

V2537

REPORT NO.: 214-MGA-97-15
SAFETY COMPLIANCE TESTING FOR
FMVSS 214 "SIDE IMPACT PROTECTION -
PASSENGER CARS"

NISSAN MOTOR COMPANY, LTD.
1997 NISSAN ALTIMA 4 DOOR
NHTSA NO: CV5200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: December 11, 1996

Report Date: January 10, 1997

FINAL REPORT

Prepared For:

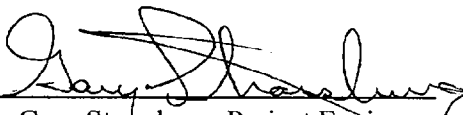
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NSA-30
400 SEVENTH STREET, SW ROOM 6115
WASHINGTON, D.C. 20590

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 214-MGA-97-15		2. Government Accession No.		3. Recipient's Catalog No.																			
4. Title and Subtitle Final Report of FMVSS No.214 Compliance Side Impact Protection Testing of a 1997 Nissan Altima 4 Door NHTSA No. CV0206				5. Report Date January 10, 1996																			
				6. Performing Organization Code MGA																			
7. Author(s) Gary Strassburg, Project Engineer				8. Performing Organization Report No. MGA-DOT-214-15																			
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105				10. Work Unit No.																			
				11. Contract or Grant No. DTNH22-93-C-02047																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (Mail Code: NSA-30) 400 Seventh St., S.W., Room 6115 Washington, D.C. 20590				13. Type of Report and Period Covered Final Test Report December 21, 1996 to January 10, 1997																			
				14. Sponsoring Agency Code NSA-30																			
15. Supplementary Notes																							
16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1997 Nissan Altima 4 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 December 11, 1996. The impact velocity of the Moving Deformable Barrier (MDB) was 53.6 kph, and the ambient temperature at the struck side of the target vehicle at the time of impact was 21.1°C. The target vehicle post test maximum crush was 419 mm at level 2. The test vehicle's performance follows: <table border="1"> <thead> <tr> <th></th> <th><u>RIGHT FRONT PASS.</u></th> <th><u>RIGHT REAR PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Right Upper Rib (RUR) Accel., g</td> <td>66</td> <td>58</td> </tr> <tr> <td>Right Lower Rib (RLR) Accel., g</td> <td>71</td> <td>76</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>69</td> <td>66</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>70</td> <td>71</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>96</td> <td>88</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.							<u>RIGHT FRONT PASS.</u>	<u>RIGHT REAR PASS.</u>	Right Upper Rib (RUR) Accel., g	66	58	Right Lower Rib (RLR) Accel., g	71	76	Lower Spine (T ₁₂) Accel., g	69	66	Thoracic Trauma Index (TTI)	70	71	Pelvis (PEV) Accel., g	96	88
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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 Hornickel																			
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages																			
				22. Price																			

This Final Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-93-C-02047.

This document is disseminated under the sponsorship of the U. S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its content or use thereof.

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FINAL REPORT ACCEPTED BY (OVSC):

Accepted By: 
Contract Technical Manager

Acceptance Date: 4/1/97

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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 of a 1997 Nissan Altima 4 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 1997 Nissan Altima 4 Door was impacted on the right 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 33.3 mph (53.6 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 December 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 right front and rear right 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. Right Upper Rib (RUR) uniaxial accelerometer (Y-direction)
2. Right Lower Rib (RLR) 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 FMVSS 214 Right Side Impact test:

Injury Criteria	Front SID	Rear SID
TTI (g)	70.0	71.1
Pelvis (g)	96.3	87.8

TEST NOTES

1. The following accelerometers were not used for this test:

Right Front Door on Centerline

Midrear of Right Front Door

Right Front Door Upper Centerline

Midrear of Right Rear Door

Right 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: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 VIN: 1N4BU31D4VC152164

Vehicle Body Color: Black Build Date: 7/96

Engine Data: 4 Cylinders; CID; 2.4 Liter; cc

Placement Longitudinal; X Lateral

Transmission: 5 speed; Manual; X Automatic; Overdrive

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

Odometer Reading 46 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): 29 Psi FRONT

29 Psi REAR

Recommended Tire Size: P205/60R15

Tires on Test Vehicle: P205/60R15 Manufacturer: General

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 = 408.2 kg (A)

No. of Occupants x 68.04 kg. = 340.2 kg (B)

Cargo Capacity (A-B) = 68.0 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>389.6</u> kg	Right Rear	=	<u>247.7</u> kg
Left Front	=	<u>395.5</u> kg	Left Rear	=	<u>232.7</u> kg
TOTAL FRONT	=	<u>785.1</u> kg	TOTAL REAR	=	<u>480.4</u> kg
% of Total Vehicle Weight = <u>62.0</u> %;		% of Total Weight = <u>48.0</u> %			
TOTAL WEIGHT = <u>1265.5</u> kg					

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	= <u>1265.5</u> kg
Cargo Carrying Capacity of Test Vehicle	= <u>68.0</u> kg
Weight of 2 Side Impact Dummies (2 x <u>80.7</u> kg.)	= <u>161.4</u> kg
TEST VEHICLE TARGET WEIGHT	= <u>1494.9</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>440.4</u> kg	Right Rear	= <u>352.4</u> kg
Left Front	= <u>404.6</u> kg	Left Rear	= <u>296.7</u> kg
TOTAL FRONT	= <u>845.0</u> kg	TOTAL REAR	= <u>649.1</u> kg
% of Total Weight	= <u>56.6</u> %	% of Total Weight	= <u>43.4</u> %
TOTAL TEST WEIGHT	= <u>1494.1</u> kg		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 710 mm Left Front 710 mm Right Rear 692 mm Left Rear 695 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 695 mm Left Front 702 mm Right Rear 647 mm Left Rear 658 mm

TEST ATTITUDE:

Right Front 698 mm Left Front 698 mm Right Rear 655 mm Left Rear 659 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2624 mm

C.G. = 1095 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4307 mm

Centerline = 4564 mm

Left Side = 4307 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 230 mm

Test Position: 11th position rearward out of 20 total

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 25°

REAR POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: None

Seat Back Adjustment Position: N/A

ADJUSTABLE STEERING COLUMN POSITION: Mid position

WINDOW POSITIONS: Left Front Down Left Rear Down
Right Front Up Right Rear Up

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

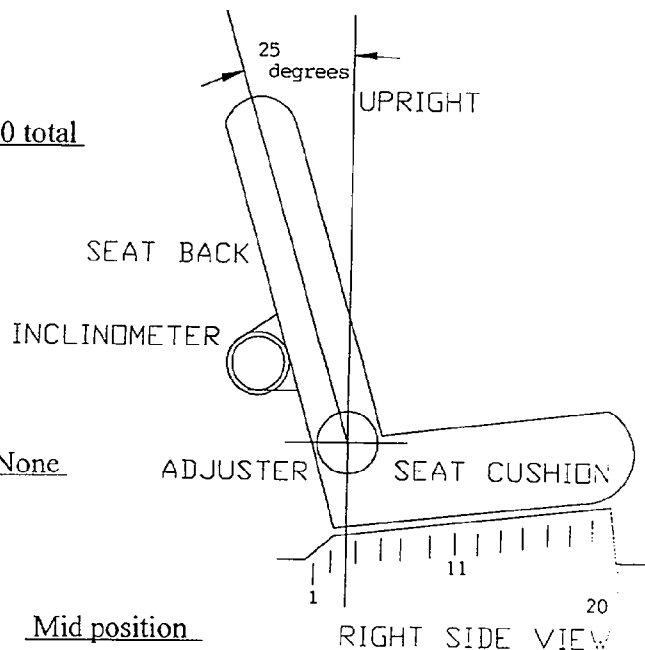
Fuel system usable capacity = 58.0 liters

Test Volume: 53.9 liters 92.9 % of capacity

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

Wheelbase: = 2624 mm

Impact Point is 372 mm rearward of front axle centerline



DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

Overall Length = 4564 mm; Overall Width = 1683 mm

TEST WEIGHT:

Right Front = 444.5 kg Right Rear = 329.8 kg

Left Front = 422.8 kg Left Rear = 291.7 kg

TOTAL FRONT = 867.3 kg TOTAL REAR = 621.5 kg

% of Total Weight = 58.3 % % of Total Weight = 41.7 %

TOTAL VEHICLE WEIGHT = 1488.8 kg

Wheelbase = 2624 mm

Longitudinal C.G. from Center of Front Axle = 1095 mm

Impact Angle with Respect to Impactor = 0° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (282 mm above ground) = 238 mm

2. LEVEL 2 (483 mm above ground) = 419 mm

3. LEVEL 3 (615 mm above ground) = 360 mm

4. LEVEL 4 (863 mm above ground) = 323 mm

5. LEVEL 5 (1214 mm above ground) = 58 mm

Maximum Post-Test Intrusion = 419 mm

OCCUPANTS:

	<u>Right Front Passenger</u>	<u>Right Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>type II belt</u> <u>with airbag</u>	<u>type II belt</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: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to right

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>1096 mm</u>
C.G. Location From Center Line	= <u>14.7 mm</u>
C.G. Location Above Ground Level	= <u>488 mm</u>

MDB WEIGHT:

Left Front	= <u>434.5 kg</u>	Left Rear	= <u>233.2 kg</u>
Right Front	= <u>342.9 kg</u>	Right Rear	= <u>346.0 kg</u>
TOTAL FRONT	= <u>777.4 kg</u>	TOTAL REAR	= <u>579.2 kg</u>
TOTAL MDB WEIGHT = <u>1356.6 kg</u>			

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

Impact Speed = Primary: 33.28 mph (53.6 kph) Secondary: 33.25 mph (53.5 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>146</u> mm |
| 2. | Row B Mid Stack (686 mm) | = <u>114</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = <u>55</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = <u>85</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

VISIBLE DUMMY CONTACT POINTS:

	<u>RIGHT FRONT SID</u>	<u>RIGHT REAR SID</u>
Head	<u>to window sill</u>	<u>to C Post and header</u>
Arm	<u>to armrest & door panel</u>	<u>to door panel</u>
Pelvis	<u>to door panel</u>	<u>to armrest and door panel</u>
Left Knee	<u>to right knee</u>	<u>to right knee</u>
Right Knee	<u>to door panel</u>	<u>to door panel</u>

DOOR OPENING:

	<u>LEFT SIDE</u>	<u>RIGHT SIDE</u>
Front	<u>No</u>	<u>No</u>
Rear	<u>No</u>	<u>No</u>

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 13 mm forward
 rearward

Vertical: 9 mm high

ARM REST LOCATIONS:

Front: 228 mm from bottom of window
Rear: 253 mm from bottom of window

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 155 mm Front Seat Cushion: 170 mm

Left Rear Seat Back: 139 mm Rear Seat Cushion: 247 mm

GLAZING DAMAGE:

Right side windows broken, windshield cracked

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

Separated from 1330 to 1400 and from 1800 to 1880 mm

rearward of the impact point

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: 1997/Nissan/Altima/4 Door

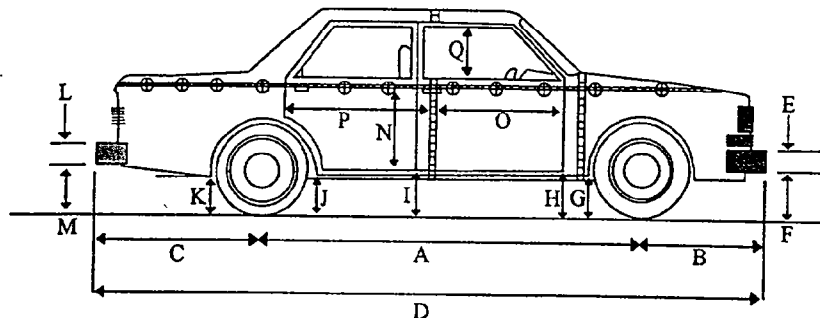
Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

	Front SID ID #270			Rear SID ID #269		
	Pos. Direct.		Neg. Direct	Pos. Direct.		Neg. Direct
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS						
Right Upper Rib (RUR) Y	12.8	83	-66.5	39	5.5	156
Right Lower Rib (RLR) Y	12.7	33	-70.9	39	10.6	69
SPINE ACCELERATIONS						
Lower Lateral Y	16.5	71	-69.0	31	20.6	73
PELVIS ACCELERATIONS						
Lateral Y	15.4	52	-96.3	28	17.3	76

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)

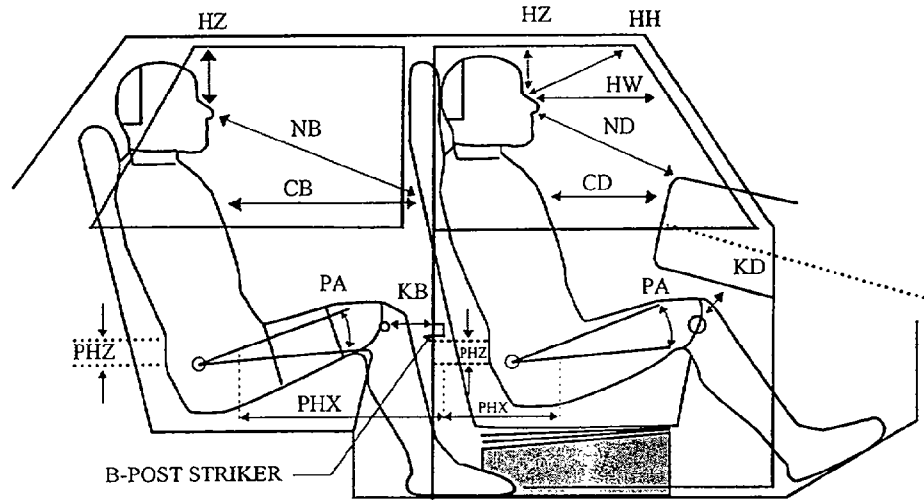
	PRE-TEST	POST-TEST	Δ CHANGE
A	2624	2564	60
B	894	883	11
C	1046	1016	30
D	4564	4463	101
E	175	175	0
F	435	430	5
G	252	253	-1
H	204	243	-39
I	196	228	-32
J1/J2	198/196	178/215	20/-19
K	271	271	0
L	163	163	0
M	308	313	-5
N	590	522	68
O	725	716	9
P	1243	1123	120
Q	460	452	8
R	4307	4269	38
S	4307	4348	-41
T	1683	1332	351

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

NHTSA NO.: CV5200 Test Date: December 11, 1996



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

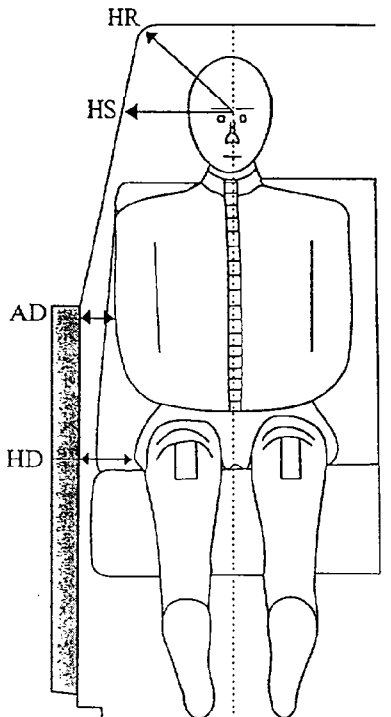
	FRONT PASSENGER ID #270		REAR PASSENGER SID ID #269
HH	376	HZ	142
HW	639	NB	558
HZ	169	CB	481
ND	727	KBL (KBA)	197 (0°)
CD	609	KBR (KBA)	216 (0°)
CS	N/A	PA°	24.4°
KDL(KDA°)	164 (22.2°)	PHX	230
KDR(KDA°)	157 (28.9°)	PHZ	293
PA°	24.4°		
PHX	198		
PHZ	112		

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: 1997/Nissan/Altima/4 Door

NHTSA NO.: CV5200 Test Date: December 11, 1996



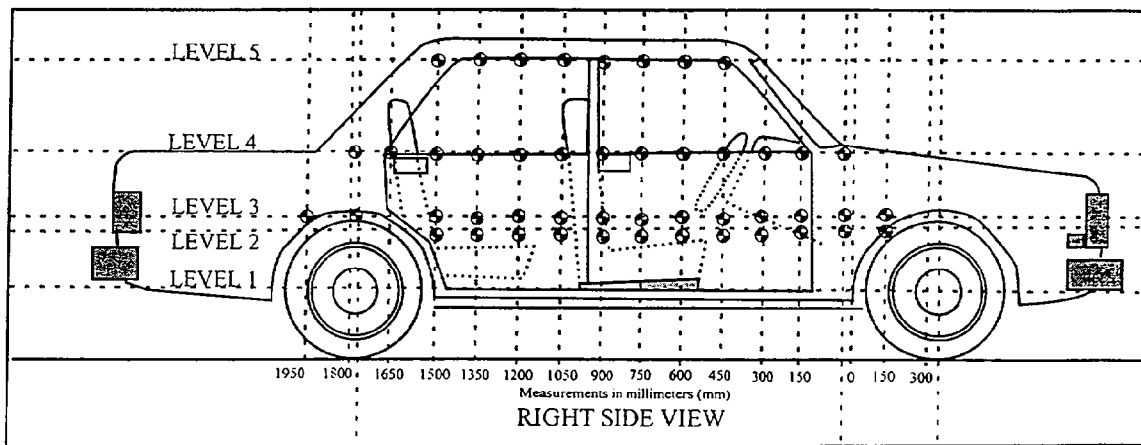
NOTE: All dimensions are in mm

	FRONT PASSENGER ID #270	REAR PASSENGER ID #269
HR	182	183
HS	284	194
AD	97	101
HD	112	165

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

NHTSA NO.: CV5200 Test Date: December 11, 1996



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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

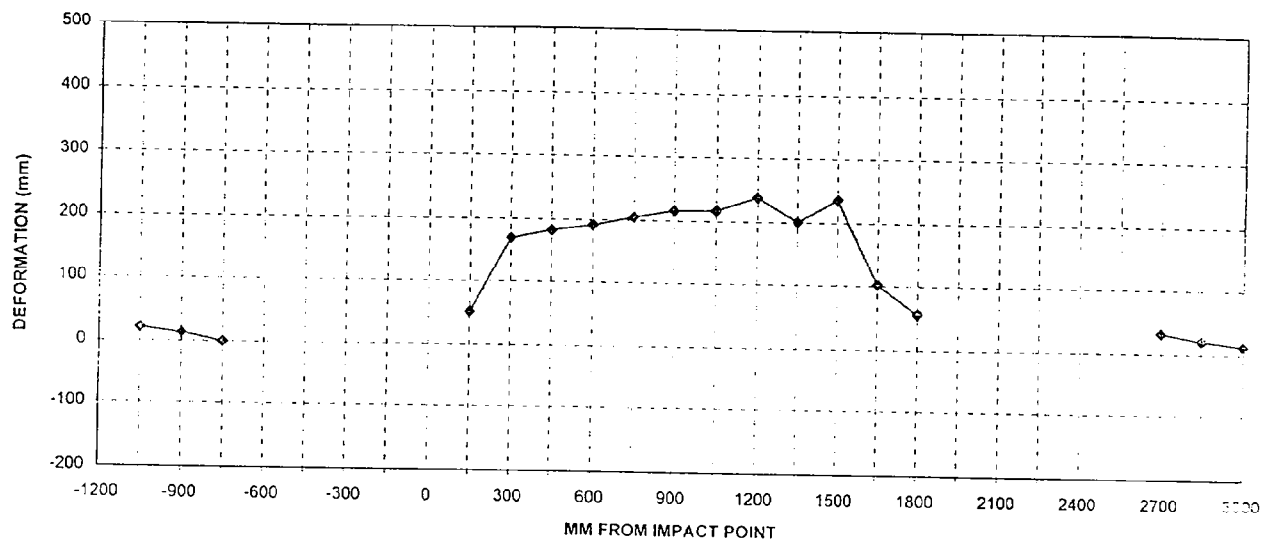
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>282</u> mm
Level 2 @ Occupant H-Point	= <u>483</u> mm
Level 3 @ Mid Door	= <u>615</u> mm
Level 4 @ Window Sill	= <u>863</u> mm
Level 5 @ Window Top	= <u>1214</u> mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050	750	729	21
-900	714	701	13
-750	687	687	0
-600			
-450			
-300			
-150			
0 (impact point)			
150	691	742	51
300	693	863	170
450	695	878	183
600	696	888	192
750	696	901	205
900	699	915	216
1050	699	916	217
1200	701	939	238
1350	700	901	201
1500	702	938	236
1650	703	805	102
1800	702	758	56
1950			
2100			
2250			
2400			
2550			
2700	700	732	32
2850	714	735	21
3000	732	745	13

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



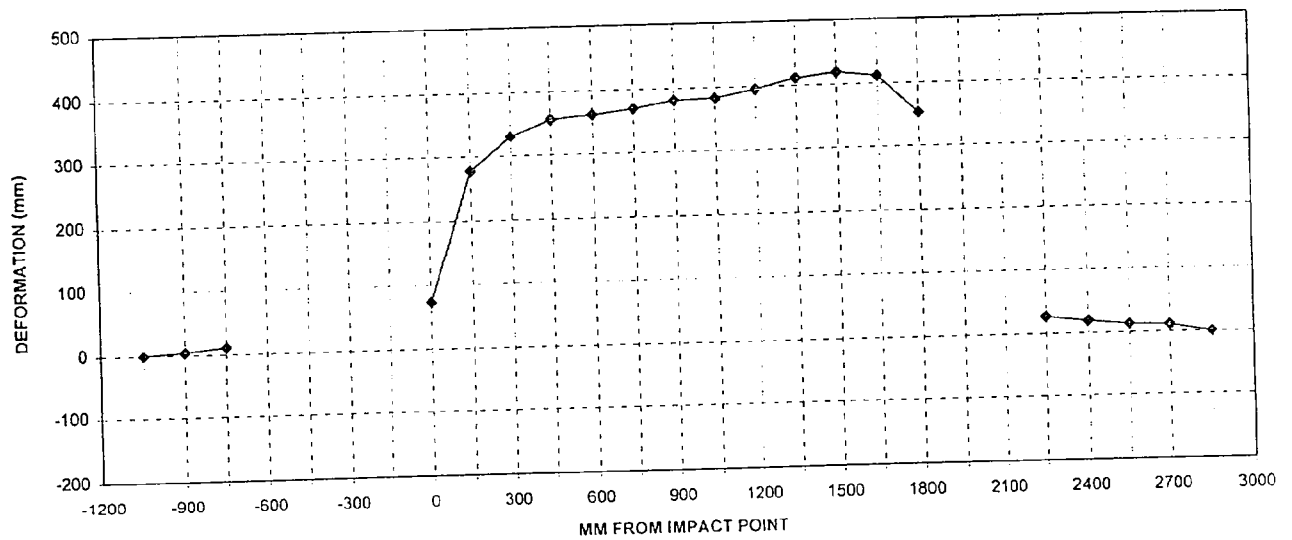
LEVEL 1 - AXLE CENTERLINE

DATA SHEET NO. 10 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 2 - Occupant H Point		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050	718	718	0
-900	682	686	4
-750	659	670	11
-600			
-450			
-300			
-150			
0 (impact point)	638	711	73
150	641	918	277
300	638	968	330
450	640	997	357
600	644	1007	363
750	643	1014	371
900	644	1026	382
1050	645	1029	384
1200	646	1042	396
1350	645	1056	411
1500	647	1066	419
1650	646	1058	412
1800	648	1002	354
1950			
2100			
2250	653	679	26
2400	665	684	19
2550	680	693	13
2700	699	710	11
2850	732	732	0
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



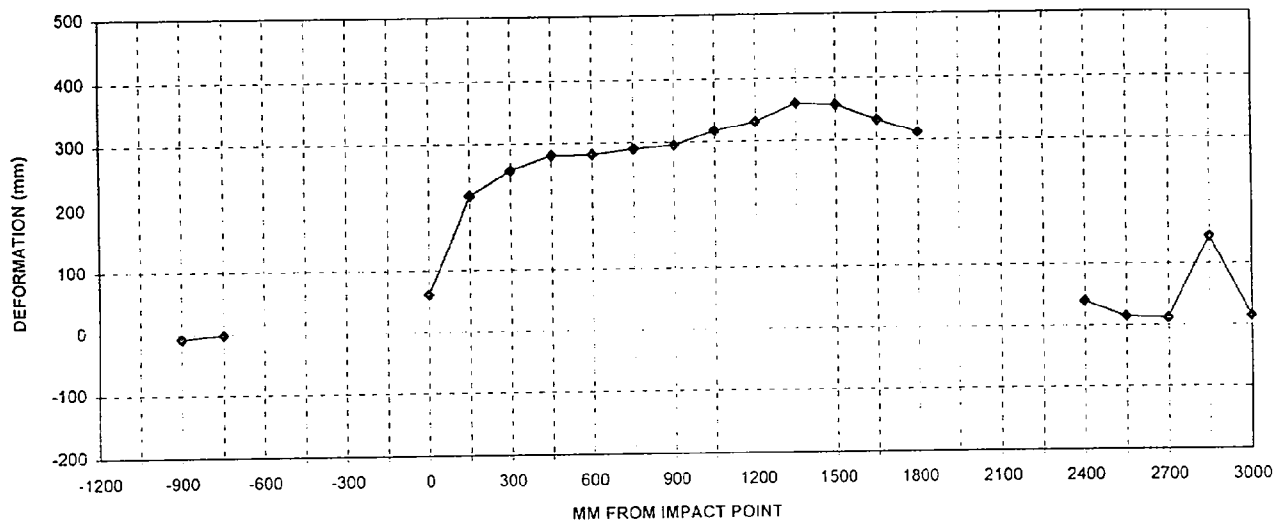
LEVEL 2 - OCCUPANT H-POINT

DATA SHEET NO. 10 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 3 - Mid Door		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900	710	702	-8
-750	678	676	-2
-600			
-450			
-300			
-150			
0 (impact point)	646	706	60
150	645	864	219
300	642	900	258
450	644	925	281
600	646	928	282
750	648	938	290
900	648	943	295
1050	648	965	317
1200	648	980	332
1350	648	1008	360
1500	649	1006	357
1650	651	984	333
1800	652	964	312
1950	652	84	
2100			
2250			
2400	640	679	39
2550	660	674	14
2700	670	681	11
2850	686	691	145
3000	710	724	14

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



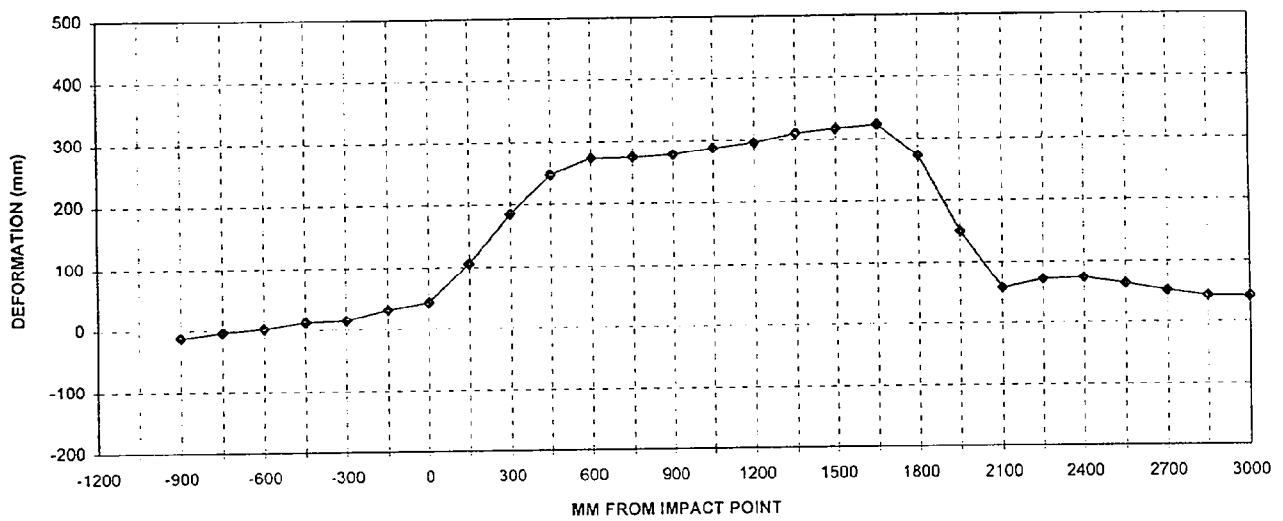
LEVEL 3 - MID DOOR

DATA SHEET NO. 10 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 4 - Window Sill		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900	772	760	-12
-750	744	740	-4
-600	723	725	2
-450	706	718	12
-300	702	716	14
-150	689	720	31
0 (impact point)	684	726	42
150	683	789	106
300	680	865	185
450	647	894	247
600	651	924	273
750	650	924	274
900	652	930	278
1050	652	940	288
1200	655	951	296
1350	656	966	310
1500	656	973	317
1650	659	982	323
1800	660	932	272
1950	664	814	150
2100	666	723	57
2250	669	740	71
2400	675	748	73
2550	681	744	63
2700	690	741	51
2850	702	744	42
3000	724	765	41

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



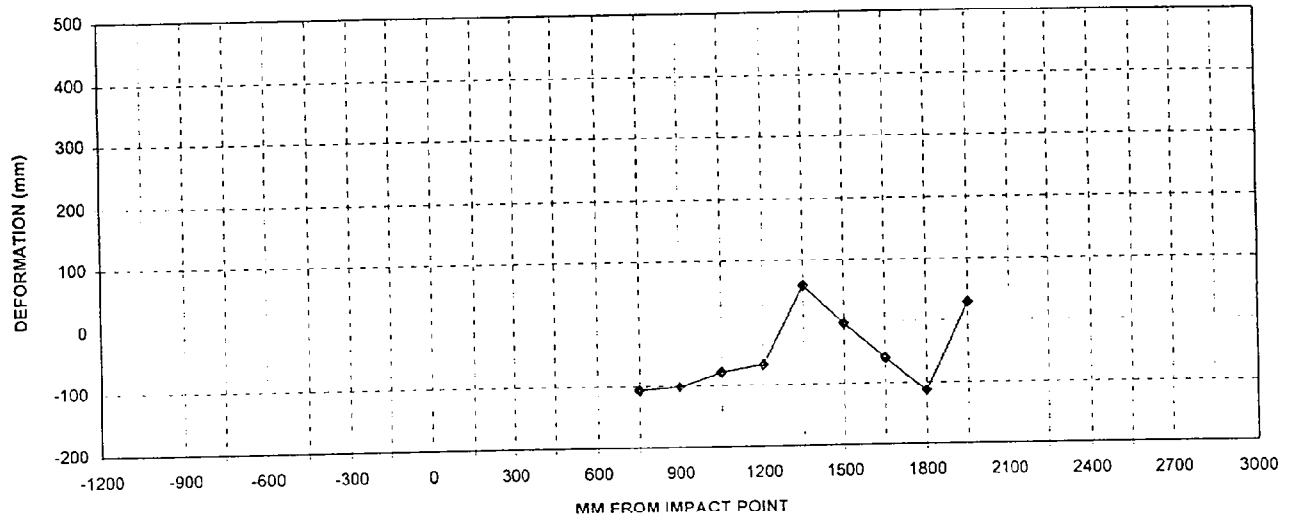
LEVEL 4 - WINDOW SILL

DATA SHEET NO. 10 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 5 - Window Top		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750	912	805	-107
900	909	807	-102
1050	904	826	-78
1200	909	842	-67
1350	910	968	58
1500	915	912	-3
1650	917	858	-59
1800	923	809	-114
1950	936	964	28
2100			
2250			
2400			
2550			
2700			
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

NHTSA NO.: CV5200 Test Date: December 11, 1996

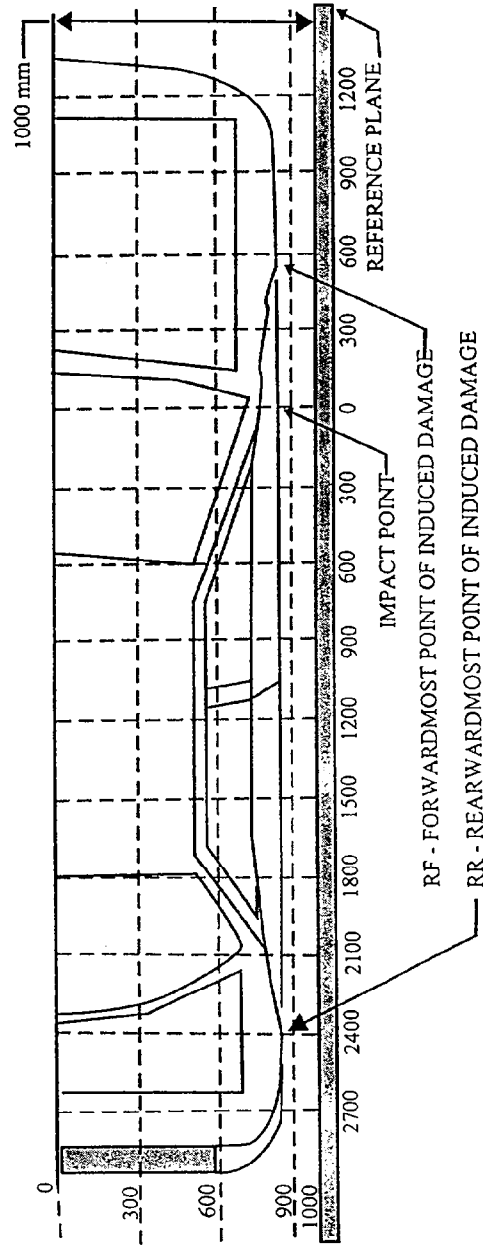


Figure is not representative of the actual test configuration

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (RF = -1050 mm)	718	718	0
2. -240 mm	711	690	21
3. 575 mm	1011	643	368
4. 1420 mm	1058	646	412
5. 240 mm	740	672	68
6. (RR = 3150 mm)	732	732	0

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

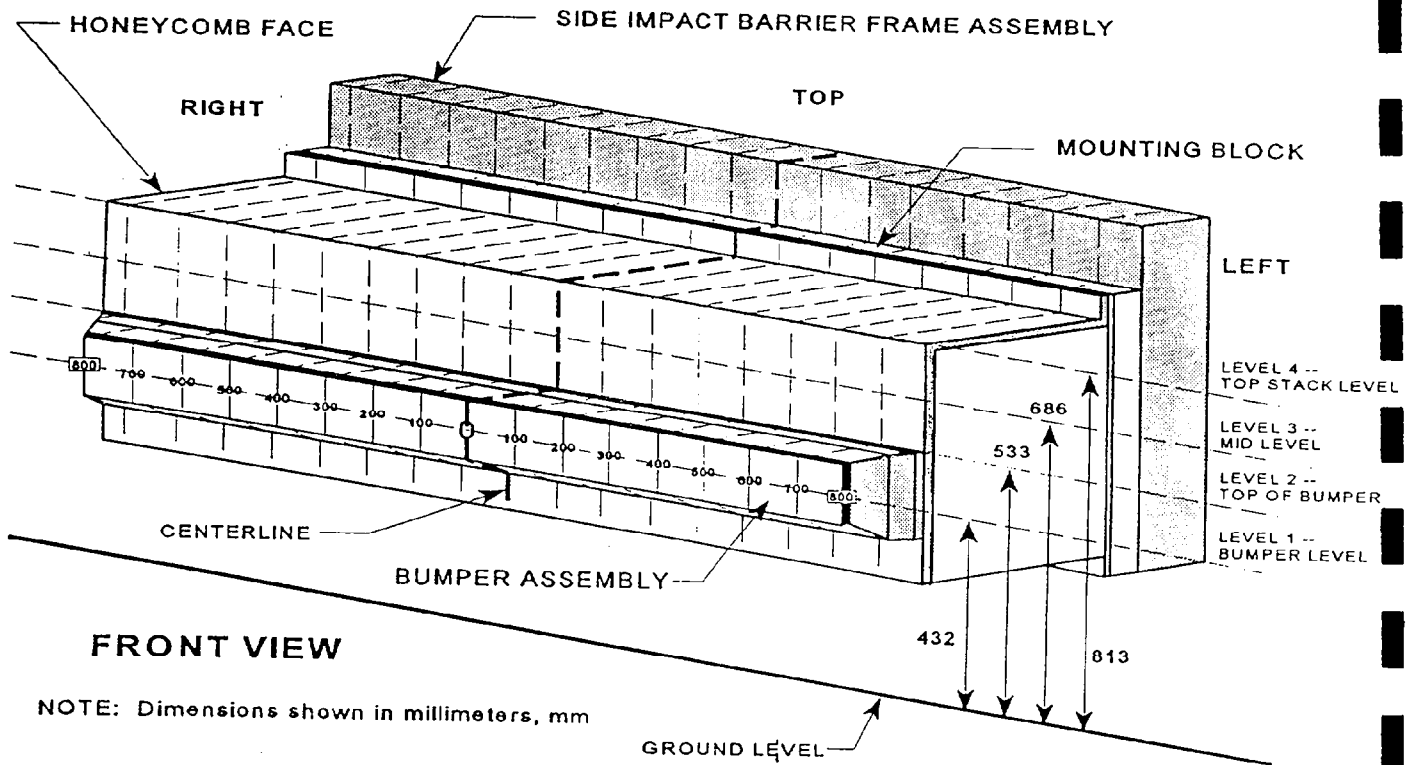
Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

Location	Height at CL *	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	800
Top Stack Level 4	813 mm	146	102	66	40	16	7	5	4	3	1	0	-1	-3	-3	-5	0	45
Mid Level Level 3	686 mm	114	47	20	4	1	0	0	-1	0	-2	-4	-4	-5	-5	-7	-8	1
Top Bumper Level 2	533 mm	55	33	21	17	15	14	10	8	5	4	2	1	-1	-3	-5	-4	1
Mid Bumper Level 1	432 mm	85	65	41	33	31	29	26	24	21	20	18	18	15	12	10	11	23

See next page for Barrier Face Graphic

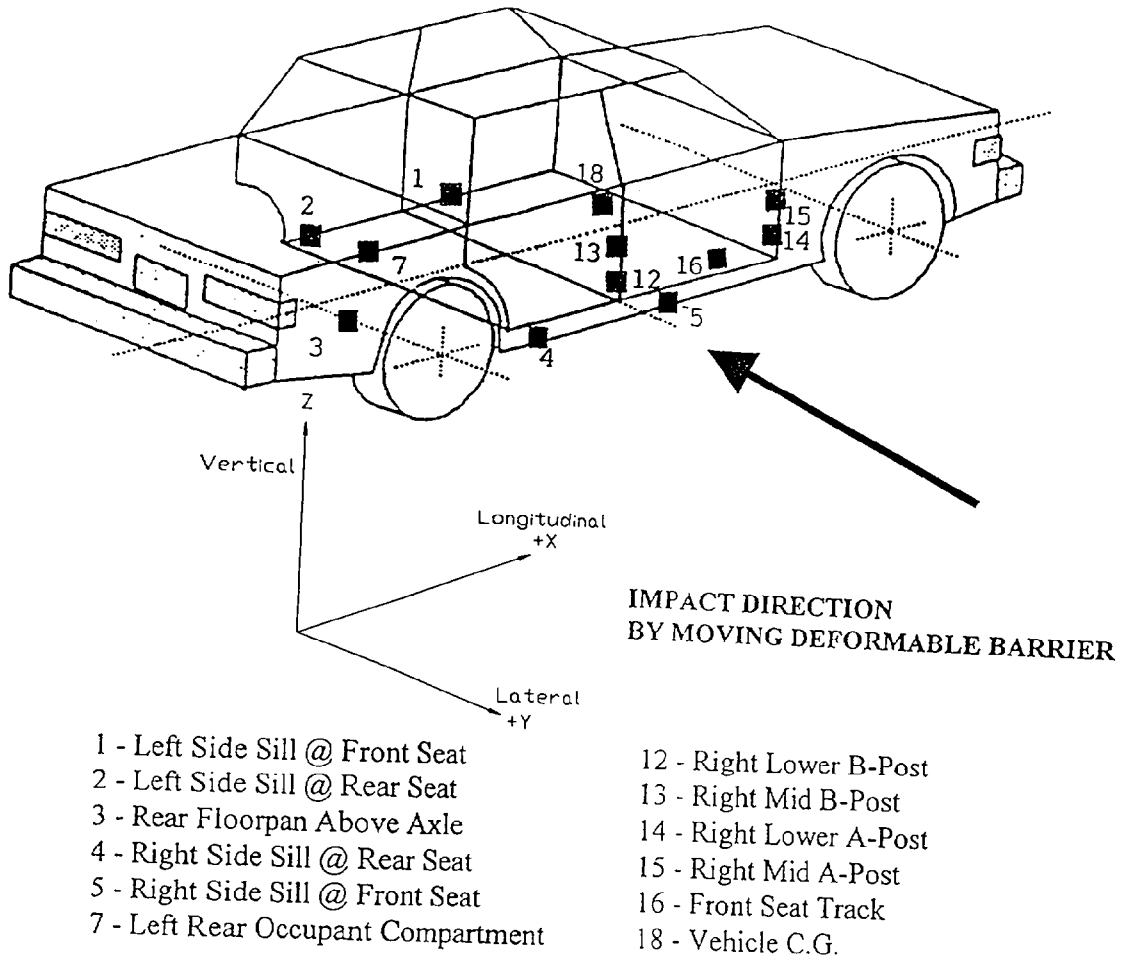
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996



DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 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	Left Side Sill @ Front Seat	2407	-713	225	3.5	-5.6	2.5	-19.5	4.9	-5.5	19.8
2	Left Side Sill @ Rear Seat	1712	-671	250	3.3	-6.3	2.2	-18.6	5.8	-4.5	19.5
3	Rr. Floorpan Above Axle	898	0	463	4.7	-7.7	2.8	-16.2	7.0	-7.7	17.5
4	Right Side Sill @ Rr. Seat	1696	671	257	---	---	9.3	-40.0	---	---	---
5	Right Side Sill @ Frt. Seat	2442	713	230	---	---	5.7	-28.8	---	---	---
7	Left Rear Occupant Compartment	1823	-514	270	---	---	2.8	-21.0	---	---	---
12	Right Lower B-Post	2041	708	387	---	---	30.4	-143.8	---	---	---
13	Right Mid B-Post	2072	687	793			67.0	-136.8	---	---	---
14	Right Lower A-Post	3011	672	309	---	---	18.3	-52.3	---	---	---
15	Right Mid A-Post	3156	753	853	---	---	64.5	-87.8	---	---	---
16	Right Front Passenger Seat Track	2301	555	262	---	---	58.9	-84.1	---	---	---
18	Vehicle CG	2673	20	345	2.0	-8.6	2.4	-32.4	14.0	-4.6	35.6

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

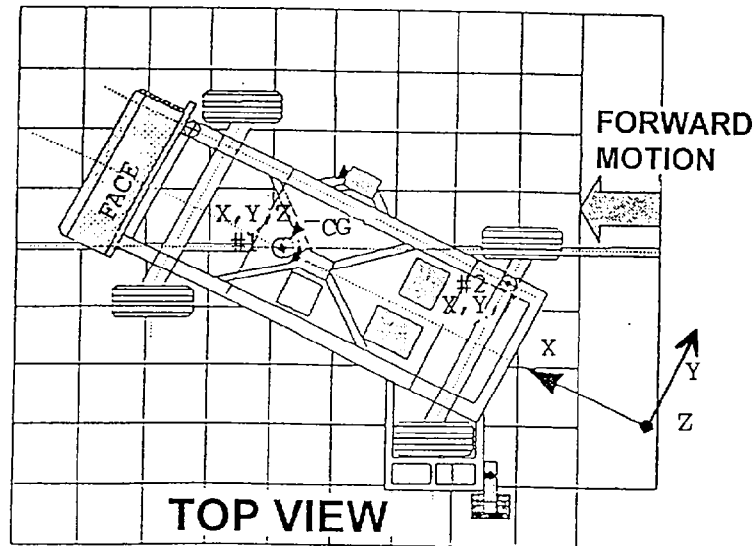
Z - Ground Level (+ Up)

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996



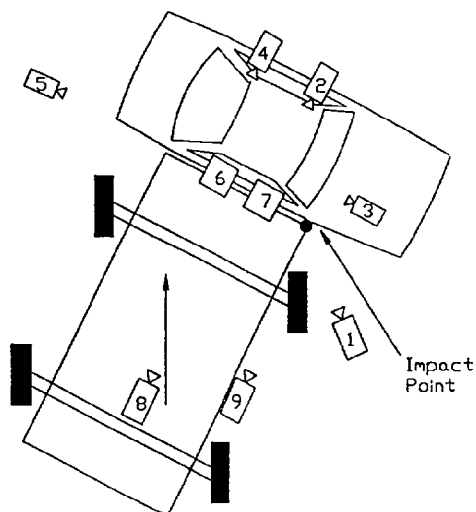
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.8	172	-15.3	34
	Lateral (Y)	---	---	---	6.2	35	-1.5	56
	Vertical (Z)	---	---	---	10.0	37	-10.1	23
	Resultant (R)	---	---	---	18.7	37	---	---
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	2.1	180	-19.8	36
	Lateral (Y)	---	---	---	1.7	176	-6.1	37

*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: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time					13	24
1	Right Impact	-840	2100	1620	90°	13	1015
2	Onboard Front Passenger					8	877
4	Onboard Rear Passenger					8	971
3	Onboard Hood					13	1010
5	Rear Impact	100	-9310	1910	90°	25	1000
6	Top Overall	-370	-1110	5000	90°	8	1042
7	Top Impact	-320	120	5000	90°	13	862
8	Cart Wide					13	1026
9	Cart Impact					35	952

* Reference: (from impact point)
 +X = Forward
 +Y = To Right
 +Z = Upward from floor level

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 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 33.3 mph (53.6 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

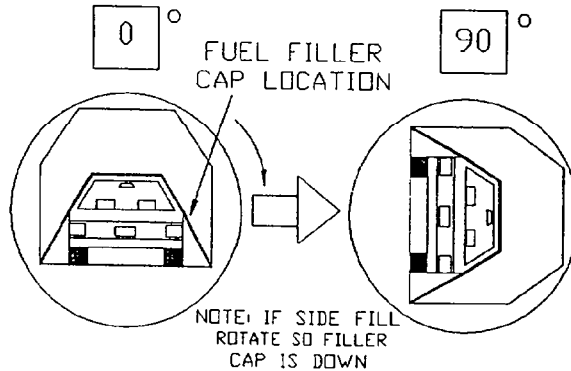
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 49 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 49 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	0 oz	1 oz

FUEL SPILLAGE LOCATIONS(S): None

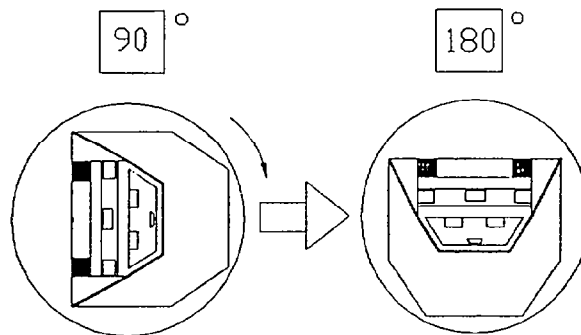
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 32 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 32 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	0 oz	1 oz

FUEL SPILLAGE LOCATIONS(S): None

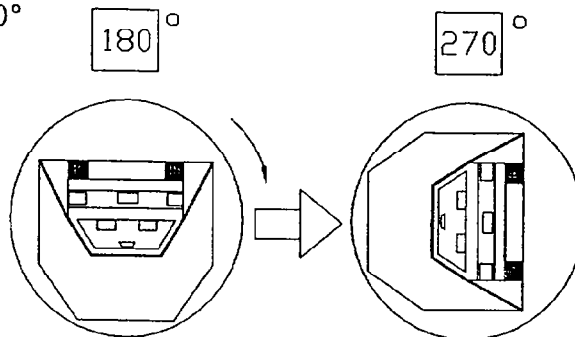
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 16 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 16 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	0 oz	1 oz

FUEL SPILLAGE LOCATIONS(S): None

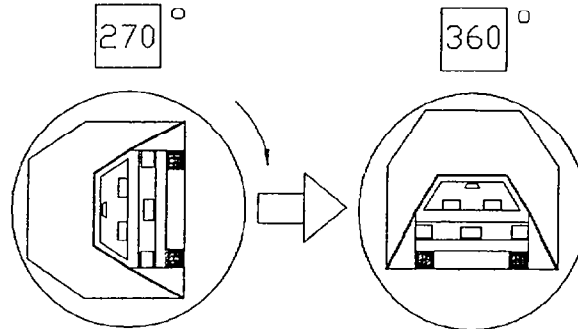
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Nissan/Altima/4 Door

Vehicle NHTSA No.: CV5200 Test Date: December 11, 1996

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 41 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 41 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	0 oz	1 oz

FUEL SPILLAGE LOCATIONS(S): None

APPENDIX A - PHOTOGRAPHS

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Photo No. A-50 - Left Front Attitude Point	A-50
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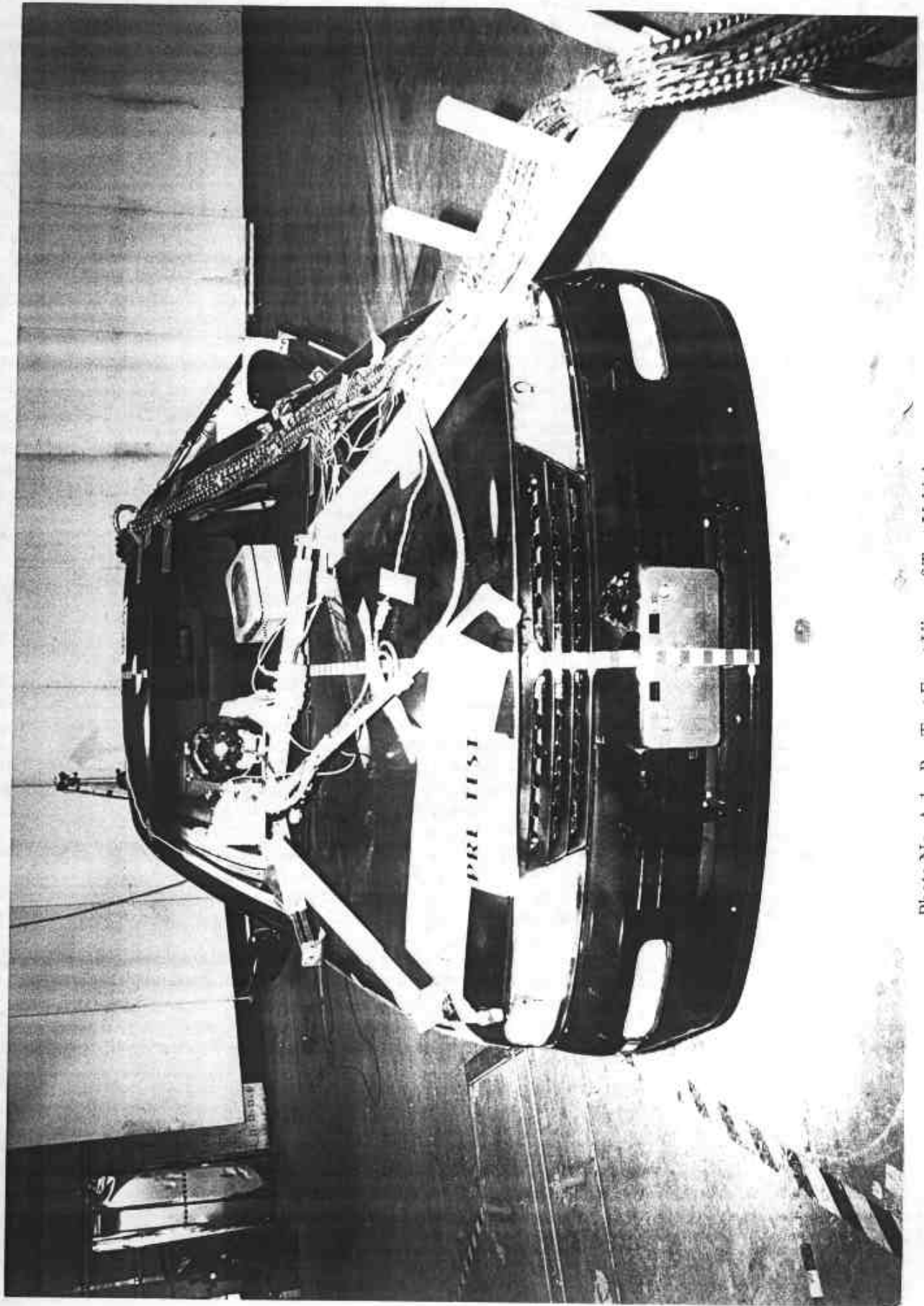


Photo No. A-1 - Pre-Test Front View of Test Vehicle

A-1

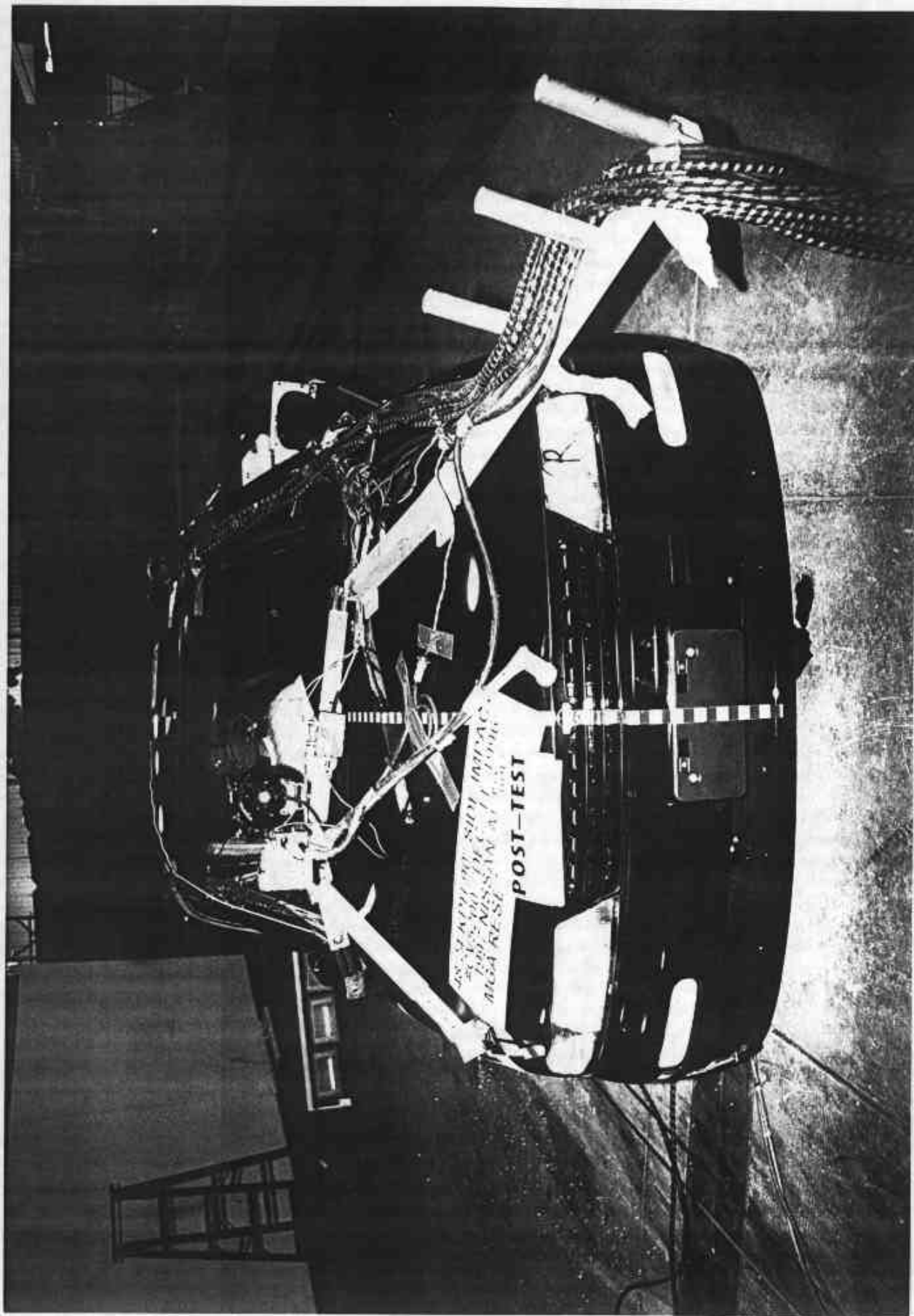


Photo No. A-2 - Post-Test Front View of Test Vehicle

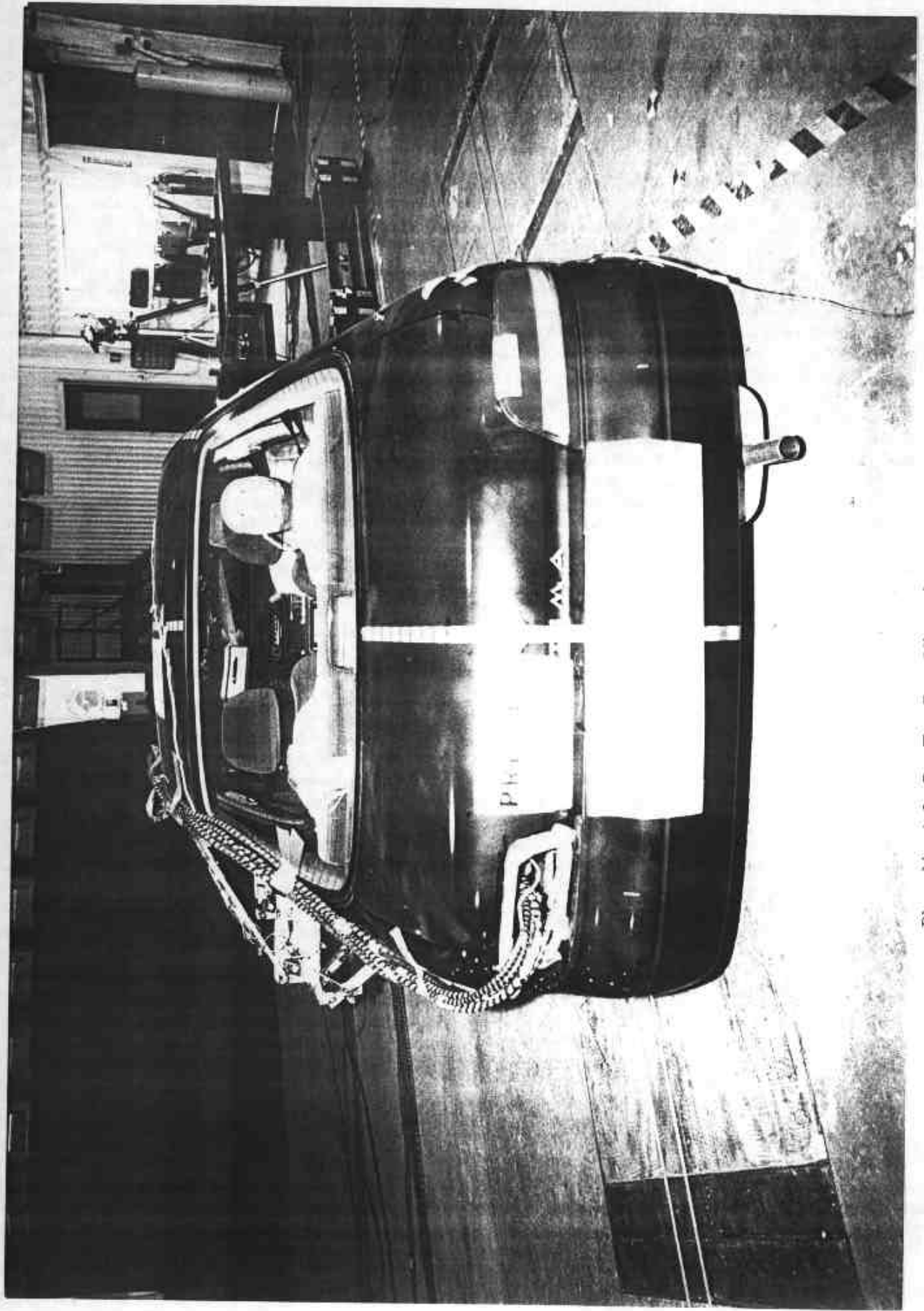


Photo No. A-3 - Pre-Test Rear View of Test Vehicle



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

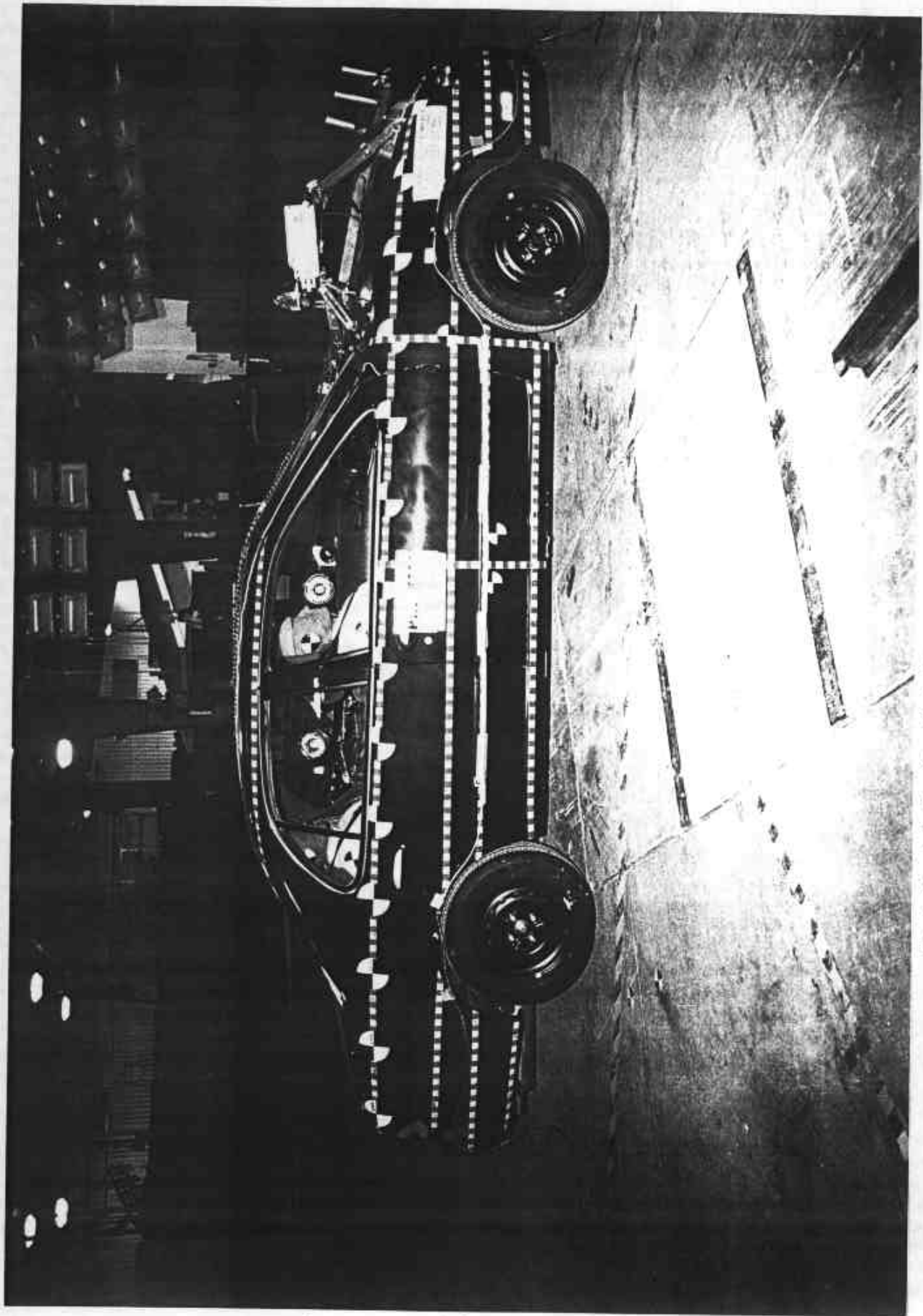


Photo No. A-5 - Pre-Test Right Side View of Test Vehicle

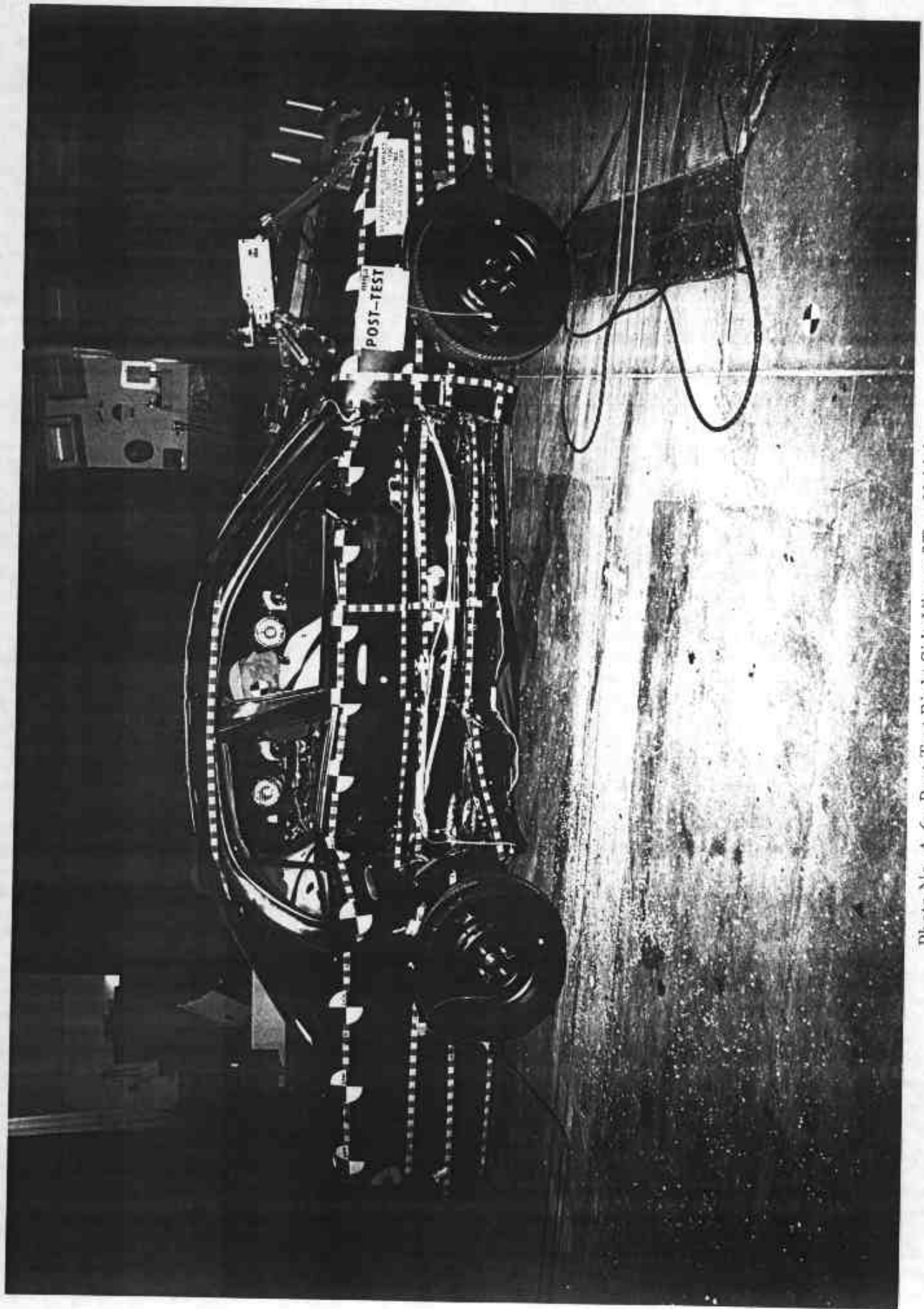


Photo No. A-6 - Post-Test Right Side View of Test Vehicle

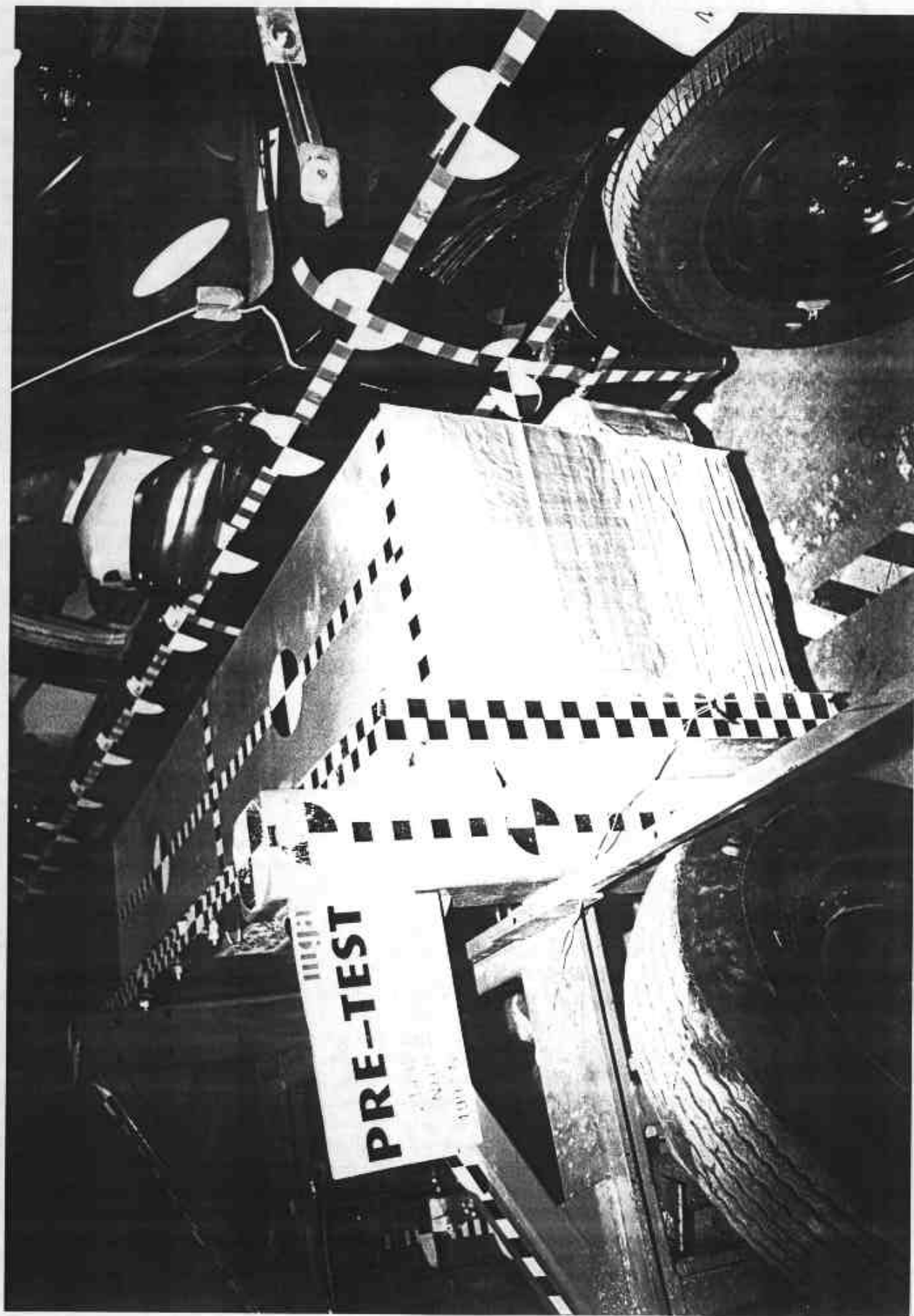


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (right side)

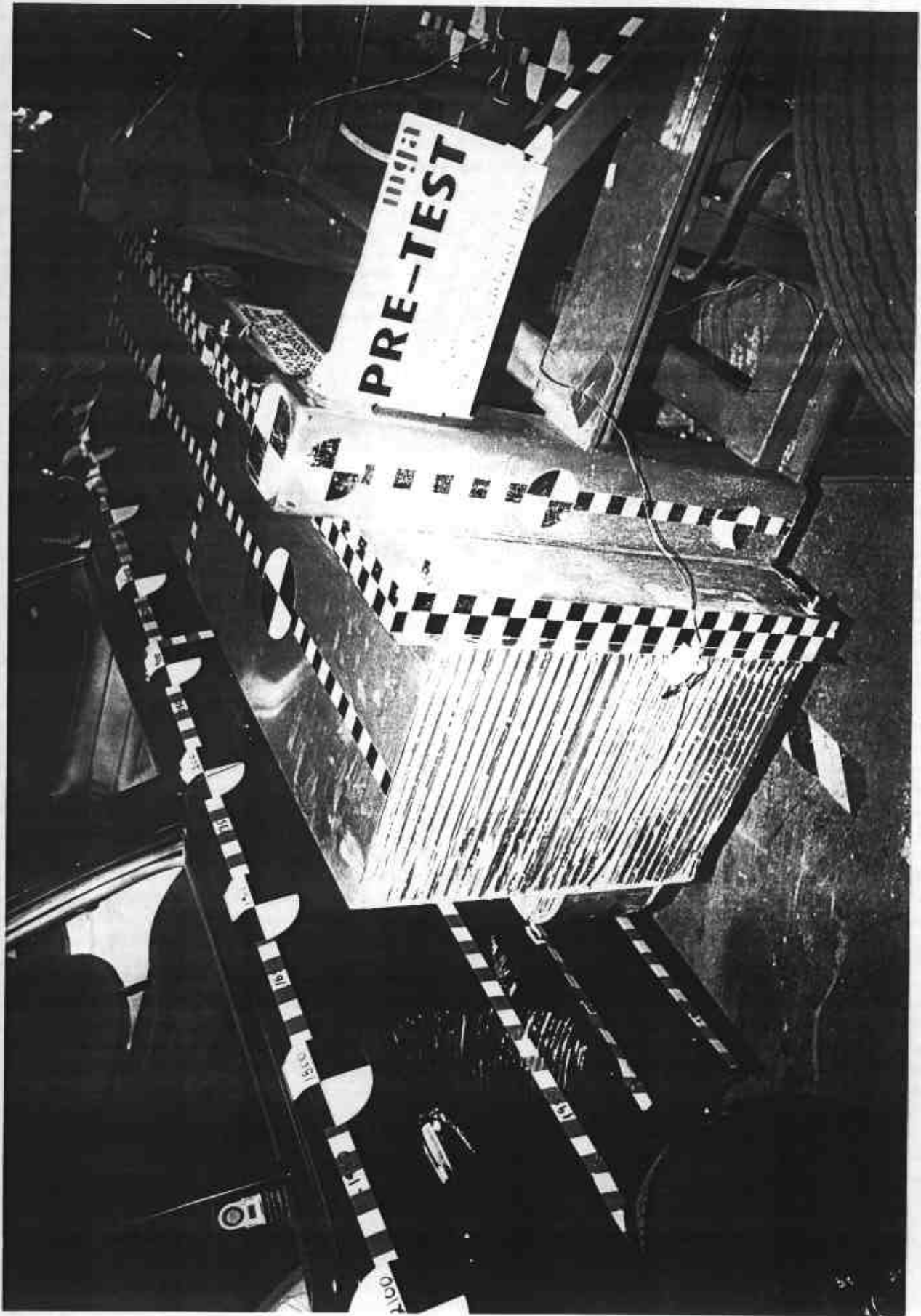


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (left side)

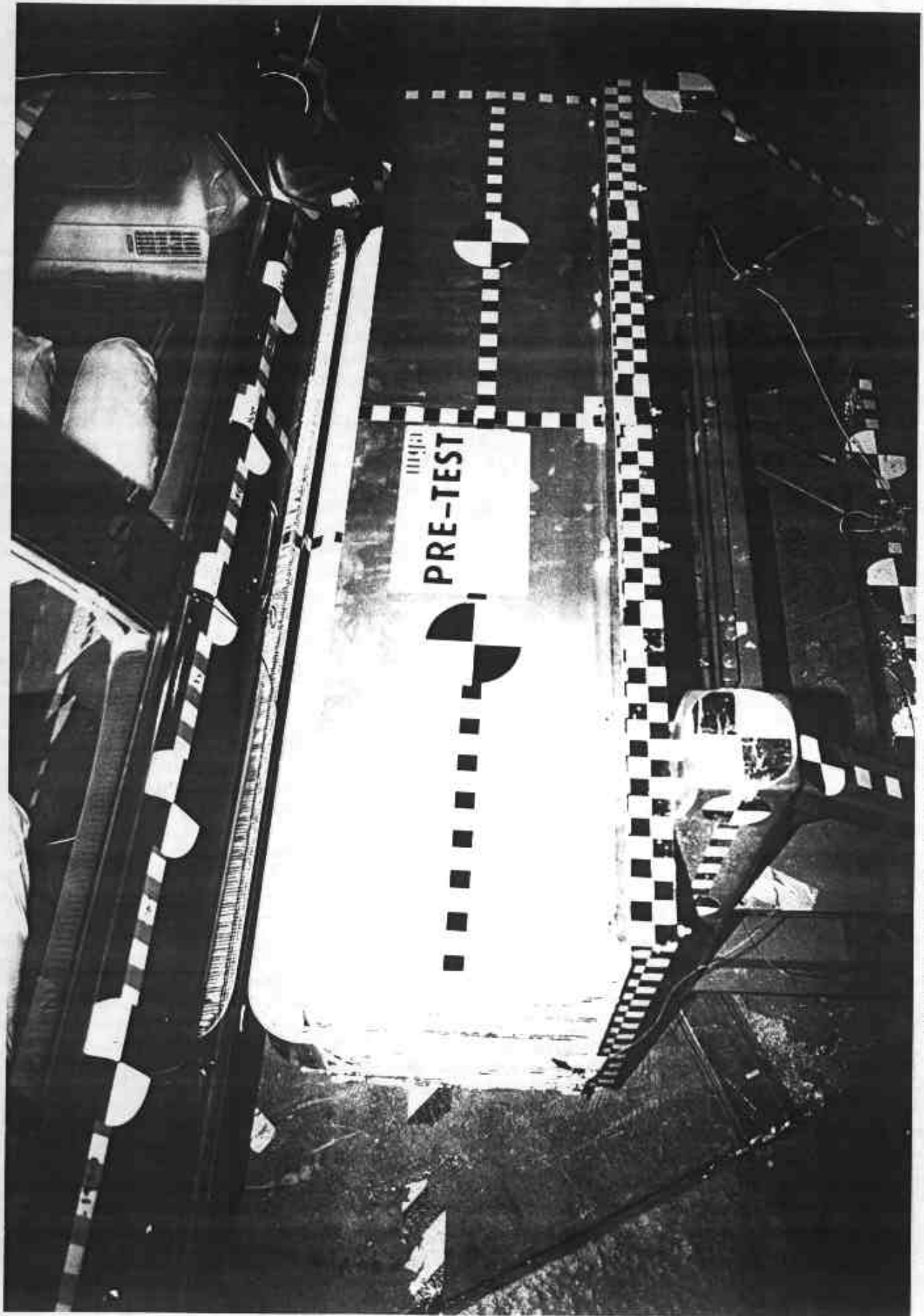


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

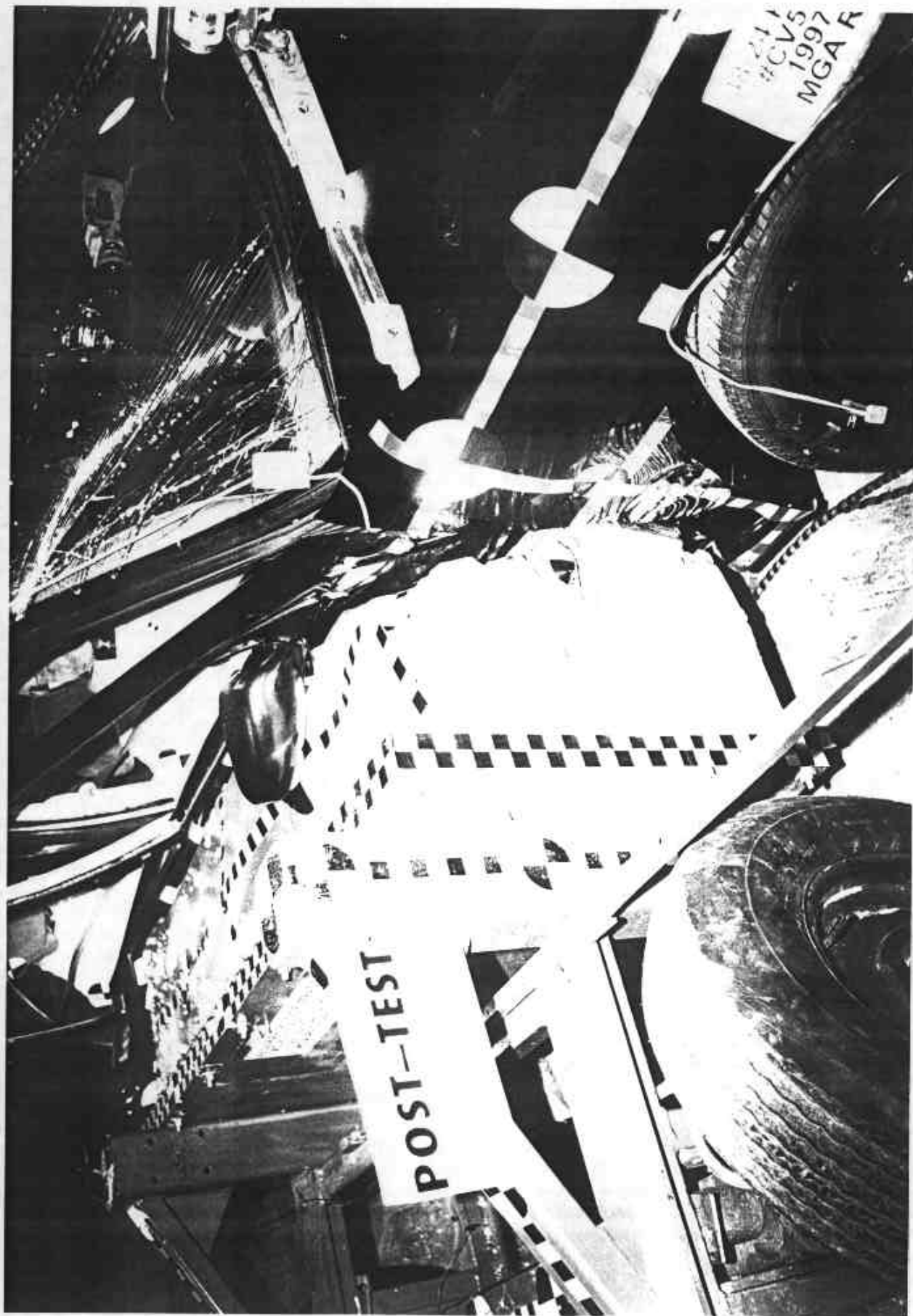


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (right side)

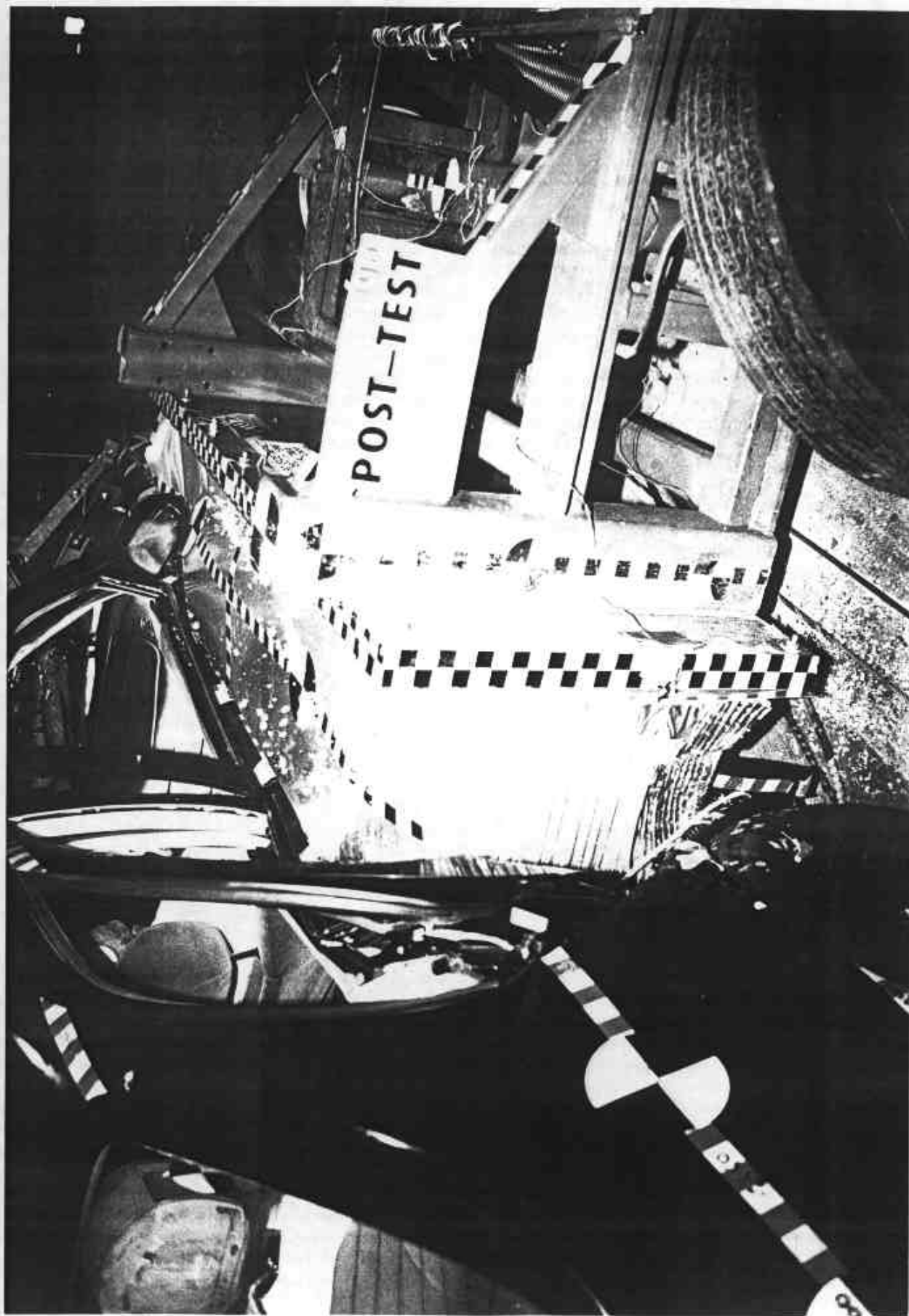


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (left side)

A-11

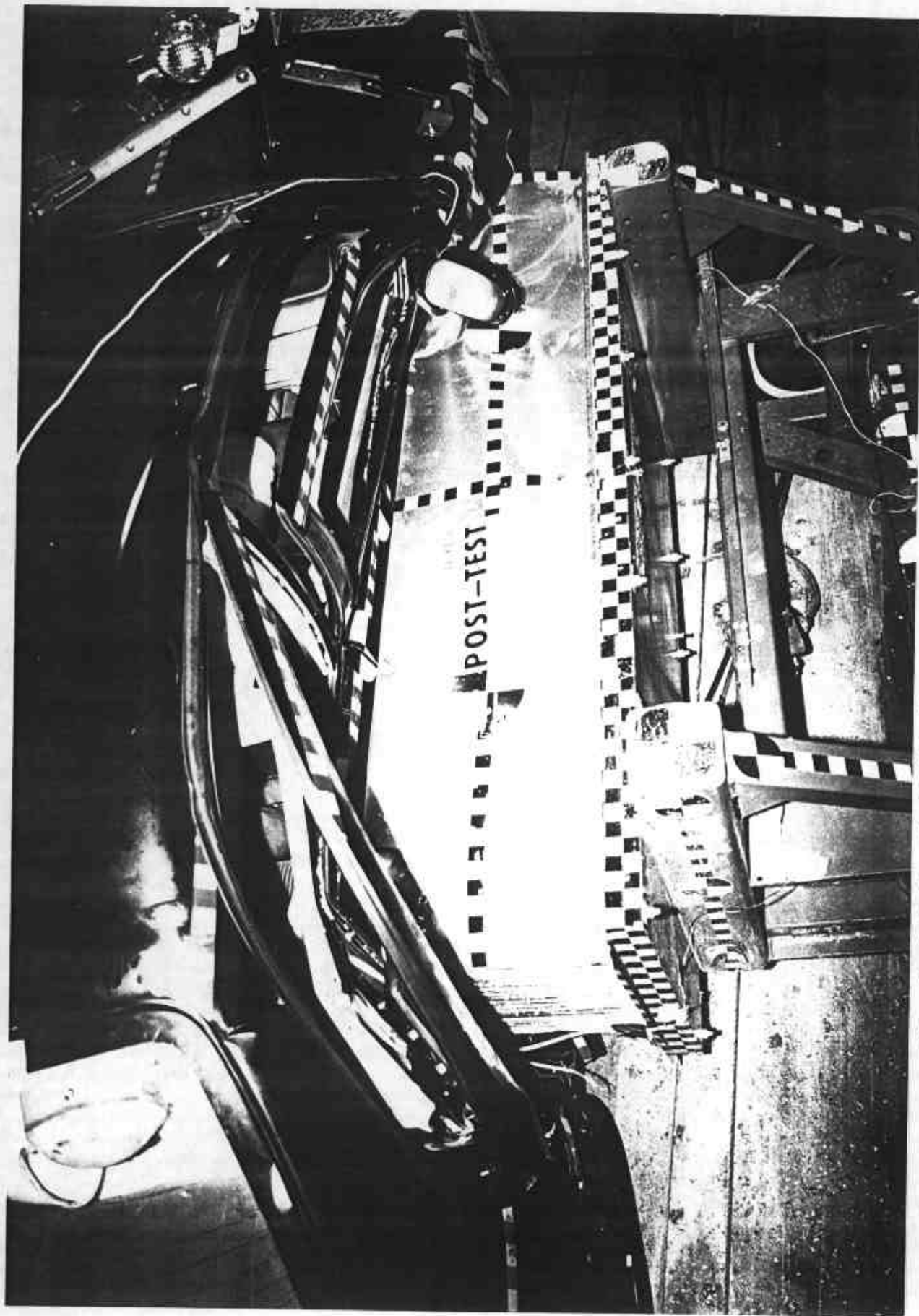


Photo No. A-12 - Post-Test MDB Positioned Against Vehicle Overhead View

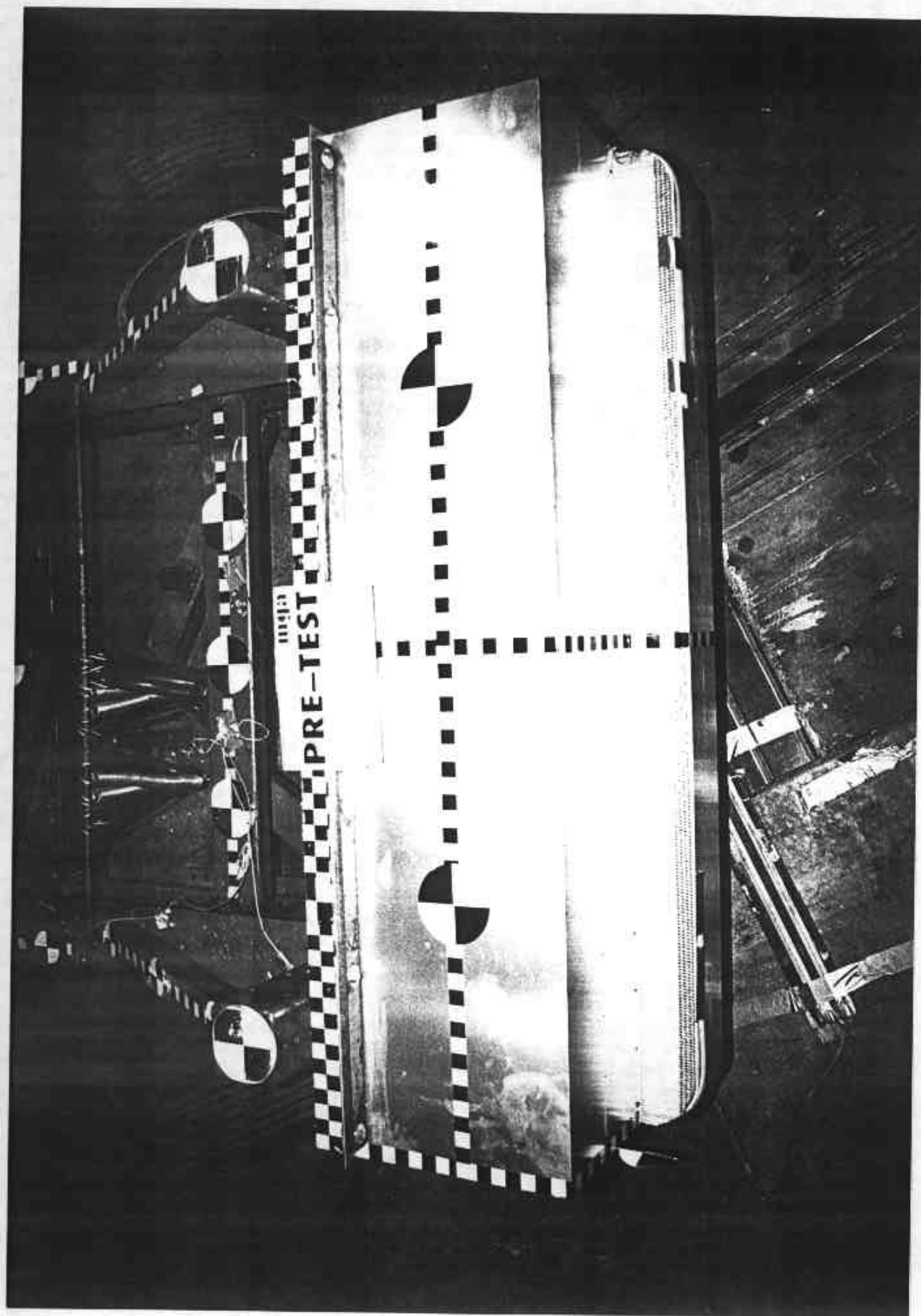


Photo No. A-13 - Pre-Test MDB Top View

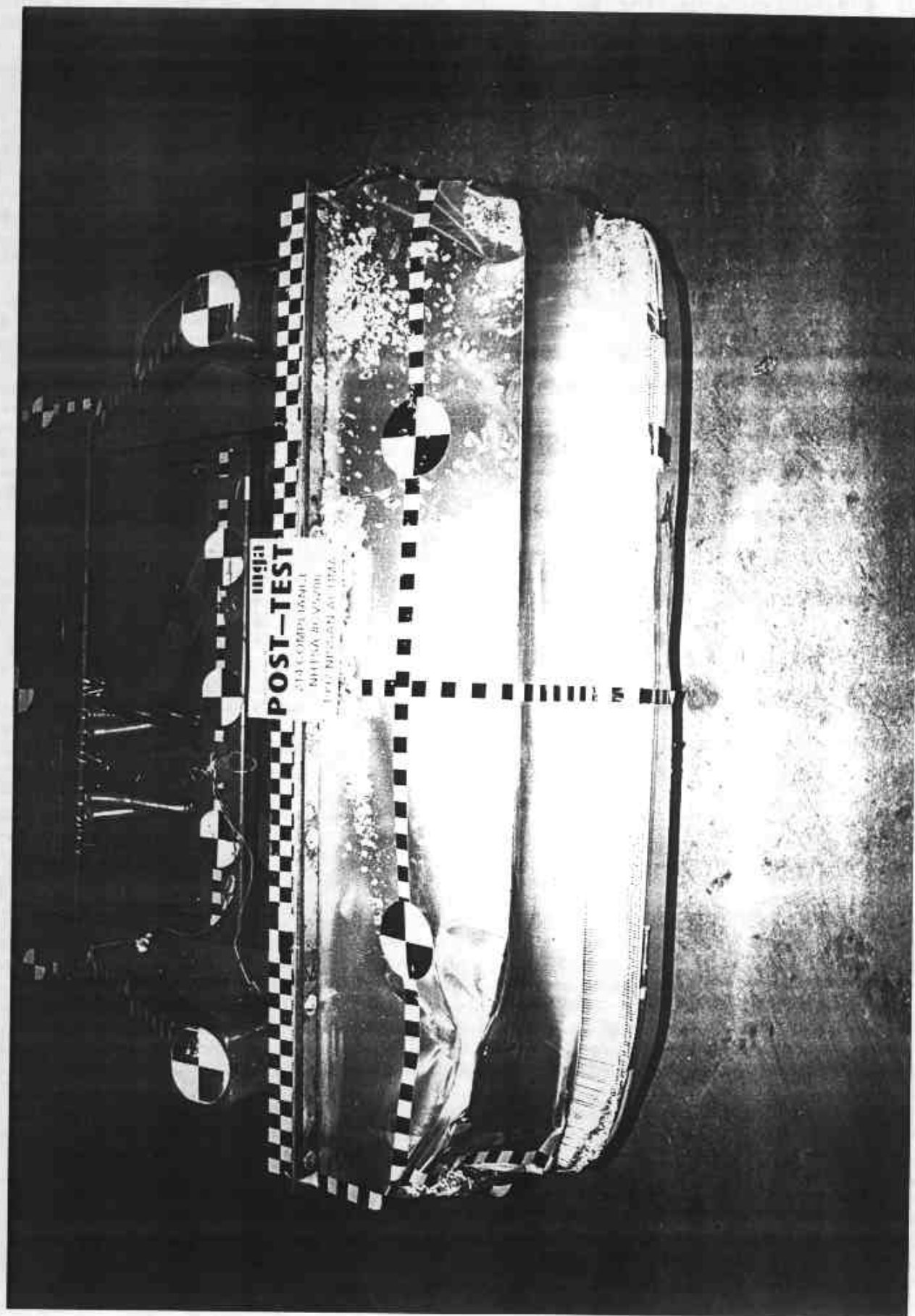


Photo No. A-14 - Post-Test MDB Top View



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

A-15

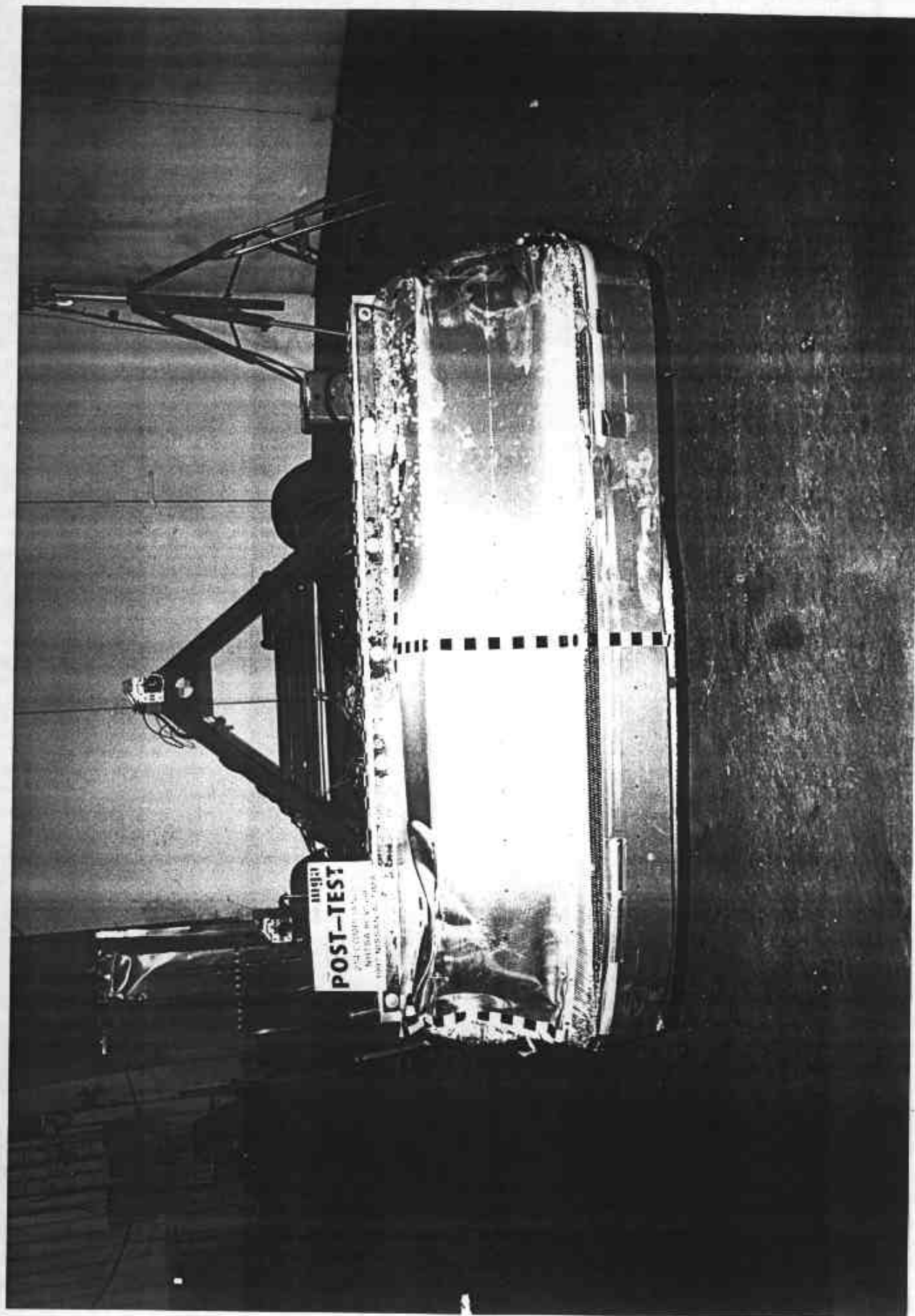


Photo No. A-16 - Post-Test MDB Front View

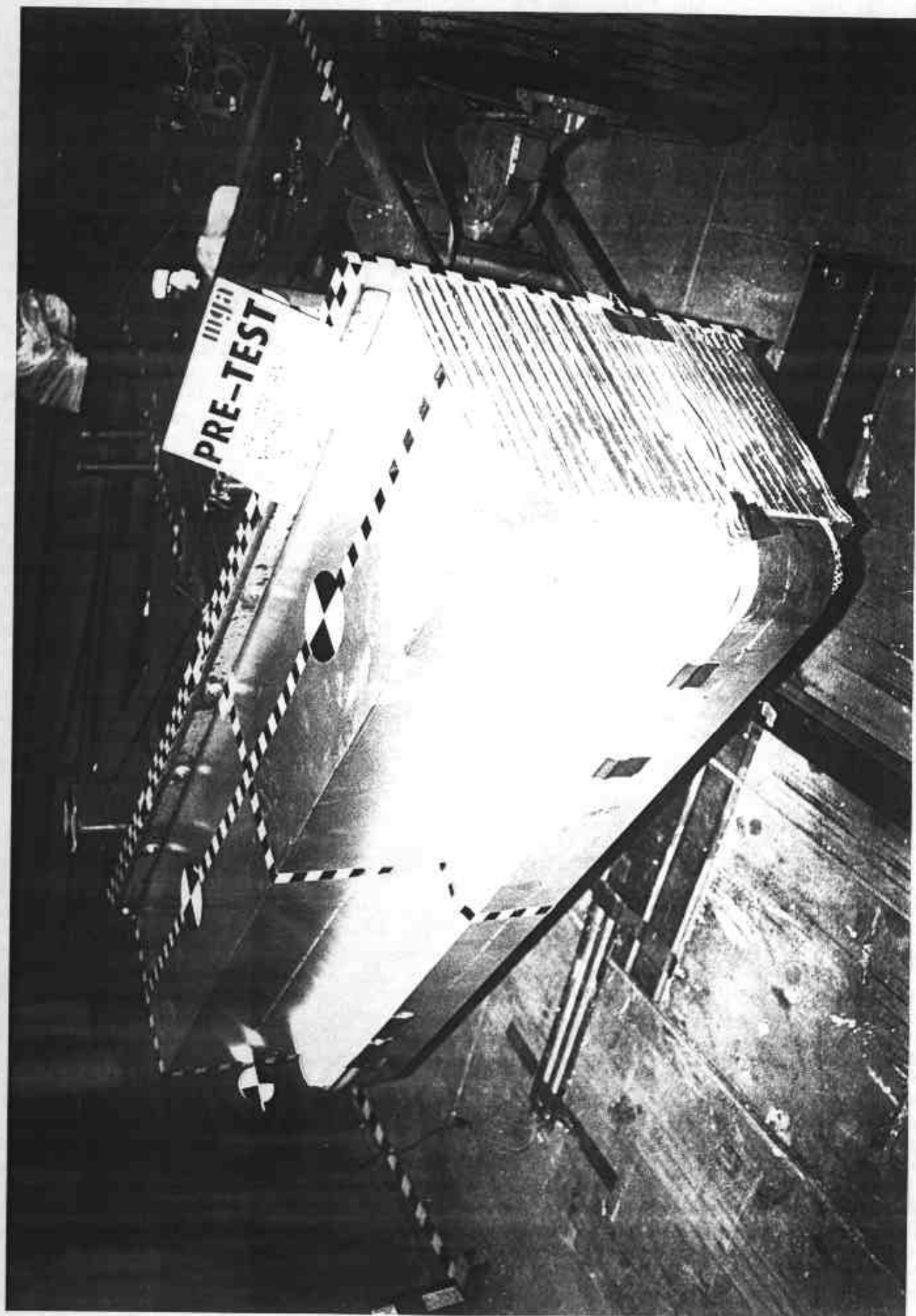


Photo No. A-17 - Pre-Test MDB Left Side View

A-17

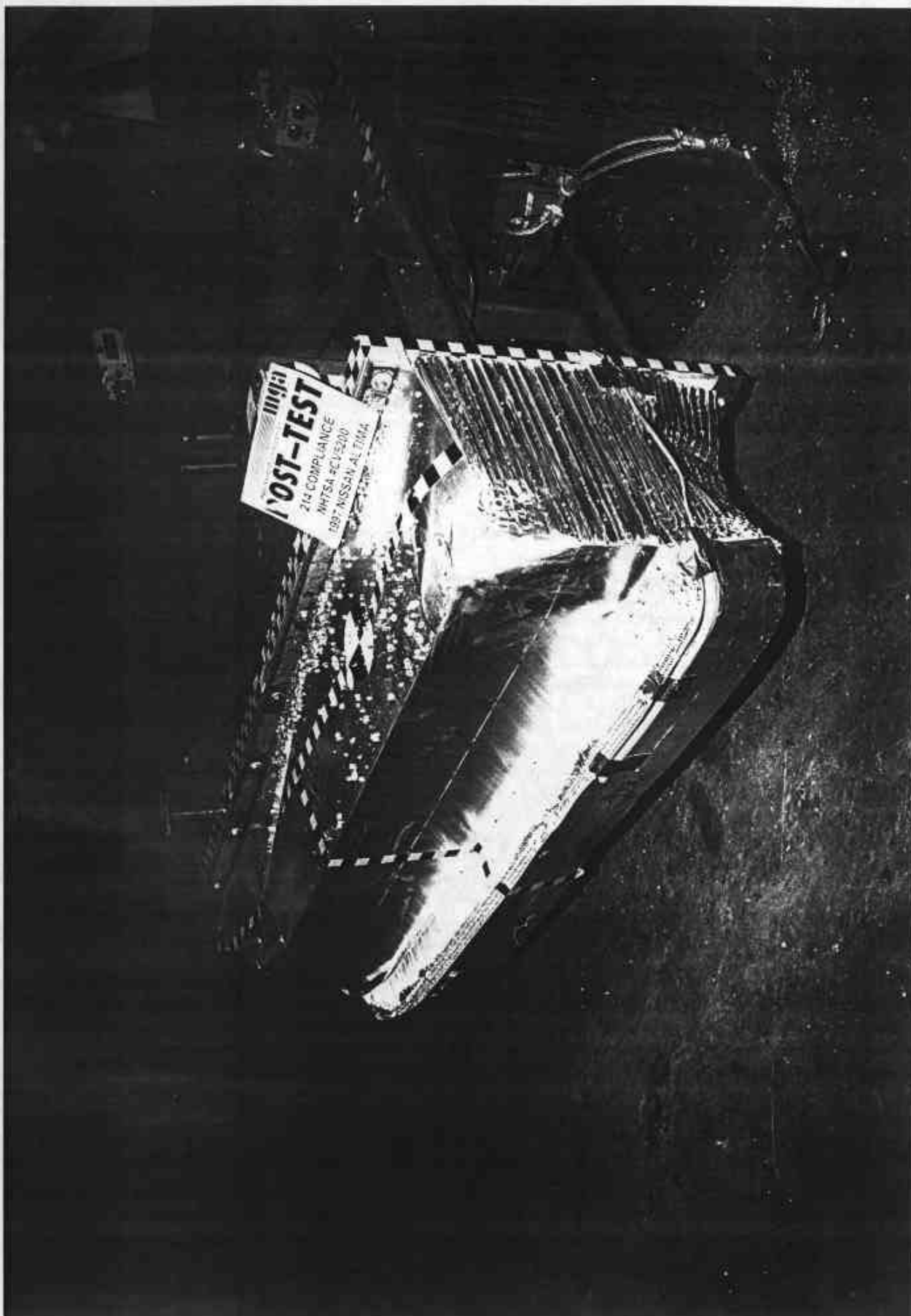


Photo No. A-18 - Post-Test MDB Left Side View

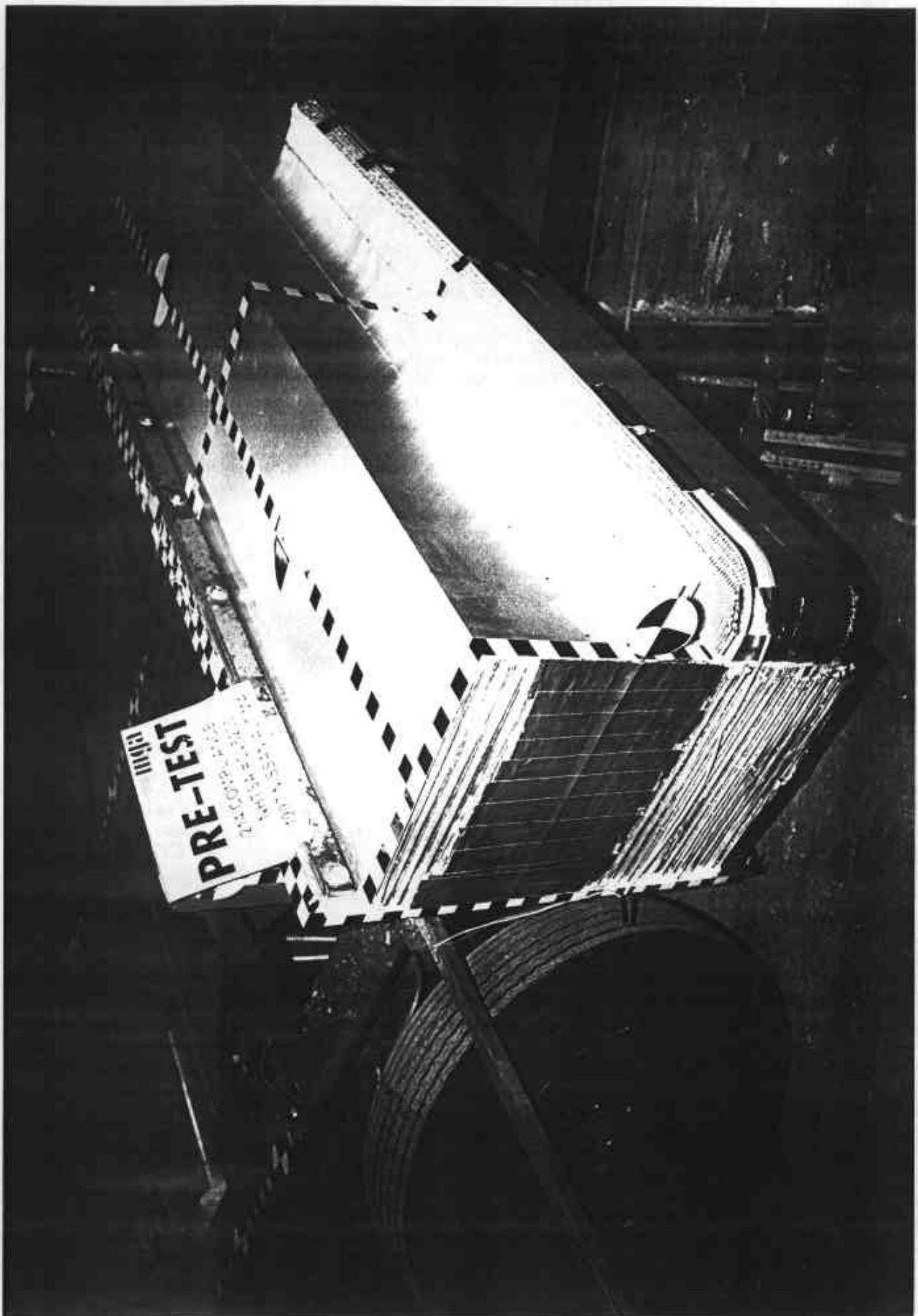


Photo No. A-19 - Pre-Test MDB Right Side View

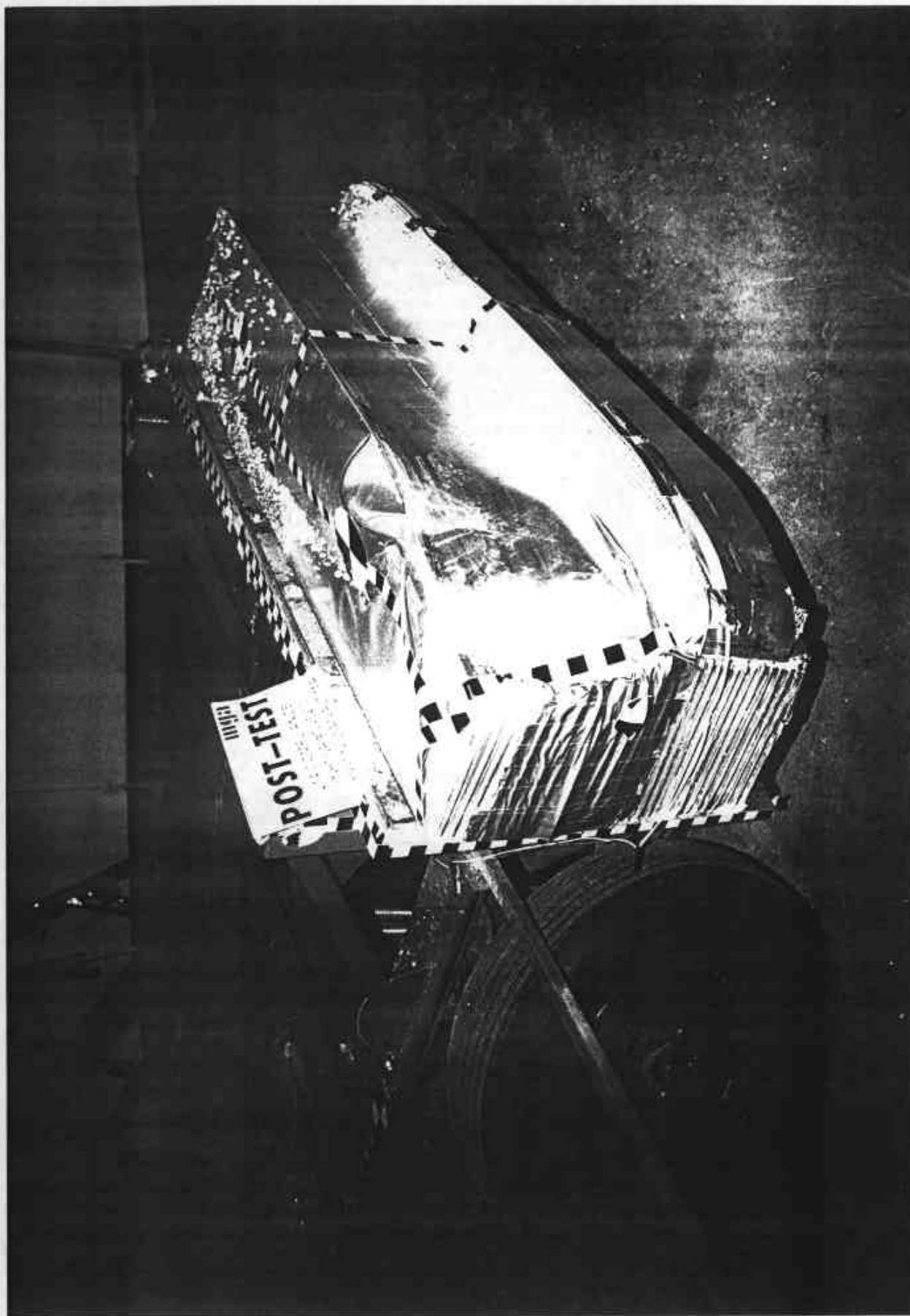


Photo No. A-20 - Post-Test MDB Right Side View



Photo No. A-21 - Pre-Test Front Passenger Seat Position View



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



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

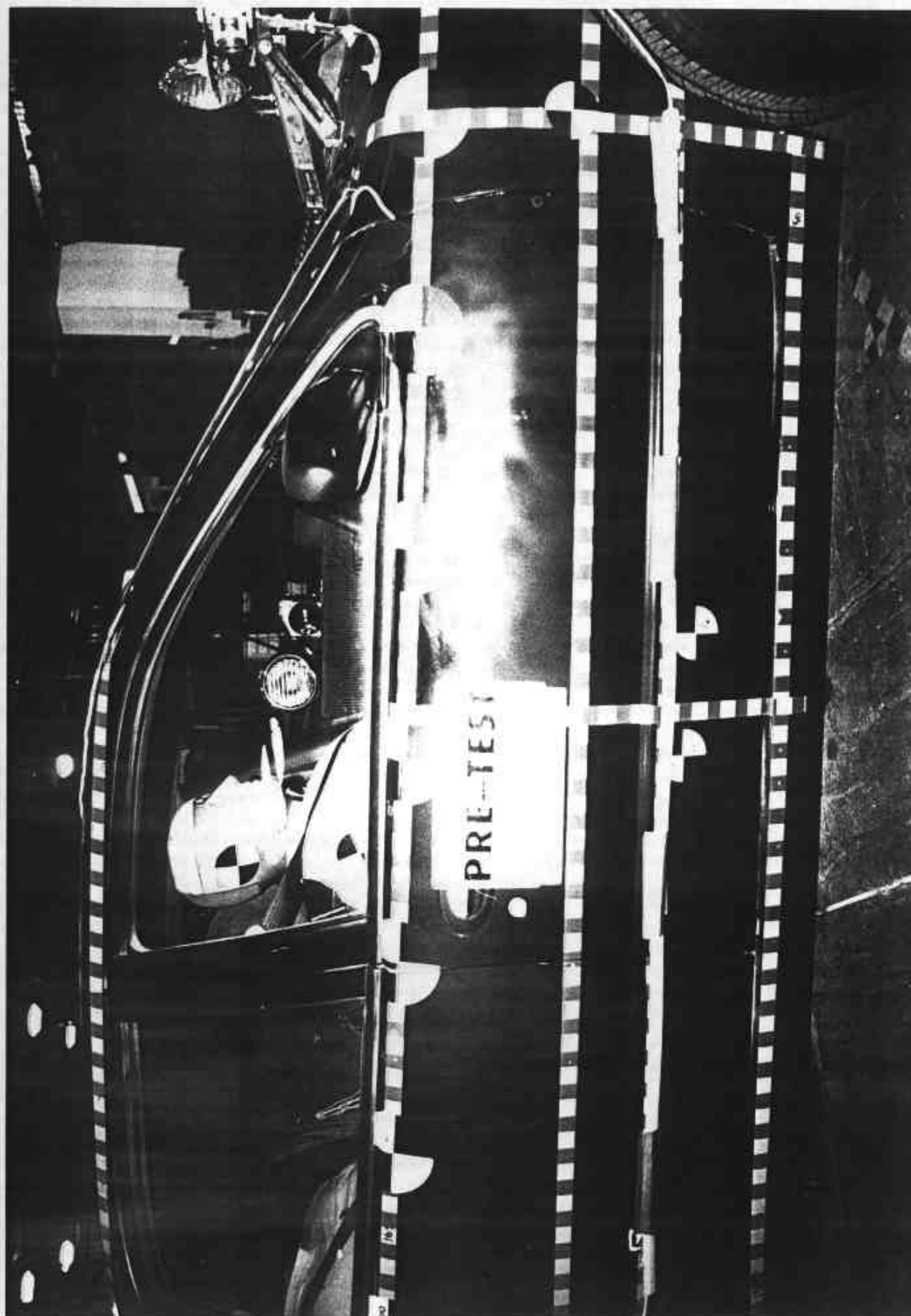


Photo No. A-24 - Pre-Test Front Passenger Dummy Right Side View

A-24

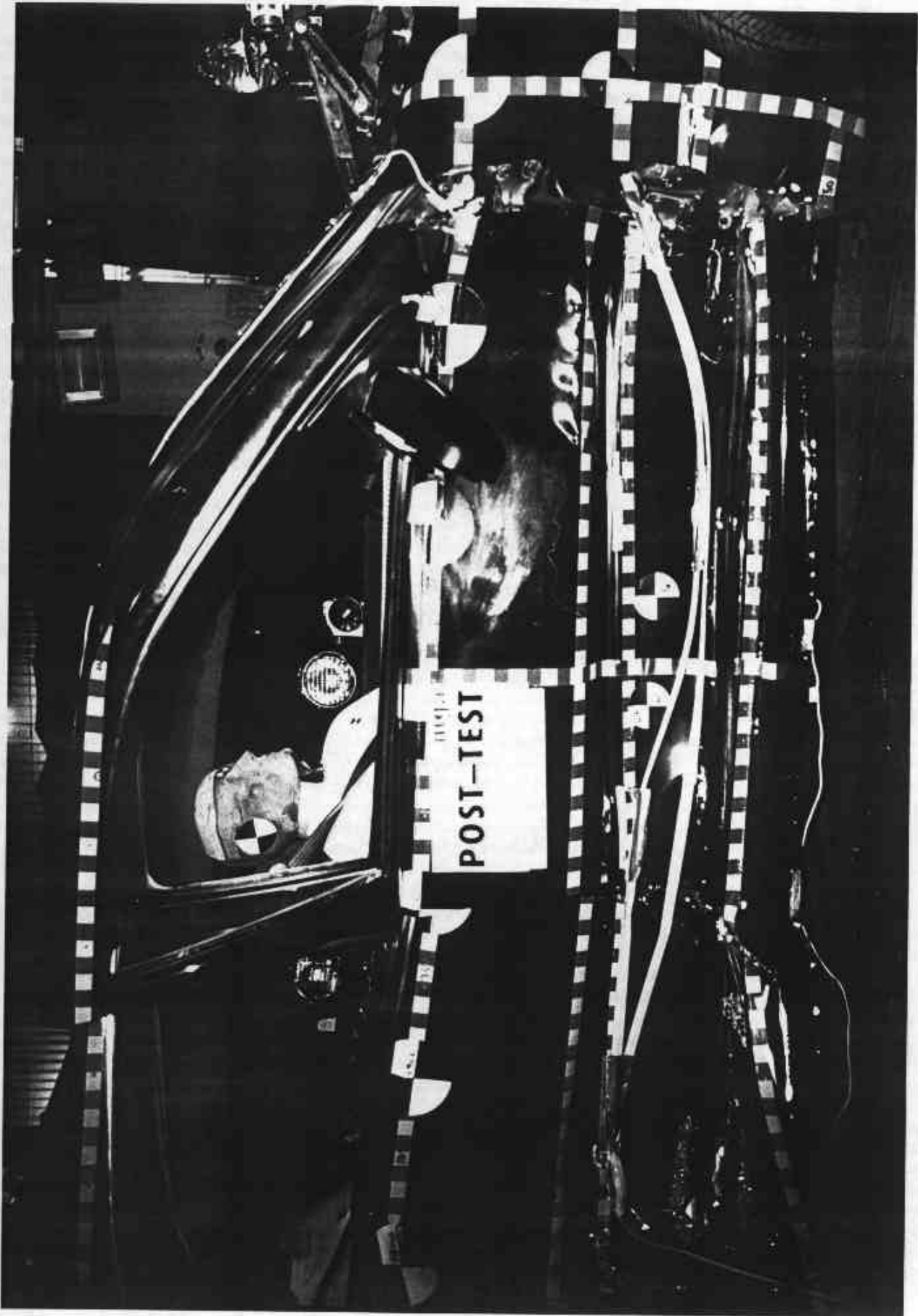


Photo No. A-25 - Post-Test Front Passenger Dummy Right Side View

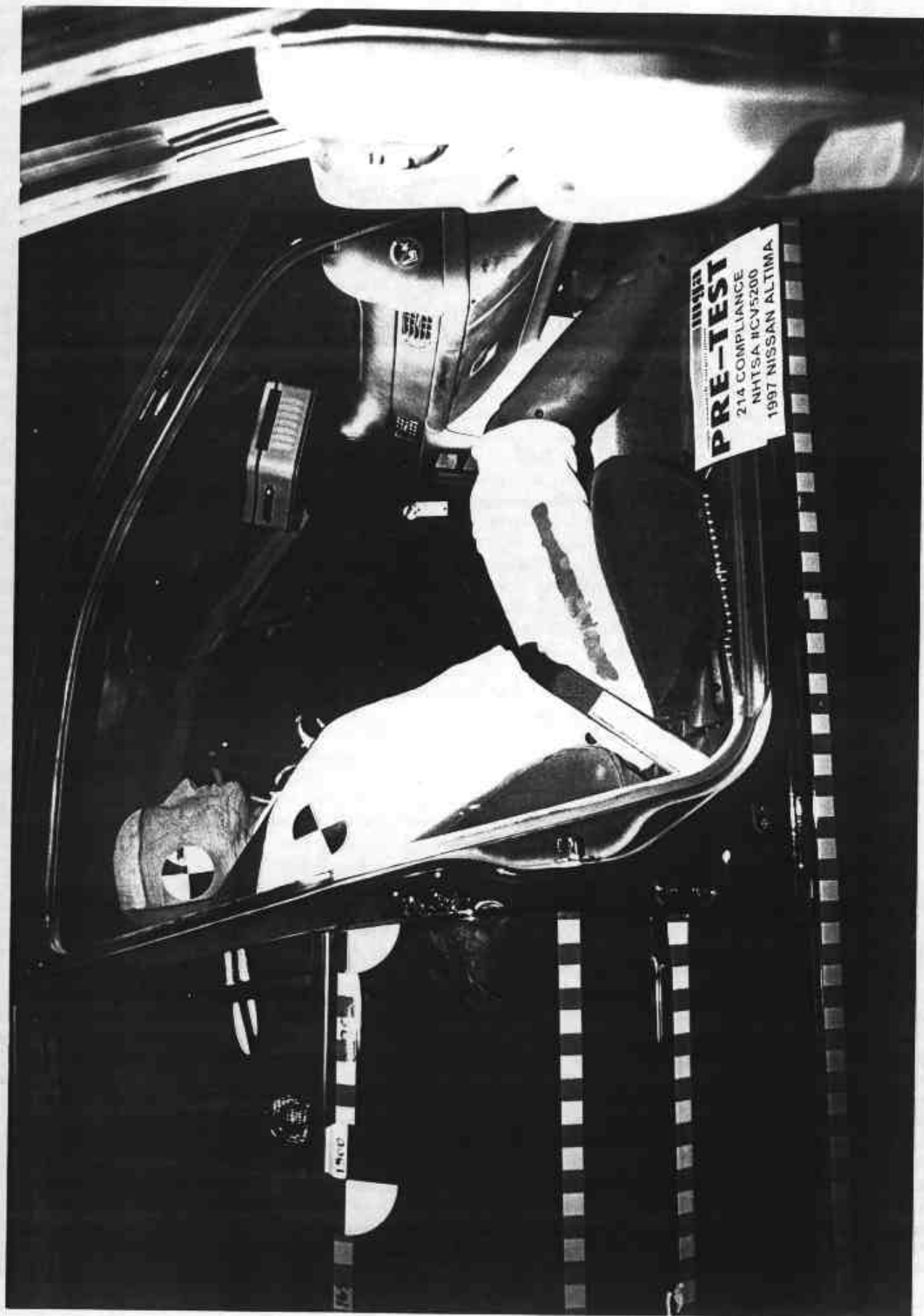


Photo No. A-26 - Pre-Test Front Passenger Dummy Right Side View (Door Open)



Photo No. A-27 - Pre-Test Front Passenger Shoulder and Door Top View



Photo No. A-28 - Post-Test Front Passenger Shoulder and Door Top View



Photo No. A-29 - Post-Test Front Passenger Dummy Contact

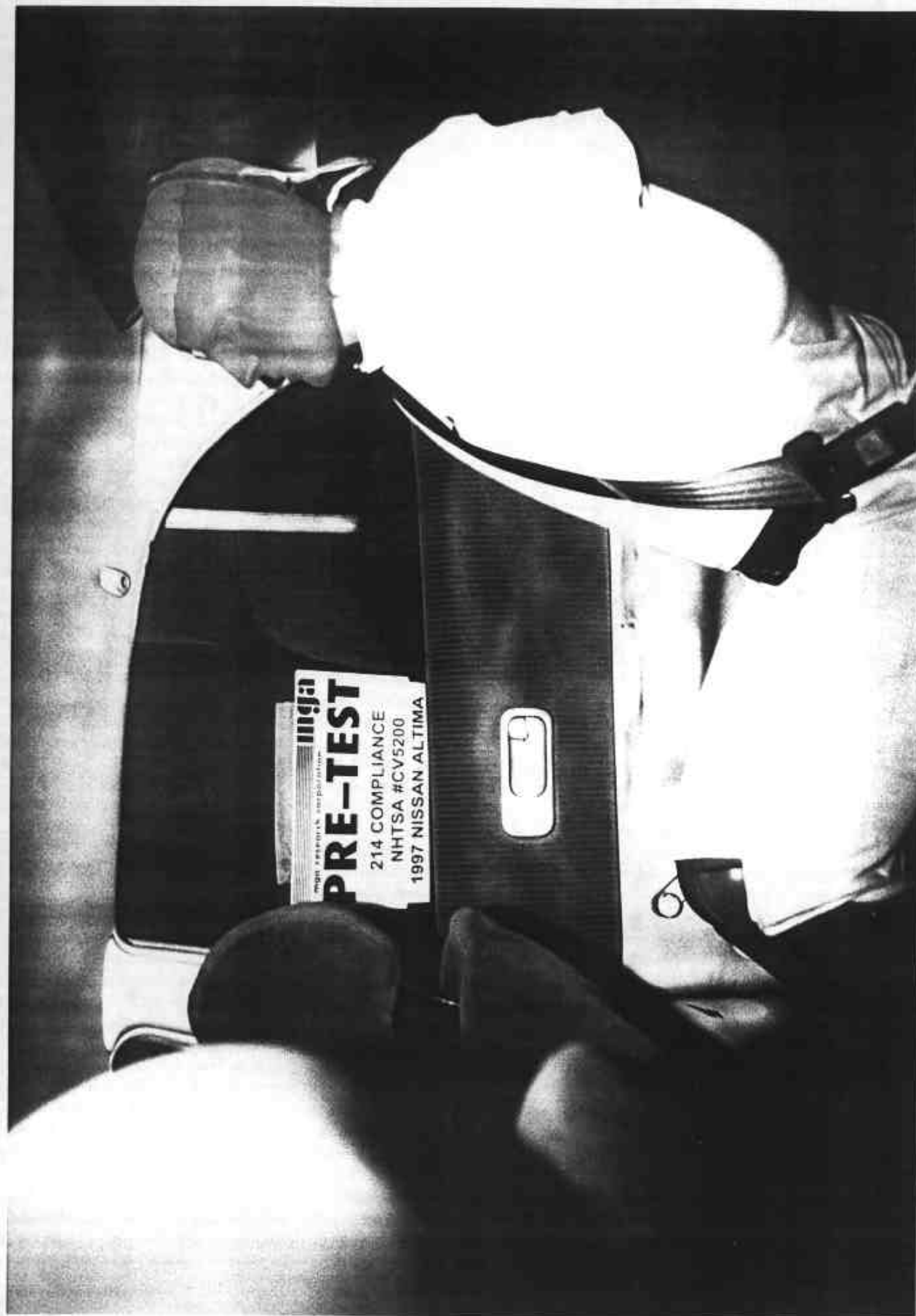
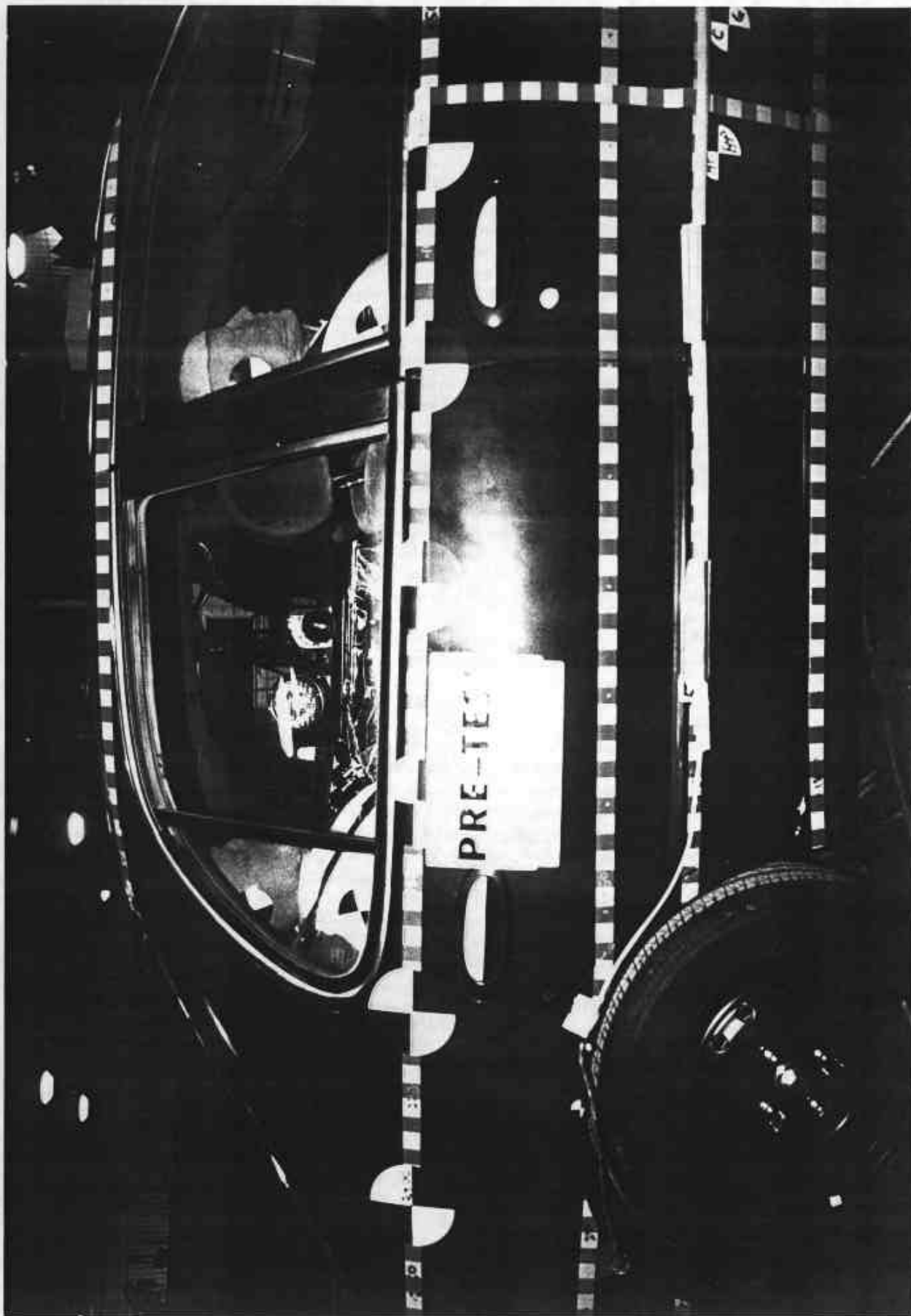


Photo No. A-30 - Pre-Test Rear Passenger Dummy Left Side View



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



A-32

Photo No. A-32 - Pre-Test Rear Passenger Dummy Right Side View

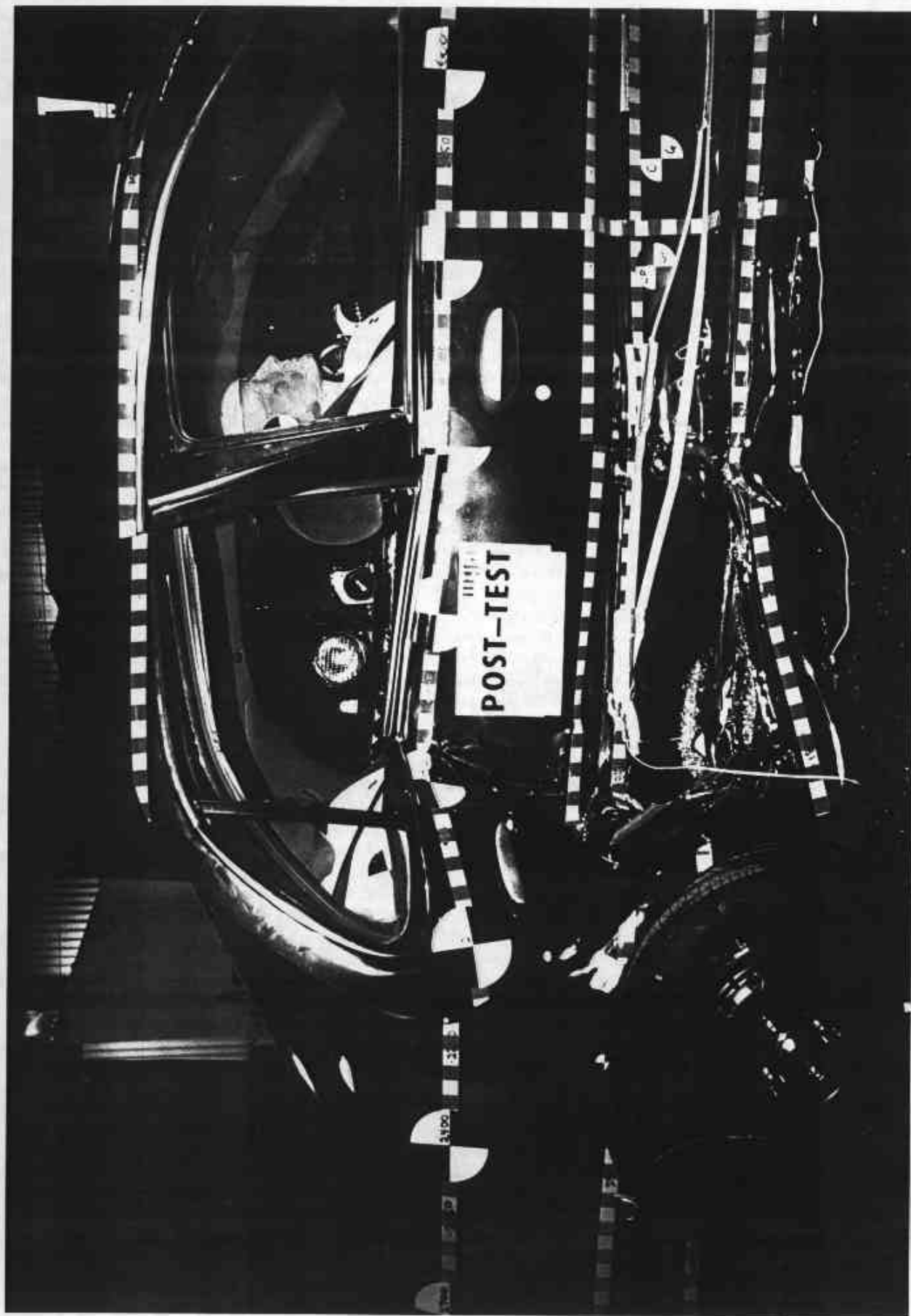


Photo No. A-33 - Post-Test Rear Passenger Dummy Right Side View

A-33

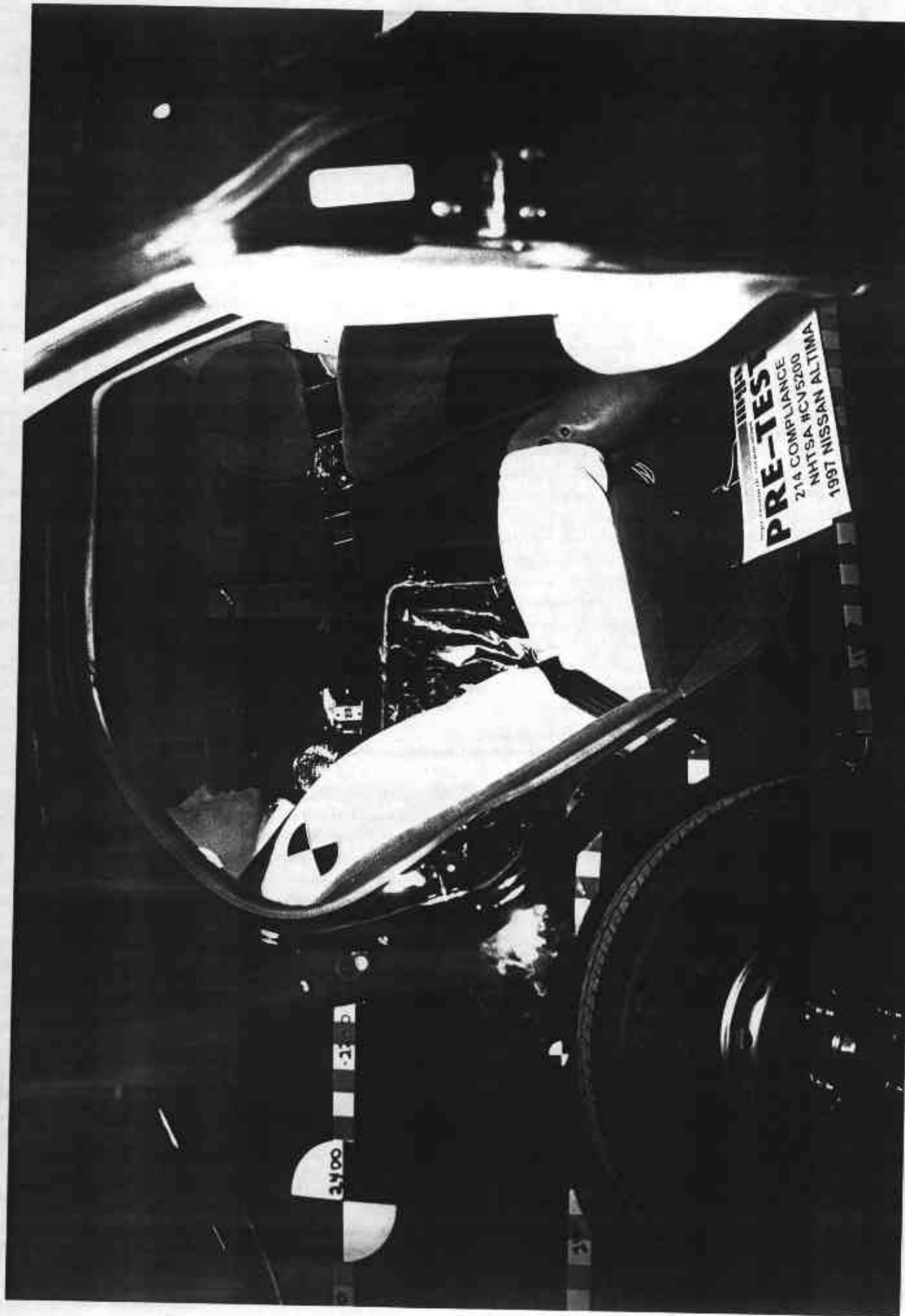


Photo No. A-34 - Pre-Test Rear Passenger Dummy Right Side View (Door Open)

A-34



Photo No. A-35 - Pre-Test Rear Passenger Dummy Shoulder and Door Top View

A-35

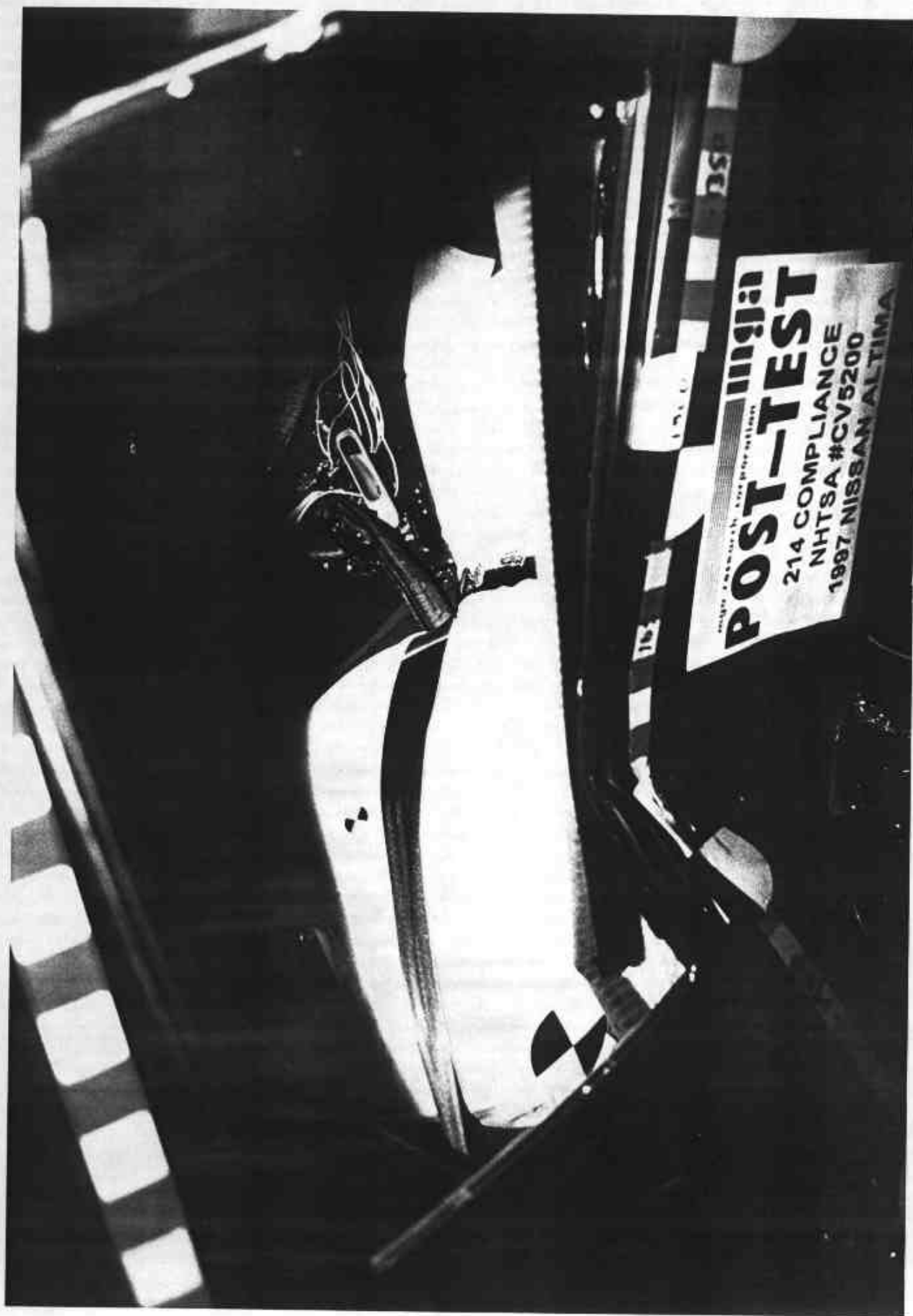


Photo No. A-36 - Post-Test Rear Passenger Dummy Shoulder and Door Top View

A-36



Photo No. A-37 - Post-Test Rear Passenger Dummy Contact

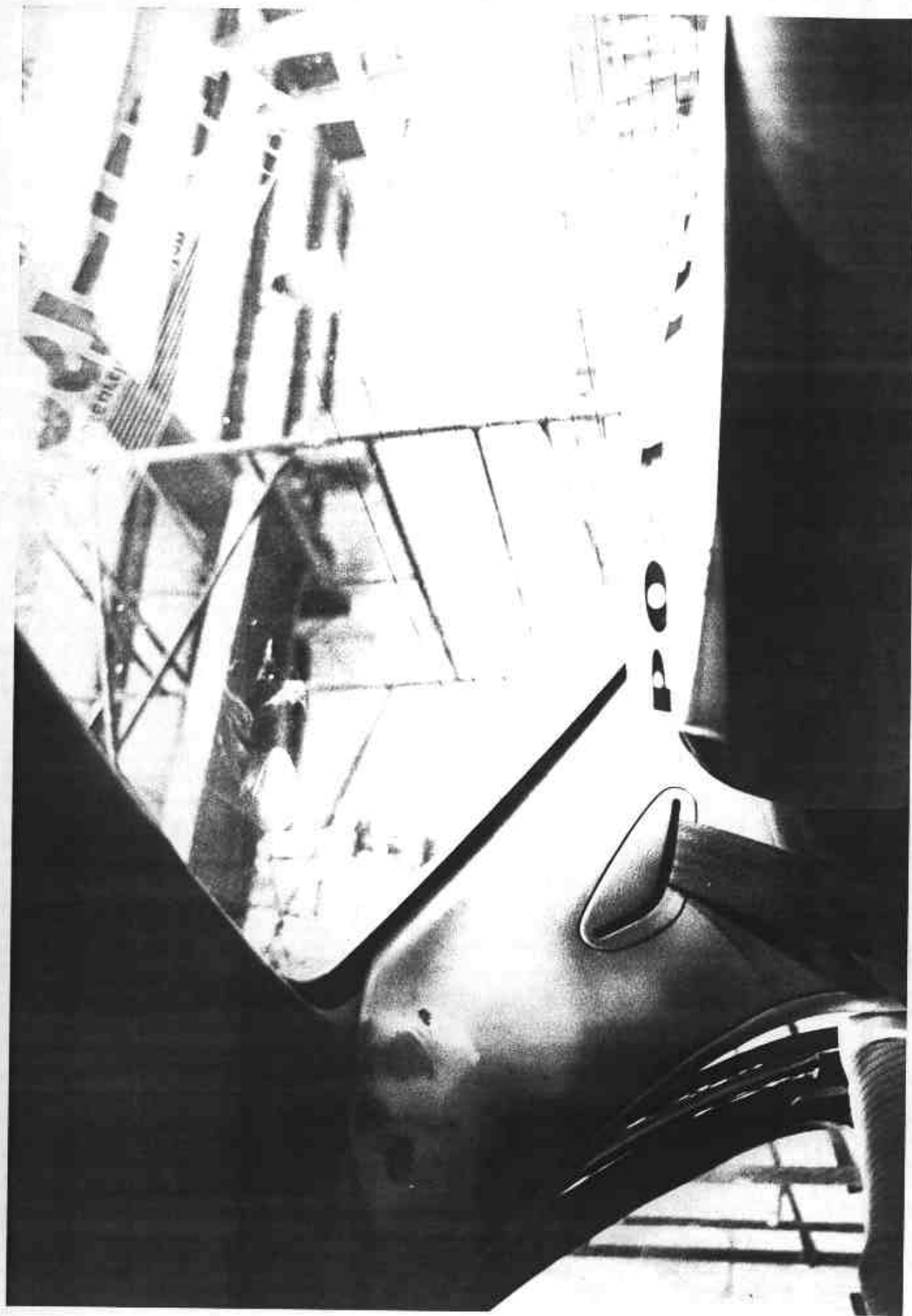


Photo No. A-38 - Post-Test Rear Passenger Dummy Head Contact



Photo No. A-39 - Post-Test Rear Passenger Dummy Head Contact

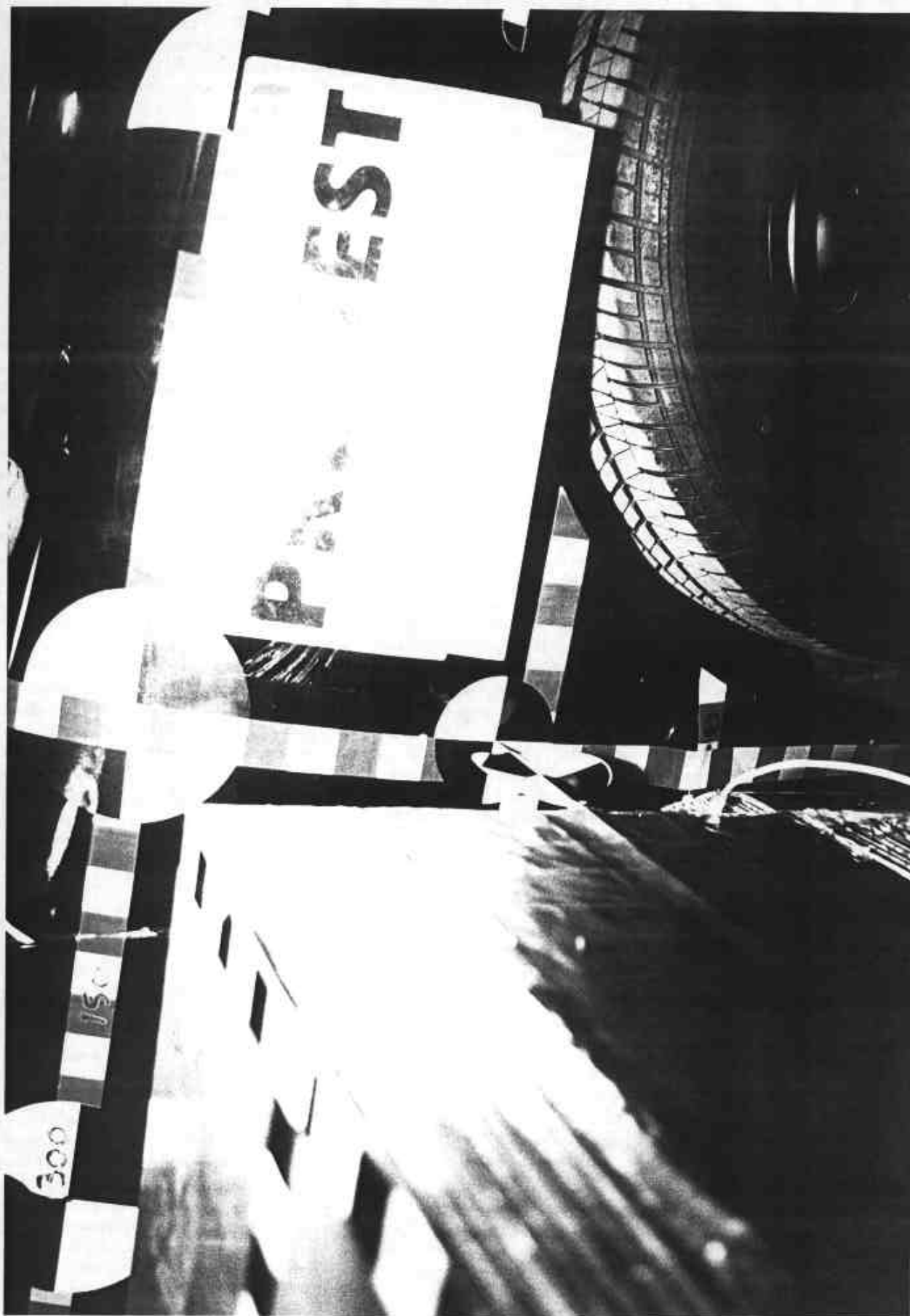


Photo No. A-40 - Pre-Test Right Front Impact Point on Vehicle

A-40



Photo No. A-41 - Post-Test Right Front Impact Point on Vehicle

A-41

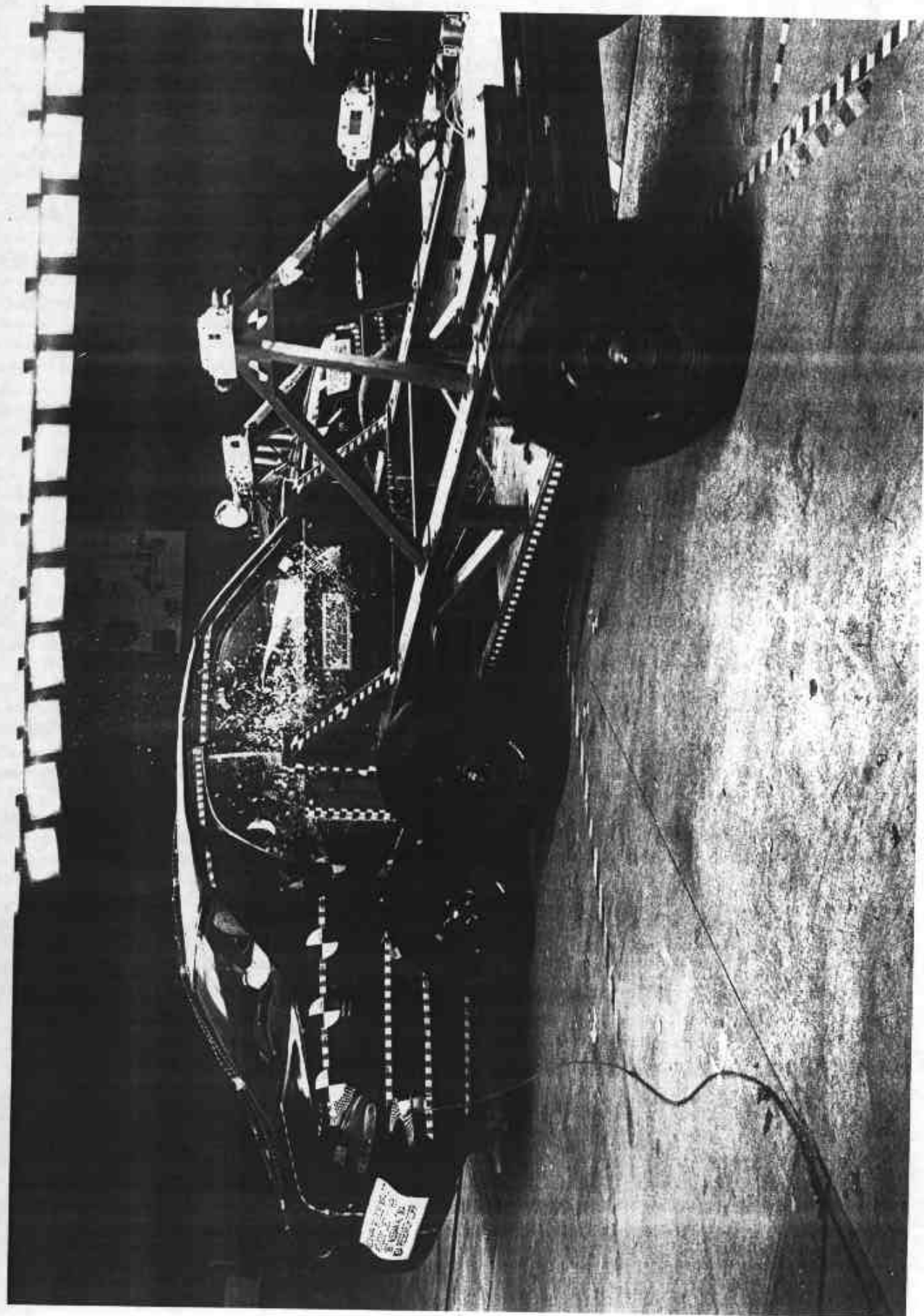


Photo No. A-42 - Impact

A-42

MANUFACTURED BY
NISSAN MOTOR CO., LTD. 081

DATE 07/96
GVWR 4047 LB
GAWR FR. 2270 LB
GAWR RR. 1862 LB

THIS VEHICLE CONFORMS TO
ALL APPLICABLE FEDERAL
MOTOR VEHICLE SAFETY
BUMPER AND THEFT
PREVENTION STANDARDS IN
EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE
SEE OWNERS MANUAL FOR
ADDITIONAL INFORMATION.

1N4BU31D4UC152164

MODEL BB6RLHF-EUA

PASSENGER CAR

COLOR TRIM 88000

KH3 H TRANS

AXLE RS5F50q
F636 ENGINE

K0240E 2389CC

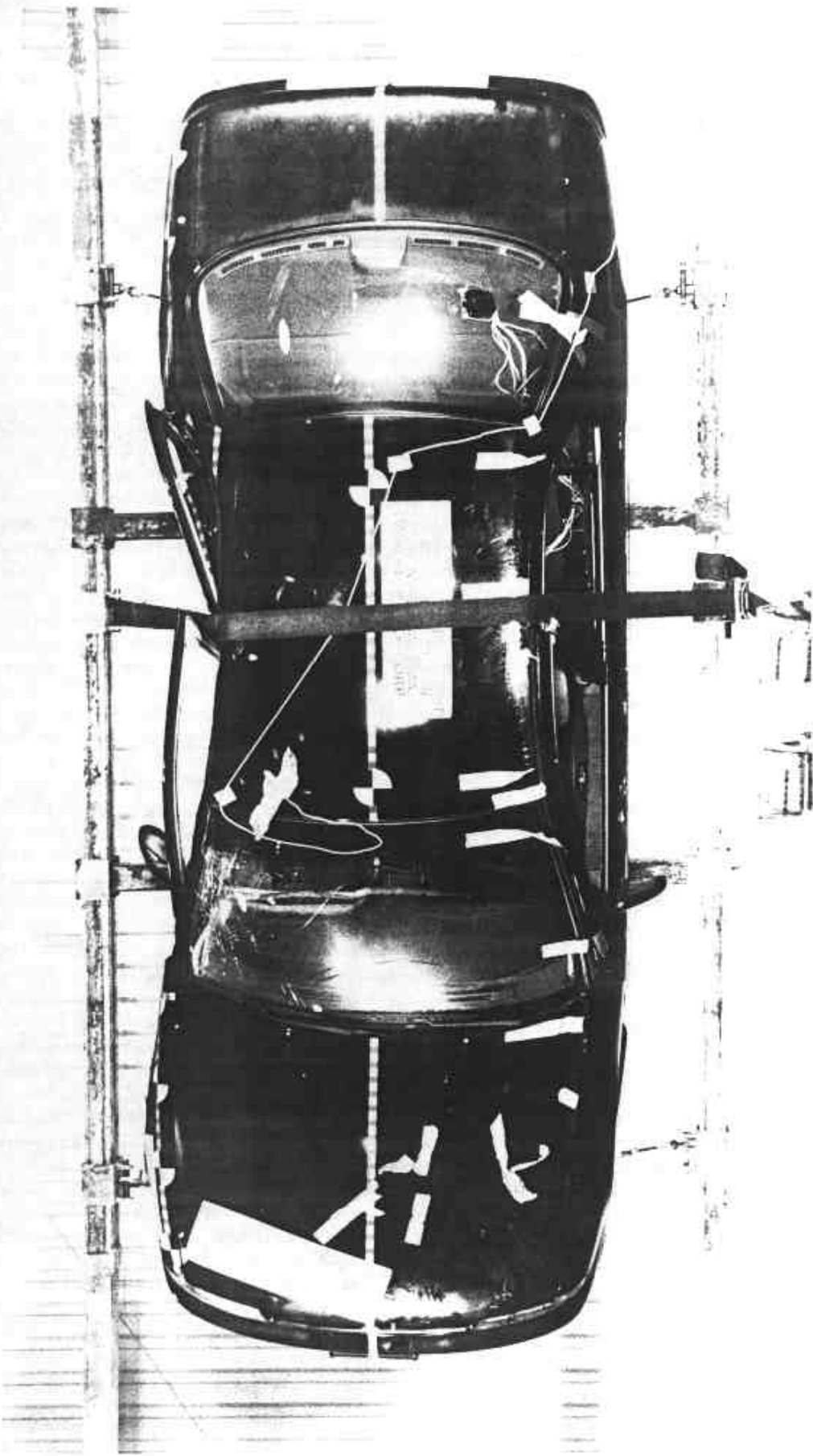
1N4BU31D4UC152164

Photo No. A-43 - Vehicle Certification Label

VEHICLE SPACER WEIGHT	Wt. (lb)	22,000	Wt. (kg)	10,000	Wt. (lb)	22,000	Wt. (kg)	10,000
PROBABLE CONVEYANCE	20000	20000	20000	20000	20000	20000	20000	20000
RECOMMENDED TIRE PER AXLE, INCLUDING PRESOFTENING AND REINFORCEMENT								
TIRE SIZE DIMENSIONS	1800R15	1800R15	1800R15	1800R15	1800R15	1800R15	1800R15	1800R15
1800R15	1800R15	1800R15	1800R15	1800R15	1800R15	1800R15	1800R15	1800R15

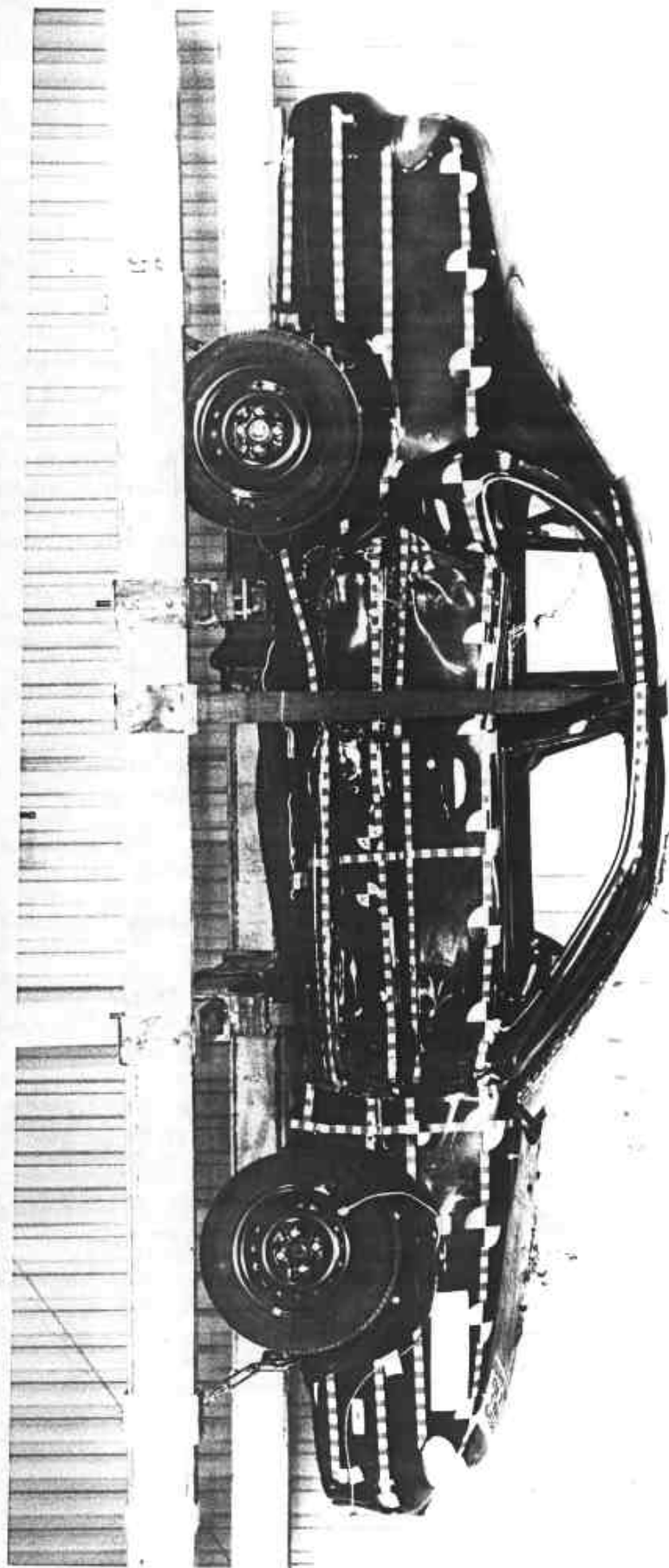
DO NOT USE H EX
50 mph (80 km/h)
SEE OWNER'S MANUAL
ADDITIONAL
UTILIZATION A 100
MAX 50 mph (80 km/h)
LESS 10-15 REIN
MANUAL INSTRUCTIONS

Photo No. A-44 - Tire Placard



A-45

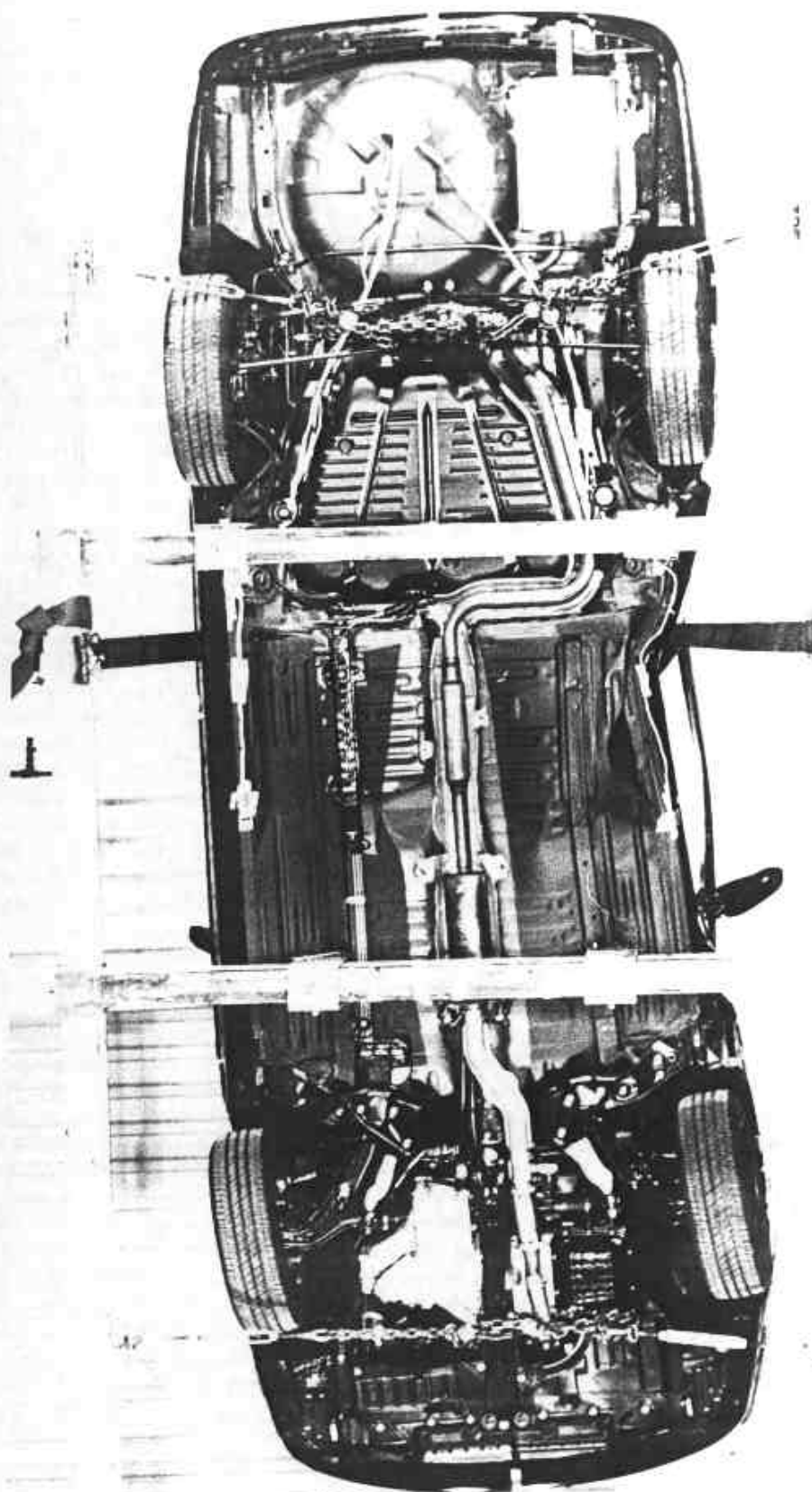
Photo No. A-45 - Rollover 90°



A-46

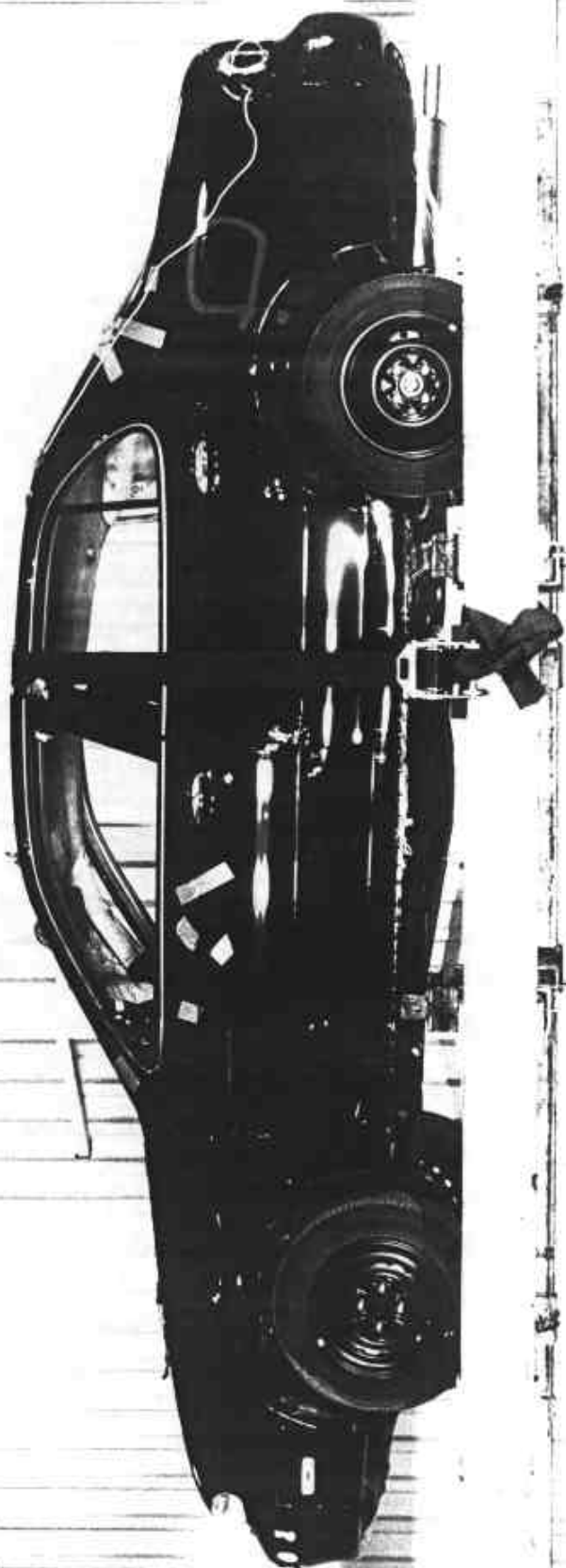


Photo No. A-46 - Rollover 180°



A-47

Photo No. A-47 - Rollover 270°



A-48

Photo No. A-48 - Rollover 360°



Photo No. A-49 - Right Front Attitude Point

A-49



Photo No. A-50 - Left Front Attitude Point

A-50



Photo No. A-51 - Right Rear Attitude Point



Photo No. A-52 - Left Rear Attitude Point

A-52

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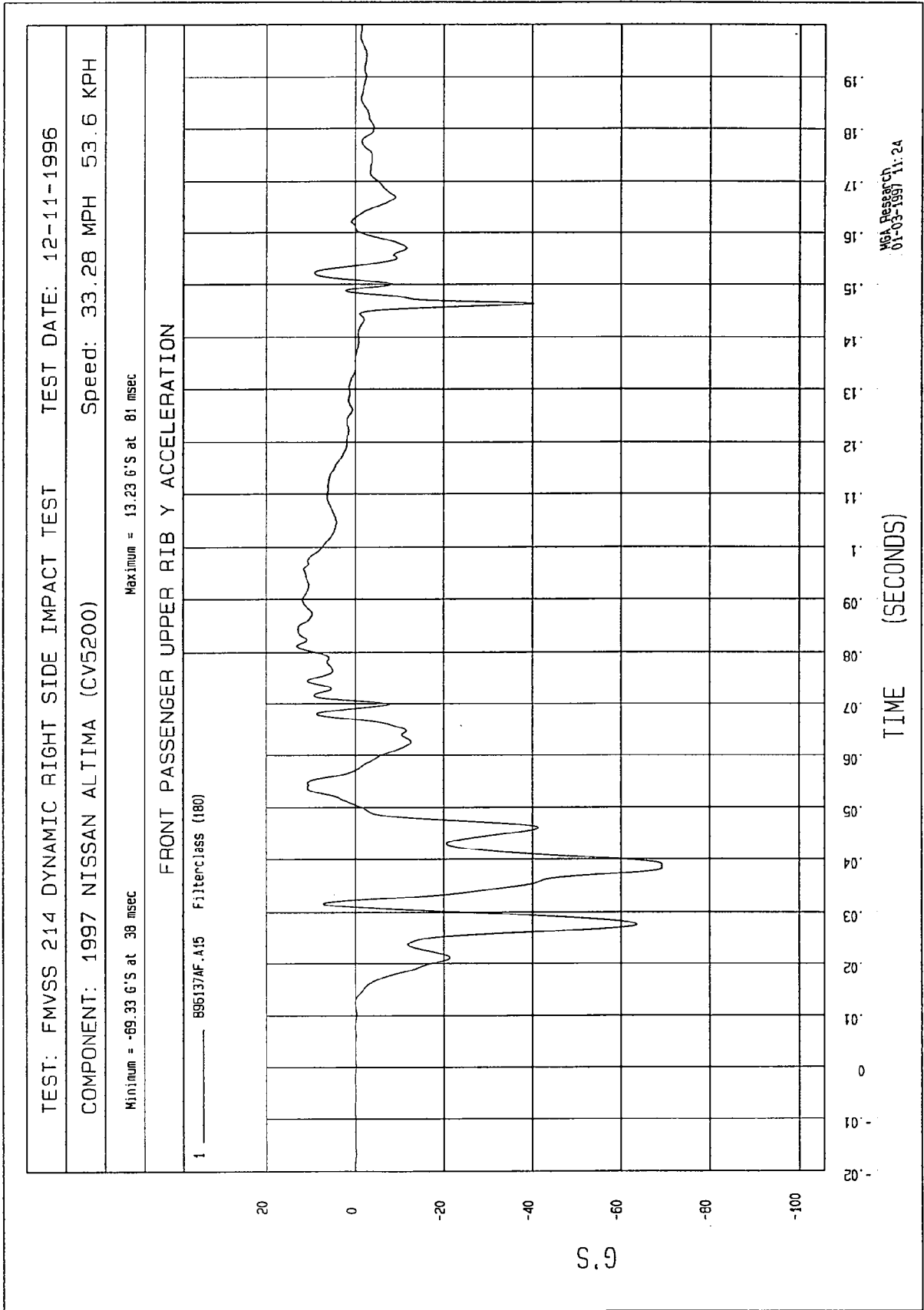
Table of Data Plots

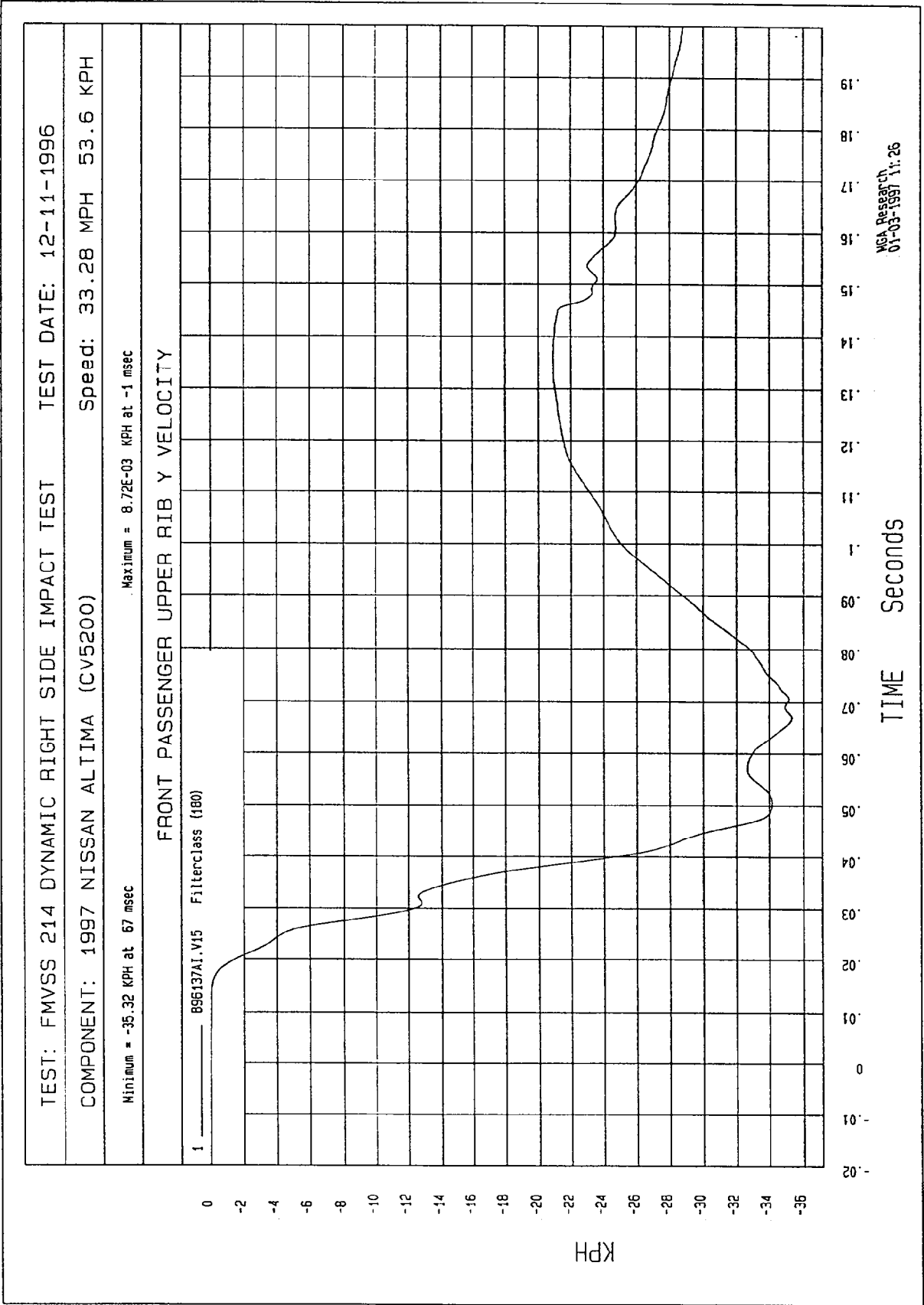
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FIR Filter

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TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

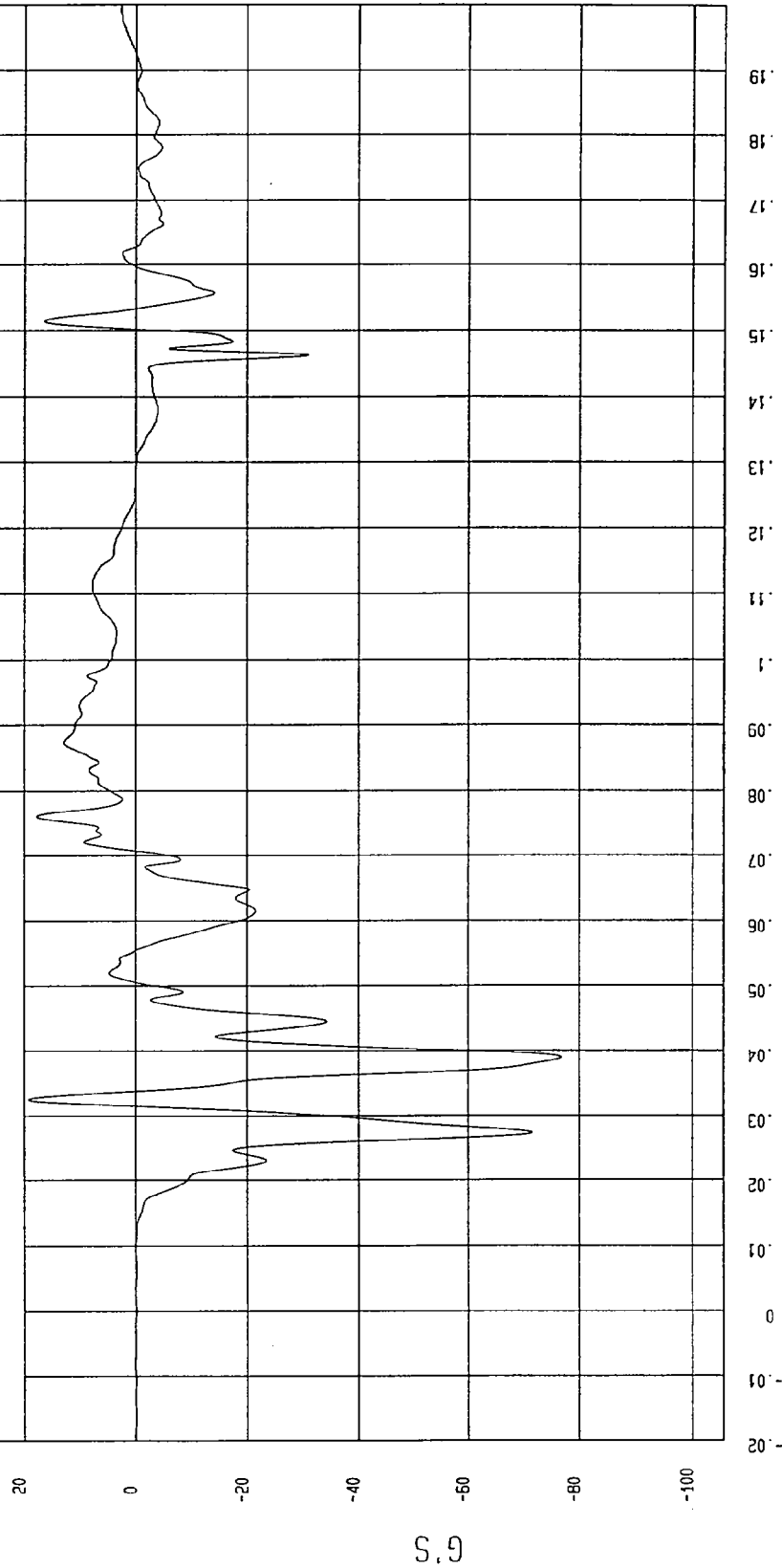
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -76.72 G'S at 39 msec

Maximum = 19.34 G'S at 32 msec

FRONT PASSENGER LOWER RIB Y ACCELERATION

1 — B96137AF.A16 Filterclass (180)



MSA Research
01-03-1997 11:24

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

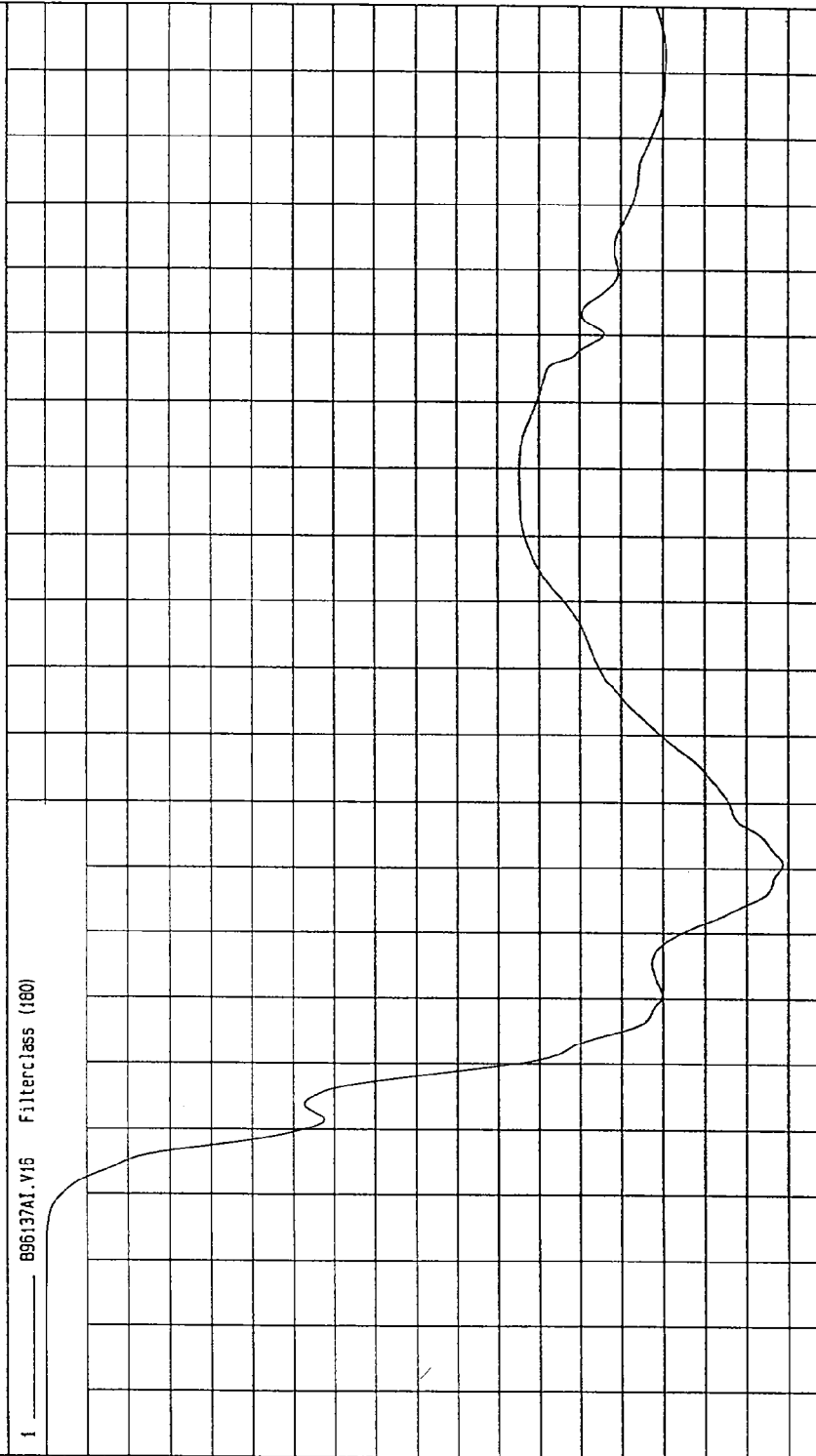
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -35.75 KPH at 71 msec Maximum = 4.33E-03 KPH at -18 msec

FRONT PASSENGER LOWER RIB Y VELOCITY

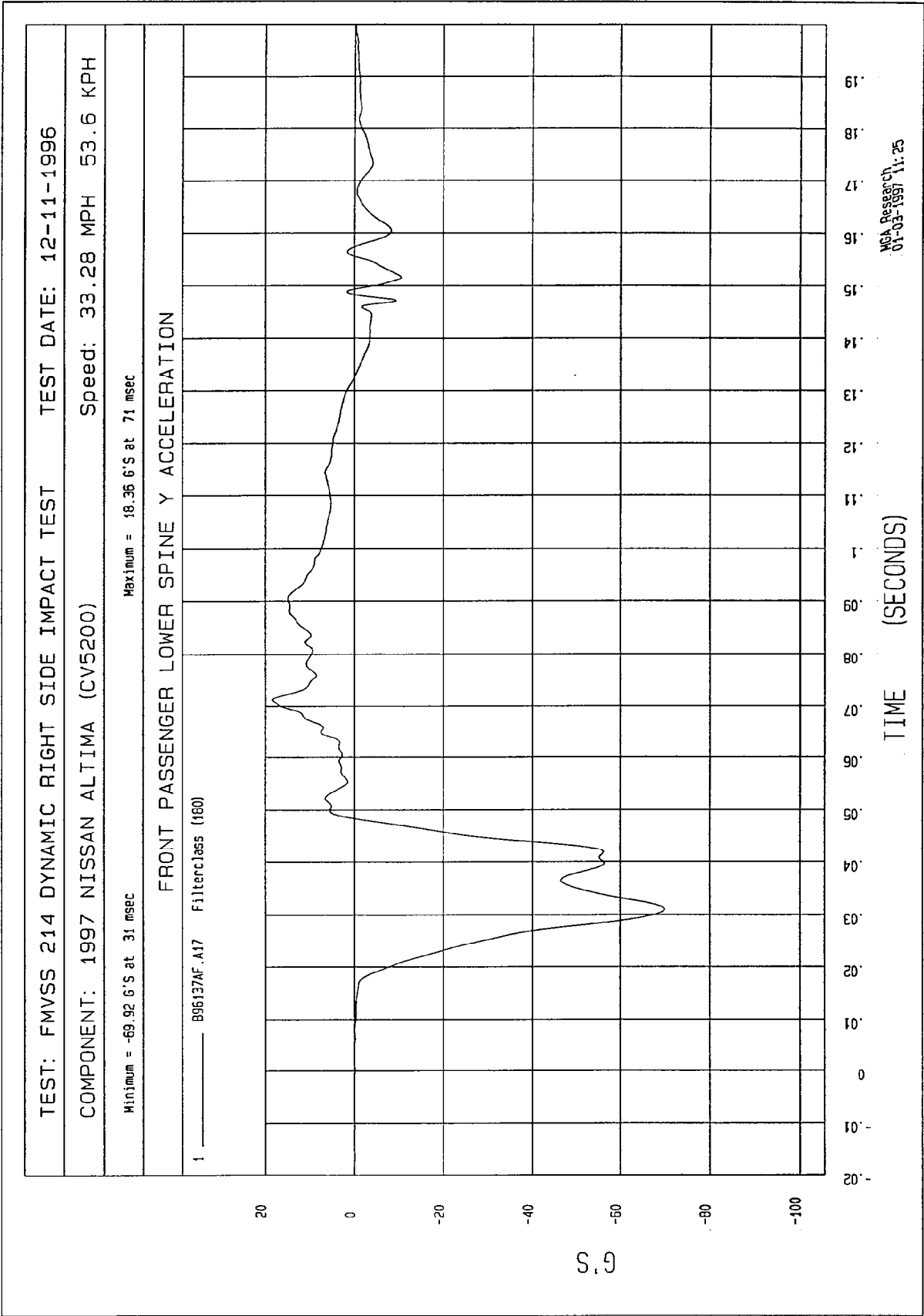
1 B96137A1.V16 Filterclass (180)

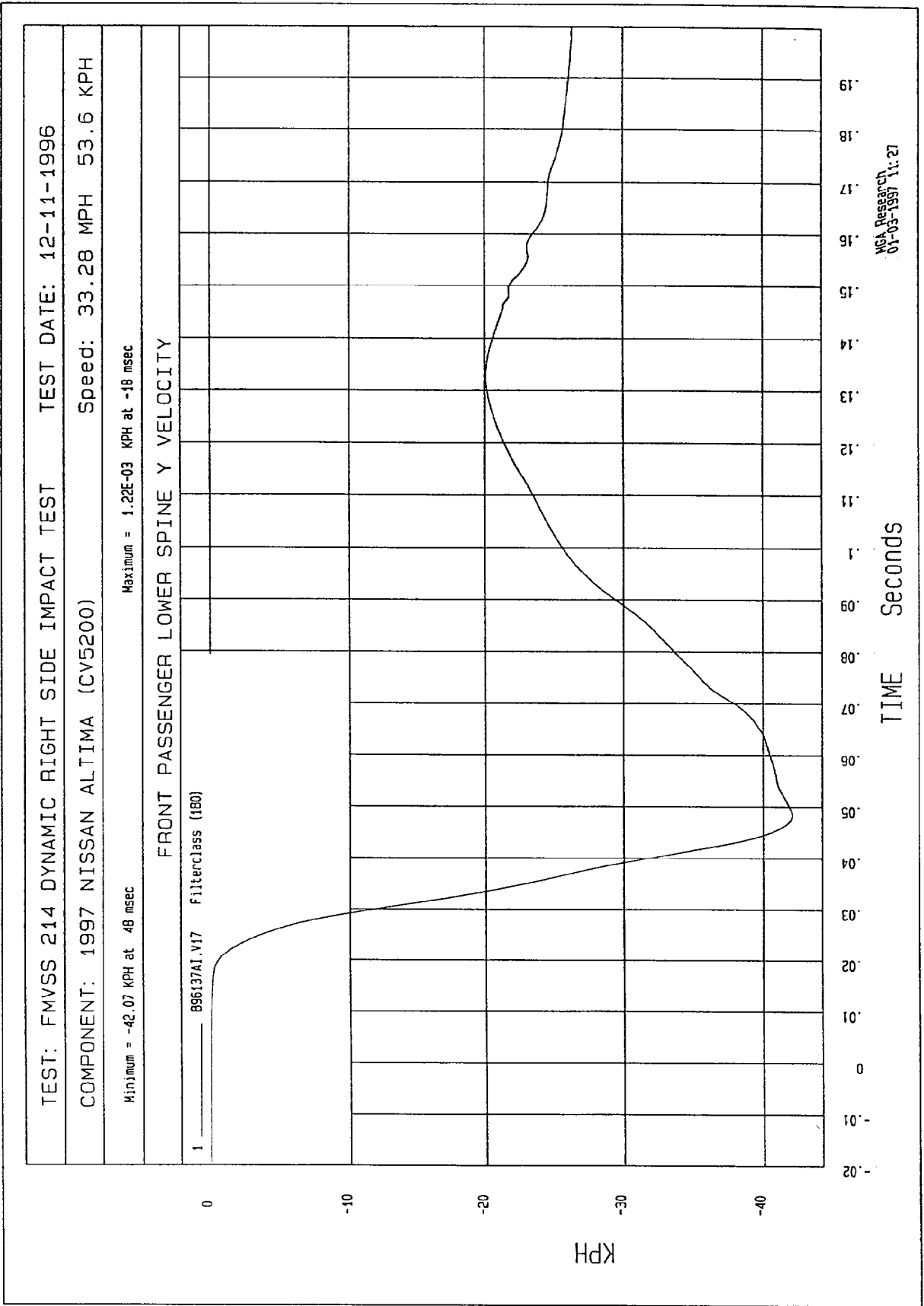
KPH



NSA Research
01-03-1997 11:27

TIME Seconds

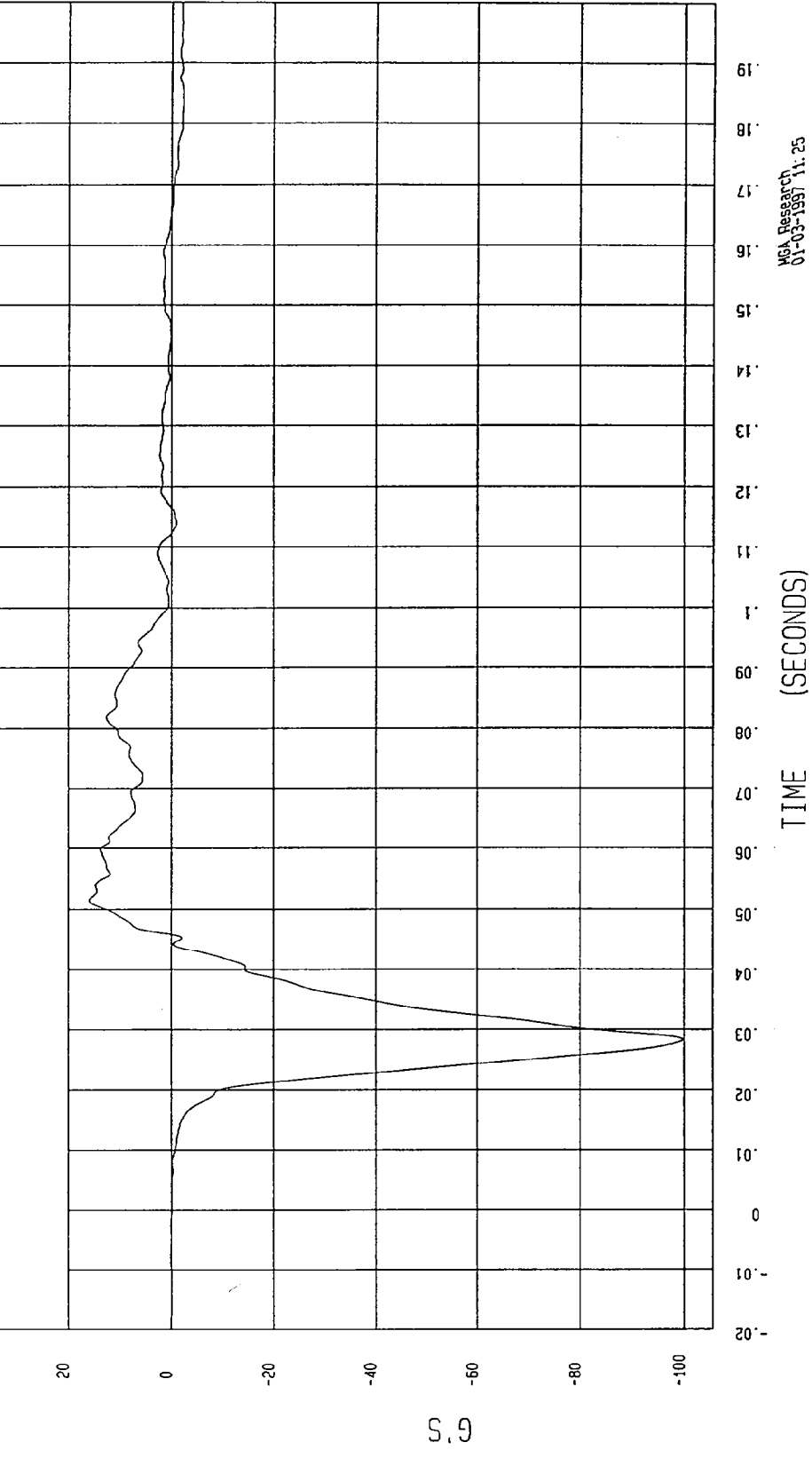




TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH
Minimum = -99.71 G'S at 28 msec Maximum = 15.08 G'S at 51 msec

FRONT PASSENGER PELVIS Y ACCELERATION

1 _____ 896137AF.A18 FilterClass (180)



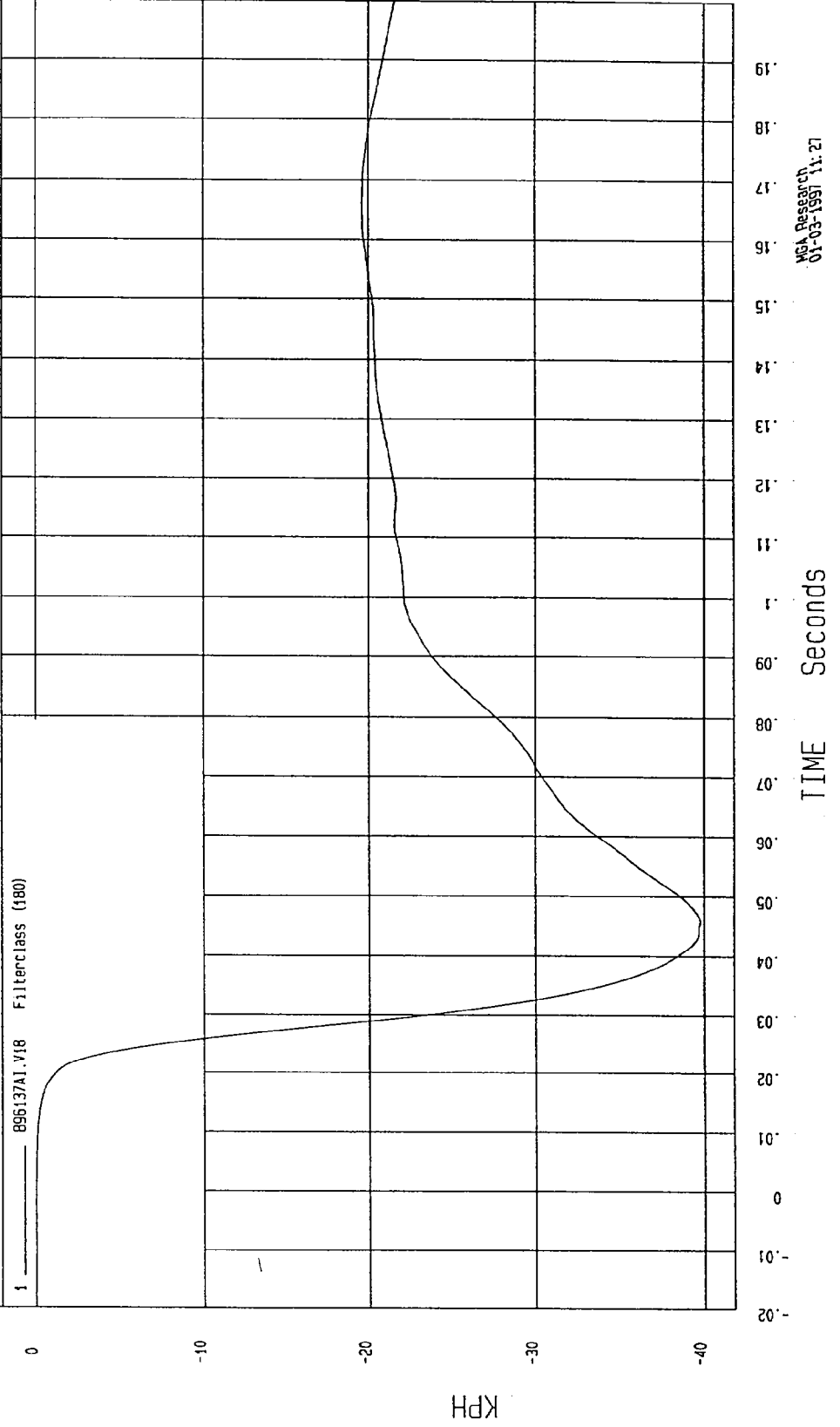
HGA Research
01-03-1997 11:25

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -39.76 KPH at 46 msec Maximum = .00 KPH at -18 msec

FRONT PASSENGER PELVIS Y VELOCITY



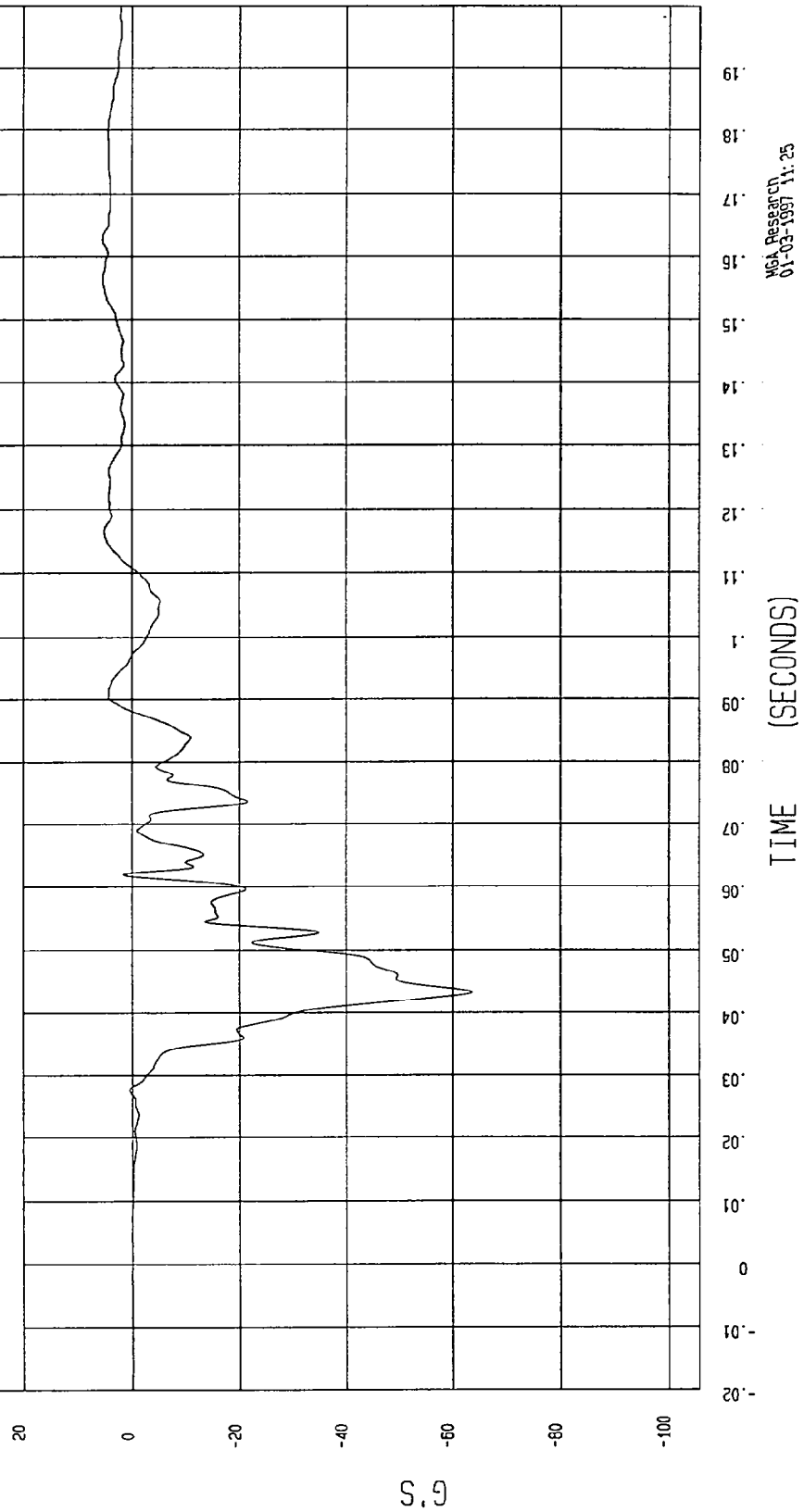
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -63.65 G'S at 43 msec Maximum = 5.67 G'S at 163 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 896137AF.A25 Filterclass (180)



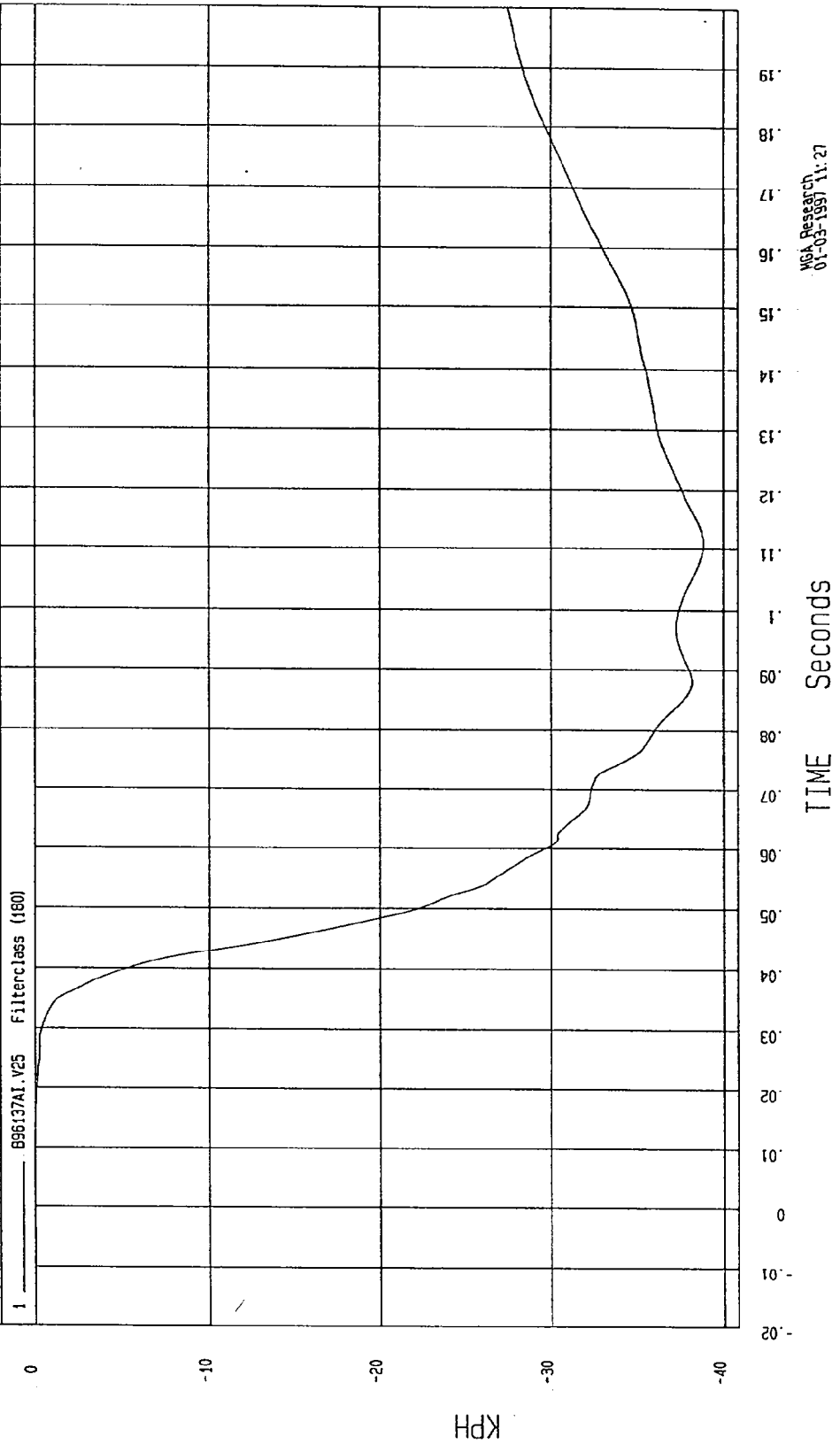
NCI Research
01-03-1997 11:25

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -38.84 KPH at 111 msec Maximum = 4.34E-02 KPH at 8 msec

REAR PASSENGER UPPER RIB Y VELOCITY



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

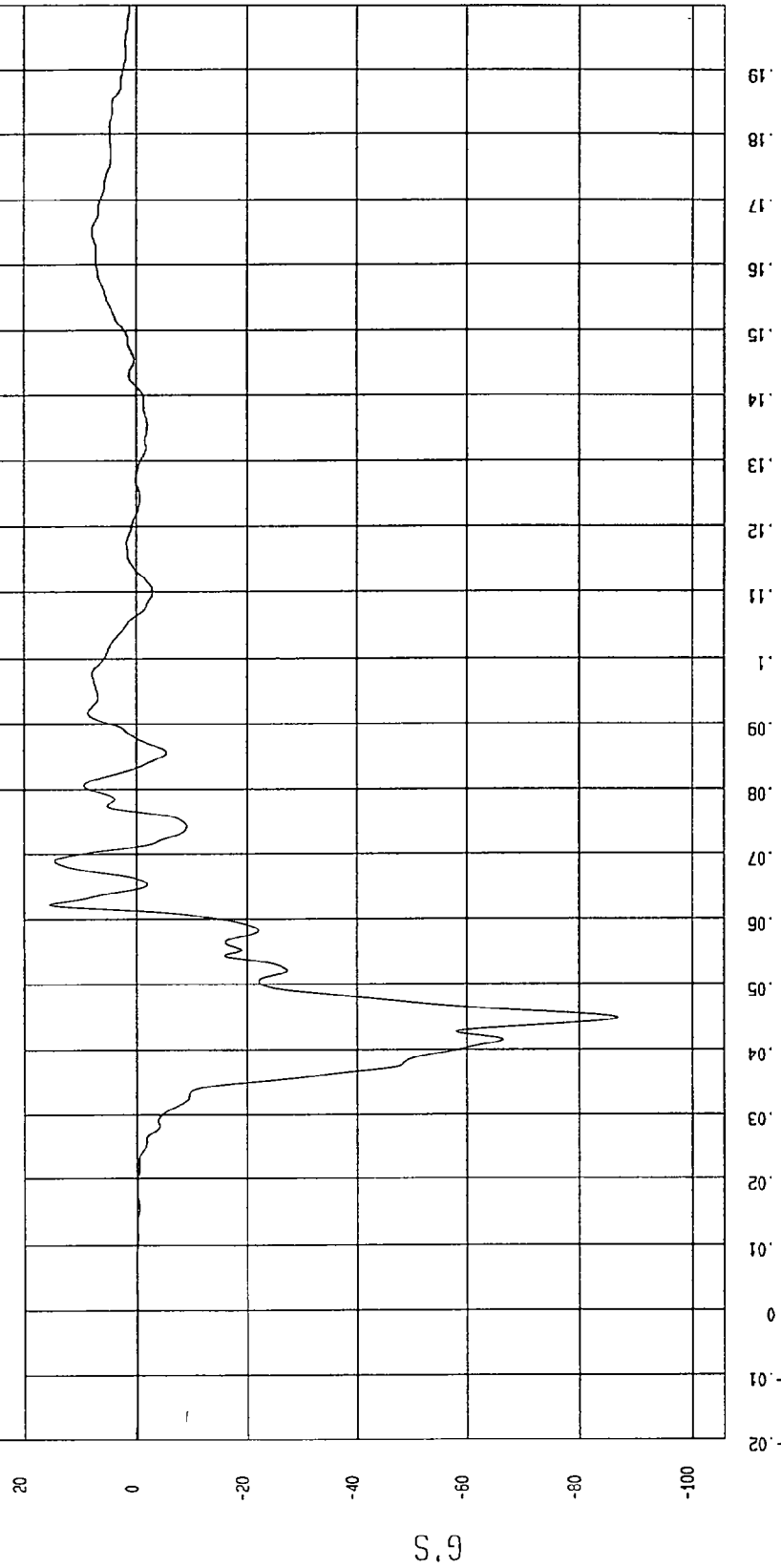
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -86.87 G'S at 45 msec

Maximum = 15.58 G'S at 62 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 996137AF.A26 Filterclass (180)



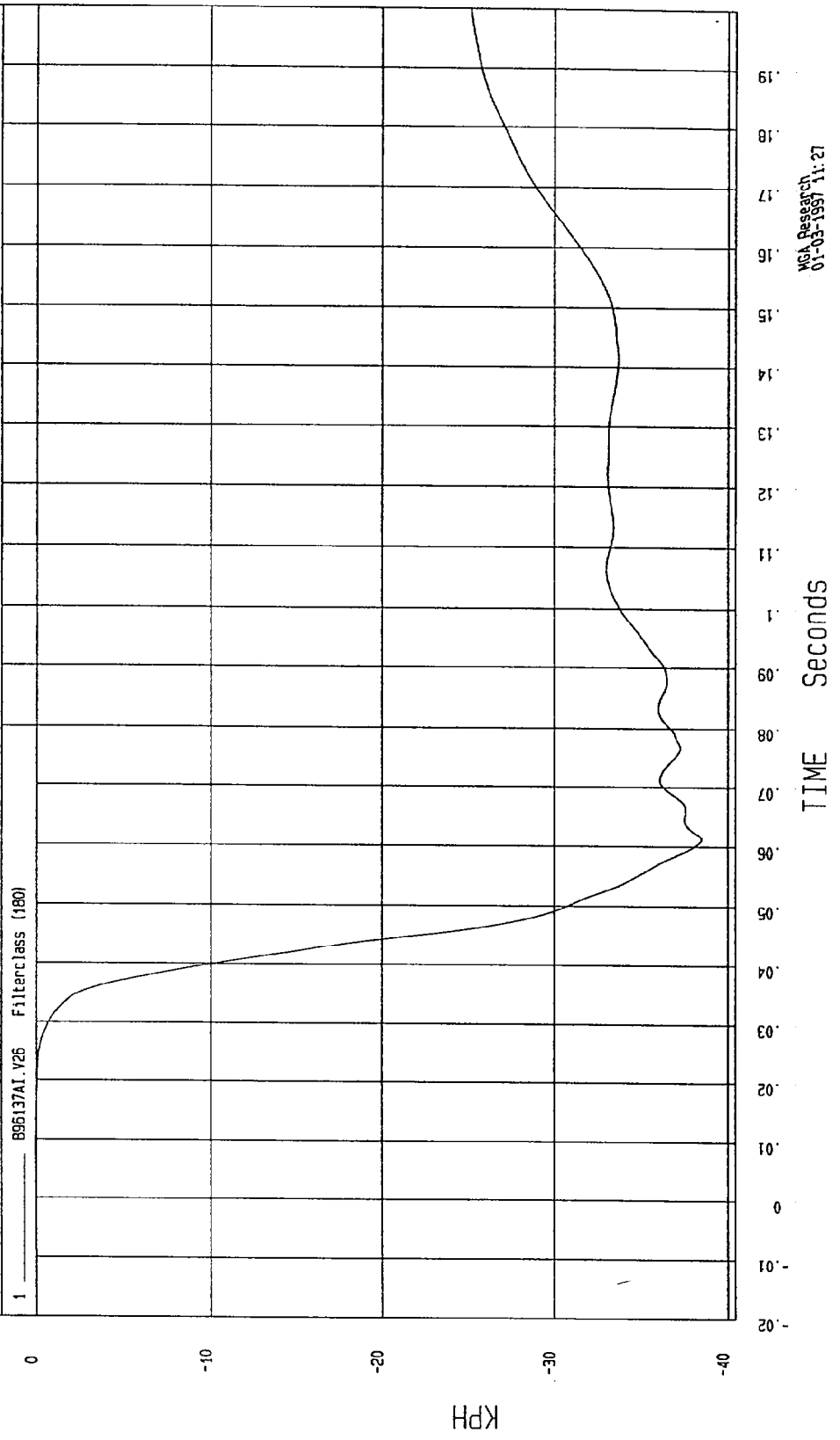
NGA Research
01-03-1997 11:25

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -38.49 KPH at 61 msec Maximum = 7.74E-02 KPH at 9 msec

REAR PASSENGER LOWER RIB Y VELOCITY



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -66.80 G'S at 42 msec Maximum = 21.91 G'S at 66 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 B96137AF.A27 Filter: class (180)

20

0

-20

-40

-60

-80

-100

G.S

19

18

17

16

15

14

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09

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01

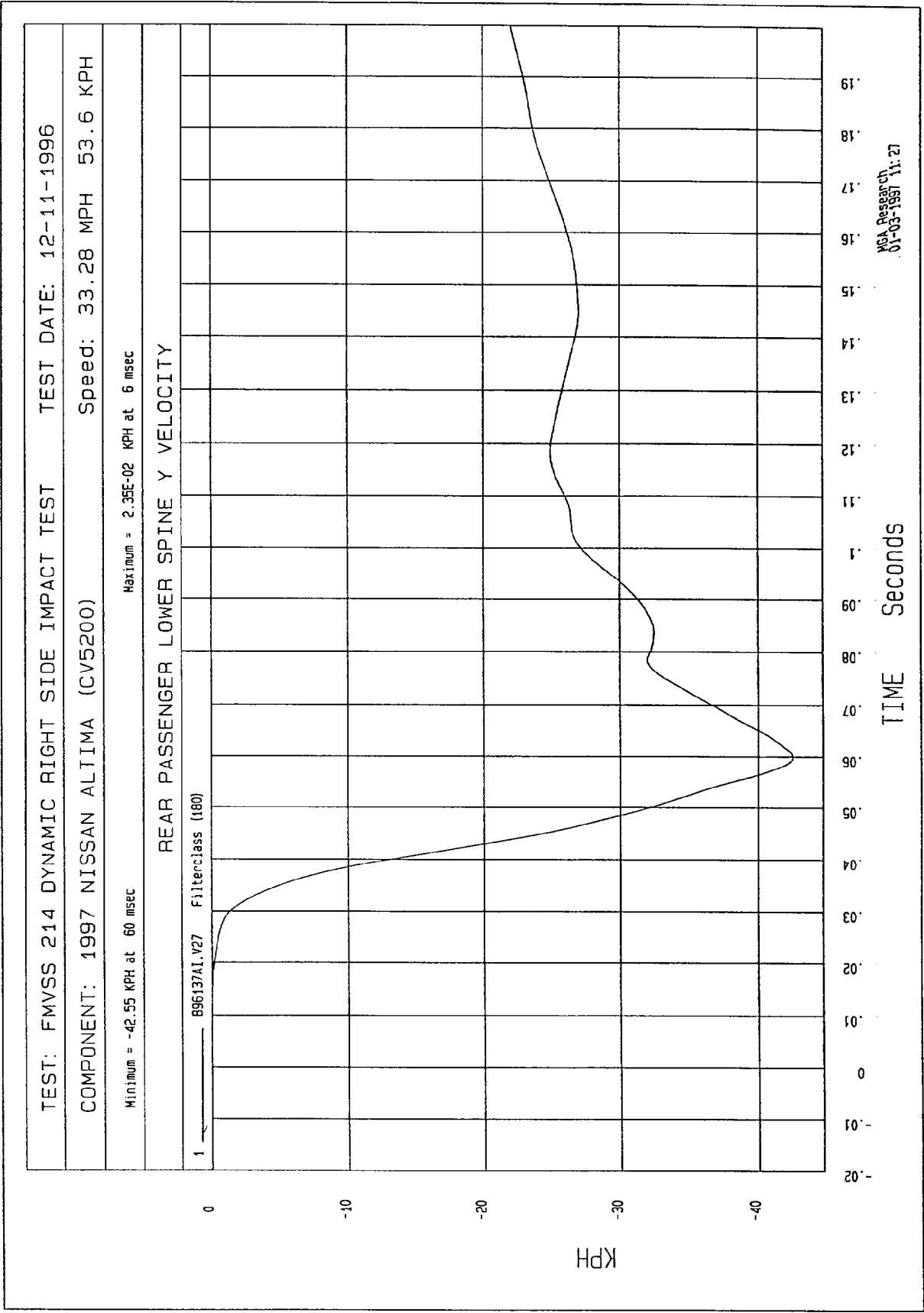
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-01

-02

TIME (SECONDS)

MOA Research
01-03-1997 11:25



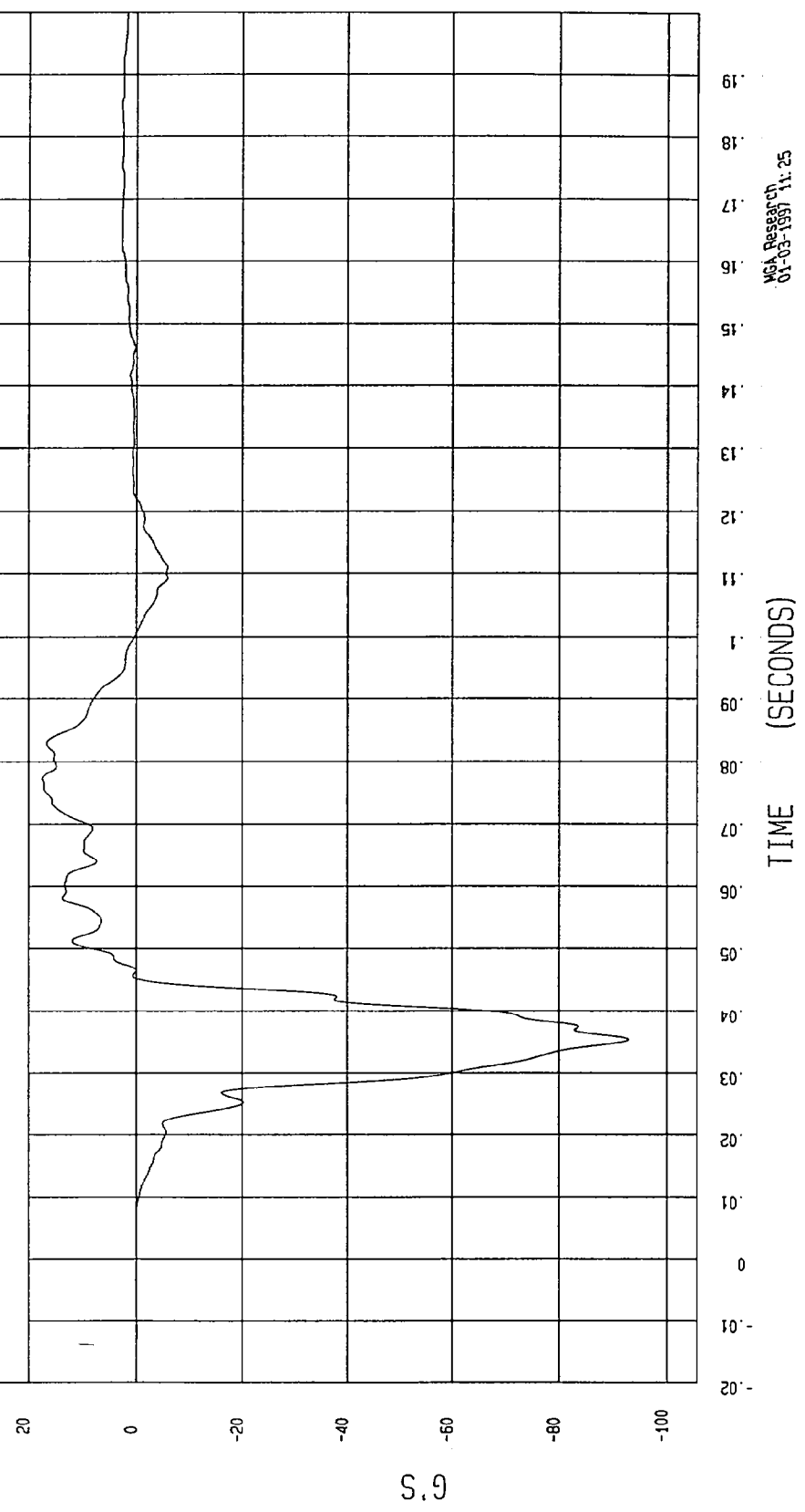
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -92.95 G'S at 35 msec Maximum = 17.43 G'S at 77 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 _____ B95137AF.A28 Filterclass (180)



MGA Research
01-03-1997 11:25

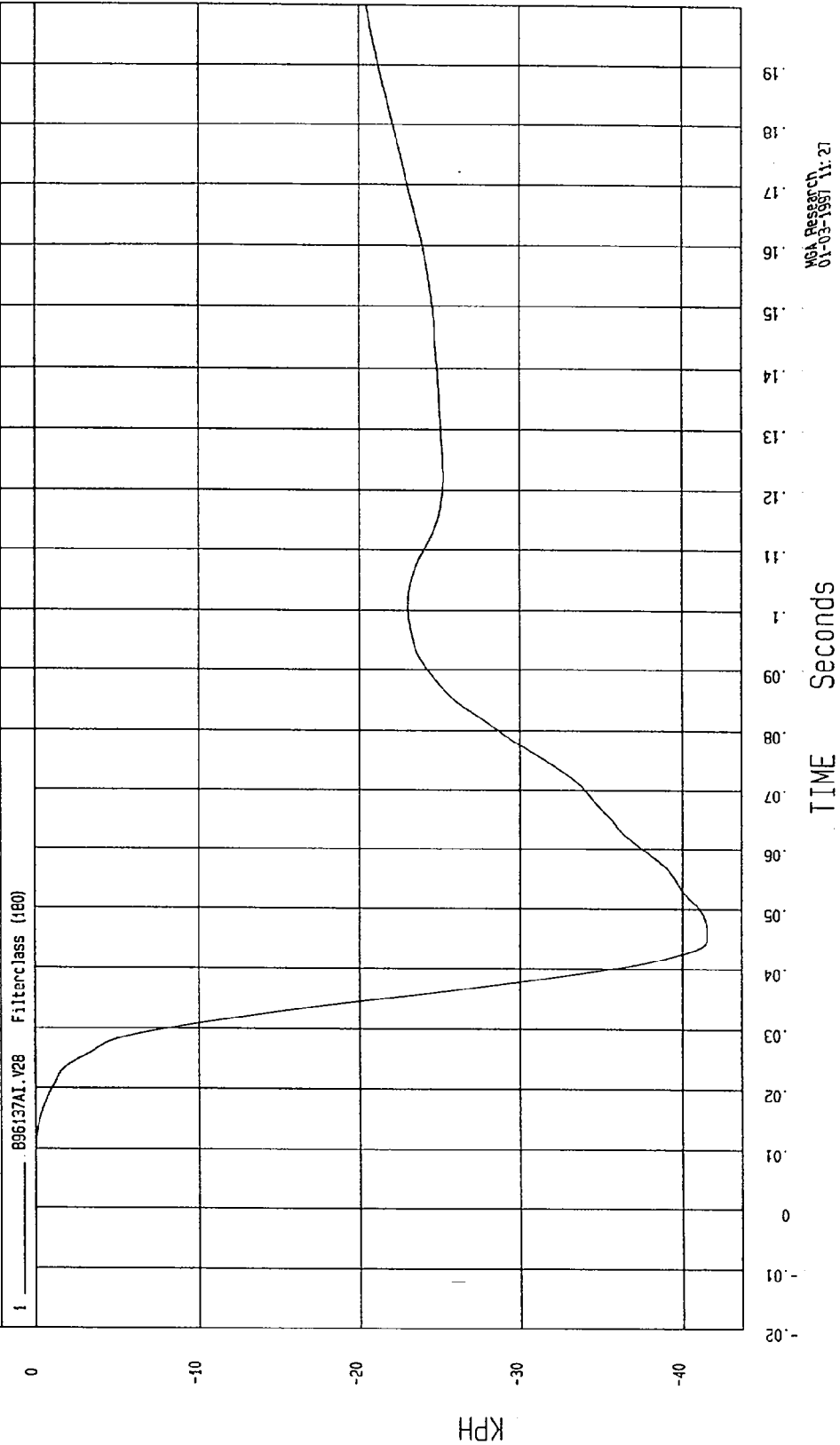
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -41.52 KPH at 45 msec

Maximum = 1.86E-02 KPH at -1 msec

REAR PASSENGER PELVIS Y VELOCITY

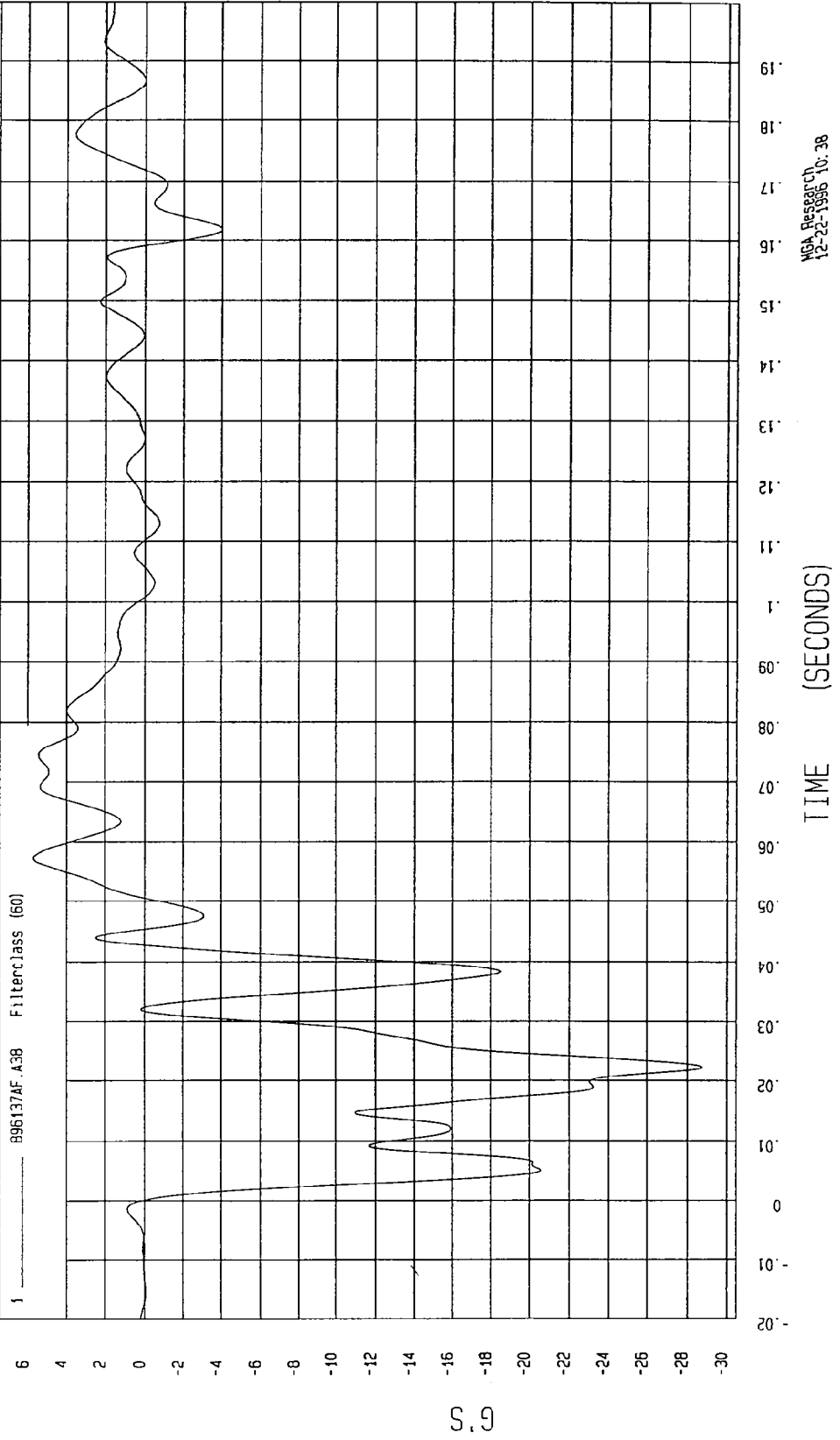


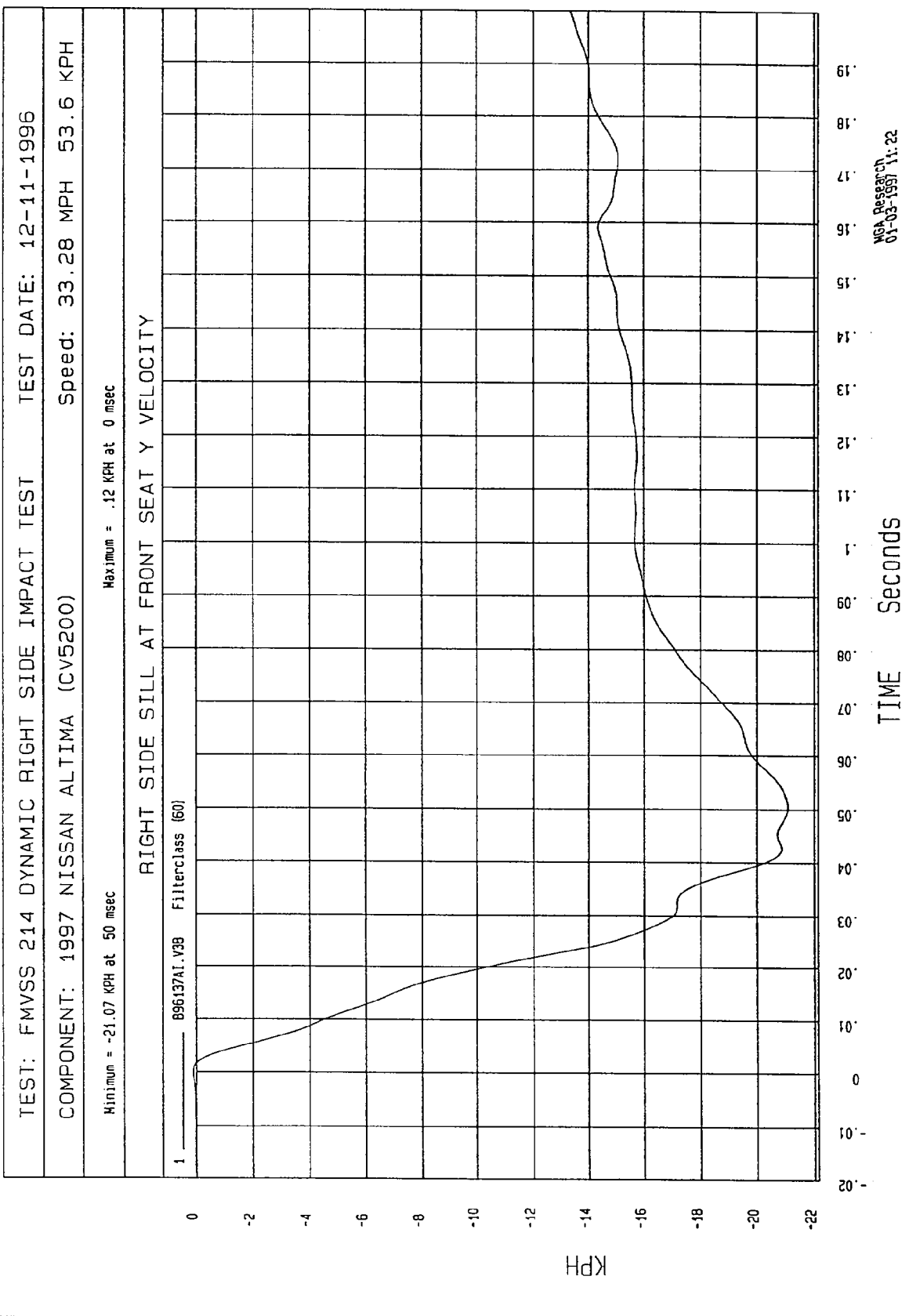
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -28.75 G'S at 22 msec Maximum = 5.72 G'S at 57 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION





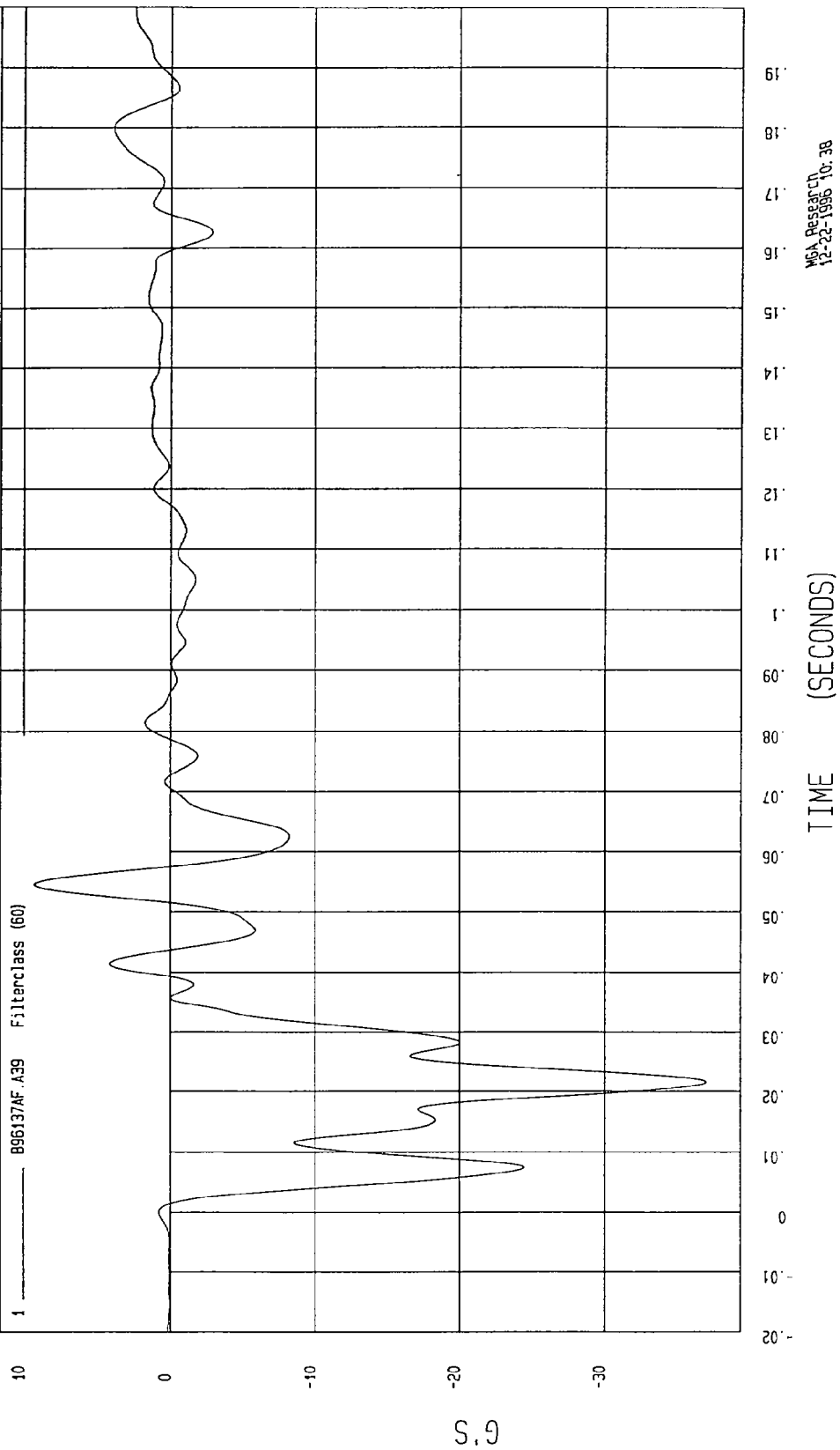
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -36.96 G'S at 22 msec Maximum = 9.27 G'S at 54 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

1 B96137AF.A39 FilterClass (60)

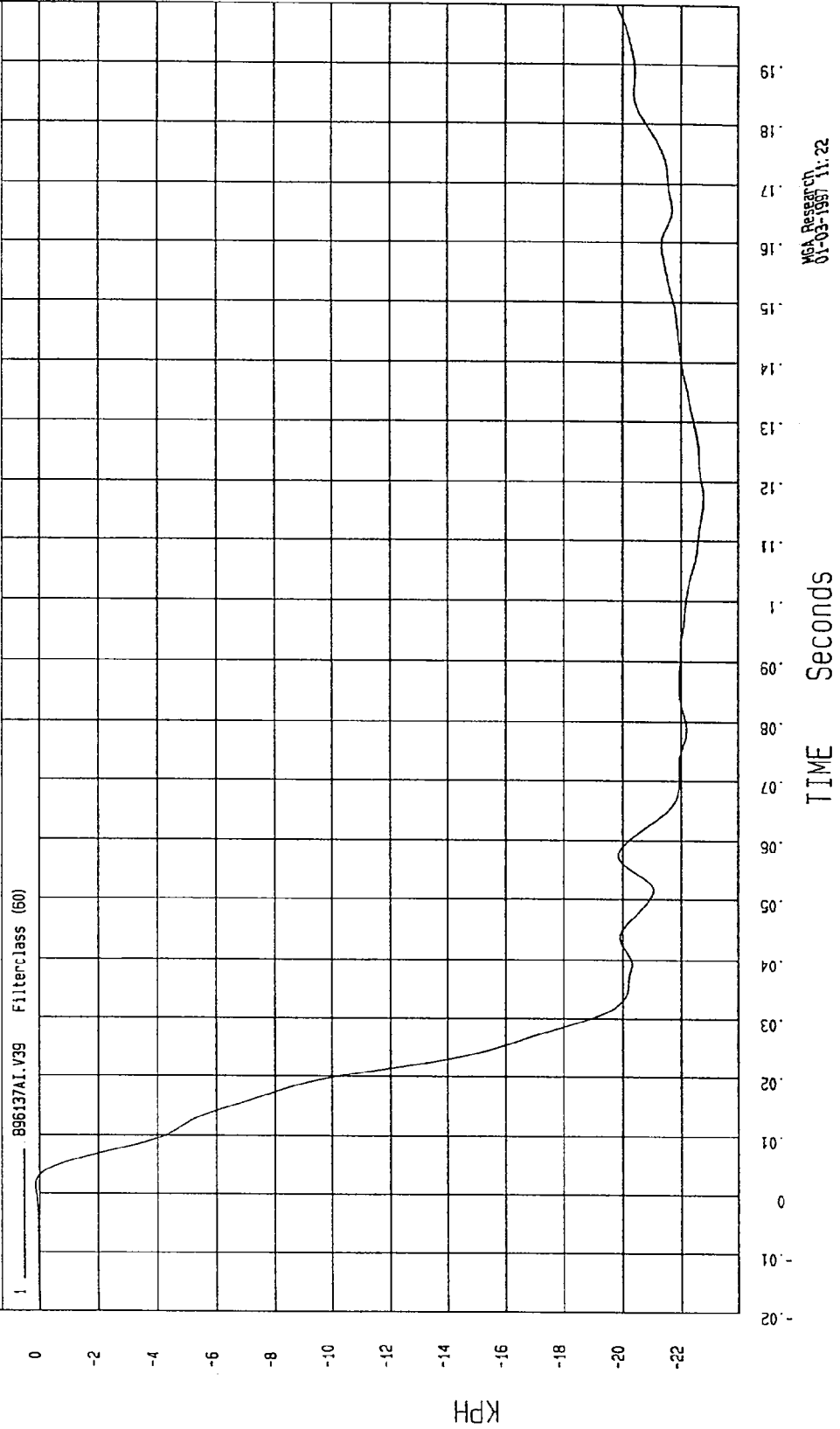


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -22.74 KPH at 117 msec Maximum = .13 KPH at 2 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY



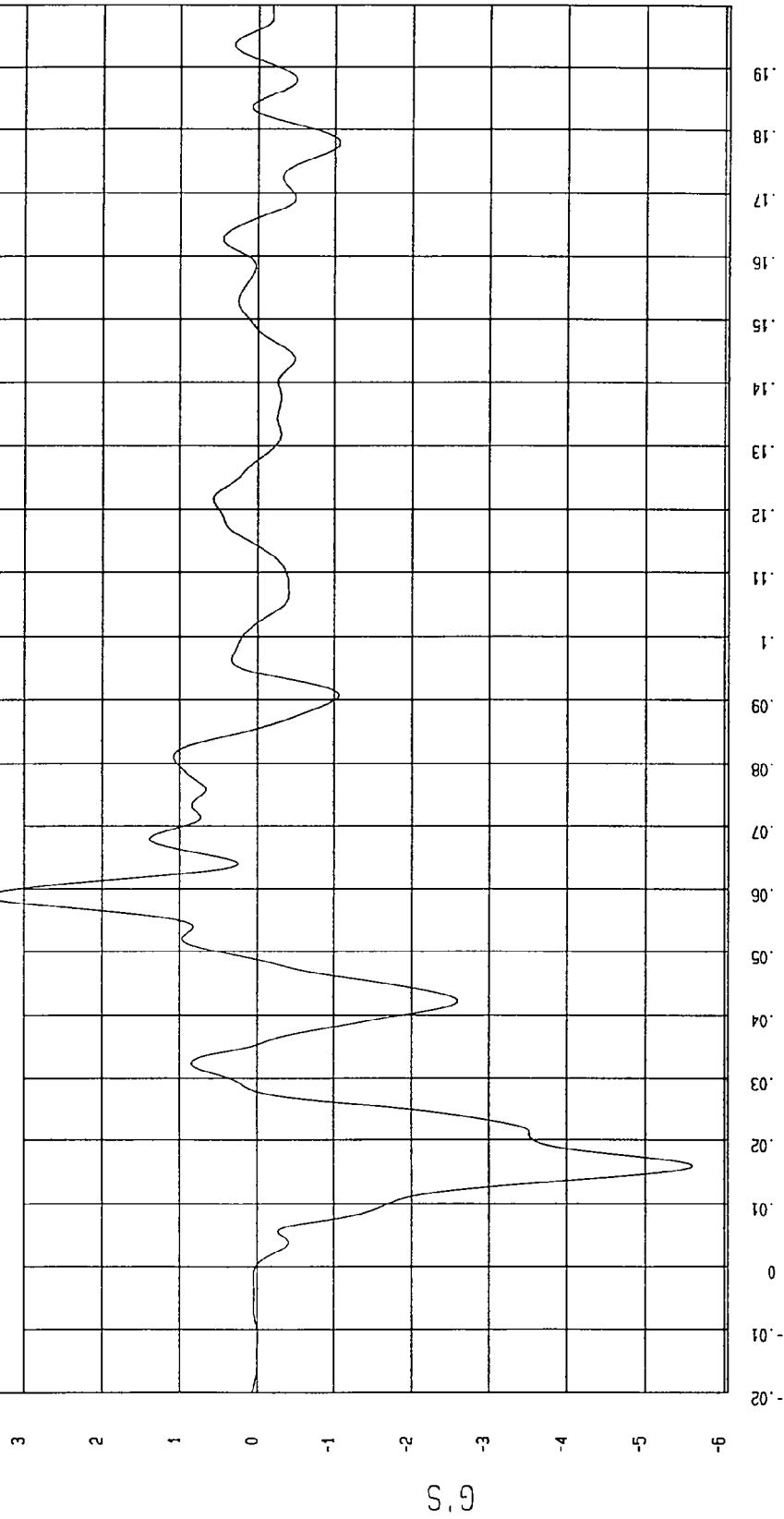
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -5.59 G'S at 16 msec Maximum = 3.48 G'S at 59 msec

LEFT SIDE SILL AT FRONT SEAT X ACCELERATION

1 896137AF.A32 Filterclass (60)



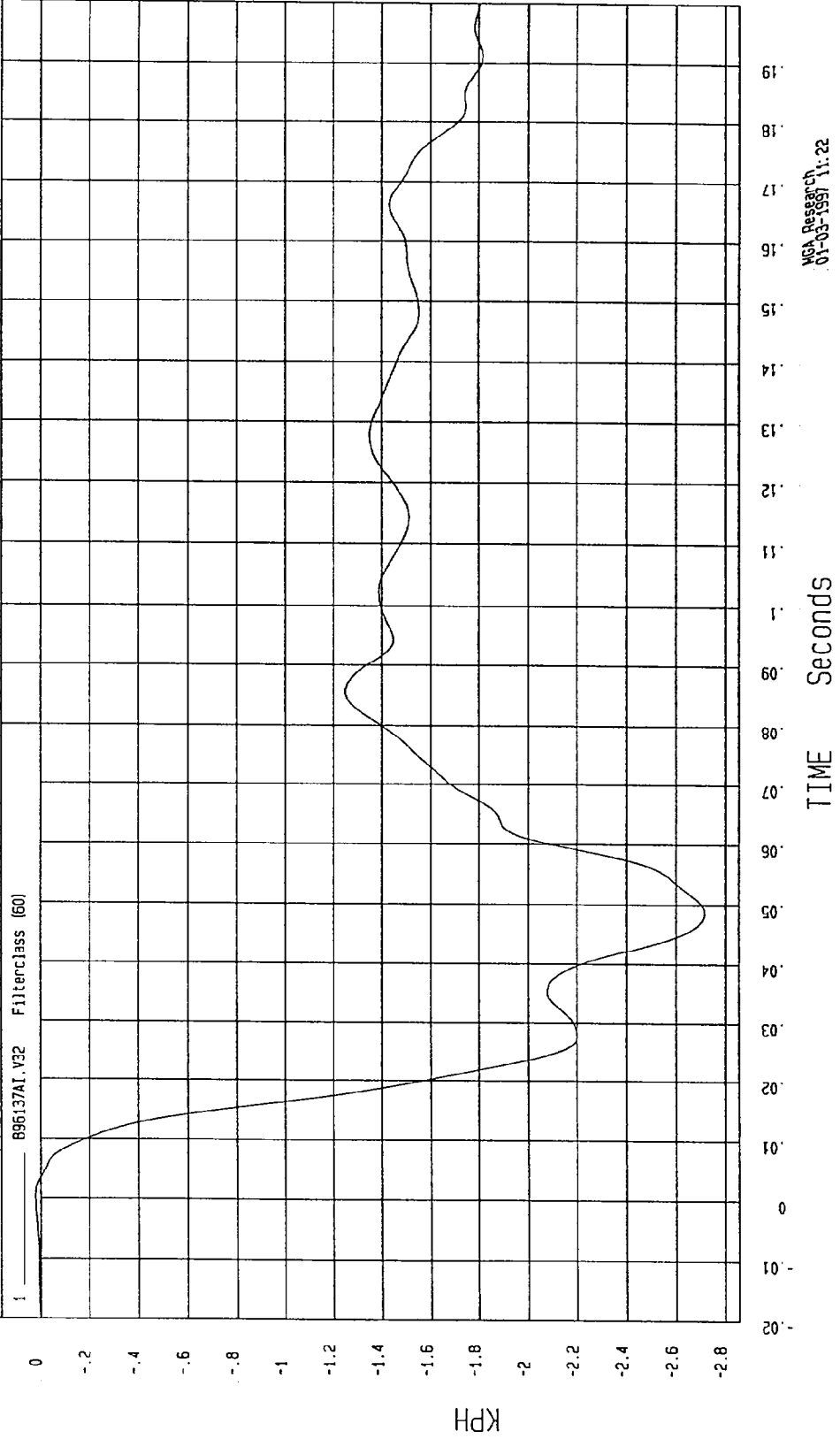
MCA Research
12-22-1996 10:38

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -2.71 KPH at 49 msec Maximum = 1.98E-02 KPH at 0 msec

LEFT SIDE SILL AT FRONT SEAT X VELOCITY



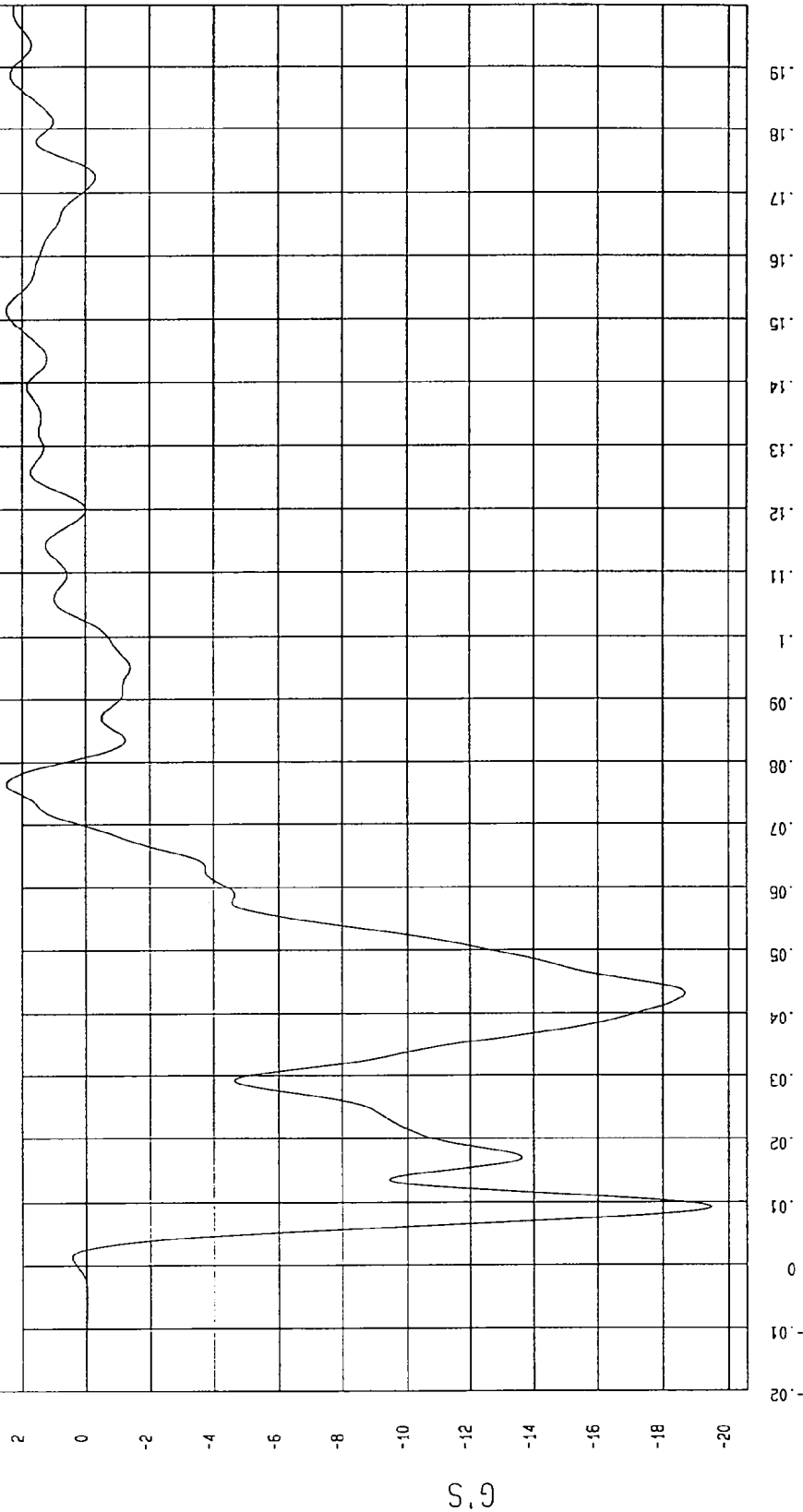
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -19.47 G's at 9 msec Maximum = 2.48 G's at 152 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 896137AF.A33 Filterclass (60)



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12-22-1996 10:38

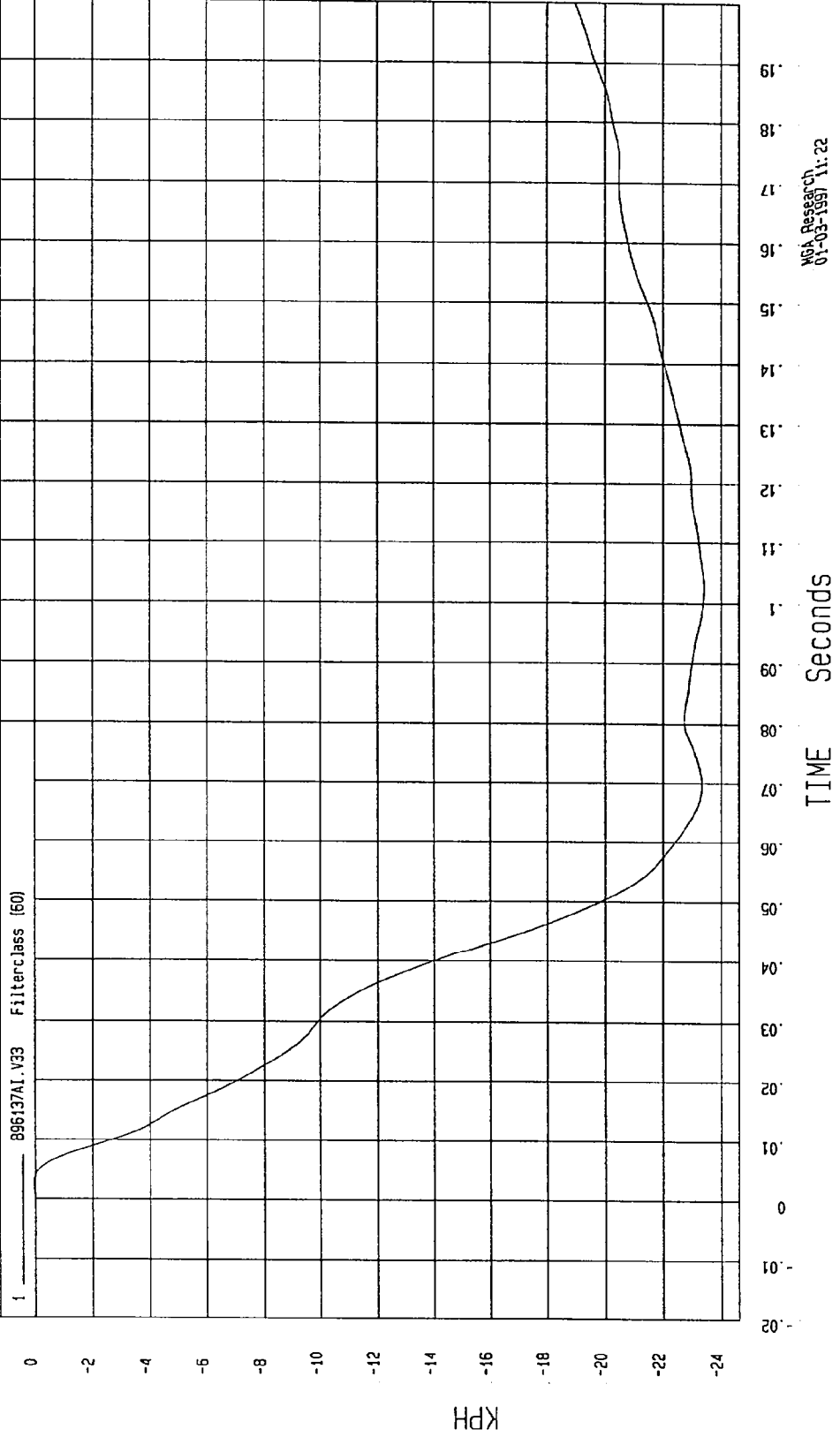
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -23.42 KPH at 102 msec

Maximum = .03 KPH at 3 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY



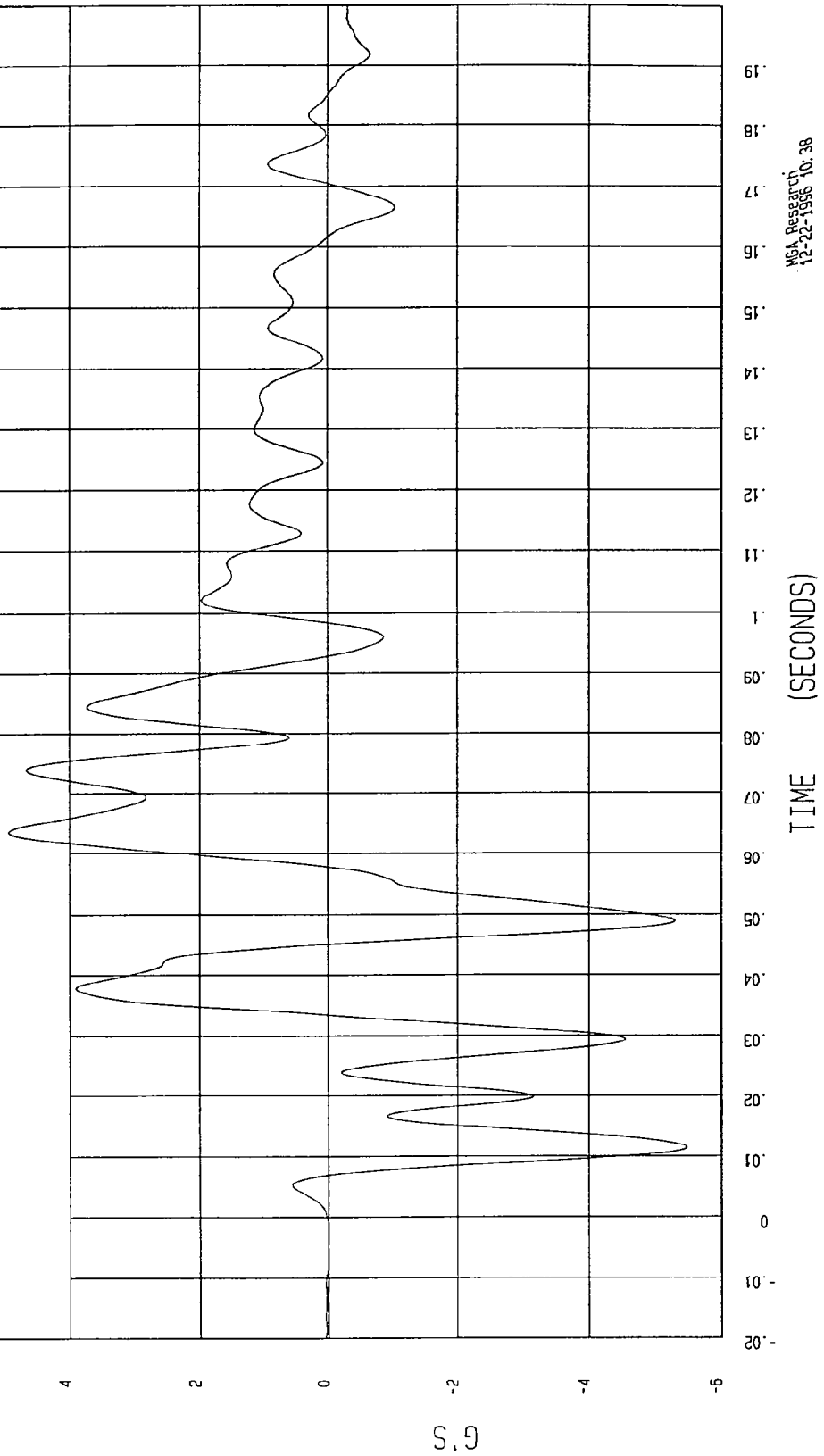
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

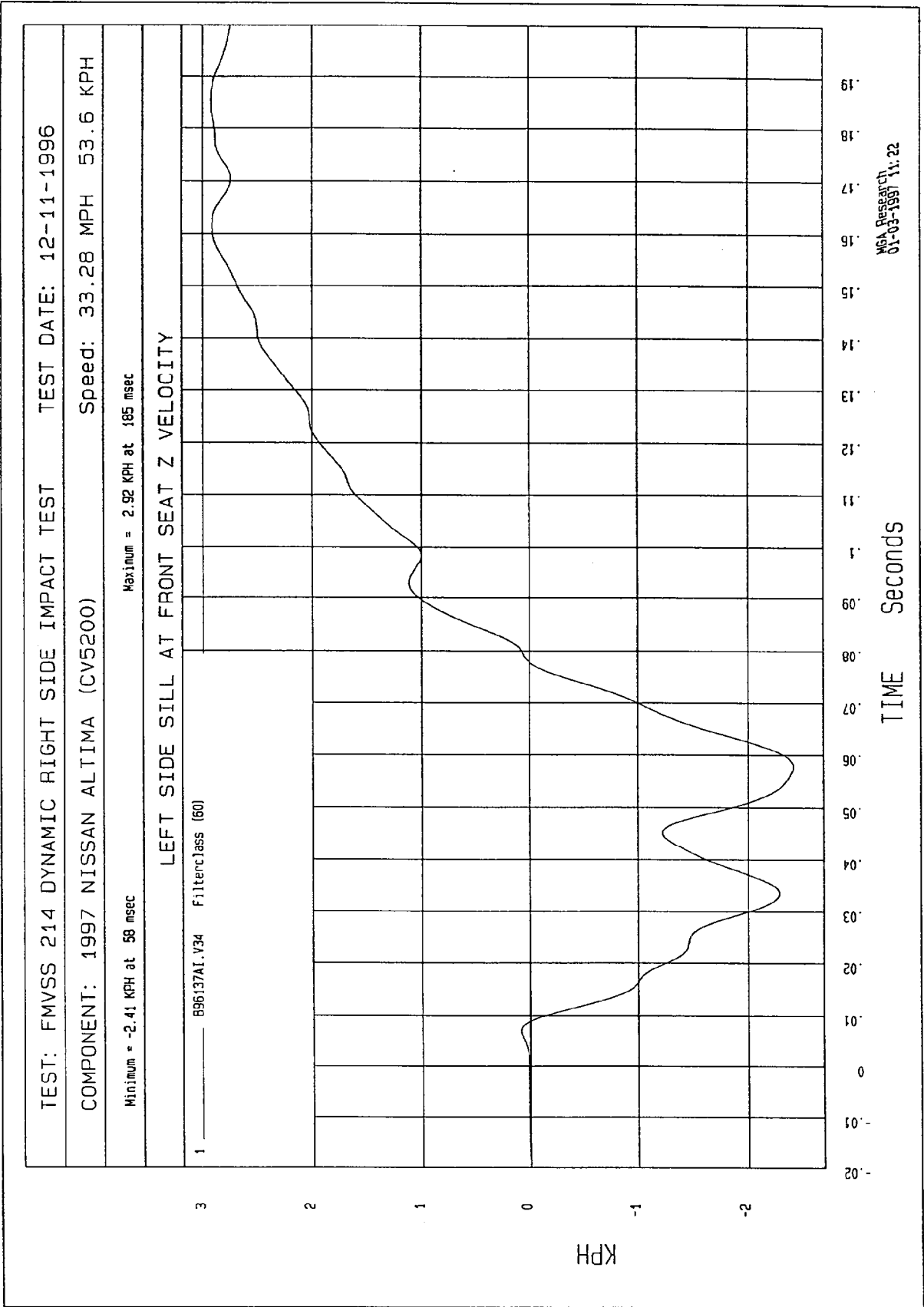
Minimum = -5.49 G'S at 11 msec Maximum = 4.92 G'S at 64 msec

LEFT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 896137AF.A34 Filterclass (60)



MSA Research
12-22-1996 10:38

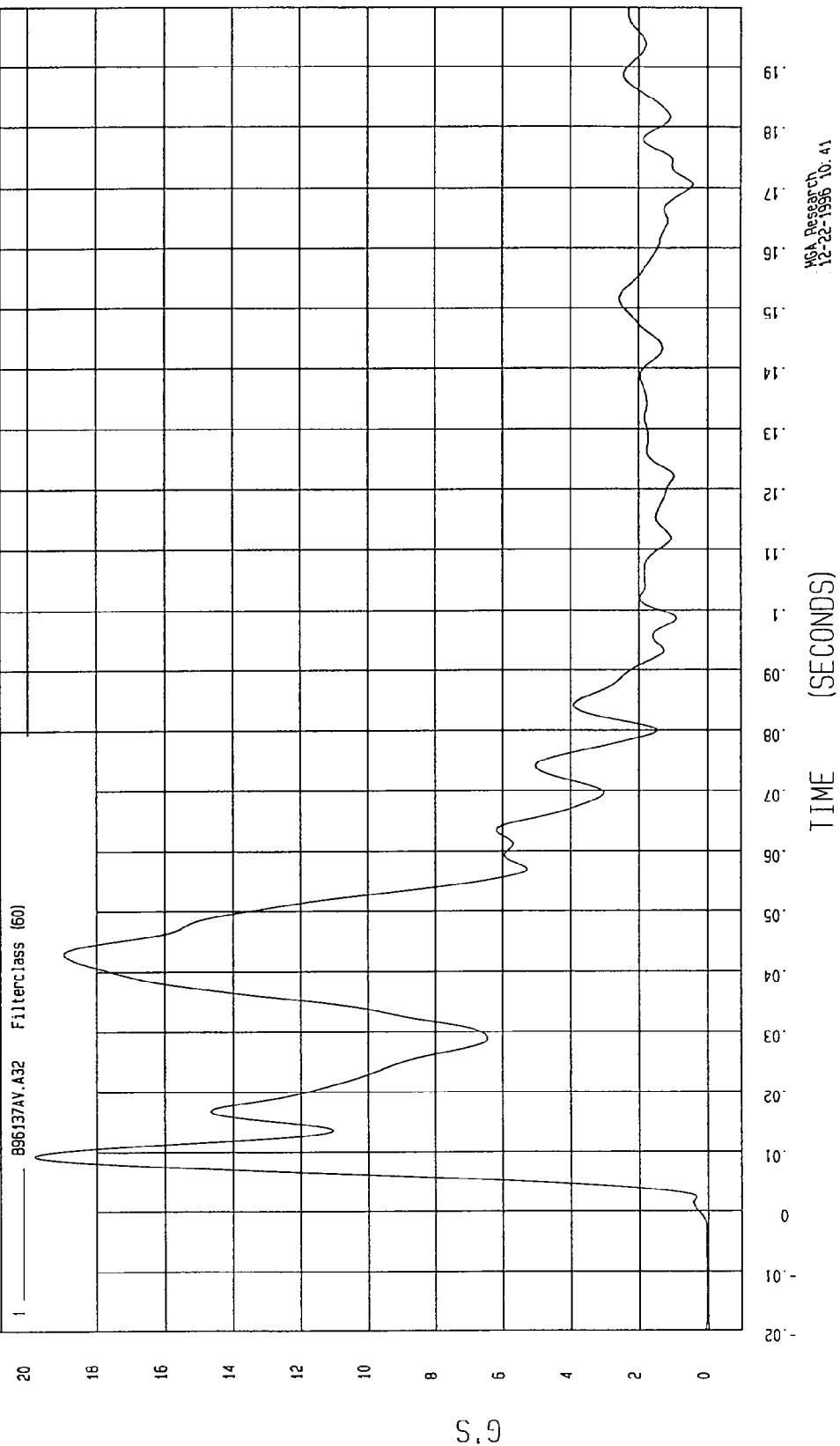


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = 2.70E-02 G'S at -13 msec Maximum = 19.82 G'S at 9 msec

LEFT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

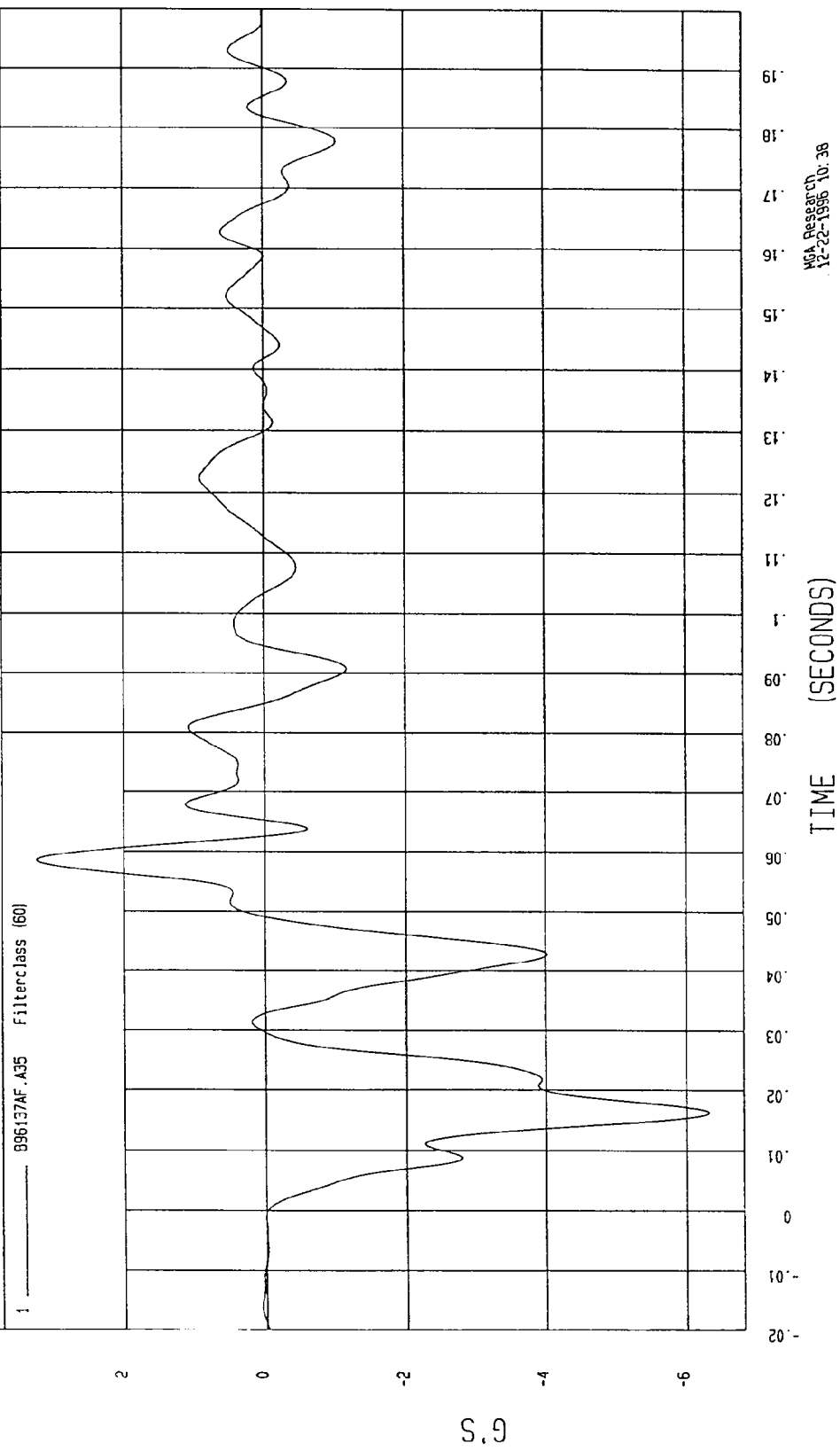


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -6.32 G'S at 16 msec Maximum = 3.25 G'S at 58 msec

LEFT SIDE SILL AT REAR SEAT X ACCELERATION



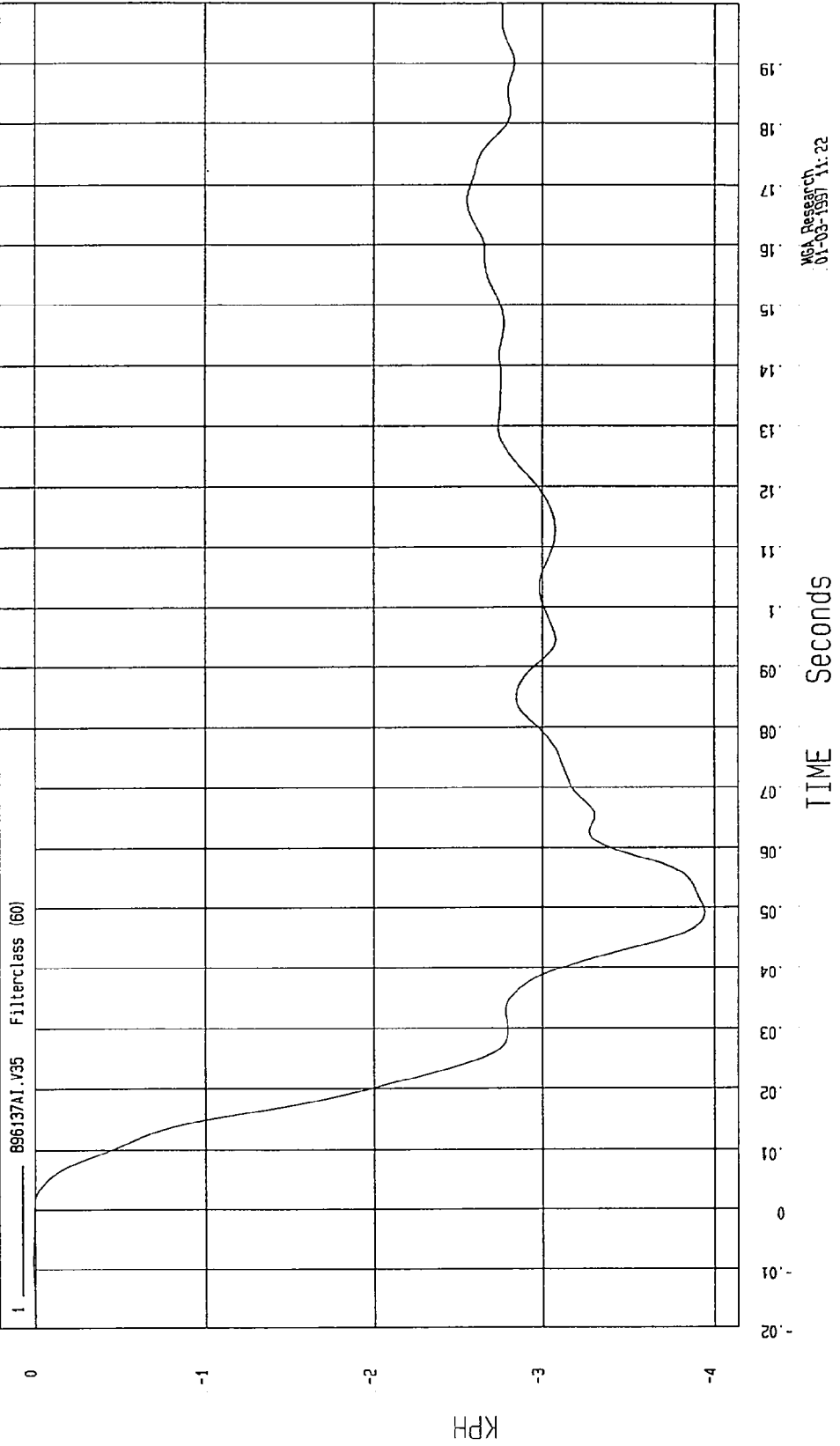
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

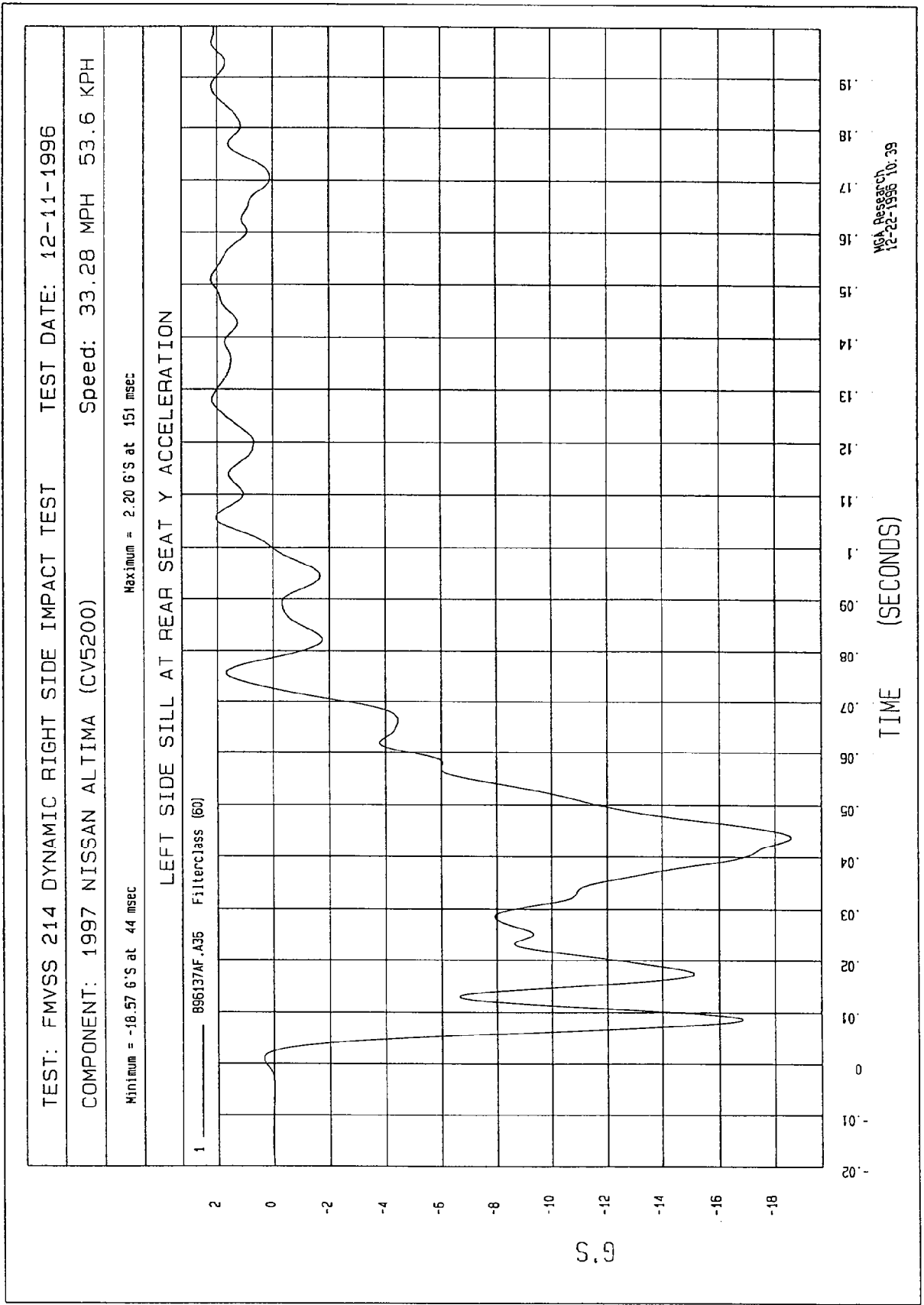
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -3.94 KPH at 49 msec

Maximum = 1.16E-02 KPH at -9 msec

LEFT SIDE SILL AT REAR SEAT X VELOCITY



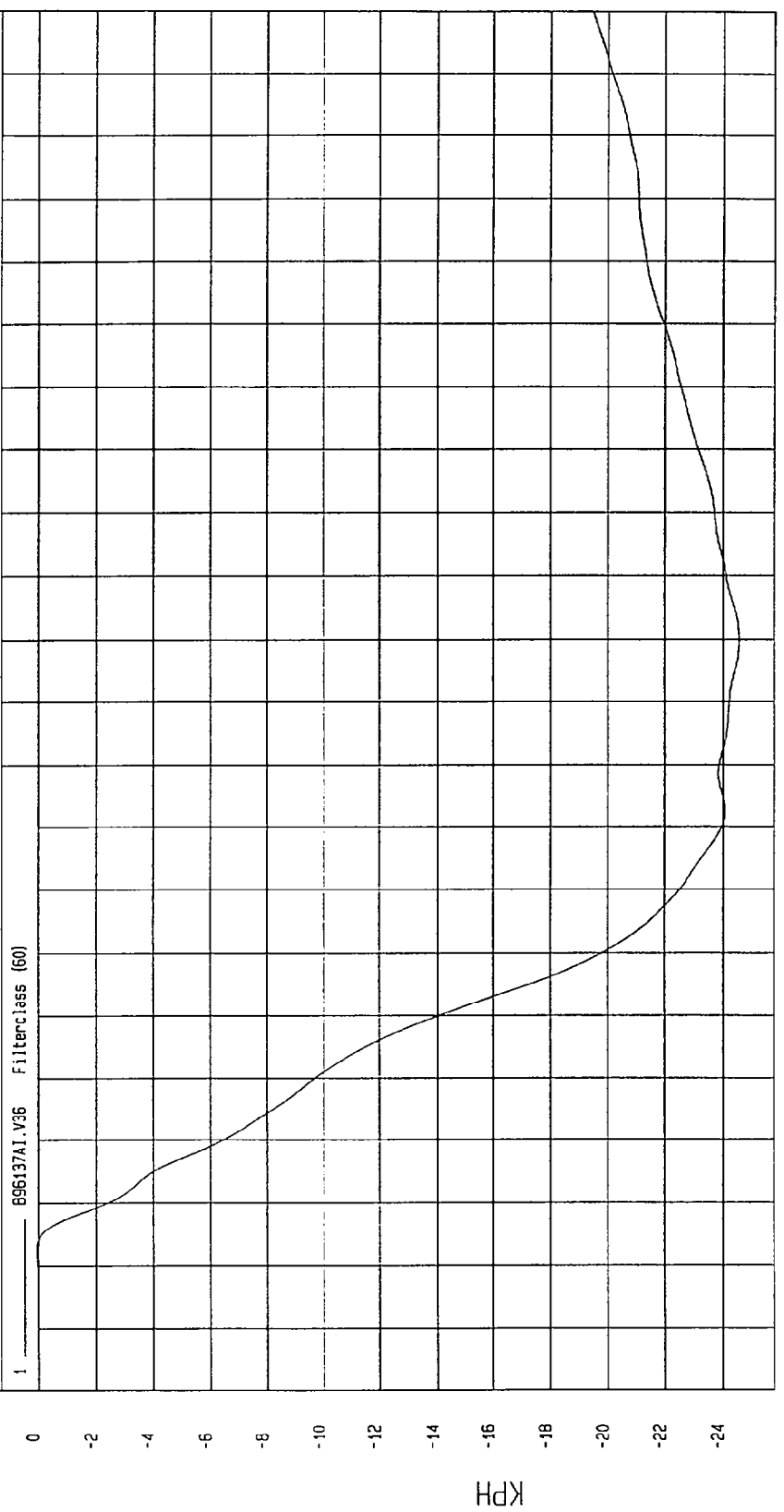


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

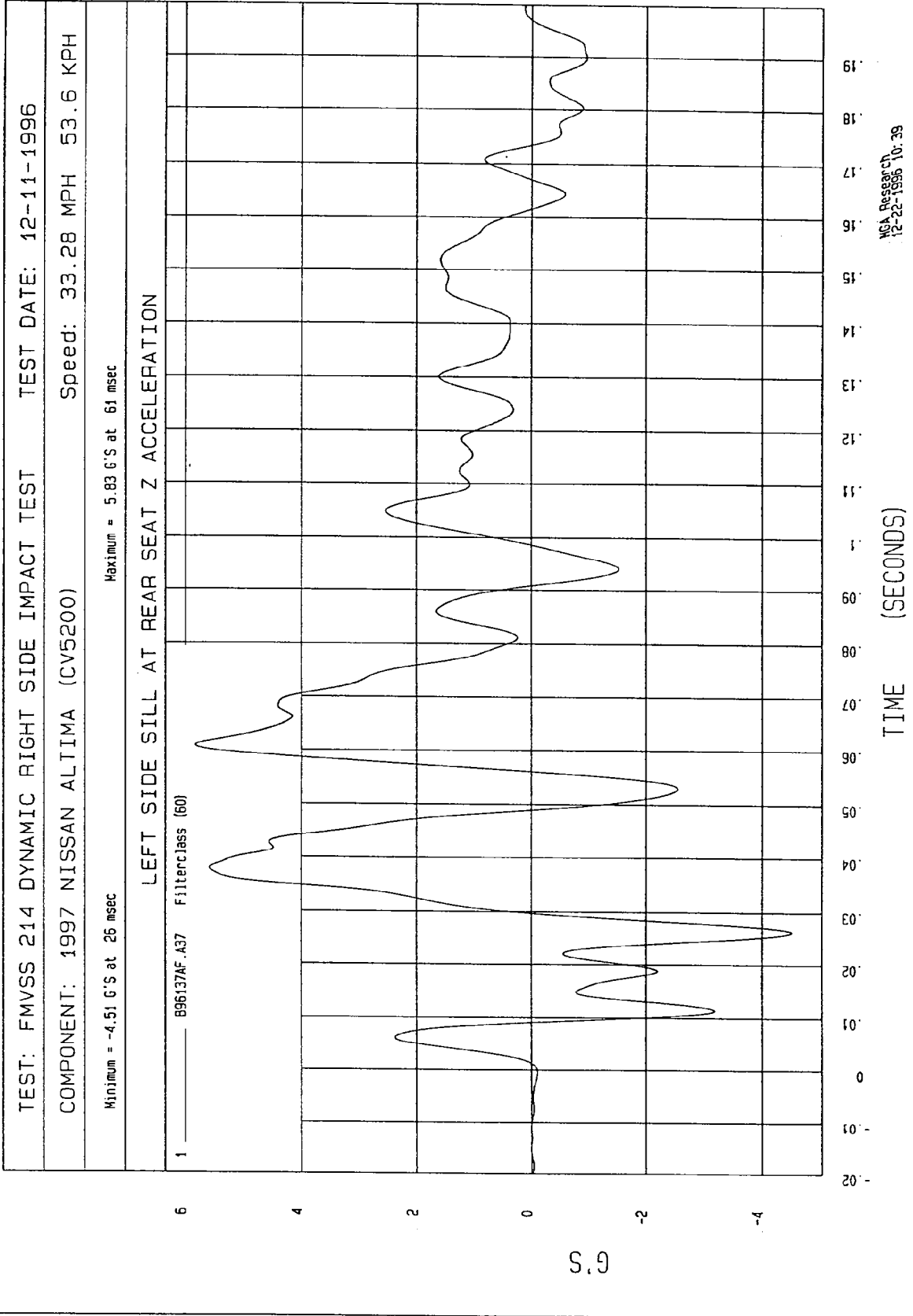
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -24.56 KPH at 100 msec Maximum = 4.50E-02 KPH at 2 msec

LEFT SIDE SILL AT REAR SEAT Y VELOCITY



MOA Research
01-03-1997 11:22

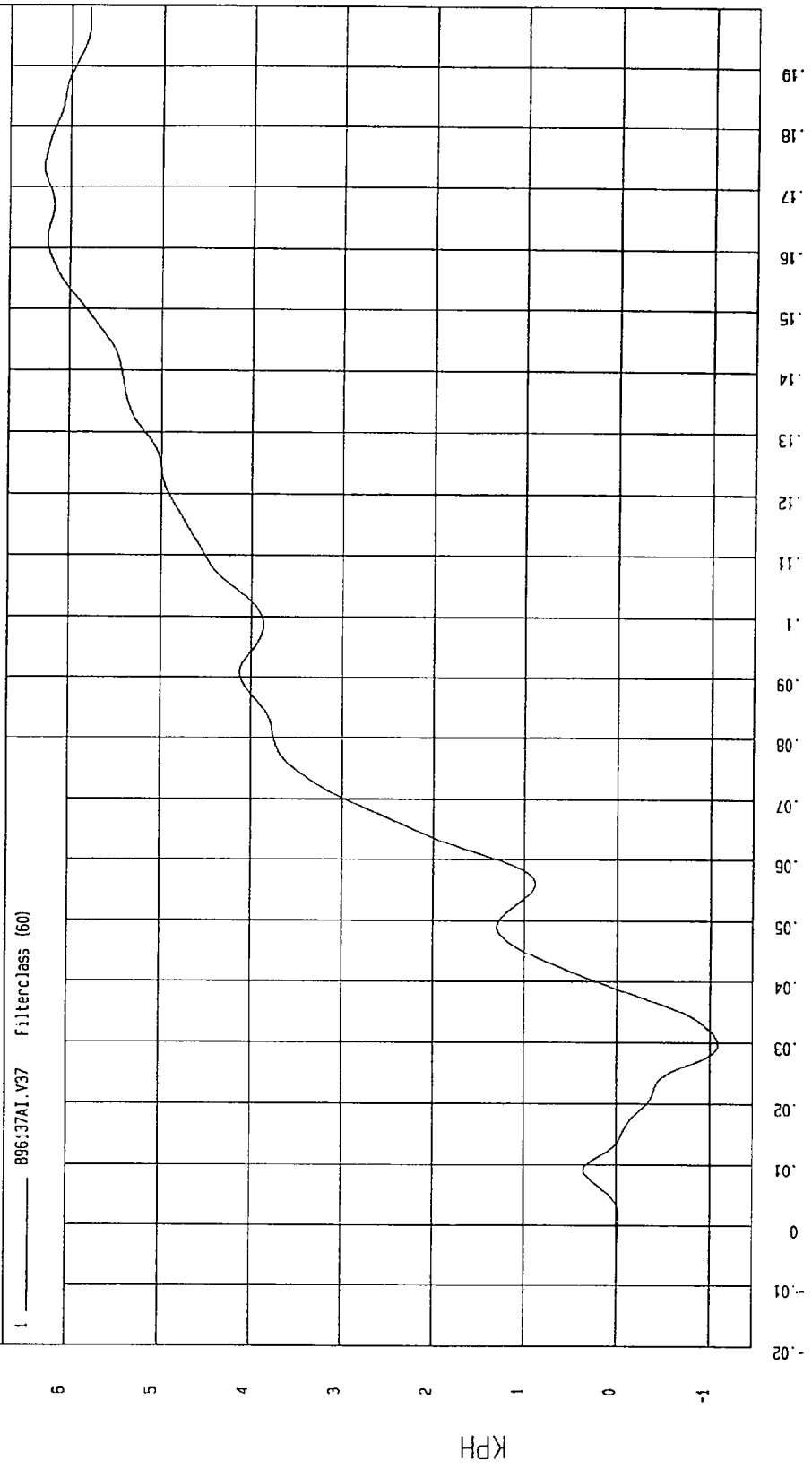


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

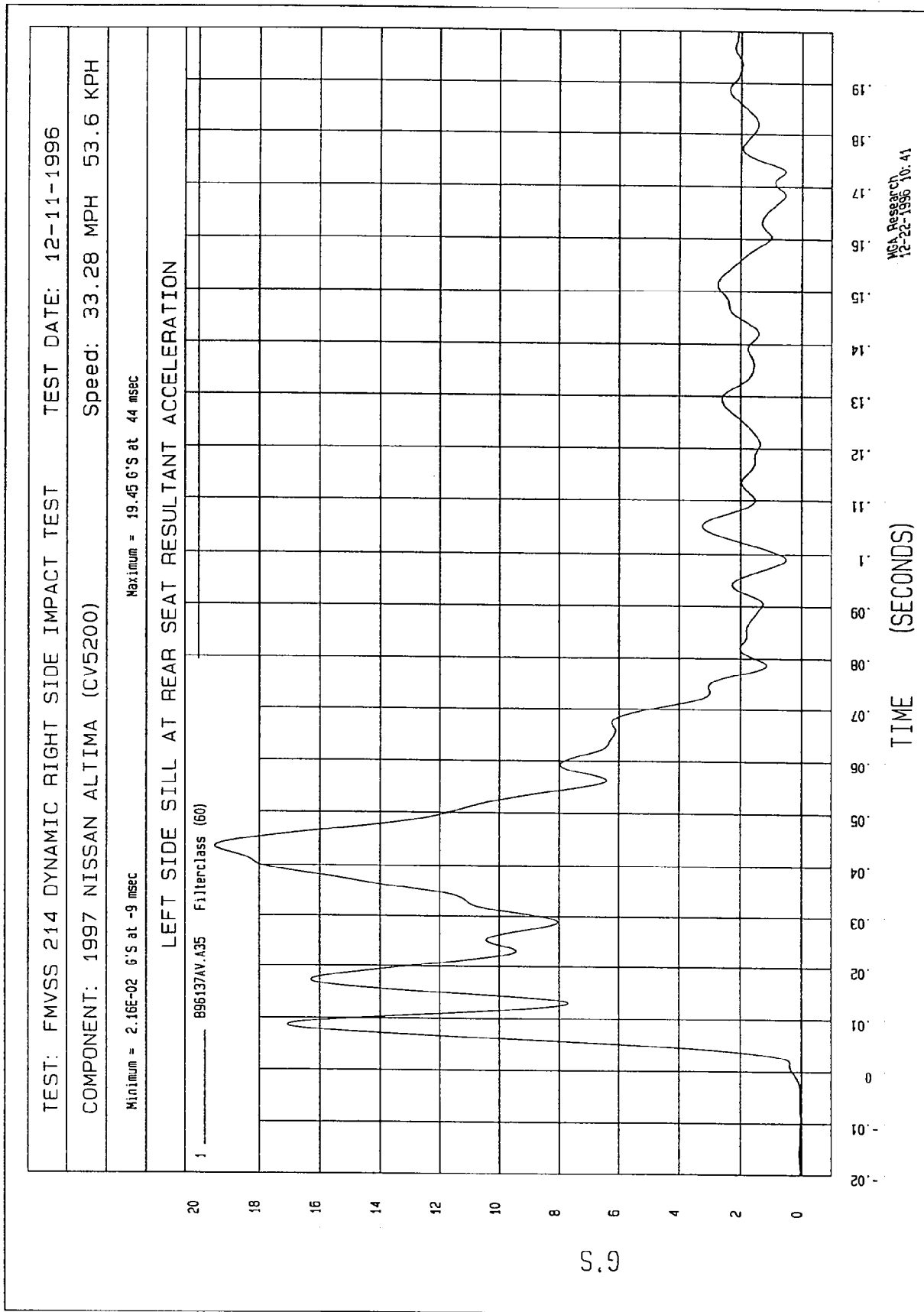
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -1.08 KPH at 30 msec Maximum = 6.28 KPH at 173 msec

LEFT SIDE SILL AT REAR SEAT Z VELOCITY



MGA Research
01-03-1997 11:23



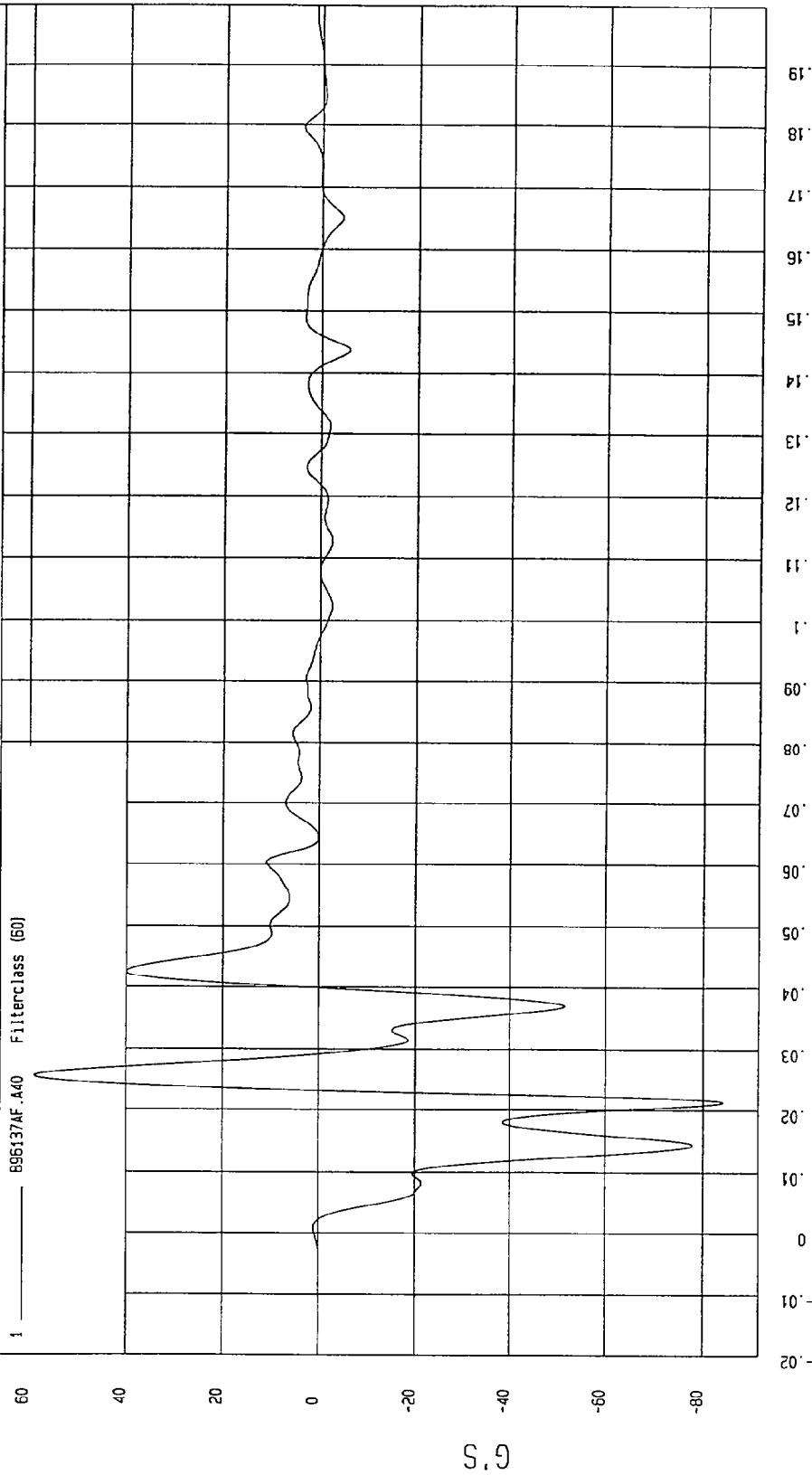
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -84.13 G'S at 21 msec Maximum = 58.92 G'S at 26 msec

RIGHT FRONT PASSENGER SEAT TRACK Y ACCELERATION

1 896137AF.A40 Filterclass (60)



MGA Research
12-22-1996 10:39

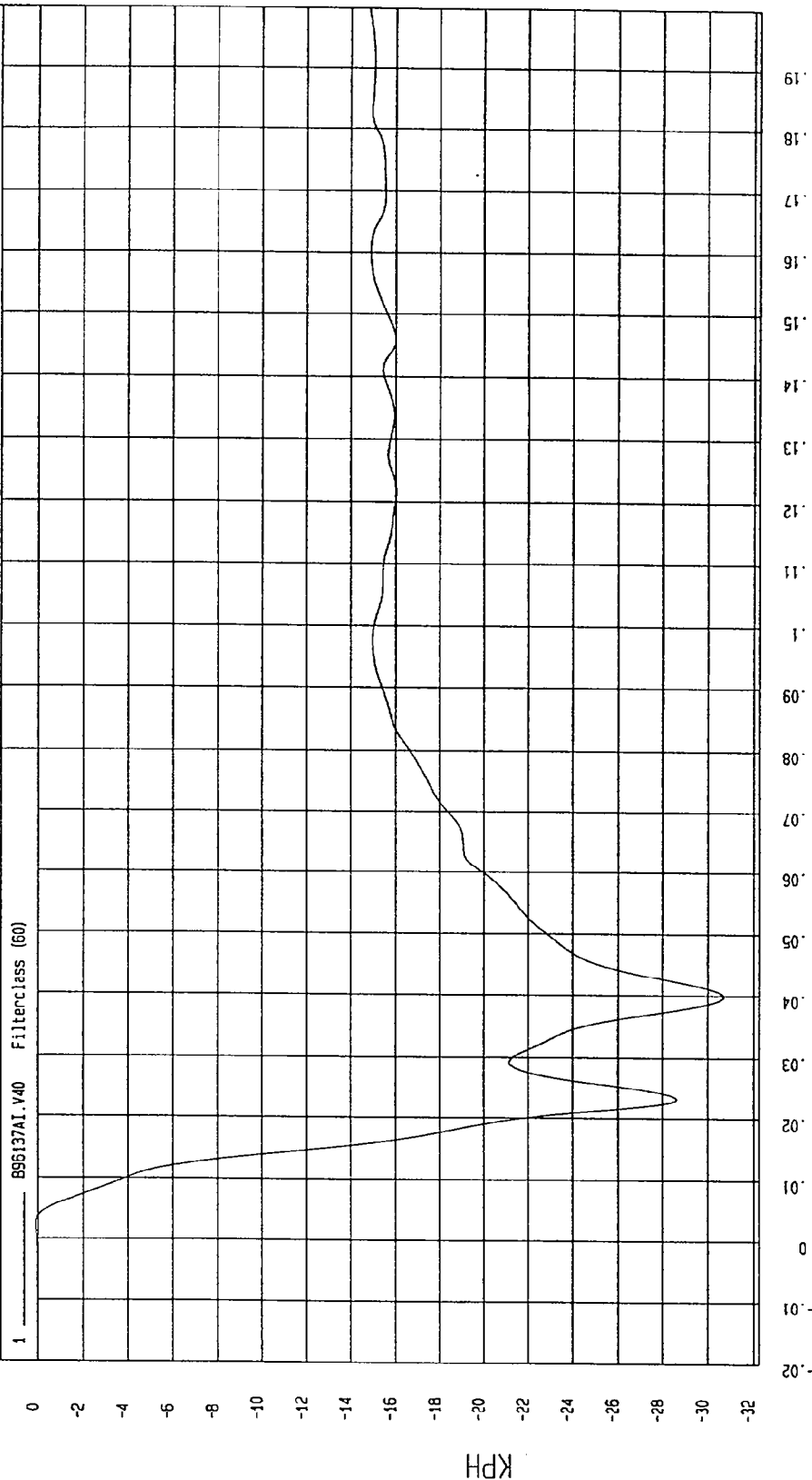
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -30.69 KPH at 40 msec

Maximum = .12 KPH at 2 msec

RIGHT FRONT PASSENGER SEAT TRACK Y VELOCITY



MCA Research
01-03-1997 11:23

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

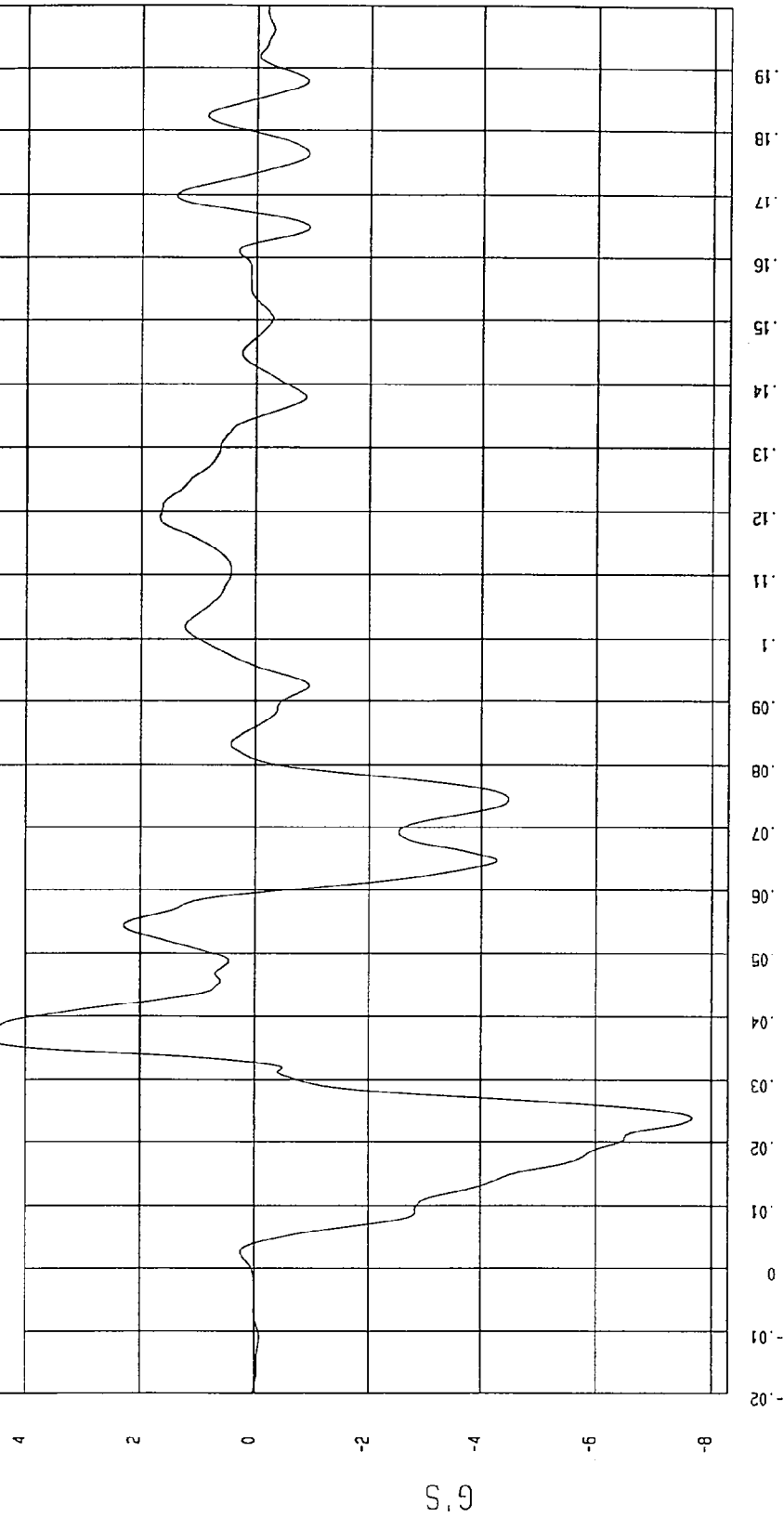
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -7.66 G'S at 24 msec

Maximum = 4.69 G'S at 36 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION

1 B96137AF.A08 Filterclass (60)



WCA Research
12-22-1998 10:39

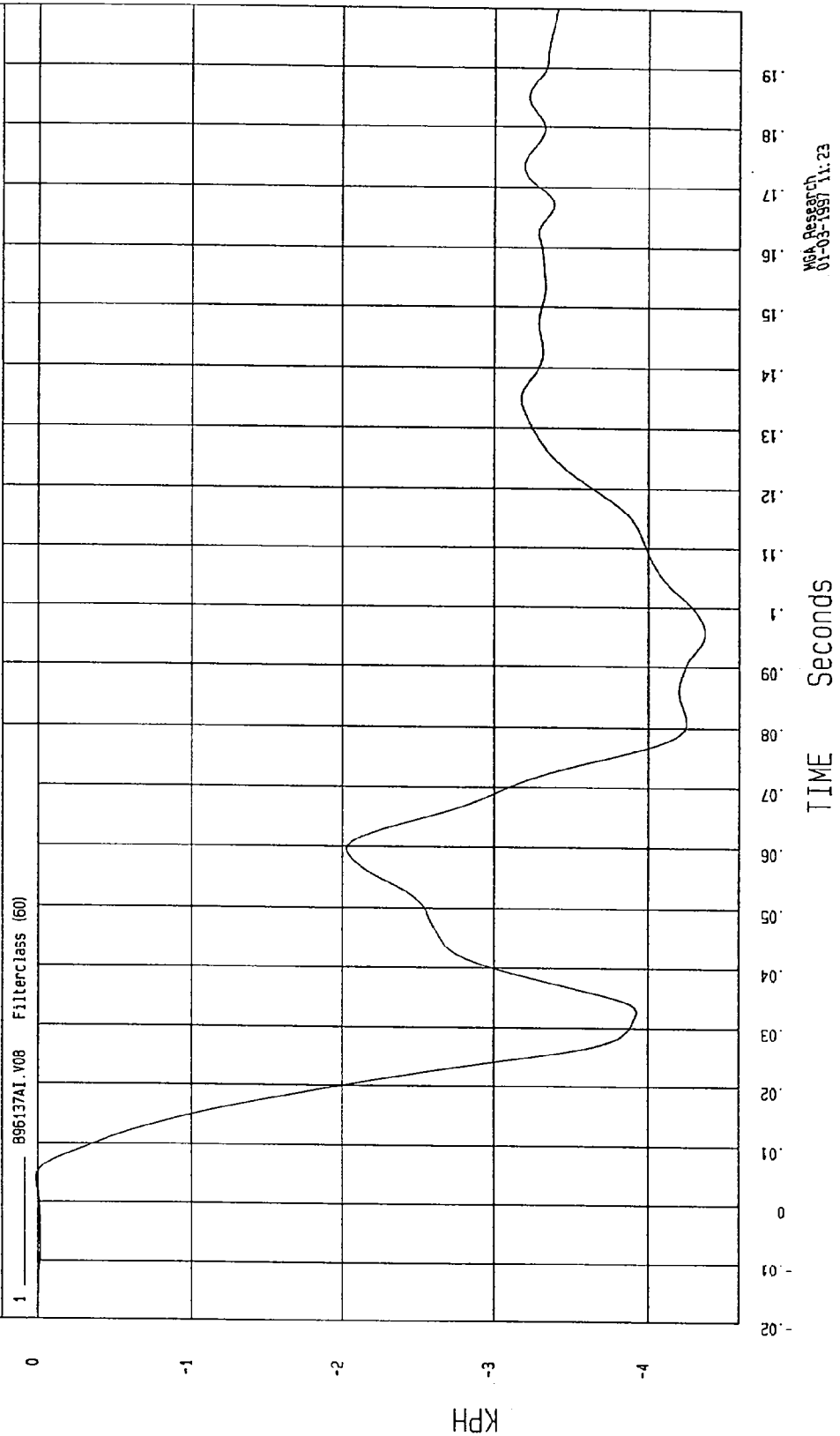
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -4.36 KPH at 96 msec

Maximum = 1.26E-02 KPH at 4 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

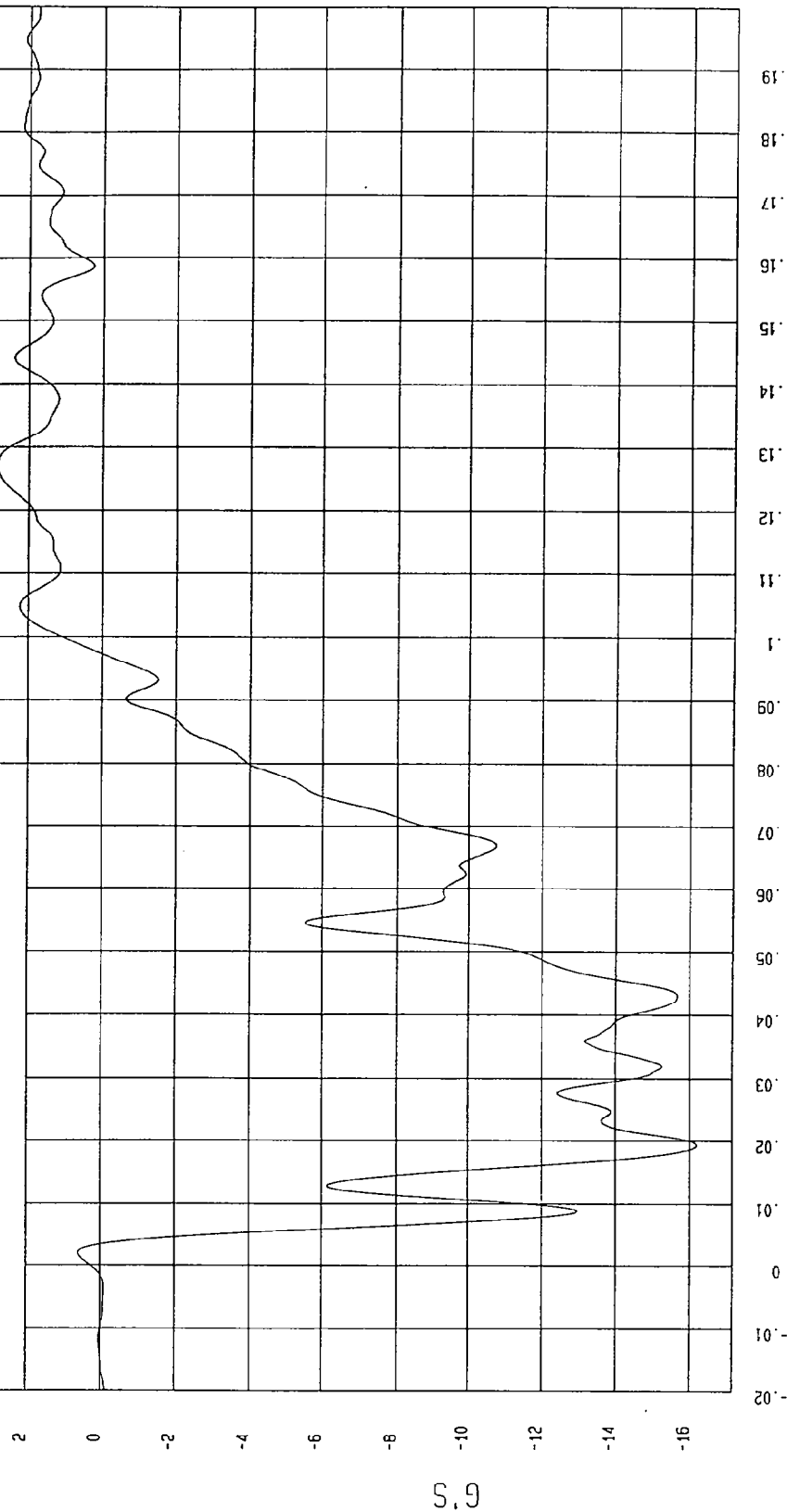
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -16.18 G'S at 19 msec

Maximum = 2.83 G'S at 127 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION

1 B96137AF.A09 Filterclass (60)



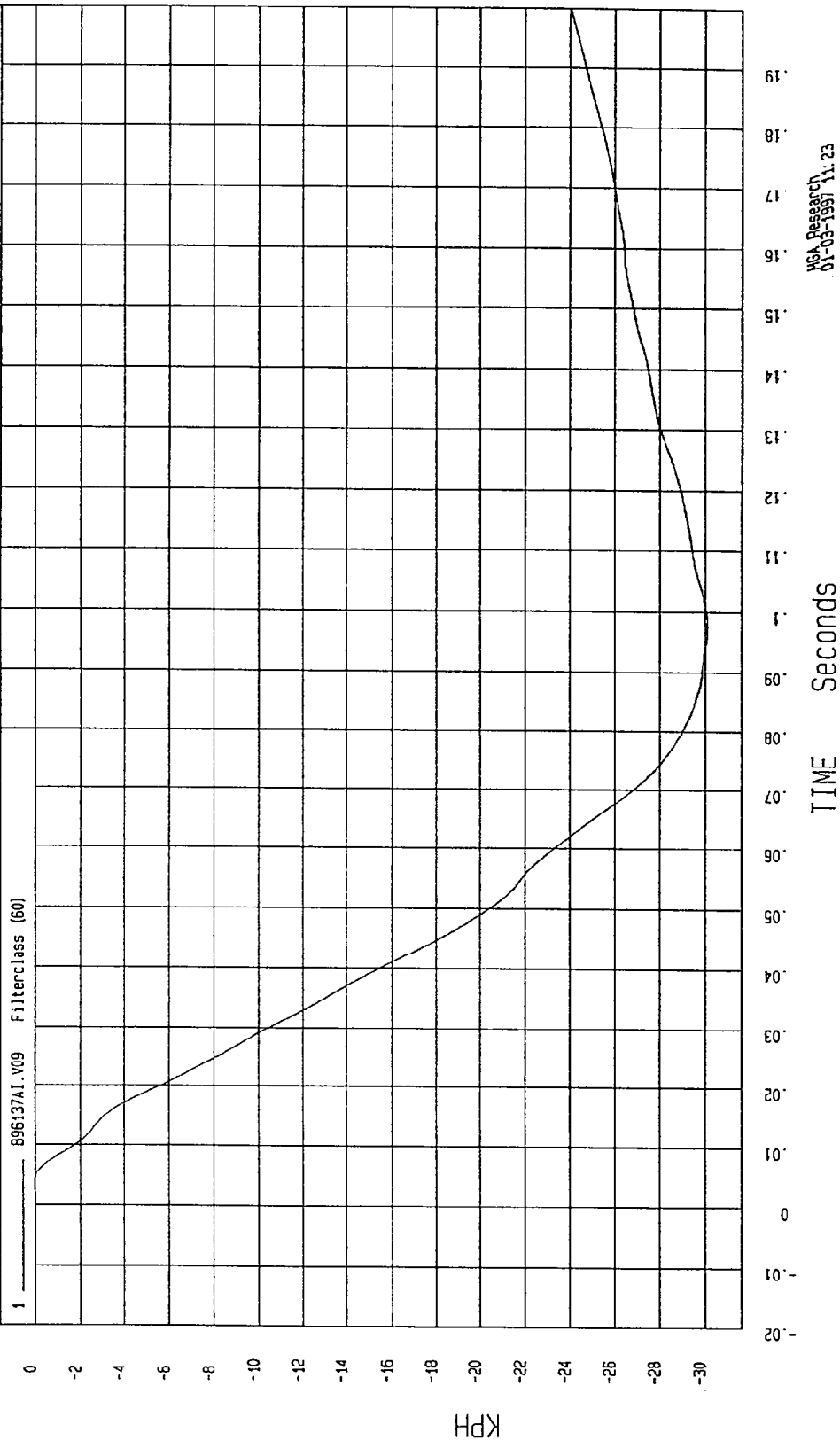
NSA Research
12-22-1996 10:39

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -30.10 KPH at 97 msec Maximum = 3.40E-02 KPH at 3 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

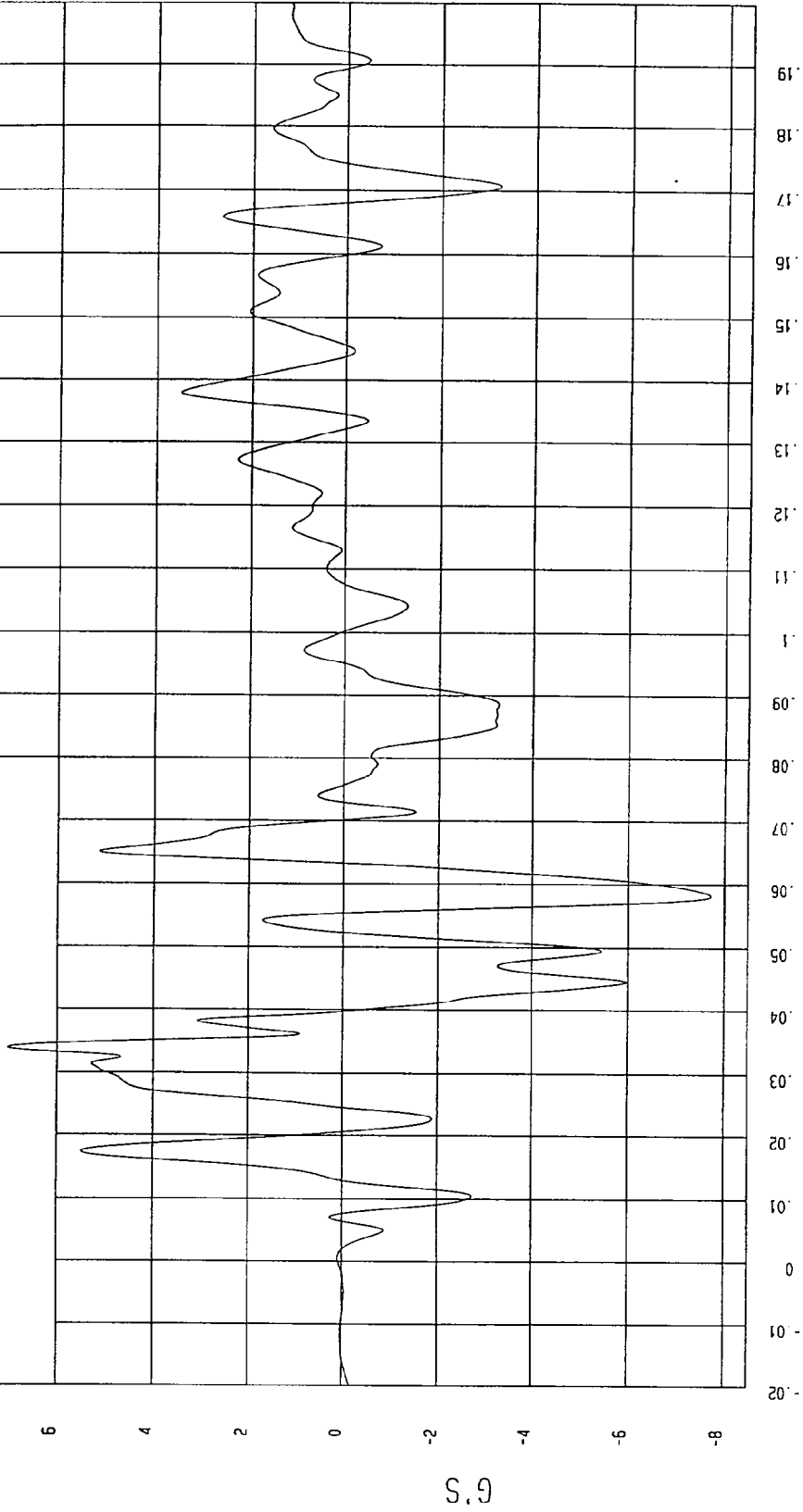
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -7.73 G'S at 59 msec

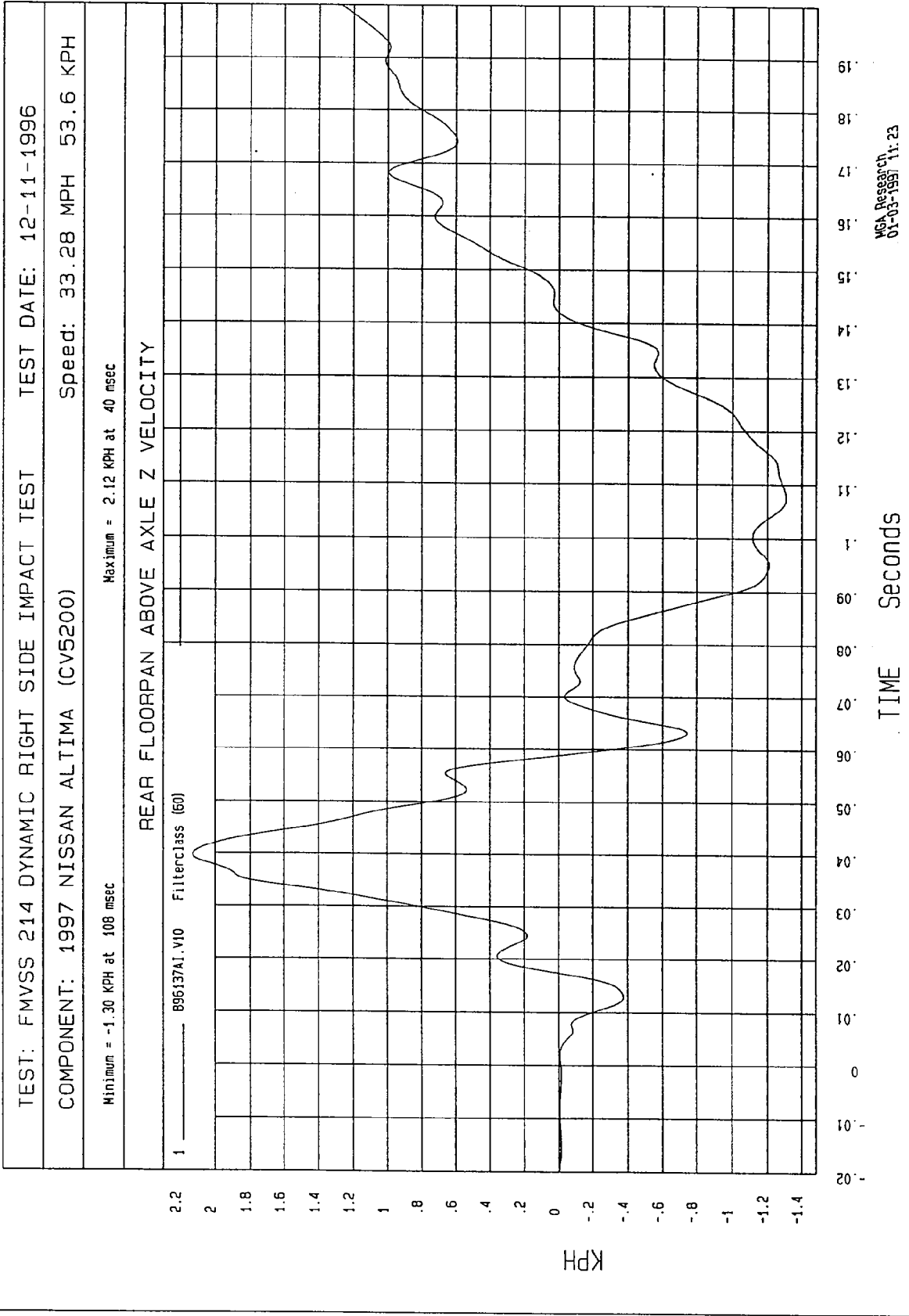
Maximum = 7.01 G'S at 34 msec

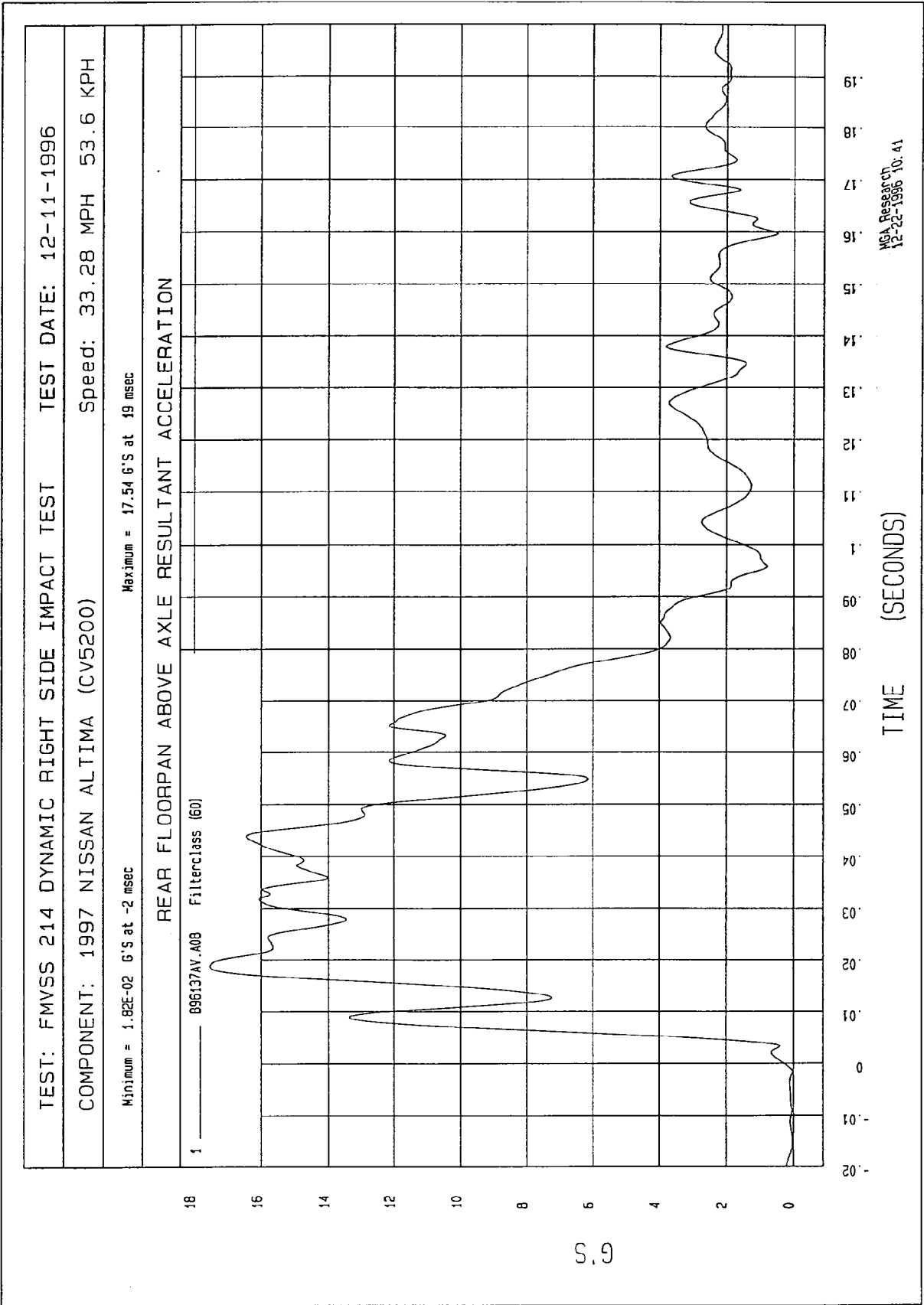
REAR FLOORPAN ABOVE AXLE Z ACCELERATION

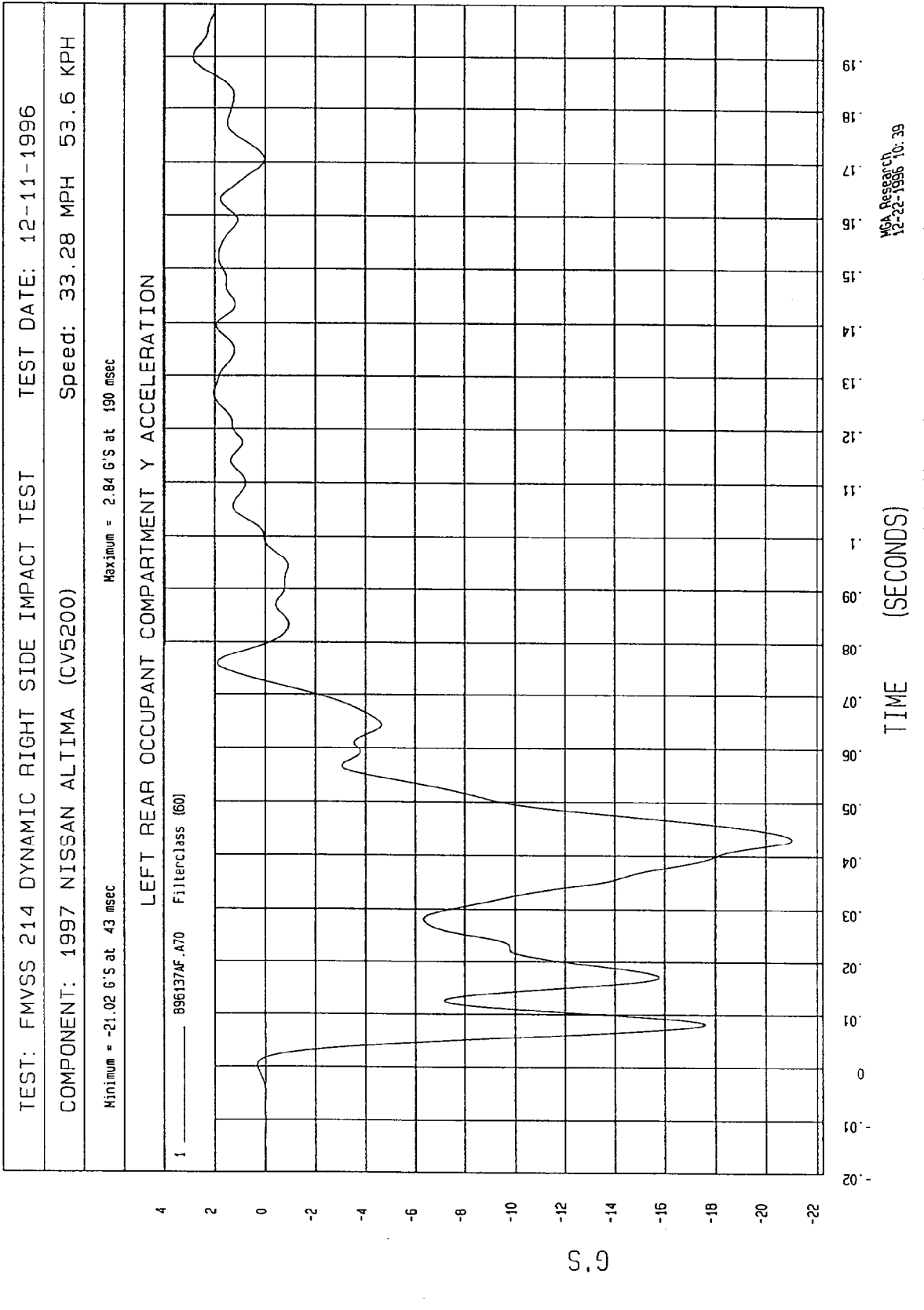
1 B96137AF.A10 Filterclass (60)



MSA Research
12-22-1996 10:39





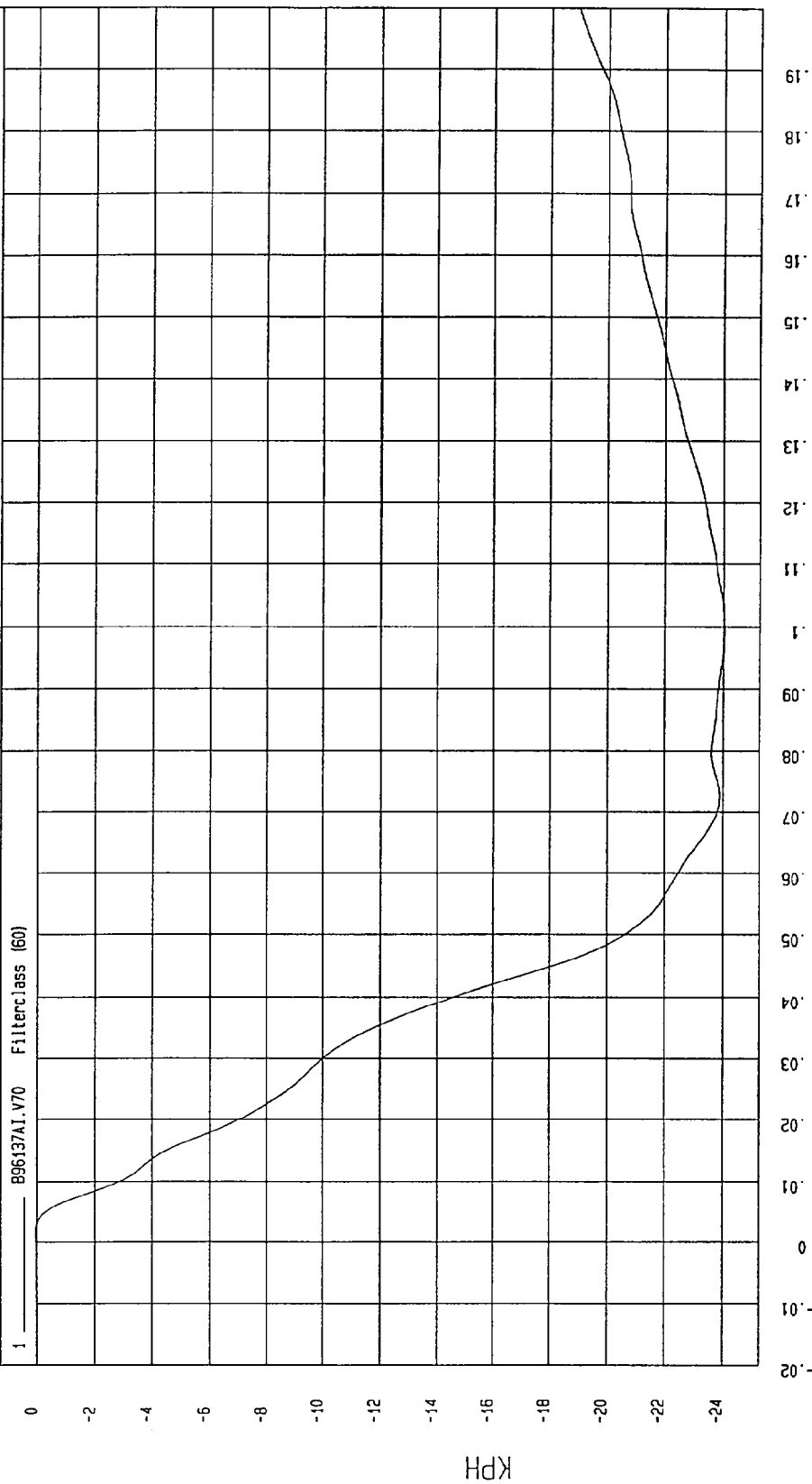


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

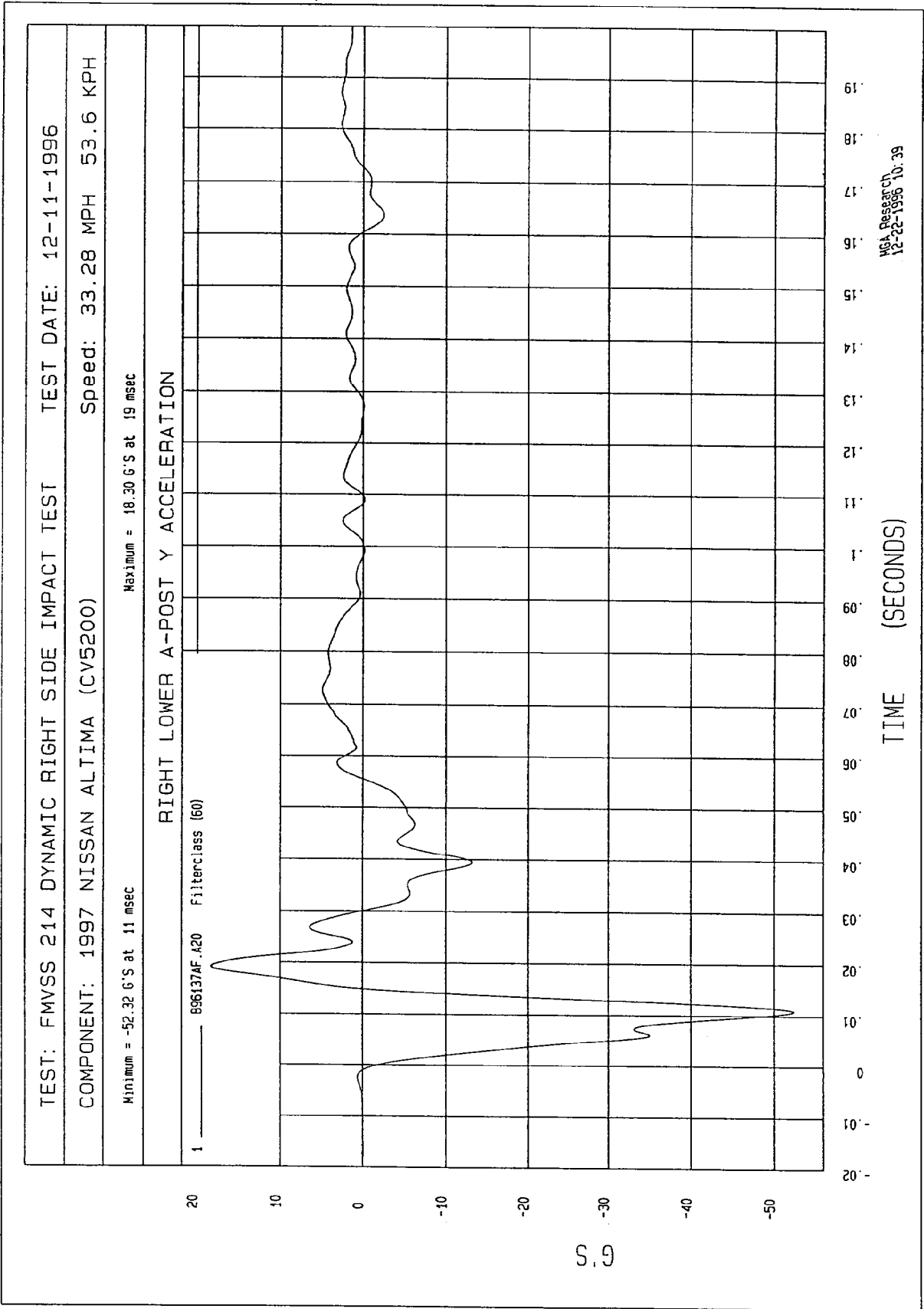
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -24.04 KPH at 99 msec Maximum = 4.79E-02 KPH at 2 msec

LEFT REAR OCCUPANT COMPARTMENT Y VELOCITY



MCA Research
01-03-1997 11:23

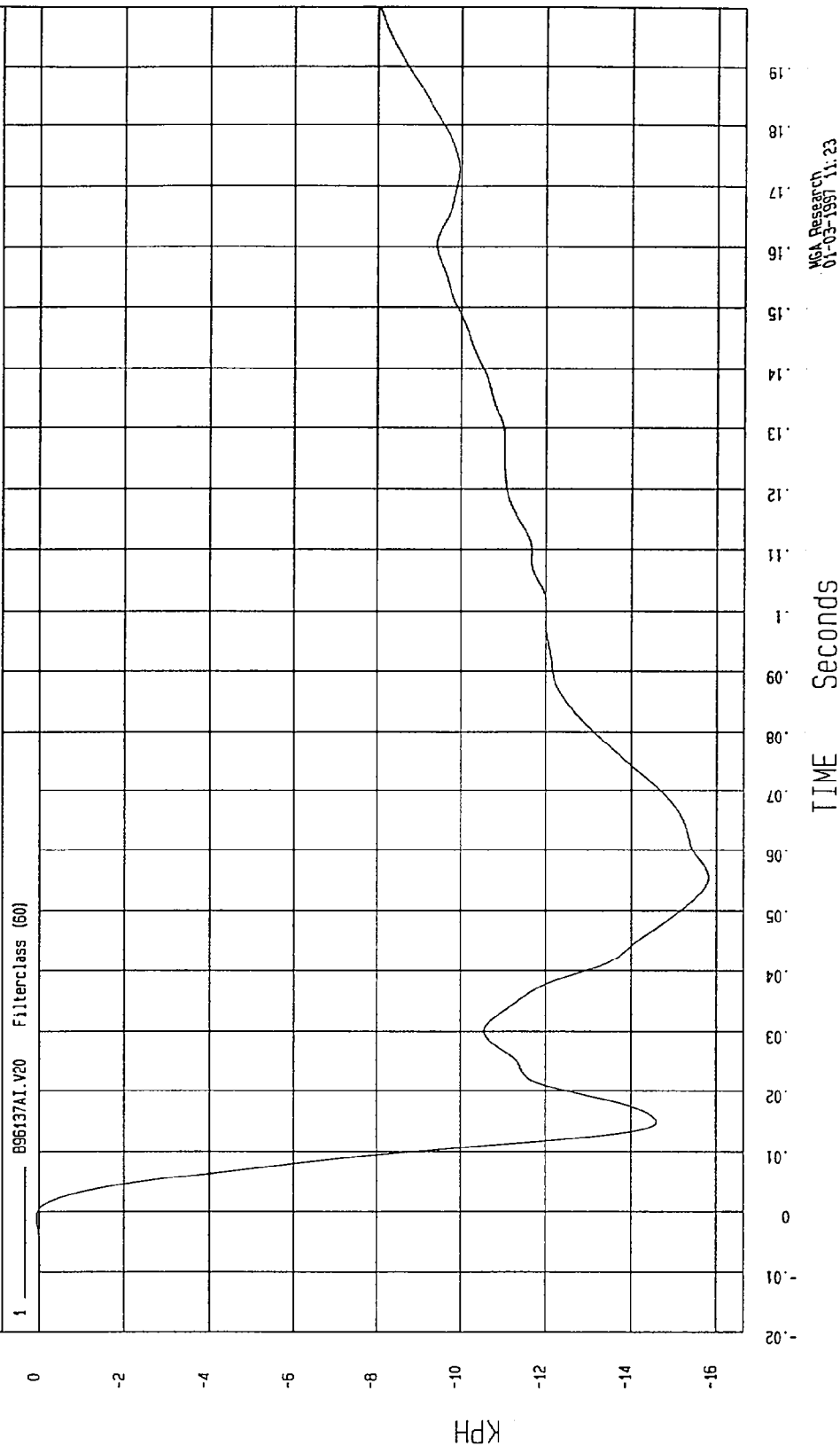


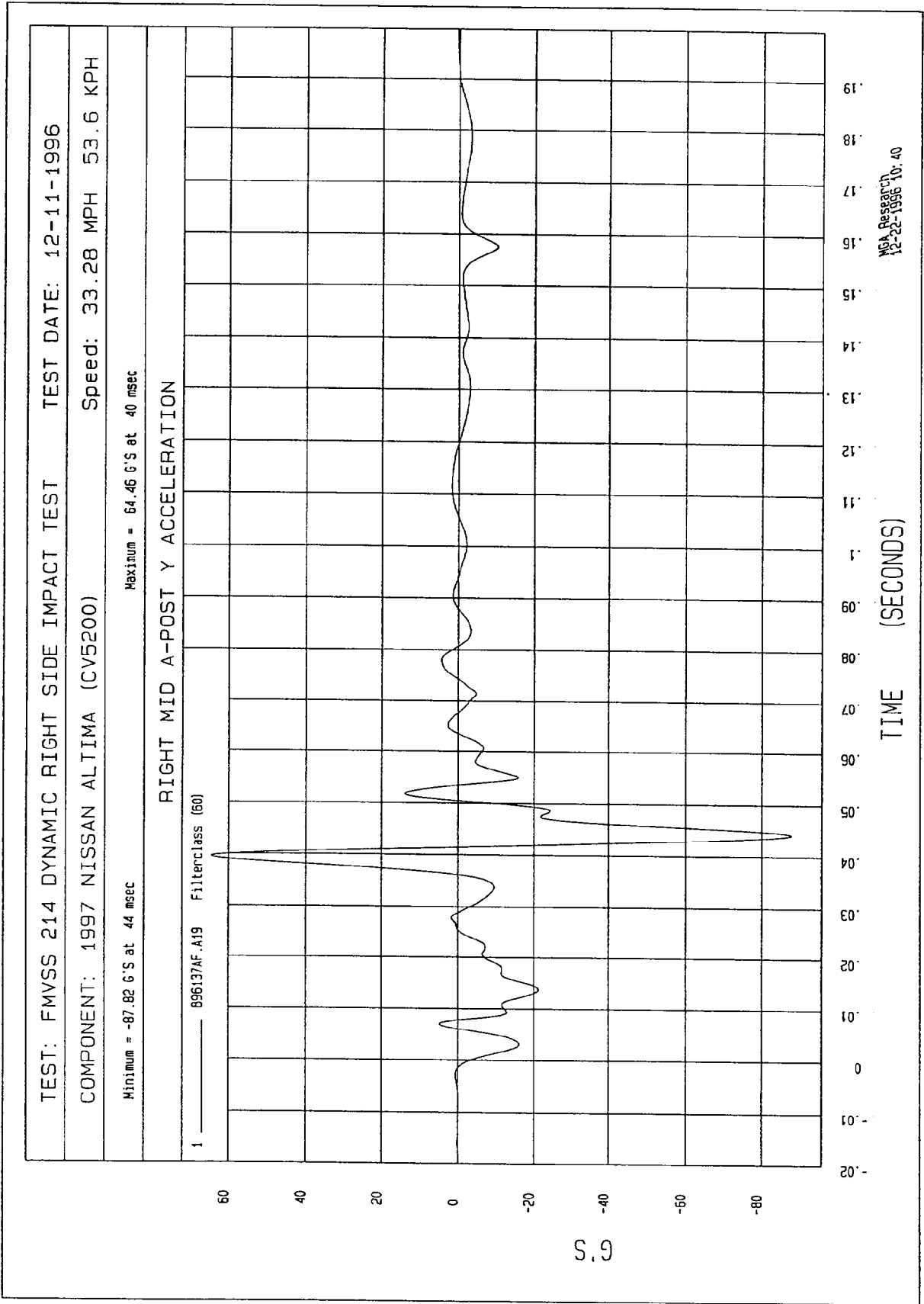
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -15.81 KPH at 56 msec Maximum = 6.74E-02 KPH at -1 msec

RIGHT LOWER A-POST Y VELOCITY



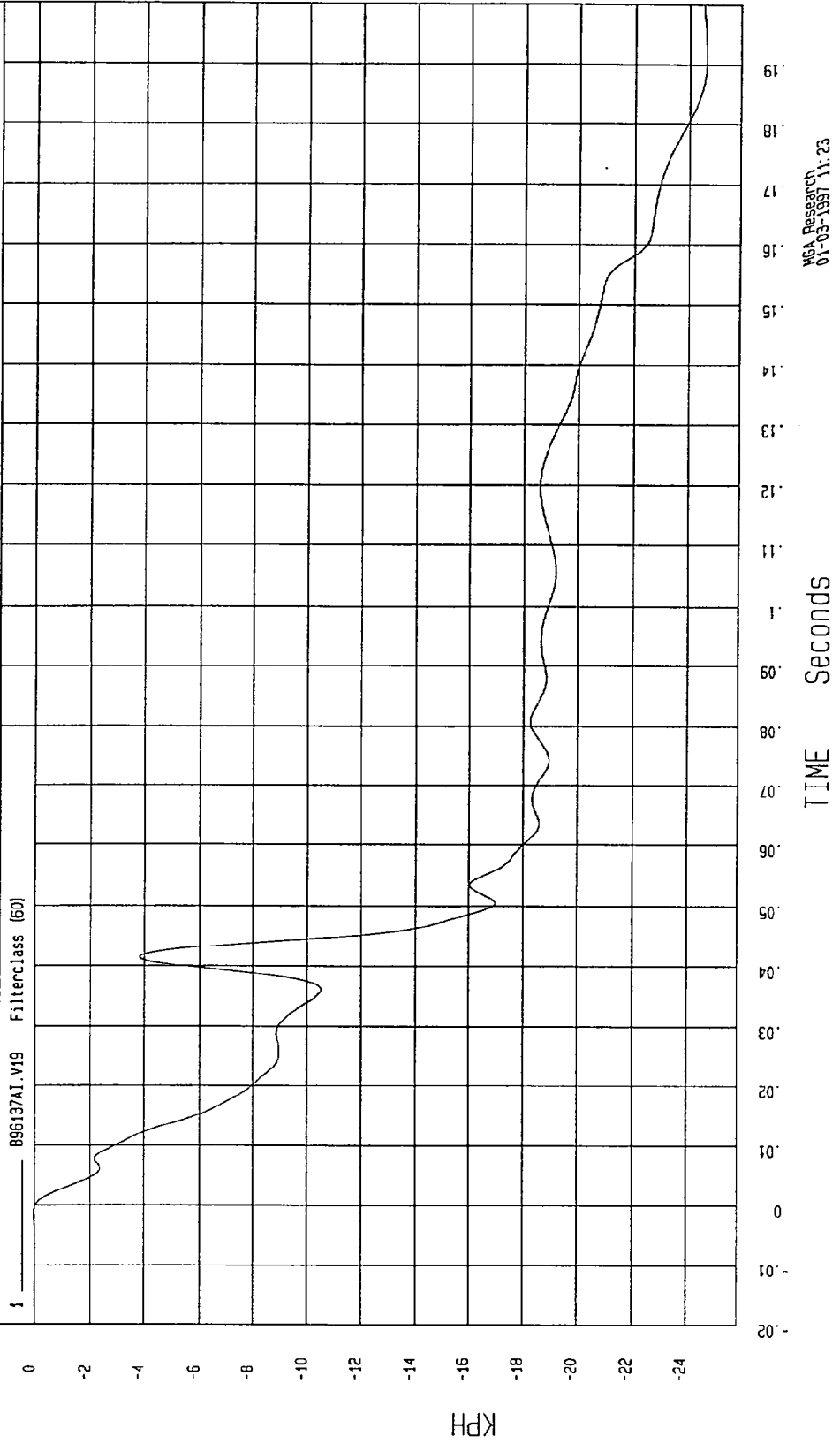


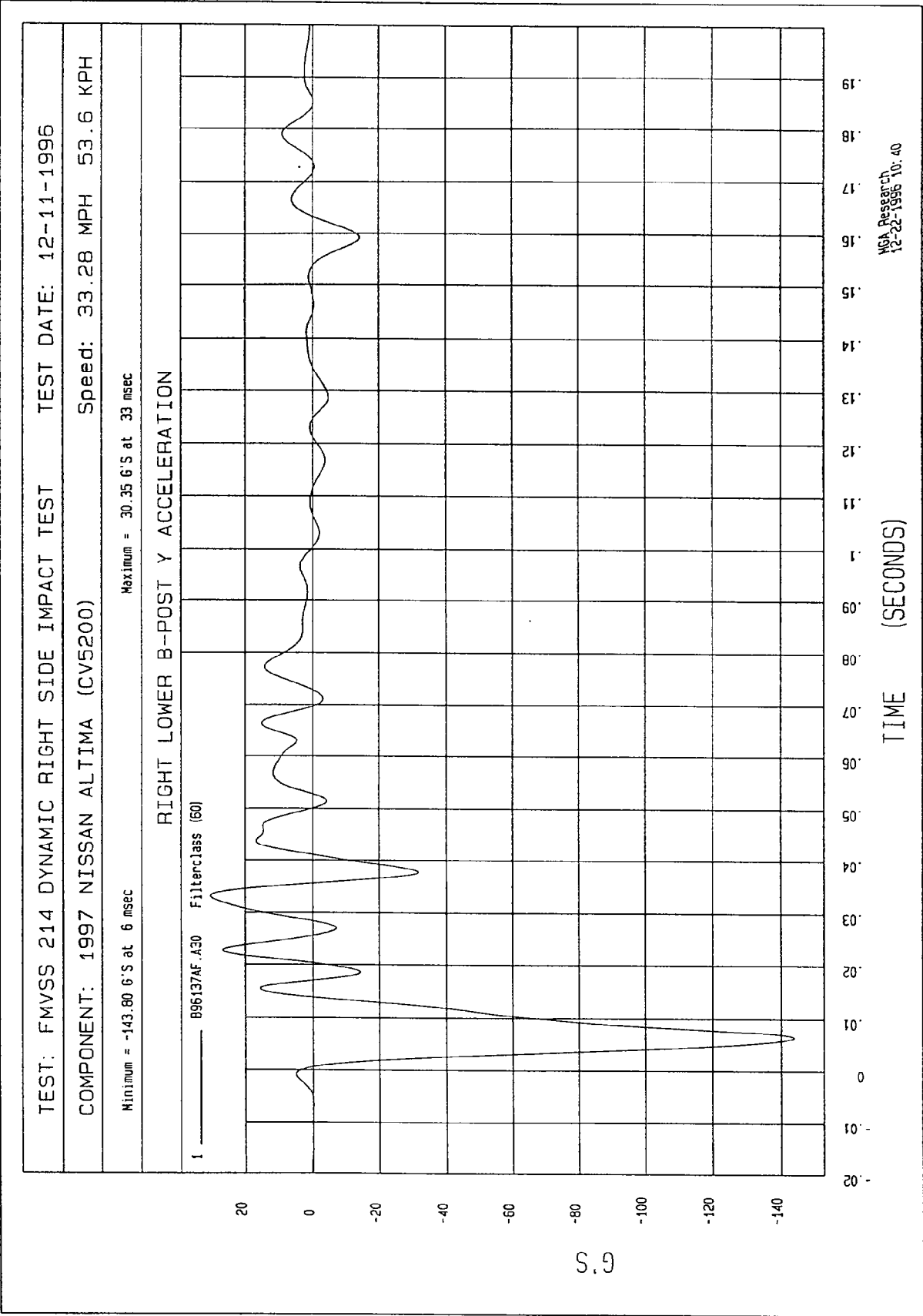
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -24.61 KPH at 192 msec Maximum = 5.02E-02 KPH at -2 msec

RIGHT MID A-POST Y VELOCITY



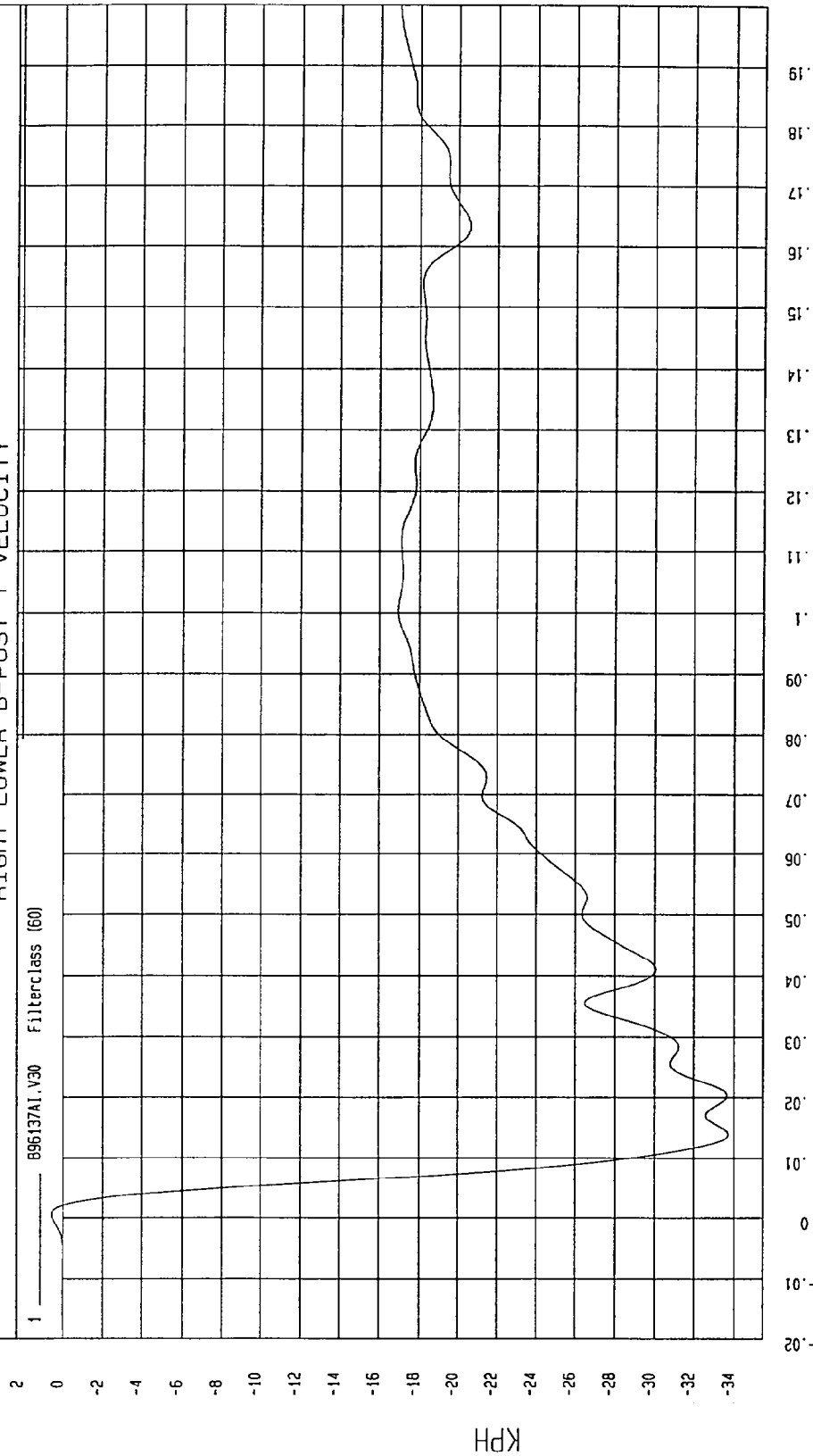


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

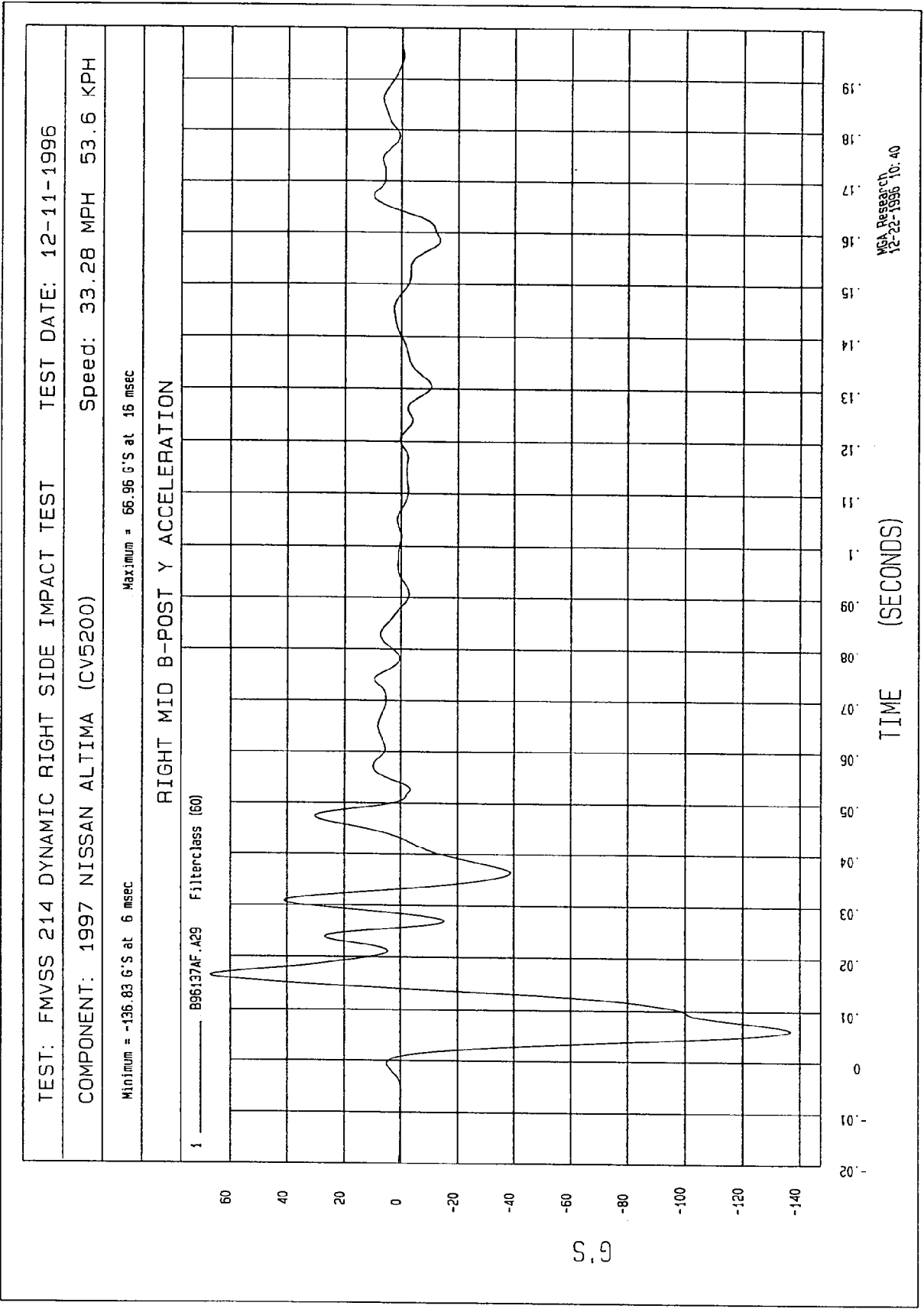
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -33.71 KPH at 14 msec Maximum = .55 KPH at 1 msec

RIGHT LOWER B-POST Y VELOCITY



MGA Research
01-03-1997 11:23

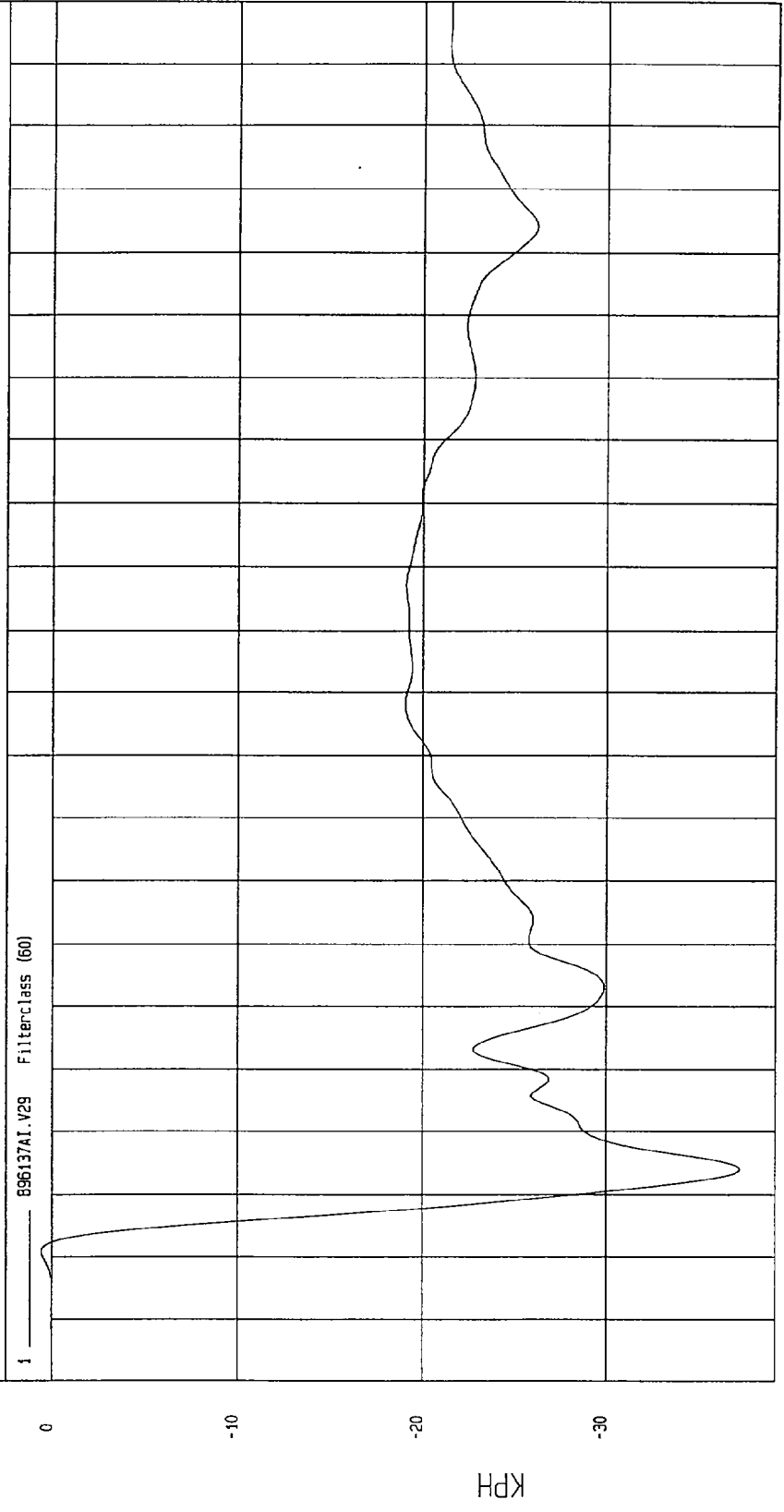


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -37.18 KPH at 14 msec Maximum = .58 KPH at 1 msec

RIGHT MID B-POST Y VELOCITY



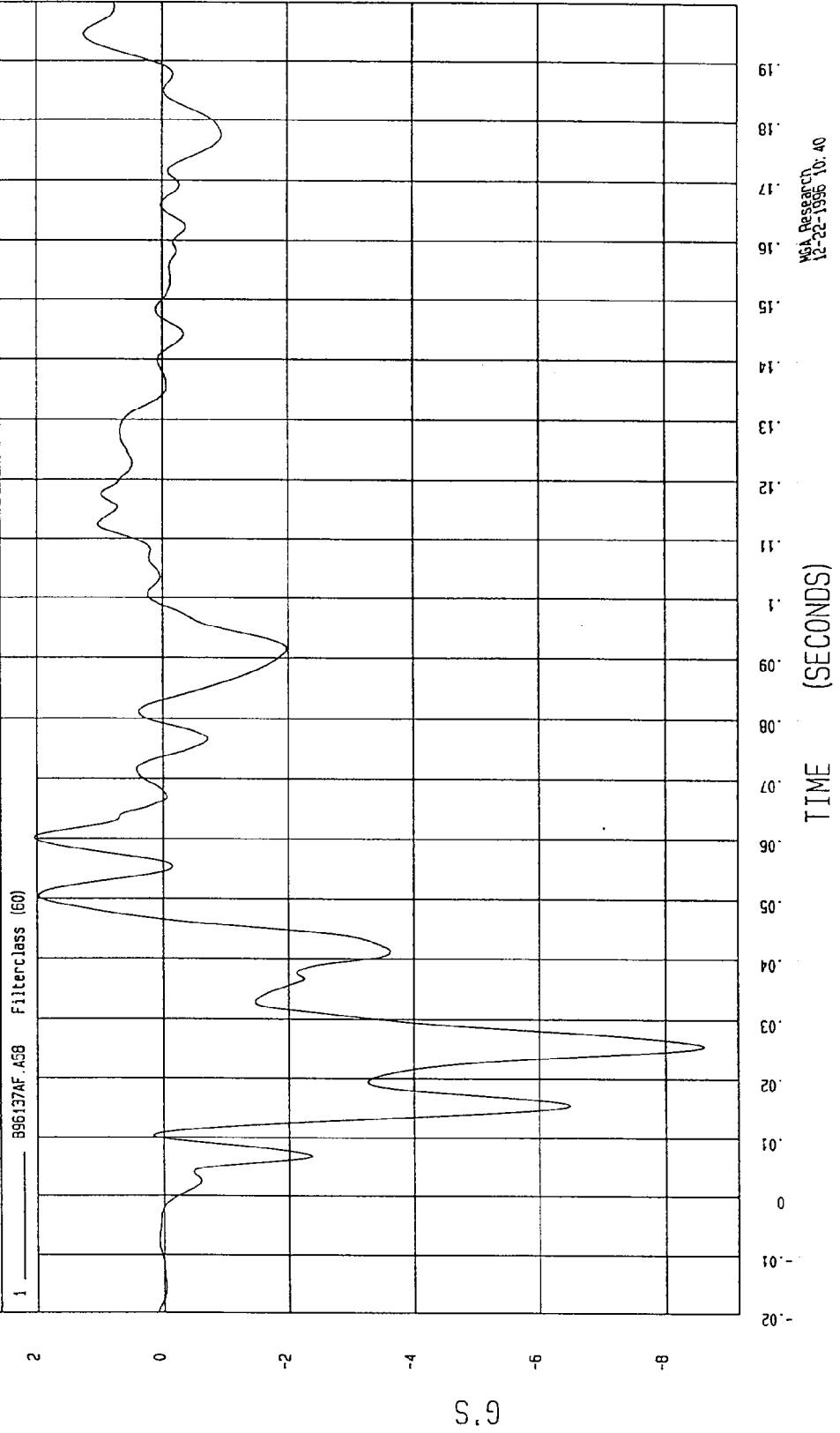
NGA Research
01-03-1997 11:23

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -8.59 G'S at 26 msec Maximum = 2.04 G'S at 60 msec

VEHICLE CG X ACCELERATION

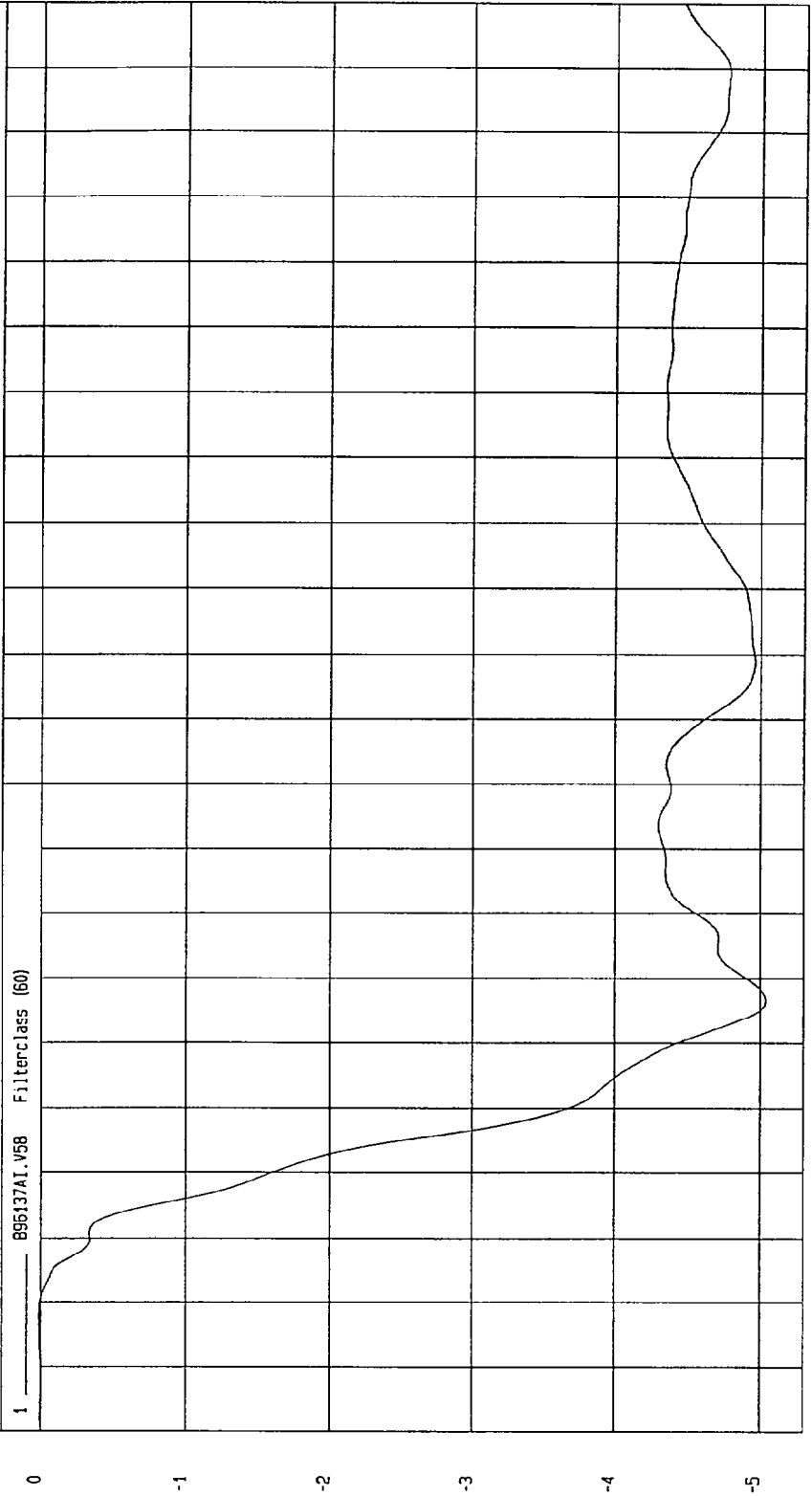


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

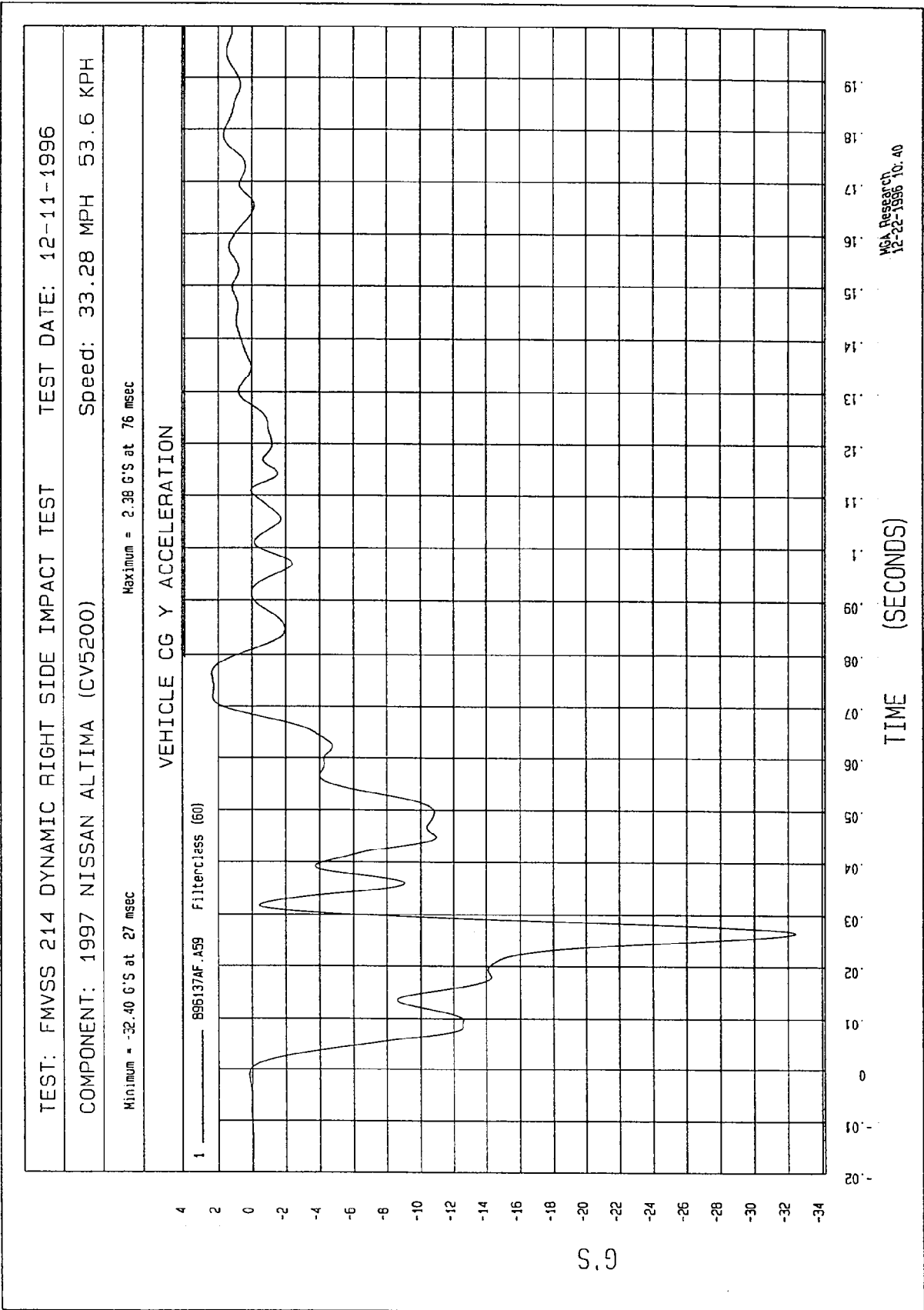
Minimum = -5.04 KPH at 47 msec Maximum = 1.29E-02 KPH at -2 msec

VEHICLE CG X VELOCITY



TIME Seconds

NCA Research
01-03-1997 11:24



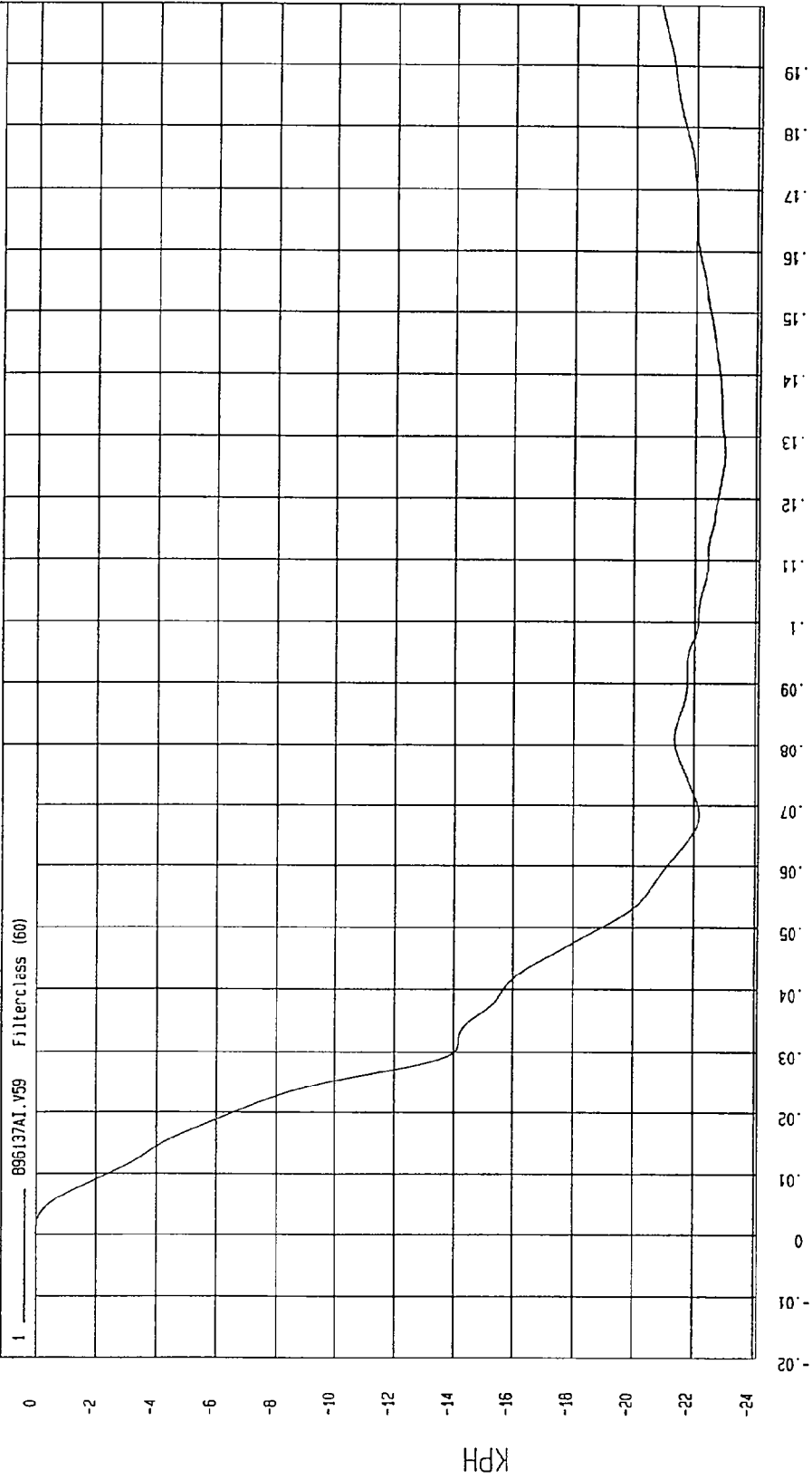
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

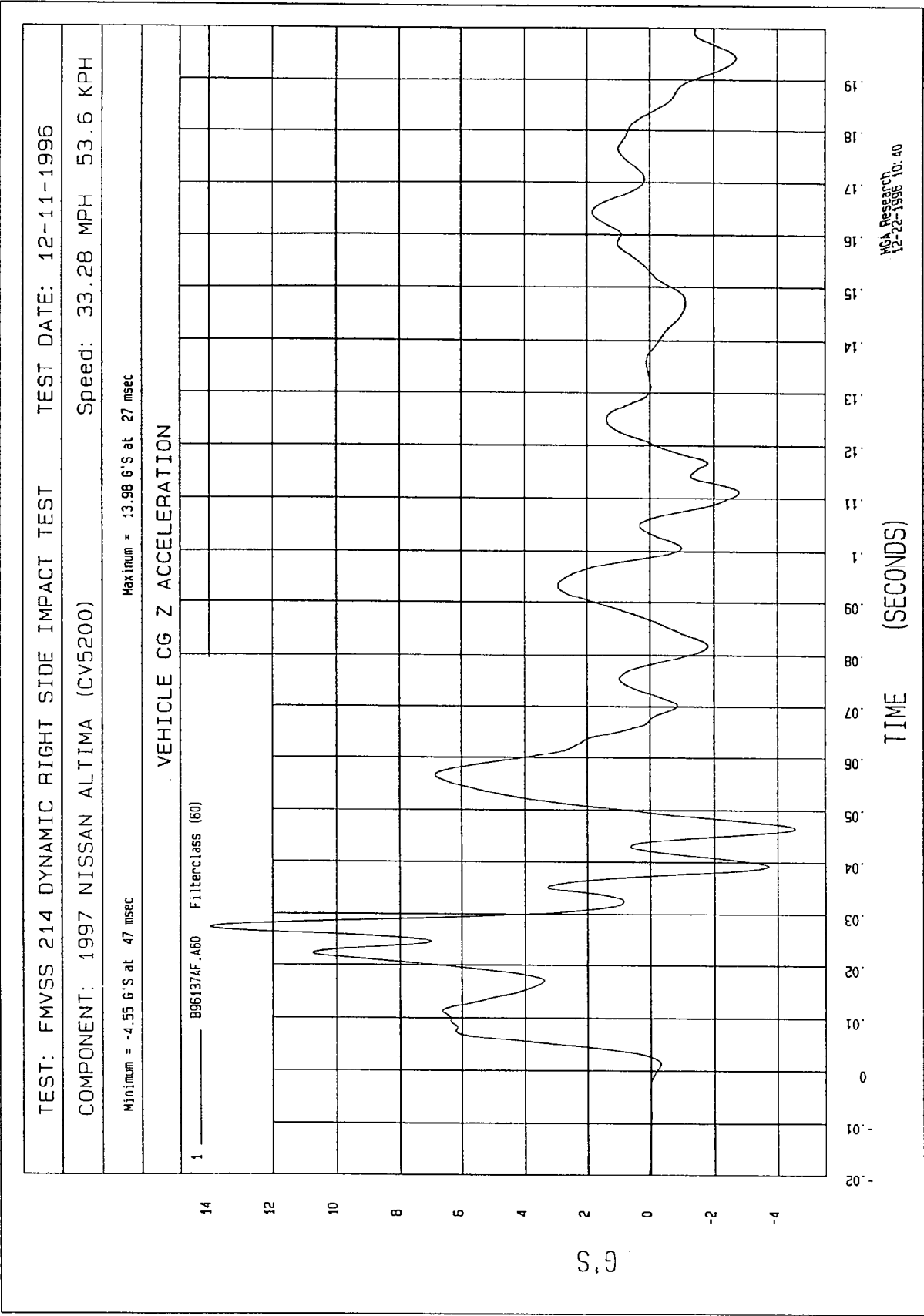
Minimum = -22.95 KPH at 128 msec

Maximum = 1.33E-02 KPH at 0 msec

VEHICLE CG Y VELOCITY



MCA Research
01-03-1997 11:24

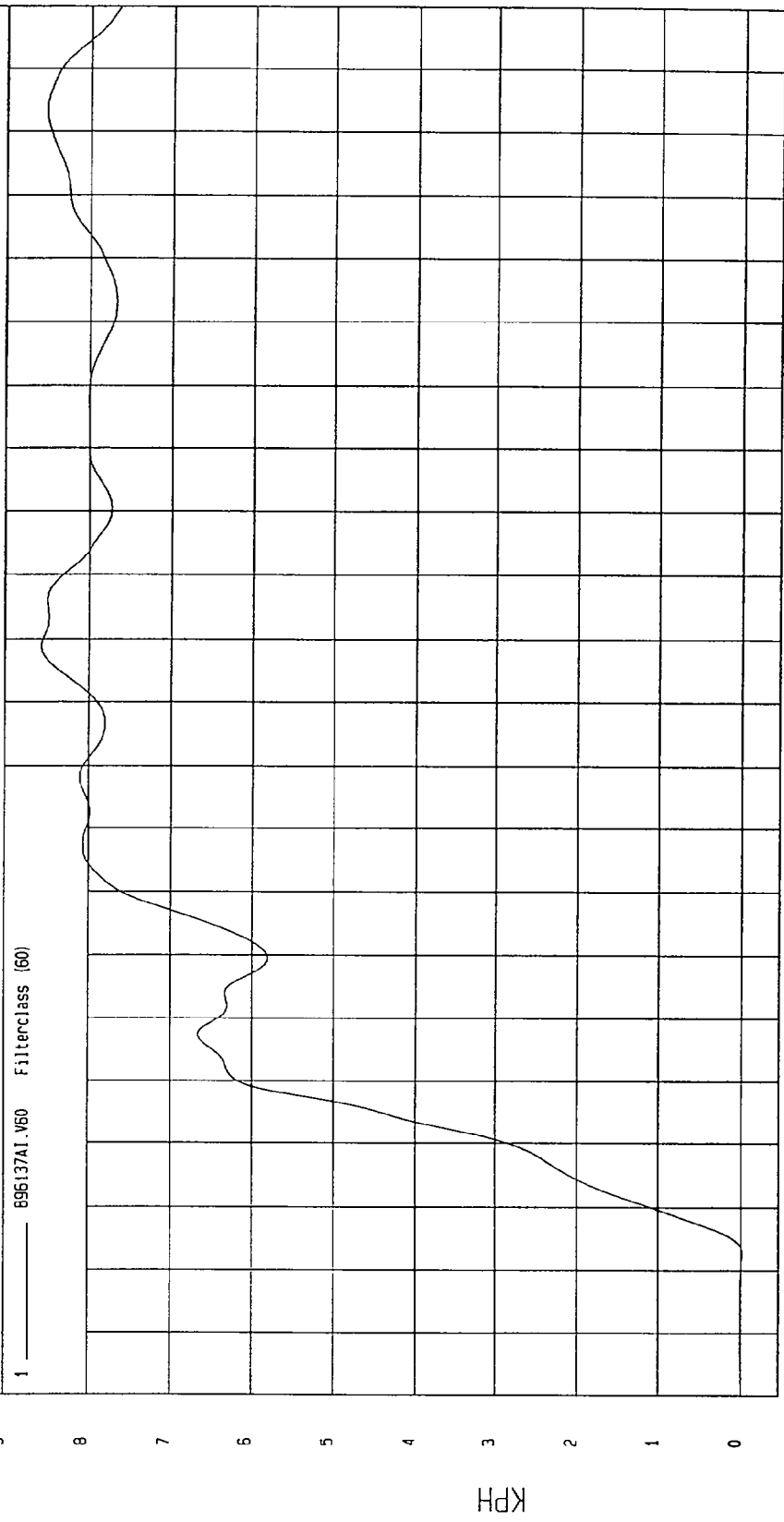


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -2.01E-02 KPH at 3 msec Maximum = 8.57 KPH at 99 msec

VEHICLE CG Z VELOCITY



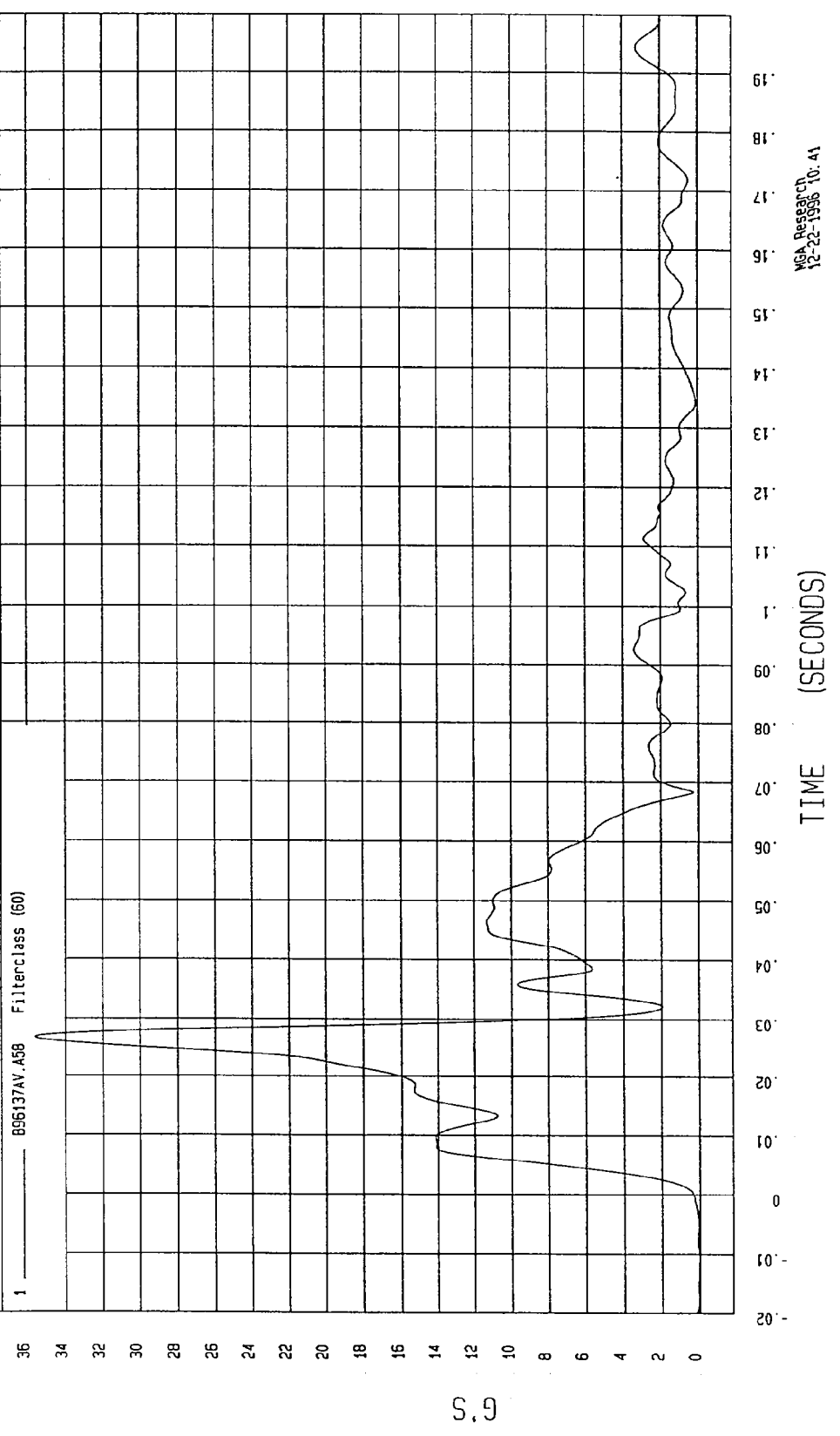
TIME Seconds

NGA Research
01-03-1997 11:24

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = .01 G'S at -11 msec Maximum = 35.60 G'S at 27 msec

VEHICLE CG RESULTANT ACCELERATION



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

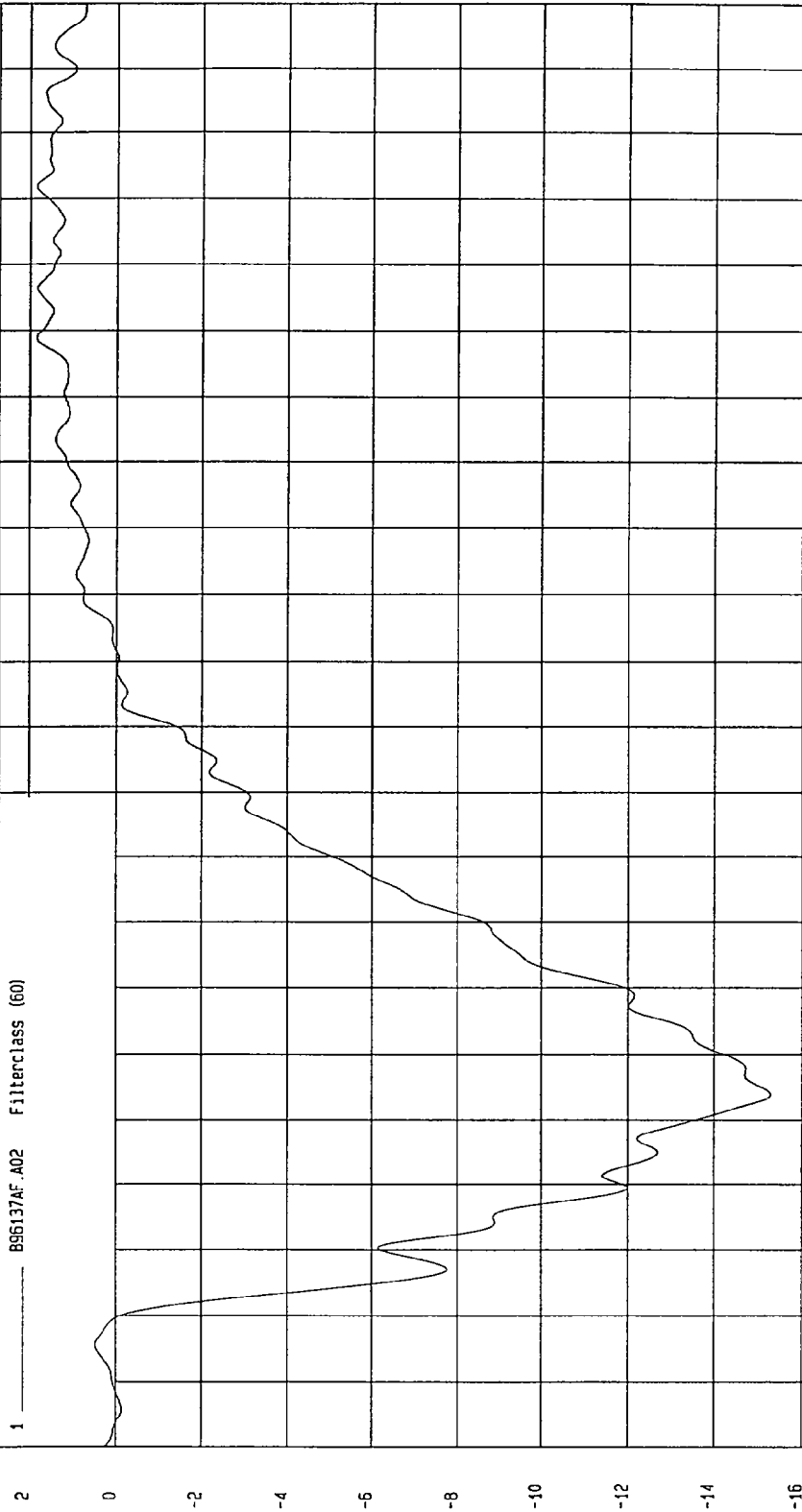
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -15.28 G'S at 34 msec

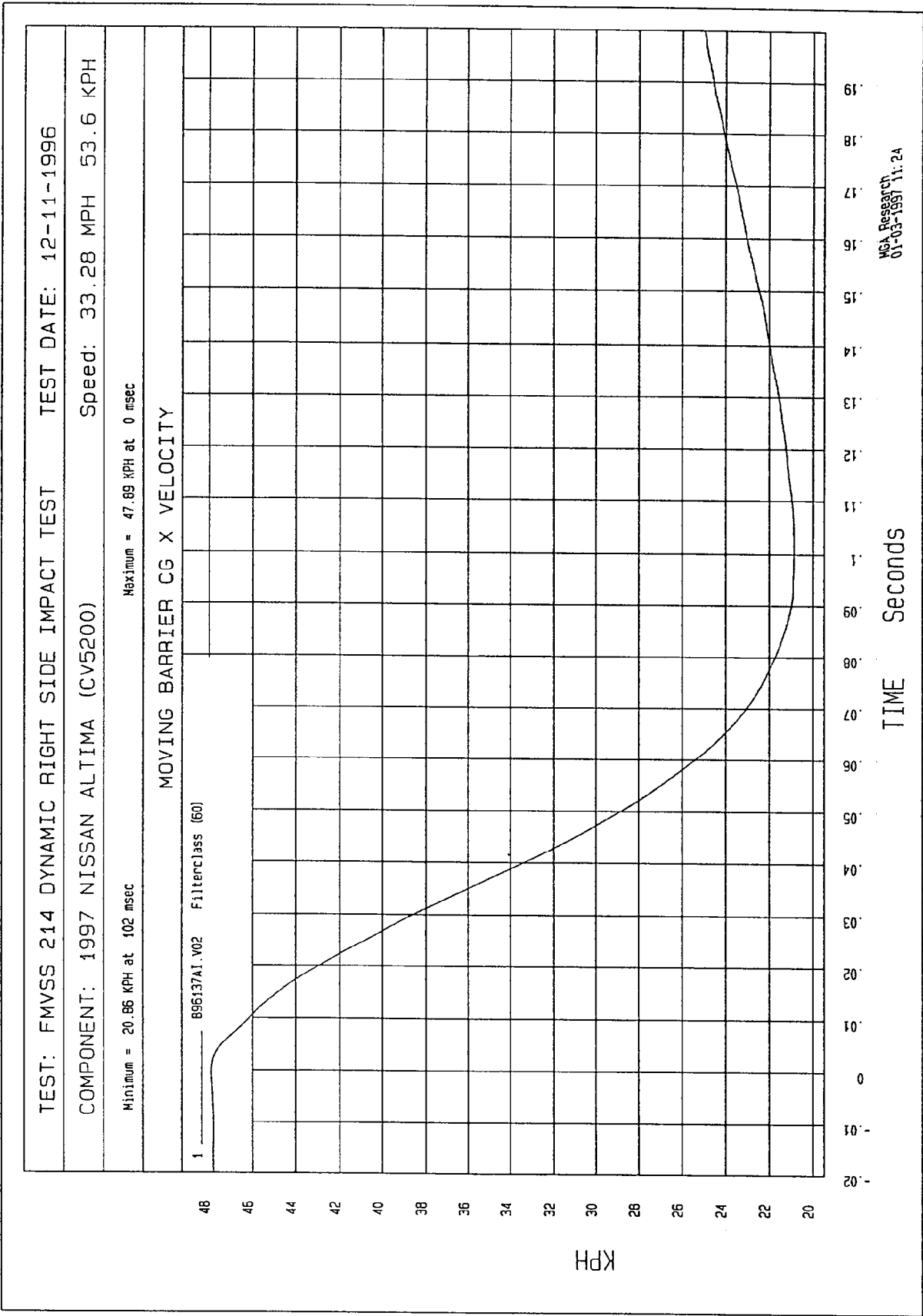
Maximum = 1.84 G'S at 172 msec

MOVING BARRIER CG X ACCELERATION

1 ——— B96137AF.A02 Filterclass (60)



MGA Research
12-30-1996 13.41

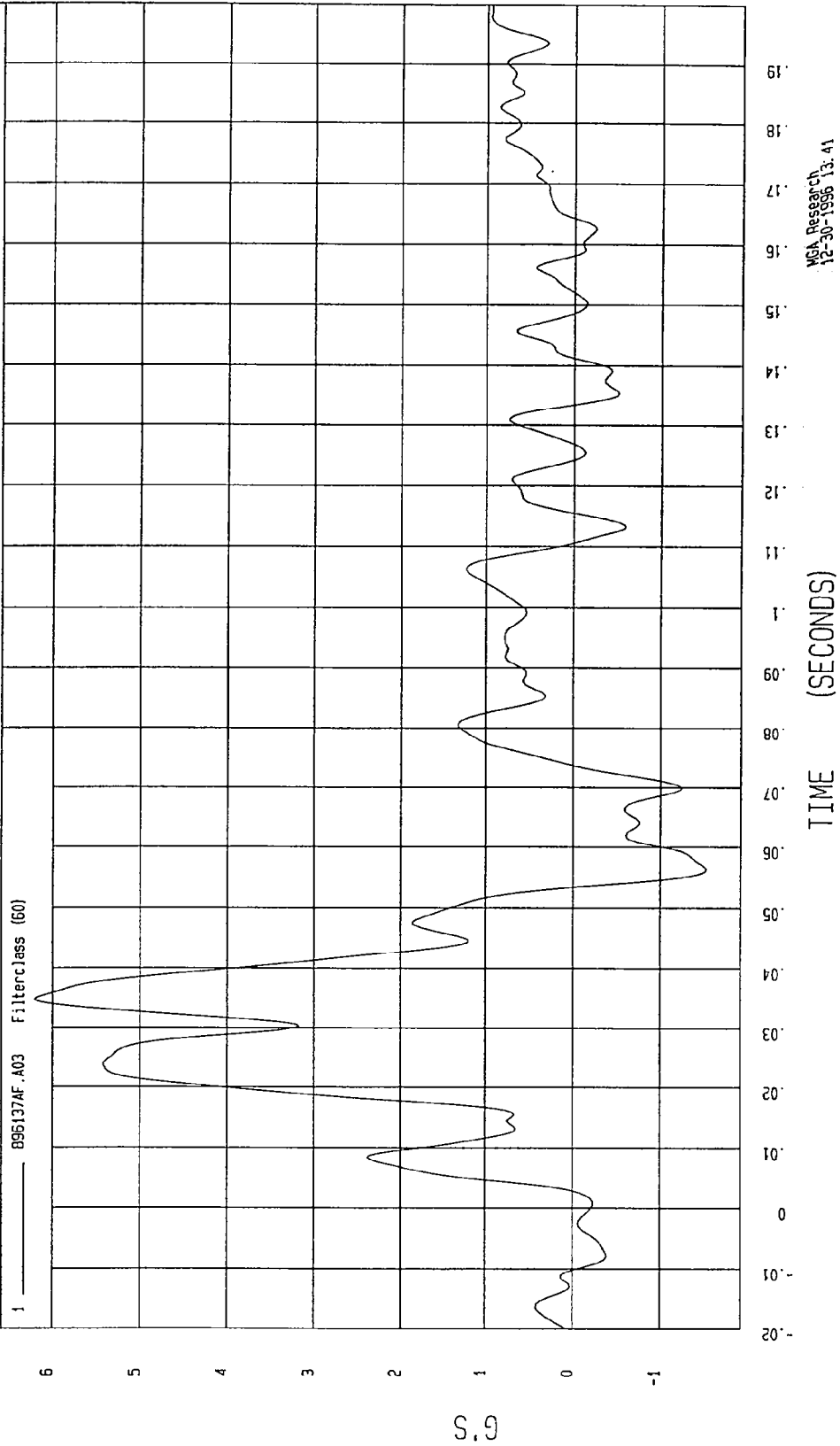


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -1.52 G'S at 56 msec Maximum = 6.20 G'S at 35 msec

MOVING BARRIER CG Y ACCELERATION



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

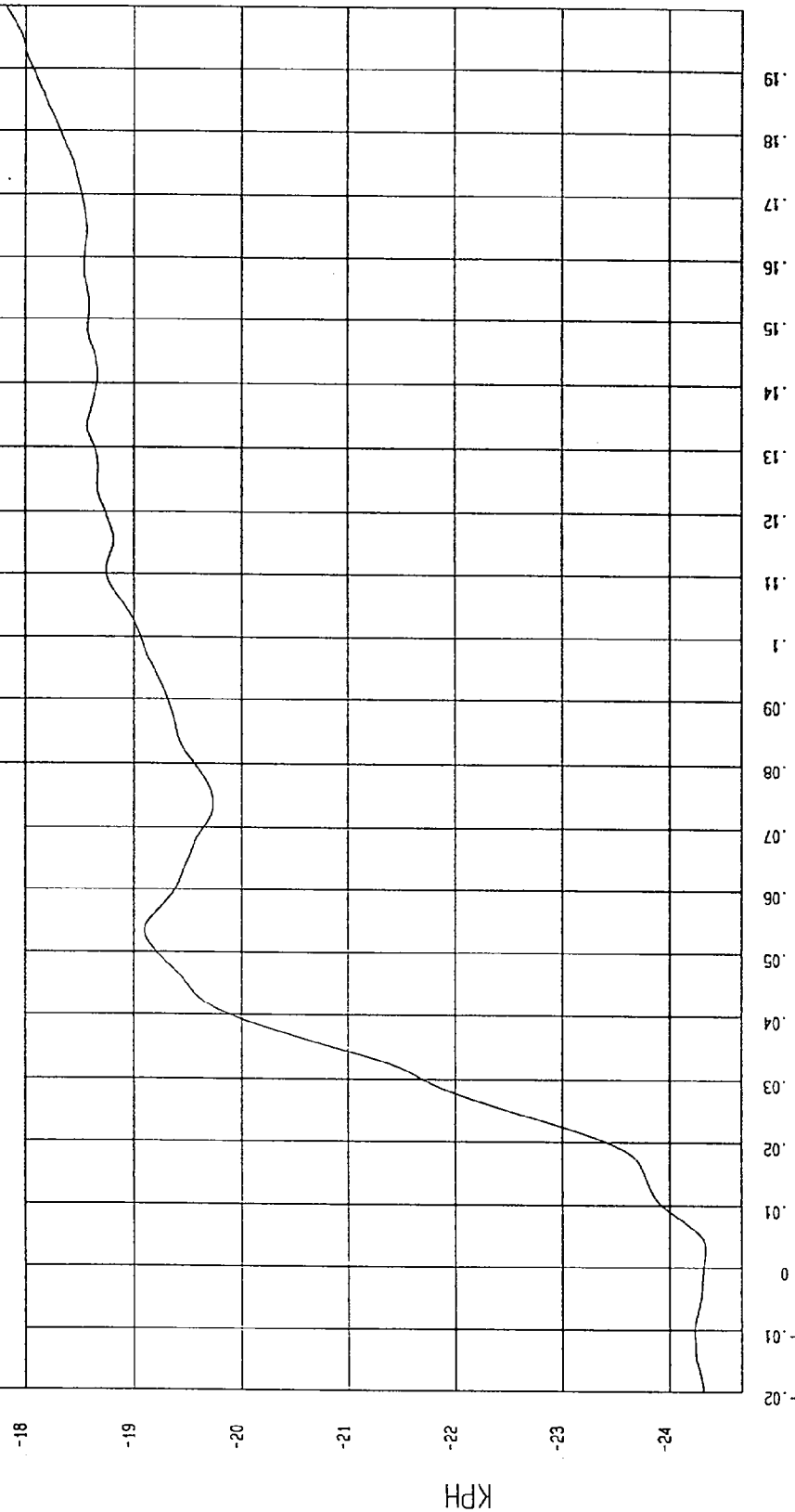
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -24.32 KPH at 3 msec

Maximum = -17.92 KPH at 200 msec

MOVING BARRIER CG Y VELOCITY

1 B96137A1.V03 Filterclass (60)



MGA Research
01-03-1997 15:15

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -10.07 G'S at 23 msec

Maximum = 9.99 G'S at 37 msec

MOVING BARRIER CG Z ACCELERATION

1 ——— B96137AF.A04 Filterclass (60)

10

8

6

4

2

0

-2

-4

-6

-8

-10

G.S

-02

0

01

02

03

04

05

06

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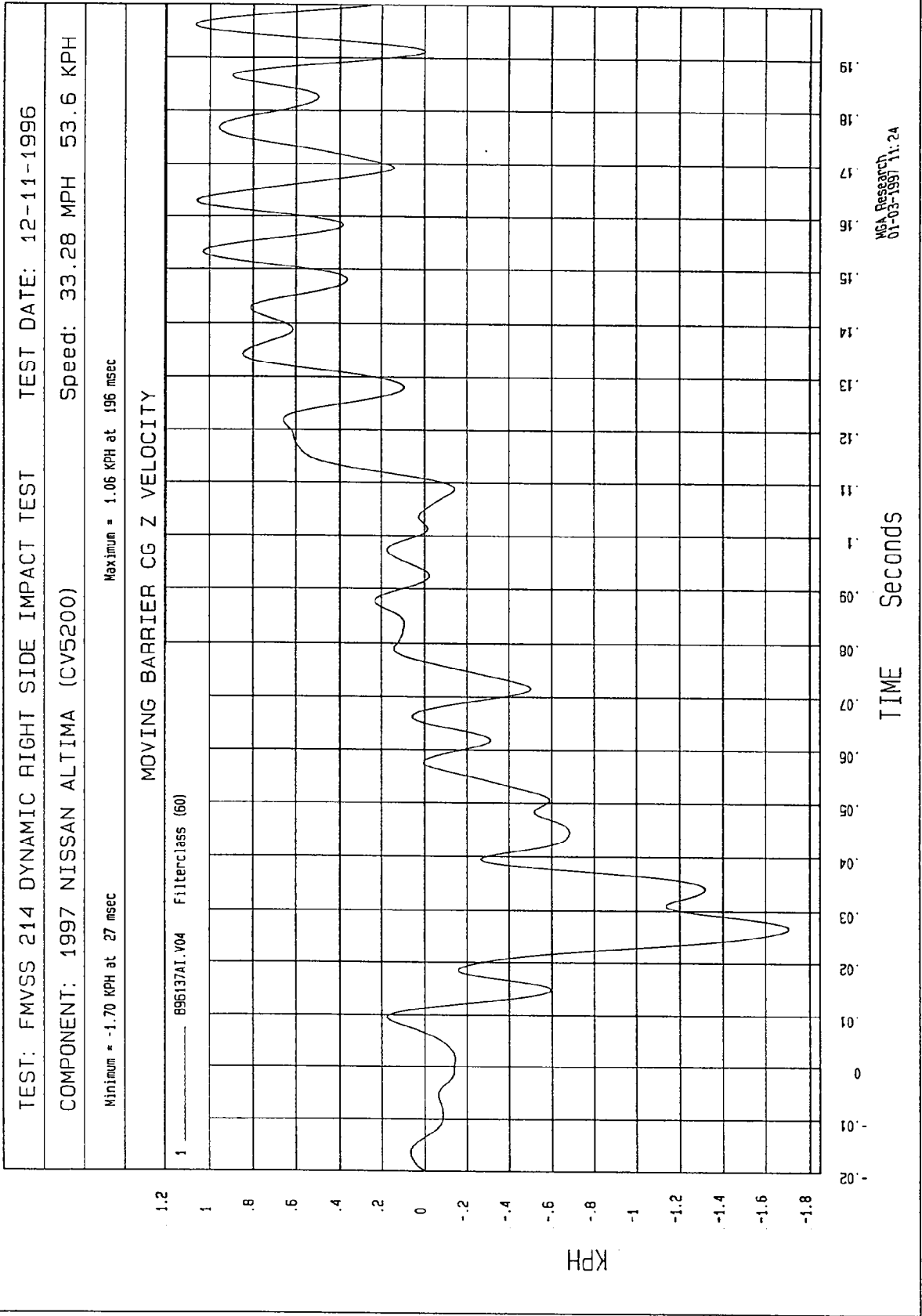
48

49

50

TIME (SECONDS)

NCA Research
12-30-1996 13:41



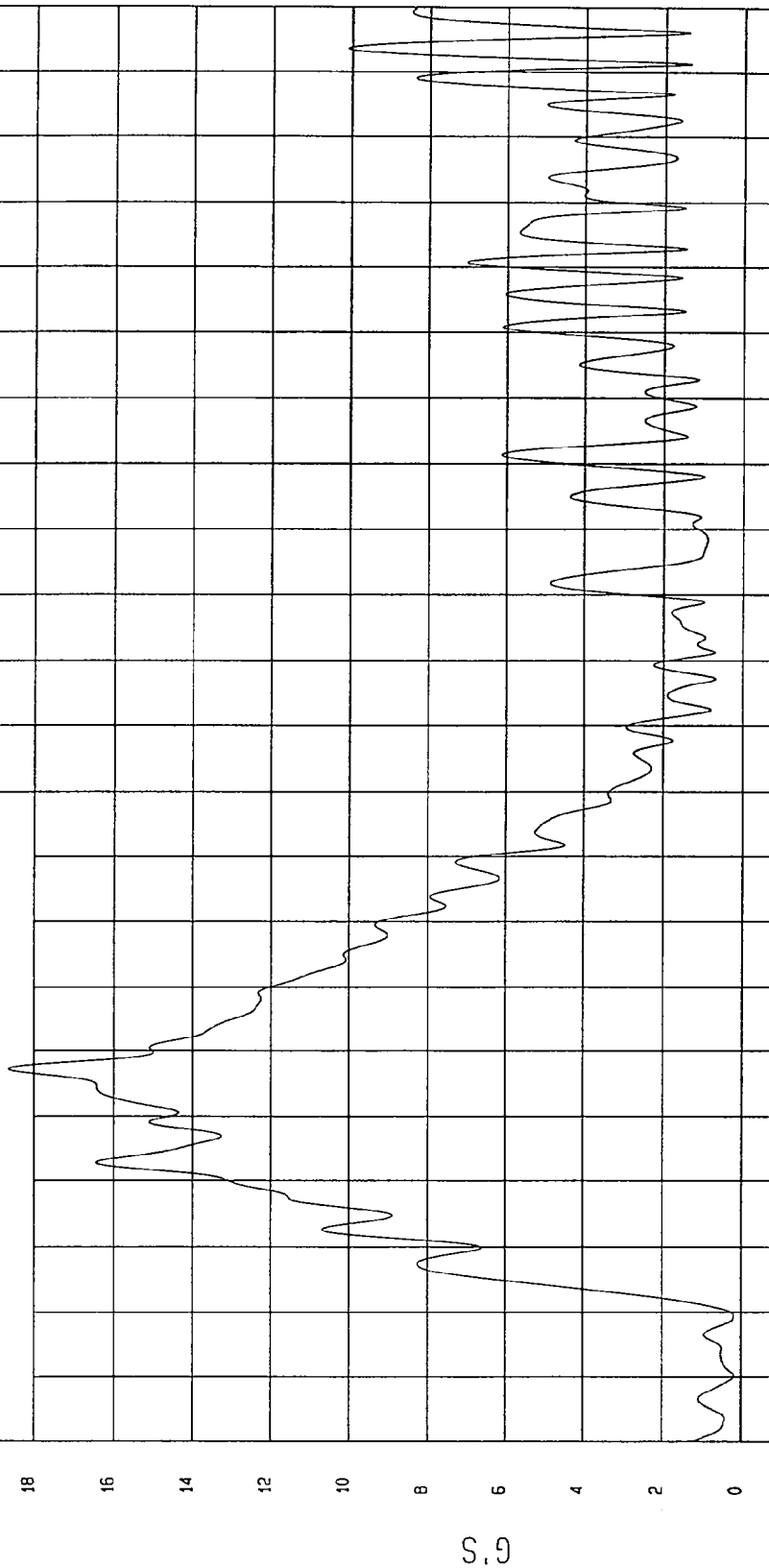
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

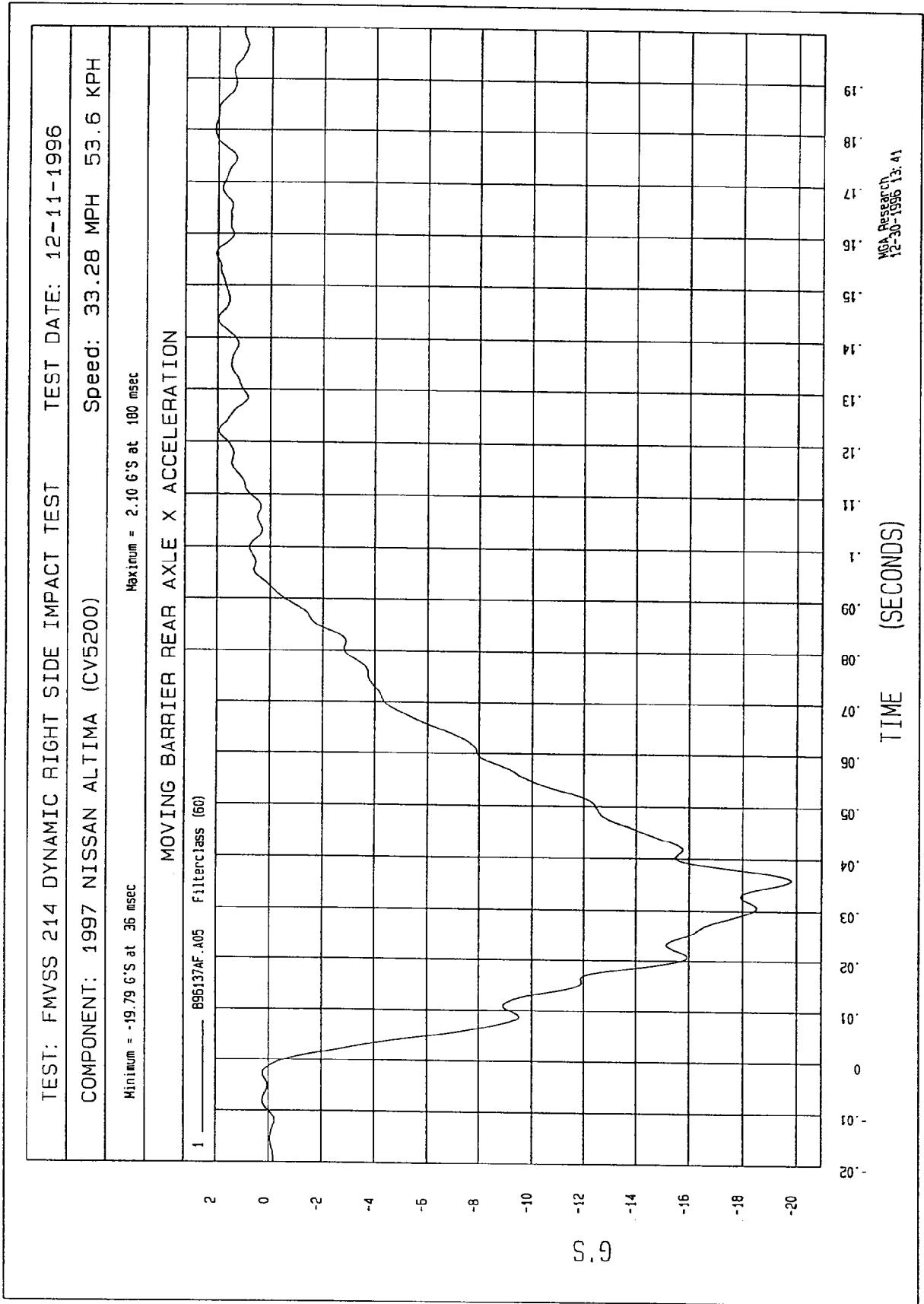
Minimum = .18 G'S at -10 msec Maximum = 18.66 G'S at 37 msec

MOVING BARRIER CG RESULTANT ACCELERATION

1 ——— B96137AV.A02 Filterclass (60)



NCA Research
12-30-1996 13:41



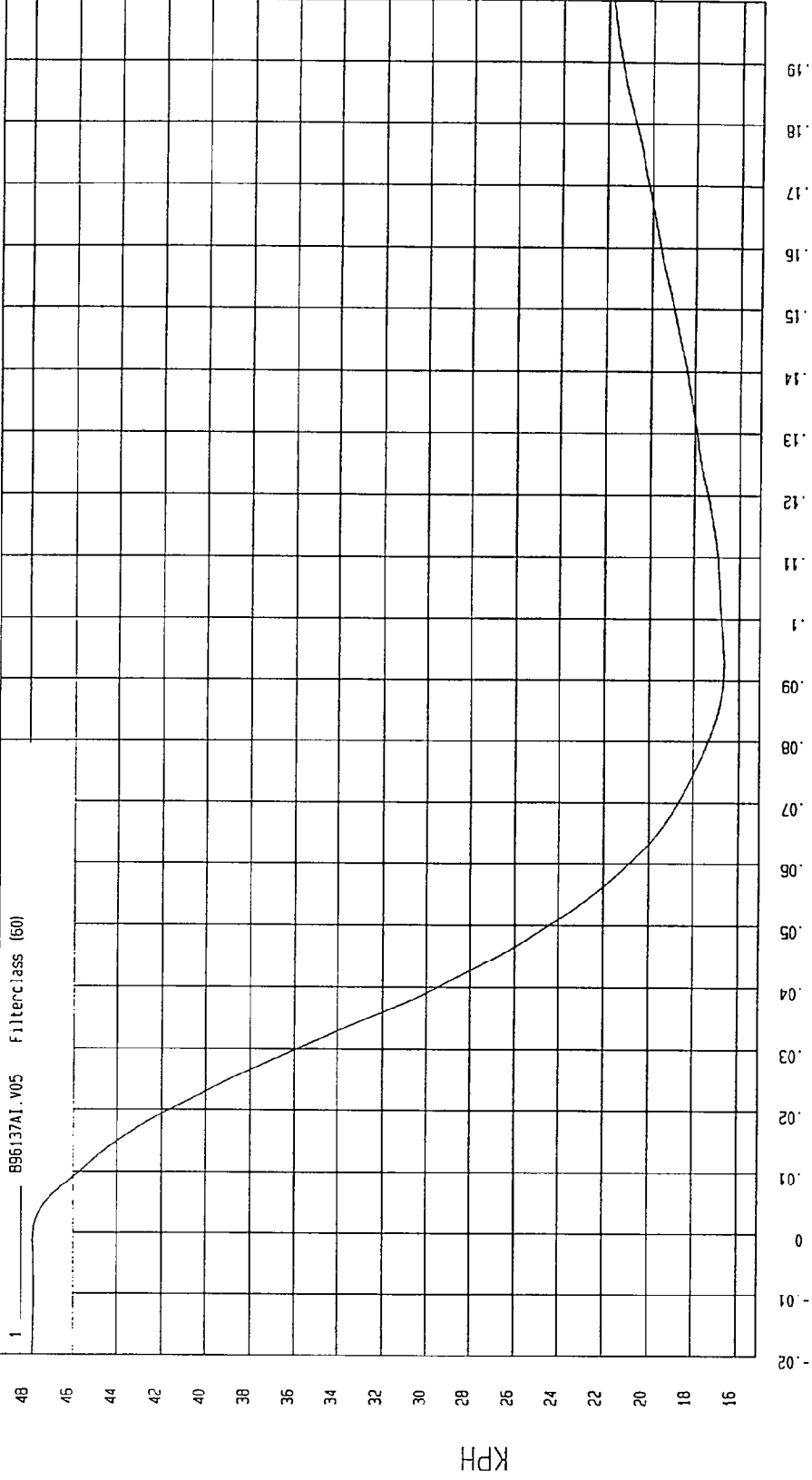
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = 16.64 KPH at 92 msec

Maximum = 47.80 KPH at -1 msec

MOVING BARRIER REAR AXLE X VELOCITY



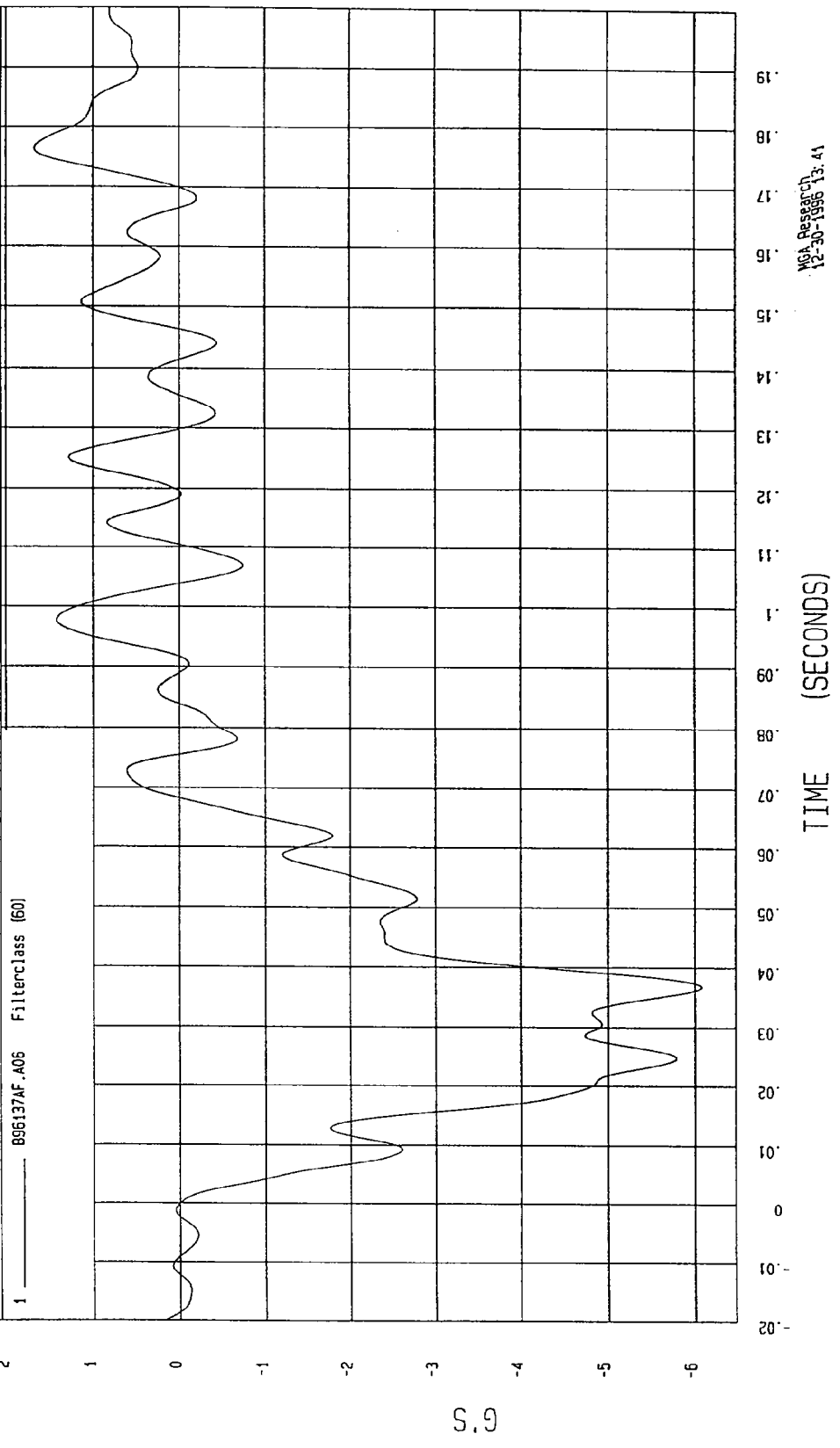
NSA Research
01-03-1997 11:24

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -5.07 G'S at 37 msec Maximum = 1.67 G'S at 176 msec

MOVING BARRIER REAR AXLE Y ACCELERATION



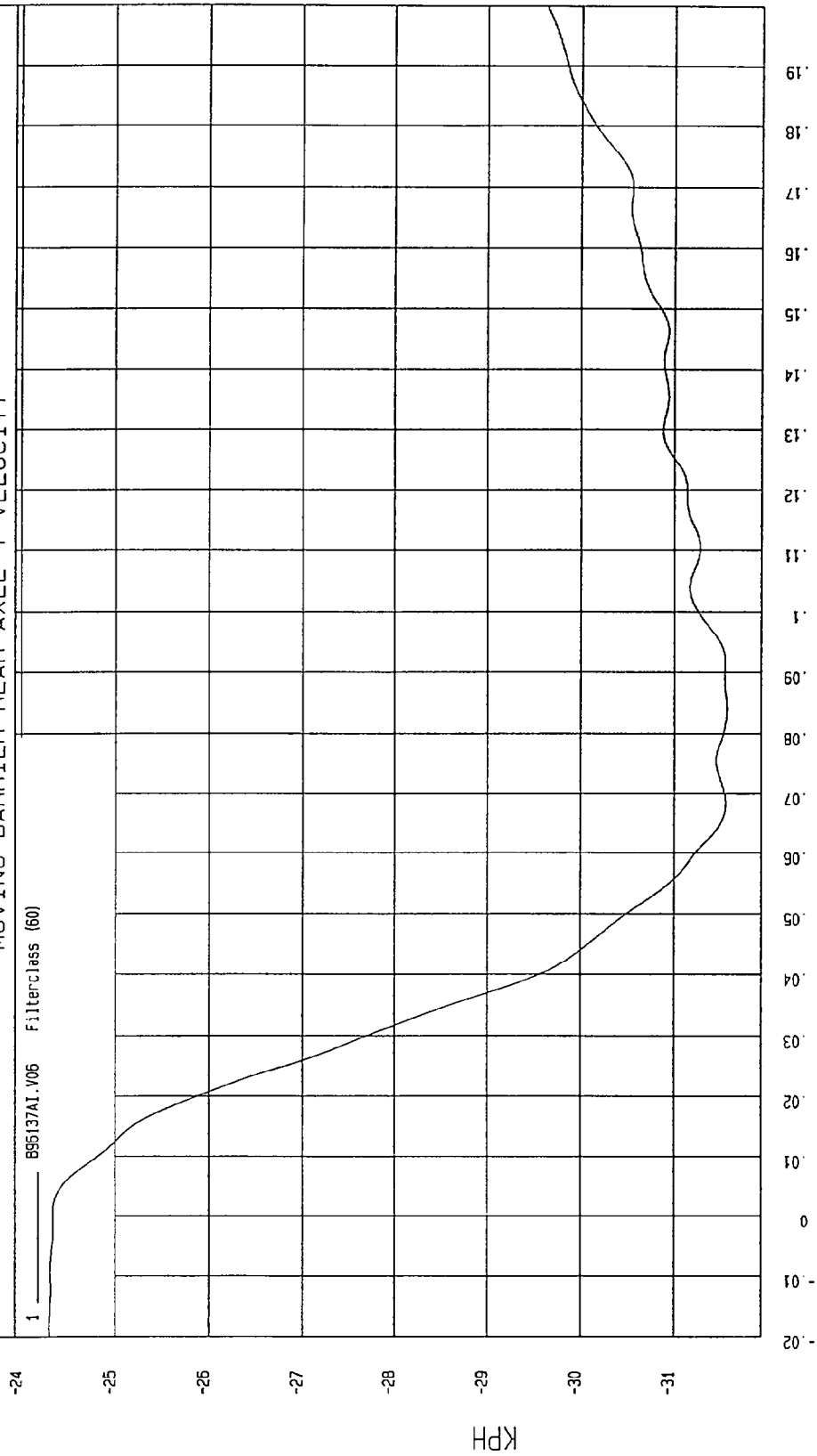
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -31.56 KPH at 84 msec

Maximum = -24.29 KPH at -19 msec

MOVING BARRIER REAR AXLE Y VELOCITY



MOA Research
01-03-1997 13: 15

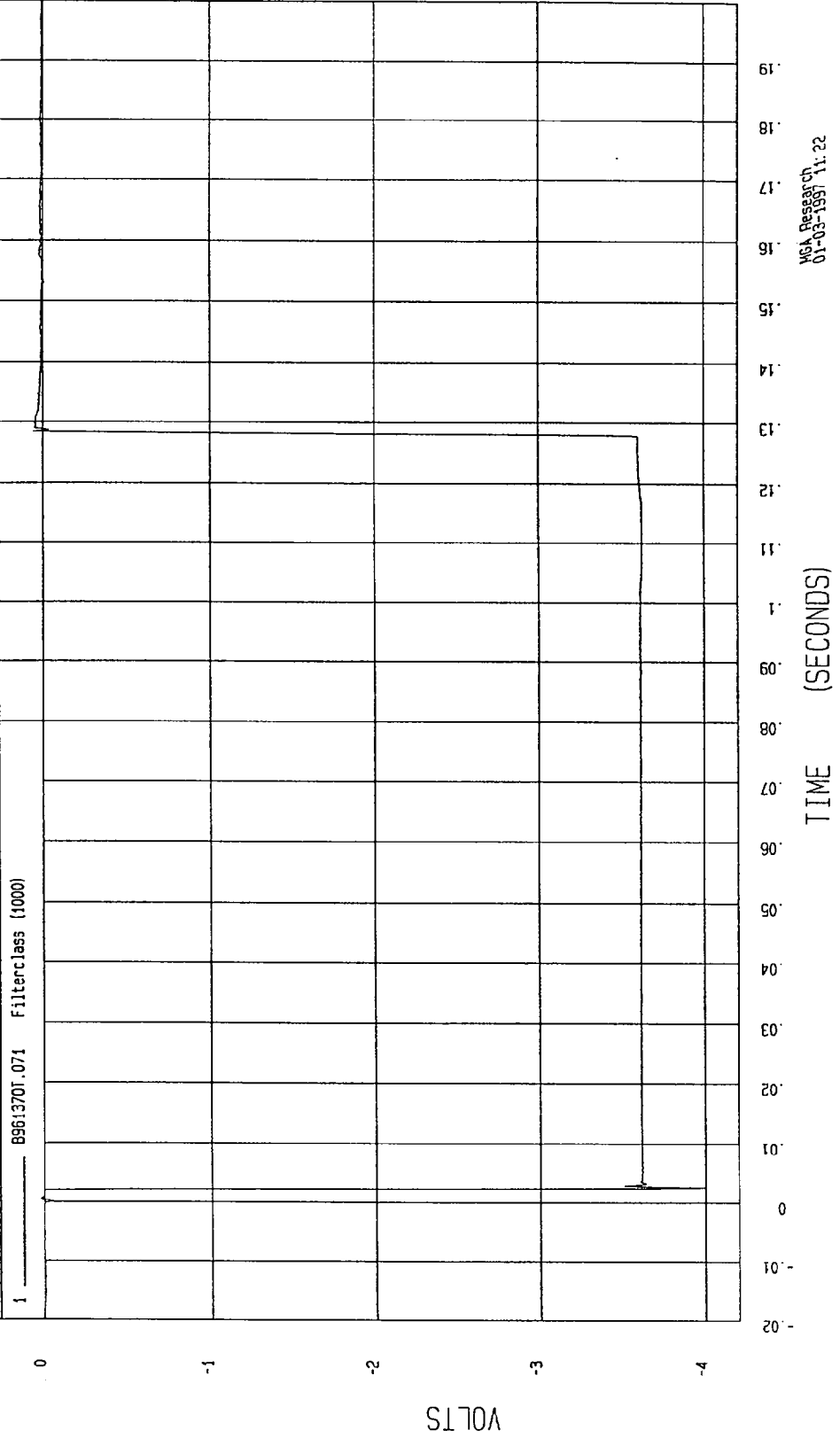
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

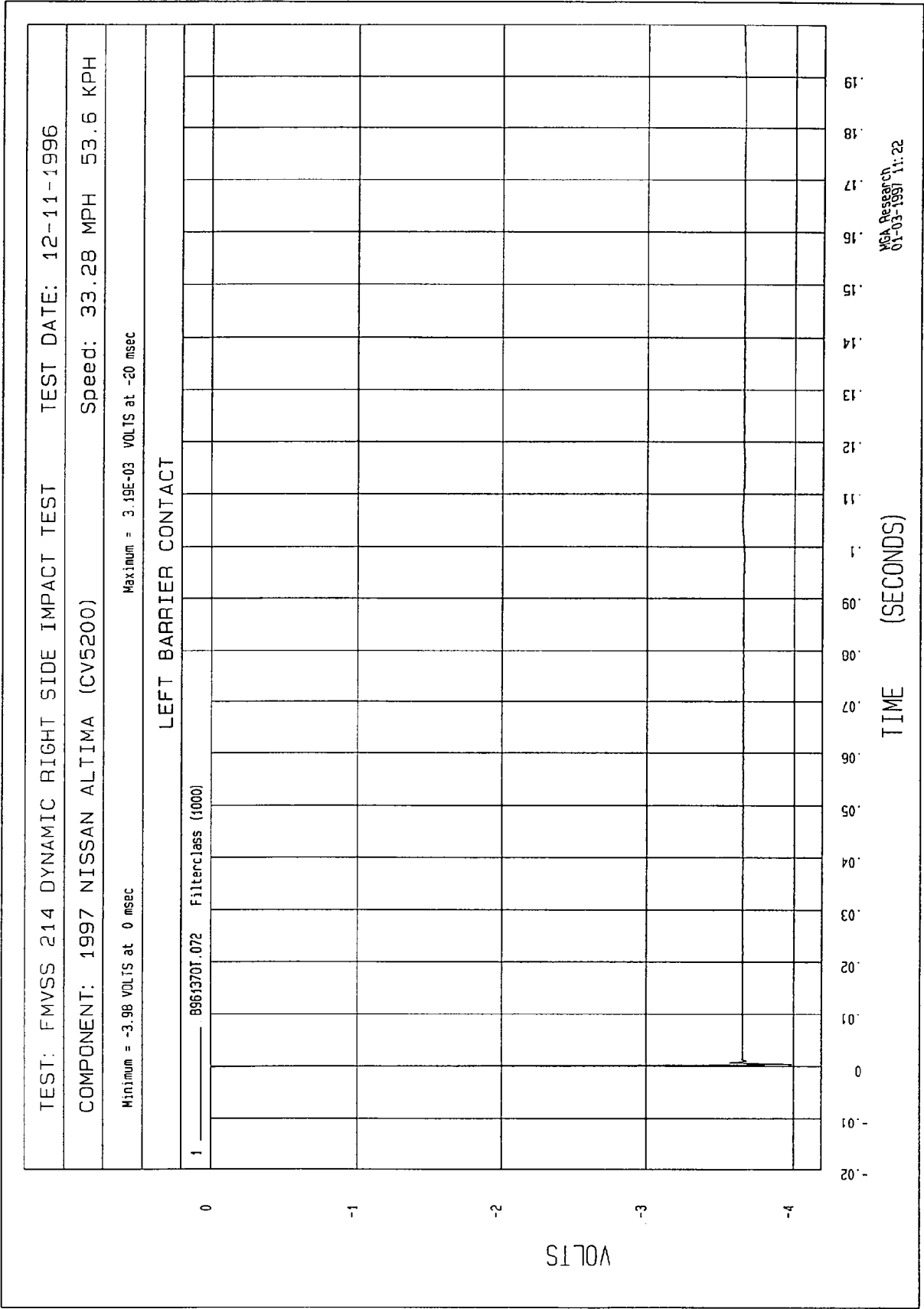
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

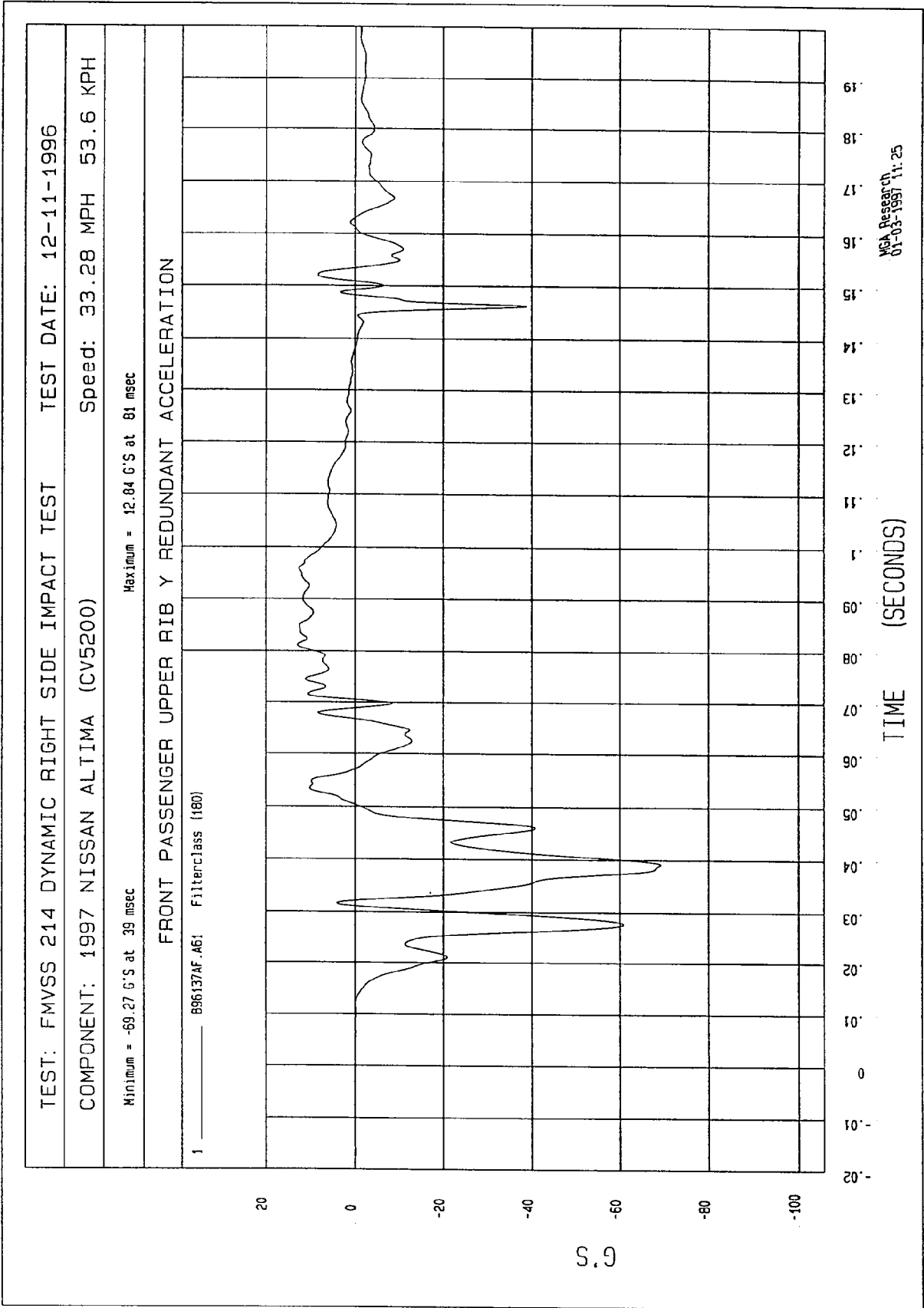
Minimum = -3.99 VOLTS at 2 msec

Maximum = 5.63E-02 VOLTS at 128 msec

LEFT BARRIER CONTACT







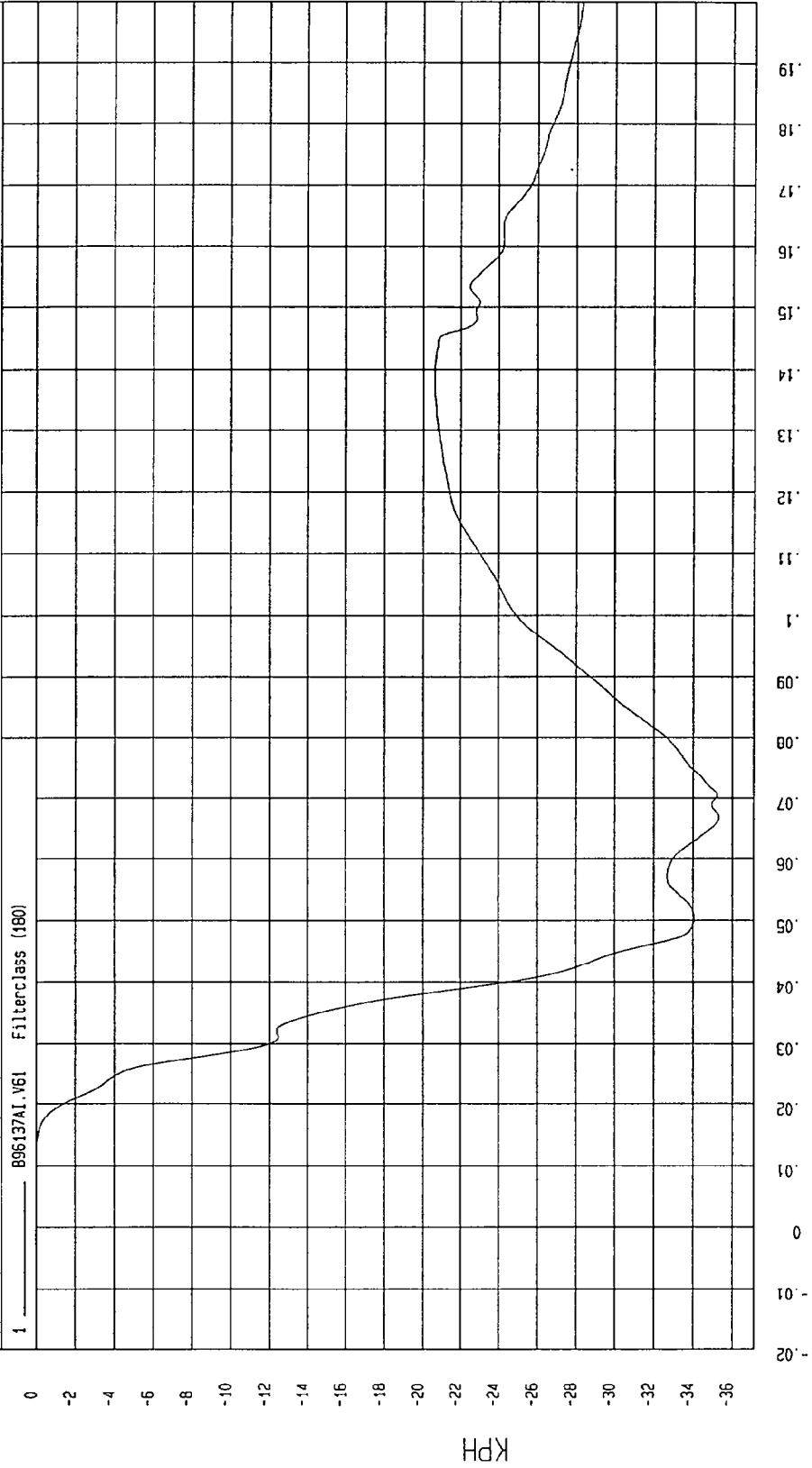
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -35.32 KPH at 67 msec

Maximum = 2.11E-02 KPH at -2 msec

FRONT PASSENGER UPPER RIB Y REDUNDANT VELOCITY



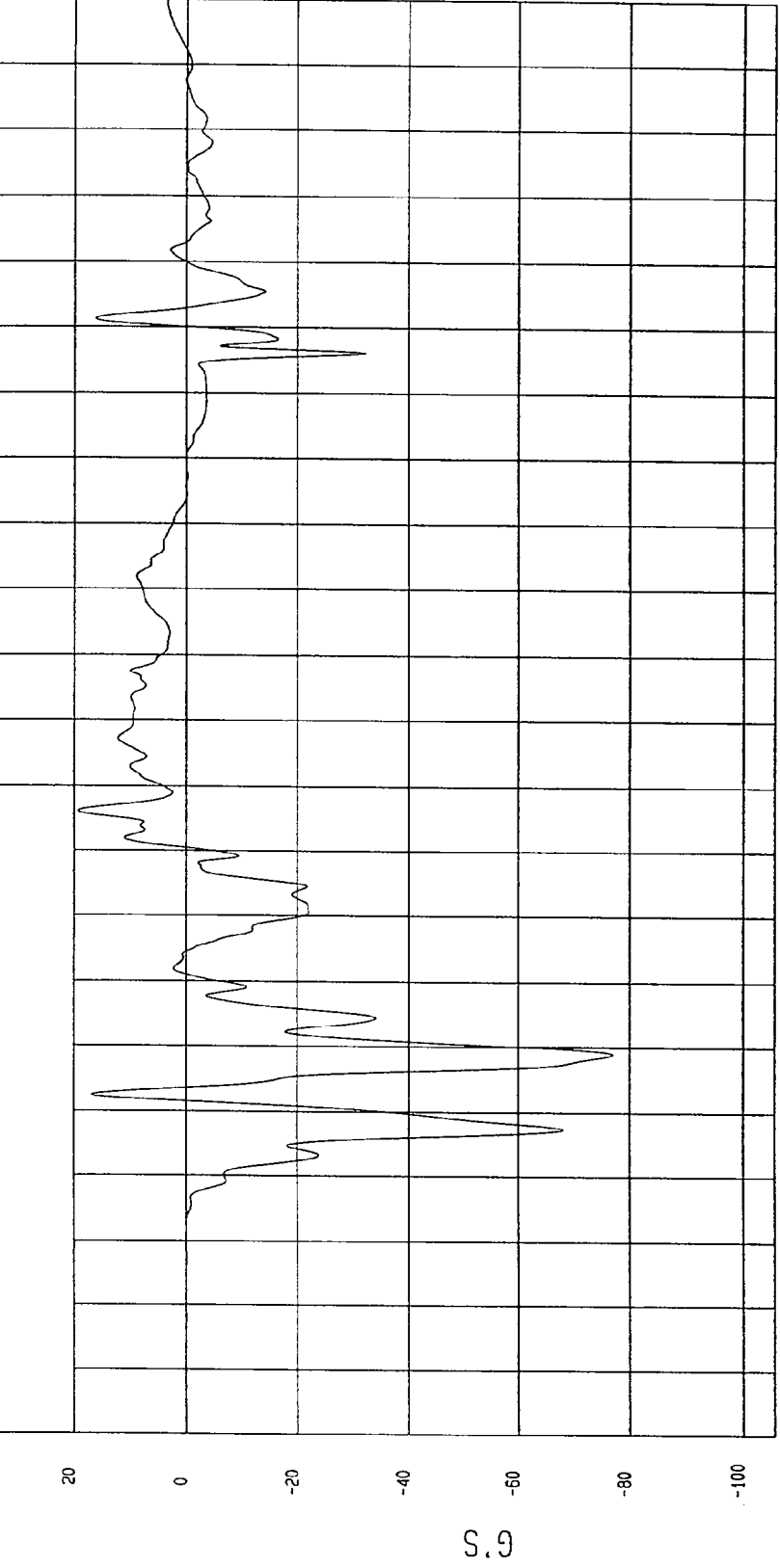
NSA Research
01-03-1997 11:27

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -76.91 G'S at 39 msec Maximum = 19.41 G'S at 76 msec

FRONT PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 B96137AF.A62 Filterclass (180)



NGA Research
01-03-1997 11:26

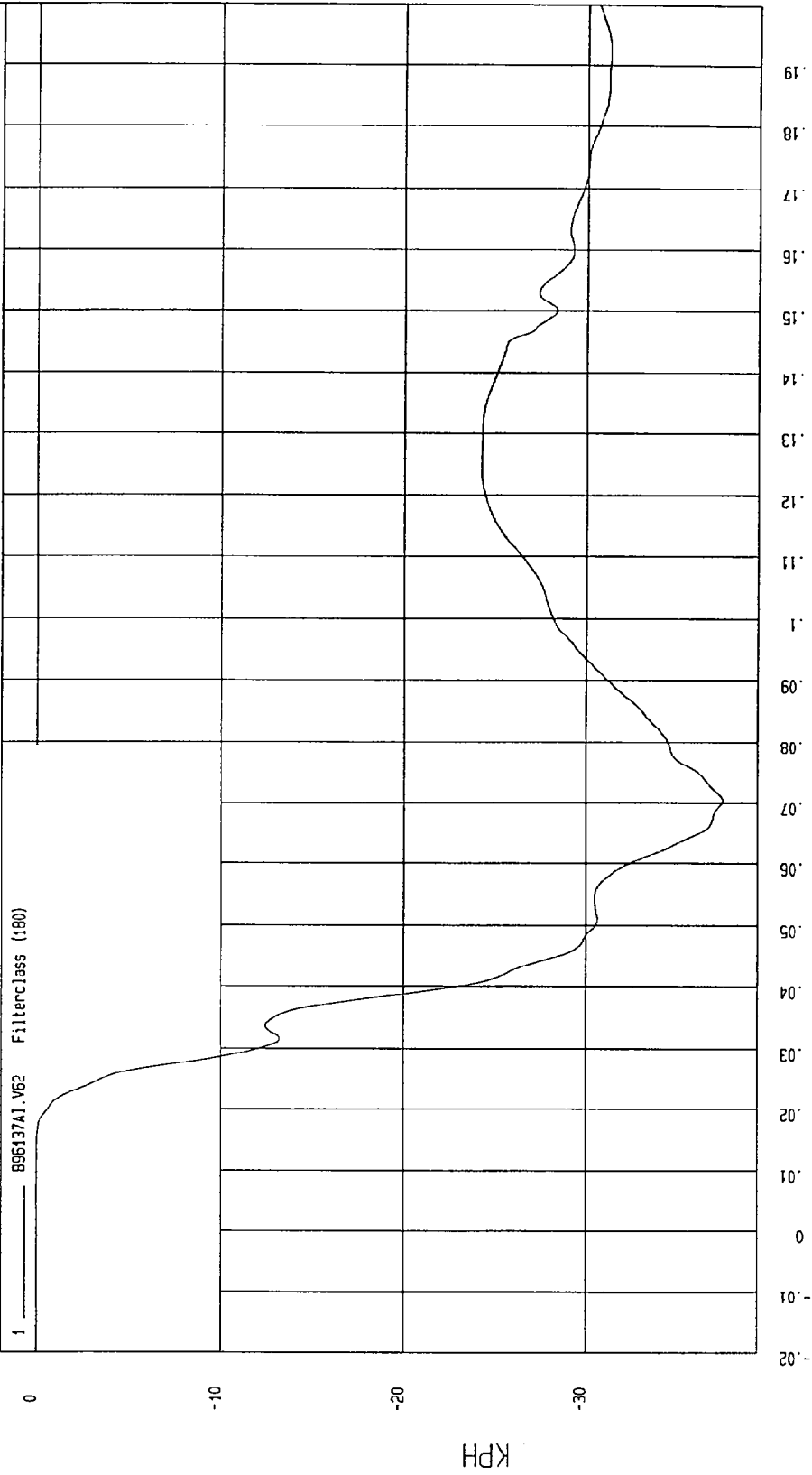
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -37.27 KPH at 70 msec Maximum = .01 KPH at 6 msec

FRONT PASSENGER LOWER RIB Y REDUNDANT VELOCITY

1 ——— B96137A1.V62 Filterclass (180)



WGA Research
01-03-1997 11: 27

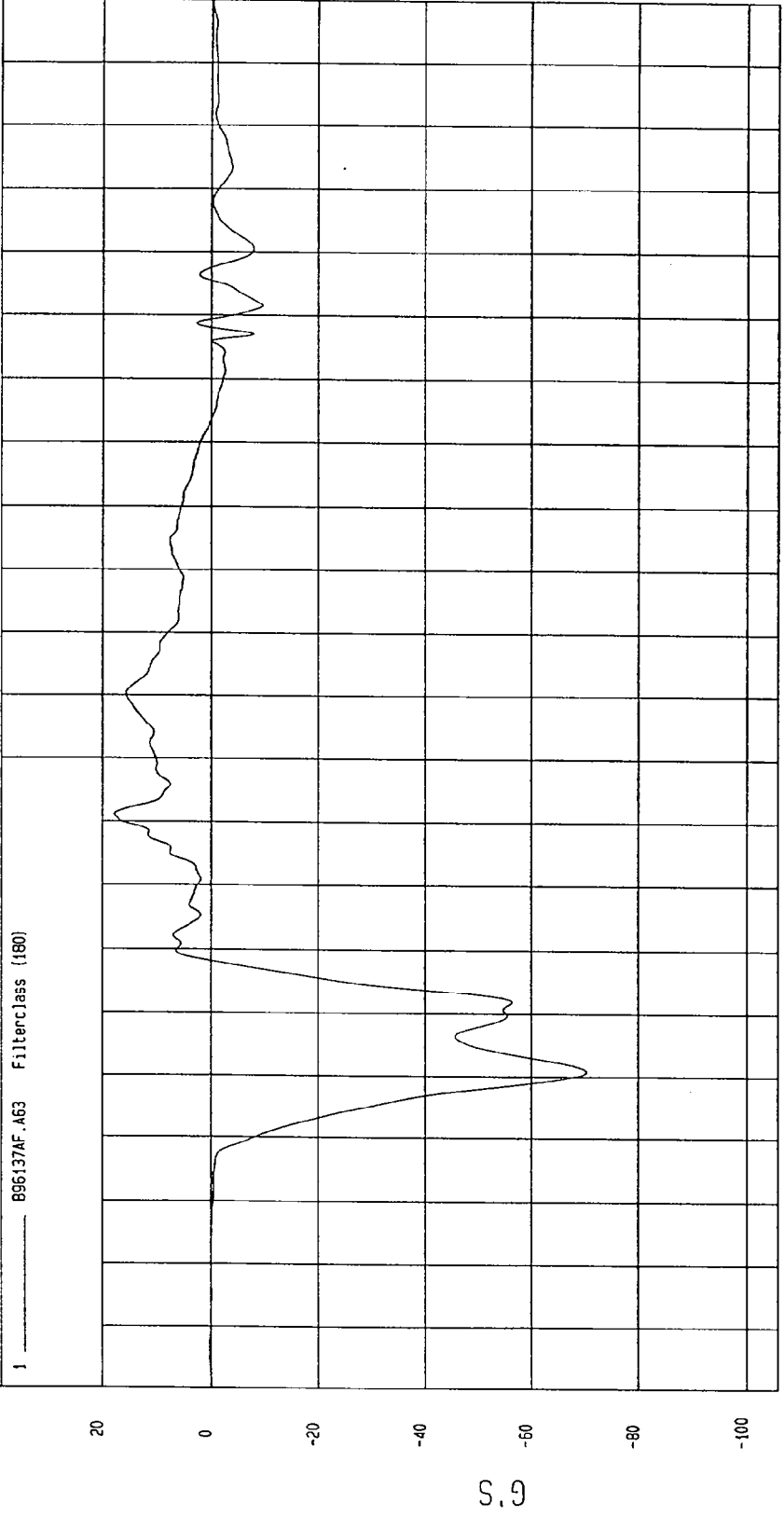
TIME Seconds

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -70.33 G'S at 31 msec Maximum = 17.84 G'S at 71 msec

FRONT PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION



TIME (SECONDS)

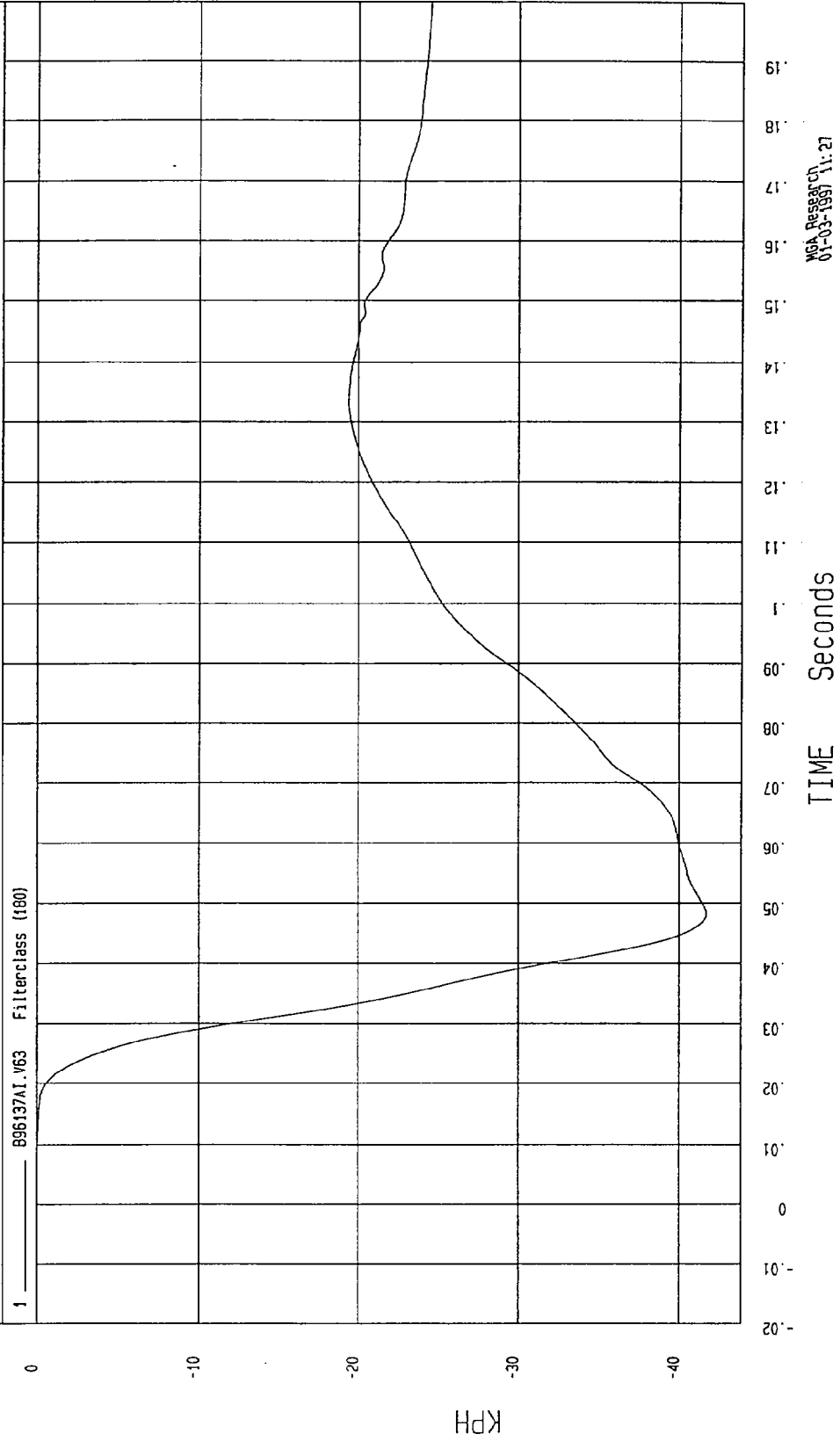
NSA Research
01-03-1997 11:26

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -41.69 KPH at 48 msec Maximum = 3.48E-02 KPH at -8 msec

FRONT PASSENGER LOWER SPINE Y REDUNDANT VELOCITY



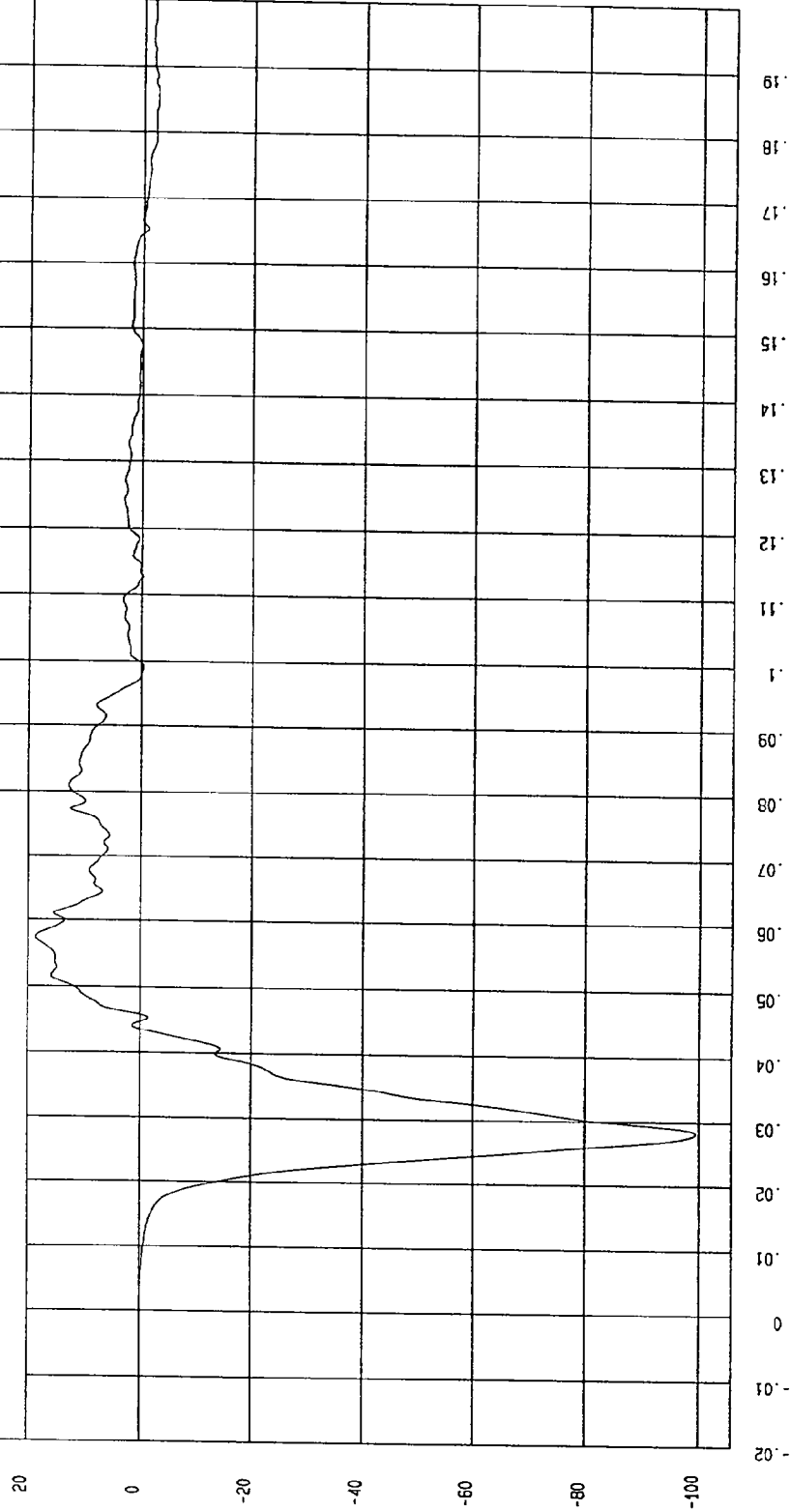
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -99.44 G'S at 28 msec Maximum = 18.74 G'S at 57 msec

FRONT PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 B96137AF A64 Filterclass (180)



MGA Research
01-03-1997 11:26

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

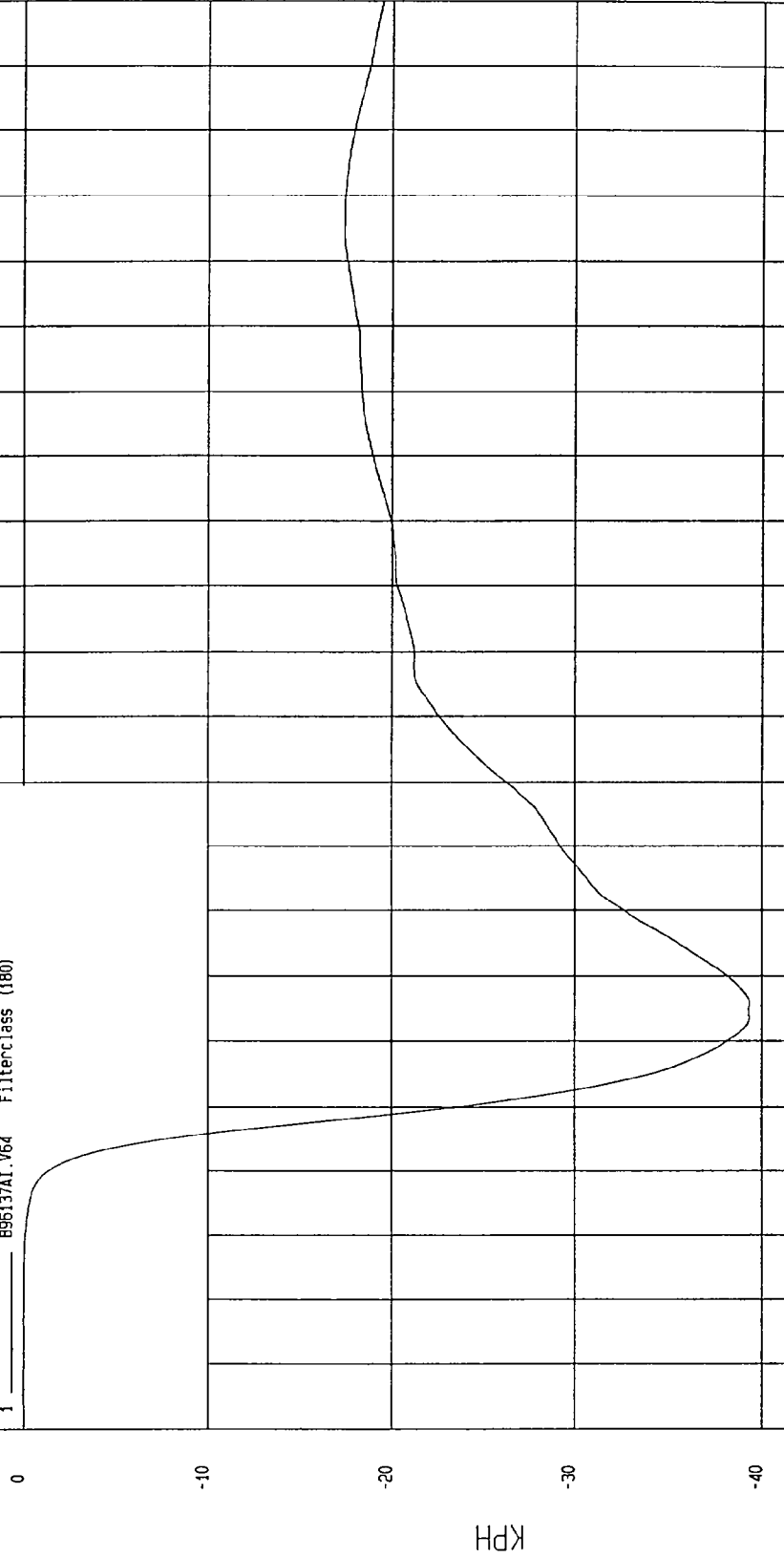
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -39.33 KPH at 44 msec

Maximum = 3.03E-03 KPH at -15 msec

FRONT PASSENGER PELVIS Y REDUNDANT VELOCITY

1 ——— B95137AI.V64 Filterclass (180)



WCA Research
01-03-1997 11:28

TIME Seconds

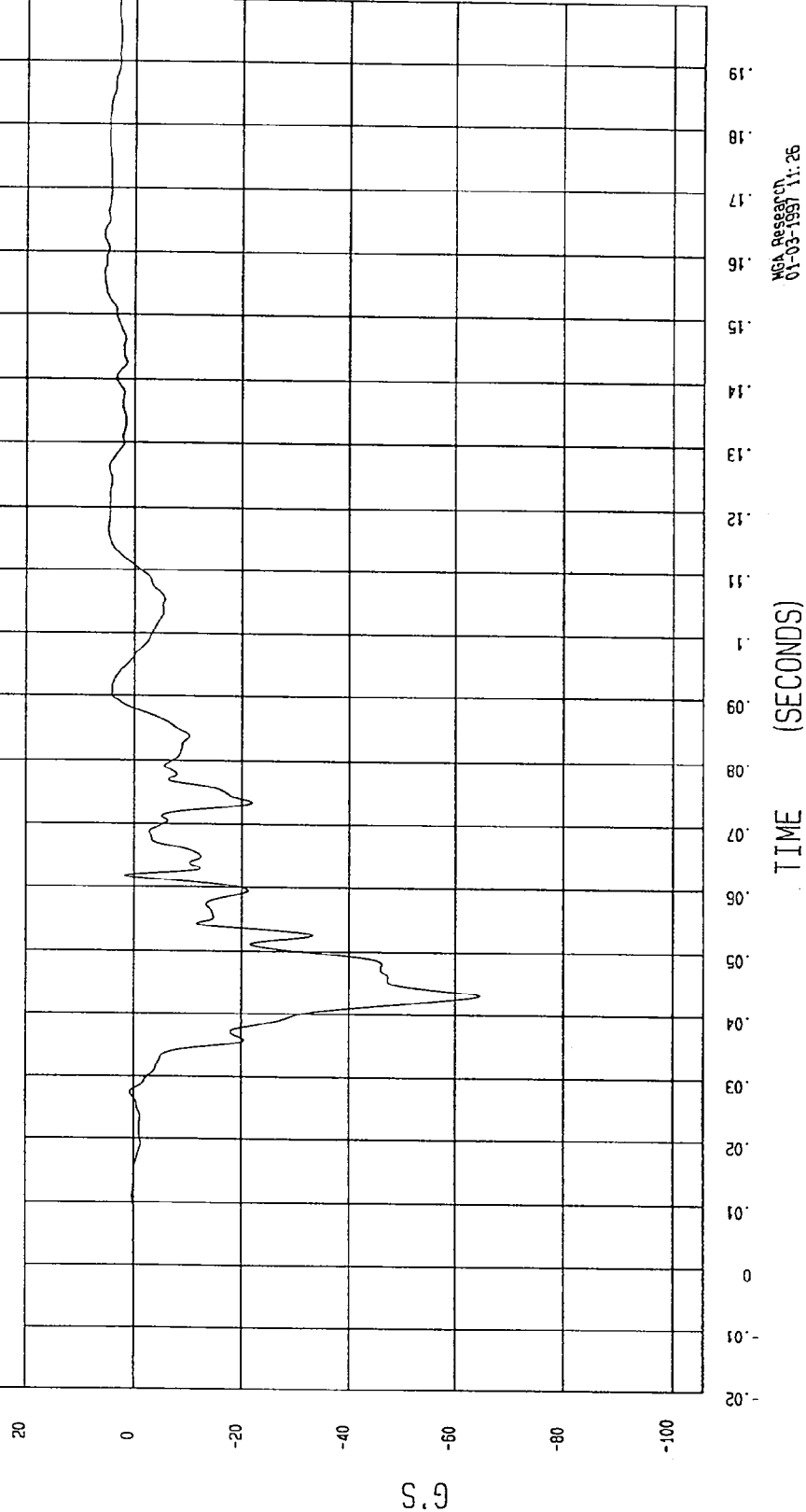
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -64.54 G'S at 43 msec Maximum = 5.62 G'S at 157 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 ——— B96137AF.A65 Filterclass (180)

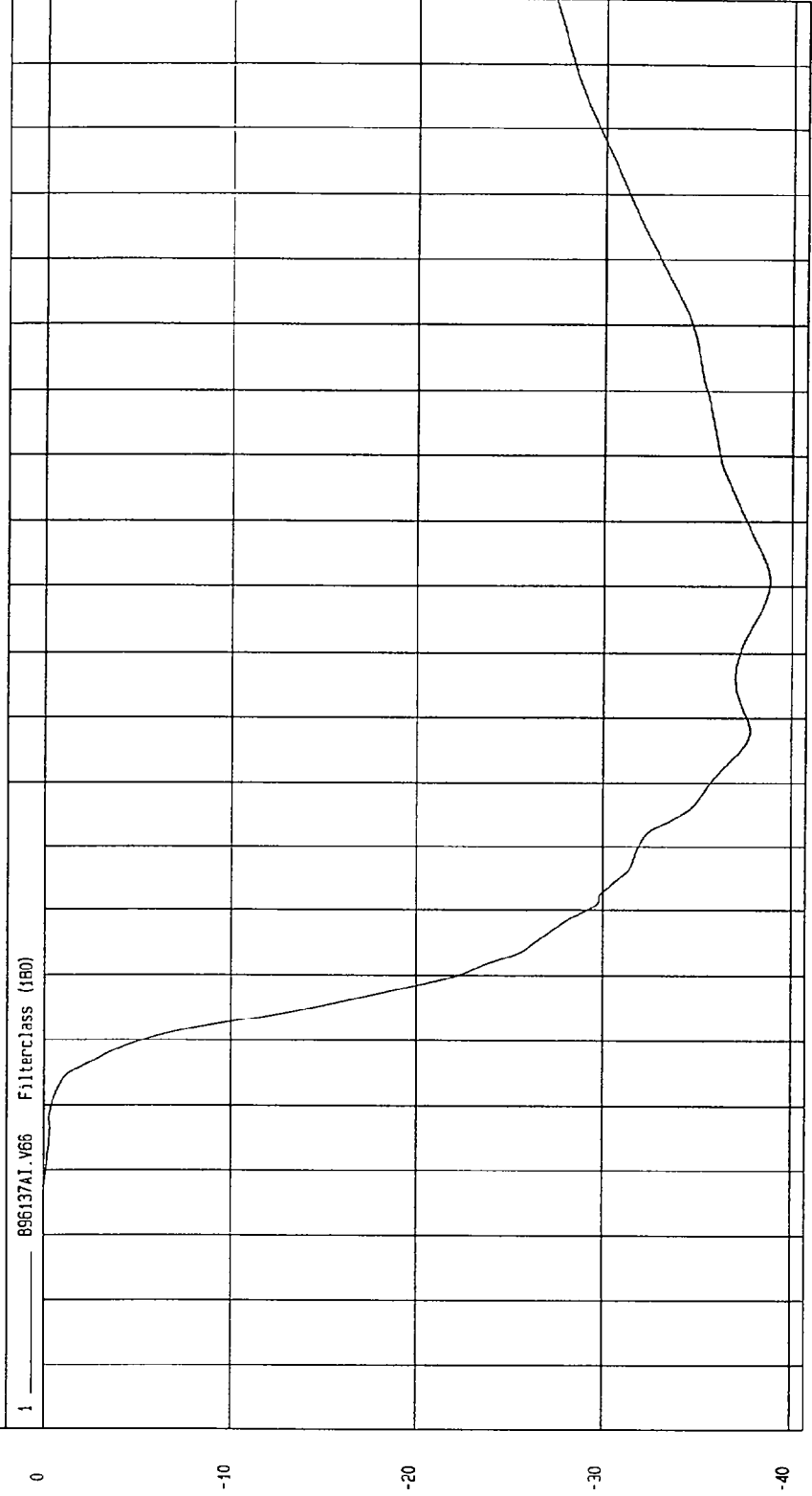


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -38.82 KPH at 111 msec Maximum = 2.05E-02 KPH at 15 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY



TIME Seconds

MGA Research
01-03-1997 11:28

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

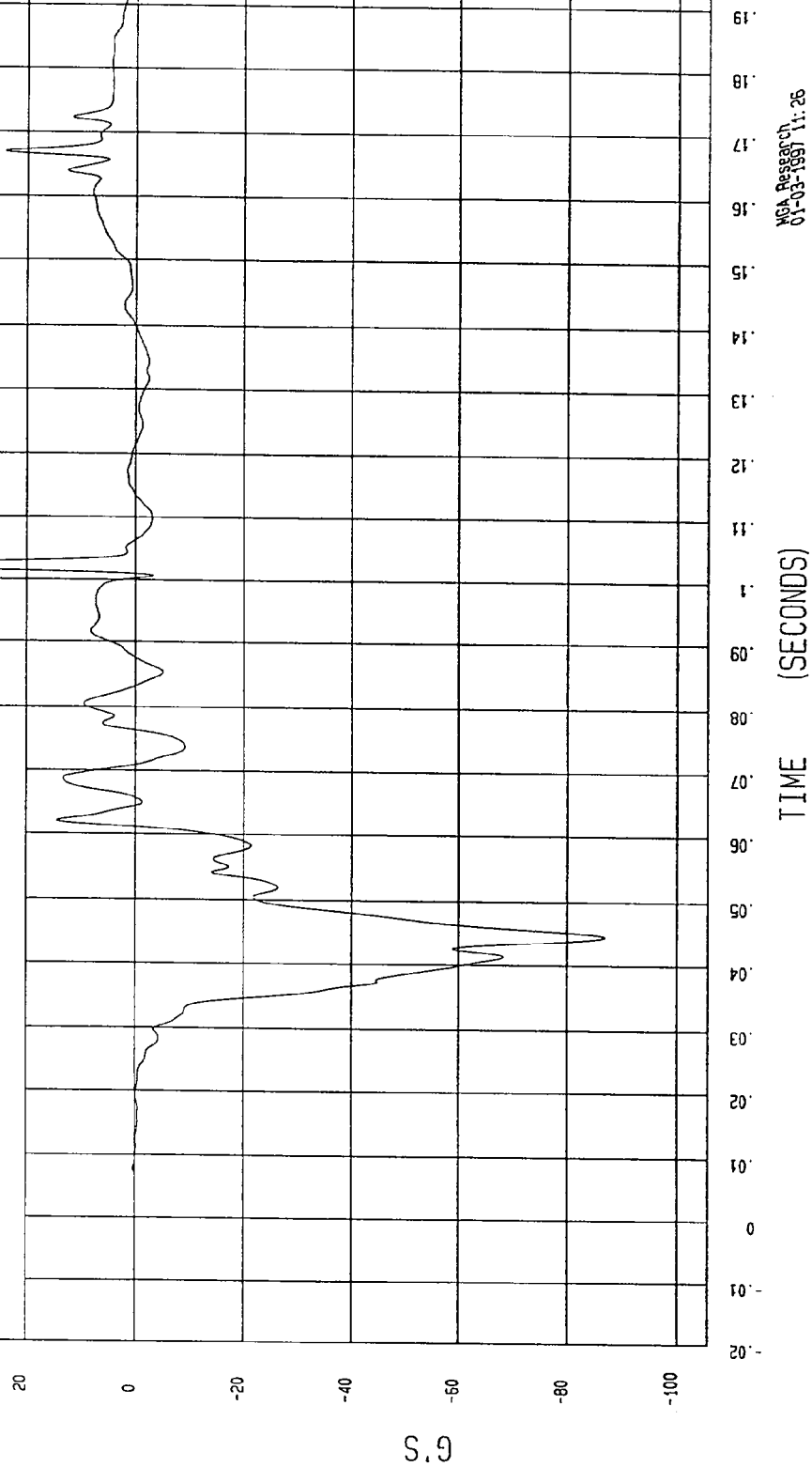
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -87.06 G'S at 45 msec

Maximum = 63.30 G'S at 102 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 996137AF.A67 Filterclass (180)



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

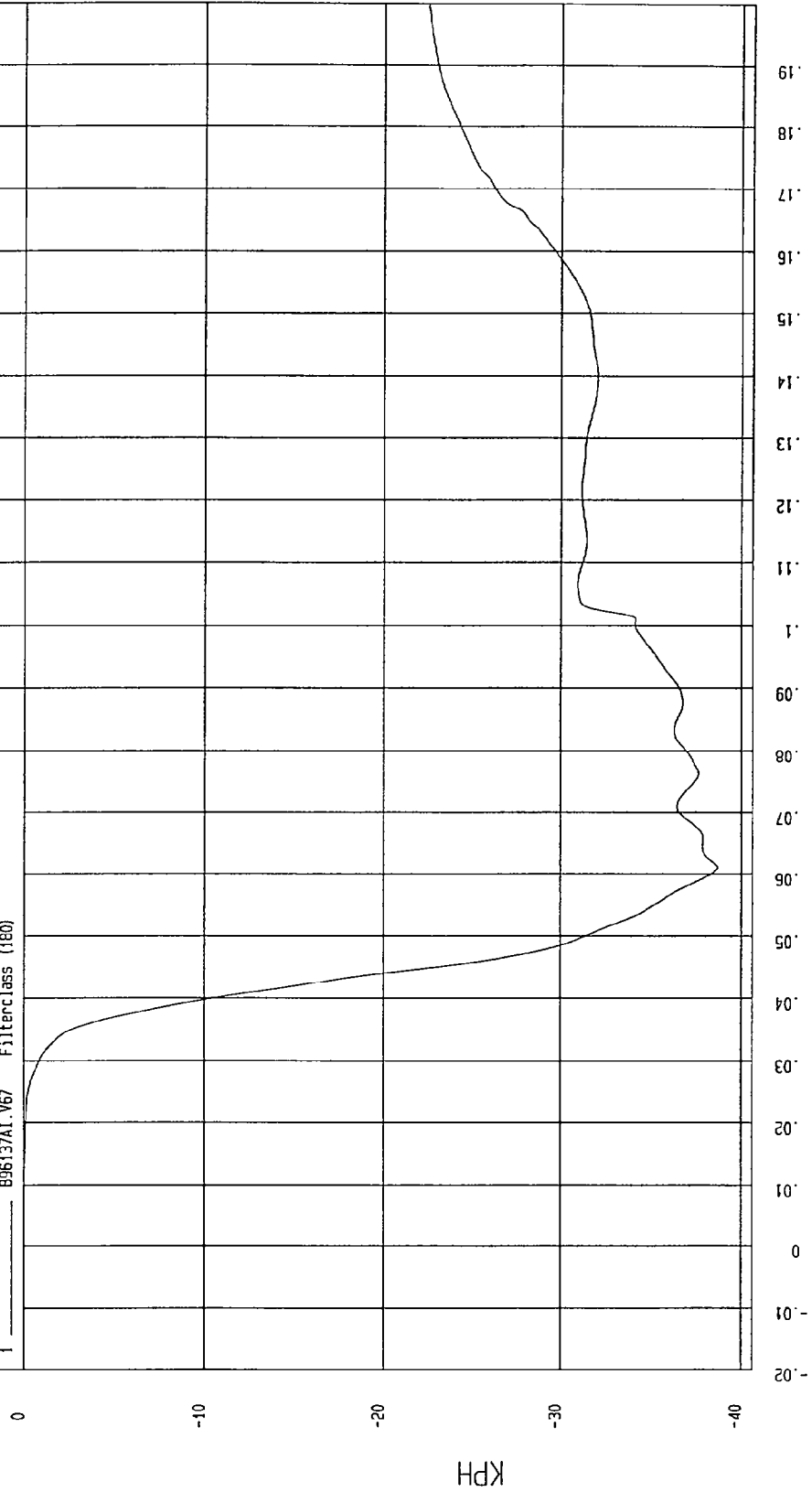
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -38.69 KPH at 61 msec

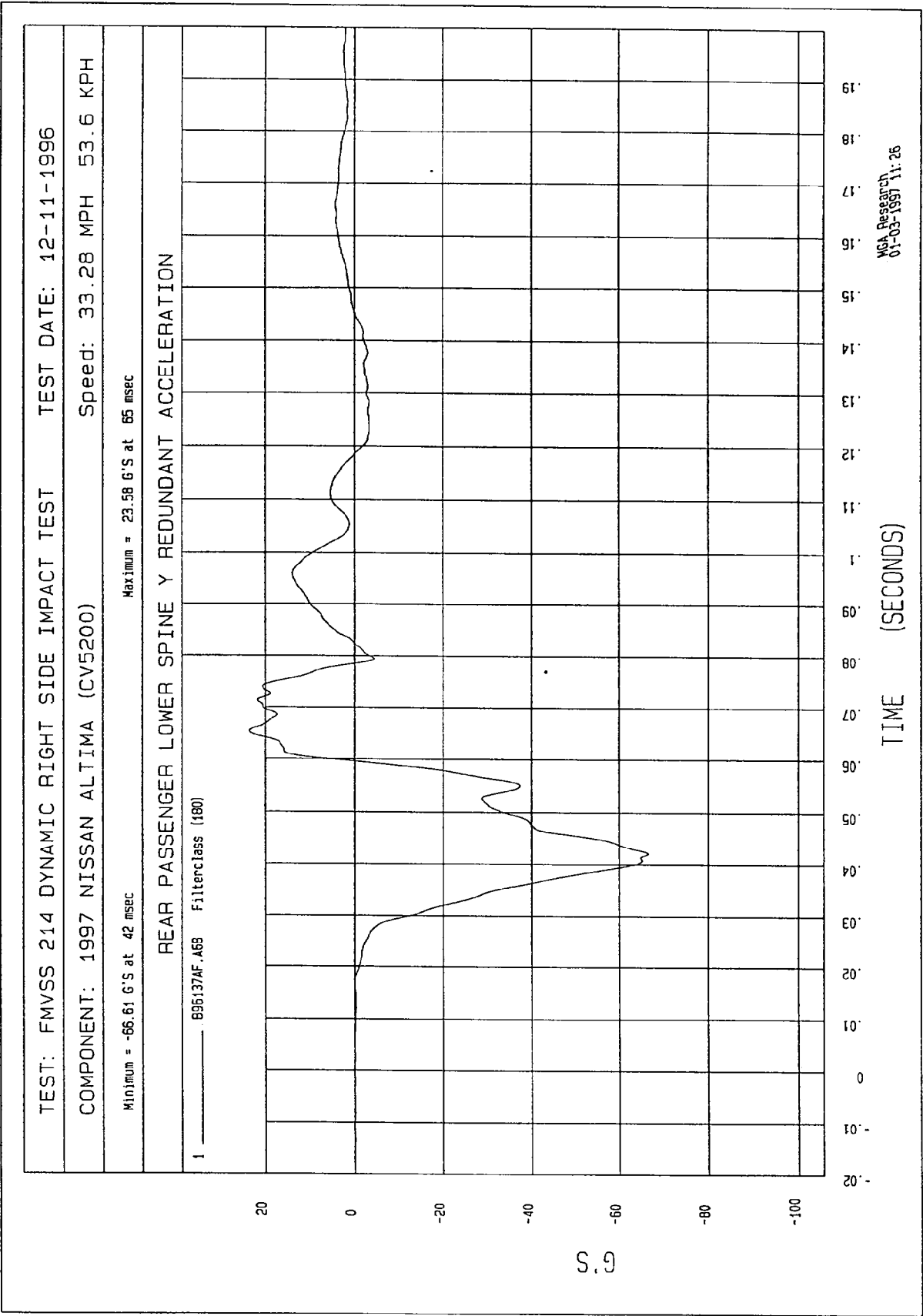
Maximum = 1.43E-02 KPH at 9 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY

1 B96137A1.V67 Filterclass (180)

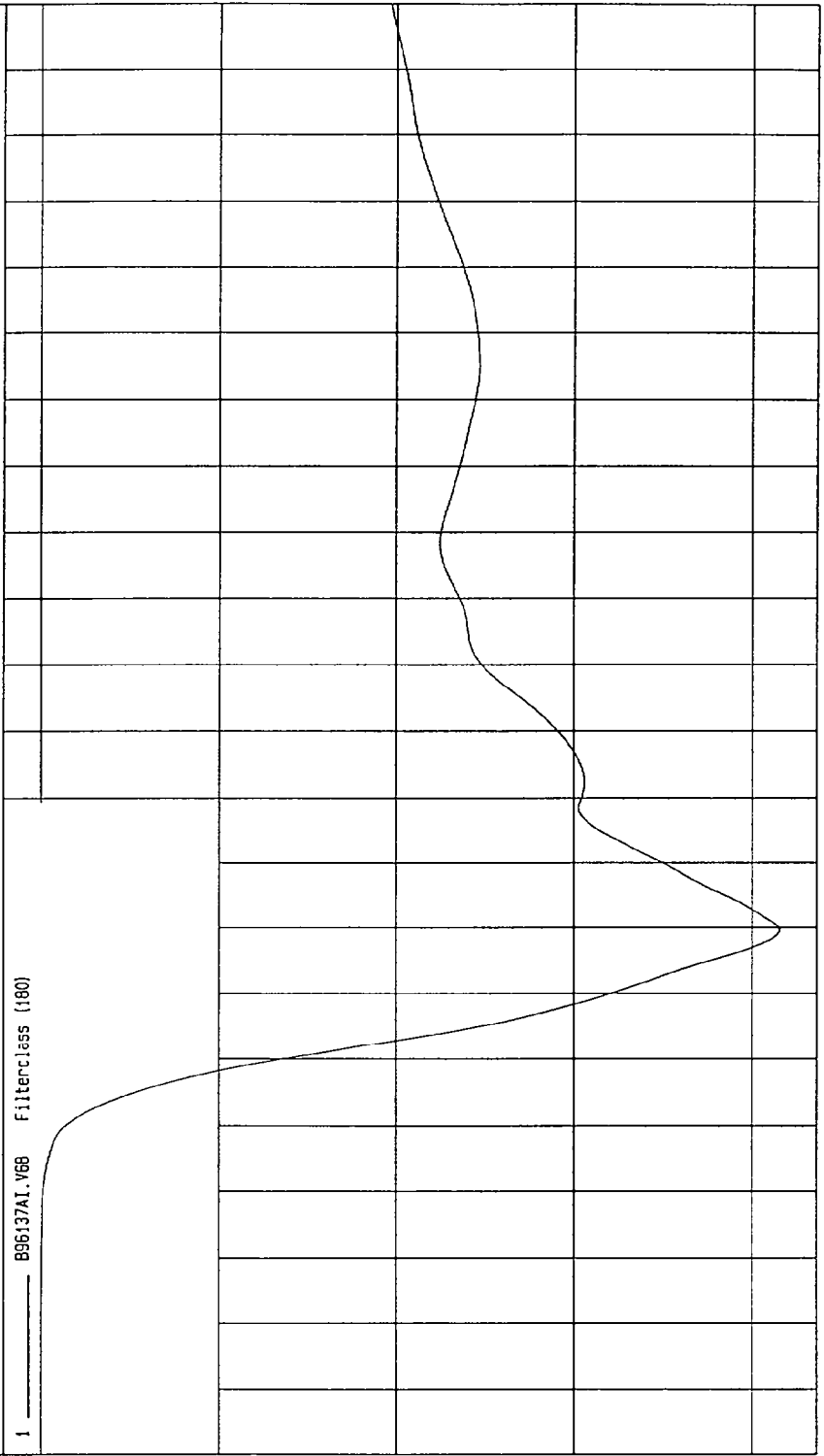


MGA Research
01-03-1997 11:28



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST	TEST DATE: 12-11-1996
COMPONENT: 1997 NISSAN ALTIMA (CV5200)	Speed: 33.28 MPH 53.6 KPH
Minimum = -41.44 KPH at 50 msec	
Maximum = 2.21E-03 KPH at -16 msec	

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY



TIME Seconds

MGA Research
01-03-1997 11:28

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -92.14 G'S at 35 msec

Maximum = 18.55 G'S at 76 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 _____ B96137AF.A69 Filterclass (180)

20

0

-20

-40

-60

-80

-100

G

-0.20

0

0.10

0.20

0.30

0.40

0.50

0.60

0.70

0.80

0.90

1.00

1.10

1.20

1.30

1.40

1.50

1.60

1.70

1.80

1.90

TIME (SECONDS)

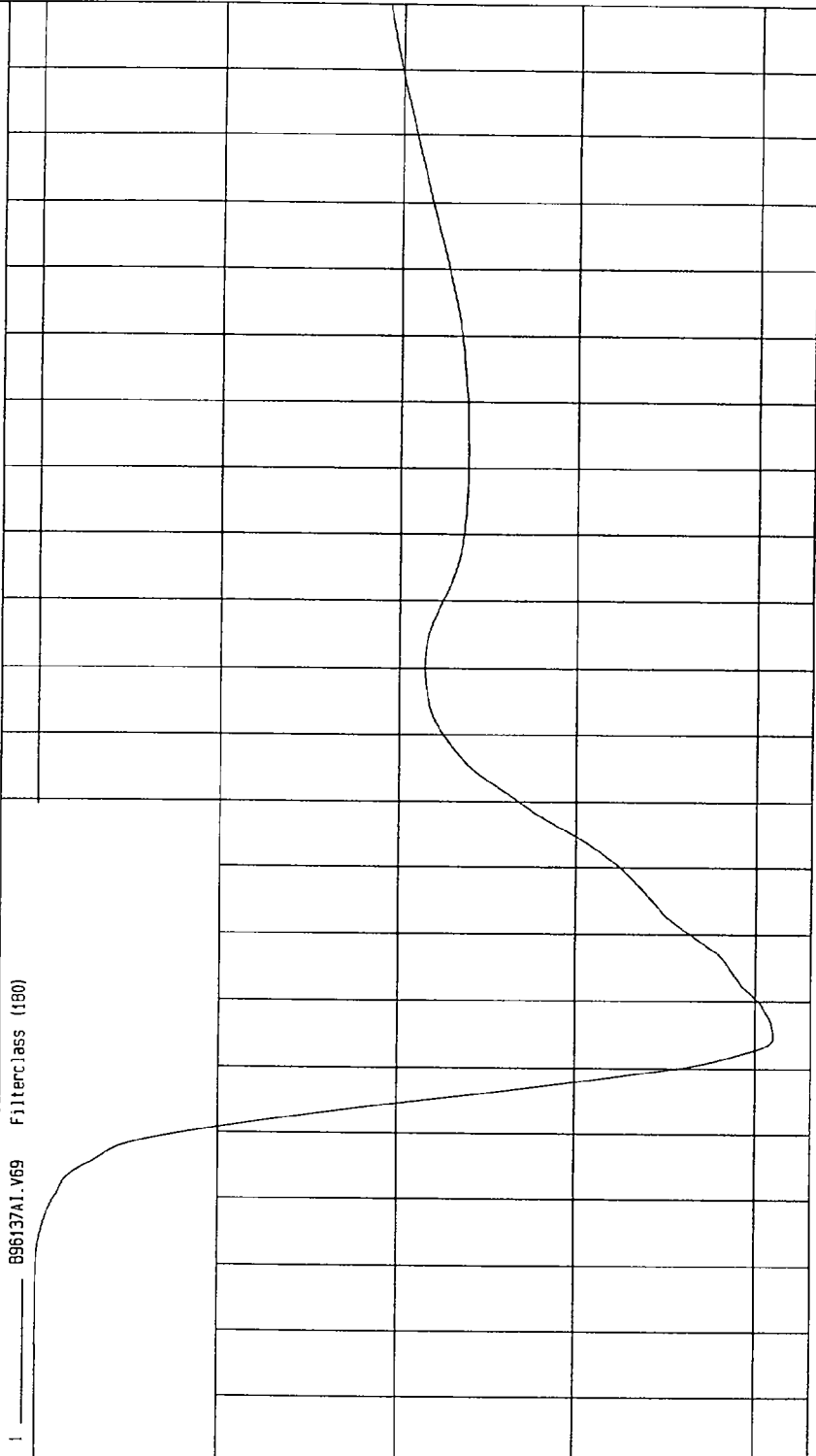
MOA Research
01-03-1997 11:28

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -40.98 KPH at 45 msec Maximum = 4.68E-03 KPH at -1 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY



TIME Seconds

MSA Research
01-03-1997 11:28

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

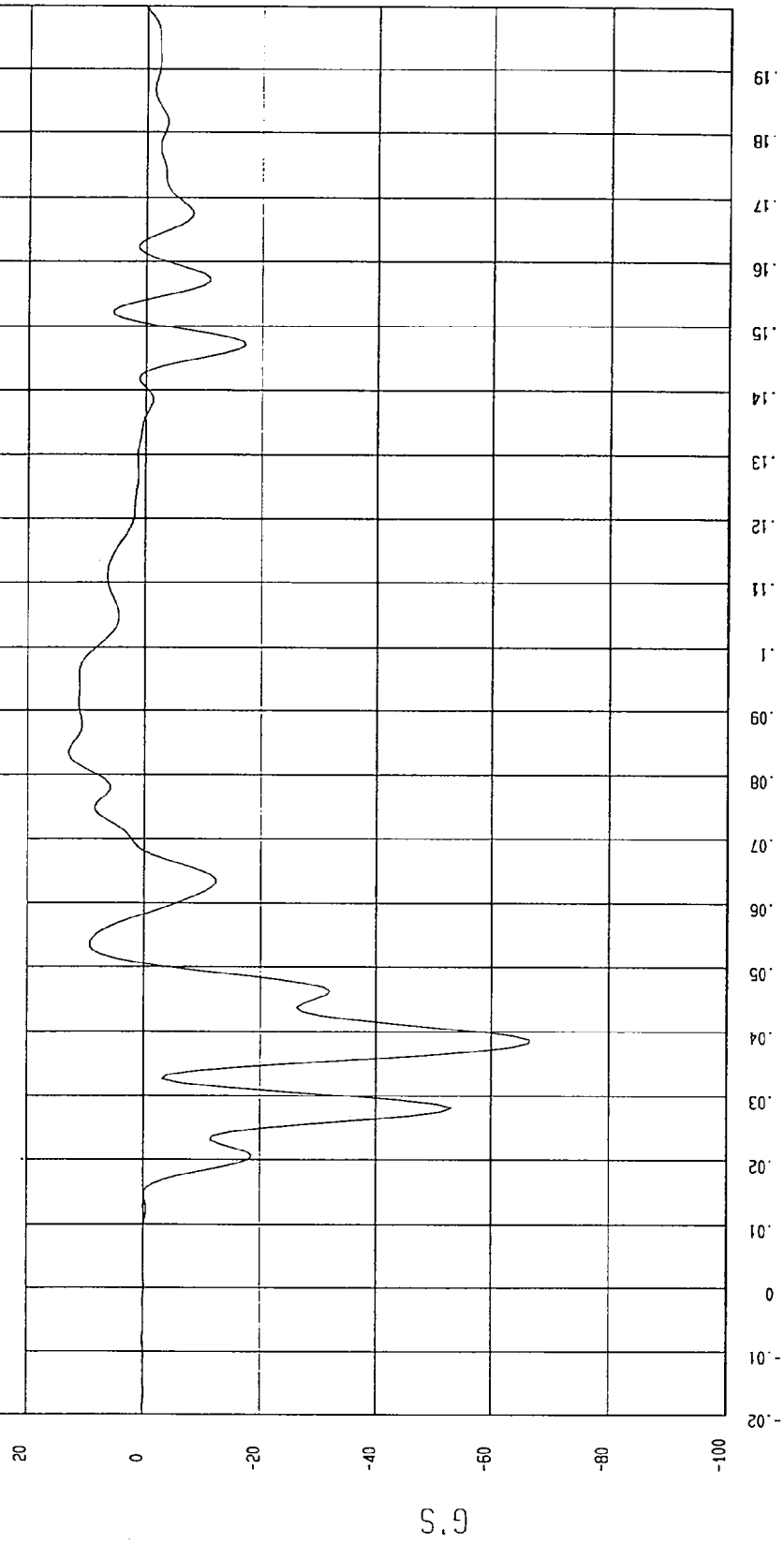
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -66.53 G'S at 39 msec Maximum = 12.84 G'S at 83 msec

FRONT PASSENGER UPPER RIB Y ACCELERATION

1 8961371.R15 FilterClass (FIR Filtered)



MSA Research
12-22-1996 10:36

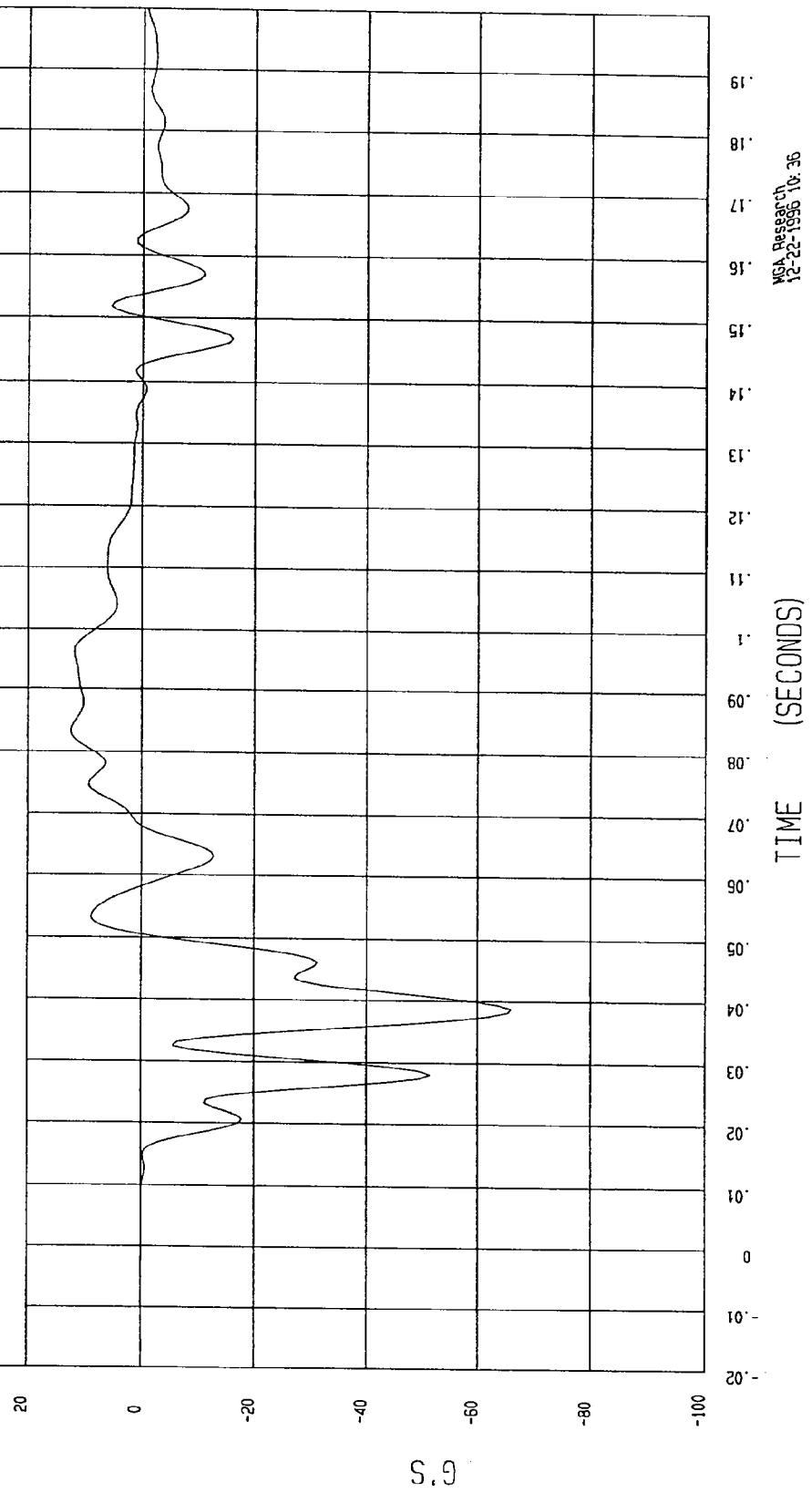
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -65.96 G'S at 39 msec Maximum = 12.38 G'S at 83 msec

FRONT PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

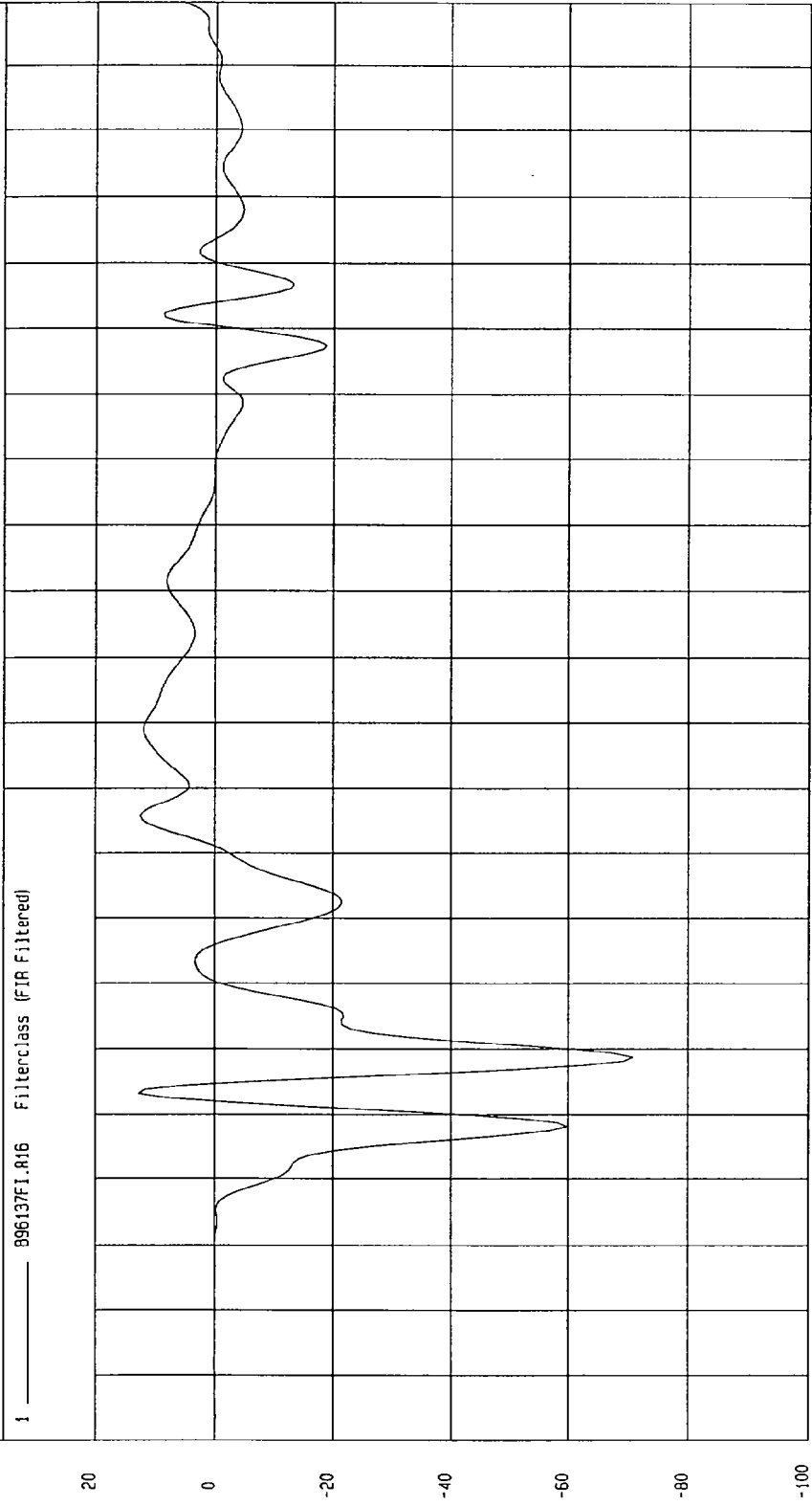
1 ——— B96137FI.R61 Filterclass (FIR Filtered)



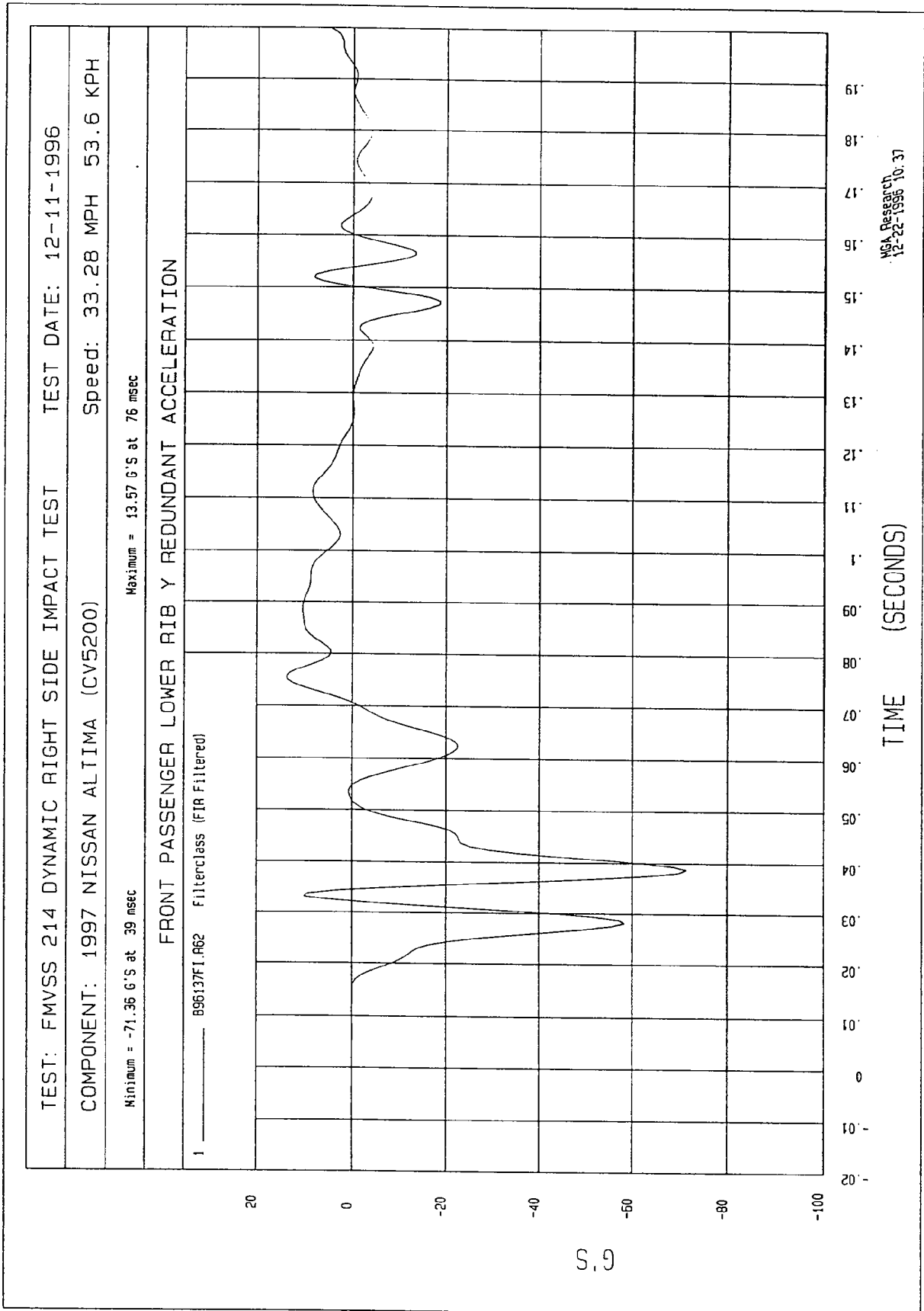
MCA Research
12-22-1996 10:36

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST	TEST DATE: 12-11-1996
COMPONENT: 1997 NISSAN ALTIMA (CV5200)	Speed: 33.28 MPH 53.6 KPH
Minimum = -70.86 G'S at 39 msec	Maximum = 12.68 G'S at 33 msec

FRONT PASSENGER LOWER RIB Y ACCELERATION



WCA Research
12-22-1996 10:36



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

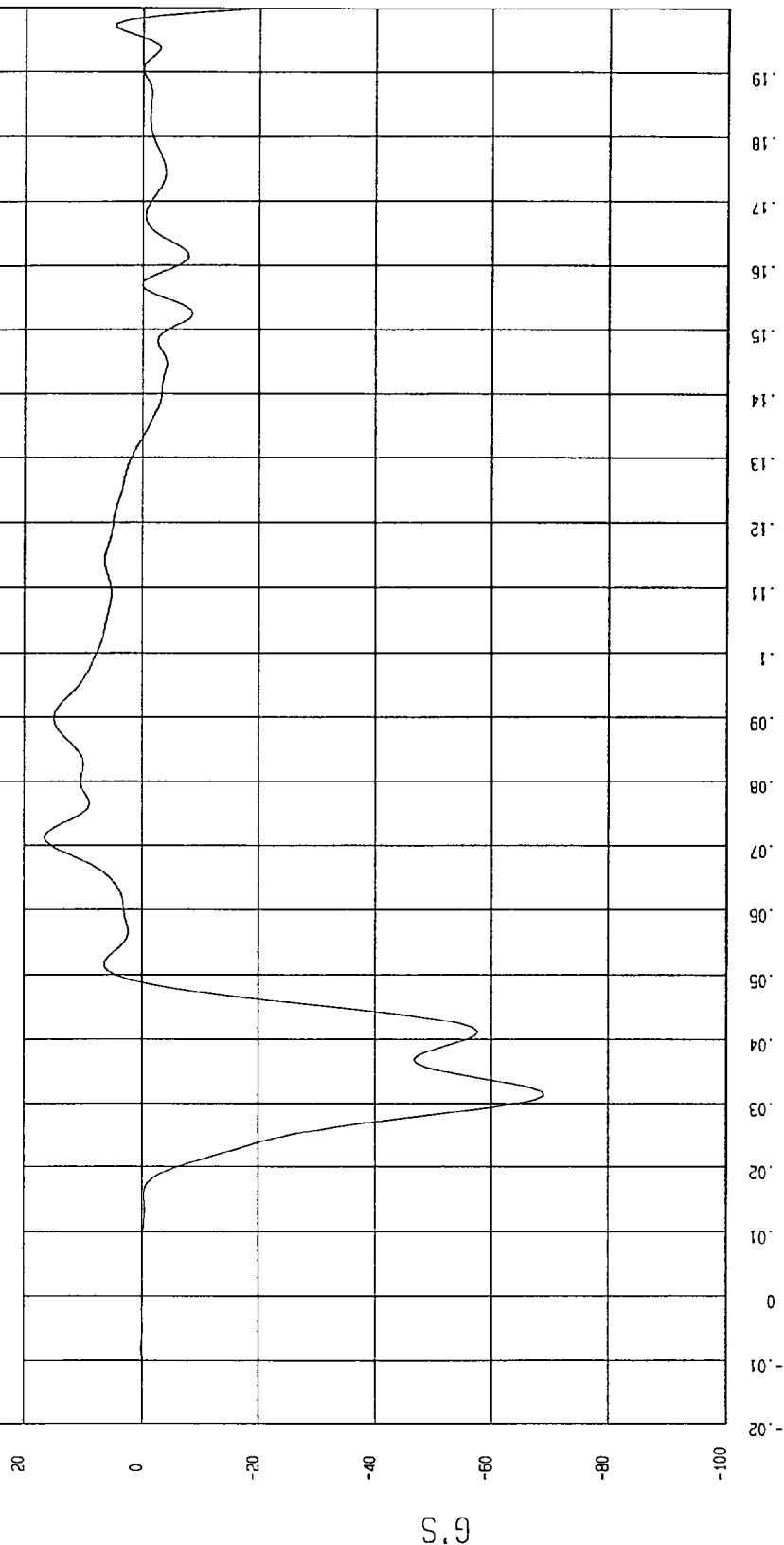
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -69.00 G'S at 31 msec

Maximum = 16.48 G'S at 71 msec

FRONT PASSENGER LOWER SPINE Y ACCELERATION

1 996137FLA17 Filterclass (FIR Filtered)



MGA Research
12-22-1996 10:37

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

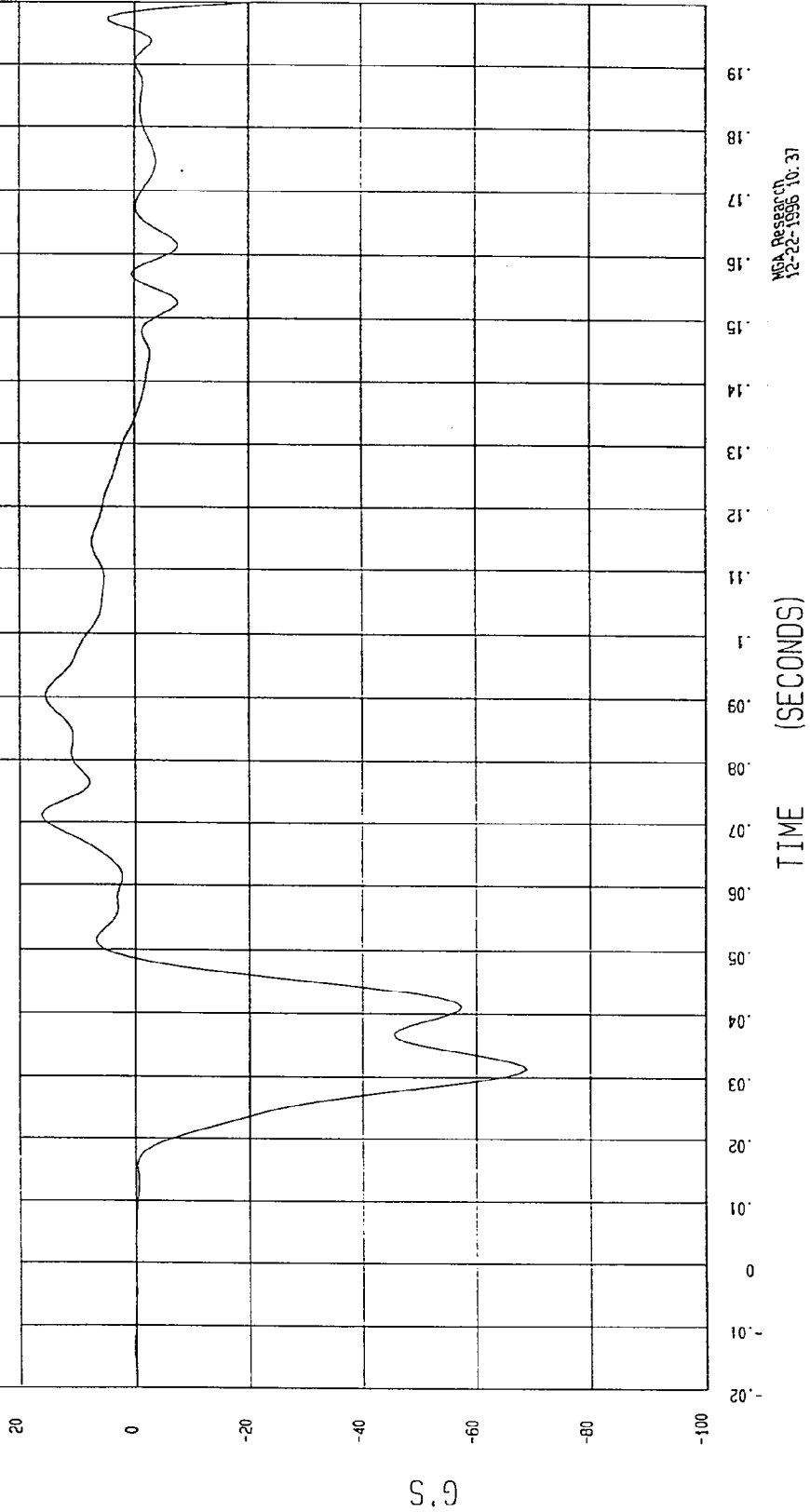
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -68.99 G'S at 31 msec

Maximum = 16.03 G'S at 71 msec

FRONT PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 _____ B96137F1.R63 Filterclass (FIR Filtered)



MECA Research
12-22-1996 10:37

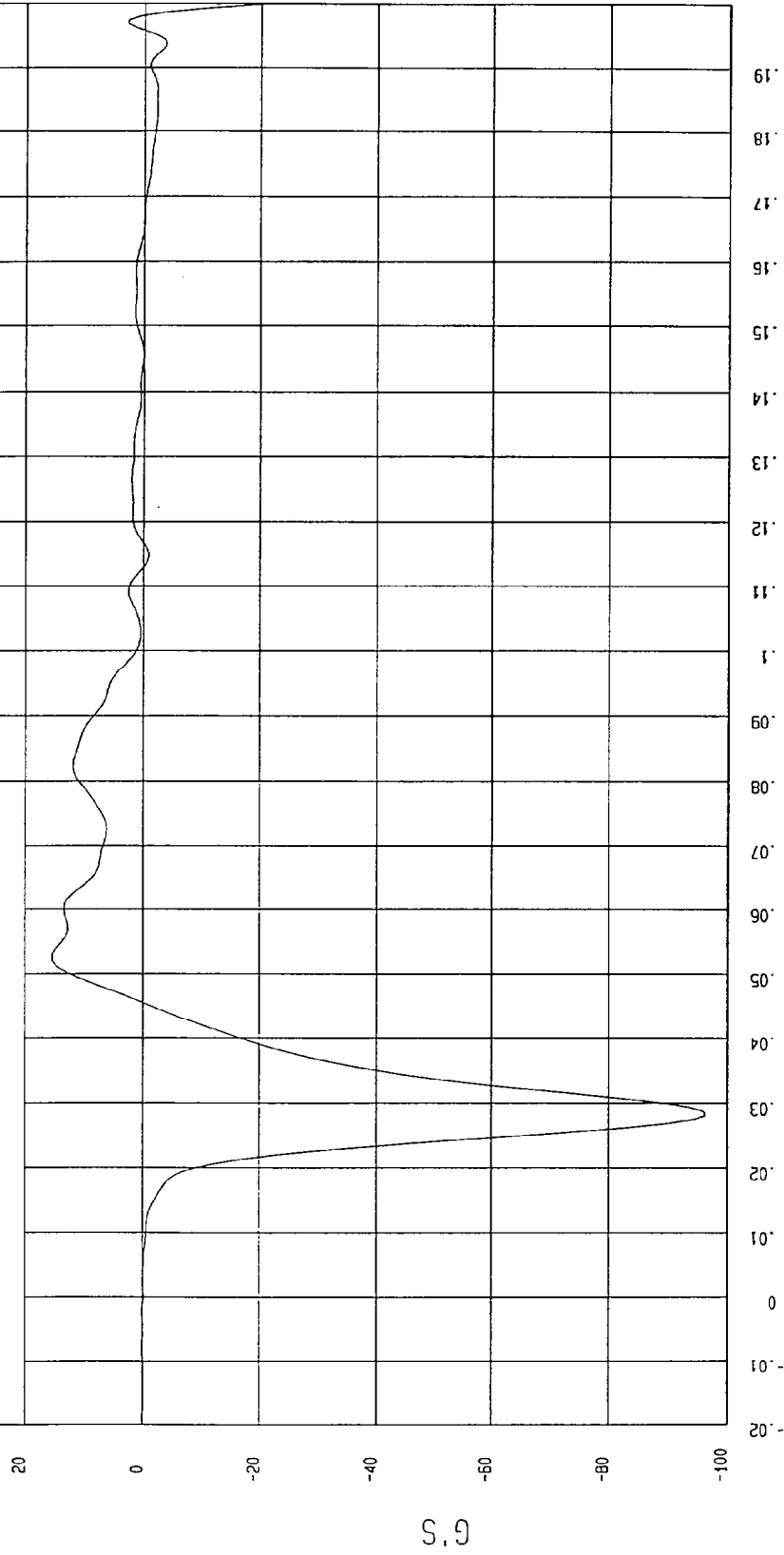
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

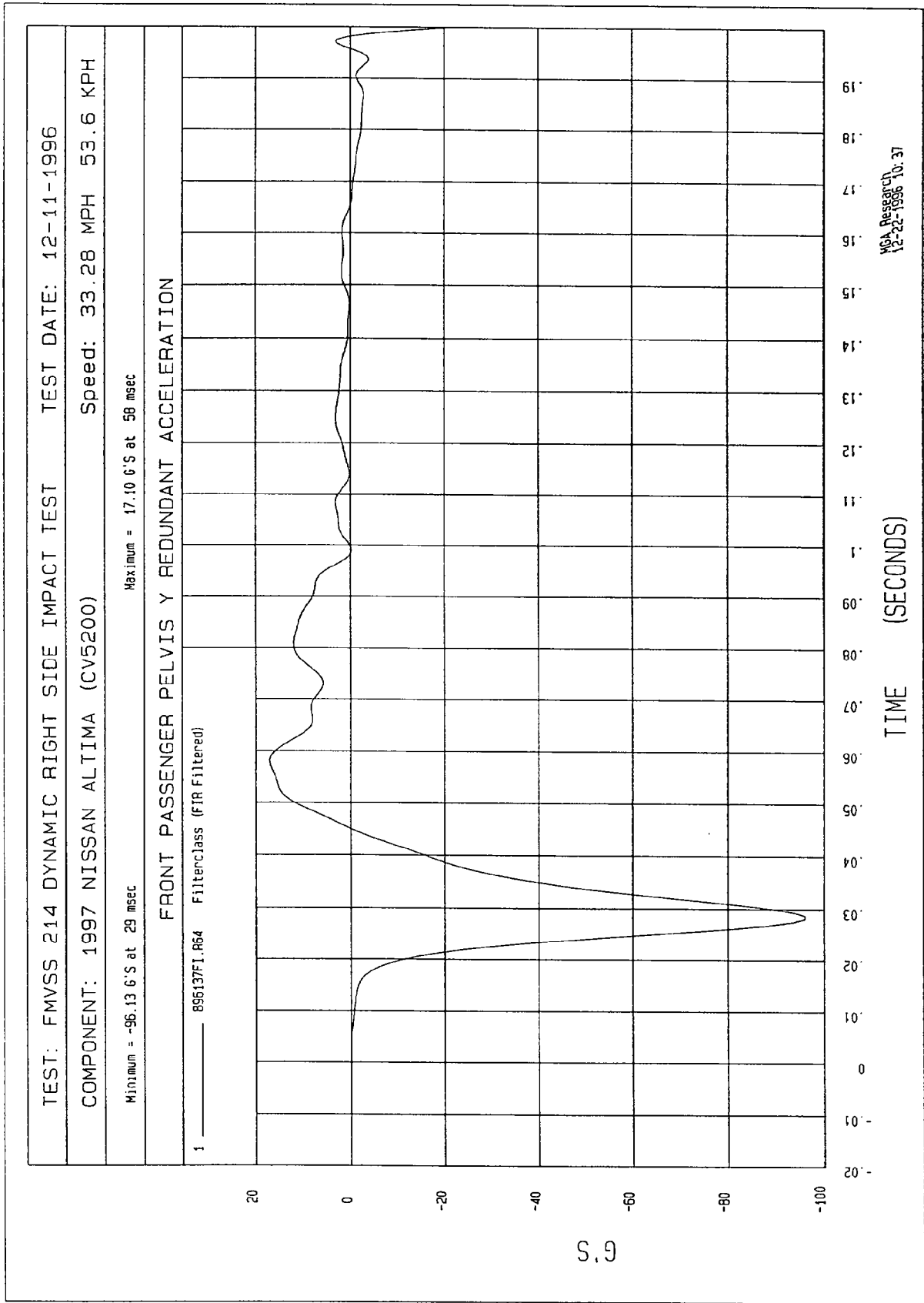
Minimum = -96.31 G'S at 28 msec Maximum = 15.42 G'S at 52 msec

FRONT PASSENGER PELVIS Y ACCELERATION

1 896137F1.R18 Filterclass (FIR Filtered)



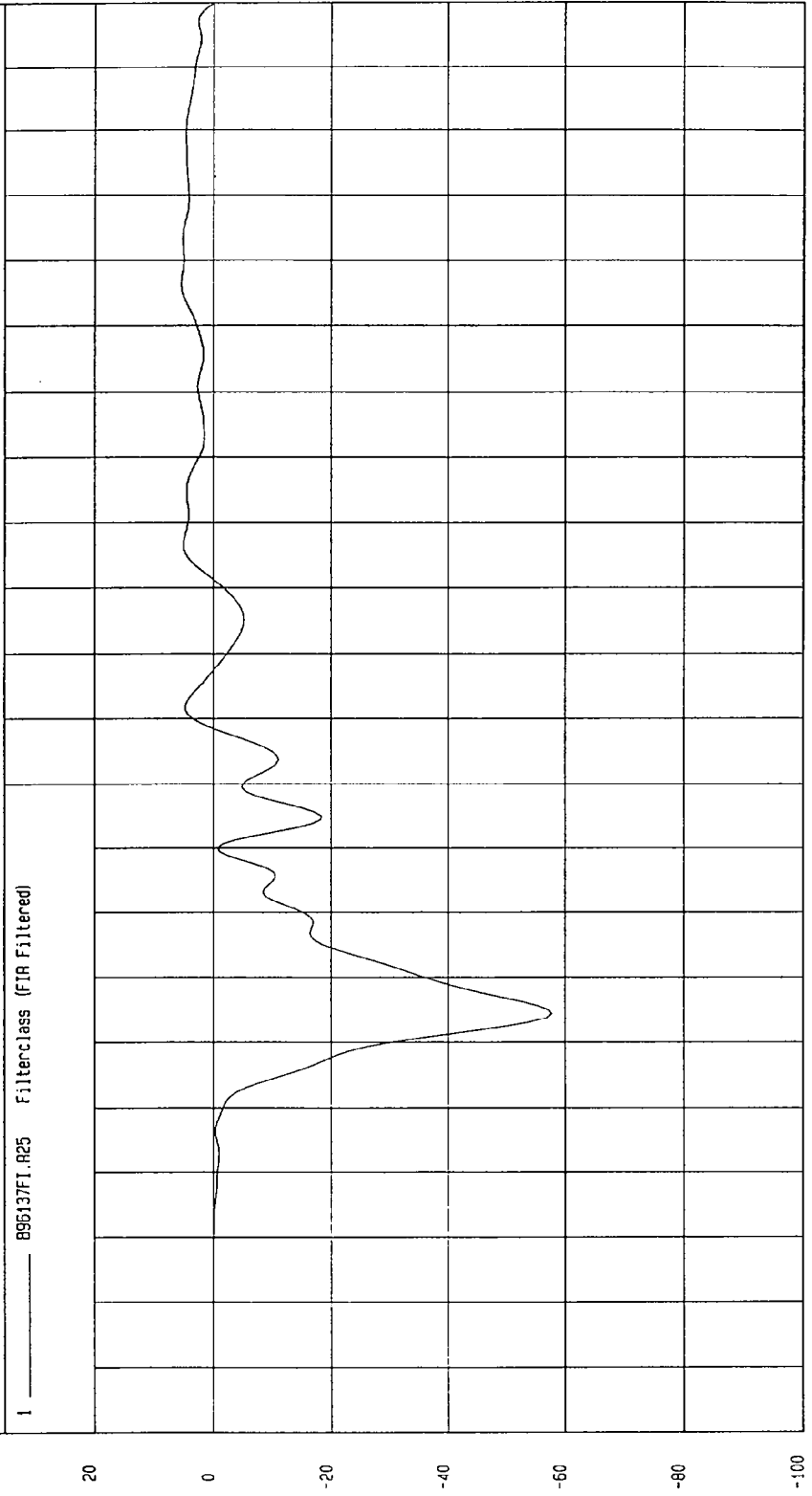
NGA Research
12-22-1996 10:37



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -57.75 G'S at 44 msec
Maximum = 5.52 G'S at 156 msec

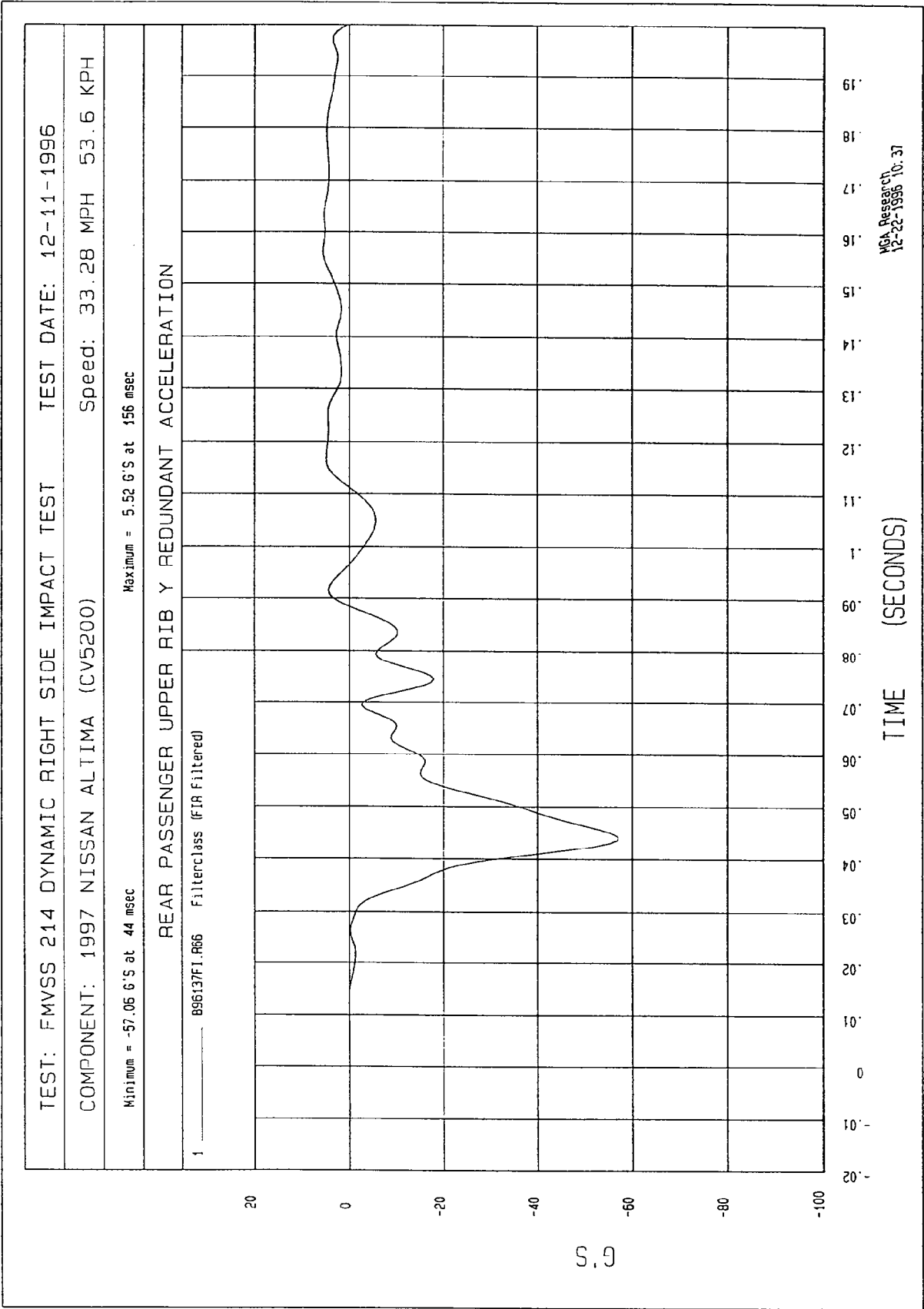
REAR PASSENGER UPPER RIB Y ACCELERATION



TIME (SECONDS)

MGA Research
12-22-1996 10:37

S.G

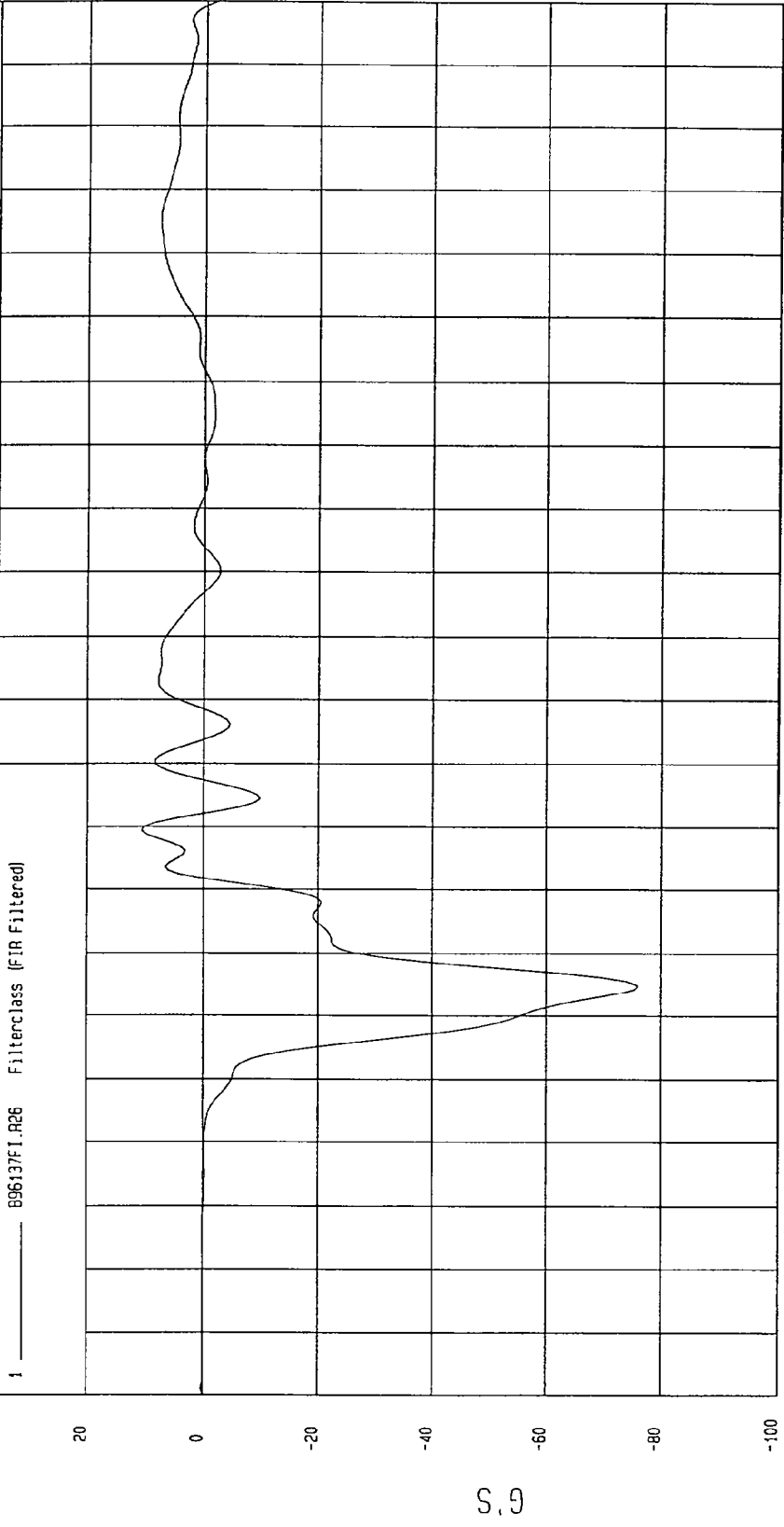


TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -75.96 G'S at 45 msec Maximum = 10.61 G'S at 69 msec

REAR PASSENGER LOWER RIB Y ACCELERATION



TIME (SECONDS)

MOA Research
12-22-1996 10:37

TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

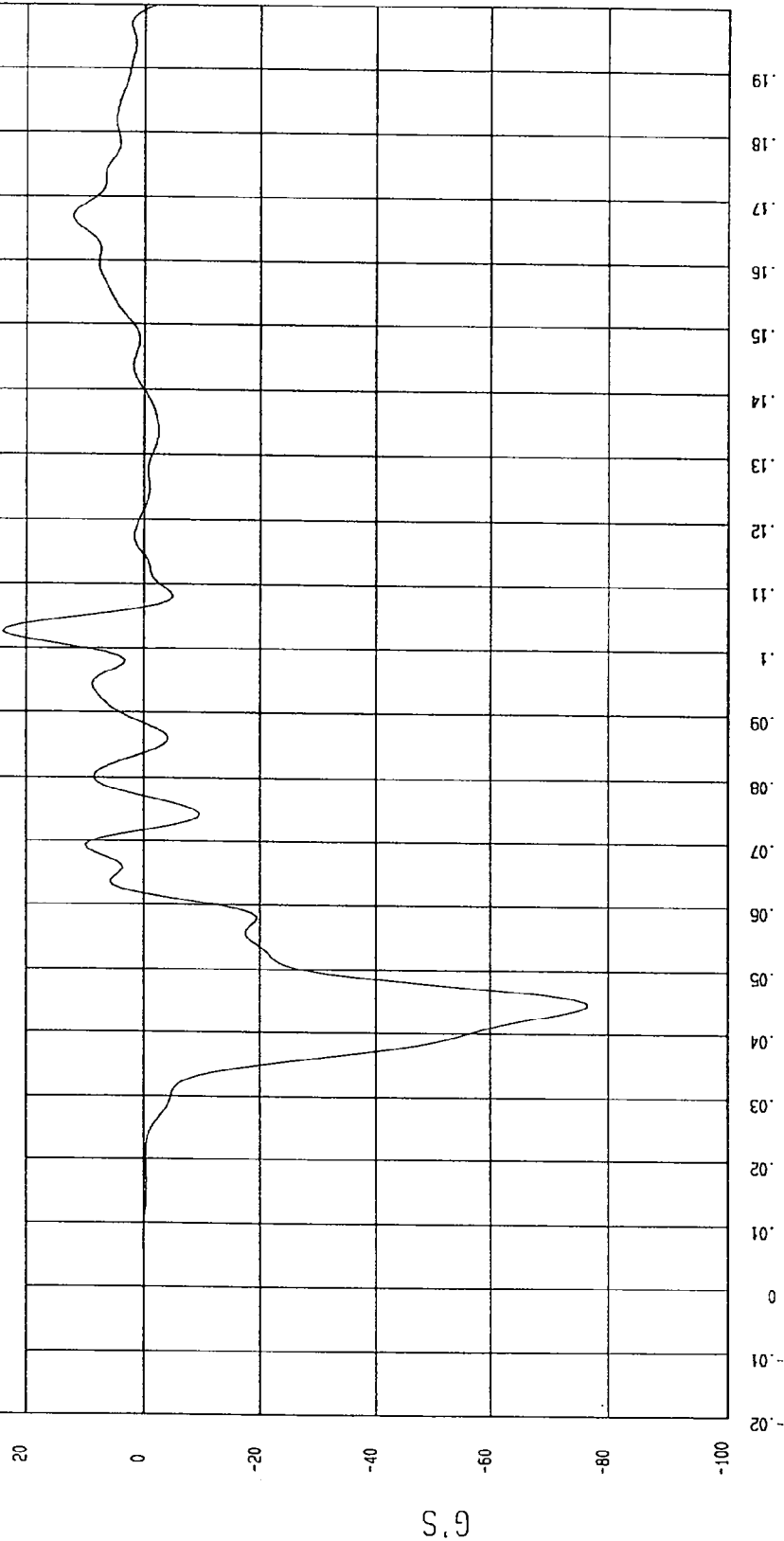
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -76.47 G'S at 44 msec

Maximum = 23.88 G'S at 102 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 89613/F1.067 Filterclass (FIR Filtered)



MSA Research
12-22-1996 10:37

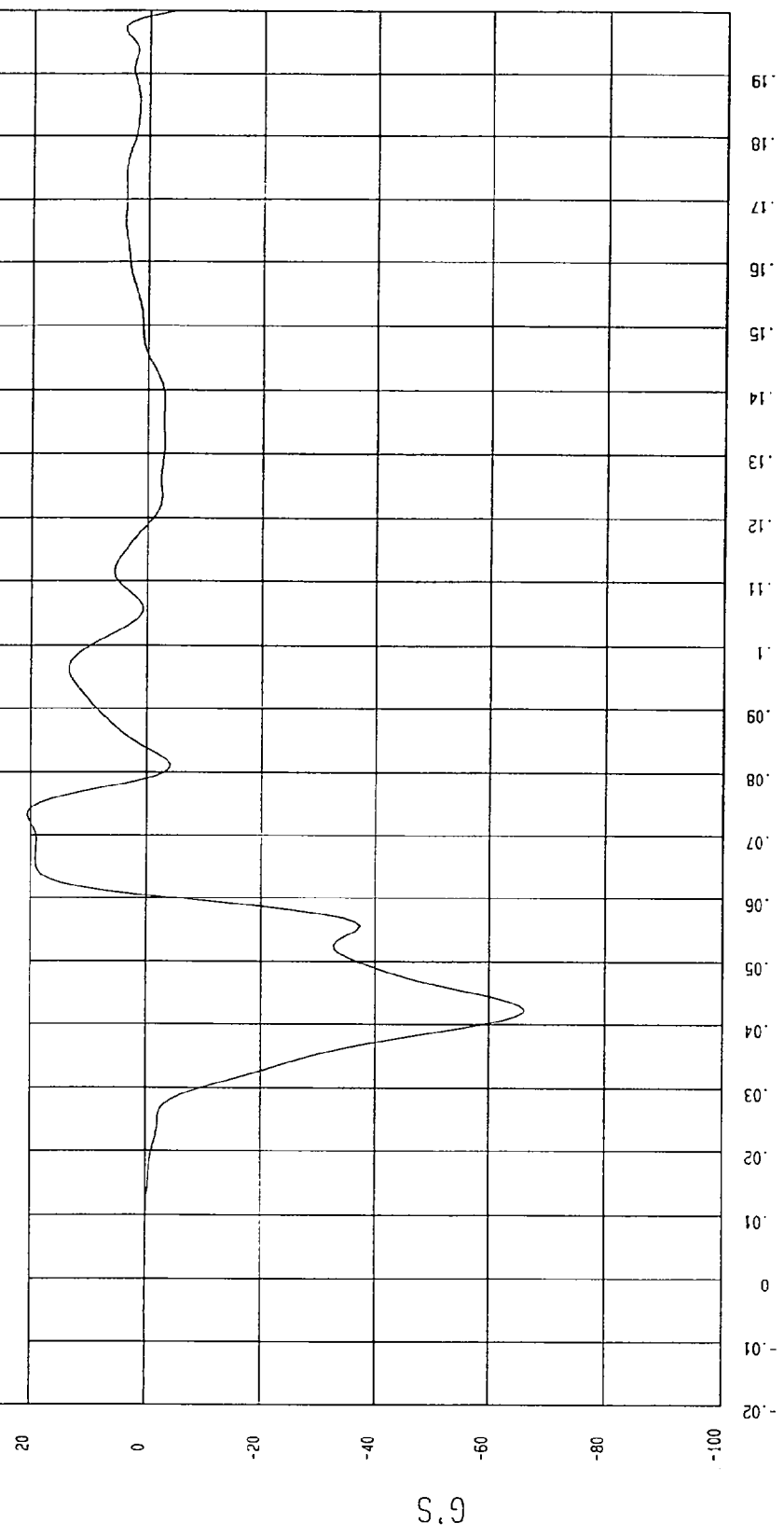
TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

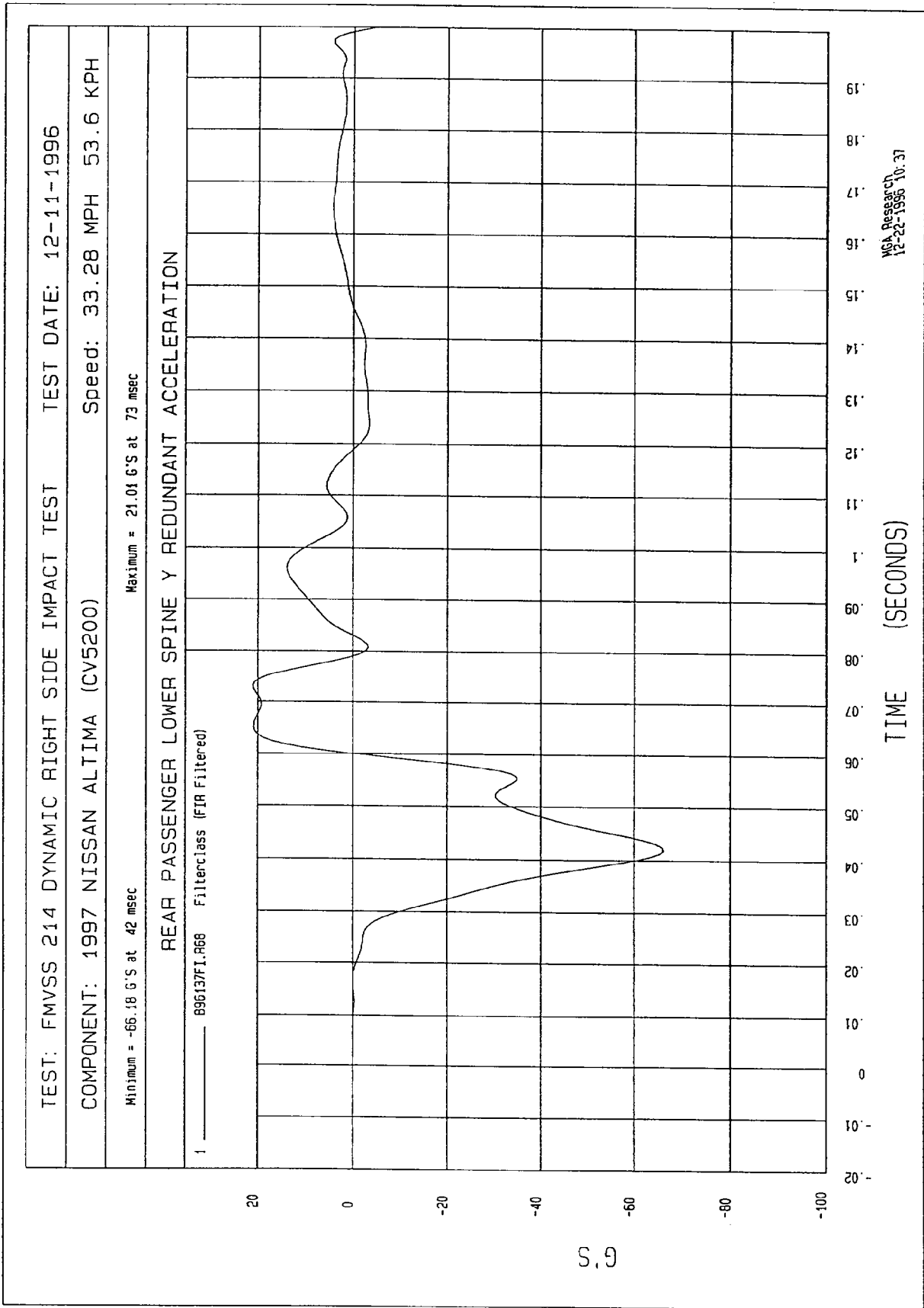
Minimum = -66.14 G'S at 42 msec Maximum = 20.60 G'S at 73 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 — 896137F1.R27 Filterclass (FIR Filtered)



MCA Research
12-22-1996 10:37



TEST: FMVSS 214 DYNAMIC RIGHT SIDE IMPACT TEST TEST DATE: 12-11-1996

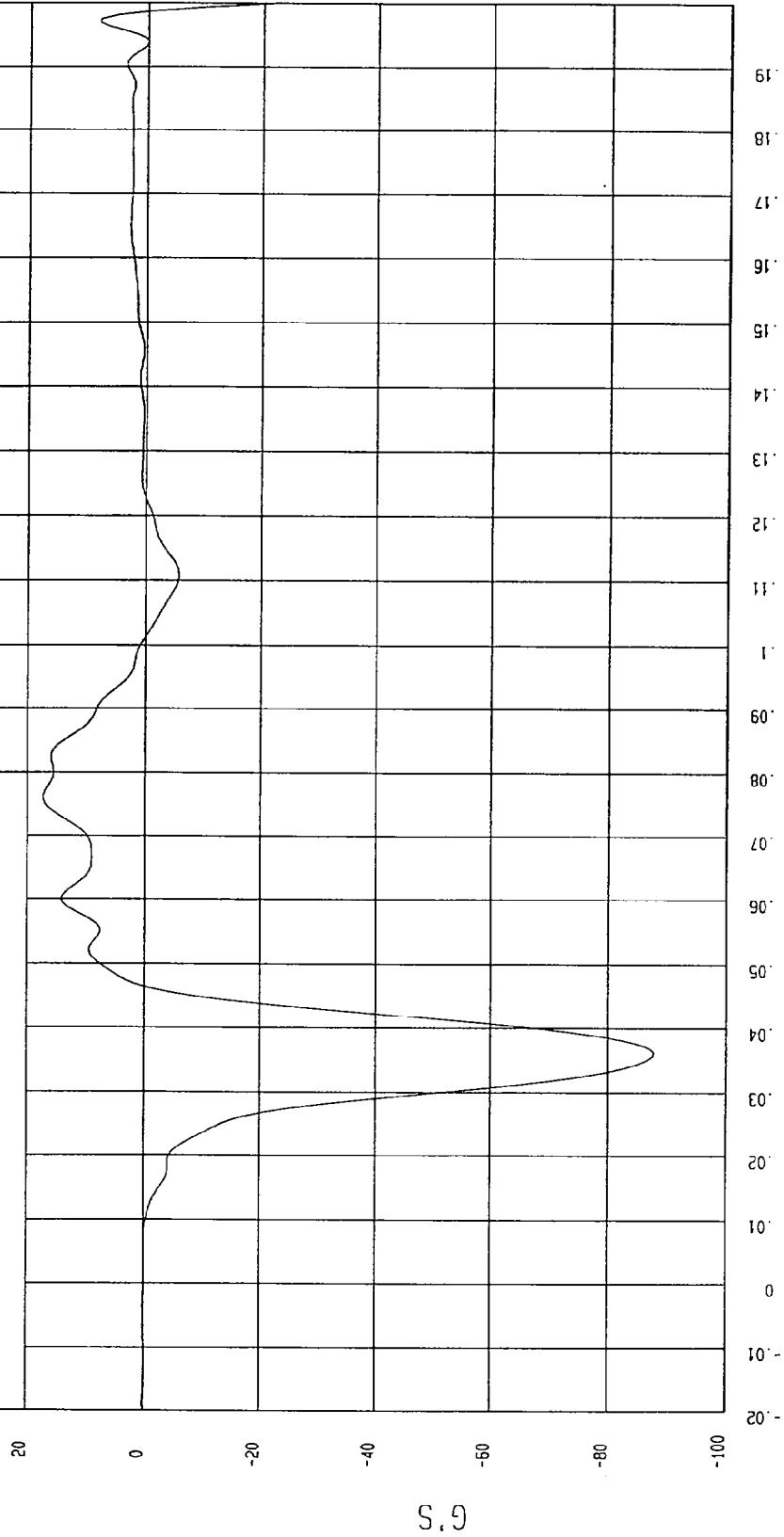
COMPONENT: 1997 NISSAN ALTIMA (CV5200) Speed: 33.28 MPH 53.6 KPH

Minimum = -87.79 G'S at 36 msec

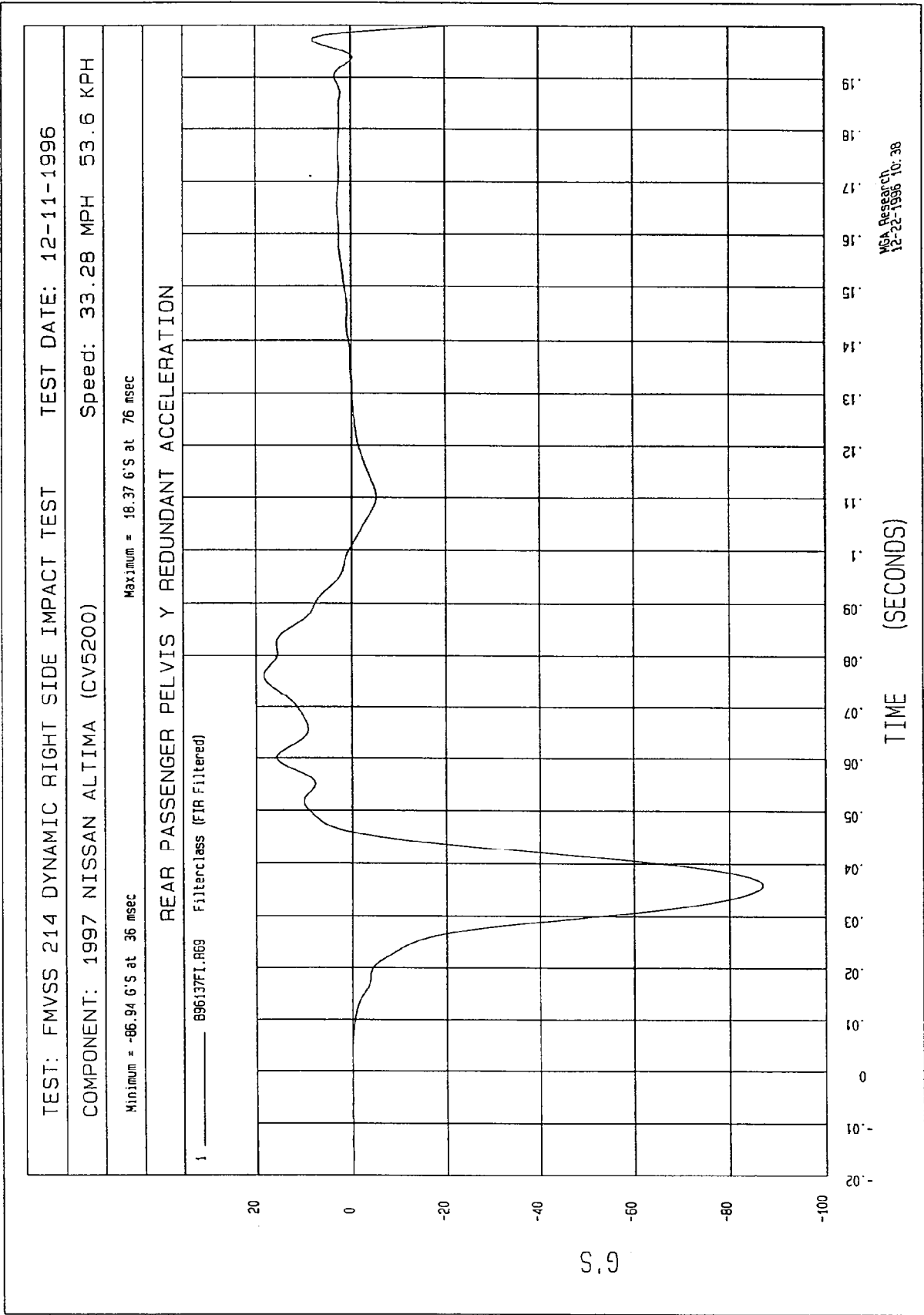
Maximum = 17.26 G'S at 76 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 ——— B9613/F1.R28 Filterclass (FIR Filtered)



MEA Research
12-22-1996 10:37



APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-96-DC15

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

NISSAN MOTOR COMPANY, LTD.

1997 NISSAN ALTIMA 4 DOOR

NHTSA NO. CV5200

MGA PROVING GROUNDS

5000 WARREN ROAD

BURLINGTON, WI 53105



Test Date: December 11, 1996

Report Date: January 10, 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
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Washington, D.C. 20590

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PRE-TEST CERTIFICATION DATA

Front 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.

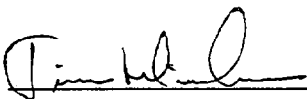
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

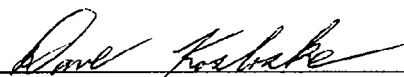
DATE OF VERIFICATION: December 10, 1996

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"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY:



APPROVED BY:



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

DATE: December 10, 1996

DUMMY NUMBER: 270

TEST NUMBER: D96211678

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66° - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	25%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	251
	DISPLACEMENT (in.)	1.18 - 1.38	1.30
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	436
	DISPLACEMENT (in.)	1.26 - 1.47	1.30
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	908
	DISPLACEMENT (in.)	1.30 - 1.57	1.43

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim White

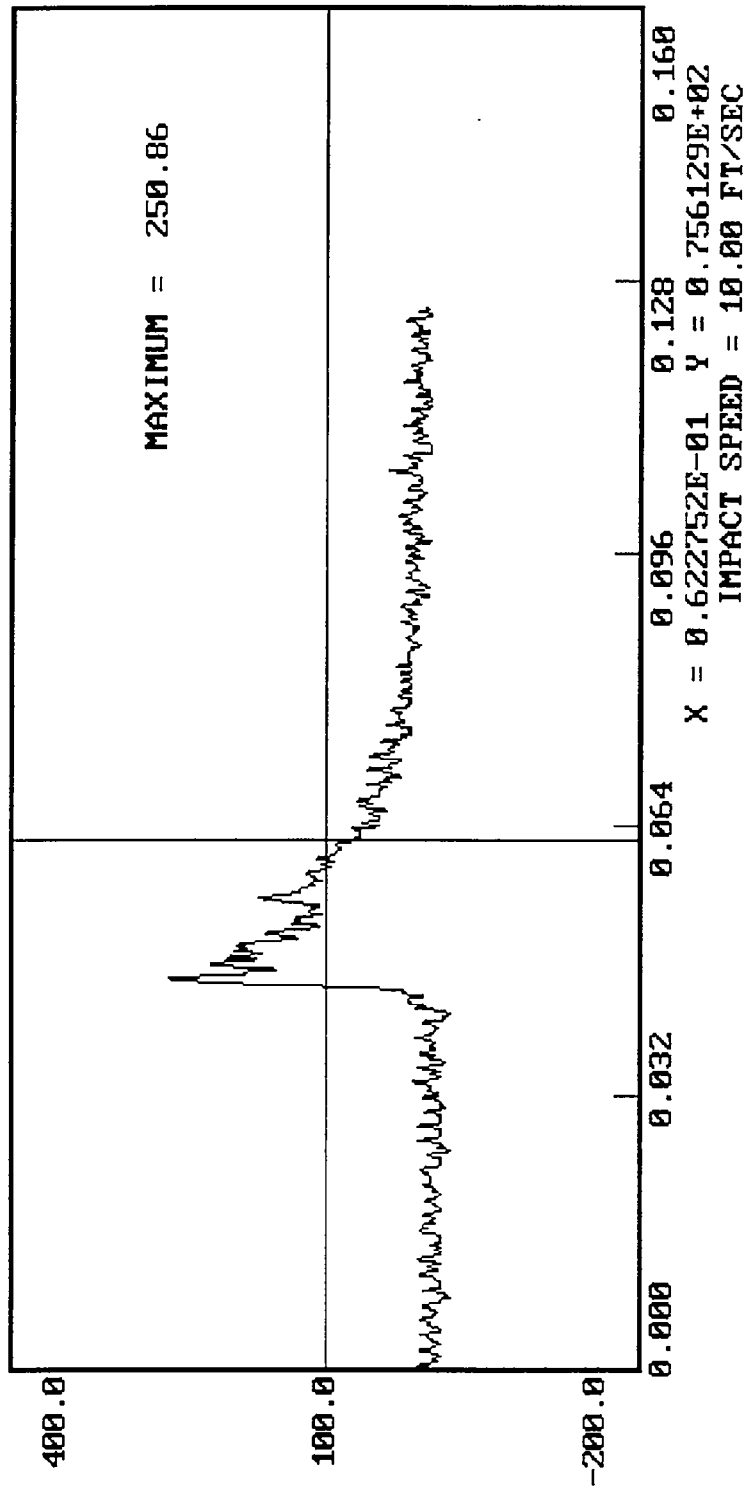
APPROVED BY Gene Kelsche

12-10-1996 11:12

DUMMY CALIBRATION - DAMPENER BENCH TEST

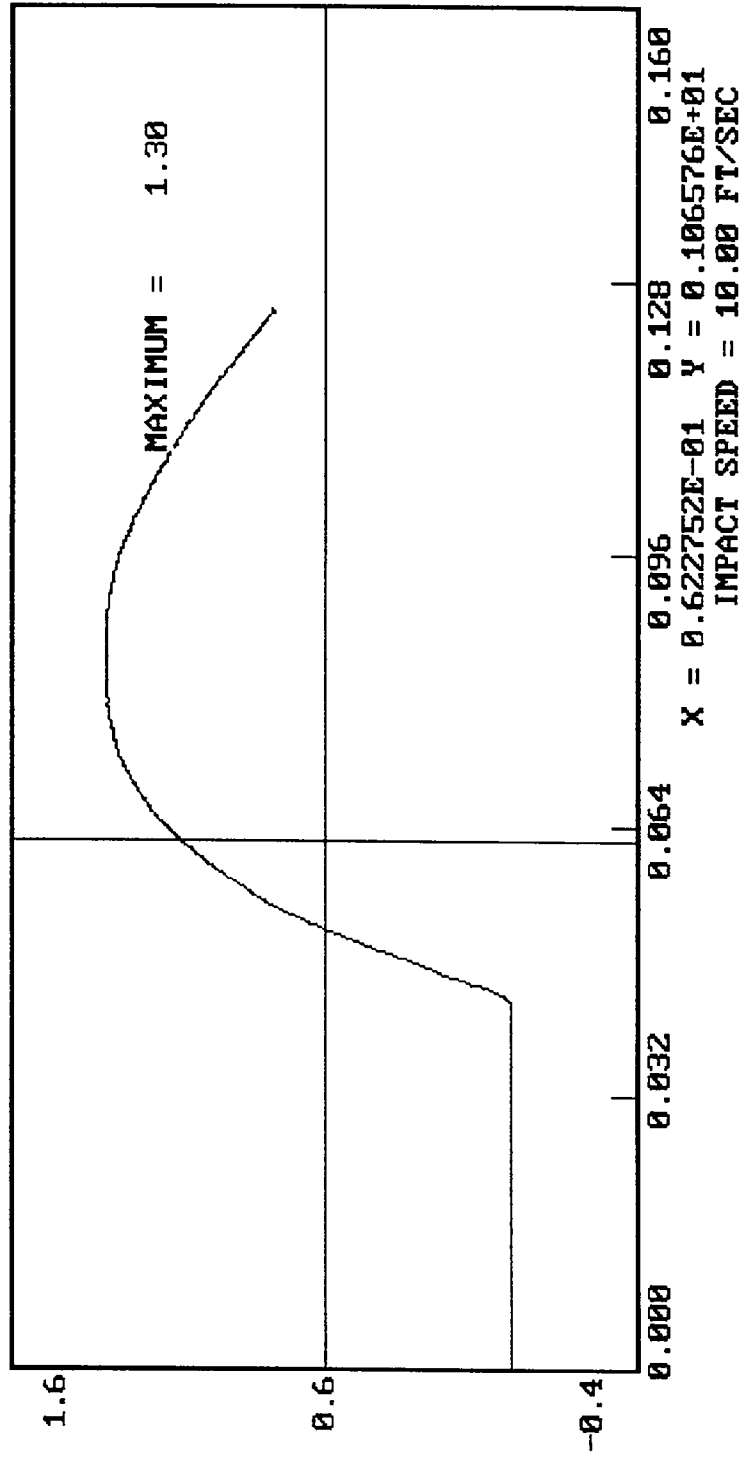
DUMMY # 270

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



12-10-1996 . 11:12

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

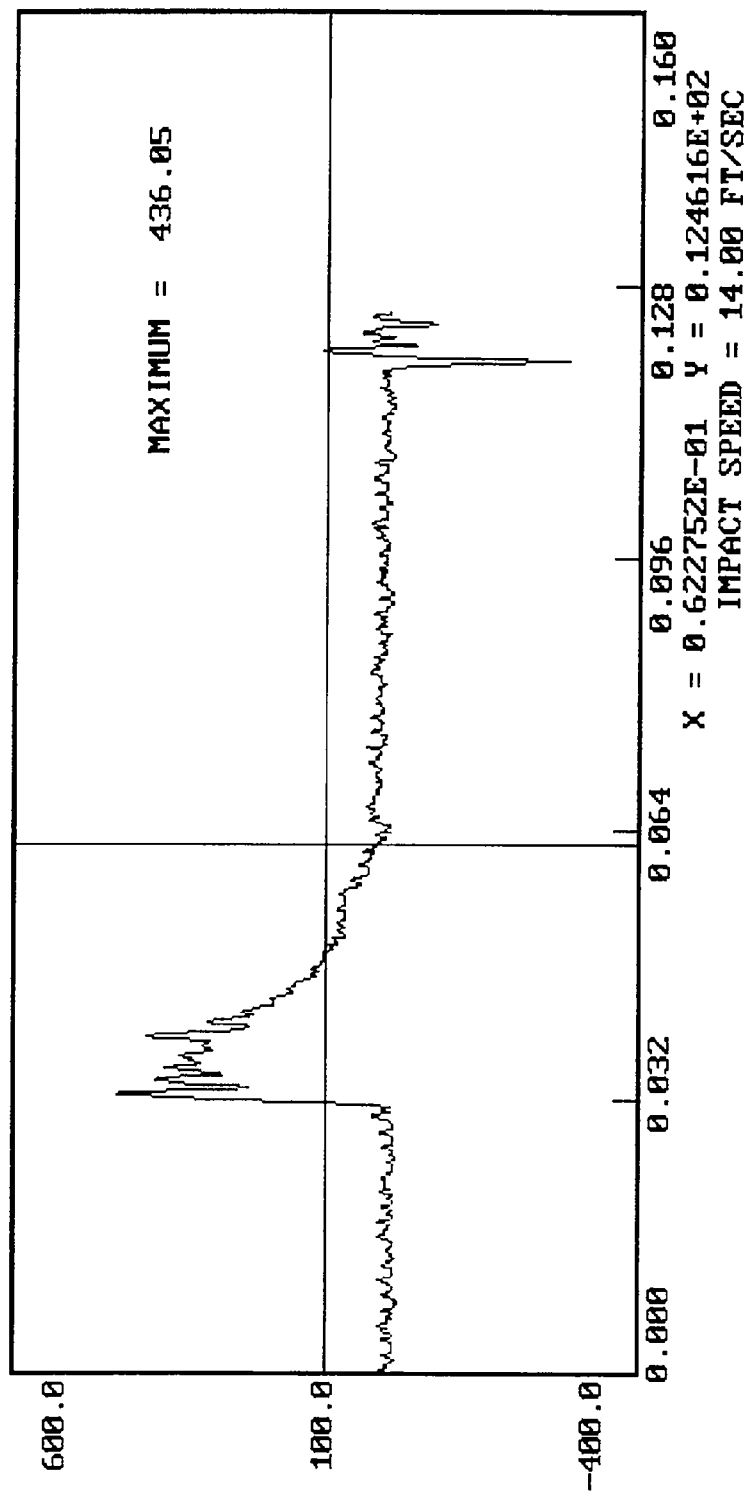


12-10-1996 10:48

DUMMY CALIBRATION - DAMPENER BENCH TEST

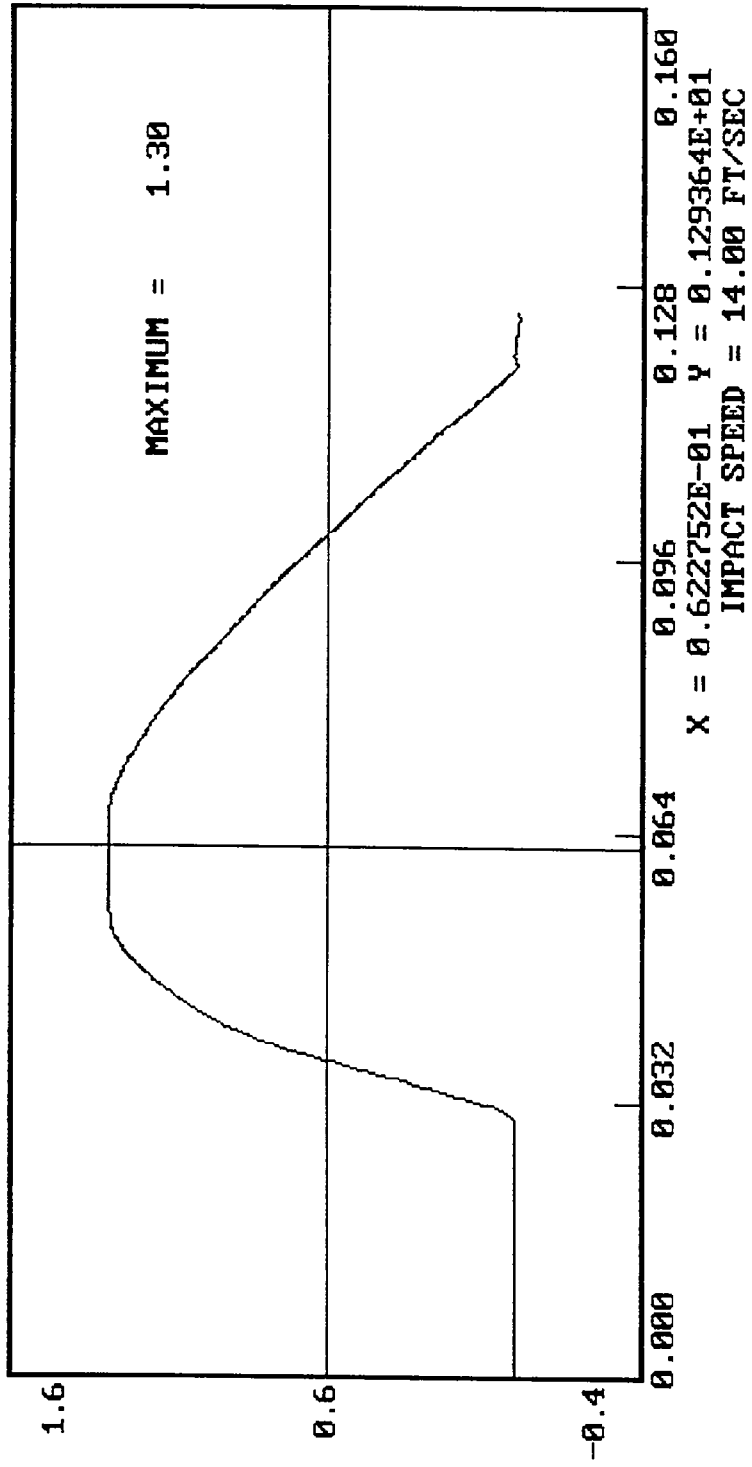
DUMMY # 270

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

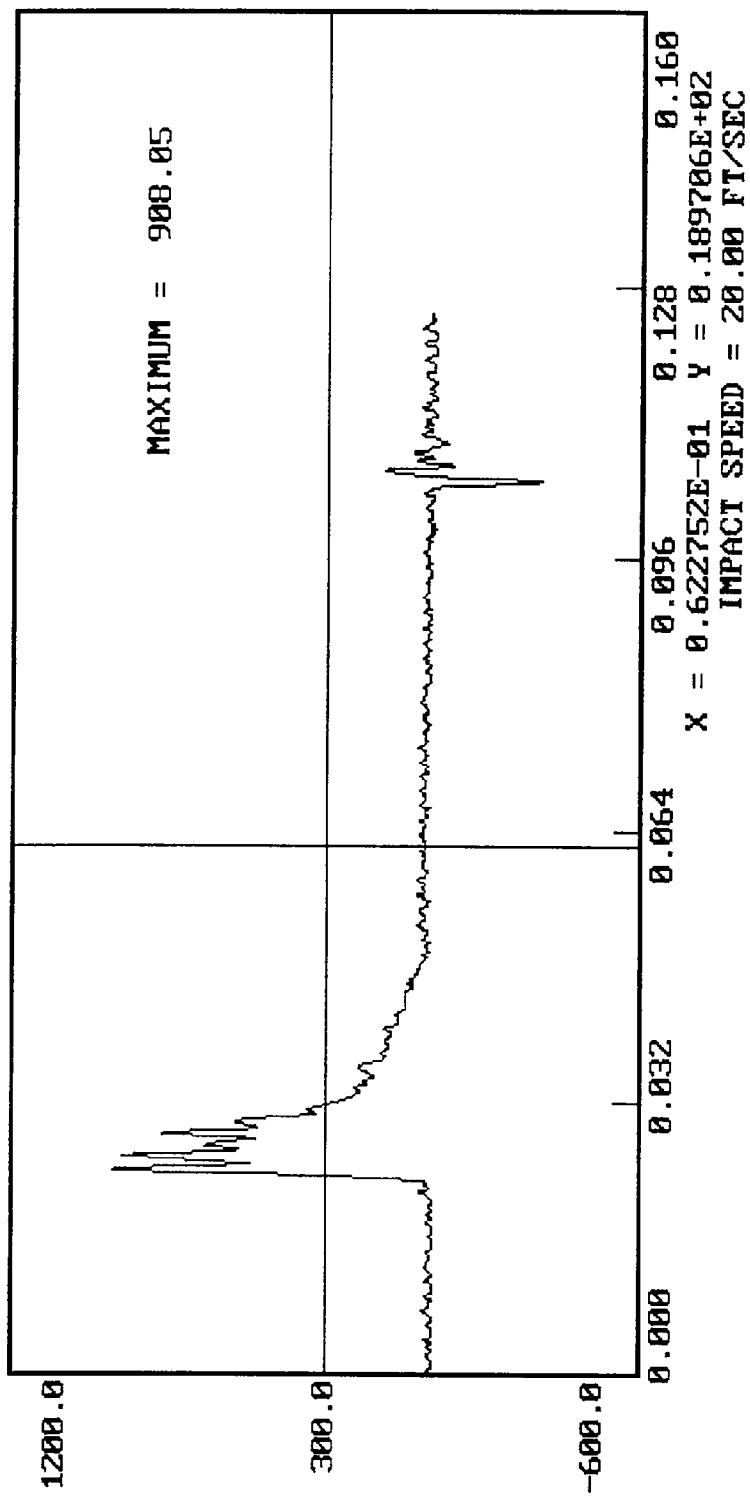


12-10-1996 10:48

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

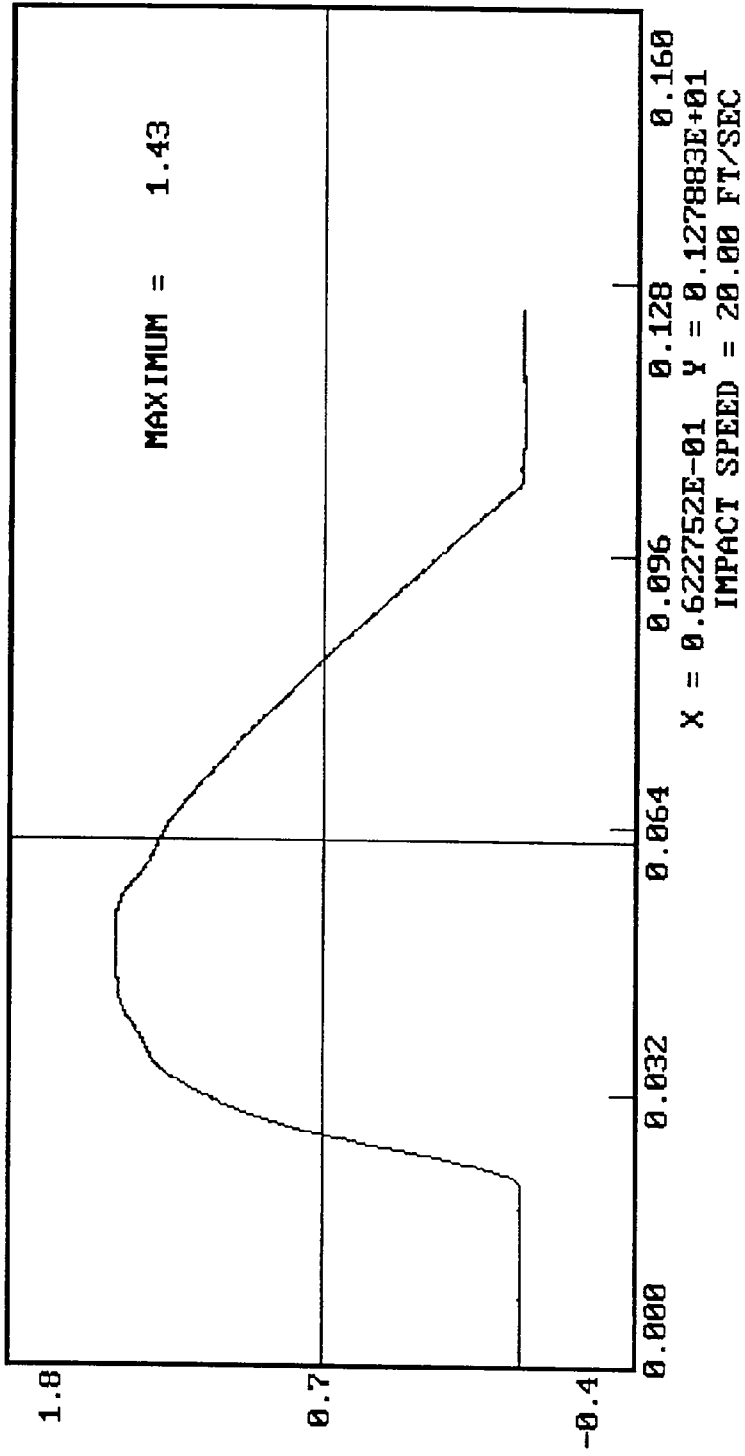


DUMMY CALIBRATION - DAMPENER BENCH TEST
 DUMMY # 270
 12-10-1996 10:45
 FORCE (LBS) VS. TIME ((SECONDS))



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

12-10-1996 10:45



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 10, 1996

DUMMY NUMBER: 270

TEST NUMBER: D962112

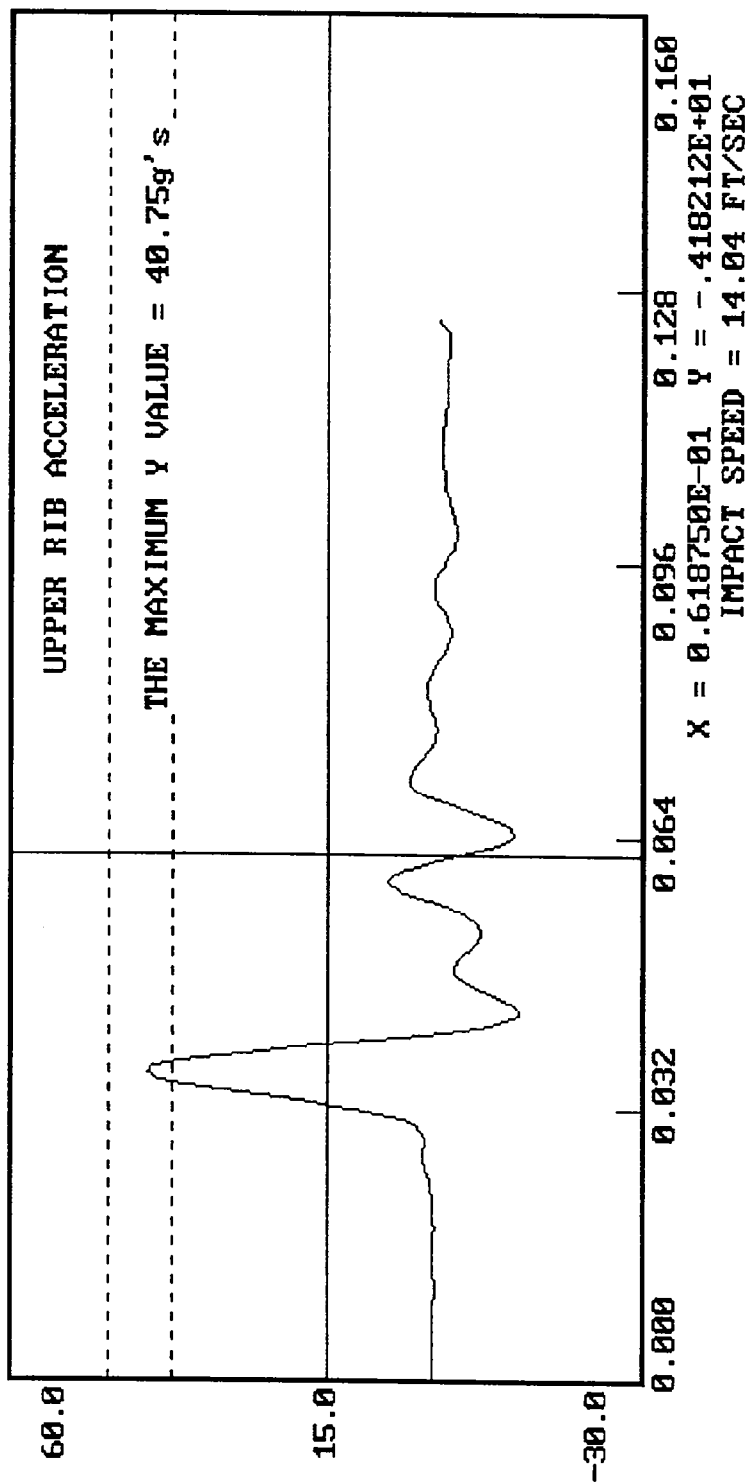
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	41
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

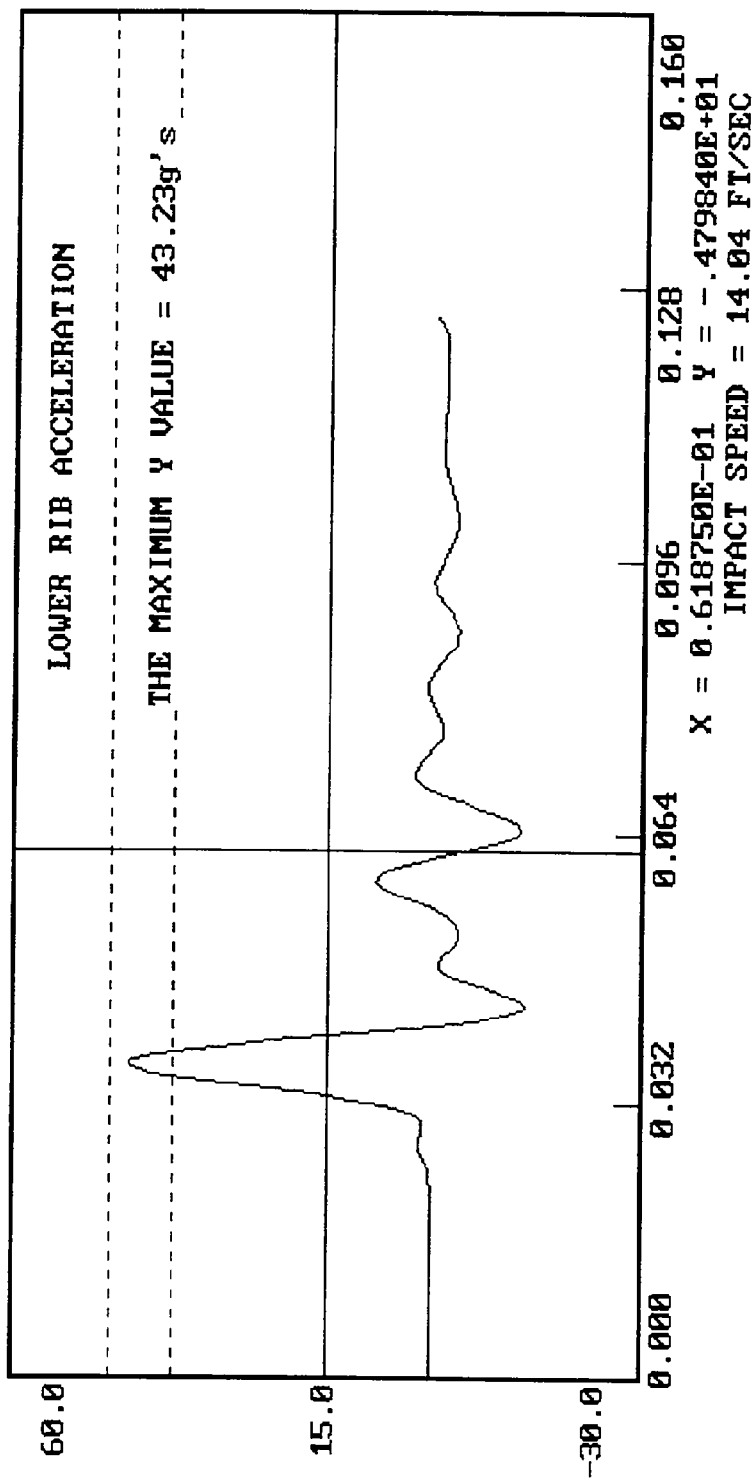
TECHNICIAN Tim Hill

APPROVED BY David Koabake

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 12-10-1996 16:04
 ACCELERATION (G'S) VS. TIME ((SECONDS))

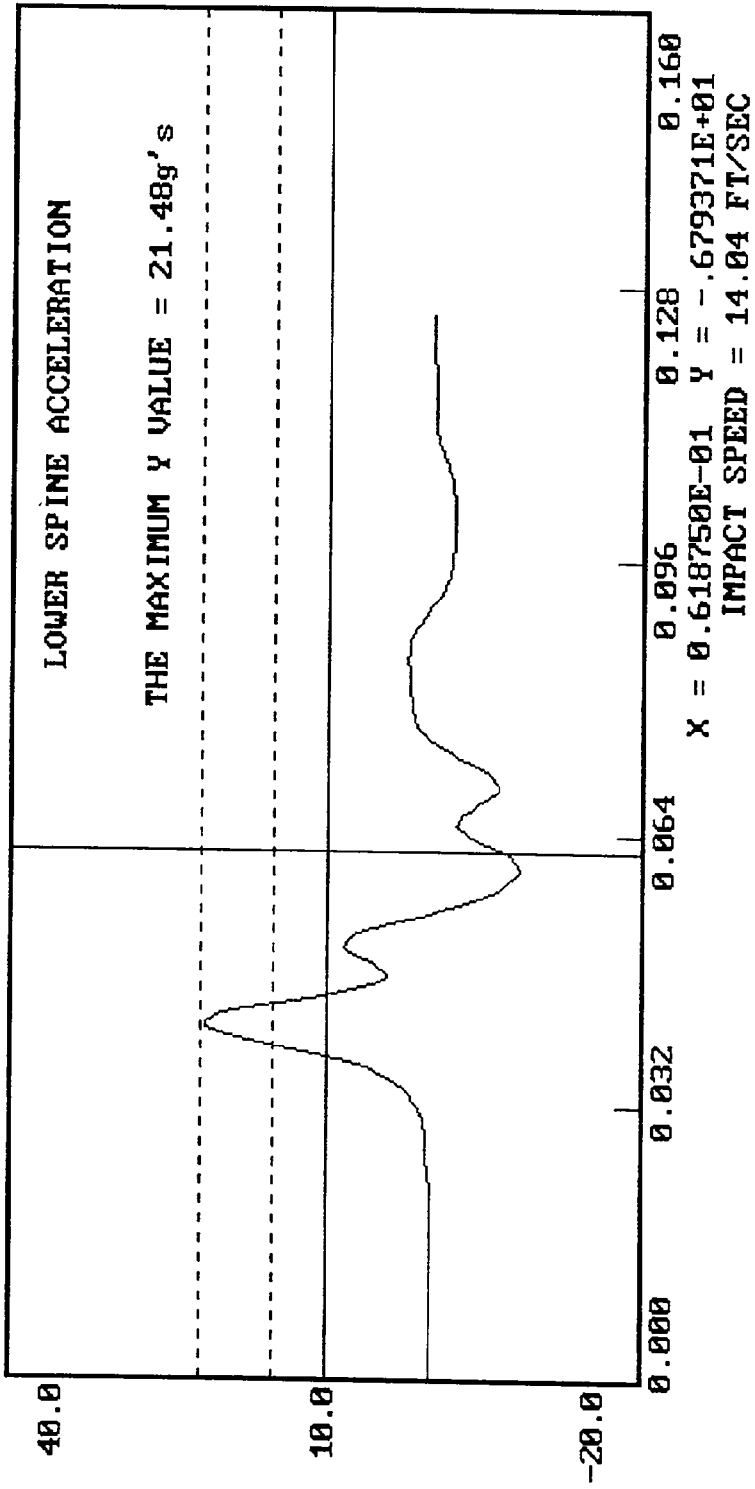


DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 12-10-1996 16:04
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
12-10-1996 16:09

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 10, 1996

DUMMY NUMBER: 270

TEST NUMBER: D962113

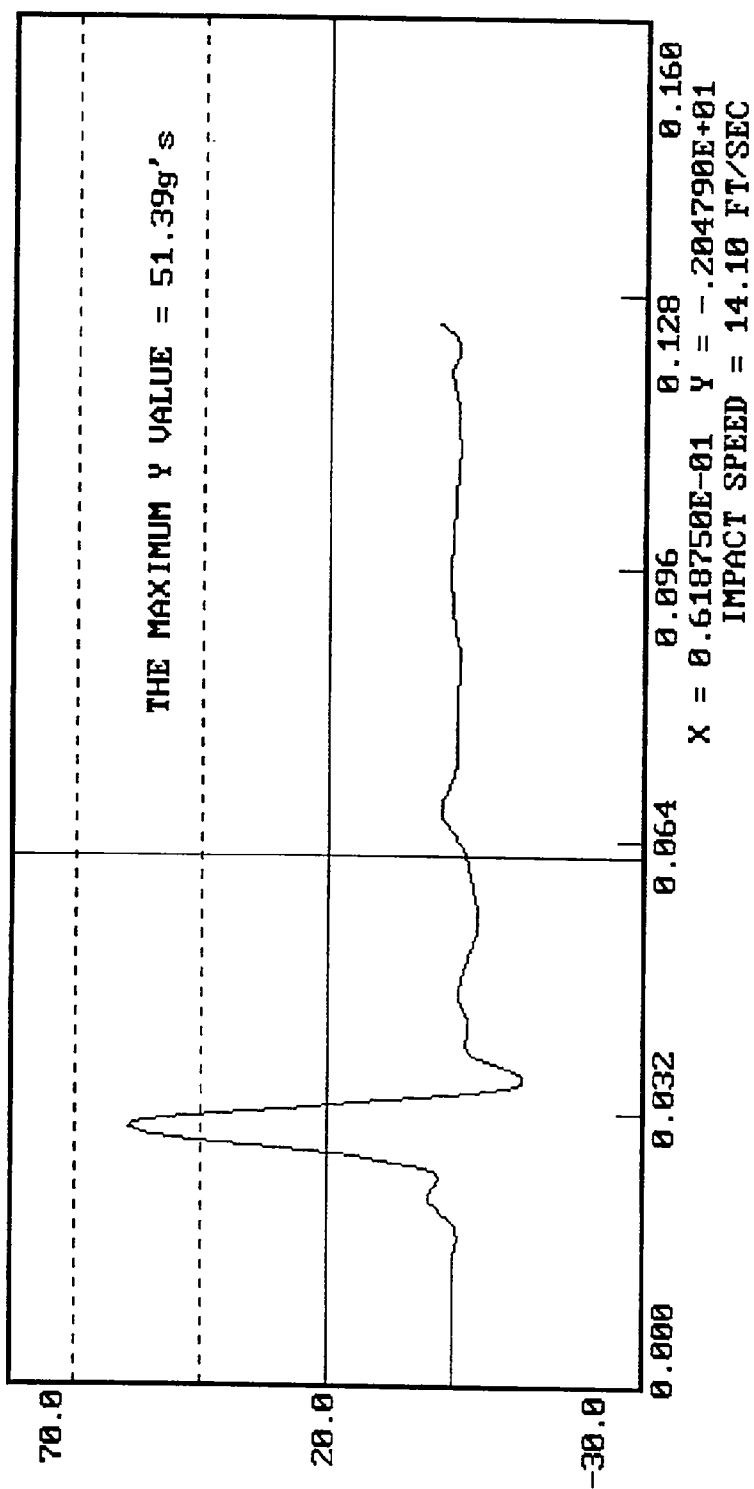
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
PROBE SPEED	13.8 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	51

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

APPROVED BY Rene Kabeke

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 270
 12-10-1996 16:19
 ACCELERATION (G'S) VS. TIME ((SECONDS))



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

DATE: December 10, 1996

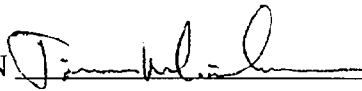
DUMMY NUMBER: 270

TEST NUMBER: D962114

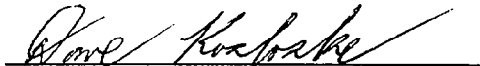
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.8
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.6
FORCE @ 1.0 in	50 - 63 lbs	58
FORCE @ 1.3 in	73 - 88 lbs	81

TEST MEETS SPECIFICATIONS

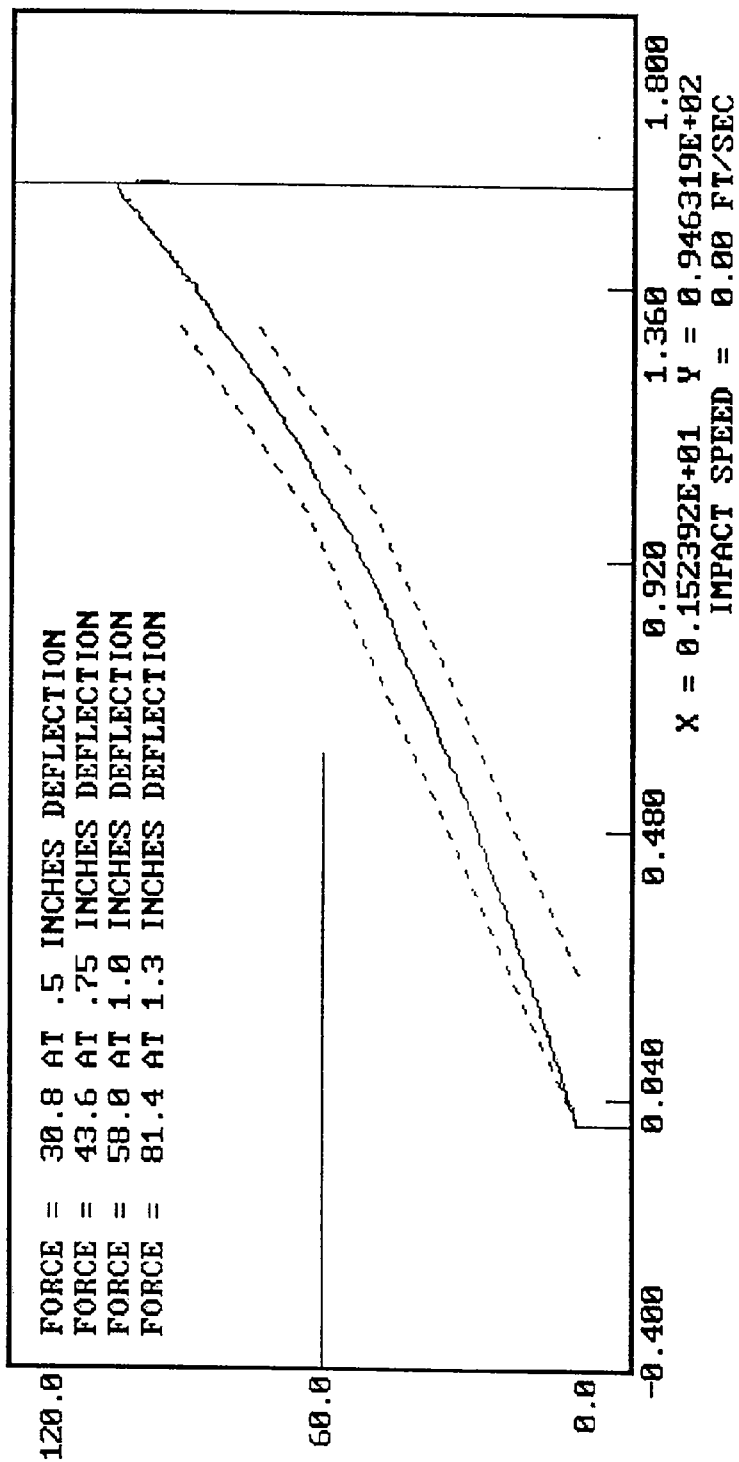
TECHNICIAN



APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 12-10-1996 14:43
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

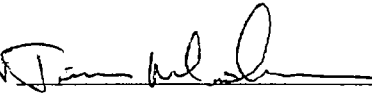
DATE: December 10, 1996

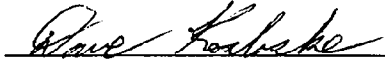
DUMMY NUMBER: 270

TEST NUMBER: D962115

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	28
FORCE @ 30°	34 - 46 lbs	39
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	2°

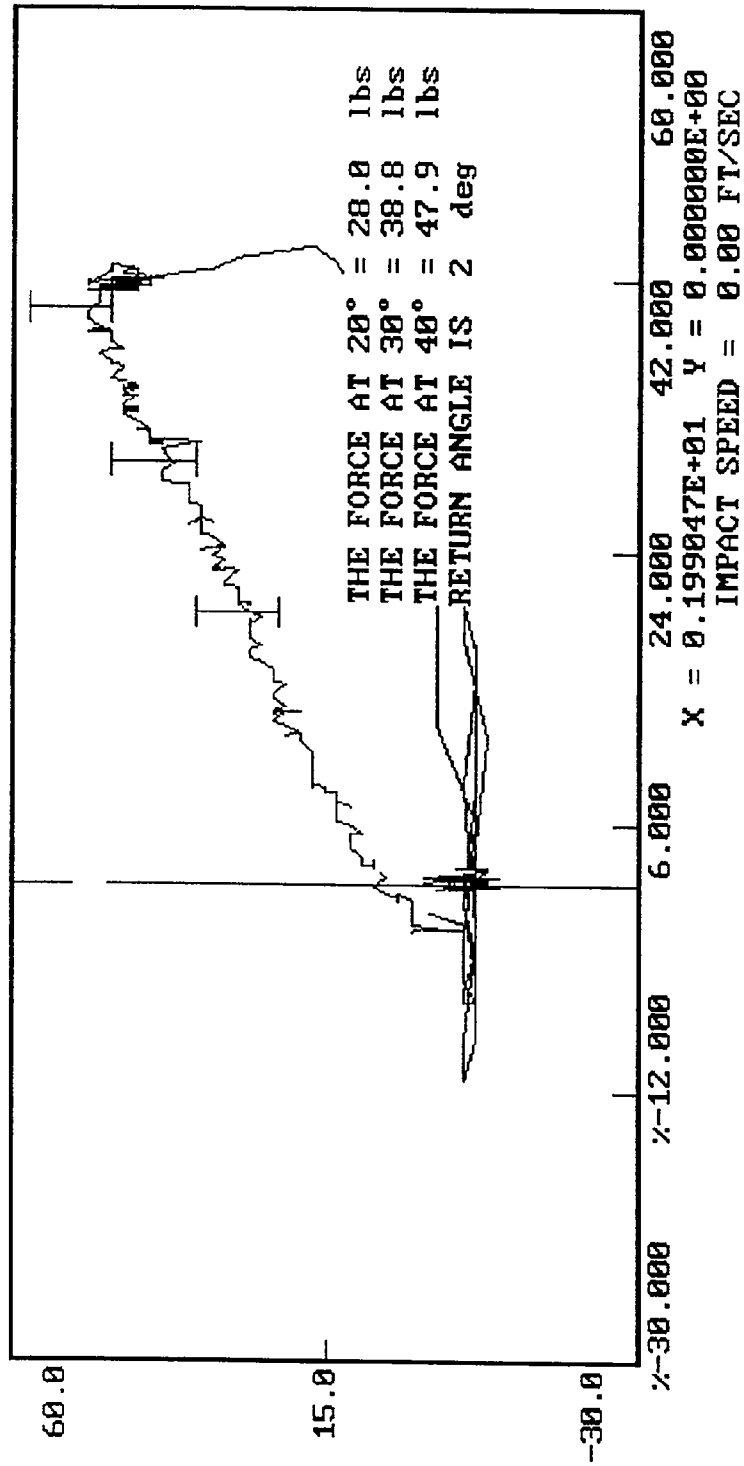
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

12-10-1996 14:26

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



PRE-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 269

Calibration Test Results Summary

Passenger Serial Number: 269

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

DATE OF VERIFICATION: December 10, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.1
RH - Rib Height	19.75" - 20.50"	20.00
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: Timothy L.

APPROVED BY: Paul Kelske

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

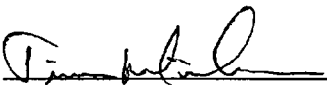
DATE: December 10, 1996

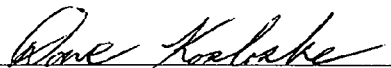
DUMMY NUMBER: 269

TEST NUMBER: D96210678

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66° - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	25%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	219
	DISPLACEMENT (in.)	1.18 - 1.38	1.31
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	457
	DISPLACEMENT (in.)	1.26 - 1.47	1.42
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	971
	DISPLACEMENT (in.)	1.30 - 1.57	1.49

TEST MEETS SPECIFICATIONS

TECHNICIAN 

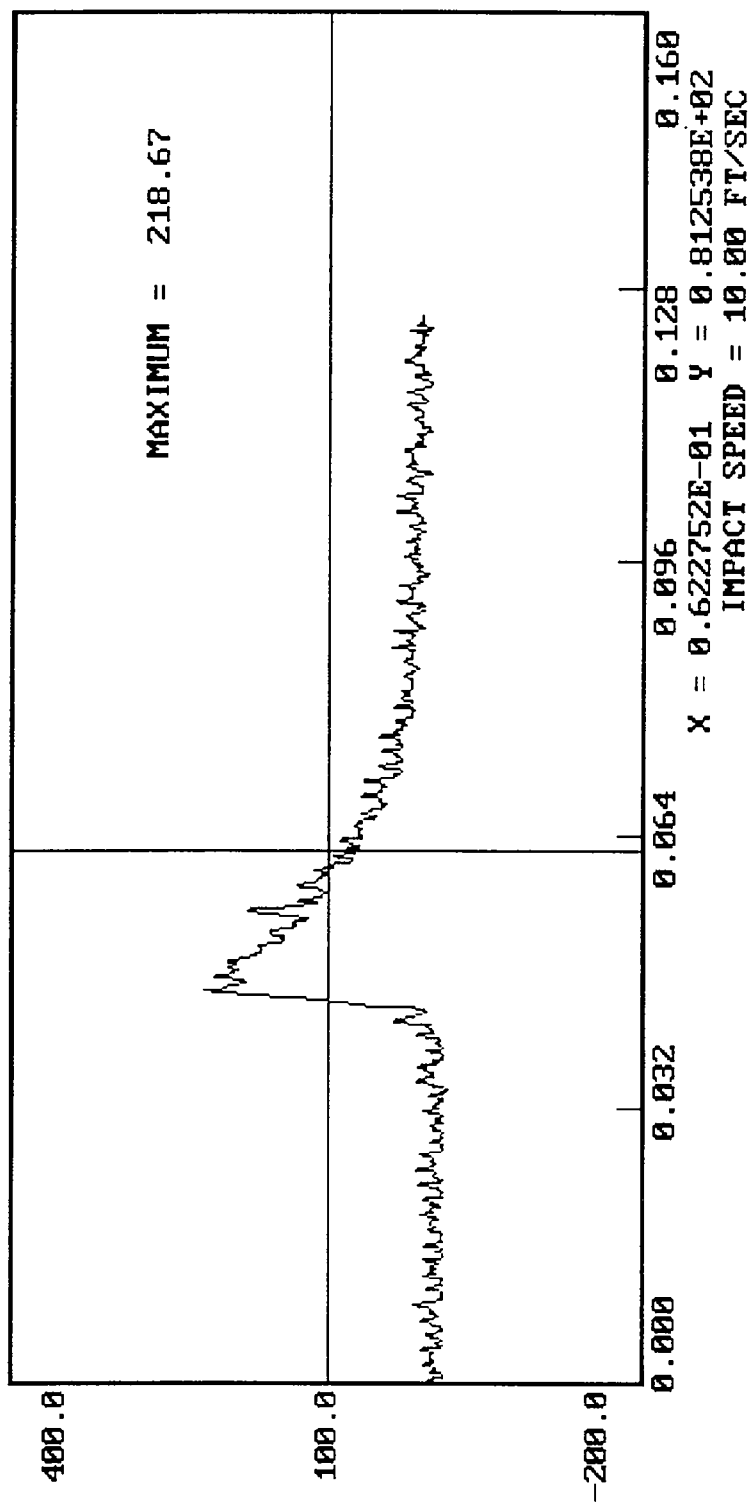
APPROVED BY 

12-10-1996 12:22

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

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

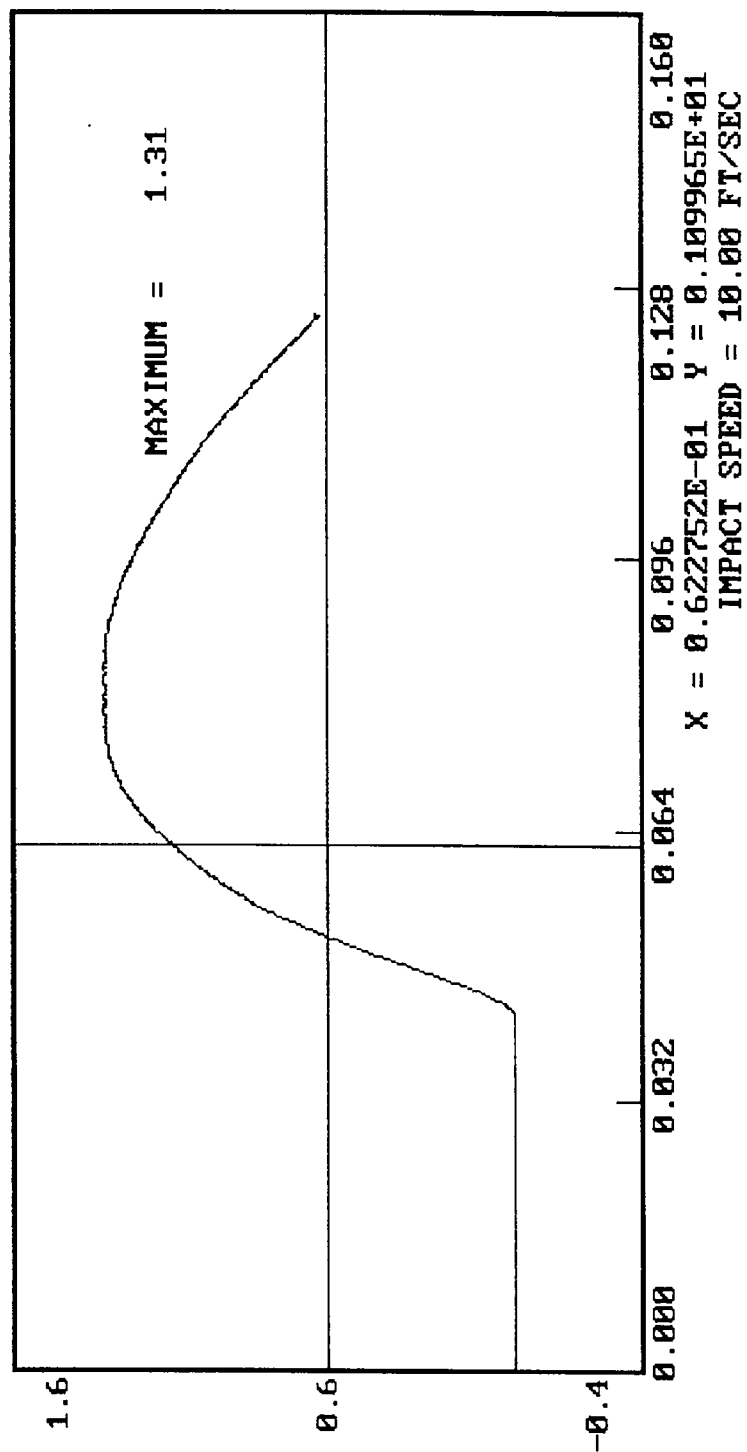


12-10-1996 12:22

DUMMY CALIBRATION - DAMPENER BENCH TEST

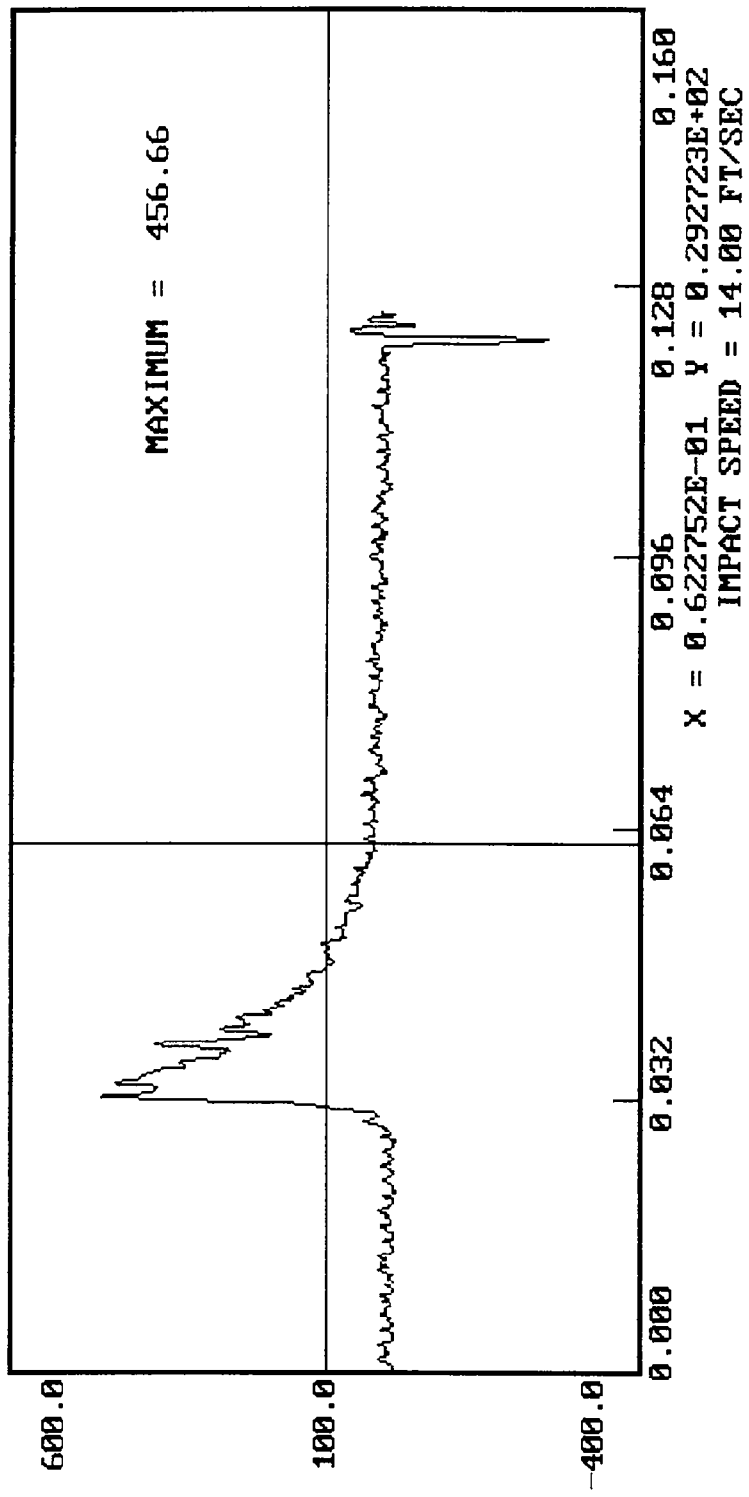
DUMMY # 269

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



DUMMY CALIBRATION - DAMPENER BENCH TEST
DUMMY # 269
FORCE (LBS) VS. TIME ((SECONDS))

12-10-1996 12:25

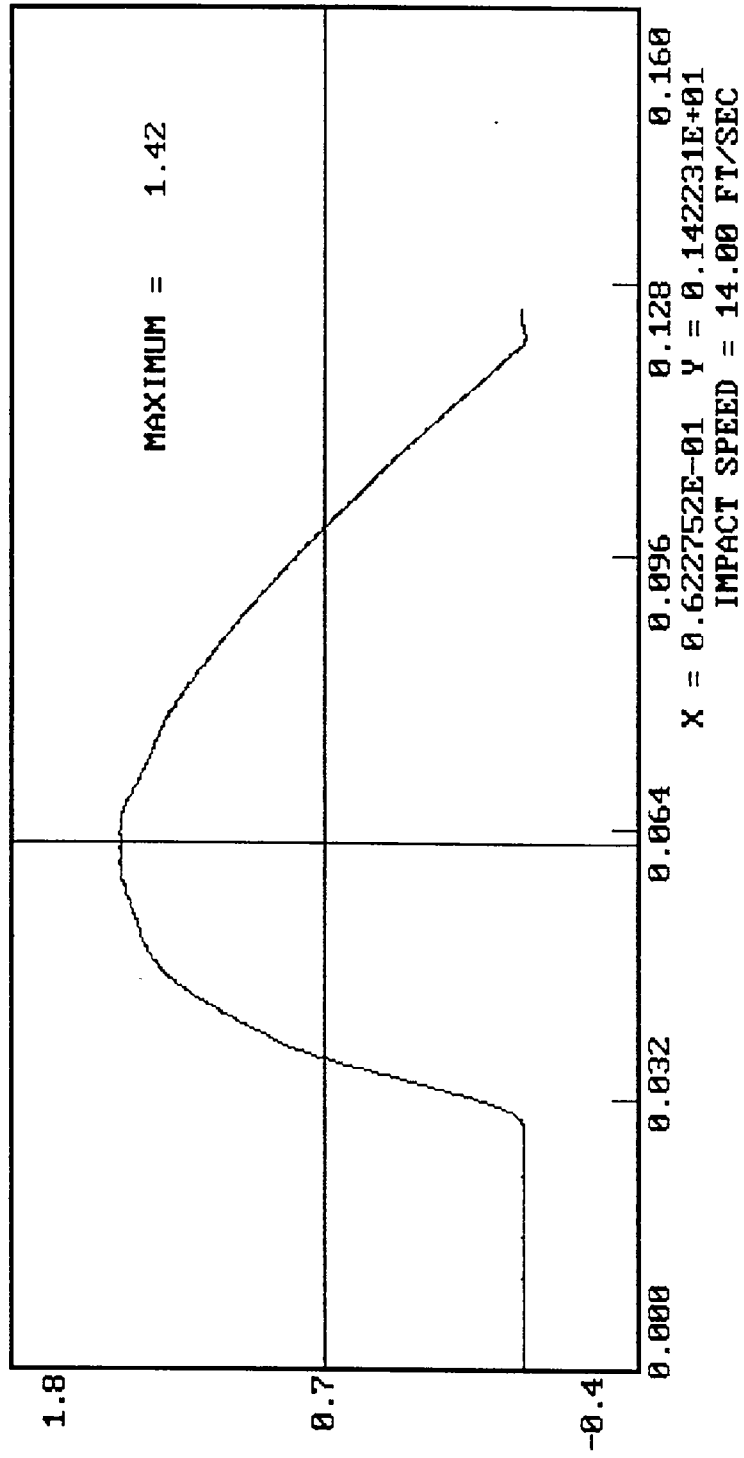


DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

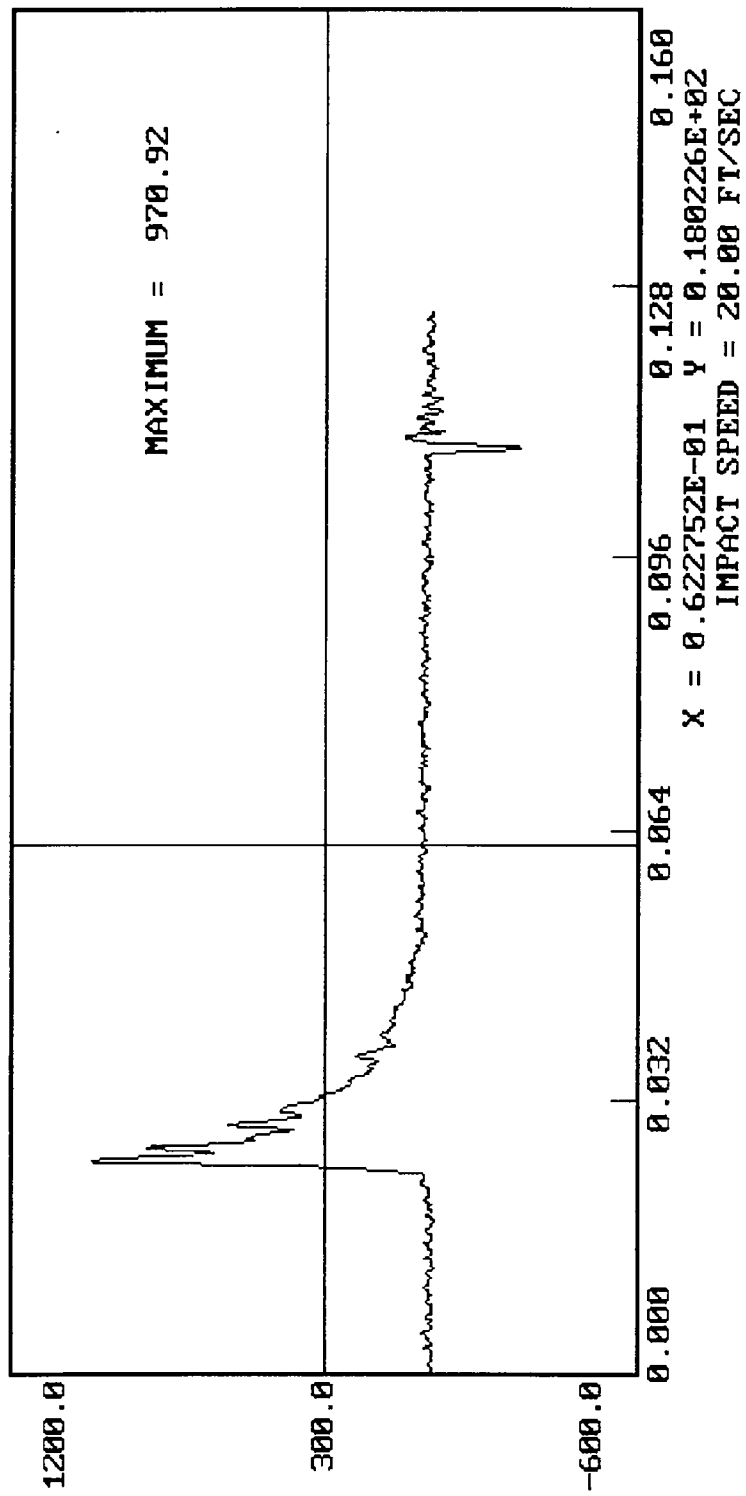
DISPLACEMENT (IN) VS. TIME ((SECONDS))

12-10-1996 12:25



DUMMY CALIBRATION - DAMPENER BENCH TEST
 DUMMY # 269
 FORCE (LBS) VS. TIME ((SECONDS))

12-10-1996 13:24

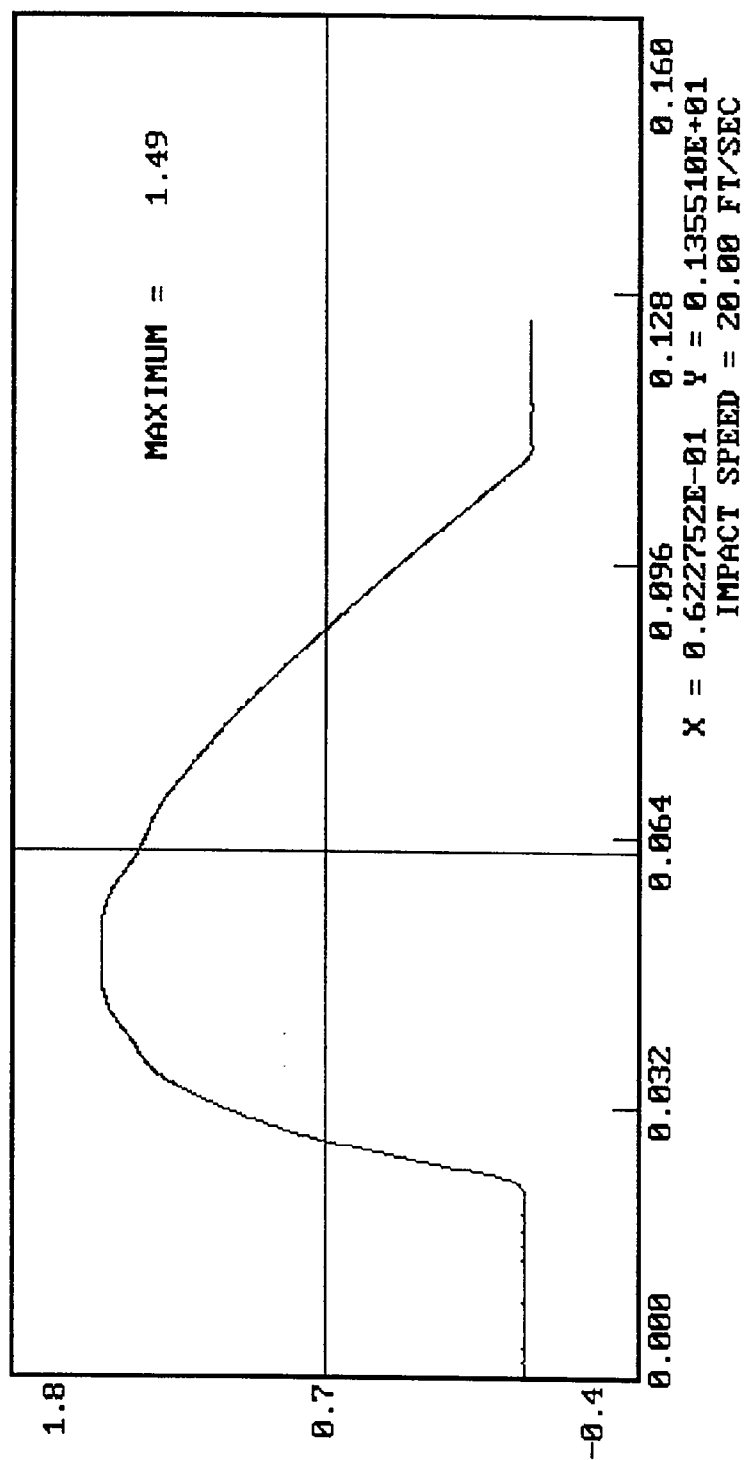


12-10-1996 13:24

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

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



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 10, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962102

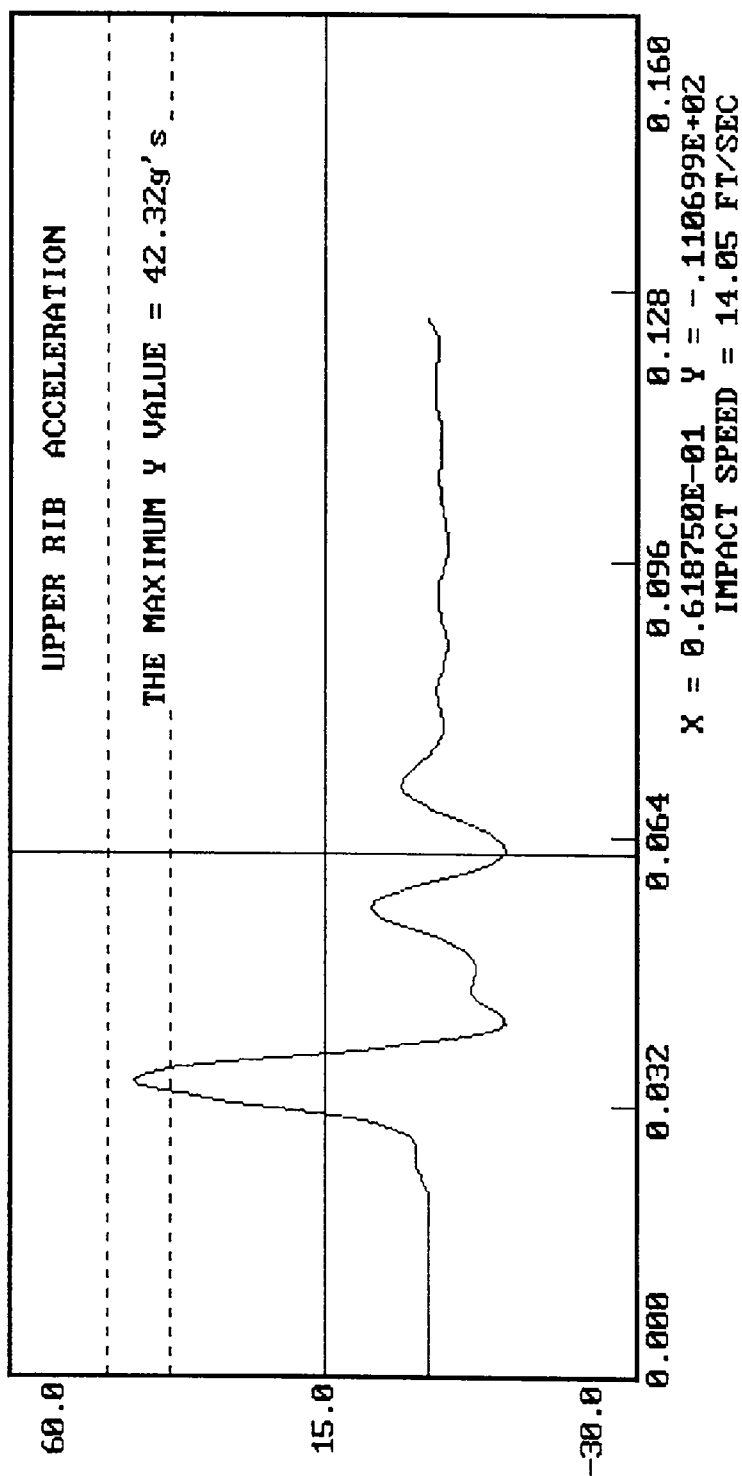
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	42
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

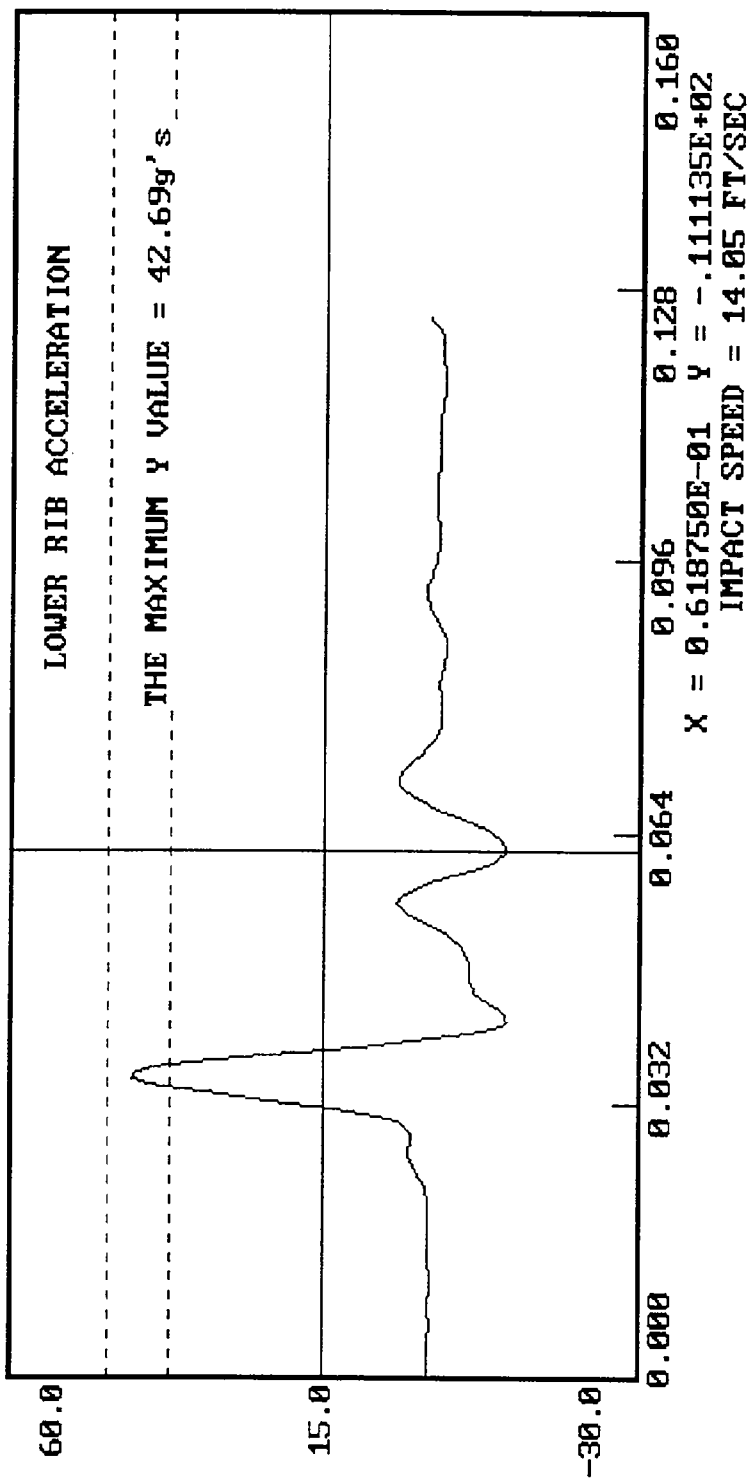
TECHNICIAN Jim Wil - L

APPROVED BY Rene Kraboske

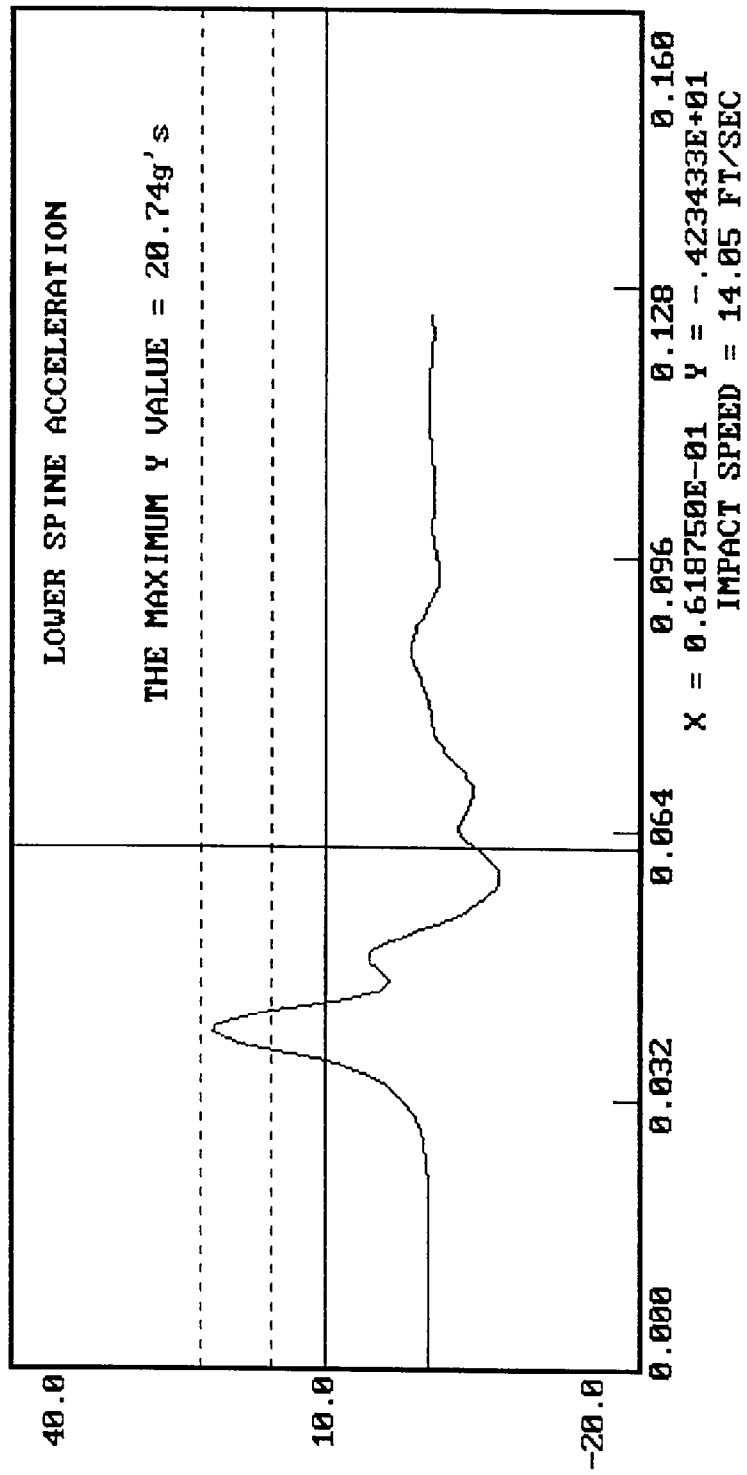
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 12-10-1996 15:40
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 12-10-1996 15:40
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 12-10-1996 15:40
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

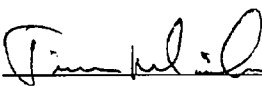
DATE: December 10, 1996

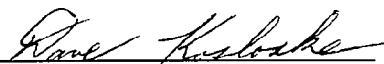
DUMMY NUMBER: 269

TEST NUMBER: D962103

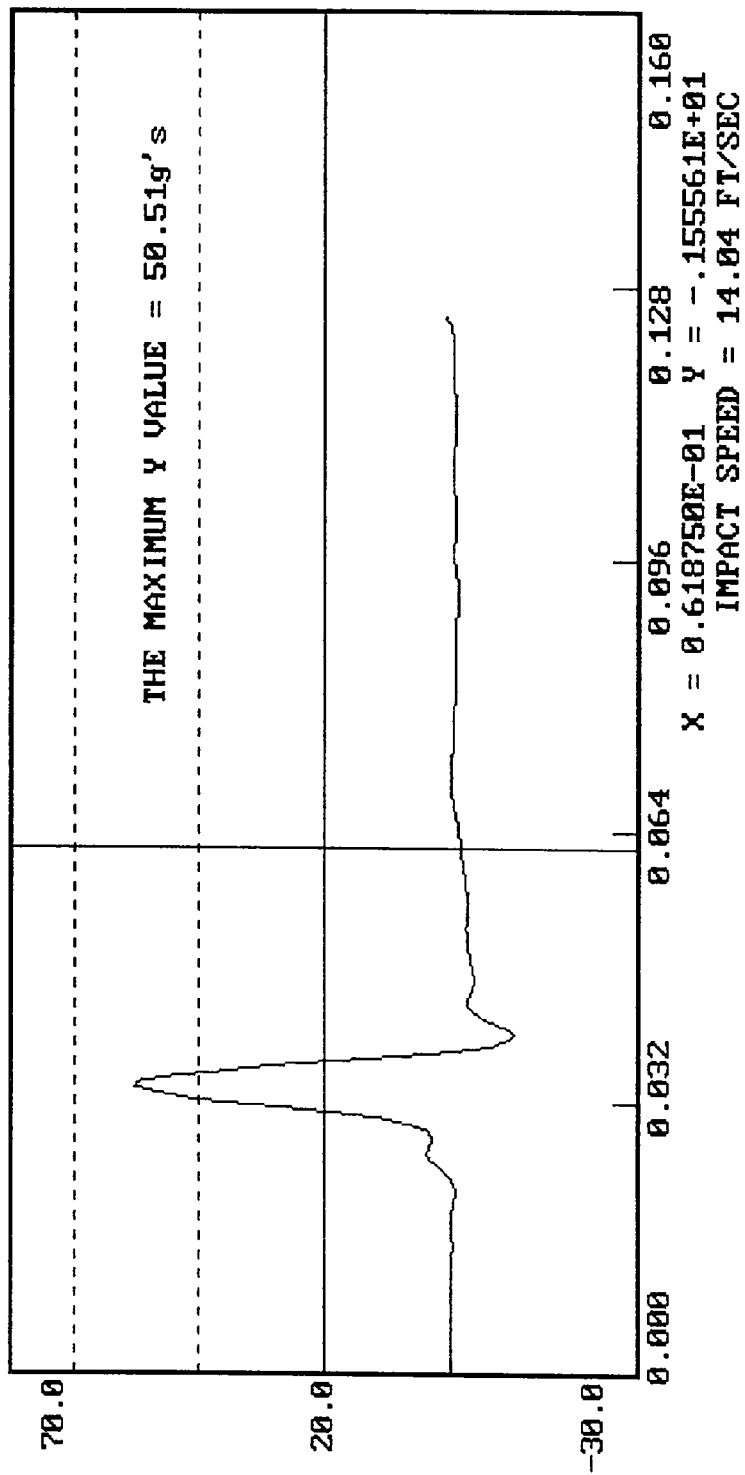
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	51

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 269
 12-10-1996 15:48
 ACCELERATION (G'S) VS. TIME ((SECONDS))



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

DATE: December 10, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962104

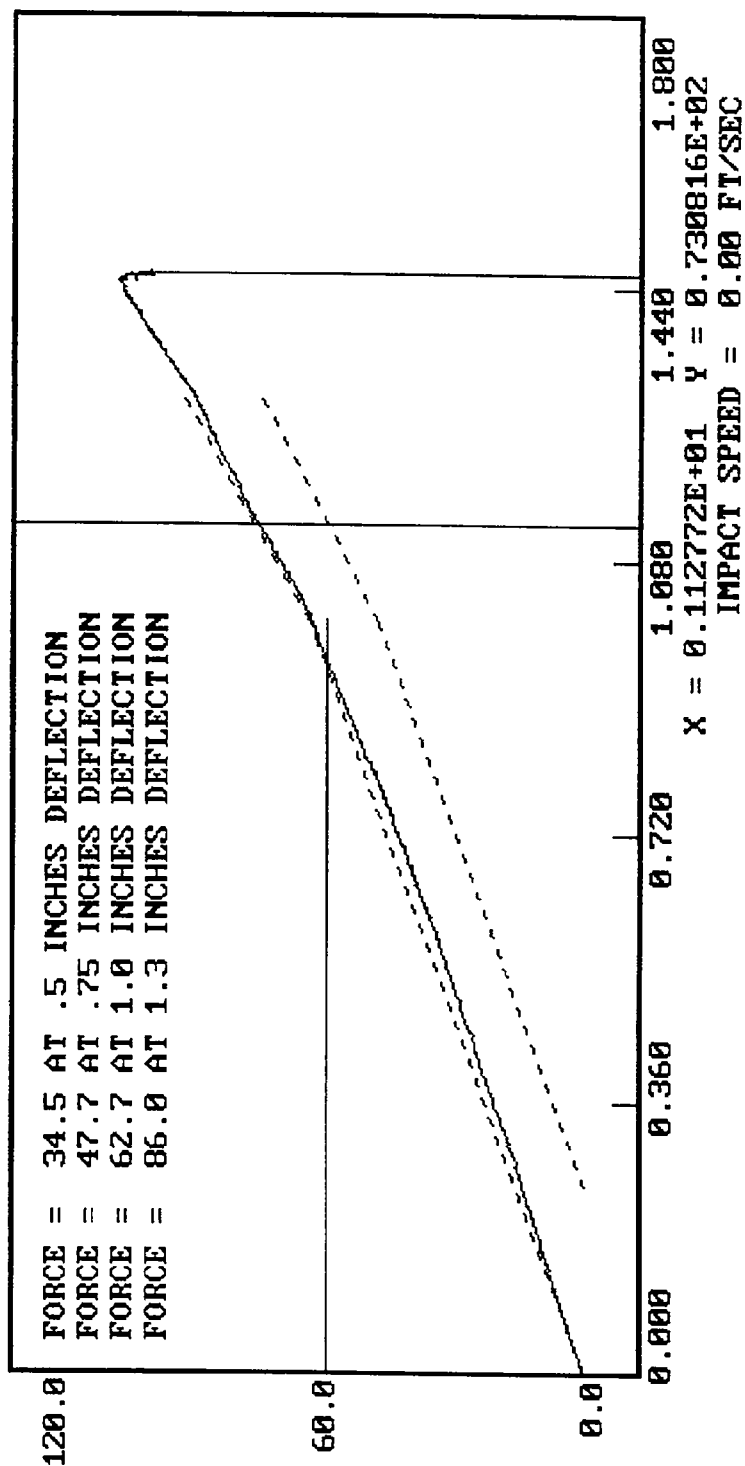
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.5
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.7
FORCE @ 1.0 in	50 - 63 lbs	63
FORCE @ 1.3 in	73 - 88 lbs	86

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Hilborn

APPROVED BY Paul Koabacke

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 269
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES) 12-10-1996 14:39



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

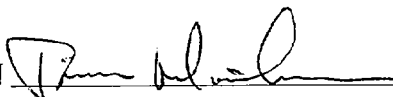
DATE: December 10, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962105

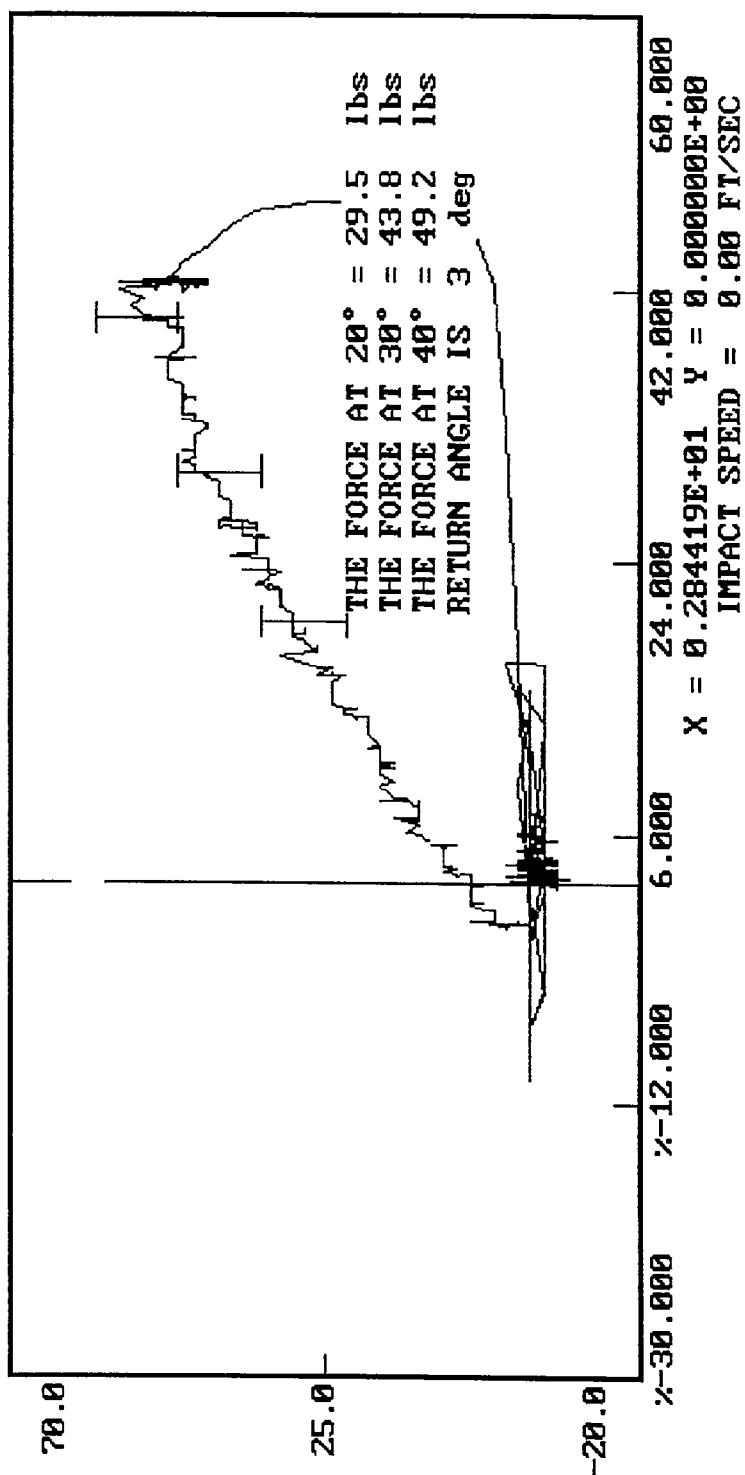
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	25%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	30
FORCE @ 30°	34 - 46 lbs	44
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	3°

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 269
 12-10-1996 14:05
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Front 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: December 16, 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"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: Tim Wilkins

APPROVED BY: Dave Koschake

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1996

DUMMY NUMBER: 270

TEST NUMBER: D962172

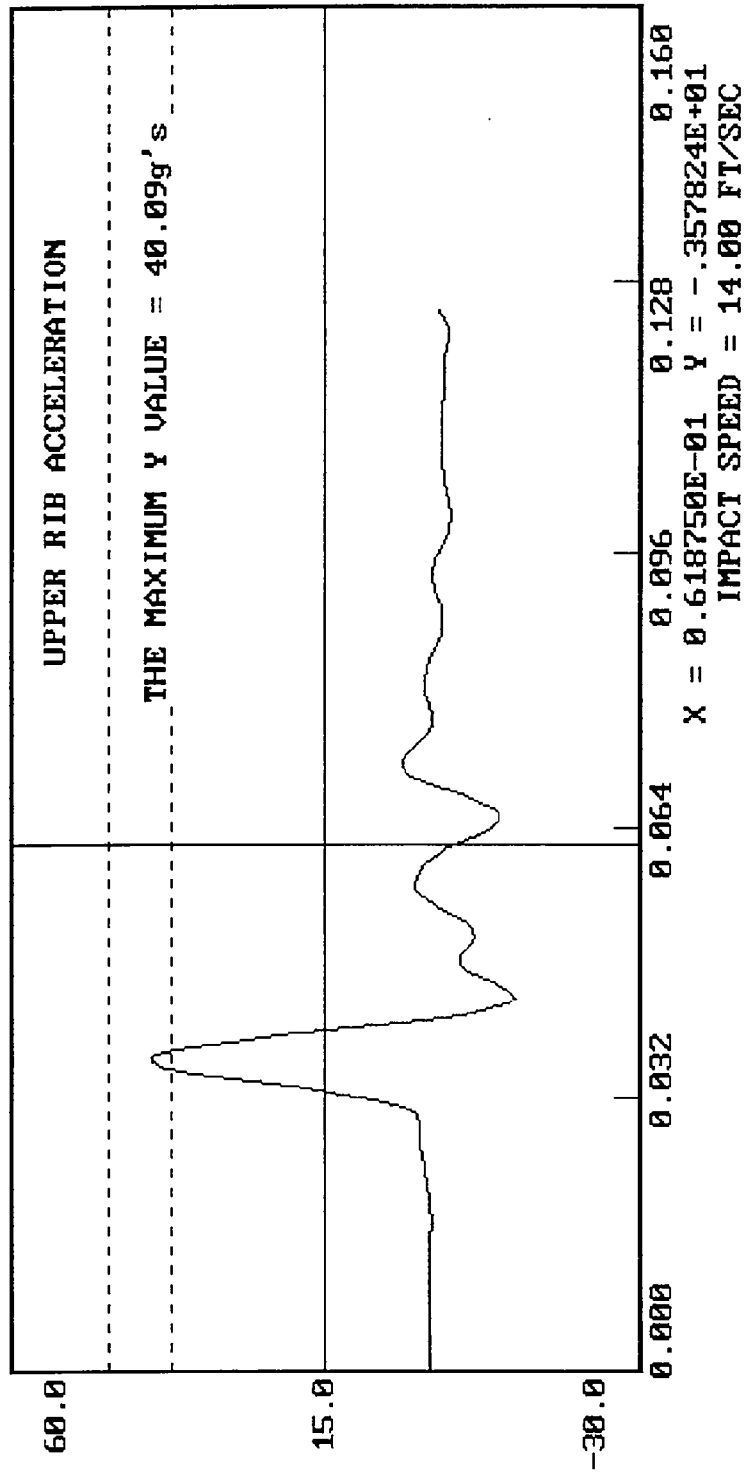
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	43
LOWER SPINE	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

TECHNICIAN Jimbelin

APPROVED BY Rene Koschke

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 12-16-1996 21:48
 ACCELERATION (G'S) VS. TIME ((SECONDS))

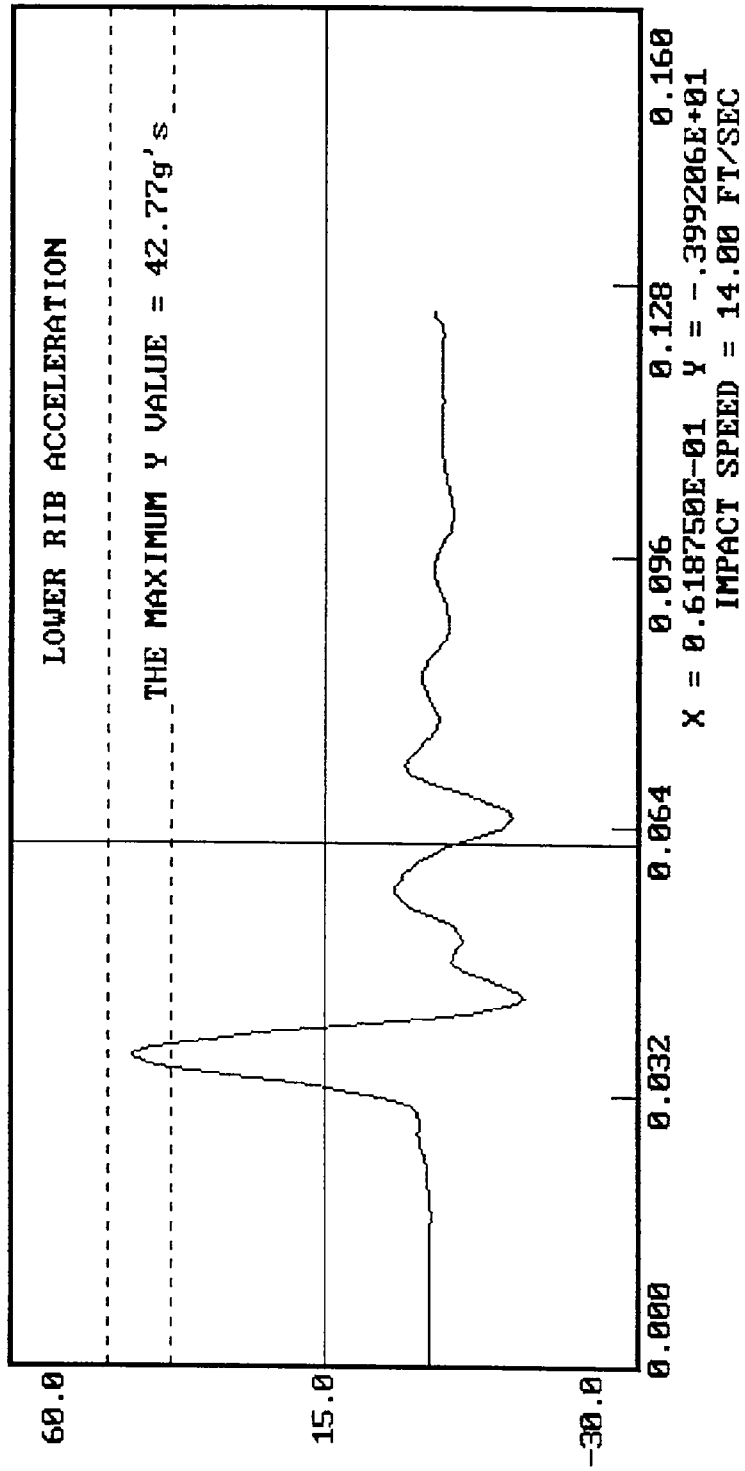


12-16-1996 21:48

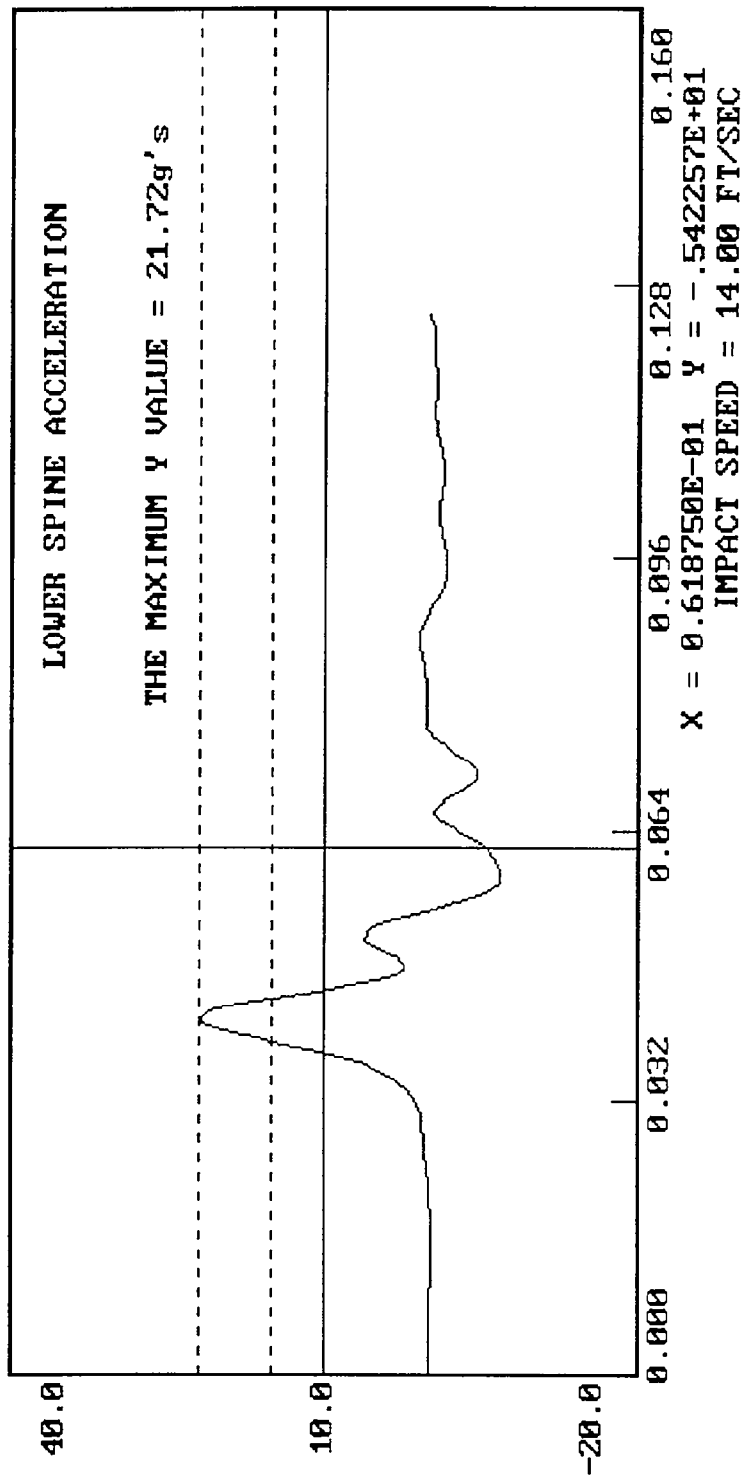
DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 270

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



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 12-16-1996 21:50
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1996

DUMMY NUMBER: 270

TEST NUMBER: D962173

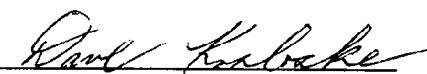
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	60

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

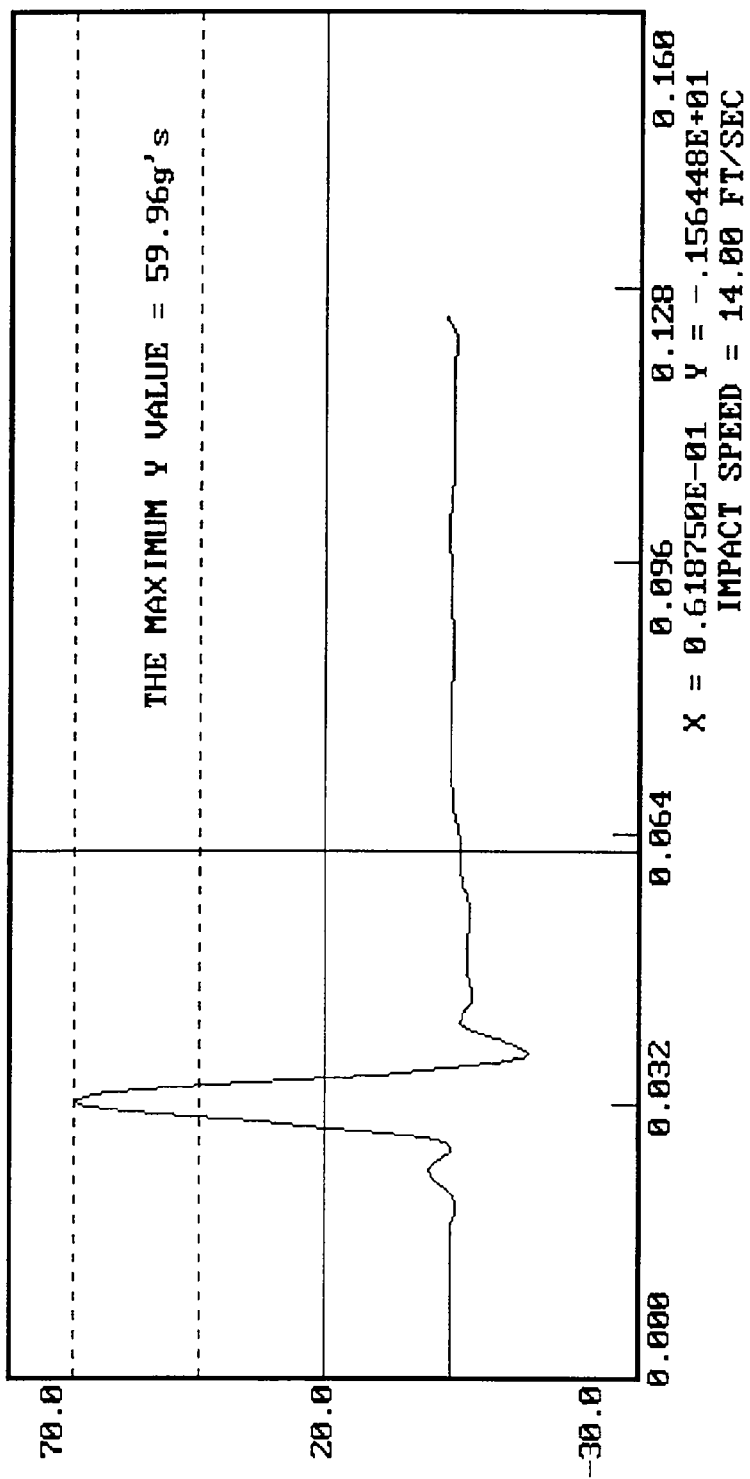


12-16-1996 21:54

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 278

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



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1996

DUMMY NUMBER: 270

TEST NUMBER: D962174

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.1
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

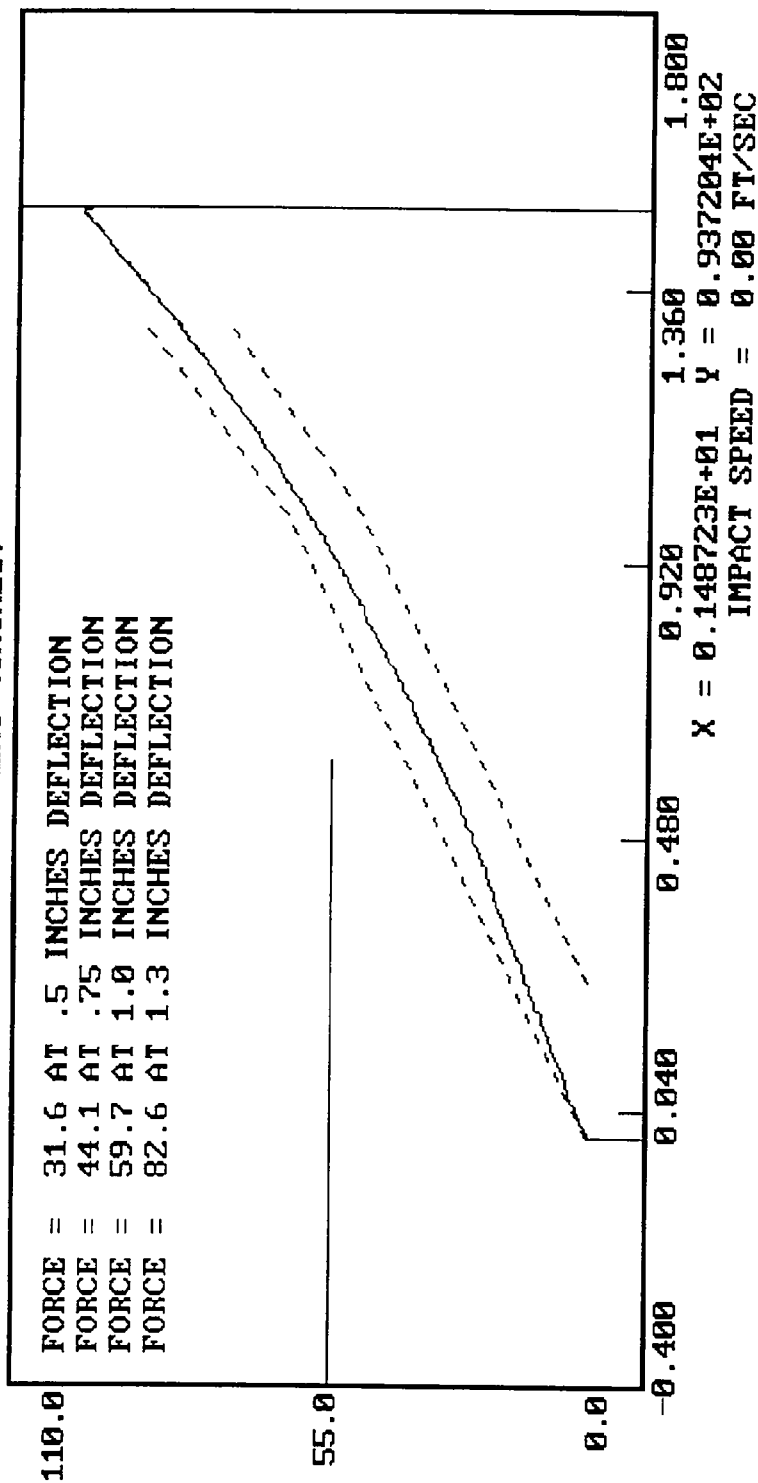
TECHNICIAN

Tim H. H. H.

APPROVED BY

Steve Korbake

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 12-16-1996 12:16
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

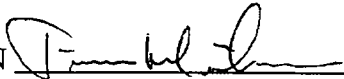
DATE: December 16, 1996

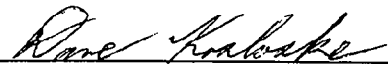
DUMMY NUMBER: 270

TEST NUMBER: D962175

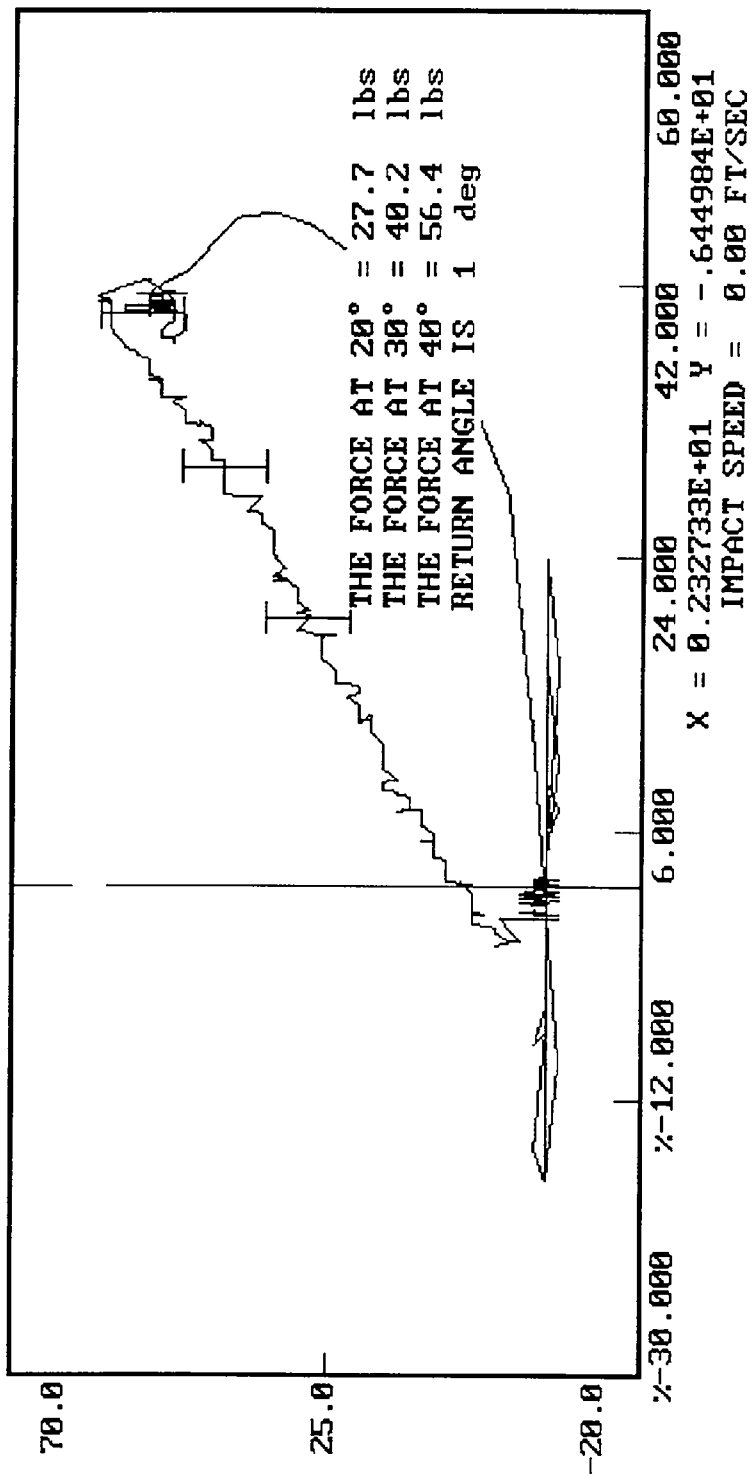
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	28
FORCE @ 30°	34 - 46 lbs	40
FORCE @ 40°	46 - 58 lbs	56
RETURN ANGLE	12° maximum	1°

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 270
 12-16-1996 14:33
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

DATE OF VERIFICATION: December 16, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.1
RH - Rib Height	19.75" - 20.50"	20.00
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: Jim White

APPROVED BY: Rene Kaba

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962162

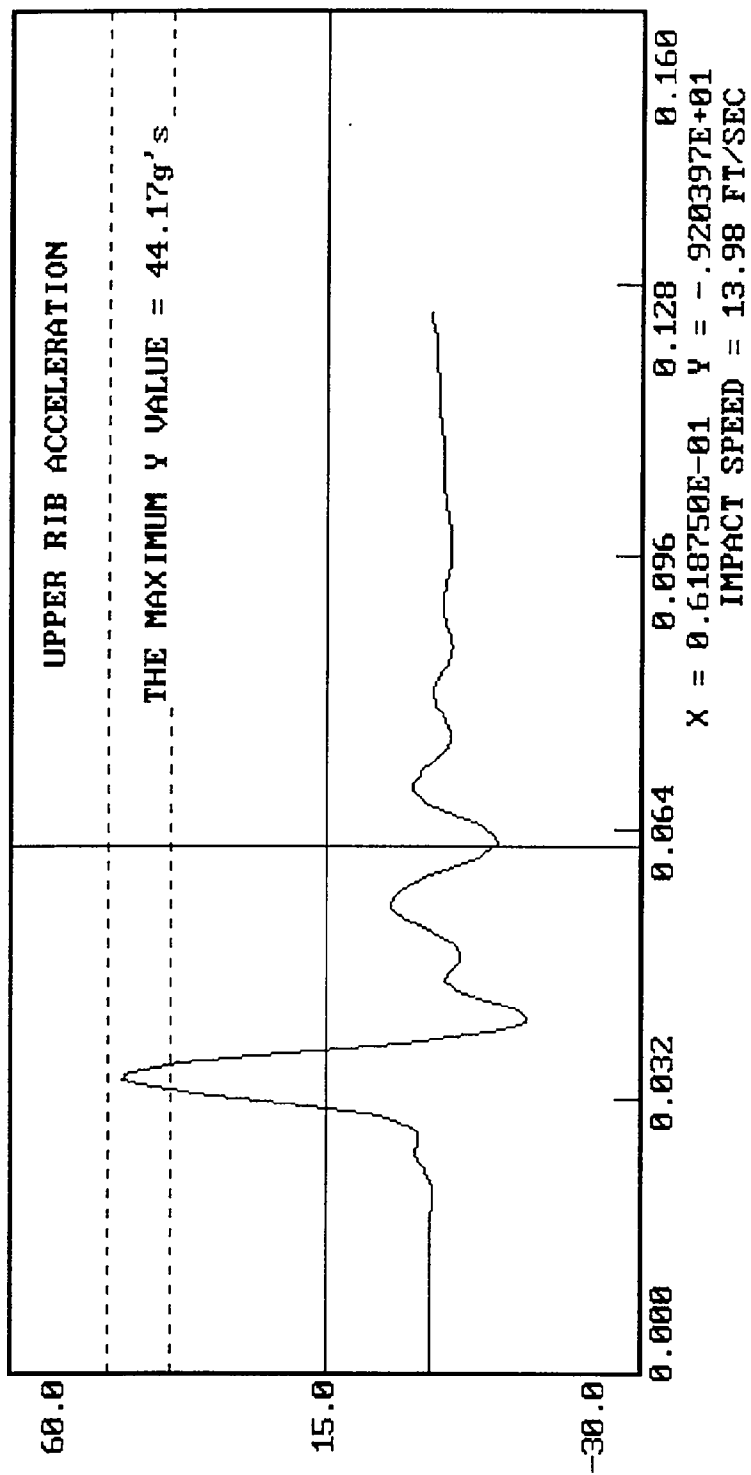
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	44
LOWER RIB	37 - 46 g's	42
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

APPROVED BY Rene Korbake

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 12-16-1996 15:15
 ACCELERATION (G'S) VS. TIME ((SECONDS))

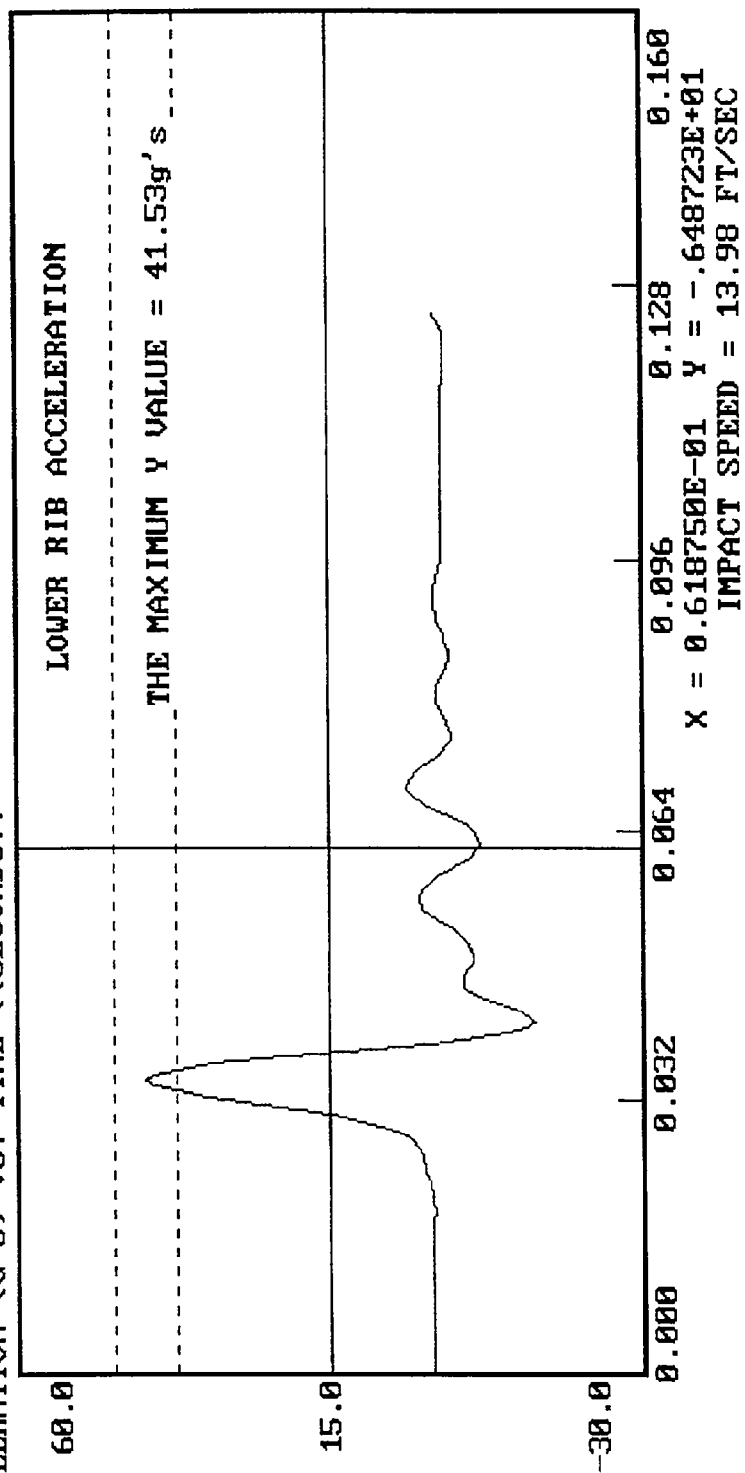


12-16-1996 15:15

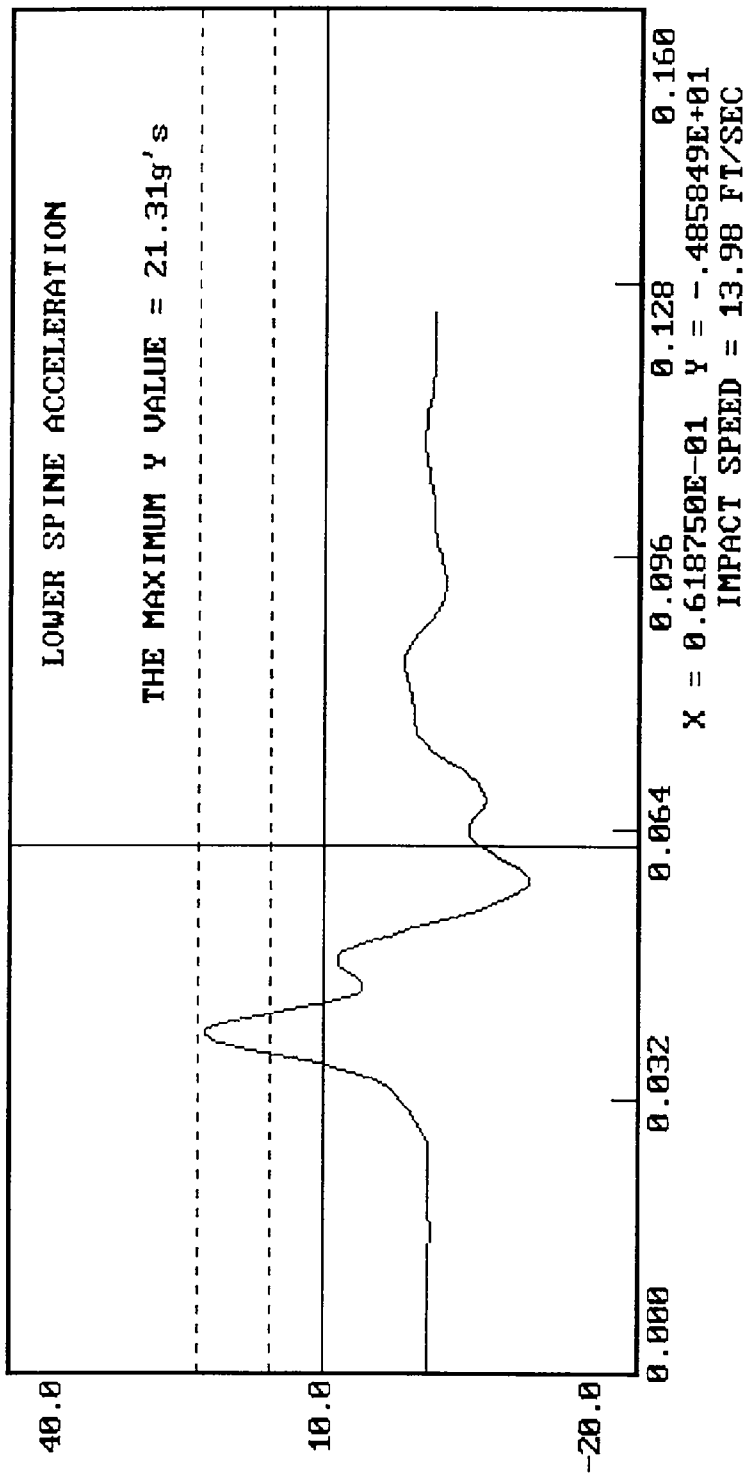
DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 269

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



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 12-16-1996 15:15
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962163

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	45

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

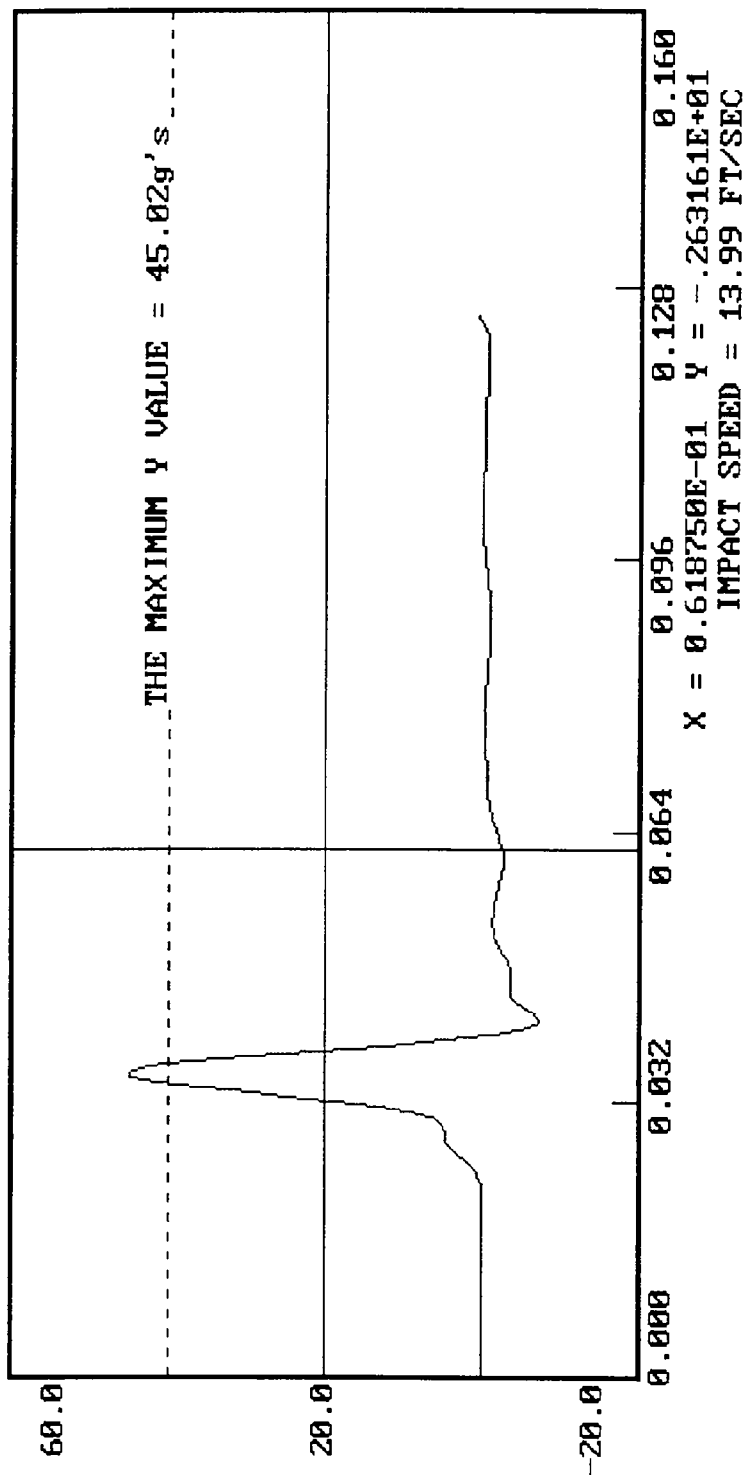
APPROVED BY Dave Korbake

12-16-1996 15:24

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 269

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



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

DATE: December 16, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962164

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	48.7
FORCE @ 1.0 in	50 - 63 lbs	63
FORCE @ 1.3 in	73 - 88 lbs	87

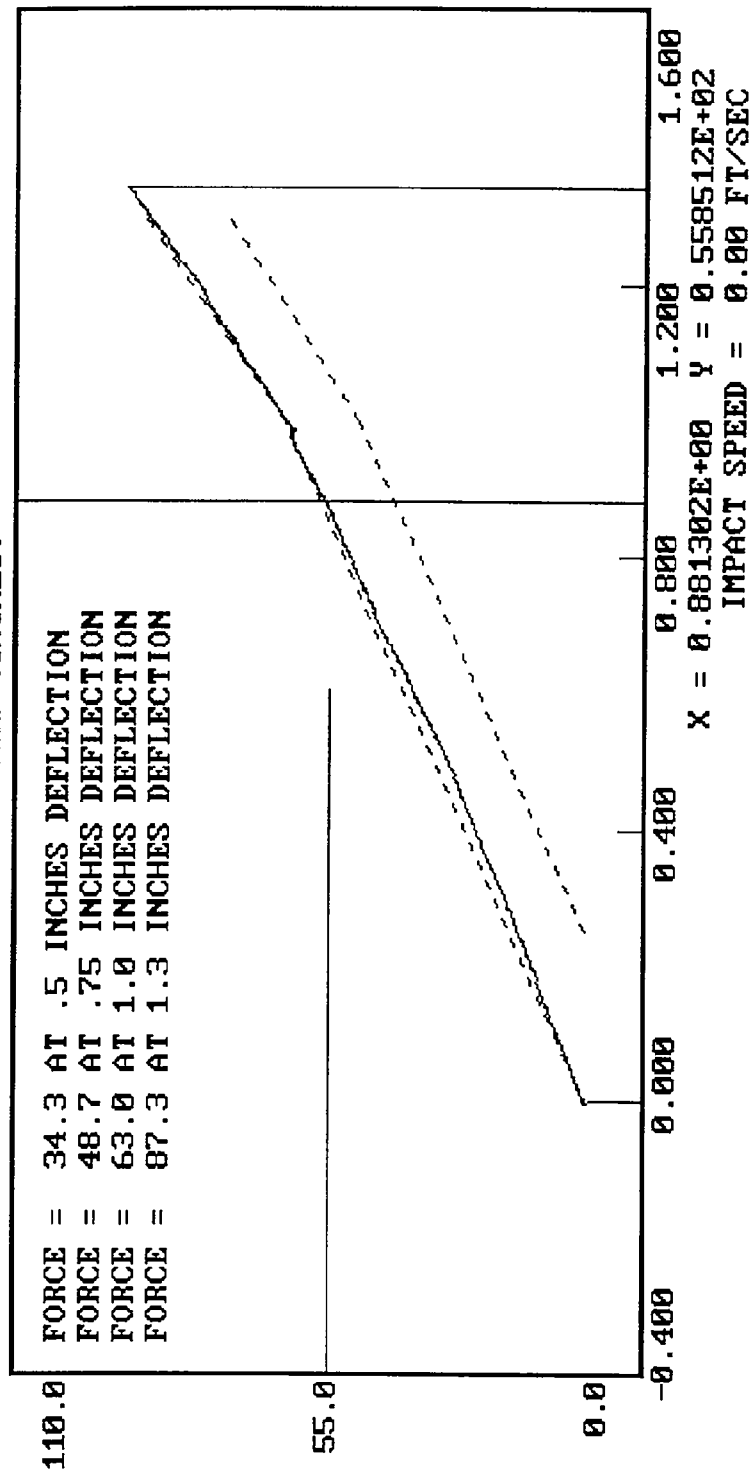
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim White

APPROVED BY Rene Kabeke

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 269
 12-16-1996 12:12

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



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1996

DUMMY NUMBER: 269

TEST NUMBER: D962165

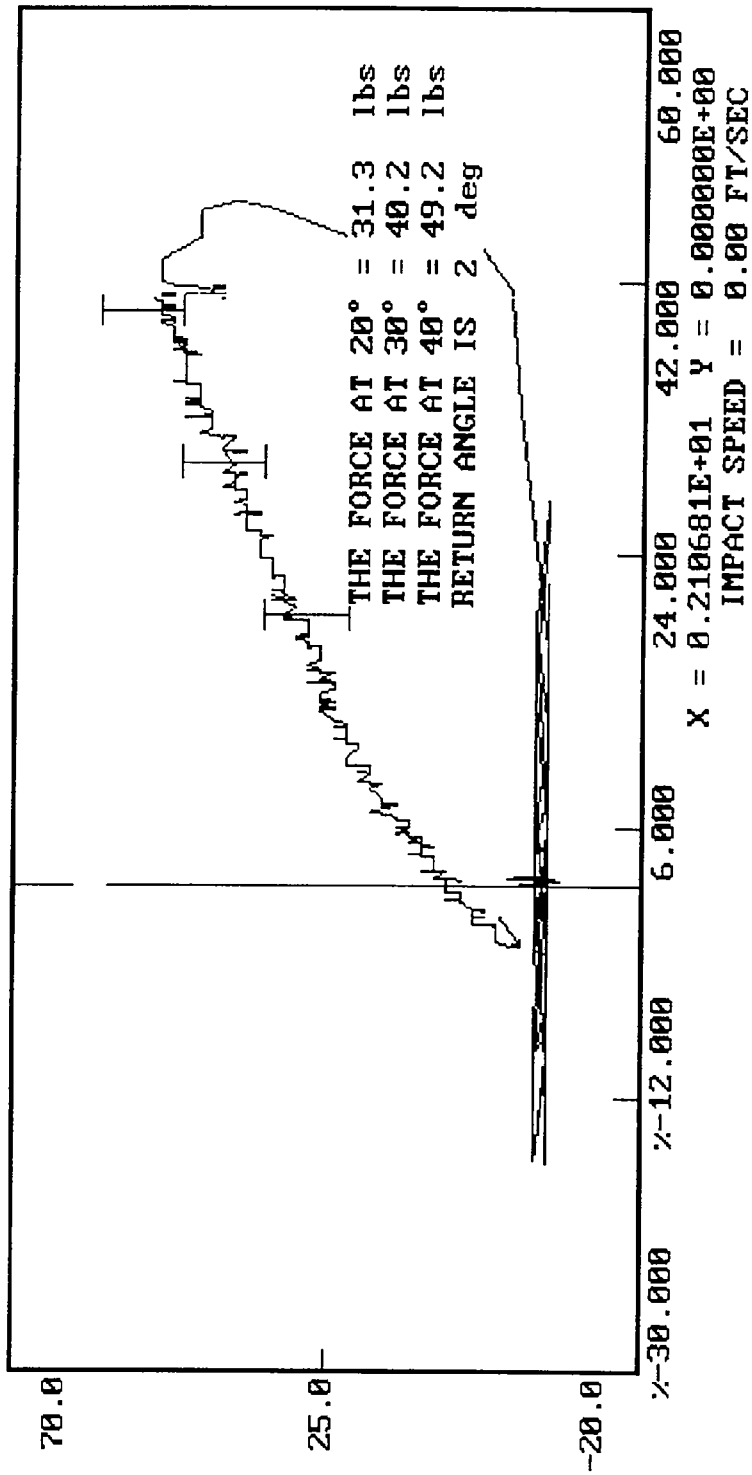
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	31
FORCE @ 30°	34 - 46 lbs	40
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim M. Smith

APPROVED BY Paul Korbake

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 269
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)
 12-16-1996 14:48



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Tim Michnay

Date: December 16, 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	Rib wrap torn from rivets on impact side - replaced	

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

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 269

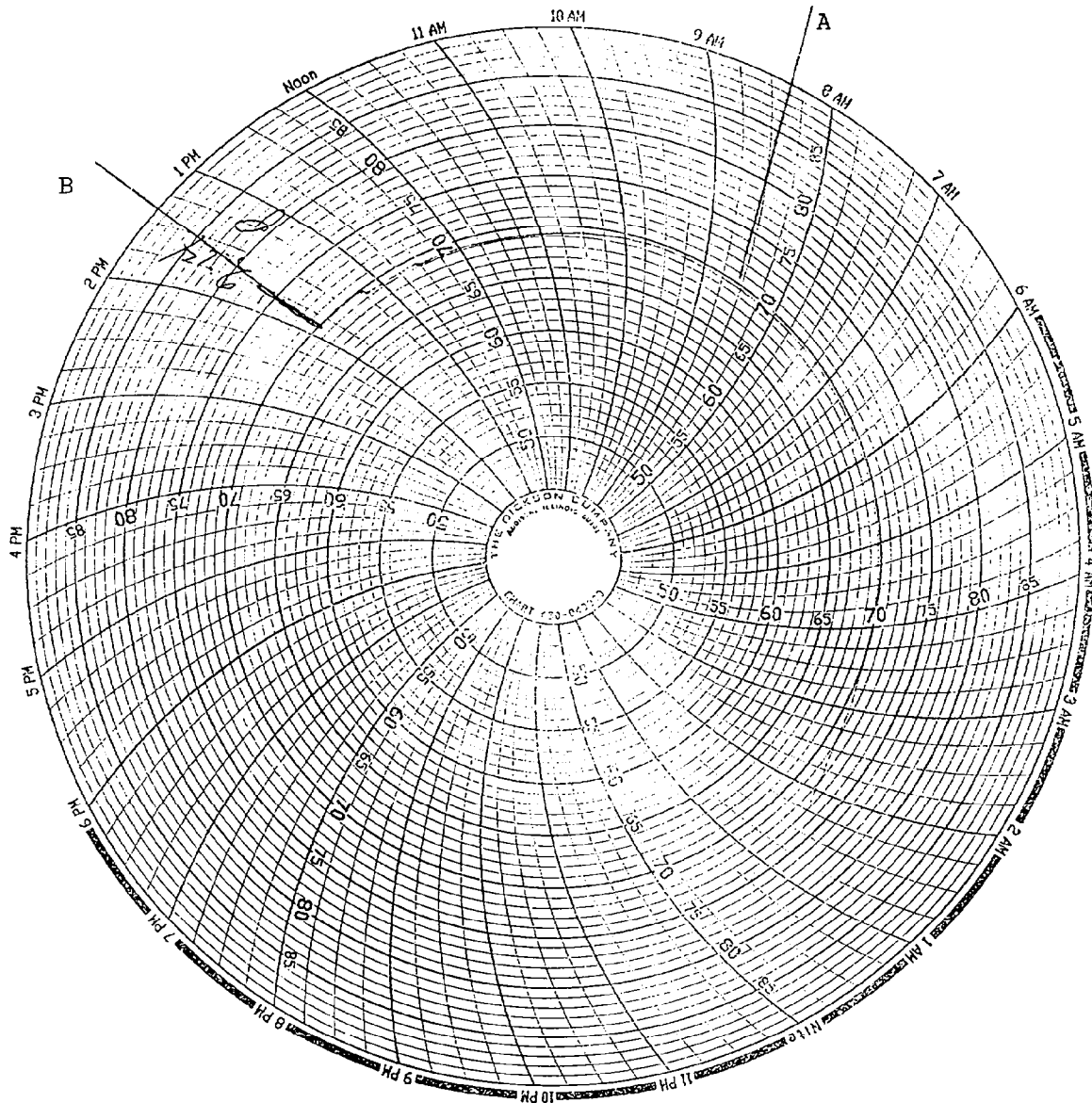
Inspected By: Tim Michnay

Date: December 16, 1996

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	Jacket Torn
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	Jacket torn on right impact side - replaced	

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

VEHICLE AND DUMMY TEMPERATURE



A = Dummies installed in vehicle
B = Test conducted

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR RIGHT FRONT PASSENGER DUMMY NO. 270

	RIGHT FRONT PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP1H2	Endevco	September 10, 1996
Lower Rib Y	AJ9C2	Endevco	September 09, 1996
Lower Spine Y	AP2D7	Endevco	September 10, 1996
Pelvis Y	ALCH7	Endevco	September 09, 1996
Upper Rib Redundant Y	AH0B0	Endevco	September 10, 1996
Lower Rib Redundant Y	AHTT2	Endevco	September 09, 1996
Lower Spine Redundant Y	APT18	Endevco	September 10, 1996
Pelvis Redundant Y	AJ420	Endevco	September 09, 1996

INSTRUMENTS FOR RIGHT REAR PASSENGER DUMMY NO. 269

RIGHT REAR PASSENGER			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AGTM2	Endevco	September 10, 1996
Lower Rib Y	ALEC1	Endevco	September 11, 1996
Lower Spine Y	AH1G2	Endevco	September 11, 1996
Pelvis Y	ALCN9	Endevco	September 10, 1996
Upper Rib Redundant Y	AGTB5	Endevco	September 11, 1996
Lower Rib Redundant Y	J10411	Endevco	September 11, 1996
Lower Spine Redundant Y	AM751	Endevco	September 11, 1996
Pelvis Redundant Y	AKAF3	Endevco	September 10, 1996

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	C14-Z10	Entran	July 12, 1996
Moving Barrier CG Y	B14-R01	Entran	July 15, 1996
Moving Barrier CG Z	B14-R16	Entran	July 11, 1996
Moving Barrier Rear Axle X	B14-R03	Entran	July 11, 1996
Moving Barrier Rear Axle Y	B14-R13	Entran	July 15, 1996
Right Mid A-Post Y	A09-G03	Entran	December 03, 1996
Right Lower A-Post Y	C25-A01	Entran	December 04, 1996
Right Mid B-Post Y	A09-G05	Entran	December 03, 1996
Right Lower B-Post Y	C06-G12	Entran	December 03, 1996
Rear Floorpan Above Axle X	J06-D19	Entran	July 11, 1996
Rear Floorpan Above Axle Y	J10-E16	Entran	July 10, 1996
Rear Floorpan Above Axle Z	D05-R25	Entran	July 12, 1996
Right Front Passenger Seat Track Y	G19-G08	Entran	December 03, 1996
Left Side Sill at Front Seat X	D06-A09	Entran	July 03, 1996
Left Side Sill at Front Seat Y	C20-J10	Entran	July 11, 1996
Left Side Sill at Front Seat Z	A09-G10	Entran	July 12, 1996
Left Side Sill at Rear Seat X	J10-E03	Entran	July 10, 1996
Left Side Sill at Rear Seat Y	B02-G06	Entran	October 02, 1996
Left Side Sill at Rear Seat Z	D05-R05	Entran	July 11, 1996
Right Side Sill at Front Seat Y	B28-B01	Entran	July 15, 1996

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Right Side Sill at Rear Seat Y	C05-Z10	Entran	July 11, 1996
Left Rear Occupant Compartment Y	C25-A11	Entran	December 03, 1996
Vehicle CG X	C14-Z05	Entran	December 04, 1996
Vehicle CG Y	L14-D19	Entran	December 04, 1996
Vehicle CG Z	D05-R24	Entran	December 04, 1996

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