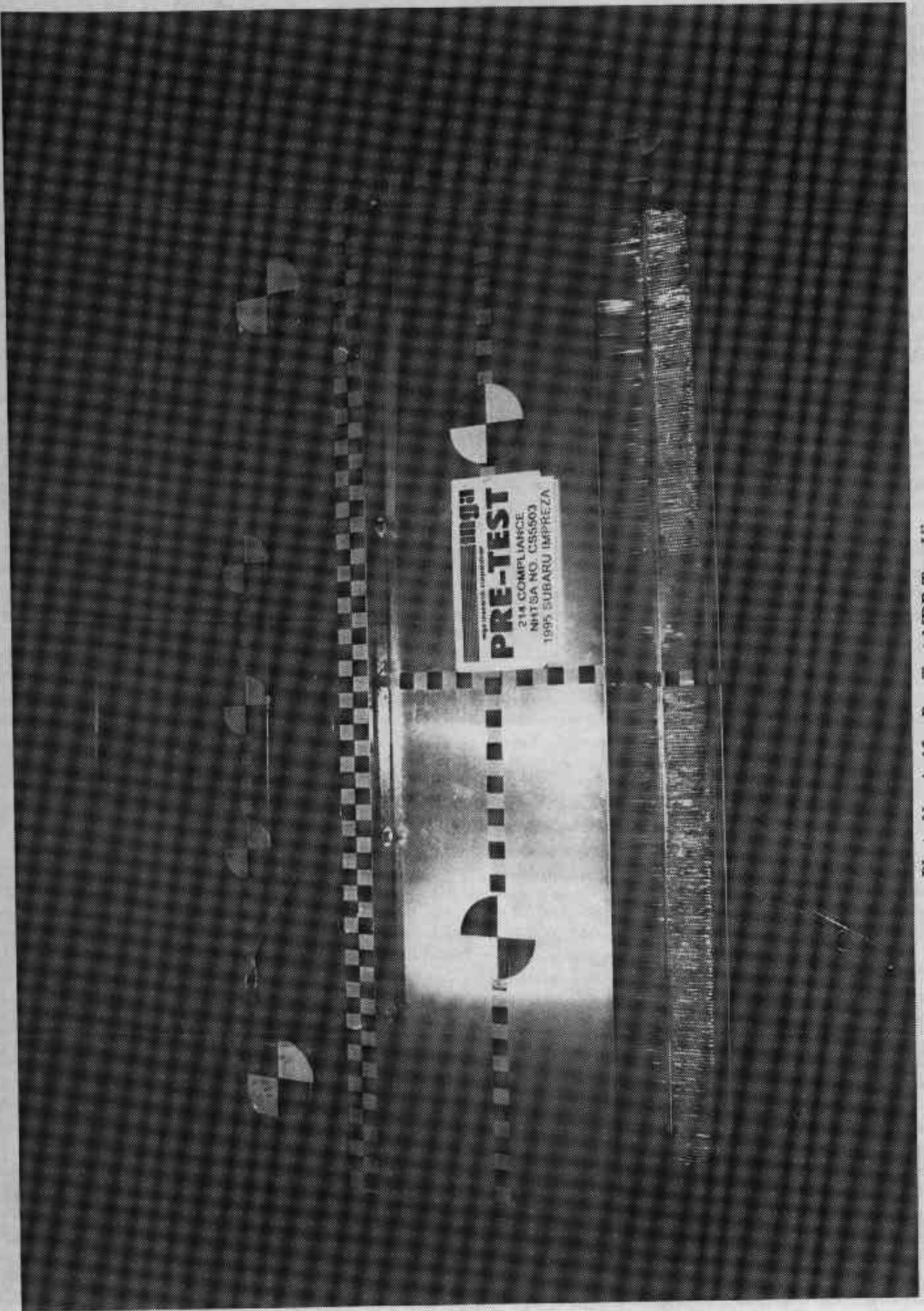


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (right side)



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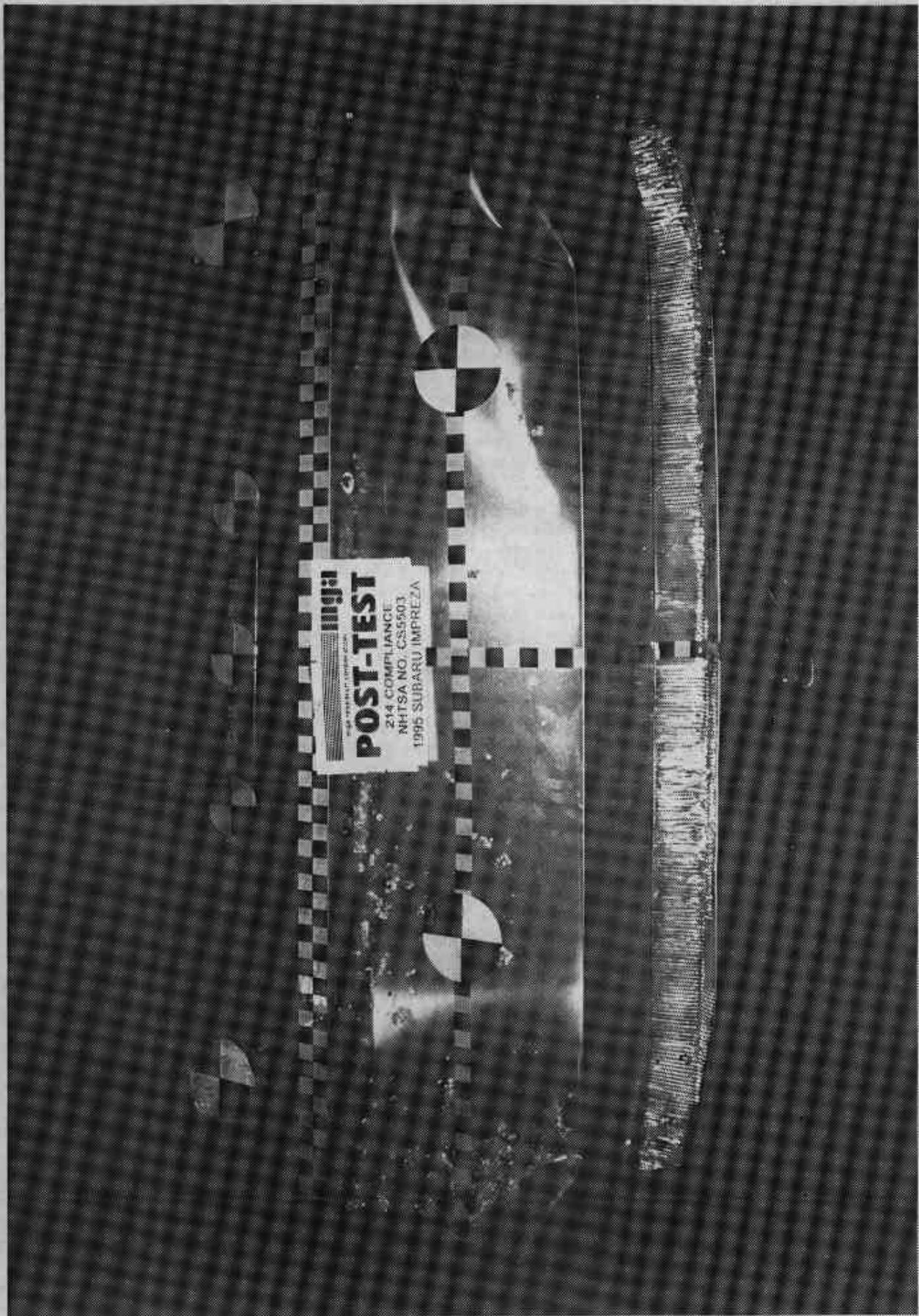


Photo No. A-13 - Post-Test MDB Top View

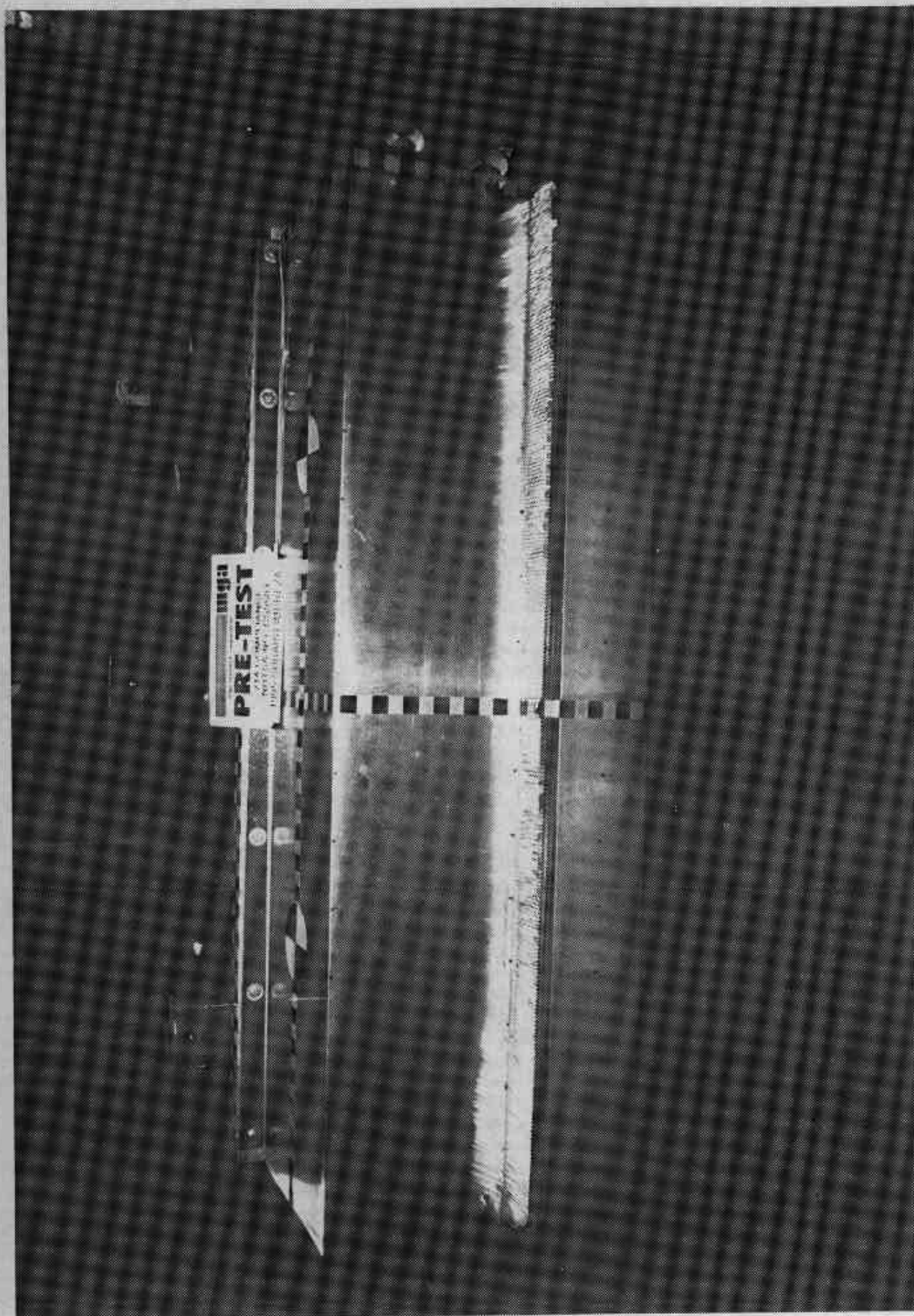


Photo No. A-14 - Pre-Test MDB Front View

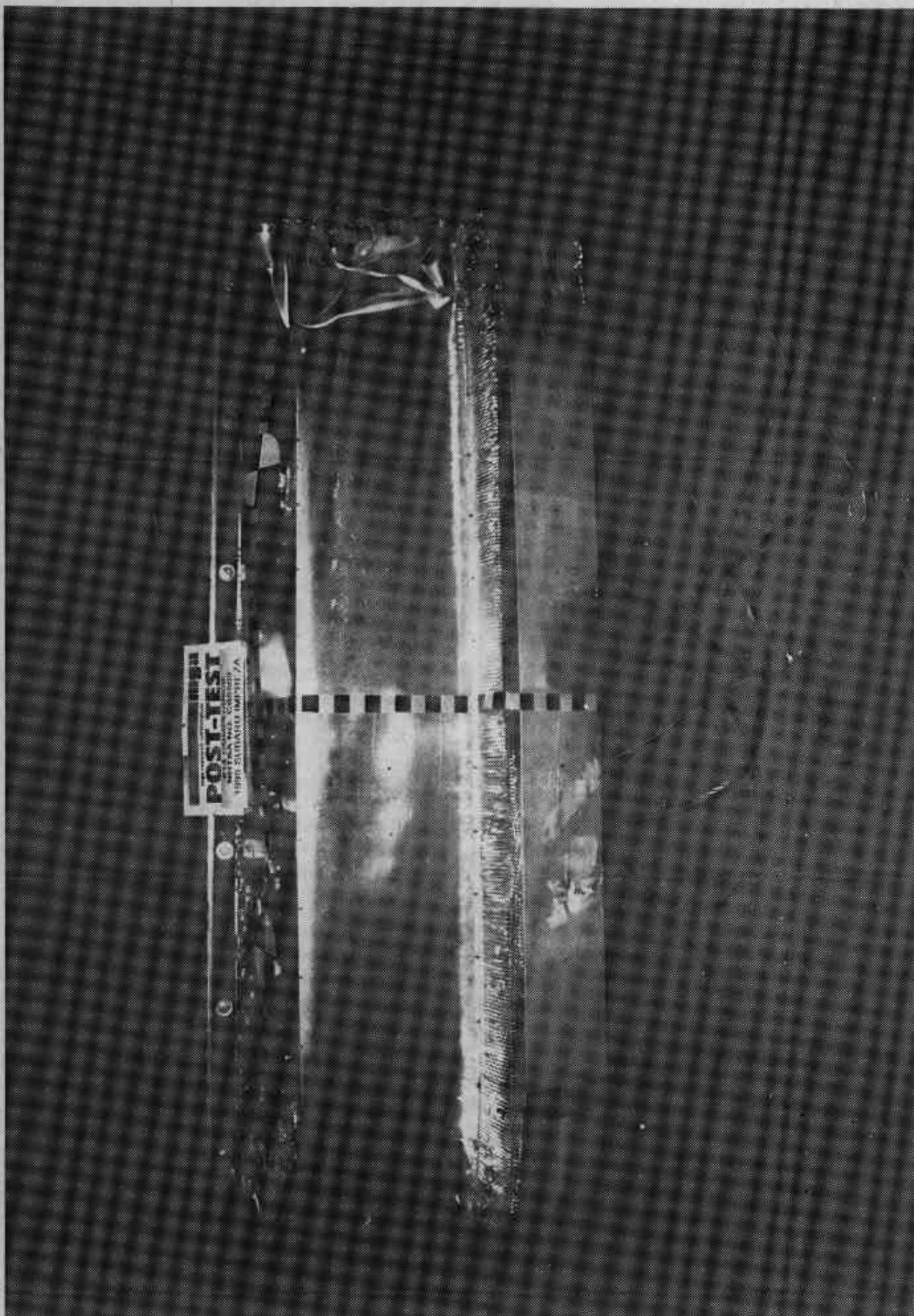
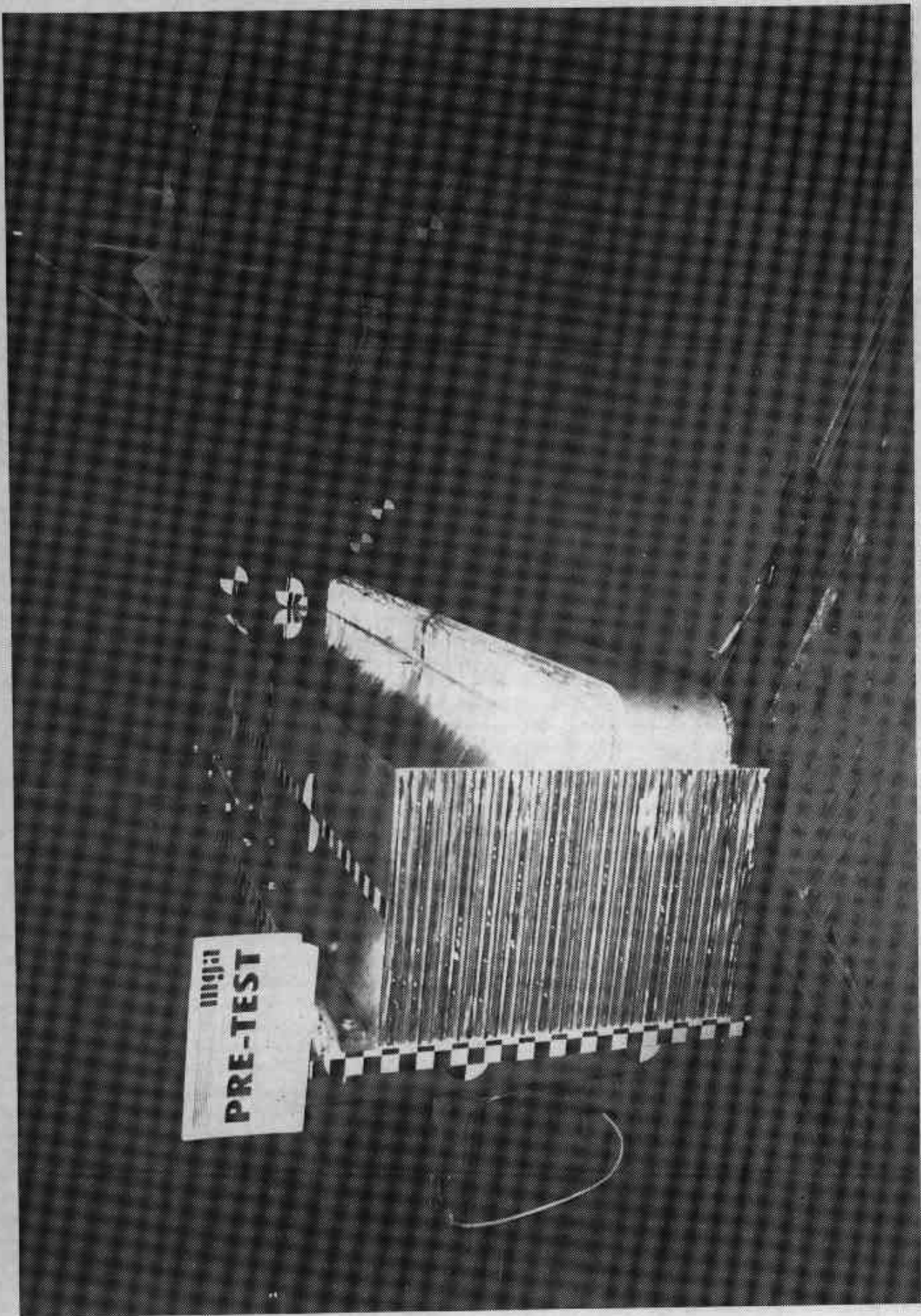


Photo No. A-15 - Post-Test MDB Front View



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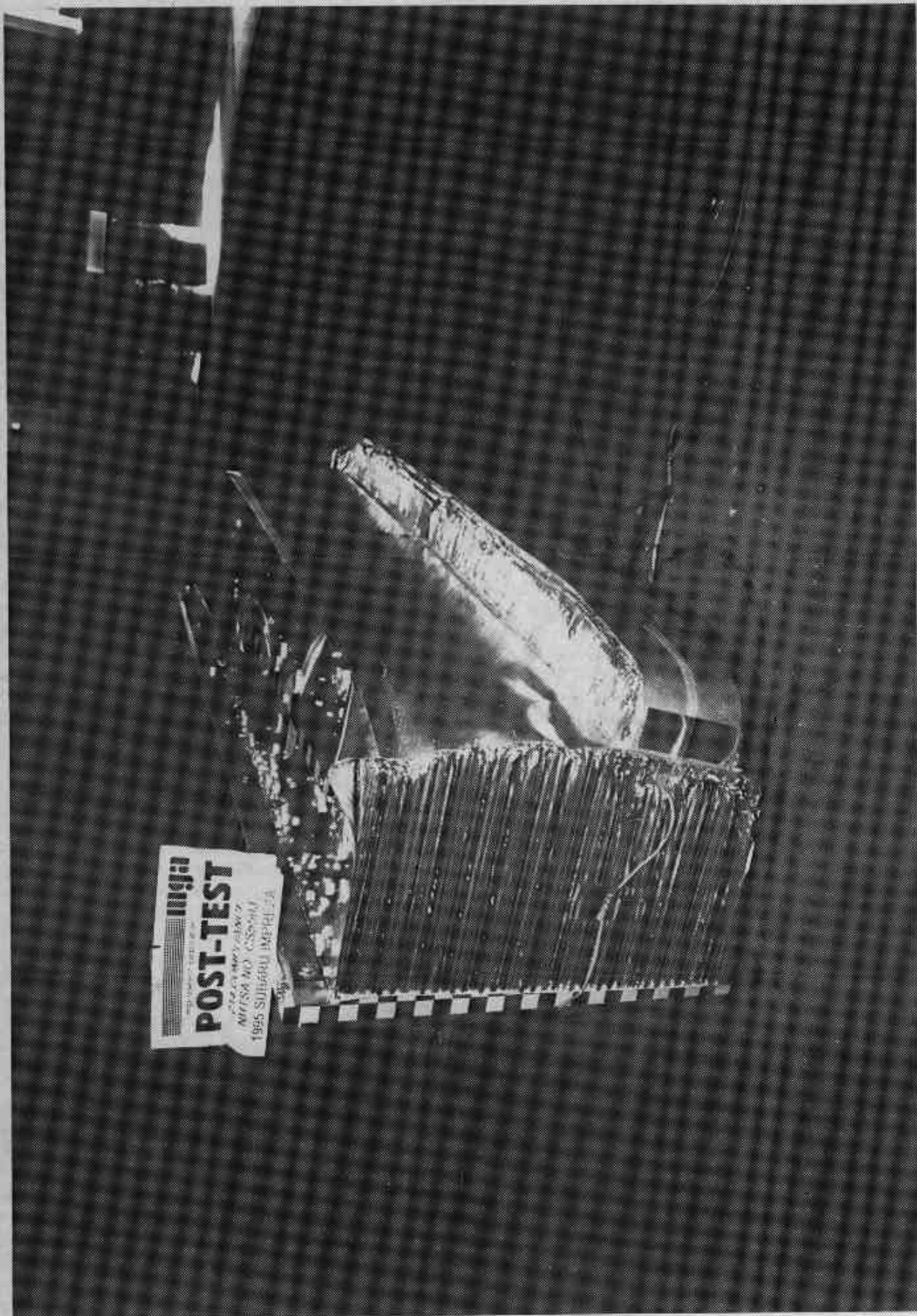


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Photo No. A-18 - Pre-Test Driver Dummy Right Side View



Photo No. A-19 - Post-Test Driver Dummy Right Side View

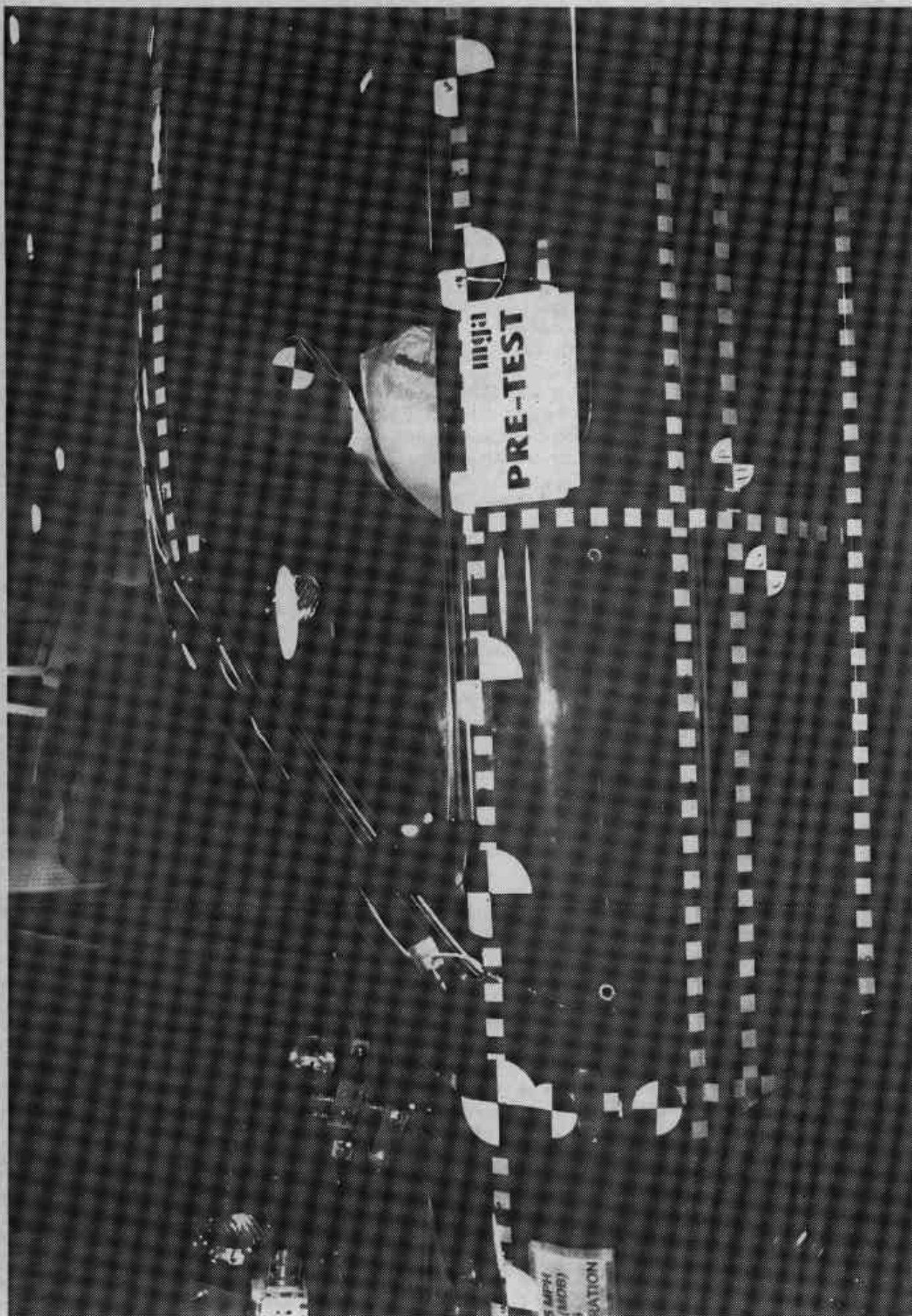
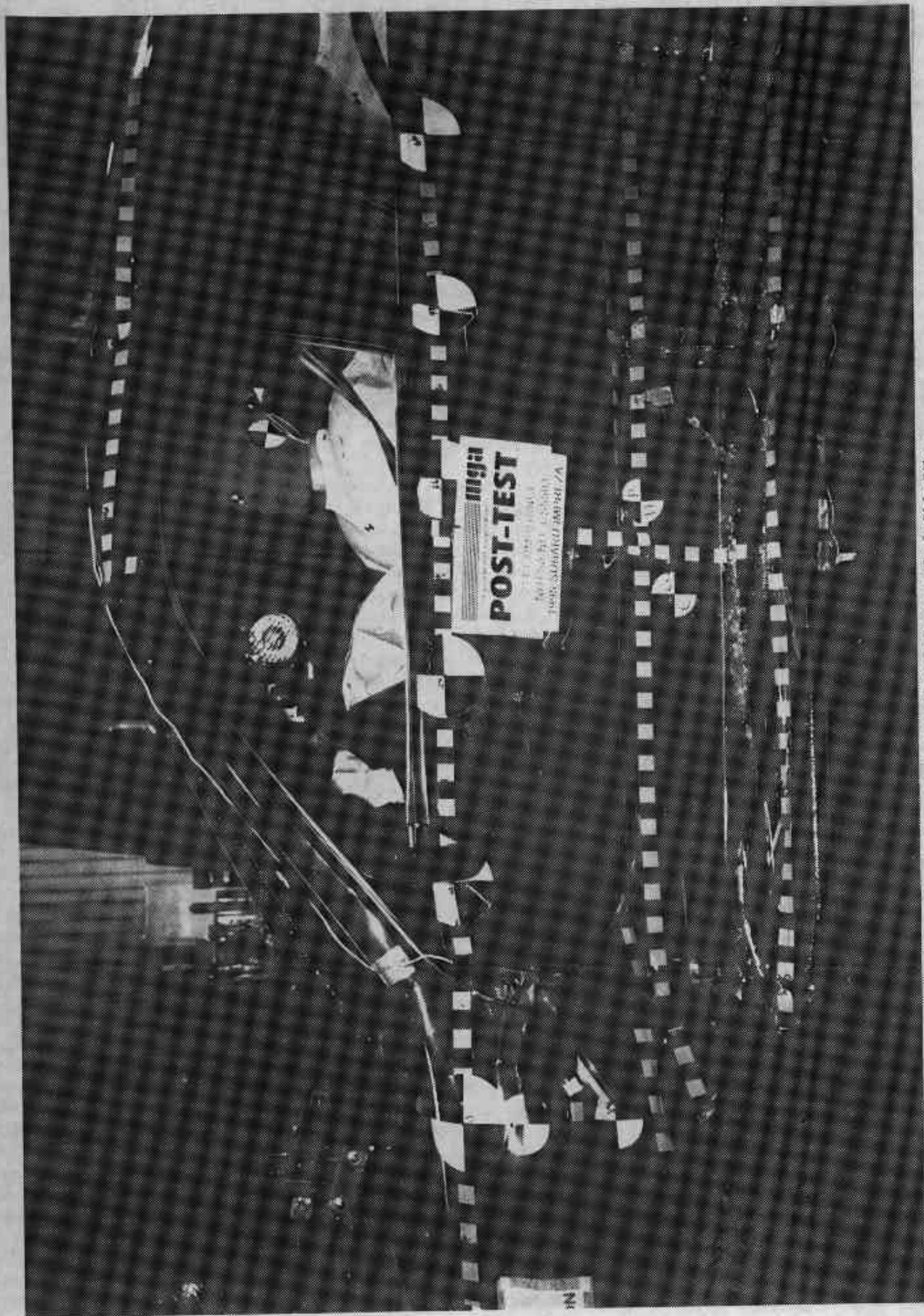


Photo No. A-20 - Pre-Test Driver Dummy Left Side View

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

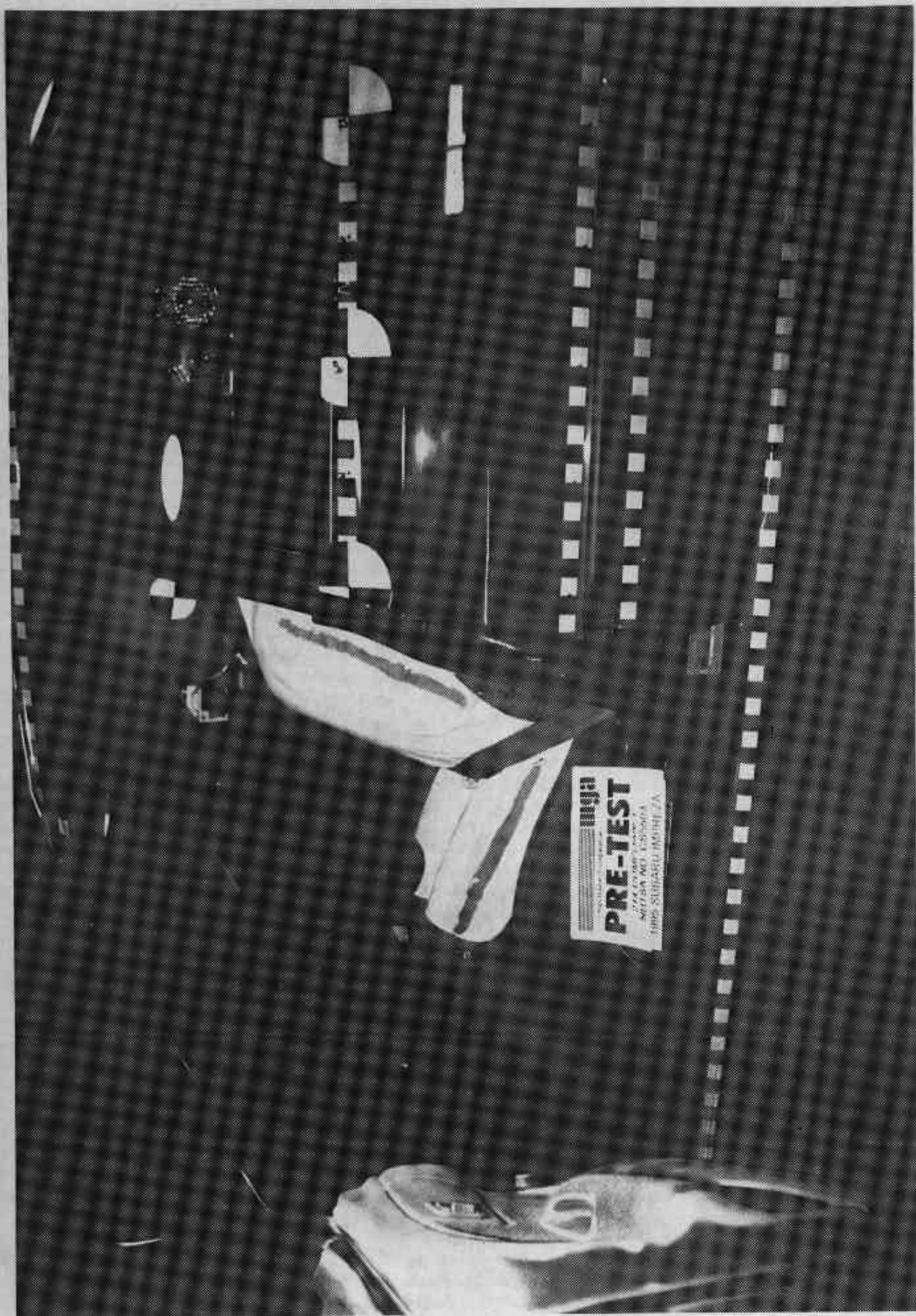


Photo No. A-22 - Pre-Test Driver Dummy Left Side View (Door Open)

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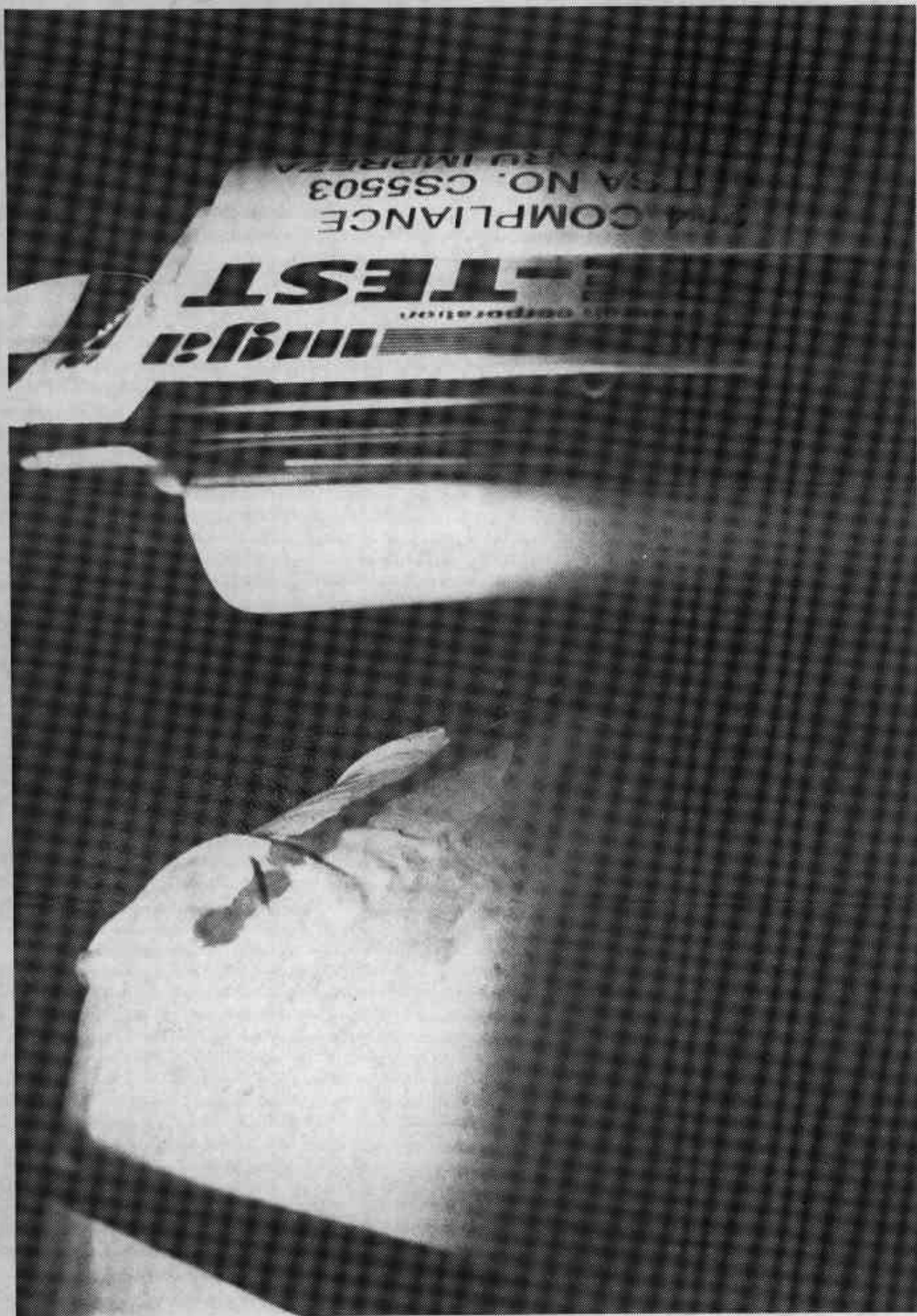


Photo No. A-23 - Pre-Test Driver Dummy Shoulder and Door Top View

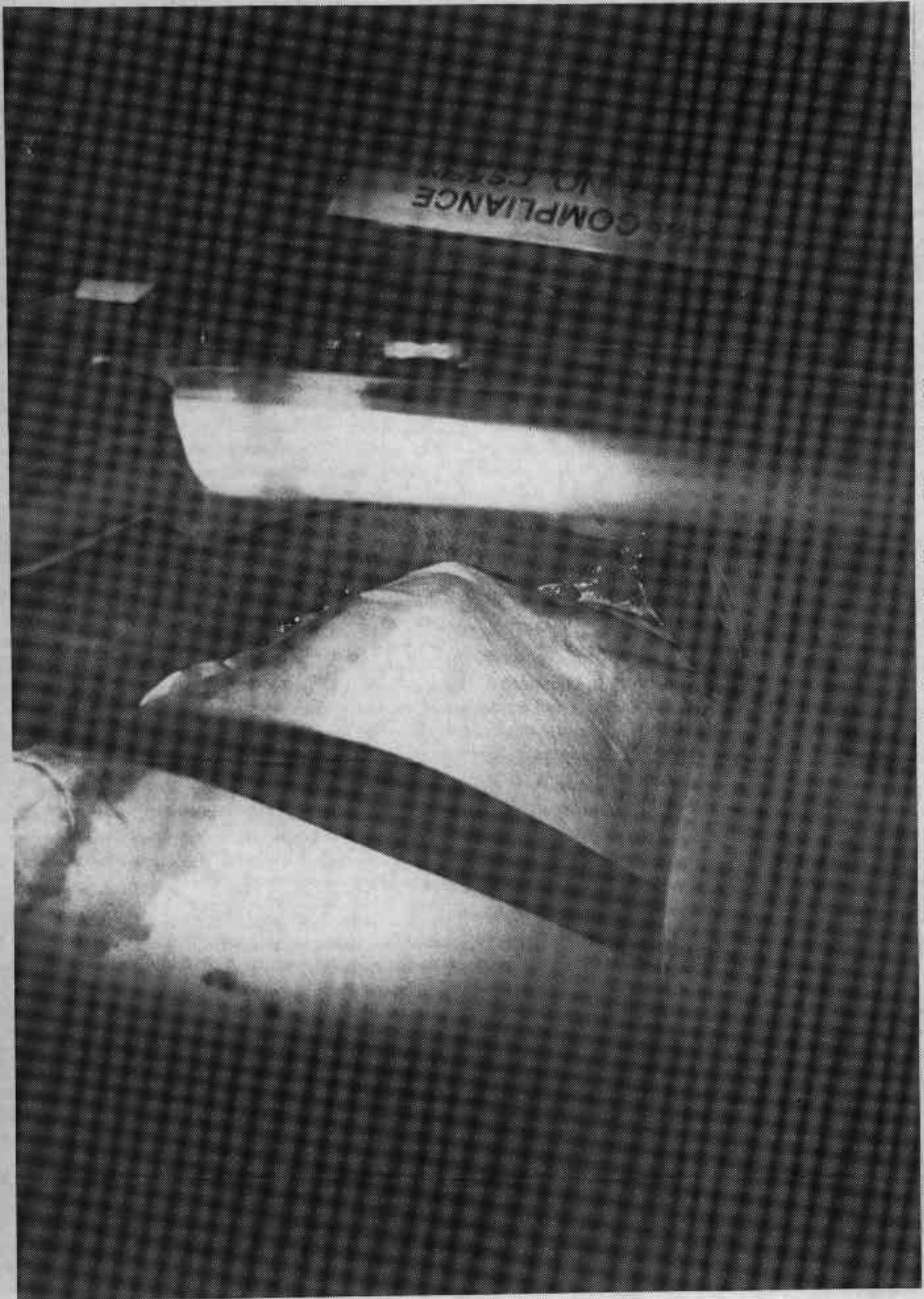


Photo No. A-24 - Post-Test Driver Dummy Shoulder and Door Top View

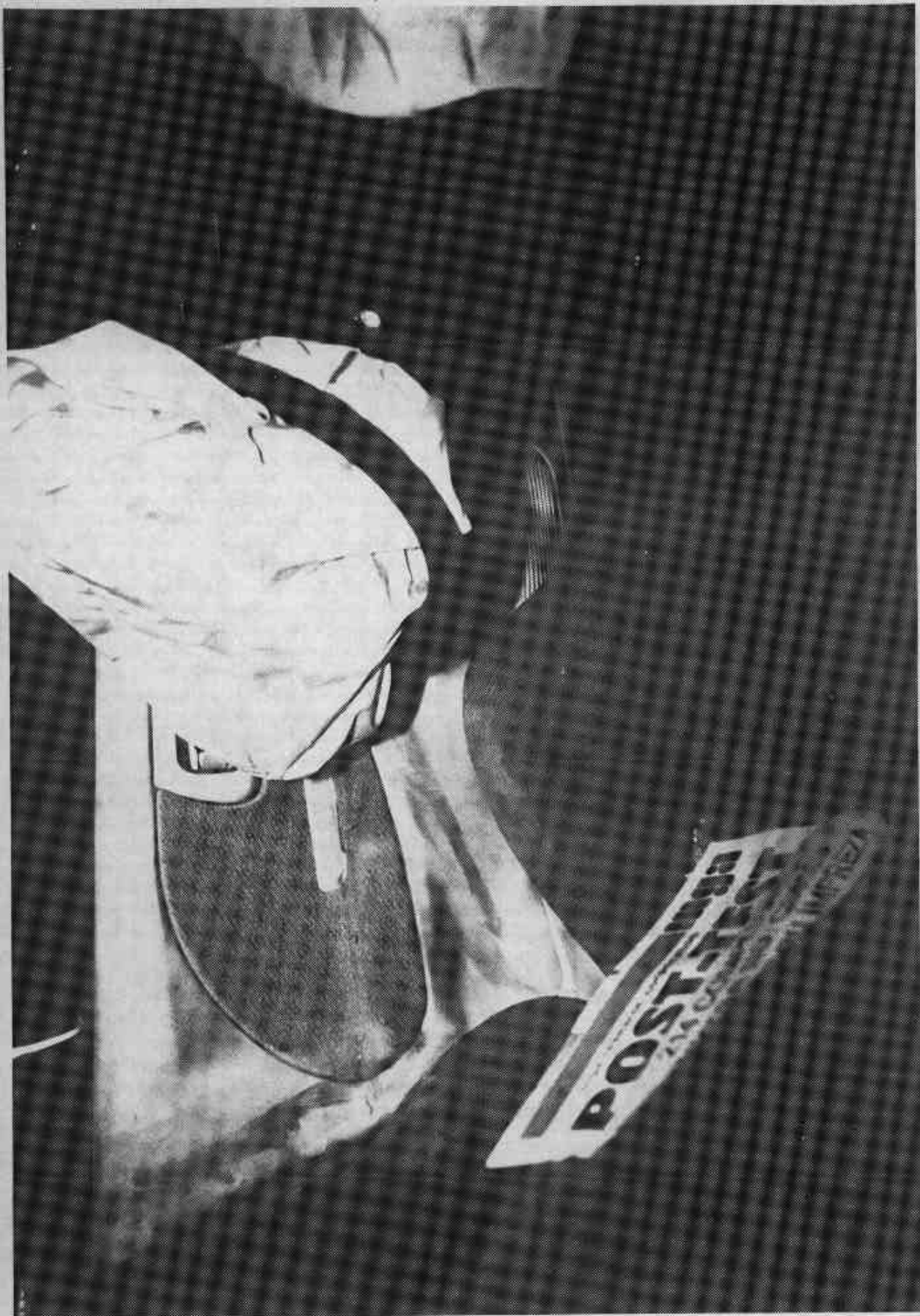


Photo No. A-25 - Post-Test Driver Dummy Contact

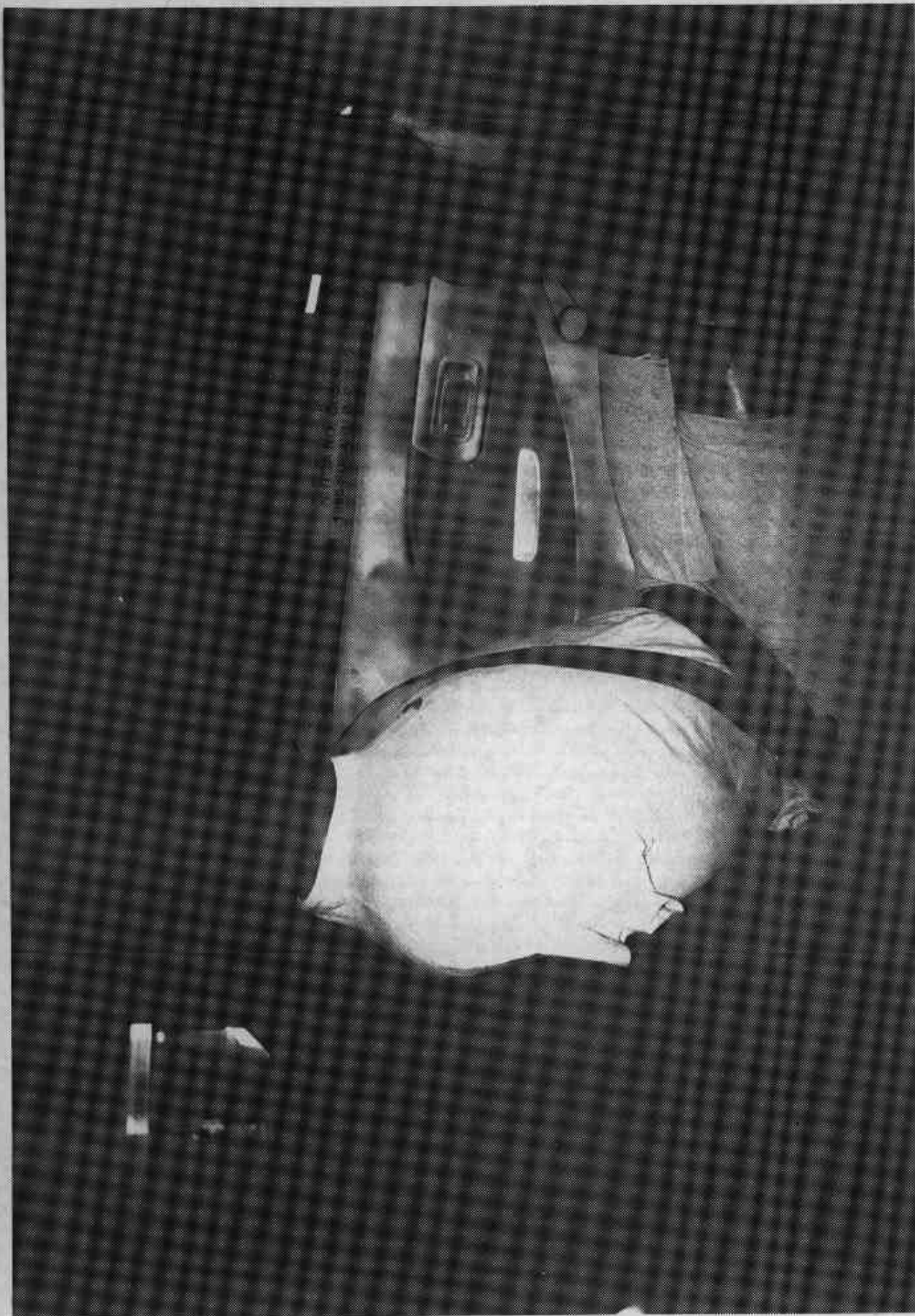


Photo No. A-26 - Pre-Test Passenger Dummy Right Side View

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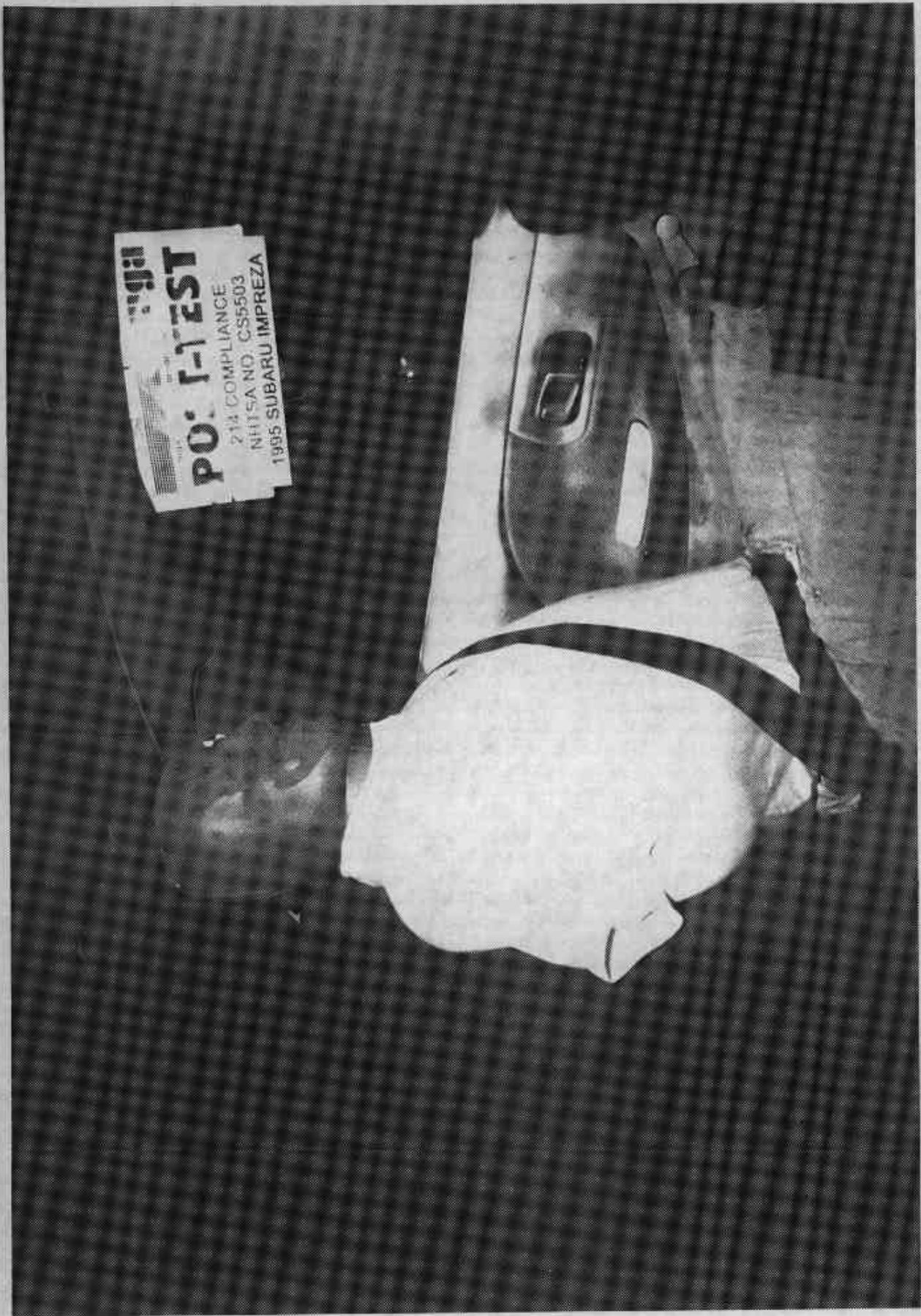


Photo No. A-27 - Post-Test Passenger Dummy Right Side View



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

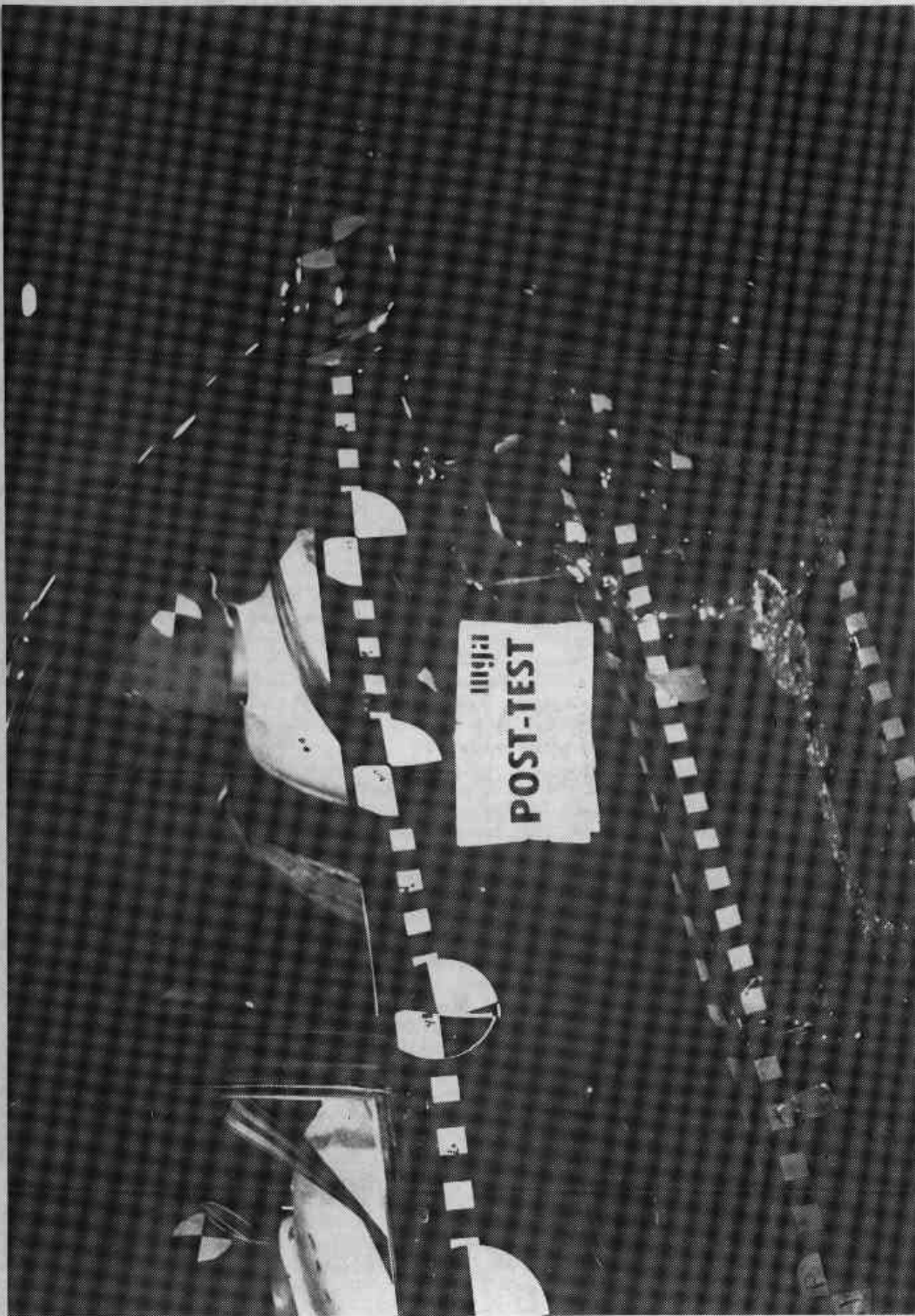
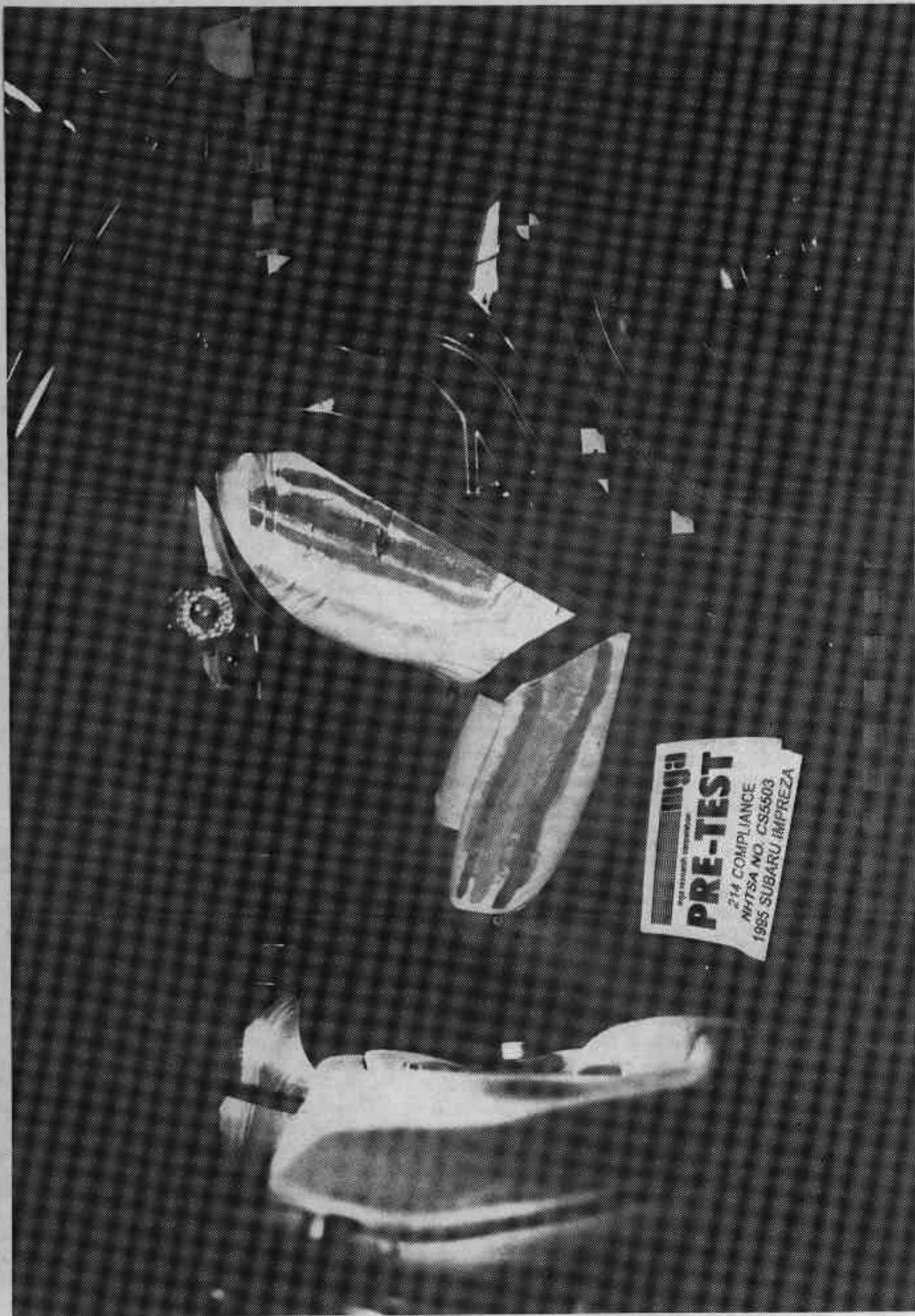


Photo No. A-29 - Post-Test Passenger Dummy Left Side View



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Photo No. A-30 - Pre-Test Passenger Dummy Left Side View (Door Open)

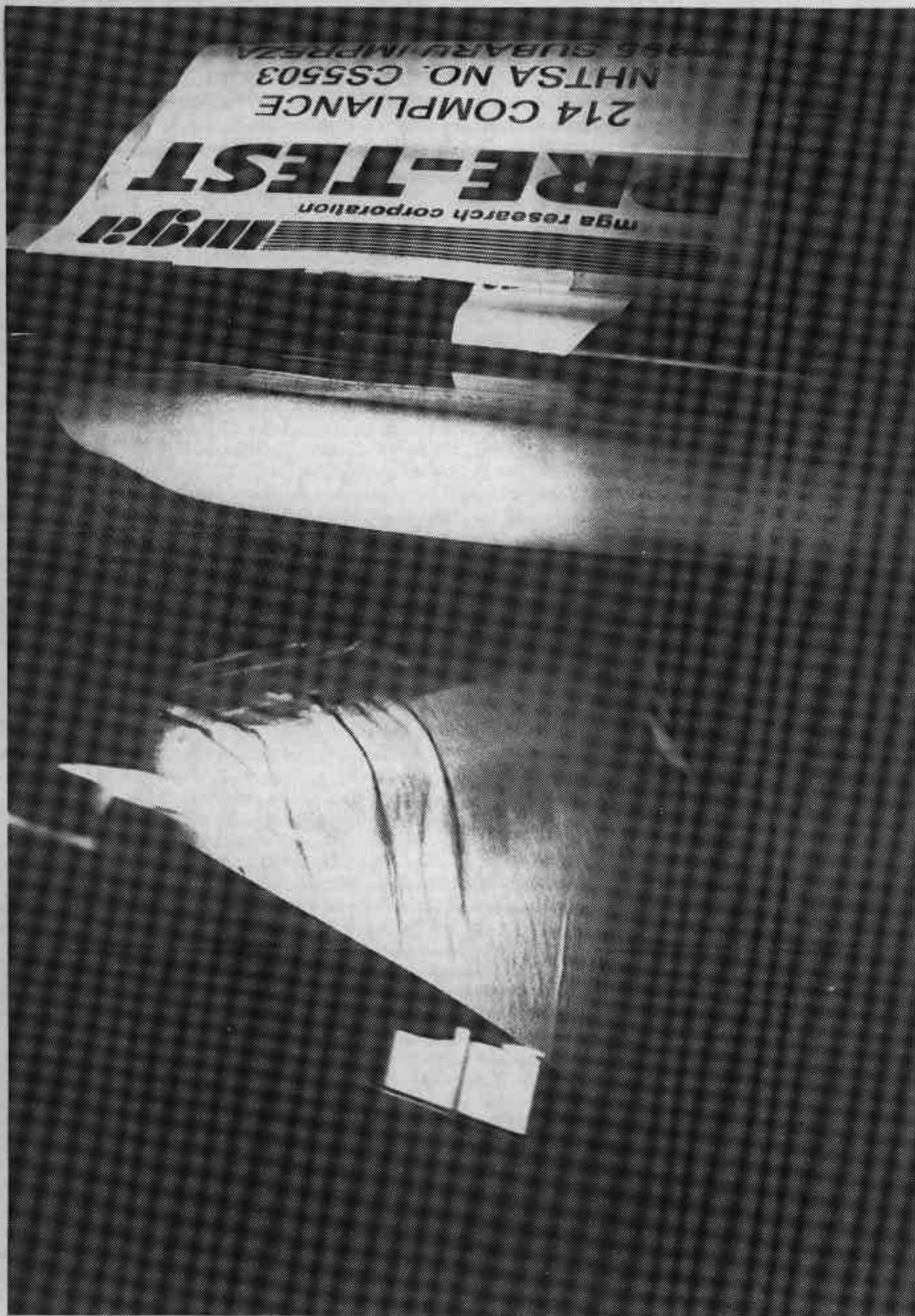


Photo No. A-31 - Pre-Test Passenger Dummy Shoulder and Door Top View

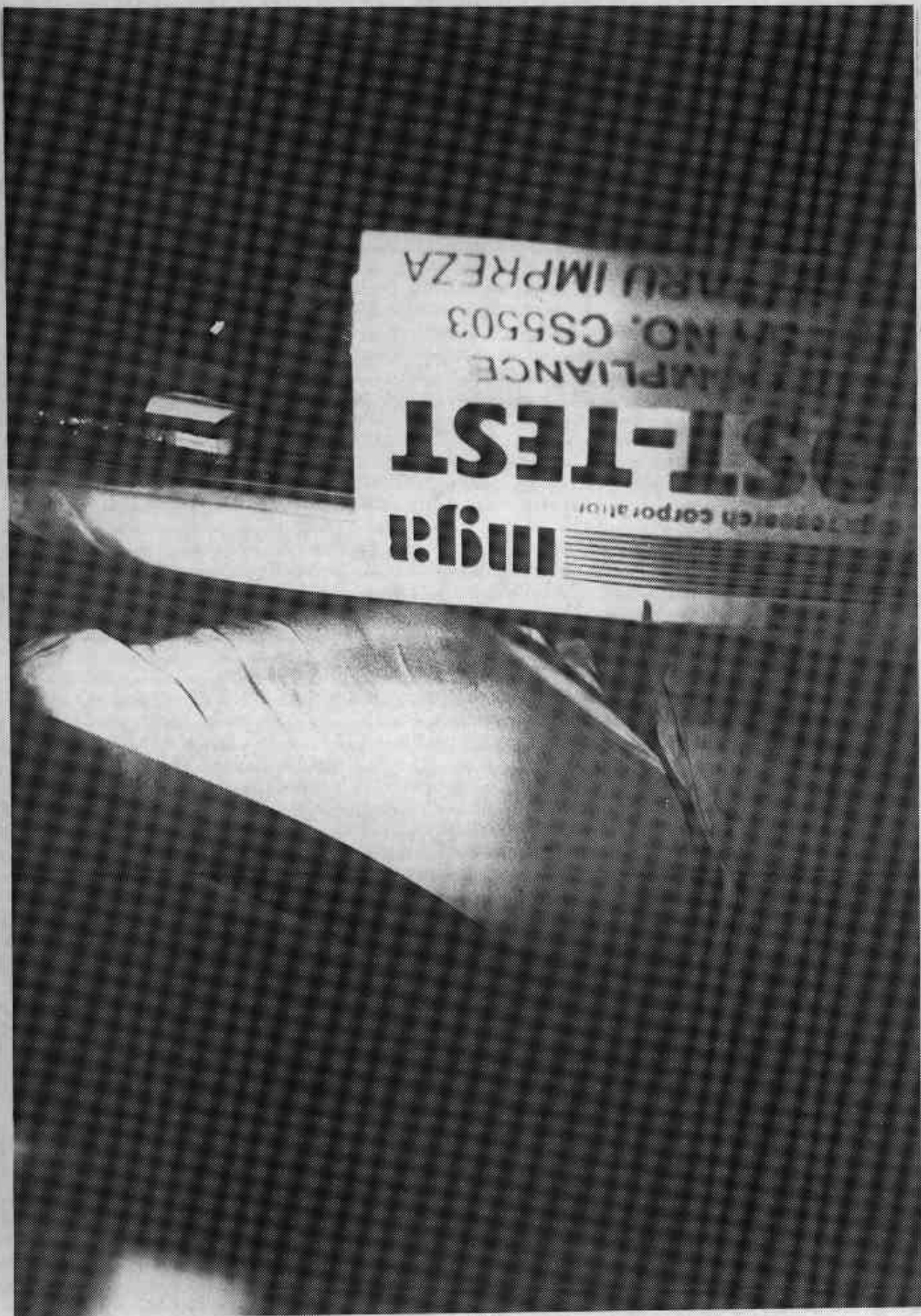


Photo No. A-32 - Post-Test Passenger Dummy Shoulder and Door Top View



Photo No. A-33 - Post-Test Passenger Dummy Contact

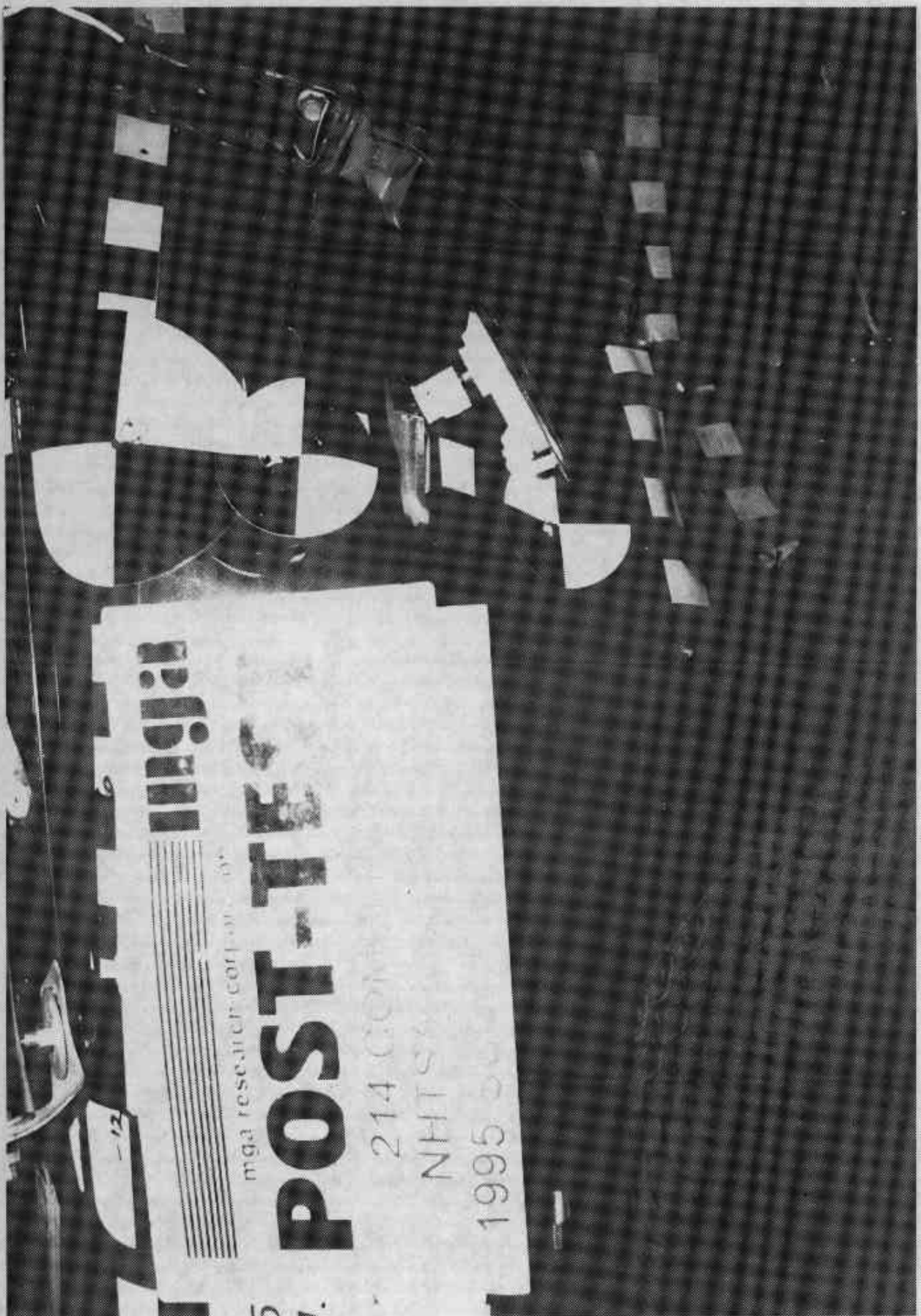
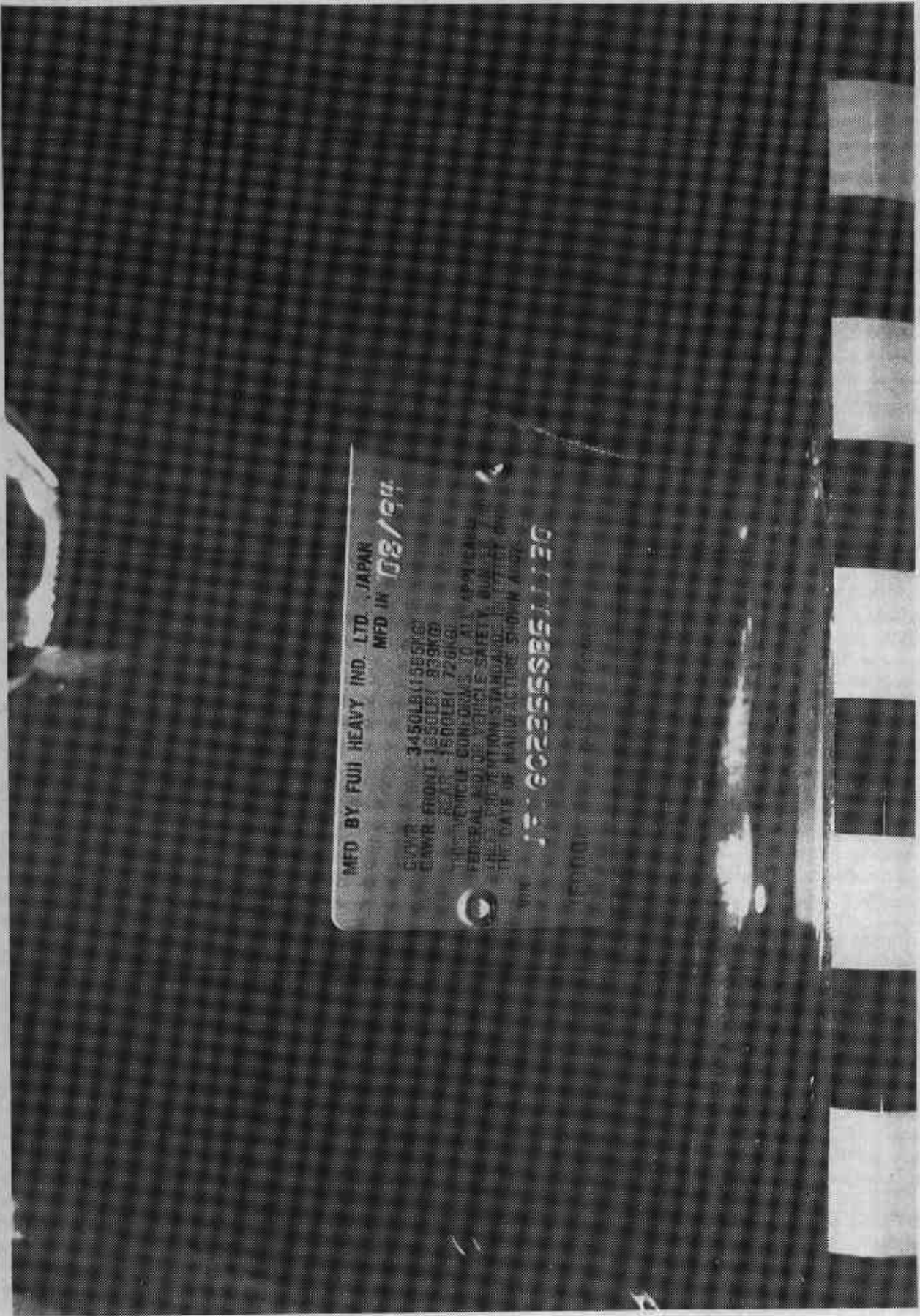


Photo No. A-34 - Left Front Impact Point on Vehicle



MFD BY FUJI HEAVY IND. LTD. JAPAN
MFD IN 1984
GVWR 3450LB (1565KG)
CWBV FRONT 1850LB (839KG)
REAR 1600LB (726KG)
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY STANDARDS
THE DATE OF MANUFACTURE SHOWN ABOVE
VIN 1F-60223558511120

Photo No. A-35 - Vehicle Certification Label

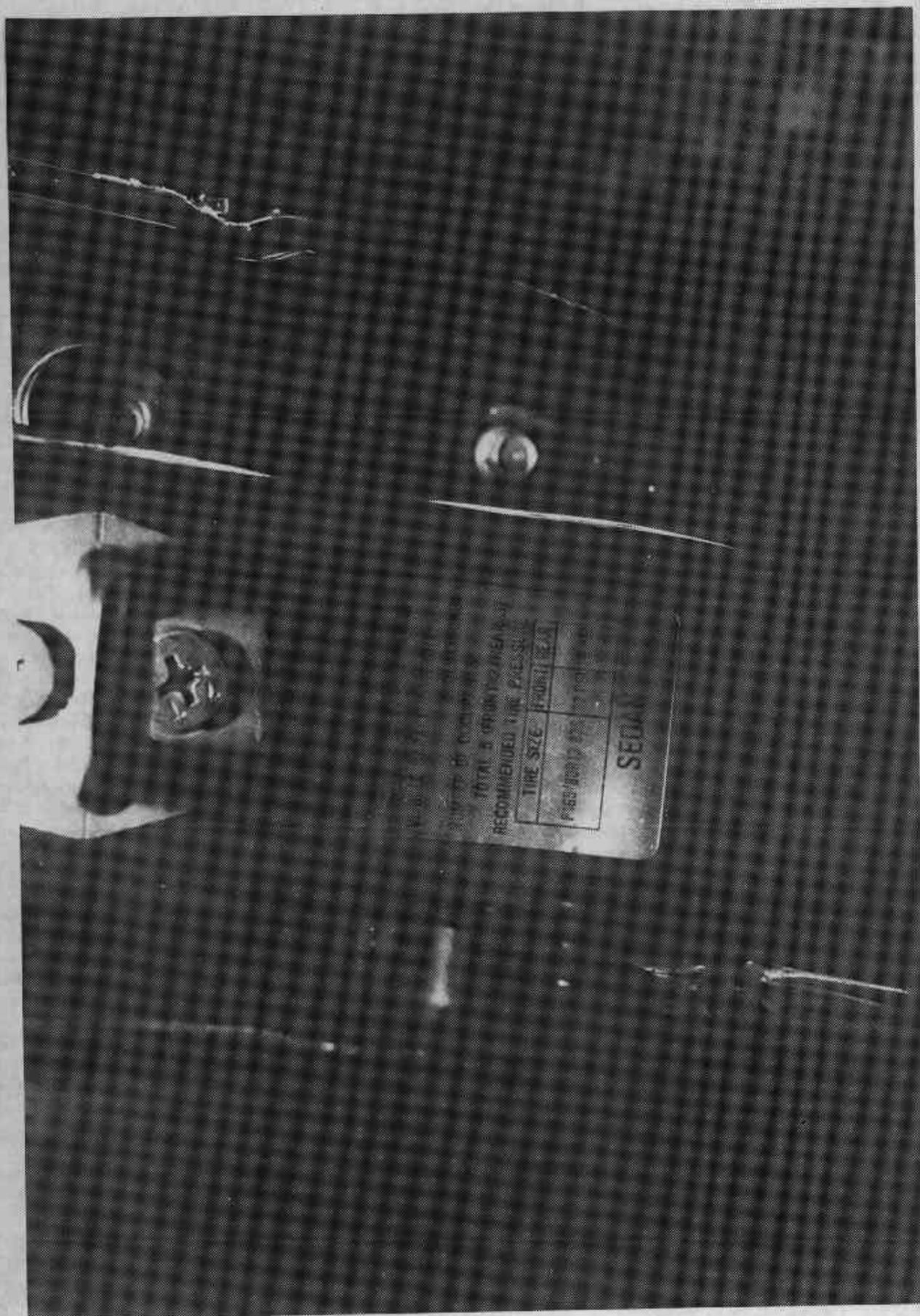


Photo No. A-36 - Tire Placard

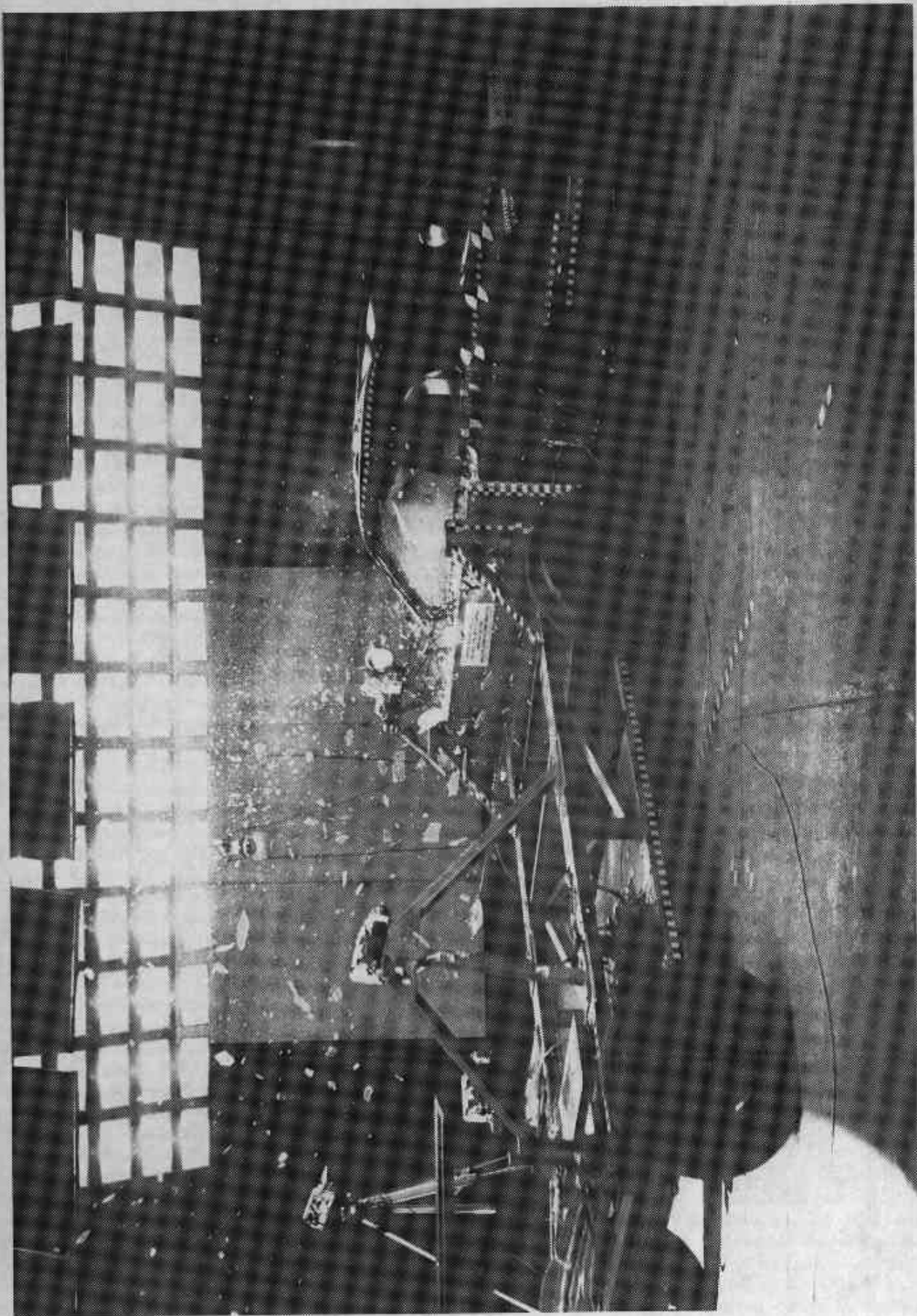


Photo No. A-37 - Impact

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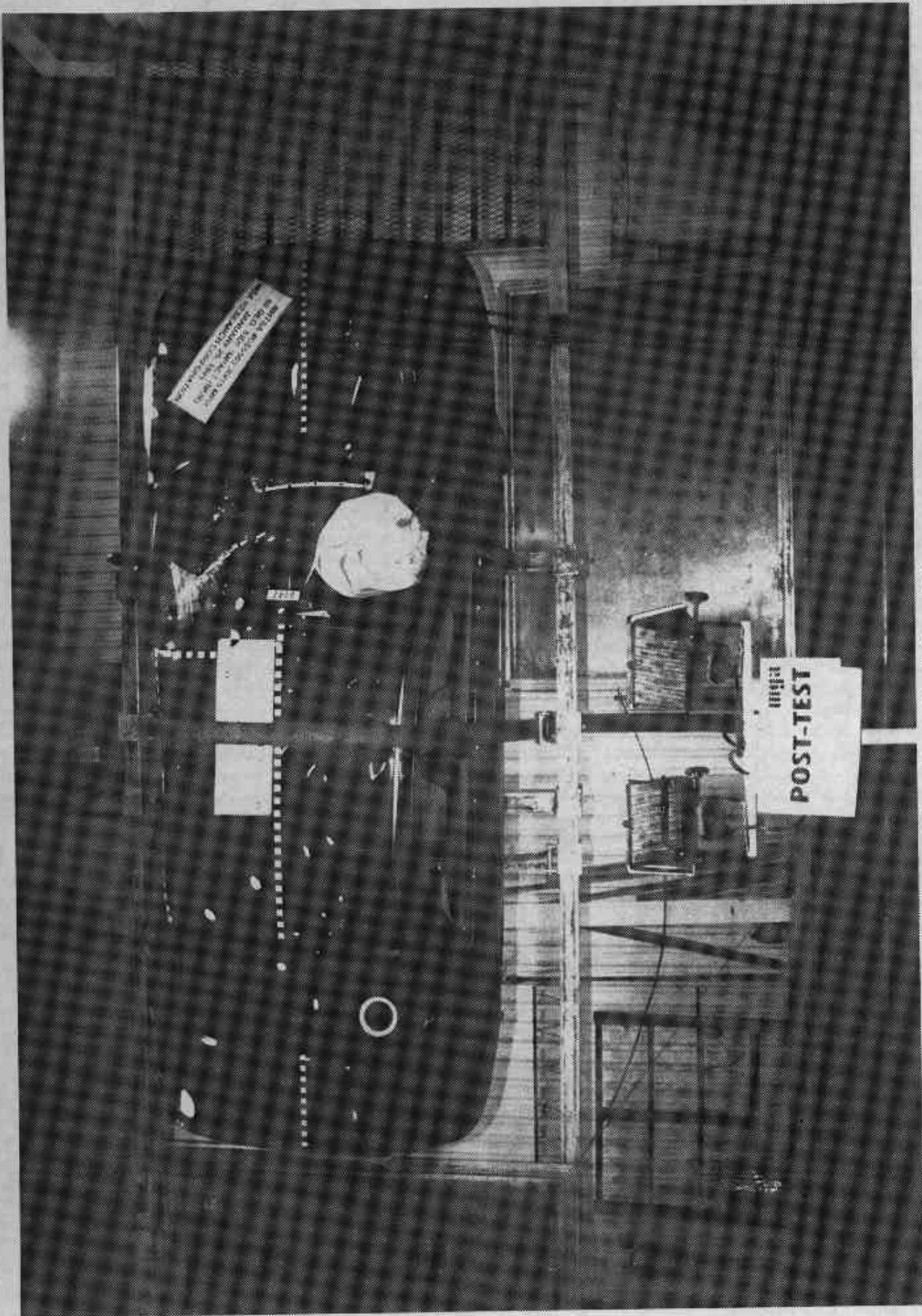


Photo No. A-38 - Rollover 90°

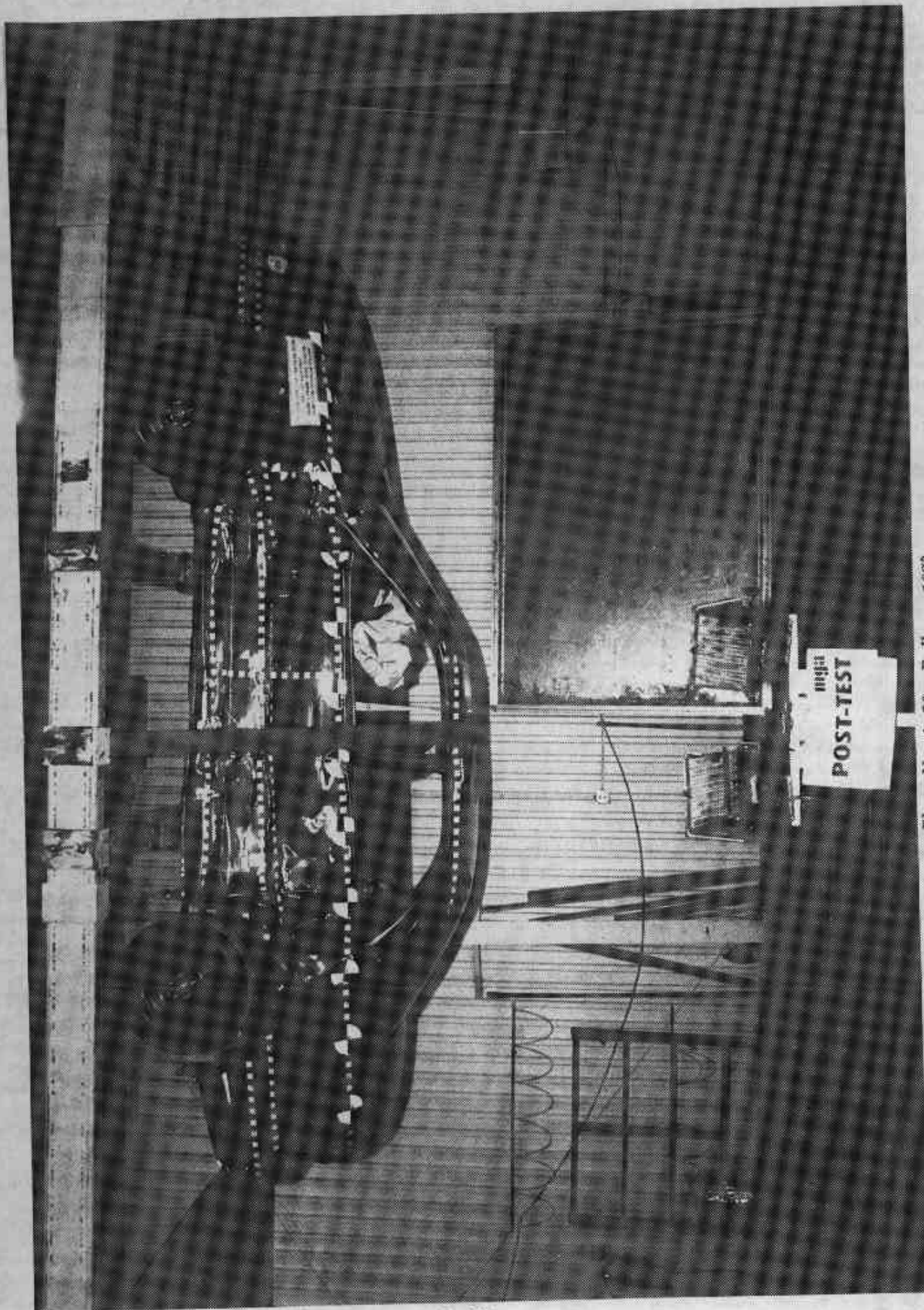


Photo No. A-39 - Rollover 188°

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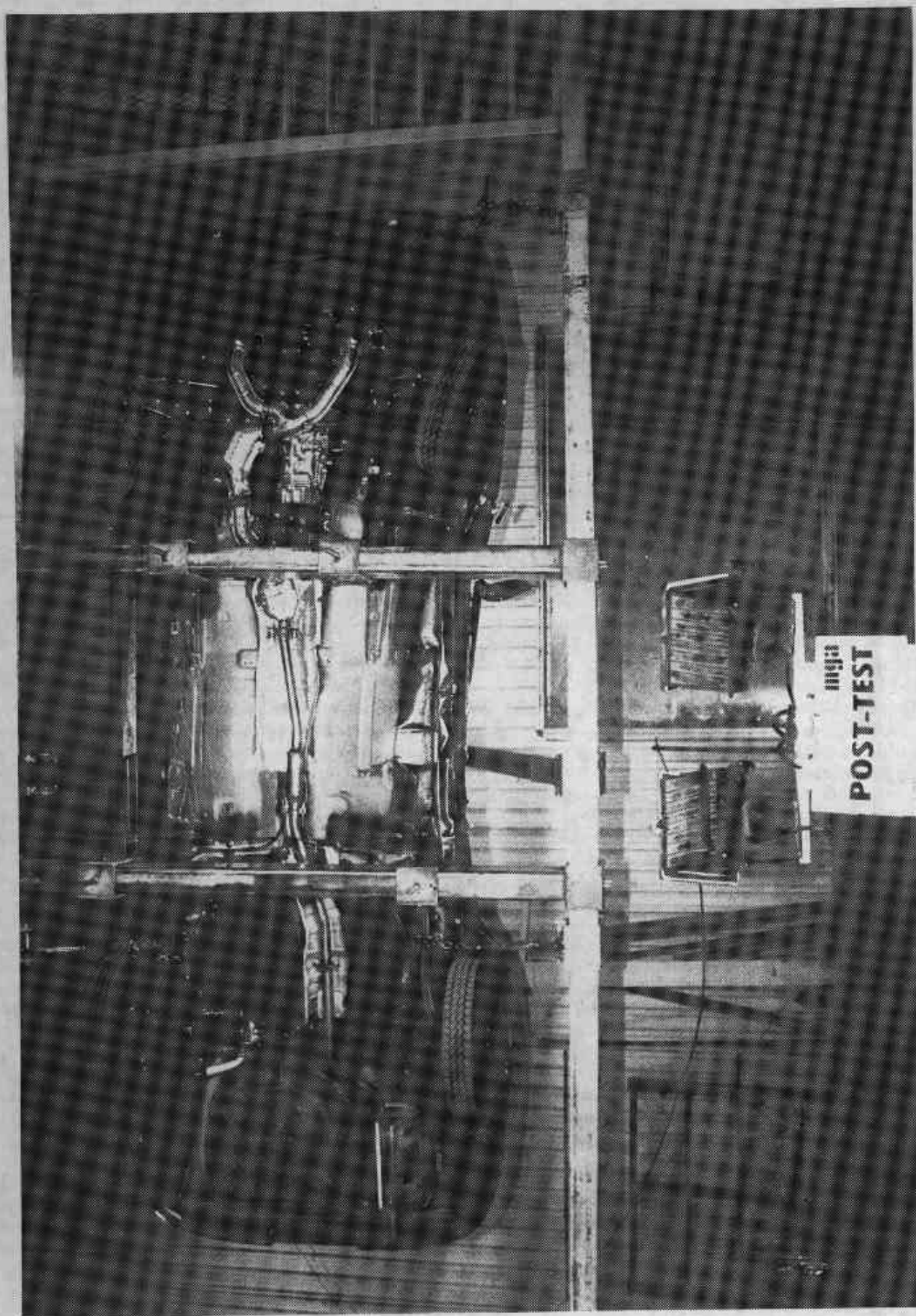


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Photo No. A-41 - Rollover 368°

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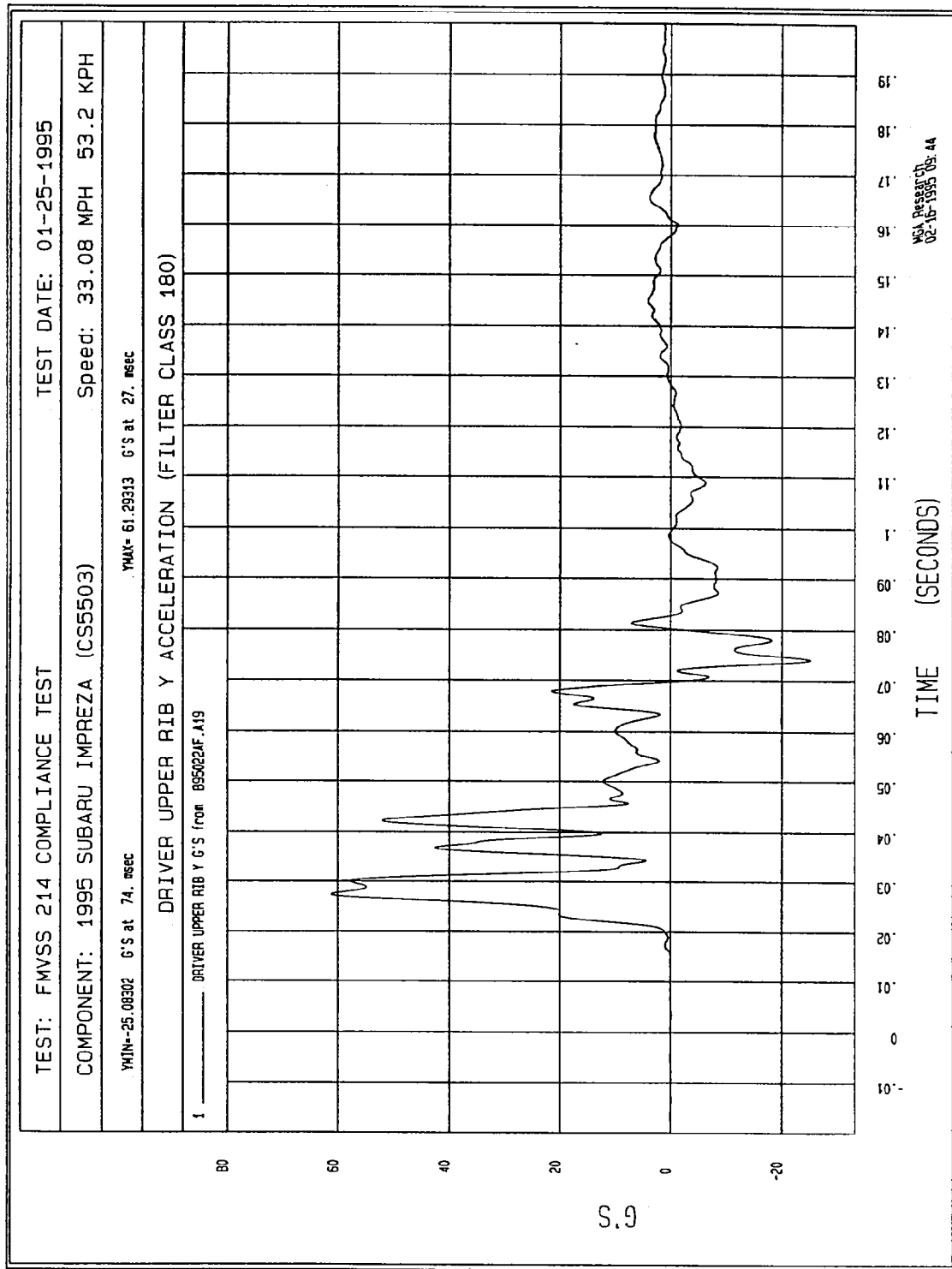


Figure B-1 - Driver Upper Rib Y Acceleration vs. Time

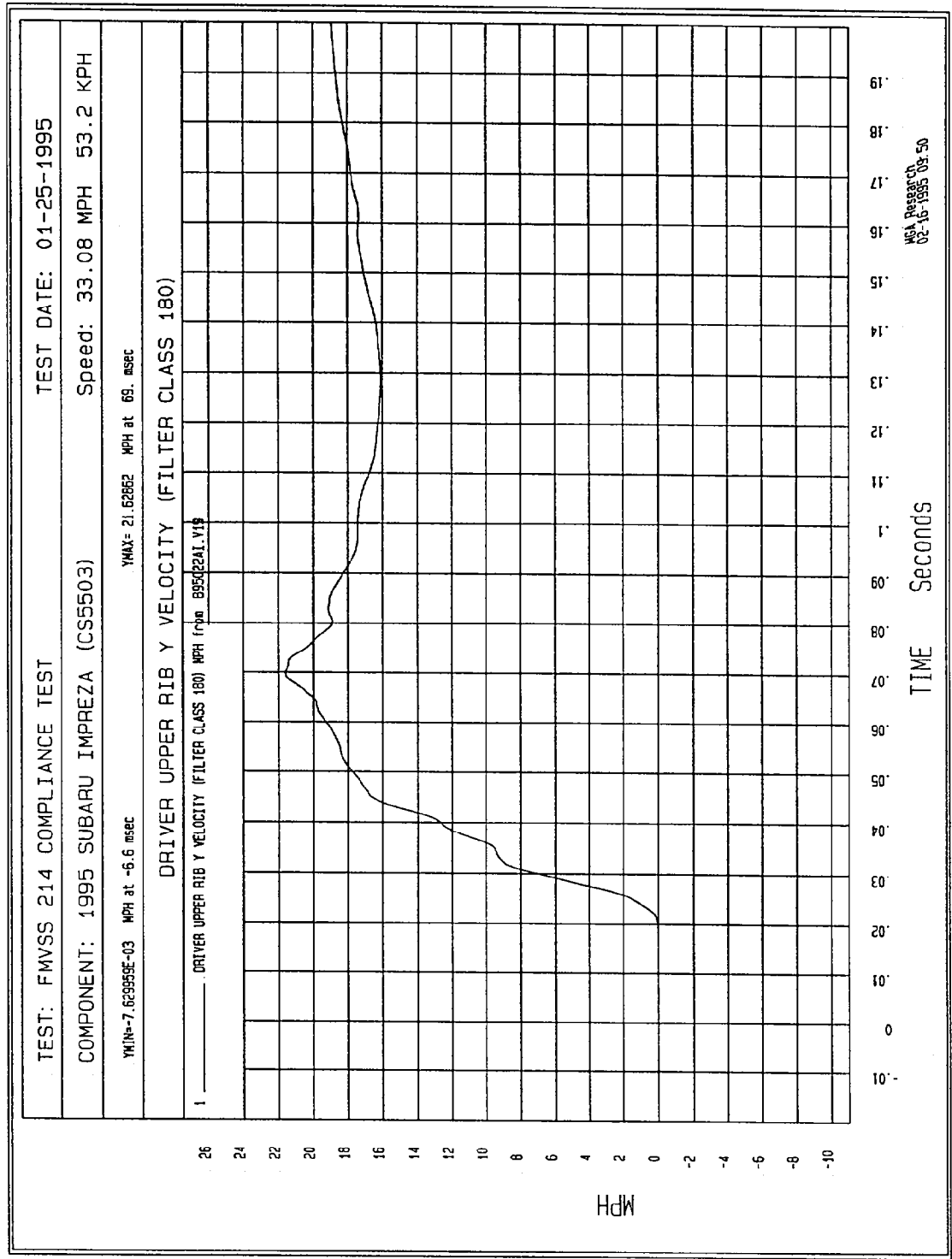


Figure B-2 - Driver Upper Rib Y Velocity vs. Time

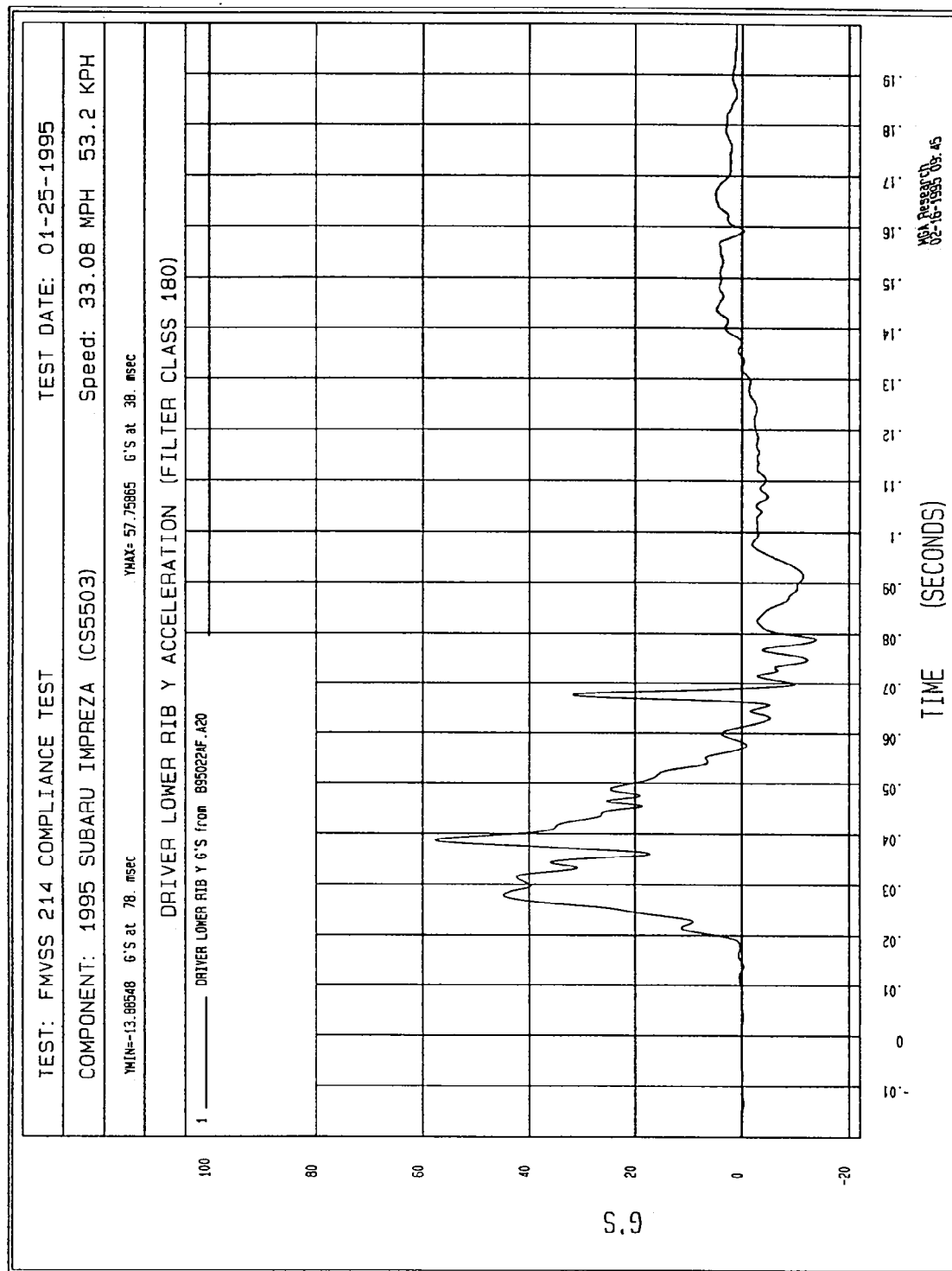


Figure B-3 - Driver Lower Rib Y Acceleration vs. Time

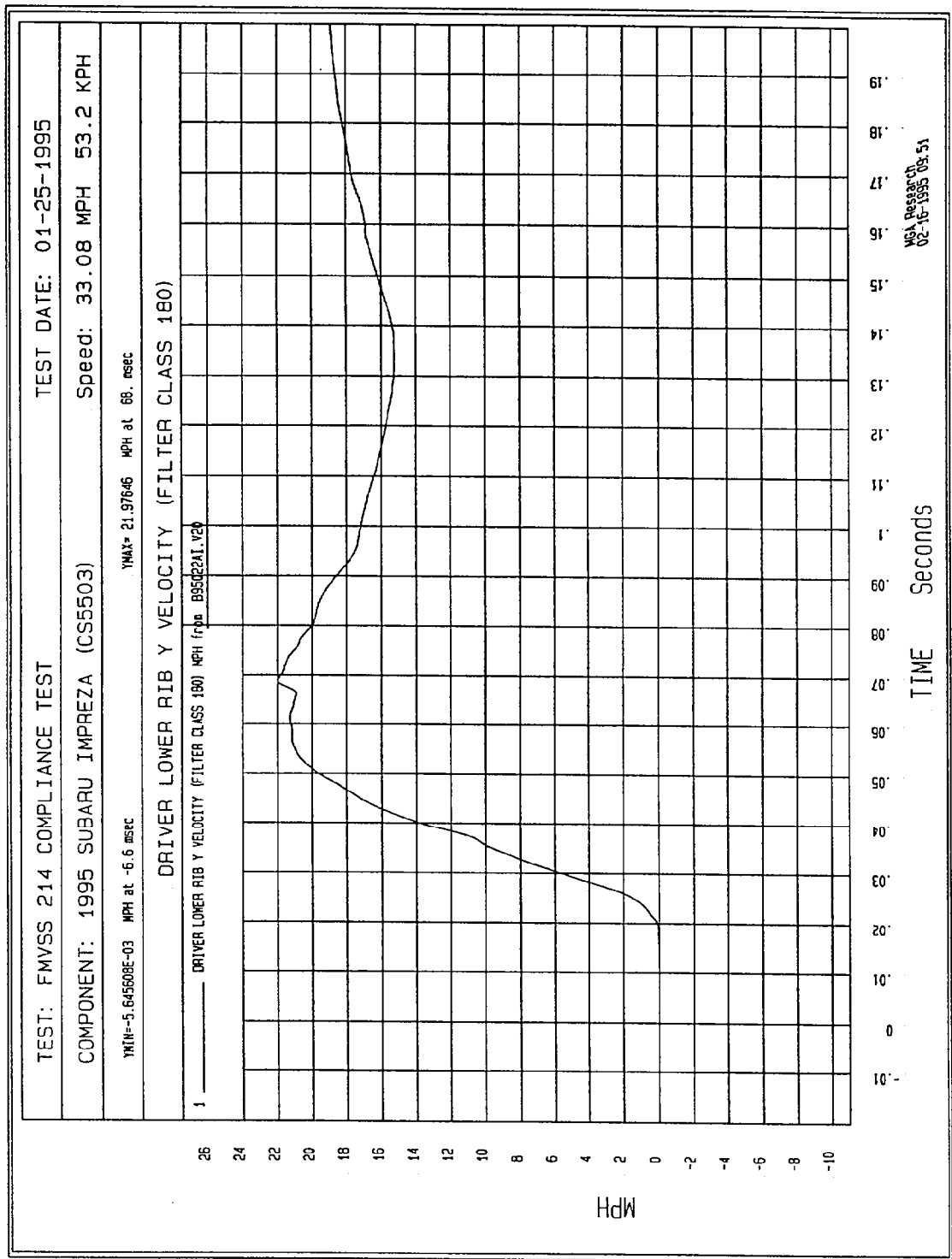


Figure B-4 - Driver Lower Rib Y Velocity vs. Time

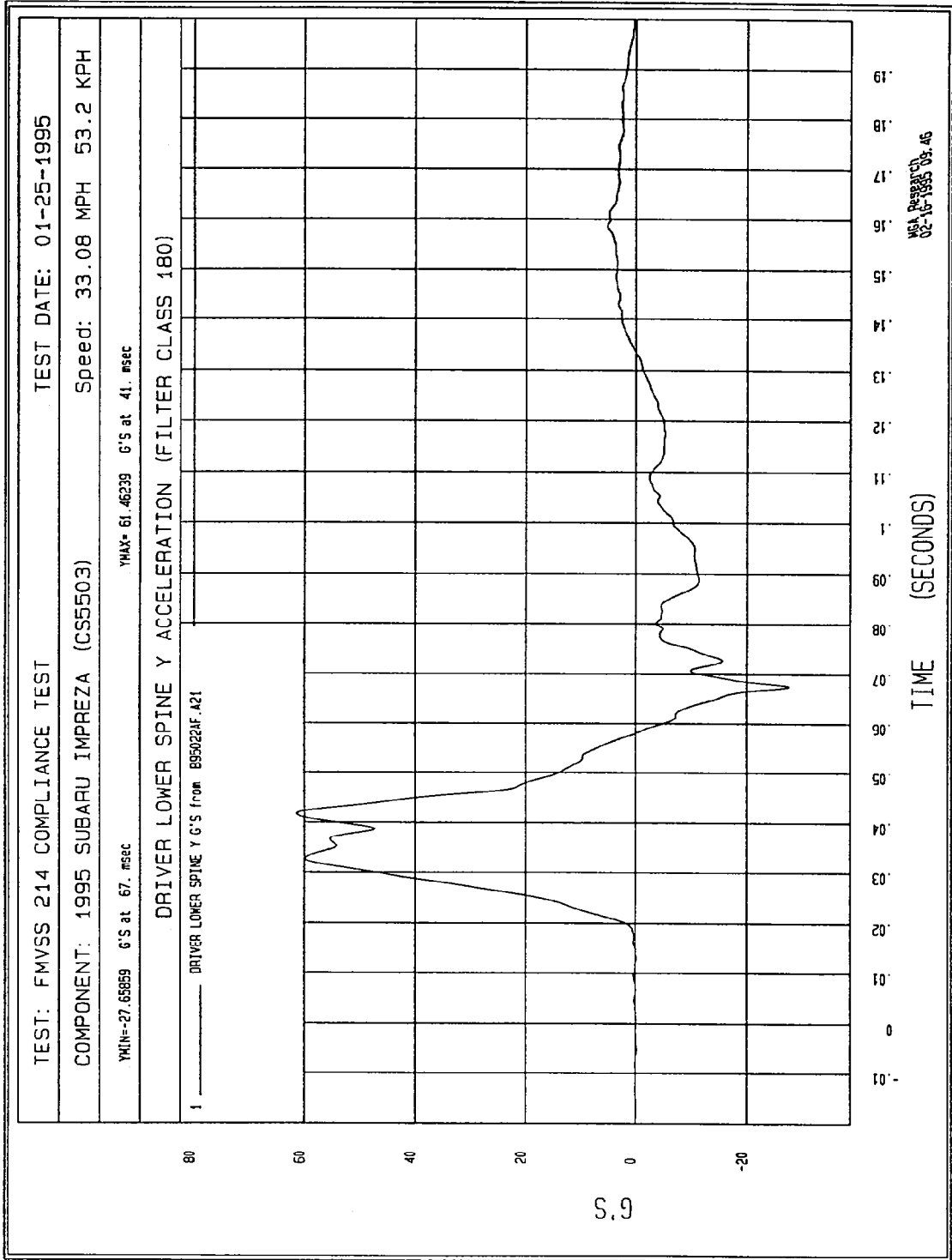


Figure B-5 - Driver Lower Spine Y Acceleration vs. Time

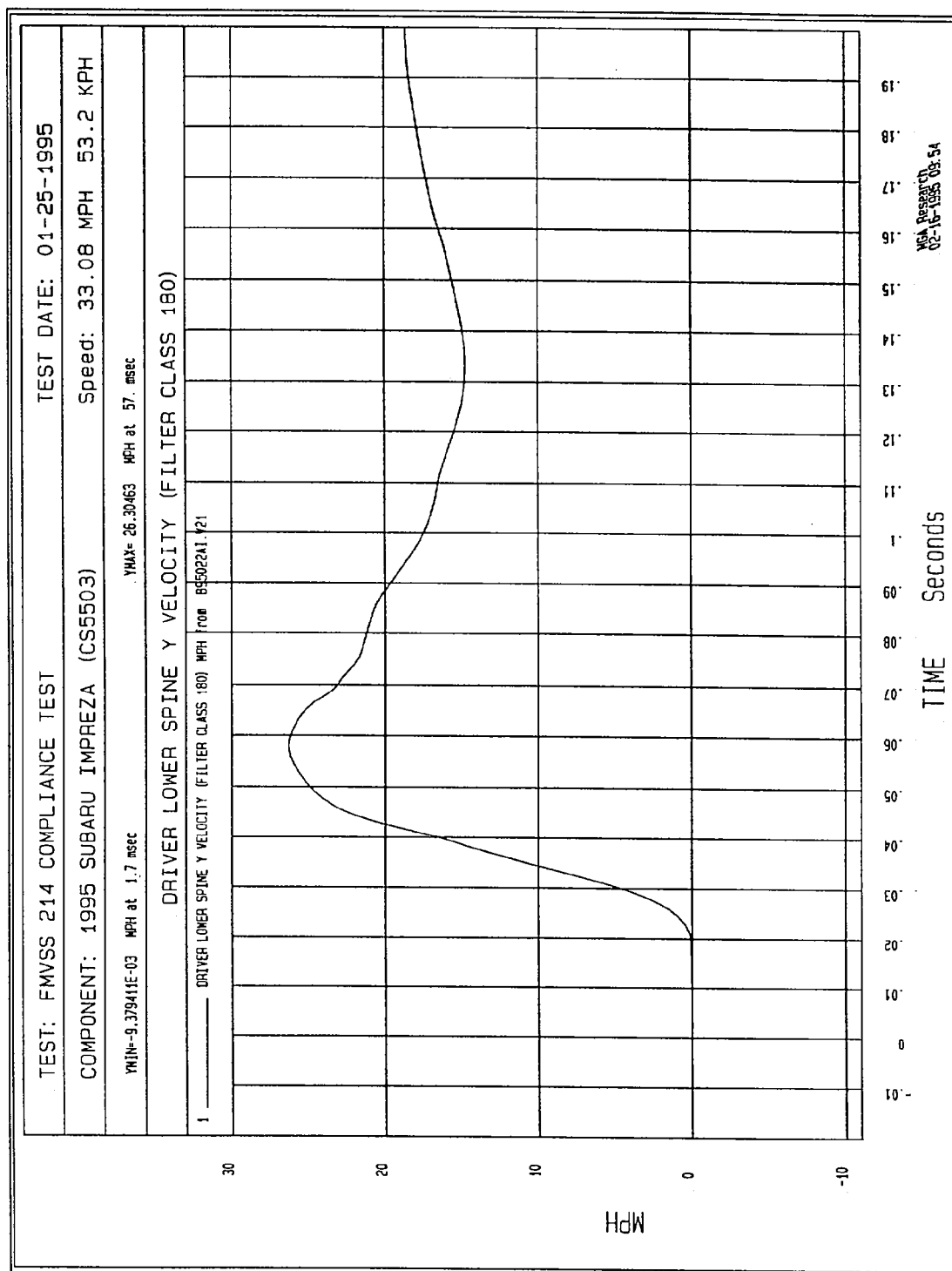


Figure B-6 - Driver Lower Spine Y Velocity vs. Time

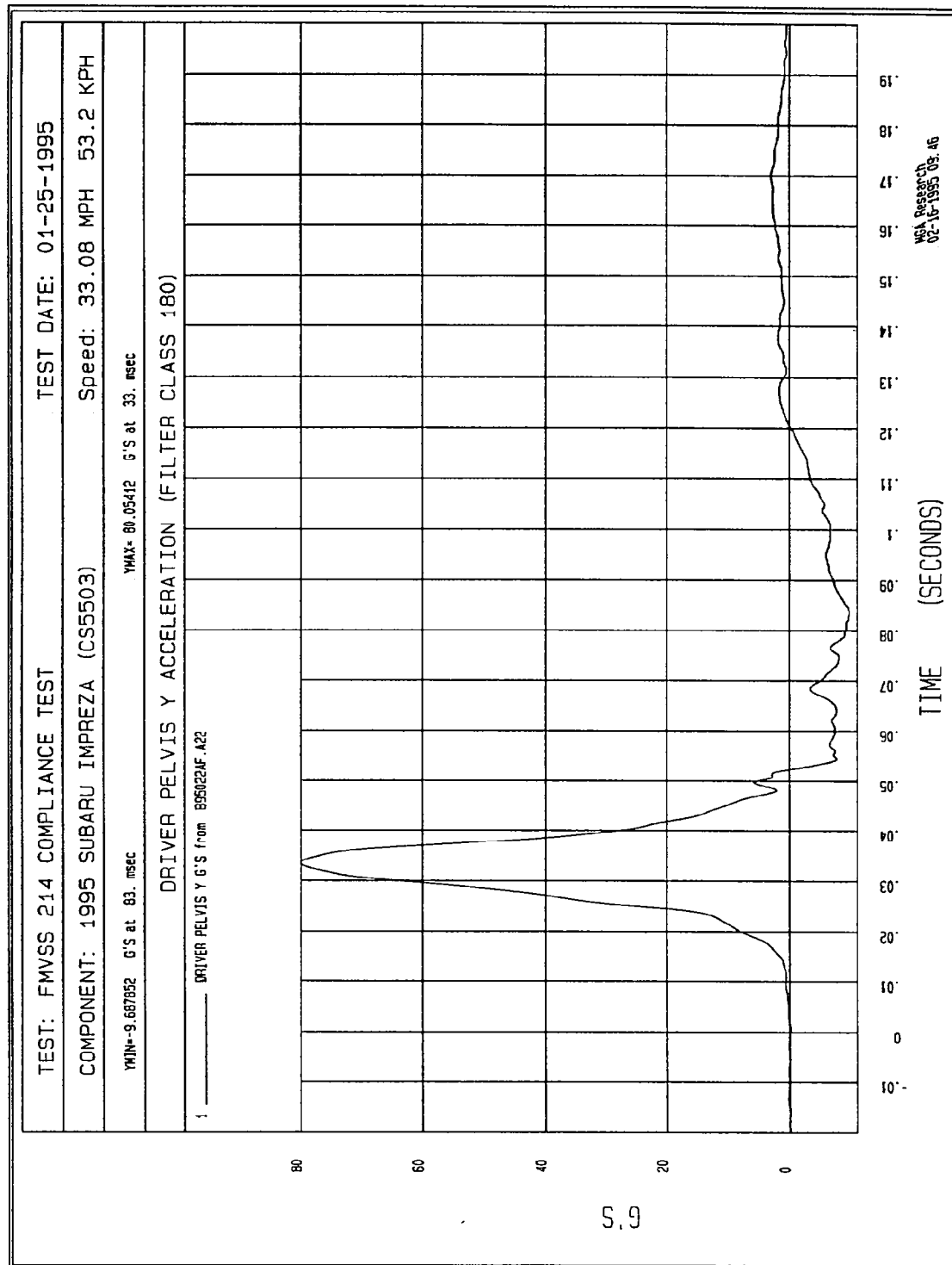


Figure B-7 - Driver Pelvis Y Acceleration vs. Time

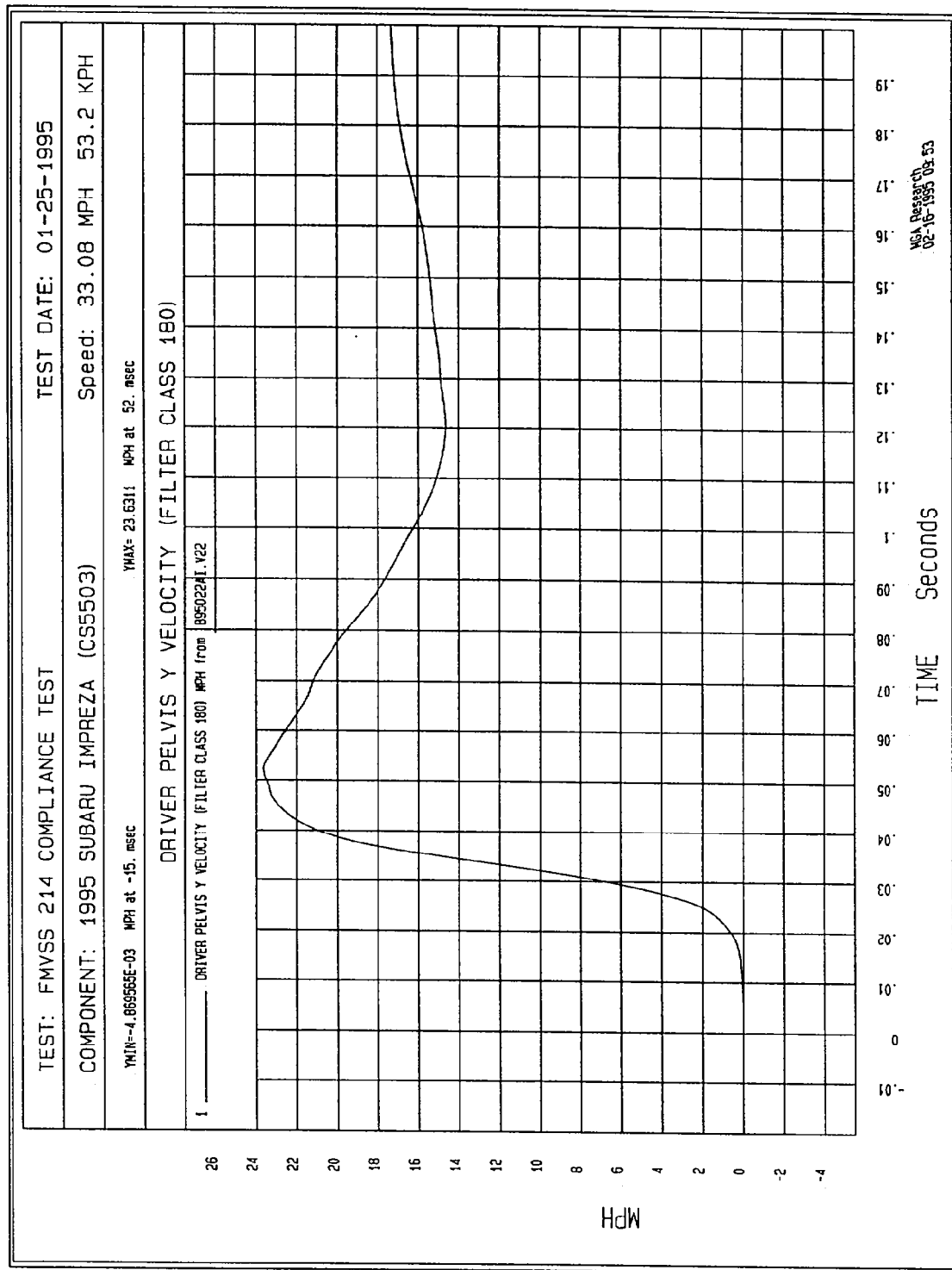


Figure B-8 - Driver Pelvis Y Velocity vs. Time

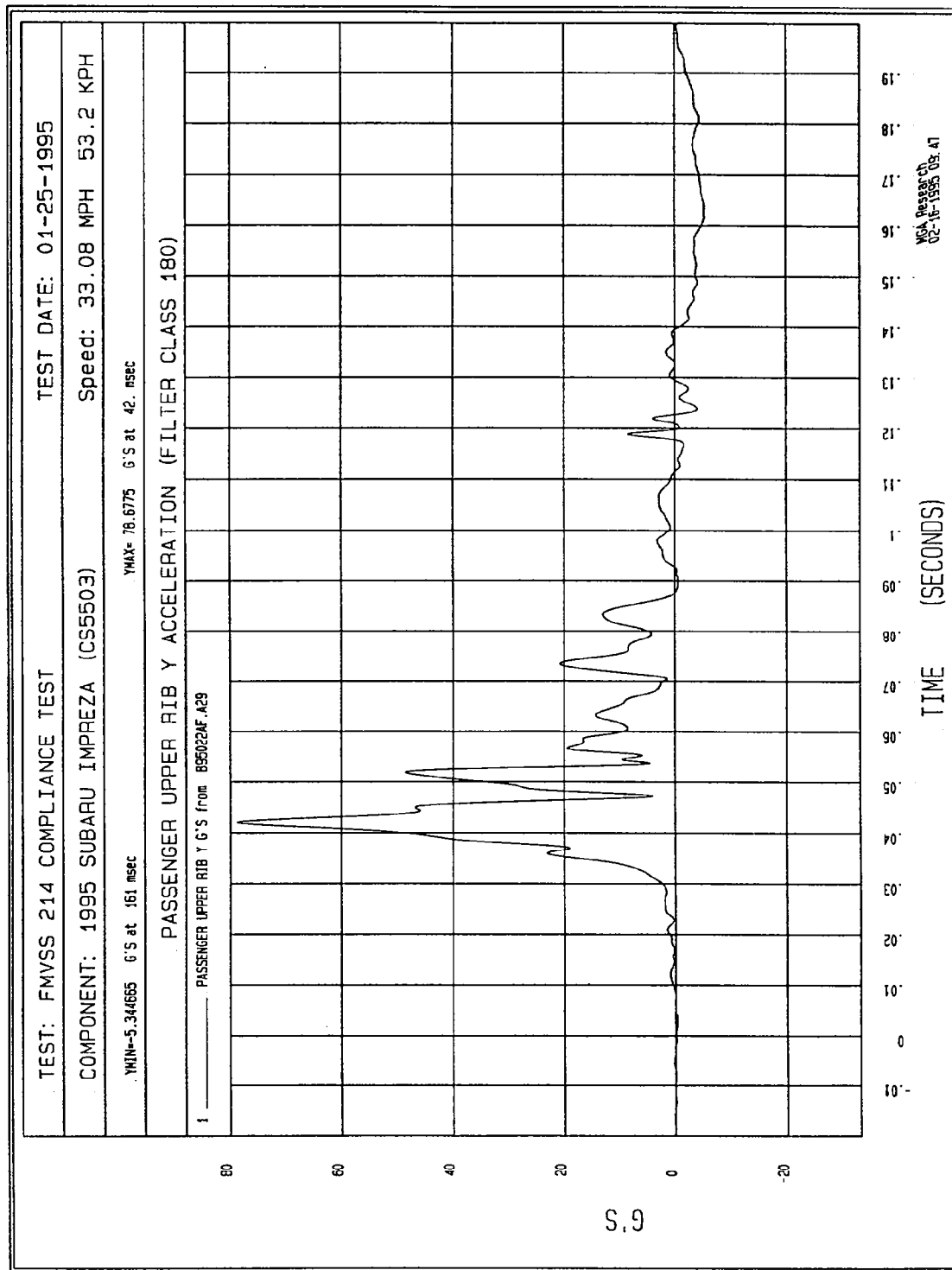


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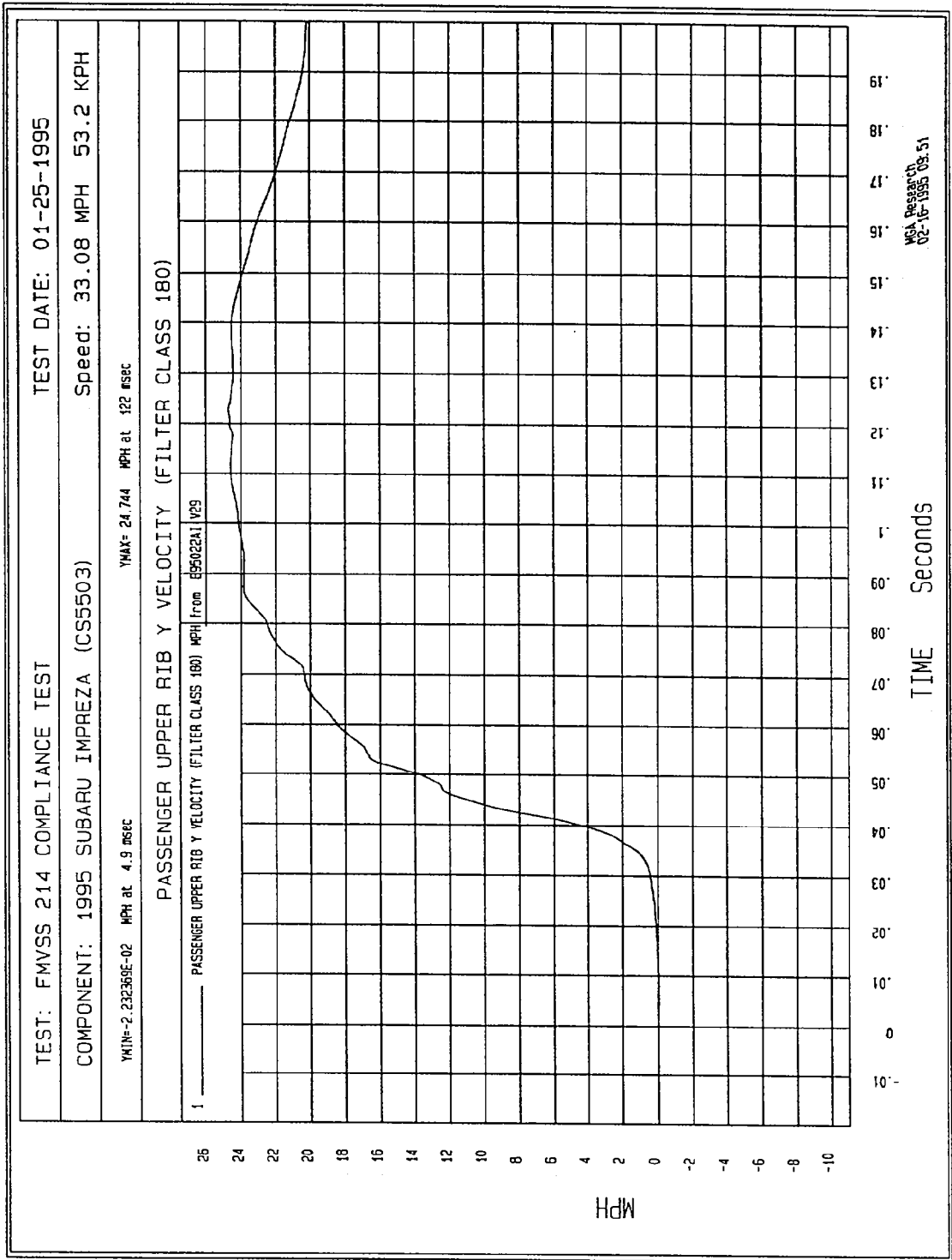


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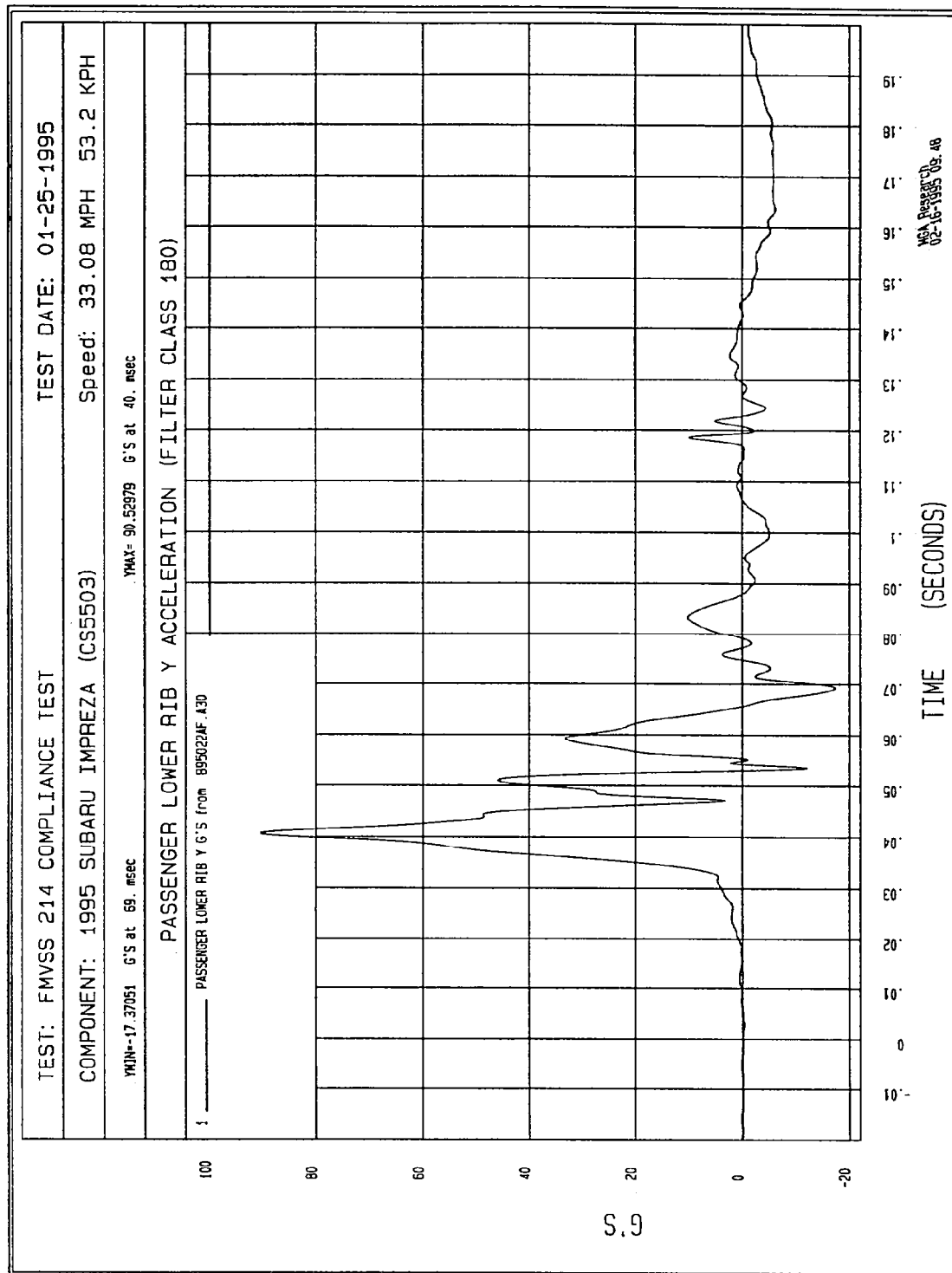


Figure B-11 - Passenger Lower Rib Y Acceleration vs. Time

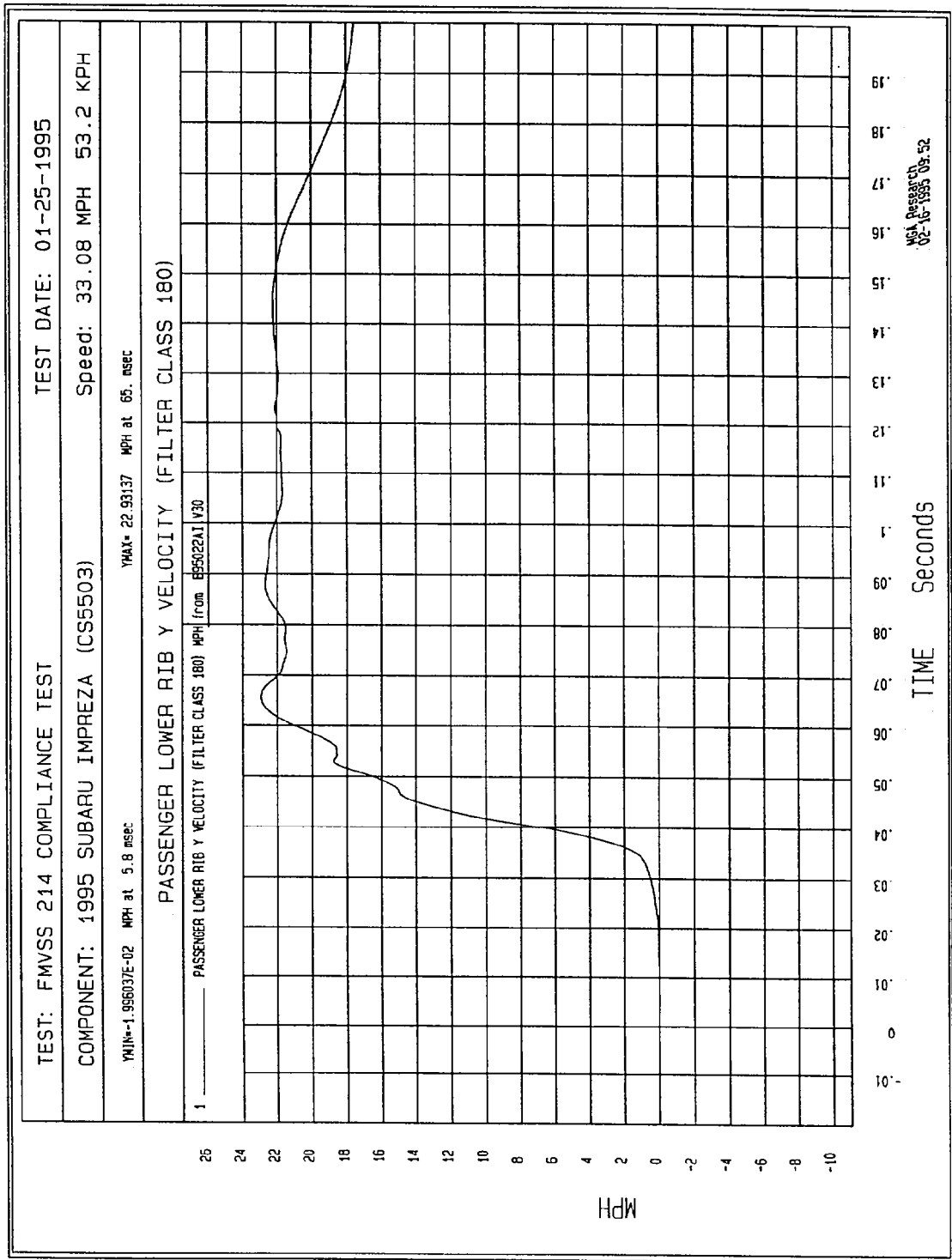


Figure B-12 - Passenger Lower Rib Y Velocity vs. Time

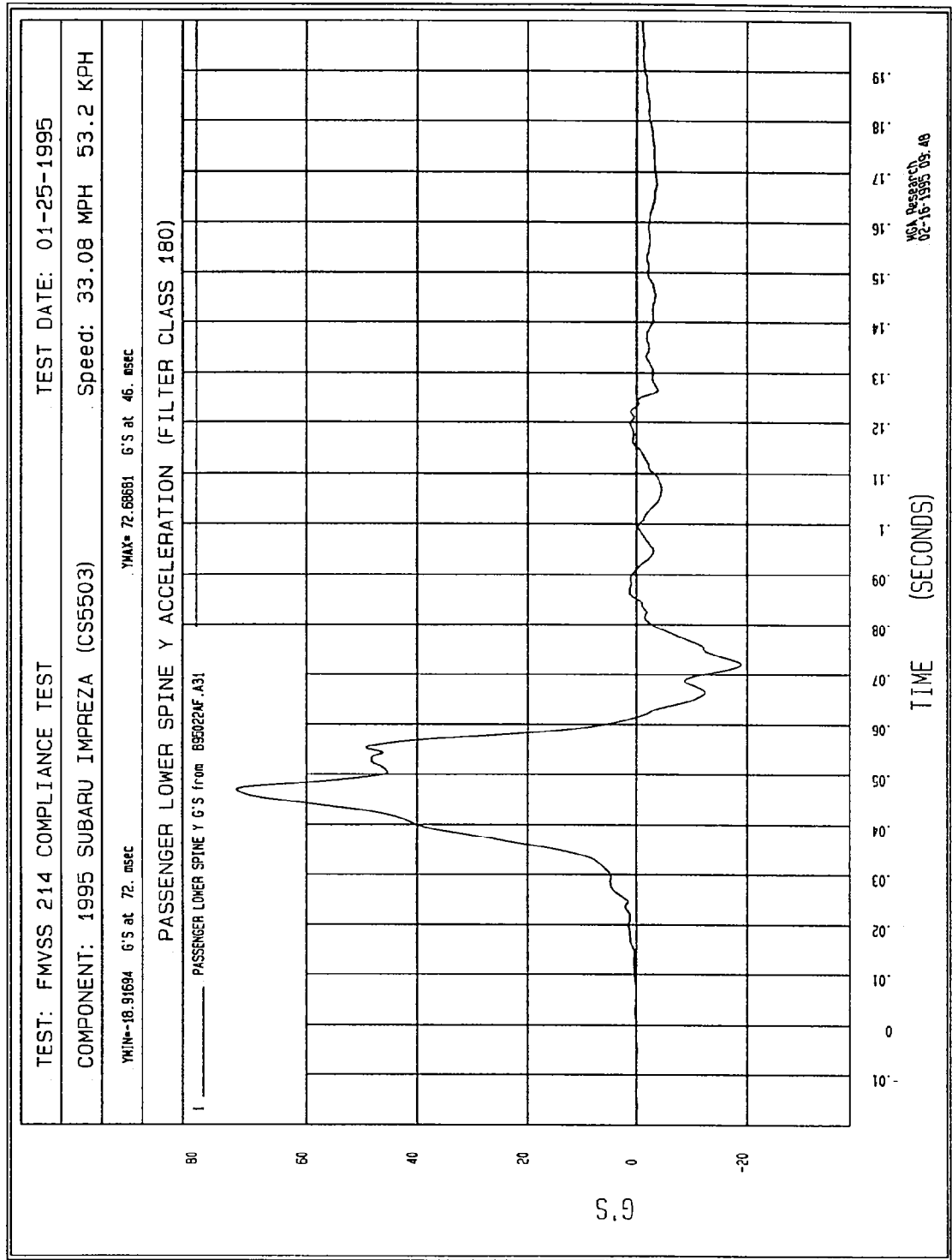


Figure B-13 - Passenger Lower Spine Y Acceleration vs. Time

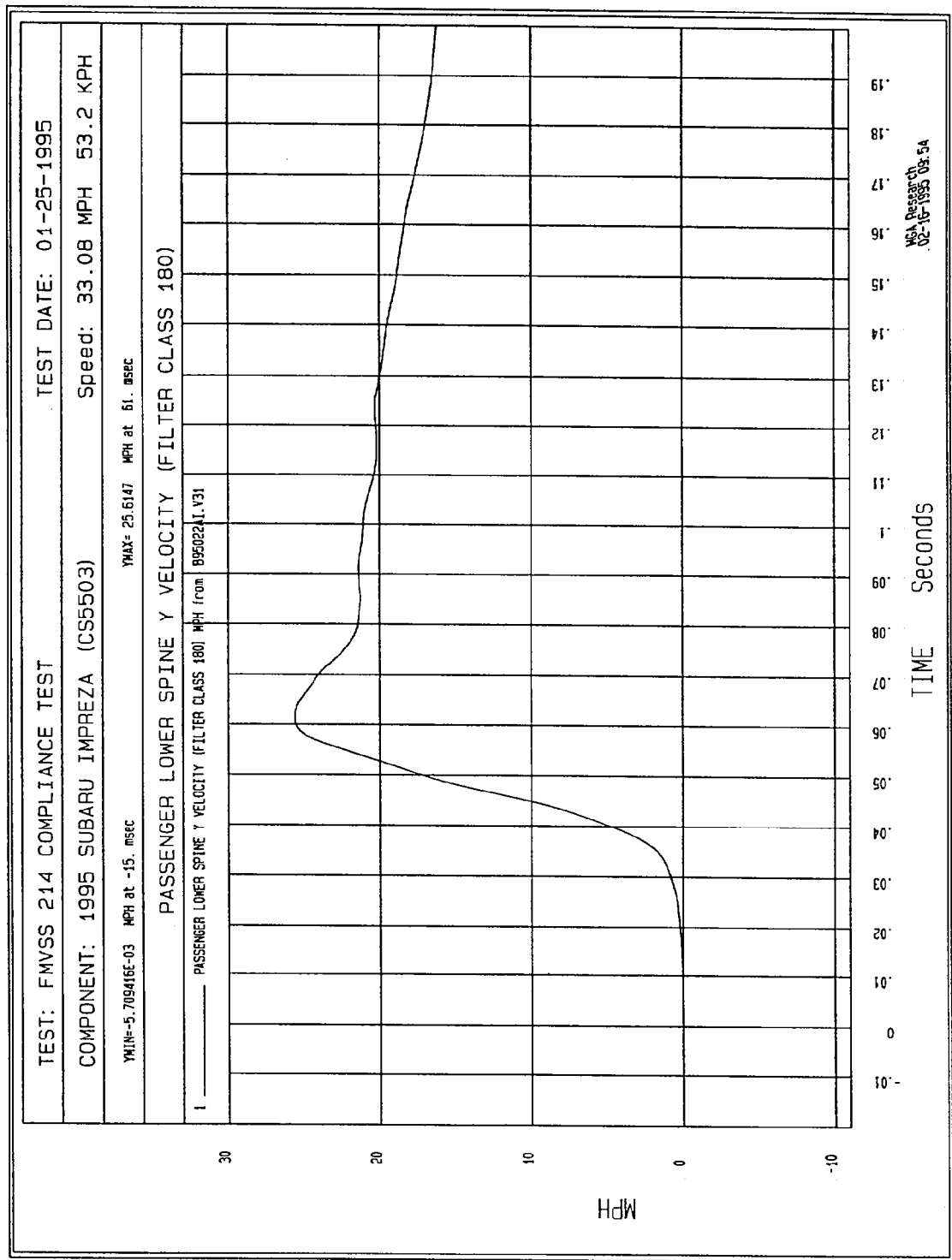


Figure B-14 - Passenger Lower Spine Y Velocity vs. Time

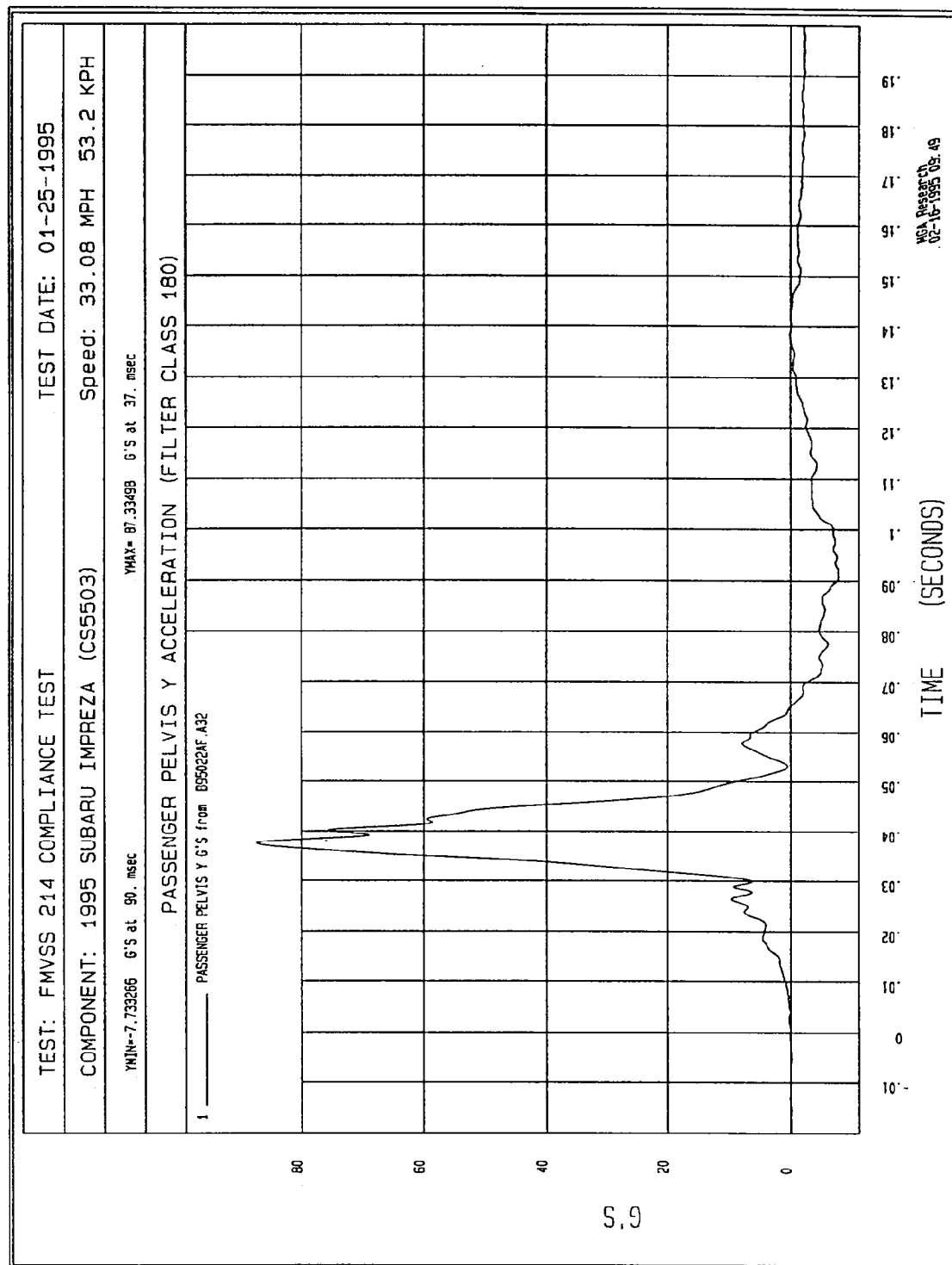


Figure B-15 - Passenger Pelvis Y Acceleration vs. Time

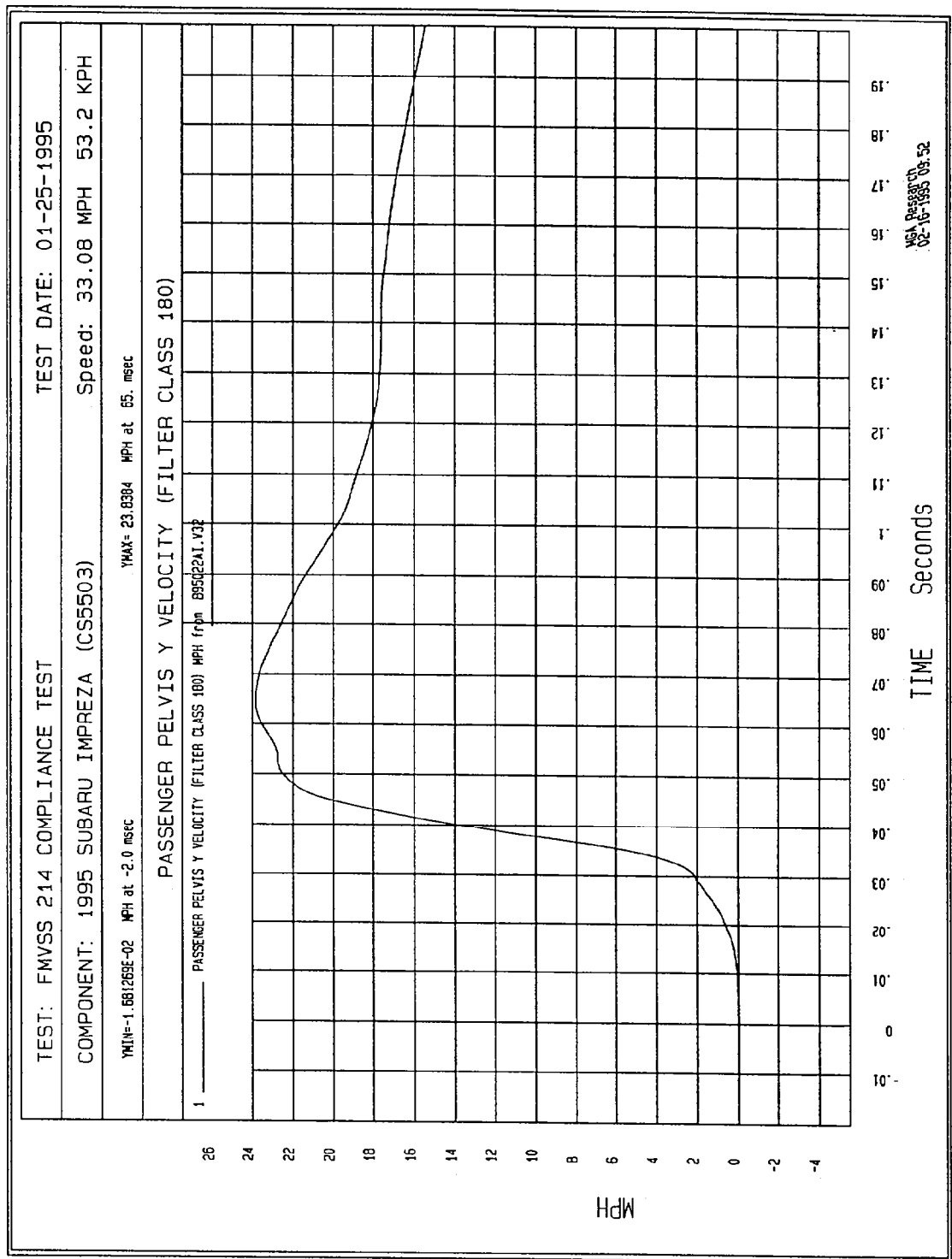


Figure B-16 - Passenger Pelvis Y Velocity vs. Time

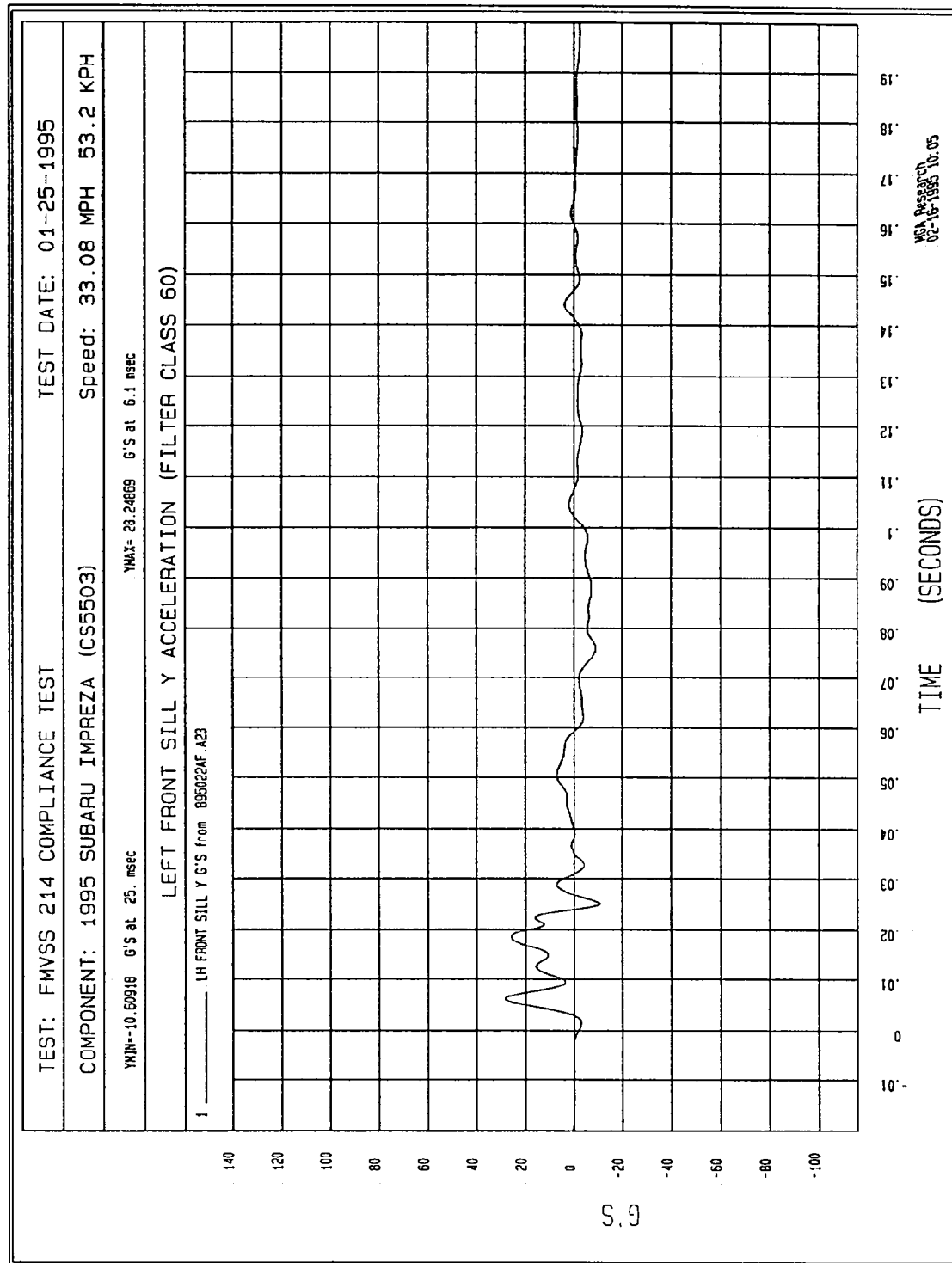


Figure B-17 - Left Front Sill Y Acceleration vs. Time

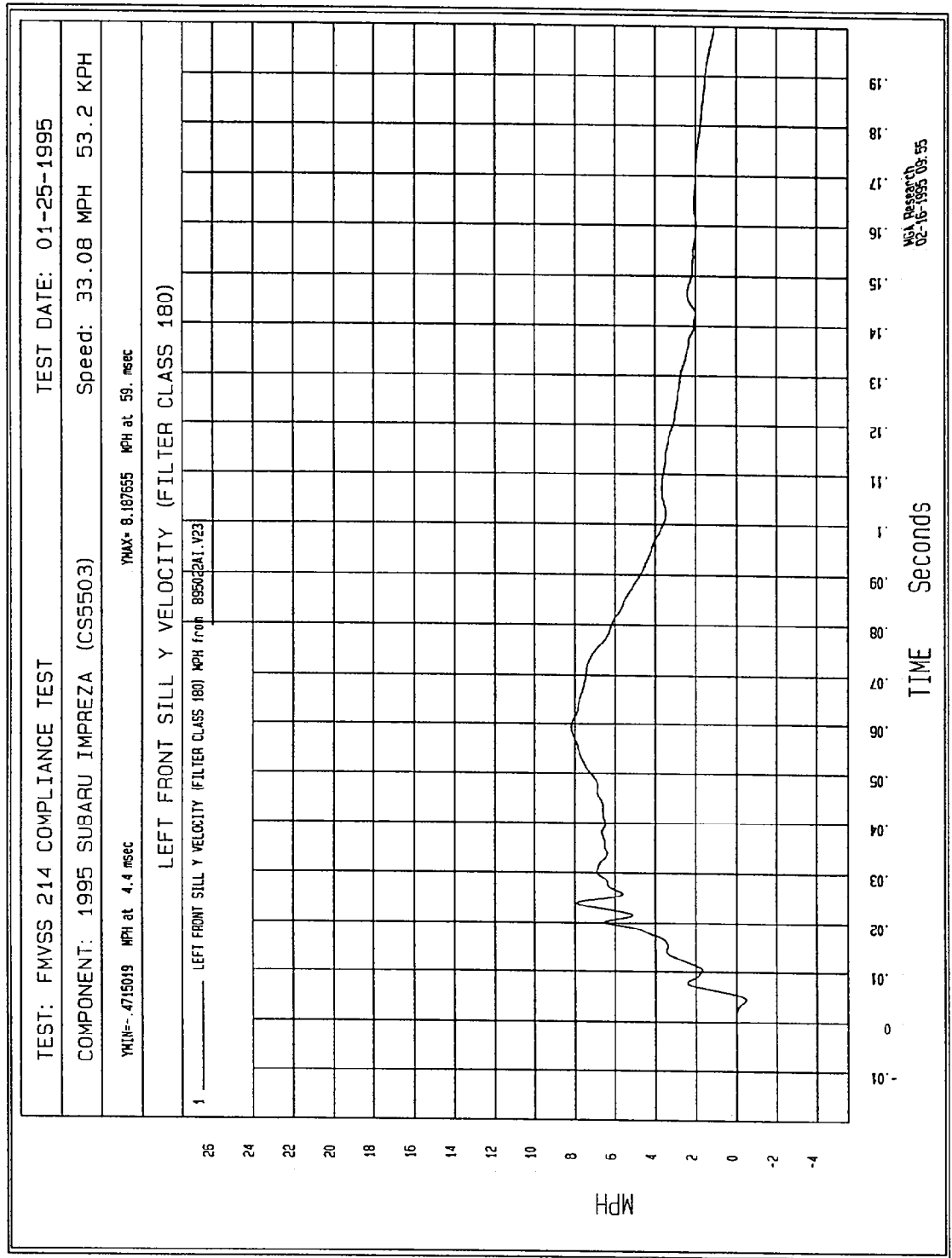


Figure B-18 - Left Front Sill Y Velocity vs. Time

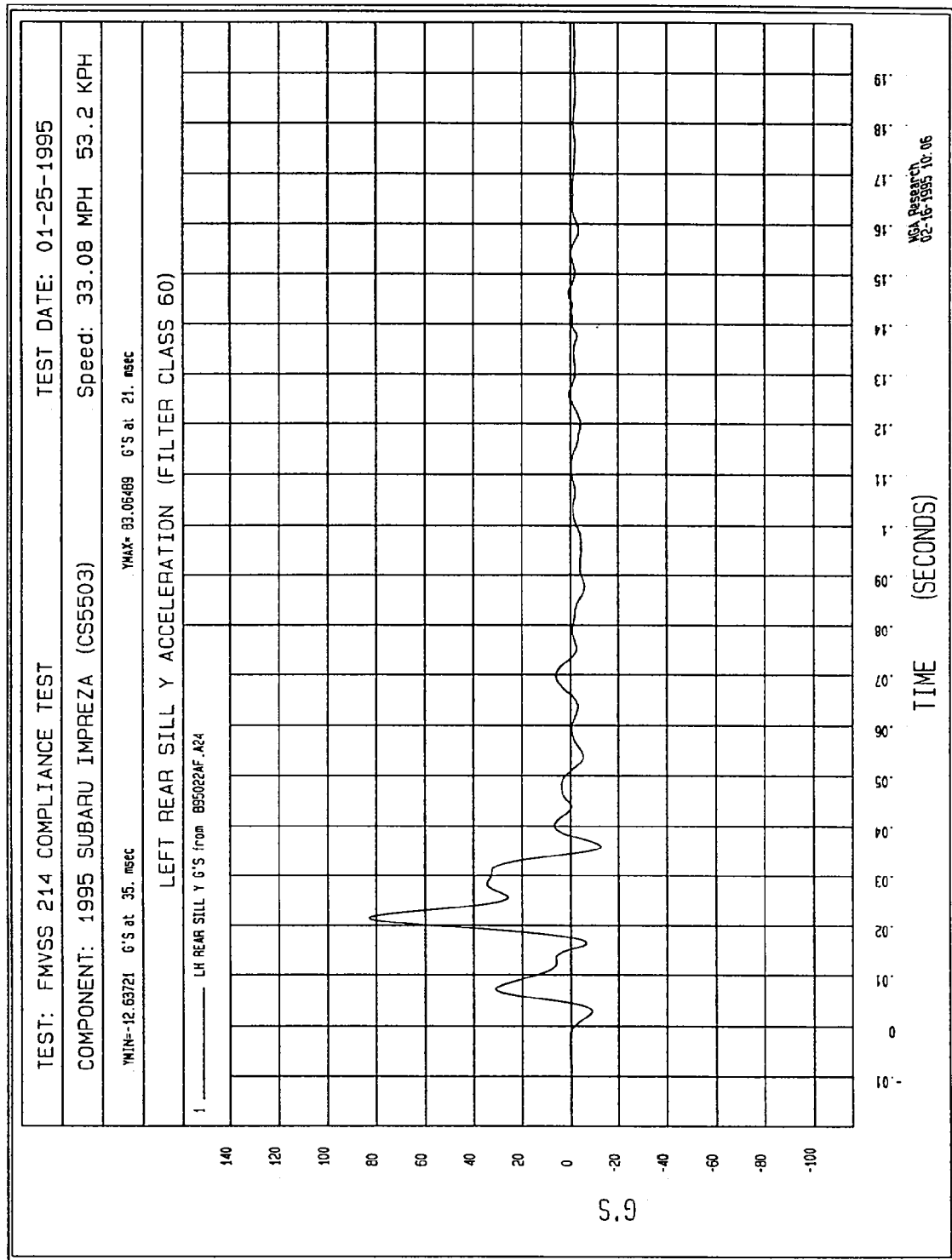


Figure B-19 - Left Rear Sill Y Acceleration vs. Time

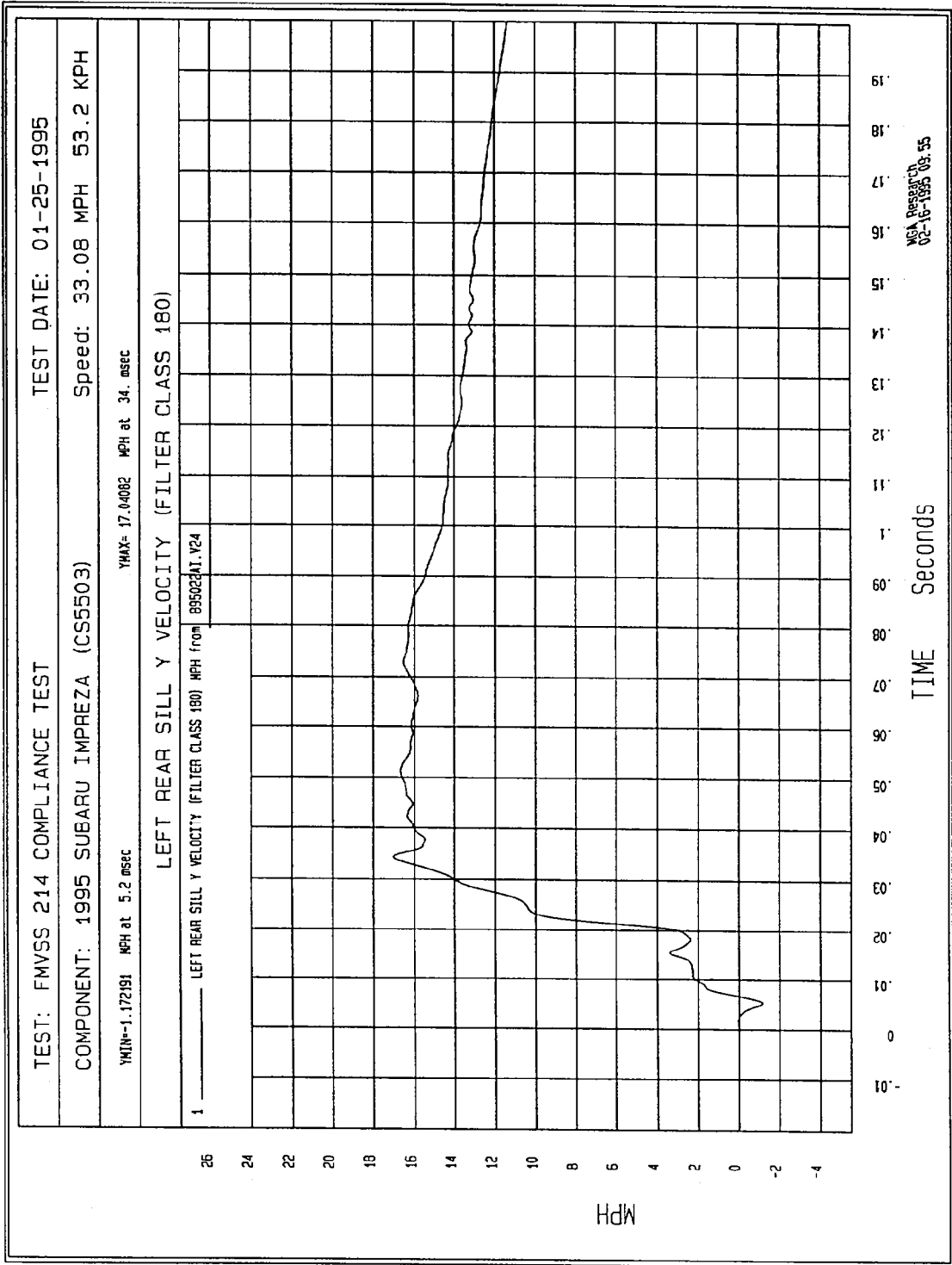


Figure B-20 - Left Rear Sill Y Velocity vs. Time

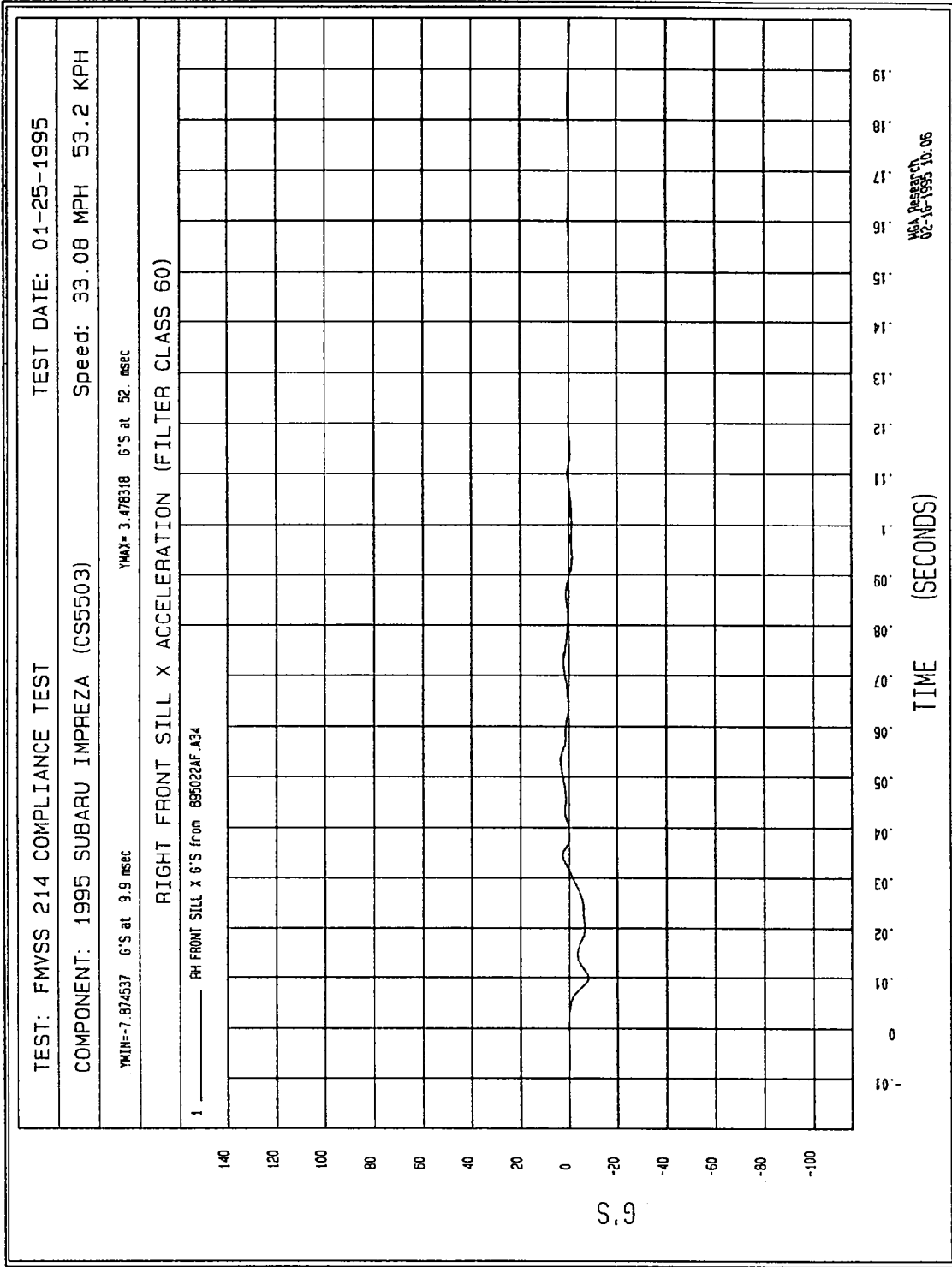


Figure B-21 - Right Front Sill X Acceleration vs. Time

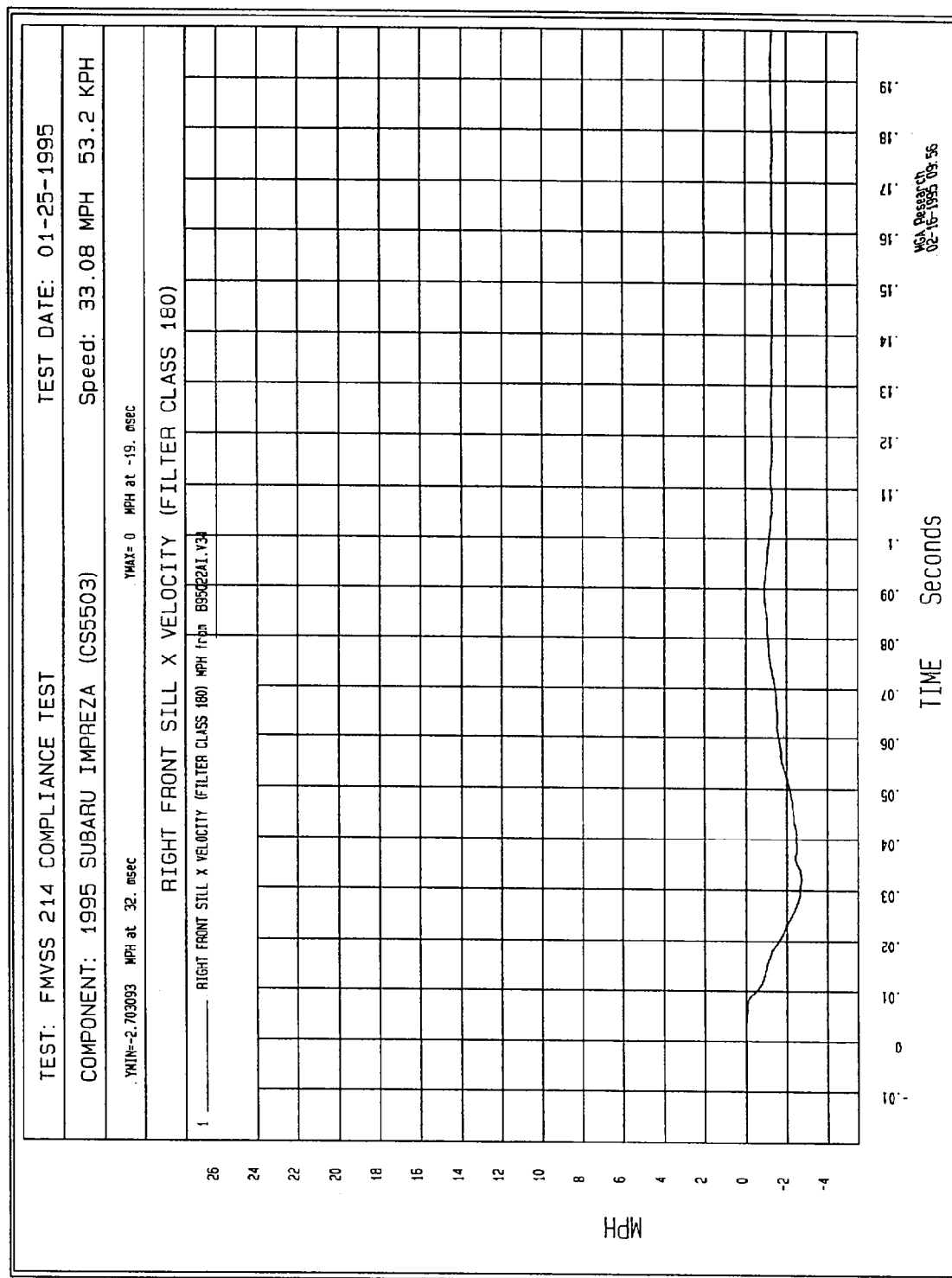


Figure B-22 - Right Front Sill X Velocity vs. Time

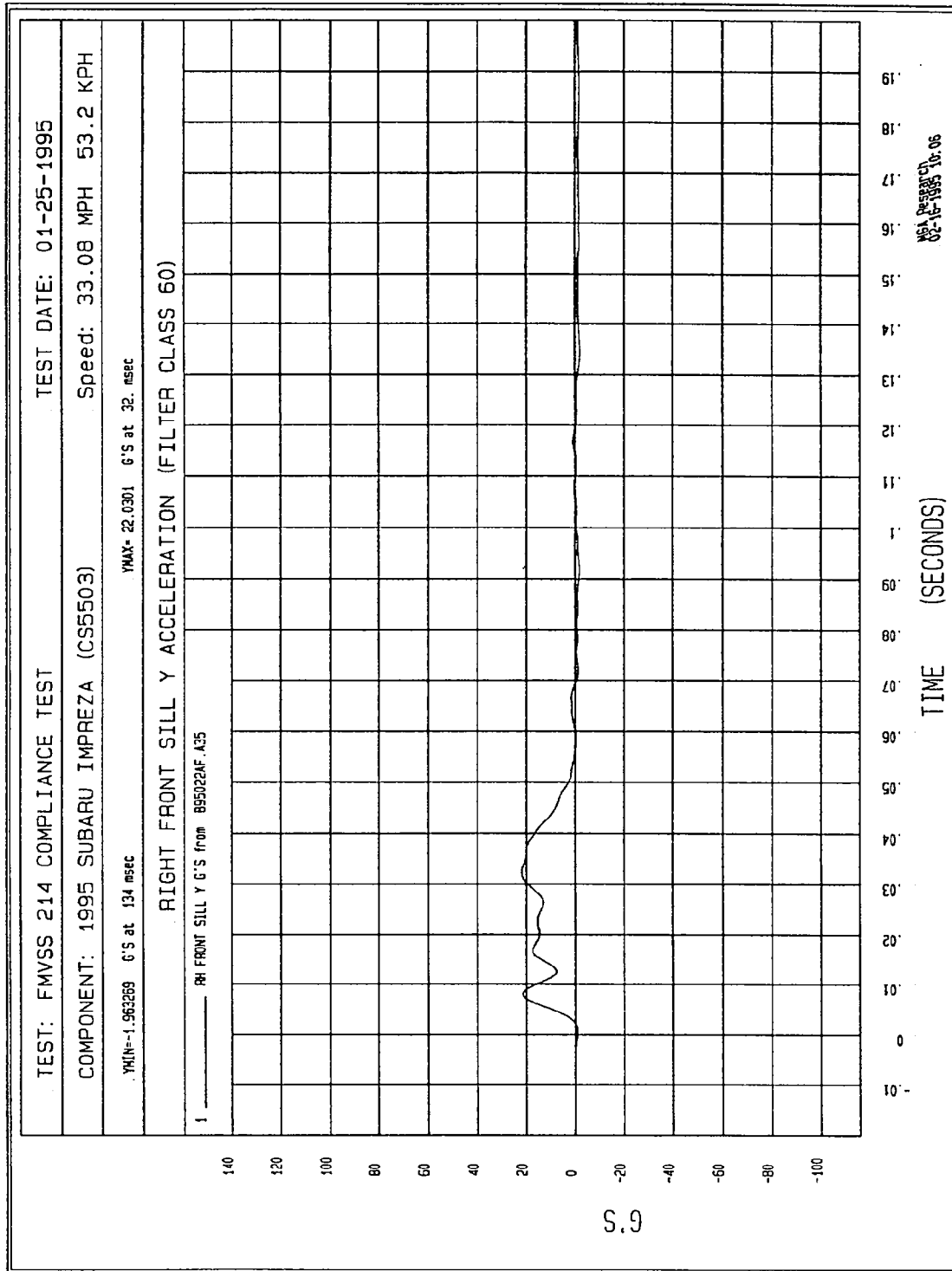


Figure B-23 - Right Front Sill Y Acceleration vs. Time

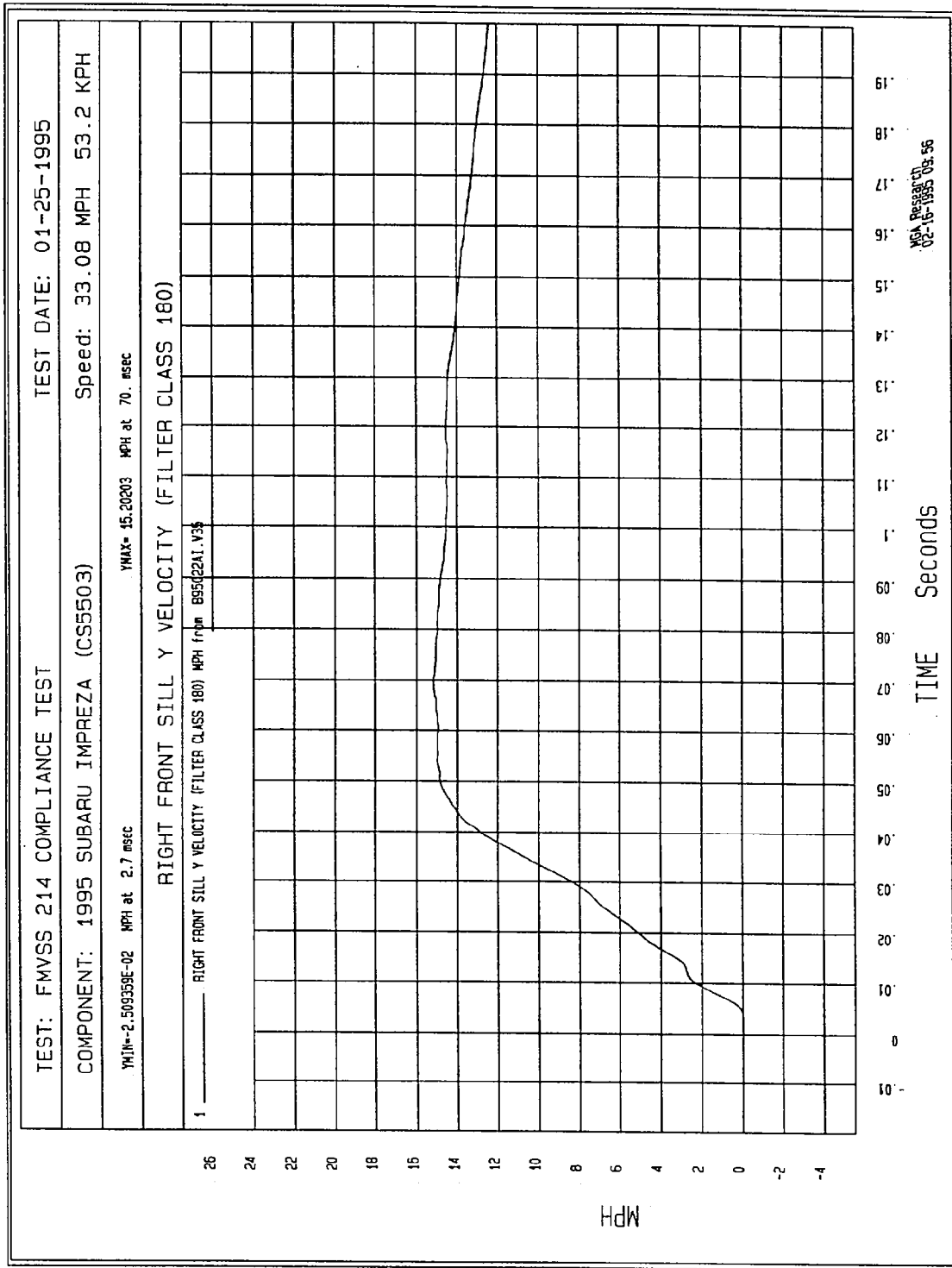


Figure B-24 - Right Front Sill Y Velocity vs. Time

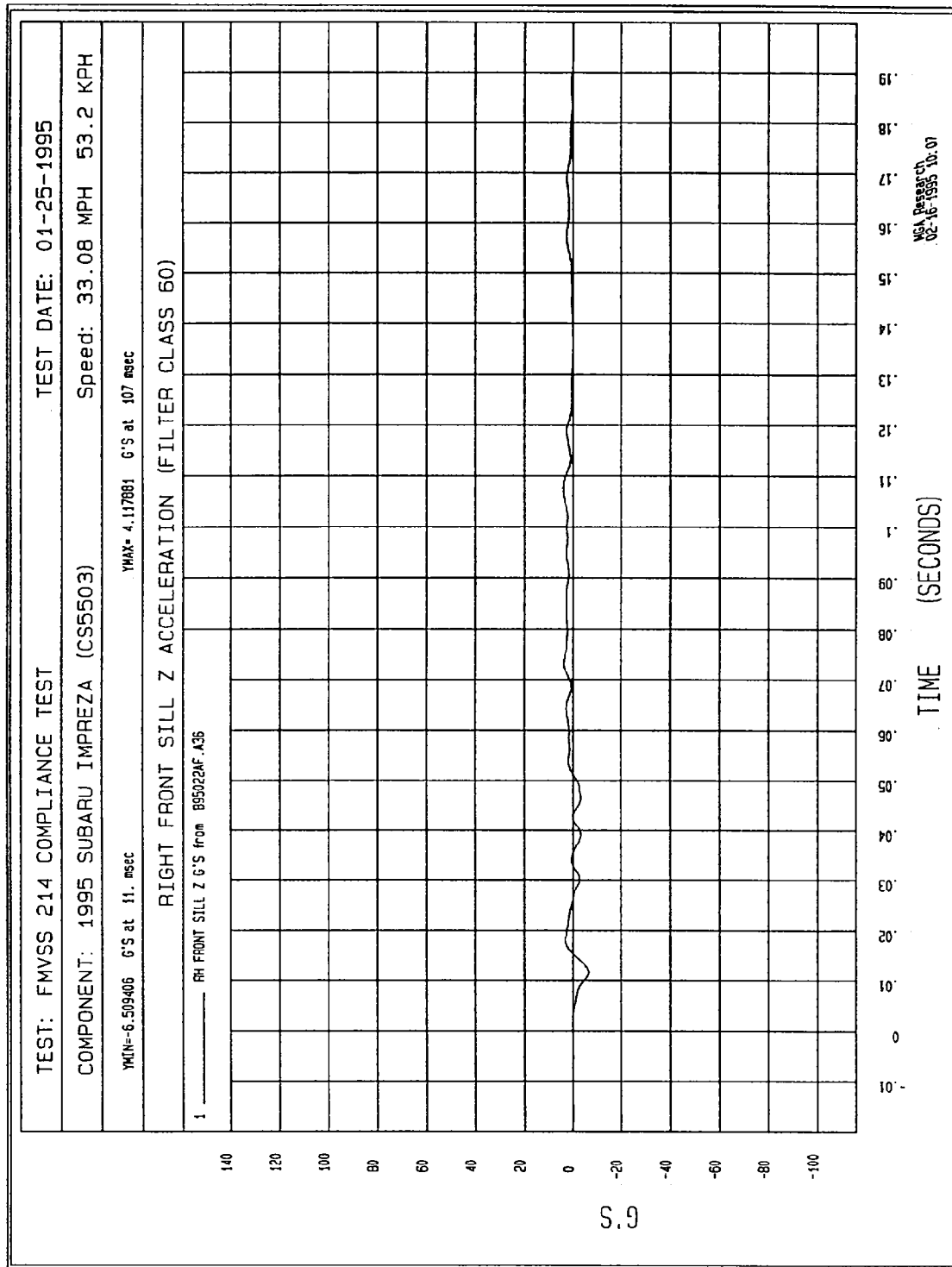


Figure B-25 - Right Front Sill Z Acceleration vs. Time

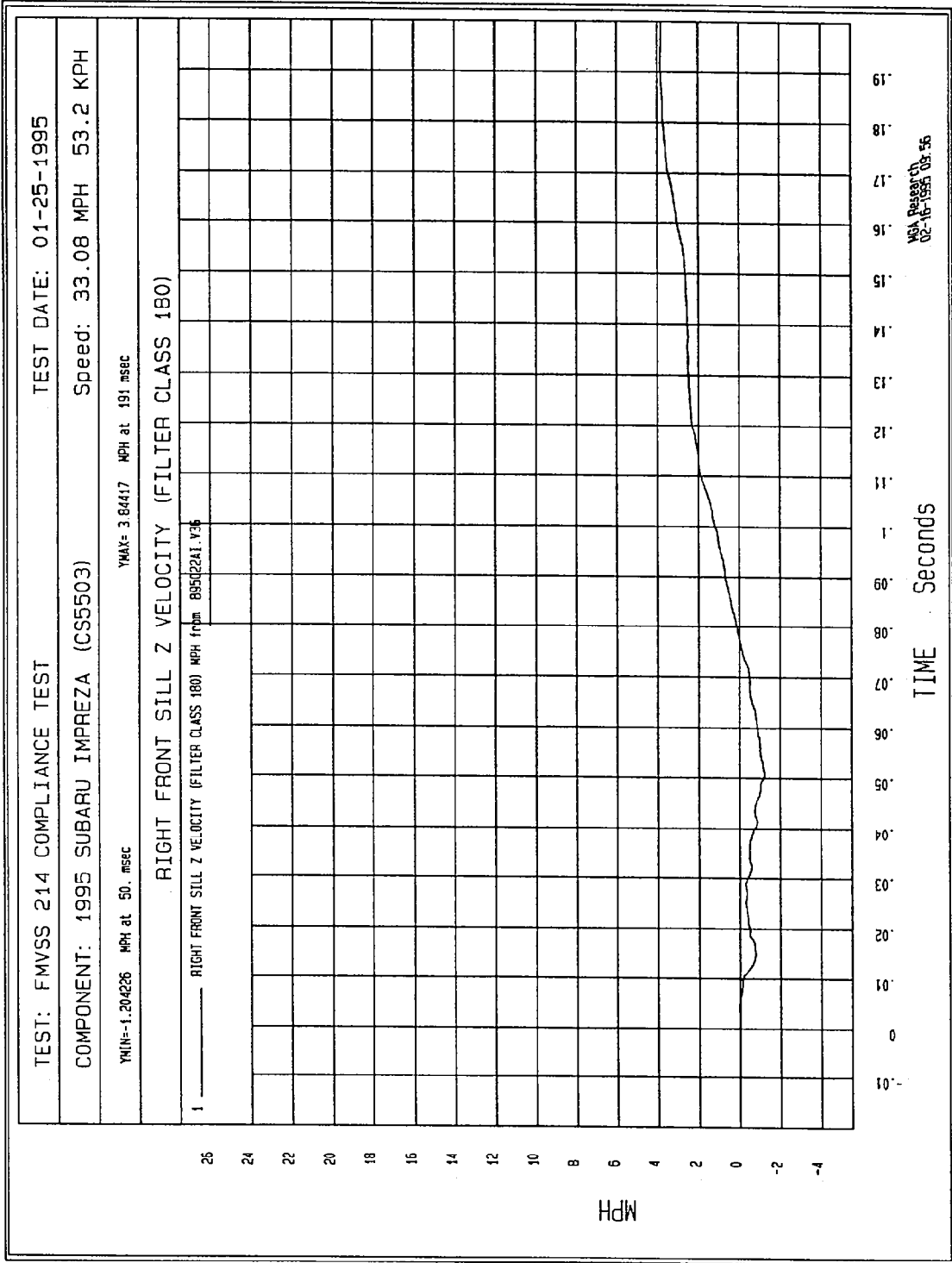


Figure B-26 - Right Front Sill Z Velocity vs. Time

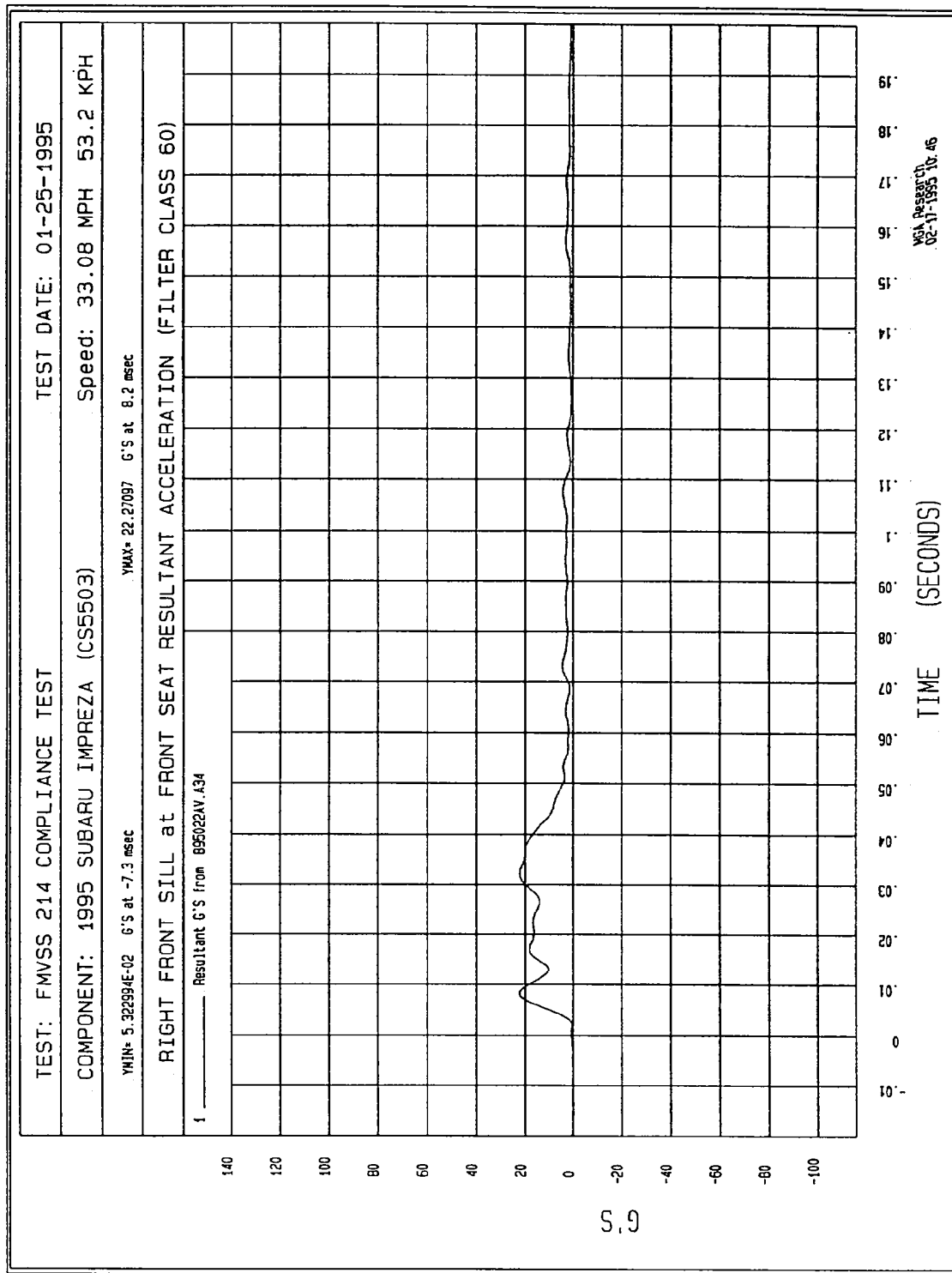


Figure B-27 - Right Front Sill at Front Seat Resultant vs. Time

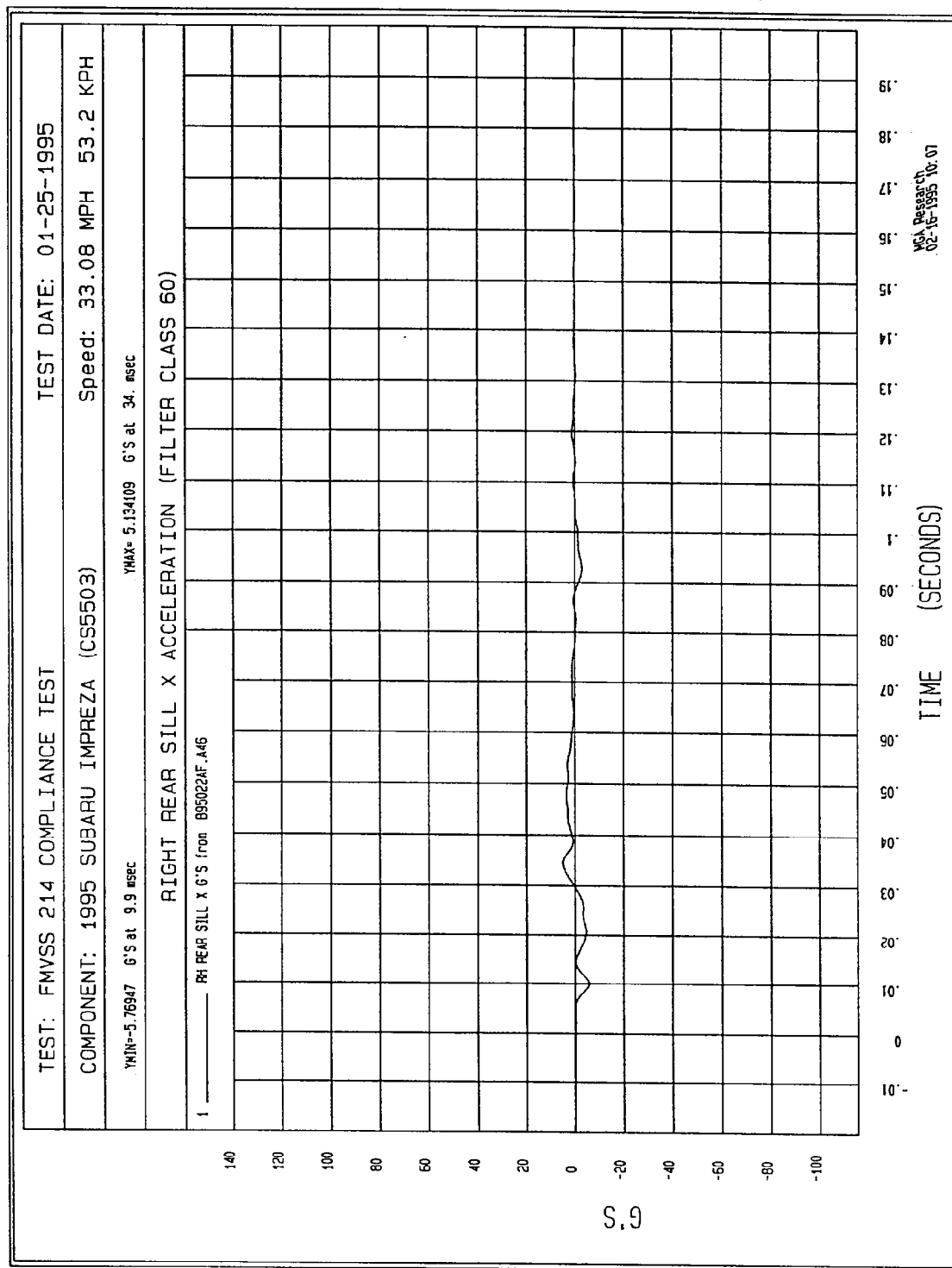


Figure B-28 - Right Rear Sill X Acceleration vs. Time

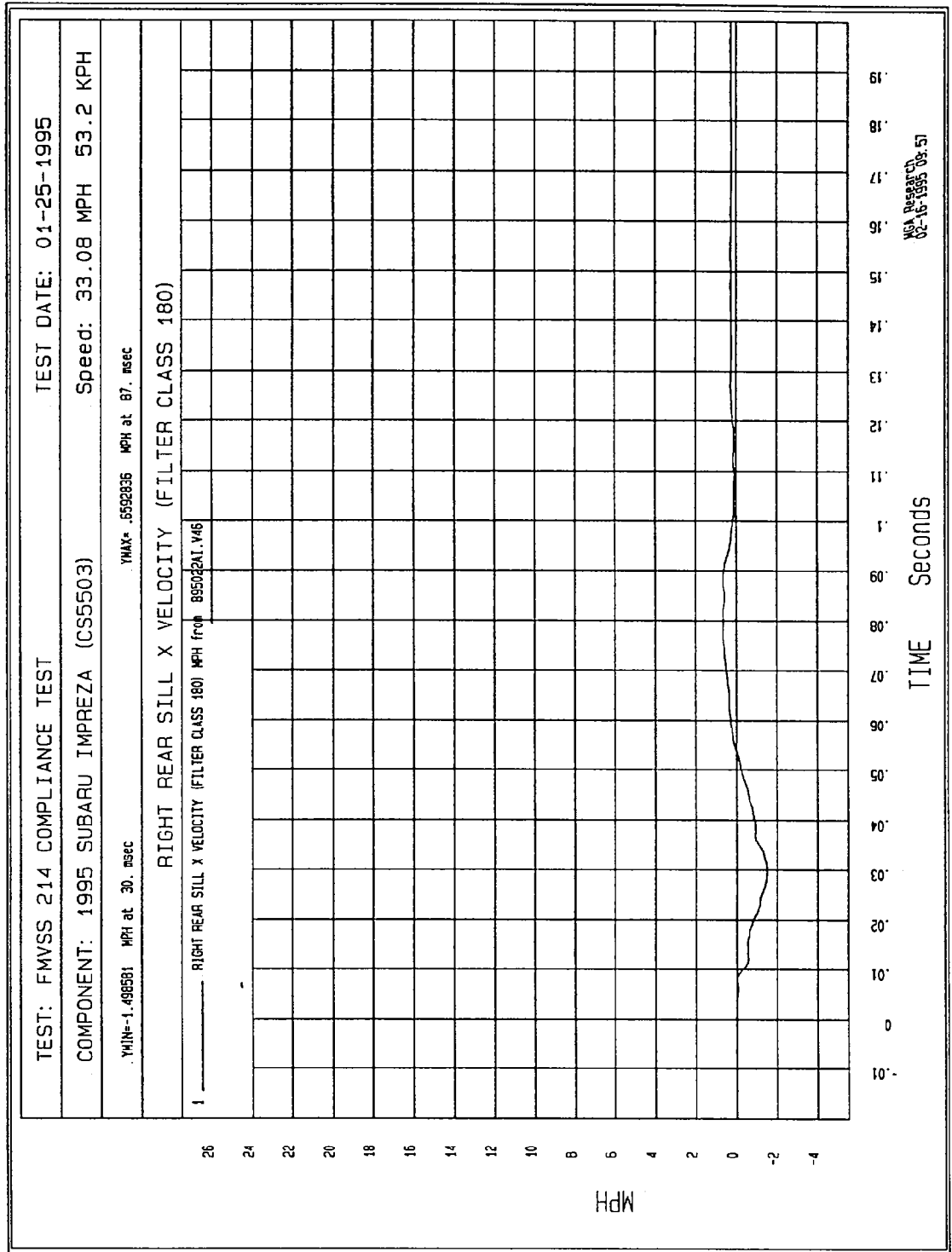


Figure B-29 - Right Rear Sill X Velocity vs. Time

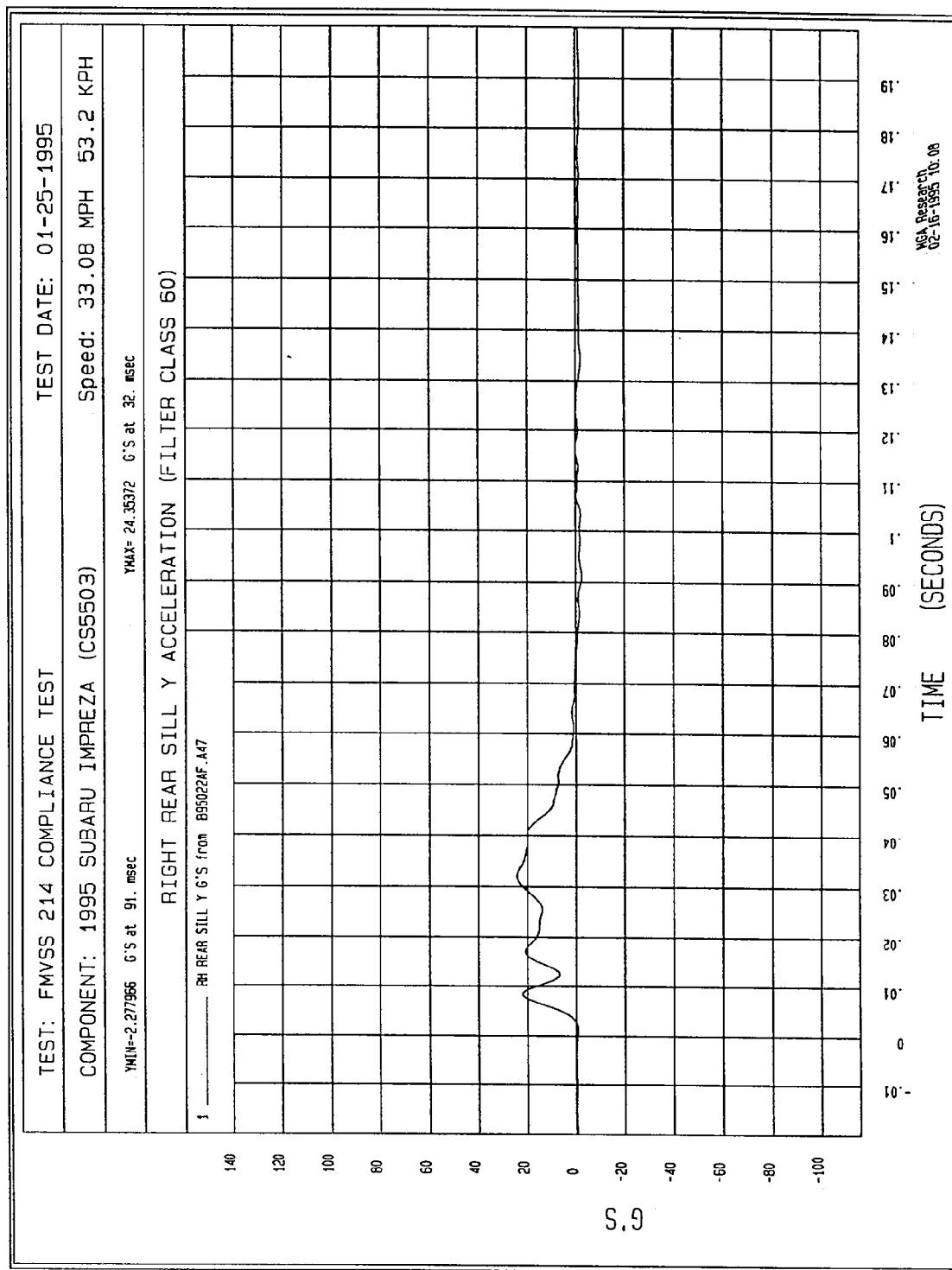


Figure B-30 - Right Rear Sill Y Acceleration vs. Time

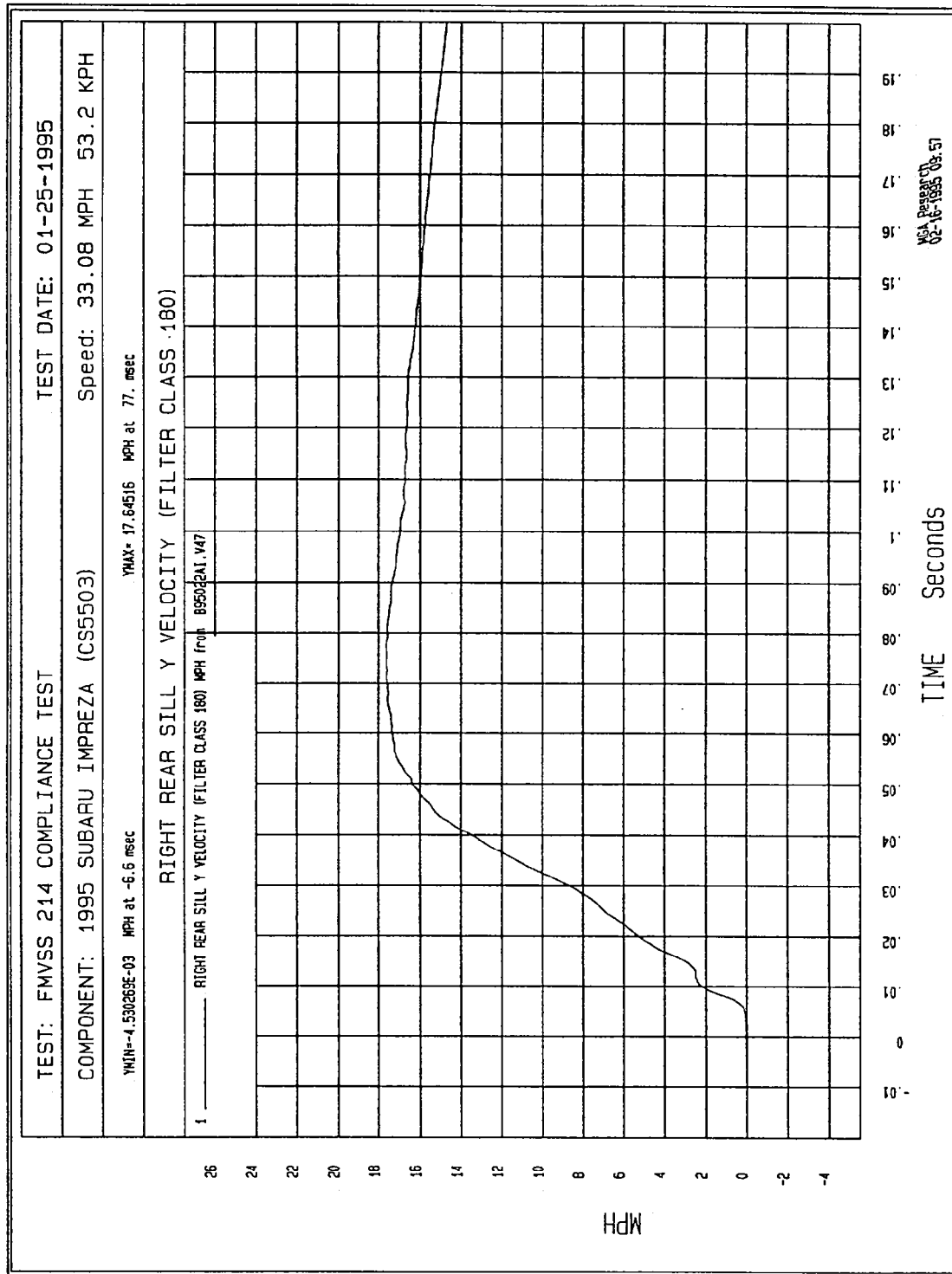


Figure B-31 - Right Rear Sill Y Velocity vs. Time

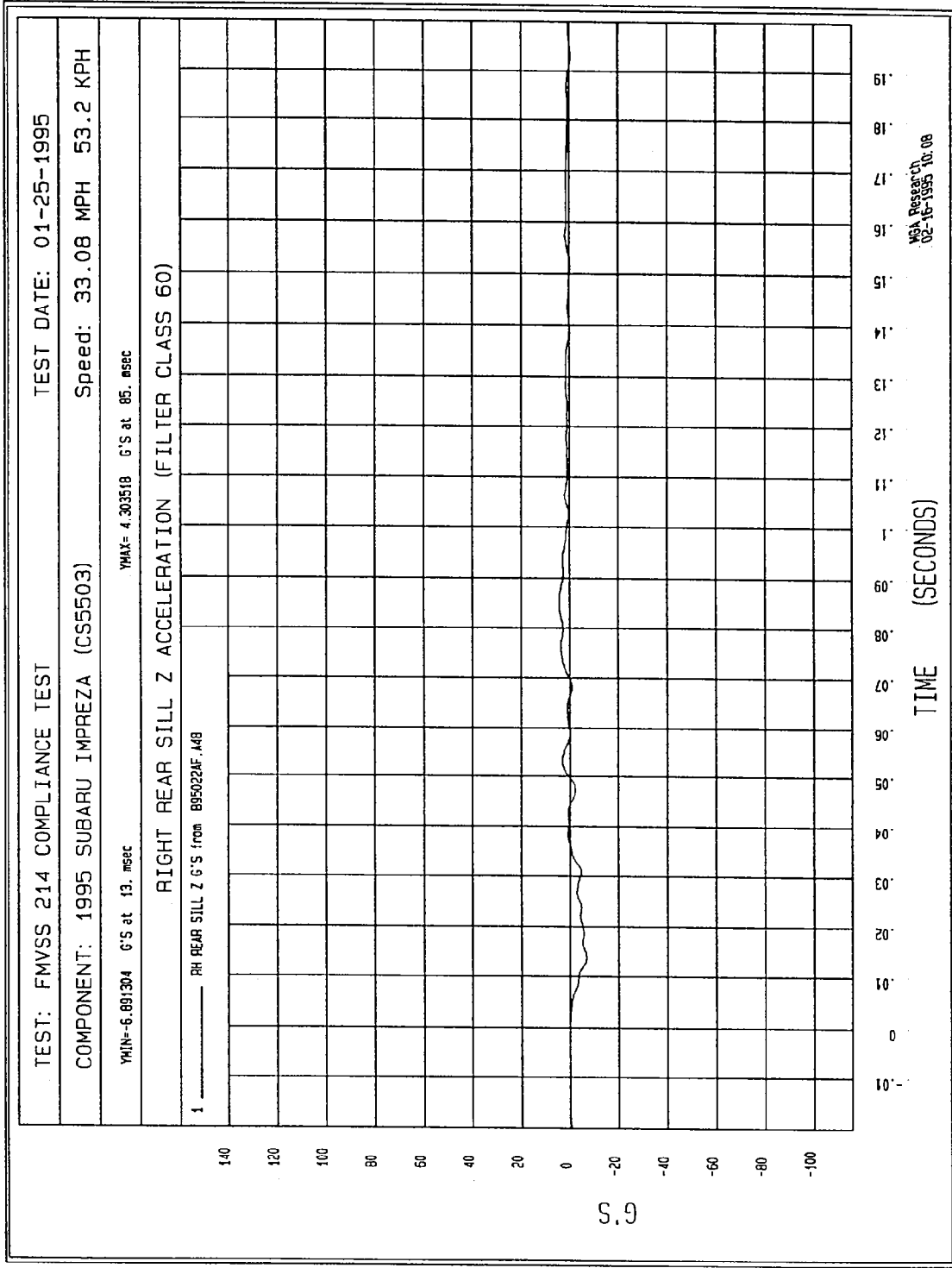


Figure B-32 - Right Rear Sill Z Acceleration vs. Time

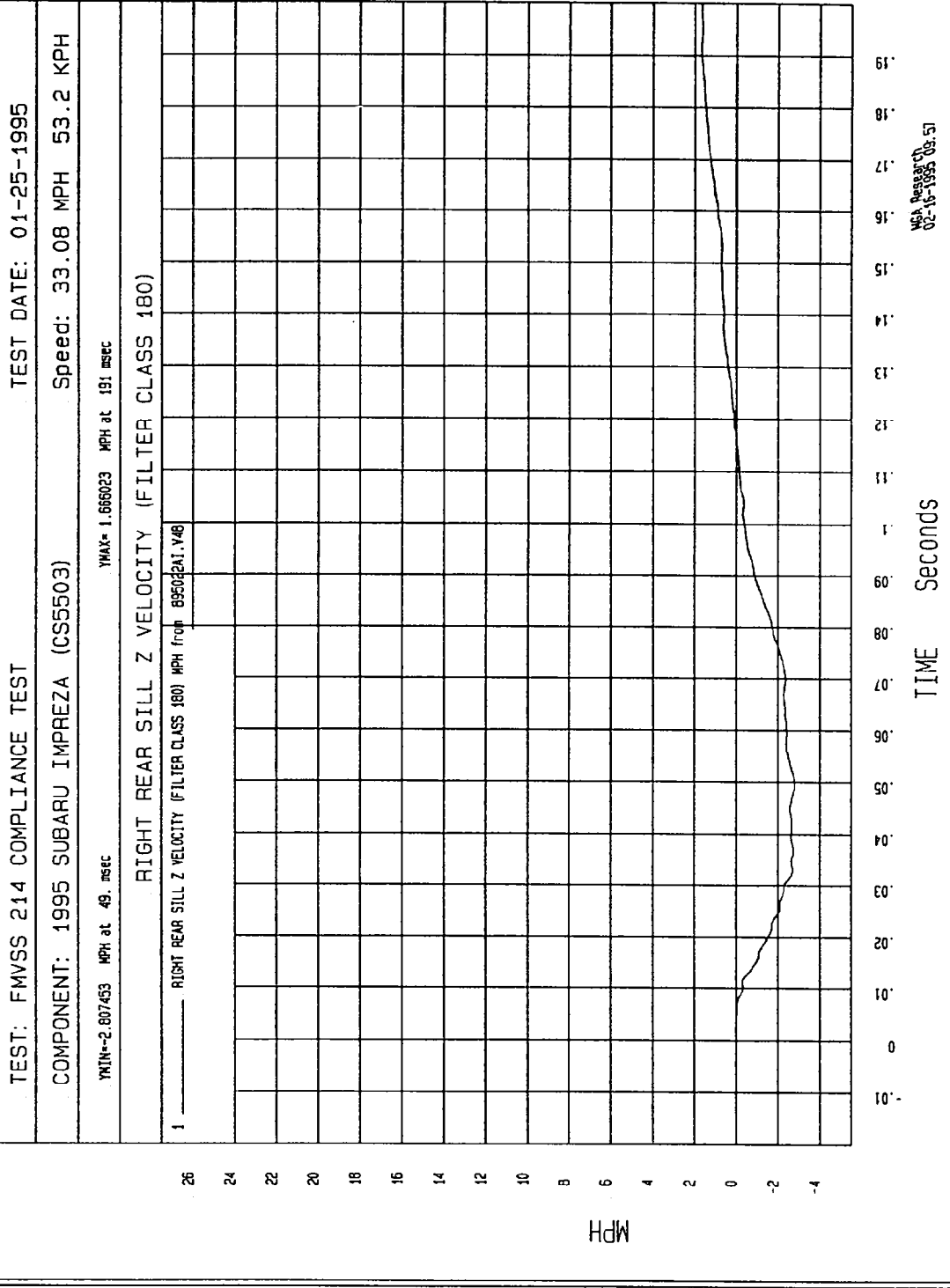


Figure B-33 - Right Rear Sill Z Velocity vs. Time

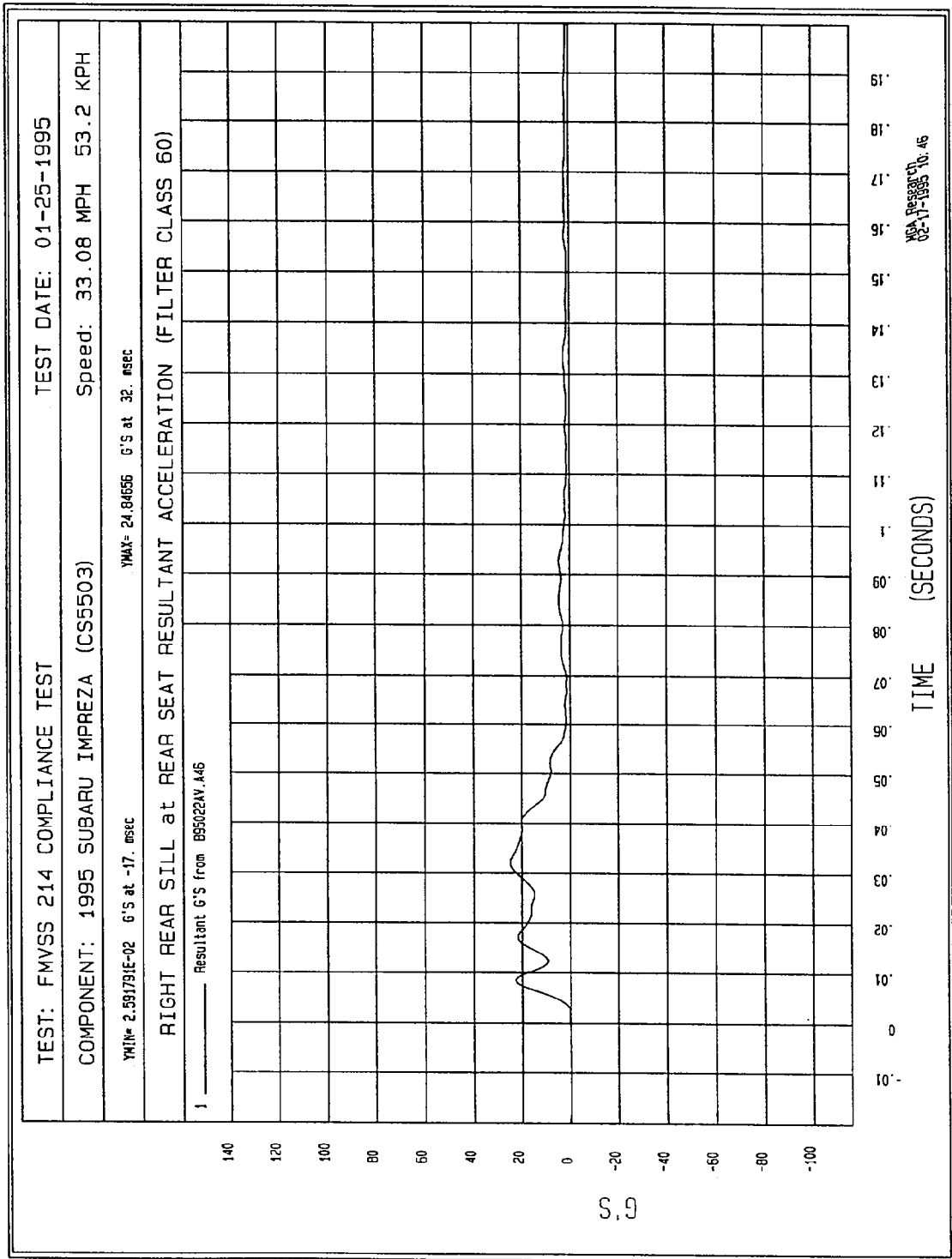


Figure B-34 - Right Rear Sill at Rear Seat Resultant vs. Time

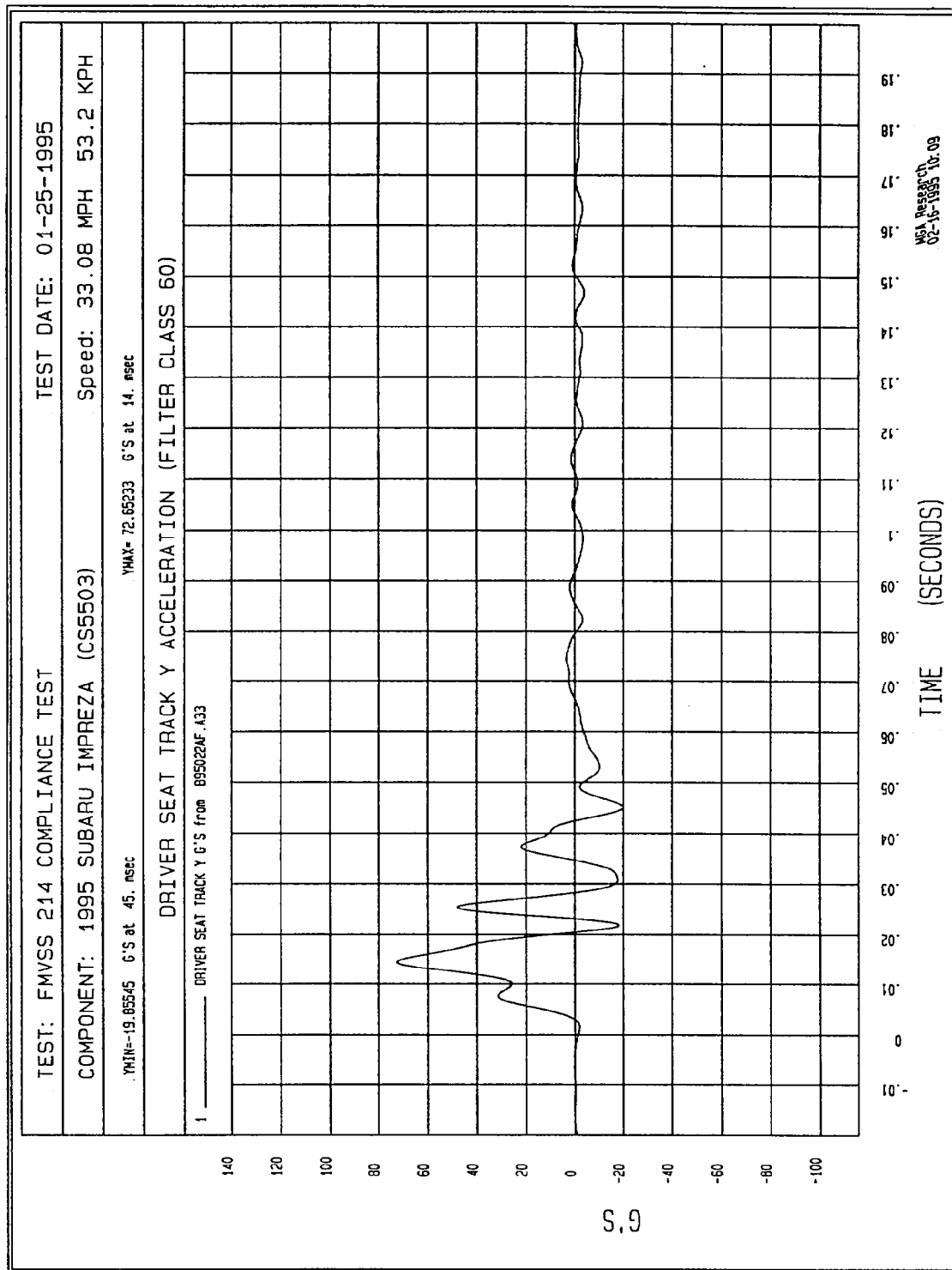


Figure B-35 - Driver Seat Track Y Acceleration vs. Time

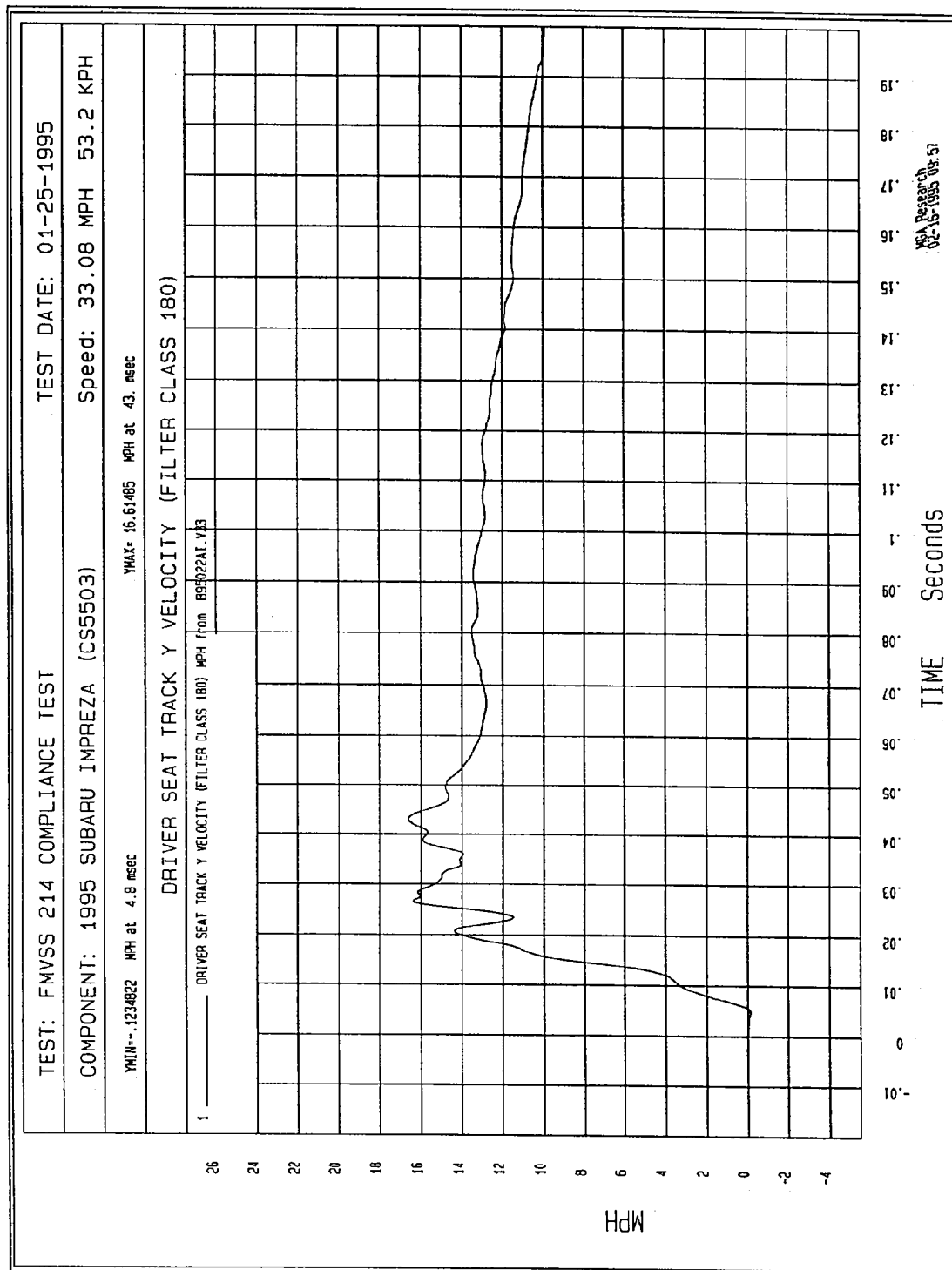


Figure B-36 - Driver Seat Track Y Velocity vs. Time

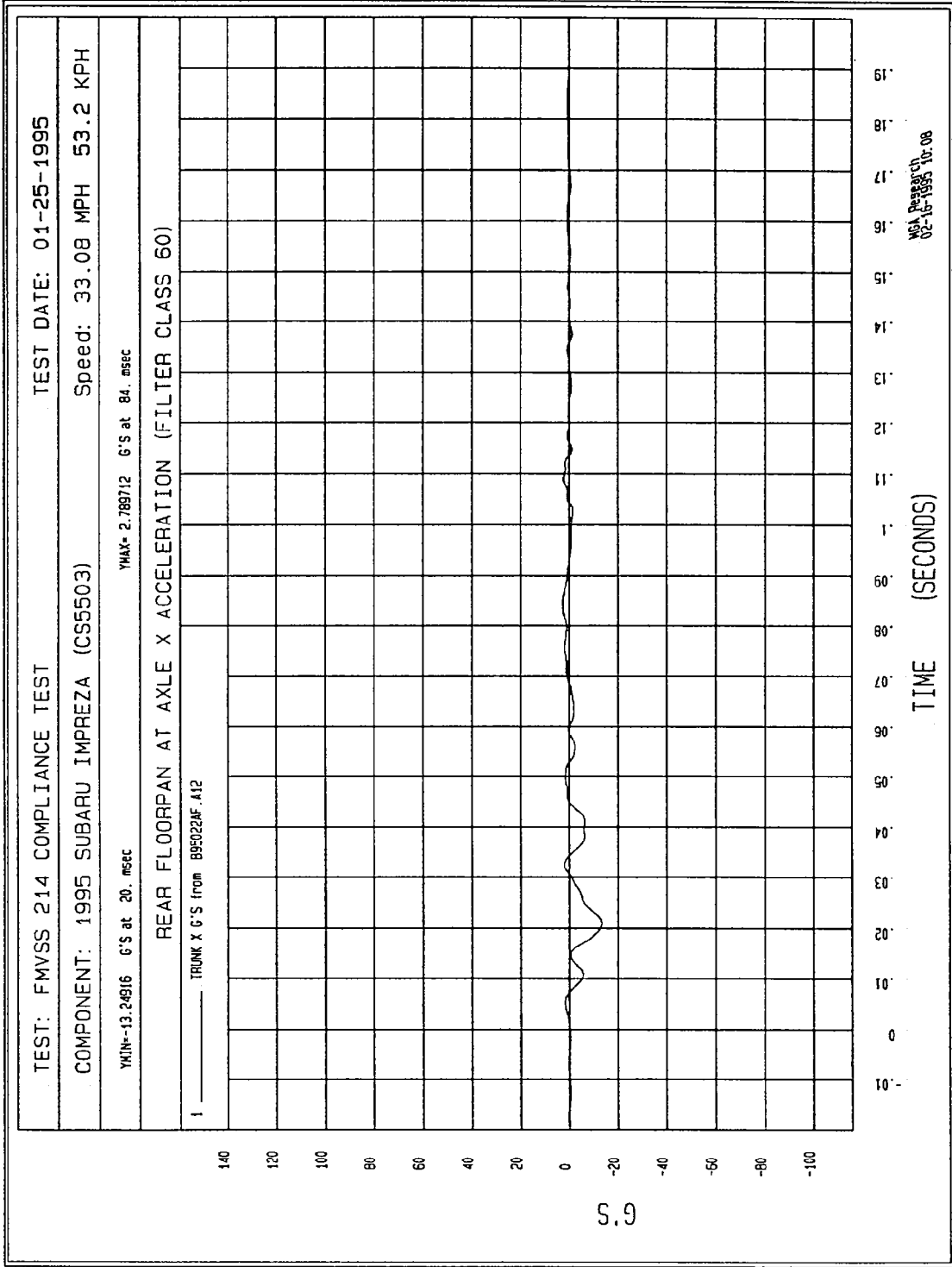
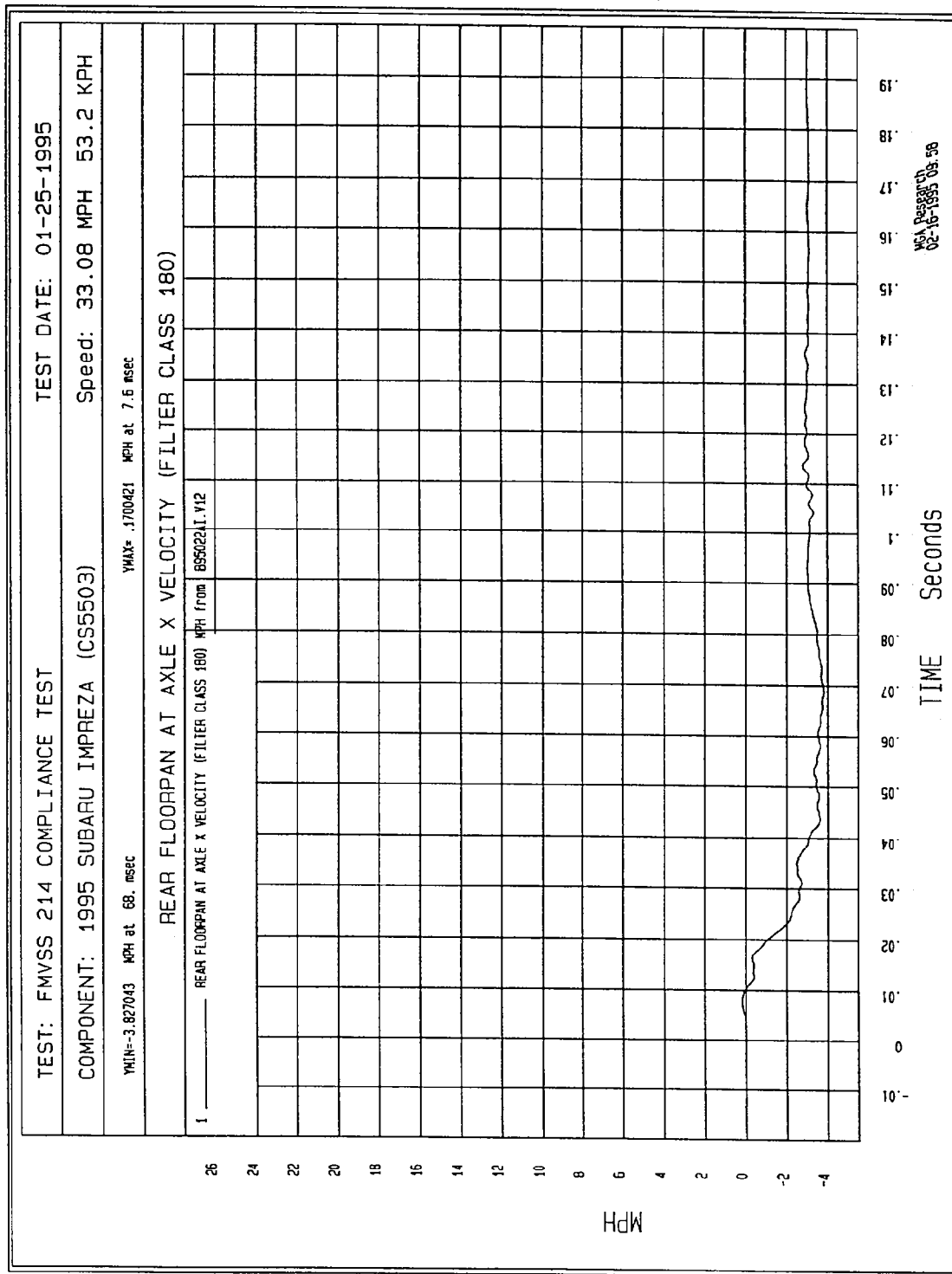


Figure B-37 - Rear Floorpan at Axle X Acceleration vs. Time



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

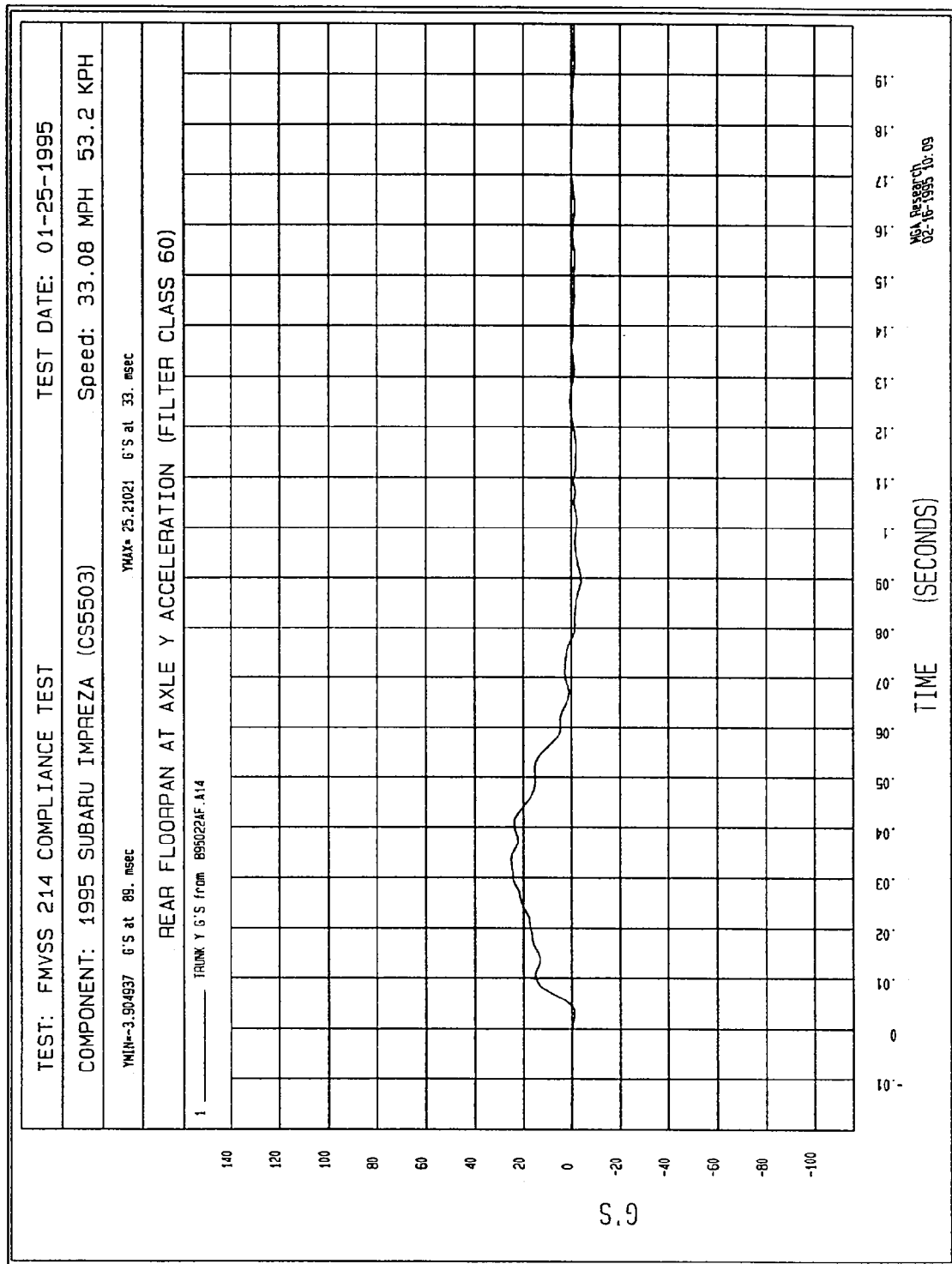


Figure B-39 - Rear Floorpan at Axle Y Acceleration vs. Time

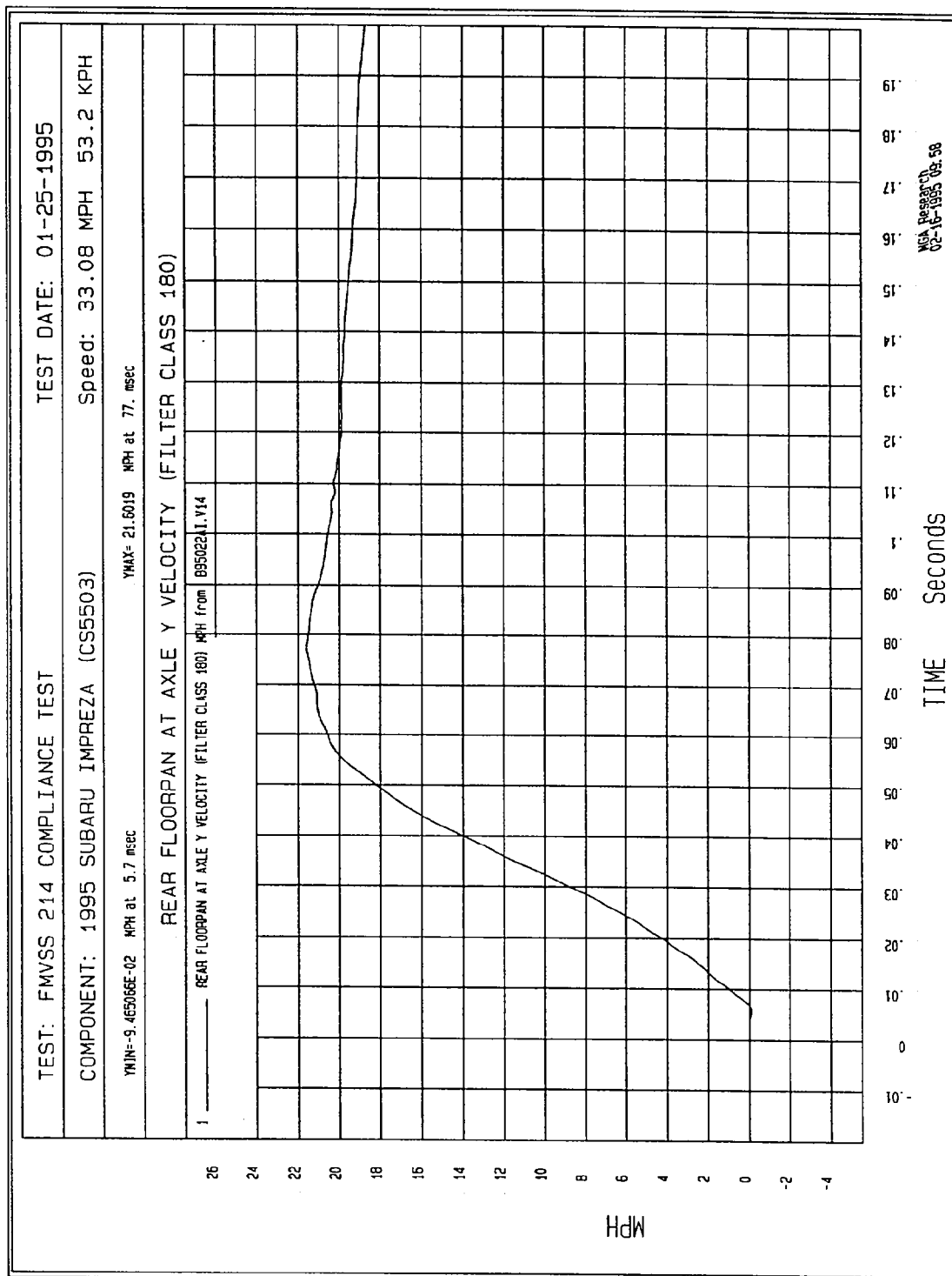


Figure B-40 - Rear Floorpan at Axle Y Velocity vs. Time

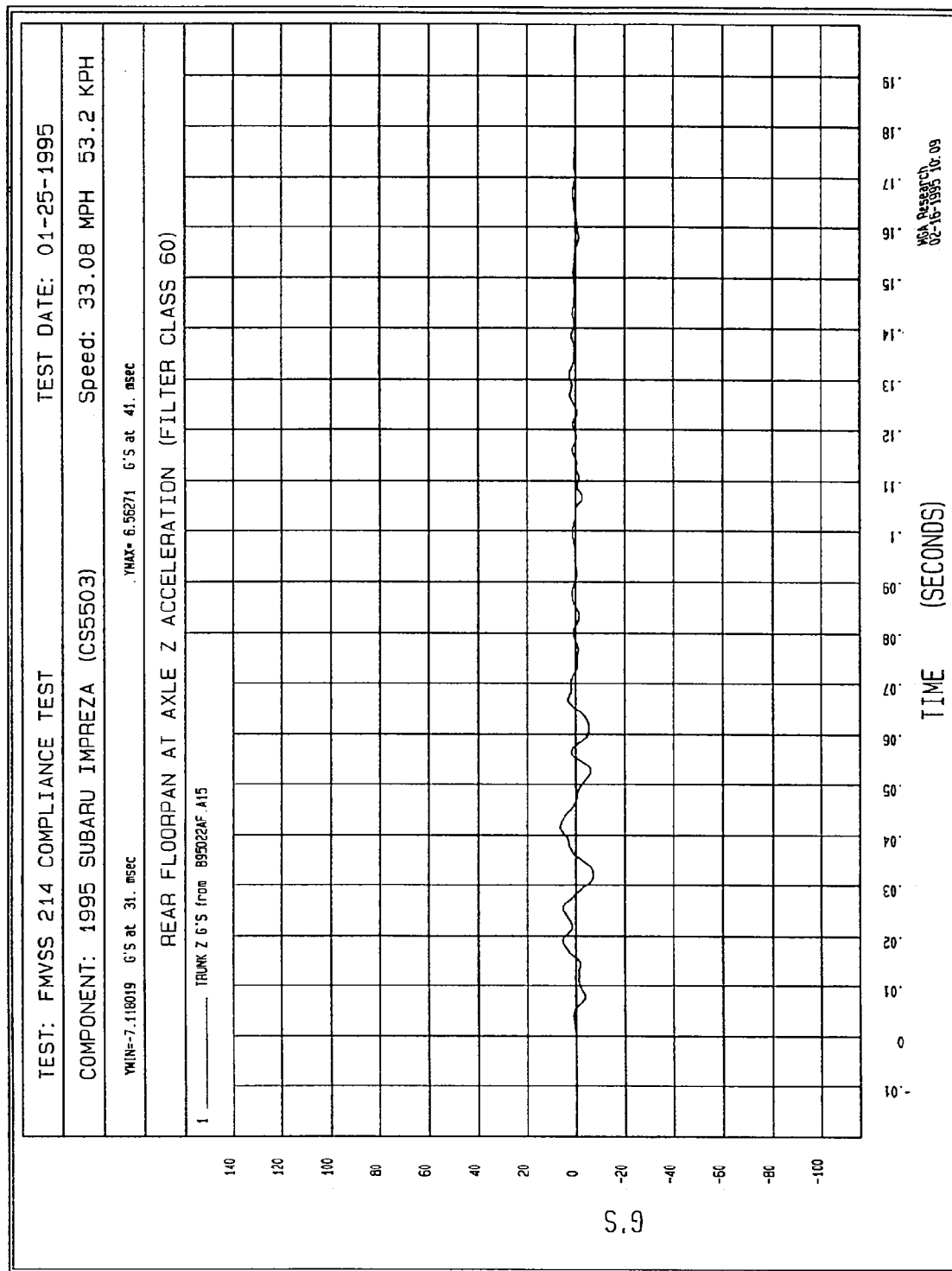
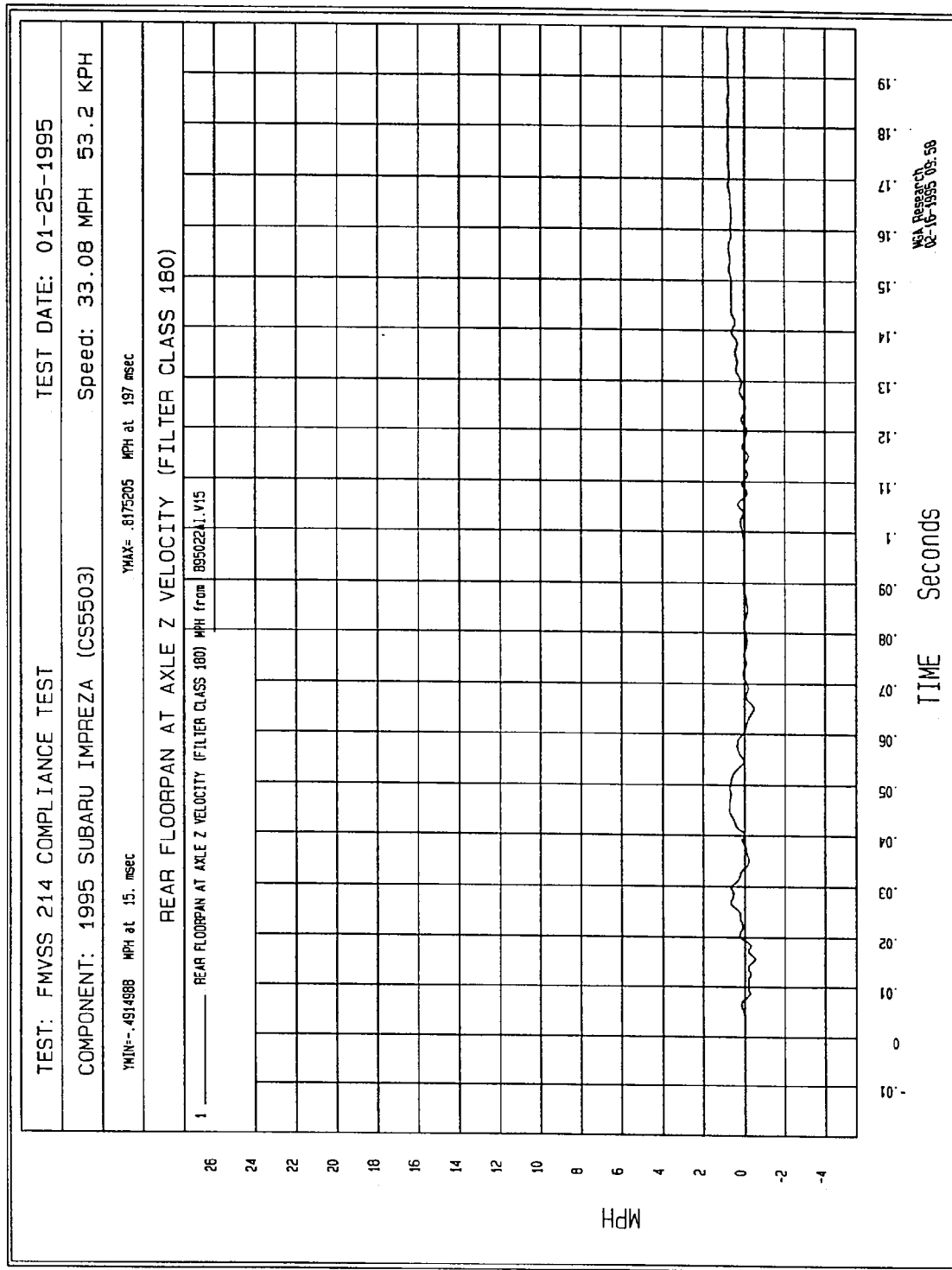


Figure B-41 - Rear Floorpan at Axle Z Acceleration vs. Time



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

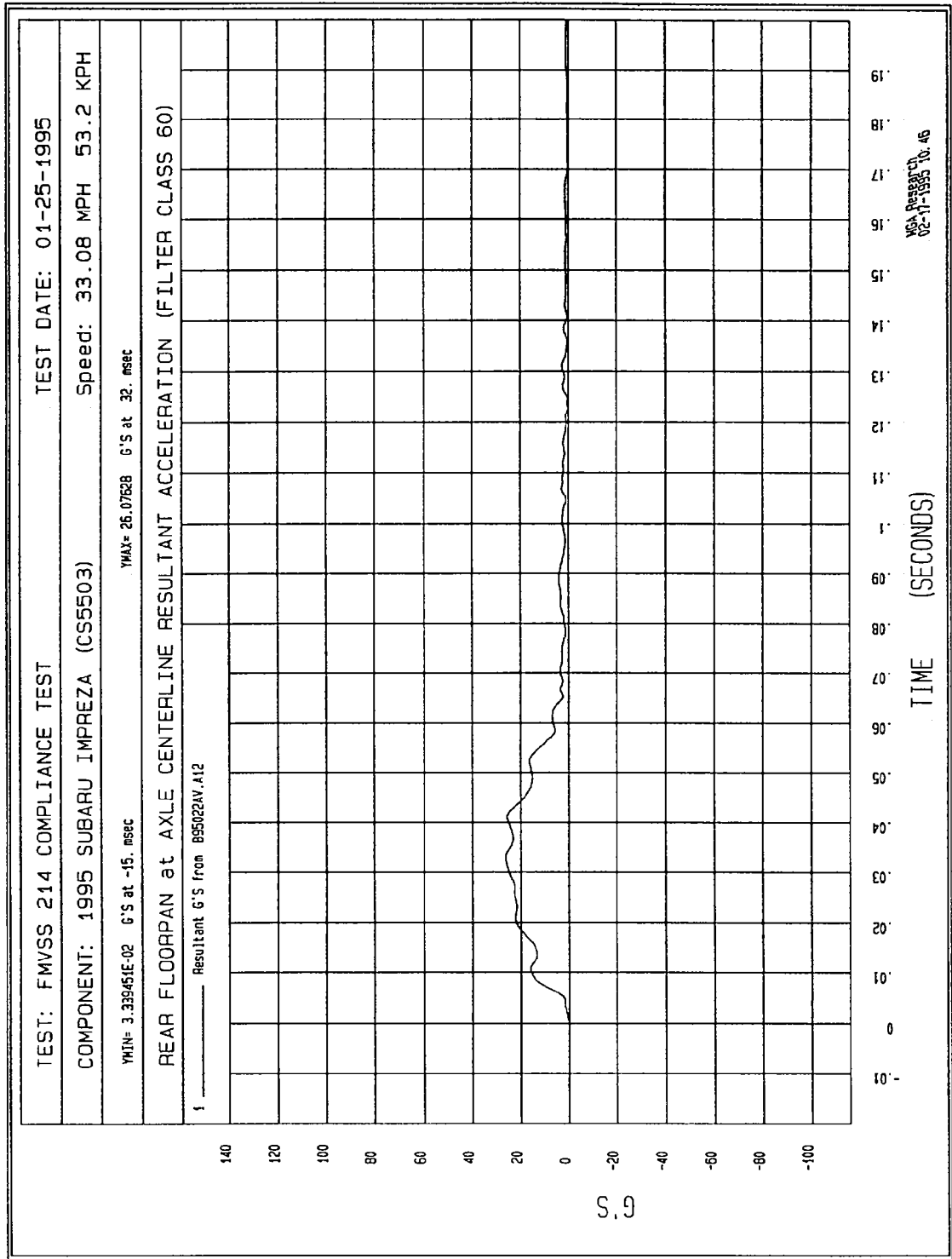


Figure B-43 - Rear Floorpan at Axle Centerline Resultant vs. Time

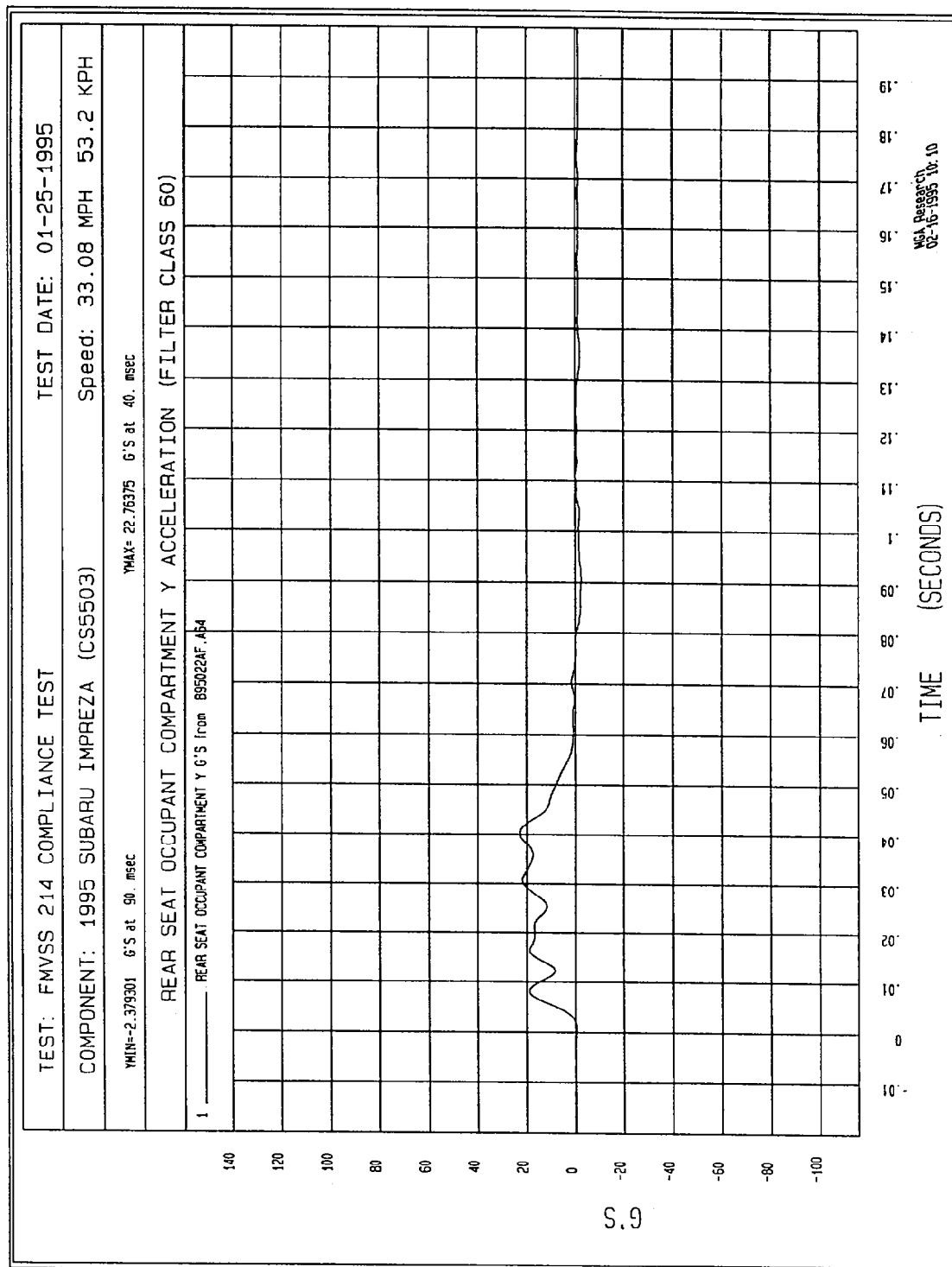


Figure B-44 - Rear Seat Occupant Compartment Y Acceleration vs. Time

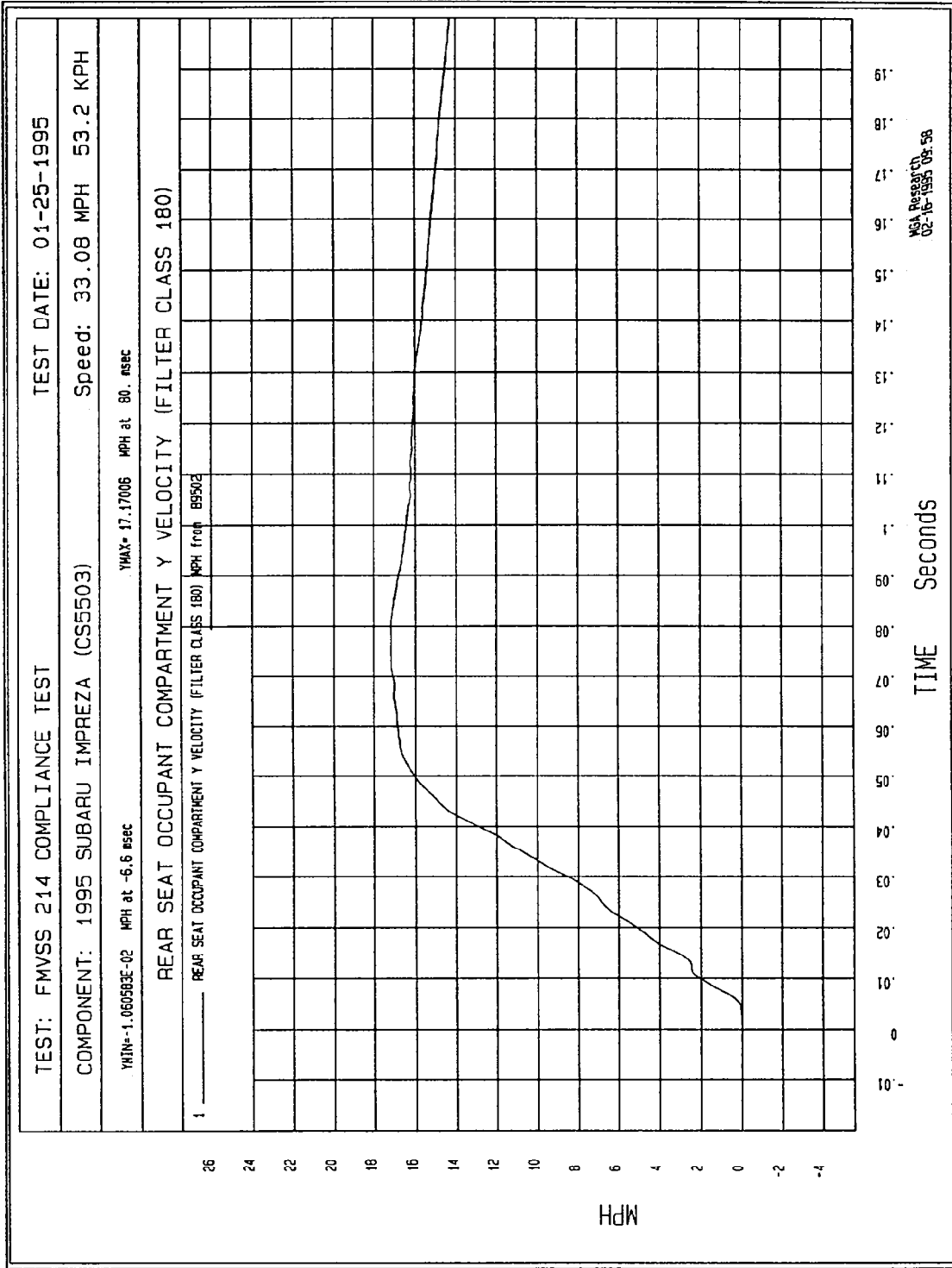


Figure B-45 - Rear Seat Occupant Compartment Y Velocity vs. Time

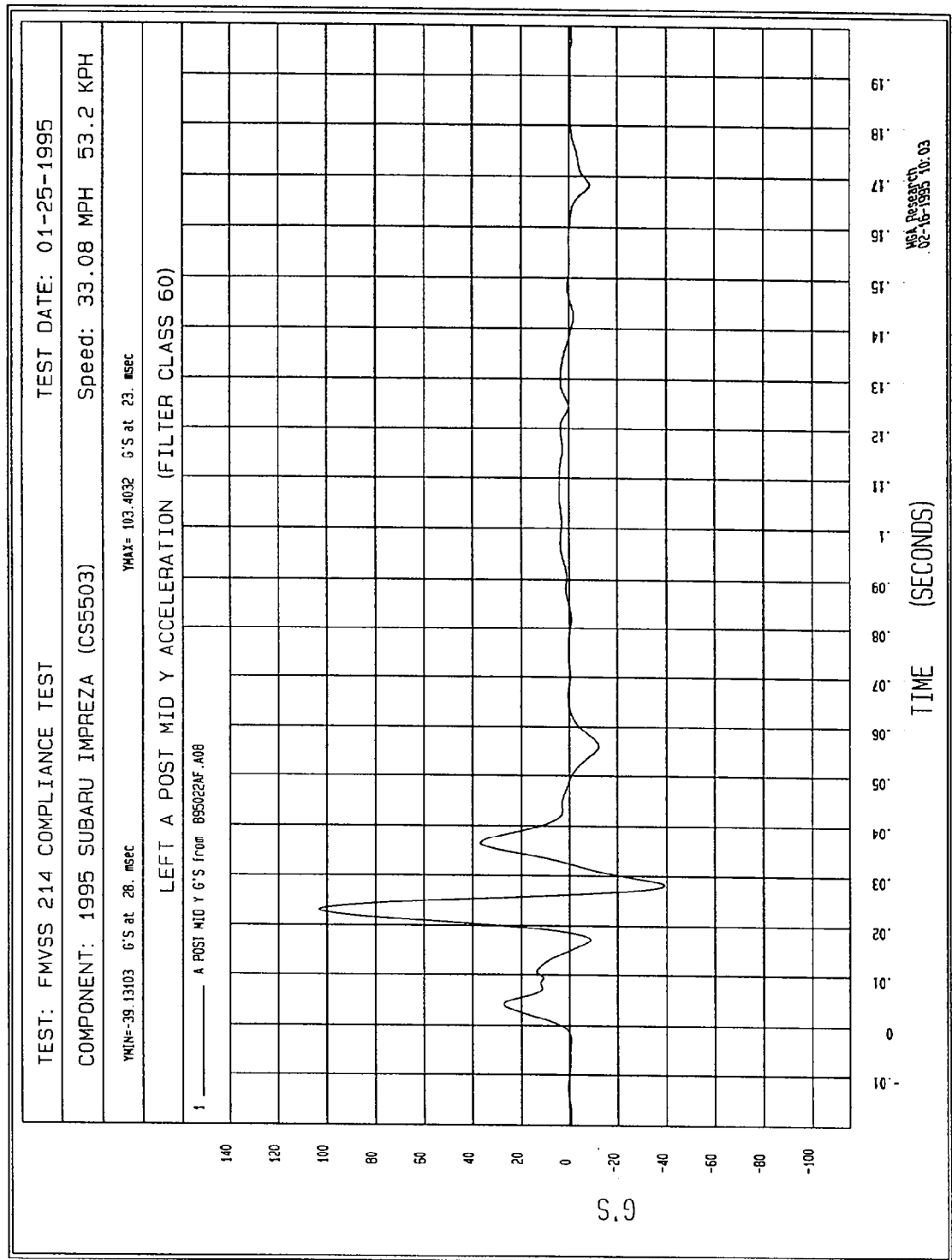


Figure B-46 - Left A Post Mid Y Acceleration vs. Time

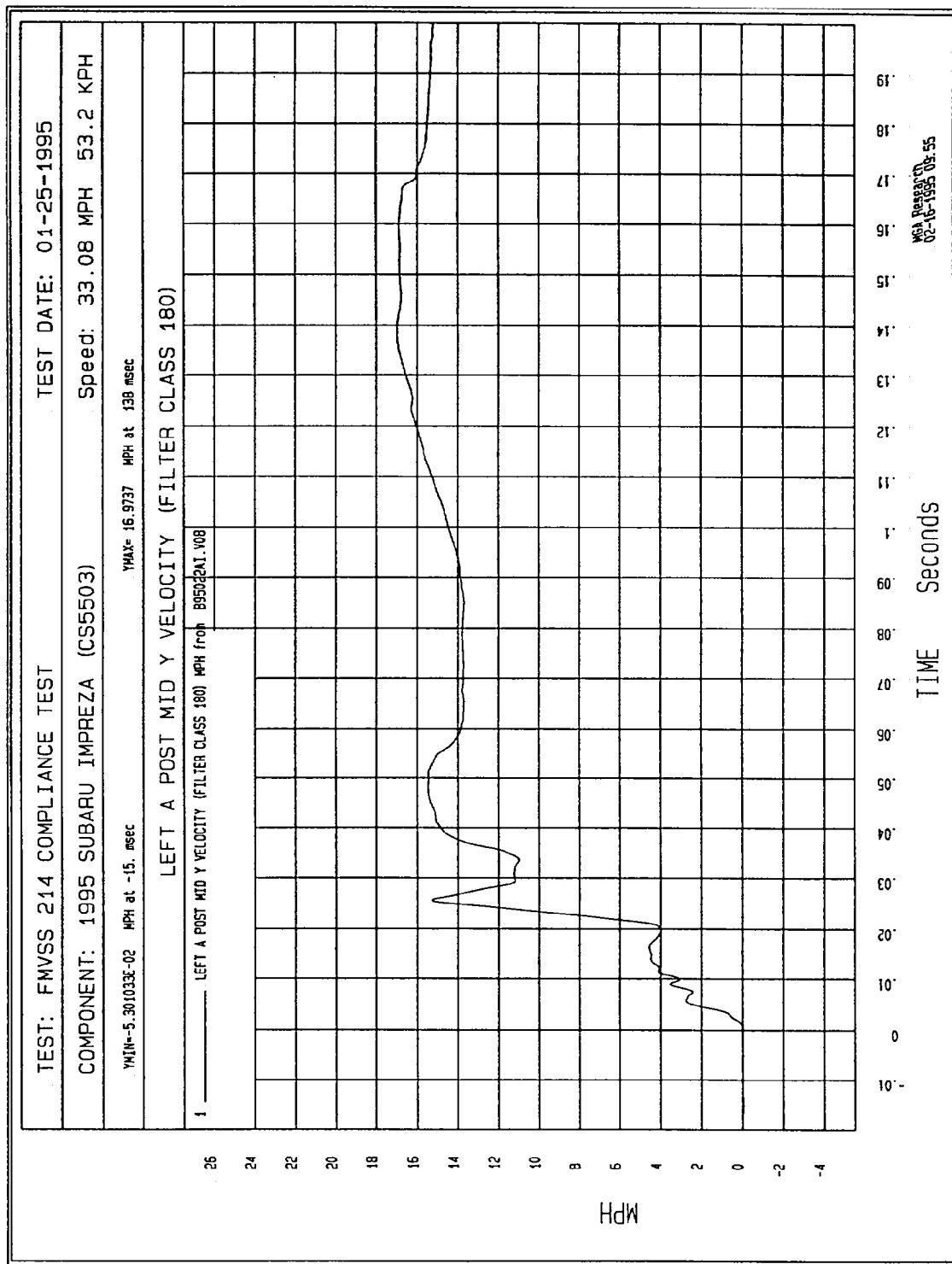


Figure B-47 - Left A Post Mid Y Velocity vs. Time

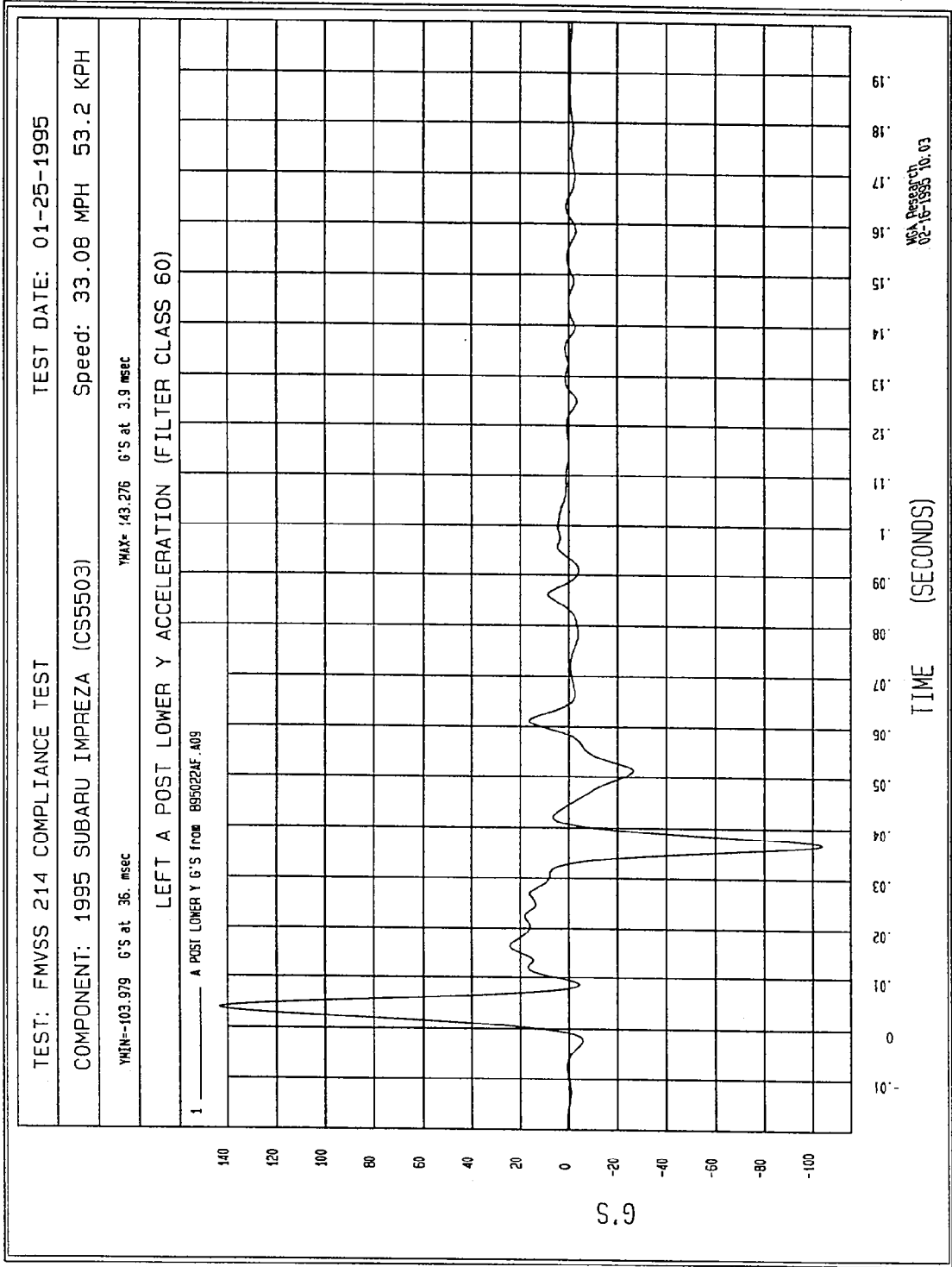


Figure B-48 - Left A Post Lower Y Acceleration vs. Time

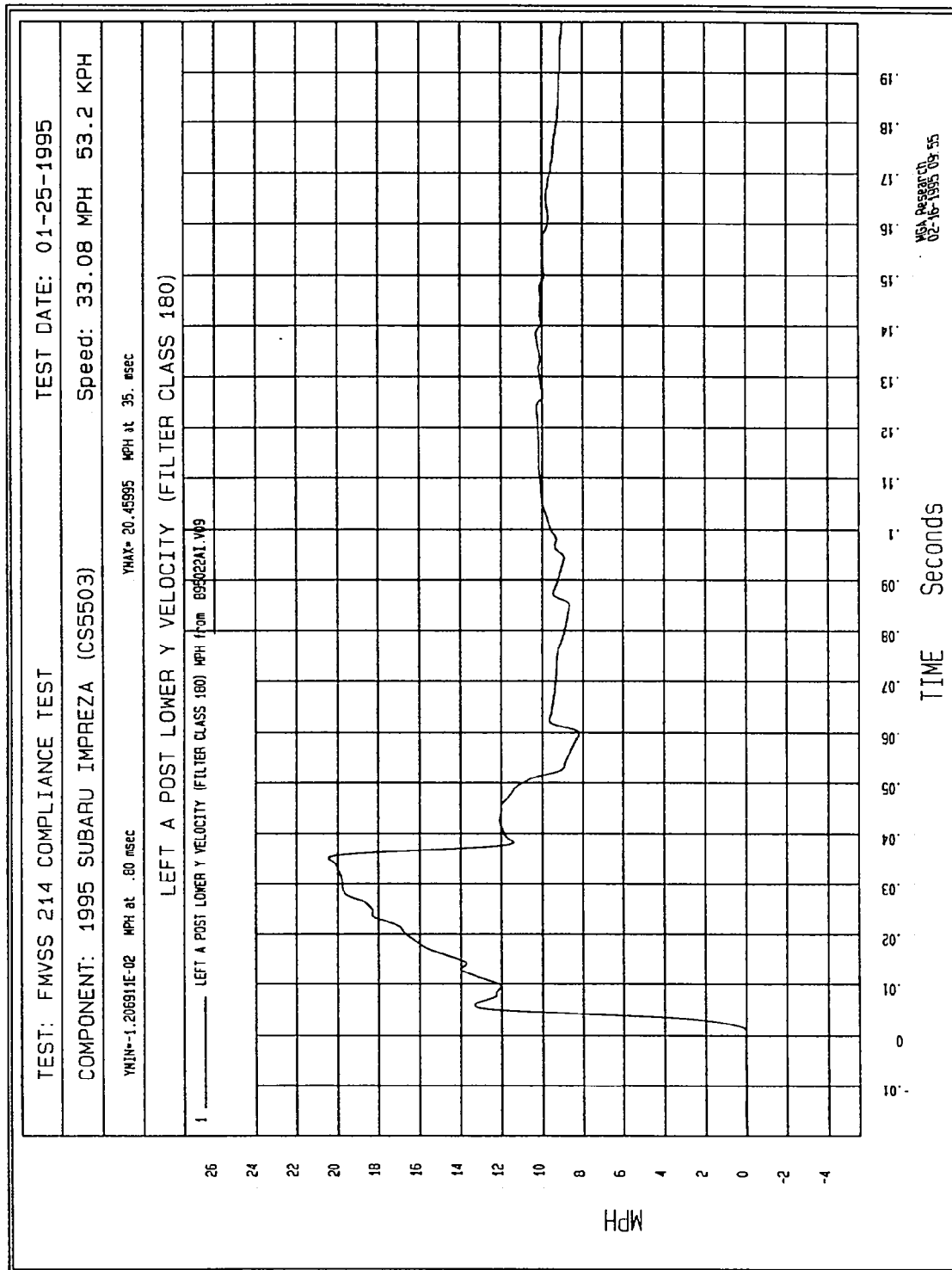


Figure B-49 - Left A Post Lower Y Velocity vs. Time

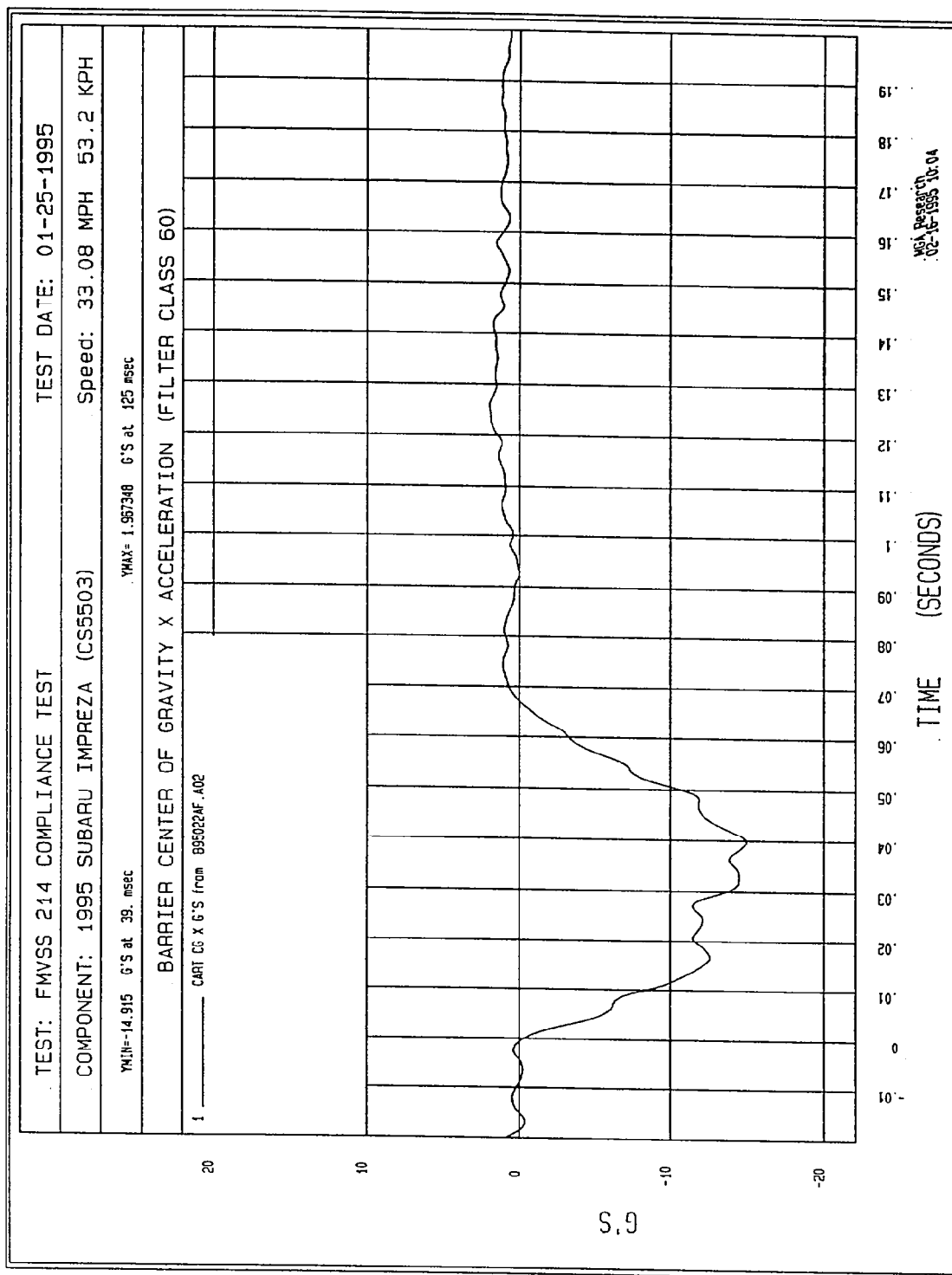


Figure B-50 - Moving Barrier Center of Gravity X Acceleration vs. Time

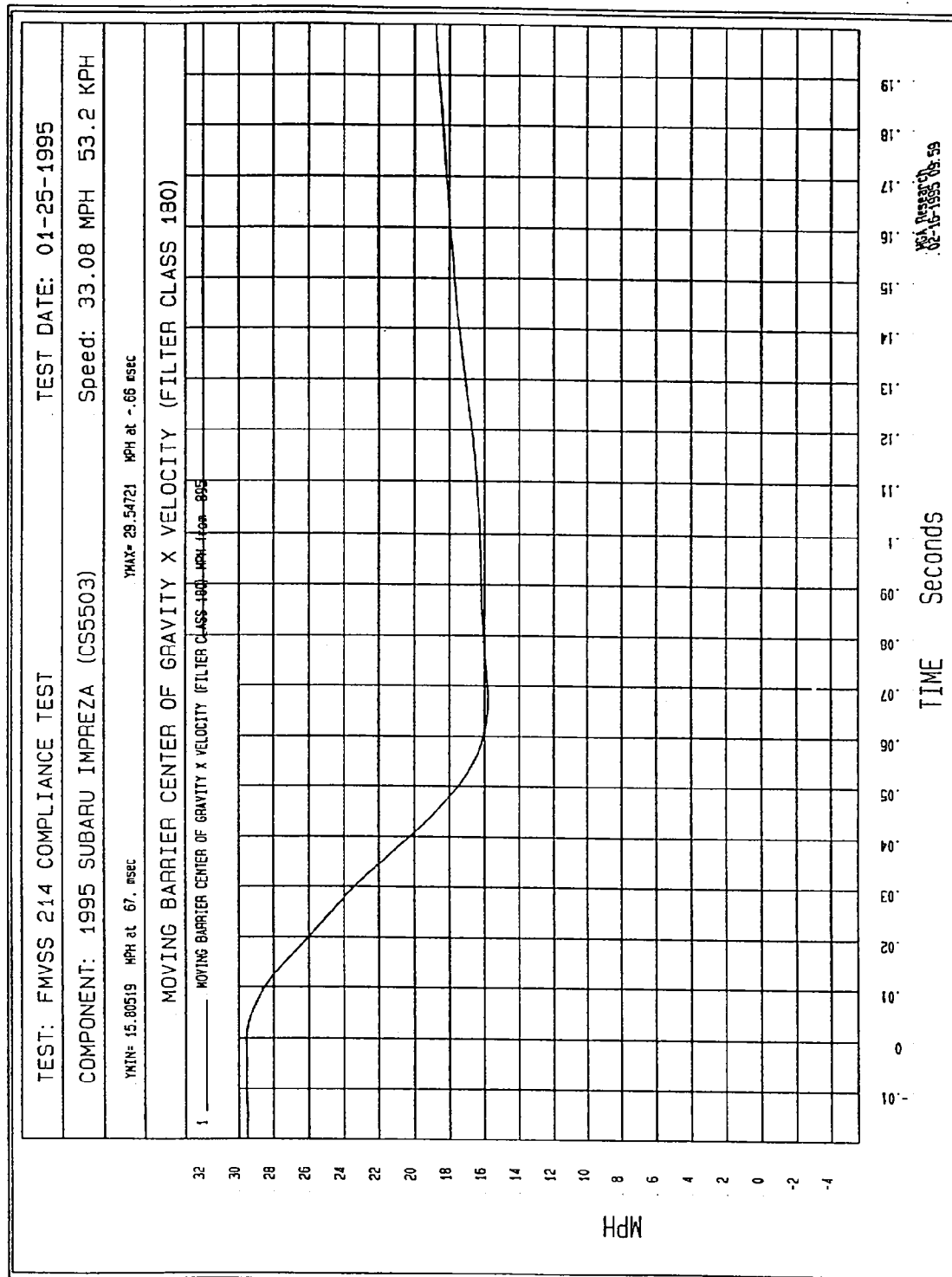


Figure B-51 - Moving Barrier Center of Gravity X Velocity vs. Time

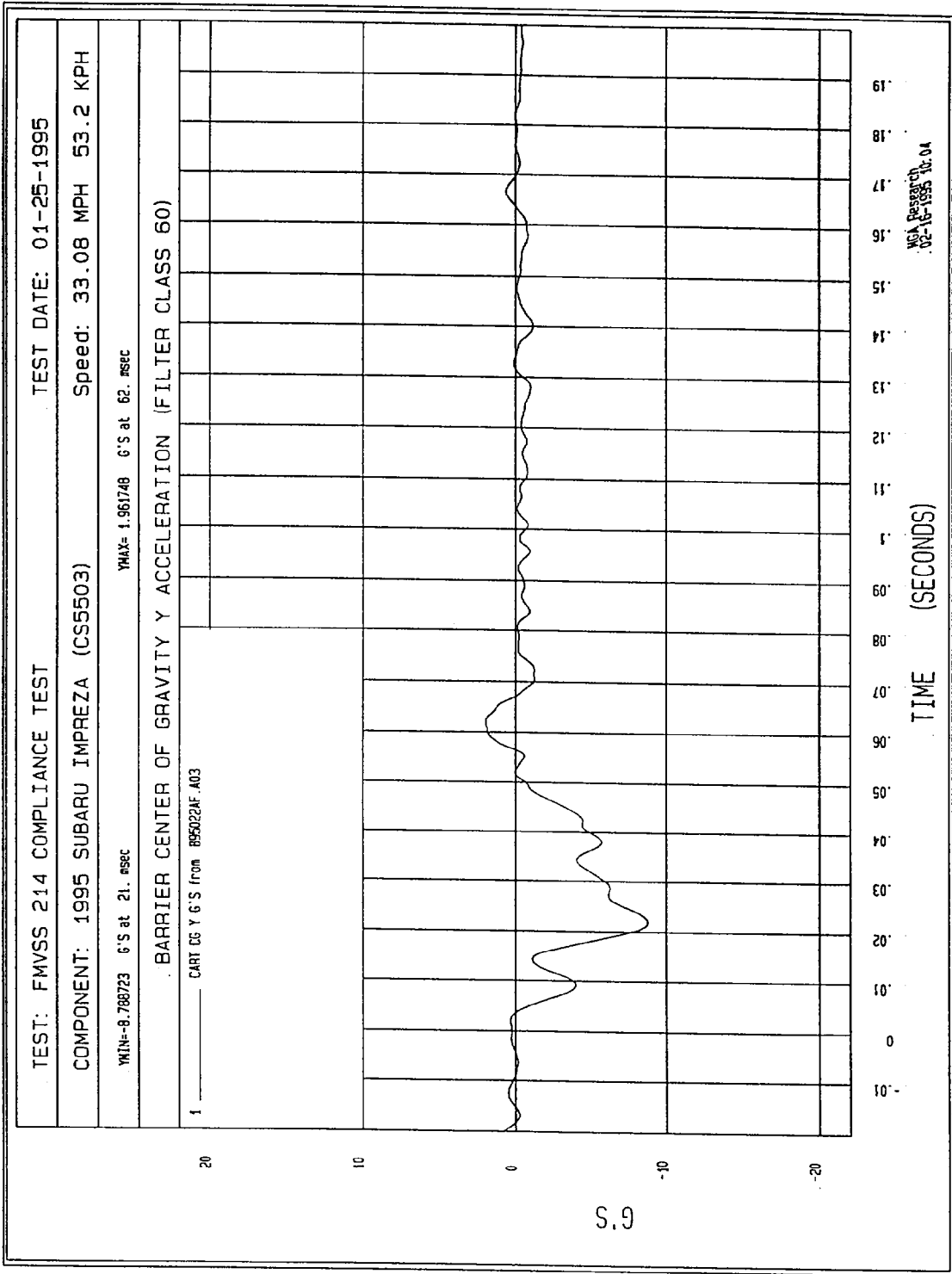


Figure B-52 - Moving Barrier Center of Gravity Y Acceleration vs. Time

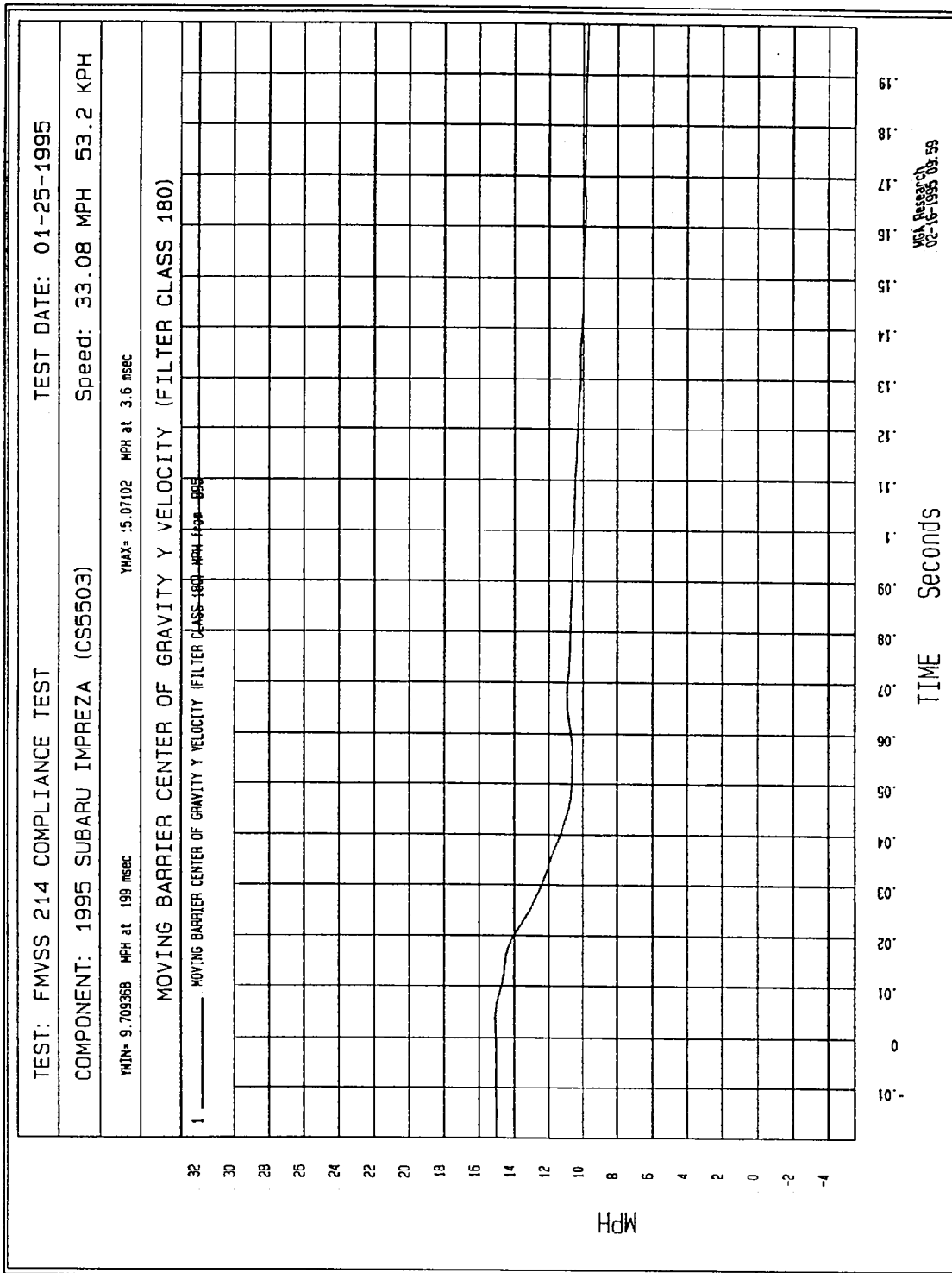


Figure B-53 - Moving Barrier Center of Gravity Y Velocity vs. Time

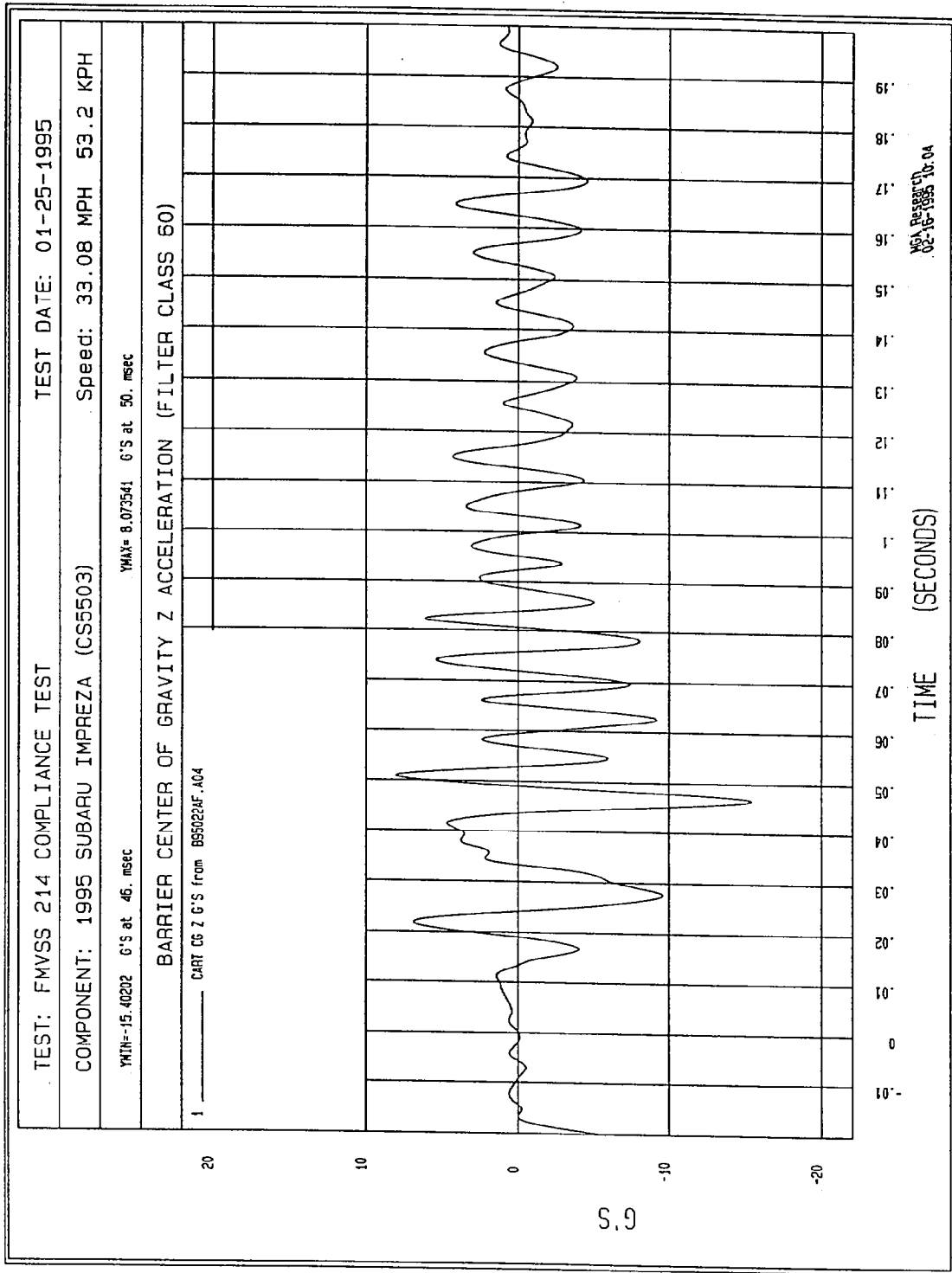


Figure B-54 - Moving Barrier Center of Gravity Z Acceleration vs. Time

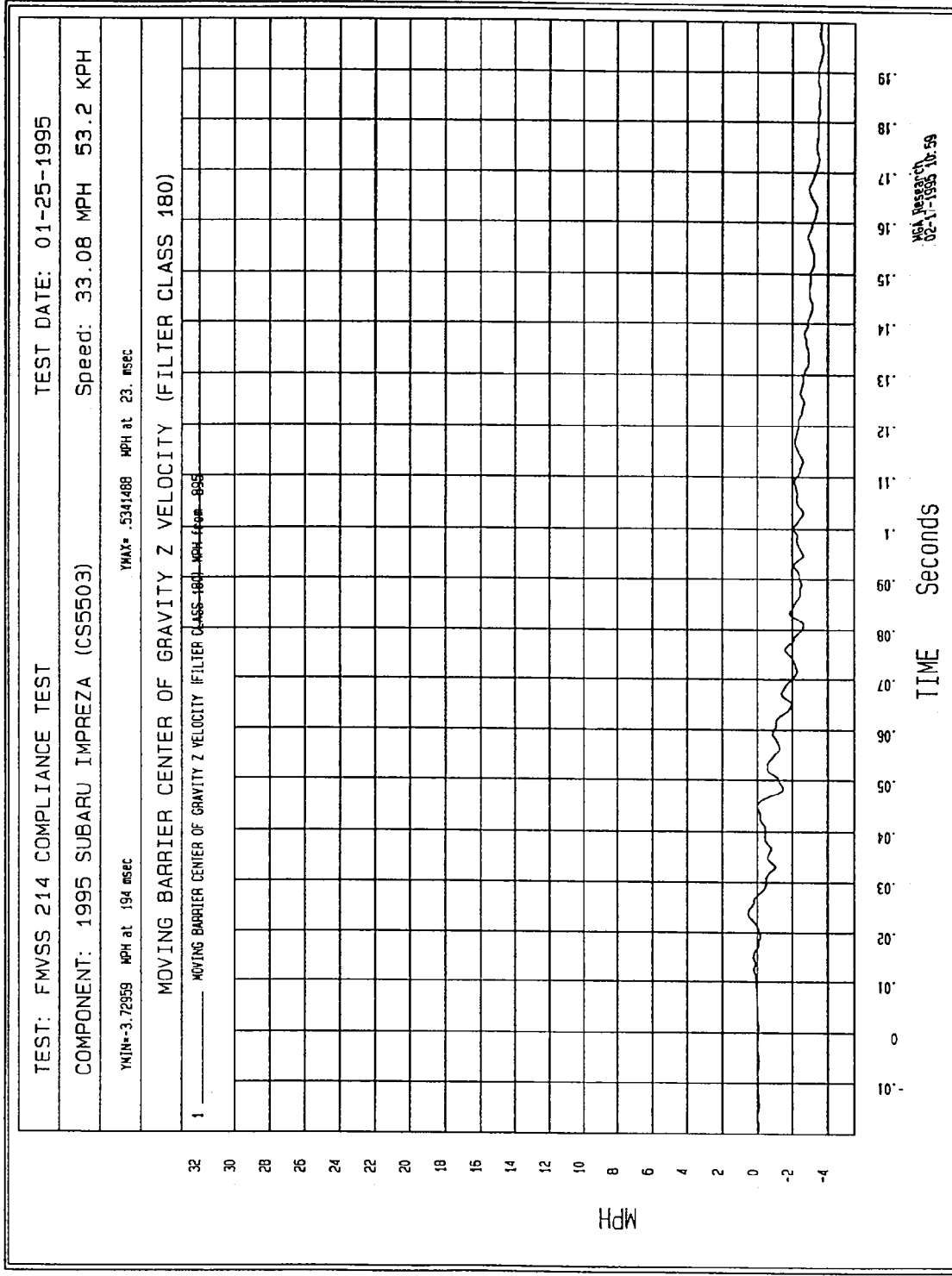


Figure B-55 - Moving Barrier Center of Gravity Z Velocity vs. Time

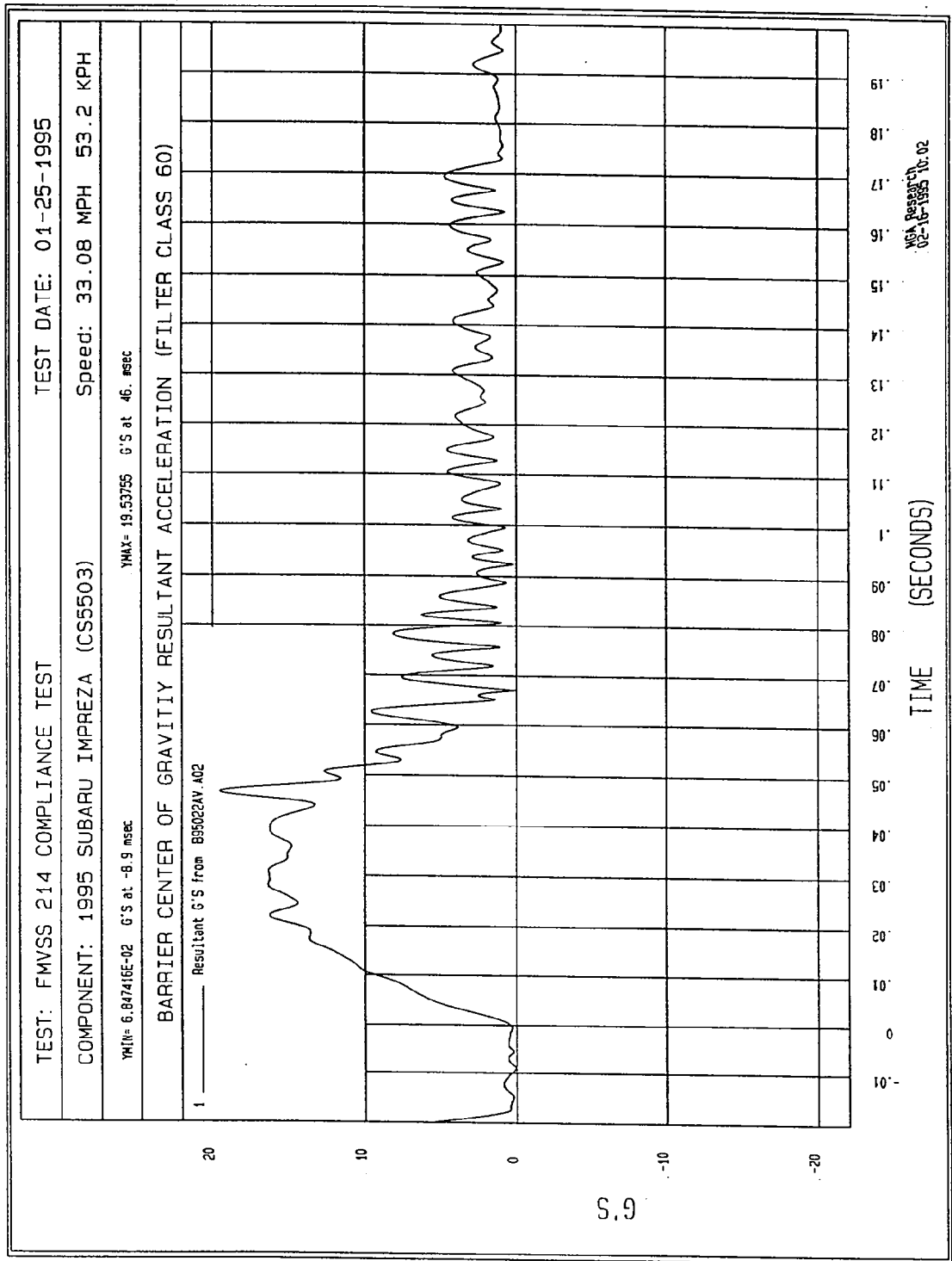


Figure B-56 - Moving Barrier Center of Gravity Resultant vs. Time

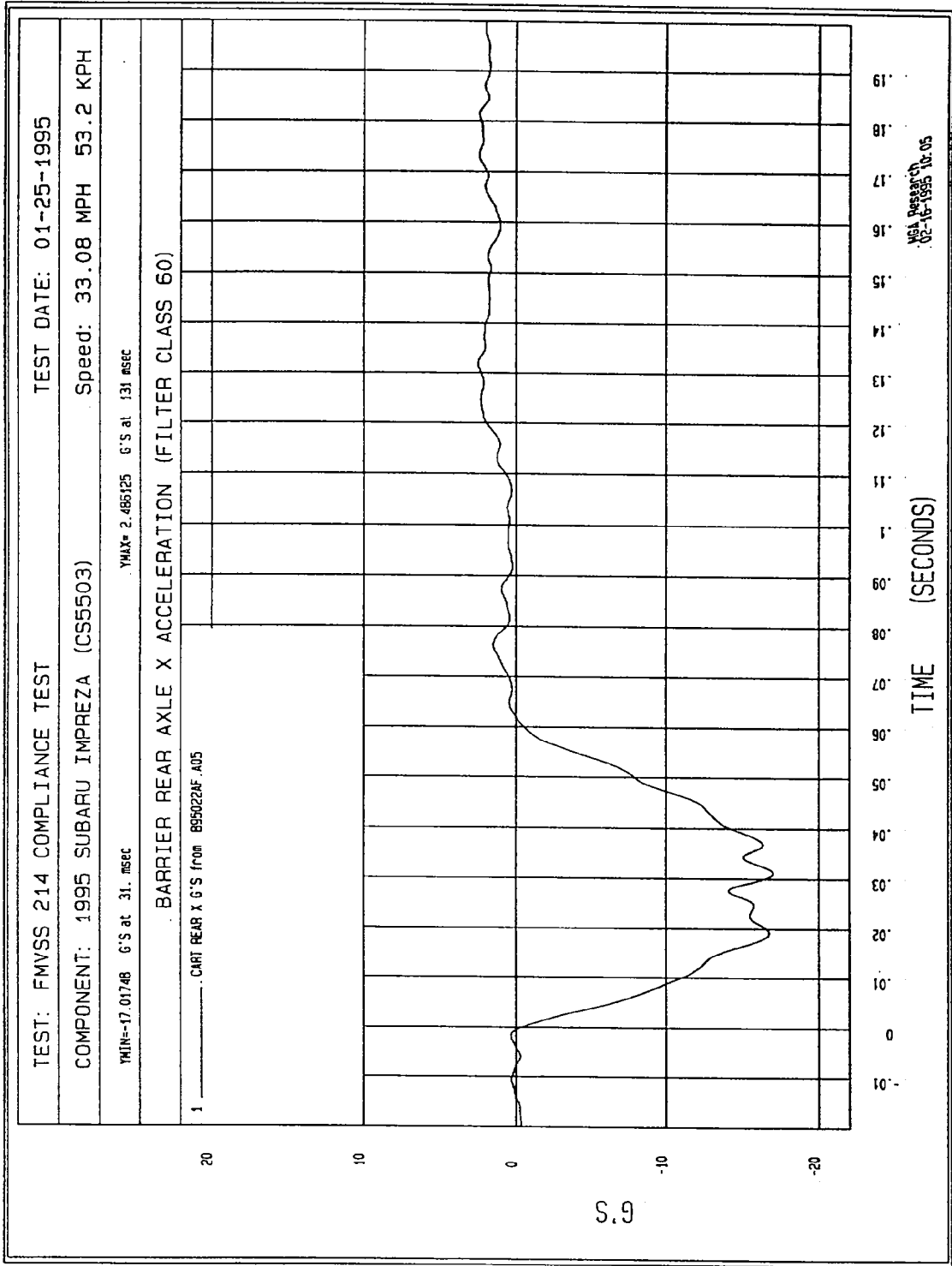


Figure B-57 - Moving Barrier Rear Axle X Acceleration vs. Time

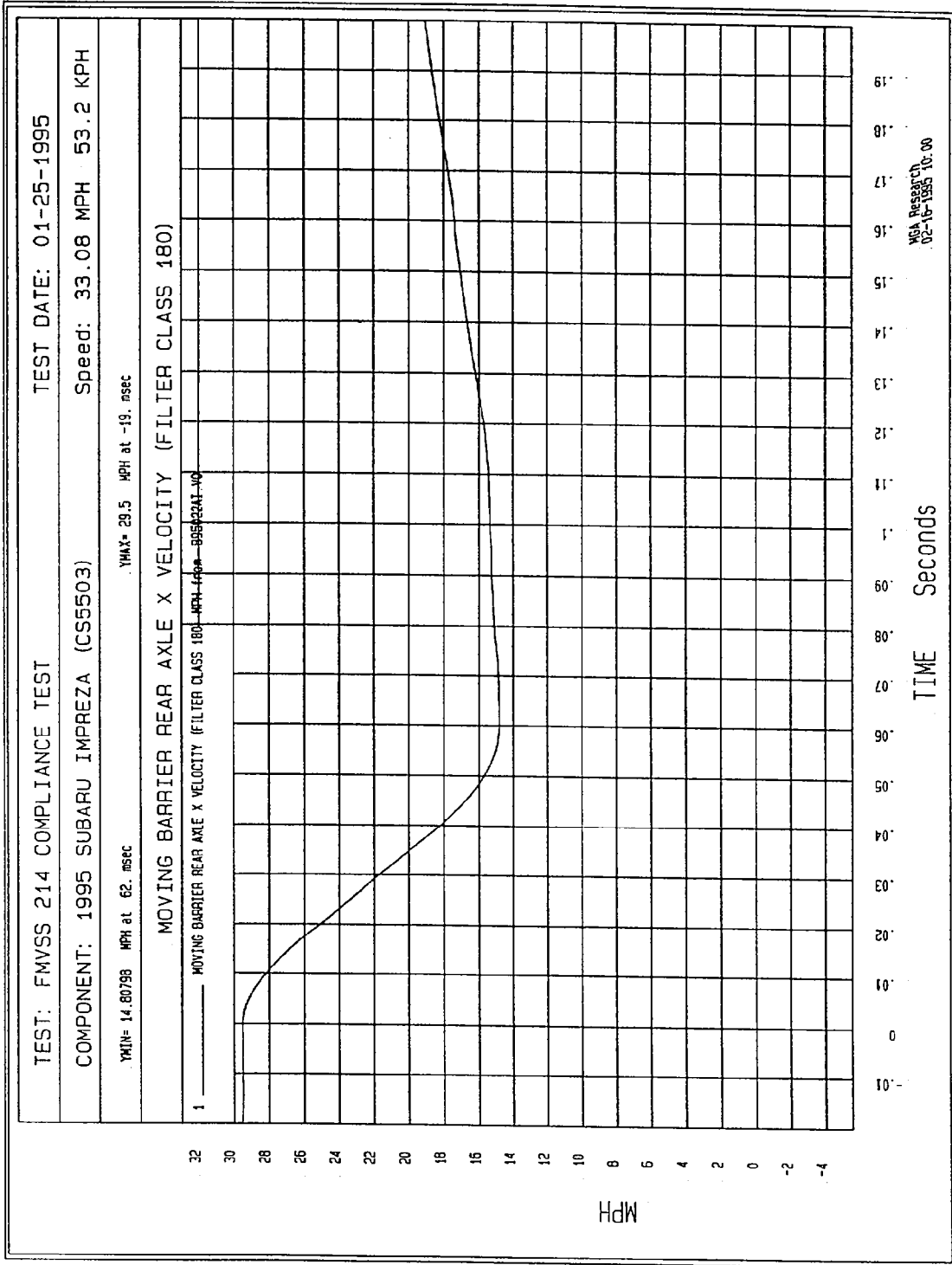


Figure B-58 - Moving Barrier Rear Axle X Velocity vs. Time

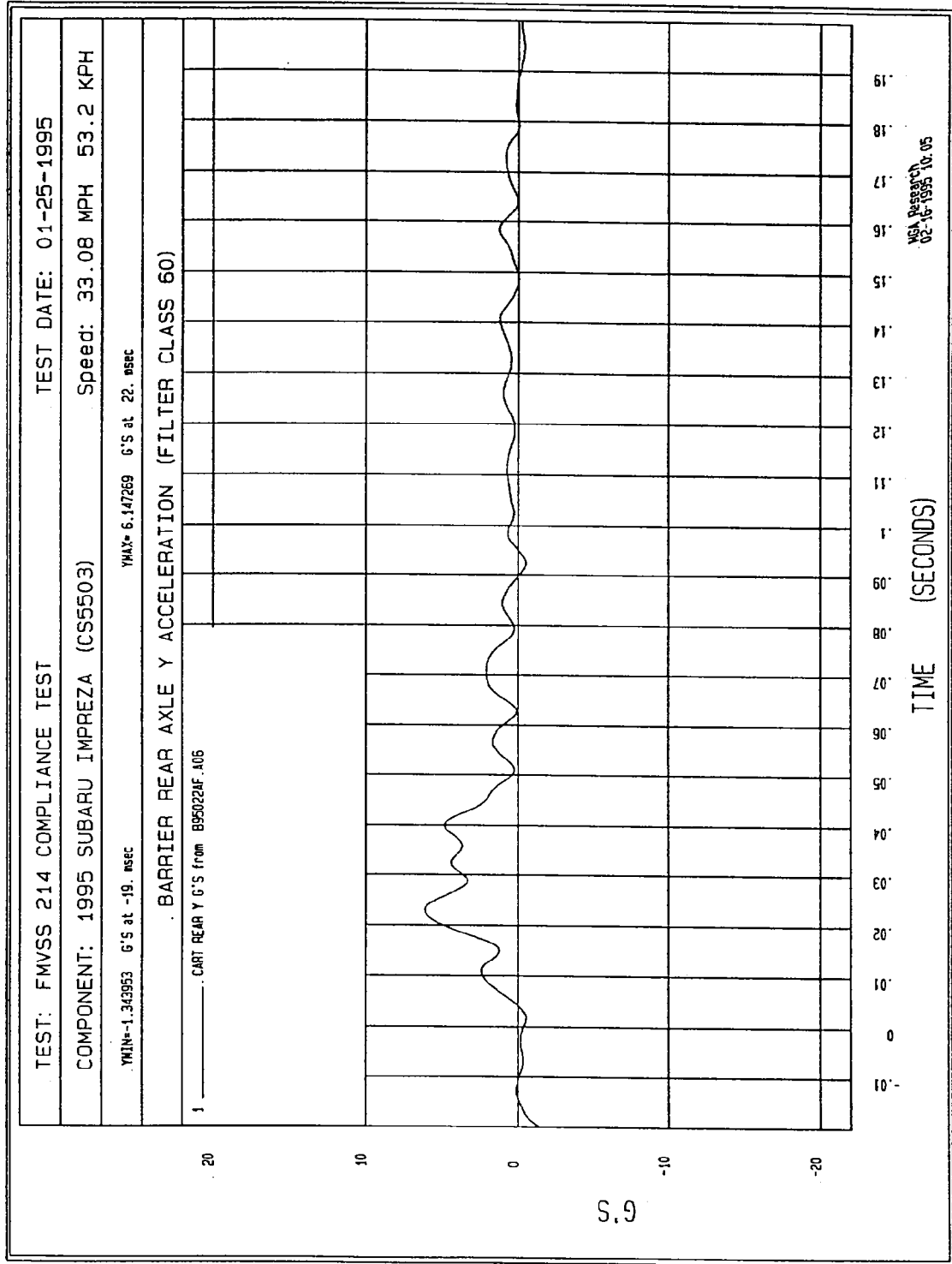


Figure B-59 - Moving Barrier Rear Axle Y Acceleration vs. Time

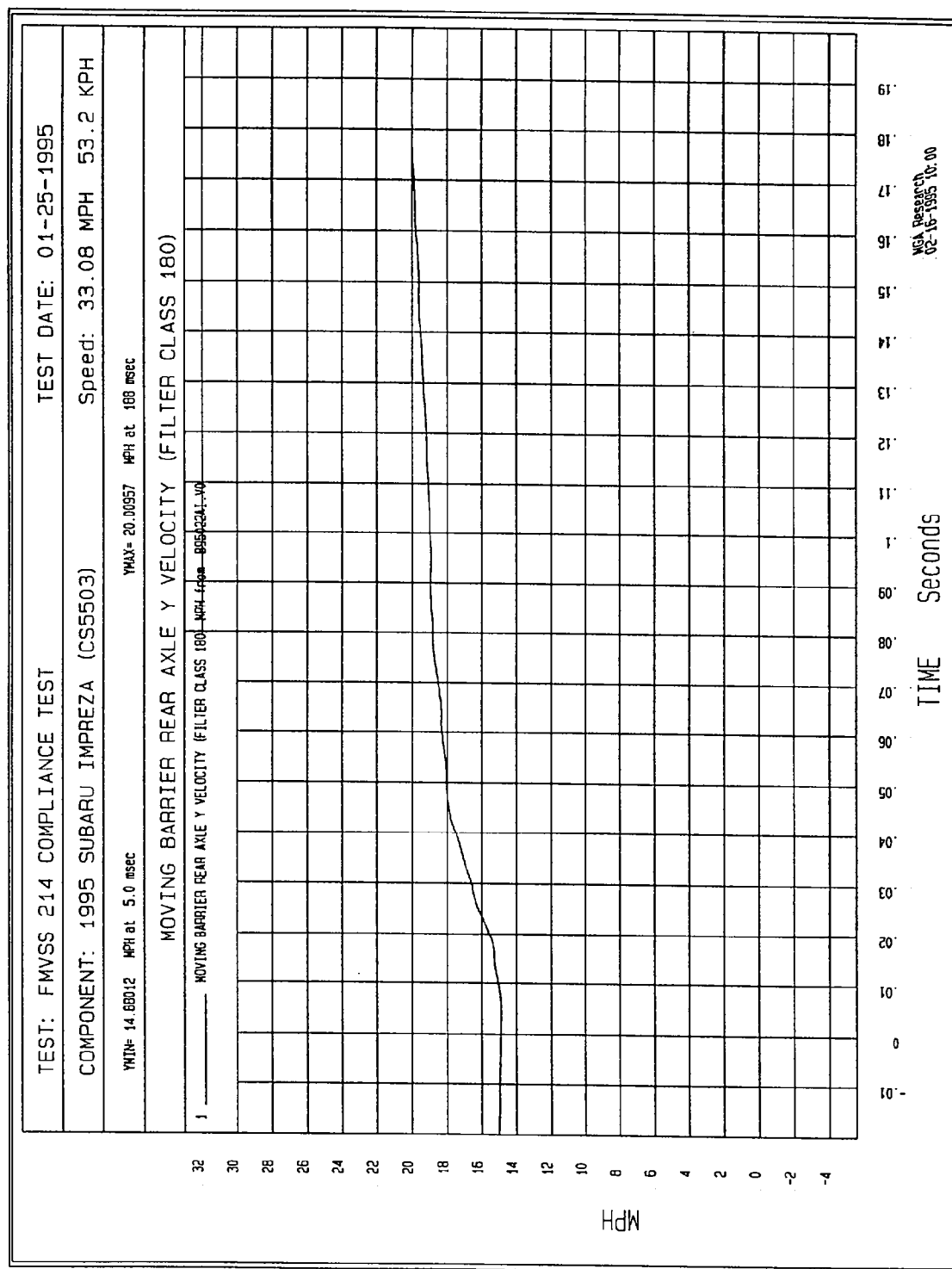


Figure B-60 - Moving Barrier Rear Axle Y Velocity vs. Time

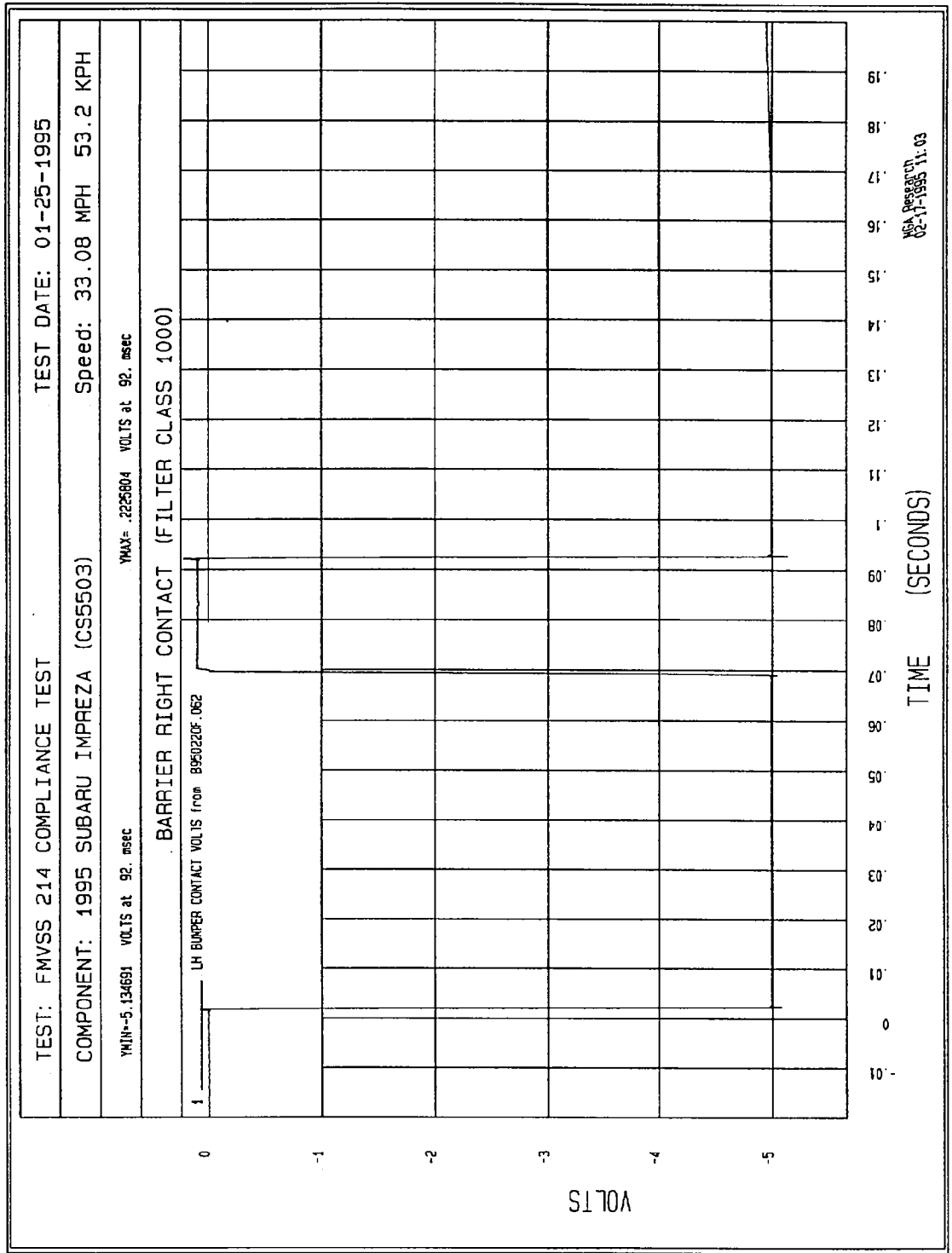


Figure B-61 - Right Hand Barrier Contact

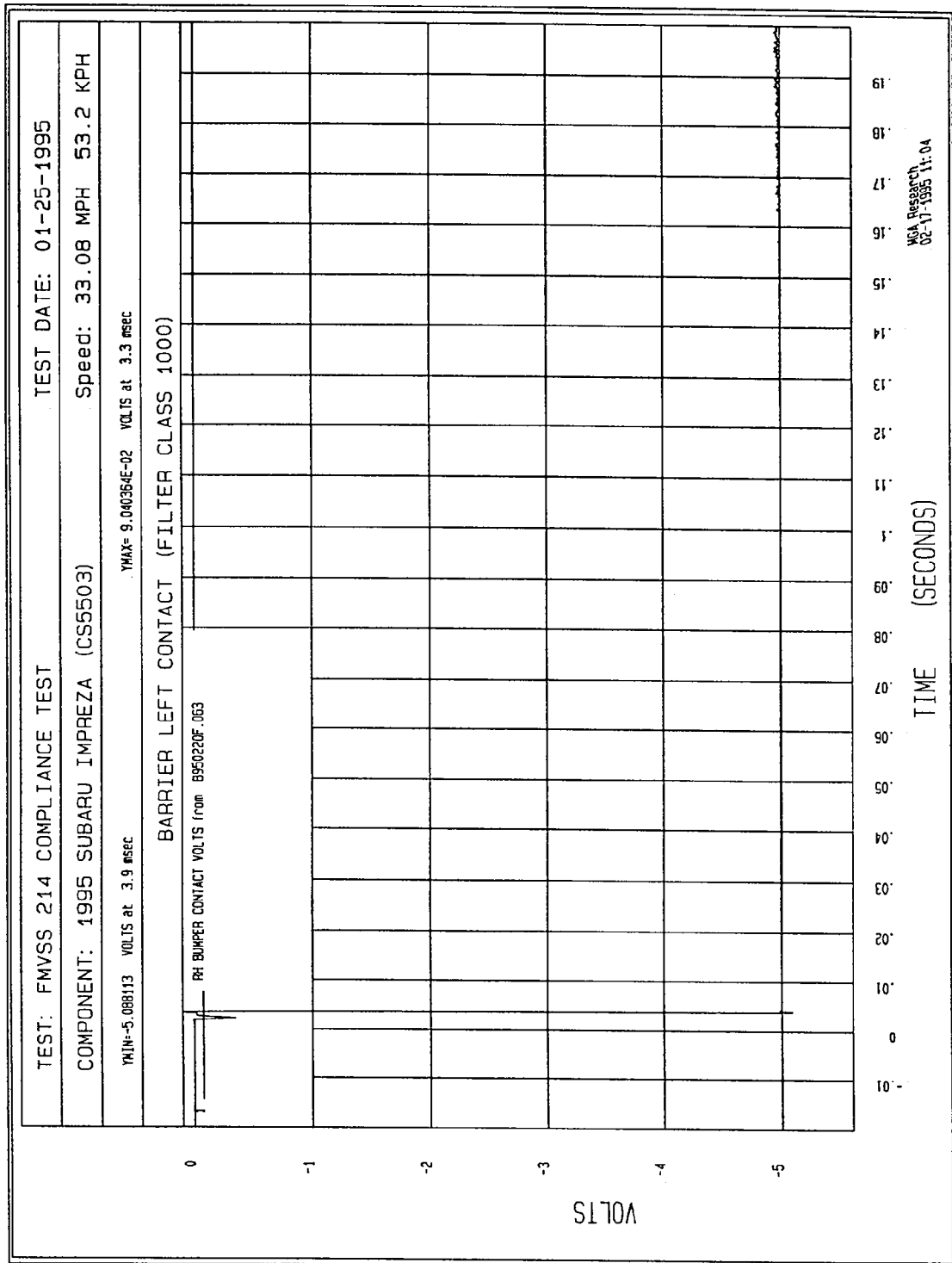


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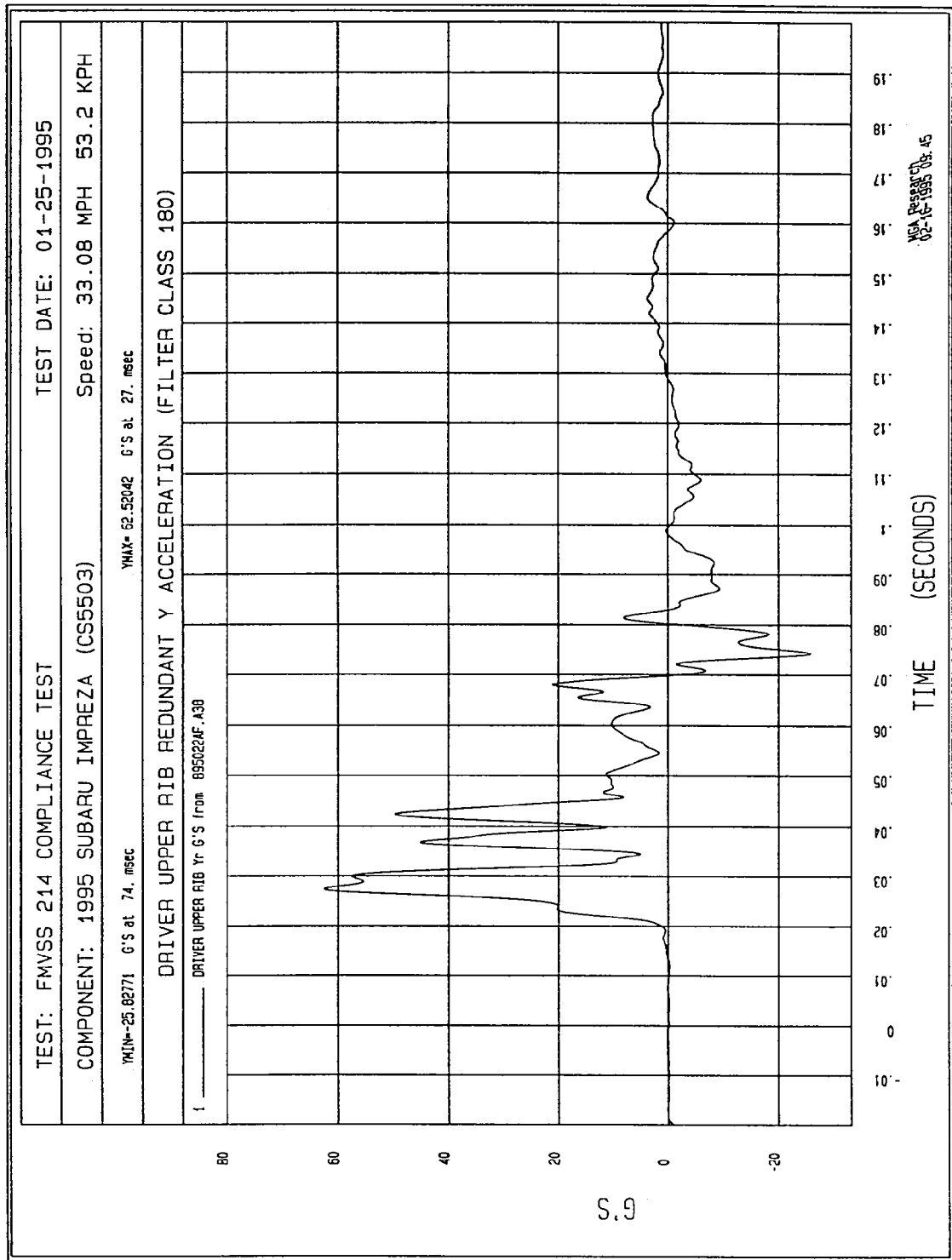


Figure B-63 - Driver Upper Rib Y Redundant Acceleration vs. Time

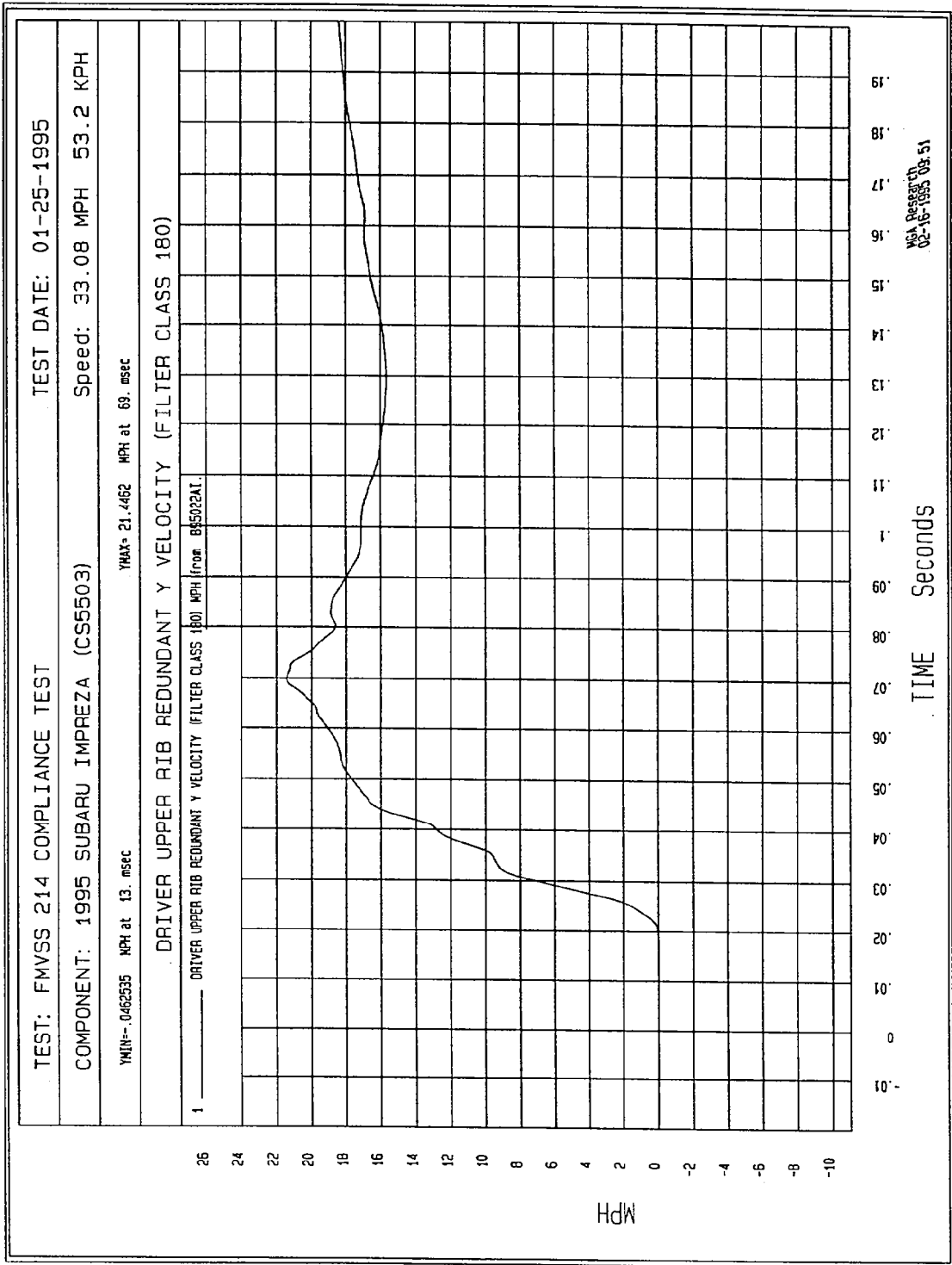


Figure B-64 - Driver Upper Rib Y Redundant Velocity vs. Time

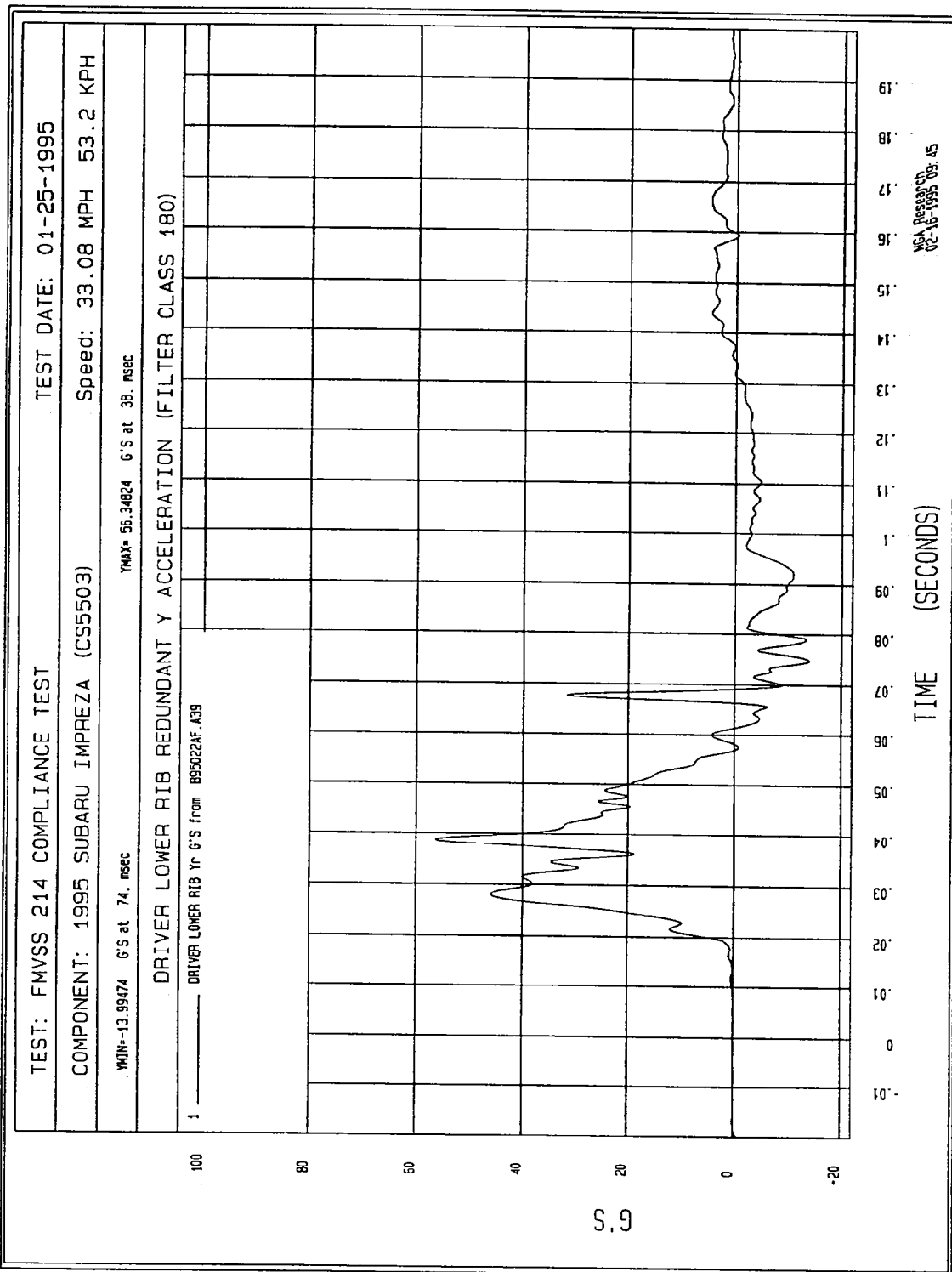


Figure B-65 - Driver Lower Rib Y Redundant Acceleration vs. Time

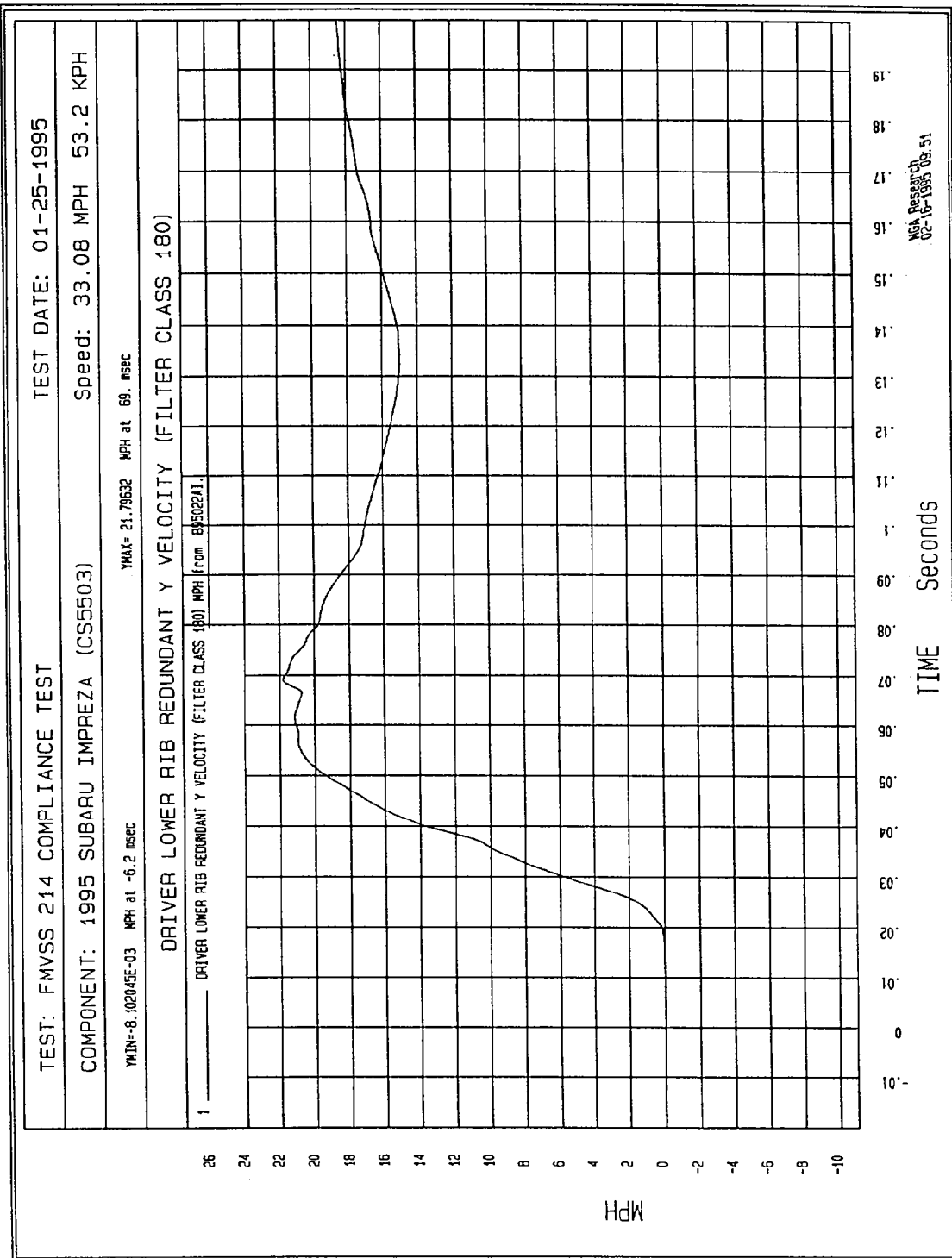


Figure B-66 - Driver Lower Rib Y Redundant Velocity vs. Time

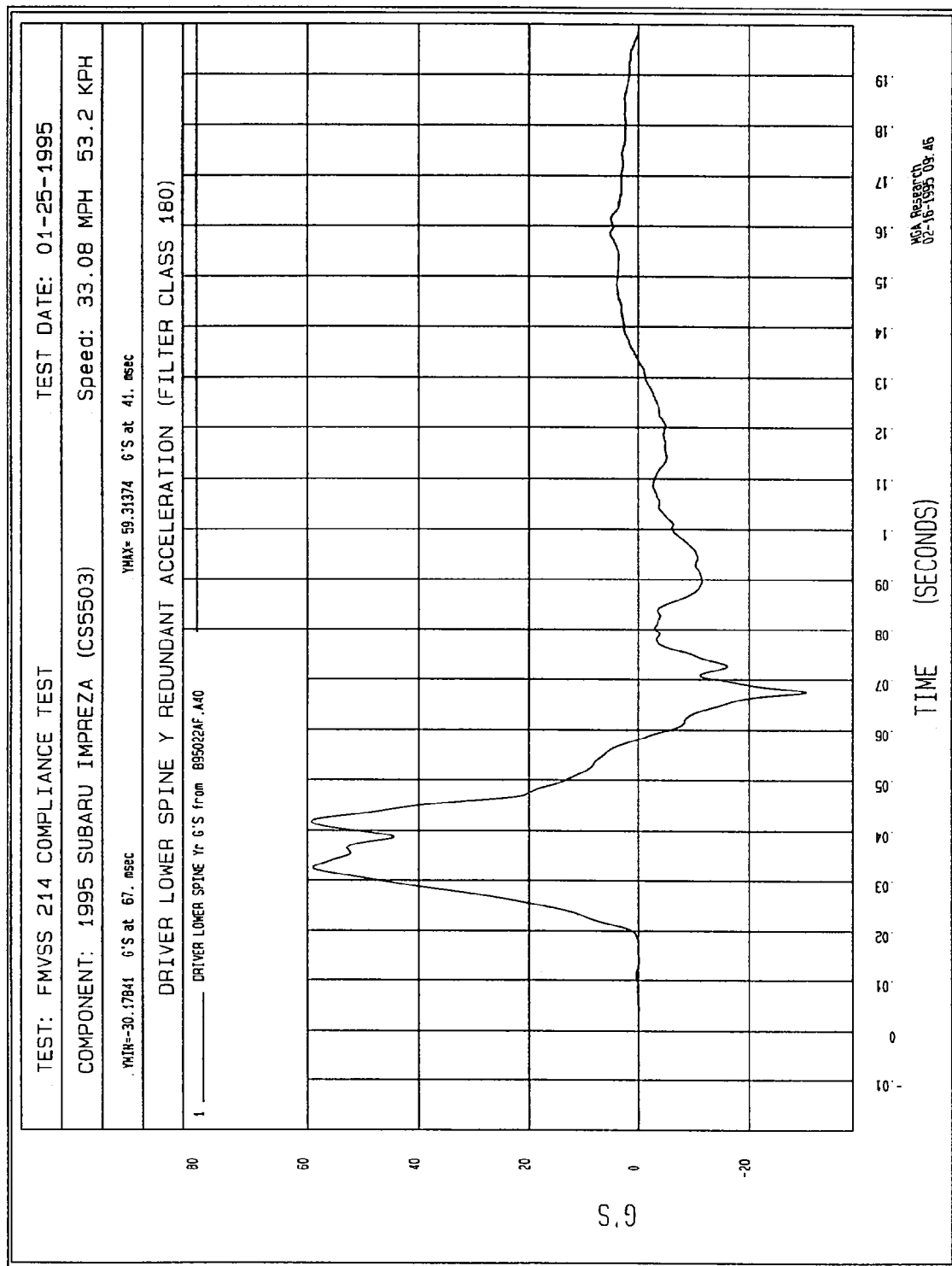
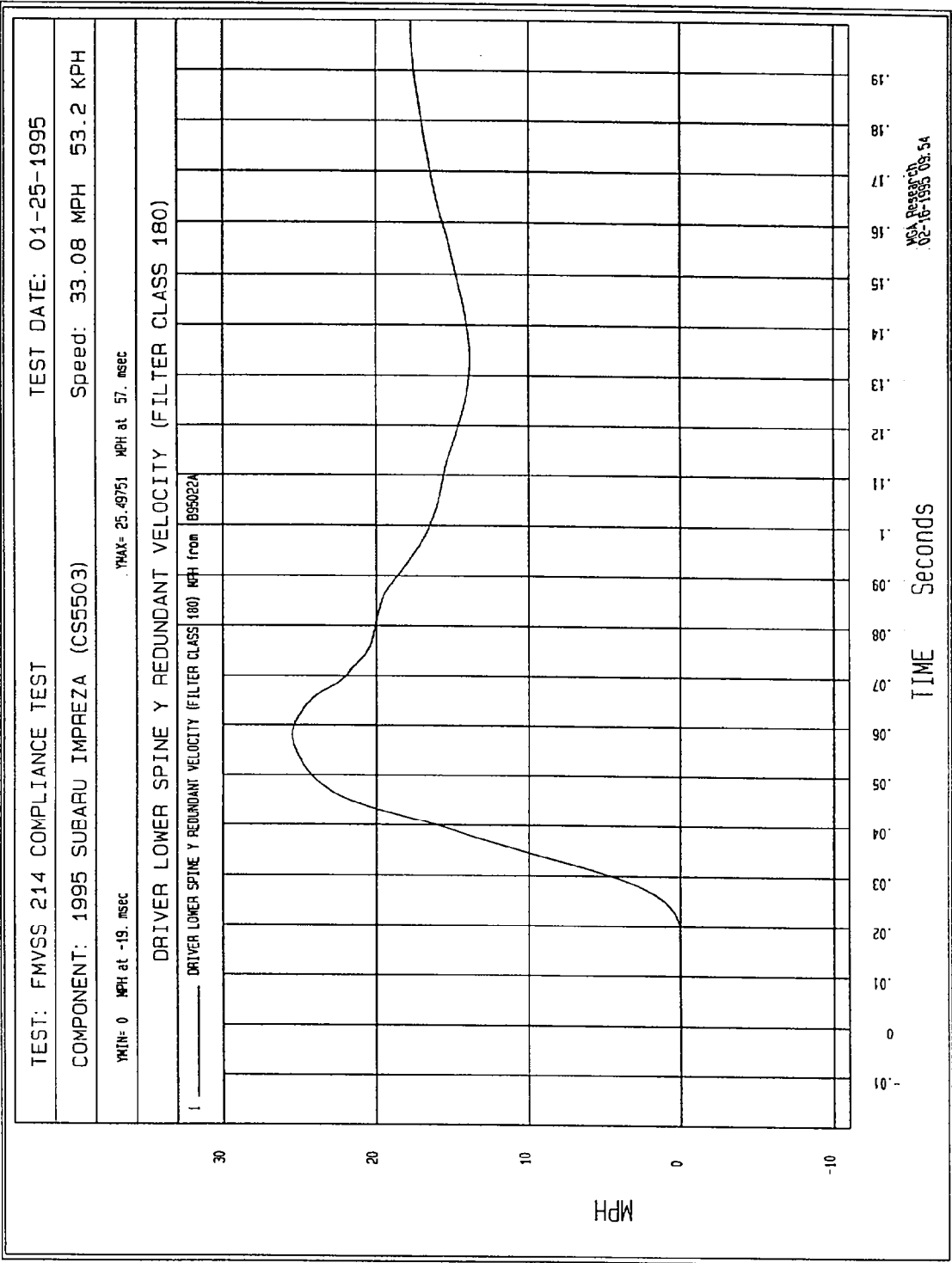


Figure B-67 - Driver Lower Spine Y Redundant Acceleration vs. Time



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

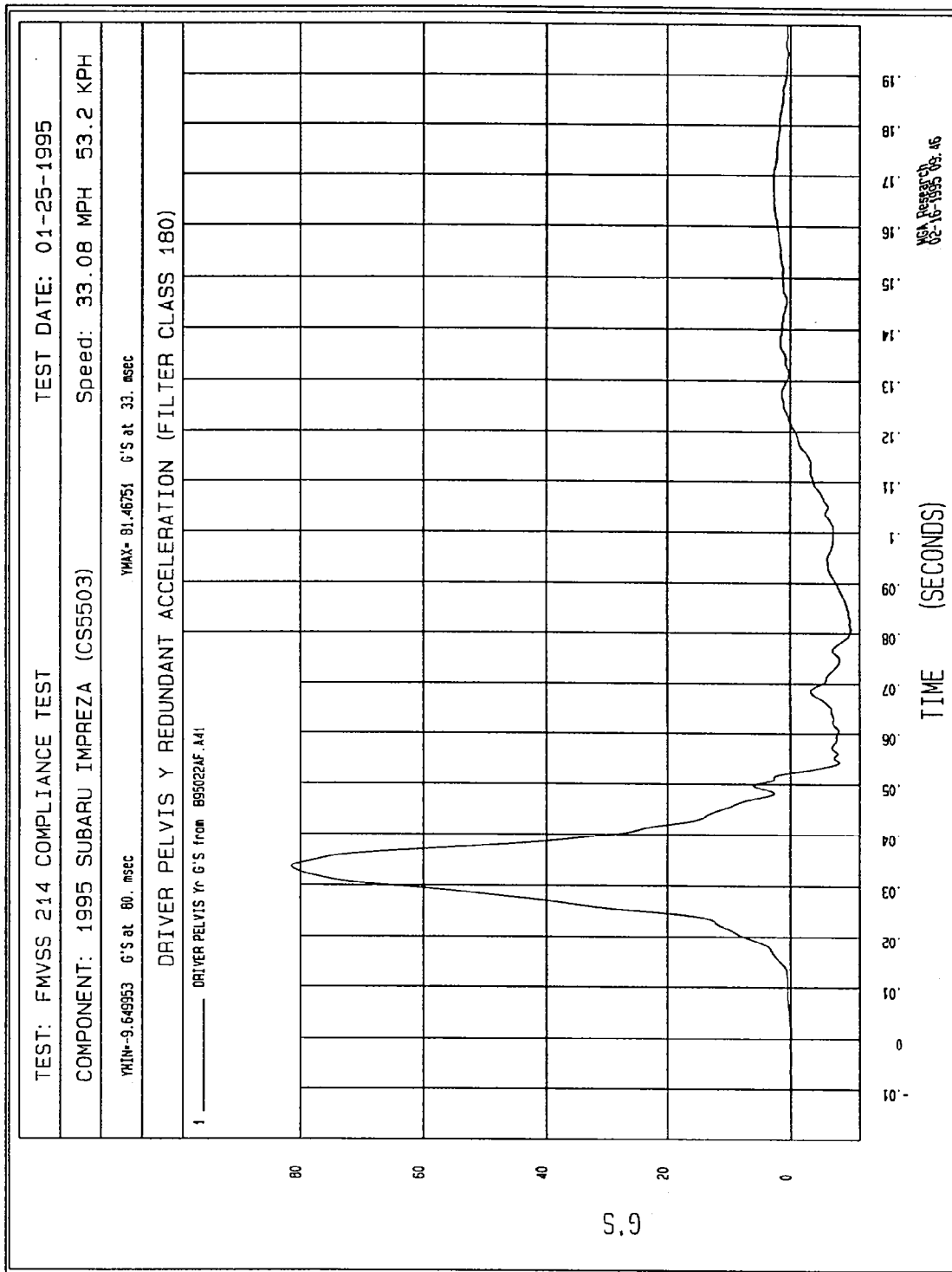


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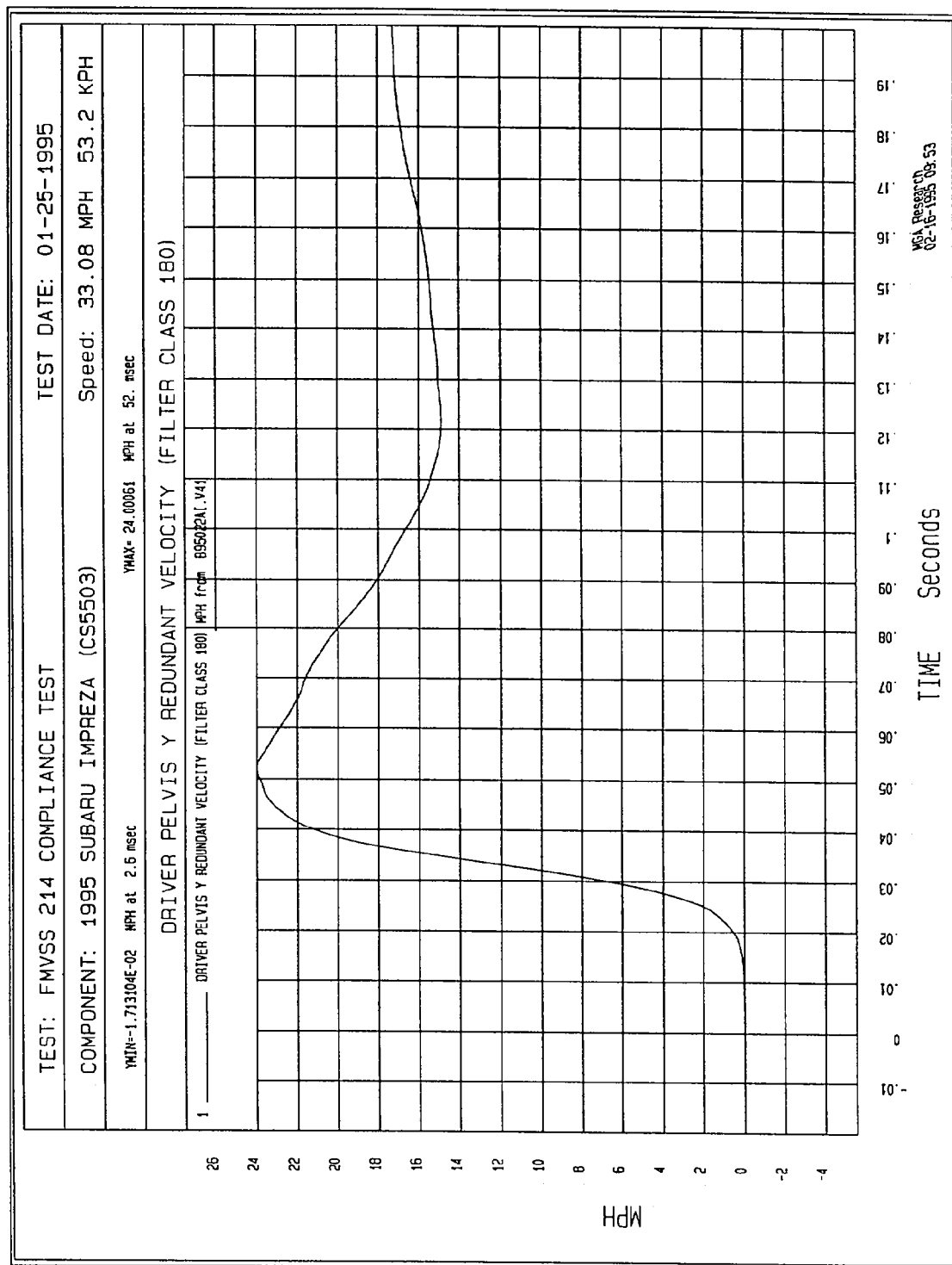


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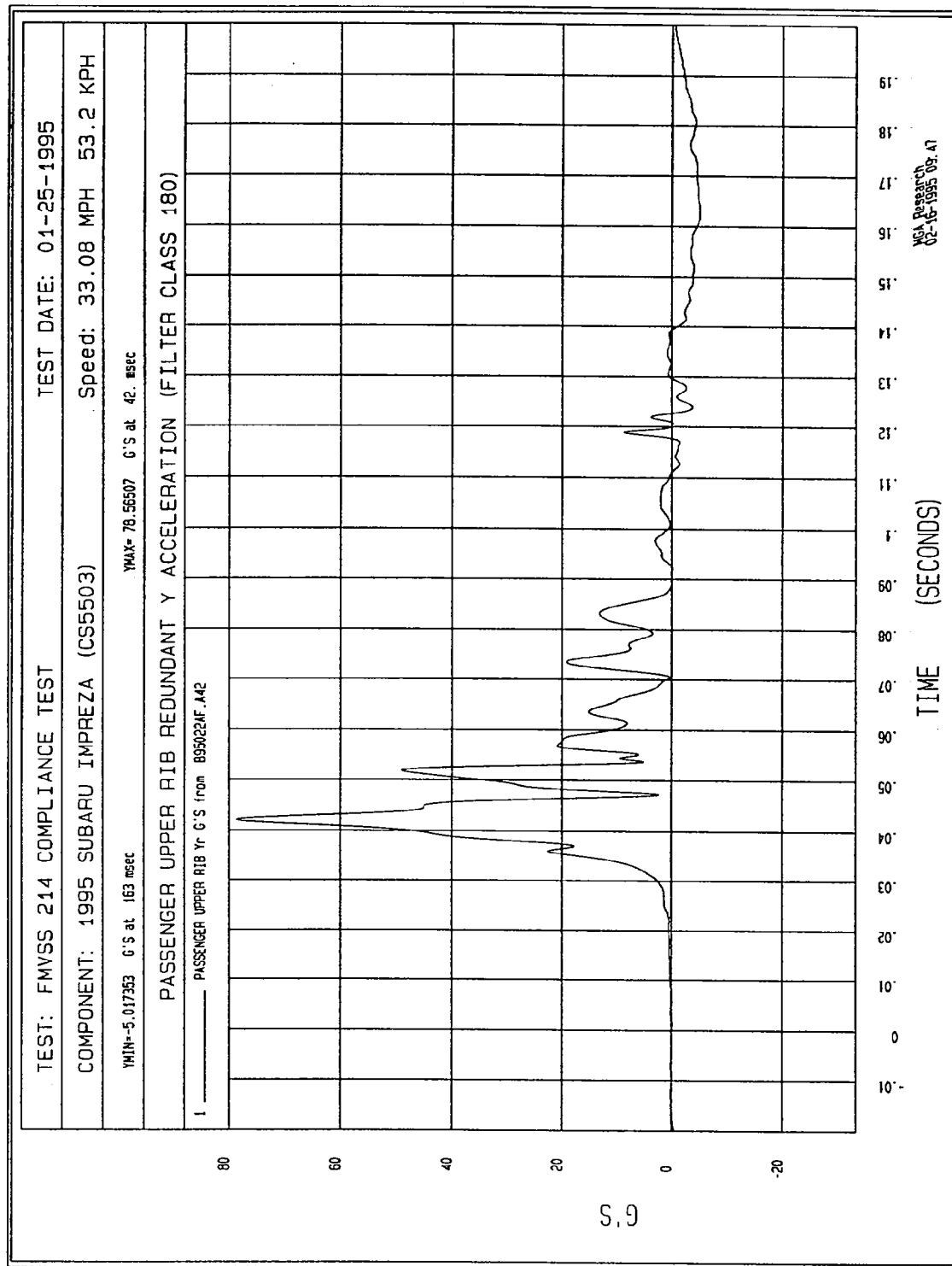


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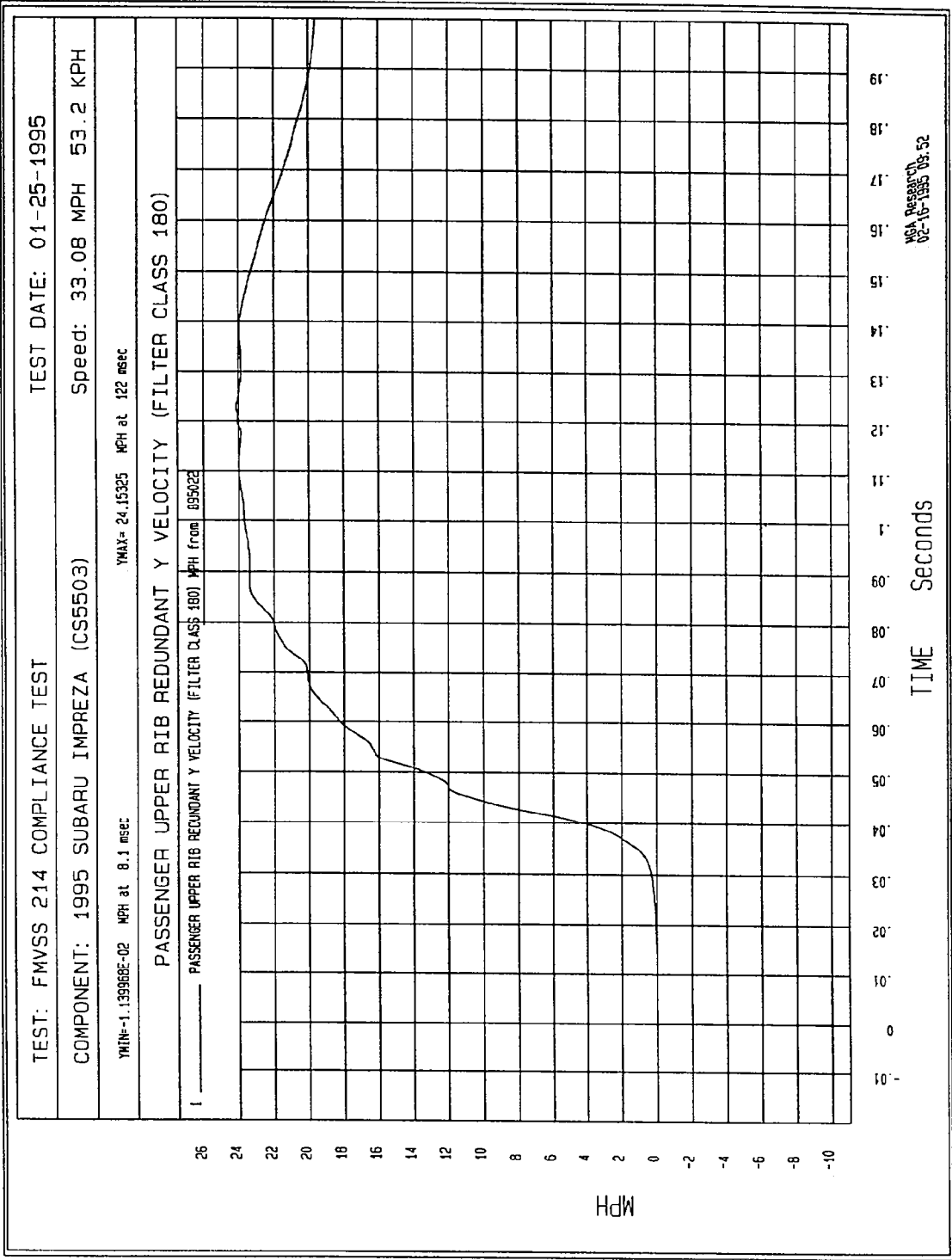


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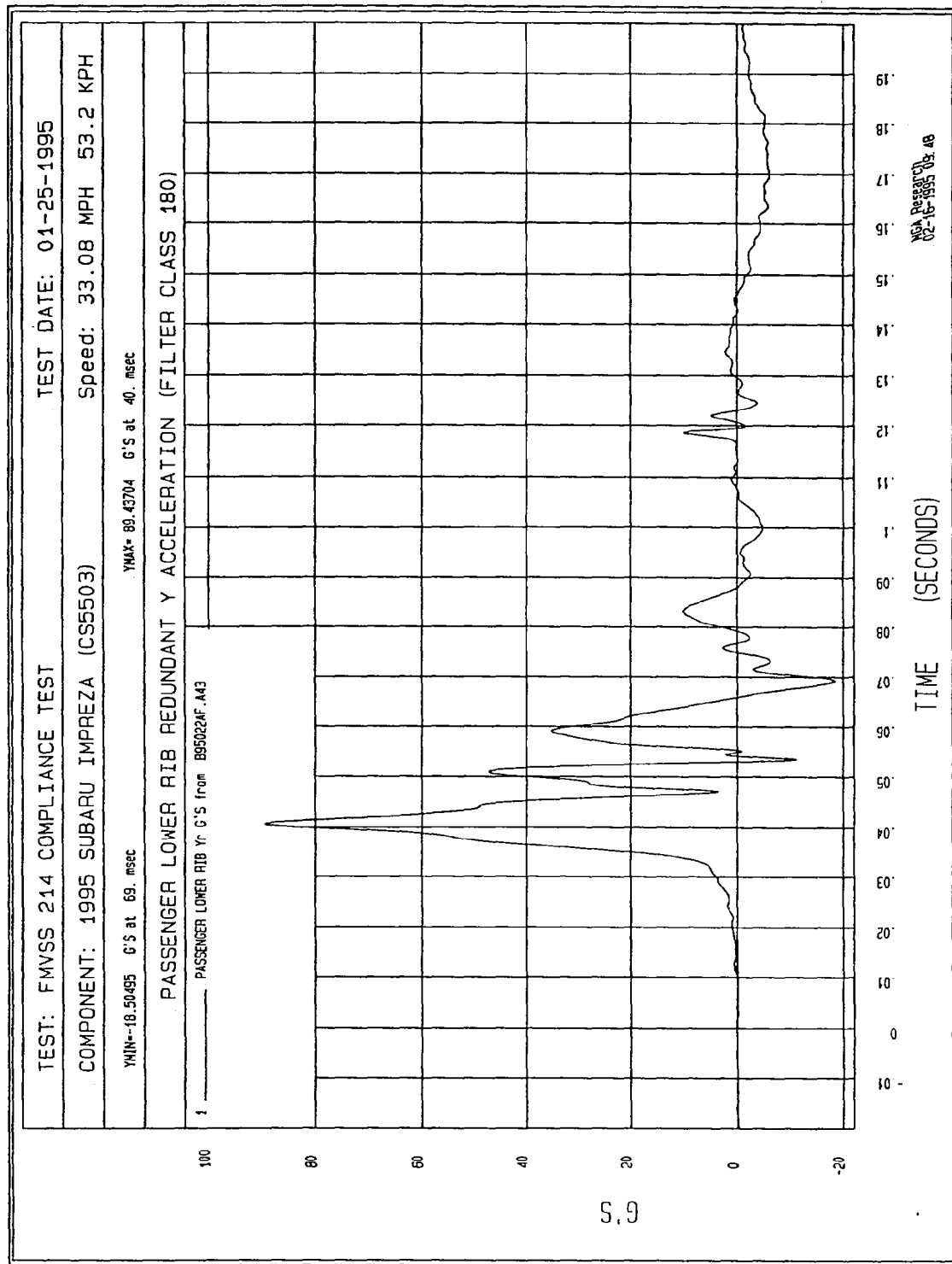


Figure B-73 - Passenger Lower Rib Y Redundant Acceleration vs. Time

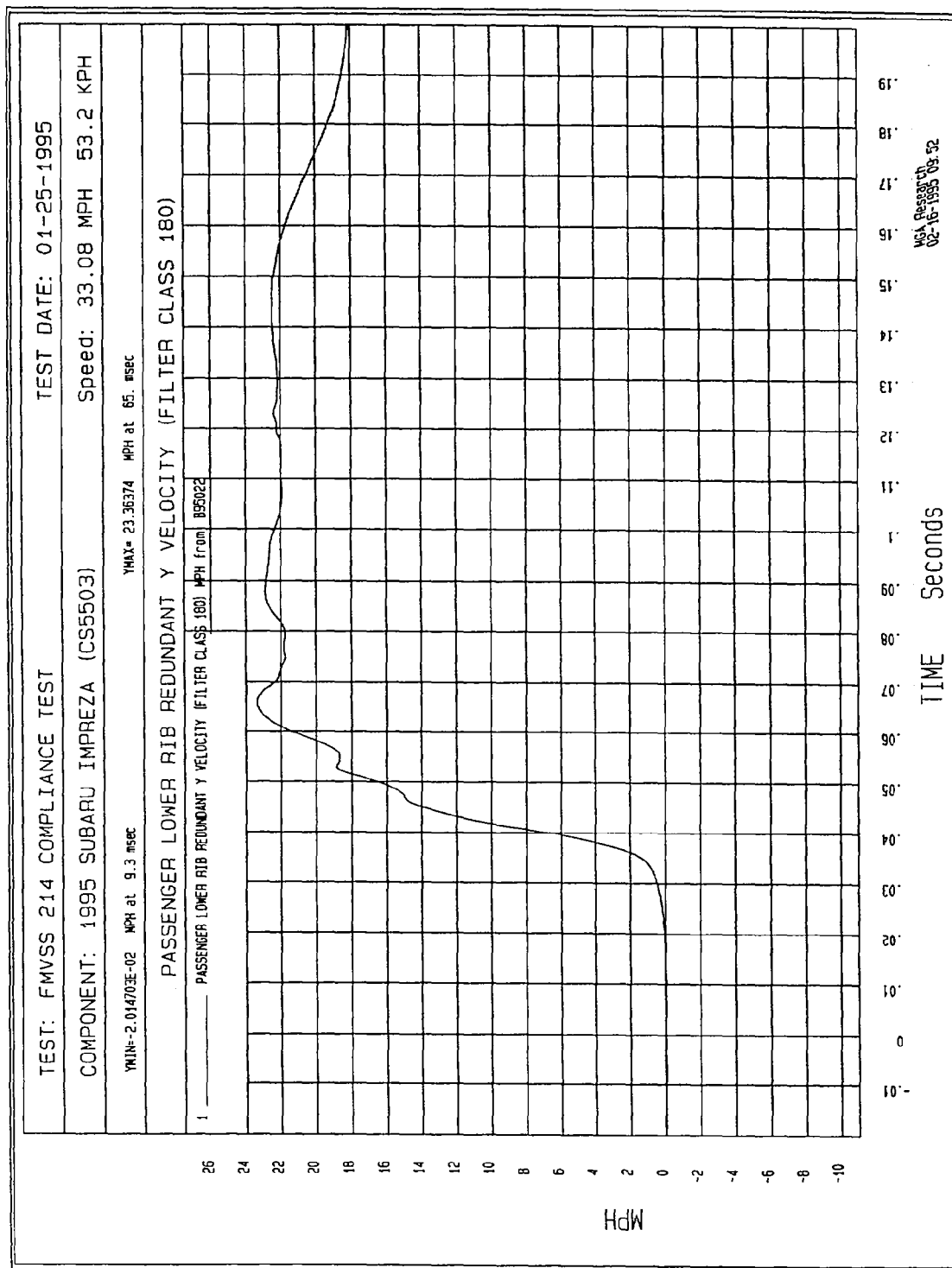


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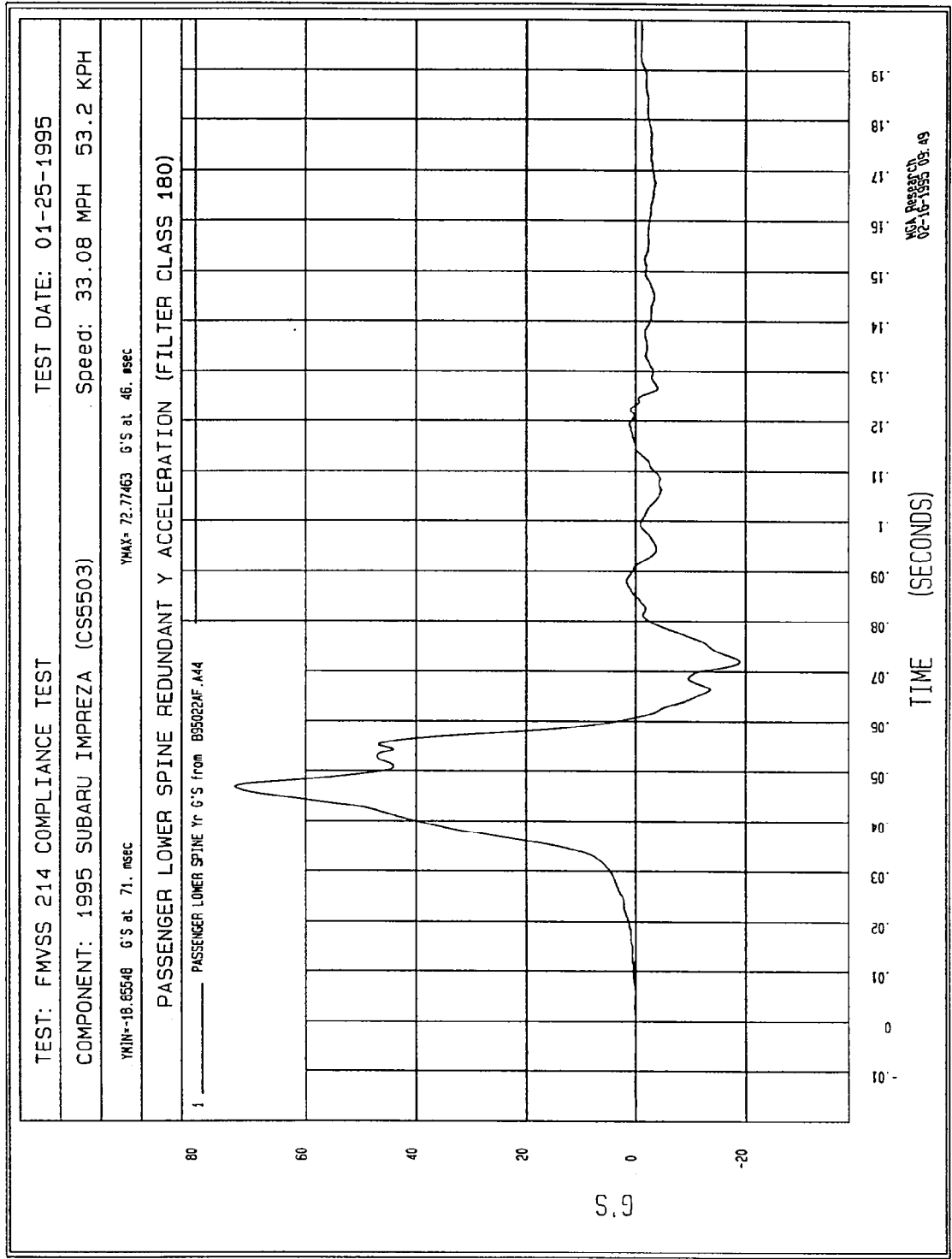


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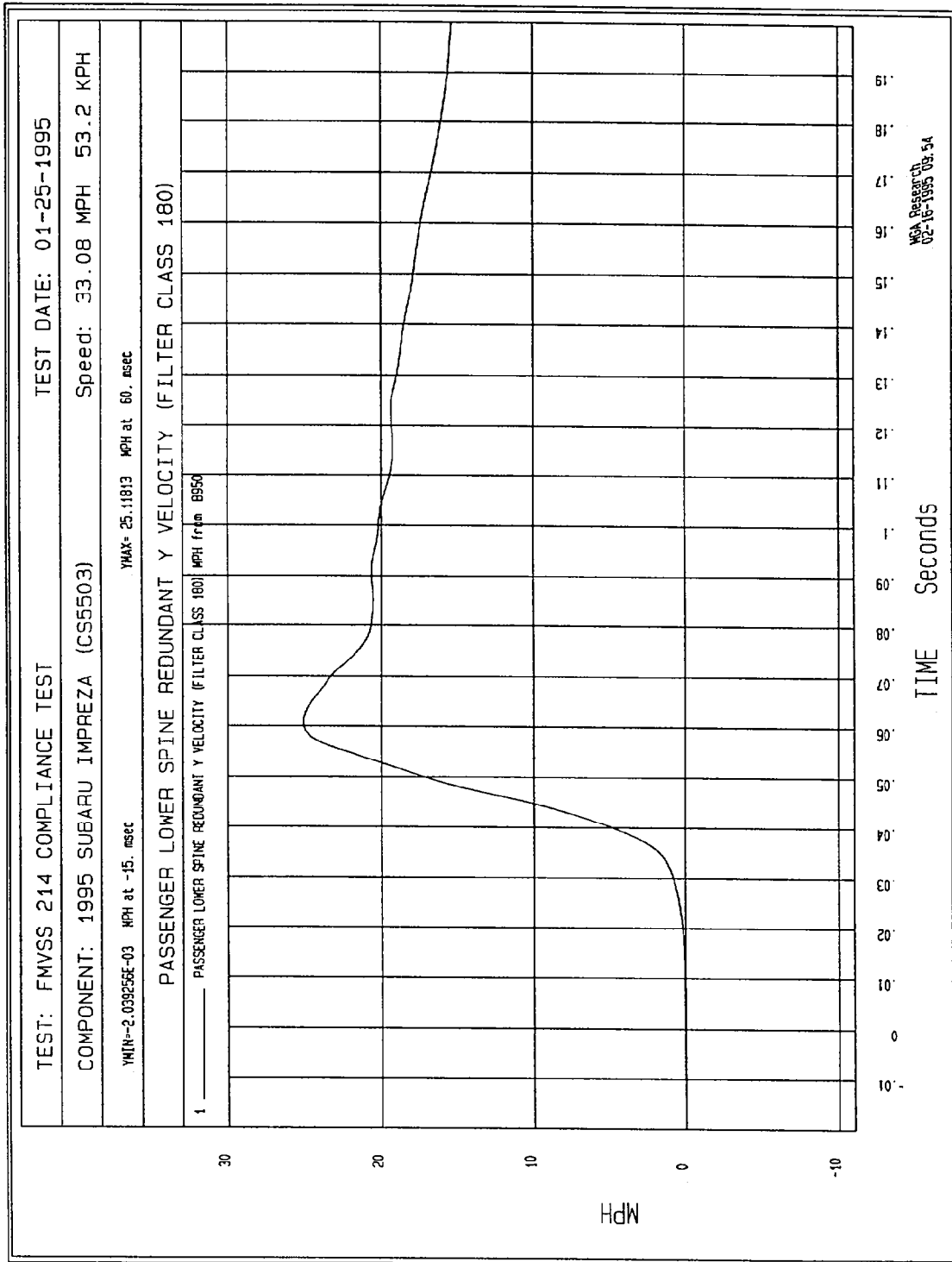


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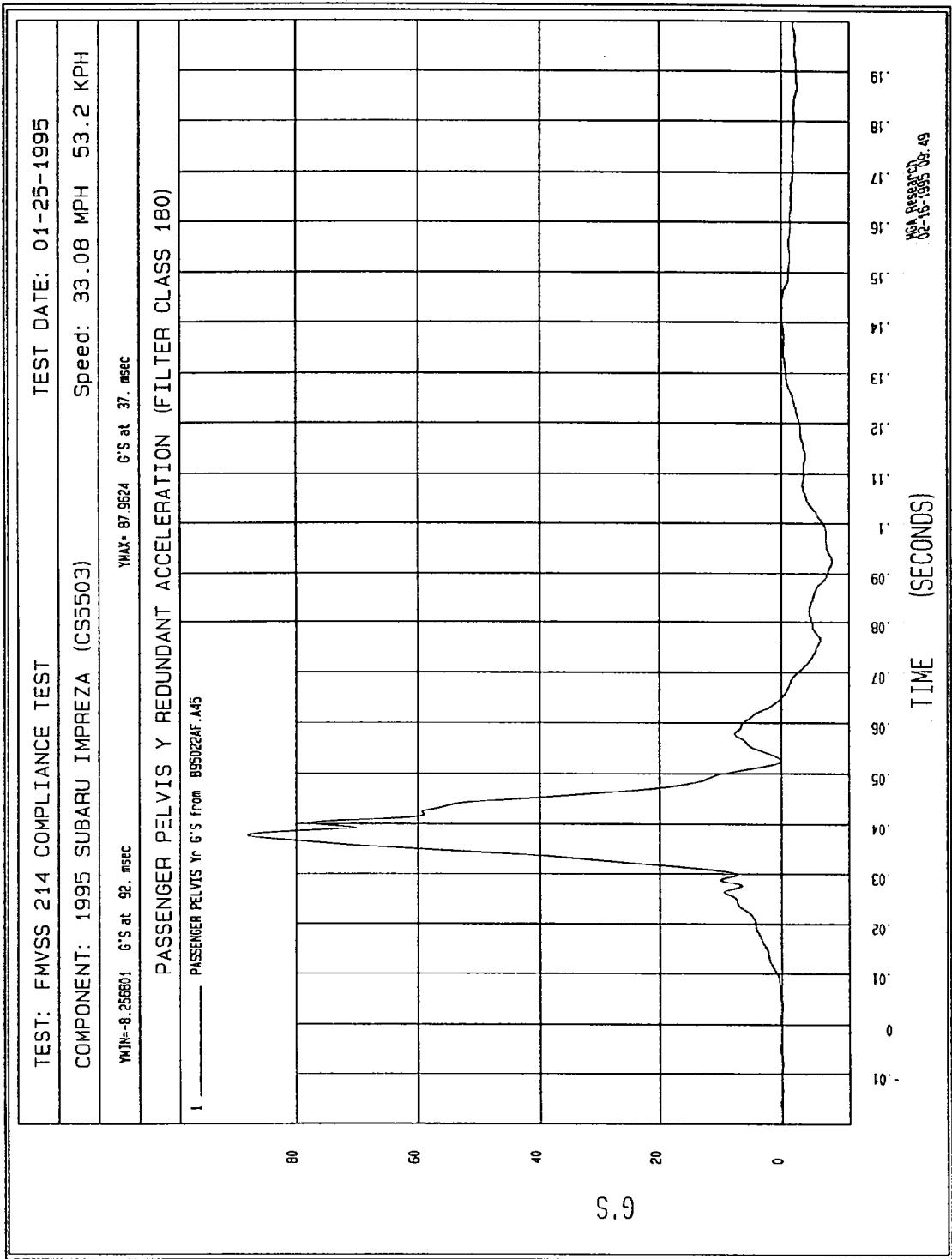


Figure B-77 - Passenger Pelvis Y Redundant Acceleration vs. Time

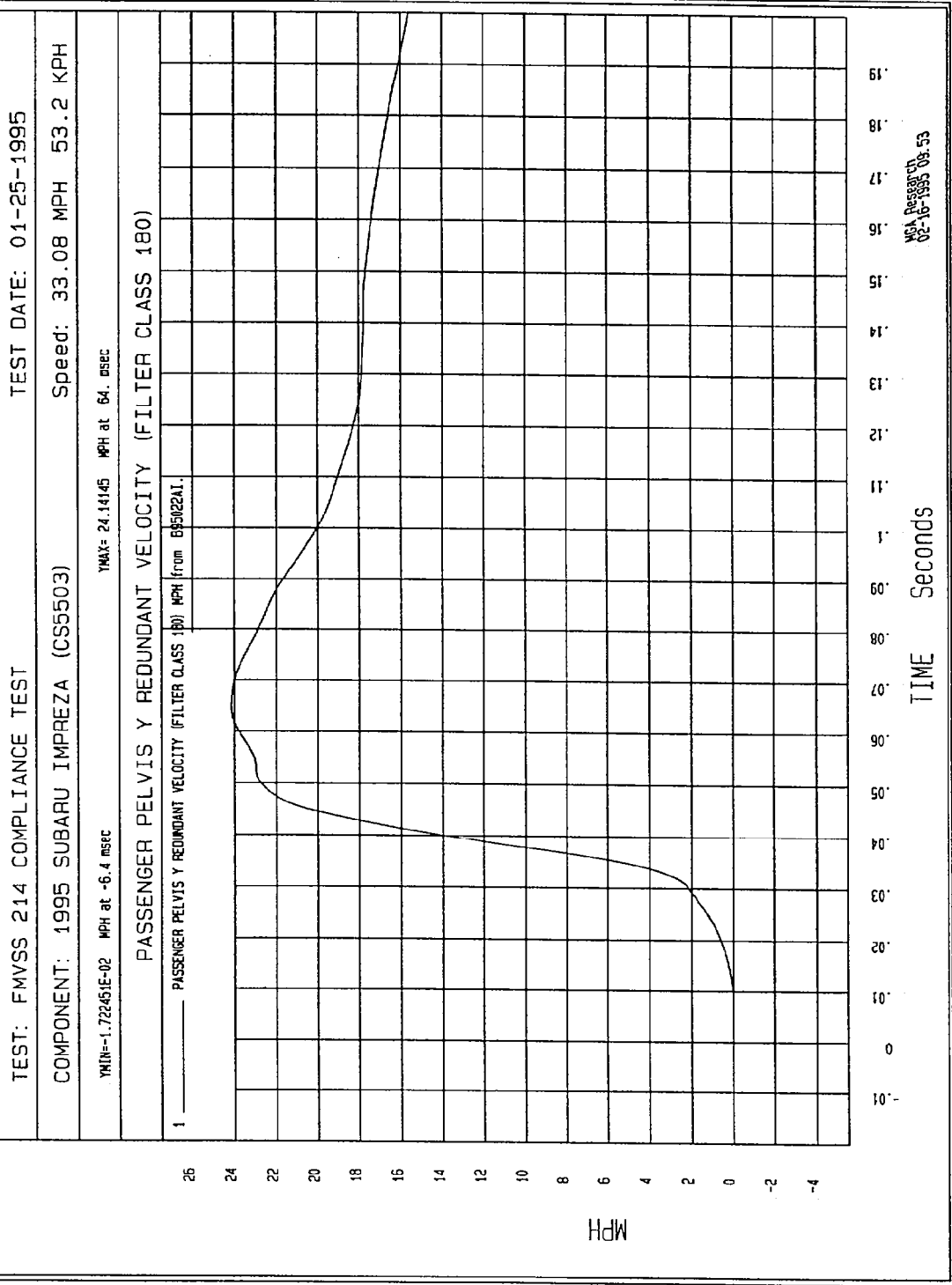


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FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

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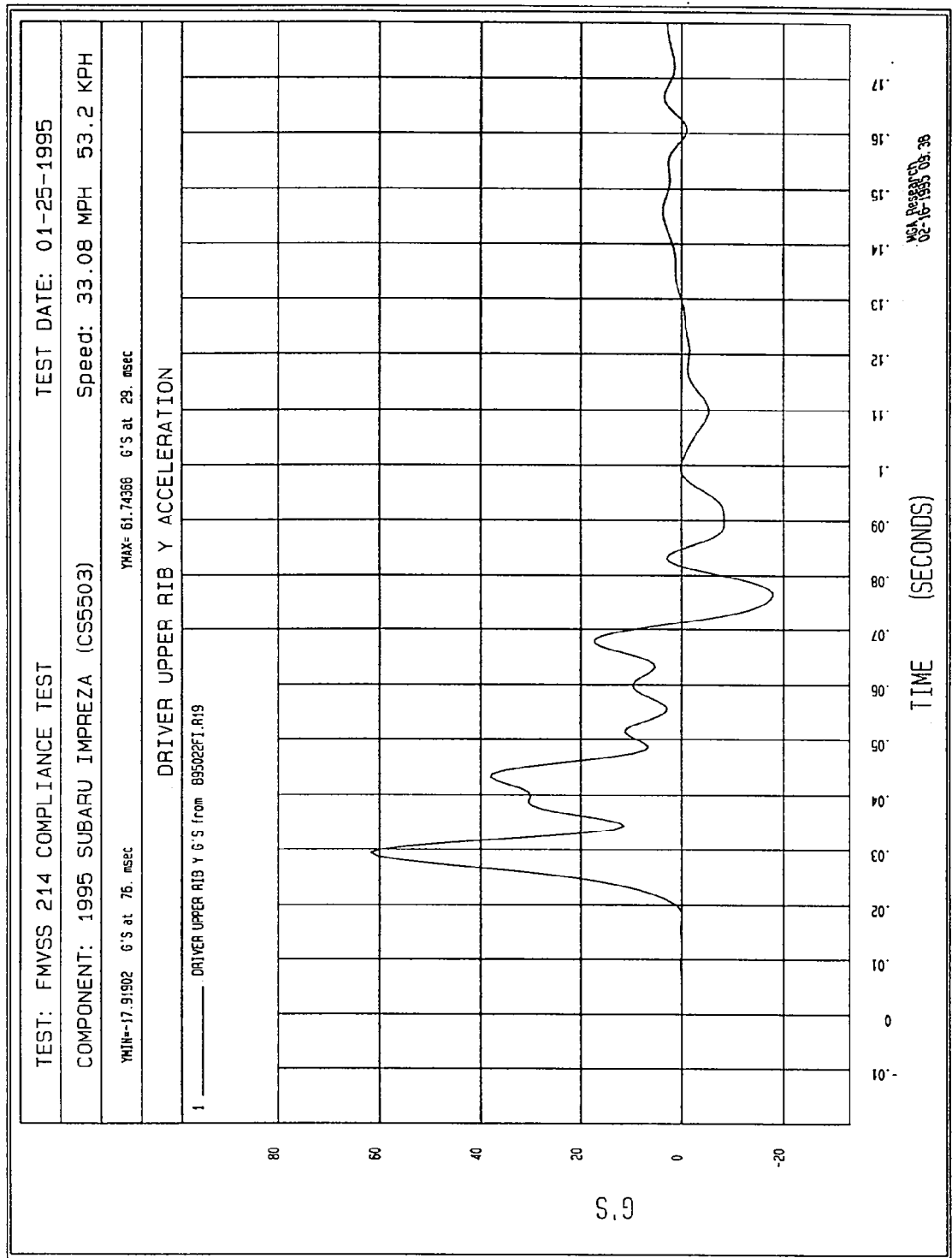


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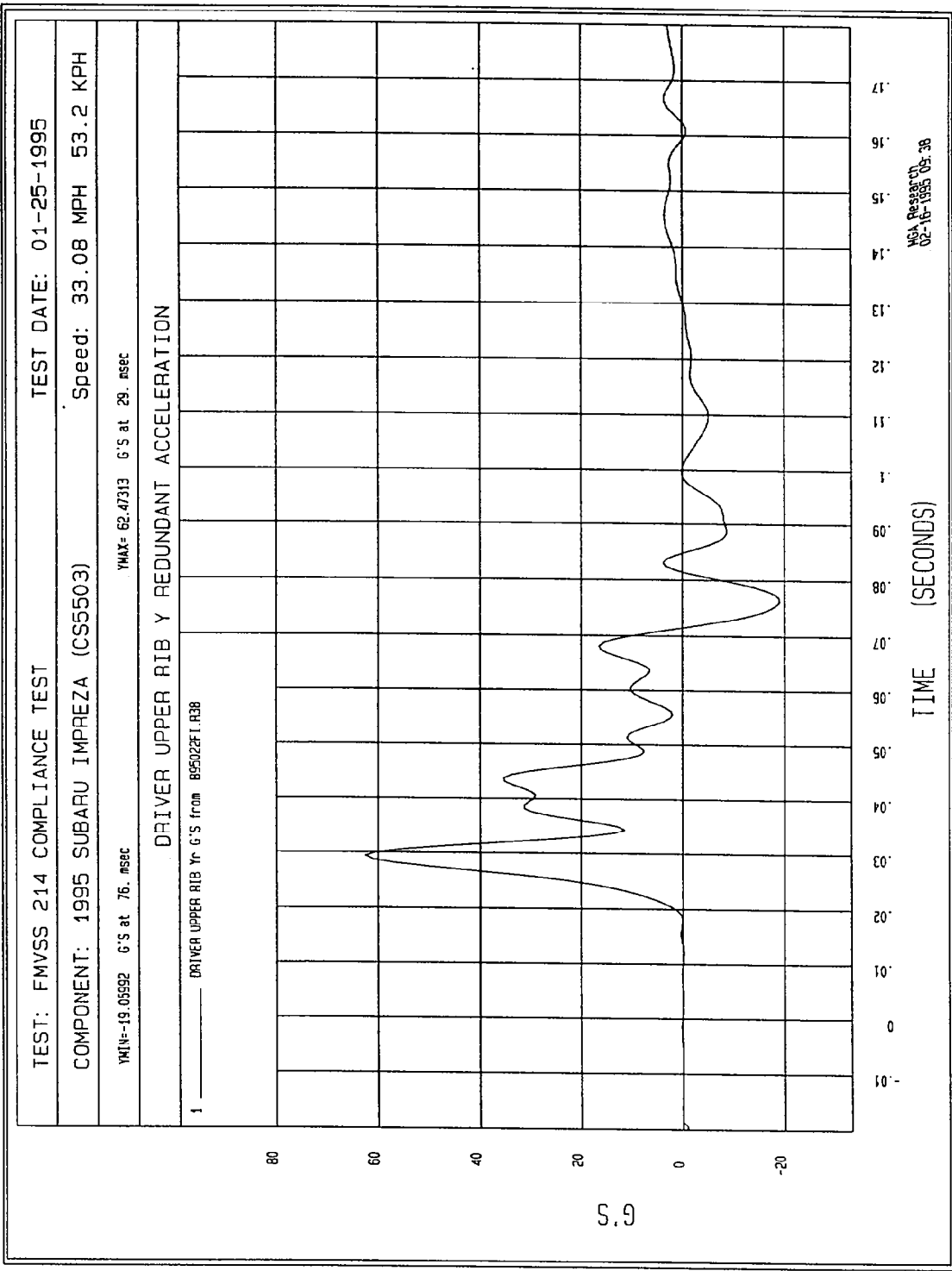


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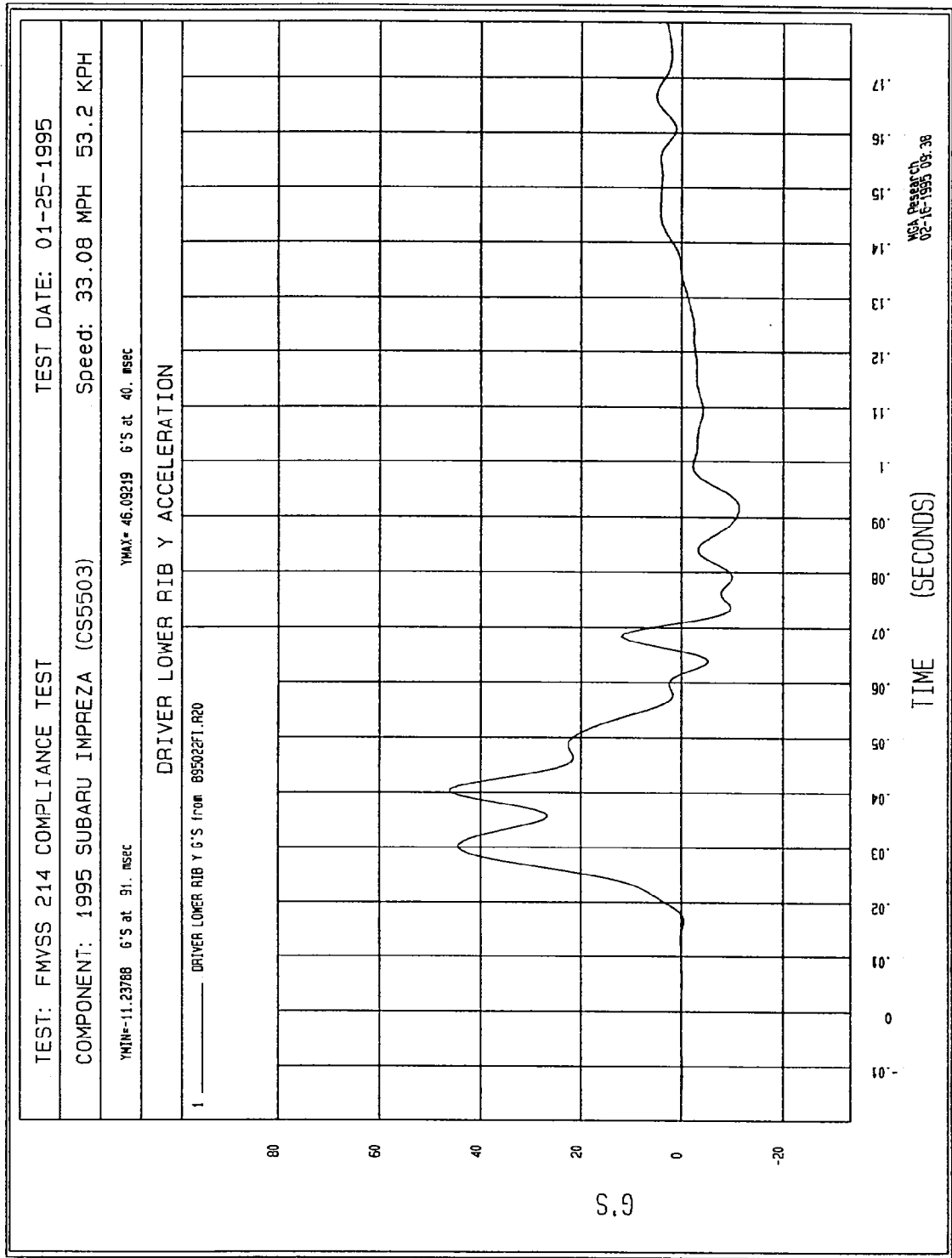


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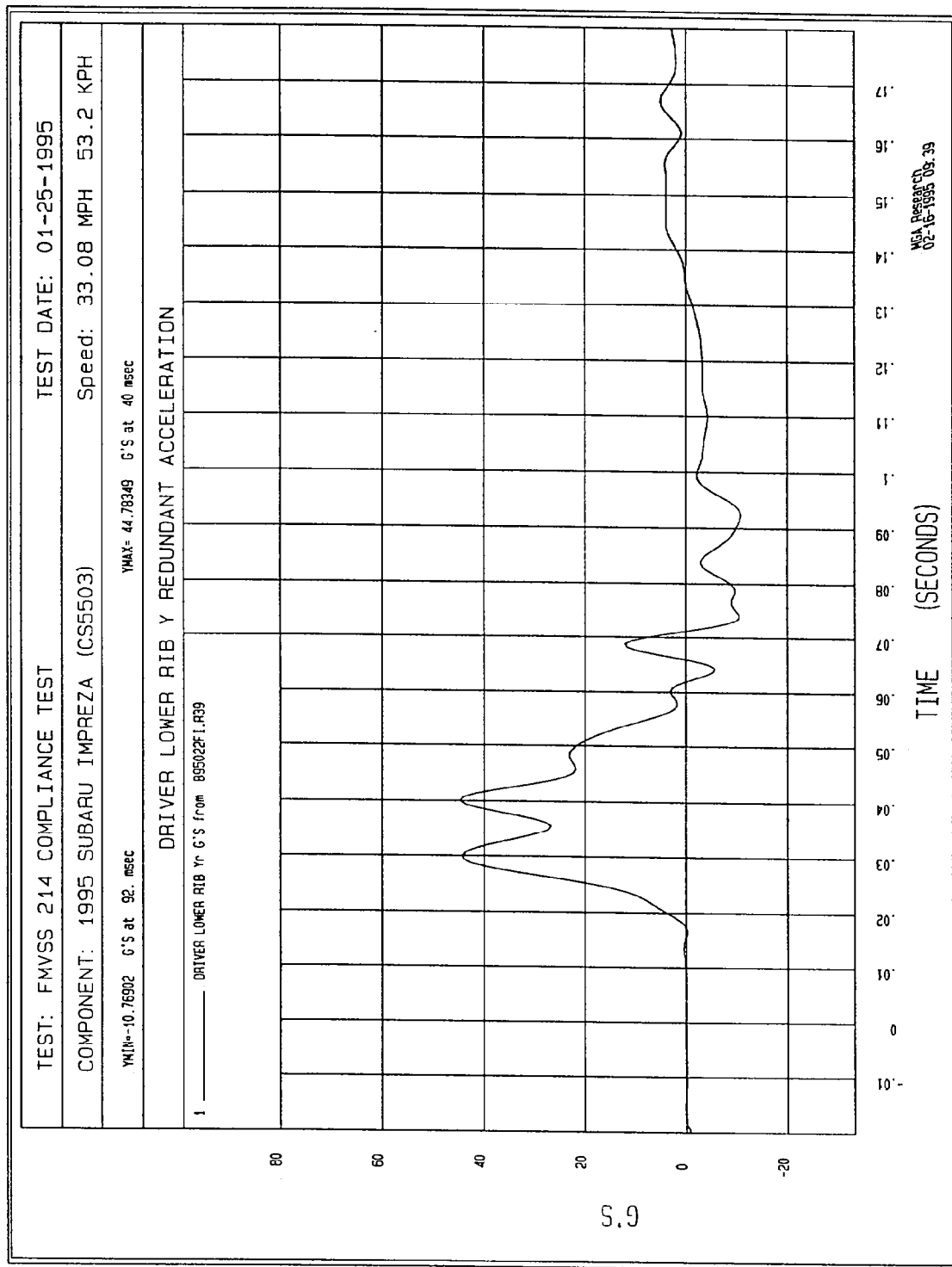


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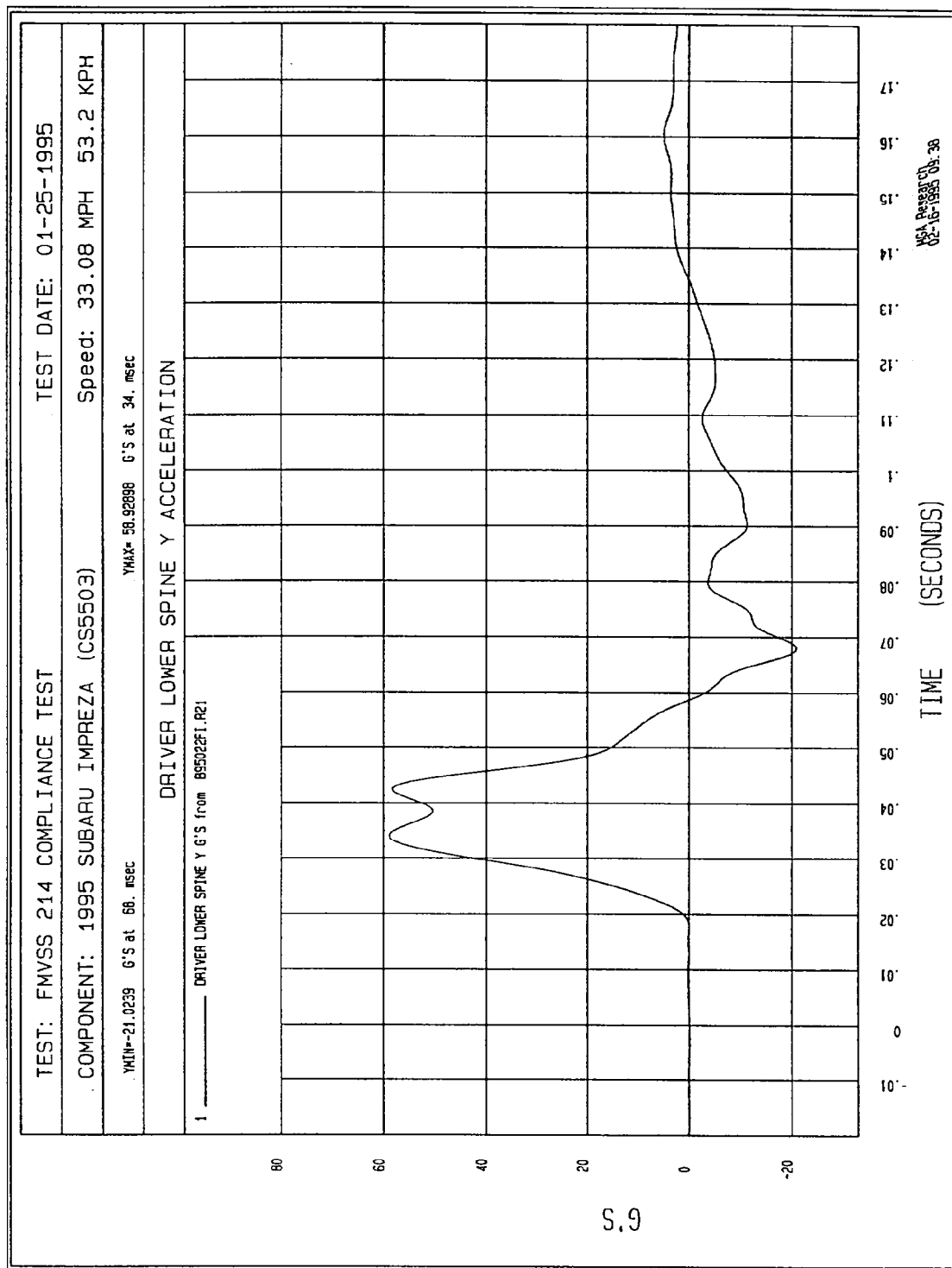


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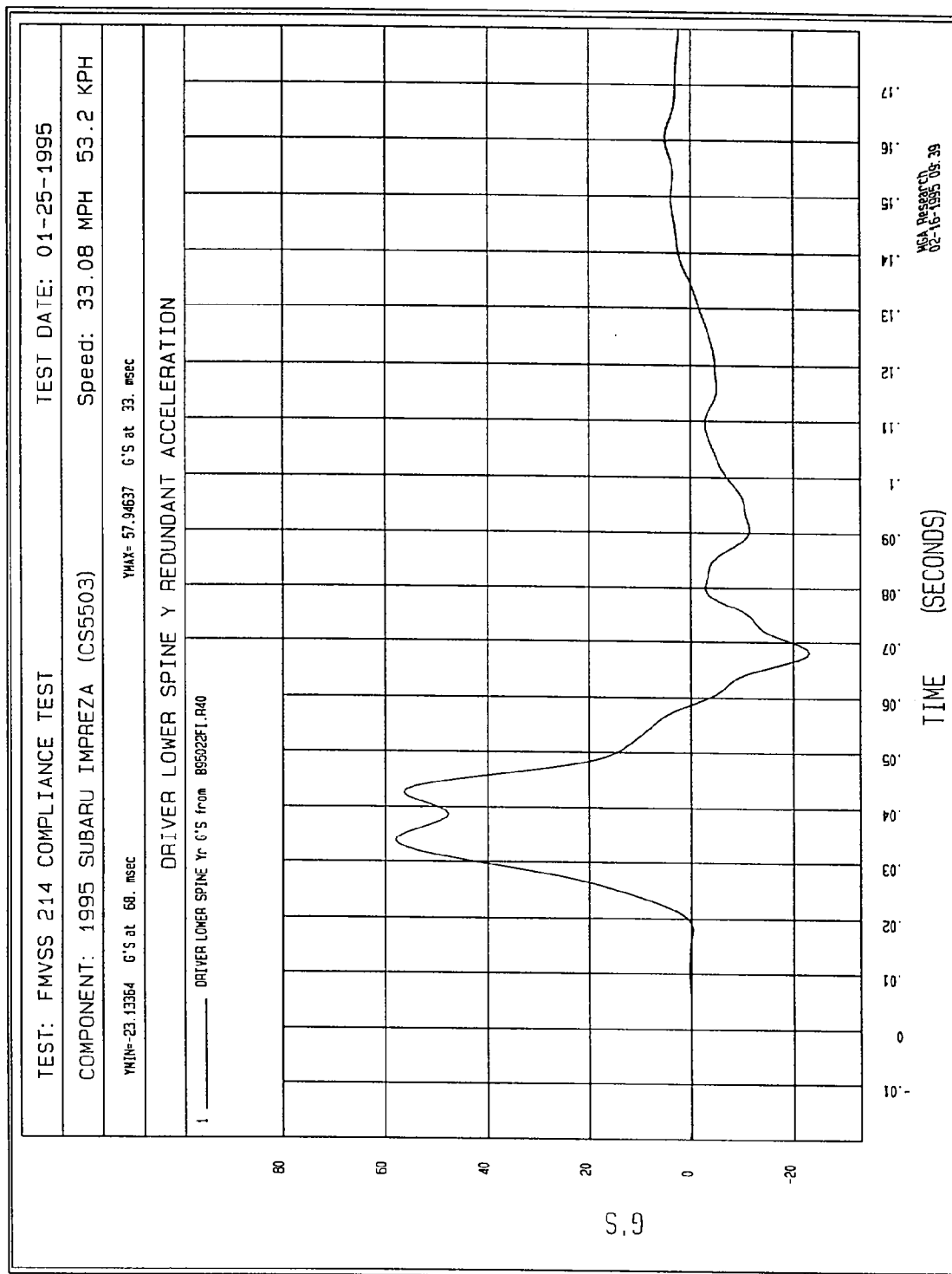


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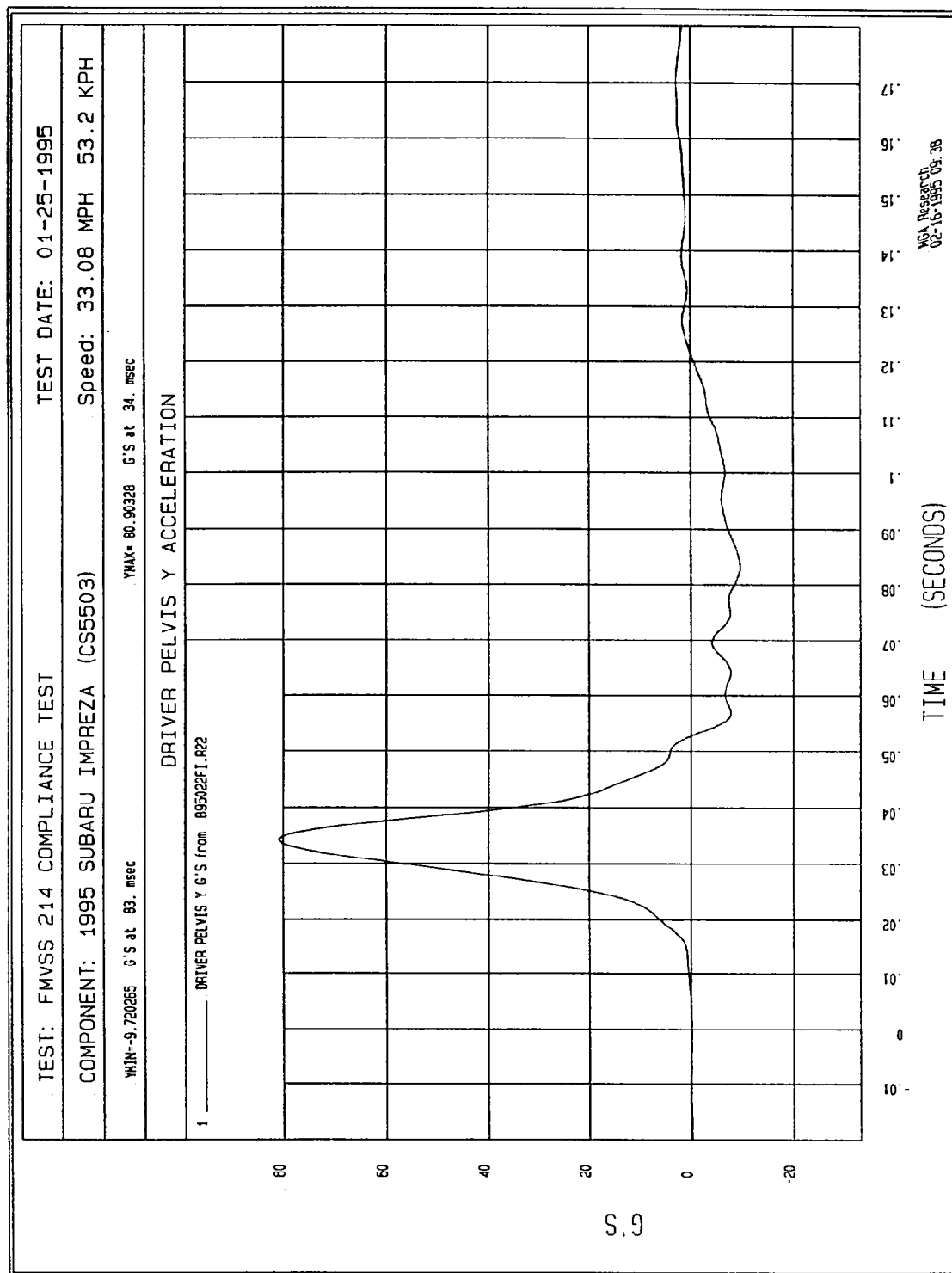


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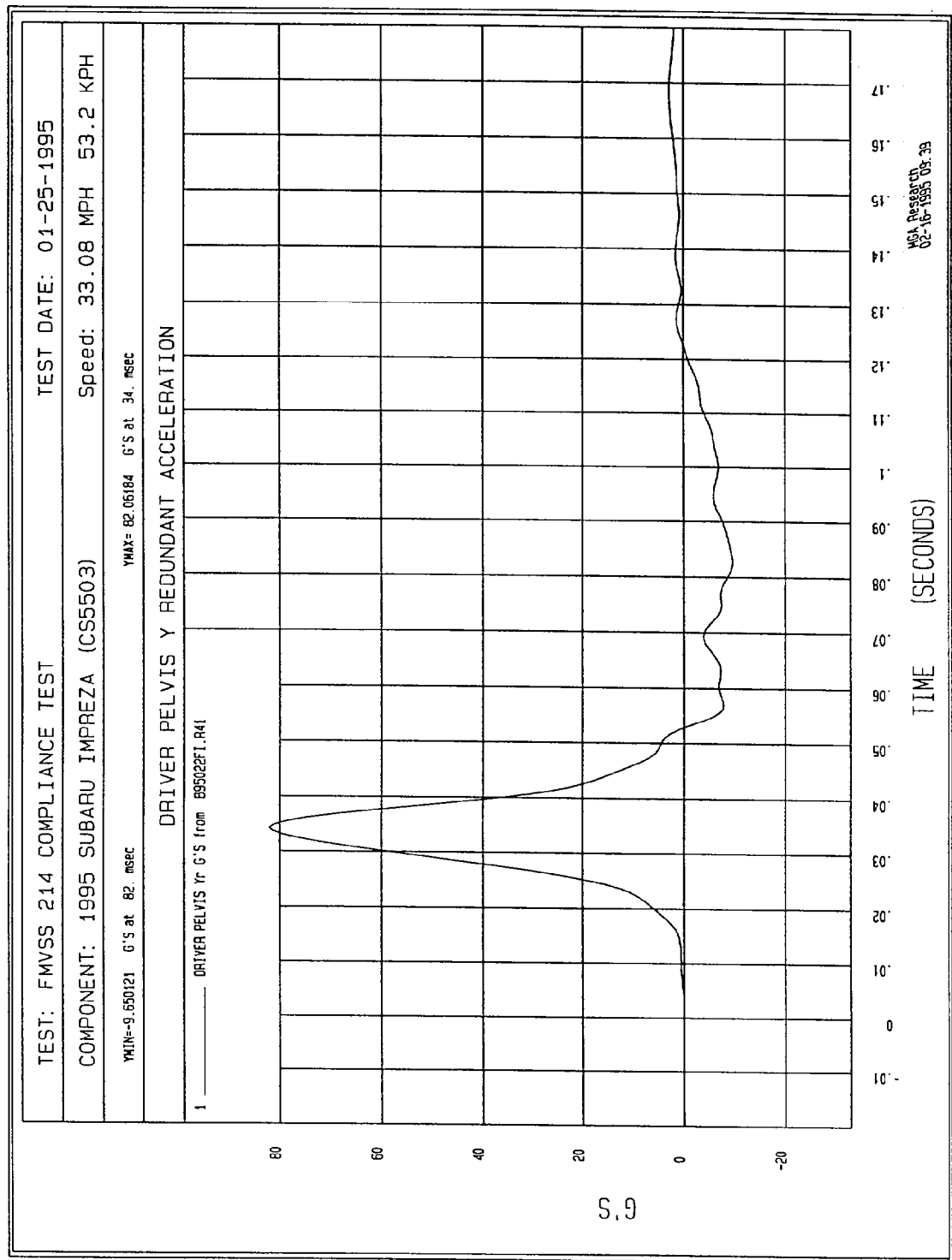


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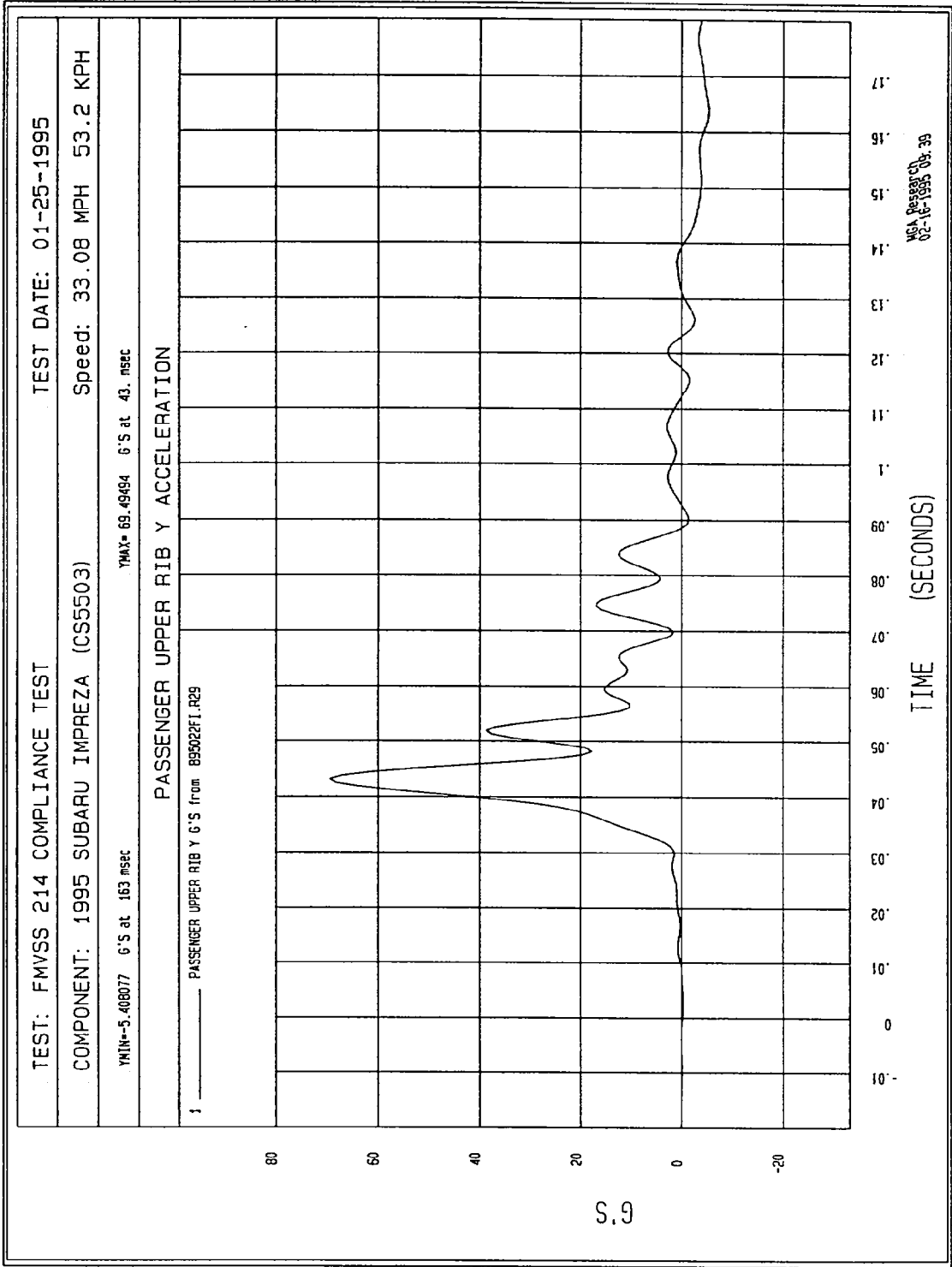
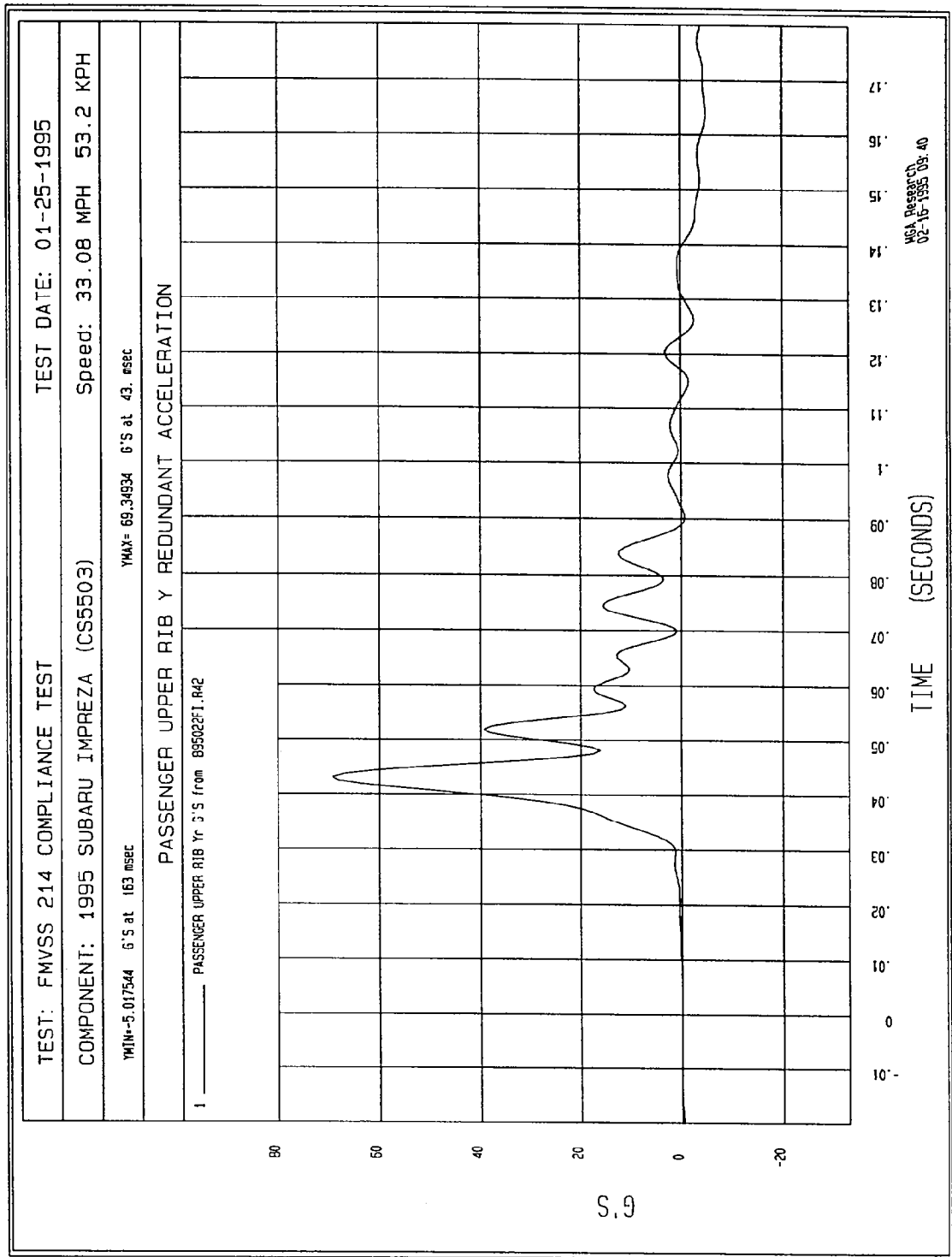


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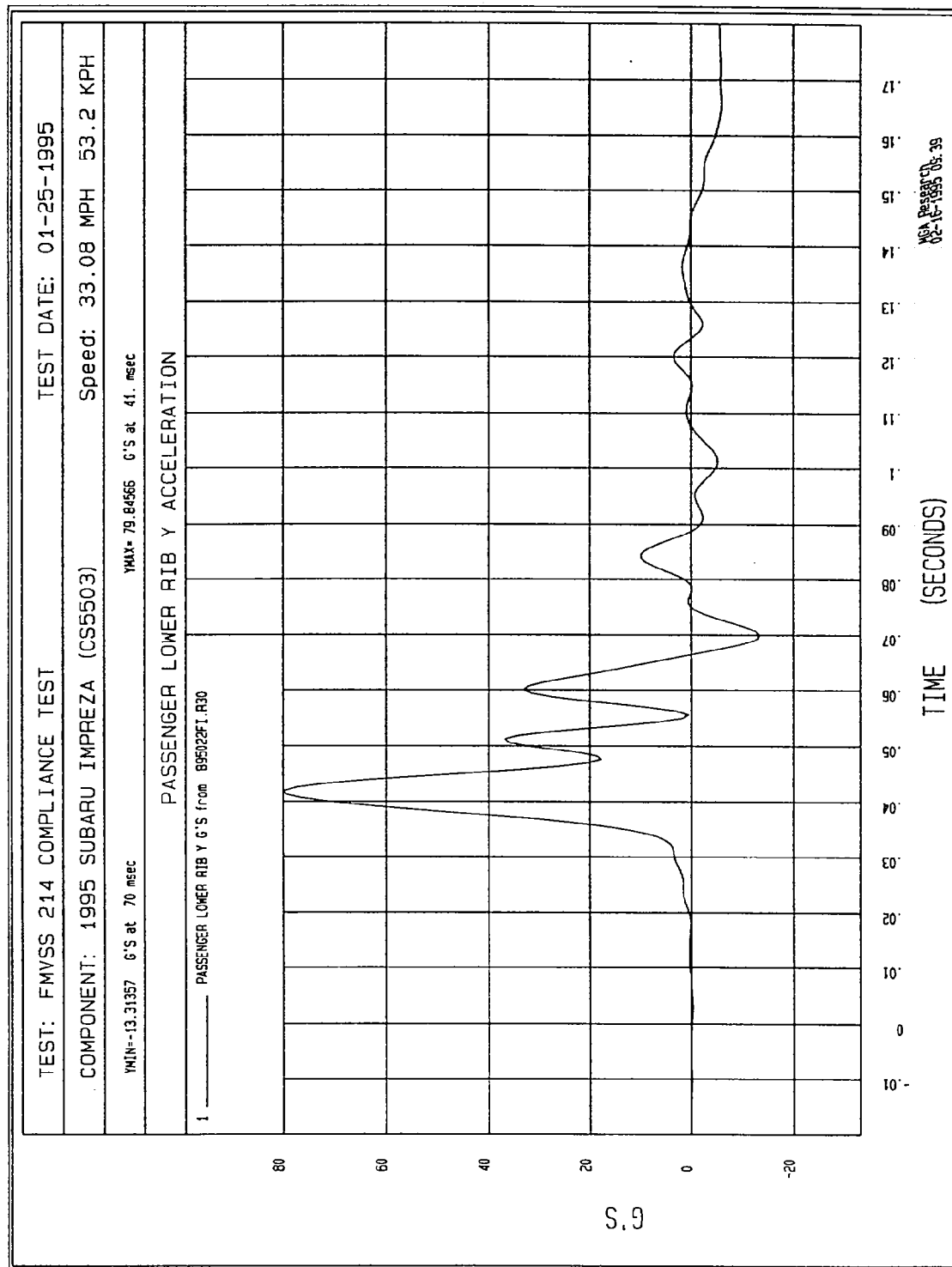


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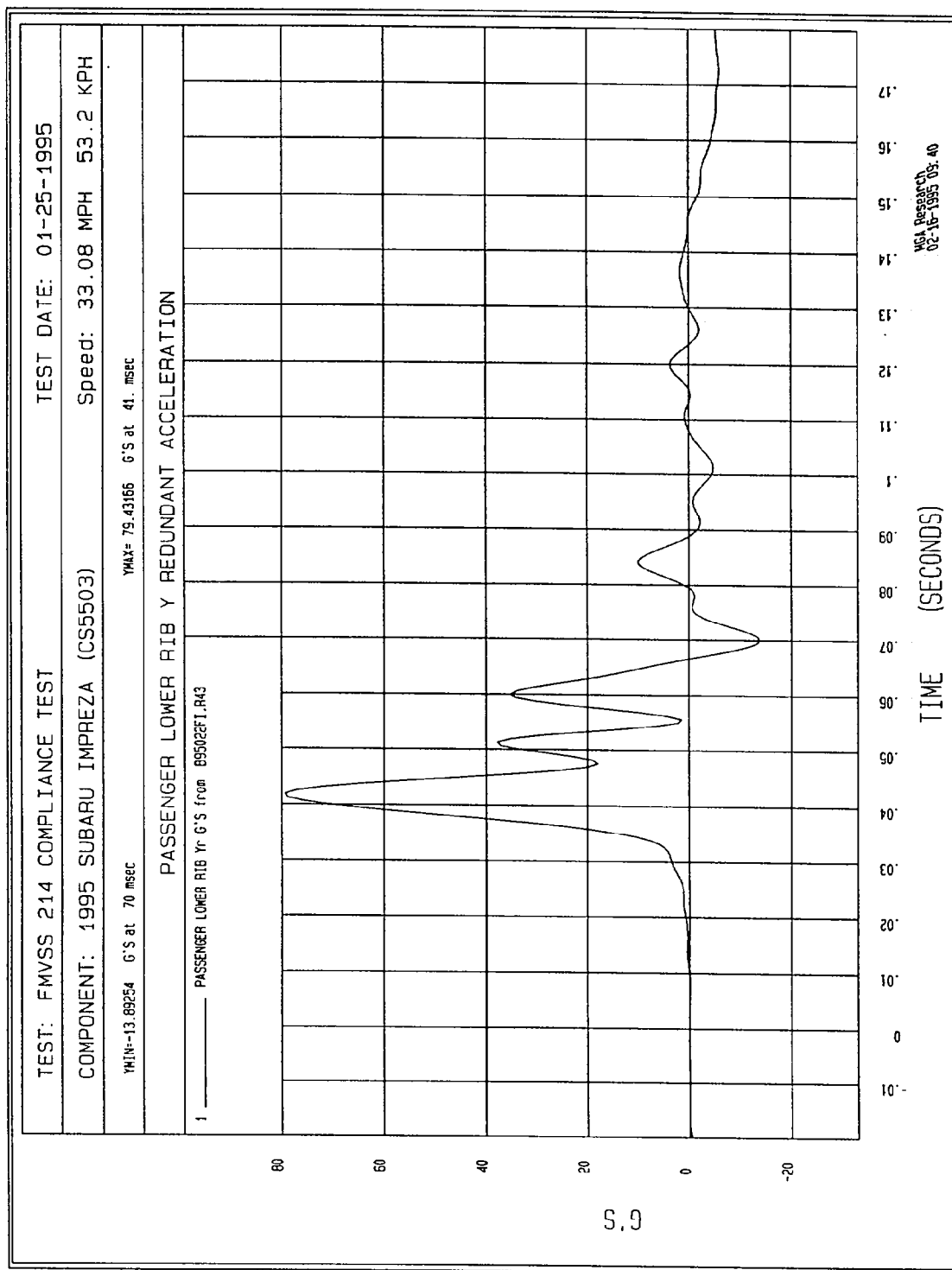


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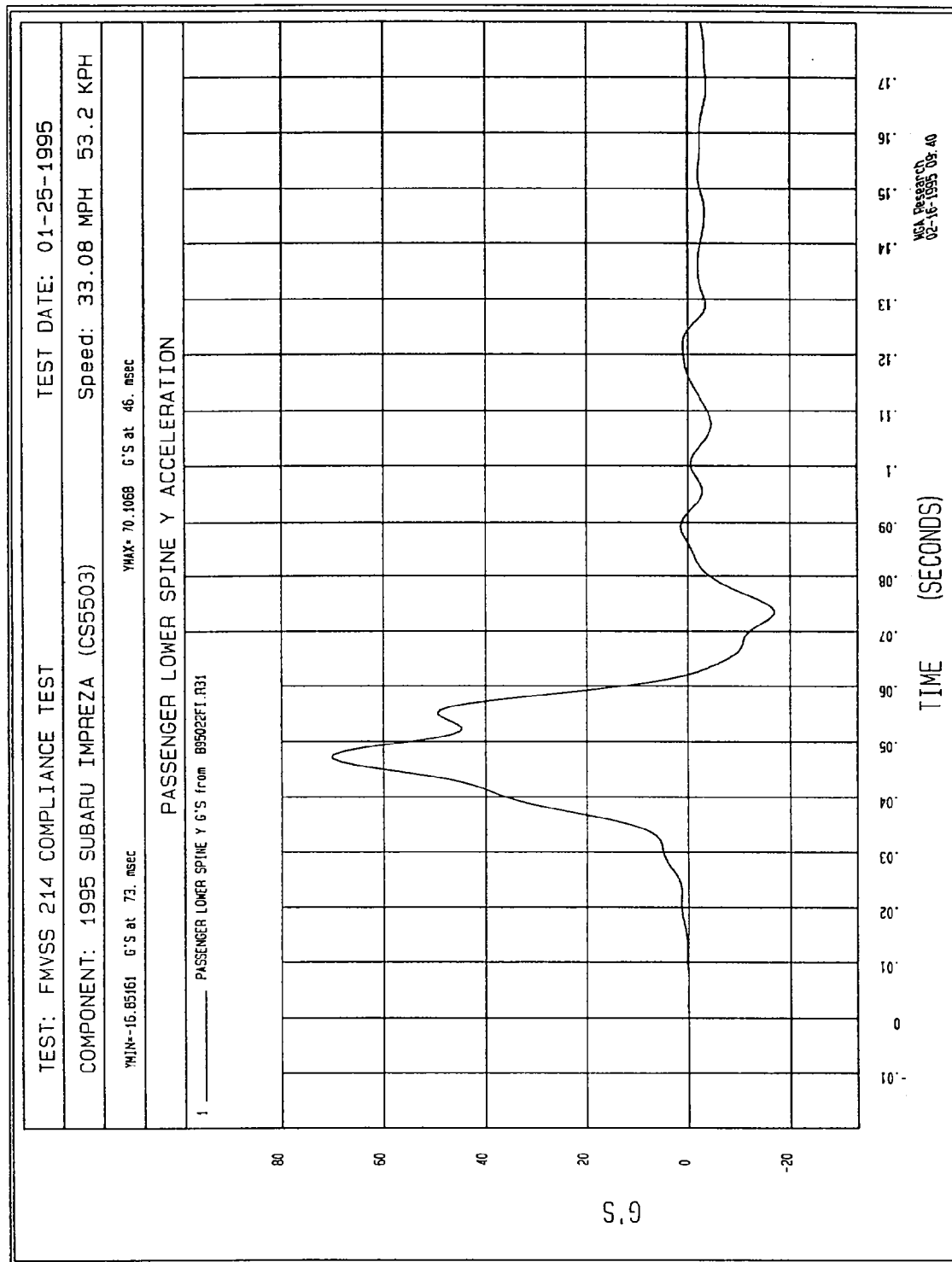


Figure B-91 - Passenger Lower Spine Y Acceleration vs. Time

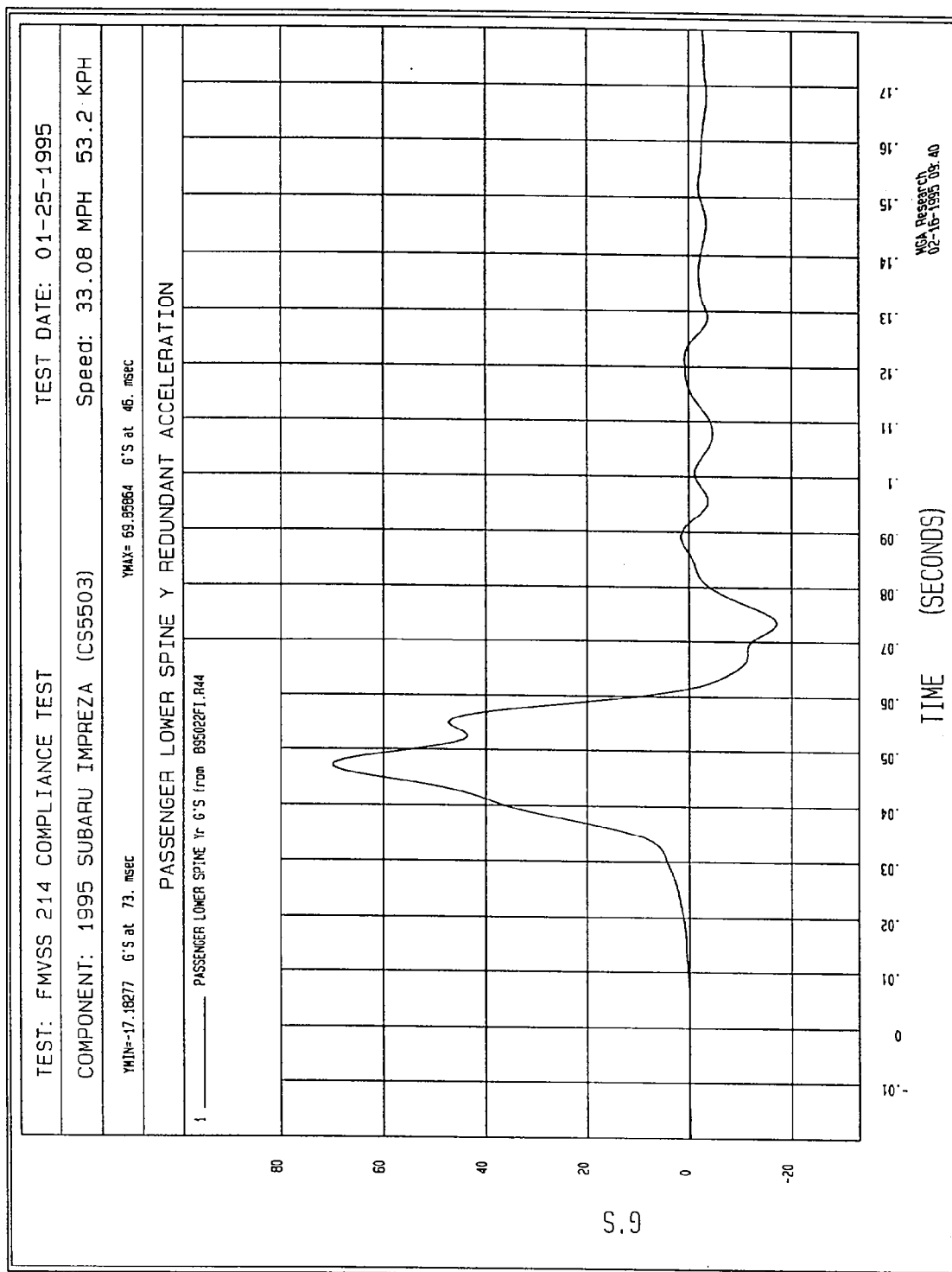


Figure B-92 - Passenger Lower Spine Y Redundant Acceleration vs. Time

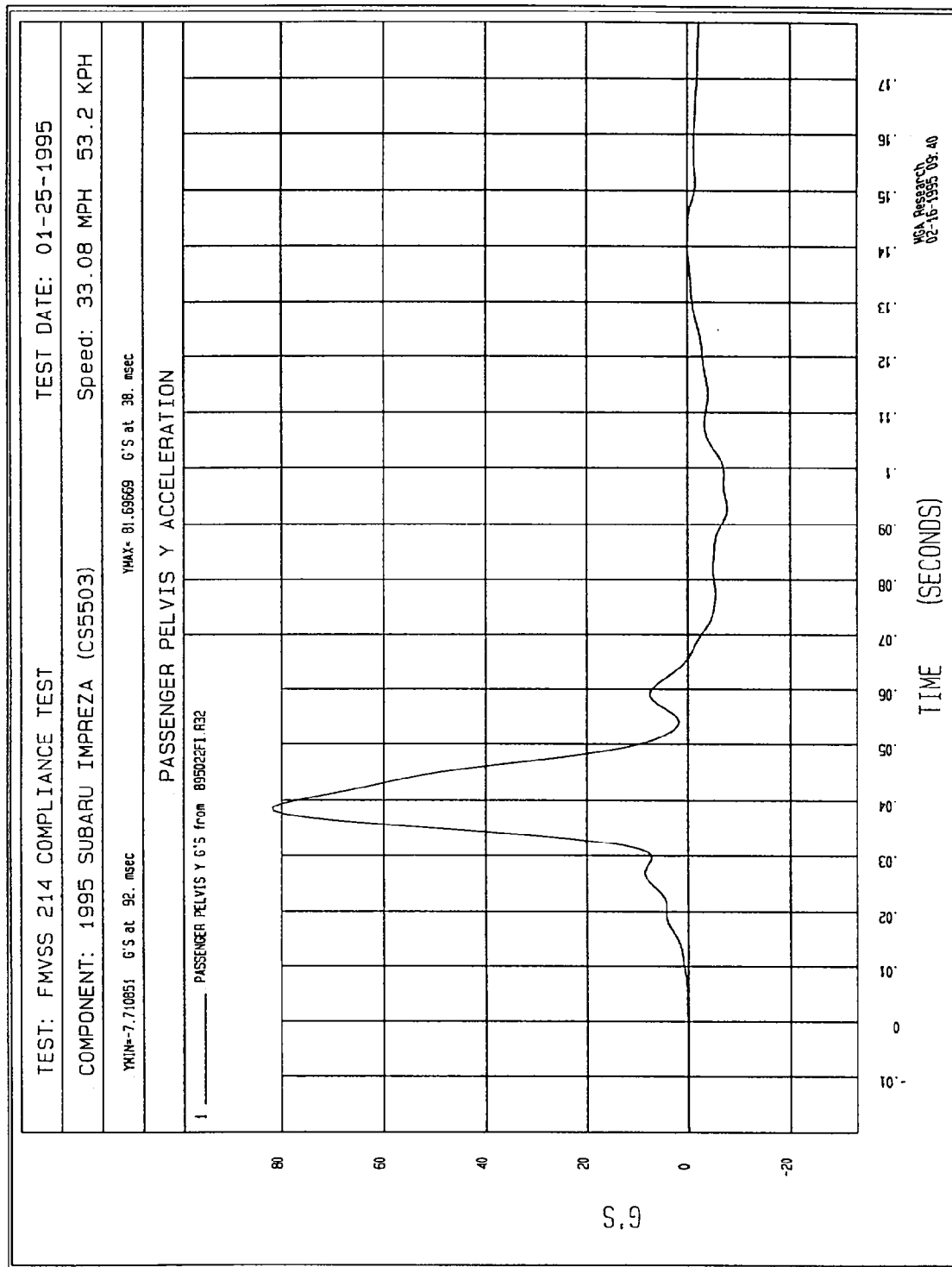


Figure B-93 - Passenger Pelvis Y Acceleration vs. Time

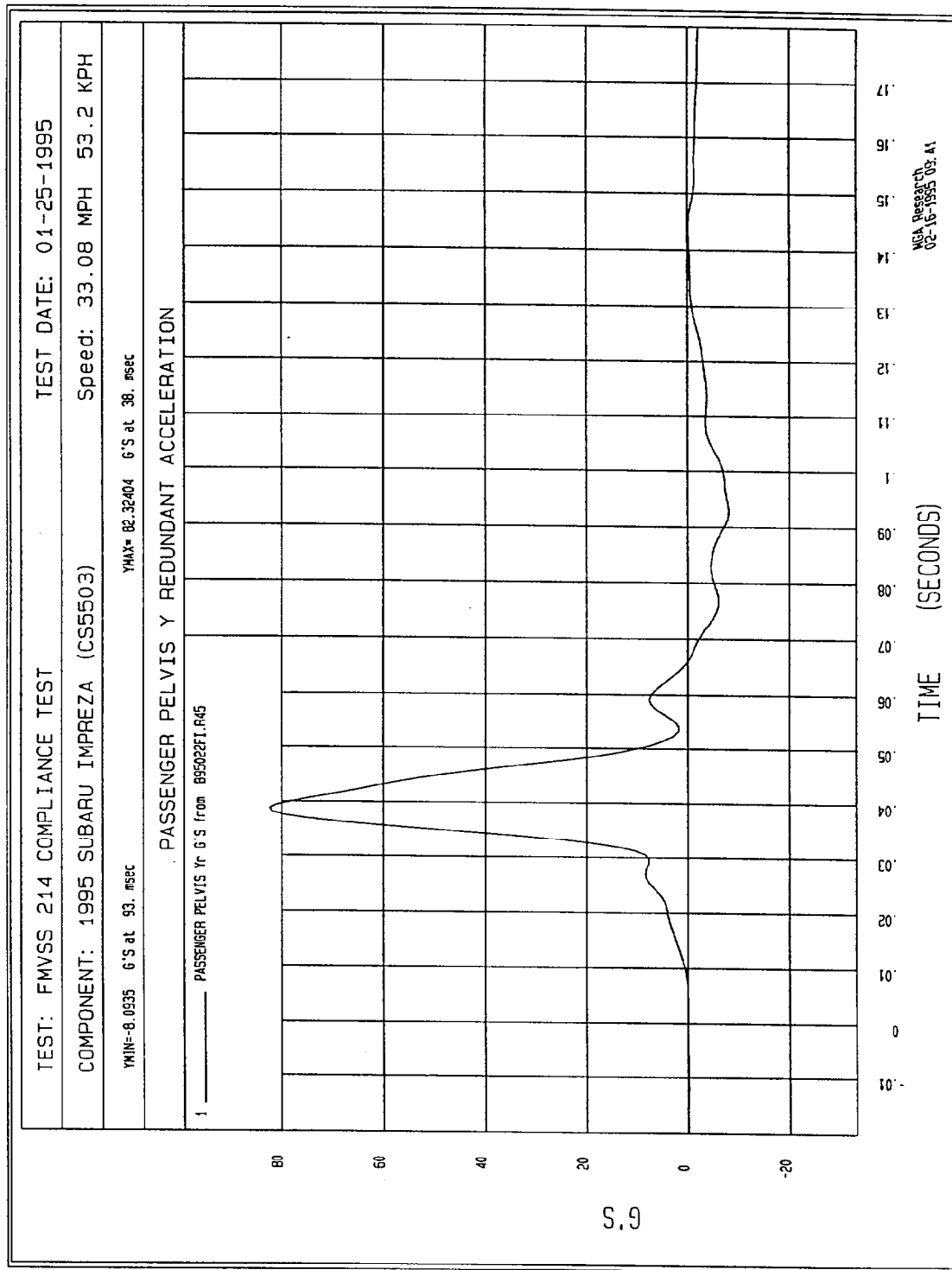


Figure B-94 - Passenger Pelvis Y Redundant Acceleration vs. Time

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-95-DC016

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

SUBARU
1995 SUBARU IMPREZA 4 DOOR SEDAN
NHTSA NO. CS5503

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 25, 1995

Report Date: February 17, 1995

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: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Pre-Test Calibration

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

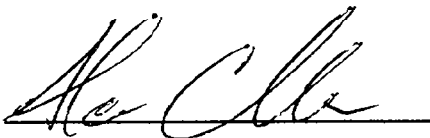
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

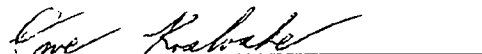
DATE OF VERIFICATION: January 23, 1995

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.0
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"	20.5
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: January 23, 1995

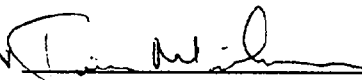
DUMMY NUMBER: 270

TEST NUMBER: D95112

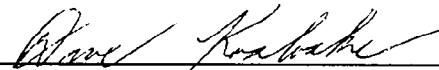
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 fps	13.8
UPPER RIB	37 - 46 g's	45
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

TECHNICIAN

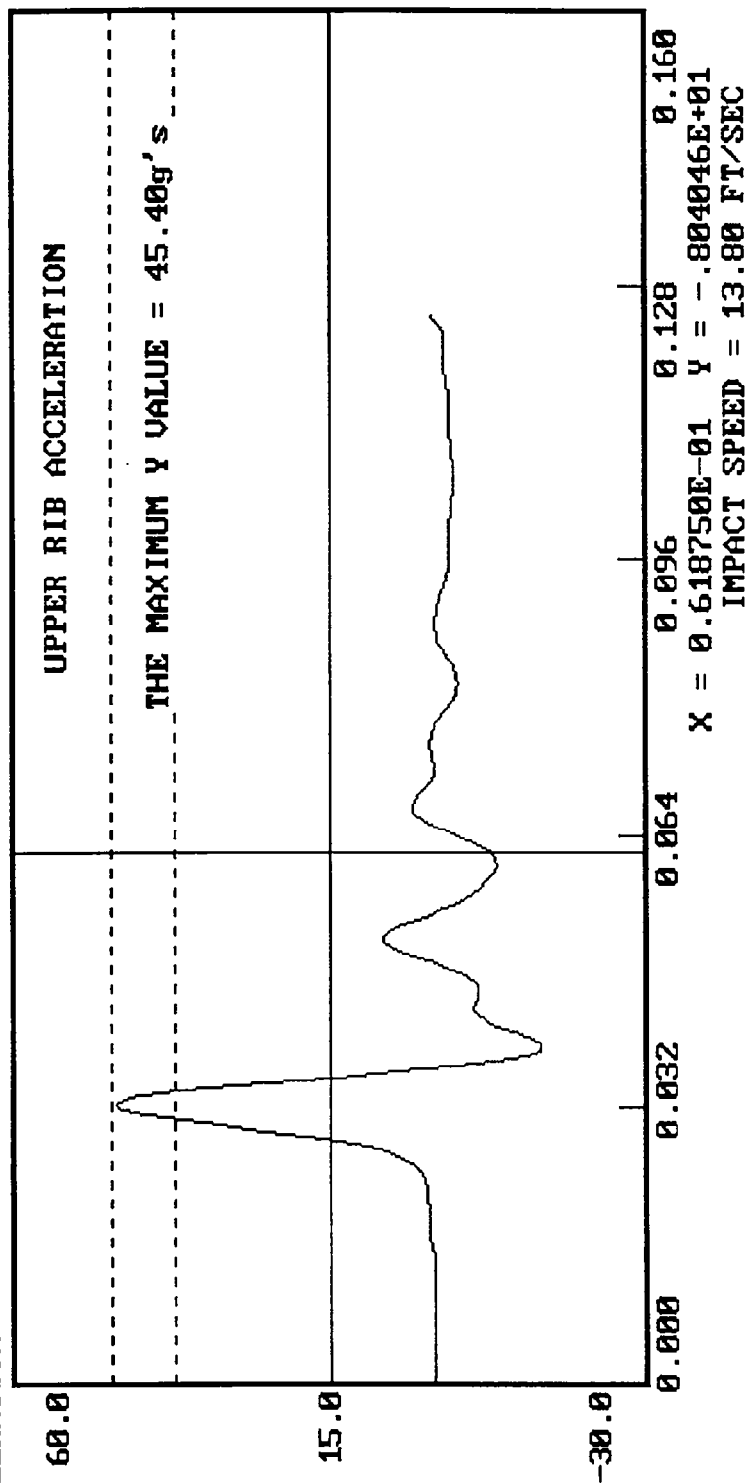


APPROVED BY



01-23-1995 09:55

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

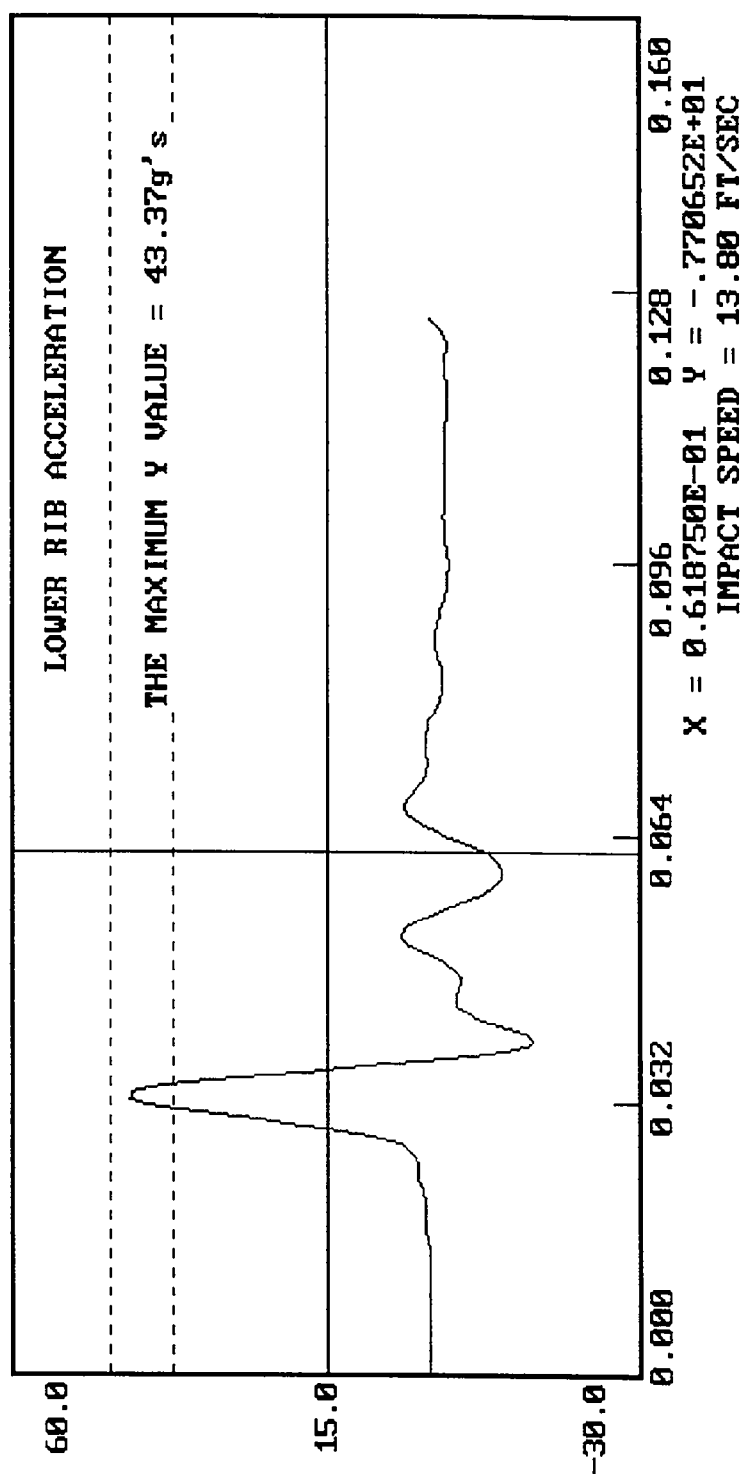


01-23-1995 09:55

DUMMY CALIBRATION - THORAX IMPACT

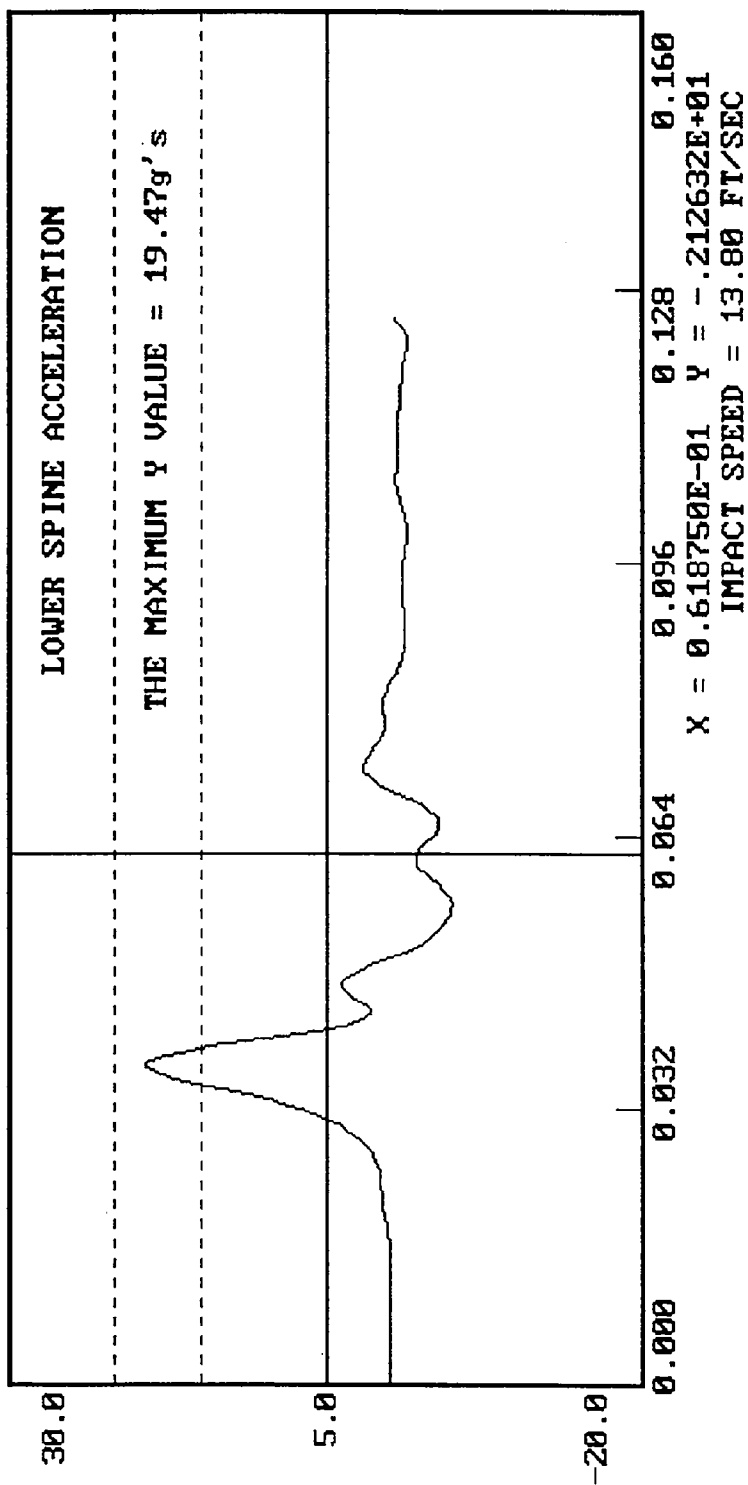
DUMMY # 270

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



01-23-1995 09:55

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 23, 1995

DUMMY NUMBER: 270

TEST NUMBER: D95113

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	48

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim McIntosh

APPROVED BY

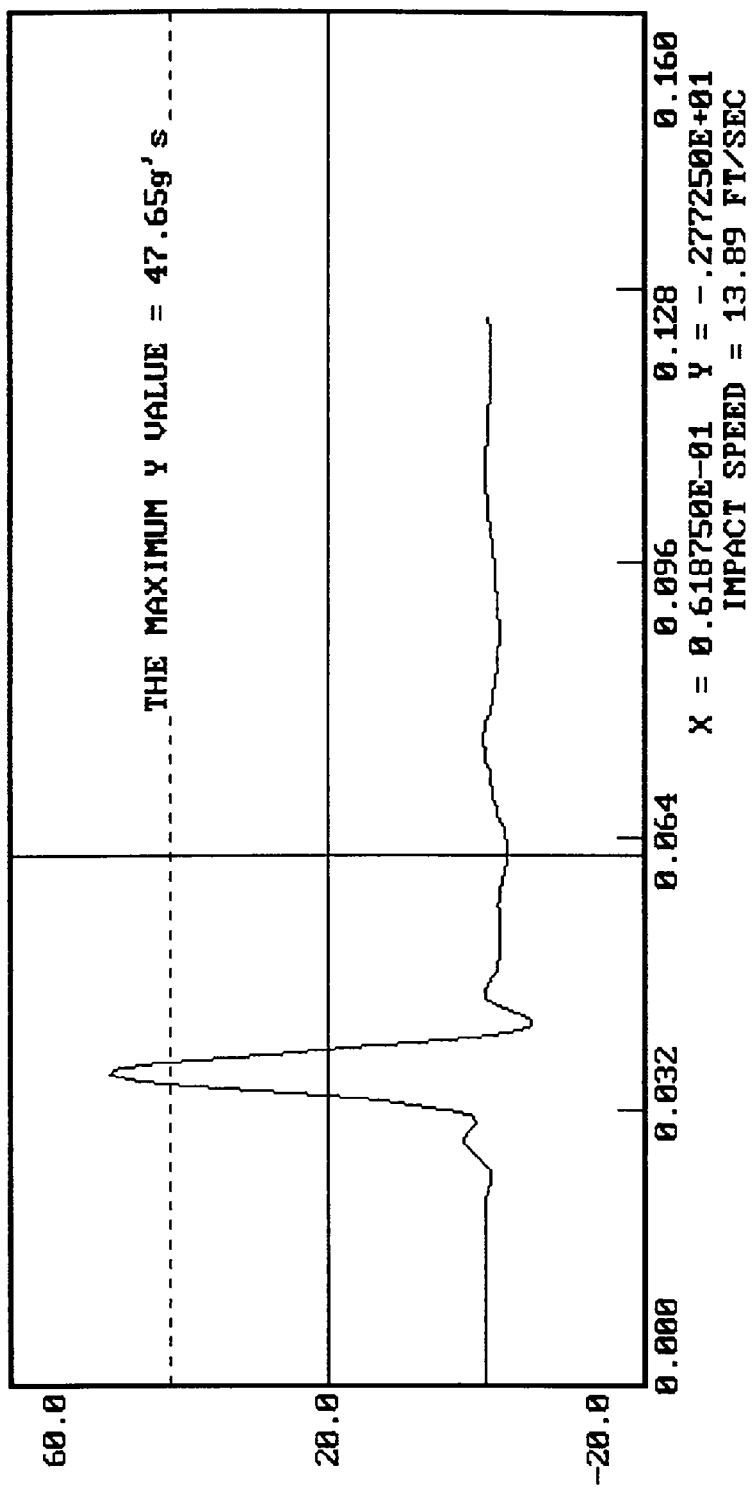
Dave Kabecki

01-23-1995 08:58

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: January 20, 1995

DUMMY NUMBER: 270

TEST NUMBER: D95114

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	24%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	45.5
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim M. L.

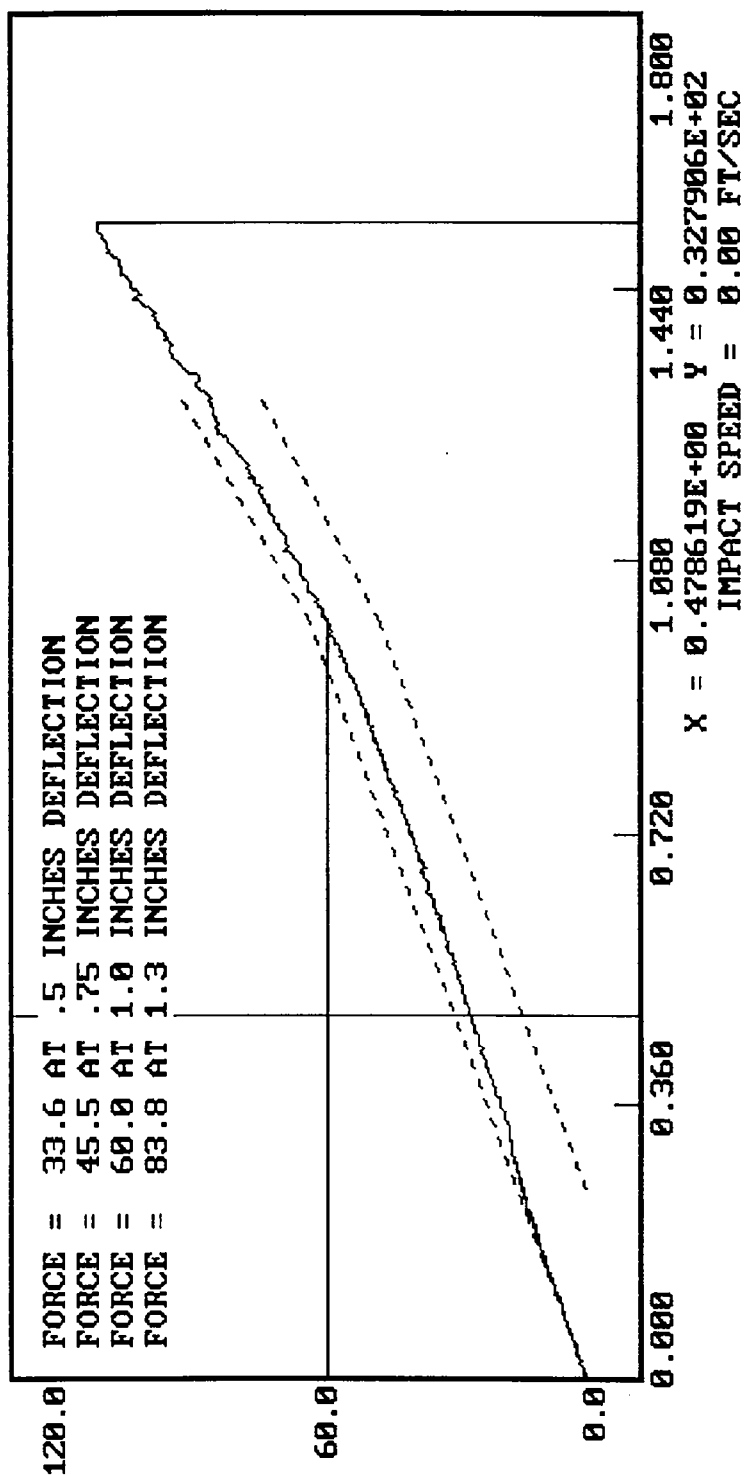
APPROVED BY Steve Korbach

01-20-1995 16:33

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 270

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 20, 1995

DUMMY NUMBER: 270

TEST NUMBER: D95115

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	24%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	26
FORCE @ 30°	34 - 46 lbs	40
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	10°

TEST MEETS SPECIFICATIONS

TECHNICIAN

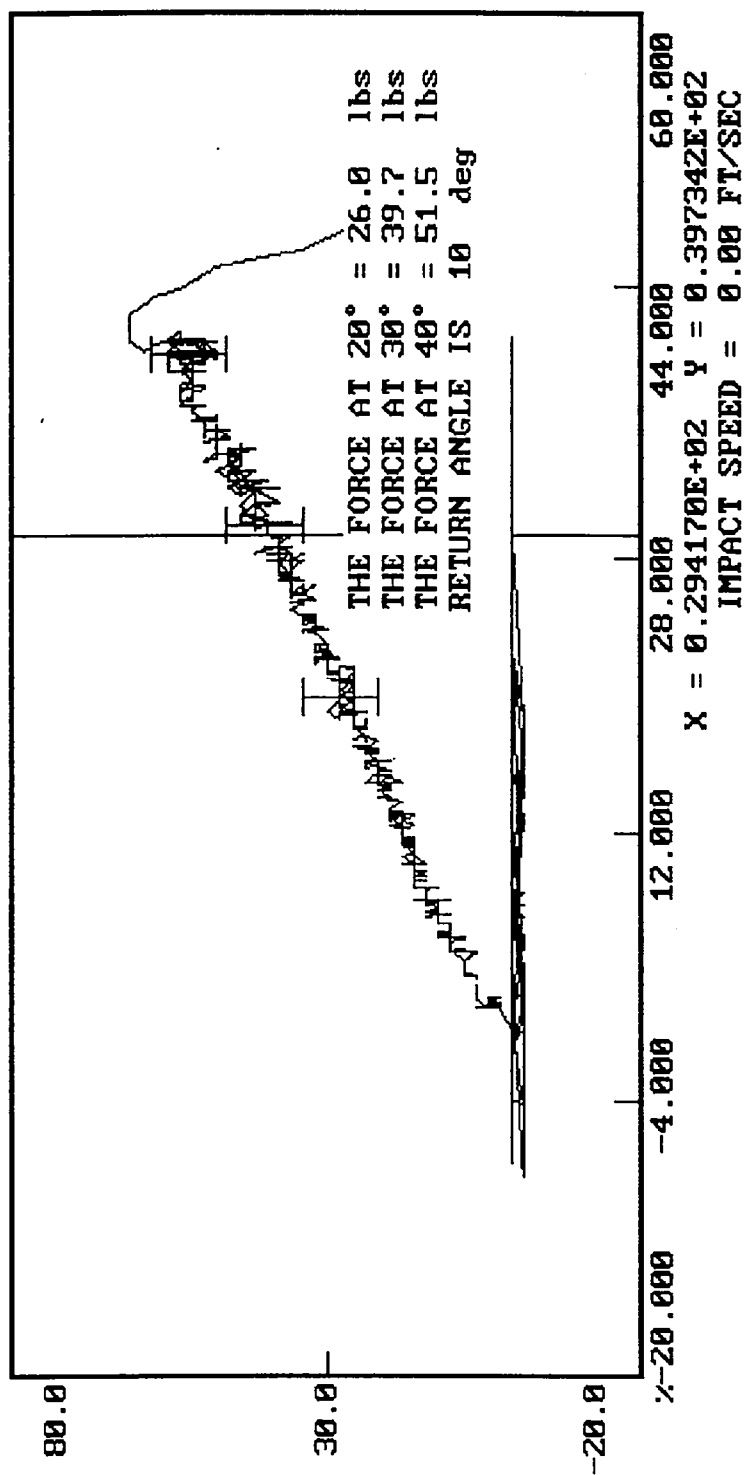
Al Cle

APPROVED BY

Mike Kabeke

01-20-1995 14:39

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



PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 271

Calibration Test Results Summary

Passenger Serial Number: 271

Pre-Test Calibration

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

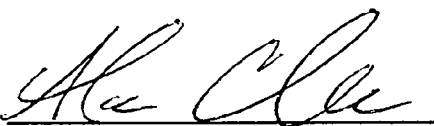
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

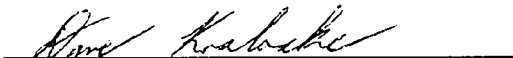
DATE OF VERIFICATION: January 23, 1995

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.1
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: January 23, 1995

DUMMY NUMBER: 271

TEST NUMBER: D95122

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 fps	13.9
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

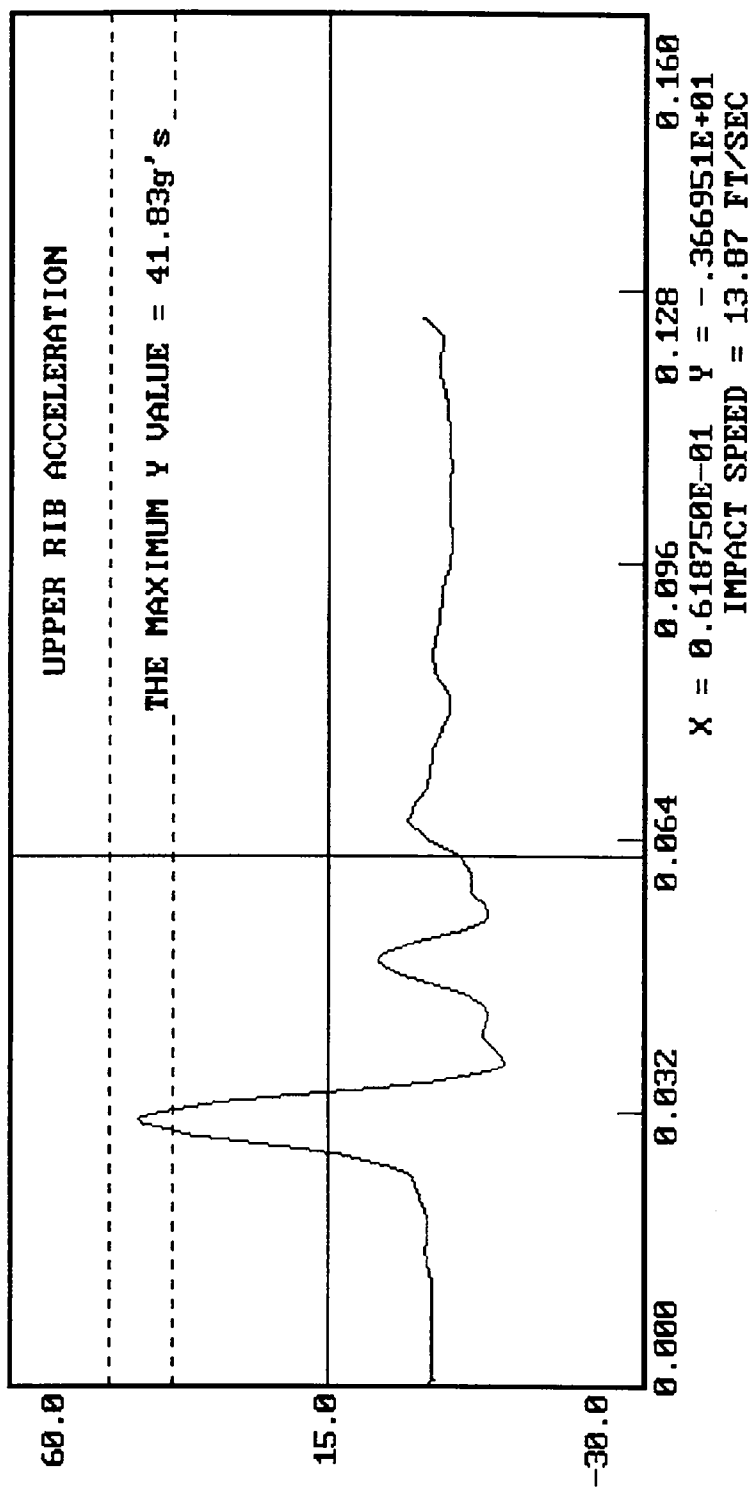
Mac Clae

APPROVED BY

Dave Korbak

01-23-1995 09:30

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271
ACCELERATION (G'S) VS. TIME ((SECONDS))

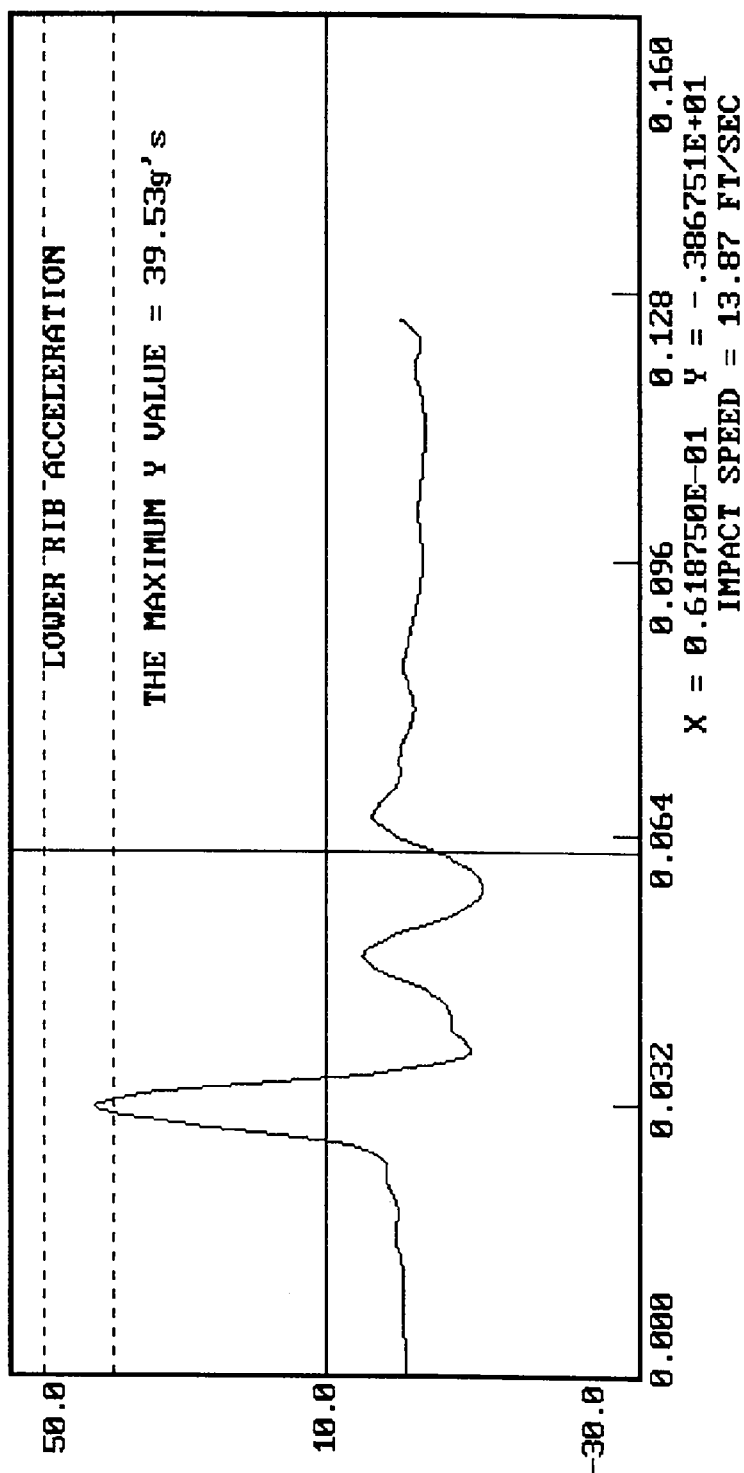


01-23-1995 09:30

DUMMY CALIBRATION - THORAX IMPACT

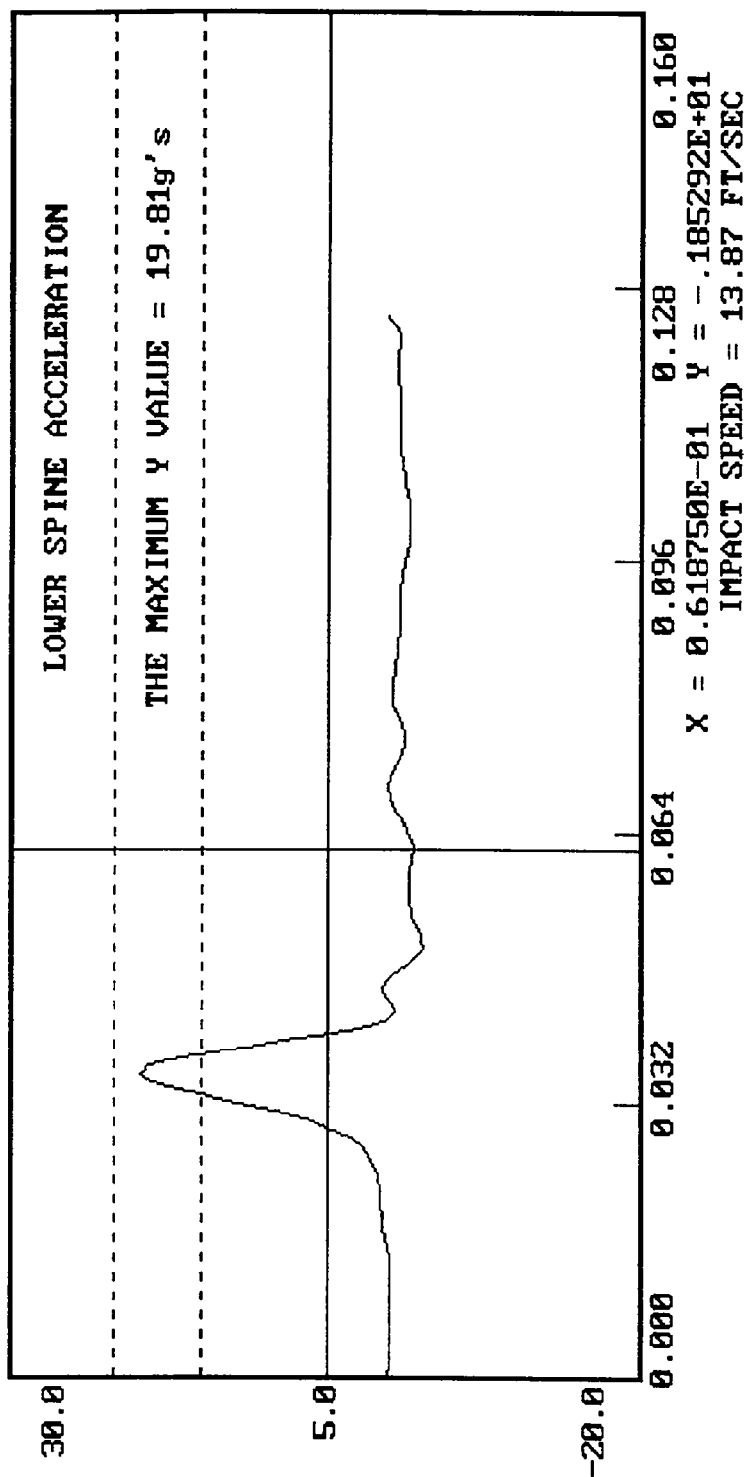
DUMMY # 271

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



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271
01-23-1995 09:30

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 23, 1995

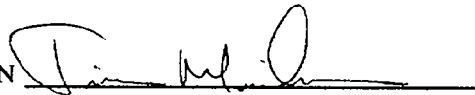
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TEST NUMBER: D95123

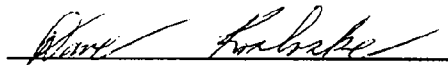
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	49

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

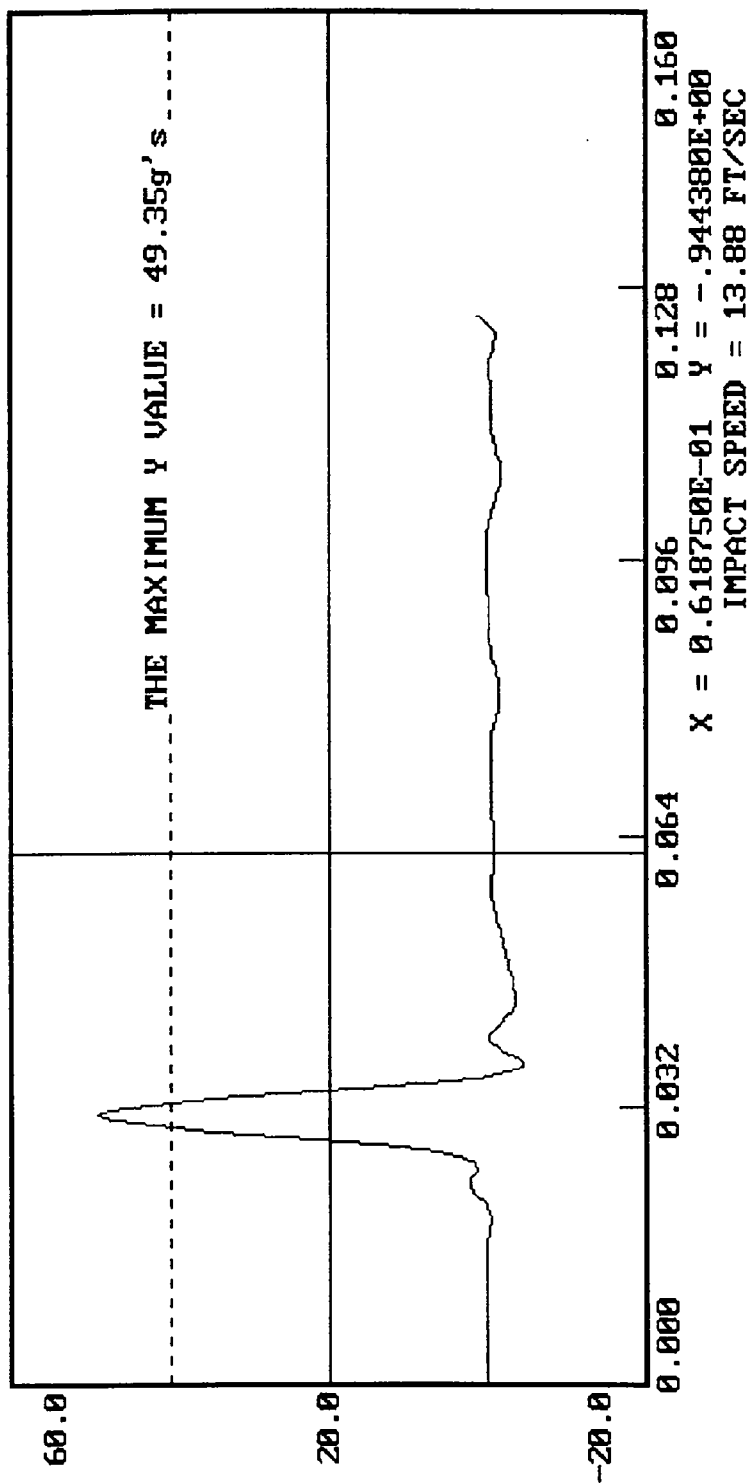


01-23-1995 09:11

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 271

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: January 20, 1995

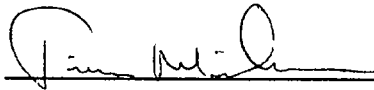
DUMMY NUMBER: 271

TEST NUMBER: D95124

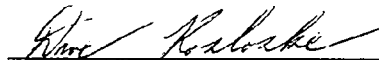
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	24%
FORCE @ 0.5 in	23.3 - 36.5 lbs	28.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	41.2
FORCE @ 1.0 in	50 - 63 lbs	55
FORCE @ 1.3 in	73 - 88 lbs	78

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

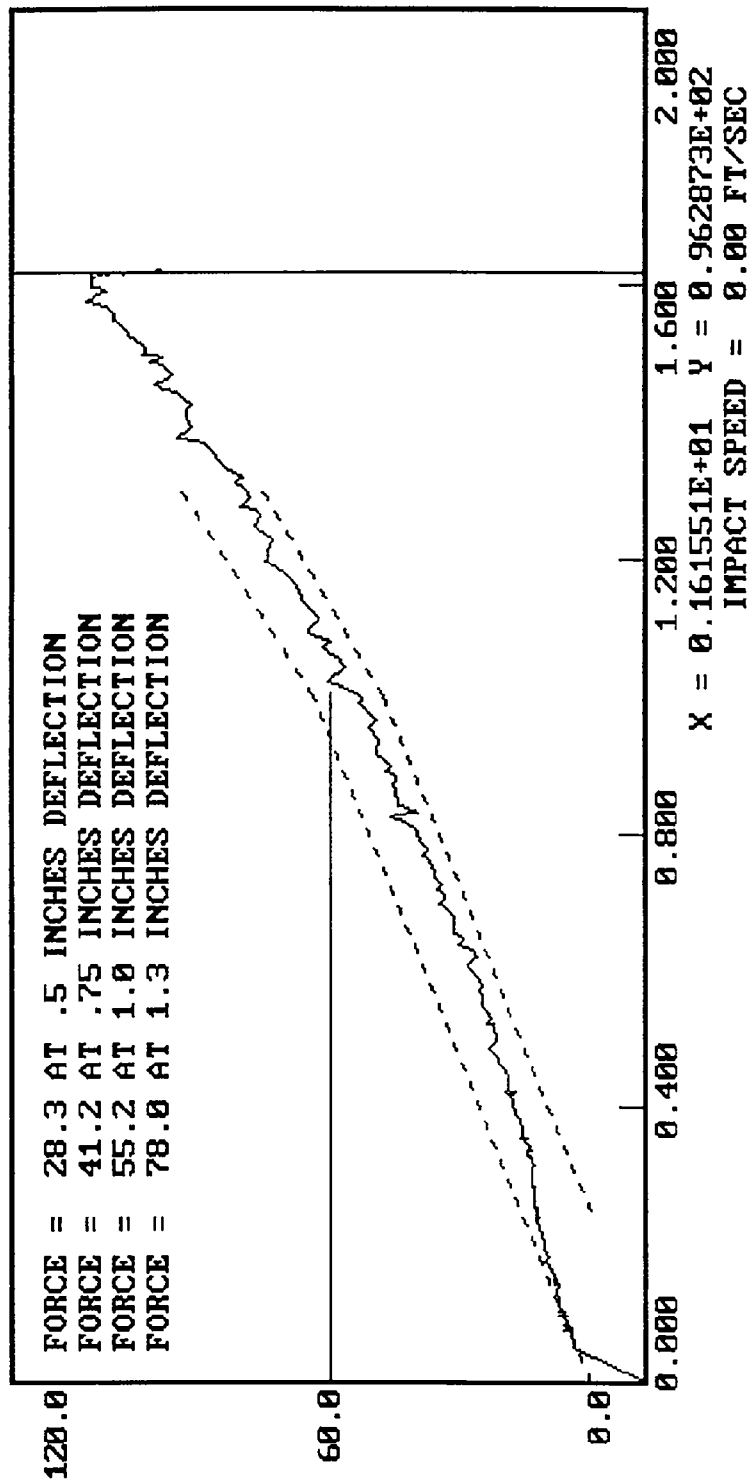


DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 271

01-20-1995 16:10

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 20, 1995

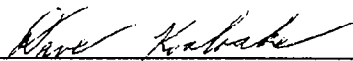
DUMMY NUMBER: 271

TEST NUMBER: D95125

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	24%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	26
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	9°

TEST MEETS SPECIFICATIONS

TECHNICIAN 

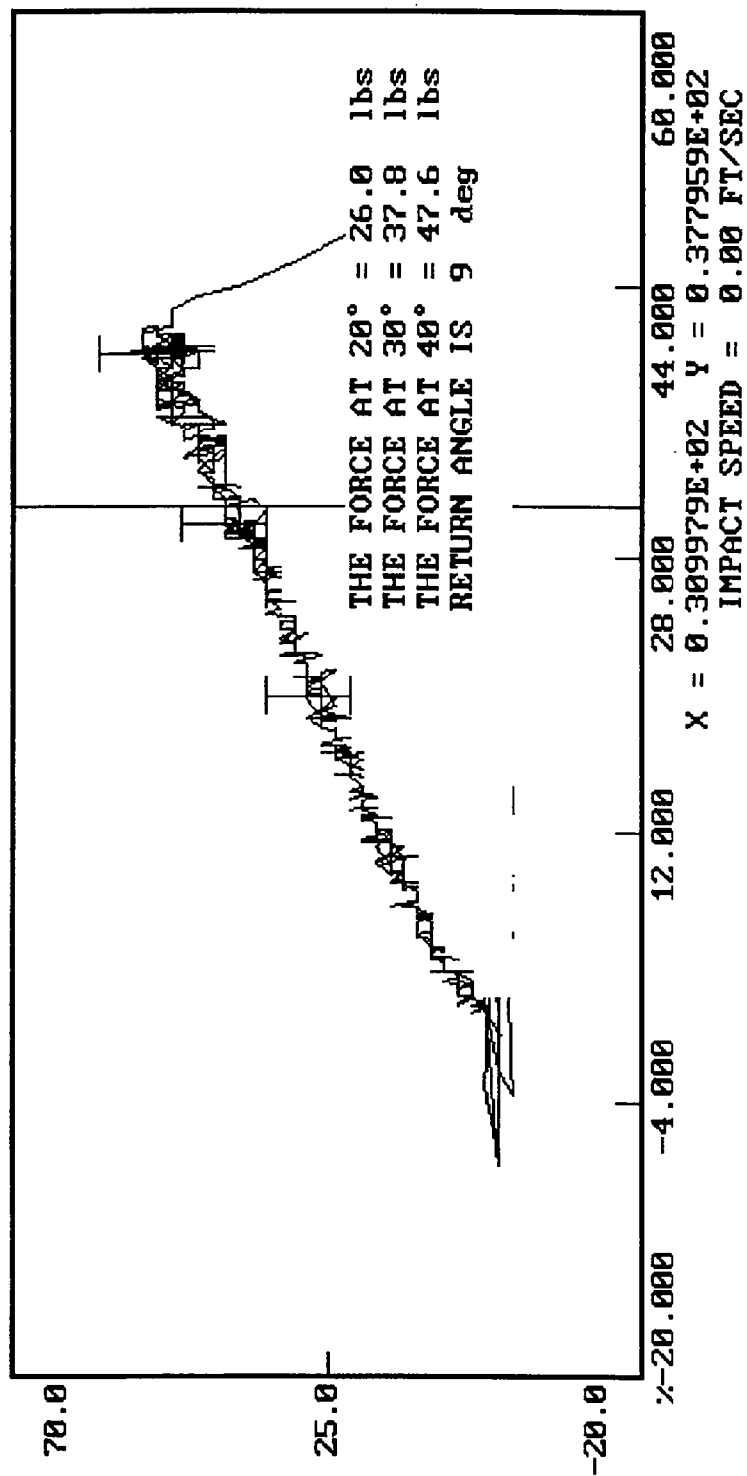
APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 271

FORCE () VS. TORSO ROTATION (DEGREES)

01-20-1995 15:45



POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

DATE OF VERIFICATION: January 26, 1995

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.0
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"	9.2
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: *Steve Kozlowski*

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 26, 1995

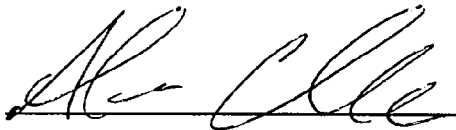
DUMMY NUMBER: 270

TEST NUMBER: D95172

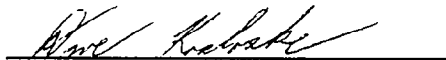
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	14%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	46
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN

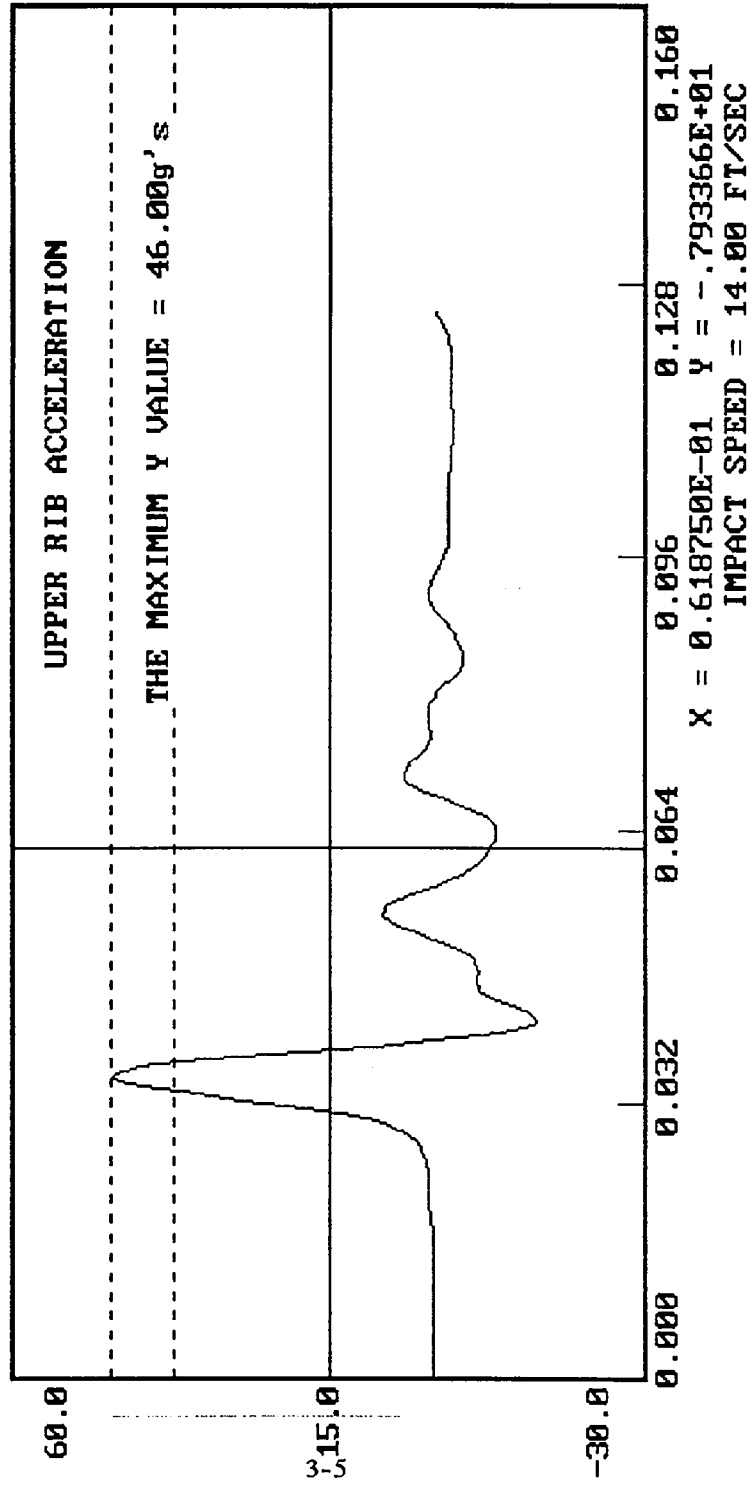


APPROVED BY



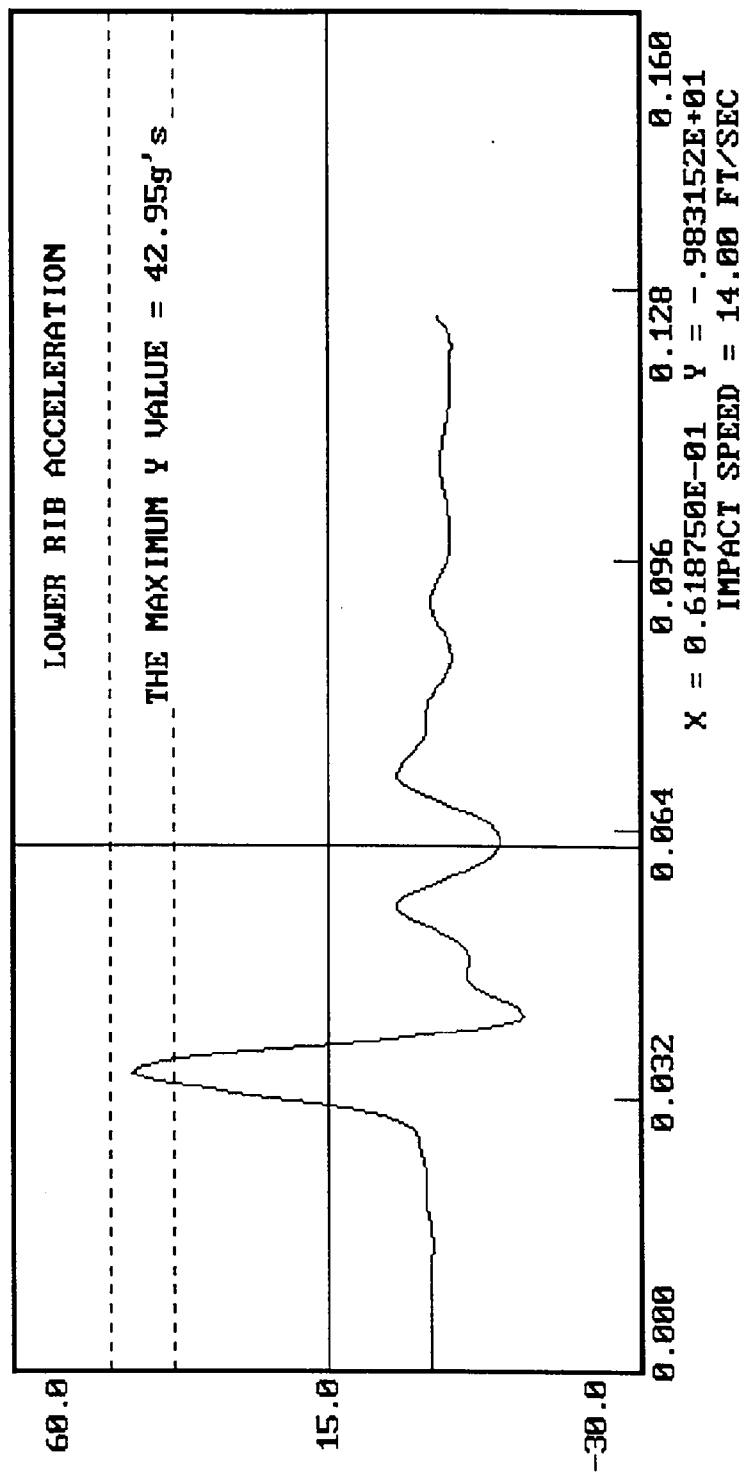
01-26-1995 11:01

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



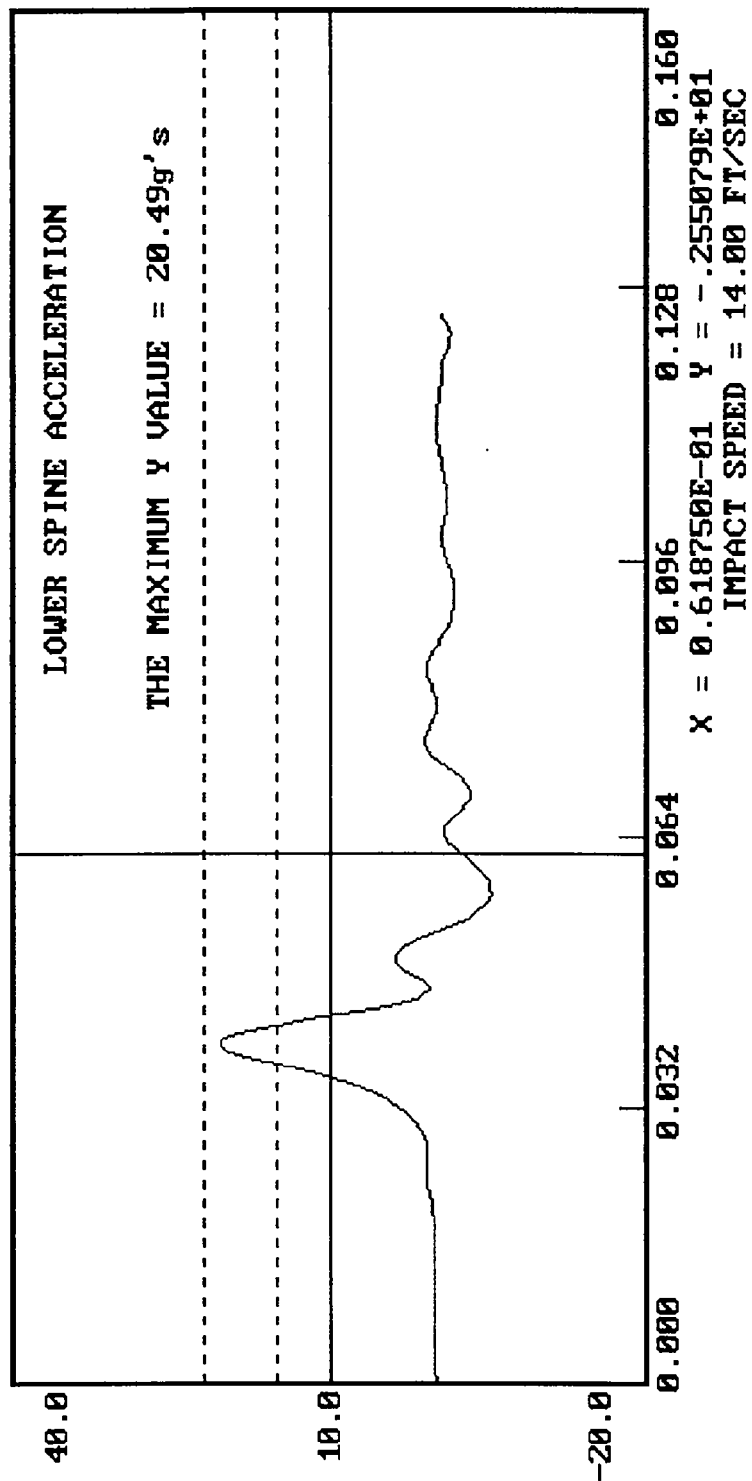
01-26-1995 11:01

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



01-26-1995 11:01

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 26, 1995

DUMMY NUMBER: 270

TEST NUMBER: D95173

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim Melish

APPROVED BY

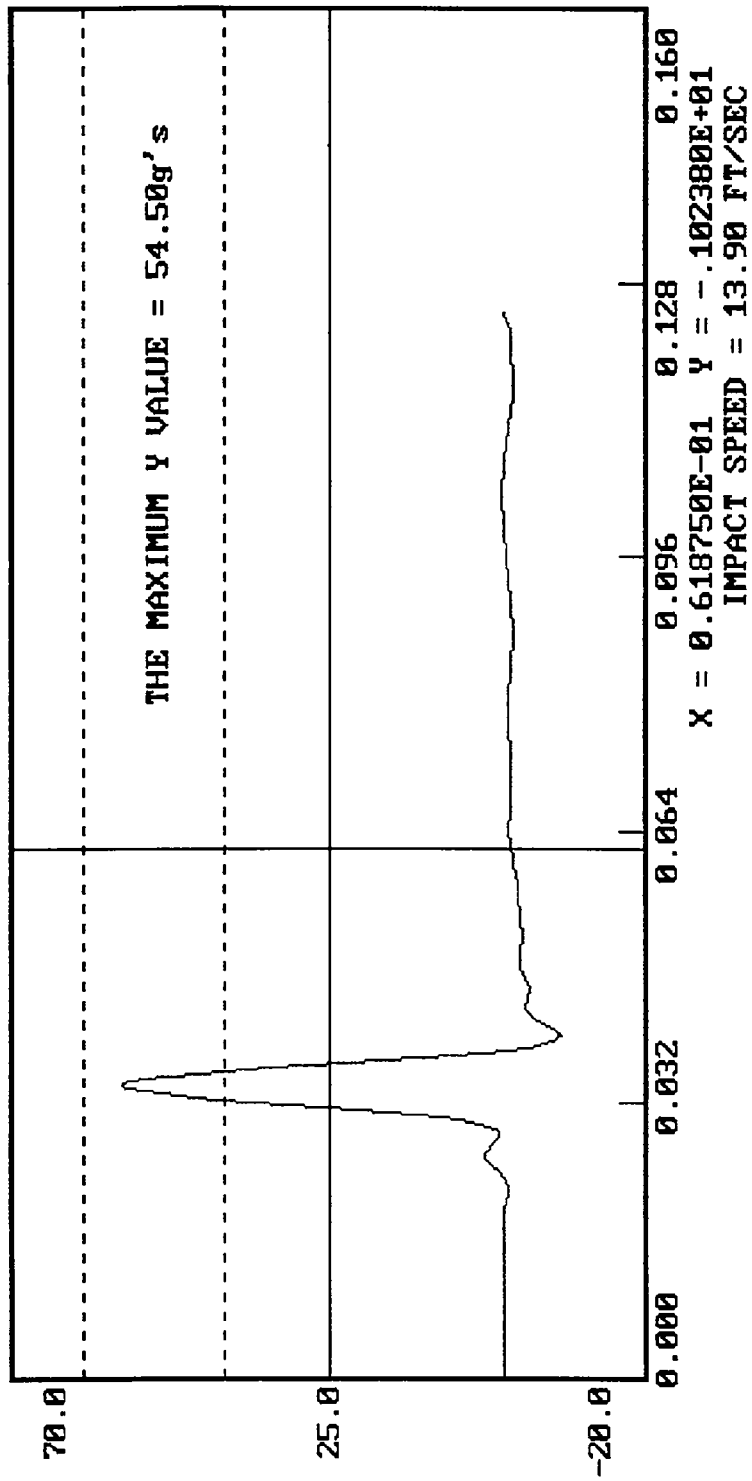
Steve Kishabe

01-26-1995 13:31

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: January 26, 1995

DUMMY NUMBER: 270

TEST NUMBER: D95174

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.4
FORCE @ 1.0 in	50 - 63 lbs	61
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN 

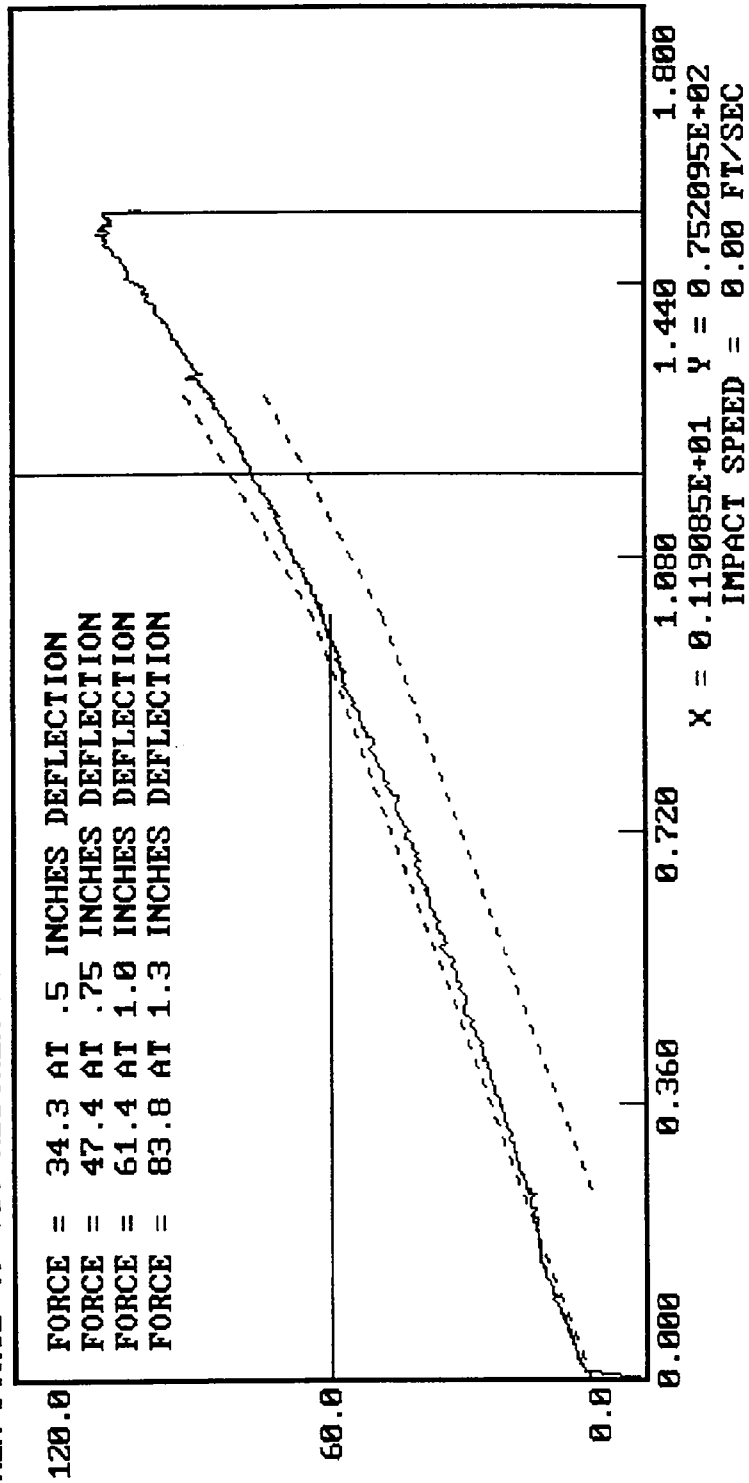
APPROVED BY 

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 270

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)

01-26-1995 15:12



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 26, 1995

DUMMY NUMBER: 270

TEST NUMBER: D95175

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	54
RETURN ANGLE	12° maximum	5°

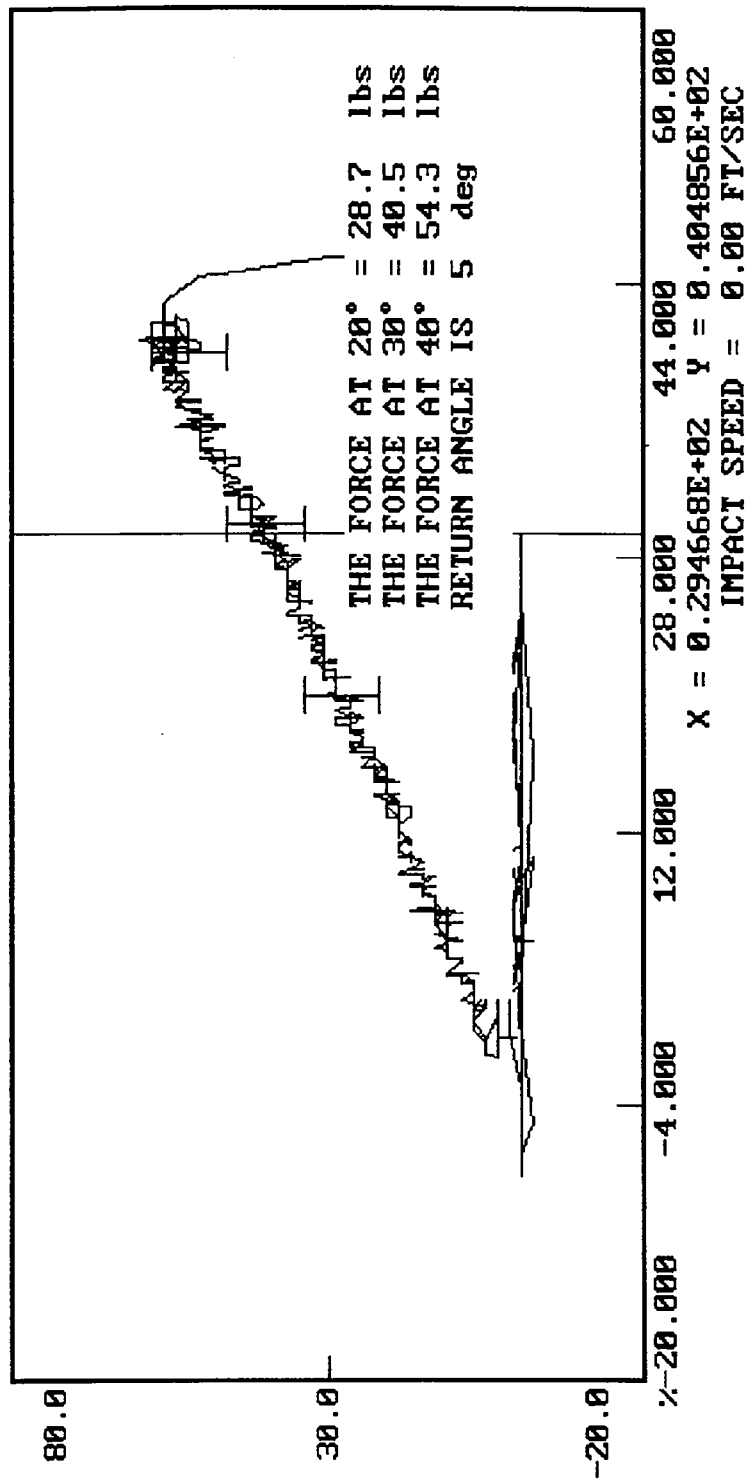
TEST MEETS SPECIFICATIONS

TECHNICIAN _____

APPROVED BY *Mark Kibake*

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

01-26-1995 14:32



POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

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

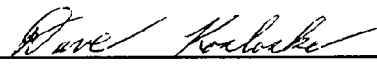
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: January 26, 1995

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.0
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"	20.5
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: January 26, 1995

DUMMY NUMBER: 271

TEST NUMBER: D95182

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	44
LOWER RIB	37 - 46 g's	38
LOWER SPINE	15 - 22 g's	21

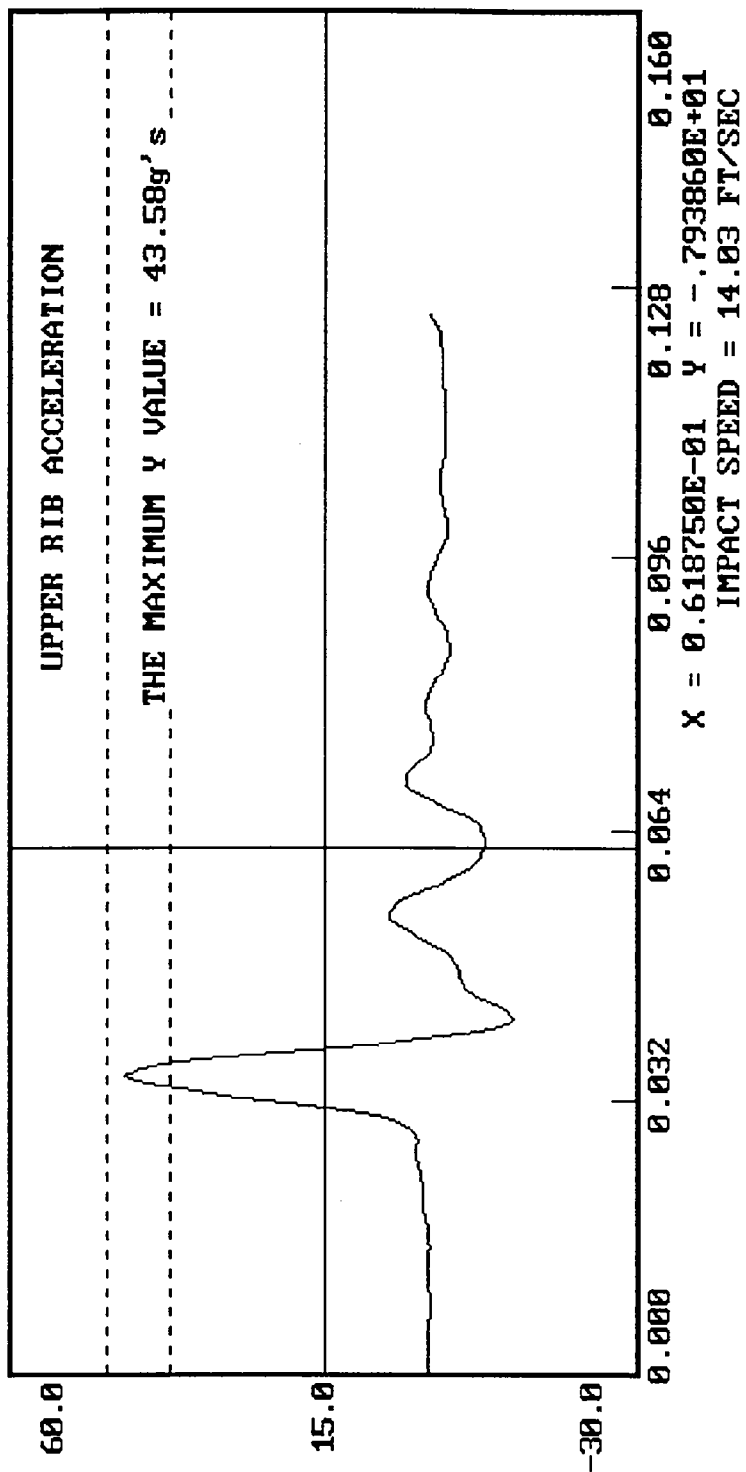
TEST MEETS SPECIFICATIONS

TECHNICIAN Tim McLean

APPROVED BY David K. Kachape

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 01-26-1995 11:37

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

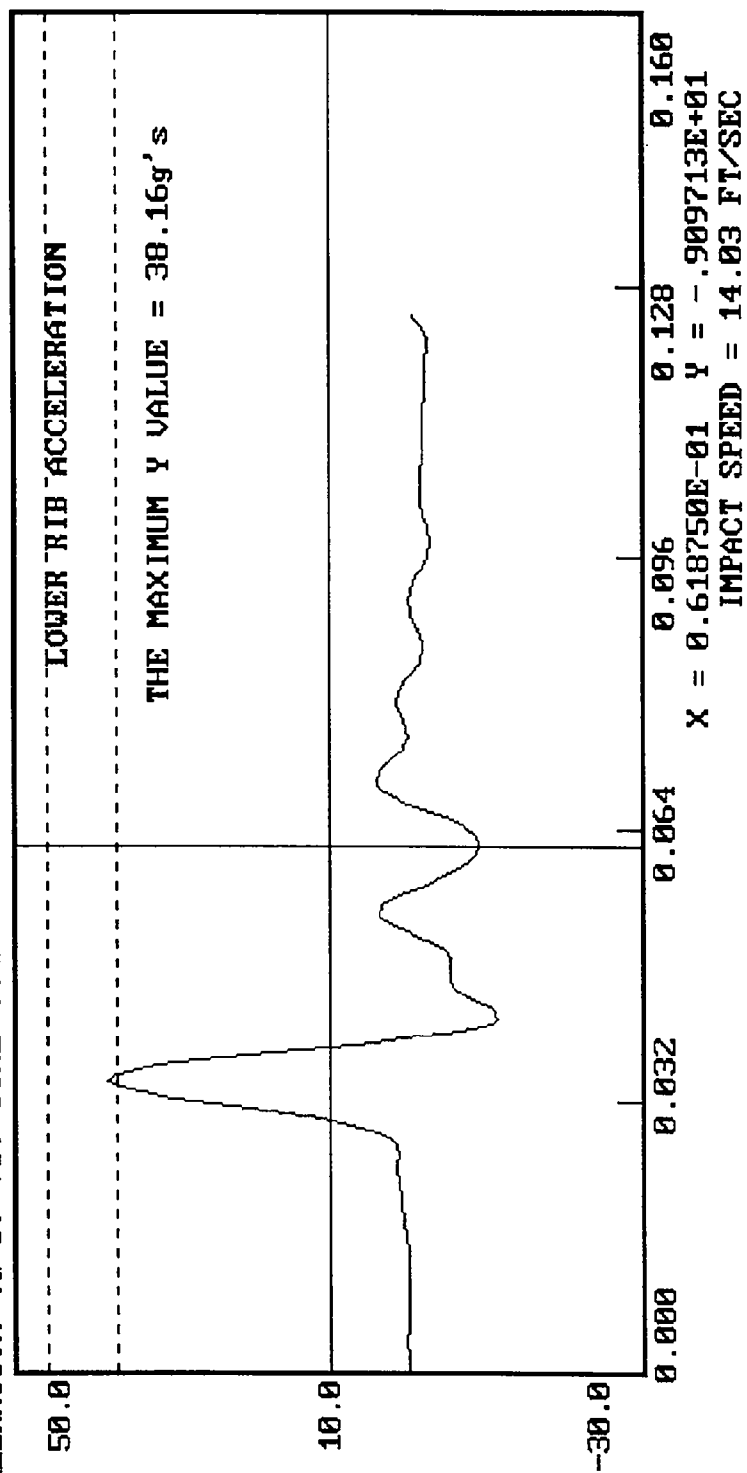


01-26-1995 11:37

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

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

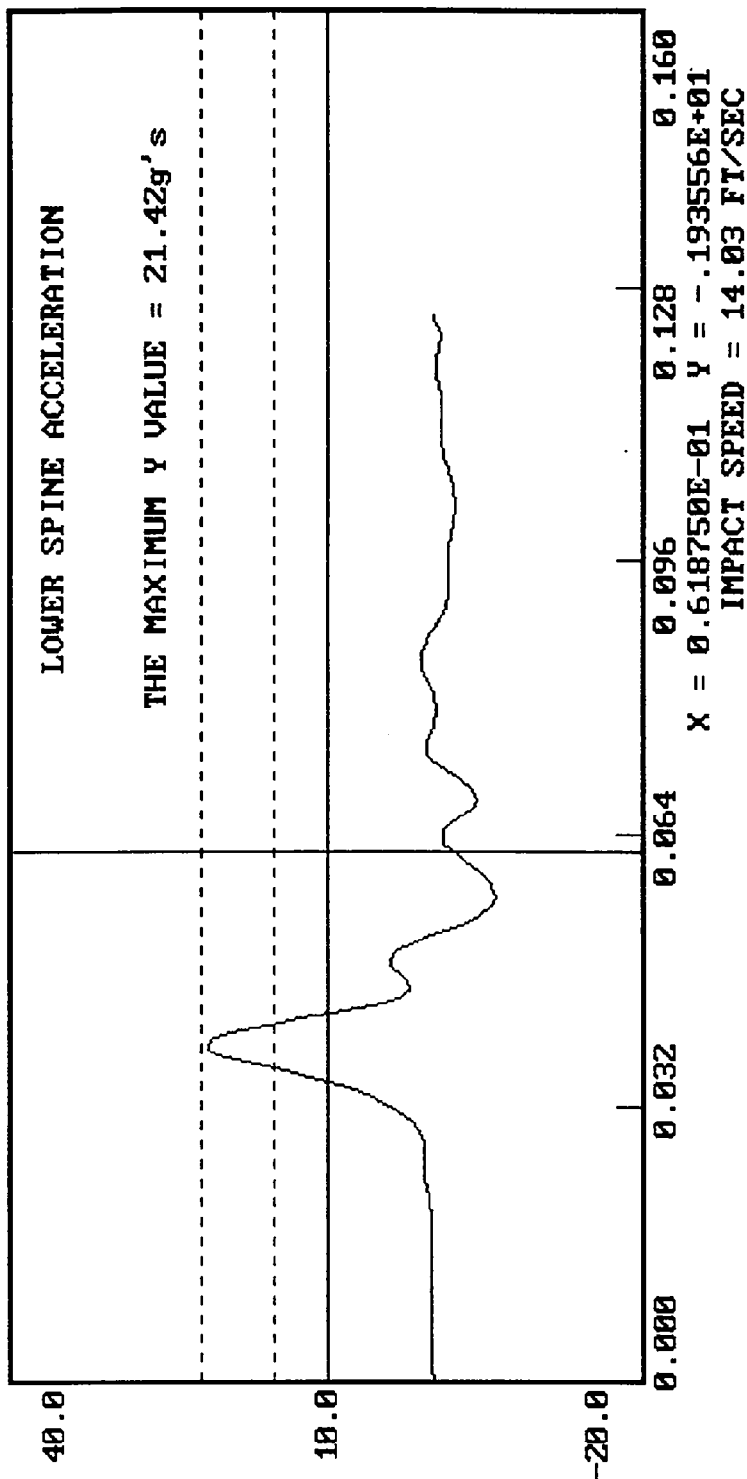


01-26-1995 11:37

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 271

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 26, 1995

DUMMY NUMBER: 271

TEST NUMBER: D95183

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	57

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim Meli

APPROVED BY

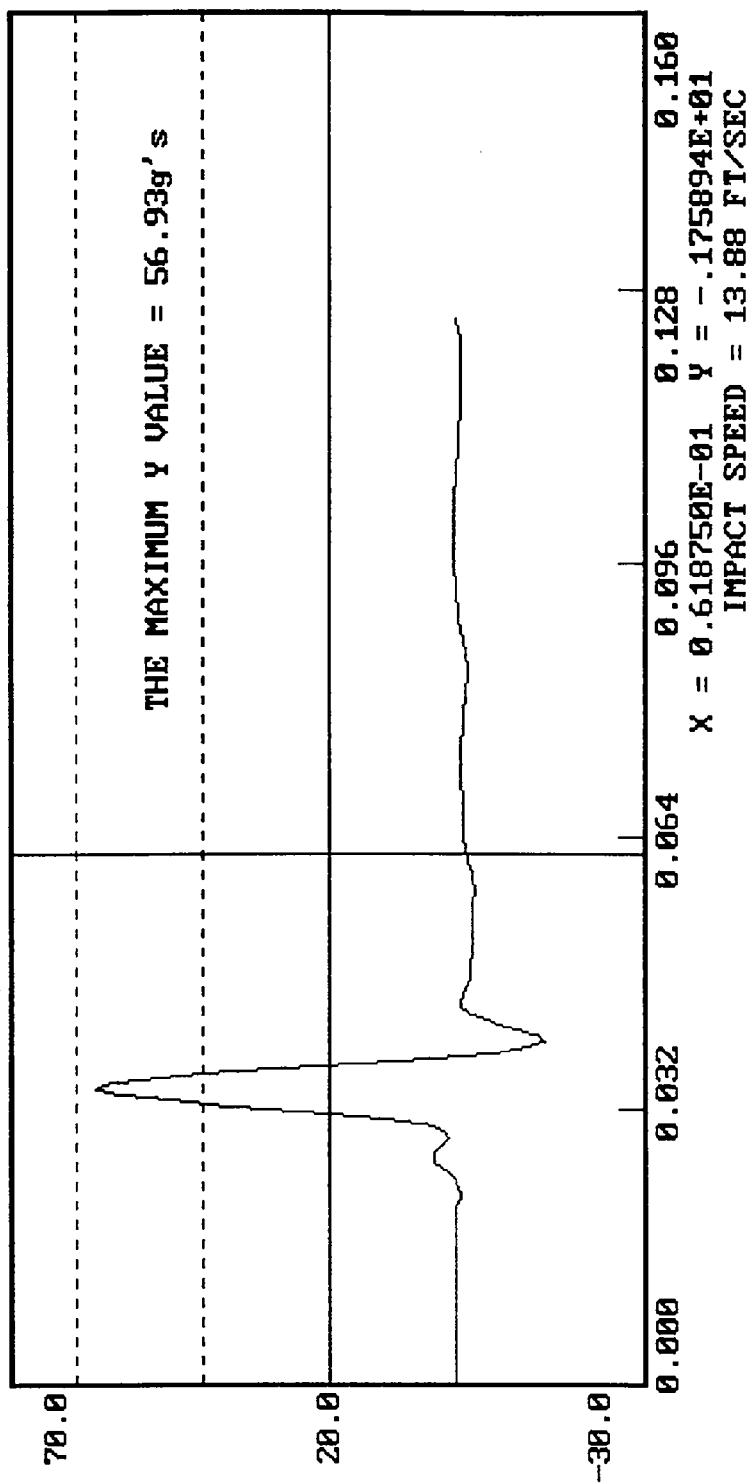
Wm. K. K. K.

01-26-1995 12:03

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 271

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

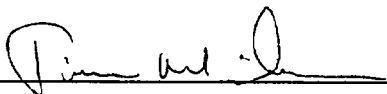
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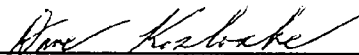
DUMMY NUMBER: 271

TEST NUMBER: D95184

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.0
FORCE @ 0.75 in	36.7 - 49.8 lbs	46.0
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	84

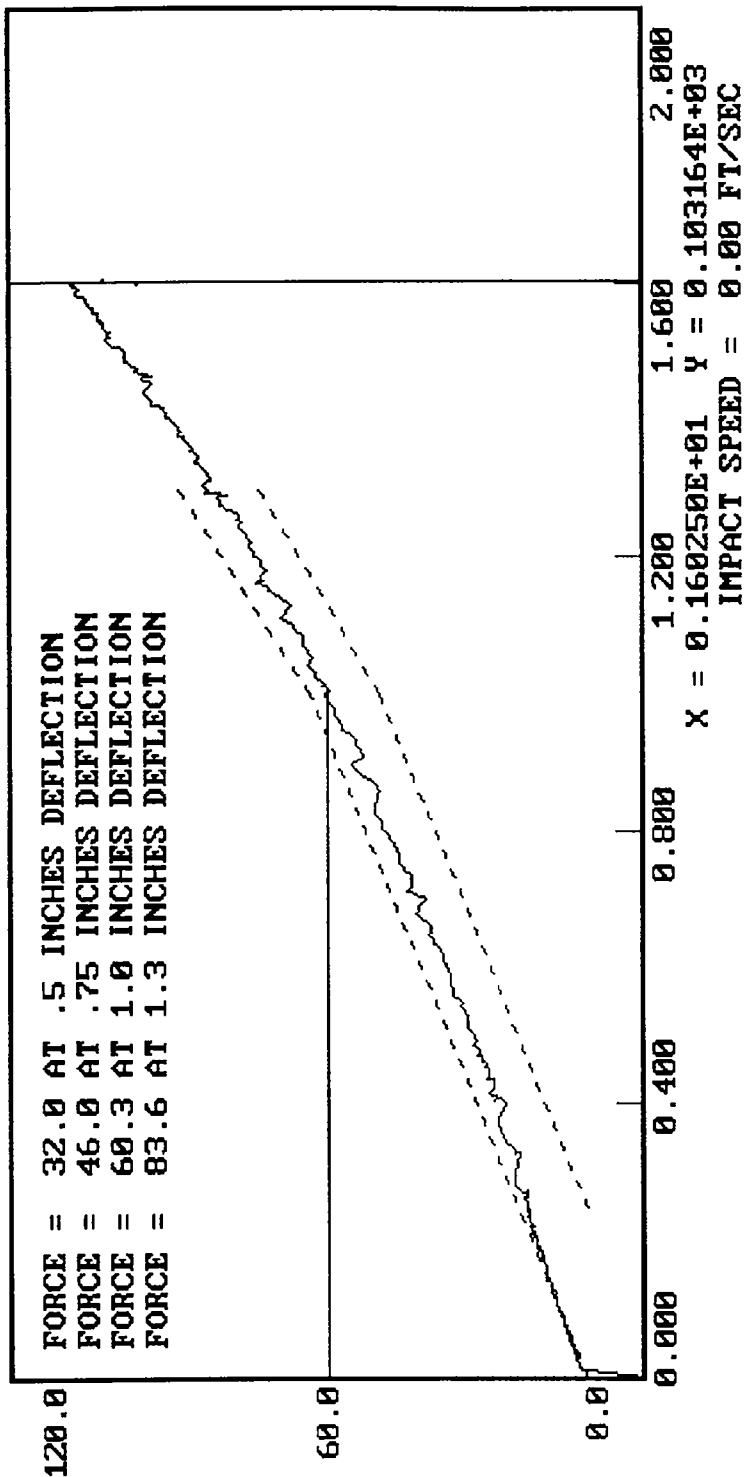
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 271
 01-26-1995 15:07

ABDOMEN FORCE () VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 26, 1995

DUMMY NUMBER: 271

TEST NUMBER: D95185

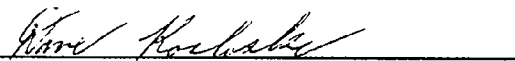
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	27
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	53
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

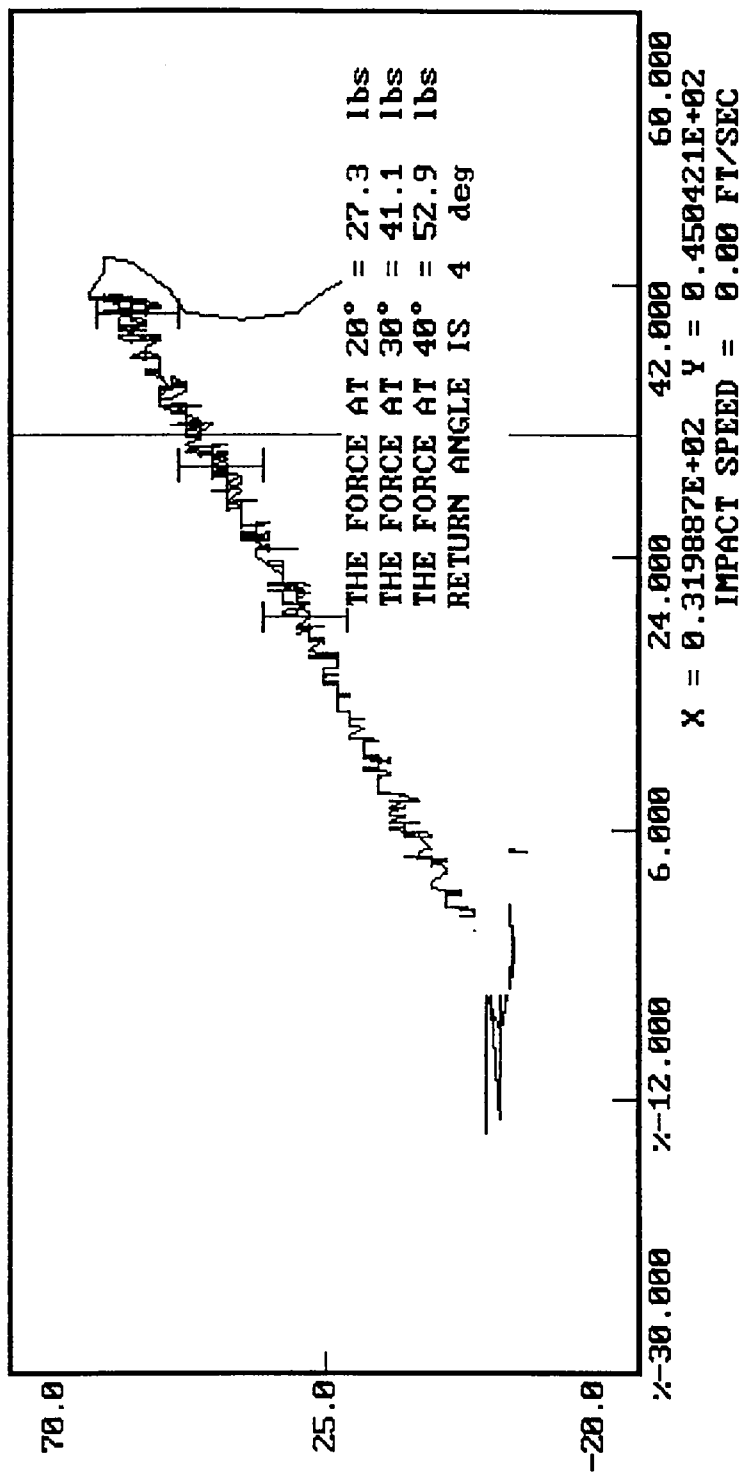


01-26-1995 14:45

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 271

FORCE () VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Al Chalmers

Date: January 26, 1995

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

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

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 271

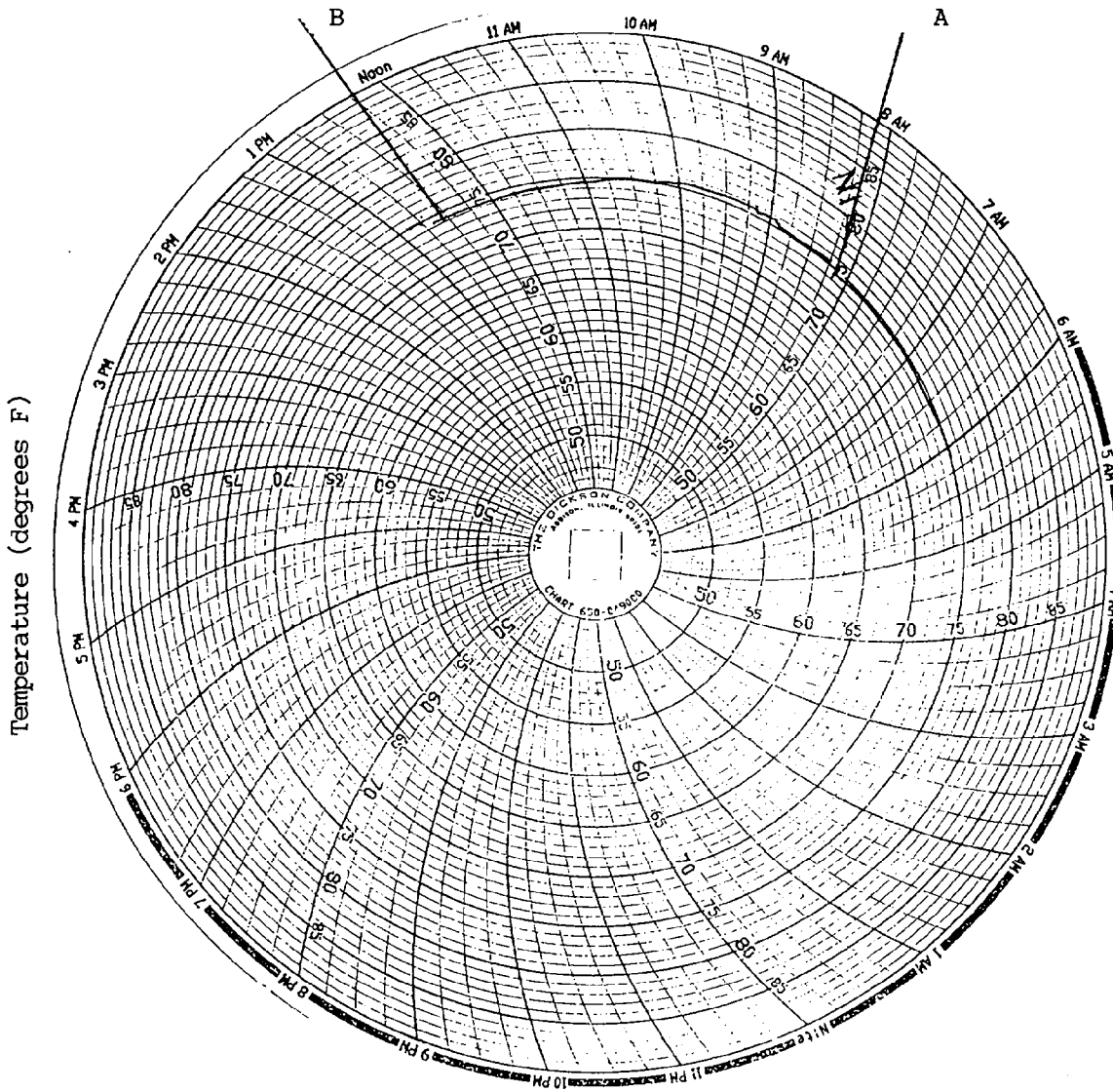
Inspected By: Al Chalmers

Date: January 26, 1995

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

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

VEHICLE AND DUMMY TEMPERATURE



A = Dummies placed in Vehicle
B = Test Conducted

APPENDIX D
DUMMY AND VEHICLE CALIBRATION DATA

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

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AHTF1	Endevco	September 12, 1994
Lower Rib	AHY78	Endevco	November 07, 1994
Lower Spine	AJ9B0	Endevco	October 19, 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

INSTRUMENTS FOR PASSENGER DUMMY NO. 271

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib	AGTM8	Endevco	January 16, 1995
Lower Rib	AHY21	Endevco	September 02, 1994
Lower Spine	AJ417	Endevco	October 10, 1994
Pelvis	AGTM2	Endevco	September 16, 1994
Upper Rib Redundant	AJ411	Endevco	January 16, 1995
Lower Rib Redundant	AGTG8	Endevco	September 16, 1994
Lower Spine Redundant	AGP20	Endevco	October 10, 1994
Pelvis Redundant	AHY98	Endevco	September 16, 1994

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB CG X	AHDR9	Endevco	August 12, 1994
MDB CG Y	X14	Entran	October 30, 1994
MDB CG Z	MGA140	Entran	January 04, 1995
MDB Rear Axle X	AJ9E1	Endevco	October 14, 1994
MDB Rear Axle Y	AN47	Endevco	December 14, 1994
Mid Left A -Post	X03	Entran	November 07, 1994
Lower Left A -Post	X08	Entran	January 17, 1995
Trunk Centerline X	X02	Entran	November 07, 1994
Trunk Centerline Y	MGA145	Entran	December 16, 1994
Trunk Centerline Z	A01	Entran	November 04, 1994
Driver Seat Track	AKAE8	Endevco	October 14, 1994
Right Front Sill X	MGA021	Entran	December 14, 1994
Right Front Sill Y	MGA106	Entran	November 18, 1994
Right Front Sill Z	MGA126	Entran	November 18, 1994
Right Rear Sill X	MGA094	Entran	December 02, 1994
Right Rear Sill Y	MGA159	Entran	January 04, 1995
Right Rear Sill Z	MGA150	Entran	December 02, 1994
Left Front Sill Y	MGA084	Entran	January 16, 1995
Left Rear Sill Y	A06	Entran	November 07, 1994
Right Rear Seat Occupant Compartment Y	MGA122	Entran	January 11, 1995

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