

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING
PASSENGER CARS

1997 HYUNDAI SONATA
4-DOOR
NHTSA NO: MV0500

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 28, 1997

Report Date: February 11, 1997

FINAL REPORT

Prepared For:

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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John Fleck, Facility Director

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				14. Sponsoring Agency Code NPS-10																			
15. Supplementary Notes																							
16. Abstract A 90°Moving Deformable Barrier NCAP Side Impact was conducted on the subject 1997 Hyundai Sonata 4-Door to obtain New Car Assessment and Research data indicant of FMVSS No. 214D Performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on January 28, 1997. The impact velocity of the Moving Deformable Barrier (MDB) was 61 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 19 °C. The target vehicle post test maximum crush was 449 mm at level 3. The test vehicle's performance follows: <table border="1"> <thead> <tr> <th></th> <th>DRIVER</th> <th>PASS.</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>114</td> <td>109</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>109</td> <td>108</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>90</td> <td>84</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>102</td> <td>97</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>113</td> <td>99</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.							DRIVER	PASS.	Left Upper Rib (LUR) Accel., g	114	109	Left Lower Rib (LLR) Accel., g	109	108	Lower Spine (T ₁₂) Accel., g	90	84	Thoracic Trauma Index (TTI)	102	97	Pelvis (PEV) Accel., g	113	99
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17. Key Words New Car Assessment Program (NCAP) FMVSS No. 214D Side Impact Dummy (SID) Occupant Side Impact Protection				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. 202-366-4946 Attn: Robert Hornickle																			
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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 97 NCAP Side Impact 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 Hyundai Sonata 4-Door.

This side impact test was conducted in accordance with the New Car Assessment Program Side Impact Testing Procedure dated October 1996.

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 Hyundai Sonata 4-Door was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 37.9 mph (61 kph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on January 28, 1997. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (SIDs) are included in Appendix A.

Two Side Impact Dummies (SIDs) were placed in the driver and left rear designated seating positions according to instructions specified in the New Car Assessment Program Side Impact Laboratory Test Procedure which is dated October 1996. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers.

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

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

The following table summarizes the results of the test:

Injury Criteria	Front SID	Rear SID
TTI (g)	102	97
Pelvis (g)	113	99

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/Hyundai/Sonata/4-Door
Vehicle NHTSA No.: MV0500 VIN: KMHCF24F9VU716302
Vehicle Body Color: Gray Build Date: 8/13/96
Engine Data: 4 Cylinders; CID; 2.0 Liter; cc
Placement Longitudinal; X Lateral
Transmission: 3 Speed; Manual; X Automatic; X Overdrive
Final Drive: Rear Wheel Drive; X Frt. Wheel Drive; Four Wheel Drive

Odometer Reading 126 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): 30 Psi FRONT
30 Psi REAR
Recommended Tire Size: P195/70/R14
Tires on Test Vehicle: P195/70/R14 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 Lever X Knob
Vehicle Maximum Capacity Loading = 390.0 kg (A)
No. of Occupants x 68.04 kg. = 340.2 kg (B)
Cargo Capacity (A-B) = 49.8 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>411.4</u> kg	Right Rear	=	<u>251.7</u> kg
Left Front	=	<u>408.2</u> kg	Left Rear	=	<u>260.4</u> kg
TOTAL FRONT	=	<u>819.6</u> kg	TOTAL REAR	=	<u>512.1</u> kg
% of Total Vehicle Weight	=	<u>62</u> %;	% of Total Weight	=	<u>38</u> %
TOTAL WEIGHT	=	<u>1331.7</u> kg			

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	=	<u>1331.7</u> kg
Cargo Carrying Capacity of Test Vehicle	=	<u>49.8</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>1542.9</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	=	<u>423.0</u> kg	Right Rear	=	<u>308.4</u> kg
Left Front	=	<u>456.2</u> kg	Left Rear	=	<u>355.1</u> kg
TOTAL FRONT	=	<u>879.2</u> kg	TOTAL REAR	=	<u>663.5</u> kg
% of Total Weight	=	<u>57</u> %	% of Total Weight	=	<u>43</u> %
TOTAL TEST WEIGHT	=	<u>1542.7</u> kg			

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 691 mm Left Front 689 mm Right Rear 687 mm Left Rear 673 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 682 mm Left Front 670 mm Right Rear 659 mm Left Rear 634 mm

TEST ATTITUDE:

Right Front 679 mm Left Front 673 mm Right Rear 662 mm Left Rear 639 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2700 mm

C.G. = 1161 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4404 mm

Centerline = 4662 mm

Left Side = 4404 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

FRONT SEAT CUSHION PLACEMENT:

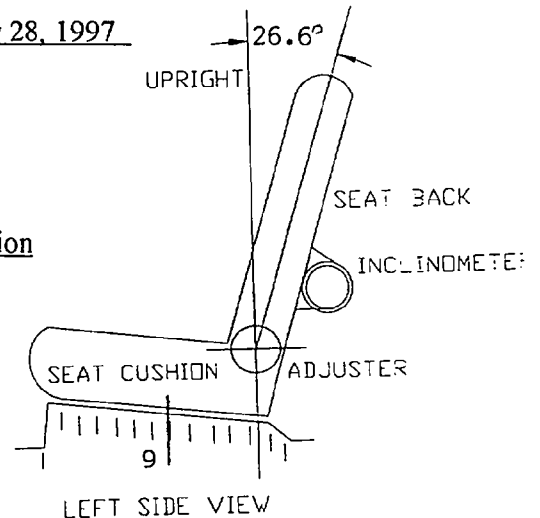
Total Length of Adjustment Travel: 225 mm

Test Position: 9th notch from foremost locking position

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 26.6°

Seat Back Angle = 13th from first locking position



SECOND POSITION SEAT:

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

Seat Back Adjustment Position: Fixed

ADJUSTABLE STEERING COLUMN POSITION:

WINDOW POSITIONS: Left Front Closed Left Rear Closed
Right Front Open Right Rear Open

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 17.17 gallons

Test Volume: 15.97 gallons which is 93 % of capacity

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

Wheelbase: = 2700 mm

Impact Point is 410 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door
Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997
Overall Length = 4662 mm; Overall Width = 1750 mm

TEST WEIGHT:

Right Front = 442.3 kg Right Rear = 302.6 kg
Left Front = 461.7 kg Left Rear = 328.9 kg
TOTAL FRONT = 904.0 kg TOTAL REAR = 631.5 kg
% of Total Weight = 59 % % of Total Weight = 41 %
TOTAL VEHICLE WEIGHT = 1535.5 kg
Wheelbase = 2700 mm
Longitudinal C.G. from Center of Front Axle = 1161 mm
Impact Angle with Respect to Impactor = 90 ° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (268 mm above ground) = 258 mm
 2. LEVEL 2 (485 mm above ground) = 441 mm
 3. LEVEL 3 (563 mm above ground) = 449 mm
 4. LEVEL 4 (865 mm above ground) = 345 mm
 5. LEVEL 5 (1316 mm above ground) = 130 mm
- Maximum Post-Test Intrusion = 449 mm

OCCUPANTS:

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

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

Number of Vehicle Data Channels:	=	<u>25</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/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>1252 mm</u>
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4115 mm</u>
Wheelbase of Framework Carriage	=	<u>2591 mm</u>
Tread of Framework Carriage (Front & Rear)	=	<u>1880 mm</u>
C.G. Location Rearward of Front Axle	=	<u>1102 mm</u>
C.G. Location From Center Line	=	<u>-23 mm</u>
C.G. Location Above Ground Level	=	<u>508 mm</u>

MDB WEIGHT:

Left Front	=	<u>396.1 kg</u>	Left Rear	=	<u>284.4 kg</u>
Right Front	=	<u>383.4 kg</u>	Right Rear	=	<u>293.8 kg</u>
TOTAL FRONT	=	<u>779.5 kg</u>	TOTAL REAR	=	<u>578.2 kg</u>
TOTAL MDB WEIGHT = <u>1357.7 kg</u>					

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

Impact Speed = Primary: 37.9 mph (61 kph) Secondary: 37.9 mph (61 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>160</u> mm |
| 2. | Row B Mid Stack (686 mm) | = | <u>79</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = | <u>74</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = | <u>91</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door
Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to D-ring</u>	<u>to C-Post</u>
Arm	<u>to door</u>	<u>to door</u>
Pelvis	<u>to door</u>	<u>to door</u>
Left Knee	<u>to door</u>	<u>to door</u>
Right Knee	<u>to left knee</u>	<u>to left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 35 mm rearward Vertical: 3 mm low

ARM REST LOCATIONS:

Front: 234 mm from bottom of window
Rear: 240 mm from bottom of window

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 21 mm Front Seat Cushion: 141 mm
Left Rear Seat Back: 194 mm Rear Seat Cushion: 237 mm

GLAZING DAMAGE:

Driver and passenger door side glass broken, windshield cracked

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

No separation noted

OTHER NOTABLE IMPACT EFFECTS:

Driver and passenger airbags deployed

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA

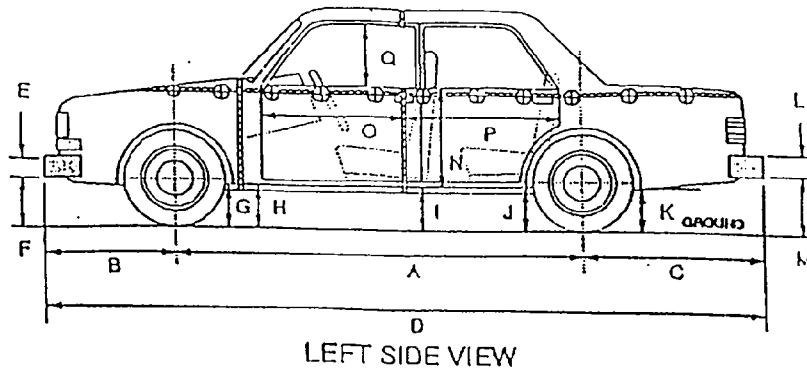
Year/Make/Model/Body Style: 1997/Hvundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

	Front Dummy ID # 269				Rear Dummy ID # 270			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS								
Left Upper Rib (LUR) Y	113.9	34	-36.2	69	108.7	40	-11.0	81
Left Lower Rib (LLR) Y	109.1	33	-20.8	70	107.9	39	-25.5	78
SPINE ACCELERATIONS								
Lower Lateral Y	89.7	35	-20.8	64	84.4	44	-41.4	73
PELVIS ACCELERATIONS								
Lateral Y	112.8	28	-31.8	54	98.6	34	-22.8	68

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

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)

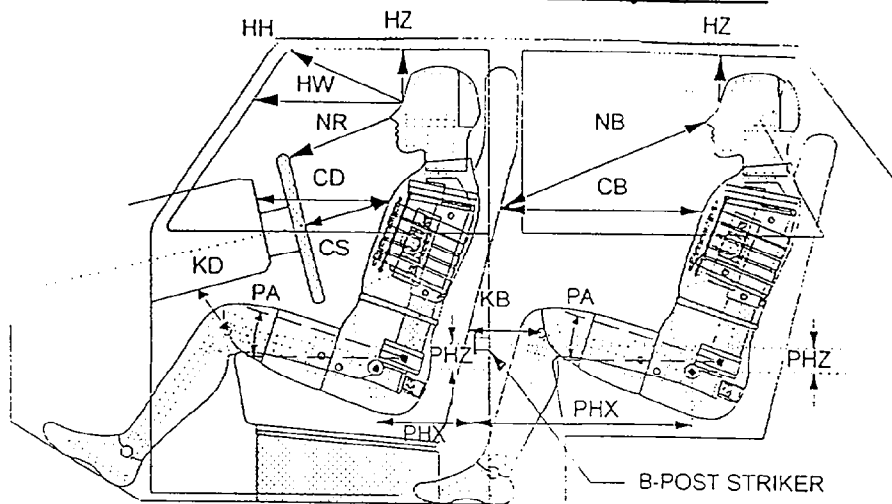
	PRE-TEST	POST-TEST	Δ CHANGE
A	2696	2630	66
B	952	986	34
C	1014	1012	2
D	4662	4628	34
E	120	120	0
F	389	398	9
G	185	187	2
H	183	203	20
I	175	249	74
J1/J2	180/180	181/175	1/5
K	225	230	5
L	232	232	0
M	340	354	14
N	612	518	94
O	721	634	87
P	1186	1109	77
Q	443	439	4
R	4404	4425	21
S	4404	4325	79
T	1750	1428	322

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

NHTSA NO.: MV0500 Test Date: January 28, 1997



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

	FRONT SID ID # 269
HH	395
HW	621
HZ	168
NR	518
CD	581
CS	N/R
KDL(KDA°)	186 (26.2°)
KDR(KDA°)	207 (24.9°)
PA°	24.5°
PHX	222
PHZ	137

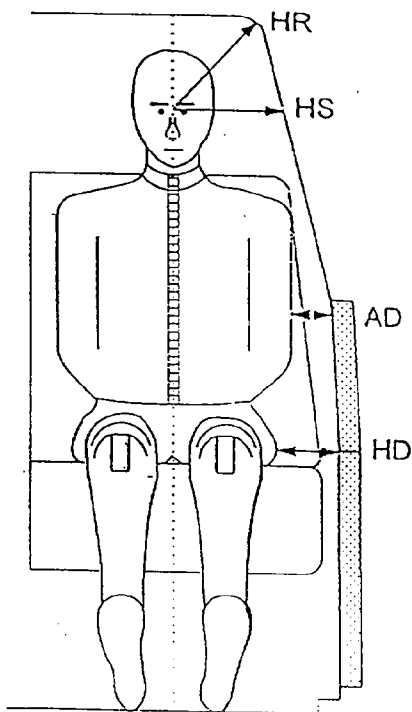
	REAR PASSENGER SID ID # 270
HZ	139
NB	621
CB	533
KBL (KBA)	222 (0.0°)
KBR (KBA)	238 (0.0°)
PA°	23.2
PHX	275
PHZ	283

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/Hyundai/Sonata/4-Door

NHTSA NO.: MV0500 Test Date: January 28, 1997



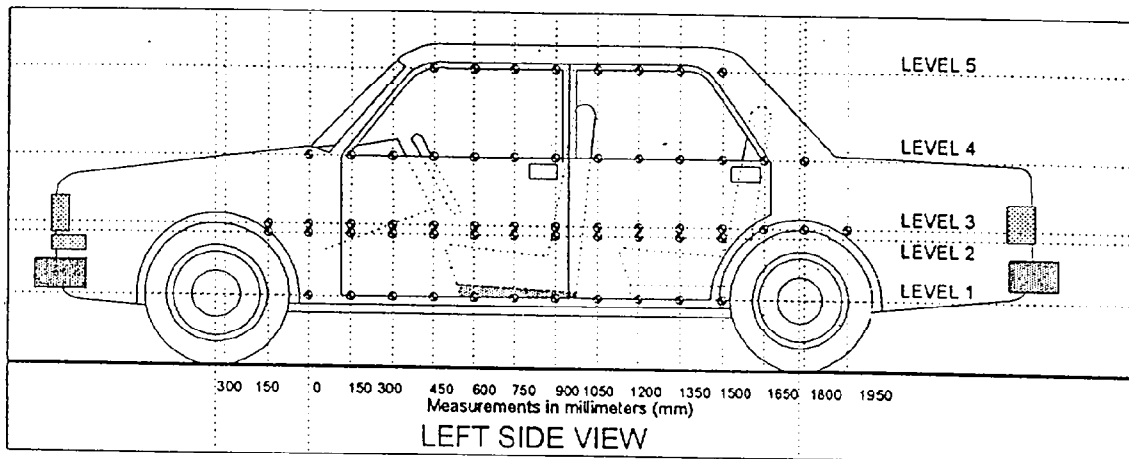
NOTE: All dimensions are in mm

	DRIVER ID # 269	LEFT REAR PASSENGER ID # 270
HR	212	192
HS	321	235
AD	133	142
HD	169	200

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

NHTSA NO.: MV0500 Test Date: January 28, 1997



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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

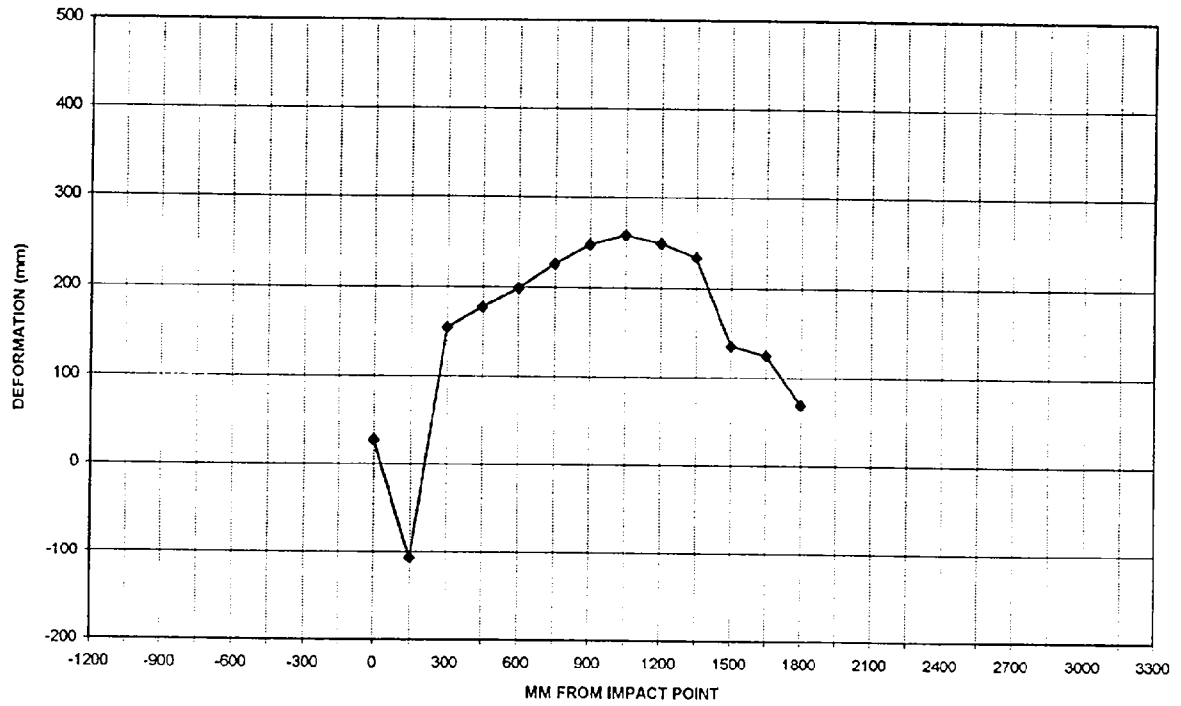
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>268</u> mm
Level 2 @ Occupant H-Point	= <u>485</u> mm
Level 3 @ Mid Door	= <u>563</u> mm
Level 4 @ Window Sill	= <u>865</u> mm
Level 5 @ Window Top	= <u>1316</u> mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	625	652	27
150	626	519	-107
300	628	780	154
450	630	807	177
600	632	831	199
750	633	859	226
900	635	882	247
1050	637	895	258
1200	634	883	249
1350	635	869	234
1500	634	769	135
1650	632	756	124
1800	631	701	70
1950			
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



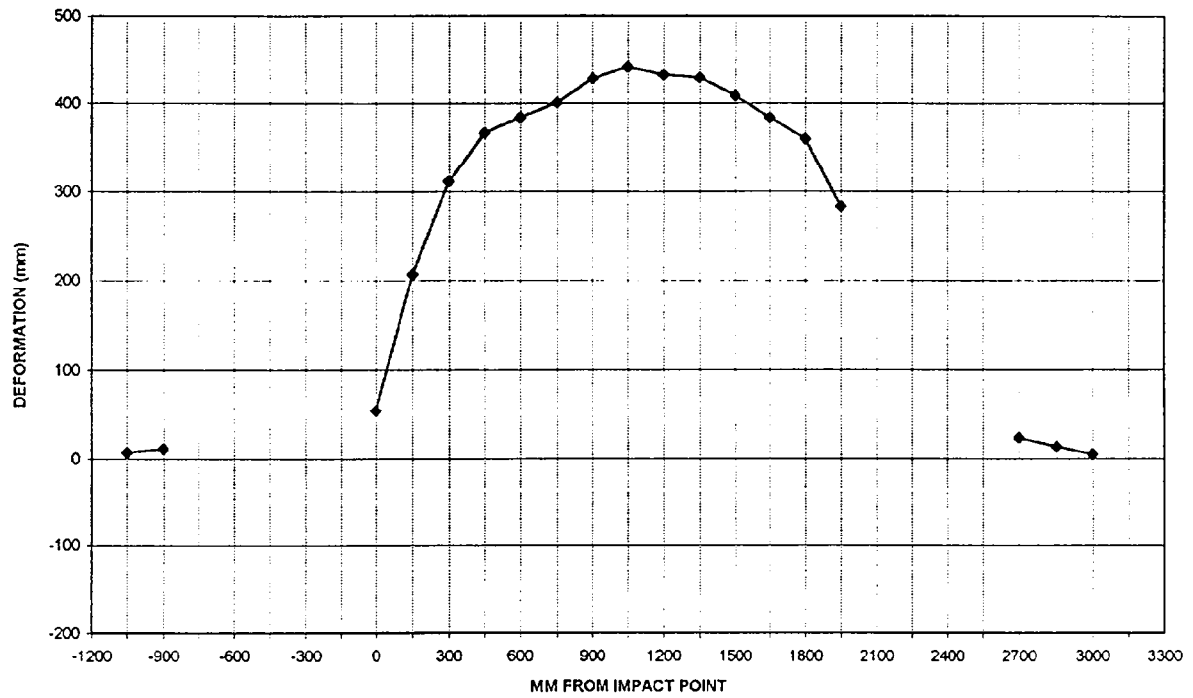
LEVEL 1 - AXLE CENTERLINE

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 2 - Occupant H Point		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050	658	665	7
-900	628	639	11
-750			
-600			
-450			
-300			
-150			
0 (impact point)	585	639	54
150	583	790	207
300	580	892	312
450	578	945	367
600	576	960	384
750	574	975	401
900	573	996	428
1050	573	1014	441
1200	578	1010	432
1350	572	1001	429
1500	571	980	409
1650	575	959	384
1800	577	937	360
1950	590	873	283
2100			
2250			
2400			
2550			
2700	607	630	23
2850	626	639	13
3000	653	658	5

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

VEHICLE EXTERIOR STATIC CRUSH



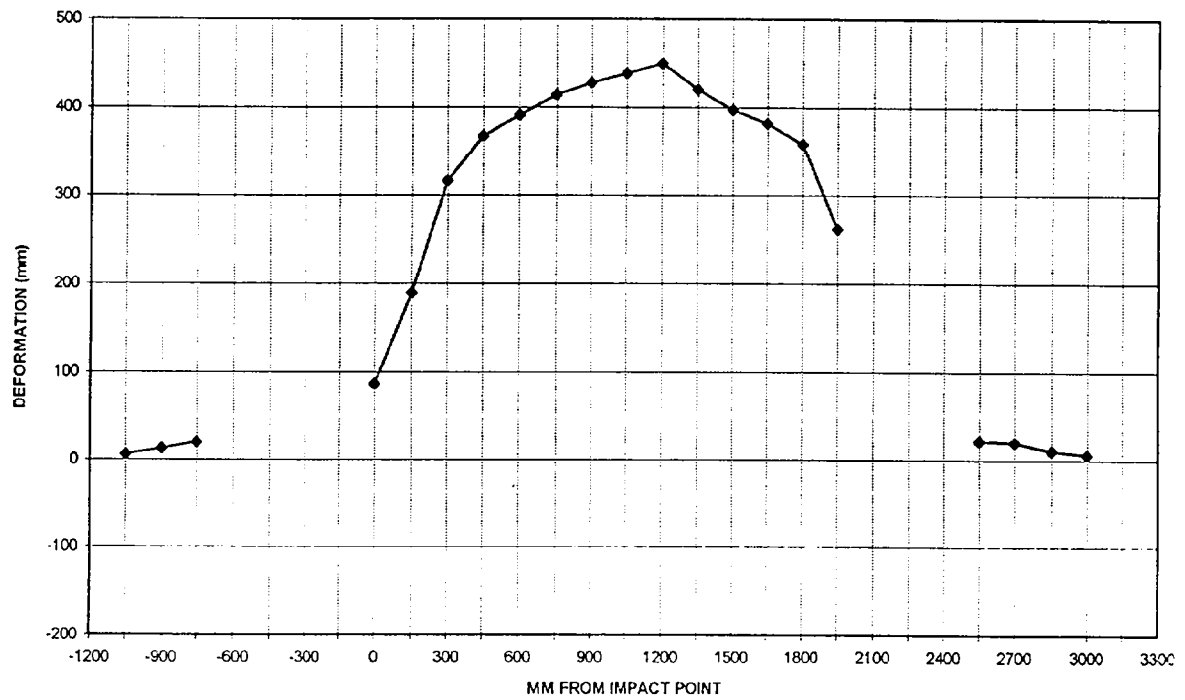
LEVEL 2 - OCCUPANT H-POINT

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 3 - Mid Door		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050	664	670	6
-900	633	646	13
-750	603	623	20
-600			
-450			
-300			
-150			
0 (impact point)	602	689	87
150	600	789	189
300	596	912	316
450	594	961	367
600	593	984	391
750	590	1004	414
900	590	1017	427
1050	590	1028	438
1200	590	1039	449
1350	588	1008	420
1500	587	984	397
1650	590	972	382
1800	593	951	358
1950	592	854	262
2100			
2250			
2400			
2550	600	622	22
2700	622	642	20
2850	647	658	11
3000	678	684	6

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

VEHICLE EXTERIOR STATIC CRUSH



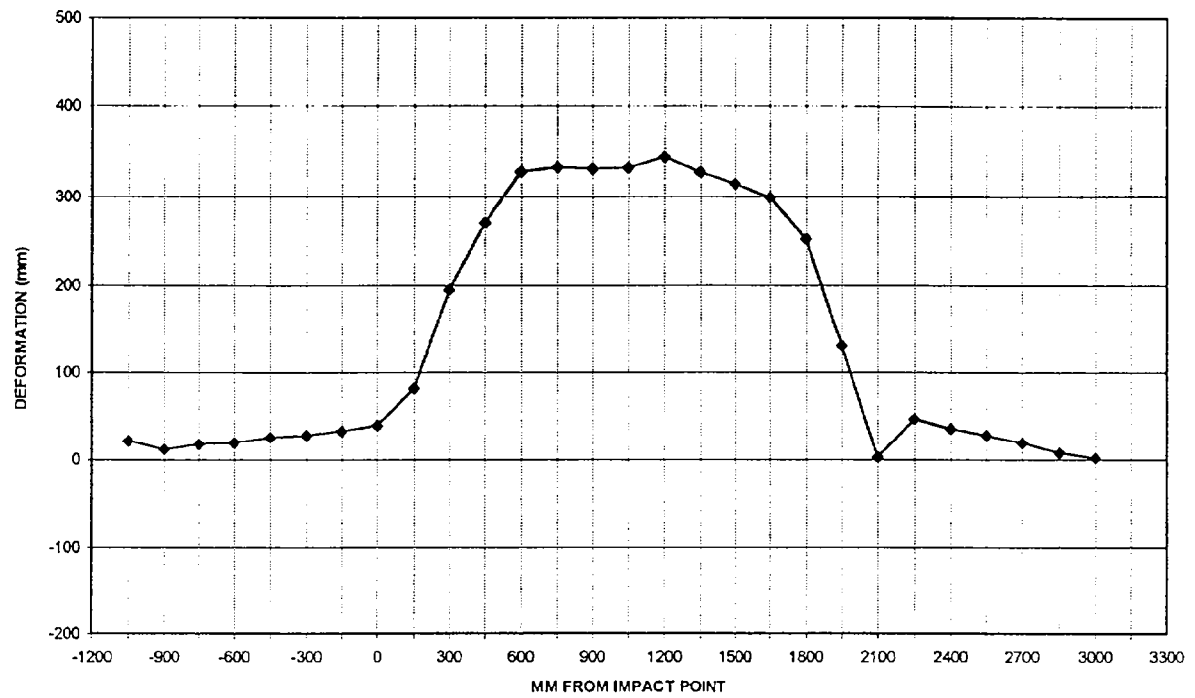
LEVEL 3 - MID DOOR

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 4 - Window Sill		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050	733	755	22
-900	707	719	12
-750	682	700	18
-600	667	687	20
-450	651	677	26
-300	644	672	28
-150	637	670	33
0 (impact point)	630	670	40
150	628	710	82
300	627	822	195
450	626	896	270
600	626	955	329
750	623	957	334
900	625	957	332
1050	626	959	333
1200	630	975	345
1350	630	958	328
1500	631	946	315
1650	637	936	299
1800	642	894	252
1950	647	777	130
2100	656	659	3
2250	665	712	47
2400	676	712	36
2550	689	717	28
2700	704	724	20
2850	720	728	8
3000	745	747	2

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

VEHICLE EXTERIOR STATIC CRUSH



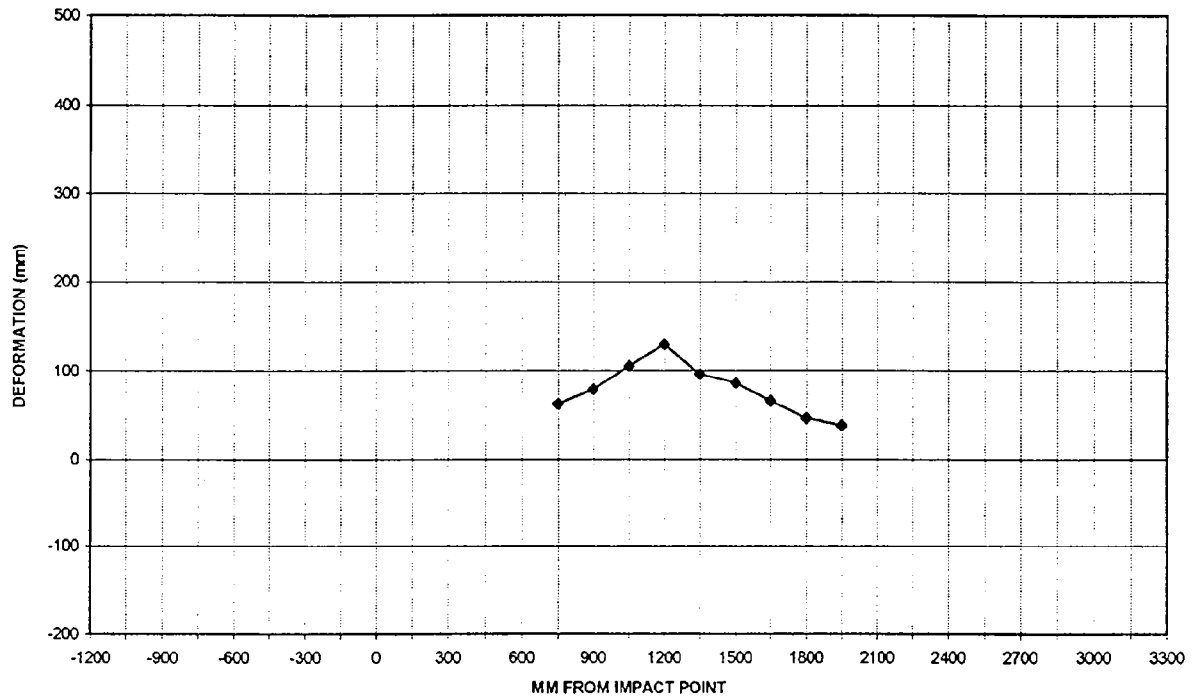
LEVEL 4 - WINDOW SILL

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 5 - Window Top		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750	872	934	62
900	870	948	78
1050	870	975	105
1200	872	1002	130
1350	876	972	96
1500	880	965	85
1650	882	947	65
1800	890	936	46
1950	900	938	38
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



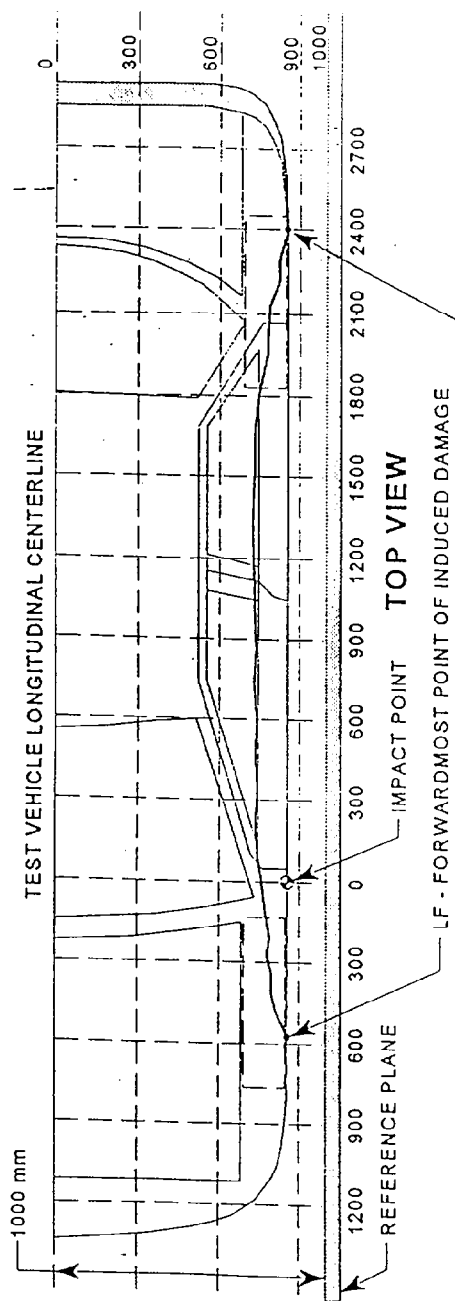
LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

NHTSA NO.: MV0500 Test Date: January 28, 1997



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

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LF = -1050 mm)	670	670	0
2. -252 mm	672	644	28
3. 568 mm	982	593	389
4. 1329 mm	1018	587	431
5. 2232 mm	714	667	47
6. (LR = 3000 mm)	684	684	0

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

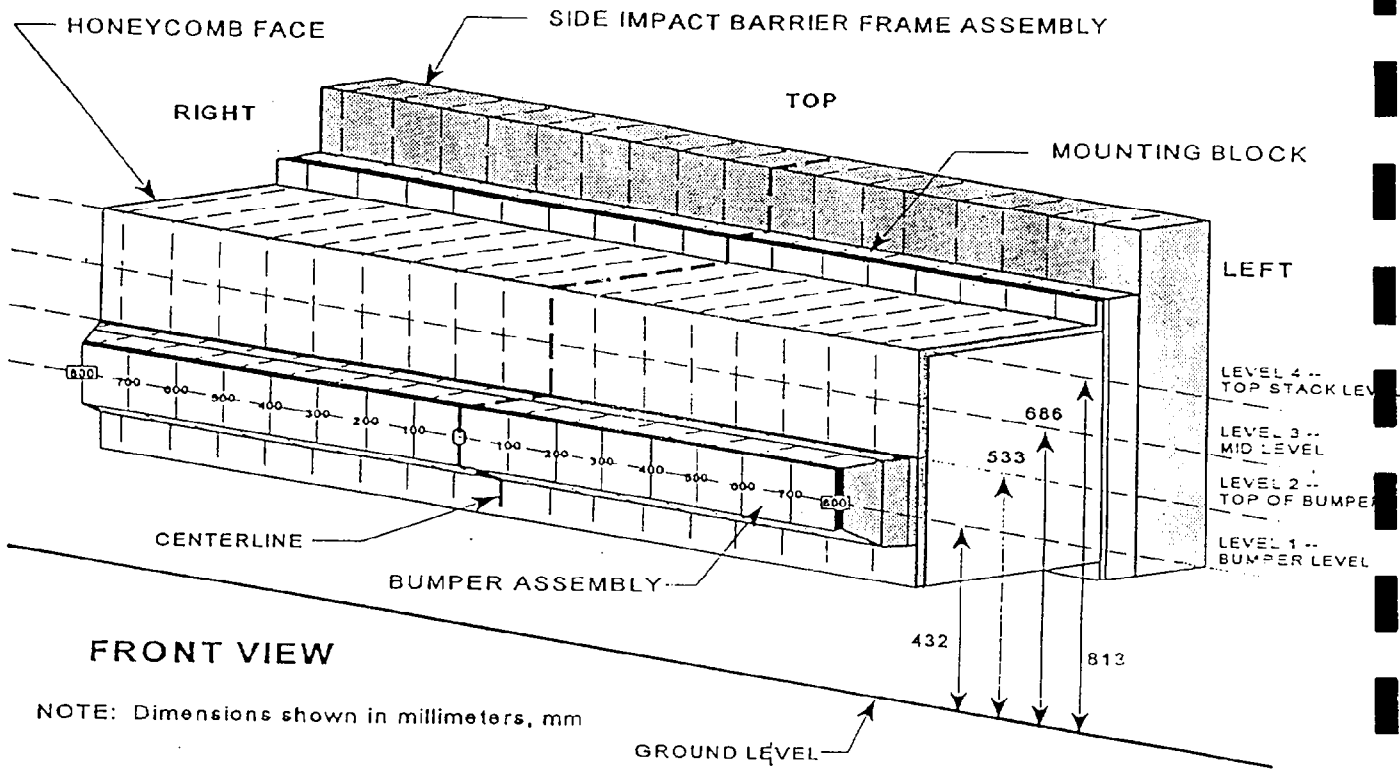
Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

		Distance Right of Center (mm)									Distance Left of Center (mm)							
Location	Height at CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level 4	813 mm	109	46	1	-3	-3	-2	-1	5	1	2	4	4	4	20	53	119	160
Mid Level Level 3	686 mm	52	9	3	4	3	2	3	2	2	4	5	5	6	4	7	29	79
Top Bumper Level 2	533 mm	57	31	11	5	5	6	7	8	11	13	18	21	25	31	42	60	74
Mid Bumper Level 1	432 mm	57	57	29	41	37	36	39	41	41	44	49	53	59	69	85	85	91

See next page for Barrier Face Graphic

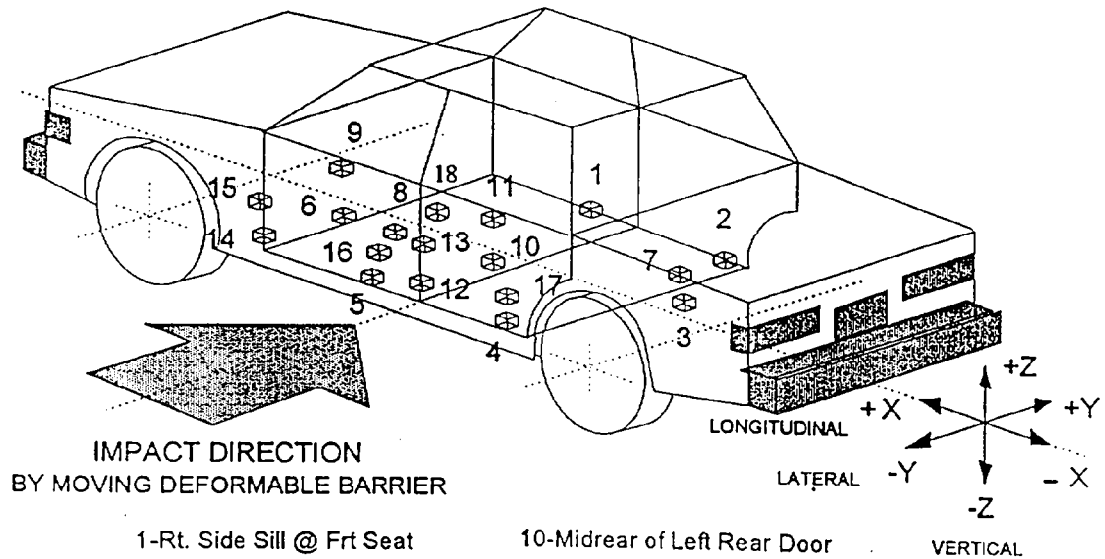
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997



- 1-Rt. Side Sill @ Frt Seat
- 2-Rt. Side Sill @ Rr. Seat
- 3-Rr. Floorpan Above Axle
- 4-Left Side Sill @ Rr. Seat
- 5-Left Side Sill @ Frt. Seat
- 6-Left Frt. Door On Centerline
- 7-Rt. Rr. Occ Compartment
- 8-Midrear of Left Frt. Door
- 9-Left Frt. Door Upper Ctrline

- 10-Midrear of Left Rear Door
- 11-Left Rear Door Upper Ctrline
- 12-Left Lower B-Post
- 13-Left Middle B-Post
- 14-Left Lower A-Post
- 15-Left Middle A-Post
- 16-Front Seat Track
- 17-Rear Seat Track
- 18-Vehicle C.G.

DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2563	711	216	3.3	4.0	18.1	2.7	6.2	6.4	18.1
2	Rt. Side Sill @ Rear Seat	1456	709	214	7.2	2.6	21.9	3.5	6.2	6.5	22.6
3	Rr. Floorpan Above Axle	1058	0	516	2.0	8.8	18.7	3.3	10.0	5.2	18.8
4	Left Side Sill @ Rr. Seat	1455	-709	234	---	---	42.0	7.3	---	---	---
5	Left Side Sill @ Frt. Seat	2681	-711	205	---	---	60.2	32.1	---	---	---
6	Left Front Door Centerline	2712	-785	650	---	---	282.8	167.6	---	---	---
7	Right Rear Occupant Compartment	1850	-388	338	---	---	19.9	4.8	---	---	---
8	Mid Rear of Left Front Door (3)	2378	-780	630	---	---	190.8	56.2	---	---	---
9	Left Front Door Upper Centerline (1)	2665	-805	840	---	---	---	---	---	---	---
10	Left Rear Door Mid Rear	1712	-735	870	---	---	131.5	-163.2	---	---	---
11	Left Rear Door Upper Centerline (2)	1712	-735	722	---	---	---	---	---	---	---
12	Left Lower B-Post	2075	-700	332	---	---	88.2	-21.1	---	---	---
13	Left Mid B-Post	2084	-705	842	---	---	185.3	-85.9	---	---	---
14	Left Lower A-Post	3135	-718	218	---	---	39.3	-8.7	---	---	---
15	Left Mid A-Post	3166	-776	862	---	---	21.1	-22.5	---	---	---
16	Driver Left Seat Track	2310	-614	345	---	---	96.7	72.9	---	---	---
18	Vehicle CG	2598	-15	285	5.7	7.0	17.1	3.9	16.6	8.1	19.3

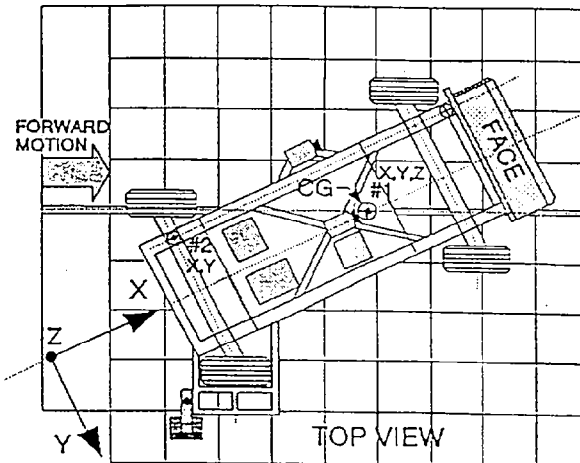
*Reference: X - Rear Bumper (+ Forward) (1) Wire cut @ 25 msec.
Y - Vehicle Centerline (+ To right) (2) Wire Cut @ 30 msec.
Z - Ground Level (+ Up) (3) Data not valid after 20 msec.

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997



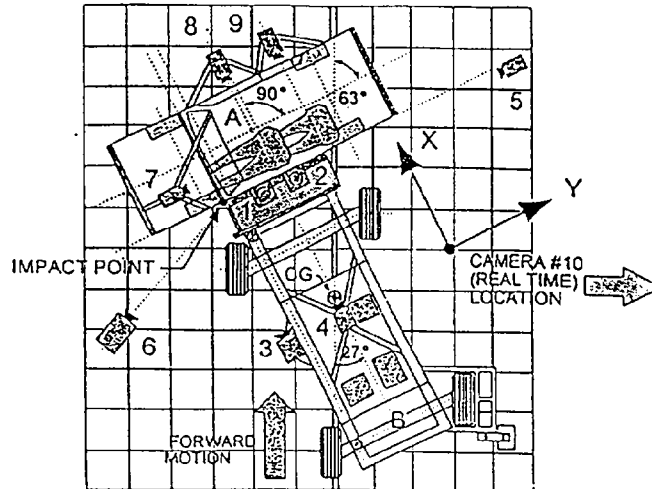
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.5	161	-15.9	35
	Lateral (Y)	---	---	---	4.4	57	-1.4	133
	Vertical (Z)	---	---	---	8.8	76	-10.9	30
	Resultant (R)	---	---	---	18.6	30	---	---
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	2.5	162	-20.1	30
	Lateral (Y)	---	---	---	3.1	49	-1.5	190

*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/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time						
6	Left Impact	-860	-2090	1670		13	980
8	Onboard Driver					8	820
9	Onboard Passenger					8	995
7	Onboard Hood					13	606
5	Right Impact	-390	10560	1775		25	1015
1	Top Overall	-280	1180	5000		8	1036
2	Top Impact	-260	50	5000		13	847
4	Cart Overall					13	1020
3	Cart Pointer					35	1005

* Reference: (from point of impact)

+X = Forward

+Y = To Right

+Z = Upward

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

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 37.9 mph (61 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

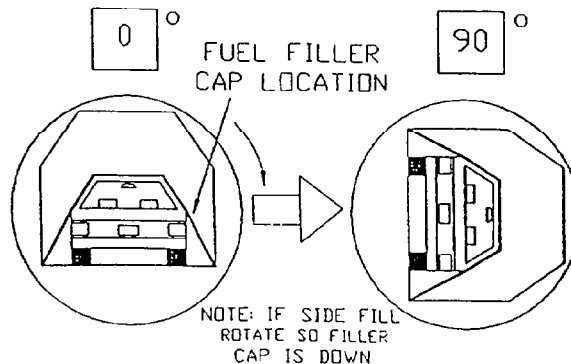
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 42 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 42 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

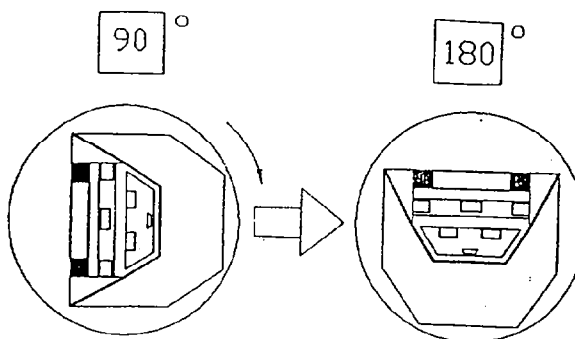
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 56 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 56 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

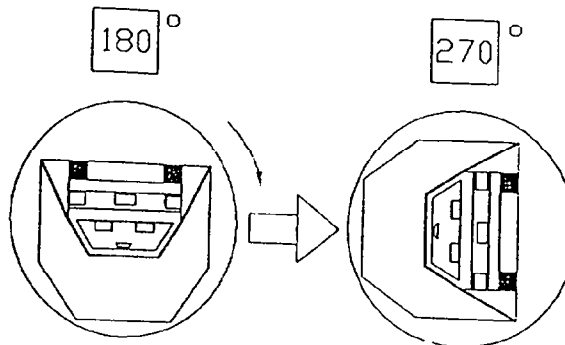
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 33 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 33 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

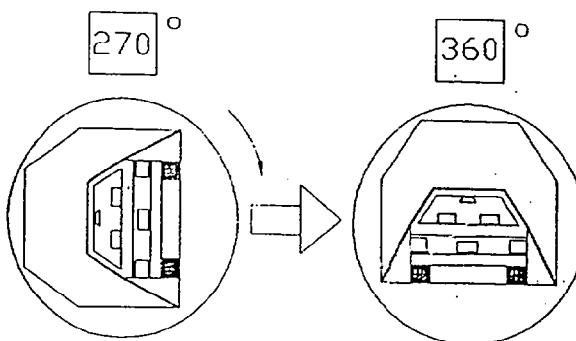
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Hyundai/Sonata/4-Door

Vehicle NHTSA No.: MV0500 Test Date: January 28, 1997

TEST PHASE: 270° - 360°



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:

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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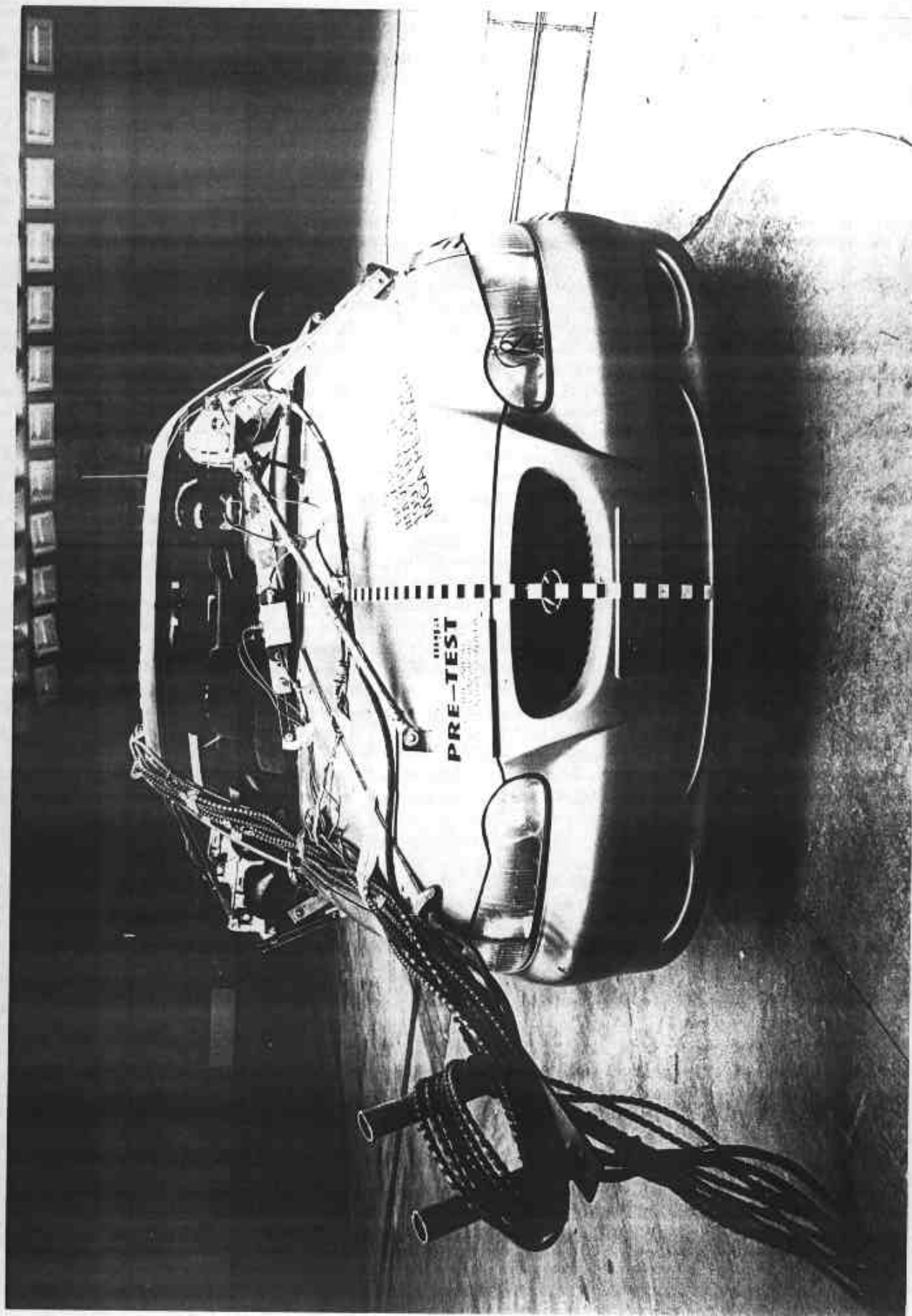
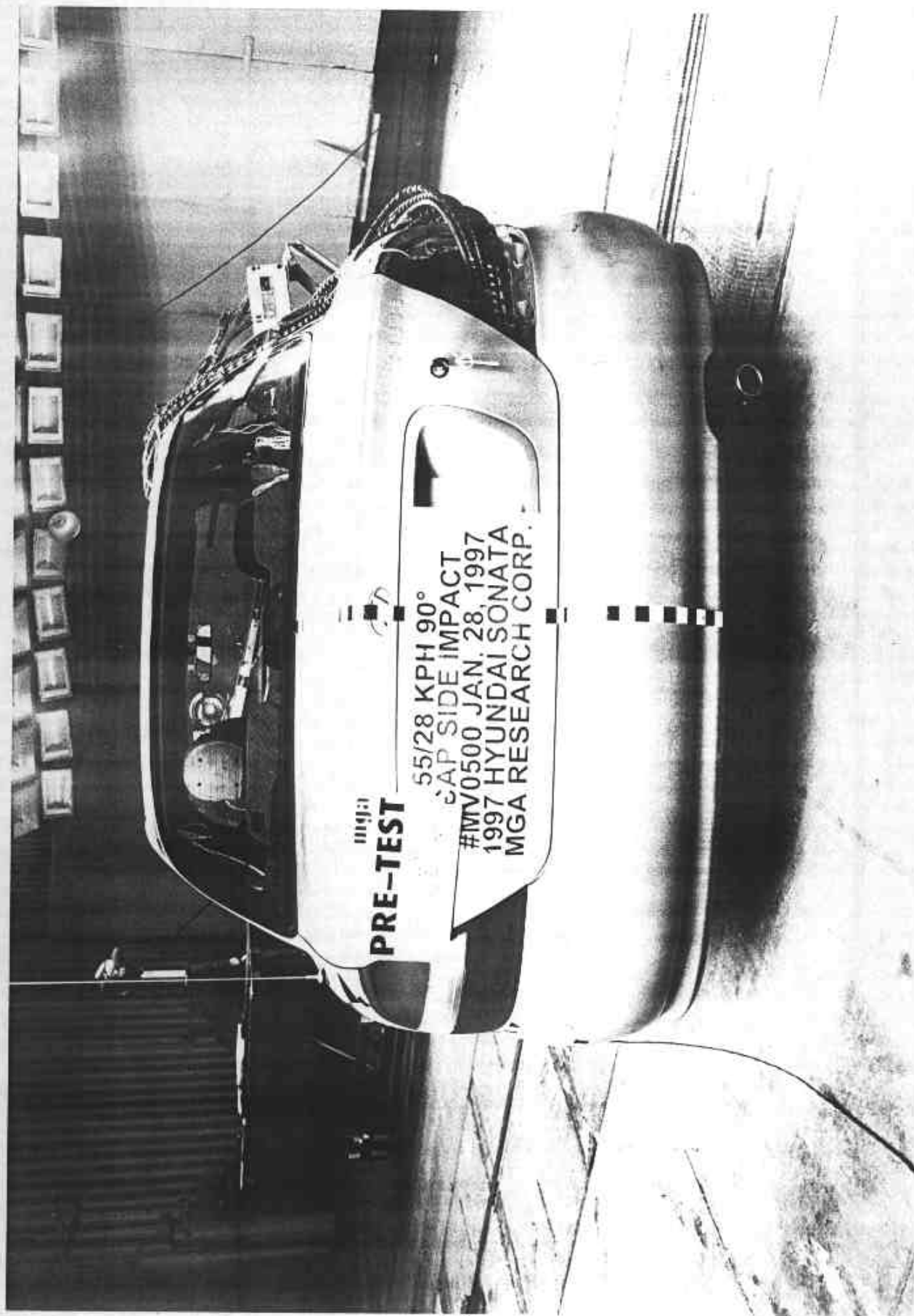


Photo No. A-1 - Pre-Test Front View of Test Vehicle

A-1



A-2

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



A-3

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

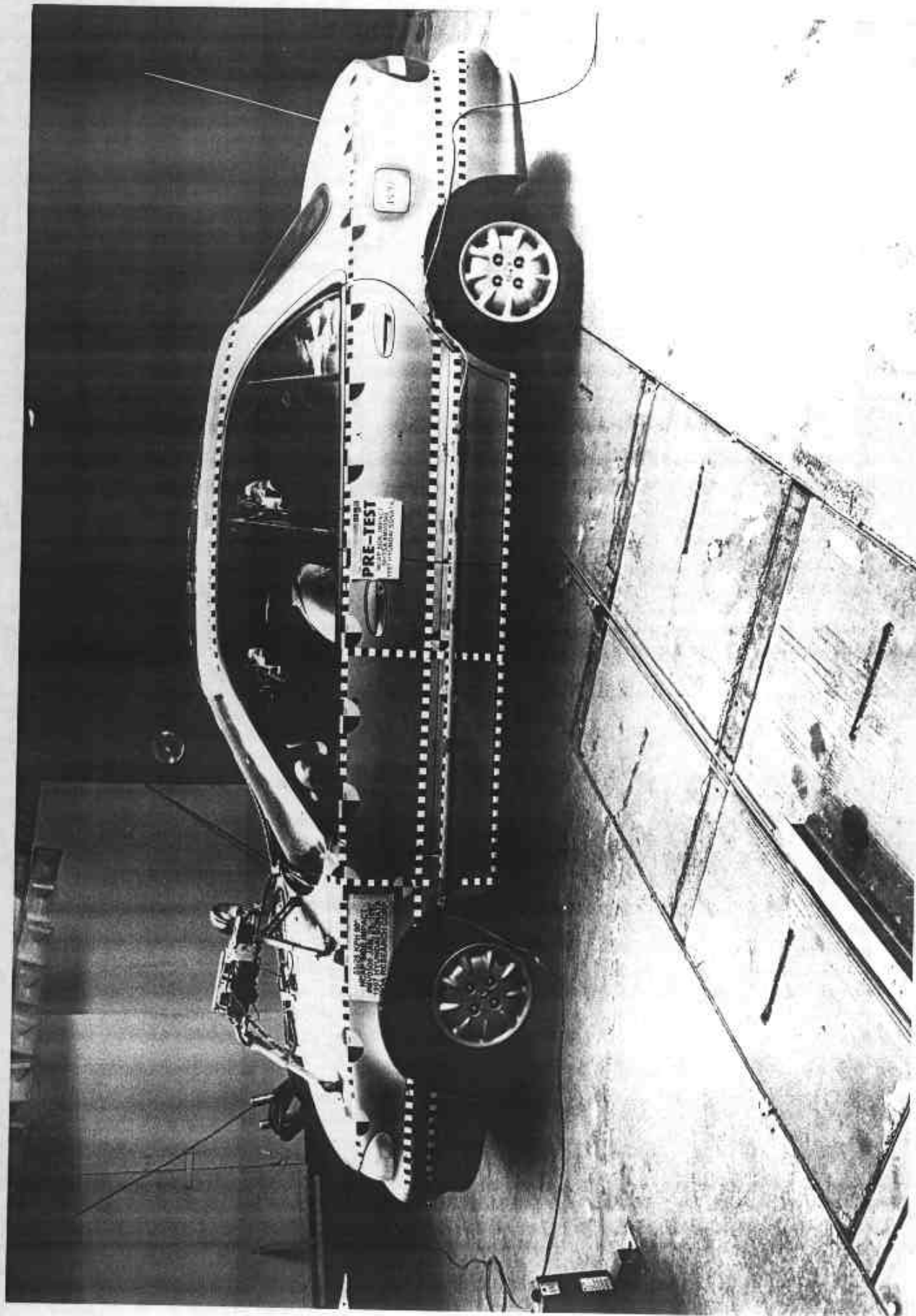


Photo No. A-4 - Pre-Test Left Side View of Test Vehicle

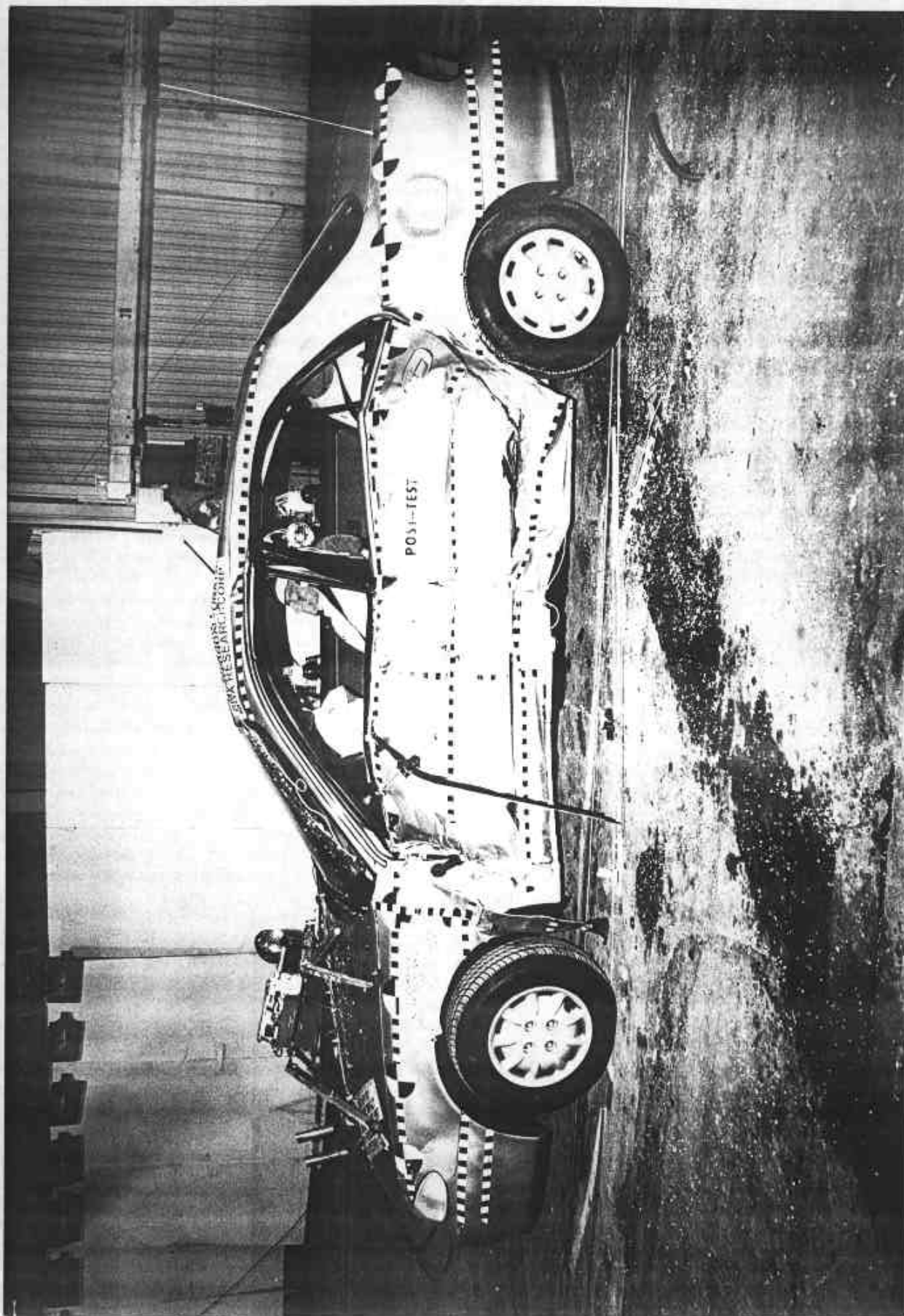


Photo No. A-5 - Post-Test Left Side View of Test Vehicle

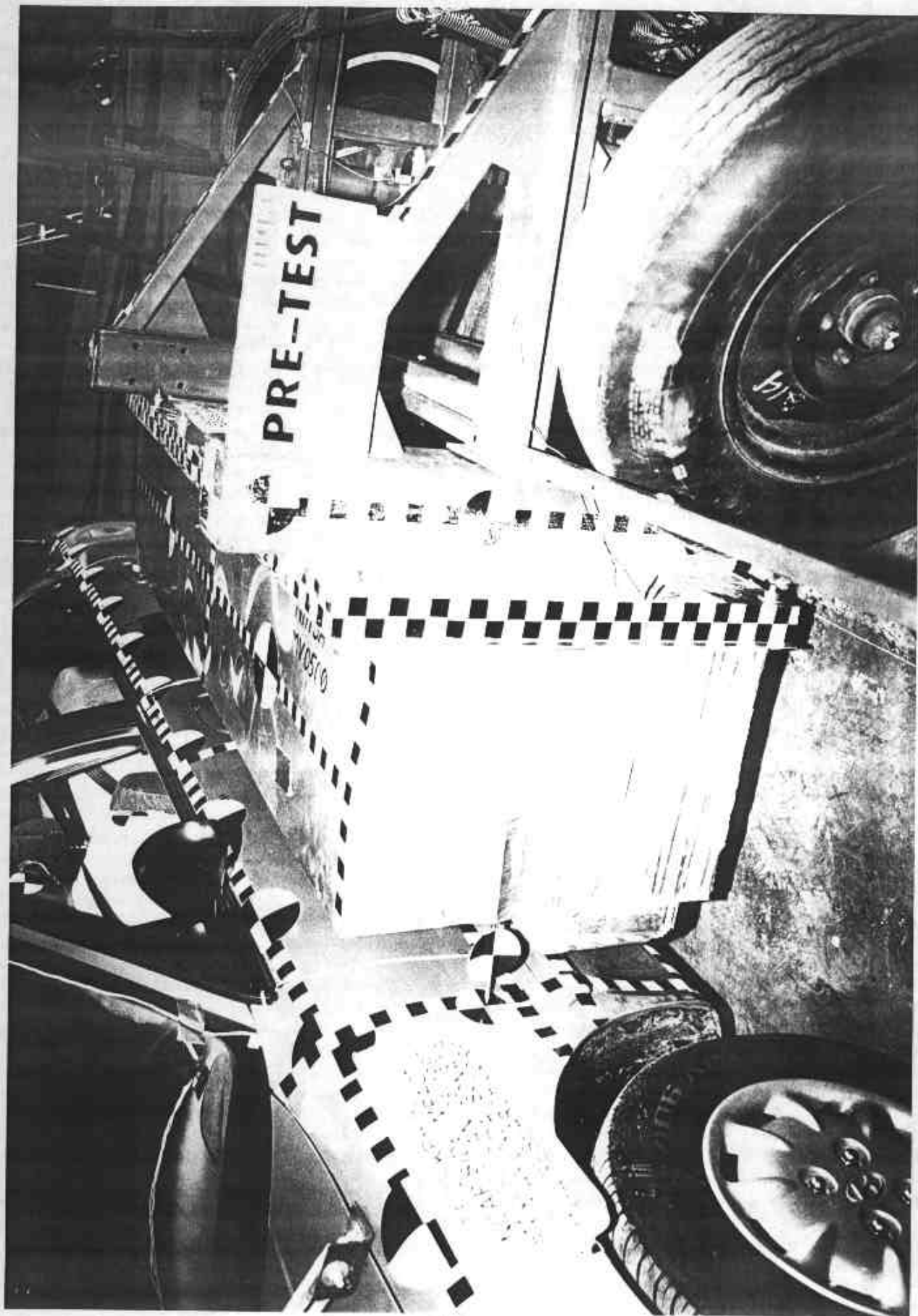


Photo No. A-6 - Pre-Test MDB Positioned Against Vehicle (left side)

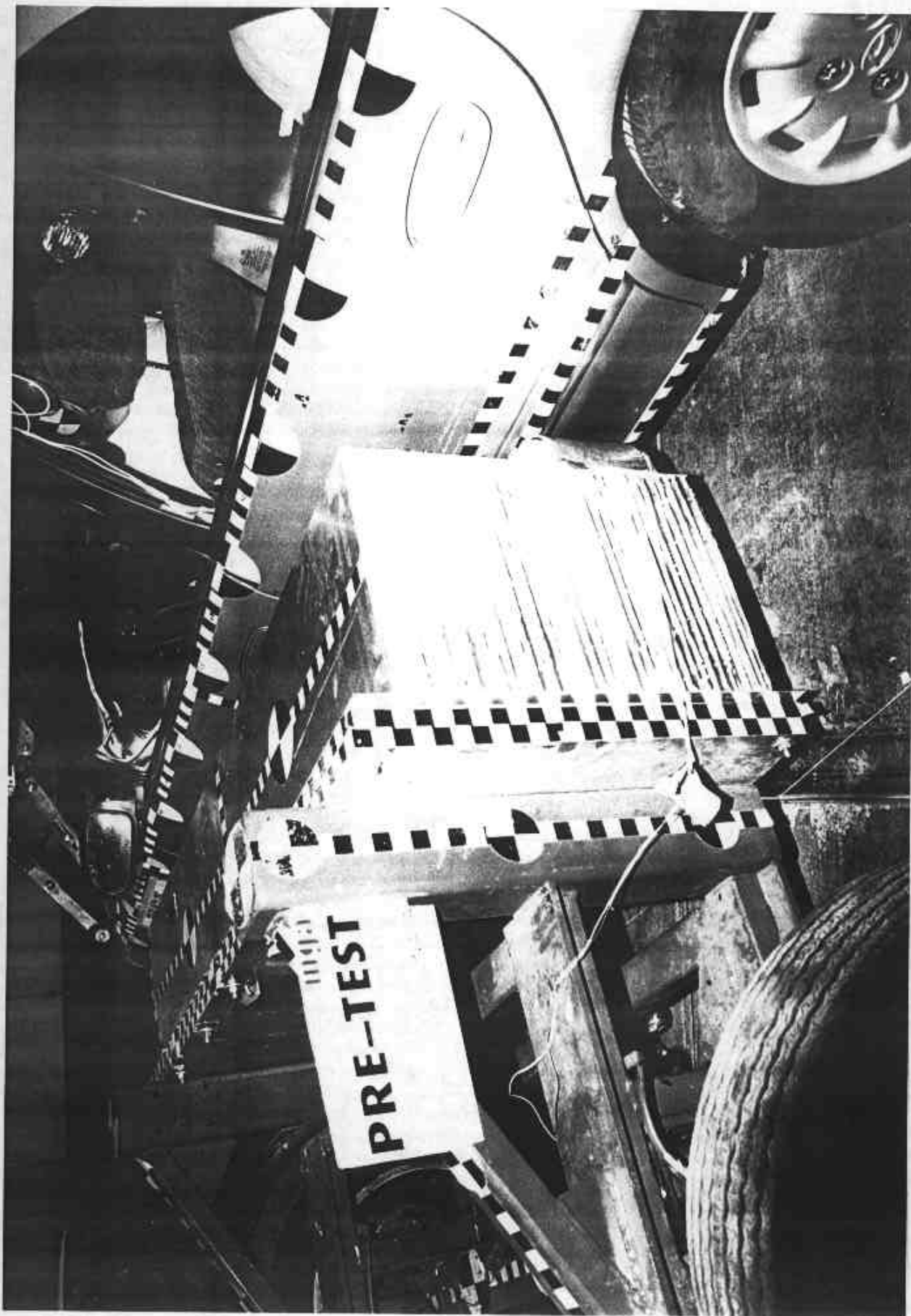


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (right side)

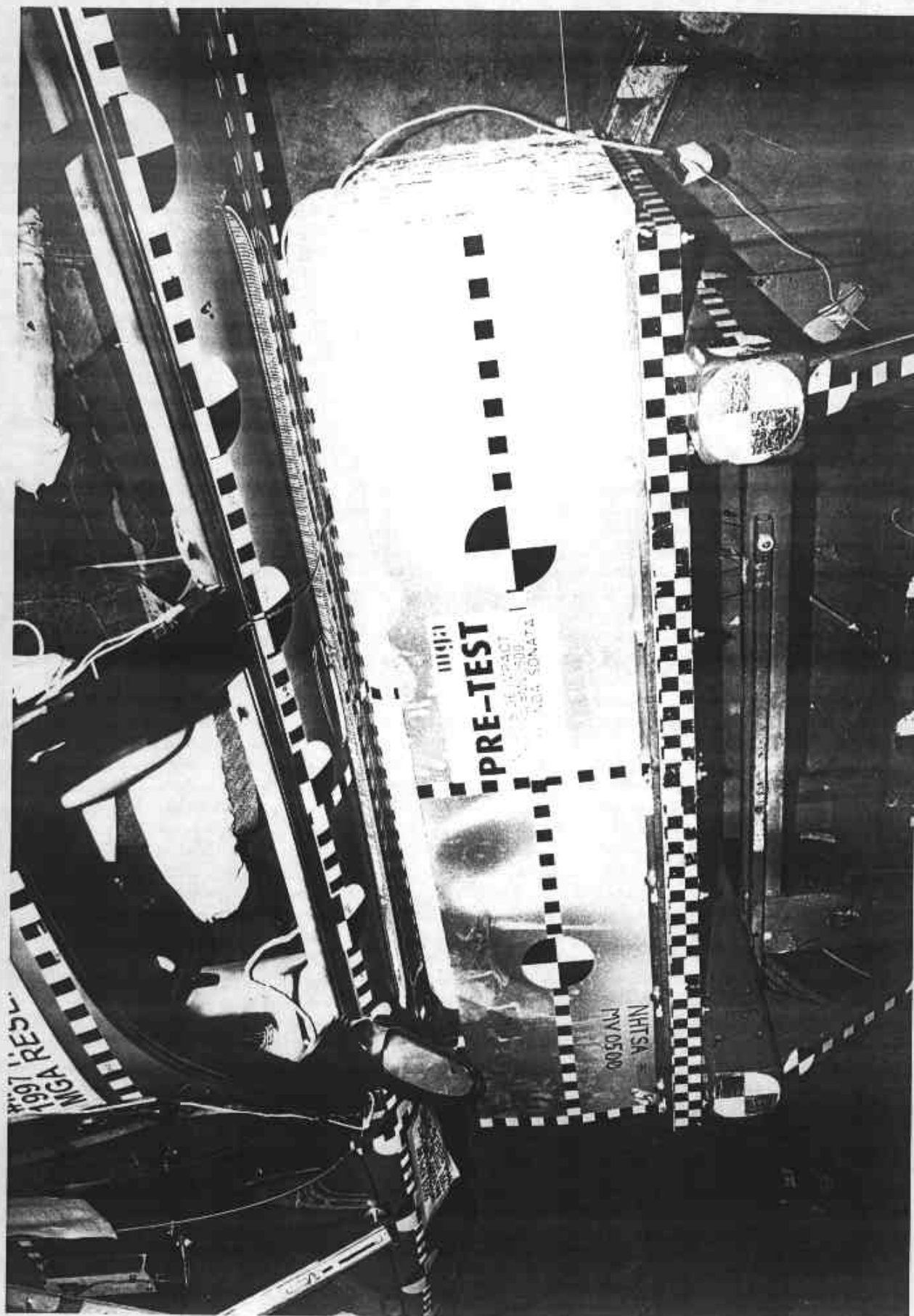


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle Overhead View

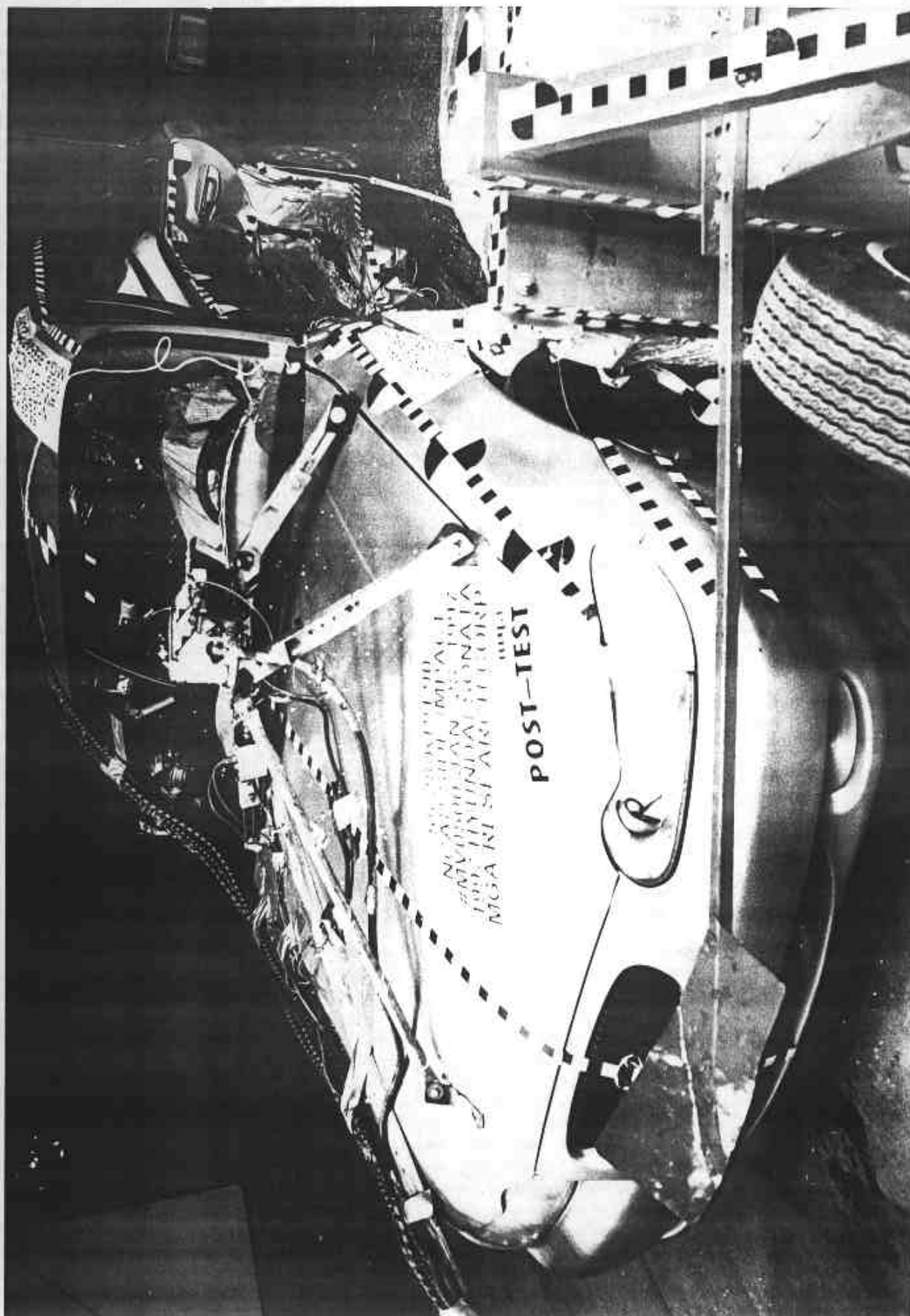


Photo No. A-9 - Post-Test MDB Positioned Against Vehicle (left side)

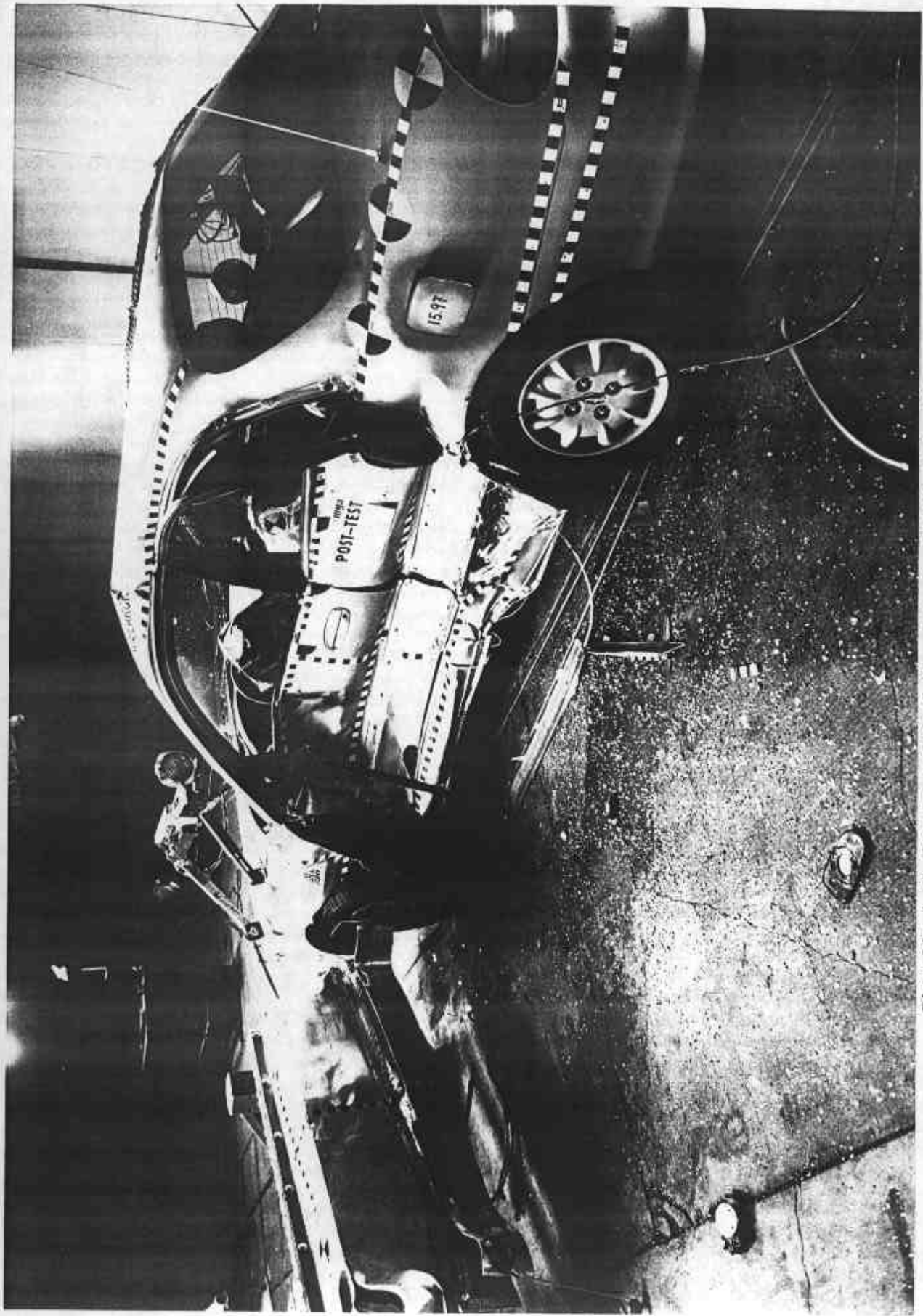
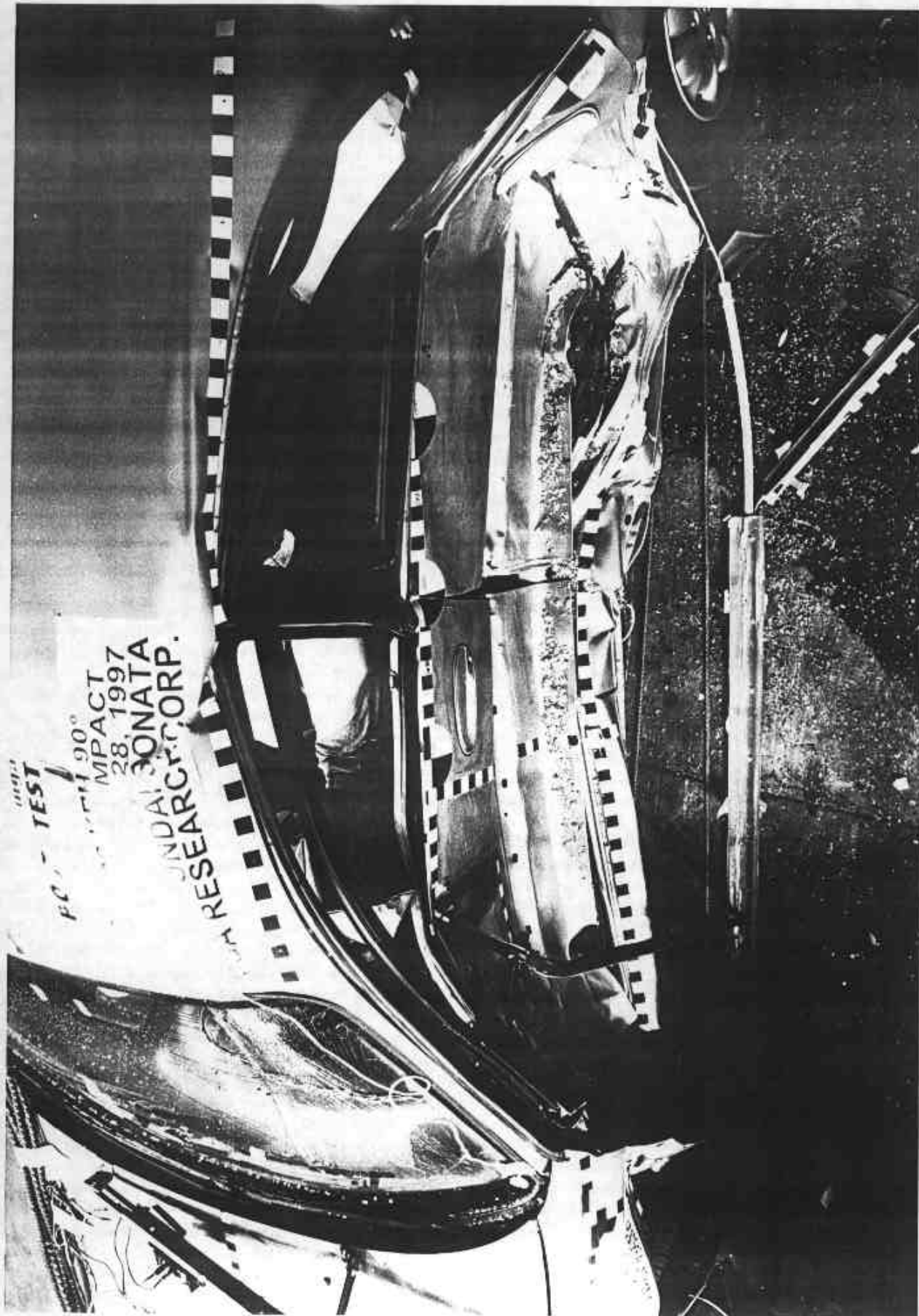


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (right side)

A-10



A-11

Photo No. A-11 - Post-Test MDB Positioned Against Vehicle Overhead View

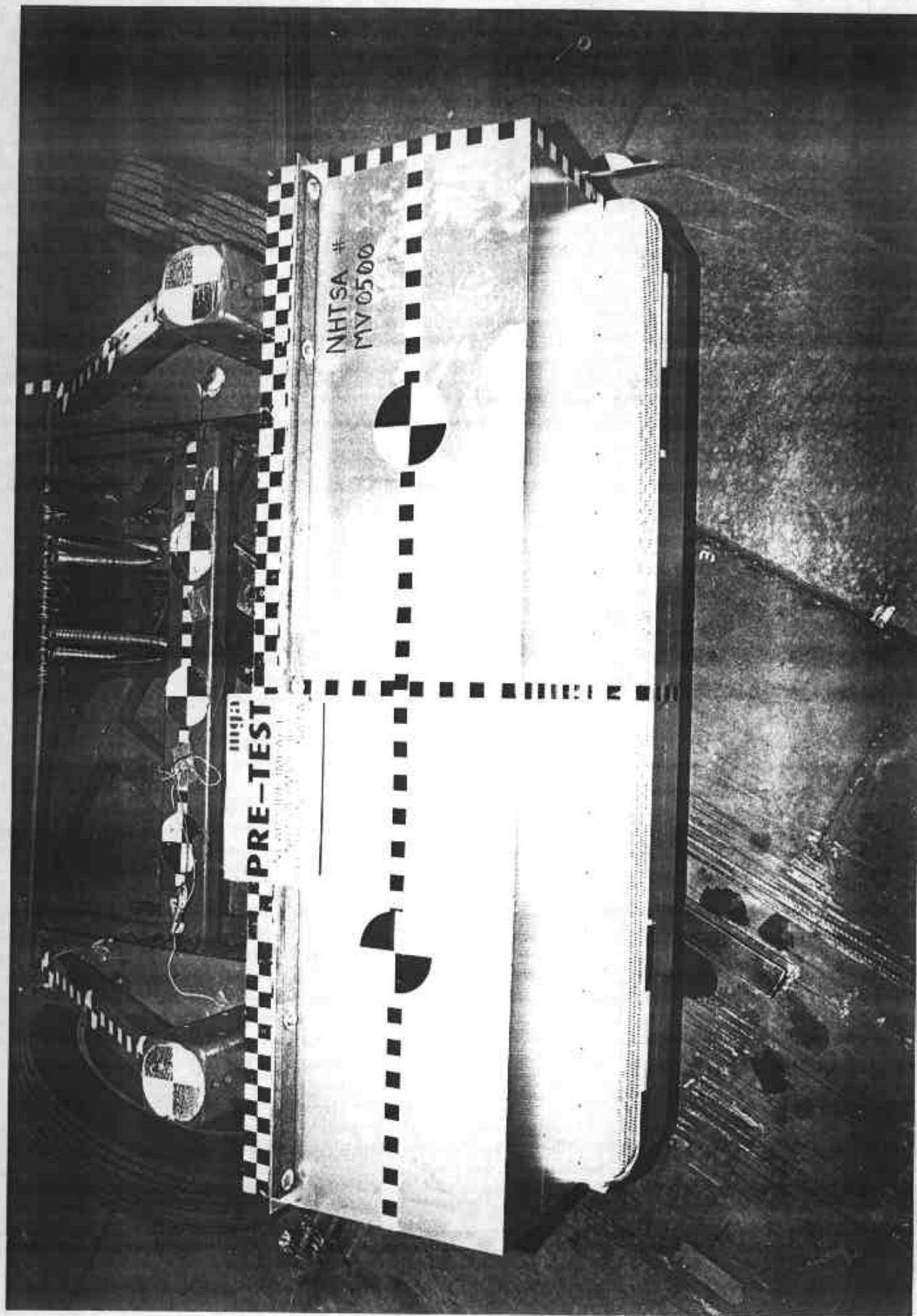


Photo No. A-12 - Pre-Test MDB Top View

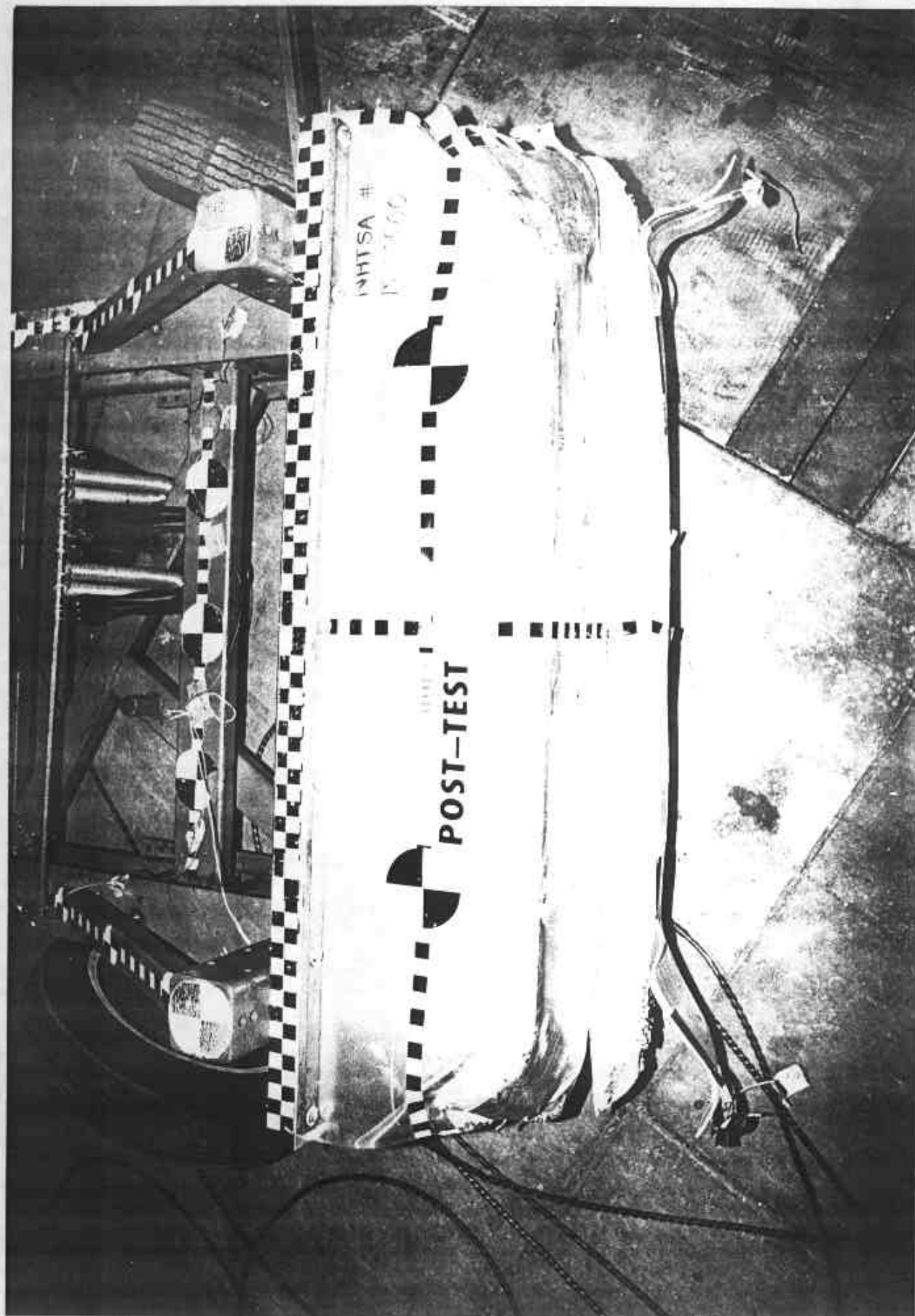
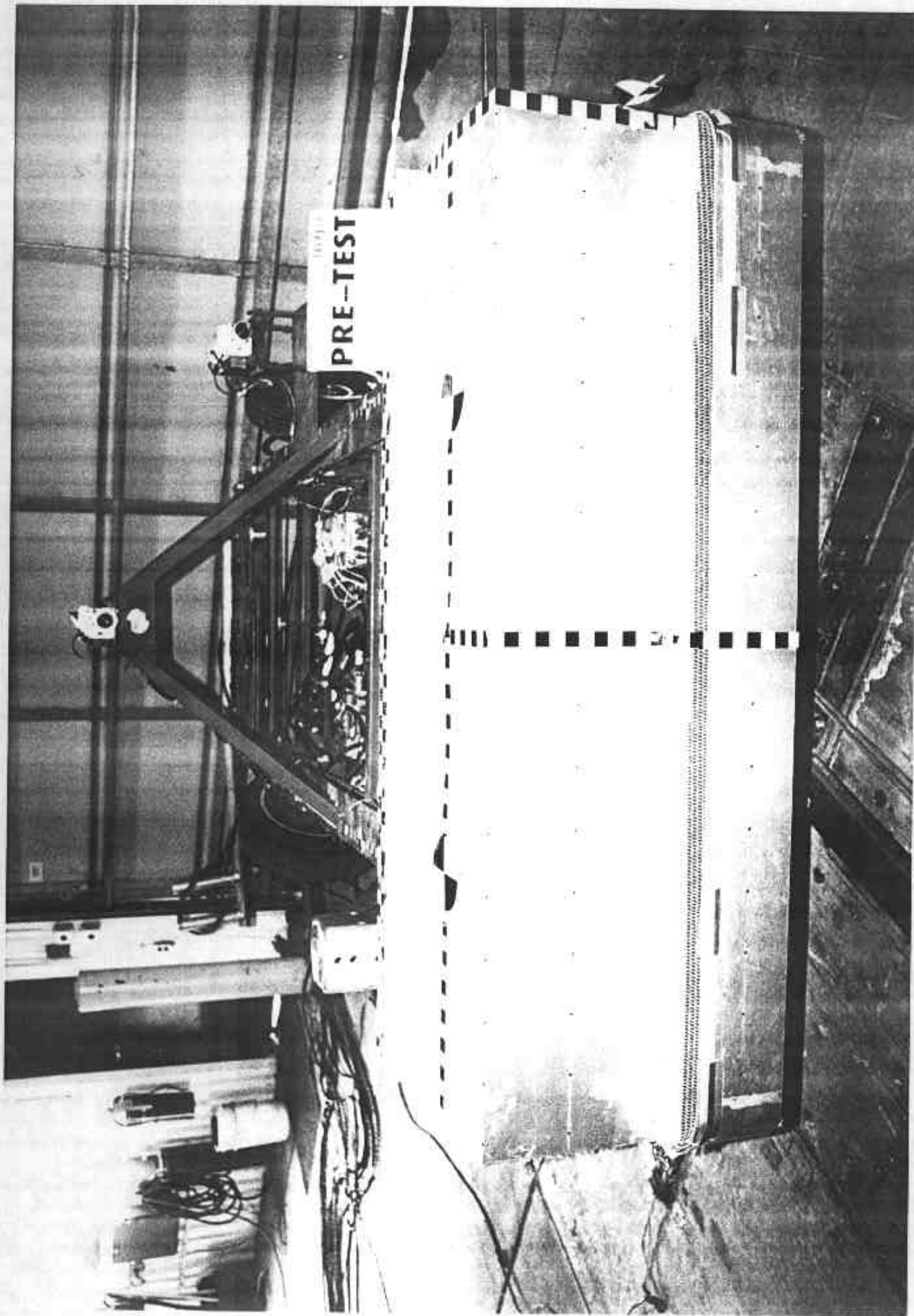
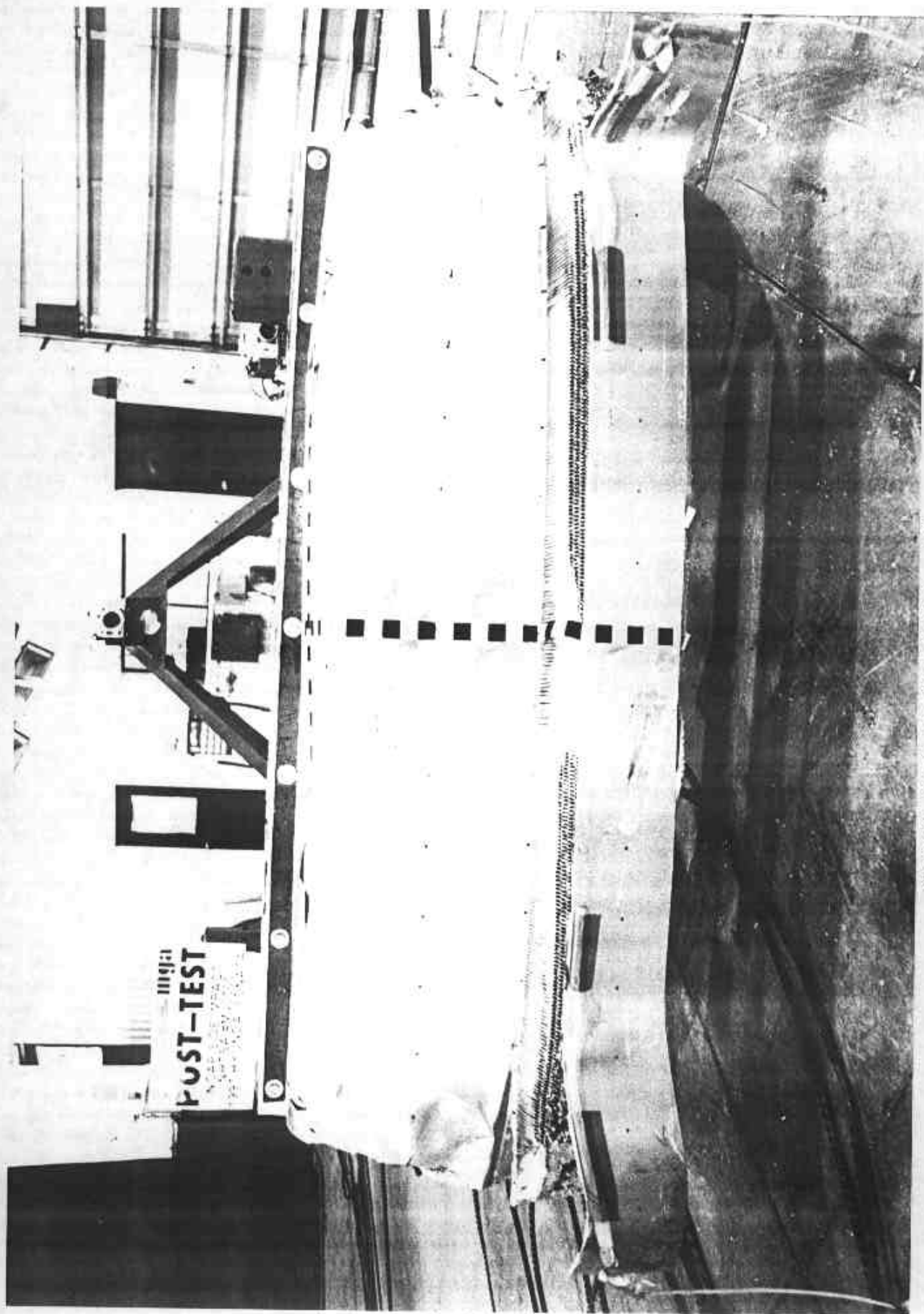


Photo No. A-13 - Post-Test MDB Top View



A-14

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



A-15

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

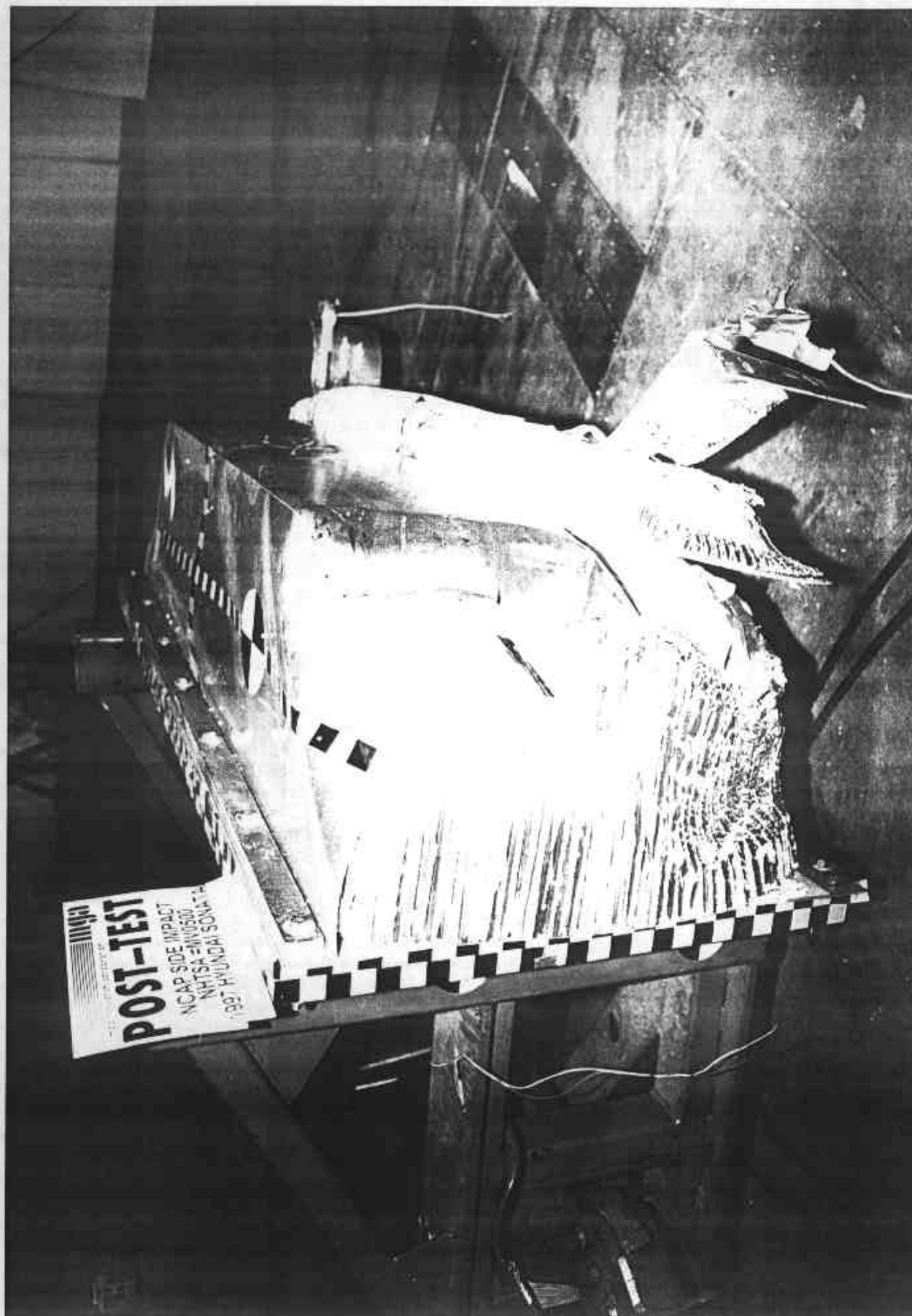


Photo No. A-17 - Post-Test MDB Right Side View

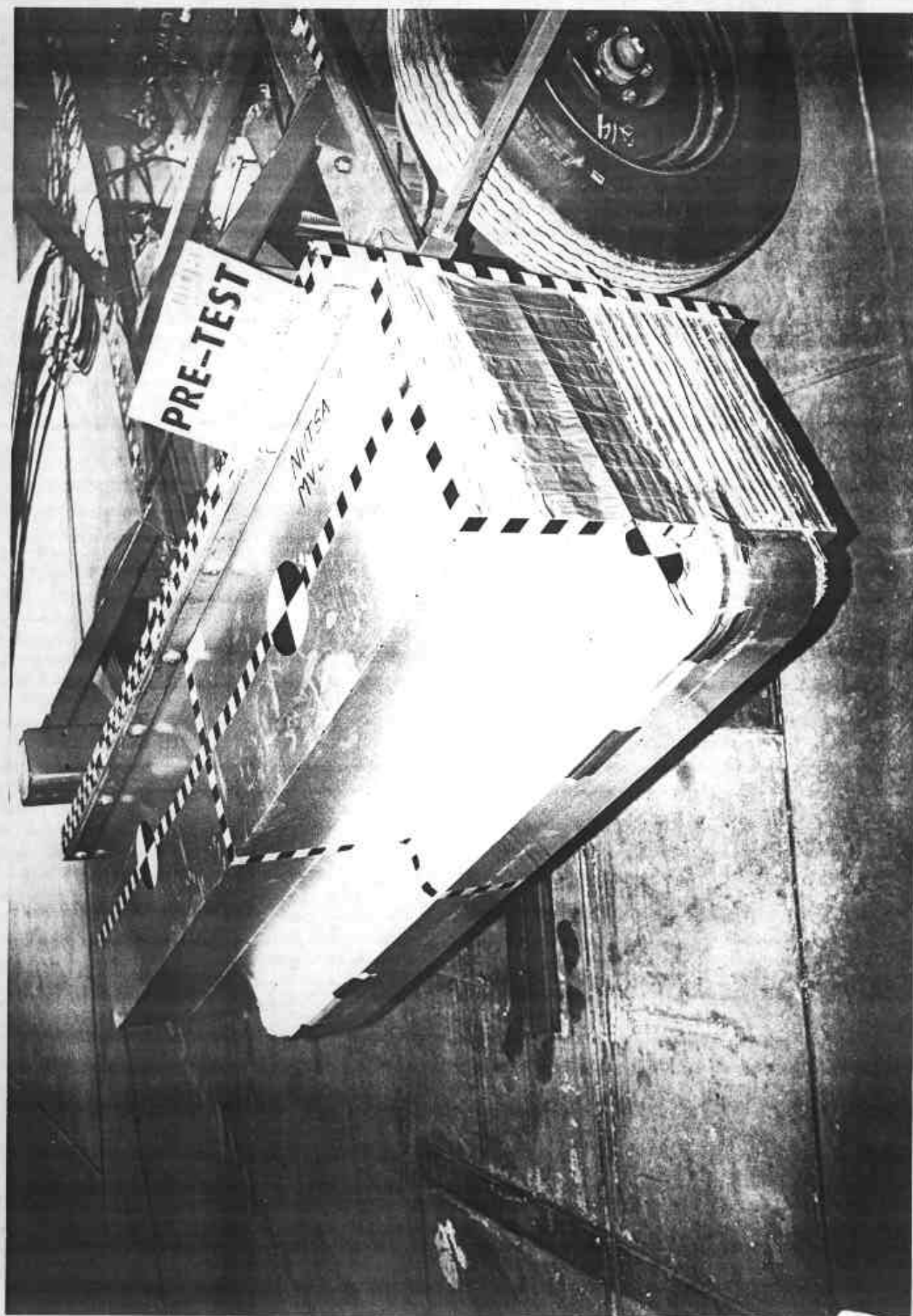


Photo No. A-18 - Pre-Test MDB Left Side View

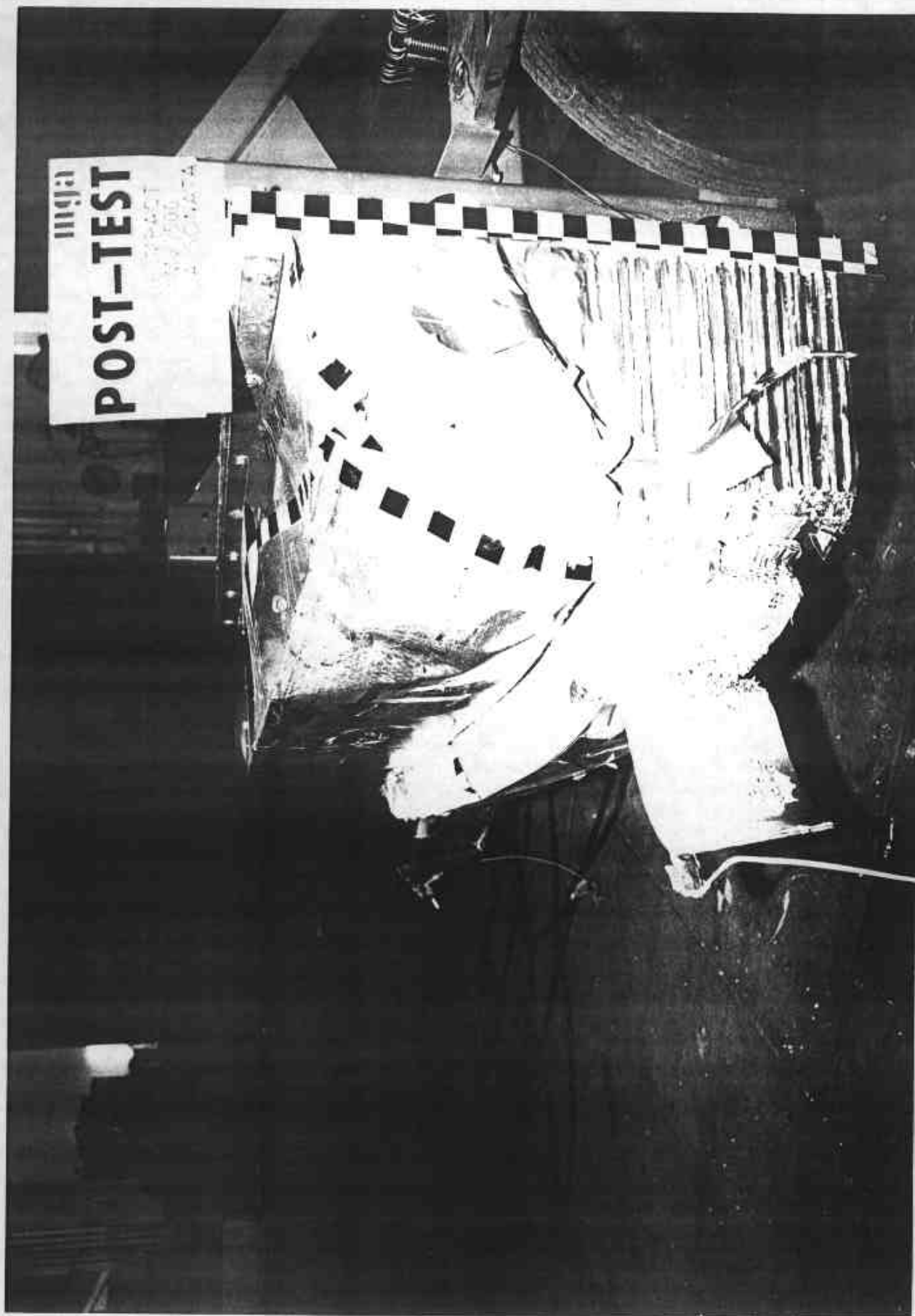


Photo No. A-19 - Post-Test MDB Left Side View



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

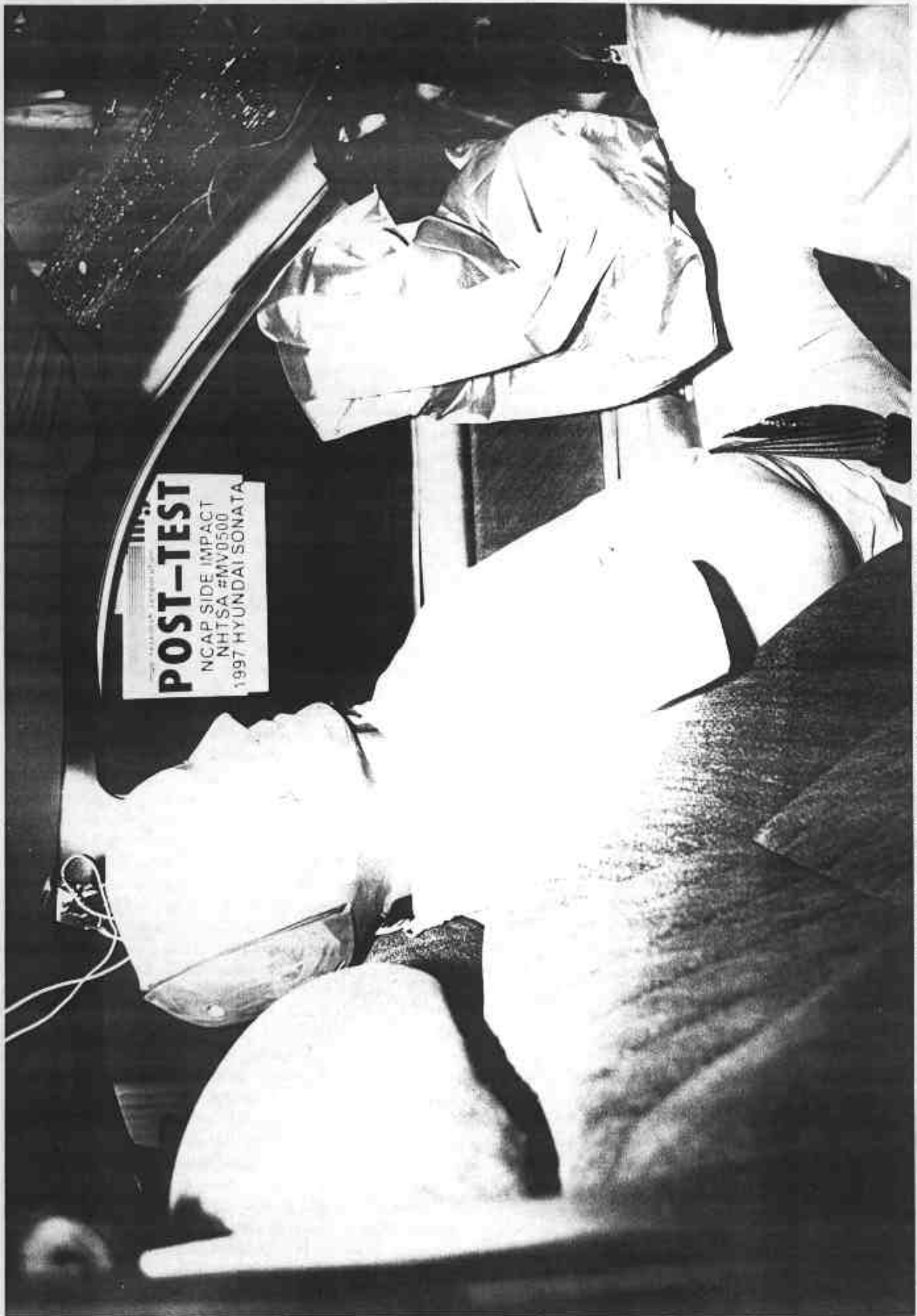


Photo No. A-21 - Post-Test Driver Dummy Right Side View

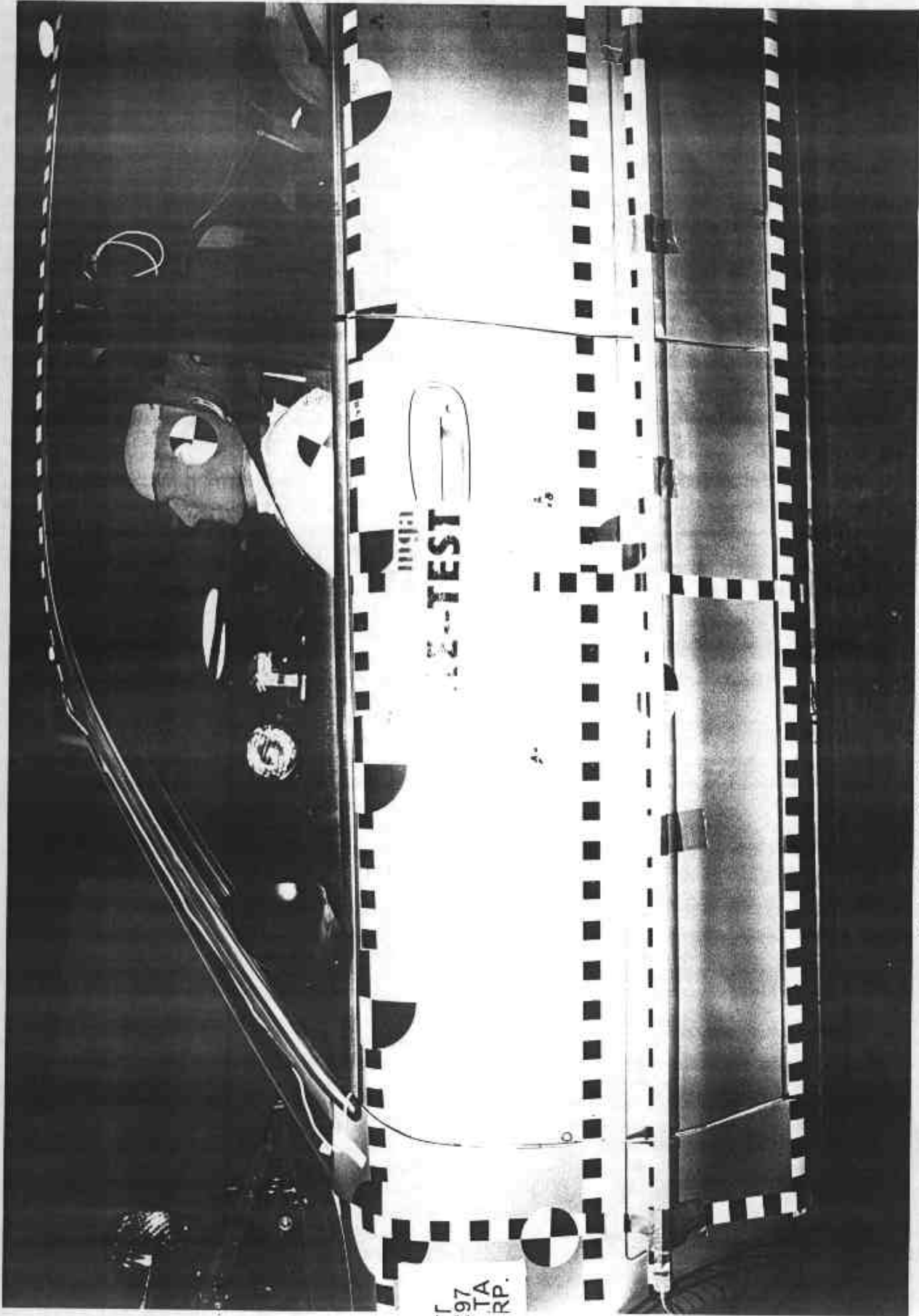


Photo No. A-22 - Pre-Test Driver Dummy Left Side View

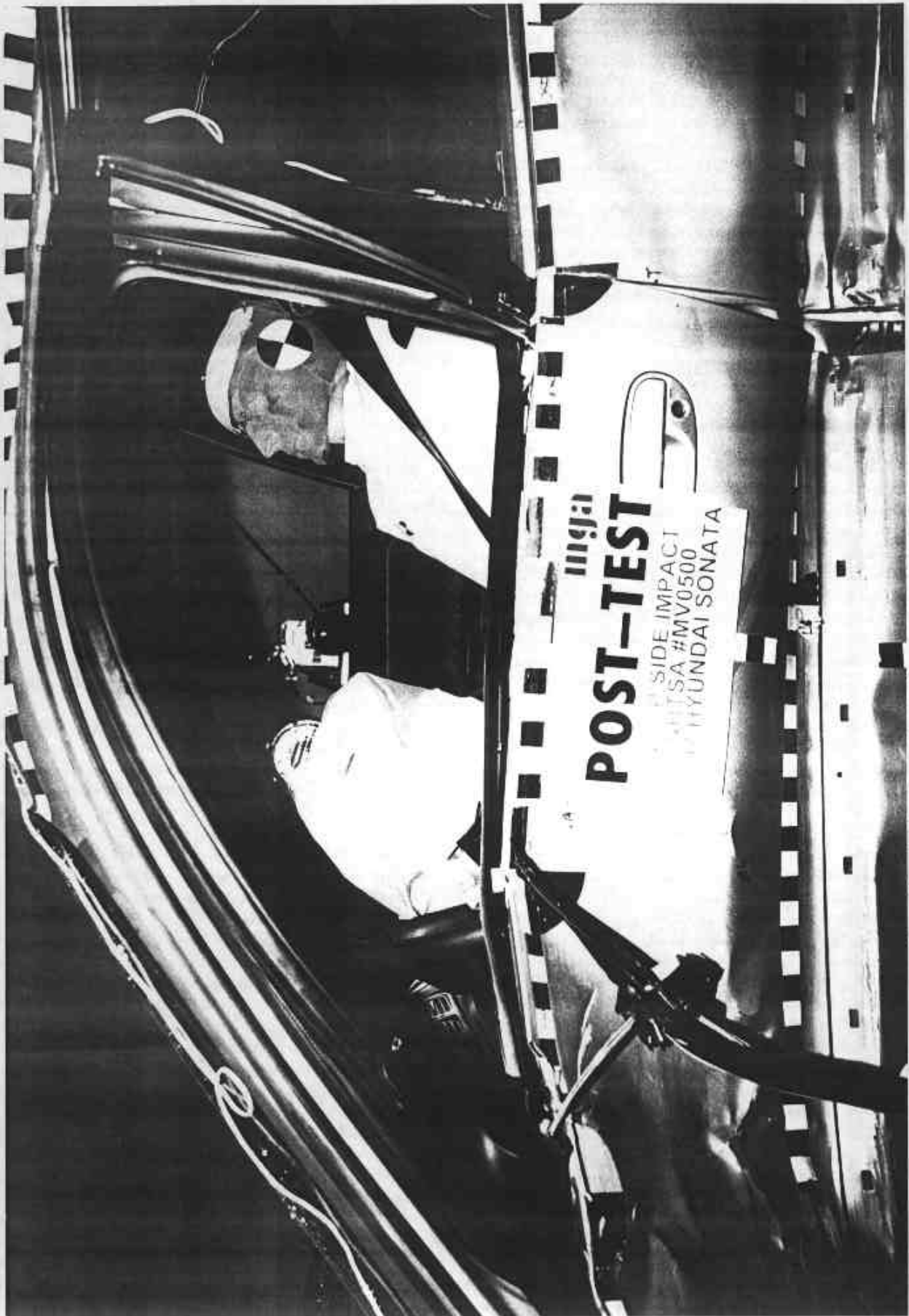


Photo No. A-23 - Post-Test Driver Dummy Left Side View

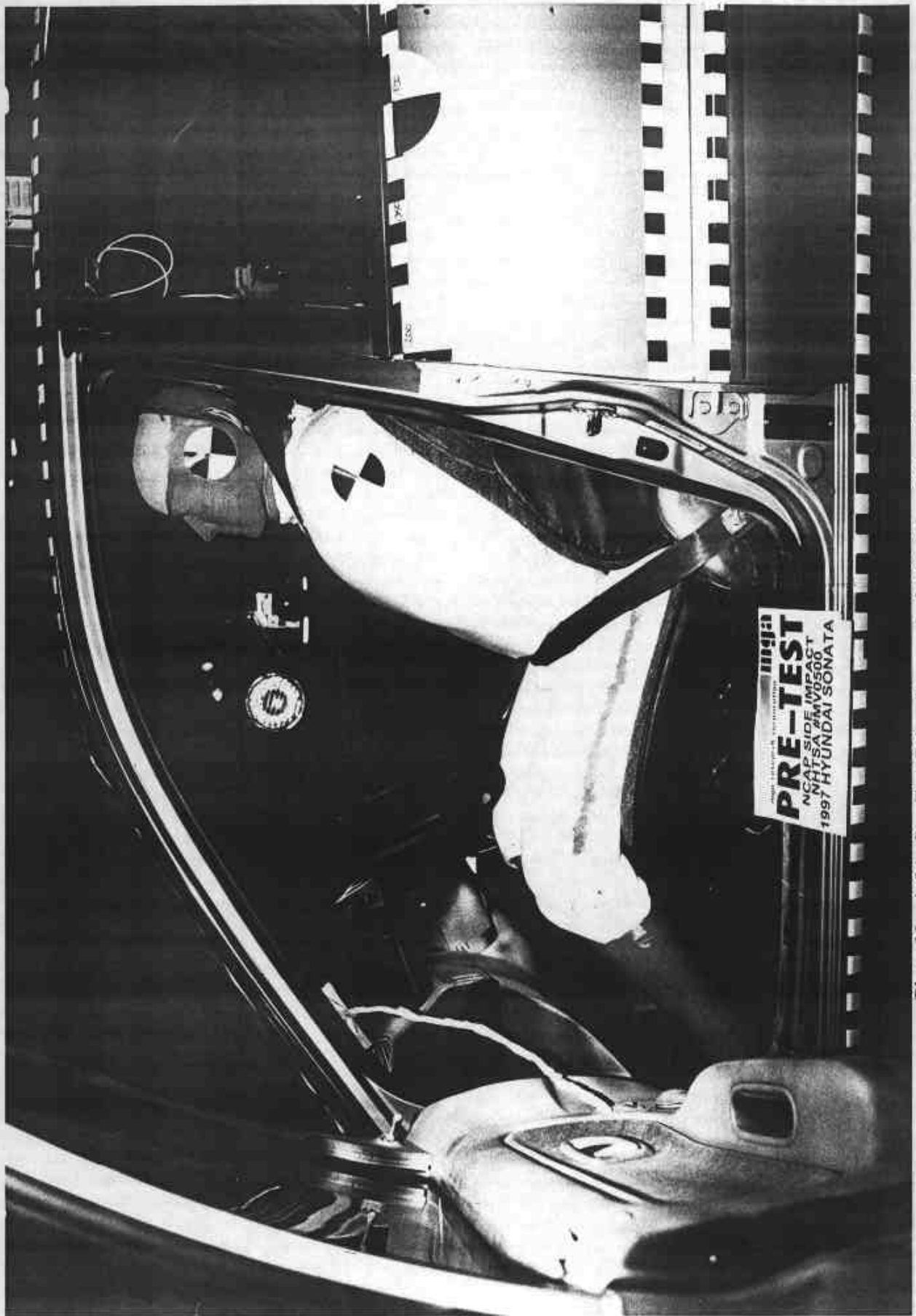


Photo No. A-24 - Pre-Test Driver Dummy Left Side View (Door Open)



A-25

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



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



Photo No. A-27 - Post-Test Driver Dummy Contact



A-28

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



Photo No. A-29 - Post-Test Driver Dummy Head Contact

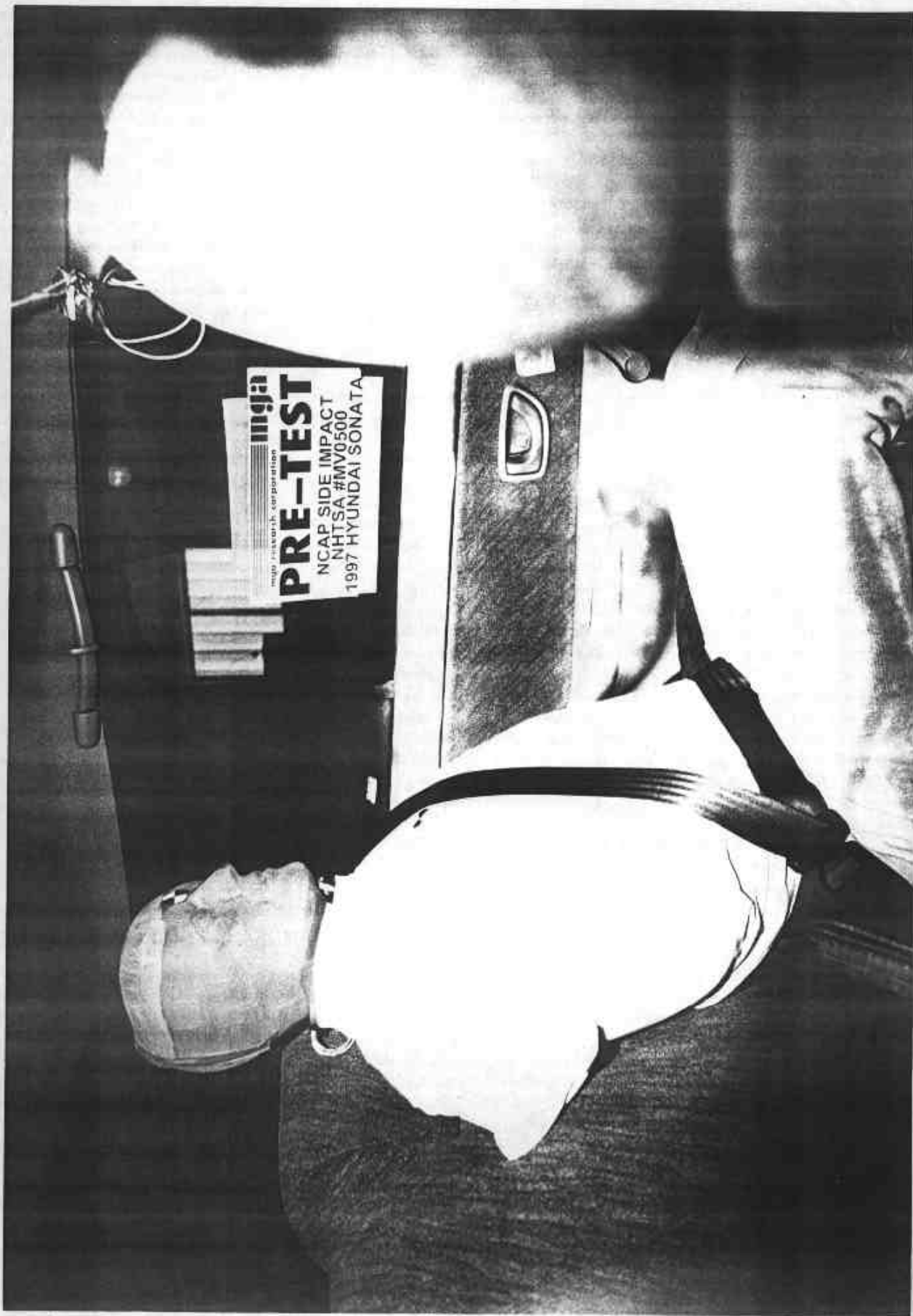


Photo No. A-30 - Pre-Test Passenger Dummy Right Side View



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

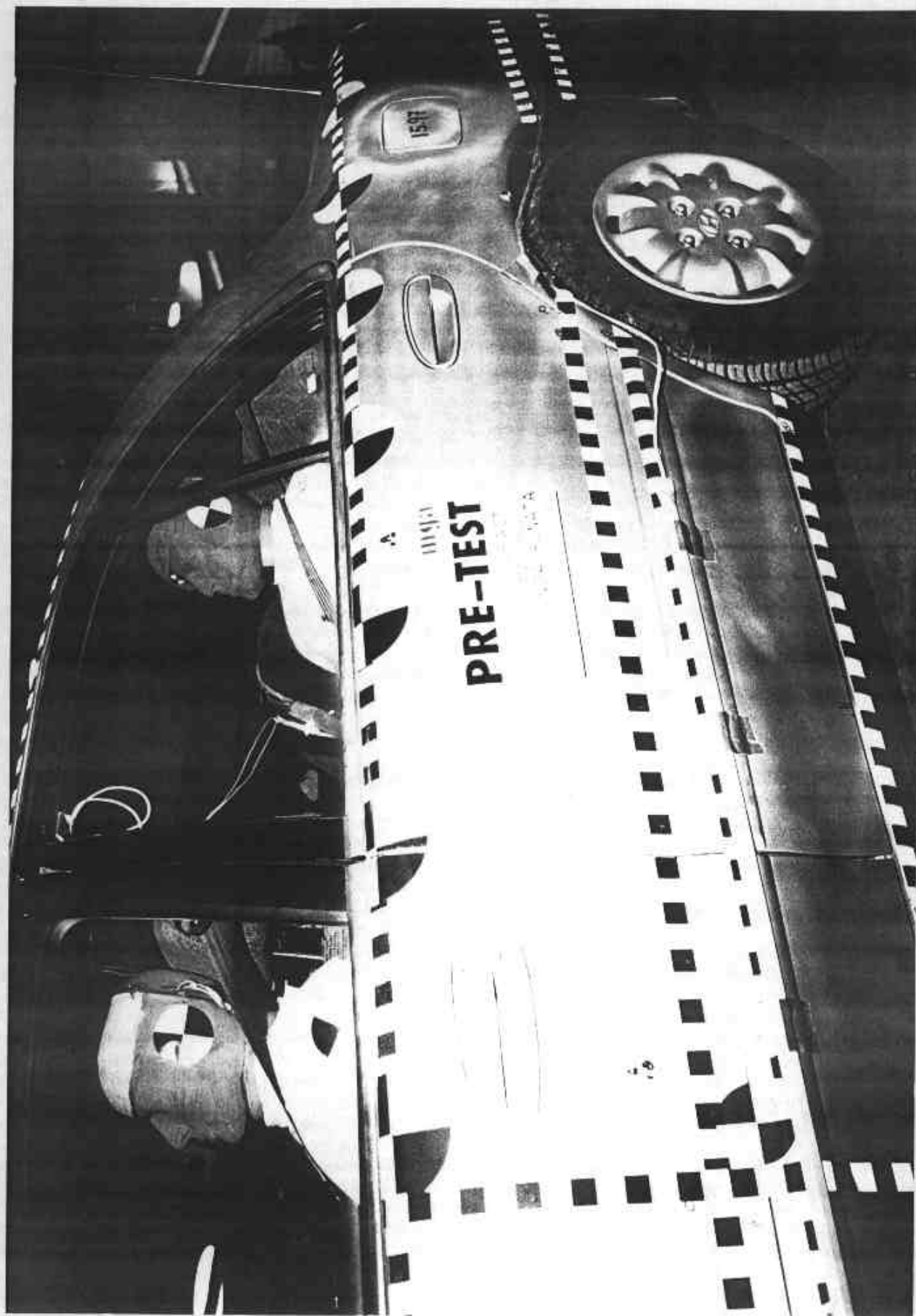


Photo No. A-32 - Pre-Test Passenger Dummy Left Side View

A-32



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

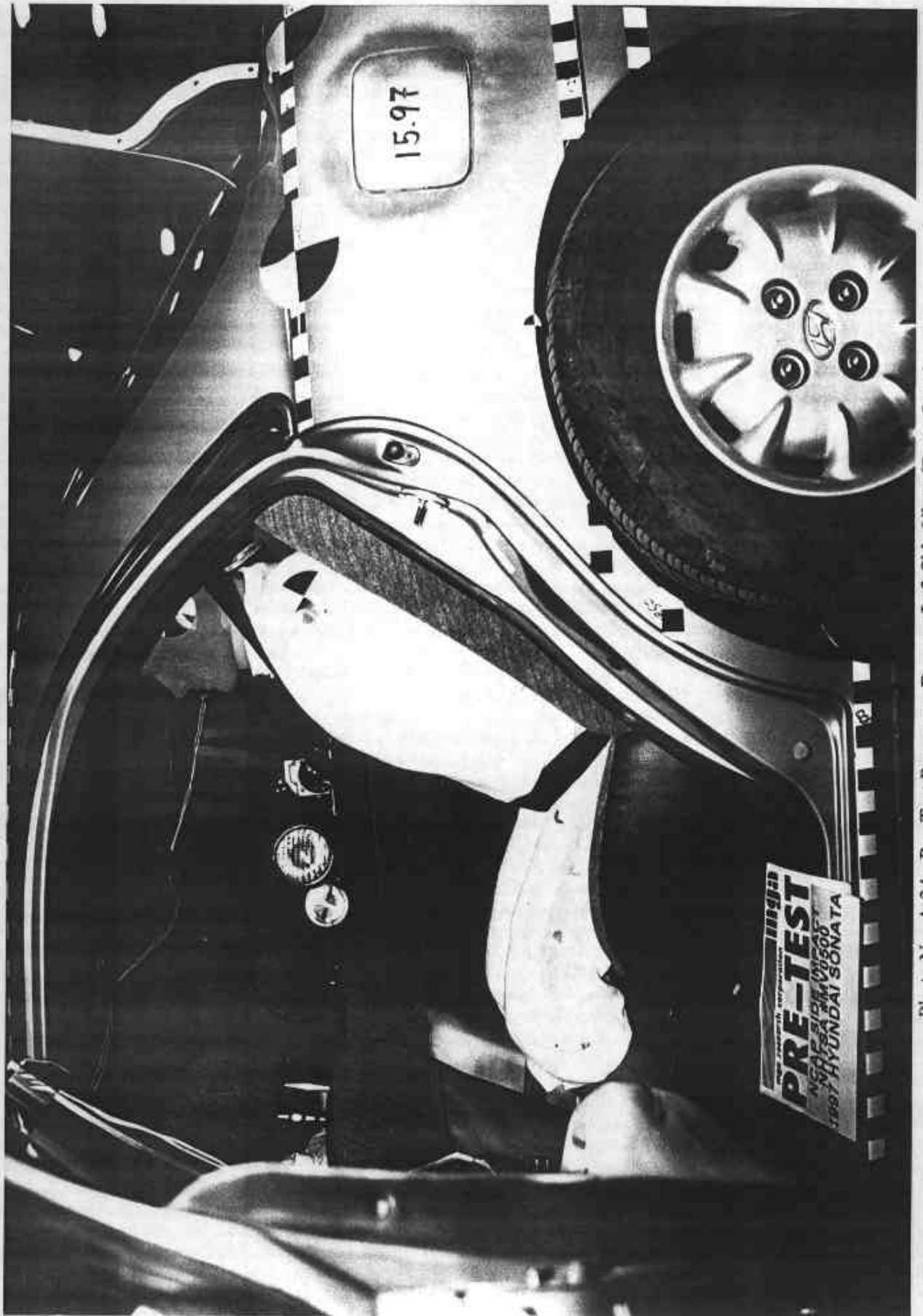


Photo No. A-34 - Pre-Test Passenger Dummy Left Side View (Door Open)

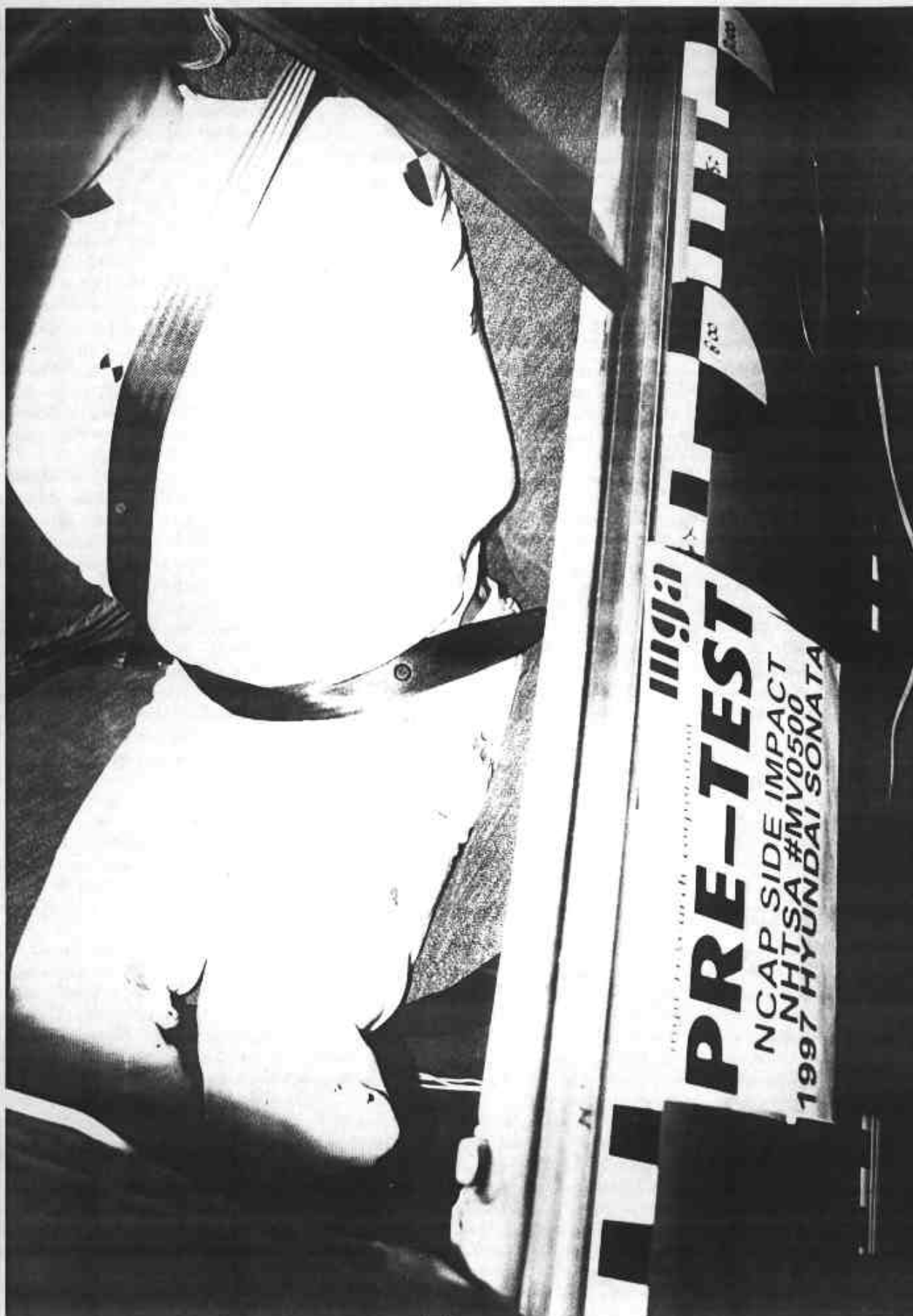


Photo No. A-35 - Pre-Test Passenger Dummy Shoulder and Door Top View



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



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



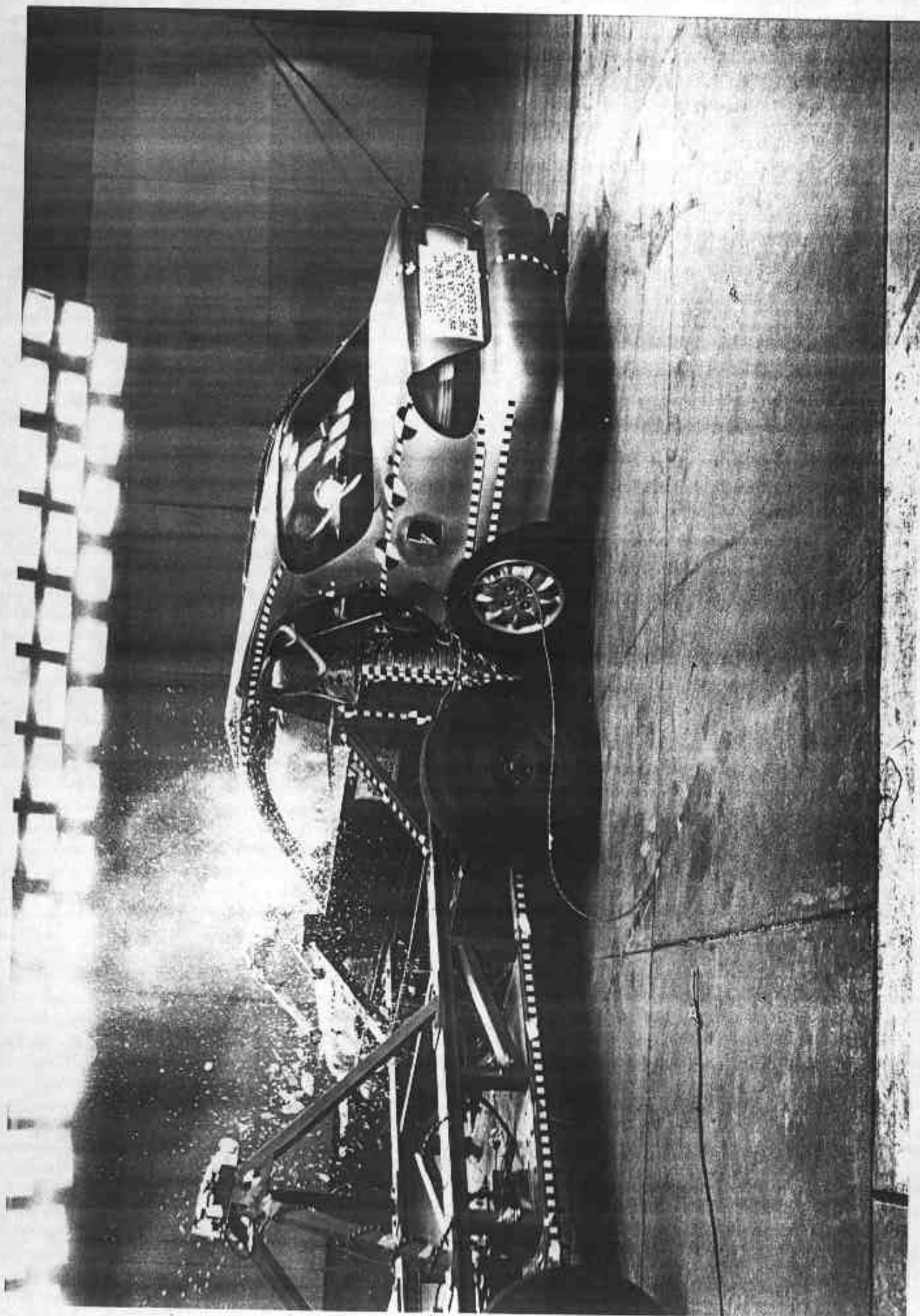
Photo No. A-38 - Post-Test Passenger Dummy Head Contact



Photo No. A-39 - Pre-Test Left Front Impact Point on Vehicle



Photo No. A-40 - Post-Test Left Front Impact Point on Vehicle



A-41

Photo No. A-41 - Impact

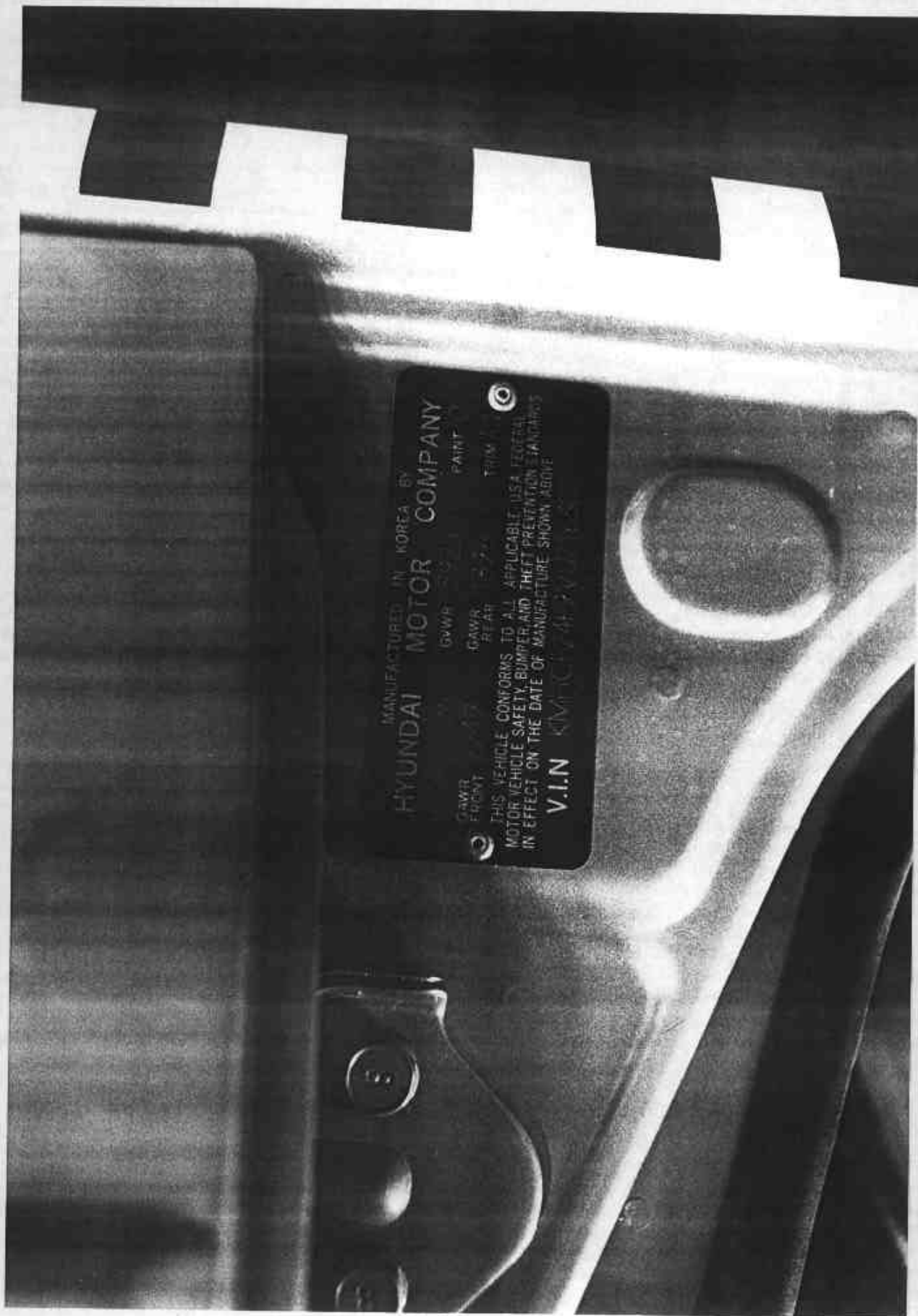


Photo No. A-42 - Vehicle Certification Label



TIRE INFLATION
PRESSURE (COLD)

NO INFLATION
RE FOR ALL LOAD

WT 2 PASS.
WT 3 PASS.
WT 5 PASS.

50kg (110LBS)
CAPACITY WT.
390kg (860LBS)

195/70R14 90H
205/60R15 90H

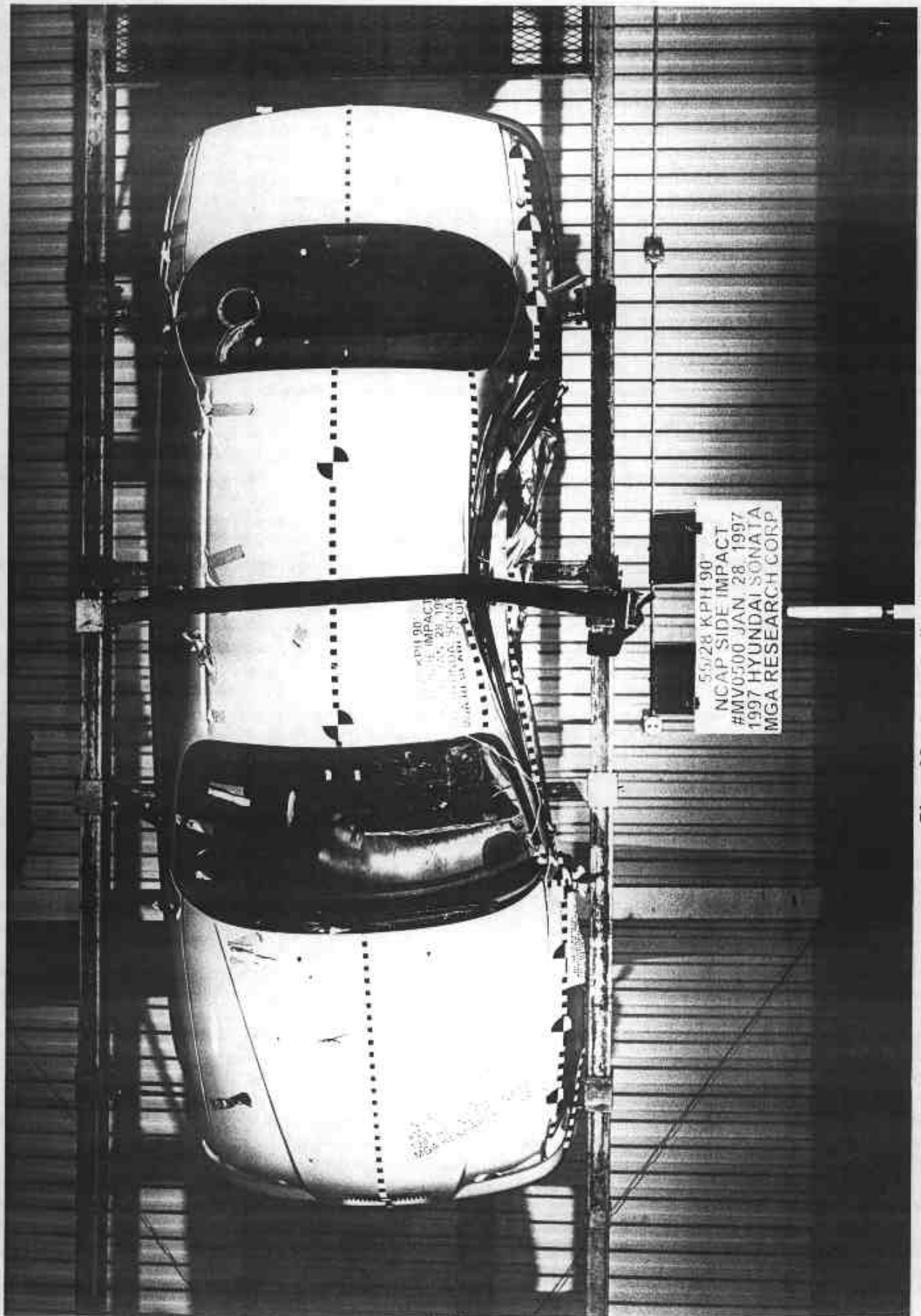
REAR

210kPa
(30psi)

1125/70D15
USE ONLY

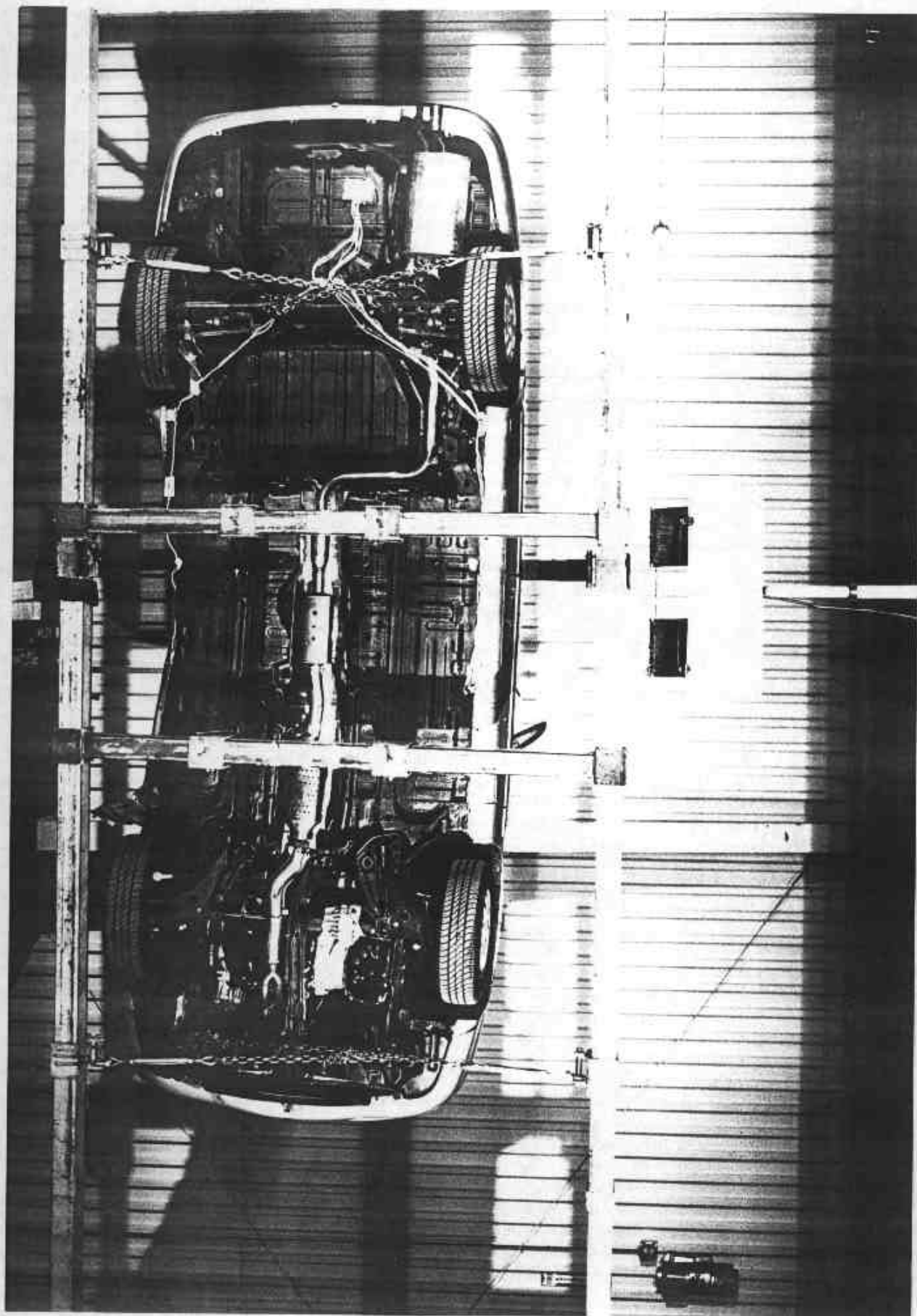
(60psi)

Photo No. A-43 - Tire Placard



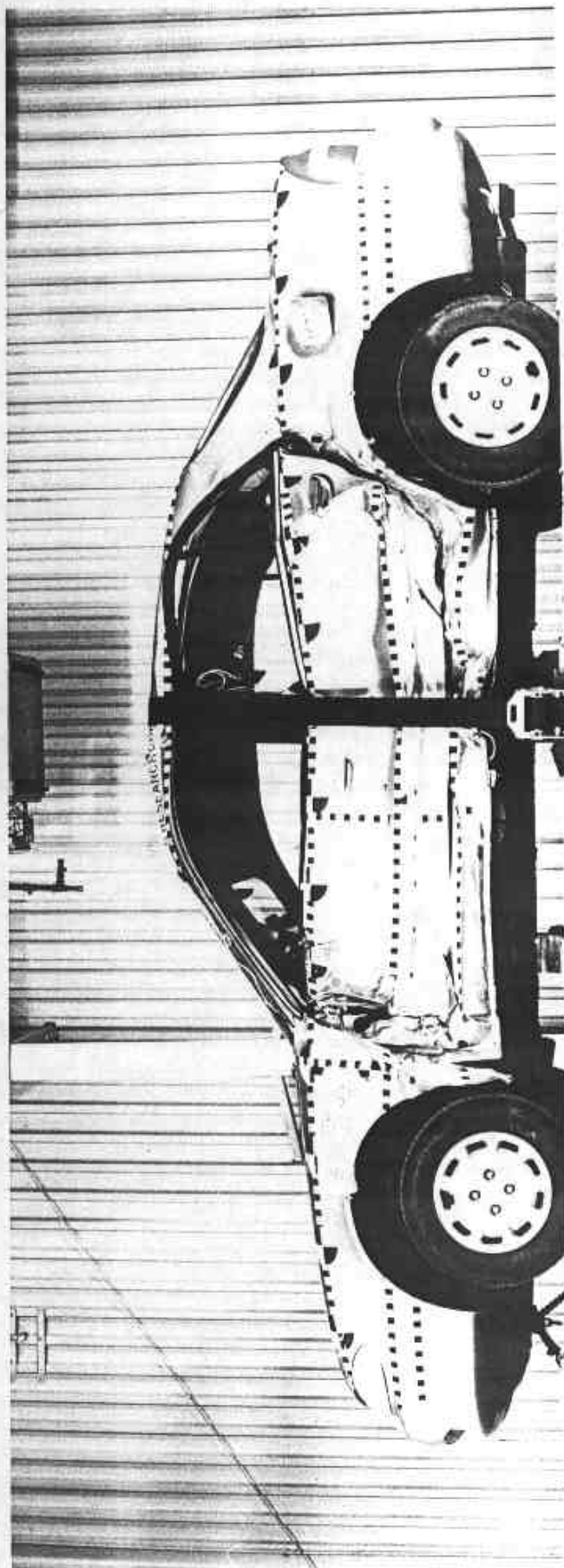
A-44

Photo No. A-44 - Rollover 90°



A-46

Photo No. A-46 - Rollover 270°



A-47



55/28 KPH 90°
NCAP SIDE IMPACT
#MV0500 JAN. 28, 1997
1997 HYUNDAI SONATA
MGA RESEARCH CORP.

Photo No. A-47 - Rollover 360°

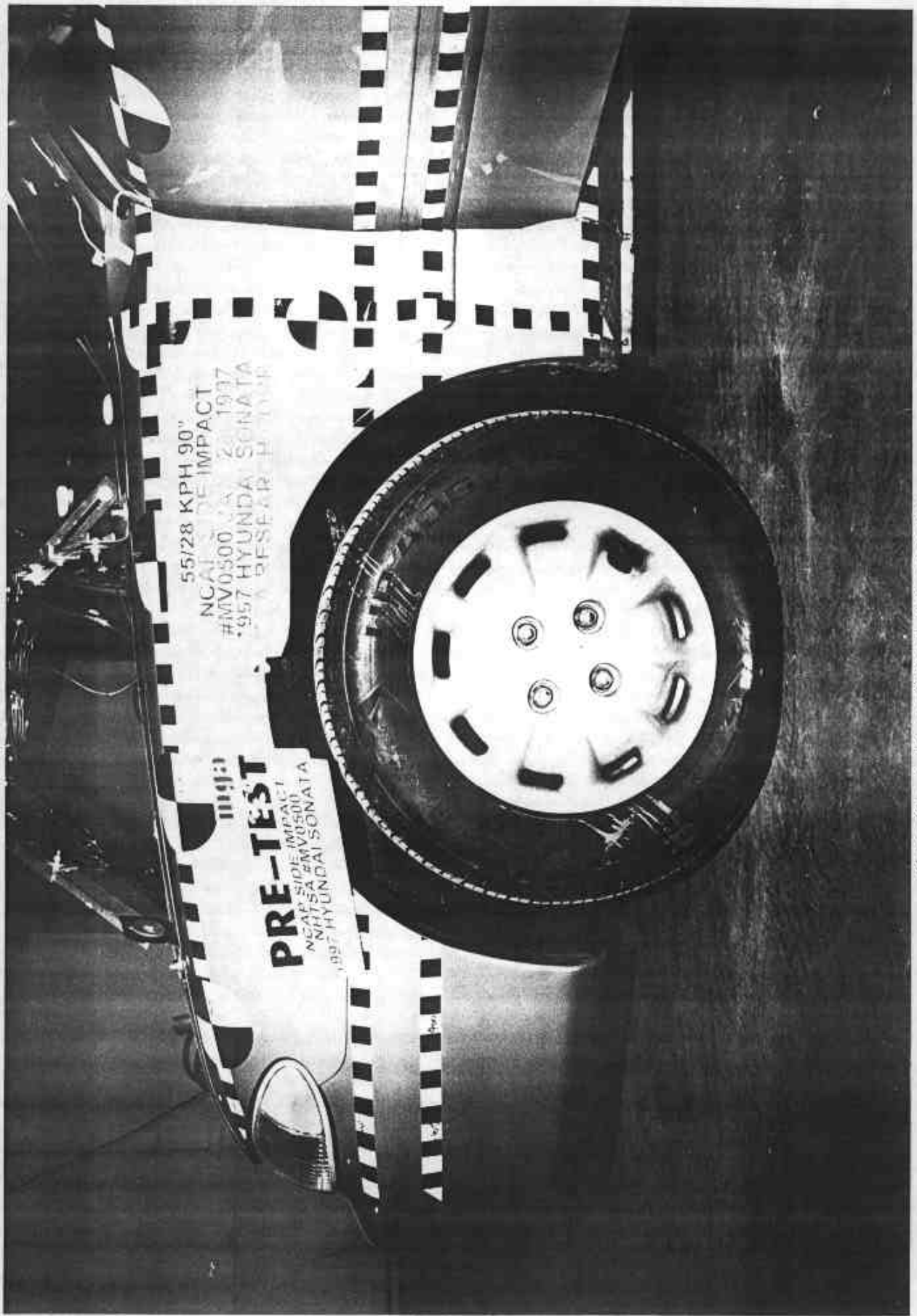


Photo No. A-48 - Left Front Attitude Point



Photo No. A-49 - Right Front Attitude Point

A-49

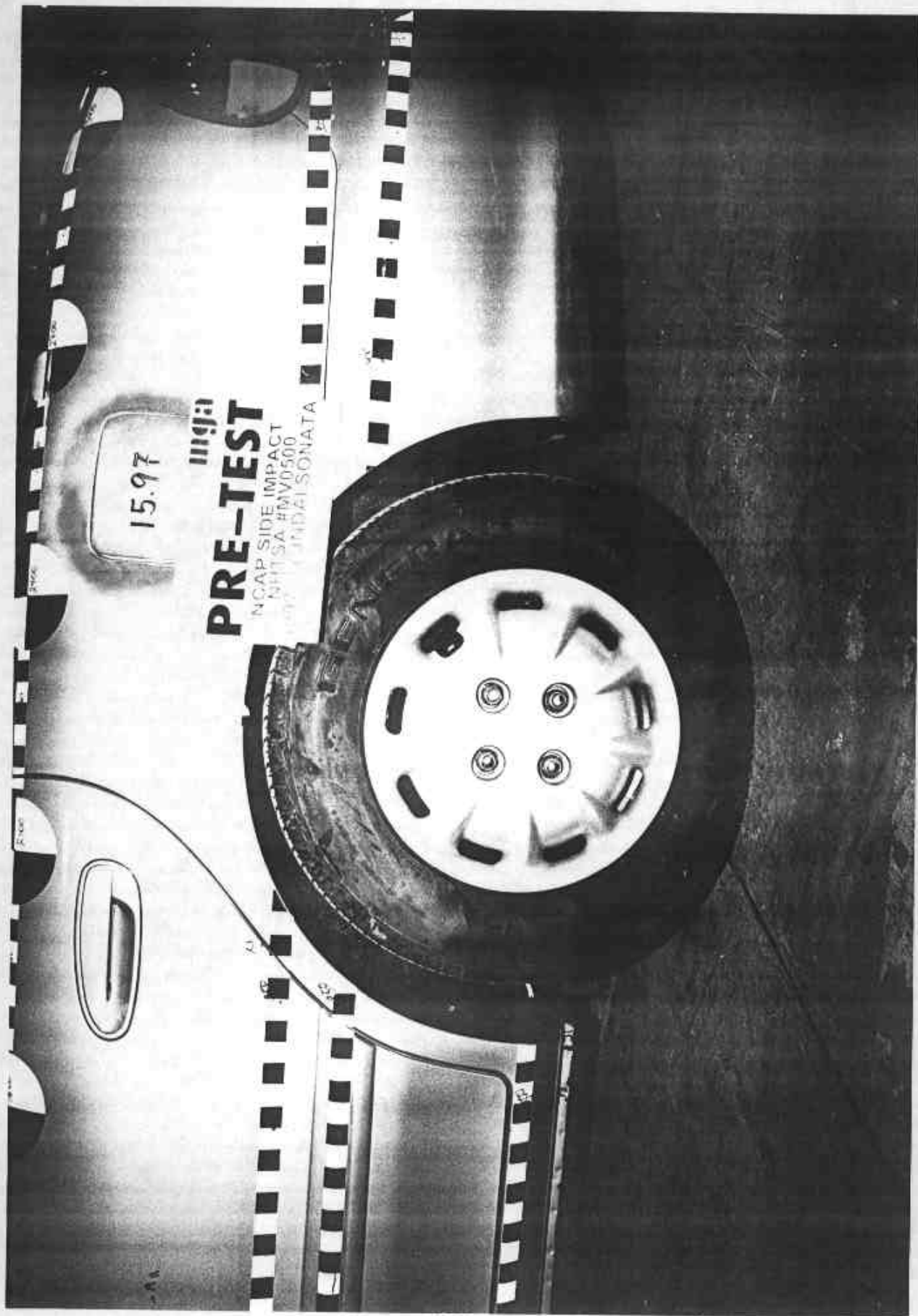


Photo No. A-50 - Left Rear Attitude Point



Photo No. A-51 - Right Rear Attitude Point

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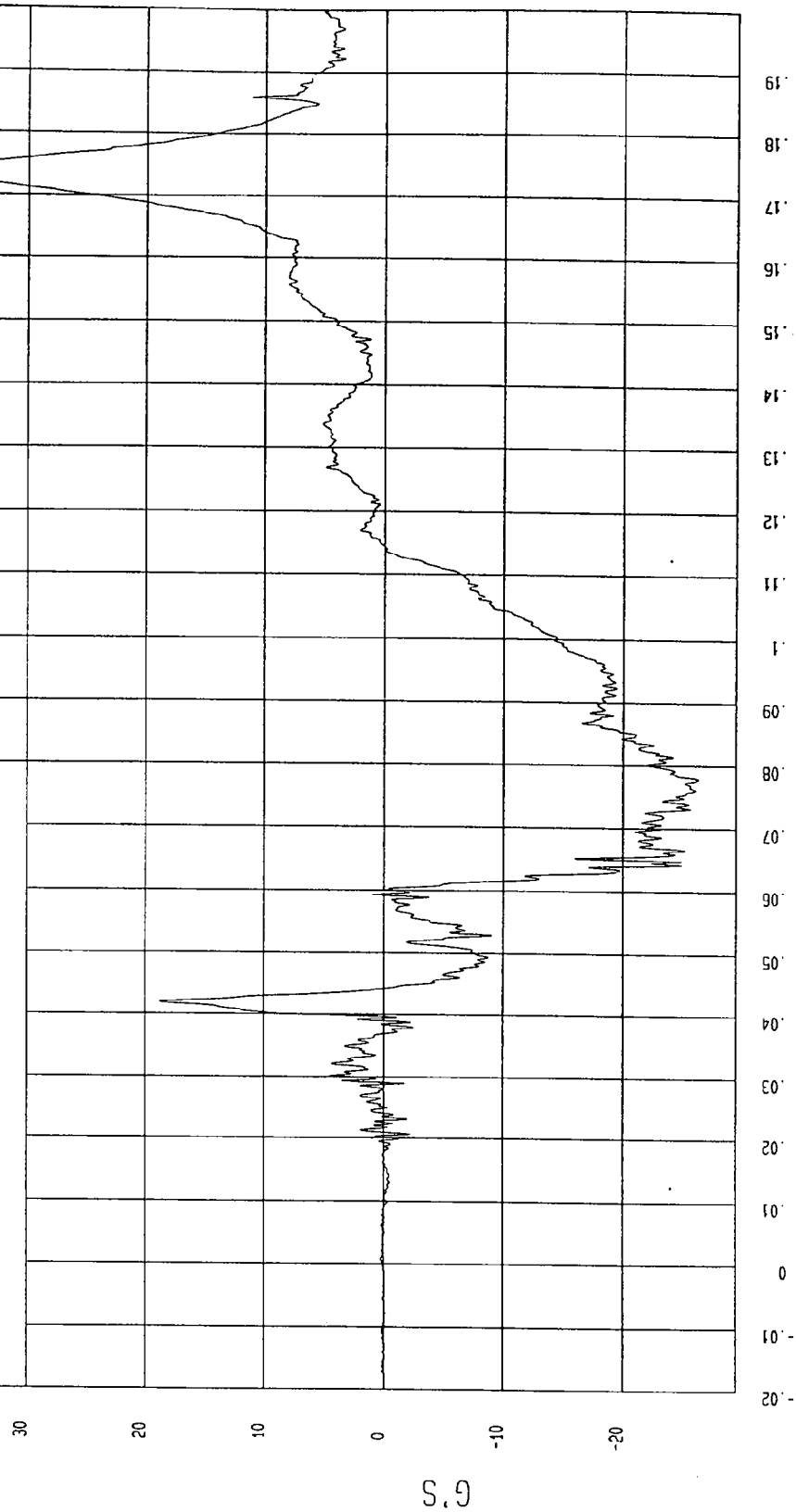
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TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH
Minimum = -26.35 G'S at 78 msec Maximum = 35.86 G'S at 174 msec

DRIVER HEAD X ACCELERATION

1 ——— 897016AF.A12 Filterclass (1000)



MSA Research
02-01-1997 16:23

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 70.73 G'S at 42 msec

Minimum = -15.52 G'S at 55 msec

DRIVER HEAD Y ACCELERATION

1 ——— B97016AF.A13 FilterClass (1000)

70

60

50

40

30

20

10

0

-10

G'S

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

MCA Research
02-01-1997 15:23

TIME (SECONDS)

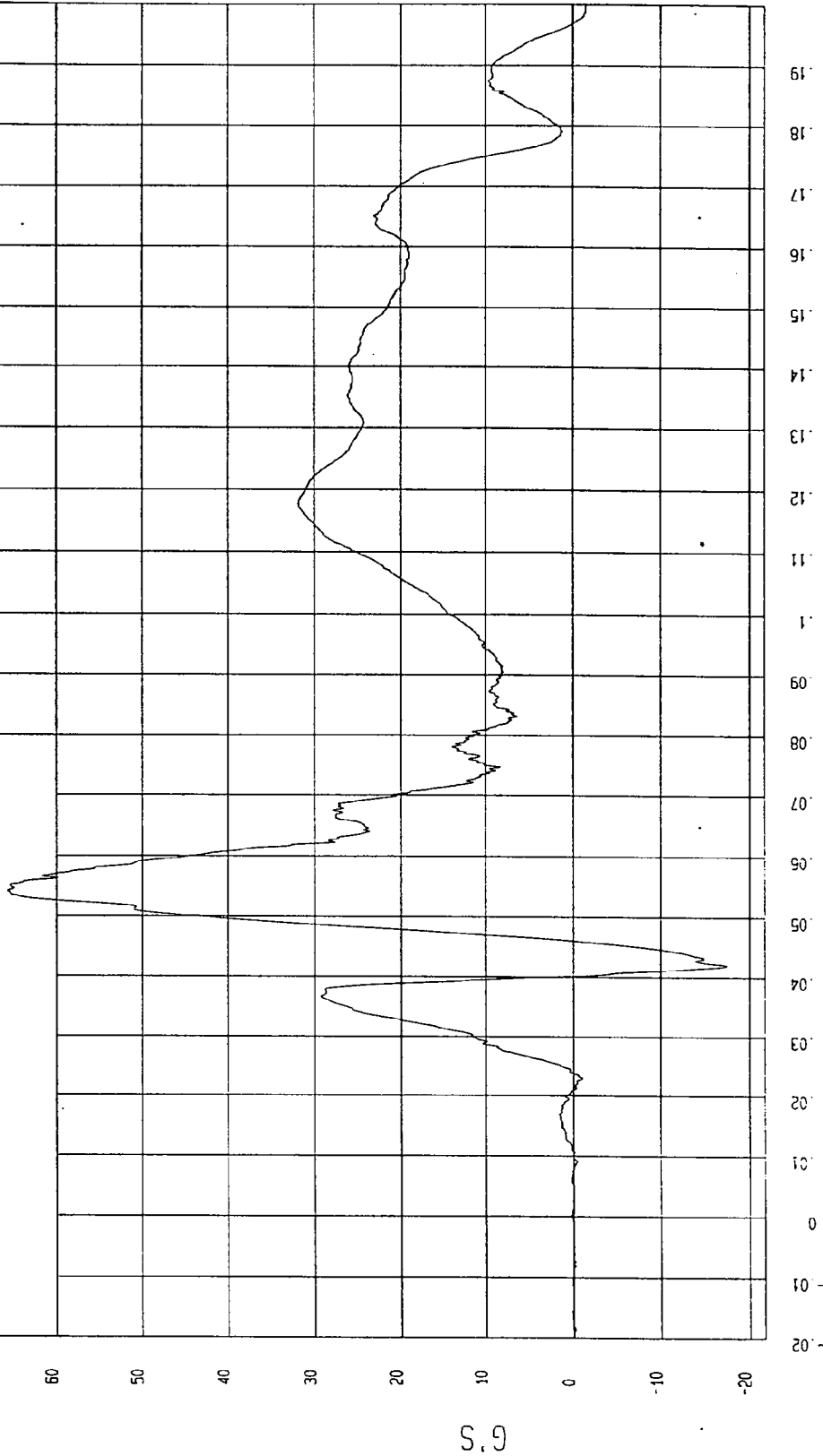
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -17.56 G'S at 42 msec Maximum = 65.64 G'S at 54 msec

DRIVER HEAD Z ACCELERATION

1 897016AF.A14 Filterclass (1000)



MSA Research
02-01-1997 16:23

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

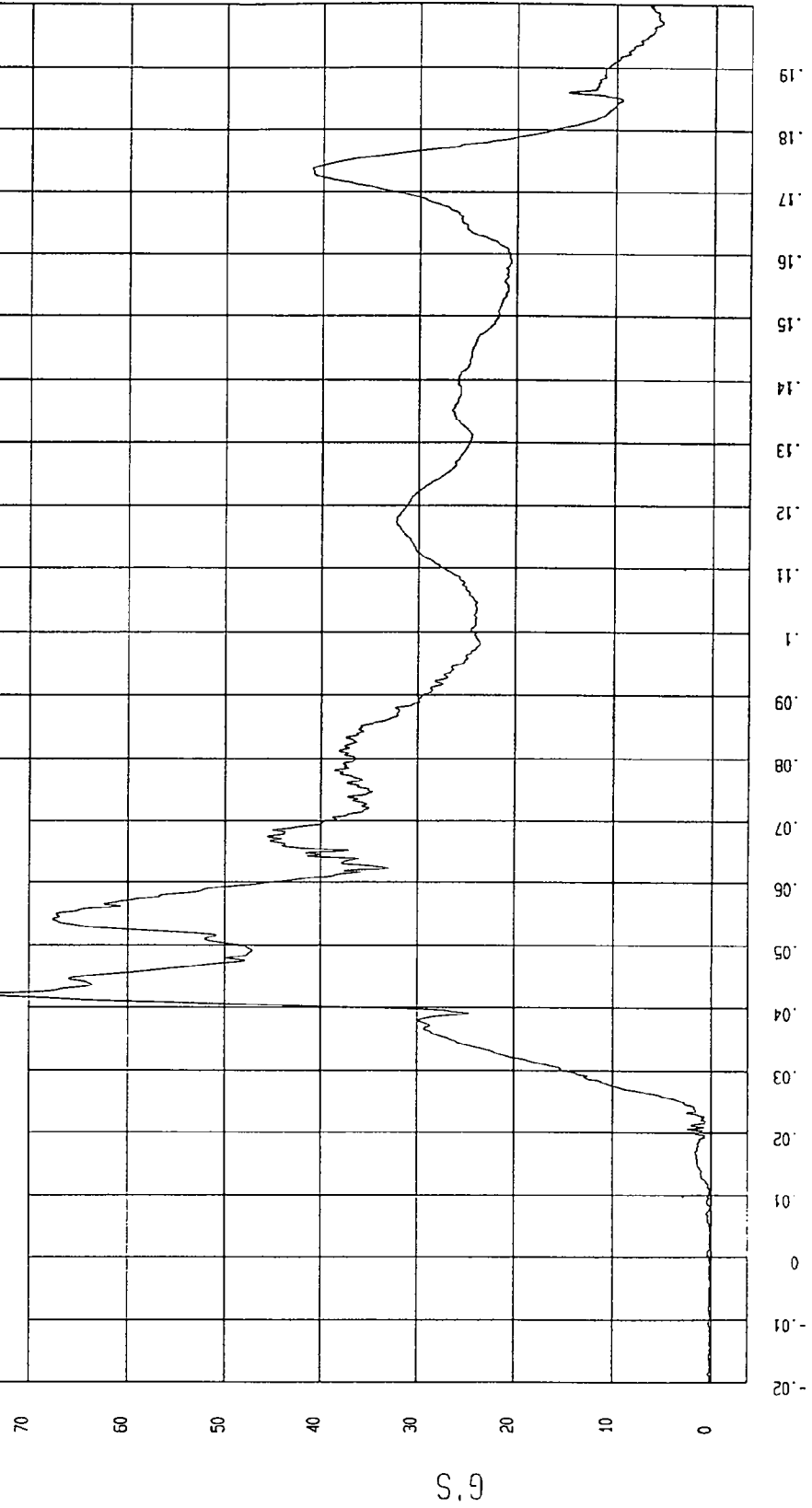
Speed: 37.9 MPH 61 KPH

Minimum = 2.17E-02 G'S at -14 msec

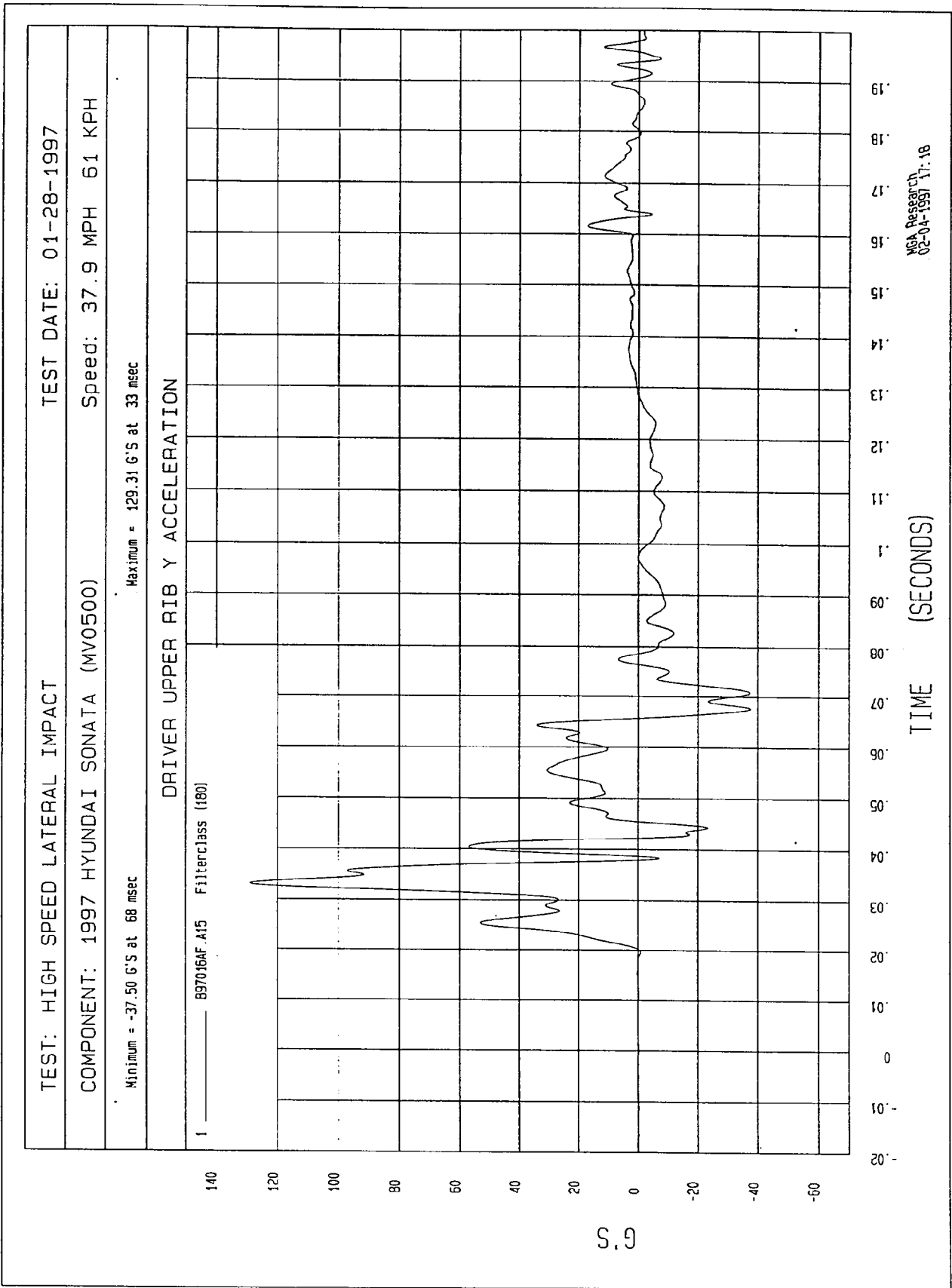
Maximum = 75.23 G'S at 42 msec

DRIVER HEAD RESULTANT

1 ——— 897016AV.A12 Filterclass (1000)



WGA Research
02-01-1997 16:23



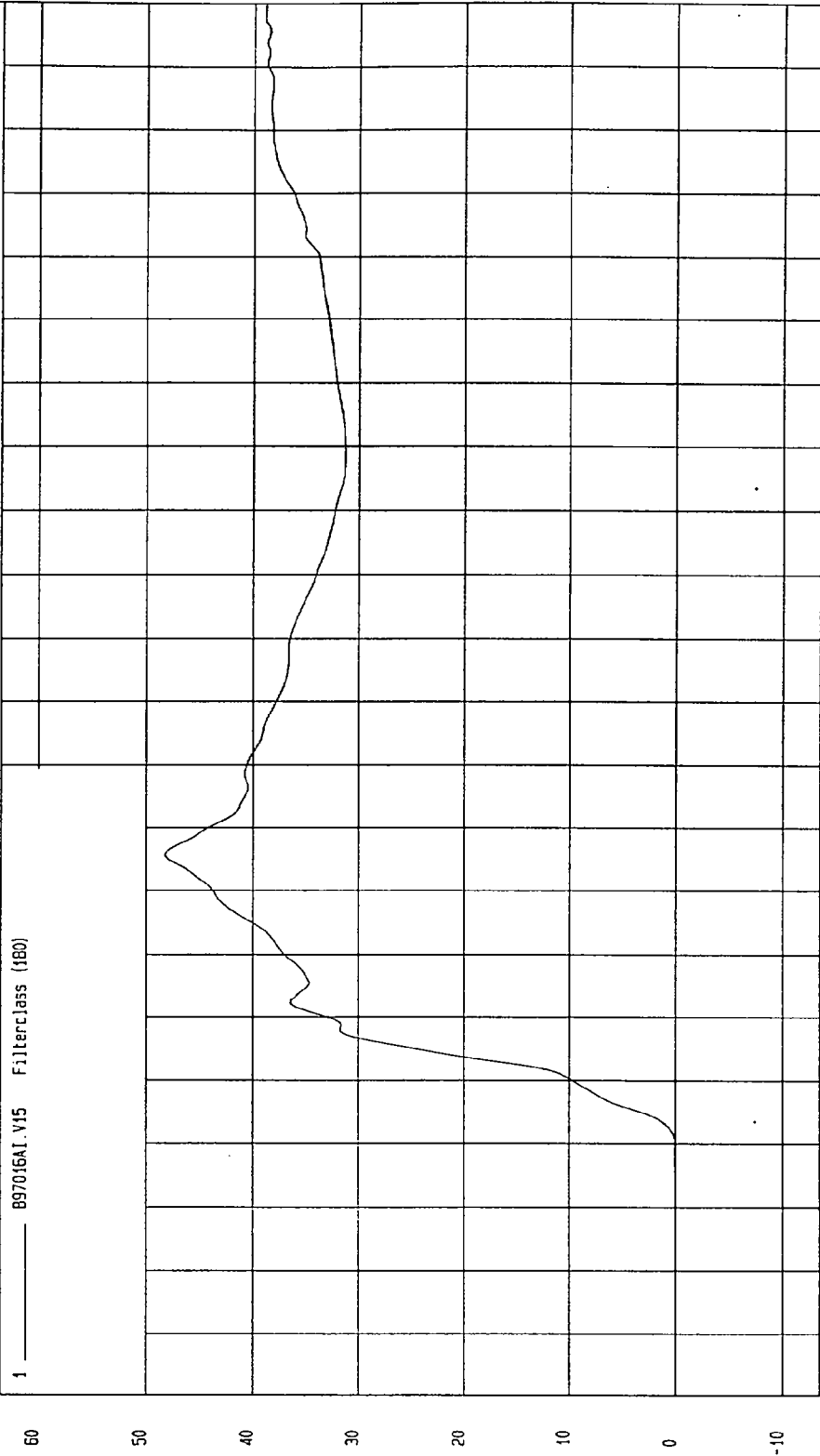
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -5.95E-03 KPH at -10 msec Maximum = 48.25 KPH at 56 msec

DRIVER UPPER RIB Y VELOCITY

1 — 897016A1.V15 Filterclass (f80)



TIME Seconds
MCA Research
02-01-1997 16:27

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

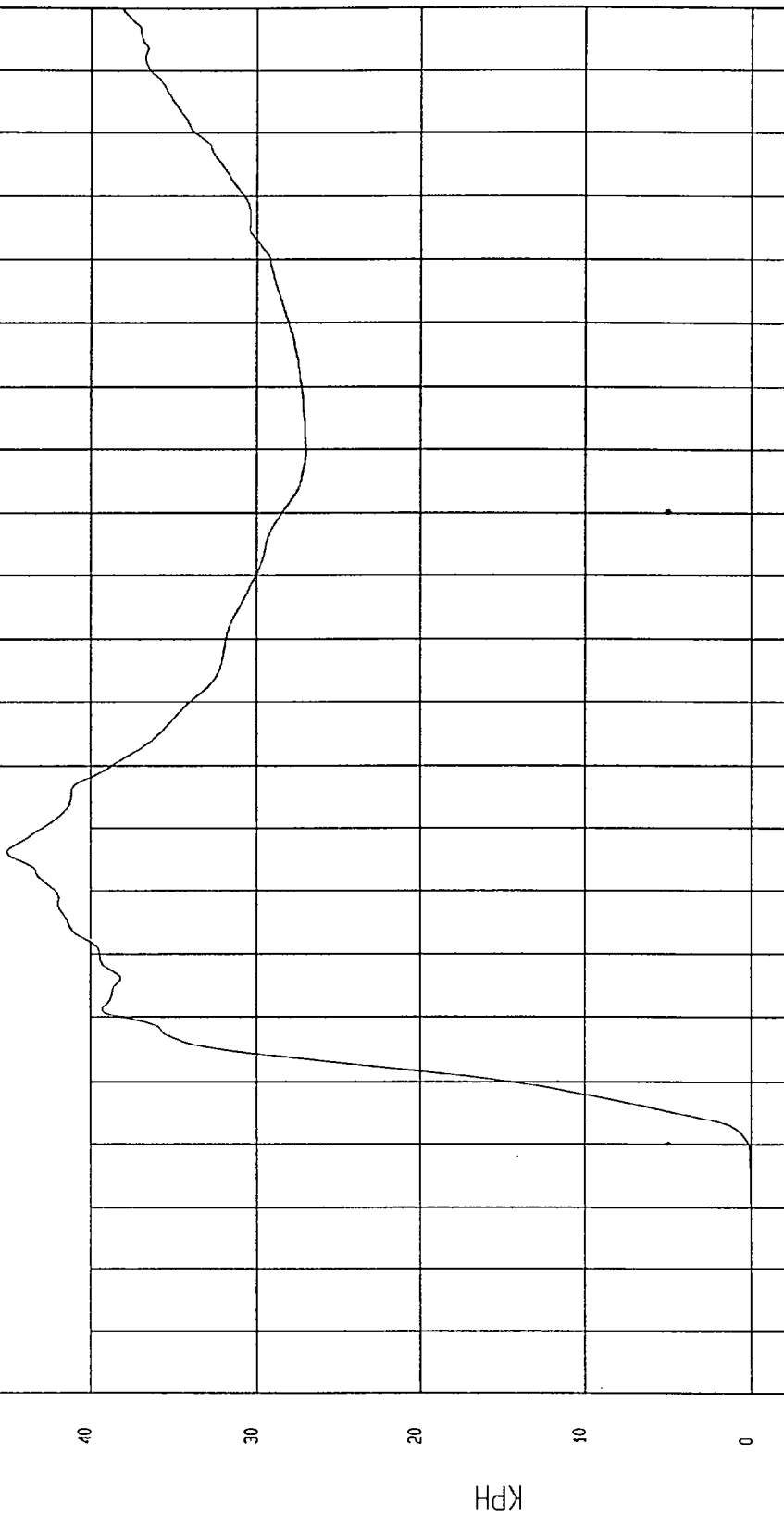
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 45.00 KPH at 66 msec

Minimum = 0 KPH at -20 msec

DRIVER LOWER RIB Y VELOCITY

1 ——— B97016A1.V16 Filterclass (180)



MGA Research
02-12-1997 07:02

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

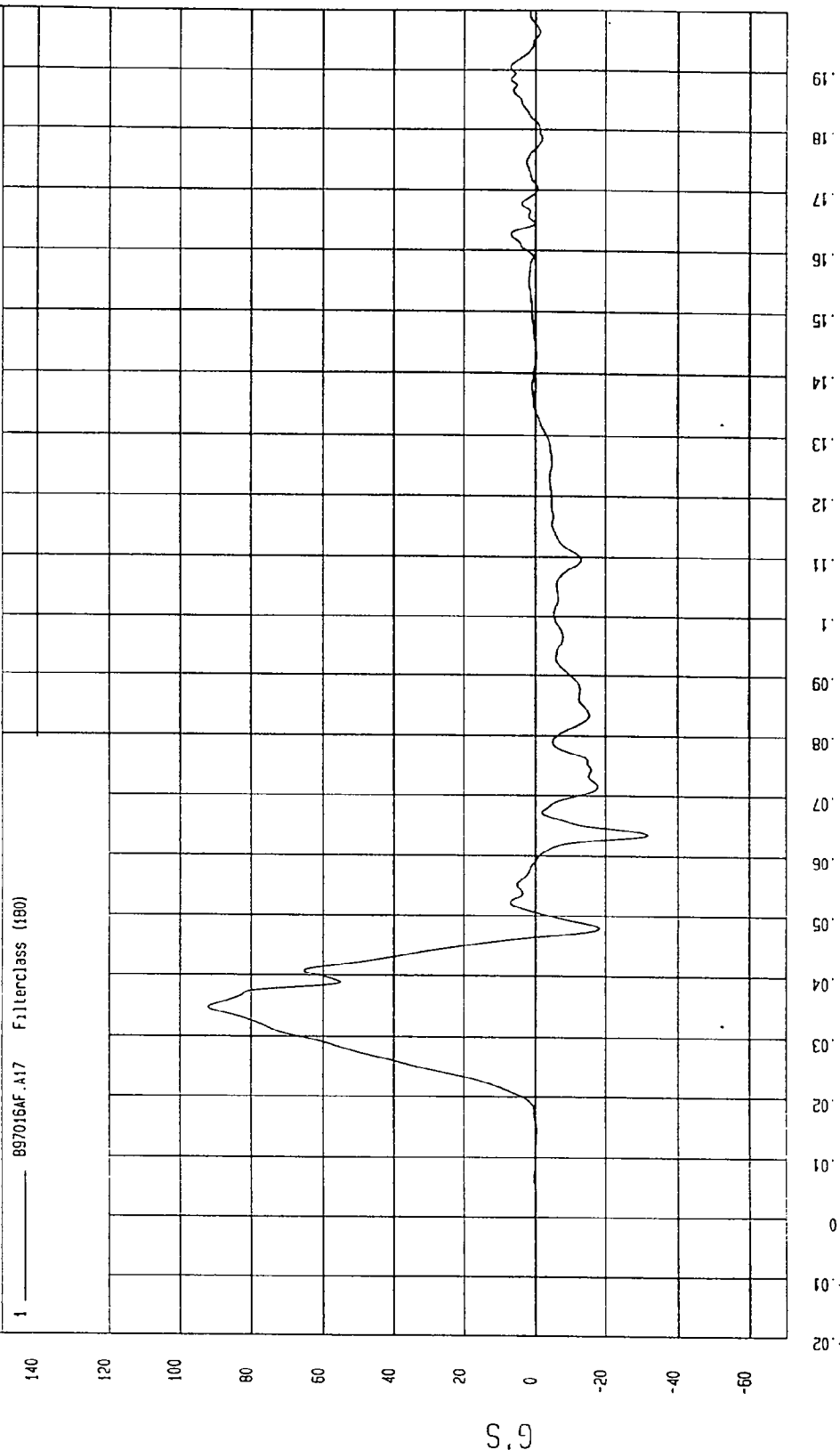
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -31.62 G'S at 64 msec

Maximum = 92.37 G'S at 35 msec

DRIVER LOWER SPINE Y ACCELERATION

1 ——— 897016AF.A17 Filterclass (180)



WGA Research
02-01-1997 17:18

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

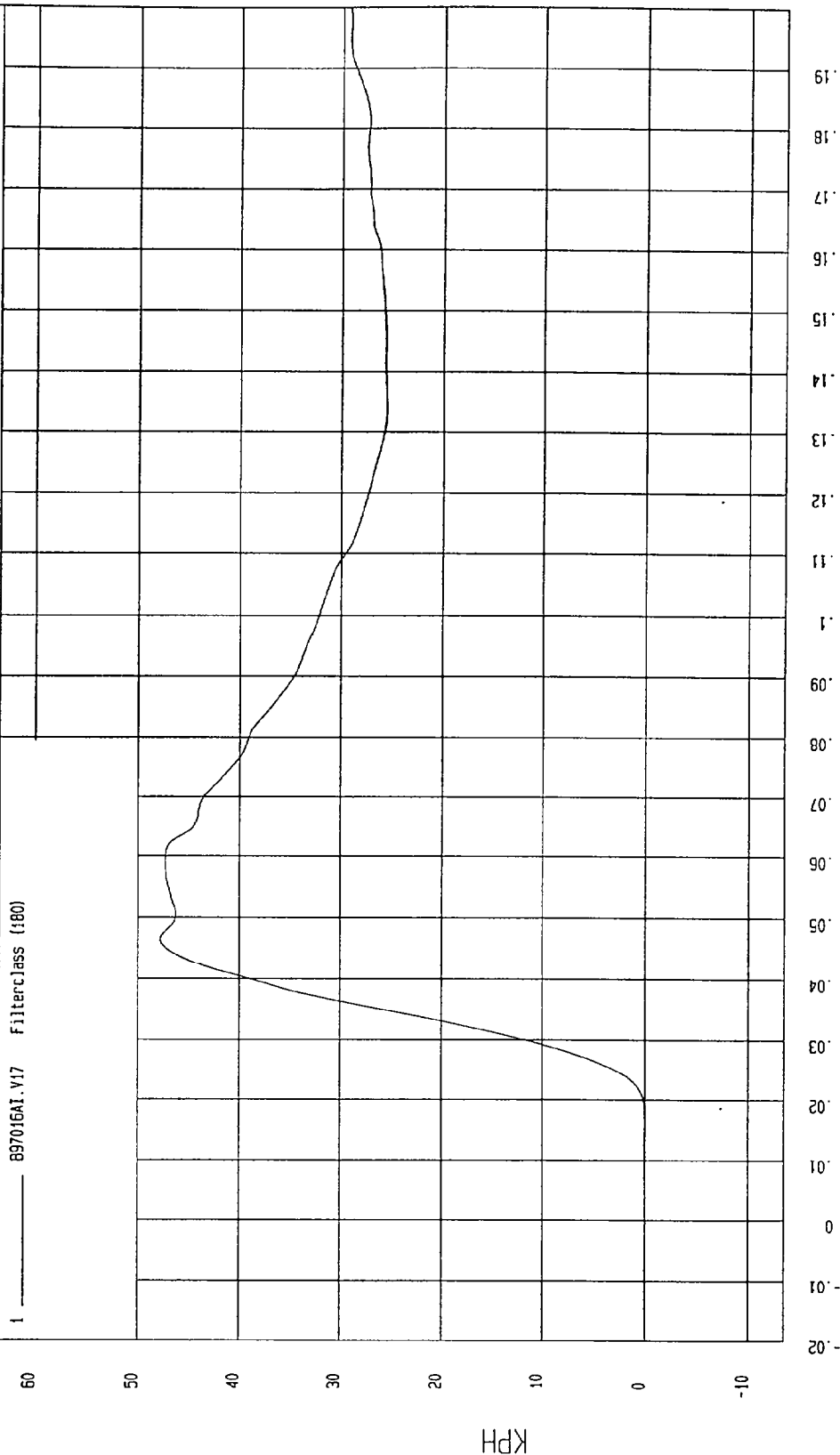
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -4.17E-03 KPH at -18 msec

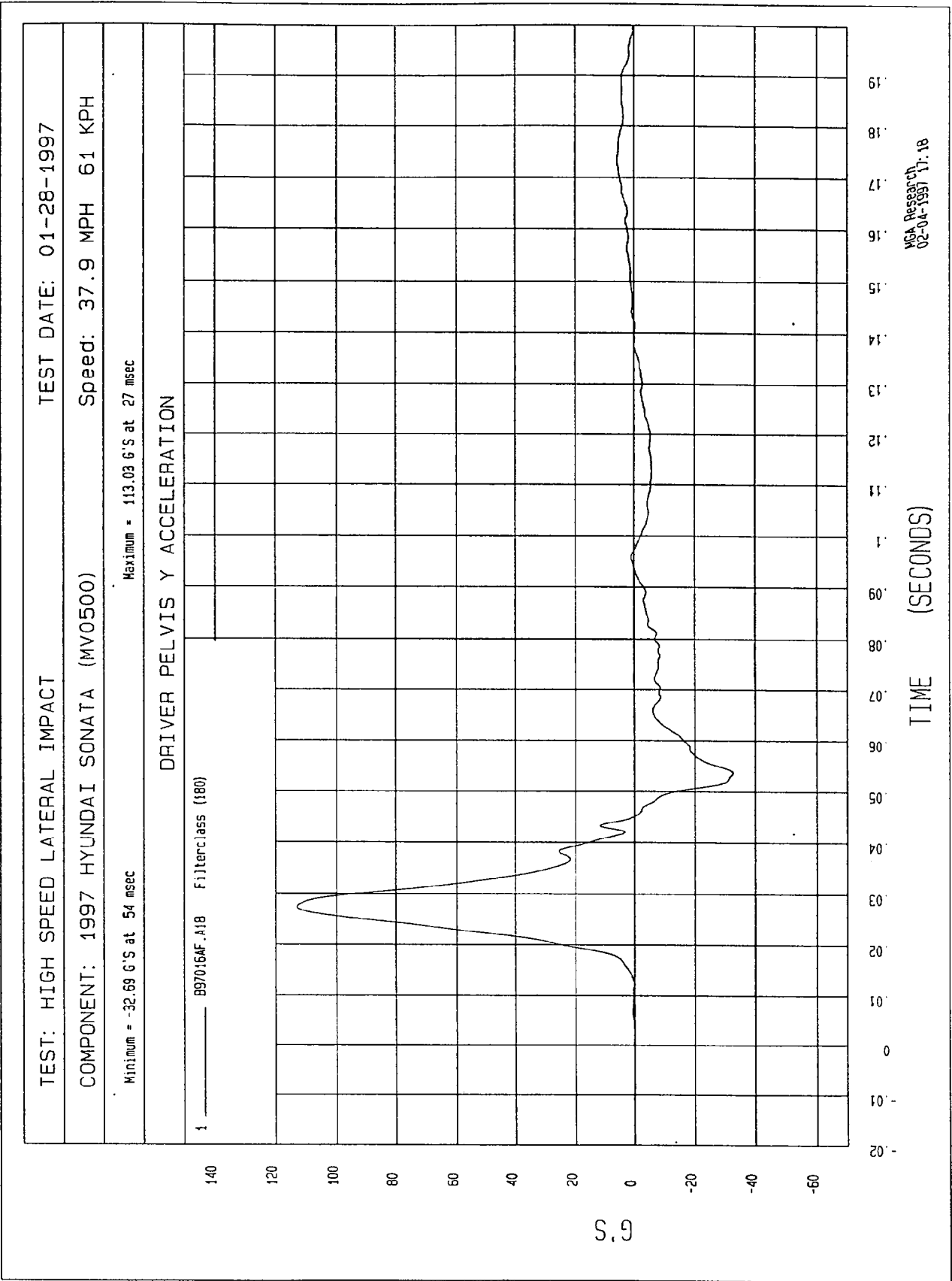
Maximum = 47.83 KPH at 46 msec

DRIVER LOWER SPINE Y VELOCITY

1 897016A1.V17 FilterClass (180)



MGA Research
02-01-1997 16:27



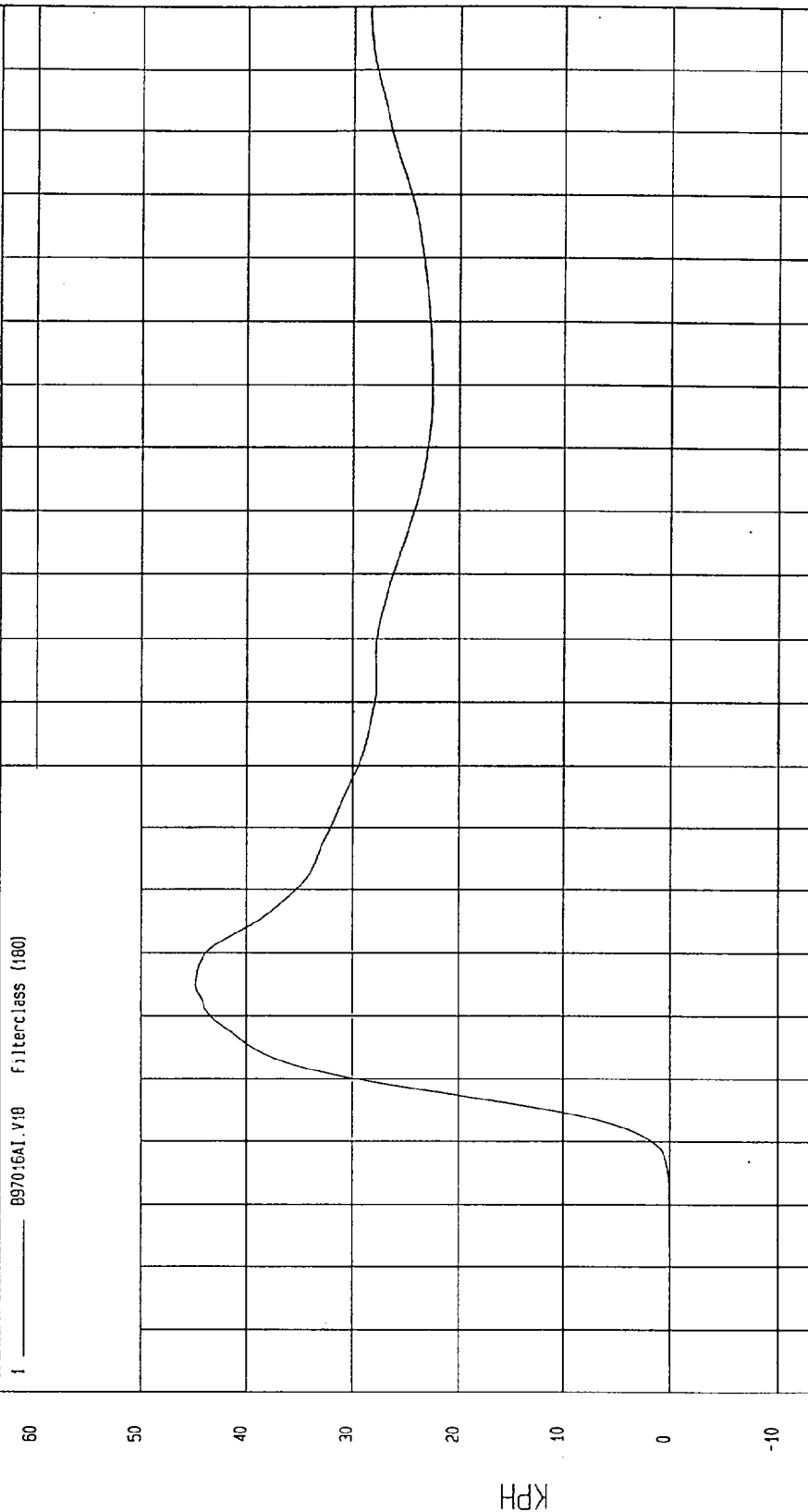
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

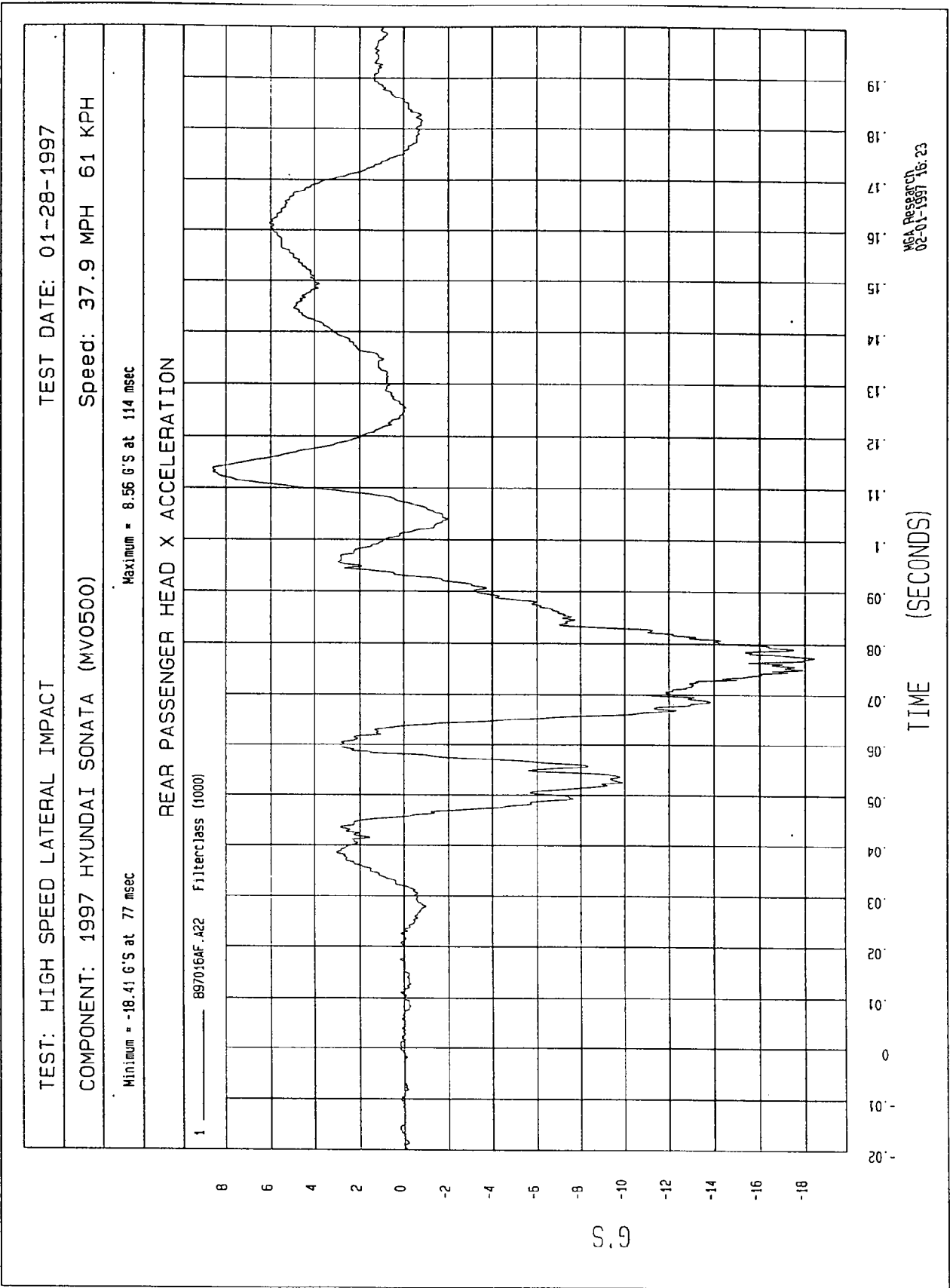
Minimum = -6.42E-03 KPH at -1 msec
Maximum = 44.84 KPH at 45 msec

DRIVER PELVIS Y VELOCITY

1 ——— B97016A1.V10 Filterclass (180)



TIME Seconds
MGA Research
02-01-1997 15:27



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

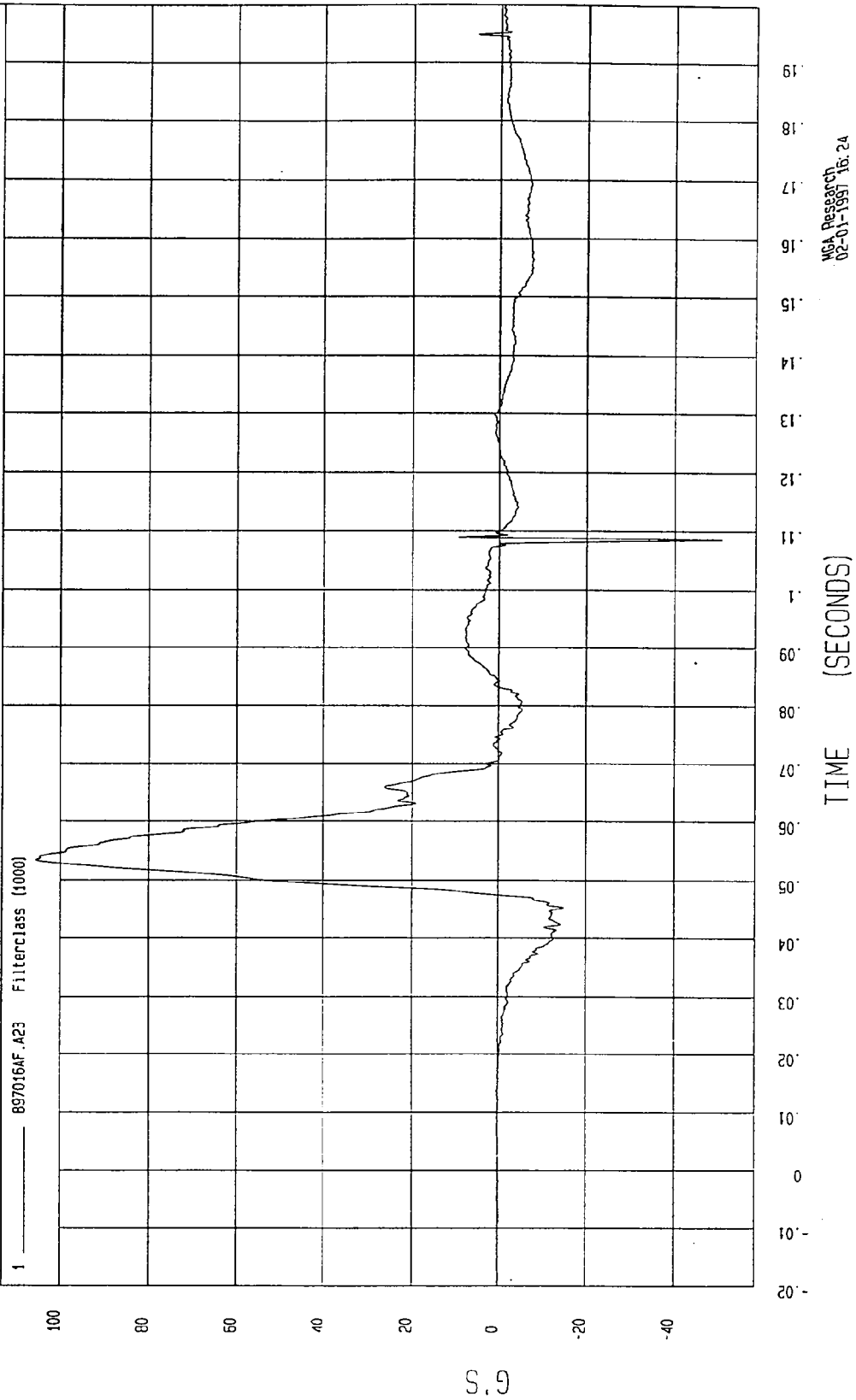
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

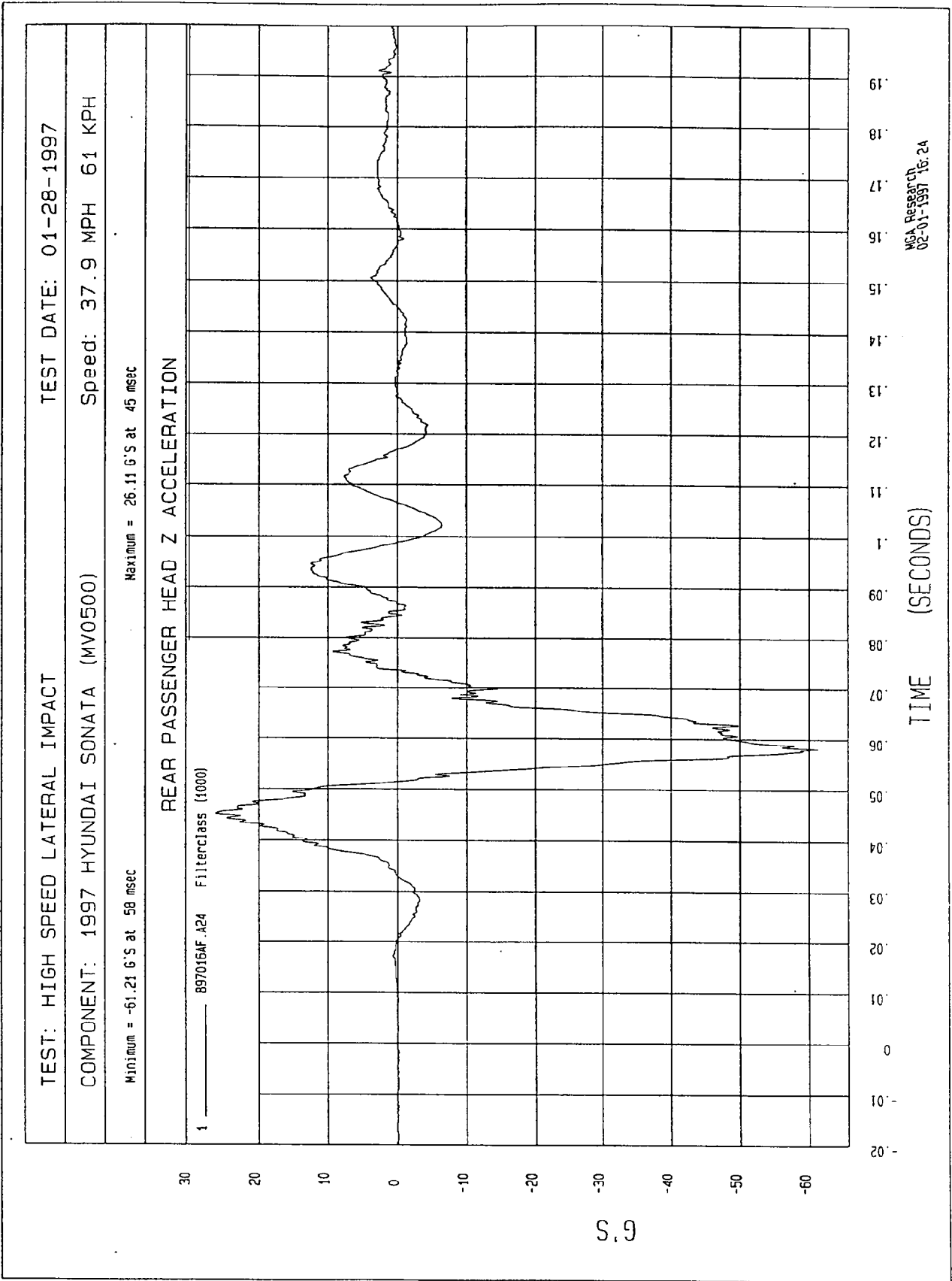
Speed: 37.9 MPH 61 KPH

Minimum = -50.52 G'S at 109 msec

Maximum = 105.36 G'S at 53 msec

REAR PASSENGER HEAD Y ACCELERATION



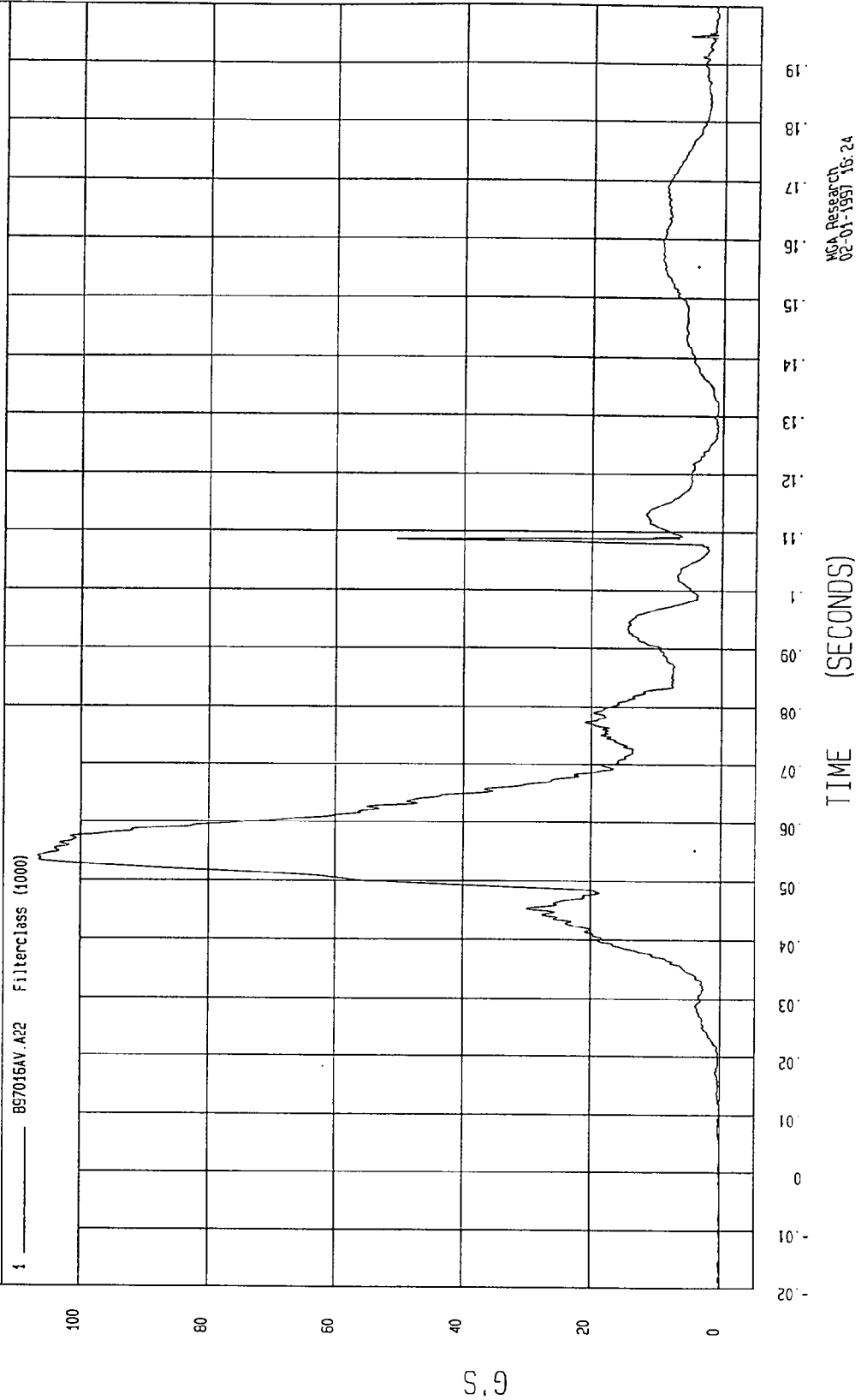


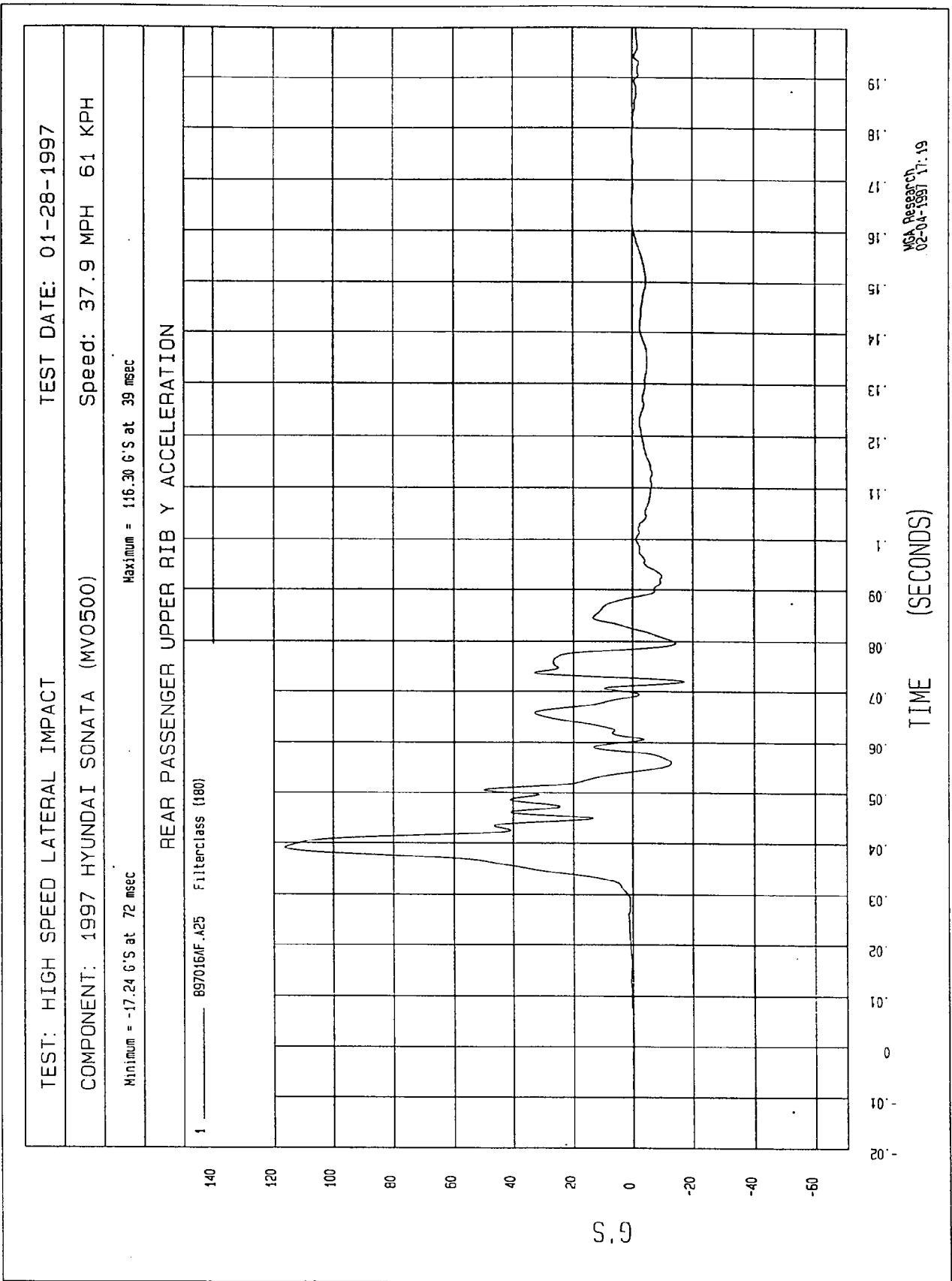
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 2.23E-02 G's at -13 msec Maximum = 106.63 G's at 54 msec

REAR PASSENGER HEAD RESULTANT

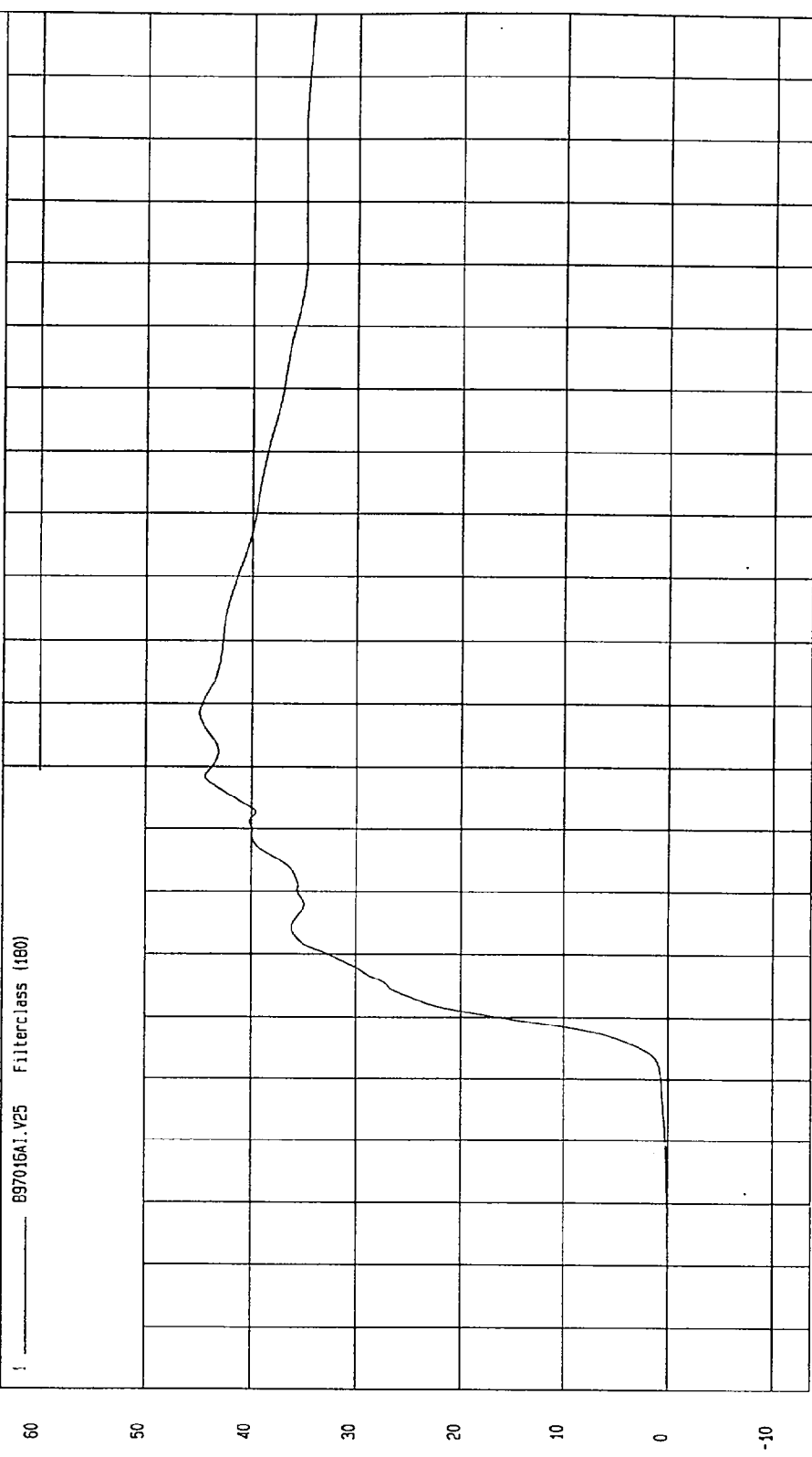




TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH
Minimum = 0 KPH at -20 msec Maximum = 44.97 KPH at 88 msec

REAR PASSENGER UPPER RIB Y VELOCITY

1 _____ 897016A1.V25 Filterclass (180)



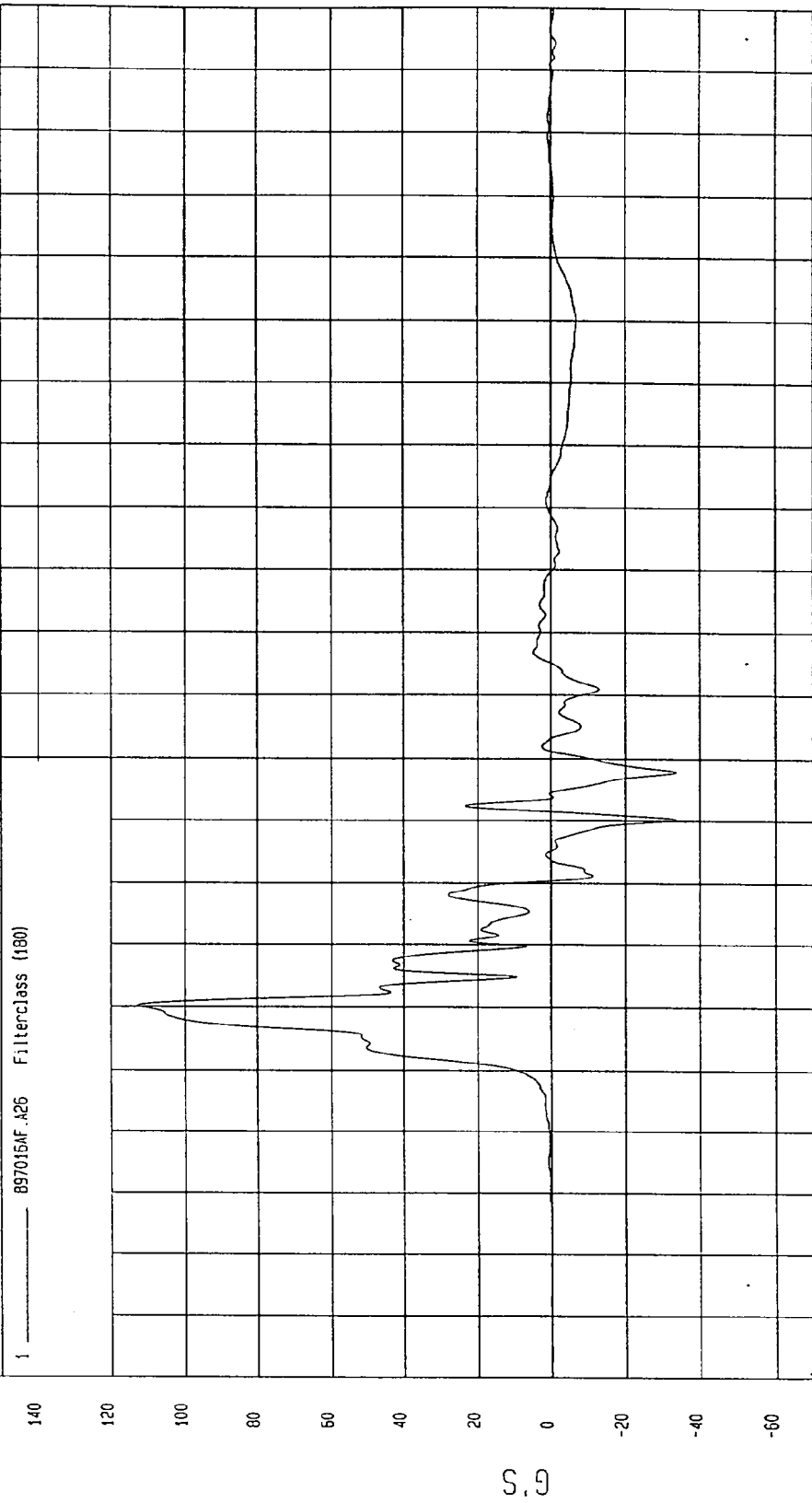
60
50
40
30
20
10
0
-10

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

MCA Research
02-01-1997 16:27

TEST: HIGH SPEED LATERAL IMPACT	TEST DATE: 01-28-1997
COMPONENT: 1997 HYUNDAI SONATA (MV0500)	Speed: 37.9 MPH 61 KPH
Minimum = -33.65 G'S at 70 msec	Maximum = 112.93 G'S at 40 msec

REAR PASSENGER LOWER RIB Y ACCELERATION



MSA Research
02-04-1997 17:19

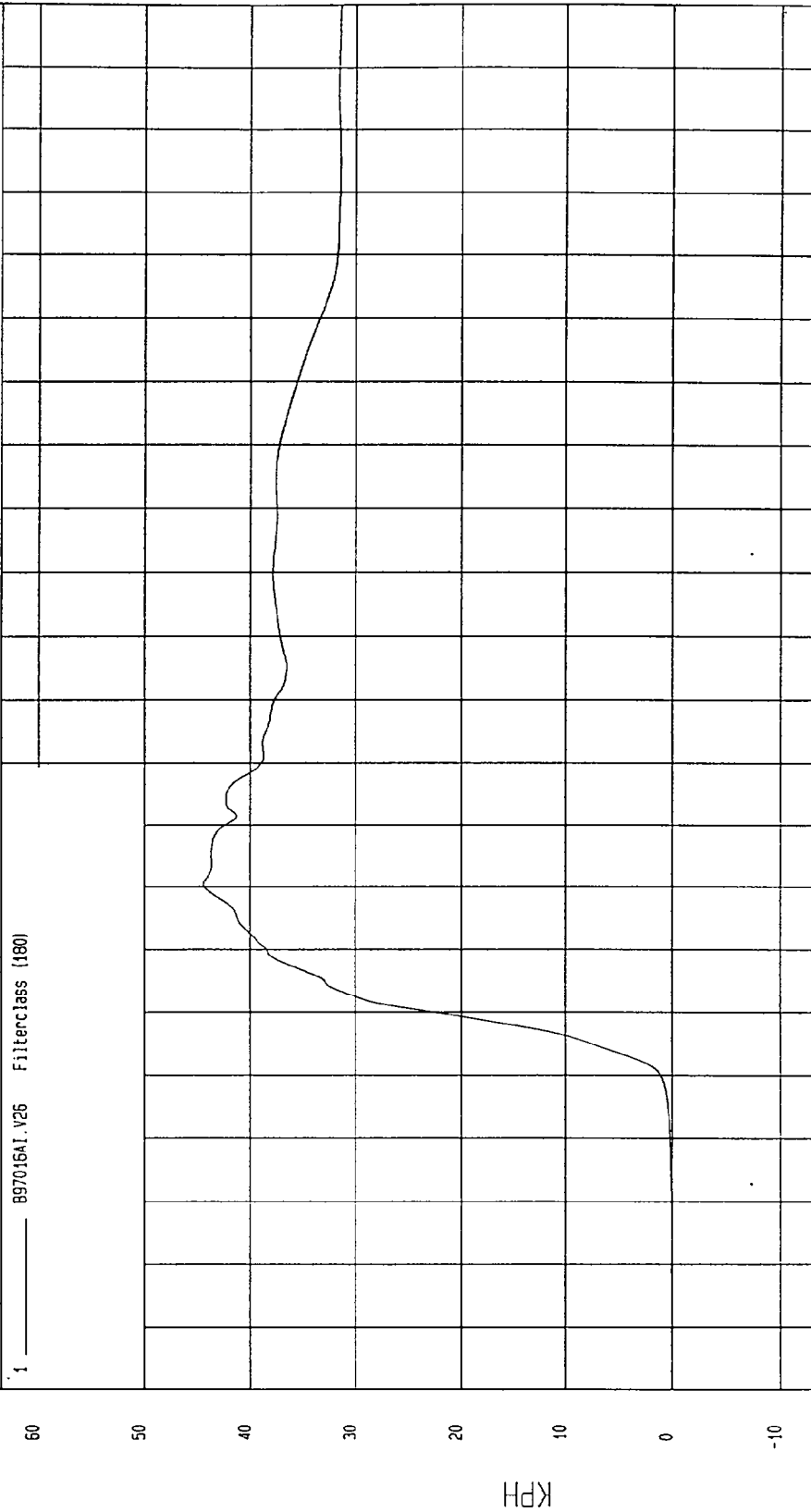
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -1.10E-02 KPH at -9 msec Maximum = 44.54 KPH at 60 msec

REAR PASSENGER LOWER RIB Y VELOCITY

1 897016A1.V26 Filterclass (180)



NCA Research
02-01-1997 16:28

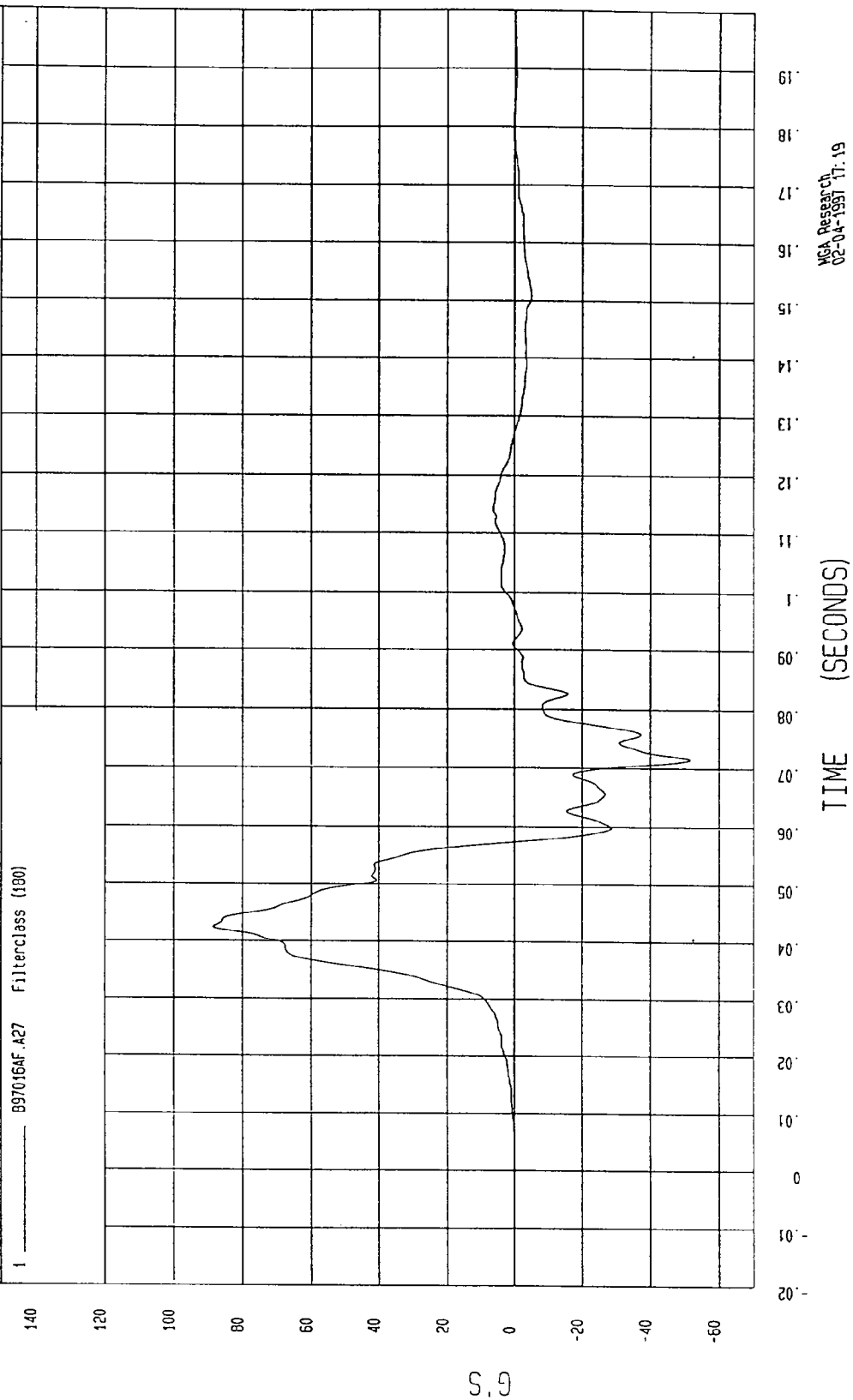
TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -51.55 G'S at 72 msec Maximum = 88.68 G'S at 42 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION



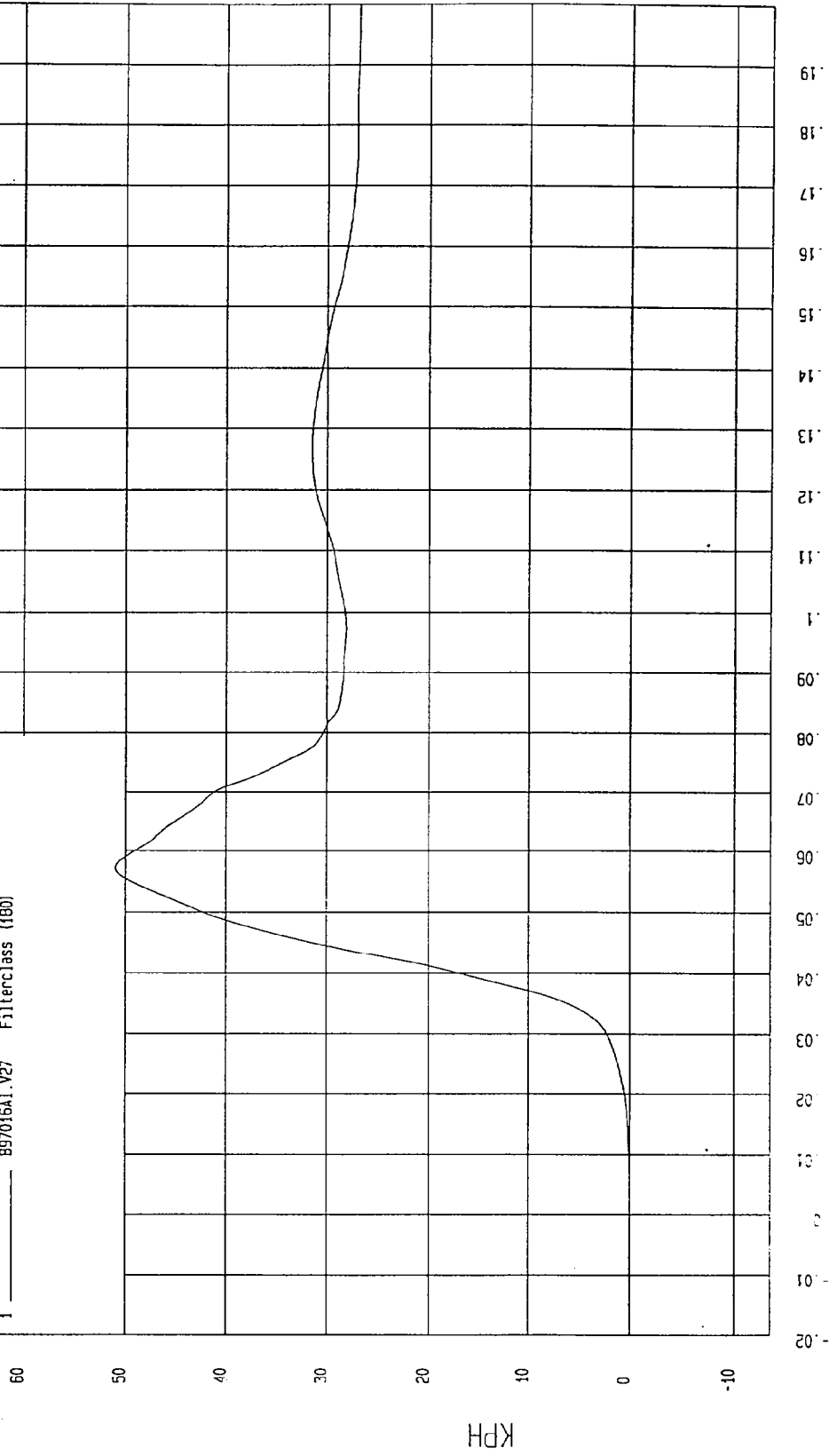
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 0 KPH at -20 msec Maximum = 51.00 KPH at 57 msec

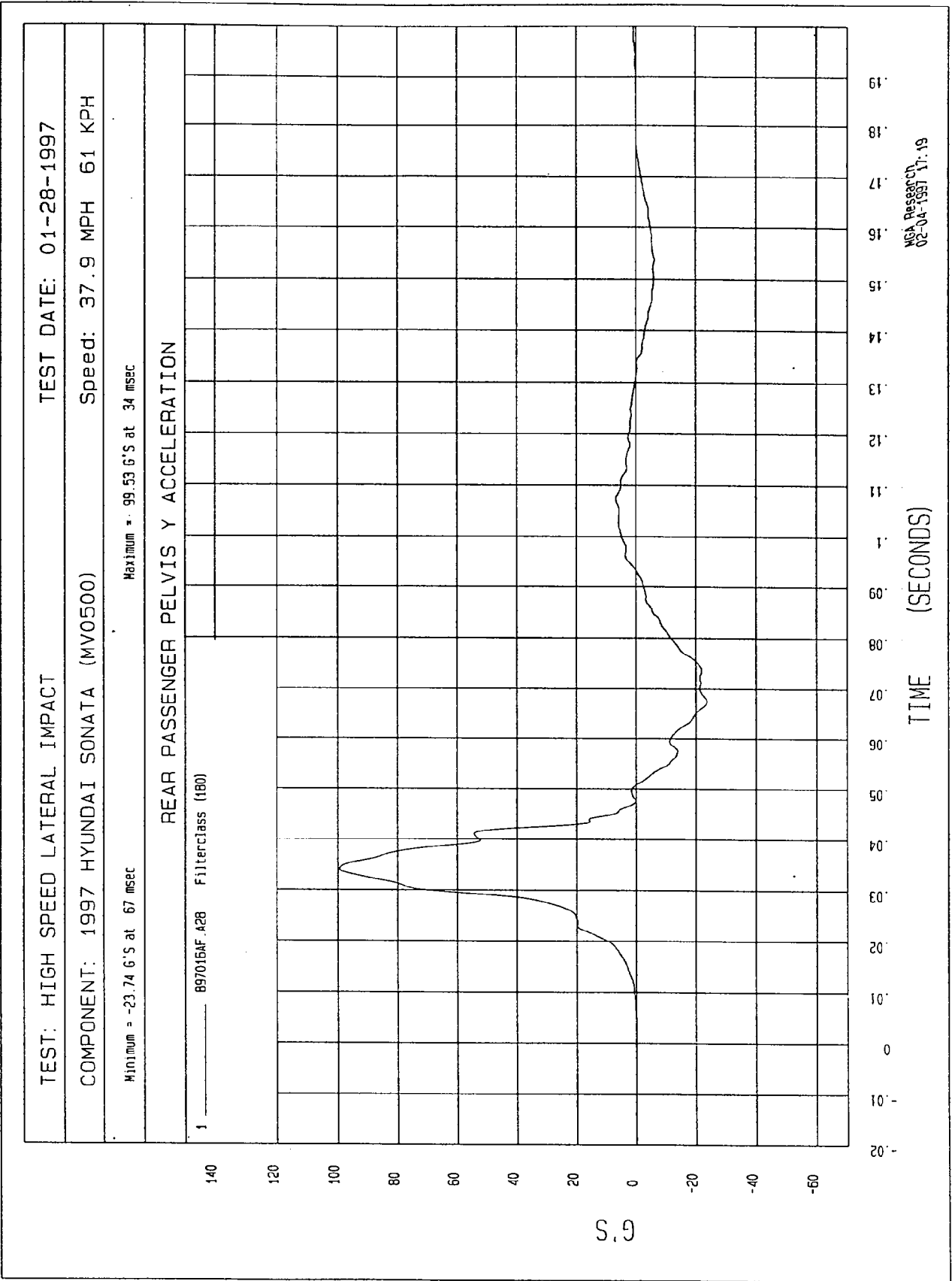
REAR PASSENGER LOWER SPINE Y VELOCITY

1 ——— 897016A1.V27 Filterclass (100)



WGA Research
02-01-1997 16:28

TIME Seconds



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

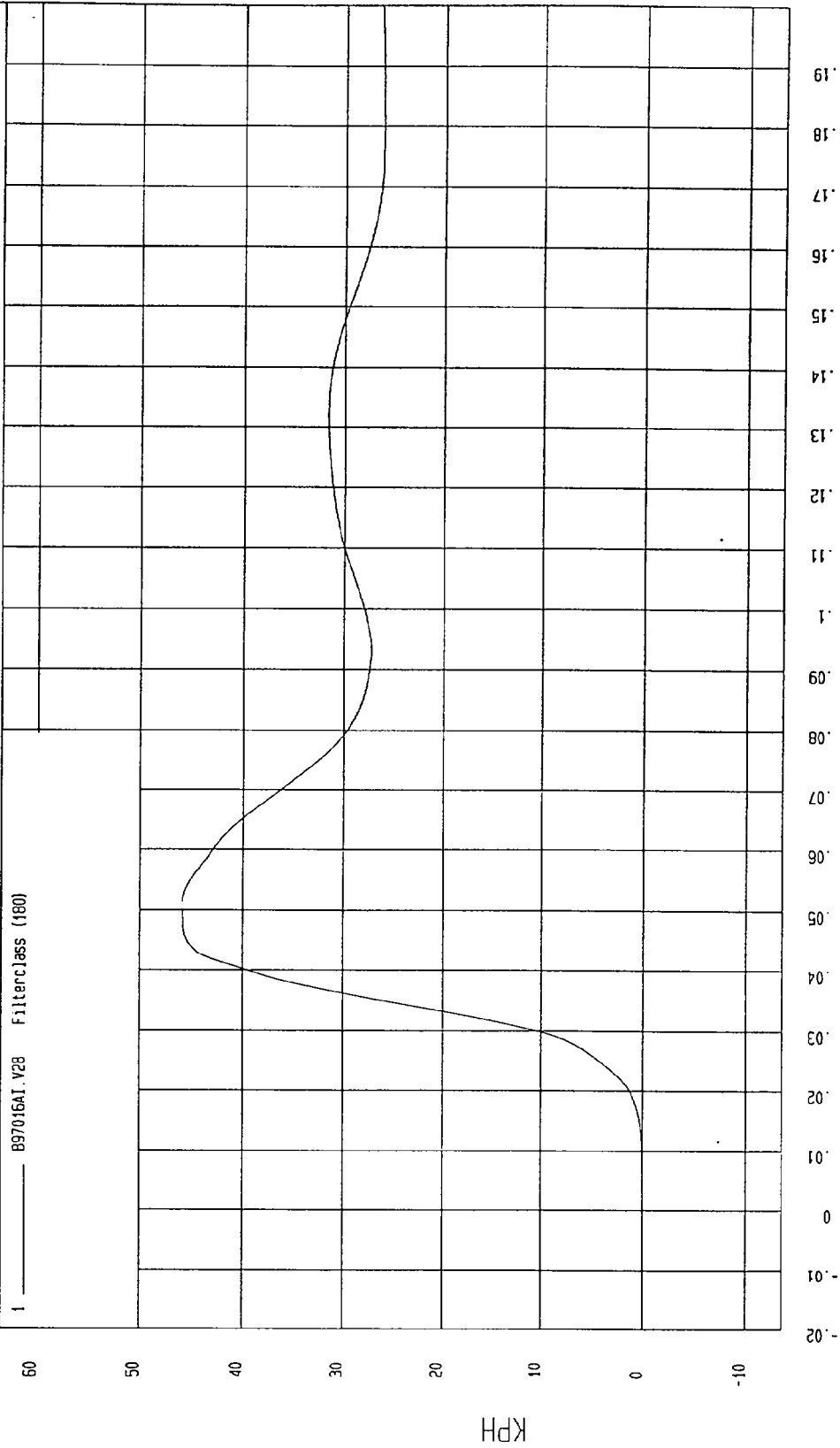
Speed: 37.9 MPH 61 KPH

Minimum = -1.34E-02 KPH at -1 msec

Maximum = 46.01 KPH at 51 msec

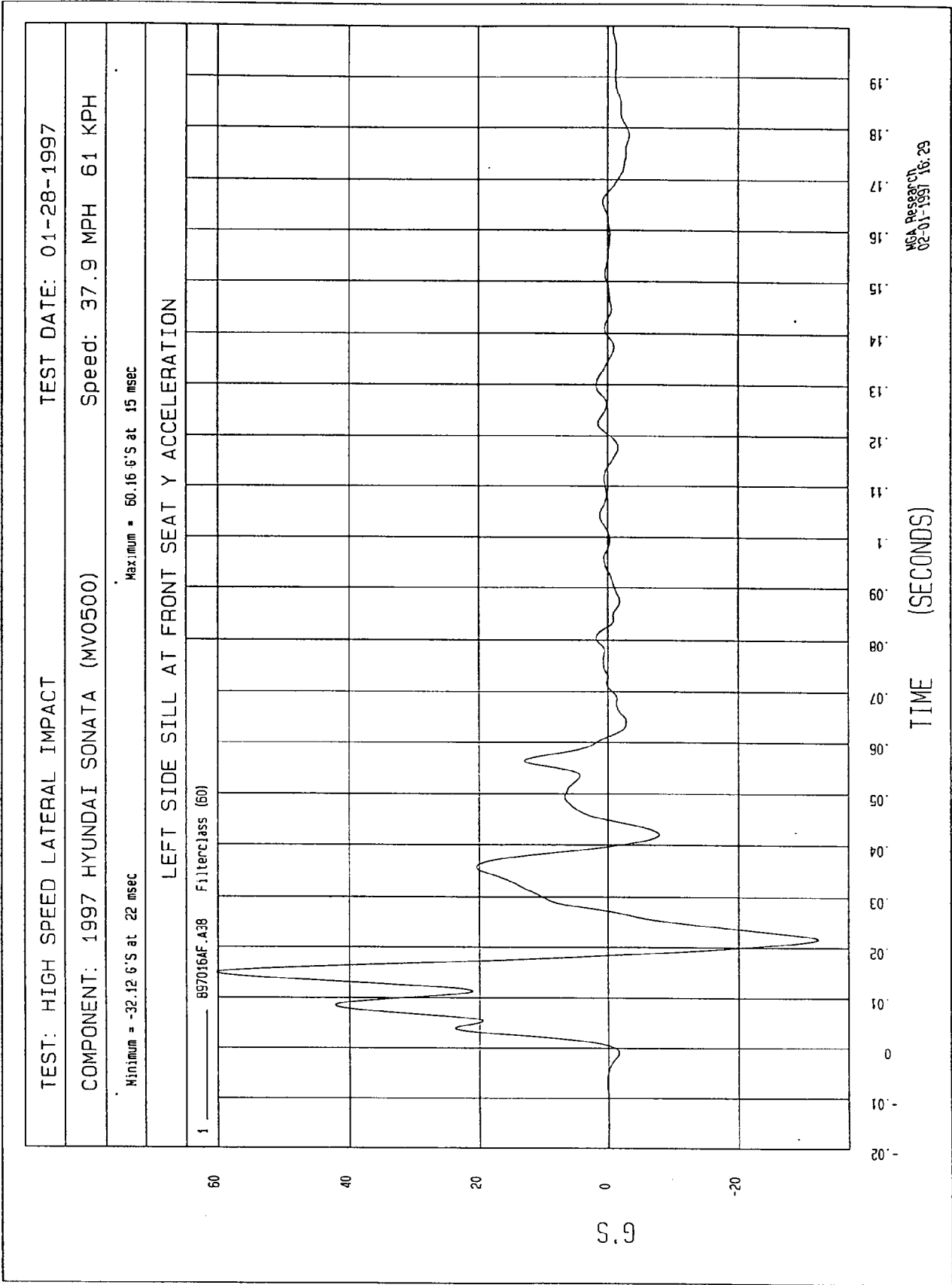
REAR PASSENGER PELVIS Y VELOCITY

1 ——— B97016A1.V28 Filterclass (180)



NSA Research
02-01-1997 16:28

TIME Seconds



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Speed: 37.9 MPH 61 KPH

Minimum = -.69 KPH at .3 msec

Maximum = 21.13 KPH at .61 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY

1 ——— B97016A1.V38 Filterclass (180)

60

50

40

30

20

10

0

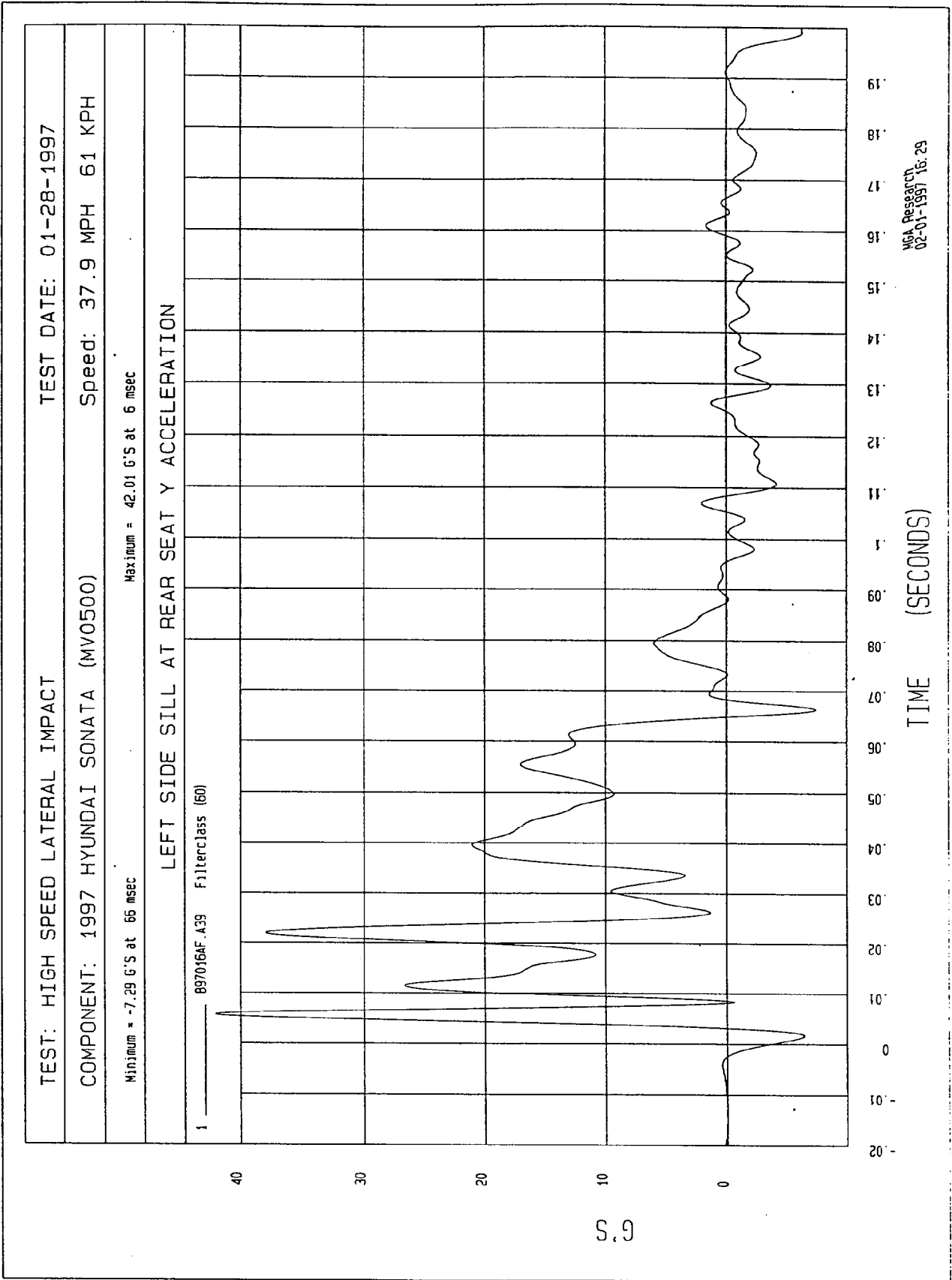
-10

KPH

-.02 -.01 0 .01 .02 .03 .04 .05 .06 .07 .08 .09 .1 .11 .12 .13 .14 .15 .16 .17 .18 .19

TIME Seconds

MCA Research
02-01-1997 16:25

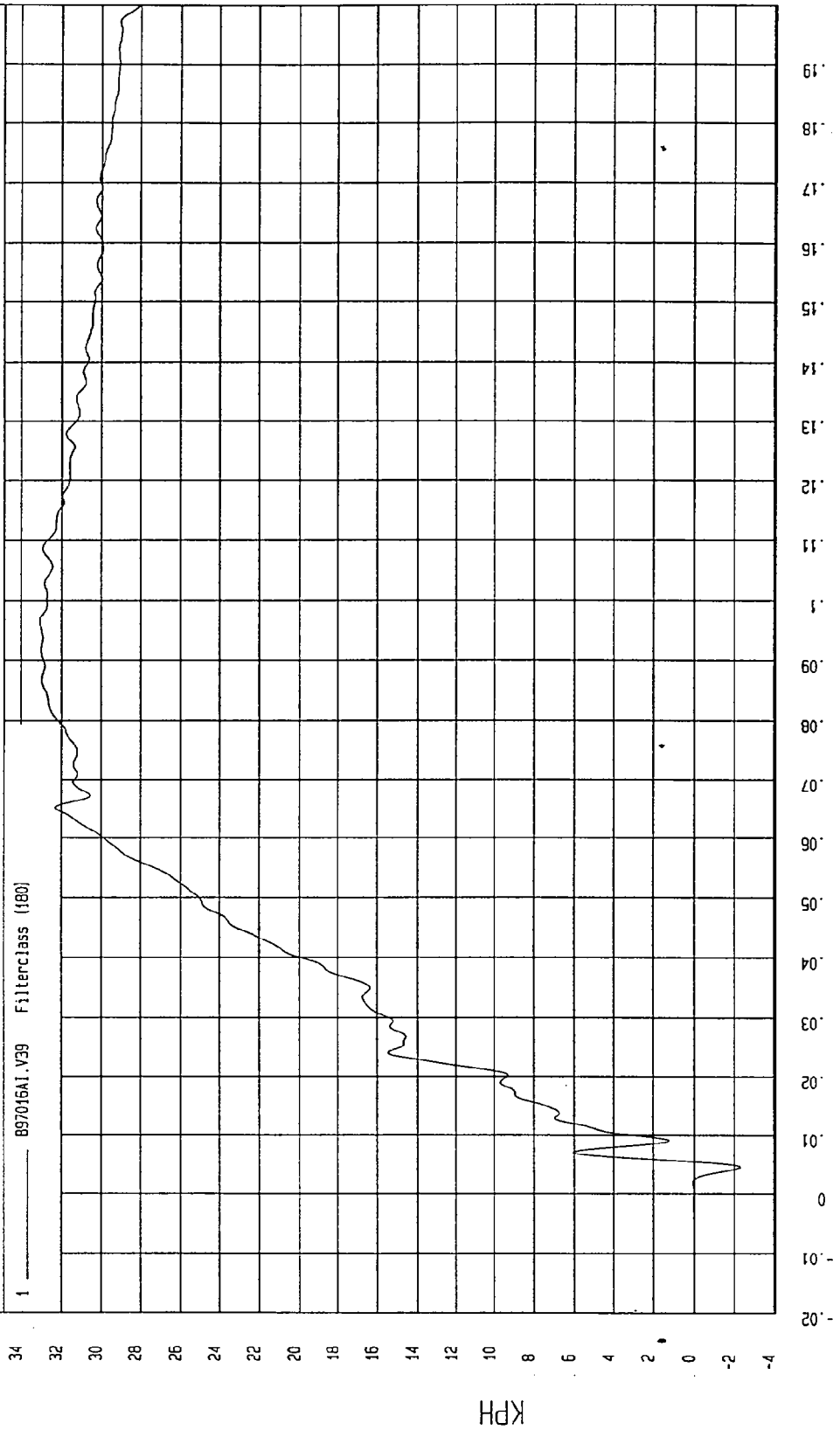


TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -2.30 KPH at 4 msec Maximum = 33.08 KPH at 96 msec

LEFT SIDE SILL AT REAR SEAT Y VELOCITY



NGA Research
02-12-1997 07.02

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

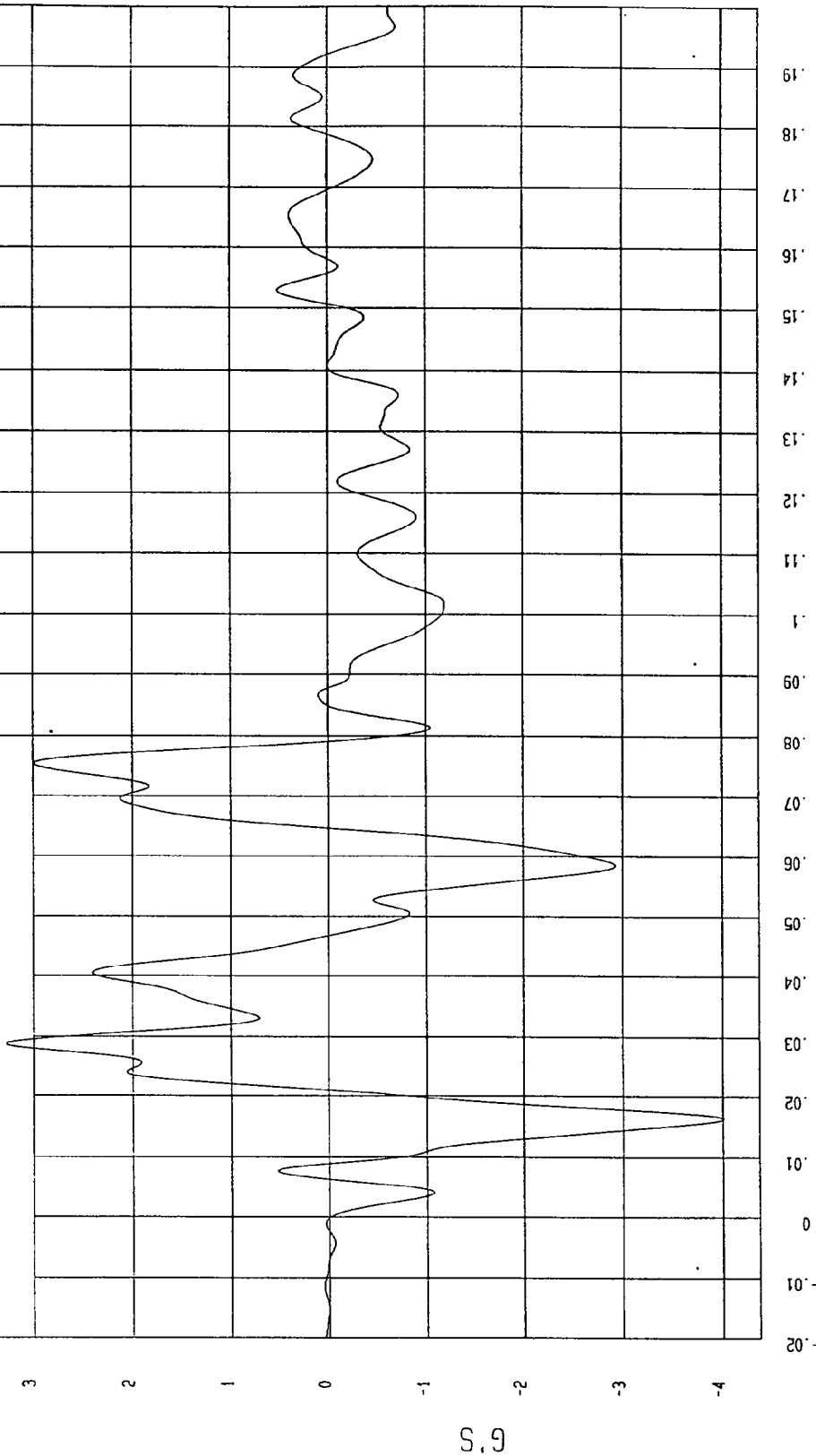
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 3.26 G'S at 29 msec

Minimum = -4.00 G'S at 16 msec

RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

1 B97016AF.A32 FilterClass (60)



MGA Research
02-01-1997 16:29

TIME (SECONDS)

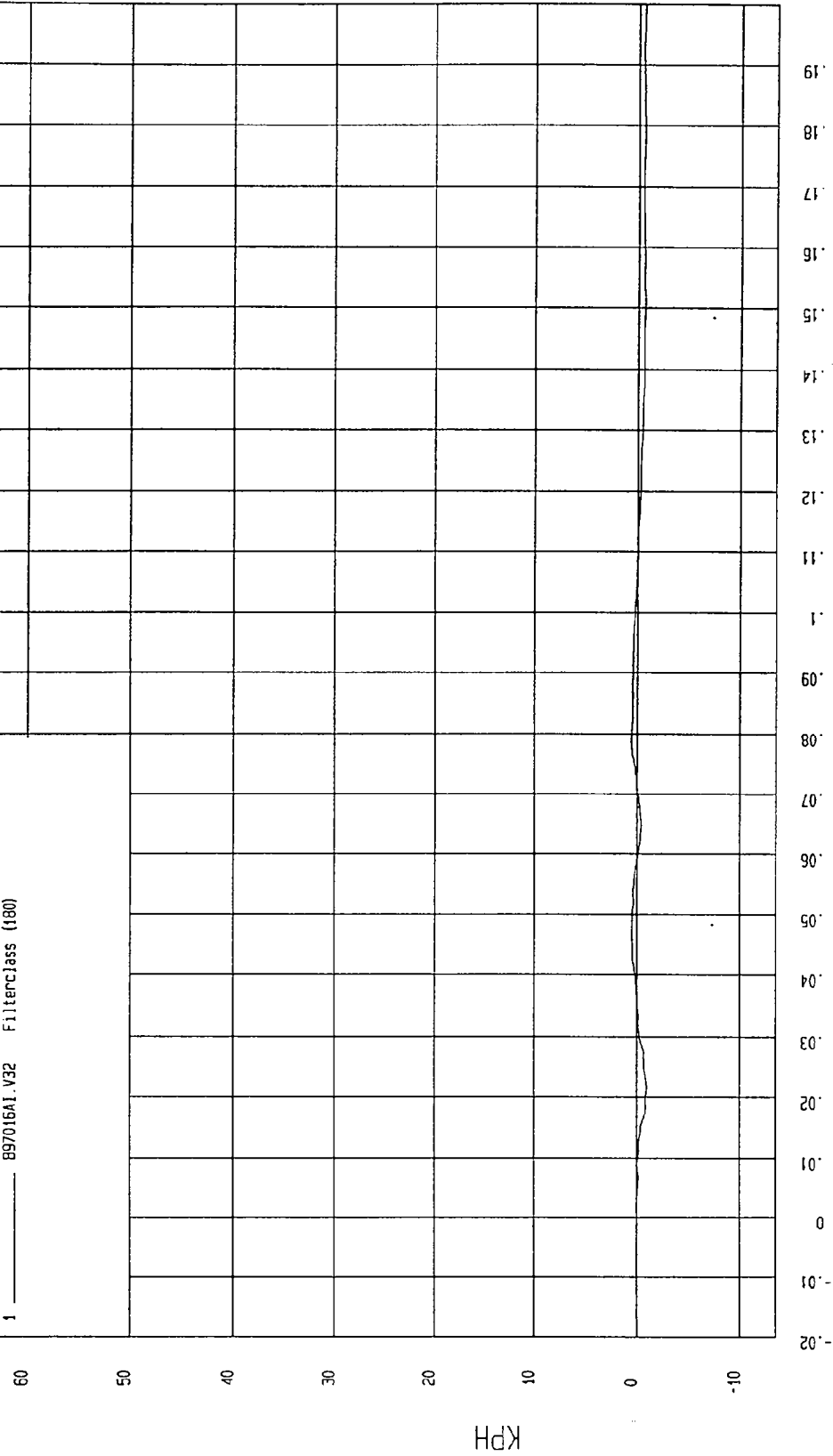
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -98 KPH at 22 msec Maximum = .60 KPH at 79 msec

RIGHT SIDE SILL AT FRONT SEAT X VELOCITY

1 ——— B97016A1.V32 FilterClass (180)



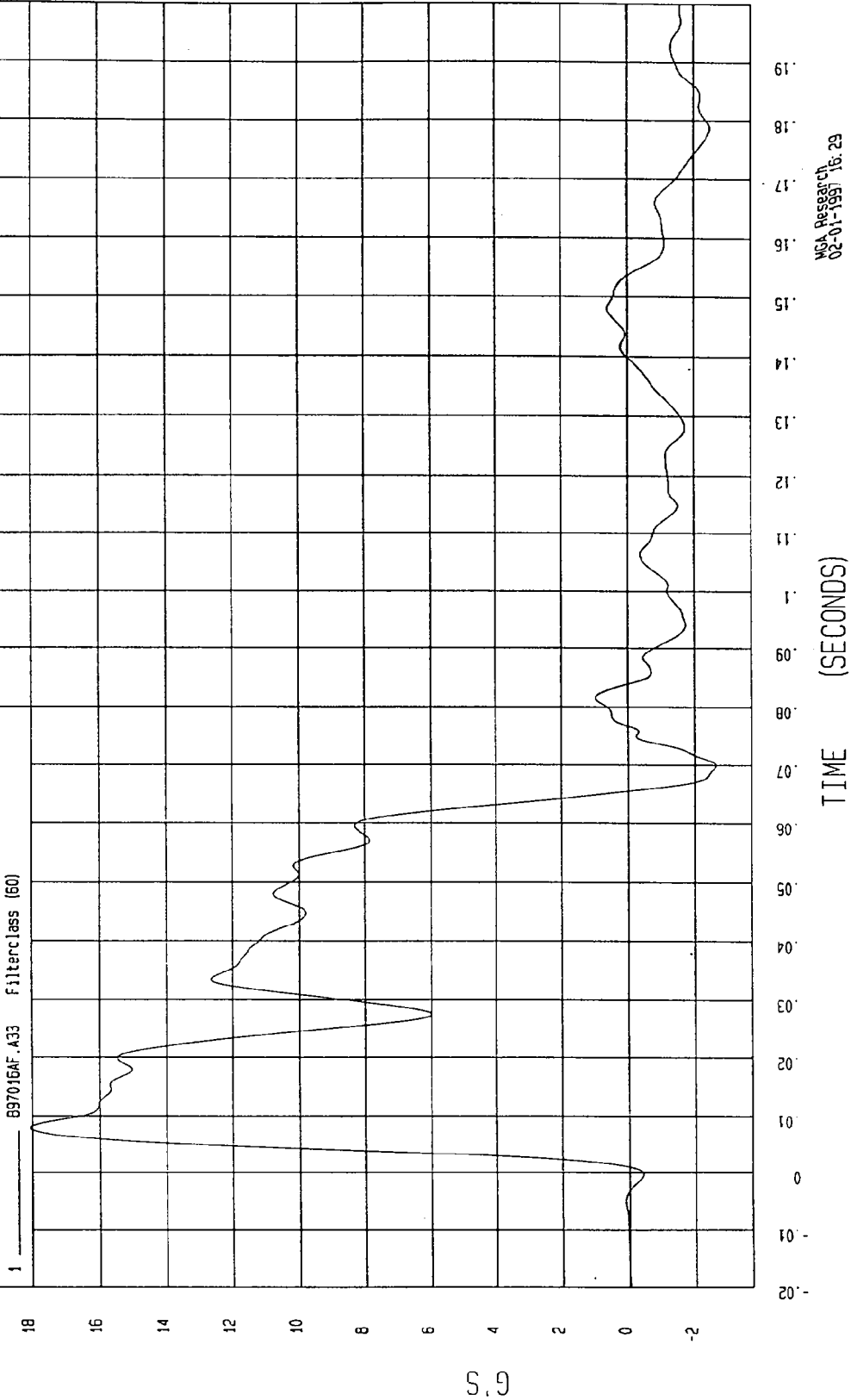
MCA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -2.65 G'S at 70 msec Maximum = 18.06 G'S at 8 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION



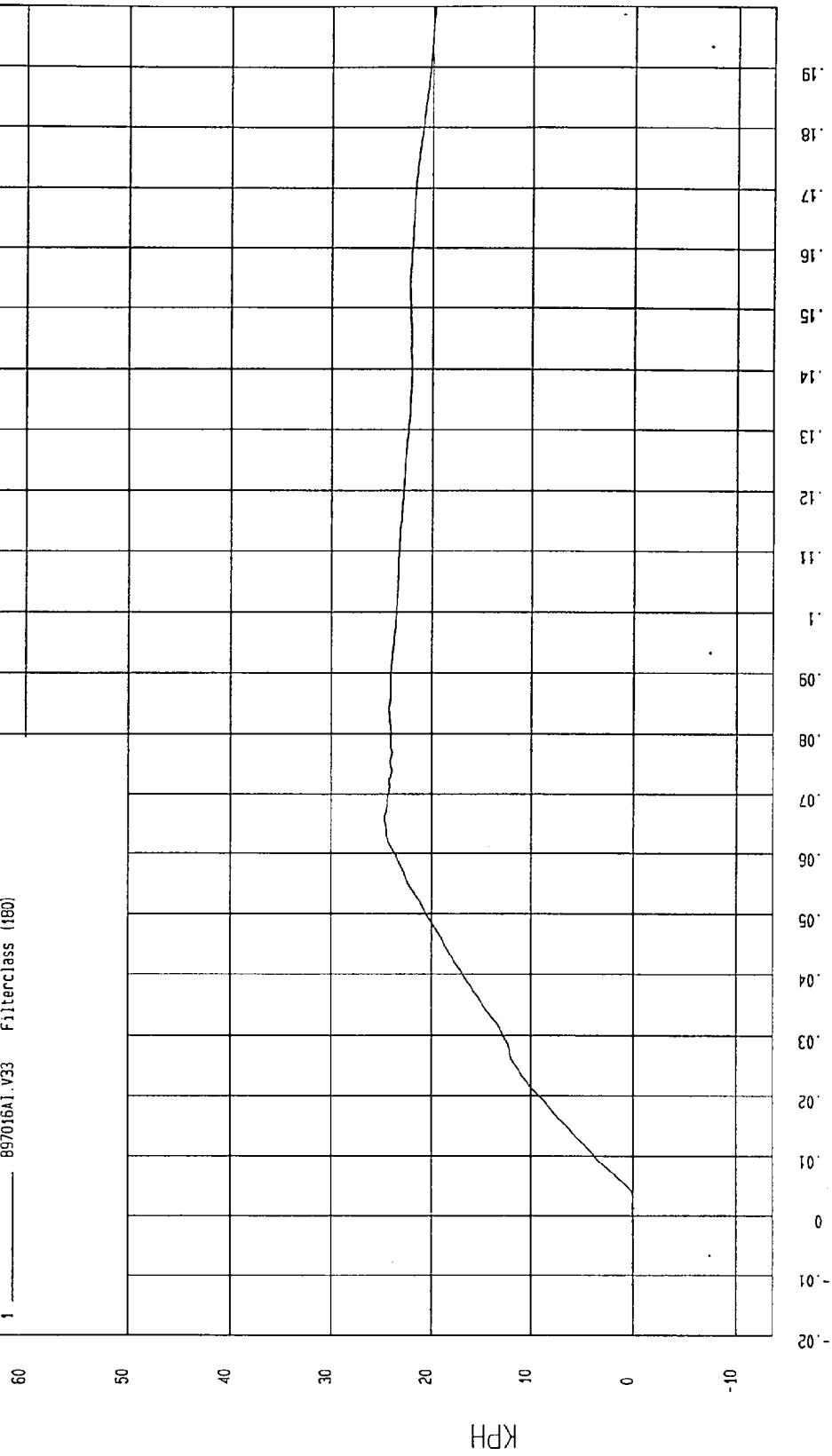
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -2.32E-04 KPH at -18 msec
Maximum = 24.69 KPH at 66 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY

1 897016A1.V33 Filterclass (180)



MCA Research
02-01-1997 16:25

TIME Seconds

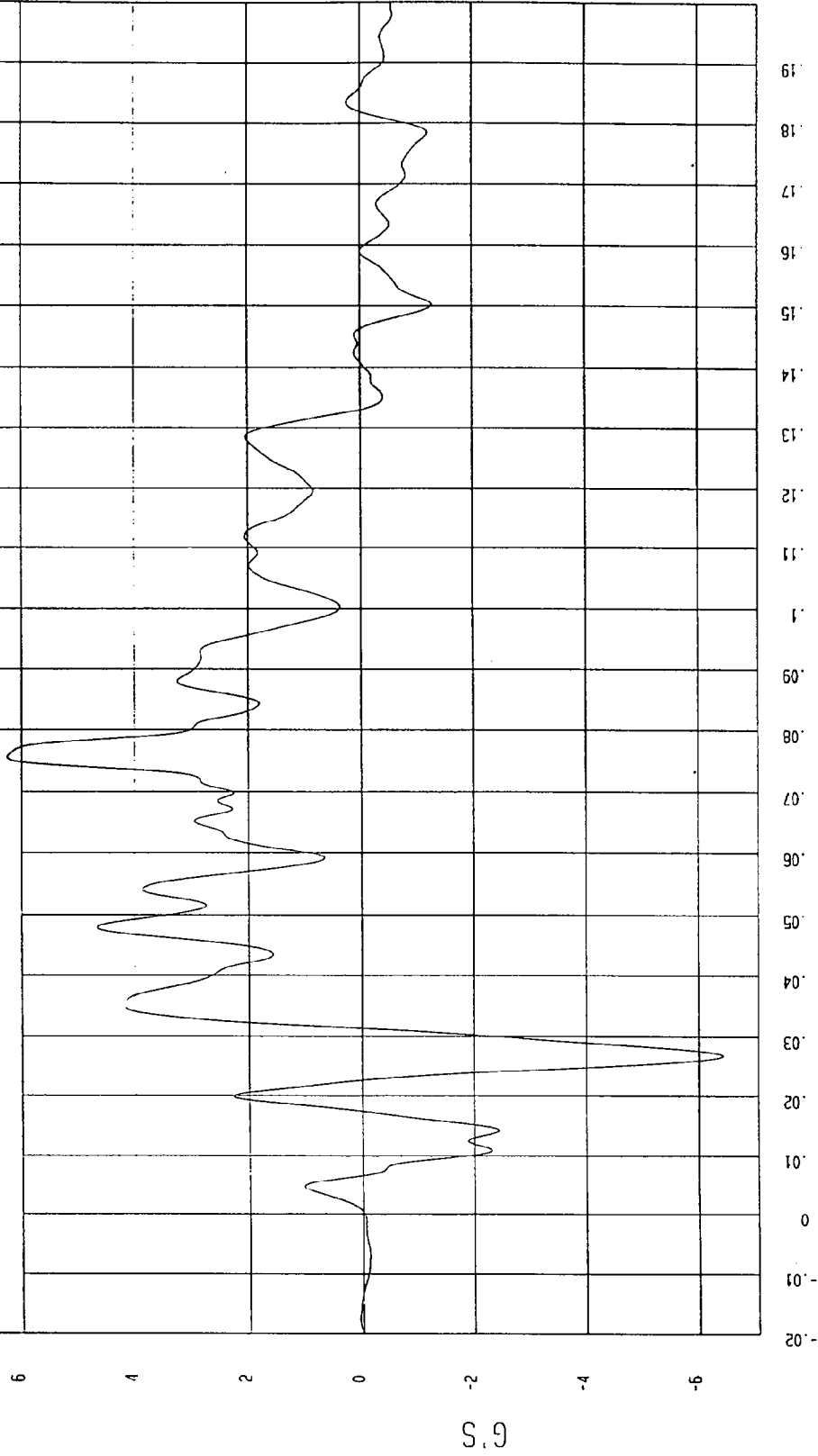
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -6.41 G'S at 27 msec Maximum = 6.24 G'S at 75 msec

RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 897016AF.A34 FilterClass (60)



M&A Research
02-01-1997 15:29

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

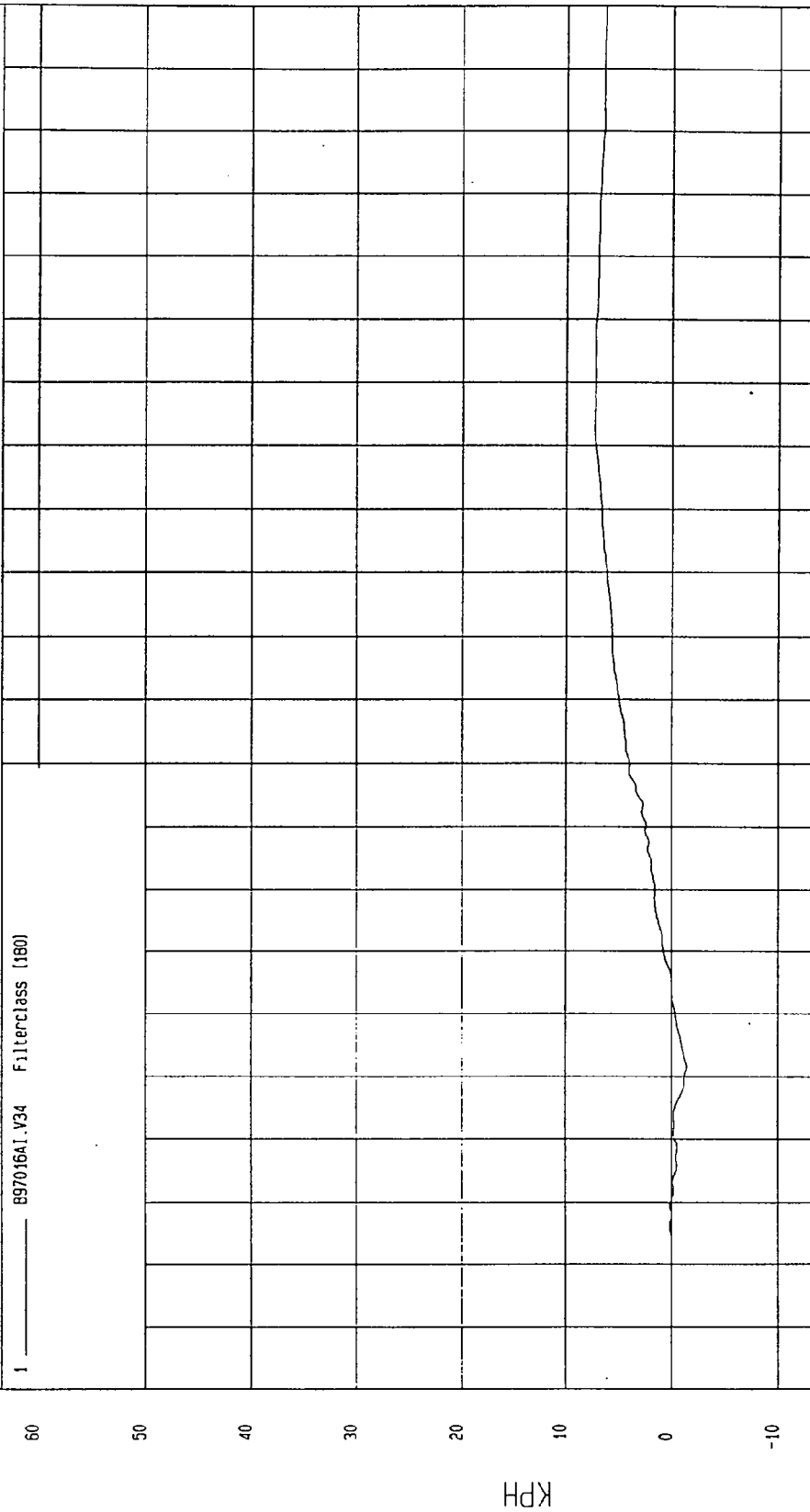
Speed: 37.9 MPH 61 KPH

Minimum = -1.45 KPH at 32 msec

Maximum = 7.27 KPH at 133 msec

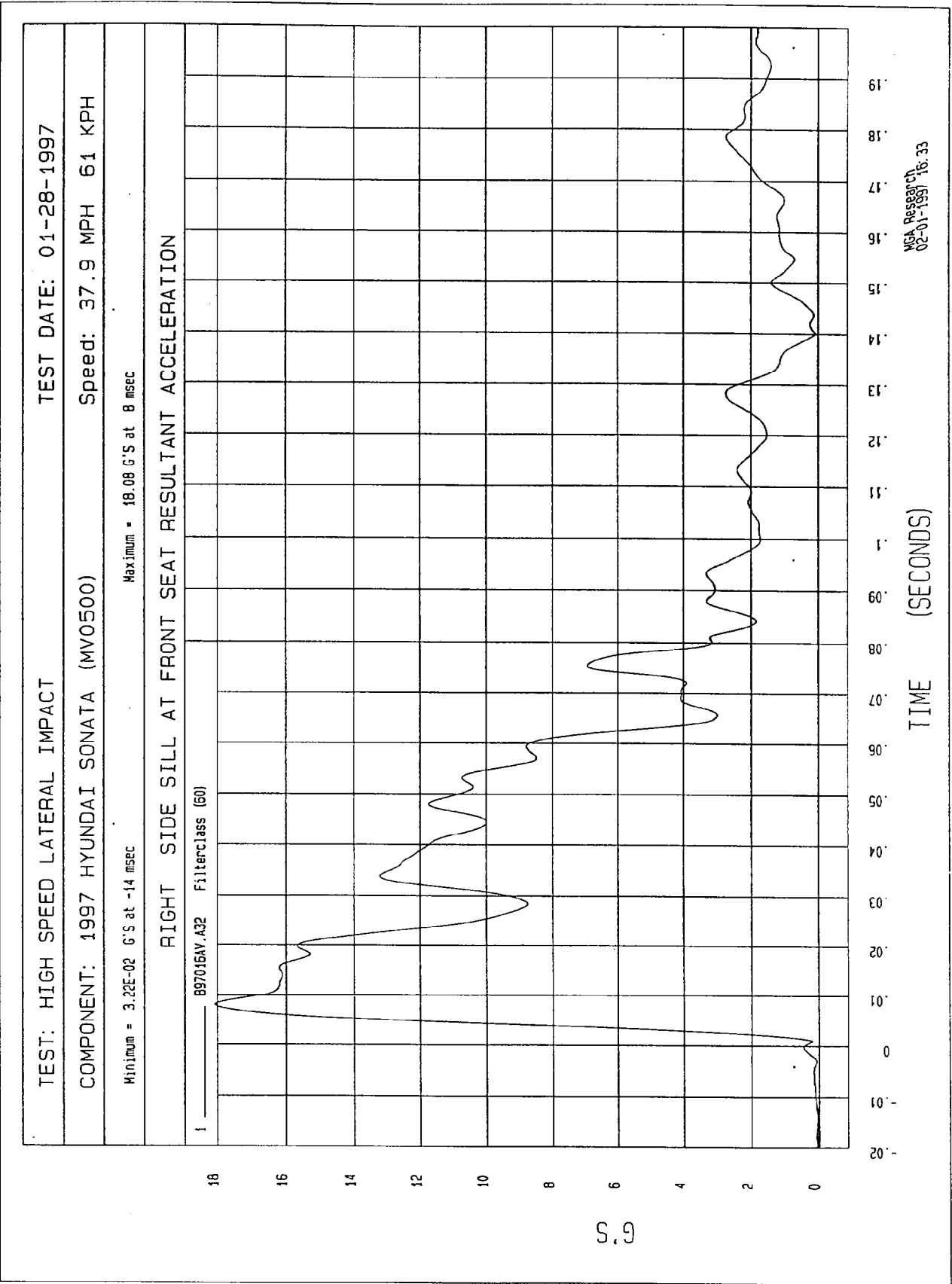
RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY

1 ——— B97016A1.V34 Filterclass (180)



TIME Seconds

MGA Research
02-01-1997 16:25



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 7.16 G'S at 16 msec

Minimum = -2.59 G'S at 74 msec

RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

1 ——— 897016AF A35 Filterclass (60)

6

4

2

0

-2

G.S

.19

.18

.17

.16

.15

.14

.13

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

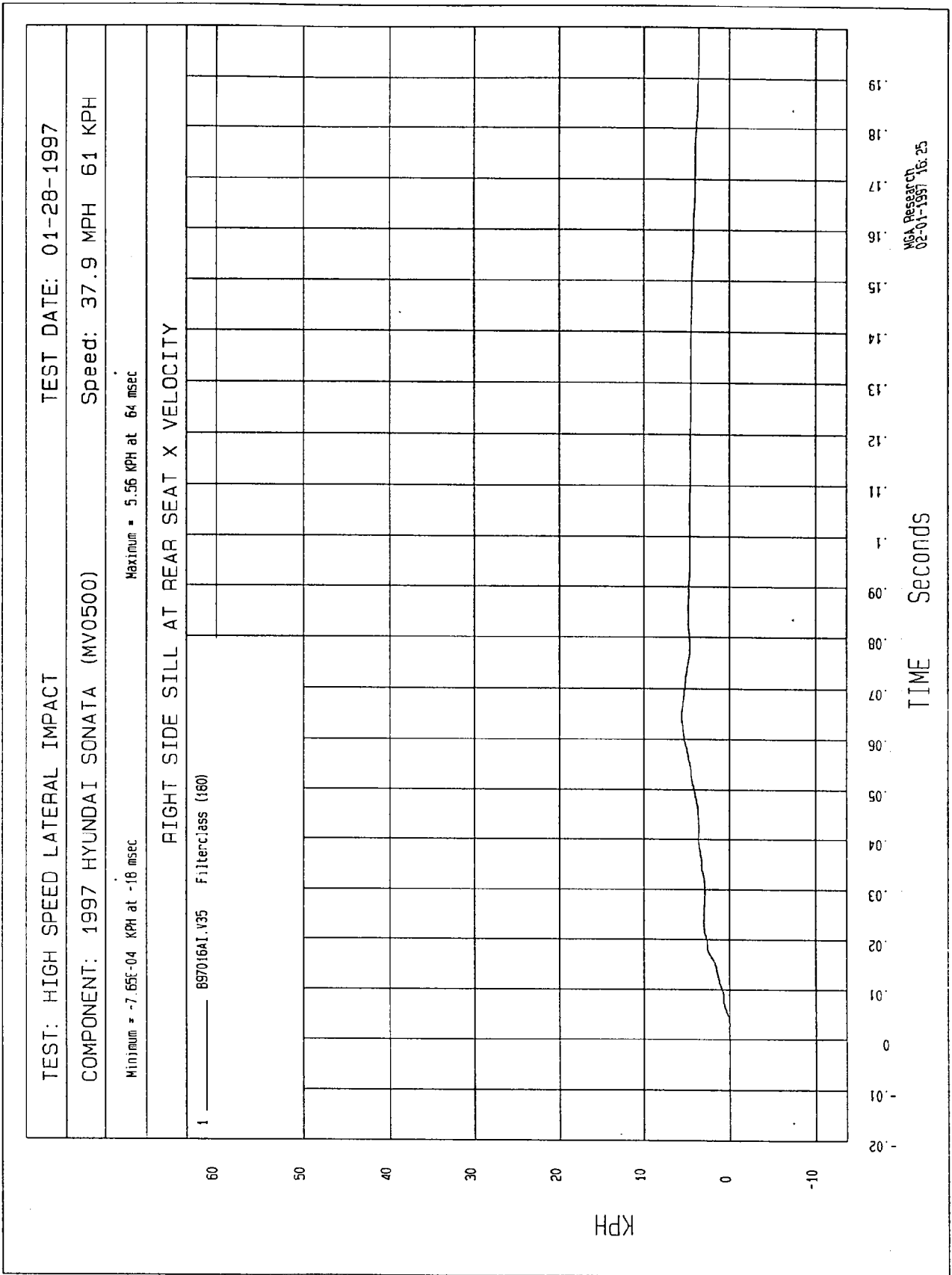
0

-.01

-.02

MCA Research
02-01-1997 16:29

TIME (SECONDS)



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

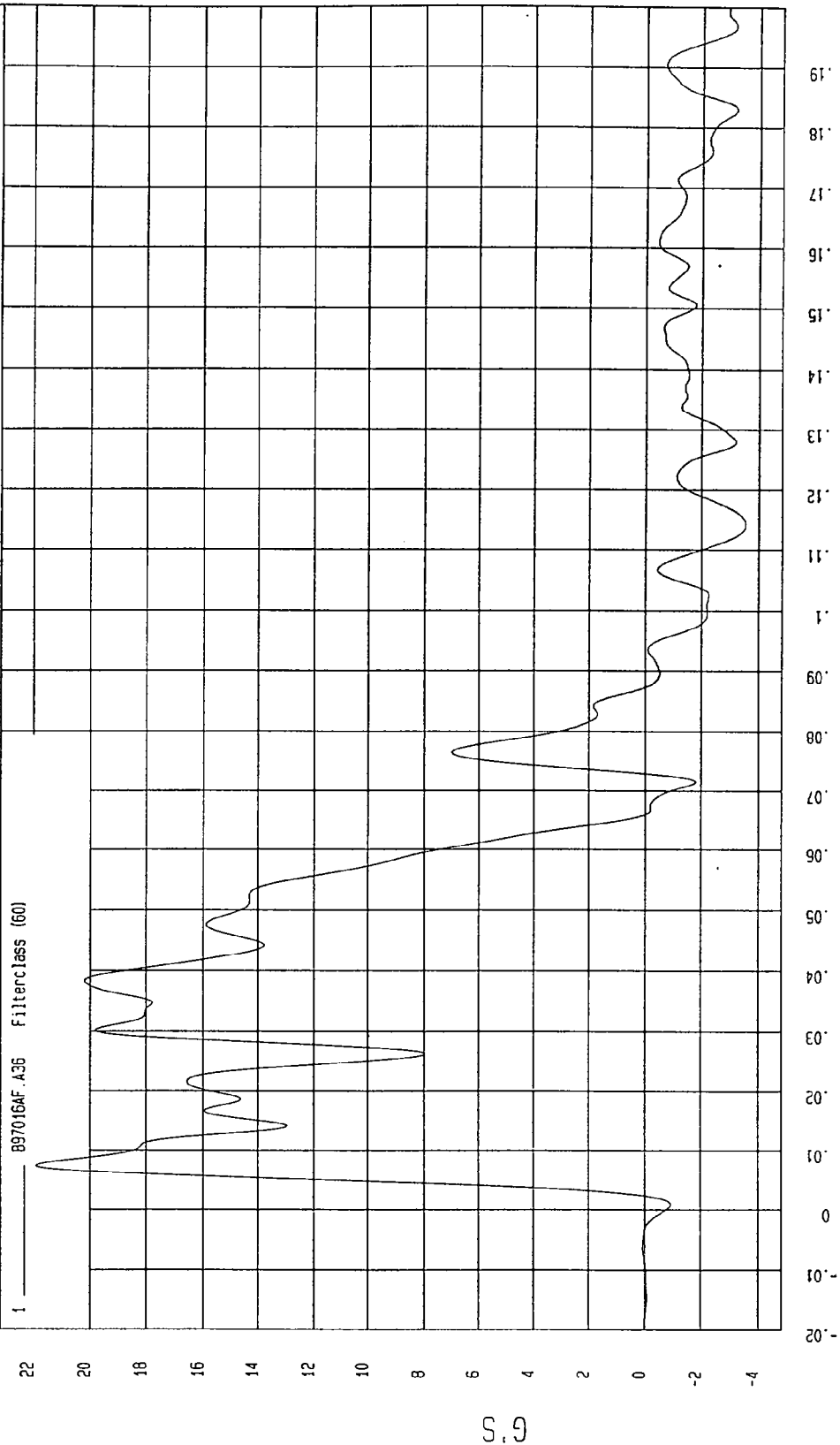
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -3.53 G's at 114 msec

Maximum = 21.88 G's at 8 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

1 897016AF.A36 Filterclass (60)



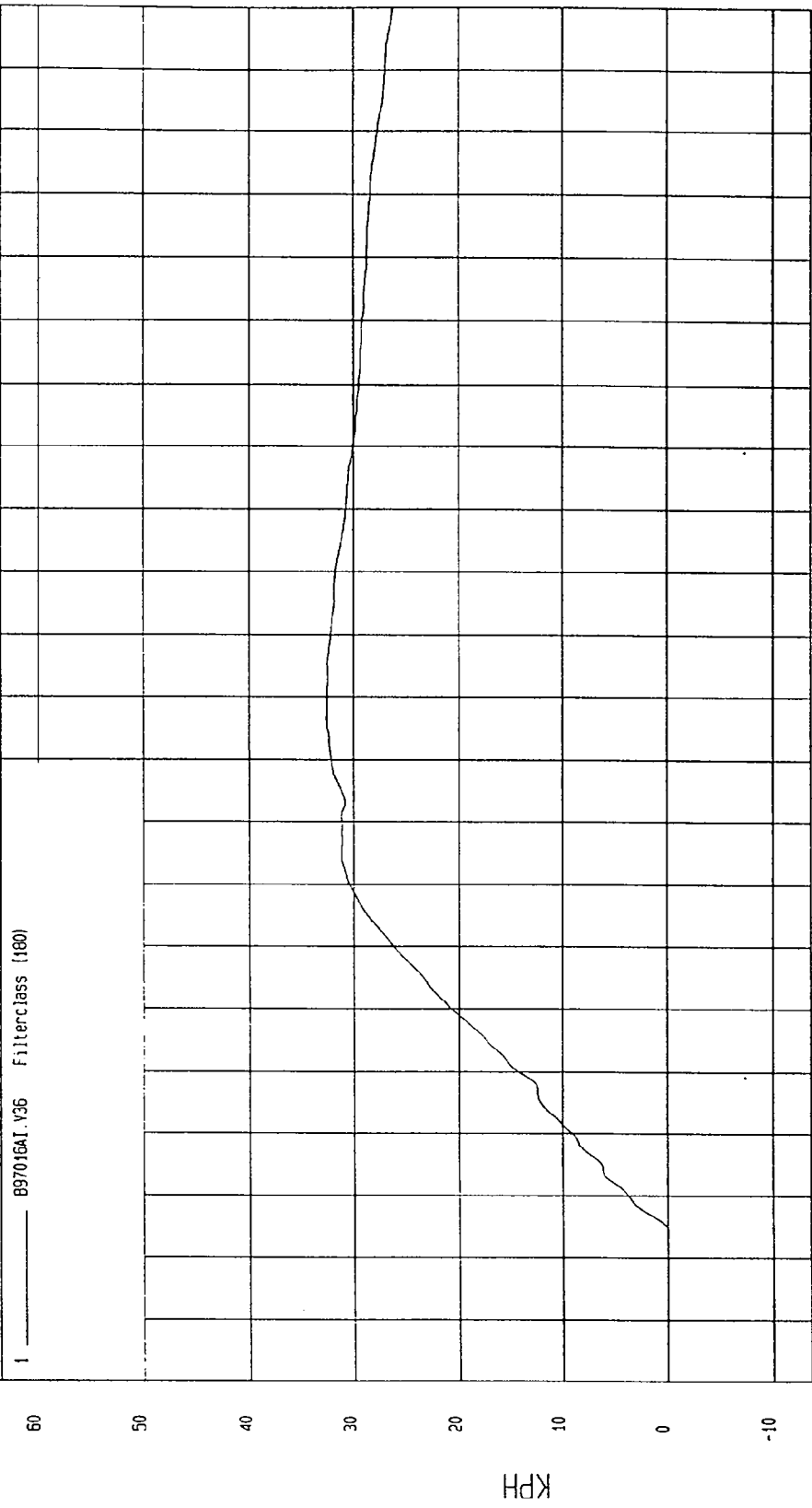
MCA Research
02-01-1997 16:30

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -4.56E-02 KPH at 4 msec Maximum = 32.58 KPH at 86 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY



TIME Seconds

MCA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

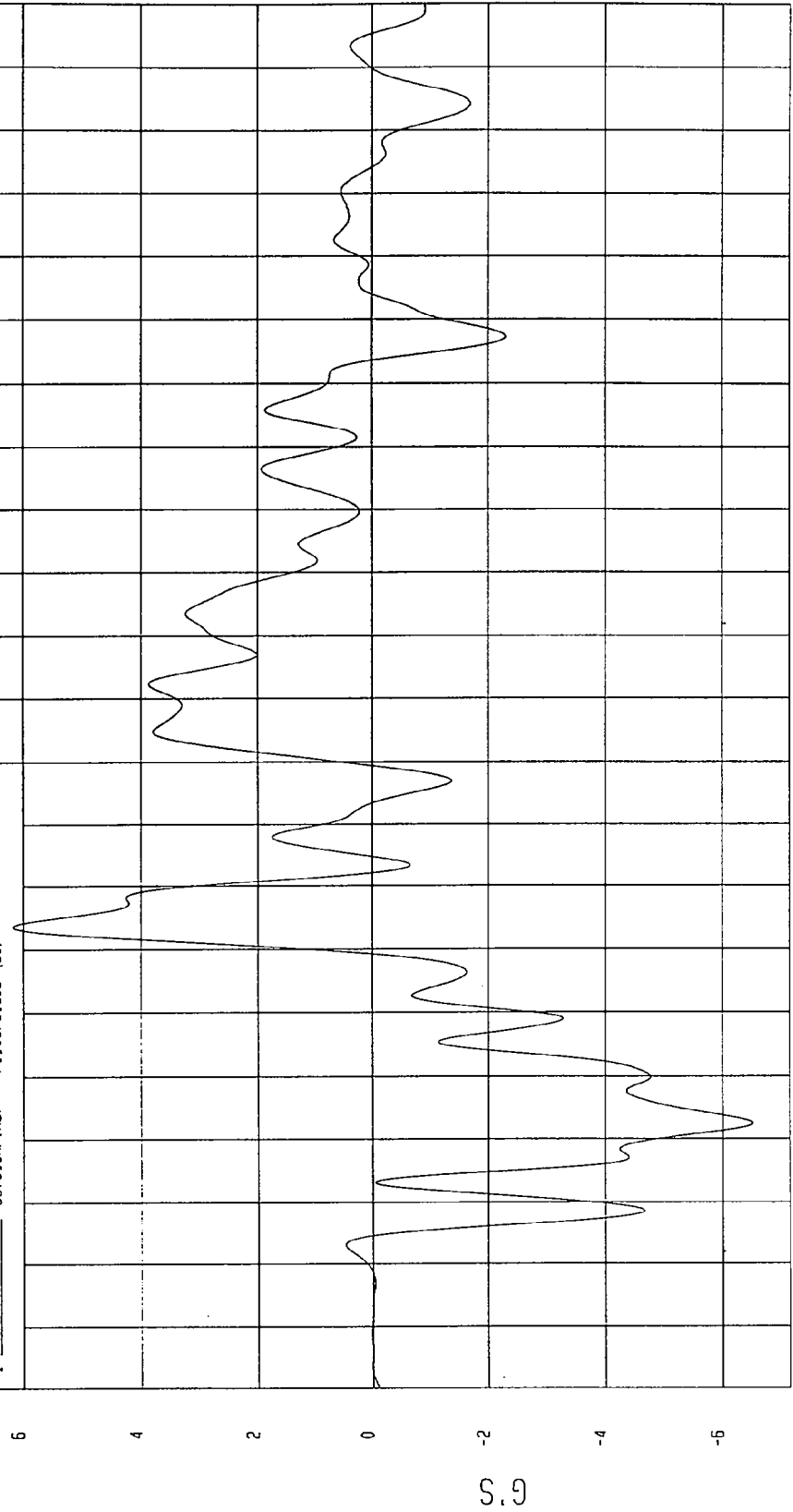
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 6.17 G'S at 54 msec

Minimum = -5.51 G'S at 22 msec

RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

1 897016AF.A37 Filterclass [60]



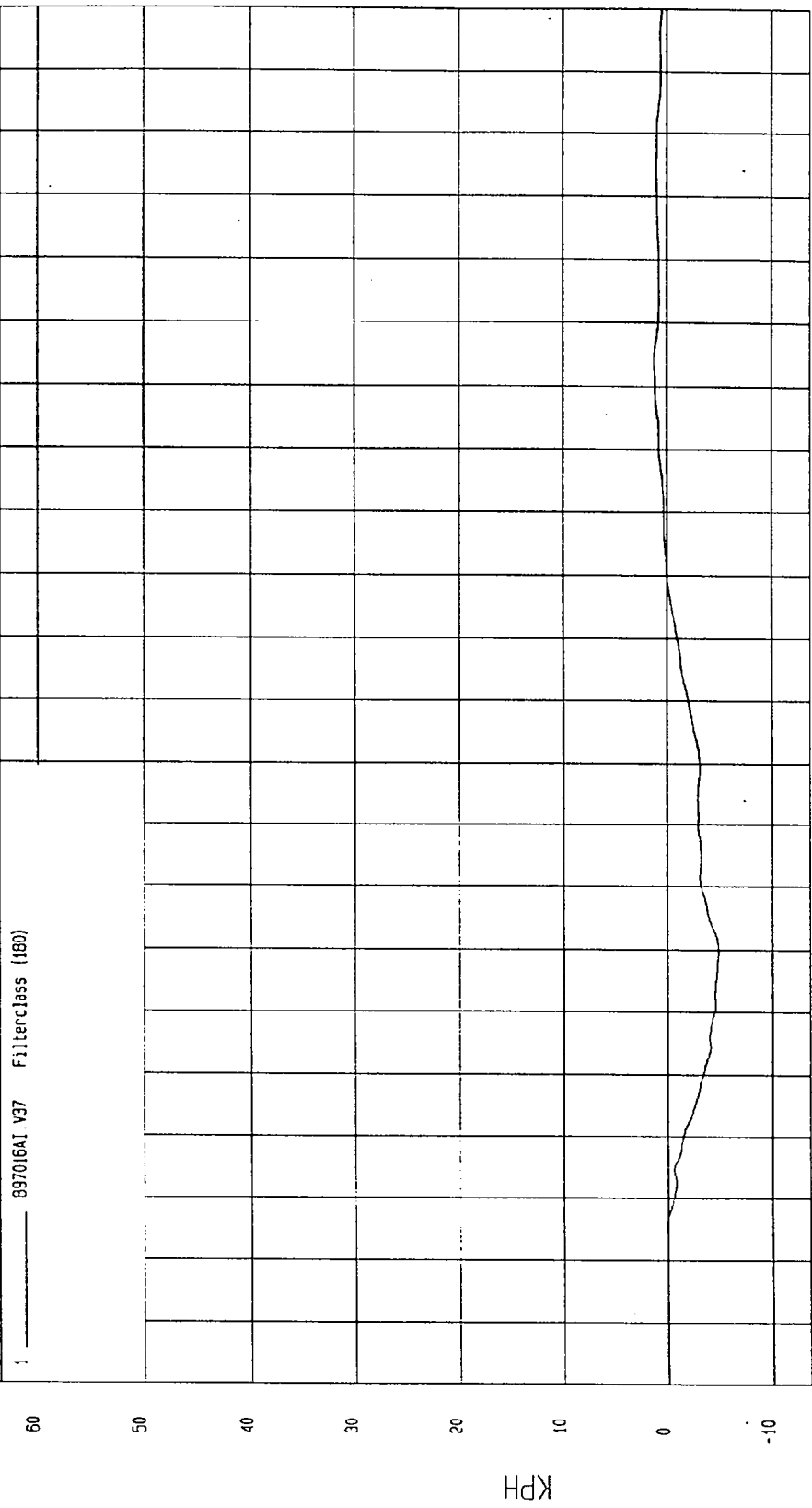
MCA Research
02-01-1997 15:30

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -4.84 KPH at 50 msec Maximum = 1.19 KPH at 144 msec

RIGHT SIDE SILL AT REAR SEAT Z VELOCITY



TIME Seconds

MCA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

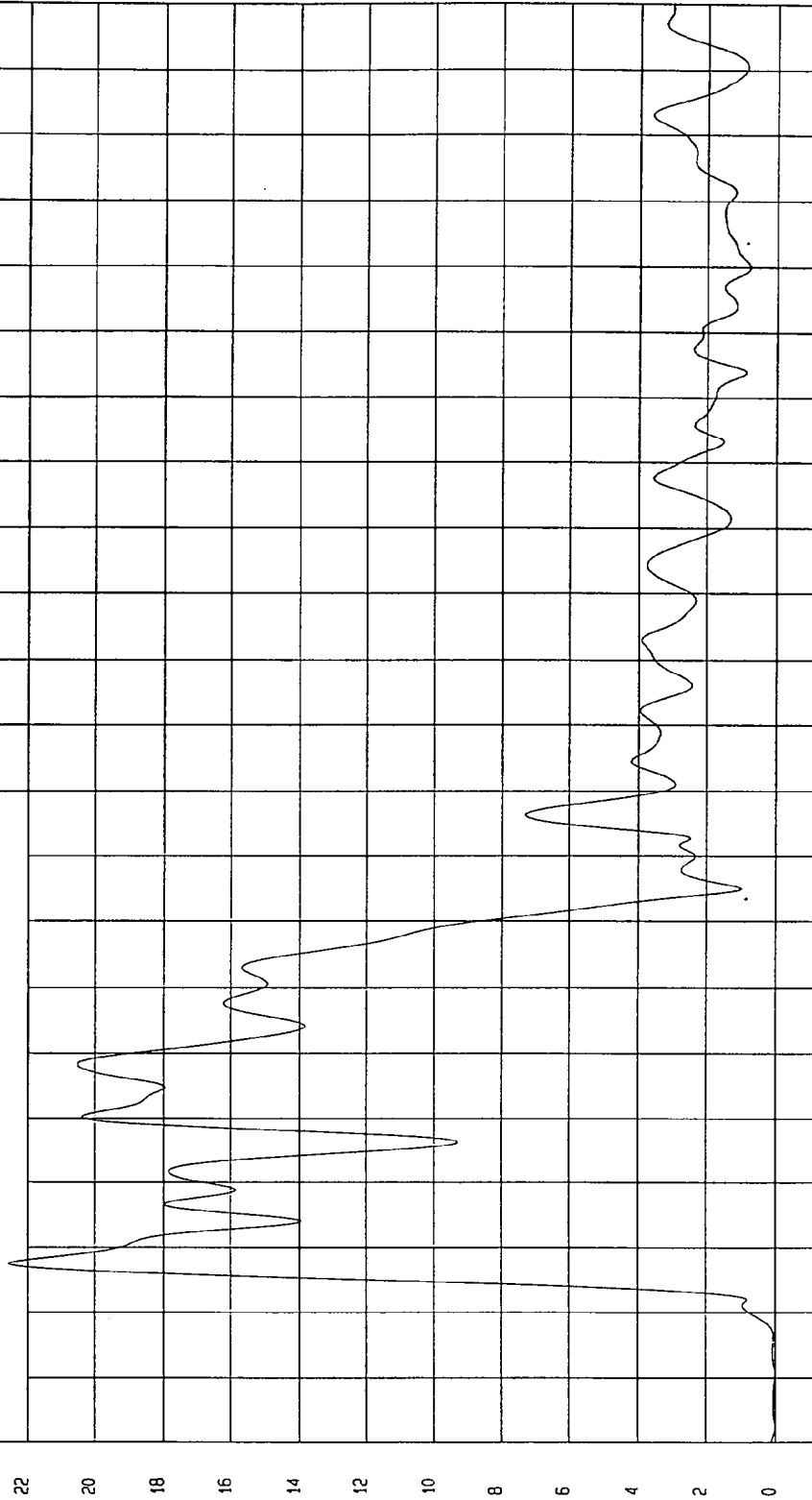
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = .00 G's at -18 msec

Maximum = 22.55 G's at 8 msec

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

1 — B97016AV.A35 Filterclass (60)



NSA Research
02-01-1997 16:33

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Speed: 37.9 MPH 61 KPH

Minimum = -72.85 G'S at 25 msec

Maximum = 96.88 G'S at 16 msec

DRIVER SEAT TRACK Y ACCELERATION

1 ——— B9701GAF.A40 Filterclass (60)

100

80

60

40

20

0

-20

-40

-60

-80

G

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

NCA Research
02-01-1997 16:30

TIME (SECONDS)

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

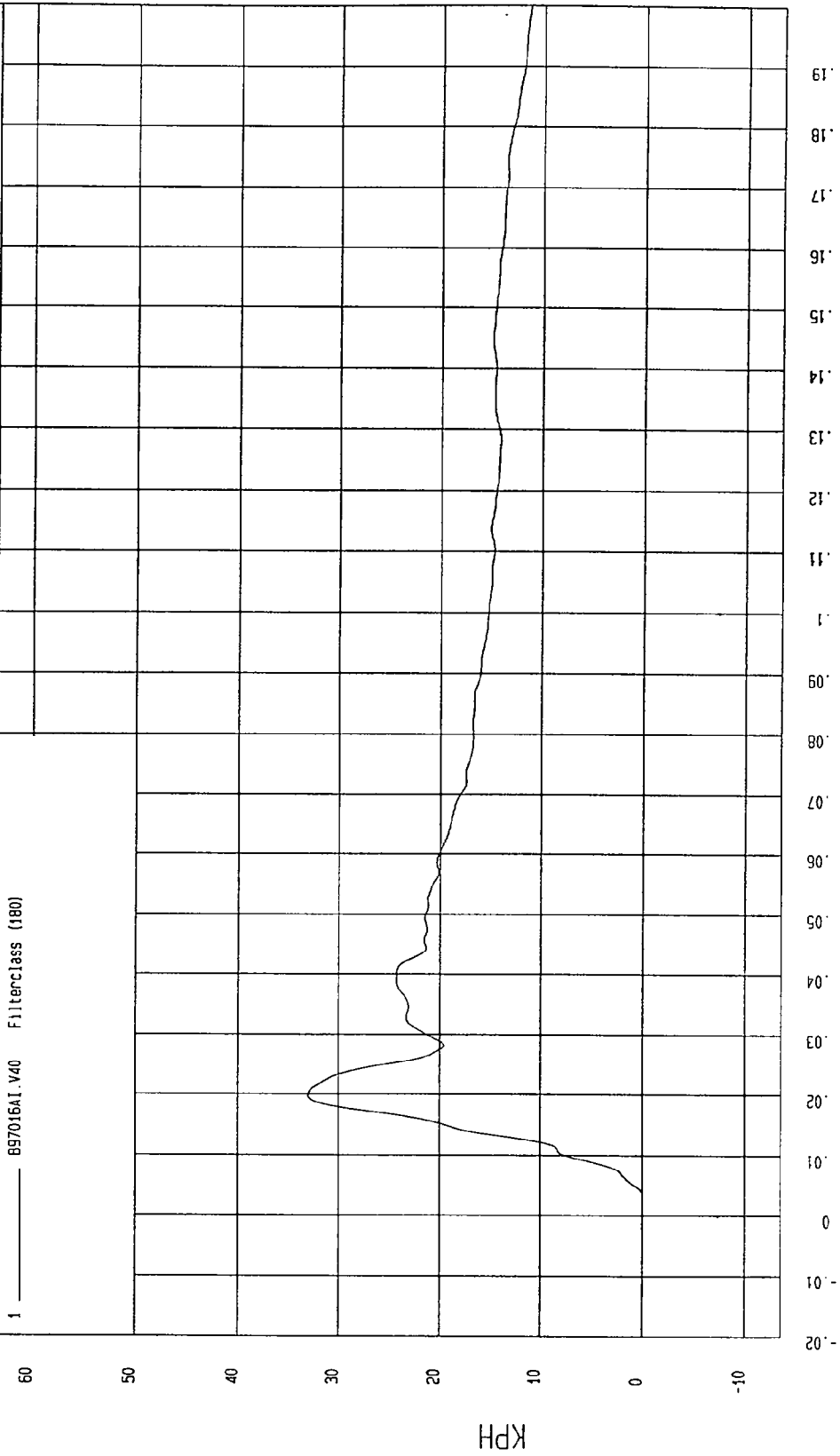
Speed: 37.9 MPH 61 KPH

Minimum = -4.34E-02 KPH at 3 msec

Maximum = 33.05 KPH at 20 msec

DRIVER SEAT TRACK Y VELOCITY

1 ——— B97016A1.V40 Filterclass (180)



MSA Research
02-01-1997 16:26

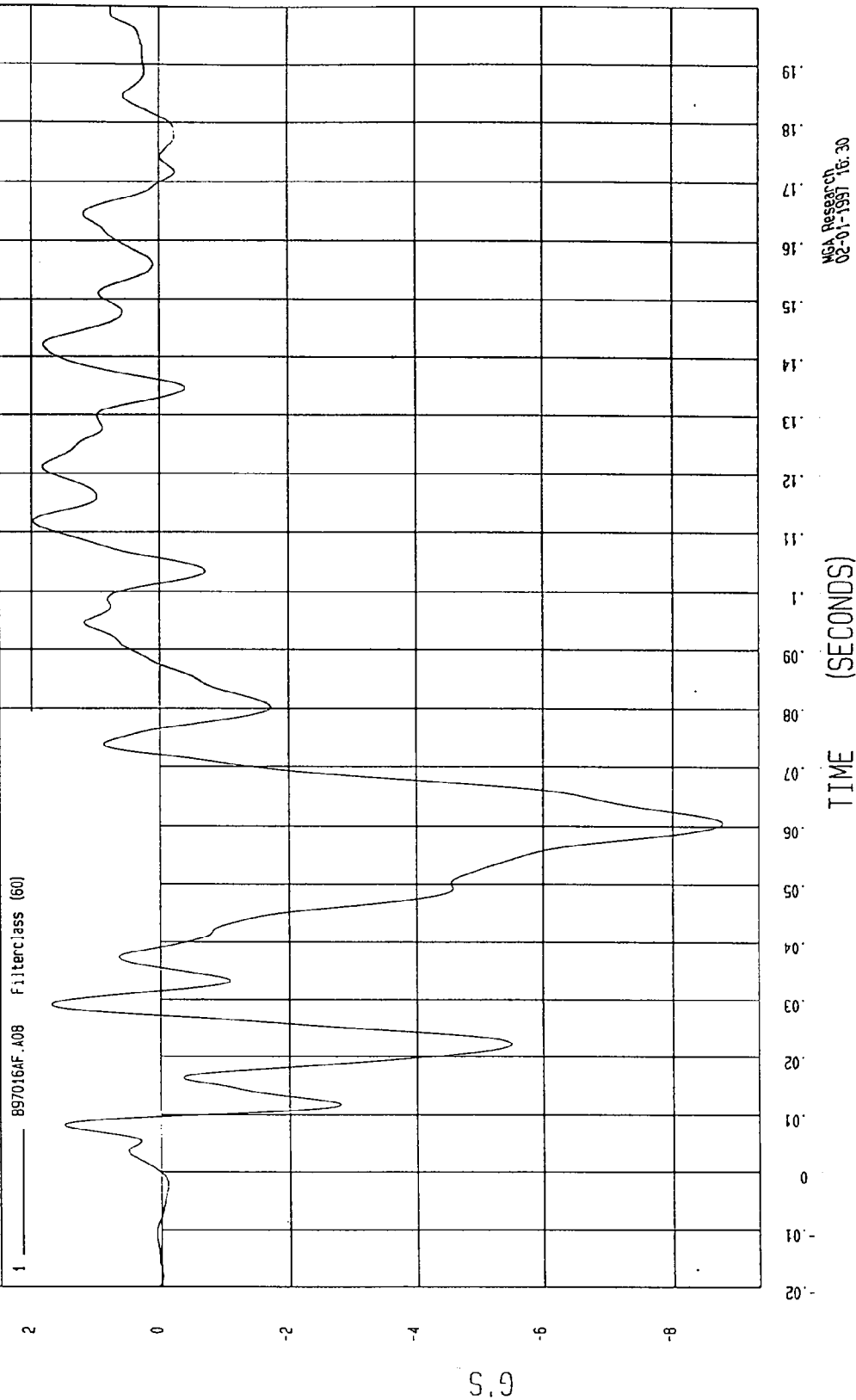
TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -8.76 G'S at 61 msec Maximum = 1.97 G'S at 112 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION



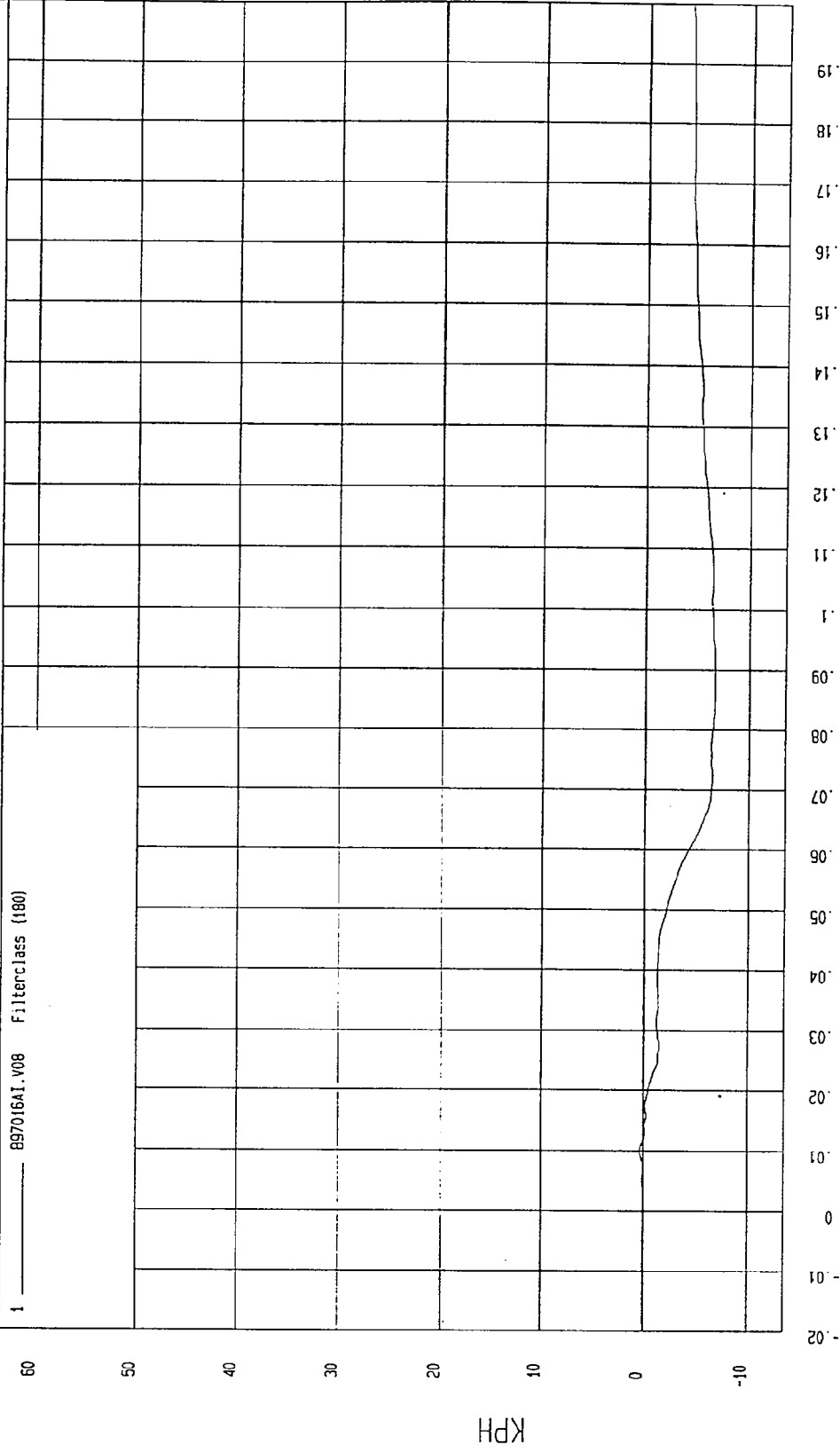
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -6.75 KPH at 87 msec
Maximum = .37 KPH at 10 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY

1 ——— 897016AI.V08 Filterclass (180)



MCA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

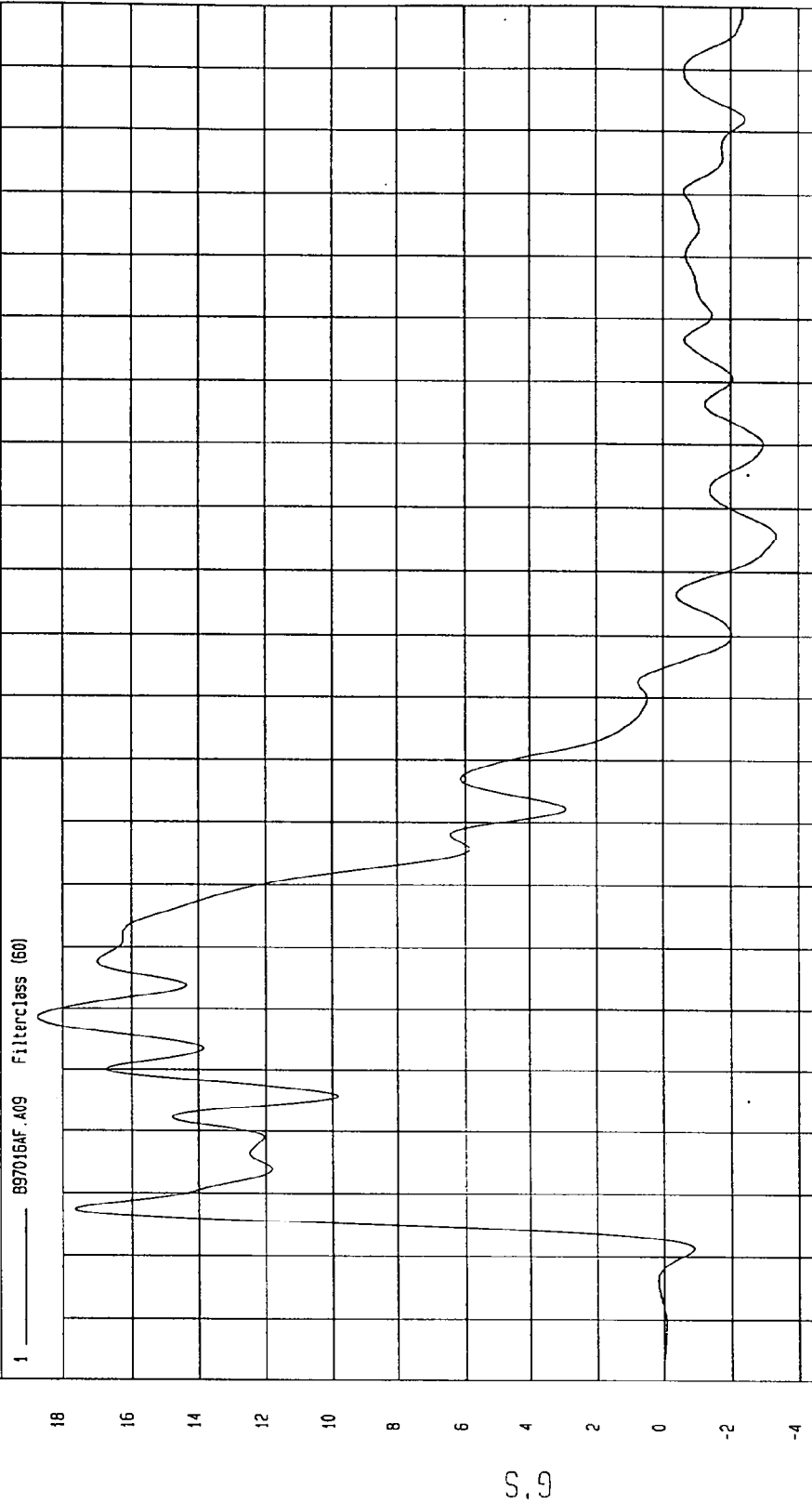
Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 18.73 G'S at 39 msec

Minimum = -3.34 G'S at 116 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION



MGA Research
02-01-1997 16:30

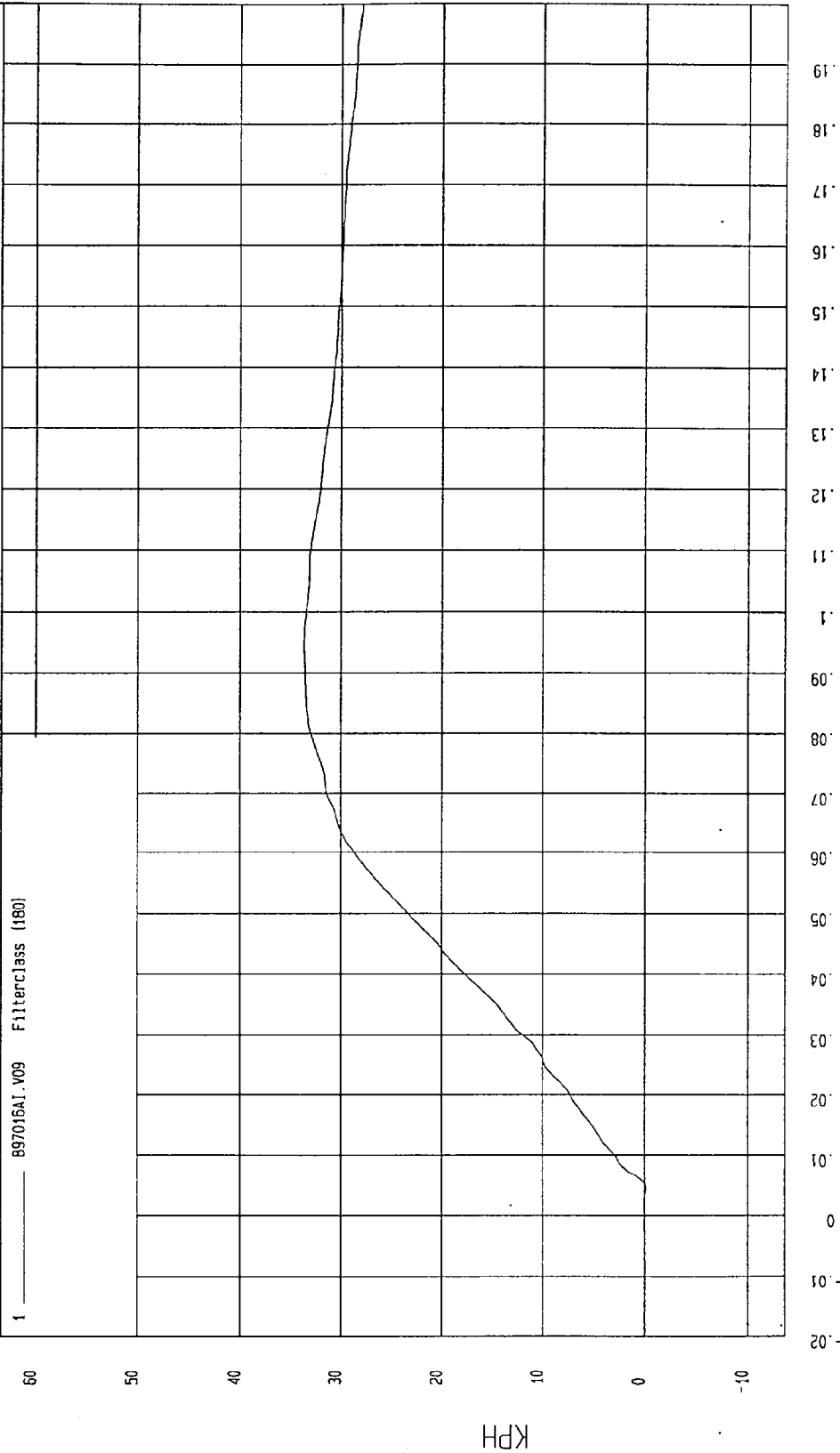
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

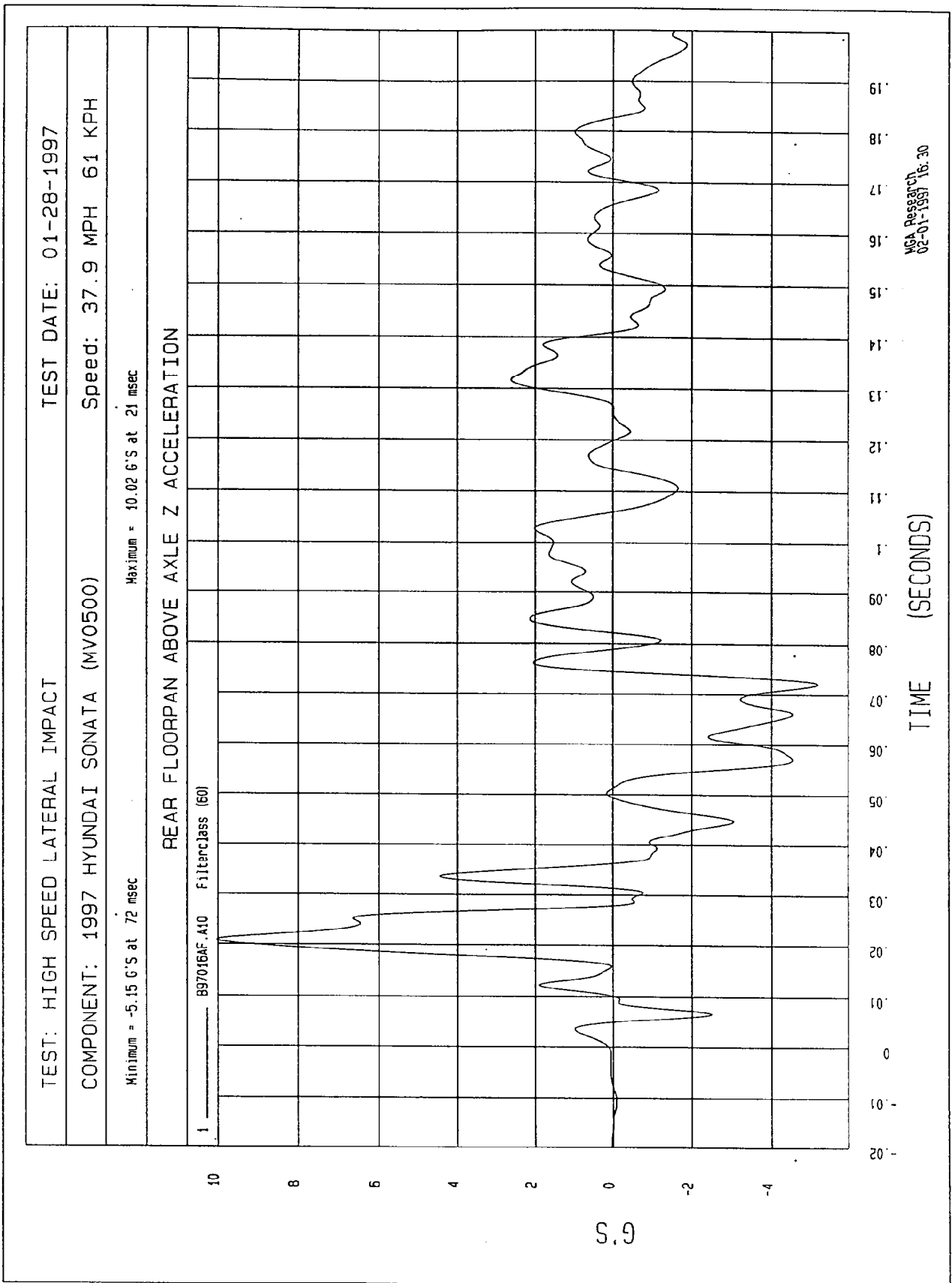
Minimum = -10 KPH at 4 msec Maximum = 33.70 KPH at 94 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY

1 B97016A1.V09 FilterClass (180)



MGA Research
02-01-1997 16:25



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 3.00 KPH at 35 msec

Minimum = -62 KPH at 74 msec

REAR FLOORPAN ABOVE AXLE Z VELOCITY

1 _____ B97016A1.V10 Filterclass (180)

60

50

40

30

20

10

0

-10

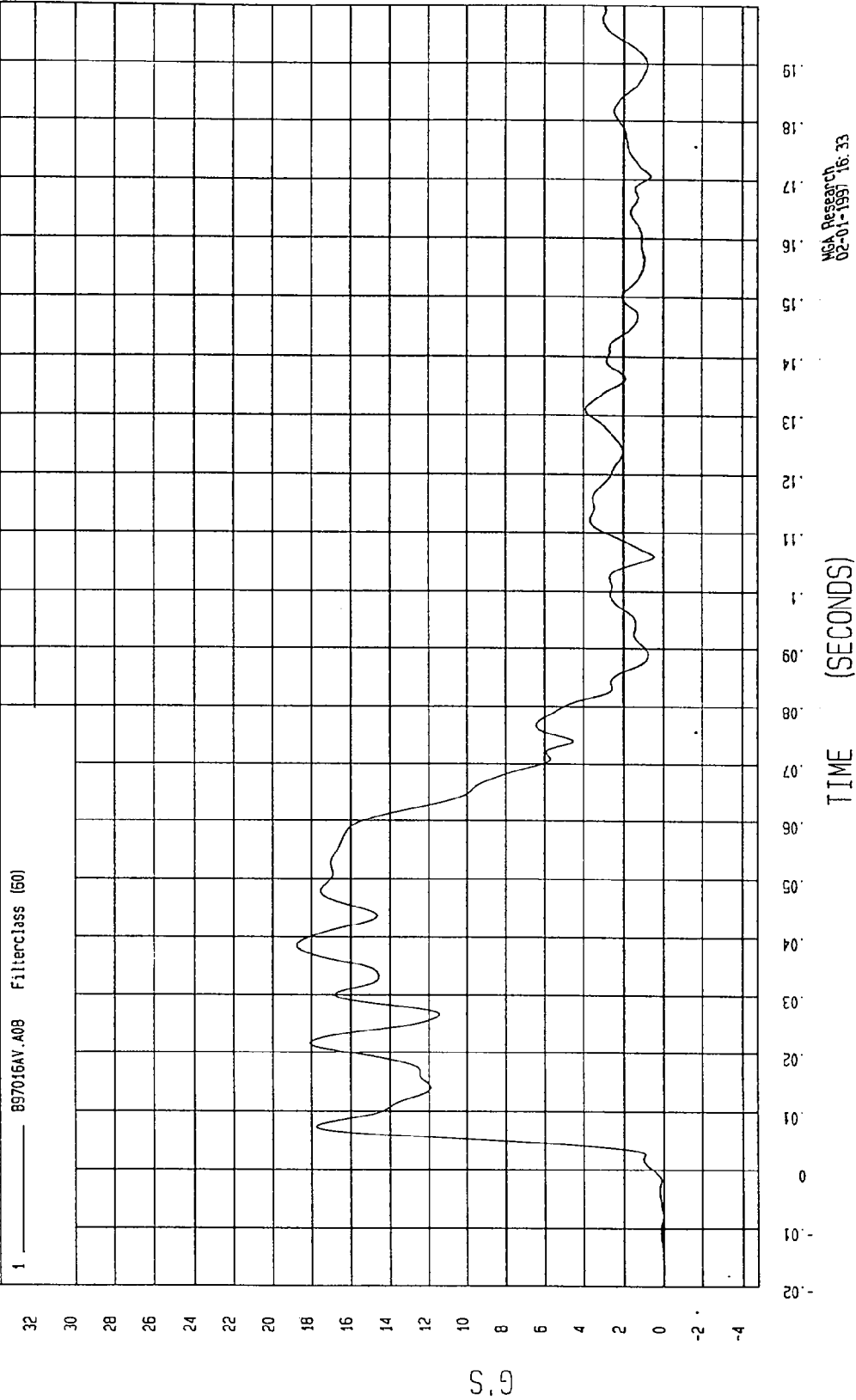
KPH

TIME Seconds

NGA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH
Minimum = 7.52E-03 G'S at -8 msec Maximum = 18.76 G'S at 39 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

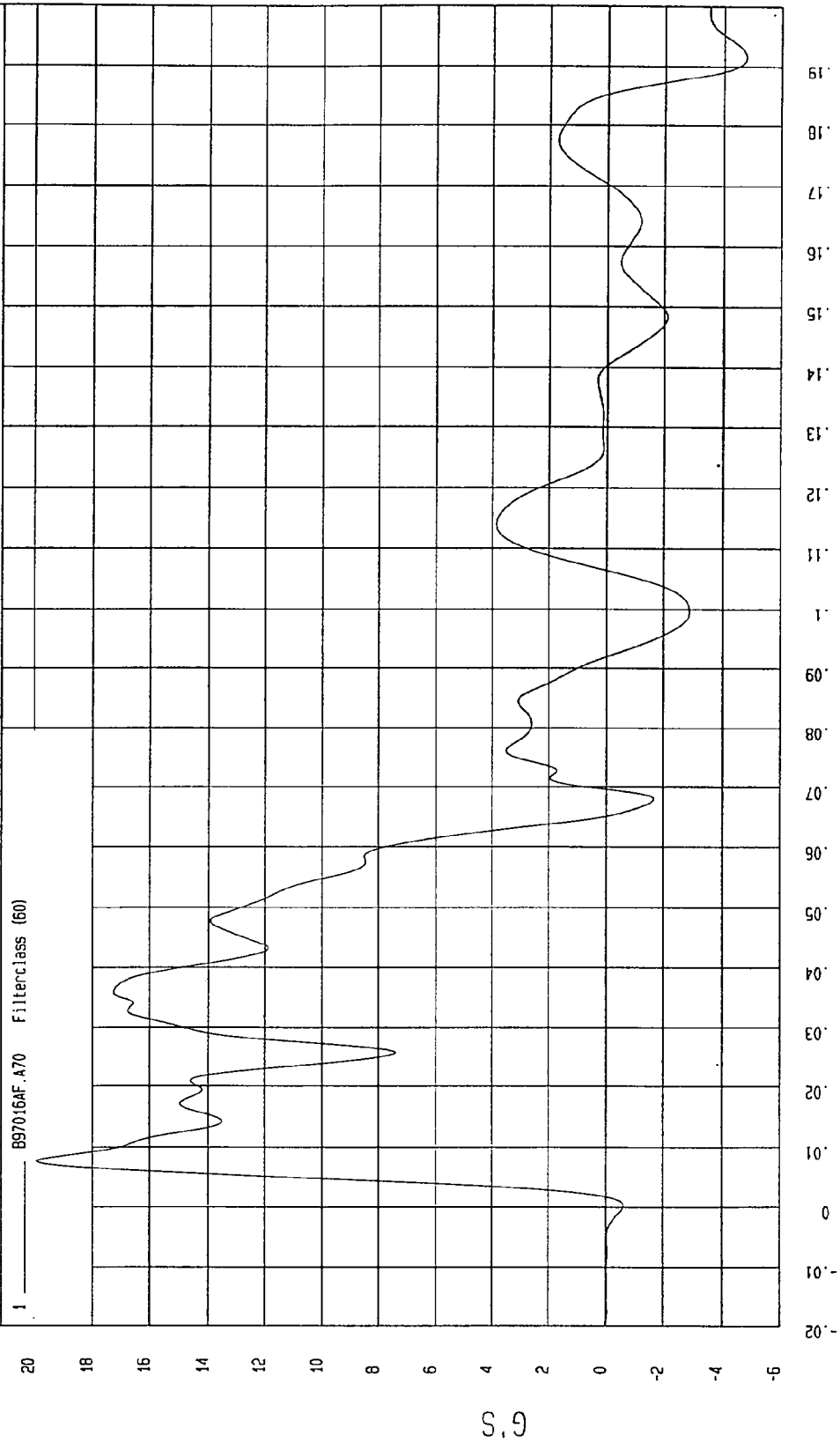
Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 19.90 G'S at 8 msec

Minimum = -4.77 G'S at 192 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION



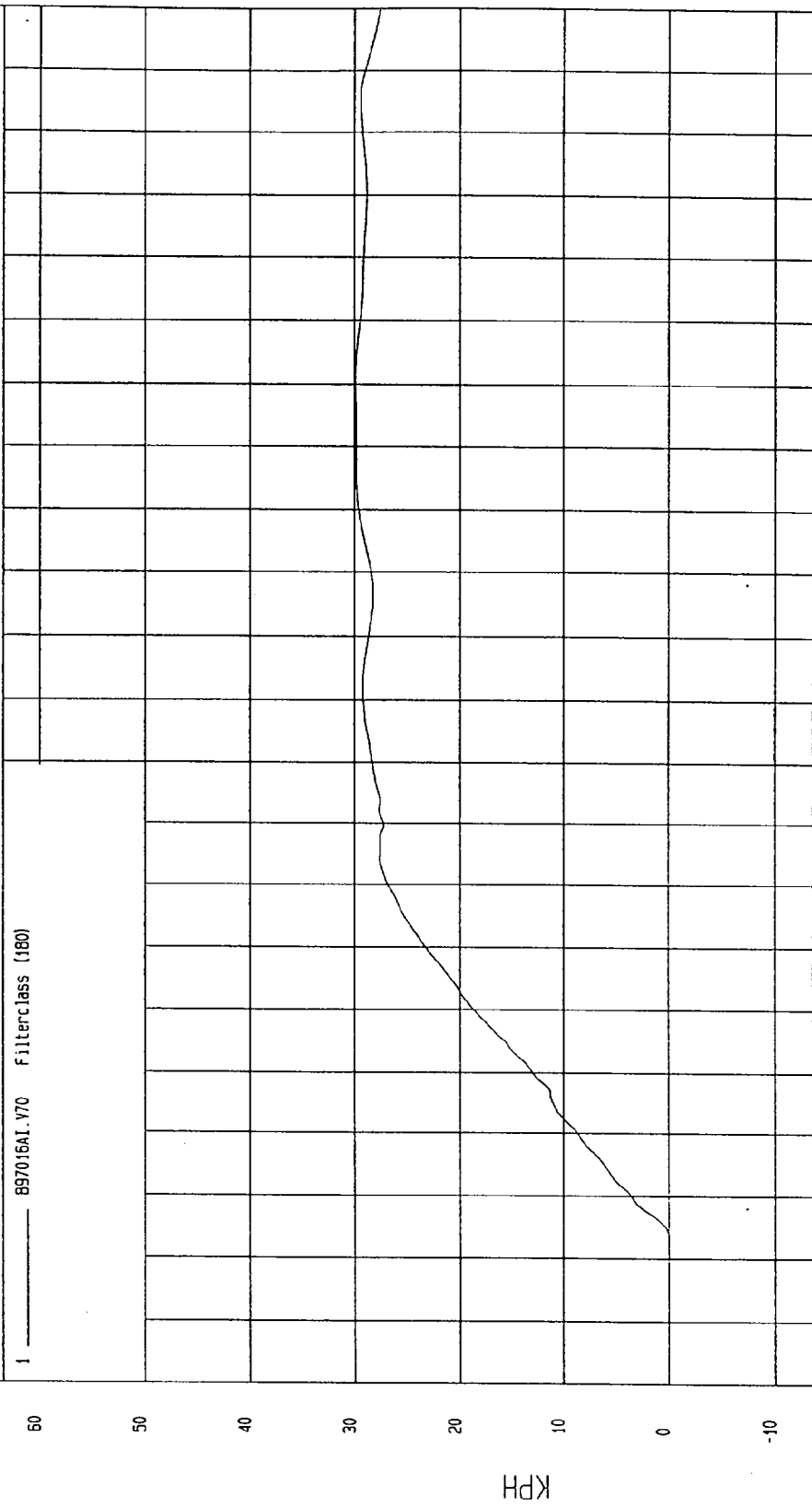
MCA Research
02-01-1997 16:30

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -2.38E-02 KPH at 3 msec Maximum = 29.90 KPH at 141 msec

RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY

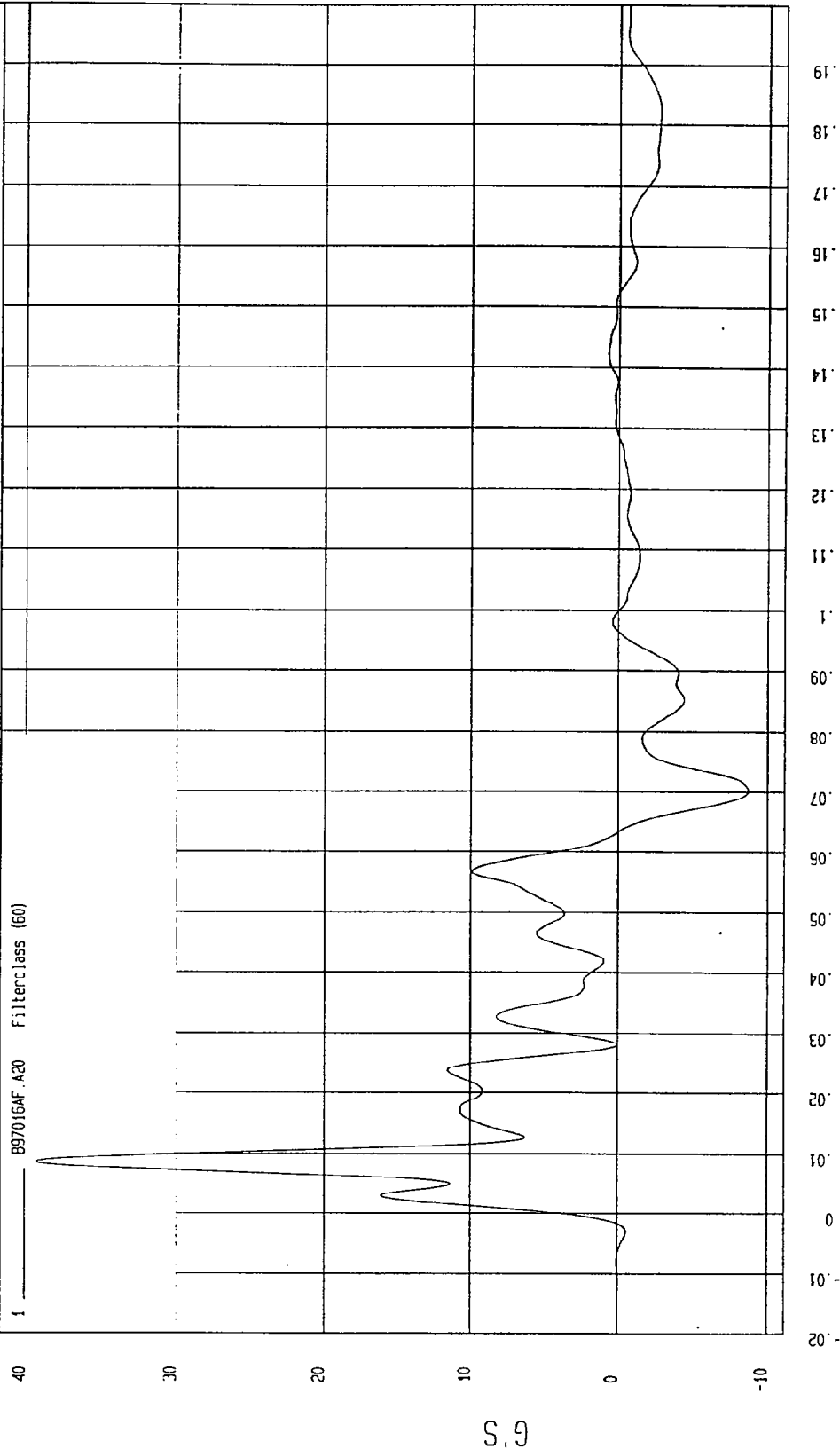


TIME Seconds

MCA Research
02-01-1997 16:26

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH
Minimum = -8.71 G'S at 70 msec Maximum = 39.27 G'S at 9 msec

LEFT LOWER A-POST Y ACCELERATION



MCA Research
02-02-1997 17:07

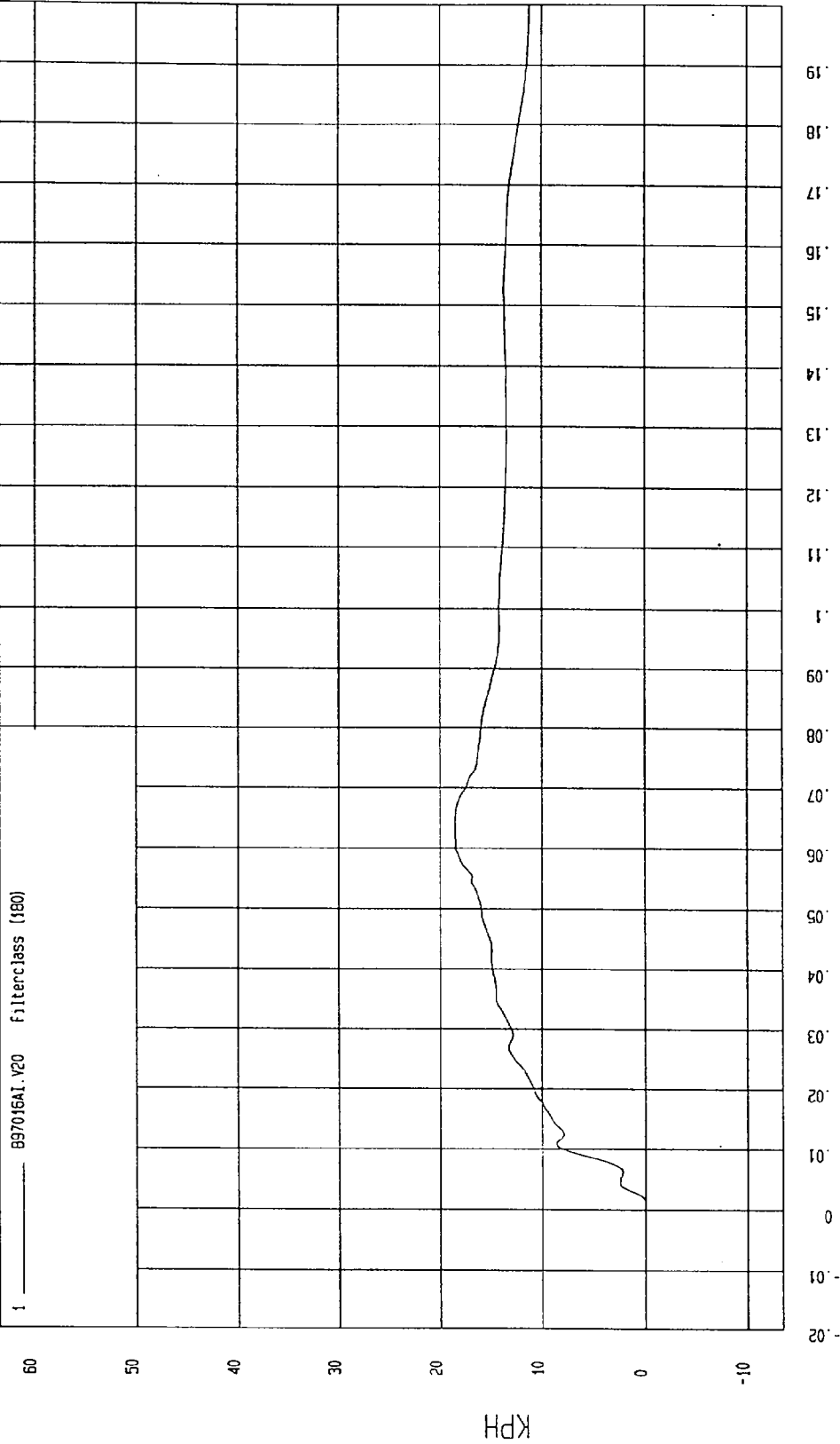
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -6.35E-03 KPH at -9 msec Maximum = 18.54 KPH at 64 msec

LEFT LOWER A-POST Y VELOCITY

1 ——— 897016A1.V20 Filterclass (180)



MSA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

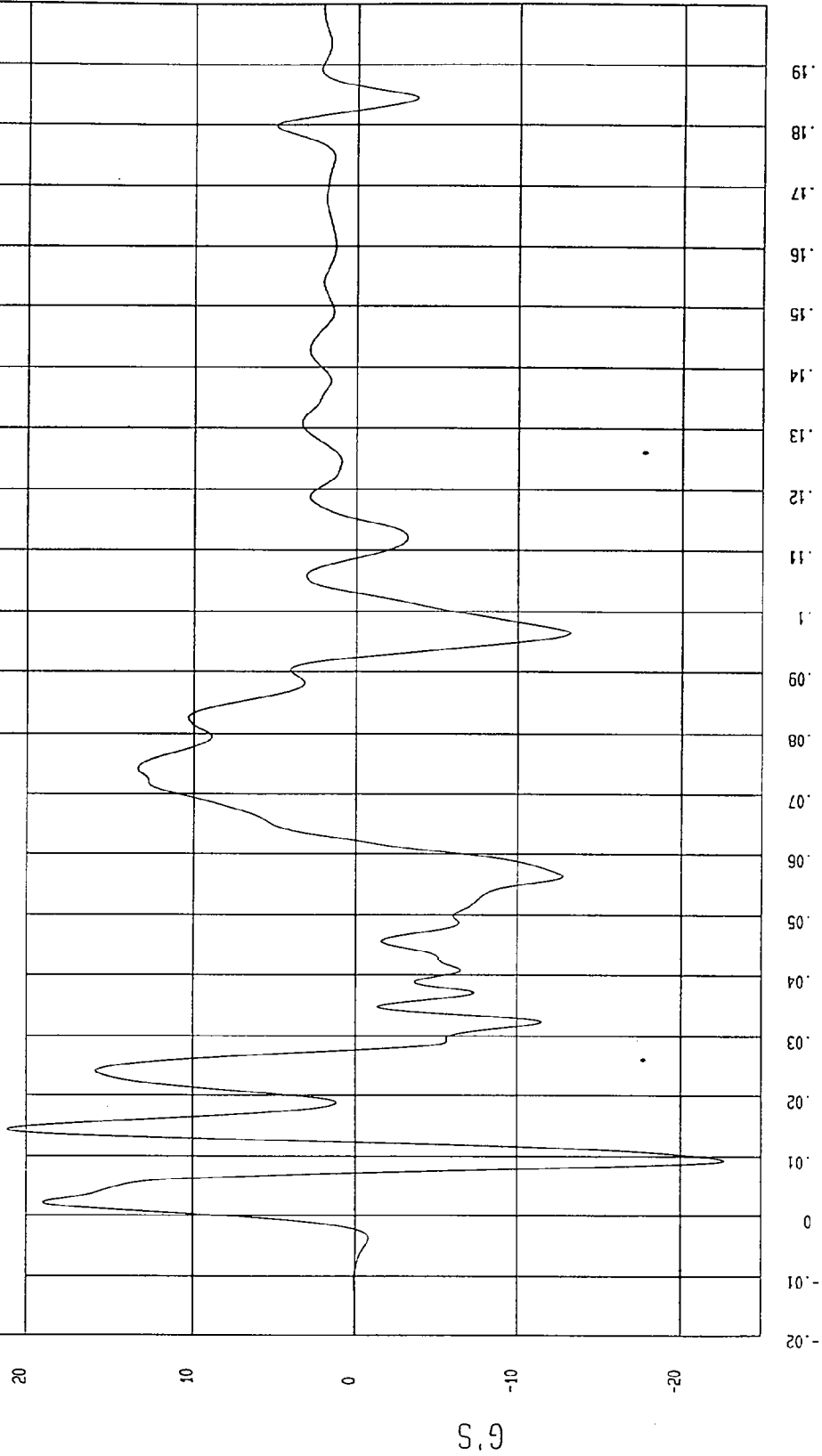
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 21.12 G'S at 14 msec

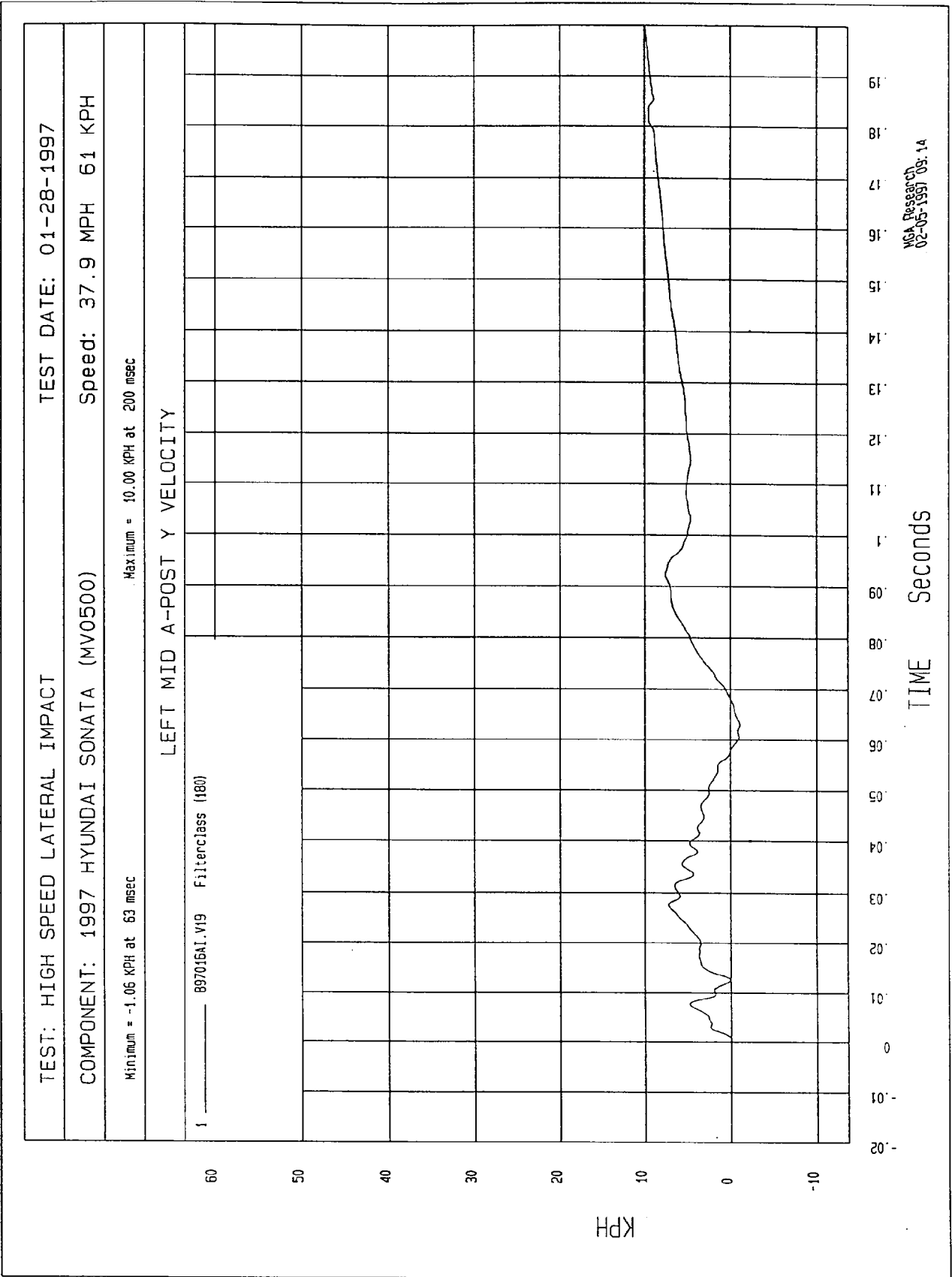
Minimum = -22.53 G'S at 9 msec

LEFT MID A-POST Y ACCELERATION

1 897016AF.A19 Filterclass (60)



MCA Research
02-05-1997 09.03



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -21.09 G'S at 12 msec Maximum = 88.18 G'S at 5 msec

LEFT LOWER B-POST Y ACCELERATION

1 ——— B97016AF.A30 Filterclass (60)

80

60

40

20

0

-20

G'S

TIME (SECONDS)

MCA Research
02-02-1997 17:07

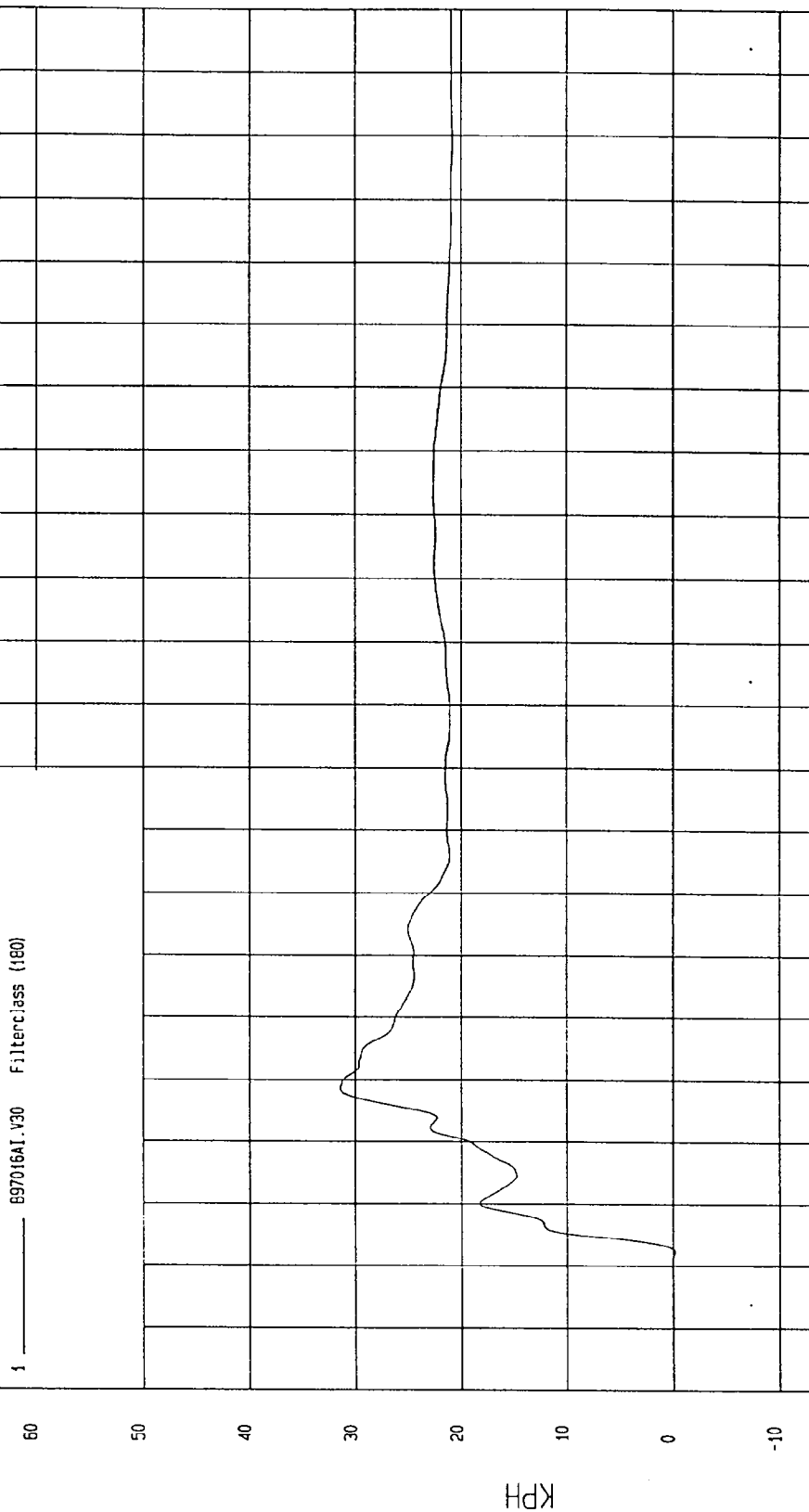
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -16 KPH at 2 msec Maximum = 31.47 KPH at 29 msec

LEFT LOWER B-POST Y VELOCITY

1 897016AI.V30 Filterclass (180)



MCA Research
02-01-1997 16:26

TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -65.69 G'S at 31 msec
Maximum = 165.32 G'S at 6 msec

LEFT MID B-POST Y ACCELERATION

1 097016AF A29 Filterclass (60)

180

160

140

120

100

80

60

40

20

0

-20

-40

-60

G.S

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

TIME (SECONDS)

WCA Research
02-02-1997 11:07

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

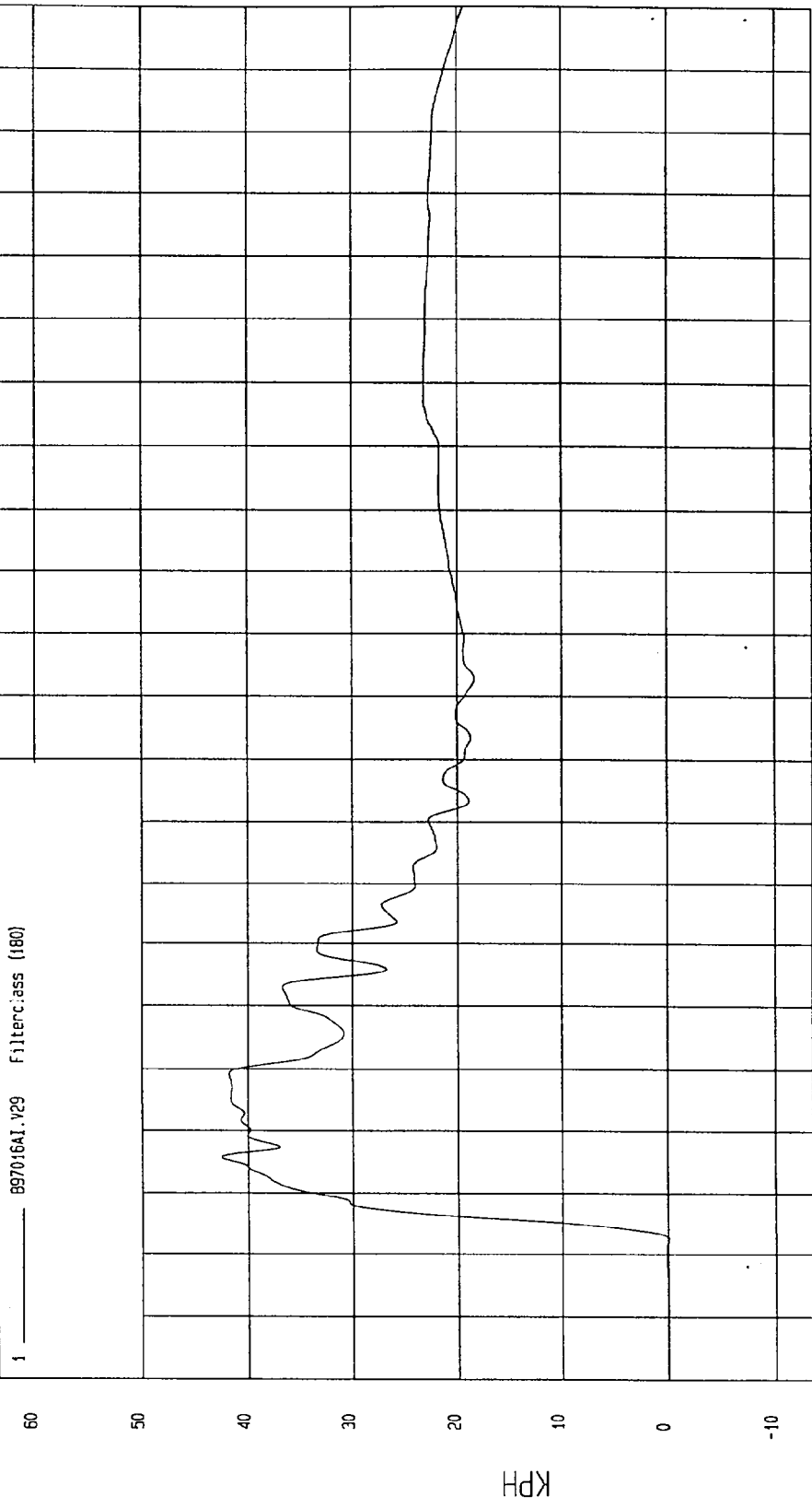
Speed: 37.9 MPH 61 KPH

Minimum = -7.34E-02 KPH at 2 msec

Maximum = 42.54 KPH at 16 msec

LEFT MID B-POST Y VELOCITY

1 — 897016A1.V29 Filter: class (180)



TIME Seconds

MCA Research
02-01-1997 16:26

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

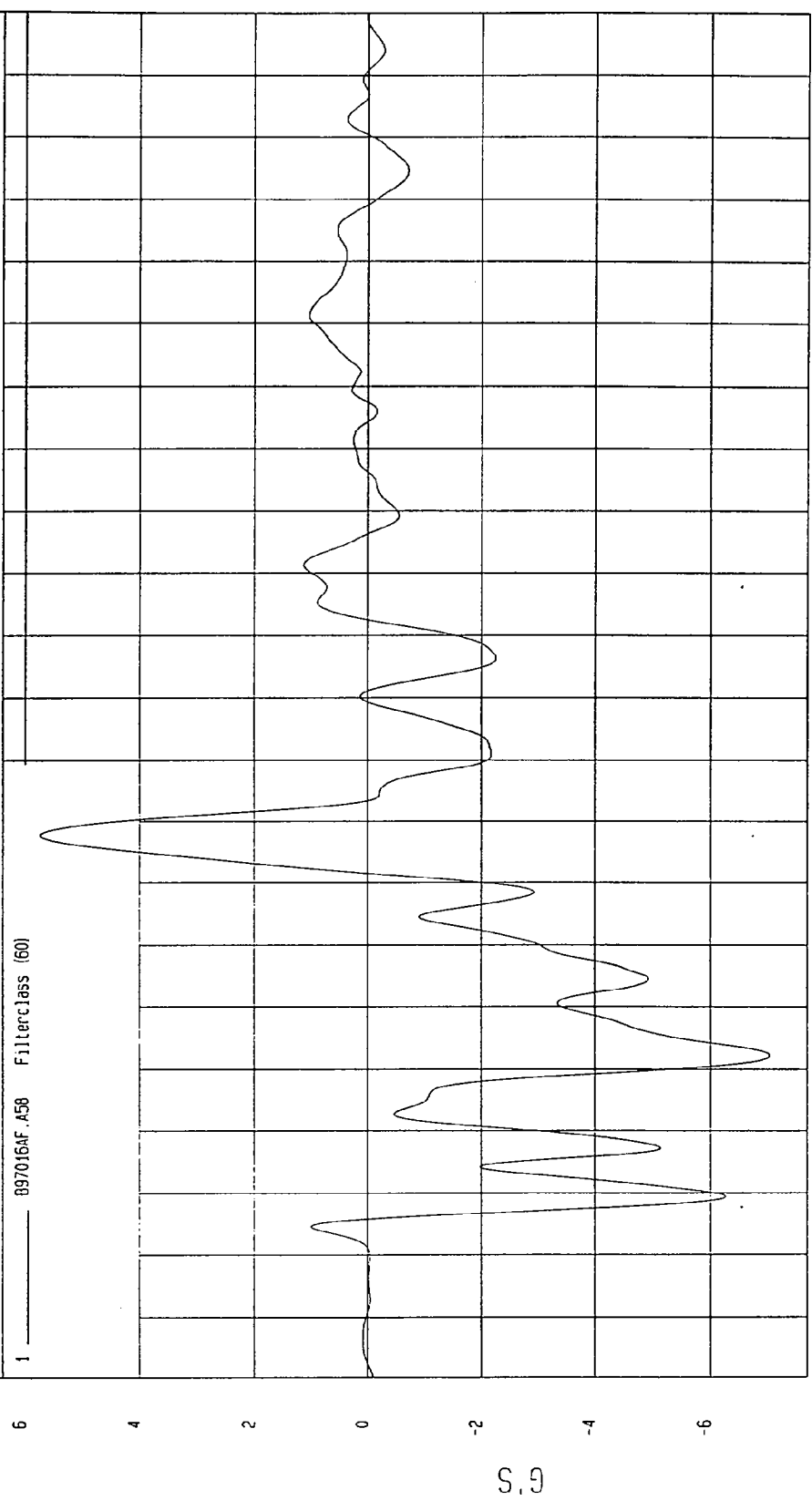
Speed: 37.9 MPH 61 KPH

Minimum = -5.99 G'S at 32 msec

Maximum = 5.74 G'S at 68 msec

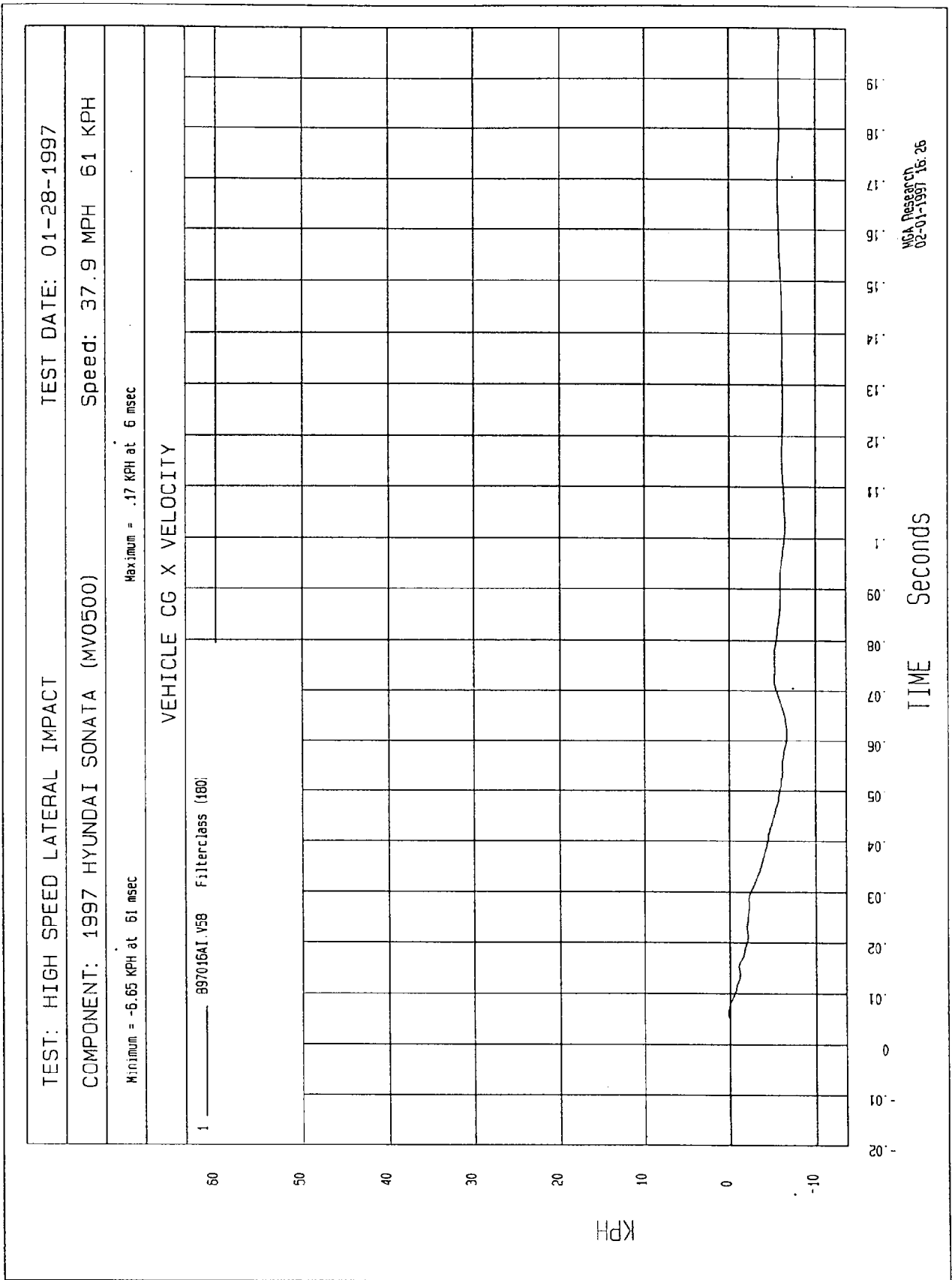
VEHICLE CG X ACCELERATION

1 897016AF.A58 Filterclass (60)



TIME (SECONDS)

MCA Research
02-01-1997 16:31

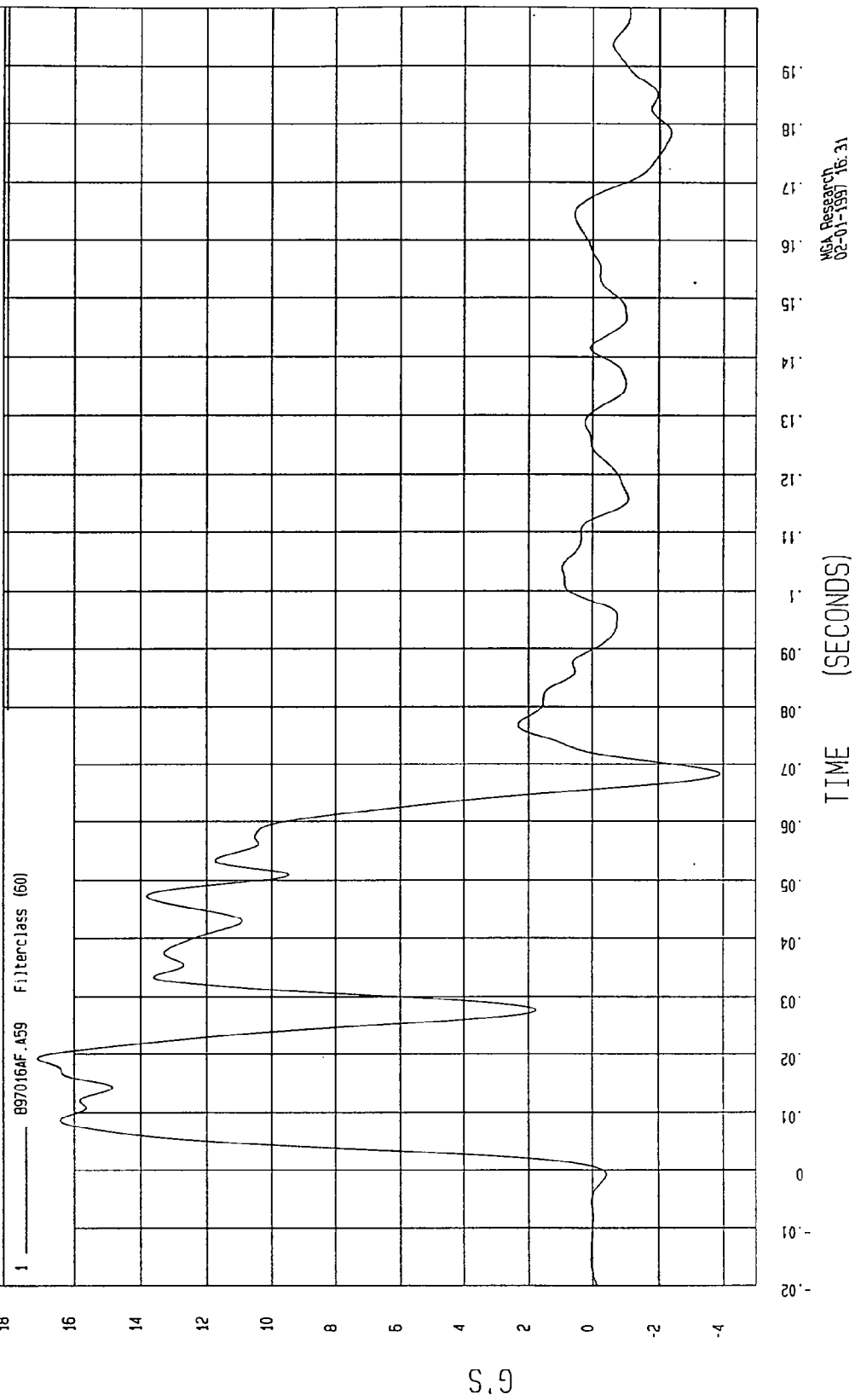


TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -3.90 G'S at 68 msec Maximum = 17.09 G'S at 19 msec

VEHICLE CG Y ACCELERATION



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

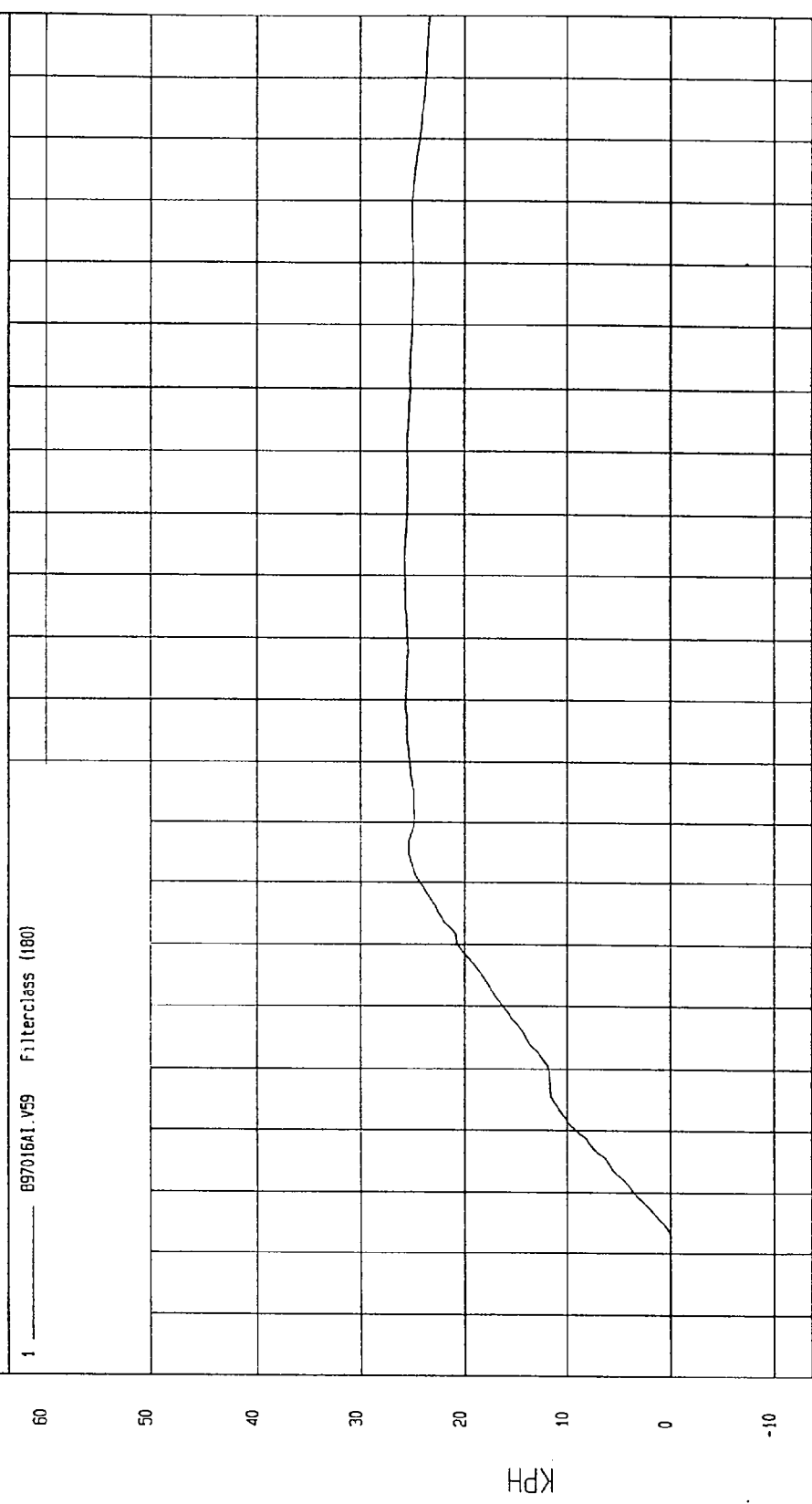
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 25.73 KPH at 113 msec

Minimum = -3.91E-03 KPH at -18 msec

VEHICLE CG Y VELOCITY

1 ——— 897016A1.V59 Filterclass (180)



TIME Seconds
MCA Research
02-01-1997 16:26

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

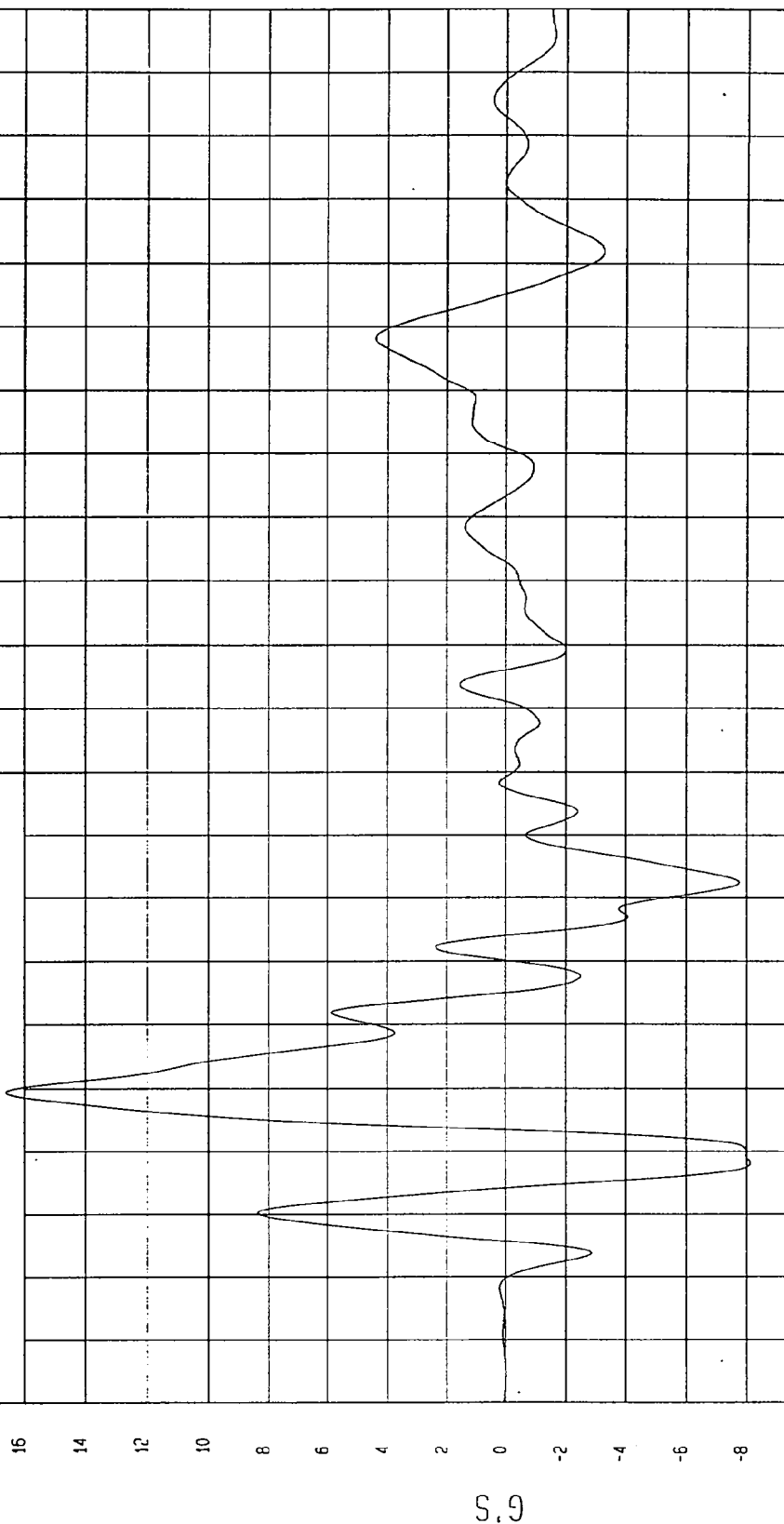
COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 16.59 G'S at 29 msec

Minimum = -8.11 G'S at 18 msec

VEHICLE CG Z ACCELERATION

1 897016AF.A60 Filterclass (60)



MSA Research
02-01-1997 16:31

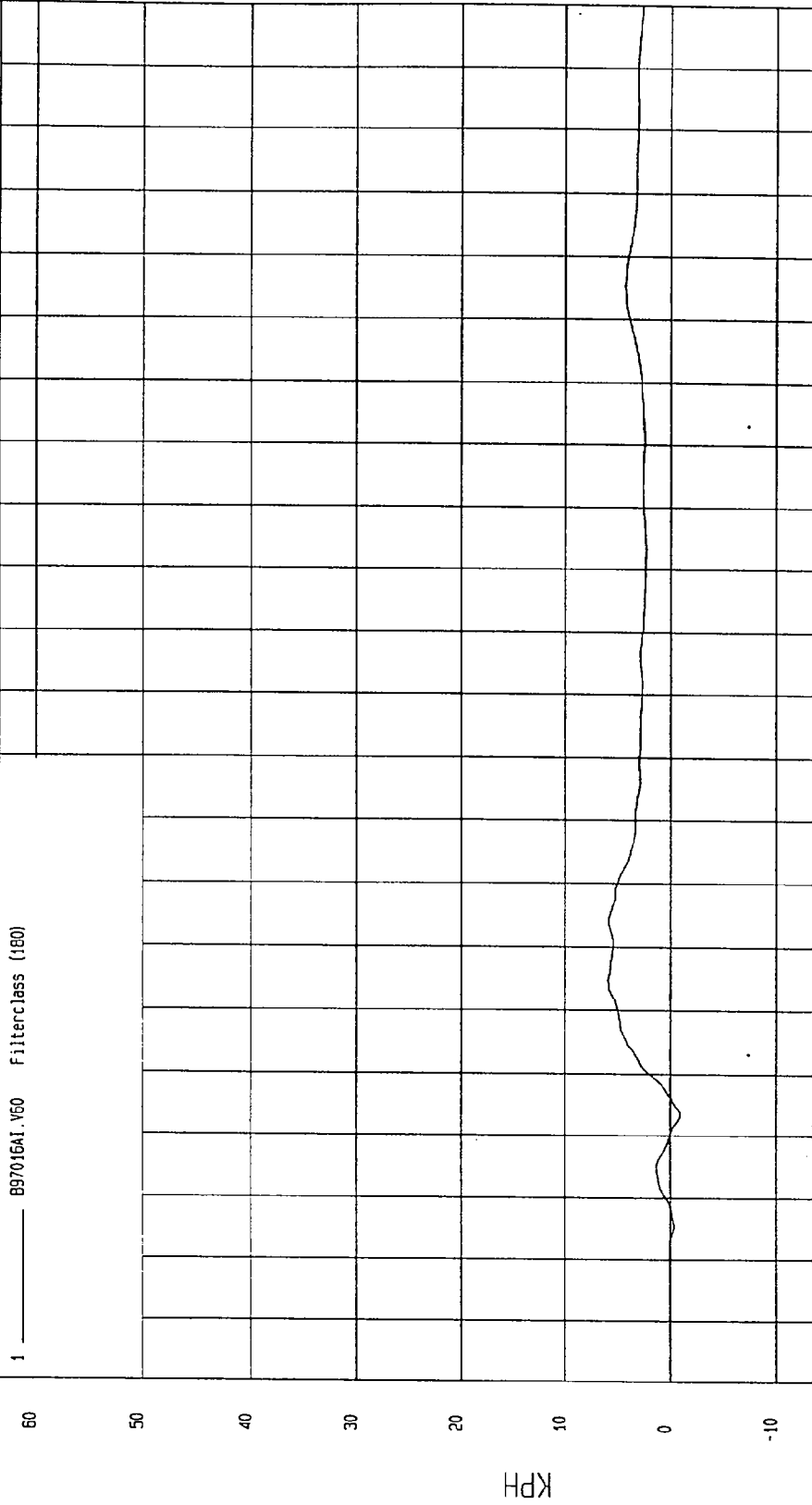
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -.94 KPH at 24 msec Maximum = 5.87 KPH at 45 msec

VEHICLE CG Z VELOCITY

1 ——— B97016A1.V50 Filterclass (180)



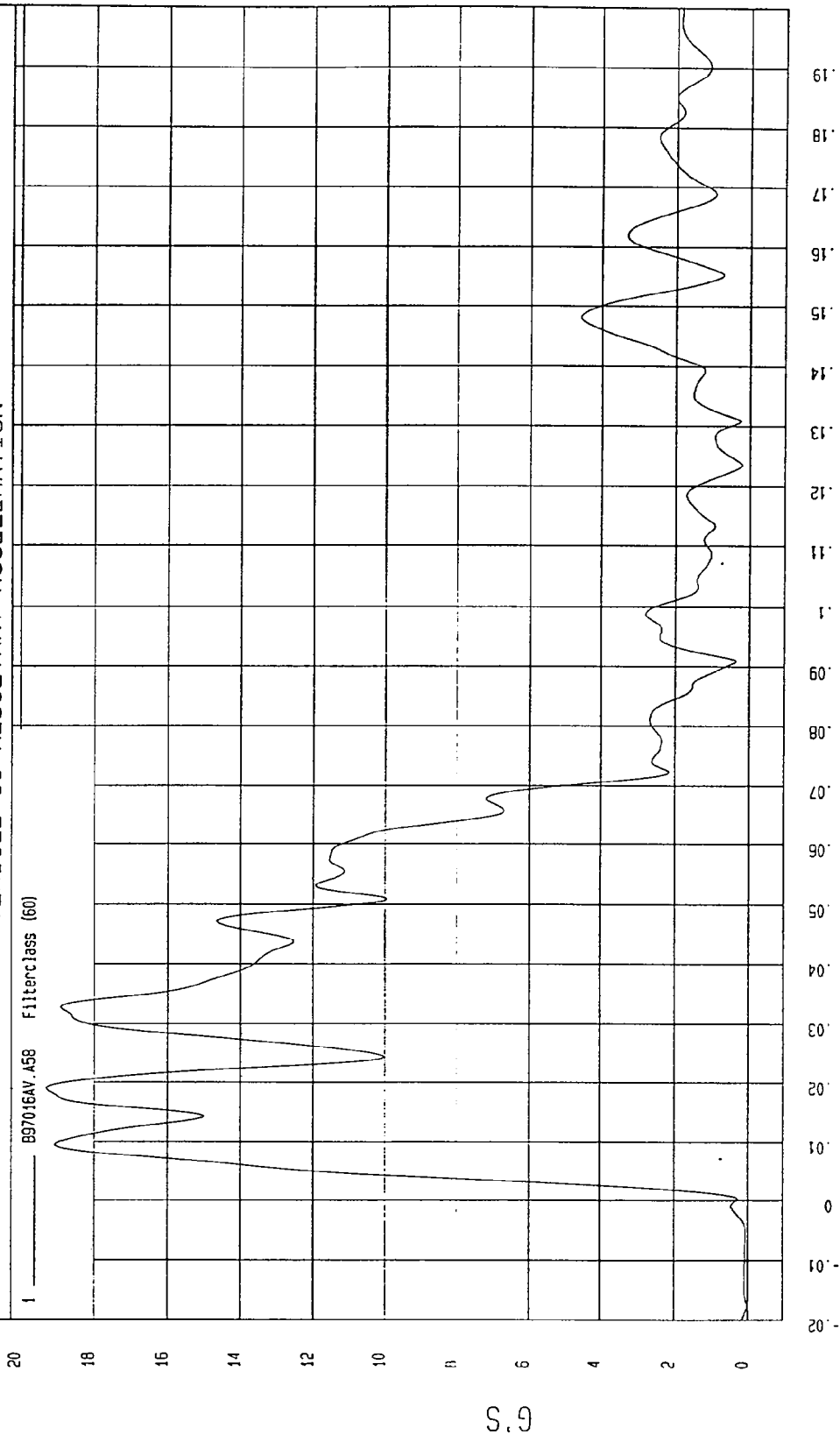
MCA Research
02-01-1997 16:26

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 1.28E-02 G'S at -18 msec Maximum = 19.28 G'S at 19 msec

VEHICLE CG RESULTANT ACCELERATION



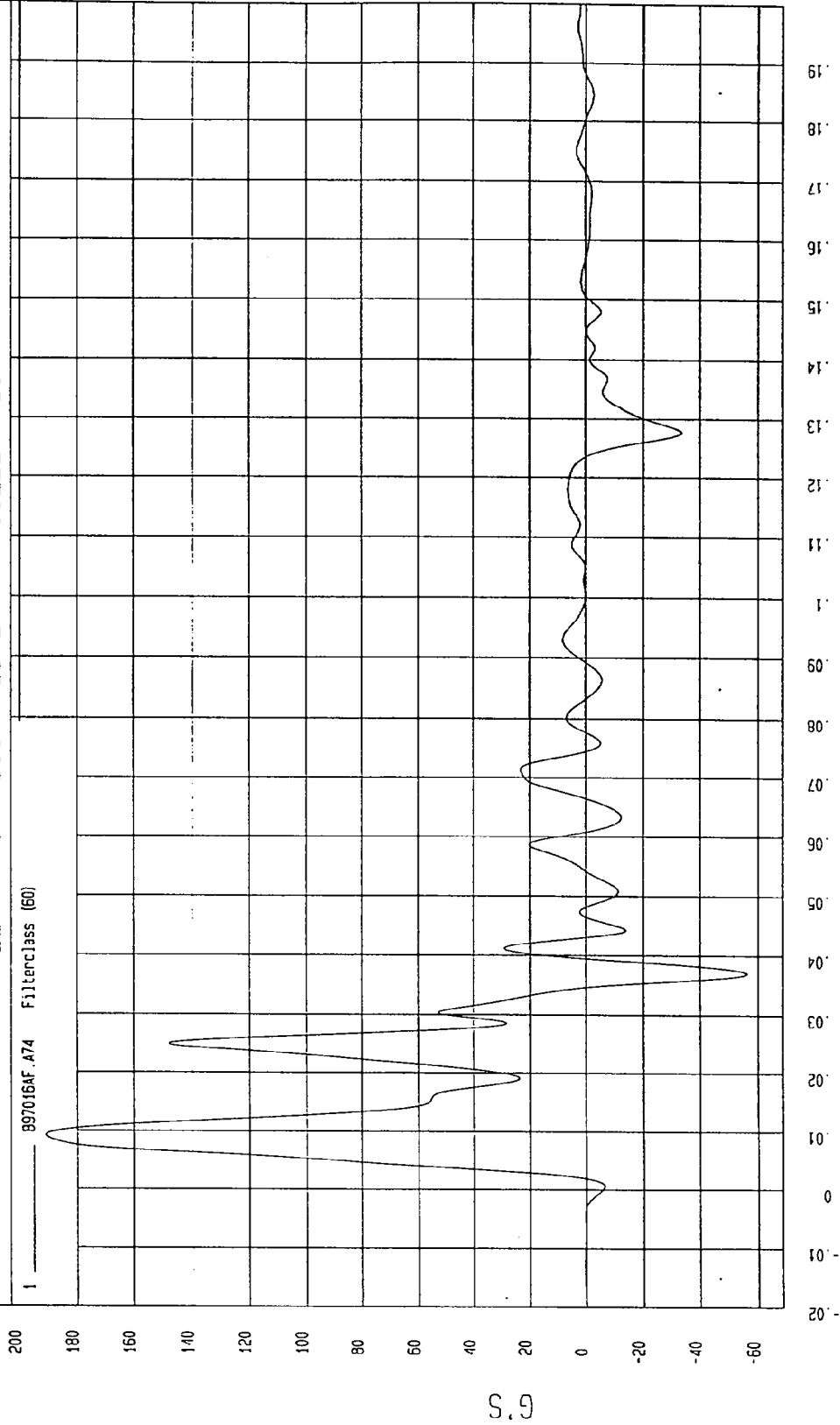
NCA Research
02-01-1997 16:33

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -56.18 G'S at 37 msec Maximum = 190.83 G'S at 9 msec

LEFT FRONT DOOR MIDREAR Y ACCELERATION



MCA Research
02-01-1997 15:32

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

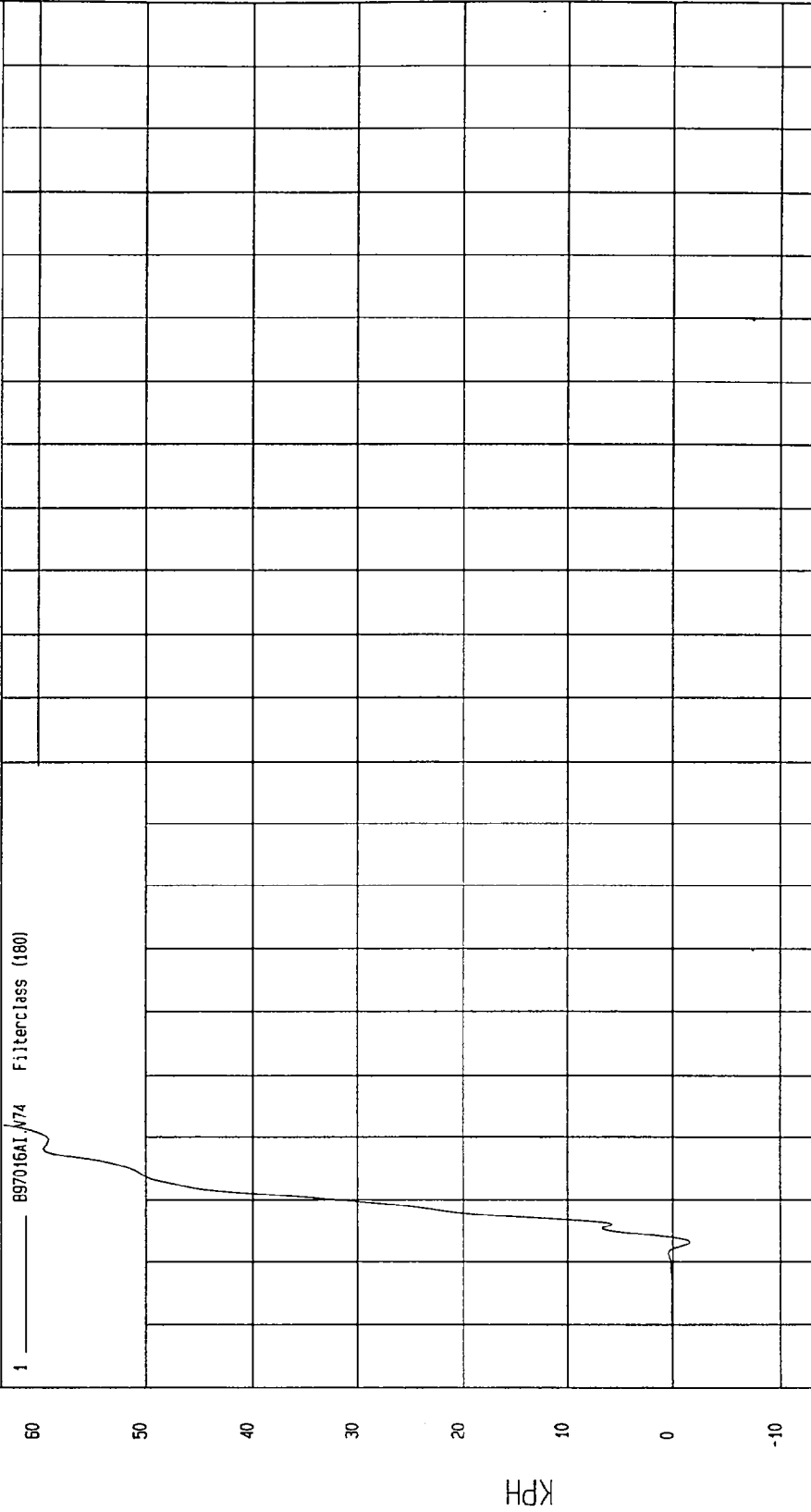
Speed: 37.9 MPH 61 KPH

Minimum = -1.65 KPH at 3 msec

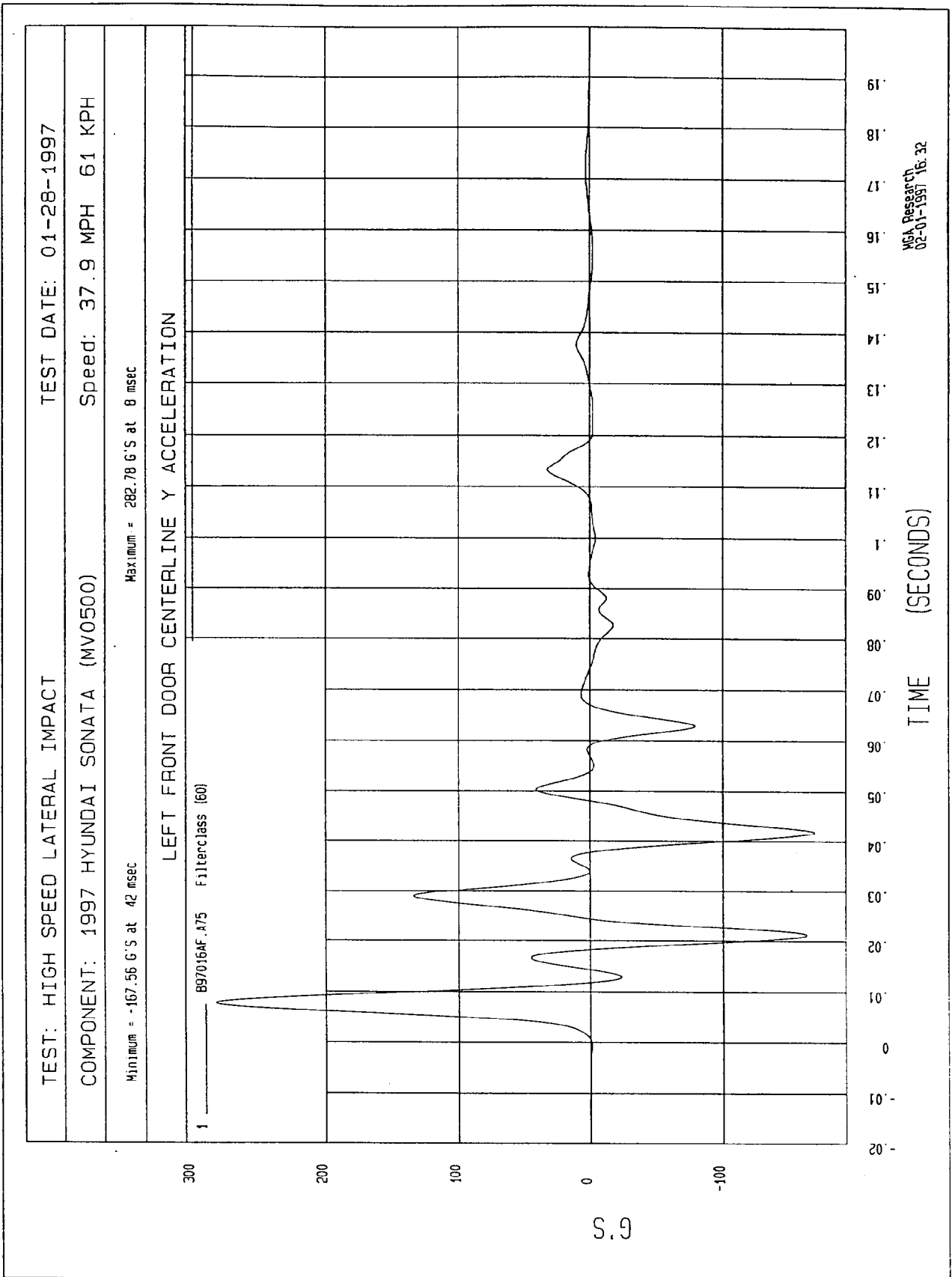
Maximum = 95.77 KPH at 124 msec

LEFT FRONT DOOR MIDREAR Y VELOCITY

1 ——— B97016A1 V74 Filterclass (180)



M&A Research
02-01-1997 16:21



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

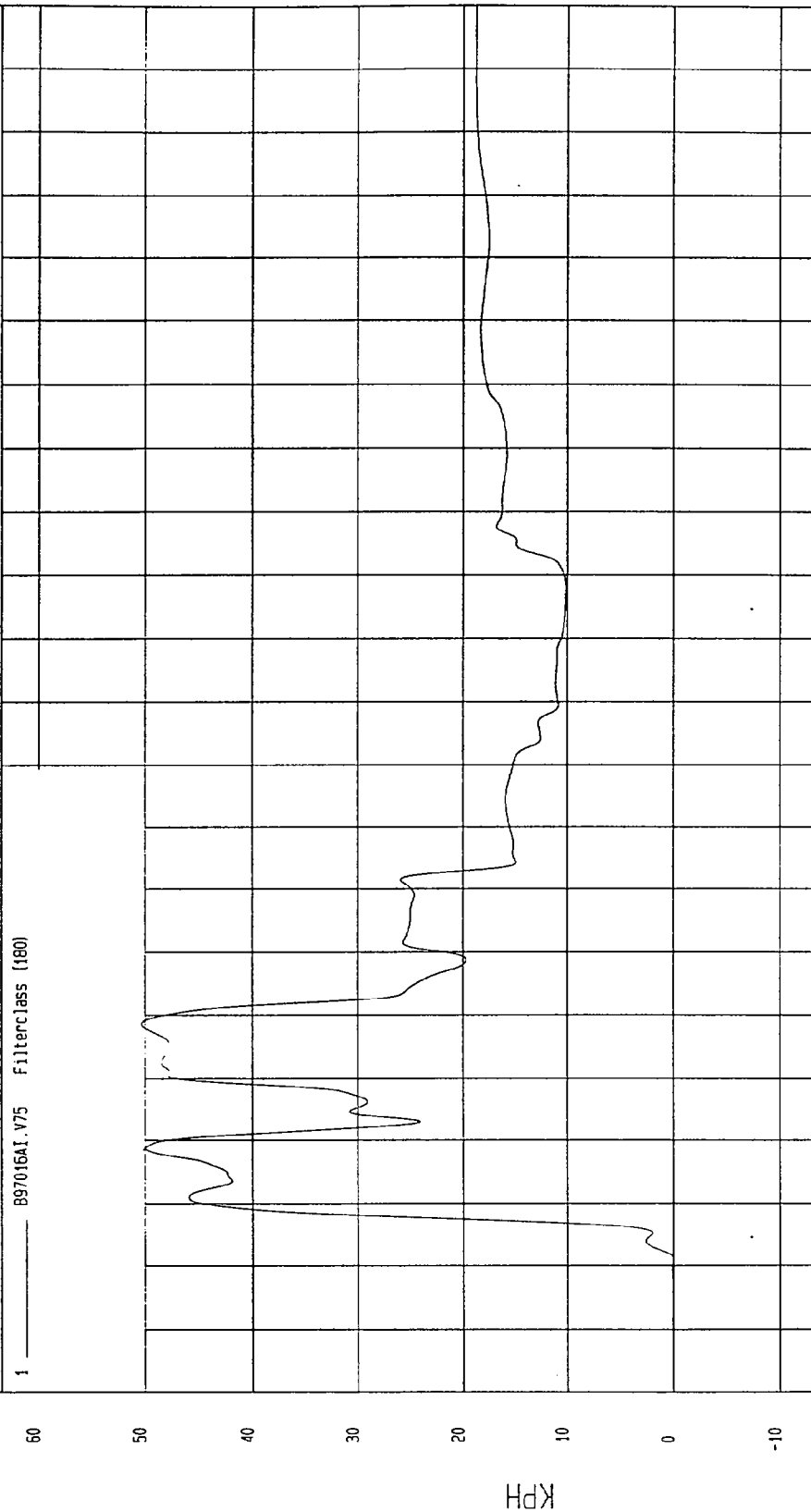
SPEED: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -1.85E-02 KPH at 1 msec Maximum = 50.37 KPH at 39 msec

LEFT FRONT DOOR CENTERLINE Y VELOCITY

1 B97016A1.V75 Filterclass (180)



TIME Seconds

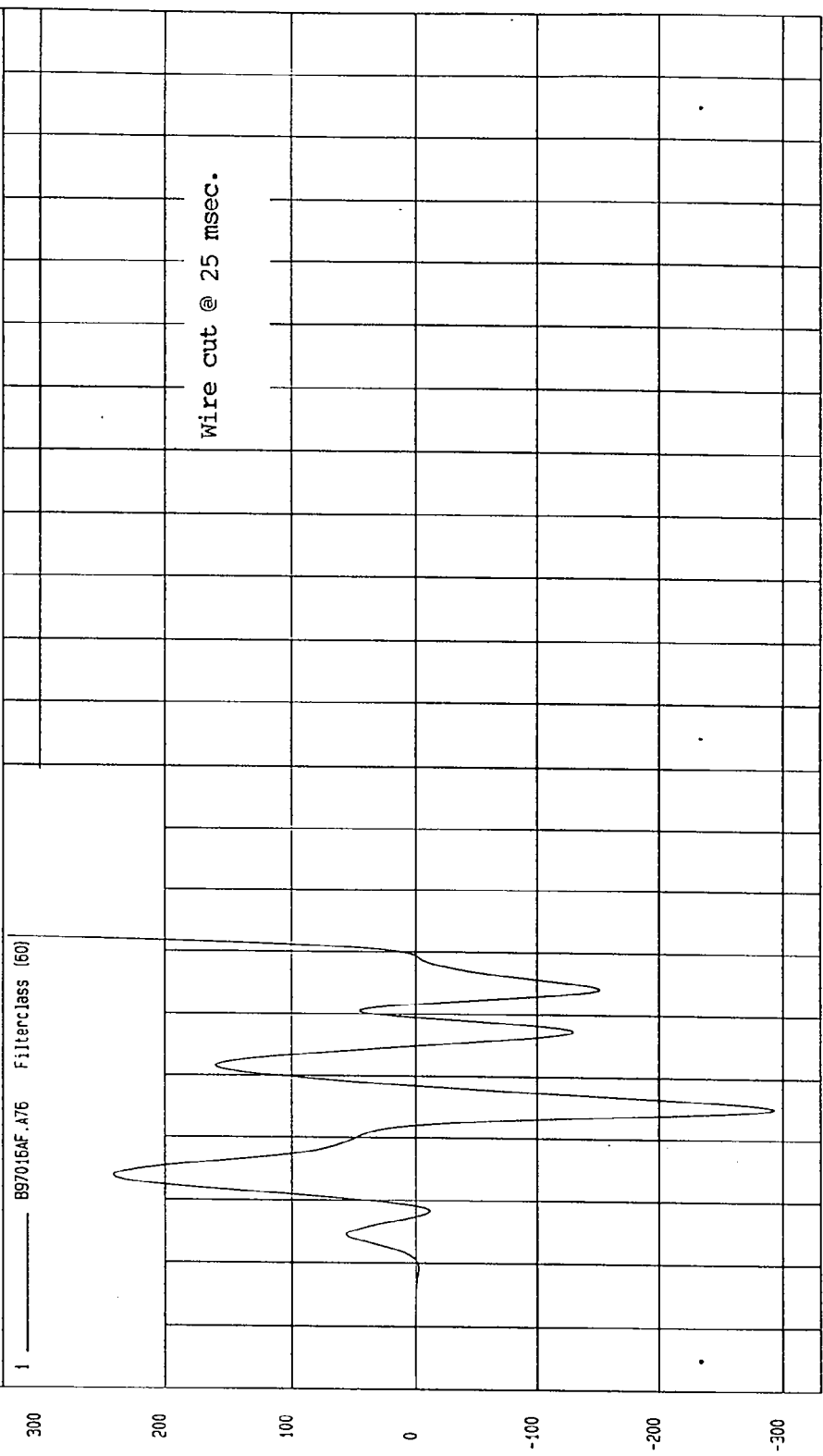
MGA Research
02-01-1997 16:27

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -293.05 G'S at 25 msec Maximum = 1195.58 G'S at 57 msec

LEFT FRONT DOOR UPPER CENTERLINE Y ACCELERATION



TIME (SECONDS)

NGA Research
02-05-1997 09:09

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 6013.80 KPH at 200 msec

Minimum = - .42 KPH at 3 msec

LEFT FRONT DOOR UPPER CENTERLINE Y VELOCITY

1 _____ B97016A1.V76 FilterClass (180)

70

60

50

40

30

20

10

0

-10

KPH

.19

.18

.17

.16

.15

.14

.13

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

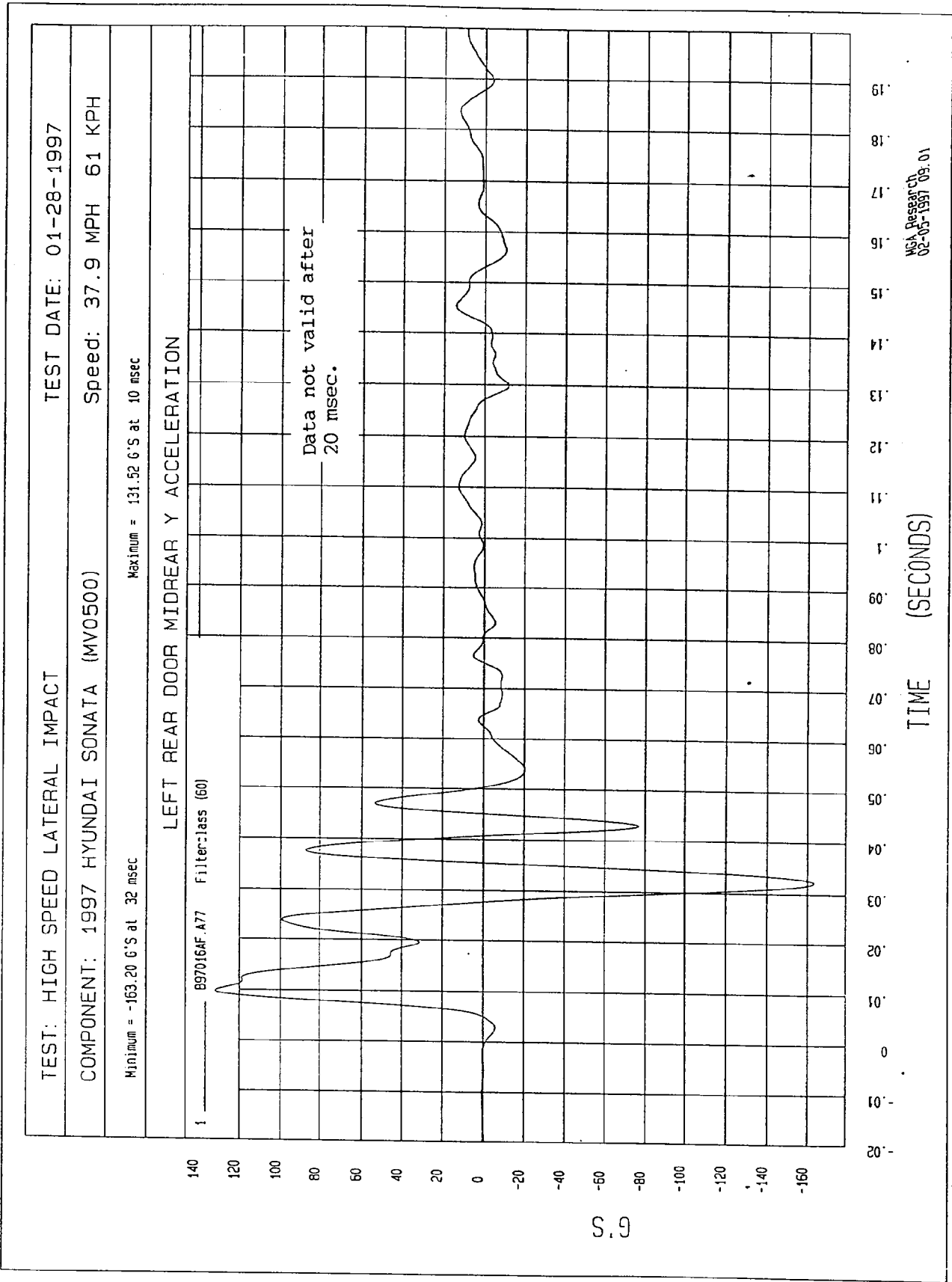
0

-.01

-.02

MCA Research
02-05-1997 09:23

TIME Seconds



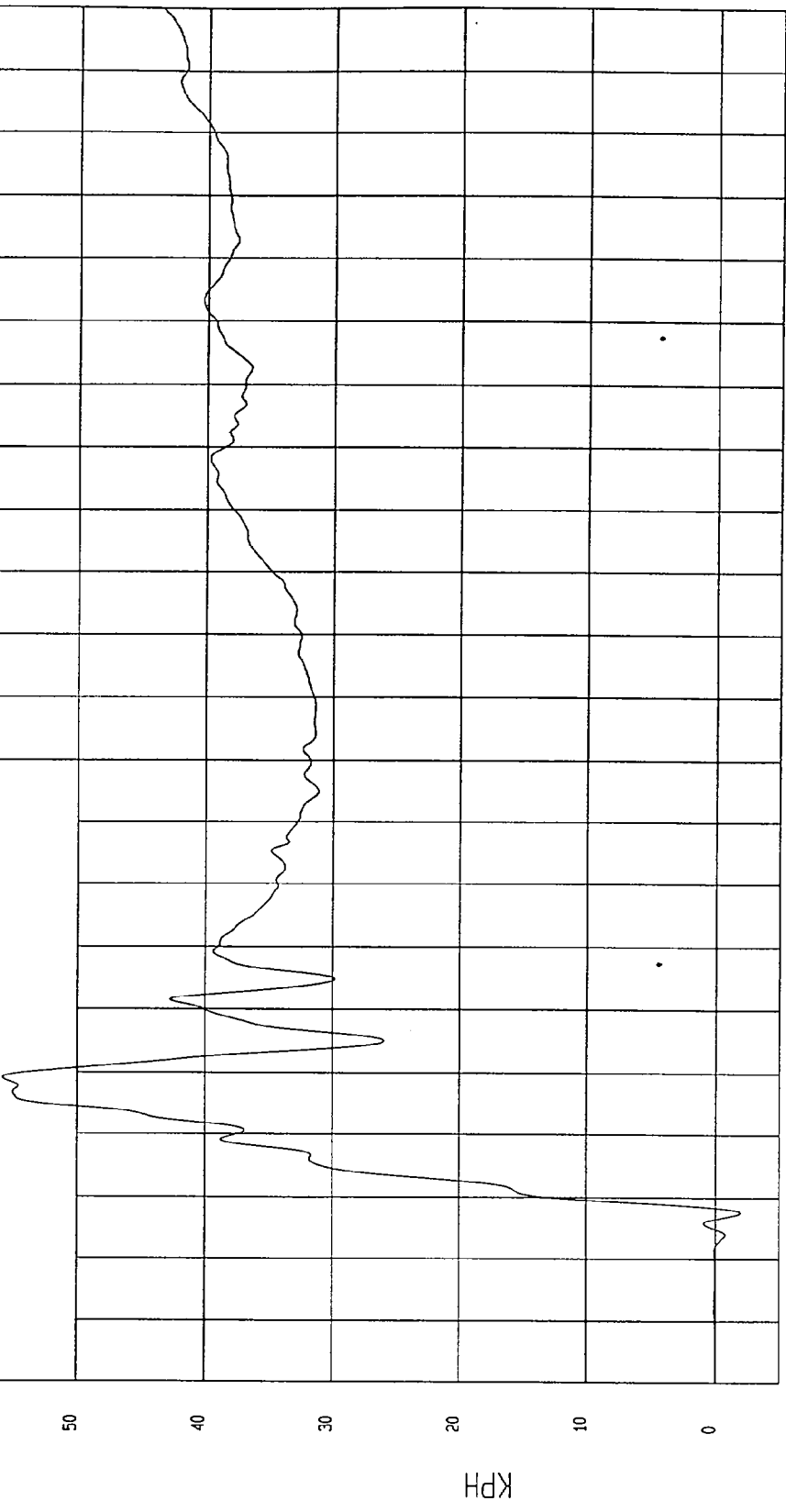
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -1.92 KPH at 8 msec Maximum = 55.87 KPH at 29 msec

LEFT REAR DOOR MIDREAR Y VELOCITY

1 ——— 897016A1.V77 Filterclass (180)



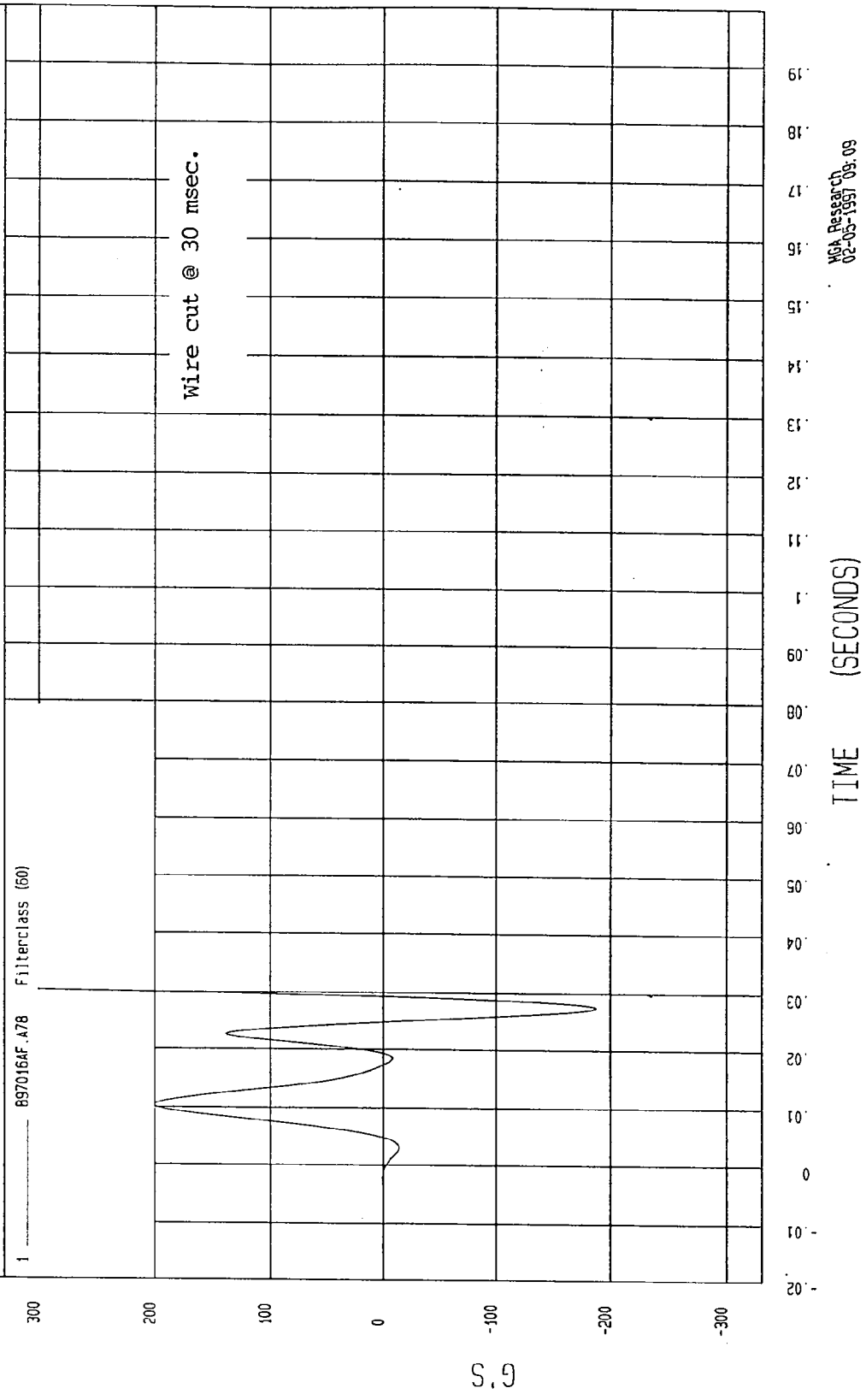
MCA Research
02-05-1997 09:12

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -187.29 G'S at 28 msec Maximum = 1088.36 G'S at 35 msec

LEFT REAR DOOR UPPER CENTERLINE Y ACCELERATION



MGA Research
02-05-1997 09:09

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Speed: 37.9 MPH 61 KPH

Minimum = -1.50 KPH at 6 msec

Maximum = 6278.57 KPH at 200 msec

LEFT REAR DOOR UPPER CENTERLINE Y VELOCITY

1 ——— B97016A1.V7B Filterclass (180)

60

50

40

30

20

10

0

-10

KPH

-0.02

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

0.16

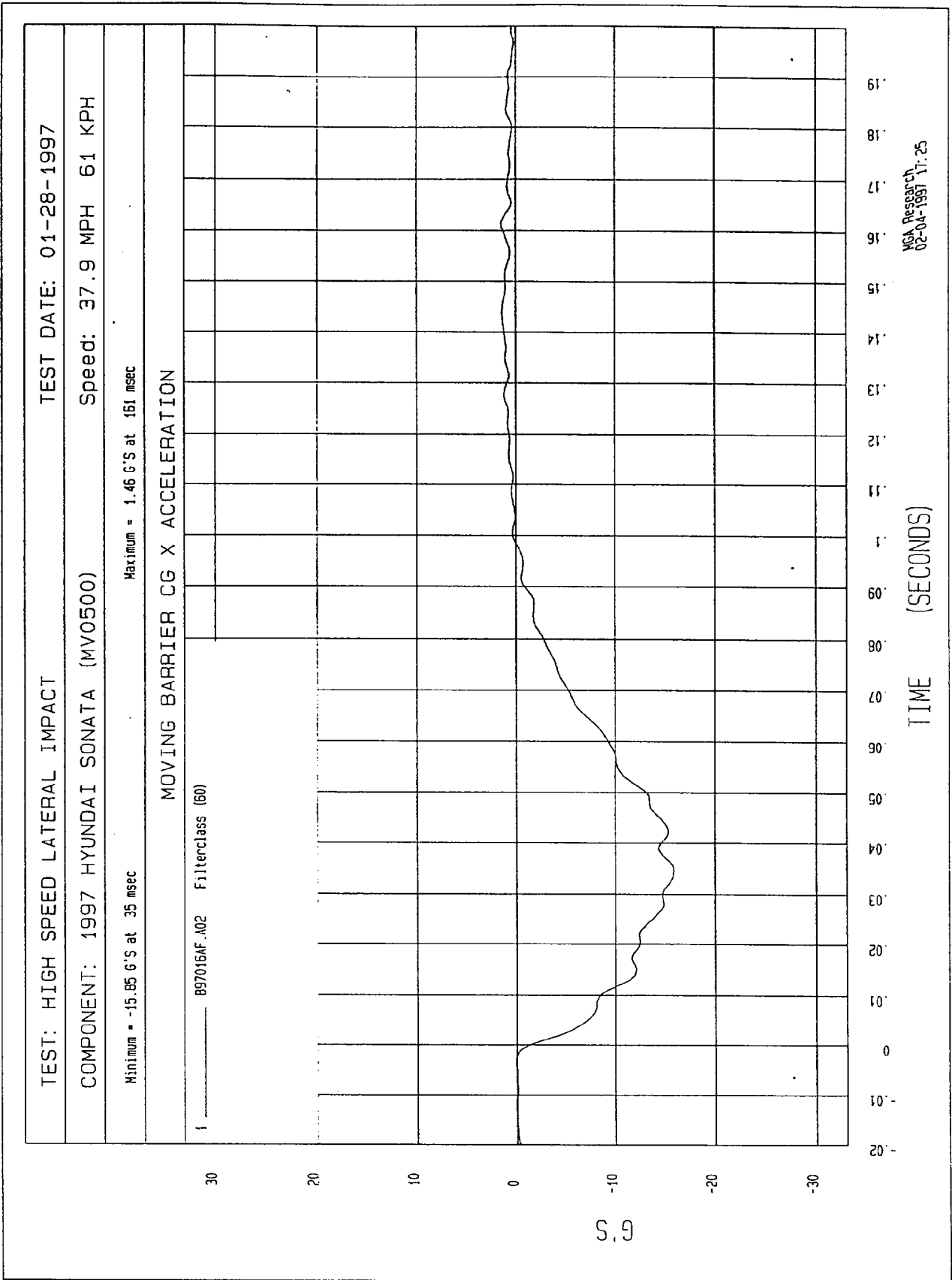
0.17

0.18

0.19

TIME Seconds

NSA Research
02-05-1997 09:14

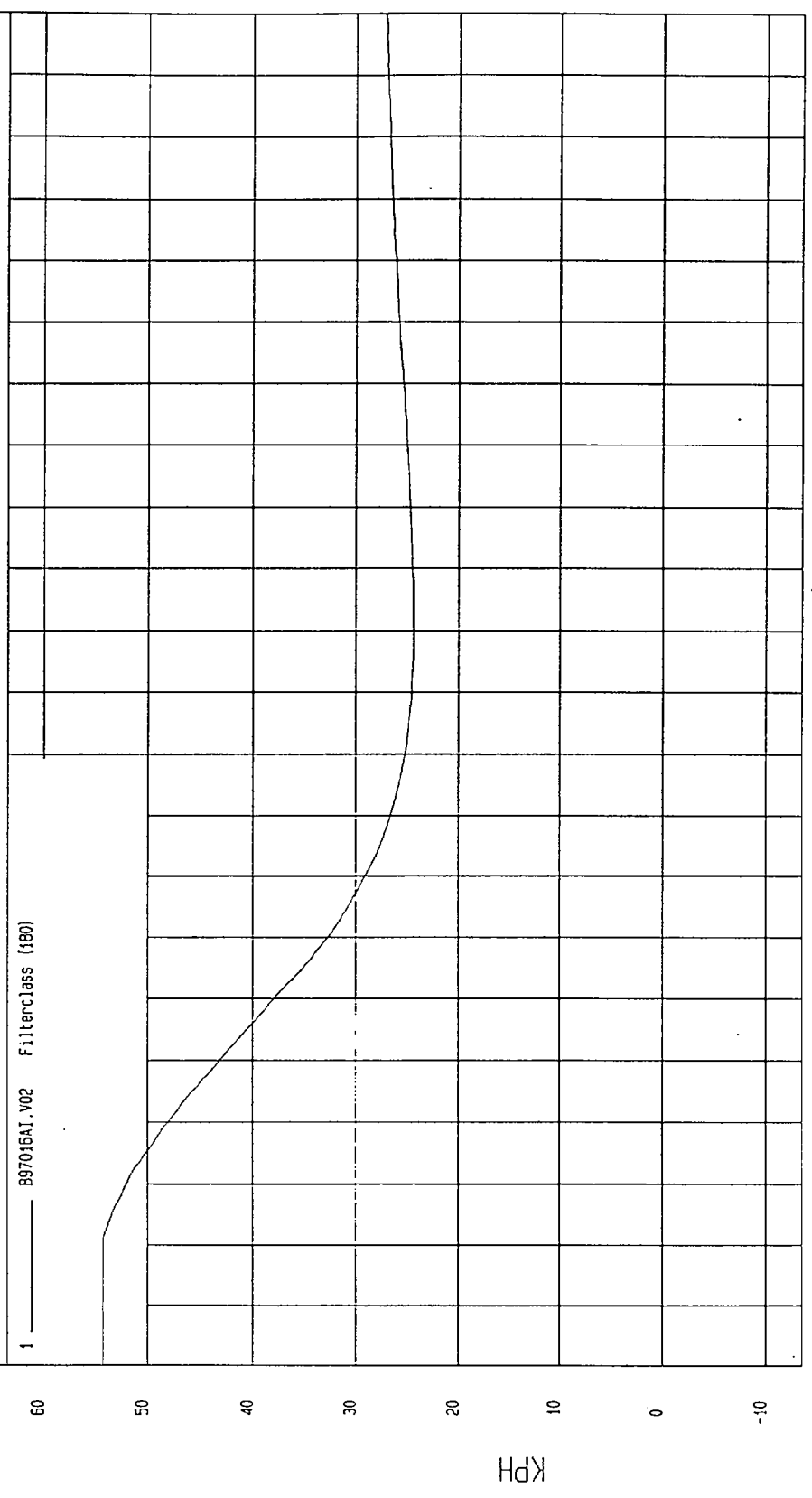


TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 24.37 KPH at 98 msec Maximum = 54.35 KPH at -11 msec

MOVING BARRIER CG X VELOCITY



TIME Seconds MGA Research 02-01-1997 16:25

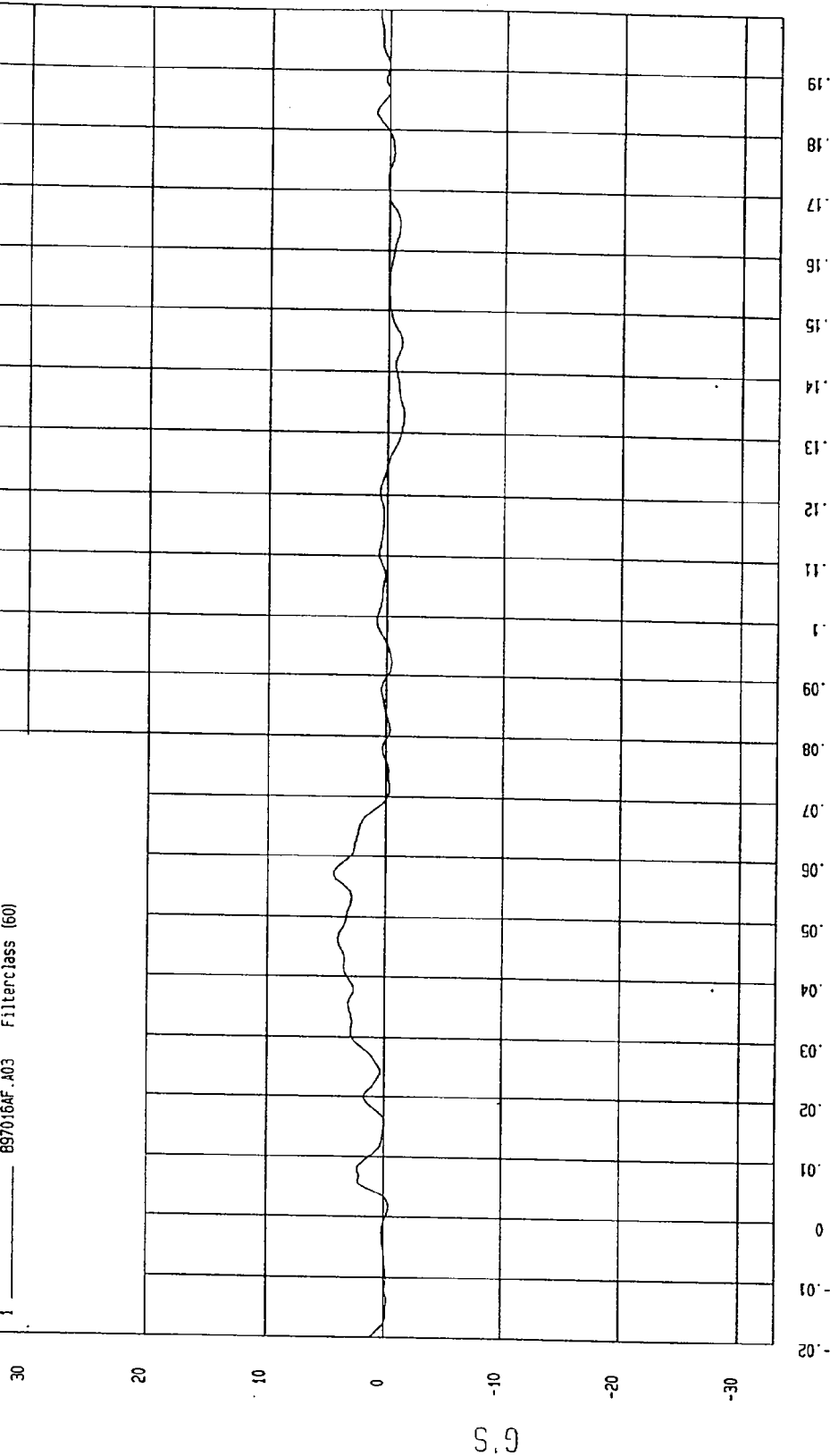
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -1.36 G'S at 133 msec Maximum = 4.38 G'S at 57 msec

MOVING BARRIER CG Y ACCELERATION

1 _____ 897016AF.A03 Filterclass (60)



NCA Research
02-04-1997 17:25

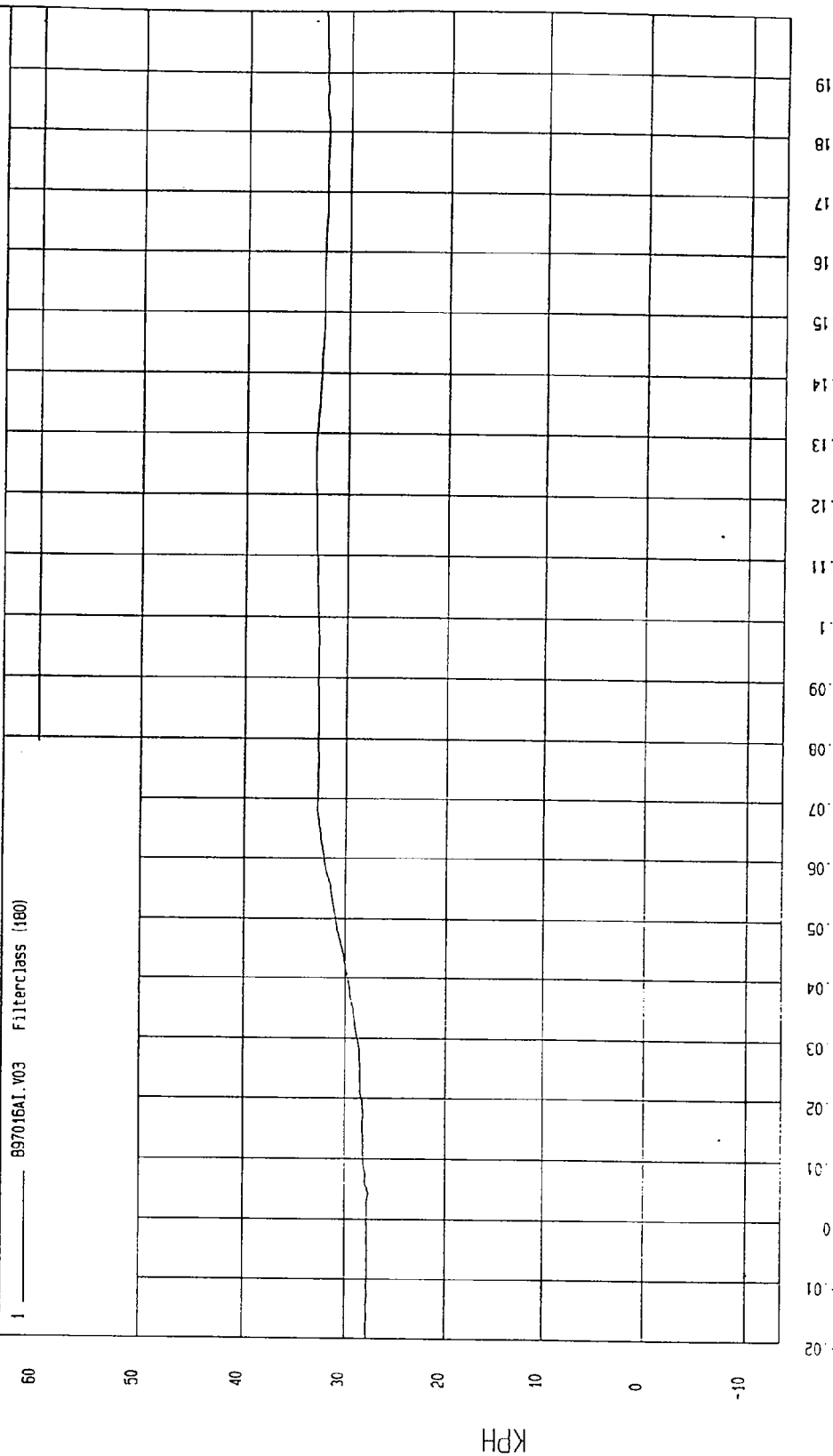
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 27.57 KPH at 4 msec Maximum = 33.32 KPH at 122 msec

MOVING BARRIER CG Y VELOCITY

1 ——— B97016A1.V03 Filterclass (180)



MGA Research
02-01-1997 16:25

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

Speed: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Maximum = 8.80 G'S at 76 msec

Minimum = -10.86 G'S at 30 msec

MOVING BARRIER CG Z ACCELERATION

1 ——— 897016AF.A04 Filterclass (60)

30

20

10

0

G.S

-10

-20

-30

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

MCA Research
02-04-1997 17:25

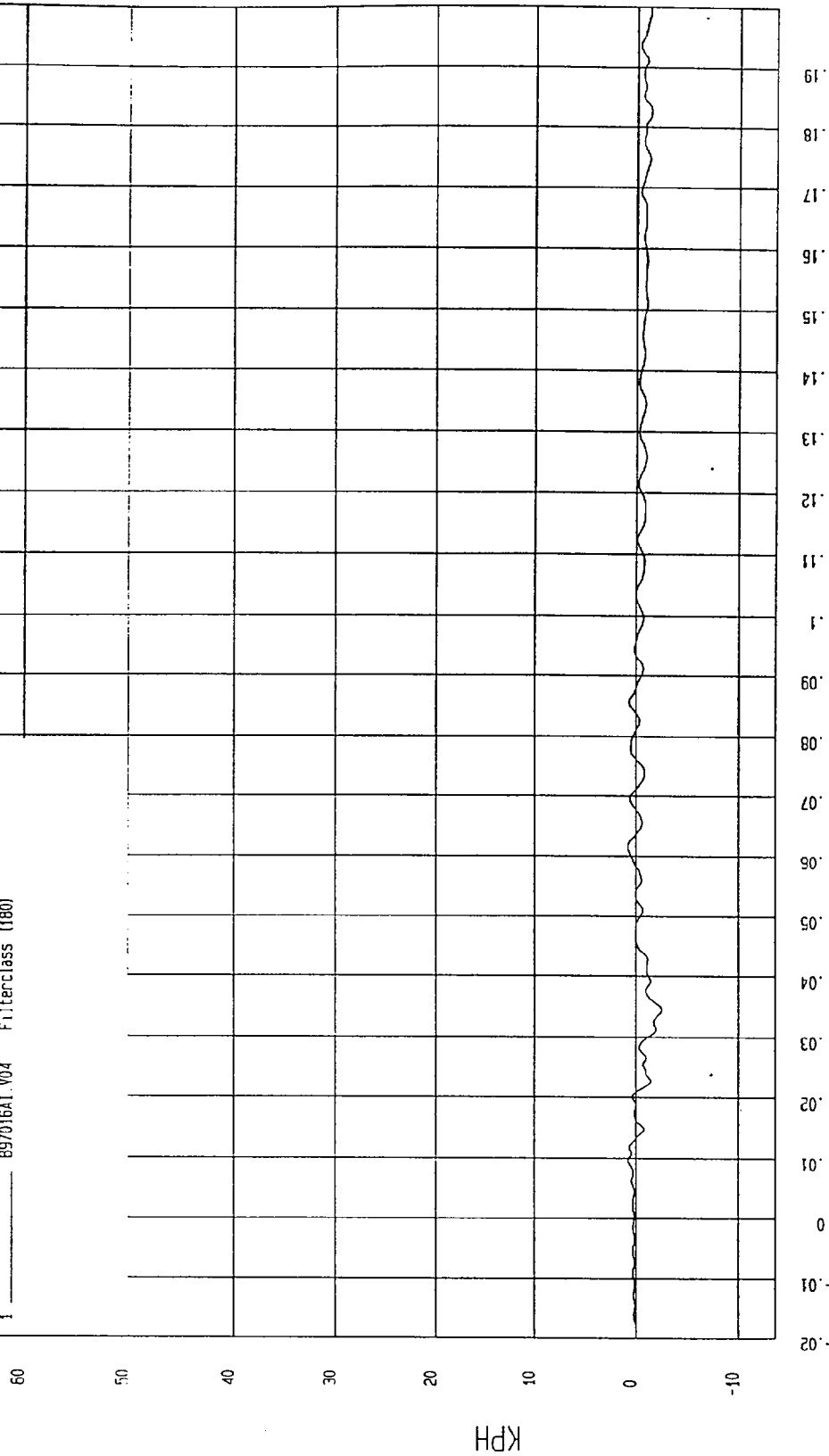
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -2.56 KPH at 34 msec Maximum = .74 KPH at 62 msec

MOVING BARRIER CG Z VELOCITY

1 _____ 897016A1 V04 Filterclass (180)



MCA Research
02-01-1997 16:26

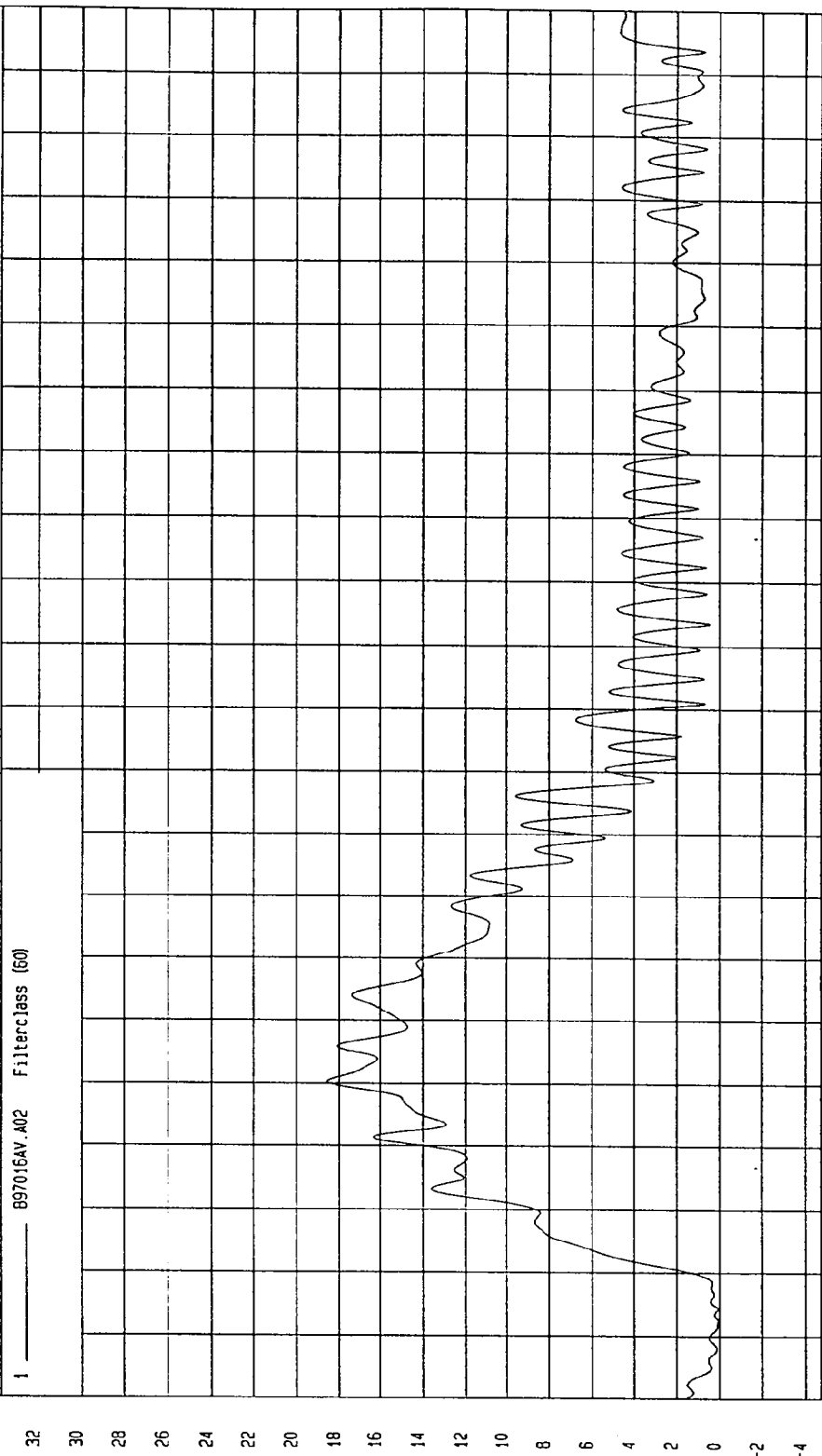
TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = .05 G'S at -8 msec Maximum = 18.58 G'S at 30 msec

MOVING BARRIER CG RESULTANT ACCELERATION



MGA Research
02-01-1997 16:33

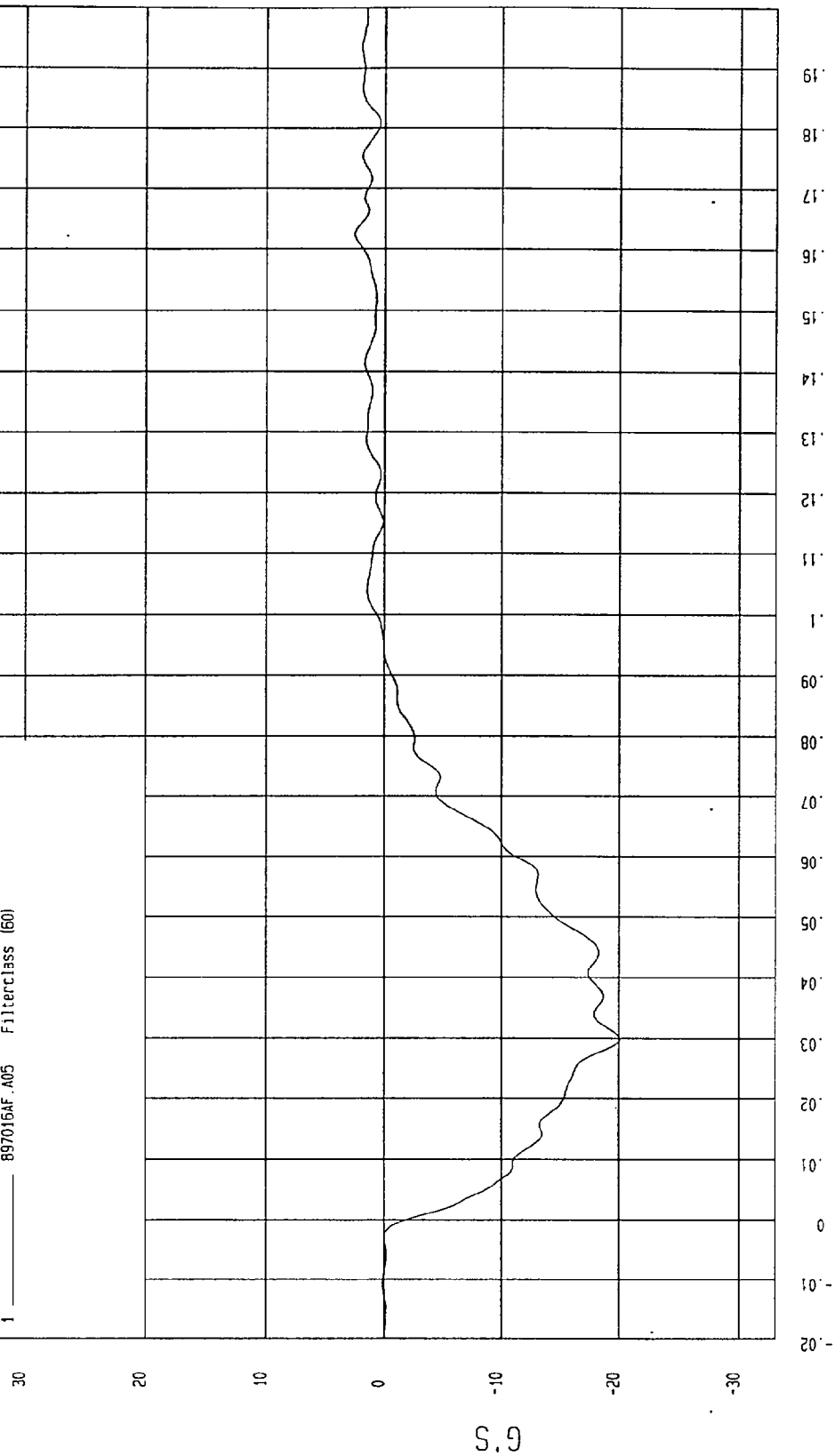
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -20.05 G'S at 30 msec Maximum = 2.53 G'S at 162 msec

MOVING BARRIER REAR AXLE X ACCELERATION

1 — 897016AF.A05 Filterclass (60)



MCA Research
02-04-1997 17:25

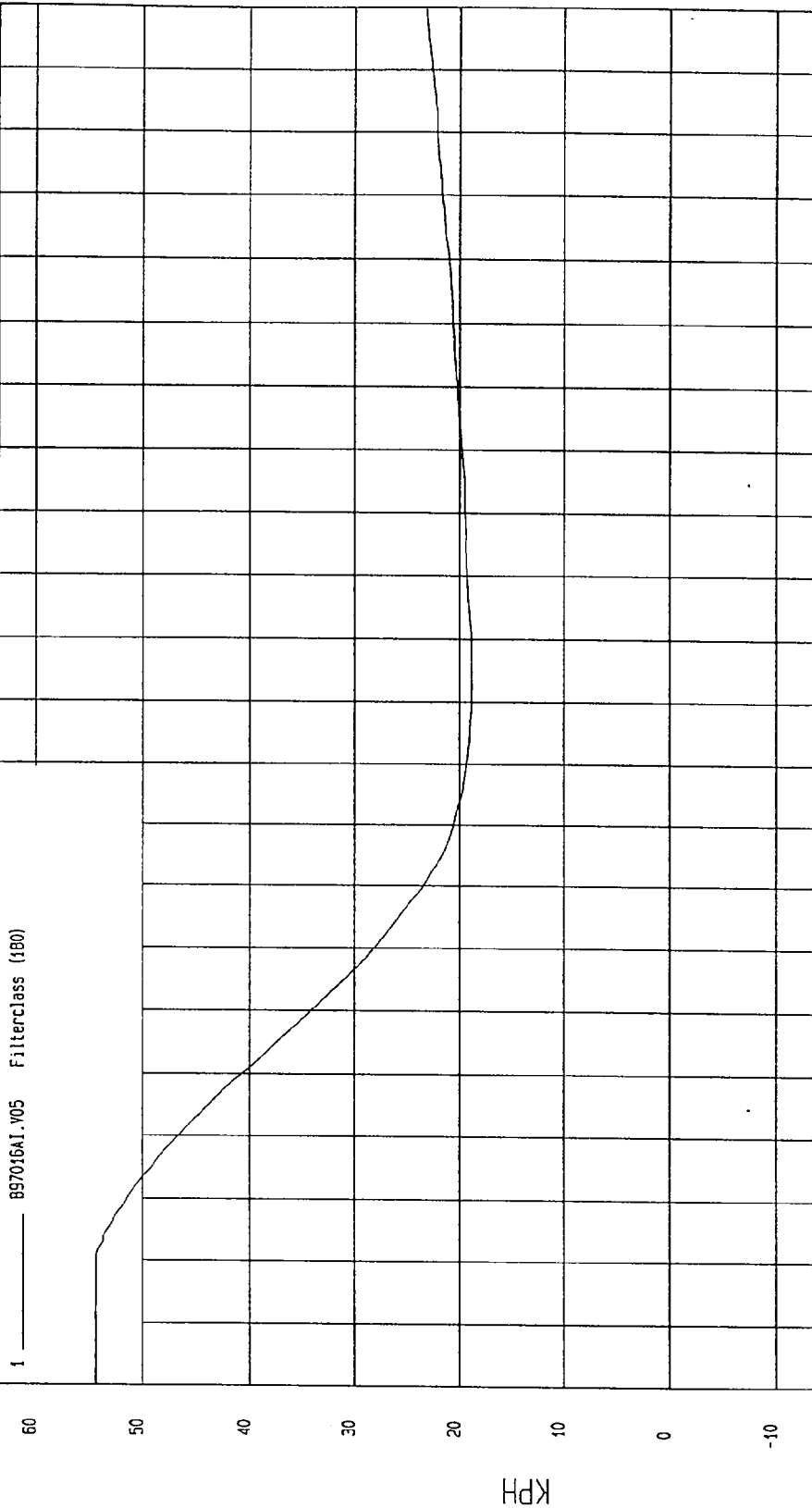
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 18.83 KPH at 92 msec Maximum = 54.35 KPH at -19 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 ——— 897016A1.V05 Filterclass (180)



TIME Seconds

MECA Research
02-01-1997 16:27

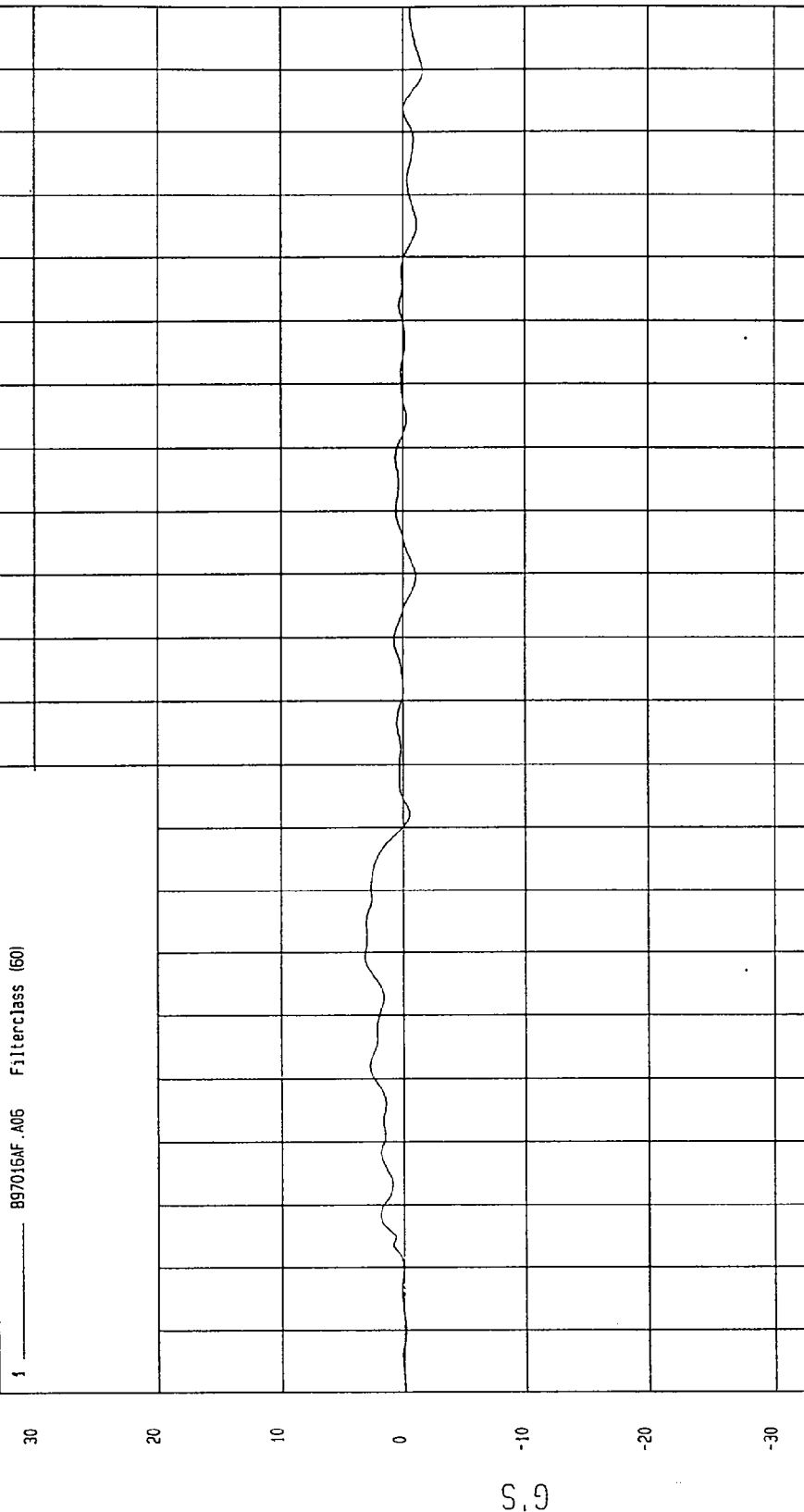
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -1.54 G'S at 190 msec Maximum = 3.11 G'S at 49 msec

MOVING BARRIER REAR AXLE Y ACCELERATION

1 _____ B97016AF.A05 Filterclass (60)



HGA Research
02-04-1997 17:26

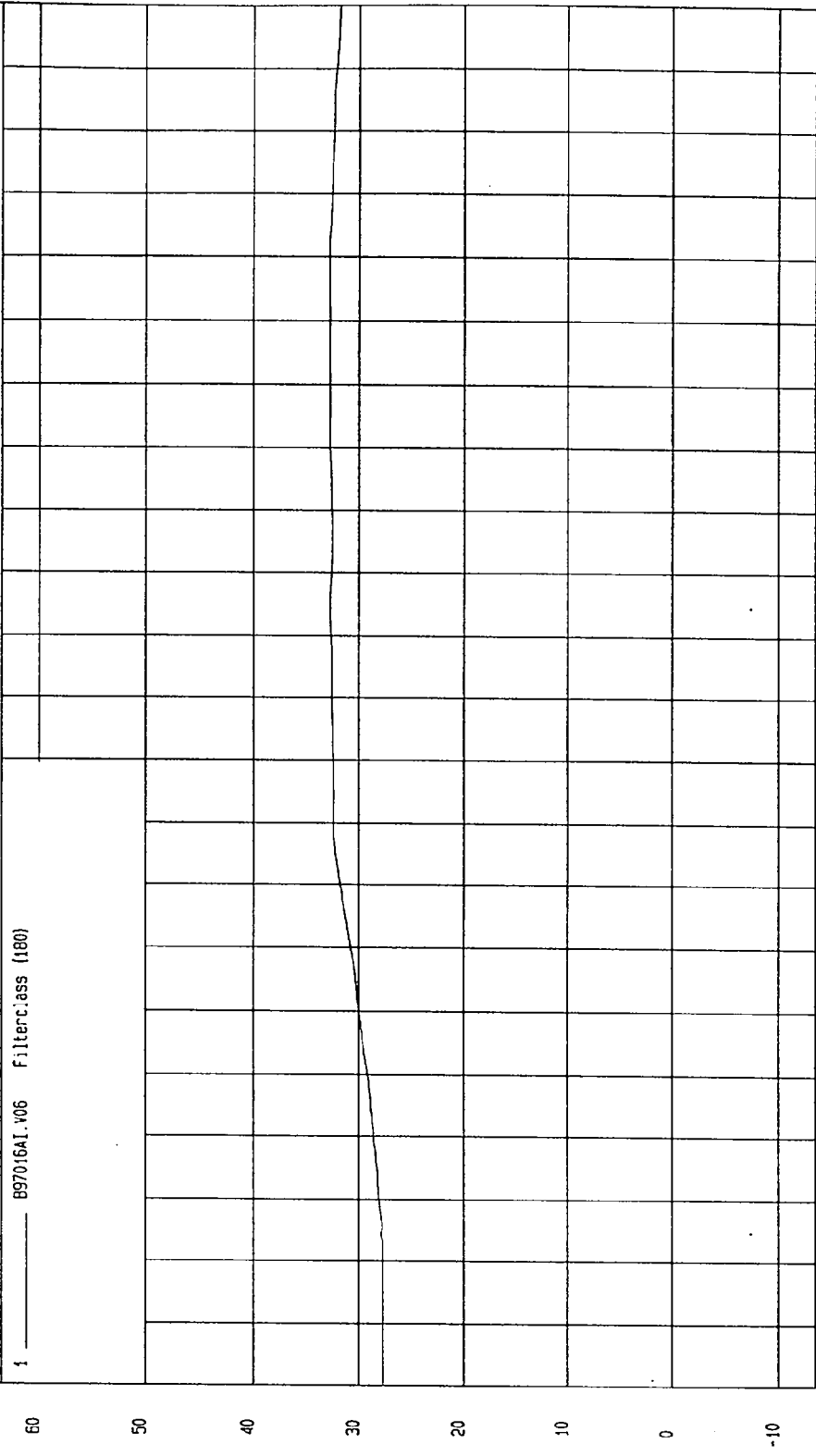
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = 27.68 KPH at -19 msec Maximum = 32.82 KPH at 160 msec

MOVING BARRIER REAR AXLE Y VELOCITY

1 ——— B97016A1.V06 Filter: class (180)



TIME Seconds

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

M&A Research
02-01-1997 16:27

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

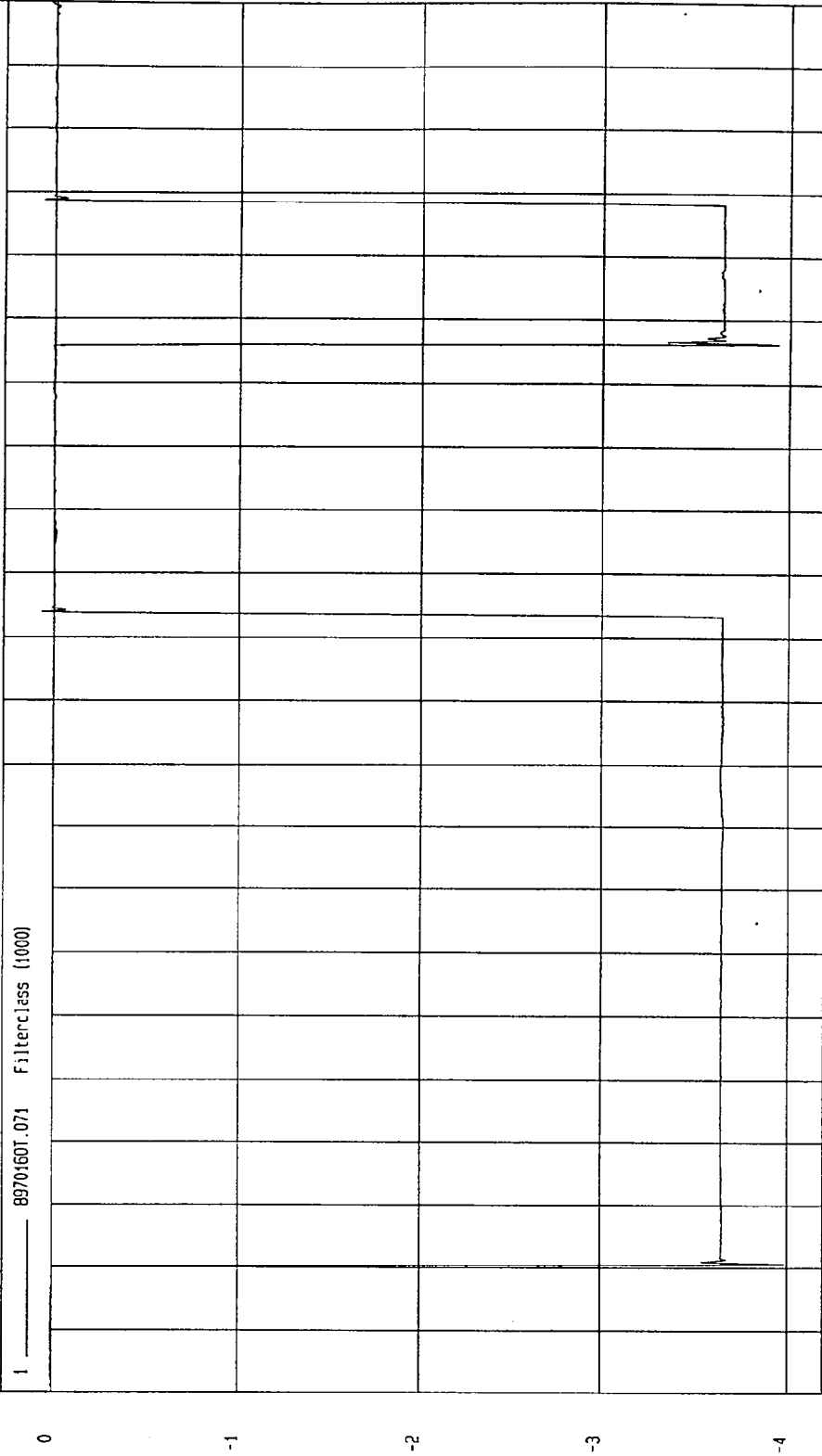
Speed: 37.9 MPH 61 KPH

Minimum = -3.99 VOLTS at 0 msec

Maximum = 6.23E-02 VOLTS at 104 msec

LEFT BARRIER CONTACT

1 8970160T.071 Filterclass (1000)



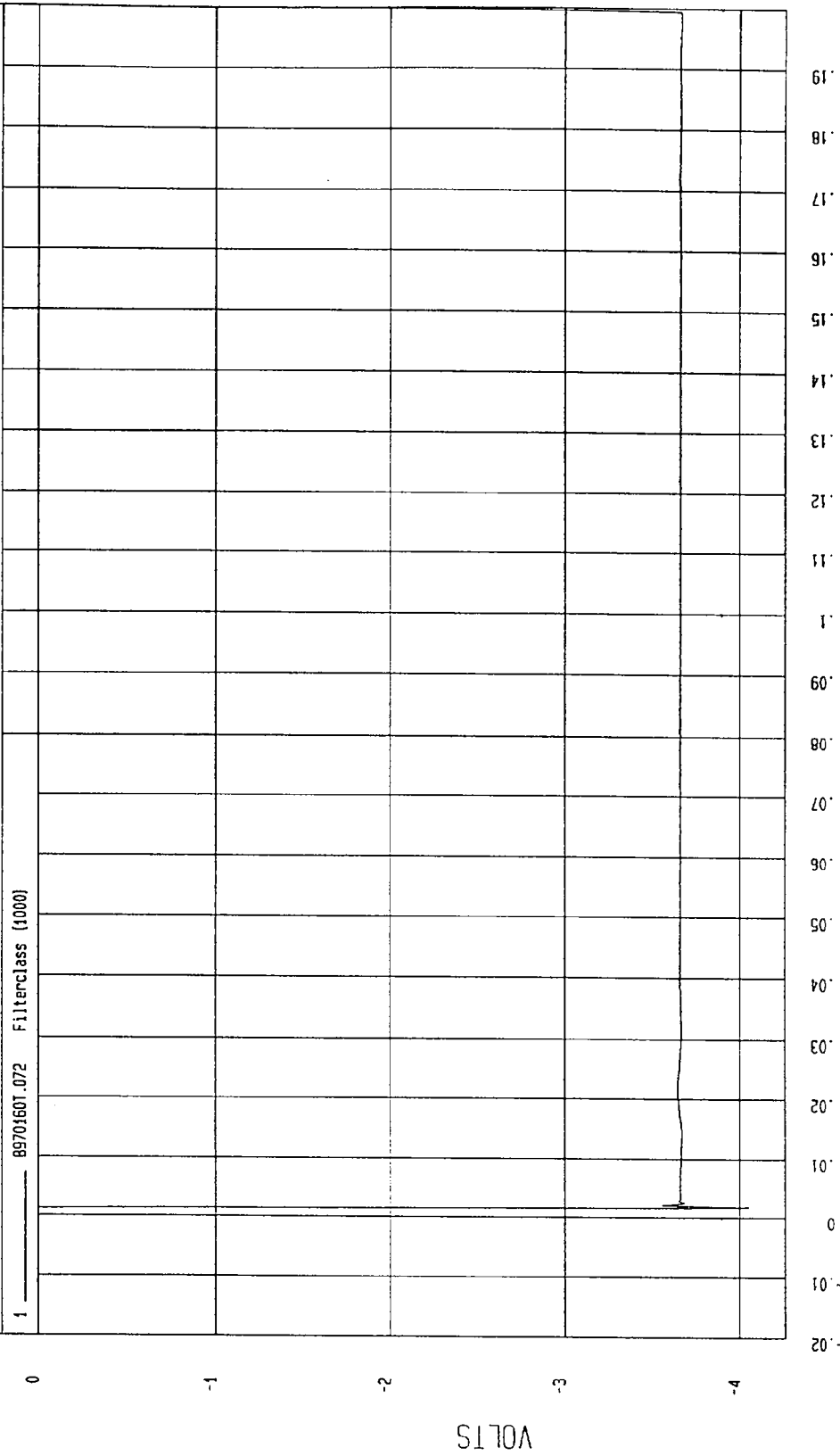
HGA Research
02-01-1997 16:32

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -4.05 VOLTS at 2 msec Maximum = 3.78E-03 VOLTS at -18 msec

RIGHT BARRIER CONTACT



WSA Research
02-01-1997 16:32

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

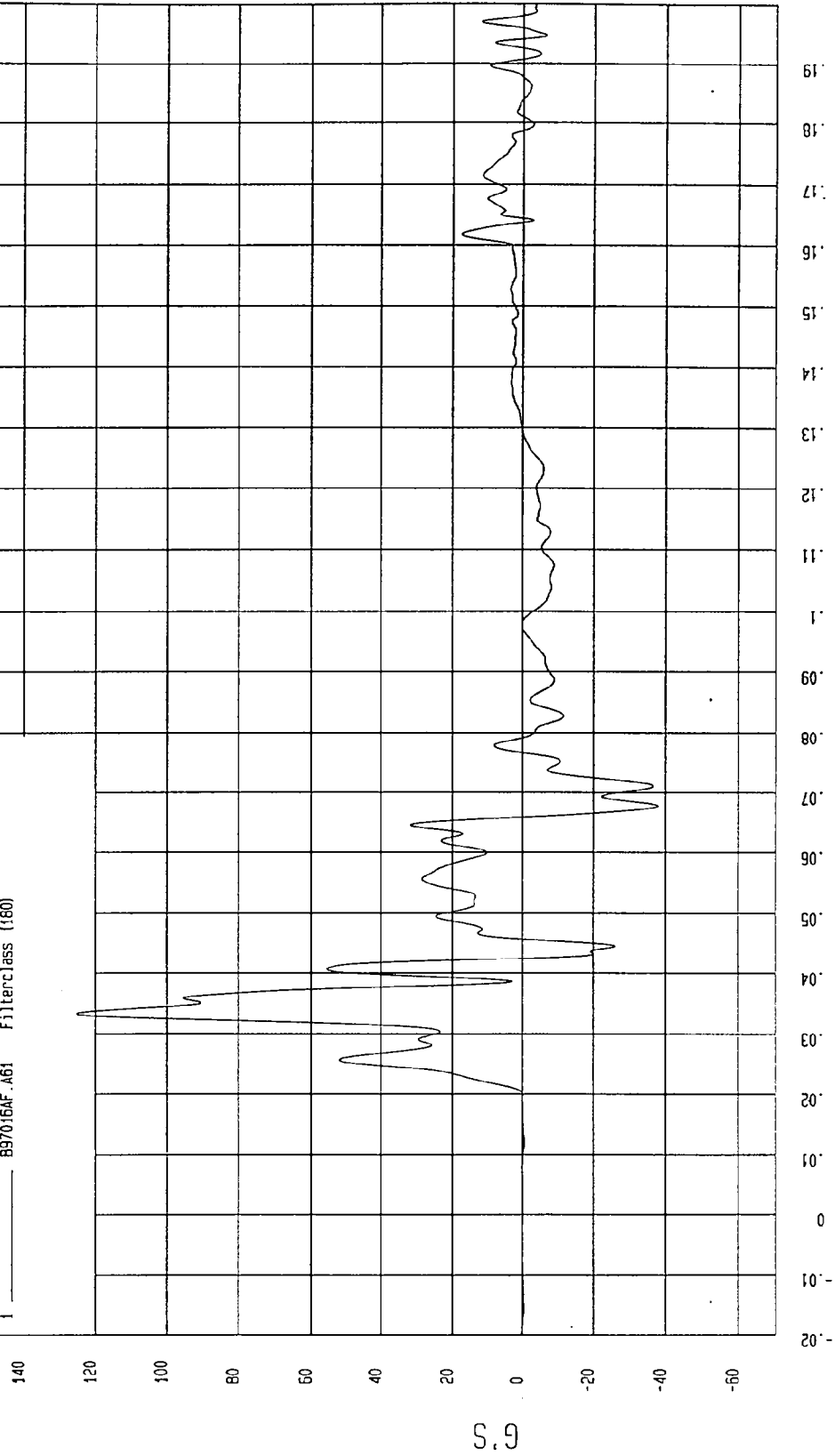
Speed: 37.9 MPH 61 KPH

Minimum = -37.86 G'S at 68 msec

Maximum = 125.35 G'S at 33 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 — B97016AF.A61 Filterclass (180)



MCA Research
02-04-1997 17:19

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

SPEED: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -17 KPH at 18 msec Maximum = 47.09 KPH at 66 msec

DRIVER UPPER RIB Y REDUNDANT VELOCITY

1 B9701GA1.V61 Filterclass (180)

60

50

40

30

20

10

0

-10

KPH

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

MCA Research
02-01-1997 15:41

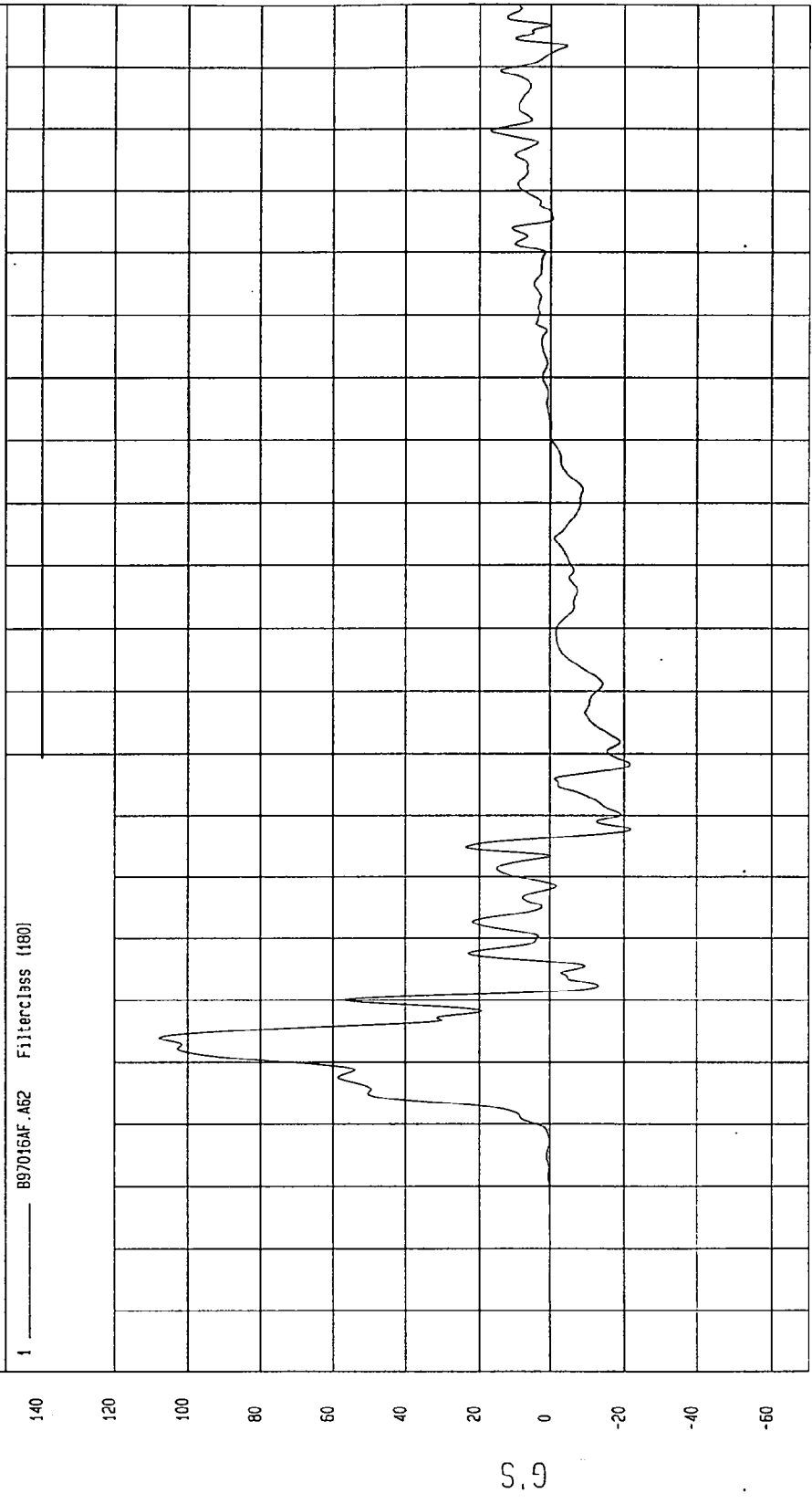
TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -22.00 G'S at 68 msec Maximum = 107.97 G'S at 34 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION



TIME (SECONDS)

NCA Research
02-04-1997 17:19

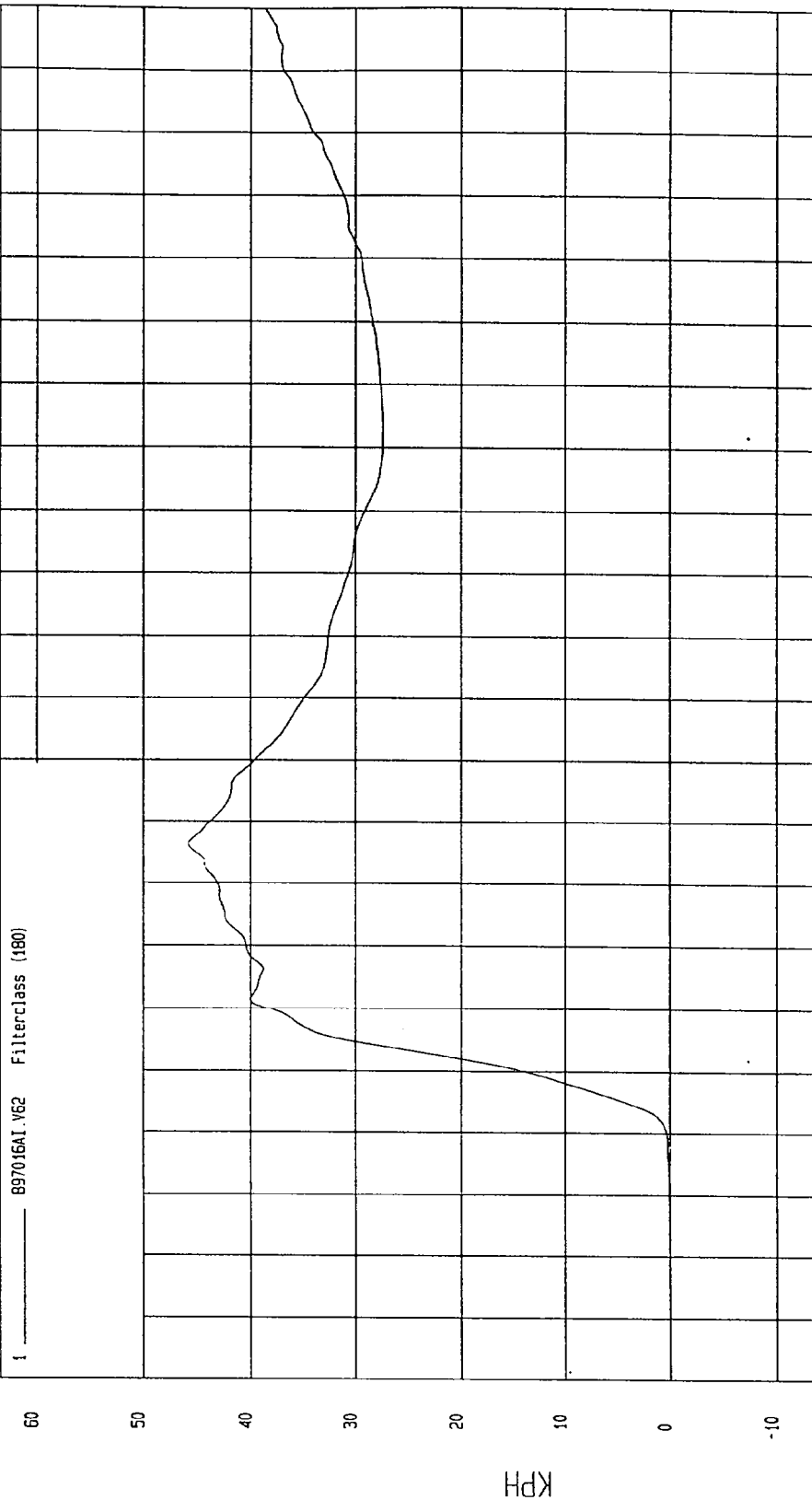
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -4.85E-03 KPH at -12 msec Maximum = 45.81 KPH at 55 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY

1 ——— B97016A1.V62 Filterclass (180)



NCA Research
02-01-1997 16:28

TIME Seconds

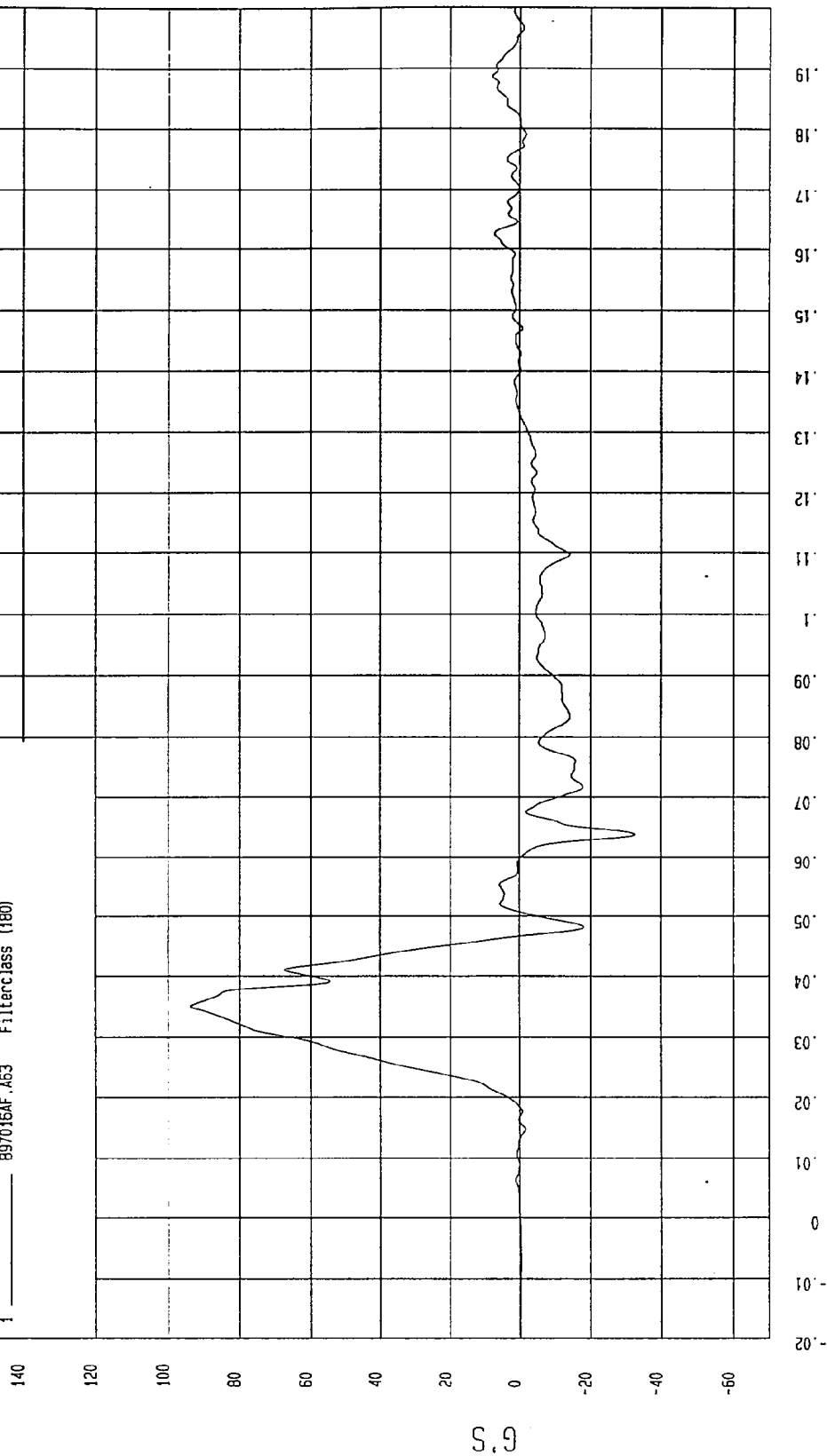
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -32.63 G'S at 64 msec Maximum = 93.91 G'S at 35 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 ——— B97015AF.A63 Filterclass (180)



MGA Research
02-04-1997 17:19

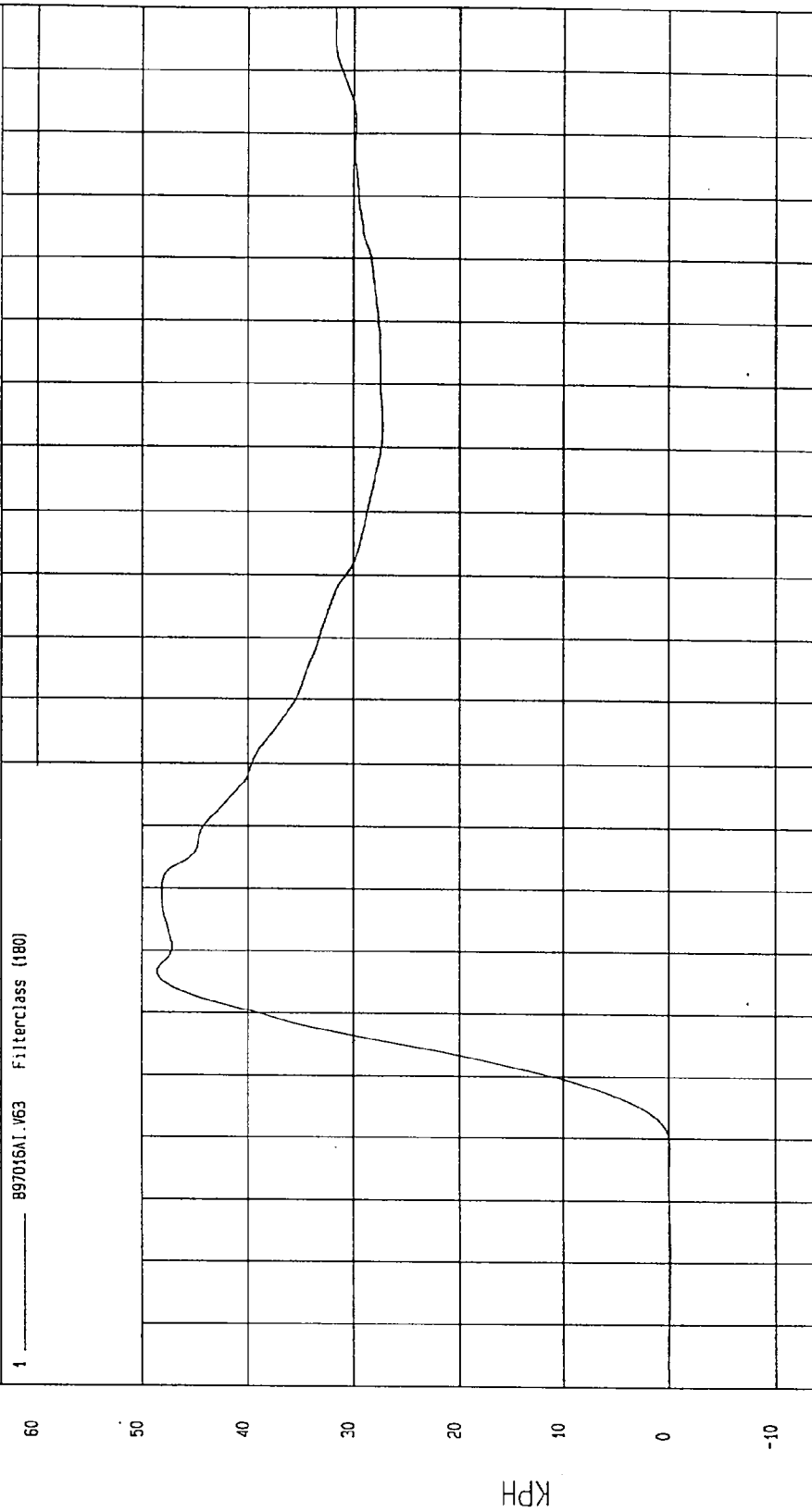
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MVO500) Speed: 37.9 MPH 61 KPH

Minimum = -.18 KPH at 0 msec Maximum = 48.59 KPH at 47 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

1 ——— 897016A1.V63 Filterclass (180)



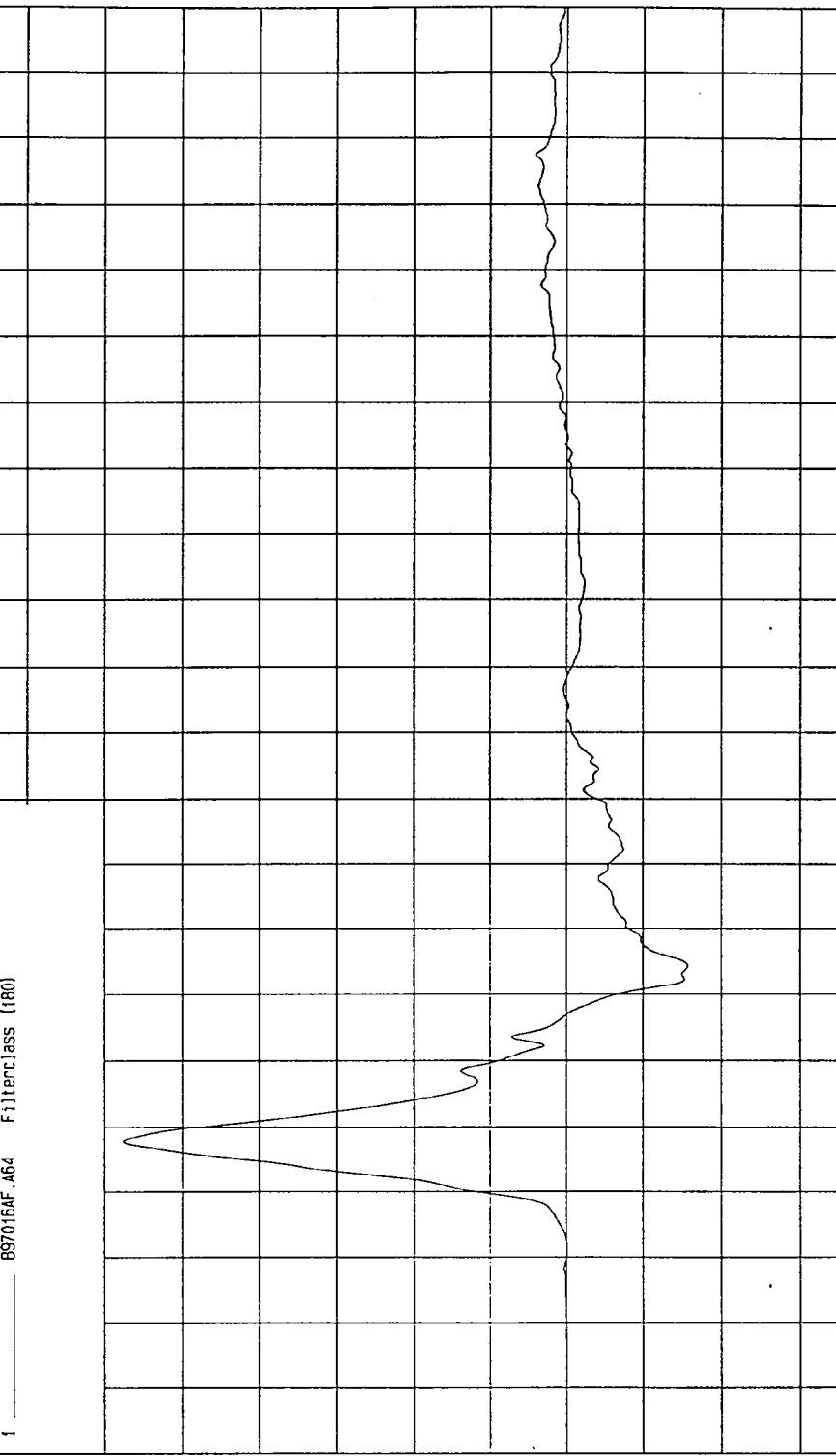
MSA Research
02-01-1997 16:28

TEST: HIGH SPEED LATERAL IMPACT	TEST DATE: 01-28-1997
COMPONENT: 1997 HYUNDAI SONATA (MV0500)	Speed: 37.9 MPH 61 KPH
Minimum = -31.40 G'S at 54 msec	Maximum = 115.14 G'S at 28 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION

1 897015AF.A64 Filterclass (180)

G.S



NGA Research
02-04-1997 17:20

TIME (SECONDS)

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

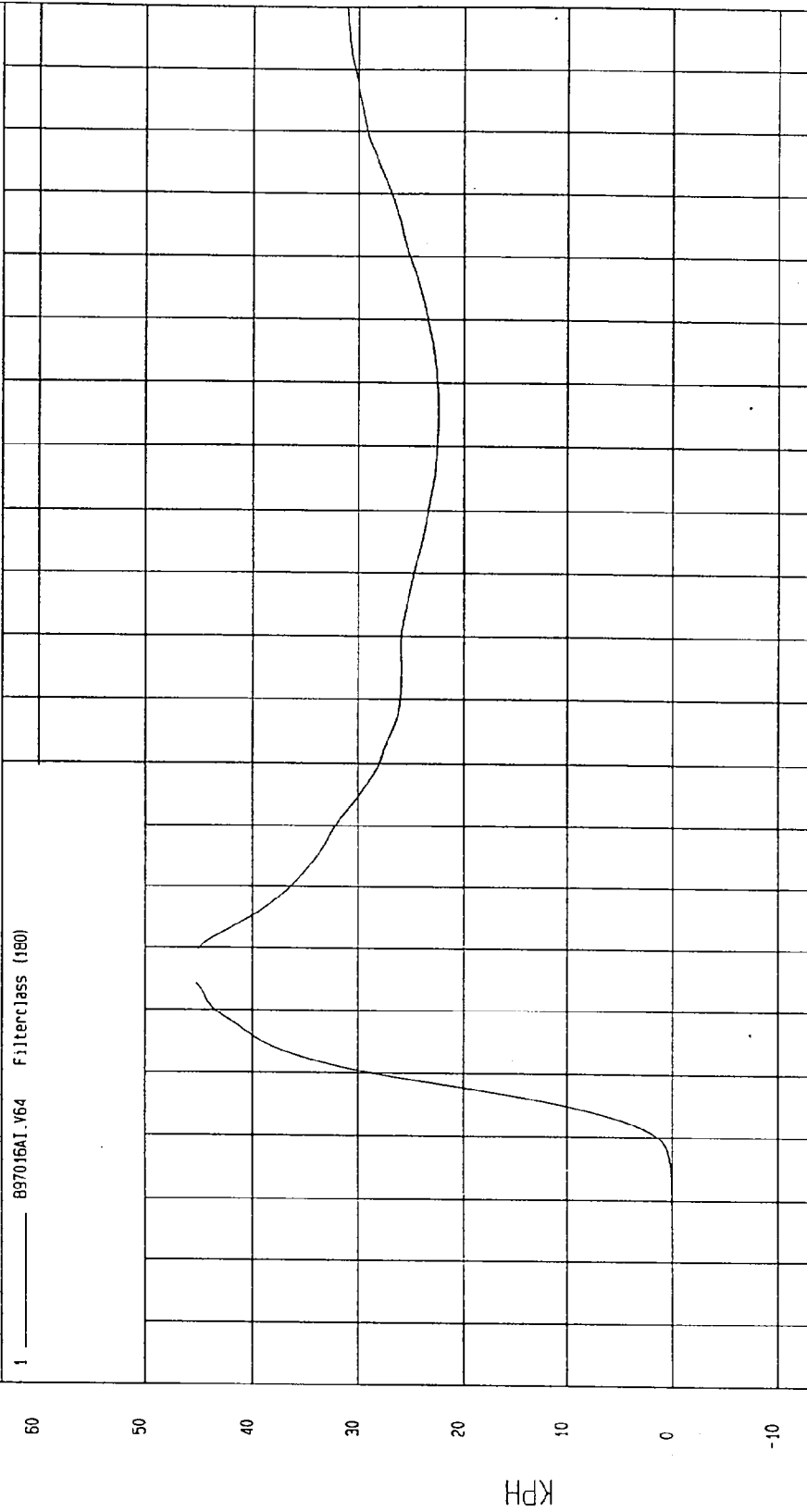
Speed: 37.9 MPH 61 KPH

Minimum = 0 KPH at -20 msec

Maximum = 45.69 KPH at 47 msec

DRIVER PELVIS Y REDUNDANT VELOCITY

1 ——— 897016A1.V64 FilterClass (180)



MCA Research
02-01-1997 16:28

TIME Seconds

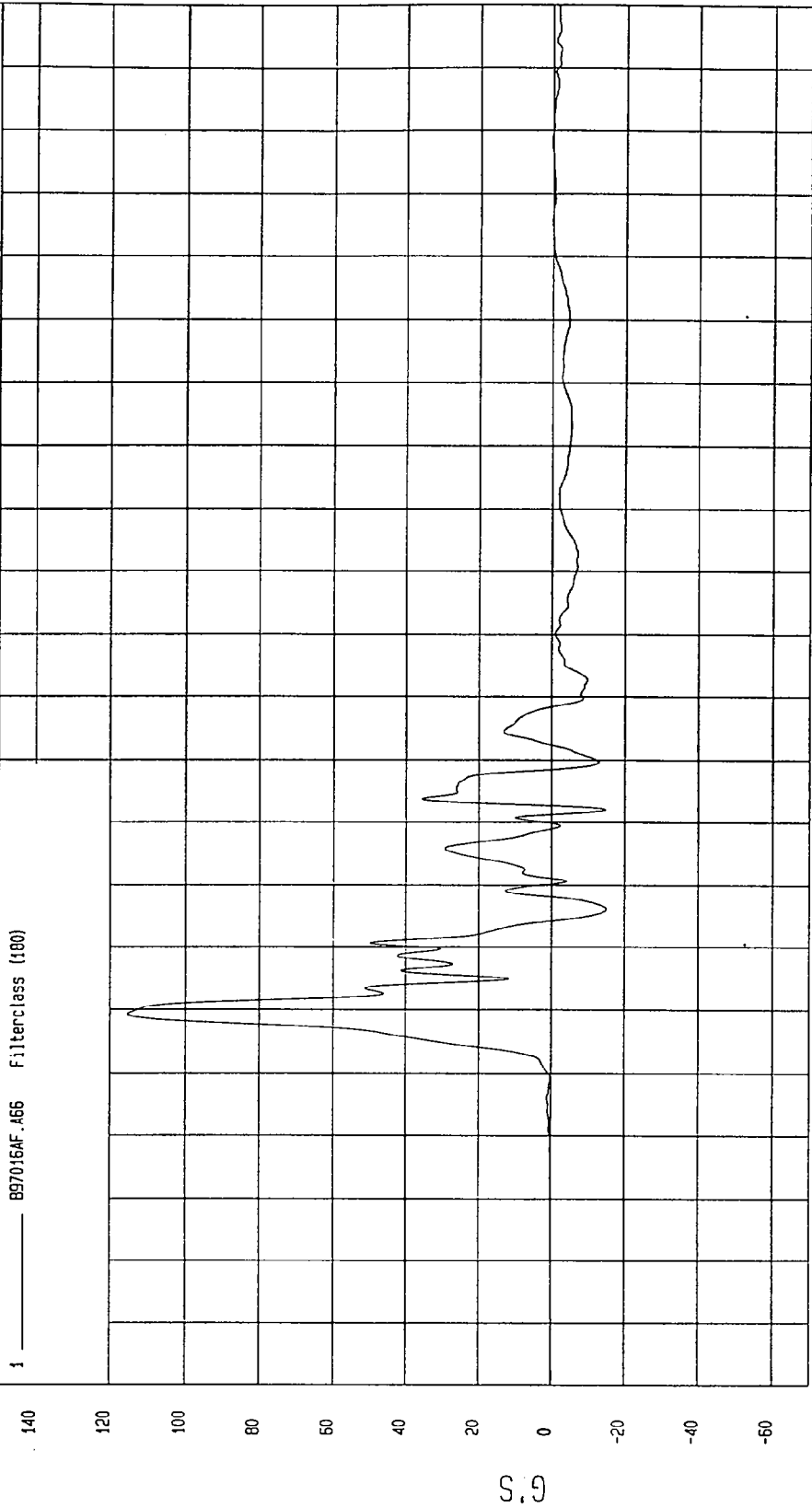
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -15.05 G'S at 56 msec Maximum = 115.21 G'S at 39 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 ——— B97016AF.A66 Filterclass (180)



MGA Research
02-04-1997 17:20

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -2.54E-02 KPH at -9 msec Maximum = 44.35 KPH at 88 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY

1 ——— 897016A1.V65 Filterclass (180)



WCA Research
02-01-1997 15:28

TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Speed: 37.9 MPH 61 KPH

Minimum = -32.86 G'S at 78 msec

Maximum = 114.95 G'S at 40 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 ——— B97016AF.A67 Filterclass (180)

140

120

100

80

60

40

20

0

-20

-40

-60

G.S

.19

.18

.17

.16

.15

.14

.13

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

-.01

-.02

TIME (SECONDS)

MEA Research
02-04-1997 17:20

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

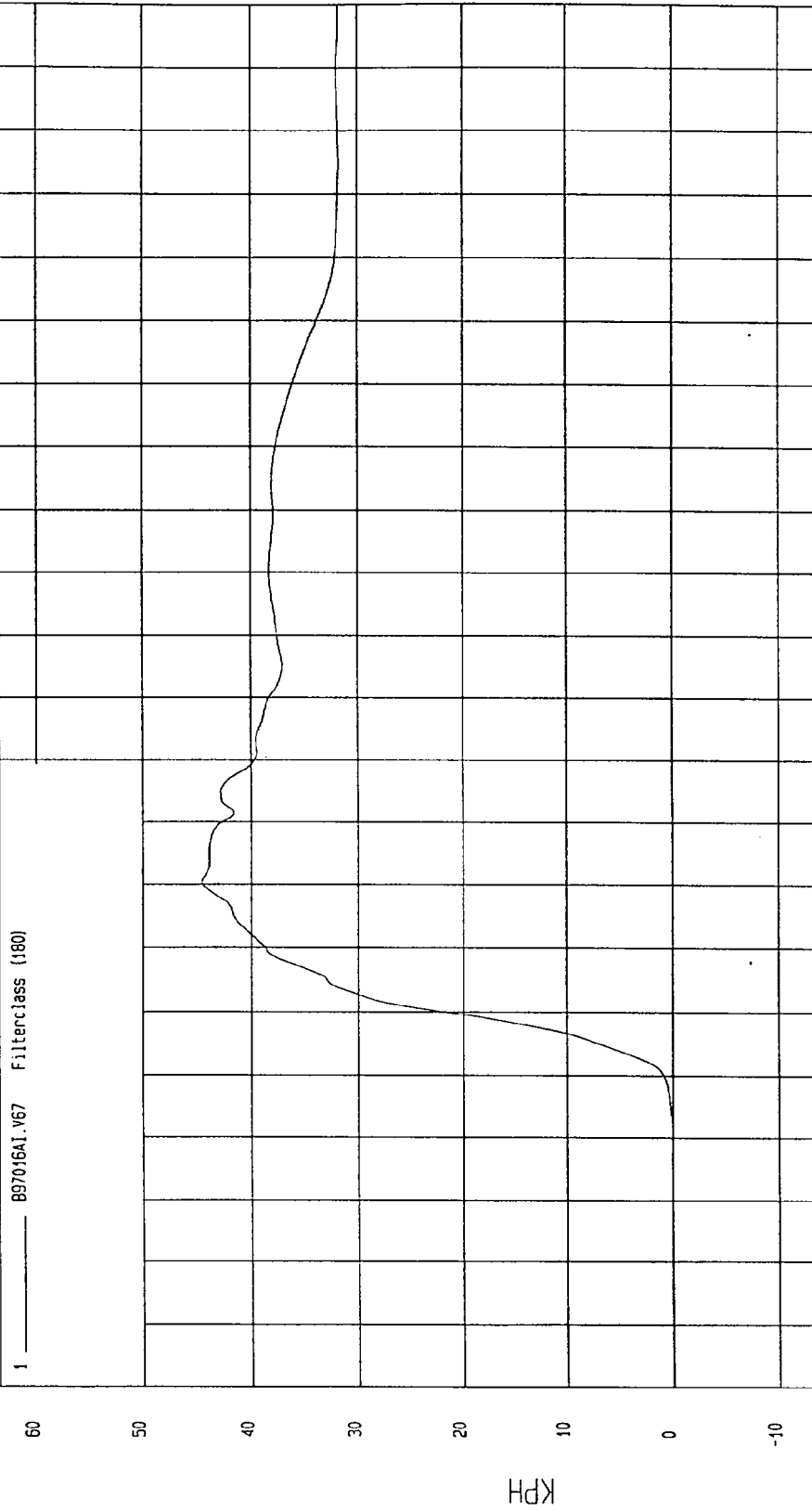
Speed: 37.9 MPH 61 KPH

Minimum = 0 KPH at -20 msec

Maximum = 44.67 KPH at 60 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY

1 ——— B97016A1.V67 Filterclass (180)



TIME Seconds

MGA Research
02-01-1997 16:28

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

SPEED: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -54.29 G'S at 72 msec Maximum = 91.64 G'S at 42 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 897016AF A68 FilterClass (180)

140

120

100

80

60

40

20

0

-20

-40

-60

G.S

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

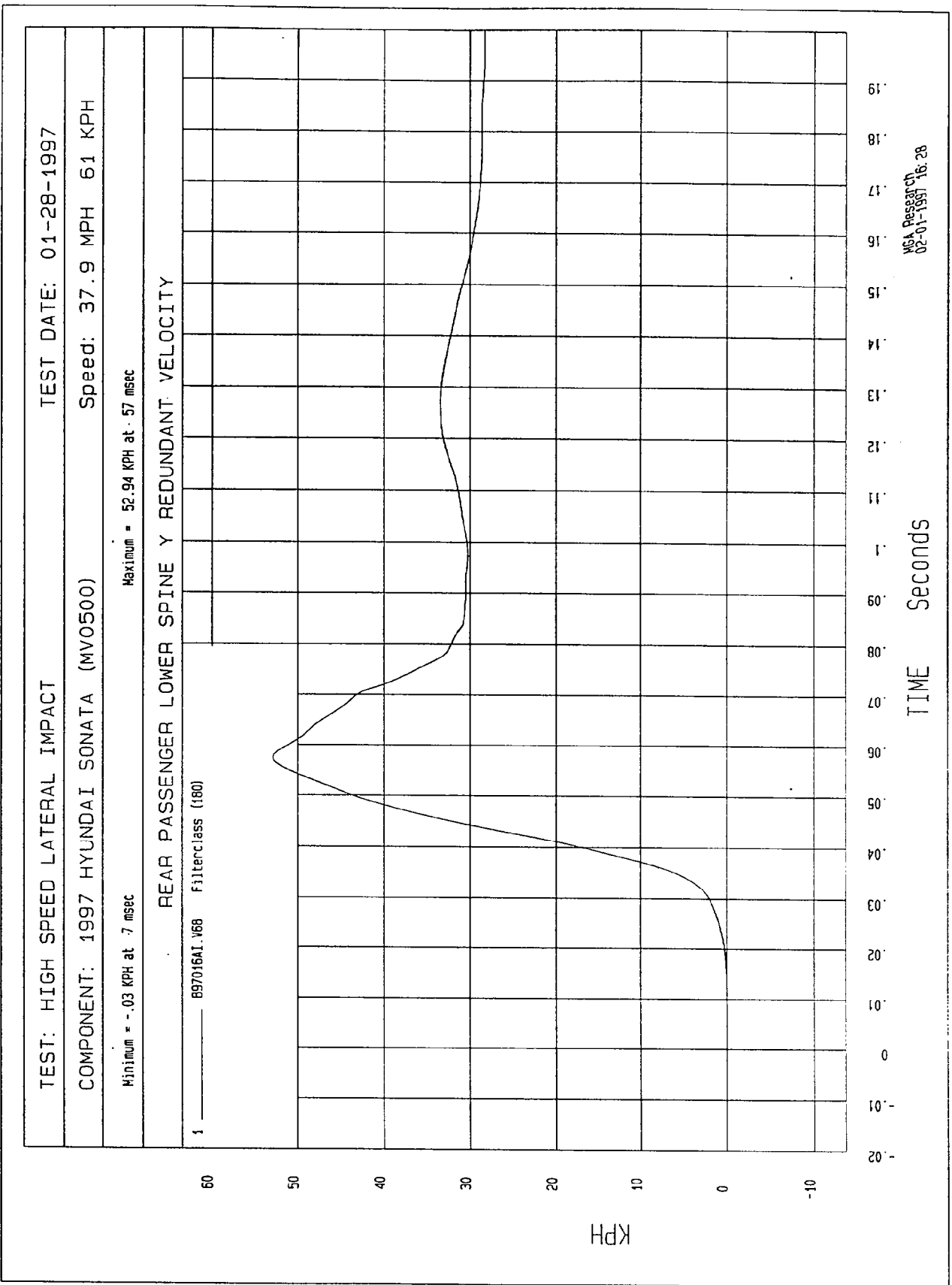
0

-01

-02

MGA Research
02-04-1997 17:20

TIME (SECONDS)



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

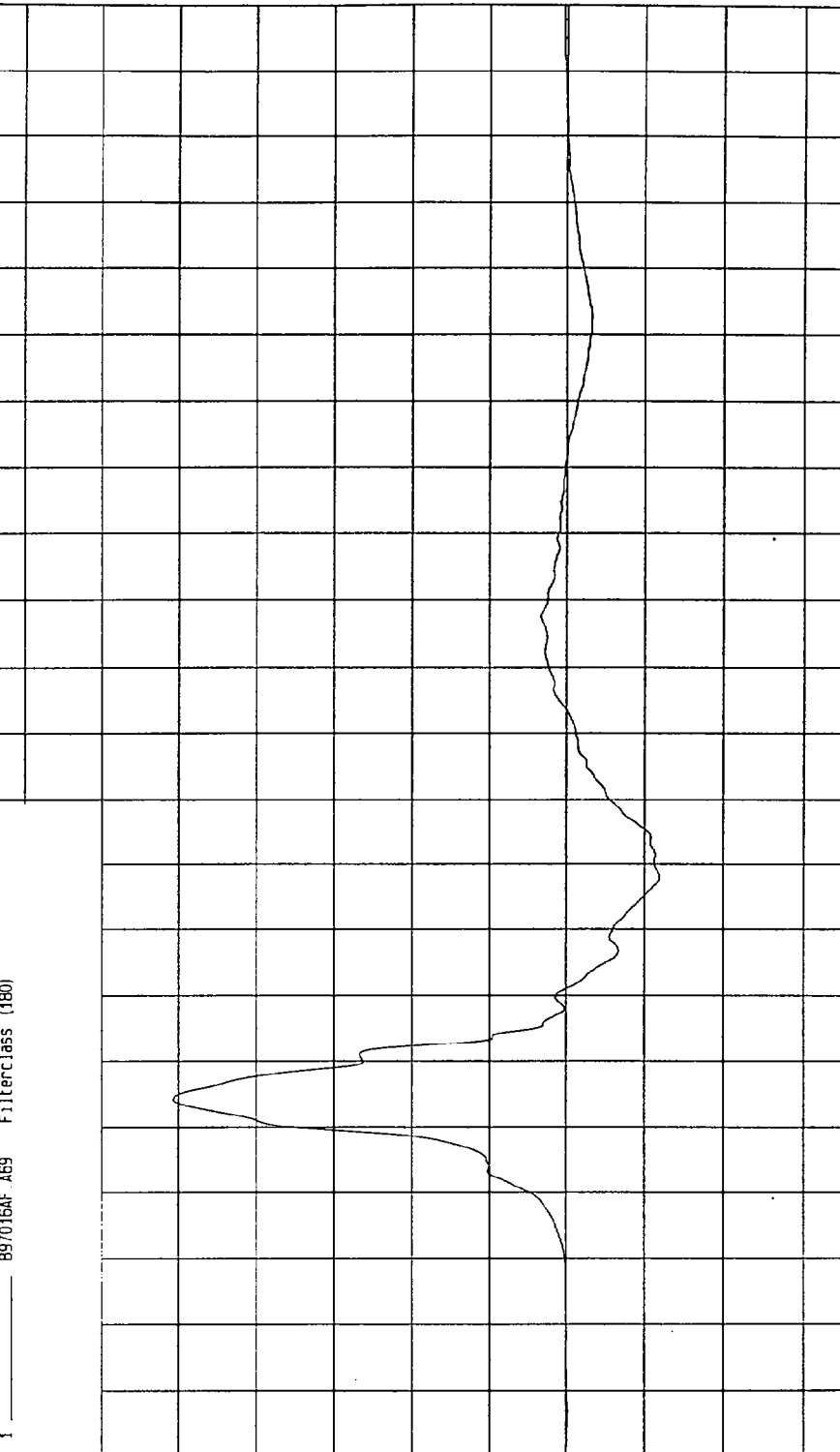
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -23.89 G's at 68 msec Maximum = 101.41 G's at 34 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

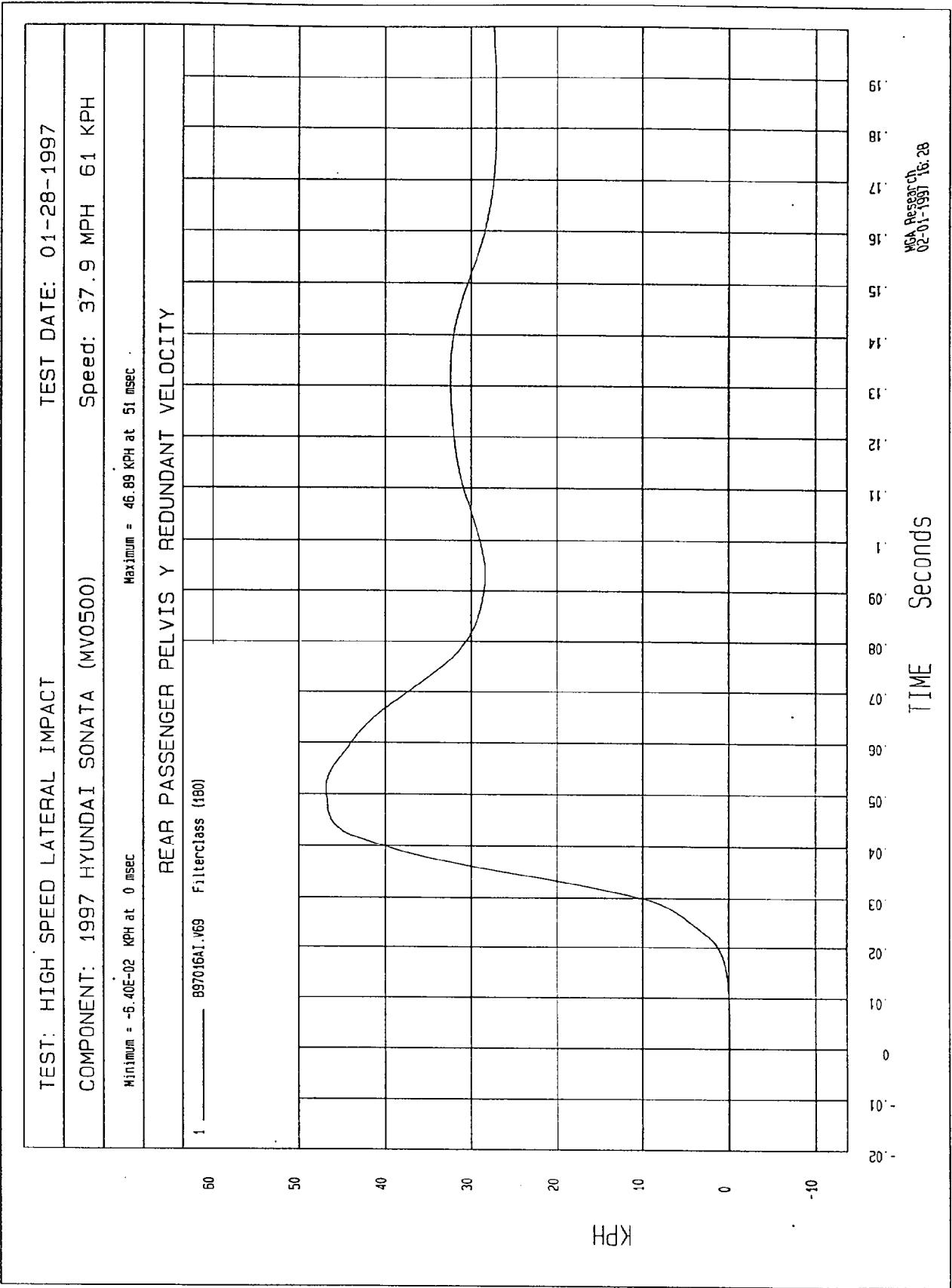
1 ——— 897016AF A69 Filterclass (180)

G.S

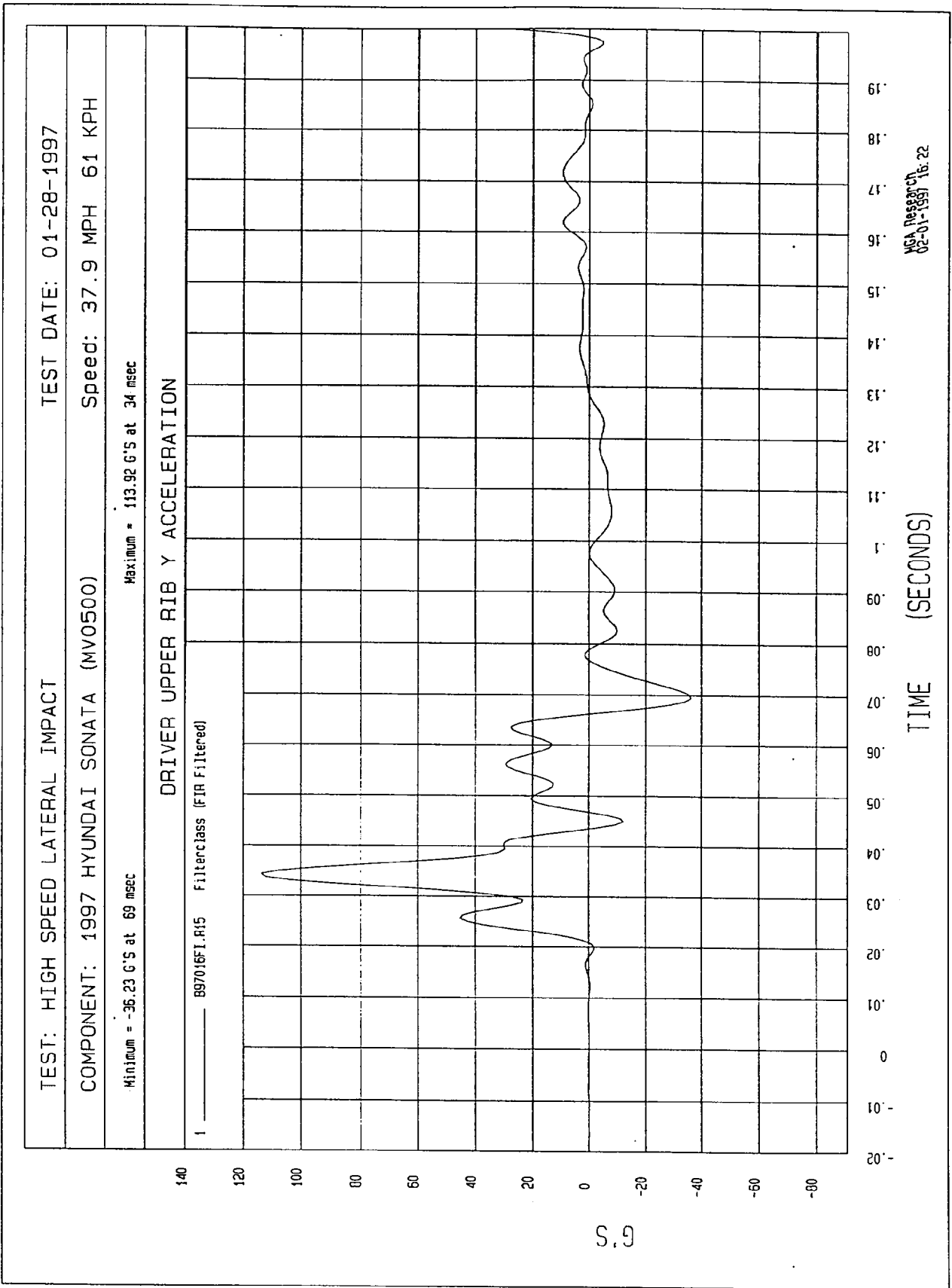


MCA Research
02-04-1997 11:20

TIME (SECONDS)



FINITE IMPULSE RESPONSE (FIR) FILTERED DATA



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

SPEED: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -35.47 G'S at 70 msec Maximum = 110.23 G'S at 34 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 B97016F1.R61 Filterclass (FIR Filtered)

140

120

100

80

60

40

20

0

-20

-40

-60

-80

G.S

TIME (SECONDS)

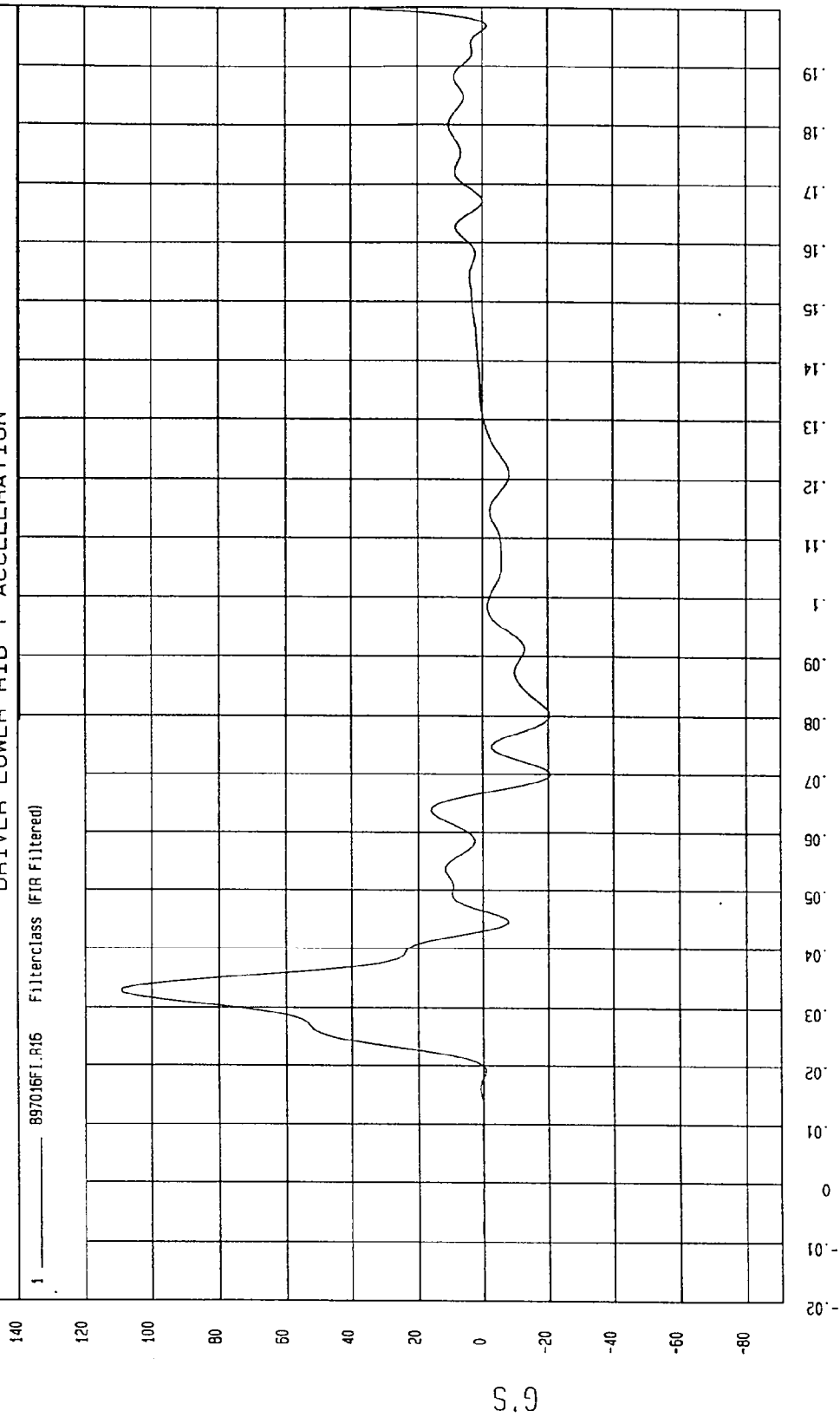
MGA Research
02-01-1997 15: 41

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -20.81 G'S at 70 msec Maximum = 109.14 G'S at 33 msec

DRIVER LOWER RIB Y ACCELERATION



MSA Research
02-01-1997 16:22

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

SPEED: 37.9 MPH 61 KPH

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Minimum = -20.11 G'S at 70 msec Maximum = 107.08 G'S at 33 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 897016FI.R62 Filterclass (FIR Filtered)

140

120

100

80

60

40

20

0

-20

-40

-60

-80

G.S

-02

-01

0

01

02

03

04

05

06

07

08

09

10

11

12

13

14

15

16

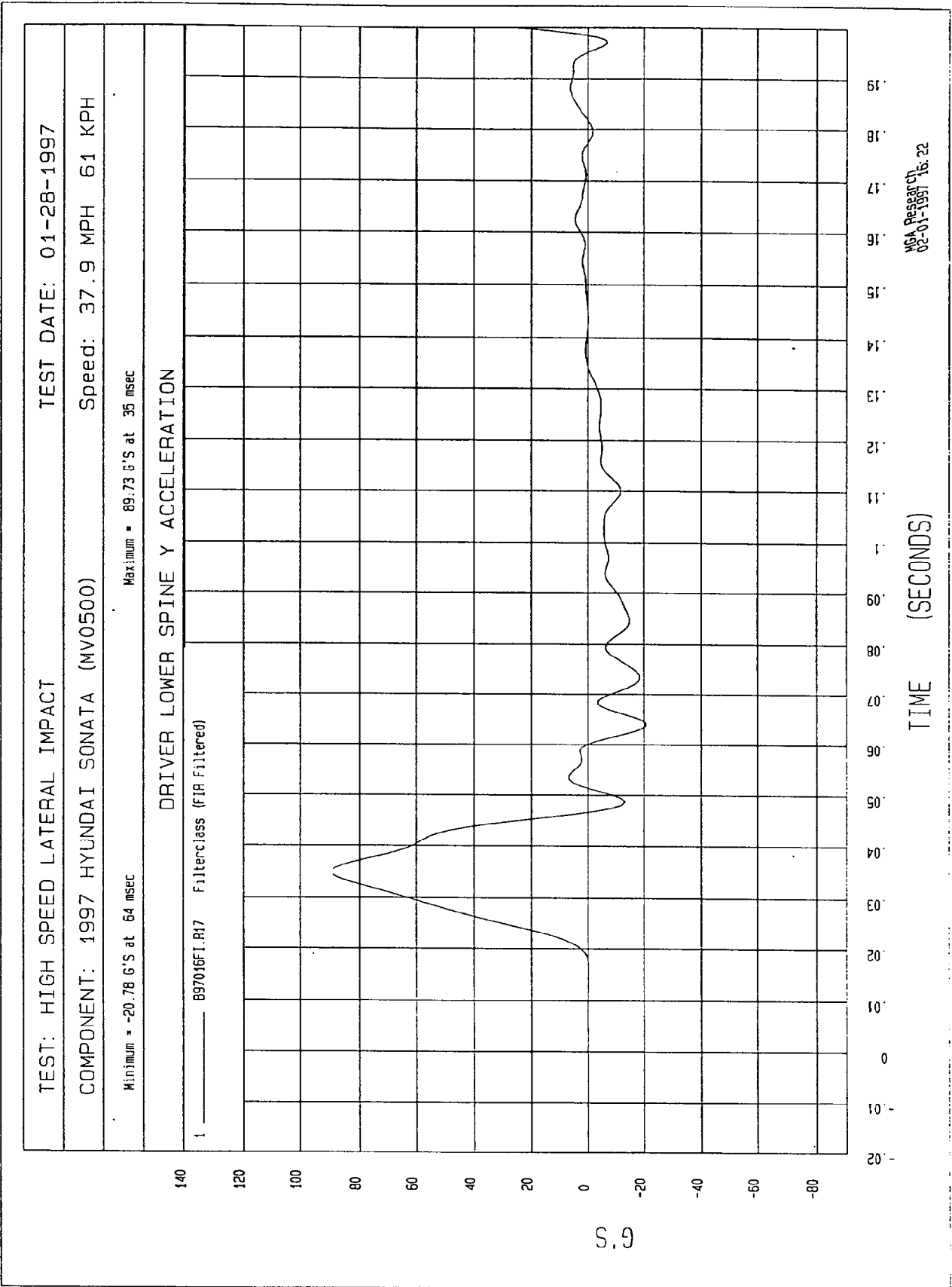
17

18

19

TIME (SECONDS)

MCA Research
02-01-1997 16:22



TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500)

Speed: 37.9 MPH 61 KPH

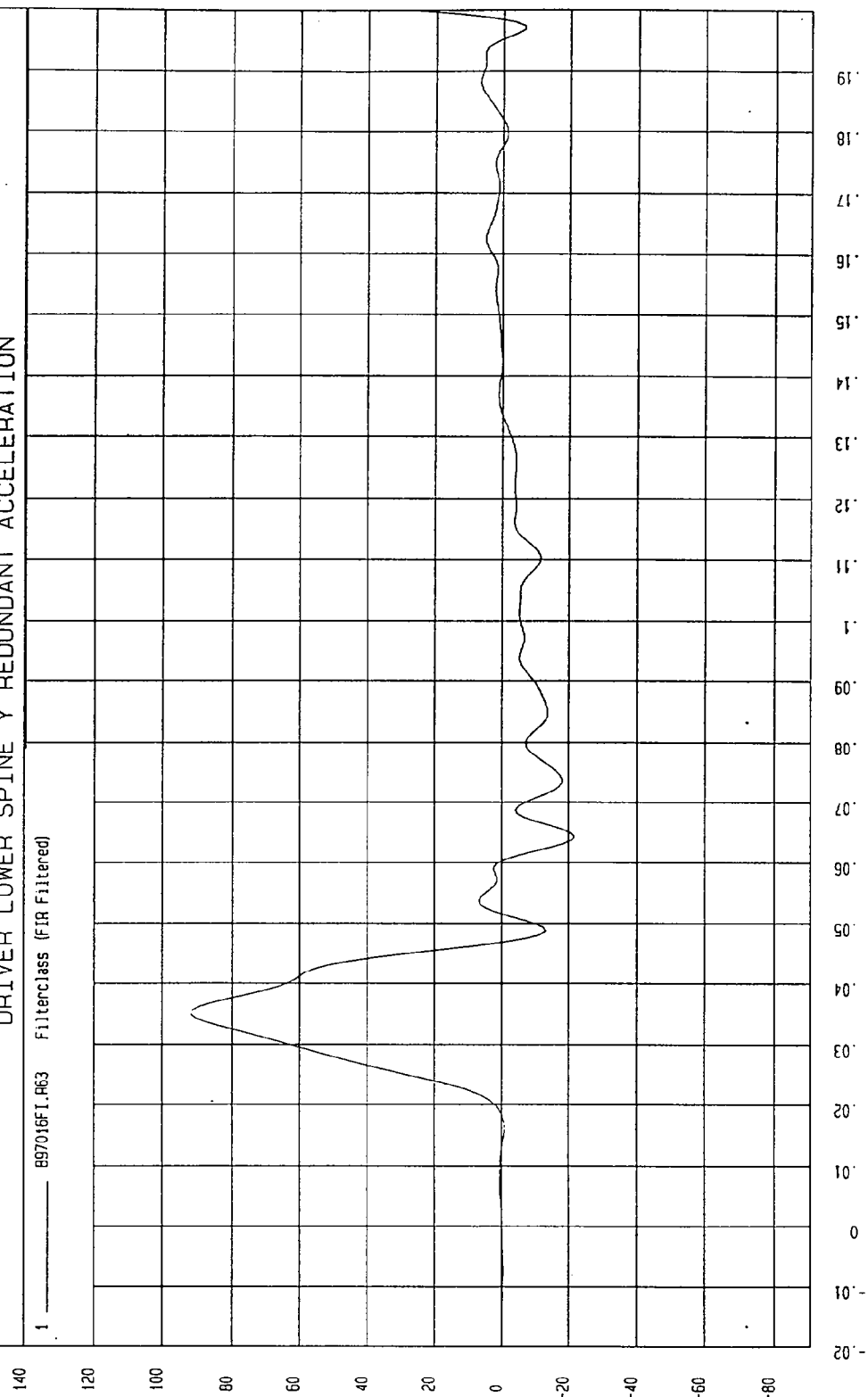
Minimum = -21.64 G'S at 64 msec

Maximum = 92.02 G'S at 35 msec

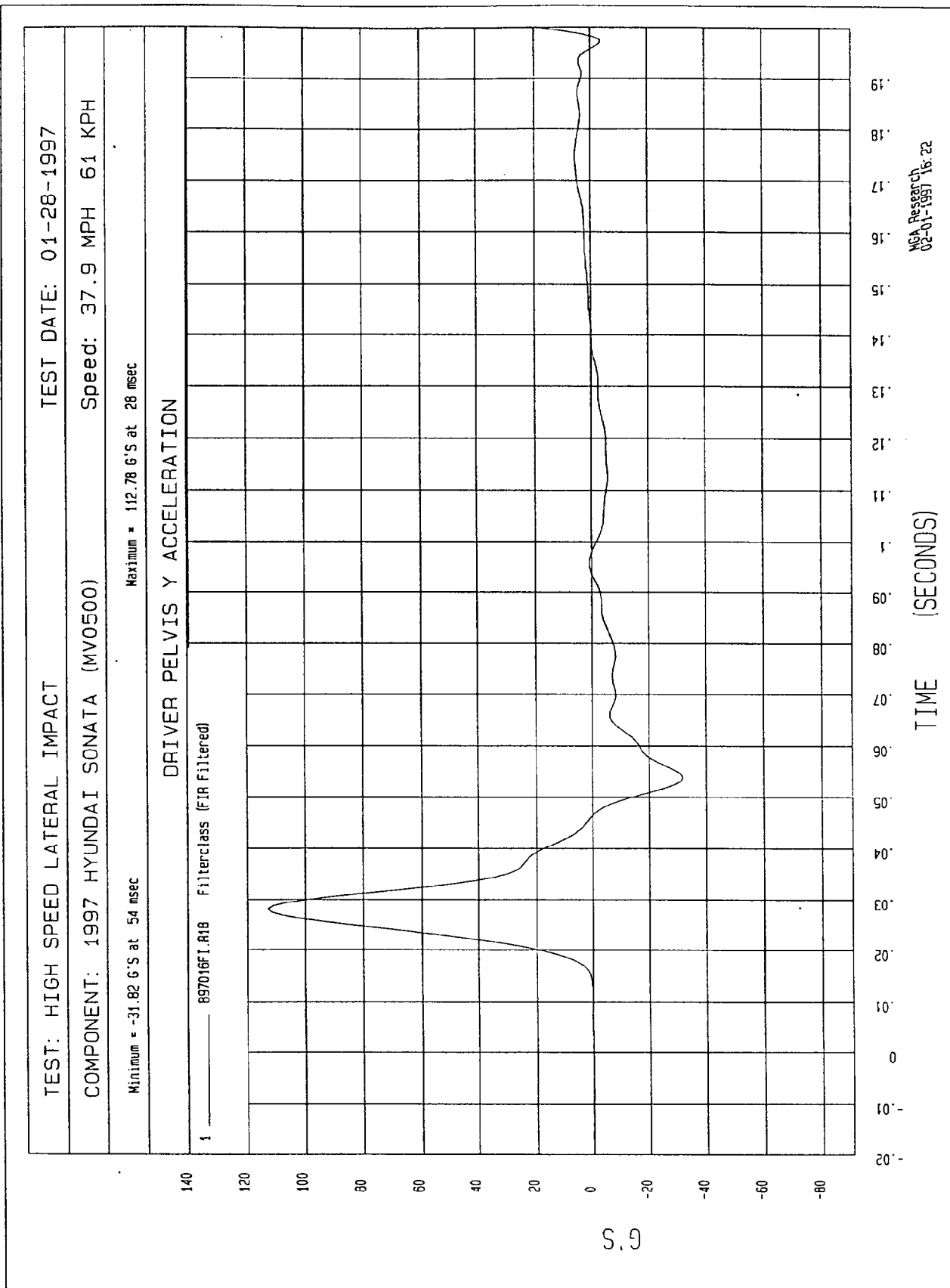
DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 ——— B97016F1.P63 FilterClass (FIR Filtered)

G.S



MCA Research
02-01-1997 16:22

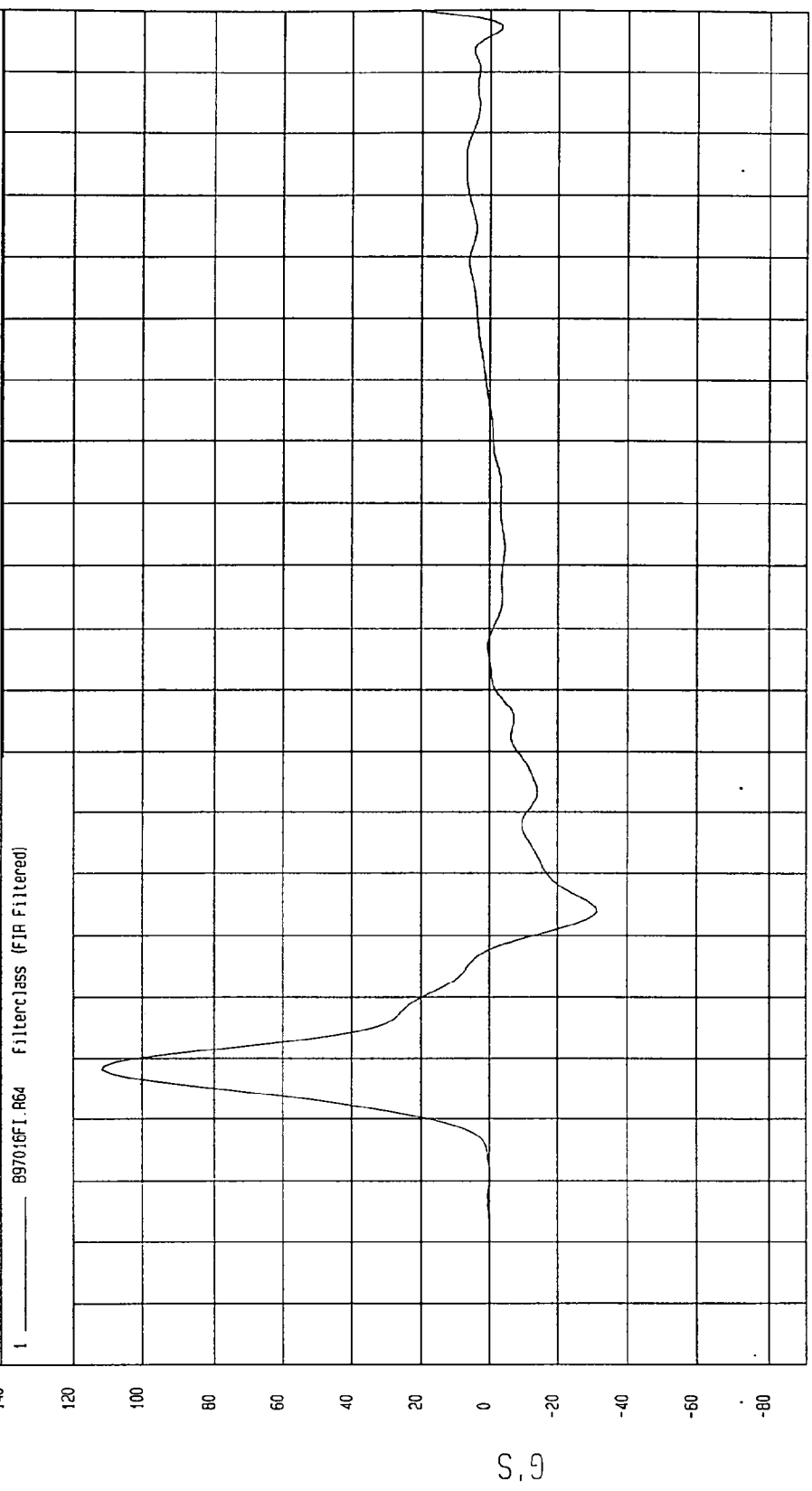


TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -31.36 G'S at 54 msec Maximum = 111.64 G'S at 28 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION



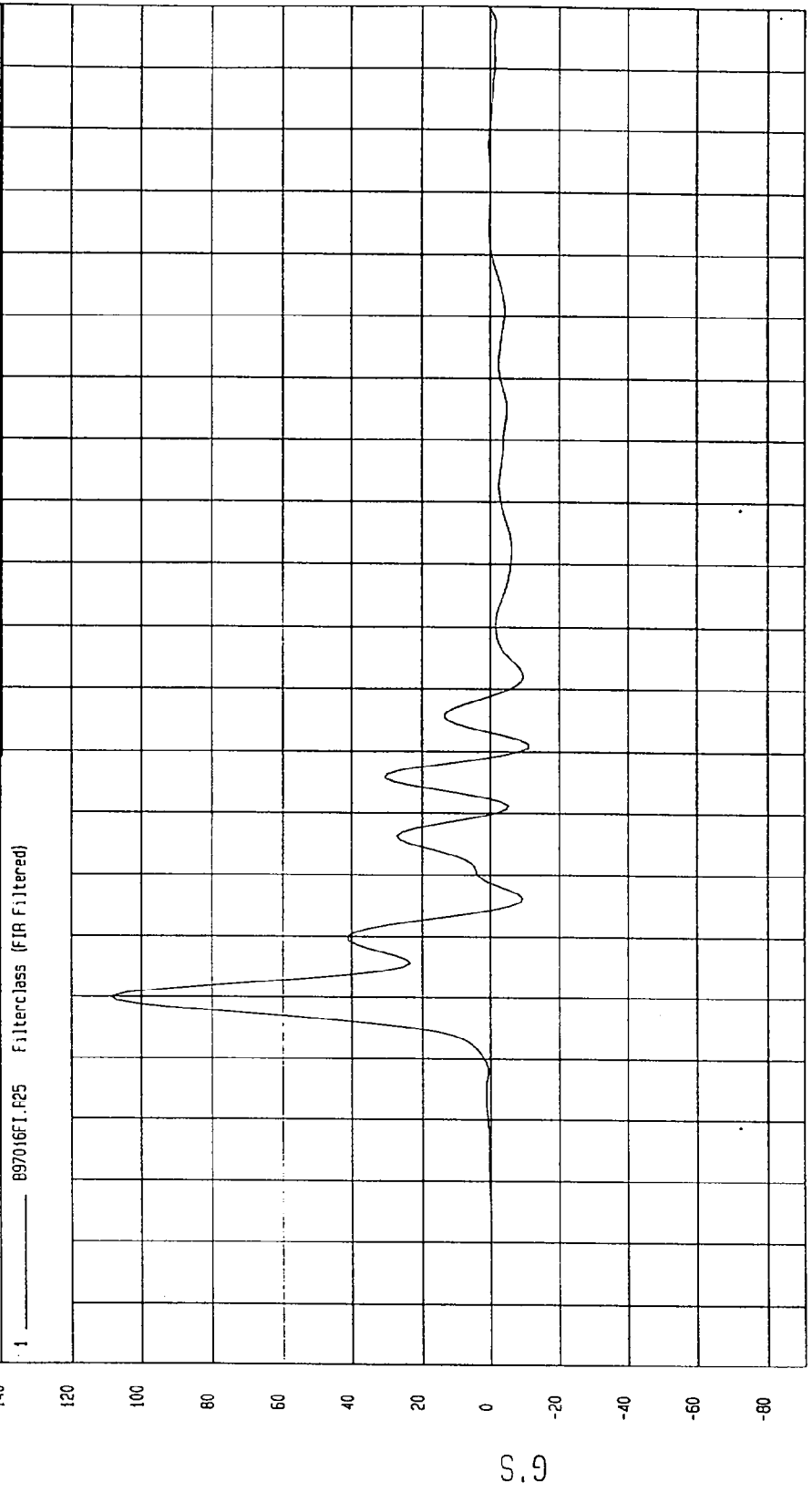
MCA Research
02-01-1997 15:22

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -11.04 G'S at 81 msec Maximum = 108.66 G'S at 40 msec

REAR PASSENGER UPPER RIB Y ACCELERATION



TIME (SECONDS)

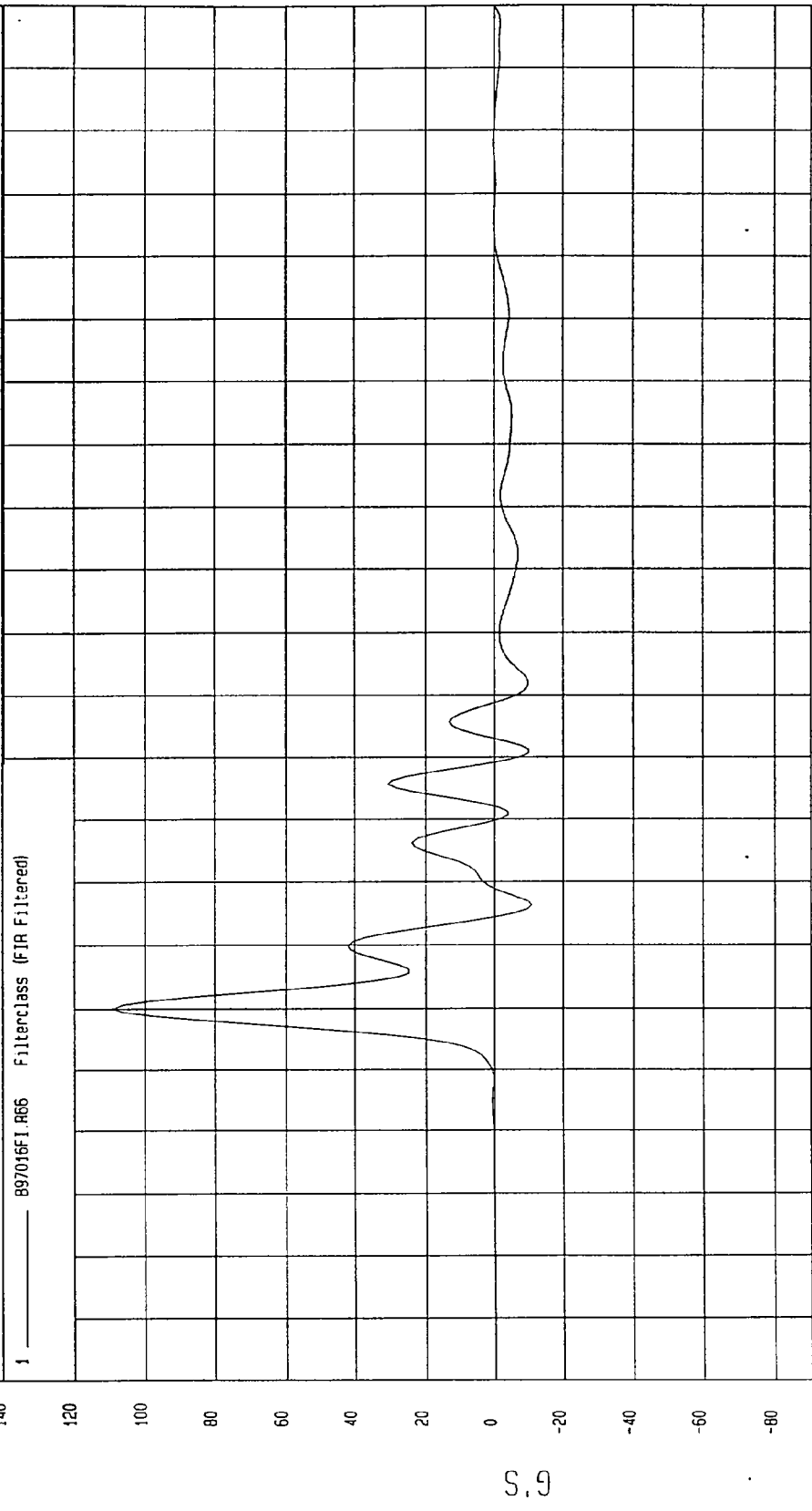
MCA Research
02-01-1997 16:22

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -10.81 G'S at 56 msec Maximum = 109.06 G'S at 40 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION



TIME (SECONDS)

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

02-01-1997 16:22
MGA Research

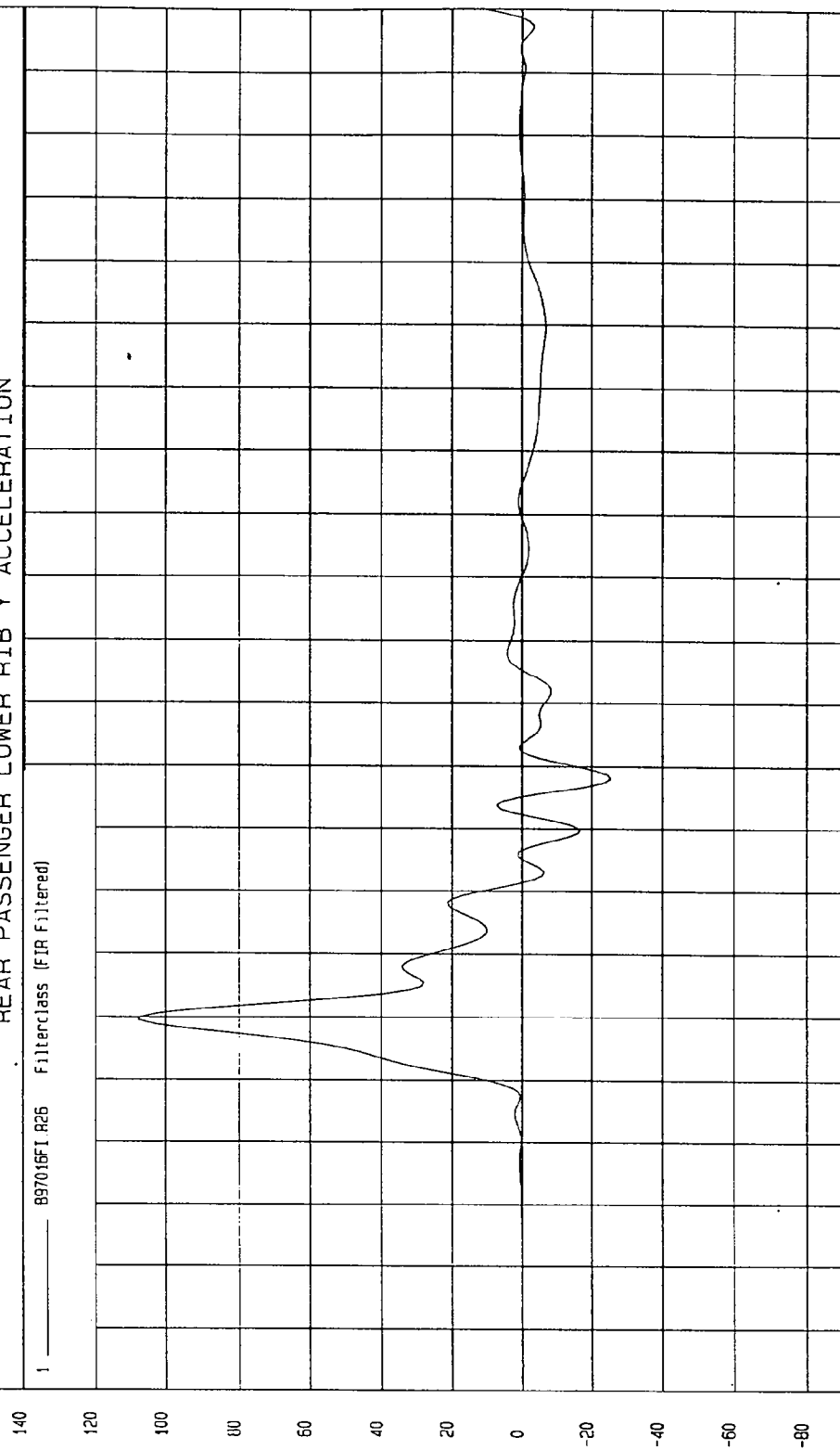
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -25.50 G'S at 78 msec Maximum = 107.94 G'S at 39 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 897016F1.R26 Filterclass (FIR Filtered)



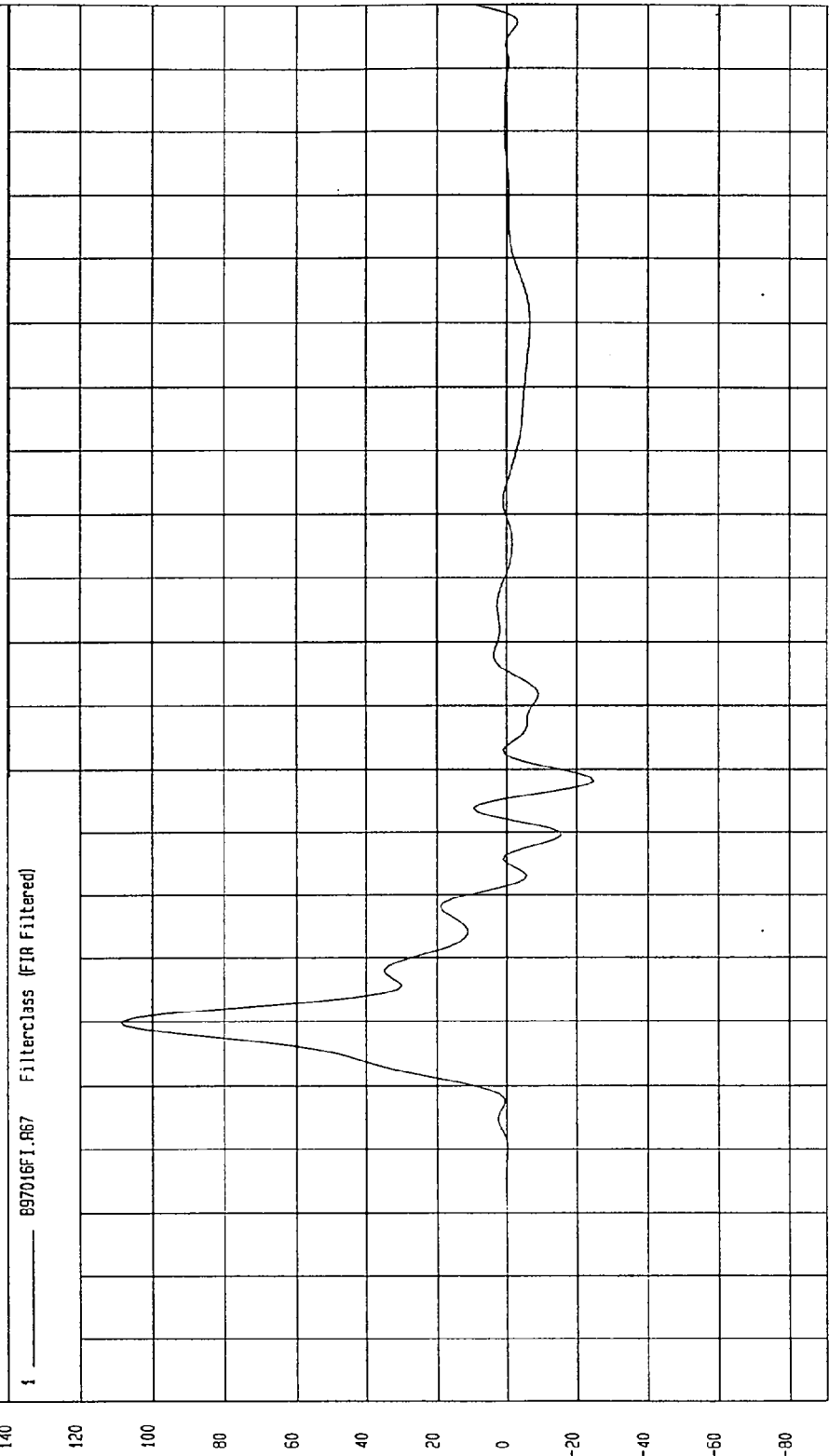
MGA Research
02-01-1997 16:22

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

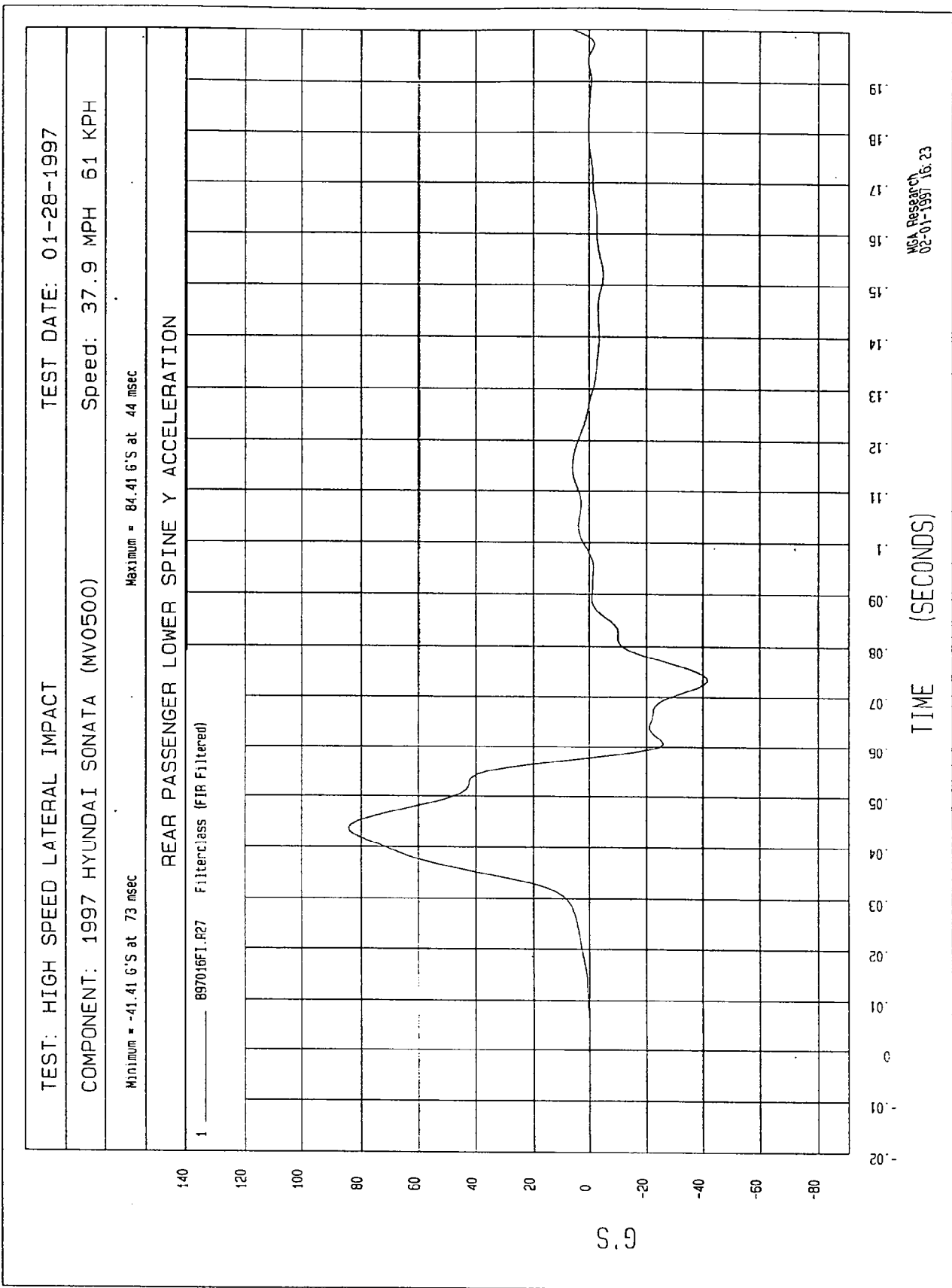
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -24.74 G'S at 78 msec Maximum = 108.97 G'S at 40 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION



MCA Research
02-01-1997 16:22



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

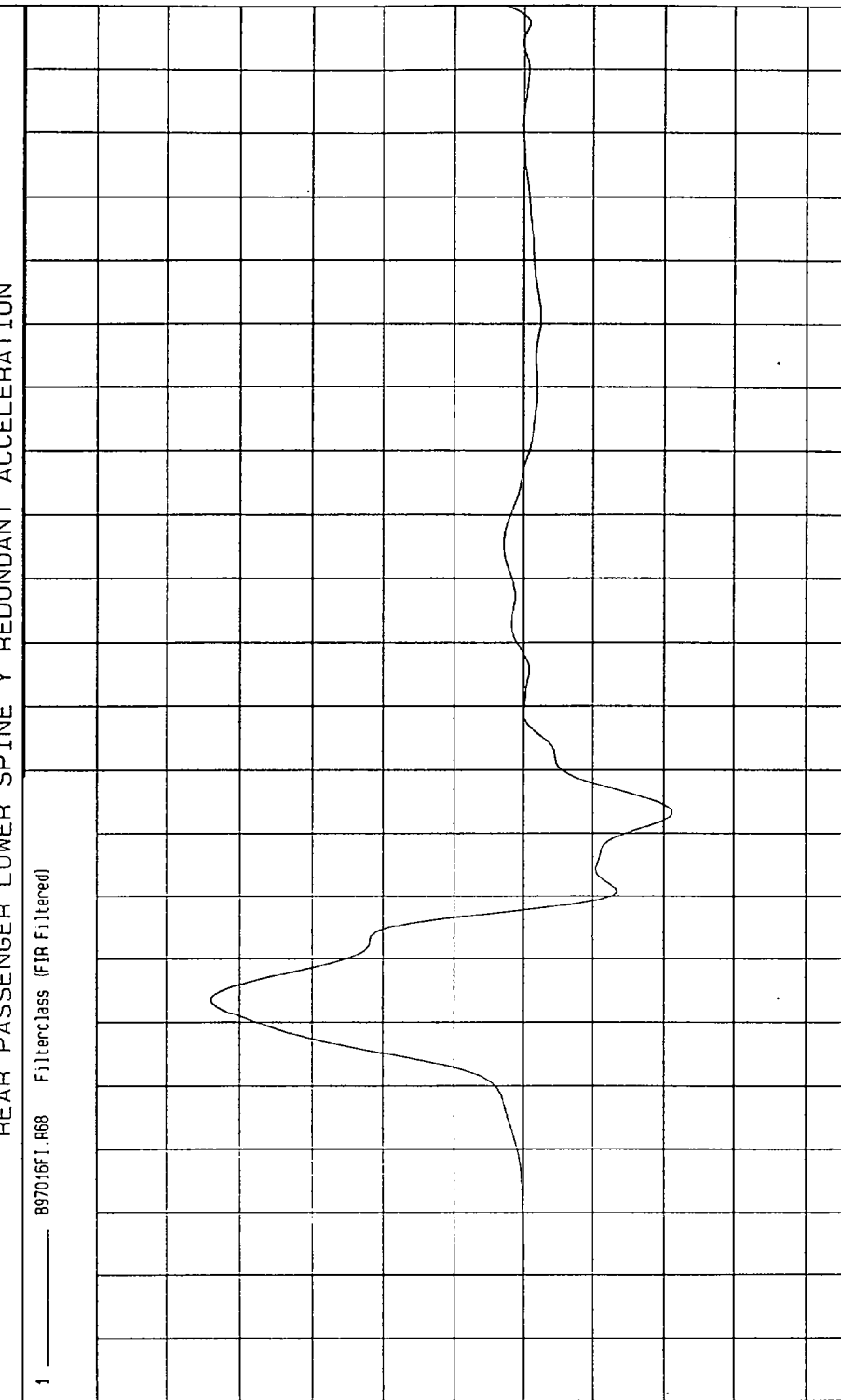
COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -42.34 G'S at 73 msec Maximum = 88.10 G'S at 44 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

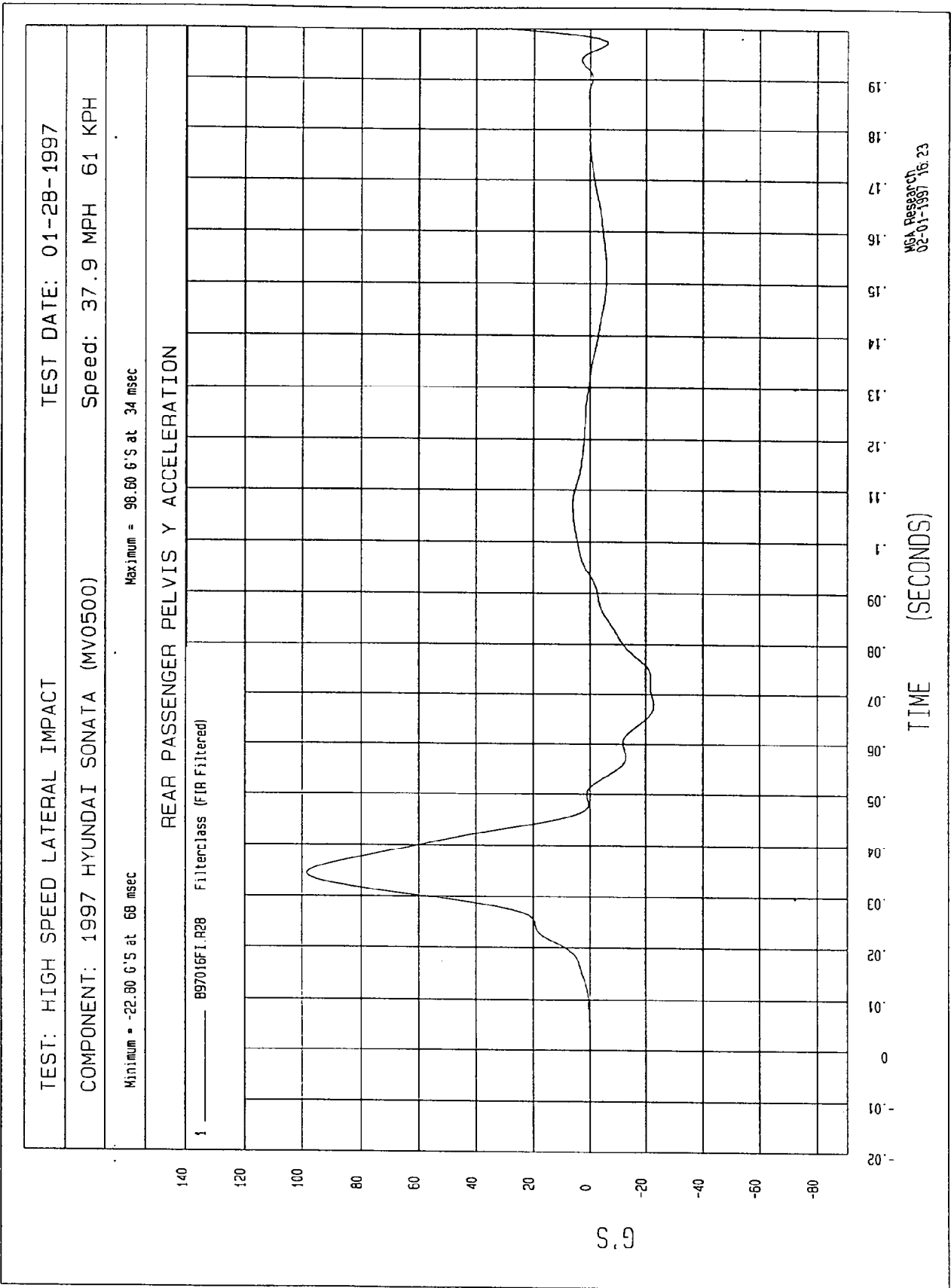
1 ——— B97016FI.R68 Filterclass (FIR Filtered)

G.S



TIME (SECONDS)

MCA Research
02-01-1997 16:23



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1997

COMPONENT: 1997 HYUNDAI SONATA (MV0500) Speed: 37.9 MPH 61 KPH

Minimum = -23.24 G'S at 69 msec Maximum = 100.59 G'S at 34 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 897016F1.R69 Filterclass (FIR Filtered)

140

120

100

80

60

40

20

0

-20

-40

-60

-80

G.S

TIME (SECONDS)

NCA Research
02-01-1997 16:23

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-97-DC12

DUMMY PERFORMANCE CALIBRATIONS

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

1997 HYUNDAI SONATA 4-DOOR
NHTSA NO. MV0500

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 28, 1997

Report Date: February 11, 1997

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
ROOM 5313, NPS-10
400 SEVENTH STREET, S.W.
Washington, D.C. 20590

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DUMMY S/N: 270	POST-TEST CERTIFICATION DATA	4-1
DUMMY S/N: 269	POST-TEST INSPECTION CHECKLIST	5-1
DUMMY S/N: 270	POST-TEST INSPECTION CHECKLIST	6-1
	VEHICLE AND DUMMY TEMPERATURE	7-1

PRE-TEST CERTIFICATION DATA

Front Dummy Serial Number: 269

Calibration Test Results Summary

Dummy 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: January 27, 1997

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"	15.1

MEASUREMENTS BY: Tim White

APPROVED BY: Dave Kosloske

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 27, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97212

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	13%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	45
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim Wilson

APPROVED BY

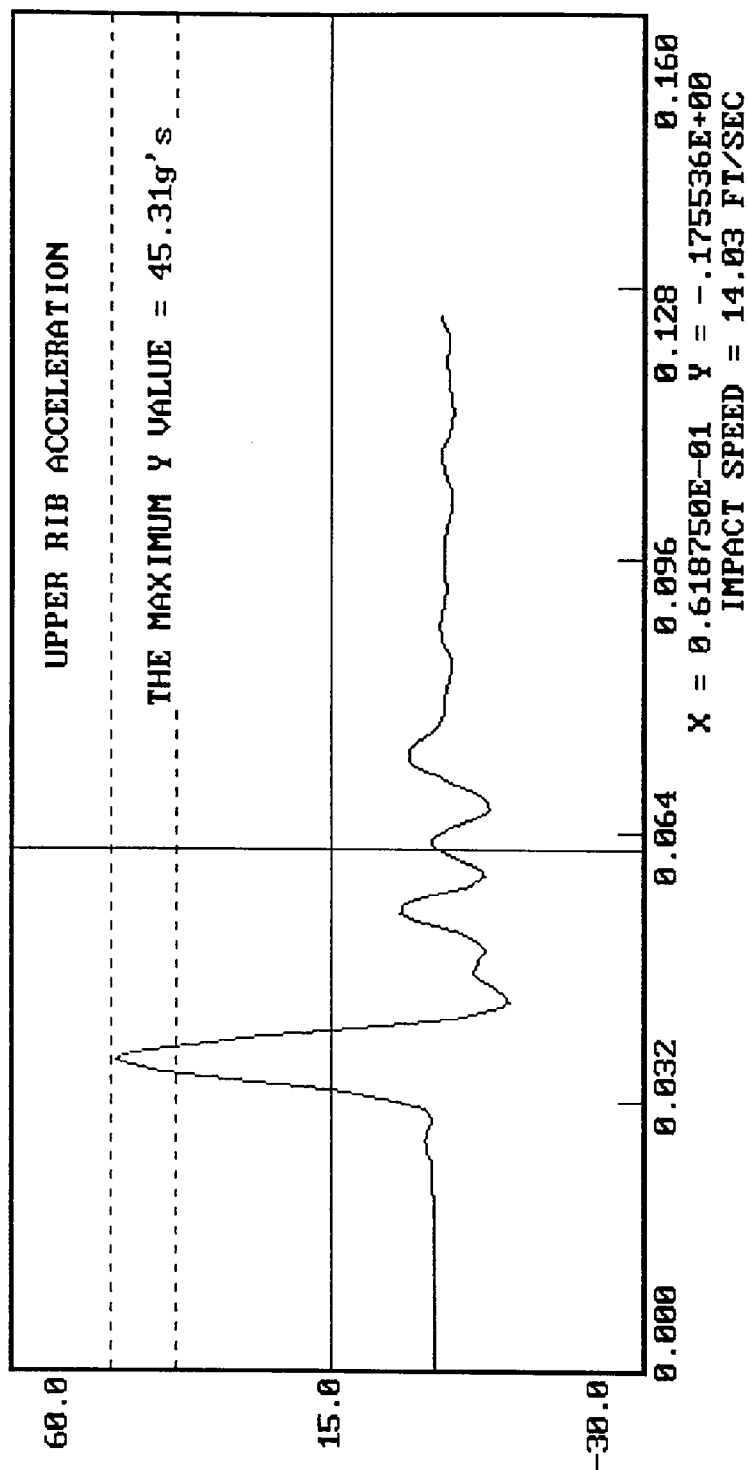
David K. Korb

01-27-1997 23:50

DUMMY CALIBRATION - THORAX IMPACT

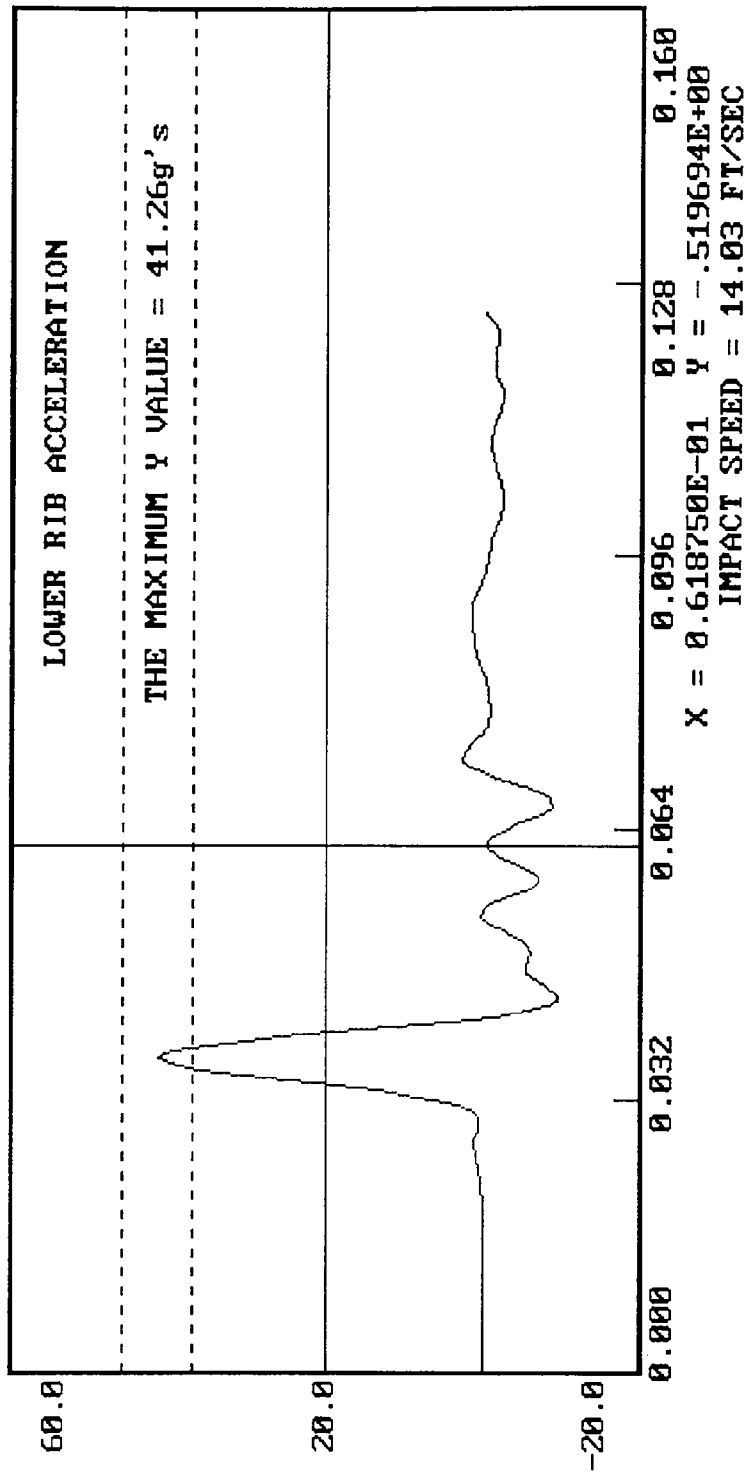
DUMMY # 269

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



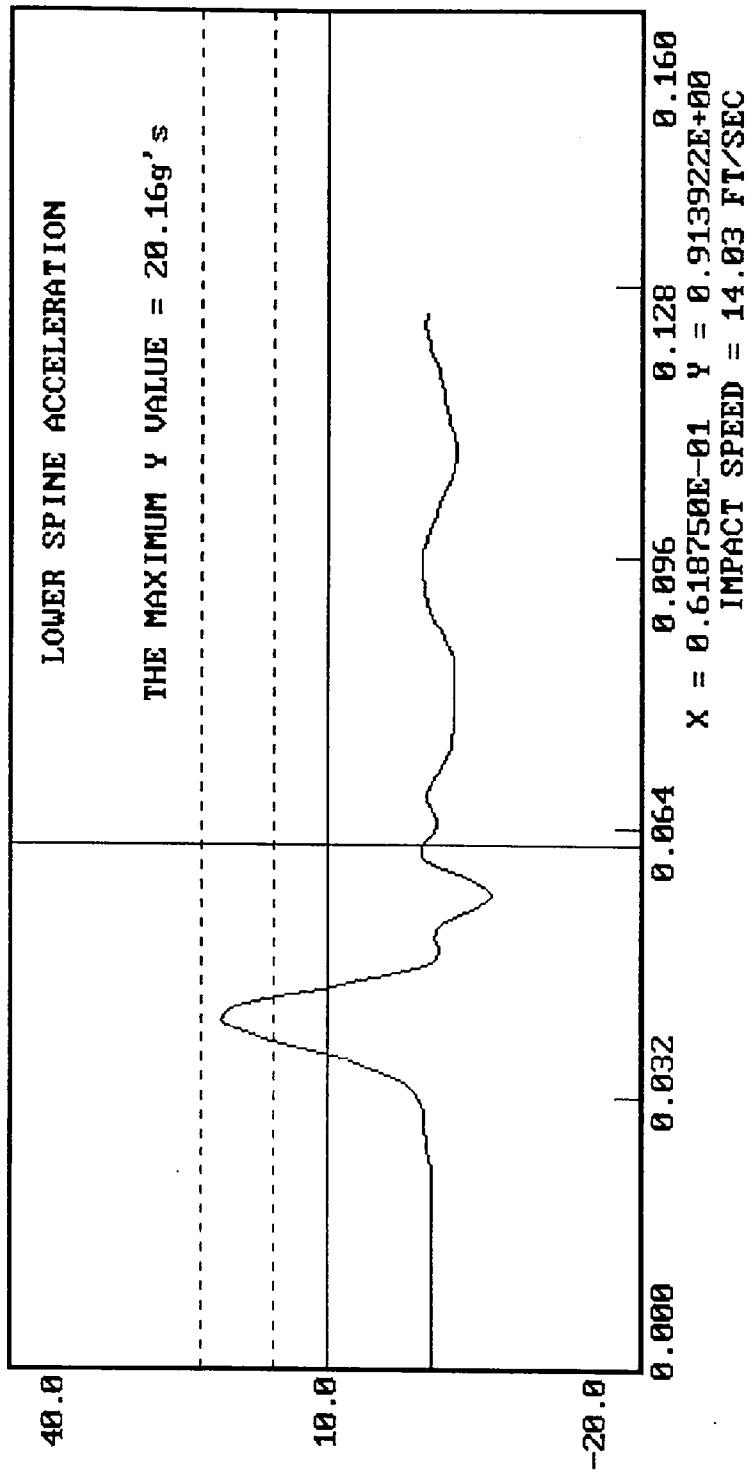
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 01-27-1997 23:50

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



01-27-1997 23:52

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 27, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97213

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	13%
PROBE SPEED	13.8 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	57

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

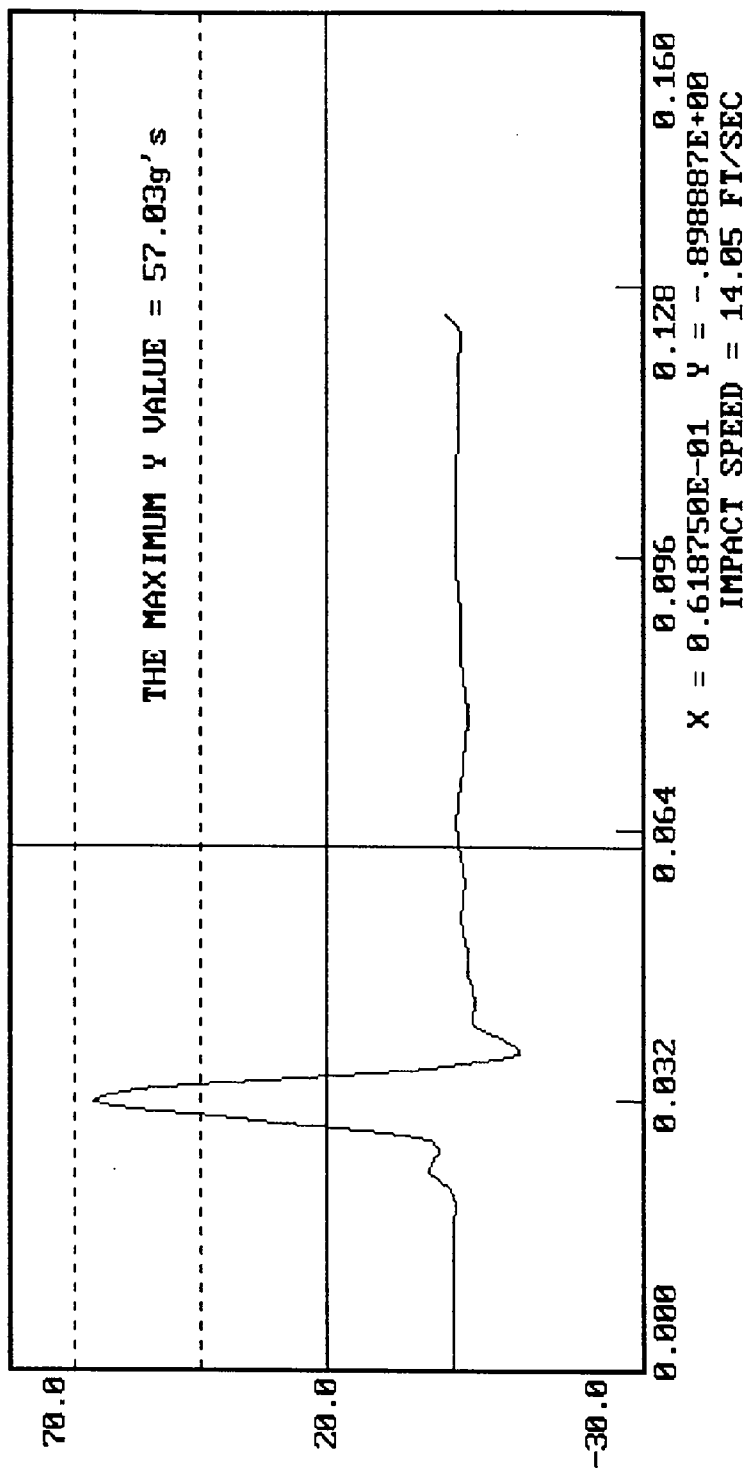
APPROVED BY Dave Kabiske

01-27-1997 23:58

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: January 27, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97214

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.9
FORCE @ 0.75 in	36.7 - 49.8 lbs	47.1
FORCE @ 1.0 in	50 - 63 lbs	61
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim White

APPROVED BY

Gene Kosloski

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 269

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

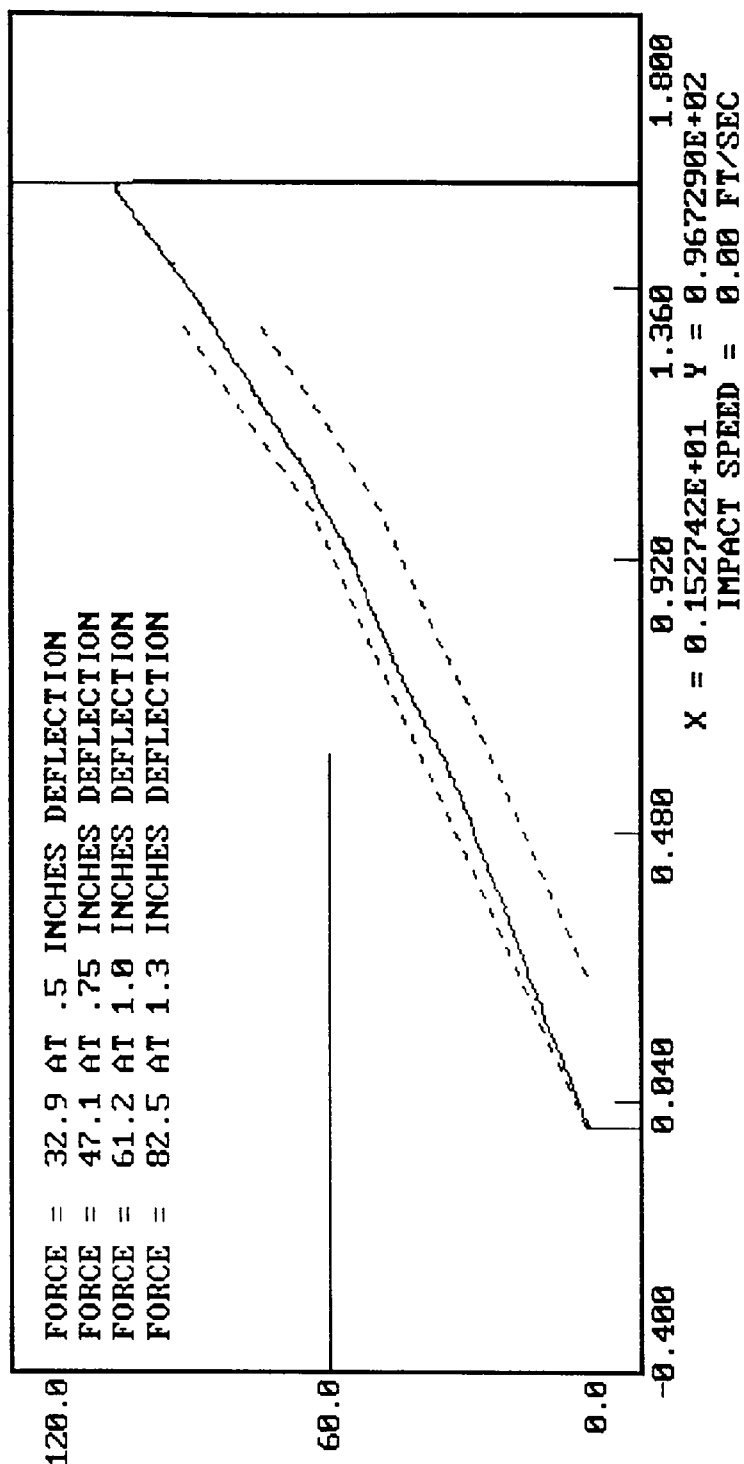
01-27-1997 14:43

FORCE = 32.9 AT .5 INCHES DEFLECTION

FORCE = 47.1 AT .75 INCHES DEFLECTION

FORCE = 61.2 AT 1.0 INCHES DEFLECTION

FORCE = 82.5 AT 1.3 INCHES DEFLECTION



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 27, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97215

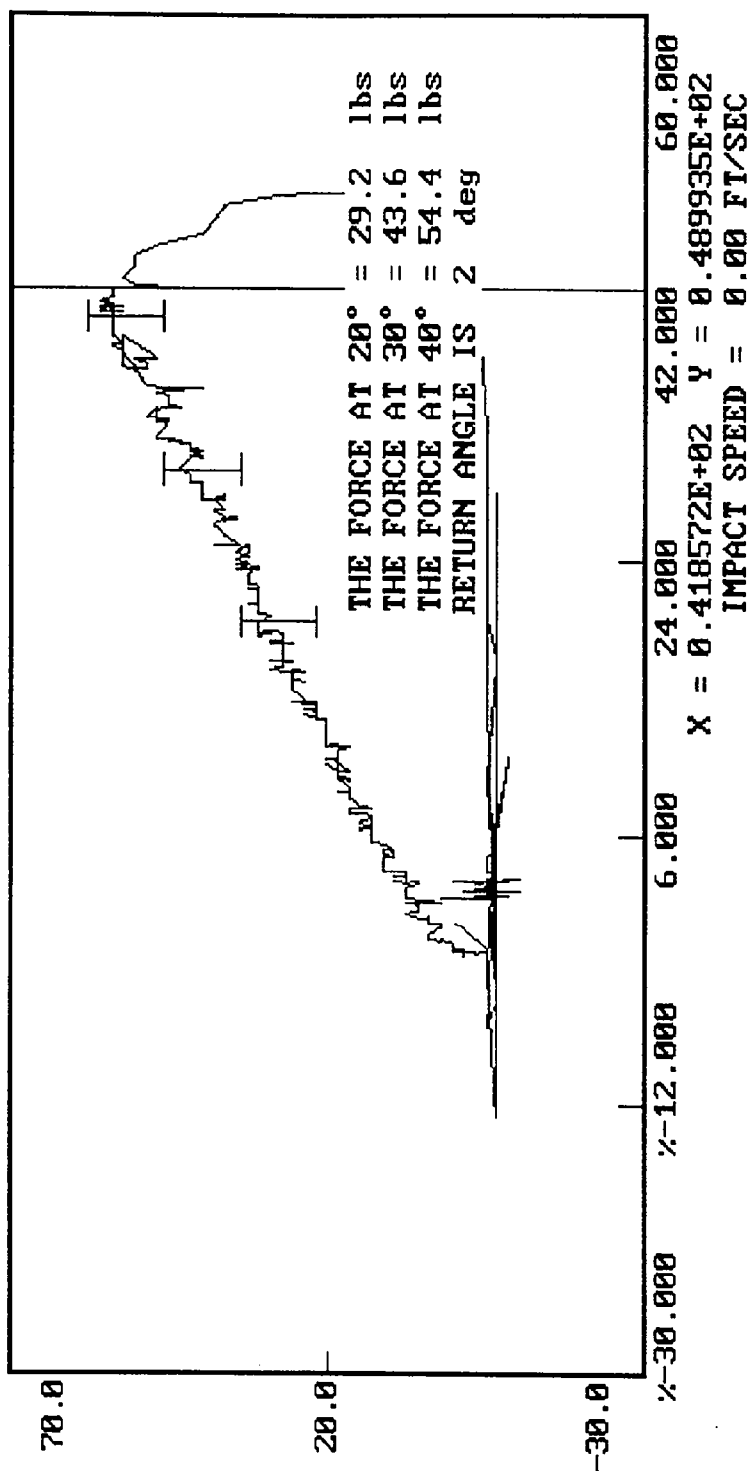
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	44
FORCE @ 40°	46 - 58 lbs	54
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim White

APPROVED BY Dave Kurbatke

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 269
 01-27-1997 15:30
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)



PRE-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

DATE OF VERIFICATION: January 28, 1997

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: Jim Helich

APPROVED BY: Dave Kosloske

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 28, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97222

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	13%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	39
LOWER RIB	37 - 46 g's	37
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim Mula

APPROVED BY

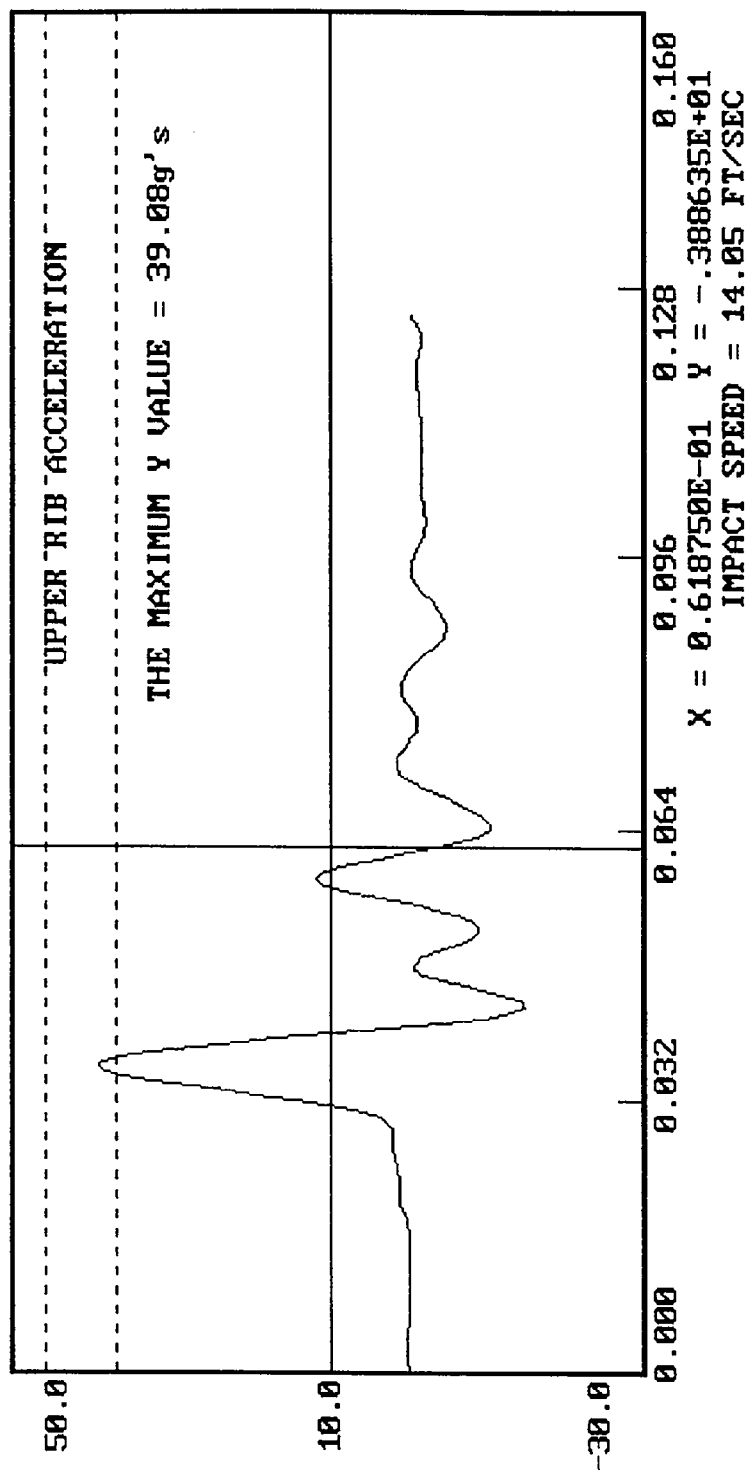
Rene Kabahe

01-28-1997 00:17

DUMMY CALIBRATION - THORAX IMPACT

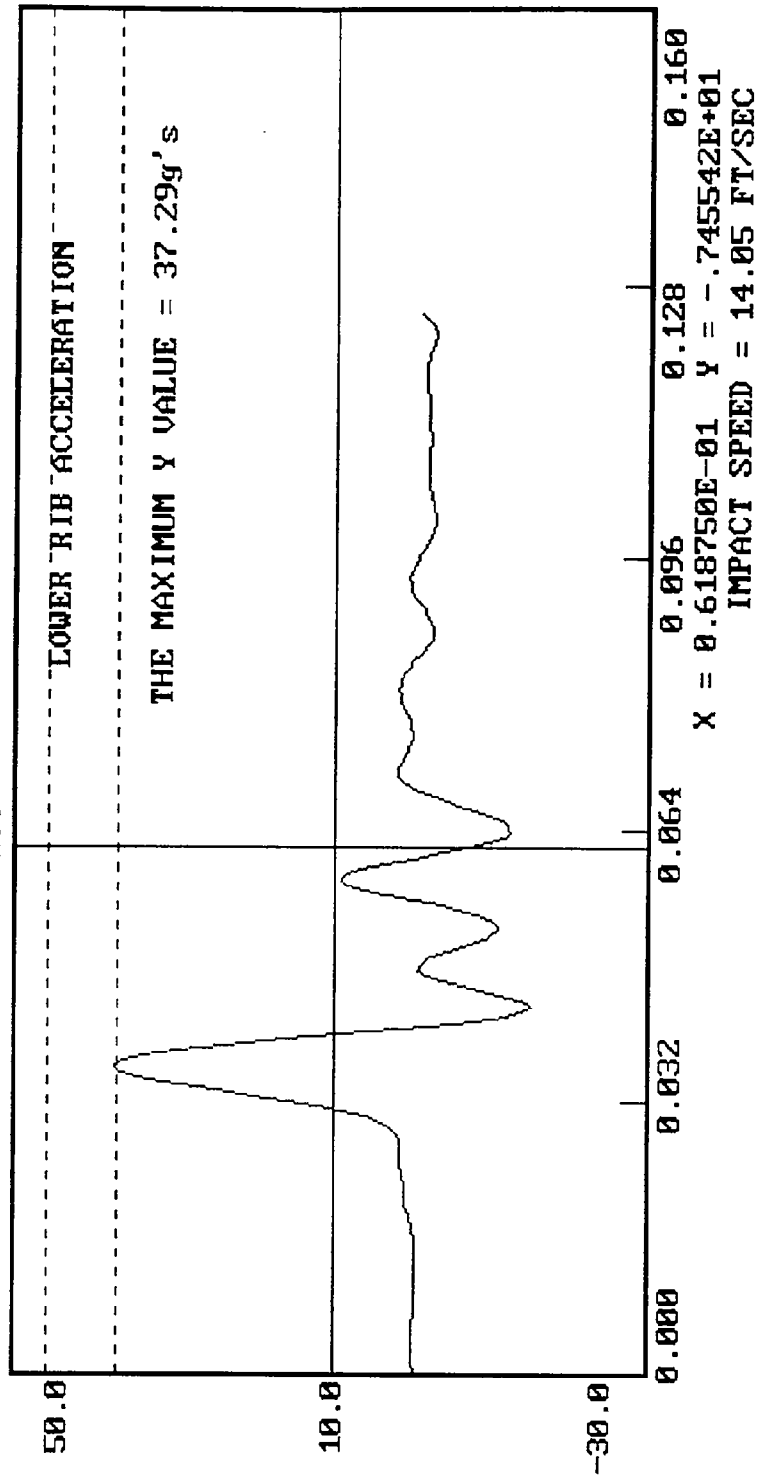
DUMMY # 270

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



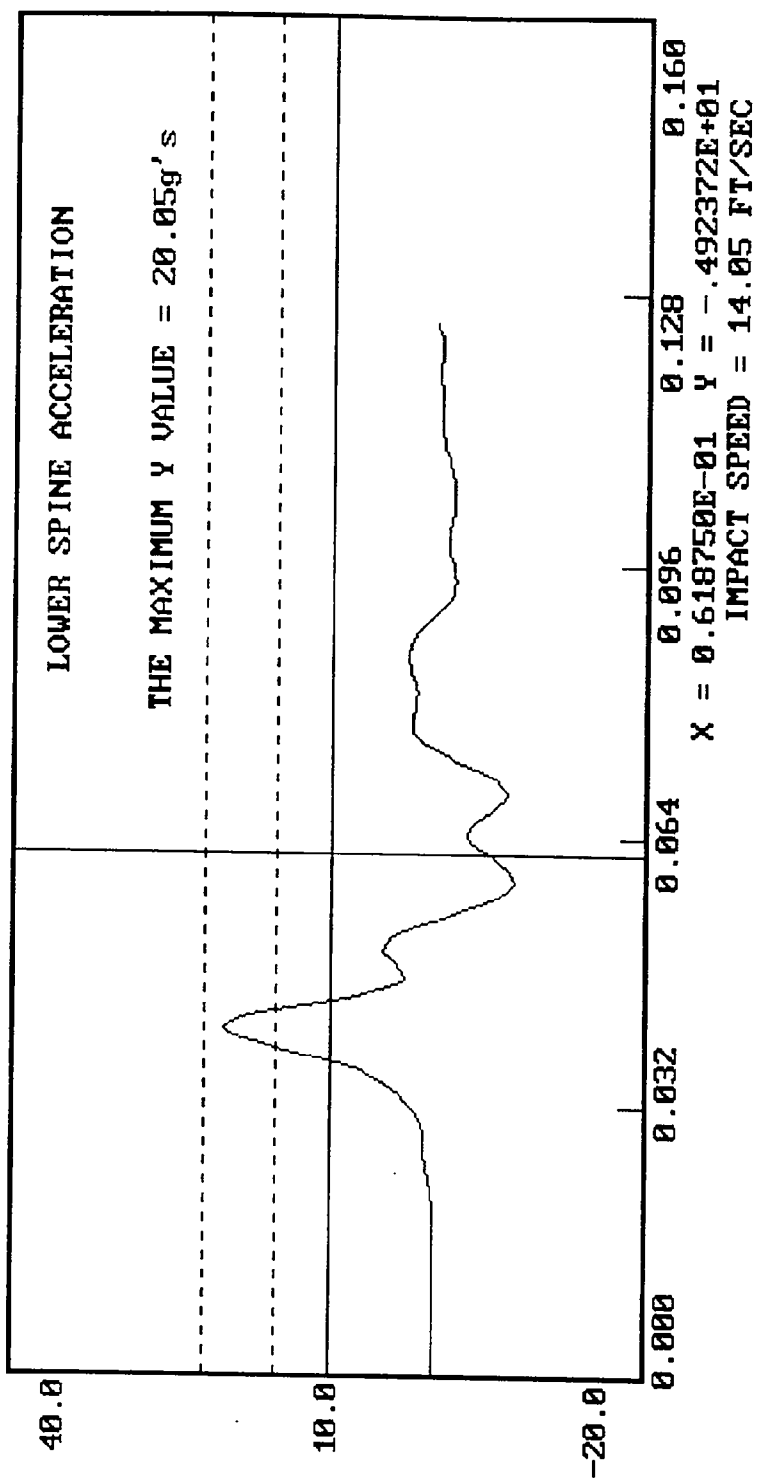
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 278
 ACCELERATION (G'S) VS. TIME ((SECONDS))

01-28-1997 00:19



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

01-28-1997 00:17



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: January 28, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97223

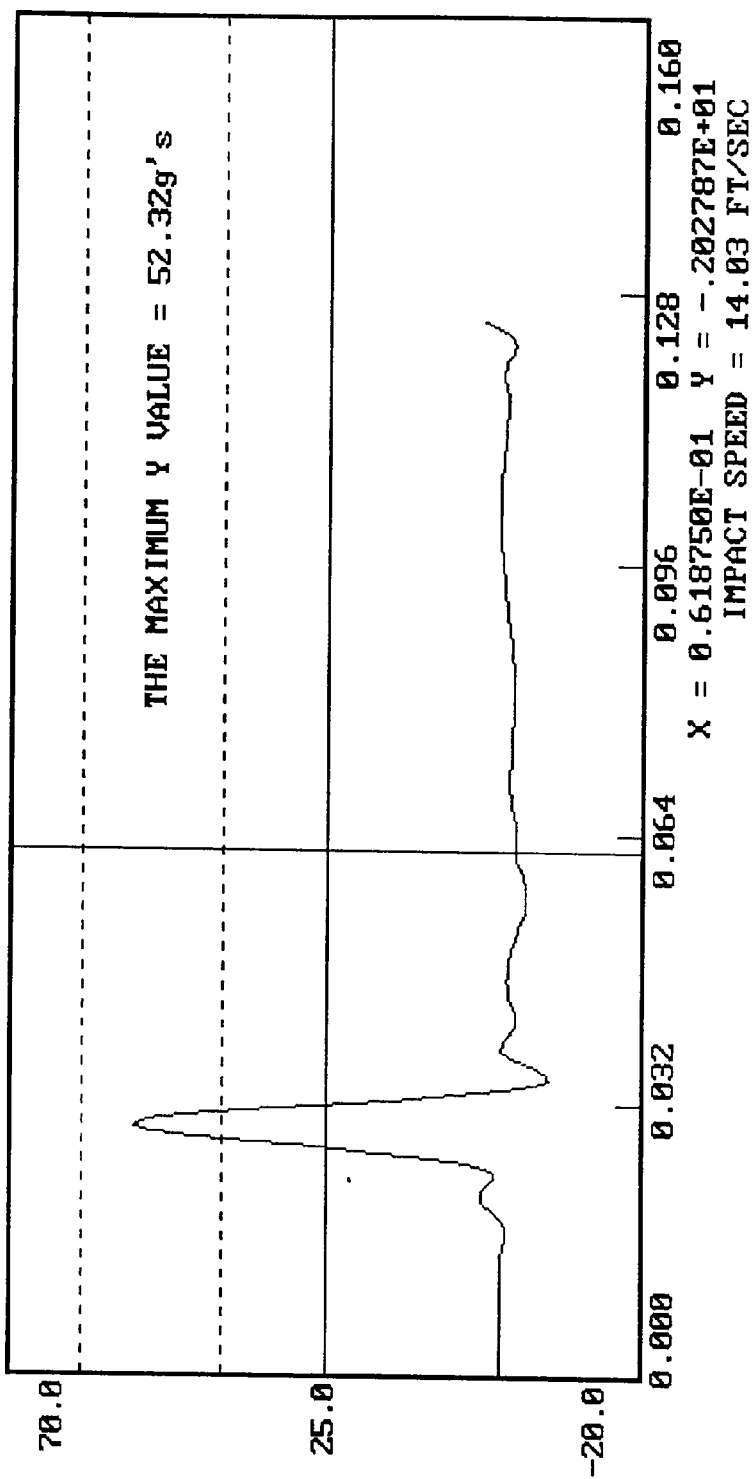
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	13%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	52

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Melch

APPROVED BY Dave Korbake

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 270
ACCELERATION (G'S) VS. TIME ((SECONDS))
01-28-1997 00:24



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

DATE: January 27, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97224

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.2
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.6
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim McInch

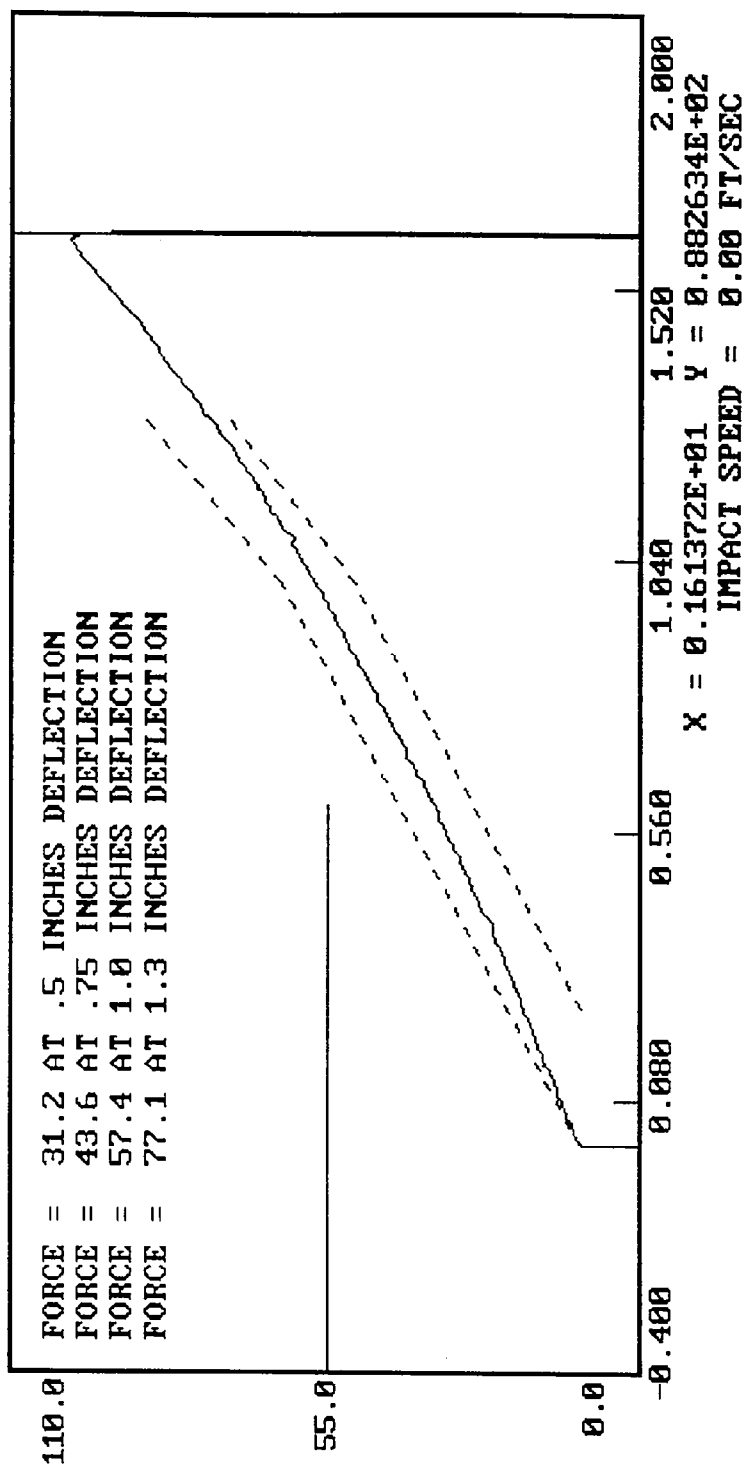
APPROVED BY Don Koalache

DUMMY CALIBRATION - ABDOMEN COMPRESSION

DUMMY # 270

01-27-1997 14:52

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



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 27, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97225

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	27
FORCE @ 30°	34 - 46 lbs	43
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	0°

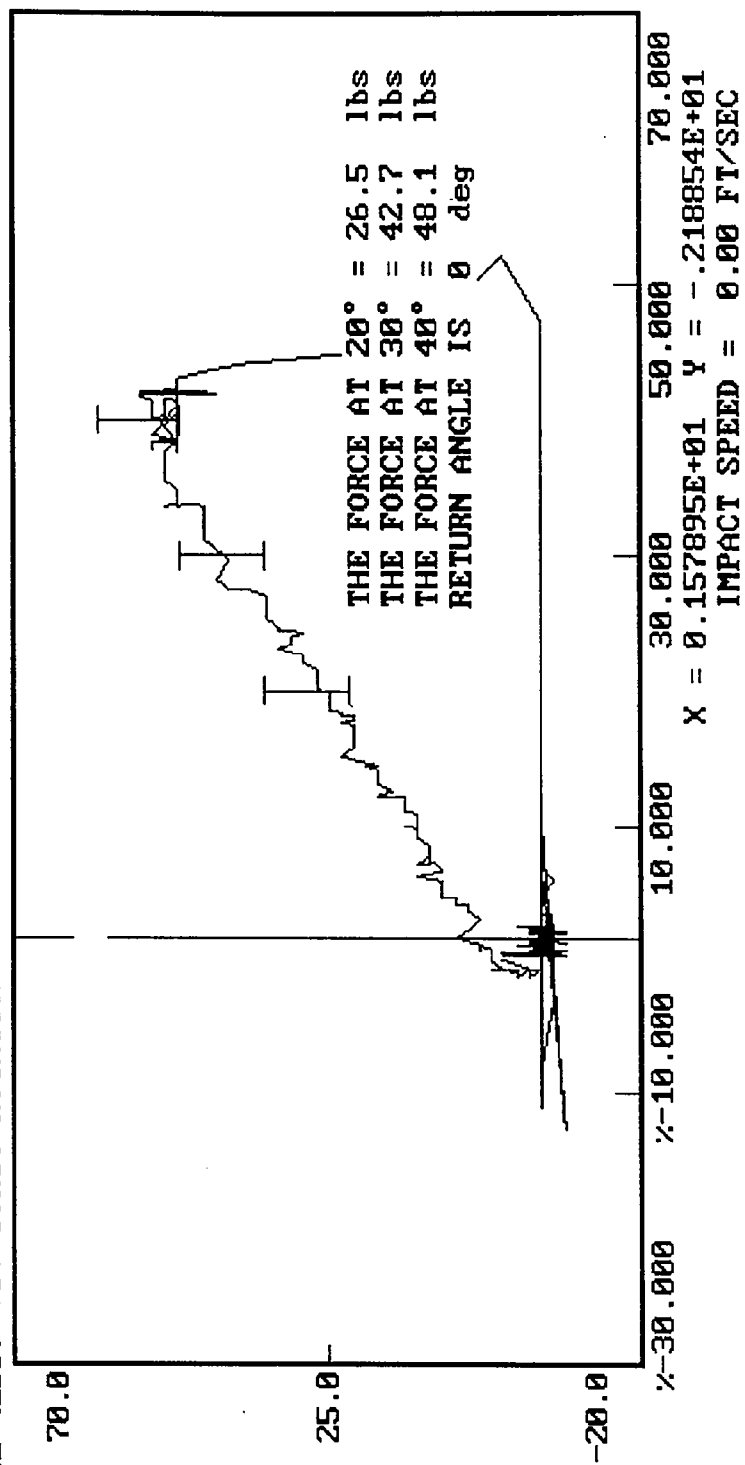
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Mahan

APPROVED BY Dave Kabeke

01-27-1997 16:16

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



POST-TEST CERTIFICATION DATA

Front 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: February 6, 1997

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"	15.1

MEASUREMENTS BY: Jim Melich

APPROVED BY: Dave Kobake

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

DATE: February 5, 1997

DUMMY NUMBER: 269

TEST NUMBER: D9729678

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66 - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	19%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	207
	DISPLACEMENT (in.)	1.18 - 1.38	1.30
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	445
	DISPLACEMENT (in.)	1.26 - 1.47	1.39
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	983
	DISPLACEMENT (in.)	1.30 - 1.57	1.49

TEST MEETS SPECIFICATIONS

TECHNICIAN

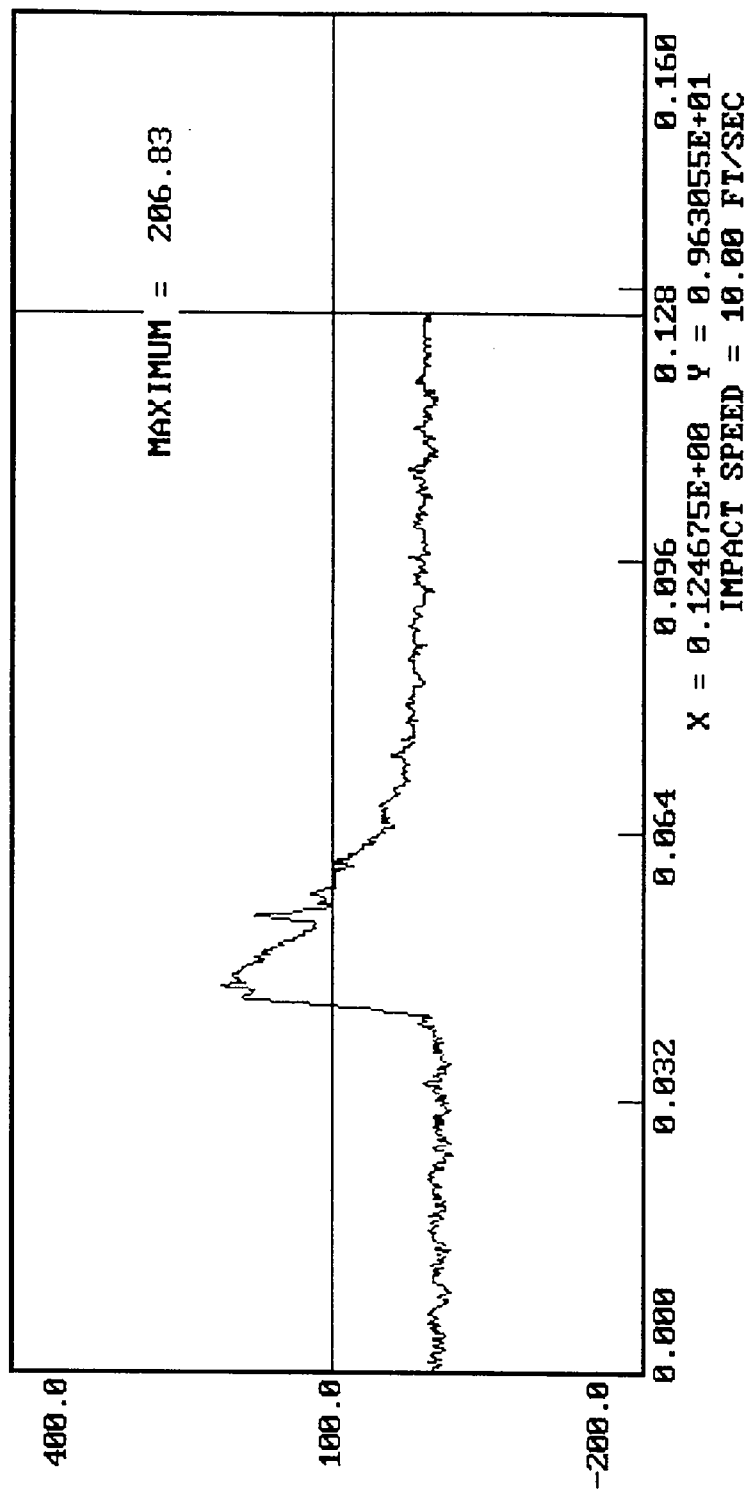
Jim Mich

APPROVED BY

Paul Kibake

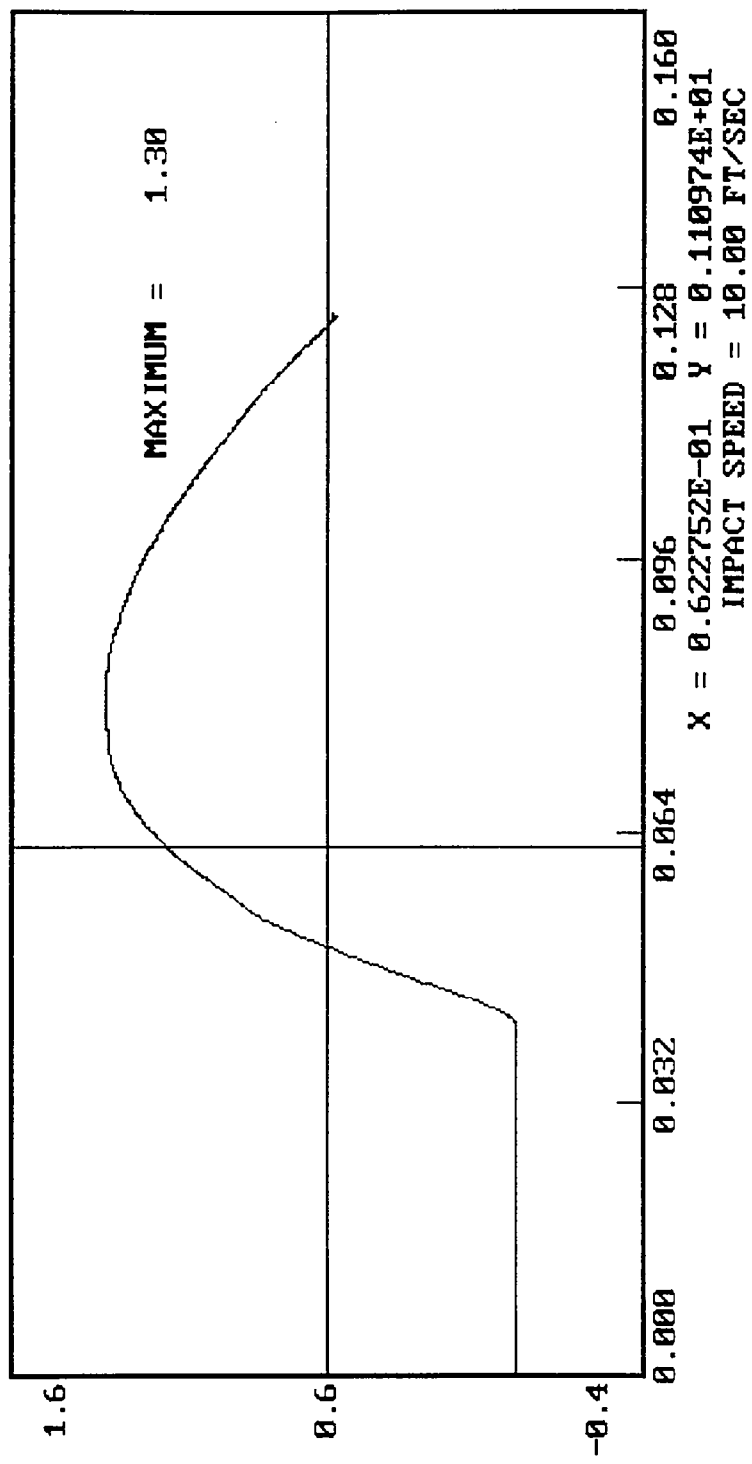
DUMMY CALIBRATION - DAMPENER BENCH TEST
 DUMMY # 269
 FORCE (LBS) VS. TIME ((SECONDS))

02-05-1997 11:53



DUMMY CALIBRATION - DAMPENER BENCH TEST
 DUMMY # 269
 DISPLACEMENT (IN) VS. TIME ((SECONDS))

02-05-1997 11:53

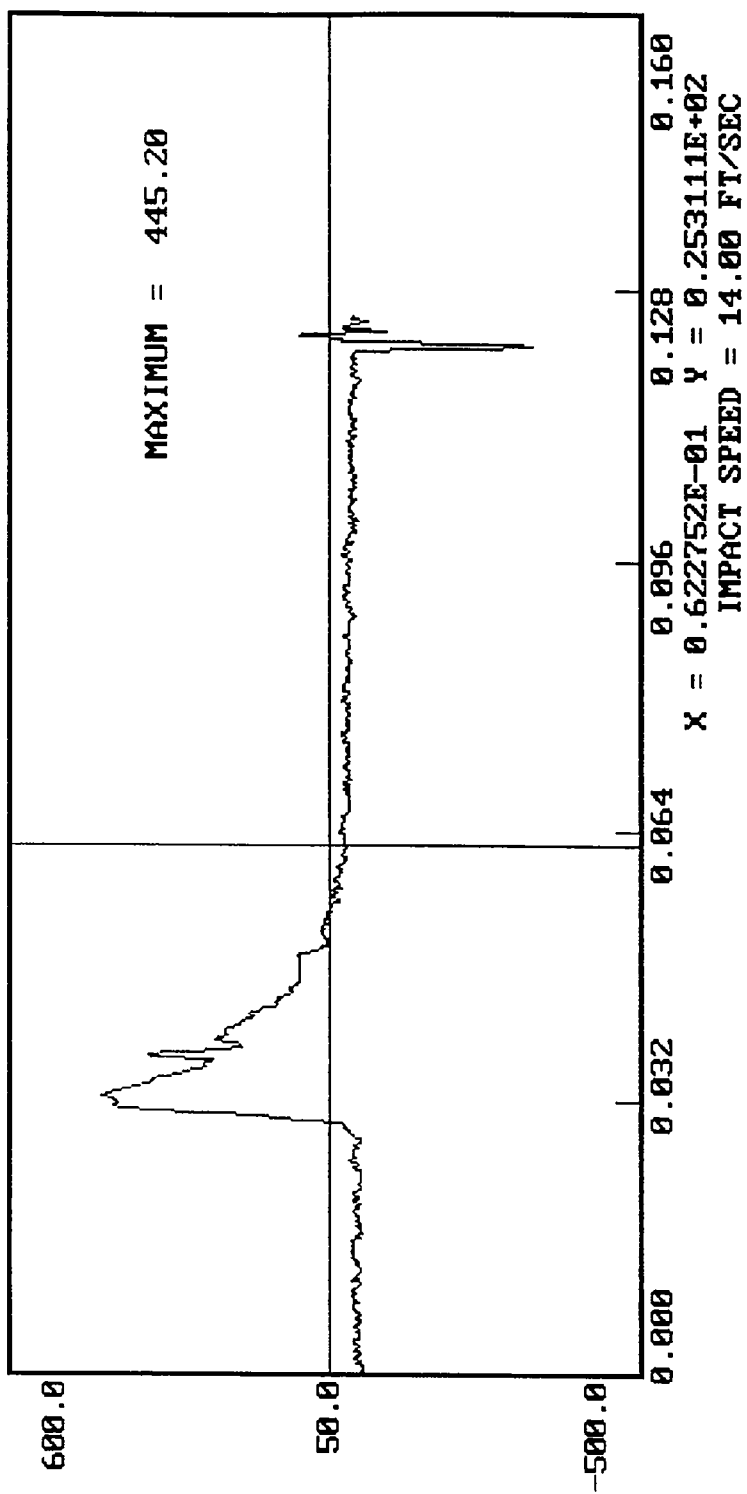


02-05-1997 11:56

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

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

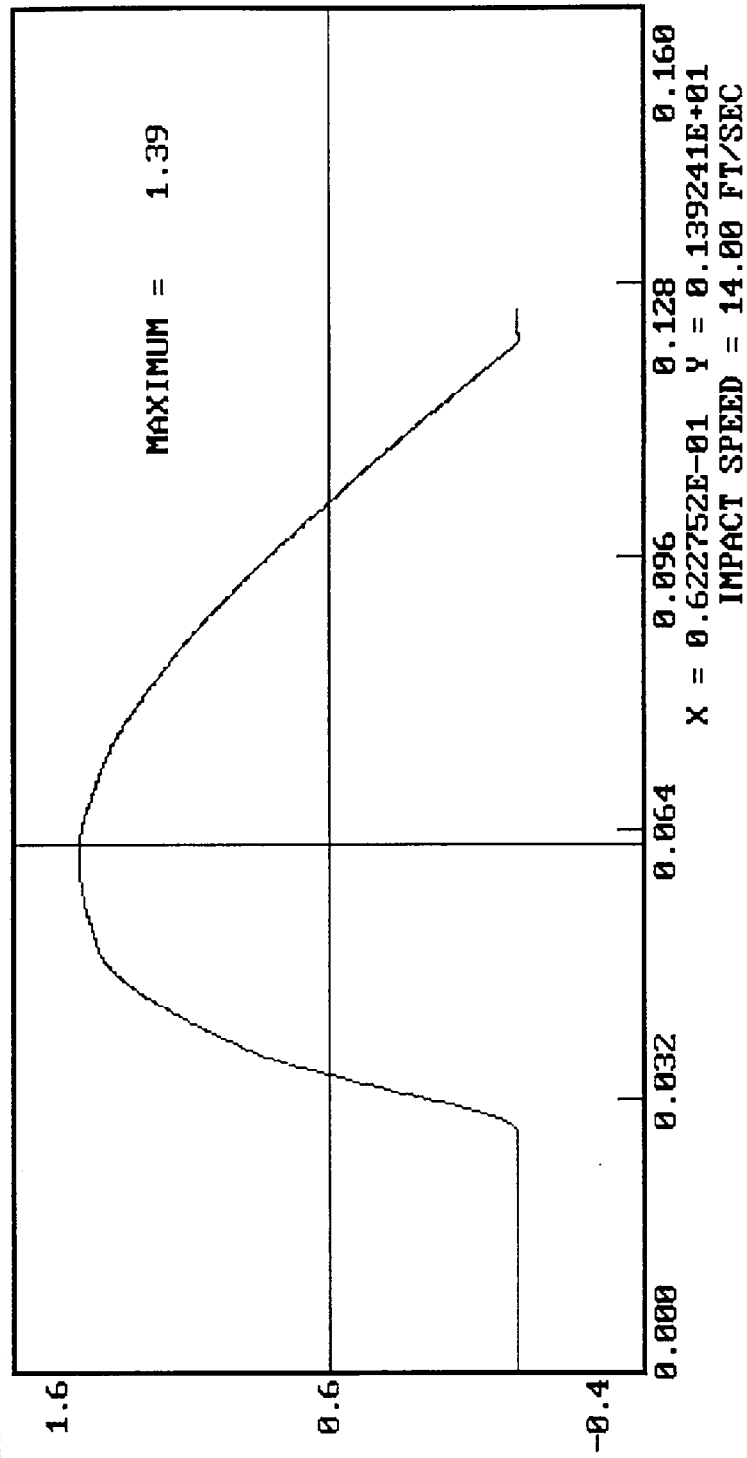


02-05-1997 11:56

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

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

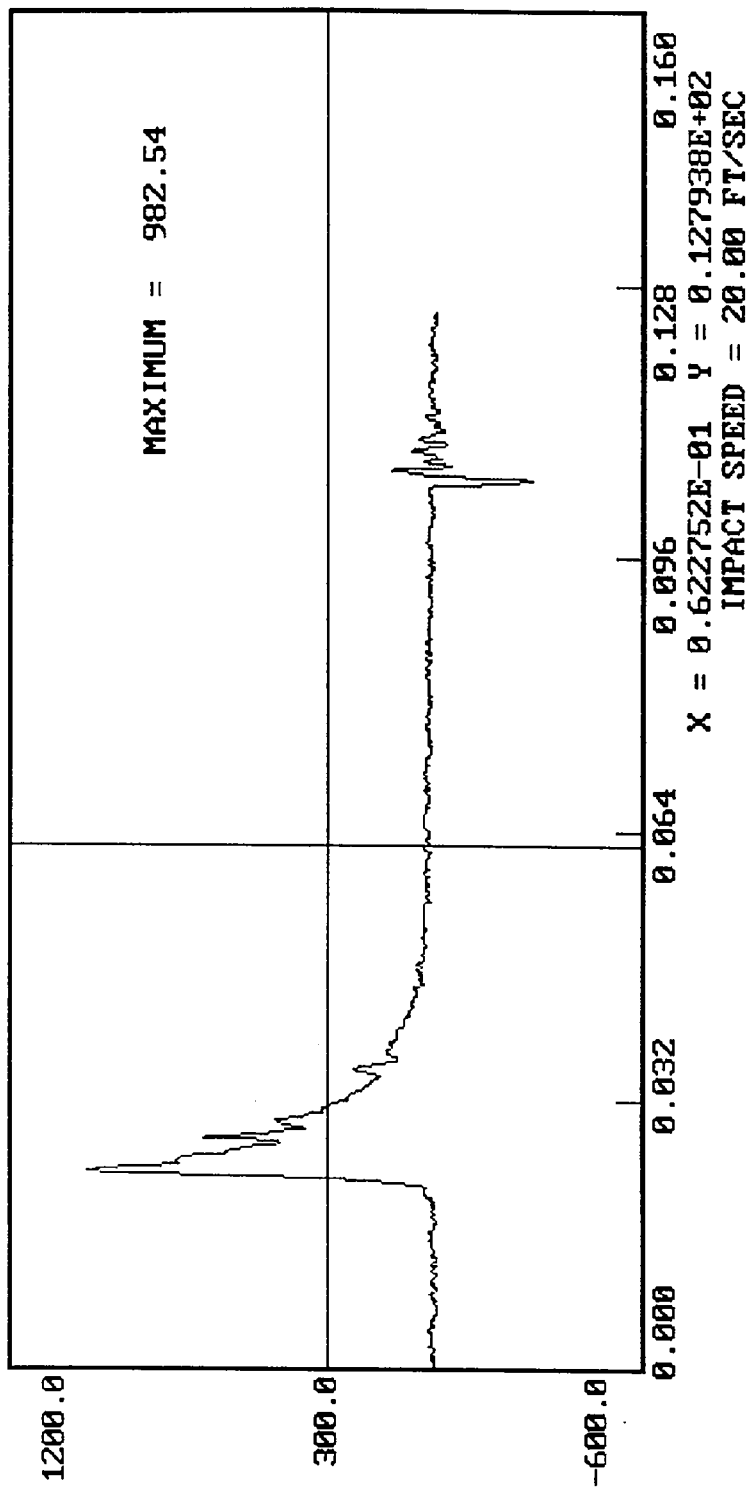


02-05-1997 12:04

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

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

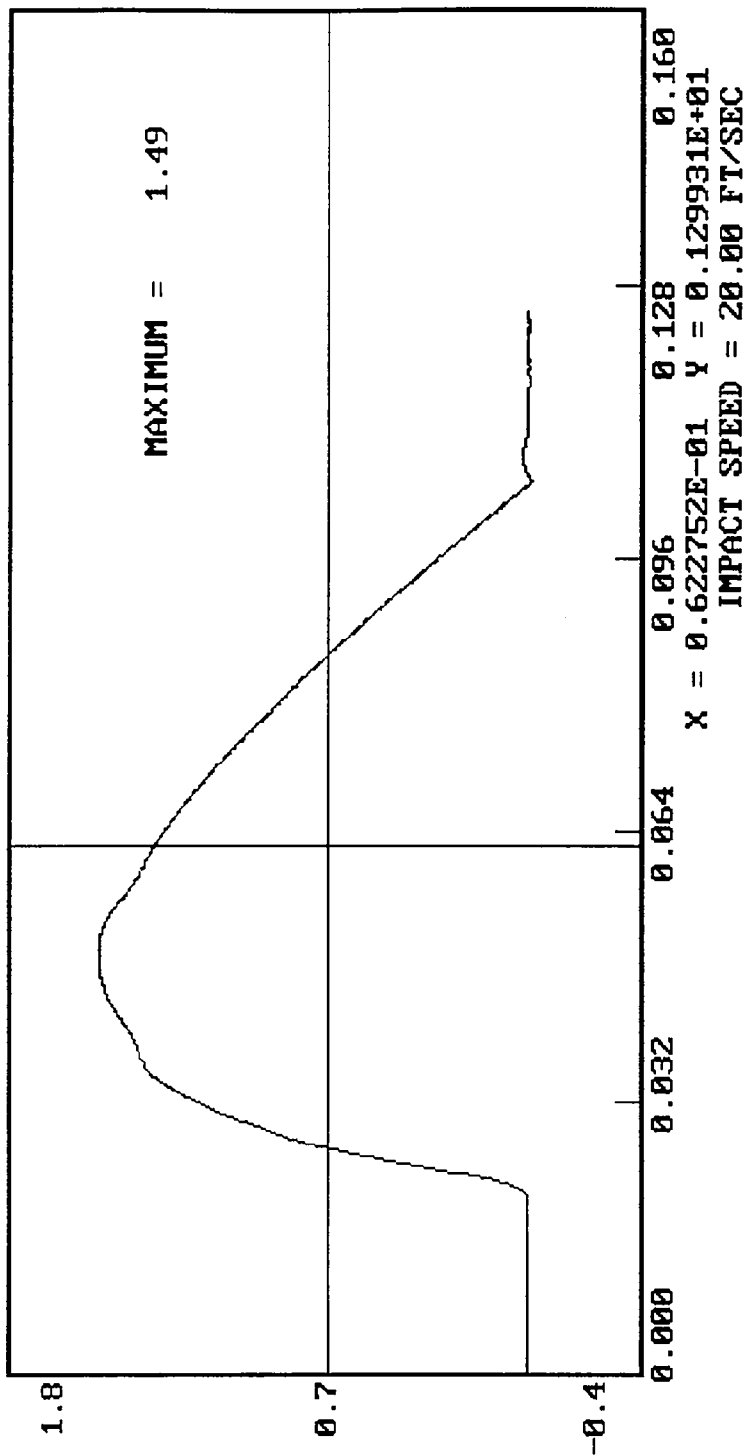


02-05-1997 12:04

DUMMY CALIBRATION - DAMPENER BENCH TEST

DUMMY # 269

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



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: February 6, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97292

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	16%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	44
LOWER SPINE	15 - 22 g's	20

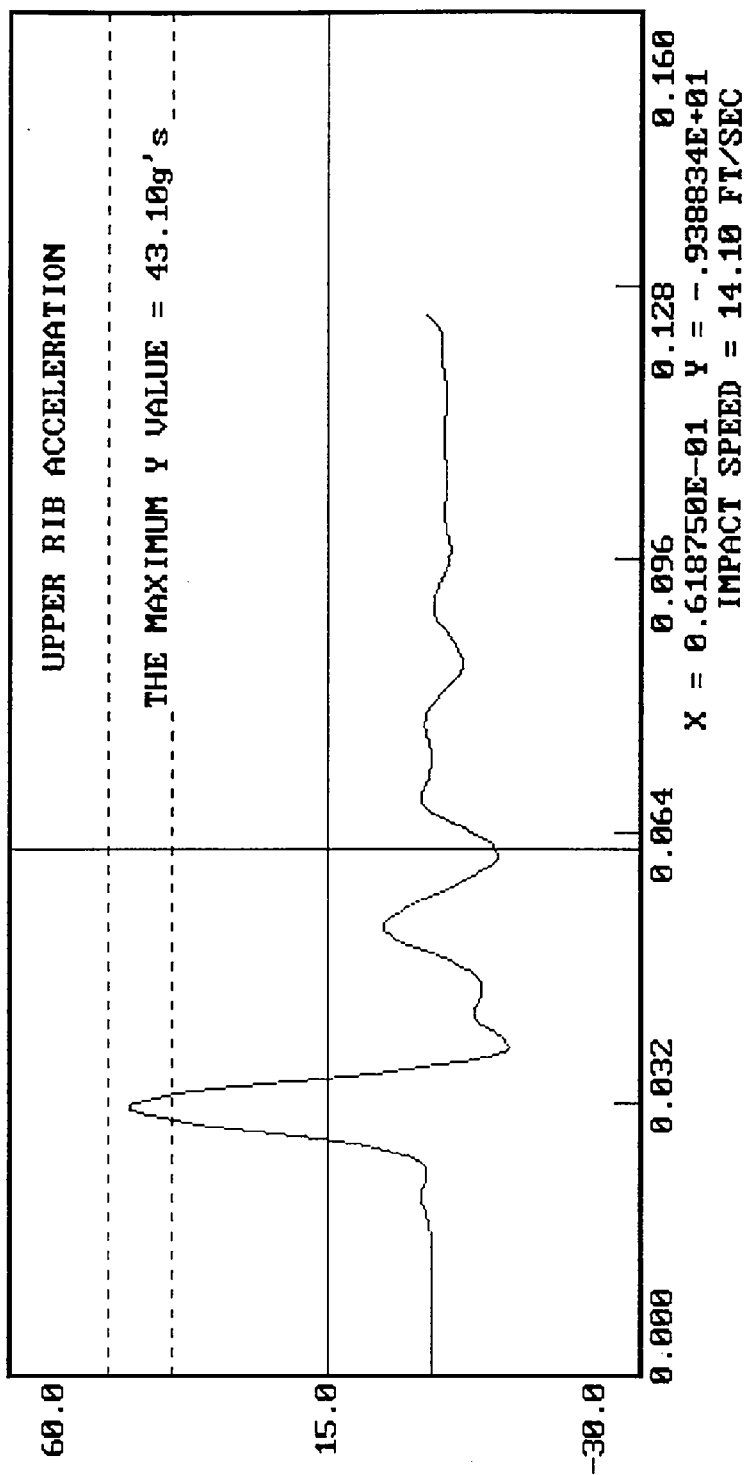
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Melich

APPROVED BY Paul Korbake

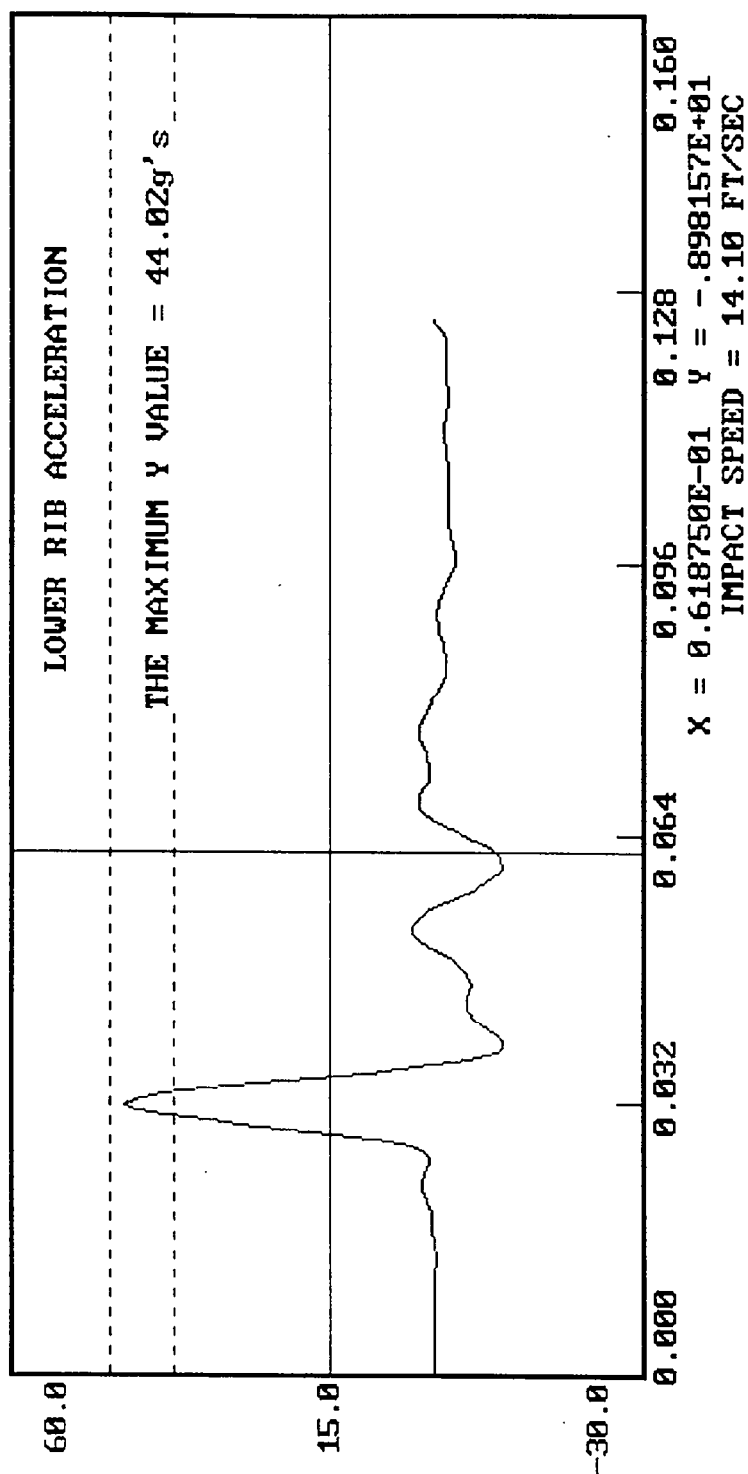
02-06-1997 13:43

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

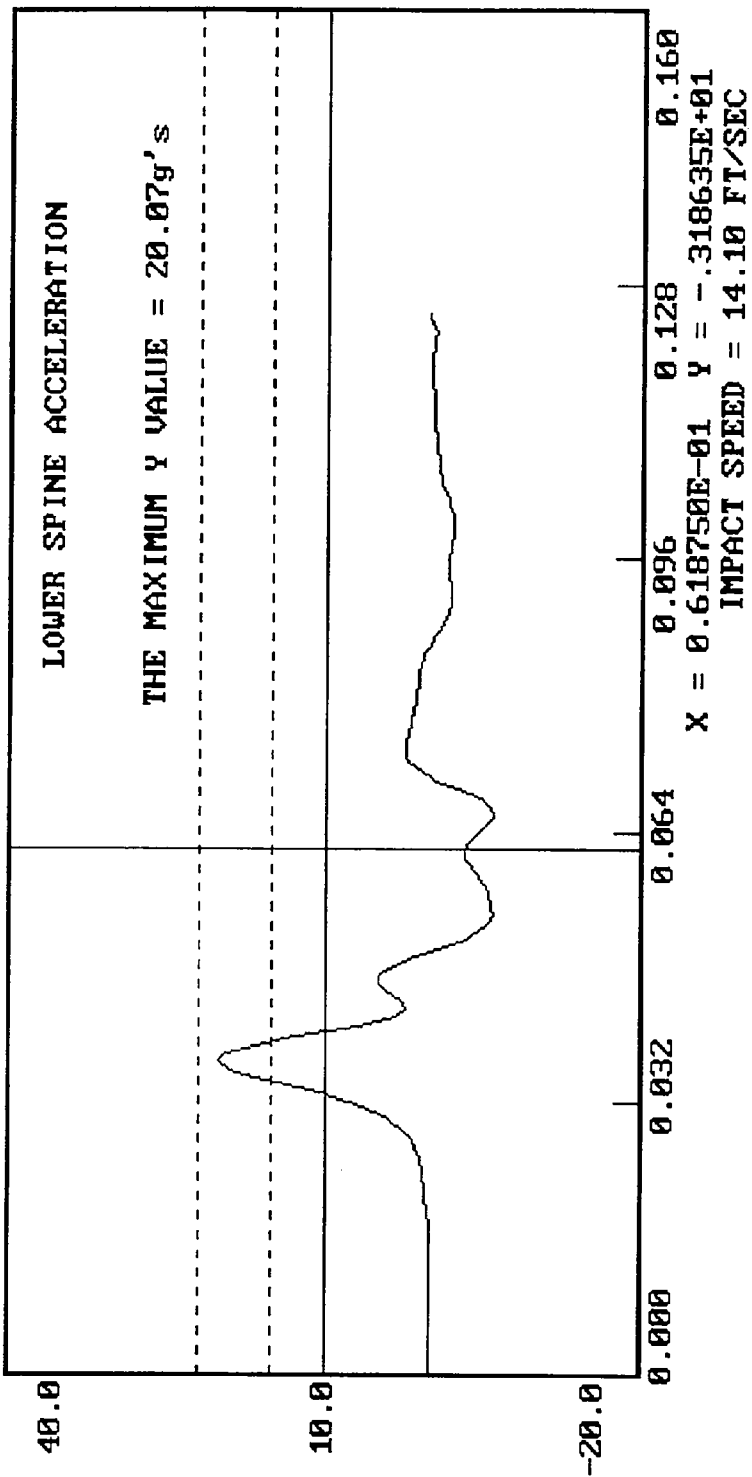


DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 ACCELERATION (G'S) VS. TIME ((SECONDS))

02-06-1997 13:43



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269
 02-06-1997 13:46
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: February 6, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97293

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
PROBE SPEED	13.8 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	57

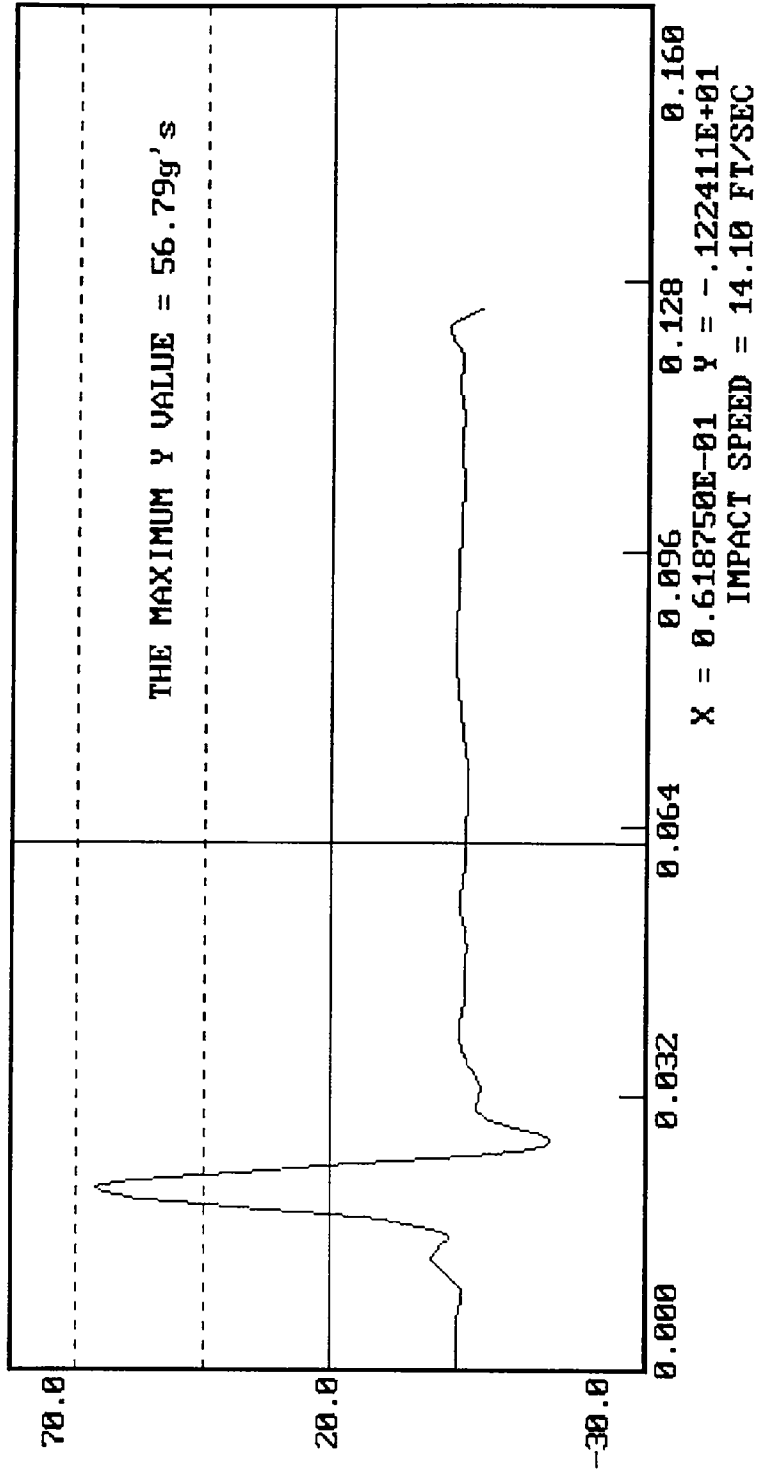
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Melancon

APPROVED BY Dave Kosloske

02-06-1997 14:49

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: January 31, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97294

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	16%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.5
FORCE @ 0.75 in	36.7 - 49.8 lbs	46.3
FORCE @ 1.0 in	50 - 63 lbs	59
FORCE @ 1.3 in	73 - 88 lbs	79

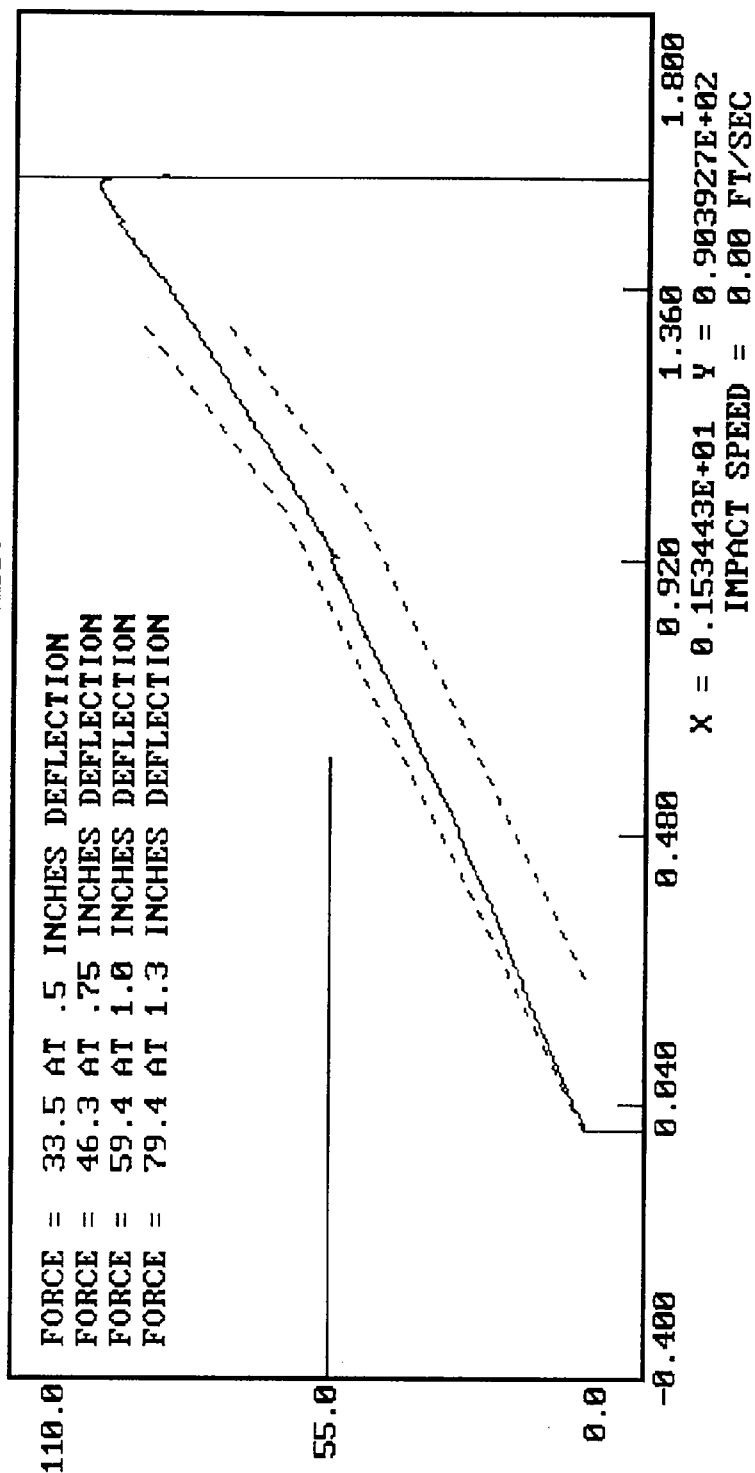
TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Kitchin

APPROVED BY Dave Kraitsirke

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 269
 01-31-1997 11:17

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



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 31, 1997

DUMMY NUMBER: 269

TEST NUMBER: D97295

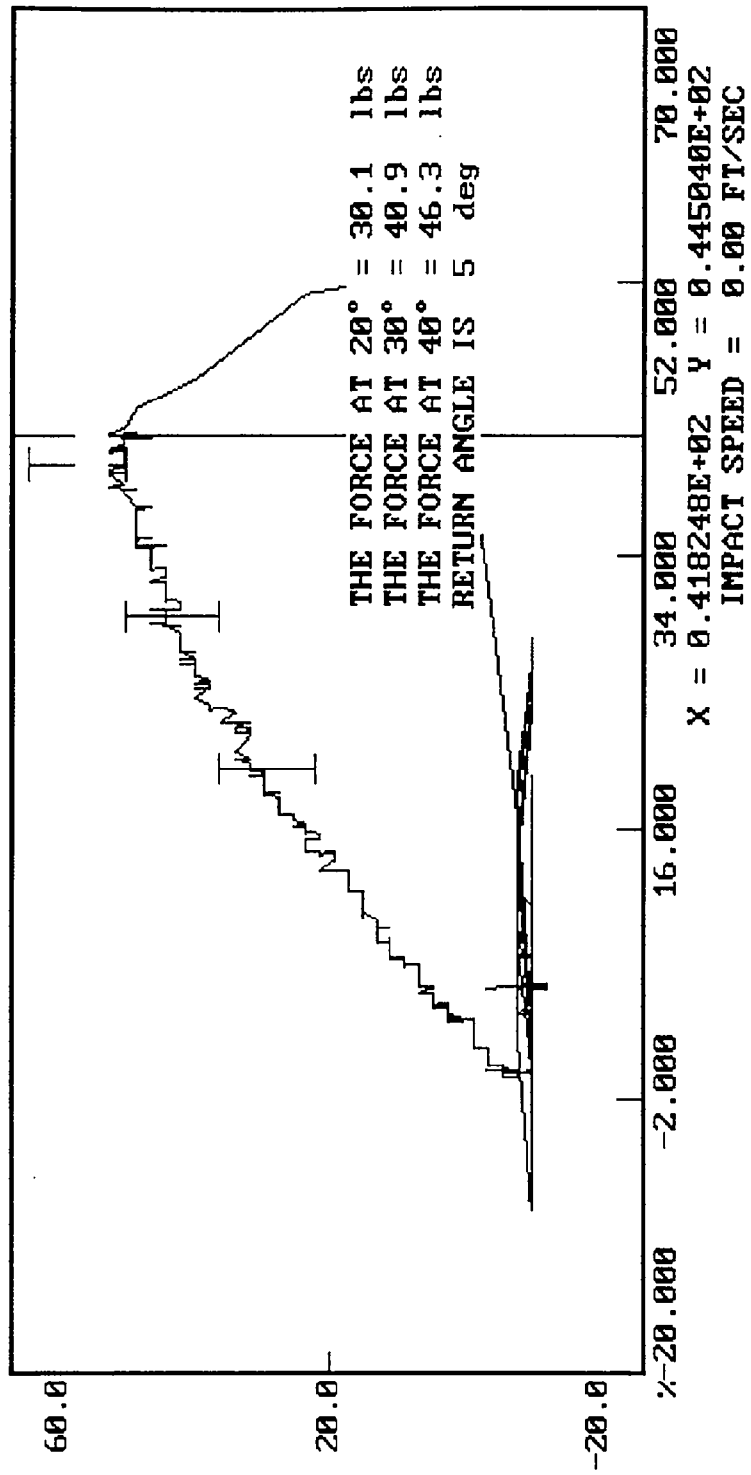
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	19%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	30
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	46
RETURN ANGLE	12° maximum	5°

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim M. Linn

APPROVED BY Rene Kabsche

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 269
 01-31-1997 15:59
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Rear 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: February 6, 1997

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 M. [Signature]

APPROVED BY: Dave Kosbake

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

DATE: February 5, 1997

DUMMY NUMBER: 270

TEST NUMBER: D9730678

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66 - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	18%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	236
	DISPLACEMENT (in.)	1.18 - 1.38	1.32
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	446
	DISPLACEMENT (in.)	1.26 - 1.47	1.40
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	977
	DISPLACEMENT (in.)	1.30 - 1.57	1.38

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim Mahan

APPROVED BY

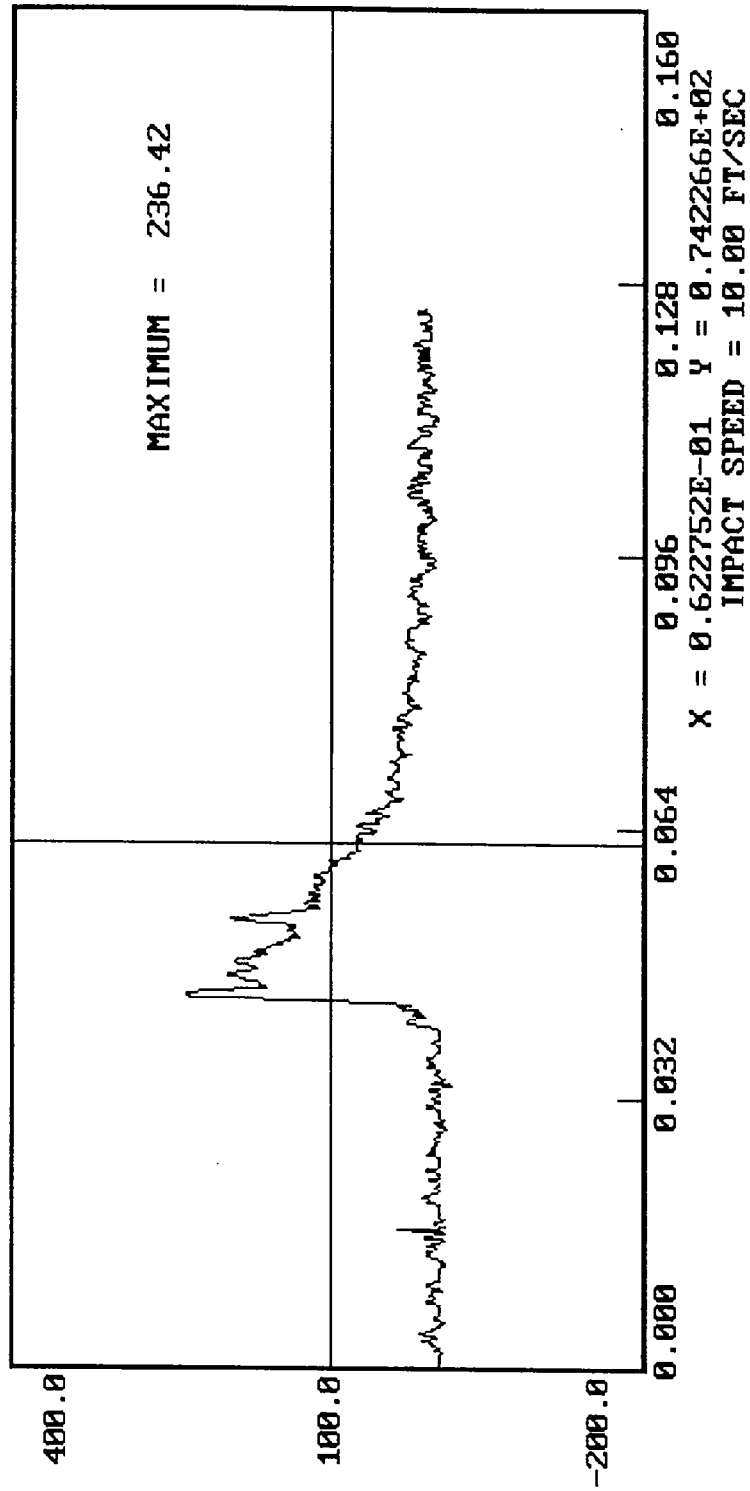
Dave Kosloski

02-05-1997 15:12

DUMMY CALIBRATION - DAMPENER BENCH TEST

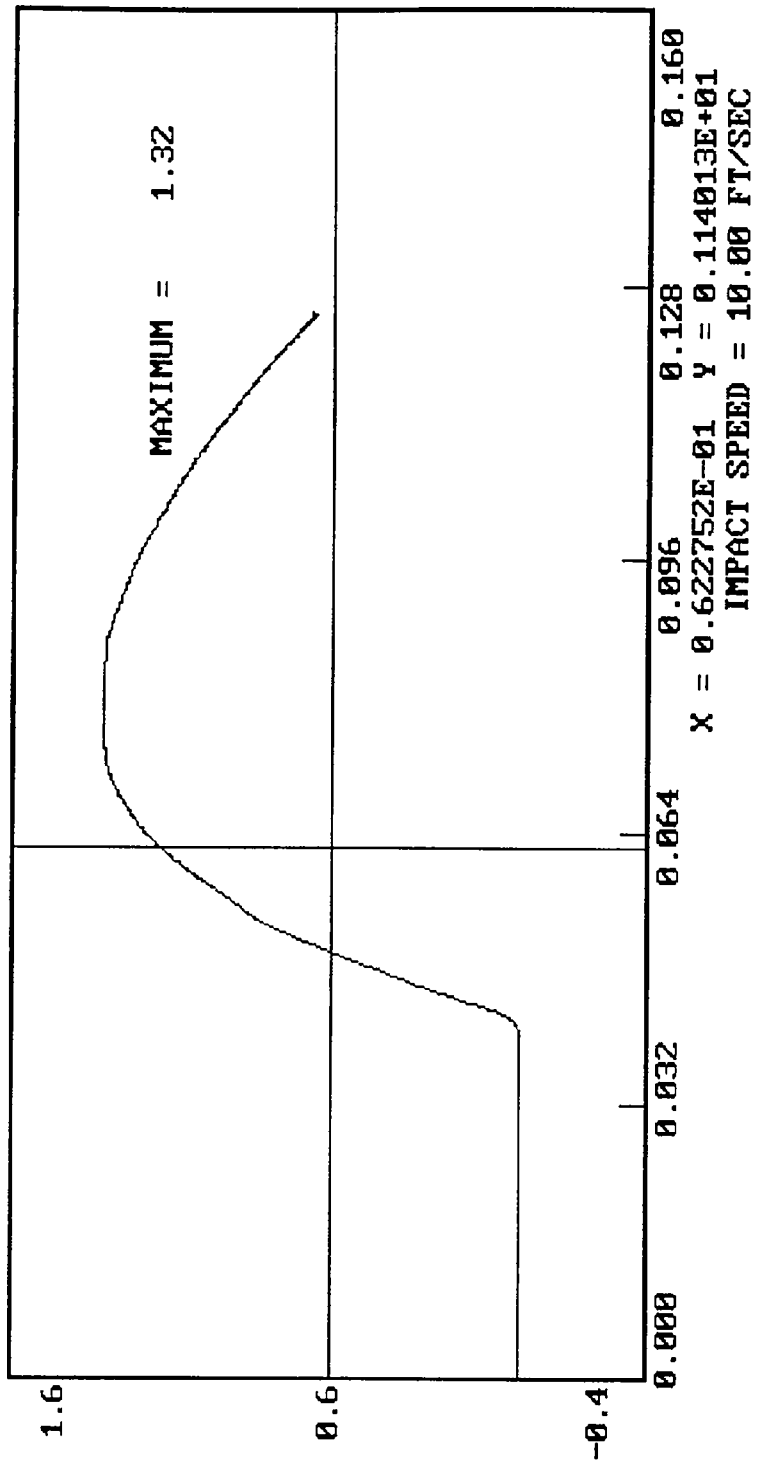
DUMMY # 270

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



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

02-05-1997 15:12

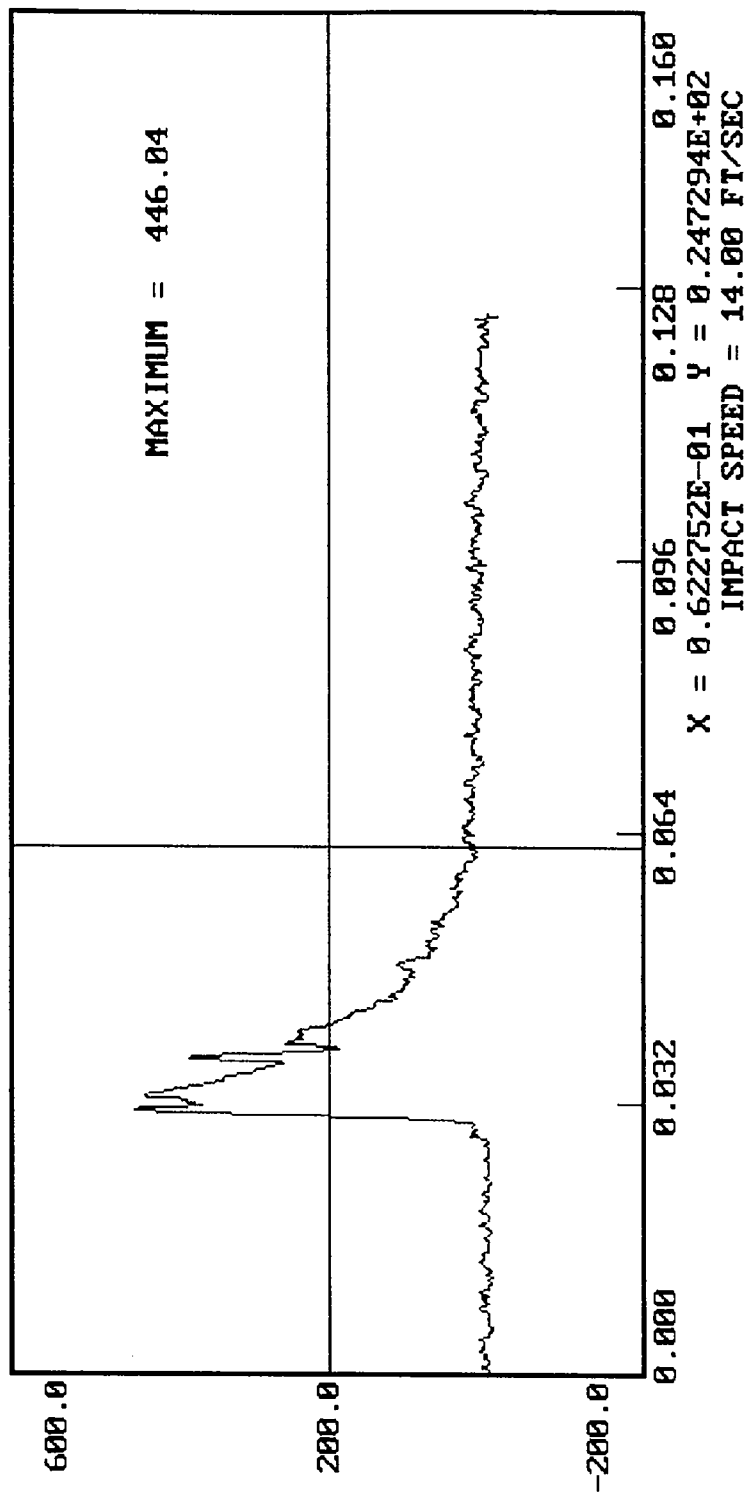


02-05-1997 15:17

DUMMY CALIBRATION - DAMPENER BENCH TEST

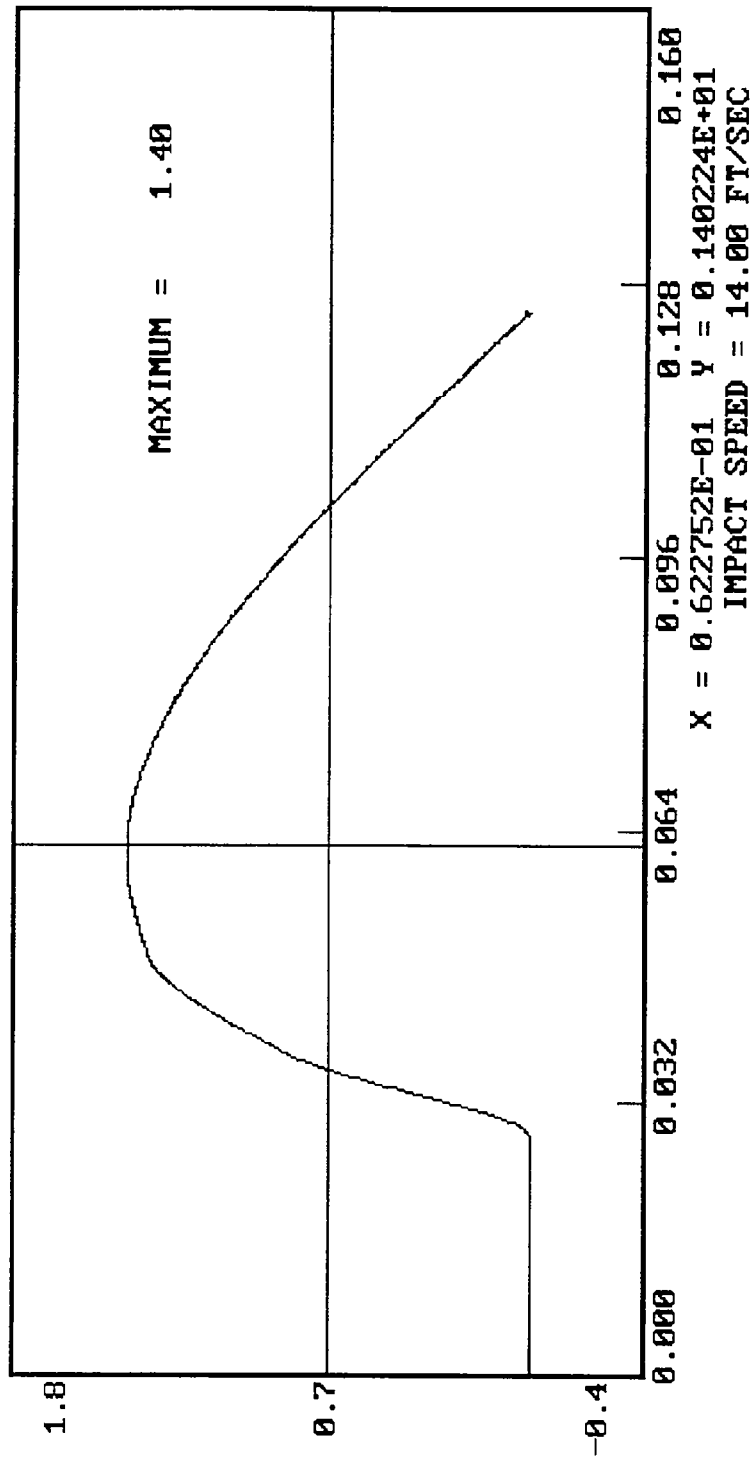
DUMMY # 270

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



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

02-05-1997 15:17

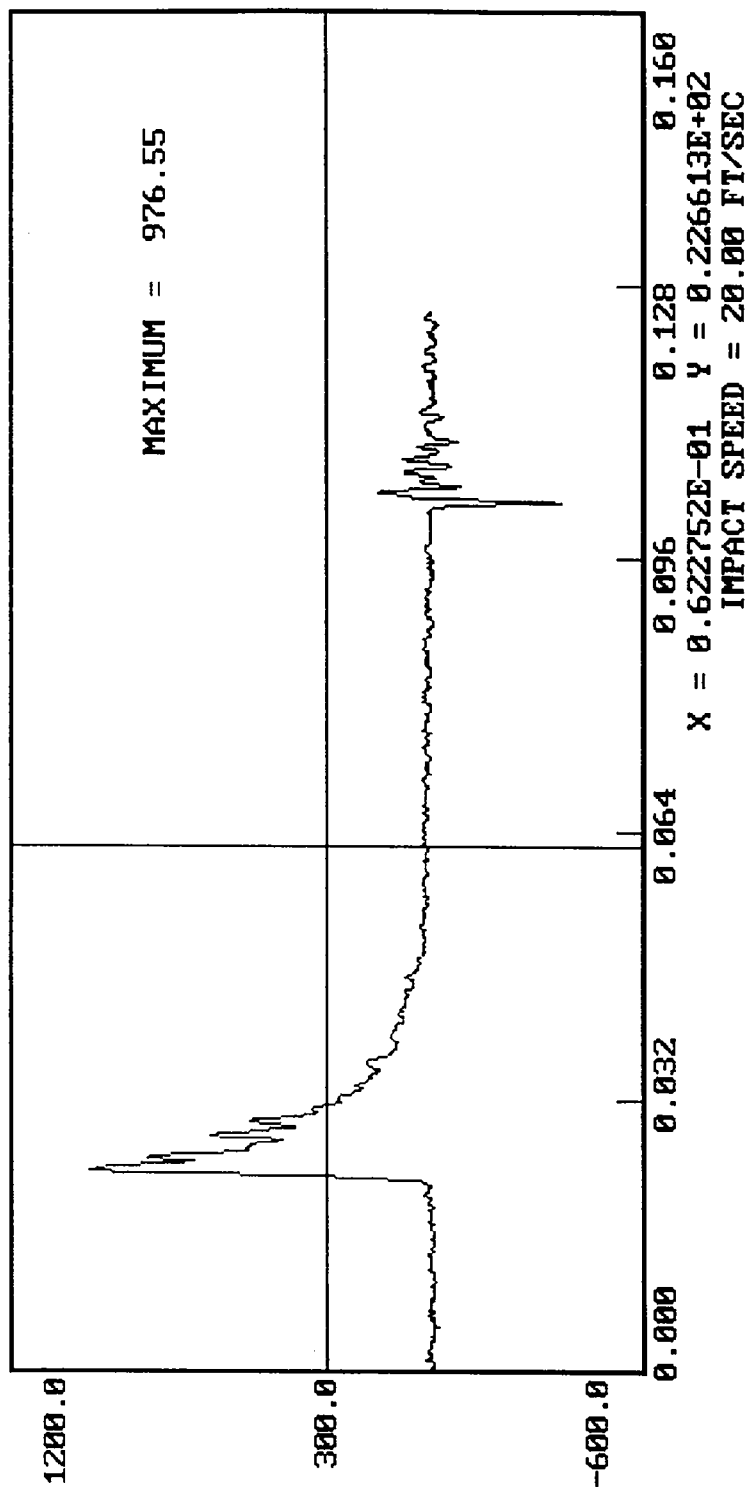


02-05-1997 16:10

DUMMY CALIBRATION - DAMPENER BENCH TEST

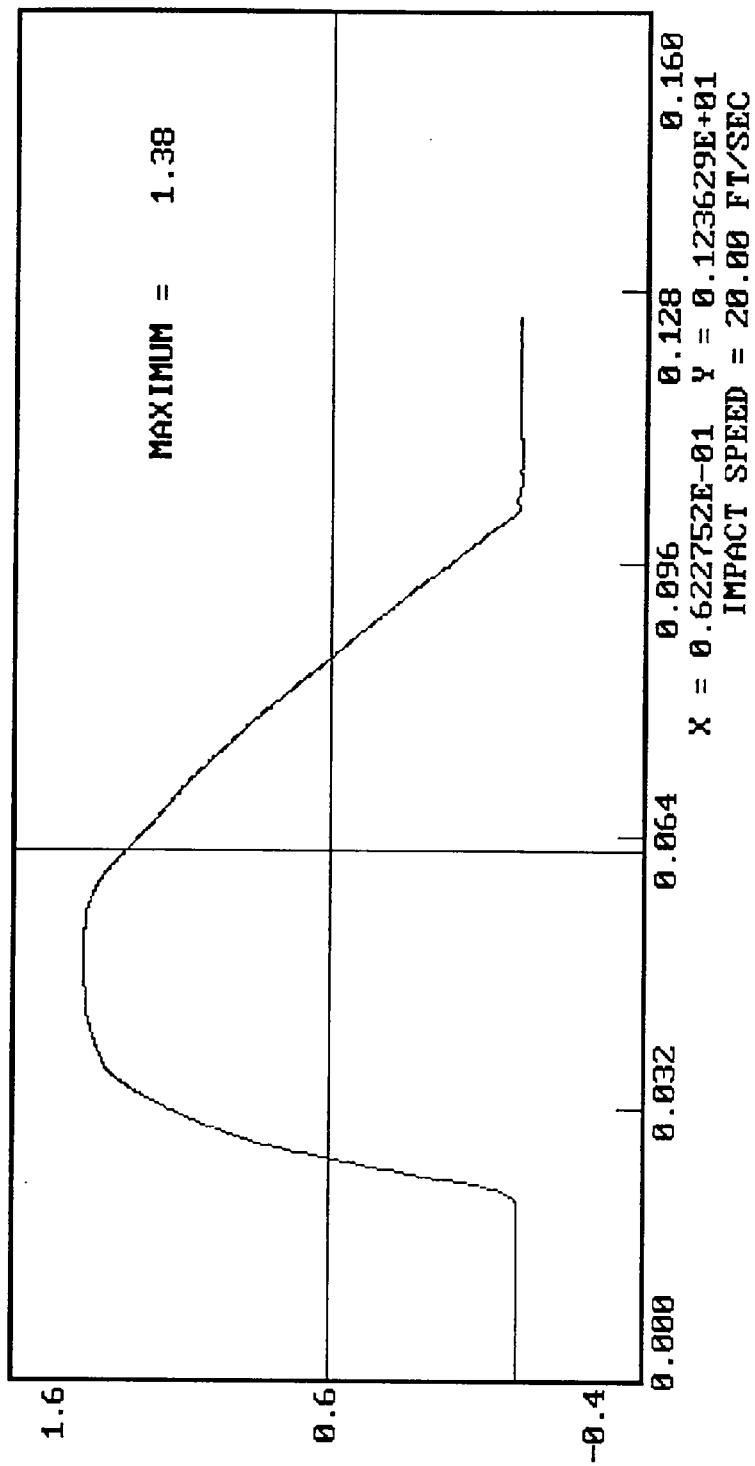
DUMMY # 270

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



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

02-05-1997 16:10



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: February 6, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97302

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	17%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	38
LOWER RIB	37 - 46 g's	37
LOWER SPINE	15 - 22 g's	21

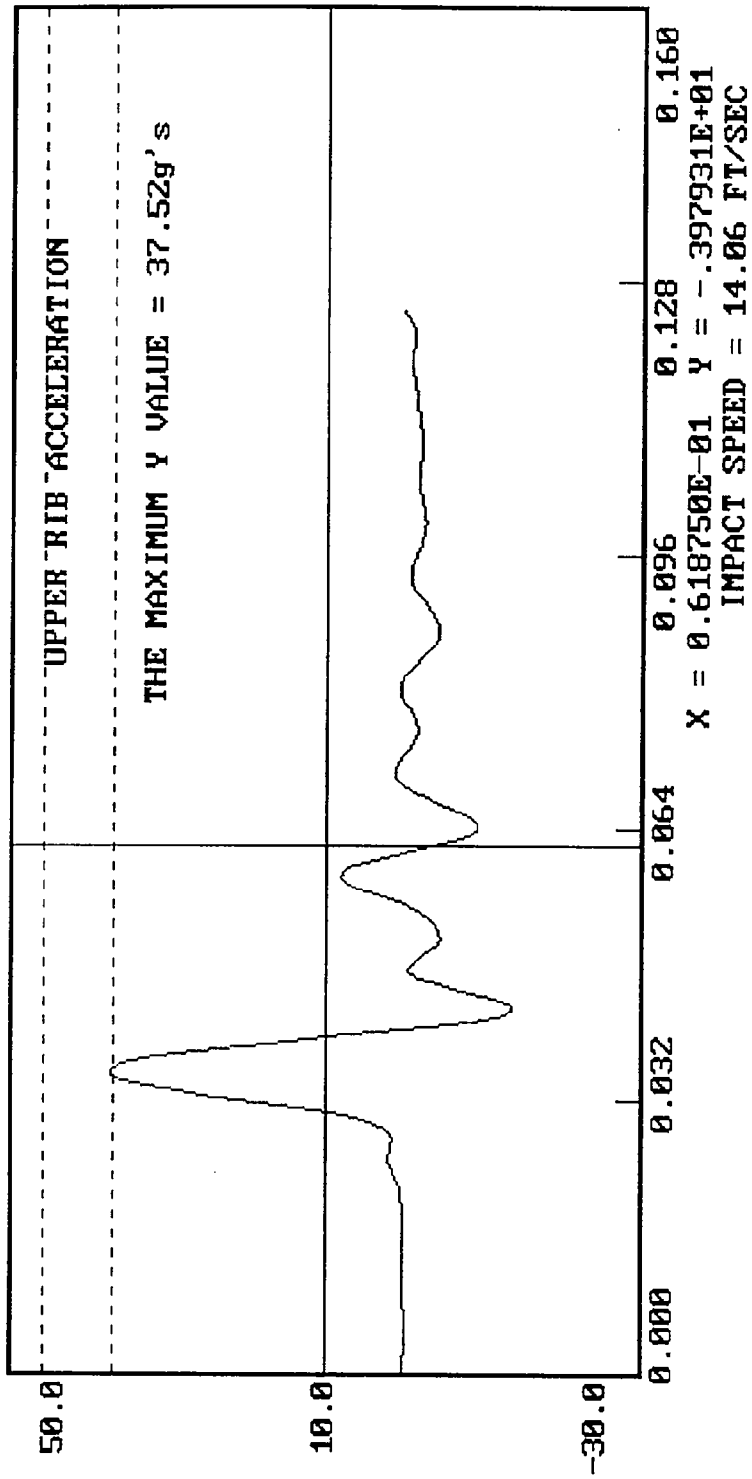
TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Mahan

APPROVED BY Dave Koschke

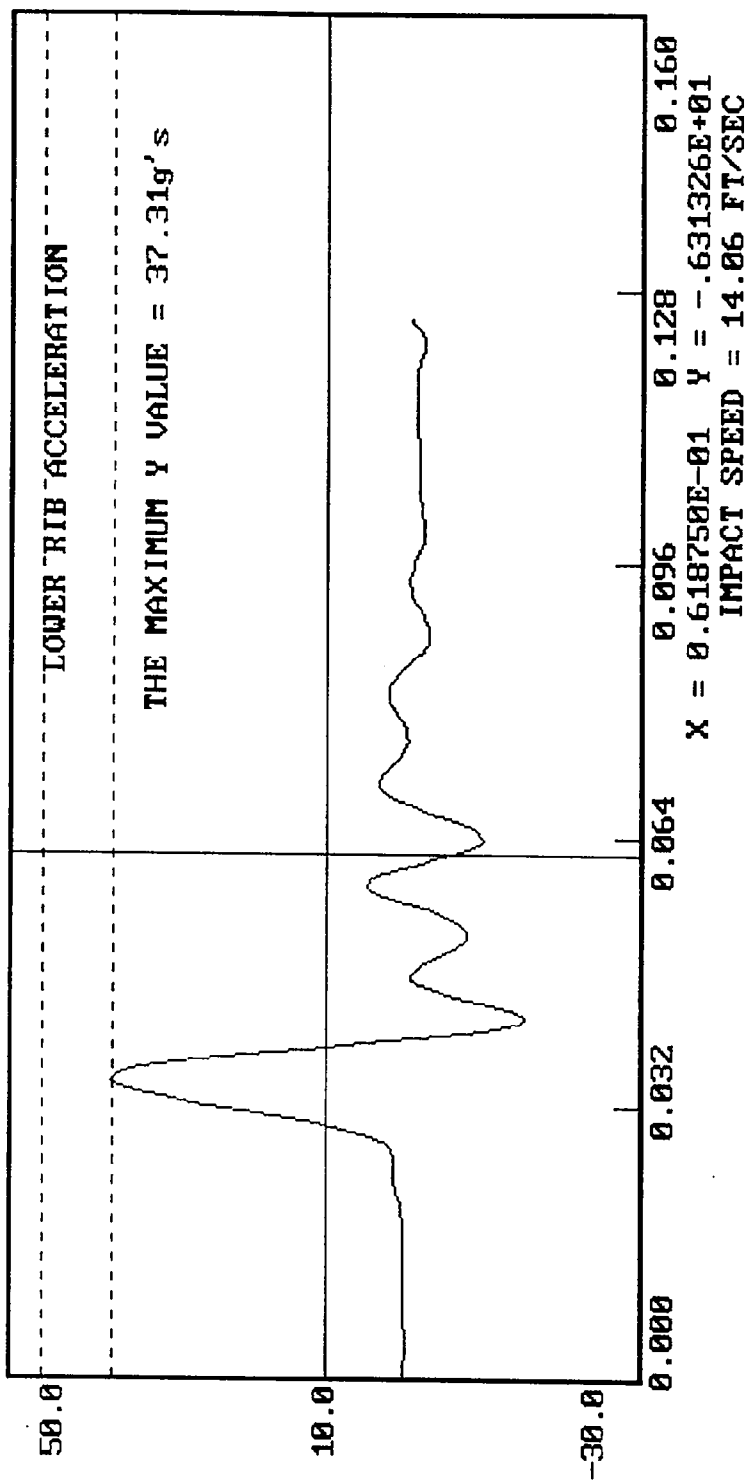
02-06-1997 15:47

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



DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
02-06-1997 15:47

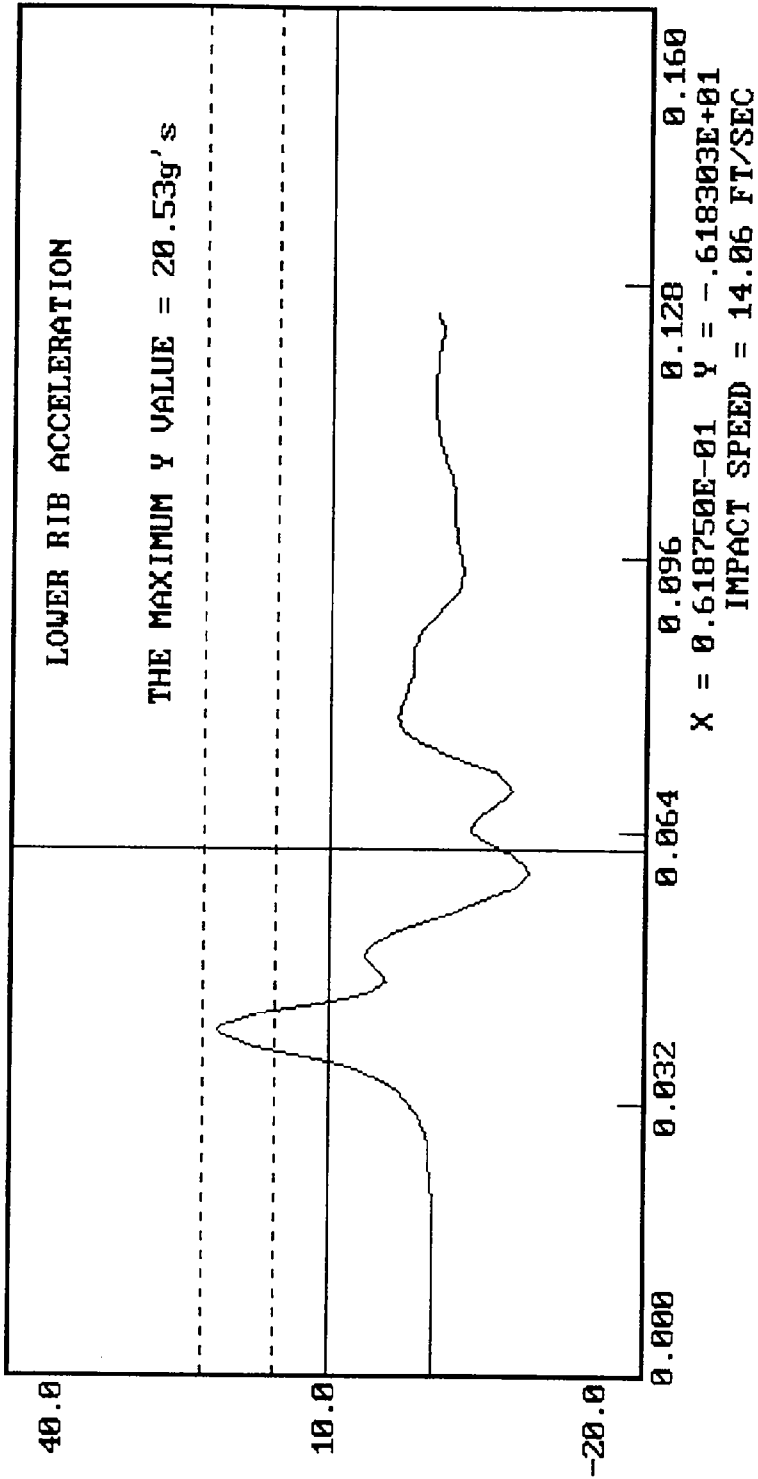
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270

02-06-1997 15:47

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: February 6, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97303

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	17%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	57

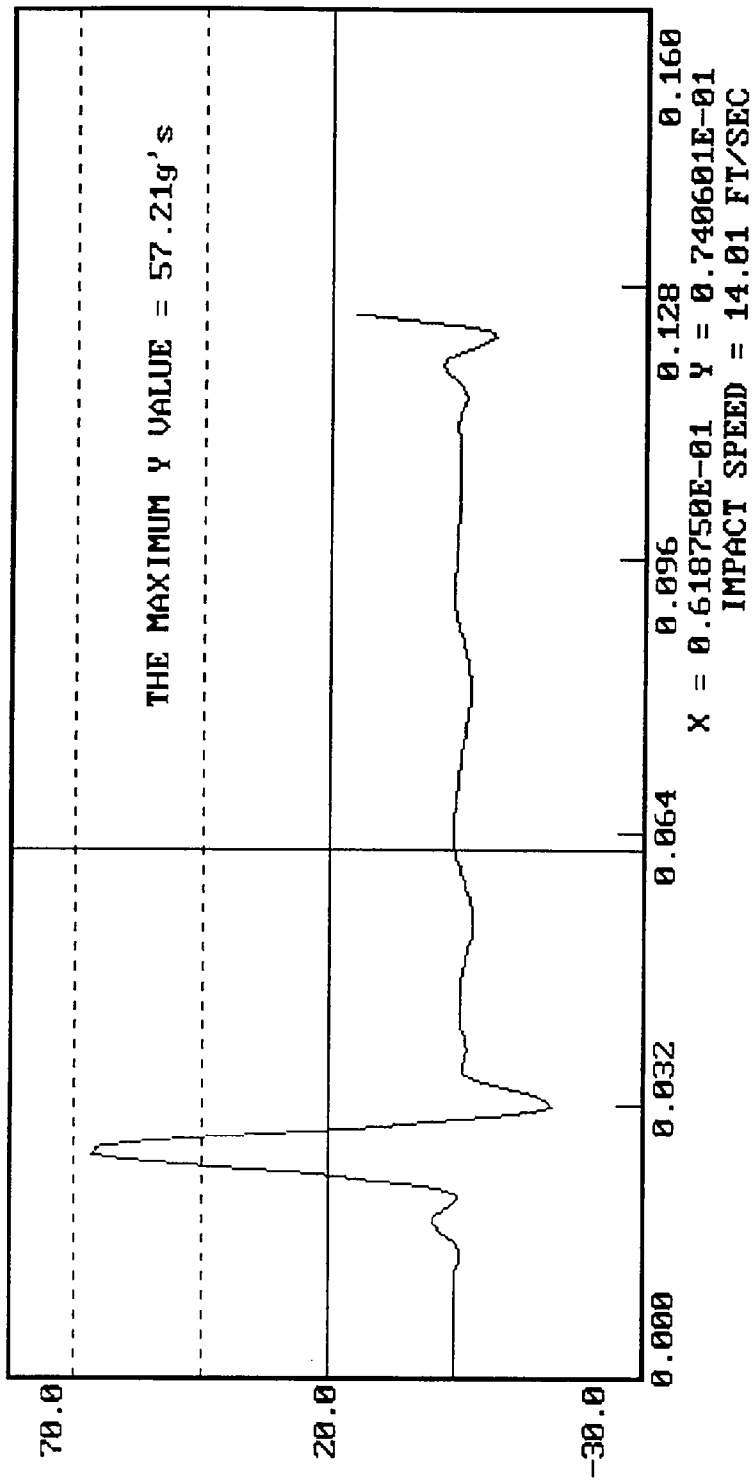
TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

APPROVED BY Dave Koelke

02-06-1997 15:58

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



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

DATE: January 31, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97304

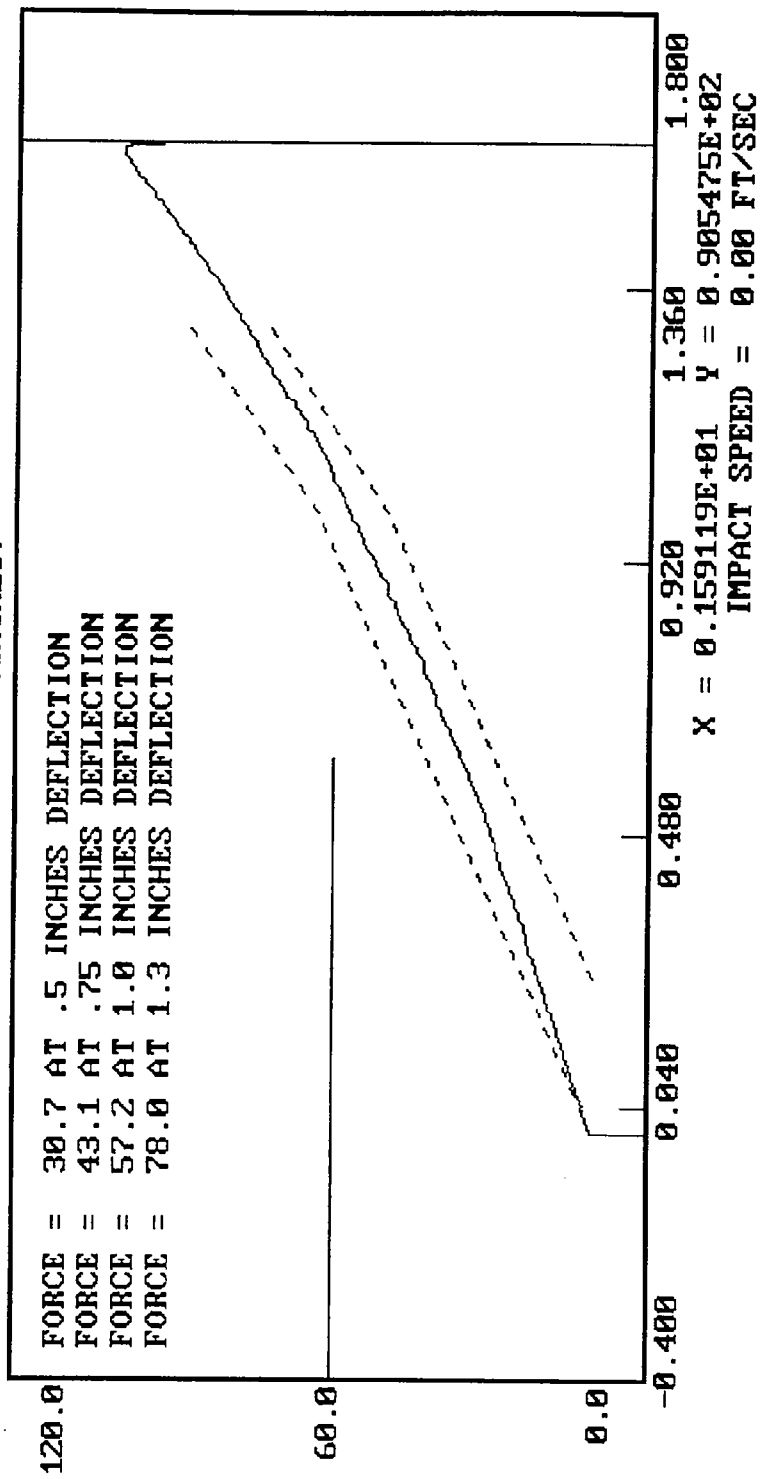
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	16%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.7
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.1
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	78

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Melch

APPROVED BY Dave Kosbake

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 278
 01-31-1997 11:41
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: January 31, 1997

DUMMY NUMBER: 270

TEST NUMBER: D97305

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	19%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	0°

TEST MEETS SPECIFICATIONS

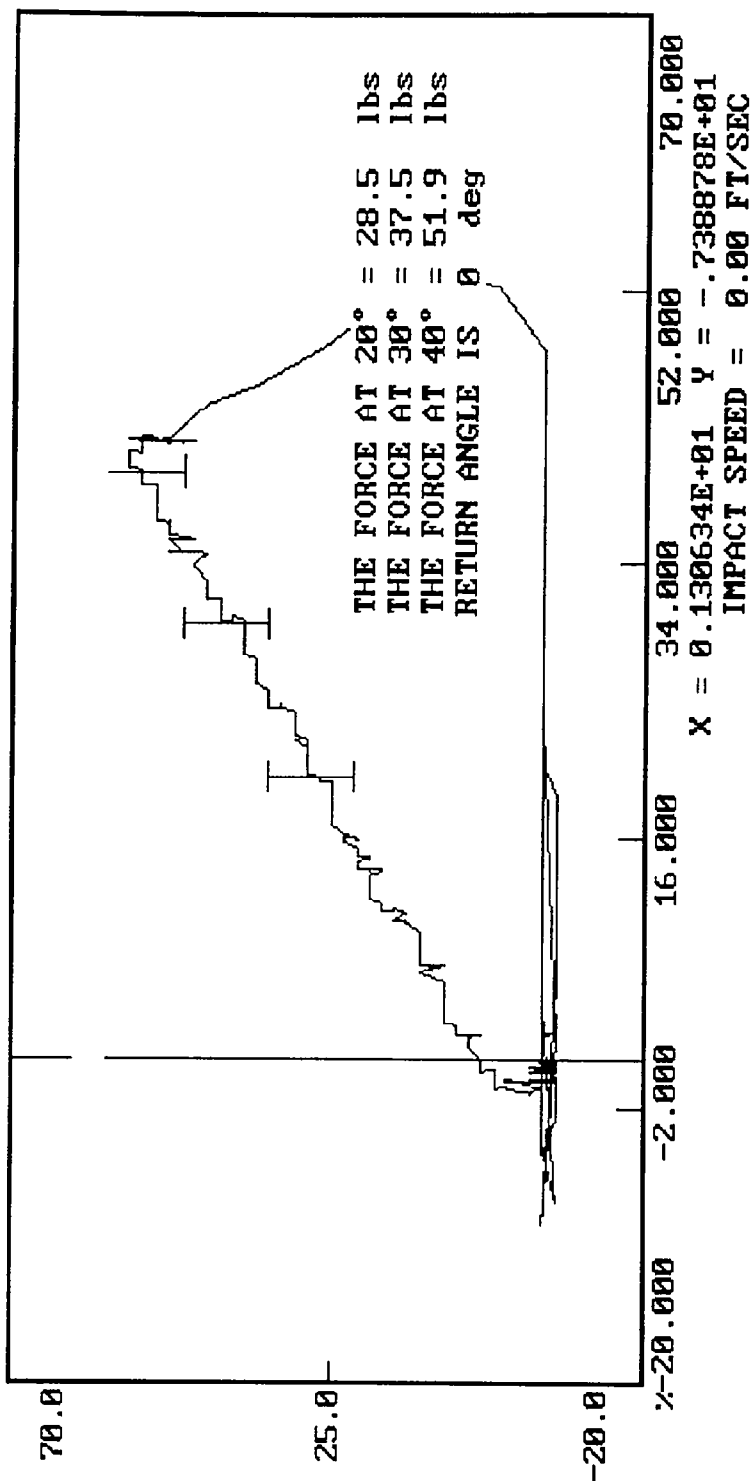
TECHNICIAN

Tim M. [Signature]

APPROVED BY

[Signature]

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 270 J
 01-31-1997 16:10
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 269

Inspected By: Tim Michnay

Date: February 6, 1997

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

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

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 269

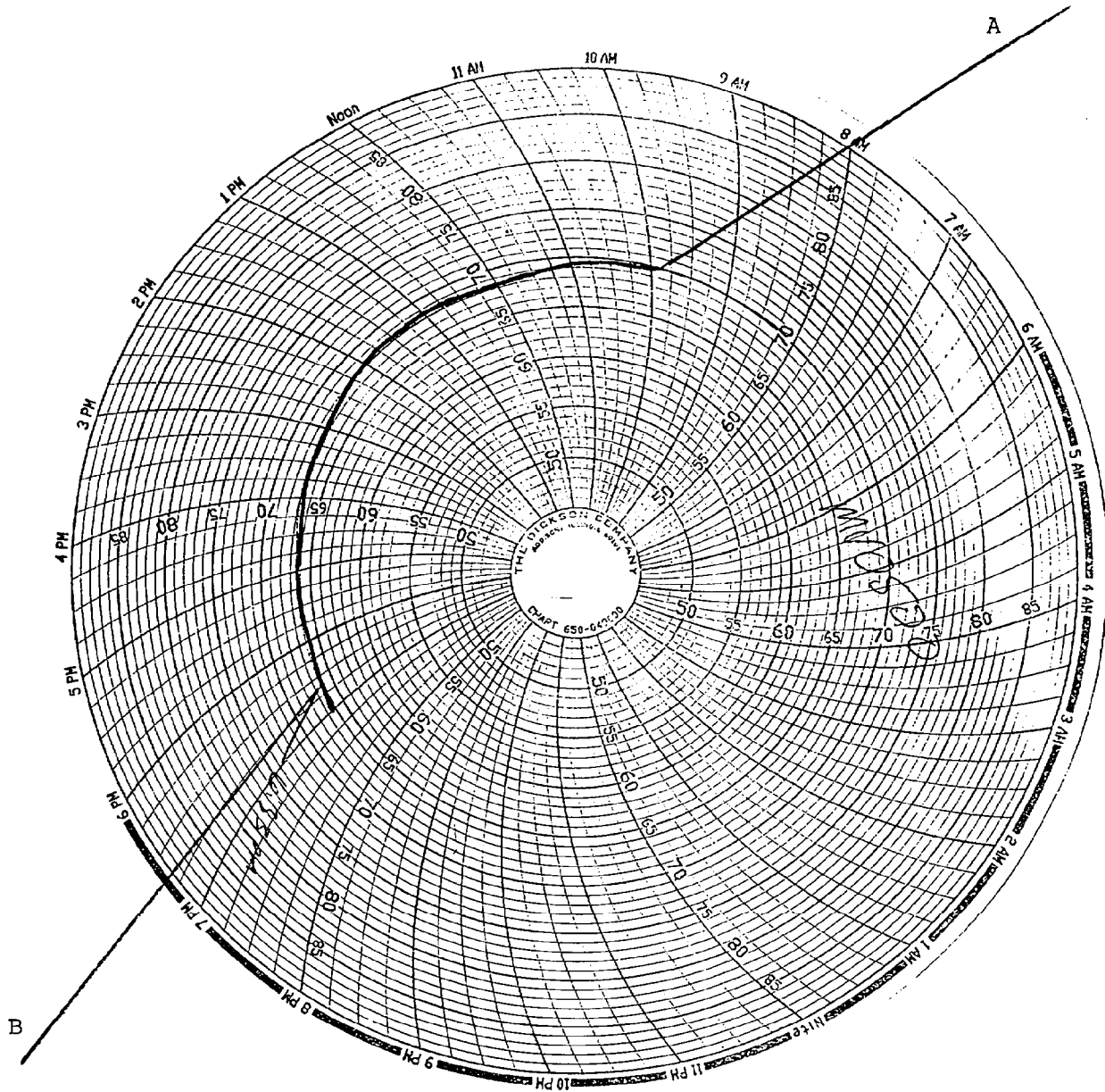
Inspected By: Tim Michnay

Date: February 6, 1997

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

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

VEHICLE AND DUMMY TEMPERATURE



APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

INSTRUMENTS FOR DRIVER DUMMY NO. 270

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP1H2	Endevco	9/10/96
Lower Rib Y	AJ9C2	Endevco	9/09/96
Lower Spine Y	AP2D7	Endevco	9/10/96
Pelvis Y	ALCH7	Endevco	9/09/96
Upper Rib Redundant Y	AH0B0	Endevco	9/10/96
Lower Rib Redundant Y	AHTT2	Endevco	9/09/96
Lower Spine Redundant Y	HP1T8	Endevco	9/10/96
Pelvis Redundant Y	AJ420	Endevco	9/09/96

INSTRUMENTS FOR PASSENGER DUMMY NO. 269

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AGTM2	Endevco	9/10/96
Lower Rib Y	ALECI	Endevco	9/16/96
Lower Spine Y	AH1G2	Endevco	9/11/96
Pelvis Y	ALCN9	Endevco	9/10/96
Upper Rib Redundant Y	AGTB5	Endevco	9/10/96
Lower Rib Redundant Y	J10411	Endevco	9/16/96
Lower Spine Redundant Y	AM751	Endevco	9/11/96
Pelvis Redundant Y	AKAF3	Endevco	9/10/96

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	C25-A04	Entran	1/06/97
Moving Barrier CG Y	C25-A06	Entran	1/07/97
Moving Barrier CG Z	B13-Z02	Entran	7/11/96
Moving Barrier Rear Axle X	D05-R19	Entran	1/02/97
Moving Barrier Rear Axle Y	D05-R20	Entran	1/02/97
Left Mid A-Post Y	J10-E14	Entran	1/03/97
Left Lower A-Post Y	J06-D17	Entran	1/03/97
Left Mid B-Post Y	D05-R12	Entran	1/03/97
Left Lower B-Post Y	J10-E08	Entran	1/03/97
Rear Floorpan Above Axle X	W14-D10	Entran	1/07/97
Rear Floorpan Above Axle Y	C25-A17	Entran	1/02/97
Rear Floorpan Above Axle Z	A10-G07	Entran	1/03/97
Driver Seat Track Y	G19-G12	Entran	1/08/97
Right Side Sill at Front Seat X	MGA125	Entran	1/06/97
Right Side Sill at Front Seat Y	D05-R16	Entran	1/06/97
Right Side Sill at Front Seat Z	L18-D18	Entran	1/08/97
Right Side Sill at Rear Seat X	H16-X15	Entran	1/07/97
Right Side Sill at Rear Seat Y	MGA144	Entran	1/03/97
Right Side Sill at Rear Seat Z	E24-E07	Entran	1/06/97
Left Side Sill at Front Seat Y	B14-R15	Entran	1/03/97

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Rear Seat Y	L14-D14	Entran	1/06/97
Right Rear Occupant Compartment Y	F07-A04	Entran	1/07/97
Vehicle CG X	MGA095	Entran	1/02/97
Vehicle CG Y	D06-A09	Entran	1/02/97
Vehicle CG Z	C20-J10	Entran	1/02/97
Left Front Door Midrear Y	L18-G02	Entran	1/02/97
Left Front Door Centerline Y	E24-G06	Entran	1/07/97
Left Front Door Upper Centerline Y	E12-G18	Entran	1/07/97
Left Rear Door Midrear Y	E13-D01	Entran	1/03/97
Left Rear Door Upper Centerline Y	L14-D17	Entran	12/03/96

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