

REPORT NO.: 214-MGA-96-011
SAFETY COMPLIANCE TESTING FOR
FMVSS 214 "SIDE IMPACT PROTECTION -
PASSENGER CARS"

SUBARU MOTORS CORPORATION
1996 SUBARU IMPREZA 2 DOOR
NHTSA NO: CT5501

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 11, 1996

Report Date: January 16, 1996

FINAL REPORT

Prepared For:

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				6. Performing Organization Code MGA																			
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16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1996 Subaru Impreza 2 Door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-04 for the determination of FMVSS No. 214 Side Impact Protection compliance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on January 11, 1996. The impact velocity of the Moving Deformable Barrier (MDB) was 53.3 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 21°C. The target vehicle post test maximum crush was 316 mm at level 2. The test vehicle's performance follows: <table border="0"> <thead> <tr> <th></th> <th><u>DRIVER</u></th> <th><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>76</td> <td>71</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>86</td> <td>61</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>73</td> <td>58</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>79</td> <td>65</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>93</td> <td>75</td> </tr> </tbody> </table> The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door did not open during the side impact event.							<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	76	71	Left Lower Rib (LLR) Accel., g	86	61	Lower Spine (T ₁₂) Accel., g	73	58	Thoracic Trauma Index (TTI)	79	65	Pelvis (PEV) Accel., g	93	75
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17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID)				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. 202-366-4946 Attn: Robert Hornickle																			
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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 96 FMVSS 214 Side Impact Protection 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 1996 Subaru Impreza 2 Door.

This side impact test was conducted in accordance with the Vehicle Safety Compliance's FMVSS 214 test procedure (TP-214D-04, dated September 1, 1995).

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 1996 Subaru Impreza 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 tow road guidance system at a velocity of 33.1 mph (53.3 kph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on January 11, 1996. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (SIDs) are included in Appendix A.

Two Side Impact Dummies (SIDs) were placed in the driver and left rear designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated September 1, 1995. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report.

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)

Appendix B contains the vehicle and dummy response data traces. A summary of the side impact dummy (SID) configuration and performance verification test data is shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.

The following table summarizes the results of the test:

Injury Criteria	Front SID	Rear SID
TTI (g)	79	65
Pelvis (g)	93	75

TEST NOTES

The following accelerometers were not used for this test:

Left Front Door on Centerline

Midrear of Left Front Door

Left Front Door Upper Centerline

Midrear of Left Rear Door

Left Rear Door Upper Centerline

Rear Seat Track

SECTION 3
SIDE IMPACT DUMMY (SID) AND
VEHICLE TEST DATA

DATA SHEET NO. 1

GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 VIN: JF1GM2253TG410610

Vehicle Body Color: Blue Build Date: 8/95

Engine Data: 4 Cylinders; CID; 1.8 Liter; cc

Placement X Longitudinal; Lateral

Transmission: 5 speed; X Manual; Automatic; Overdrive

Final Drive: Rear Wheel Drive; Frt. Wheel Drive; X Four Wheel Drive

Odometer Reading 55 miles

Options: X A/C; X Pwr. Steering.; X Pwr. Brakes; Pwr. Windows;

 Cruise Control; X Tilt Wheel; Power Door Locks;

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 32 Psi FRONT

29 Psi REAR

Recommended Tire Size: P175/70R14

Tires on Test Vehicle: P175/70R14 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 = 367 kg (A)

No. of Occupants x 68.04 kg. = 340 kg (B)

Cargo Capacity (A-B) = 27 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>345.6</u> kg	Right Rear	=	<u>243.6</u> kg
Left Front	=	<u>355.2</u> kg	Left Rear	=	<u>244.0</u> kg
TOTAL FRONT	=	<u>700.8</u> kg	TOTAL REAR	=	<u>487.6</u> kg
% of Total Vehicle Weight = <u>59.0</u> %;		% of Total Weight = <u>41.0</u> %			
TOTAL WEIGHT = <u>1188.4</u> kg					

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids = 1188.4 kg
Cargo Carrying Capacity of Test Vehicle = 27.0 kg
Weight of 2 Side Impact Dummies (2 x 80.7 kg.) = 161.4 kg
TEST VEHICLE TARGET WEIGHT = 1376.8 kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front = 366.1 kg Right Rear = 290.3 kg
Left Front = 398.7 kg Left Rear = 316.2 kg
TOTAL FRONT = 764.8 kg TOTAL REAR = 606.5 kg
% of Total Weight = 55.8 % % of Total Weight = 44.2 %
TOTAL TEST WEIGHT = 1371.3 kg

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 676 mm Left Front 676 mm Right Rear 670 mm Left Rear 662 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 672 mm Left Front 657 mm Right Rear 650 mm Left Rear 631 mm

TEST ATTITUDE:

Right Front 671 mm Left Front 664 mm Right Rear 656 mm Left Rear 641 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2516 mm

C.G. = 1113 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4120 mm

Centerline = 4338 mm

Left Side = 4136 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

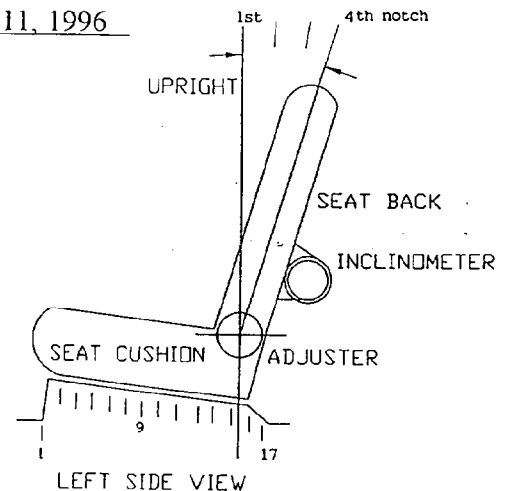
FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 220 mm

Test Position: 9th detent rearward out of 17 total

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 4th notch



SECOND POSITION SEAT:

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

Seat Back Adjustment Position: Non-Adjustable

ADJUSTABLE STEERING COLUMN POSITION: Mid Position

WINDOW POSITIONS: Left Front Closed Left Rear Closed

Right Front Open Right Rear Open

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 50 liters

Test Volume: 46.2 liters 92 % of capacity

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

Wheelbase: = 2516 mm

Impact Point is 318 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

Overall Length = 4338 mm; Overall Width = 1687 mm

TEST WEIGHT:

Right Front = 366.1 kg

Right Rear = 290.3 kg

Left Front = 398.7 kg

Left Rear = 316.2 kg

TOTAL FRONT = 764.8 kg

TOTAL REAR = 606.5 kg

% of Total Weight = 55.8 %

% of Total Weight = 44.2 %

TOTAL VEHICLE WEIGHT = 1371.3 kg

Wheelbase = 2516 mm

Longitudinal C.G. from Center of Front Axle = 1113 mm

Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (248 mm above ground) = 114 mm

2. LEVEL 2 (496 mm above ground) = 316 mm

3. LEVEL 3 (576 mm above ground) = 255 mm

4. LEVEL 4 (887 mm above ground) = 201 mm

5. LEVEL 5 (1325 mm above ground) = 71 mm

Maximum Post-Test Intrusion = 316 mm

OCCUPANTS:

	<u>Left Front Passenger</u>	<u>Left Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>type II belt</u>	<u>type II belt</u>
	<u>system</u>	<u>system</u>

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

Number of Vehicle Data Channels:	=	<u>20</u>
Number of Cameras: Onboard Vehicle	=	<u>3</u>
Offboard Vehicle	=	<u>4</u>
Deformable Barrier	=	<u>2</u>
TOTAL	=	<u>9</u>

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	= <u>1252 mm</u>
Overall Length of MDB (incl. honeycomb impact face)	= <u>4115 mm</u>
Wheelbase of Framework Carriage	= <u>2591 mm</u>
Tread of Framework Carriage (Front & Rear)	= <u>1880 mm</u>
C.G. Location Rearward of Front Axle	= <u>1102 mm</u>
C.G. Location From Center Line	= <u>-8 mm</u>
C.G. Location Above Ground Level	= <u>488 mm</u>

MDB WEIGHT:

Left Front	= <u>496.7 kg</u>	Left Rear	= <u>187.3 kg</u>
Right Front	= <u>283.0 kg</u>	Right Rear	= <u>389.2 kg</u>
TOTAL FRONT	= <u>779.7 kg</u>	TOTAL REAR	= <u>576.5 kg</u>
TOTAL MDB WEIGHT = <u>1356.2 kg</u>			

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

Impact Speed = Primary: 33.1 mph (53.3 kph) Secondary: 32.9 mph (52.9 kph)

CRASH TEST SUMMARY FOR SIDE IMPACTOR (Cont'd)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

- | | | |
|----|---------------------------------|-----------------|
| 1. | Row A Top of Stack (813 mm) | = <u>128</u> mm |
| 2. | Row B Mid Stack (686 mm) | = <u>133</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = <u>95</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = <u>151</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to shoulder</u>	<u>to C Post</u>
Arm	<u>to door</u>	<u>to trim panel</u>
Pelvis	<u>to door</u>	<u>to trim panel</u>
Left Knee	<u>to door</u>	<u>to trim panel</u>
Right Knee	<u>to left knee</u>	<u>to left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 16 mm rearward Vertical: 6 mm high

ARM REST LOCATIONS:

Front: 234 mm Below window opening
Rear: N/A

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 46 mm Front Seat Cushion: 45 mm

Left Rear Seat Back: 96 mm Rear Seat Cushion: 158 mm

GLAZING DAMAGE:

Both left side windows broke, windshield cracked

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

No failure noted

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

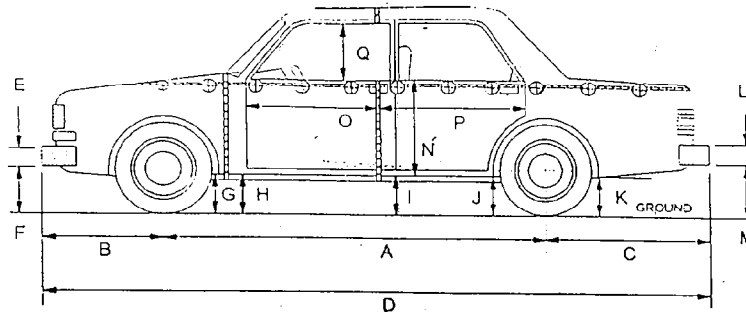
DATA SHEET NO. 5
SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA
 Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
 Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

	Front Dummy ID #270			Rear Dummy ID #271		
	Pos. Direct.		Neg. Direct	Pos. Direct.		Neg. Direct
	Max (g)	Time (msec)	Max (g)	Max (g)	Time (msec)	Max (g)
RIB ACCELERATIONS						
Left Upper Rib (LUR) Y	76.2	38	16.5	71.3	45	5.3
Left Lower Rib (LLR) Y	85.7	38	9.4	60.6	45	7.3
SPINE ACCELERATIONS						
Lower Lateral Y	72.8	34	16.7	58.1	48	6.1
PELVIS ACCELERATIONS						
Lateral Y	92.9	31	10.7	74.9	36	6.0

REFERENCE: Positive Direction- Longitudinal (X) = forward
 Lateral (Y) = to right
 Vertical (Z) = down

Negative Direction - Longitudinal (X) = rearward
 Lateral (Y) = to left
 Vertical (Z) = up

DATA SHEET NO. 6
VEHICLE 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

ALL MEASUREMENTS IN (mm)

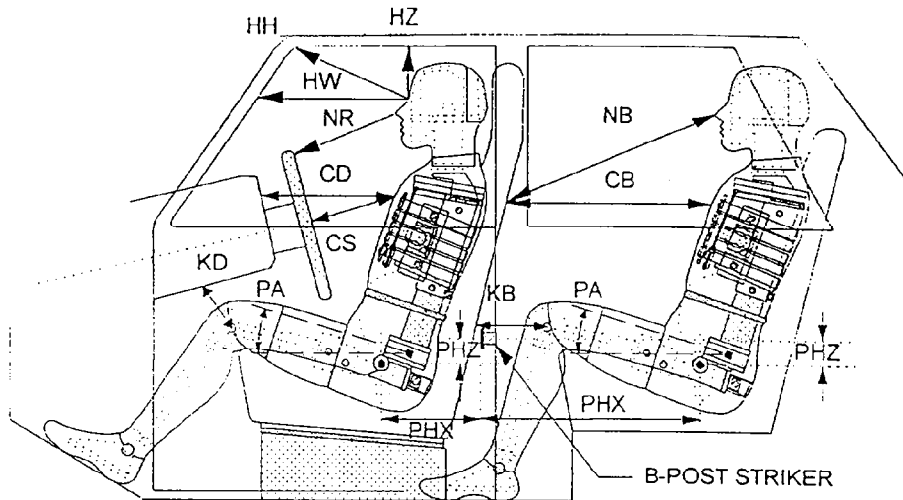
	PRE-TEST	POST-TEST	Δ CHANGE
A	2516	2486	30
B	875	838	37
C	947	950	3
D	4338	4274	64
E	177	190	13
F	391	411	20
G	222	231	9
H	175	197	22
I	166	177	11
J1/J2	164/170	172/173	8/3
K	262	256	6
L	297	310	13
M	305	301	4
N	627	580	47
O	720	682	38
P	621	628	7
Q	421	393	28
R	4120	4106	14
S	4136	4072	64
T	1687	1494	193

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

NHTSA NO.: CT5501 Test Date: January 11, 1996



NOTE: All dimensions are in mm with tolerance of ± 3 mm

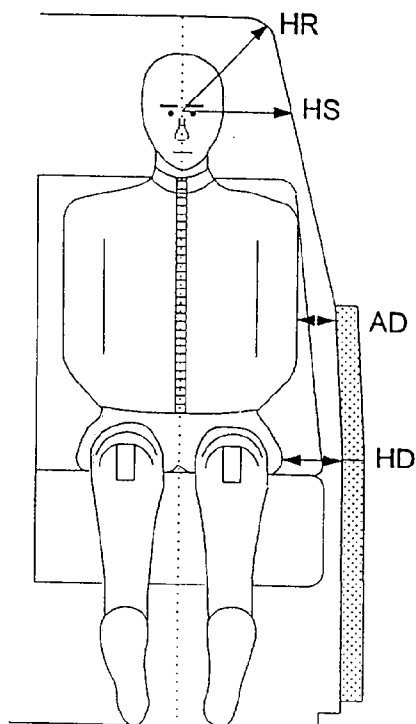
	FRONT SID ID #270		REAR PASSENGER SID ID #271
HH	352	HZ	144
HW	548	NB	559
HZ	167	CB	463
NR	470	KBL (KBA)	164 (9.8)
CD	520	KBR (KBA)	164 (24.2)
CS	334	PA°	24.8
KDL(KDA°)	182 (22.8)	PHX	380
KDR(KDA°)	180 (33.2)	PHZ	77
PA°	23.8		
PHX	450		
PHZ	88		

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

DATA SHEET NO. 8
SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

NHTSA NO.: CT5501 Test Date: January 11, 1996



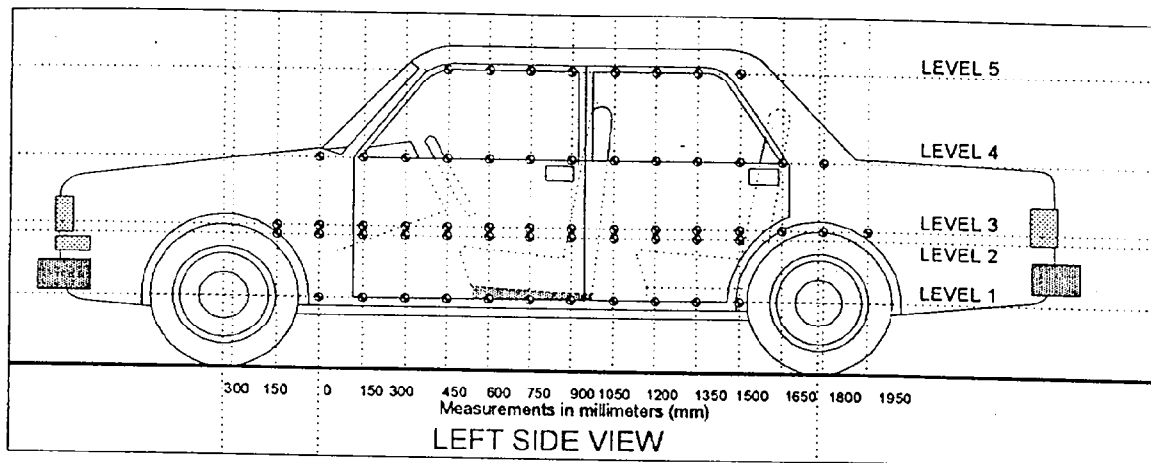
NOTE: All dimensions are in mm

	DRIVER ID #270	LEFT REAR PASSENGER ID #271
HR	201	186
HS	304	303
AD	112	91
HD	134	152

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

NHTSA NO.: CT5501 Test Date: January 11, 1996



LEVEL 5 - WINDOW TOP
LEVEL 4 - WINDOW SILL
LEVEL 3 - MID-DOOR
LEVEL 2 - OCCUPANT H-POINT
LEVEL 1 - AXLE CENTERLINE HEIGHT or SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED"
CONFIGURATION

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

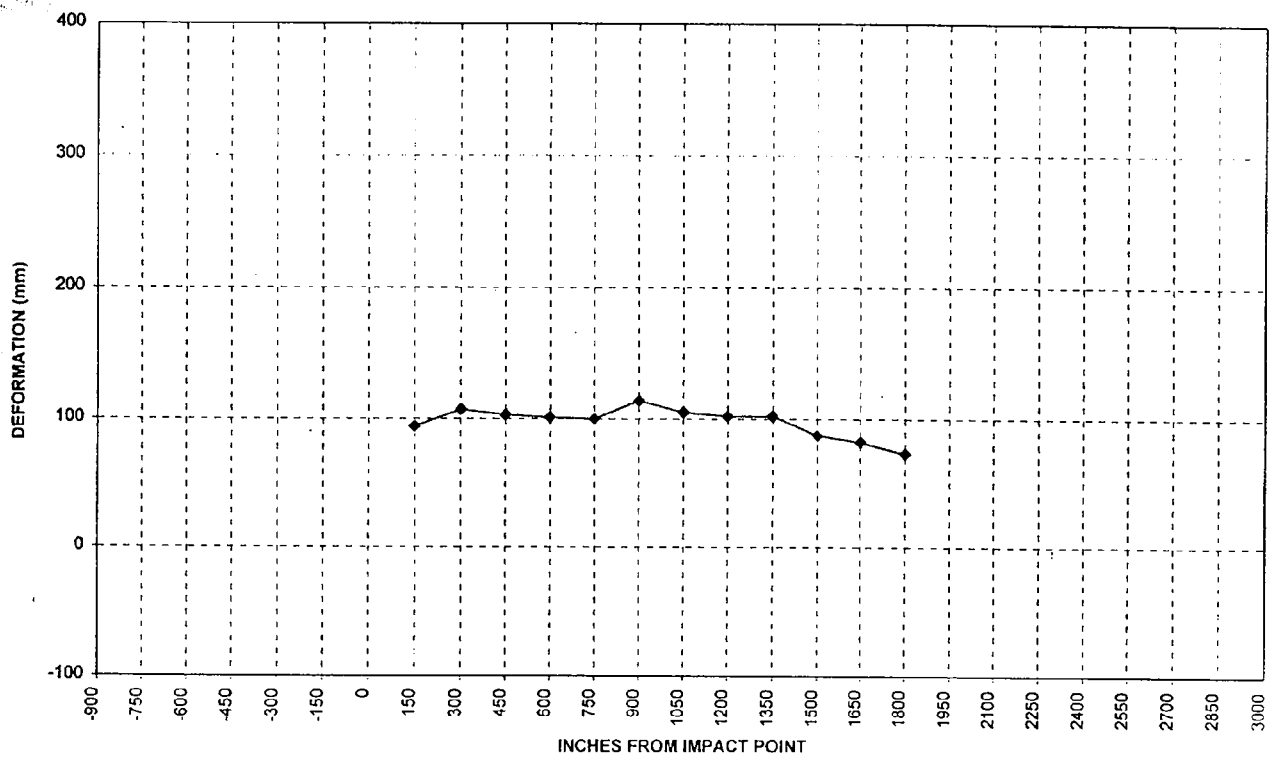
Level 5 @ Window Top	=	<u>1325</u> mm
Level 4 @ Window Sill	=	<u>887</u> mm
Level 3 @ Mid Door	=	<u>576</u> mm
Level 2 @ Occupant H-Point	=	<u>496</u> mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>248</u> mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS
 Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
 NHTSA NO.: CT5501 Test Date: January 11, 1996

	Level 1 - Axle Centerline		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150	823	917	94
300	826	933	107
450	827	930	103
600	823	924	101
750	821	921	100
900	820	934	114
1050	818	923	105
1200	817	919	102
1350	816	918	102
1500	815	902	87
1650	812	894	82
1800	809	882	73
1950			
2100			
2250			
2400			
2550			
2700			
2850			

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

VEHICLE EXTERIOR STATIC CRUSH



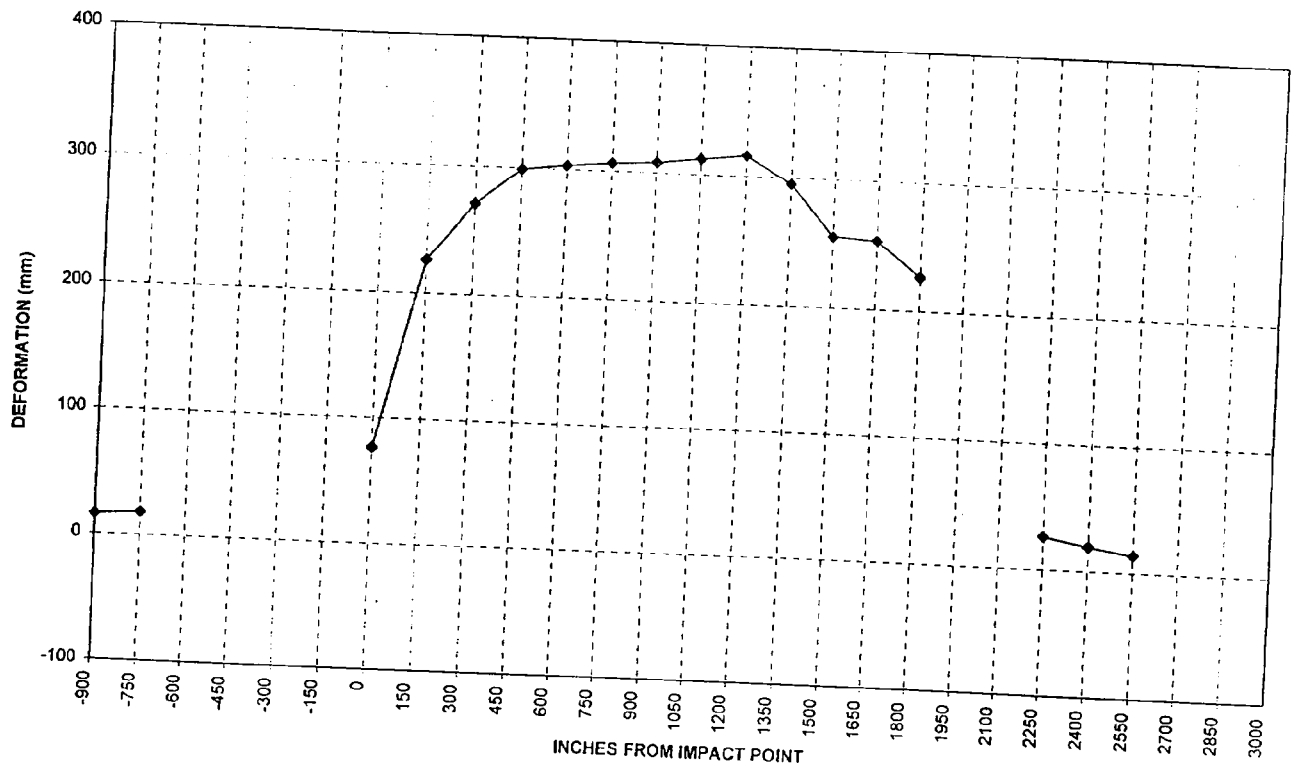
LEVEL 1 - AXLE CENTERLINE

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS
Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
NHTSA NO.: CT5501 Test Date: January 11, 1996

	Level 2 - Occupant H Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-900	806	822	16
-750	782	800	18
-600			
-450			
-300			
-150			
0 (impact point)	766	842	76
150	771	997	226
300	772	1043	271
450	771	1070	299
600	770	1073	303
750	769	1075	306
900	767	1075	308
1050	766	1078	312
1200	764	1080	316
1350	763	1058	295
1500	763	1019	256
1650	763	1017	254
1800	764	991	227
1950			
2100			
2250	769	796	27
2400	791	811	20
2550	816	830	14
2700			
2850			

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

VEHICLE EXTERIOR STATIC CRUSH



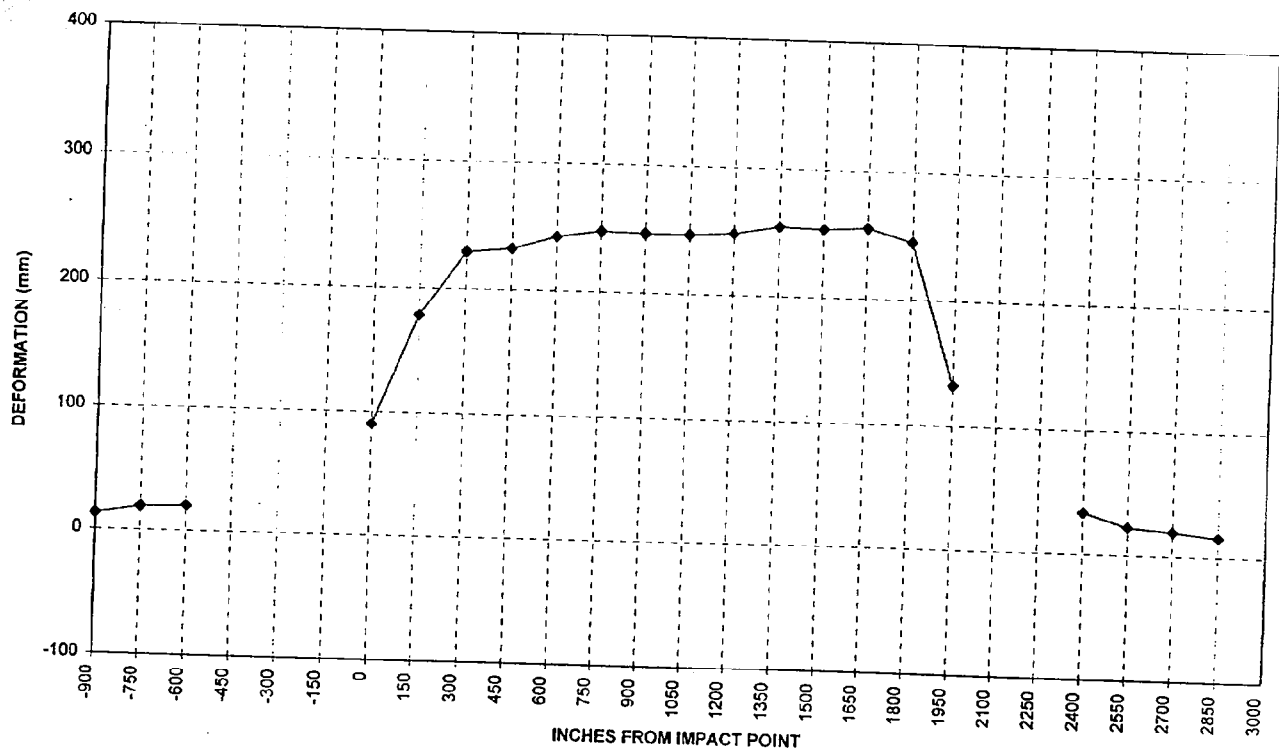
LEVEL 2 - OCCUPANT H-POINT

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS
 Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
 NHTSA NO.: CT5501 Test Date: January 11, 1996

	Level 3 - Mid Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-900	820	833	13
-750	788	807	19
-600	765	785	20
-450			
-300			
-150			
0 (impact point)	761	851	90
150	764	942	178
300	765	994	229
450	766	998	232
600	765	1007	242
750	765	1012	247
900	765	1011	246
1050	764	1010	246
1200	762	1010	248
1350	760	1014	254
1500	760	1013	253
1650	760	1015	255
1800	760	1005	245
1950	758	891	133
2100			
2250			
2400	755	789	34
2550	780	803	23
2700	807	827	20
2850	844	860	16

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

VEHICLE EXTERIOR STATIC CRUSH



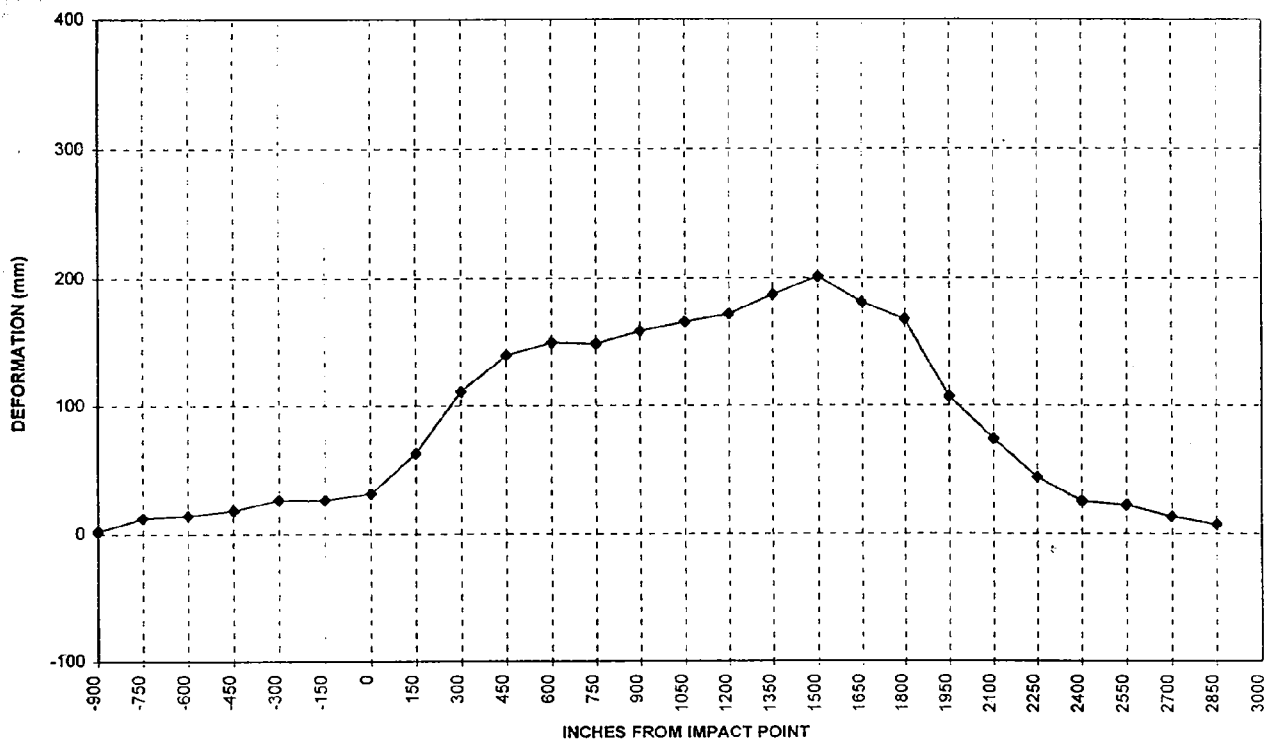
LEVEL 3 - MID DOOR

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS
Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
NHTSA NO.: CT5501 Test Date: January 11, 1996

	Level 4 - Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-900	877	879	2
-750	861	873	12
-600	853	867	14
-450	848	866	18
-300	842	868	26
-150	839	865	26
0 (impact point)	836	867	31
150	834	897	63
300	832	943	111
450	832	972	140
600	833	983	150
750	834	983	149
900	833	992	159
1050	832	998	166
1200	831	1003	172
1350	833	1020	187
1500	834	1035	201
1650	835	1016	181
1800	837	1005	168
1950	840	947	107
2100	843	917	74
2250	848	892	44
2400	854	879	25
2550	868	890	22
2700	890	903	13
2850	921	928	7

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

VEHICLE EXTERIOR STATIC CRUSH



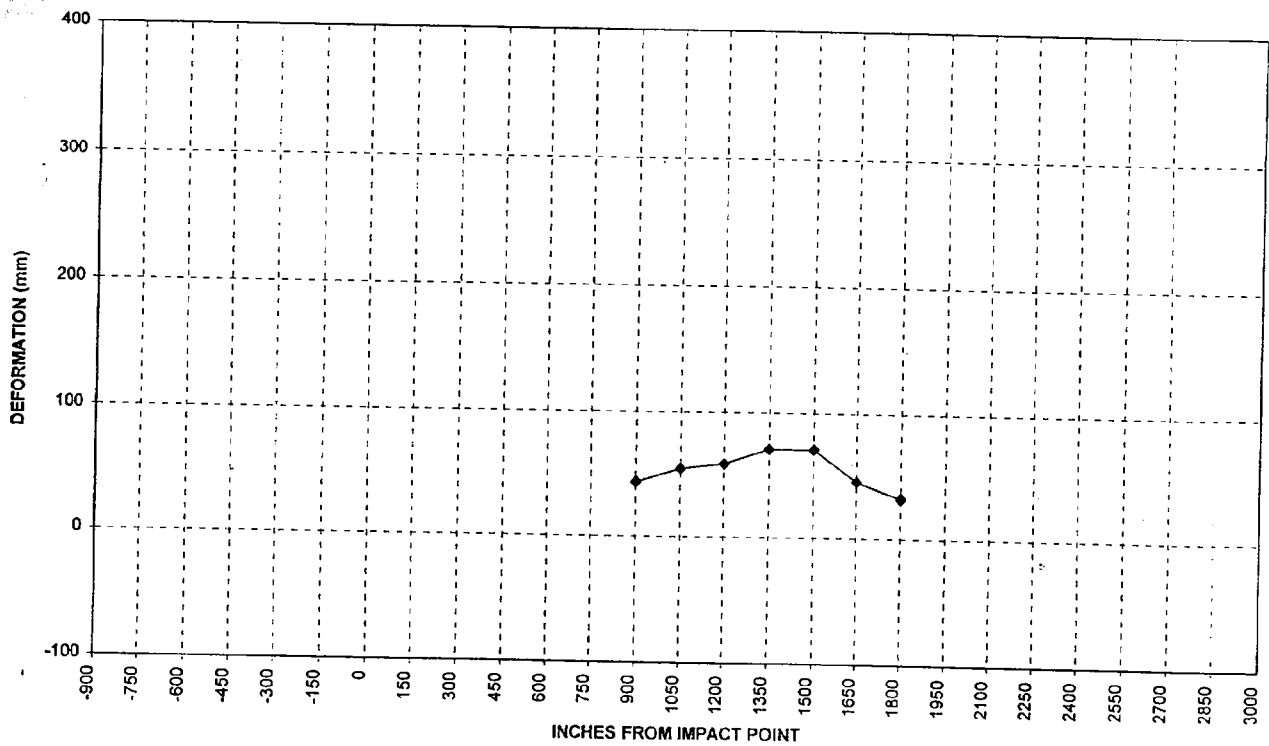
LEVEL 4 - WINDOW SILL

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS
Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
NHTSA NO.: CT5501 Test Date: January 11, 1996

	Level 5 - Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750			
900	1045	1089	44
1050	1049	1104	55
1200	1056	1115	59
1350	1061	1132	71
1500	1070	1141	71
1650	1075	1121	46
1800	1083	1116	33
1950			
2100			
2250			
2400			
2550			
2700			
2850			

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

VEHICLE EXTERIOR STATIC CRUSH



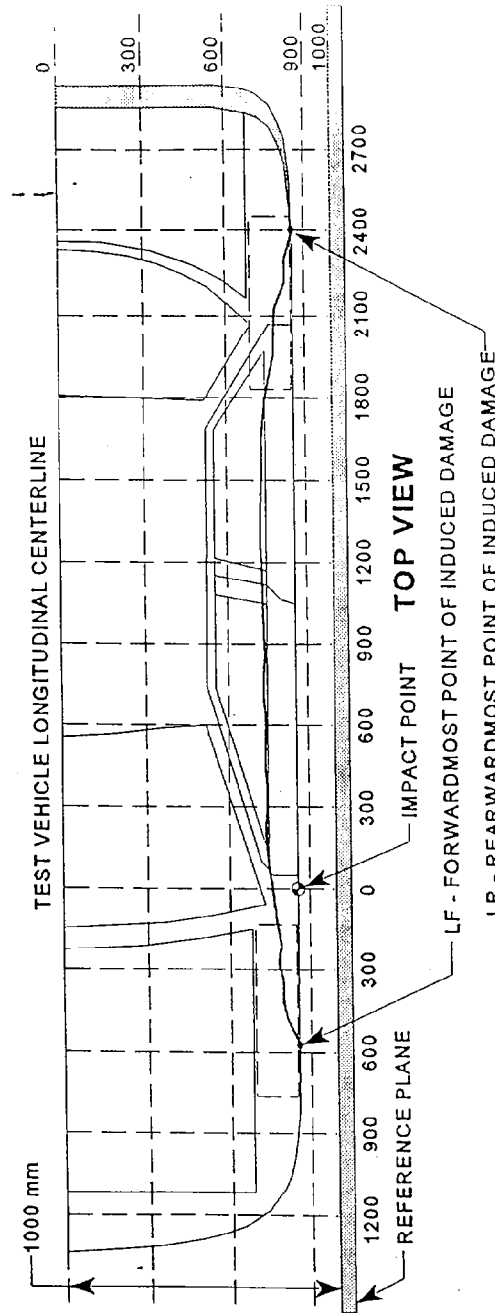
LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

NHTSA NO.: CT5501 Test Date: January 11, 1996



MEASUREMENT CONVENTIONS:
 LR - REARWARDMOST POINT OF INDUCED DAMAGE
 Forward of the impact point (towards front of vehicle) is considered negative (-).
 Rearward of the impact point (toward rear of vehicle) is considered positive (+).

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LF = 150 mm)	823	823	0
2. 360 mm	1004	772	232
3. 870 mm	1070	768	302
4. 1380 mm	1077	763	314
5. 1890 mm	1019	766	253
6. (LR = 2400 mm)	888	888	0

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

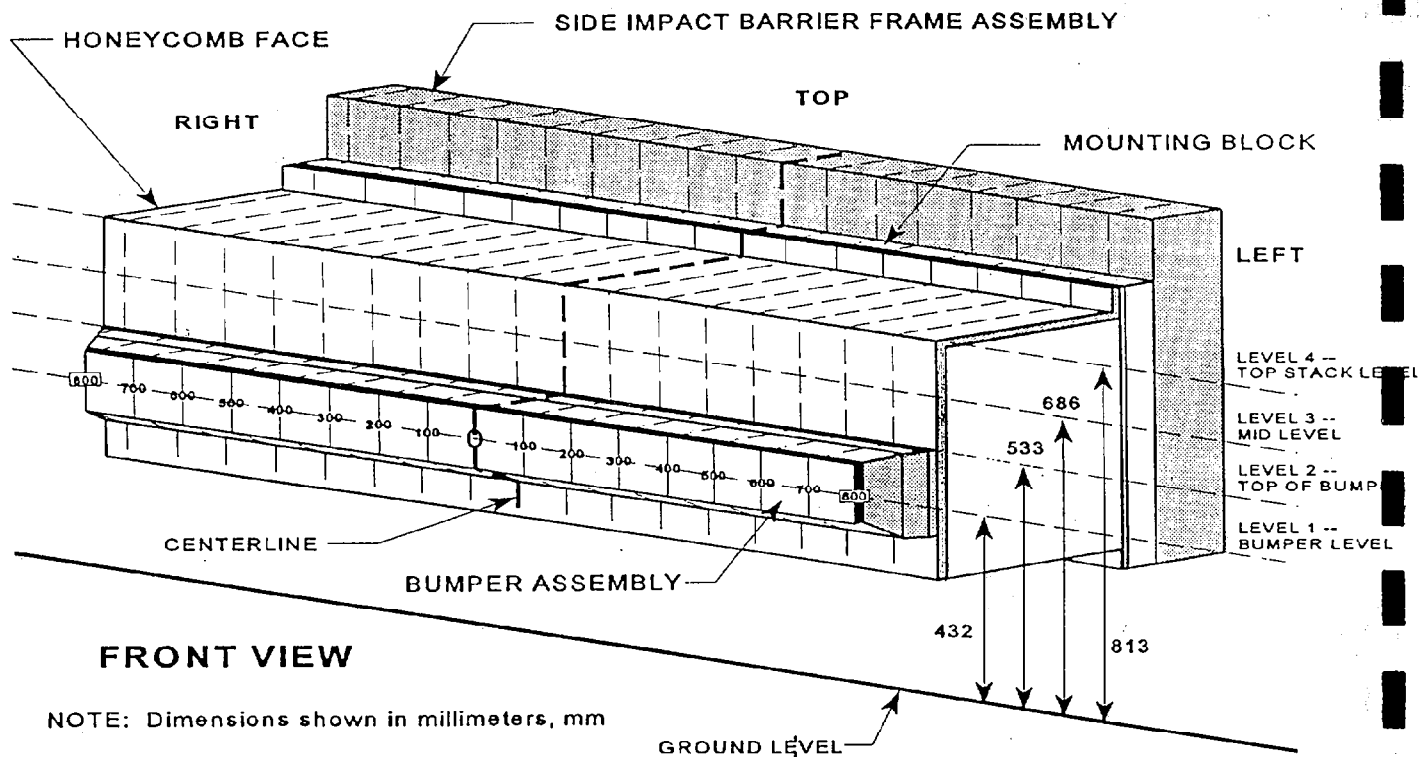
Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

		Distance Right of Center (mm)									Distance Left of Center (mm)							
		800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
Location	Height at CL*																	
Top Stack Level 4	813 mm	68	10	10	10	11	11	12	13	13	16	16	16	17	34	55	86	128
Mid Level Level 3	686 mm	30	18	18	19	14	15	15	14	16	16	16	17	17	19	35	67	133
Top Bumper Level 2	533 mm	83	86	80	62	39	28	25	25	26	26	26	28	32	36	46	65	95
Mid Bumper Level 1	432 mm	129	147	151	129	90	67	57	50	48	45	43	43	42	47	54	94	129

See next page for Barrier Face Graphic

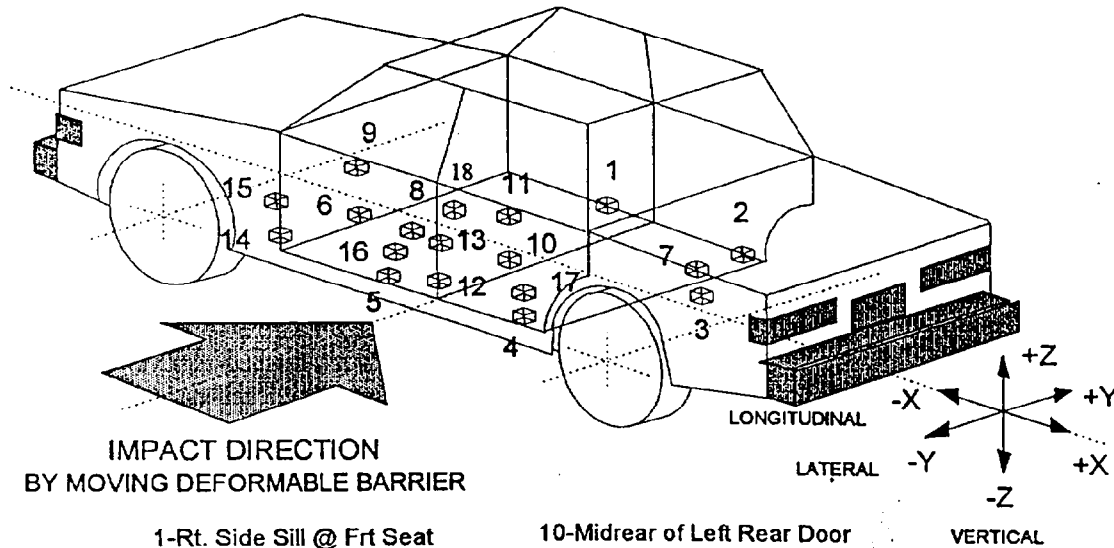
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996



**IMPACT DIRECTION
BY MOVING DEFORMABLE BARRIER**

- | | |
|--------------------------------|---------------------------------|
| 1-Rt. Side Sill @ Frt Seat | 10-Midrear of Left Rear Door |
| 2-Rt. Side Sill @ Rr. Seat | 11-Left Rear Door Upper Ctrline |
| 3-Rr. Floorpan Above Axle | 12-Left Lower B-Post |
| 4-Left Side Sill @ Rr. Seat | 13-Left Middle B-Post |
| 5-Left Side Sill @ Frt. Seat | 14-Left Lower A-Post |
| 6-Left Frt. Door On Centerline | 15-Left Middle A-Post |
| 7-Rt. Rr. Occ Compartment | 16-Front Seat Track |
| 8-Midrear of Left Frt. Door | 17-Rear Seat Track |
| 9-Left Frt. Door Upper Ctrline | 18-Vehicle C.G. |

DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

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	2035	690	205	4.2	4.9	25.8	3.4	7.4	3.1	26.4
2	Rt. Side Sill @ Rear Seat	1542	690	200	4.2	7.3	26.4	2.8	4.8	7.6	27.5
3	Rr. Floorpan Above Axle	885	0	503	4.5	6.8	25.4	2.8	14.5	11.4	26.2
4	Left Side Sill @ Rr. Seat	1523	-690	213	---	---	54.4	11.3	---	---	---
5	Left Side Sill @ Frt. Seat	2046	-690	210	---	---	74.8	14.8	---	---	---
7	Right Rear Occupant Compartment	1748	330	320	---	---	26.1	2.0	---	---	---
12	Left Lower B-Post	1786	-695	275	---	---	**	**	---	---	---
13	Left Mid B-Post	1749	-730	774	---	---	108.2	36.4	---	---	---
14	Left Lower A-Post	2976	-655	411	---	---	85.7	52.4	---	---	---
15	Left Mid A-Post	3032	-725	717	---	---	52.3	10.2	---	---	---
16	Driver Left Seat Track	1813	-545	302	---	---	70.9	26.4	---	---	---
18	Vehicle CG	2405	-21	425	6.0	9.0	25.5	1.8	9.4	5.3	26.8

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

Z - Ground Level (+ Up)

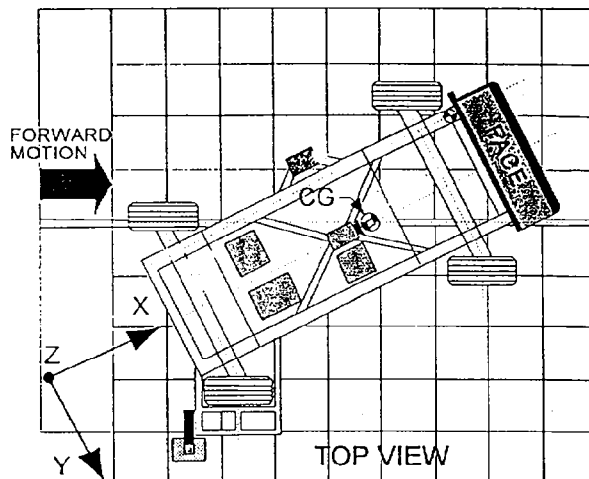
** No valid data collected

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996



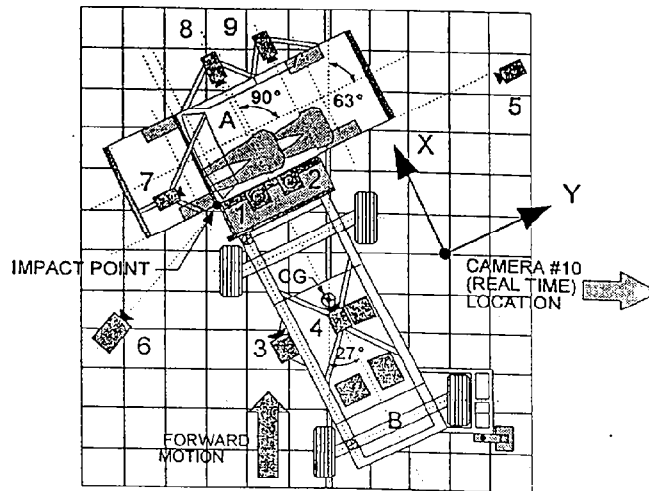
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	3.5	124	20.5	34
	Lateral (Y)	---	---	---	2.6	124	11.6	50
	Vertical (Z)	---	---	---	12.7	37	20.7	23
	Resultant (R)	---	---	---	24.8	33	---	---
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	5.0	167	21.8	23
	Lateral (Y)	---	---	---	7.1	33	2.1	115

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

DATA SHEET NO. 15
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time					13	24
1	Top Impact	-350	850	5400		13	901
2	Top Wide	-700	0	5130		8	1124
3	Cart Pointer					35	1026
4	Cart					13	1015
5	Right Impact	-3190	-8230	1880	90°	25	1015
6	Left Overall	2850	2580	1685	90°	13	893
7	Onboard Driver					8	952
8	Onboard Hood					8	NR
9	Onboard Passenger					13	922

* Reference: (from point of impact)

+X = Forward

+Y = To Right

+Z = Upward

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

TEST REQUIREMENTS:

Drain the test vehicle's fuel system and operate the engine until the fuel system is dry. Add Stoddard solvent, which has been dyed purple, until 92-94% of the stated usable capacity is reached. Operate the engine to assure the Stoddard solvent is present throughout the entire fuel system.

TEST VEHICLE IMPACT TYPE: X Side Impact MDB 33.1 mph (53.3 kph)

FUEL SPILLAGE MEASUREMENT:

POST IMPACT TEST	TEST RESULTS	MAXIMUM ALLOWABLE
1. From impact until vehicle motion ceases	0	1 oz
2. For 5 minute period after vehicle motion ceases	0	5 oz
3. For next 25 minutes	0	1 oz./1 min

FUEL SPILLAGE LOCATION(S): None

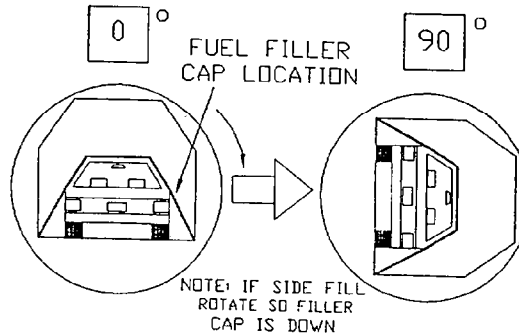
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 52 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 52 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

0° TO 90° ROTATION (FILLER CAP DOWN)	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0 oz	5 oz
2. Sixth Minute From Onset of Rotation	0 oz	1 oz
3. Seventh Minute From Onset of Rotation	0 oz	1 oz
4. Eighth Minute if Required	N/R	1 oz

FUEL SPILLAGE LOCATIONS(S): None

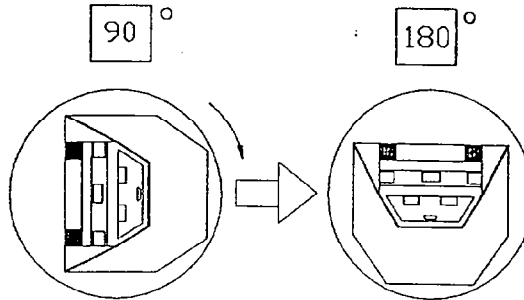
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 20 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 20 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0 oz	5 oz
2. Sixth Minute From Onset of Rotation	0 oz	1 oz
3. Seventh Minute From Onset of Rotation	0 oz	1 oz
4. Eighth Minute if Required	N/R	1 oz

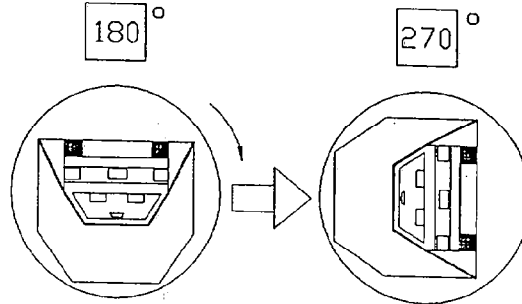
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door
 Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 23 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 23 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

180° TO 270° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0 oz	5 oz
2. Sixth Minute From Onset of Rotation	0 oz	1 oz
3. Seventh Minute From Onset of Rotation	0 oz	1 oz
4. Eighth Minute if Required	N/R	1 oz

FUEL SPILLAGE LOCATIONS(S): None

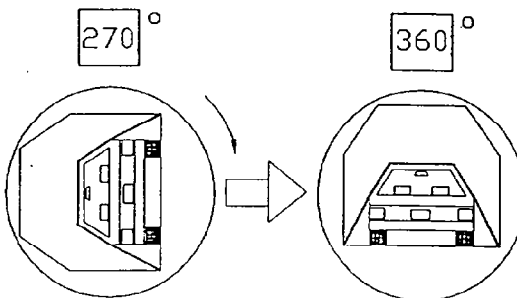
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1996/Subaru/Impreza/2 Door

Vehicle NHTSA No.: CT5501 Test Date: January 11, 1996

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 44 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 44 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

270° TO 360° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0 oz	5 oz
2. Sixth Minute From Onset of Rotation	0 oz	1 oz
3. Seventh Minute From Onset of Rotation	0 oz	1 oz
4. Eighth Minute if Required	N/R	1 oz

FUEL SPILLAGE LOCATIONS(S): None

APPENDIX A - PHOTOGRAPHS

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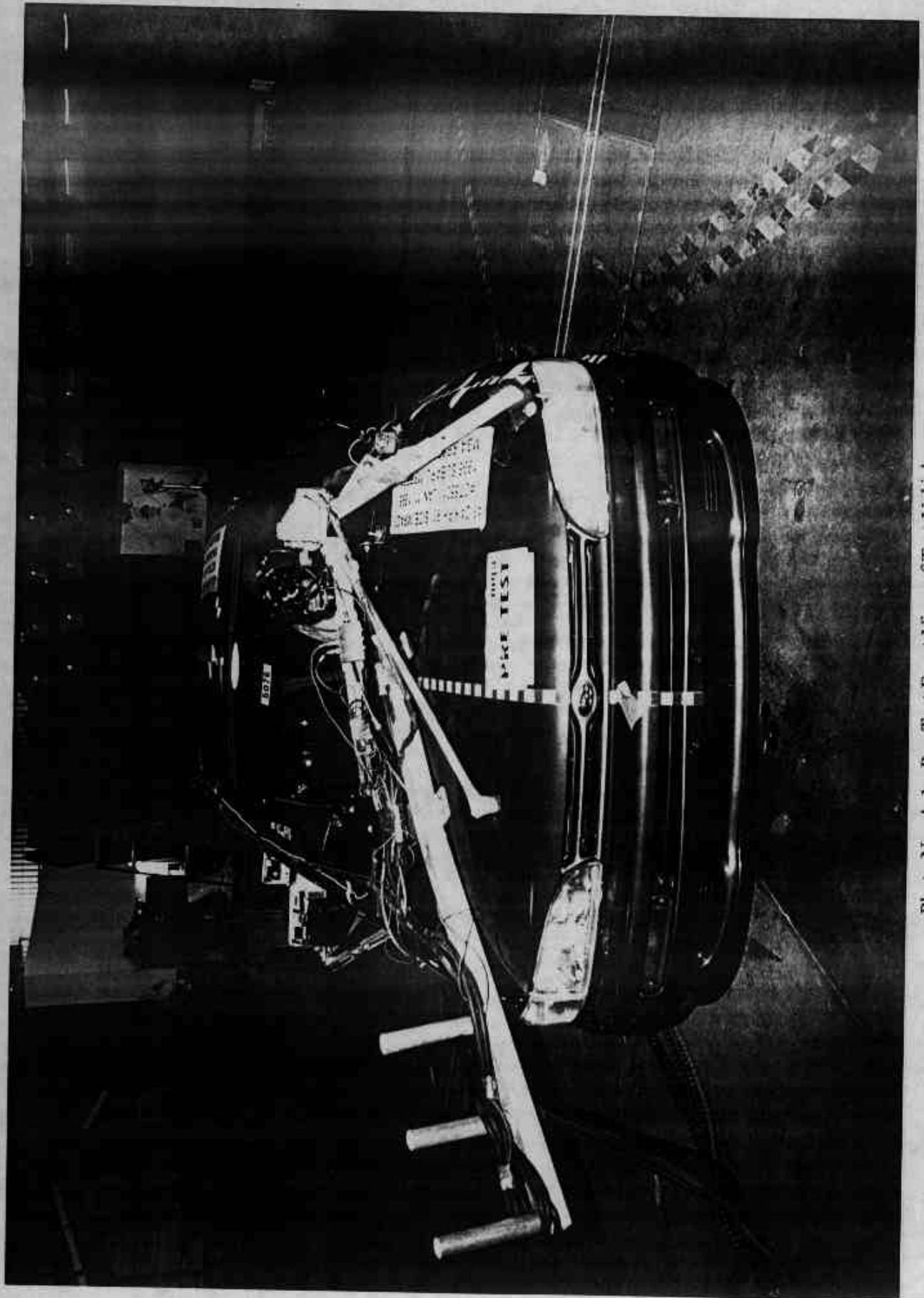


Photo No. A-1 - Pre-Test Front View of Test Vehicle

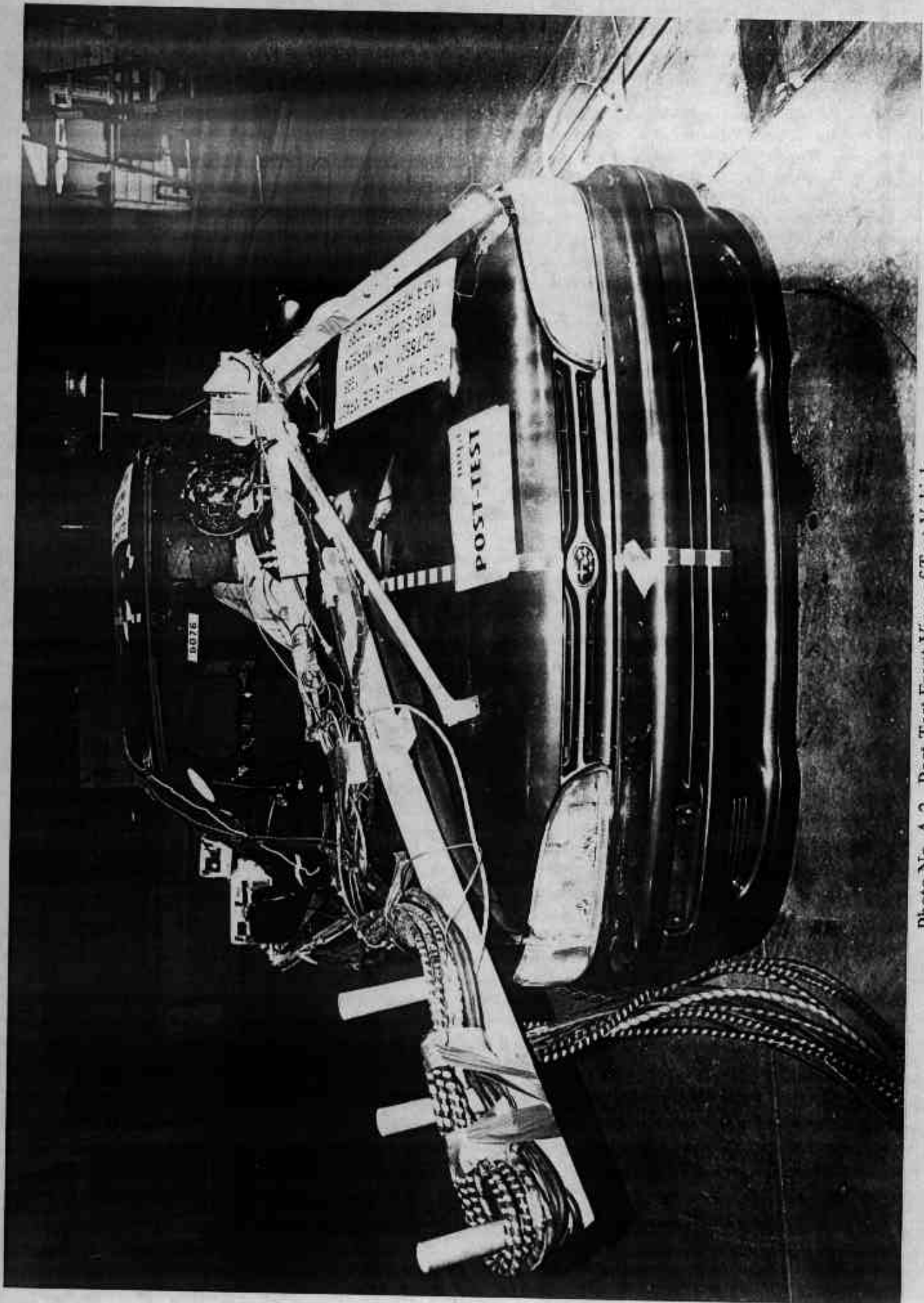


Photo No. A-2 - Post-Test Front View of Test Vehicle

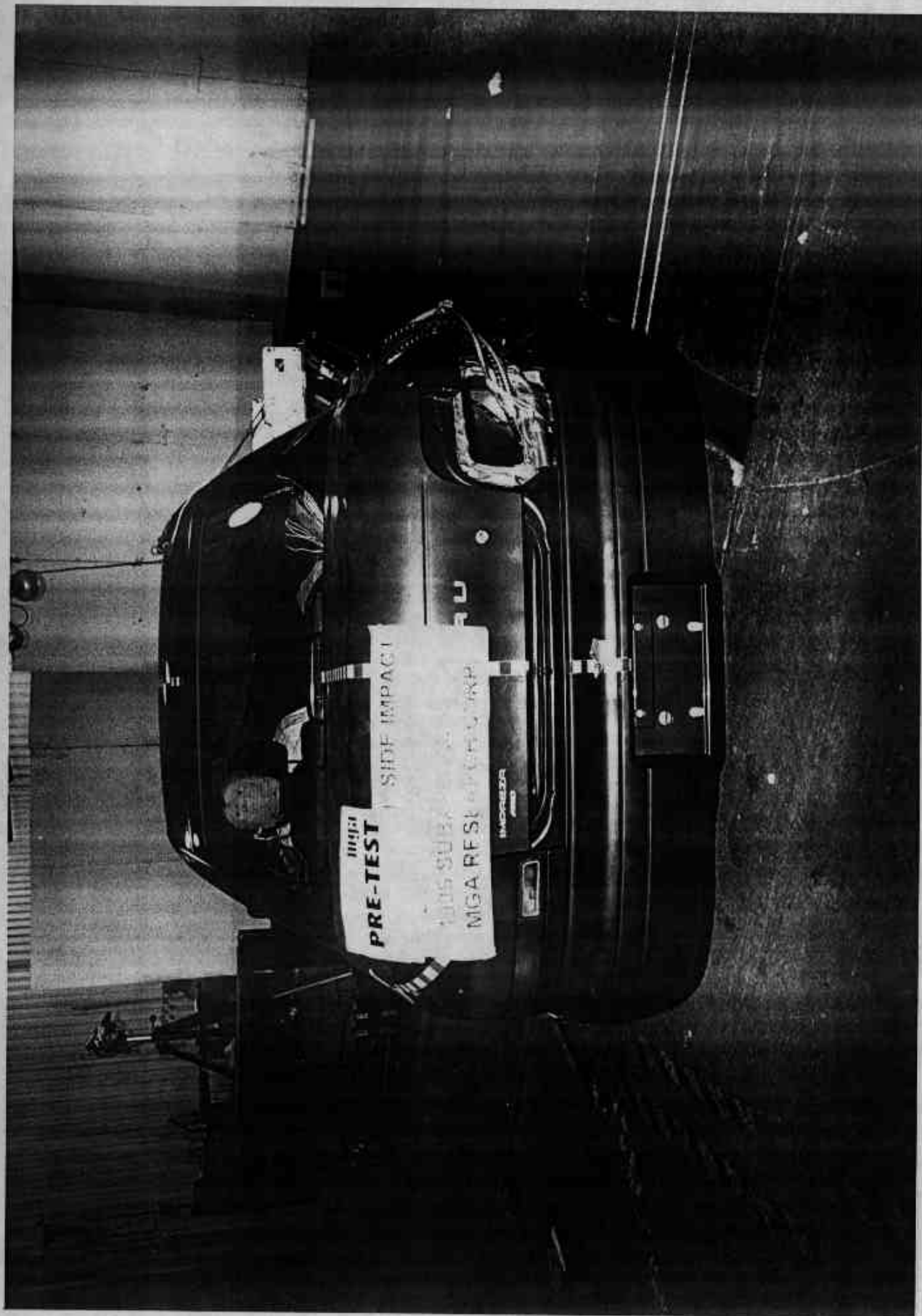


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

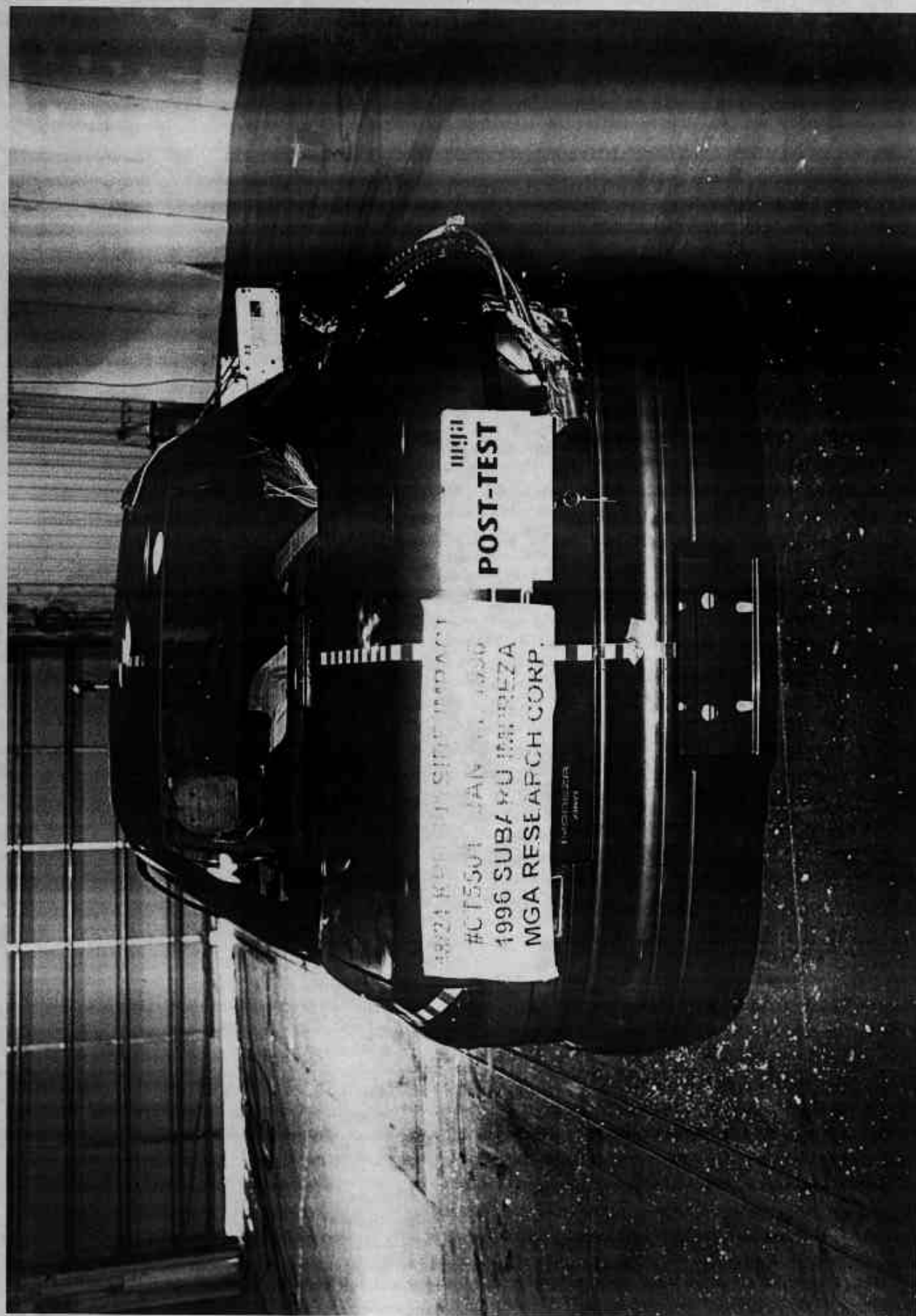


Photo No. A-4 - Post-Test Rear View of Test Vehicle

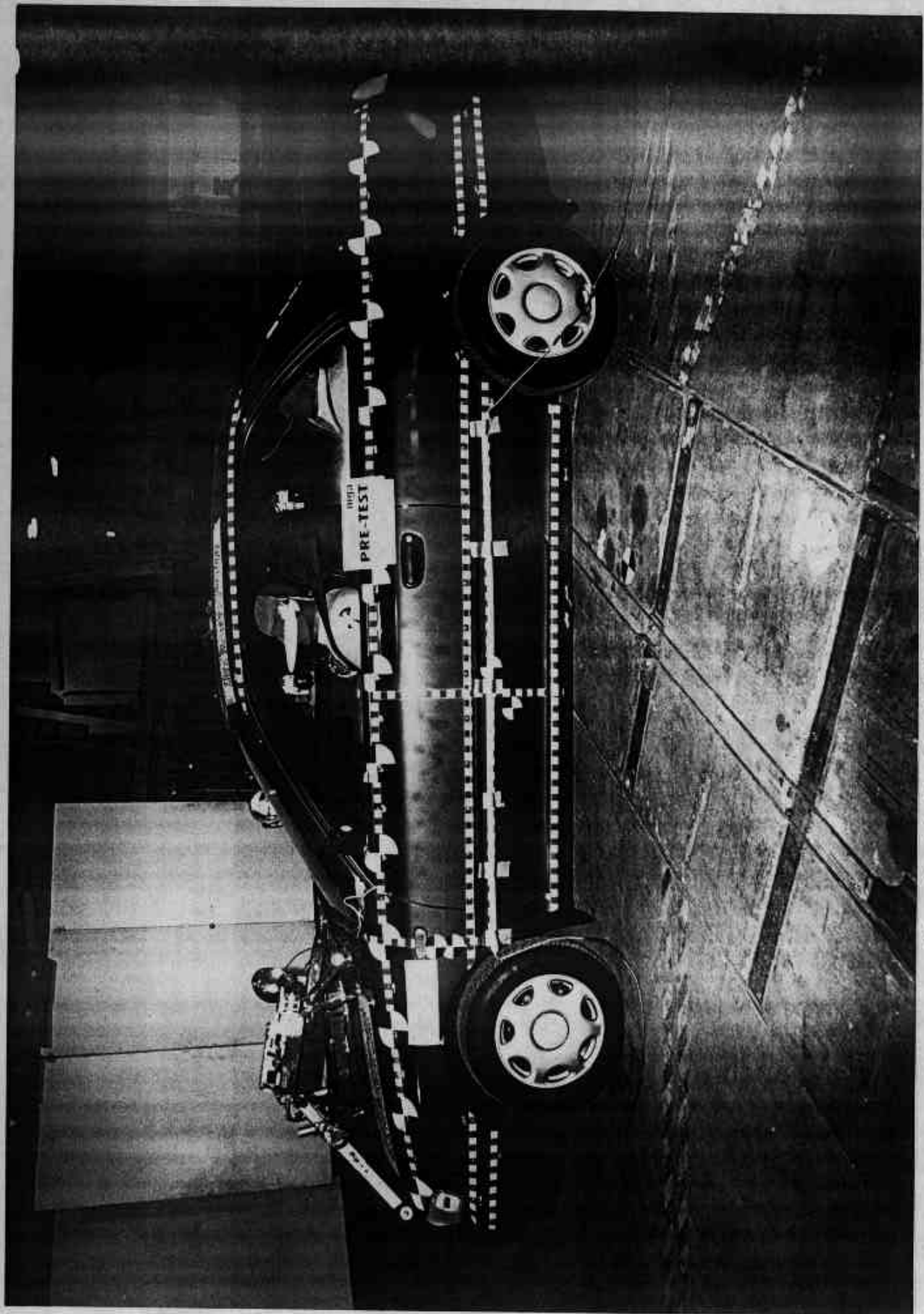


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

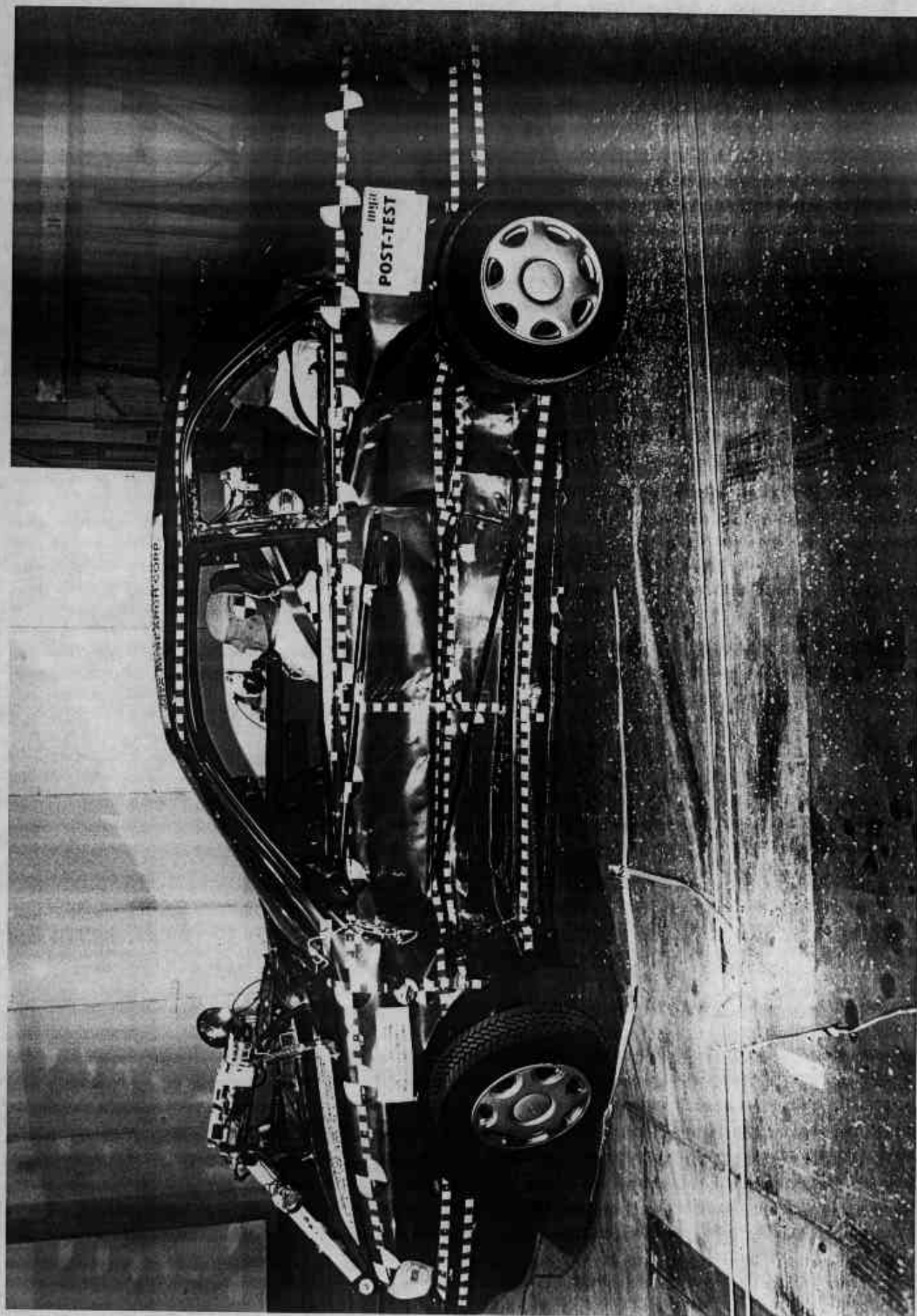


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

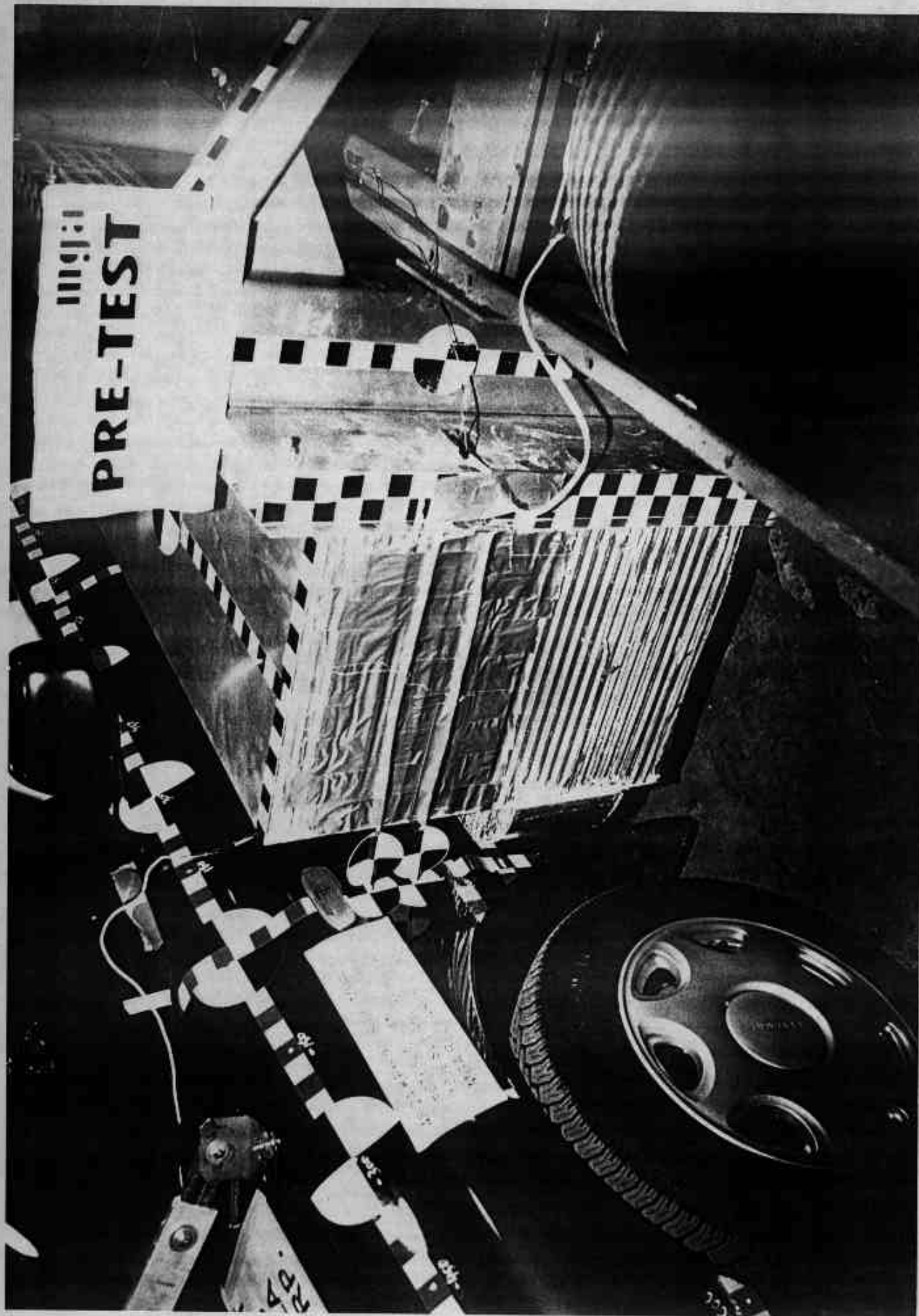


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

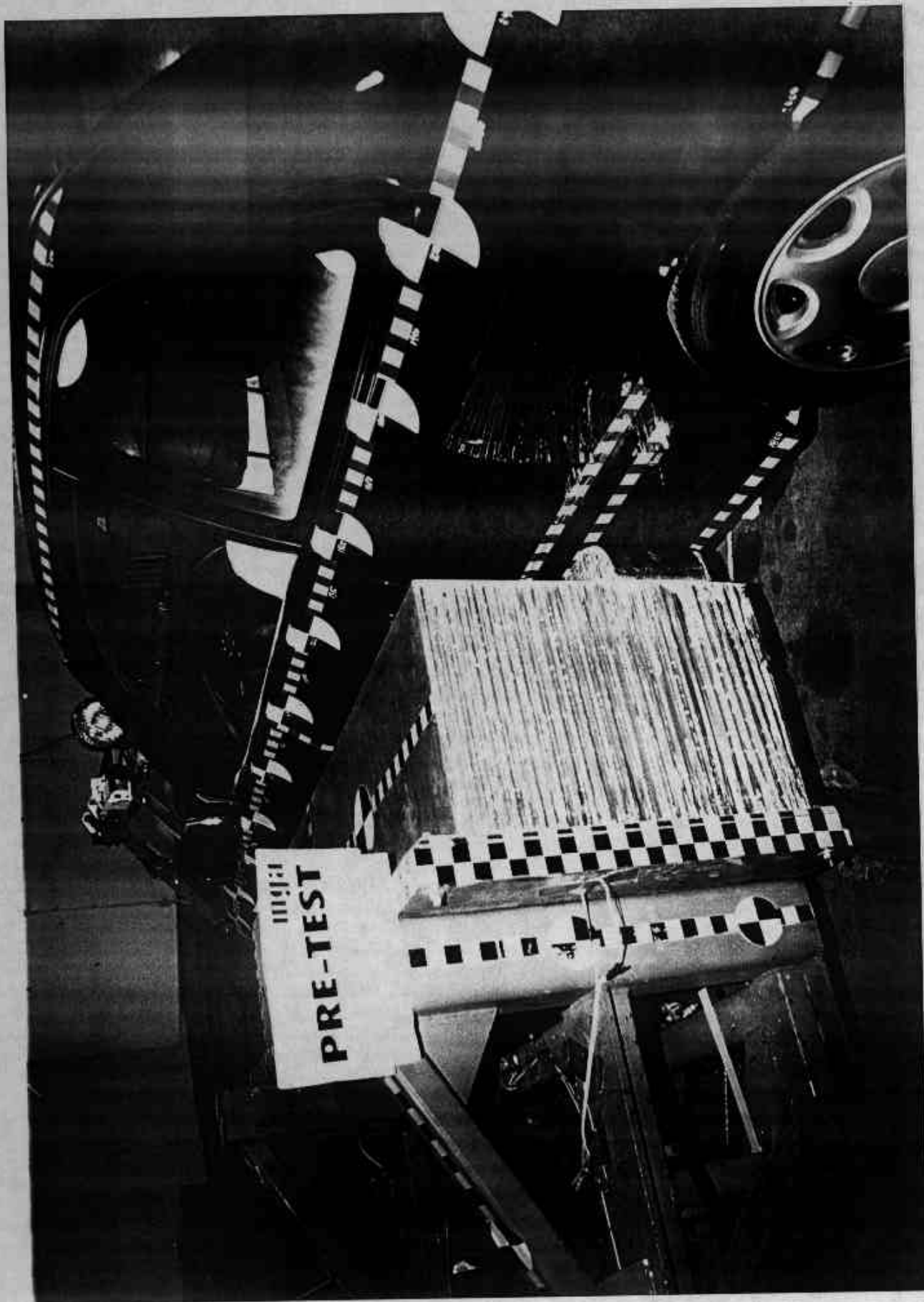


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

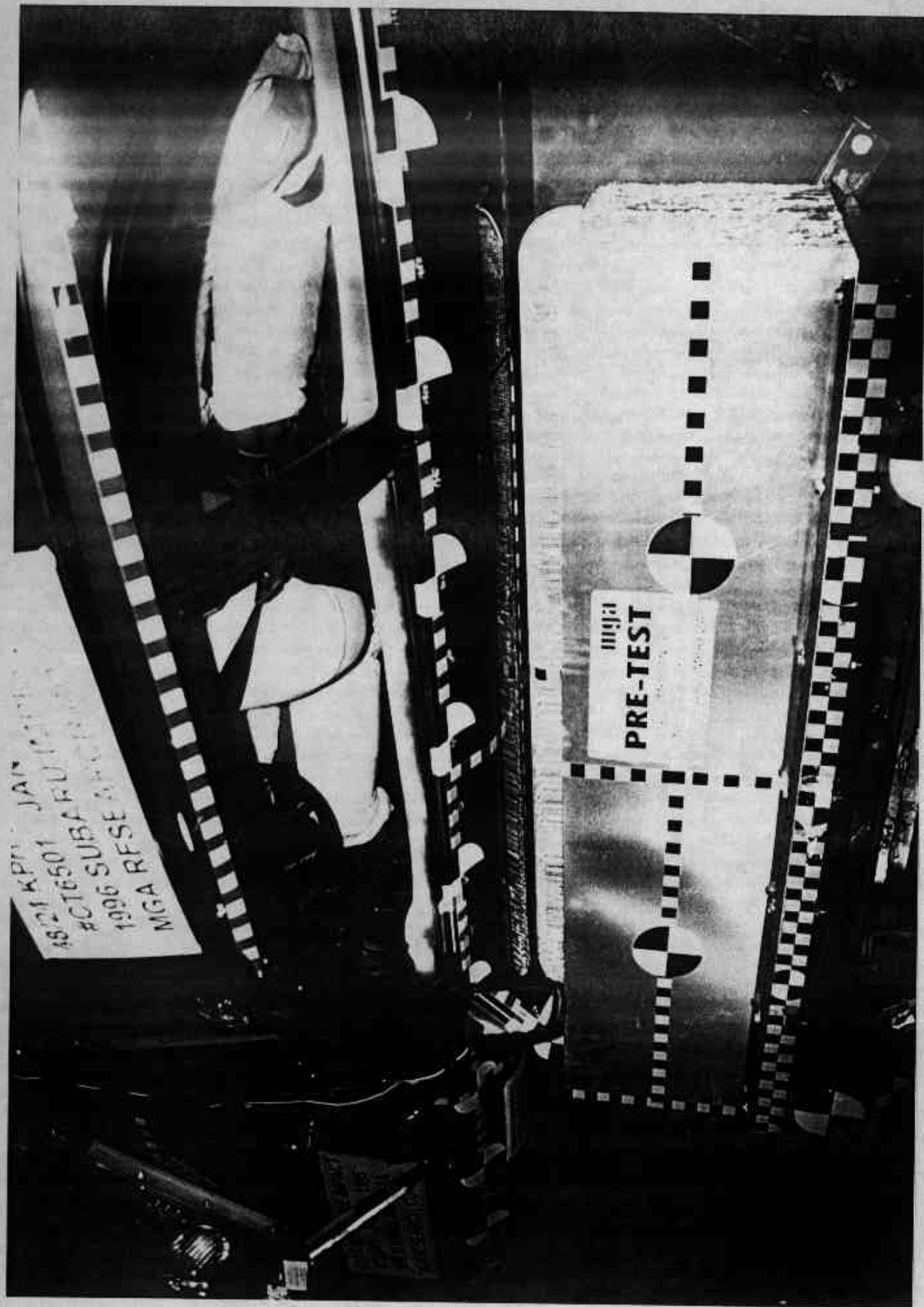


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

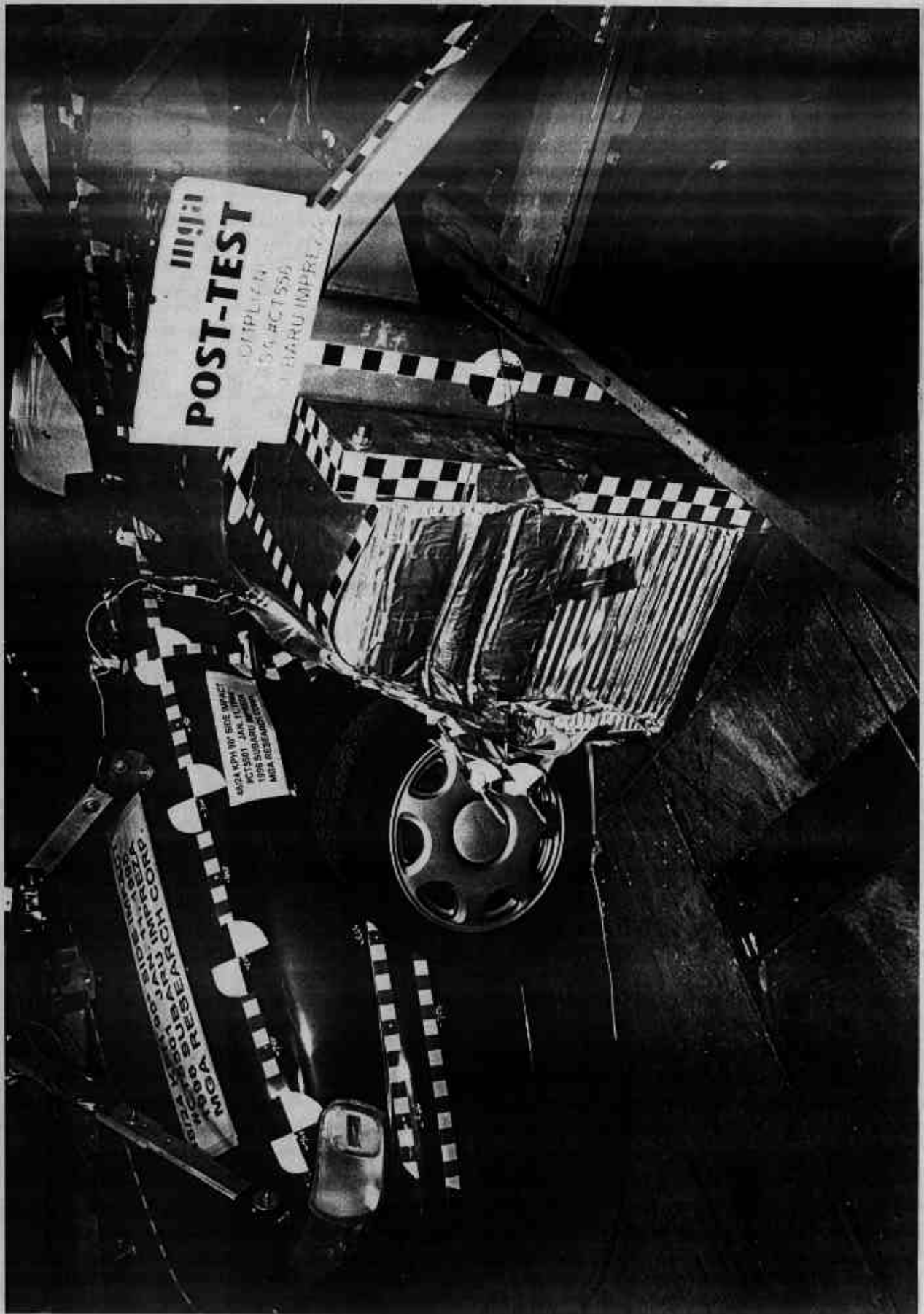


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (left side)

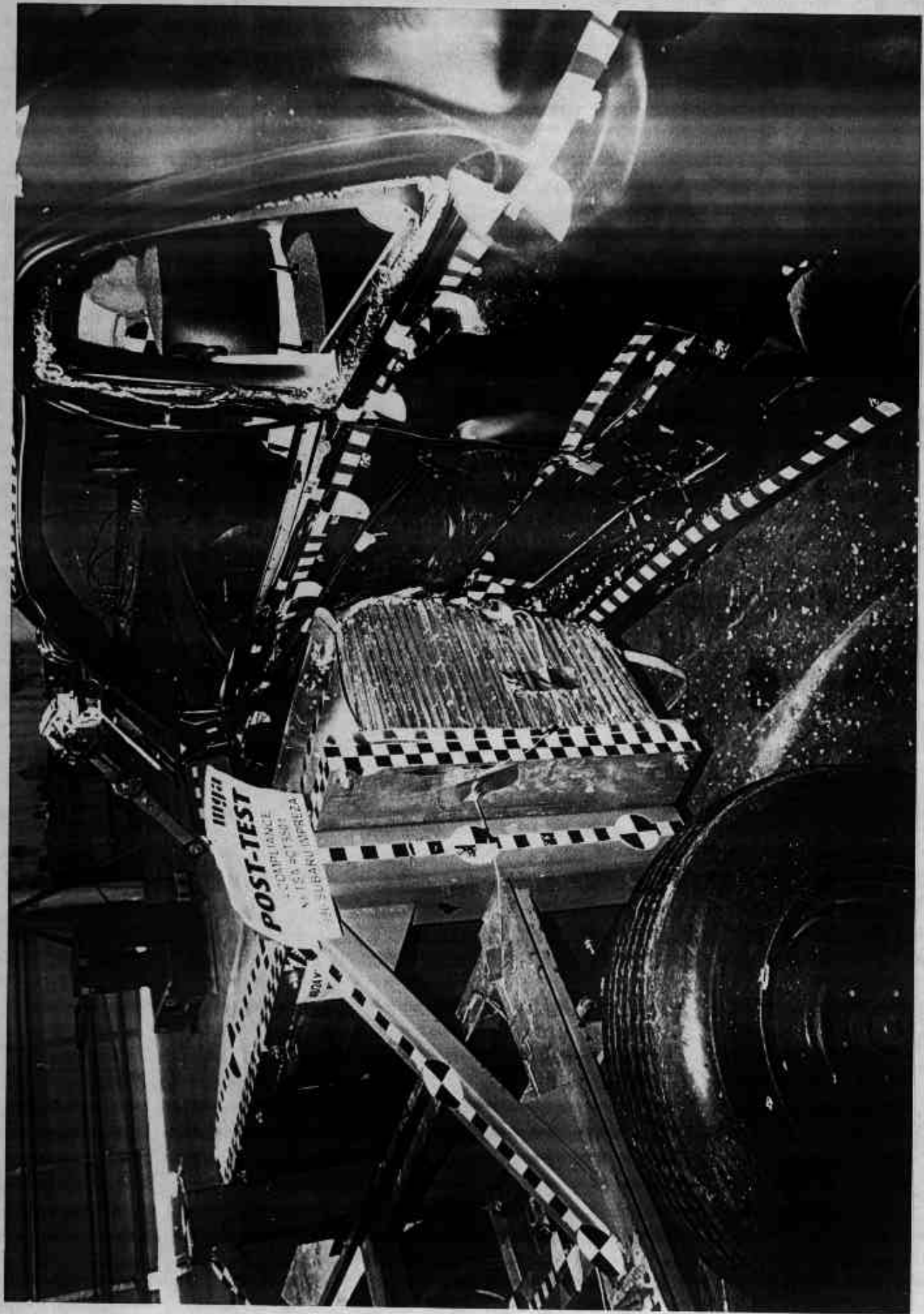


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (right side)

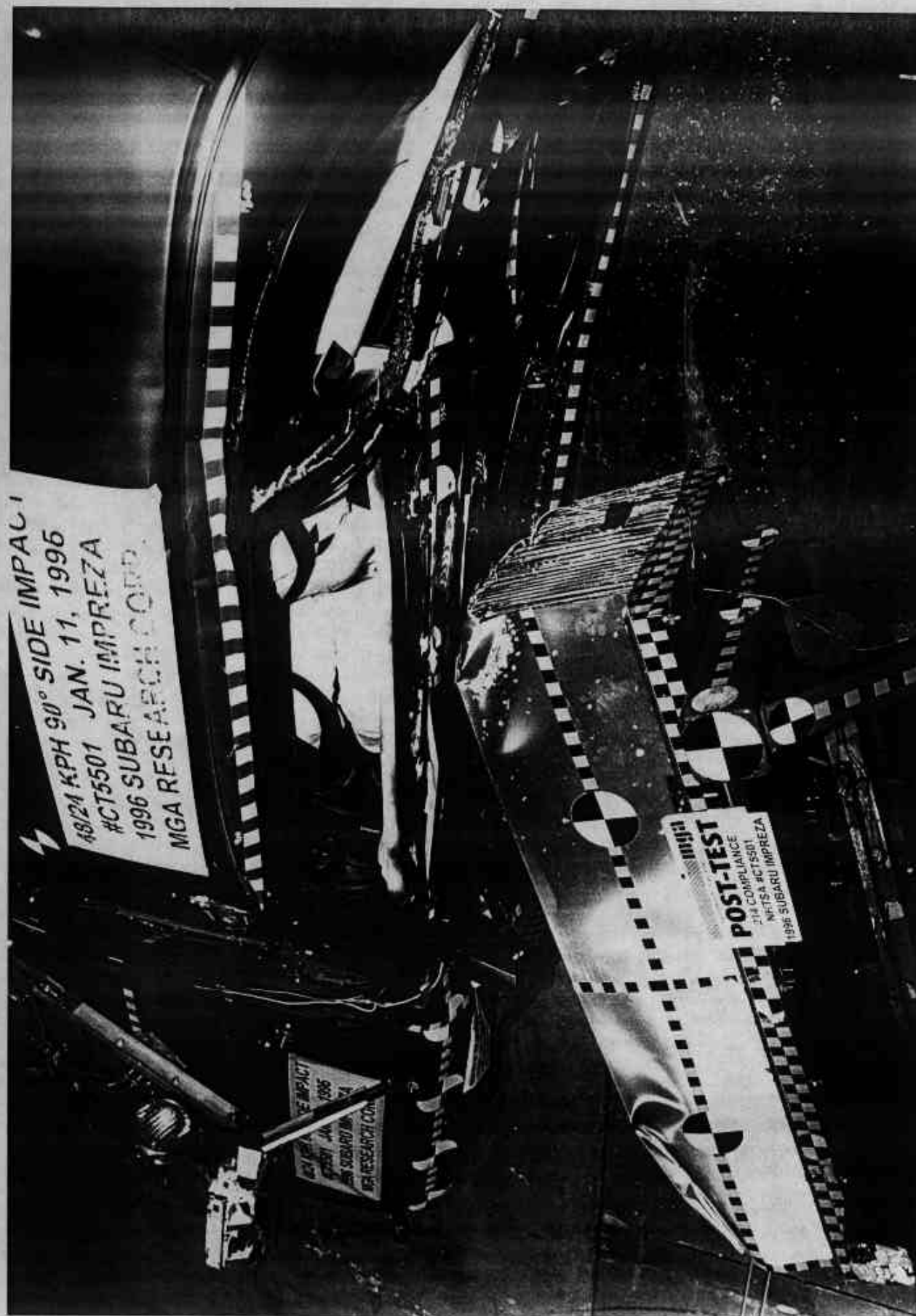


Photo No. A-12 - Post-Test MDB Positioned Against Vehicle Overhead View

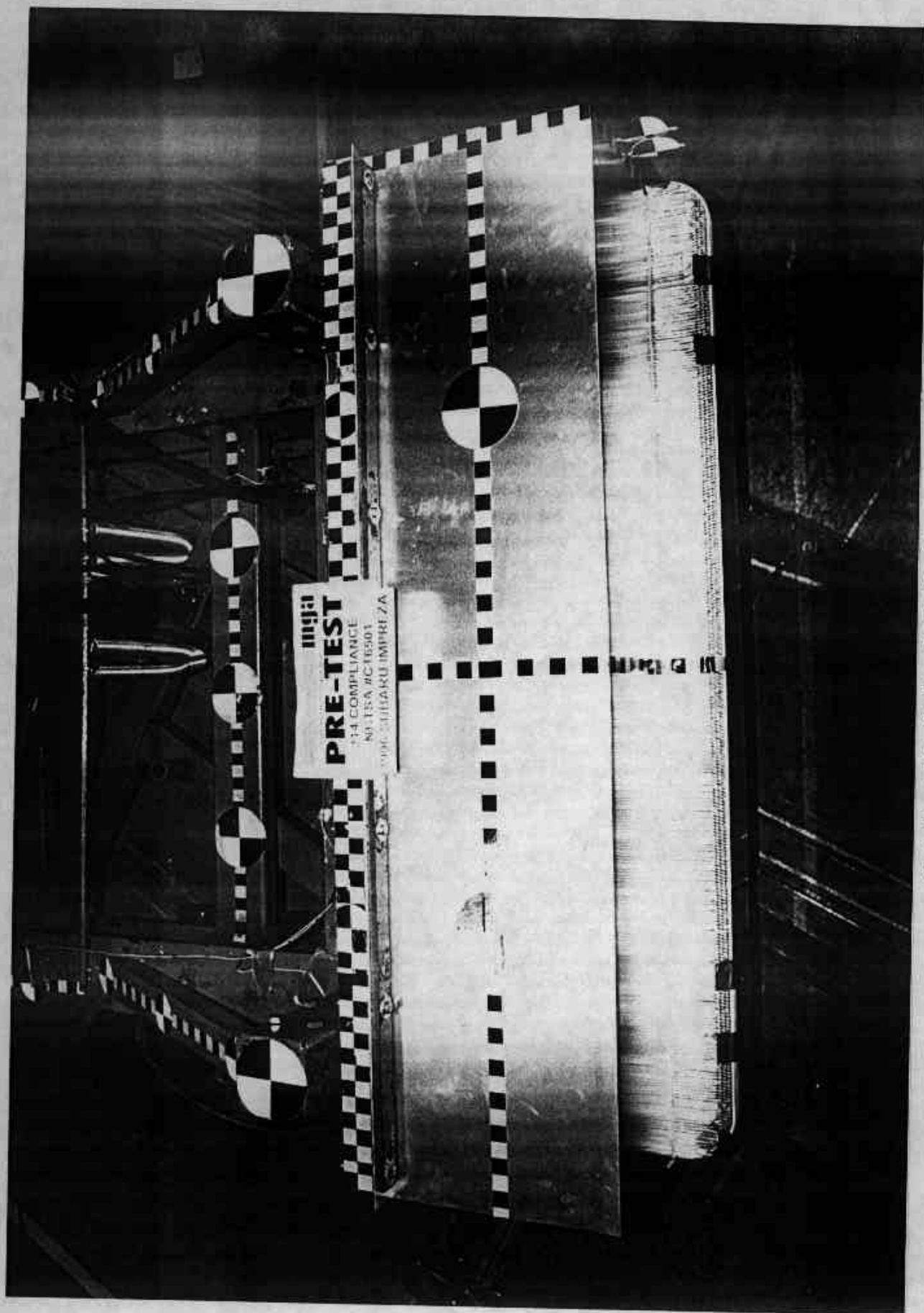


Photo No. A-13 - Pre-Test MDB Top View

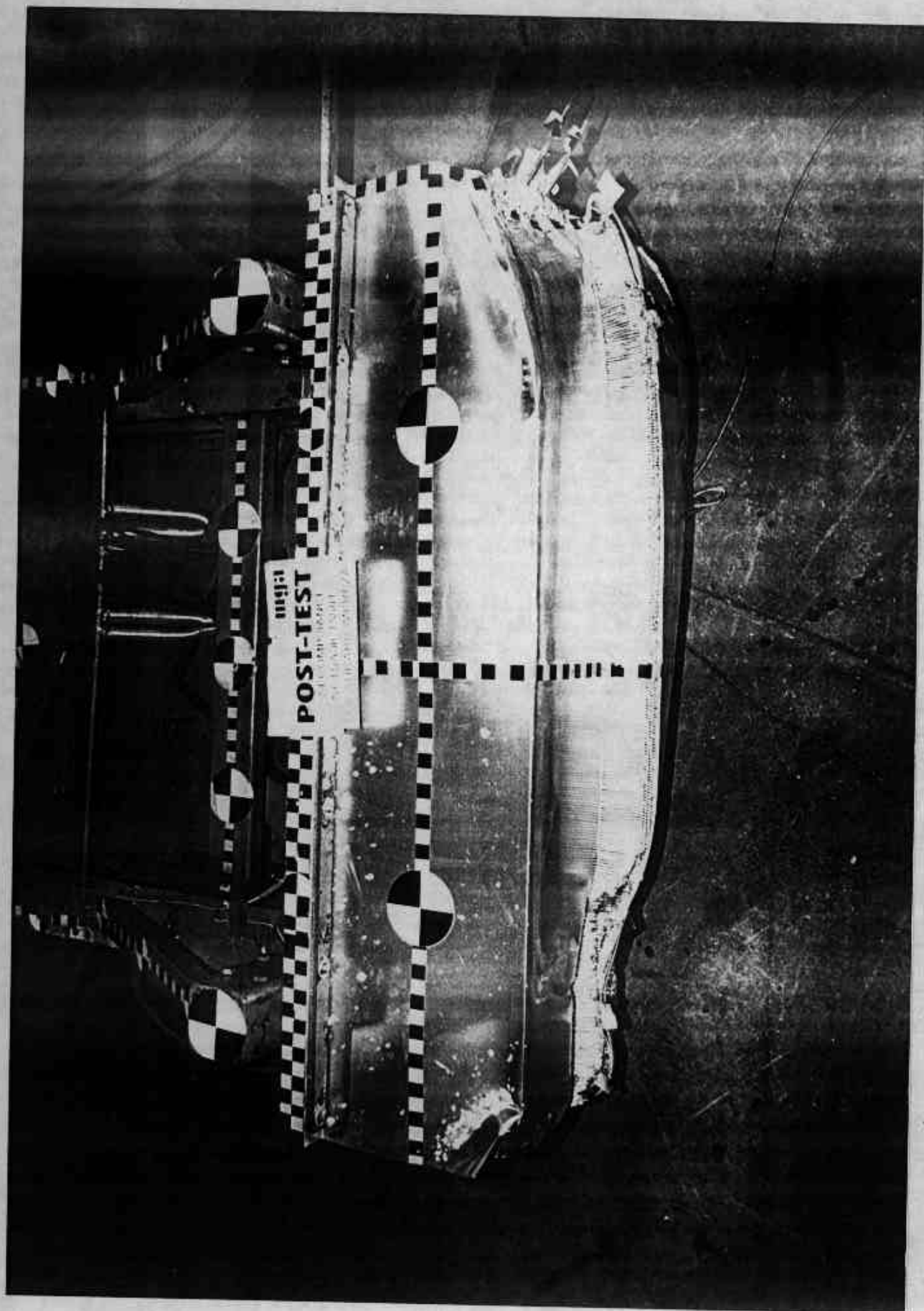


Photo No. A-14 - Post-Test MDB Top View

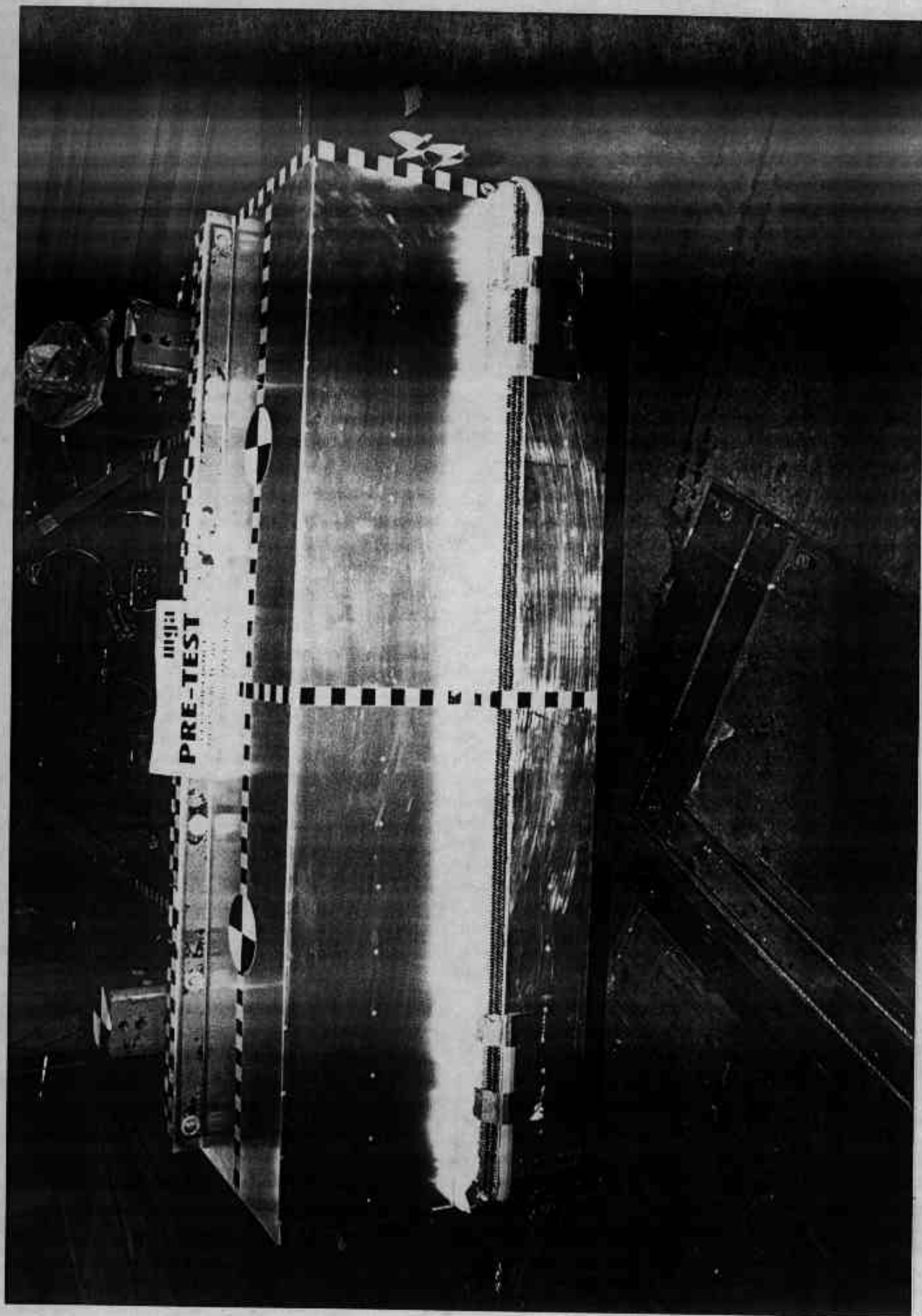


Photo No. A-15 - Pre-Test MDB Front View

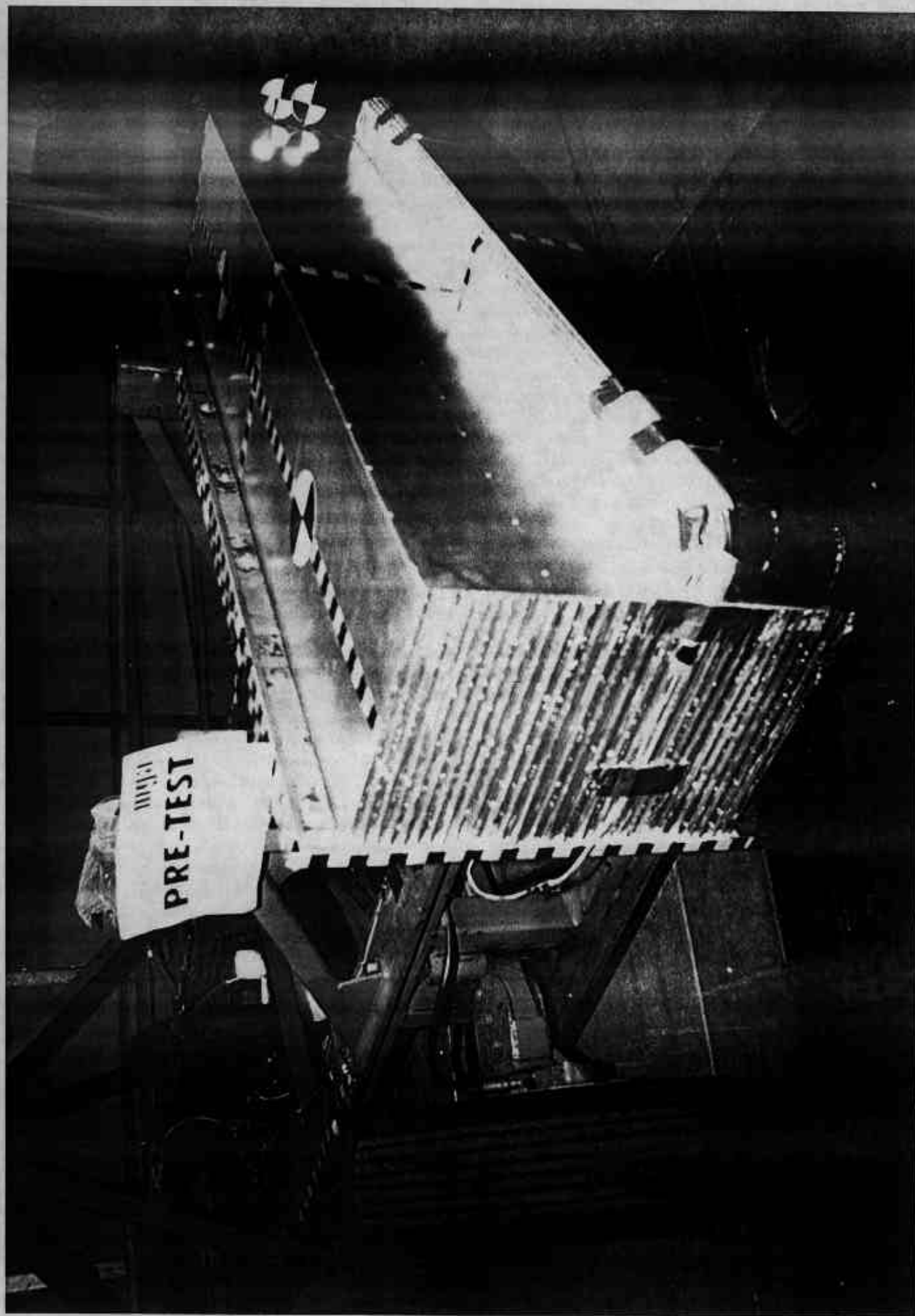


Photo No. A-17 - Pre-Test MDB Right Side View

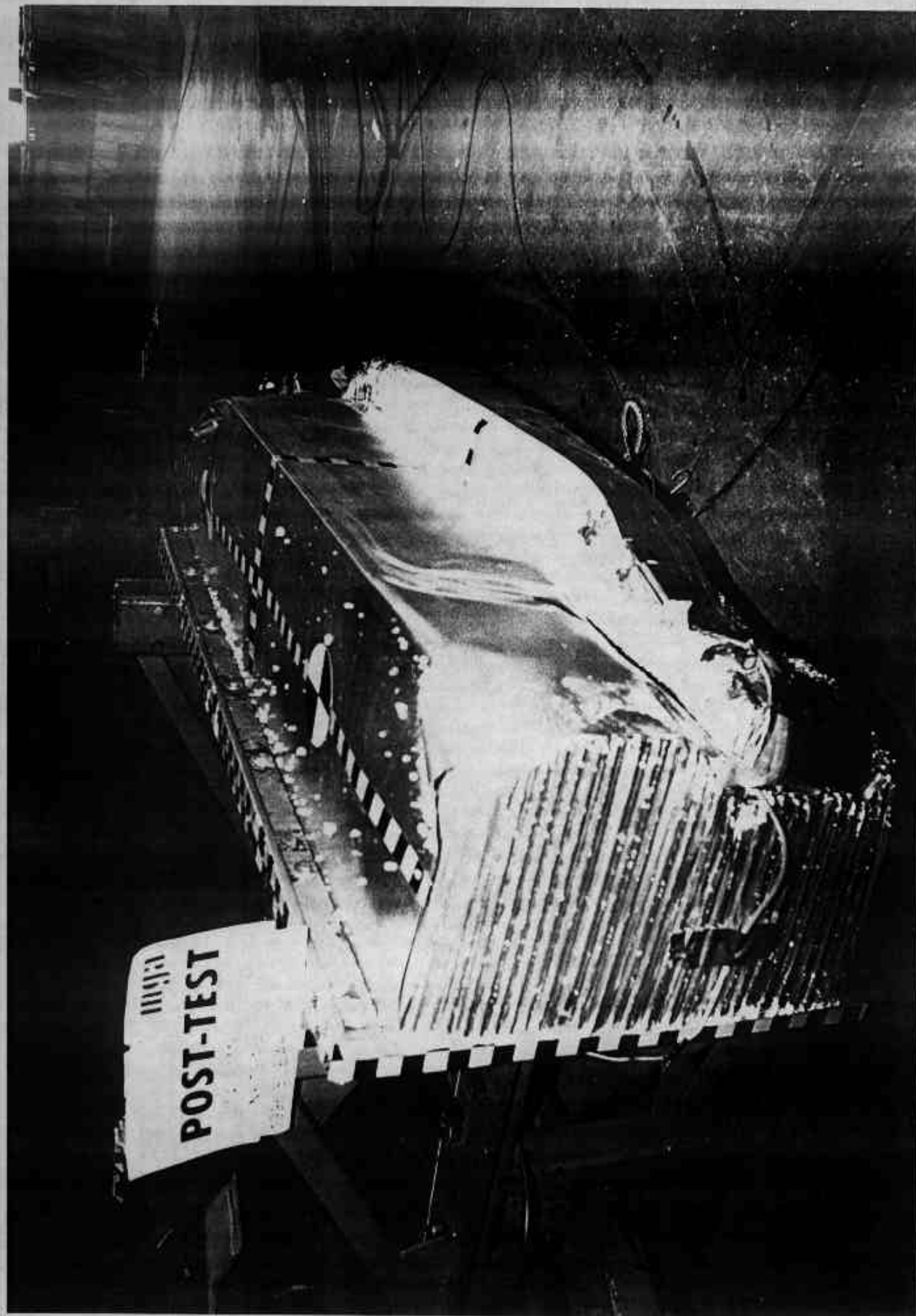


Photo No. A-18 - Post-Test MDB Right Side View

A-18

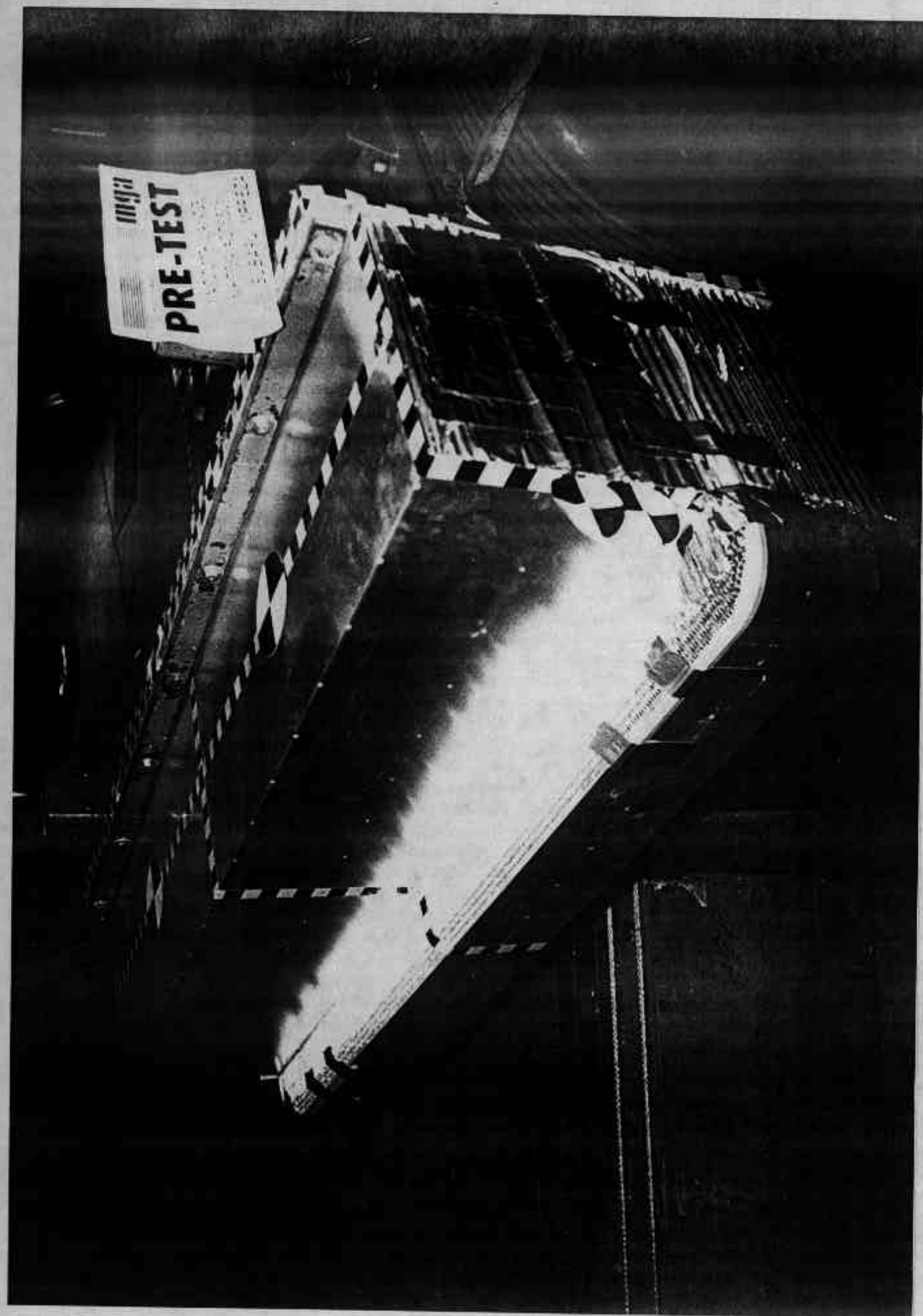


Photo No. A-19 - Pre-Test MDB Left Side View

A-19

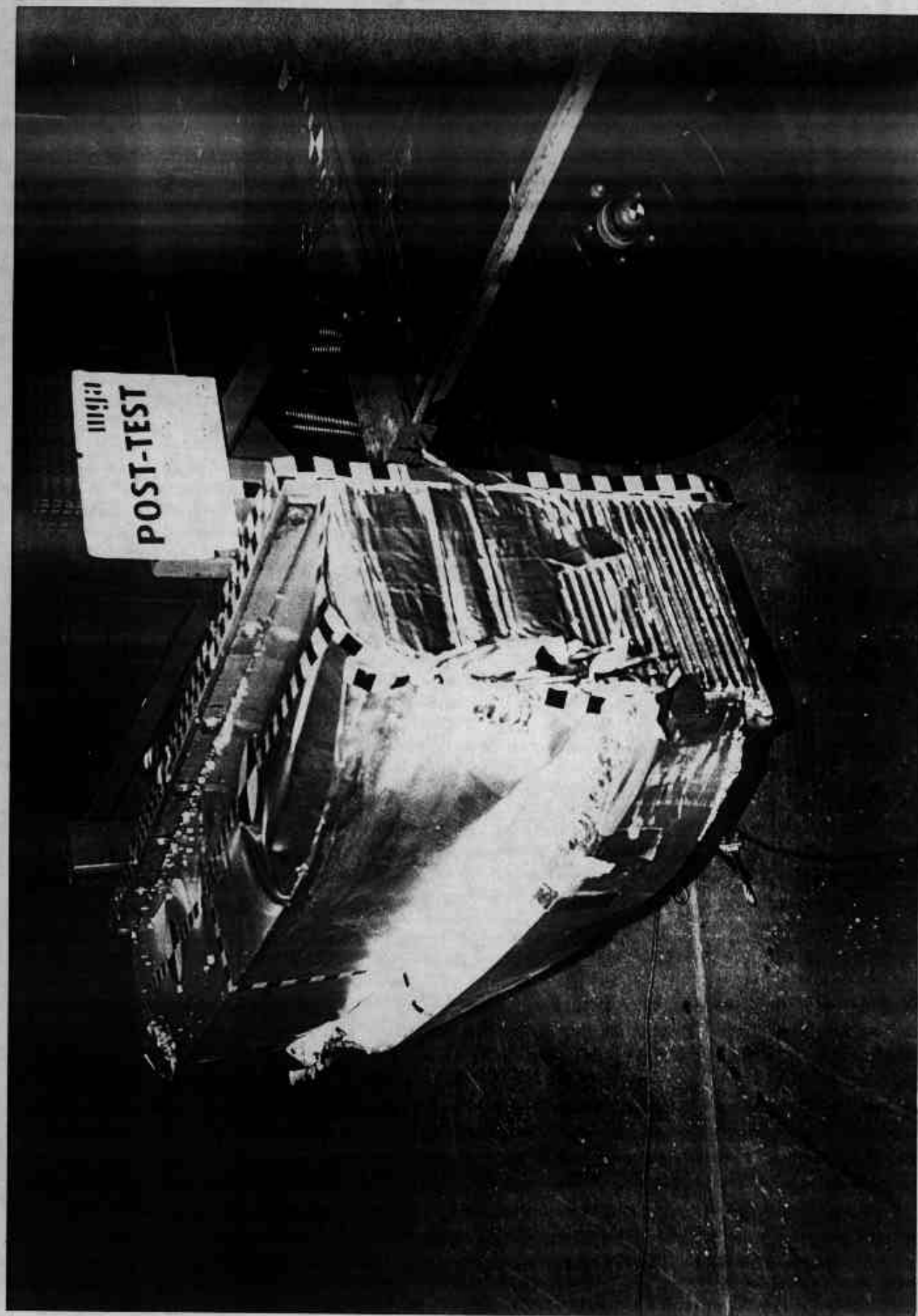


Photo No. A-20 - Post-Test MDB Left Side View

A-20



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

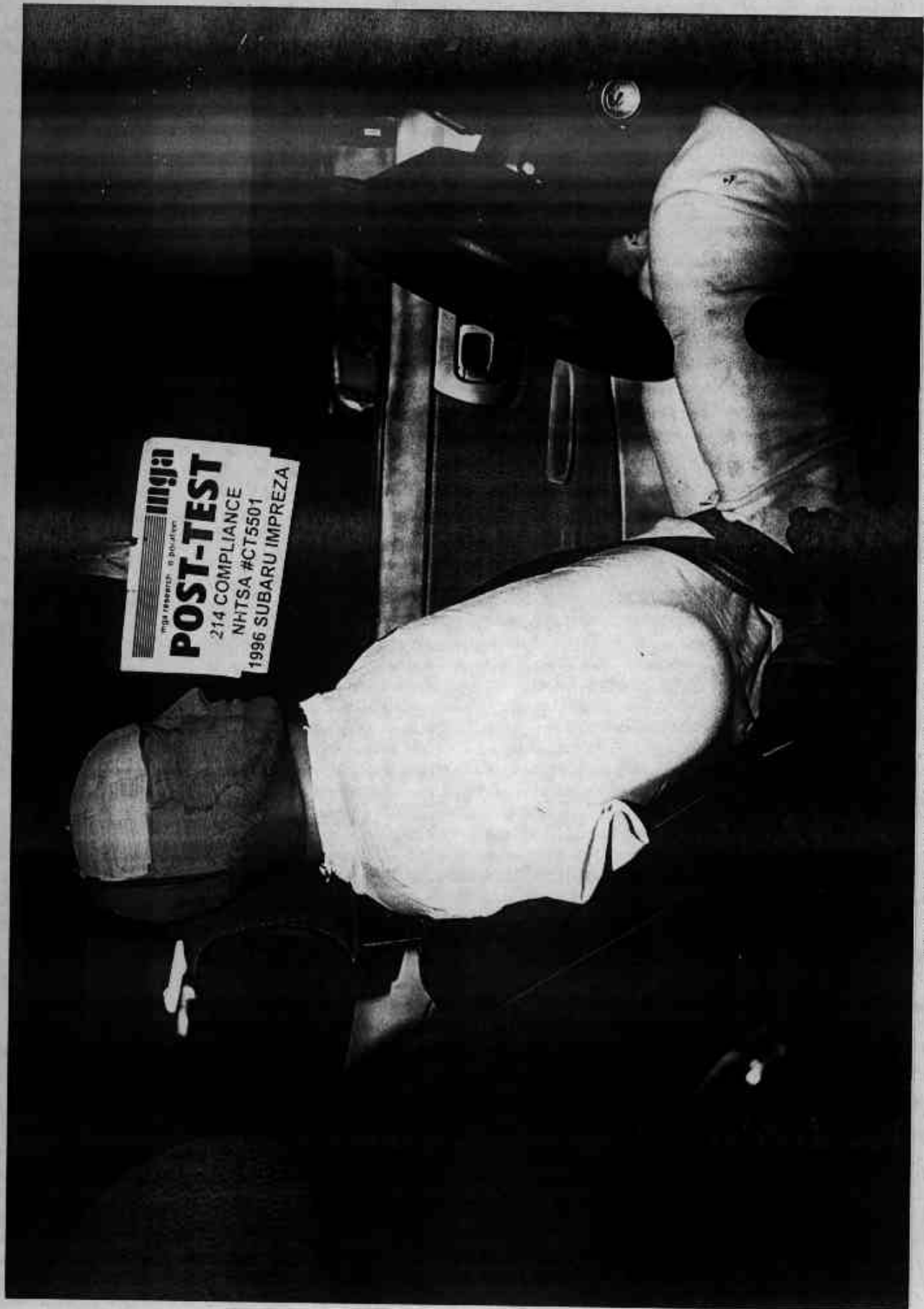


Photo No. A-22 - Post-Test Driver Dummy Right Side View

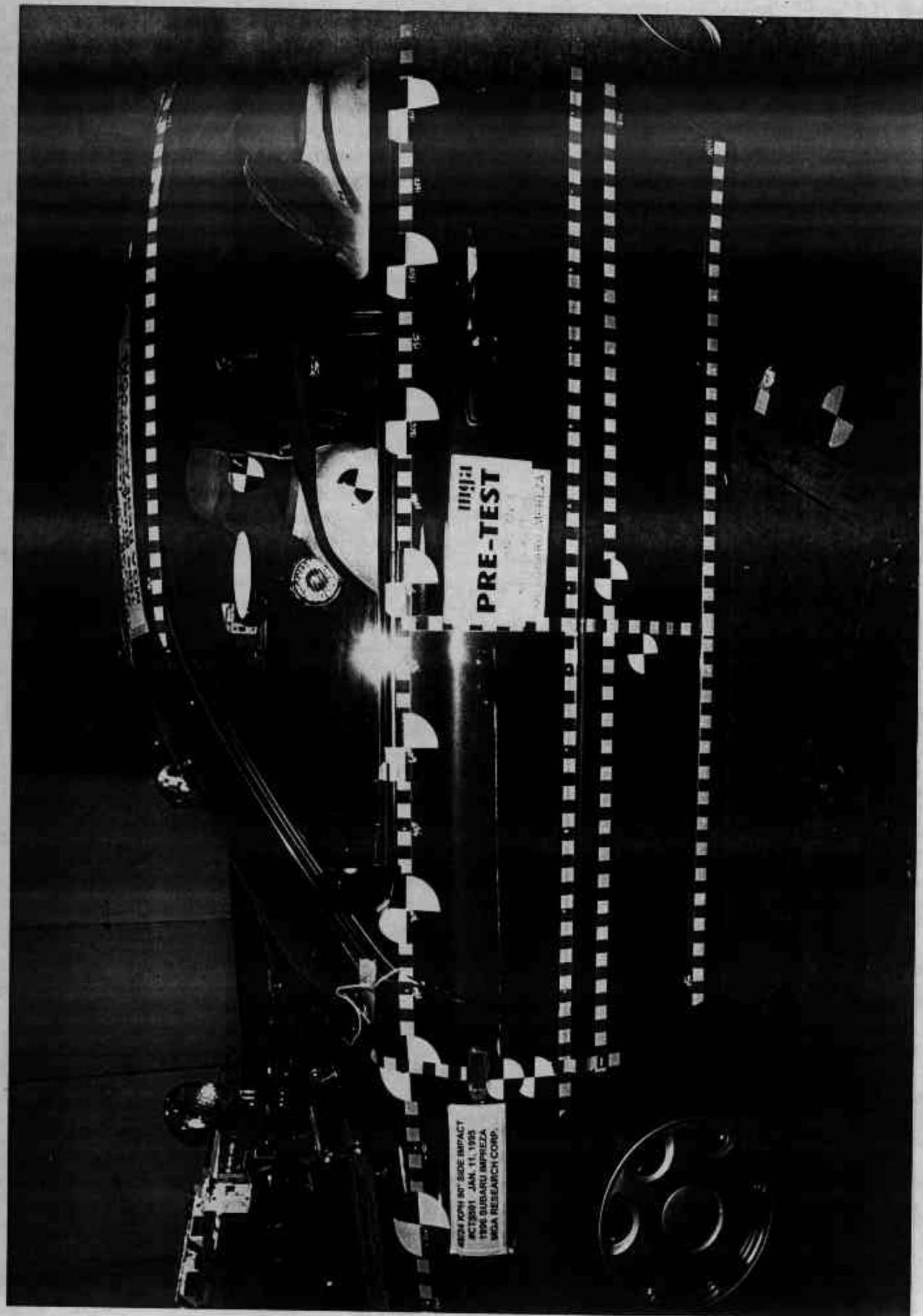


Photo No. A-23 - Pre-Test Driver Dummy Left Side View

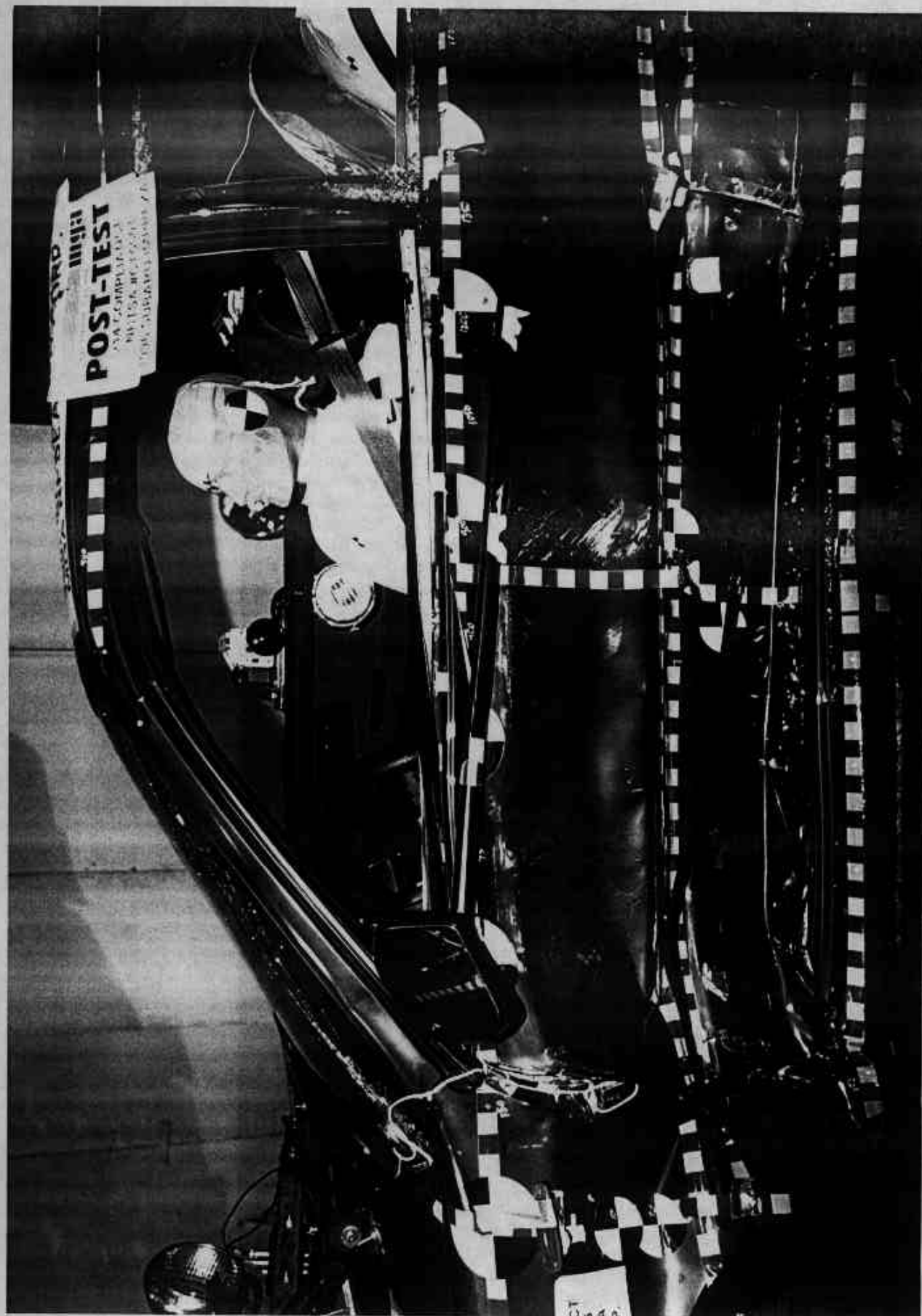


Photo No. A-24 - Post-Test Driver Dummy Left Side View

A-24

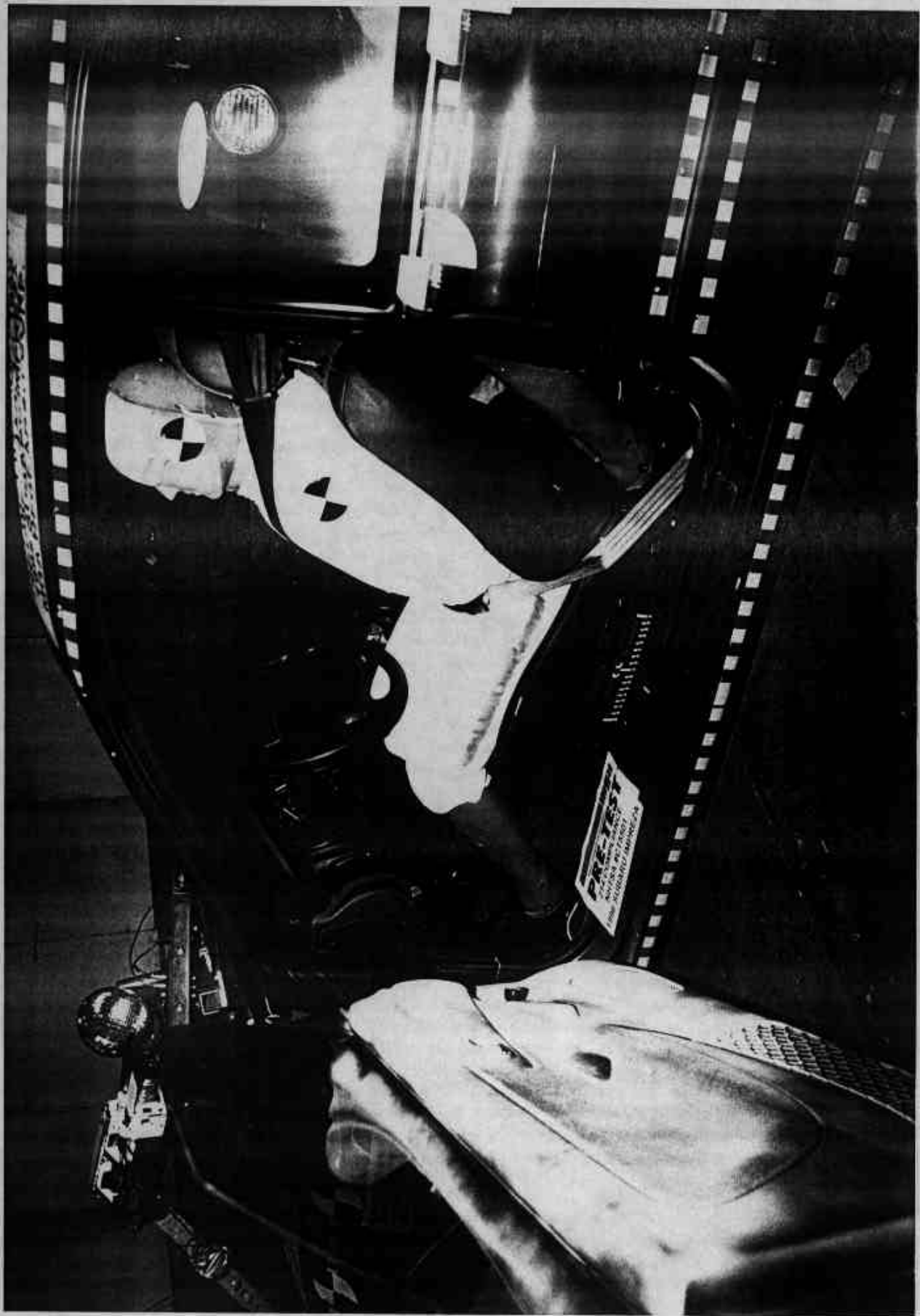


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)

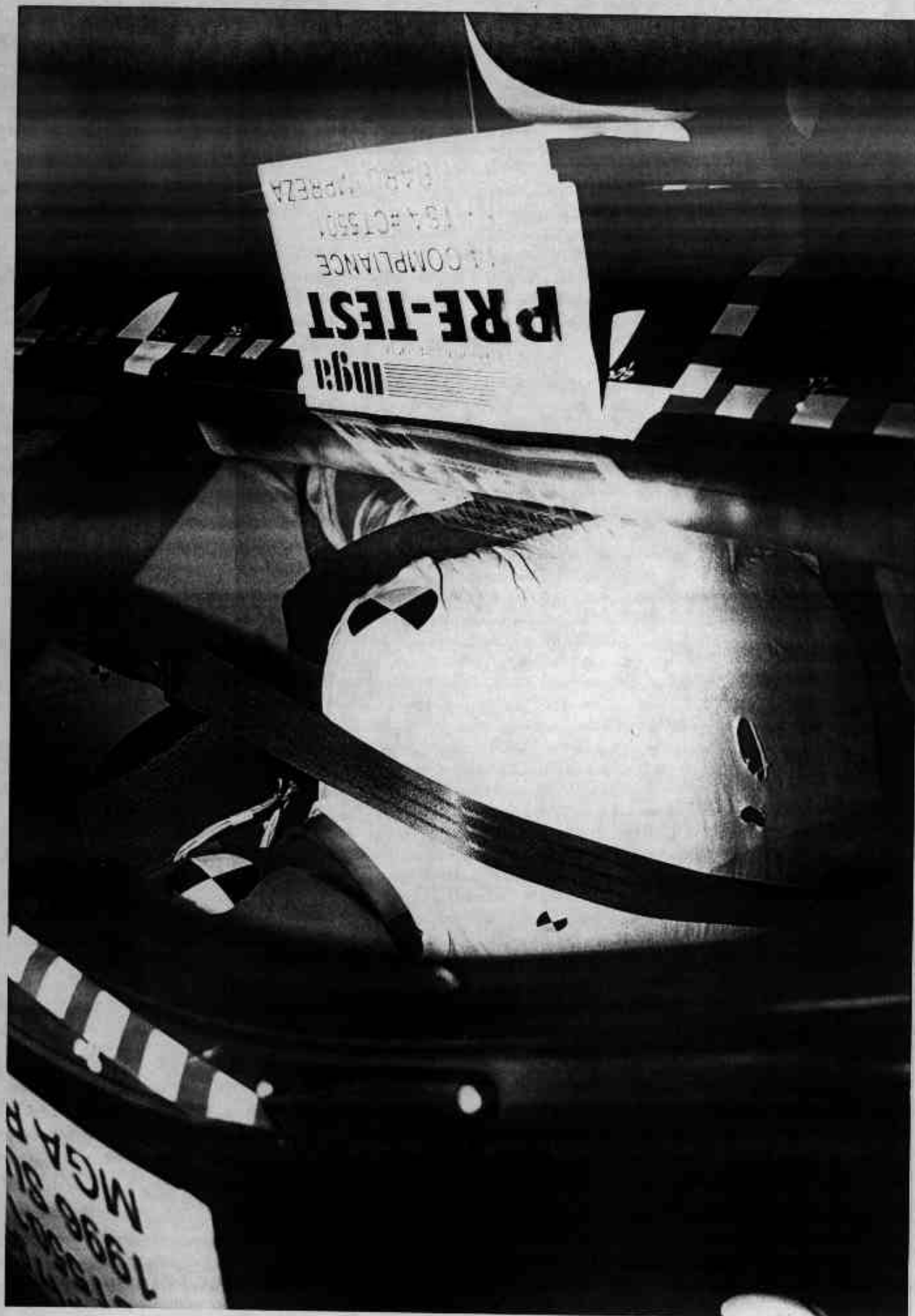


Photo No. A-26 - Pre-Test Driver Dummy Shoulder and Door Top View



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



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

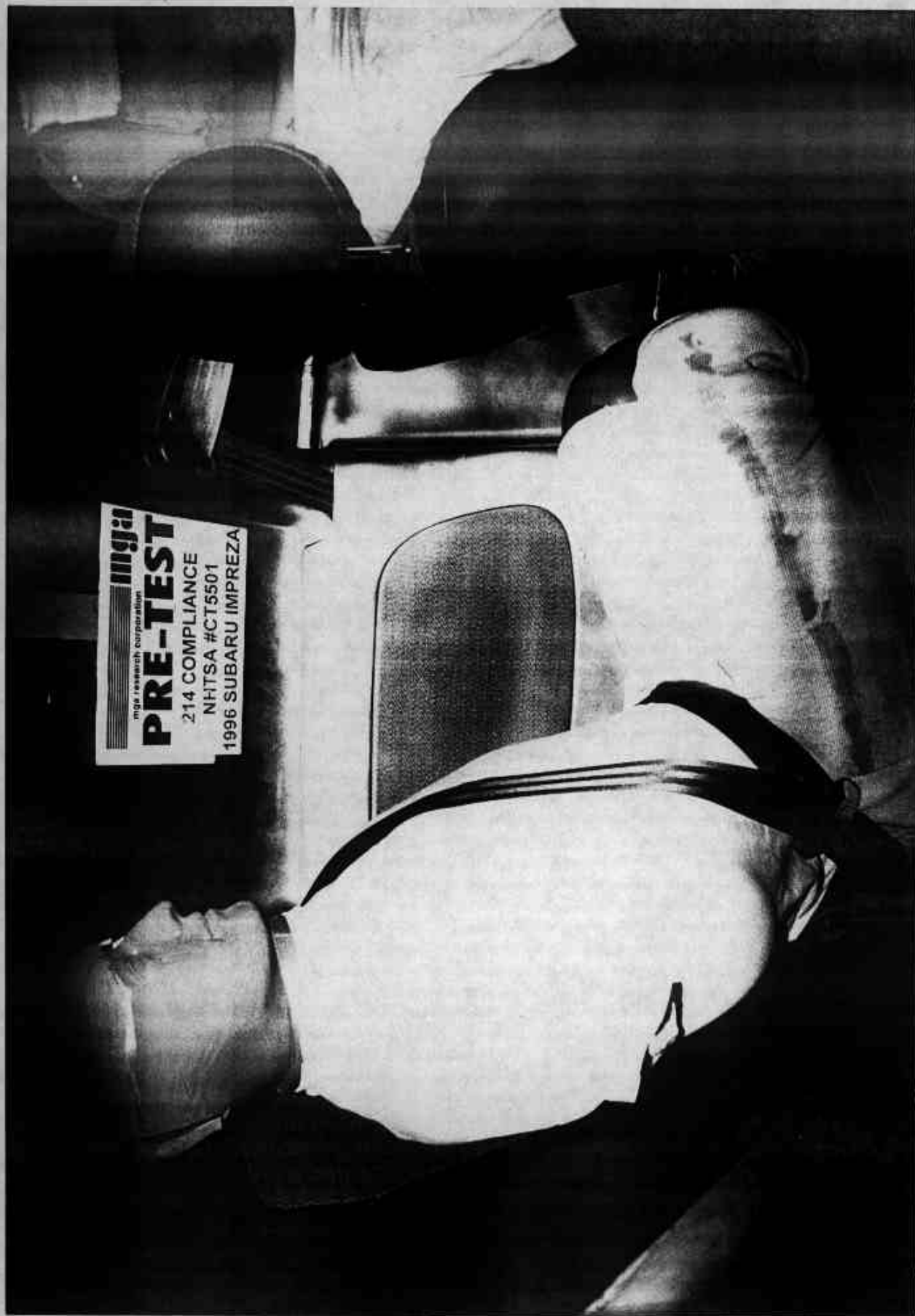


Photo No. A-29 - Pre-Test Passenger Dummy Right Side View



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

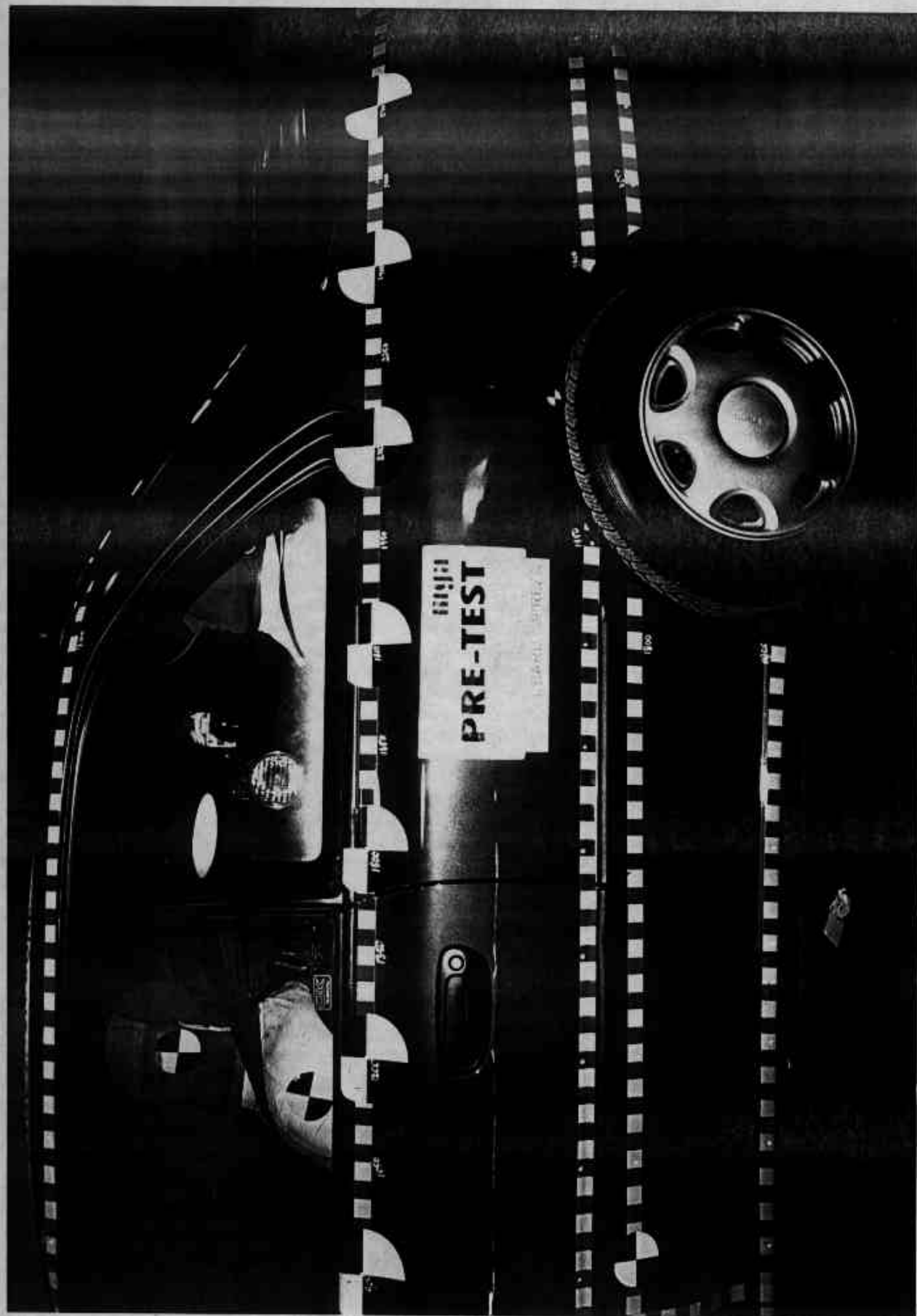


Photo No. A-31 - Pre-Test Passenger Dummy Left Side View

A-31

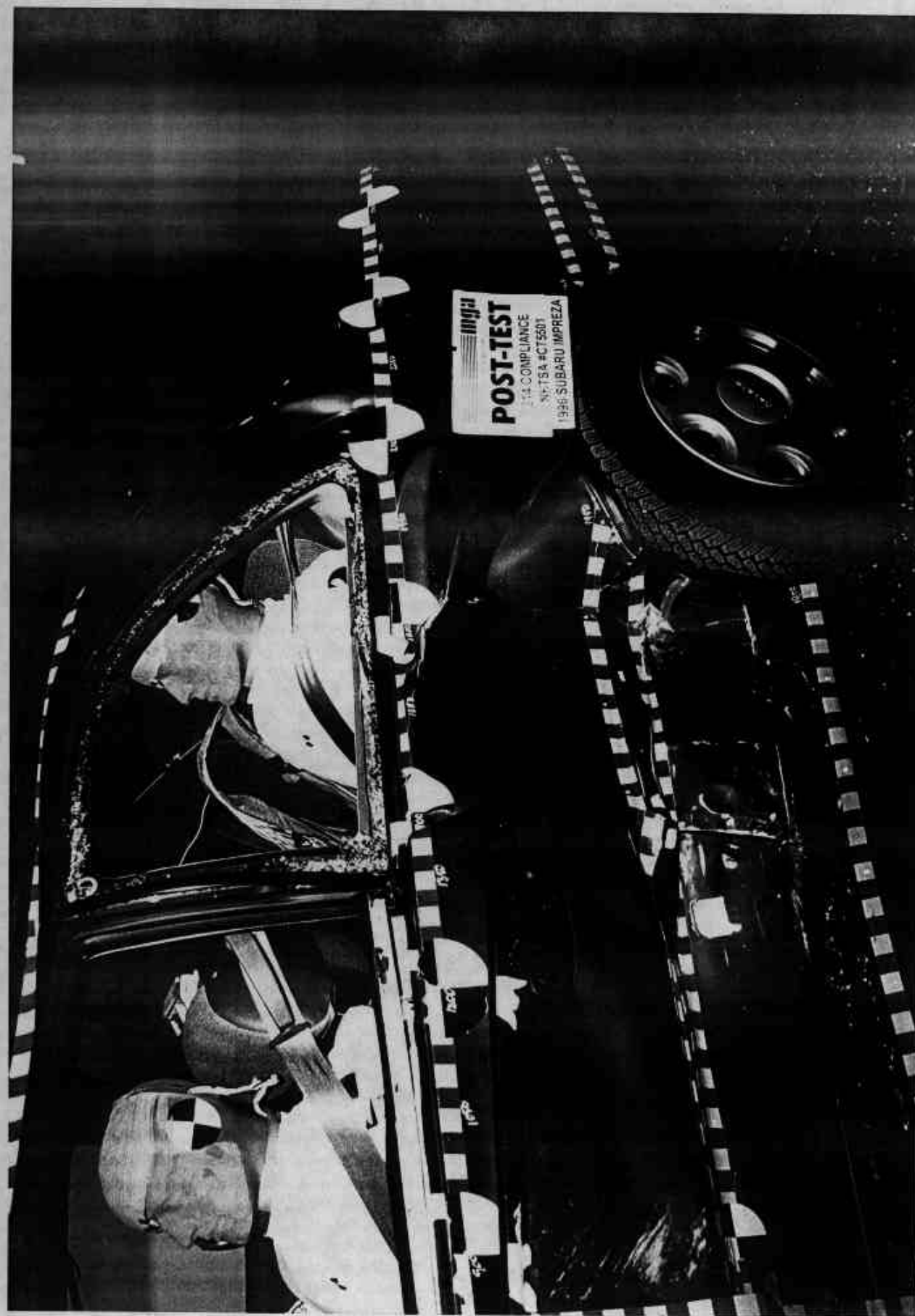


Photo No. A-32 - Post-Test Passenger Dummy Left Side View



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



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

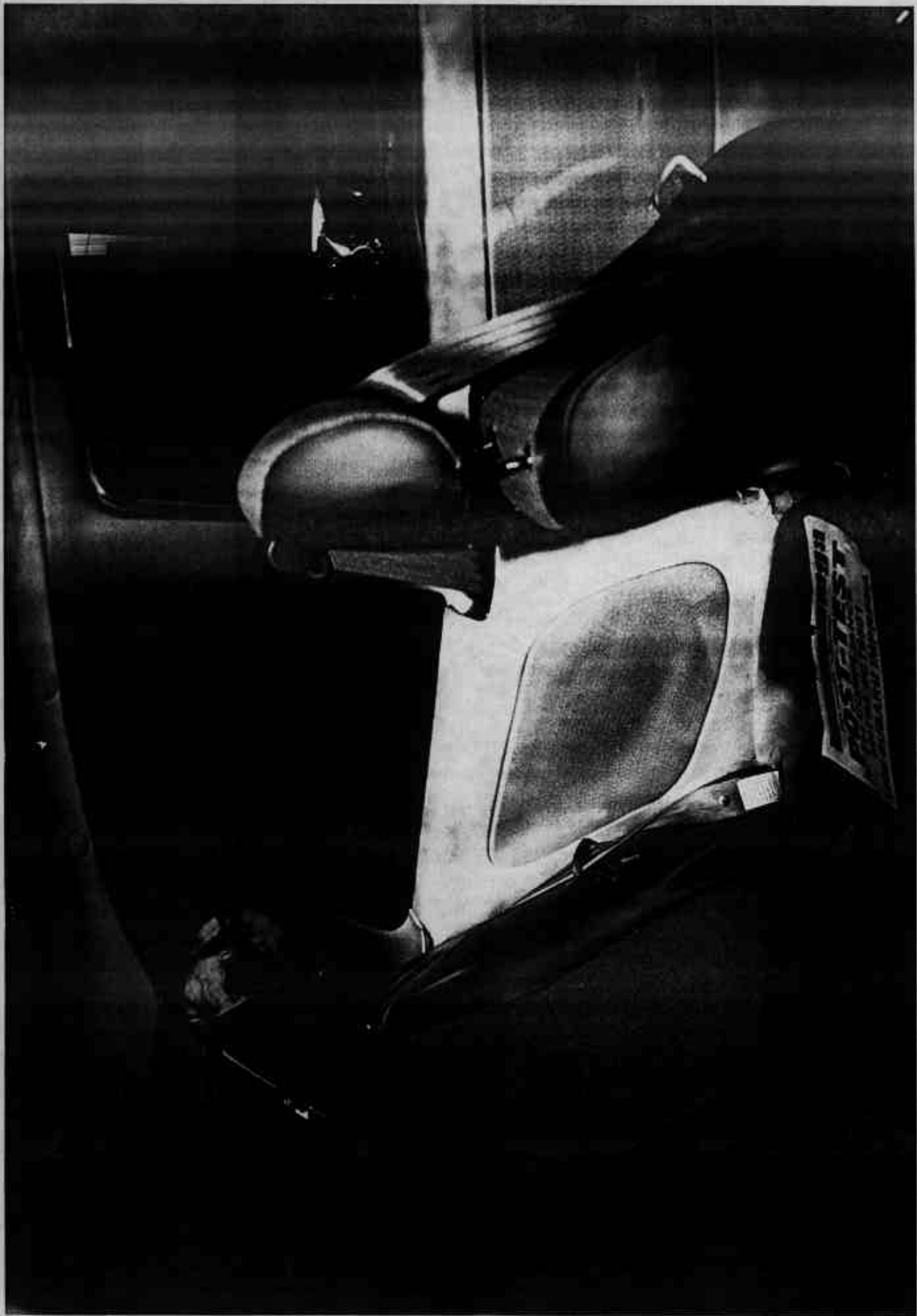


Photo No. A-35 - Post-Test Passenger Dummy Contact



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



Photo No. A-37 - Post-Test Left Front Impact Point on Vehicle

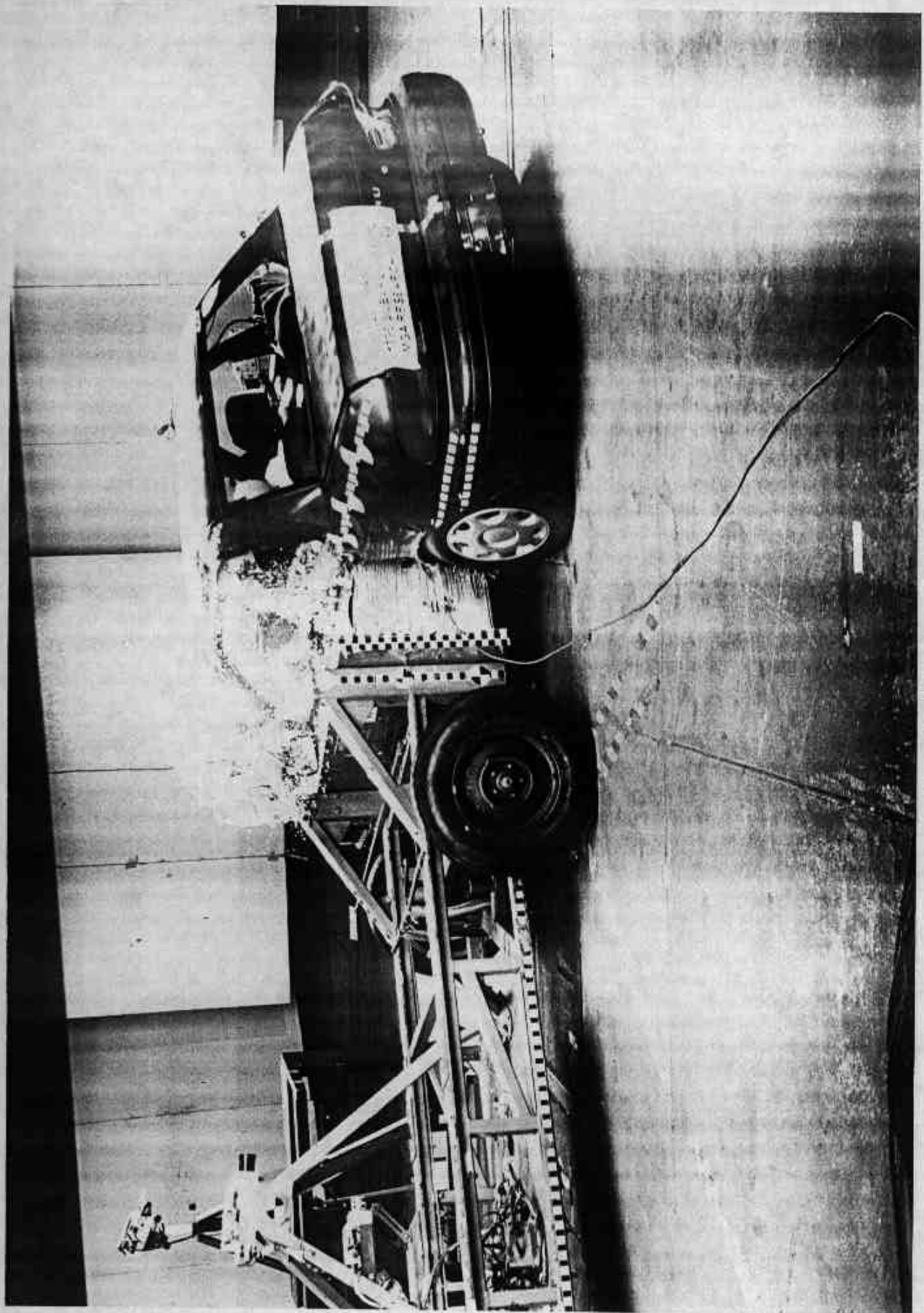
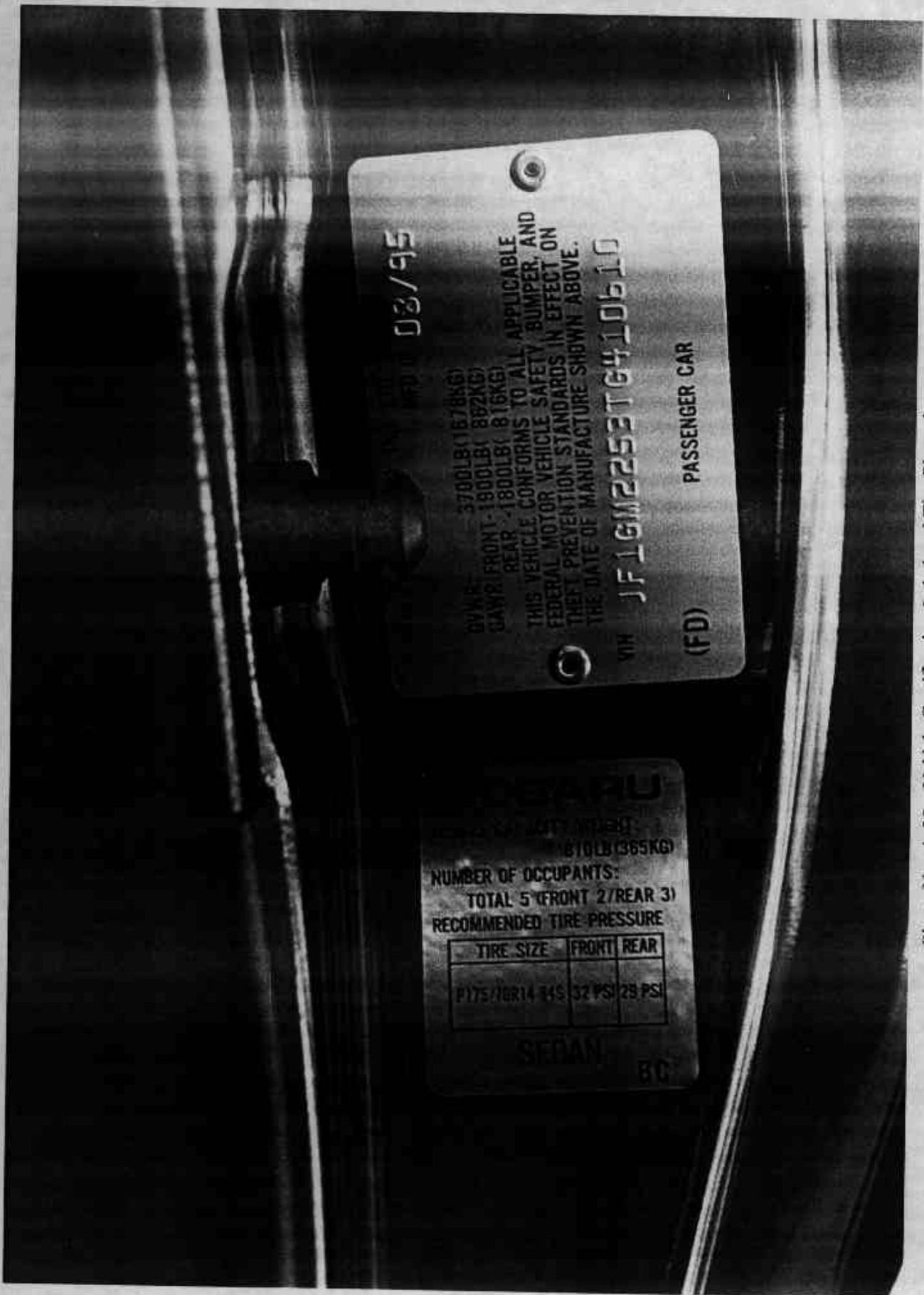


Photo No. A-38 - Impact

A-38



03/95

GVWR 3700LB (1678KG)
GAWR FRONT 1900LB (862KG)
REAR 1800LB (816KG)

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

VIN JF16M2253TG410610

PASSENGER CAR

(FD)

NUMBER OF OCCUPANTS:
TOTAL 5 (FRONT 2/REAR 3)
RECOMMENDED TIRE PRESSURE

TIRE SIZE	FRONT	REAR
P175/10R14 84S	32 PSI	29 PSI

SEDAN

80

Photo No. A-39 - Vehicle Certification Label and Tire Placard

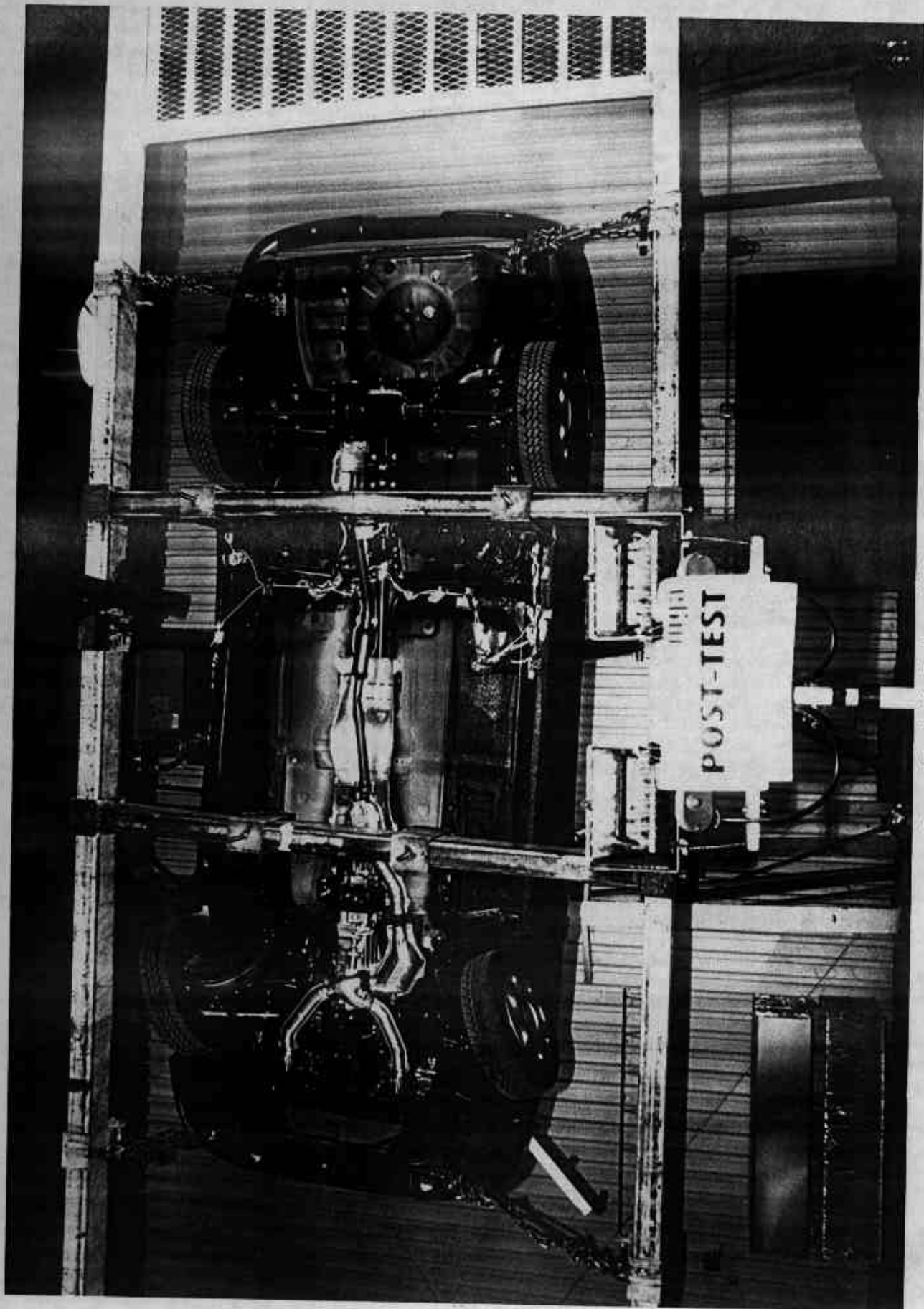


Photo No. A-40 - Rollover 90°

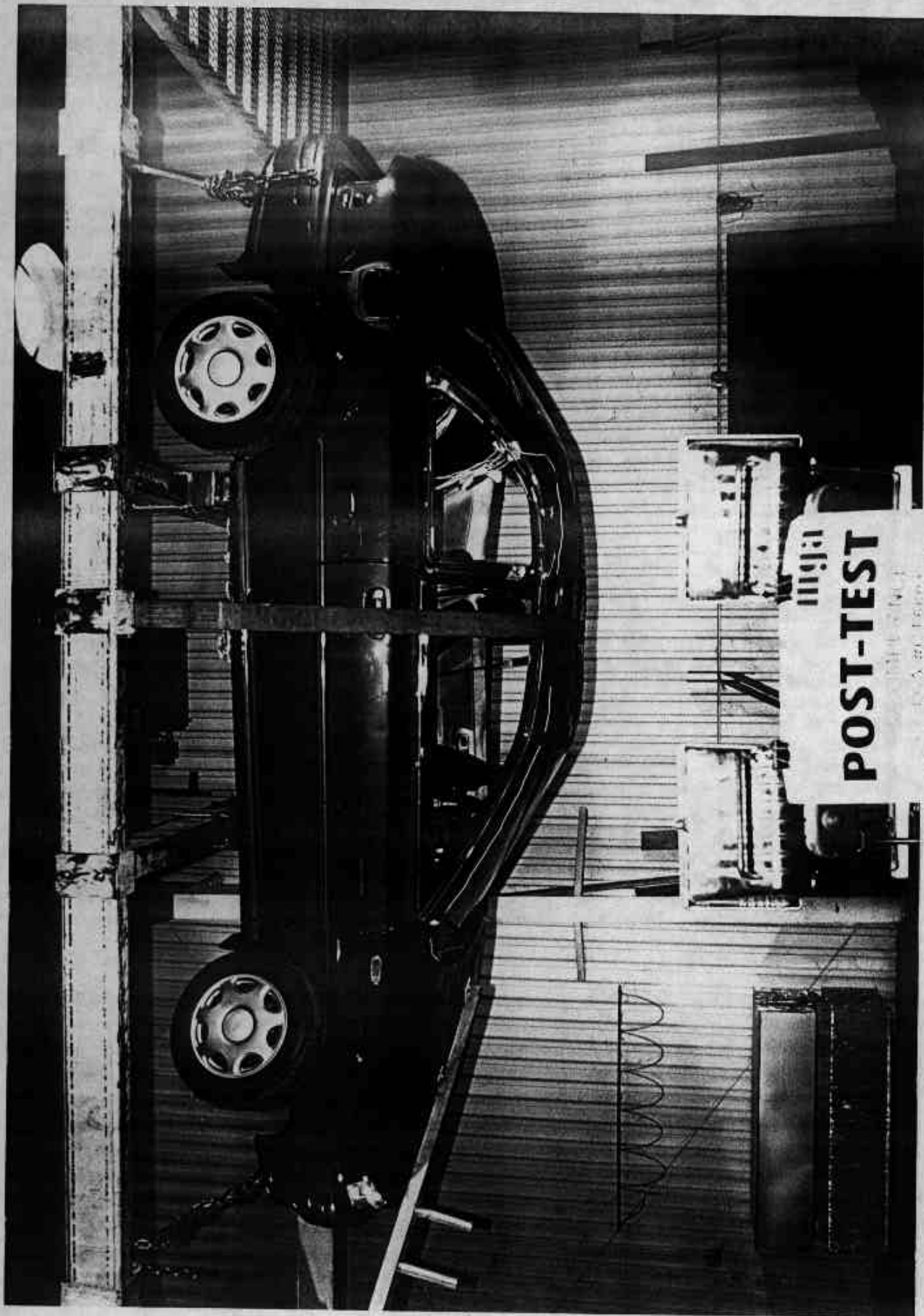


Photo No. A-41 - Rollover 180°

A-41

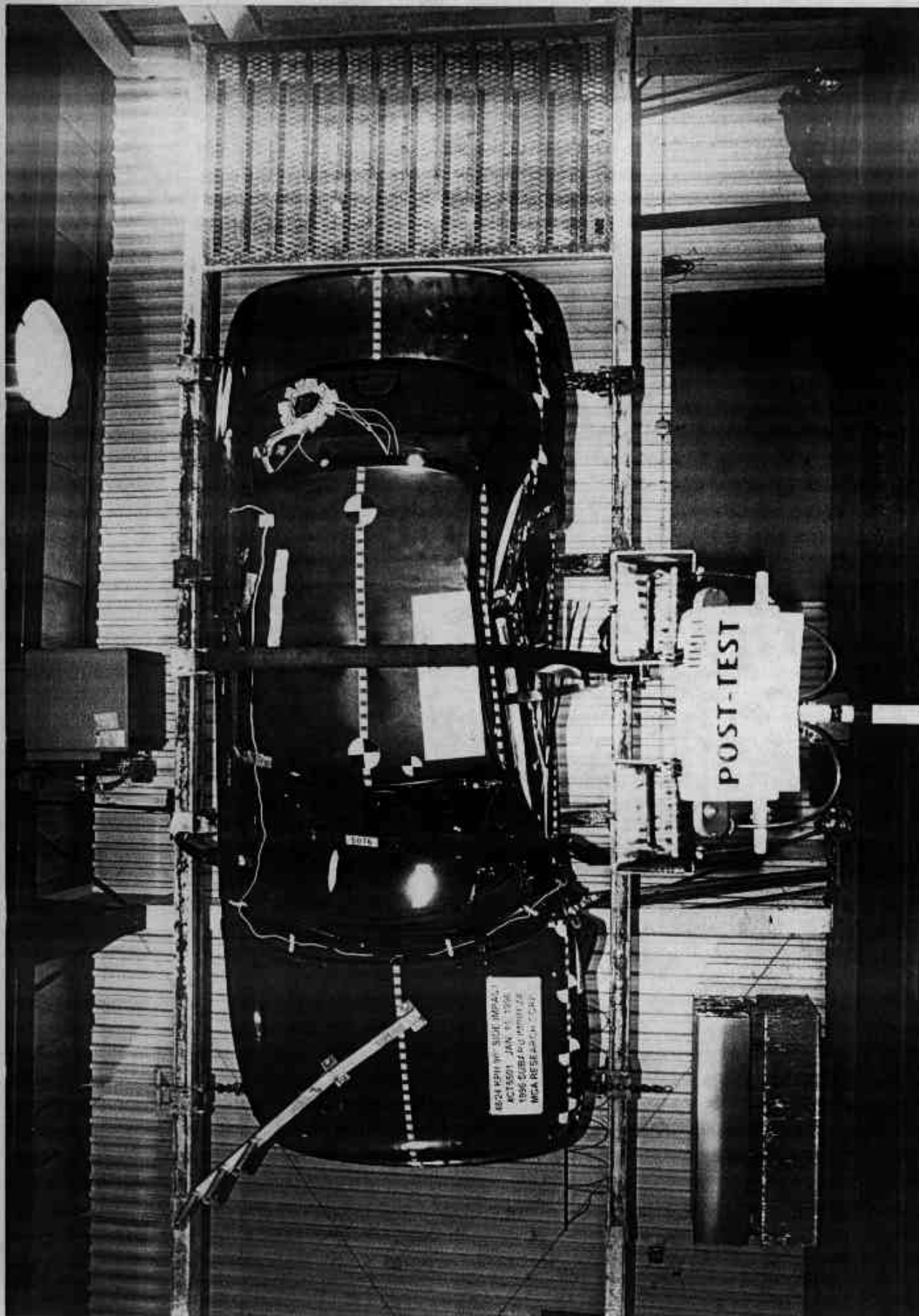


Photo No. A-42 - Rollover 270°

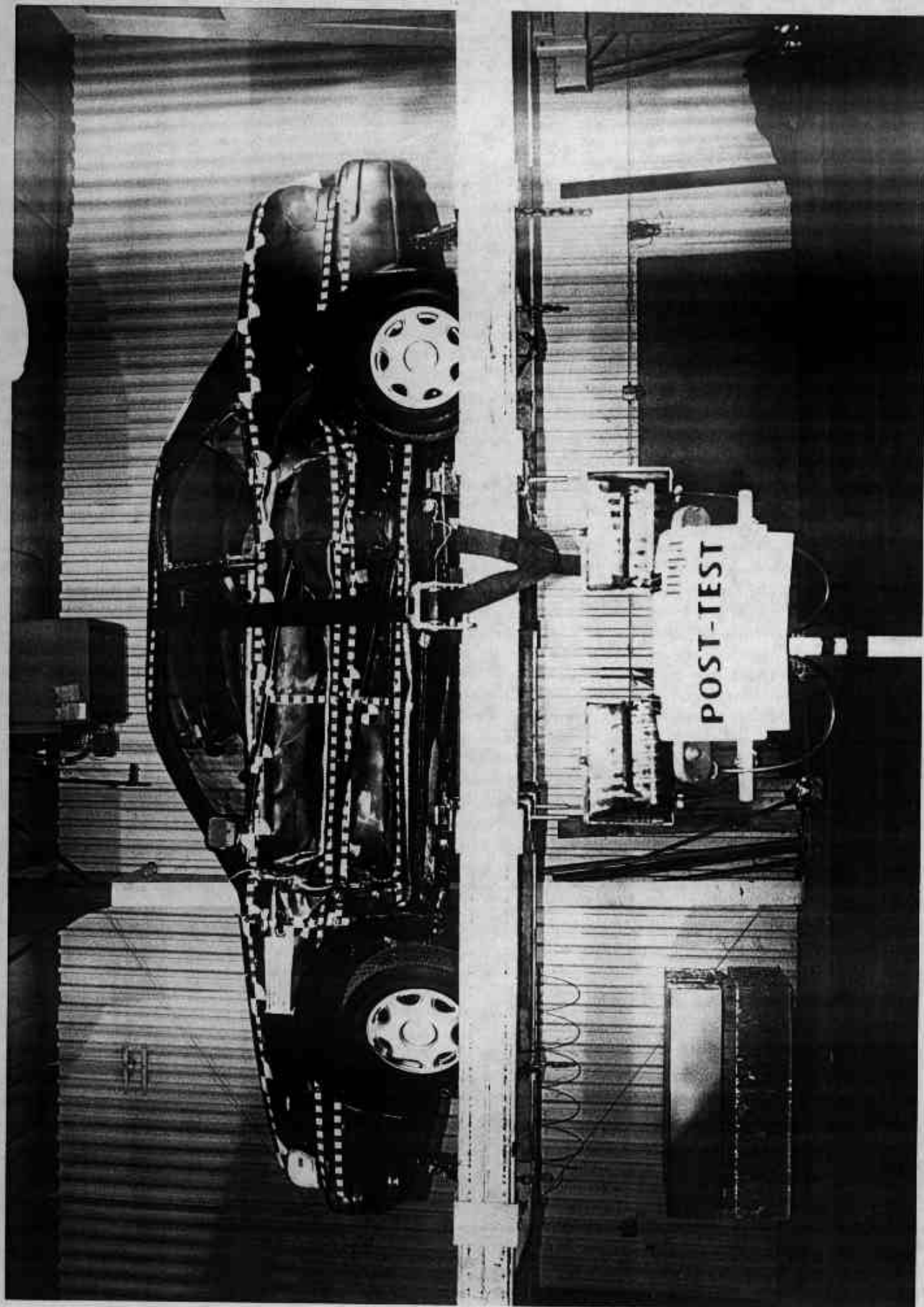


Photo No. A-43 - Rollover 360°

A-43

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* No Valid Data Collected

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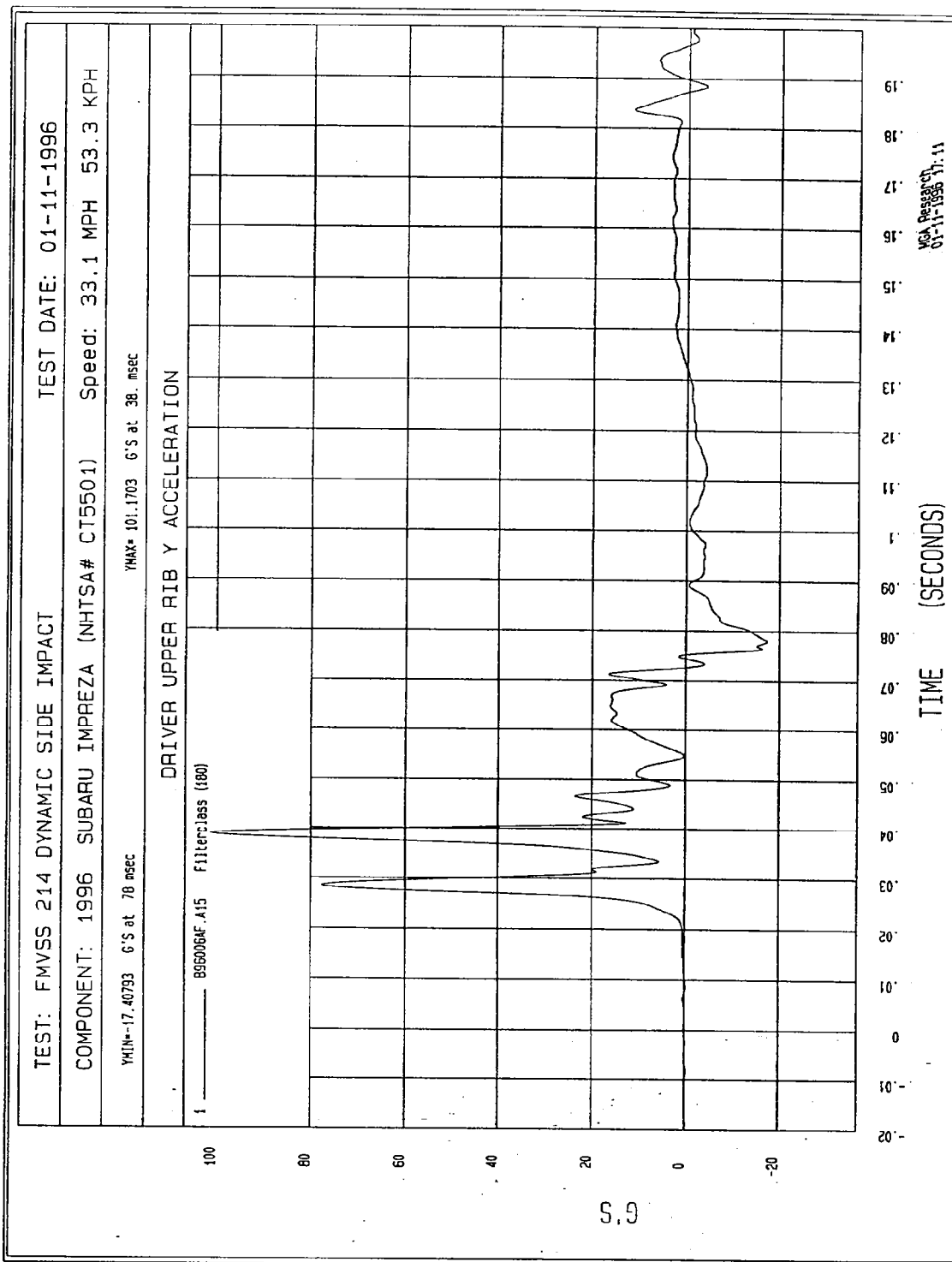
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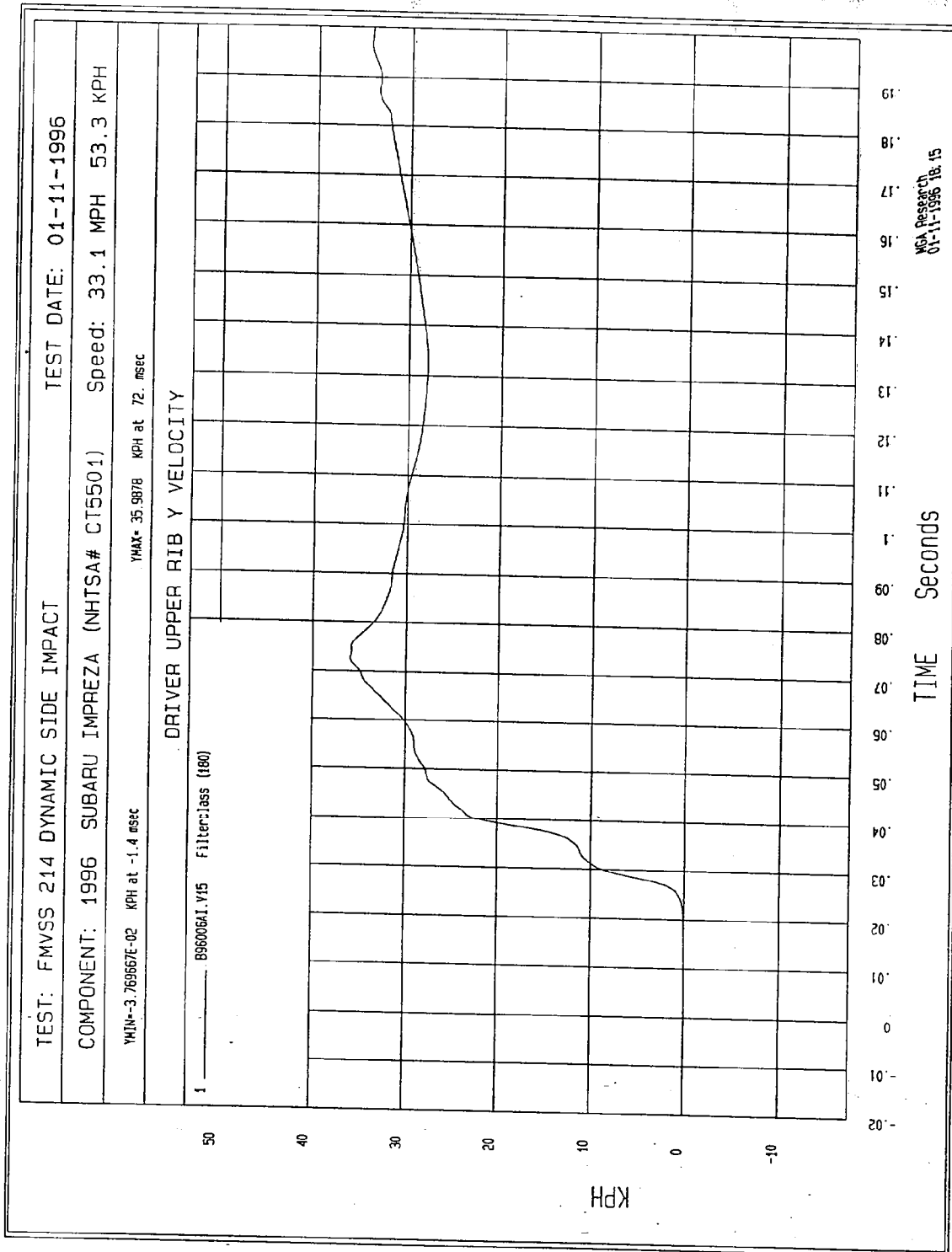
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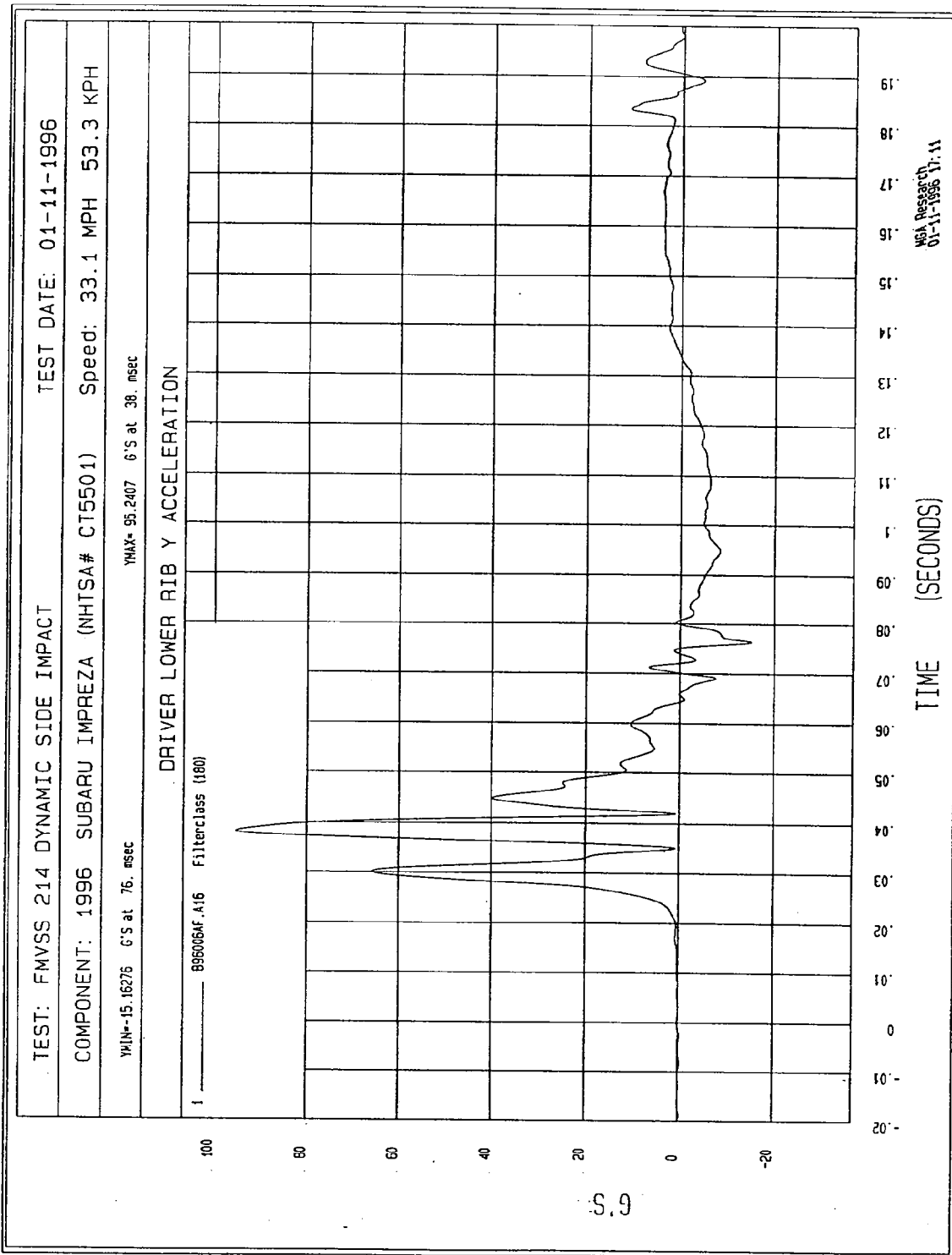
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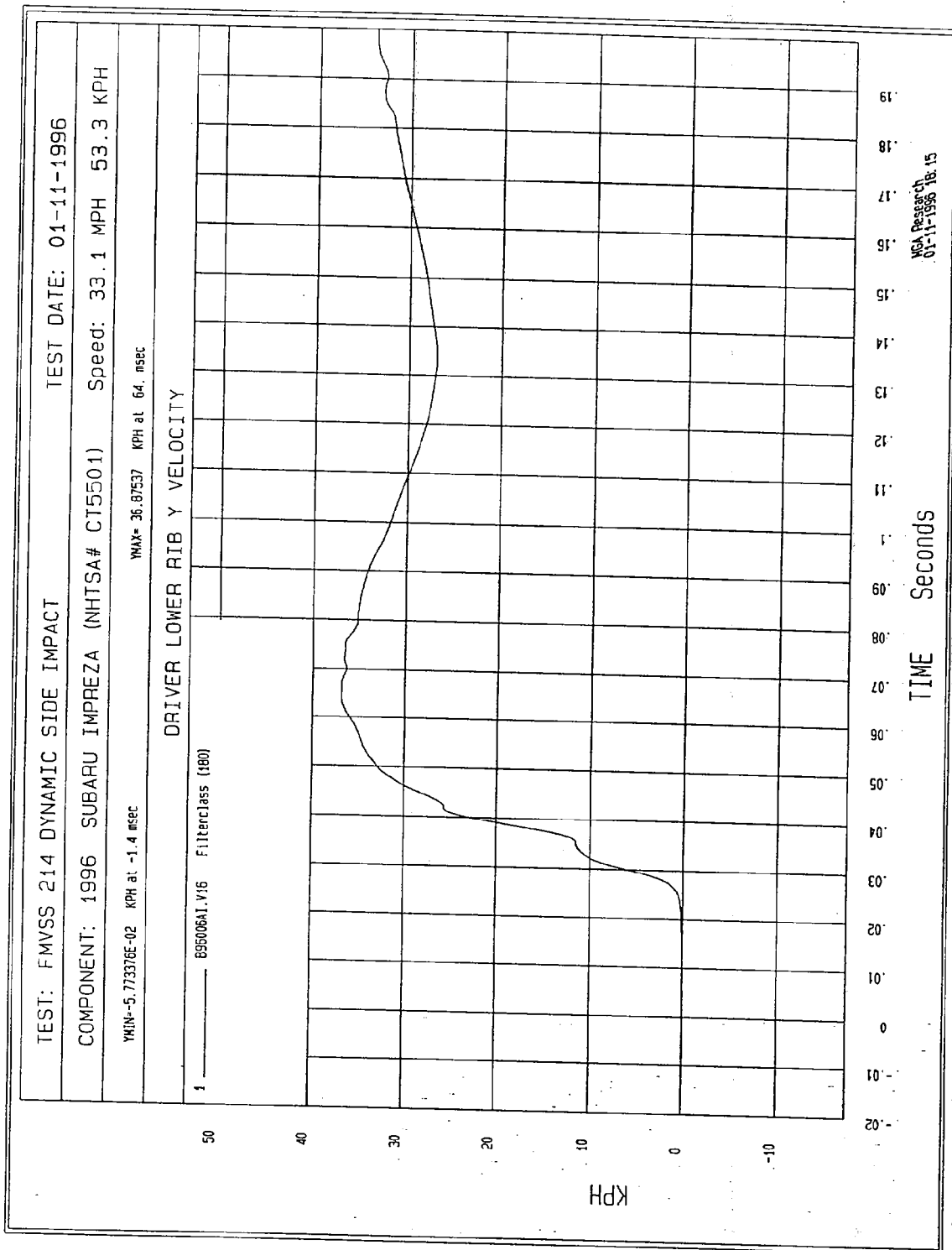
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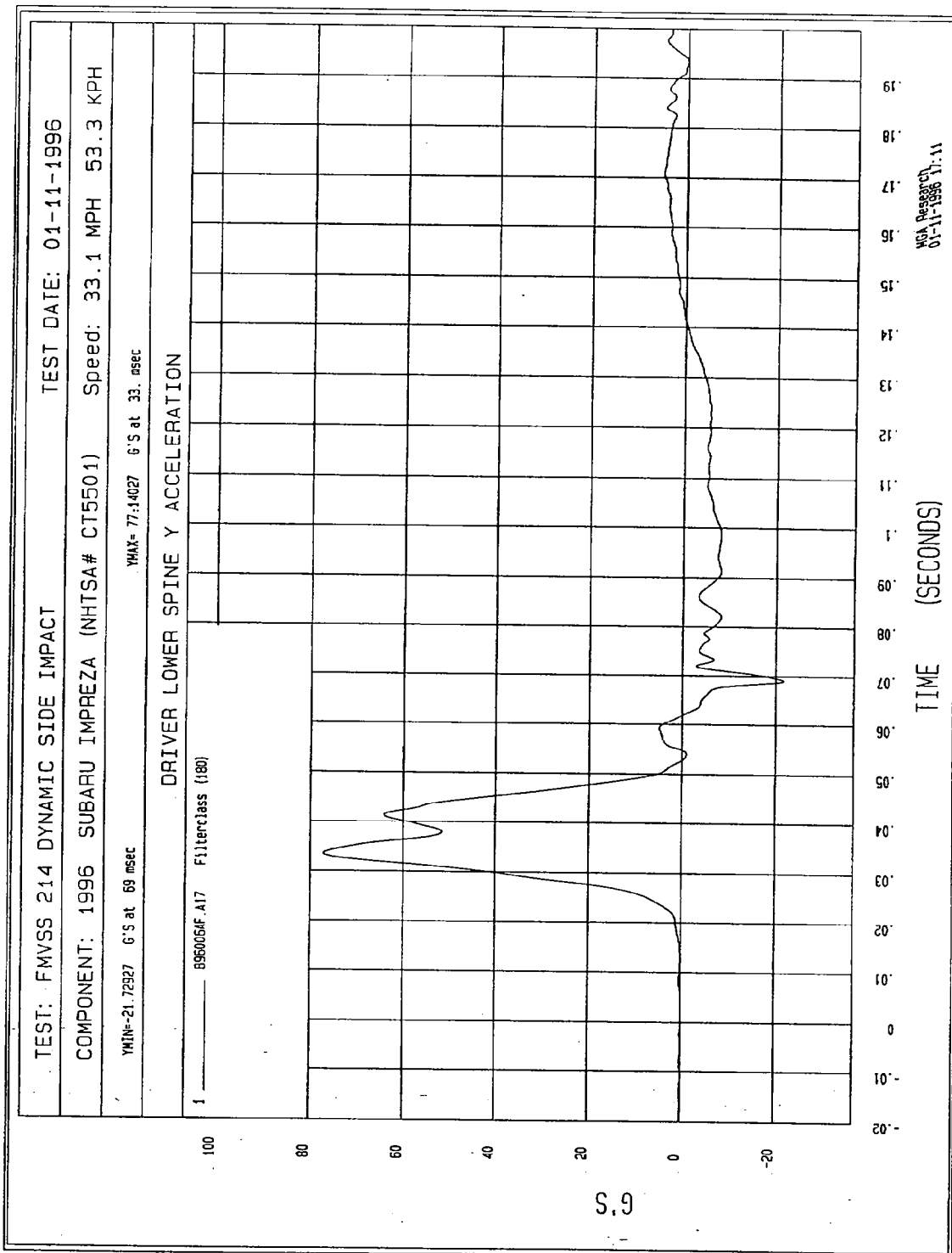
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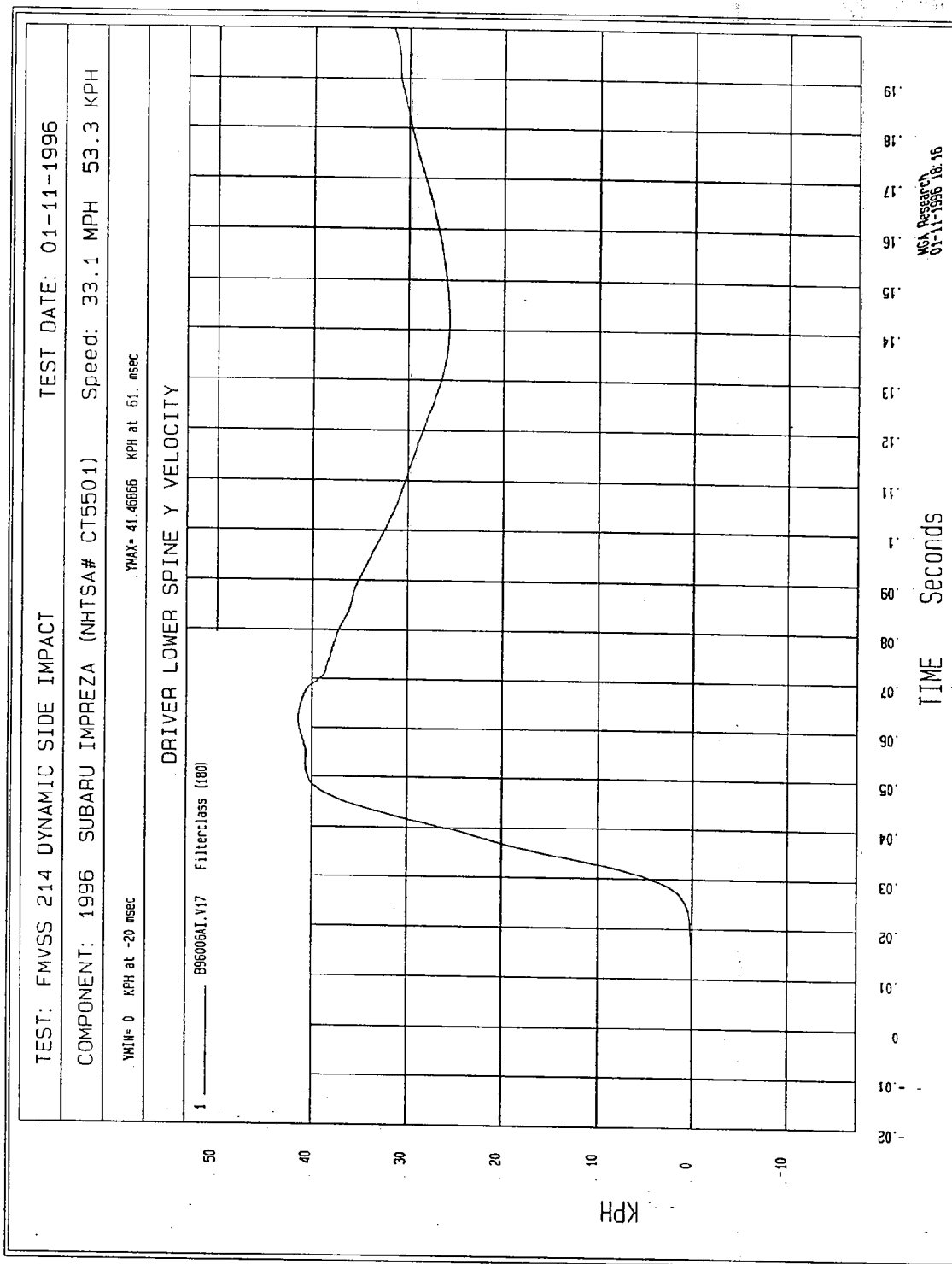


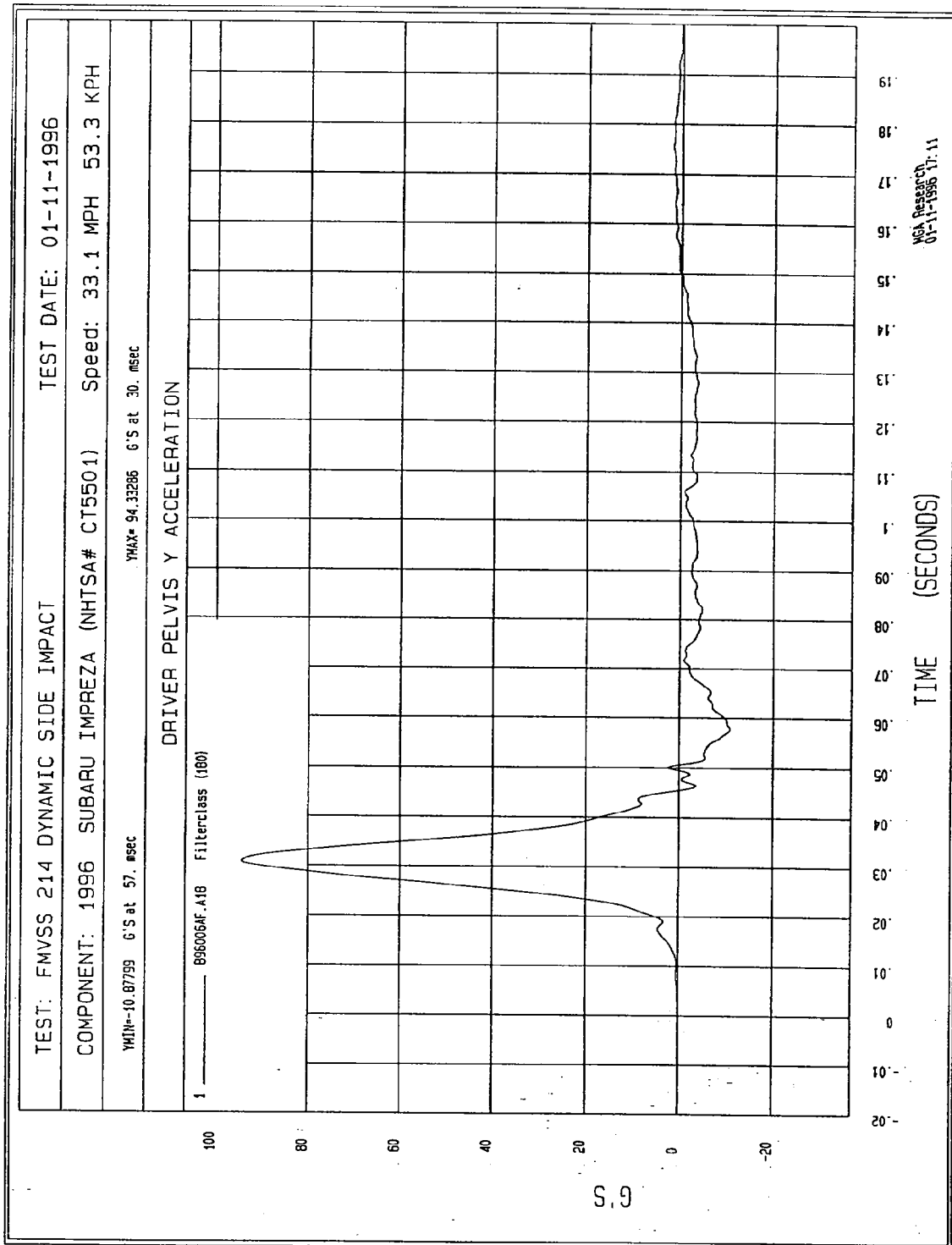


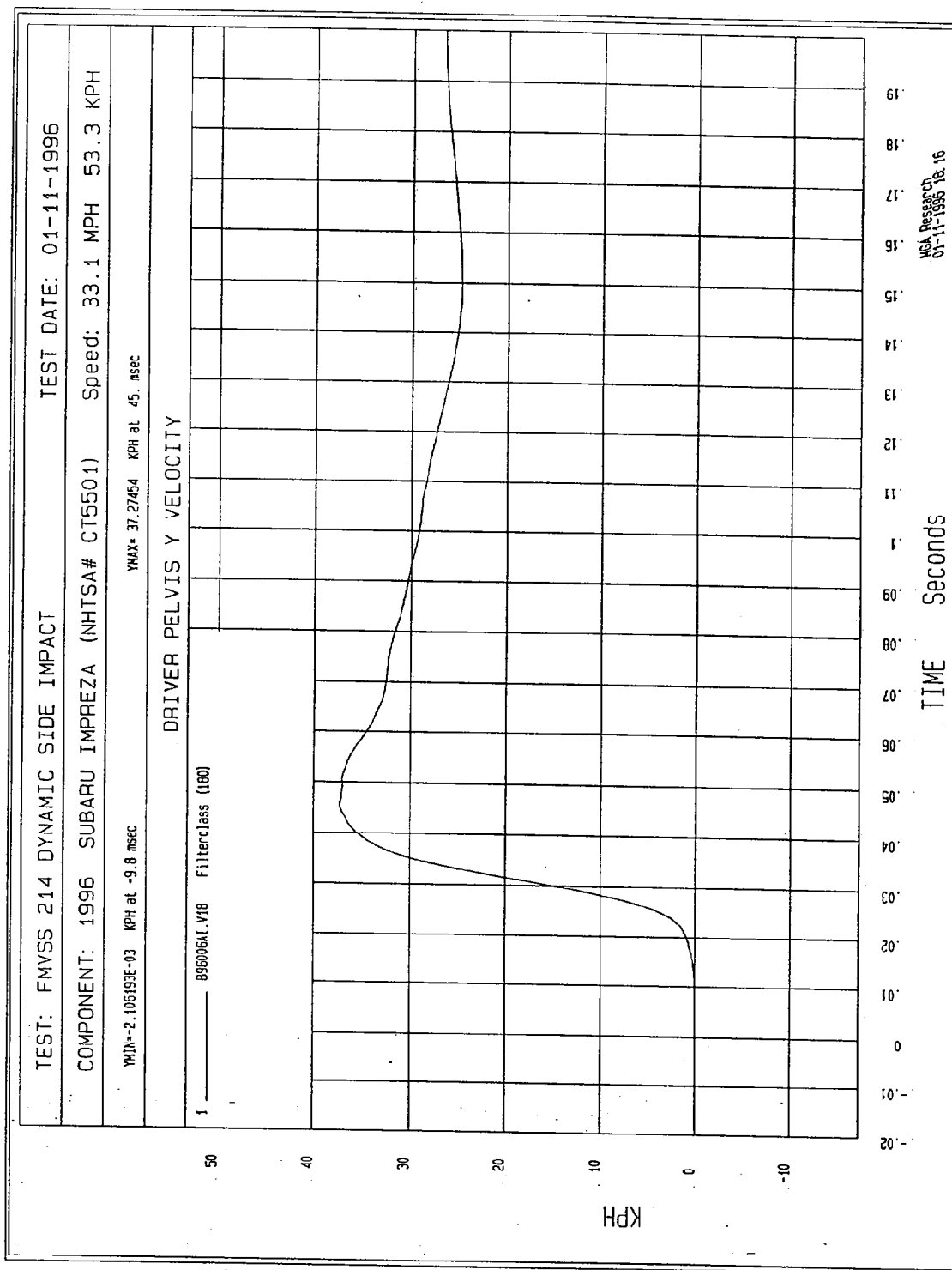


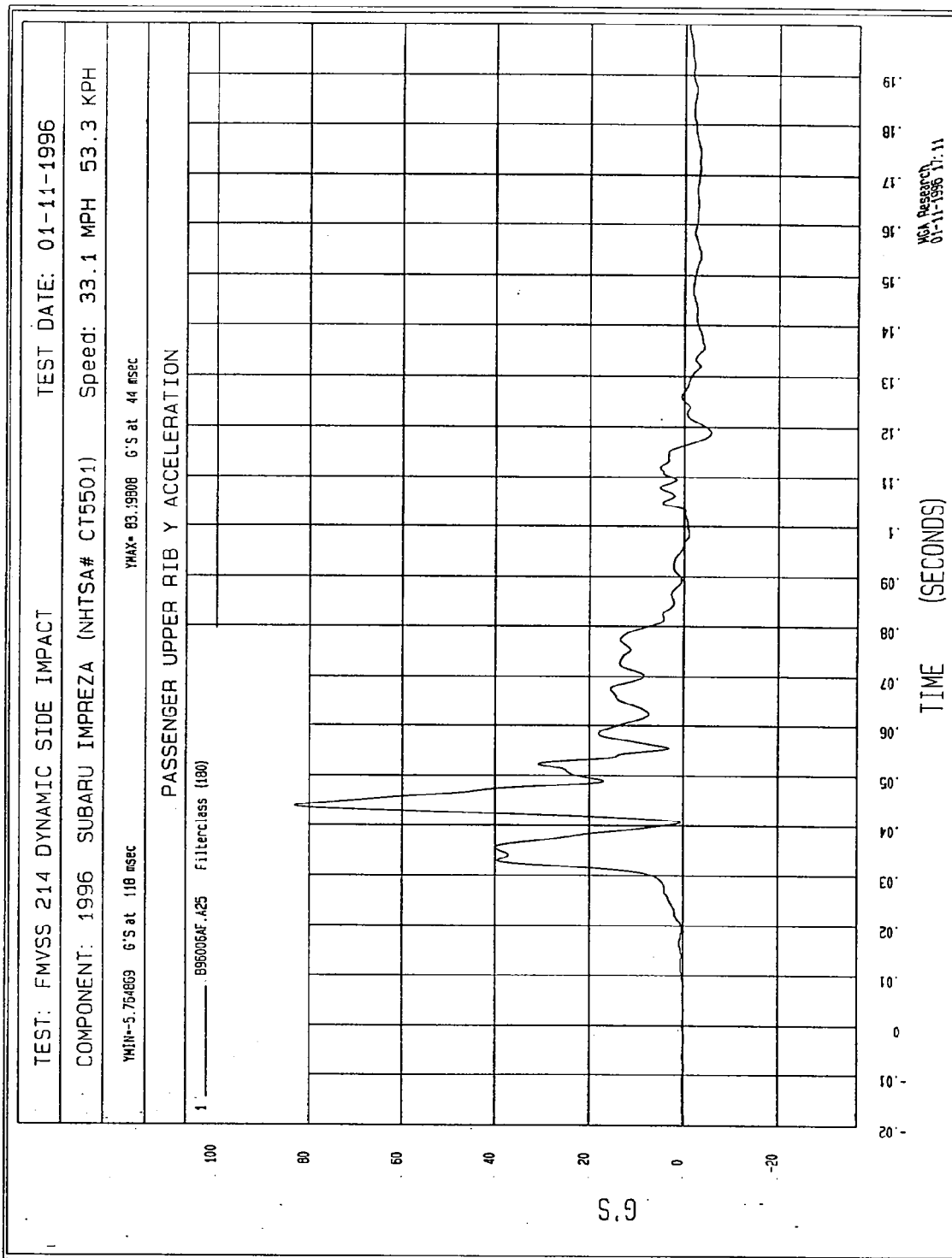


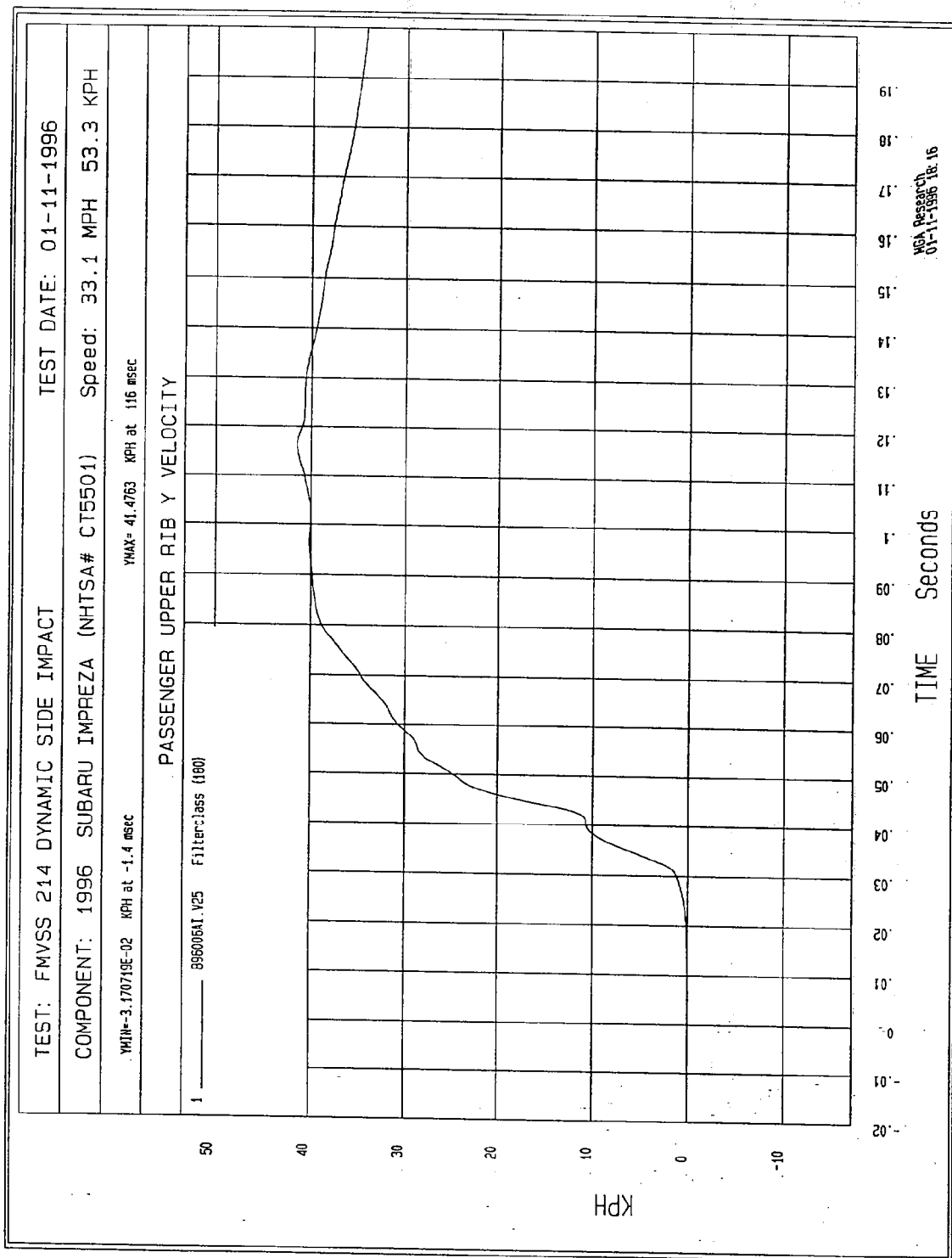


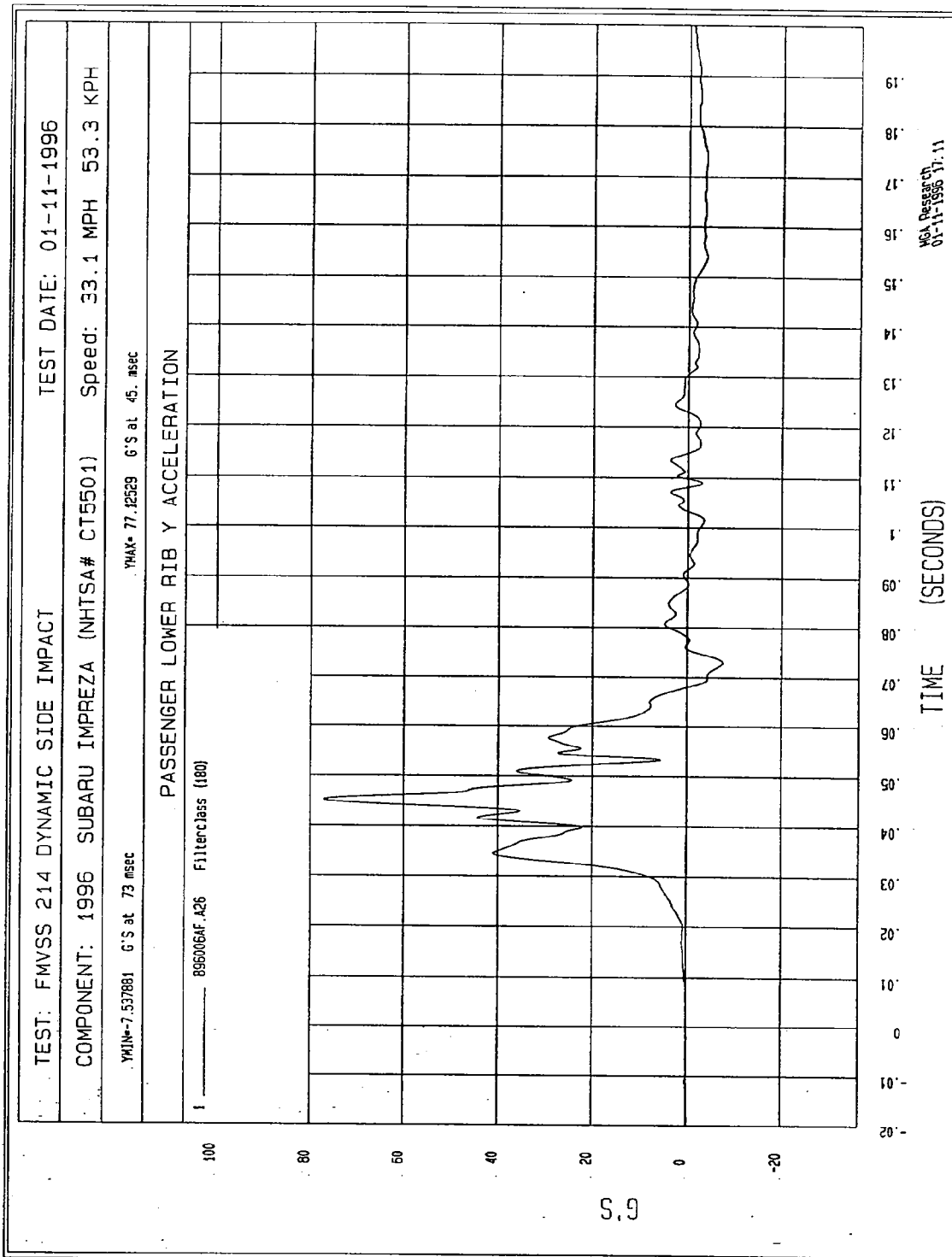


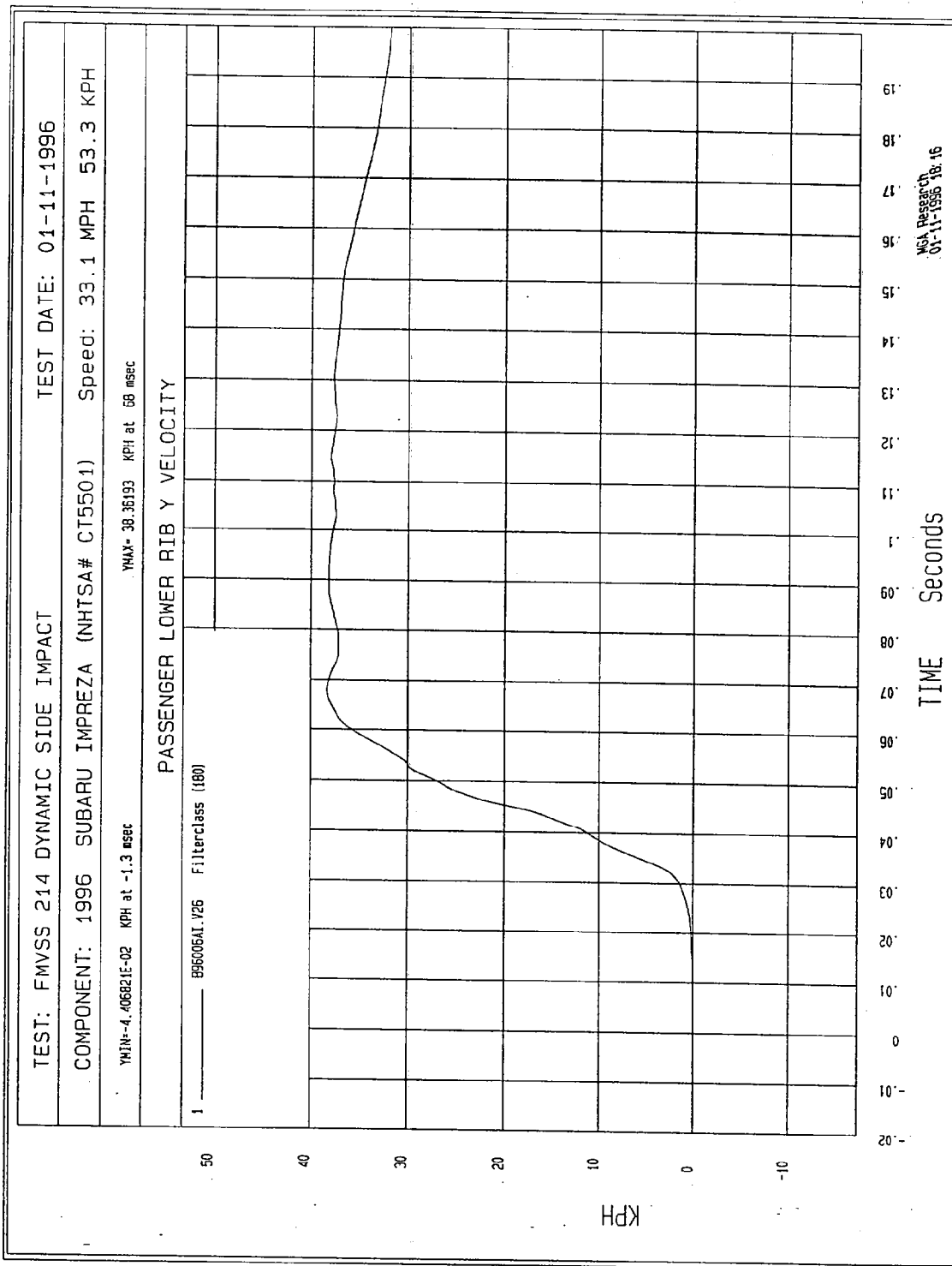


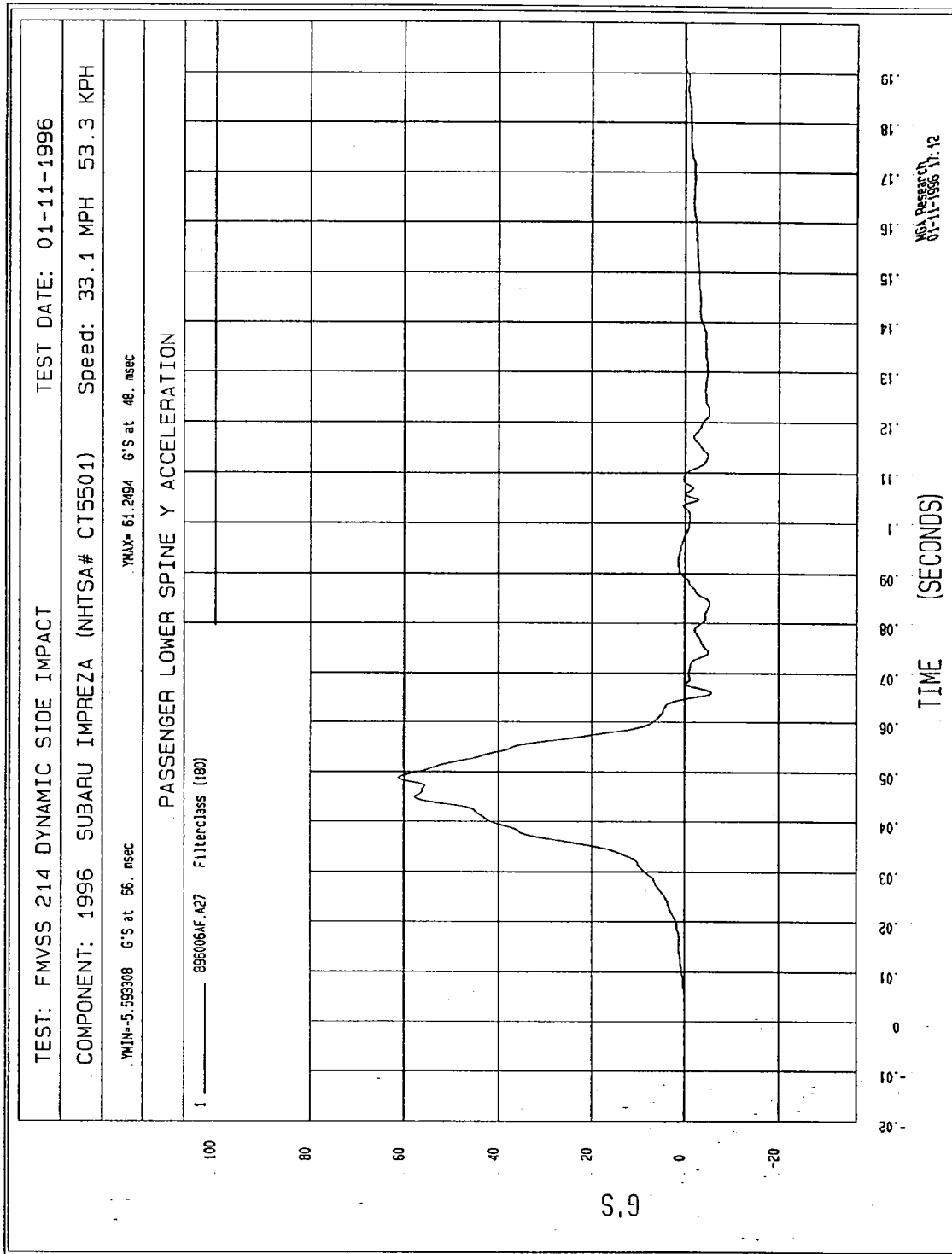


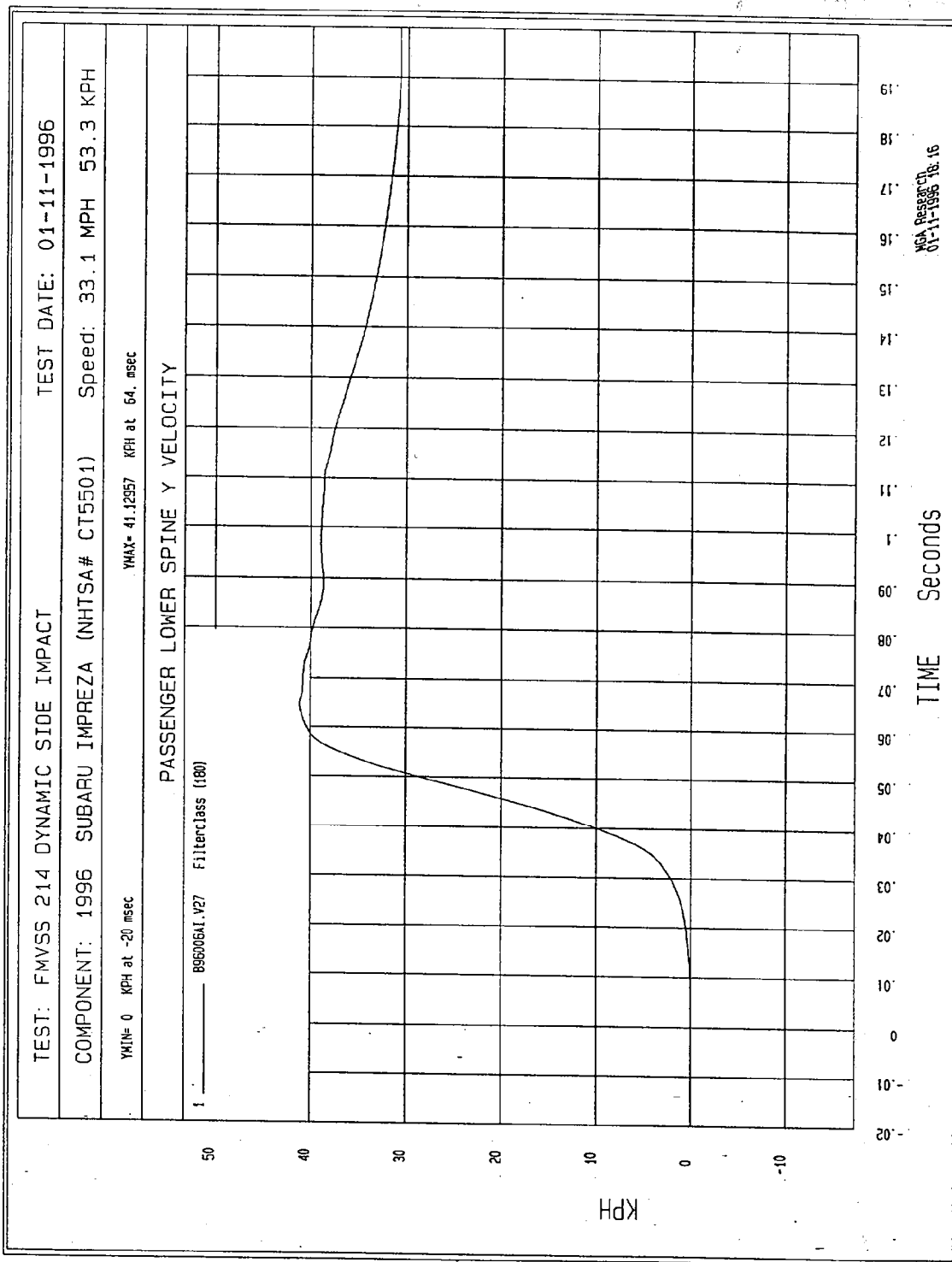










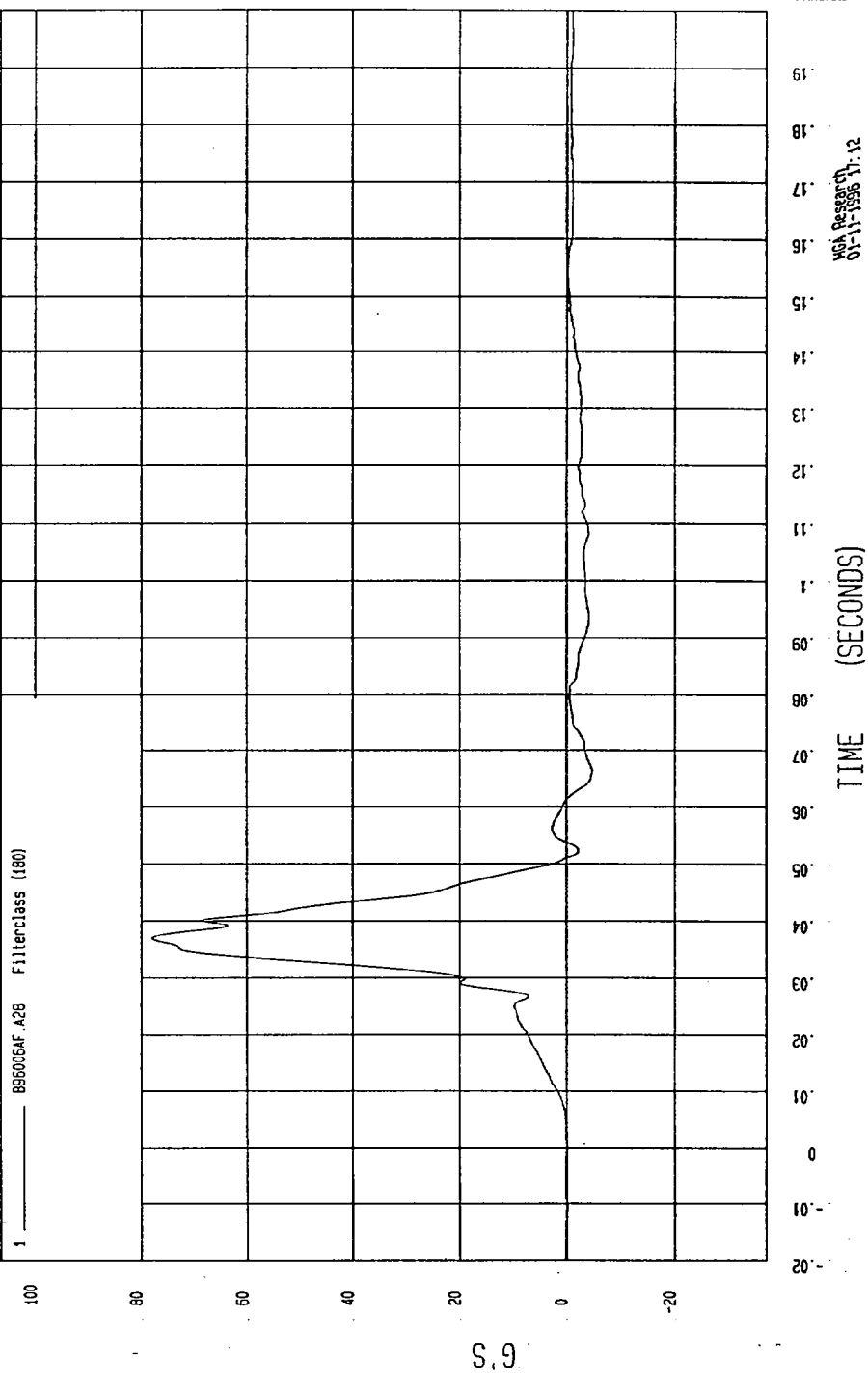


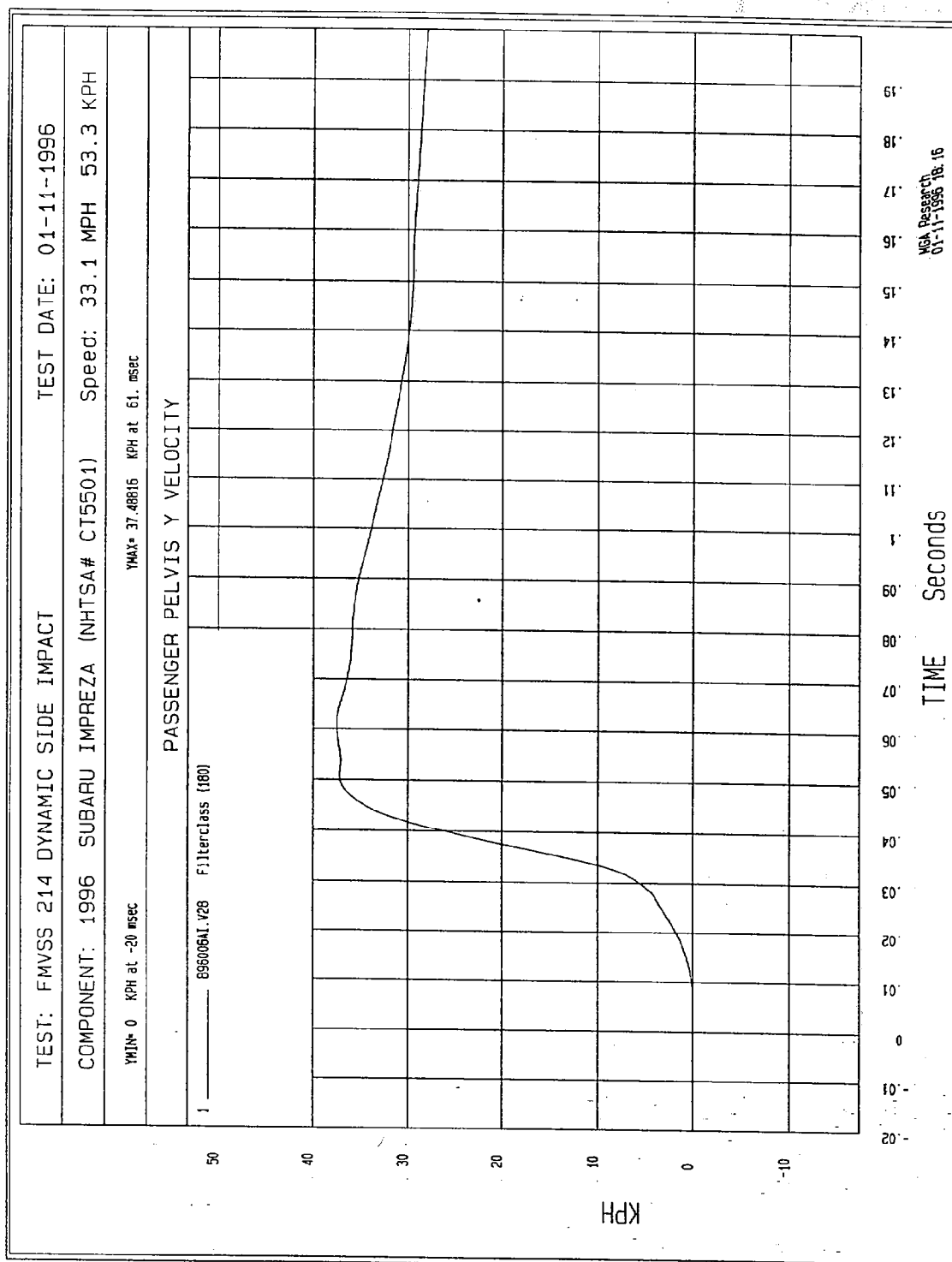
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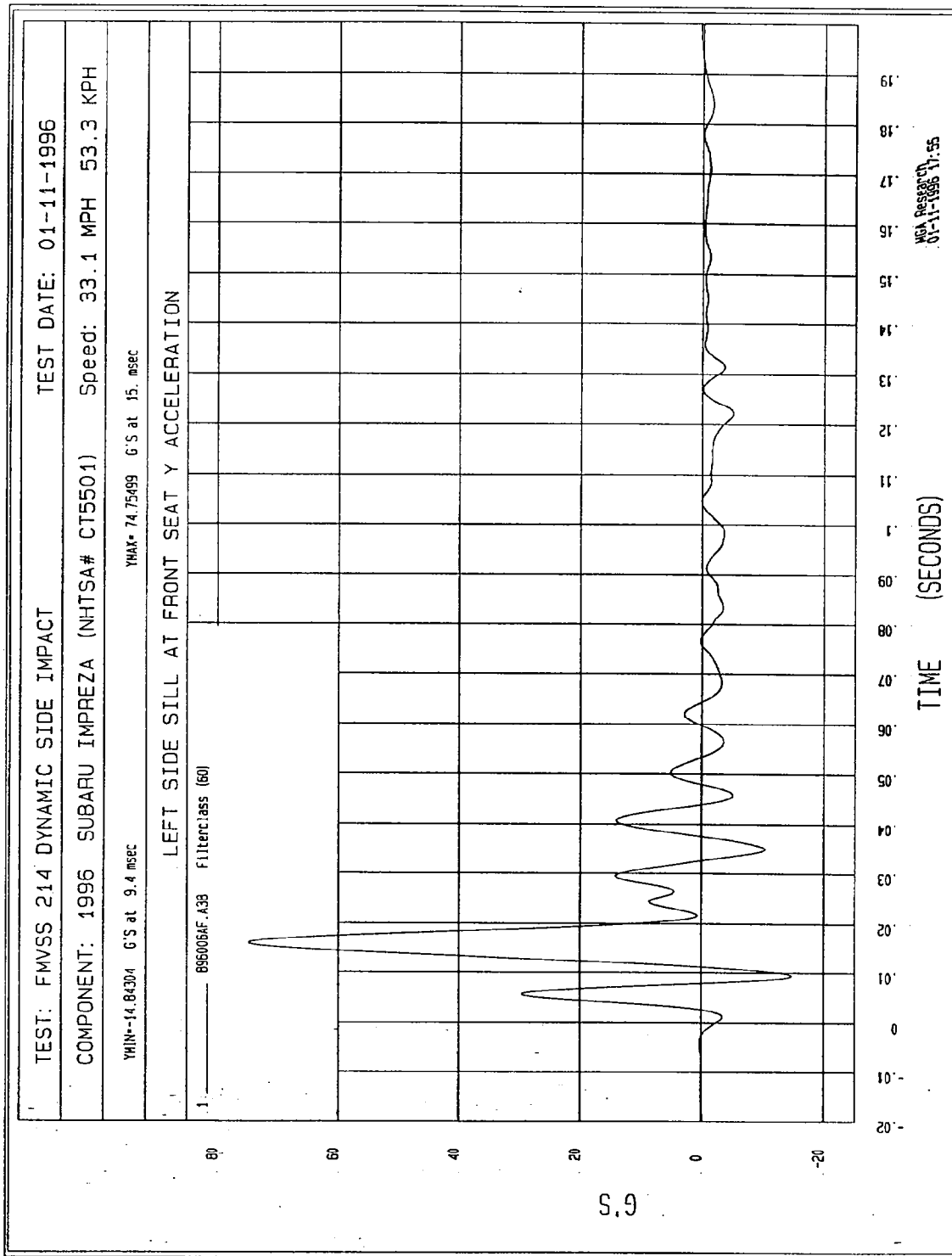
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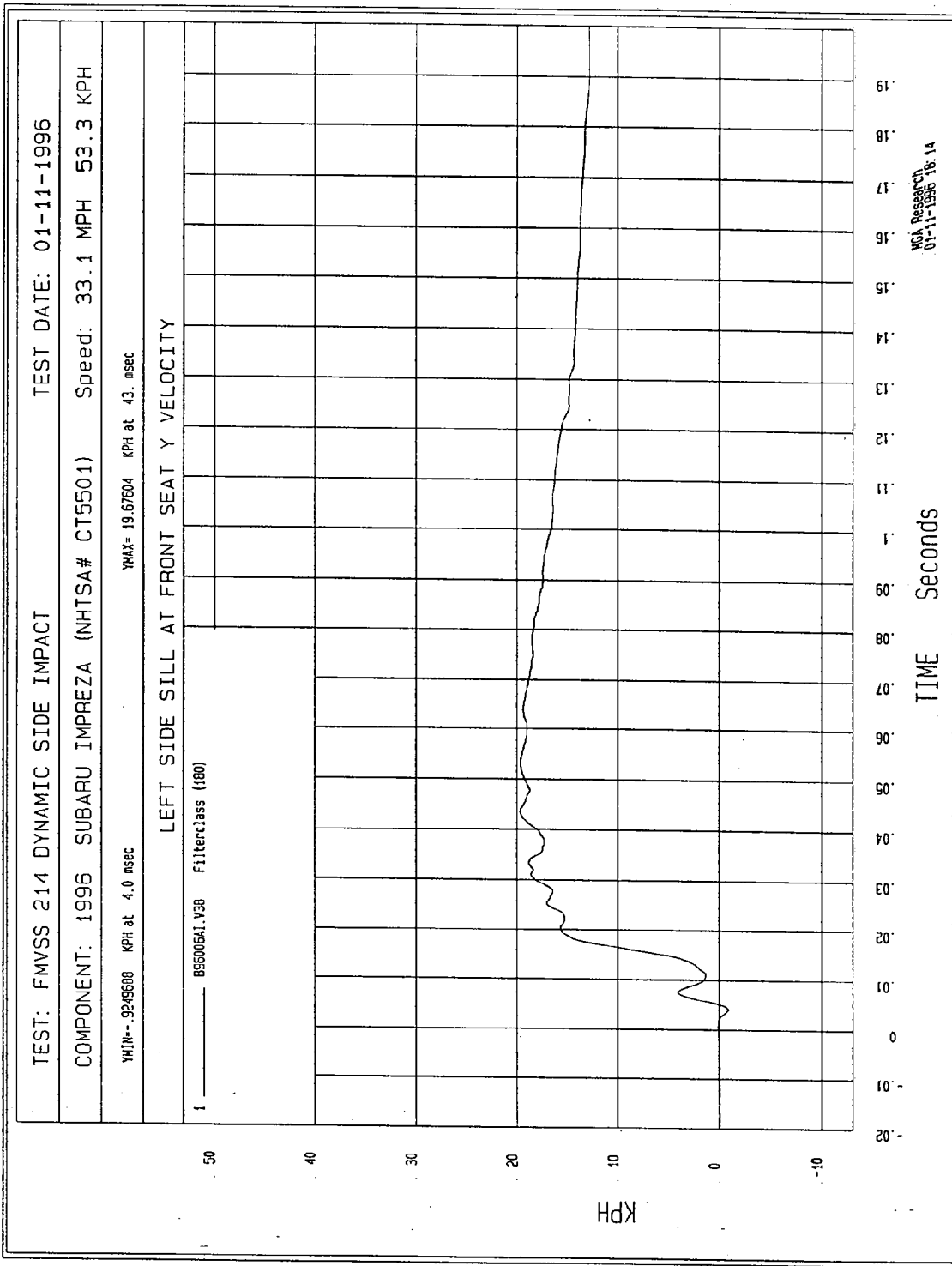
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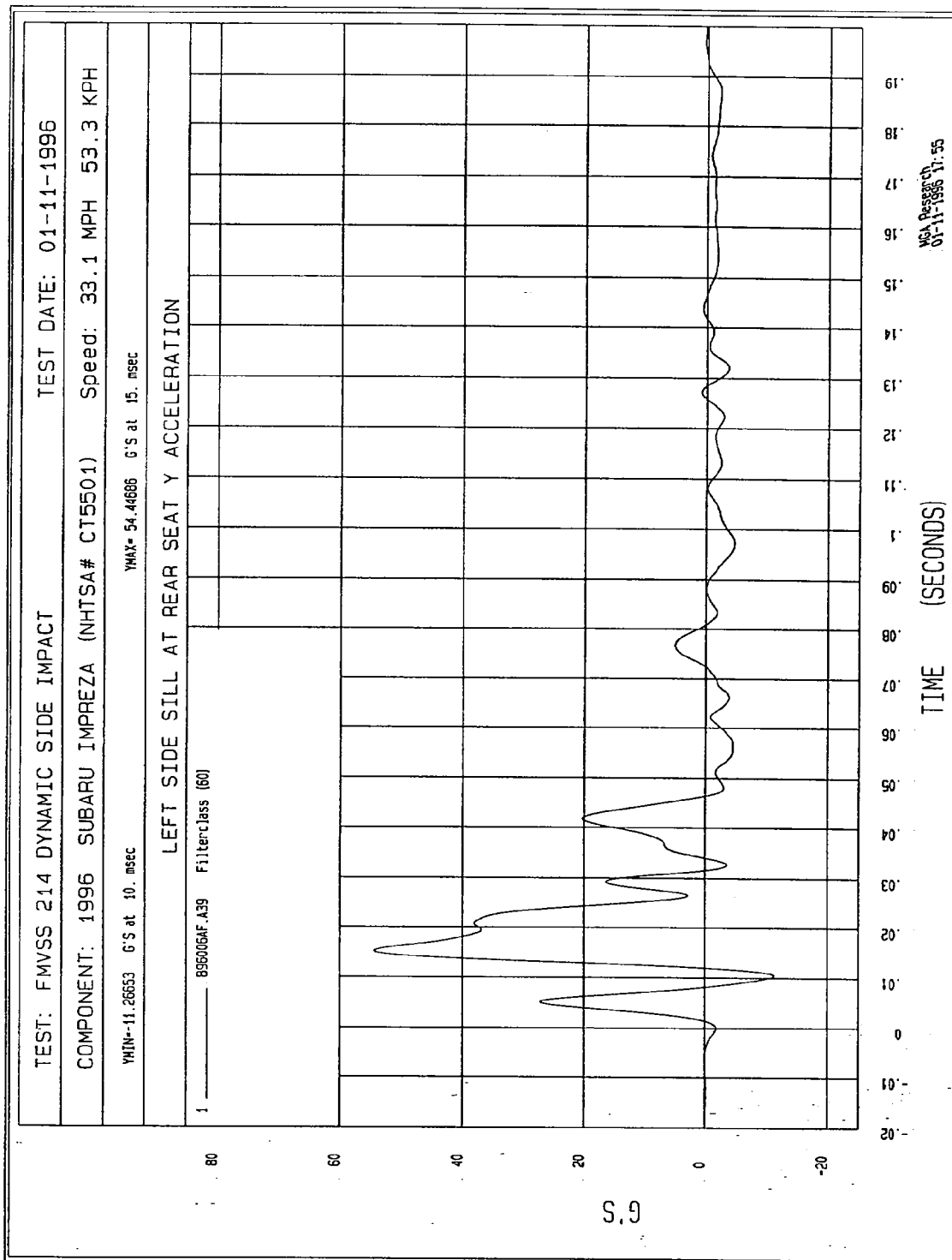
PASSENGER PELVIS Y ACCELERATION

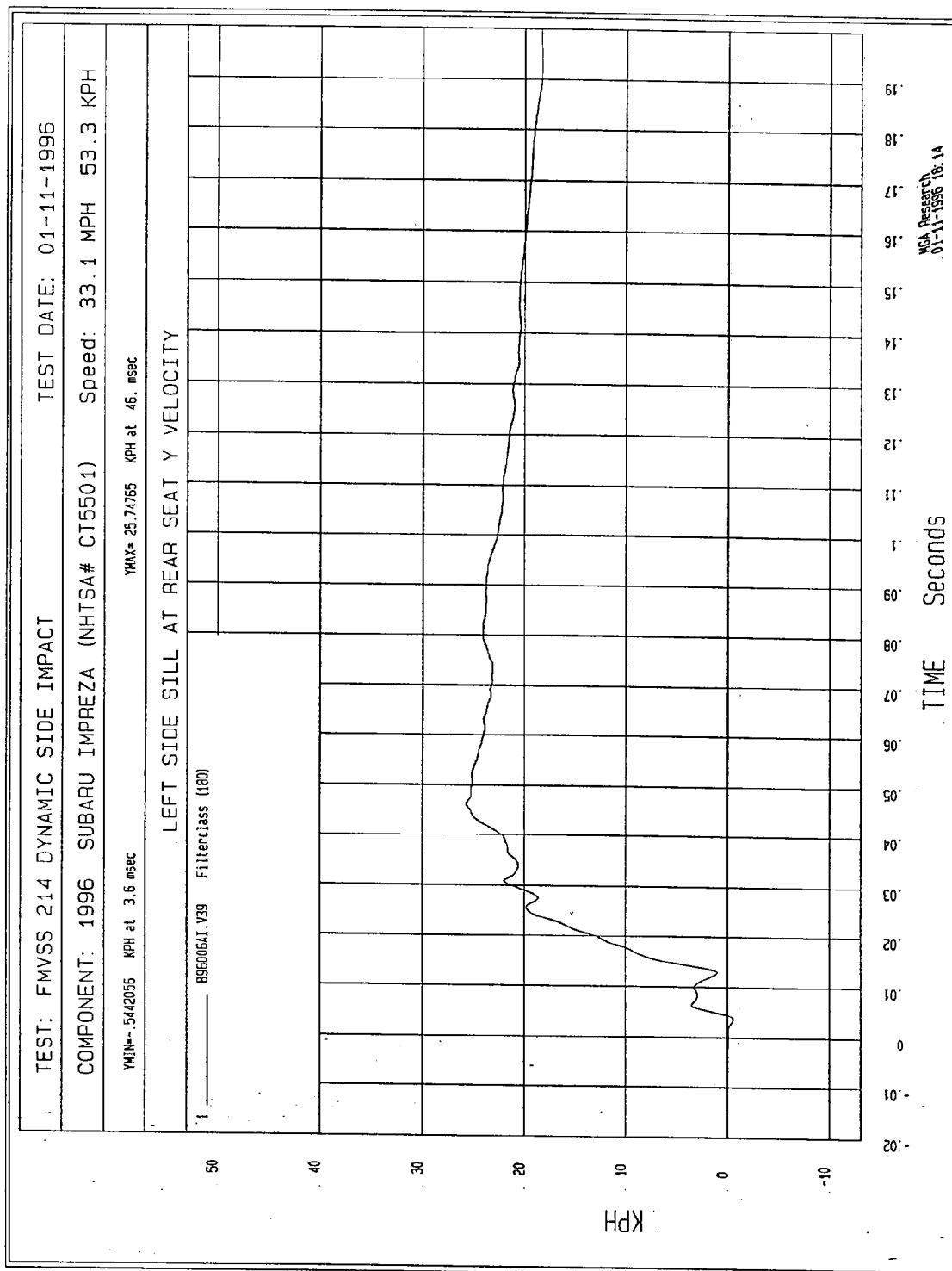


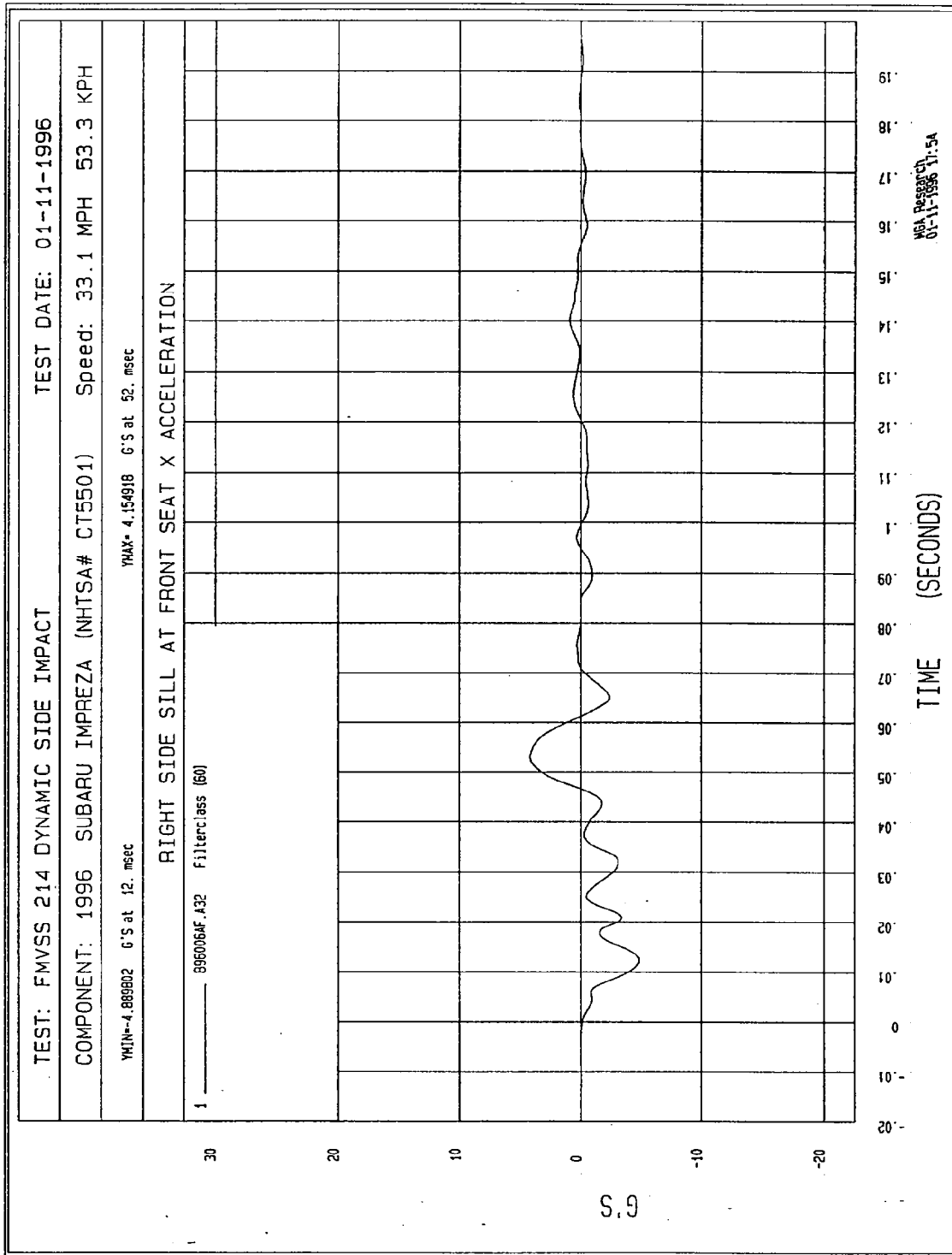


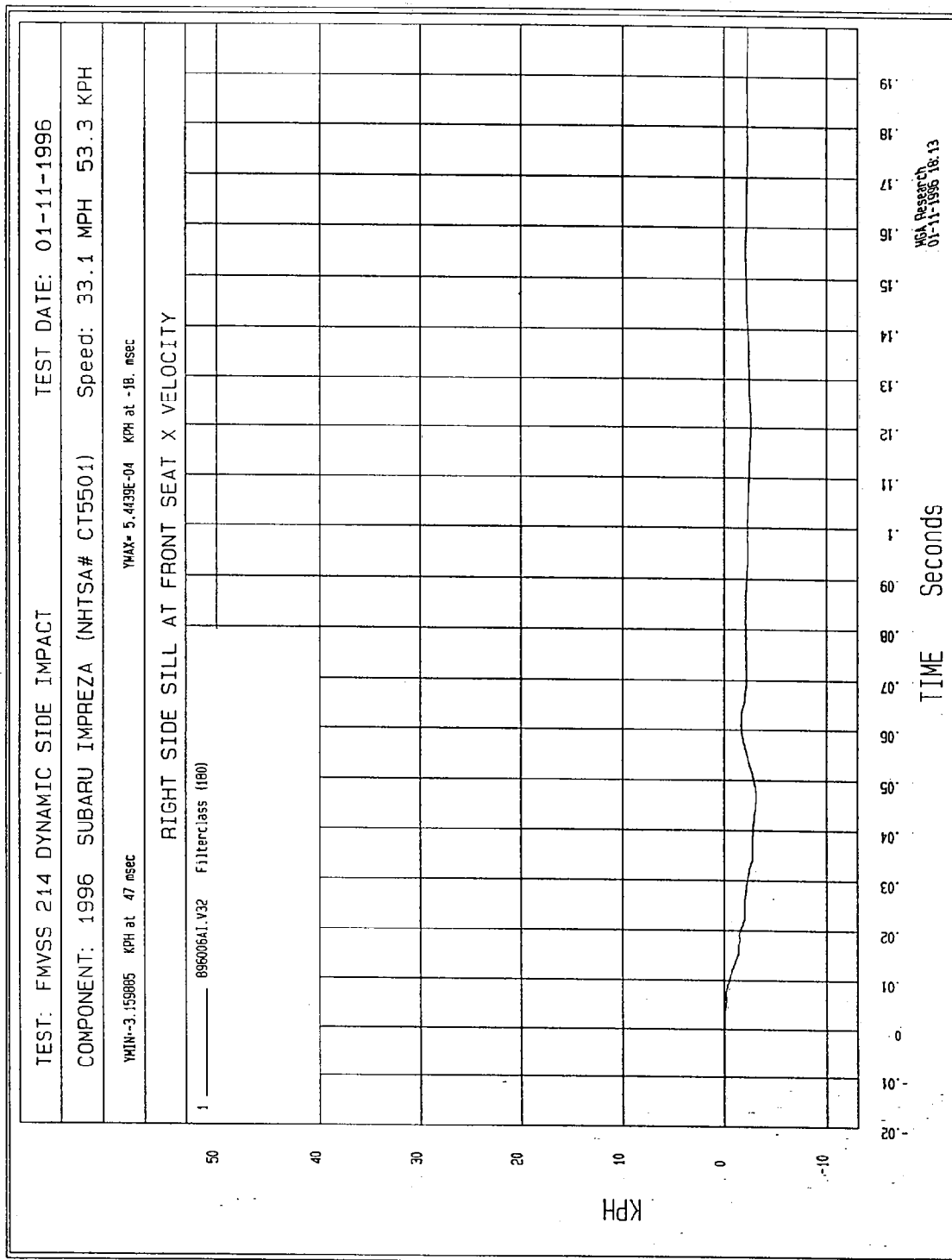


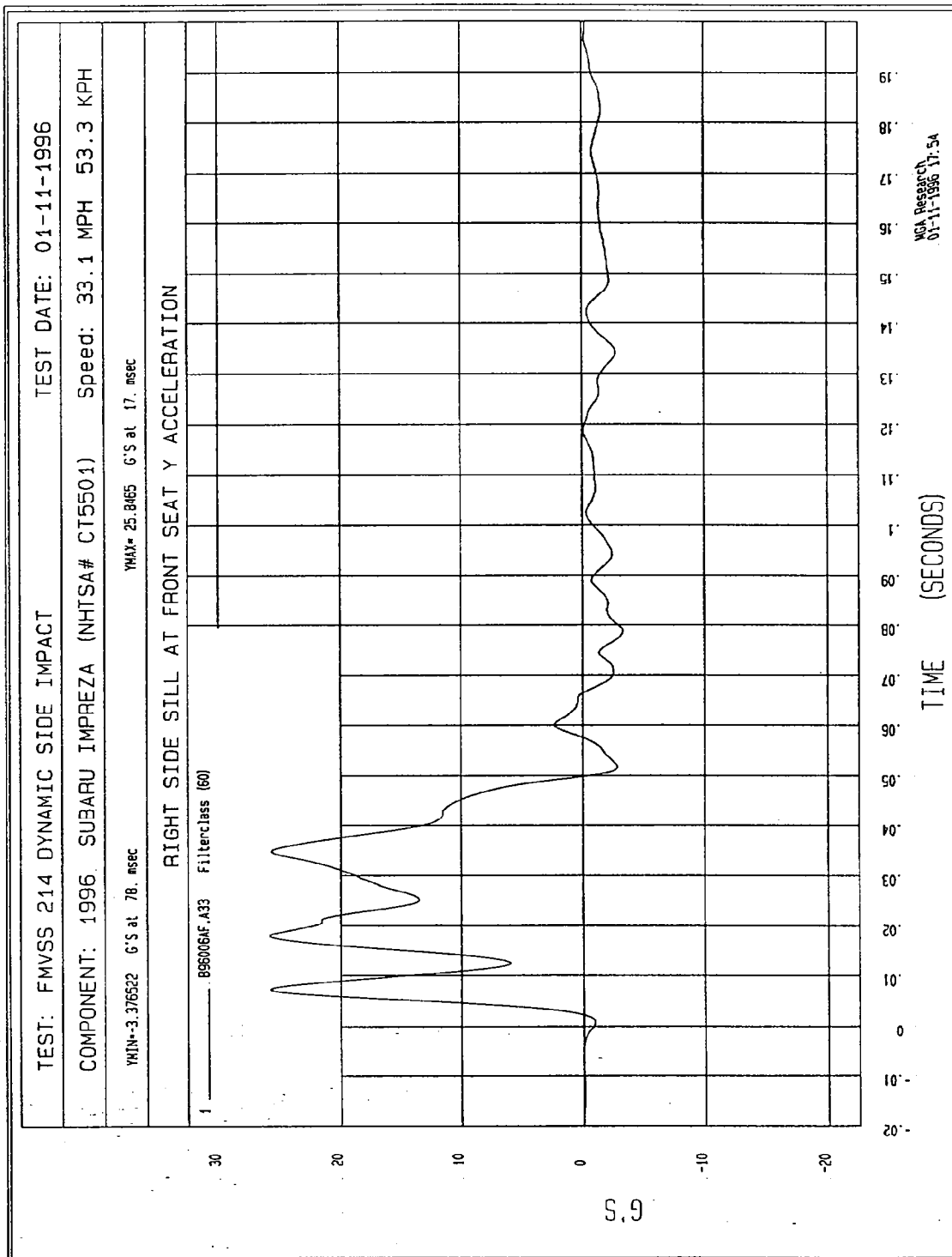


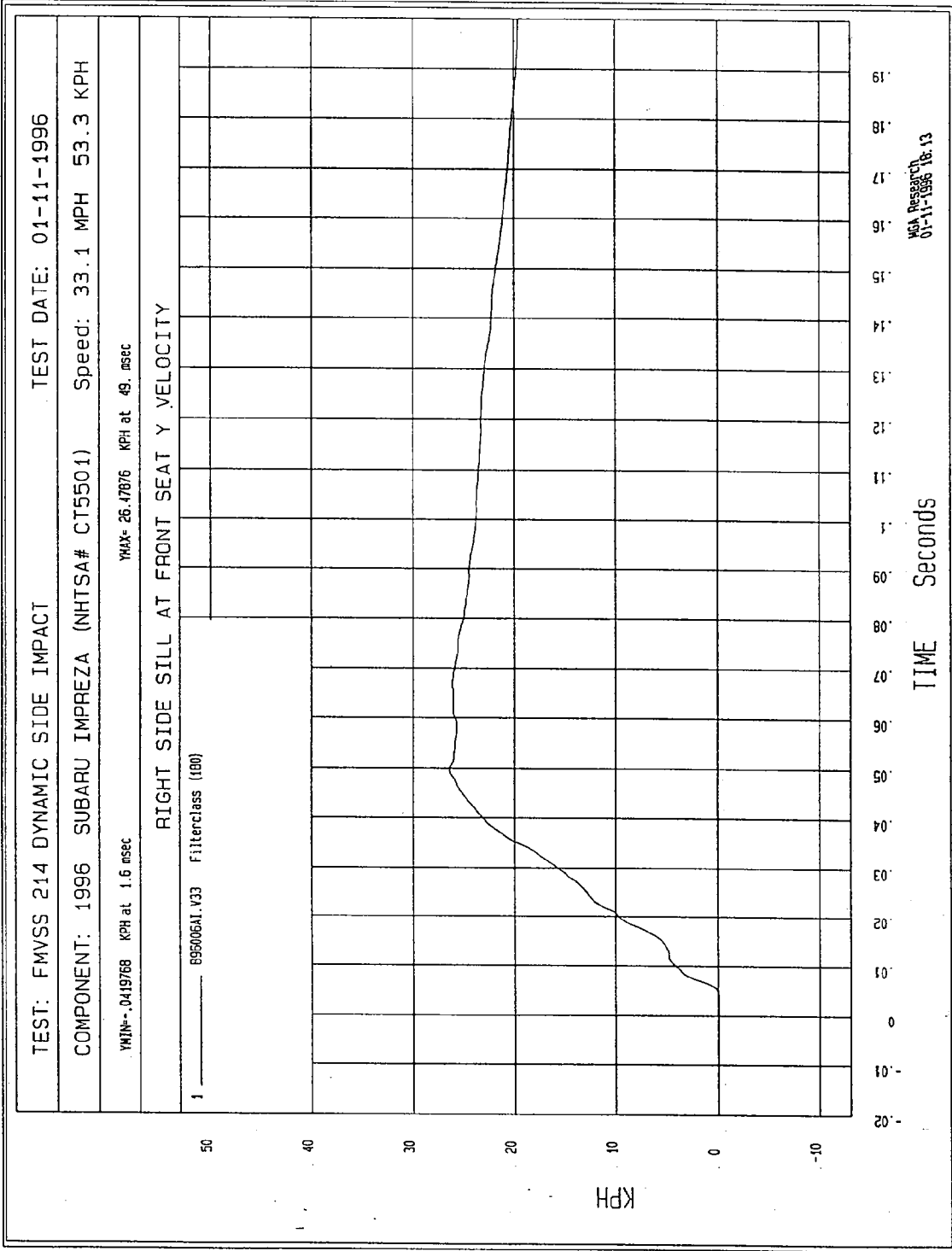


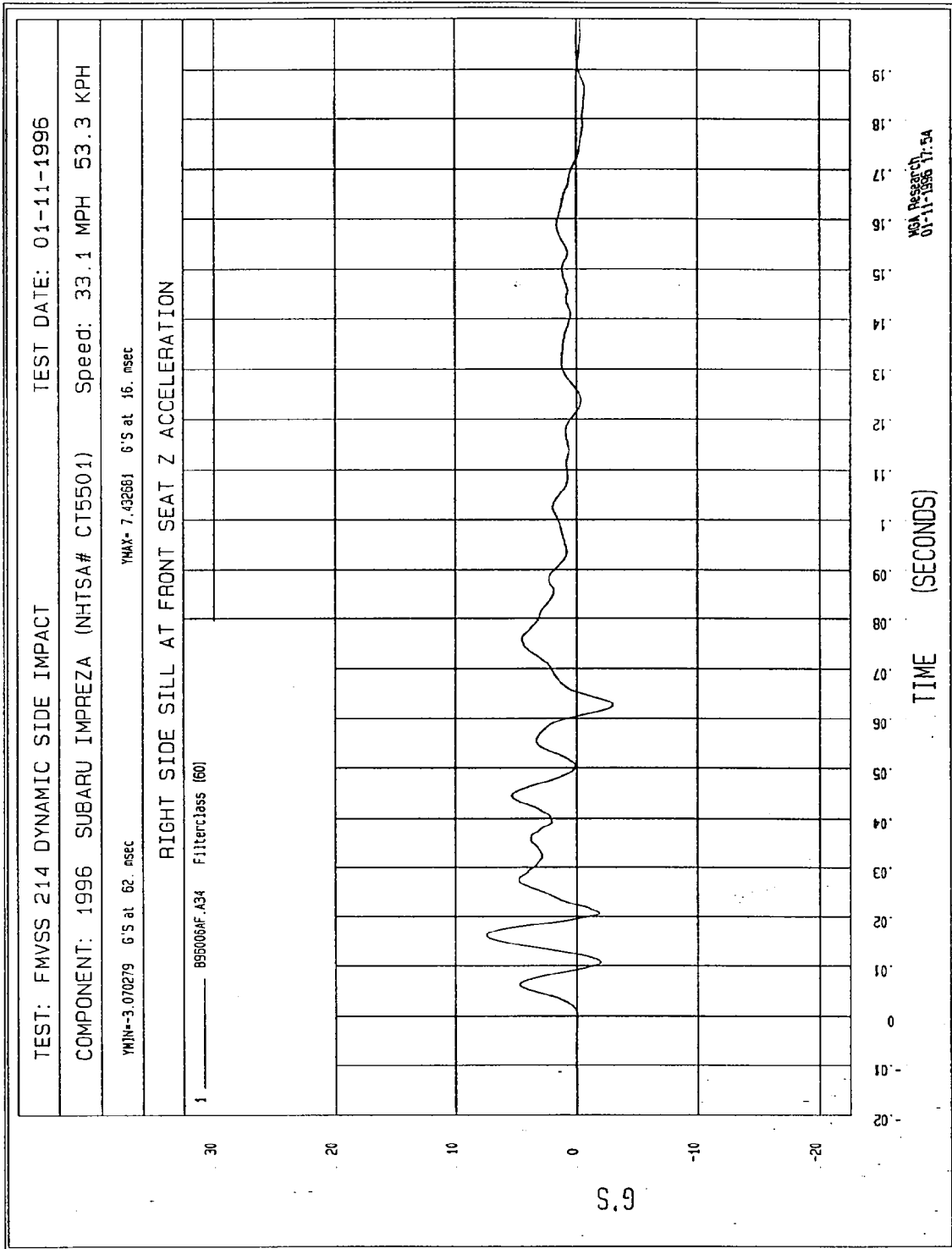


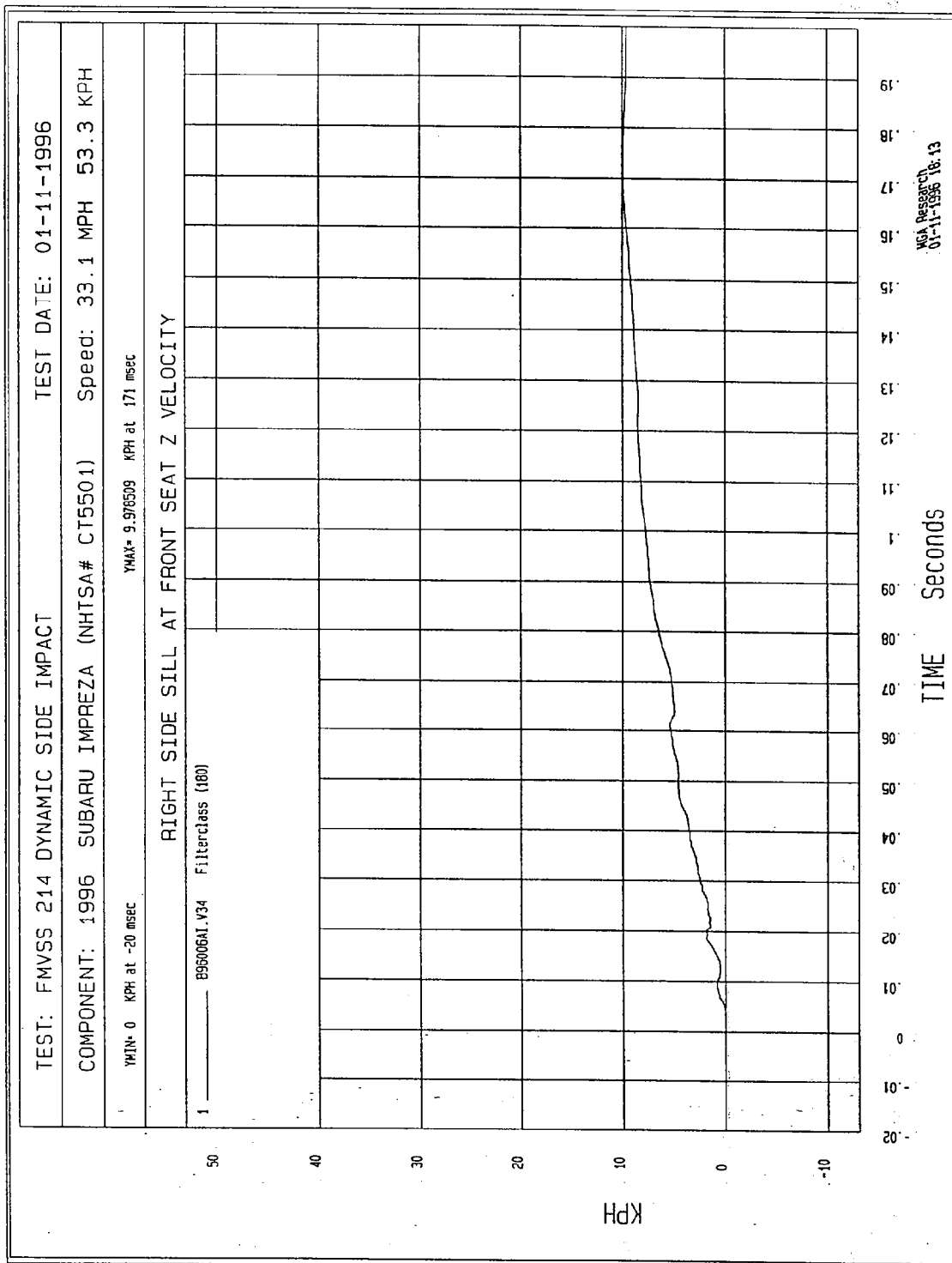


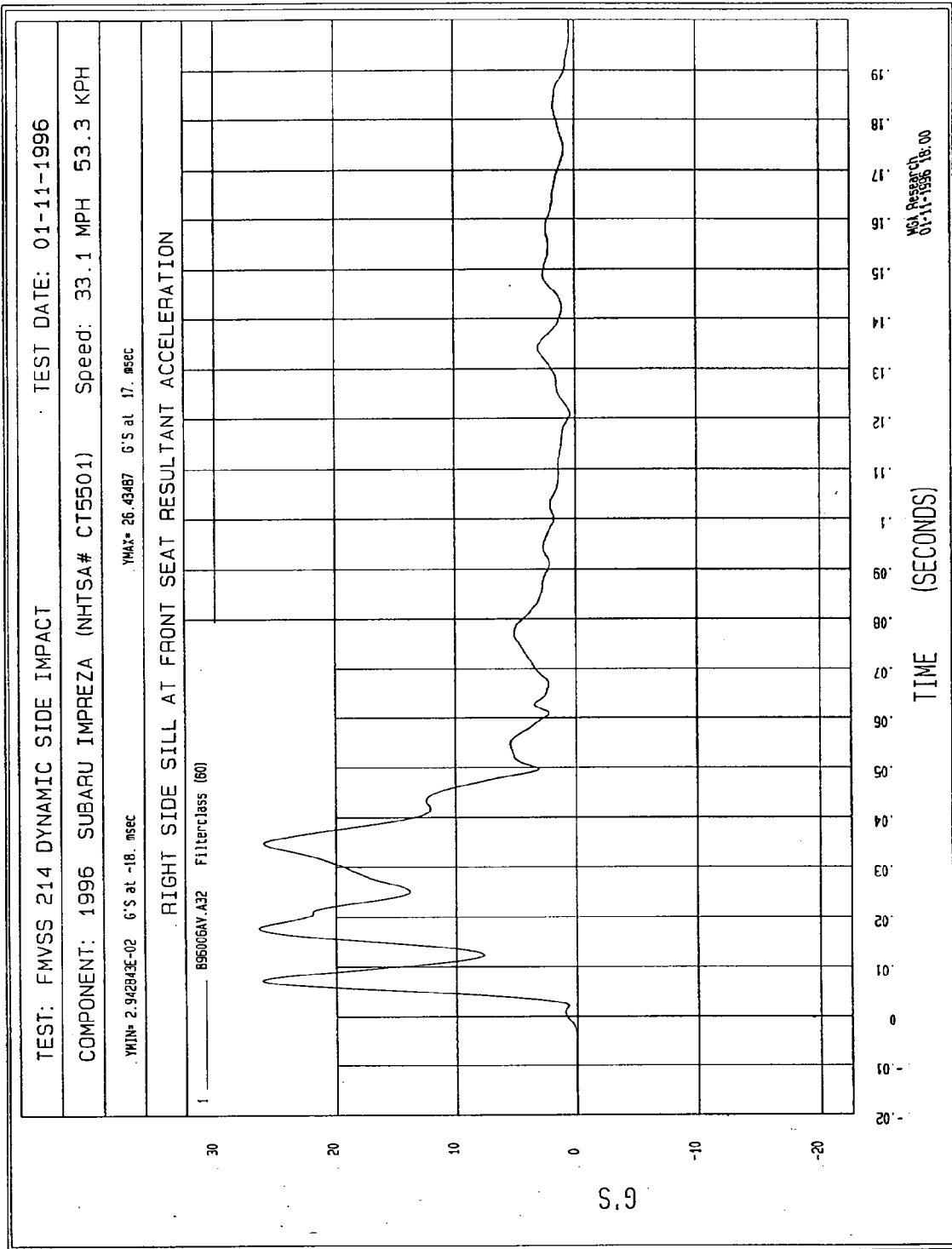


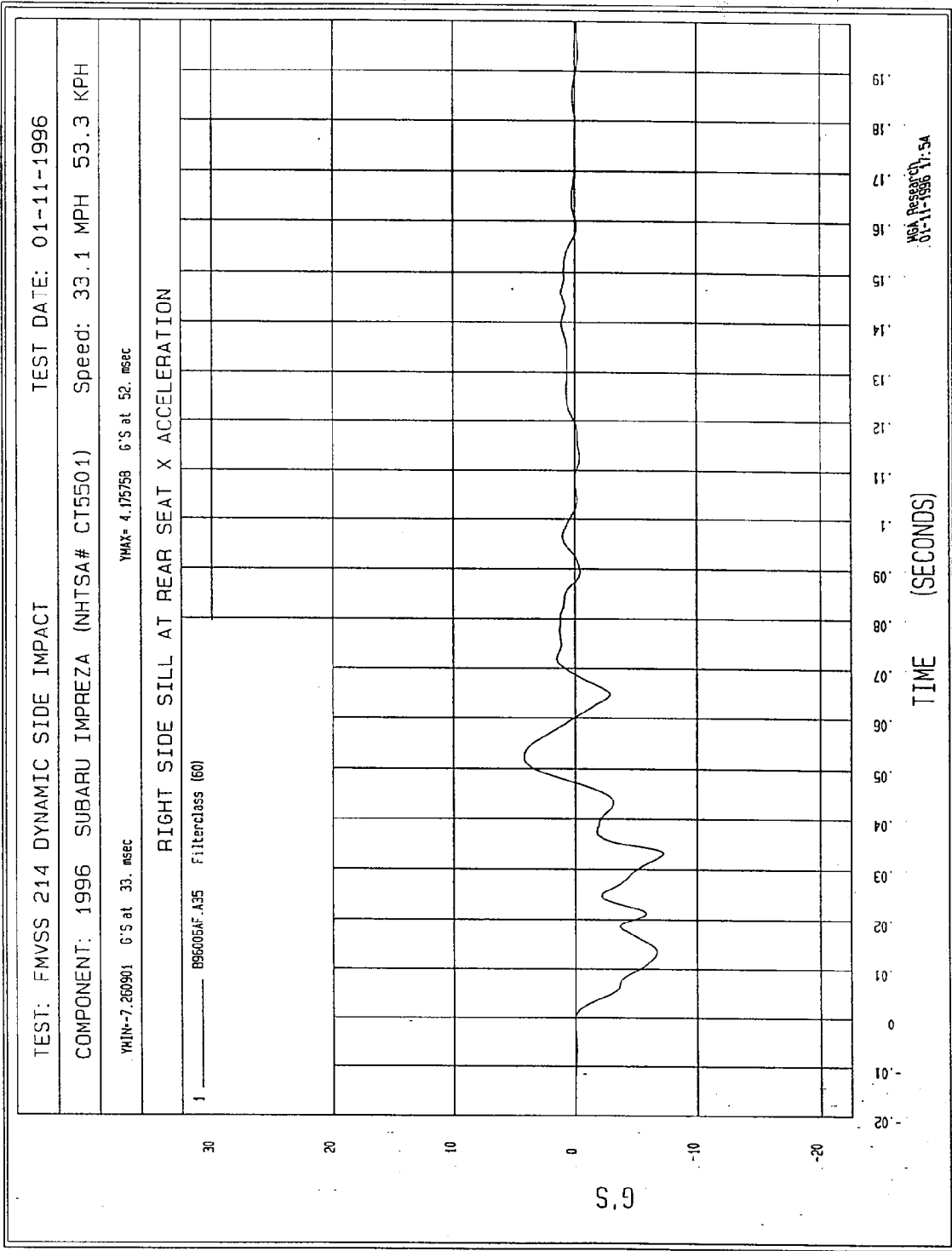


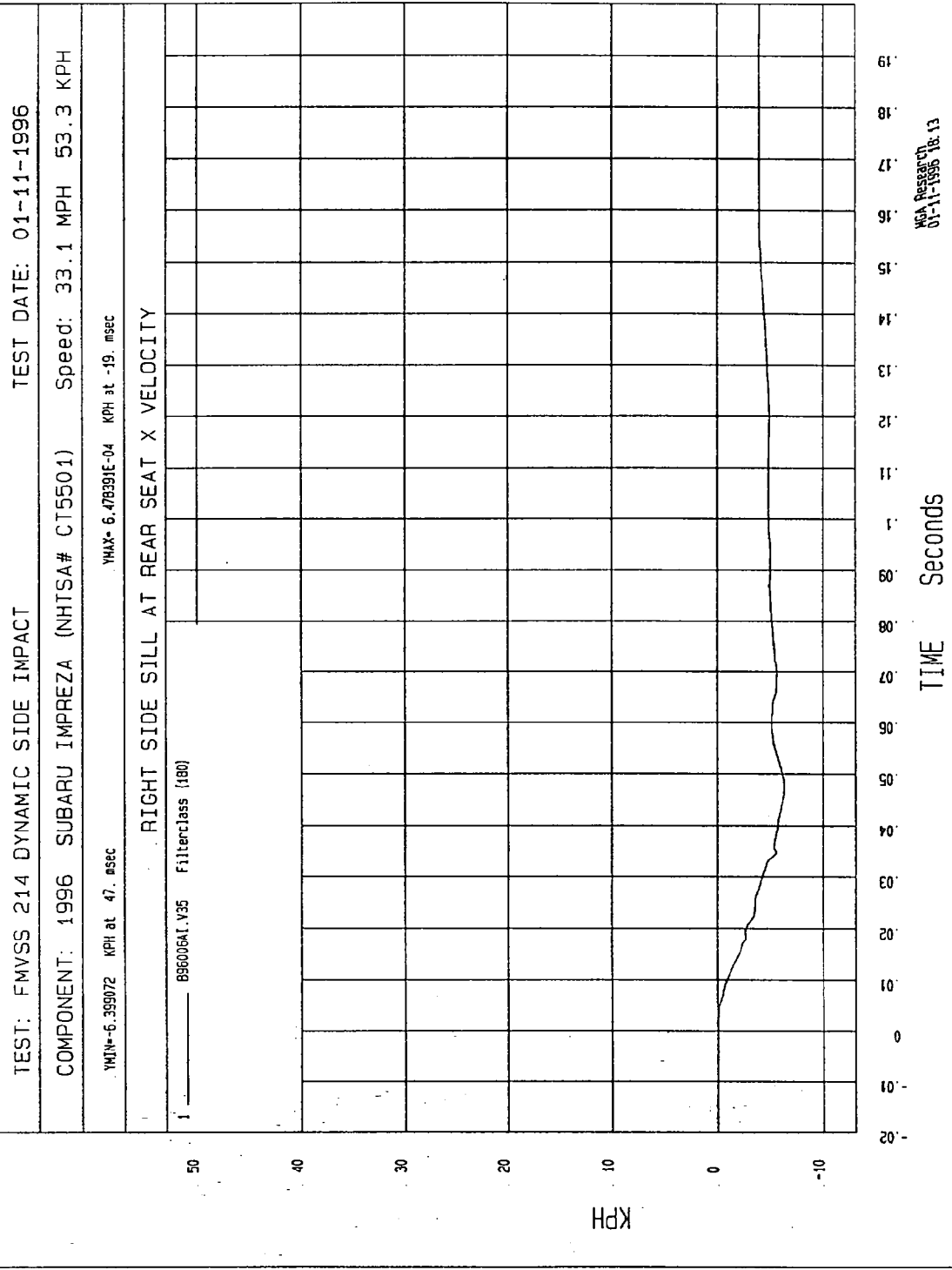


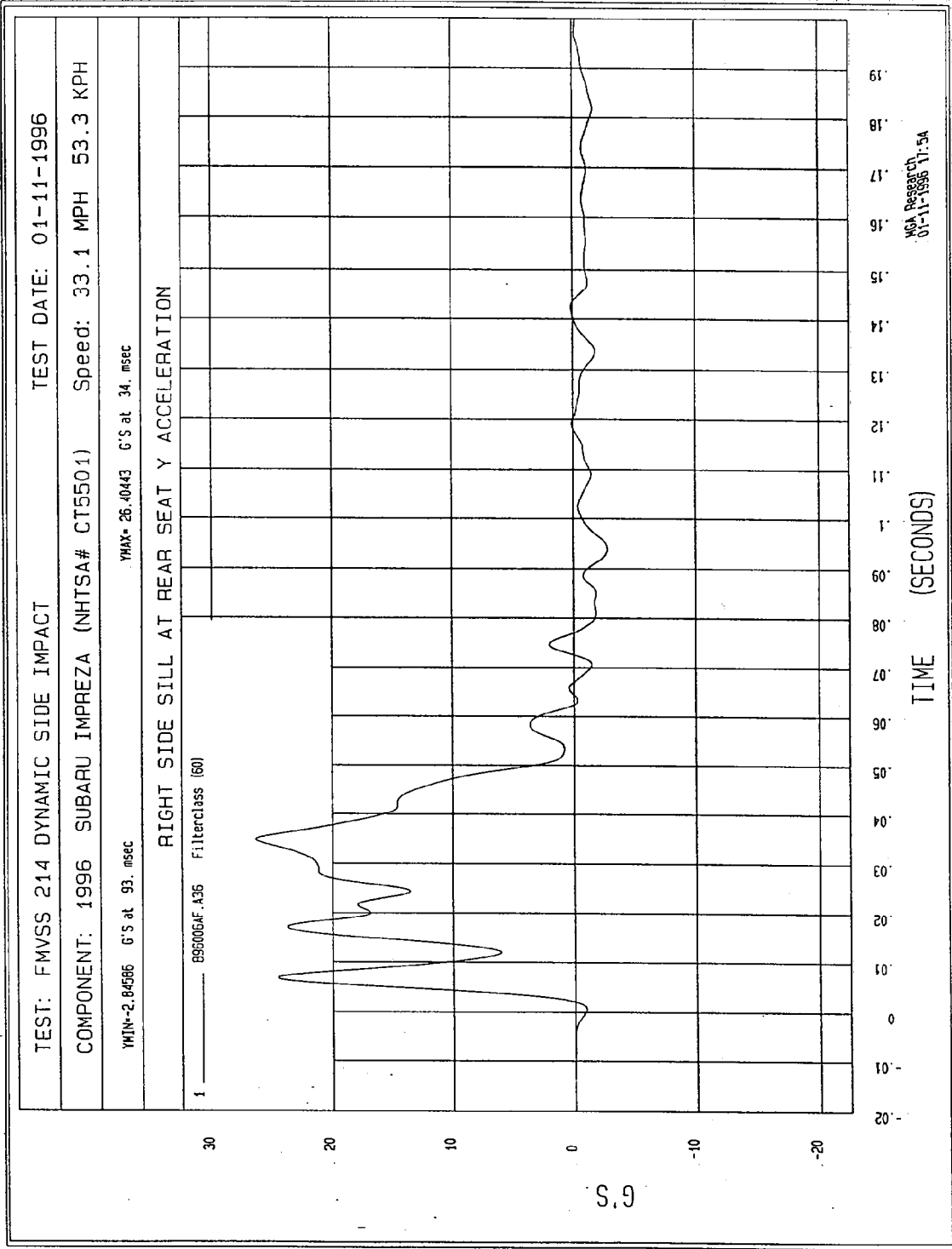


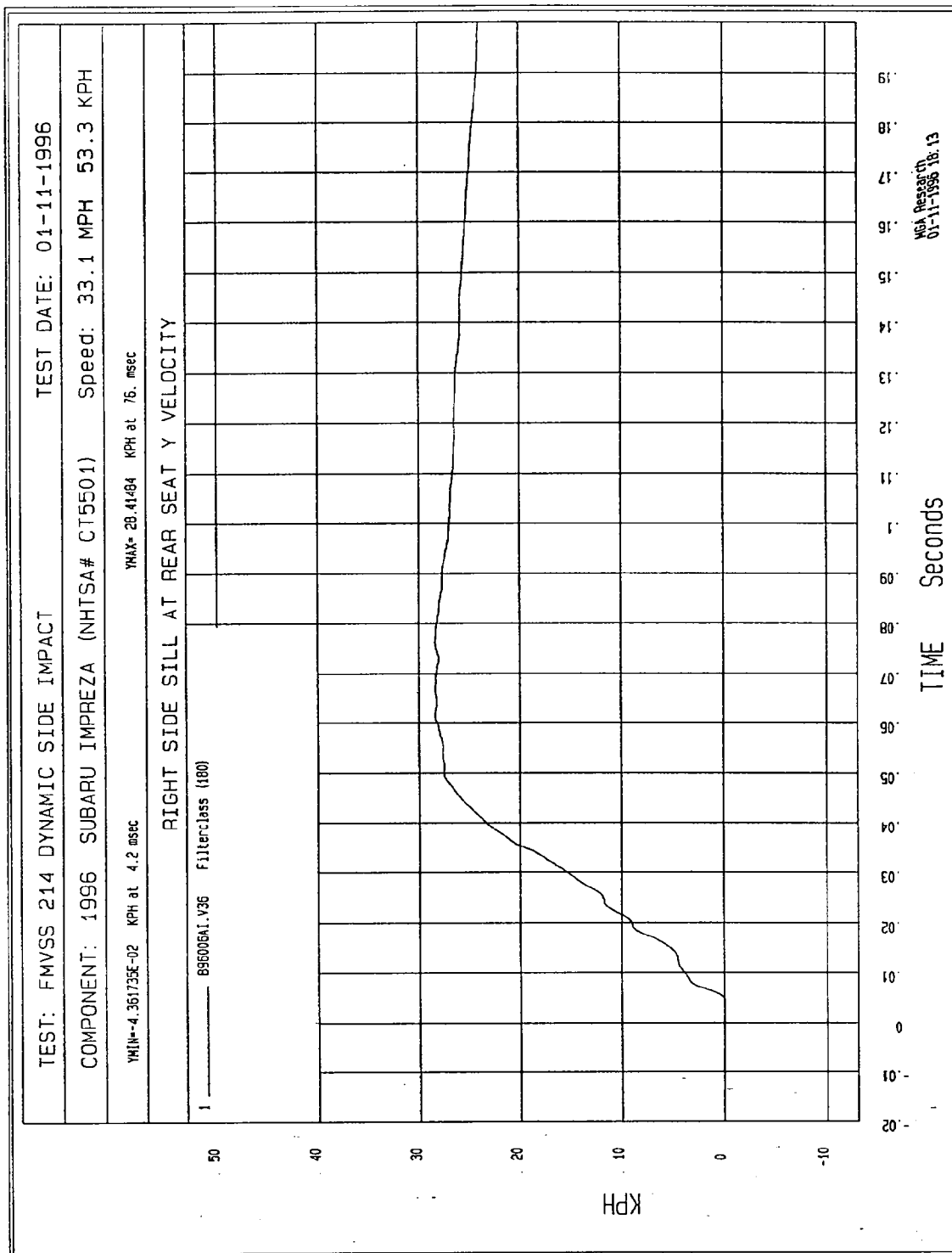


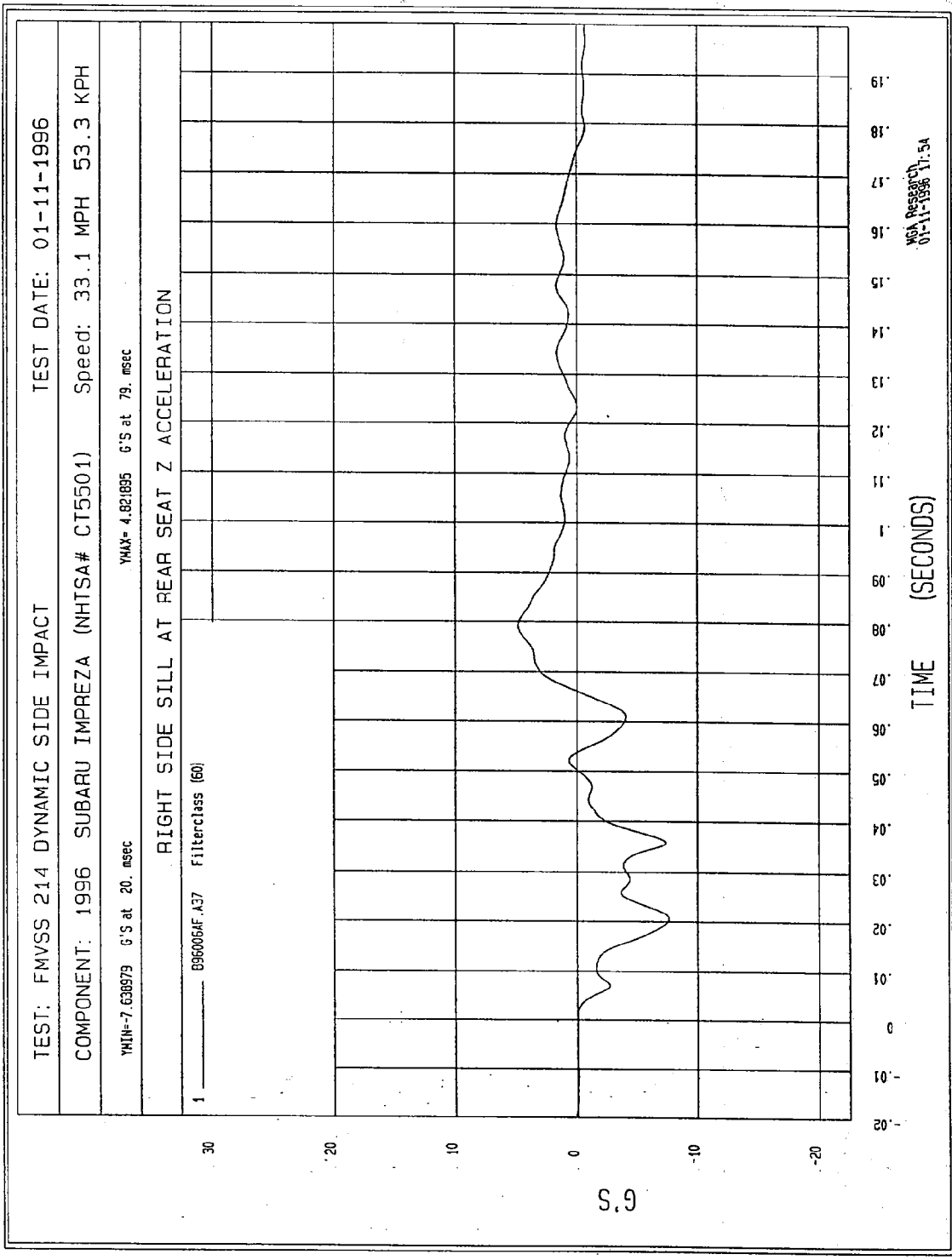


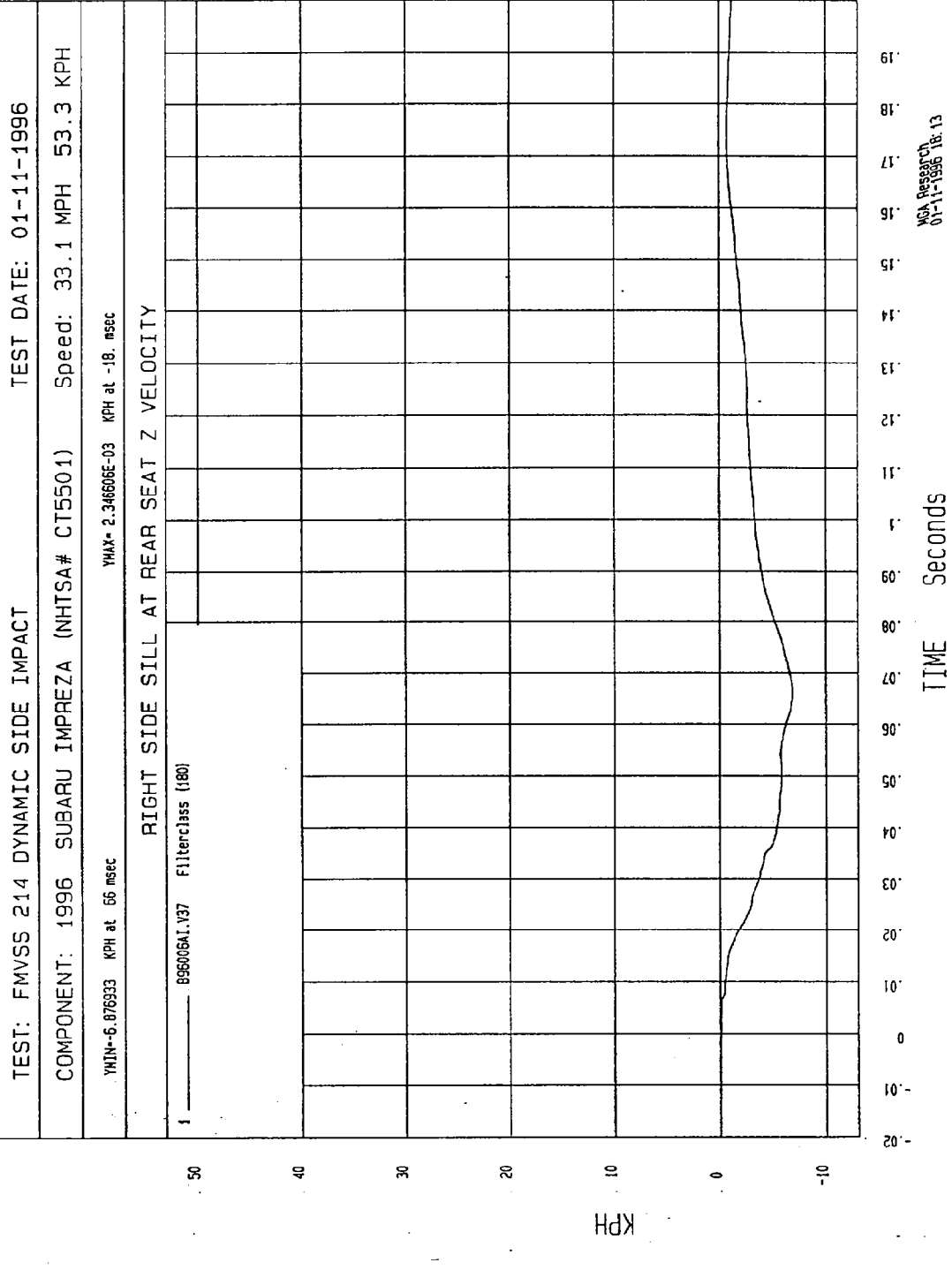


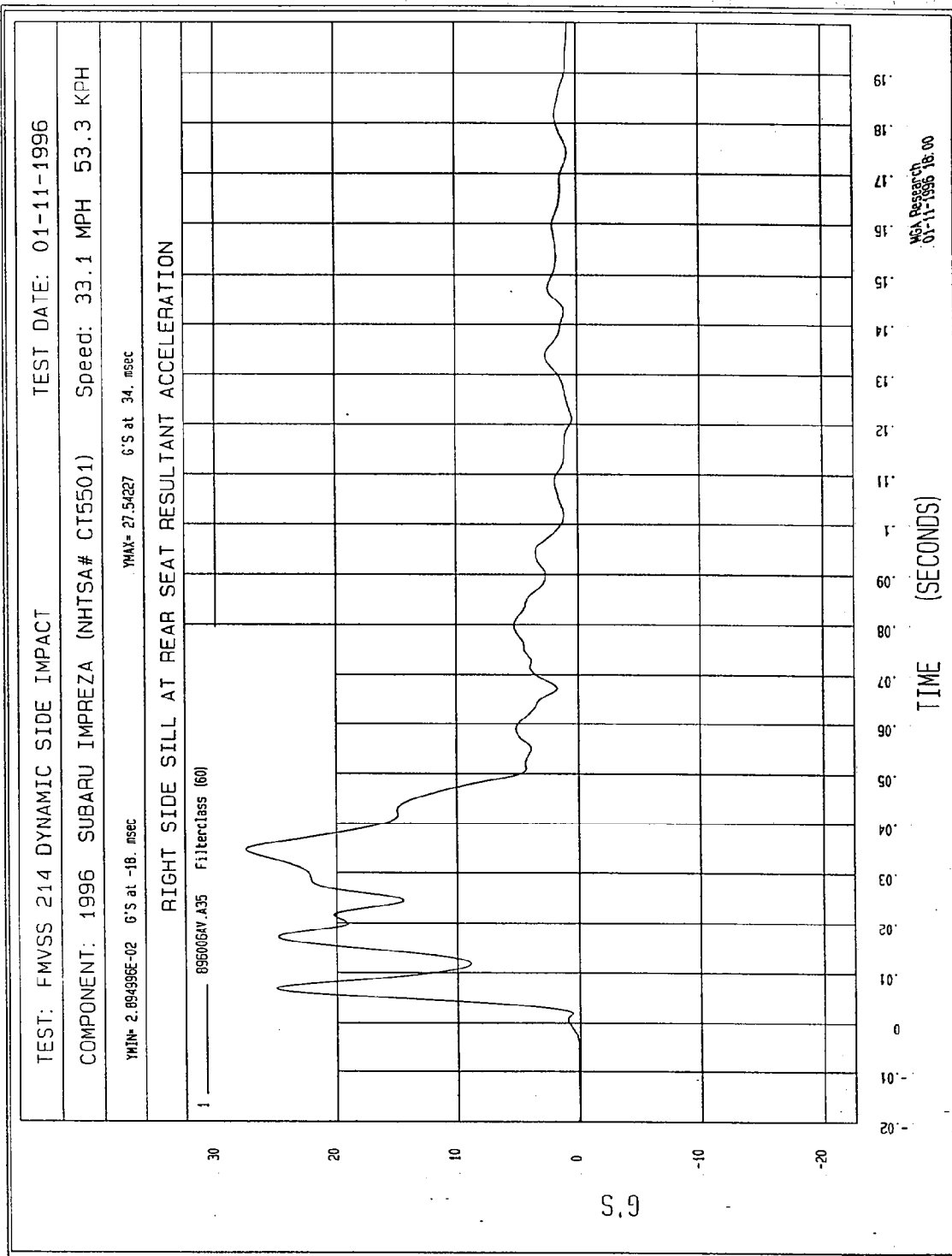










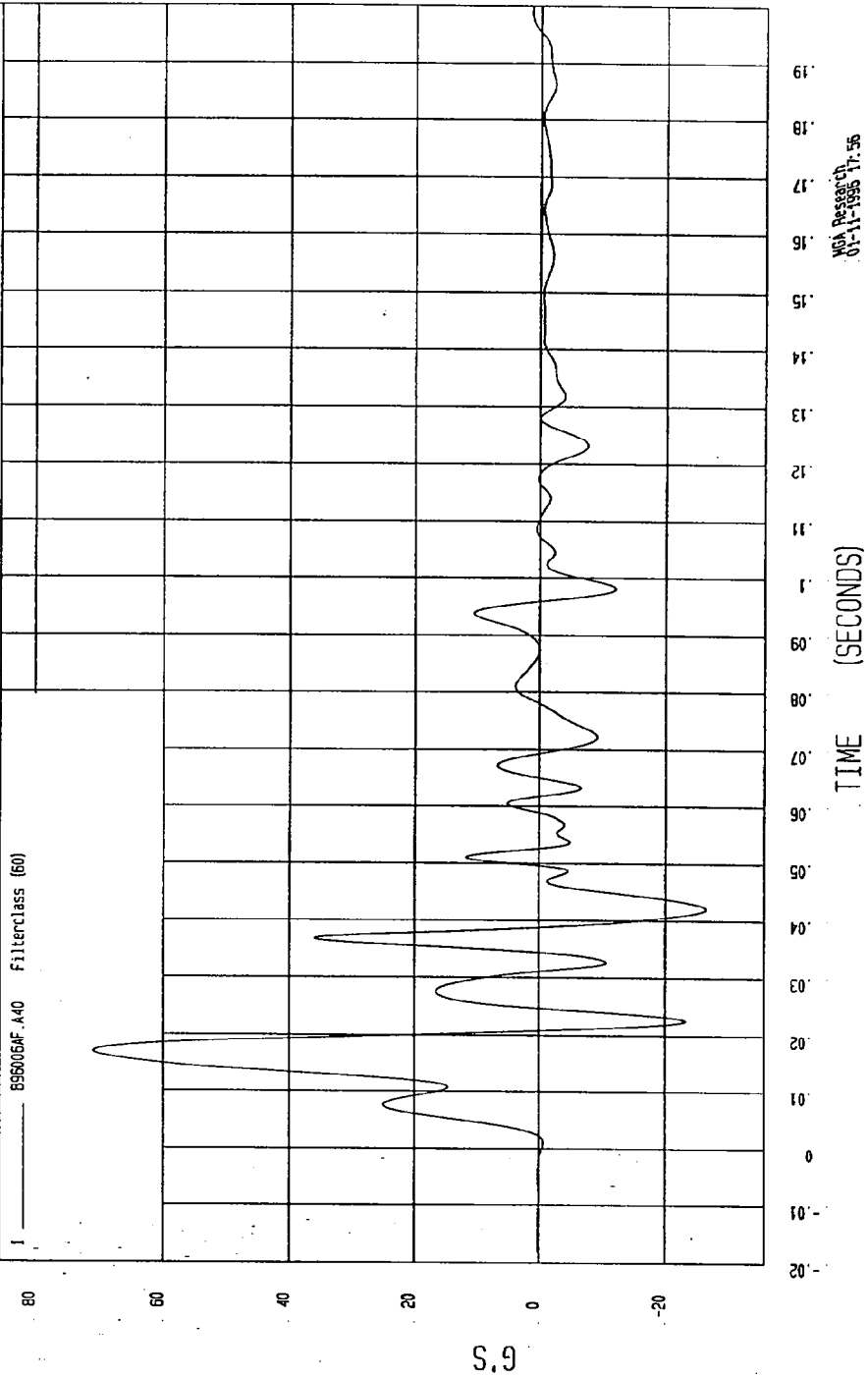


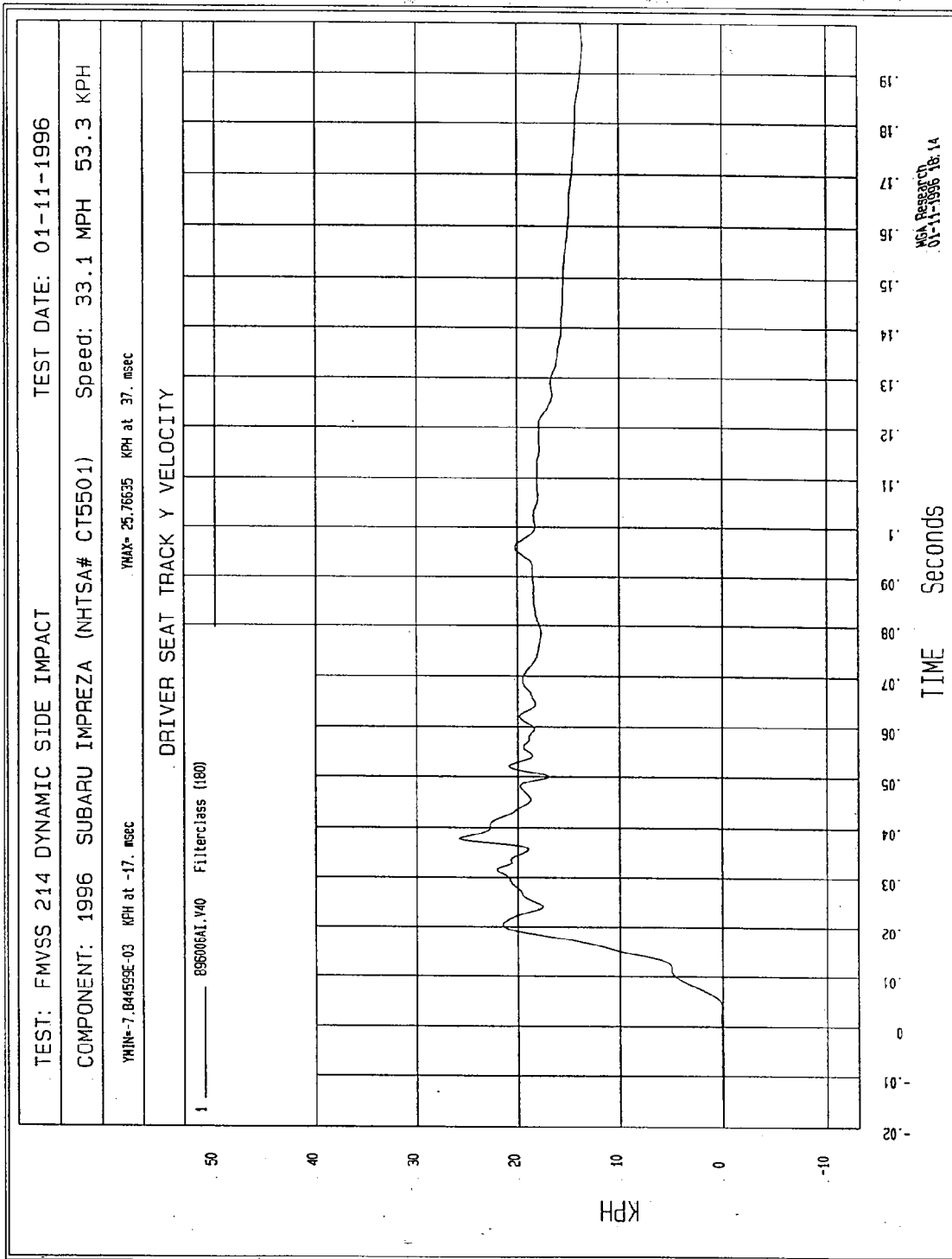
TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 01-11-1996

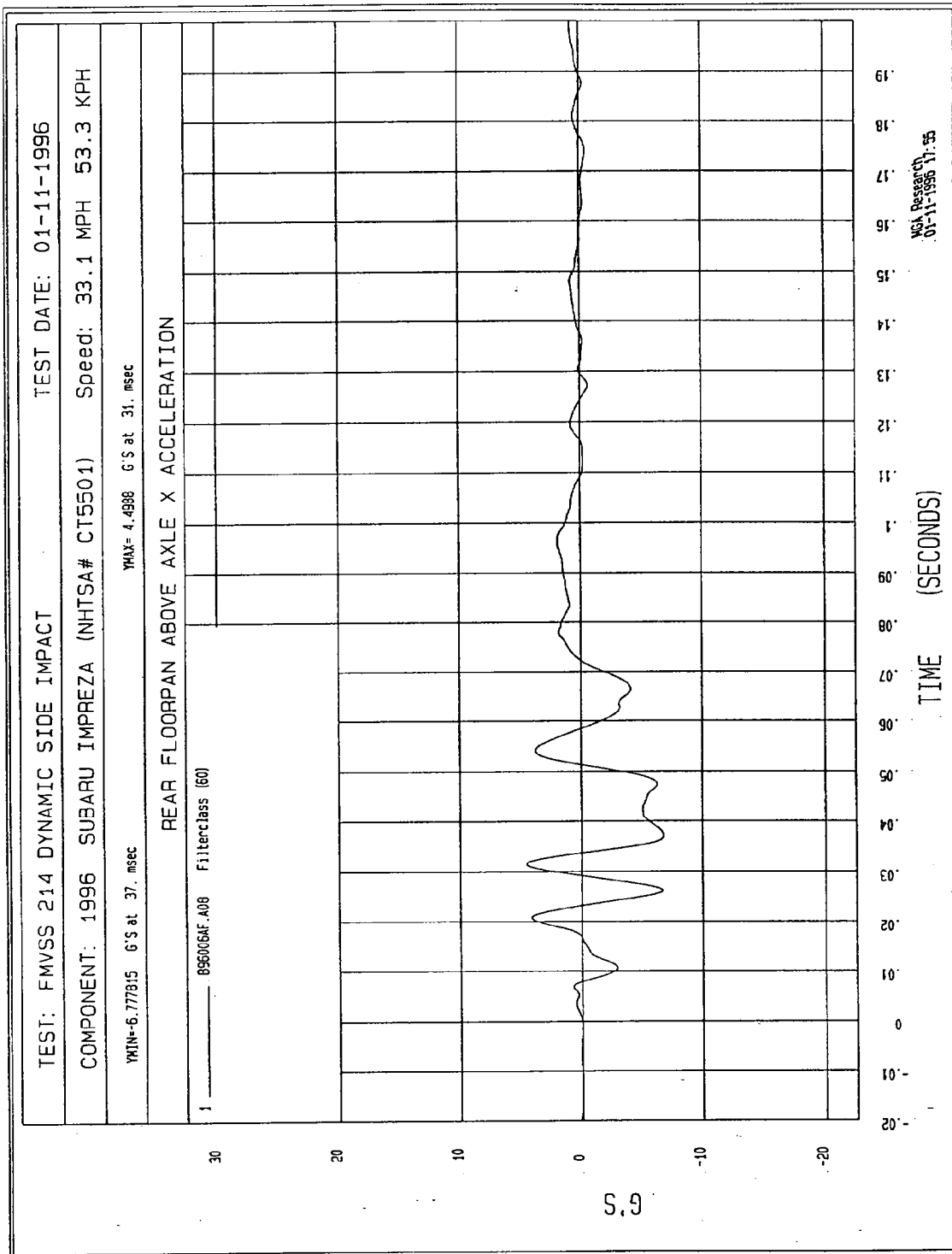
COMPONENT: 1996 SUBARU IMPREZA (NHTSA# CT5501) Speed: 33.1 MPH 53.3 KPH

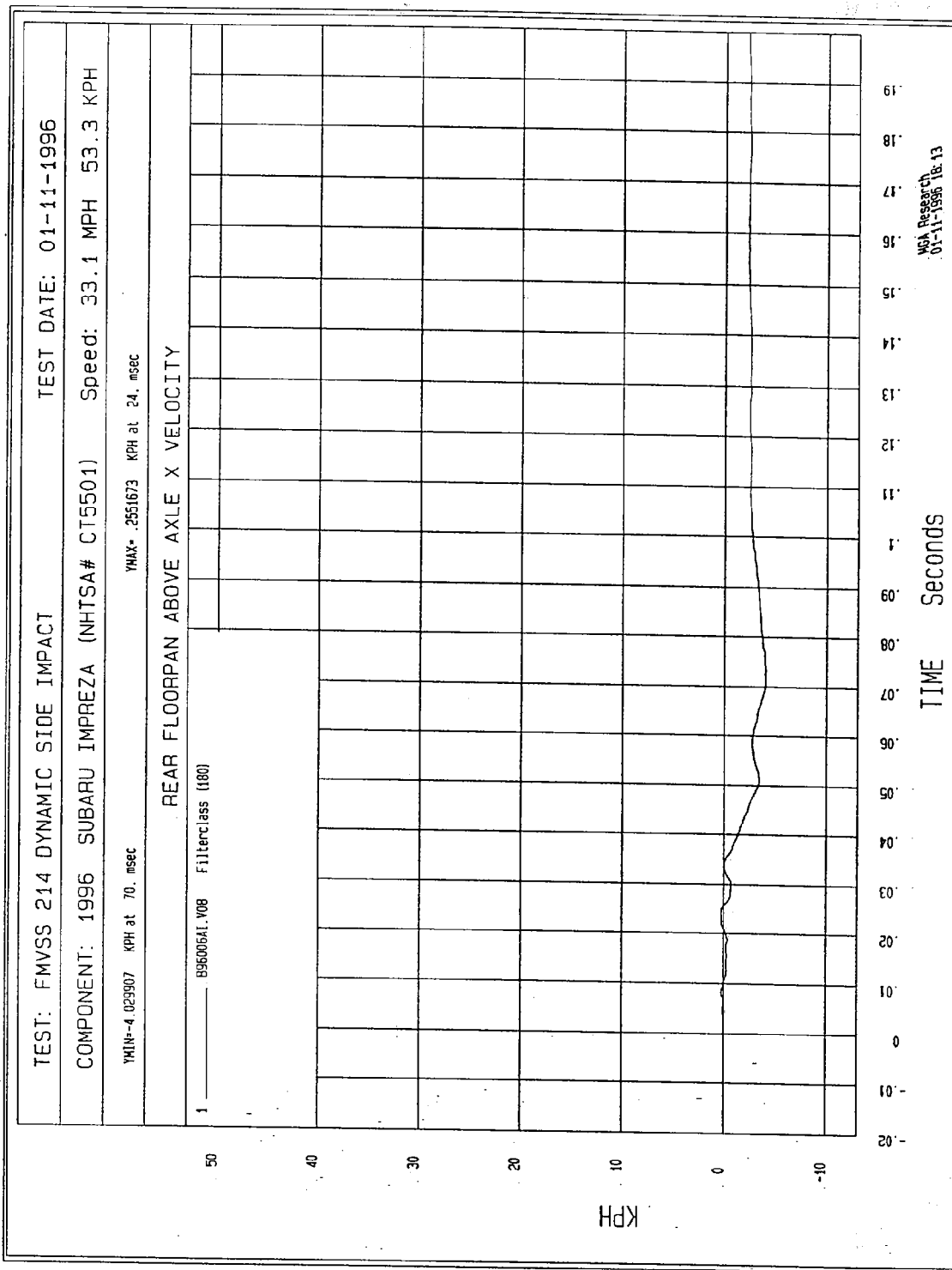
YMIN=-26.43231 G'S at 42. msec YMAX= 70.91339 G'S at 16. msec

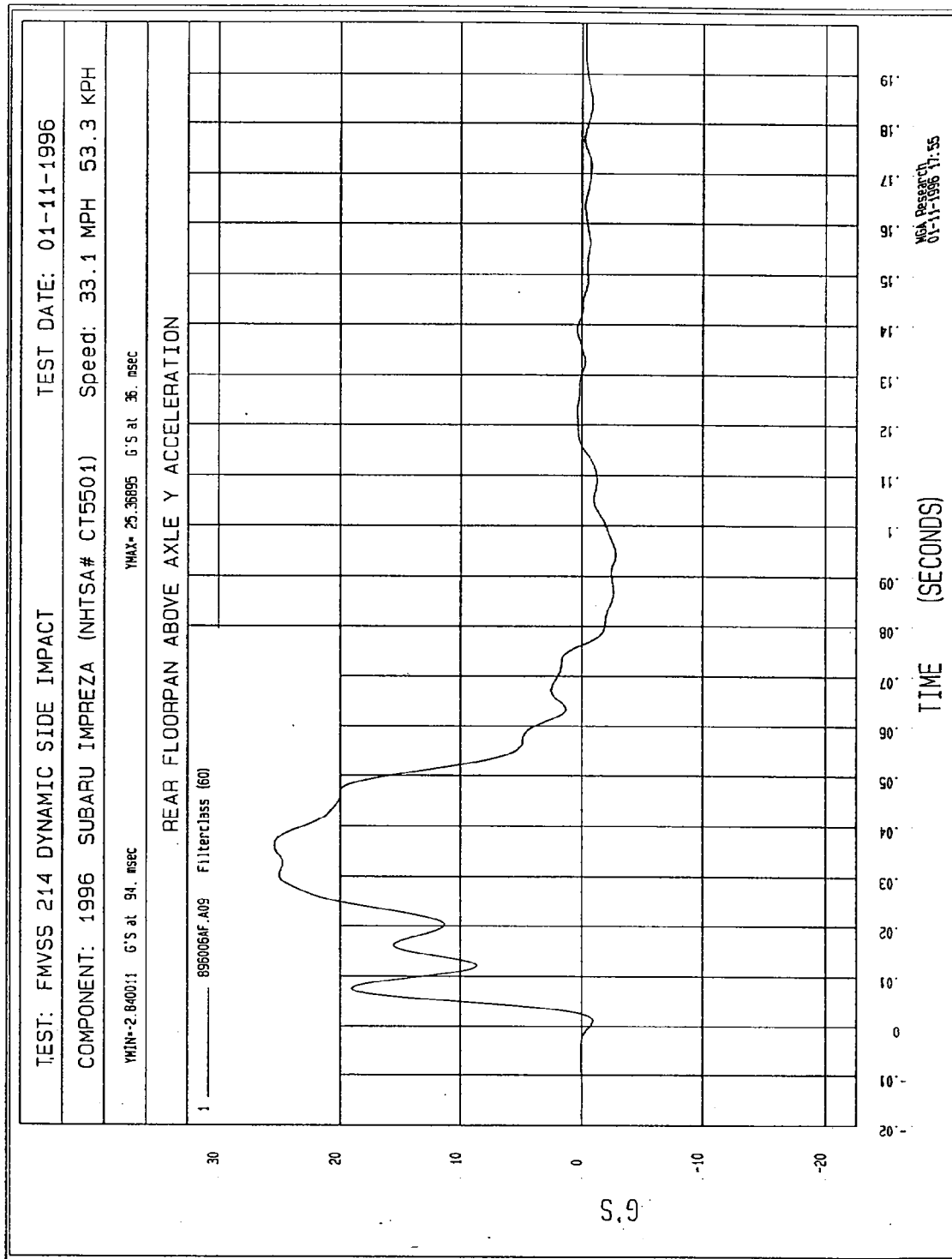
DRIVER SEAT TRACK Y ACCELERATION

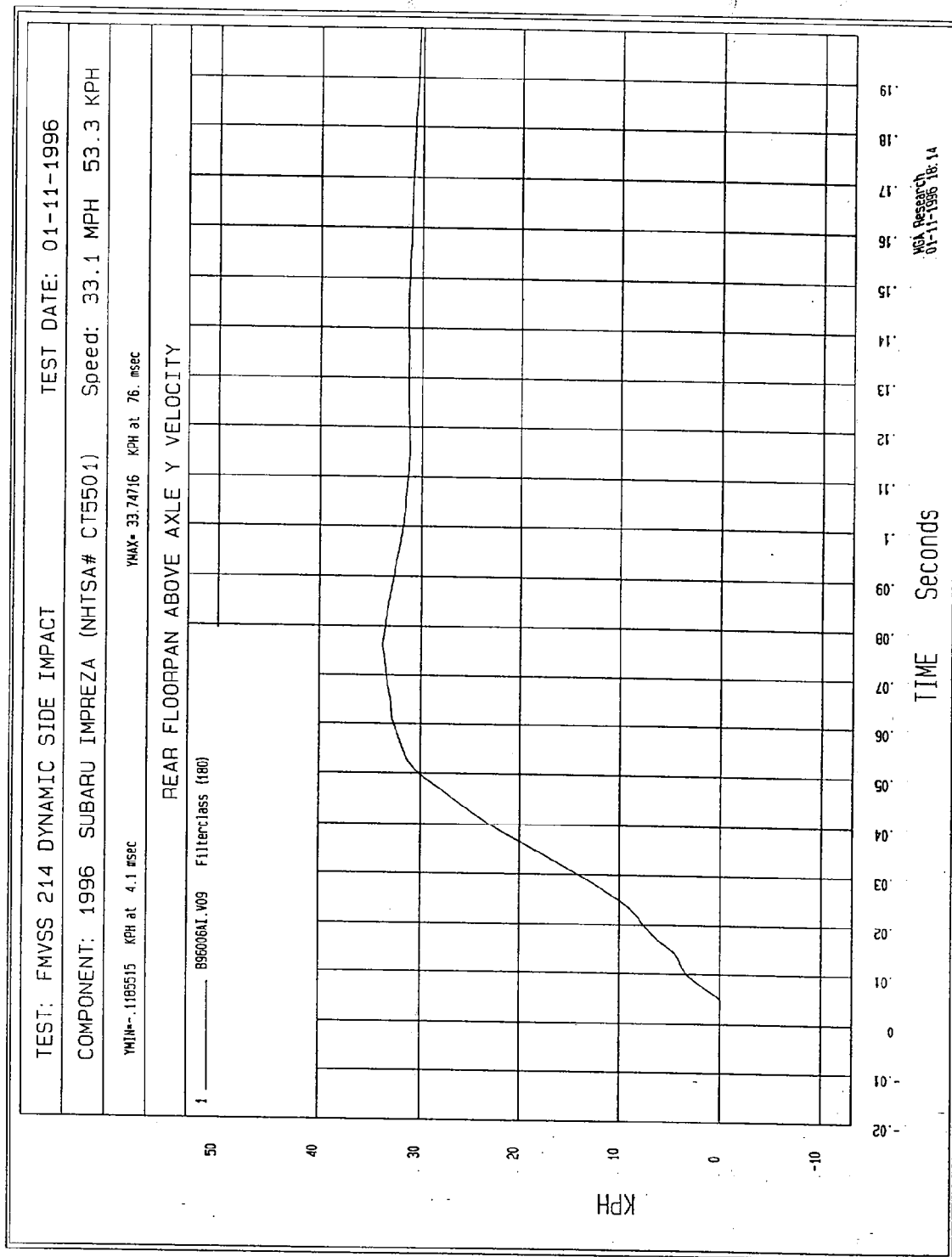


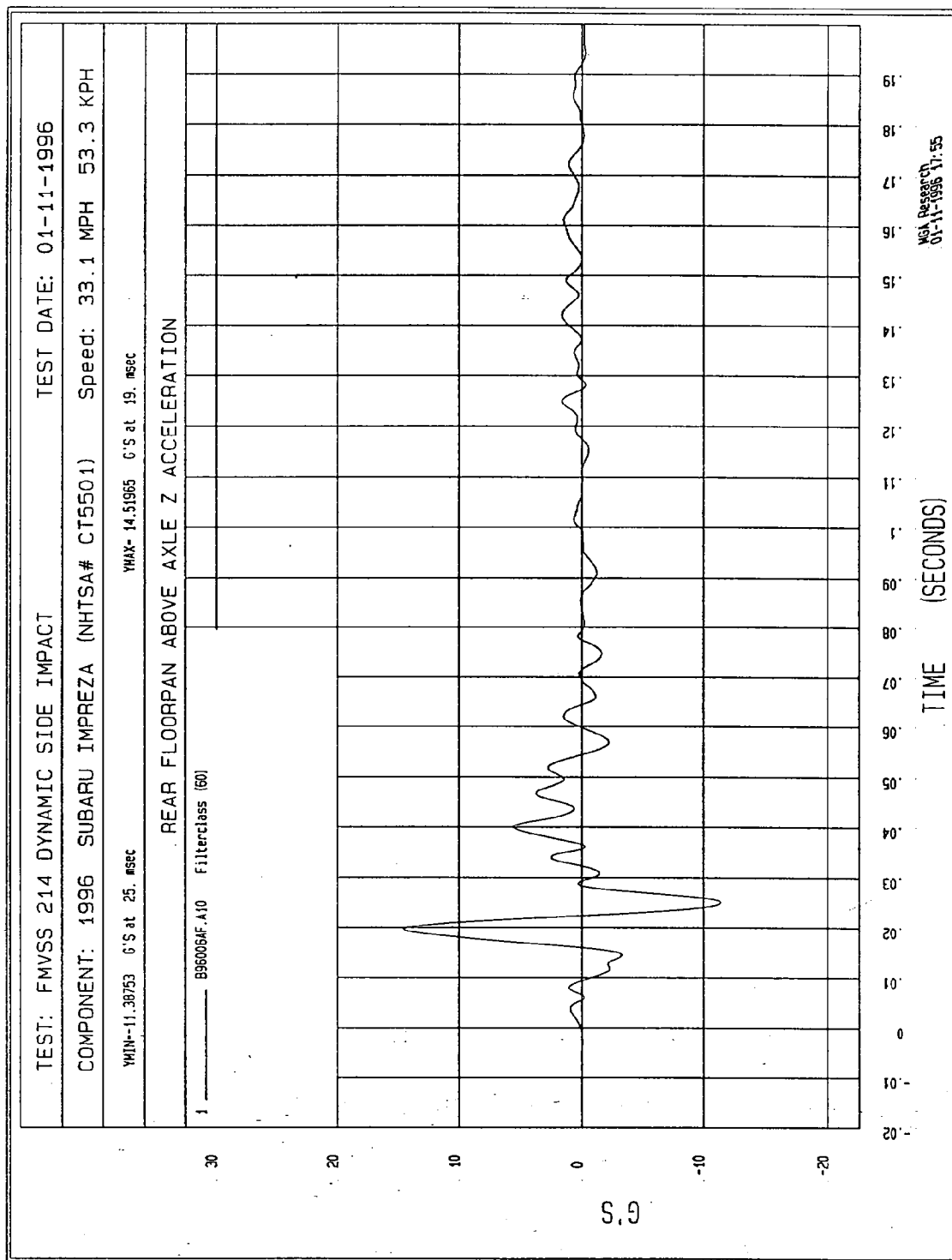


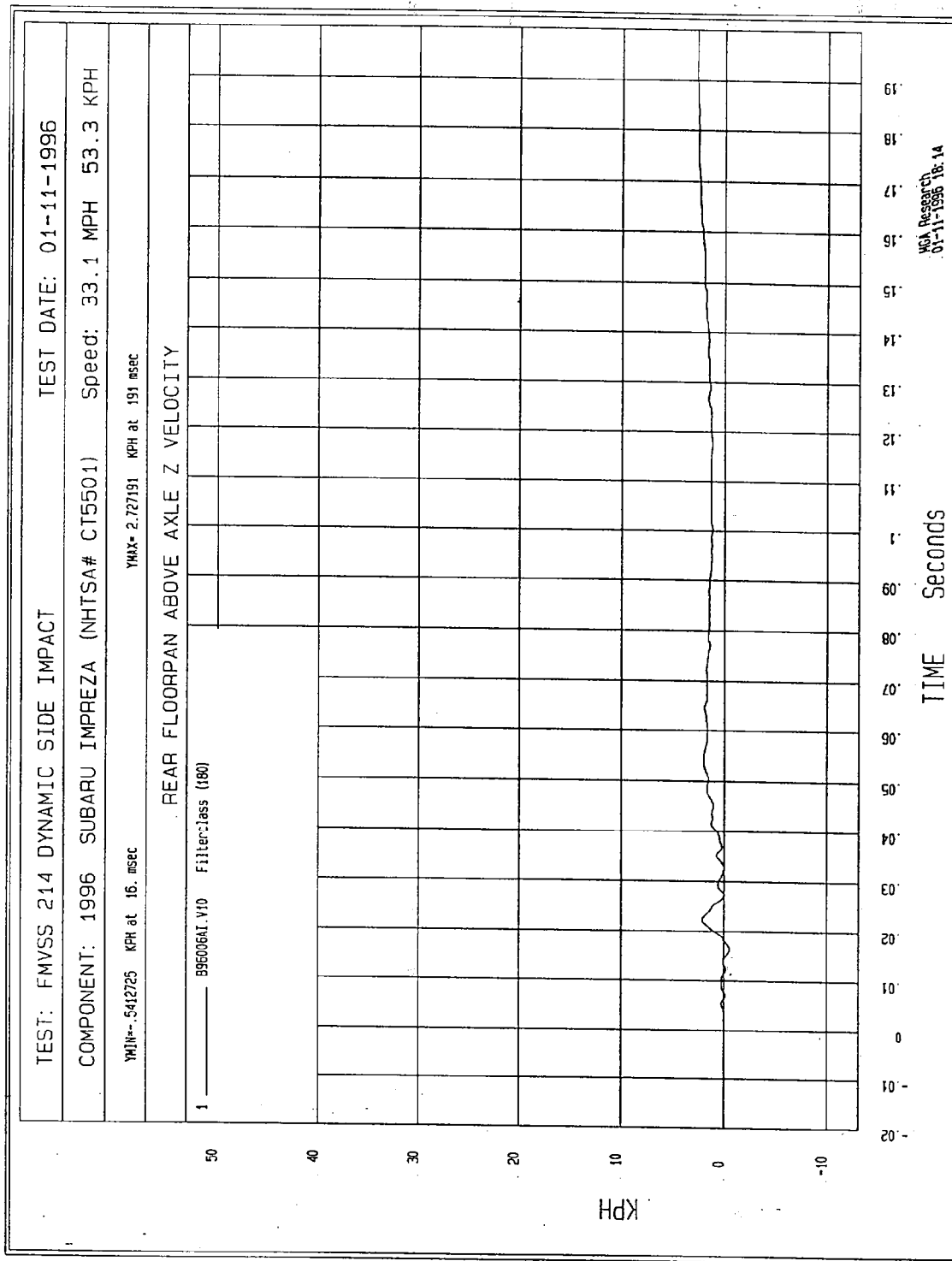


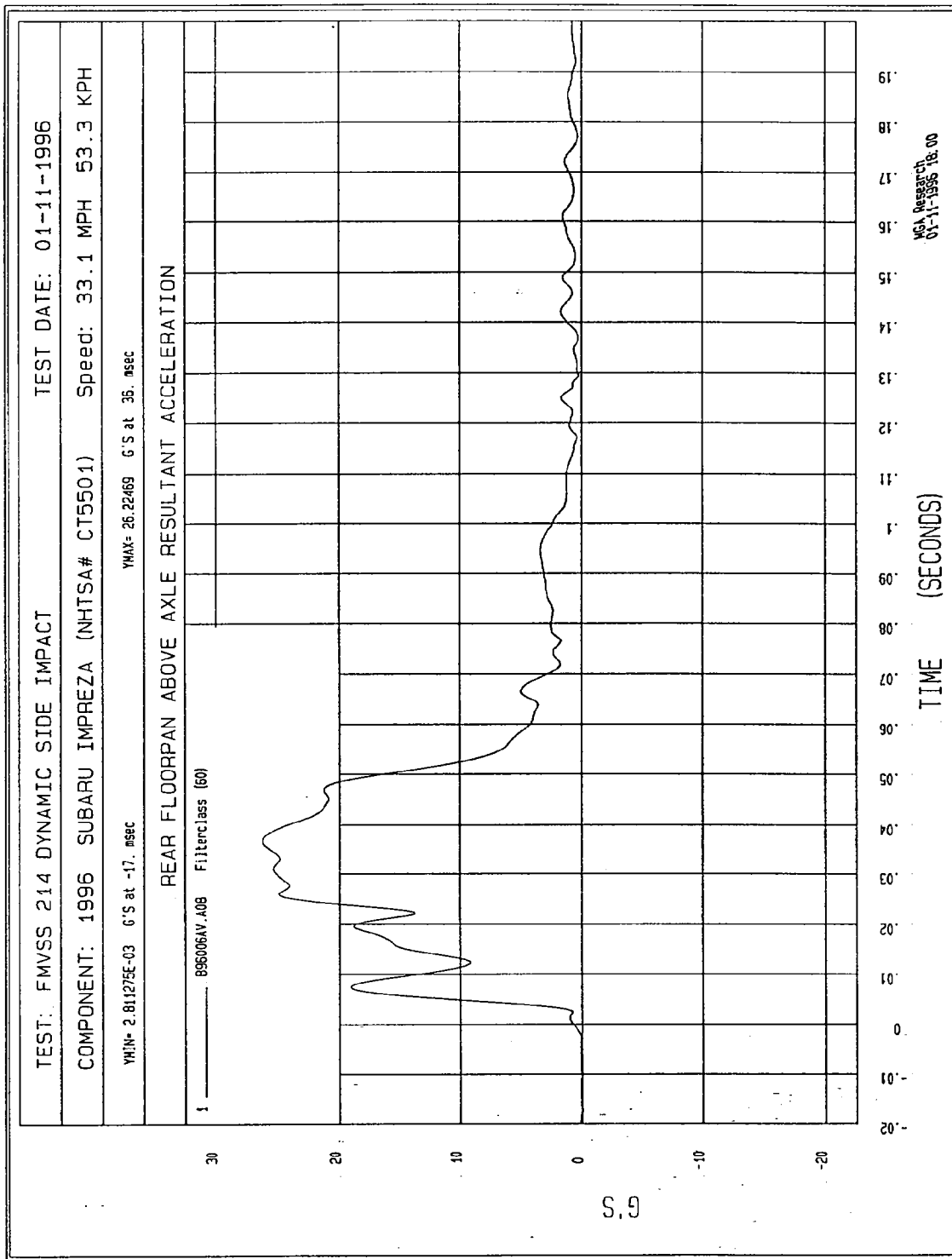


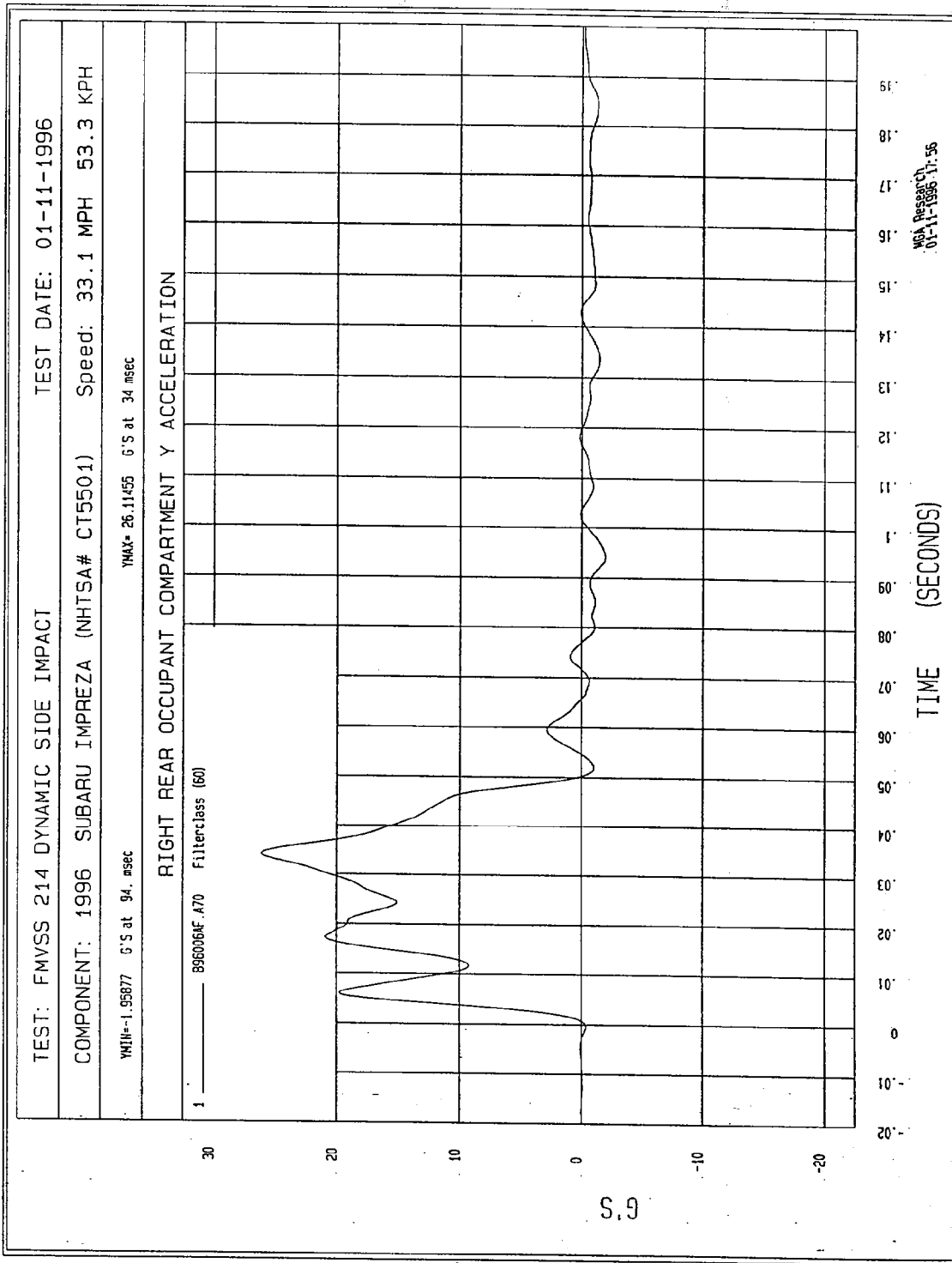


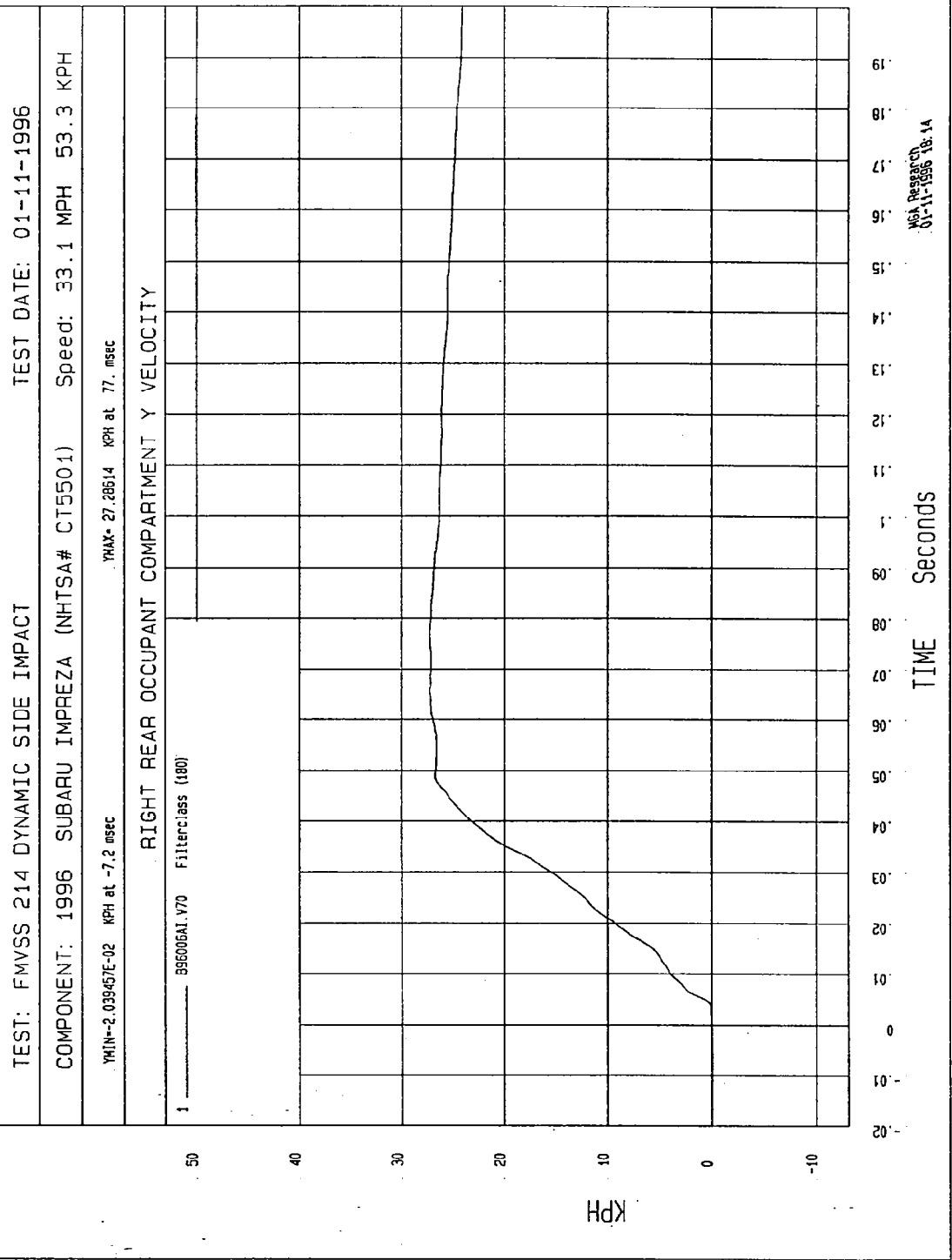


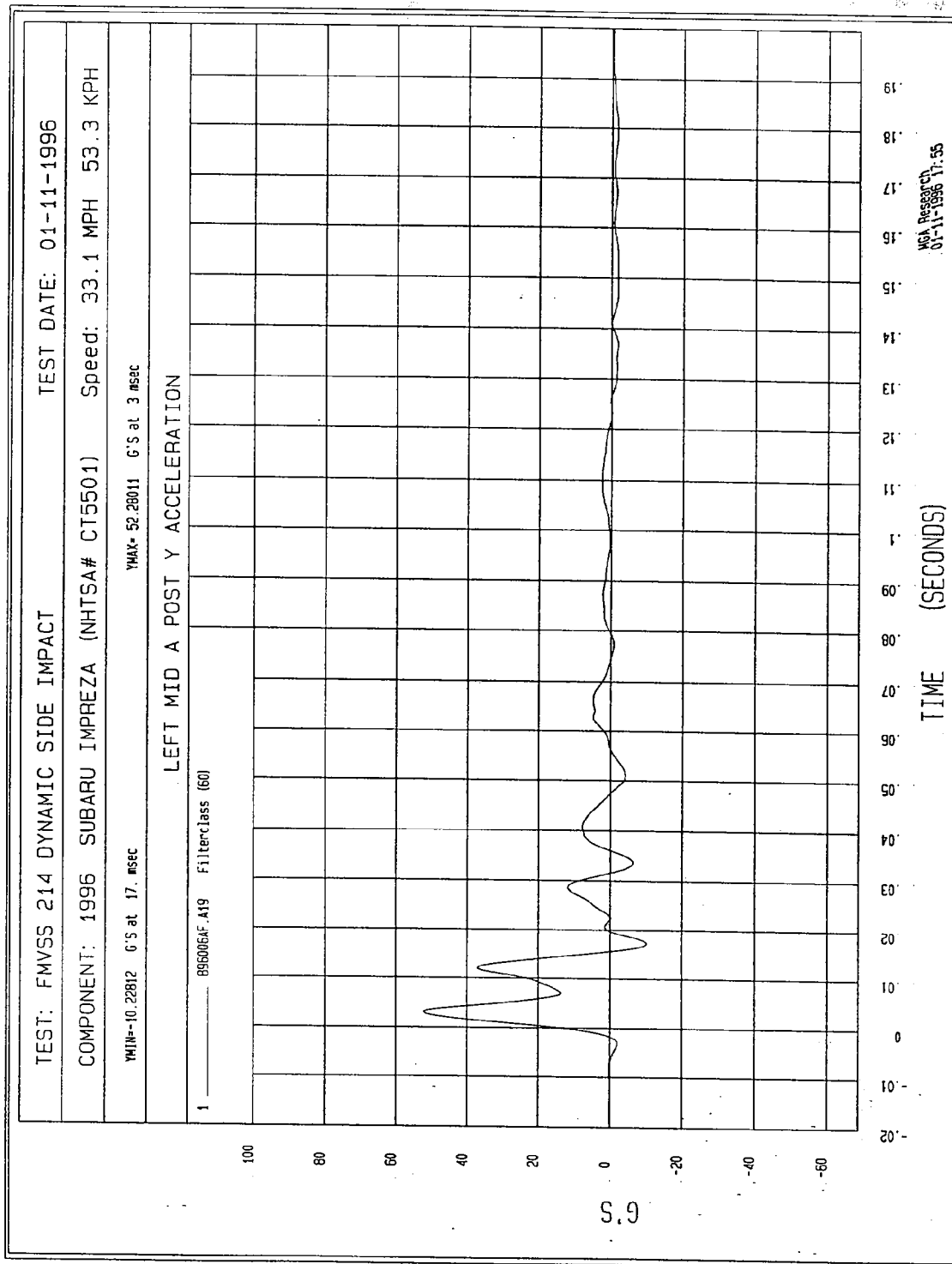


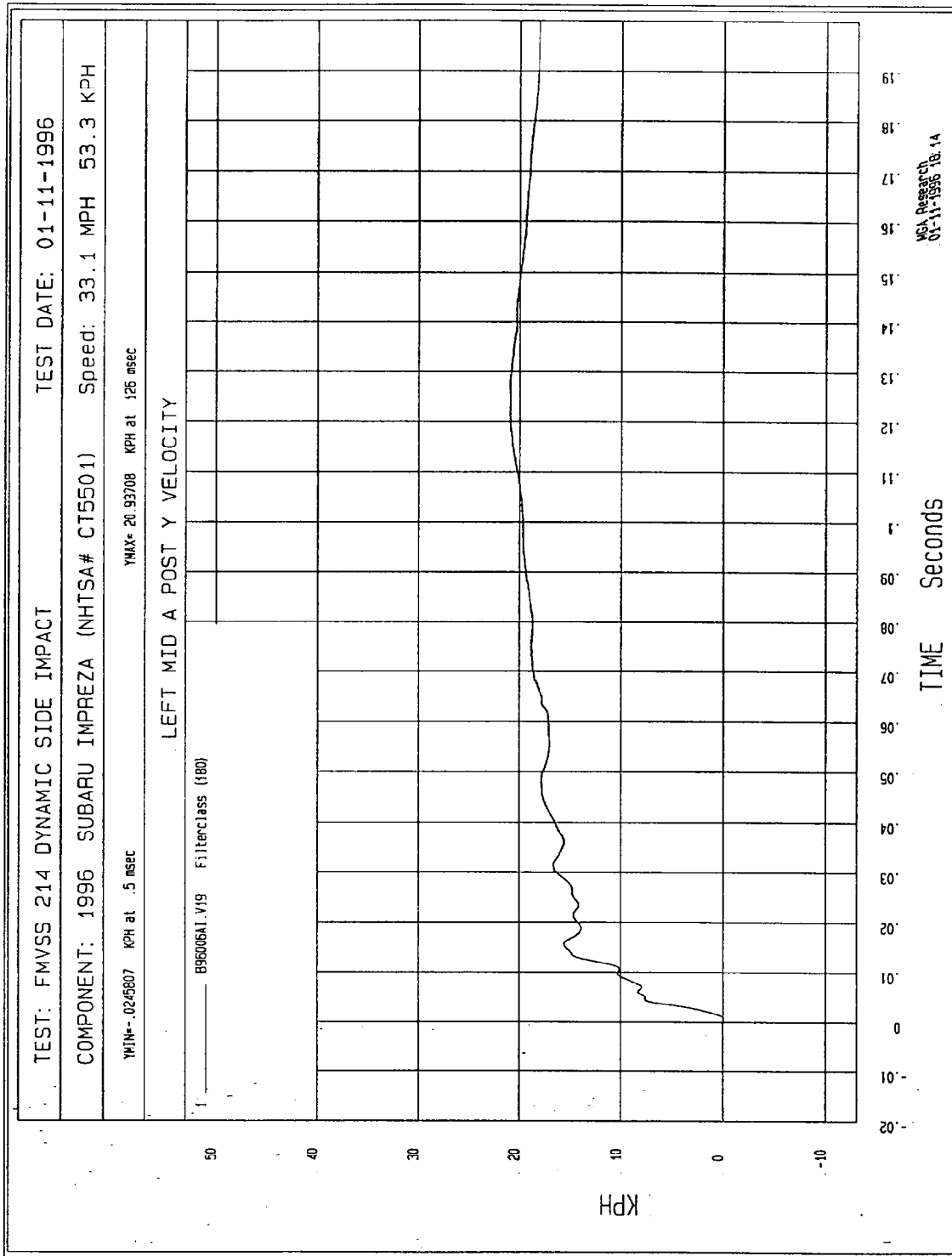


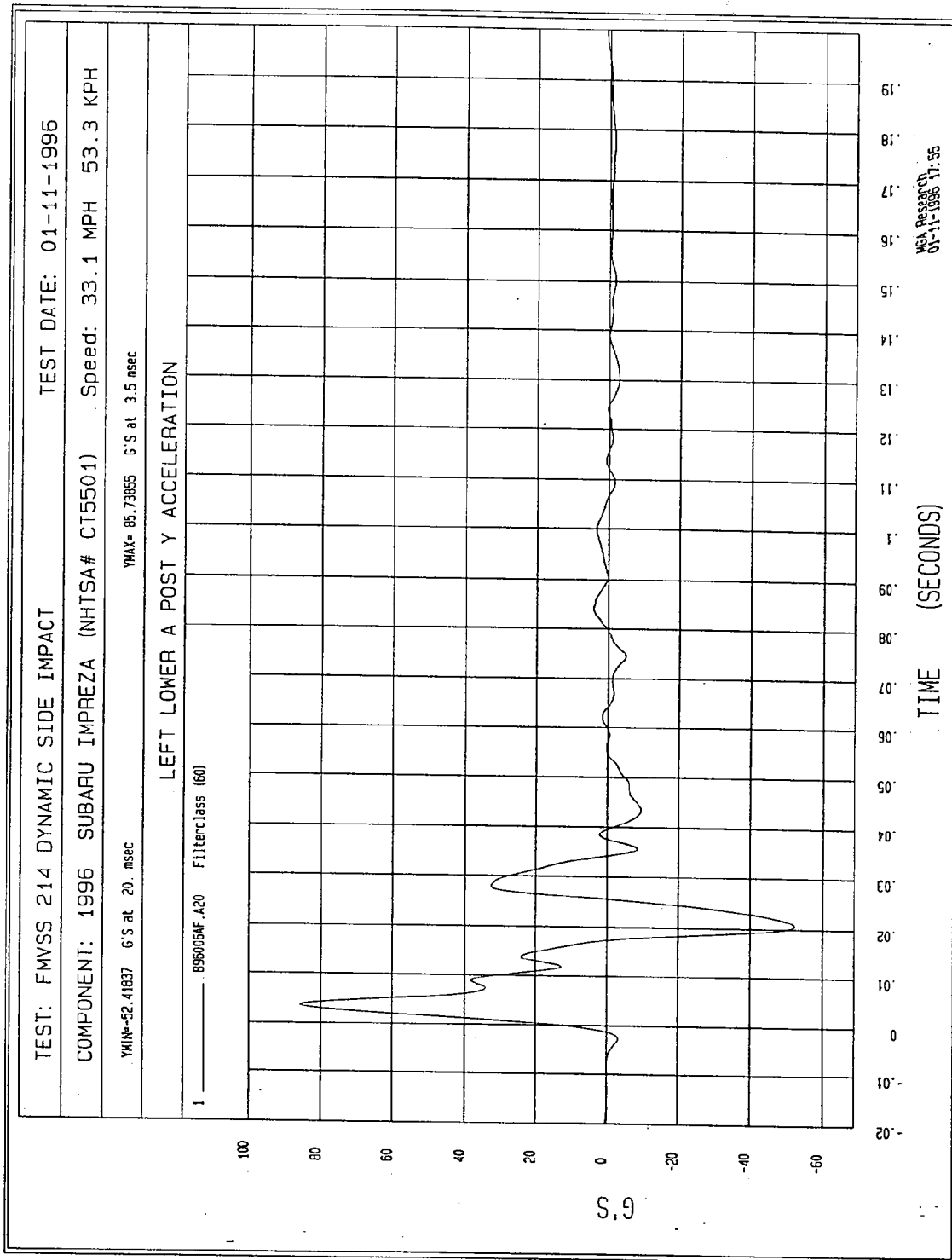










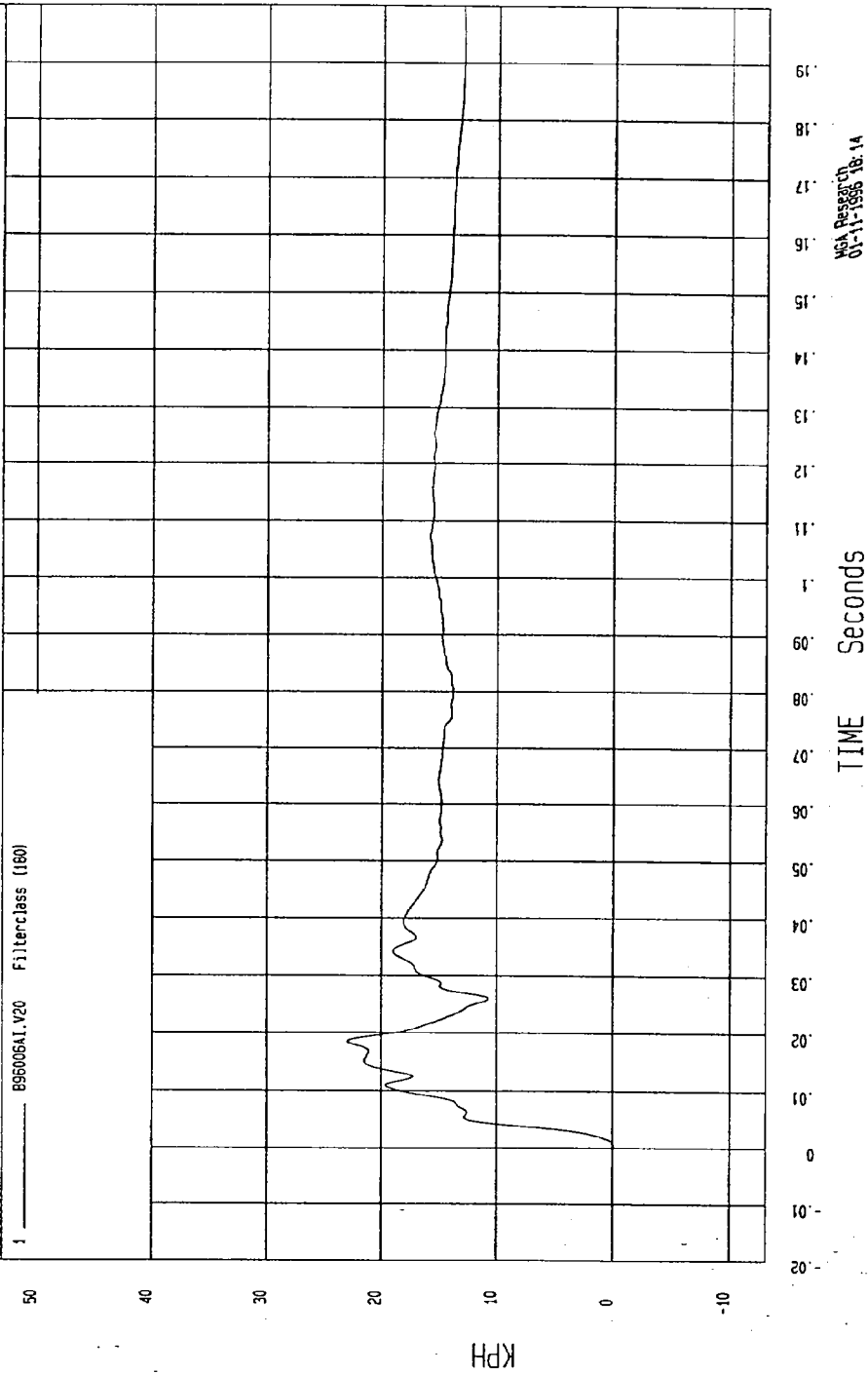


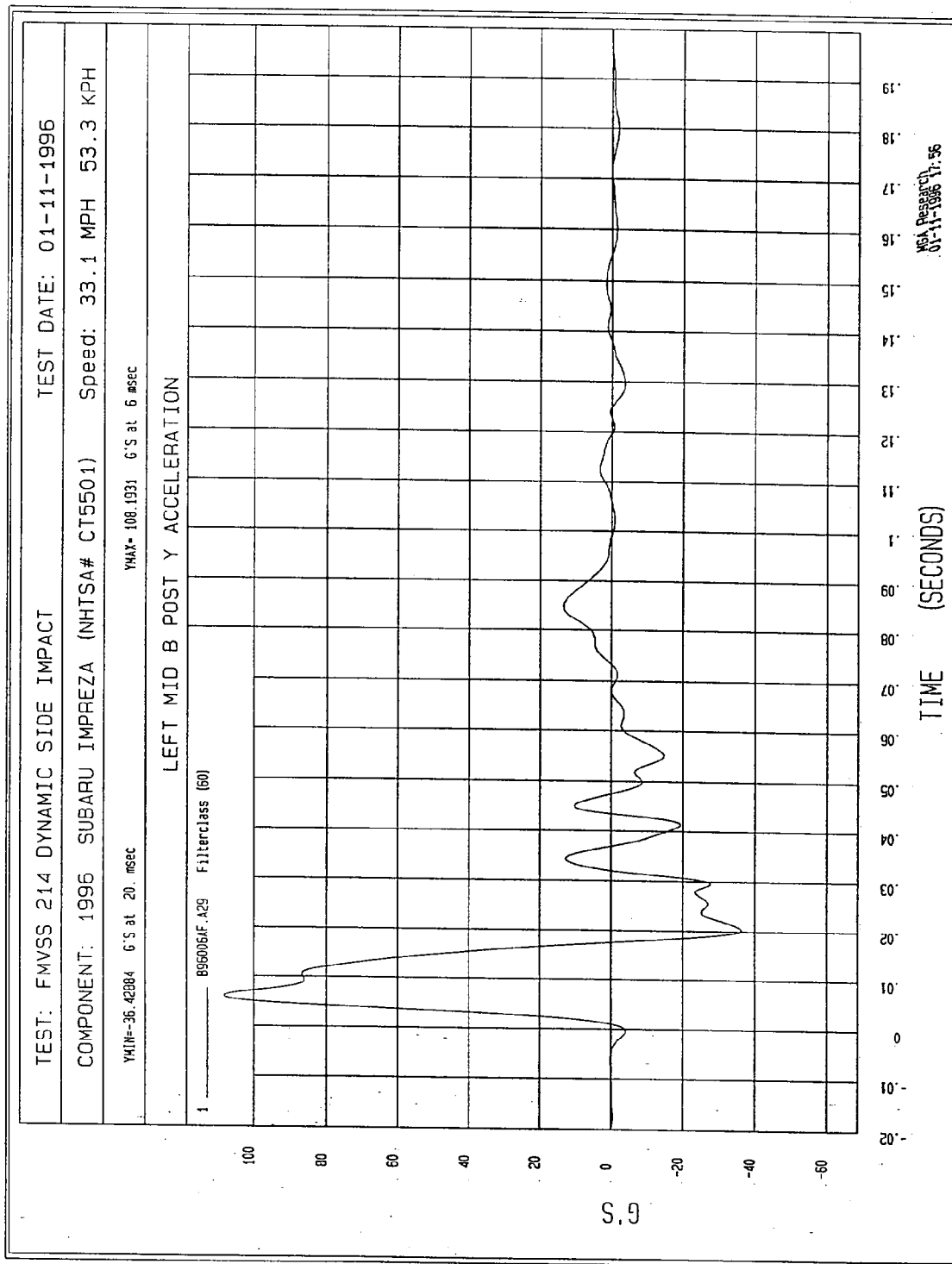
TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 01-11-1996

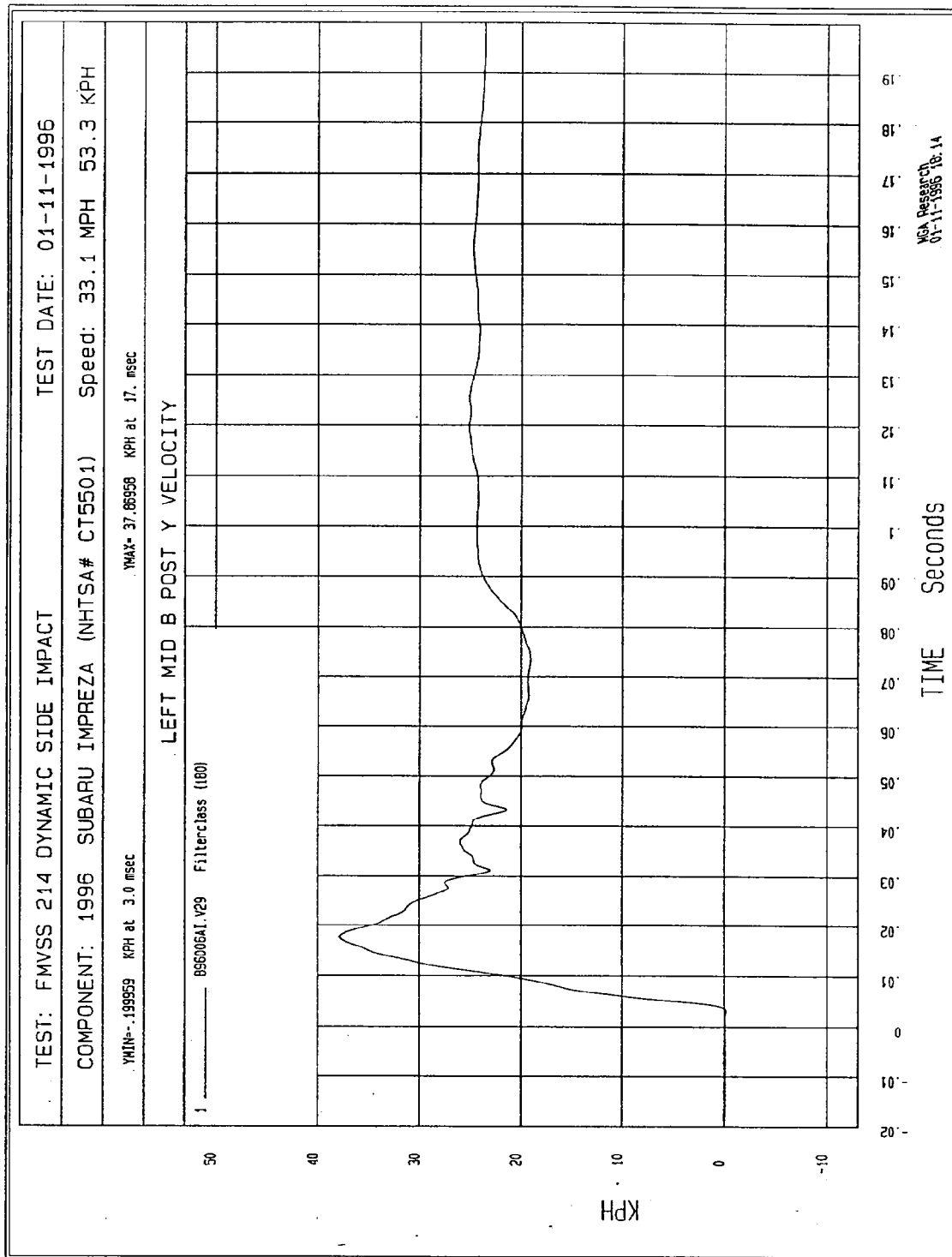
COMPONENT: 1996 SUBARU IMPREZA (NHTSA# CT5501) Speed: 33.1 MPH 53.3 KPH

YMIN=-7.44126E-02 KPH at .39 msec YMAX= 22.93589 KPH at 18. msec

LEFT LOWER A POST Y VELOCITY



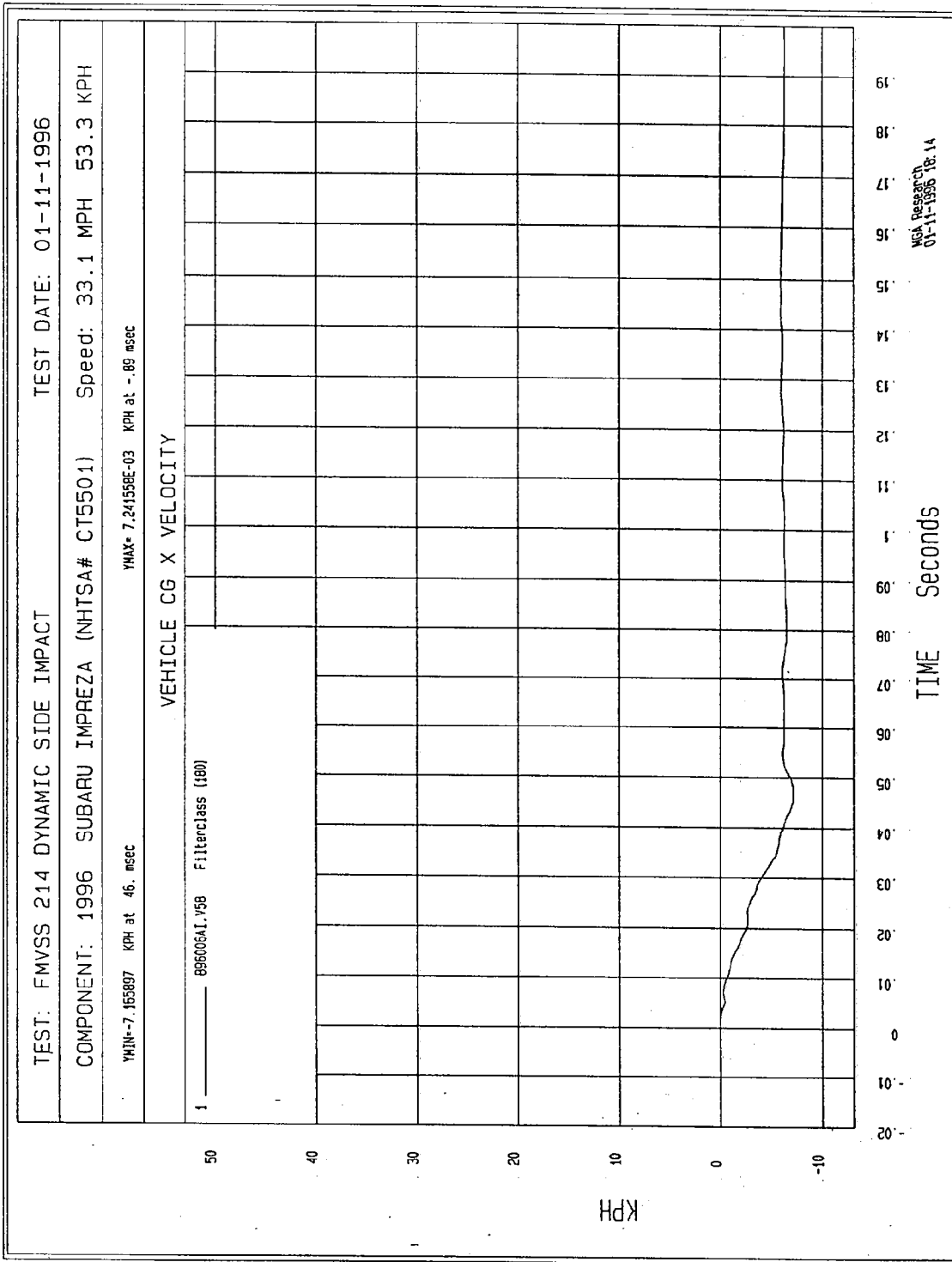


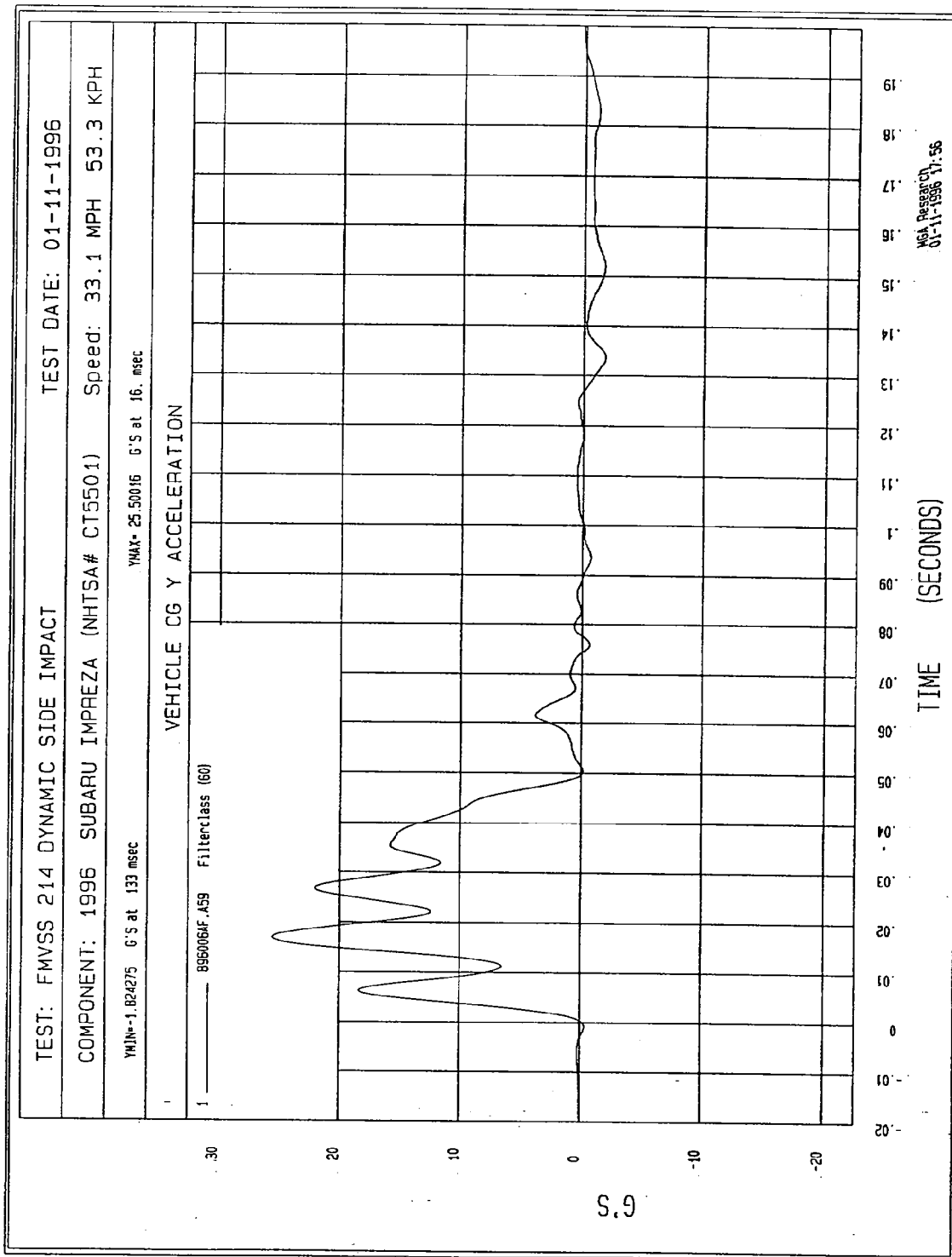


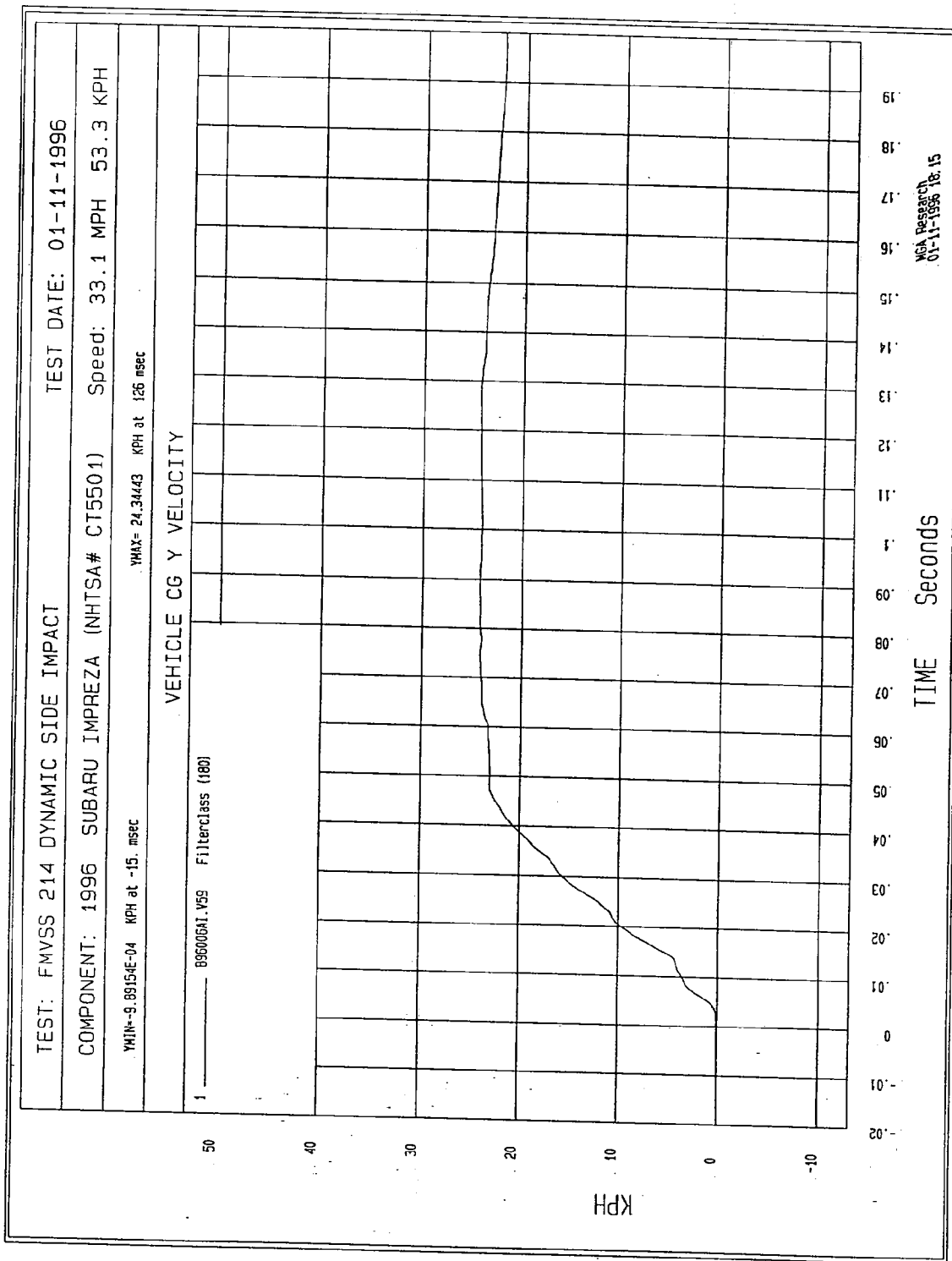
LEFT LOWER B POST Y ACCELERATION VS. TIME

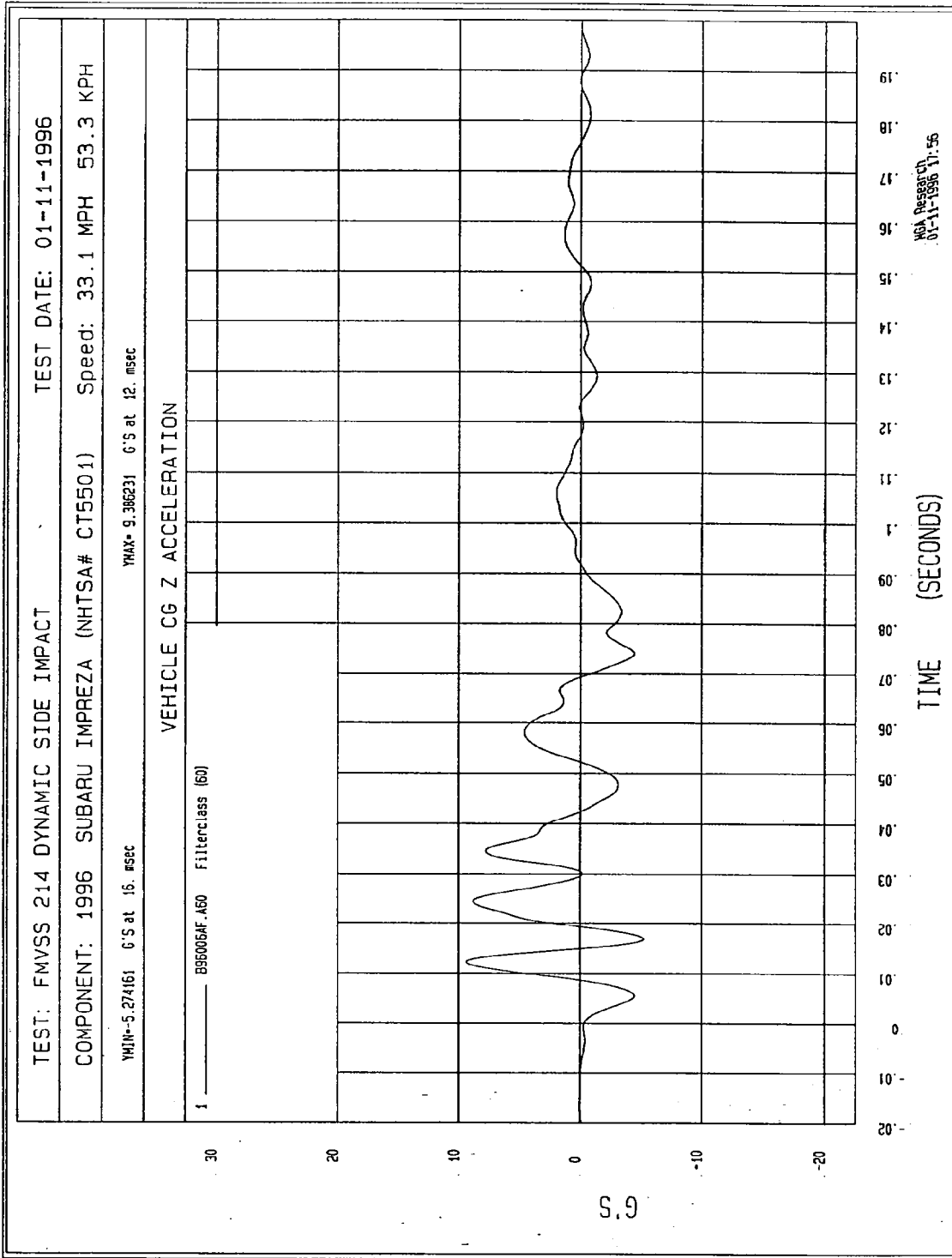
NO VALID DATA COLLECTED

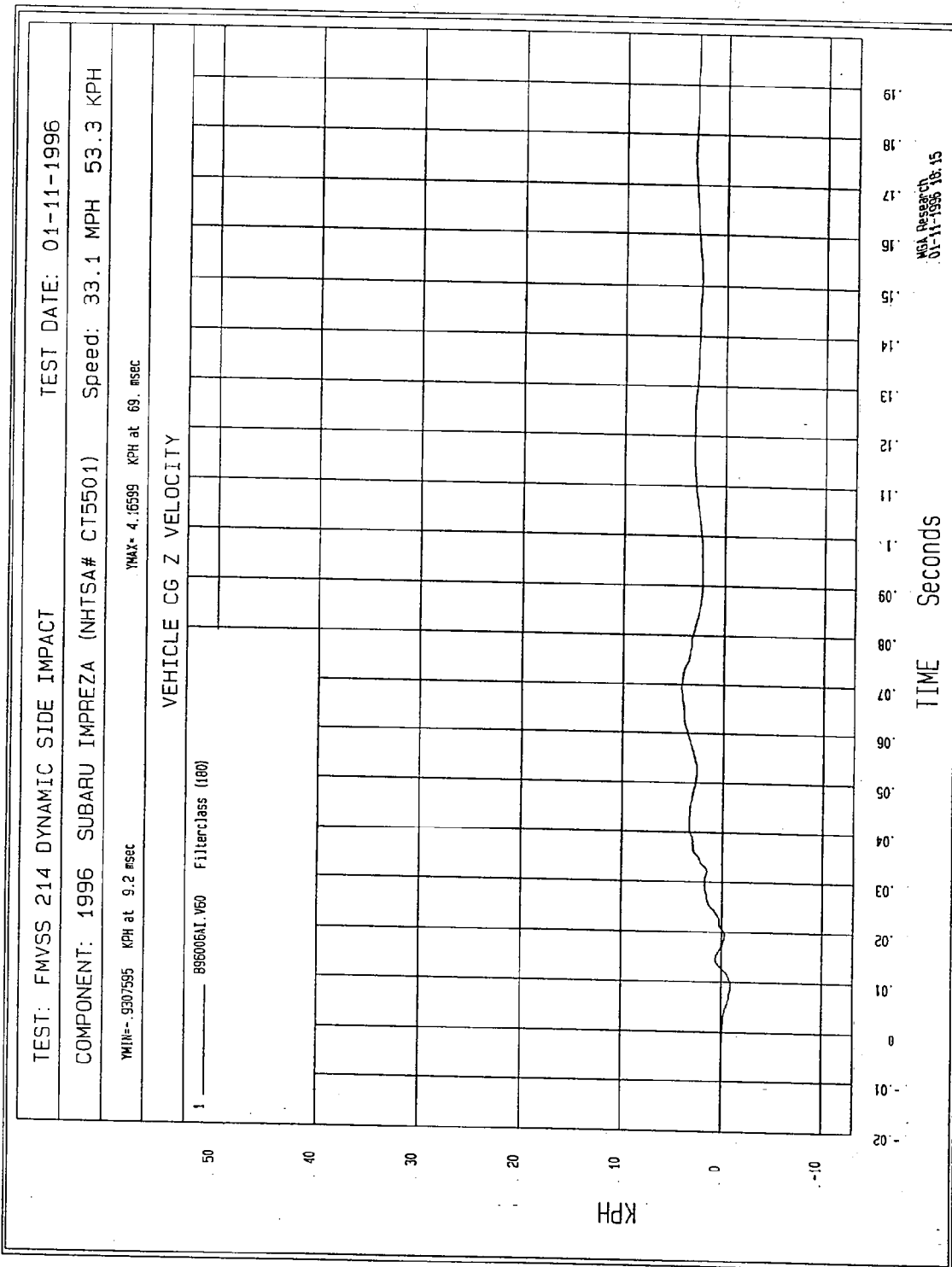
MGA Research
01-11-1996 17:56

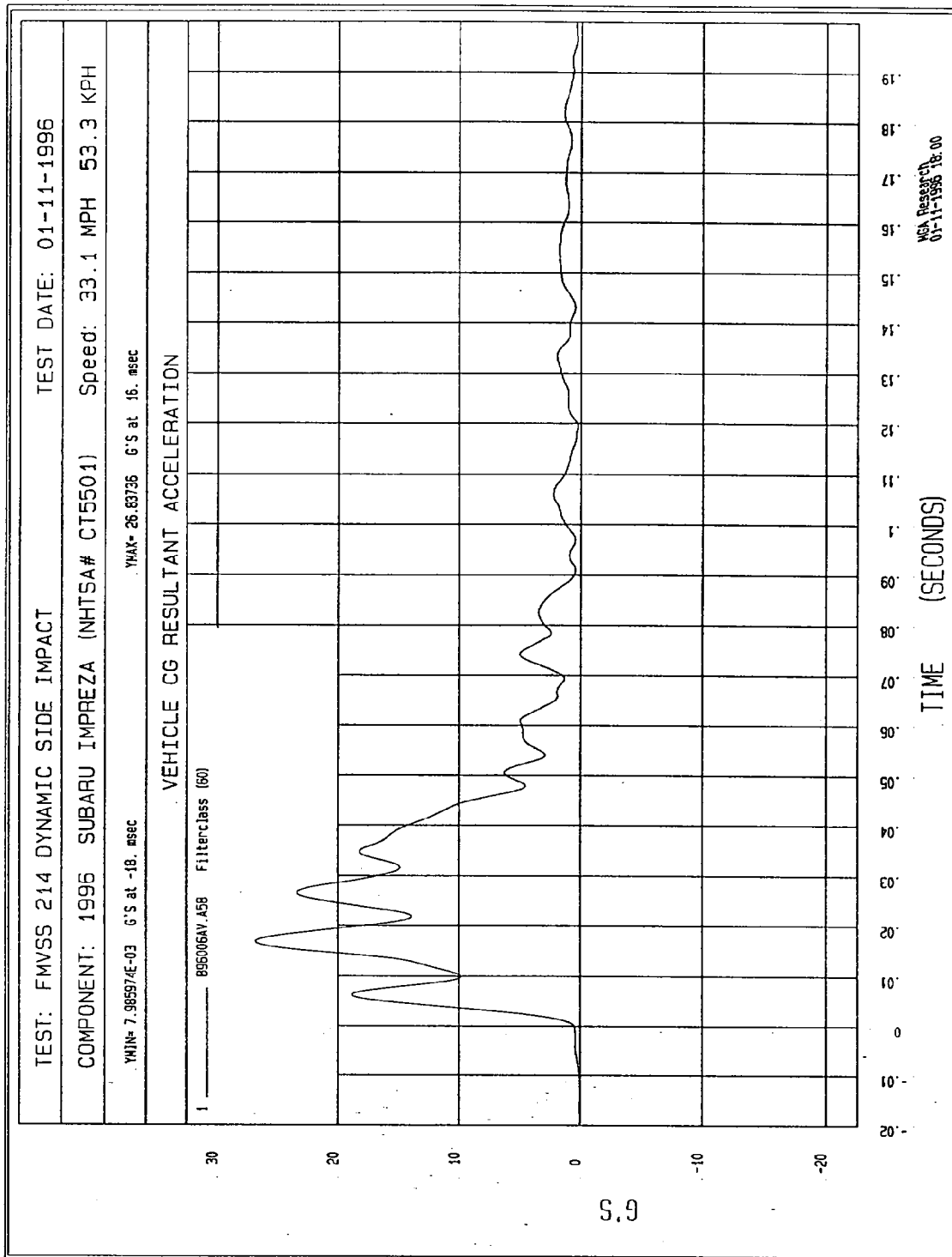


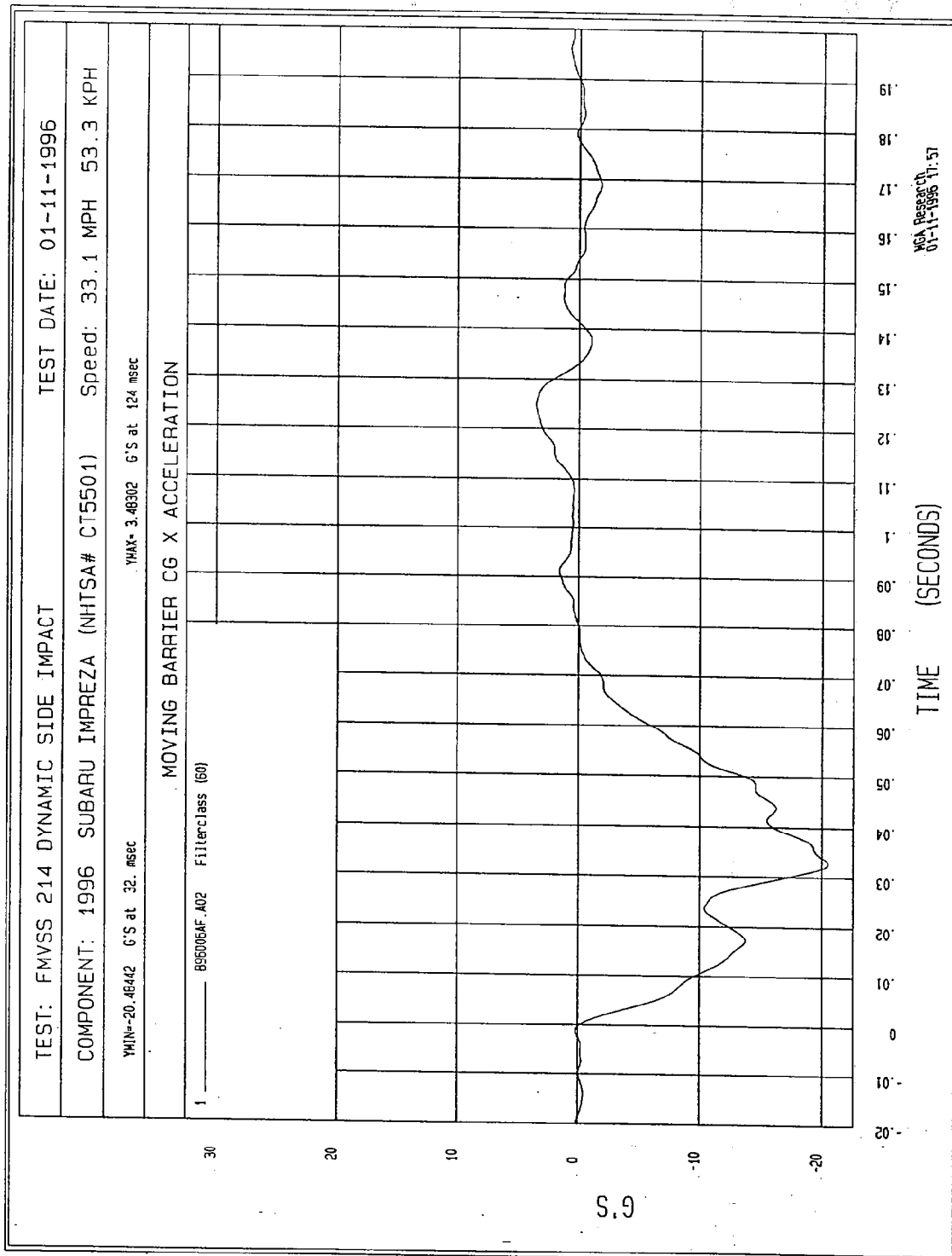


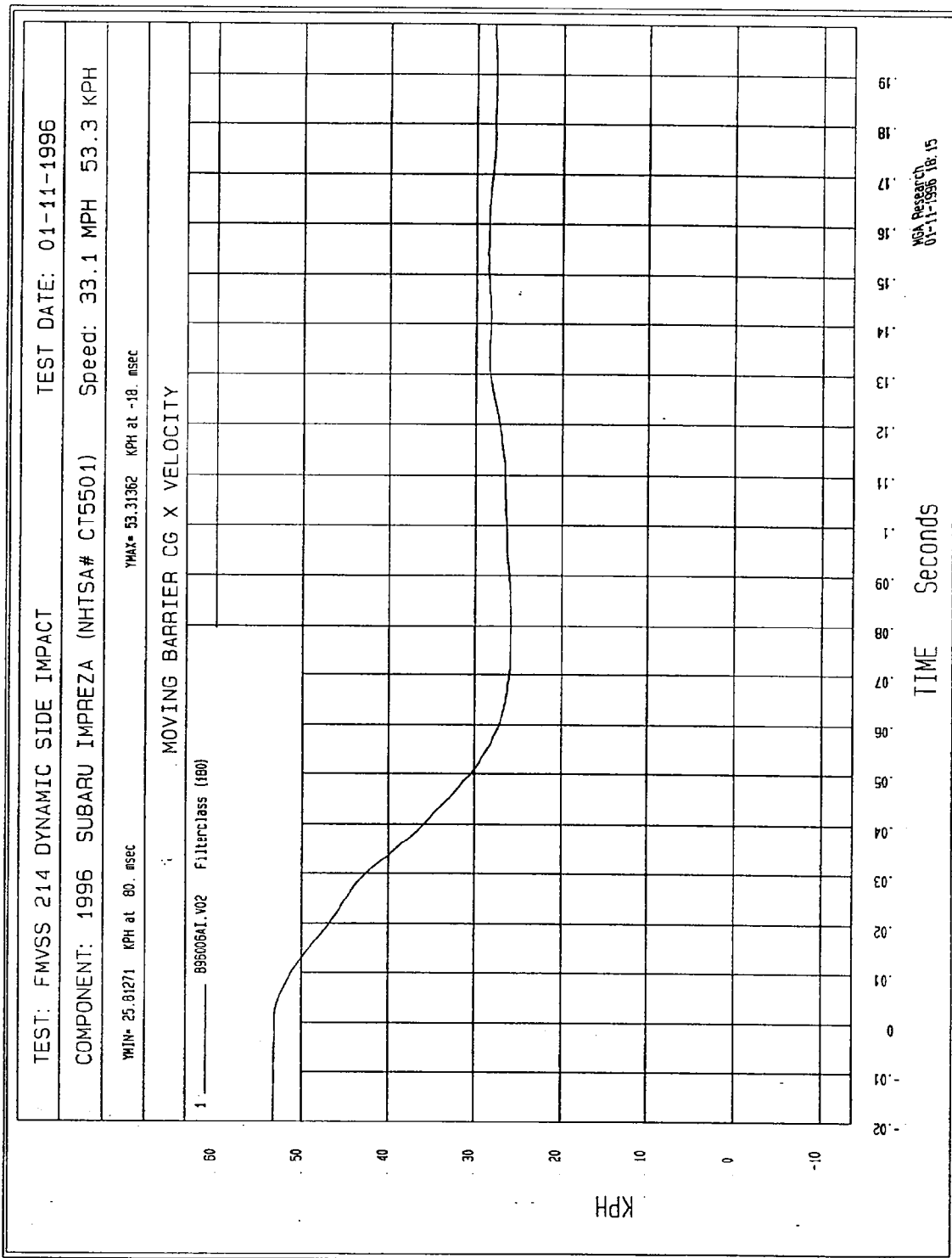


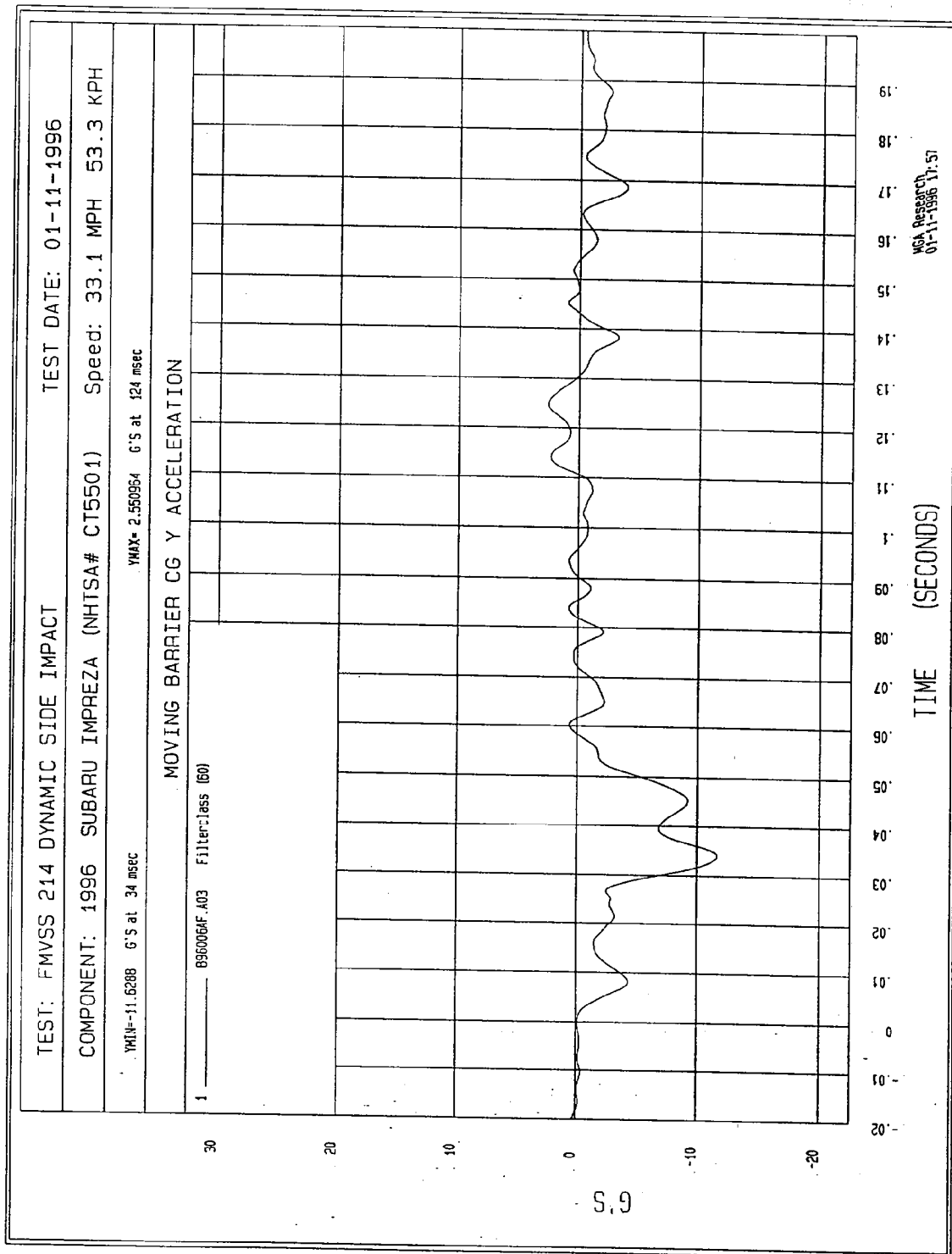


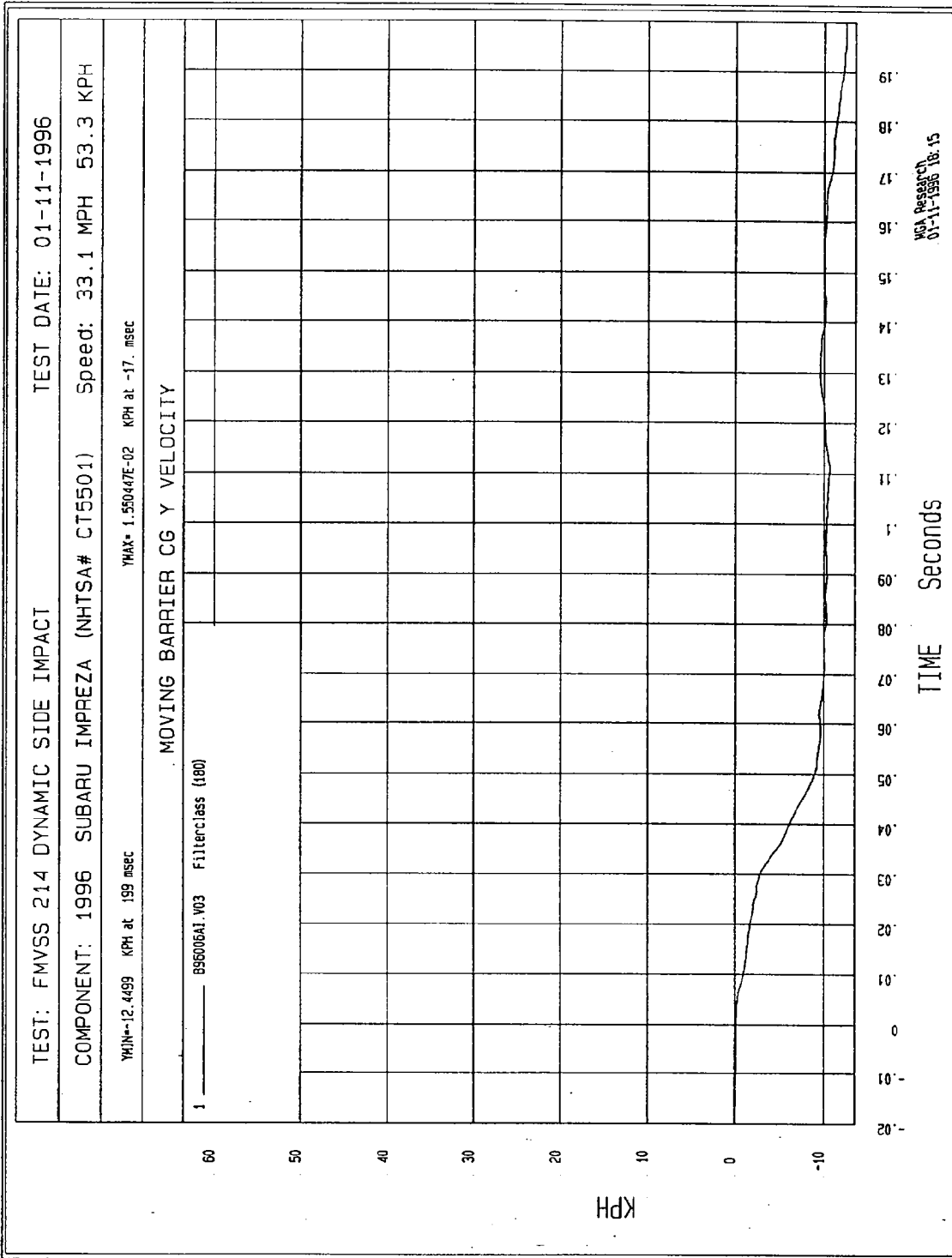


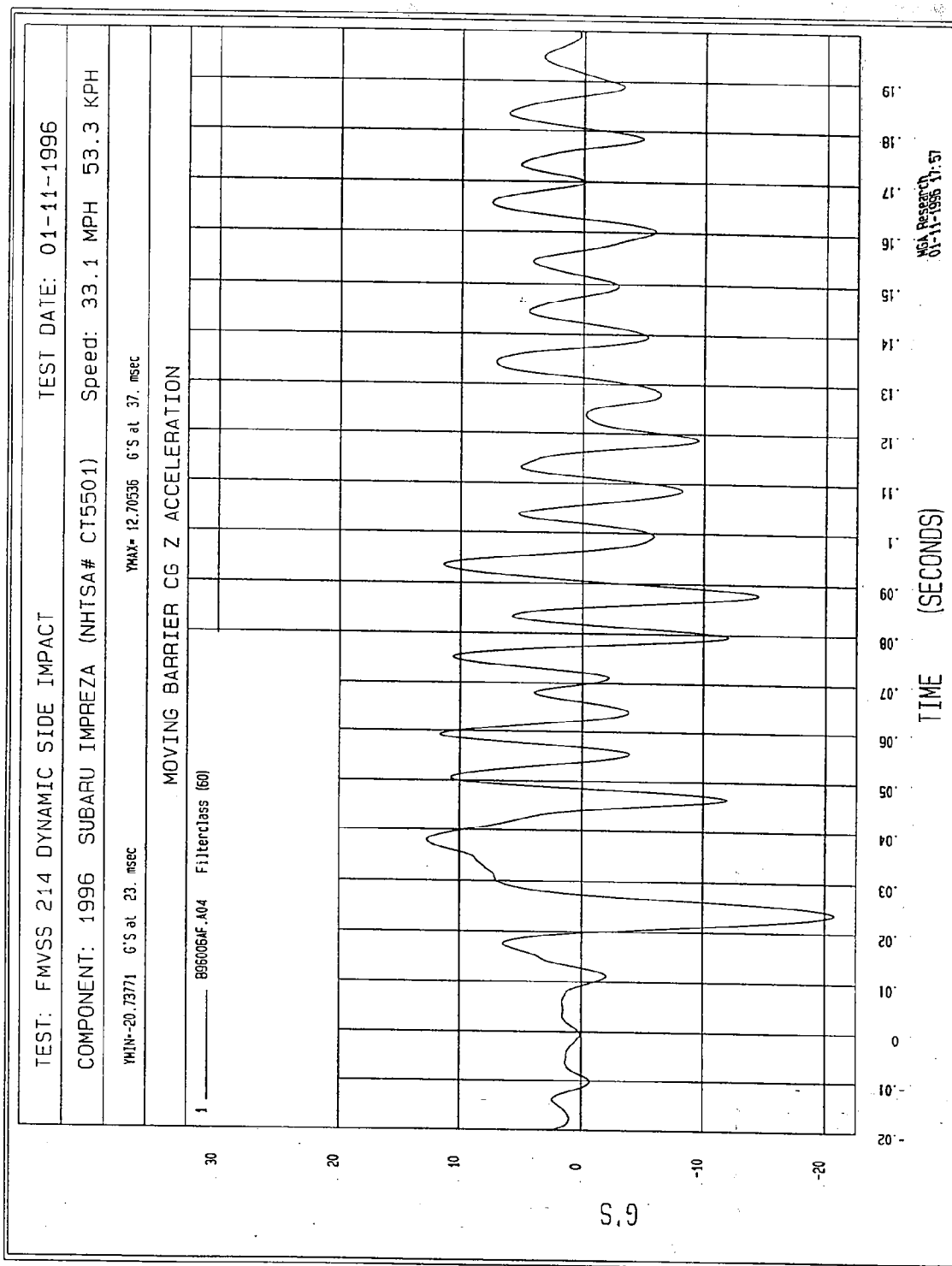


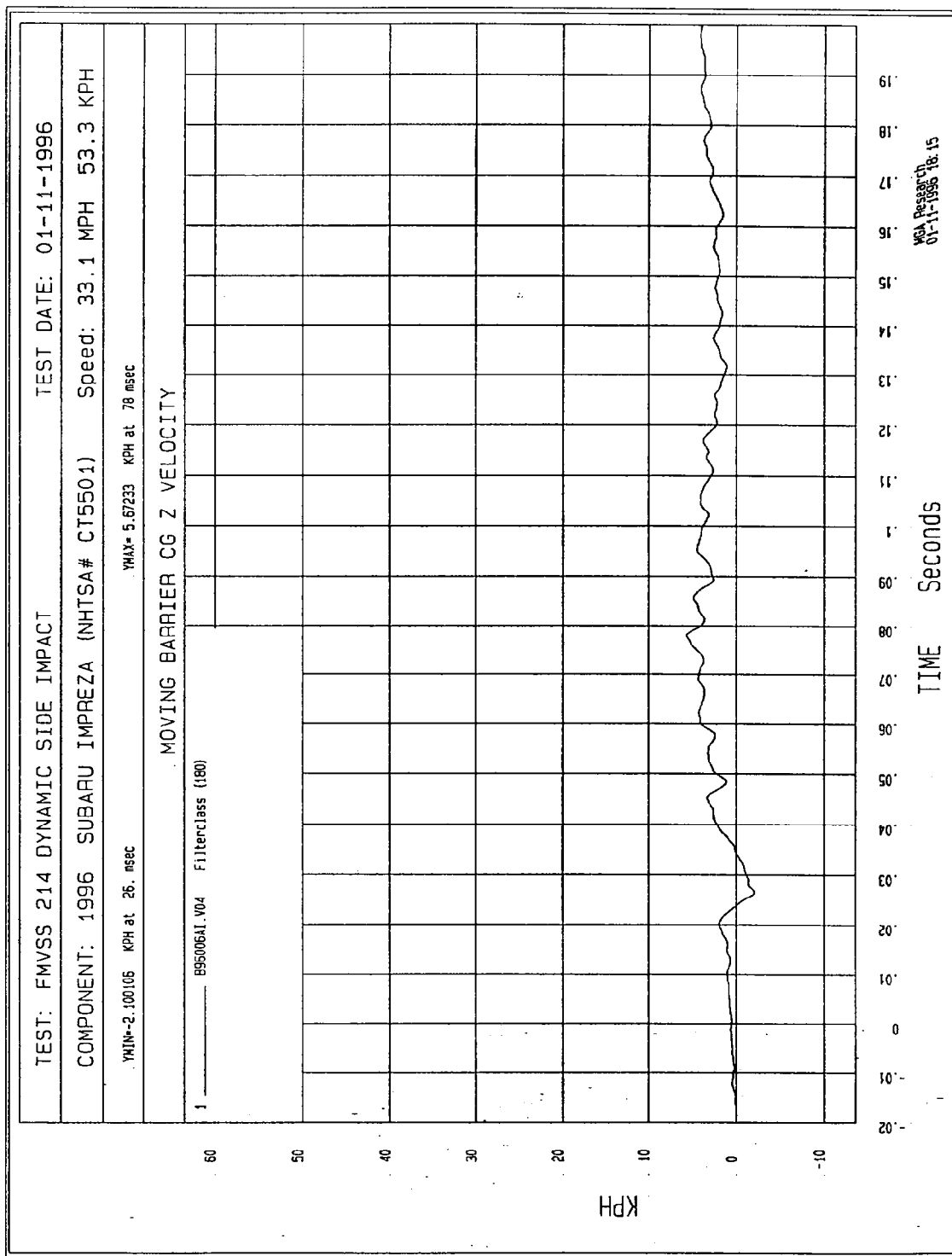


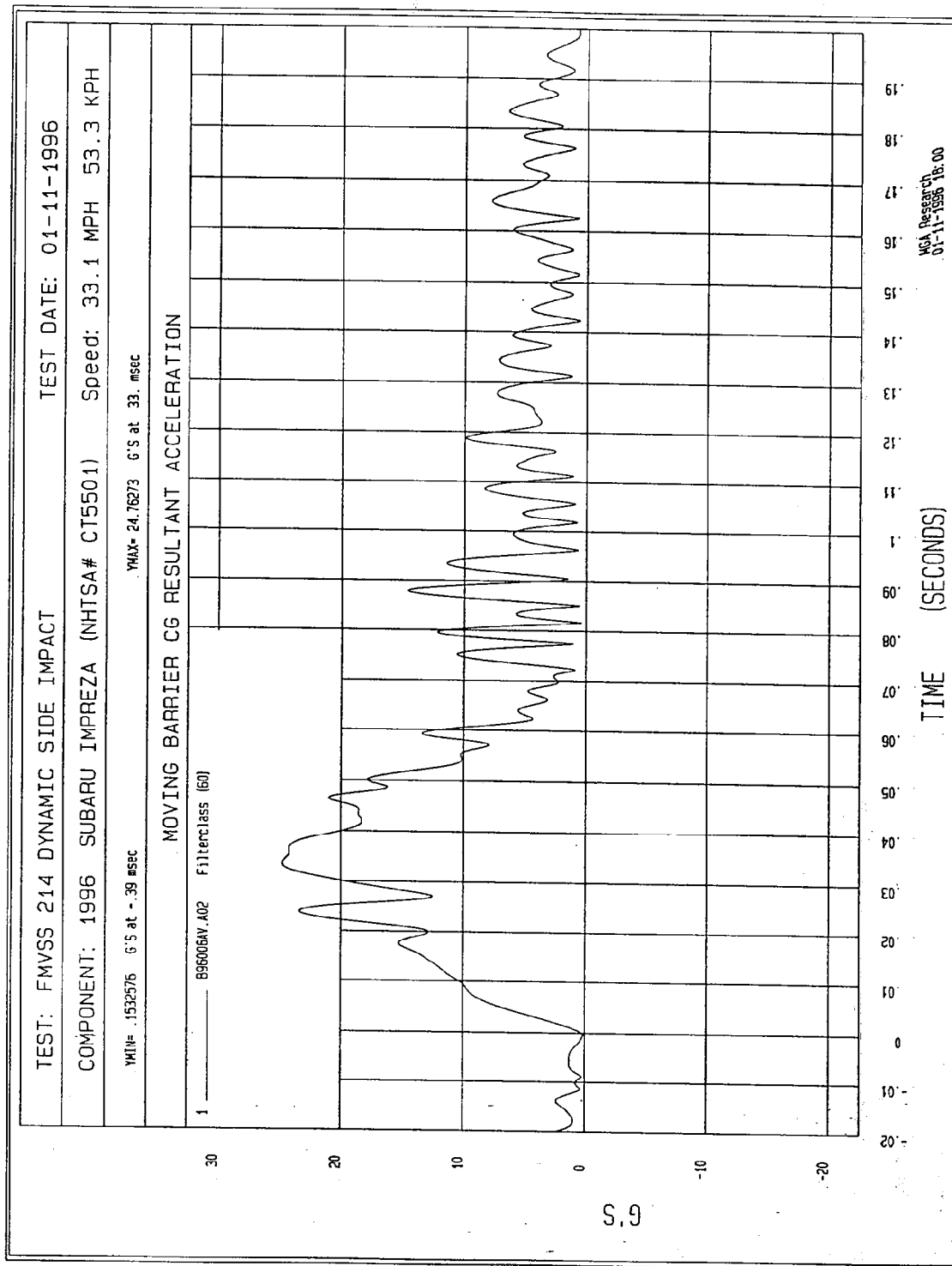


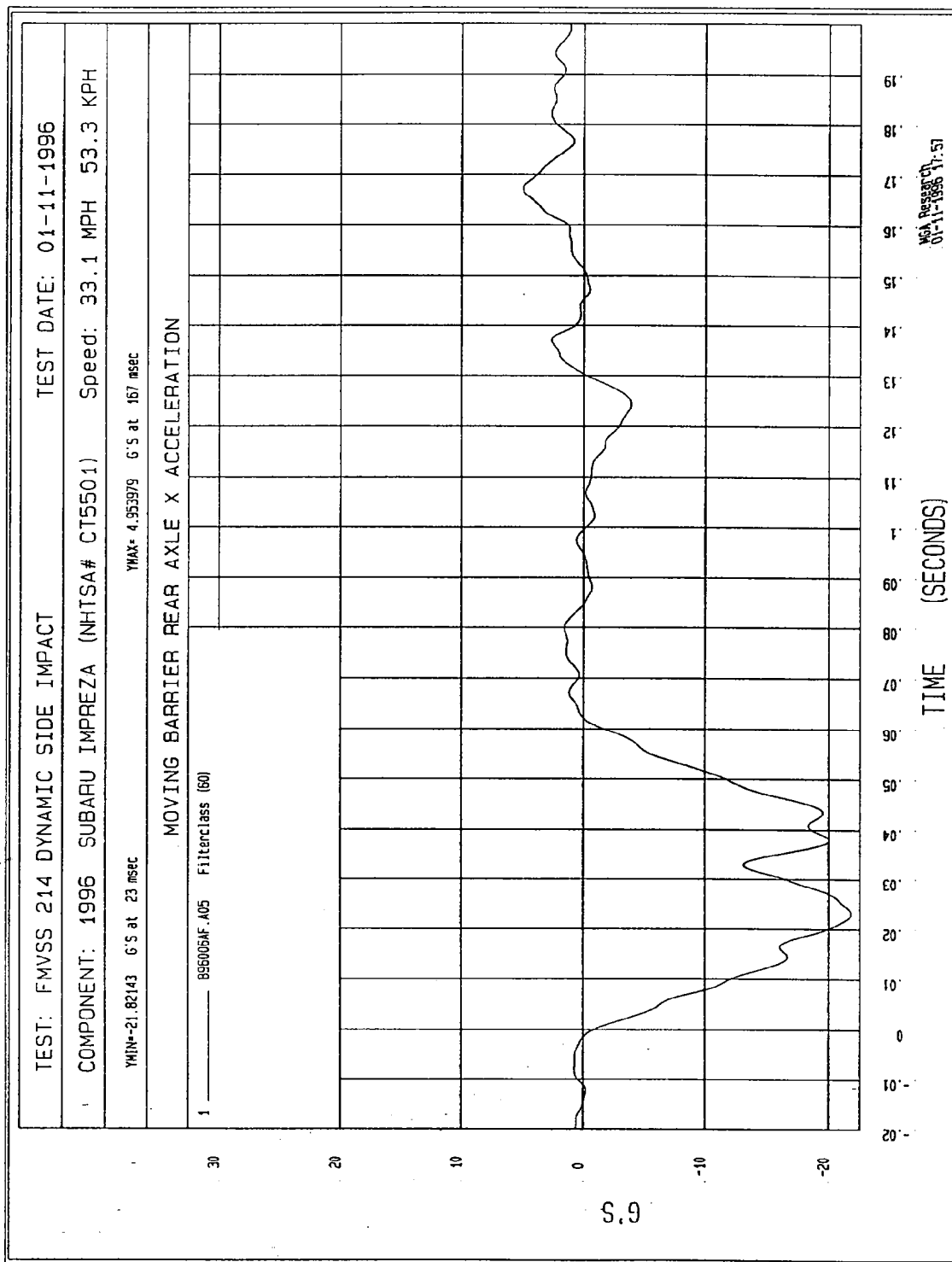


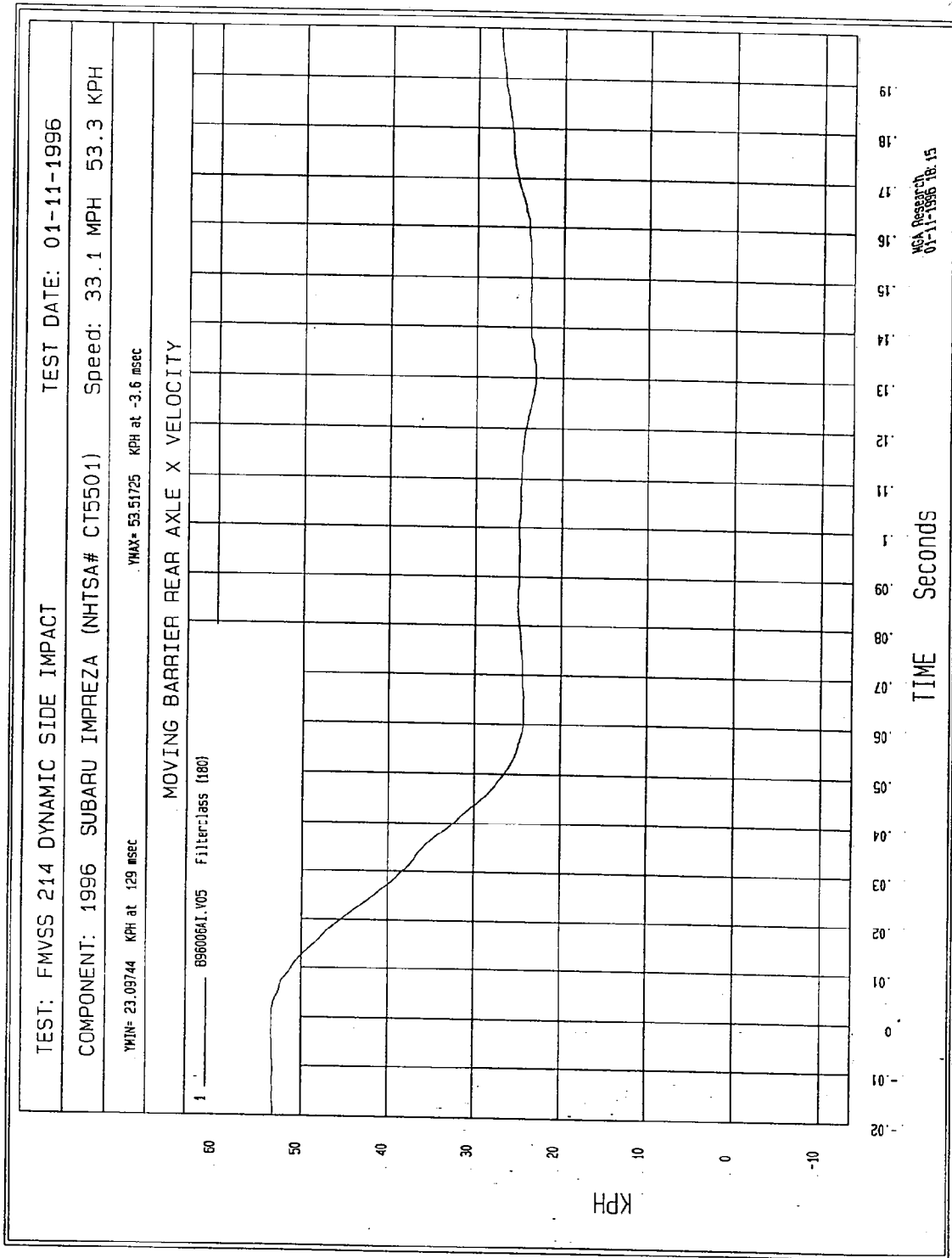


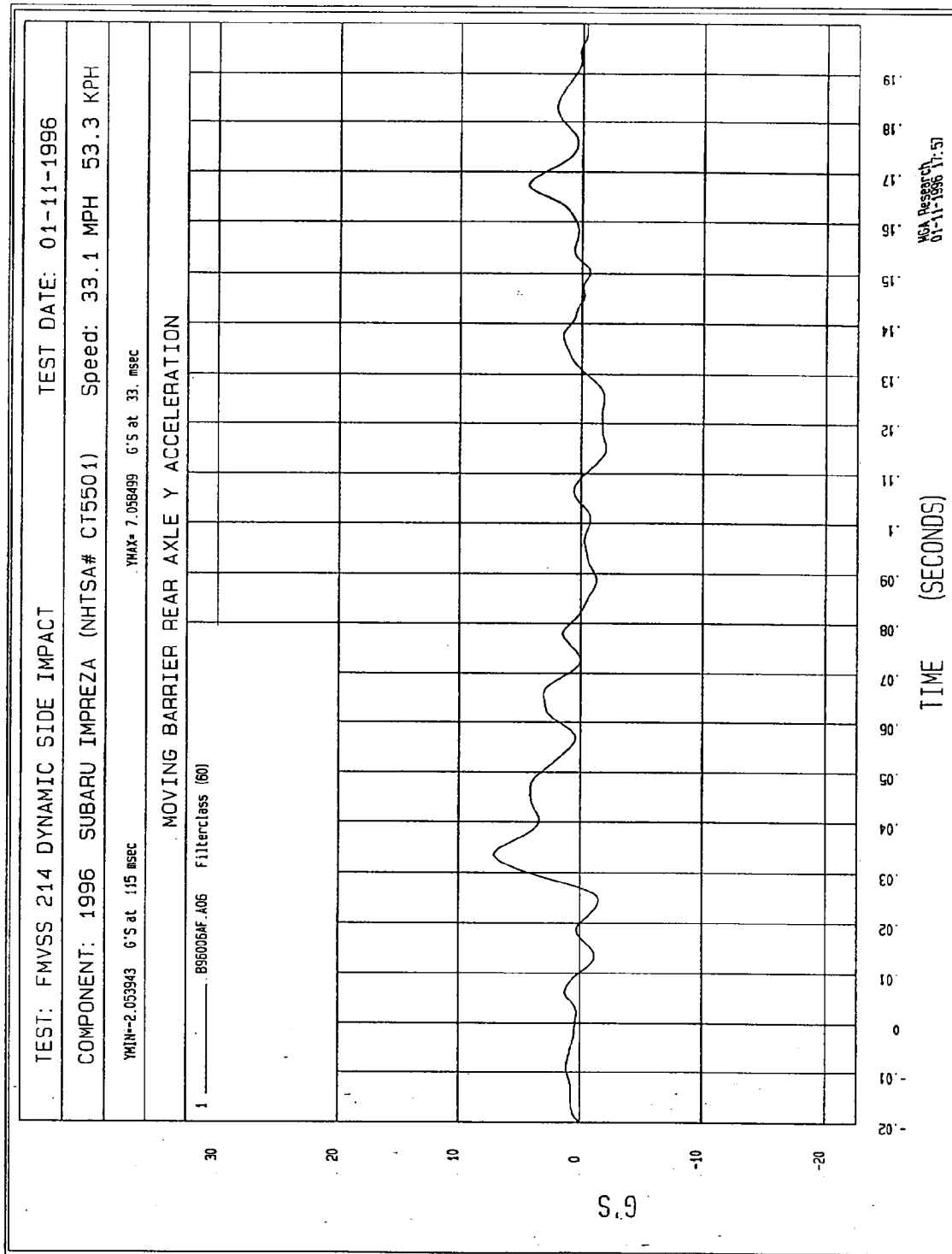


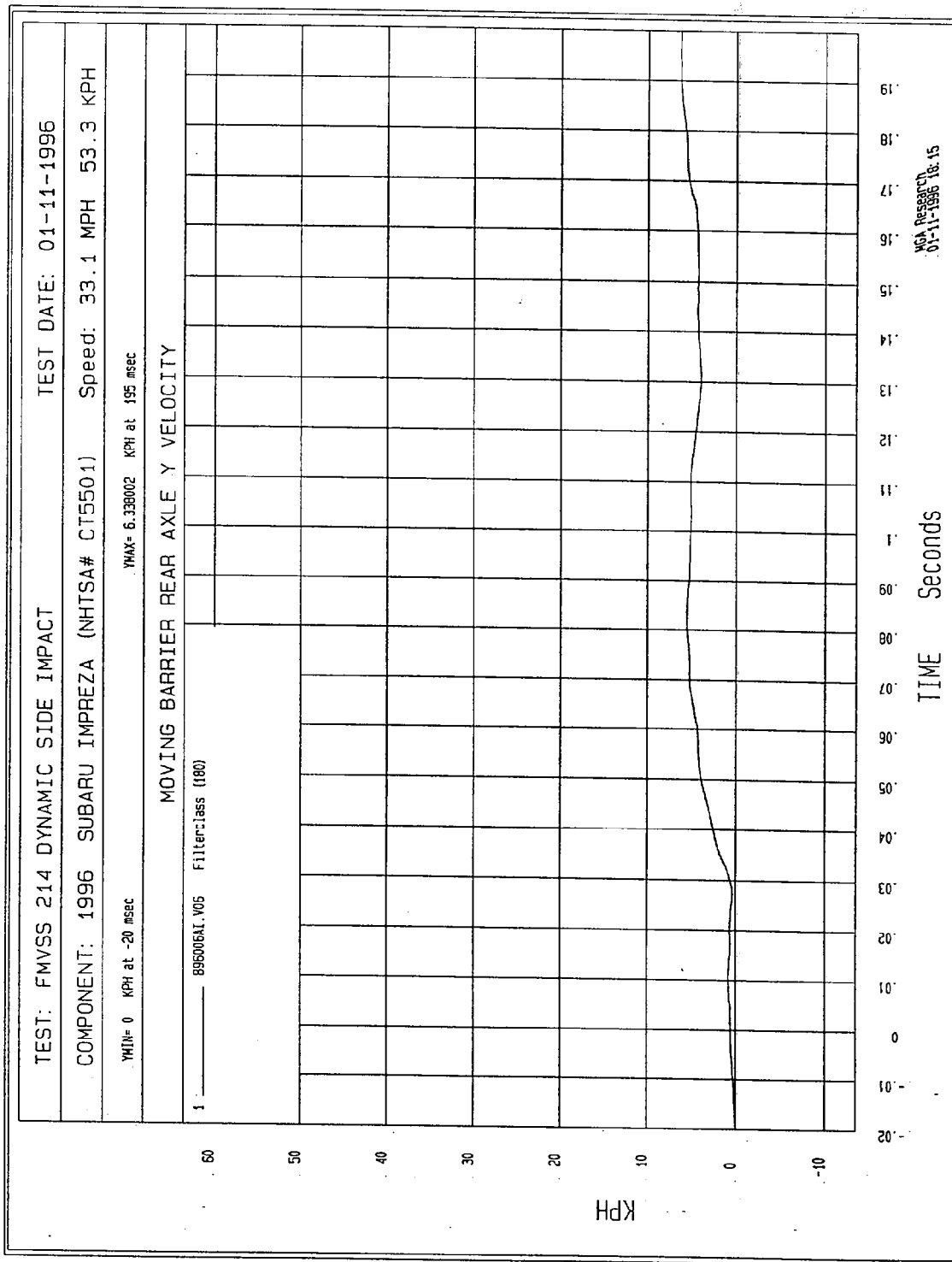


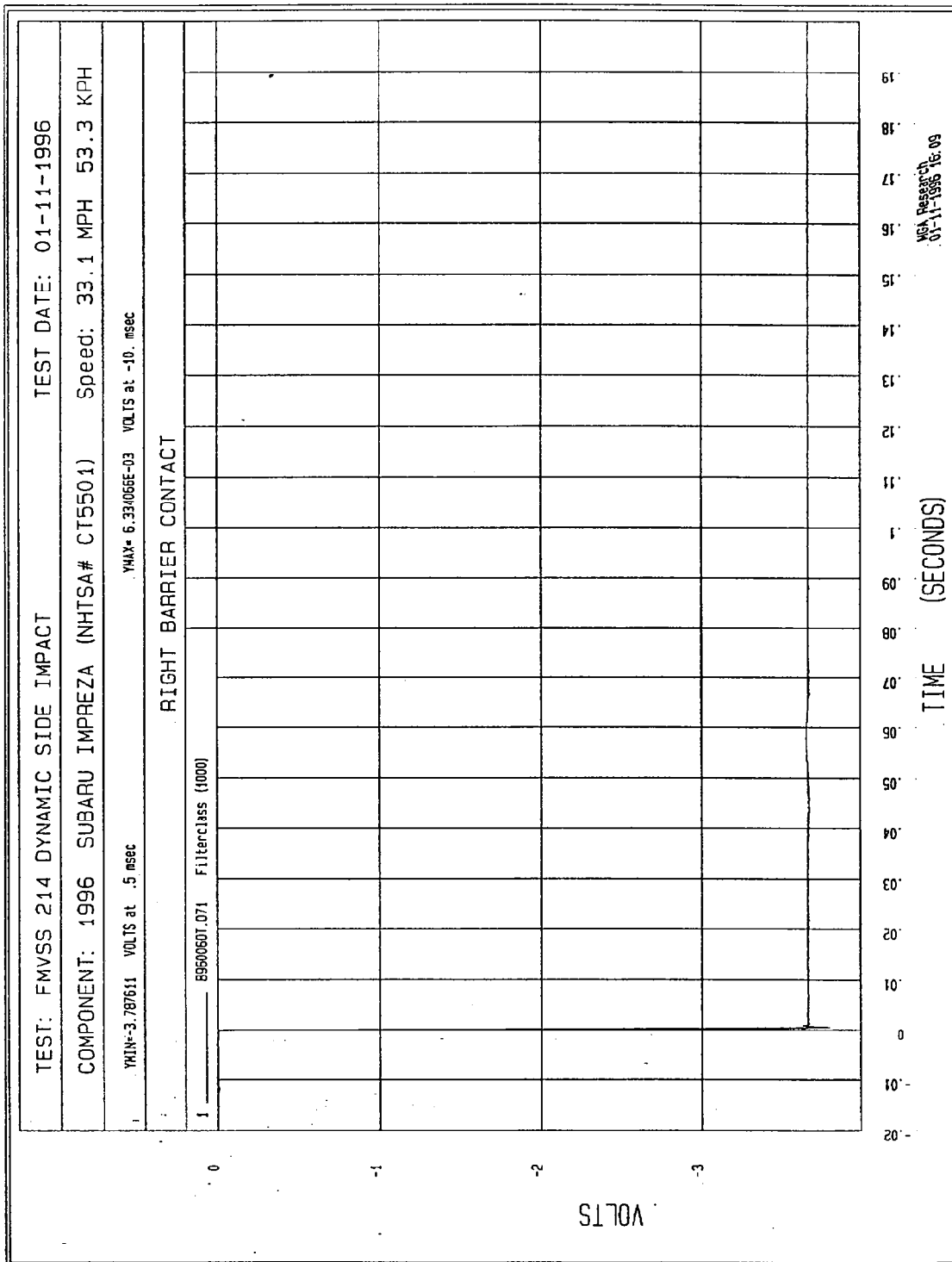


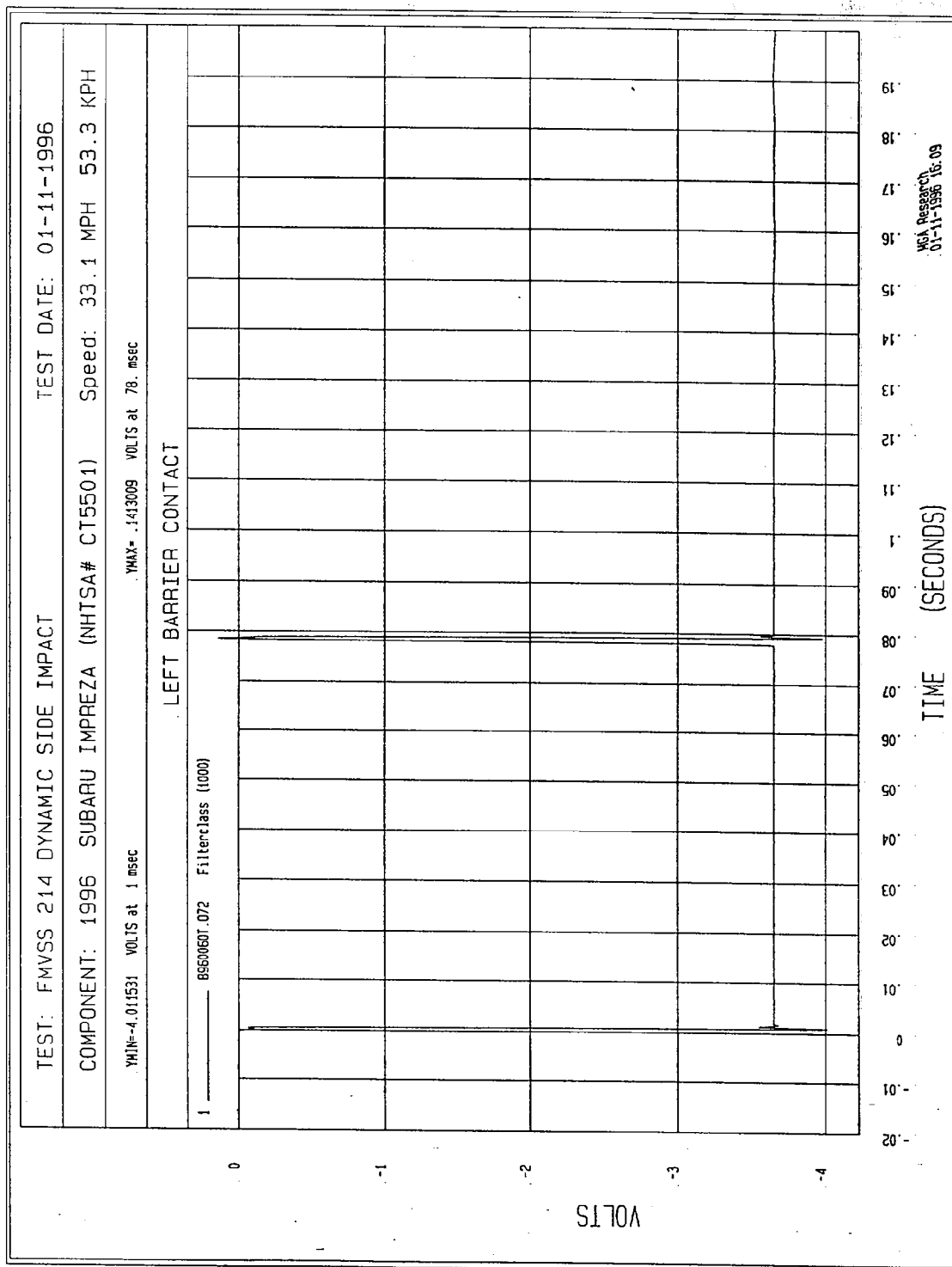


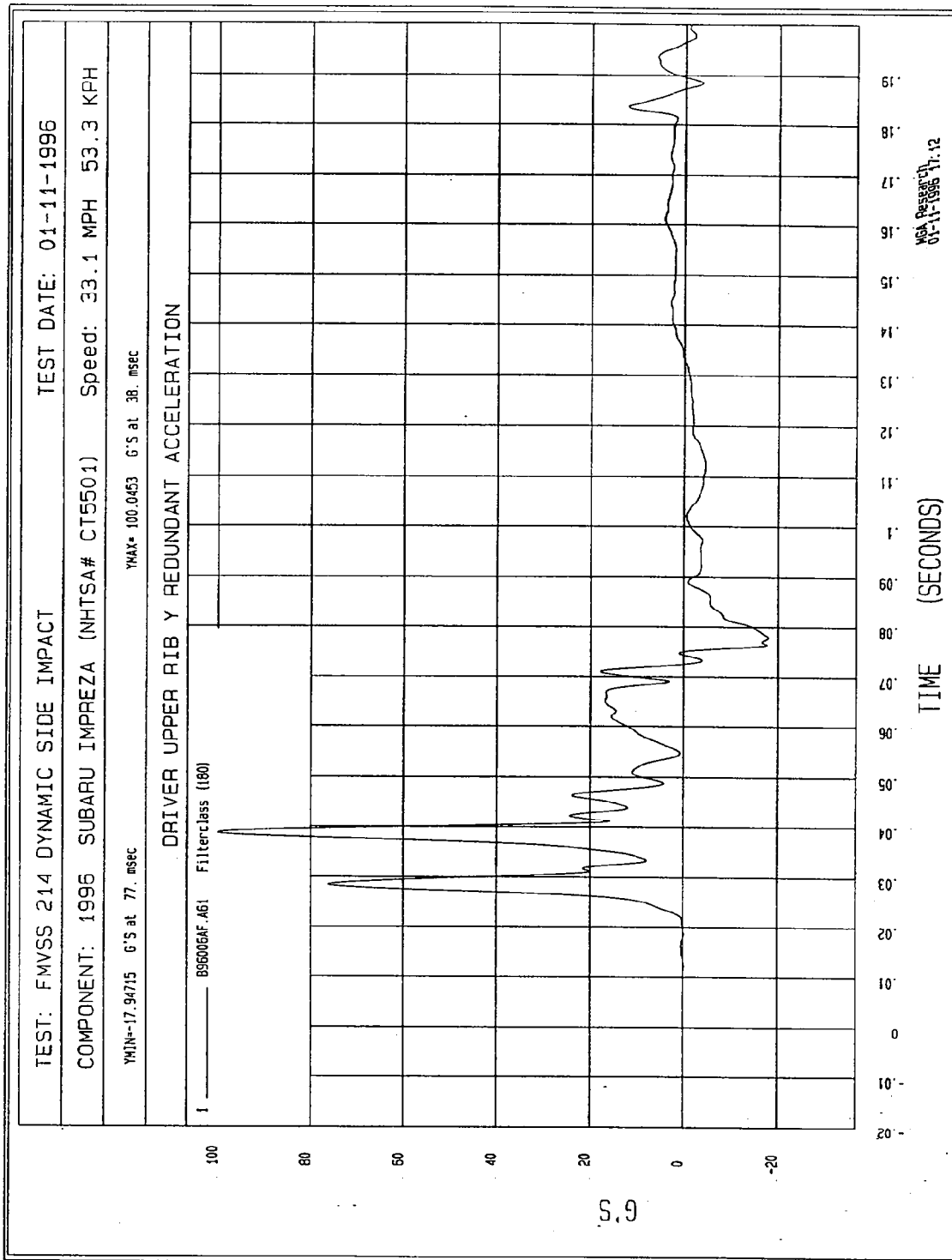


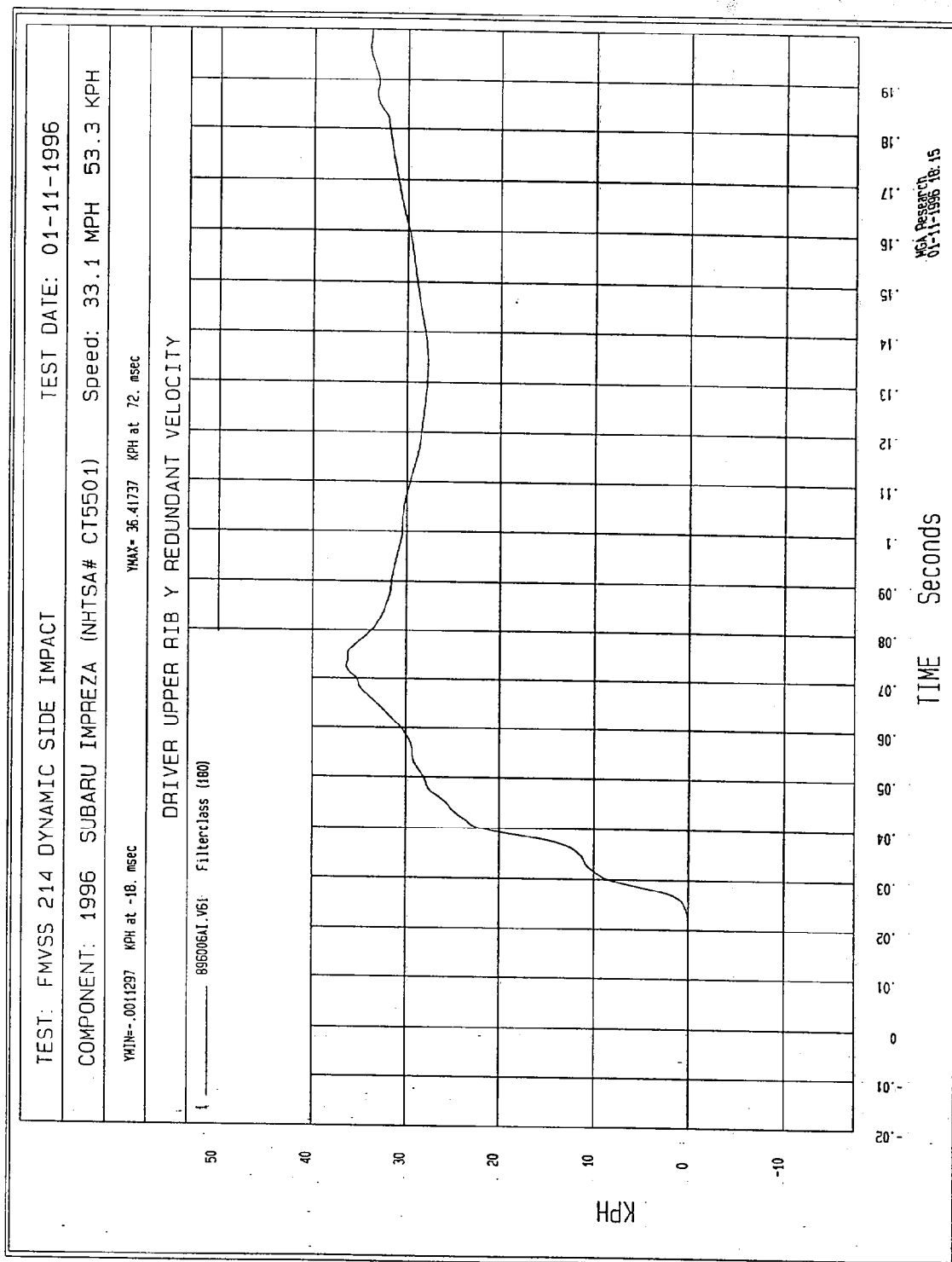












TEST DATE: 01-11-1996

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

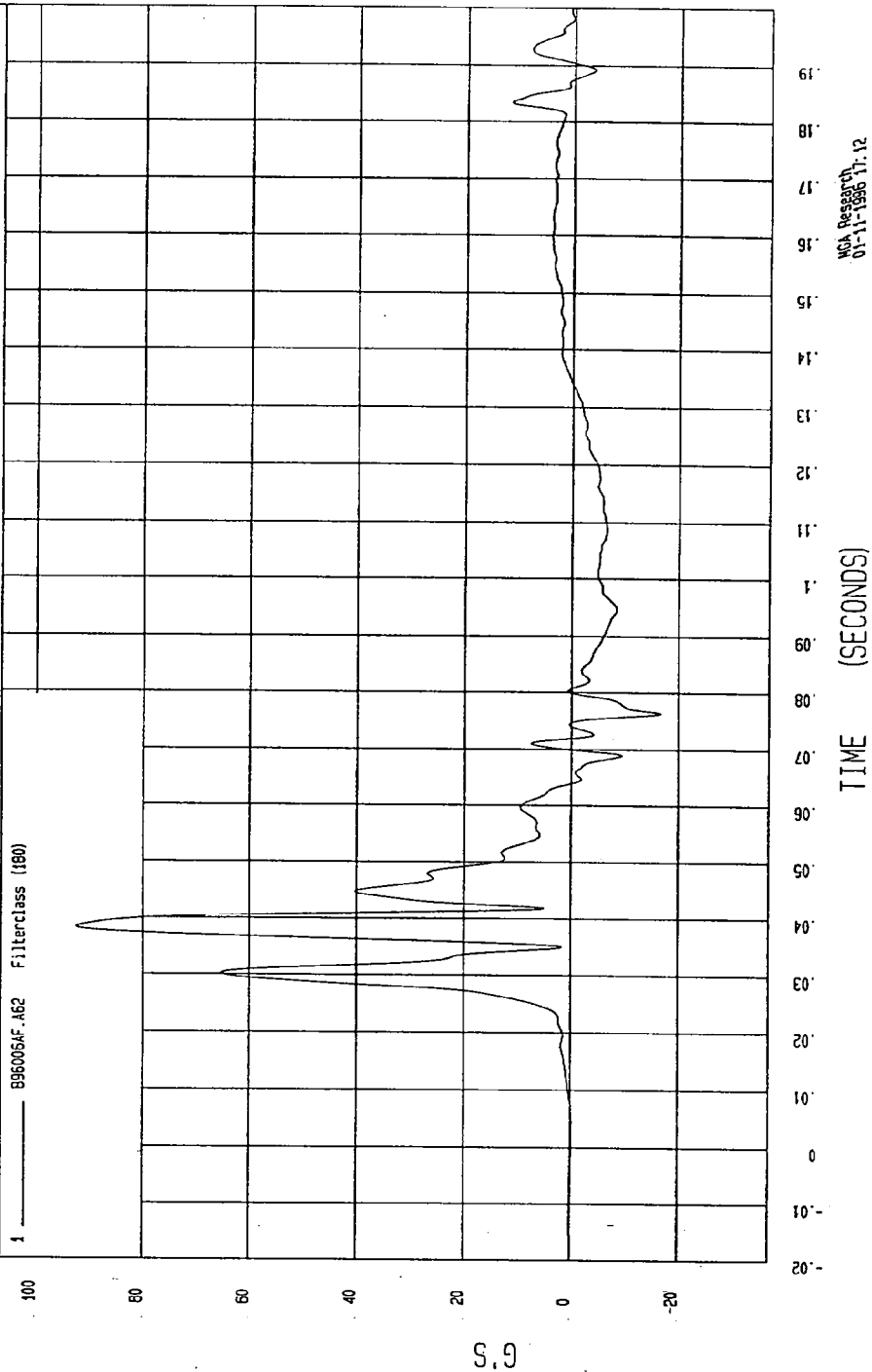
COMPONENT: 1996 SUBARU IMPREZA (NHTSA# CT5501) Speed: 33.1 MPH 53.3 KPH

YMIN=-16.6398 G'S at 76. msec

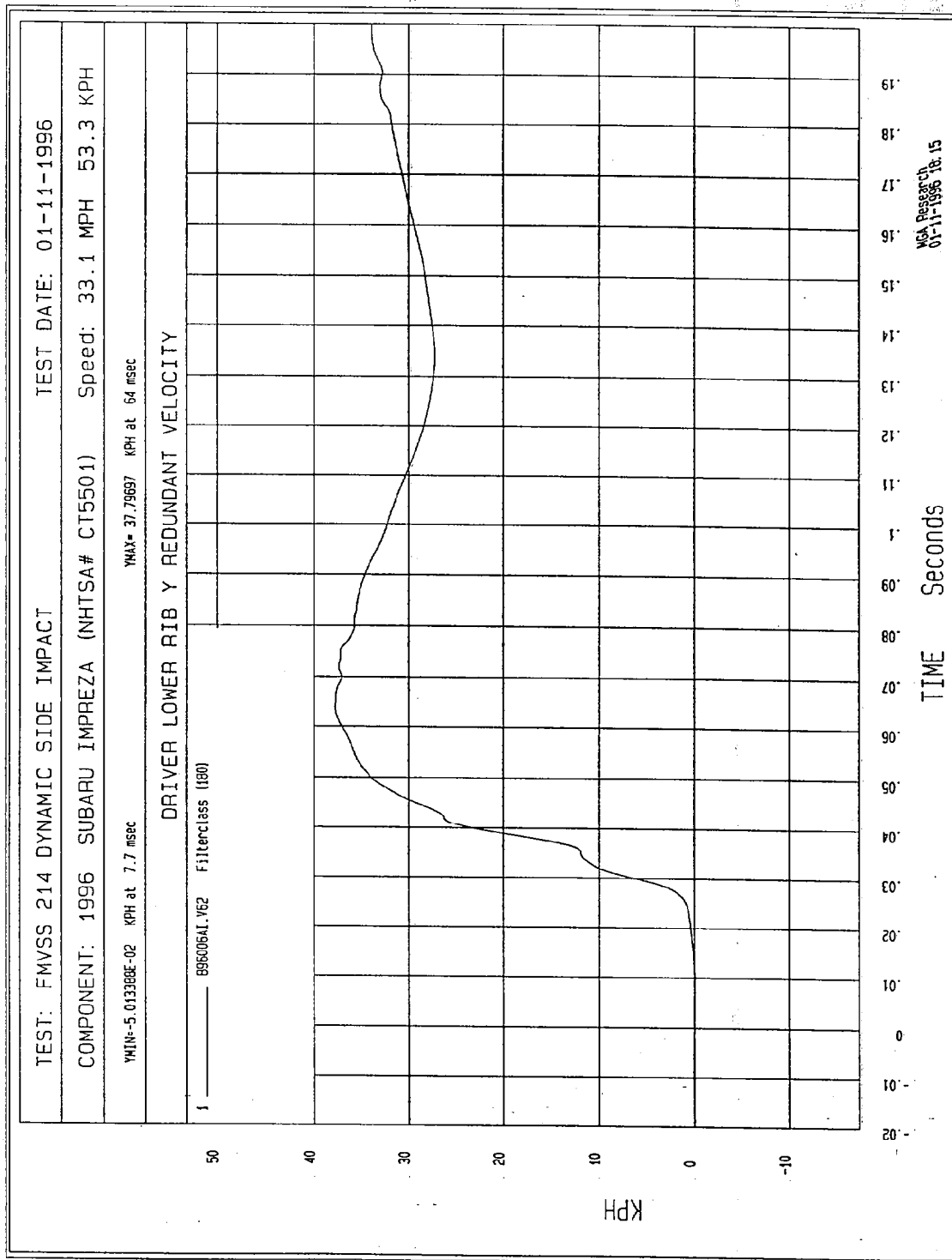
YMAX= 92.4545} G'S at 38. msec

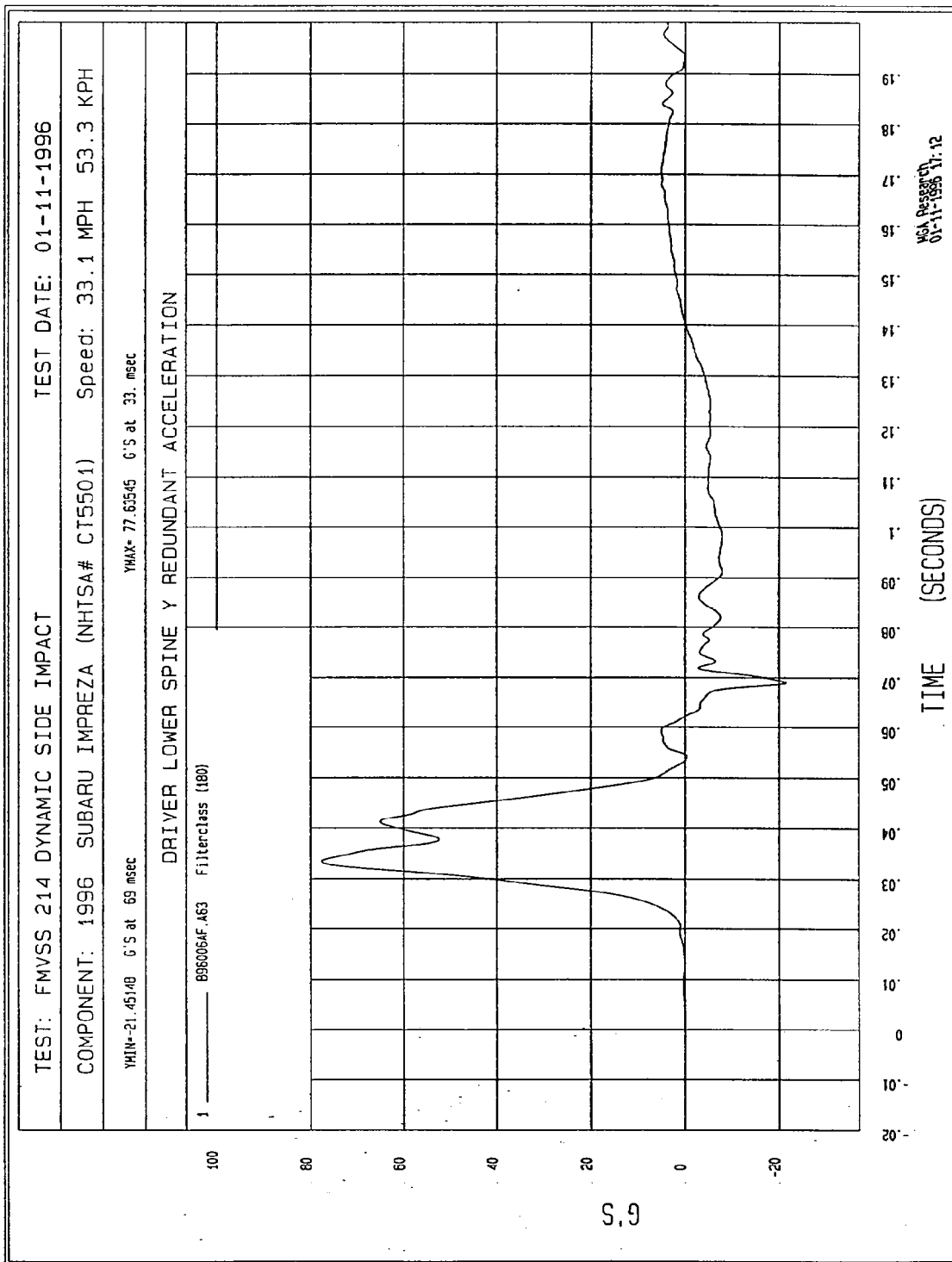
DRIVER LOWER RIB Y REDUNDANT ACCELERATION

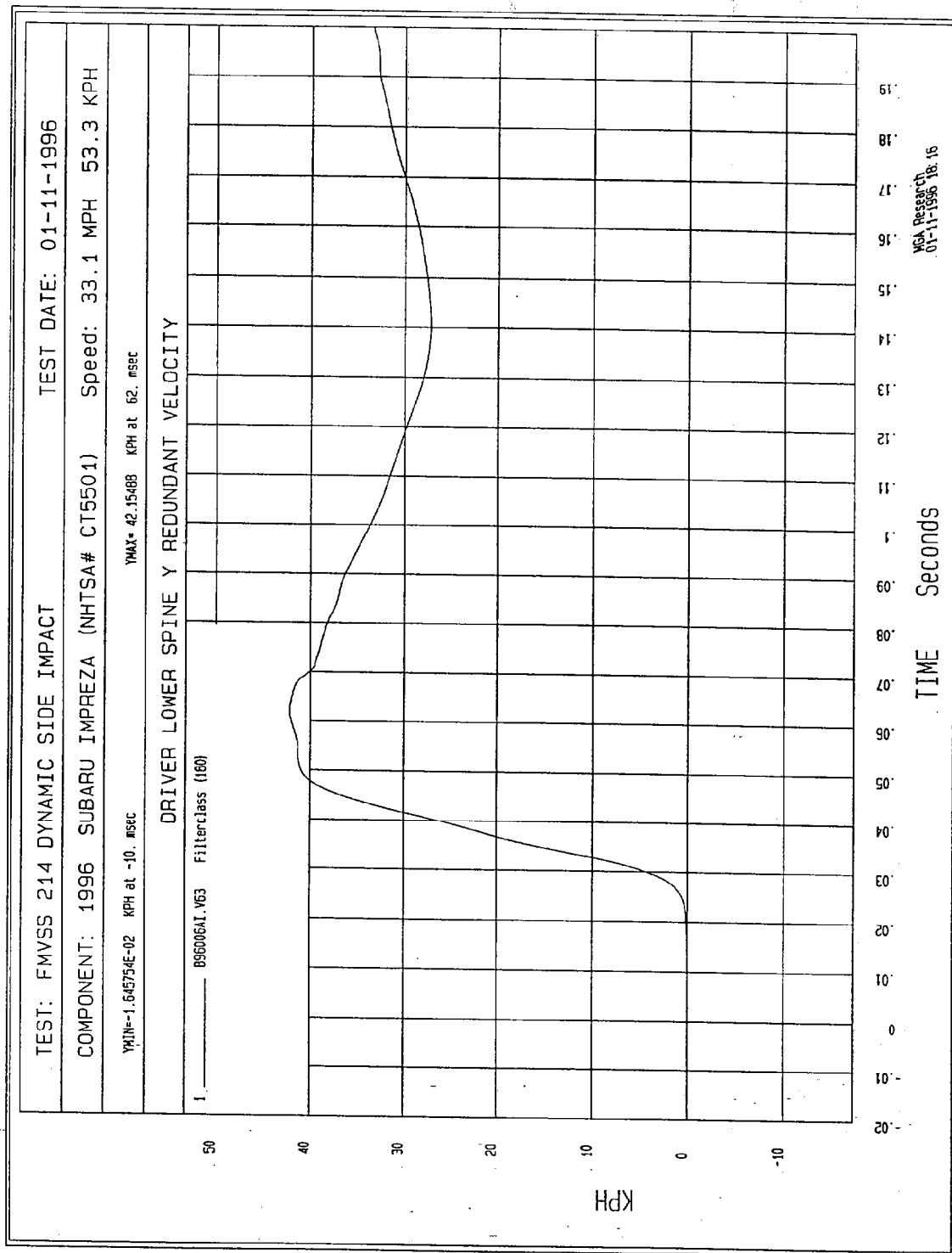
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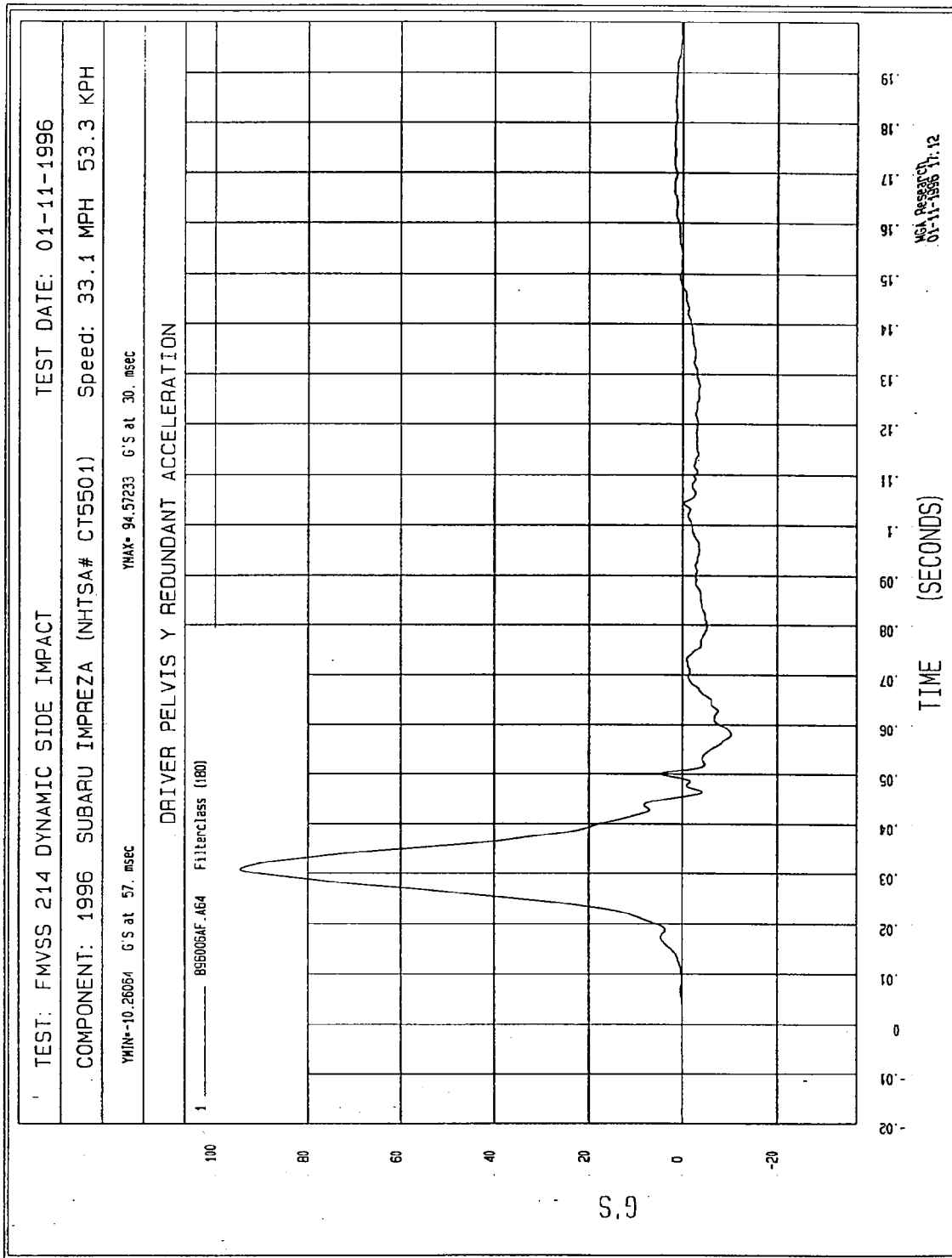


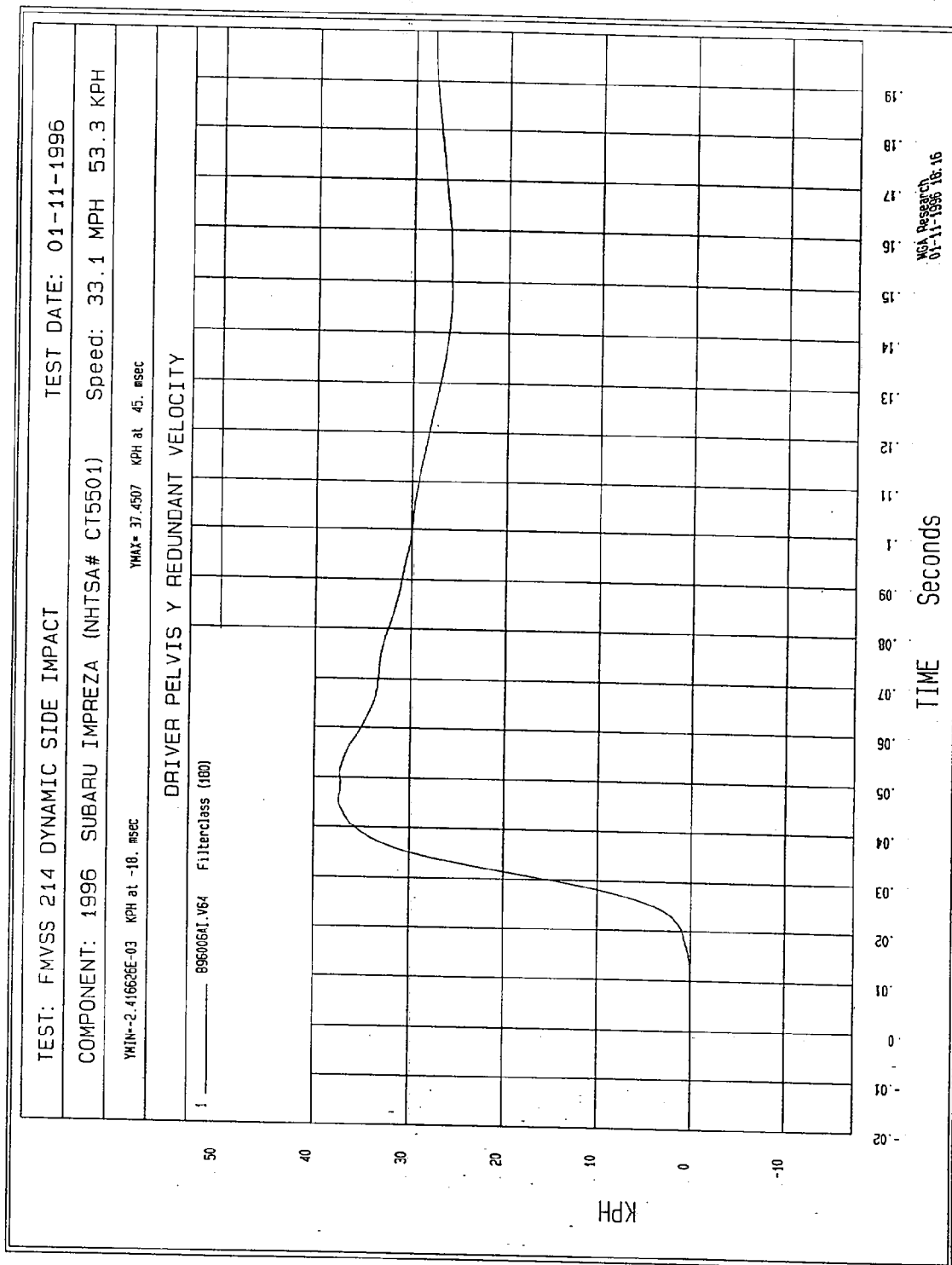
WGA Research
01-11-1996 17:12

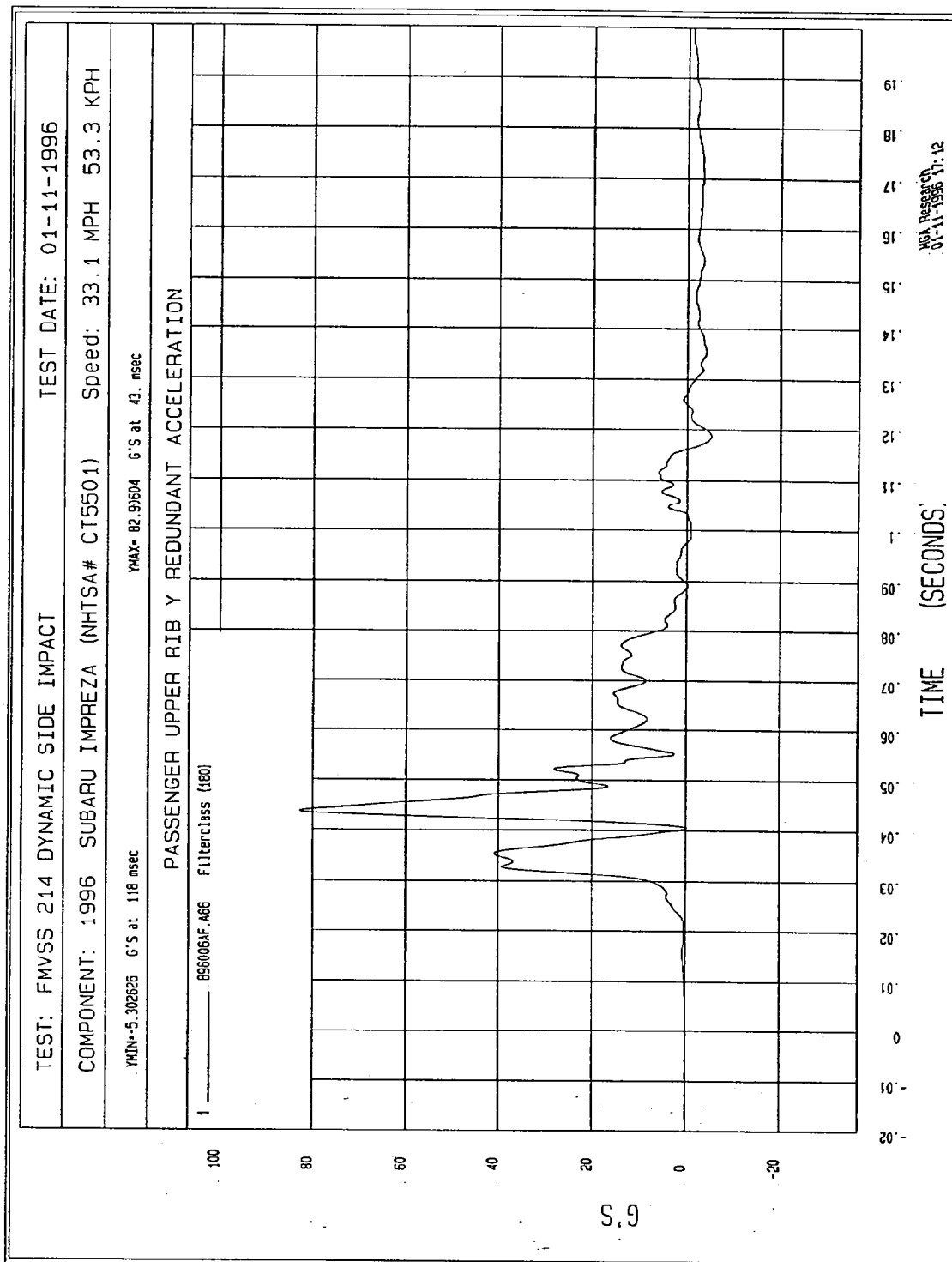


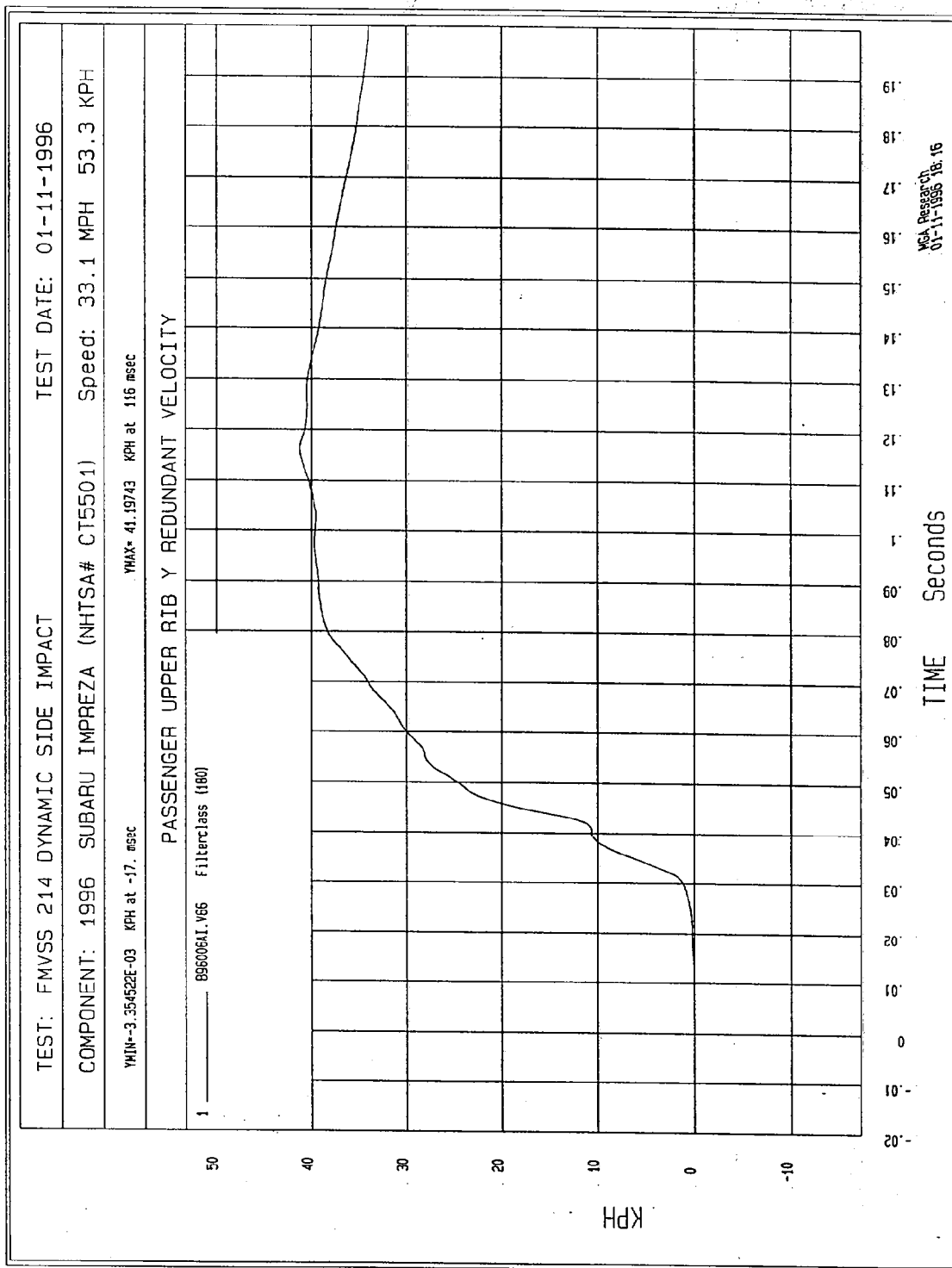






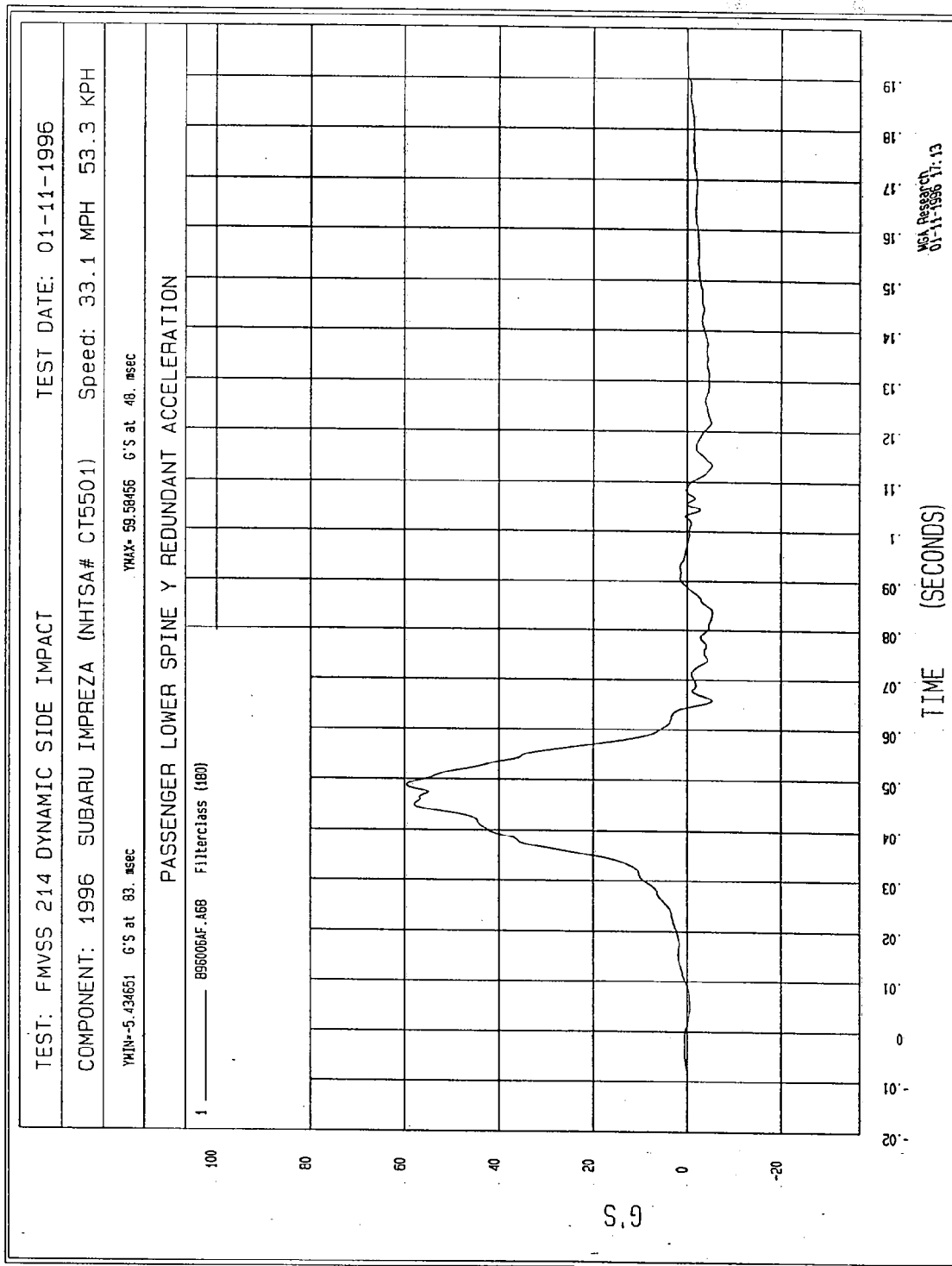


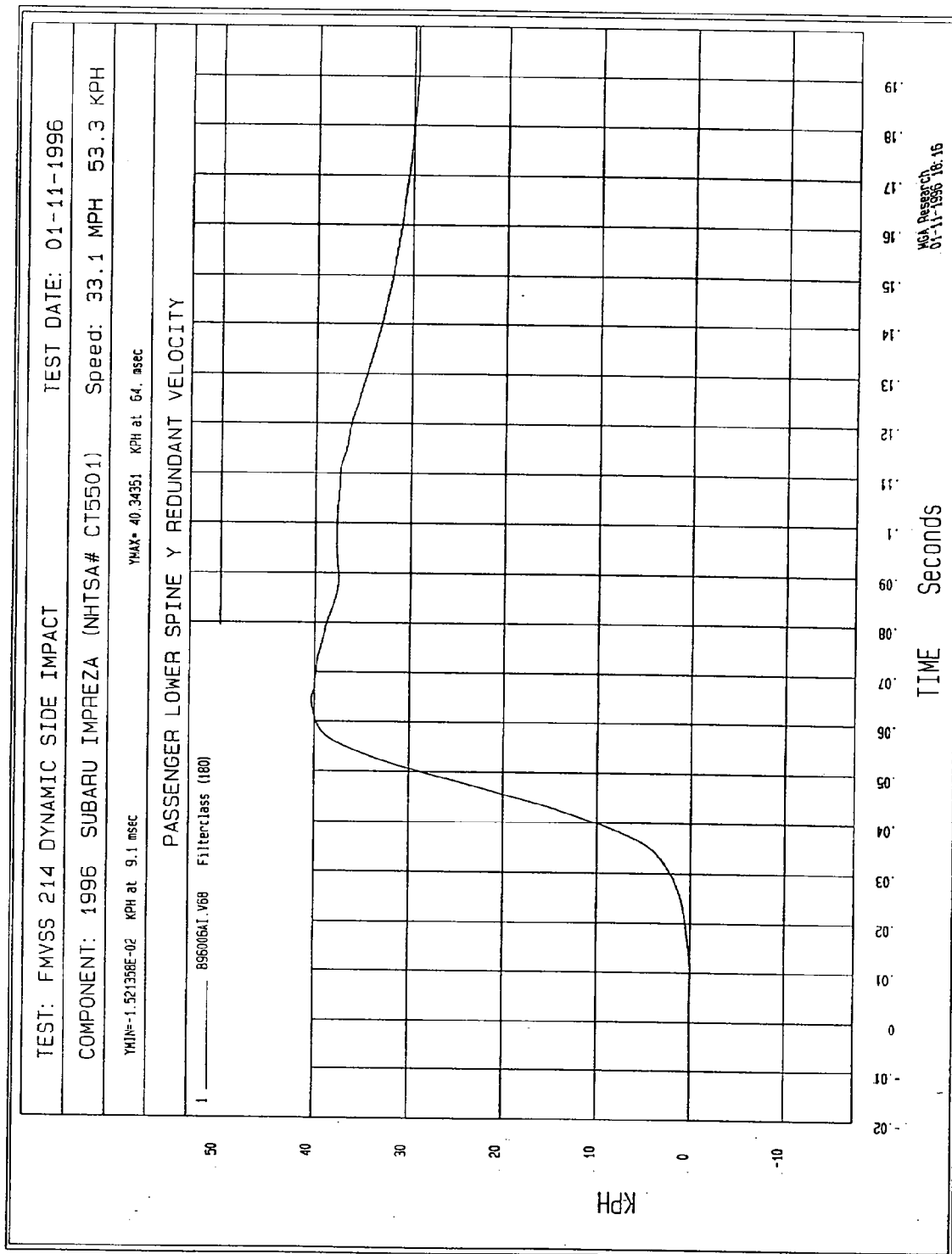


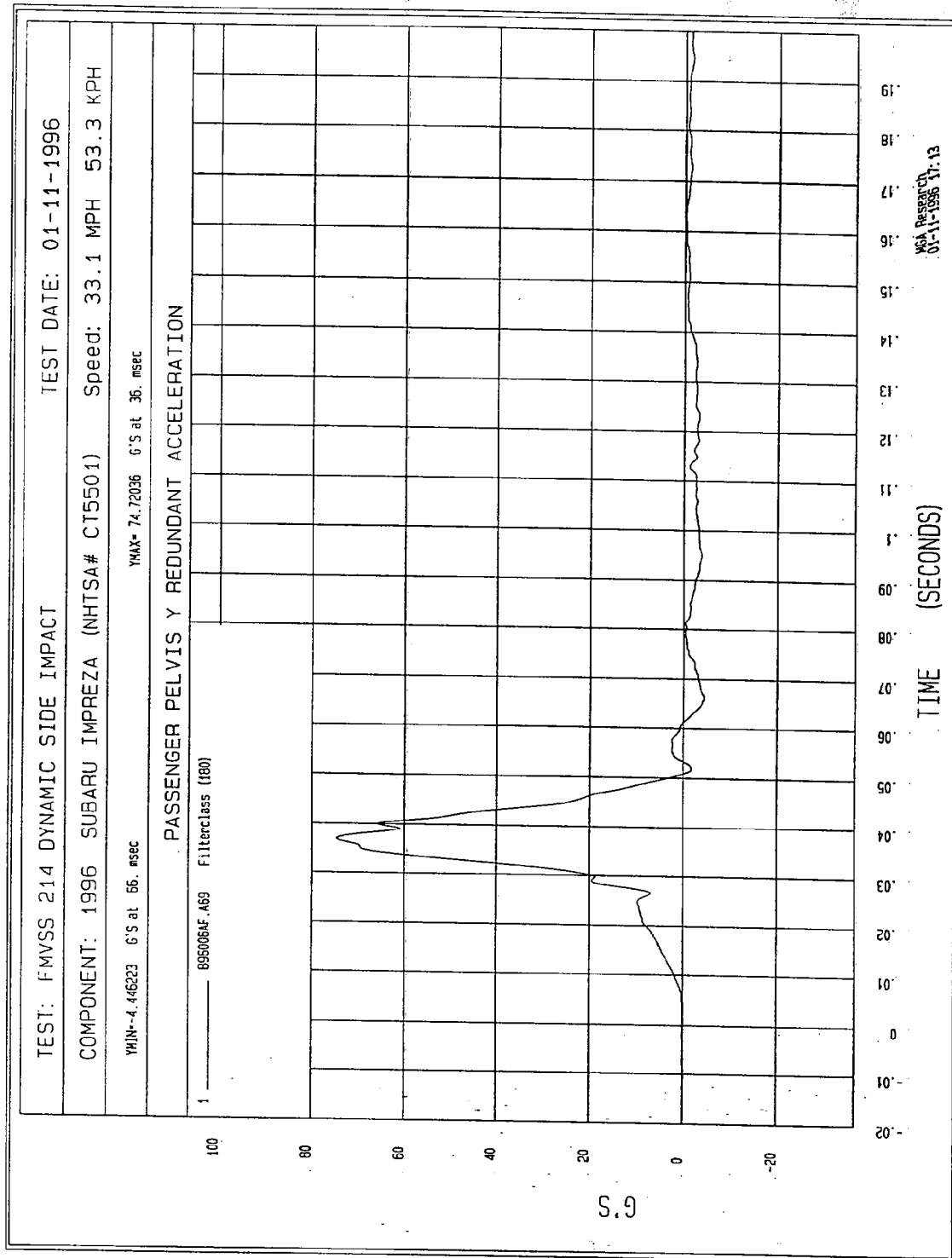


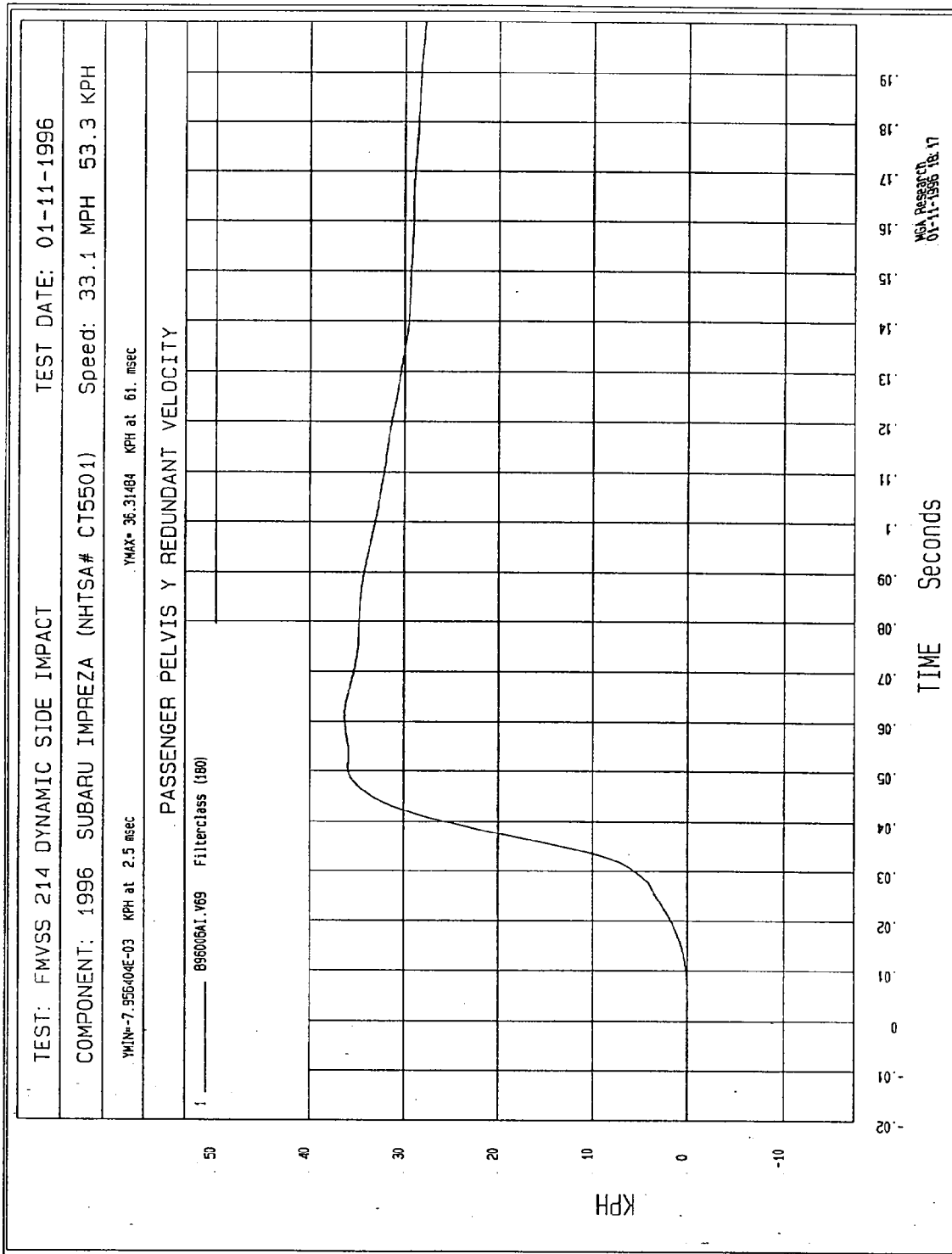
PASSENGER LOWER RIB Y REDUNDANT ACCELERATION VS. TIME

NO VALID DATA COLLECTED

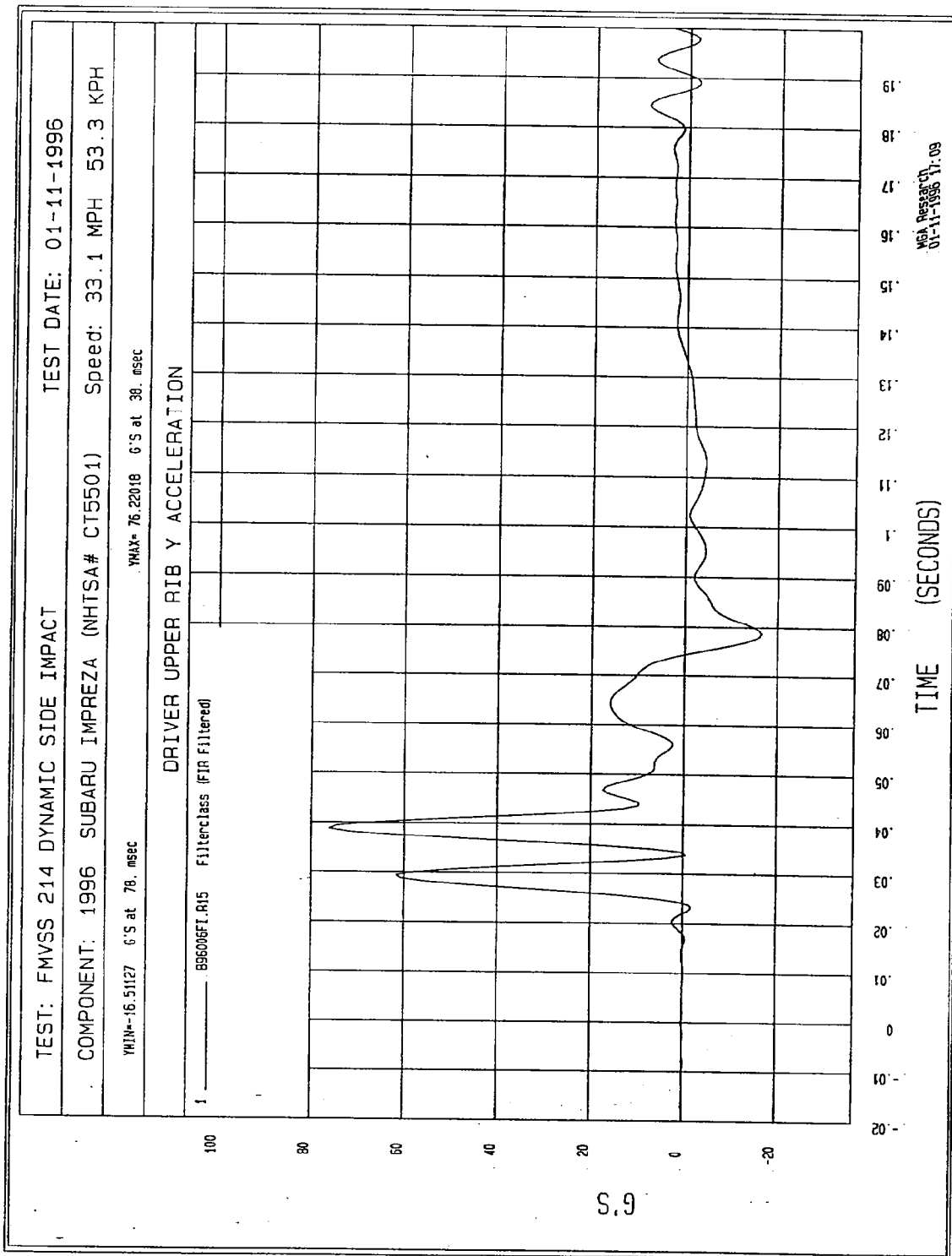


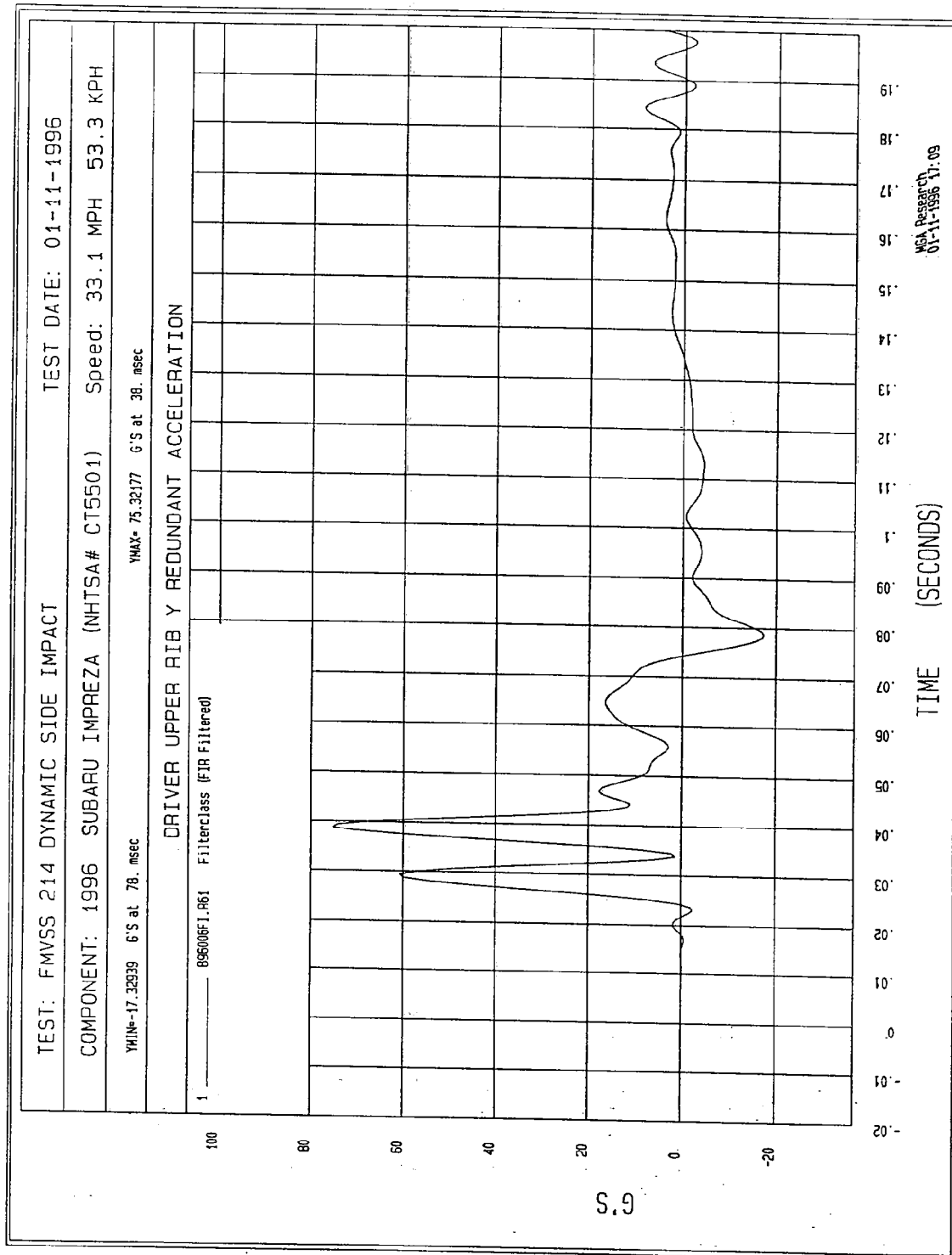


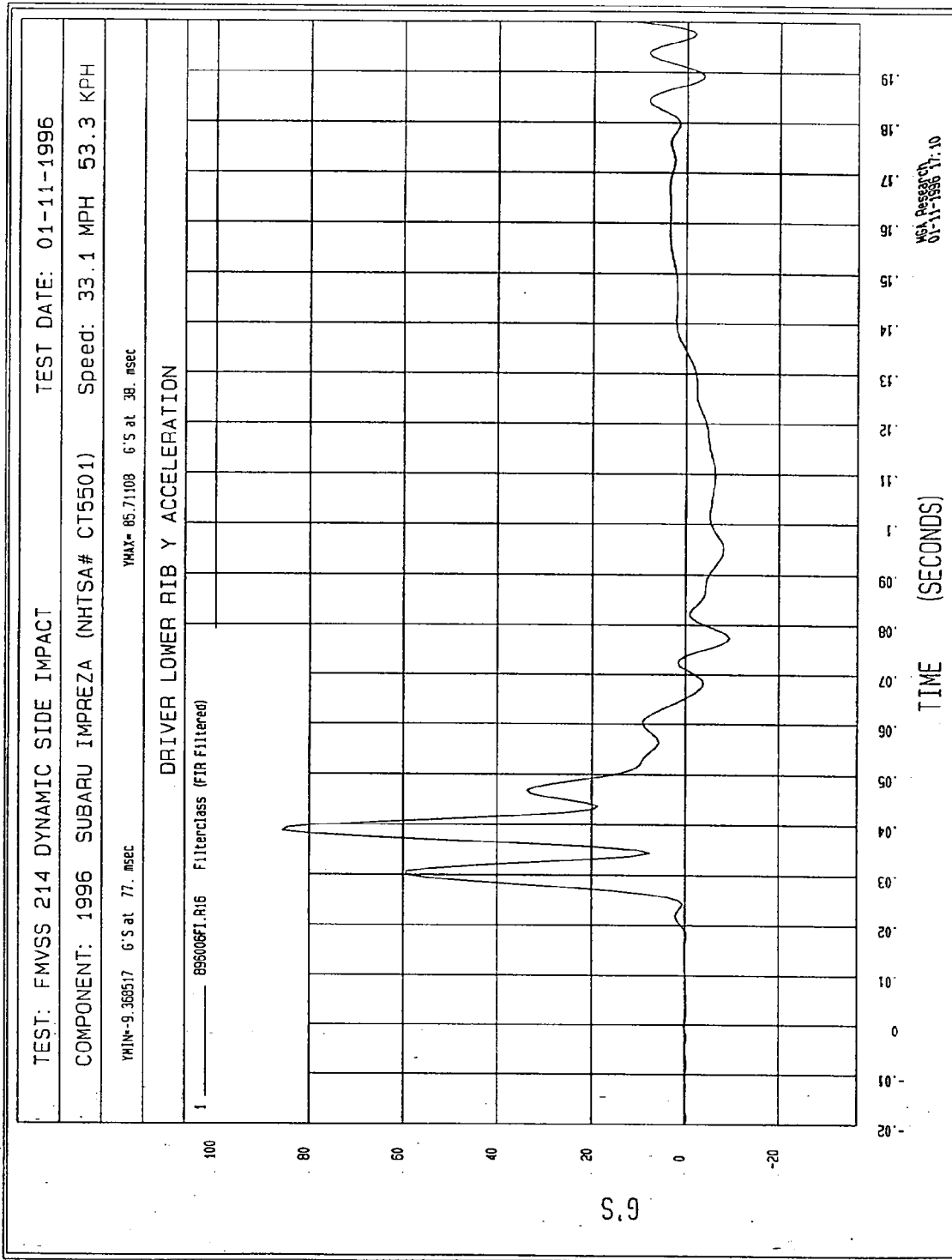


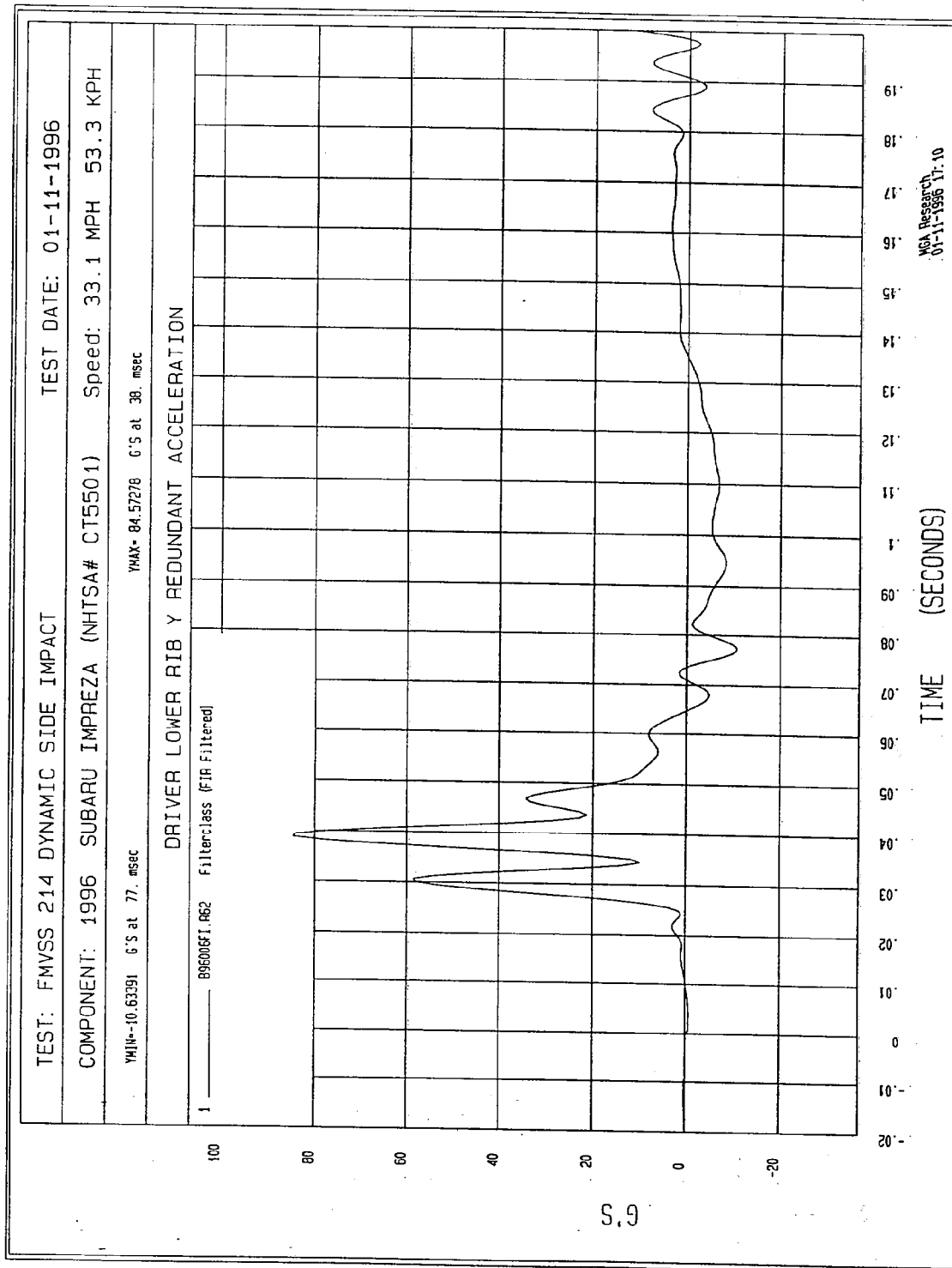


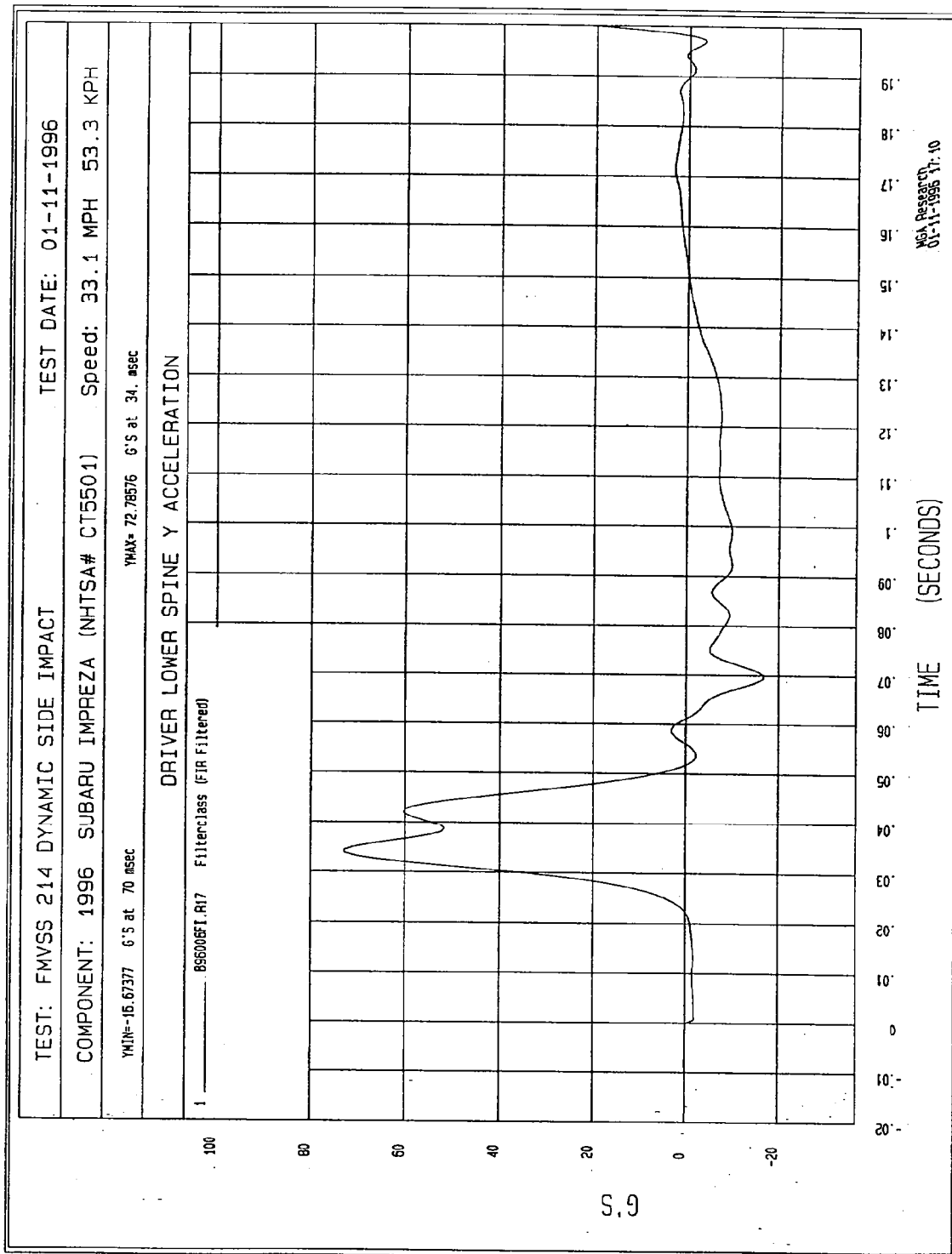
FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

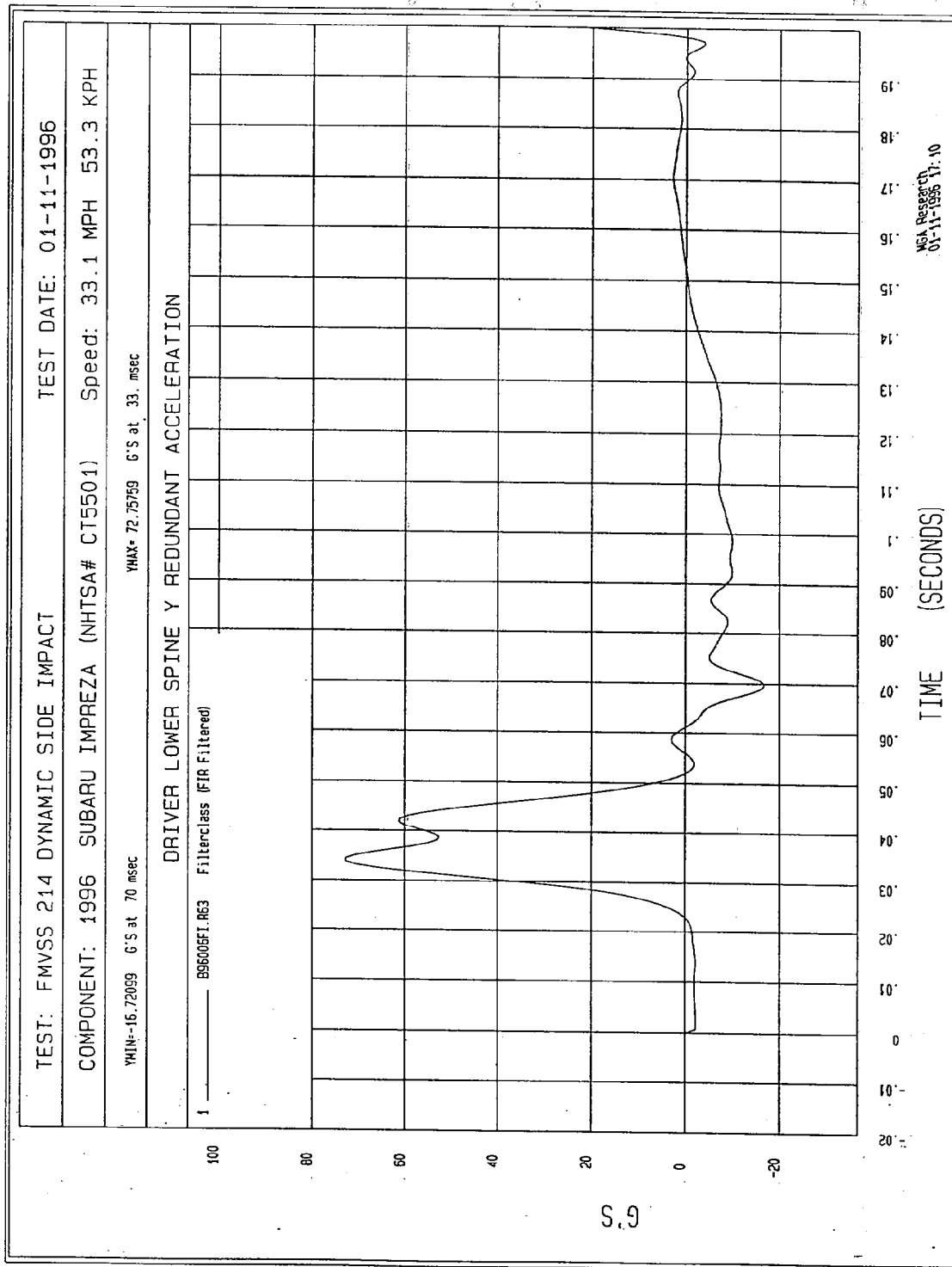


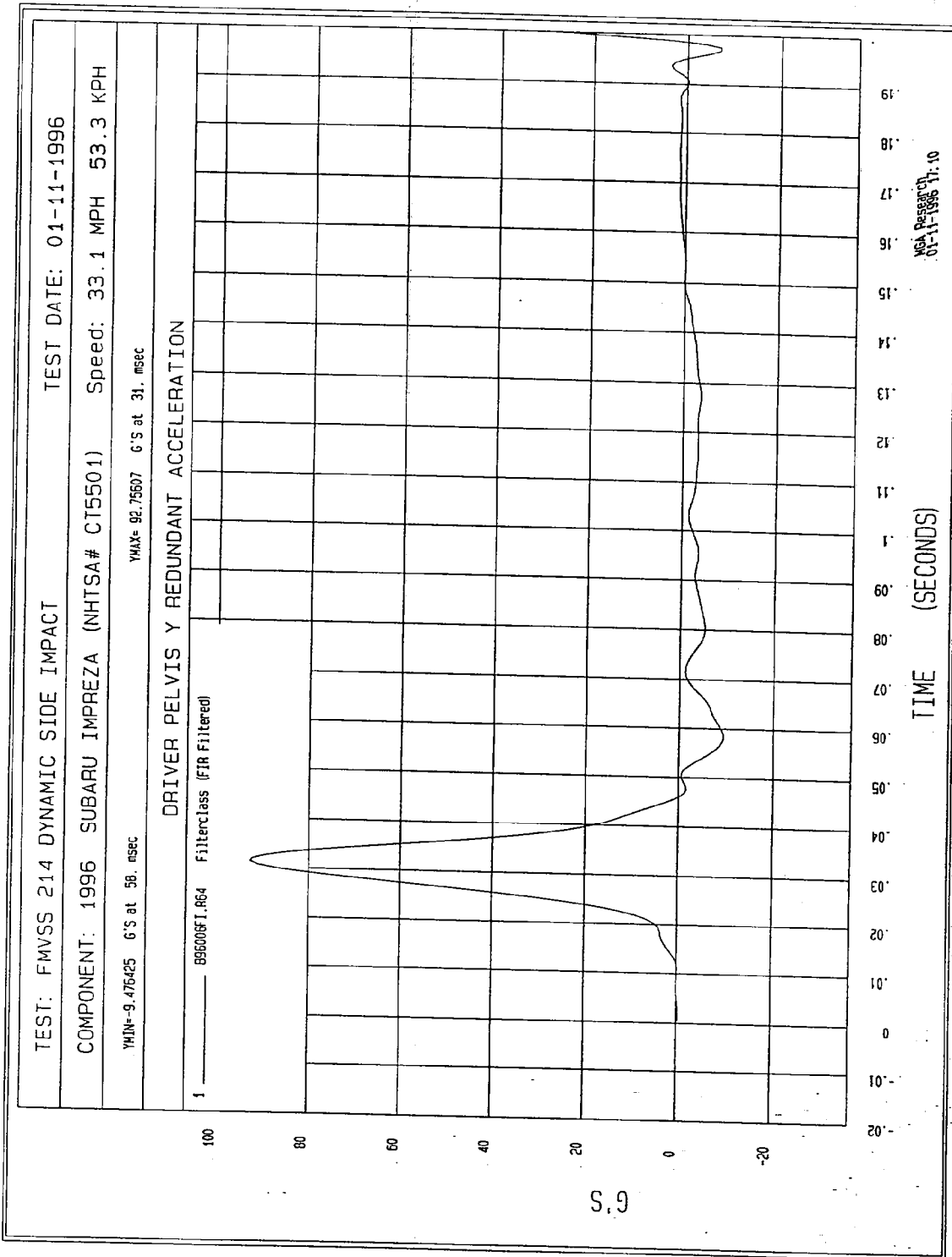


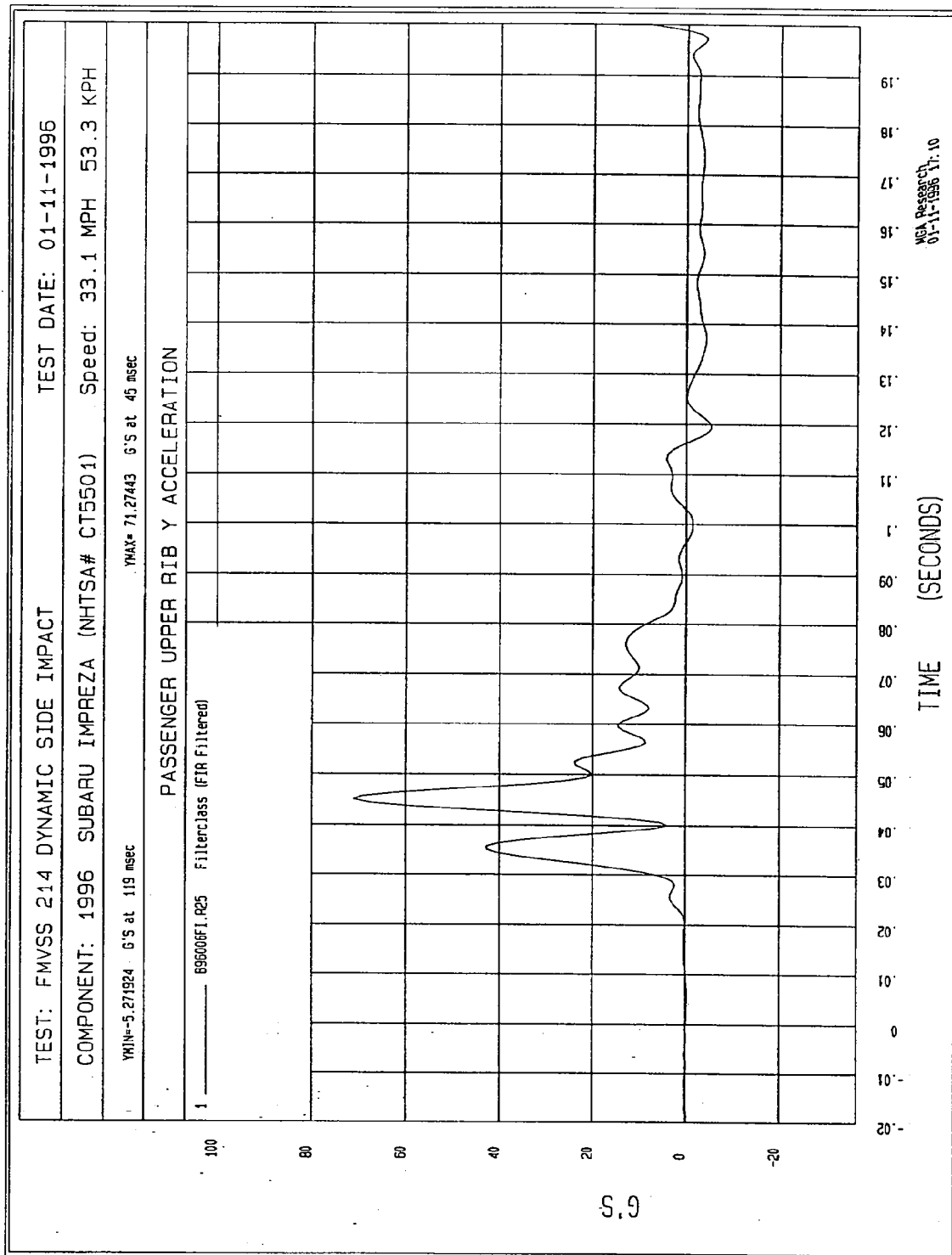


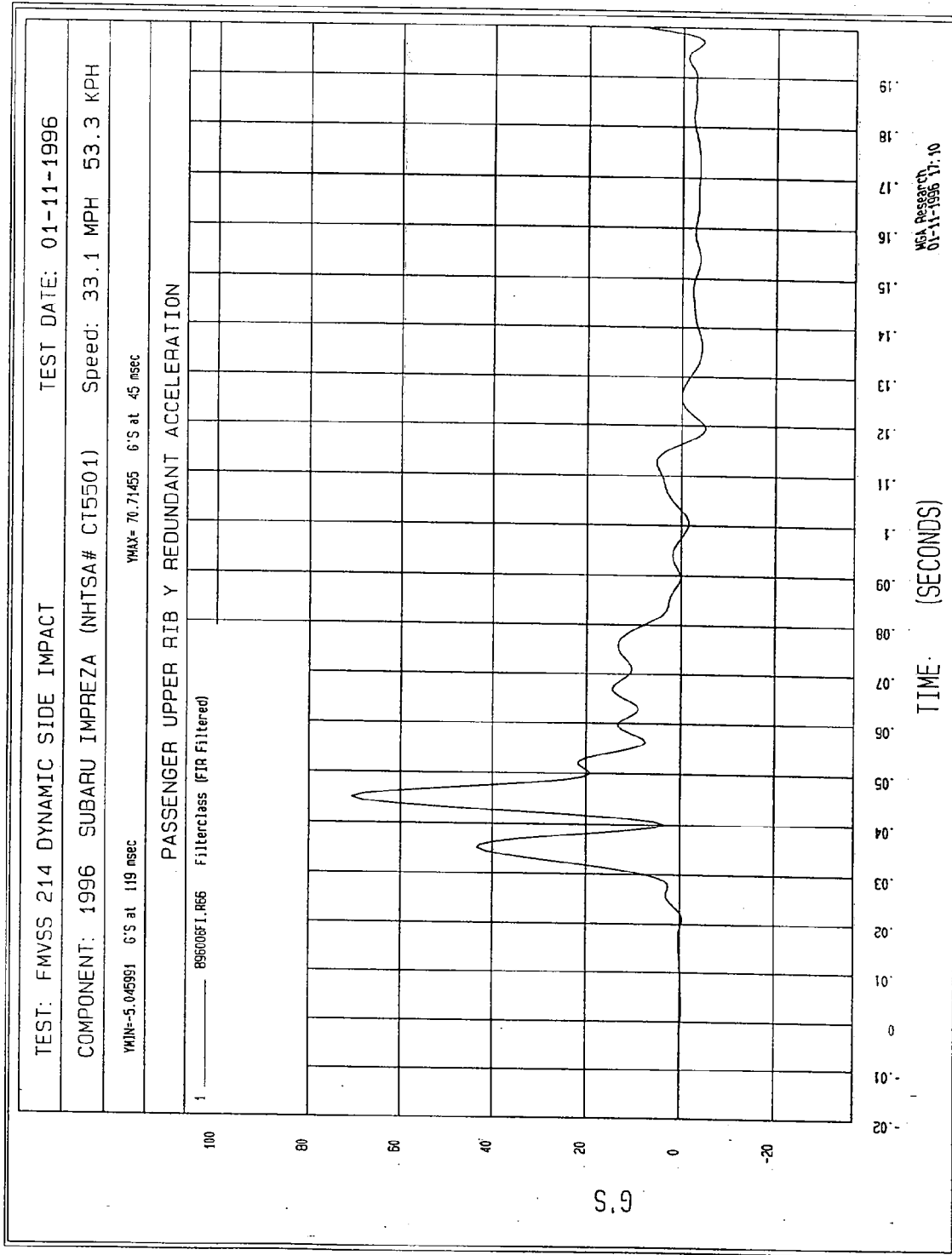


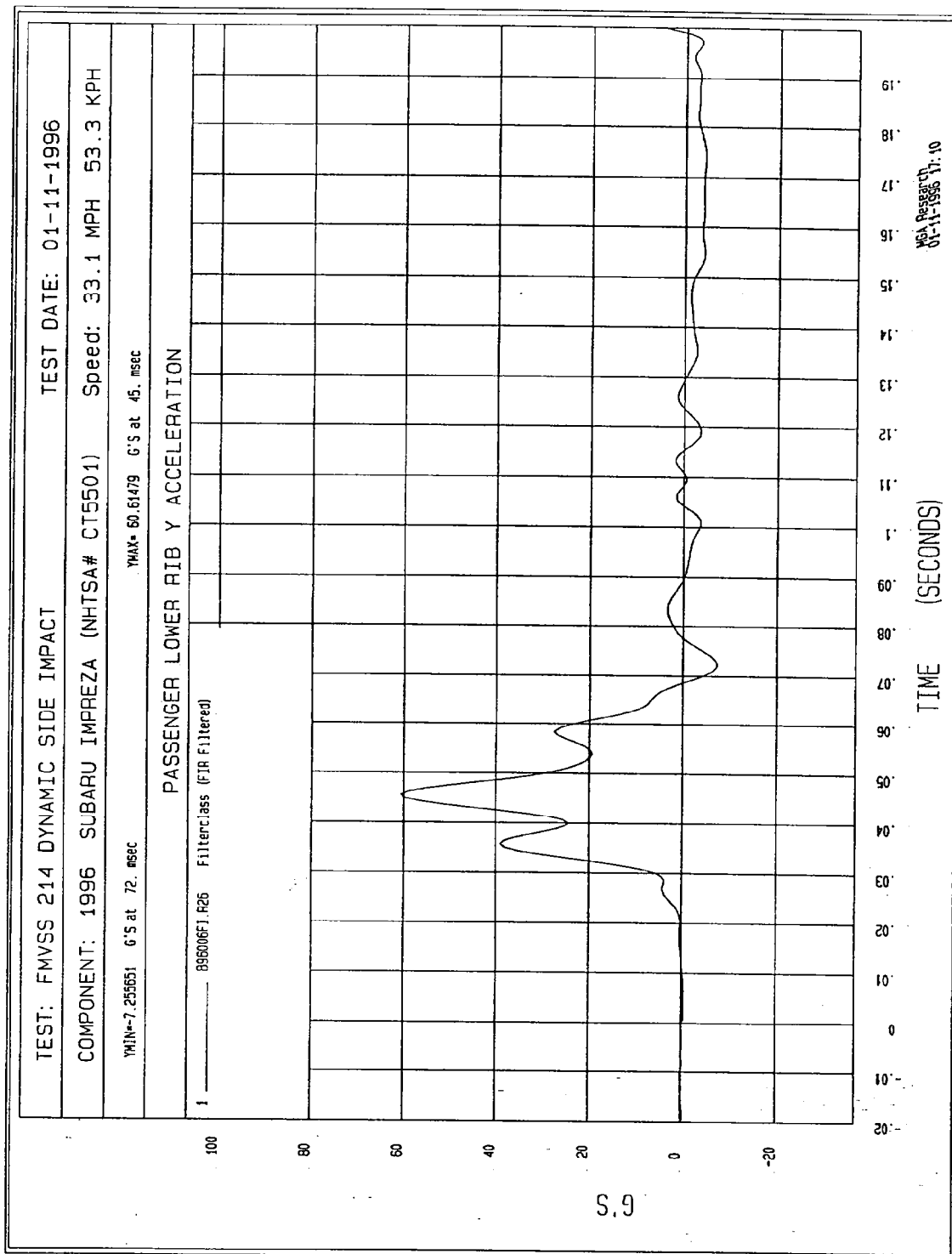






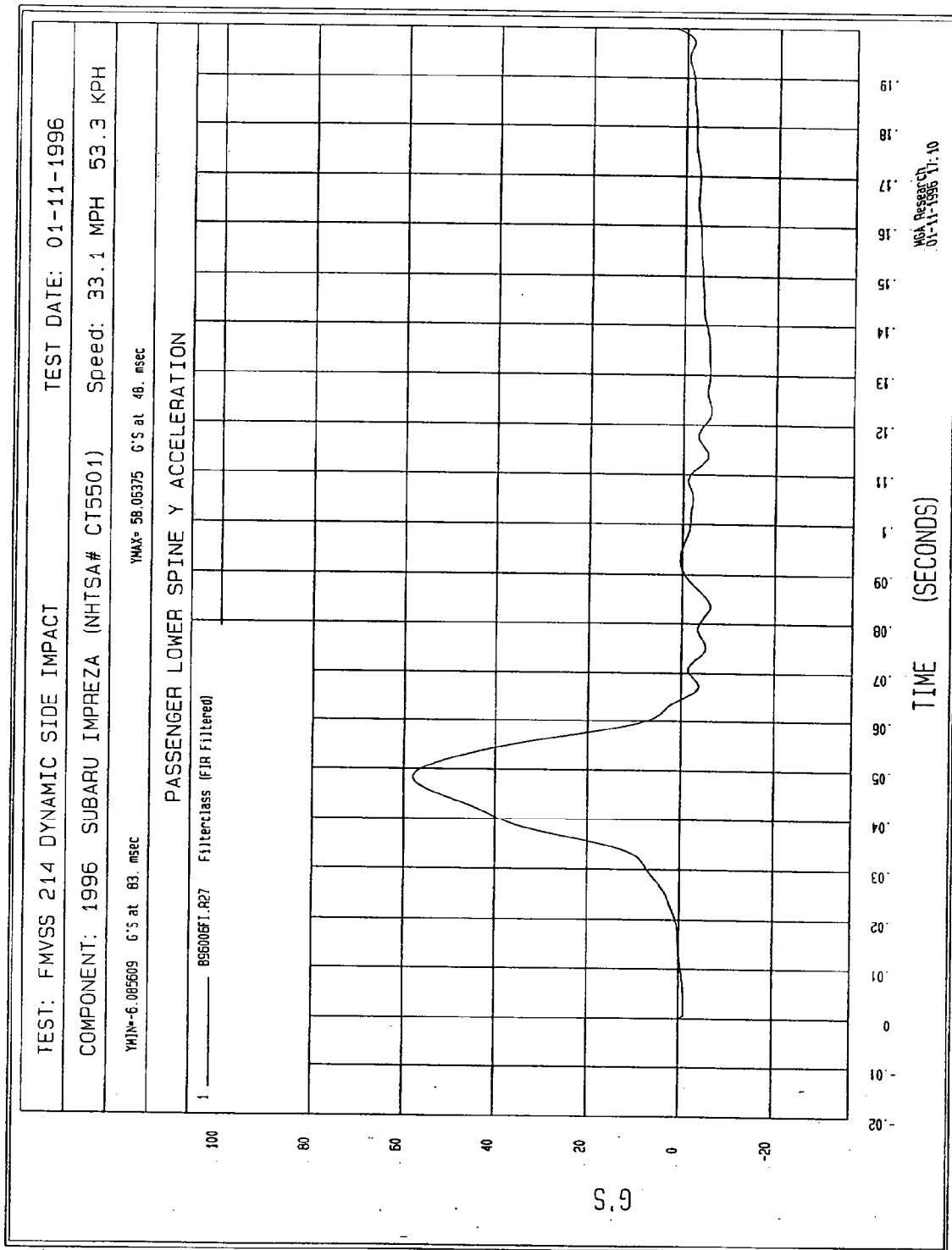


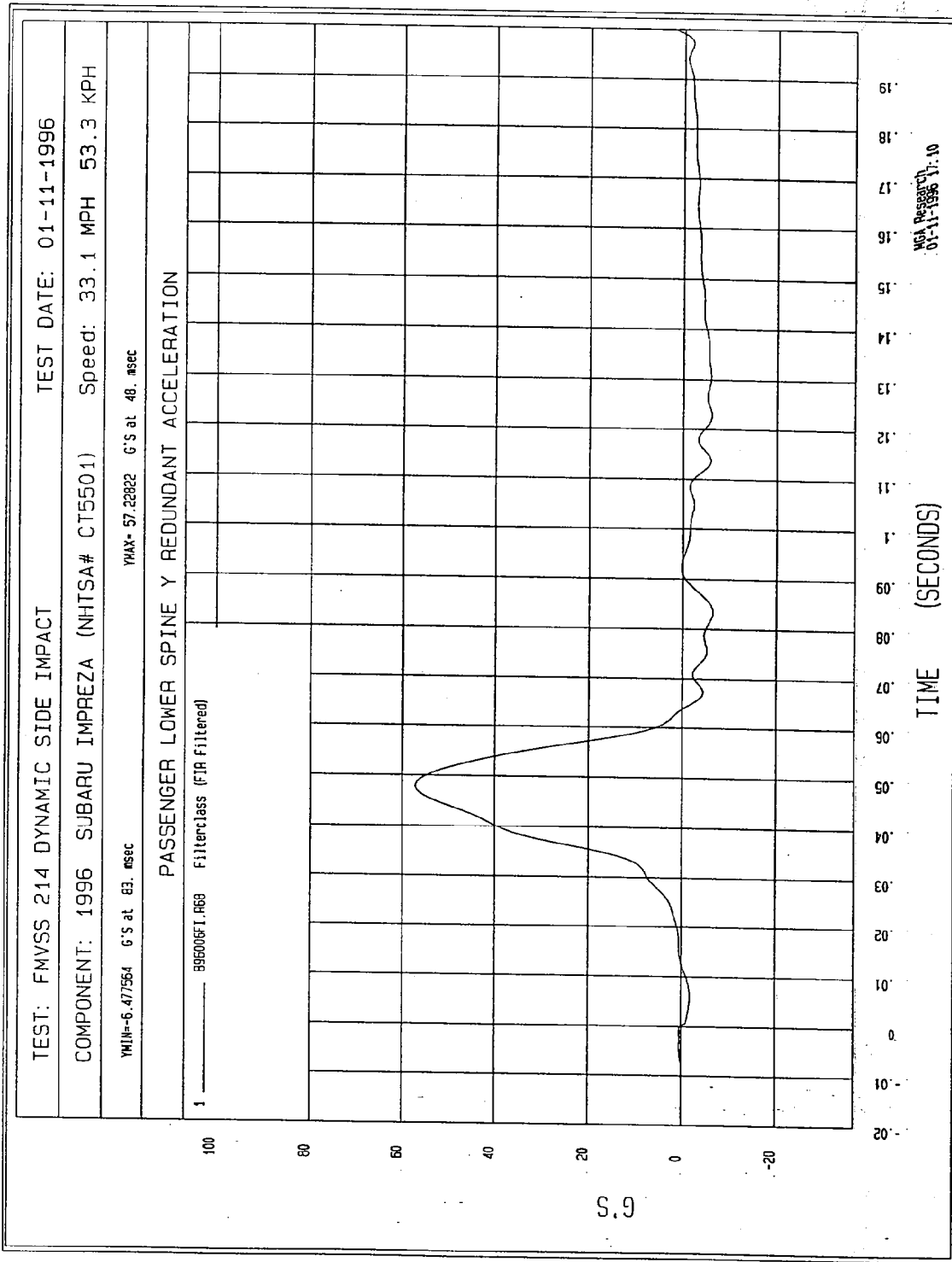


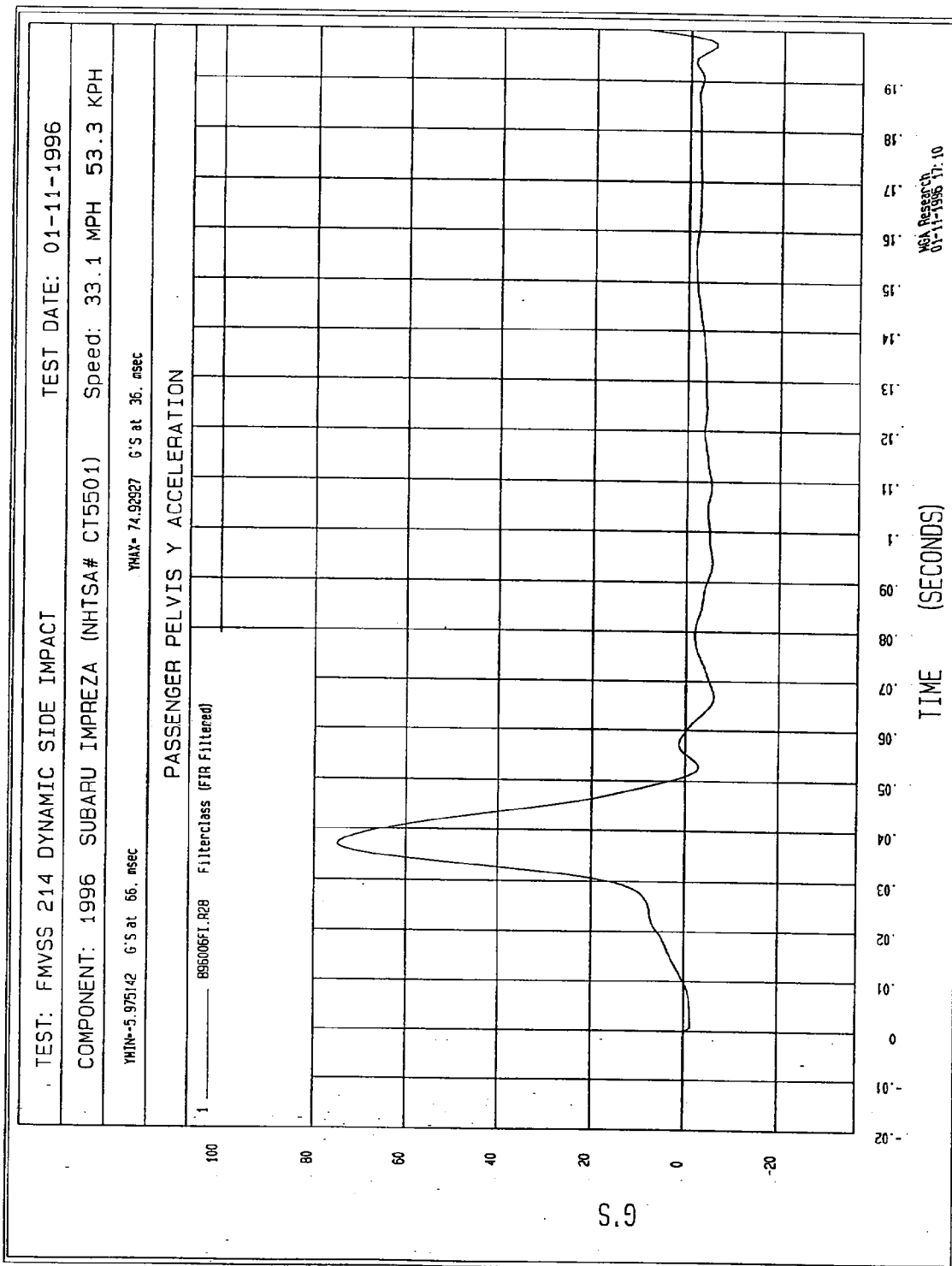


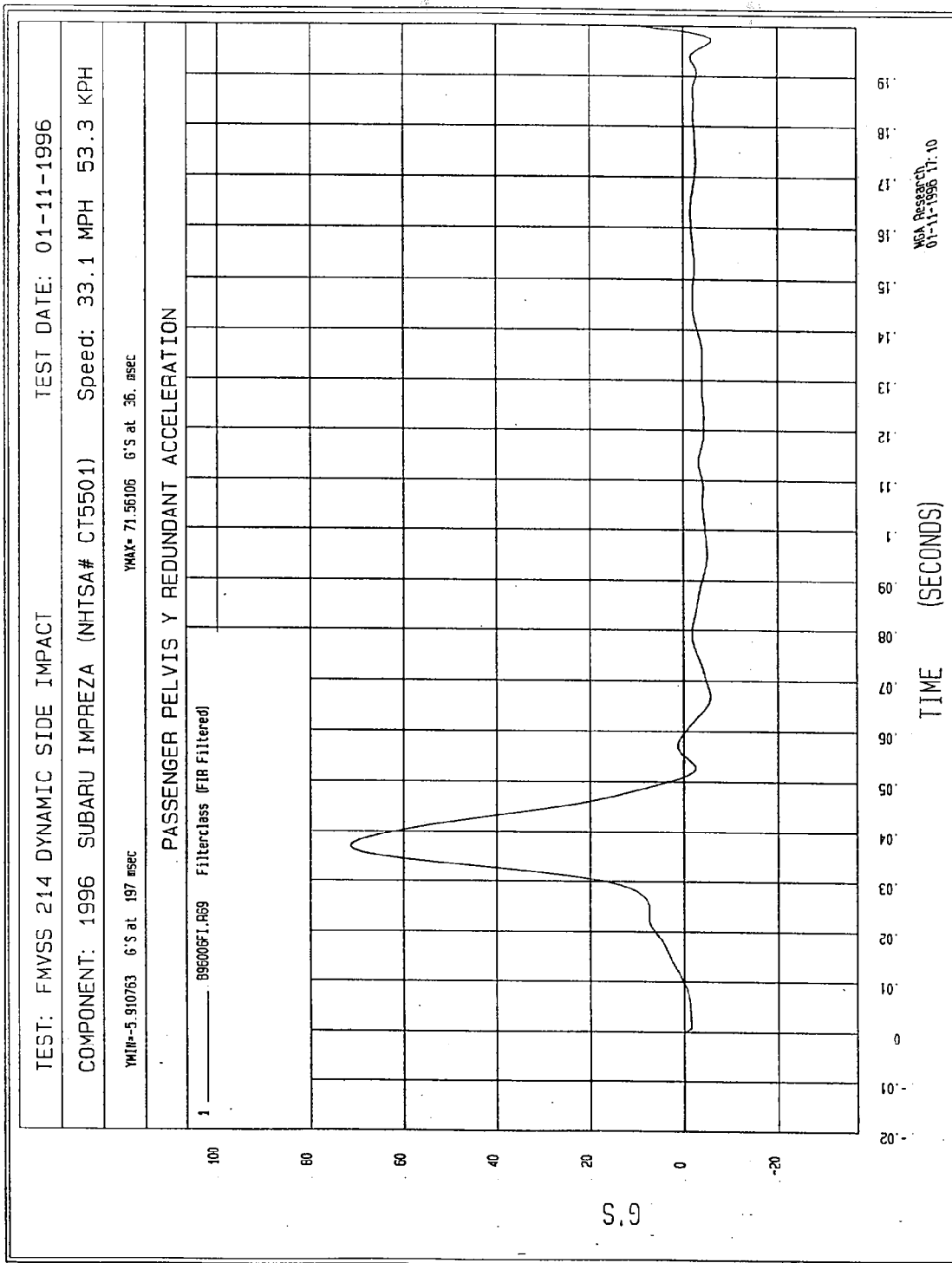
PASSENGER LOWER RIB Y REDUNDANT ACCELERATION VS. TIME

NO VALID DATA COLLECTED









APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

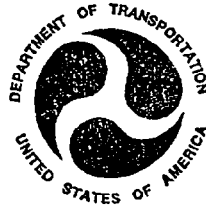
REPORT NO. MGA-96-DC11

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

SUBARU MOTORS CORPORATION
1996 SUBARU IMPREZA 2 DOOR
NHTSA NO. CT5501

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 11, 1996

Report Date: January 16, 1996

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: December 18, 1995

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

MEASUREMENTS BY: Tim W. O.

APPROVED BY: Dave K. Kabeke

MGA RESEARCH CORPORATION
THORACIC SHOCK ABSORBER TEST
SIDE IMPACT DUMMY (SID)

DATE: ^{January} ~~December~~ 18, 1995

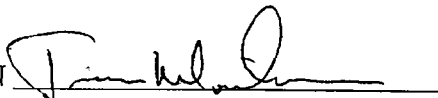
DUMMY NUMBER: 270

TEST NUMBER: D95209678

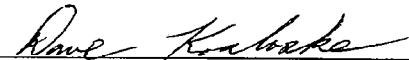
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66° - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	15%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	248
	DISPLACEMENT (in.)	1.18 - 1.38	1.19
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	420
	DISPLACEMENT (in.)	1.26 - 1.47	1.34
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	954
	DISPLACEMENT (in.)	1.30 - 1.57	1.30

TEST MEETS SPECIFICATIONS

TECHNICIAN

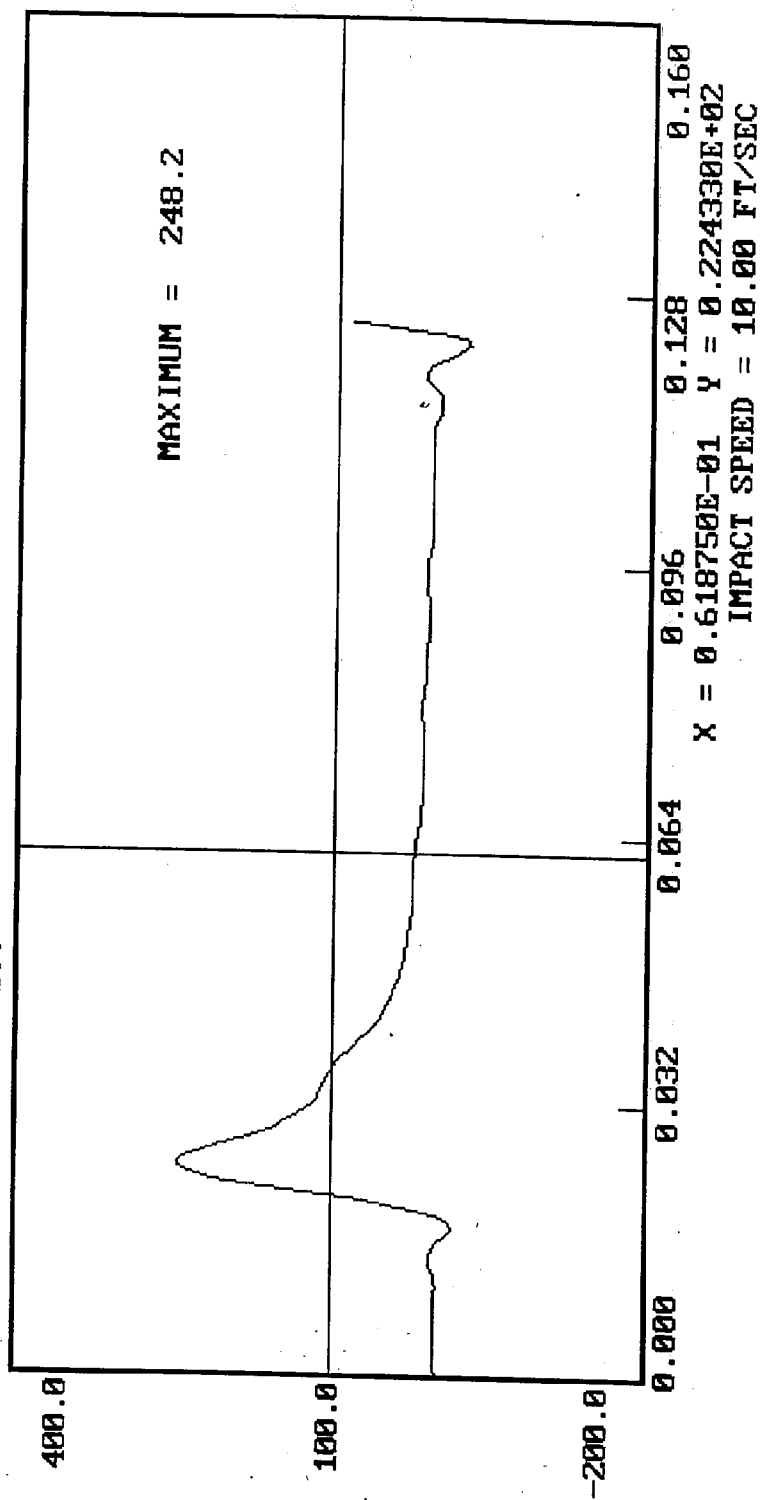


APPROVED BY



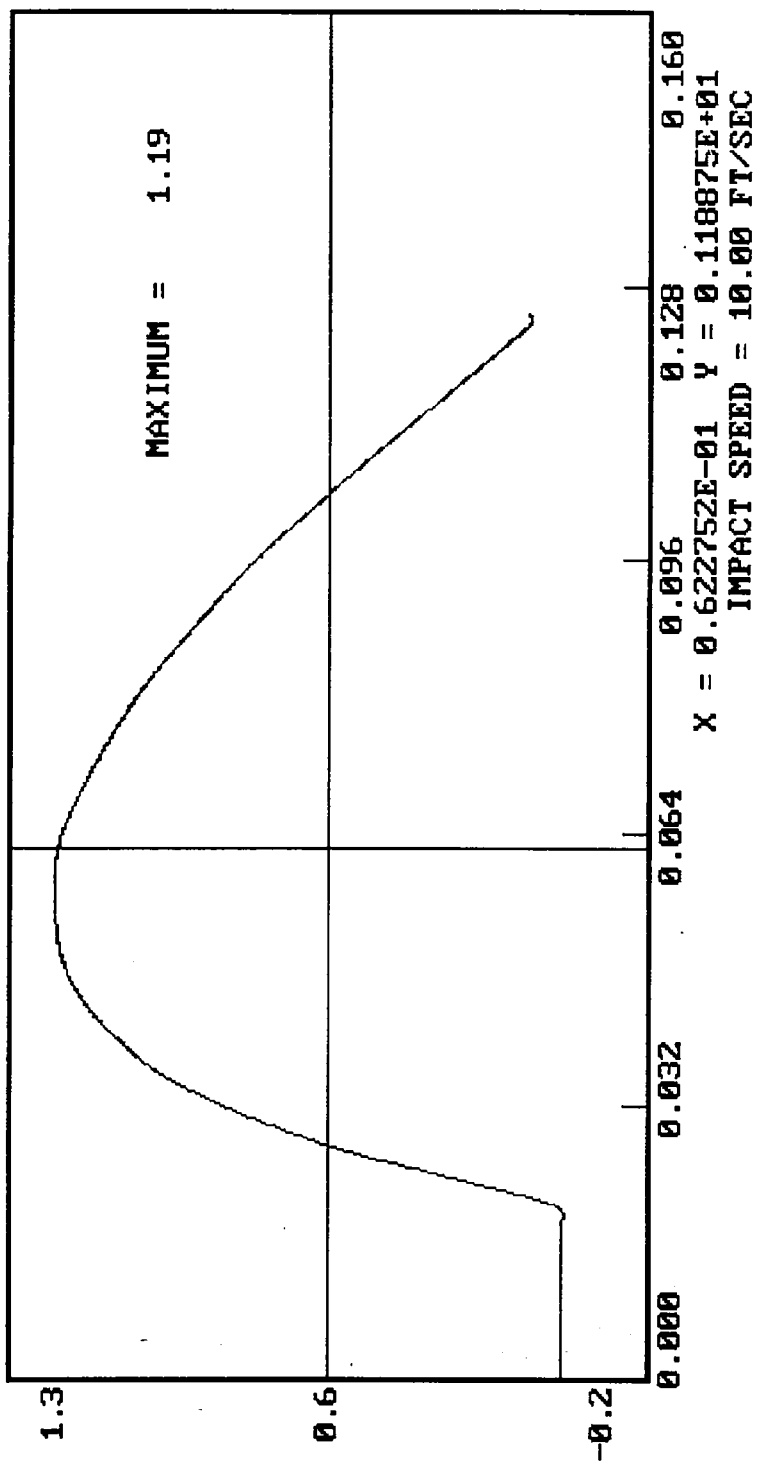
DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 270
FORCE (LBS) VS. TIME ((SECONDS))

12-18-1995 10:01



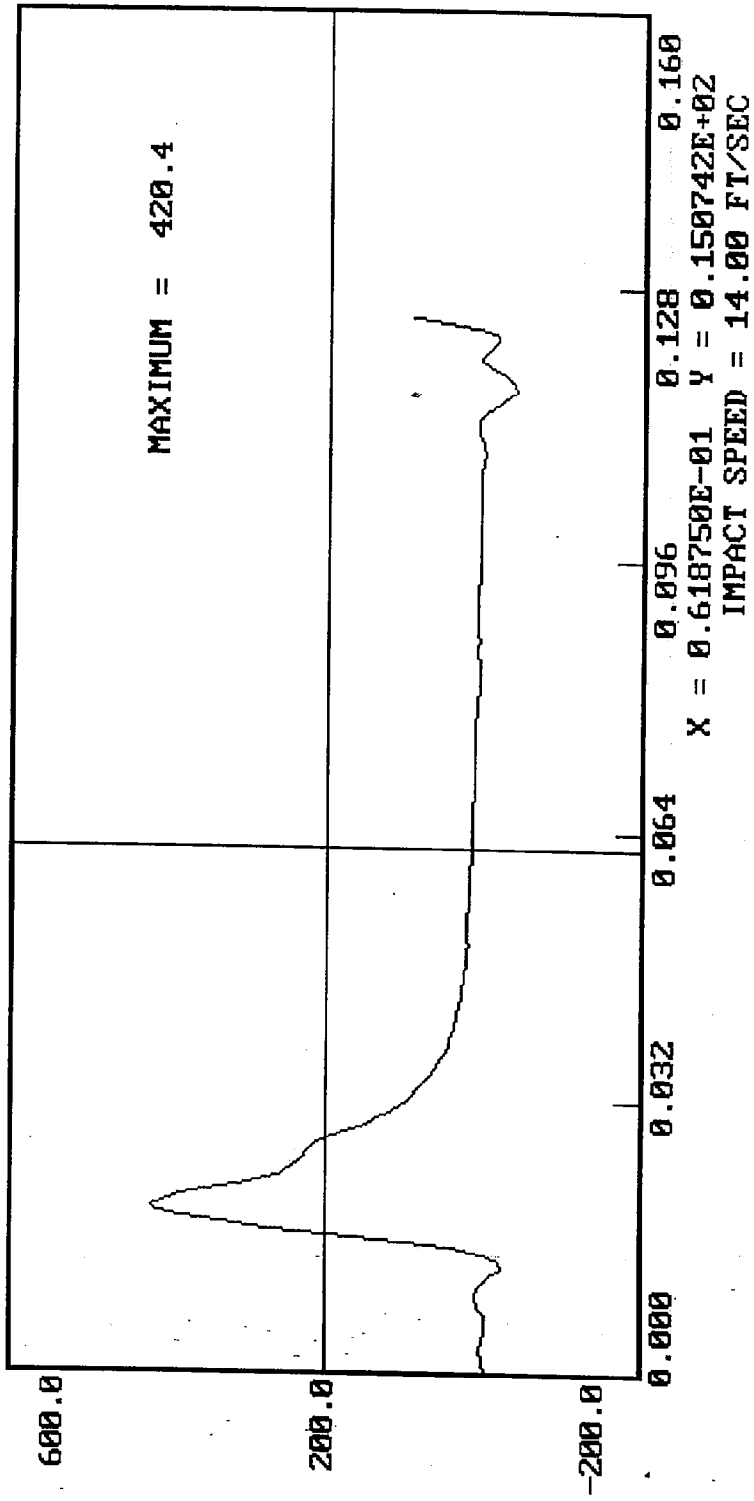
01-18-1996 11:12

DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 270
DISPLACEMENT (IN) VS. TIME ((SECONDS))



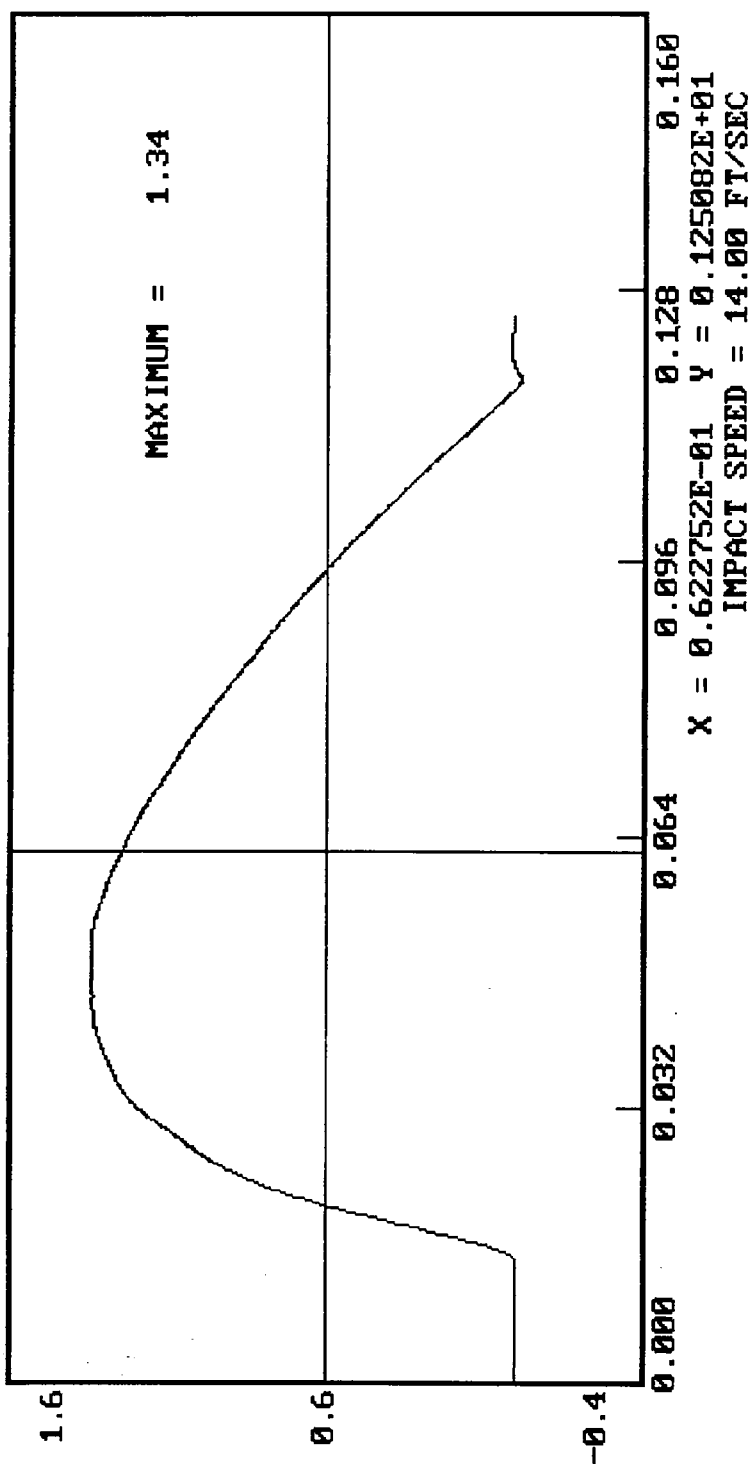
DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 270
FORCE (LBS) VS. TIME (SECONDS))

12-18-1995 10:14

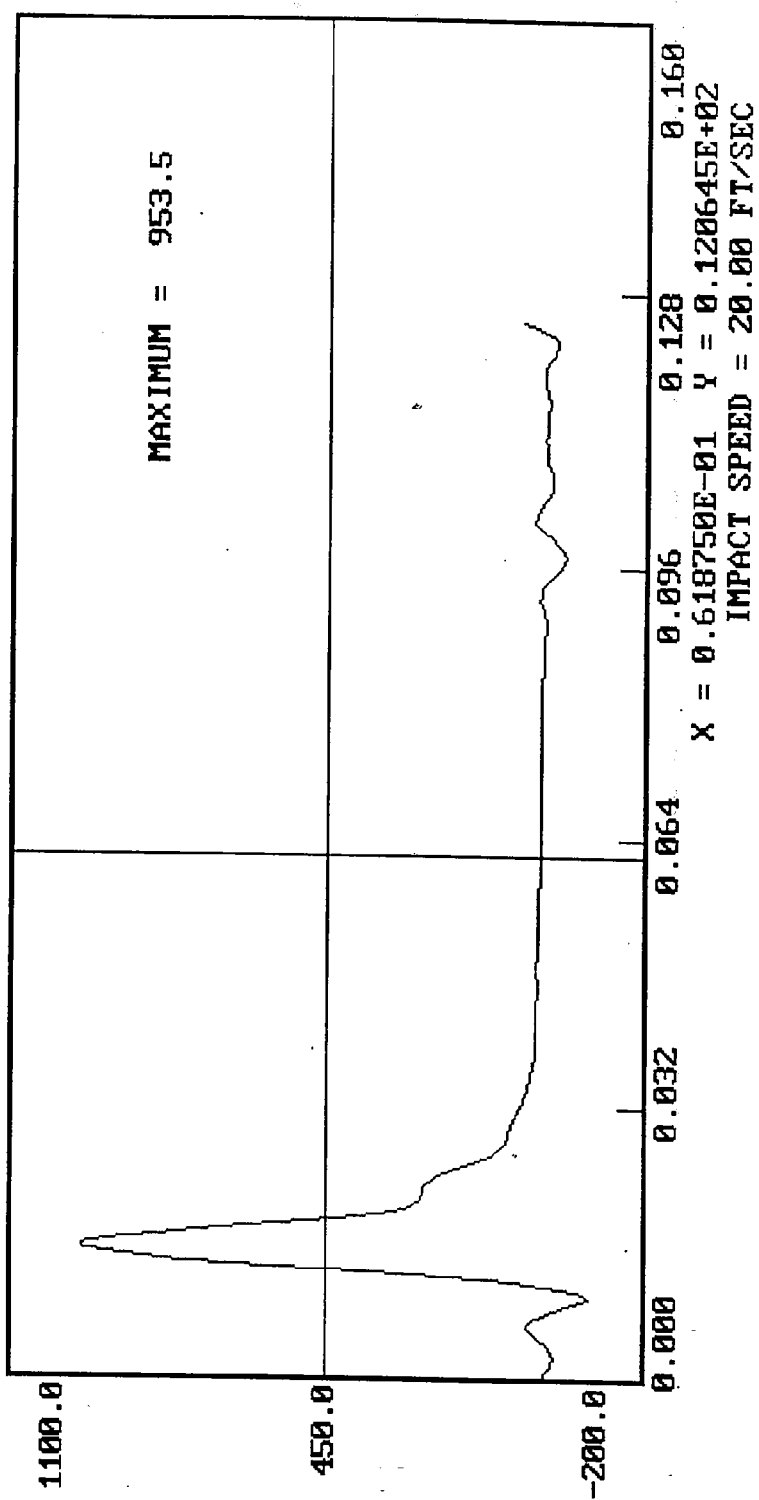


DUMMY CALIBRATION - DAMPENER BENCH TEST
 DUMMY # 270
 DISPLACEMENT (IN) VS. TIME ((SECONDS))

01-18-1996 11:12



DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 270
FORCE (LBS) VS. TIME ((SECONDS))
12-18-1995 12:34

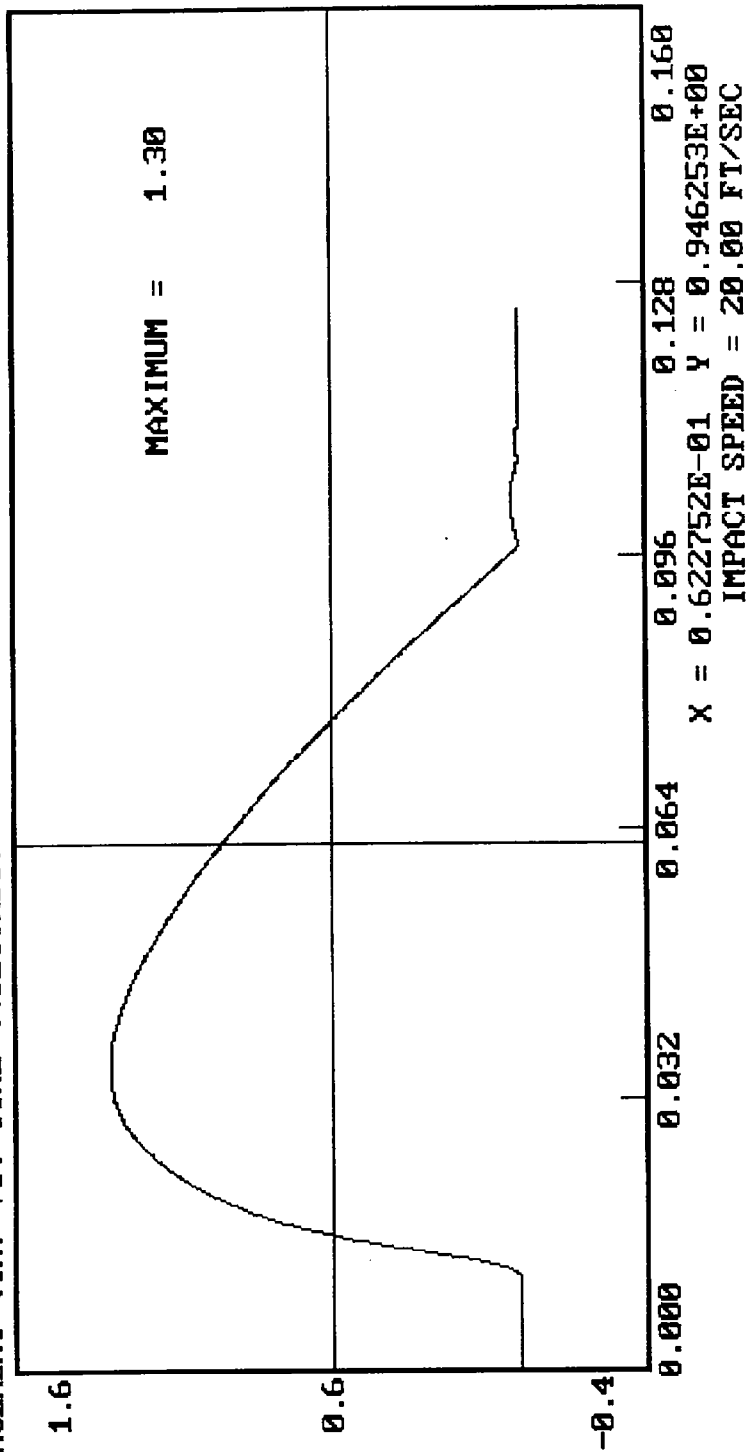


01-18-1996 11:14

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 270

DISPLACEMENT (IN) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 14, 1995

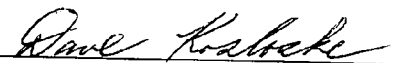
DUMMY NUMBER: 270

TEST NUMBER: D952092

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	23%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN 

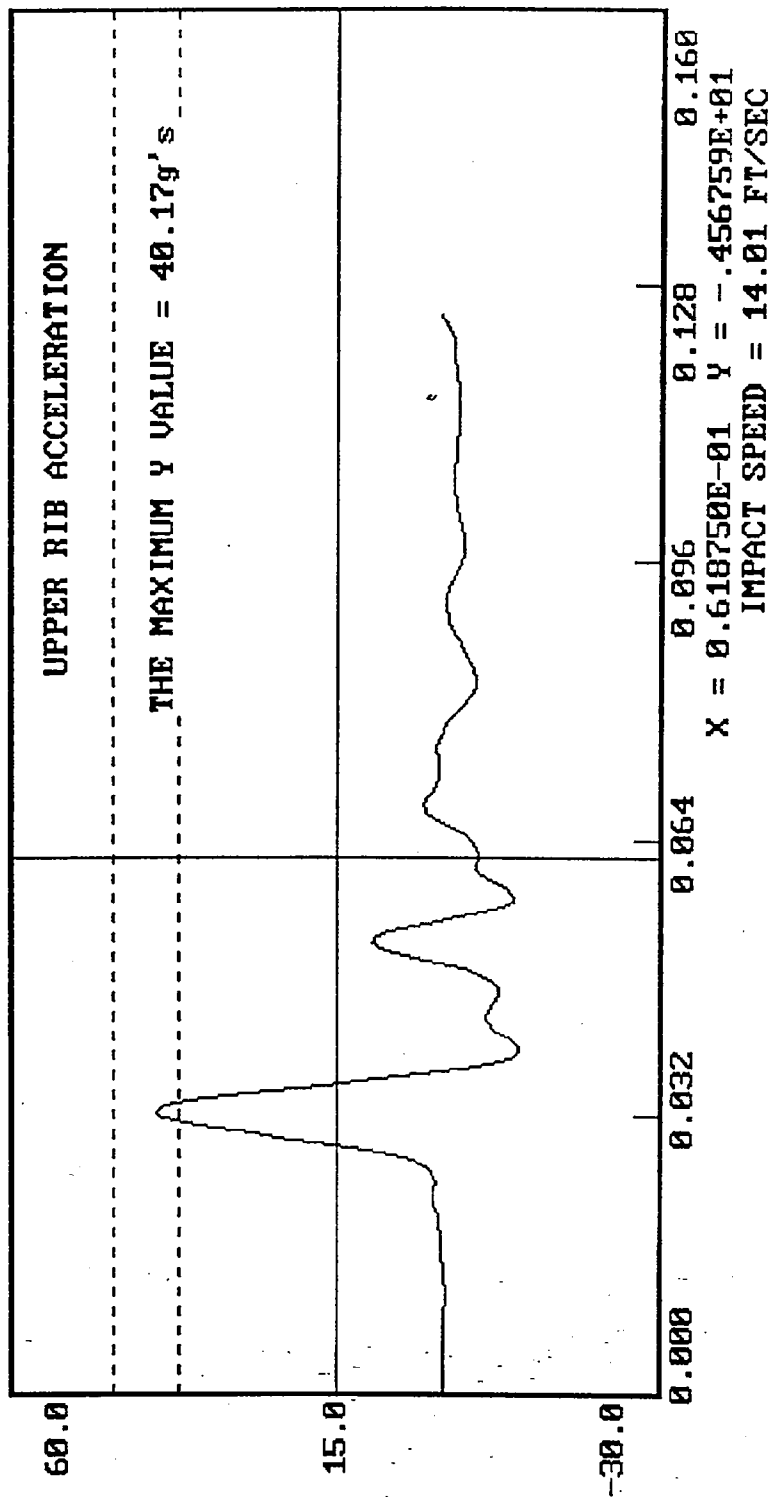
APPROVED BY 

12-14-1995 10:48

DUMMY CALIBRATION - THORAX IMPACT

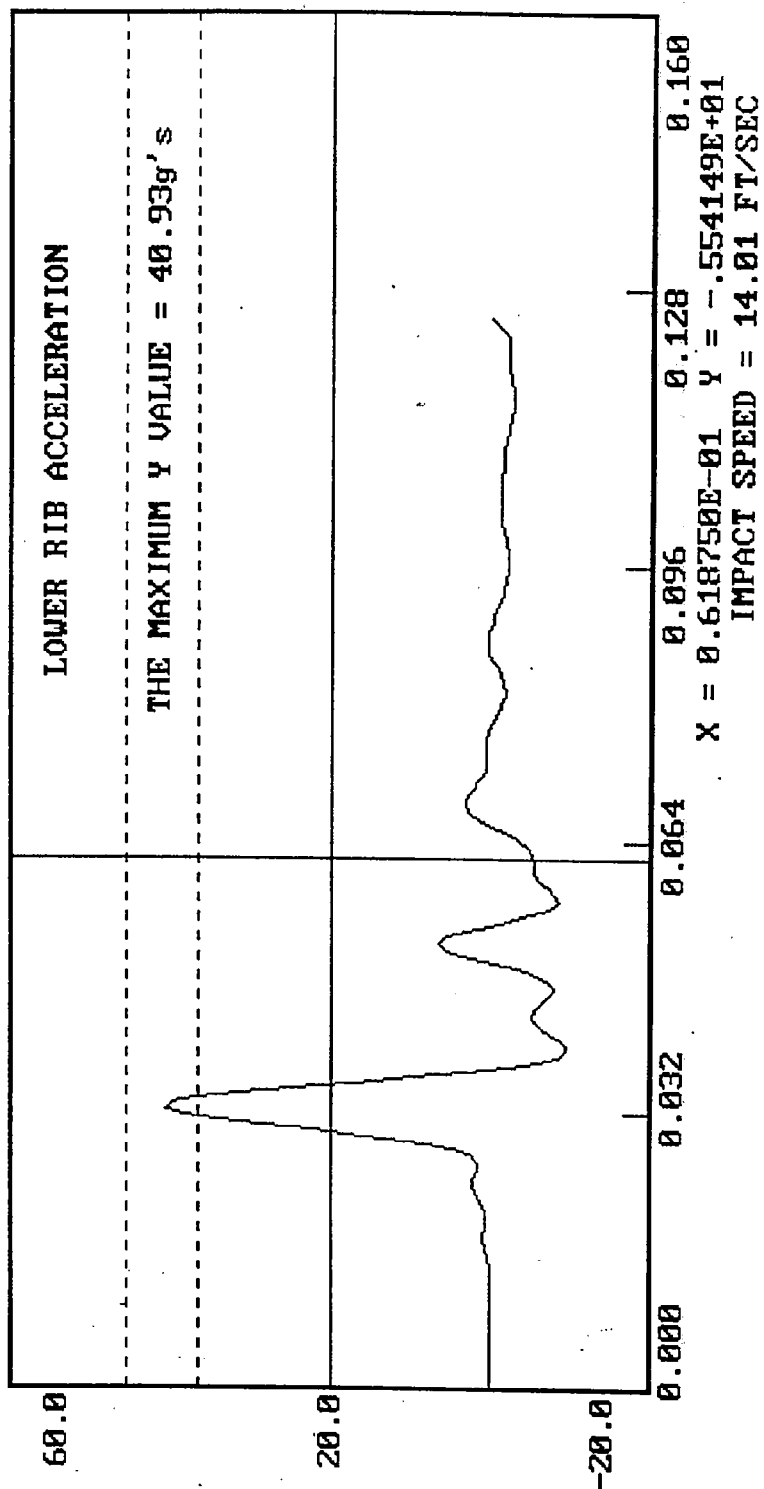
DUMMY # 270

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



12-14-1995 10:48

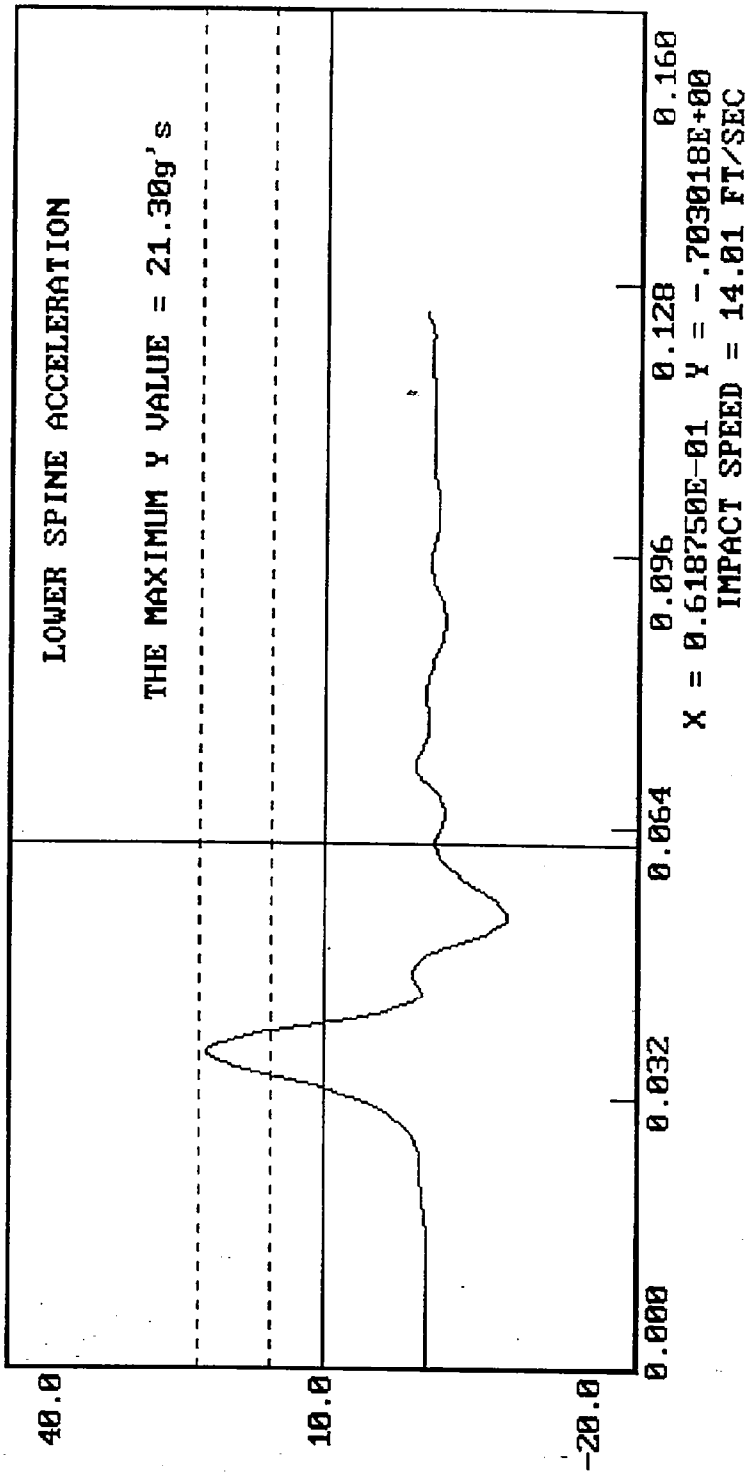
DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270

12-14-1995 10:48

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 14, 1995

DUMMY NUMBER: 270

TEST NUMBER: 0952093

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	23%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	59

TEST MEETS SPECIFICATIONS

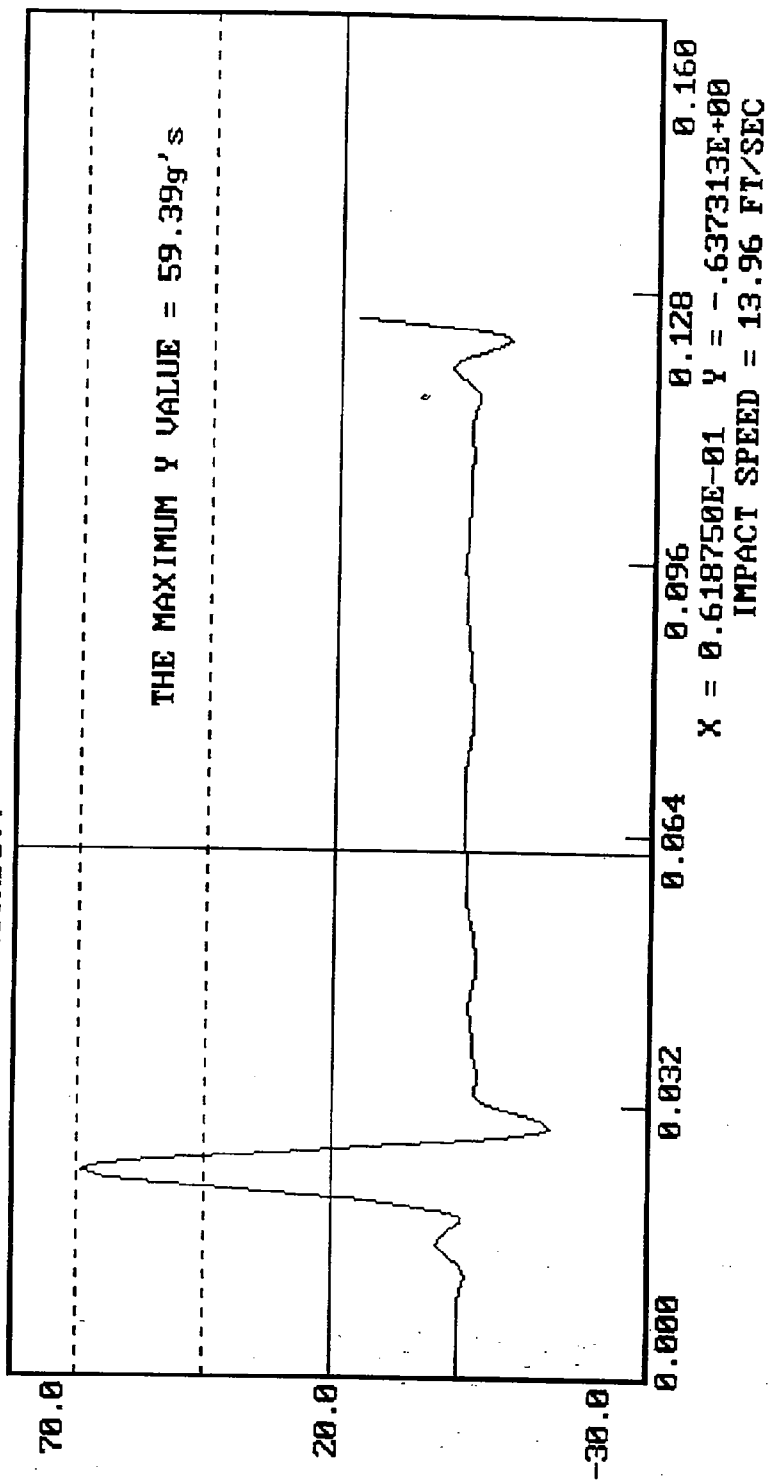
TECHNICIAN

Tim McQuinn

APPROVED BY

Paul Korbake

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 270
12-14-1995 11:04
ACCELERATION (G'S) VS. TIME ((SECONDS))



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

DATE: December 15, 1995

DUMMY NUMBER: 270

TEST NUMBER: D952094

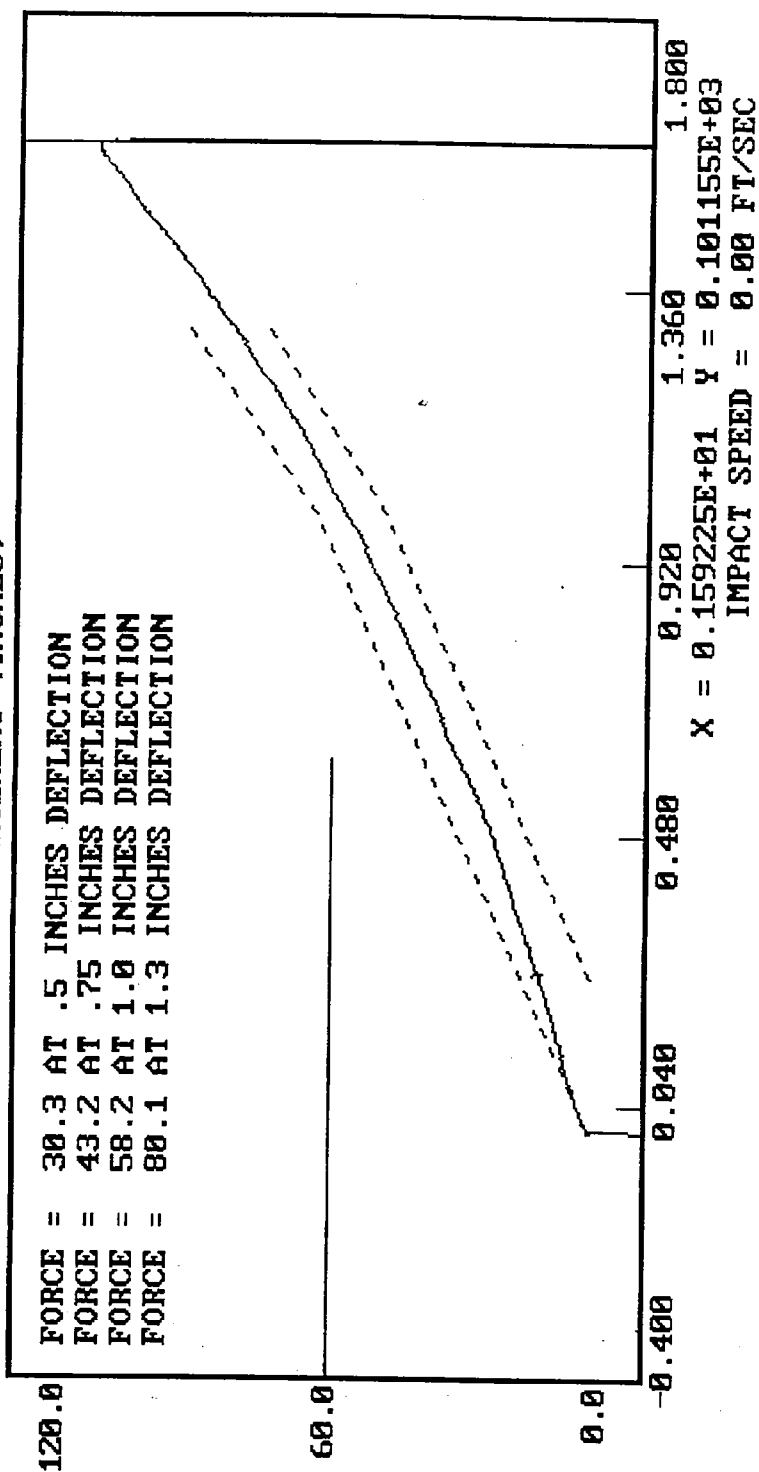
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.2
FORCE @ 1.0 in	50 - 63 lbs	58
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Hill

APPROVED BY Rene Korbake

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 12-15-1995 11:06
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 15, 1995

DUMMY NUMBER: 270

TEST NUMBER: D952095

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	23
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	50
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

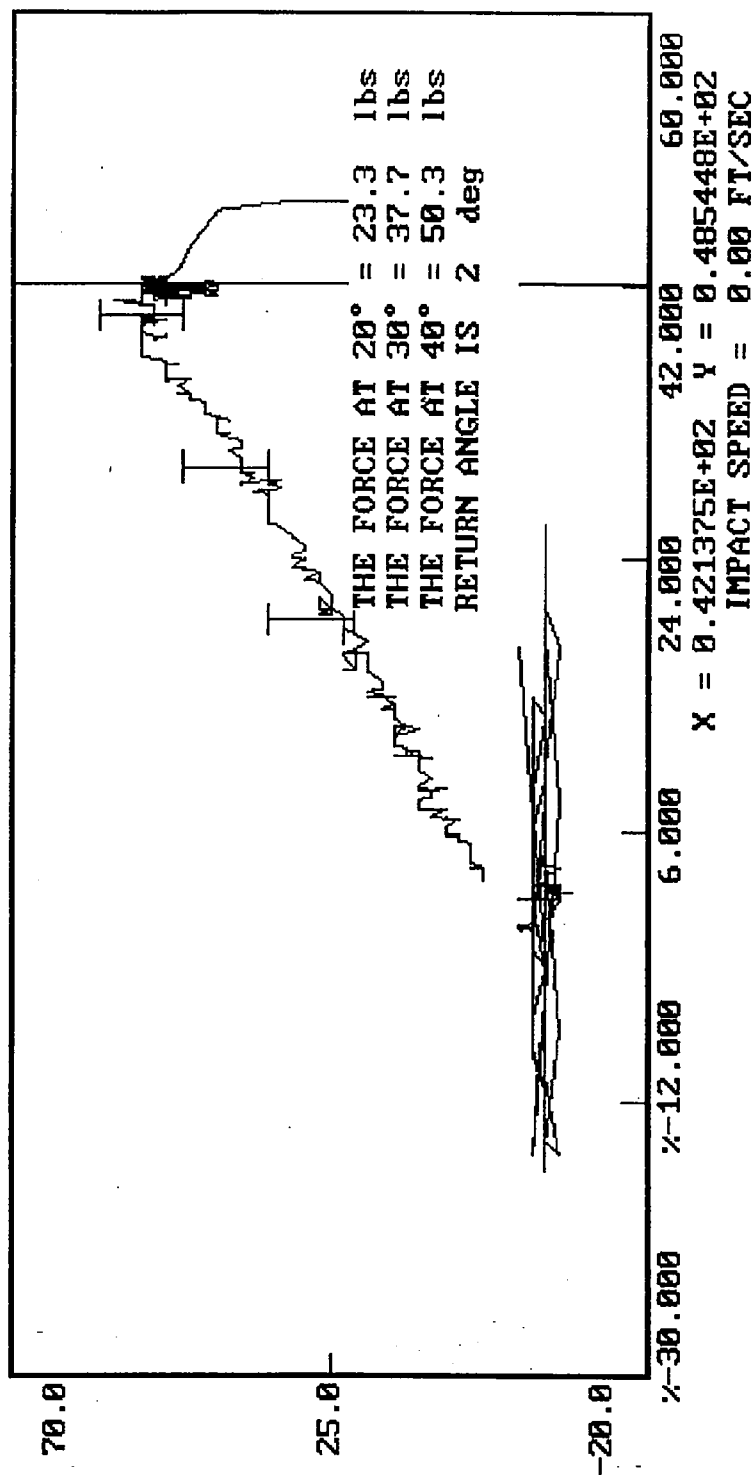
TECHNICIAN

Jim Hill

APPROVED BY

Rene Kralchak

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 270
 12-15-1995 14:08
 FORCE (LBS) 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: December 18, 1995

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
RH - Rib Height	19.75" - 20.50"	20.40
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: Tim W. O.

APPROVED BY: Rene K. Koobacke

MGA RESEARCH CORPORATION
THORACIC SHOCK ABSORBER TEST
SIDE IMPACT DUMMY (SID)

DATE: December 18, 1995

DUMMY NUMBER: 271

TEST NUMBER: D95210678

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66° - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	20%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	225
	DISPLACEMENT (in.)	1.18 - 1.38	1.26
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	397
	DISPLACEMENT (in.)	1.26 - 1.47	1.41
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	907
	DISPLACEMENT (in.)	1.30 - 1.57	1.35

TEST MEETS SPECIFICATIONS

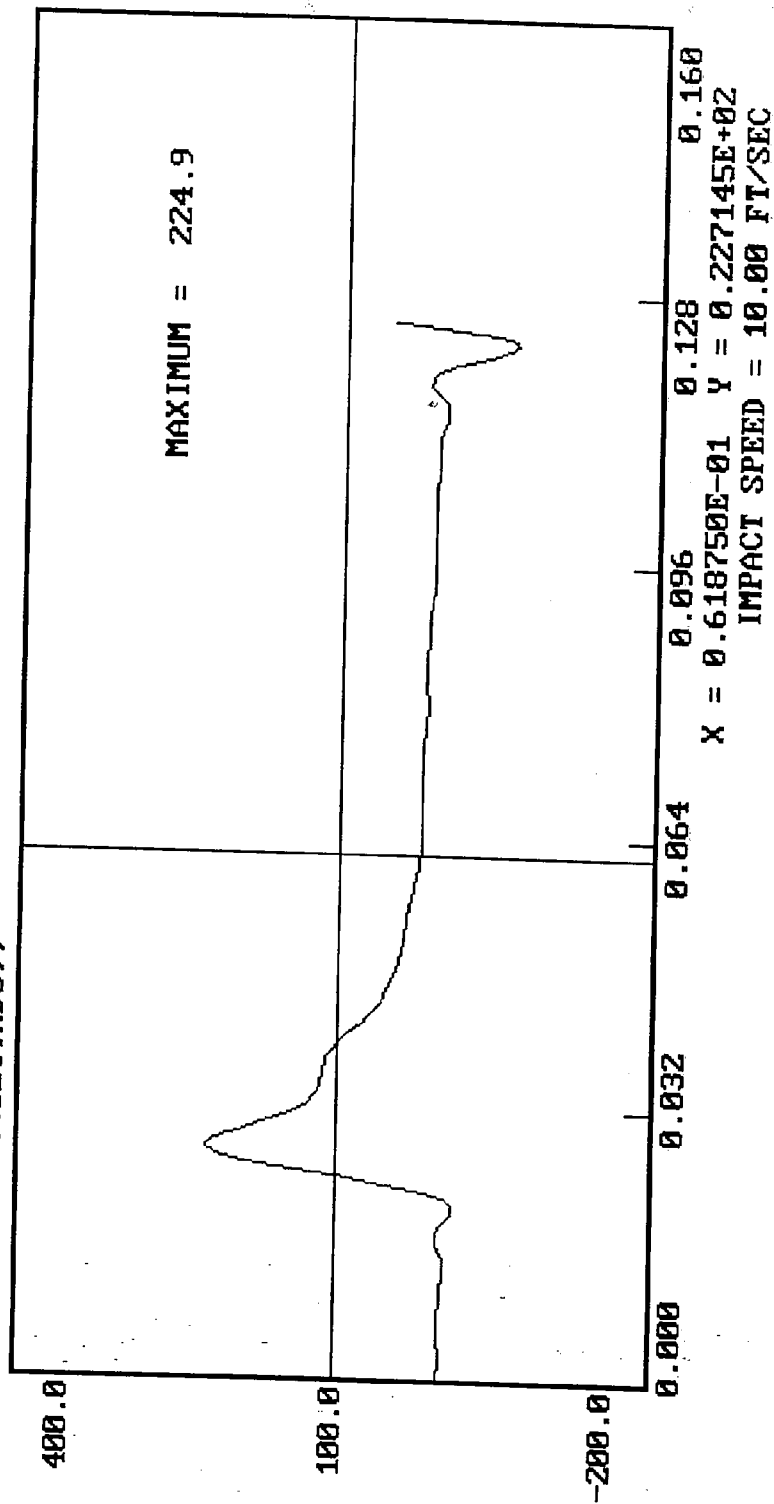
TECHNICIAN Tim Wil-O

APPROVED BY Rene Kabahe

DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 271

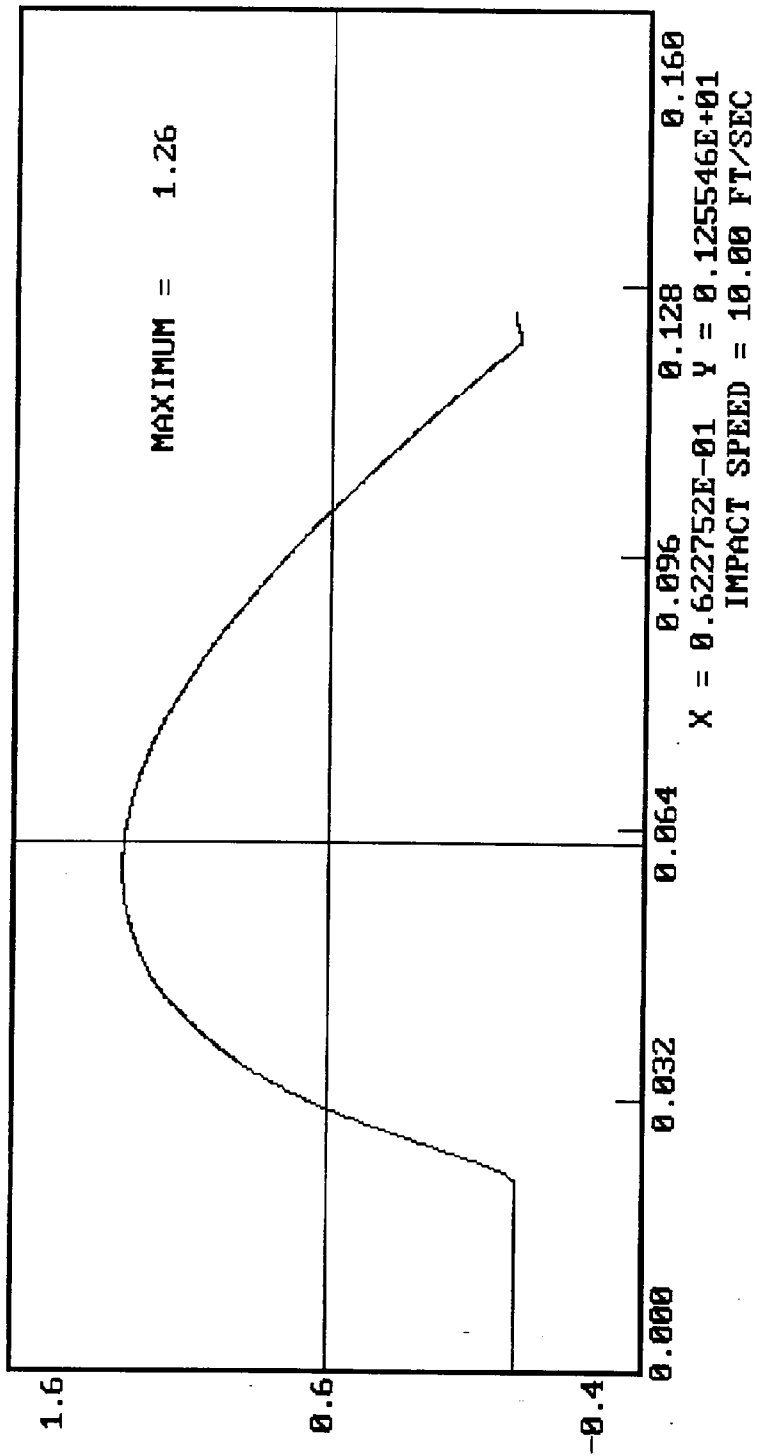
12-18-1995 15:42

FORCE (LBS) VS. TIME ((SECONDS))



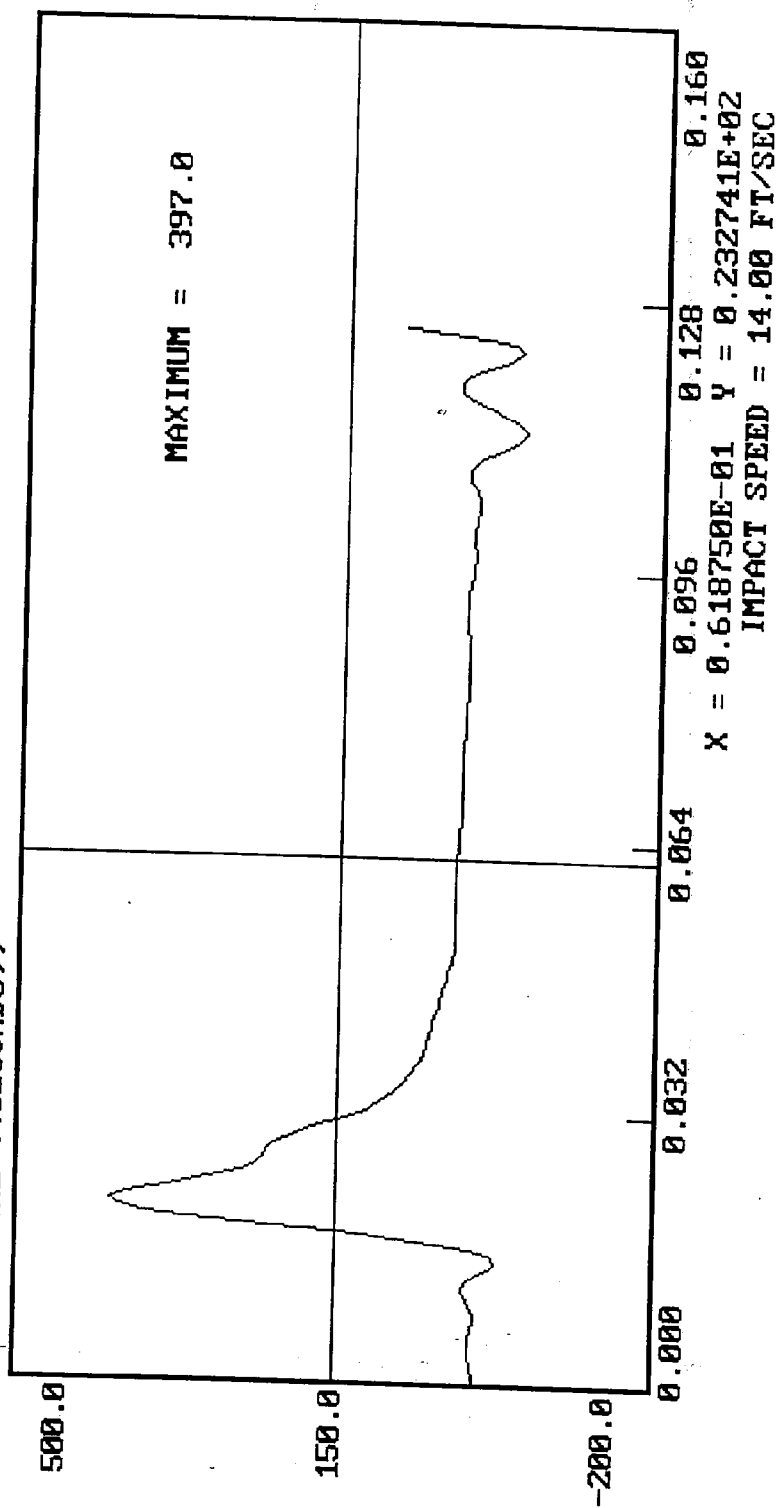
DUMMY CALIBRATION - DAMPENER BENCH TEST
 DUMMY # 271
 DISPLACEMENT (IN) VS. TIME ((SECONDS))

12-18-1995 15:42



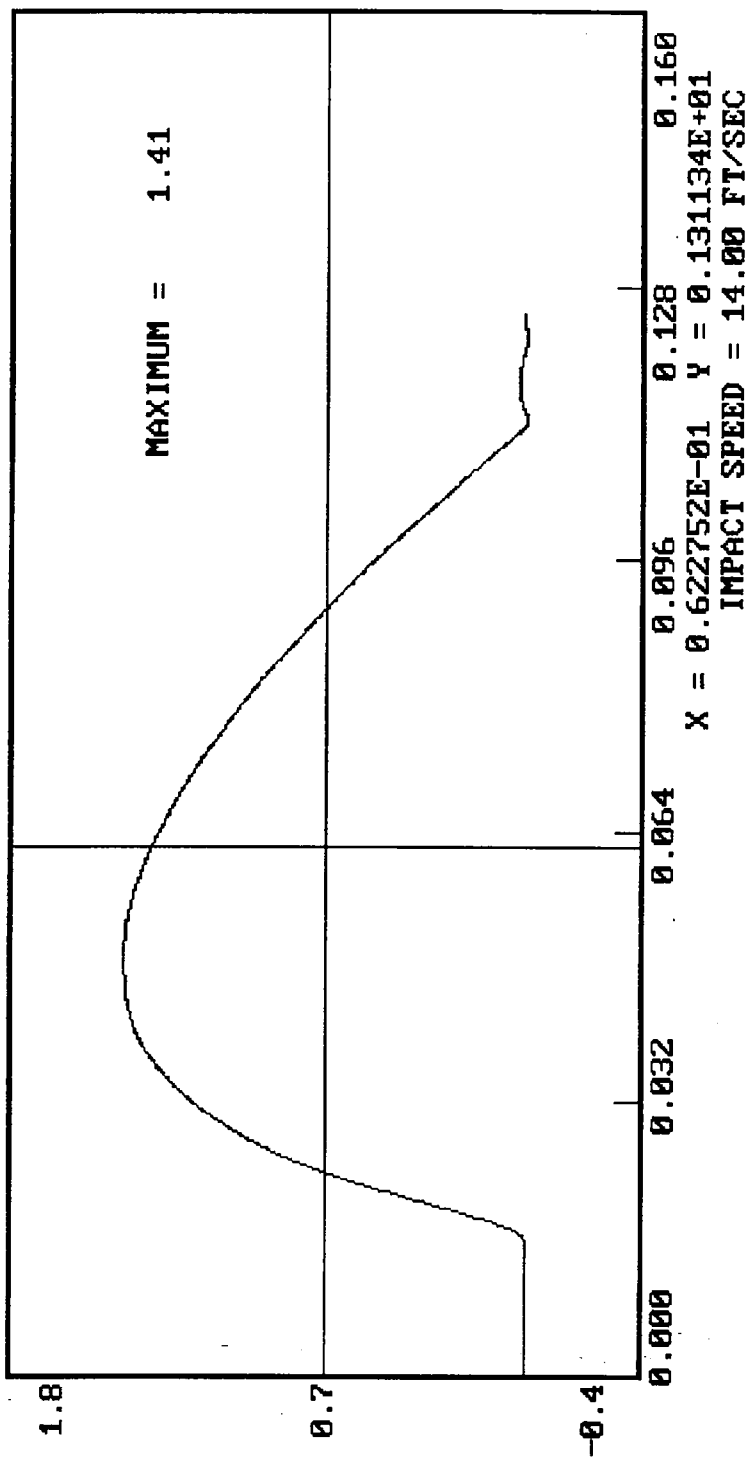
DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 271
FORCE (LBS) VS. TIME ((SECONDS))

12-18-1995 15:45

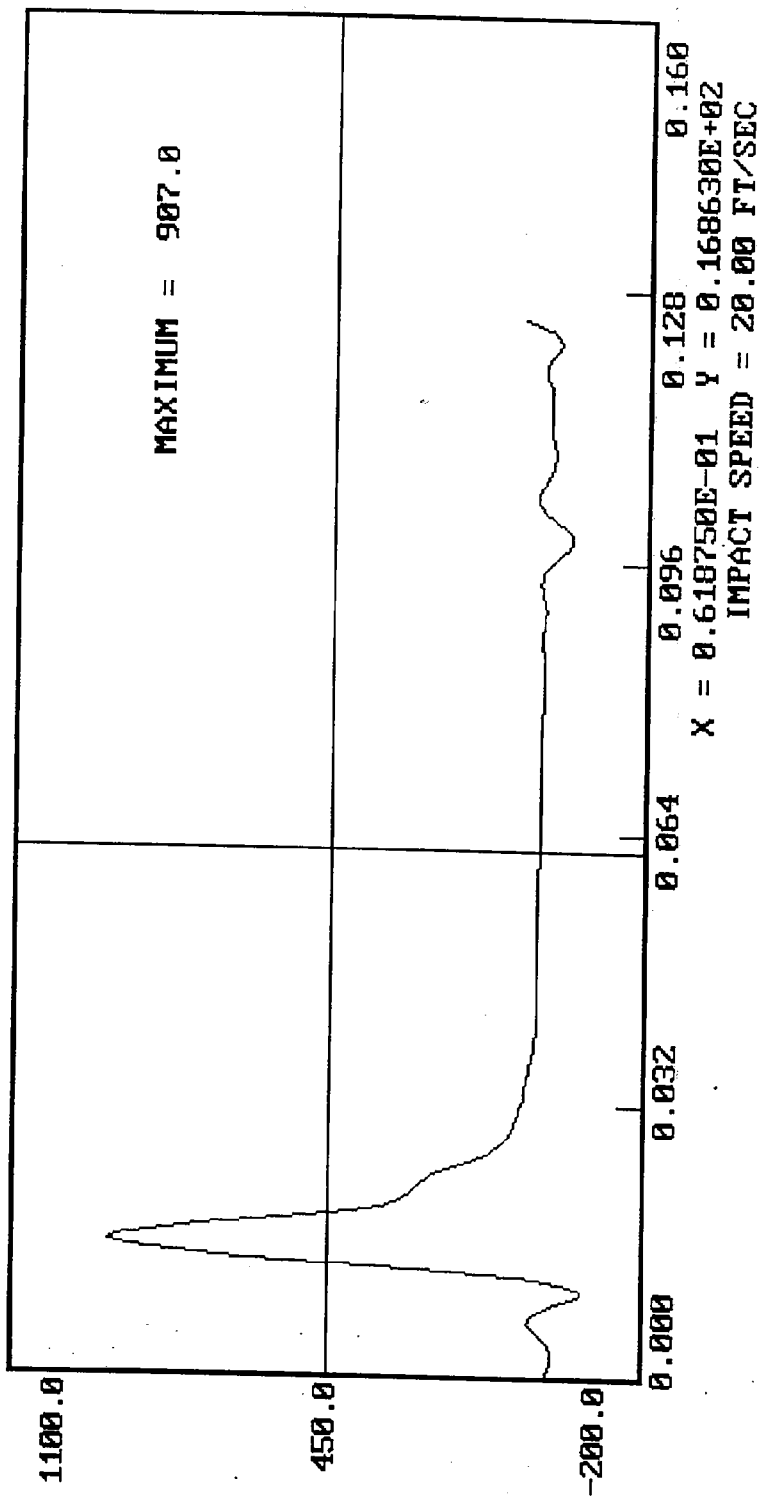


12-18-1995 15:45

DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 271
DISPLACEMENT (IN) VS. TIME ((SECONDS))



DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 271
FORCE (LBS) VS. TIME ((SECONDS))
12-18-1995 15:02

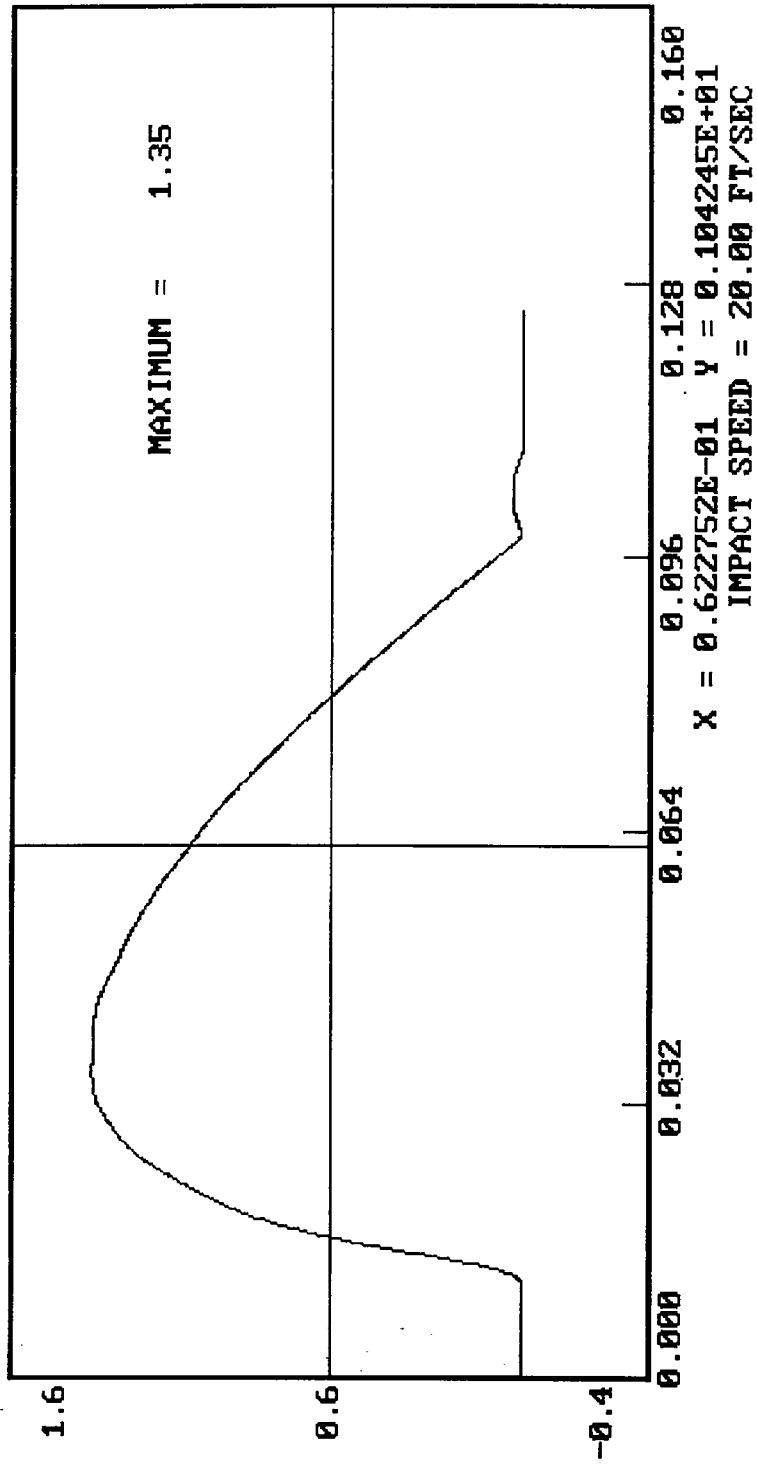


12-18-1995 15:02

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 271

DISPLACEMENT (IN) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 14, 1995

DUMMY NUMBER: 271

TEST NUMBER: D952102

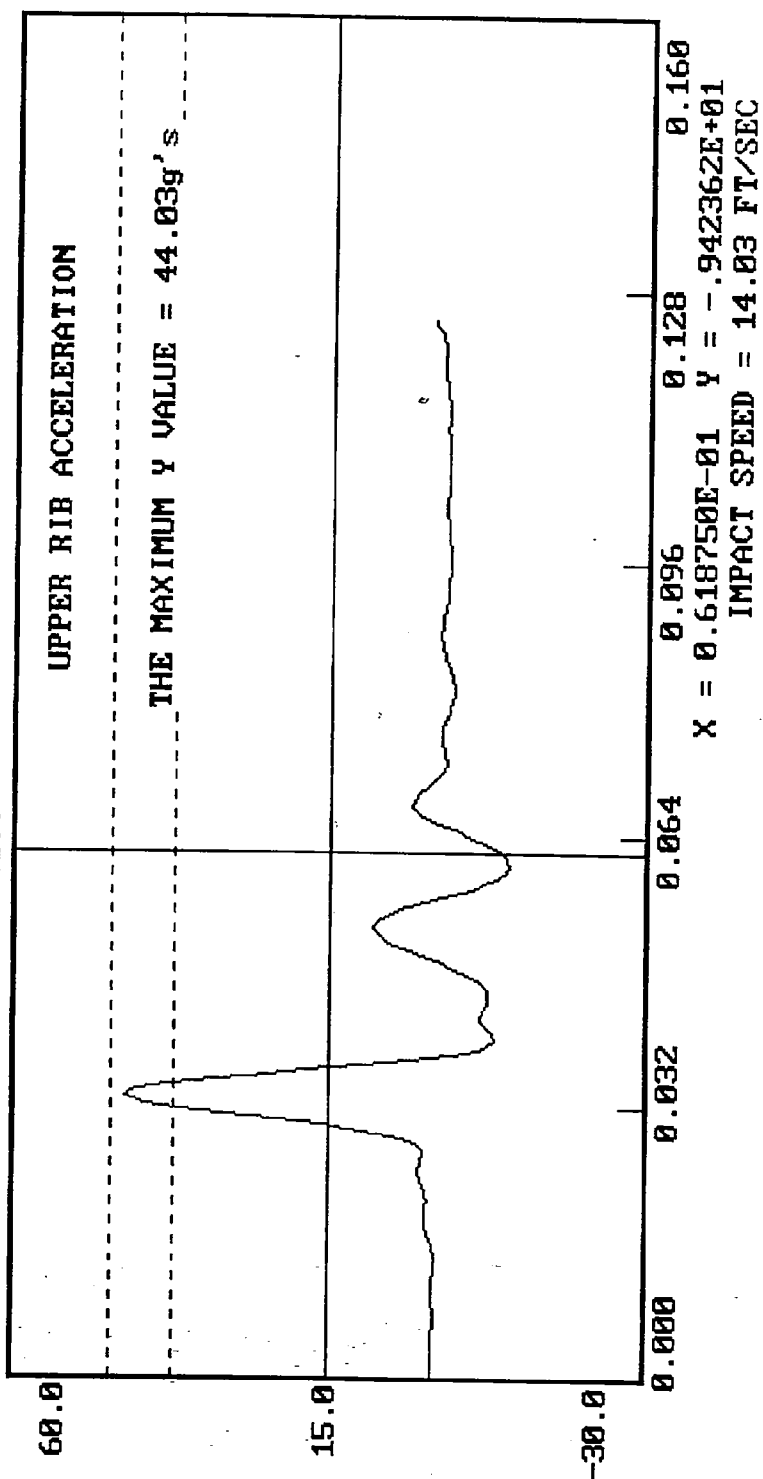
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	23%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	44
LOWER RIB	37 - 46 g's	38
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

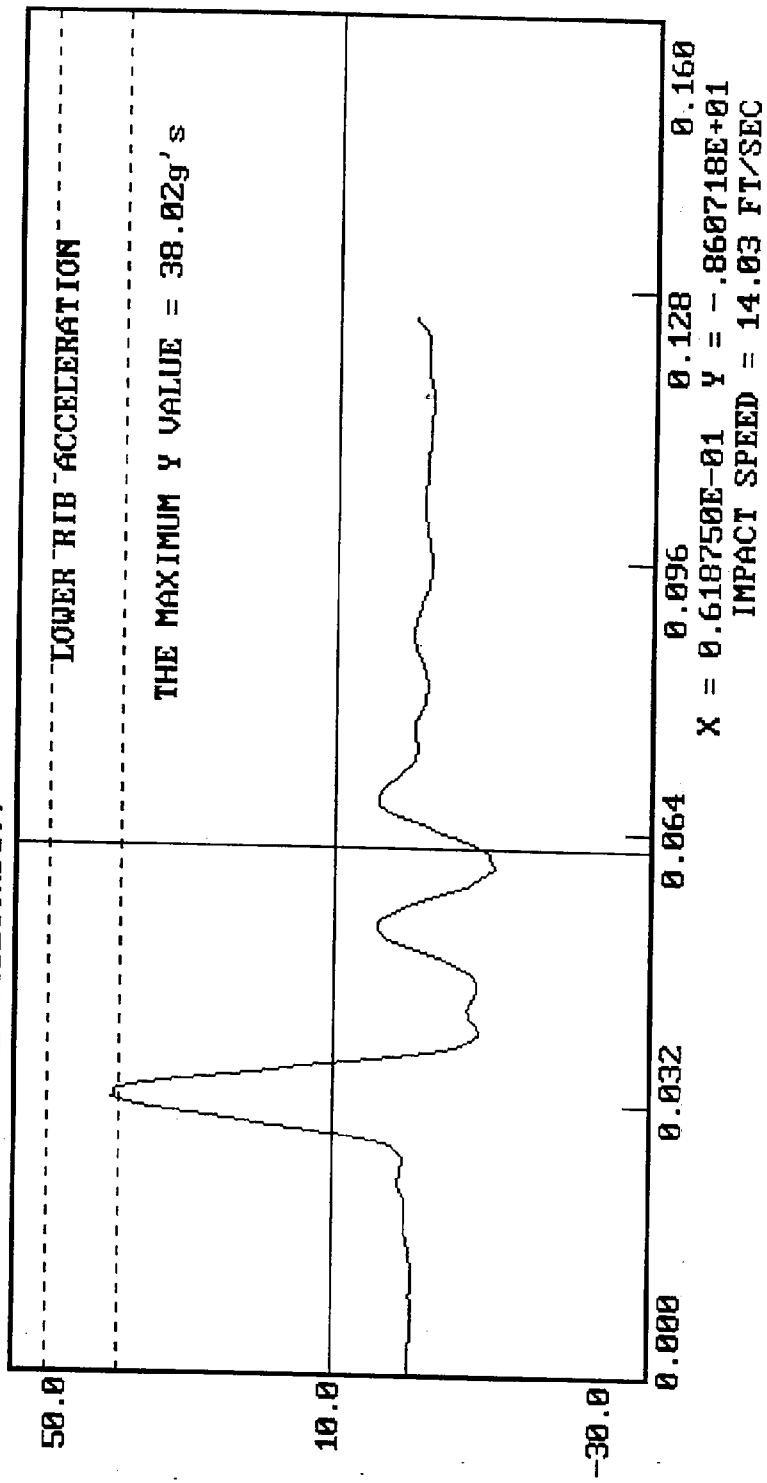
TECHNICIAN Jim Wilson

APPROVED BY Rene Korbach

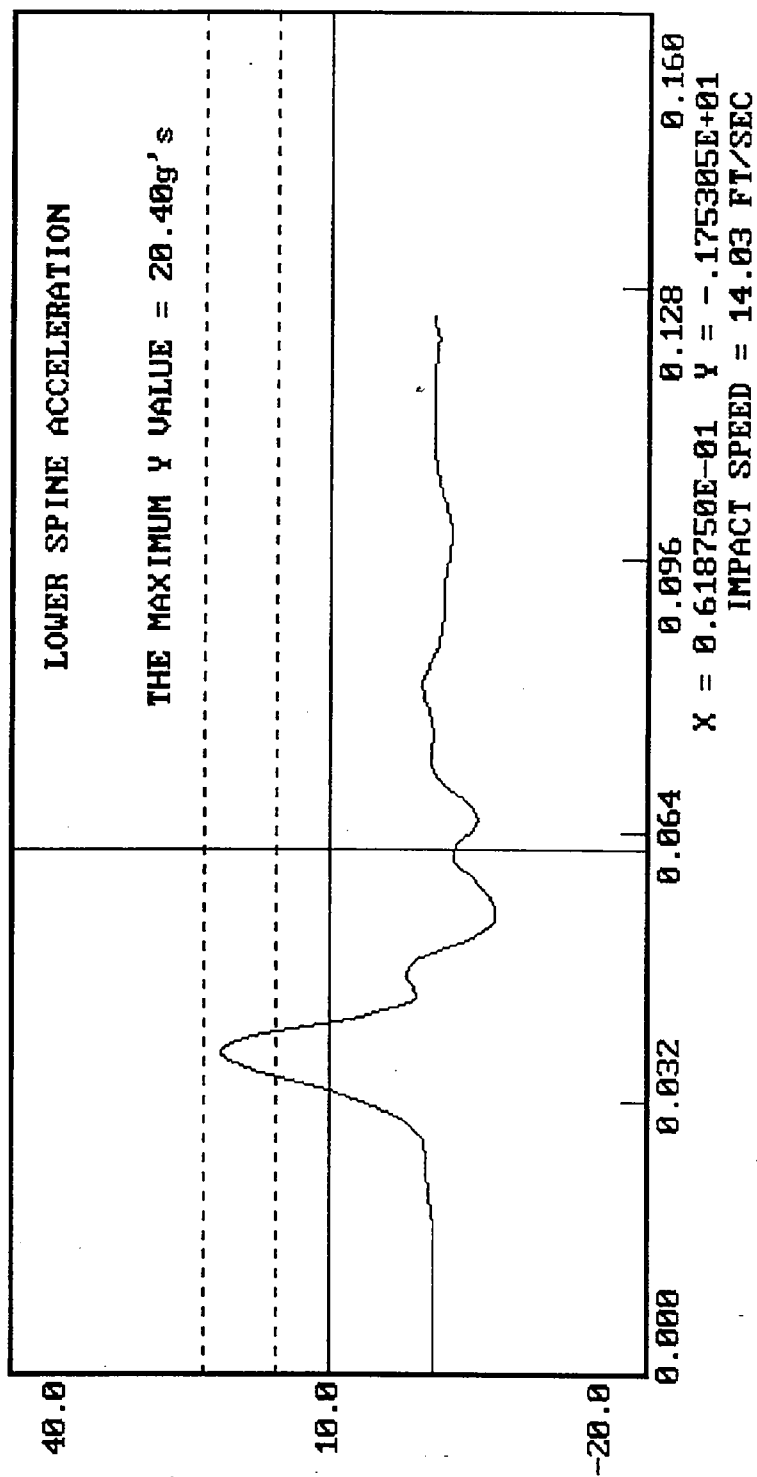
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 12-14-1995 11:30
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271
12-14-1995 11:30
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 12-14-1995 11:30
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 19, 1995

DUMMY NUMBER: 271

TEST NUMBER: D952103

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	15%
PROBE SPEED	13.8 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	56

TEST MEETS SPECIFICATIONS

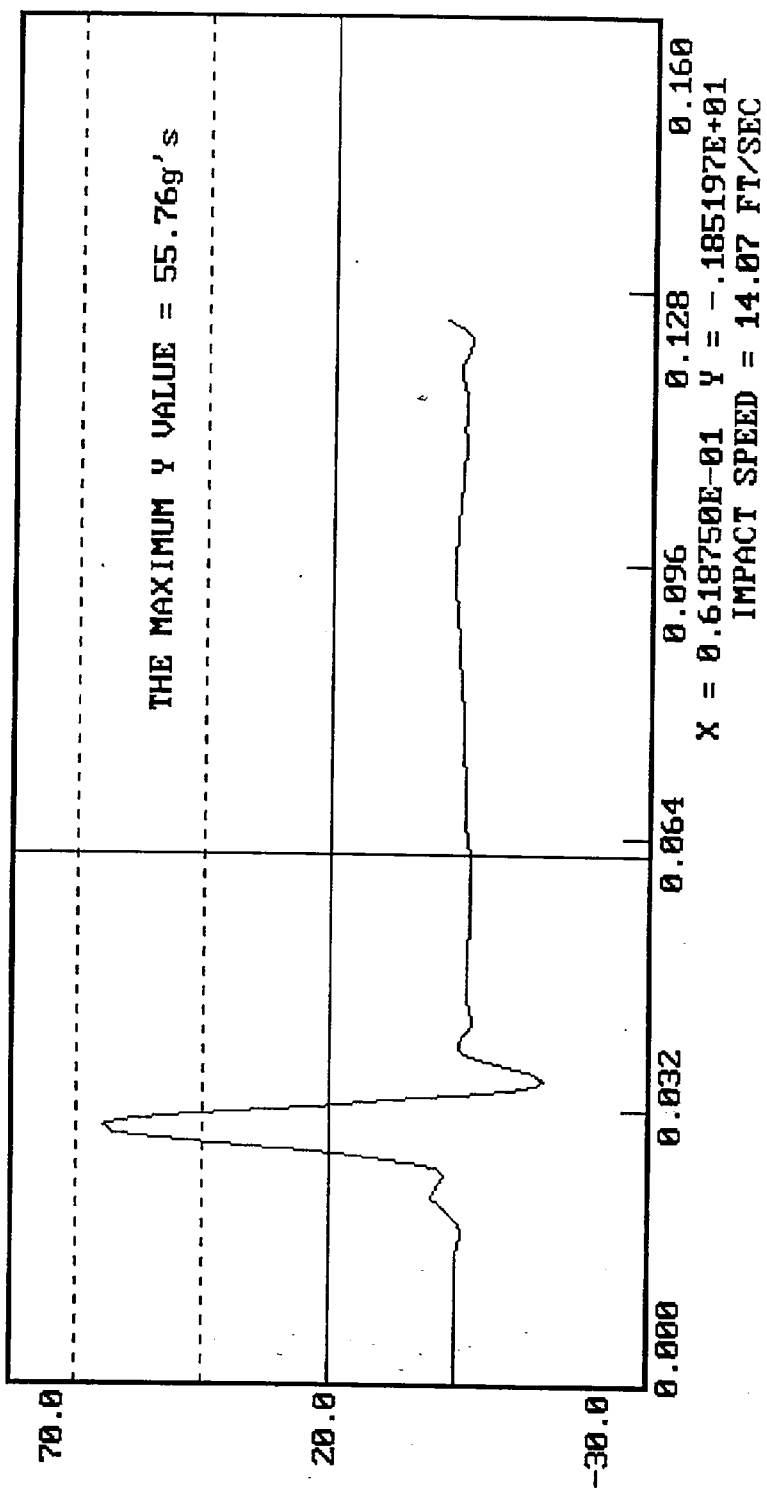
TECHNICIAN

Tim White

APPROVED BY

Dave Kosbuke

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 271
 12-19-1995 09:10
 ACCELERATION (G'S) VS. TIME ((SECONDS))



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

DATE: December 15, 1995

DUMMY NUMBER: 271

TEST NUMBER: D952104

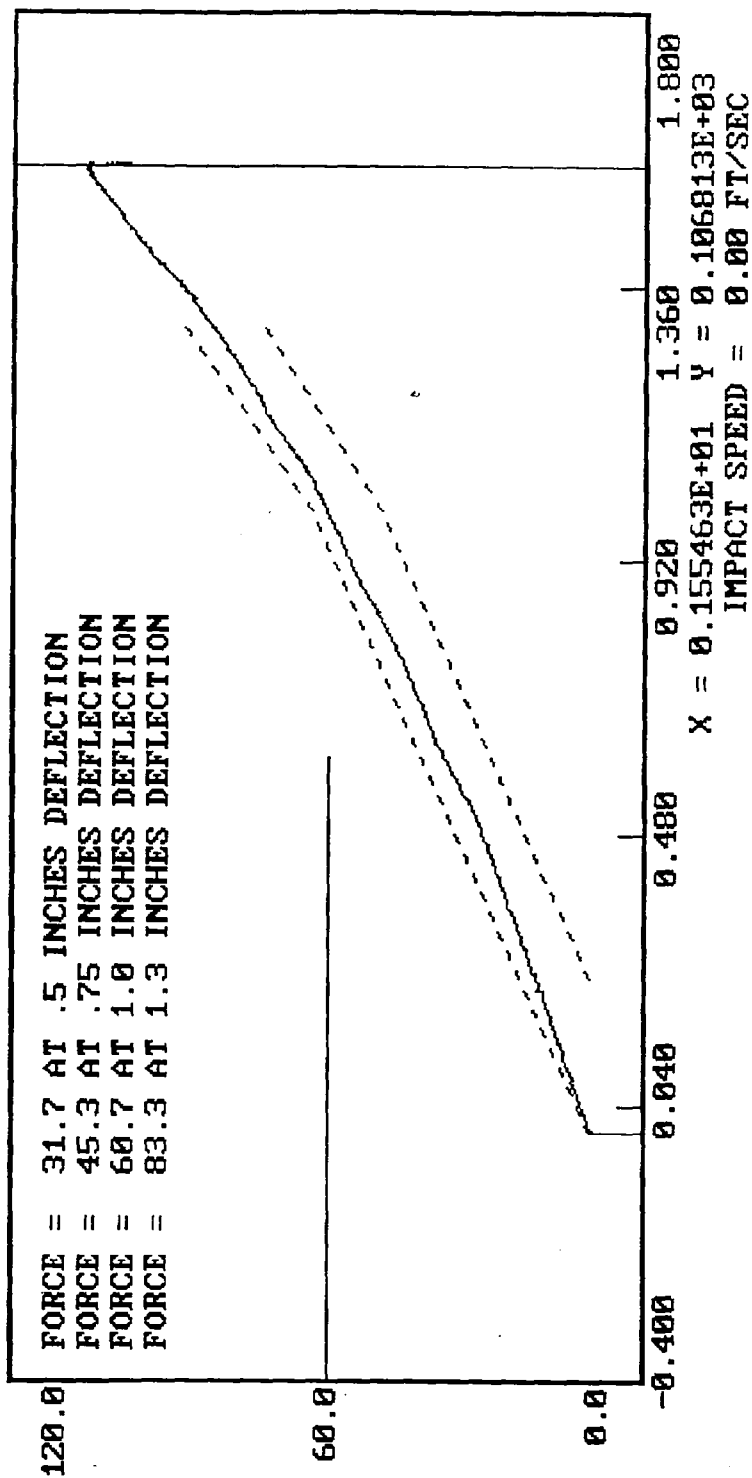
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.7
FORCE @ 0.75 in	36.7 - 49.8 lbs	45.3
FORCE @ 1.0 in	50 - 63 lbs	61
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim K. O.

APPROVED BY Dave Koschke

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 271
 12-15-1995 11:00
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 15, 1995

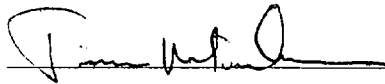
DUMMY NUMBER: 271

TEST NUMBER: D952105

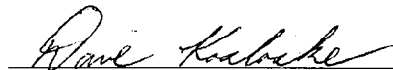
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	43
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN

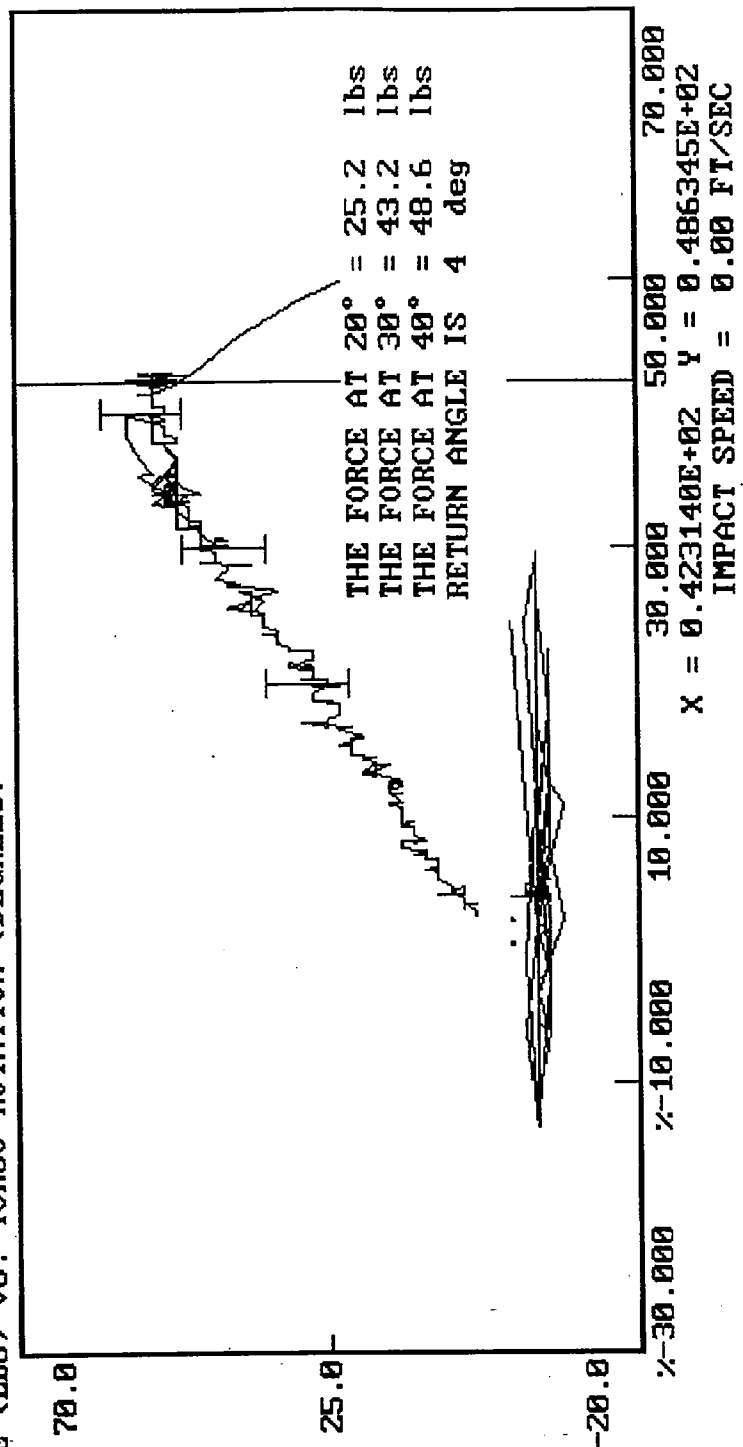


APPROVED BY



12-15-1995 13:52

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 271
FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Post-Test Calibration

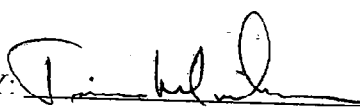
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

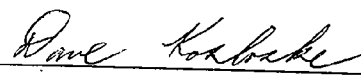
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

DATE OF VERIFICATION: January 17, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.50
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.5
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.7
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 17, 1996

DUMMY NUMBER: 270

TEST NUMBER: D96142

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	38
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

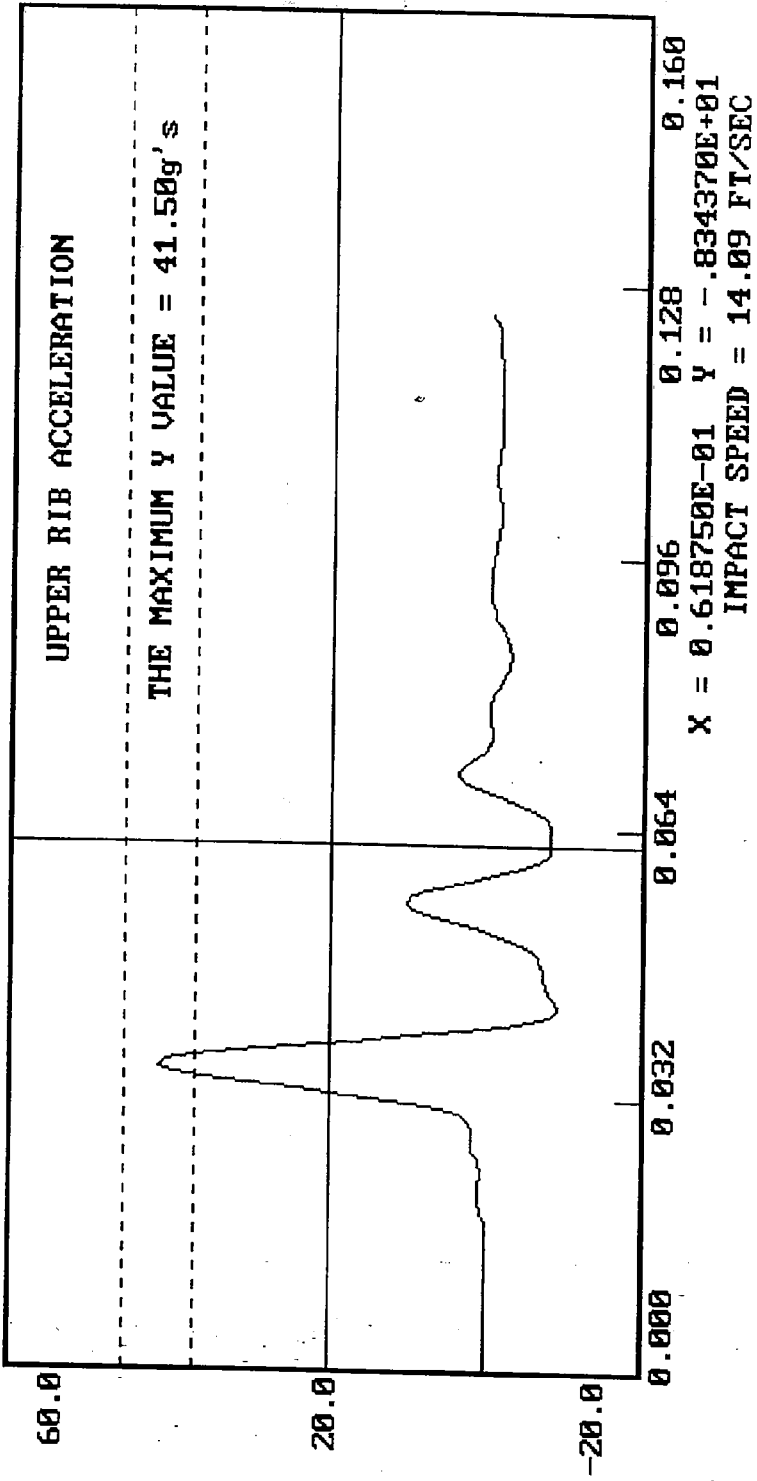
TECHNICIAN

Tim Melton

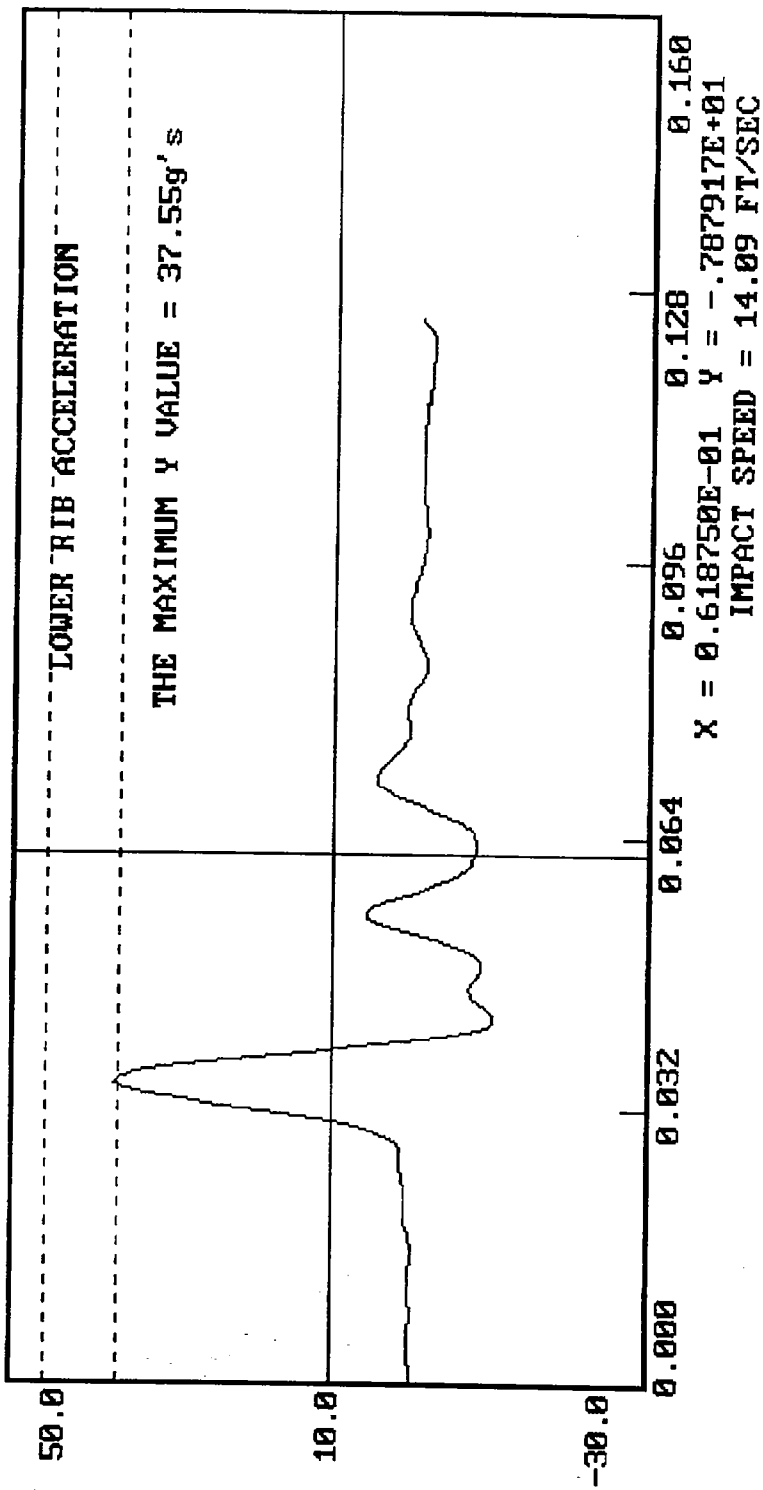
APPROVED BY

Rene Kuchake

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 01-17-1996 10:55
 ACCELERATION (G'S) VS. TIME ((SECONDS))



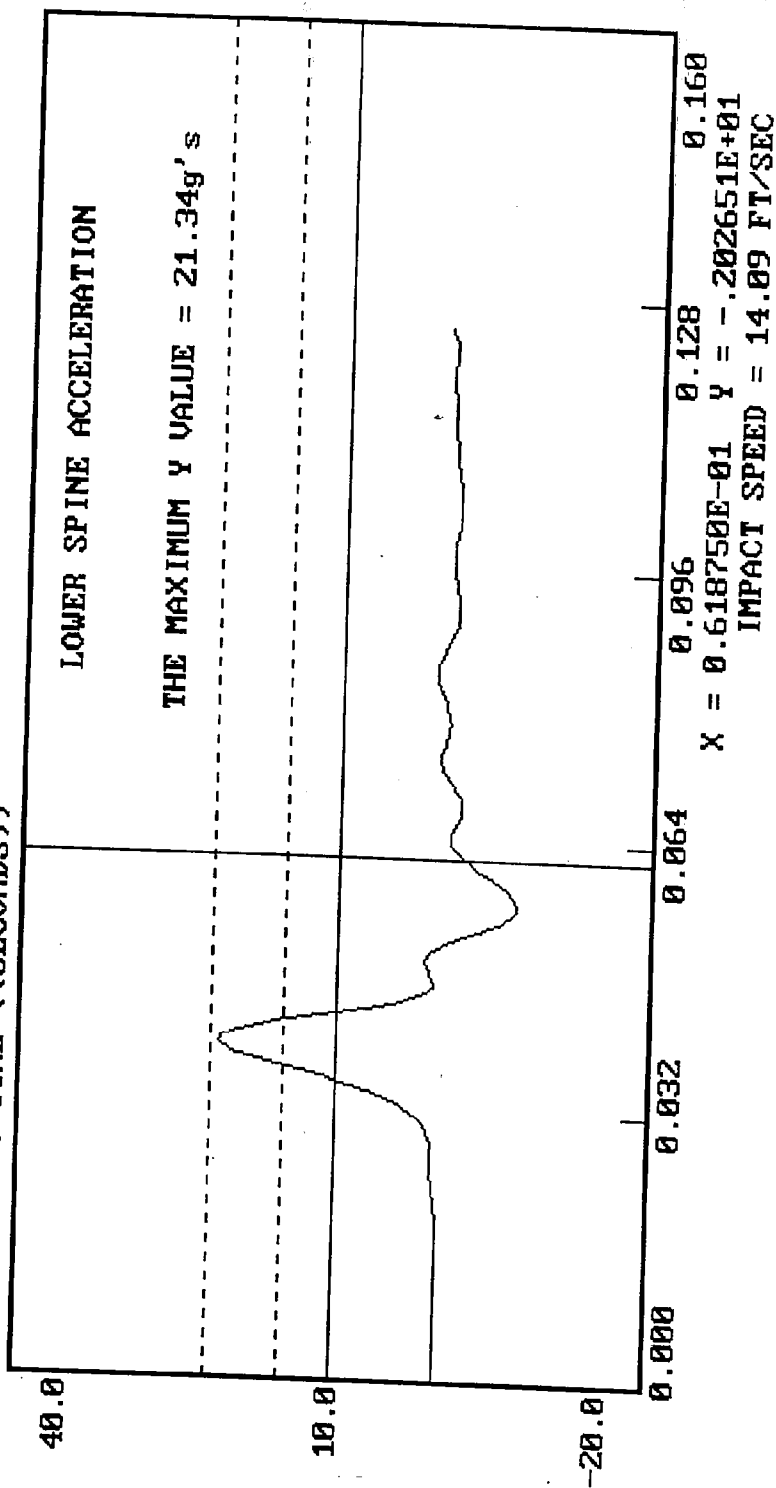
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 01-17-1996 10:55
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270

01-17-1996 10:55

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 17, 1996

DUMMY NUMBER: 270

TEST NUMBER: D96143

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

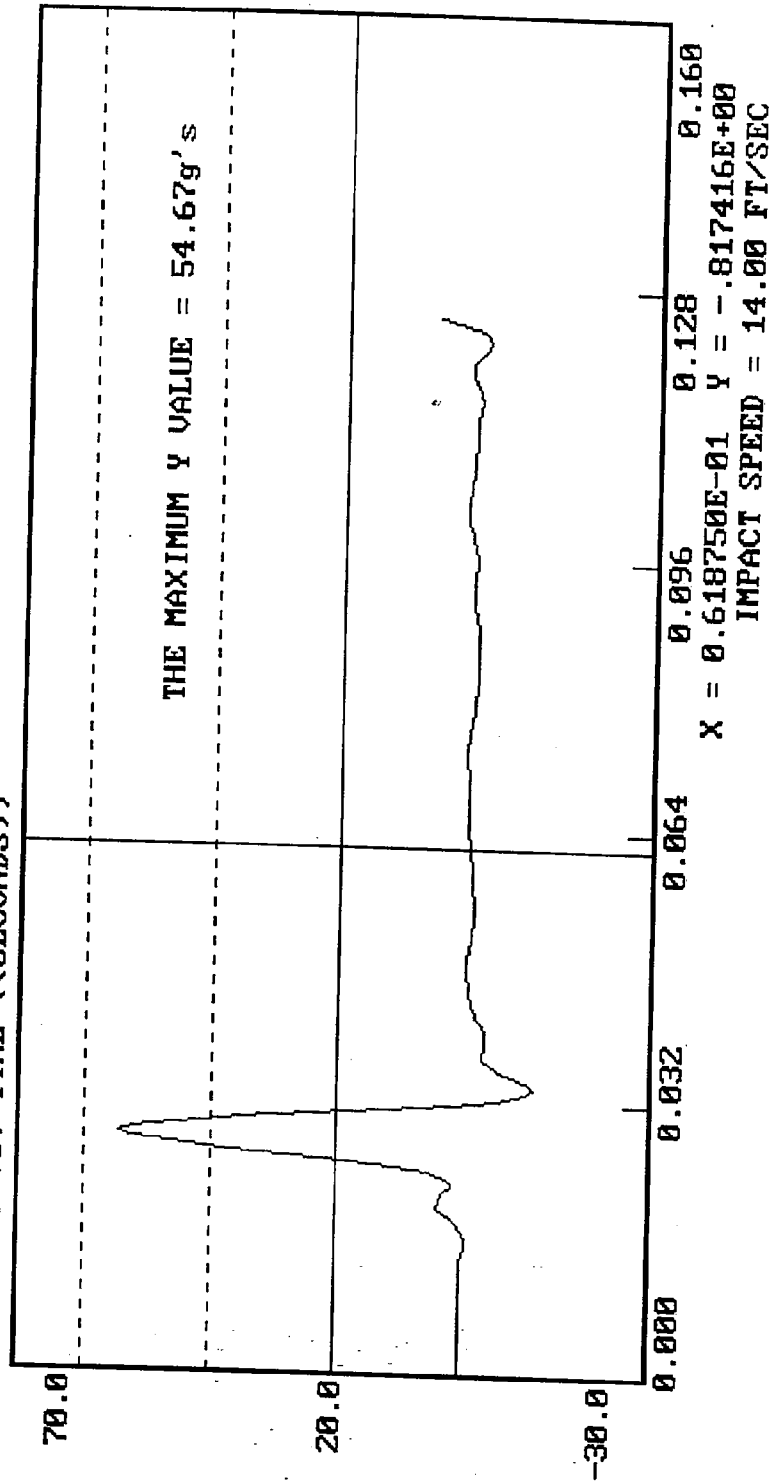
TECHNICIAN Timothy D.

APPROVED BY Rene Korbake

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 270

01-17-1996 11:02

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



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

DATE: January 17, 1996

DUMMY NUMBER: 270

TEST NUMBER: D96144

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.4
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.1
FORCE @ 1.0 in	50 - 63 lbs	62
FORCE @ 1.3 in	73 - 88 lbs	85

TEST MEETS SPECIFICATIONS

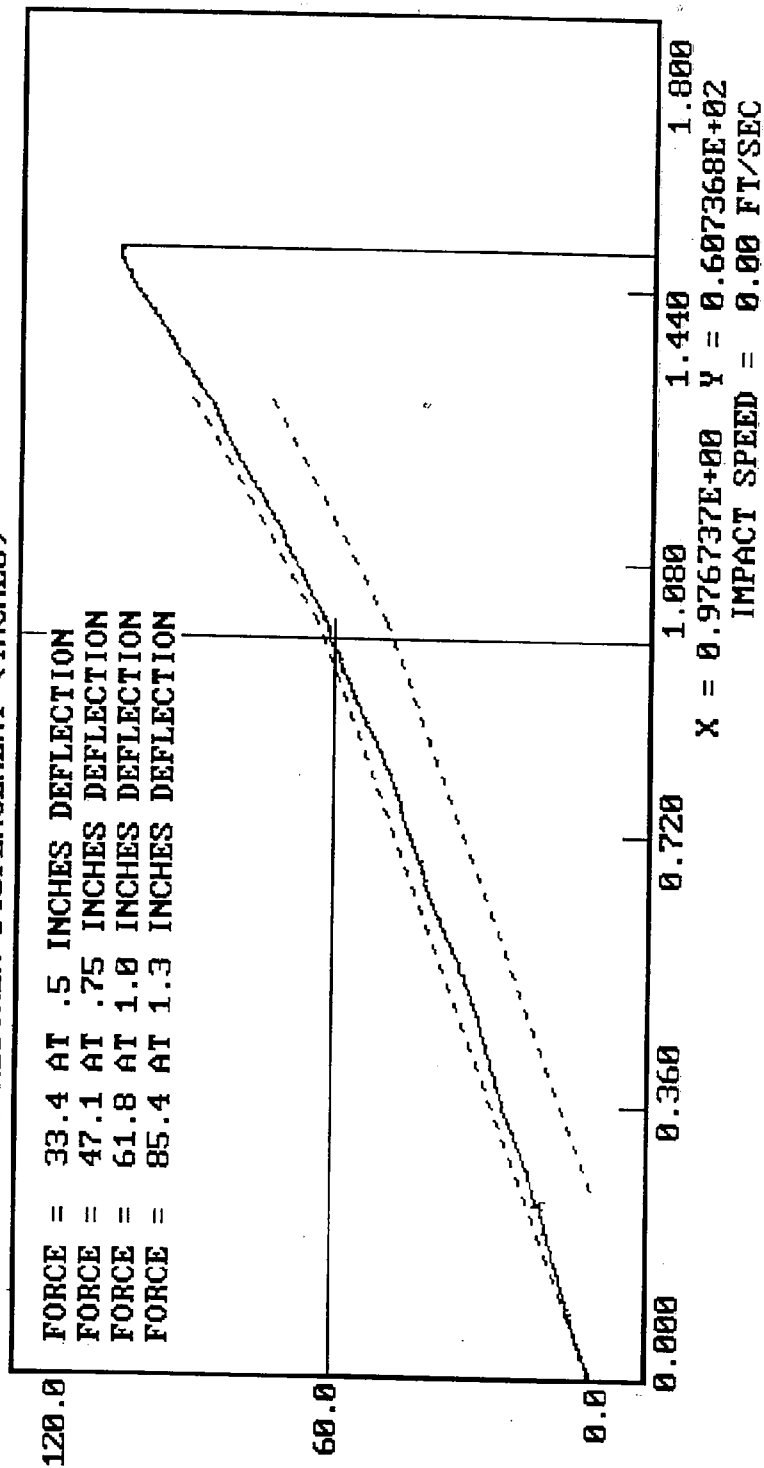
TECHNICIAN Jim Wilson

APPROVED BY Dave Kucharske

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270

01-17-1996 14:10

ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 17, 1996

DUMMY NUMBER: 270

TEST NUMBER: D96145

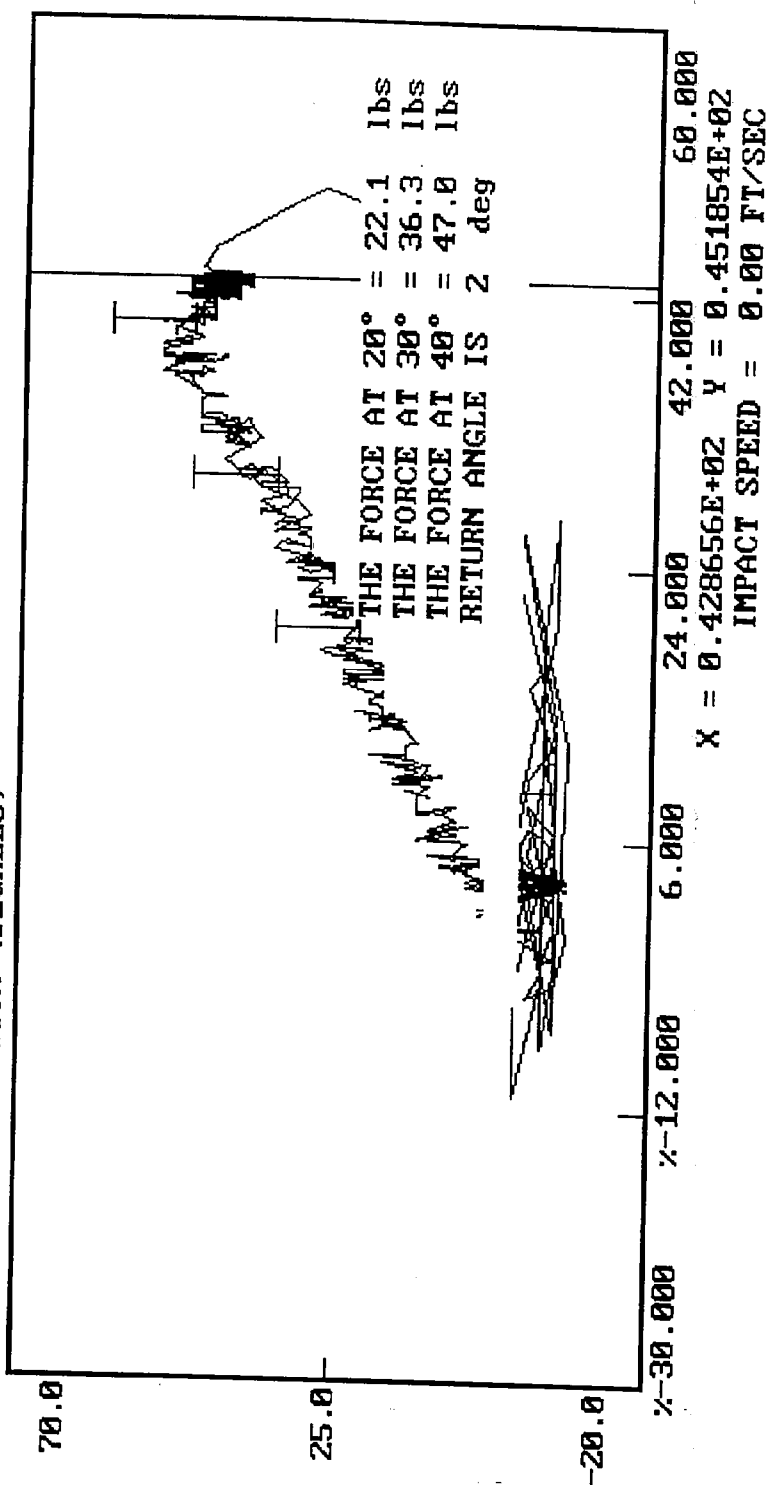
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	22
FORCE @ 30°	34 - 46 lbs	36
FORCE @ 40°	46 - 58 lbs	47
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Melan

APPROVED BY Dave Koelake

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 270
 01-17-1996 15:38
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)



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 17, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
RH - Rib Height	19.75" - 20.50"	20.40
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: Tim W. D.

APPROVED BY: Rene Korbake

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 17, 1996

DUMMY NUMBER: 271

TEST NUMBER: D96152

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	45
LOWER RIB	37 - 46 g's	44
LOWER SPINE	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

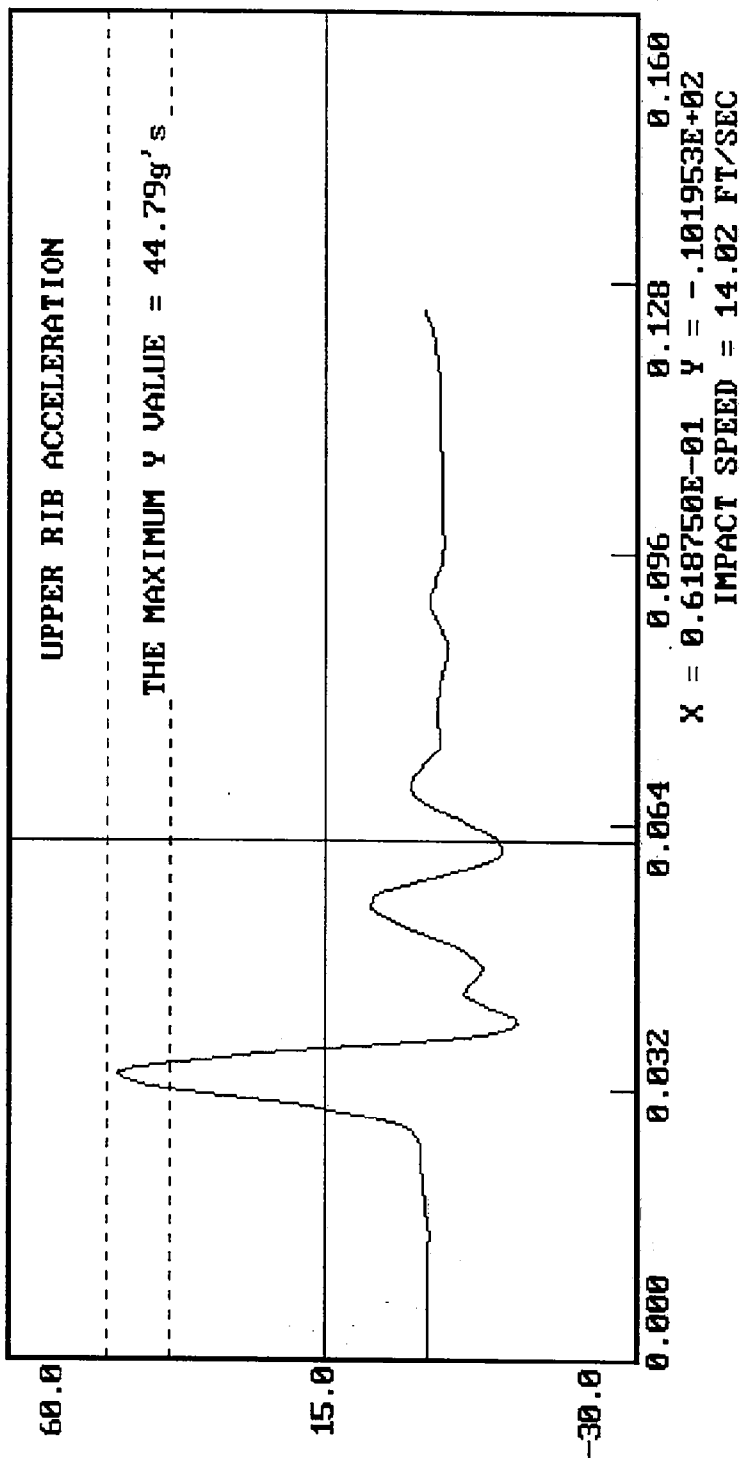
TECHNICIAN

Tim K. O.

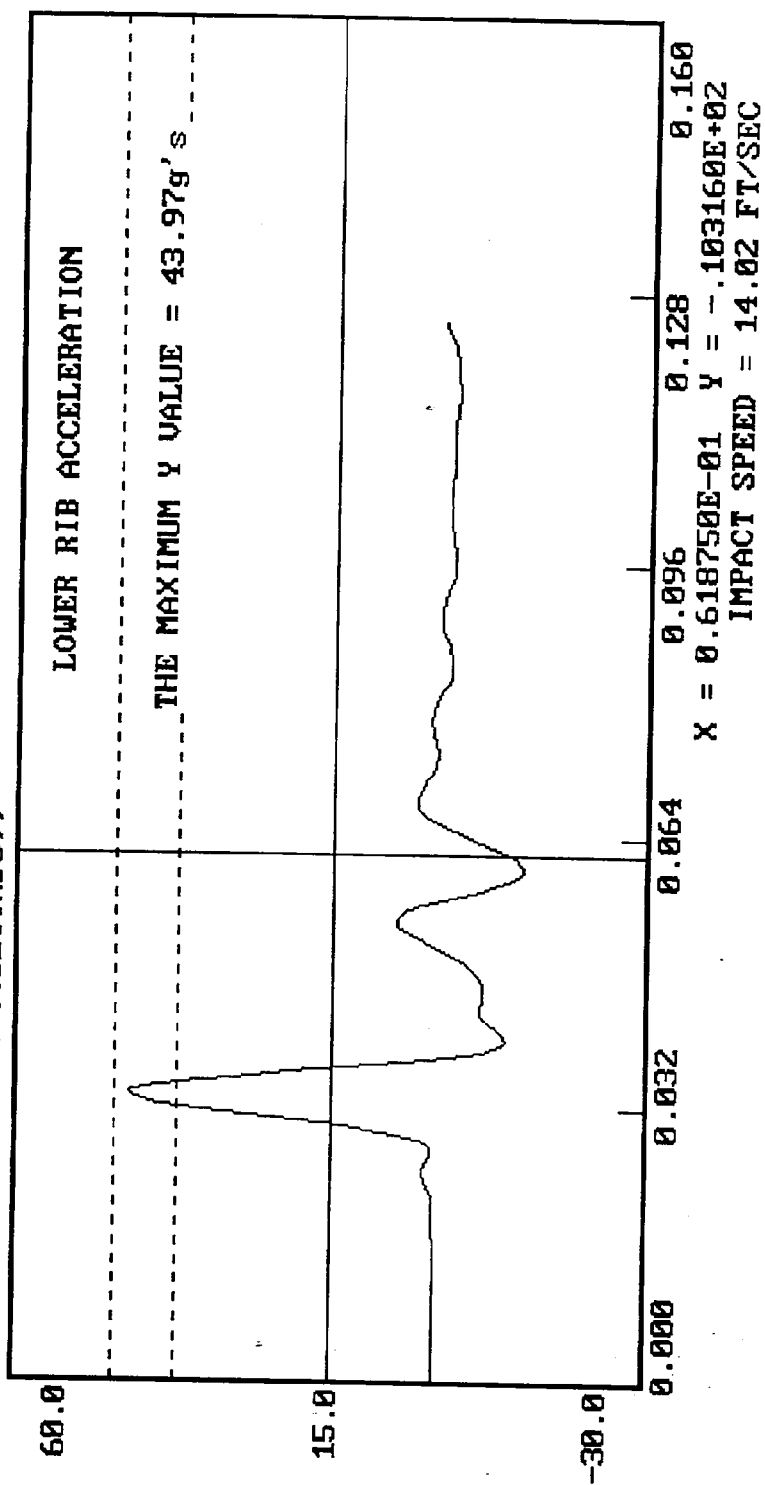
APPROVED BY

Rare Koobake

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 01-17-1996 11:21
 ACCELERATION (G'S) VS. TIME ((SECONDS))



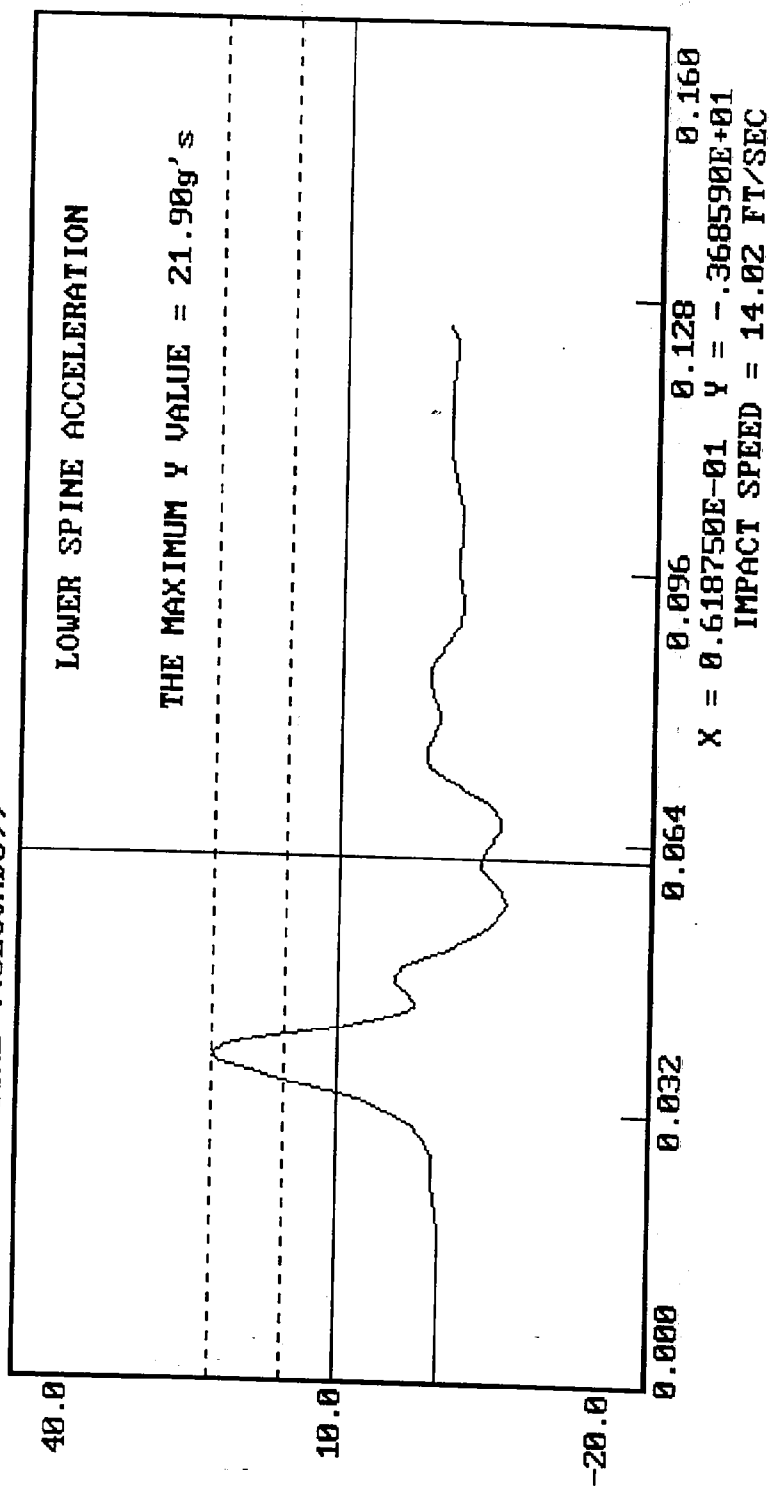
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 01-17-1996 11:21
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271

01-17-1996 11:21

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 17, 1996

DUMMY NUMBER: 271

TEST NUMBER: D96153

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	51

TEST MEETS SPECIFICATIONS

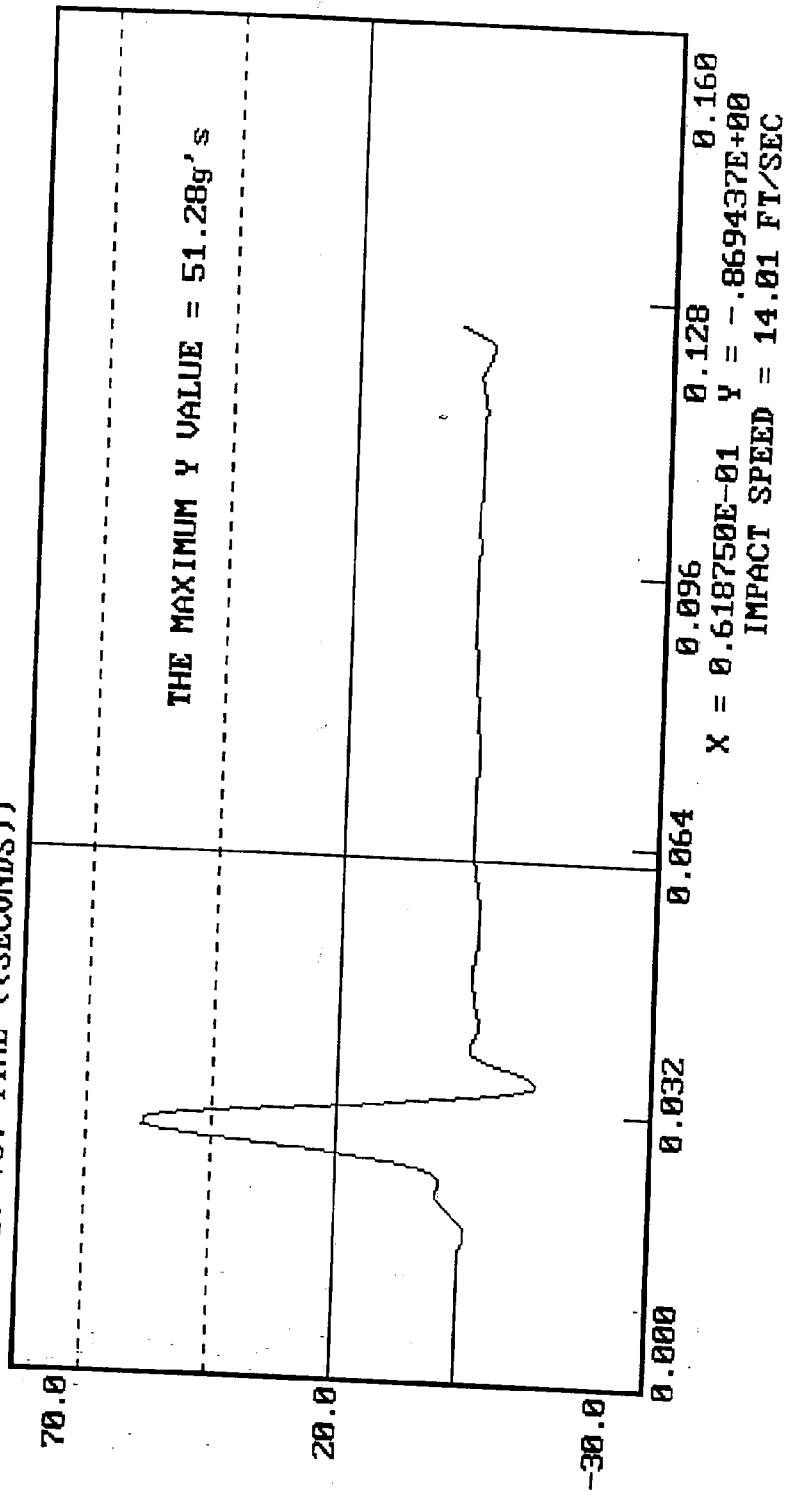
TECHNICIAN Jim Wilson

APPROVED BY Dave Konbade

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 271

01-17-1996 11:28

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: January 17, 1996

DUMMY NUMBER: 271

TEST NUMBER: D96154

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.7
FORCE @ 0.75 in	36.7 - 49.8 lbs	45.2
FORCE @ 1.0 in	50 - 63 lbs	61
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

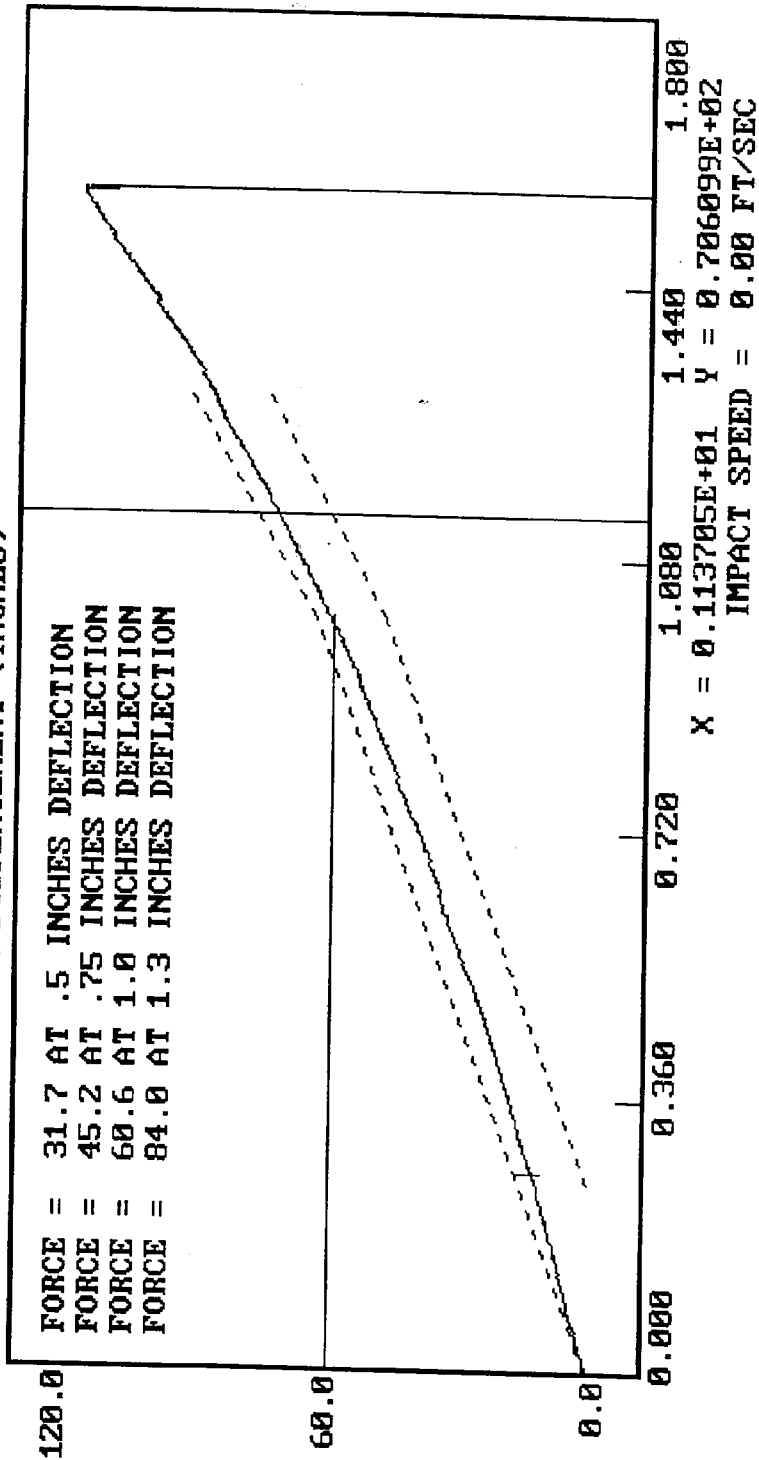
TECHNICIAN Jim W. O.

APPROVED BY Rene K. K. K.

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 271

01-17-1996 14:16

ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 17, 1996

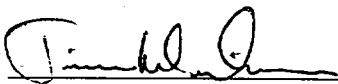
DUMMY NUMBER: 271

TEST NUMBER: D96155

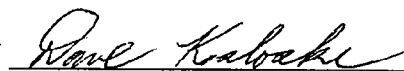
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	27
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	5°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

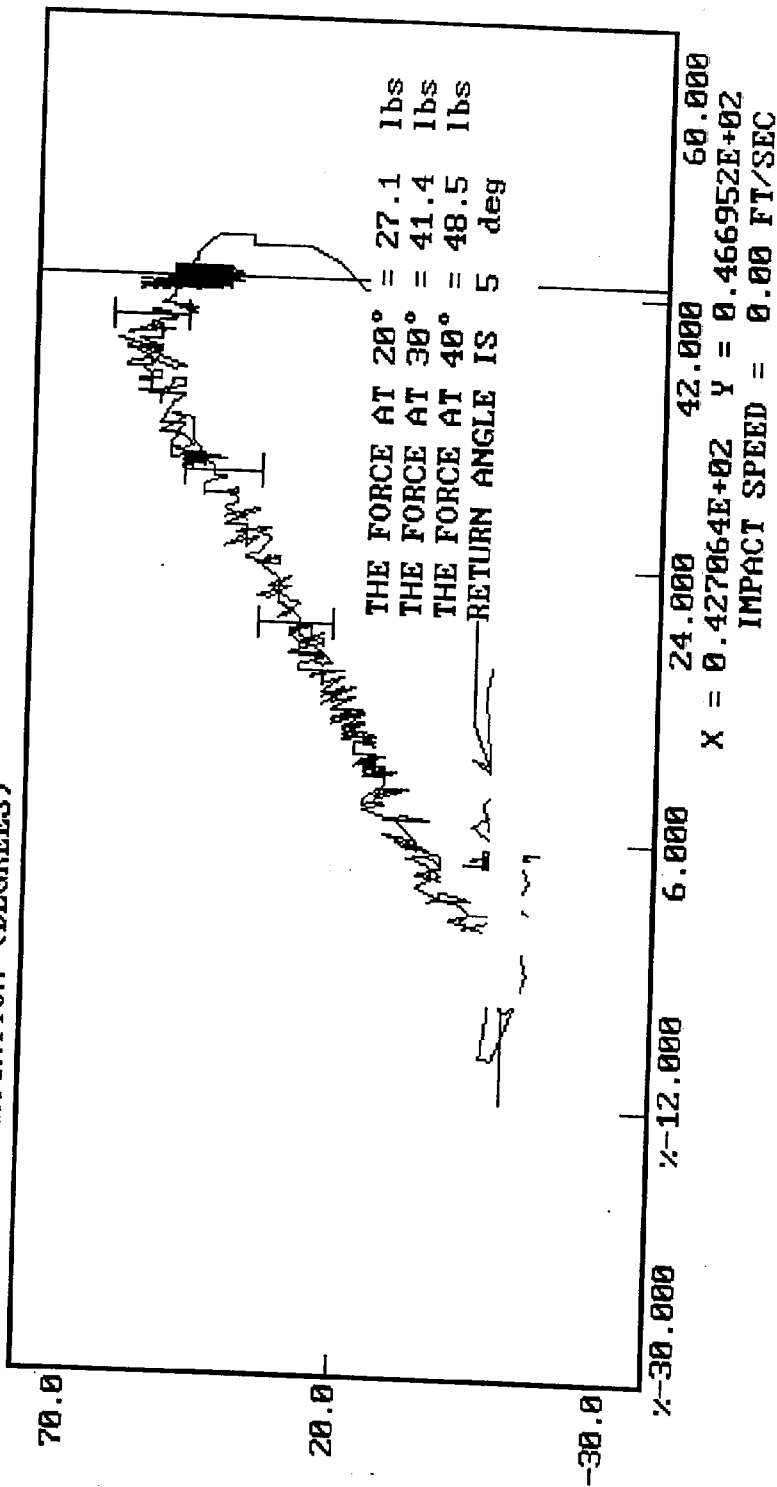


DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 271

FORCE (LBS) VS. TORSO ROTATION (DEGREES)

01-17-1996 15:50



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Al Chalmers

Date: January 17, 1996

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual	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

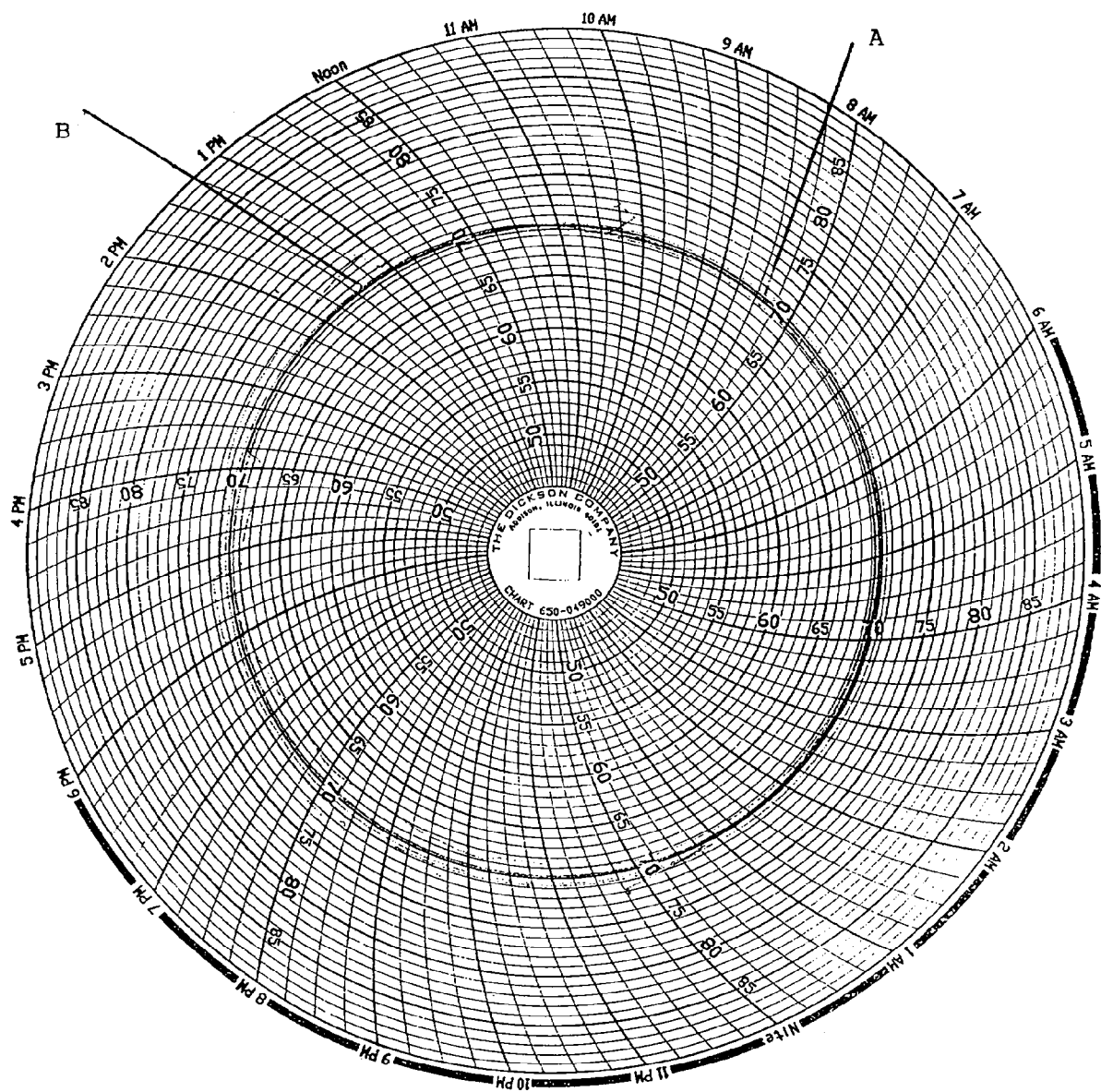
Inspected By: Al Chalmers

Date: October 19, 1995

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual	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
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR DRIVER DUMMY NO. 270

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP1H2	Endevco	September 25, 1995
Lower Rib Y	AJ9C2	Endevco	September 25, 1995
Lower Spine Y	AP2D7	Endevco	September 25, 1995
Pelvis Y	ALCH7	Endevco	September 15, 1995
Upper Rib Redundant Y	AH0B0	Endevco	September 25, 1995
Lower Rib Redundant Y	AHTT2	Endevco	September 25, 1995
Lower Spine Redundant Y	AP1T8	Endevco	September 25, 1995
Pelvis Redundant Y	AJ420	Endevco	September 15, 1995

INSTRUMENTS FOR PASSENGER DUMMY NO. 271

LEFT REAR PASSENGER			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP2A4	Endevco	September 14, 1995
Lower Rib Y	AP1B3	Endevco	September 25, 1995
Lower Spine Y	ANAP1	Endevco	November 08, 1995
Pelvis Y	AHTC3	Endevco	December 12, 1995
Upper Rib Redundant Y	AP2D8	Endevco	September 14, 1995
Lower Rib Redundant Y	AP1C6	Endevco	September 25, 1995
Lower Spine Redundant Y	ANAT6	Endevco	November 08, 1995
Pelvis Redundant Y	AJ420	Endevco	September 15, 1995

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	L18-E14	Entran	October 23, 1995
Moving Barrier CG Y	E13-D01	Entran	September 28, 1995
Moving Barrier CG Z	H07-A06	Entran	September 05, 1995
Moving Barrier Rear Axle X	L18-G01	Entran	October 24, 1995
Moving Barrier Rear Axle Y	E25-G09	Entran	June 26, 1995
Left Mid A-Post Y	L14-D11	Entran	October 23, 1995
Left Lower A-Post Y	C16-F01	Entran	October 19, 1995
Left Mid B-Post Y	C06-G15	Entran	October 19, 1995
Left Lower B-Post Y	D06-A13	Entran	June 09, 1995
Rear Floorpan Above Axle X	L14-D14	Entran	October 24, 1995
Rear Floorpan Above Axle Y	L18-E07	Entran	October 23, 1995
Rear Floorpan Above Axle Z	C27-B02	Entran	September 28, 1995
Driver Seat Track Y	L15-G19	Entran	July 19, 1995
Right Side Sill at Front Seat X	F07-A04	Entran	August 01, 1995
Right Side Sill at Front Seat Y	L18-E18	Entran	October 23, 1995
Right Side Sill at Front Seat Z	L18-E10	Entran	October 23, 1995
Right Side Sill at Rear Seat X	C25-A03	Entran	October 19, 1995
Right Side Sill at Rear Seat Y	H07-A15	Entran	September 05, 1995
Right Side Sill at Rear Seat Z	G19-G12	Entran	September 15, 1995
Left Side Sill at Front Seat Y	F10-D05	Entran	August 01, 1995

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Rear Seat Y	L18-E02	Entran	October 23, 1995
Right Rear Occupant Compartment Y	F07-A09	Entran	August 01, 1995
Vehicle CG X	B12-G18	Entran	October 05, 1995
Vehicle CG Y	H16-X11	Entran	September 21, 1995
Vehicle CG Z	E25-G11	Entran	June 26, 1995

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