

REPORT NO.: 214D-MGA-99-06

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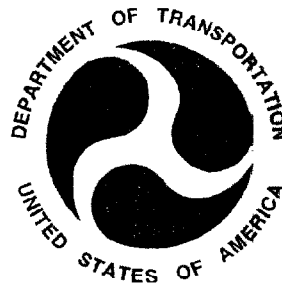
NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING
PASSENGER CARS

GENERAL MOTORS CORPORATION

1999 CHEVROLET S-10 EXTENDED CAB PICKUP

NHTSA NO: MX0104

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: November 24, 1998

Report Date: December 7, 1998

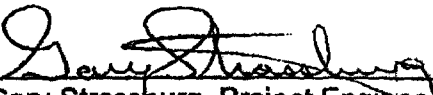
FINAL REPORT

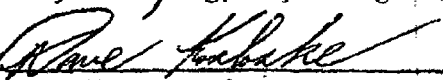
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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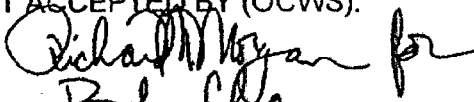
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12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards 400 Seventh St., S.W. Washington, D.C. 20590				13. Type of Report and Period Covered Final Test Report November 24, 1998 to December 7, 1998													
				14. Sponsoring Agency Code NPS-10													
15. Supplementary Notes																	
16. Abstract A 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 1999 Chevrolet S-10 Pickup 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 November 24, 1998. The impact velocity of the Moving Deformable Barrier (MDB) was 61.5 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 22.8 °C. The target vehicle post test maximum crush was 435 mm at level 3. The test vehicle's performance follows: <table border="0"> <tr> <td></td> <td style="text-align: center;"><u>DRIVER</u></td> </tr> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">58</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">83</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">85</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">84</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">92</td> </tr> </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. The vehicle leaked fuel on impact.							<u>DRIVER</u>	Left Upper Rib (LUR) Accel., g	58	Left Lower Rib (LLR) Accel., g	83	Lower Spine (T ₁₂) Accel., g	85	Thoracic Trauma Index (TTI)	84	Pelvis (PEV) Accel., g	92
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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													
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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY99 NCAP Side Impact Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-97-D-22001. The purpose of this test was to evaluate side impact protection of a 1999 Chevrolet S-10 Extended Cab Pickup.

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.

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 1999 Chevrolet S-10 Extended Cab Pickup 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 38.23 mph (61.5 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 November 24, 1998. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummy (SID) are included in Appendix A.

One Side Impact Dummy (SID) was placed in the driver designated seating position 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 eight high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SID was 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)
5. Head Center of Gravity triaxial accelerometers (X, Y, and Z-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
TTI (g)	84
Pelvis (g)	92

Test Notes:

A rear passenger ATD was not run. The vehicle has a side facing rear seat. The data from the rear ATD would have little value.

The following accelerometers were not recorded:

- Left rear door centerline

- Left rear door

- Left rear seat track

The vehicle leaked stoddard on impact.

A bolt on the driveshaft punctured the fuel tank. The post-test static rollover was not conducted due to the amount of fuel spillage.

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: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 VIN: 1GCCS1949XK117013

Vehicle Body Color: Red Build Date: 10/98

Engine Data: 4 Cylinders; CID; 2.2 Liter; cc

Placement X Longitudinal; Lateral

Transmission: 5 Speed; X Manual; Automatic; X Overdrive

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

Odometer Reading 19 miles

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

X Cruise Control; X Tilt Wheel; Power Door Locks;

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 35 Psi FRONT

35 Psi REAR

Recommended Tire Size: P205/75R15

Tires on Test Vehicle: P205/175R15 Manufacturer: Uniroyal

Vehicle Capacity Data:

Number of Occupants: 3 Front; 2 Rear; 3rd Seat, 5 Total

Type of Front Seats: Bucket; Bench; X Split Bench

Type of Front Seat Back: Fixed; X Adjustable with X Lever

Vehicle Maximum Capacity Loading = 564.7 kg (A)

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

Cargo Capacity (A-B) = 224.5 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>415.5</u> kg	Right Rear	=	<u>314.8</u> kg
Left Front	=	<u>445.9</u> kg	Left Rear	=	<u>316.6</u> kg
TOTAL FRONT	=	<u>861.4</u> kg	TOTAL REAR	=	<u>631.4</u> kg
% of Total Vehicle Weight =		<u>57.7</u> %;	% of Total Weight =		<u>42.3</u> %
TOTAL WEIGHT = <u>1492.8</u> kg					

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab PickupVehicle NHTSA No.: MX0104 Test Date: November 24, 1998CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	=	<u>1492.8</u> kg
Cargo Carrying Capacity of Test Vehicle *	=	<u>136.1</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>1790.3</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO (Fully Loaded):

Right Front	=	<u>422.3</u> kg	Right Rear	=	<u>415.0</u> kg
Left Front	=	<u>522.5</u> kg	Left Rear	=	<u>432.3</u> kg
TOTAL FRONT	=	<u>944.8</u> kg	TOTAL REAR	=	<u>847.3</u> kg
% of Total Weight	=	<u>52.7</u> %	% of Total Weight	=	<u>47.3</u> %
TOTAL TEST WEIGHT	=	<u>1792.1</u> kg			

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 777 mm Left Front 766 mm Right Rear 832 mm Left Rear 823 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 773 mm Left Front 750 mm Right Rear 804 mm Left Rear 784 mm

TEST ATTITUDE:

Right Front 771 mm Left Front 754 mm Right Rear 806 mm Left Rear 786 mm* light trucks and MPVs RCW is 136 kgs or manufacturer's value, whichever is less

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 3120 mm

C.G. = 1454 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4938 mm

Centerline = 5203 mm

Left Side = 4933 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab PickupVehicle NHTSA No.: MX0104 Test Date: November 24, 1998FRONT SEAT CUSHION PLACEMENT:Total Length of Adjustment Travel: 200 mmTest Position: 11th position rearward out of 21 possible positionsFRONT SEAT BACK ADJUSTMENT POSITION:Seat Back Angle = 23.3°SECOND POSITION SEAT:Total Length of Fore/Aft Adjustment Travel: N/ASeat Back Adjustment Position: N/AADJUSTABLE STEERING COLUMN POSITION: Mid Position

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:Fuel system usable capacity = 18.3 gallonsTest Volume: 17.0 gallons 92.9 % of capacityLOCATIONS OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:Wheelbase: = 3120 mmImpact Point is 508 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998

Overall Length = 5203 mm; Overall Width = 1686 mm

TEST WEIGHT:

Right Front = 440.4 kg Right Rear = 414.1 kg

Left Front = 511.7 kg Left Rear = 416.9 kg

TOTAL FRONT = 952.1 kg TOTAL REAR = 831.0 kg

% of Total Weight = 53.4 % % of Total Weight = 46.6 %

TOTAL VEHICLE WEIGHT = 1783.1 kg

Wheelbase = 3120 mm

Longitudinal C.G. from Center of Front Axle = 1454 mm

Impact Angle with Respect to Impactor = 0 ° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (341 mm above ground) = 366 mm

2. LEVEL 2 (675 mm above ground) = 431 mm

3. LEVEL 3 (705 mm above ground) = 435 mm

4. LEVEL 4 (1025 mm above ground) = 293 mm

5. LEVEL 5 (1516 mm above ground) = 74 mm

Maximum Post-Test Intrusion = 435 mm

OCCUPANTS:

Driver _____

Type of Dummy

SID

Restraints Used

3 point belt

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)INSTRUMENTATION:

Number of Vehicle Data Channels:	=	<u>23</u>
Number of Cameras:		
Onboard Vehicle	=	<u>2</u>
Offboard Vehicle	=	<u>4</u>
Deformable Barrier	=	<u>2</u>
TOTAL	=	<u>8</u>

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTSYear/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab PickupVehicle NHTSA No.: MX0104 Test Date: November 24, 1998POSITION OF IMPACT (MDB) ON MONORAIL:Crabbed 27° to leftMDB 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>1098 mm</u>
C.G. Location From Center Line	=	<u>-15 mm</u>
C.G. Location Above Ground Level	=	<u>485 mm</u>

MDB WEIGHT:

Left Front	=	<u>457.7 kg</u>	Left Rear	=	<u>235.1 kg</u>
Right Front	=	<u>328.1 kg</u>	Right Rear	=	<u>342.6 kg</u>
TOTAL FRONT	=	<u>785.8 kg</u>	TOTAL REAR	=	<u>577.7 kg</u>
TOTAL MDB WEIGHT = <u>1363.5 kg</u>					

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degreesImpact Speed = Primary: 38.23 mph (61.5 kph) Secondary: 38.44 mph (61.9 kph)

CRASH TEST SUMMARY FOR SIDE IMPACTOR (Cont'd)MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Top of Stack (813 mm) = 231 mm
2. Row B Mid Stack (686 mm) = 195 mm
3. Row C Top of Bumper (533 mm) = 123 mm
4. Row D Center of Bumper (432 mm) = 91 mm

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SIDE</u>
Head	<u>Headrest</u>
Arm	<u>Door panel/armrest</u>
Pelvis	<u>door panel</u>
Left Knee	<u>door panel</u>
Right Knee	<u>left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 21 mm rear Vertical: 4 mm high

ARM REST LOCATIONS:

Front: 200 mm from down window opening
 Rear: N/A

POST-TEST OBSERVATIONS (Cont'd)SEAT CRUSH:

Front Seat Back: 15 mm Front Seat Cushion: 23 mm

GLAZING DAMAGE:

Driver door window broken

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

None

OTHER NOTABLE IMPACT EFFECTS:

The vehicle leaked stoddard solvent on impact

AIRBAG DEPLOYMENT STATUS:

	<u>DRIVER</u>	<u>PASSENGER</u>
Frontal	<u>No</u>	<u>No</u>
Side	<u>N/A</u>	<u>N/A</u>

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

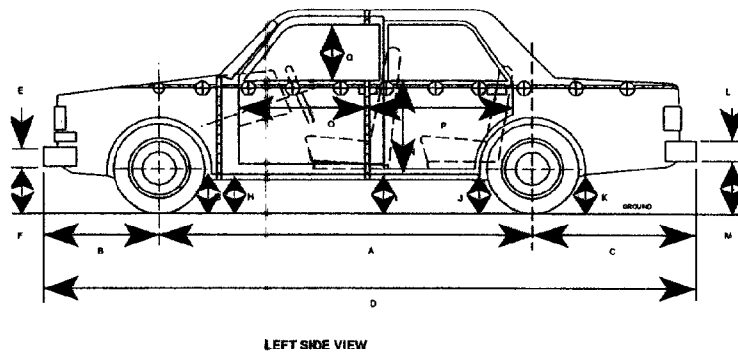
DATA SHEET NO. 5

Vehicle NHTSA No.: MX0104
Test Date: November 24, 1998

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

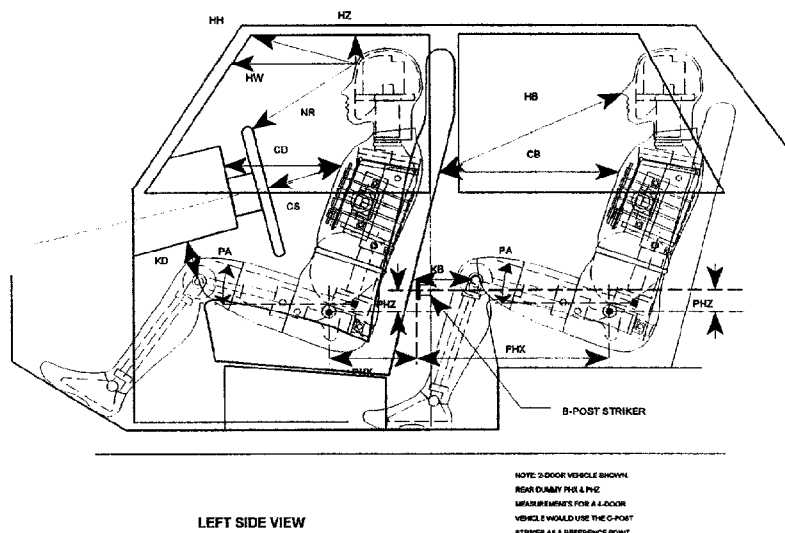
J1 = To Pinch Weld

J2 = To Sill

ALL MEASUREMENTS IN (mm)

	PRE-TEST	POST-TEST	Δ CHANGE
A	3120	3119	1
B	690	680	10
C	1393	1382	11
D	5203	5181	22
E	105	105	0
F	465	458	7
G	315	322	-7
H	315	322	-7
I	320	347	-27
J1/J2	330/315	374/N/A	-44/N/A
K	349	404	-55
L	135	135	0
M	404	114	-290
N	750	690	60
O	878	875	3
P	294	293	1
Q	490	500	-10
R	4938	4940	-2
S	4933	4926	7
T	1686	1632	54

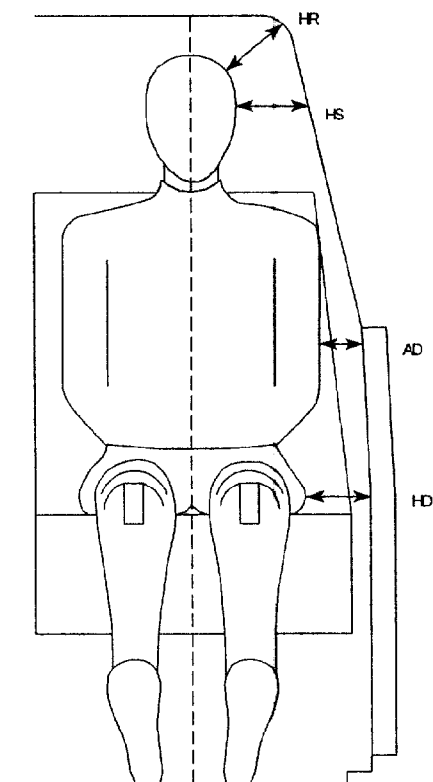
DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONSYear/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab PickupNHTSA NO.: MX0104 Test Date: November 24, 1998NOTE: All dimensions are in mm with tolerance of ± 3 mm

	DRIVER SID ID # 271
HH	512
HW	697
HZ	197
NR	419
CD	550
CS	330
KDL(KDA°)	174/0.0°
KDR(KDA°)	211/0.0°
PA°	24.5°
PHX	314
PHZ	86

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 DIMENSIONSYear/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab PickupNHTSA NO.: MX0104Test Date: November 24, 1998

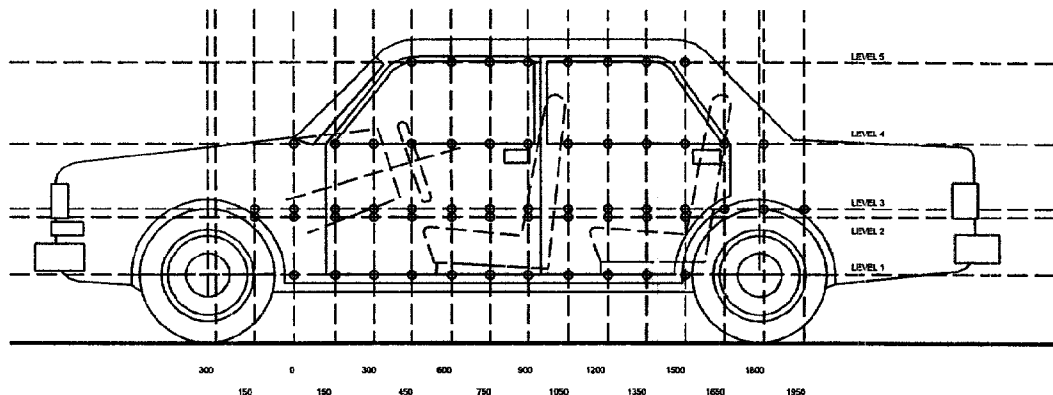
NOTE: All dimensions are in mm

	DRIVER SID ID # 271
HR	238
HS	350
AD	52
HD	168

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup

NHTSA NO.: MX0104 Test Date: November 24, 1998



LEFT SIDE VIEW

NOTE: All measurements are in millimeters (mm)

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

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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

Level 1 @ Axle Centerline Height

(or Sill Top Height) = 341 mm

Level 2 @ Occupant H-Point = 675 mm

Level 3 @ Mid Door = 705 mm

Level 4 @ Window Sill = 1025 mm

Level 5 @ Window Top = 1516 mm

Note: The measurement 0 point is 54 mm forward of the actual target 0 point.

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 1 - Axle Centerline		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	782	904	122
150	784	978	194
300	784	1076	292
450	781	1105	324
600	778	1126	348
750	777	1131	354
900	772	1137	365
1050	776	1131	355
1200	773	1121	348
1350	772	1126	354
1500	770	1136	366
1650	772	1138	366
1800	768	1123	355

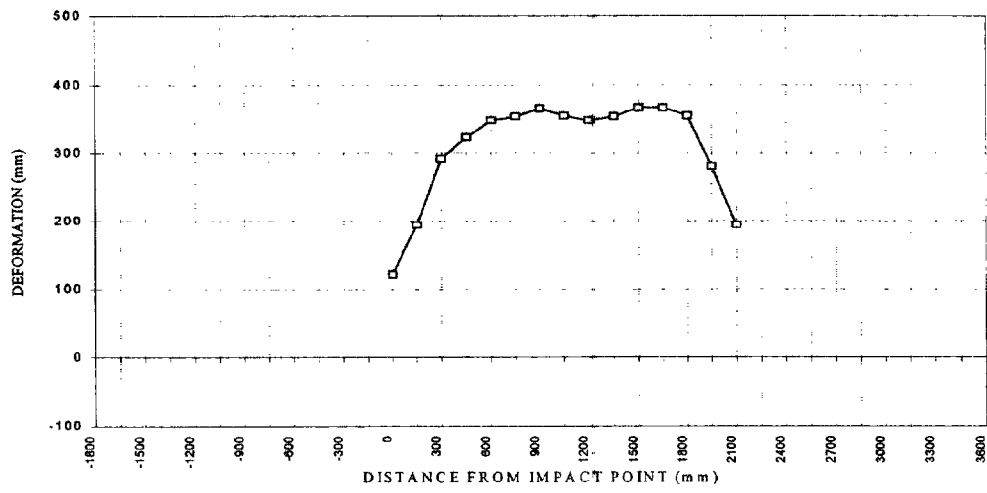
Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 1 - Axle Centerline		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	766	1047	281
2100	767	961	194
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

	Level 2 - Occupant H-Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900	740	772	32
-750			
-600			
-450			
-300			
-150			
0 (impact point)	710	724	14
150	708	903	195
300	704	970	266
450	702	998	296
600	700	1027	327
750	699	1052	353
900	697	1072	375
1050	694	1086	392
1200	694	1106	412
1350	694	1125	431
1500	693	1105	412
1650	691	1085	394
1800	693	934	241

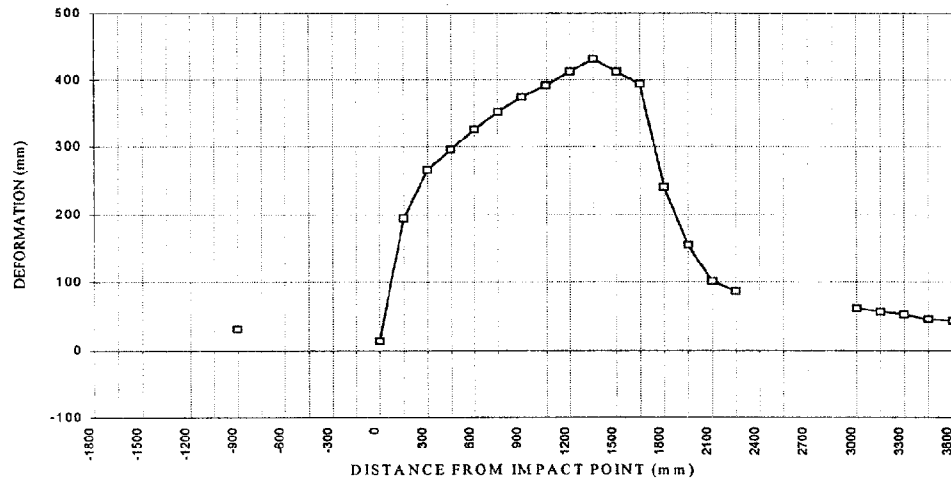
Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 2 - Occupant H-Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	692	848	156
2100	692	793	101
2250	685	772	87
2400			
2550			
2700			
2850			
3000	681	743	62
3150	711	768	57
3300	714	767	53
3450	720	766	46
3600	735	779	44

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

	Level 3 - Mid-Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900	739	773	34
-750			
-600			
-450			
-300			
-150	688	783	95
0 (impact point)	707	816	109
150	704	898	194
300	701	948	247
450	699	979	280
600	697	1008	311
750	693	1033	340
900	691	1063	372
1050	690	1082	392
1200	689	1089	400
1350	687	1122	435
1500	688	1102	414
1650	687	1087	400
1800	689	927	238

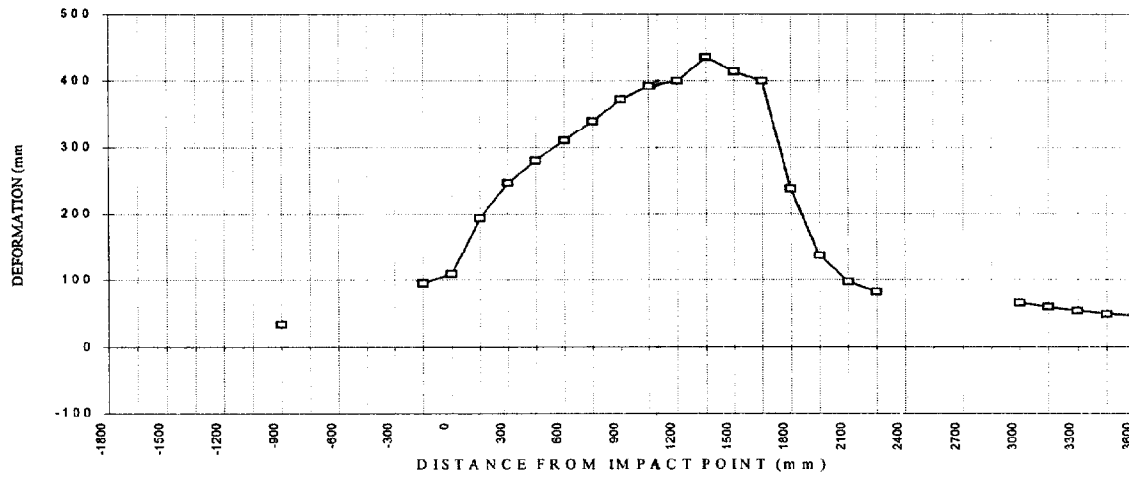
Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 3 - Mid-Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	687	824	137
2100	686	783	97
2250	689	771	82
2400			
2550			
2700			
2850			
3000	681	747	66
3150	707	767	60
3300	711	765	54
3450	716	765	49
3600	732	779	47

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)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050	820	831	11
-900	789	817	28
-750	772	811	39
-600	757	801	44
-450	744	804	60
-300	735	805	70
-150	727	811	84
0 (impact point)	720	816	96
150	714	821	107
300	710	859	149
450	709	869	160
600	706	888	182
750	704	907	203
900	700	927	227
1050	698	962	264
1200	698	991	293
1350	698	977	279
1500	698	959	261
1650	698	957	259
1800	704	833	129

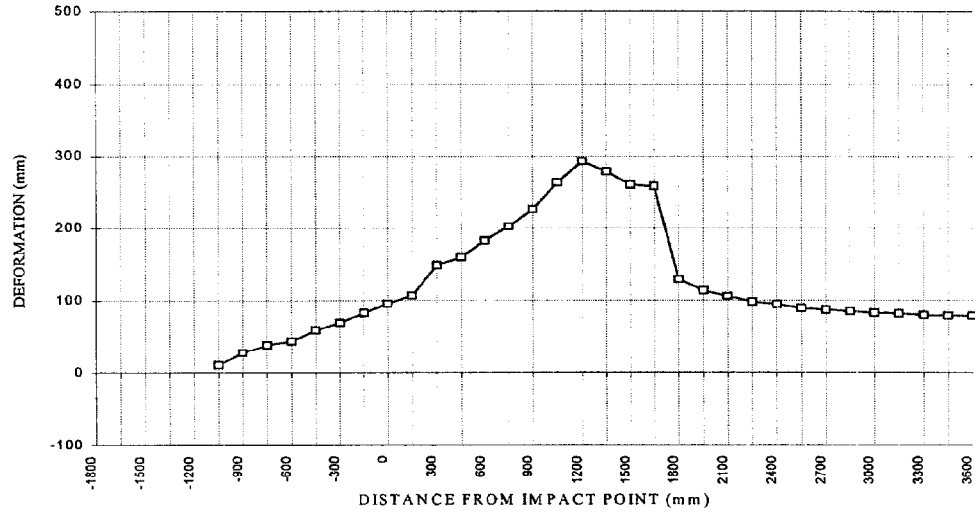
Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 4 - Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	704	818	114
2100	702	808	106
2250	705	803	98
2400	706	801	95
2550	711	801	90
2700	714	802	88
2850	720	806	86
3000	724	808	84
3150	729	812	83
3300	731	812	81
3450	739	819	80
3600	746	826	80

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

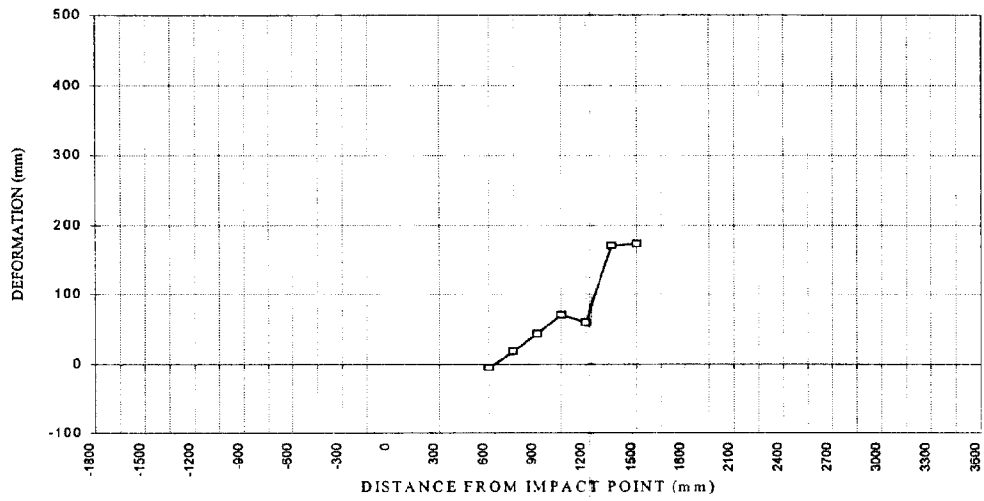
	Level 5 - Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600	888	883	-5
750	885	904	19
900	887	931	44
1050	886	957	71
1200	889	1049	60
1350	886	1057	171
1500	886	1060	174
1650			
1800			

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 5 - Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

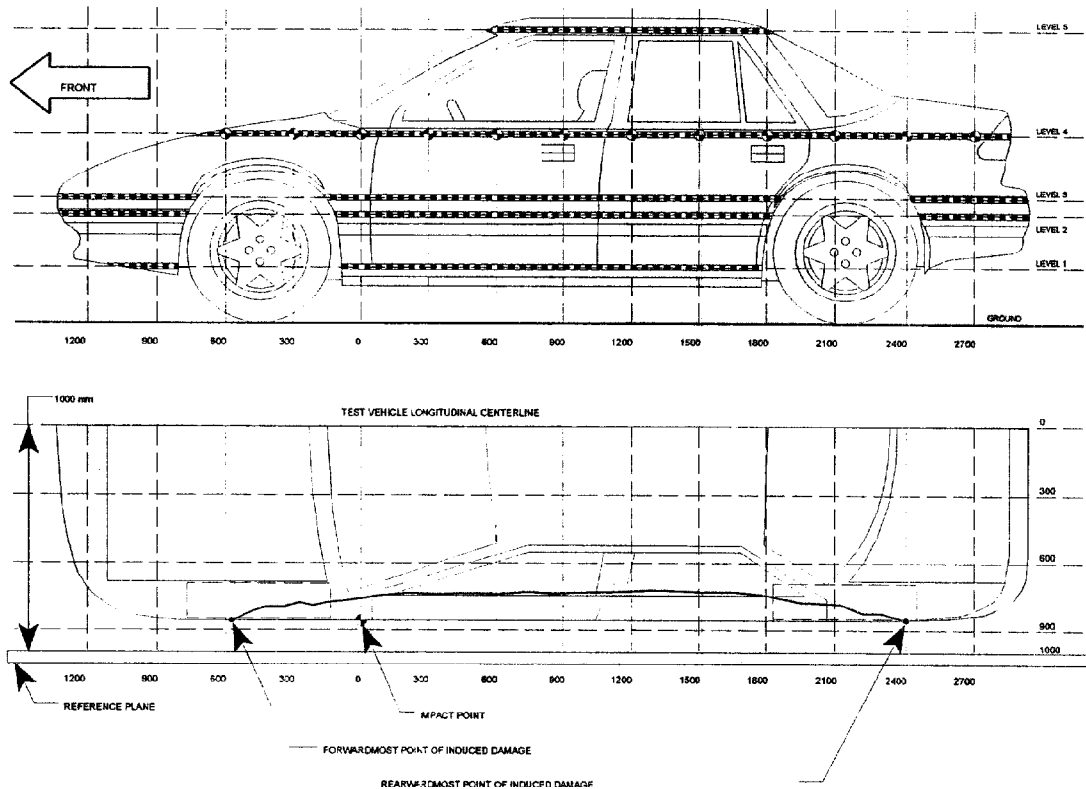
VEHICLE EXTERIOR STATIC CRUSH

LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup

NHTSA NO.: MX0104 Test Date: November 24, 1998



NOTE: All measurements are in millimeters (mm)

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LF = <u>-600</u> mm)	760	760	0
2. <u>-63</u> mm	797	720	77
3. <u>448</u> mm	1093	702	391
4. <u>987</u> mm	1136	697	439
5. <u>1573</u> mm	1131	693	438
6. (LR = <u>2700</u> mm)	710	710	0

DATA SHEET NO. 12
EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

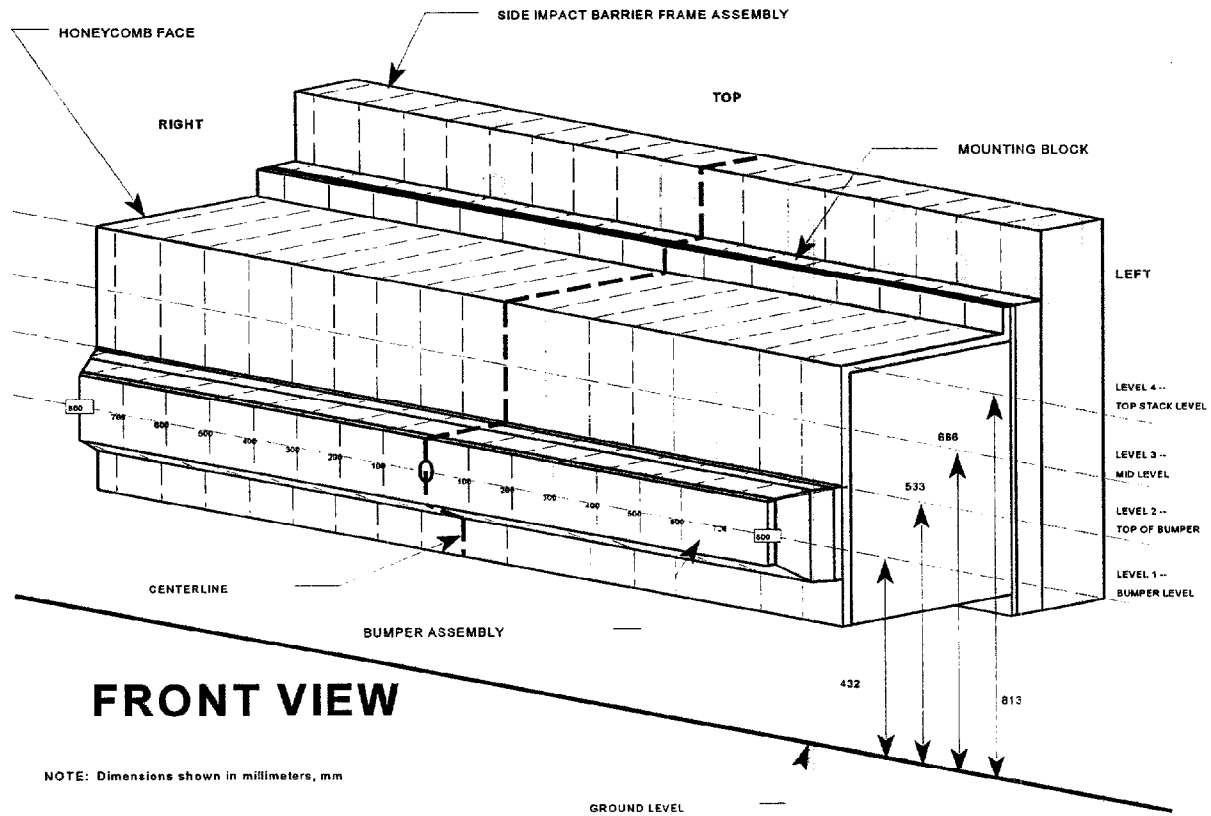
Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998

		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	231	197	113	48	22	28	35	46	38	36	32	38	50	66	88	119	153
Mid Level Level 3	686 mm	195	157	71	11	6	7	7	6	5	5	5	7	9	10	14	30	63
Top Bumper Level 2	533 mm	123	55	55	55	55	55	55	55	55	55	55	55	55	51	50	50	49
Mid Bumper Level 1	432 mm	52	50	50	50	49	53	60	61	55	46	41	47	40	55	60	77	91

See next page for Barrier Face Graphic

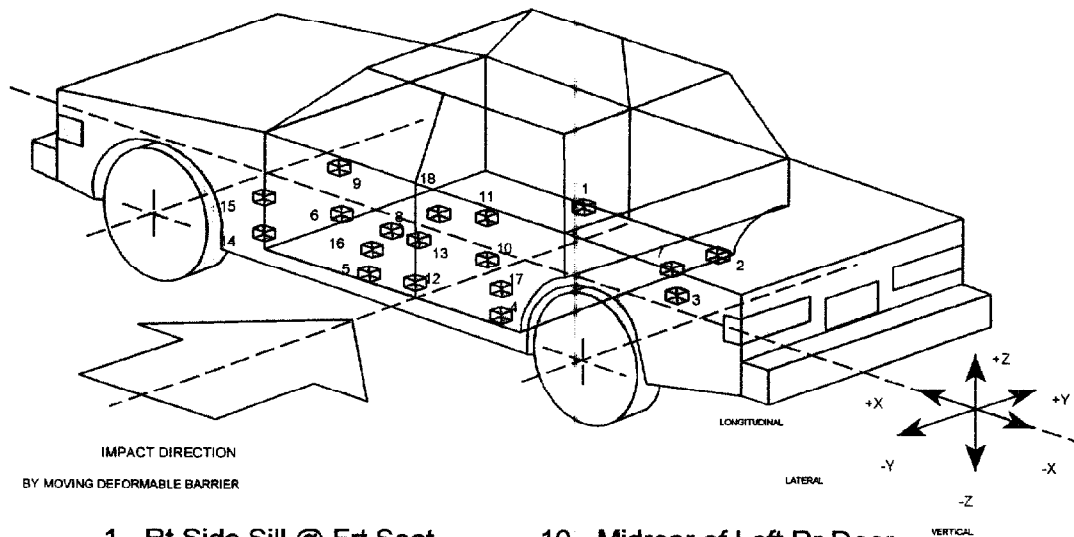
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998



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

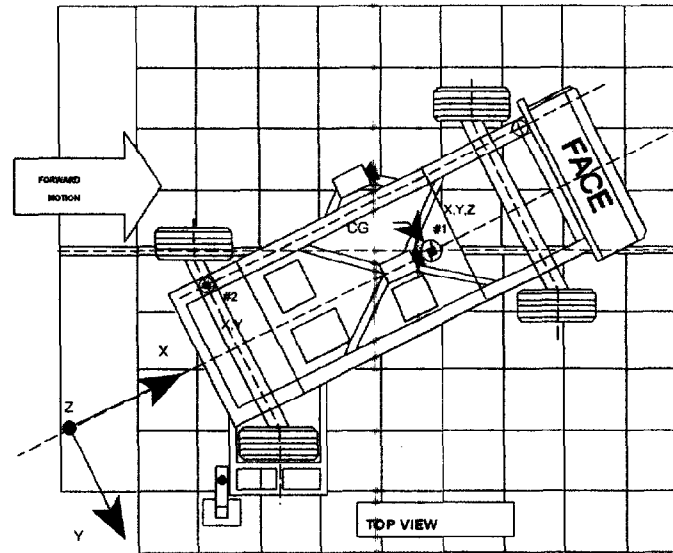
DATA SHEET NO. 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY
Year/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab Pickup
Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998

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	2964	709	390	10.3	11.2	33.6	9.4	9.1	13.4	34.1
2	Rt. Side Sill @ Rear Seat	2404	709	425	10.6	10.0	47.6	17.5	7.9	5.8	47.8
3	Rr. Floorpan Above Axle	1146	0	685	6.0	12.0	23.5	2.6	32.9	40.9	41.6
4	Left Side Sill @ Rr. Seat	2395	-709	395	---	---	124.6	56.7	---	---	---
5	Left Side Sill @ Frt. Seat	2935	-709	370	---	---	142.2	65.2	---	---	---
6	Left Front Door Centerline	3170	-845	697	---	---	285.4	151.3	---	---	---
7	Right Rear Occupant Compartment	2268	435	610	---	---	40.2	16.4	---	---	---
8	Mid Rear of Left Front Door	2810	-845	709	---	---	NVD	NVD	---	---	---
9	Left Front Door Upper Centerline	3165	-795	1016	---	---	150.9	80.9	---	---	---
12	Left Lower B-Post	2578	-675	435	---	---	133.8	39.5	---	---	---
13	Left Mid B-Post	2645	-775	997	---	---	145.5	66.0	---	---	---
14	Left Lower A-Post	3710	-775	460	---	---	95.1	66.1	---	---	---
15	Left Mid A-Post	3710	-770	980	---	---	24.6	2.2	---	---	---
16	Driver Left Seat Track	2895	-495	490	---	---	**	**	---	---	---
18	Vehicle CG	2775	0	495	16.8	12.4	33.5	9.4	40.3	32.4	45.5

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

NVD = No valid data ** No valid data after approximately 23 msec.

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1999/Chevrolet/S-10/Extended Cab PickupVehicle NHTSA No.: MX0104 Test Date: November 24, 1998

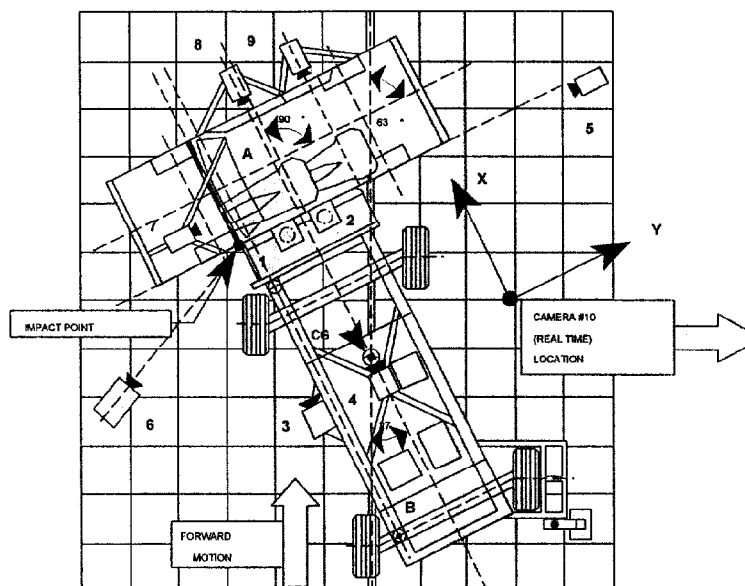
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	6.8	136	19.7	34
	Lateral (Y)	---	---	---	.7	179	11.2	48
	Vertical (Z)	---	---	---	10.8	21	11.2	25
	Resultant (R)	---	---	---	21.4	39	---	---
2	Rear Frame Member	-2501	-625	622				
	Longitudinal (X)	---	---	---	1.9	120	21.9	37
	Lateral (Y)	---	---	---	5.9	34	1.2	85

*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: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998



Camera No.	View	Coordinates (mm)*			Lens (mm)	Film Speed (fps)
		X	Y	Z		
	Real Time					
1	Top Overall	-210	1195	5000	8	971
2	Top Impact	-270	0	5000	13	870
3	Cart Pointer				35	1020
4	Cart Overall				13	1000
5	Right Impact	-2535	9970	1715	25	733
6	Left Impact	-480	2800	1670	13	1000
7	Onboard Hood				13	1005
8	Onboard Driver				8	990

* 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: 1999/Chevrolet/S-10/Extended Cab Pickup

Vehicle NHTSA No.: MX0104 Test Date: November 24, 1998

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 38.23 mph (61.5 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	about ~ 900 oz.	5 oz
3. For next 25 minutes	about ~ 1,000 oz.	1 oz./1 min

FUEL SPILLAGE LOCATION(S): A hole was punctured on the inboard side of the fuel tank due to contact with the driveshaft.

Note: The post-test rollover was not conducted due to the volume of fuel spillage after the crash.

APPENDIX A - PHOTOGRAPHS

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Photo No. A-36 - Right Front Attitude Point	A-36
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Photo No. A-1 - Pre-Test Front View of Test Vehicle

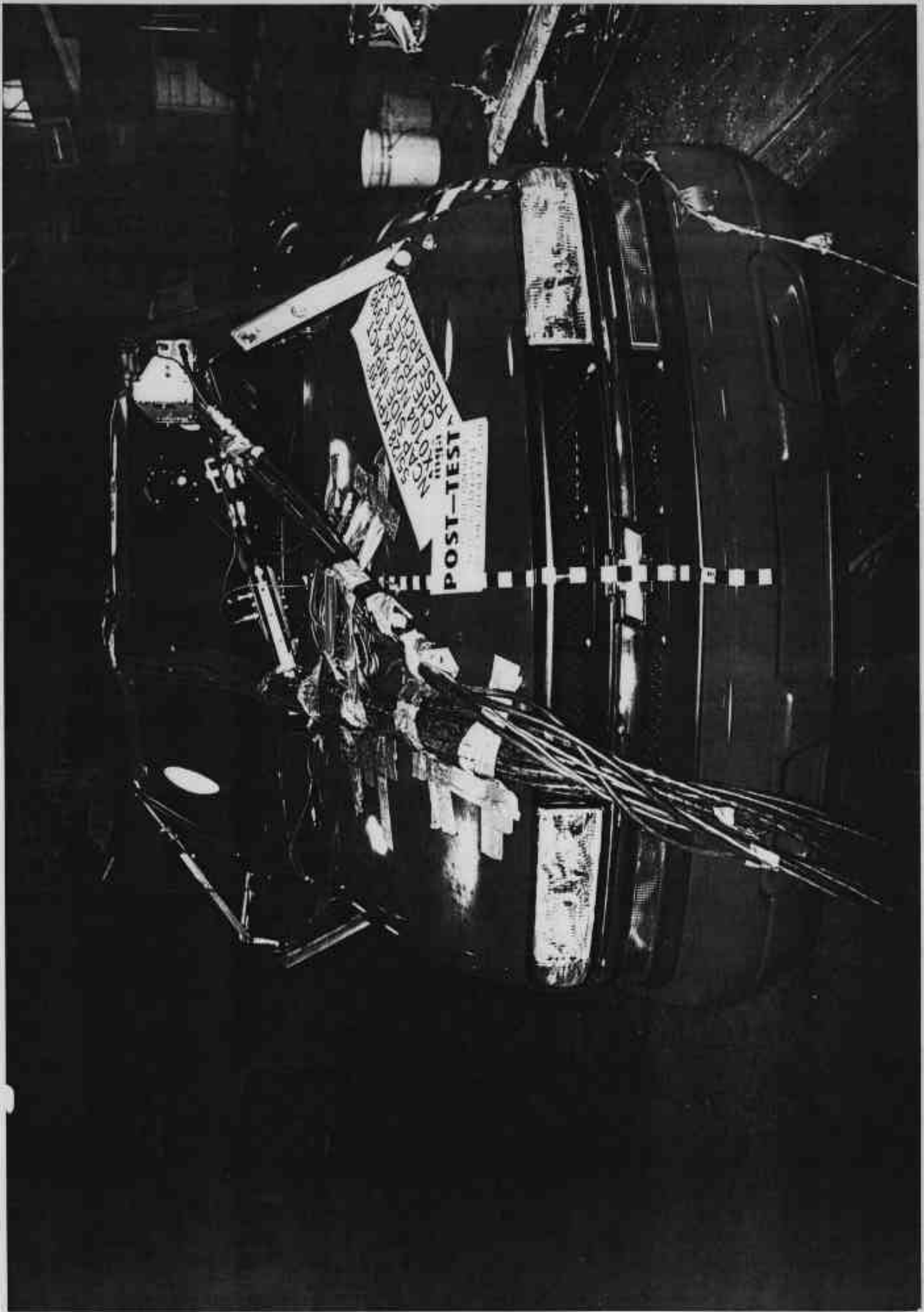


Photo No. A-2 - Post-Test Front View of Test Vehicle

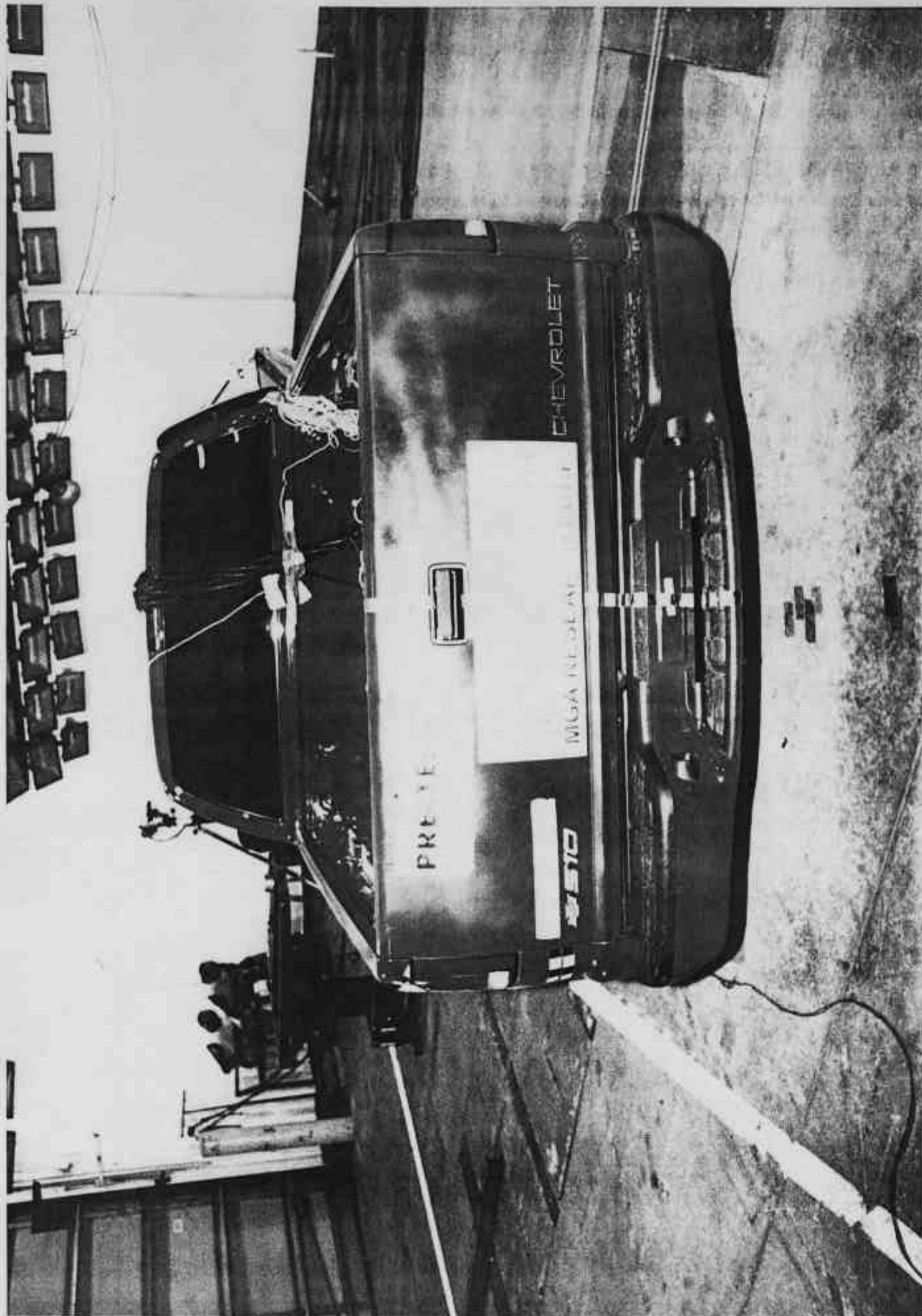


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

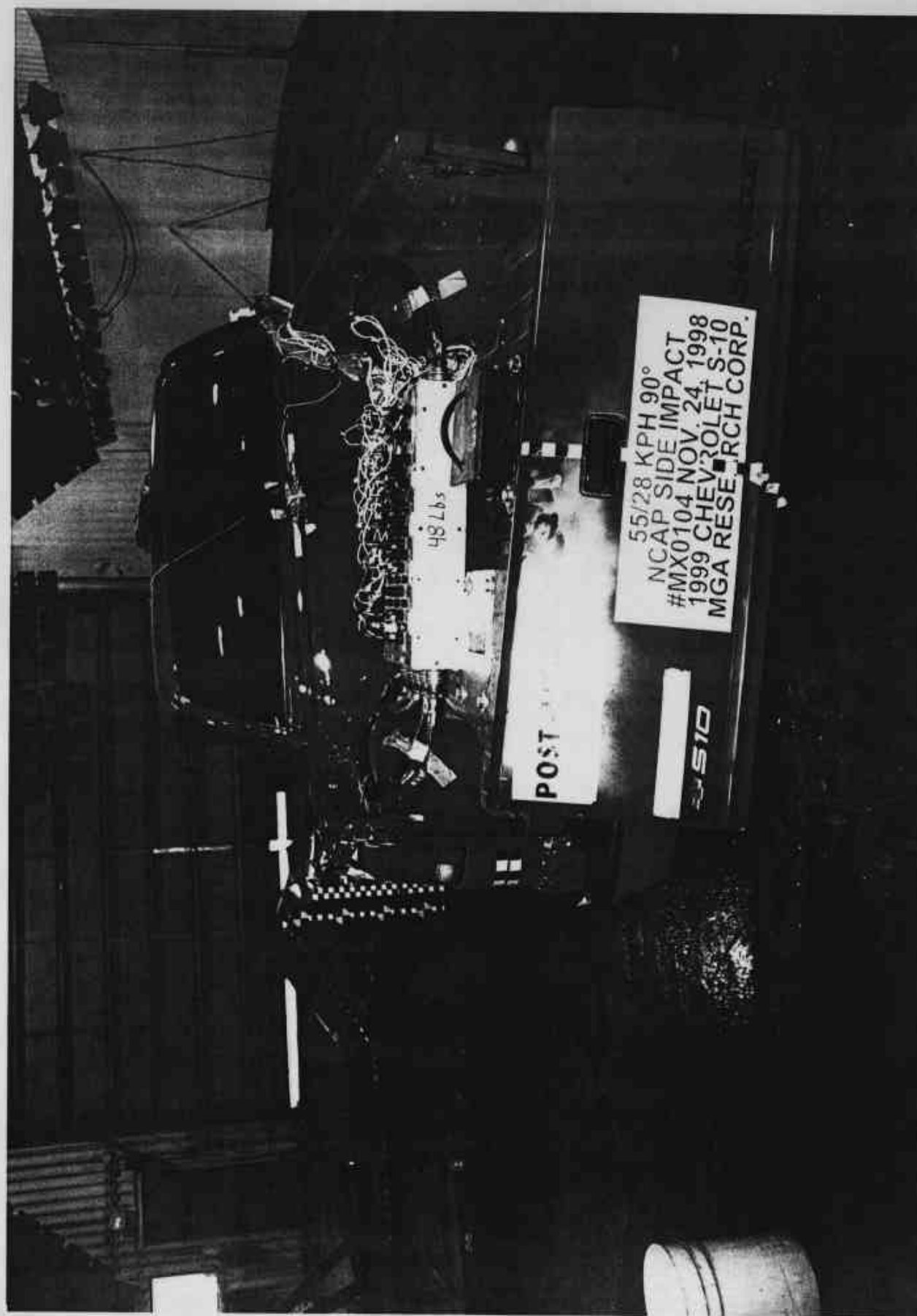


Photo No. A-4 - Post-Test Rear View of Test Vehicle

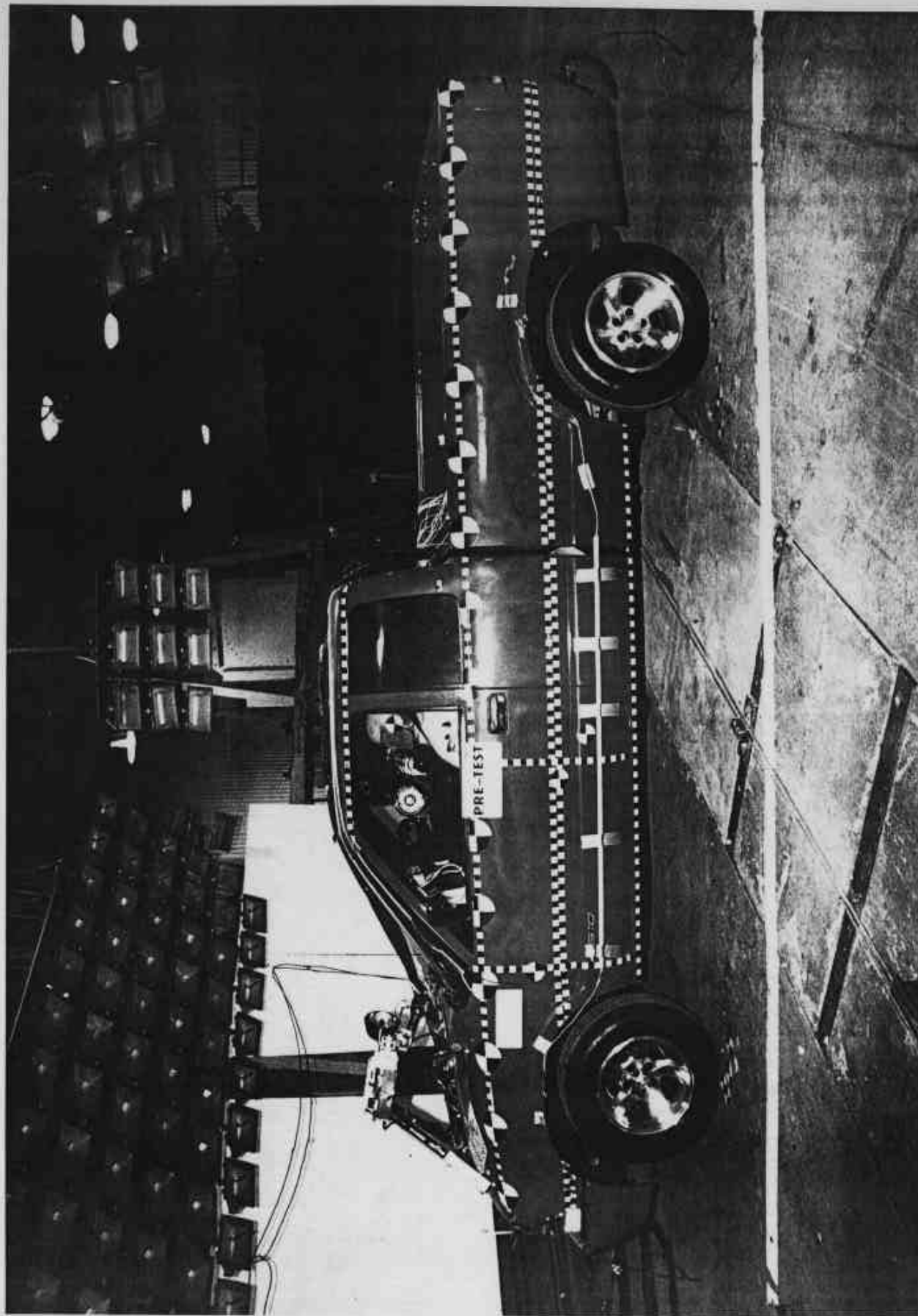


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

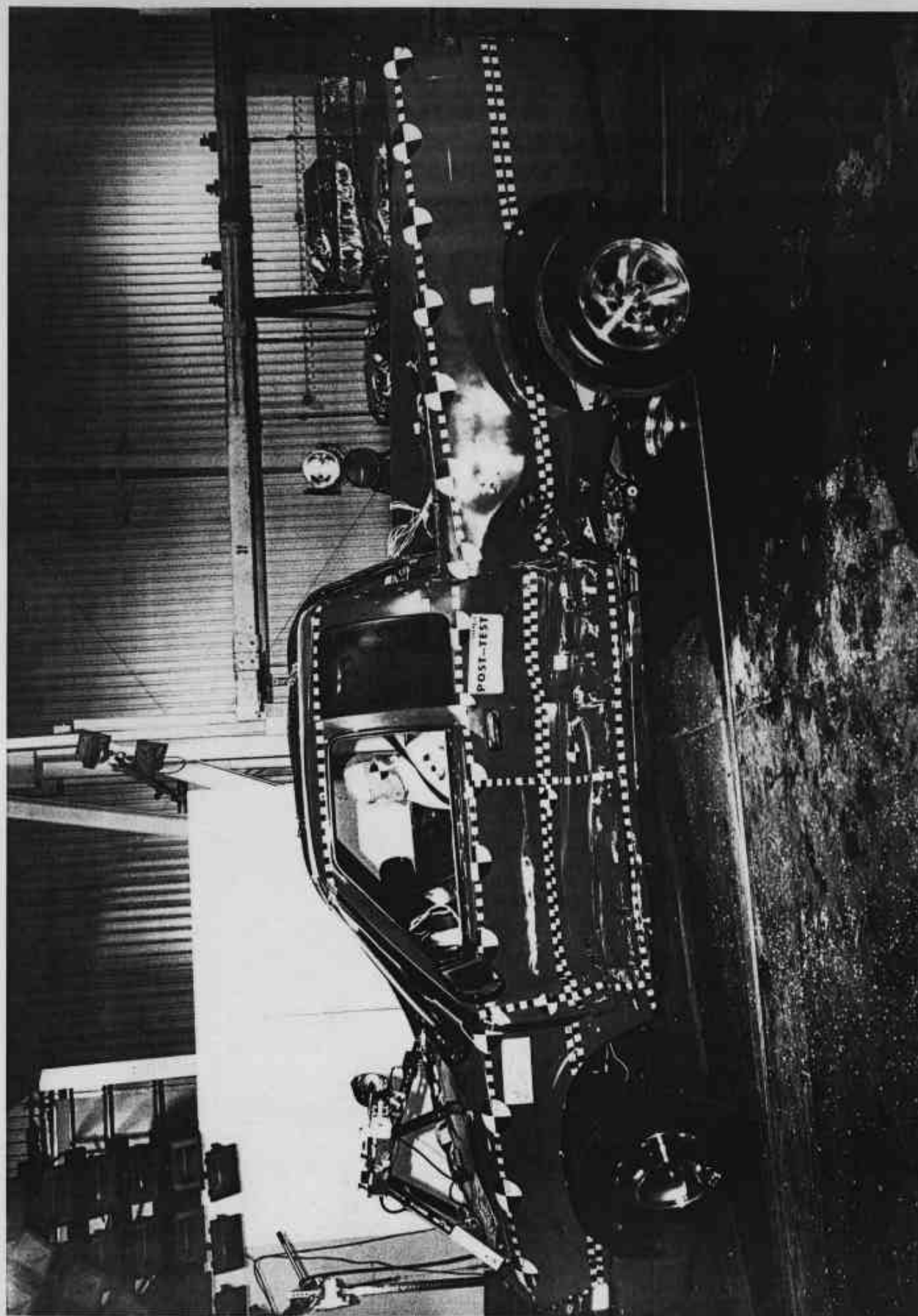


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

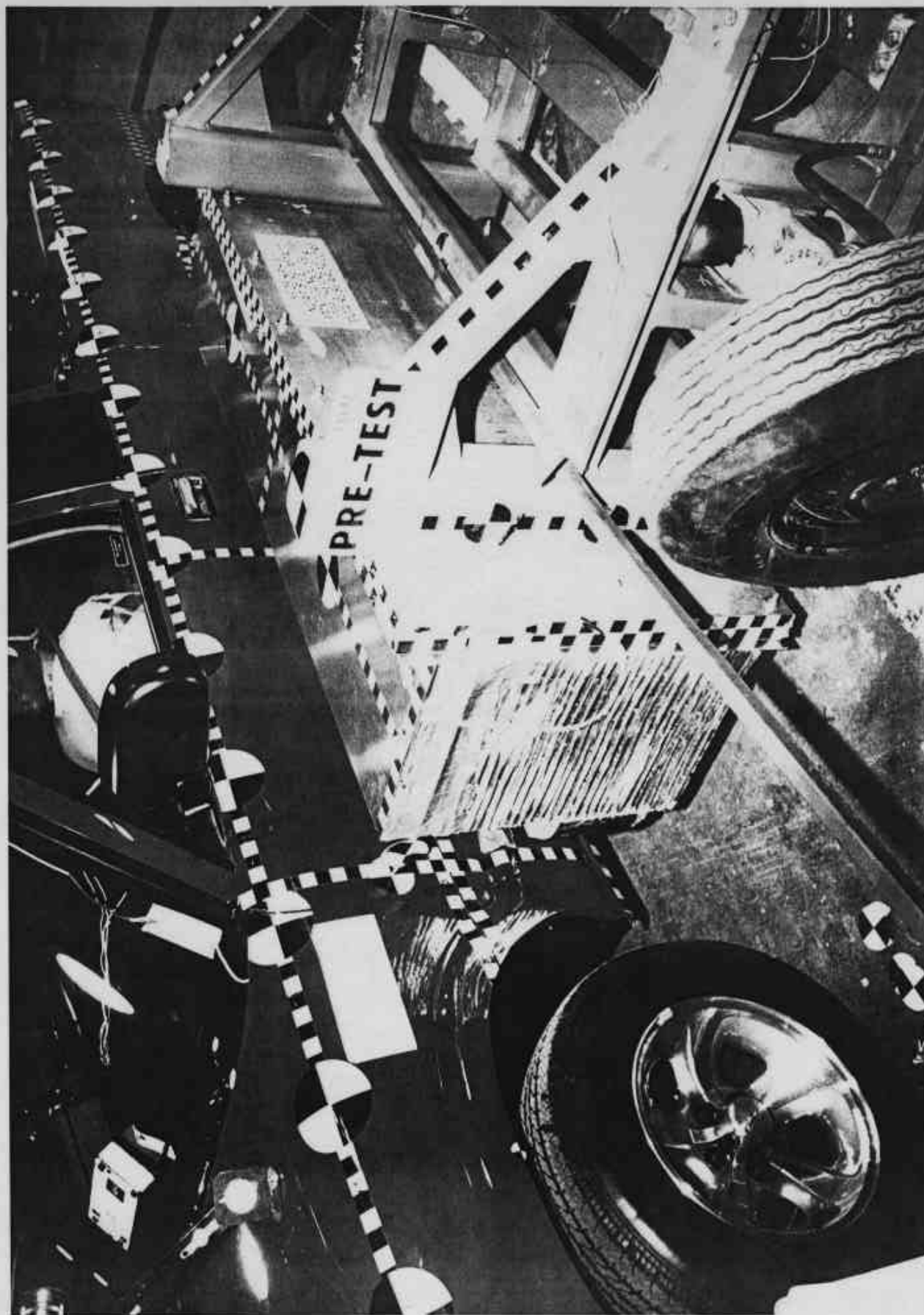


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

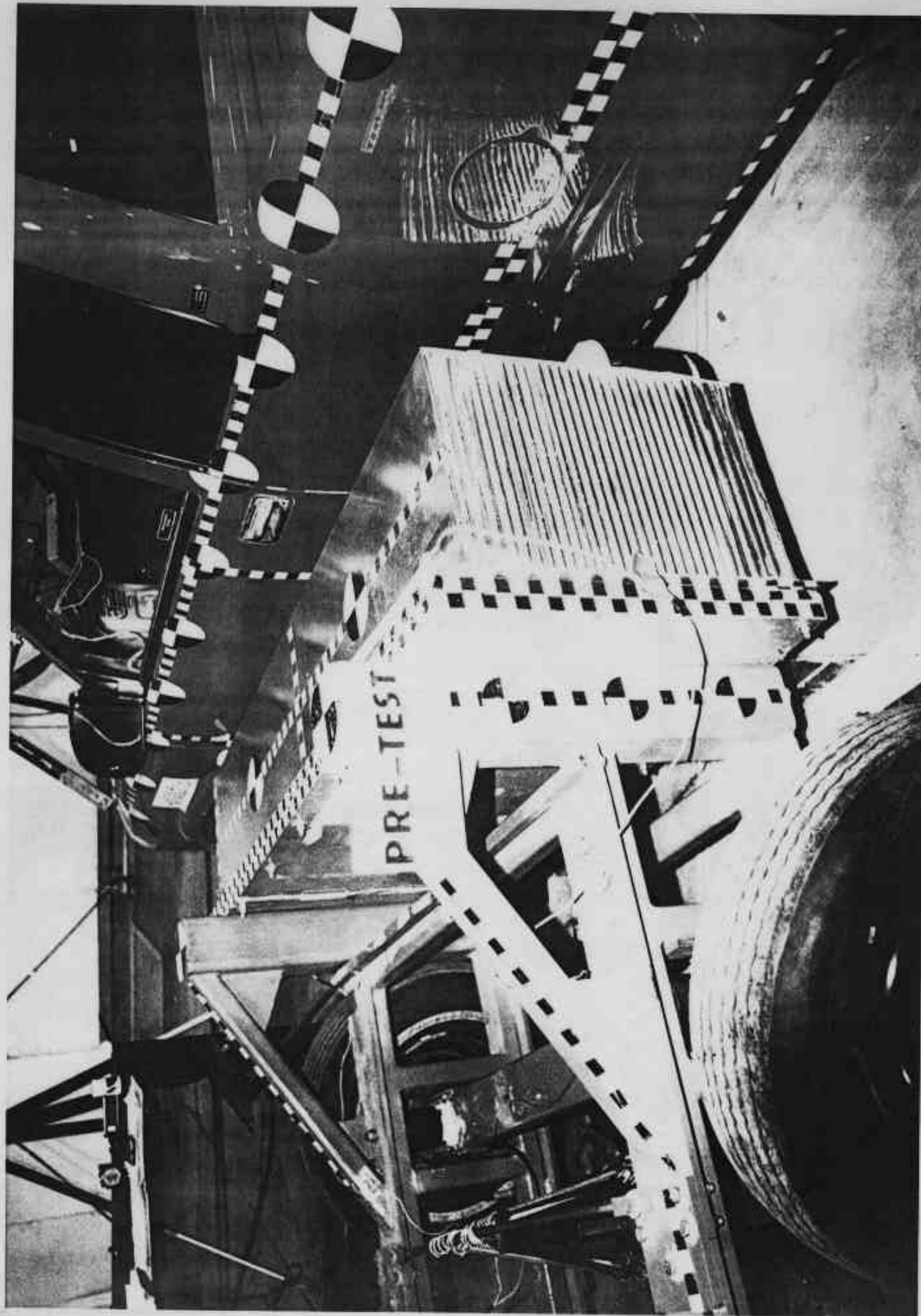


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

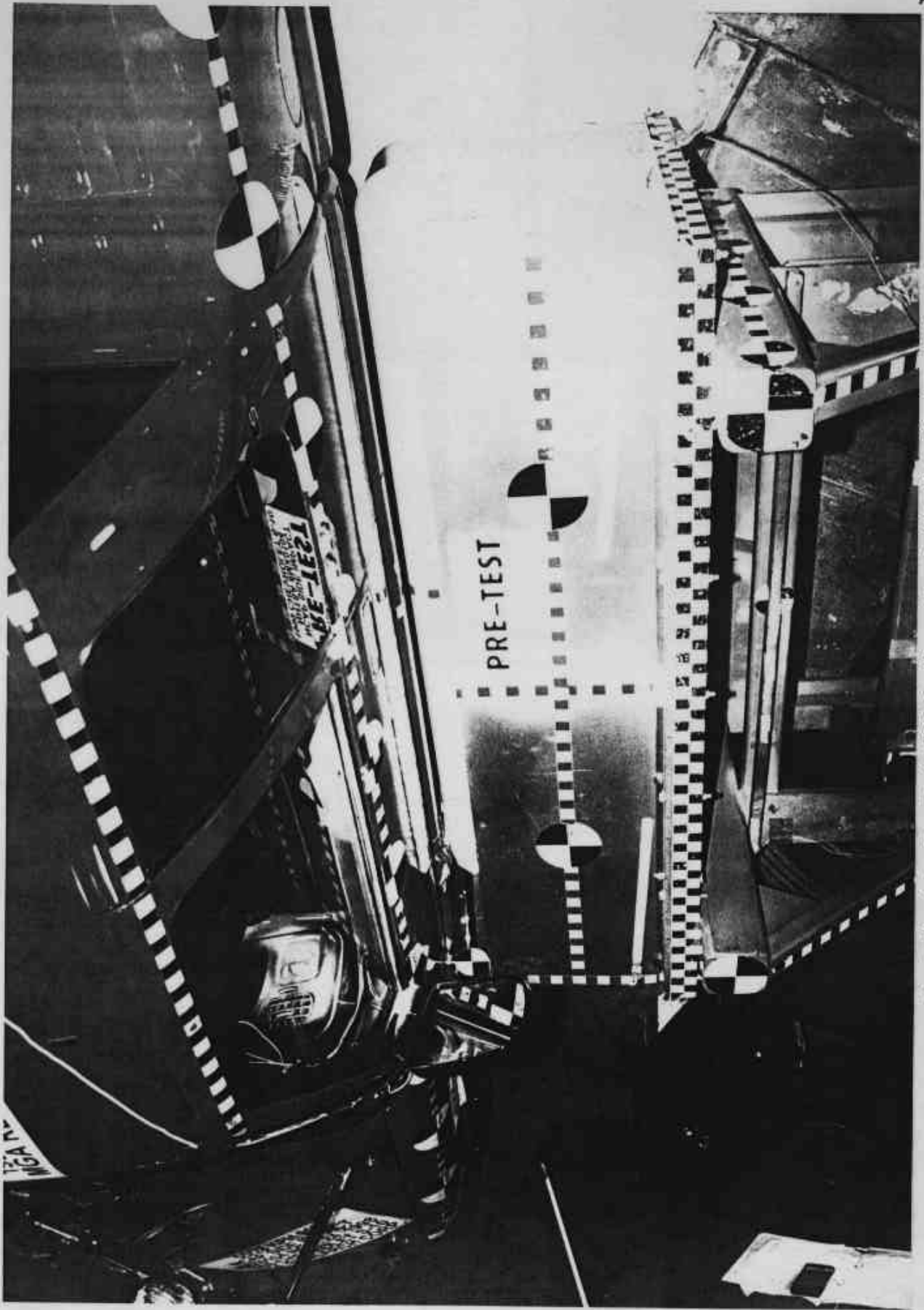


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

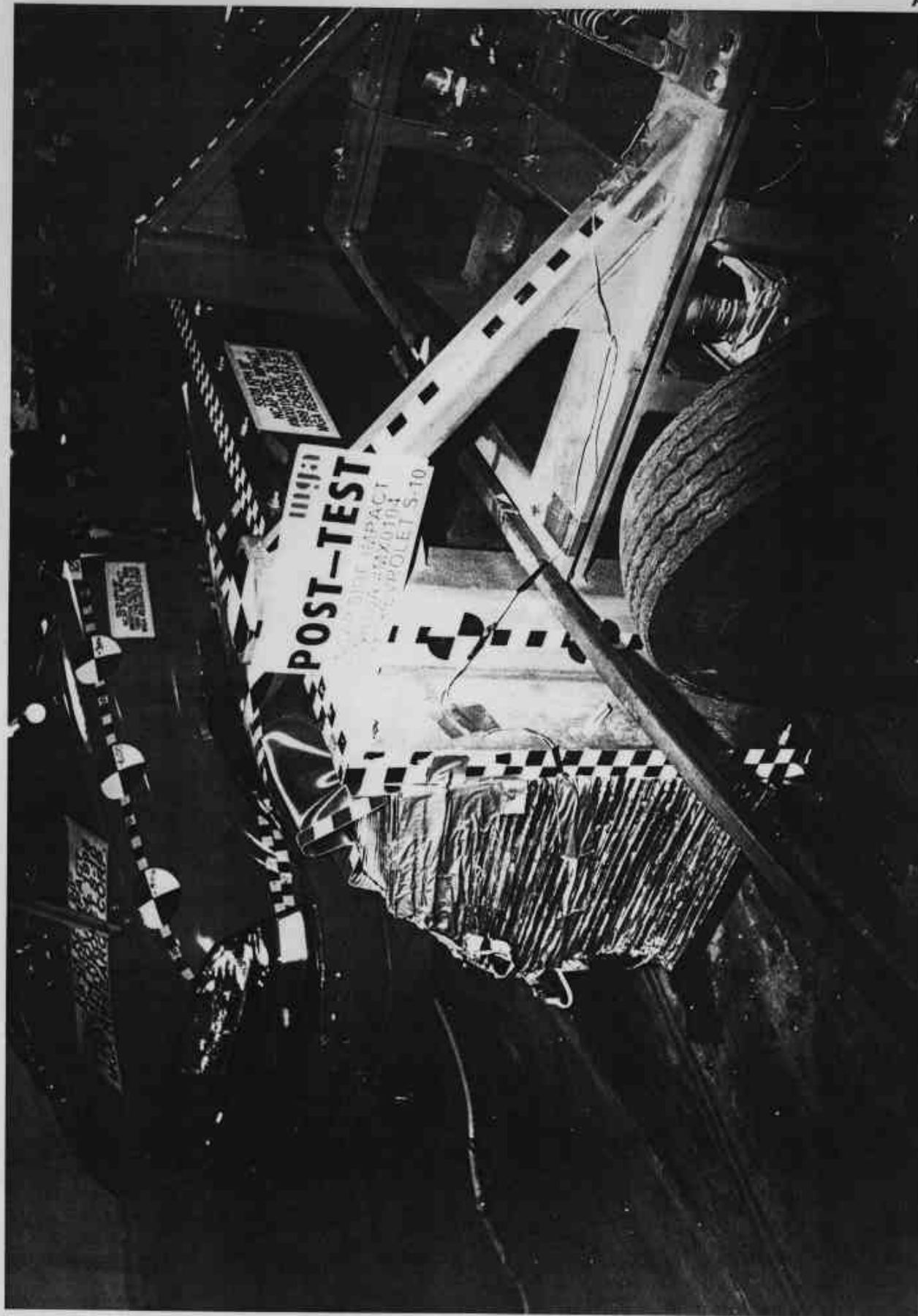


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (left side)

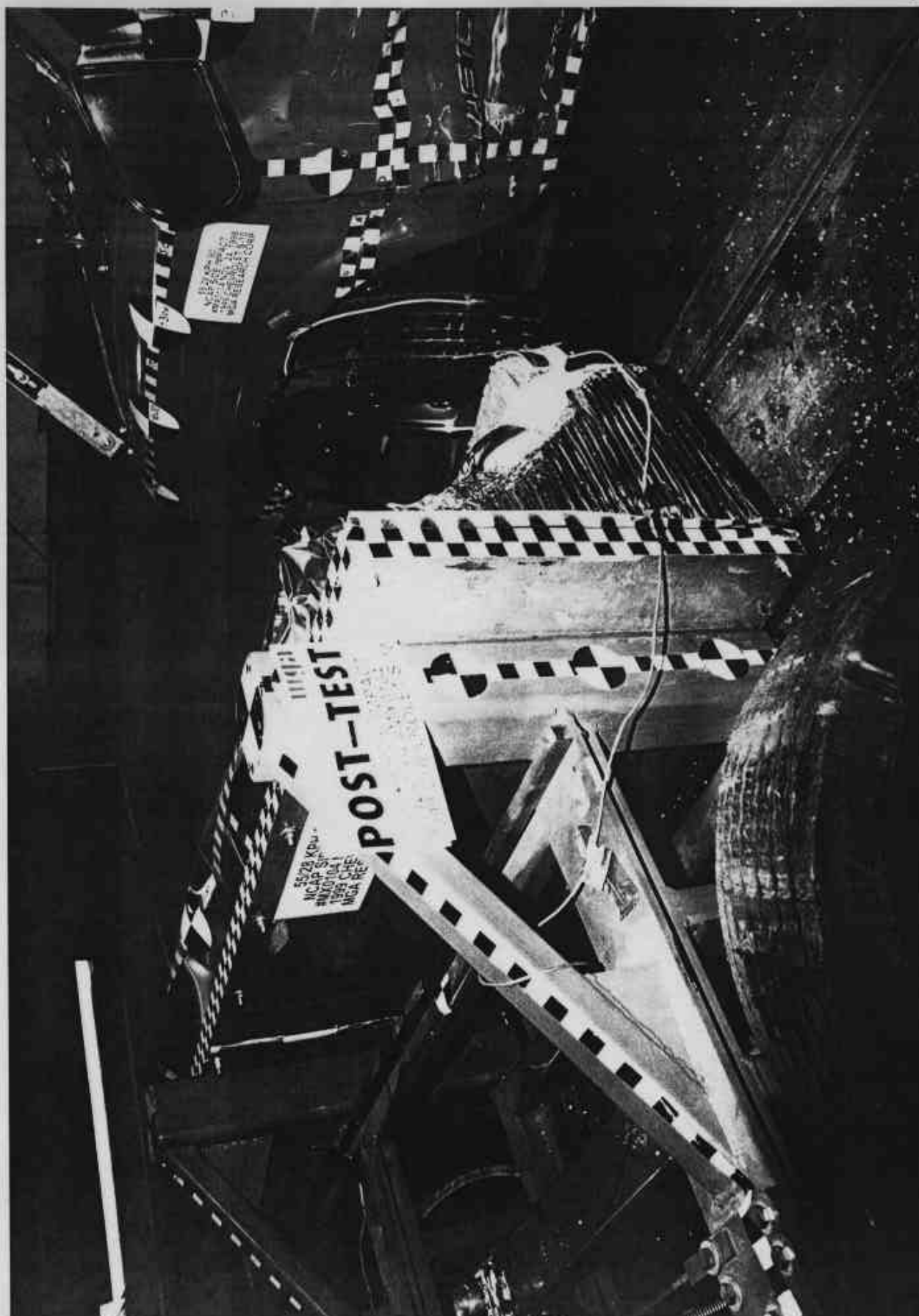


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (right side)

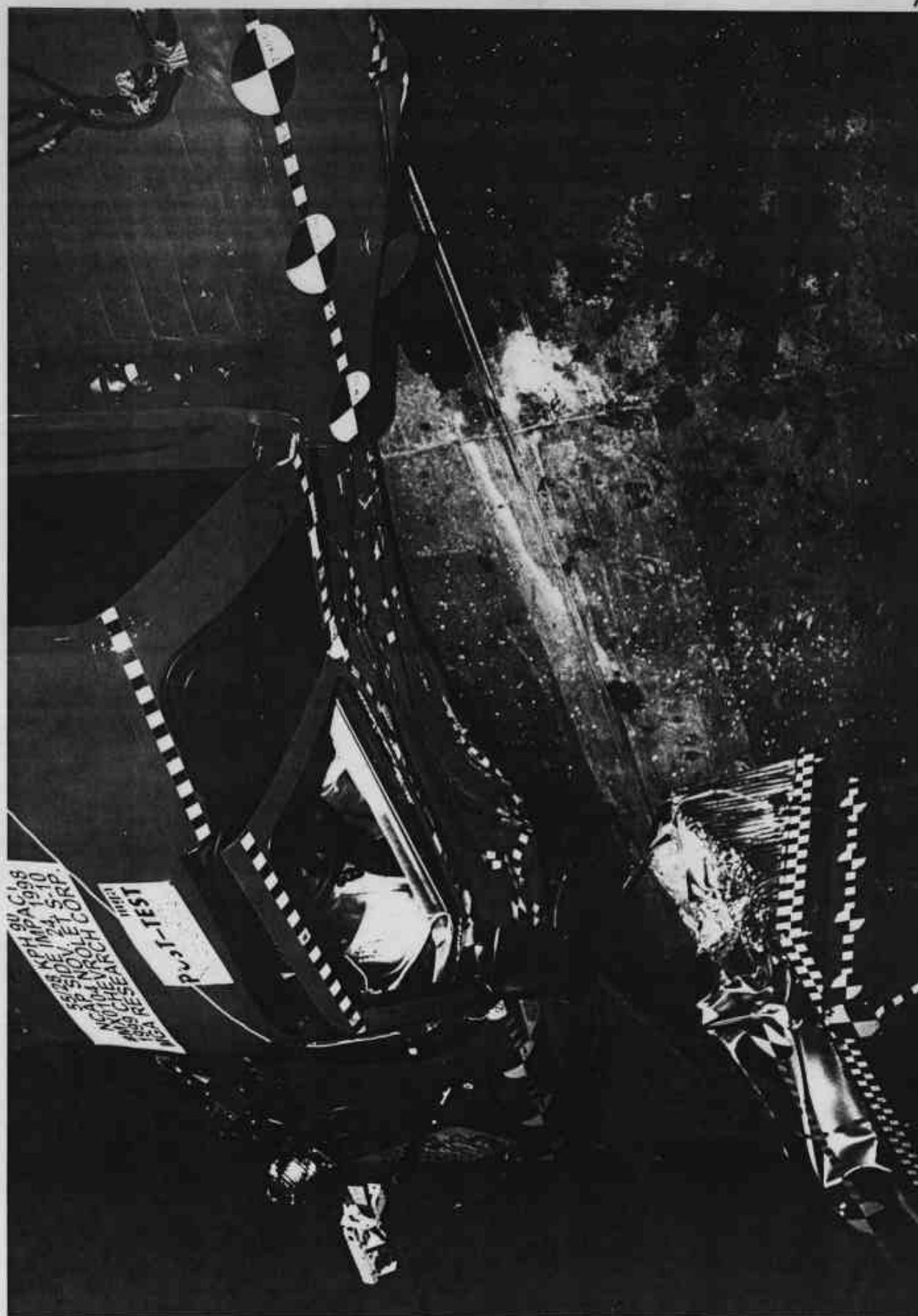


Photo No. A-12 - Post-Test MDB Positioned Against Vehicle Overhead View

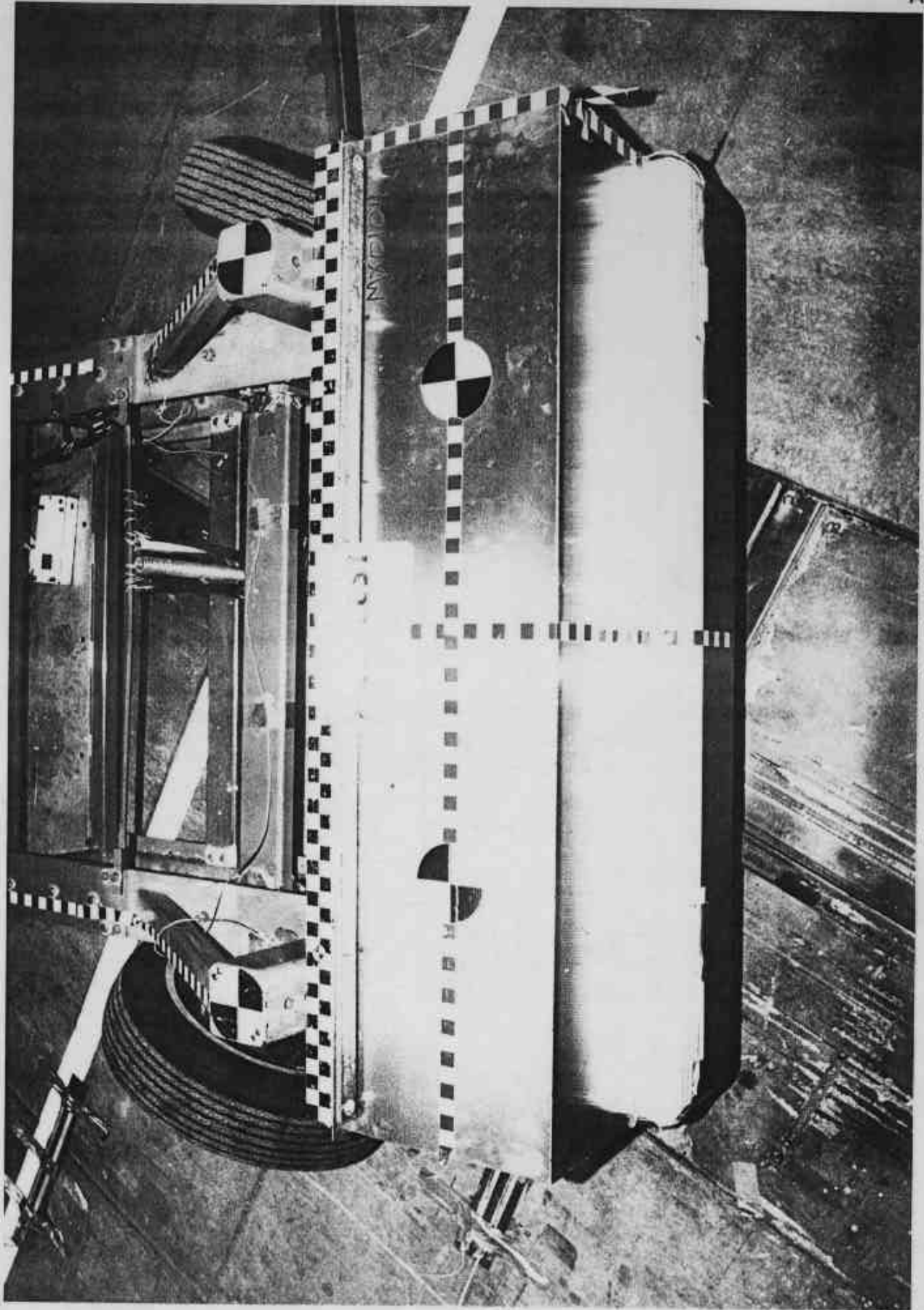


Photo No. A-13 - Pre-Test MDB Top View

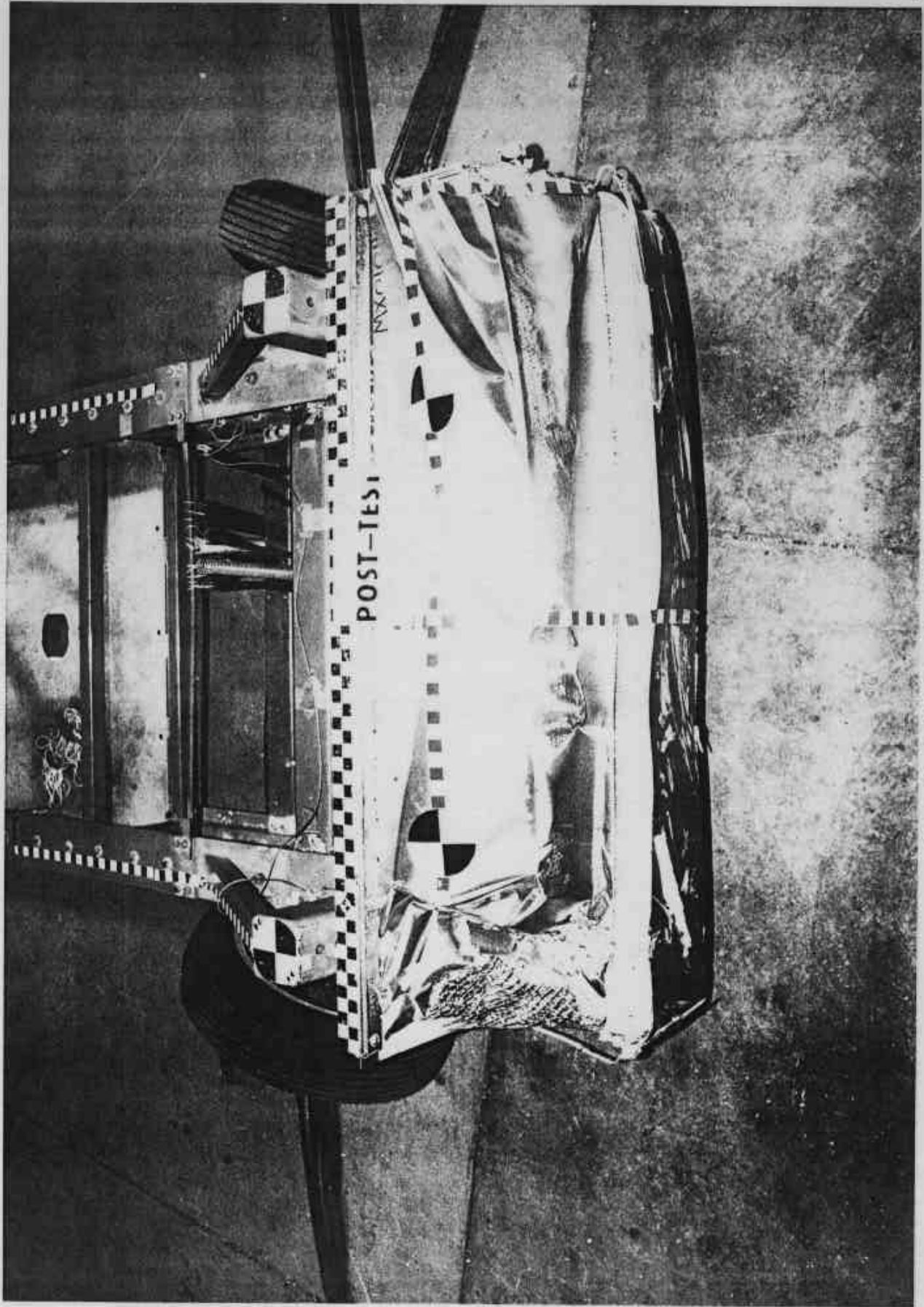


Photo No. A-14 - Post-Test MDB Top View

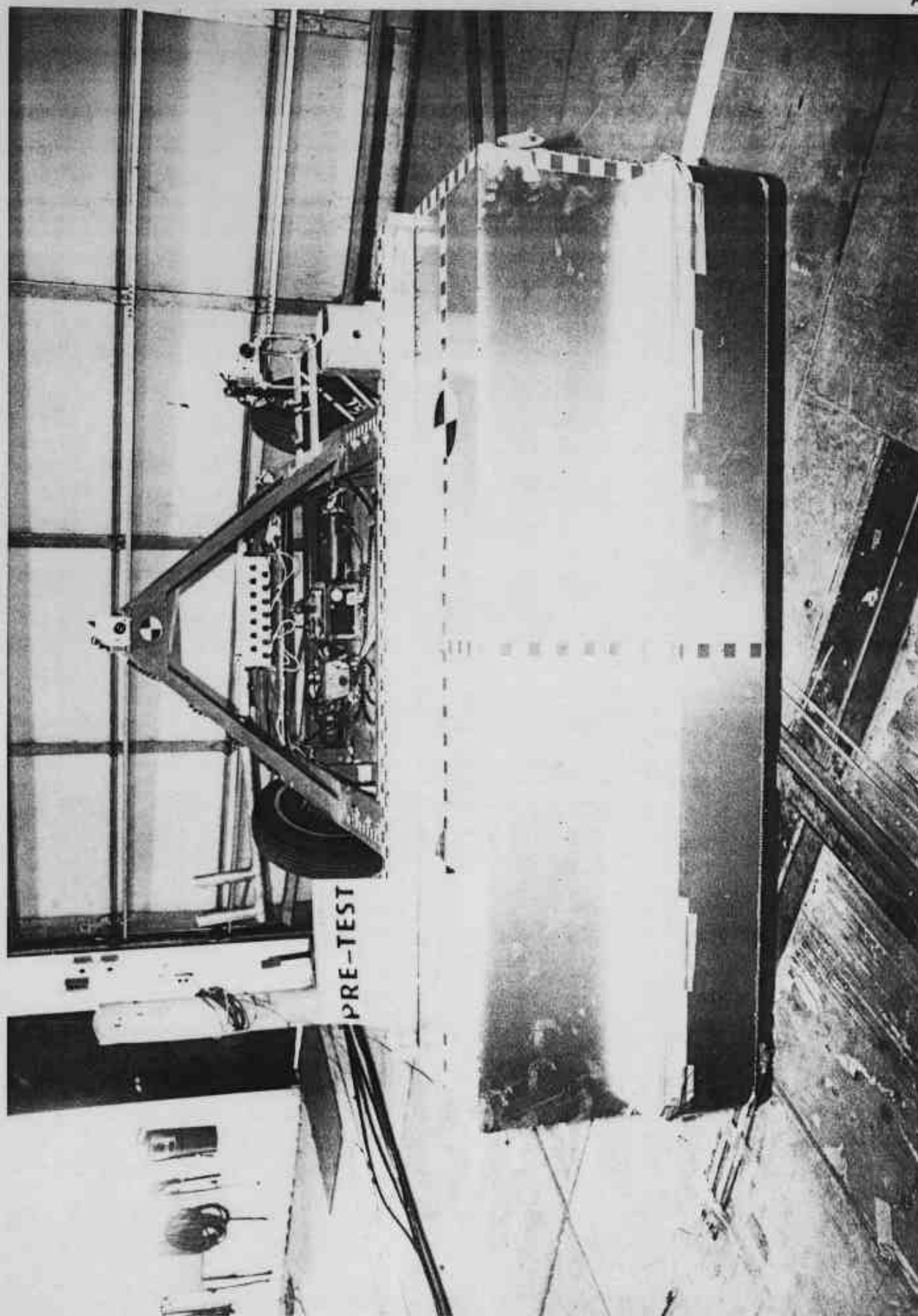


Photo No. A-15 - Pre-Test MDB Front View

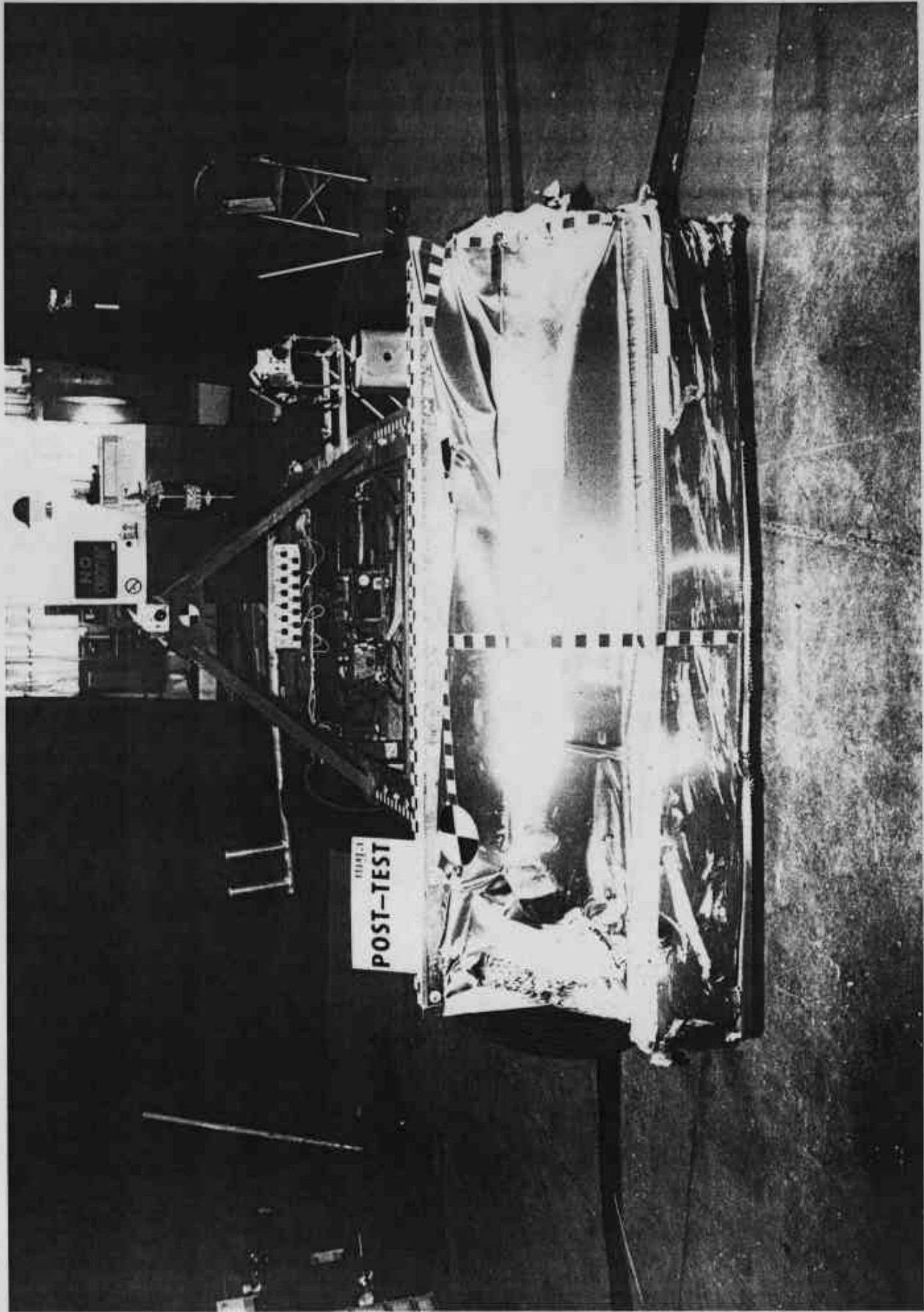


Photo No. A-16 - Post-Test MDB Front View

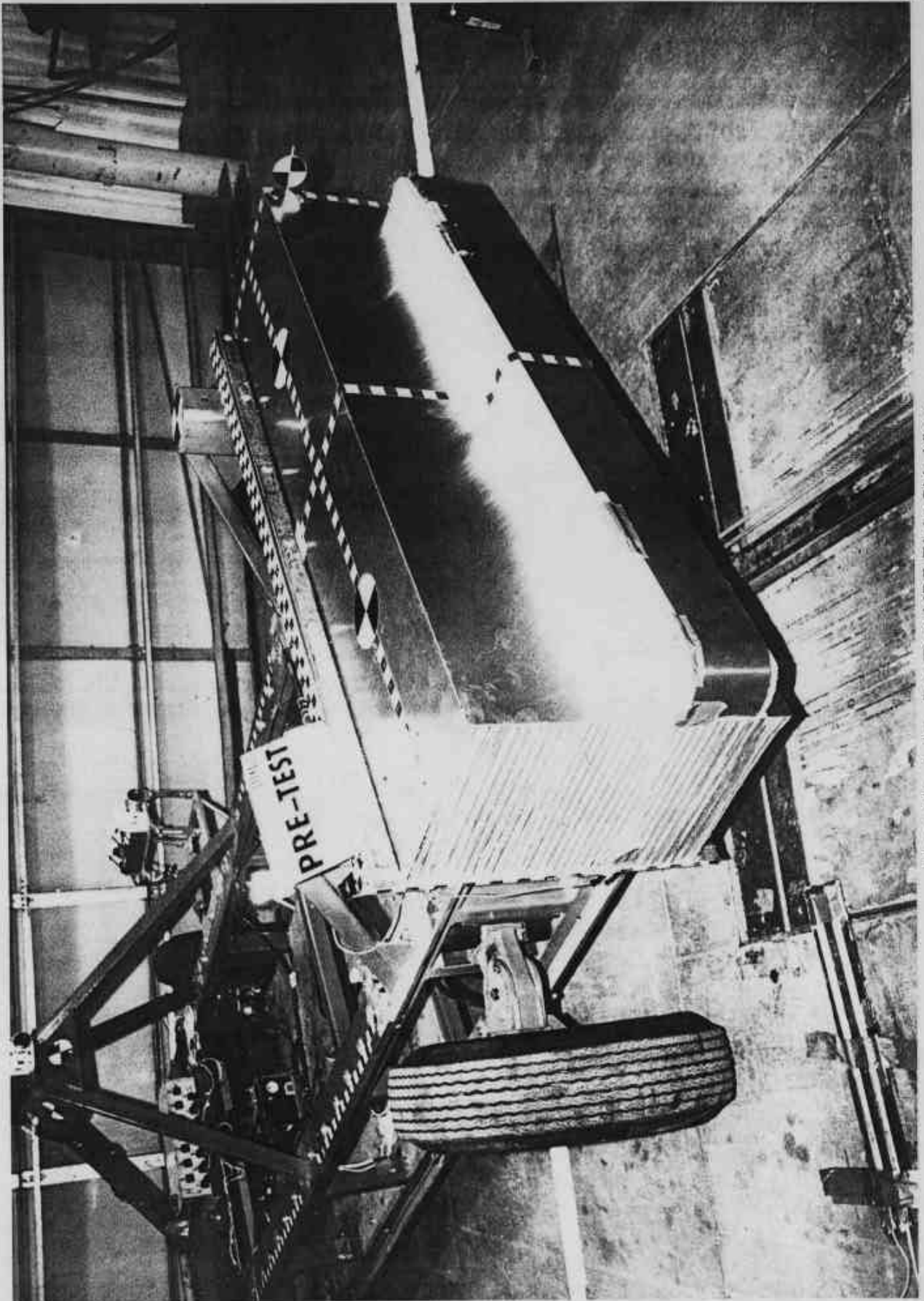


Photo No. A-17 - Pre-Test MDB Right Side View

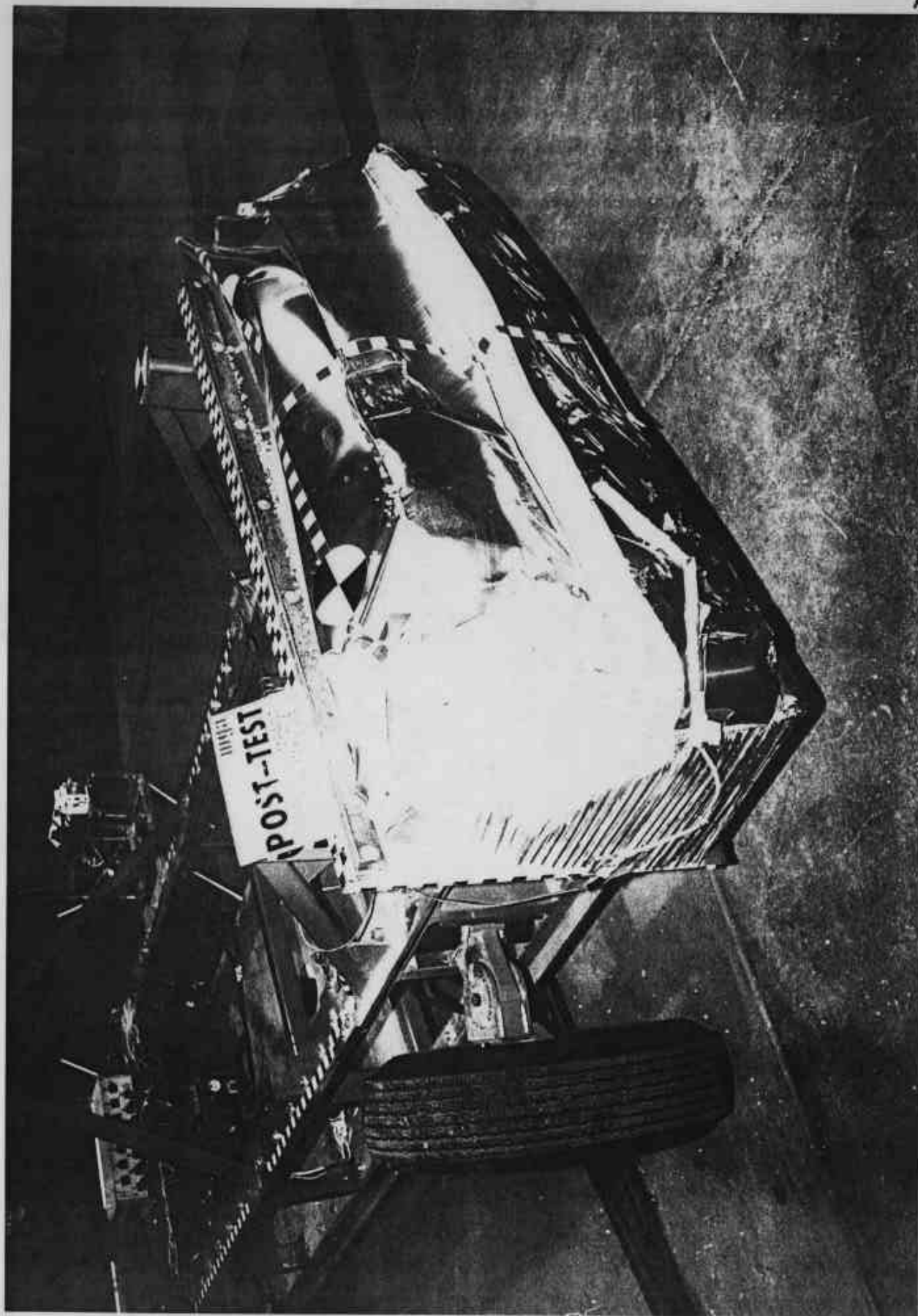


Photo No. A-18 - Post-Test MDB Right Side View

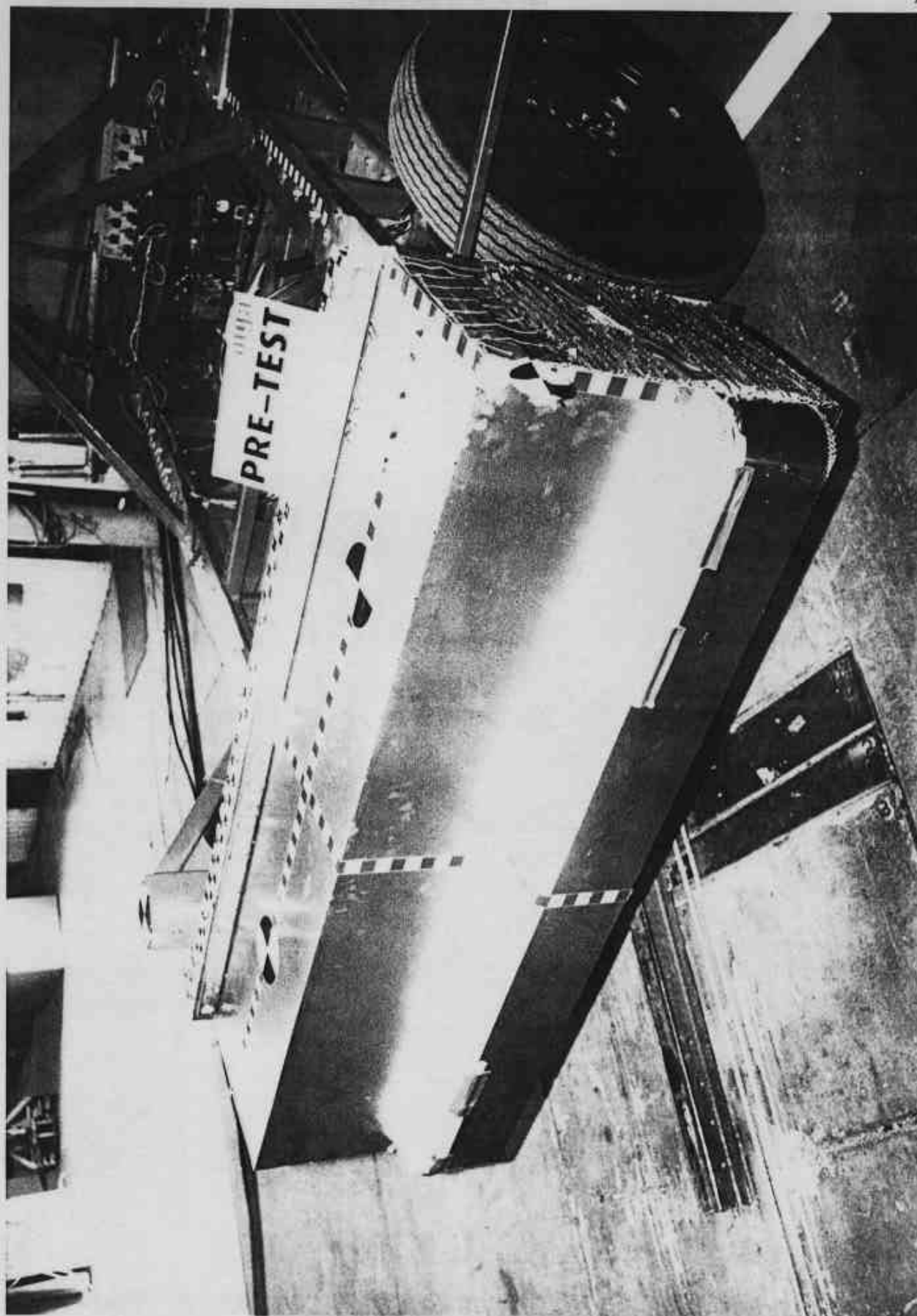


Photo No. A-19 - Pre-Test MDB Left Side View

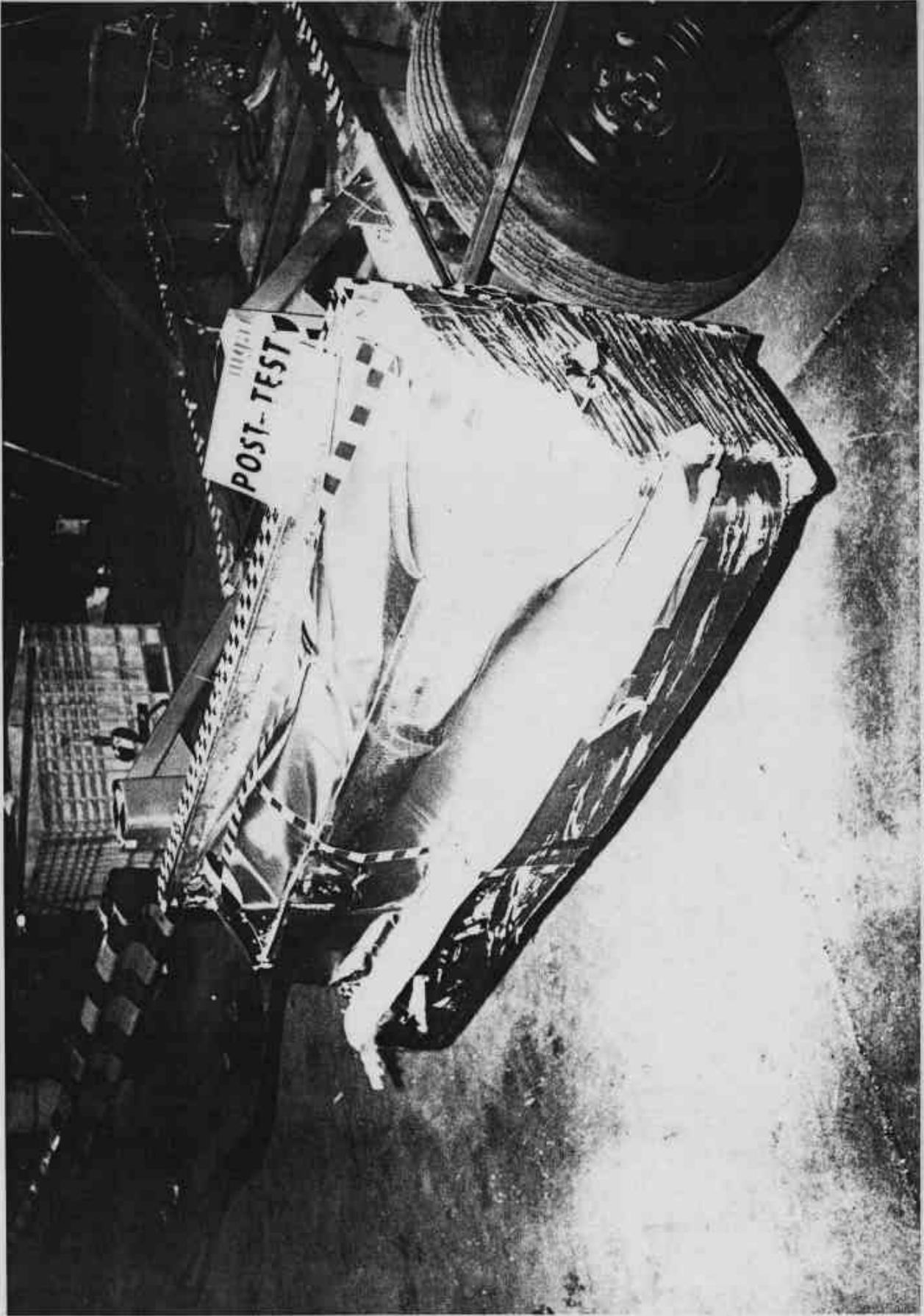


Photo No. A-20 - Post-Test MDB Left Side View

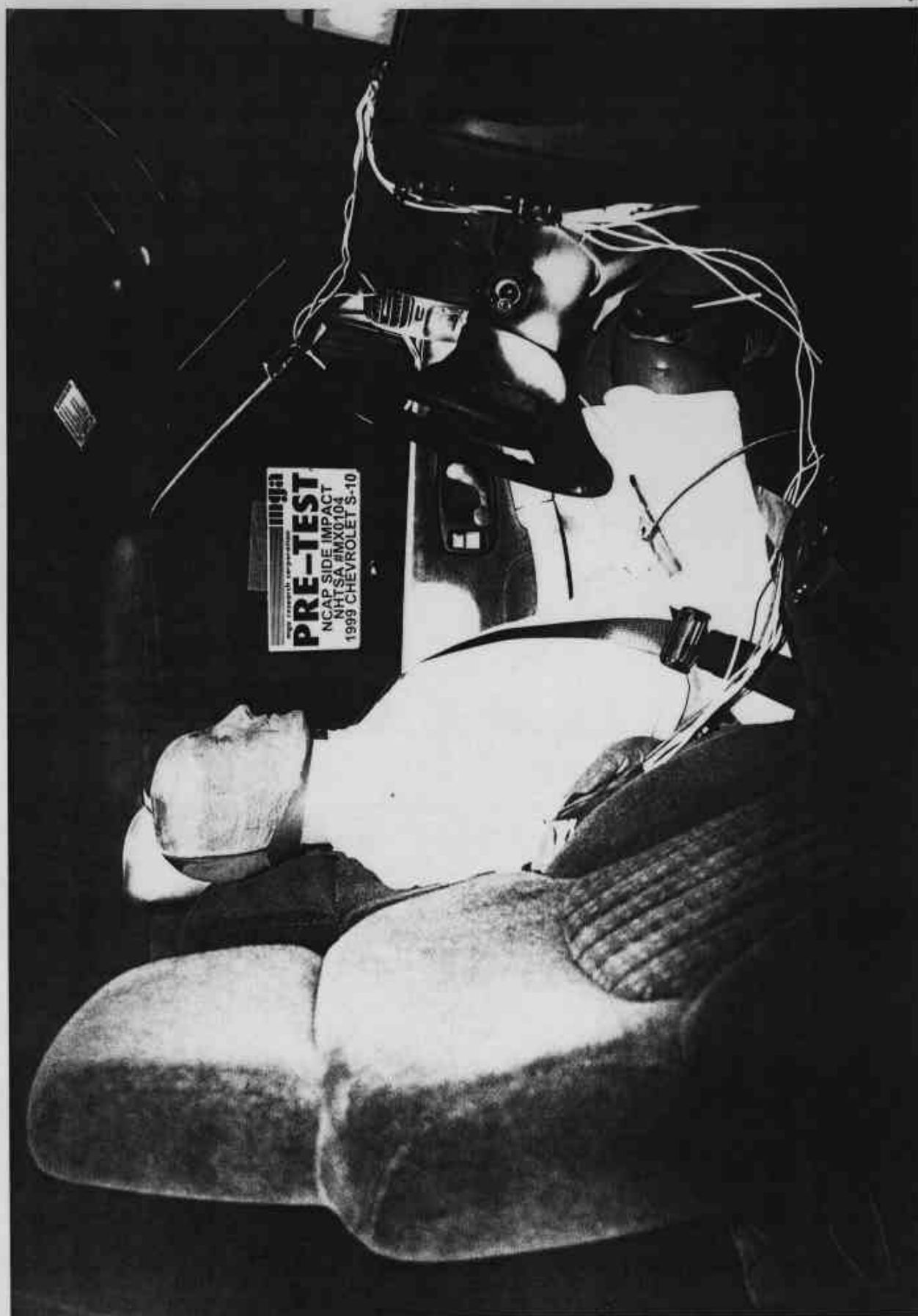


Photo No. A-21 - Pre-Test Driver Dummy Right Side View



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

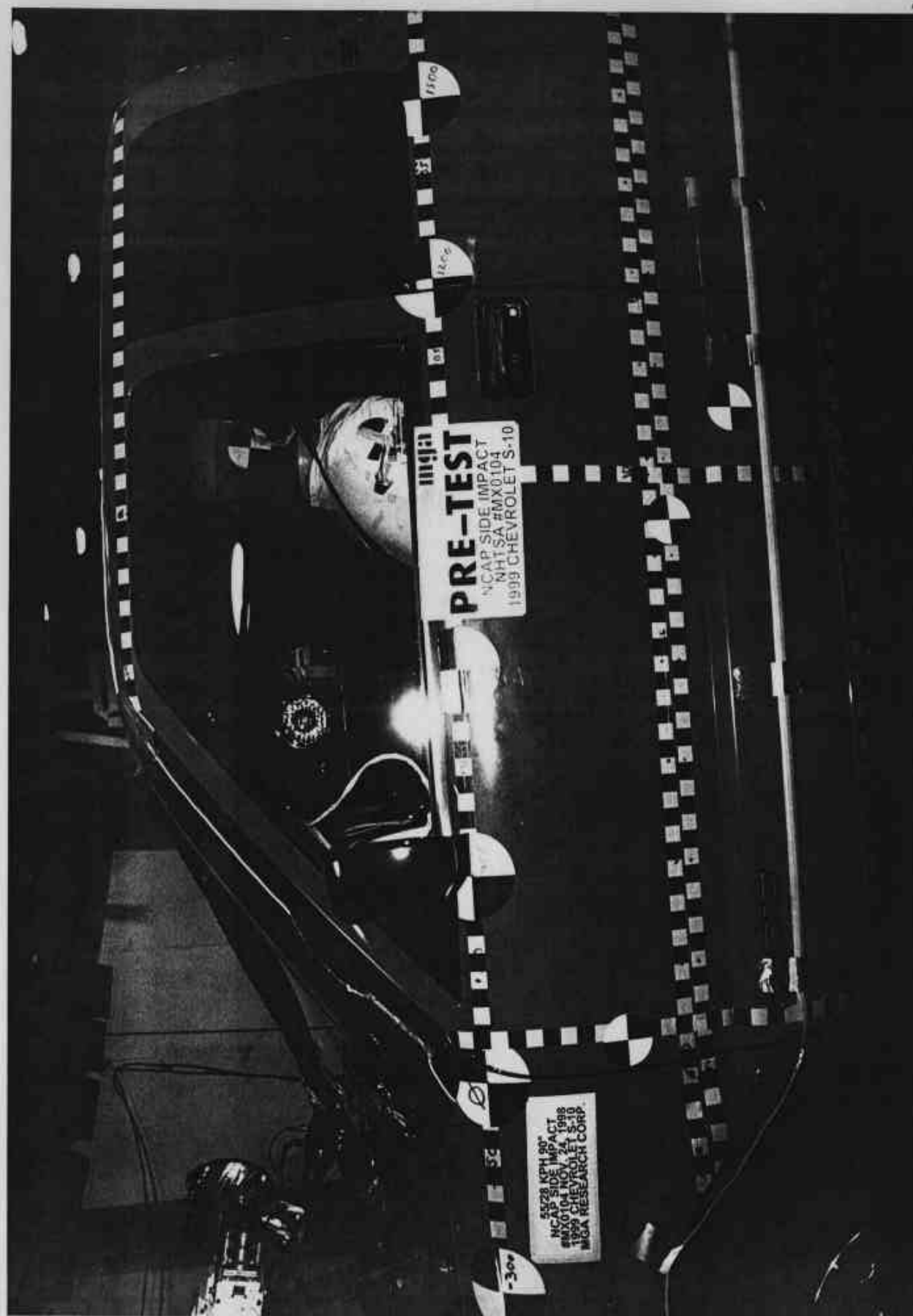


Photo No. A-23 - Pre-Test Driver Dummy Left Side View

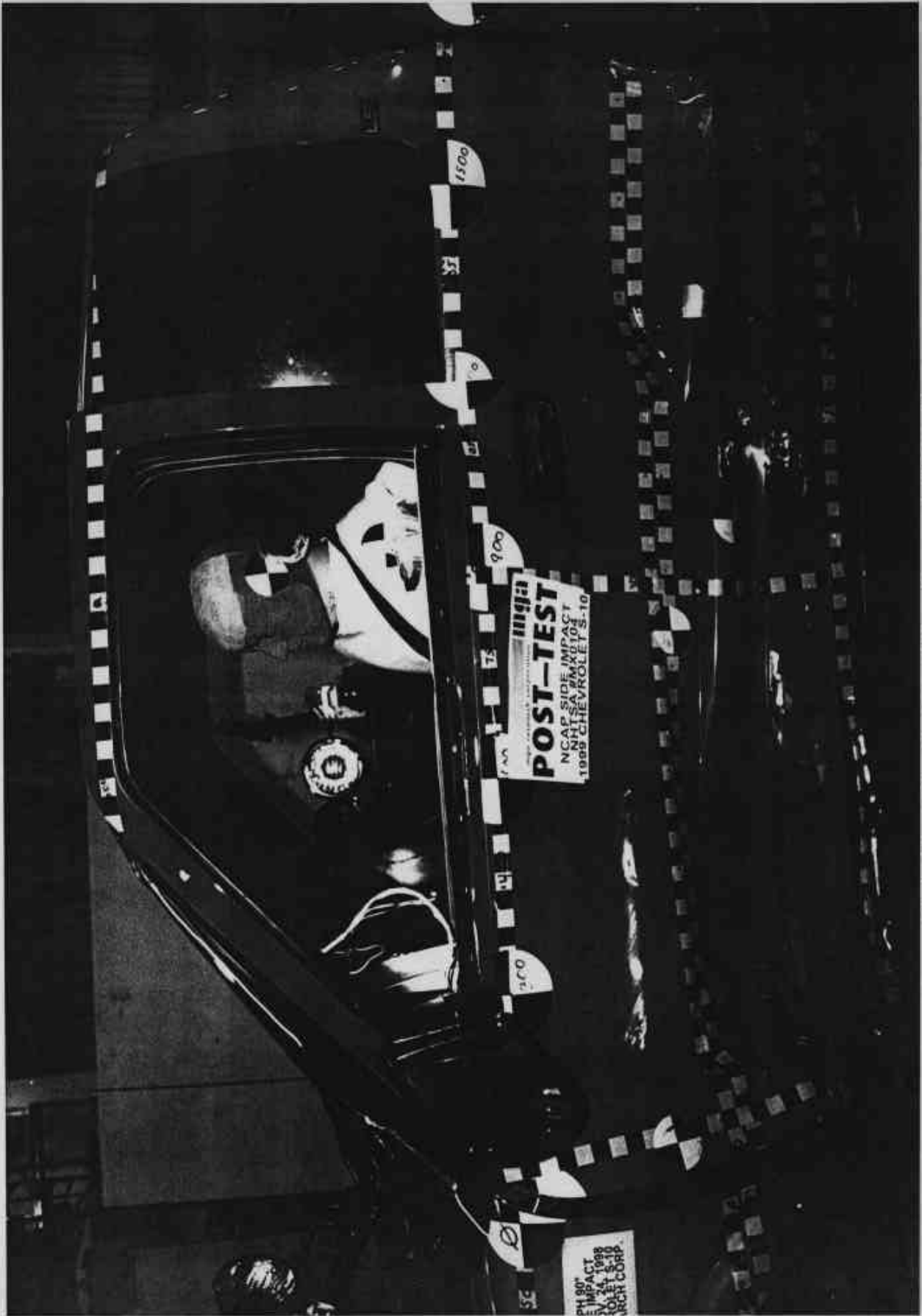


Photo No. A-24 - Post-Test Driver Dummy Left Side View



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

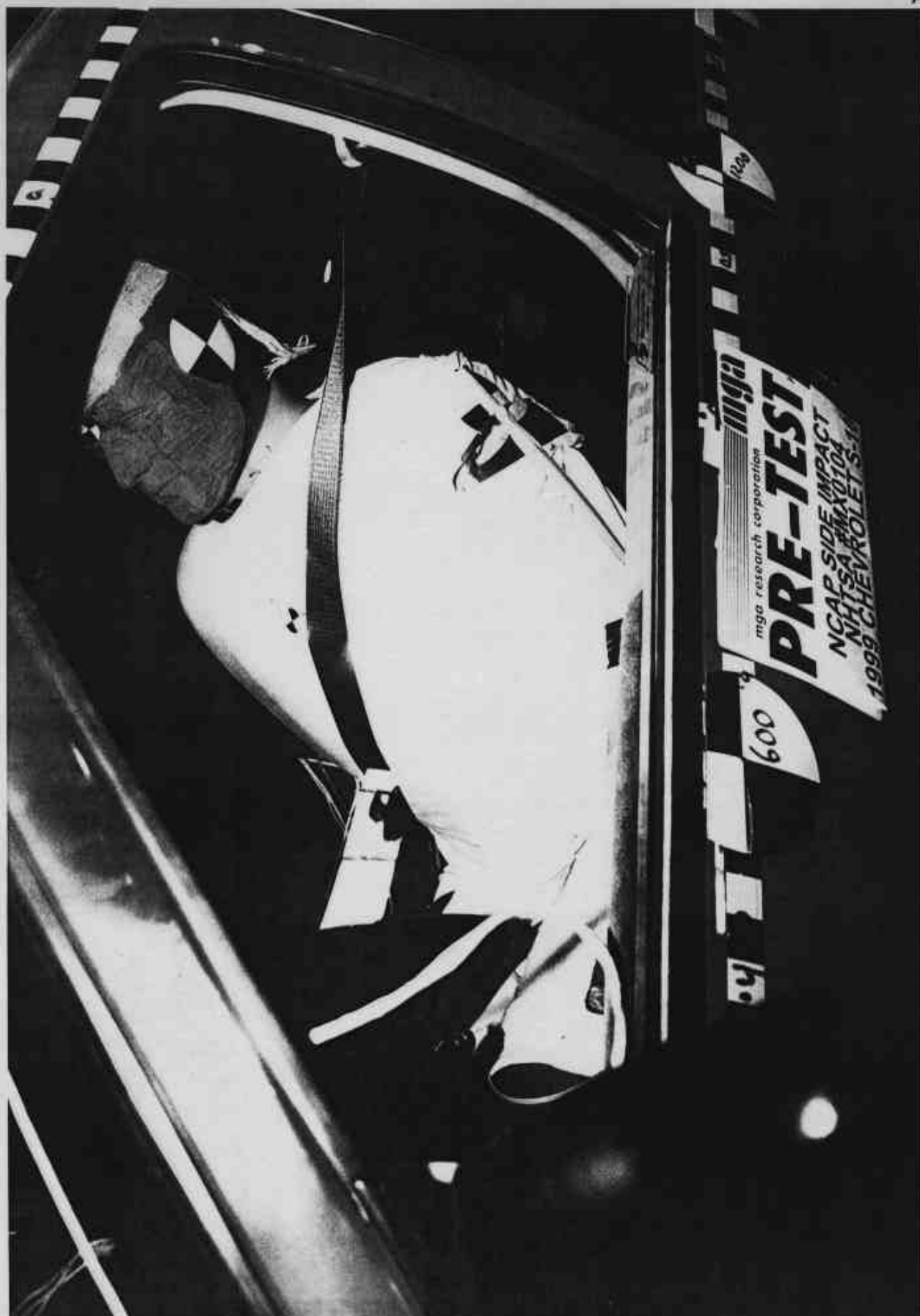


Photo No. A-26 - Pre-Test Driver Dummy Shoulder and Door Top View



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



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



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



Photo No. A-30 - Post-Test Driver Dummy Head Contact

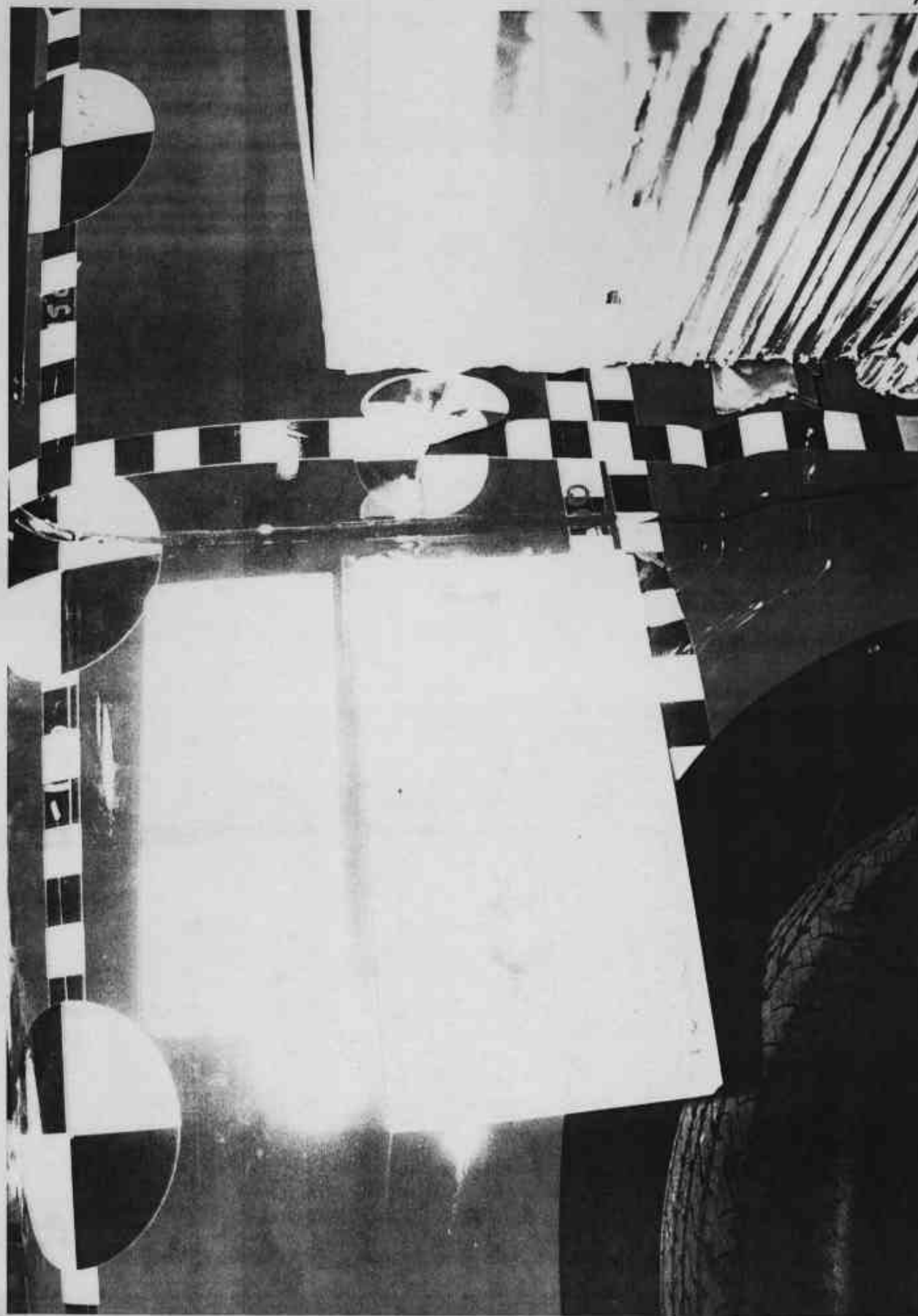


Photo No. A-31 - Pre-Test Left Front Impact Point on Vehicle



Photo No. A-32 - Post-Test Left Front Impact Point on Vehicle

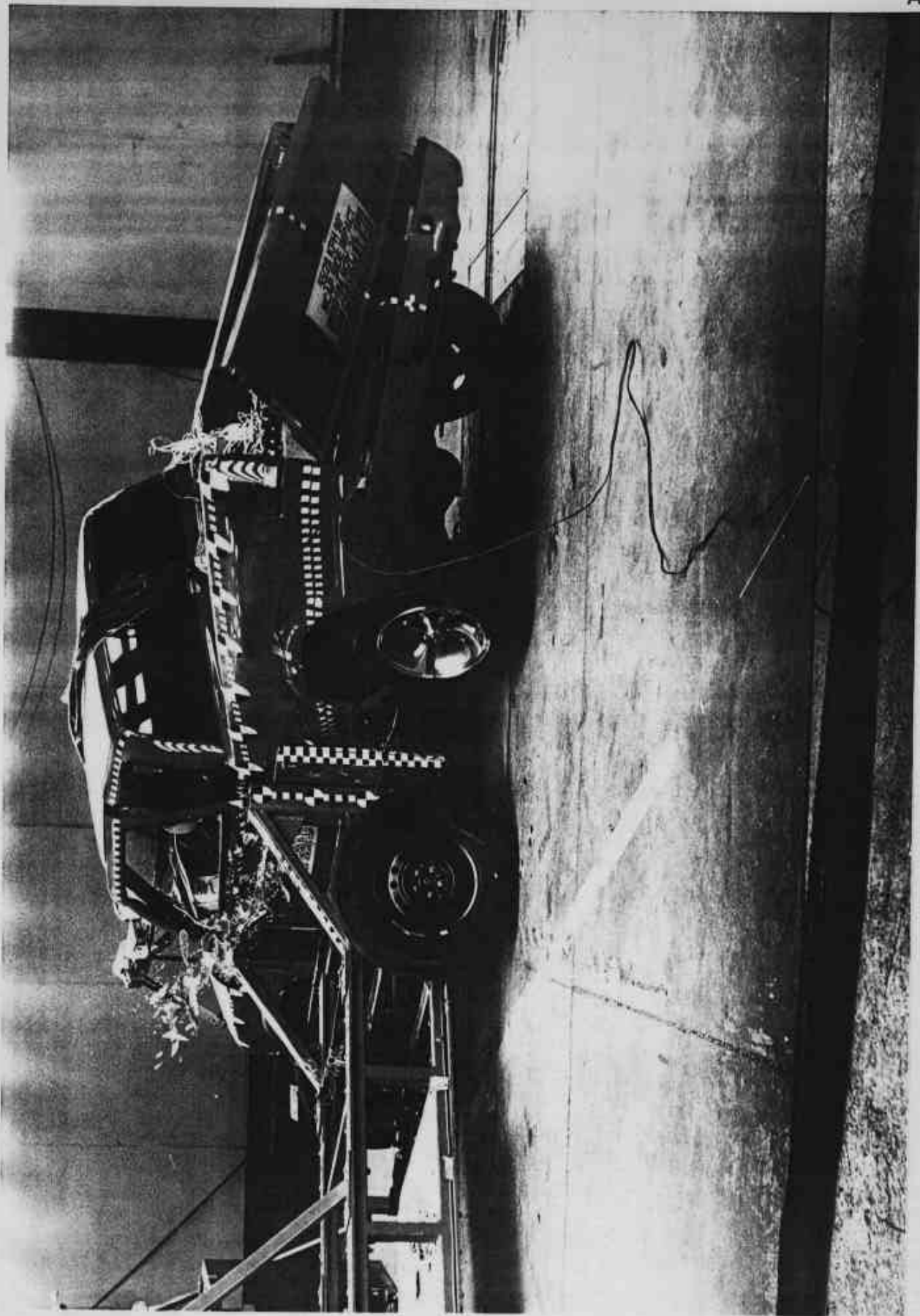


Photo No. A-33 - Impact

MFD BY GENERAL MOTORS CORP 10/98



GVWR

GAWR FRT GAWR RR

2087KG(4600LB) 1134KG(2500LB) 1225KG(2700LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR
VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE.

1GCCS1949XK117013

TYPE: TRUCK

MODEL: 610653 PAYLOAD = 565KG(1245LB)

SPBV TIRE SIZE SPEED RTG RIM

FRT P205/75R15 8 15X7J

RR P205/75R15 8 15X7J

SPA T155/90D18 M 16X4T

COLD TIRE PRESSURE

240KPA(35PSI)

240KPA(35PSI)

420KPA(60PSI)

SEE OWNER'S MANUAL FOR MORE INFORMATION.

UAW by Proud
GM
Employees

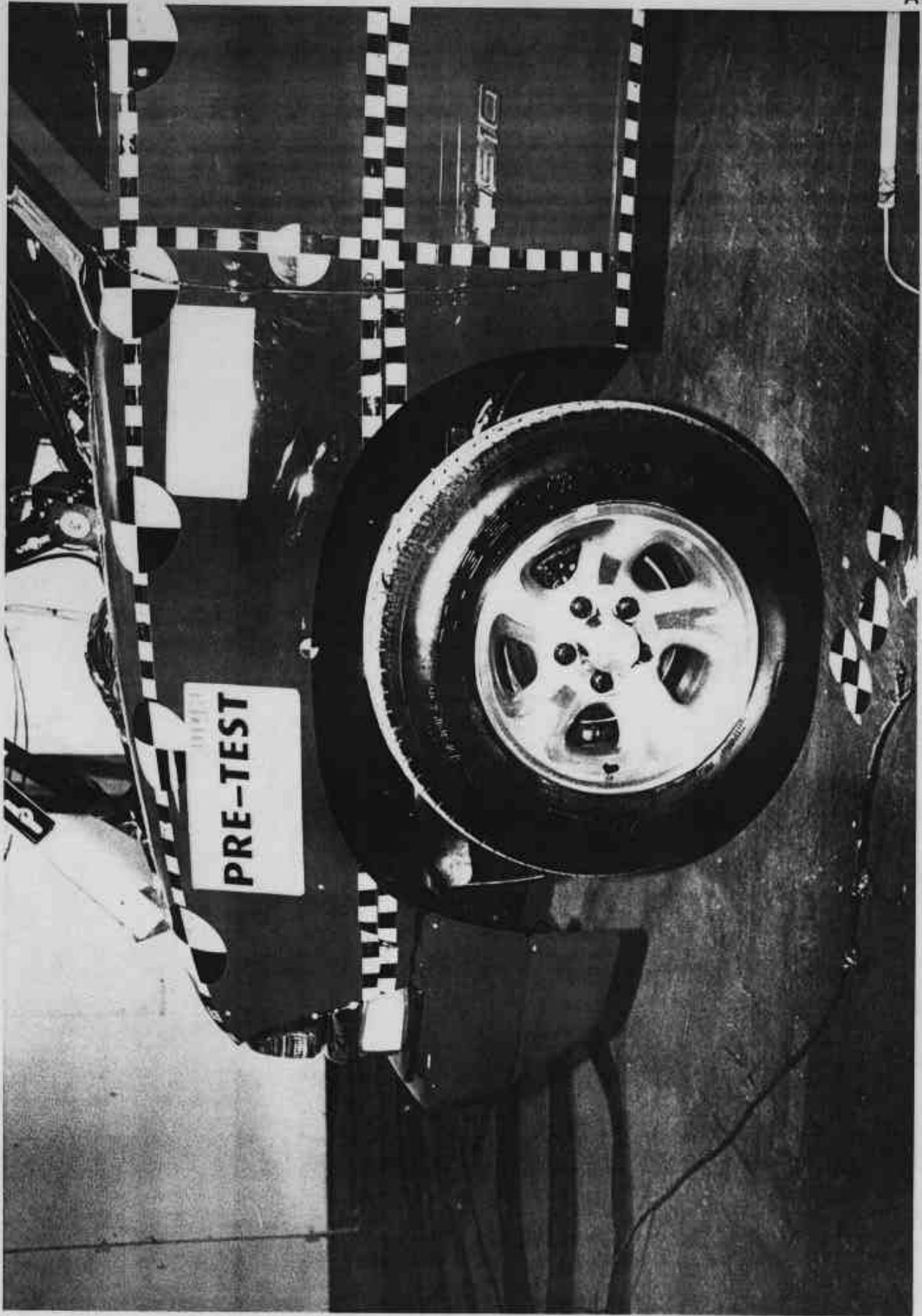


Photo No. A-35 - Left Front Attitude Point

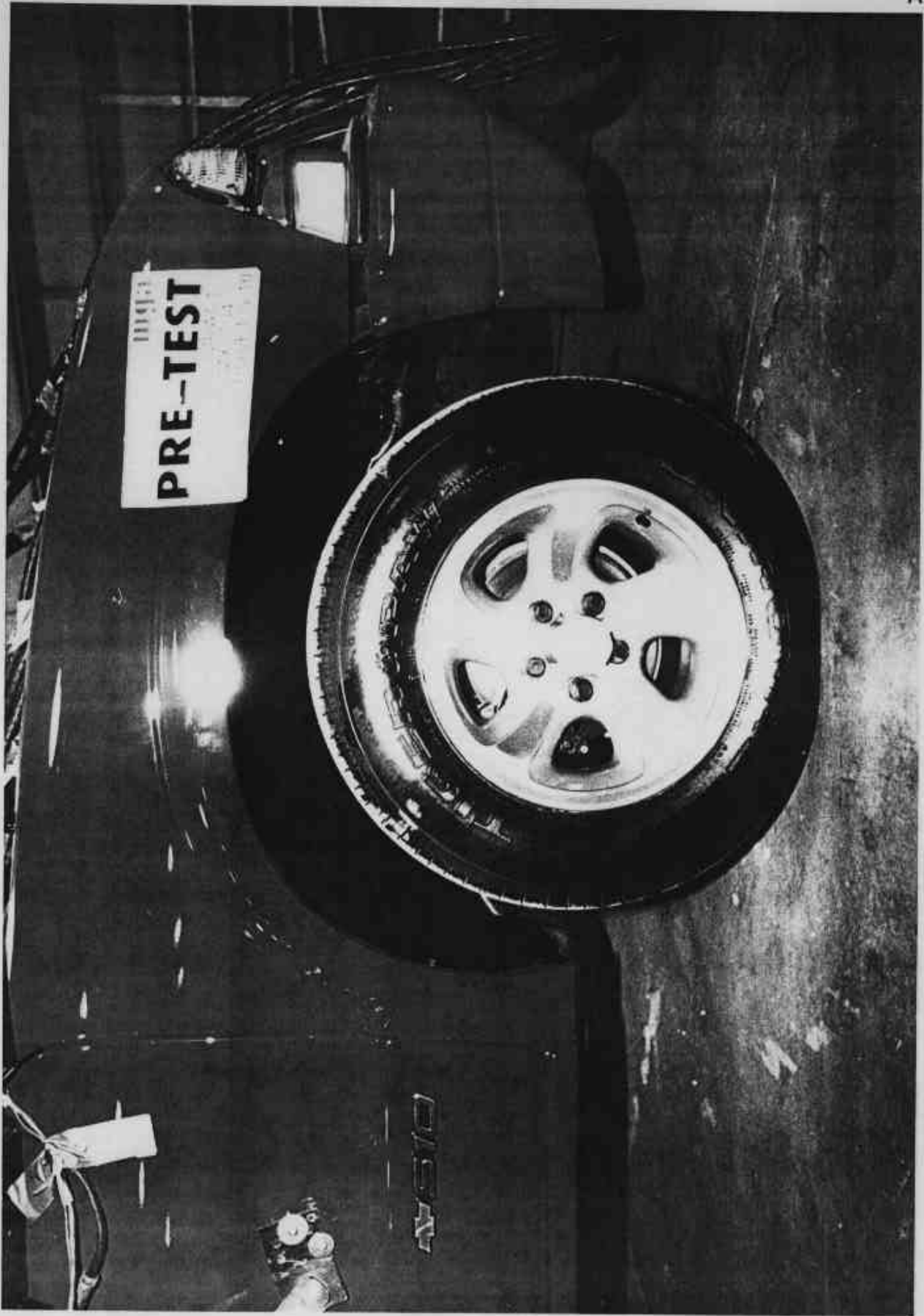


Photo No. A-36 - Right Front Attitude Point

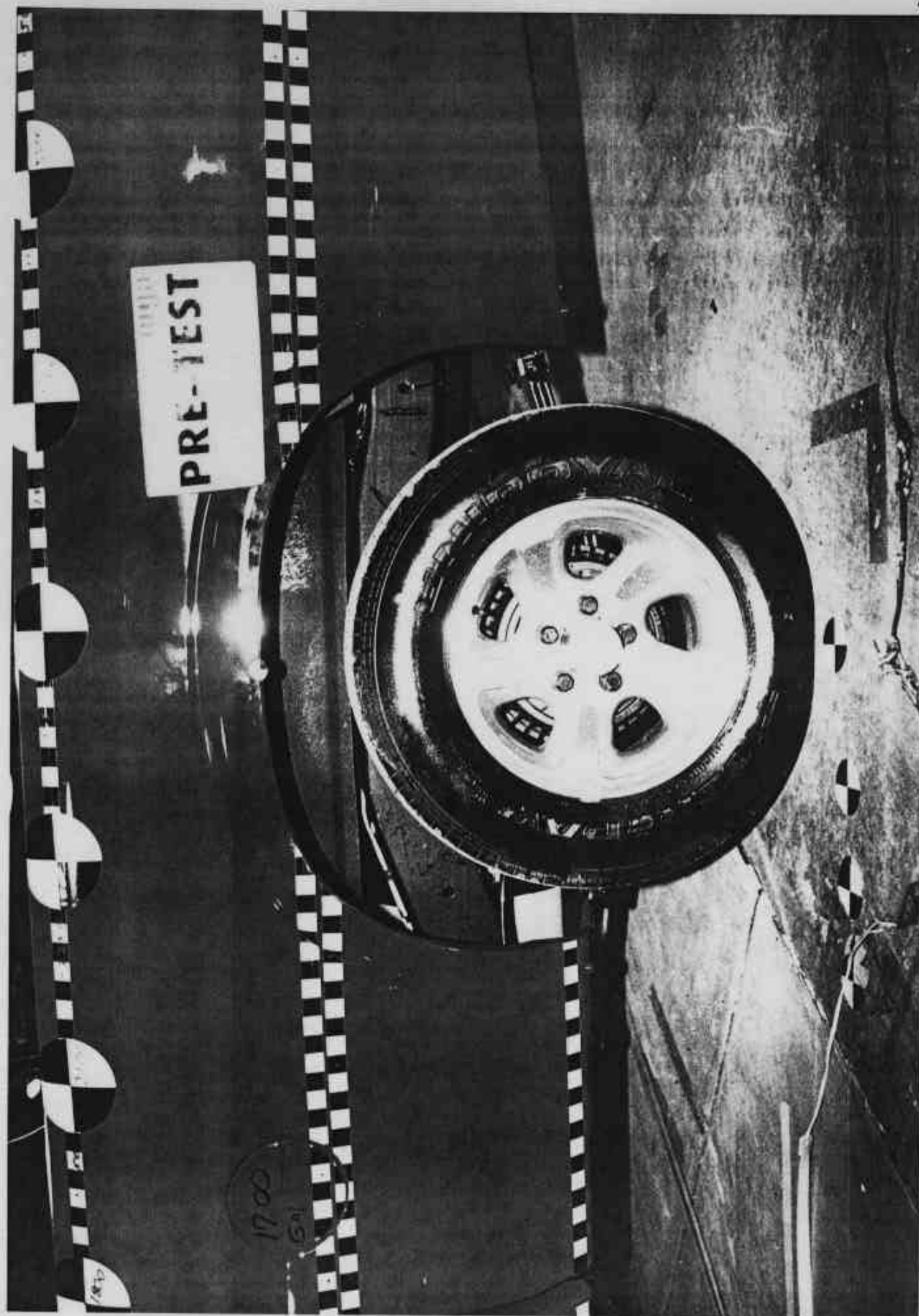


Photo No. A-37 - Left Rear Attitude Point



Photo No. A-38 - Right Rear Attitude Point

A-39

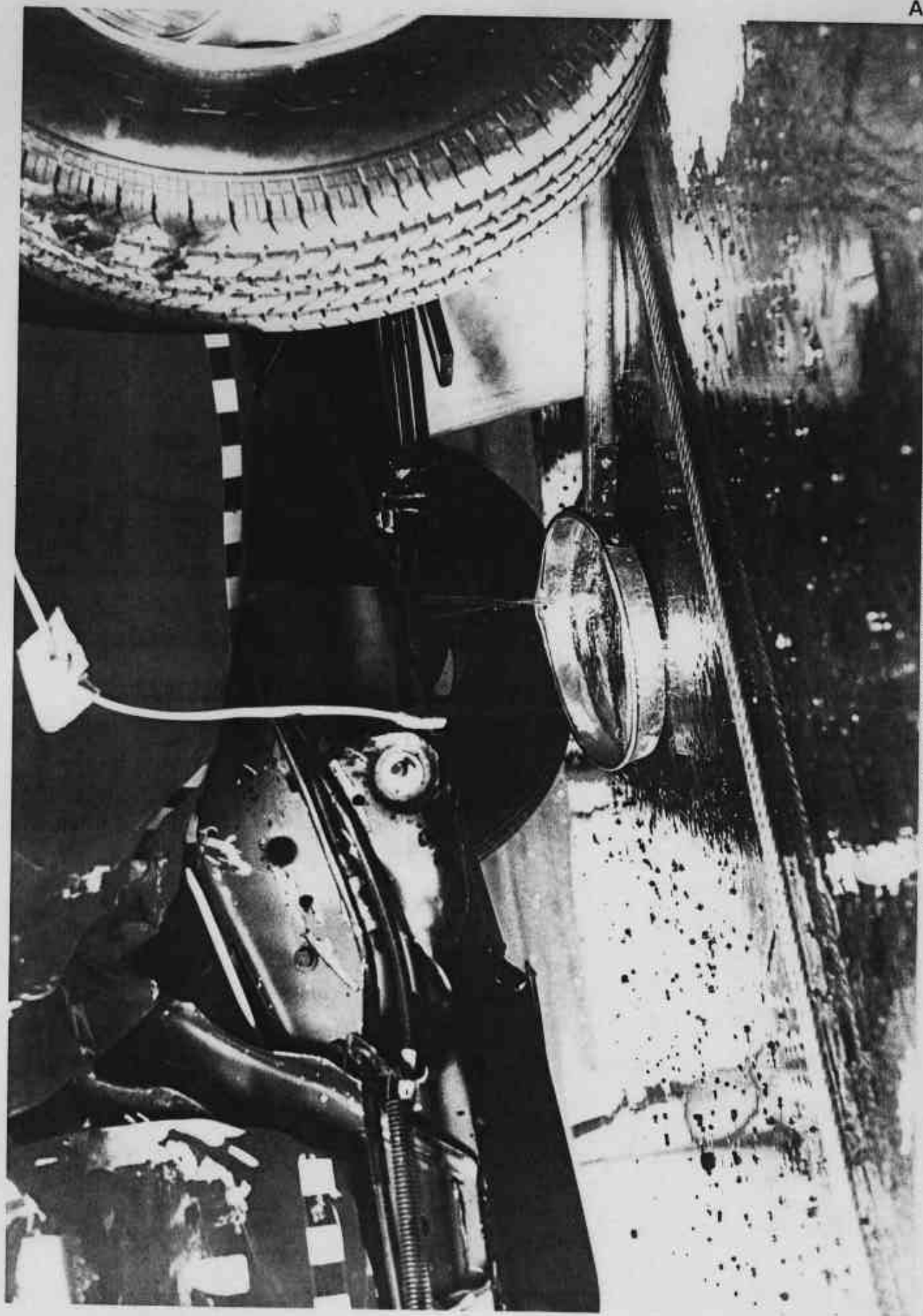


Photo No. A-39 - Stoddard Solvent Leak

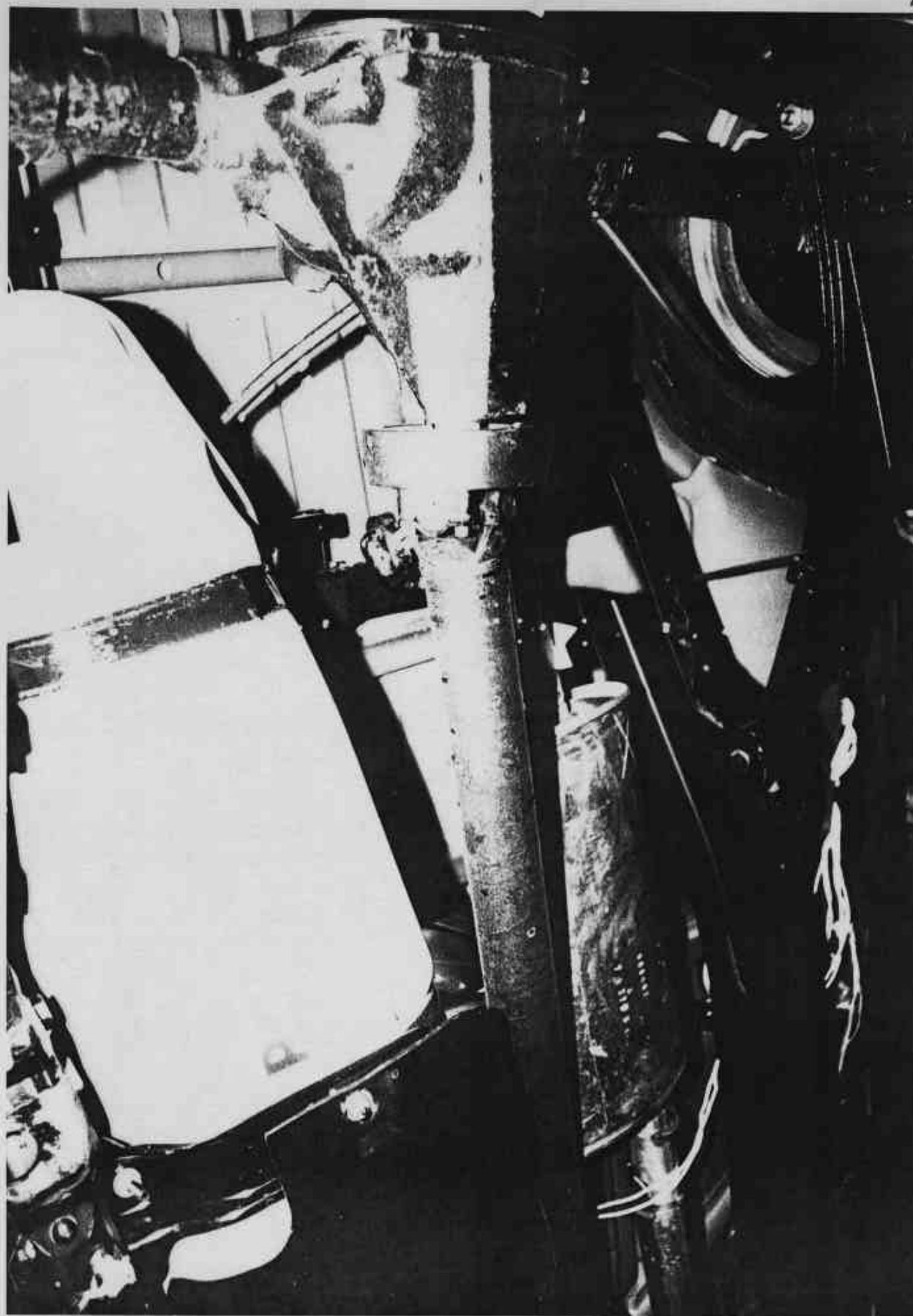


Photo No. A-40 - Point of Stoddard Solvent Leakage

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* Data not valid after approximately 23 msec.

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* Data not valid after approximately 27 msec.

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TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

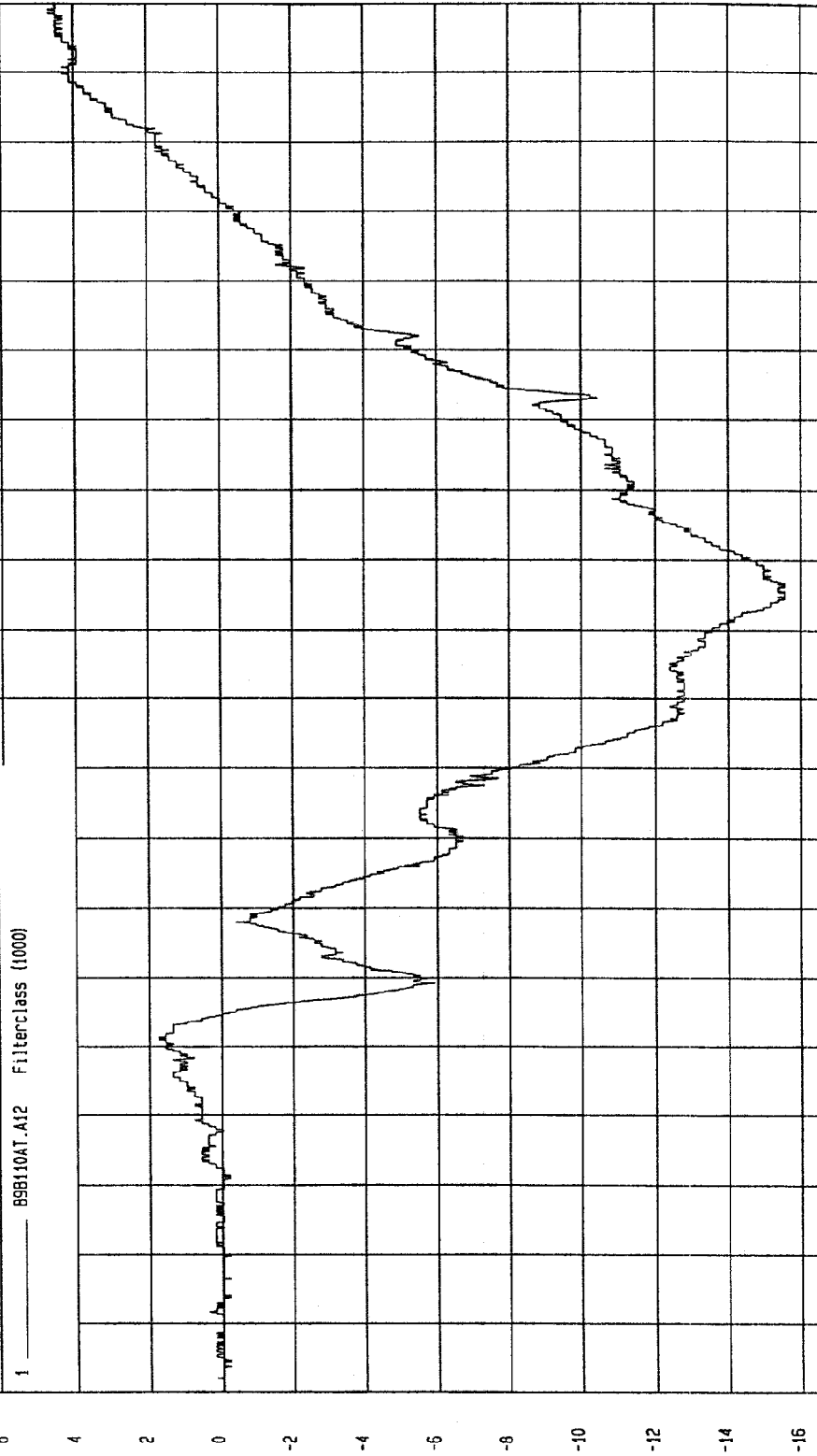
Speed: 38.23 MPH 61.5 KPH

COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 5.09 G's at 185 msec

Minimum = -15.55 G's at 94 msec

DRIVER HEAD X ACCELERATION



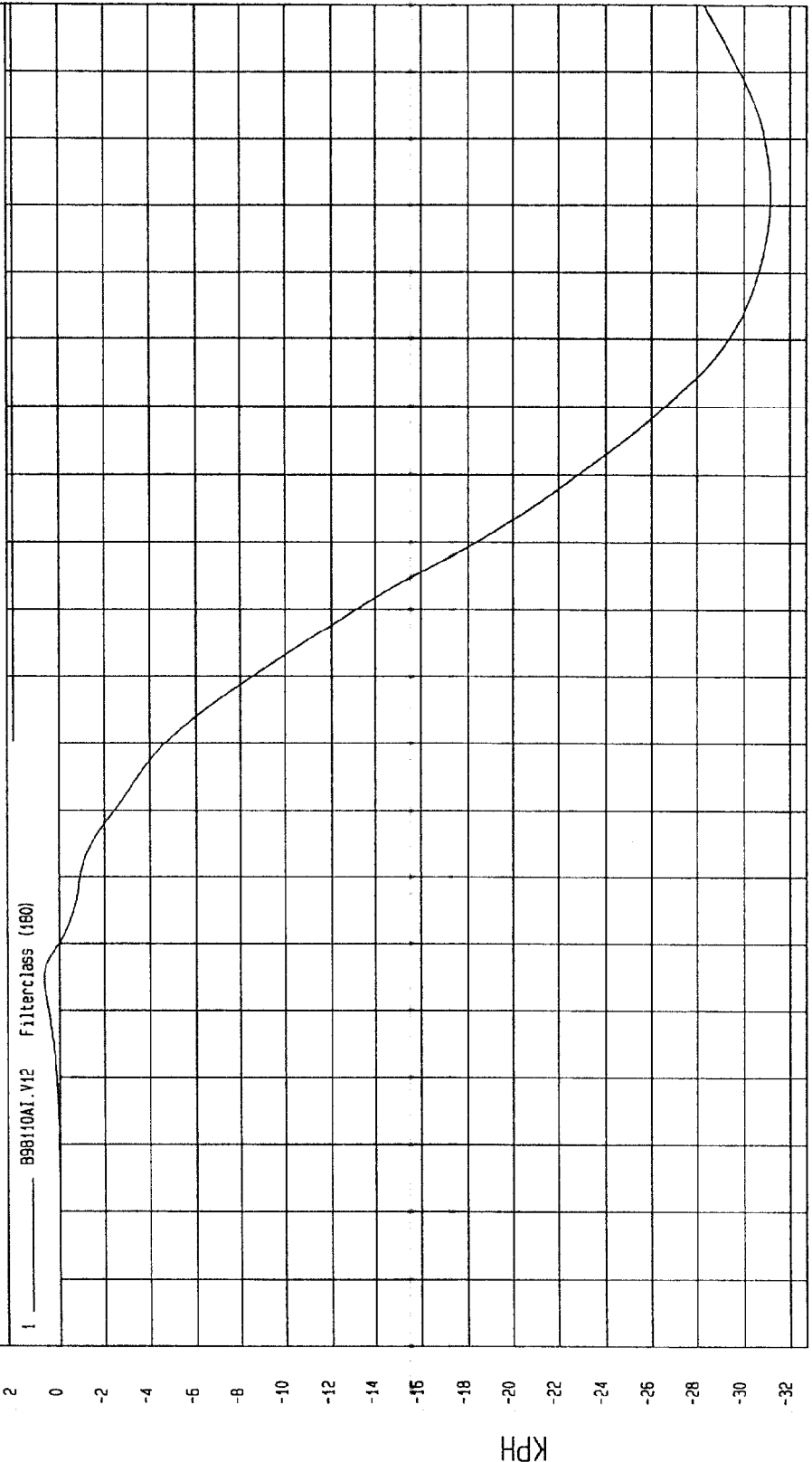
MCA Research
11-23-1998 13:25

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -31.14 KPH at 152 msec Maximum = .67 KPH at 35 msec

DRIVER HEAD X VELOCITY



WCA Research
11-23-1998 13:25

TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

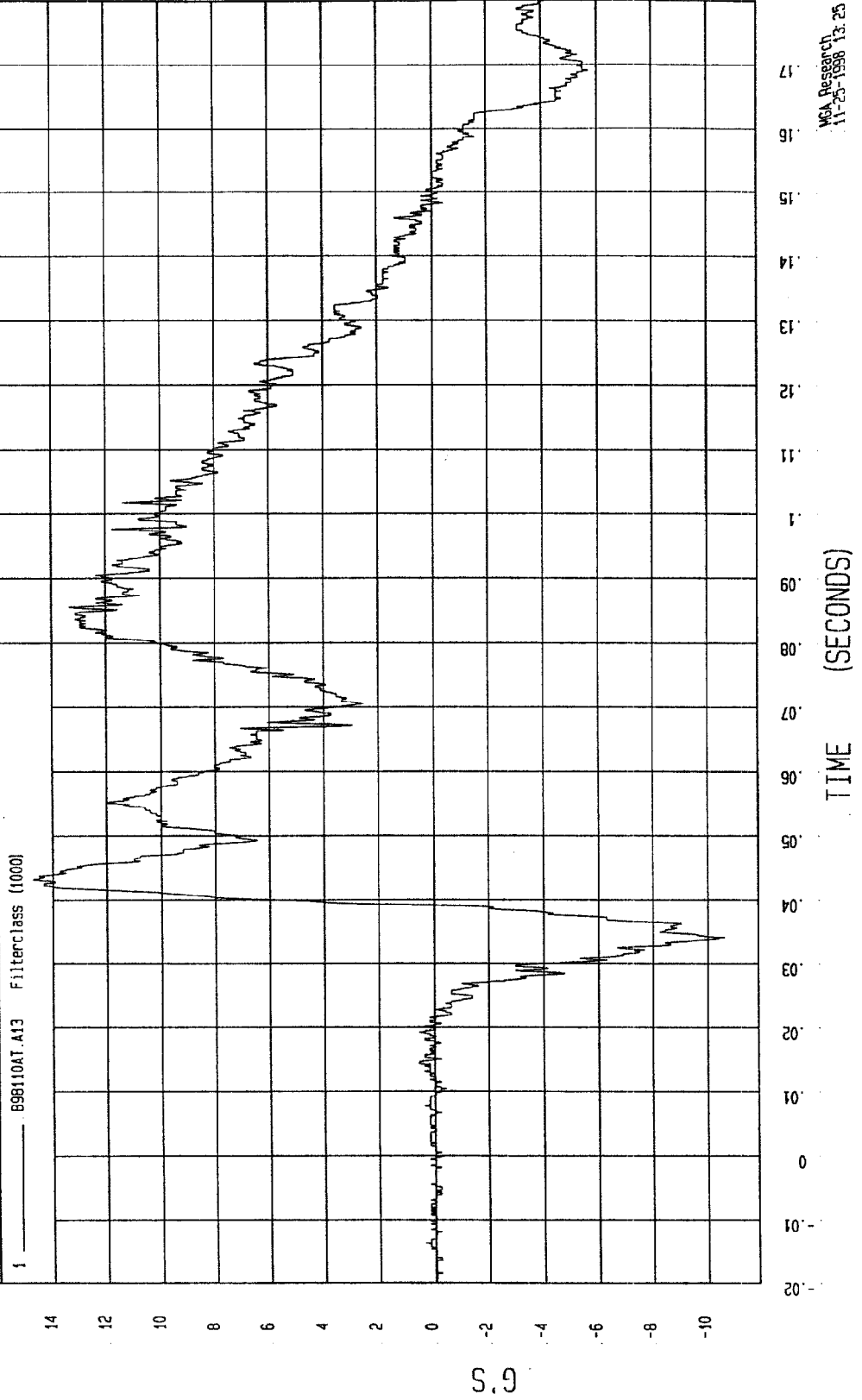
Speed: 38.23 MPH 61.5 KPH

COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 14.71 G'S at 43 msec

Minimum = -10.61 G'S at 34 msec

DRIVER HEAD Y ACCELERATION

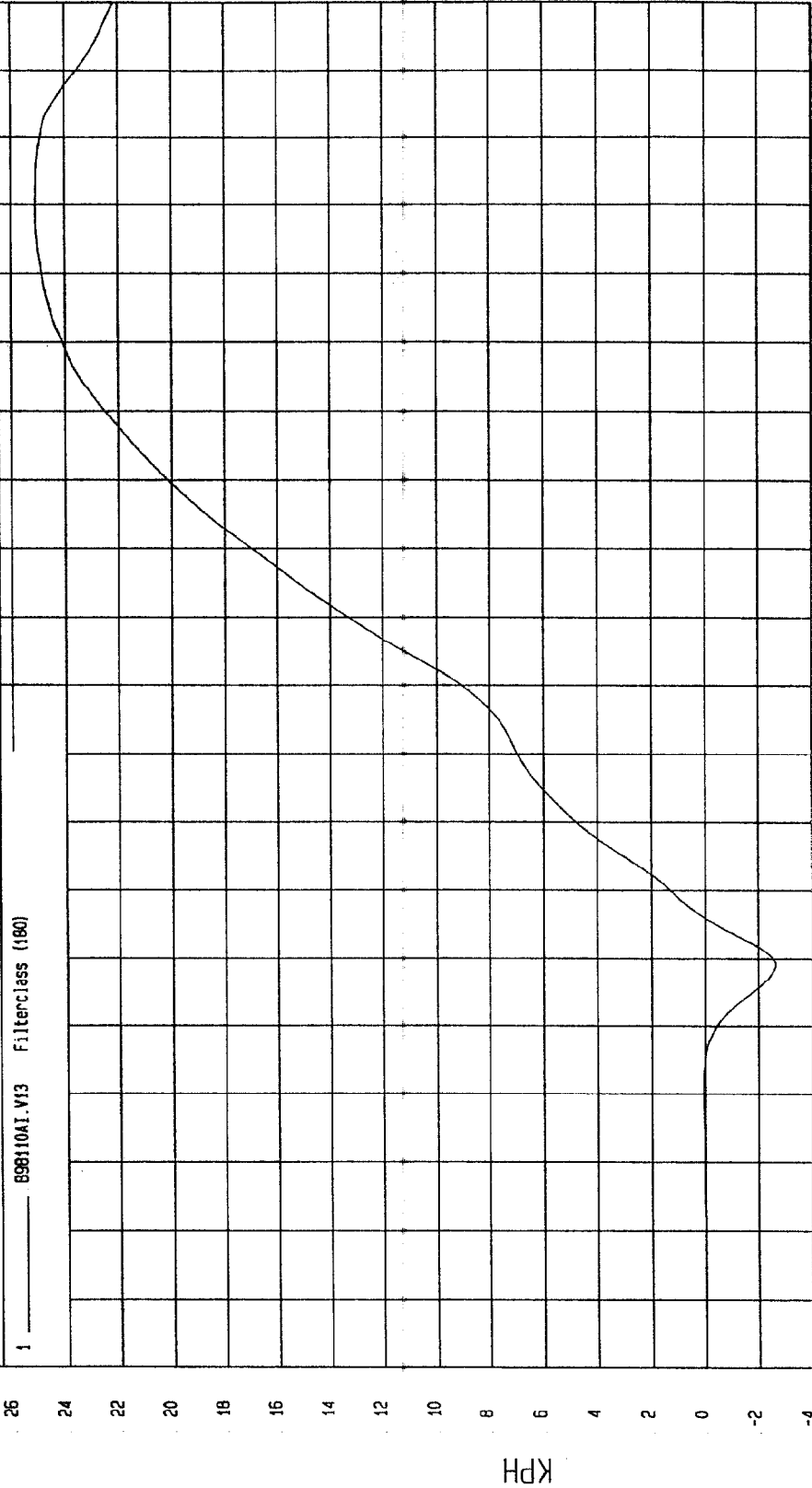


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

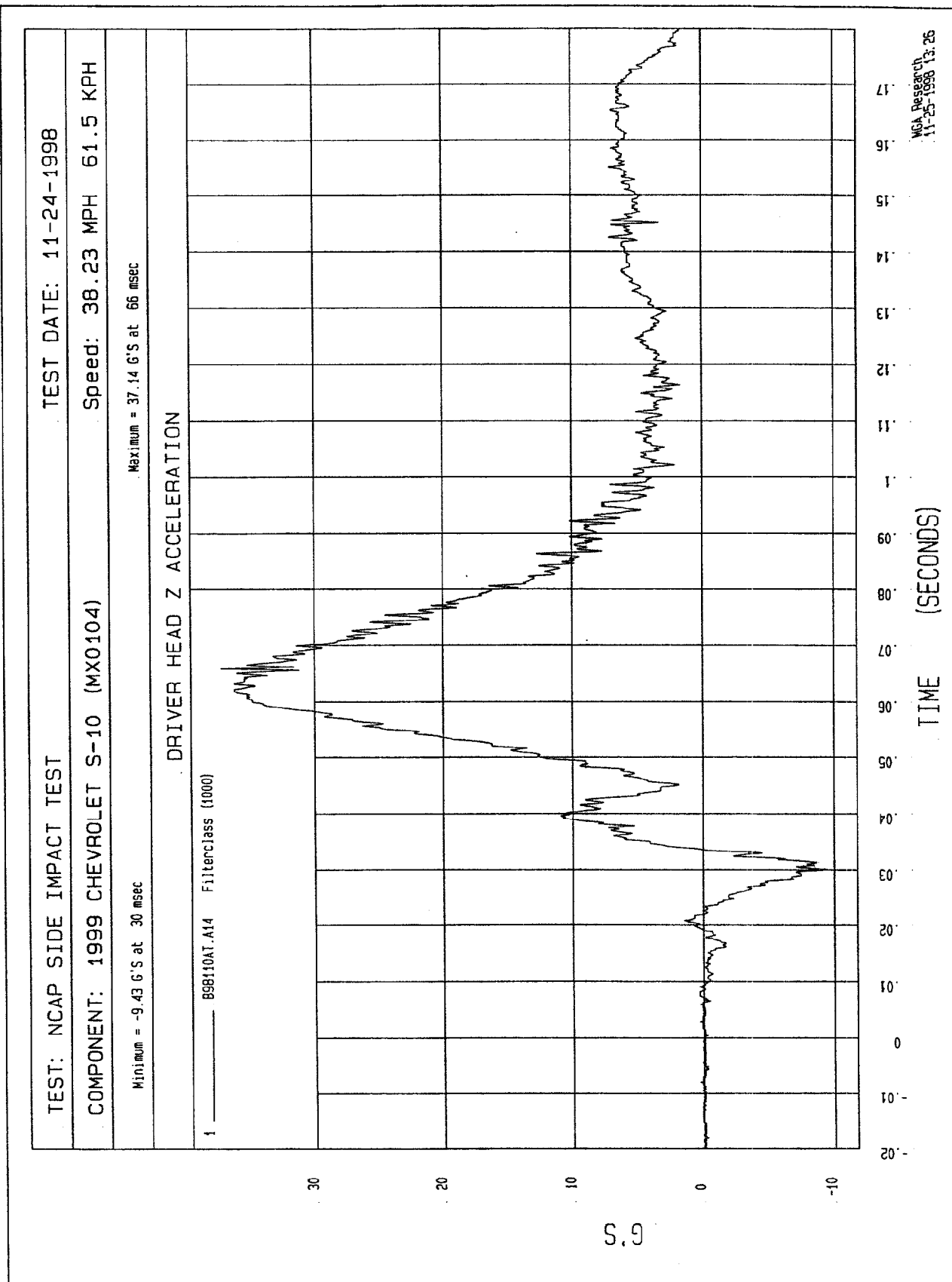
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -2.65 KPH at 39 msec Maximum = 25.09 KPH at 150 msec

DRIVER HEAD Y VELOCITY



W&A Research
11-25-1998 13:26

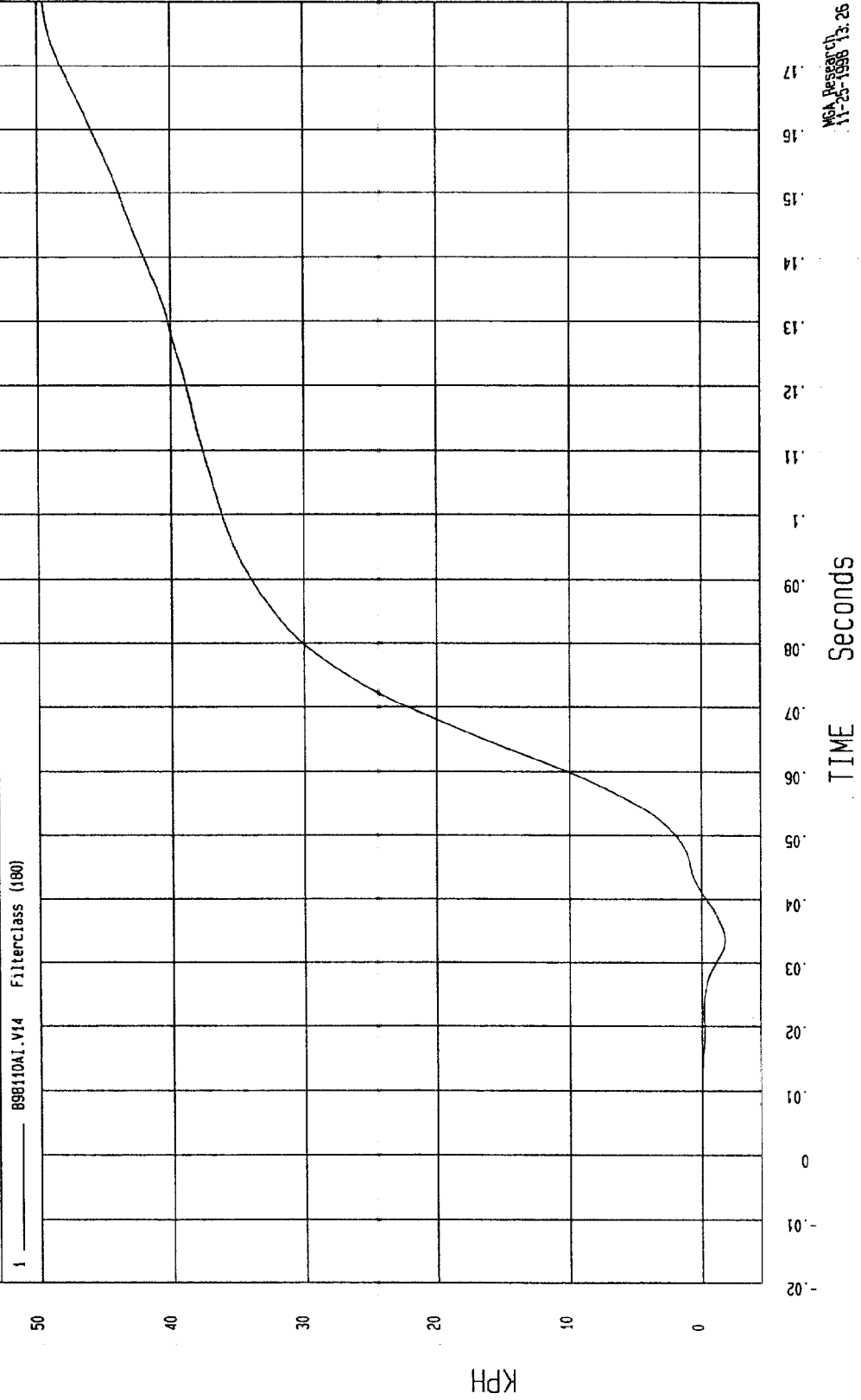


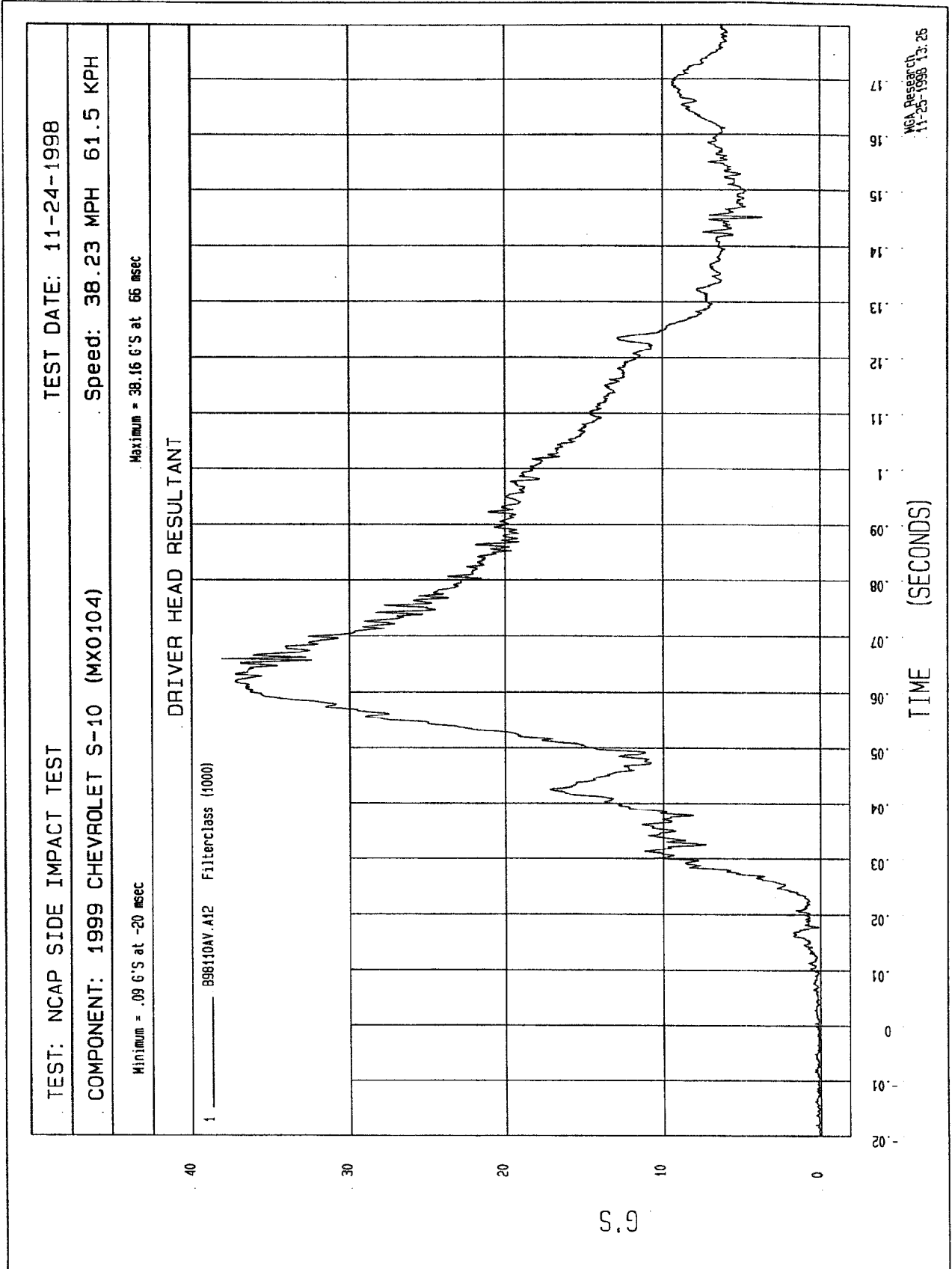
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -1.8 KPH at 34 msec Maximum = 50.53 KPH at 200 msec

DRIVER HEAD Z VELOCITY



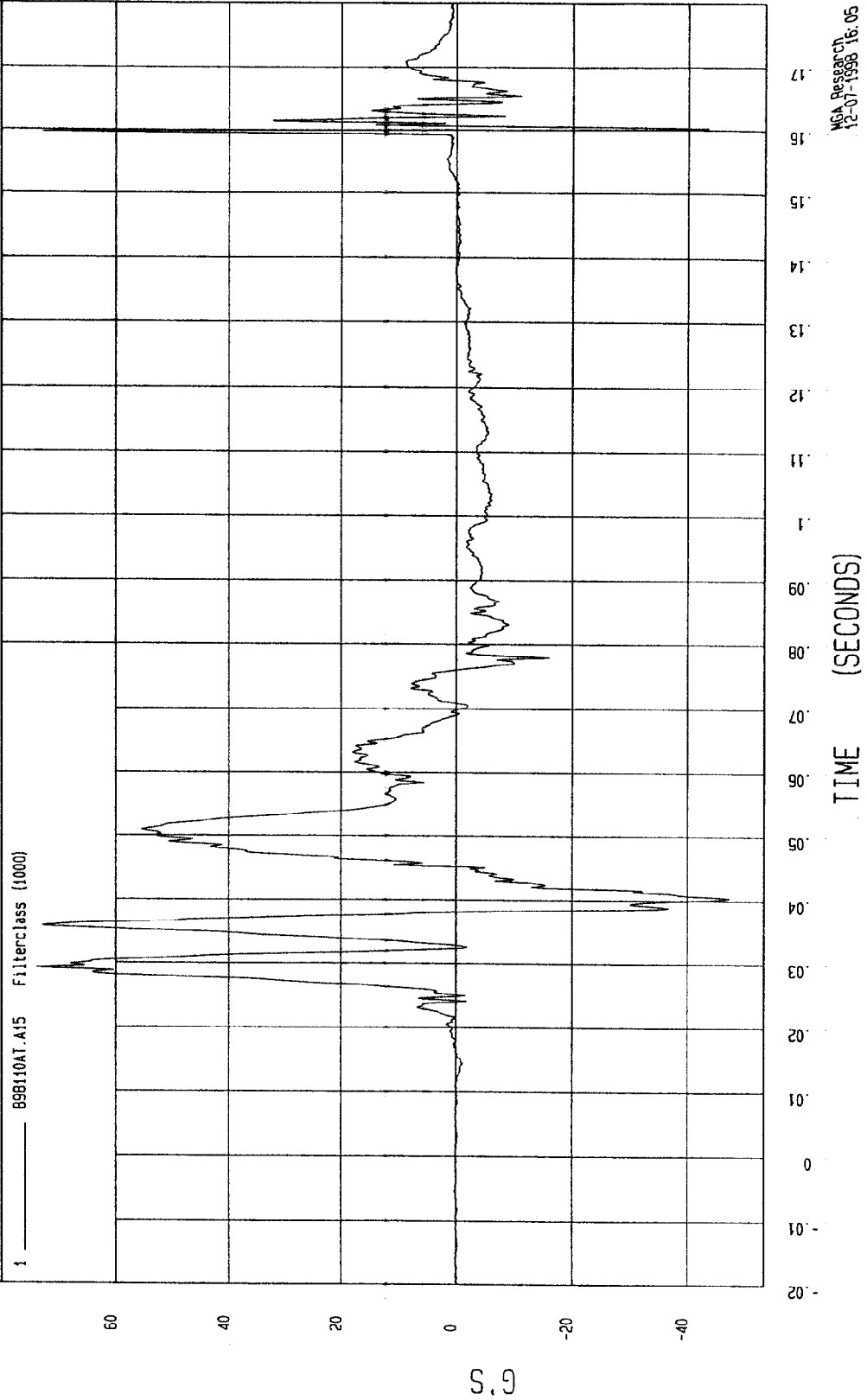


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -47.24 G'S at 40 msec Maximum = 73.82 G'S at 29 msec

DRIVER UPPER RIB Y ACCELERATION

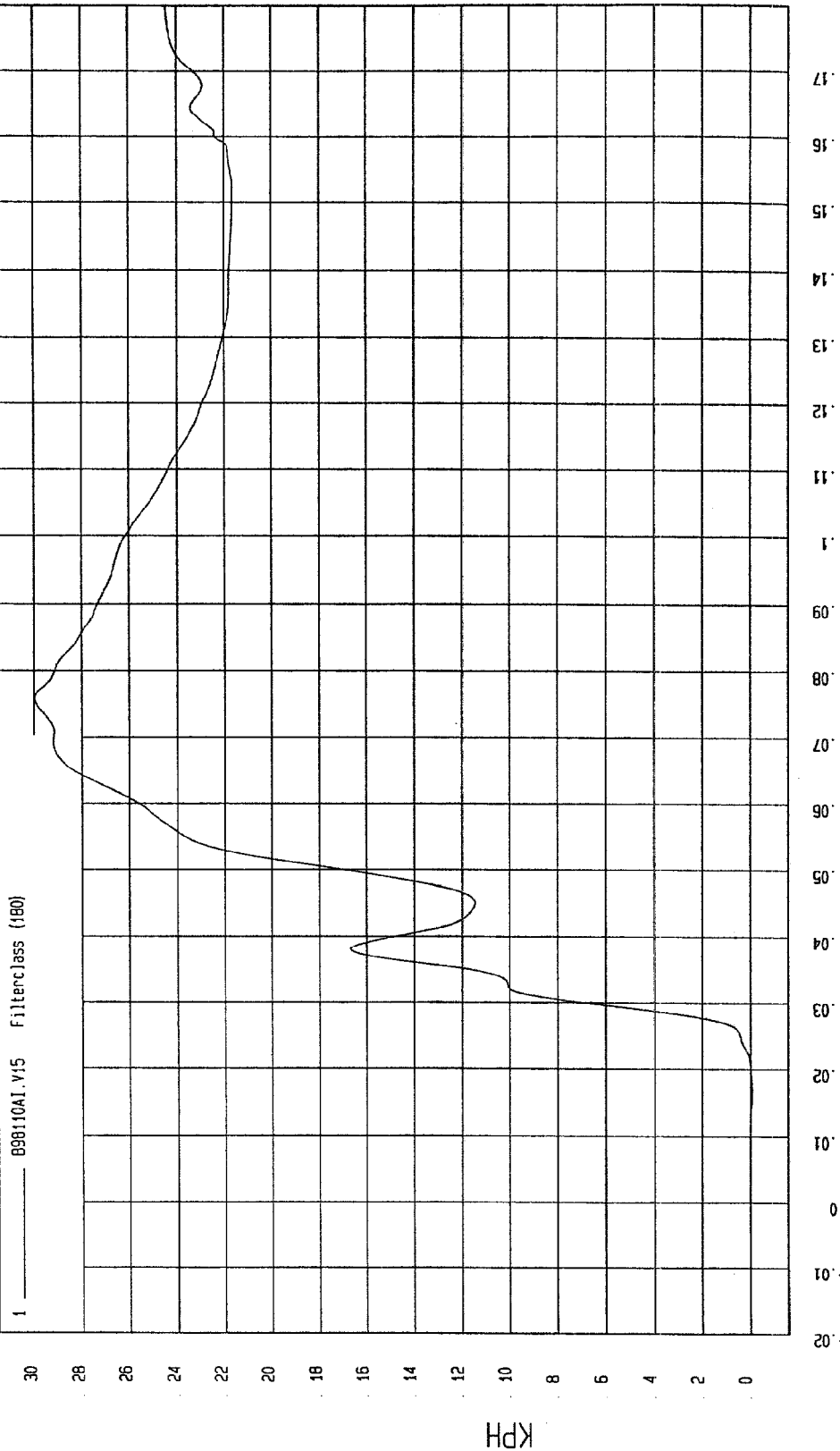


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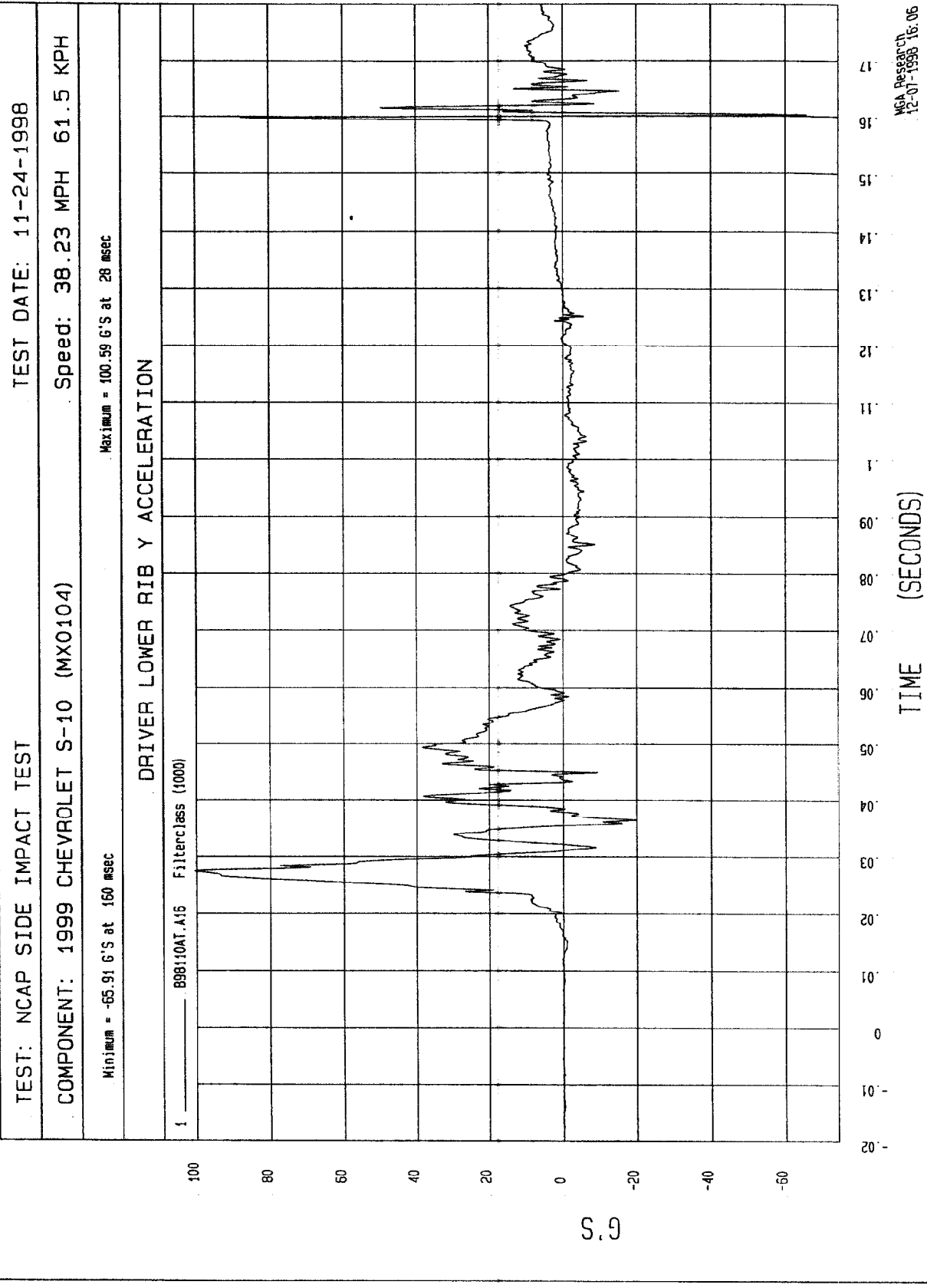
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -7.13E-02 KPH at 16 msec Maximum = 29.98 KPH at 76 msec

DRIVER UPPER RIB Y VELOCITY



MCA Research
12-07-1998 16.05

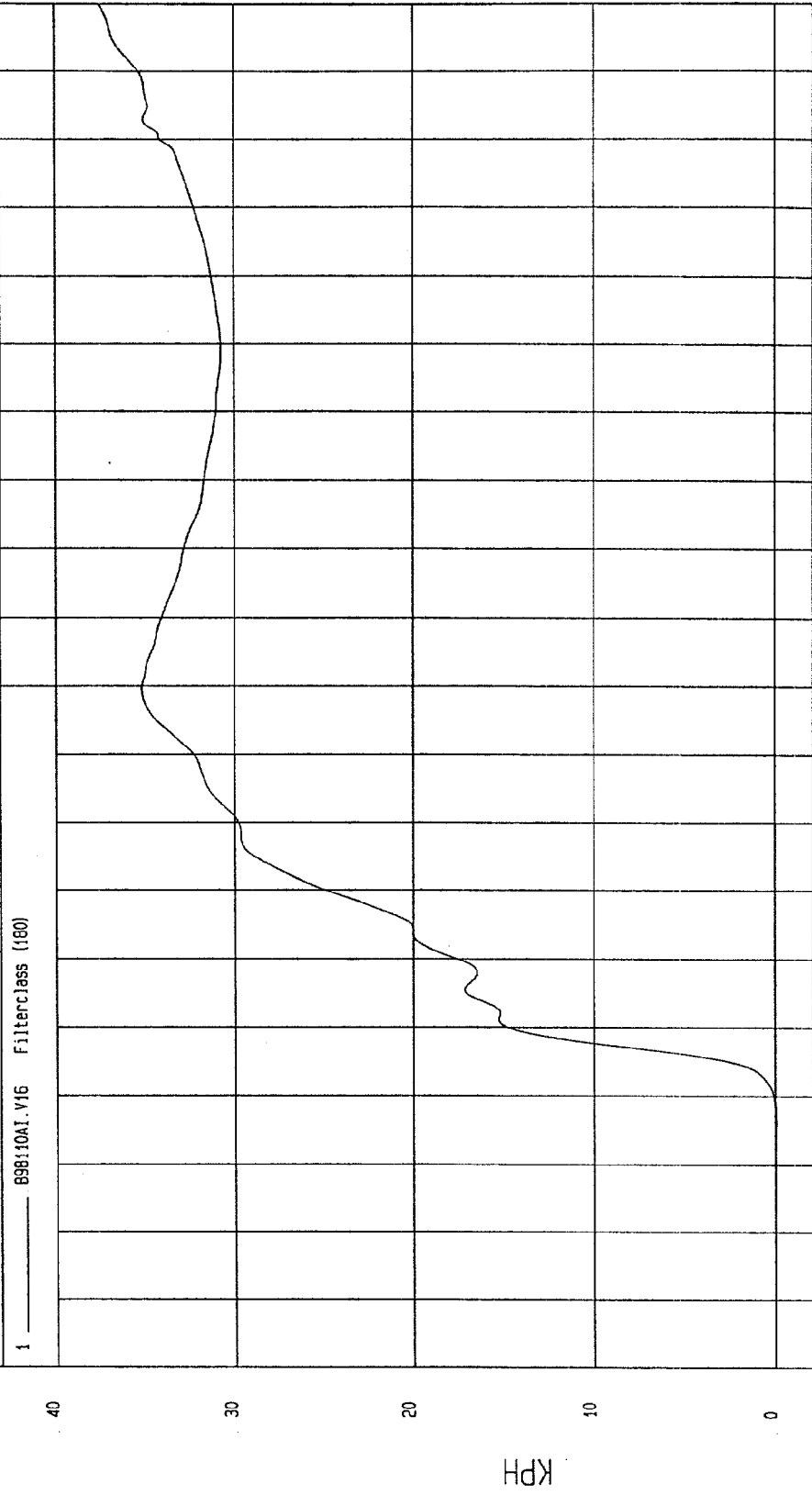


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -7.89E-02 KPH at 16 msec Maximum = 41 KPH at 200 msec

DRIVER LOWER RIB Y VELOCITY



TIME Seconds

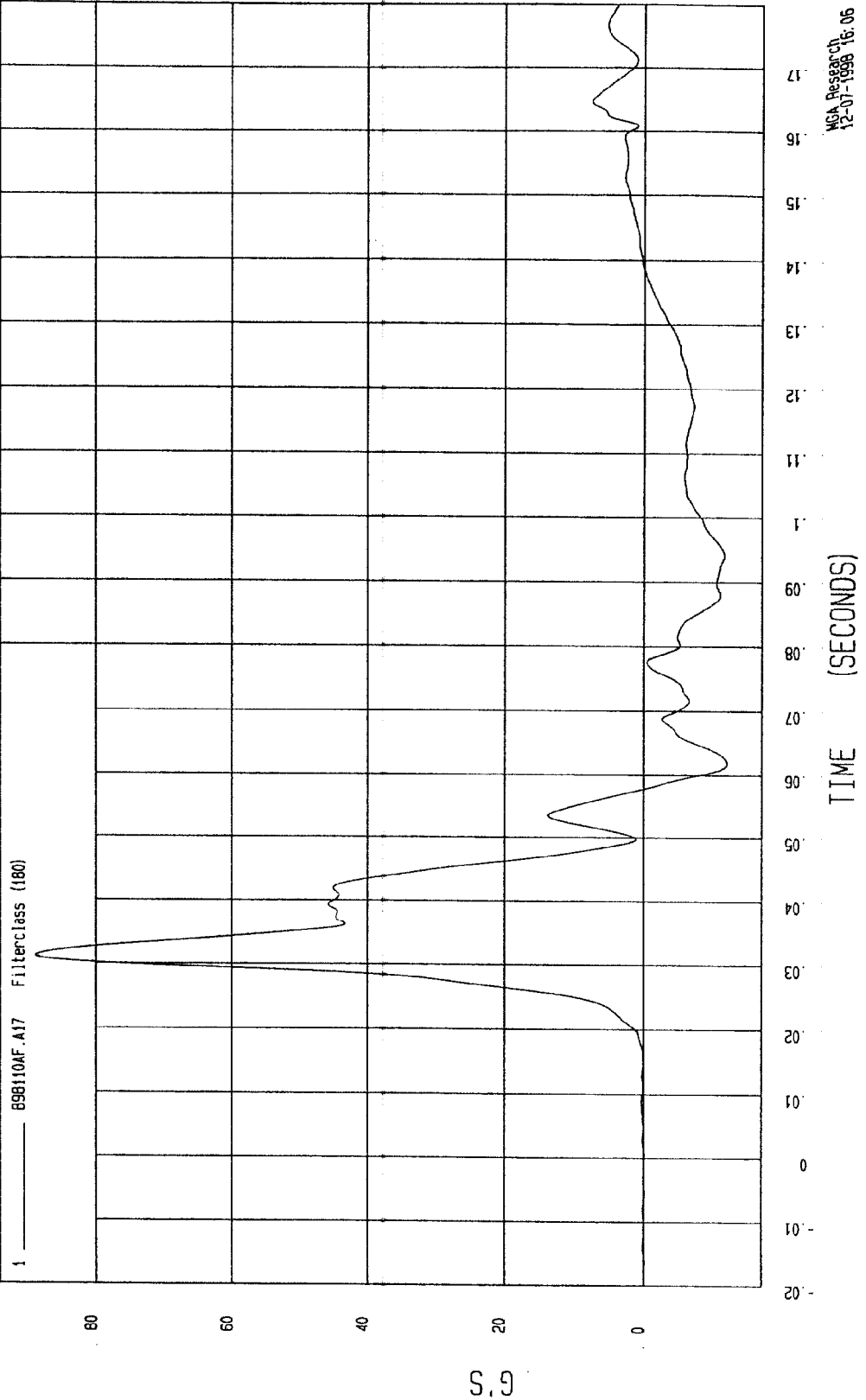
MOA Research
12-07-1998 16:06

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -12.21 G'S at 62 msec Maximum = 88.8 G'S at 31 msec

DRIVER LOWER SPINE Y ACCELERATION

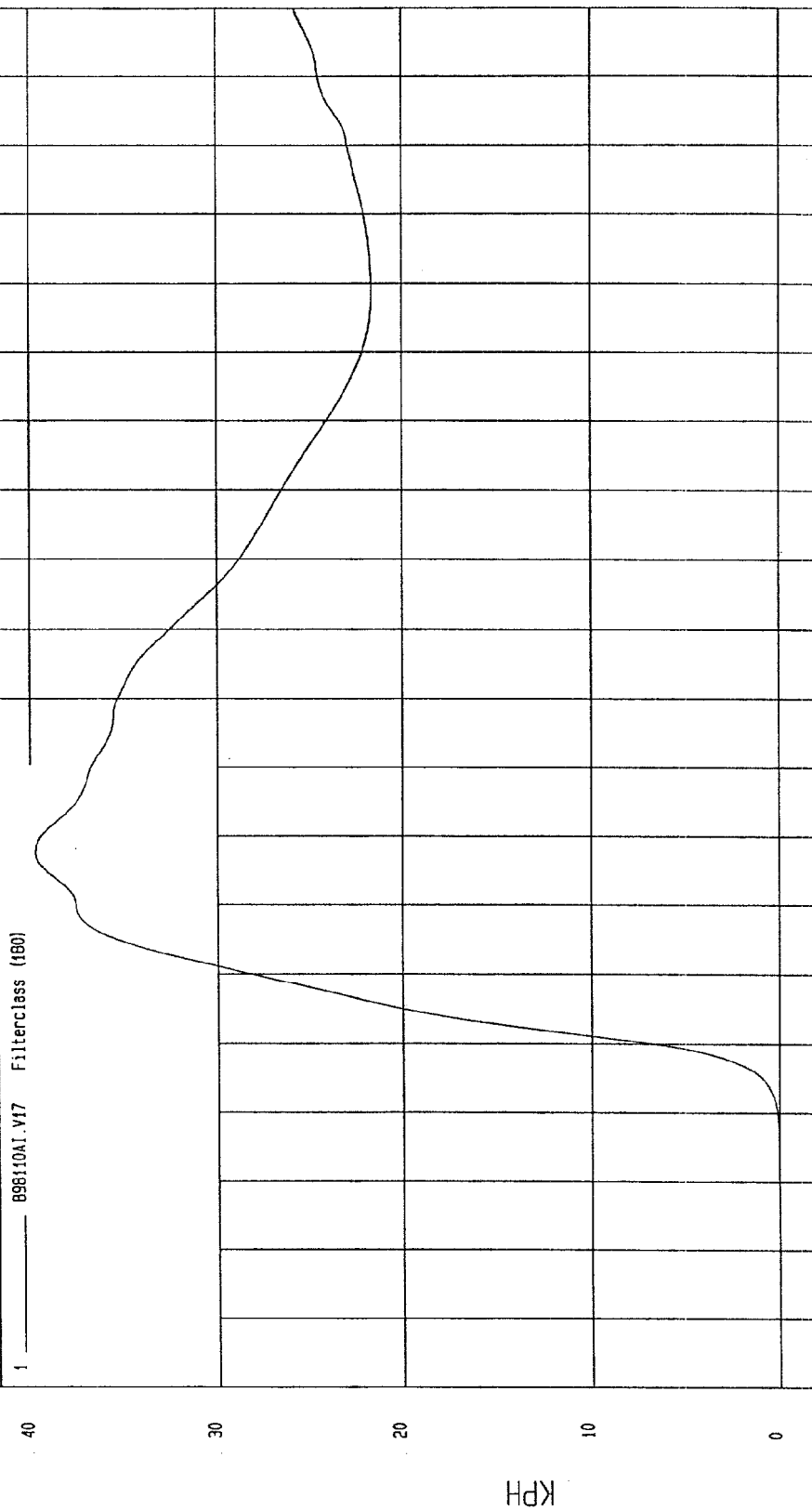


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -1.62E-02 KPH at 2 msec Maximum = 39.74 KPH at 58 msec

DRIVER LOWER SPINE Y VELOCITY



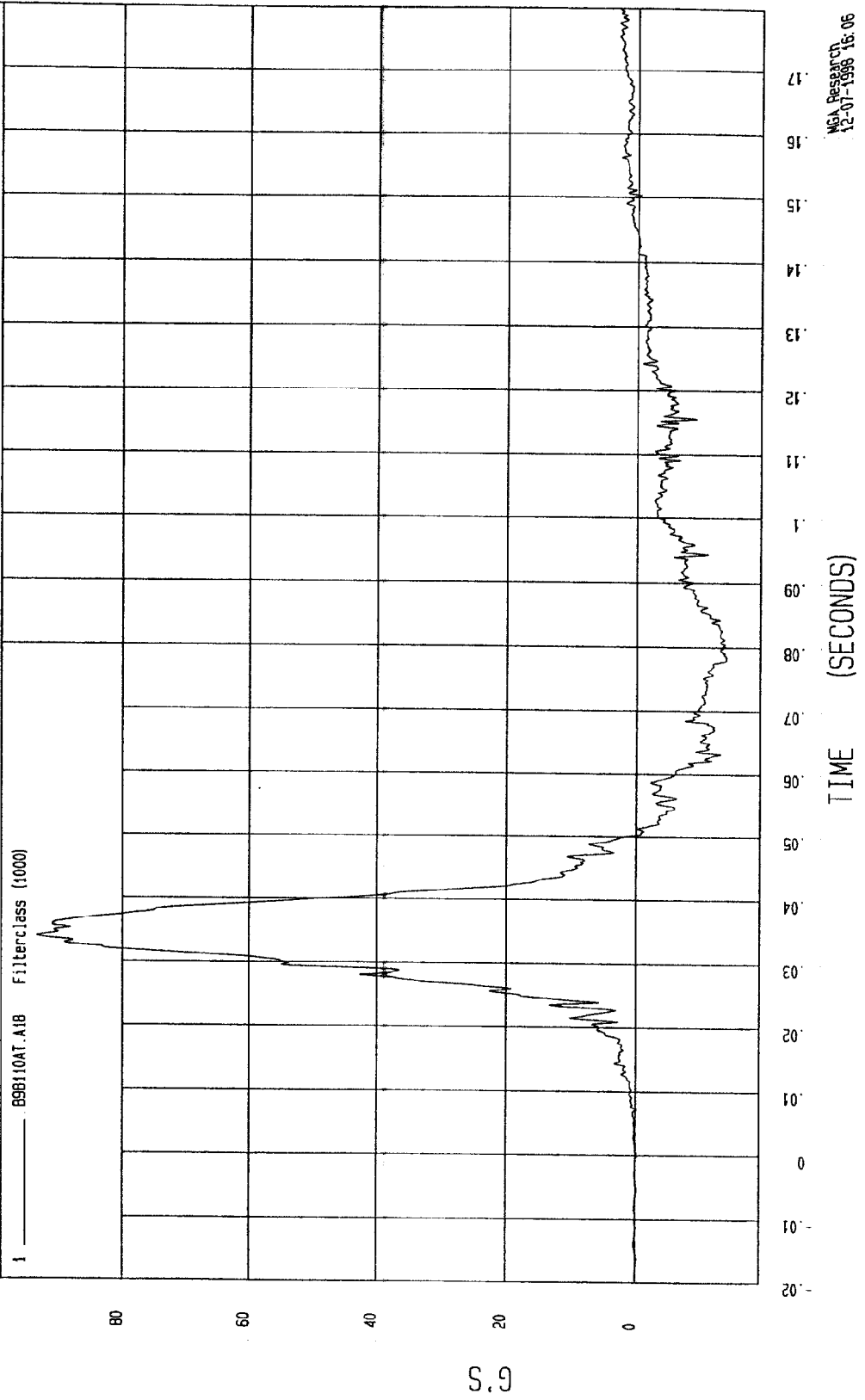
MCA Research
12-01-1998 16:06

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -13.91 G'S at 78 msec Maximum = 93.45 G'S at 34 msec

DRIVER PELVIS Y ACCELERATION



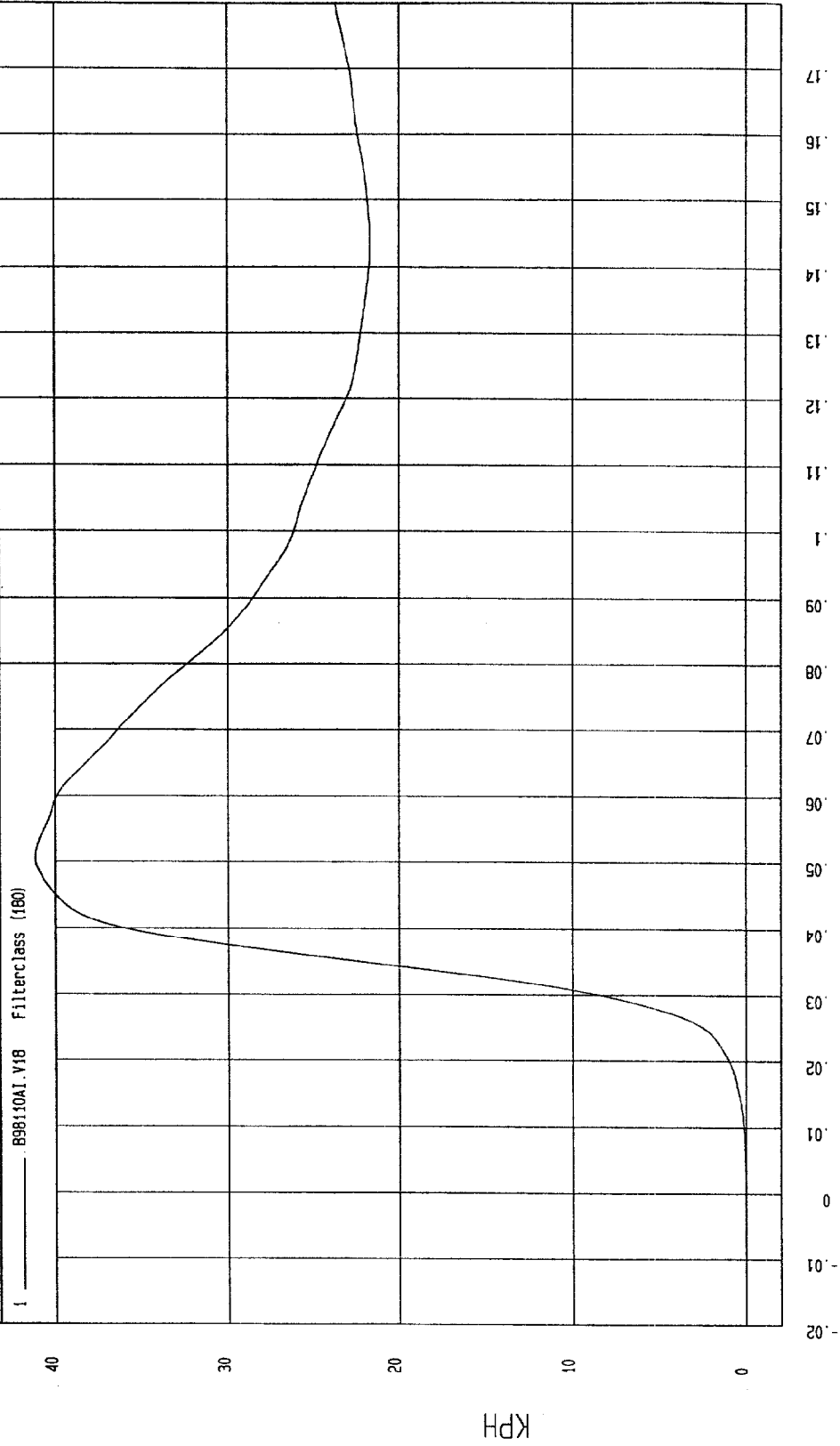
MSC Research
12-07-1998 16.06

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

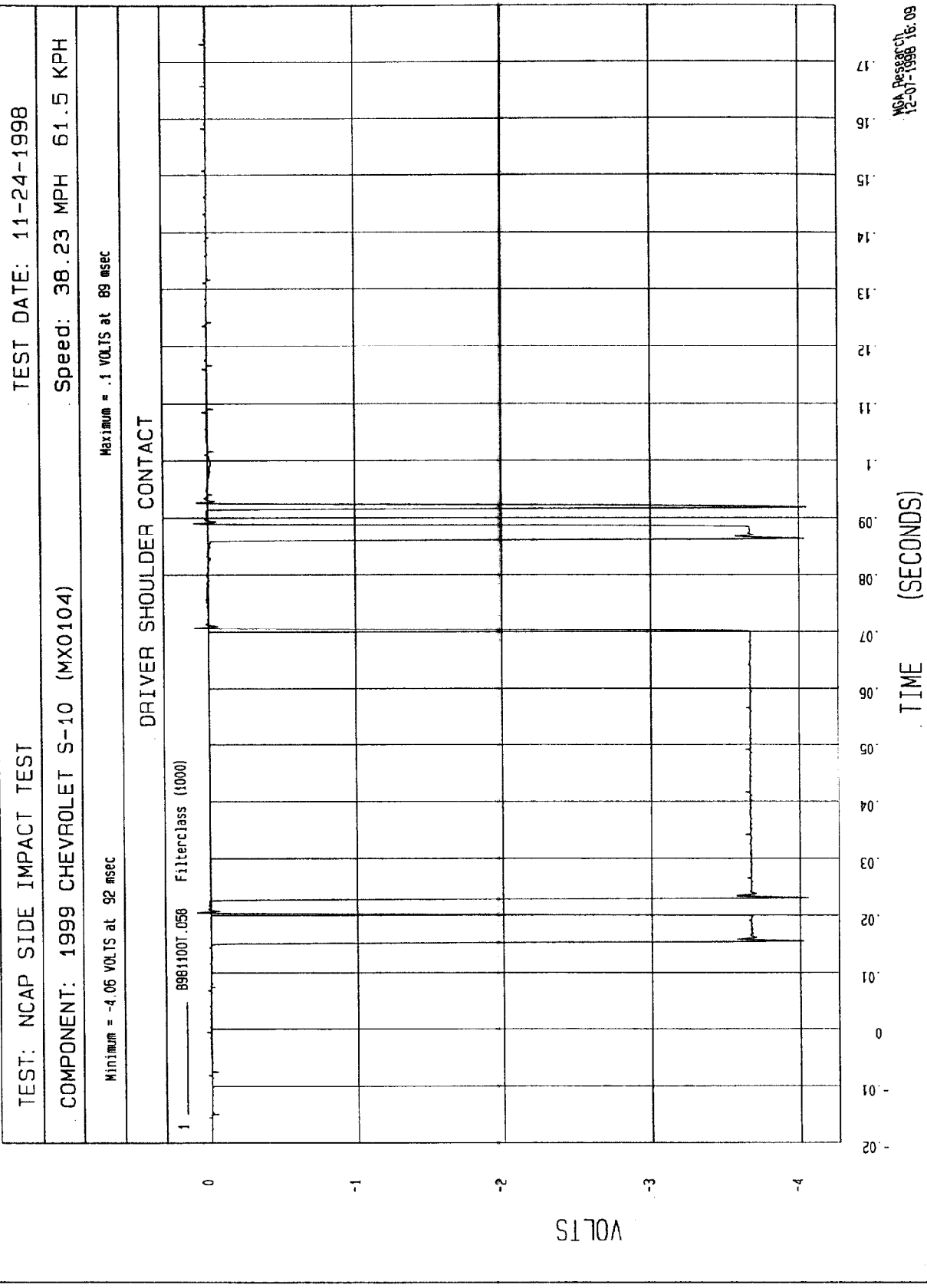
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

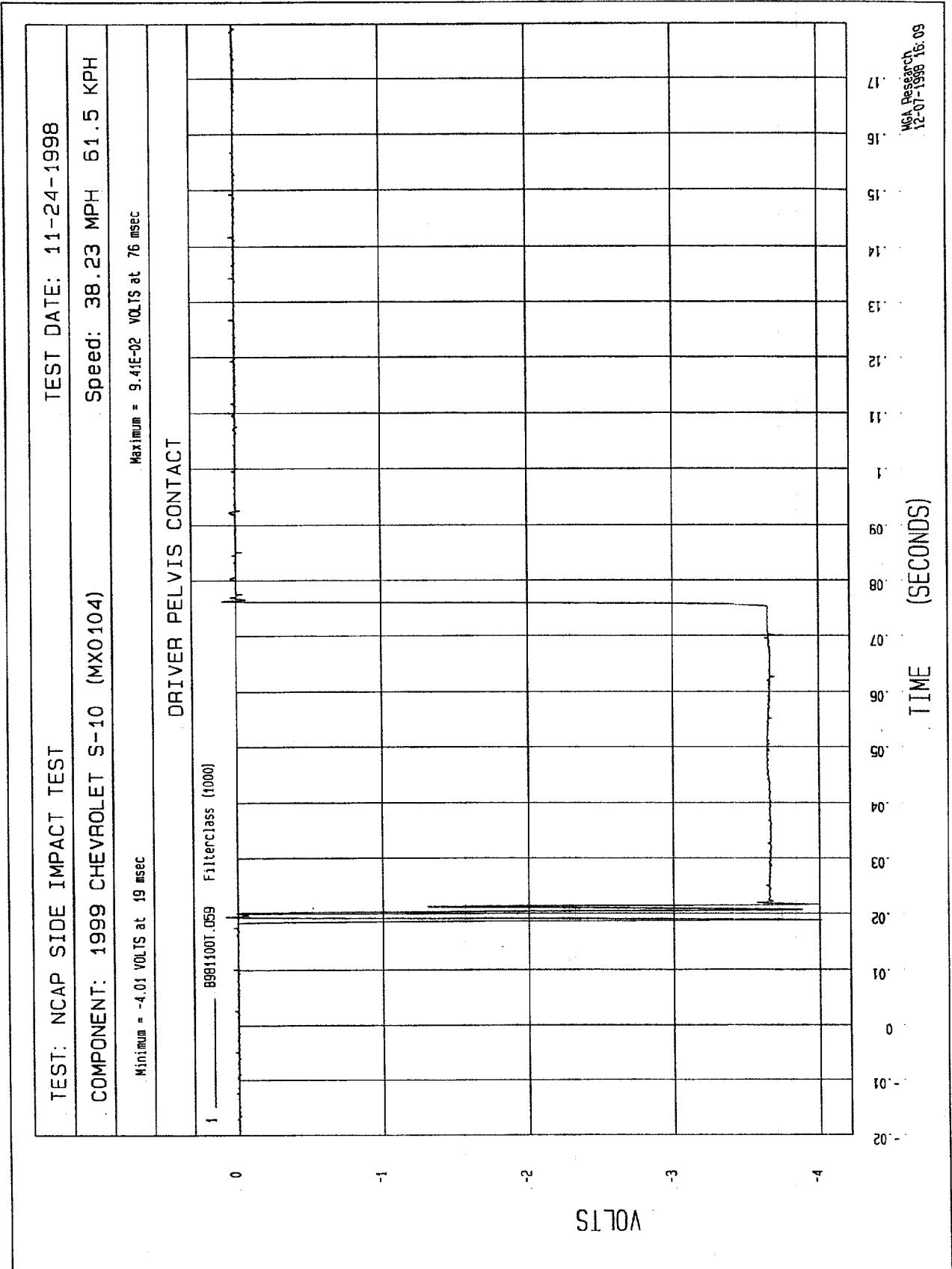
Minimum = -2.88E-03 KPH at -16 msec Maximum = 41.15 KPH at 50 msec

DRIVER PELVIS Y VELOCITY



NSA Research
12-01-1998 16:06





TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

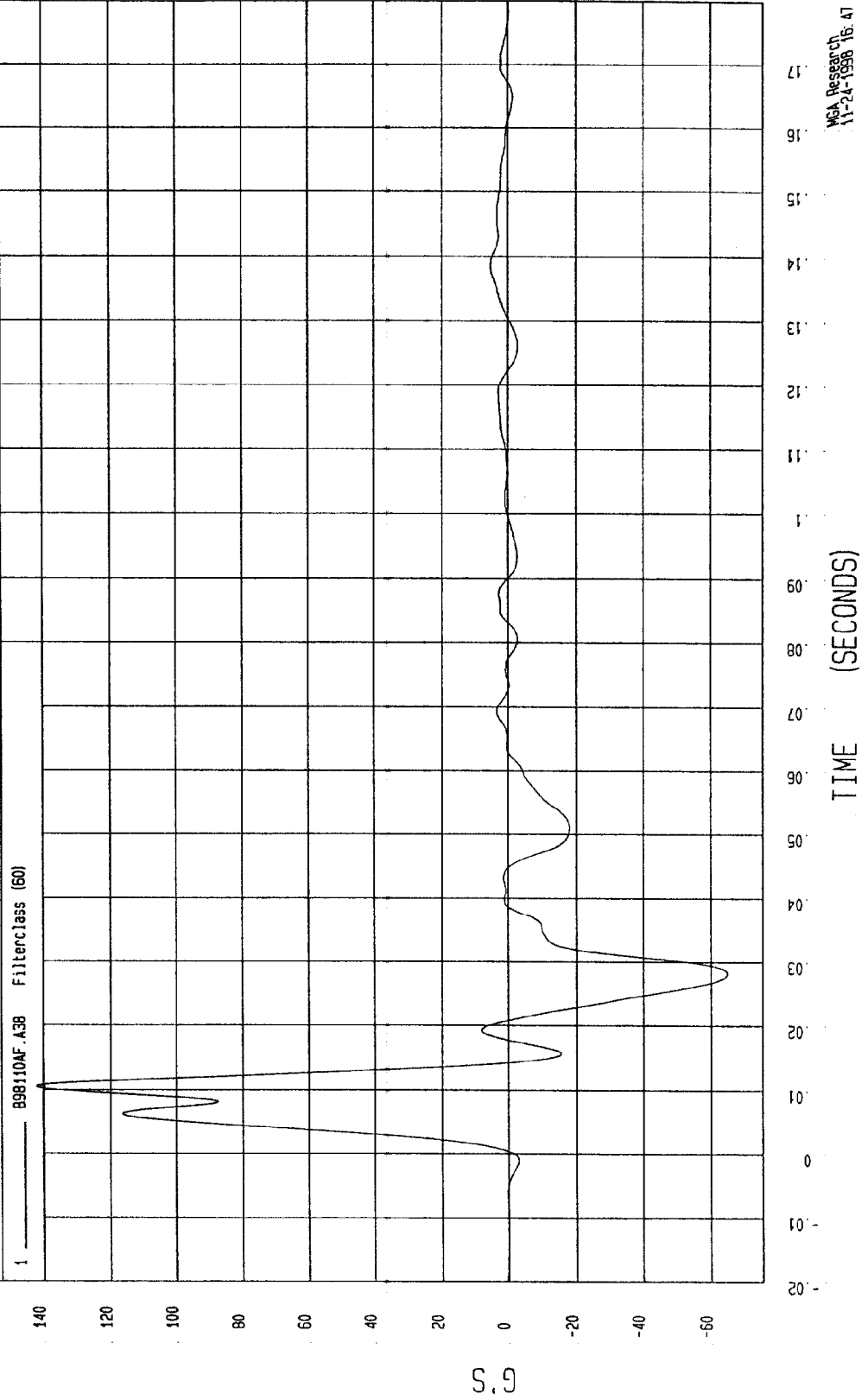
Speed: 38.23 MPH 61.5 KPH

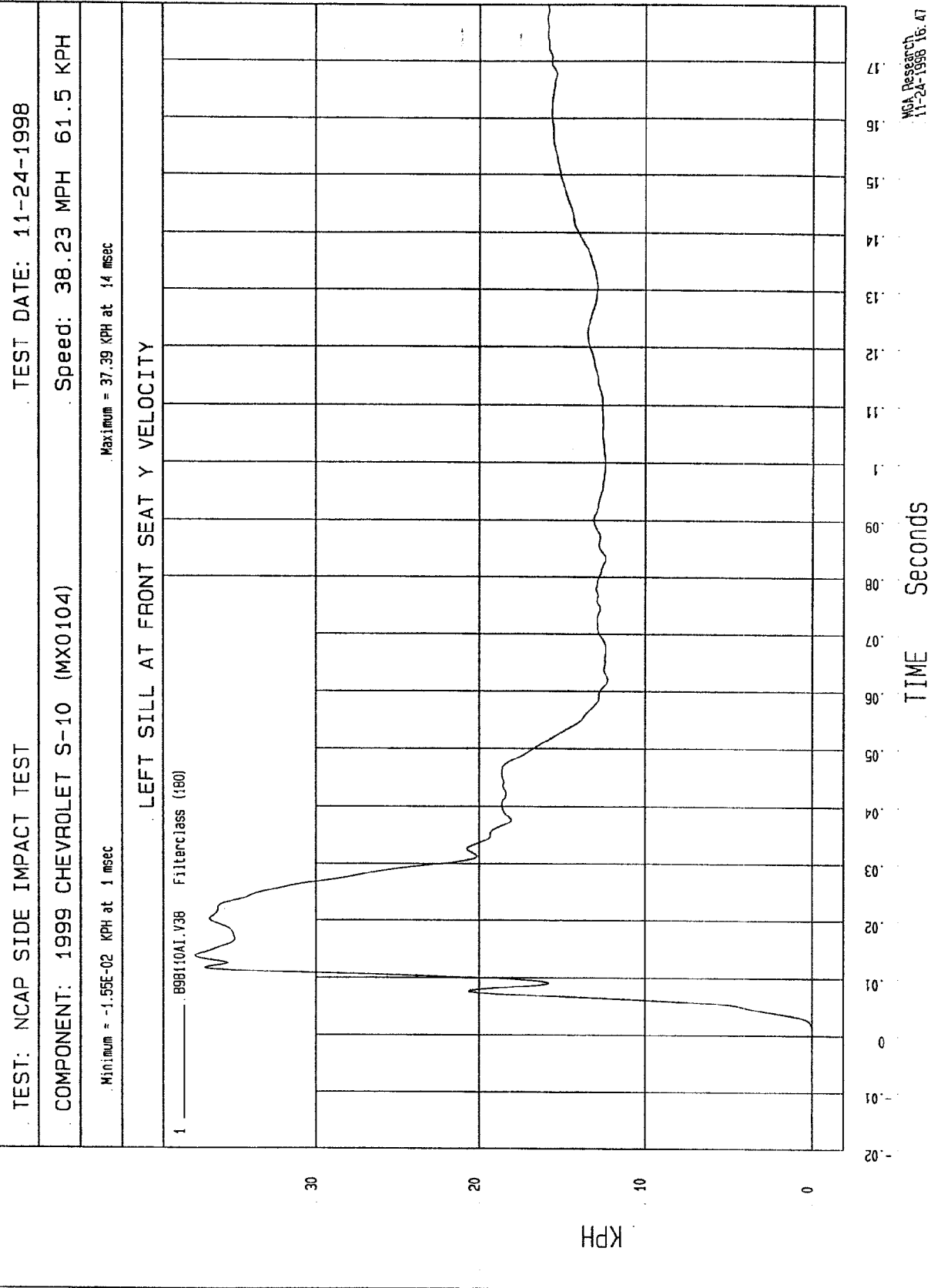
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 142.2 G'S at 11 msec

Minimum = -65.16 G'S at 28 msec

LEFT SILL AT FRONT SEAT Y ACCELERATION



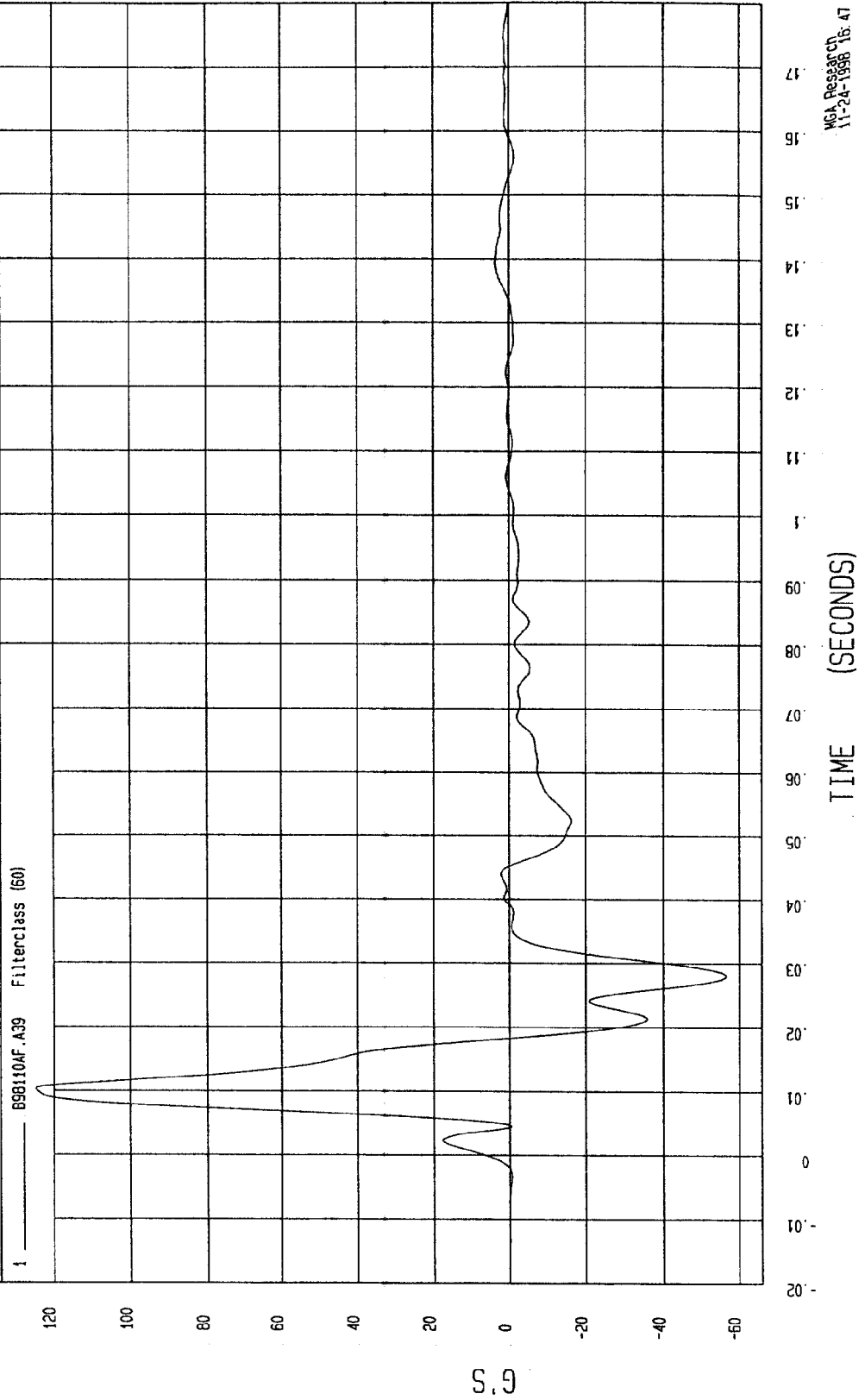


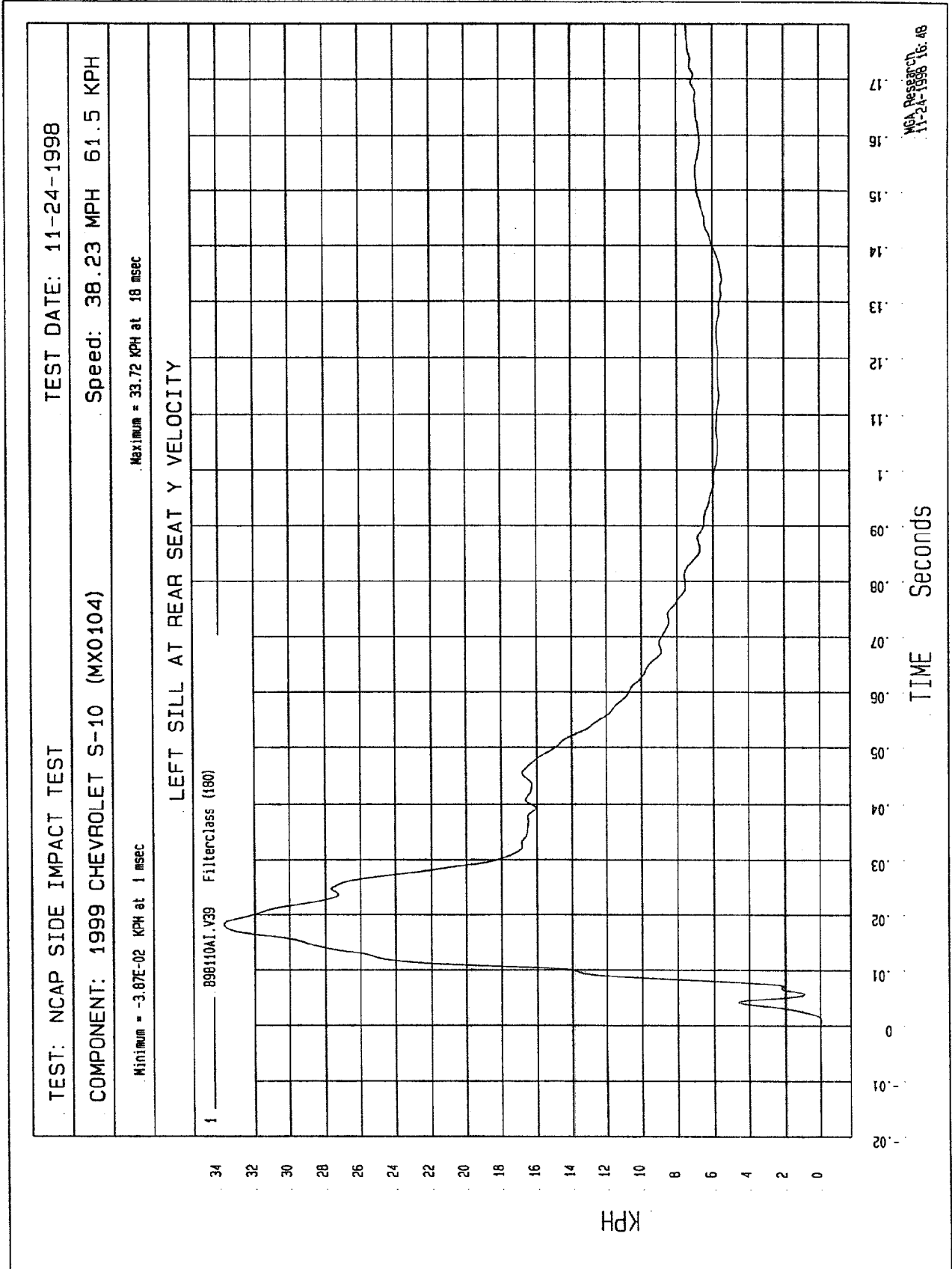
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -56.7 G'S at 28 msec Maximum = 124.62 G'S at 10 msec

LEFT SILL AT REAR SEAT Y ACCELERATION



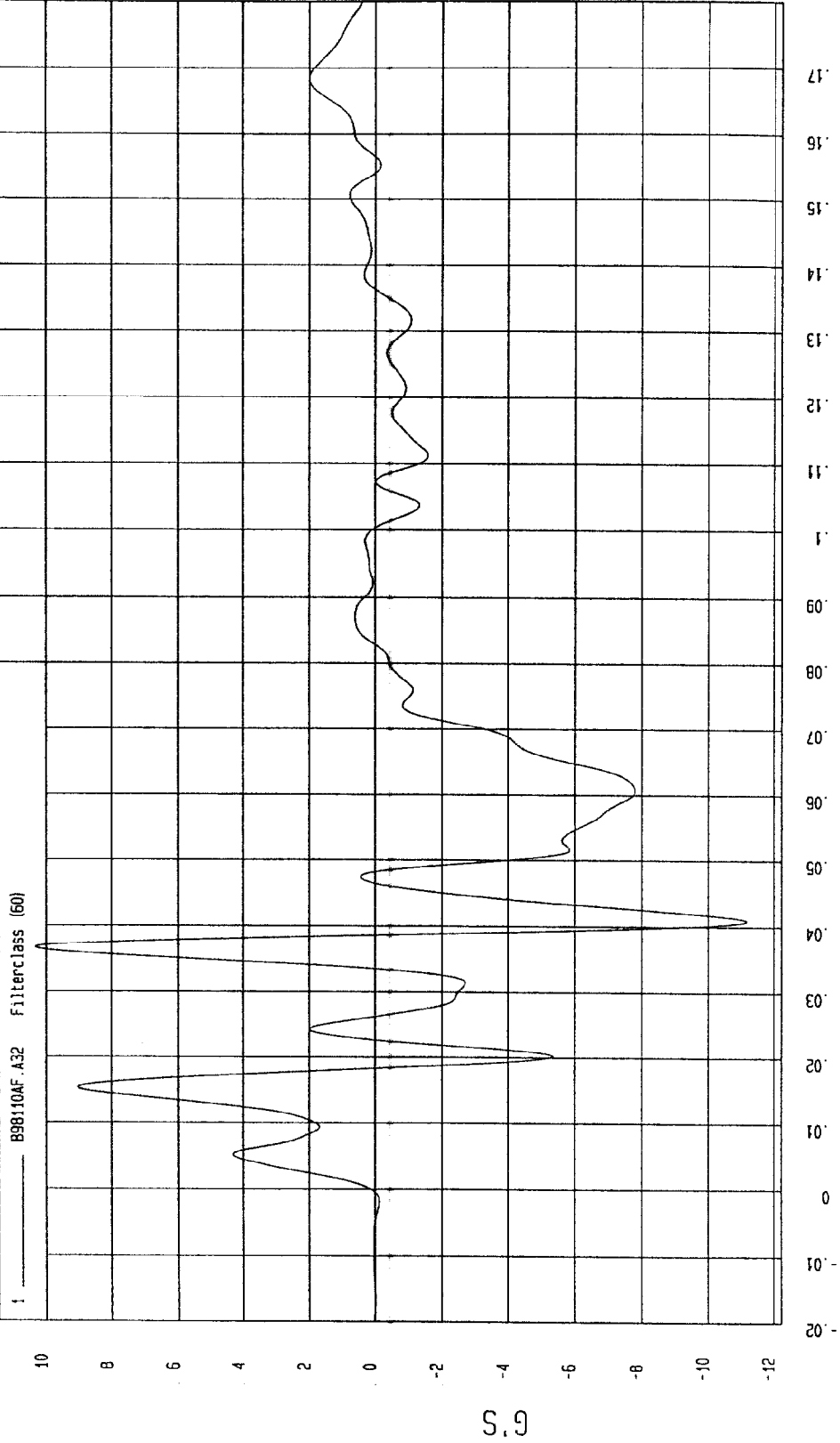


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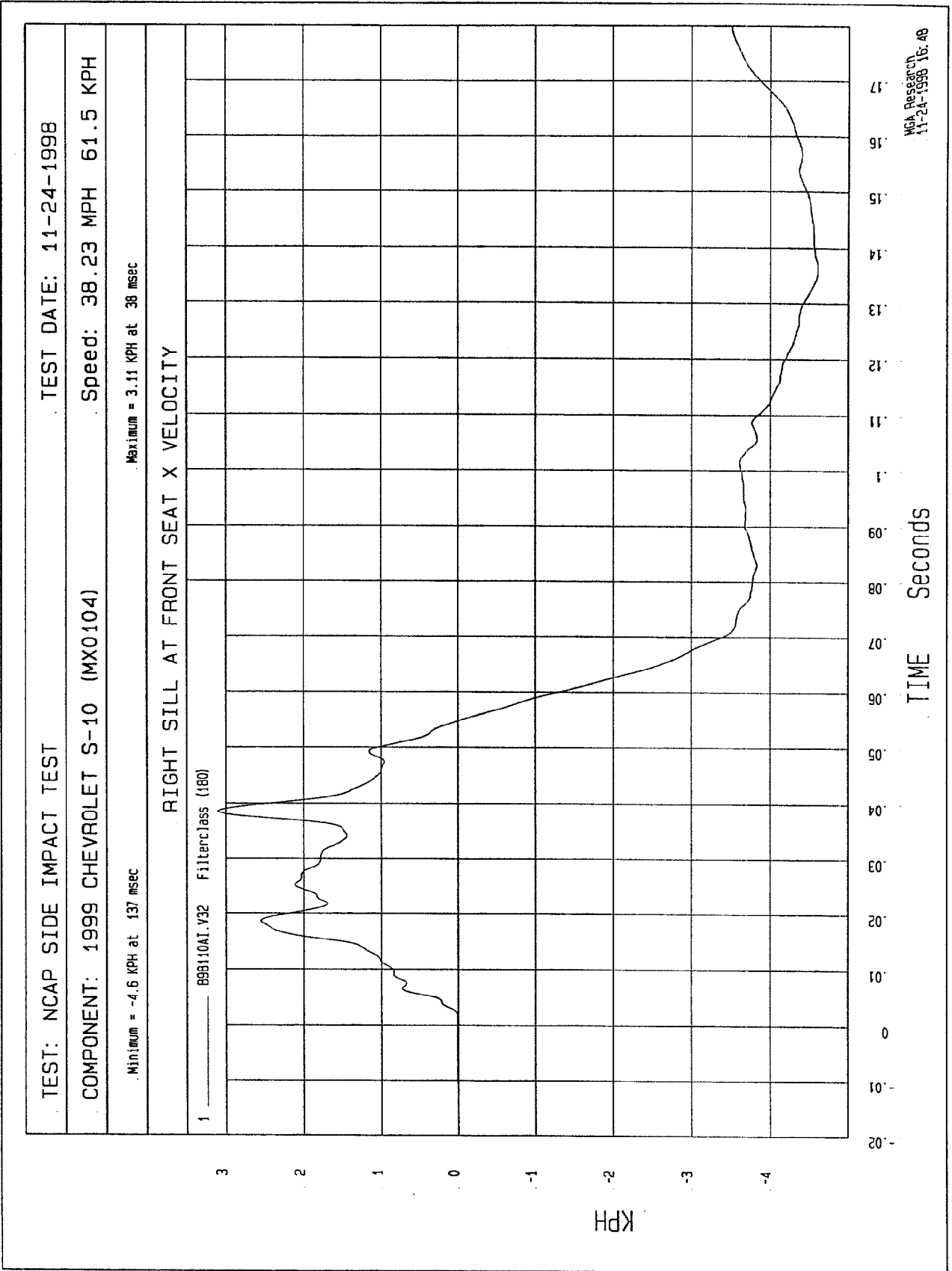
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -11.16 G'S at 41 msec Maximum = 10.33 G'S at 37 msec

RIGHT SILL AT FRONT SEAT X ACCELERATION



MCA Research
11-24-1998 16:48



TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

Speed: 38.23 MPH 61.5 KPH

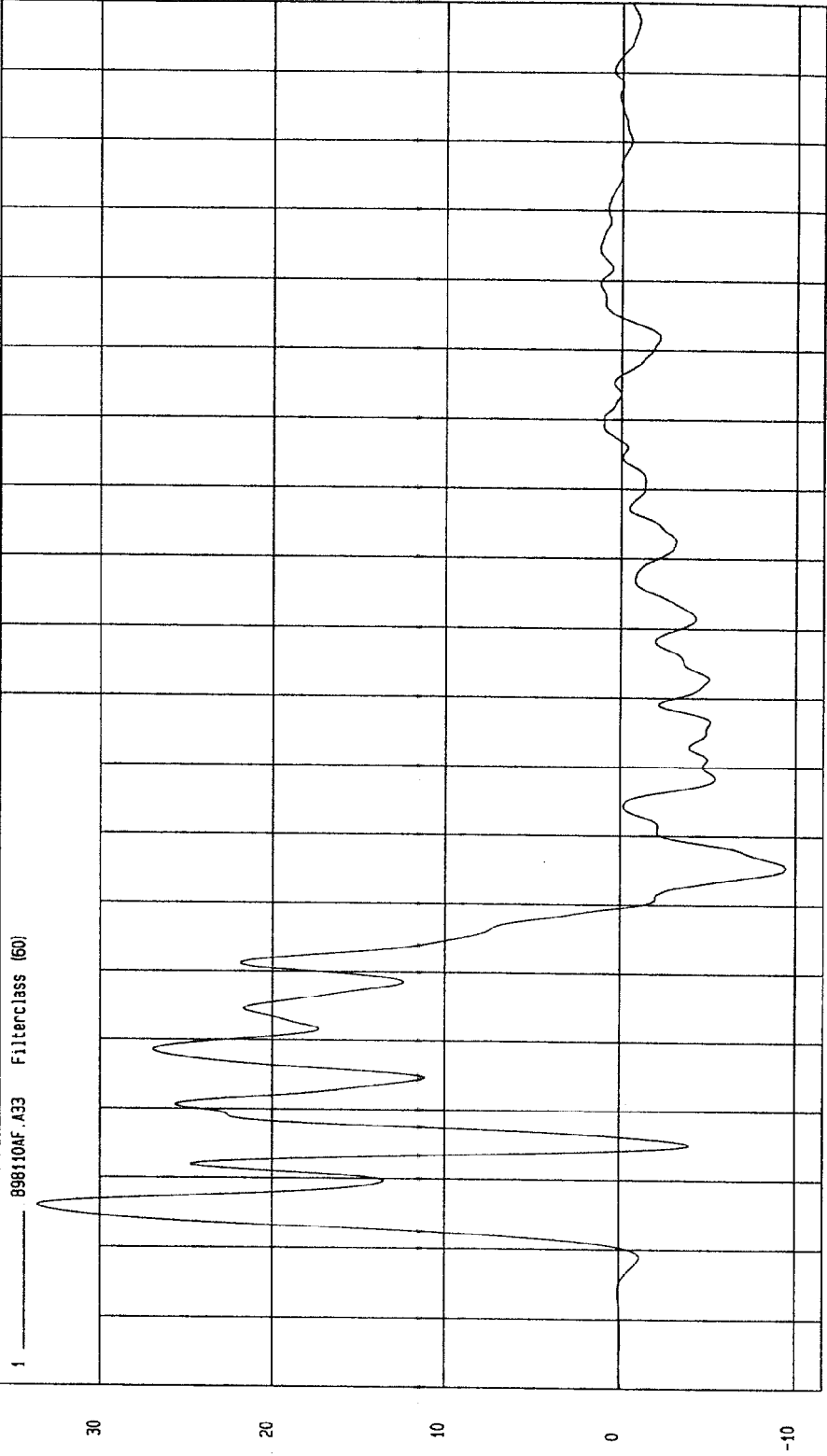
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 33.57 G'S at 6 msec

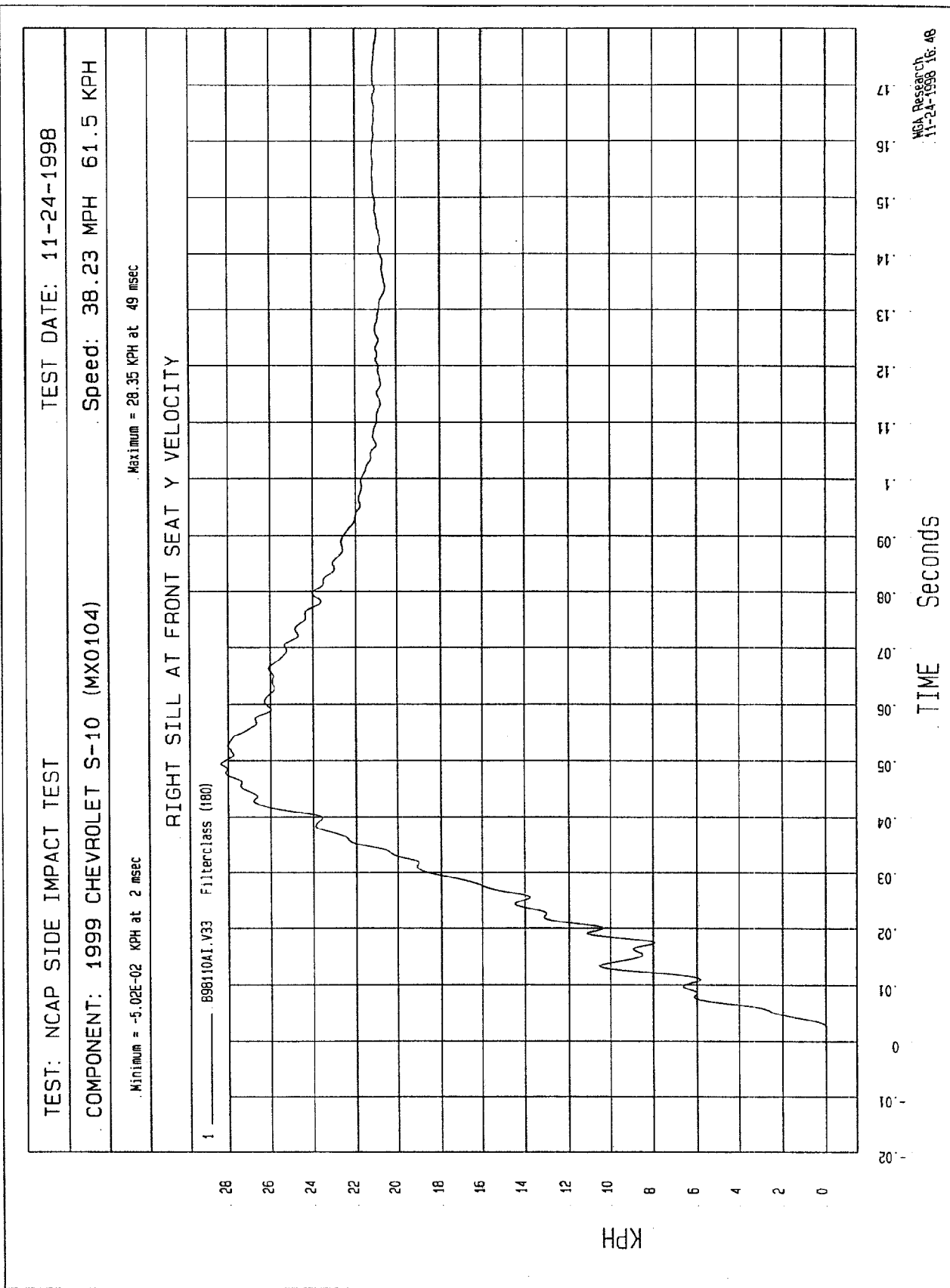
Minimum = -9.44 G'S at 56 msec

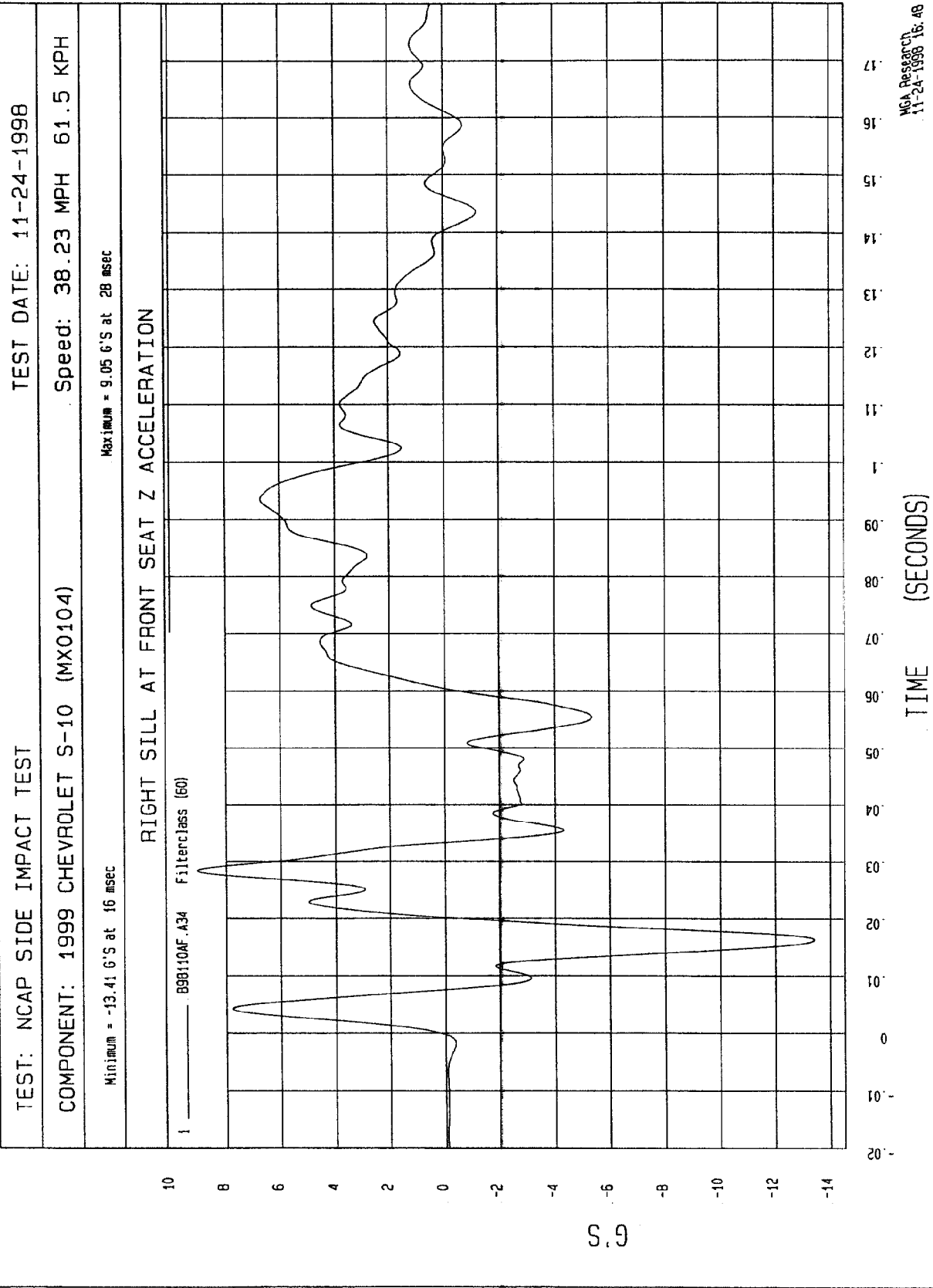
RIGHT SILL AT FRONT SEAT Y ACCELERATION

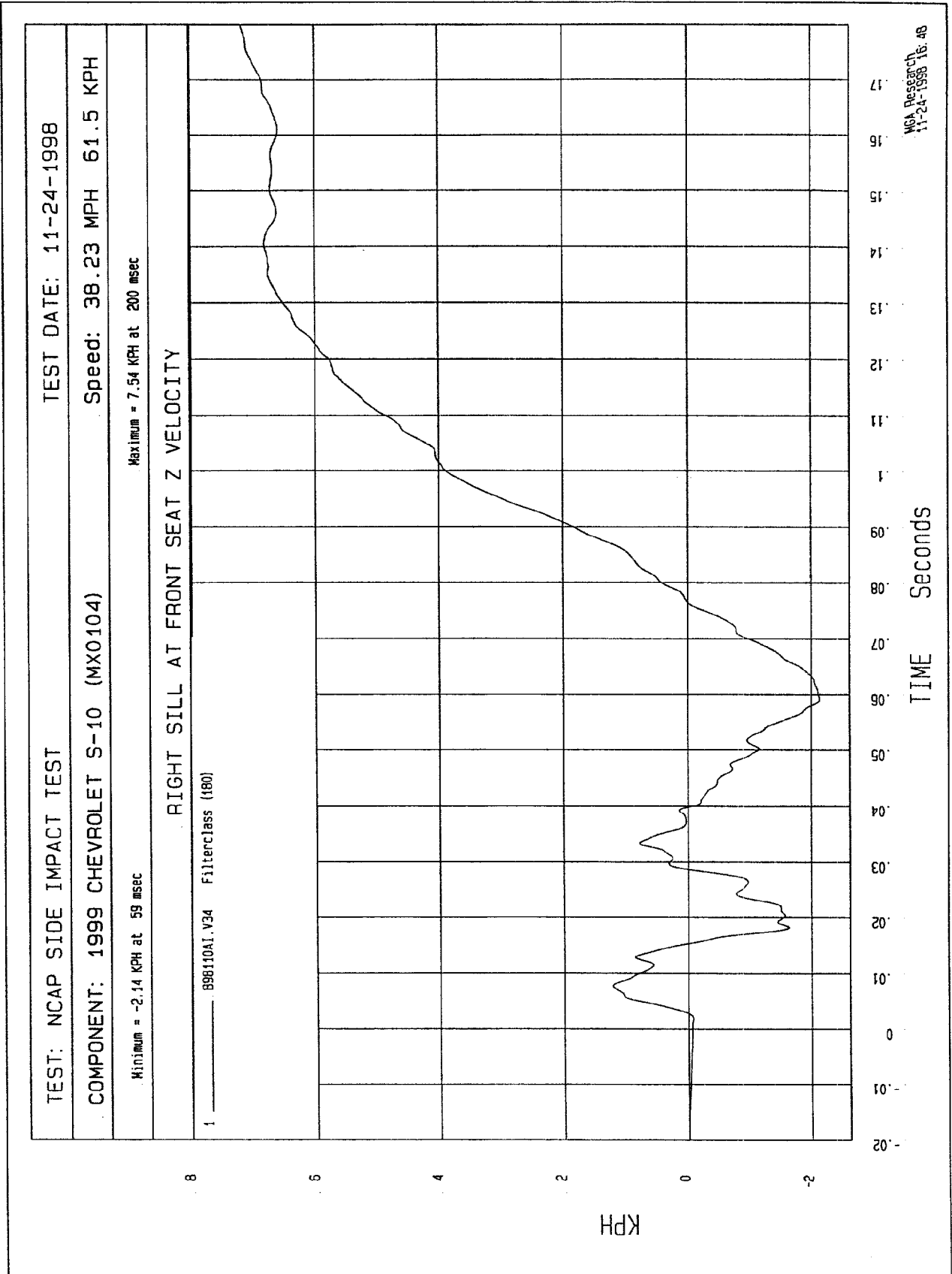
1 ——— 898104F.A33 Filterclass (60)



MCA Research
11-24-1998 16:48





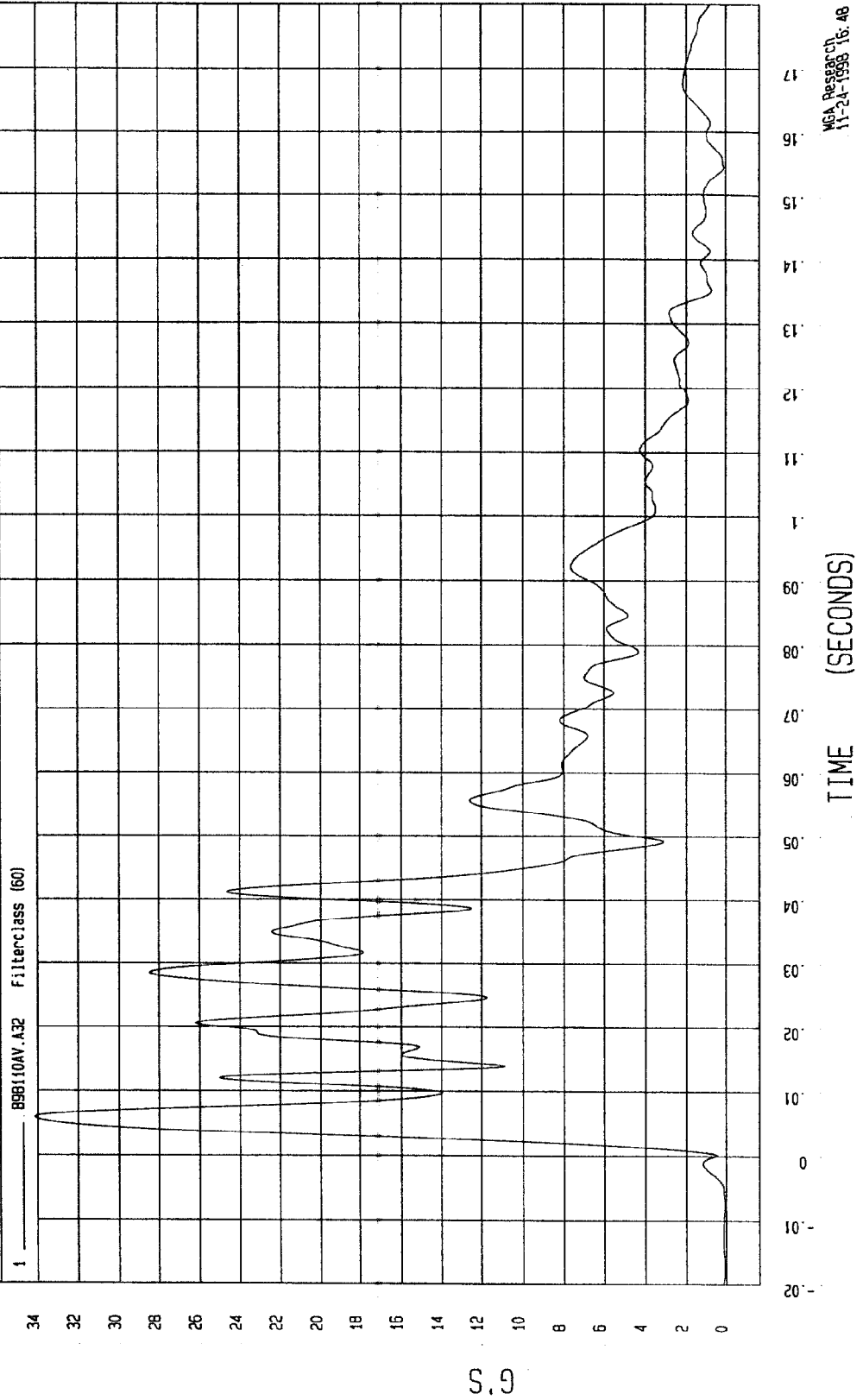


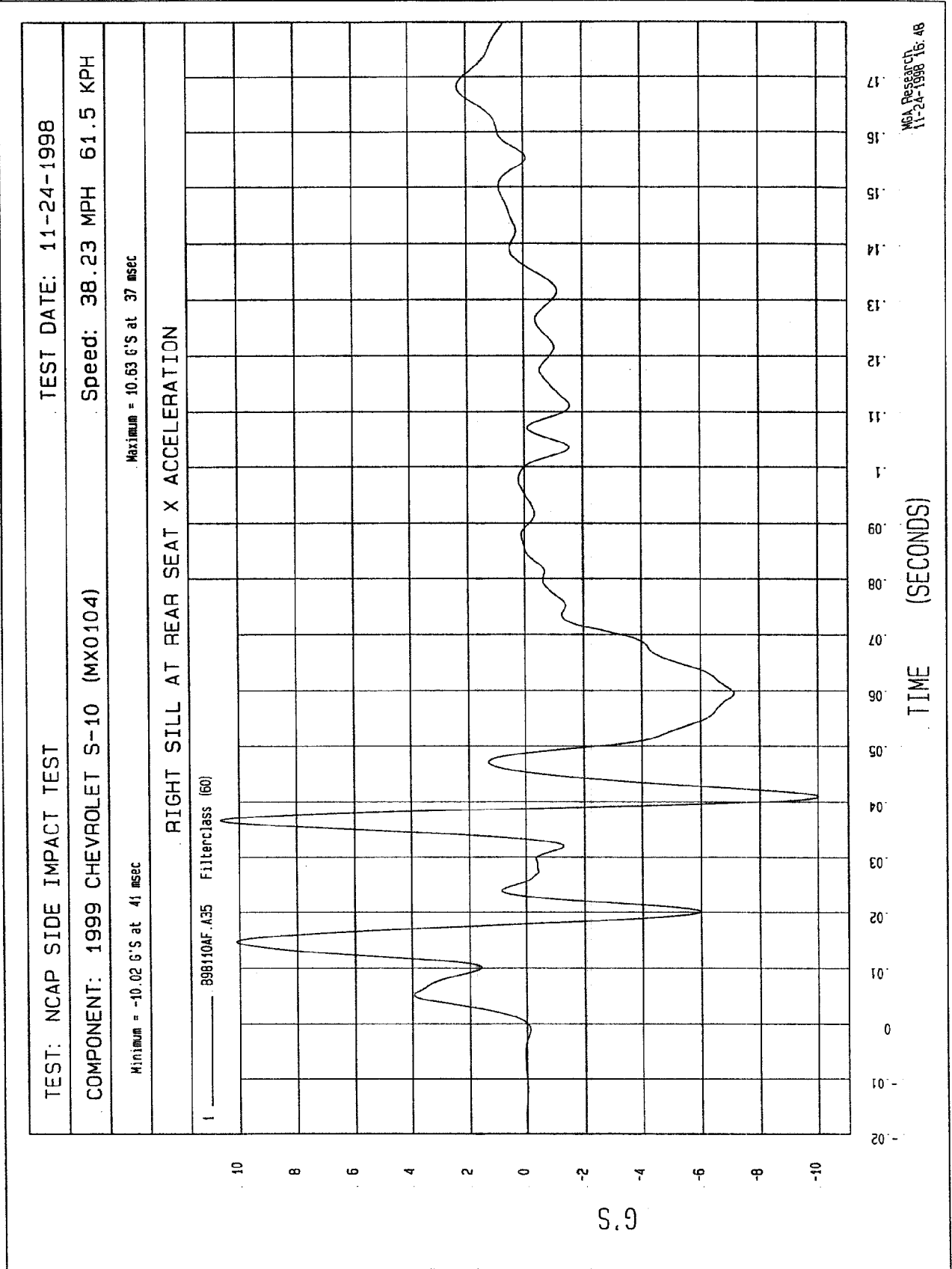
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

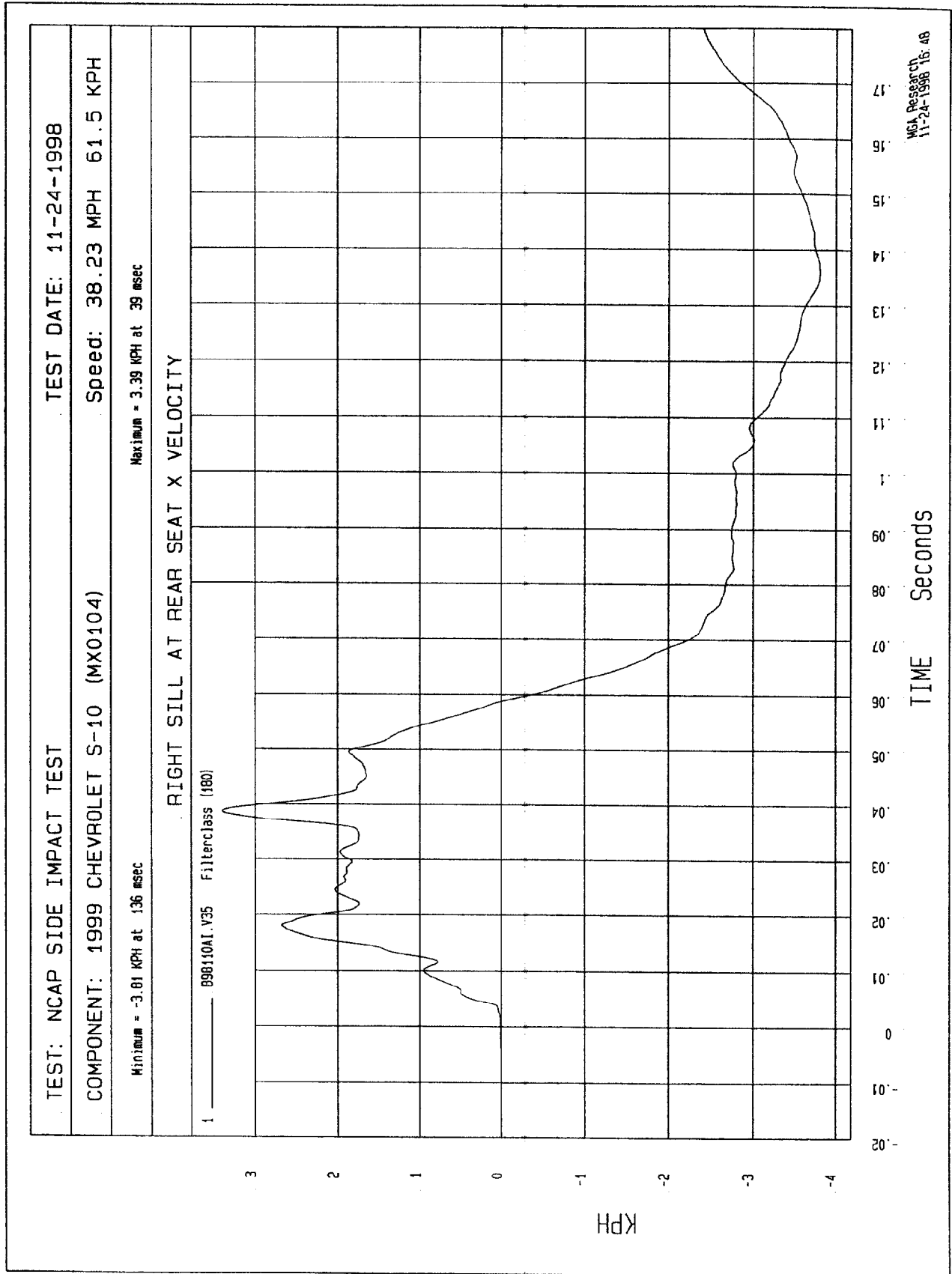
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

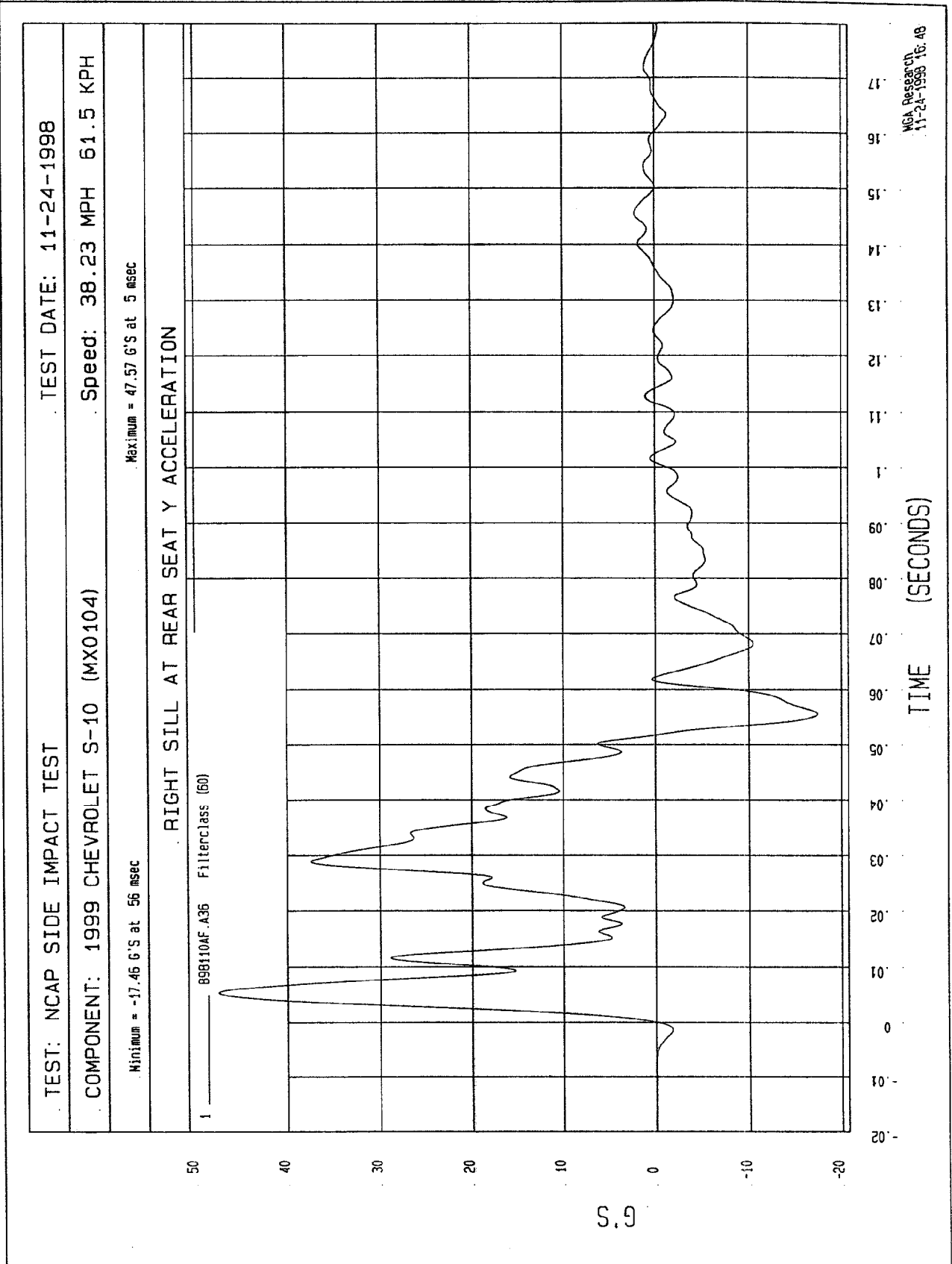
Minimum = 7.14E-02 G'S at -18 msec Maximum = 34.13 G'S at 6 msec

RIGHT SILL AT FRONT SEAT RESULTANT ACCELERATION

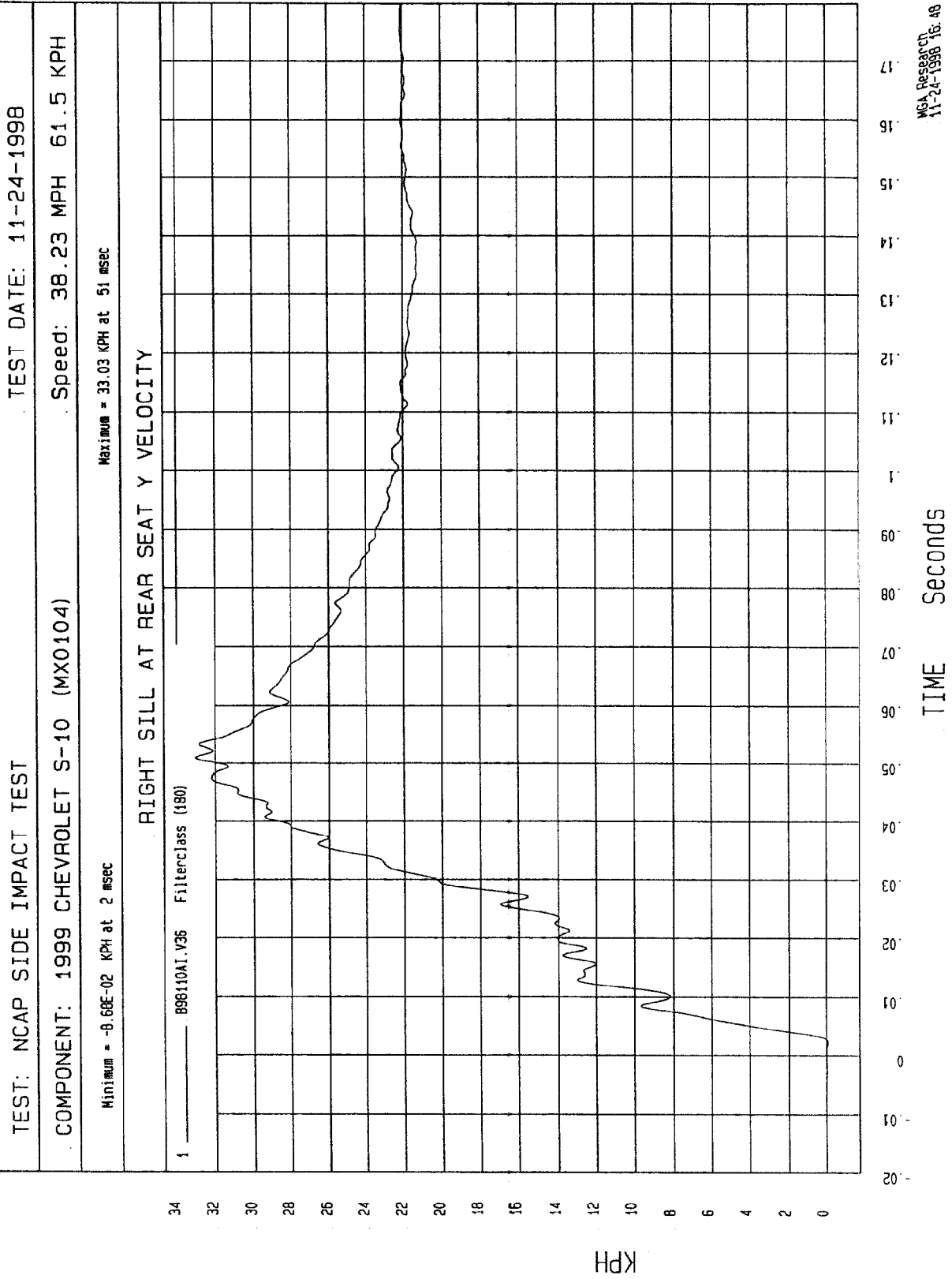


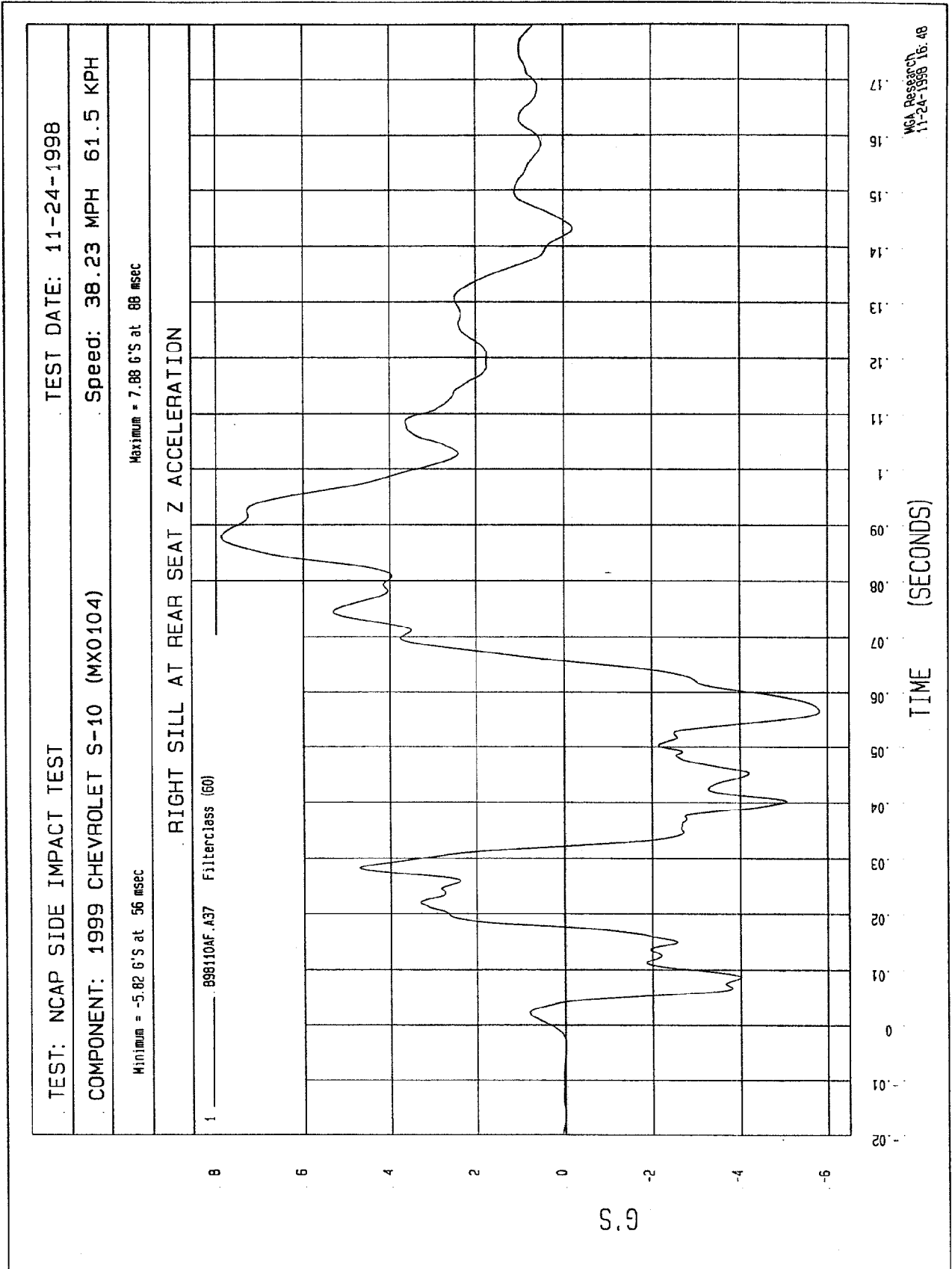






MGA Research
11-24-1998 16:48





TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

SPEED: 38.23 MPH 61.5 KPH

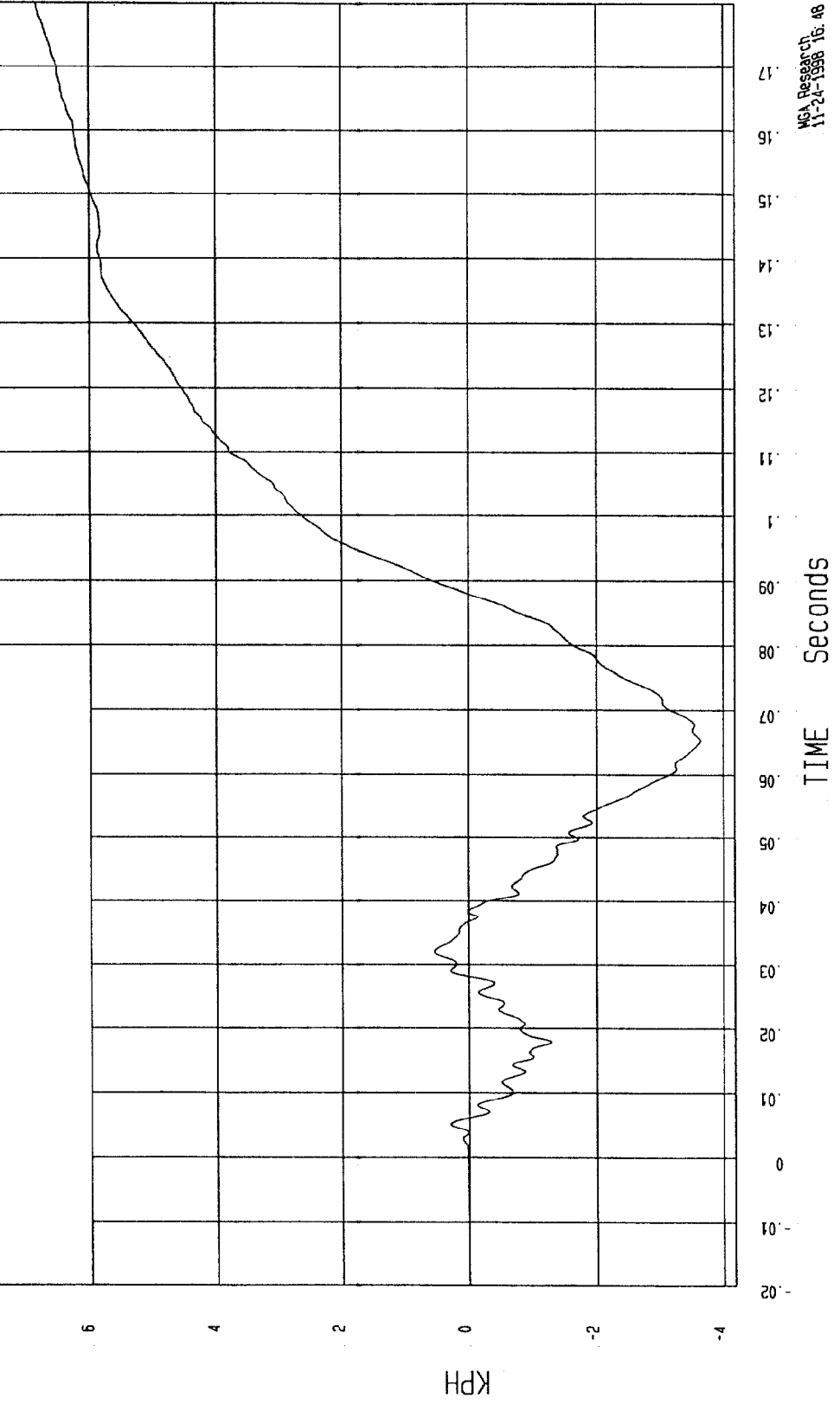
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 7.3 KPH at 200 msec

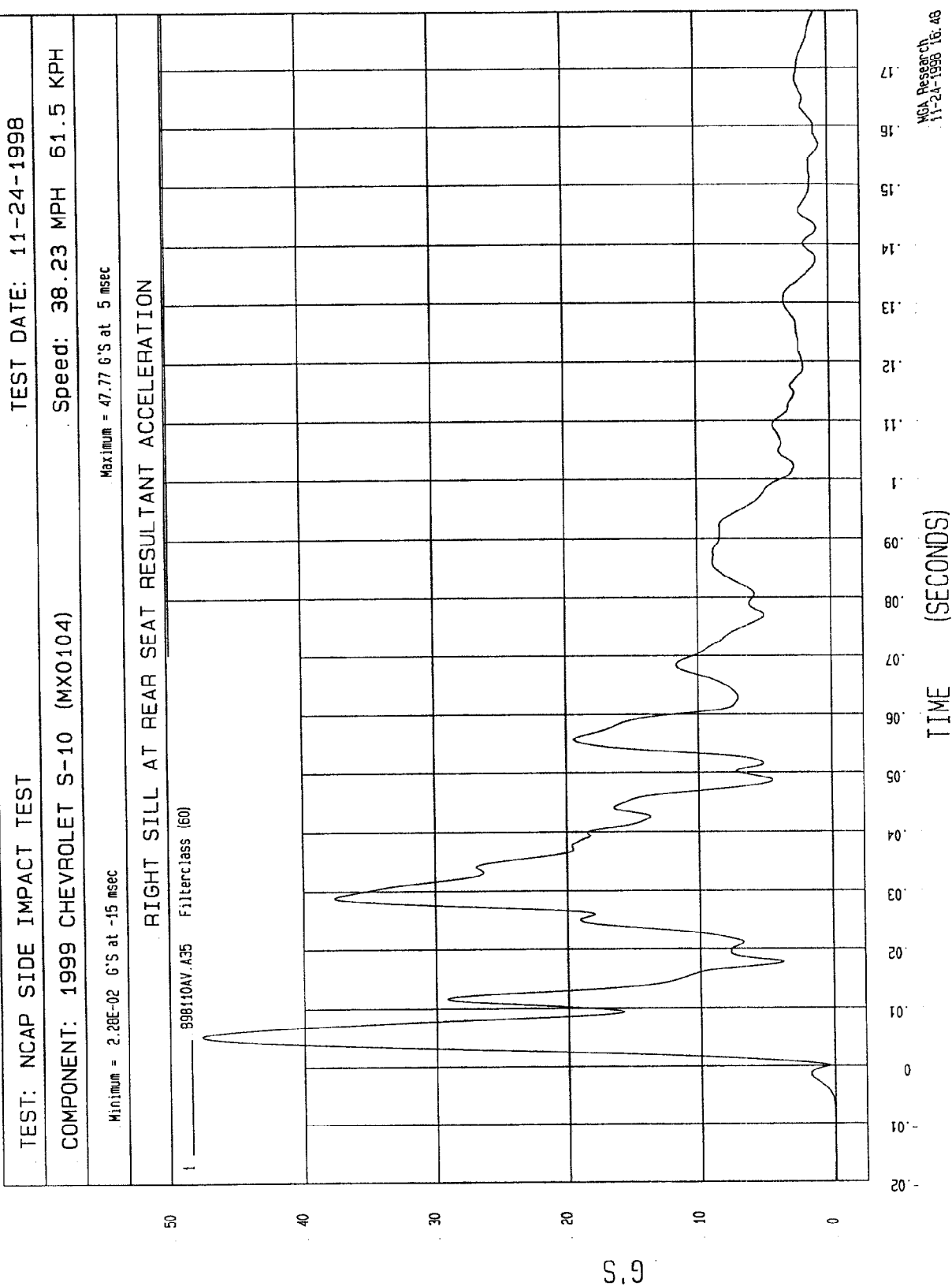
Minimum = -3.64 KPH at 65 msec

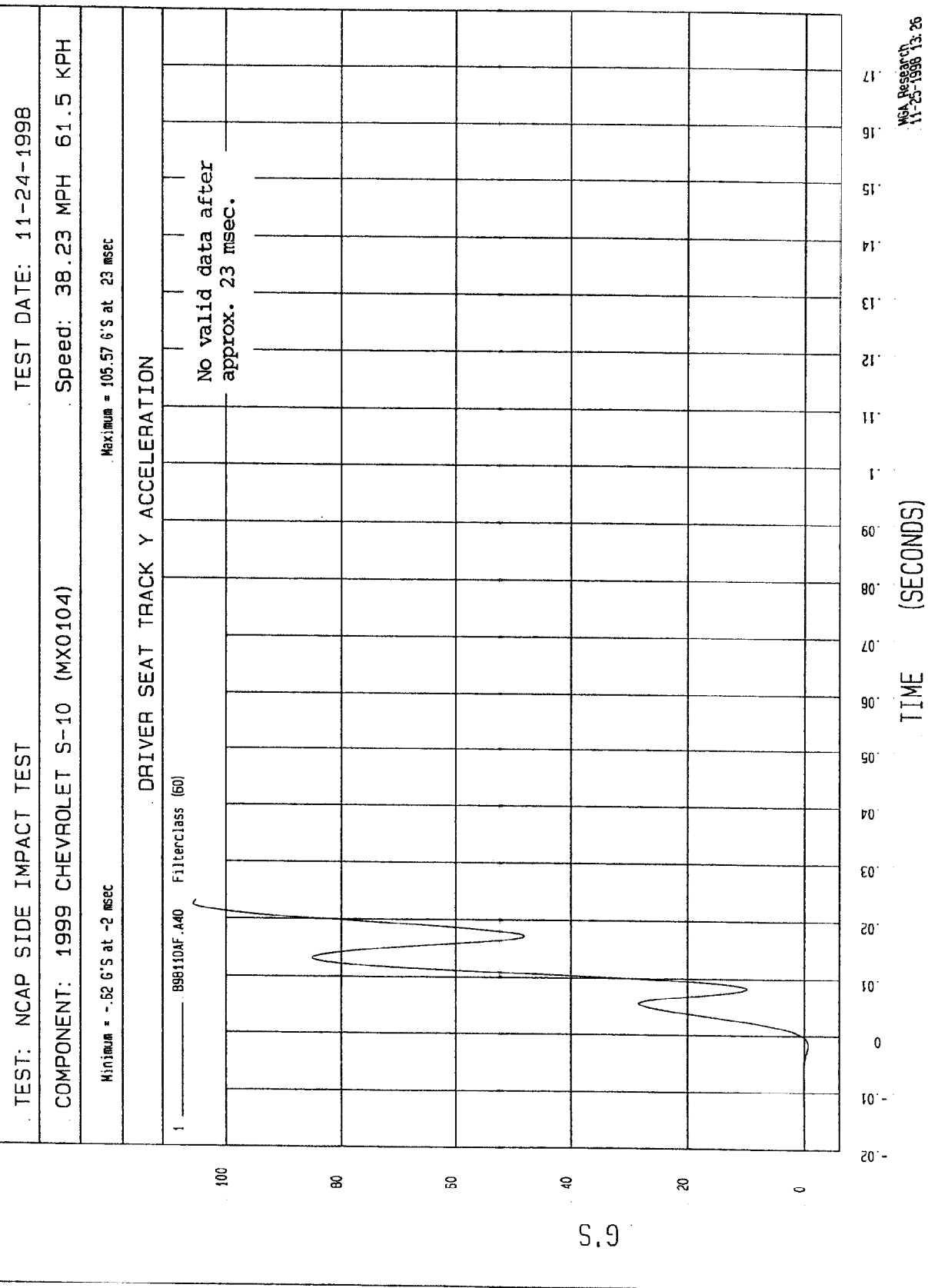
RIGHT SILL AT REAR SEAT Z VELOCITY

1 898110A1.V37 FilterClass (180)



MCA Research
11-24-1998 16:48



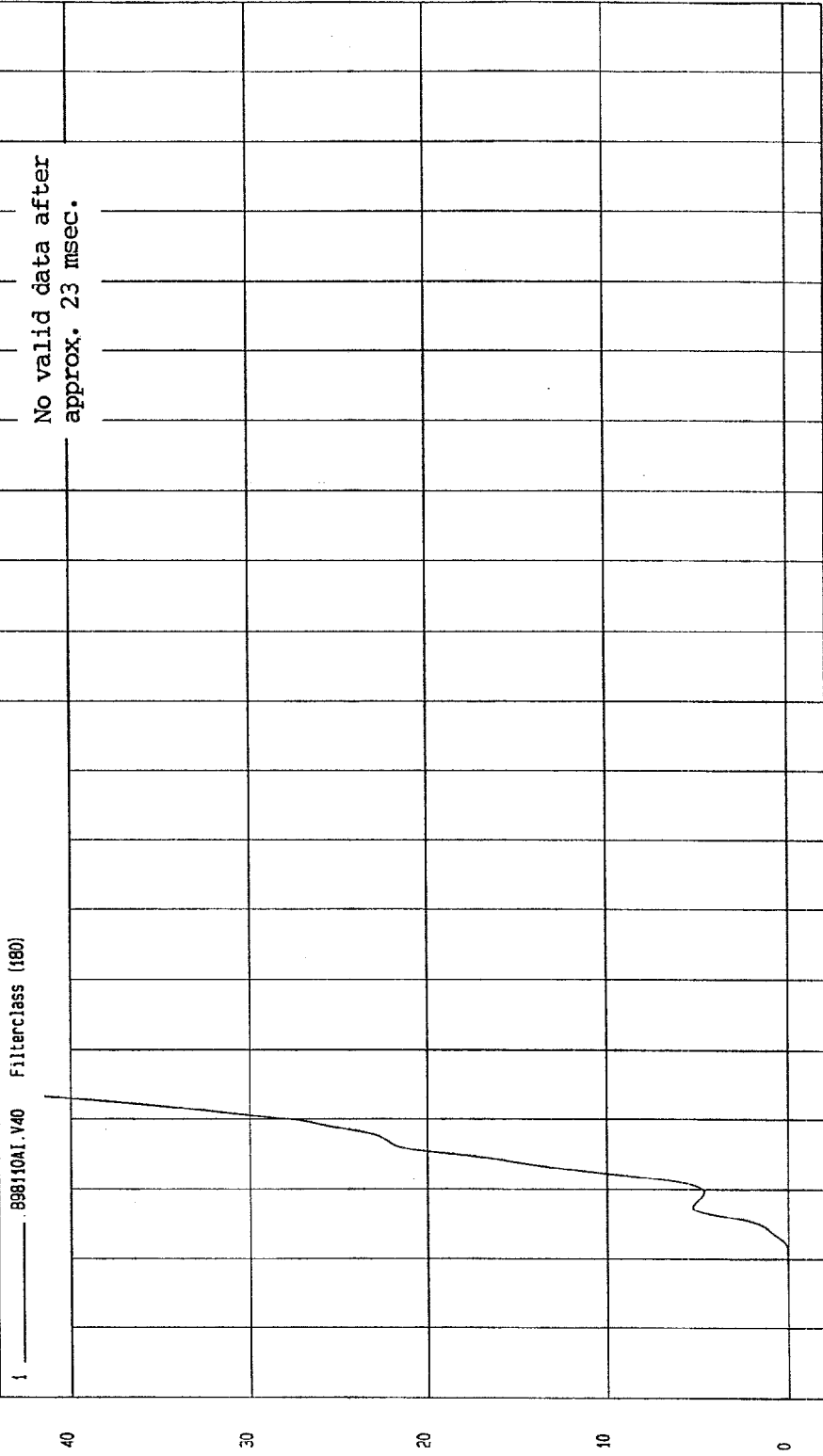


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -7.19E-03 KPH at -13 msec Maximum = 41.92 KPH at 23 msec

DRIVER SEAT TRACK Y VELOCITY



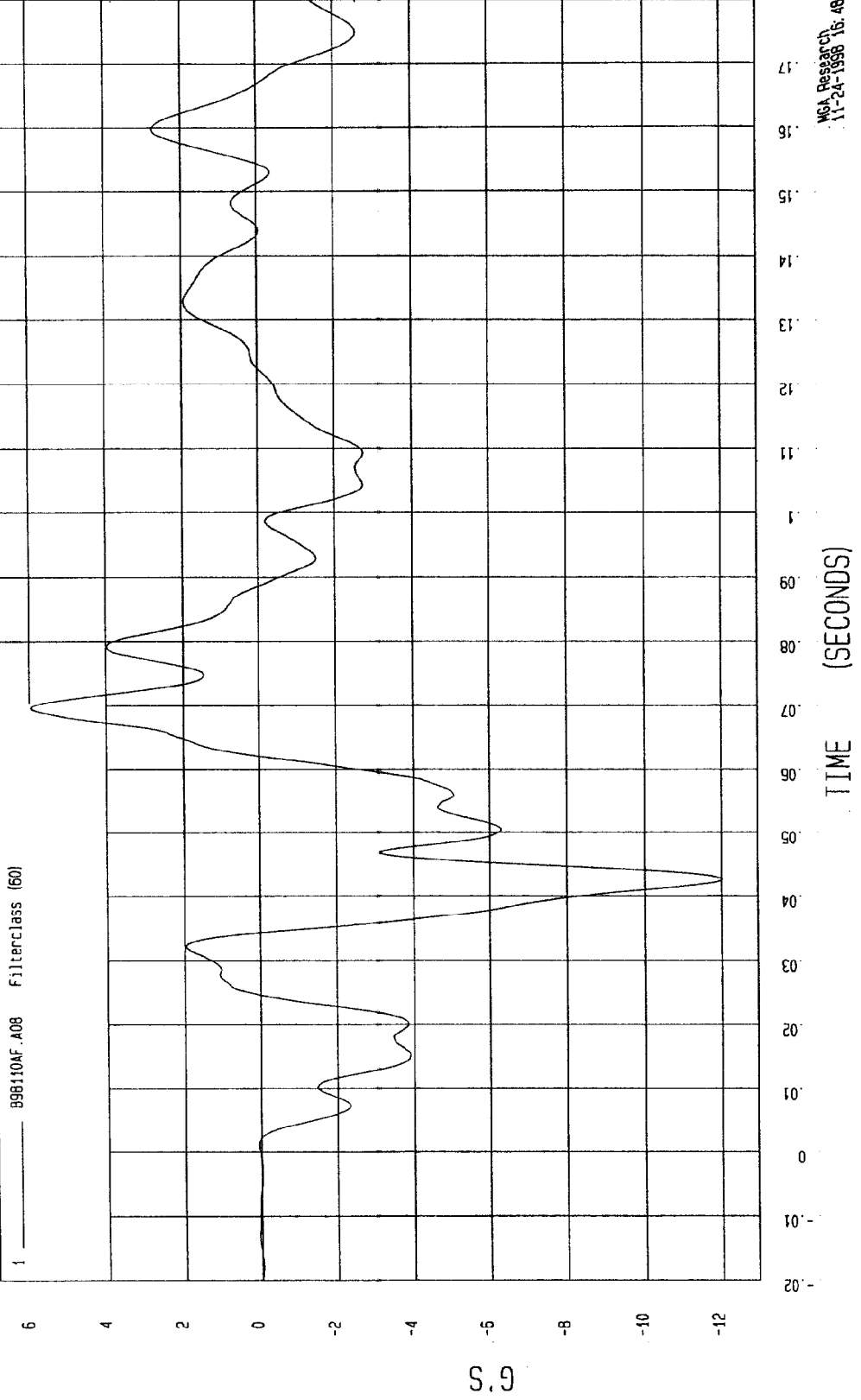
NCA Research
11-25-1998 13.26

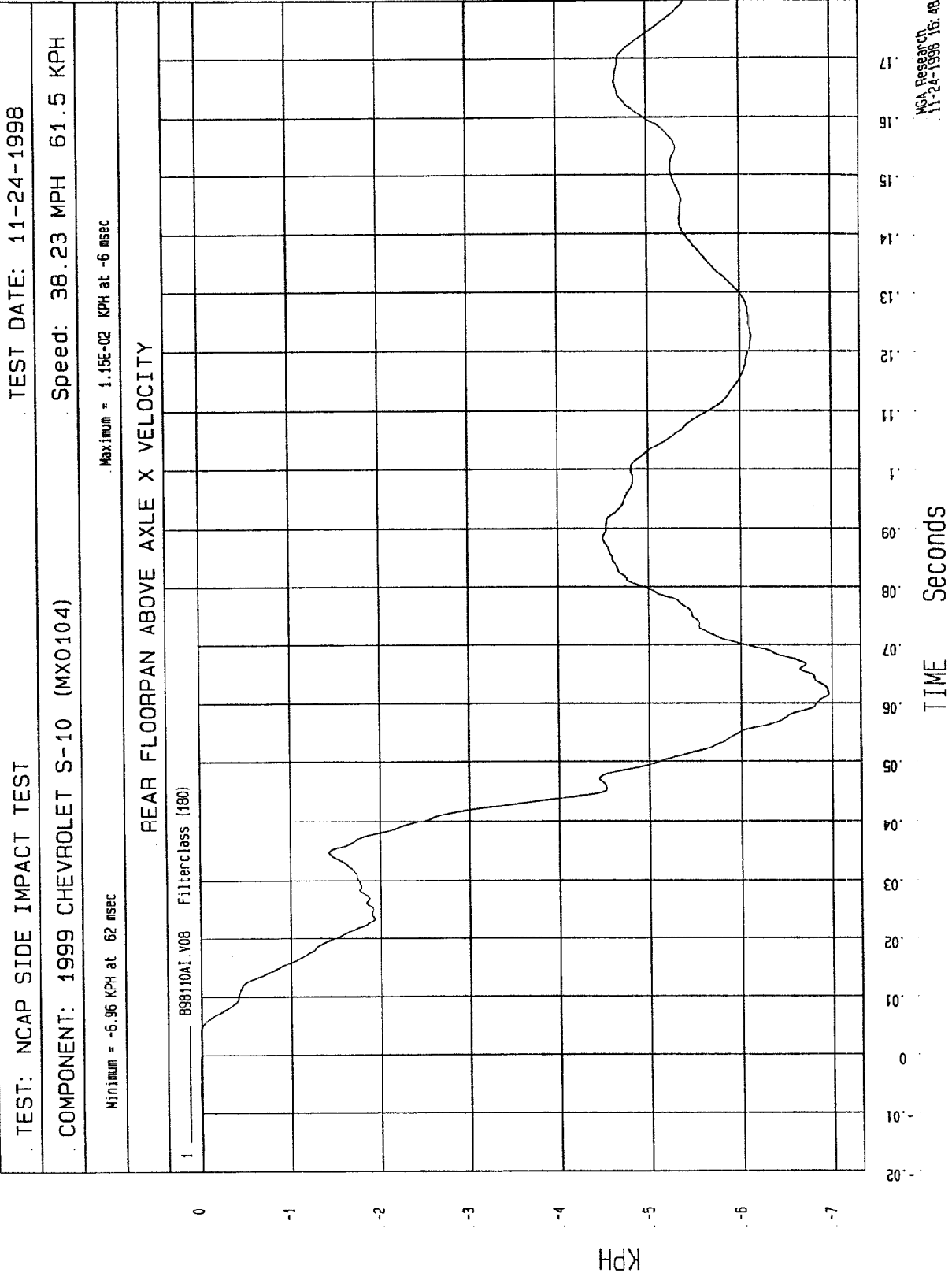
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -12.02 G'S at 43 msec Maximum = 5.96 G'S at 70 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION





TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

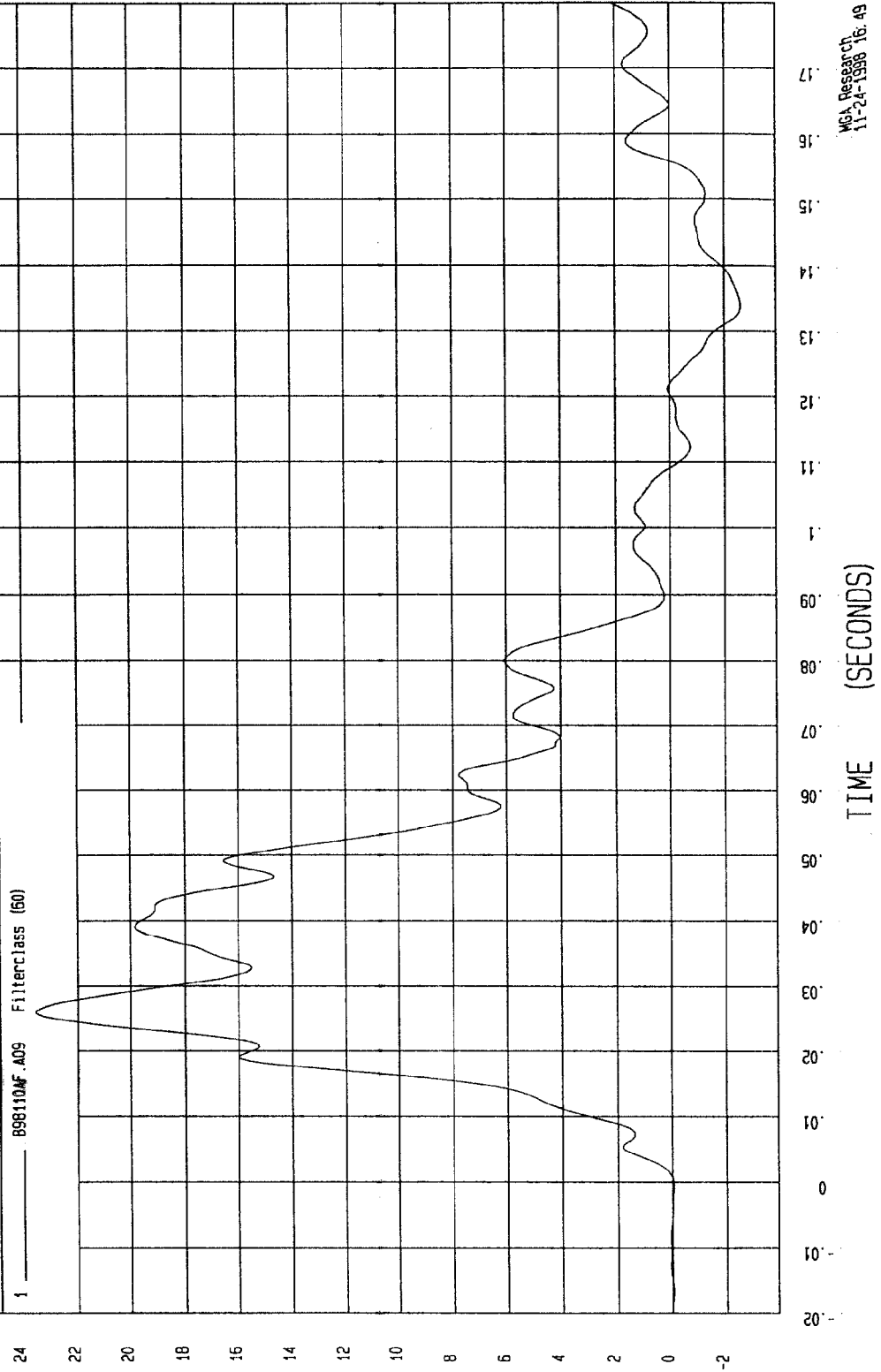
Speed: 38.23 MPH 61.5 KPH

COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 23.53 G'S at 26 msec

Minimum = -2.59 G'S at 134 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION



MOA Research
11-24-1998 16:49

TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

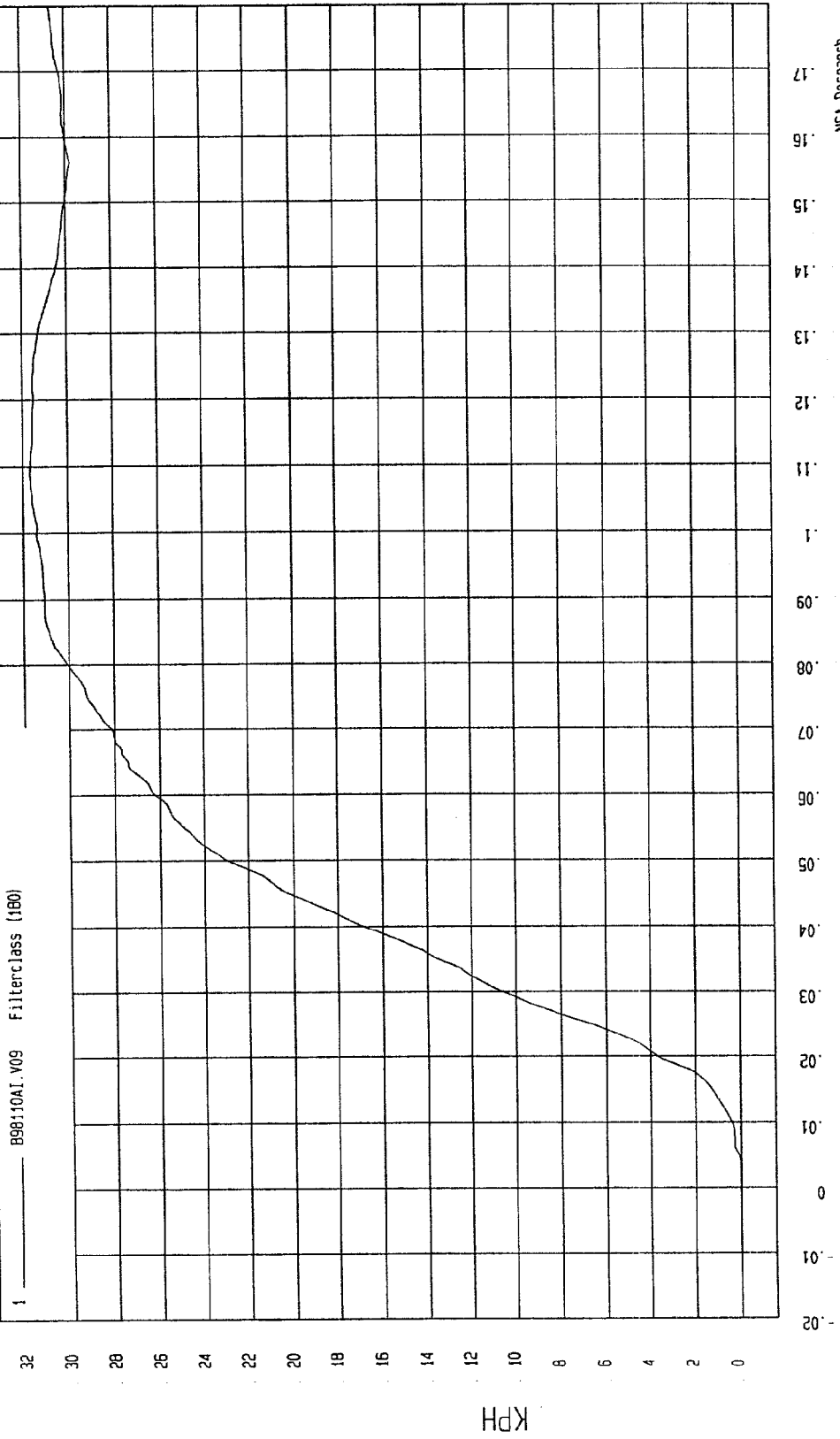
Speed: 38.23 MPH 61.5 KPH

COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 31.8 KPH at 200 msec

Minimum = -7.56E-03 KPH at -15 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY



MCA Research
11-24-1998 16:49

TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

Speed: 38.23 MPH 61.5 KPH

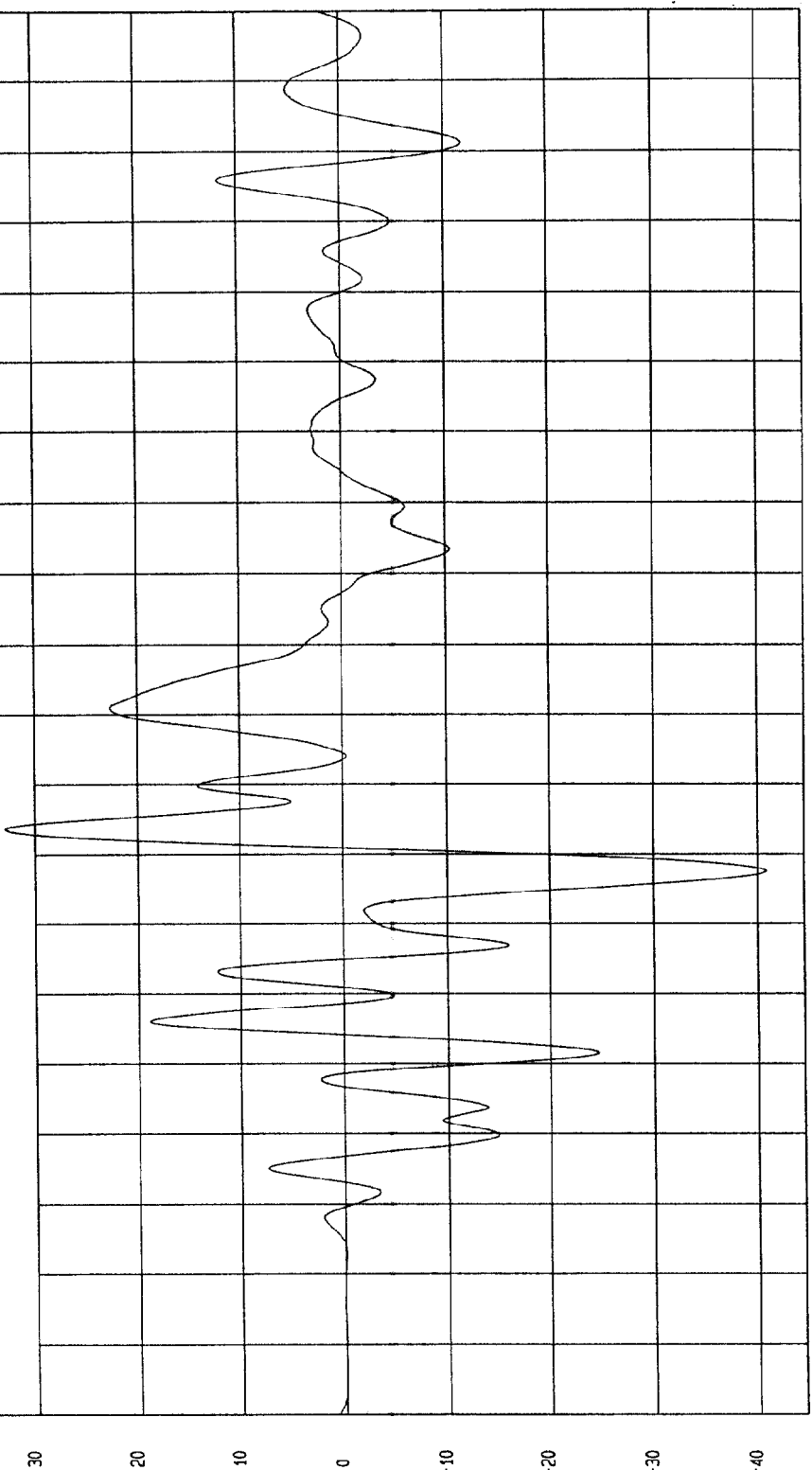
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 32.86 G'S at 64 msec

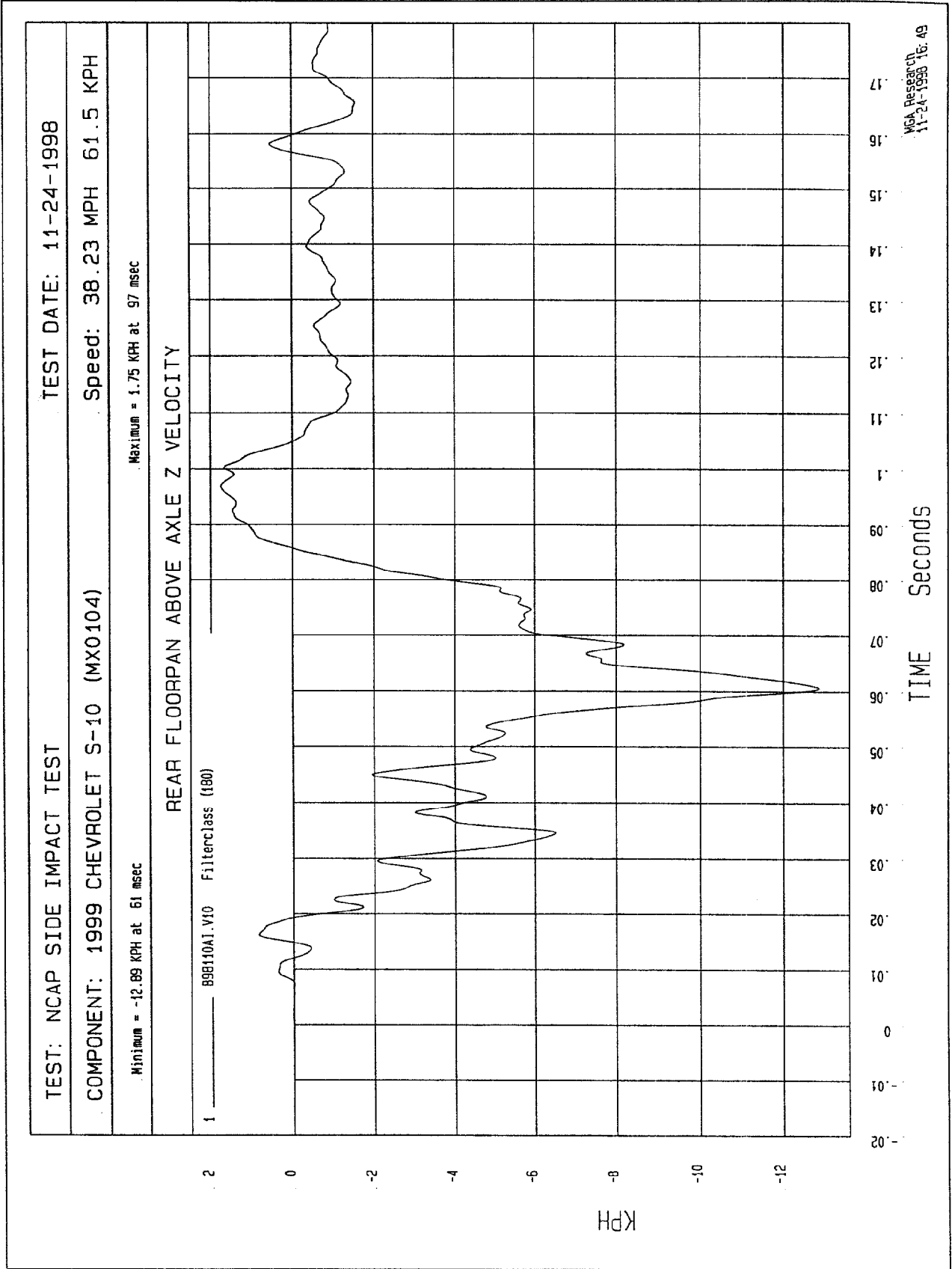
Minimum = -40.85 G'S at 58 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

1 698110AF.A10 Filterclass (60)



MCA Research
11-24-1998 16:49



TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

Speed: 38.23 MPH 61.5 KPH

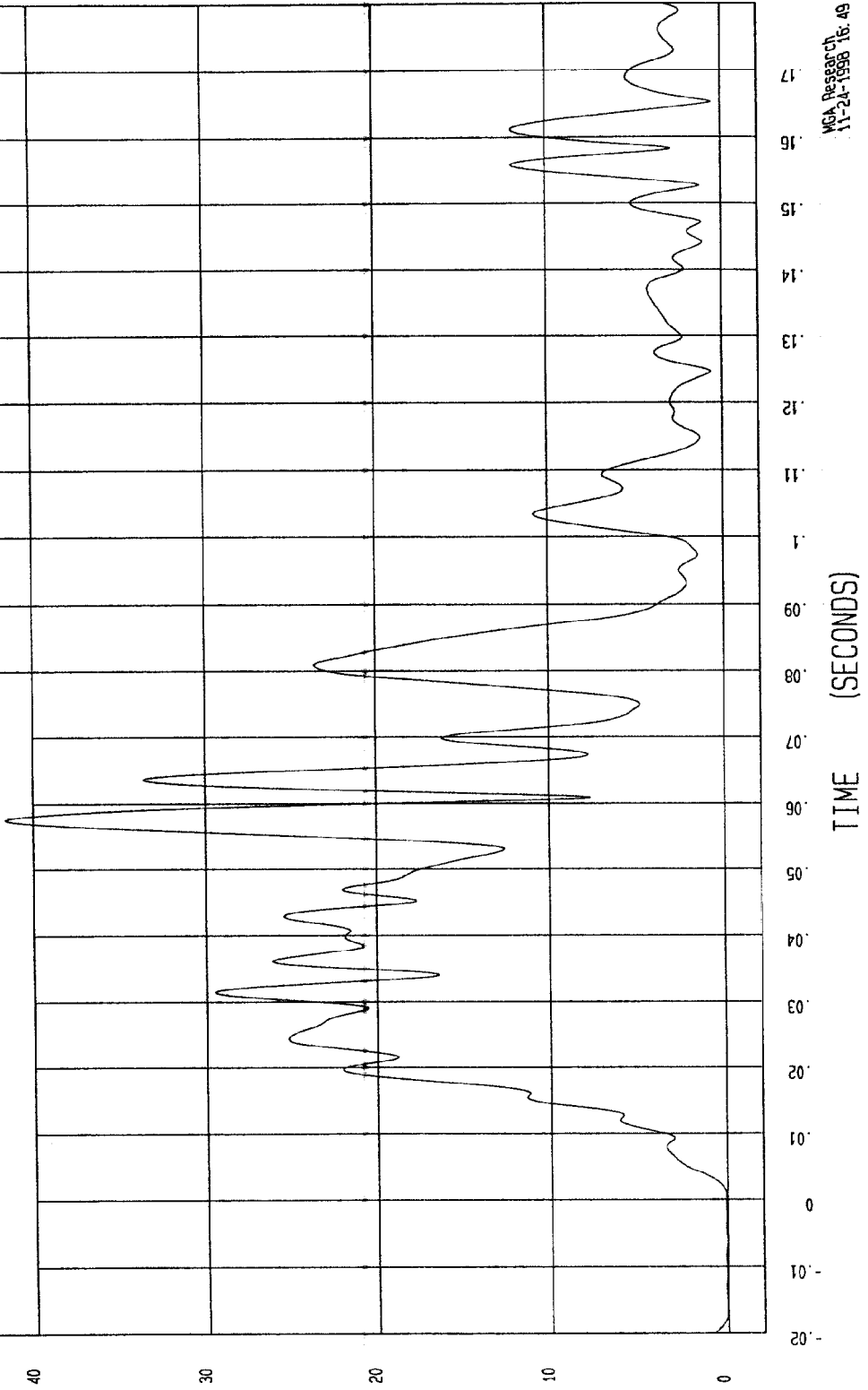
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 41.57 G'S at 58 msec

Minimum = 1.92E-02 G'S at -6 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

1 998110AV.A08 Filterclass (60)



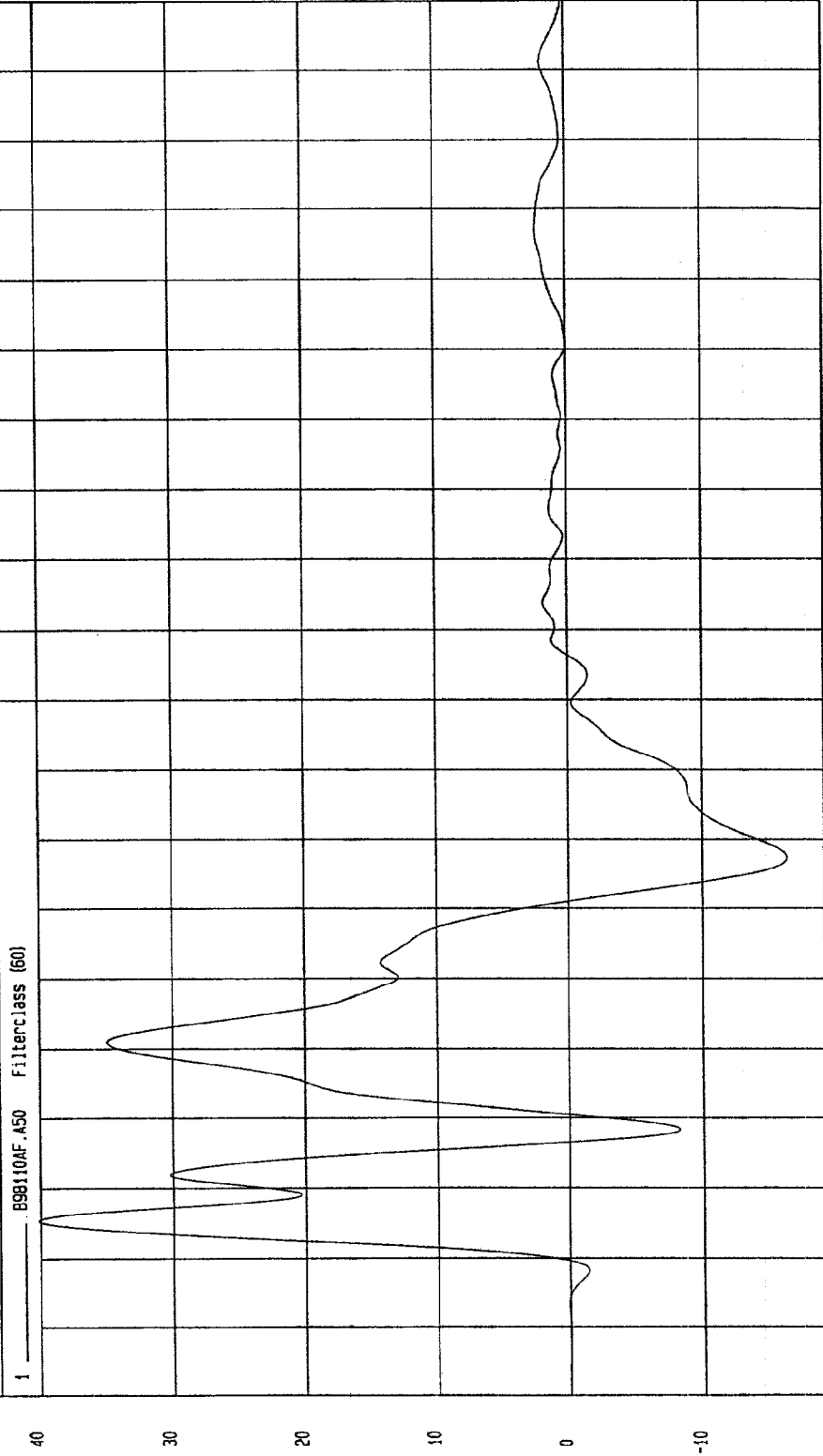
MCA Research
11-24-1998 15:49

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

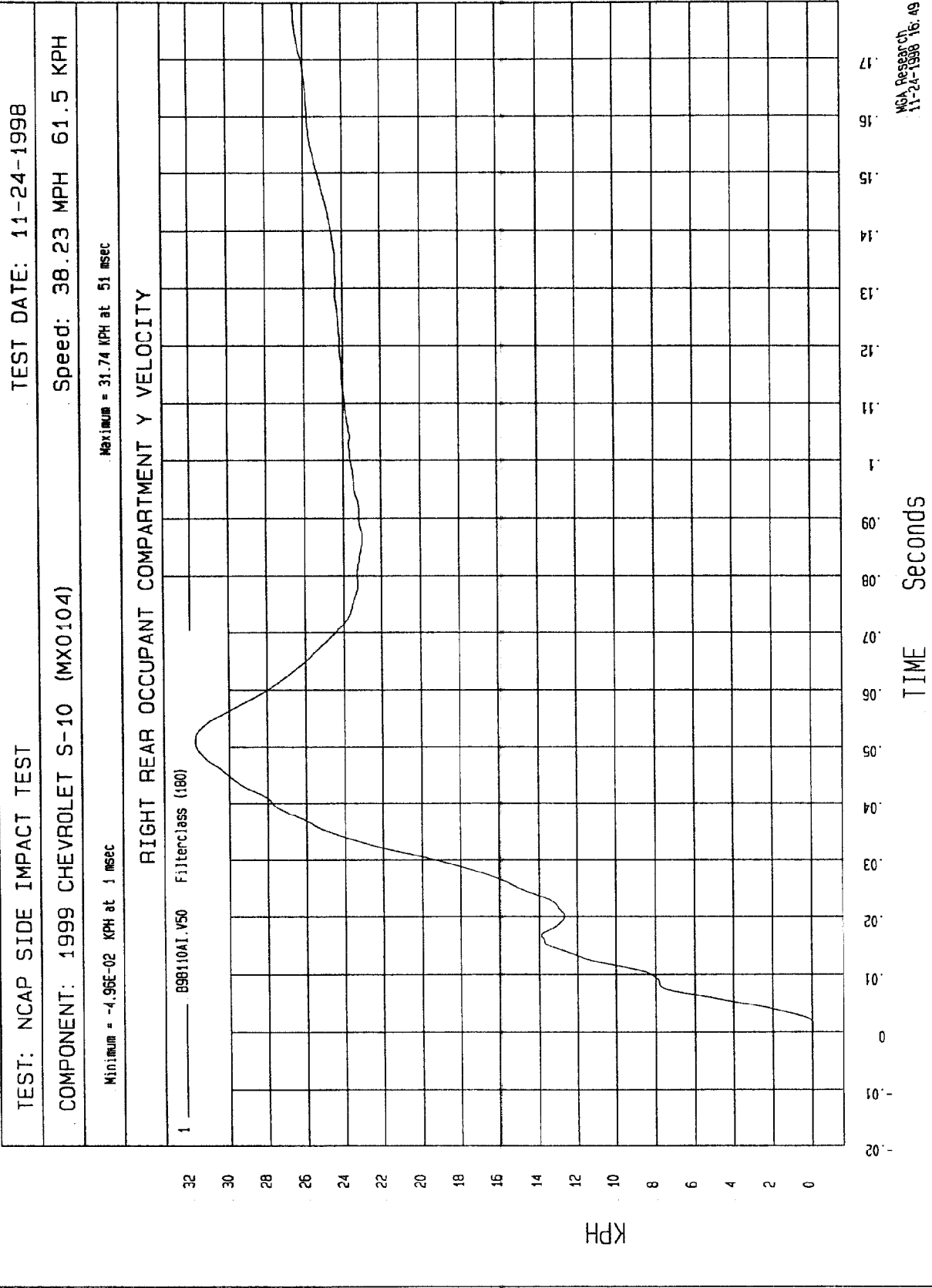
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -16.35 G's at 57 msec Maximum = 40.15 G's at 5 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION



NCA Research
11-24-1998 16:49

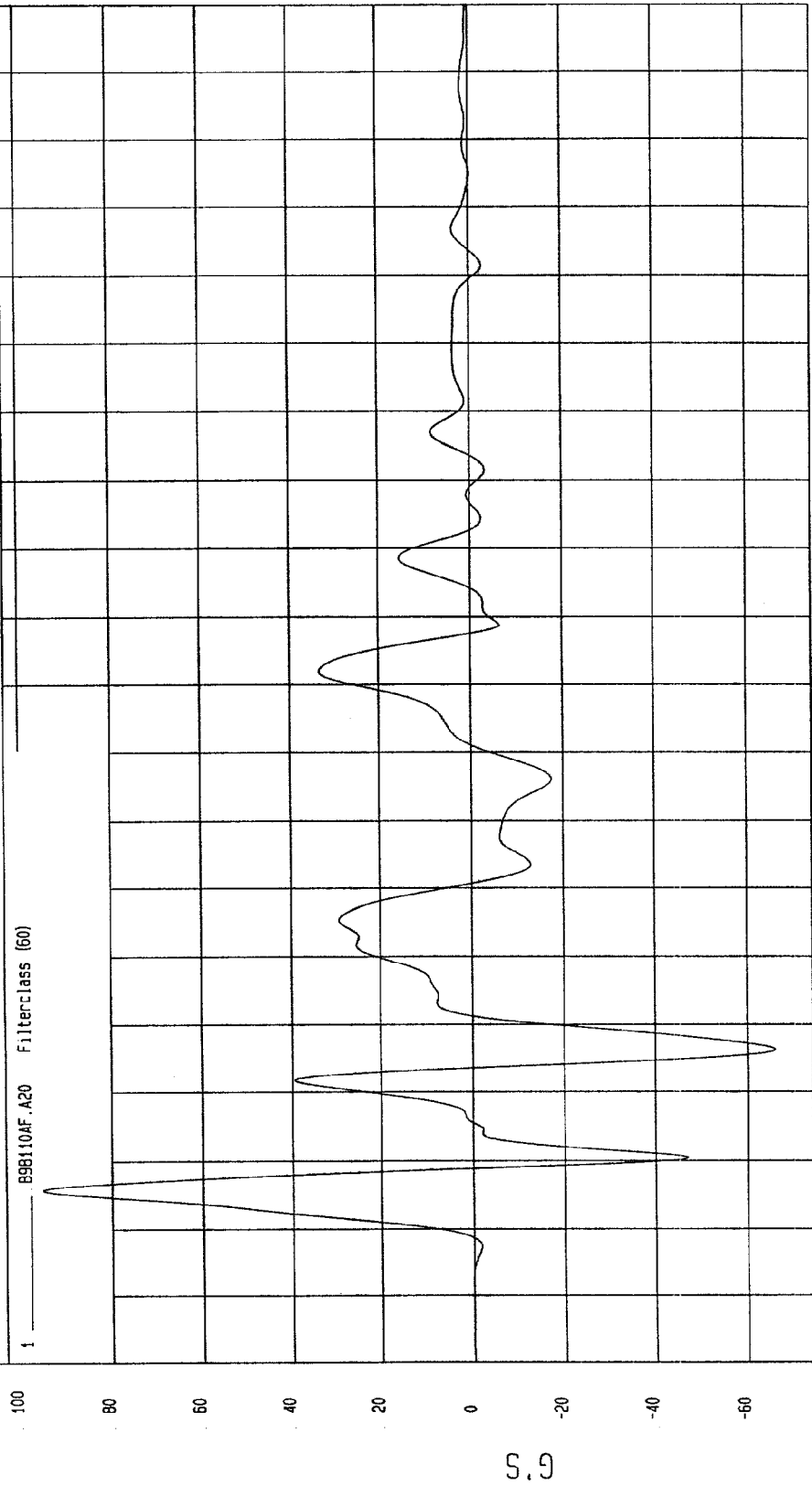


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -66.13 G'S at 26 msec Maximum = 95.08 G'S at 6 msec

LEFT LOWER A-POST Y ACCELERATION



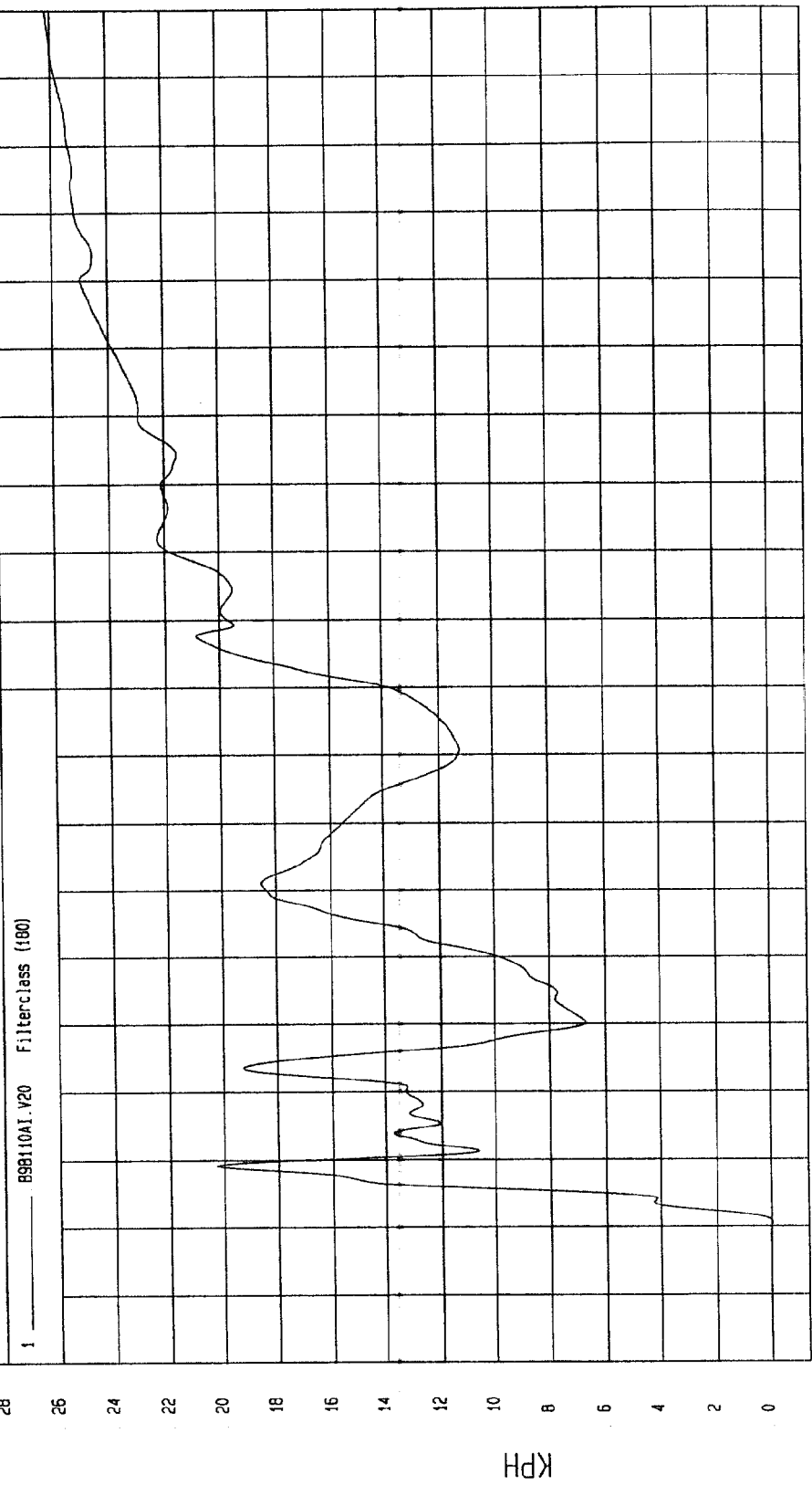
NCA Research
11-24-1998 16:49

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -4.23E-02 KPH at 1 msec Maximum = 26.67 KPH at 200 msec

LEFT LOWER A-POST Y VELOCITY



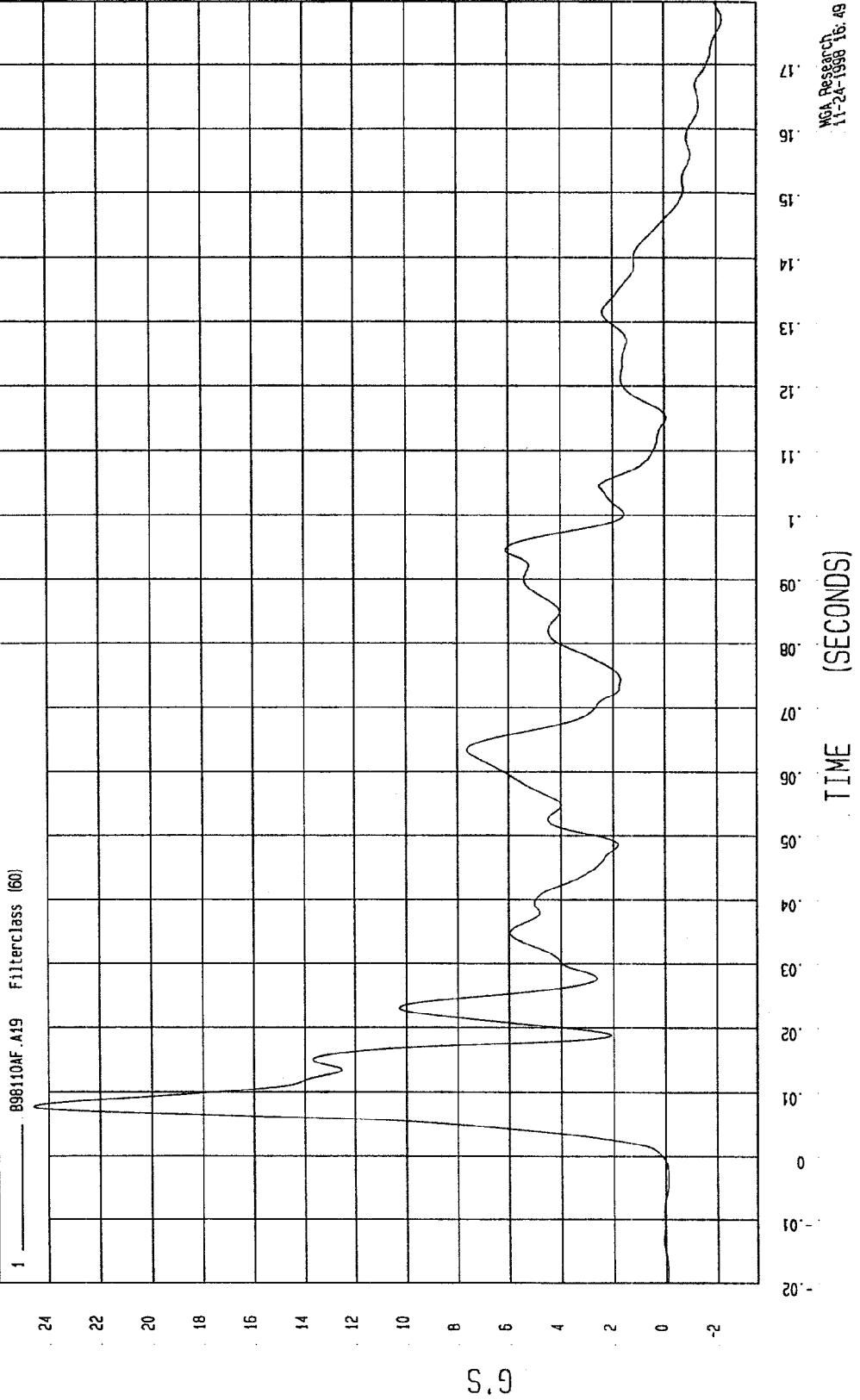
MCA Research
11-24-1998 15:49

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -2.21 G'S at 177 msec Maximum = 24.58 G'S at 8 msec

LEFT MID A-POST Y ACCELERATION



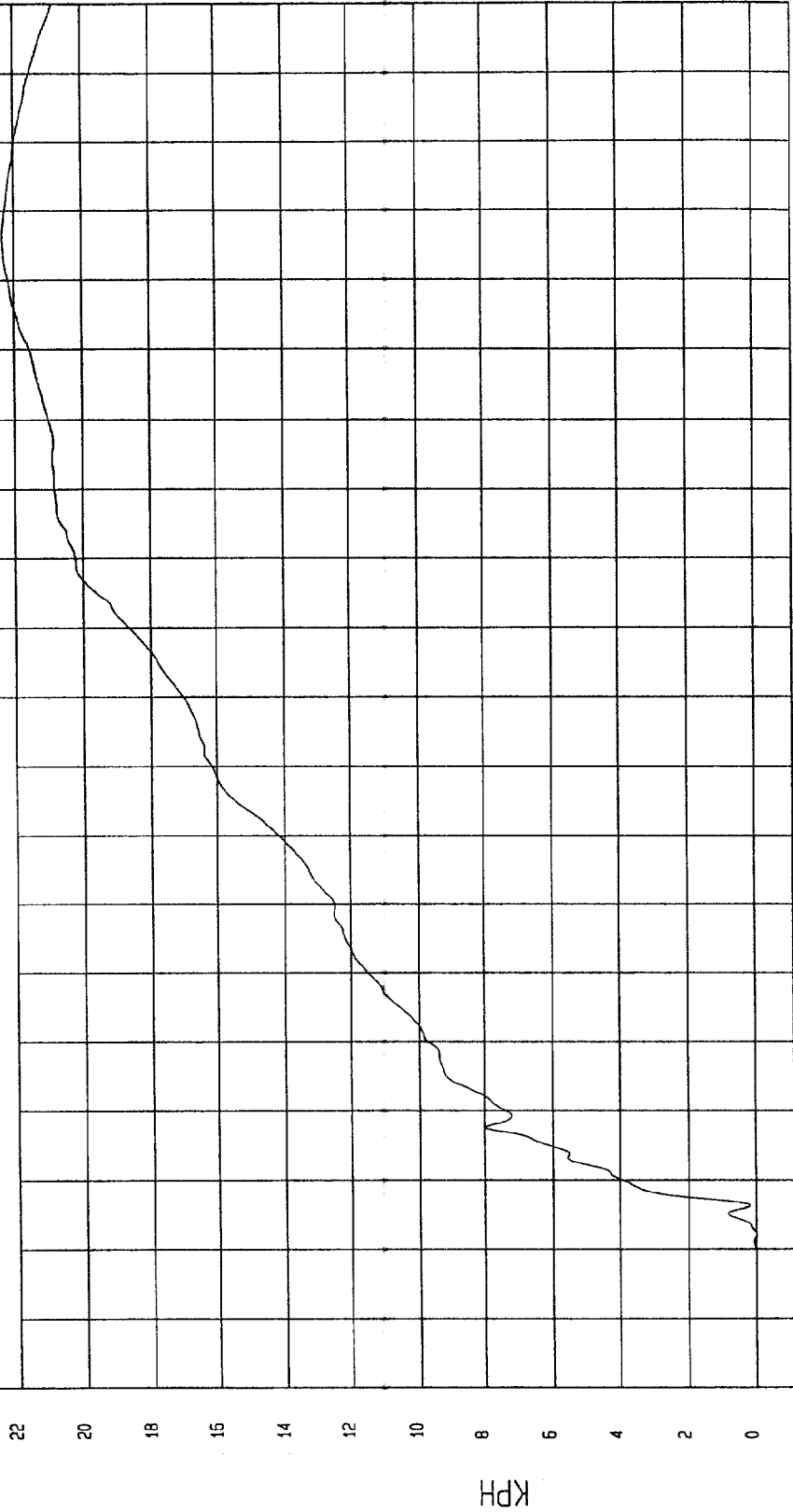
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 51.5 KPH

Minimum = -1.80E-02 KPH at 2 msec Maximum = 22.34 KPH at 146 msec

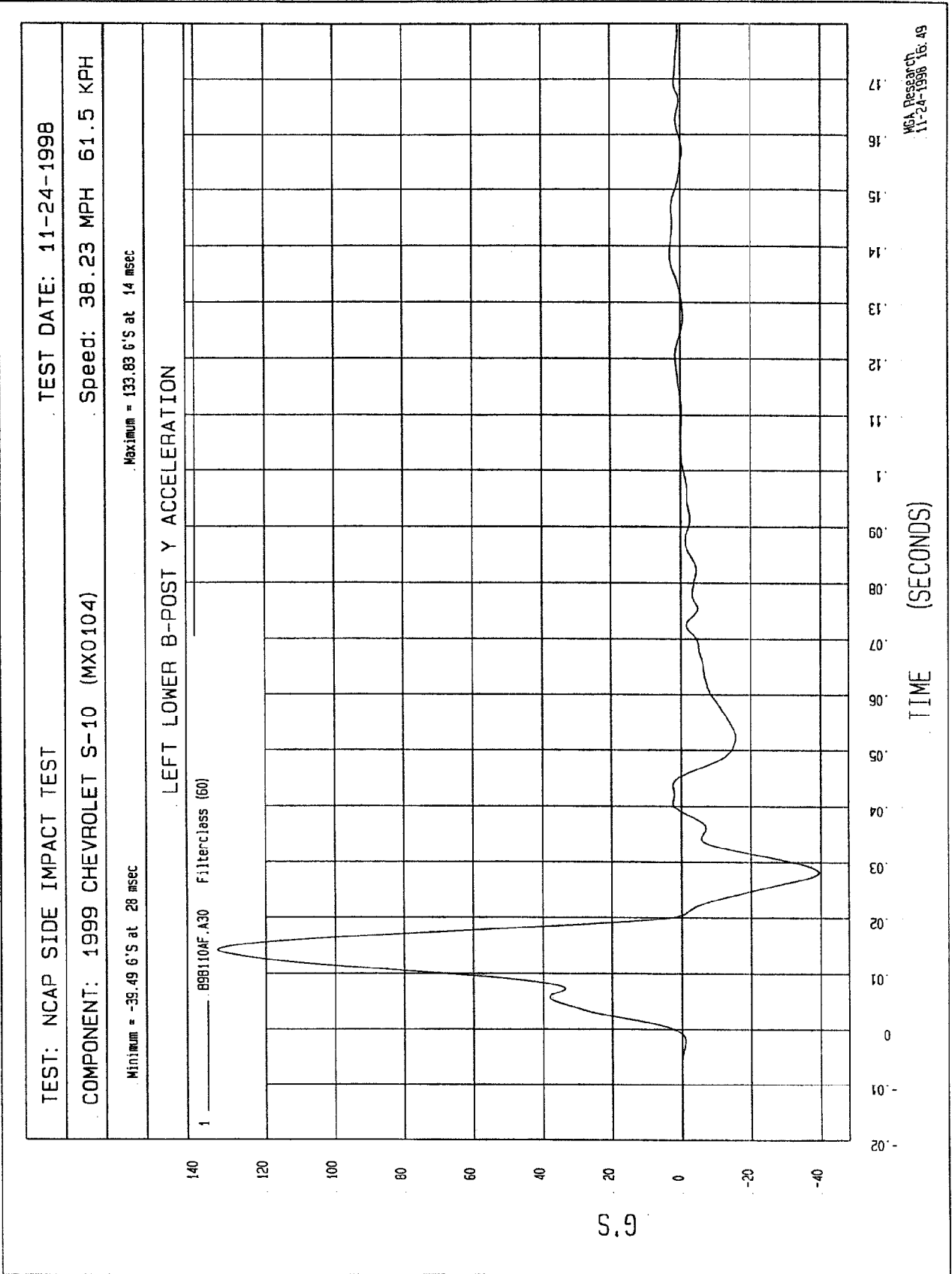
LEFT MID A-POST Y VELOCITY

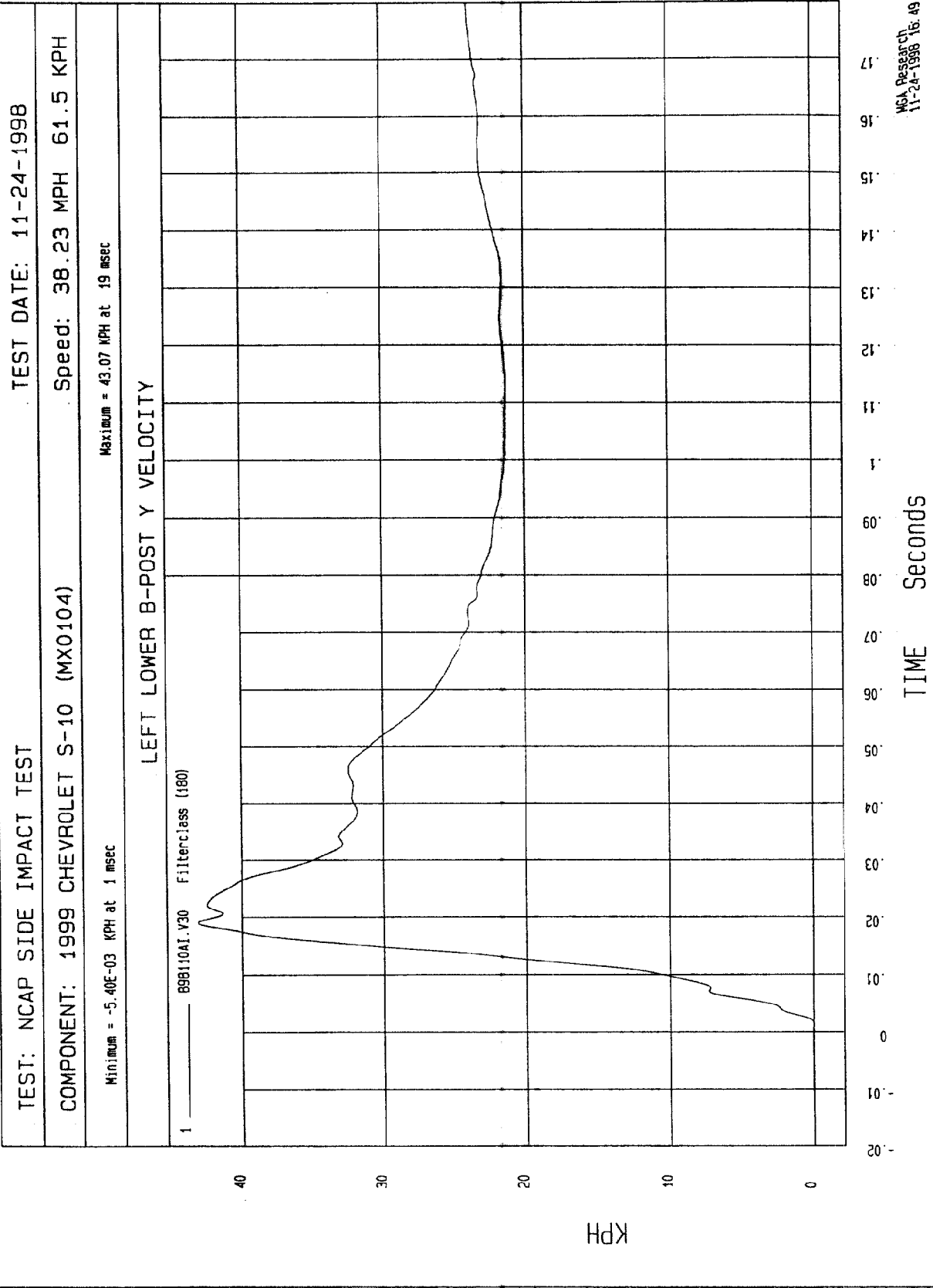
1 B98110A1.V19 Filterclass (180)



MGA Research
11-24-1998 16:49

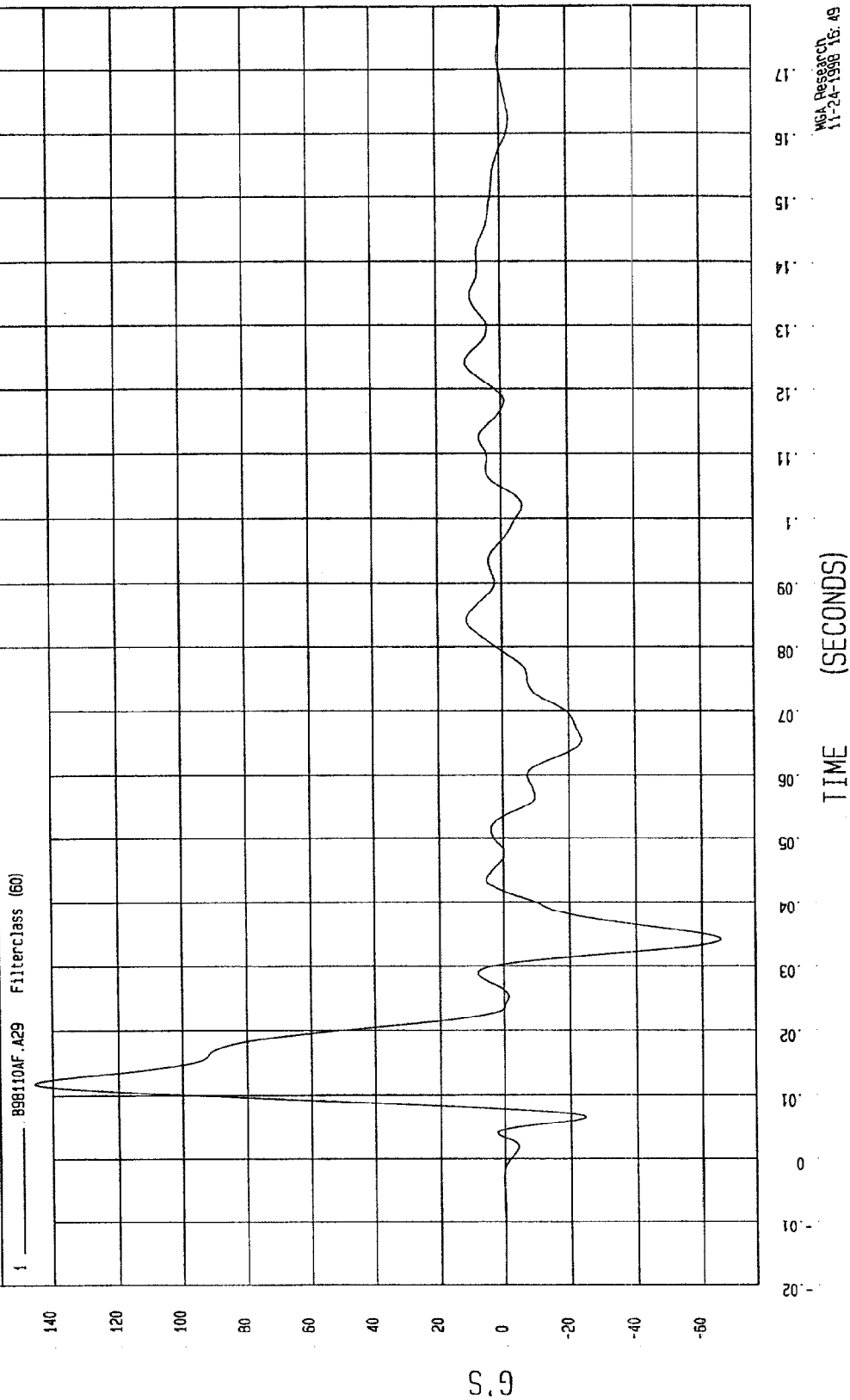
TIME Seconds

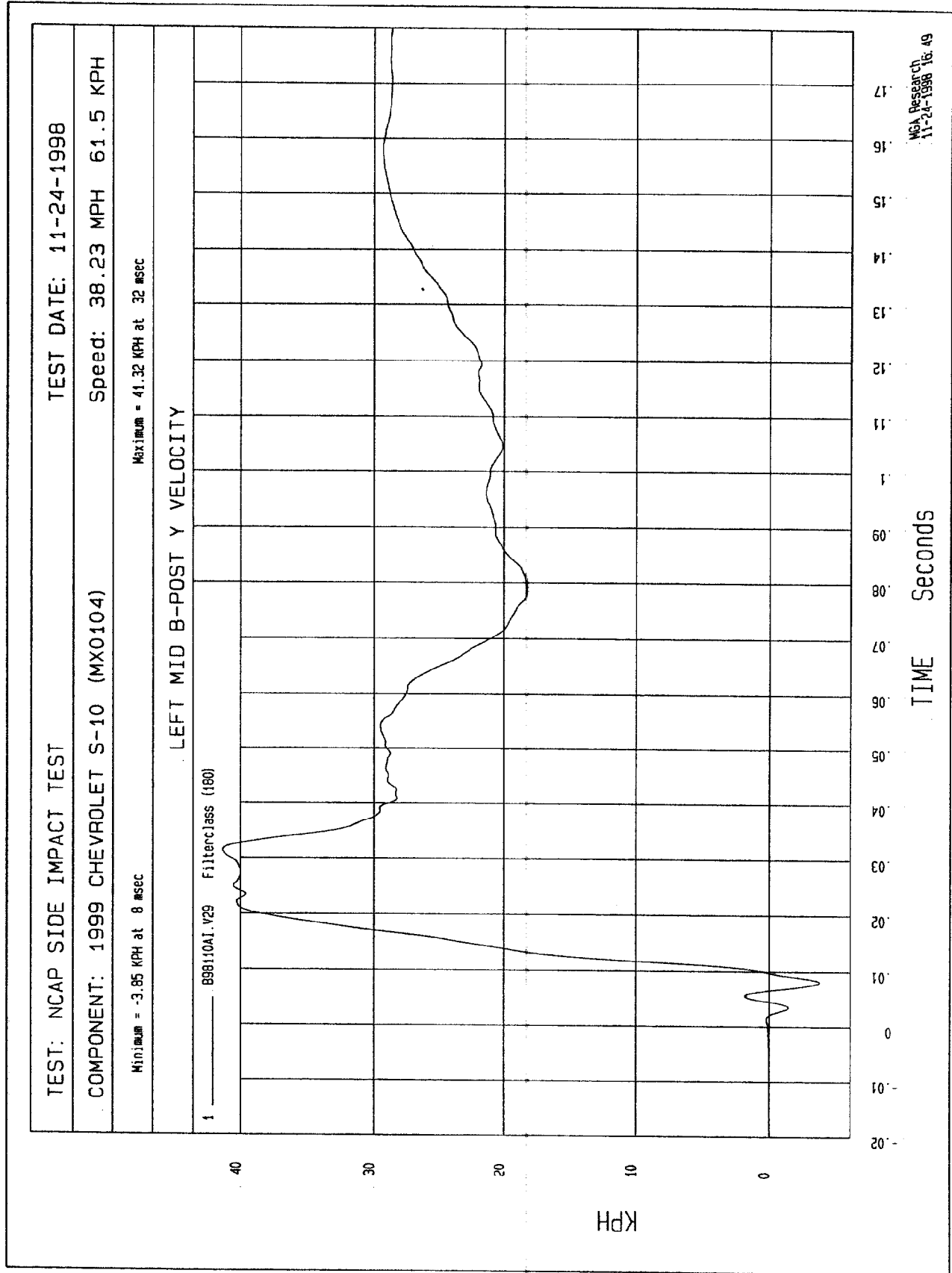


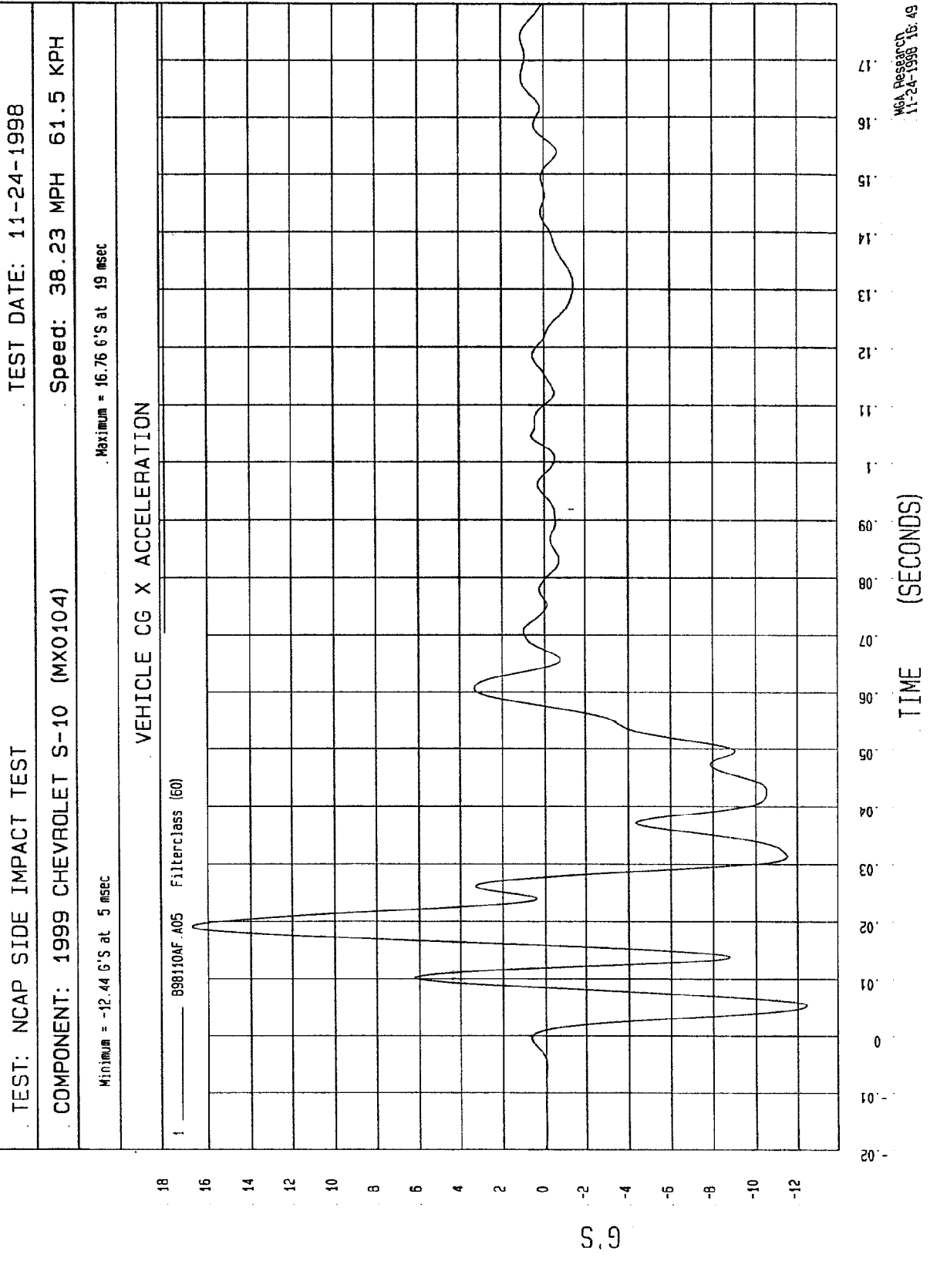


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH
Minimum = -65.98 G'S at 34 msec Maximum = 145.5 G'S at 12 msec

LEFT MID B-POST Y ACCELERATION







TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

Speed: 38.23 MPH 61.5 KPH

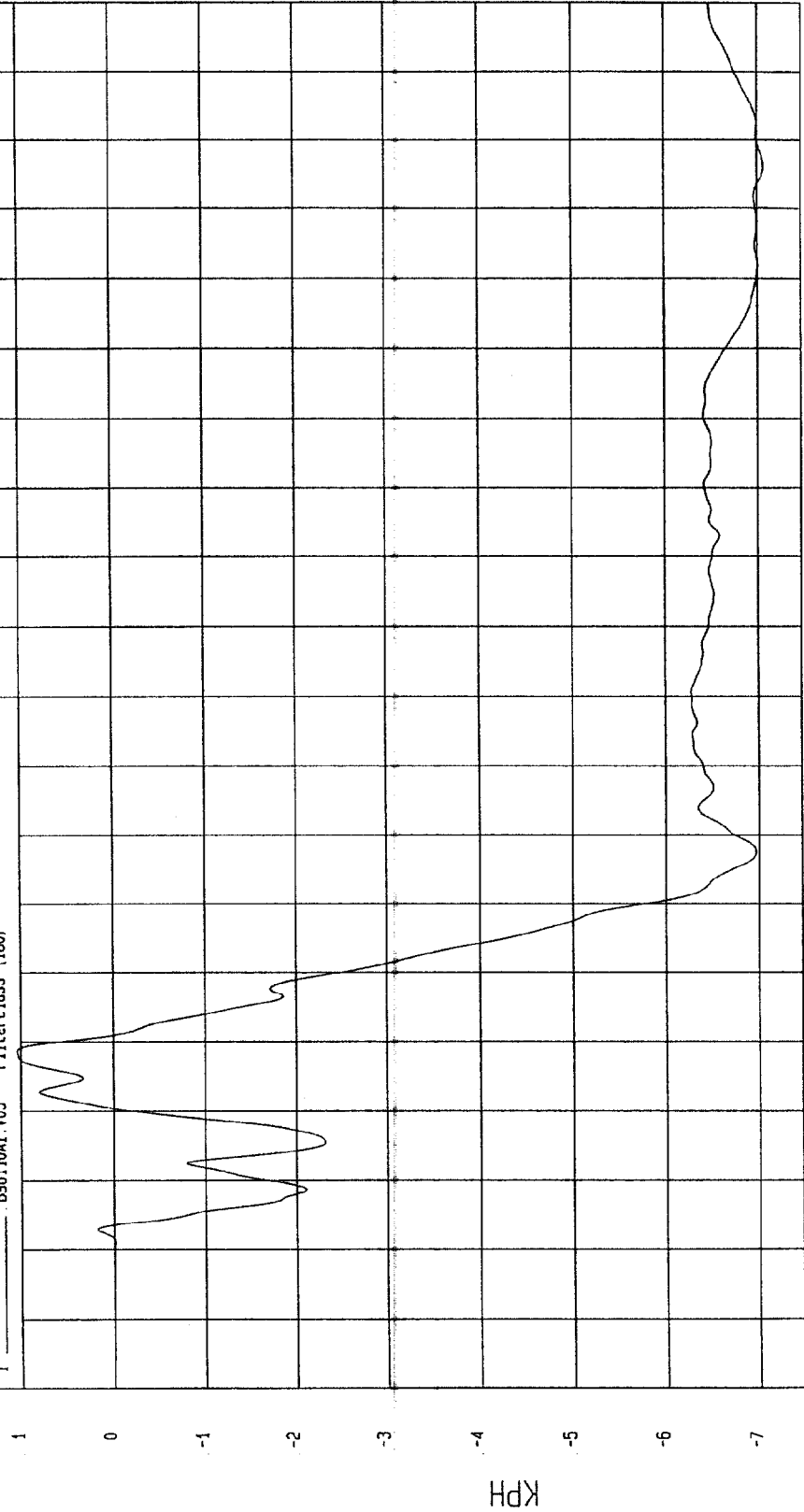
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 1.04 KPH at 29 msec

Minimum = -7.06 KPH at 156 msec

VEHICLE CG X VELOCITY

1 B98110A1.V05 Filterclass (180)



MSA Research
11-24-1998 16:49

TIME Seconds

TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

Speed: 38.23 MPH 61.5 KPH

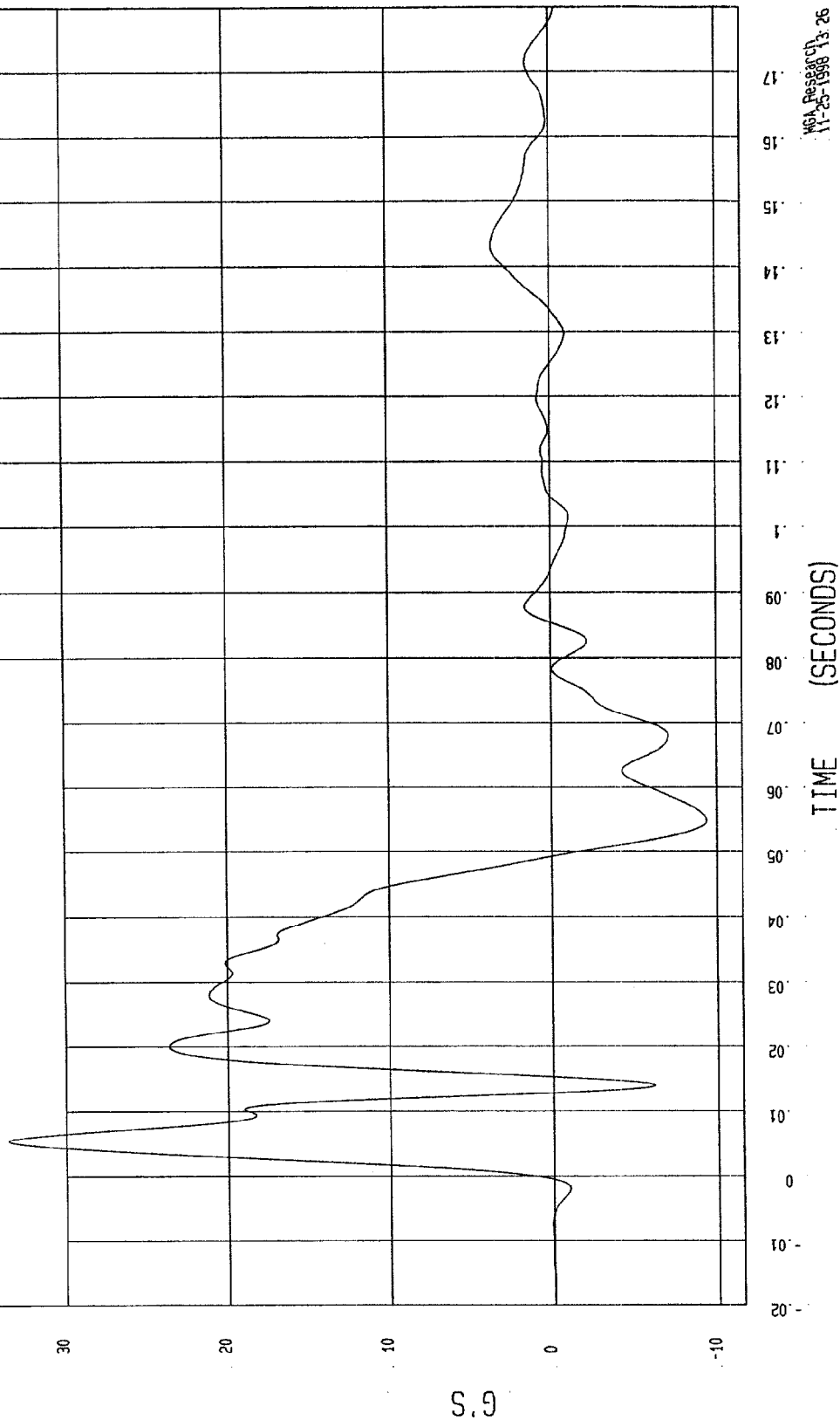
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 33.49 G'S at 6 msec

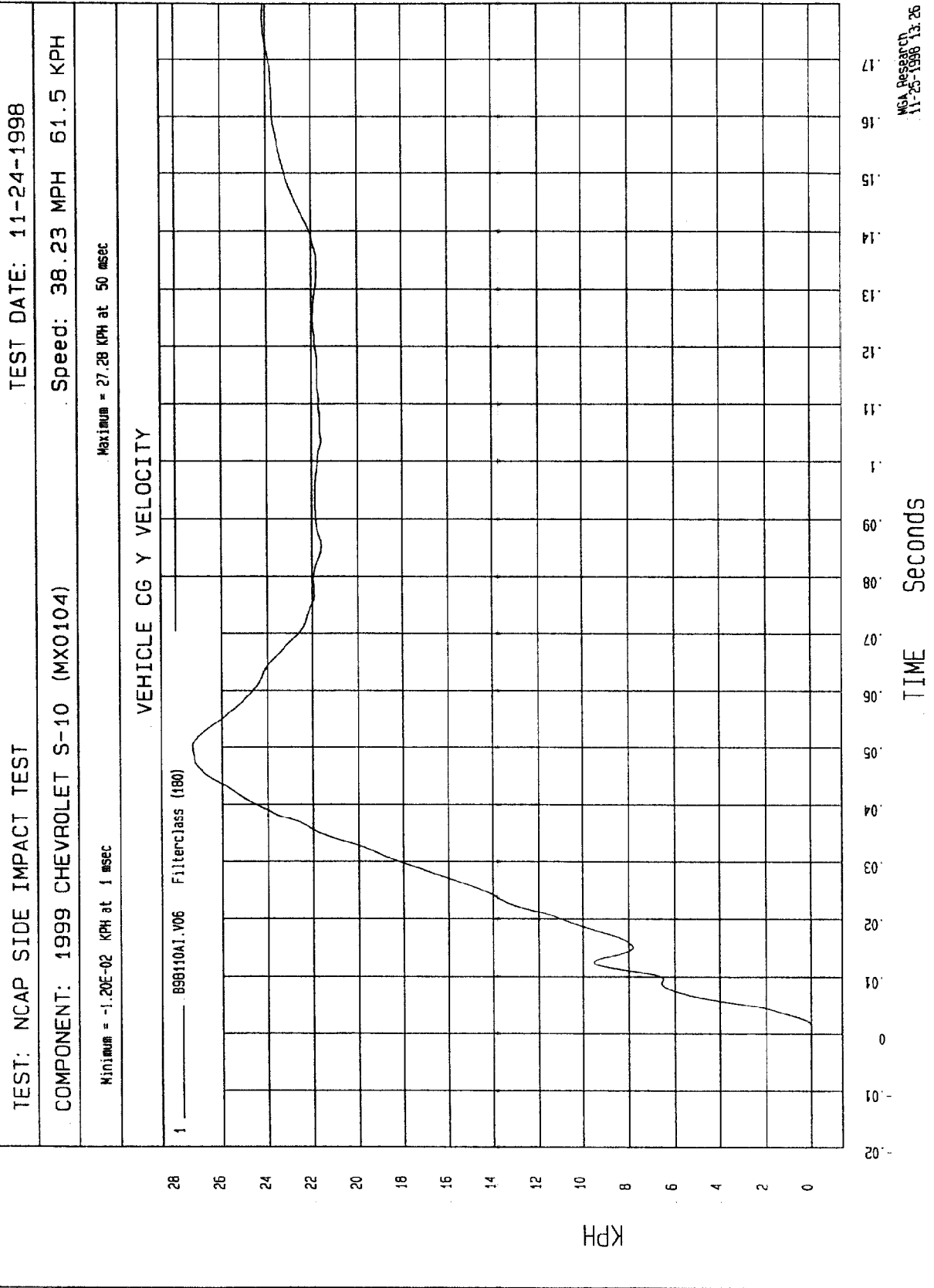
Minimum = -9.39 G'S at 55 msec

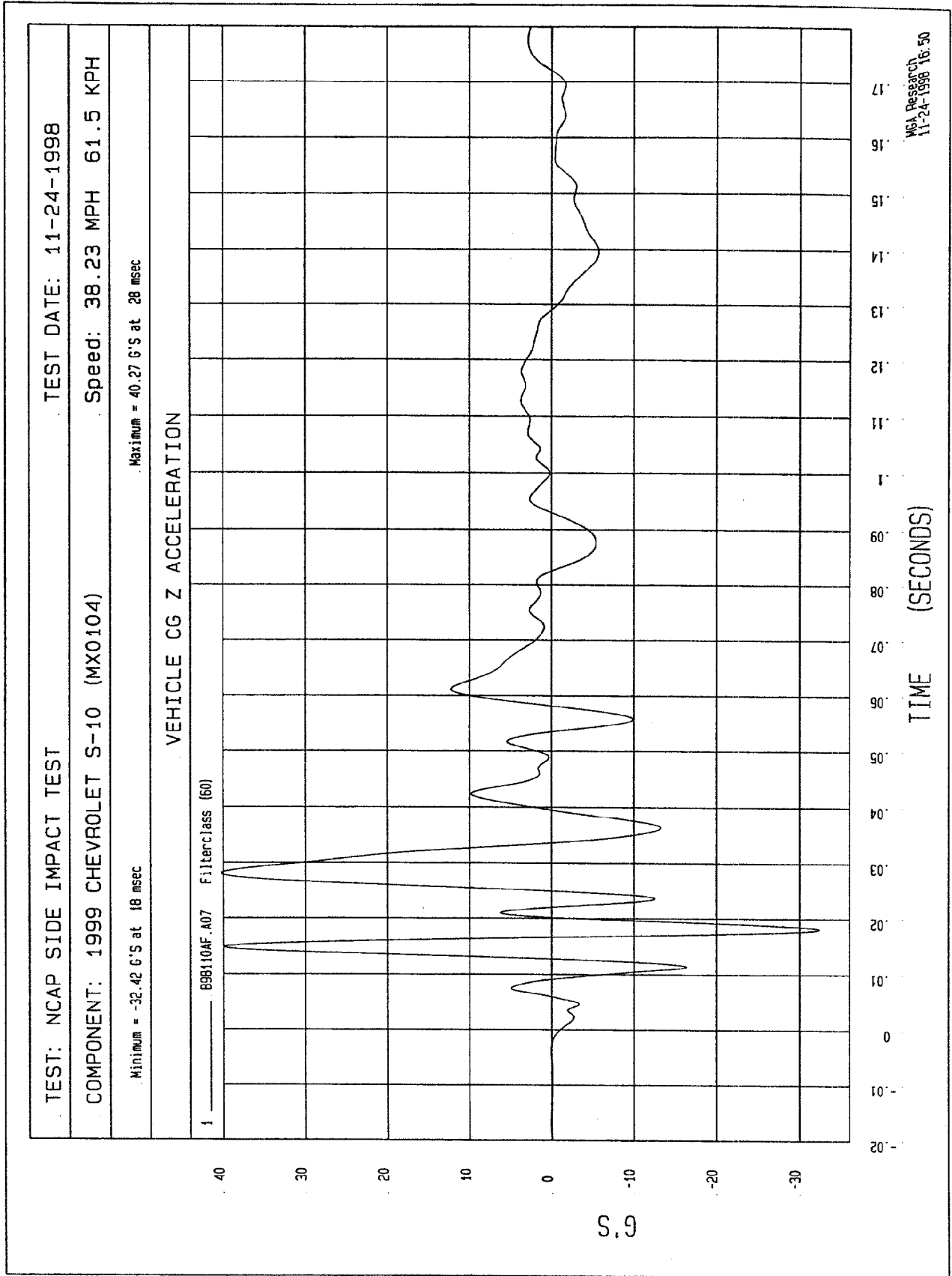
VEHICLE CG Y ACCELERATION

1 B98110AF.A06 Filterclass (60)



MOA Research
11-25-1998 13:26



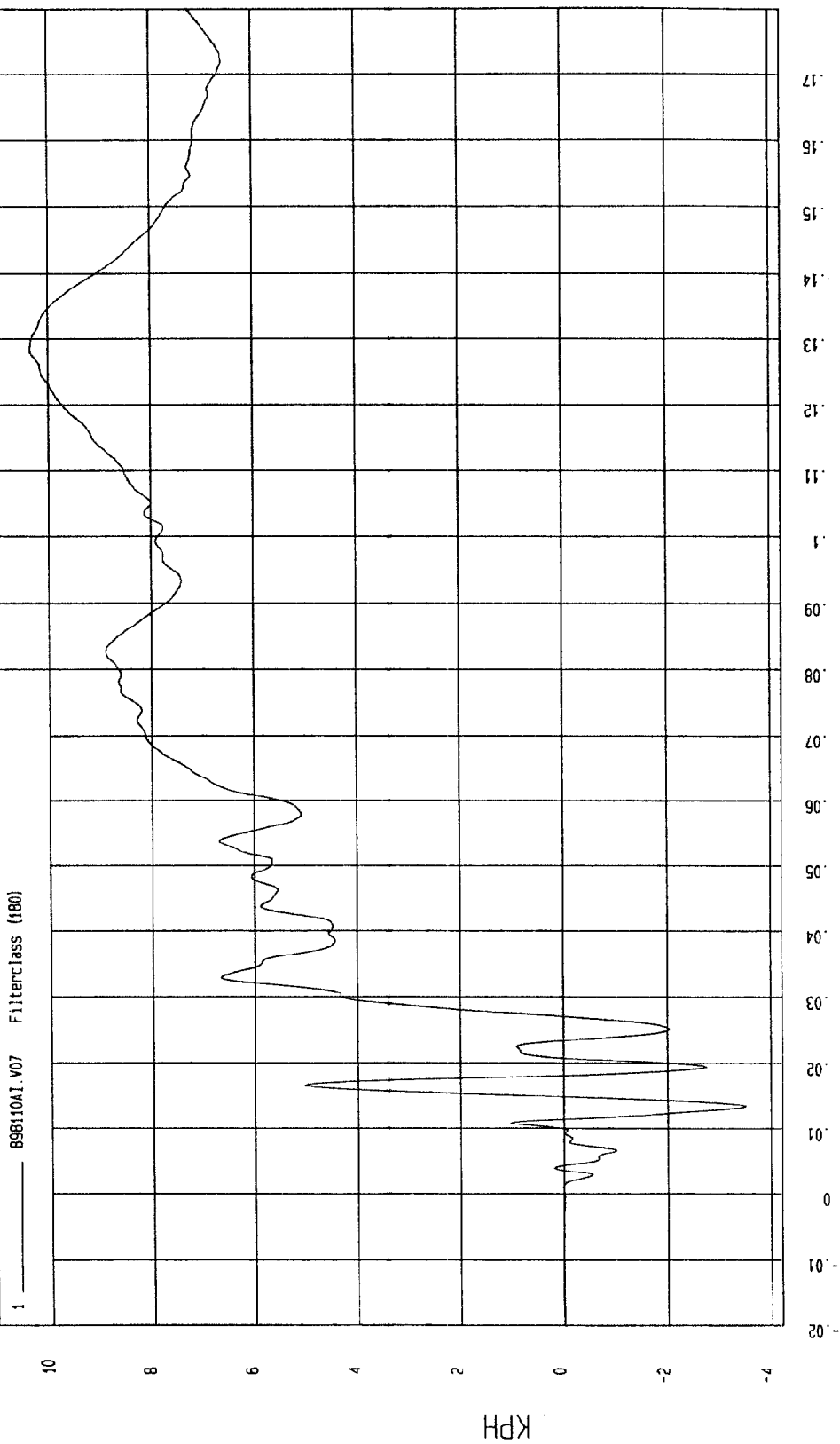


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -3.53 KPH at 14 msec Maximum = 10.34 KPH at 128 msec

VEHICLE CG Z VELOCITY



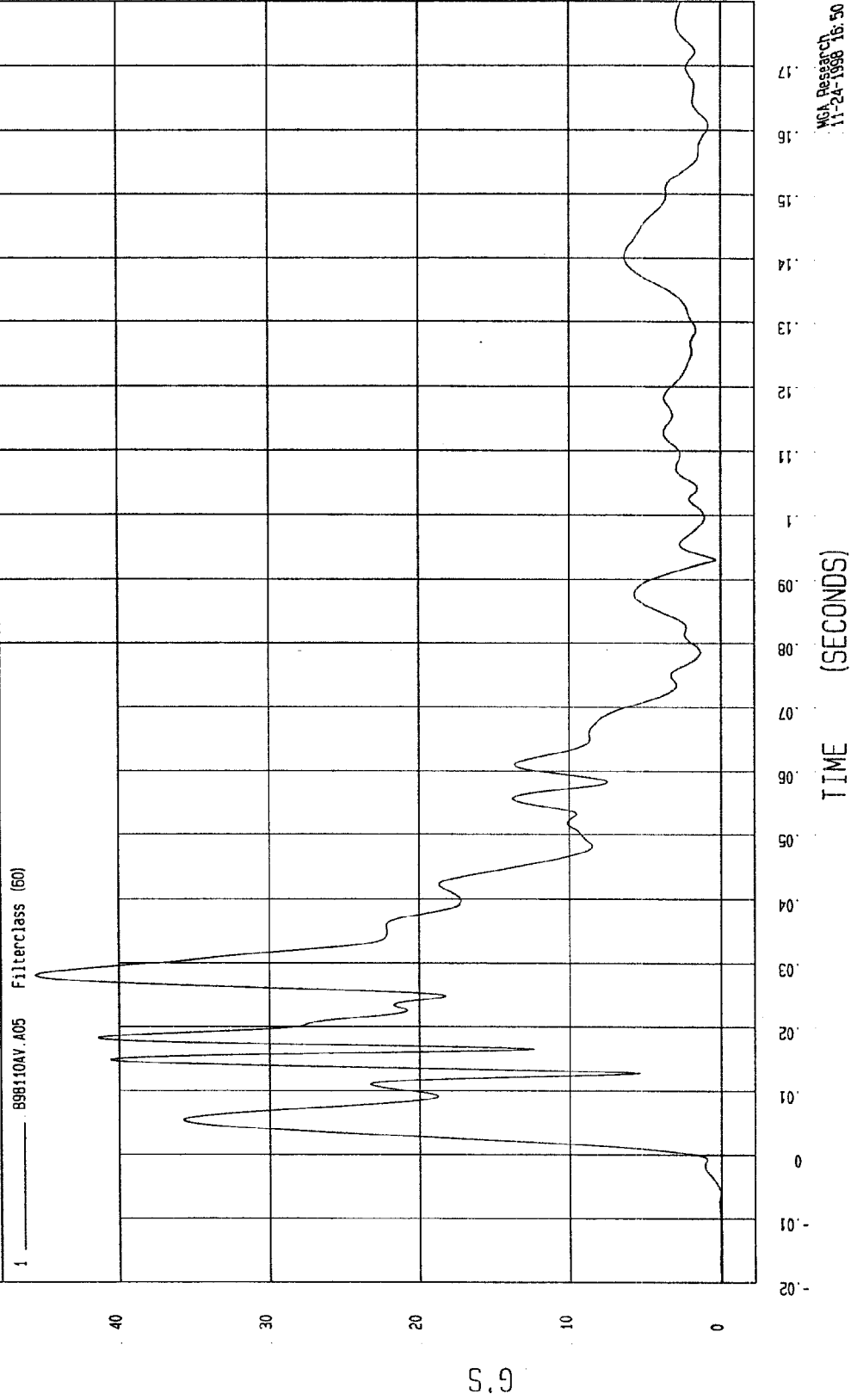
NCI Research
11-24-1998 16:50

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = 2.49E-02 G'S at -14 msec Maximum = 45.5 G'S at 28 msec

VEHICLE CG RESULTANT ACCELERATION

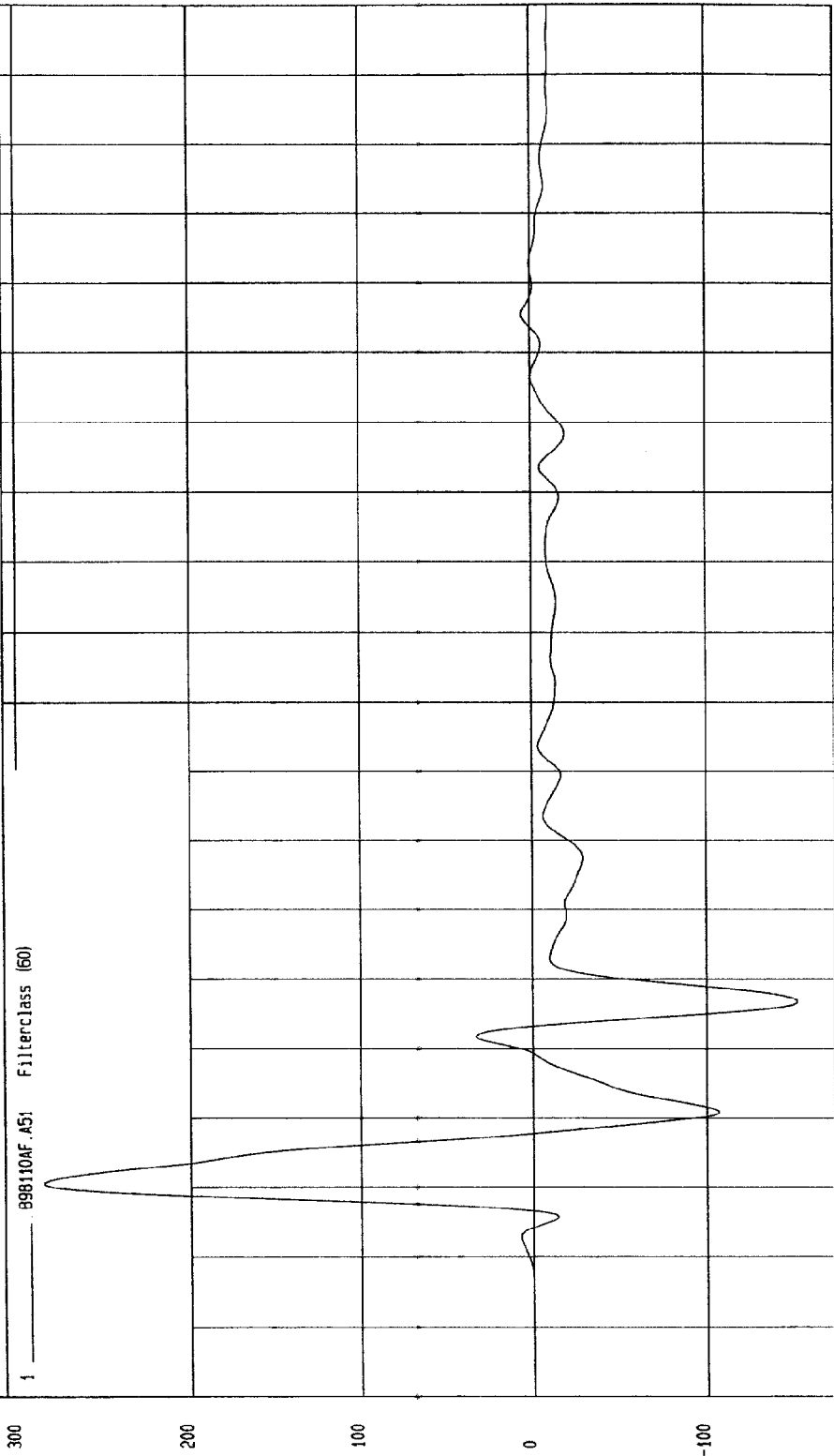


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -151.26 G'S at 37 msec Maximum = 285.44 G'S at 10 msec

LEFT FRONT DOOR CENTERLINE Y ACCELERATION



TIME (SECONDS)

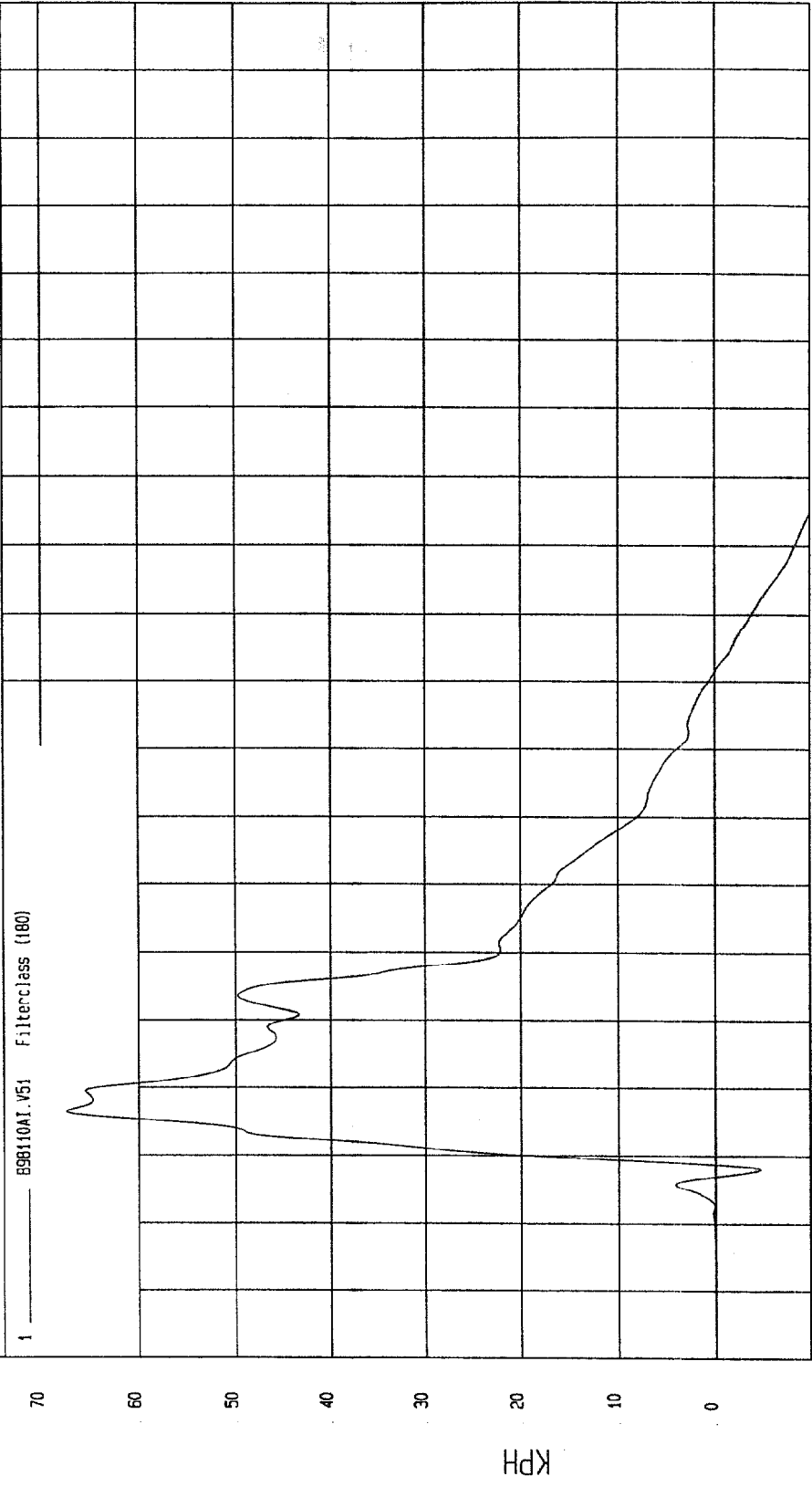
NGA Research
11-24-1998 16:50

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -43.52 KPH at 200 msec Maximum = 67.48 KPH at 16 msec

LEFT FRONT DOOR CENTERLINE Y VELOCITY



TIME Seconds

MCA Research
12-07-1998 16:04

TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

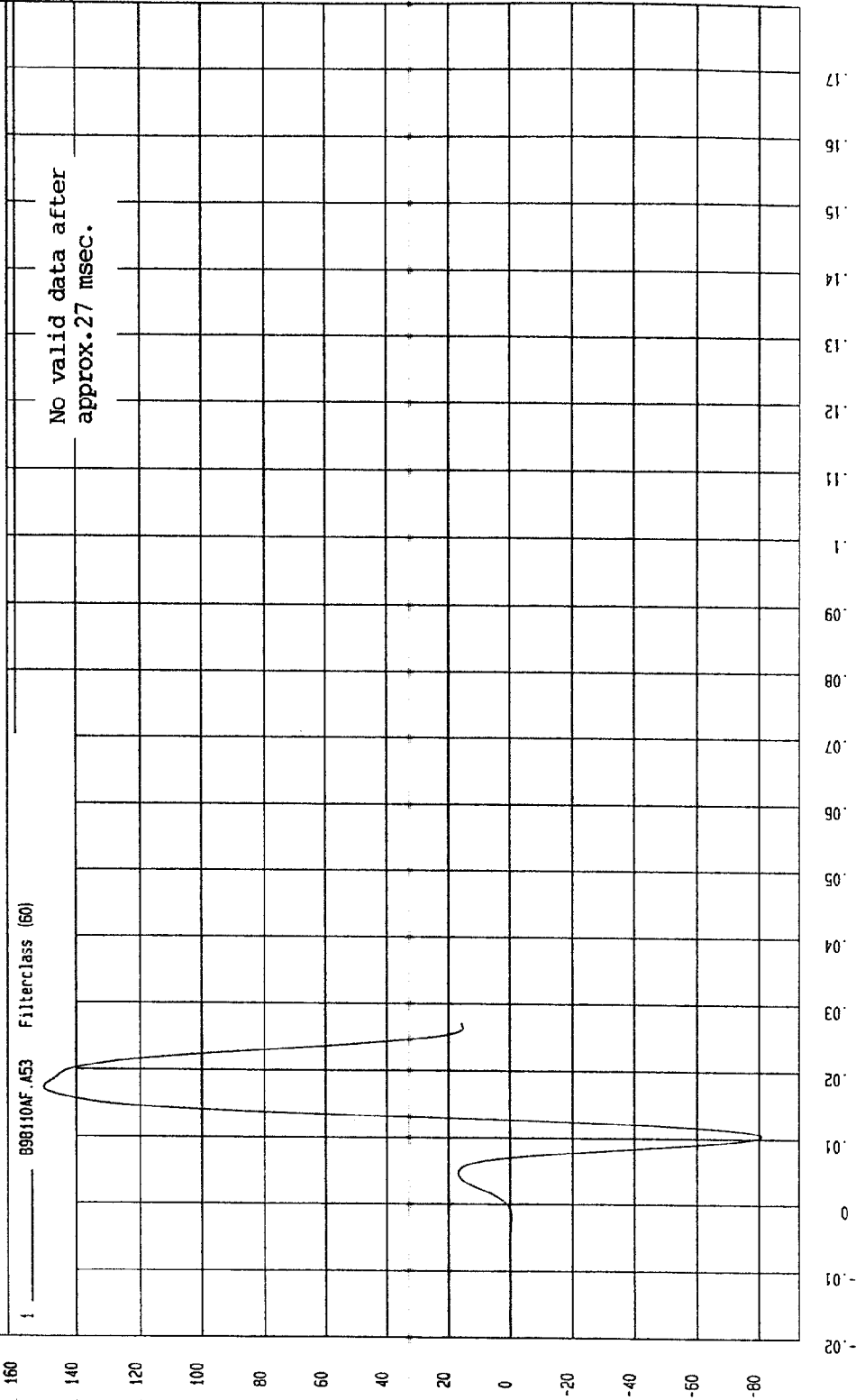
Speed: 38.23 MPH 61.5 KPH

COMPONENT: 1999 CHEVROLET S-10 (MX0104)

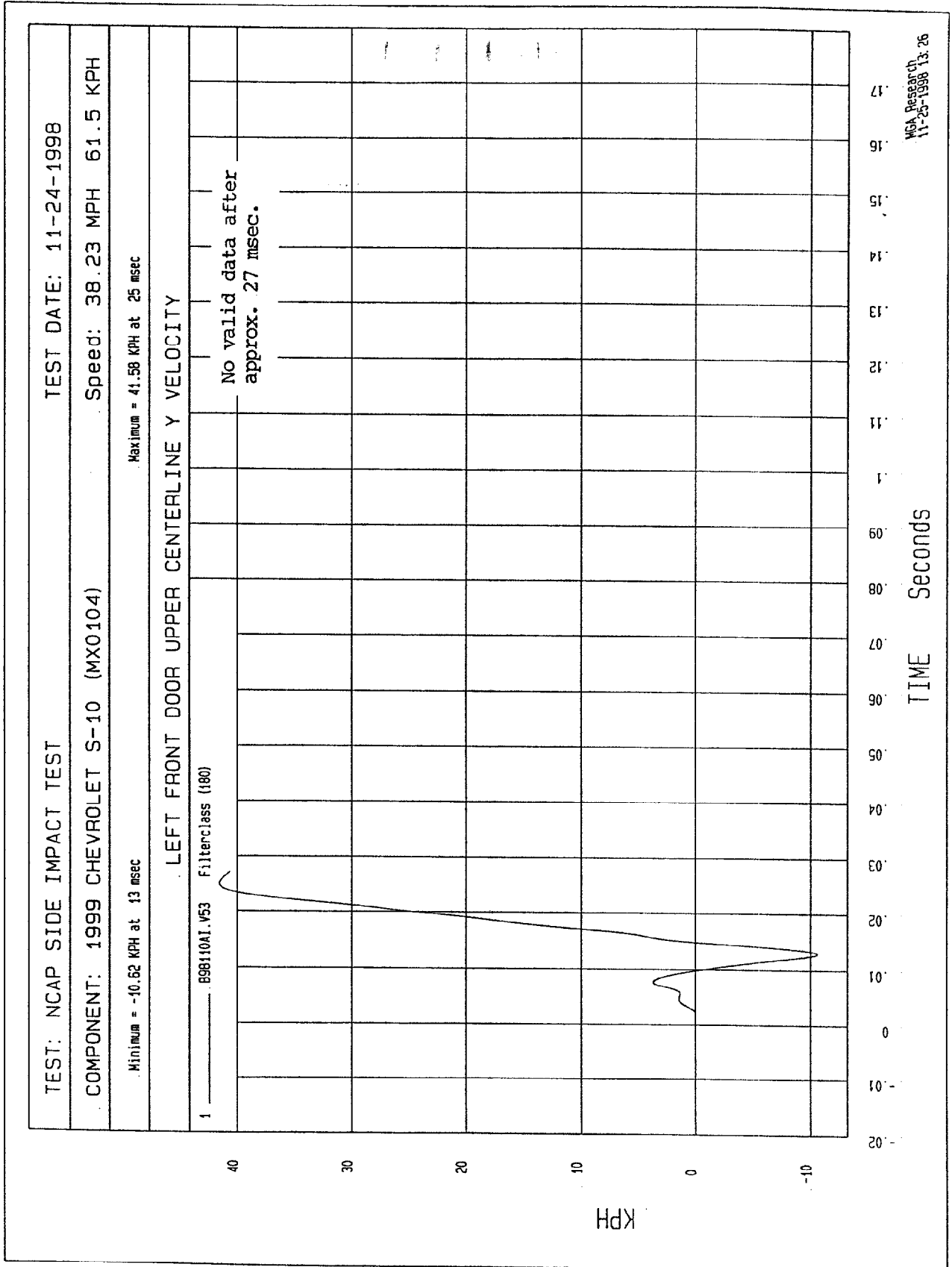
Maximum = 150.85 G's at 17 msec

Minimum = -80.9 G's at 10 msec

LEFT FRONT DOOR UPPER CENTERLINE Y ACCELERATION



MCA Research
11-25-1998 13:26



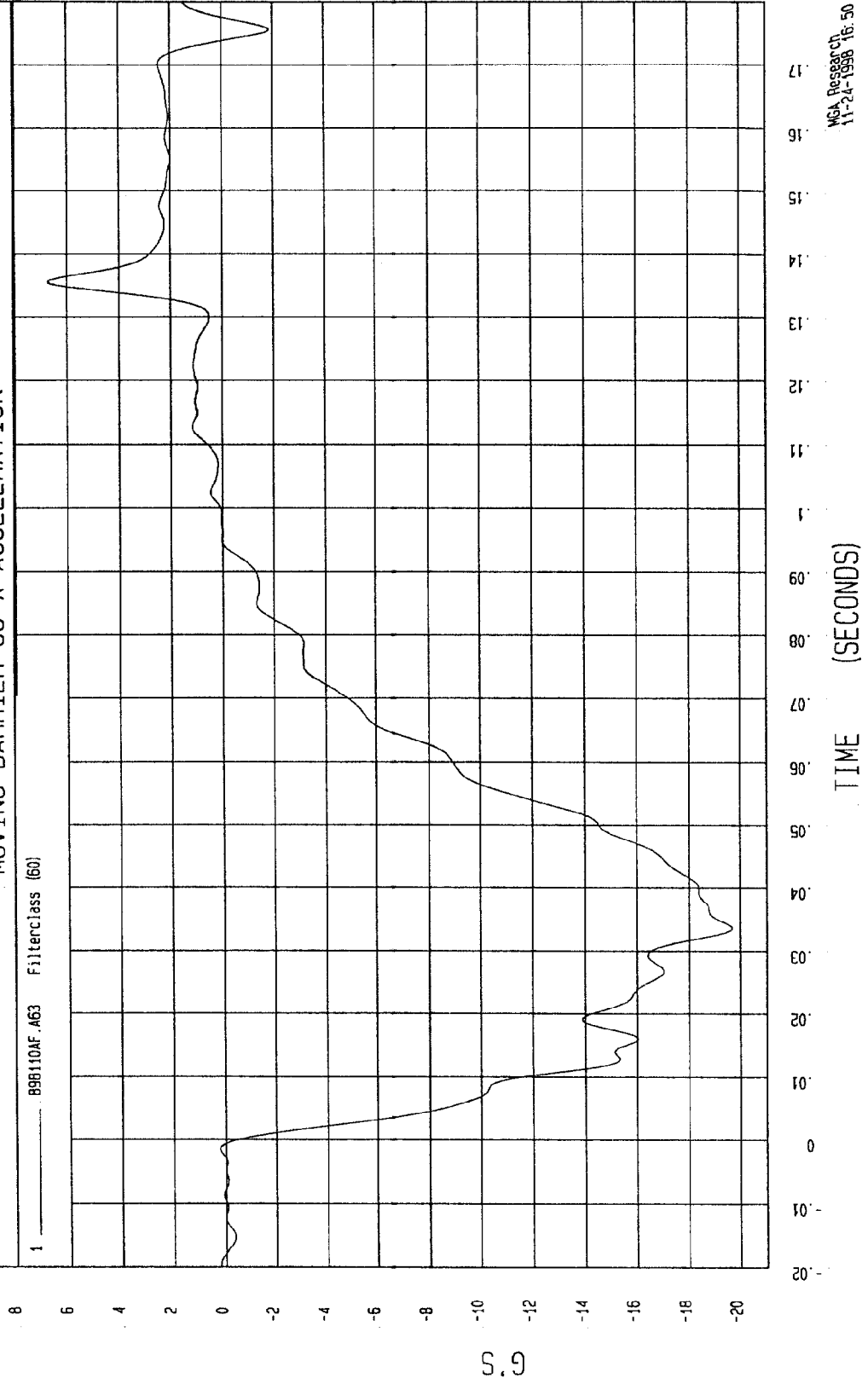
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

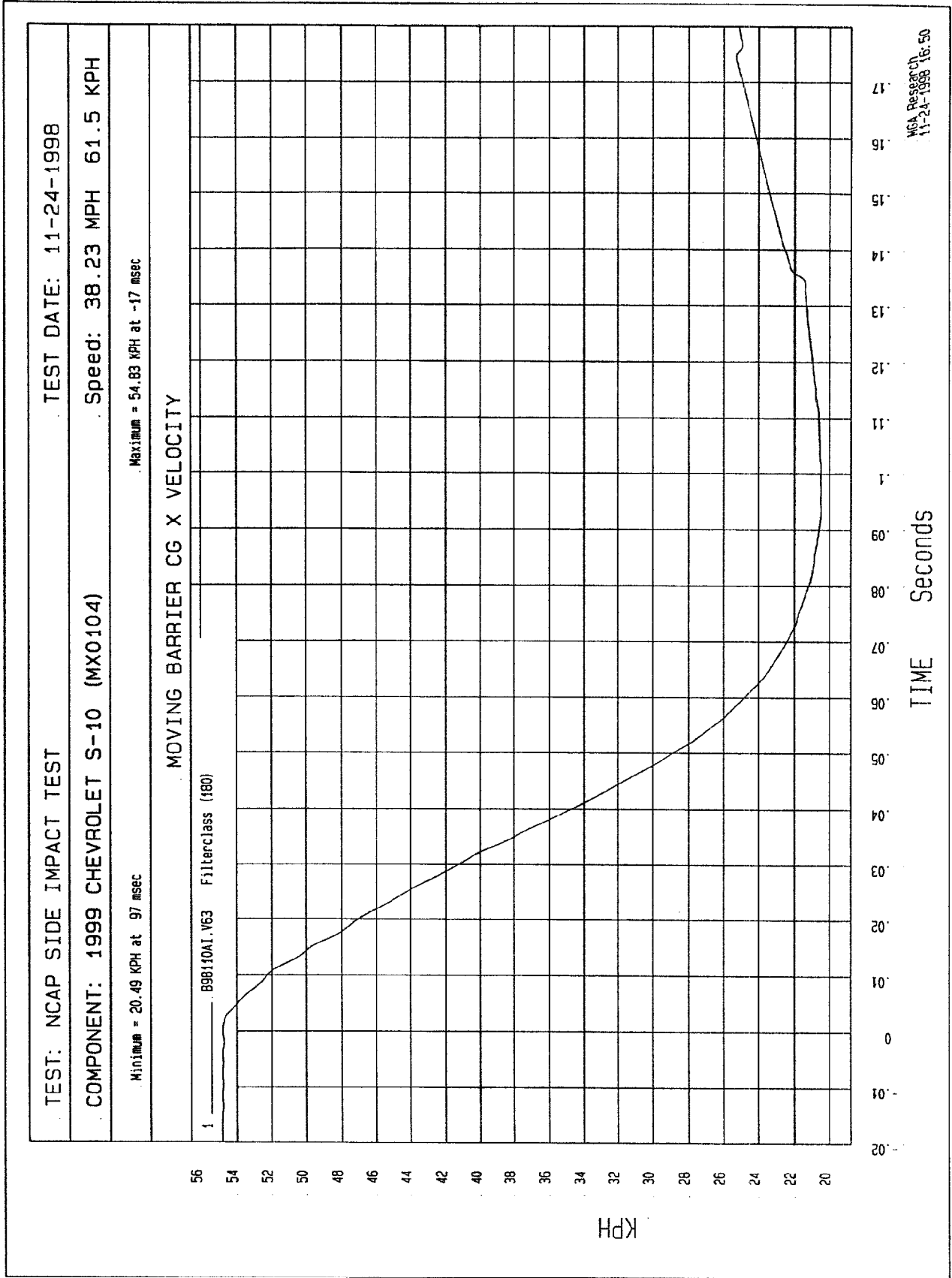
Minimum = -19.69 G'S at 34 msec Maximum = 6.75 G'S at 136 msec

MOVING BARRIER CG X ACCELERATION

1 898110AF.A63 Filterclass (60)



MCA Research
11-24-1998 16:50



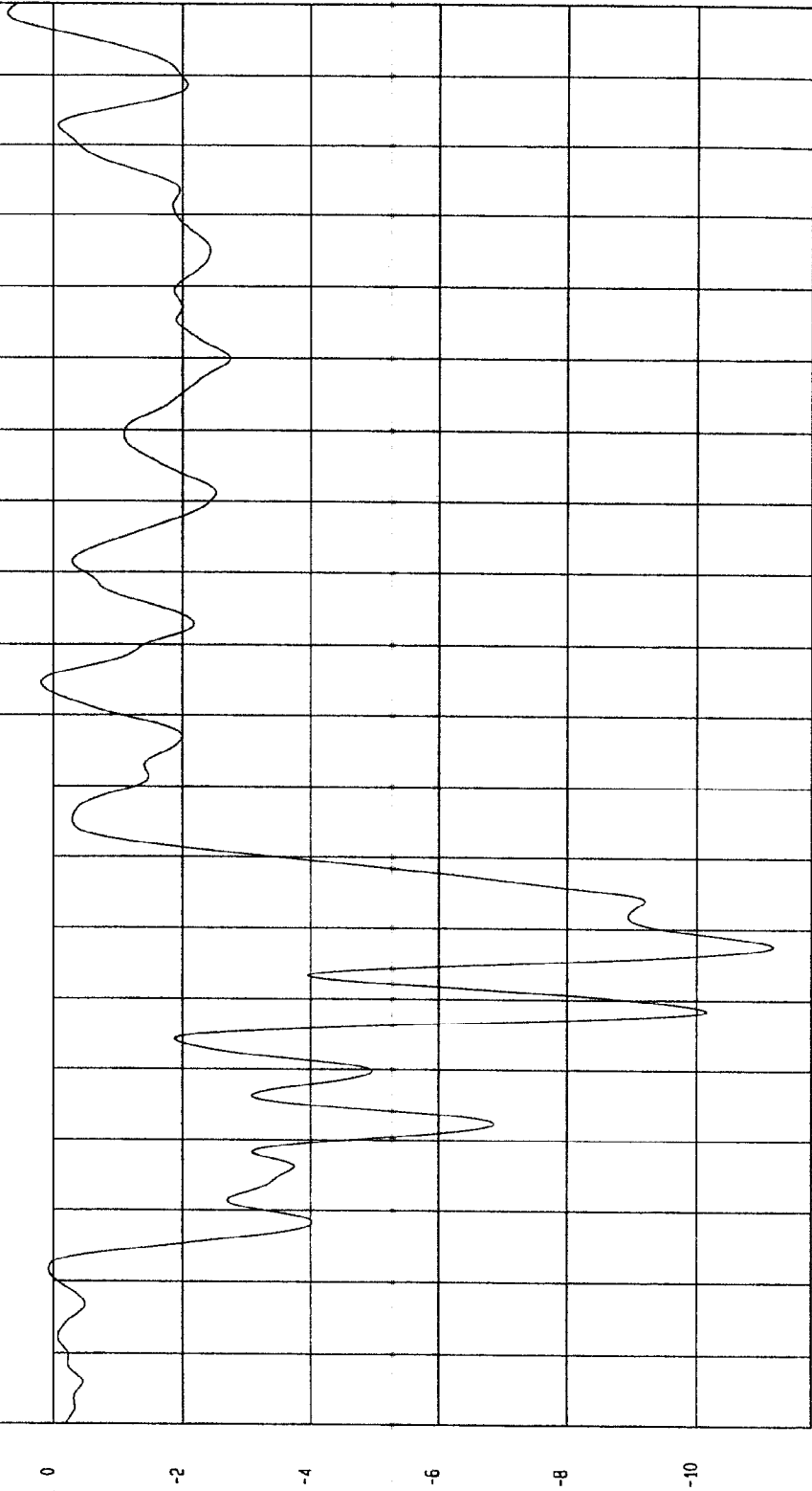
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -11.16 G'S at 48 msec Maximum = .69 G'S at 179 msec

MOVING BARRIER CG Y ACCELERATION

1 ——— B98110AF.A64 Filterclass (60)



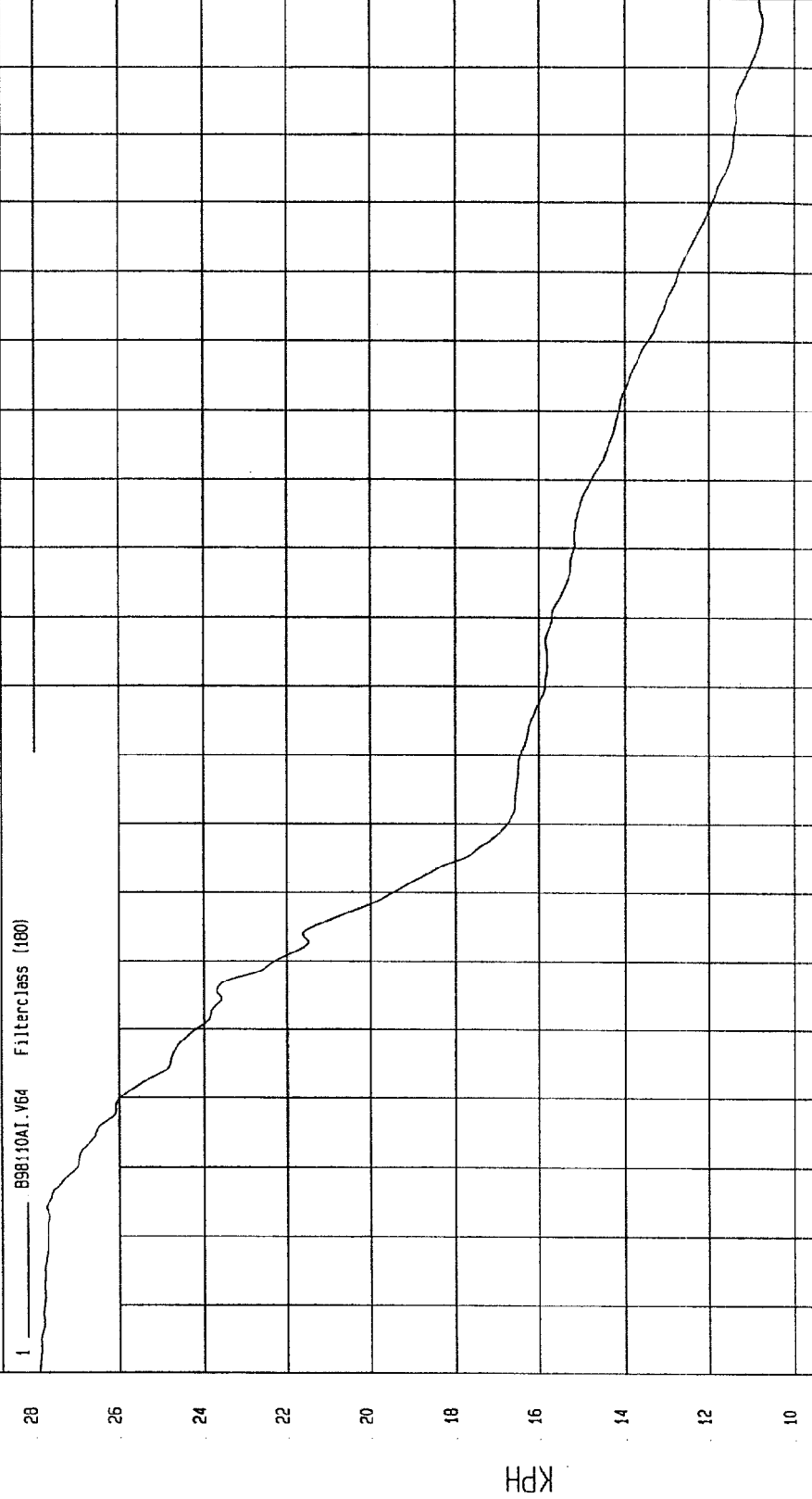
WGL Research
11-24-1998 16:50

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = 10.36 KPH at 200 msec Maximum = 27.9 KPH at -20 msec

MOVING BARRIER CG Y VELOCITY



NGA Research
11-24-1998 16:50

TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104)

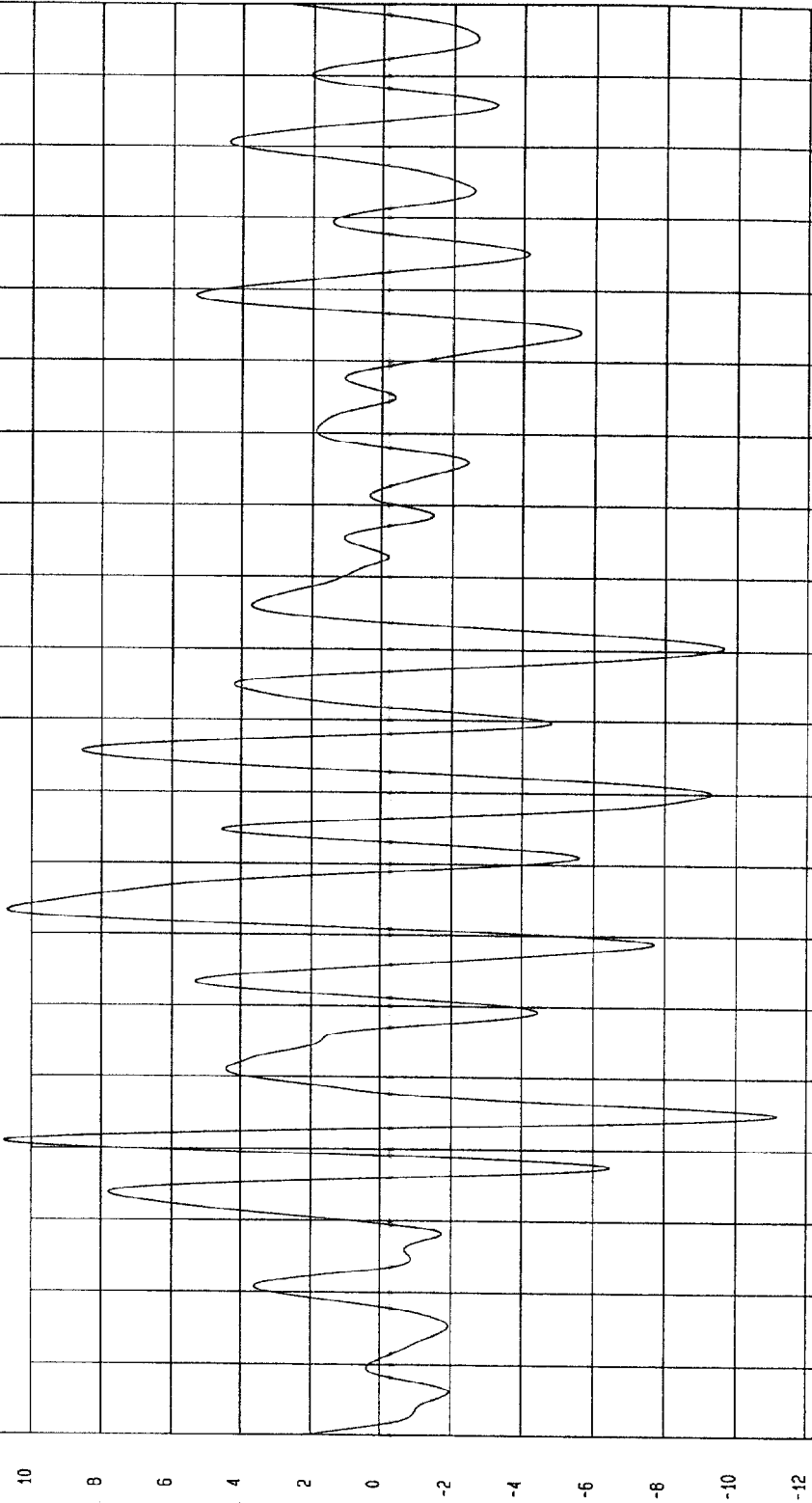
Speed: 38.23 MPH 61.5 KPH

Minimum = -11.15 G'S at 25 msec

Maximum = 10.77 G'S at 21 msec

MOVING BARRIER CG Z ACCELERATION

1 ——— B981104F.A65 Filterclass (60)



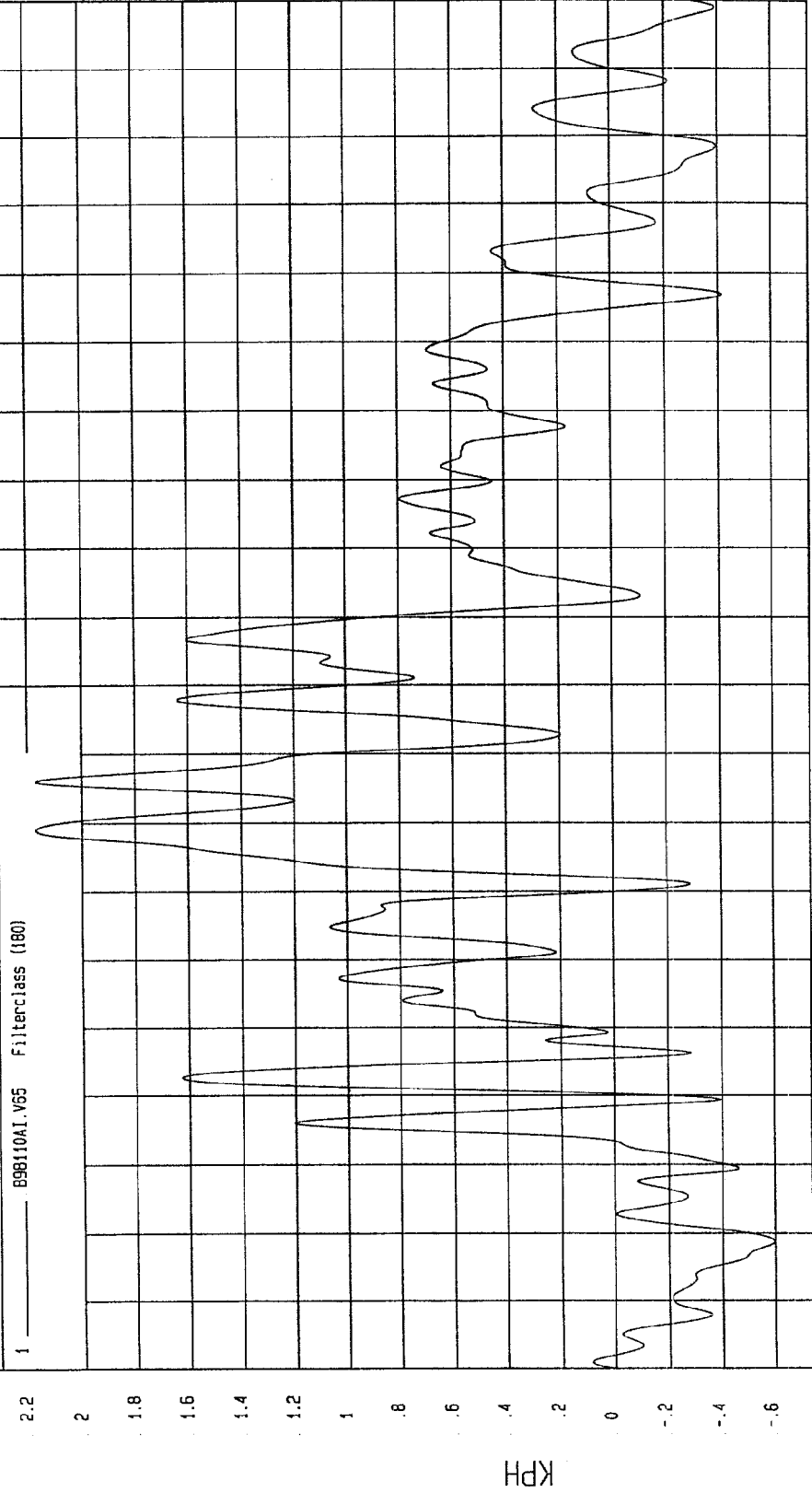
M&A Research
11-24-1998 16:50

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -6 KPH at -1 msec Maximum = 2.17 KPH at 66 msec

MOVING BARRIER CG Z VELOCITY



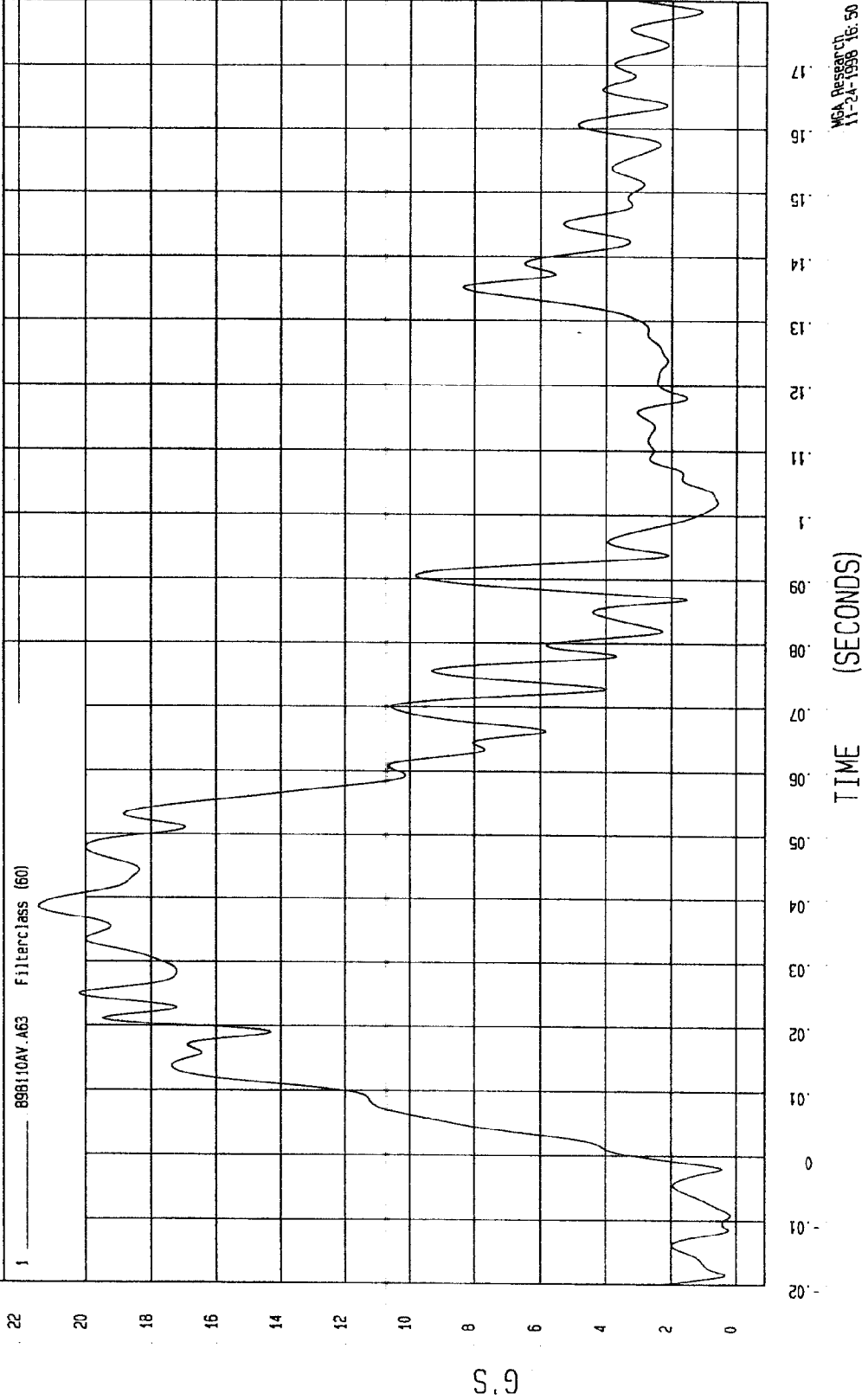
MSB Research
11-24-1998 16:50

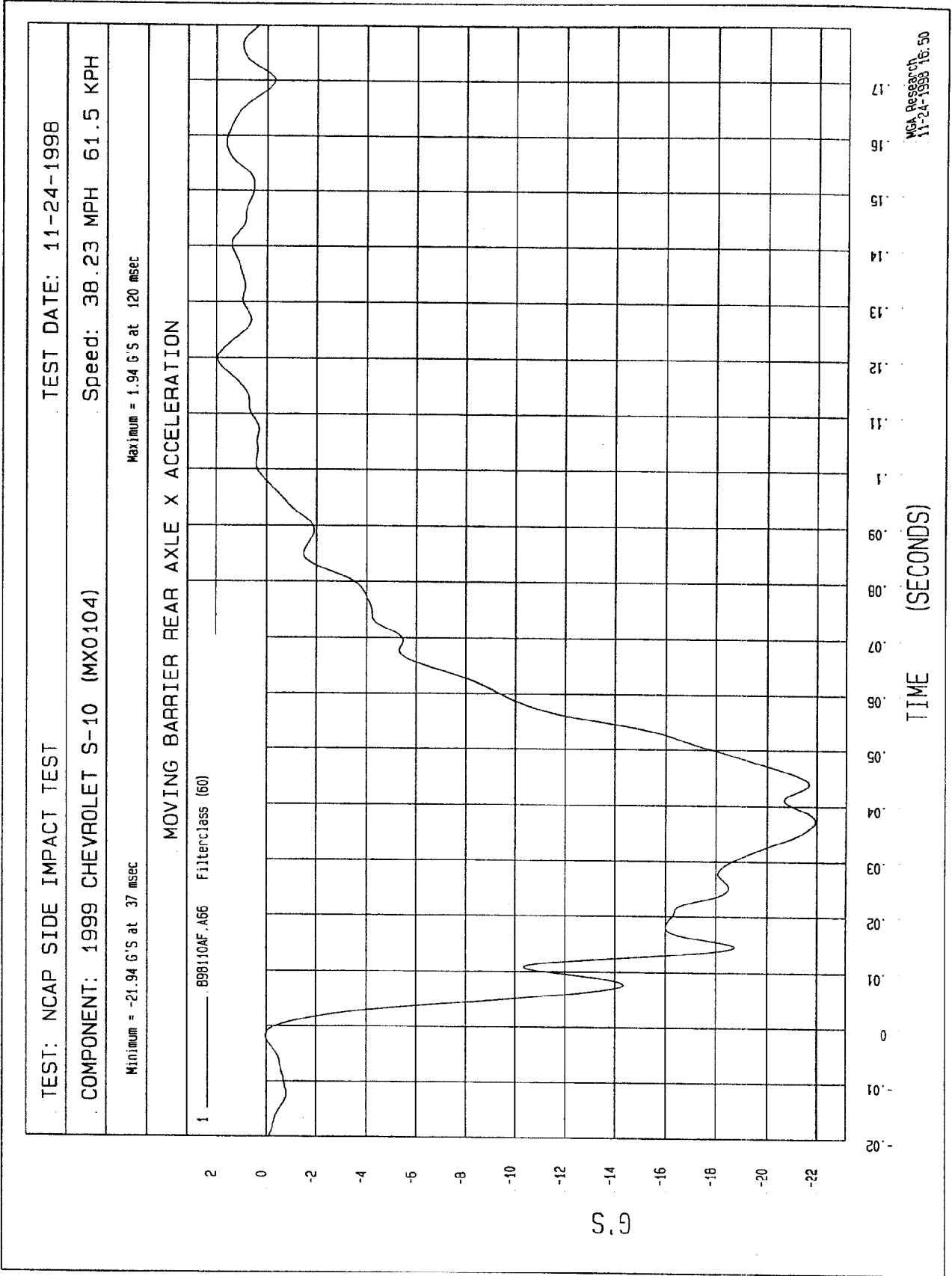
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = 17 G'S at -9 msec Maximum = 21.41 G'S at 39 msec

MOVING BARRIER CG RESULTANT ACCELERATION





TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

Speed: 38.23 MPH 61.5 KPH

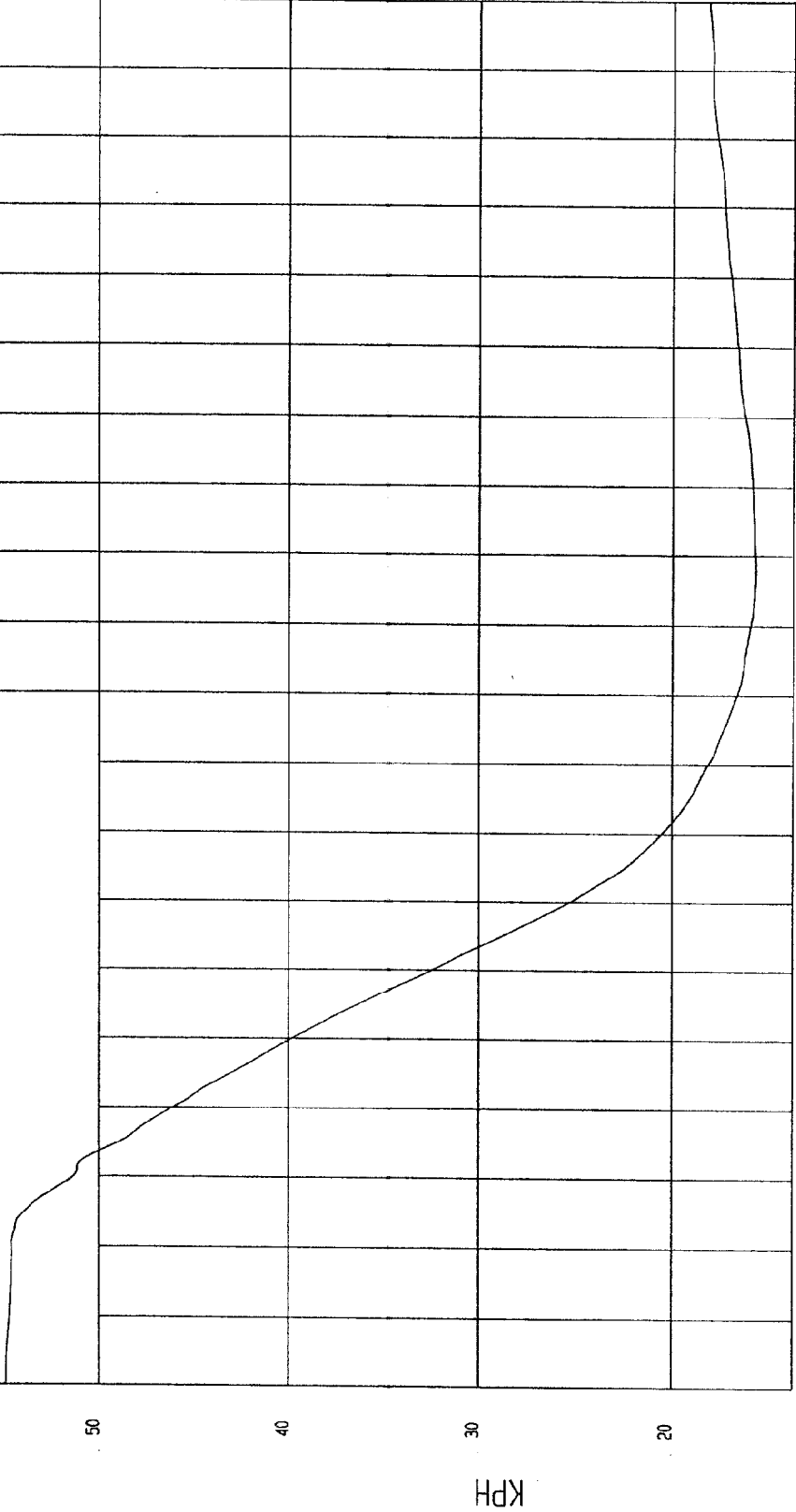
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = 54.8 KPH at -20 msec

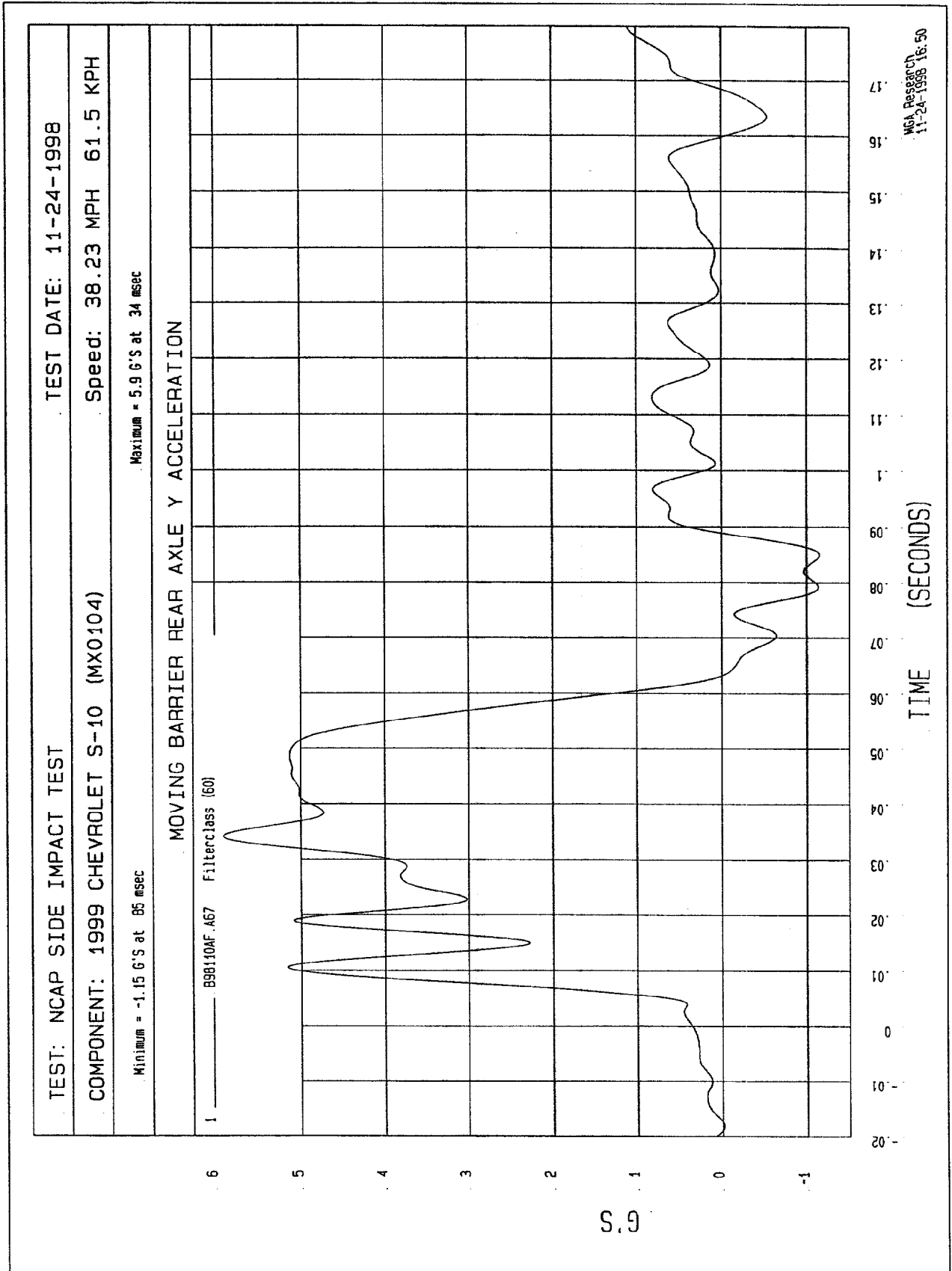
Minimum = 15.66 KPH at 99 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 — 898110A1.V66 Filterclass (180)



WCA Research
11-24-1998 16:50



TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

SPEED: 38.23 MPH 61.5 KPH

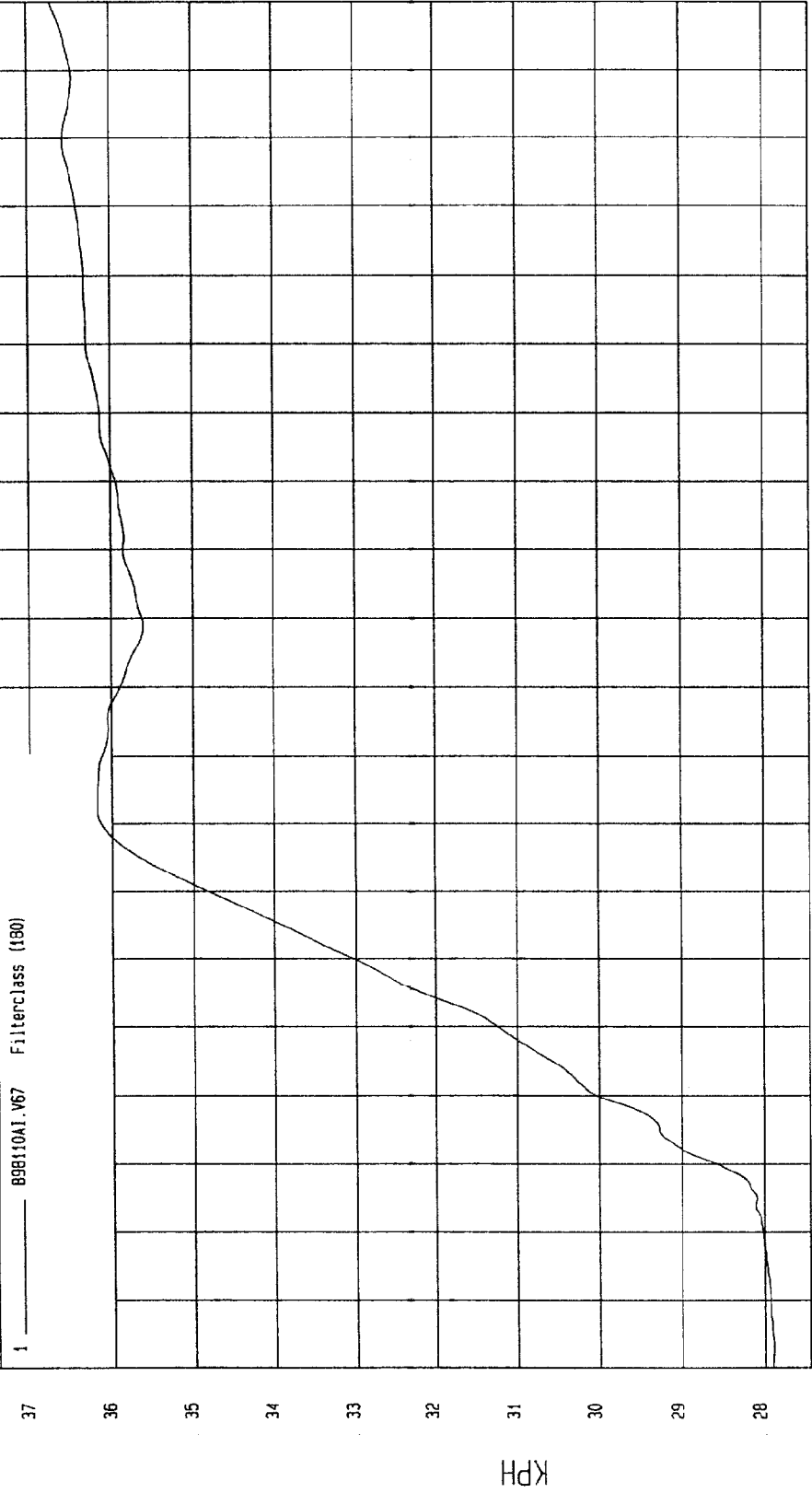
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Minimum = 27.89 KPH at -17 msec

Maximum = 36.95 KPH at 190 msec

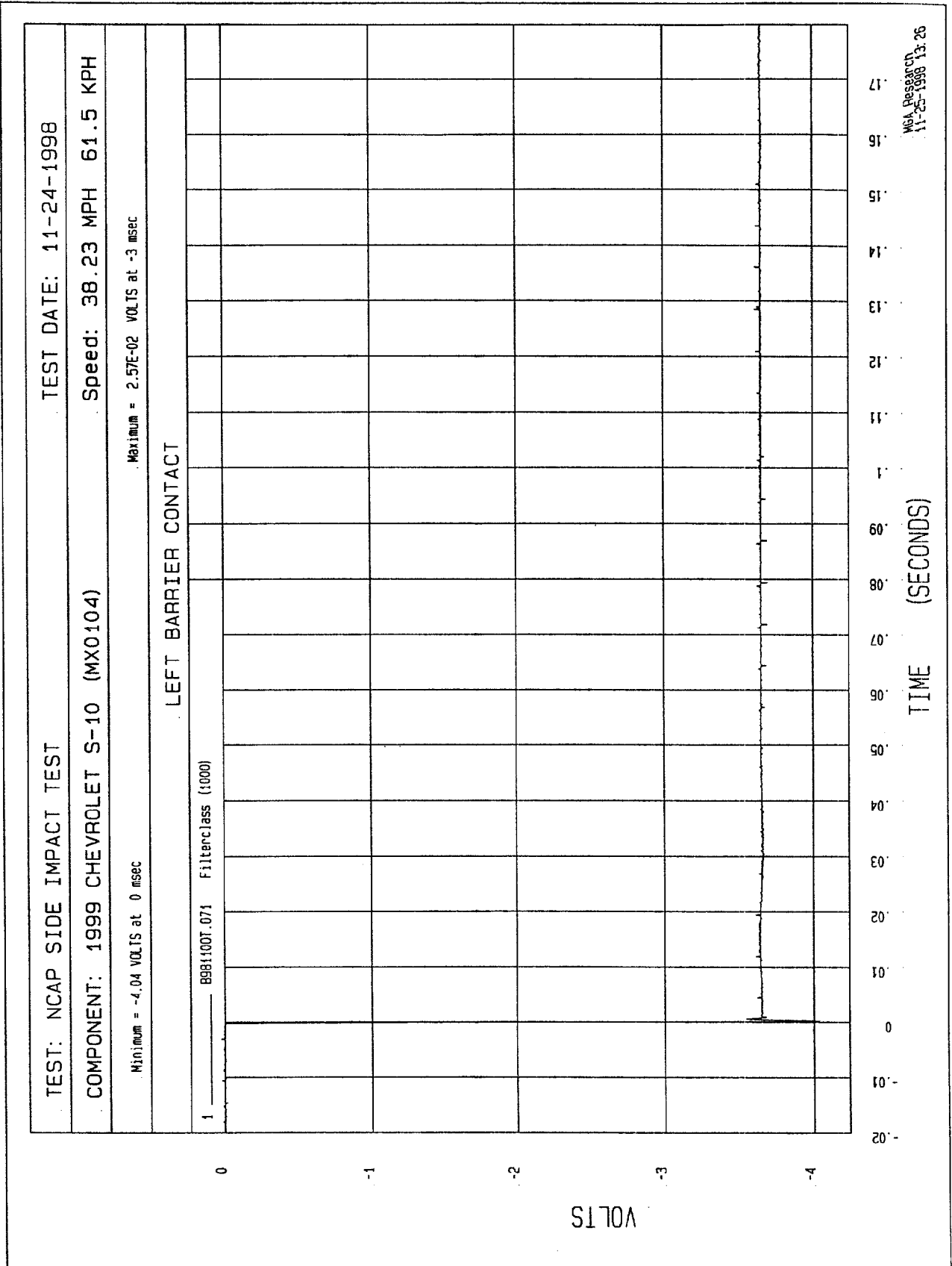
MOVING BARRIER REAR AXLE Y VELOCITY

1 ——— B9810A1.V67 Filterclass (180)



TIME Seconds

MOA Research
11-24-1998 16:50



TEST: NCAP SIDE IMPACT TEST

TEST DATE: 11-24-1998

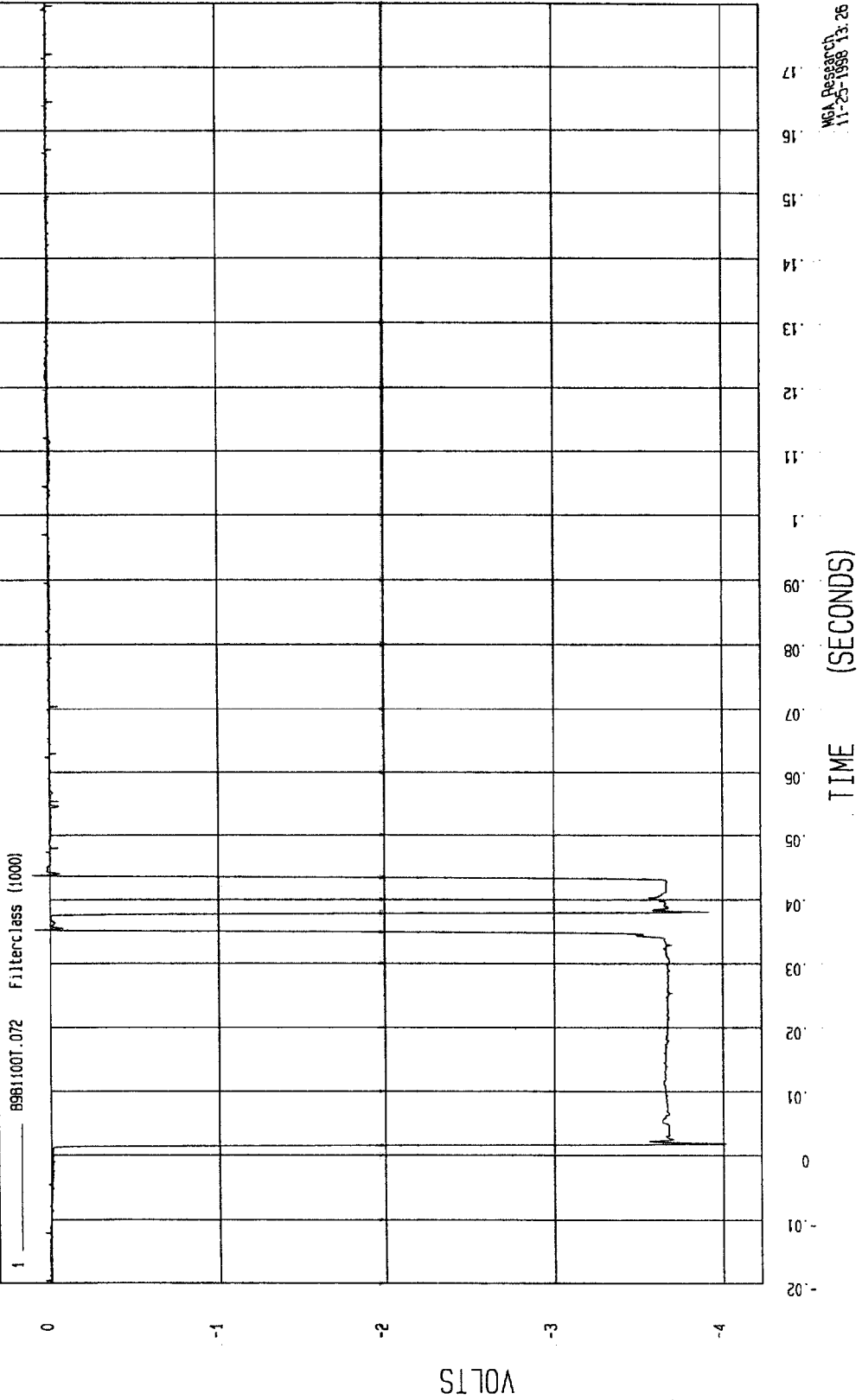
Speed: 38.23 MPH 61.5 KPH

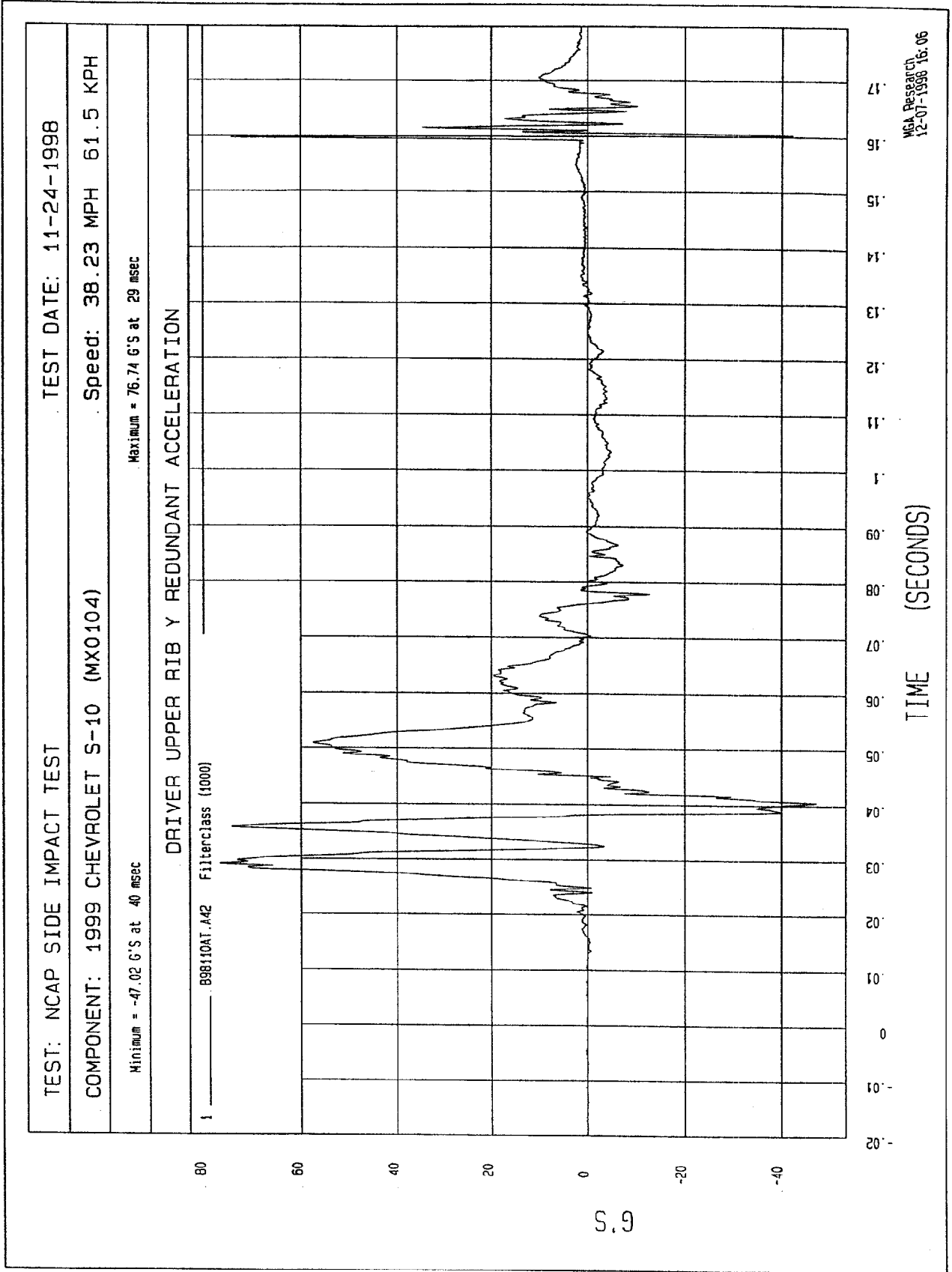
COMPONENT: 1999 CHEVROLET S-10 (MX0104)

Maximum = .11 VOLTS at 44 msec

Minimum = -4.01 VOLTS at 2 msec

RIGHT BARRIER CONTACT



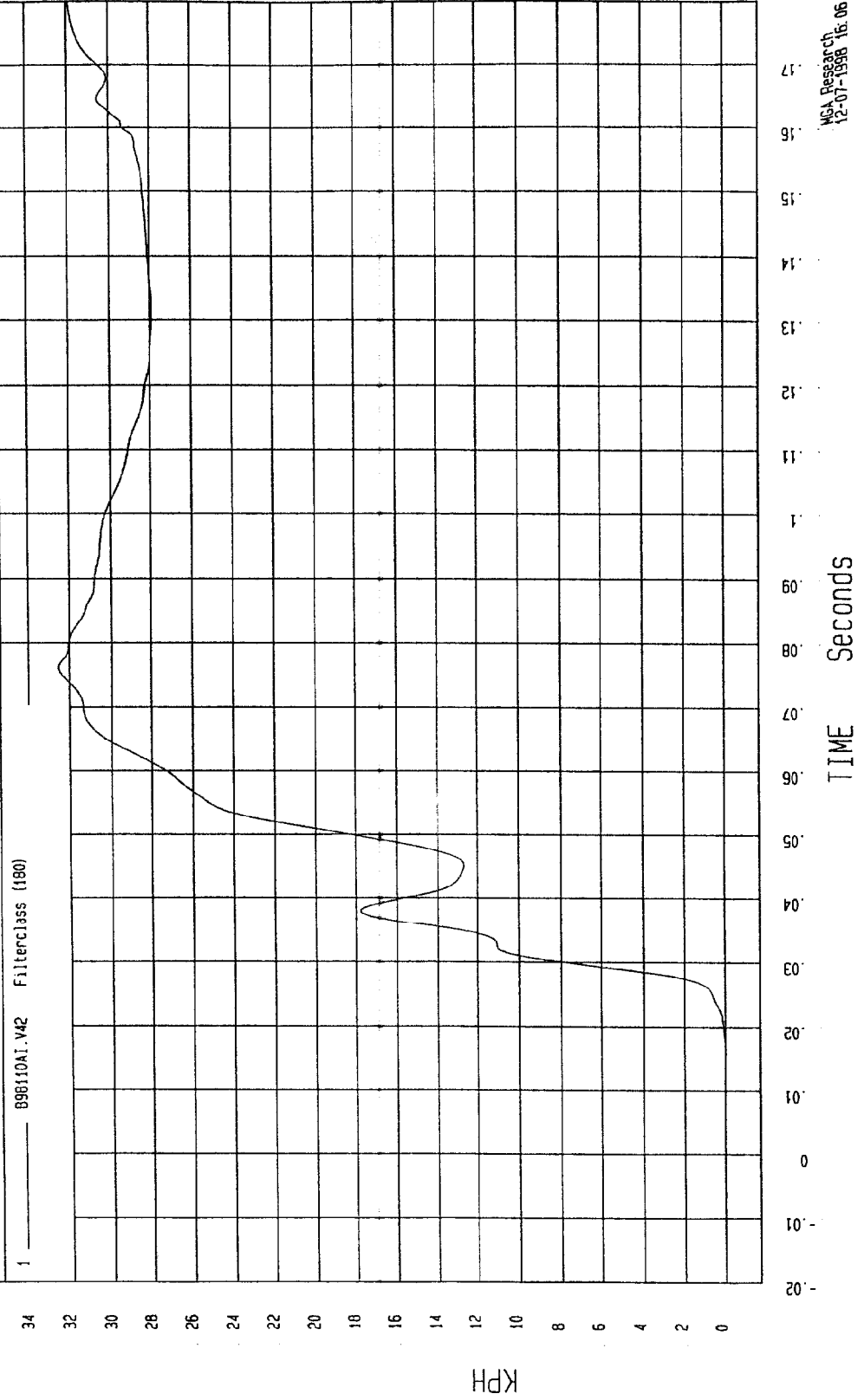


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -3.09E-02 KPH at 16 msec Maximum = 33.69 KPH at 200 msec

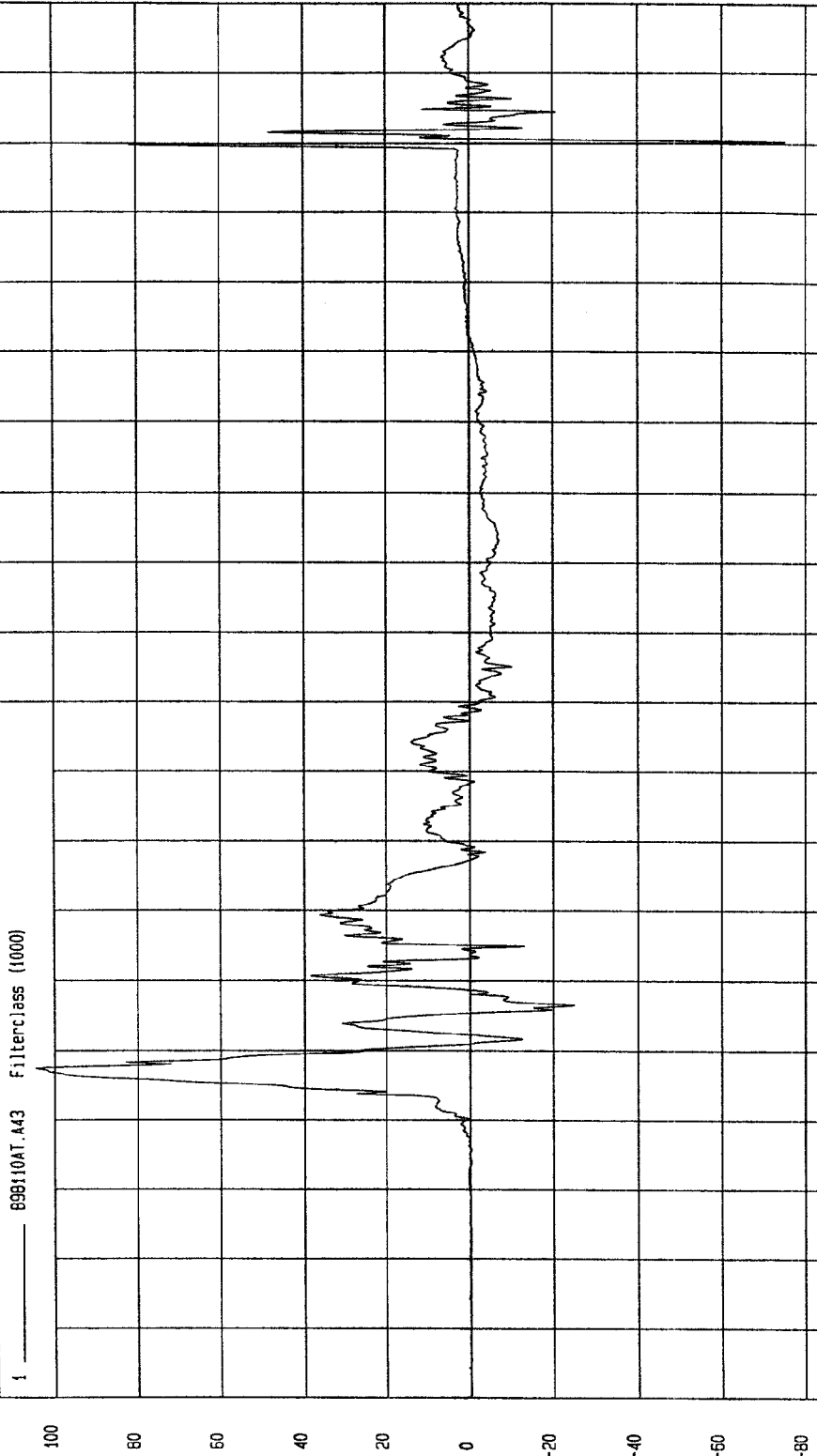
DRIVER UPPER RIB Y REDUNDANT VELOCITY



TEST: NCAP SIDE IMPACT TEST
 COMPONENT: 1999 CHEVROLET S-10 (MX0104)

TEST DATE: 11-24-1998
 Speed: 38.23 MPH 61.5 KPH
 Minimum = -75.05 G'S at 160 msec
 Maximum = 104.47 G'S at 28 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION



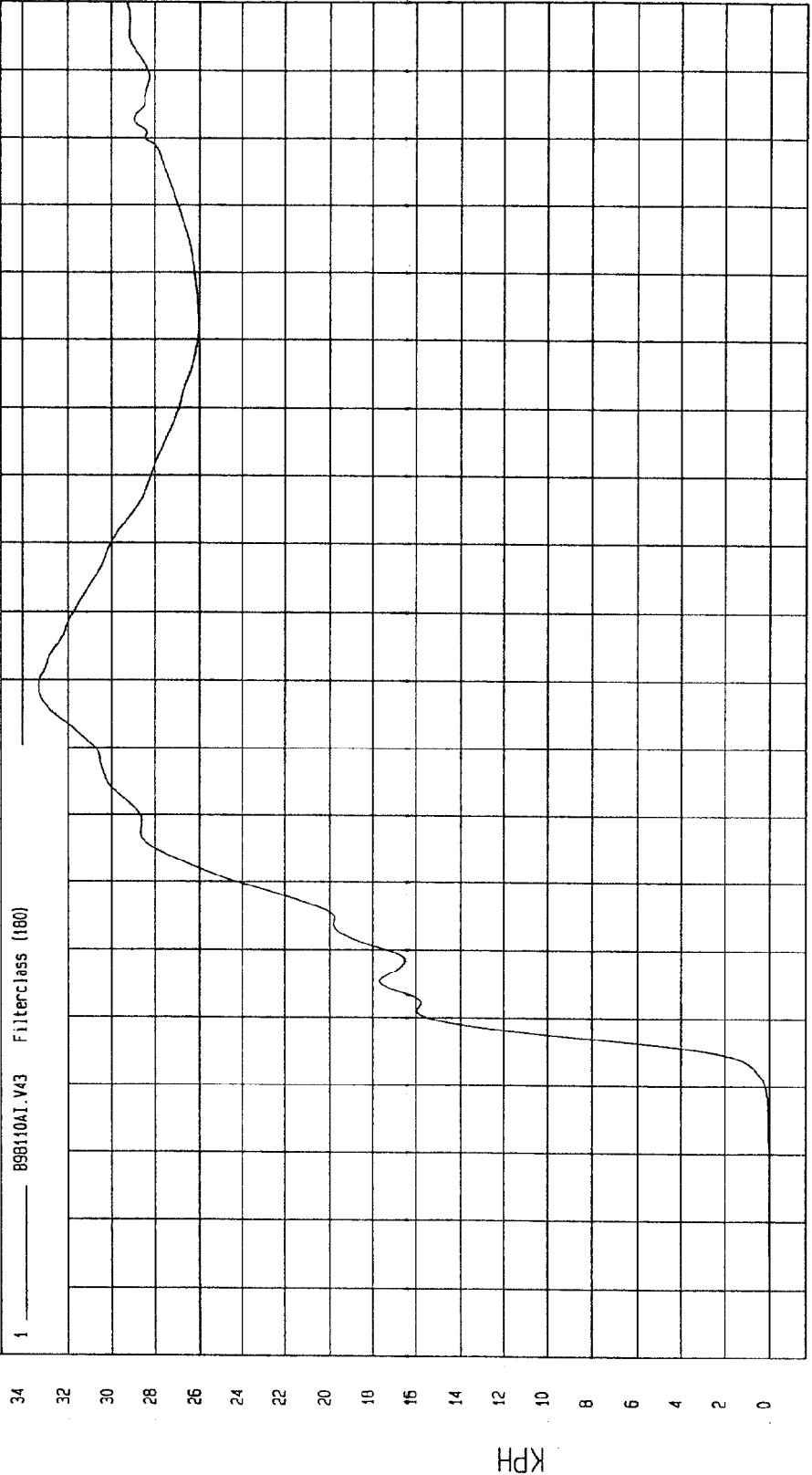
WCA Research
 12-07-1998 16:06

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = 0 KPH at -20 msec Maximum = 33.31 KPH at 79 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY



MCA Research
12-01-1998 16:06

TIME Seconds

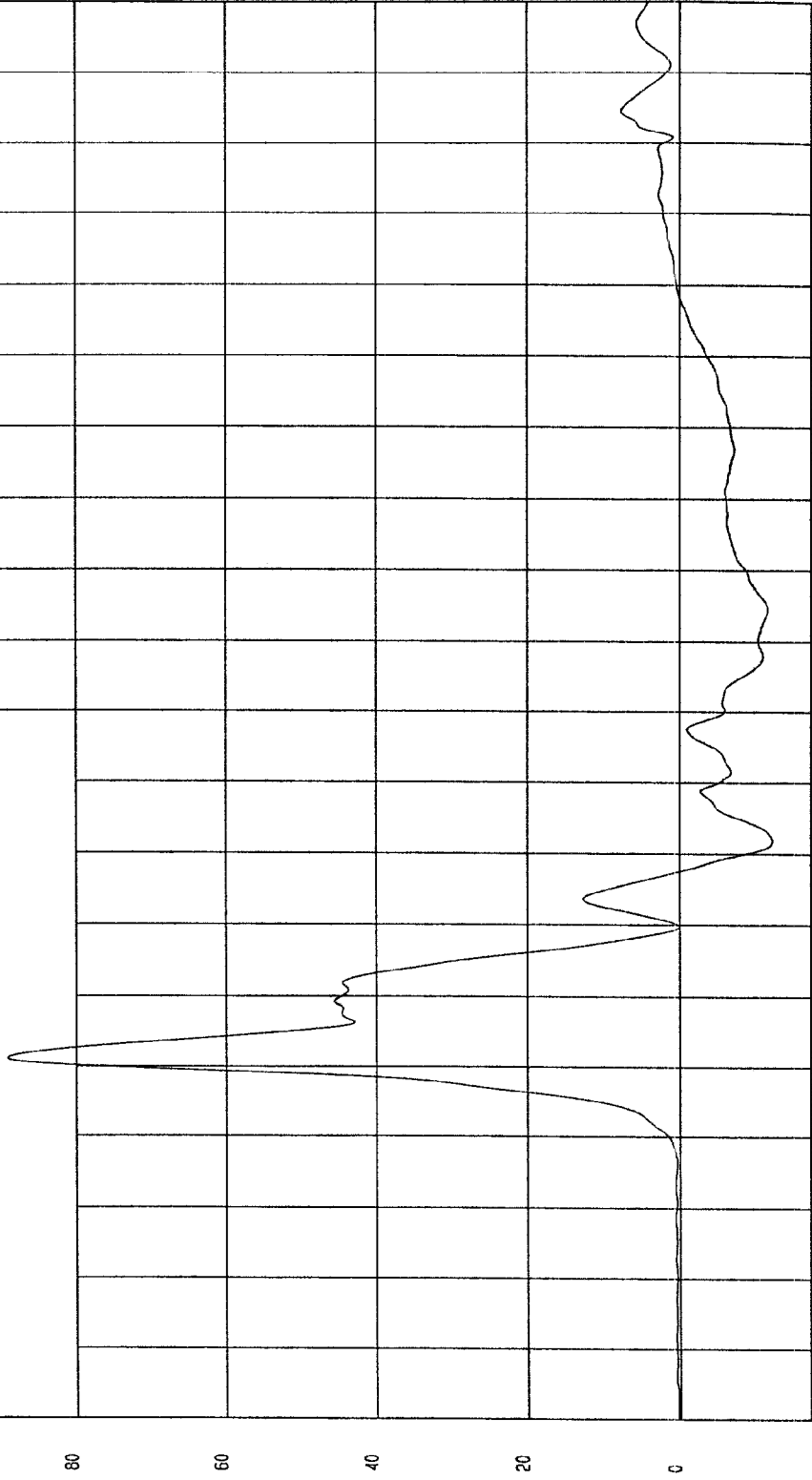
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

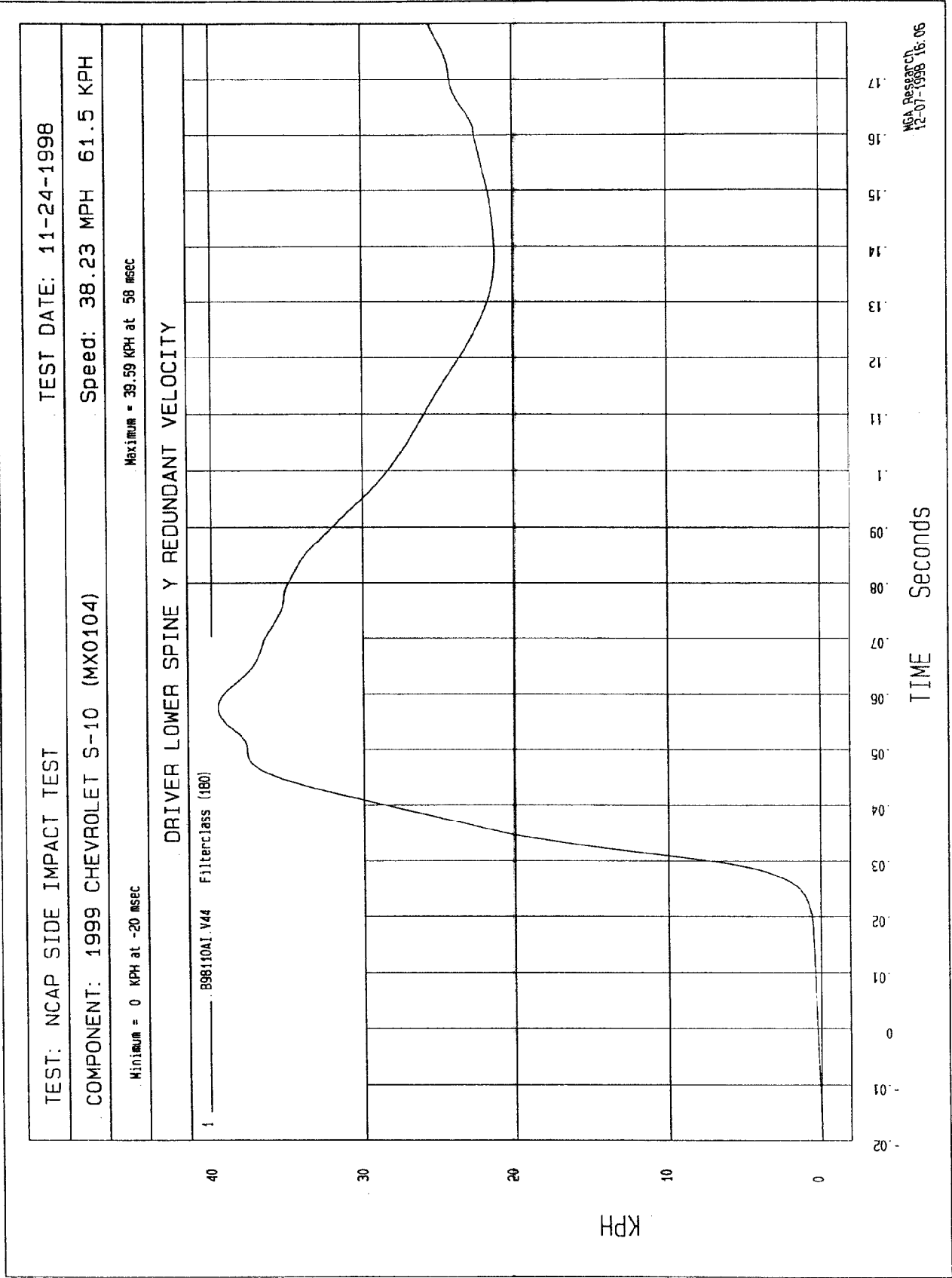
Minimum = -12.34 G'S at 62 msec Maximum = 89.04 G'S at 31 msec

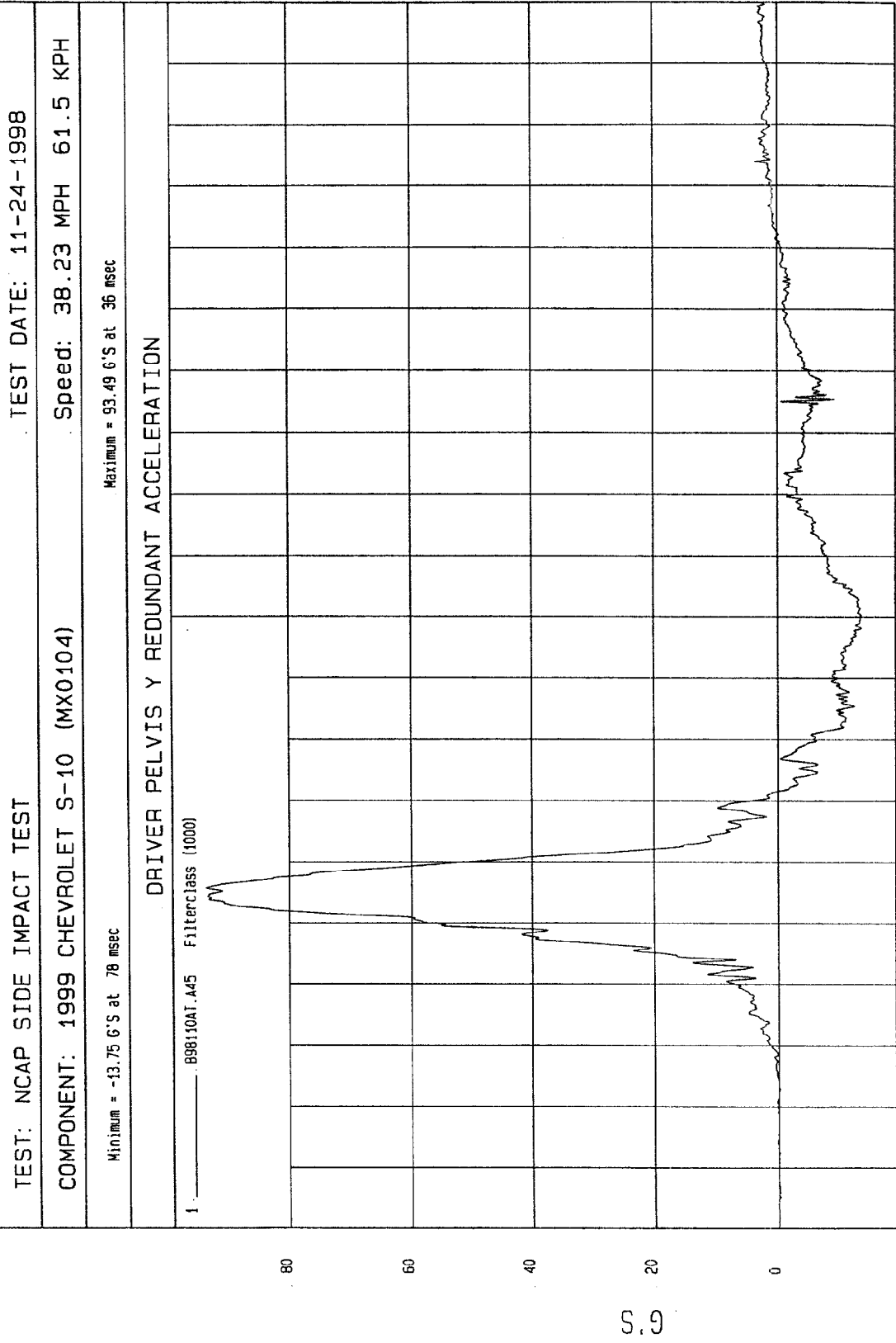
DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 _____ BSB110AF.A44 Filterclass (100)



MCA Research
12-07-1998 16:06





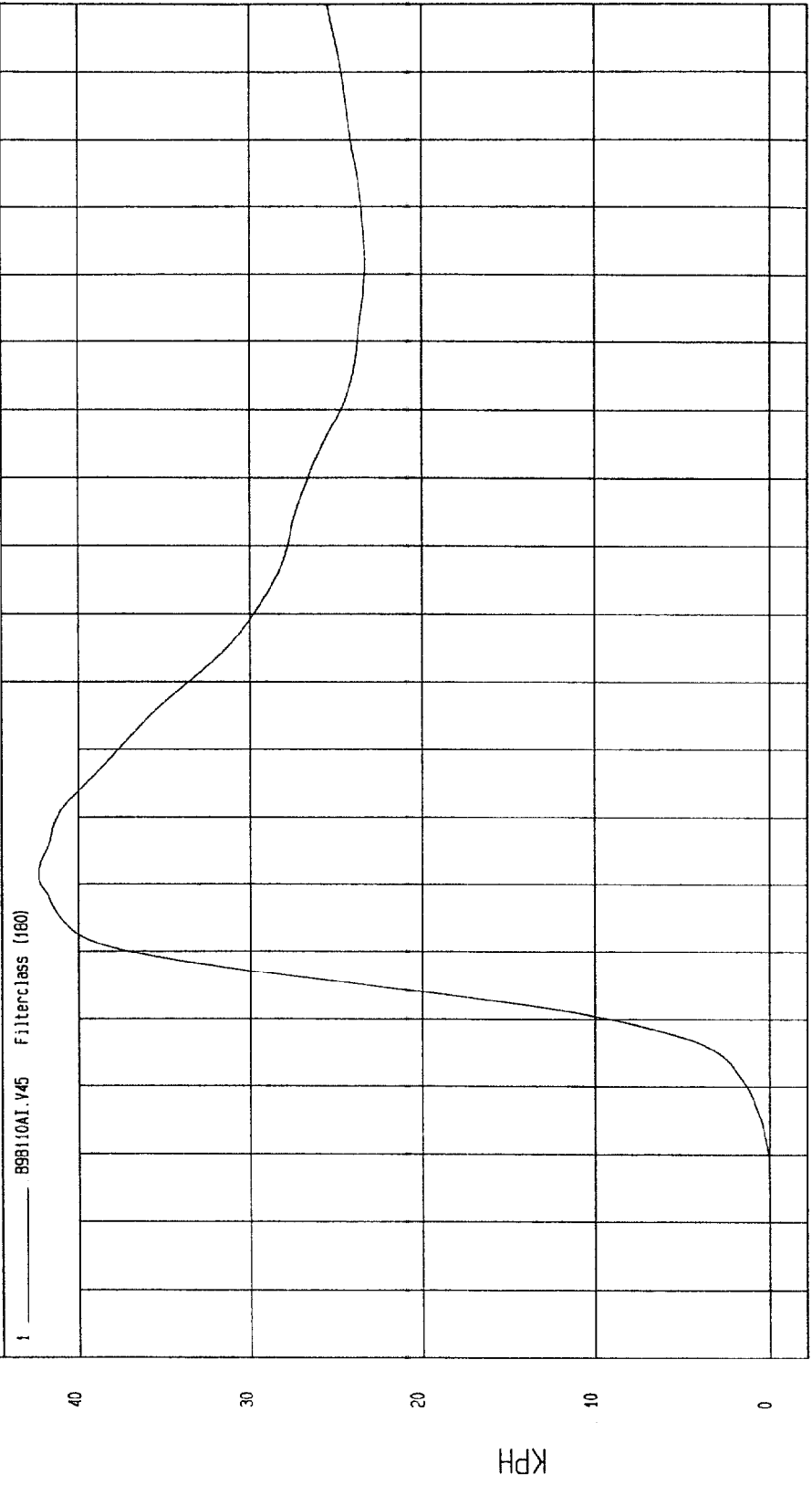
MGA Research
12-07-1998 16:06

TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

Minimum = -2.26E-03 KPH at -7 msec Maximum = 42.28 KPH at 51 msec

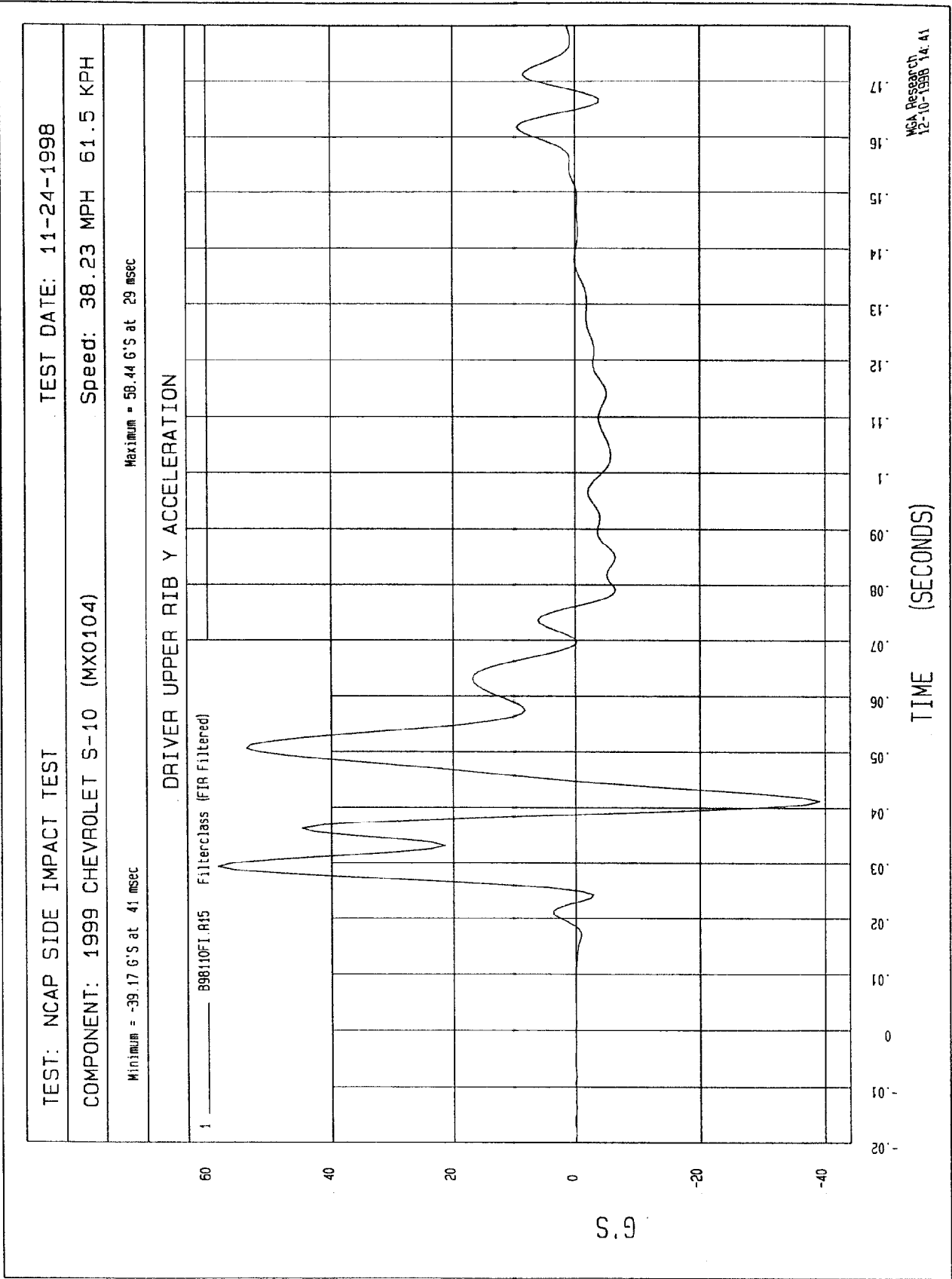
DRIVER PELVIS Y REDUNDANT VELOCITY



TIME Seconds

NSA Research
12-01-1998 16:06

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

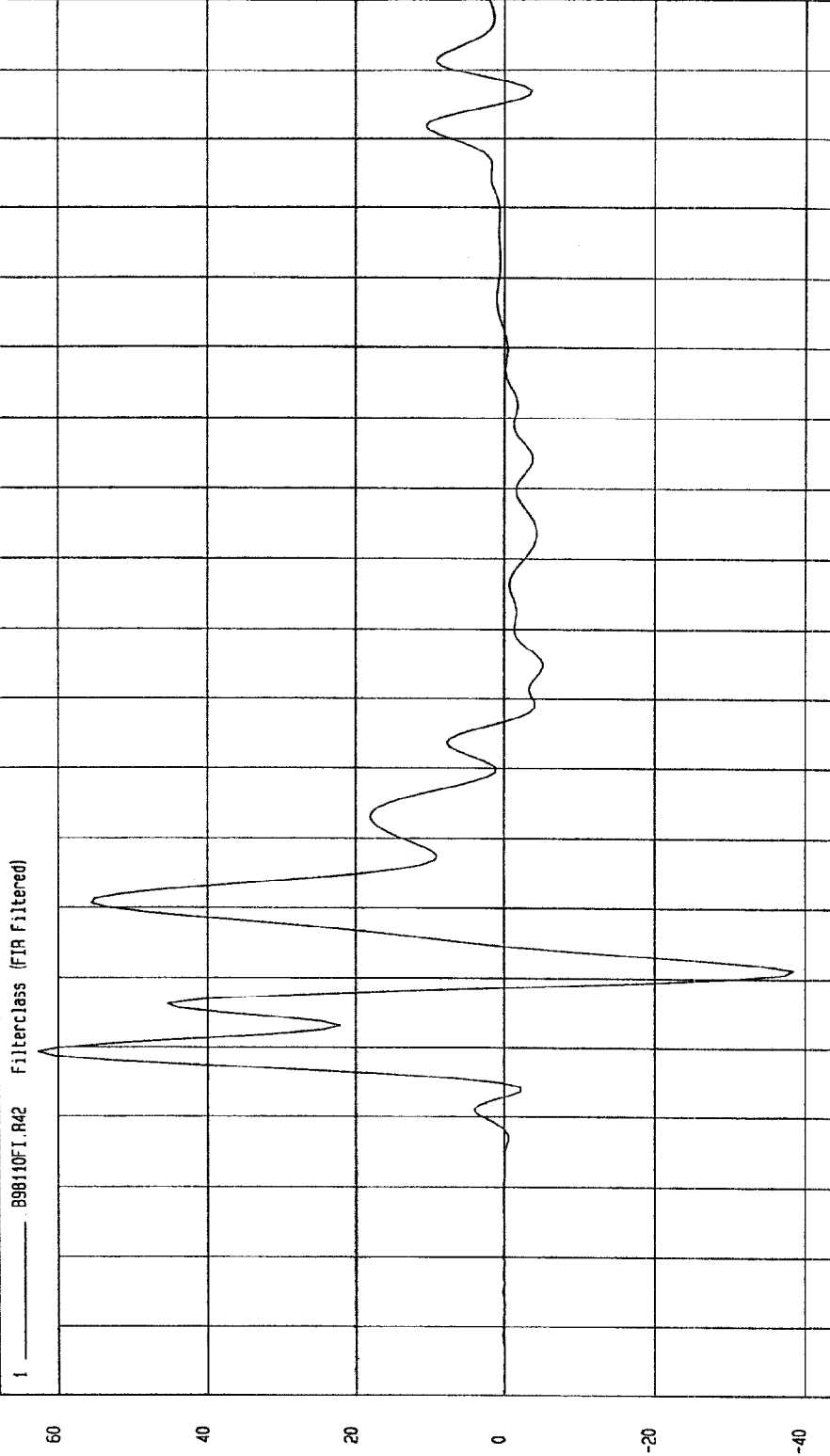


TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

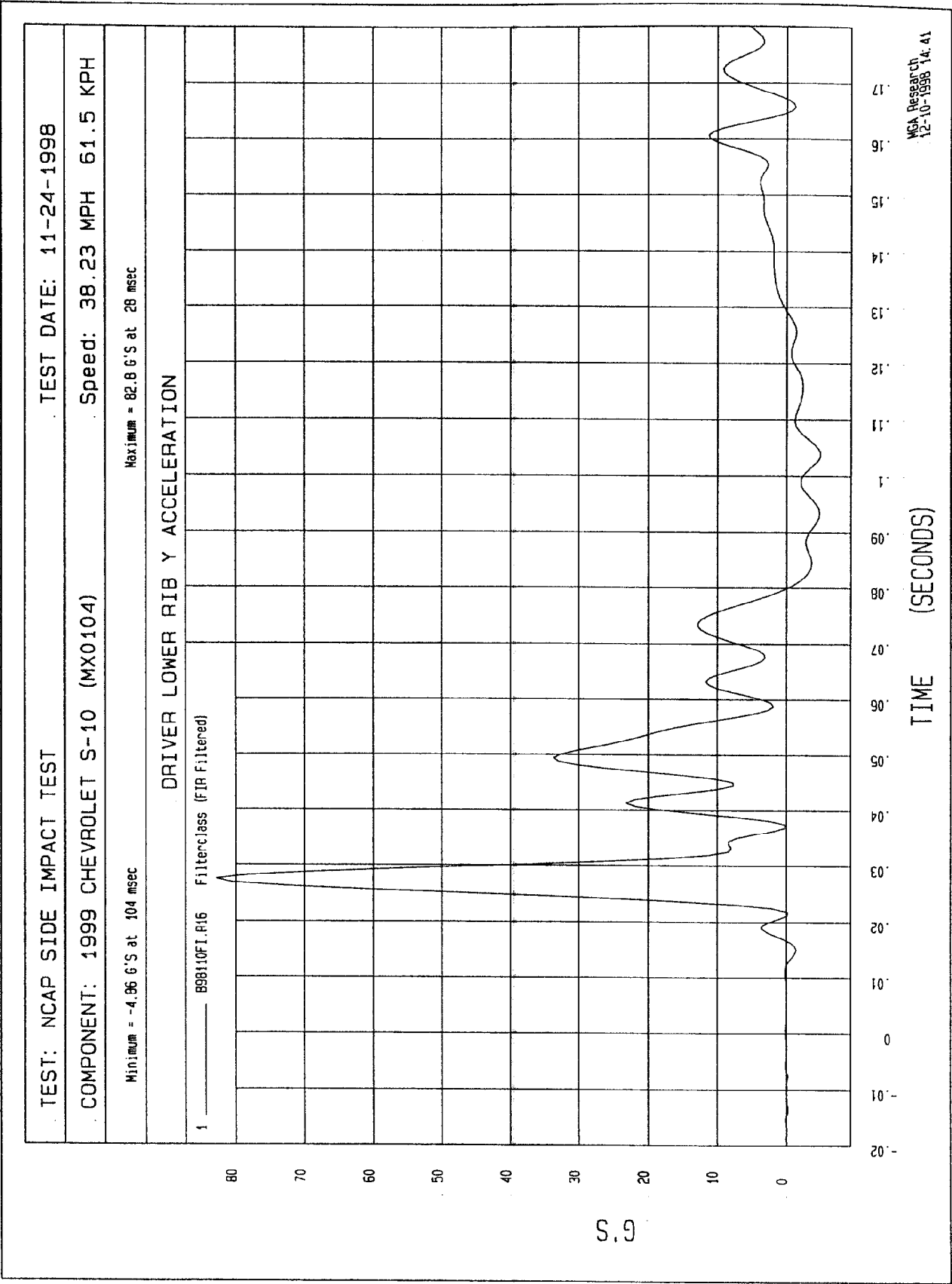
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

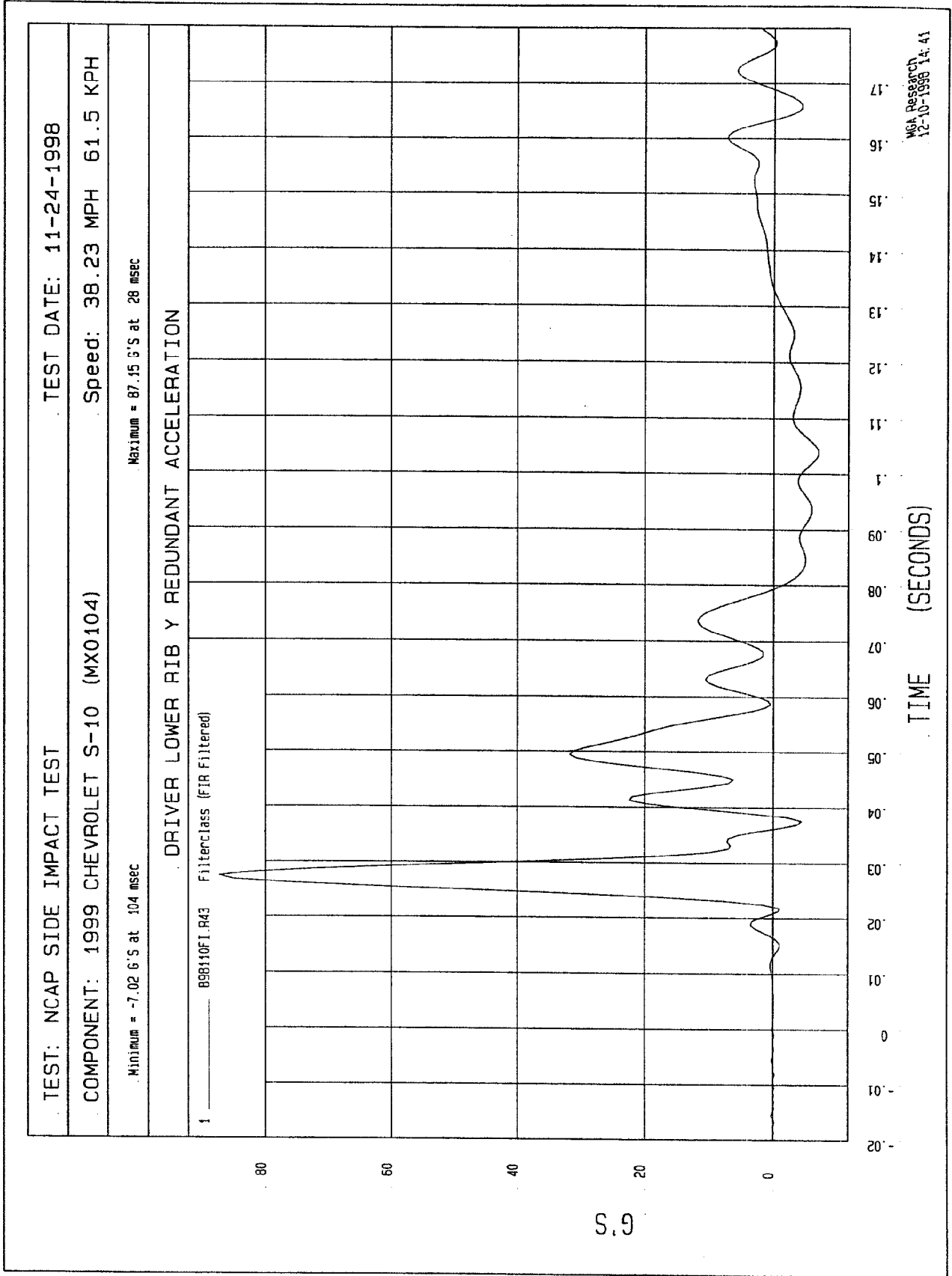
Minimum = -38.44 G'S at 41 msec Maximum = 62.77 G'S at 29 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION



MCA Research
12-10-1998 14: 41



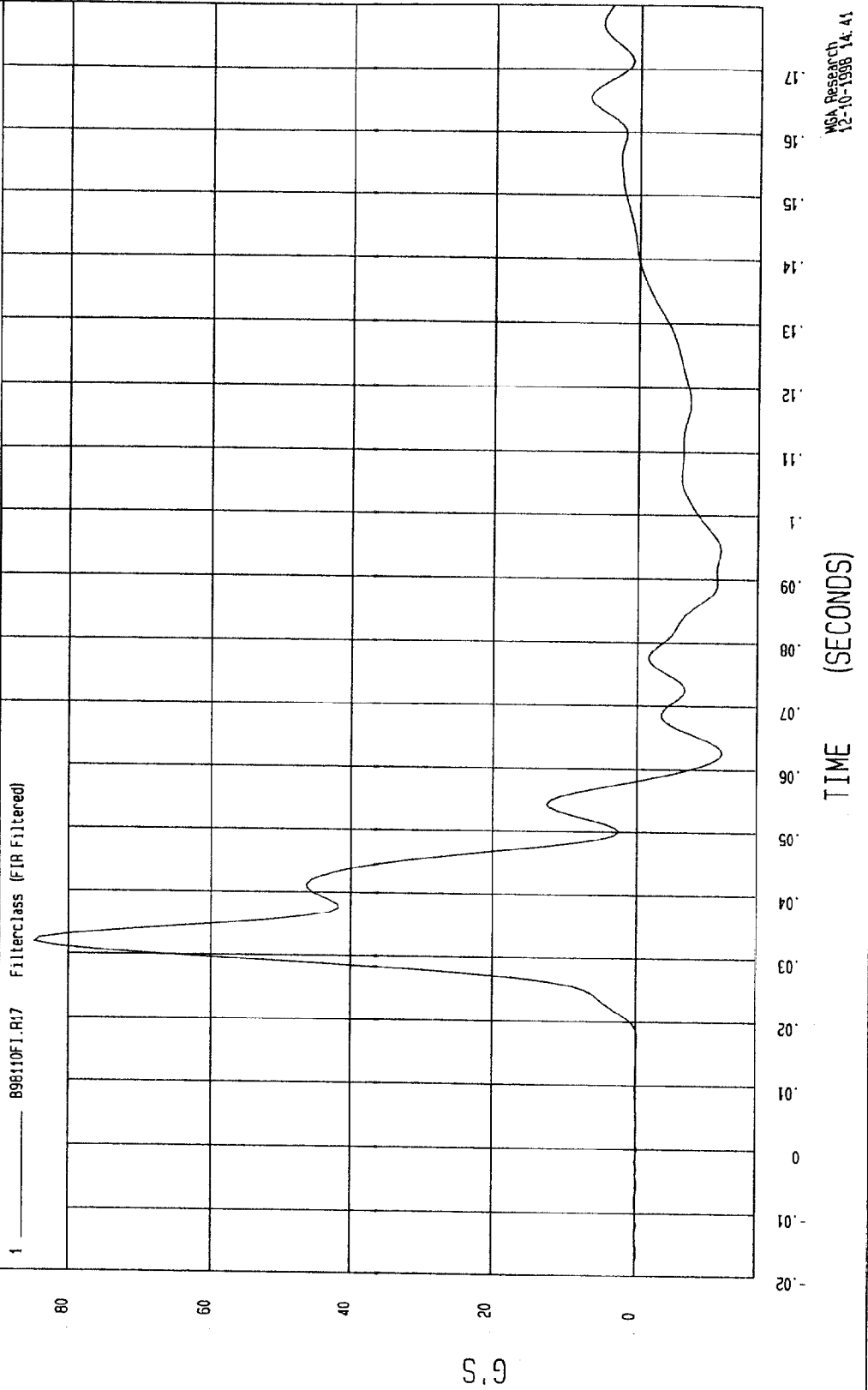


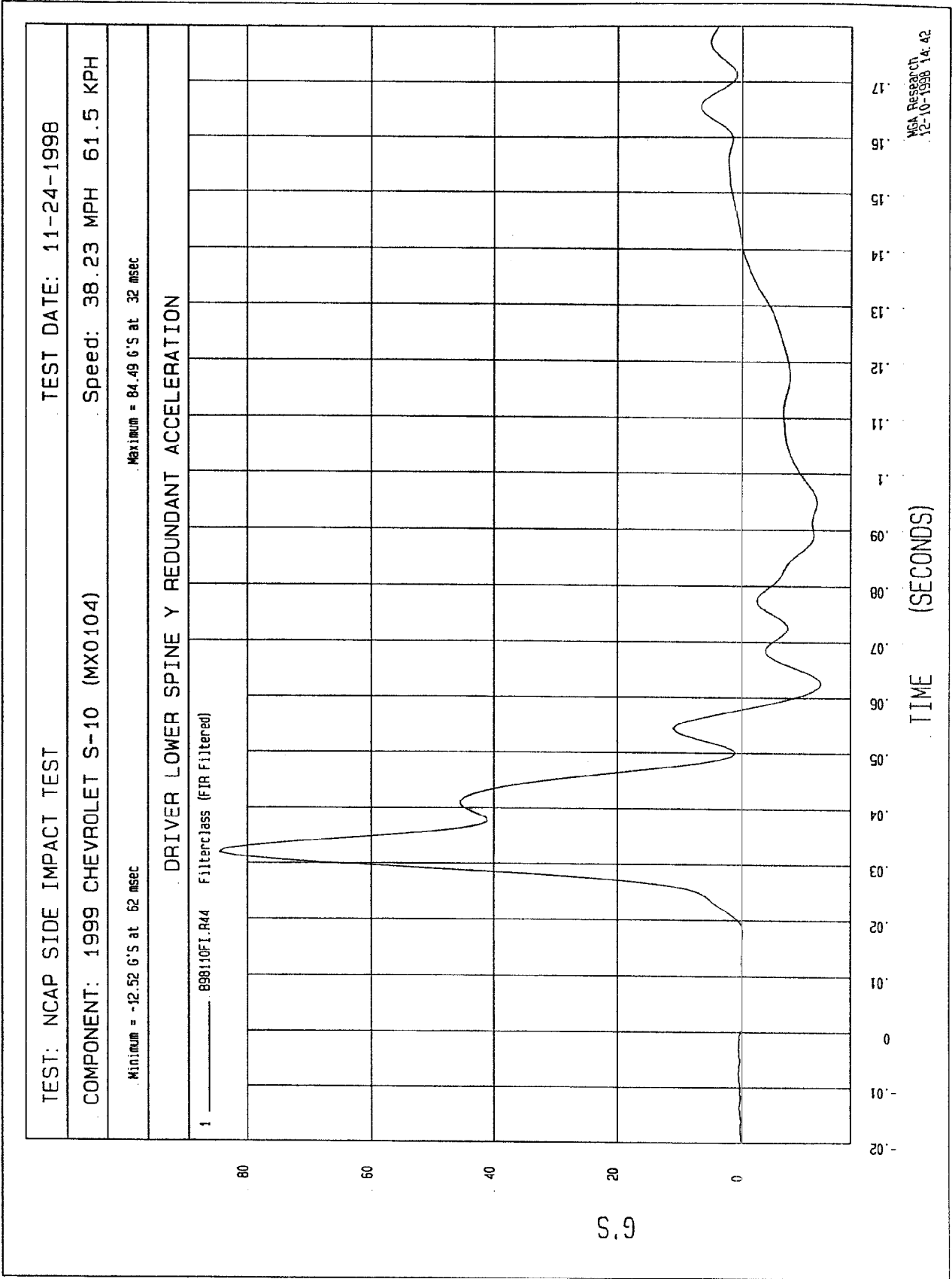
TEST: NCAP SIDE IMPACT TEST TEST DATE: 11-24-1998

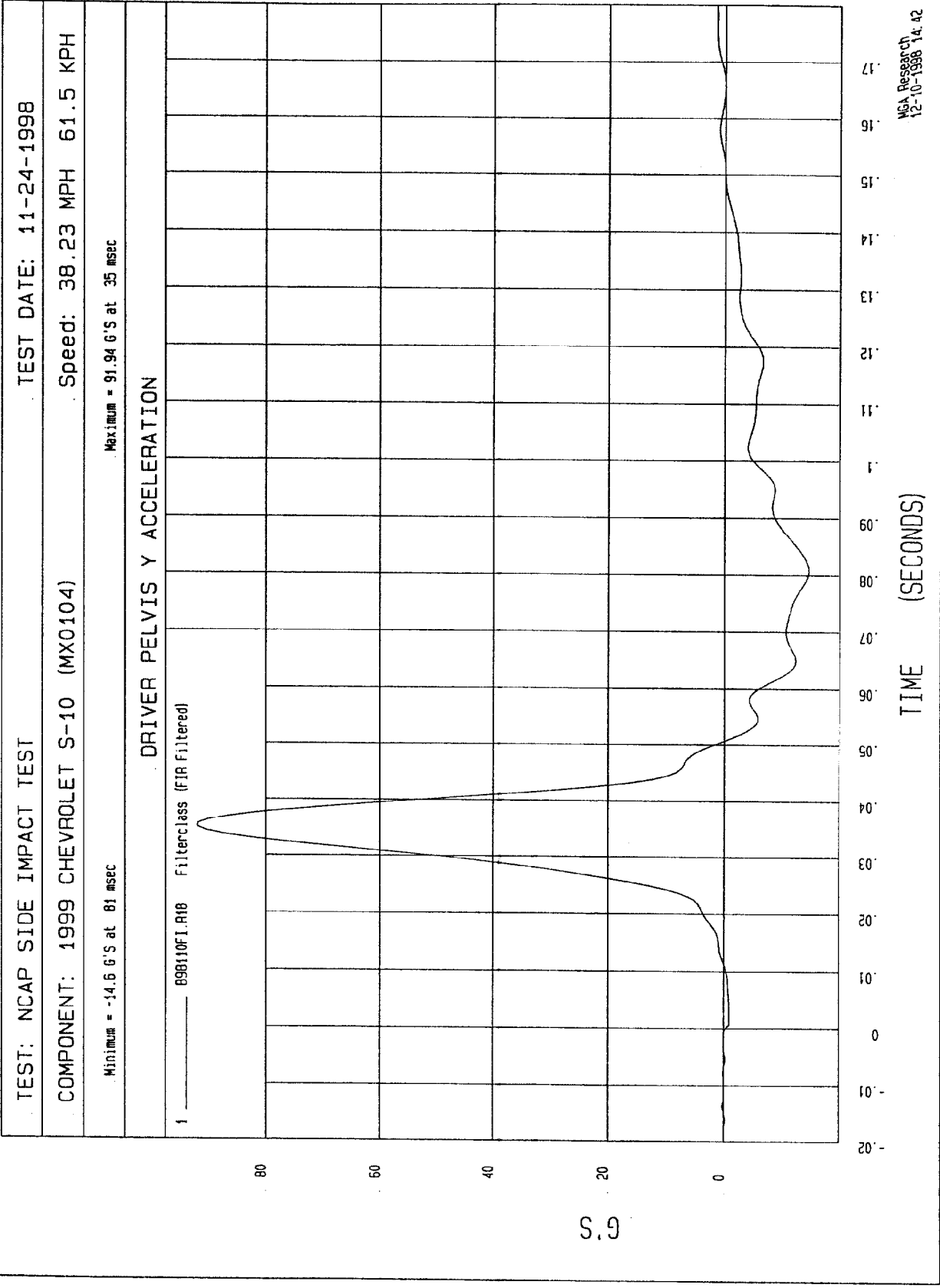
COMPONENT: 1999 CHEVROLET S-10 (MX0104) Speed: 38.23 MPH 61.5 KPH

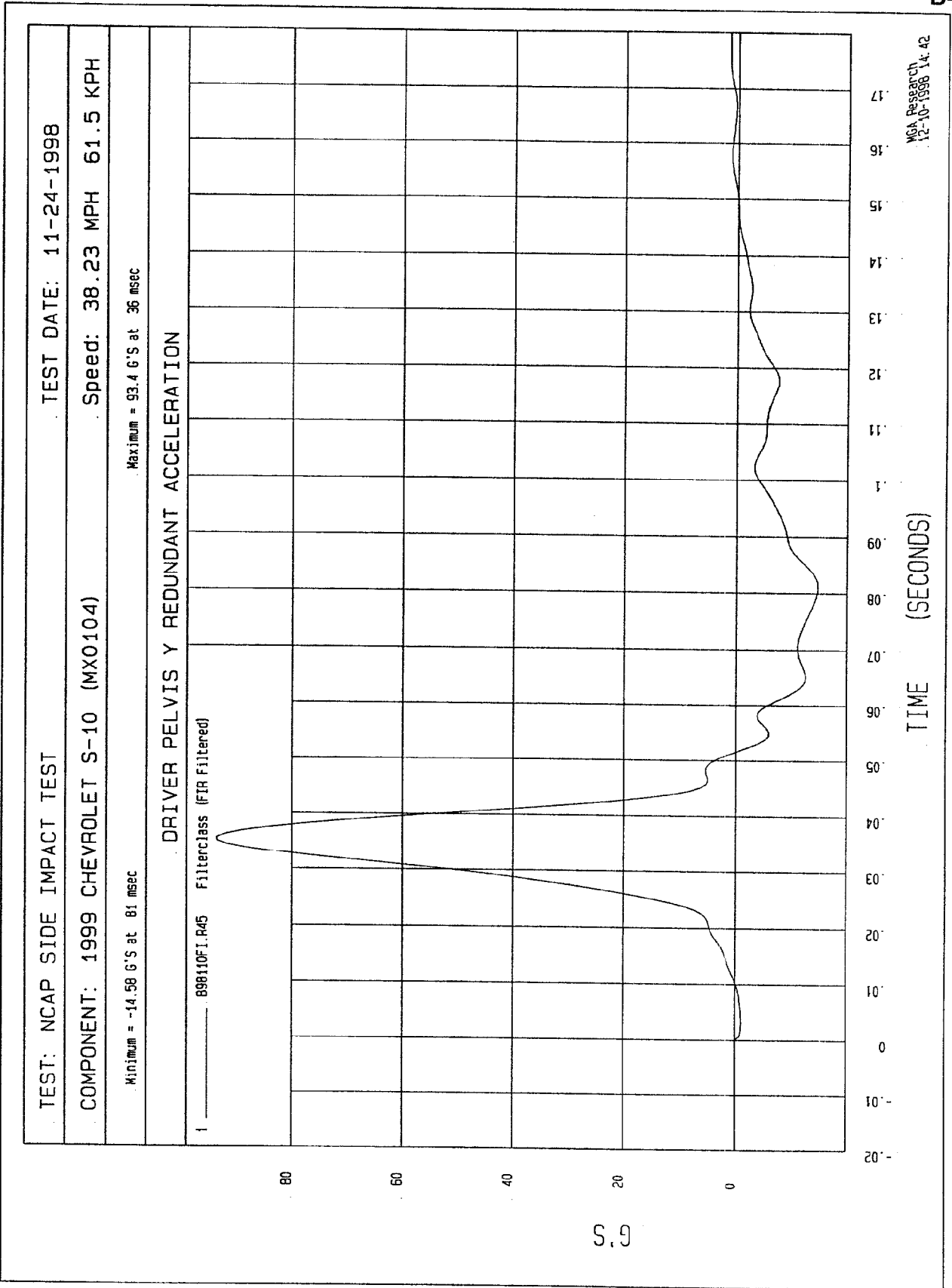
Minimum = -11.92 G'S at 62 msec Maximum = 84.76 G'S at 32 msec

DRIVER LOWER SPINE Y ACCELERATION









APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 271

Calibration Test Results Summary

Driver Dummy Serial Number: 271

Pre-Test Calibration

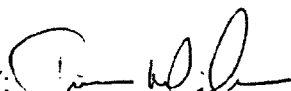
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

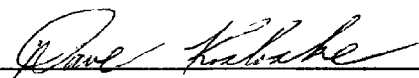
DUMMY SERIAL NUMBER: 271DATE OF VERIFICATION: November 2, 1998

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	895
RH - Rib Height (mm)	501 - 521	505
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	236
KV - Knee Pivot From Back Line (mm)	511 - 526	518
SW - Knee Pivot to Floor (mm)	490 - 505	493
HW - Hip Width (mm)	356 - 391	373

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

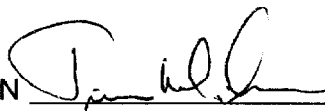
SIDE IMPACT DUMMY (SID)

DATE: October 30, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981372

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	52%
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46 g's	40
LOWER RIB (g's)	37 - 46 g's	41
LOWER SPINE (g's)	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

TECHNICIAN

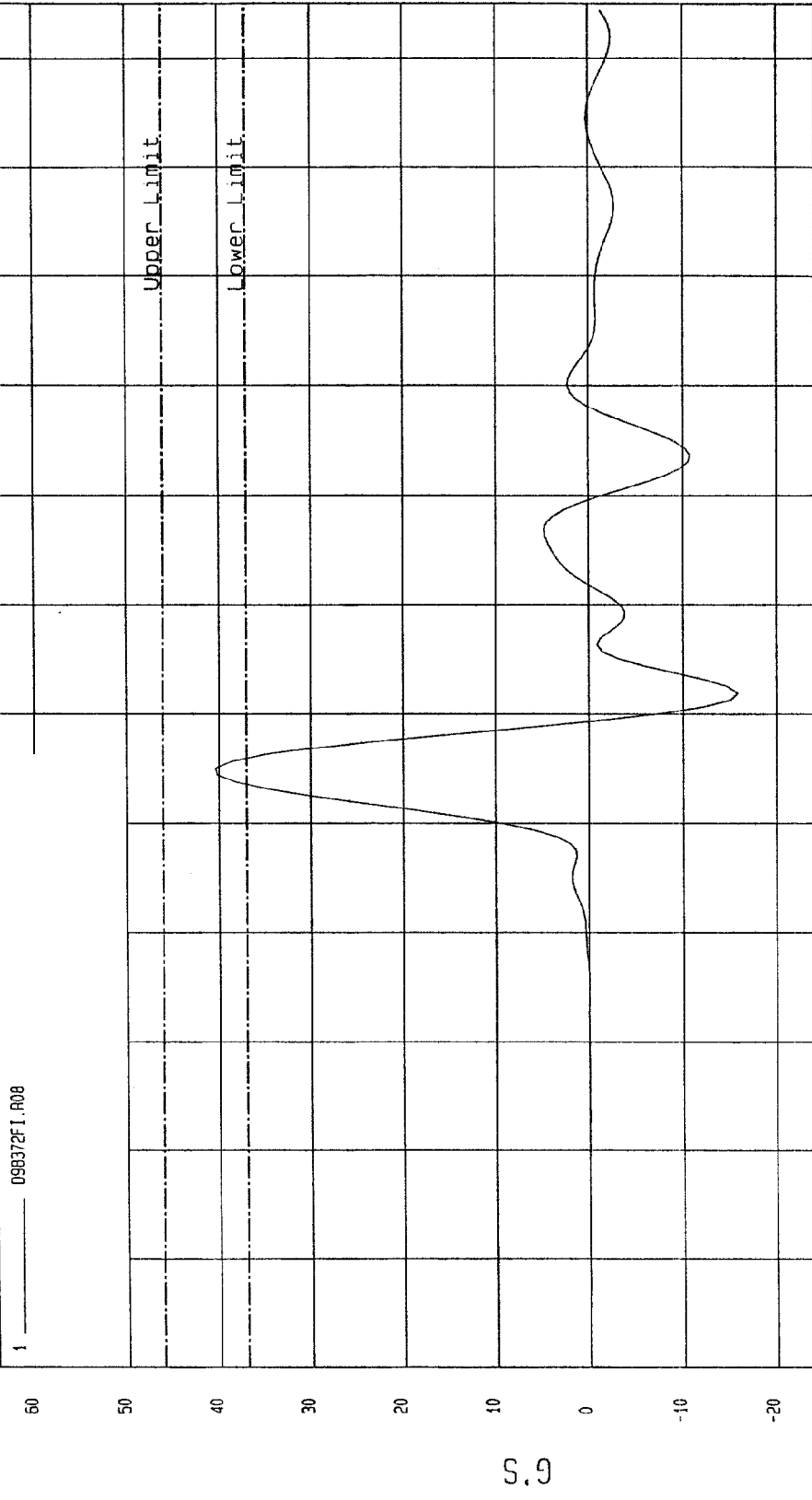


APPROVED BY



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 10-30-1998 - 15:50
COMPONENT: DUMMY # 271 Velocity: 14.024 FT/SEC 4.27 M/SEC
Minimum = -15.83 G'S at 61.8 msec Maximum = 40.38 G'S at 55 msec

UPPER RIB ACCELERATION



TIME (SECONDS)

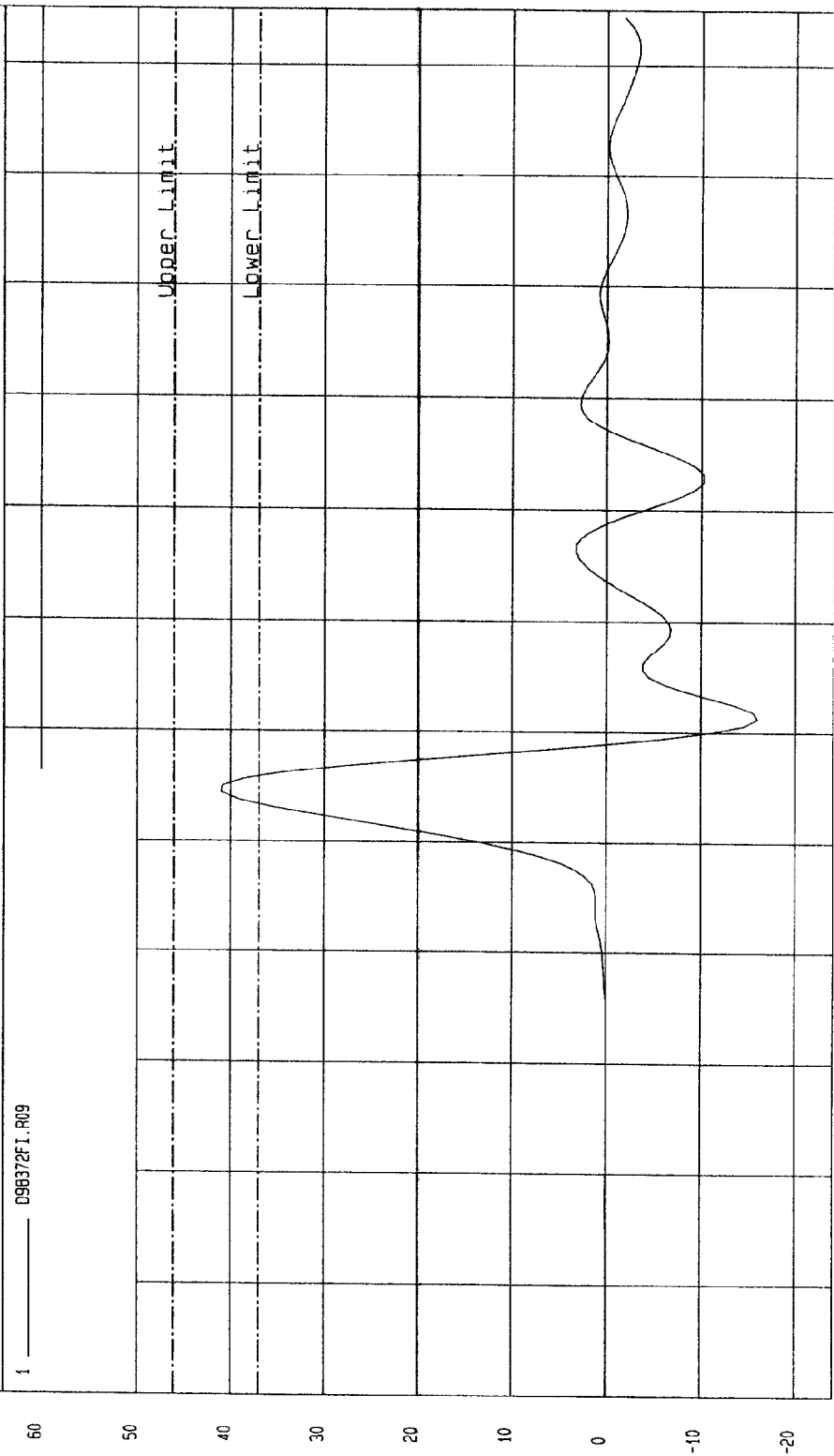
MGA Research
10-30-1998 15:56

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 10-30-1998 - 15:50

COMPONENT: DUMMY # 271 Velocity: 14.024 FT/SEC 4.27 M/SEC

Minimum = -15.99 G'S at 61.2 msec Maximum = 40.97 G'S at 54.3 msec

LOWER RIB ACCELERATION



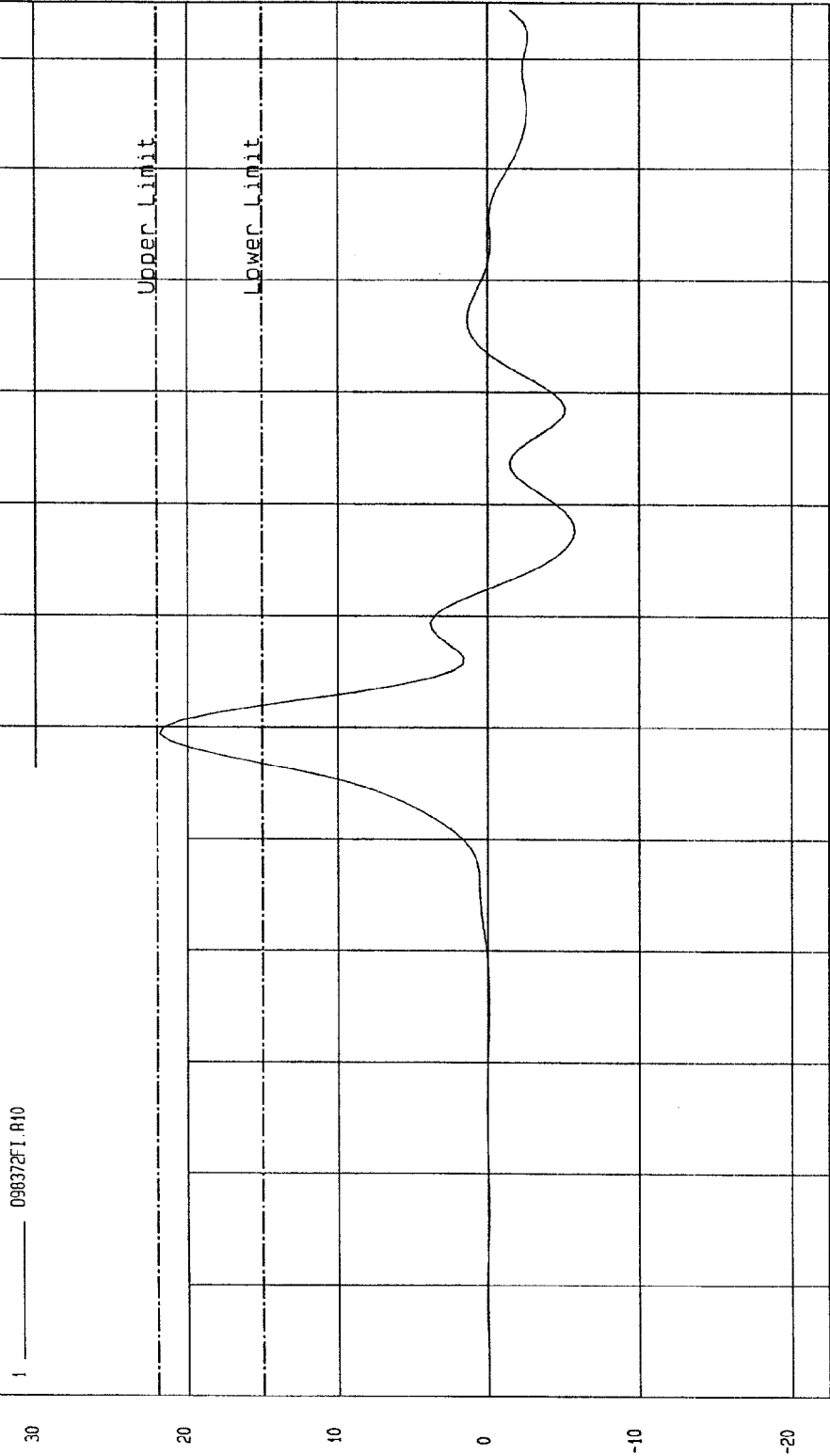
TIME (SECONDS)

M&A Research
10-30-1998 15:56

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 10-30-1998 - 15:51
COMPONENT: DUMMY # 271 Velocity: 14.024 FT/SEC 4.27 M/SEC

Minimum = -5.82 G'S at 77.5 msec Maximum = 21.83 G'S at 59.3 msec

LOWER SPINE ACCELERATION



TIME (SECONDS)

WGA Research
10-30-1998 15:56

G.S

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

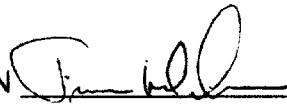
SIDE IMPACT DUMMY (SID)

DATE: October 30, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981373

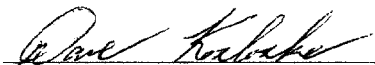
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	52%
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	52

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



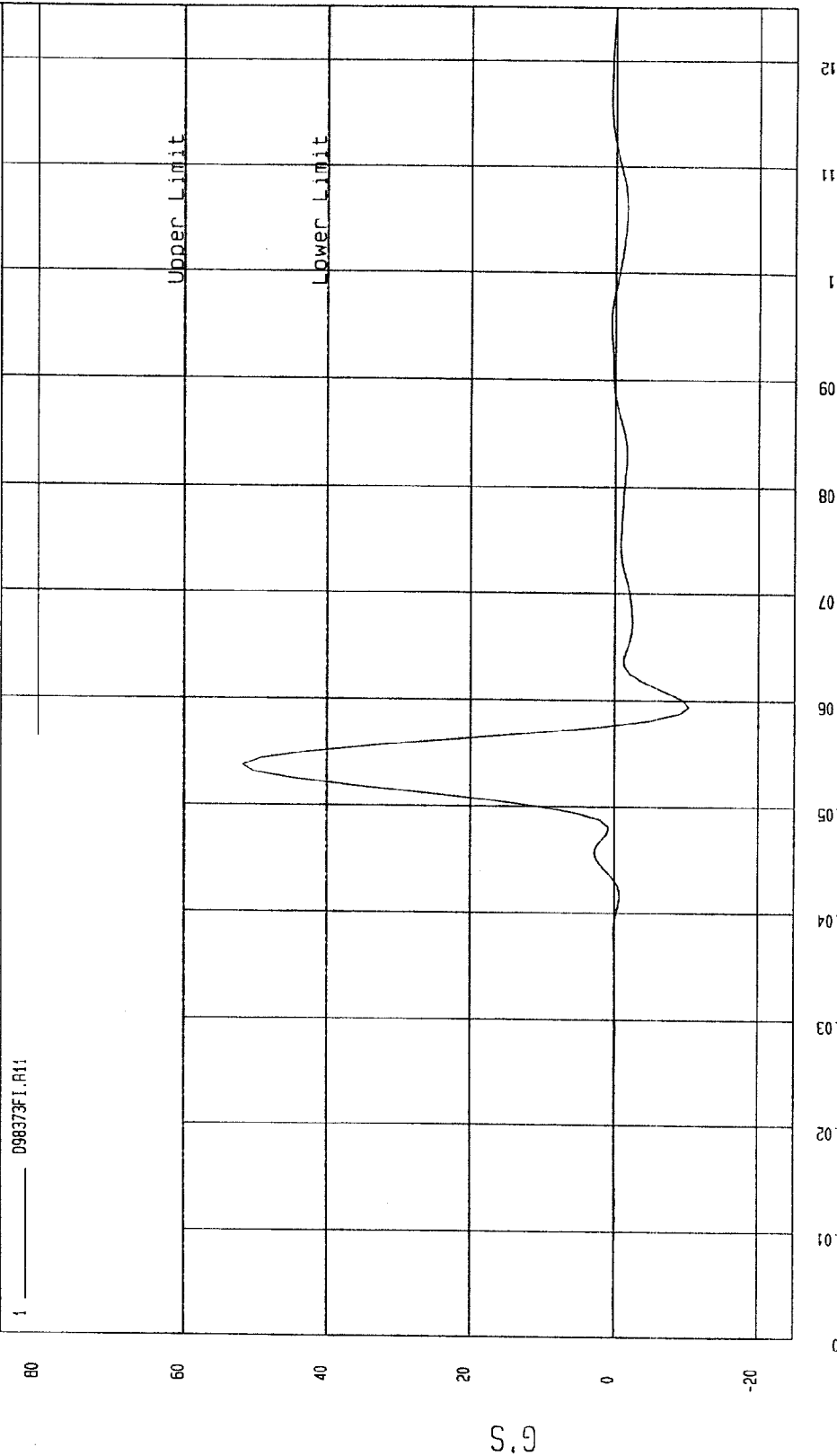
TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 10-30-1998 - 15:55

COMPONENT: DUMMY # 271 Velocity: 14.037 FT/SEC 4.28 M/SEC

Minimum = -10.32 G'S at 59.3 msec

Maximum = 51.71 G'S at 53.7 msec

PELVIS ACCELERATION



MCA Research
10-30-1998 15:57

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST

(PRELOAD = 10 LBS)

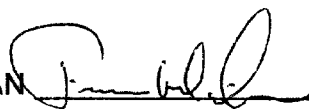
SIDE IMPACT DUMMY (SID)

DATE: November 2, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981374

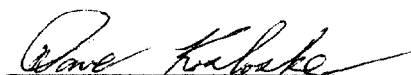
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	34%
FORCE @ 12.7 mm	104 - 162	142
FORCE @ 19.0 mm	163 - 222	195
FORCE @ 25.4 mm	222 - 280	253
FORCE @ 33 mm	325 - 391	340

TEST MEETS SPECIFICATIONS

TECHNICIAN



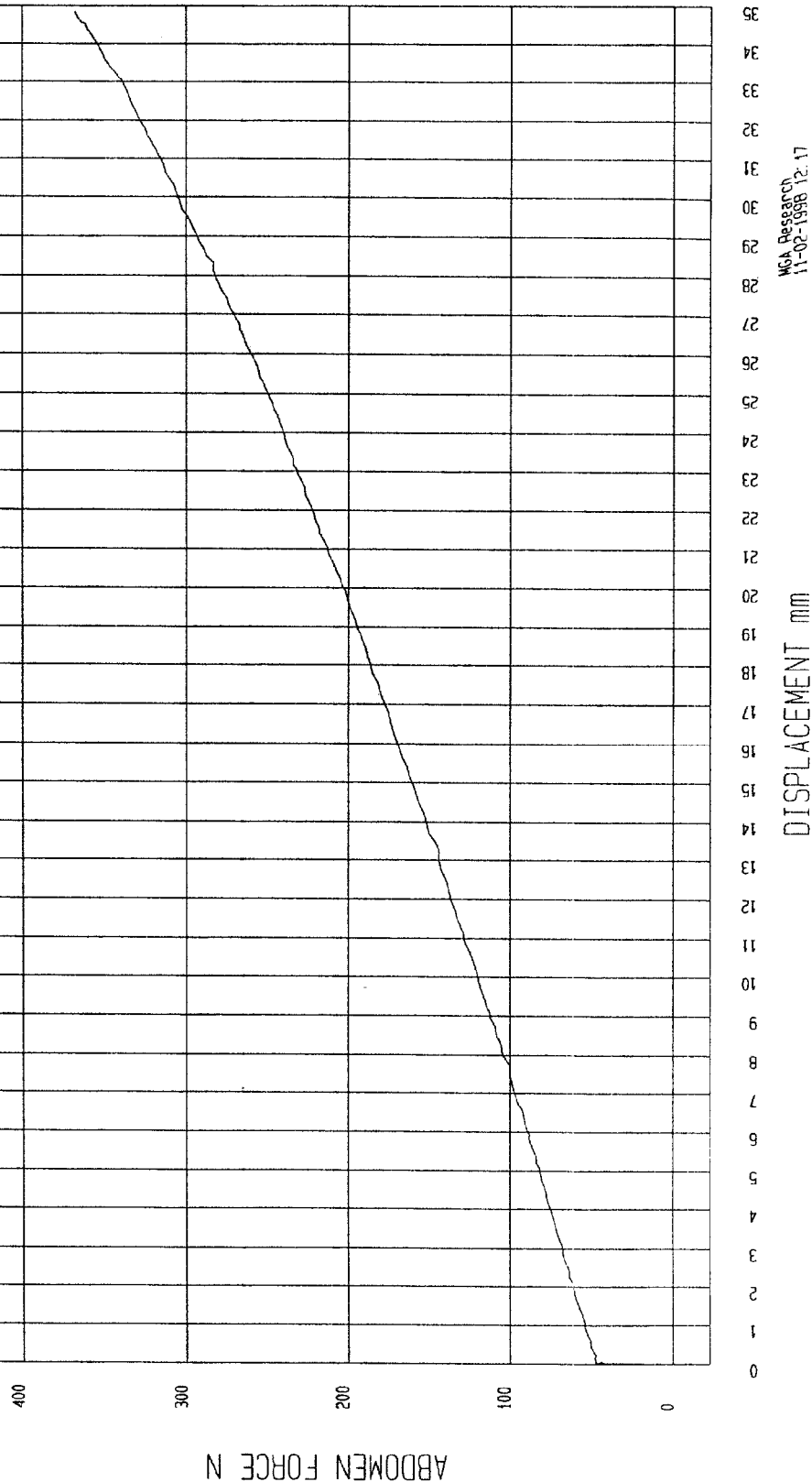
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 11-02-1998 - 12:04:06

COMPONENT: DUMMY # 271

ABDOMEN FORCE as a function of DISPLACEMENT



MGA Research
11-02-1998 12:17

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

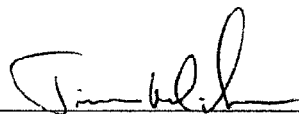
SIDE IMPACT DUMMY (SID)

DATE: November 2, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981375

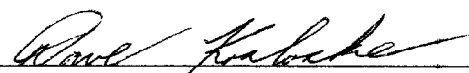
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	34%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	115.9
FORCE @ 30°	151.2 - 204.6	168.5
FORCE @ 40°	204.6 - 258.0	204.9
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN



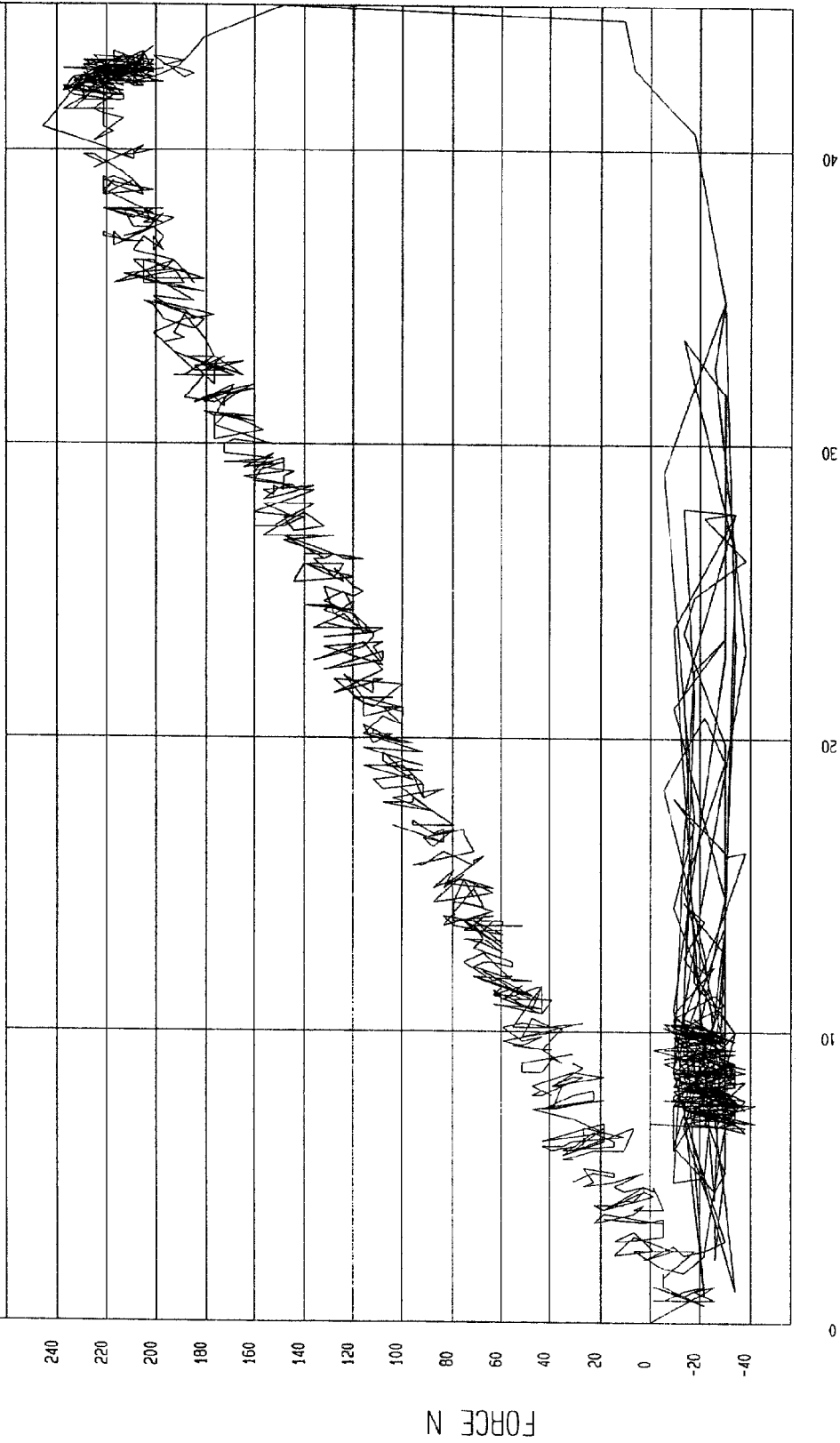
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 11-02-1998 - 10:47:12

COMPONENT: DUMMY # 271

FORCE as a function of TORSO ROTATION



MCA Research
11-02-1998 12:12

POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 271

Calibration Test Results Summary

Driver Dummy Serial Number: 271

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY SERIAL NUMBER: 271DATE OF VERIFICATION: November 30, 1998

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	895
RH - Rib Height (mm)	501 - 521	505
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	236
KV - Knee Pivot From Back Line (mm)	511 - 526	518
SW - Knee Pivot to Floor (mm)	490 - 505	493
HW - Hip Width (mm)	356 - 391	373

MEASUREMENTS BY: Jim M. L.APPROVED BY: Steve K. K.

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

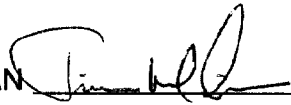
SIDE IMPACT DUMMY (SID)

DATE: November 30, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981492

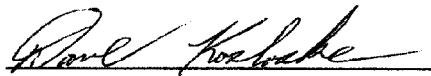
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	48%
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46 g's	43
LOWER RIB (g's)	37 - 46 g's	43
LOWER SPINE (g's)	15 - 22 g's	22

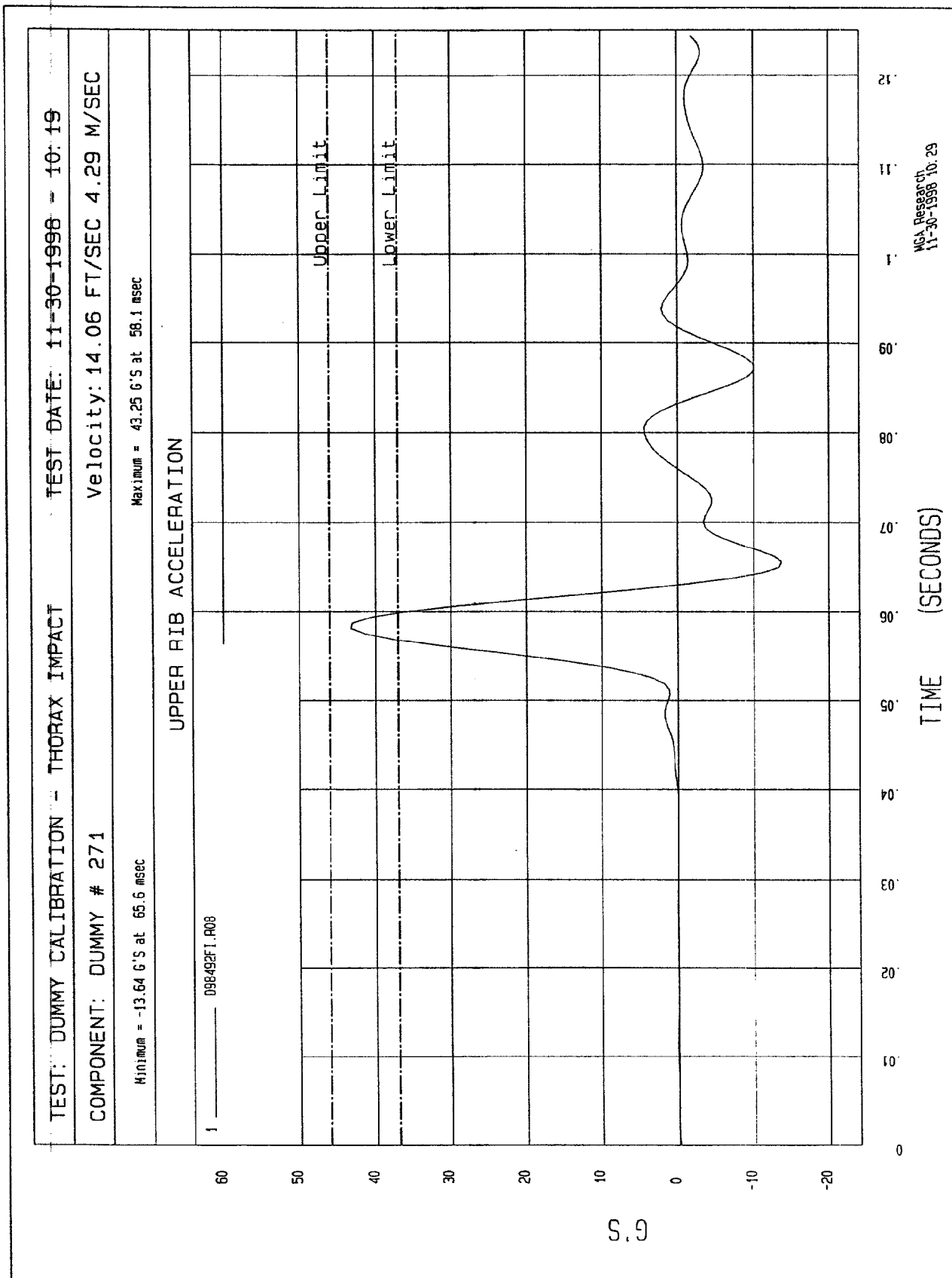
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



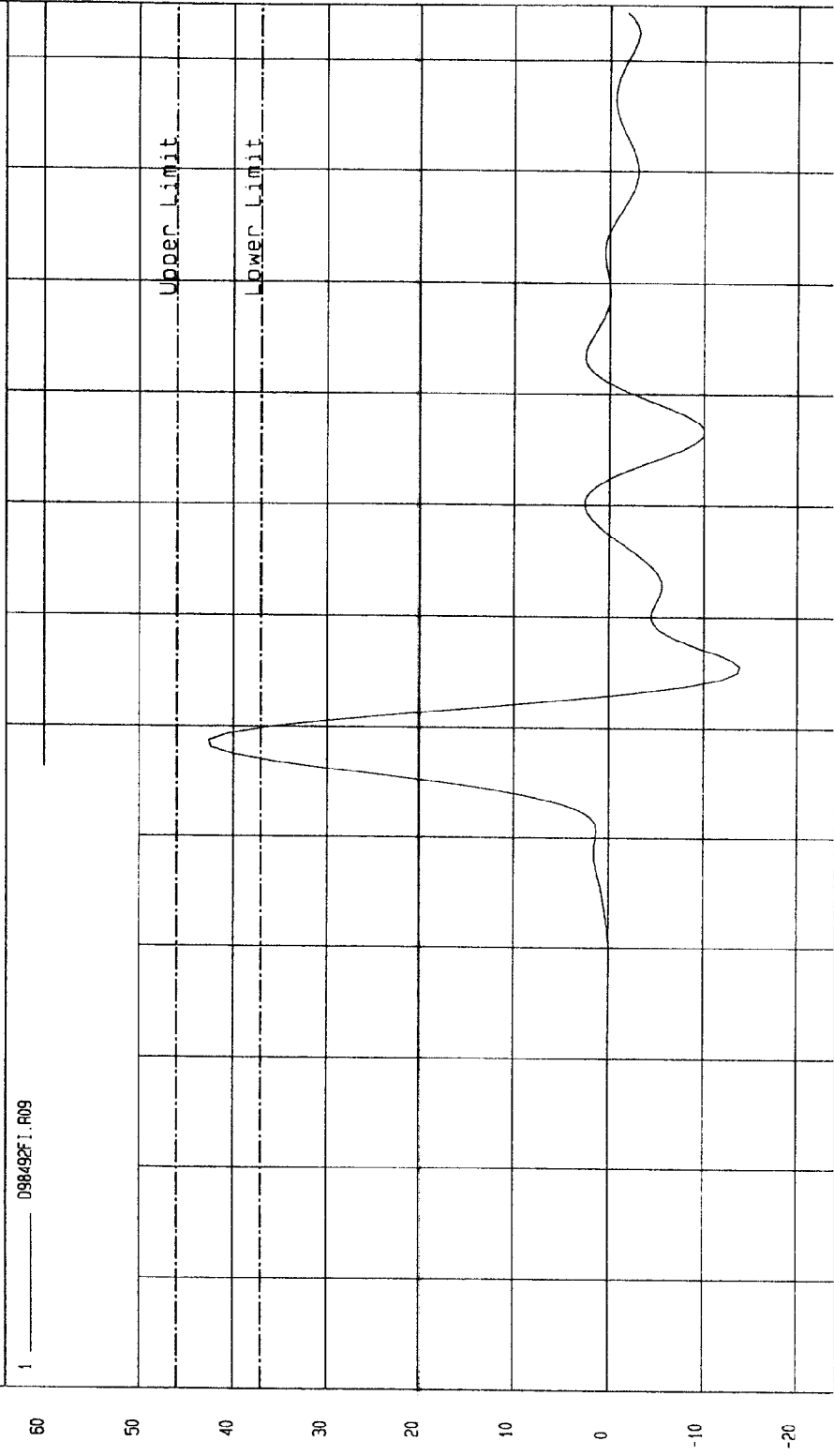


TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 11-30-1998 - 10:19

COMPONENT: DUMMY # 271 Velocity: 14.06 FT/SEC 4.29 M/SEC

Minimum = -13.76 G'S at 65.6 msec Maximum = 42.66 G'S at 58.7 msec

LOWER RIB ACCELERATION



MCA Research
11-30-1998 10:29

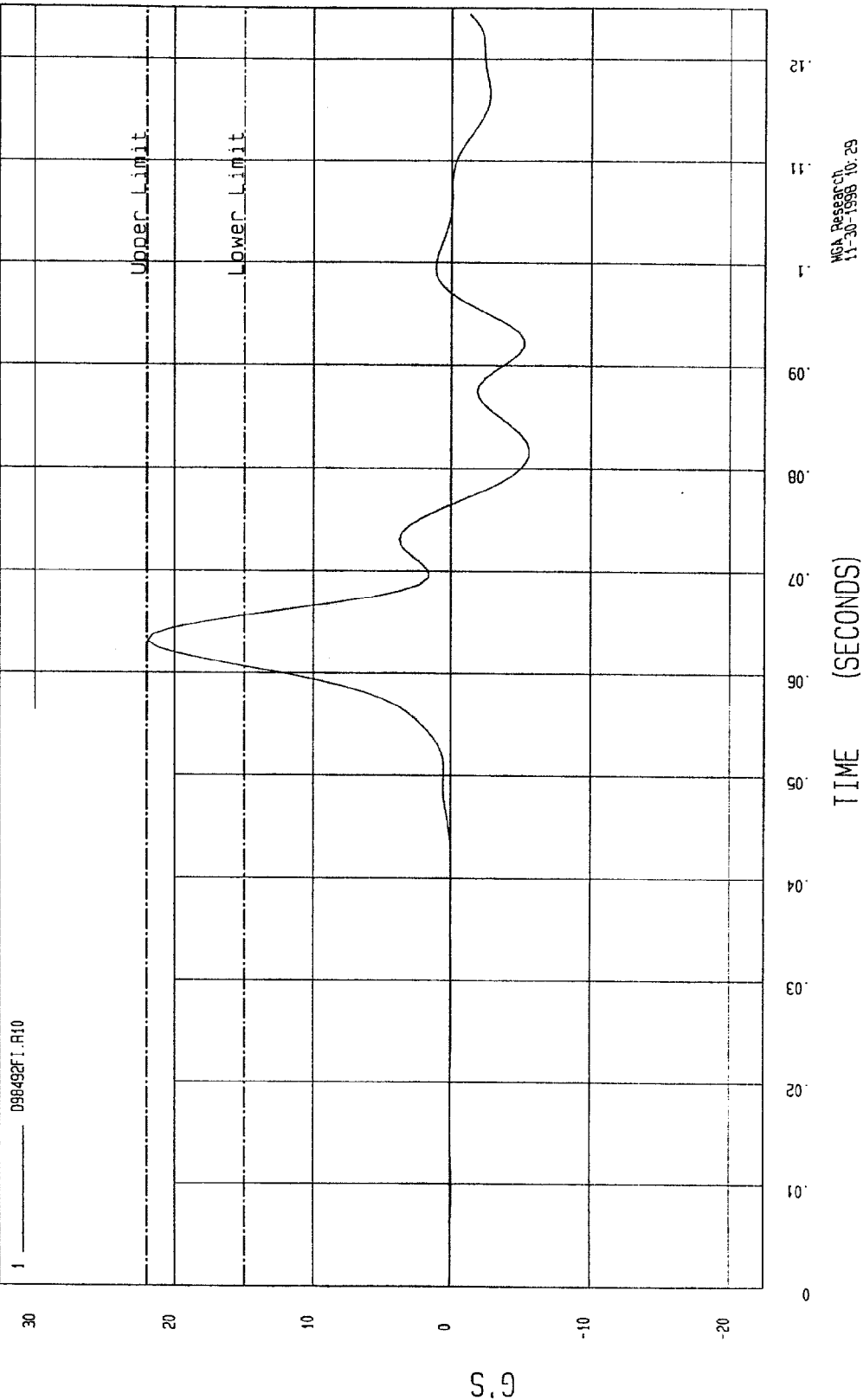
G.S

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 11-30-1998 - 10:19
COMPONENT: DUMMY # 271 Velocity: 14.06 FT/SEC 4.29 M/SEC

Minimum = -5.56 G'S at 81.8 msec

Maximum = 21.95 G'S at 63.1 msec

LOWER SPINE ACCELERATION



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

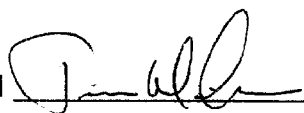
SIDE IMPACT DUMMY (SID)

DATE: November 30, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981493

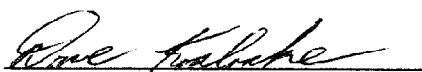
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	48%
PROBE SPEED (m/s)	4.27 - 4.33	4.30
PELVIS ACCELERATION (g's)	40 - 60	58

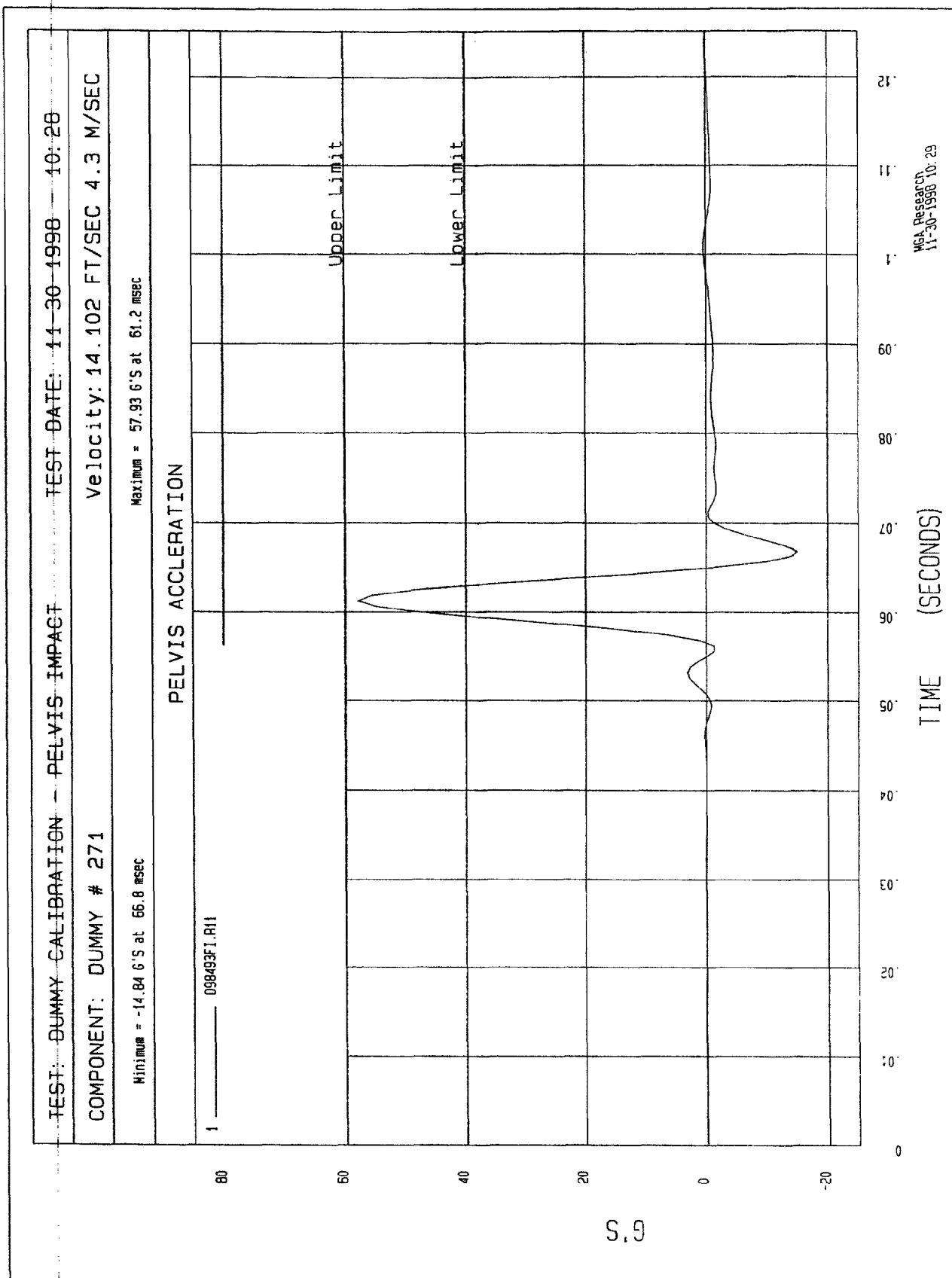
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY





MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST

(PRELOAD = 10 LBS)

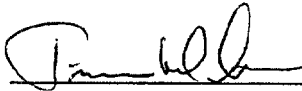
SIDE IMPACT DUMMY (SID)

DATE: November 30, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981494

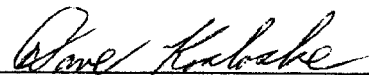
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	45%
FORCE @ 12.7 mm	104 - 162	147
FORCE @ 19.0 mm	163 - 222	201
FORCE @ 25.4 mm	222 - 280	266
FORCE @ 33 mm	325 - 391	357

TEST MEETS SPECIFICATIONS

TECHNICIAN



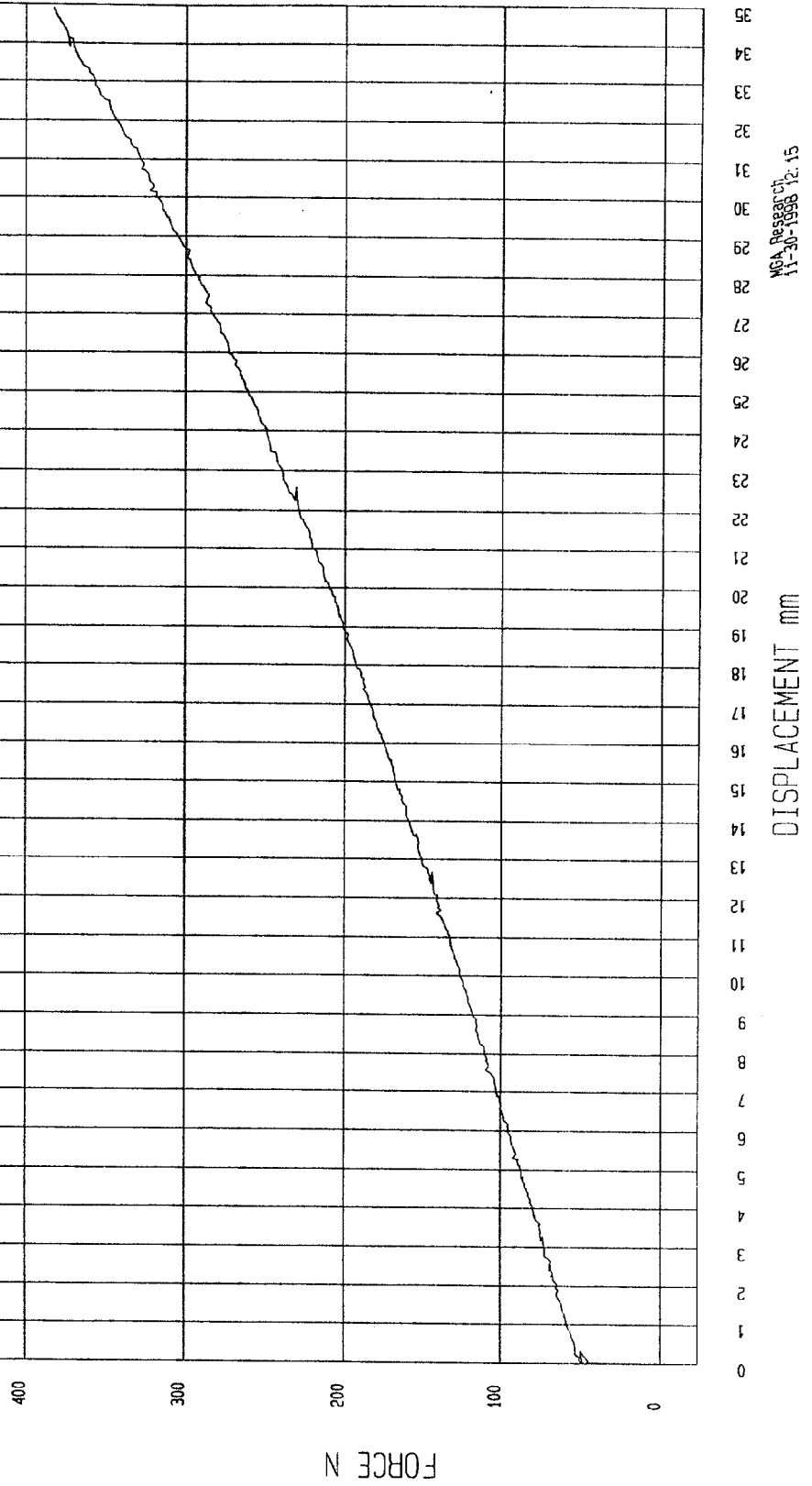
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 11-30-1998 - 12:15:11

COMPONENT: DUMMY # 271

FORCE as a function of DISPLACEMENT



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

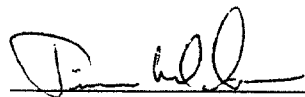
SIDE IMPACT DUMMY (SID)

DATE: November 30, 1998DUMMY SERIAL NUMBER: 271 TEST NUMBER: D981495

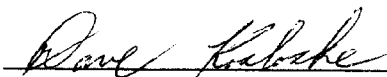
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	40%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	121.1
FORCE @ 30°	151.2 - 204.6	161.2
FORCE @ 40°	204.6 - 258.0	213.3
RETURN ANGLE	12° maximum	1°

TEST MEETS SPECIFICATIONS

TECHNICIAN



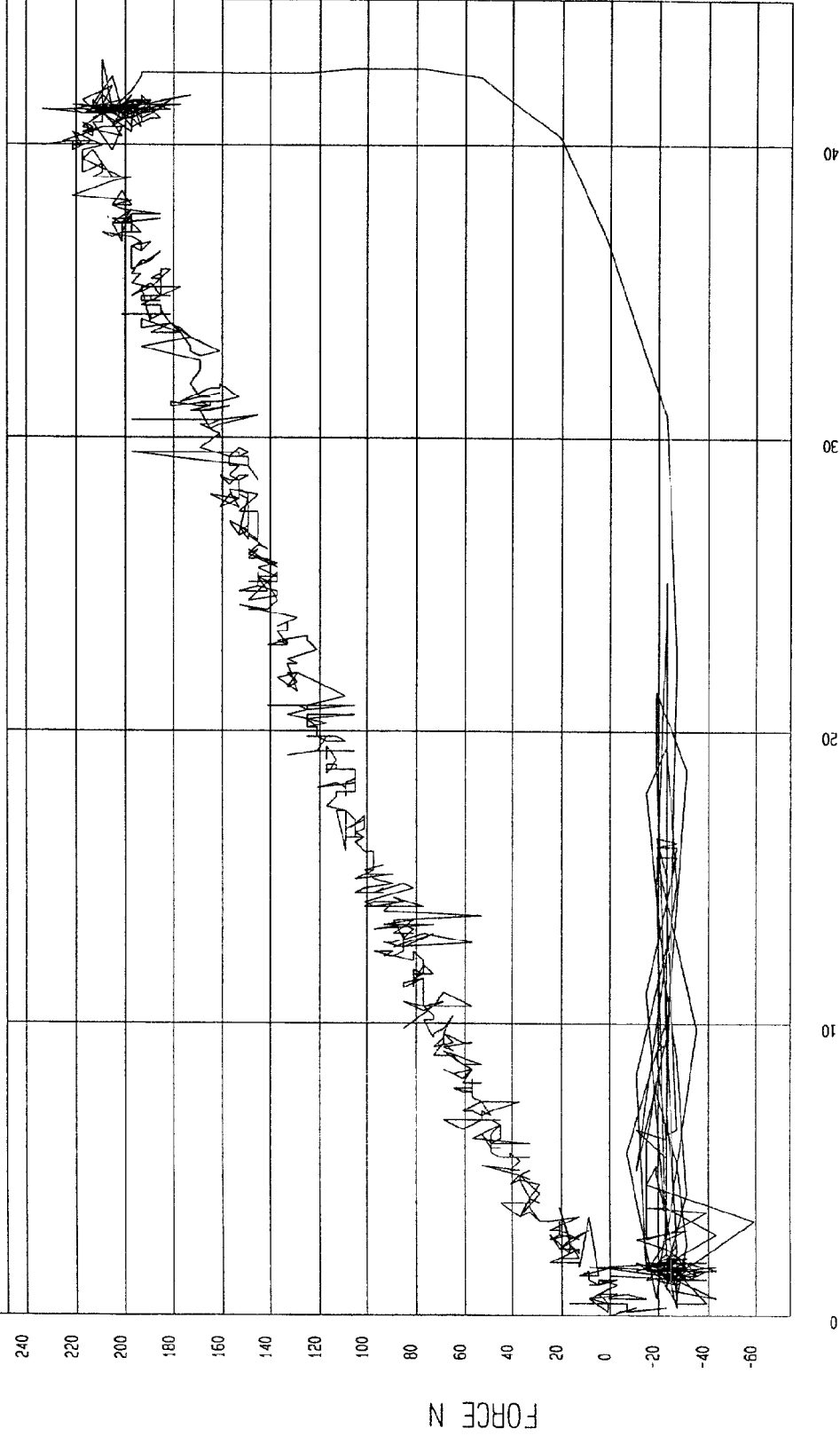
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 11-30-1998 - 15:00:53

COMPONENT: DUMMY # 271

FORCE as a function of TORSO ROTATION



MCA Research
11-30-1998 15:02

POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

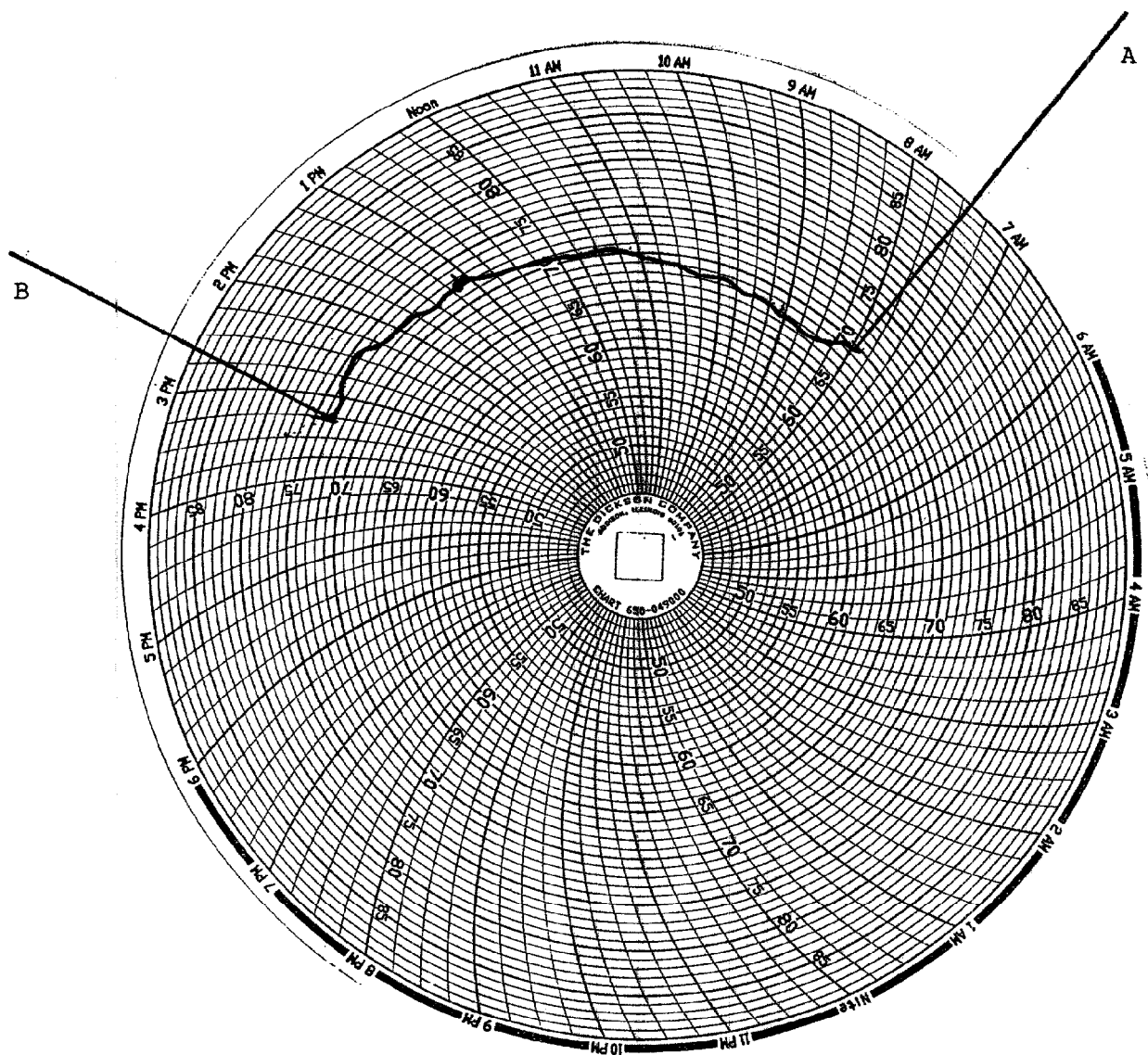
Serial Number: 271

Inspected By: Tim Michnay

Date: November 30, 1998

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

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

VEHICLE AND DUMMY TEMPERATURE

A = dummies installed in vehicle
B = test conducted

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR DRIVER DUMMY NO. 271

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AH0N9	Endevco	October 20, 1998
Lower Rib Y	AGP53	Endevco	October 20, 1998
Lower Spine Y	J12450	Endevco	October 20, 1998
Pelvis Y	AJ417	Endevco	October 20, 1998
Upper Rib Redundant Y	AHT20	Endevco	October 20, 1998
Lower Rib Redundant Y	AHTC3	Endevco	October 20, 1998
Lower Spine Redundant Y	J12461	Endevco	October 20, 1998
Pelvis Redundant Y	AGP20	Endevco	October 20, 1998
Head Center of Gravity X	J20392	Endevco	July 28, 1998
Head Center of Gravity Y	AGWA4	Endevco	July 28, 1998
Head Center of Gravity Z	ALBA7	Endevco	July 28, 1998

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	J06-D22	Entran	June 22, 1998
Moving Barrier CG Y	I18-E18	Entran	September 16, 1998
Moving Barrier CG Z	F12-G02	Entran	June 28, 1998
Moving Barrier Rear Axle X	J10-E14	Entran	June 16, 1998
Moving Barrier Rear Axle Y	F07-A14	Entran	June 16, 1998
Left Mid A-Post Y	H02-J16	Entran	June 16, 1998
Left Lower A-Post Y	G01-J16	Entran	June 28, 1998
Left Mid B-Post Y	F18-G11	Entran	September 15, 1998
Left Lower B-Post Y	D05-R25	Entran	June 16, 1998
Rear Floorpan Above Axle X	F11-G08	Entran	June 18, 1998
Rear Floorpan Above Axle Y	E10-F03	Entran	June 18, 1998
Rear Floorpan Above Axle Z	I25-J05	Entran	September 24, 1998
Driver Seat Track Y	K11-J14	Entran	September 15, 1998
Right Side Sill at Front Seat X	G01-J11	Entran	June 17, 1998
Right Side Sill at Front Seat Y	H02-J15	Entran	June 17, 1998
Right Side Sill at Front Seat Z	I25-J08	Entran	June 25, 1998
Right Side Sill at Rear Seat X	E23-R06	Entran	June 16, 1998
Right Side Sill at Rear Seat Y	J04-F14	Entran	June 28, 1998

VEHICLE INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS			
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Front Seat Y	K11-J08	Entran	September 15, 1998
Left Side Sill at Rear Seat Y	I14-D18	Entran	June 16, 1998
Right Rear Occupant Compartment Y	B13-Z05	Entran	June 18, 1998
Vehicle CG X	F12-G09	Entran	June 16, 1998
Vehicle CG Y	E13-D07	Entran	June 25, 1998
Vehicle CG Z	B14-R06	Entran	June 16, 1998
Left Front Door on Centerline	E10-F05	Entran	September 24, 1998
Midrear of Left Front Door	N/R	----	----
Left Front Door Upper Centerline	C06-G12	Entran	June 22, 1998
Midrear of Left Rear Door	N/R	----	----
Left Rear Door Upper Centerline	N/R	----	----

N/R = Not Recorded

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

All Entran accelerometers are Model No. EGE-72